Colour Television

Chassis

TPN14.1E

LA

Service
Service
Service



Service Manual

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1. Revision List

Manual xxxx xxx xxxx.0

- First release.

Manual xxxx xxx xxxx.1

- **Chapter 2:** Updated table 2.1 Technical Specifications and connection 2.7 Connections (for 40" & 47"PFT4109/12 & 50"Pxx4109/12).
- **Chapter 4:** Added figure 4-22 Cable dressing (40" & 47" PFx4109/12 series).
- **Chapter 5:** Updated table 5-2 Factory mode overview
- **Chapter 6:** Updated tables 6-2 White tone default settings and 6-3 Display code overview.
- **Chapter 7:** Updated table 7-1 Connector overview.
- **Chapter 11:** Added styling sheet 11.16 4100 series 47".

Manual xxxx xxx xxxx.2

- **Chapter 2:** Updated table 2.1 Technical Specifications.
- **Chapter 4:** Added figures 4-2 Cable dressing (22" 4200 series), 4-31 Cable dressing (50" PFx4109/12 series) and 4-32 Cable dressing (50" PFx4109/88 series).
- **Chapter 5:** Updated table 5-2 Factory mode overview.
- **Chapter 6:** Updated tables 6-2 White tone default settings and 6-3 Display code overview.
- **Chapter 7:** Updated figure 7-6 Power Architecture (for 20" & 22" & 24" & 40" & 47" & 50" & 55" & 32" 4009 series) and table 7-1 Connector overview.
- **Chapter 10:** Added circuit diagrams 10.3 A 715G6169 PSU and 10.7 A 715G6350 PSU.
- **Chapter 11:** Added styling sheets 11.2 4200 series 22" and 11.20 4100 series 50".

Manual xxxx xxx xxxx.3

- **Chapter 2:** Updated table 2.1 Technical Specifications and connections 2.8 Connections (for 32" & 40" & 50" 4009/4300 series) and 2.9 Connections (for 32" & 40" & 48" & 55" 5100 series & 42"/47"/55" 5190 & 5200 series & 32"/40"/50" 4009 series).
- **Chapter 4:** Added figures 4-6 Cable dressing (24" Pxx5219/88 series), 4-7 Cable dressing (24" Pxx5219/12 series), 4-14 Cable dressing (32" PHx4309/88 series), 4-16 Cable dressing (32" PFx4309/88 series), 4-18 Cable dressing (32" 5100 series), 4-23 Cable dressing (40" Pxx4300/88 series), 4-24 Cable dressing (40" Pxx4300/12 series), 4-25 Cable dressing (40" 5100 series), 4-28 Cable dressing (48" 5100 series), 4-34 Cable dressing (55" PFx5100/88 series), 4-35 Cable dressing (55" PFx5100/12 series) and sections 4.3 Assembly/Panel Removal (for 20"/22"/24"/28" 4100 series & 22" 4209 series & 32" 4300 series & 23" 4009 series), 4.4 Assembly/Panel Removal (for 32" 4100 series), 4.5 Assembly/Panel Removal (for 40"/47"/50" 4100 series & 40" 4300 series), 4.6 Assembly/Panel Removal (for 24" 5200 series), 4.7 Assembly/Panel Removal (for 40"/55" 5100 series) and 4.8 Assembly/Panel Removal (for 32"/48" 5100 series).
- **Chapter 5:** Updated table 5-2 Factory mode overview.
- **Chapter 6:** Updated tables 6-2 White tone default settings and 6-3 Display code overview.
- **Chapter 7:** Updated figure 7-6 Power Architecture (for 20" & 22" & 24" & 40" & 47" & 50" & 55" & 32" 4009 series) and table 7-1 Connector overview.
- **Chapter 10:** Added circuit diagrams 10.2 A 715G6161 PSU, 10.4 A 715G6197 PSU, 10.6 A 715G6338 PSU, 10.8 A 715G6353 PSU, 10.9 A 715G6405 PSU and 10.19 E 715G6316 Keyboard control panel.
- **Chapter 11:** Added styling sheets 11.5 5210 series 24", 11.9 4300 series 32", 11.10 5100 series 32", 11.13 4300 series 40", 11.14 5100 series 40", 11.18 5100 series 48", and 11.22 5100 series 55".

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- **Chapter 2:** Updated table 2.1 Technical Specifications and connection 2.9 Connections (for 32" & 40" & 48" & 55" 5100 series & 42"/47"/55" 5190 & 5200 series & 32"/40"/50" 4009 series).
- **Chapter 4:** Added figures 4-8 Cable dressing (28" 4100 series), 4-16 Cable dressing (32" PFx4309/88 series), 4-26 Cable dressing (42" 5190 & 5200 series), 4-27 Cable dressing (47" 5190 & 5200 series), 4-36 Cable dressing (55" 5190 & 5200 series) and section 4.9 Assembly/Panel Removal (for 42"/47"/55" 5190 & 5200 series).
- **Chapter 5:** Updated table 5-2 Factory mode overview.
- **Chapter 6:** Updated tables 6-2 White tone default settings and 6-3 Display code overview.
- **Chapter 7:** Updated figure 7-6 Power Architecture (for 20" & 22" & 24" & 40" & 47" & 50" & 55" & 32" 4009 series), table 7-1 Connector overview and section 7.8 Ambilight.
- **Chapter 11:** Added styling sheets 11.6 4100 series 28", 11.15 5200 series 42", 11.17 5200 series 47" and 11.23 5200 series 55".

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- **Chapter 2:** Updated table 2.1 Technical Specifications.
- **Chapter 4:** Added figures 4-3 Cable dressing (23" PHx4009/88 series), 4-4 Cable dressing (23" PHx4009/12 series), 4-17 Cable dressing (32" PFx4309/12 series) and 4-33 Cable dressing (50" 4300 series) and updated assemblys 4.3 Assembly/Panel Removal (for 20"/22"/24"/28" 4100 series & 22" 4209 series & 32" 4300 series & 23" 4009 series), 4.7 Assembly/Panel Removal (for 40"/55" 5100 series) and added assembly 4.10 Assembly/Panel Removal (for 50" 4300 series).
- **Chapter 5:** Updated table 5-2 Factory mode overview.
- **Chapter 6:** Updated tables 6-2 White tone default settings and 6-3 Display code overview.
- **Chapter 8:** Updated figrue 8-11 Internal block diagram and pin configuration.
- **Chapter 11:** Added styling sheets 11.3 4000 series 23", 11.21 4300 series 50".

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- **Chapter 2:** Updated table 2.1 Technical Specifications.
- **Chapter 5:** Updated table 5-2 Factory mode overview.
- **Chapter 6:** Updated table 6-3 Display code overview.

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- **Chapter 2:** Updated table2.1 Technical Specifications, connections 2.8 Connections (for 32" & 40" & 50" 4009/4300 series) and 2.9 Connections (for 32" & 40" & 48" & 55" 5100 series & 42"/47"/55" 5190 & 5200 series & 32"/40"/50" 4009 series).
- **Chapter 4:** Added figures 4-9 Cable dressing (32PFH4009 series), 4-10 Cable dressing (32PFK/T4009 series), 4-11 Cable dressing (32PHH4009 series), 4-12 Cable dressing (32PHK/T4009 series), 4-20 Cable dressing (40PFH4009 series), 4-21 Cable dressing (40PFK/T4009 series), 4-29 Cable dressing (50PFH4009 series) and 4-30 Cable dressing (50PFK/T4009 series) and assembly 4.11 Assembly/Panel Removal (for 32"/40"/50" 4009 series).
- **Chapter 6:** Updated tables 6-2 White tone default settings and 6-3 Display code overview.
- **Chapter 7:** Updated figures 7-5 SSB layout cells (top view) (for 32"/40"/50" 4009 series), 7-6 Power Architecture (for 20" & 22" & 24" & 40" & 47" & 50" & 55" & 32" 4009 series), table 7-1 Connector overview, section 7.1 Introduction and 7.4.3 DVB-T2 DTV part.
- **Chapter 10:** Added circuit diagrams 10.10 A 715G6550 PSU, 10.11 A 715G6863 PSU, 10.12 A 715G6934 PSU and 10.16 B 715G6901 SSB.
- **Chapter 11:** Added styling sheets 11.7 4009 series 32", 11.11 4009 series 40" and 11.19 4009 series 50".

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- **Chapter 4:** Updated figure 4-2 Cable dressing (22" 4200 series).

2. Technical Specs, Diversity, and Connections

Index of this chapter:

2.1 Technical Specifications
2.2 Directions for Use
2.3 Connections (for 20"/22"/24"/28"PxH4109/88 & 20"/24"PxH4109/60 & 50"Pxx4109/88 & 24" 5210 series & 23" 4009 series)
2.4 Connections (for 22"/24"Pxx4109/12 & 22"Pxx4209/12)
2.5 Connections (for 32" 4100 series)
2.6 Connections (for 40" & 47"PFx4109/88 & 55"Pxx5109/88)
2.7 Connections (for 40" & 47"PFT4109/12 & 50"Pxx4109/12)
2.8 Connections (for 32" & 40" & 50" 4009/4300 series)
2.9 Connections (for 32" & 40" & 48" & 55" 5100 series & 42"/47"/55" 5190 & 5200 series & 32"/40"/50" 4009 series)
2.10 Chassis Overview

Notes:

- Figures can deviate due to the different set executions.
- Specifications are indicative (subject to change).

2.1 Technical Specifications

For on-line product support please use the links in back to div. table 2-1. Here is product information available, as well as getting started, user manuals, frequently asked questions and software & drivers.

Table 2-1 Described Model Numbers and Diversity

	2	4			9	10					11
		Mechanics			Block Diagrams	Schematics					
CTN	Connection Overview	Wire Dressing	Rear Cover Removal	SSB Removal	Block Diagram	Power Supply	SSB + PSU combination panel	SSB	J (IR/LED)	E (Keyboard control panel)	Styling
20PHH4109/88	2-1	4-1	4-37	4-38	9.1	10.5	-	10.14	10.17	-	11.1
20PHH4109/60	2-1	4-1	4-37	4-38	9.1	10.5	-	10.14	10.17	-	11.1
22PFH4109/88	2-1	4-1	4-37	4-38	9.1	10.5	-	10.14	10.17	-	11.1
22PFK4109/12	2-6	4-5	4-37	4-38	9.1	10.5	-	10.15	10.17	-	11.4
22PFT4109/12	2-6	4-5	4-37	4-38	9.1	10.5	-	10.15	10.17	-	11.4
22PFK4209/12	2-6	4-2	4-37	4-38	9.1	10.7	-	10.15	10.17	-	11.2
23PHH4009/88	2-1	4-3	4-37	4-38	9.1	10.5	-	10.14	10.17	-	11.3
23PHK4009/12	2-1	4-4	4-37	4-38	9.1	10.5	-	10.15	10.17	-	11.3
23PHT4009/12	2-1	4-4	4-37	4-38	9.1	10.5	-	10.15	10.17	-	11.3
23PHH4109/60	2-1	4-3	4-37	4-38	9.1	10.5	-	10.14	10.17	-	11.3
24PHH4109/88	2-1	4-1	4-37	4-38	9.1	10.5	-	10.14	10.17	-	11.1
24PHH4109/60	2-1	4-1	4-37	4-38	9.1	10.5	-	10.14	10.17	-	11.1
24PHK4109/12	2-6	4-5	4-37	4-38	9.1	10.5	-	10.15	10.17	-	11.4
24PHT4109/12	2-6	4-5	4-37	4-38	9.1	10.5	-	10.15	10.17	-	11.4
24PHH5219/88	2-1	4-6	4-47	4-48	9.1	10.5	-	10.14	10.18	-	11.5
24PHT5219/12	2-1	4-7	4-47	4-48	9.1	10.5	-	10.15	10.18	-	11.5
28PHH4109/88	2-1	4-8	4-37	4-38	9.1	10.4	-	10.14	10.17	-	11.6
32PHH4009/88	2-25	4-11	4-59	4-60	9.1	10.11	-	10.14	10.18	-	11.7
32PHK4009/12	2-30	4-12	4-59	4-60	9.1	10.11	-	10.16	10.18	-	11.7
32PHT4009/12	2-30	4-12	4-59	4-60	9.1	10.11	-	10.16	10.18	-	11.7
32PHH4009/60	2-25	4-11	4-59	4-60	9.1	10.11	-	10.14	10.18	-	11.7
32PFH4009/88	2-25	4-9	4-59	4-60	9.1	10.10	-	10.14	10.18	-	11.7
32PFK4009/12	2-30	4-9	4-59	4-60	9.1	10.10	-	10.16	10.18	-	11.7
32PFT4009/12	2-30	4-9	4-59	4-60	9.1	10.10	-	10.16	10.18	-	11.7
32PHH4109/88	2-11	4-13	4-39	4-42	9.1	-	10.13	-	10.18	-	11.8
32PFH4109/88	2-11	4-13	4-39	4-42	9.1	-	10.13	-	10.18	-	11.8
32PFT4109/12	2-11	4-13	4-39	4-42	9.1	-	10.13	-	10.18	-	11.8
32PHT4109/12	2-11	4-13	4-39	4-42	9.1	-	10.13	-	10.18	-	11.8
32PHH4109/60	2-11	4-13	4-39	4-42	9.1	-	10.13	-	10.18	-	11.8
32PFK4109/12	2-11	4-13	4-39	4-42	9.1	-	10.13	-	10.18	-	11.8
32PHK4109/12	2-11	4-13	4-39	4-42	9.1	-	10.13	-	10.18	-	11.8
32PHH4309/88	2-25	4-14	4-37	4-38	9.1	10.4	-	10.14	10.18	-	11.9
32PHK4309/12	2-25	4-15	4-37	4-38	9.1	10.4	-	10.15	10.18	-	11.9
32PFH4309/88	2-25	4-16	4-37	4-38	9.1	10.2	-	10.14	10.18	-	11.9
32PHH4309/60	2-25	4-14	4-37	4-38	9.1	10.4	-	10.14	10.18	-	11.9
32PHT4309/12	2-25	4-16	4-37	4-38	9.1	10.4	-	10.15	10.18	-	11.9
32PFK4309/12	2-25	4-17	4-37	4-38	9.1	10.2	-	10.15	10.18	-	11.9
32PFT4309/12	2-25	4-17	4-37	4-38	9.1	10.2	-	10.15	10.18	-	11.9
32PFT4309/60	2-25	4-17	4-37	4-38	9.1	10.2	-	10.15	10.18	-	11.9
32PHH4319/88	2-25	4-14	4-37	4-38	9.1	10.4	-	10.14	10.18	-	11.9
32PHT4319/12	2-25	4-16	4-37	4-38	9.1	10.4	-	10.15	10.18	-	11.9
32PHH4329/88	2-25	4-14	4-37	4-38	9.1	10.4	-	10.14	10.18	-	11.9
32PFH4399/88	2-25	4-14	4-37	4-38	9.1	10.2	-	10.14	10.18	-	11.9
32PHK5109/12	2-30	4-18	4-51	4-52	9.1	10.2	-	10.15	-	10.19	11.10

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	2	4			9	10					11
		Mechanics			Block Diagrams	Schematics					
CTN	Connection Overview	Wire Dressing	Rear Cover Removal	SSB Removal	Block Diagram	Power Supply	SSB + PSU combination panel	SSB	J (IR/LED)	E (Keyboard control panel)	Styling
40PFH4009/88	2-25	4-20	4-59	4-60	9.1	10.12	-	10.14	10.18	-	11.11
40PFK4009/12	2-30	4-21	4-59	4-60	9.1	10.12	-	10.16	10.18	-	11.11
40PFT4009/12	2-30	4-21	4-59	4-60	9.1	10.12	-	10.16	10.18	-	11.11
40PFT4009/60	2-30	4-21	4-59	4-60	9.1	10.12	-	10.16	10.18	-	11.11
40PFH4109/88	2-16	4-20	4-43	4-46	9.1	10.1	-	10.14	10.18	-	11.12
40PFT4109/12	2-21	4-22	4-43	4-46	9.1	10.1	-	10.15	10.18	-	11.16
40PFK4109/12	2-21	4-22	4-43	4-46	9.1	10.1	-	10.15	10.18	-	11.16
40PFT4109/60	2-21	4-22	4-43	4-46	9.1	10.1	-	10.15	10.18	-	11.16
40PFH4309/88	2-25	4-23	4-43	4-46	9.1	10.8	-	10.14	10.18	-	11.13
40PFK4309/12	2-25	4-24	4-43	4-46	9.1	10.8	-	10.15	10.18	-	11.13
40PFT4309/12	2-25	4-24	4-43	4-46	9.1	10.8	-	10.15	10.18	-	11.13
40PFT4309/60	2-25	4-24	4-43	4-46	9.1	10.8	-	10.15	10.18	-	11.13
40PFH4319/88	2-25	4-23	4-43	4-46	9.1	10.8	-	10.14	10.18	-	11.13
40PFT4319/12	2-25	4-24	4-43	4-46	9.1	10.8	-	10.15	10.18	-	11.13
40PFH4329/88	2-25	4-23	4-43	4-46	9.1	10.8	-	10.14	10.18	-	11.13
40PFH4399/88	2-25	4-23	4-43	4-46	9.1	10.8	-	10.14	10.18	-	11.13
40PFK5109/12	2-30	4-25	4-49	4-50	9.1	10.3	-	10.15	-	10.19	11.14
42PFK5199/12	2-30	4-26	4-53	4-55	9.1	10.8	-	10.15	-	10.19	11.15
42PFH5209/88	2-30	4-26	4-53	4-55	9.1	10.3	-	10.15	-	10.19	11.15
42PFK5209/12	2-30	4-26	4-53	4-55	9.1	10.3	-	10.15	-	10.19	11.15
42PFT5209/12	2-30	4-26	4-53	4-55	9.1	10.3	-	10.15	-	10.19	11.15
42PFT5209/60	2-30	4-26	4-53	4-55	9.1	10.8	-	10.15	-	10.19	11.15
47PFH4109/88	2-16	4-20	4-43	4-46	9.1	10.1	-	10.14	10.18	-	11.12
47PFT4109/12	2-21	4-22	4-43	4-46	9.1	10.1	-	10.15	10.18	-	11.16
47PFK4109/12	2-21	4-22	4-43	4-46	9.1	10.1	-	10.15	10.18	-	11.16
47PFK5199/12	2-30	4-27	4-53	4-55	9.1	10.6	-	10.15	-	10.19	11.17
47PFH5209/88	2-30	4-27	4-53	4-55	9.1	10.6	-	10.15	-	10.19	11.17
47PFK5209/12	2-30	4-27	4-53	4-55	9.1	10.6	-	10.15	-	10.19	11.17
47PFT5209/12	2-30	4-27	4-53	4-55	9.1	10.6	-	10.15	-	10.19	11.17
47PFT5209/60	2-30	4-27	4-53	4-55	9.1	10.6	-	10.15	-	10.19	11.17
48PFK5109/12	2-30	4-28	4-51	4-52	9.1	10.6	-	10.15	-	10.19	11.18
50PFH4009/88	2-25	4-29	4-59	4-60	9.1	10.6	-	10.14	10.18	-	11.19
50PFK4009/12	2-30	4-30	4-59	4-60	9.1	10.6	-	10.16	10.18	-	11.19
50PFT4009/12	2-30	4-30	4-59	4-60	9.1	10.6	-	10.16	10.18	-	11.19
50PFH4109/88	2-1	4-32	4-43	4-46	9.1	10.3	-	10.14	10.18	-	11.20
50PFK4109/12	2-21	4-31	4-43	4-46	9.1	10.3	-	10.15	10.18	-	11.20
50PFT4109/12	2-21	4-31	4-43	4-46	9.1	10.3	-	10.15	10.18	-	11.20
50PFH4309/88	2-25	4-33	4-56	4-57	9.1	10.6	-	10.14	10.18	-	11.21
50PFK4309/12	2-25	4-33	4-56	4-57	9.1	10.6	-	10.15	10.18	-	11.21
50PFT4309/12	2-25	4-33	4-56	4-57	9.1	10.6	-	10.15	10.18	-	11.21
55PFH5109/88	2-16	4-34	4-49	4-50	9.1	10.9	-	10.14	-	10.19	11.22
55PFK5109/12	2-30	4-35	4-49	4-50	9.1	10.9	-	10.15	-	10.19	11.22
55PFT5109/12	2-30	4-35	4-49	4-50	9.1	10.9	-	10.15	-	10.19	11.22
55PFK5199/12	2-30	4-36	4-53	4-55	9.1	10.6	-	10.15	-	10.19	11.23
55PFH5209/88	2-30	4-36	4-53	4-55	9.1	10.6	-	10.15	-	10.19	11.23
55PFK5209/12	2-30	4-36	4-53	4-55	9.1	10.6	-	10.15	-	10.19	11.23
55PFT5209/12	2-30	4-36	4-53	4-55	9.1	10.6	-	10.15	-	10.19	11.23

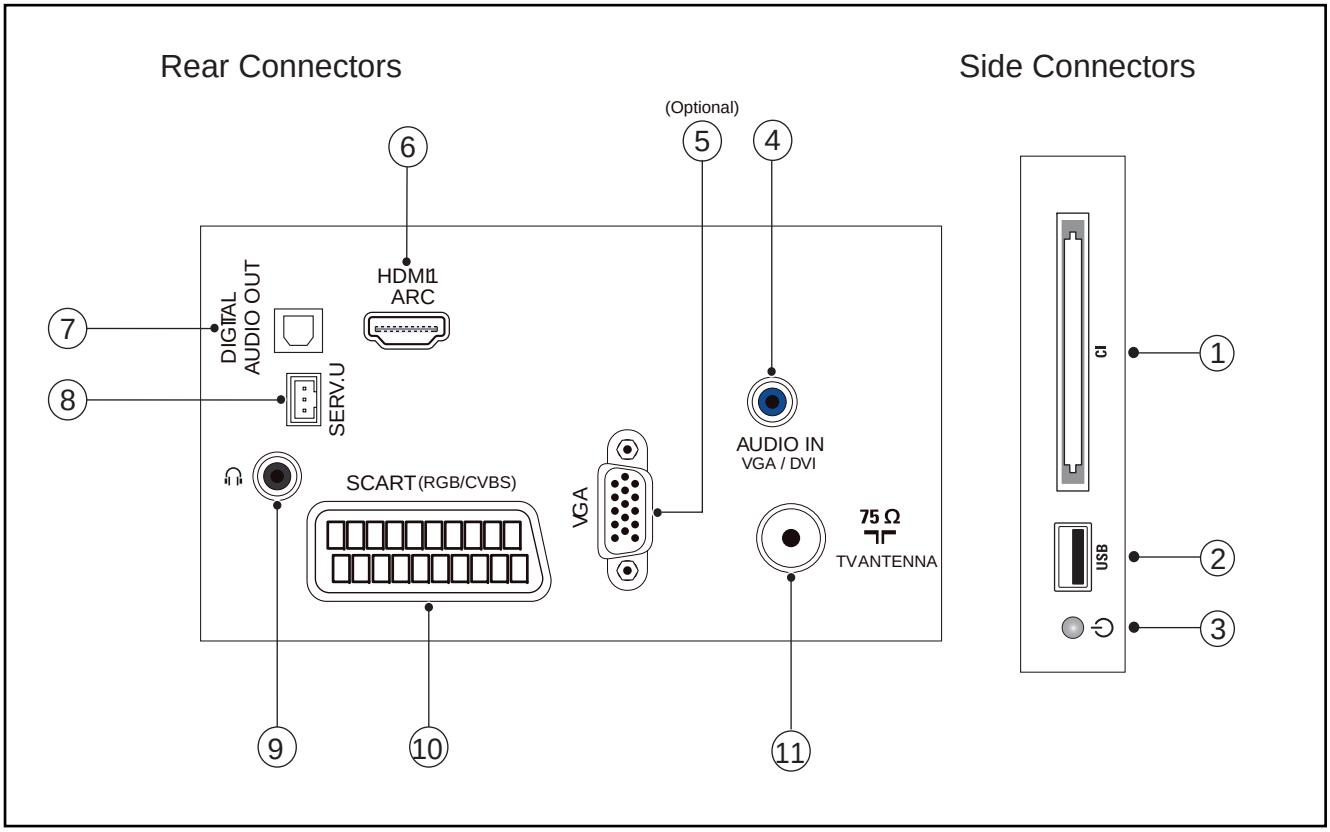
2.2 Directions for Use

Directions for use can be downloaded from the following websites:

http://www.philips.com/support

http://www.p4c.philips.com

2.3 Connections (for 20"/22"/24"/28"PxH4109/88 & 20"/24"PxH4109/60 & 50"Pxx4109/88 & 24" 5210 series & 23" 4009 series)



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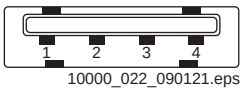
Figure 2-1 Connection overview

Note: The following connector colour abbreviations are used (acc. to DIN/IEC 757): Bk= Black, Bu= Blue, Gn= Green, Gy= Grey, Rd= Red, Wh= White, Ye= Yellow.

2.3.1 Side Connections

1 - Common Interface
68p - See figure 10-13-12

2 - USB2 2.0



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Figure 2-2 USB (type A)

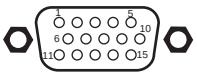
1	- +5V		
2	- Data (-)		
3	- Data (+)		
4	- Ground	Gnd	

3 - Power Button
Turn on/off the TV.

2.3.2 Rear Connections

4 - Audio - In: Left / Right, VGA
Bu - Audio L/R in 0.5 V_{RMS} / 10 kW

5 - PC IN:VGA



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090127

Figure 2-3 VGA connector

1	- Video Red	0.7 V_{PP} / 75 W	
2	- Video Green	0.7 V_{PP} / 75 W	
3	- Video Blue	0.7 V_{PP} / 75 W	
4	- n.c.		
5	- Ground	Gnd	
6	- Ground Red	Gnd	
7	- Ground Green	Gnd	
8	- Ground Blue	Gnd	
9	- +5V_{DC}	+5 V	
10	- Ground Sync	Gnd	
11	- Ground Red	Gnd	
12	- DDC_SDA	DDC data	
13	- H-sync	0 - 5 V	
14	- V-sync	0 - 5 V	
15	- DDC_SCL	DDC clock	

6 - HDMI 1: Digital Video - In, Digital Audio with ARC - In/Out



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090428

Figure 2-4 HDMI (type A) connector

1	- D2+	Data channel	
2	- Shield	Gnd	

3	- D2-	Data channel	
4	- D1+	Data channel	
5	- Shield	Gnd	
6	- D1-	Data channel	
7	- D0+	Data channel	
8	- Shield	Gnd	
9	- D0-	Data channel	
10	- CLK+	Data channel	
11	- Shield	Gnd	
12	- CLK-	Data channel	
13	- Easylink/CEC	Control channel	
14	- ARC	Audio Return Channel	
15	- DDC_SCL	DDC clock	
16	- DDC_SDA	DDC data	
17	- Ground	Gnd	
18	- +5V		
19	- HPD	Hot Plug Detect	
20	- Ground	Gnd	

7 - Cinch: Digital Audio - Out

BK	- Coaxial	0.4 - 0.6V_{PP} / 75 W	

8 - Service / UART

1	- Ground	Gnd	
2	- UART_TX	Transmit	
3	- UART_RX	Receive	

9 - Head phone (Output)

Bk	- Head phone	80 - 600 Ω / 10 mW	

10 - EXT1: Video RGB/YC - In, CVBS - In/Out, Audio - In/Out

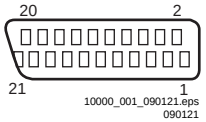


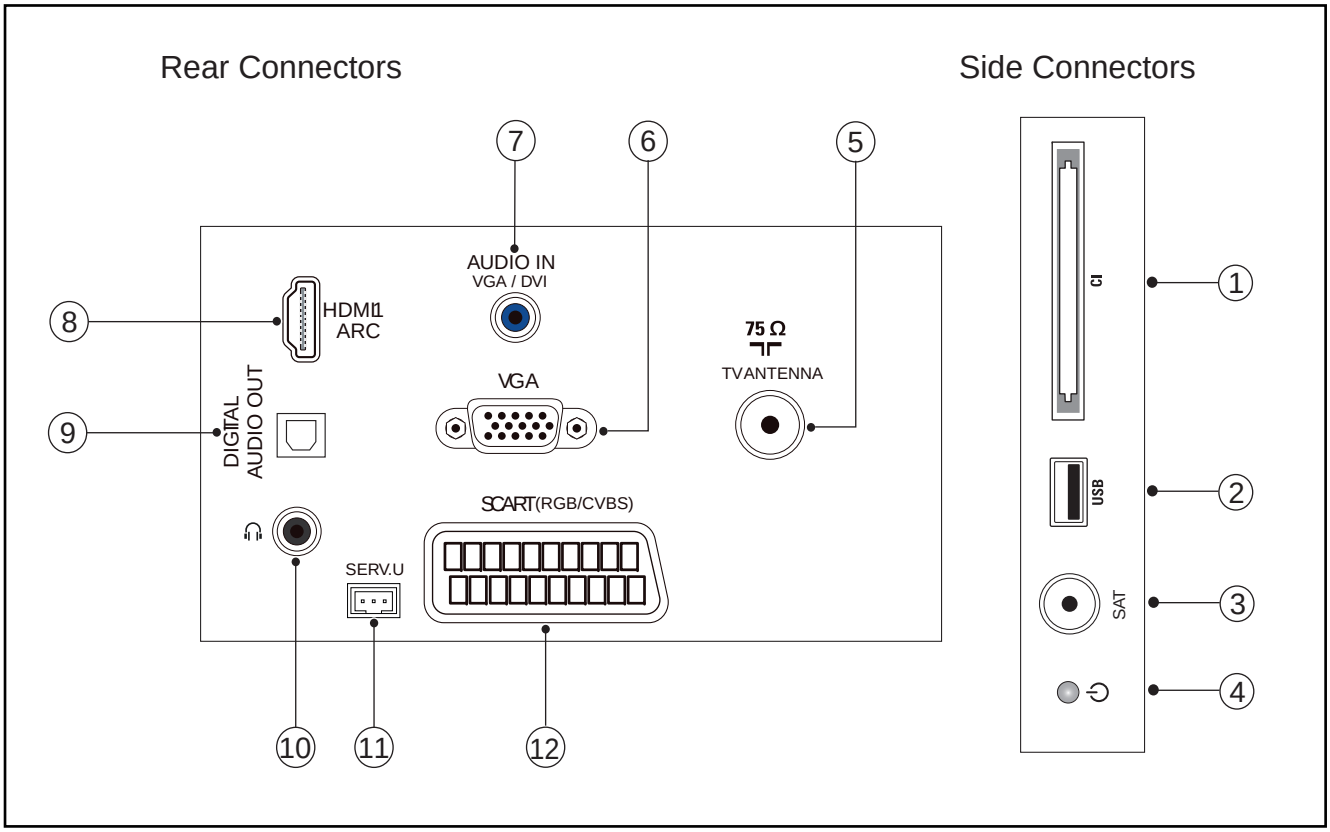
Figure 2-5 SCART connector

1	- Audio R	0.5 V_{RMS} / 1 kΩ	
2	- Audio R	0.5 V_{RMS} / 10 kΩ	
3	- Audio L	0.5 V_{RMS} / 1 kΩ	
4	- Ground Audio	Gnd	
5	- Ground Blue	Gnd	
6	- Audio L	0.5 V_{RMS} / 10 kΩ	
7	- Video Blue/C-out	0.7 V_{PP} / 75 Ω	
8	- Function Select	0 - 2 V: INT	
		4.5 - 7 V: EXT 16:9	
		9.5 - 12 V: EXT 4:3	
9	- Ground Green	Gnd	
10	- n.c.		
11	- Video Green	0.7 V_{PP} / 75 Ω	
12	- n.c.		
13	- Ground Red	Gnd	
14	- Ground P50	Gnd	
15	- Video Red/C	0.7 V_{PP} / 75 Ω	
16	- Status/FBL	0 - 0.4 V: INT	
		1 - 3 V: EXT / 75 Ω	
17	- Ground Video	Gnd	
18	- Ground FBL	Gnd	
19	- Video CVBS	1 V_{PP} / 75 Ω	
20	- Video CVBS/Y	1 V_{PP} / 75 Ω	
21	- Shield	Gnd	

11 - TV ANTENNA - In

Signal input from an antenna, cable or satellite.

2.4 Connections (for 22"/24"Pxx4109/12 & 22"Pxx4209/12)



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140110

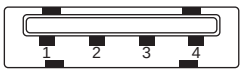
Figure 2-6 Connection overview

Note: The following connector colour abbreviations are used (acc. to DIN/IEC 757): Bk= Black, Bu= Blue, Gn= Green, Gy= Grey, Rd= Red, Wh= White, Ye= Yellow.

2.4.1 Side Connections

1 - Common Interface
68p - See figure 10-13-12

2 - USB2 2.0



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Figure 2-7 USB (type A)

1	- +5V	
2	- Data (-)	
3	- Data (+)	
4	- Ground	Gnd

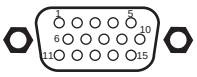
3 - SAT - In
Signal input from an SAT.

4 - Power Button
Turn on/off the TV.

2.4.2 Rear Connections

5 - TV ANTENNA - In
Signal input from an antenna, cable or satellite.

6 - PC IN:VGA



10000_002_090121.eps
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Figure 2-8 VGA connector

1	- Video Red	0.7 V_{PP} / 75 W	
2	- Video Green	0.7 V_{PP} / 75 W	
3	- Video Blue	0.7 V_{PP} / 75 W	
4	- n.c.		
5	- Ground	Gnd	
6	- Ground Red	Gnd	
7	- Ground Green	Gnd	
8	- Ground Blue	Gnd	
9	- +5V_{DC}	+5 V	
10	- Ground Sync	Gnd	
11	- Ground Red	Gnd	
12	- DDC_SDA	DDC data	
13	- H-sync	0 - 5 V	
14	- V-sync	0 - 5 V	
15	- DDC_SCL	DDC clock	

7 - Audio - In: Left / Right, VGA
Bu - Audio L/R in 0.5 V_{RMS} / 10 kW

8 - HDMI 1: Digital Video - In, Digital Audio with ARC - In/Out



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Figure 2-9 HDMI (type A) connector

1	- D2+	Data channel	
2	- Shield	Gnd	
3	- D2-	Data channel	
4	- D1+	Data channel	
5	- Shield	Gnd	
6	- D1-	Data channel	
7	- D0+	Data channel	
8	- Shield	Gnd	
9	- D0-	Data channel	
10	- CLK+	Data channel	
11	- Shield	Gnd	
12	- CLK-	Data channel	
13	- Easylink/CEC	Control channel	
14	- ARC	Audio Return Channel	
15	- DDC_SCL	DDC clock	
16	- DDC_SDA	DDC data	
17	- Ground	Gnd	
18	- +5V		
19	- HPD	Hot Plug Detect	
20	- Ground	Gnd	

9 - Cinch: Digital Audio - Out

BK	- Coaxial	0.4 - 0.6V_{PP} / 75 W	

10 - Head phone (Output)

Bk	- Head phone	80 - 600 Ω / 10 mW	

11 - Service / UART

1	- Ground	Gnd	
2	- UART_TX	Transmit	
3	- UART_RX	Receive	

12 - EXT1: Video RGB/YC - In, CVBS - In/Out, Audio - In/Out

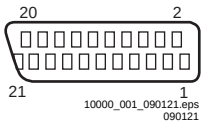
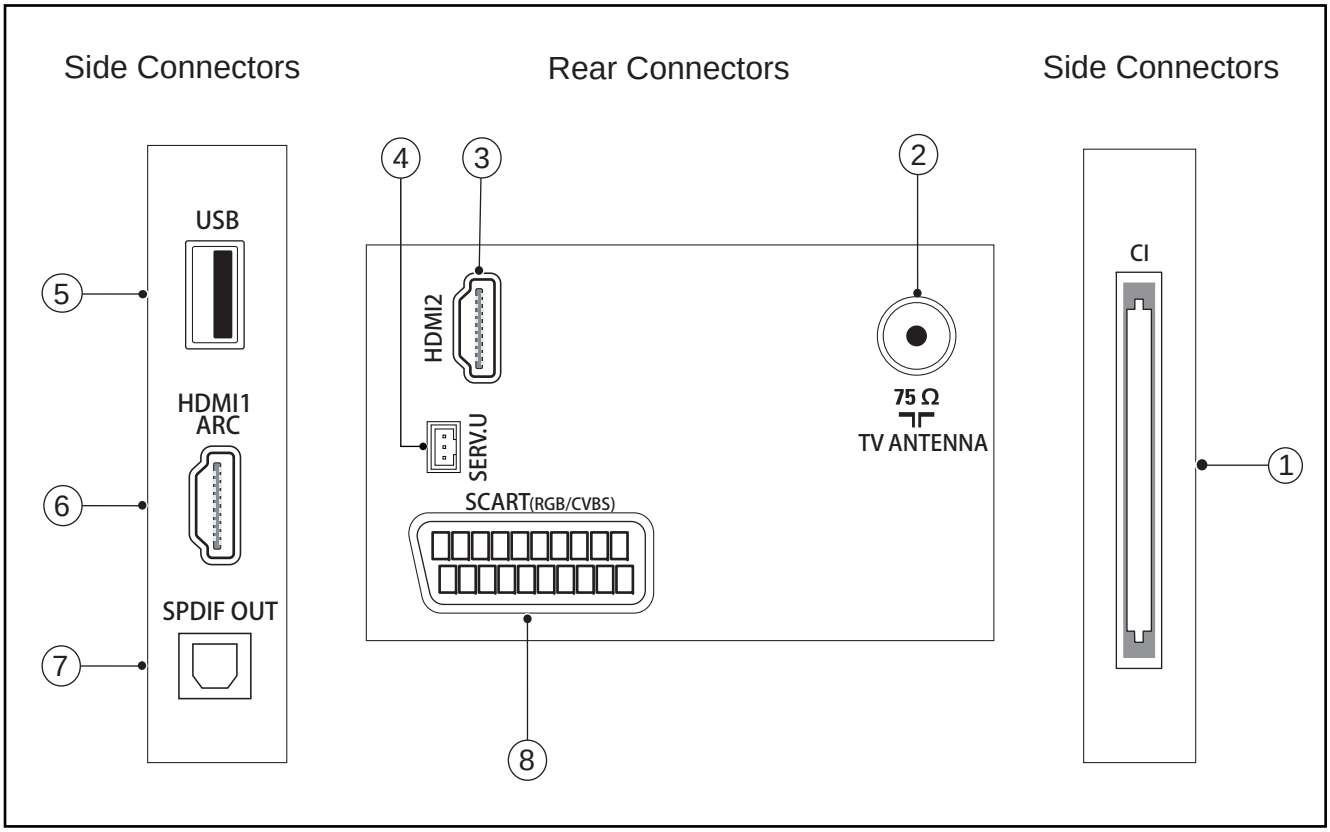


Figure 2-10 SCART connector

1	- Audio R	0.5 V_{RMS} / 1 kΩ	
2	- Audio R	0.5 V_{RMS} / 10 kΩ	
3	- Audio L	0.5 V_{RMS} / 1 kΩ	
4	- Ground Audio	Gnd	
5	- Ground Blue	Gnd	
6	- Audio L	0.5 V_{RMS} / 10 kΩ	
7	- Video Blue/C-out	0.7 V_{PP} / 75 Ω	
8	- Function Select	0 - 2 V: INT 4.5 - 7 V: EXT 16:9 9.5 - 12 V: EXT 4:3	
9	- Ground Green	Gnd	
10	- n.c.		
11	- Video Green	0.7 V_{PP} / 75 Ω	
12	- n.c.		
13	- Ground Red	Gnd	
14	- Ground P50	Gnd	
15	- Video Red/C	0.7 V_{PP} / 75 Ω	
16	- Status/FBL	0 - 0.4 V: INT 1 - 3 V: EXT / 75 Ω	
17	- Ground Video	Gnd	
18	- Ground FBL	Gnd	
19	- Video CVBS	1 V_{PP} / 75 Ω	
20	- Video CVBS/Y	1 V_{PP} / 75 Ω	
21	- Shield	Gnd	

2.5 Connections (for 32" 4100 series)



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130730

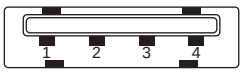
Figure 2-11 Connection overview

Note: The following connector colour abbreviations are used (acc. to DIN/IEC 757): Bk= Black, Bu= Blue, Gn= Green, Gy= Grey, Rd= Red, Wh= White, Ye= Yellow.

2.5.1 Side Connections

1 - Common Interface
68p - See figure 10-13-12

5 - USB2 2.0



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090121

Figure 2-12 USB (type A)

1	- +5V		
2	- Data (-)		
3	- Data (+)		
4	- Ground	Gnd	

6 - HDMI 1: Digital Video - In, Digital Audio with ARC - In/Out



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090428

Figure 2-13 HDMI (type A) connector

1	- D2+	Data channel	
2	- Shield	Gnd	
3	- D2-	Data channel	
4	- D1+	Data channel	
5	- Shield	Gnd	
6	- D1-	Data channel	
7	- D0+	Data channel	
8	- Shield	Gnd	
9	- D0-	Data channel	
10	- CLK+	Data channel	
11	- Shield	Gnd	
12	- CLK-	Data channel	
13	- Easylink/CEC	Control channel	
14	- ARC	Audio Return Channel	
15	- DDC_SCL	DDC clock	
16	- DDC_SDA	DDC data	
17	- Ground	Gnd	
18	- +5V		
19	- HPD	Hot Plug Detect	
20	- Ground	Gnd	

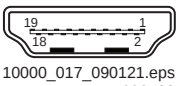
7 - Cinch: Digital Audio - Out

BK	- Coaxial	0.4 - 0.6V_{PP} / 75 Ω

2.5.2 Rear Connections

2 - TV ANTENNA - In
Signal input from an antenna, cable or satellite.

3 - HDMI2 : Digital Video - In, Digital Audio - In/Out



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090428

Figure 2-14 HDMI (type A) connector

1	- D2+	Data channel	
2	- Shield	Gnd	
3	- D2-	Data channel	
4	- D1+	Data channel	

5	- Shield	Gnd	
6	- D1-	Data channel	
7	- D0+	Data channel	
8	- Shield	Gnd	
9	- D0-	Data channel	
10	- CLK+	Data channel	
11	- Shield	Gnd	
12	- CLK-	Data channel	
13	- Easylink/CEC	Control channel	
14	- n.c.		
15	- DDC_SCL	DDC clock	
16	- DDC_SDA	DDC data	
17	- Ground	Gnd	
18	- +5V		
19	- HPD	Hot Plug Detect	
20	- Ground	Gnd	

4 - Service / UART

1	- Ground	Gnd	
2	- UART_TX	Transmit	
3	- UART_RX	Receive	

8 - EXT1: Video RGB/YC - In, CVBS - In/Out, Audio - In/Out

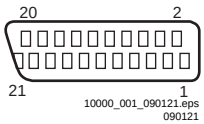
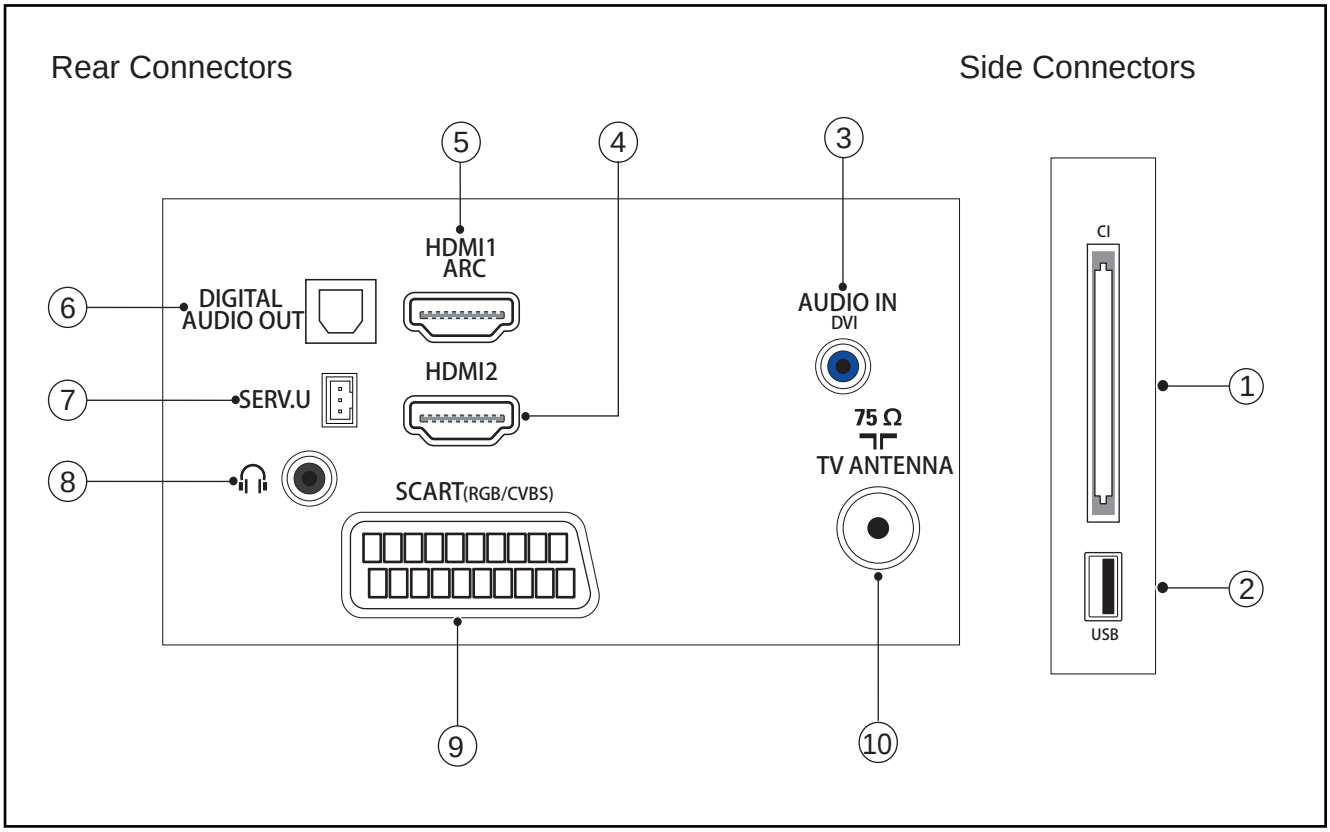


Figure 2-15 SCART connector

1	- Audio R	0.5 V_{RMS} / 1 kΩ	
2	- Audio R	0.5 V_{RMS} / 10 kΩ	
3	- Audio L	0.5 V_{RMS} / 1 kΩ	
4	- Ground Audio	Gnd	
5	- Ground Blue	Gnd	
6	- Audio L	0.5 V_{RMS} / 10 kΩ	
7	- Video Blue/C-out	0.7 V_{PP} / 75 Ω	
8	- Function Select	0 - 2 V: INT 4.5 - 7 V: EXT 16:9 9.5 - 12 V: EXT 4:3	
9	- Ground Green	Gnd	
10	- n.c.		
11	- Video Green	0.7 V_{PP} / 75 Ω	
12	- n.c.		
13	- Ground Red	Gnd	
14	- Ground P50	Gnd	
15	- Video Red/C	0.7 V_{PP} / 75 Ω	
16	- Status/FBL	0 - 0.4 V: INT 1 - 3 V: EXT / 75 Ω	
17	- Ground Video	Gnd	
18	- Ground FBL	Gnd	
19	- Video CVBS	1 V_{PP} / 75 Ω	
20	- Video CVBS/Y	1 V_{PP} / 75 Ω	
21	- Shield	Gnd	

2.6 Connections (for 40" & 47"PFx4109/88 & 55"Pxx5109/88)



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130719

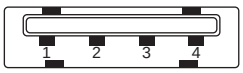
Figure 2-16 Connection overview

Note: The following connector colour abbreviations are used (acc. to DIN/IEC 757): Bk= Black, Bu= Blue, Gn= Green, Gy= Grey, Rd= Red, Wh= White, Ye= Yellow.

2.6.1 Side Connections

1 - Common Interface
68p - See figure 10-13-12

2 - USB2 2.0



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090121

Figure 2-17 USB (type A)

1	- +5V	
2	- Data (-)	
3	- Data (+)	
4	- Ground	Gnd

2.6.2 Rear Connections

3 - Audio - In: Left / Right, VGA
Bu - Audio L/R in 0.5 V_{RMS} / 10 kW

4 - HDMI2 : Digital Video - In, Digital Audio - In/Out



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Figure 2-18 HDMI (type A) connector

1	- D2+	Data channel
2	- Shield	Gnd
3	- D2-	Data channel
4	- D1+	Data channel
5	- Shield	Gnd
6	- D1-	Data channel
7	- D0+	Data channel
8	- Shield	Gnd
9	- D0-	Data channel
10	- CLK+	Data channel
11	- Shield	Gnd
12	- CLK-	Data channel
13	- Easylink/CEC	Control channel
14	- n.c.	
15	- DDC_SCL	DDC clock
16	- DDC_SDA	DDC data
17	- Ground	Gnd
18	- +5V	
19	- HPD	Hot Plug Detect
20	- Ground	Gnd

5 - HDMI 1: Digital Video - In, Digital Audio with ARC - In/Out



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090428

Figure 2-19 HDMI (type A) connector

1	- D2+	Data channel
2	- Shield	Gnd
3	- D2-	Data channel
4	- D1+	Data channel
5	- Shield	Gnd
6	- D1-	Data channel
7	- D0+	Data channel

8	- Shield	Gnd	
9	- D0-	Data channel	
10	- CLK+	Data channel	
11	- Shield	Gnd	
12	- CLK-	Data channel	
13	- Easylink/CEC	Control channel	
14	- ARC	Audio Return Channel	
15	- DDC_SCL	DDC clock	
16	- DDC_SDA	DDC data	
17	- Ground	Gnd	
18	- +5V		
19	- HPD	Hot Plug Detect	
20	- Ground	Gnd	

6 - Cinch: Digital Audio - Out

BK	- Coaxial	0.4 - 0.6V_{PP} / 75 W	

7 - Service / UART

1	- Ground	Gnd	
2	- UART_TX	Transmit	
3	- UART_RX	Receive	

8 - Head phone (Output)

Bk	- Head phone	80 - 600 Ω / 10 mW	

9 - EXT1: Video RGB/YC - In, CVBS - In/Out, Audio - In/Out

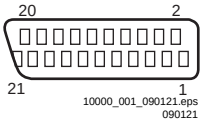


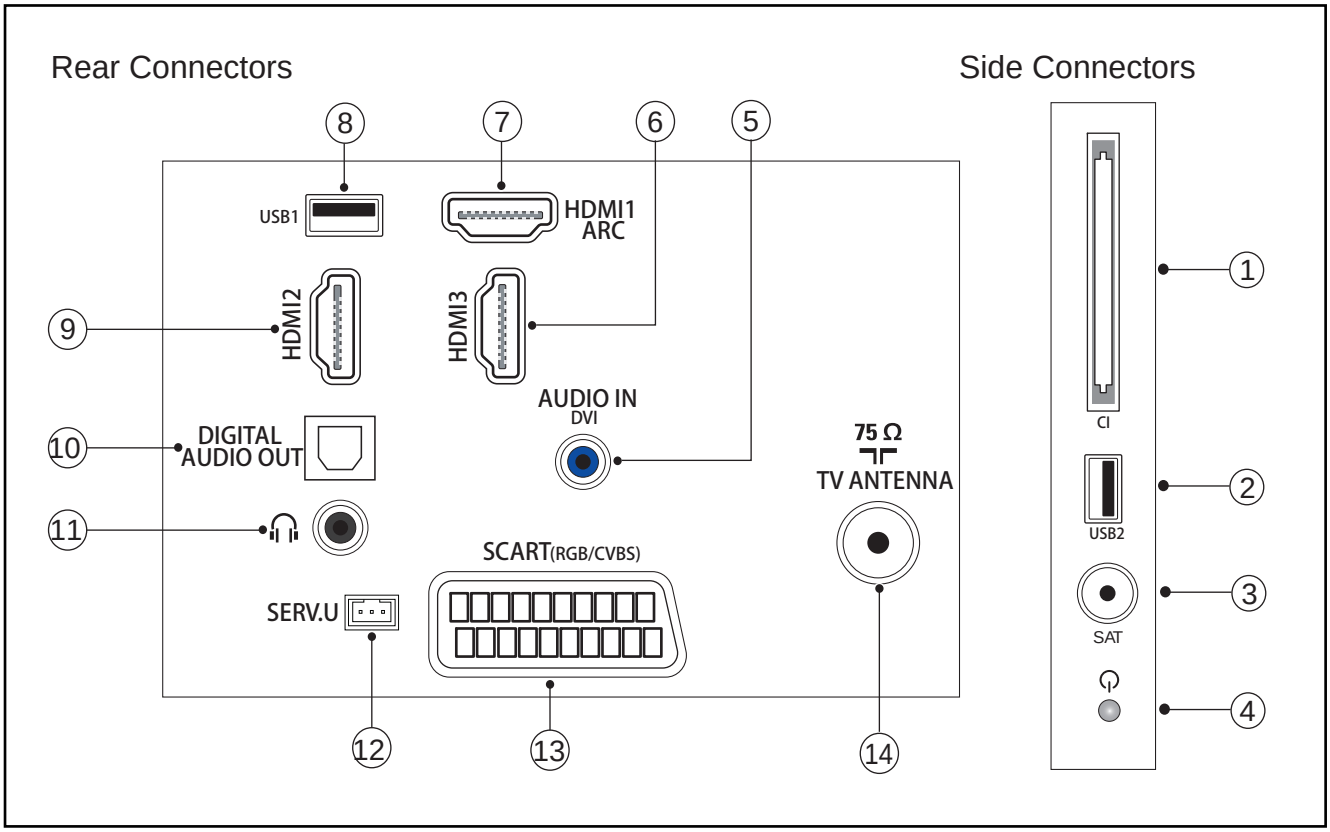
Figure 2-20 SCART connector

1	- Audio R	0.5 V_{RMS} / 1 kΩ	
2	- Audio R	0.5 V_{RMS} / 10 kΩ	
3	- Audio L	0.5 V_{RMS} / 1 kΩ	
4	- Ground Audio	Gnd	
5	- Ground Blue	Gnd	
6	- Audio L	0.5 V_{RMS} / 10 kΩ	
7	- Video Blue/C-out	0.7 V_{PP} / 75 Ω	
8	- Function Select	0 - 2 V: INT	
		4.5 - 7 V: EXT 16:9	
		9.5 - 12 V: EXT 4:3	
9	- Ground Green	Gnd	
10	- n.c.		
11	- Video Green	0.7 V_{PP} / 75 Ω	
12	- n.c.		
13	- Ground Red	Gnd	
14	- Ground P50	Gnd	
15	- Video Red/C	0.7 V_{PP} / 75 Ω	
16	- Status/FBL	0 - 0.4 V: INT	
		1 - 3 V: EXT / 75 Ω	
17	- Ground Video	Gnd	
18	- Ground FBL	Gnd	
19	- Video CVBS	1 V_{PP} / 75 Ω	
20	- Video CVBS/Y	1 V_{PP} / 75 Ω	
21	- Shield	Gnd	

10 - TV ANTENNA - In

Signal input from an antenna, cable or satellite.

2.7 Connections (for 40" & 47"PFT4109/12 & 50"Pxx4109/12)



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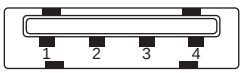
Figure 2-21 Connection overview

Note: The following connector colour abbreviations are used (acc. to DIN/IEC 757): Bk= Black, Bu= Blue, Gn= Green, Gy= Grey, Rd= Red, Wh= White, Ye= Yellow.

2.7.1 Side Connections

1 - Common Interface
68p - See figure 10-13-12

2 - USB2 2.0



10000_022_090121.eps
090121

Figure 2-22 USB (type A)

1	- +5V	
2	- Data (-)	
3	- Data (+)	
4	- Ground	Gnd

3 - SAT - In
Signal input from an SAT.

4 - Power Button
Turn on/off the TV.

2.7.2 Rear Connections

5 - Audio - In: Left / Right, VGA

Bu	- Audio L/R in	0.5 V_{RMS} / 10 kW

6 - HDMI3 : Digital Video - In, Digital Audio - In/Out



10000_017_090121.eps
090428

Figure 2-23 HDMI (type A) connector

1	- D2+	Data channel
2	- Shield	Gnd
3	- D2-	Data channel
4	- D1+	Data channel
5	- Shield	Gnd
6	- D1-	Data channel
7	- D0+	Data channel
8	- Shield	Gnd
9	- D0-	Data channel
10	- CLK+	Data channel
11	- Shield	Gnd
12	- CLK-	Data channel
13	- Easylink/CEC	Control channel
14	- n.c.	
15	- DDC_SCL	DDC clock
16	- DDC_SDA	DDC data
17	- Ground	Gnd
18	- +5V	
19	- HPD	Hot Plug Detect
20	- Ground	Gnd

7 - HDMI 1: Digital Video - In, Digital Audio - In/Out
See 6 - HDMI3 : Digital Video - In, Digital Audio - In/Out

8 - USB1 2.0
See 2 - USB2 2.0

9 - HDMI 2 : Digital Video - In, Digital Audio - In/Out
See 6 - HDMI3 : Digital Video - In, Digital Audio - In/Out

10 - Cinch: Digital Audio - Out

BK	- Coaxial	0.4 - 0.6V_{PP} / 75 W	

11 - Head phone (Output)

Bk	- Head phone	80 - 600 Ω / 10 mW	

12 - Service / UART

1	- Ground	Gnd	
2	- UART_TX	Transmit	
3	- UART_RX	Receive	

13 - EXT1: Video RGB/YC - In, CVBS - In/Out, Audio - In/Out

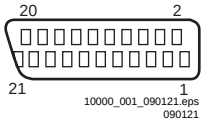


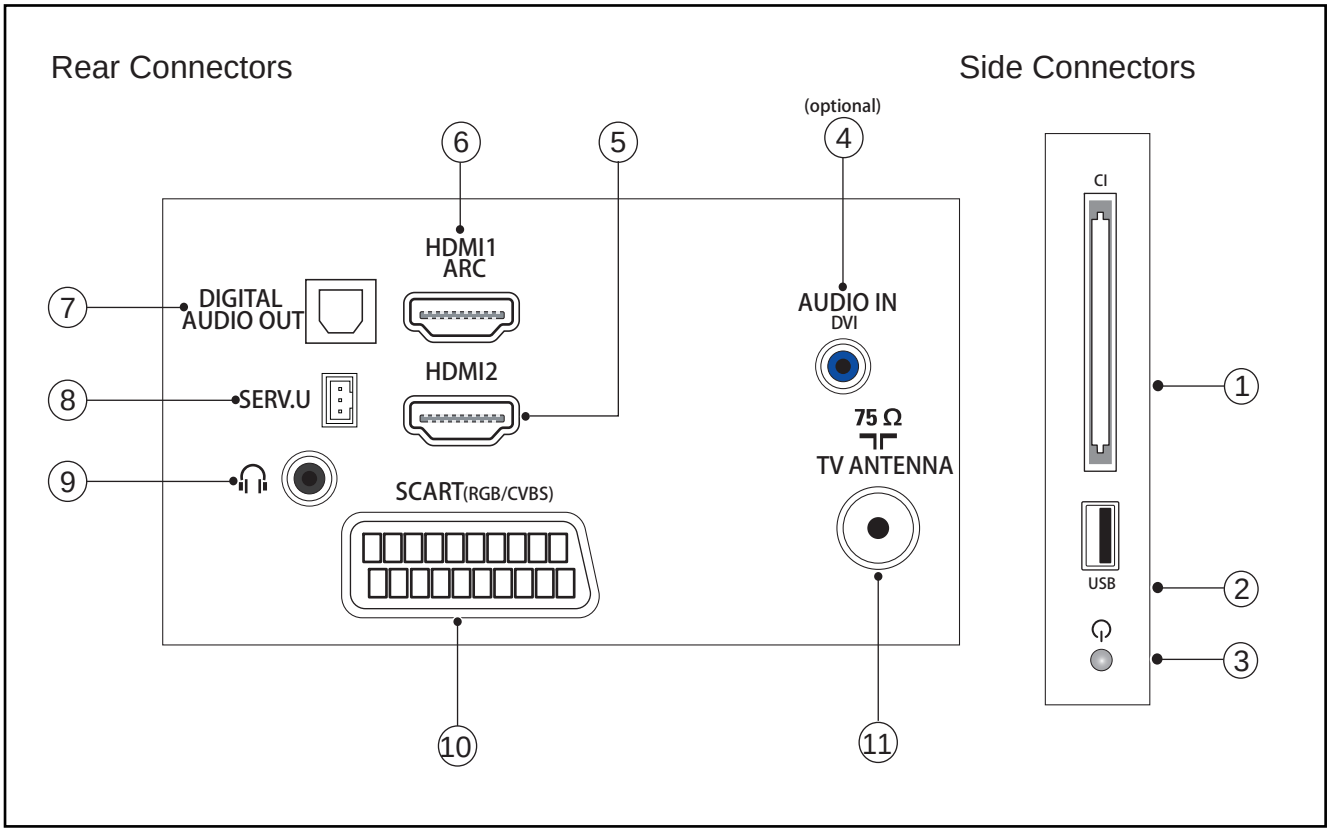
Figure 2-24 SCART connector

1	- Audio R	0.5 V_{RMS} / 1 kΩ	
2	- Audio R	0.5 V_{RMS} / 10 kΩ	
3	- Audio L	0.5 V_{RMS} / 1 kΩ	
4	- Ground Audio	Gnd	
5	- Ground Blue	Gnd	
6	- Audio L	0.5 V_{RMS} / 10 kΩ	
7	- Video Blue/C-out	0.7 V_{PP} / 75 Ω	
8	- Function Select	0 - 2 V: INT	
		4.5 - 7 V: EXT 16:9	
		9.5 - 12 V: EXT 4:3	
9	- Ground Green	Gnd	
10	- n.c.		
11	- Video Green	0.7 V_{PP} / 75 Ω	
12	- n.c.		
13	- Ground Red	Gnd	
14	- Ground P50	Gnd	
15	- Video Red/C	0.7 V_{PP} / 75 Ω	
16	- Status/FBL	0 - 0.4 V: INT	
		1 - 3 V: EXT / 75 Ω	
17	- Ground Video	Gnd	
18	- Ground FBL	Gnd	
19	- Video CVBS	1 V_{PP} / 75 Ω	
20	- Video CVBS/Y	1 V_{PP} / 75 Ω	
21	- Shield	Gnd	

14 - TV ANTENNA - In

Signal input from an antenna, cable or satellite.

2.8 Connections (for 32" & 40" & 50" 4009/4300 series)



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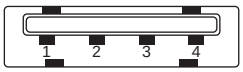
Figure 2-25 Connection overview

Note: The following connector colour abbreviations are used (acc. to DIN/IEC 757): Bk= Black, Bu= Blue, Gn= Green, Gy= Grey, Rd= Red, Wh= White, Ye= Yellow.

2.8.1 Side Connections

1 - Common Interface
68p - See figure 10-13-12

2 - USB2 2.0



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Figure 2-26 USB (type A)

1	- +5V	
2	- Data (-)	
3	- Data (+)	
4	- Ground	Gnd

3 - SAT - In
Signal input from an SAT.

4 - Power Button
Turn on/off the TV.

2.8.2 Rear Connections

5 - Audio - In: Left / Right, VGA
Bu - Audio L/R in 0.5 V_{RMS} / 10 kW

6 - HDMI2 : Digital Video - In, Digital Audio - In/Out



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Figure 2-27 HDMI (type A) connector

1	- D2+	Data channel
2	- Shield	Gnd
3	- D2-	Data channel
4	- D1+	Data channel
5	- Shield	Gnd
6	- D1-	Data channel
7	- D0+	Data channel
8	- Shield	Gnd
9	- D0-	Data channel
10	- CLK+	Data channel
11	- Shield	Gnd
12	- CLK-	Data channel
13	- Easylink/CEC	Control channel
14	- n.c.	
15	- DDC_SCL	DDC clock
16	- DDC_SDA	DDC data
17	- Ground	Gnd
18	- +5V	
19	- HPD	Hot Plug Detect
20	- Ground	Gnd

7 - HDMI 1: Digital Video - In, Digital Audio with ARC - In/Out



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Figure 2-28 HDMI (type A) connector

1	- D2+	Data channel	
2	- Shield	Gnd	
3	- D2-	Data channel	
4	- D1+	Data channel	
5	- Shield	Gnd	
6	- D1-	Data channel	
7	- D0+	Data channel	
8	- Shield	Gnd	
9	- D0-	Data channel	
10	- CLK+	Data channel	
11	- Shield	Gnd	
12	- CLK-	Data channel	
13	- Easylink/CEC	Control channel	
14	- ARC	Audio Return Channel	
15	- DDC_SCL	DDC clock	
16	- DDC_SDA	DDC data	
17	- Ground	Gnd	
18	- +5V		
19	- HPD	Hot Plug Detect	
20	- Ground	Gnd	

8 - Cinch: Digital Audio - Out

BK	- Coaxial	0.4 - 0.6V_{PP} / 75 W	

9 - Service / UART

1	- Ground	Gnd	
2	- UART_TX	Transmit	
3	- UART_RX	Receive	

10 - Head phone (Output)

Bk	- Head phone	80 - 600 W / 10 mW

11 - EXT1: Video RGB/YC - In, CVBS - In/Out, Audio - In/Out

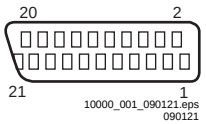


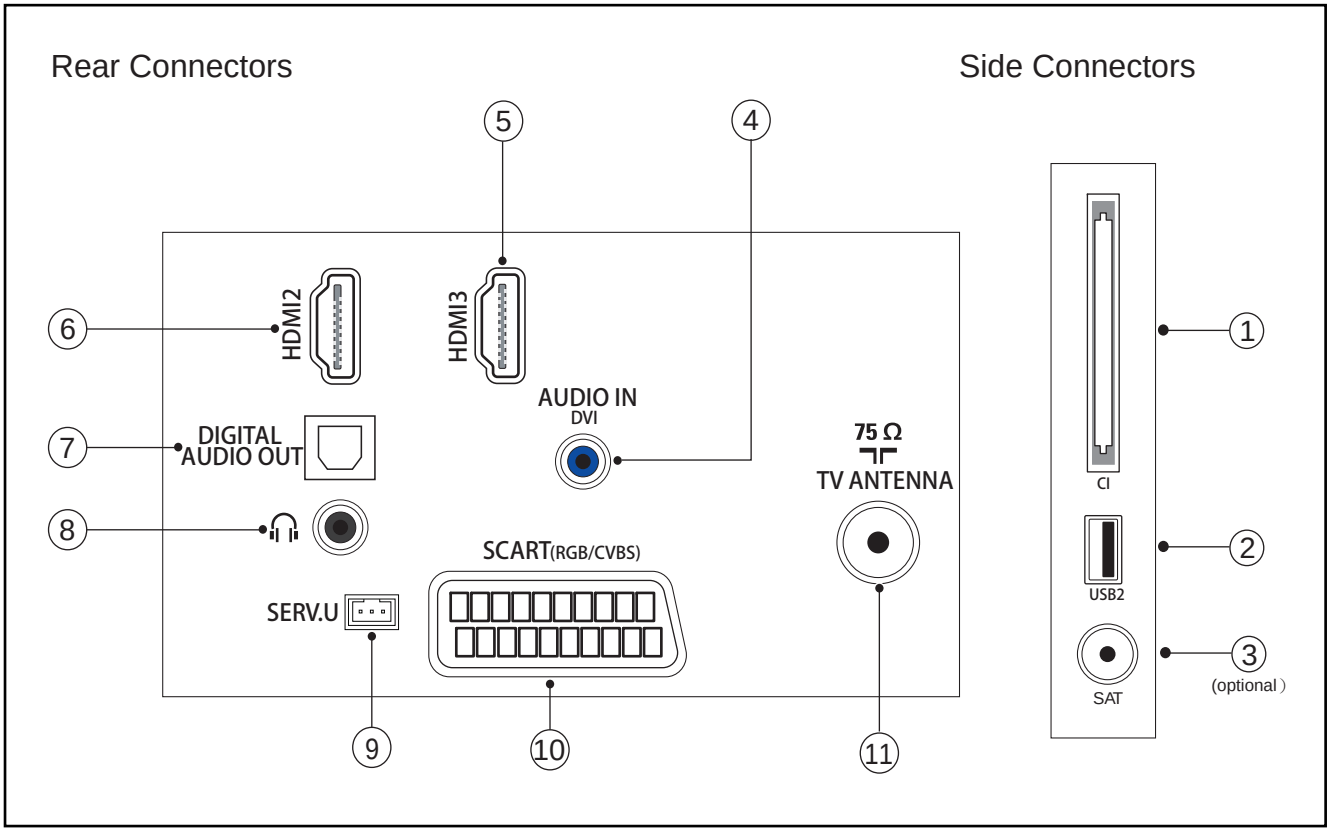
Figure 2-29 SCART connector

1	- Audio R	0.5 V_{RMS} / 1 kΩ	
2	- Audio R	0.5 V_{RMS} / 10 kΩ	
3	- Audio L	0.5 V_{RMS} / 1 kΩ	
4	- Ground Audio	Gnd	
5	- Ground Blue	Gnd	
6	- Audio L	0.5 V_{RMS} / 10 kΩ	
7	- Video Blue/C-out	0.7 V_{PP} / 75 Ω	
8	- Function Select	0 - 2 V: INT 4.5 - 7 V: EXT 16:9 9.5 - 12 V: EXT 4:3	
9	- Ground Green	Gnd	
10	- n.c.		
11	- Video Green	0.7 V_{PP} / 75 Ω	
12	- n.c.		
13	- Ground Red	Gnd	
14	- Ground P50	Gnd	
15	- Video Red/C	0.7 V_{PP} / 75 Ω	
16	- Status/FBL	0 - 0.4 V: INT 1 - 3 V: EXT / 75 Ω	
17	- Ground Video	Gnd	
18	- Ground FBL	Gnd	
19	- Video CVBS	1 V_{PP} / 75 Ω	
20	- Video CVBS/Y	1 V_{PP} / 75 Ω	
21	- Shield	Gnd	

12 - TV ANTENNA - In

Signal input from an antenna, cable or satellite.8

2.9 Connections (for 32" & 40" & 48" & 55" 5100 series & 42"/47"/55" 5190 & 5200 series & 32"/40"/50" 4009 series)



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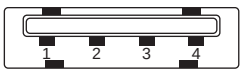
Figure 2-30 Connection overview

Note: The following connector colour abbreviations are used (acc. to DIN/IEC 757): Bk= Black, Bu= Blue, Gn= Green, Gy= Grey, Rd= Red, Wh= White, Ye= Yellow.

2.9.1 Side Connections

1 - Common Interface
68p - See figure 10-13-12

2 - USB2 2.0



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Figure 2-31 USB (type A)

1	- +5V	
2	- Data (-)	
3	- Data (+)	
4	- Ground	Gnd

3 - SAT - In
Signal input from an SAT.

4 - Power Button
Turn on/off the TV.

2.9.2 Rear Connections

5 - Audio - In: Left / Right, VGA
Bu - Audio L/R in 0.5 V_{RMS} / 10 kW

6 - HDMI 3 : Digital Video - In, Digital Audio - In/Out



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Figure 2-32 HDMI (type A) connector

1	- D2+	Data channel
2	- Shield	Gnd
3	- D2-	Data channel
4	- D1+	Data channel
5	- Shield	Gnd
6	- D1-	Data channel
7	- D0+	Data channel
8	- Shield	Gnd
9	- D0-	Data channel
10	- CLK+	Data channel
11	- Shield	Gnd
12	- CLK-	Data channel
13	- Easylink/CEC	Control channel
14	- n.c.	
15	- DDC_SCL	DDC clock
16	- DDC_SDA	DDC data
17	- Ground	Gnd
18	- +5V	
19	- HPD	Hot Plug Detect
20	- Ground	Gnd

7 - HDMI 2: Digital Video - In, Digital Audio - In/Out
See 6 - HDMI3 : Digital Video - In, Digital Audio - In/Out

8 - Cinch: Digital Audio - Out
BK - Coaxial 0.4 - 0.6V_{PP} / 75 W

9 - Head phone (Output)

Bk	- Head phone	80 - 600 Ω / 10 mW	

10 - Service / UART

1	- Ground	Gnd	⏚
2	- UART_TX	Transmit	⊖→
3	- UART_RX	Receive	→⊕

11 - EXT1: Video RGB/YC - In, CVBS - In/Out, Audio - In/Out

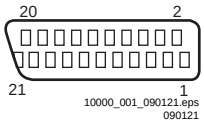


Figure 2-33 SCART connector

1	- Audio R	0.5 V_{RMS} / 1 kΩ	⊖→
2	- Audio R	0.5 V_{RMS} / 10 kΩ	→⊕
3	- Audio L	0.5 V_{RMS} / 1 kΩ	⊖→
4	- Ground Audio	Gnd	⏚
5	- Ground Blue	Gnd	⏚
6	- Audio L	0.5 V_{RMS} / 10 kΩ	→⊕
7	- Video Blue/C-out	0.7 V_{PP} / 75 Ω	⊖→
8	- Function Select	0 - 2 V: INT 4.5 - 7 V: EXT 16:9 9.5 - 12 V: EXT 4:3	→⊕
9	- Ground Green	Gnd	⏚
10	- n.c.		
11	- Video Green	0.7 V_{PP} / 75 Ω	→⊕
12	- n.c.		
13	- Ground Red	Gnd	⏚
14	- Ground P50	Gnd	⏚
15	- Video Red/C	0.7 V_{PP} / 75 Ω	→⊕
16	- Status/FBL	0 - 0.4 V: INT 1 - 3 V: EXT / 75 Ω	→⊕
17	- Ground Video	Gnd	⏚
18	- Ground FBL	Gnd	⏚
19	- Video CVBS	1 V_{PP} / 75 Ω	⊖→
20	- Video CVBS/Y	1 V_{PP} / 75 Ω	→⊕
21	- Shield	Gnd	⏚

12 - TV ANTENNA - In

Signal input from an antenna, cable or satellite.

2.10 Chassis Overview

Refer to 9. Block Diagrams for PWB/CBA locations.6

3. Precautions, Notes, and Abbreviation List

Index of this chapter:

3.1 Safety Instructions
3.2 Warnings
3.3 Notes
3.4 Abbreviation List

3.1 Safety Instructions

Safety regulations require the following **during** a repair:

- Connect the set to the Mains/AC Power via an isolation transformer (> 800 VA).
- Replace safety components, indicated by the symbol ⚠, only by components identical to the original ones. Any other component substitution (other than original type) may increase risk of fire or electrical shock hazard.

Safety regulations require that **after** a repair, the set must be returned in its original condition. Pay in particular attention to the following points:

- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the Mains/AC Power lead for external damage.
- Check the strain relief of the Mains/AC Power cord for proper function.
- Check the electrical DC resistance between the Mains/AC Power plug and the secondary side (only for sets that have a Mains/AC Power isolated power supply):
  1. Unplug the Mains/AC Power cord and connect a wire between the two pins of the Mains/AC Power plug.
  2. Set the Mains/AC Power switch to the “on” position (keep the Mains/AC Power cord unplugged!).
  3. Measure the resistance value between the pins of the Mains/AC Power plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 MΩ and 12 MΩ.
  4. Switch “off” the set, and remove the wire between the two pins of the Mains/AC Power plug.
- Check the cabinet for defects, to prevent touching of any inner parts by the customer.

3.2 Warnings

- All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. Make sure that, during repair, you are connected with the same potential as the mass of the set by a wristband with resistance. Keep components and tools also at this same potential.
- Be careful during measurements in the high voltage section.
- Never replace modules or other components while the unit is switched “on”.
- When you align the set, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.

3.3 Notes

3.3.1 General

- Measure the voltages and waveforms with regard to the chassis (= tuner) ground (⏚), or hot ground (⏚), depending on the tested area of circuitry. The voltages and waveforms shown in the diagrams are indicative. Measure them in the Service Default Mode with a colour bar signal and stereo sound (L: 3 kHz, R: 1 kHz unless stated otherwise) and picture carrier at 475.25 MHz for PAL, or 61.25 MHz for NTSC (channel 3).
- Where necessary, measure the waveforms and voltages with (⊓) and without (⊼) aerial signal. Measure the voltages in the power supply section both in normal operation (⏻) and in stand-by (⏻). These values are indicated by means of the appropriate symbols.

3.3.2 Schematic Notes

- All resistor values are in ohms, and the value multiplier is often used to indicate the decimal point location (e.g. 2K2 indicates 2.2 kΩ).
- Resistor values with no multiplier may be indicated with either an “E” or an “R” (e.g. 220E or 220R indicates 220 Ω).
- All capacitor values are given in micro-farads ($\mu = \times 10^{-6}$), nano-farads ($n = \times 10^{-9}$), or pico-farads ($p = \times 10^{-12}$).
- Capacitor values may also use the value multiplier as the decimal point indication (e.g. 2p2 indicates 2.2 pF).
- An “asterisk” (*) indicates component usage varies. Refer to the diversity tables for the correct values.
- The correct component values are listed on the Philips Spare Parts Web Portal.

3.3.3 Spare Parts

For the latest spare part overview, consult your Philips Spare Part web portal.

3.3.4 BGA (Ball Grid Array) ICs

Introduction

For more information on how to handle BGA devices, visit this URL: http://www.atyourservice-magazine.com. Select “Magazine”, then go to “Repair downloads”. Here you will find Information on how to deal with BGA-ICs.

BGA Temperature Profiles

For BGA-ICs, you **must** use the correct temperature-profile. Where applicable and available, this profile is added to the IC Data Sheet information section in this manual.

3.3.5 Lead-free Soldering

Due to lead-free technology some rules have to be respected by the workshop during a repair:

- Use only lead-free soldering tin. If lead-free solder paste is required, please contact the manufacturer of your soldering equipment. In general, use of solder paste within workshops should be avoided because paste is not easy to store and to handle.
- Use only adequate solder tools applicable for lead-free soldering tin. The solder tool must be able:
  - To reach a solder-tip temperature of at least 400°C.
  - To stabilize the adjusted temperature at the solder-tip.
  - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature of around 360°C - 380°C is reached and stabilized at the solder joint. Heating time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C, otherwise wear-out of tips will increase drastically and flux-fluid will be destroyed. To avoid wear-out of tips, switch “off” unused equipment or reduce heat.
- Mix of lead-free soldering tin/parts with leaded soldering tin/parts is possible but PHILIPS recommends strongly **to avoid** mixed regimes. If this cannot be avoided, carefully clear the solder-joint from old tin and re-solder with new tin.

3.3.6 Alternative BOM identification

It should be noted that on the European Service website, “Alternative BOM” is referred to as “Design variant”.

The **third digit** in the serial number (example: AG**2**B0335000001) indicates the number of the alternative B.O.M. (Bill Of Materials) that has been used for producing the specific TV set. In general, it is possible that the same TV model on the market is produced with e.g. two different types of displays, coming from two different suppliers. This will then

result in sets which have the same CTN (Commercial Type Number; e.g. 28PW9515/12) but which have a different B.O.M. number.
By looking at the third digit of the serial number, one can identify which B.O.M. is used for the TV set he is working with. If the third digit of the serial number contains the number “1” (example: AG**1**B033500001), then the TV set has been manufactured according to B.O.M. number 1. If the third digit is a “2” (example: AG**2**B0335000001), then the set has been produced according to B.O.M. no. 2. This is important for ordering the correct spare parts!
For the third digit, the numbers 1...9 and the characters A...Z can be used, so in total: 9 plus 26= 35 different B.O.M.s can be indicated by the third digit of the serial number.

Identification: The bottom line of a type plate gives a 14-digit serial number. Digits 1 and 2 refer to the production centre (e.g. SN is Lysomice, RJ is Kobierzyce), digit 3 refers to the B.O.M. code, digit 4 refers to the Service version change code, digits 5 and 6 refer to the production year, and digits 7 and 8 refer to production week (in example below it is 2010 week 10 / 2010 week 17). The 6 last digits contain the serial number.



Figure 3-1 Serial number (example)

3.3.7 Board Level Repair (BLR) or Component Level Repair (CLR)

If a board is defective, consult your repair procedure to decide if the board has to be exchanged or if it should be repaired on component level.
If your repair procedure says the board should be exchanged completely, do not solder on the defective board. Otherwise, it cannot be returned to the O.E.M. supplier for back charging!

3.3.8 Practical Service Precautions

- **It makes sense to avoid exposure to electrical shock.** While some sources are expected to have a possible dangerous impact, others of quite high potential are of limited current and are sometimes held in less regard.
- **Always respect voltages**. While some may not be dangerous in themselves, they can cause unexpected reactions that are best avoided. Before reaching into a powered TV set, it is best to test the high voltage insulation. It is easy to do, and is a good service precaution.

3.4 Abbreviation List

0/6/12	SCART switch control signal on A/V board. 0 = loop through (AUX to TV), 6 = play 16 : 9 format, 12 = play 4 : 3 format
AARA	Automatic Aspect Ratio Adaptation: algorithm that adapts aspect ratio to remove horizontal black bars; keeps the original aspect ratio
ACI	Automatic Channel Installation: algorithm that installs TV channels directly from a cable network by means of a predefined TXT page
ADC	Analogue to Digital Converter
AFC	Automatic Frequency Control: control signal used to tune to the correct frequency
AGC	Automatic Gain Control: algorithm that controls the video input of the feature box
AM	Amplitude Modulation
AP	Asia Pacific
AR	Aspect Ratio: 4 by 3 or 16 by 9
ASF	Auto Screen Fit: algorithm that adapts aspect ratio to remove horizontal black bars without discarding video information
ATSC	Advanced Television Systems Committee, the digital TV standard in the USA
ATV	See Auto TV
Auto TV	A hardware and software control system that measures picture content, and adapts image parameters in a dynamic way
AV	External Audio Video
AVC	Audio Video Controller
AVIP	Audio Video Input Processor
B/G	Monochrome TV system. Sound carrier distance is 5.5 MHz
BDS	Business Display Solutions (iTV)
BLR	Board-Level Repair
BTSC	Broadcast Television Standard Committee. Multiplex FM stereo sound system, originating from the USA and used e.g. in LATAM and AP-NTSC countries
B-TXT	Blue TeleteXT
C	Centre channel (audio)
CEC	Consumer Electronics Control bus: remote control bus on HDMI connections
CL	Constant Level: audio output to connect with an external amplifier
CLR	Component Level Repair
ComPair	Computer aided rePair
CP	Connected Planet / Copy Protection
CSM	Customer Service Mode
CTI	Color Transient Improvement: manipulates steepness of chroma transients
CVBS	Composite Video Blanking and Synchronization
DAC	Digital to Analogue Converter
DBE	Dynamic Bass Enhancement: extra low frequency amplification
DCM	Data Communication Module. Also referred to as System Card or Smartcard (for iTV).
DDC	See “E-DDC”
D/K	Monochrome TV system. Sound carrier distance is 6.5 MHz
DFI	Dynamic Frame Insertion
DFU	Directions For Use: owner's manual
DMR	Digital Media Reader: card reader
DMSD	Digital Multi Standard Decoding
DNM	Digital Natural Motion

DNR	Digital Noise Reduction: noise reduction feature of the set
DRAM	Dynamic RAM
DRM	Digital Rights Management
DSP	Digital Signal Processing
DST	Dealer Service Tool: special remote control designed for service technicians
DTCP	Digital Transmission Content Protection; A protocol for protecting digital audio/video content that is traversing a high speed serial bus, such as IEEE-1394
DVB-C	Digital Video Broadcast - Cable
DVB-T	Digital Video Broadcast - Terrestrial
DVD	Digital Versatile Disc
DVI(-d)	Digital Visual Interface (d= digital only)
E-DDC	Enhanced Display Data Channel (VESA standard for communication channel and display). Using E-DDC, the video source can read the EDID information form the display.
EDID	Extended Display Identification Data (VESA standard)
EEPROM	Electrically Erasable and Programmable Read Only Memory
EMI	Electro Magnetic Interference
EPG	Electronic Program Guide
EPLD	Erasable Programmable Logic Device
EU	Europe
EXT	EXTernal (source), entering the set by SCART or by cinches (jacks)
FDS	Full Dual Screen (same as FDW)
FDW	Full Dual Window (same as FDS)
FLASH	FLASH memory
FM	Field Memory or Frequency Modulation
FPGA	Field-Programmable Gate Array
FTV	Flat TeleVision
Gb/s	Giga bits per second
G-TXT	Green TeleteXT
H	H_sync to the module
HD	High Definition
HDD	Hard Disk Drive
HDCP	High-bandwidth Digital Content Protection: A “key” encoded into the HDMI/DVI signal that prevents video data piracy. If a source is HDCP coded and connected via HDMI/DVI without the proper HDCP decoding, the picture is put into a “snow vision” mode or changed to a low resolution. For normal content distribution the source and the display device must be enabled for HDCP “software key” decoding.
HDMI	High Definition Multimedia Interface
HP	HeadPhone
I	Monochrome TV system. Sound carrier distance is 6.0 MHz
I^2C	Inter IC bus
I^2D	Inter IC Data bus
I^2S	Inter IC Sound bus
IF	Intermediate Frequency
IR	Infra Red
IRQ	Interrupt Request
ITU-656	The ITU Radio communication Sector (ITU-R) is a standards body subcommittee of the International Telecommunication Union relating to radio communication. ITU-656 (a.k.a. SDI), is a digitized video format used for broadcast grade video. Uncompressed digital component or digital composite signals can be used. The SDI signal is self-synchronizing, uses 8 bit or 10 bit data words, and has a maximum data rate of 270 Mbit/s, with a minimum bandwidth of 135 MHz.
iTV	Institutional TeleVision; TV sets for hotels, hospitals etc.
LS	Last Status; The settings last chosen by the customer and read and stored in RAM or in the NVM. They are called at start-up of the set to configure it according to the customer's preferences
LATAM	Latin America
LCD	Liquid Crystal Display
LED	Light Emitting Diode
L/L'	Monochrome TV system. Sound carrier distance is 6.5 MHz. L' is Band I, L is all bands except for Band I
LPL	LG.Philips LCD (supplier)
LS	Loudspeaker
LVDS	Low Voltage Differential Signalling
Mbps	Mega bits per second
M/N	Monochrome TV system. Sound carrier distance is 4.5 MHz
MHEG	Part of a set of international standards related to the presentation of multimedia information, standardised by the Multimedia and Hypermedia Experts Group. It is commonly used as a language to describe interactive television services
MIPS	Microprocessor without Interlocked Pipeline-Stages; A RISC-based microprocessor
MOP	Matrix Output Processor
MOSFET	Metal Oxide Silicon Field Effect Transistor, switching device
MPEG	Motion Pictures Experts Group
MPIF	Multi Platform InterFace
MUTE	MUTE Line
MTV	Mainstream TV: TV-mode with Consumer TV features enabled (iTV)
NC	Not Connected
NICAM	Near Instantaneous Compounded Audio Multiplexing. This is a digital sound system, mainly used in Europe.
NTC	Negative Temperature Coefficient, non-linear resistor
NTSC	National Television Standard Committee. Color system mainly used in North America and Japan. Color carrier NTSC M/N= 3.579545 MHz, NTSC 4.43= 4.433619 MHz (this is a VCR norm, it is not transmitted off-air)
NVM	Non-Volatile Memory: IC containing TV related data such as alignments
O/C	Open Circuit
OSD	On Screen Display
OAD	Over the Air Download. Method of software upgrade via RF transmission. Upgrade software is broadcasted in TS with TV channels.
OTC	On screen display Teletext and Control; also called Artistic (SAA5800)
P50	Project 50: communication protocol between TV and peripherals
PAL	Phase Alternating Line. Color system mainly used in West Europe (colour carrier = 4.433619 MHz) and South America (colour carrier PAL M = 3.575612 MHz and PAL N = 3.582056 MHz)
PCB	Printed Circuit Board (same as “PWB”)
PCM	Pulse Code Modulation

PDP	Plasma Display Panel
PFC	Power Factor Corrector (or Pre-conditioner)
PIP	Picture In Picture
PLL	Phase Locked Loop. Used for e.g. FST tuning systems. The customer can give directly the desired frequency
POD	Point Of Deployment: a removable CAM module, implementing the CA system for a host (e.g. a TV-set)
POR	Power On Reset, signal to reset the uP
PSDL	Power Supply for Direct view LED backlight with 2D-dimming
PSL	Power Supply with integrated LED drivers
PSLS	Power Supply with integrated LED drivers with added Scanning functionality
PTC	Positive Temperature Coefficient, non-linear resistor
PWB	Printed Wiring Board (same as “PCB”)
PWM	Pulse Width Modulation
QRC	Quasi Resonant Converter
QTNR	Quality Temporal Noise Reduction
QVCP	Quality Video Composition Processor
RAM	Random Access Memory
RGB	Red, Green, and Blue. The primary color signals for TV. By mixing levels of R, G, and B, all colors (Y/C) are reproduced.
RC	Remote Control
RC5 / RC6	Signal protocol from the remote control receiver
RESET	RESET signal
ROM	Read Only Memory
RSDS	Reduced Swing Differential Signalling data interface
R-TXT	Red TeleteXT
SAM	Service Alignment Mode
S/C	Short Circuit
SCART	Syndicat des Constructeurs d'Appareils Radiorécepteurs et Téléviseurs
SCL	Serial Clock I^2C
SCL-F	CLock Signal on Fast I^2C bus
SD	Standard Definition
SDA	Serial Data I^2C
SDA-F	DAta Signal on Fast I^2C bus
SDI	Serial Digital Interface, see “ITU-656”
SDRAM	Synchronous DRAM
SECAM	SEequence Couleur Avec Mémoire. Colour system mainly used in France and East Europe. Colour carriers = 4.406250 MHz and 4.250000 MHz
SIF	Sound Intermediate Frequency
SMPS	Switched Mode Power Supply
SoC	System on Chip
SOG	Sync On Green
SOPS	Self Oscillating Power Supply
SPI	Serial Peripheral Interface bus; a 4-wire synchronous serial data link standard
S/PDIF	Sony Philips Digital InterFace
SRAM	Static RAM
SRP	Service Reference Protocol
SSB	Small Signal Board
SSC	Spread Spectrum Clocking, used to reduce the effects of EMI
STB	Set Top Box
STBY	STand-BY
SVGA	800 × 600 (4:3)
SVHS	Super Video Home System
SW	Software
SWAN	Spatial temporal Weighted Averaging Noise reduction
SXGA	1280 × 1024
TFT	Thin Film Transistor
THD	Total Harmonic Distortion
TMDS	Transmission Minimized Differential Signalling
TS	Transport Stream
TXT	TeleteXT
TXT-DW	Dual Window with TeleteXT
UI	User Interface
uP	Microprocessor
UXGA	1600 × 1200 (4:3)
V	V-sync to the module
VESA	Video Electronics Standards Association
VGA	640 × 480 (4:3)
VL	Variable Level out: processed audio output toward external amplifier
VSB	Vestigial Side Band; modulation method
WYSIWYR	What You See Is What You Record: record selection that follows main picture and sound
WXGA	1280 × 768 (15:9)
XTAL	Quartz crystal
XGA	1024 × 768 (4:3)
Y	Luminance signal
Y/C	Luminance (Y) and Chrominance (C) signal
YPbPr	Component video. Luminance and scaled color difference signals (B-Y and R-Y)
YUV	Component video

4. Mechanical Instructions

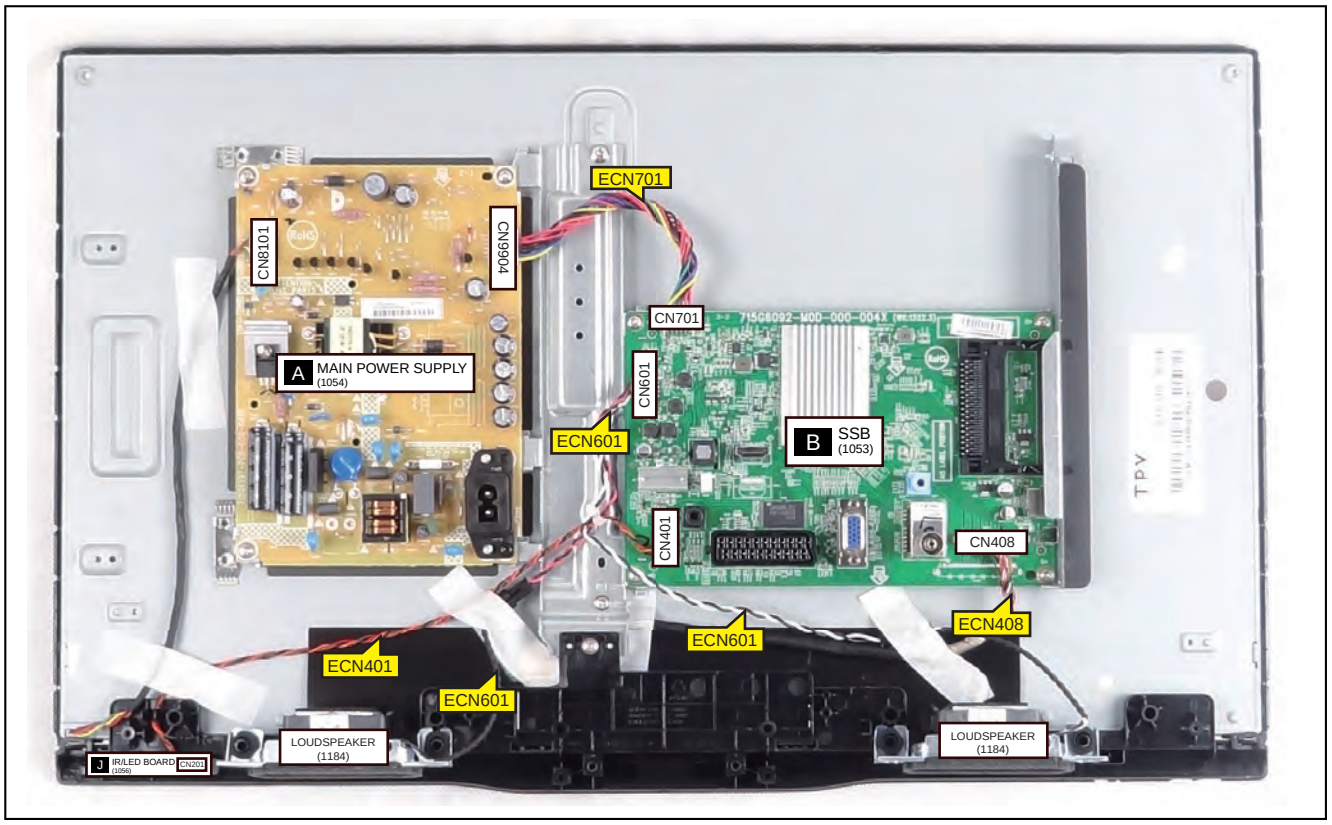
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4.2 Service Positions
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Notes:

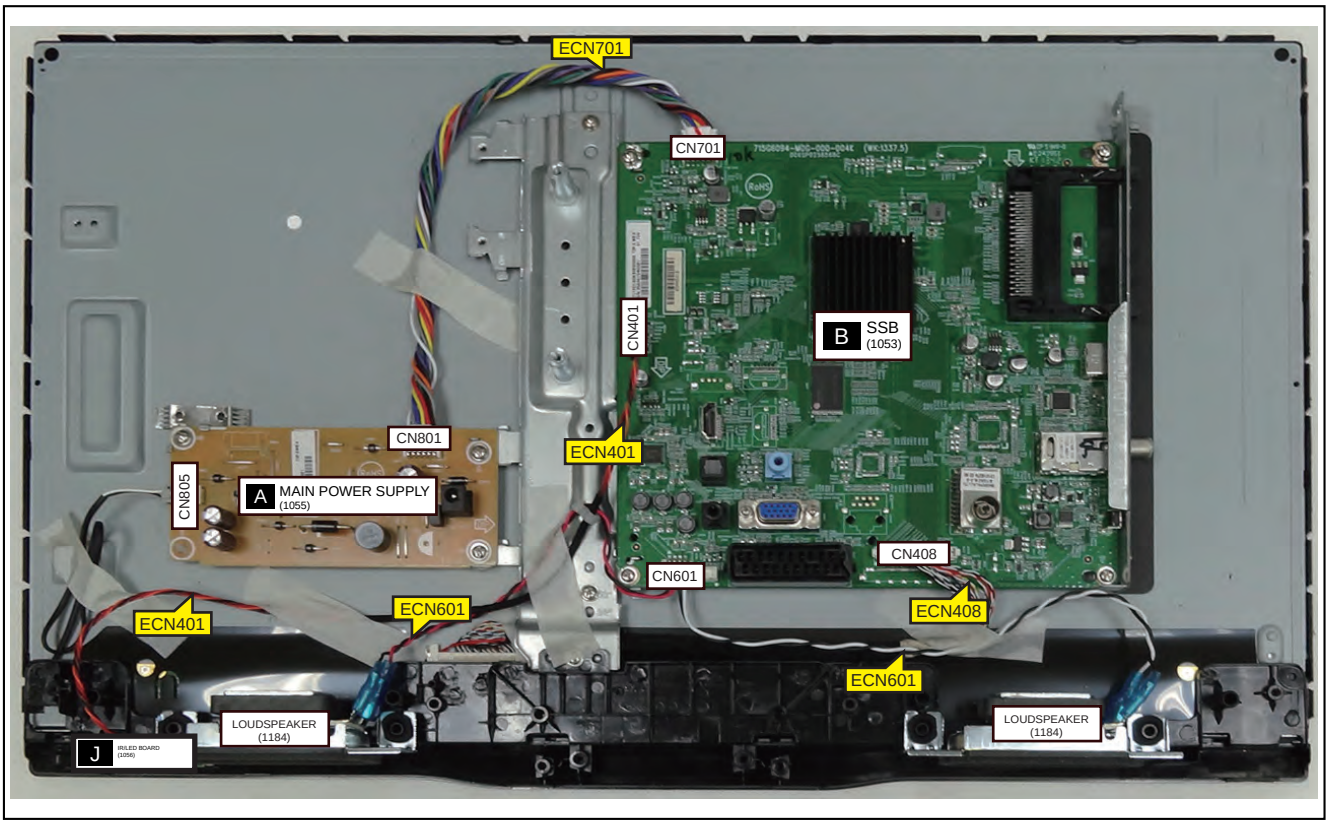
- Figures below can deviate slightly from the actual situation, due to the different set executions.

4.1 Cable Dressing



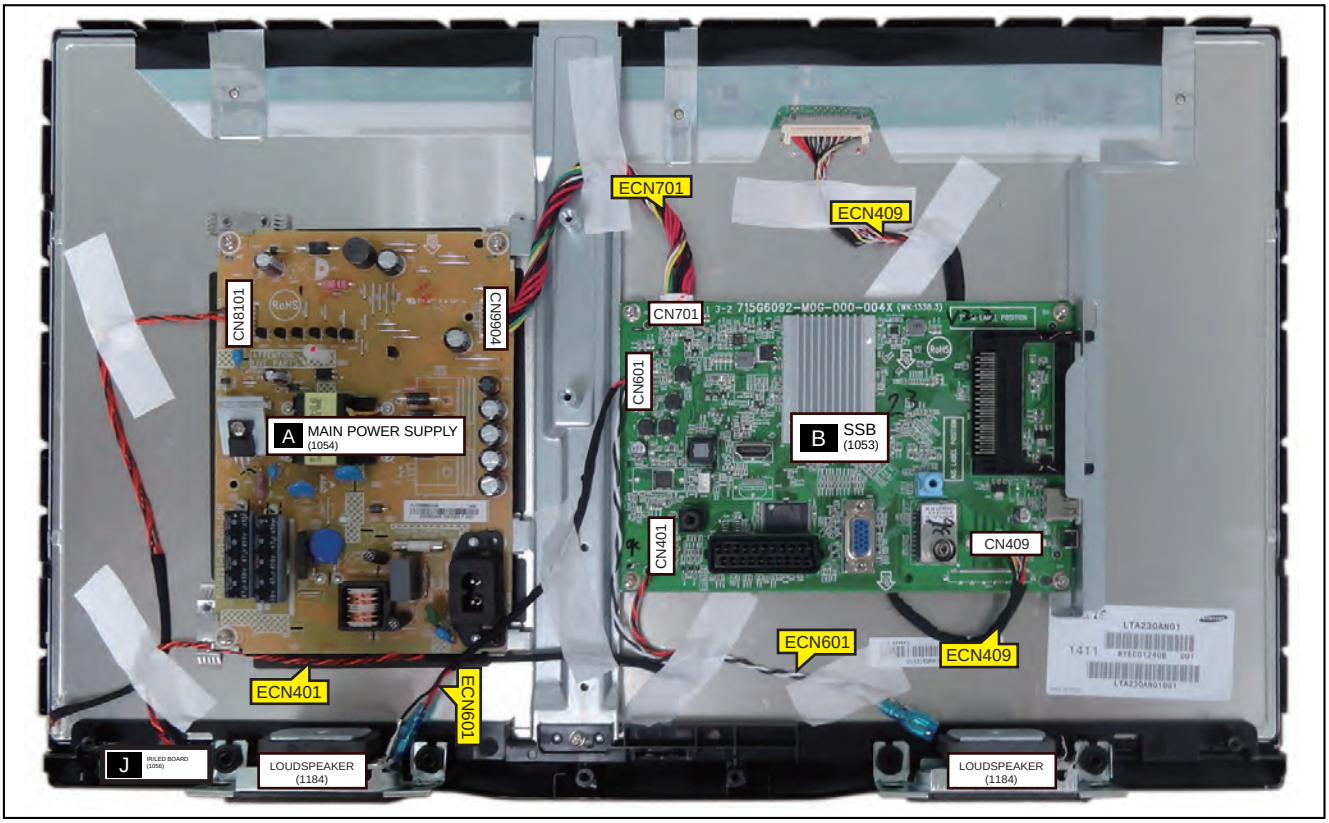
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Figure 4-1 Cable dressing (22" 4100 series)



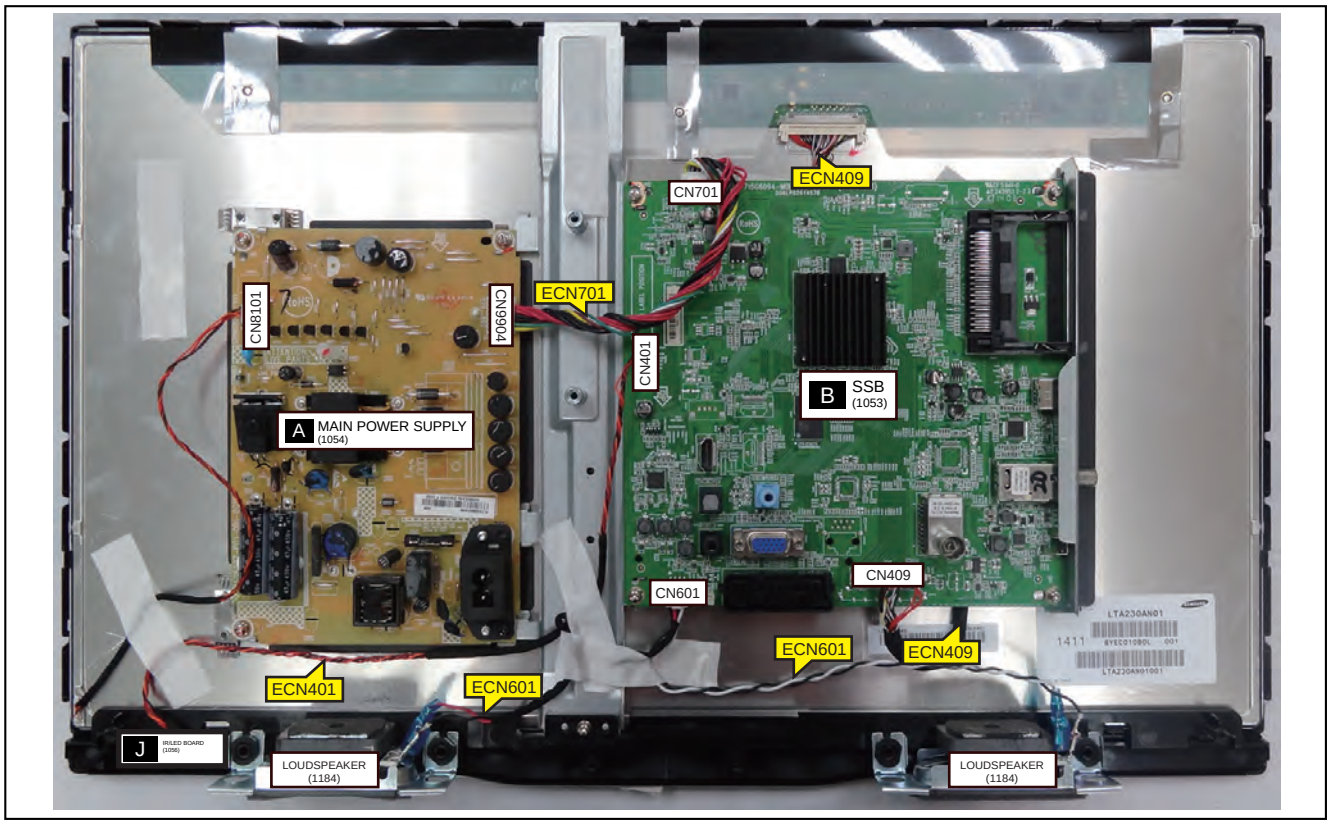
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Figure 4-2 Cable dressing (22" 4200 series)



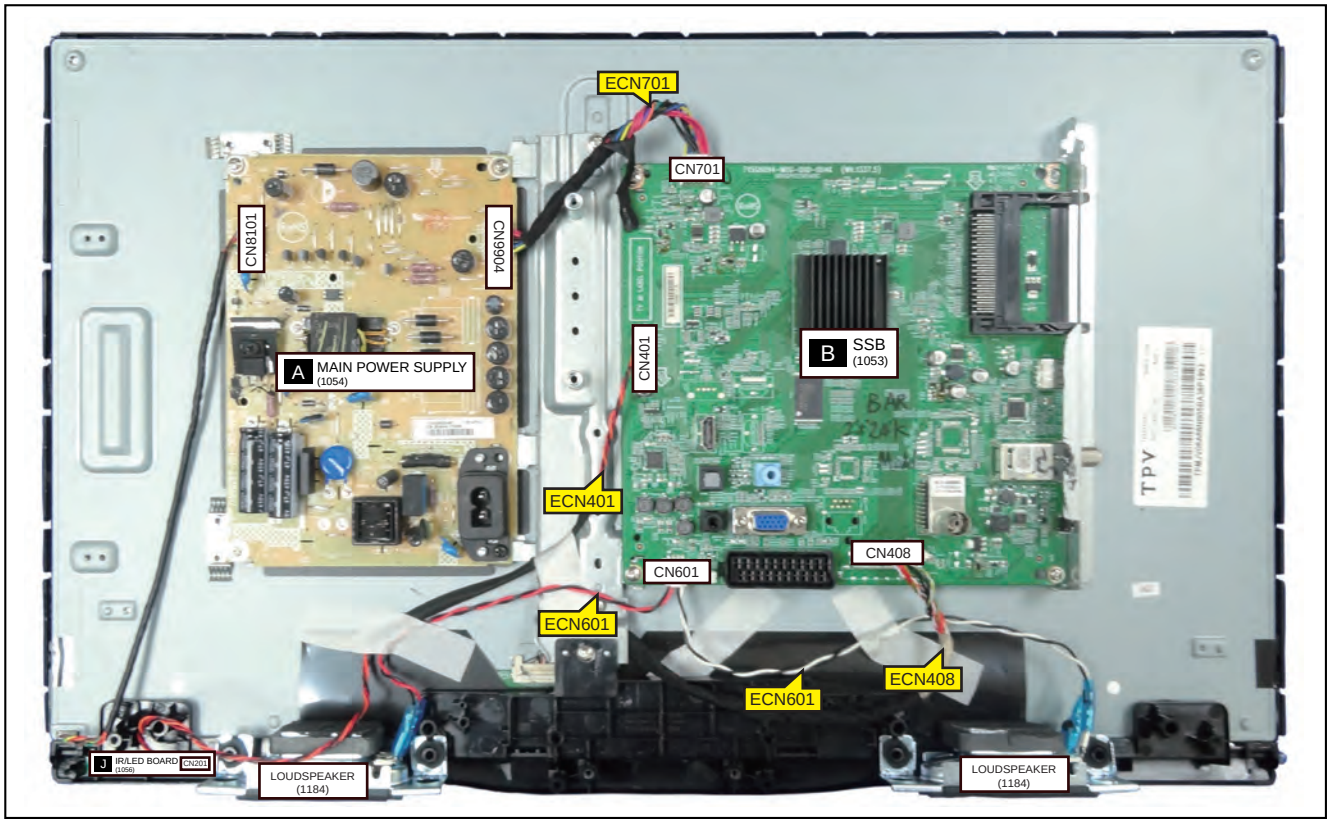
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Figure 4-3 Cable dressing (23" PHx4009/88 series)



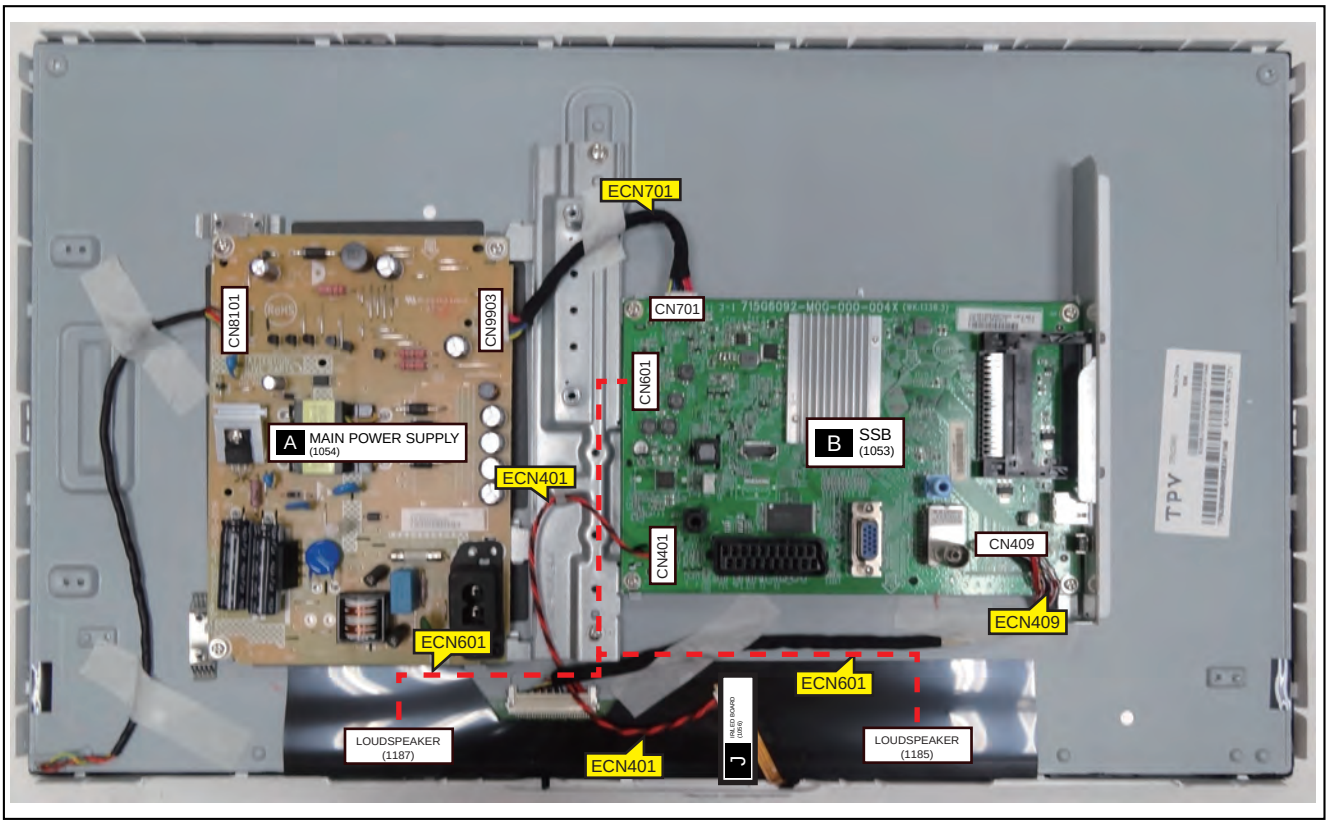
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Figure 4-4 Cable dressing (23" PHx4009/12 series)



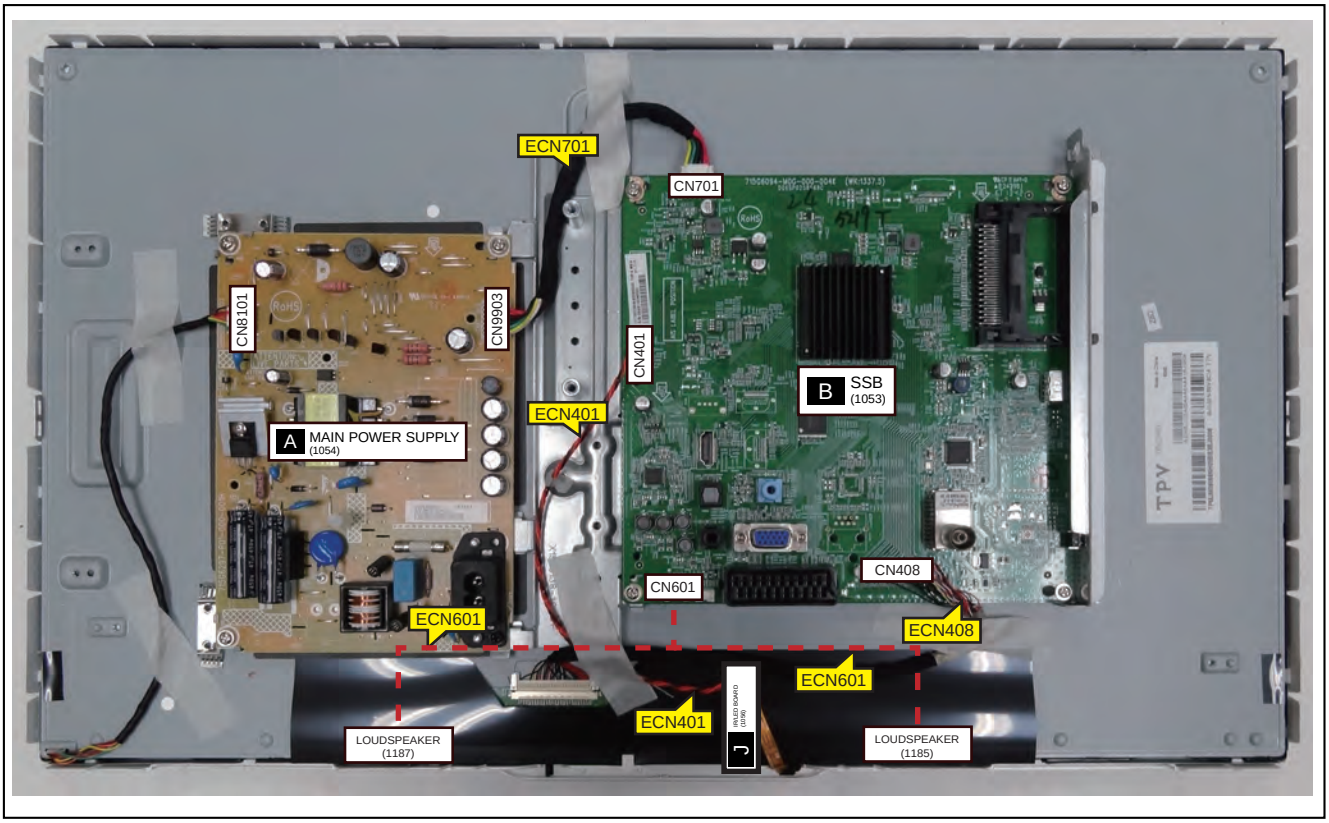
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Figure 4-5 Cable dressing (24" 4100 series)



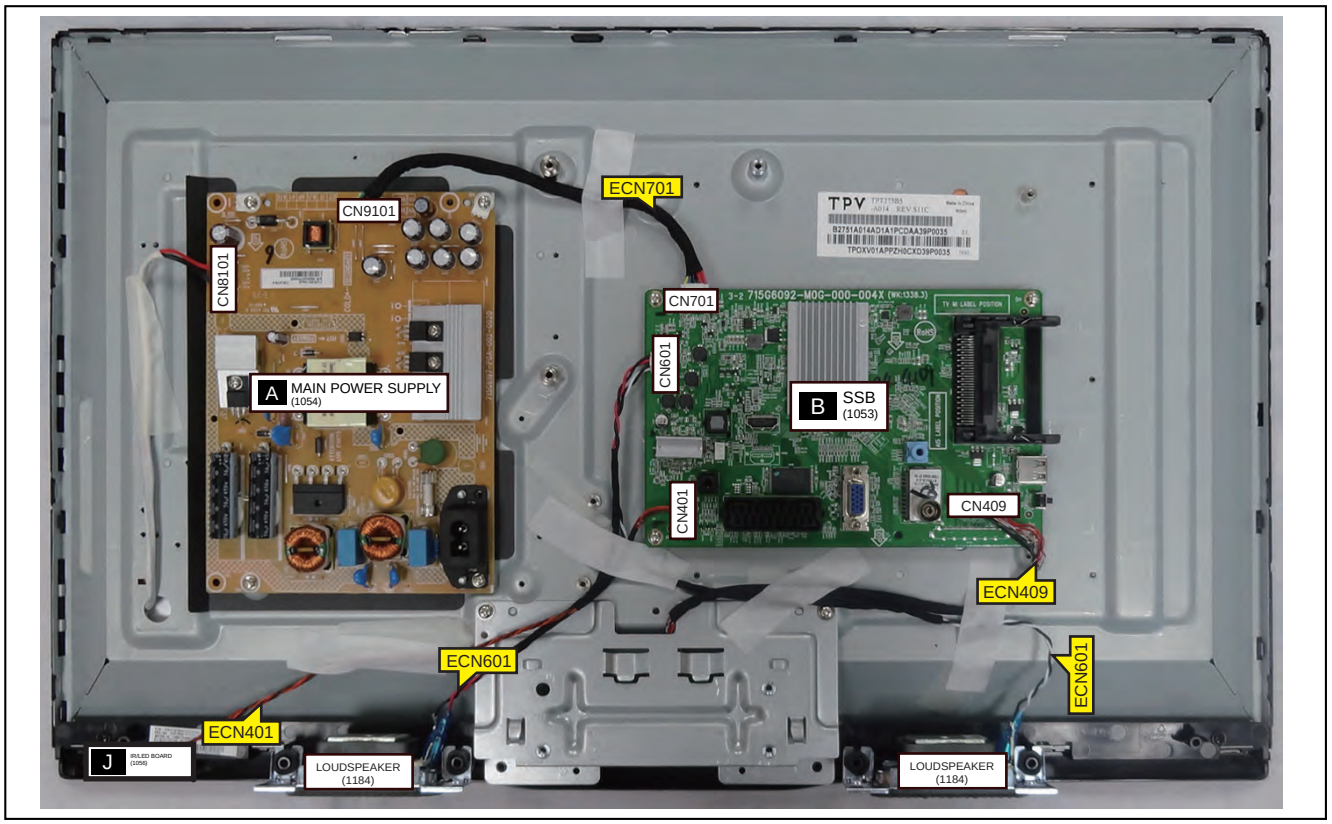
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Figure 4-6 Cable dressing (24" Pxx5219/88 series)



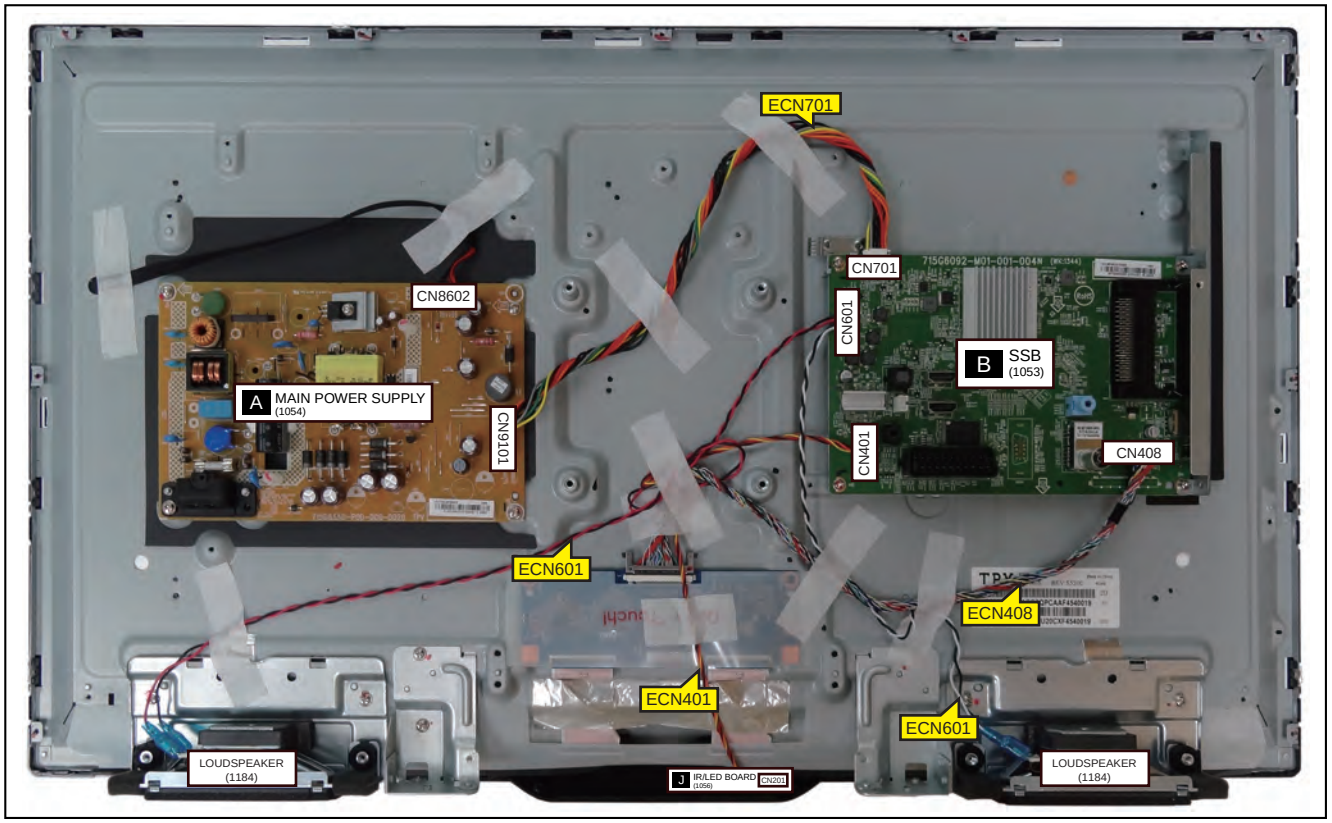
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Figure 4-7 Cable dressing (24" Pxx5219/12 series)



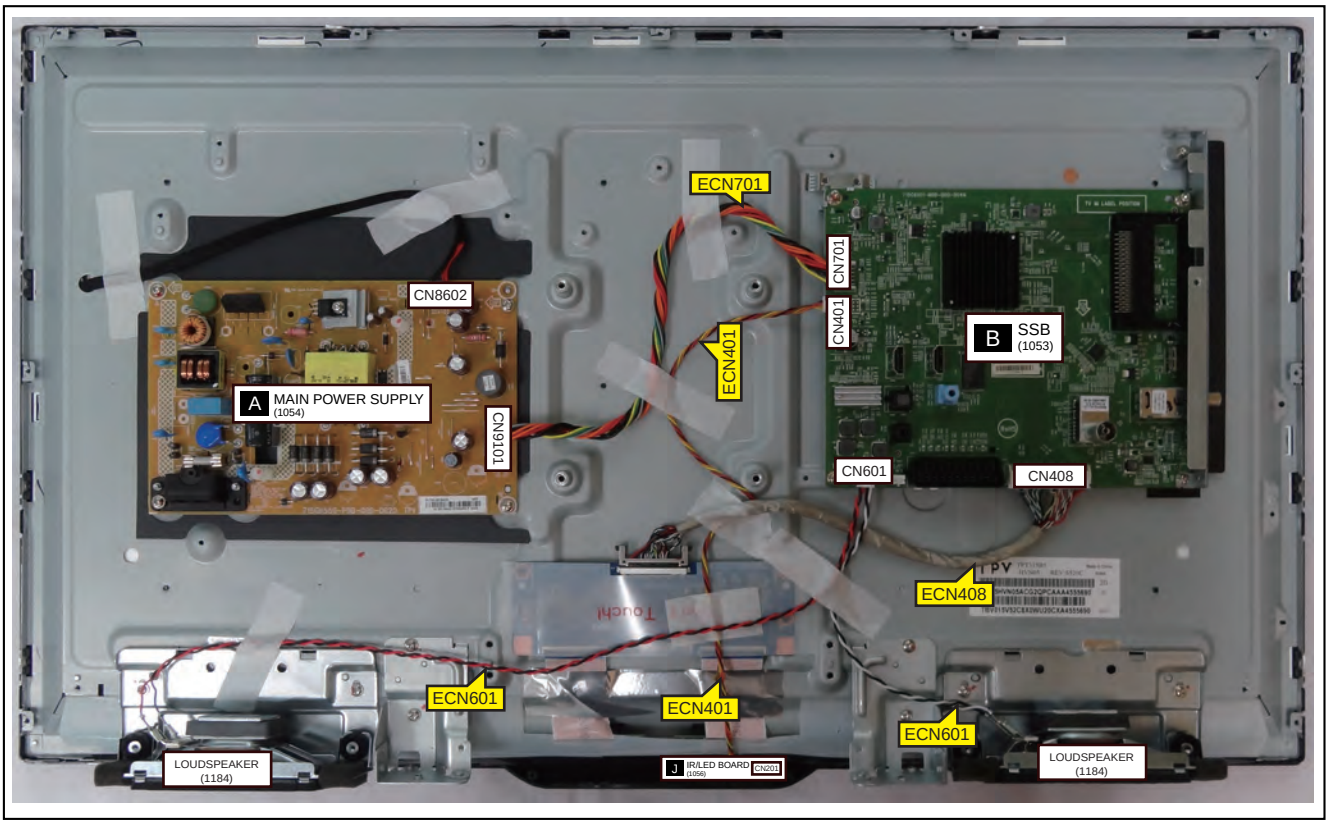
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Figure 4-8 Cable dressing (28" 4100 series)



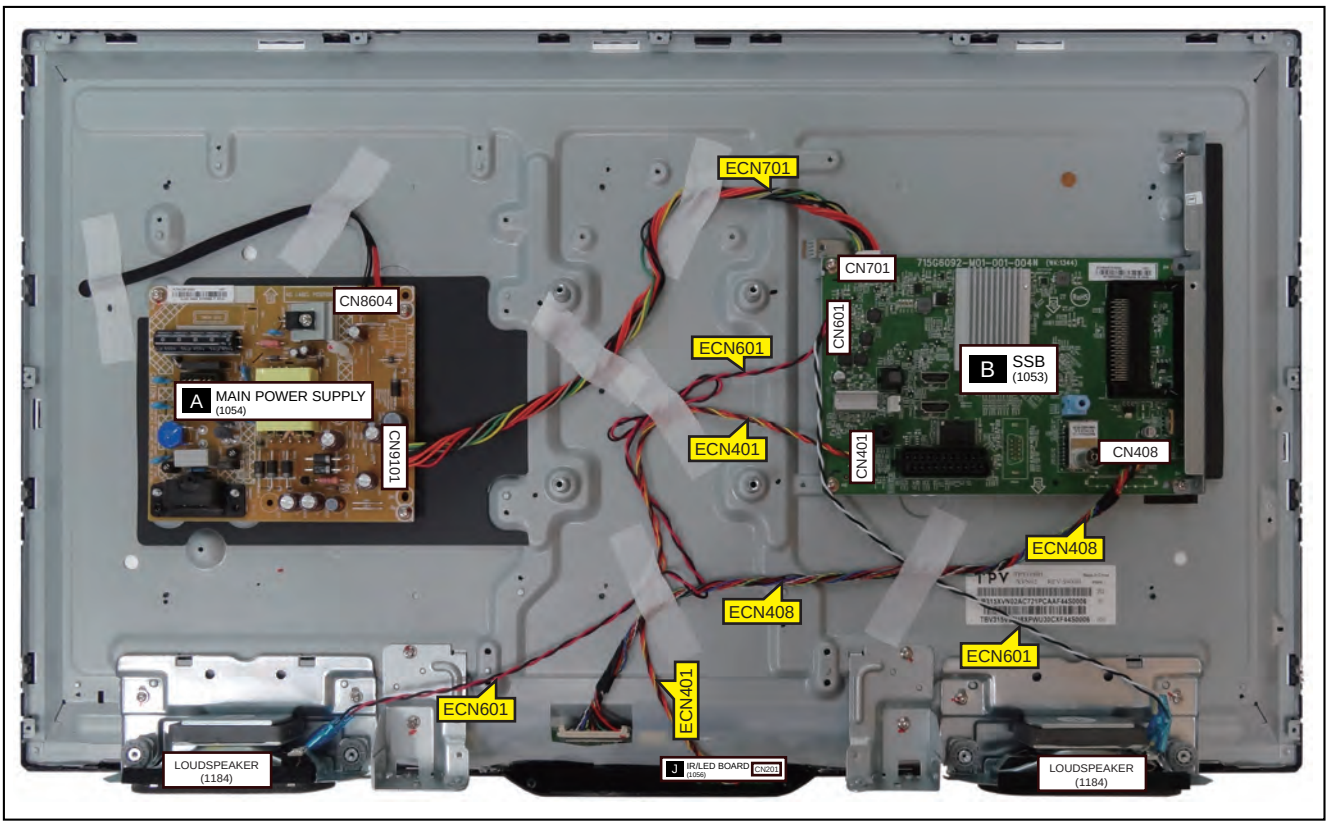
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Figure 4-9 Cable dressing (32PFH4009 series)



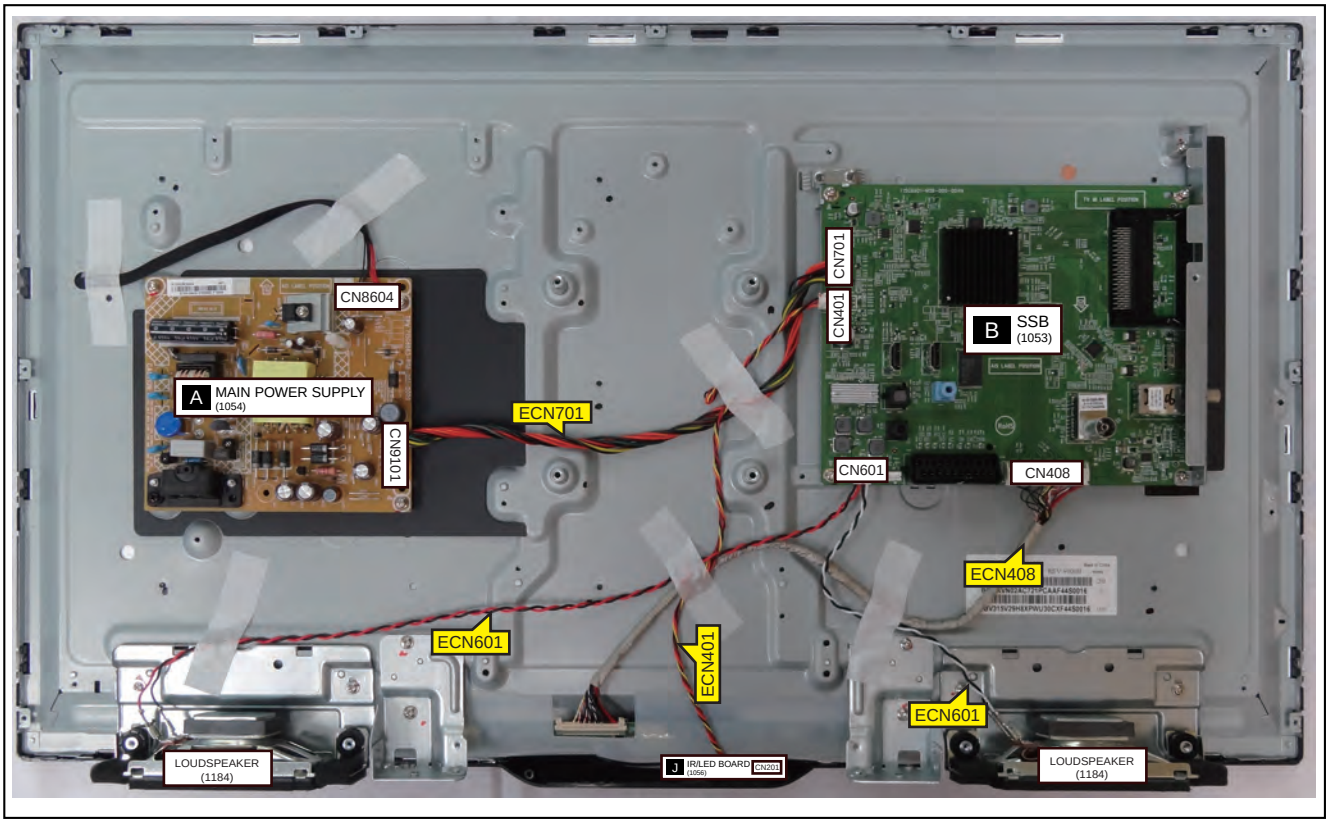
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Figure 4-10 Cable dressing (32PFK/T4009 series)



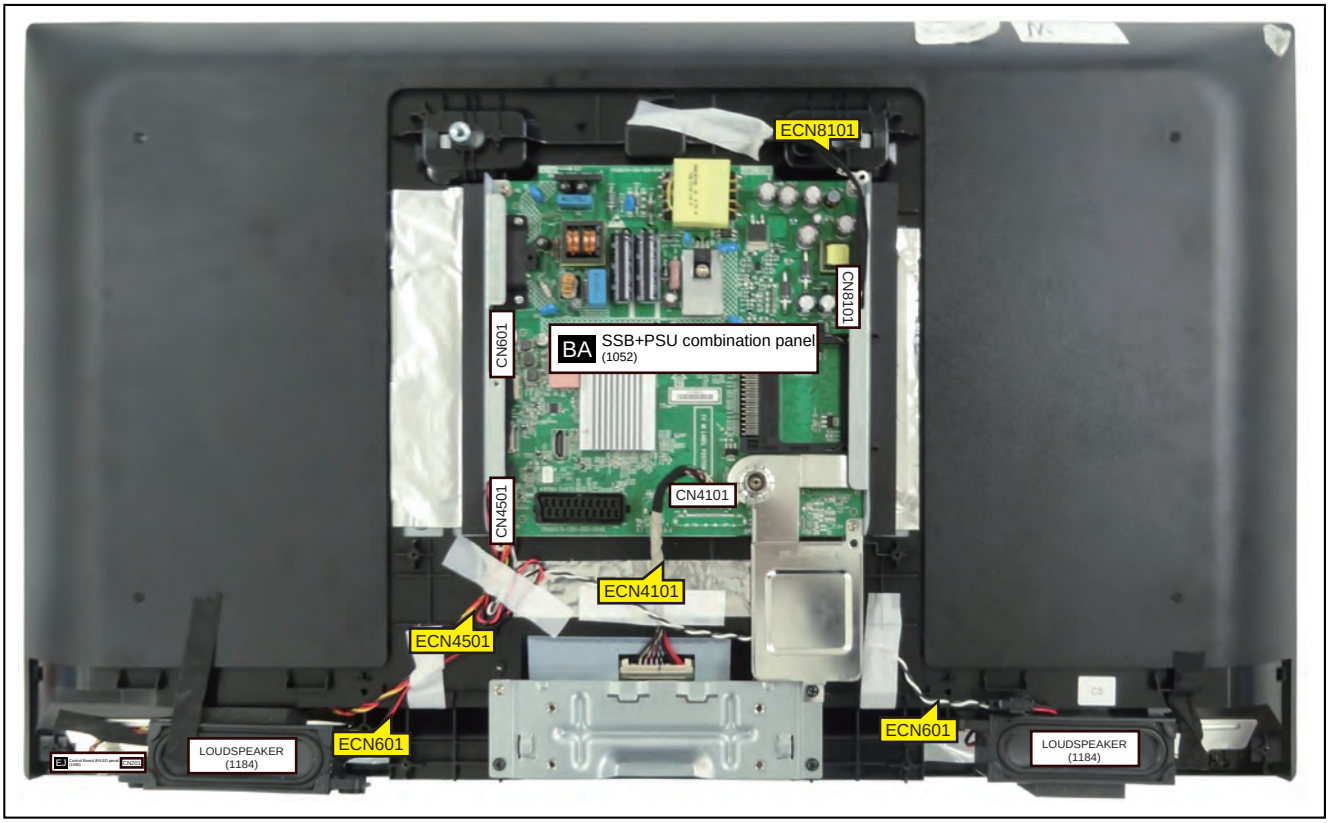
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Figure 4-11 Cable dressing (32PHH4009 series)



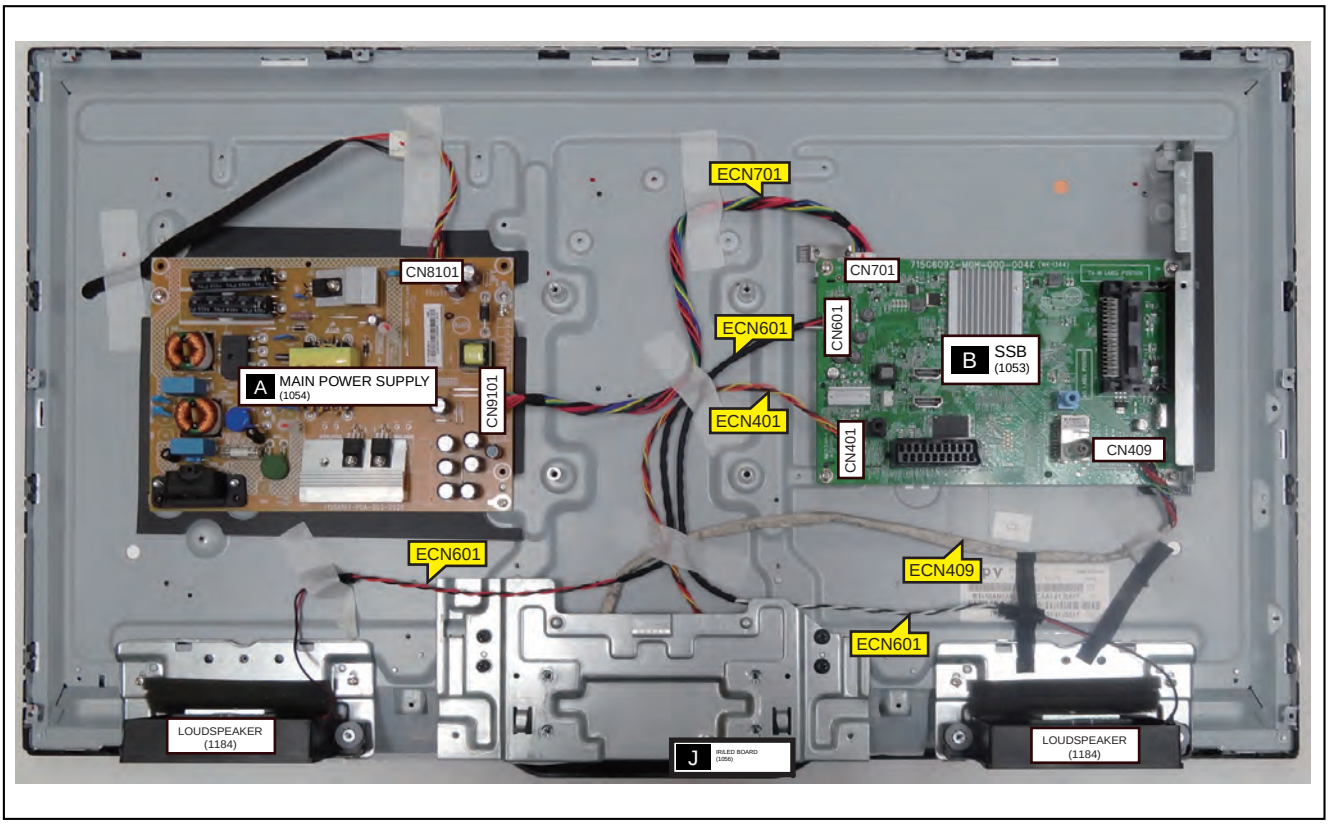
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Figure 4-12 Cable dressing (32PHK/T4009 series)



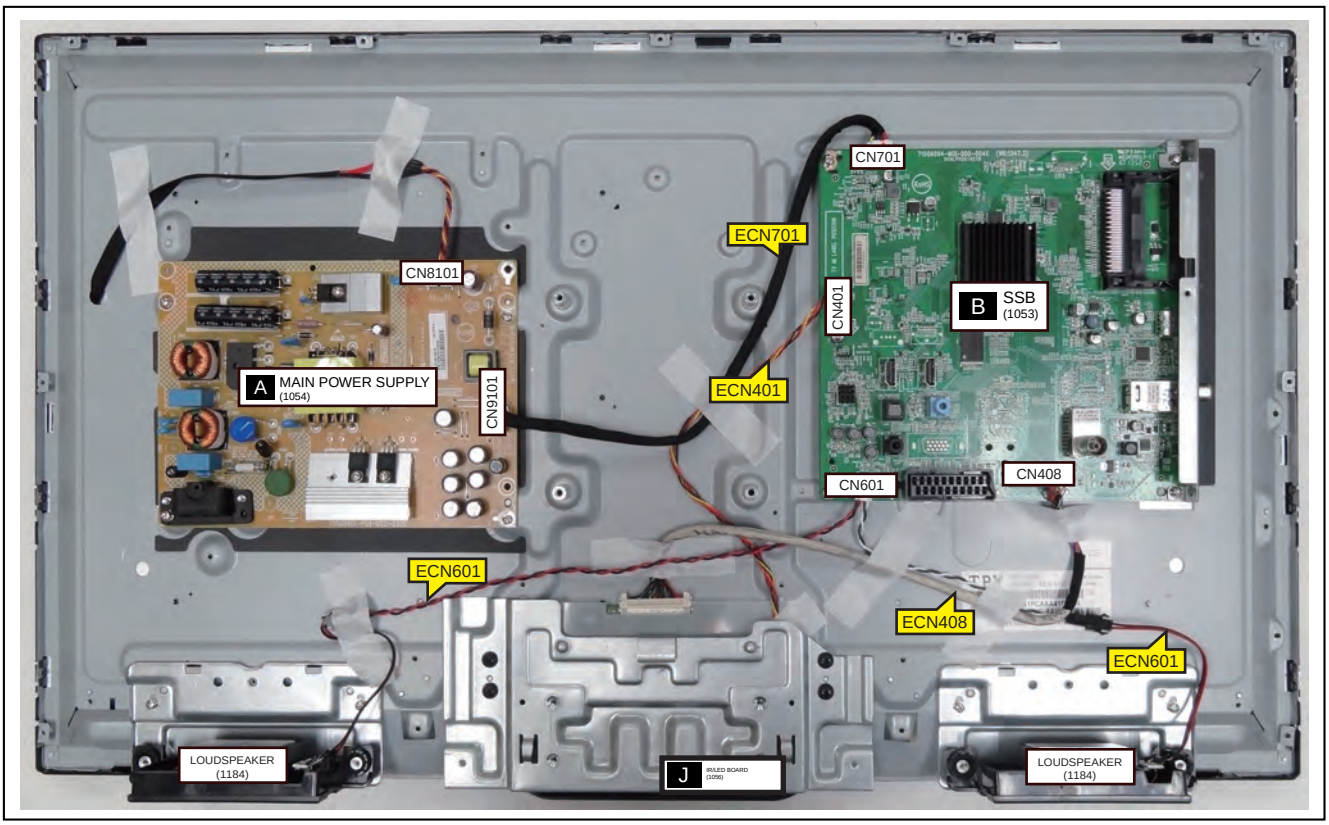
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Figure 4-13 Cable dressing (32" 4100 series)



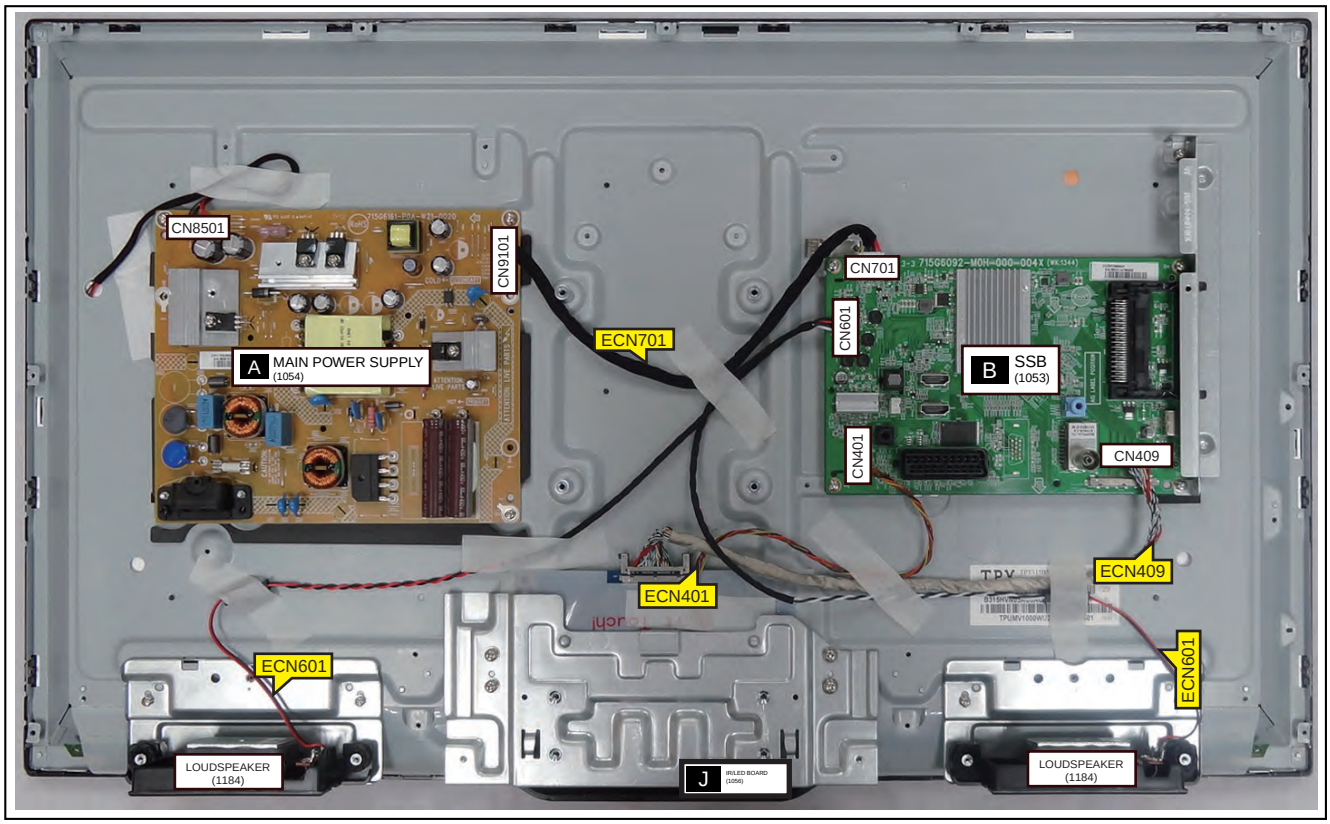
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Figure 4-14 Cable dressing (32" PHx4309/88 series)



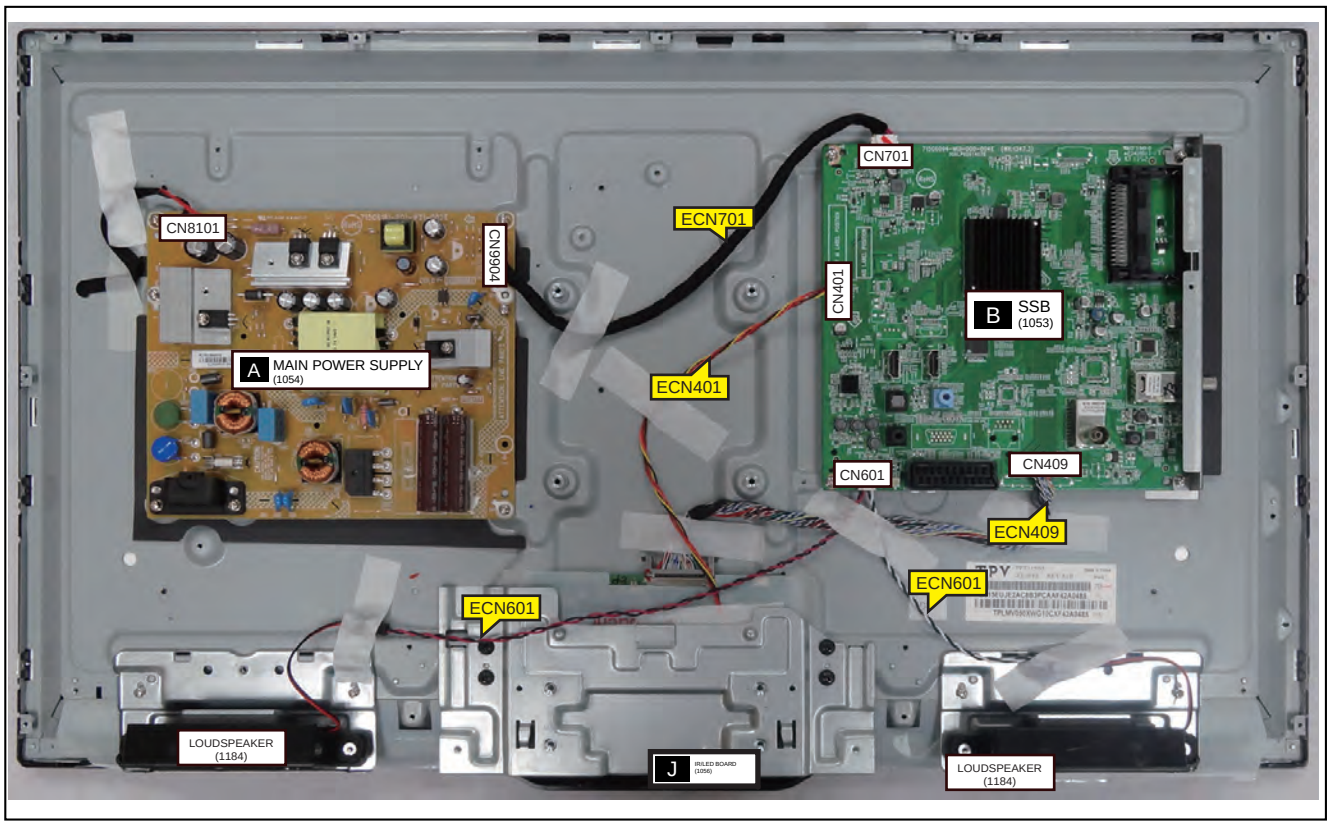
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Figure 4-15 Cable dressing (32" PHx4309/12 series)



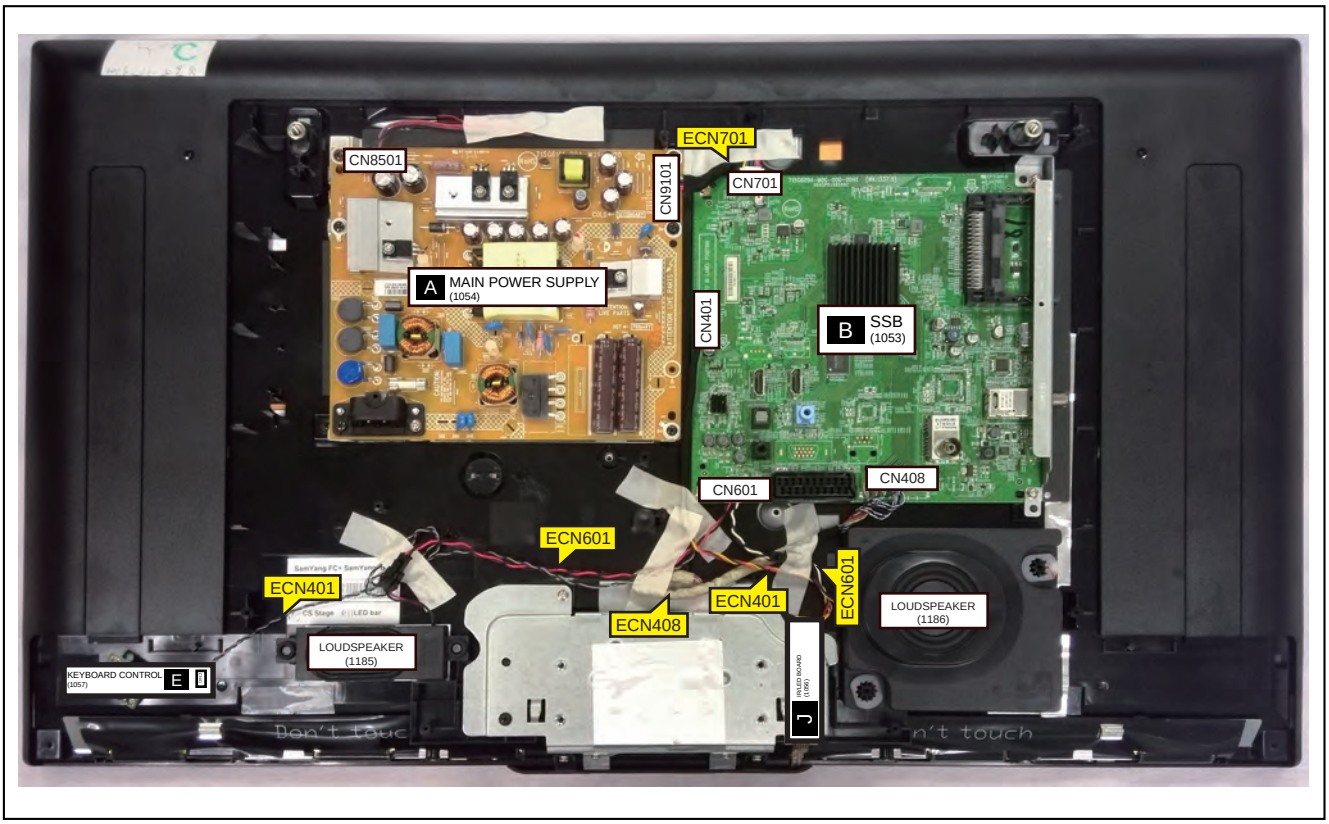
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Figure 4-16 Cable dressing (32" PFx4309/88 series)



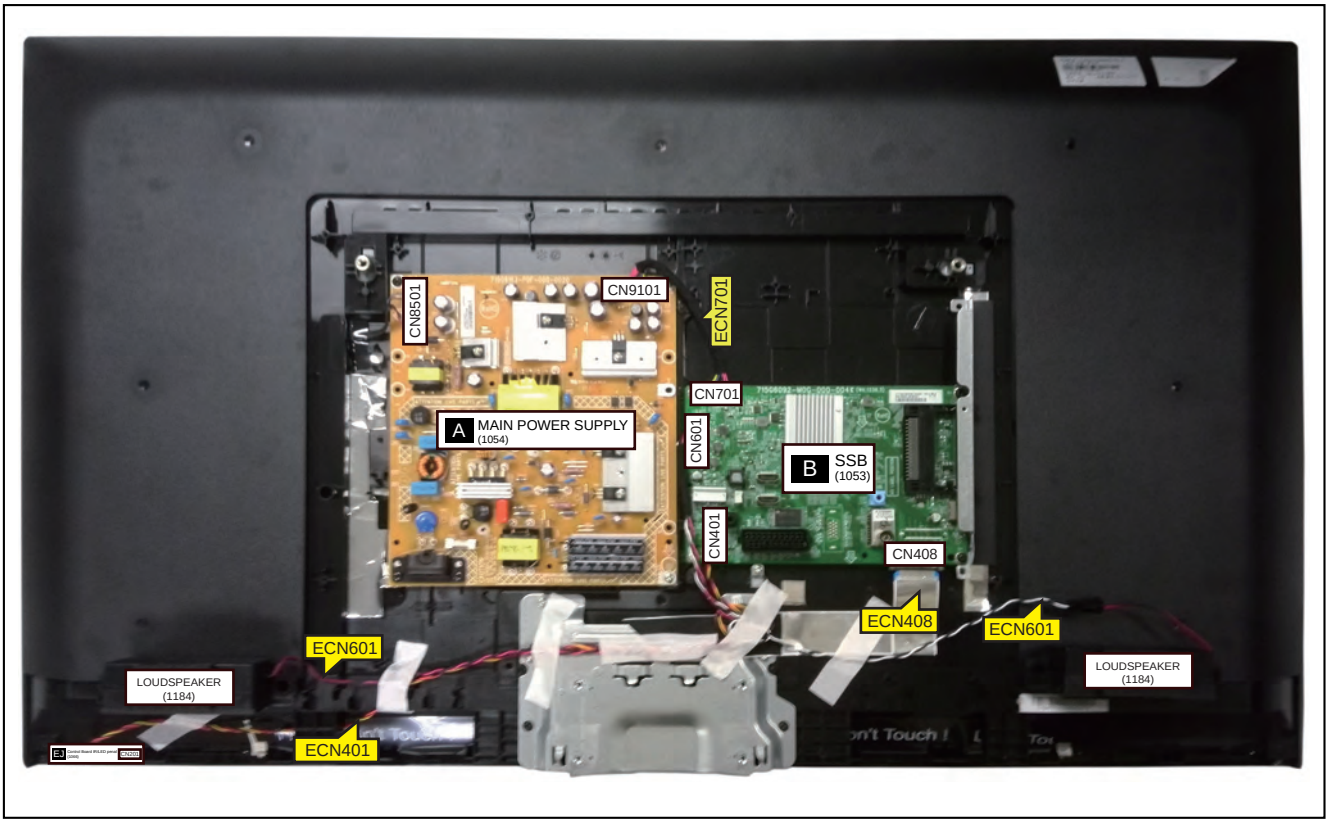
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Figure 4-17 Cable dressing (32" PFx4309/12 series)



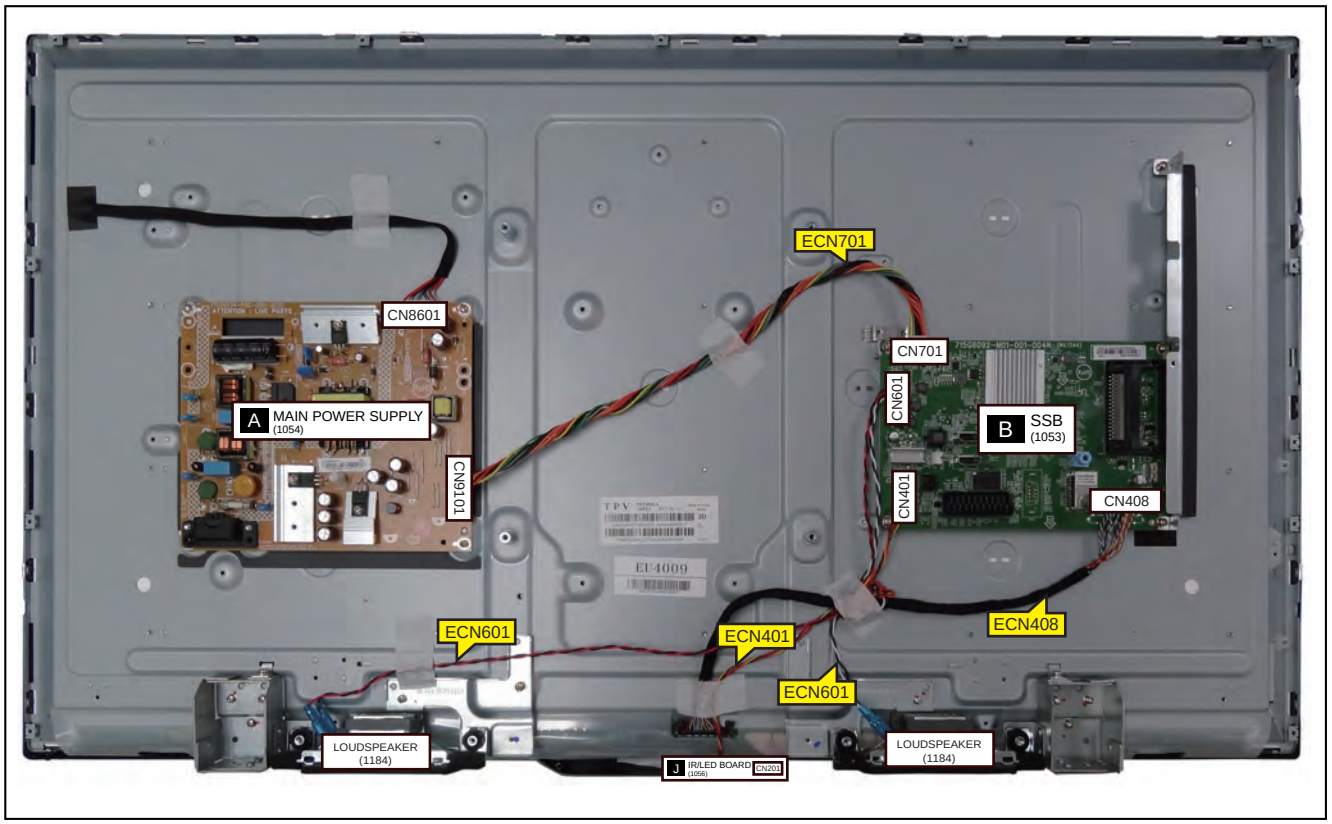
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Figure 4-18 Cable dressing (32" 5100 series)



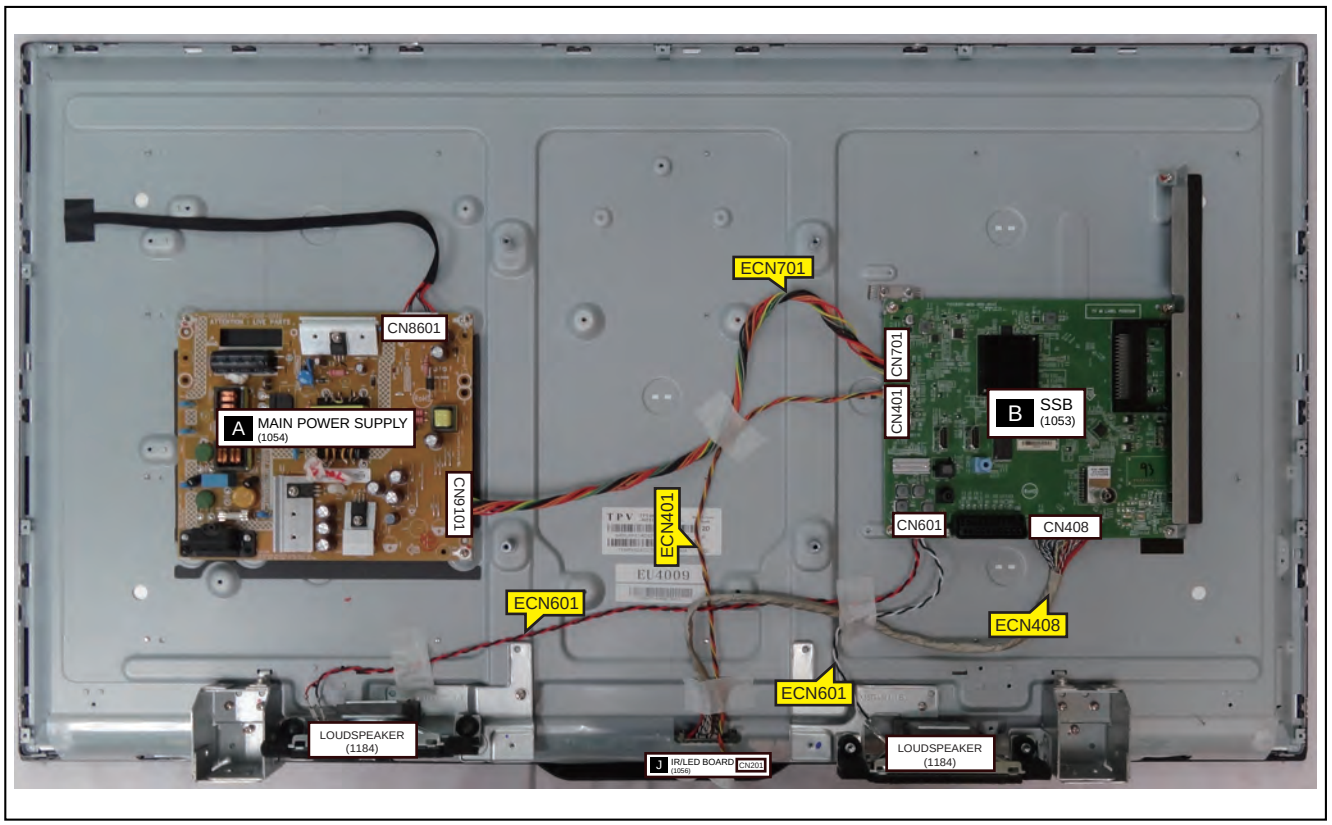
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Figure 4-19 Cable dressing (40" & 47" PFx4109/88 series)



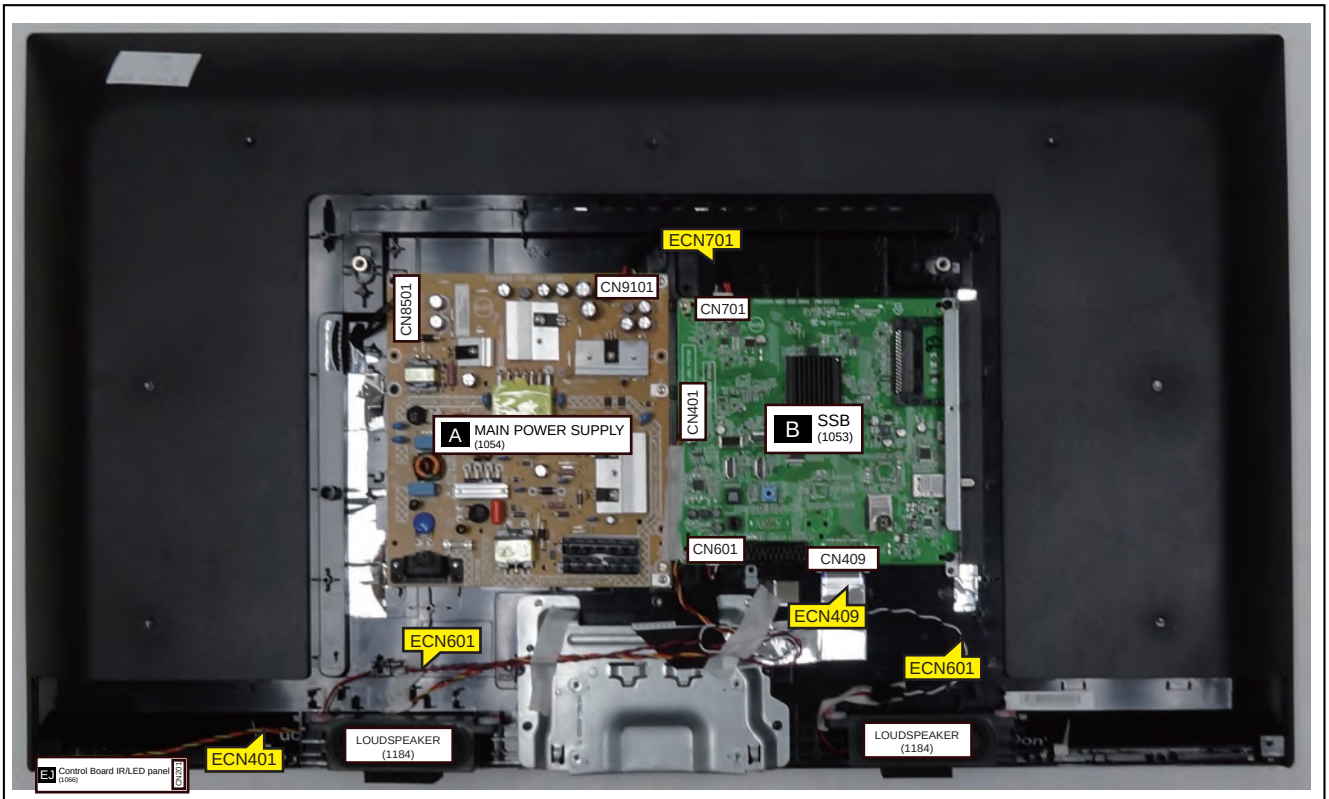
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Figure 4-20 Cable dressing (40PFH4009 series)



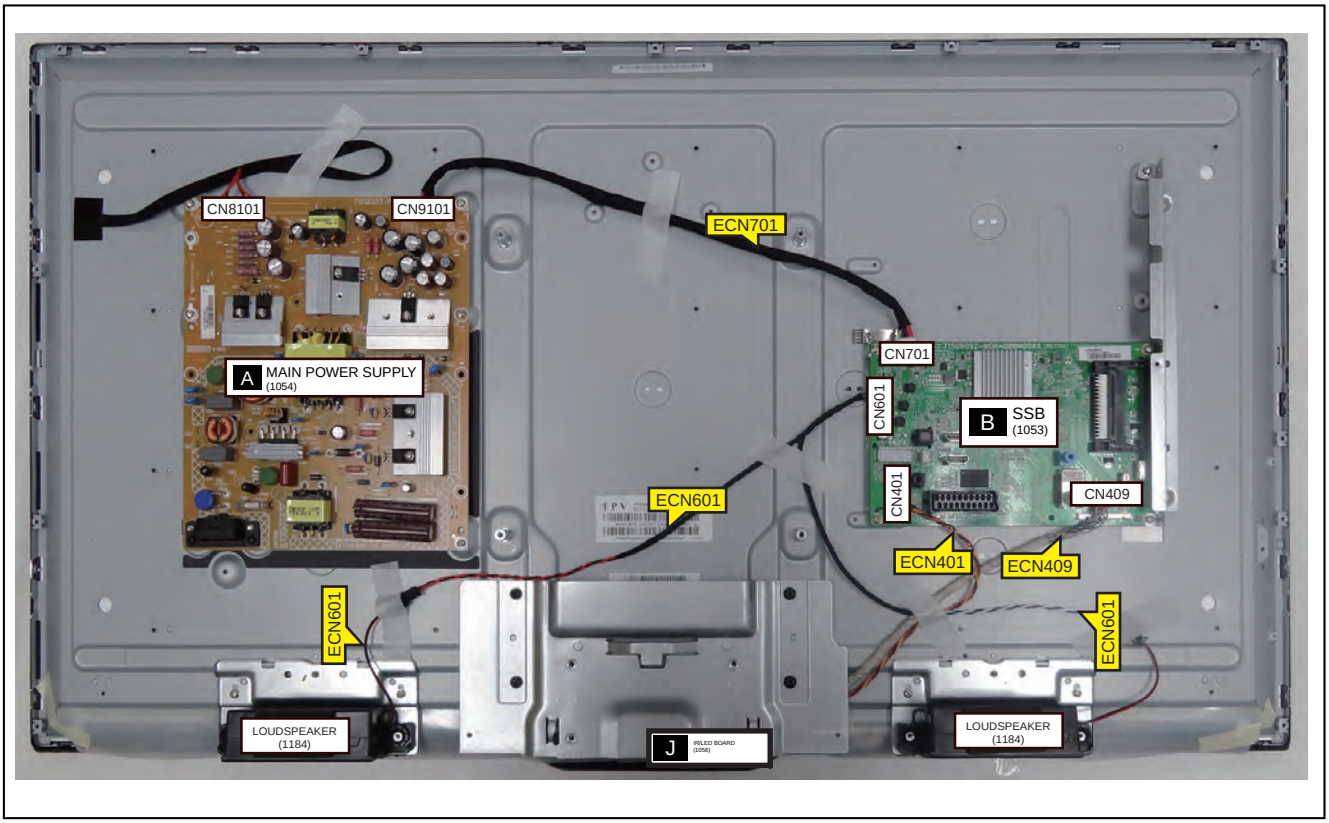
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Figure 4-21 Cable dressing (40PFK/T4009 series)



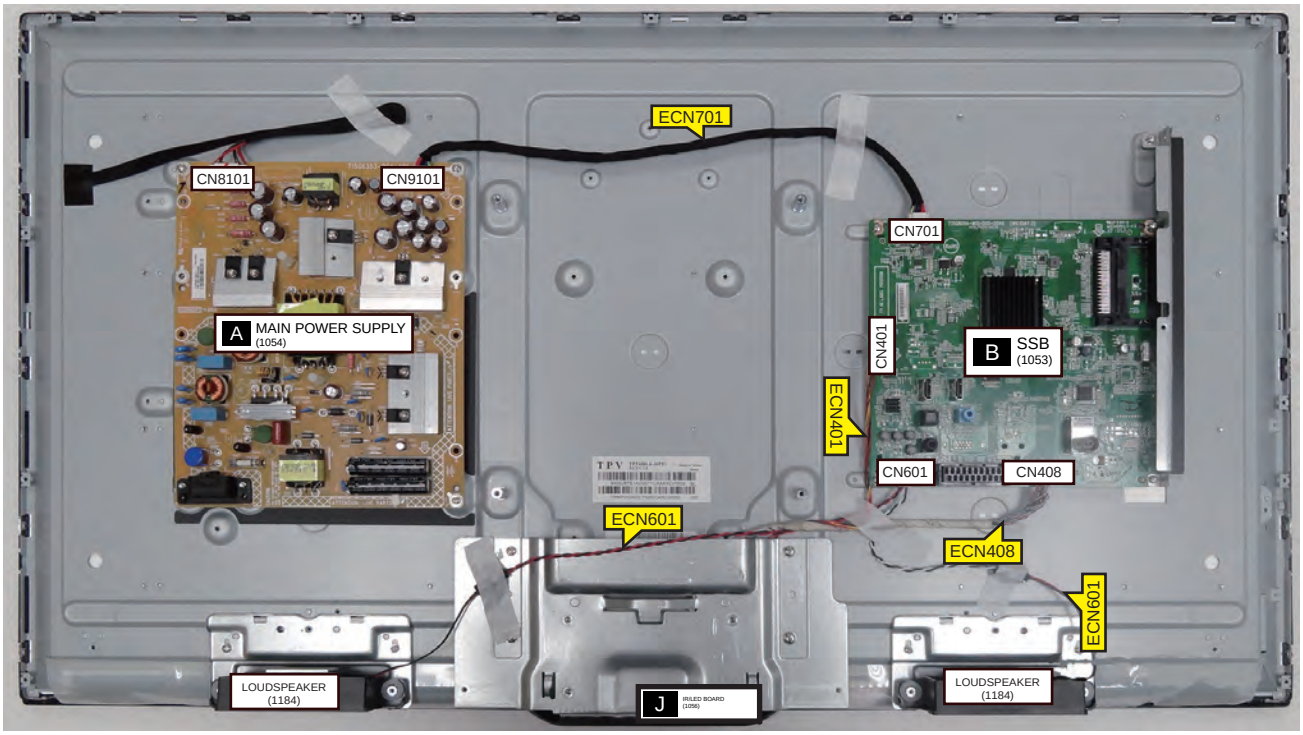
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Figure 4-22 Cable dressing (40" & 47" PFx4109/12 series)



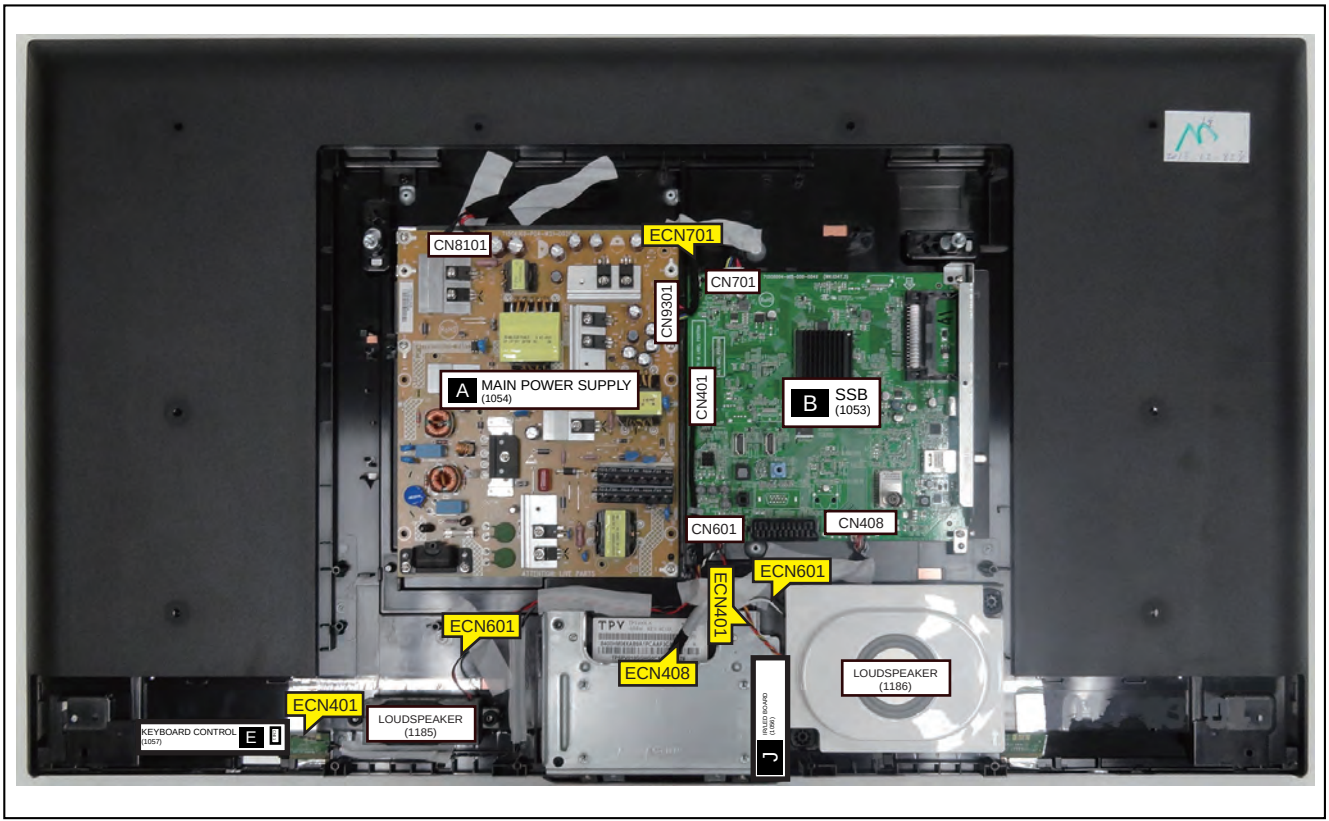
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Figure 4-23 Cable dressing (40" Pxx4300/88 series)



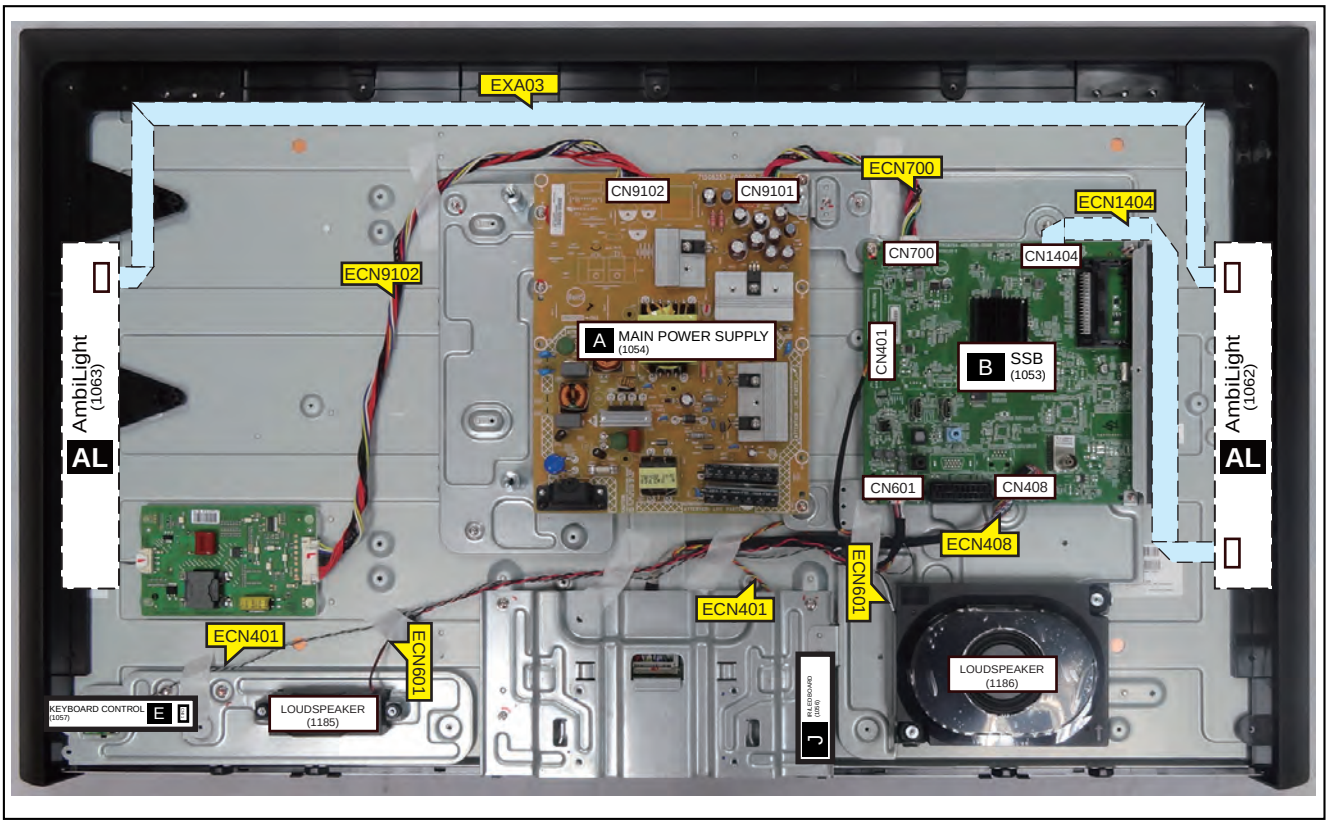
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Figure 4-24 Cable dressing (40" Pxx4300/12 series)



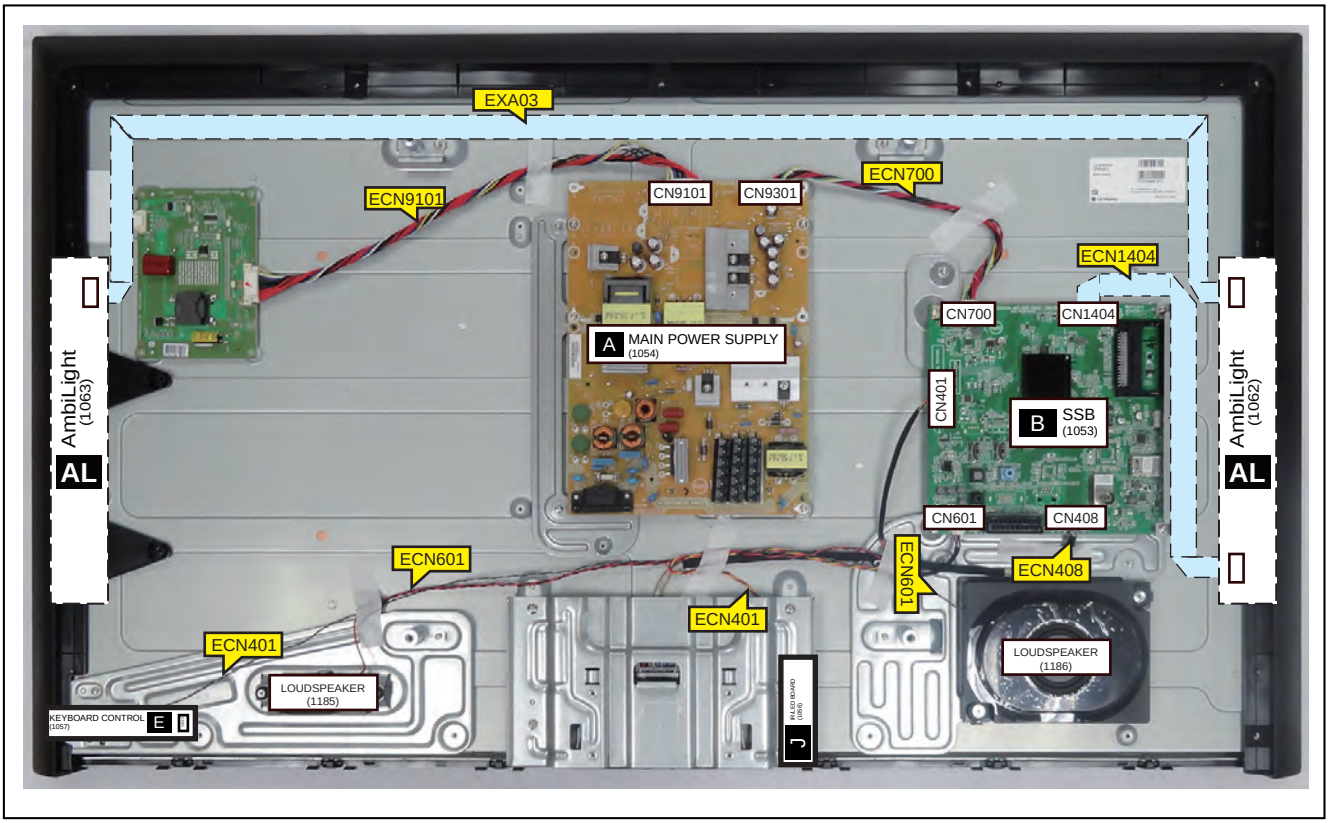
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Figure 4-25 Cable dressing (40" 5100 series)



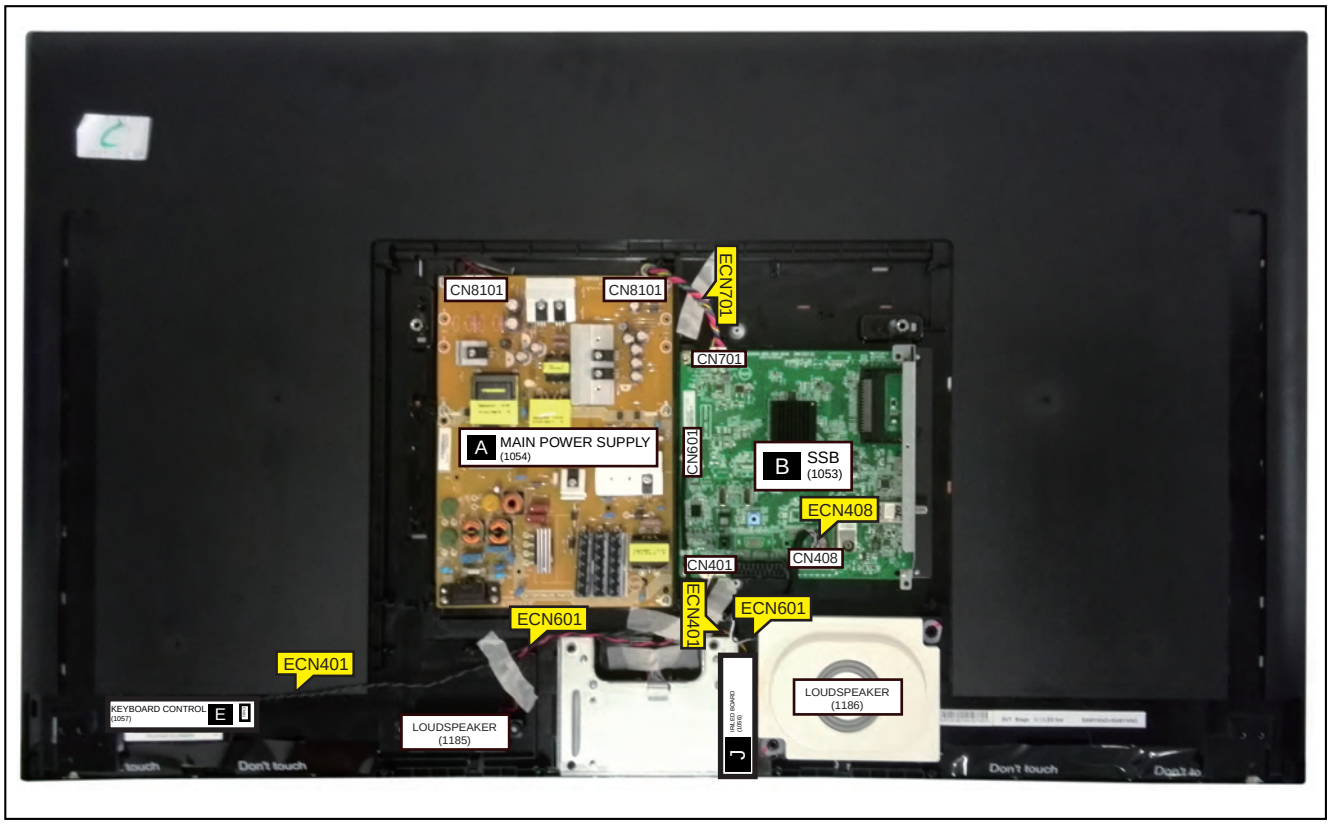
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Figure 4-26 Cable dressing (42" 5190 & 5200 series)



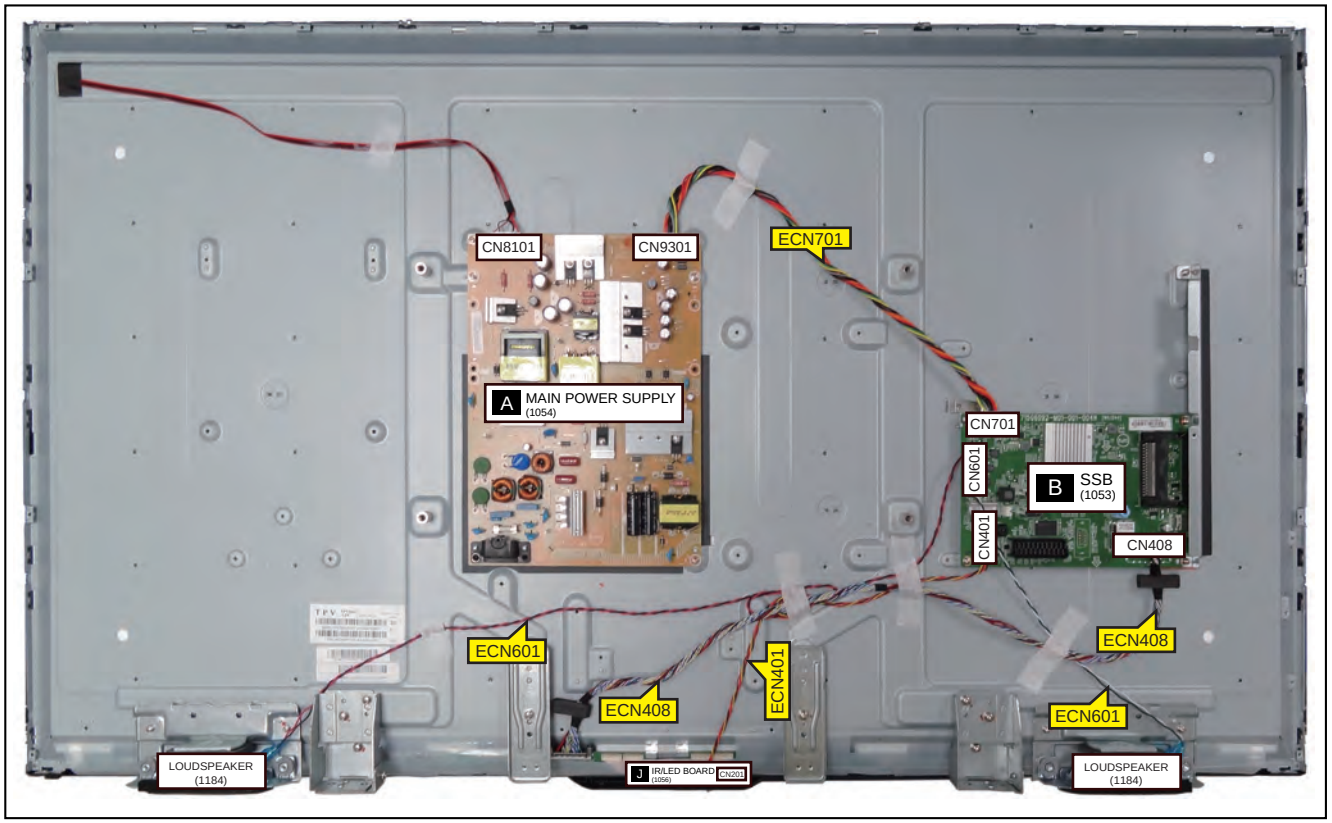
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Figure 4-27 Cable dressing (47" 5190 & 5200 series)



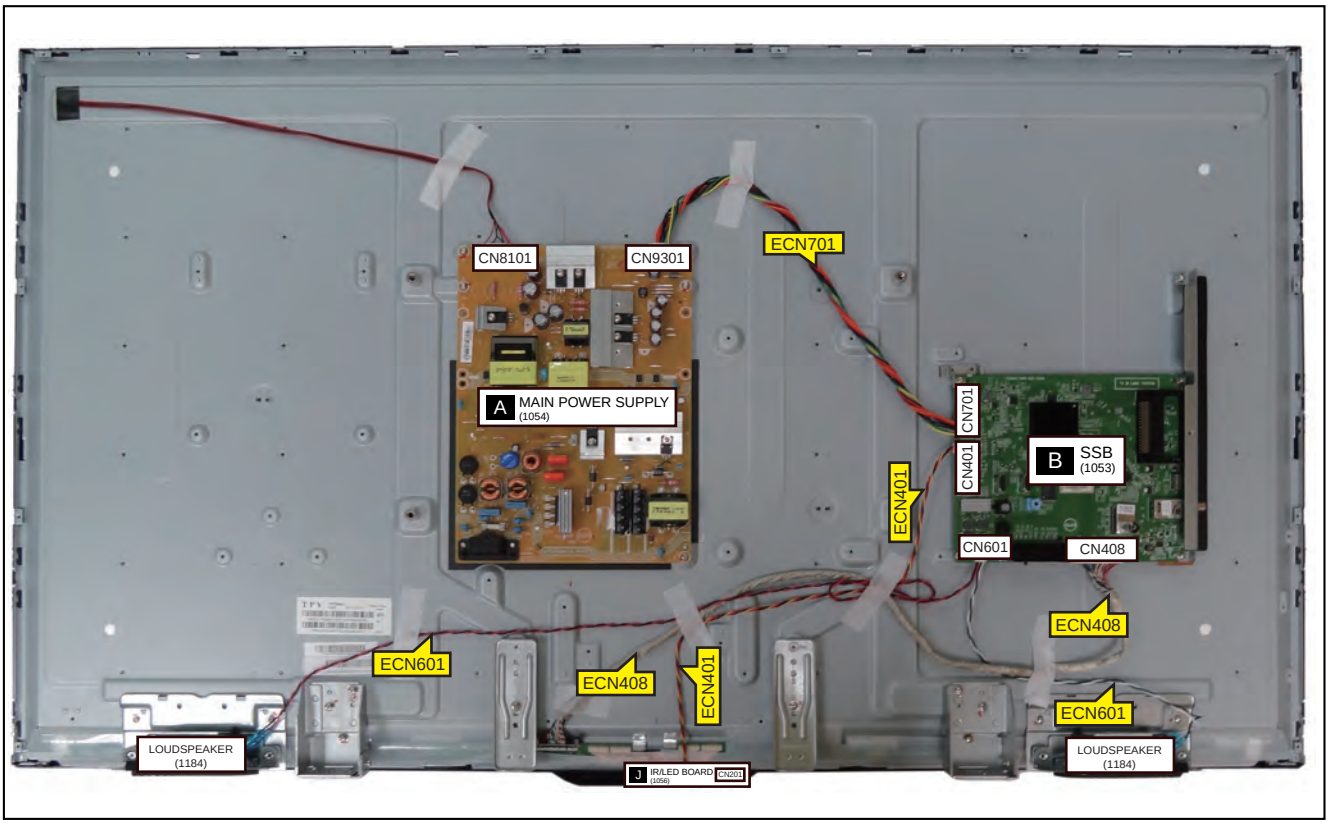
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Figure 4-28 Cable dressing (48" 5100 series)



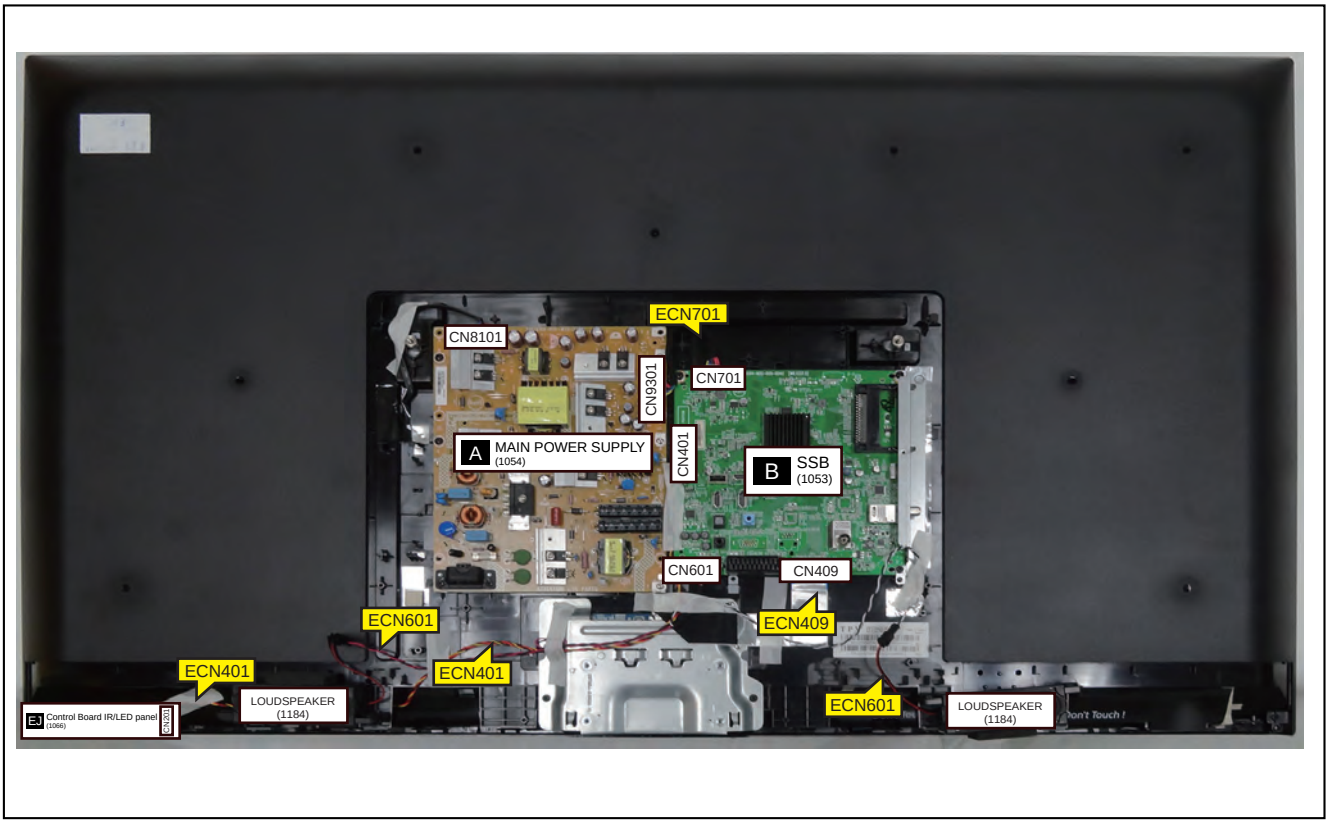
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Figure 4-29 Cable dressing (50PFH4009 series)



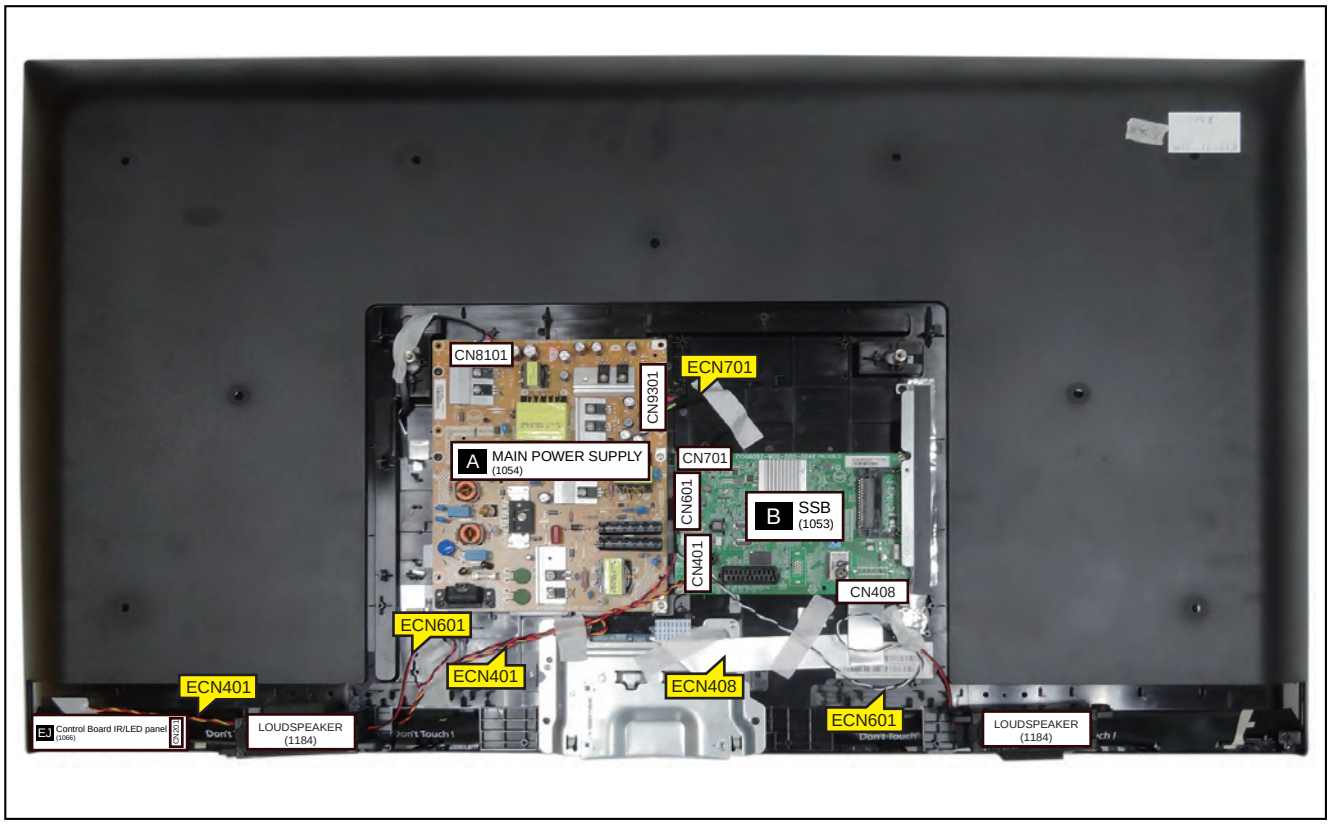
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Figure 4-30 Cable dressing (50PFK/T4009 series)



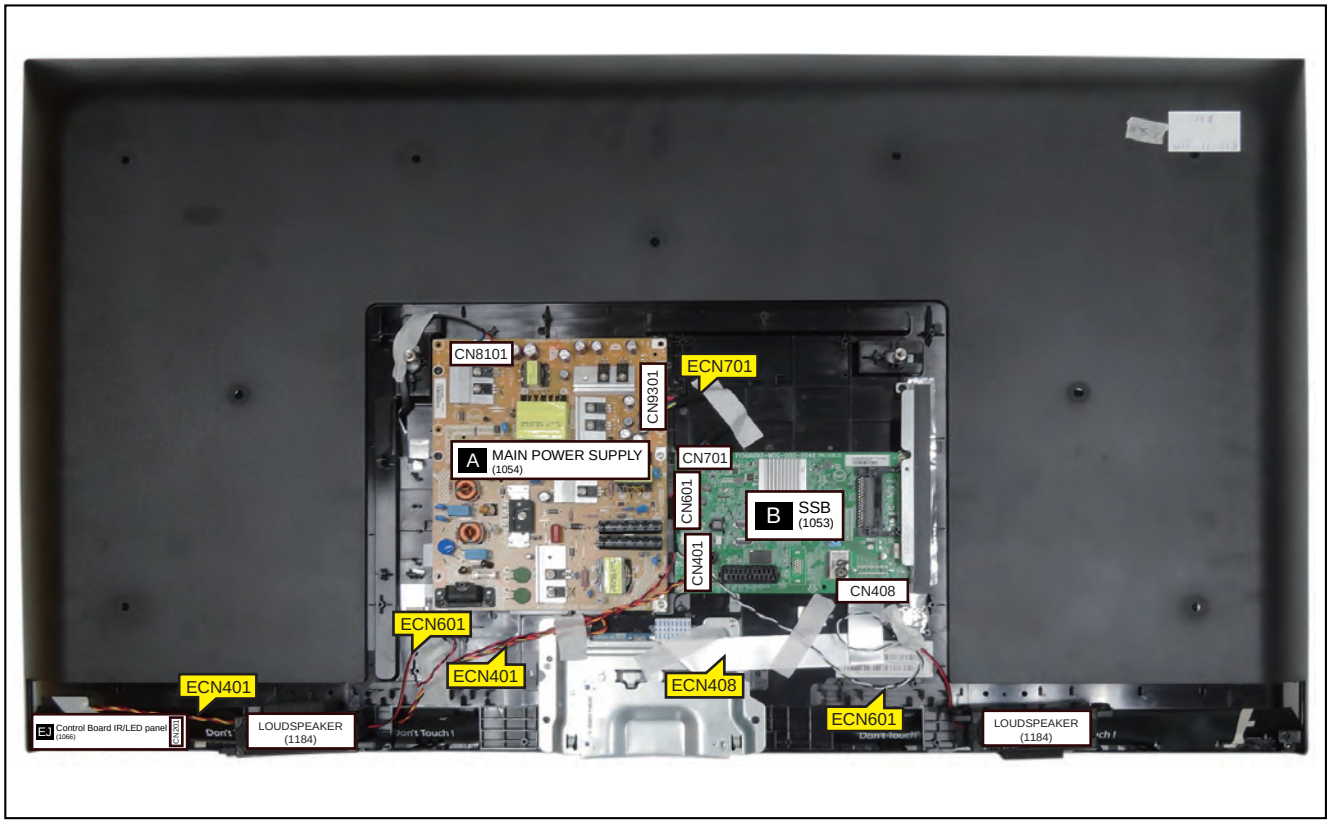
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Figure 4-31 Cable dressing (50" PFx4109/12 series)



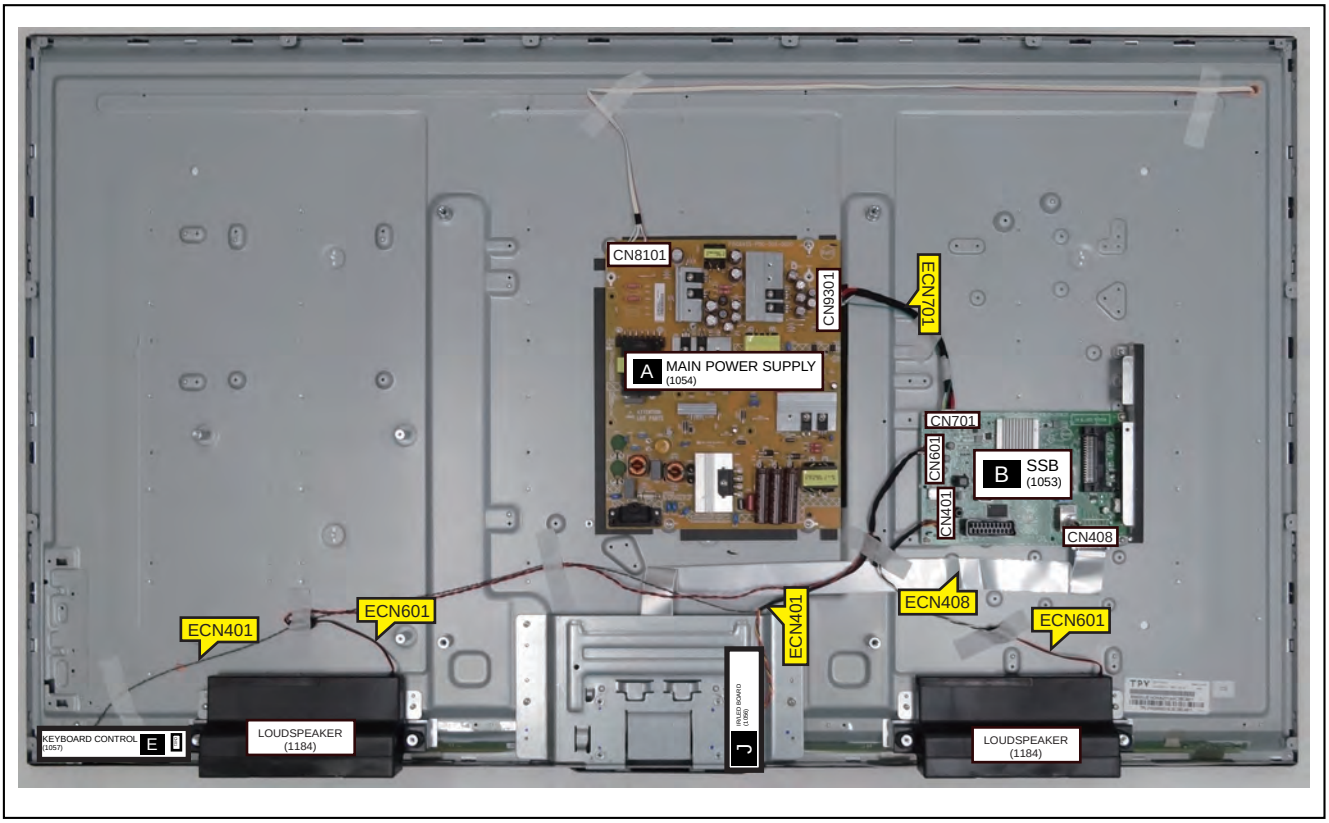
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Figure 4-32 Cable dressing (50" PFx4109/88 series)



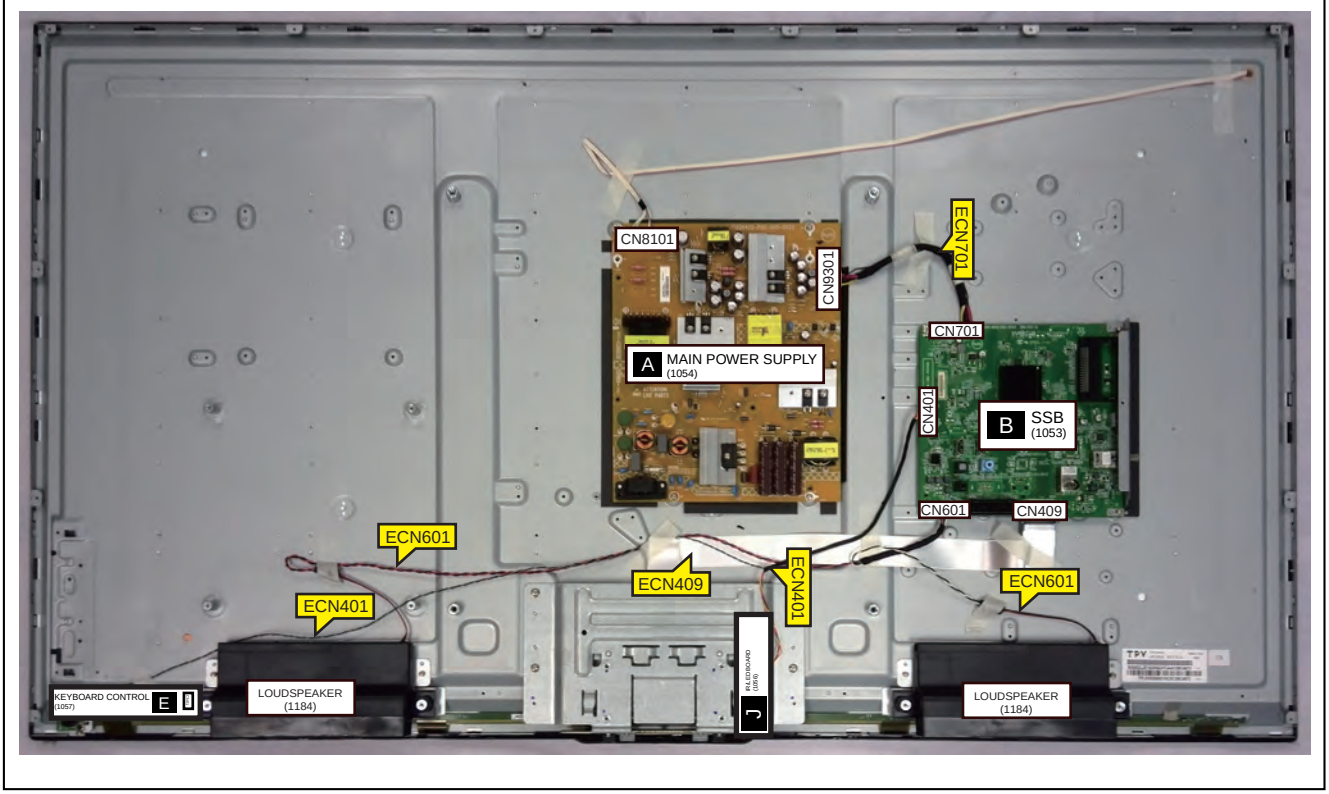
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Figure 4-33 Cable dressing (50" 4300 series)



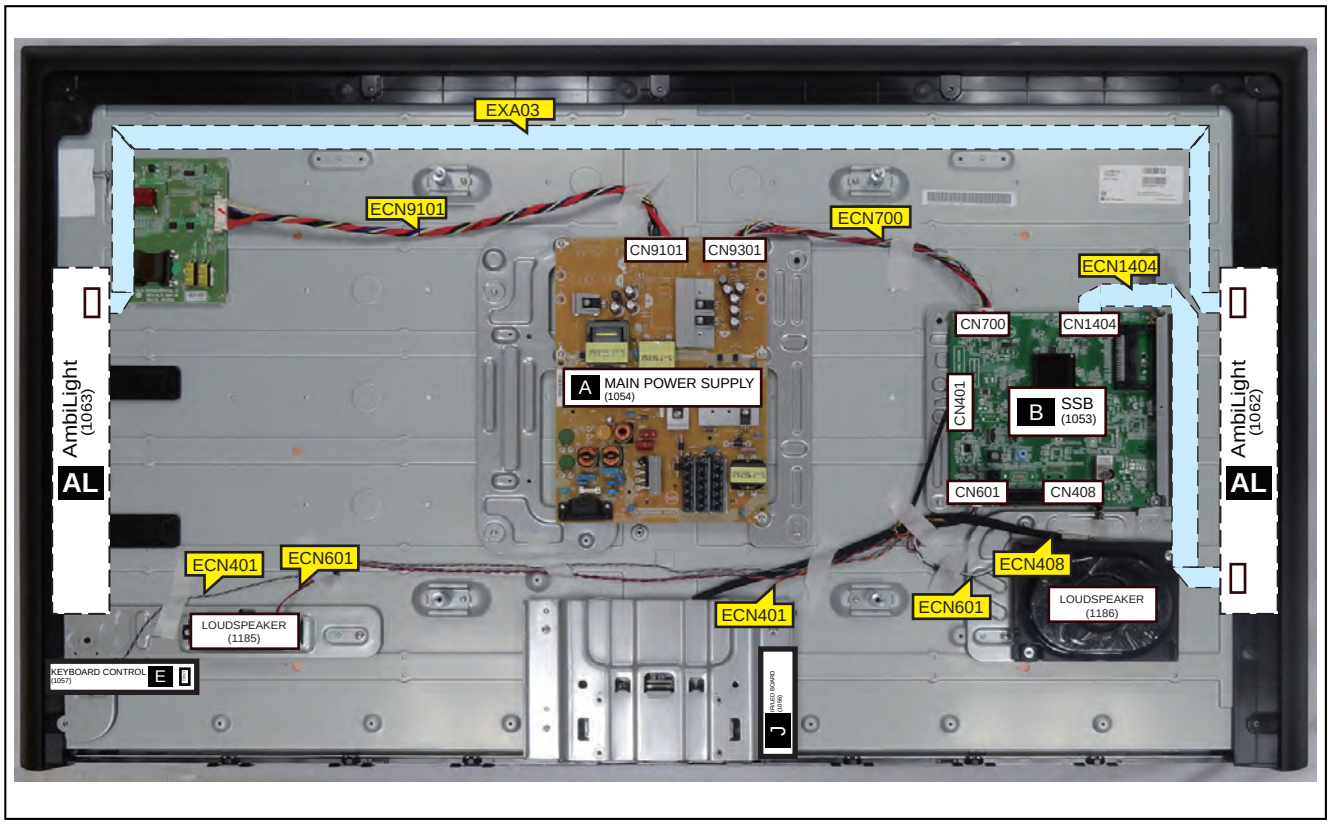
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Figure 4-34 Cable dressing (55" PFx5100/88 series)



19593_110.eps

Figure 4-35 Cable dressing (55" PFx5100/12 series)



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Figure 4-36 Cable dressing (55" 5190 & 5200 series)

4.2 Service Positions

For easy servicing of a TV set, the set should be put face down on a soft flat surface, foam buffers or other specific workshop tools. Ensure that a stable situation is created to perform measurements and alignments. When using foam bars take care that these always support the cabinet and **never** only the display. **Caution:** Failure to follow these guidelines can seriously damage the display!
Ensure that ESD safe measures are taken.

4.3 Assembly/Panel Removal (for 20"/22"/24"/28" 4100 series & 22" 4209 series & 32" 4300 series & 23" 4009 series)

Instructions below apply to the 24PFT4109/12, but will be similar for 20"/22"/24"/28" 4100 series & 22" 4209 series & 32" 4300 series & 23" 4009 series models.

4.3.1 Rear Cover

Refer to Figure 4-37 for details.
Warning: Disconnect the mains power cord before removing the rear cover.

1. Remove fixation screws [1] that secure the base assy, pull out the base assy from the set. Then remove the fixation screws [2] that secure the rear cover. Refer to Figure 4-37 for details.
2. At the indicated areas [3] the cover is secured by clips. Be very careful with releasing those.
3. Gently lift the rear cover from the TV. Make sure that wires and cables are not damaged while lifting the rear cover from the set.



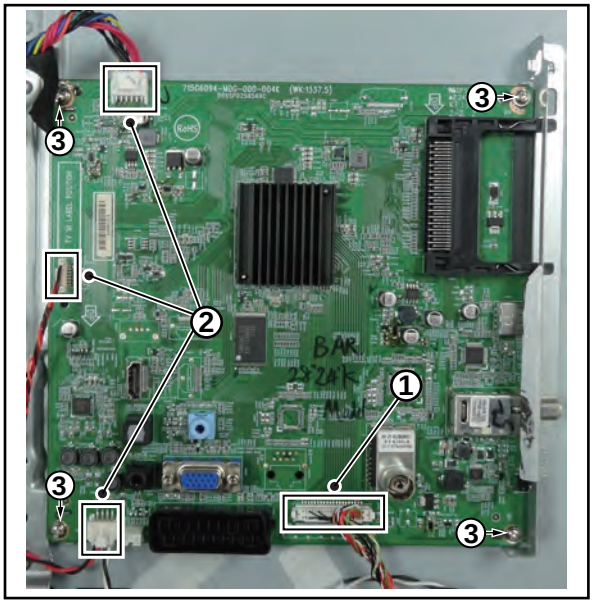
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140111

Figure 4-37 Rear cover removal

4.3.2 Small Signal Board (SSB)

Refer to Figure 4-38 for details.
Caution: it is mandatory to remount all different screws at their original position during re-assembly. Failure to do so may result in damaging the SSB.

1. Release the clips from the LVDS [1] connector that connect with the SSB.
   Caution: be careful, as these are very fragile connectors!
2. Unplug all other connectors [2].
3. Remove all the fixation screws [3] from the SSB.
4. The SSB can now be shifted from side connector cover, then lifted and taken out of the I/O bracket.Refer to Figure 4-38 for details.



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140111

Figure 4-38 SSB removal

4.3.3 Power Supply Unit (PSU)

Caution: it is mandatory to remount all different screws at their original position during re-assembly. Failure to do so may result in damaging the PSU.

1. Gently unplug all connectors from the PSU.
2. Remove all fixation screws from the PSU.
3. The PSU can be taken out of the set now.

4.3.4 Speakers

1. Gently release the tapes that secures the speaker cables.
2. Unplug the speaker connectors from the SSB.
3. Take the speakers out.

When defective, replace the both units.

4.3.5 Stand bracket

1. Remove all fixation screws of the bracket.
2. Lift the bracket from the set.

4.3.6 IR/LED panel

1. Remove the stand bracket, as described earlier.
2. Unplug the connector from the IR/LED panel.
3. Gently release the clip that holds the panel and take it out from the bezel.

When defective, replace the whole unit.

4.3.7 LCD Panel

1. Remove the SSB as described earlier.
2. Remove the PSU as described earlier.
3. Remove the stand bracket as described earlier.
4. Remove the IR/LED as described earlier.
5. Remove the fixations screws that fix the metal clamps to the front bezel. Take out those clamps.
6. Remove all other metal parts not belonging to the panel.
7. Lift the LCD Panel from the bezel.

When defective, replace the whole unit.

4.4 Assembly/Panel Removal (for 32" 4100 series)

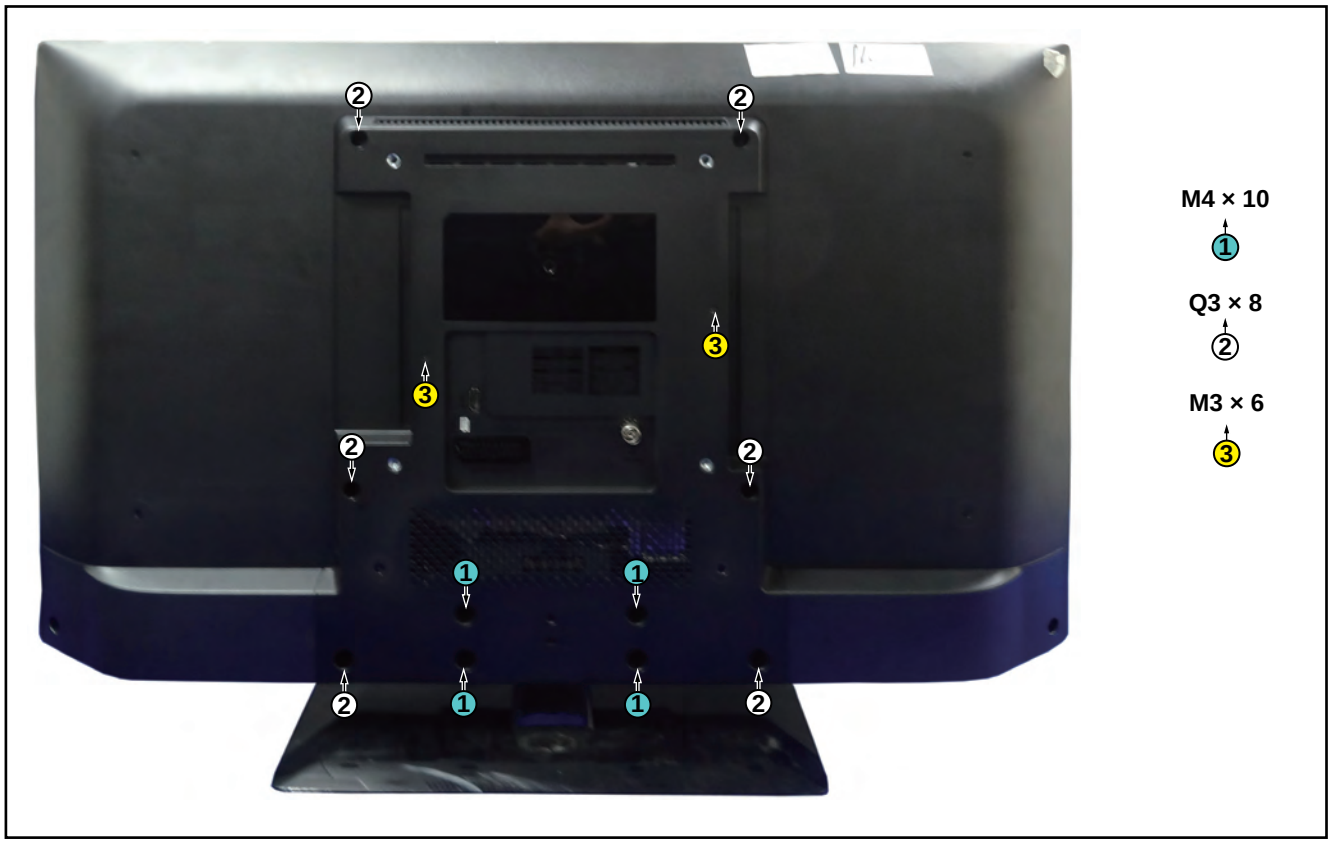
Instructions below apply to the 32PHH4109/88, but will be similar for other 32" 4100 series models.

4.4.1 Rear Cover

Refer to Figure 4-39 for details.

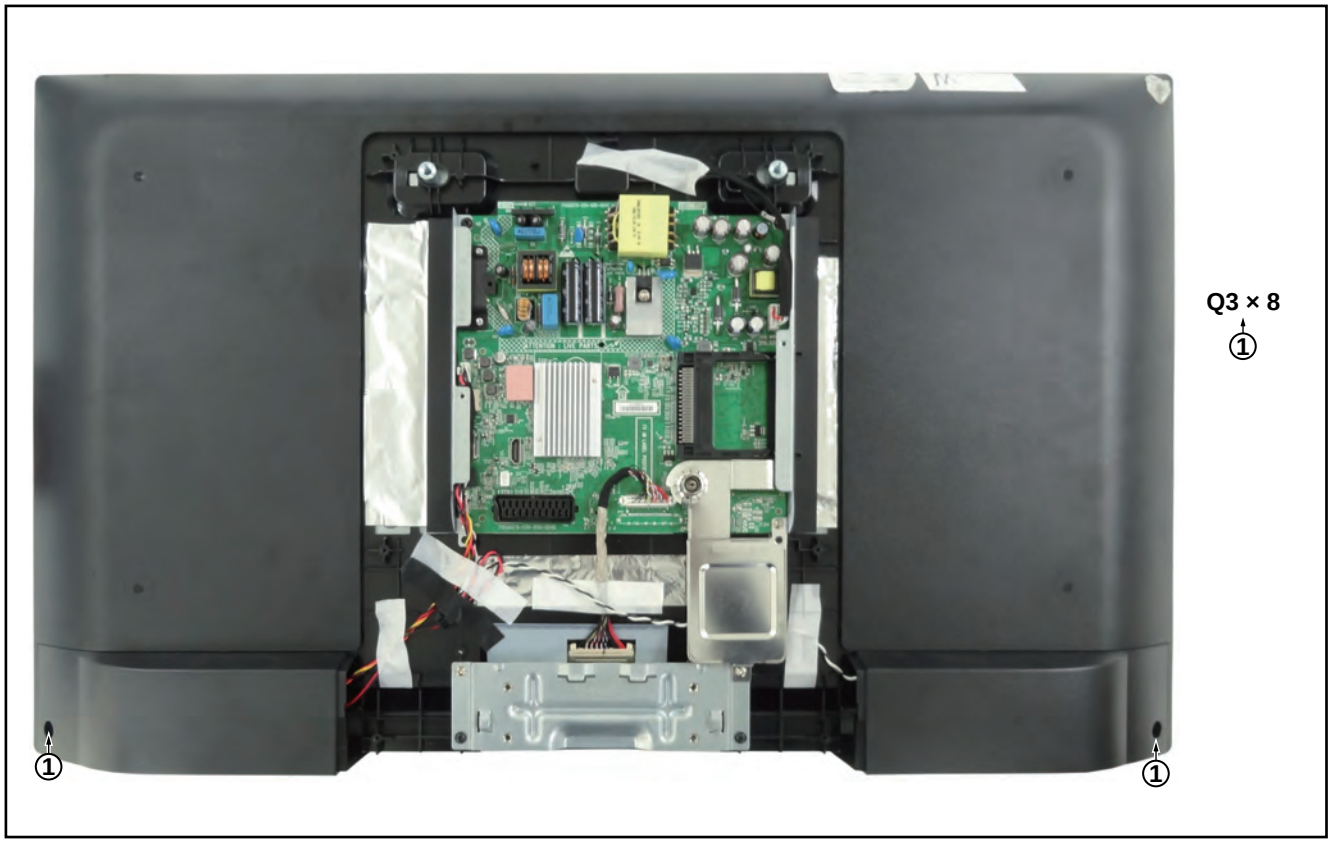
Warning: Disconnect the mains power cord before removing the rear cover.

1. Remove fixation screws [1] that secure the base assy, pull out the base assy from the set. Then remove the fixation screws [2], [3] that secure the rear cover. Refer to Figure 4-39 for details.
2. Gently lift the rear cover from the TV. Make sure that wires and cables are not damaged while lifting the rear cover from the set.



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140111

Figure 4-39 Rear cover removal [1]



19590_107_140111.eps
140111

Figure 4-40 Rear cover removal [2]

4.4.2 Speakers

Refer toFigure 4-40 and Figure 4-41 for details.

1. Remove fixation screws [1] that secure the speakers cover, Refer to Figure 4-40 for details.
2. Gently lift the speakers cover from the TV. Make sure that wires and cables are not damaged while lifting the rear cover from the set.
3. Remove the fixation screws [1] that secure the speakers. Refer to Figure 4-41 for details.
4. Gently take the speakers out.

When defective, replace the whole unit.



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140111

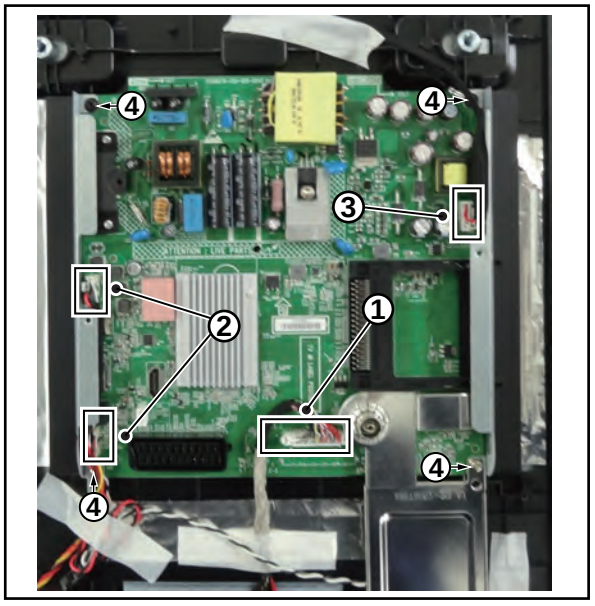
Figure 4-41 Speakers removal

4.4.3 Small Signal Board (SSB) + PSU combination panel

Refer to Figure 4-42 for details.

Caution: it is mandatory to remount all different screws at their original position during re-assembly. Failure to do so may result in damaging the SSB + PSU combination panel.

1. Release the clips from the LVDS connector that connect with the SSB + PSU combination panel [1].
   Caution: be careful, as these are very fragile connectors!
2. Unplug all other connectors [2] , [3].
3. Remove all the fixation screws [4] from the SSB + PSU combination panel.
4. The SSB + PSU combination panel can now be shifted from side connector cover, then lifted and taken out of the I/O bracket. Refer to Figure 4-42 for details.



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140111

Figure 4-42 SSB + PSU combination panel removal

4.4.4 Stand bracket

1. Remove all fixation screws of the bracket.
2. Lift the bracket from the set.

4.4.5 Control Board IR/LED Panel

1. Remove the stand bracket, as described earlier.
2. Unplug the connector from the Control Board IR/LED panel.
3. Gently release the clip that holds the panel and take it out from the bezel.

When defective, replace the whole unit.

4.4.6 LCD Panel

1. Remove the SSB + PSU combination panelas described earlier.
2. Remove the stand bracket as described earlier.
3. Remove the Control Board IR/LED panel as described earlier.
4. Remove the fixations screws that fix the metal clamps to the front bezel. Take out those clamps.
5. Remove all other metal parts not belonging to the panel.
6. Lift the LCD Panel from the bezel.

When defective, replace the whole unit.

4.5 Assembly/Panel Removal (for 40"/47"/50" 4100 series & 40" 4300 series)

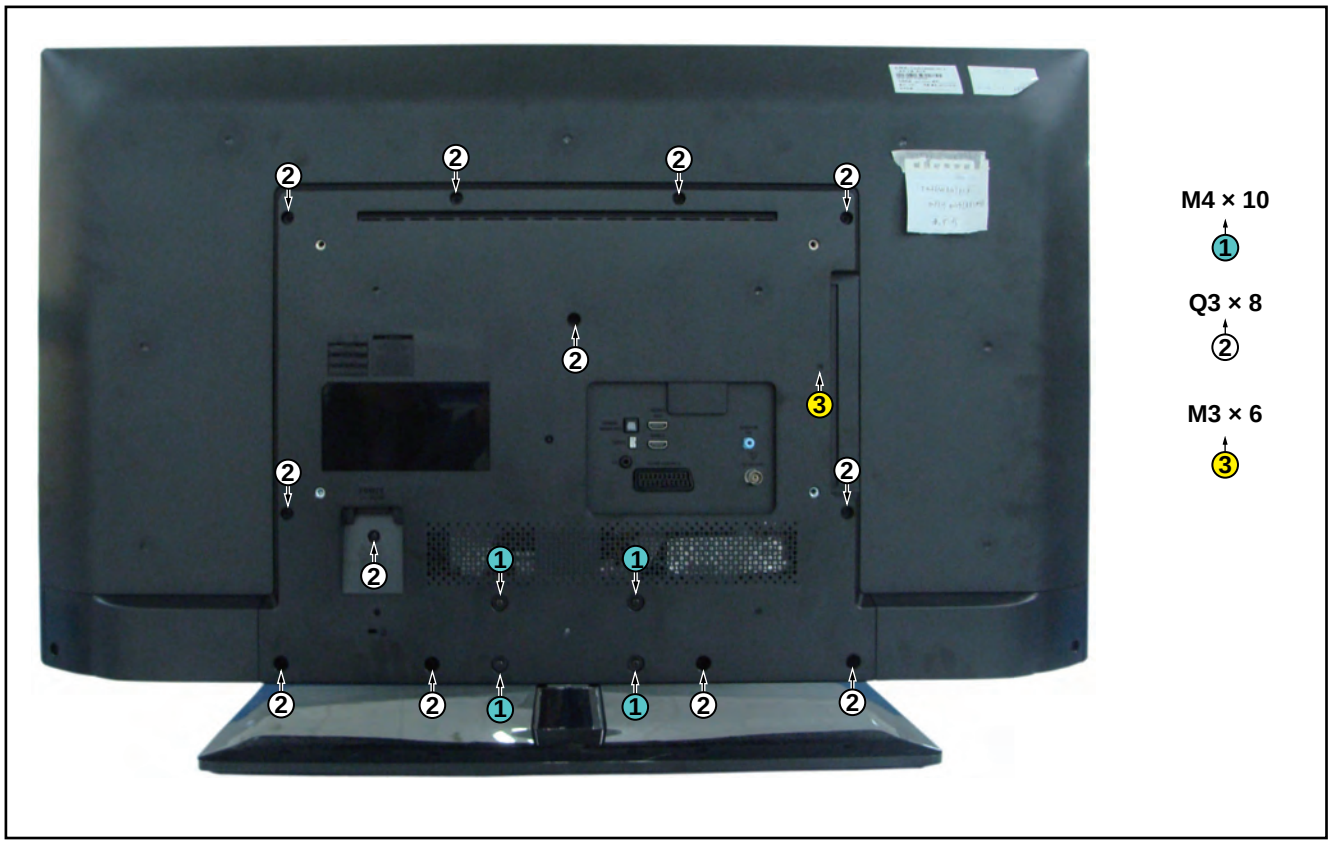
Instructions below apply to the 40PFH4109/88. but will be similar for other 40"/47"/50" 4100 & 40" 4300 series models.

4.5.1 Rear Cover

Refer to Figure 4-43 for details.

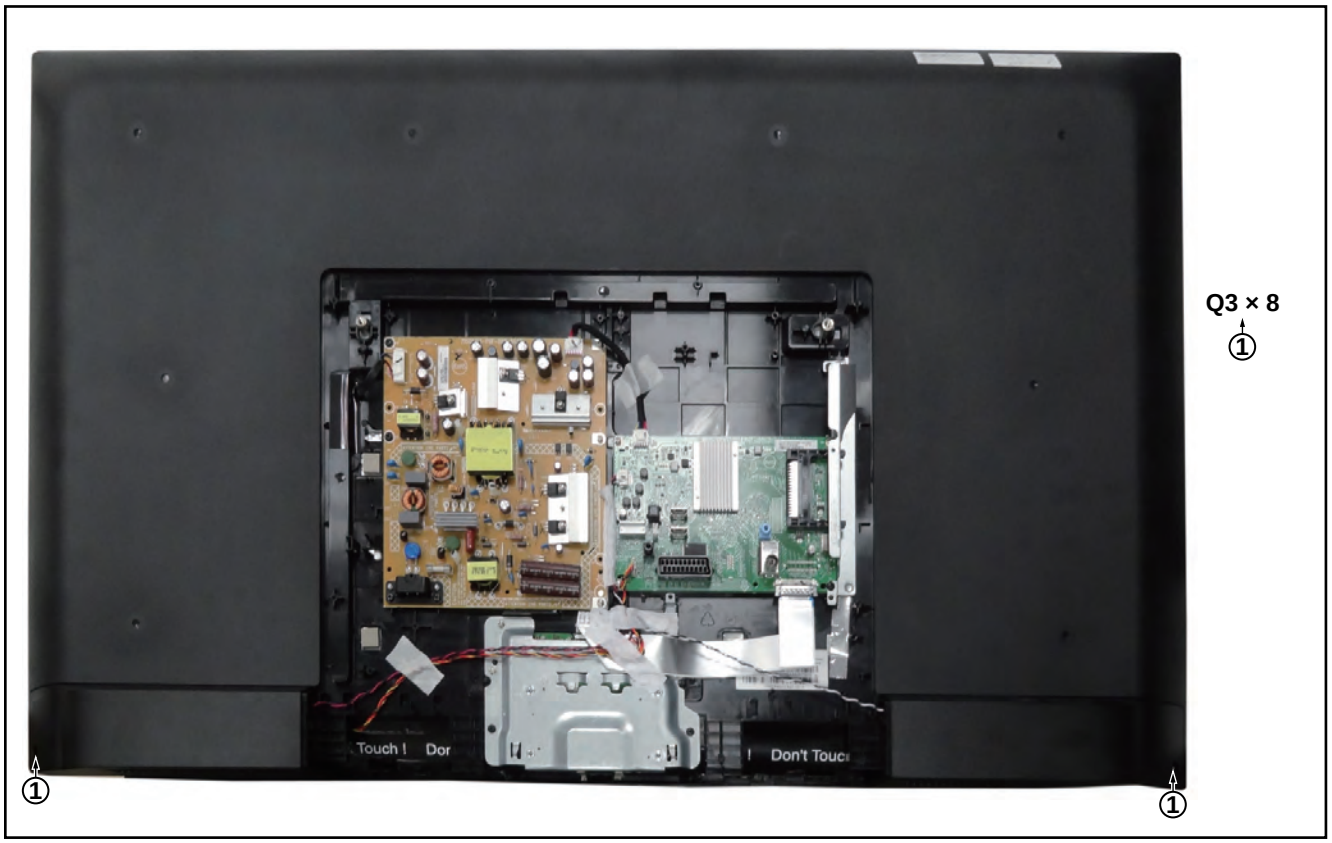
Warning: Disconnect the mains power cord before removing the rear cover.

1. Remove fixation screws [1] that secure the base assy, pull out the base assy from the set. Then remove the fixation screws [2], [3] that secure the rear cover. Refer to Figure 4-43 for details.
2. Gently lift the rear cover from the TV. Make sure that wires and cables are not damaged while lifting the rear cover from the set.



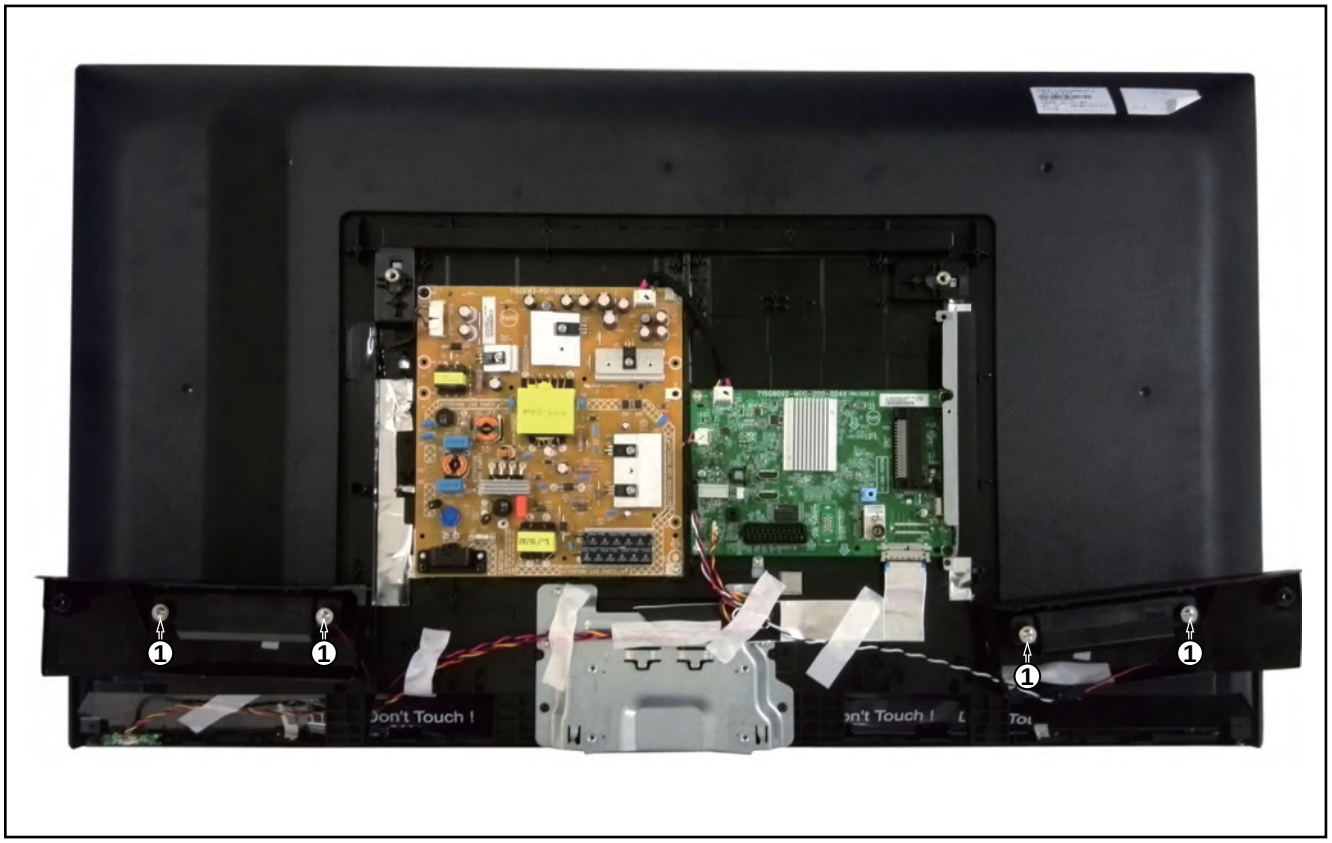
19590_110_140111.eps
14011

Figure 4-43 Rear cover removal [1]



19590_111_140111.eps
140111

Figure 4-44 Rear cover removal [2]



19590_112_140111.eps
14011

Figure 4-45 Speakers removal

4.5.2 Speakers

Refer to Figure 4-44 and Figure 4-45 for details.

1. Remove fixation screws [1] that secure the speakers cover, Refer to Figure 4-44 for details.
2. Gently lift the speakers cover from the TV. Make sure that wires and cables are not damaged while lifting the rear cover from the set.
3. Remove the fixation screws [1] that secure the speakers. Refer to Figure 4-45 for details.
4. Gently take the speakers out.

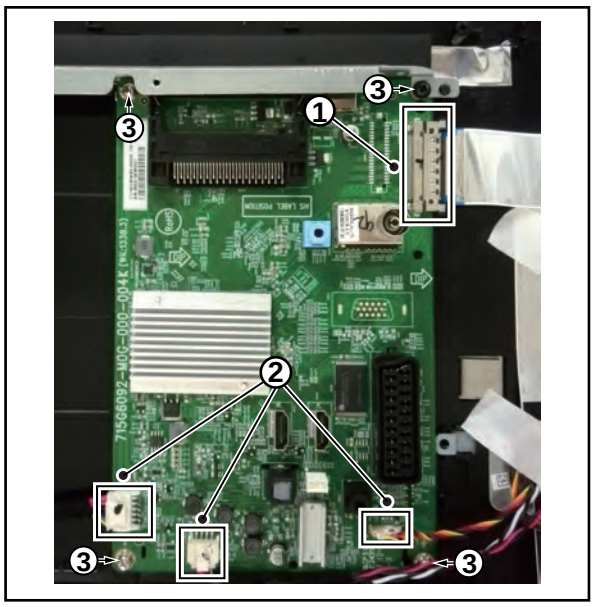
When defective, replace the whole unit.

4.5.3 Small Signal Board (SSB)

Refer to Figure 4-46 for details.

Caution: it is mandatory to remount all different screws at their original position during re-assembly. Failure to do so may result in damaging the SSB.

1. Release the clips from the LVDS connector that connect with the SSB [1].
   Caution: be careful, as these are very fragile connectors!
2. Unplug all other connectors [2].
3. Remove all the fixation screws from the SSB [3].
4. The SSB can now be shifted from side connector cover, then lifted and taken out of the I/O bracket. Refer to Figure 4-46 for details.



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Figure 4-46 SSB removal

4.5.4 Power Supply Unit (PSU)

Caution: it is mandatory to remount all different screws at their original position during re-assembly. Failure to do so may result in damaging the PSU.

1. Gently unplug all connectors from the PSU.
2. Remove all fixation screws from the PSU.
3. The PSU can be taken out of the set now.

4.5.5 Stand bracket

1. Remove all fixation screws of the bracket.
2. Lift the bracket from the set.

4.5.6 Control Board IR/LED Panel

1. Remove the stand bracket, as described earlier.
2. Unplug the connector from the Control Board IR/LED panel.
3. Gently release the clip that holds the panel and take it out from the bezel.

When defective, replace the whole unit.

4.5.7 LCD Panel

1. Unplug all the connector cables of the boards.
2. Gently take all the speakers out.
3. Lift the subframe with SSB, PSU, Control Board IR/LED panel from the LCD panel and put it aside.

Warning: Cause the panel of 40"/47"/50" 4100 series & 40" 4300 series is bolt-on panels, the panel could not release from bezel.

When defective, replace the whole unit.

4.6 Assembly/Panel Removal (for 24" 5200 series)

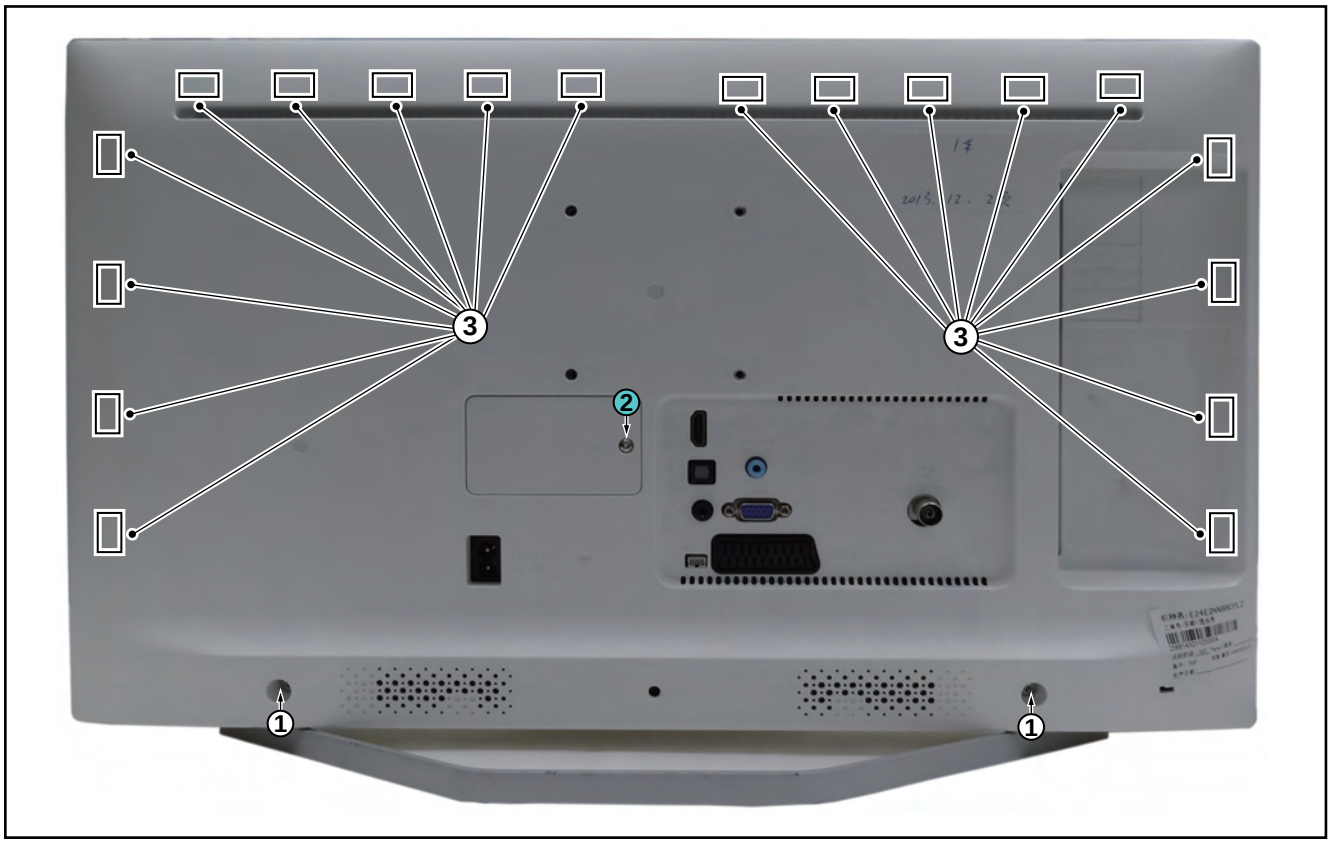
Instructions below apply to the 24PHT5219/88, but will be similar for 24" 5200 series models.

4.6.1 Rear Cover

Refer to Figure 4-47 for details.

Warning: Disconnect the mains power cord before removing the rear cover.

1. Remove fixation screws [1] that secure the base assy, pull out the base assy from the set. Then remove the fixation screws [2] that secure the rear cover. Refer to Figure 4-47 for details.
2. At the indicated areas [3] the cover is secured by clips. Be very careful with releasing those.
3. Gently lift the rear cover from the TV. Make sure that wires and cables are not damaged while lifting the rear cover from the set.



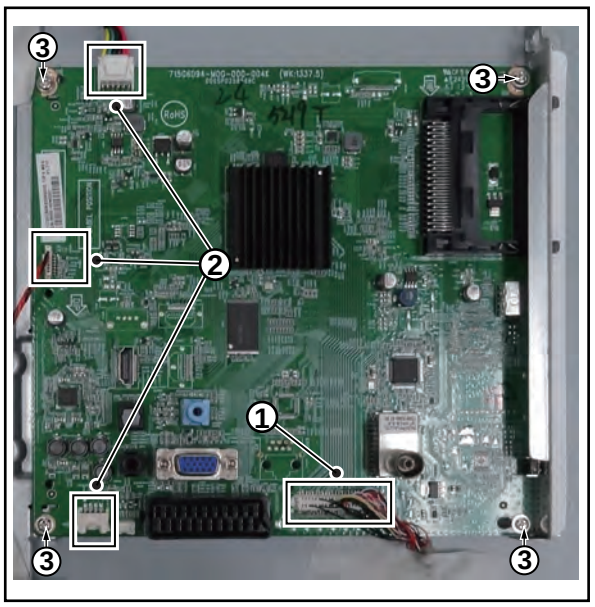
19593_111.eps

Figure 4-47 Rear cover removal

4.6.2 Small Signal Board (SSB)

Refer to Figure 4-48 for details.
Caution: it is mandatory to remount all different screws at their original position during re-assembly. Failure to do so may result in damaging the SSB.

1. Release the clips from the LVDS [1] connector that connect with the SSB.
   Caution: be careful, as these are very fragile connectors!
2. Unplug all other connectors [2].
3. Remove all the fixation screws [3] from the SSB.
4. The SSB can now be shifted from side connector cover, then lifted and taken out of the I/O bracket.Refer to Figure 4-48 for details.



19593_112.eps

Figure 4-48 SSB removal

4.6.3 Power Supply Unit (PSU)

Caution: it is mandatory to remount all different screws at their original position during re-assembly. Failure to do so may result in damaging the PSU.

1. Gently unplug all connectors from the PSU.
2. Remove all fixation screws from the PSU.
3. The PSU can be taken out of the set now.

4.6.4 Speakers

1. Gently release the tapes that secures the speaker cables.
2. Unplug the speaker connectors from the SSB.
3. Take the speakers out.

When defective, replace the both units.

4.6.5 Stand bracket

1. Remove all fixation screws of the bracket.
2. Lift the bracket from the set.

4.6.6 IR/LED Panel

1. Remove the stand bracket, as described earlier.
2. Remove fixation screw that secure the deco rear cover and take it out from the deco.
3. Unplug the connector from the IR/LED panel.
4. Gently release the double faced adhesive tape that pasted the panel and take it out from the deco.

When defective, replace the whole unit.

4.6.7 LCD Panel

1. Remove the SSB as described earlier.
2. Remove the PSU as described earlier.
3. Remove the stand bracket as described earlier.
4. Remove the IR/LED as described earlier.
5. Remove the fixations screws that fix the metal clamps to the front bezel. Take out those clamps.
6. Remove all other metal parts not belonging to the panel.
7. Lift the LCD Panel from the bezel.

When defective, replace the whole unit.

4.7 Assembly/Panel Removal (for 40"/55" 5100 series)

Instructions below apply to the 40PFK5109/12, but will be similar for 40"/55" 5100 series models.

4.7.1 Rear Cover

Refer to Figure 4-49 for details.

Warning: Disconnect the mains power cord before removing the rear cover.

1. Remove fixation screws [1] that secure the base assy, pull out the base assy from the set. Then remove the fixation screws [2], [3] that secure the rear cover. Refer to Figure 4-49 for details.
2. Gently lift the rear cover from the TV. Make sure that wires and cables are not damaged while lifting the rear cover from the set.



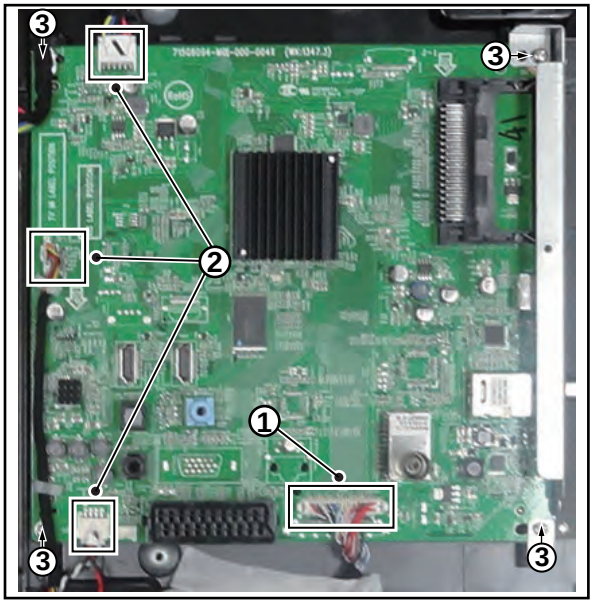
Figure 4-49 Rear cover removal

4.7.2 Small Signal Board (SSB)

Refer to Figure 4-50 for details.

Caution: it is mandatory to remount all different screws at their original position during re-assembly. Failure to do so may result in damaging the SSB.

1. Release the clips from the LVDS [1] connector that connect with the SSB.
   Caution: be careful, as these are very fragile connectors!
2. Unplug all other connectors [2].
3. Remove all the fixation screws [3] from the SSB.
4. The SSB can now be shifted from side connector cover, then lifted and taken out of the I/O bracket.Refer to Figure 4-50 for details.



19593_114.eps

Figure 4-50 SSB removal

4.7.3 Power Supply Unit (PSU)

Caution: it is mandatory to remount all different screws at their original position during re-assembly. Failure to do so may result in damaging the PSU.

1. Gently unplug all connectors from the PSU.
2. Remove all fixation screws from the PSU.
3. The PSU can be taken out of the set now.

4.7.4 Speakers

1. Gently release the tapes that secures the speaker cables.
2. Unplug the speaker connectors from the SSB.
3. Take the speakers out.

When defective, replace the both units.

4.7.5 Stand bracket

1. Remove all fixation screws of the bracket.
2. Lift the bracket from the set.

4.7.6 IR/LED Panel

1. Remove the stand bracket, as described earlier.
2. Remove fixation screw that secure the deco rear cover and take it out from the deco.
3. Unplug the connector from the IR/LED panel.
4. Gently release the double faced adhesive tape that pasted the panel and take it out from the deco.

When defective, replace the whole unit.

4.7.7 LCD Panel

1. Remove the SSB as described earlier.
2. Remove the PSU as described earlier.
3. Remove the stand bracket as described earlier.
4. Remove the IR/LED as described earlier.
5. Remove the fixations screws that fix the metal clamps to the front bezel. Take out those clamps.
6. Remove all other metal parts not belonging to the panel.
7. Lift the LCD Panel from the bezel.

When defective, replace the whole unit.

4.8 Assembly/Panel Removal (for 32"/48" 5100 series)

Instructions below apply to the 32PFK5109/12. but will be similar for other 32"/48" 5100 series models.

4.8.1 Rear Cover

Refer to Figure 4-51 for details.

Warning: Disconnect the mains power cord before removing the rear cover.

1. Remove fixation screws [1] that secure the base assy, pull out the base assy from the set. Then remove the fixation screws [2], [3] that secure the rear cover. Refer to Figure 4-51 for details.
2. Gently lift the rear cover from the TV. Make sure that wires and cables are not damaged while lifting the rear cover from the set.



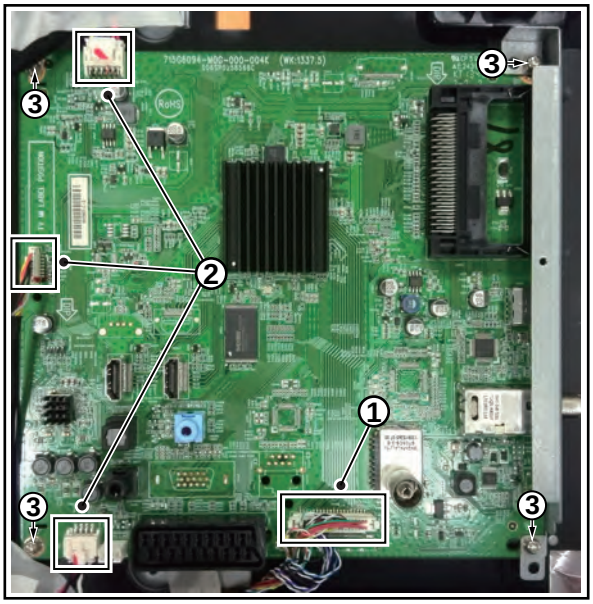
19593_115.eps

Figure 4-51 Rear cover removal

4.8.2 Small Signal Board (SSB)

Refer to Figure 4-52 for details.
Caution: it is mandatory to remount all different screws at their original position during re-assembly. Failure to do so may result in damaging the SSB.

1. Release the clips from the LVDS connector that connect with the SSB [1].
   Caution: be careful, as these are very fragile connectors!
2. Unplug all other connectors [2].
3. Remove all the fixation screws from the SSB [3].
4. The SSB can now be shifted from side connector cover, then lifted and taken out of the I/O bracket. Refer to Figure 4-52 for details.



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Figure 4-52 SSB removal

4.8.3 Power Supply Unit (PSU)

Caution: it is mandatory to remount all different screws at their original position during re-assembly. Failure to do so may result in damaging the PSU.

1. Gently unplug all connectors from the PSU.
2. Remove all fixation screws from the PSU.
3. The PSU can be taken out of the set now.

4.8.4 Speakers

1. Gently release the tapes that secures the speaker cables.
2. Unplug the speaker connectors from the SSB.
3. Take the speakers out.

When defective, replace the both units.

4.8.5 Stand bracket

1. Remove all fixation screws of the bracket.
2. Lift the bracket from the set.

4.8.6 IR/LED Panel

1. Remove the stand bracket, as described earlier.
2. Remove fixation screw that secure the deco rear cover and take it out from the deco.
3. Unplug the connector from the IR/LED panel.
4. Gently release the double faced adhesive tape that pasted the panel and take it out from the deco.

When defective, replace the whole unit.

4.8.7 LCD Panel

1. Unplug all the connector cables of the boards.
2. Gently take all the speakers out.
3. Lift the subframe with SSB, PSU, IR/LED panel from the LCD panel and put it aside.

Warning: Cause the panel of 32"/48" 5100 series is bolt-on panels, the panel could not release from bezel.

When defective, replace the whole unit.

4.9 Assembly/Panel Removal (for 42"/47"/55" 5190 & 5200 series)

Instructions below apply to the 42PFT5209/12, but will be similar for other 42"/47"/55" 5190 & 5200 series models.

4.9.1 Rear Cover

Refer to Figure 4-53 for details.

Warning: Disconnect the mains power cord before removing the rear cover.

1. Remove fixation screws [1] that secure the base assy, pull out the base assy from the set. Then remove the fixation screws [2], [3], [4] that secure the rear cover. Refer to Figure 4-53 for details.
2. Gently lift the rear cover from the TV. Make sure that wires and cables are not damaged while lifting the rear cover from the set.



19594_105.eps

Figure 4-53 Rear cover removal

4.9.2 AmbiLight Panel

Refer to Figure 4-54 for details.

1. Gently release the clamps and unplug the two connectors [1, 2,3] that secure the ambilight panels. Release the clips from the FFC connector that connect with the AmbiLight control panel [3].
2. Lift the AmbiLight panel from the rear cover. Make sure that wires and flat foils are not damaged while lifting the ambilight panel from the rear cover.



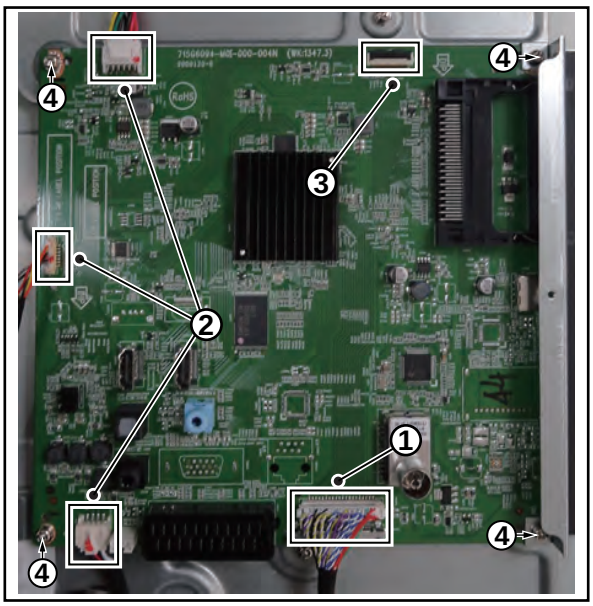
19594_106.eps

Figure 4-54 Rear cover removal [1]

4.9.3 Small Signal Board (SSB)

Refer to Figure 4-55 for details.
Caution: it is mandatory to remount all different screws at their original position during re-assembly. Failure to do so may result in damaging the SSB.

1. Release the clips from the LVDS connector that connect with the SSB [1].
   Caution: be careful, as these are very fragile connectors!
2. Unplug all other connectors [2] and the FFC connector [3].
3. Remove all the fixation screws from the SSB [4].
4. The SSB can now be shifted from side connector cover, then lifted and taken out of the I/O bracket. Refer to Figure 4-55 for details.



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Figure 4-55 SSB removal

4.9.4 Power Supply Unit (PSU)

Caution: it is mandatory to remount all different screws at their original position during re-assembly. Failure to do so may result in damaging the PSU.

1. Gently unplug all connectors from the PSU.
2. Remove all fixation screws from the PSU.
3. The PSU can be taken out of the set now.

4.9.5 Speakers

1. Gently release the tapes that secures the speaker cables.
2. Unplug the speaker connectors from the SSB.
3. Take the speakers out.

When defective, replace the both units.

4.9.6 Keyboard Control unit

1. Unplug the connector from the keyboard control panel.
2. Gently push inwards the two clips at the PSU side of the unit. Release the unit at the PSU side and turn it away from the PSU. Now push it towards the PSU to release the catches at the other side of the unit. Take it out from the metal bracket.

When defective, replace the whole unit.

4.9.7 Stand bracket

1. Remove all fixation screws of the bracket.
2. Lift the bracket from the set.

4.9.8 IR/LED Panel

1. Remove the stand bracket, as described earlier.
2. Remove fixation screw that secure the deco rear cover and take it out from the deco.
3. Unplug the connector from the IR/LED panel.
4. Gently release the double faced adhesive tape that pasted the panel and take it out from the deco.

When defective, replace the whole unit.

4.9.9 LCD Panel

1. Remove the SSB as described earlier.
2. Remove the PSU as described earlier.
3. Remove the stand bracket as described earlier.
4. Remove the Keyboard control unit as described earlier.
5. Remove the IR/LED as described earlier.
6. Remove the fixations screws that fix the metal clamps to the front bezel. Take out those clamps.
7. Remove all other metal parts not belonging to the panel.
8. Lift the LCD Panel from the bezel.

When defective, replace the whole unit.

4.10 Assembly/Panel Removal (for 50" 4300 series)

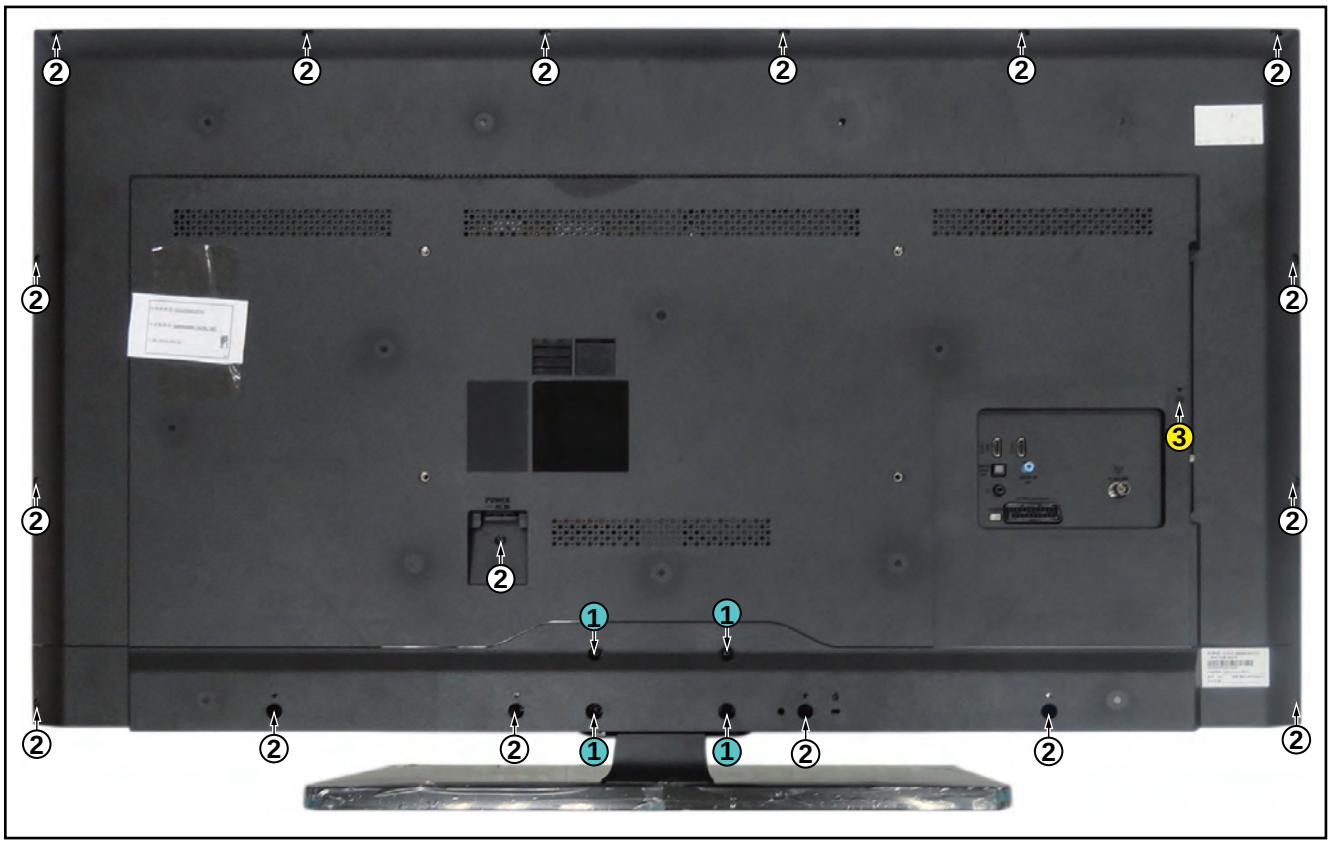
Instructions below apply to the 50PFK4309/12, but will be similar for 50" 4300 series models.

4.10.1 Rear Cover

Refer to Figure 4-56 for details.

Warning: Disconnect the mains power cord before removing the rear cover.

1. Remove fixation screws [1] that secure the base assy, pull out the base assy from the set. Then remove the fixation screws [2], [3] that secure the rear cover. Refer to Figure 4-56 for details.
2. Gently lift the rear cover from the TV. Make sure that wires and cables are not damaged while lifting the rear cover from the set.



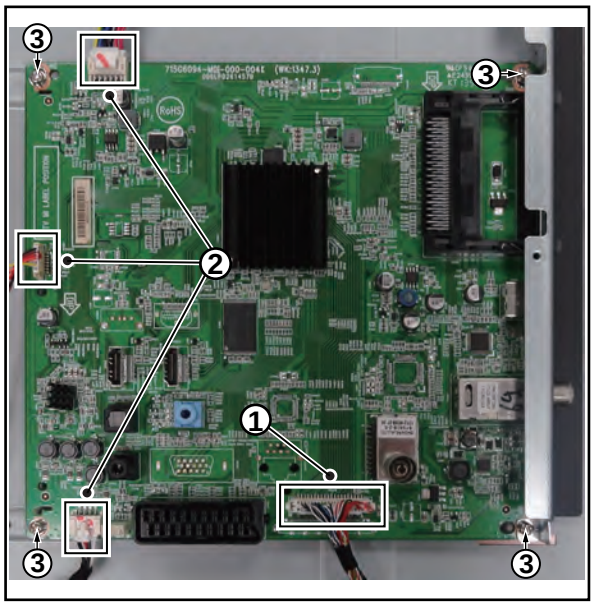
19595_104.eps

Figure 4-56 Rear cover removal

4.10.2 Small Signal Board (SSB)

Refer to Figure 4-57 for details.
Caution: it is mandatory to remount all different screws at their original position during re-assembly. Failure to do so may result in damaging the SSB.

1. Release the clips from the LVDS [1] connector that connect with the SSB.
   Caution: be careful, as these are very fragile connectors!
2. Unplug all other connectors [2].
3. Remove all the fixation screws [3] from the SSB.
4. The SSB can now be shifted from side connector cover, then lifted and taken out of the I/O bracket.Refer to Figure 4-57 for details.



19595_105.eps

Figure 4-57 SSB removal

4.10.3 Power Supply Unit (PSU)

Caution: it is mandatory to remount all different screws at their original position during re-assembly. Failure to do so may result in damaging the PSU.

1. Gently unplug all connectors from the PSU.
2. Remove all fixation screws from the PSU.
3. The PSU can be taken out of the set now.

4.10.4 Speakers

1. Gently release the tapes that secures the speaker cables.
2. Unplug the speaker connectors from the SSB.
3. Take the speakers out.

When defective, replace the both units.

4.10.5 Stand bracket

1. Remove all fixation screws of the bracket.
2. Lift the bracket from the set.

4.10.6 IR/LED Board

1. Unplug the connector from the IR/LED board.
2. Gently release the clip that holds the board and take it out from the bezel.

When defective, replace the whole unit.

4.10.7 LCD Panel

1. Remove the SSB as described earlier.
2. Remove the PSU as described earlier.
3. Remove the stand bracket as described earlier.
4. Remove the IR/LED as described earlier.
5. Remove the fixations screws that fix the metal clamps to the front bezel. Take out those clamps.
6. Remove all other metal parts not belonging to the panel.
7. Lift the LCD Panel from the bezel.

When defective, replace the whole unit.

4.11 Assembly/Panel Removal (for 32"/40"/50" 4009 series)

Instructions below only apply to the 32"/40"/50" 4009 series.

4.11.1 Stand

Refer to Figure 4-58 for details.

1. Remove the screws [1] that secure the black plastic and, gently remove the black plastic casing that covers the stand bracket, refer to Figure 4-58.



19597_108.eps

Figure 4-58 Stand removal[1]

4.11.2 Rear Cover

Refer to Figure 4-59 for details.
Warning: Disconnect the mains power cord before removing the rear cover.

1. Remove the fixation screws [1,2,3] that secure the rear cover.
2. Lift the rear cover from the TV. Make sure that wires and flat foils are not damaged while lifting the rear cover from the set.

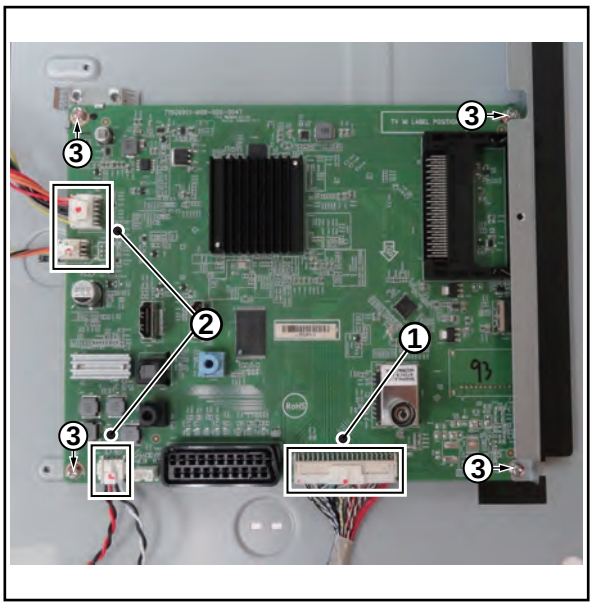


Figure 4-59 Rear cover removal

4.11.3 Small Signal Board (SSB)

Refer to Figure 4-60 for details.
Caution: it is mandatory to remount all different screws at their original position during re-assembly. Failure to do so may result in damaging the SSB.

1. Release the clips from the LVDS connector that connect with the SSB [1].
   Caution: be careful, as these are very fragile connectors!
2. Unplug all other connectors [2].
3. Remove all the fixation screws from the SSB [3].
4. The SSB can now be shifted from side connector cover, then lifted and taken out of the I/O bracket. Refer to Figure 4-60 for details.



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Figure 4-60 SSB removal

4.11.4 Power Supply Unit (PSU)

Caution: it is mandatory to remount all different screws at their original position during re-assembly. Failure to do so may result in damaging the PSU.

1. Unplug all connectors from the PSU.
2. Remove all fixation screws from the PSU.
3. The PSU can be taken out of the set now.

4.11.5 Speakers

1. Gently release the tapes that secures the speaker cables.
2. Unplug the speaker connectors from the SSB.
3. Take the speakers out.

When defective, replace the both units.

4.11.6 IR/LED Panel

1. Unplug the connector from the IR/LED panel.
2. Gently release the clip that holds the panel and take it out from the bezel.

When defective, replace the whole unit.

4.11.7 LCD Panel

1. Remove the SSB as described earlier.
2. Remove the PSU as described earlier.
3. Remove the stand bracket as described earlier.
4. Remove the IR/LED as described earlier.
5. Remove the fixations screws that fix the metal clamps to the front bezel. Take out those clamps.
6. Remove all other metal parts not belonging to the panel.
7. Lift the LCD Panel from the bezel.

When defective, replace the whole unit.

4.12 Set Re-assembly

To re-assemble the whole set, execute all processes in reverse order.

Notes:

- While re-assembling, make sure that all cables are placed and connected in their original position. See Figure 4-1 to Figure 4-36.
- Pay special attention not to damage the EMC foams on the SSB shields. Ensure that EMC foams are mounted correctly.

5. Service Modes and Fault Finding

Index of this chapter:

5.1 Test Points
5.2 Service Modes
5.3 Stepwise Start-up
5.4 Service Tools
5.5 Software Upgrading
5.6 The Blinking LED Procedure
5.7 Fault Finding and Repair Tips

5.1 Test Points

As most signals are digital, it will be difficult to measure waveforms with a standard oscilloscope. However, several key ICs are capable of generating test patterns, which can be controlled via ComPair. In this way it is possible to determine which part is defective.

Perform measurements under the following conditions:
- Service Default Mode.
- Video: Colour bar signal.
- Audio: 3 kHz left, 1 kHz right.

5.2 Service Modes

The Service Mode feature is split into five parts:
- Service Alignment Mode (SAM).
- Factory Mode.
- Customer Service Mode (CSM).
- Computer Aided Repair Mode (ComPair).

SAM and the Factory mode offer features, which can be used by the Service engineer to repair/align a TV set. Some features are:
- Make alignments (e.g. White Tone), reset the error buffer (SAM and Factory Mode).
- Display information (“SAM” indication in upper right corner of screen, error buffer, software version, operating hours, options and option codes, sub menus).

The CSM is a Service Mode that can be enabled by the consumer. The CSM displays diagnosis information, which the customer can forward to the dealer or call centre. In CSM mode, “CSM”, is displayed in the top right corner of the screen. The information provided in CSM and the purpose of CSM is to:
- Increase the home repair hit rate.
- Decrease the number of nuisance calls.
- Solved customers’ problem without home visit.

ComPair Mode is used for communication between a computer and a TV on I^2C /UART level and can be used by a Service engineer to quickly diagnose the TV set by reading out error codes, read and write in NVMs, communicate with ICs and the micro processor (PWM, registers, etc.), and by making use of a fault finding database. It will also be possible to up and download the software of the TV set via I^2C with help of ComPair. To do this, ComPair has to be connected to the TV set via the ComPair connector, which will be accessible through the rear of the set (without removing the rear cover).

Note: For the new model range, a new remote control (RC) is used with some renamed buttons. This has an impact on the activation of the Service modes. For instance the old “MENU” button is now called “HOME” (or is indicated by a “house” icon).

5.2.1 General

Next items are applicable to all Service Modes or are general.

Life Timer

During the life time cycle of the TV set, a timer is kept (called “Op. Hour”). It counts the normal operation hours (not the Stand-by hours). The actual value of the timer is displayed in SAM in a decimal value. Every two soft-resets increase the hour by + 1. Stand-by hours are not counted.

Software Identification, Version, and Cluster

The software ID, version, and cluster will be shown in the main menu display of SAM and CSM.
The screen will show: “AAAAB-X.YYY”, where:
- AAAA is the chassis name: TPN149E x.yy.
- B is the region indication: E = Europe, A = AP/China, U = NAFTA, L = LATAM.
- X is the main version number: this is updated with a major change of specification (incompatible with the previous software version). Numbering will go from 1 - 99 and AA - ZZ.
  - If the main version number changes, the new version number is written in the NVM.
  - If the main version number changes, the default settings are loaded.
- YYY is the sub version number: this is updated with a minor change (backwards compatible with the previous versions). Numbering will go from 000 - 999.
  - If the sub version number changes, the new version number is written in the NVM.
  - If the NVM is refreshed, the software identification, version, and cluster will also be written to NVM.

Display Option Code Selection

When after an SSB or display exchange, the display option code is not set properly, it will result in a TV with “no display”. Therefore, it is required to set this display option code after such a repair.
To do so, press the following key sequence on a standard RC transmitter: “062598” directly followed by MENU and “xxx”, where “xxx” is a 3 digit decimal value of the panel type: see column “Display Code” in back to div. table 6-3. When the value is accepted and stored in NVM, the set will switch to Stand-by, to indicate that the process has been completed.
During this algorithm, the NVM-content must be filtered, because several items in the NVM are TV-related and not SSB related (e.g. Model and Prod. S/N). Therefore, “Model” and “Prod. S/N” data is changed into “See Type Plate”. In case a call centre or consumer reads “See Type Plate” in CSM mode.

5.2.2 Service Alignment Mode (SAM)

Purpose
- To modify the NVM.
- To display/clear the error code buffer.
- To perform alignments.

Specifications
- Operation hours counter (maximum five digits displayed).
- Software version, error codes, and option settings display.
- Error buffer clearing.
- Option settings.
- Software alignments (White Tone).
- NVM Editor.
- Set screen mode to full screen (all content is visible).

How to Activate SAM

To activate SAM, use one of the following methods:
- Press the following key sequence on the remote control transmitter: “062596”, directly followed by the “INFO/OK” button. Do not allow the display to time out between entries while keying the sequence.
- Or via ComPair.

After entering SAM, the following items are displayed, with “SAM” in the upper right corner of the screen to indicate that the television is in Service Alignment Mode.

Table 5-1 SAM mode overview

Main Menu	Sub-menu 1	Sub-menu 2	Description
System Information	Op Hour	e.g. 00082	This represents the life timer. The timer counts normal operation hours, but does not count Stand-by hours.
Clear	Press [OK] to clean the Error Codes immediately		Erases the contents of the error buffer. Select this menu item and press the MENU RIGHT key on the remote control. The content of the error buffer is cleared.
RGB Align	Warm	R Gain	To align the White Tone. See paragraph 6.3 Software Alignments in the Alignments section for a detailed description
		G Gain	
		B Gain	
	Normal	R Gain	
		G Gain	
		B Gain	
	Cool	R Gain	
		G Gain	
		B Gain	
	Store		Store the RGB value
Upload to USB	Copy Channel List to USB		To upload several settings from the TV to an USB stick
Download from USB	Copy Channel List from USB		To download several settings from the USB stick to the TV

How to Navigate

- In the SAM menu, select menu items with the UP/DOWN keys on the remote control transmitter. The selected item will be indicated. When not all menu items fit on the screen, use the UP/DOWN keys to display the next/previous menu items.
- With the “LEFT/RIGHT” keys, it is possible to:
  - (De) activate the selected menu item.
  - (De) activate the selected sub menu.
  - Change the value of the selected menu item.
- When you press the MENU button once while in top level SAM, the set will switch to the normal user menu (with the SAM mode still active in the background).
- Press the following key sequence on the remote control transmitter: “062596” directly followed by the “Home/Menu” button to switch to SDM (do not allow the display to time out between entries while keying the sequence).

How to Store SAM Settings

To store the settings changed in SAM mode (except the RGB Align settings), leave the top level SAM menu by using the POWER button on the remote control transmitter or the television set. The mentioned exceptions must be stored separately via the STORE button.

How to Exit SAM

Use one of the following methods:

- Switch the set to STANDBY by pressing the mains button on the remote control transmitter or the television set.
- Via a standard RC-transmitter, key in “00” sequence.

Note: When the TV is switched “off” by a power interrupt while in SAM, the TV will show up in “normal operation mode” as soon as the power is supplied again. The error buffer will not be cleared.

5.2.3 Contents of the Factory mode:

Purpose

- To perform extended alignments.

Specifications

- Displaying and or changing Panel ID information.
- Displaying and or changing Tuner ID information.
- Error buffer clearing.
- Various software alignment settings.
- Testpattern displaying.
- Public Broadcasting Service password Reset.
- etc.

How to Activate the Factory mode

To activate the Factory mode, use the following method:

- Press the following key sequence on the remote control transmitter: from the “menu/home” press “1999”, directly followed by the “Back/Return” button. Do not allow the display to time out between entries while keying the sequence.

After entering the Factory mode, the following items are displayed,

Table 5-2 Factory mode overview

Item	Item value	Default value											Description
		22"	23"	24"	28"	32"	40"	42"	47"	48"	50"	55"	
0	F/W VERSION	Press OK											Displays the software versions of the supplier, Flash PQ, Smart Picture, BL Dimming, Source Meter, the Picture Quality checksum, the Dimming library, the Source meter library, the Flash AQ, MCU and OAD software versions.
1	Board ID	715G6092	715G6092	715G6094	715G6092	715G6079	715G6092	715G6094	715G6094	715G6094	715G6094	715G6092	Dispaly the Board ID; be careful changing this, it can result in not correct displaying the screen!

Item	Item value	Default value											Description
		22"	23"	24"	28"	32"	40"	42"	47"	48"	50"	55"	
2	PANEL_ID	19	28	19	20	6	9	25	9	23	12	24	Displays and changes the Panel ID with the left and right cursor; be careful changing this, it can result in not correct displaying the screen!
3	DB COPY TV to USB	Press OK											DB COPY TV to USB
4	DB READ USB to TV	Press OK											DB READ USB to TV
5	CLR_TEMP_R	68	128	128	128	128	73	128	128	128	128	128	Red colour temperature setting
6	CLR_TEMP_G	76	128	128	128	128	89	128	128	128	92	128	Green colour temperature setting
7	CLR_TEMP_B	128	128	128	128	128	128	128	128	128	90	128	Blue colour temperature setting
8	AUTO_COLOR	Press OK											PC: any pattern that has black and white, YPbPr: SMPTE bar (colour bar), any timing.
9	ADC_GAIN_R	0	360	360	0	0	0	0	0	0	0	0	Red ADC gain
10	ADC_GAIN_G	0	360	360	0	0	0	0	0	0	0	0	Green ADC gain
11	ADC_GAIN_B	0	312	312	0	0	0	0	0	0	0	0	Blue ADC gain
12	ADC_OFFSET_R	0	375	375	0	0	0	0	0	0	0	0	Red ADC offset
13	ADC_OFFSET_G	0	403	403	0	0	0	0	0	0	0	0	Green ADC offset
14	ADC_OFFSET_B	0	434	434	0	0	0	0	0	0	0	0	Blue ADC offset
15	VIRGING_MODE	off	off	off	off	off	on	off	off	off	on	on	Use this to return the set to virgin mode. Depends whether the set has been used already.
16	E_Fuse	on											E-fuse mode
17	ORT_MODE	off											ORT mode
18	AGEING MODE	off											Use this for aging a new LCD panel
19	AUD_LIMITE_MODE	1											Three modes,0: off, 1: adaptive mode, 2: fixed mode
20	AUD_THRESHOLD_BYTE1	100											Limit threshold
21	AUD_THRESHOLD_BYTE2	200											Limit threshold
22	AUD_THRESHOLD_BYTE3	100											Limit threshold
23	AUD_GAIN_LINEIN	0	0	0	0	0	0	0	0	0	0	-1	Line-in audio gain
24	AUD_GAIN_HDMI	0											HDMI audio gain
25	AUD_GAIN_ATV	0											Analogue TV audio gain
26	AUD_GAIN_DTV	10	0	10	0	0	0	0	0	0	0	0	Digital TV audio gain
27	AUD_GAIN_USB	0											USB audio gain
28	TUNER_ID	0											Displays and changes the Tuner ID with the left and right cursor. Not to be changed when the tuner is replaced with the correct service part.
29	CIPLUS QUERY	Press OK											Shows the Validity of the CI+ key and the supplier information
30	CIPLUS UPDATE	Press OK											Used to enter a new CI+ code into the NVM. This can only be used when no CI+ code exists in the NVM
31	CI Key Type Selection	ProductKey											CI Key Type Selection
32	AQ_TABLE_INDEX	6	6	6	2	8	8	12	8	12	10	13	Audio Quality index
33	EDID UPDATE	Press OK											Used to enter a new EDID codes into the NVM
34	LVDS SSC Ratio	3%	3%	3%	3%	2%	3%	3%	3%	3%	3%	3%	LVDS SSC ratio
35	LVDS SSC Freq	30KHz											LVDS SSC frequency
36	DDR SSC Ratio	2%											DDR SSC ratio
37	DDR SSC Freq	30KHz											DDR SSC frequency
38	Panel H.Flip	on	off	on	off	off	on	off	on	on	off	off	Flip panel
39	Panel V.Flip	on	off	on	off	off	on	off	on	on	off	off	Flip panel
40	Panel ABSwap	off	off	off	off	off	off	off	off	off	off	off	ABSwap panel
41	Watchdog	5sec	5sec	5sec	5sec	5sec	5sec	5sec	5sec	5sec	5sec	5sec	Watchdog
42	Backlight PWM freq.(Hz)	150	150	150	150	150	150	150	150	150	150	150	Backlight PWM frequency

Item	Item value	Default value											Description
		22"	23"	24"	28"	32"	40"	42"	47"	48"	50"	55"	
43	Backlight PWM Limit	20	20	20	20	20	20	20	20	20	20	20	Backlight PWM Limit
44	VGA_TxRx_Mode	off	off	off	off	off	off	off	off	off	off	off	VGA_TxRx_Mode
45	LVDS Driving	3	3	3	3	3	3	3	3	3	3	3	LVDS Driving
46	LVDS Format	VESA 8bit	JEIDA 8bit	VESA 8bit	VESA 8bit	VESA 8bit	JEIDA 10bit	VESA 8bit	JEIDA 10bit	JEIDA 10bit	VESA 8bit	VESA 8bit	LVDS Format
47	Ziggo Aging	Press OK											Ziggo Aging
48	SPDIF	On	On	On	On	On	On	On	On	On	On	On	Enable/Disable SPDIF source
49	Standard PWM Gain	98	102	98	100	100	100	100	100	100	100	100	Standard PWM Gain
50	ECO PWM Gain	100	100	100	100	100	100	100	100	100	100	100	ECO PWM Gain
51	VGA port	on	On	On	On	off	off	Off	off	off	off	off	Enable/Disable VGA port
52	Zero Detect Enable	on											Zero Detect Enable
53	Copy PQ table to TV	Press OK											Copy PQ table to TV
54	Headphone	on	On	On	On	Off	on	On	on	on	On	On	Enable/Disable Headphone source
55	EnhancedH/88	-	Off	On	Off	Off	off	Off	on	on	On	Off	EnhancedH/88
56	Joysticker Enable	-	Off	Off	Off	Off	off	On	off	on	Off	On	Joysticker Enable
57	Ambilight Enable	-	Off	-	Off	Off	off	On	off	off	Off	Off	Ambilight Enable
58	Lounge Light Enable	-	Off	-	Off	-	Off	Off	-	off	Off	Off	Lounge Light Enable
59	EXIF_FACTORY	Press OK											Exits the Factory mode

How to Exit the Factory mode

Use one of the following methods:

- Select EXIT_FACTORY from the menu and press the “OK” button.

Note: When the TV is switched “off” by a power interrupt, or normal switch to “stand-by” while in the factory mode, the TV will show up in “normal operation mode” as soon as the power is supplied again. The error buffer will not be cleared.

5.2.4 Customer Service Mode (CSM)

Purpose

The Customer Service Mode shows error codes and information on the TVs operation settings.The call centre can instruct the customer (by telephone) to enter CSM in order to identify the status of the set.This helps the call centre to diagnose problems and failures in the TV set before making a service call.

The CSM is a read-only mode; therefore, modifications are not possible in this mode.

Specifications

- Ignore “Service unfriendly modes”.
- Line number for every line (to make CSM language independent).
- Set the screen mode to full screen (all contents on screen is visible).
- After leaving the Customer Service Mode, the original settings are restored.
- Possibility to use “CH+” or “CH-” for channel surfing, or enter the specific channel number on the RC.

How to Activate CSM

To activate CSM, press the following key sequence on a standard remote control transmitter: “123654” (do not allow the display to time out between entries while keying the sequence). After entering the Customer Service Mode, the following items are displayed.

Note: Activation of the CSM is only possible if there is no (user) menu on the screen!

Contents of CSM

- **1.1 Set Type** This information is very helpful for a helpdesk/workshop as reference for further diagnosis. In this way, it is not necessary for the customer to look at the rear of the TV-set. Note that if an NVM is replaced or is initialized after corruption, this set type has to be re-written to NVM.
- **1.2 Production code** Displays the production code (the serial number) of the TV. Note that if an NVM is replaced or is initialized after corruption, this production code has to be re-written to NVM.
- **1.3 Installation date** Indicates the date of the first installation of the TV. This date is acquired via time extraction.
- **1.4 SSB** Gives an identification of the SSB as stored in NVM. Note that if an NVM is replaced or is initialized after corruption, this identification number has to be re-written to NVM. This identification number is the 12NC number of the SSB.
- **1.5 Display** 12NC NVM read/write.
- **1.6 PSU** 12NC NVM read/write.
- **2.1 Current Main SW** Displays the built-in main software version. In case of field problems related to software, software can be upgraded. As this software is consumer upgradeable, it will also be published on the internet.
- **2.2 Standby SW** Displays the built-in stand-by processor software version. Upgrading this software will be possible via USB.
- **2.3 Panel Code** Displays the Display Code number.
- **3.1 Signal Quality** Analog/digital signal strength.
- **3.2 Child lock** Not active / active. This is a combined item for locks. If any lock (channel lock, parental lock) is active, it is indicated as “active”.
- **3.3 HDCP keys** Indicates the validity of the HDMI keys (or HDCP keys). In case these keys are not valid and the customer wants to make use of the HDMI functionality, the SSB has to be replaced.

How to Navigate

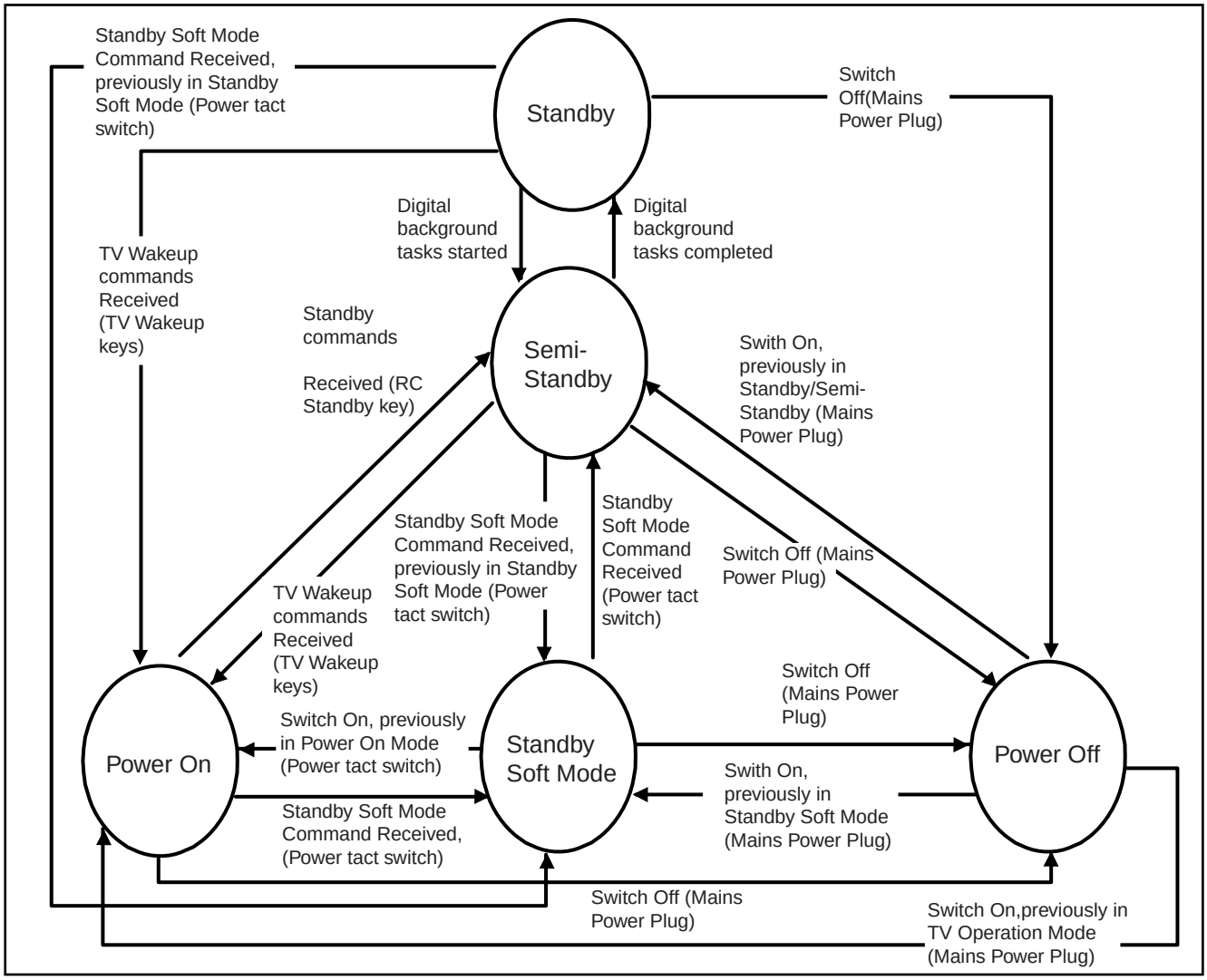
By means of the “CURSOR-DOWN/UP” knob (or the scroll wheel) on the RC-transmitter, can be navigated through the menus.

How to Exit CSM

To exit CSM, use one of the following methods.

- Press the MENU/HOME button on the remote control transmitter.
- Press the POWER button on the remote control transmitter.
- Press the POWER button on the television set.

5.3 Stepwise Start-up



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120224

Figure 5-1 Stepwise Start-up

5.4 Service Tools

5.4.1 ComPair

Introduction

ComPair (Computer Aided Repair) is a Service tool for Philips Consumer Electronics products. and offers the following:

1. ComPair helps to quickly get an understanding on how to repair the chassis in a short and effective way.
2. ComPair allows very detailed diagnostics and is therefore capable of accurately indicating problem areas. No knowledge on I^2C or UART commands is necessary, because ComPair takes care of this.
3. ComPair speeds up the repair time since it can automatically communicate with the chassis (when the micro processor is working) and all repair information is directly available.
4. ComPair features TV software up possibilities.

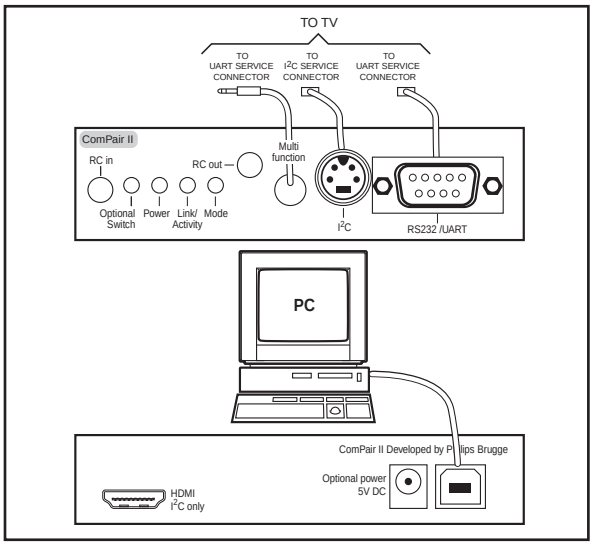
Specifications

ComPair consists of a Windows based fault finding program and an interface box between PC and the (defective) product. The ComPair II interface box is connected **to the PC** via an USB cable. For the TV chassis, the ComPair interface box and the TV communicate via a bi-directional cable via the service connector(s).

The ComPair fault finding program is able to determine the problem of the defective television, by a combination of automatic diagnostics and an interactive question/answer procedure.

How to Connect

This is described in the chassis fault finding database in ComPair.



10000_036_090121.eps
091118

Figure 5-2 ComPair II interface connection

Caution: It is compulsory to connect the TV to the PC as shown in the picture above (with the ComPair interface in between), as the ComPair interface acts as a level shifter. If one connects the TV directly to the PC (via UART), ICs can be blown!

How to Order

ComPair II order codes:

- ComPair II interface: 3122 785 91020.
- Software is available via the Philips Service web portal.
- ComPair UART interface cable for TPM10.1x xx. (using DB9 to 2mm pitch JST connector): 3122 785 90630.

Note: When you encounter problems, contact your local support desk.

5.5 Software Upgrading

5.5.1 Description

It is possible for the user to upgrade the main software via the USB port. This allows replacement of a software image in a stand alone set. A description on how to upgrade the main software can be found in the DFU or on the Philips website.

5.5.2 Introduction

Philips continuously tries to improve its products, and it's recommend that the TV software is updated when updates are available. Software update files can be obtained from the dealer or can be downloaded from the following websites: http://www.philips.com/support

Preparing a portable memory for software upgrade

The following requirements have to be met:

1. A personal computer connected to the internet.
2. An archive utility that supports the ZIP-format (e.g. WinZip for Windows or StuffIt for Mac OS).
3. A FAT formatted USB memory stick (preferably empty).

Note:

1. Only FAT/DOS-formatted memory sticks are supported.
2. Only use software update files that can be found on the http://www.philips.com/support web site.

5.5.3 Check the current TV software version

Before starting the software upgrade procedure, it is advised to check that what the current TV software:

1. Press the "1 2 3 6 5 4" button on the remote control to enter the CSM mode.
2. Use the up/down cursor keys to select "Current Main Software".

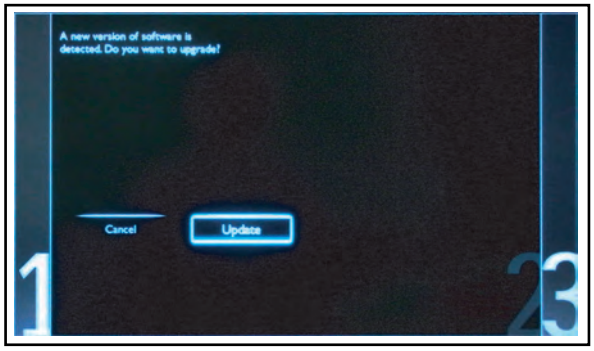
If the current software version of the TV is the same as the latest update file found on http://www.philips.com/support, it is not necessary to update the TV software.

5.5.4 Download the latest software

1. Open the internet page http://www.philips.com/support.
2. Find information and software related to the TV.
3. Select the latest software update file and download it to the PC.
4. Insert the USB memory stick into one of the USB ports of the PC.
5. Decompress the downloaded ZIP file and copy it to the root directory of the USB flash drive.

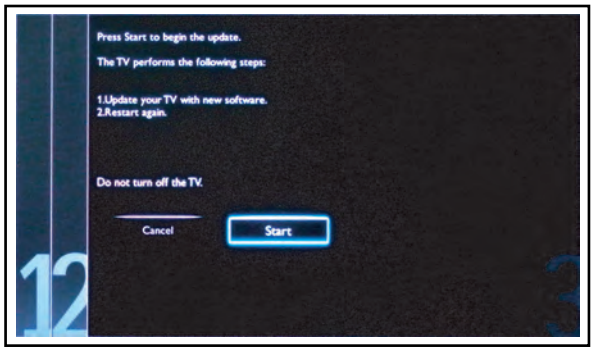
5.5.5 Update the TV software

1. Turn the TV on and wait for it to boot completely.
2. Insert the USB memory stick that contains the software update files in one of the TV's USB ports.
3. The TV will detect the USB memory stick automatically. Then a window jumps out as Figure 5-3.
   Note: If the USB flash drive is not detected after power up, disconnect it and re-insert it.
4. Select [Update] and press OK. See Figure 5-3.
5. To proceed, In next menu select [Start] and press OK to start software updates. See Figure 5-4.
6. Upgrading will now begins and the status of the updating progress will be displayed.
7. When the TV software is updated. Remove your USB flash drive, then select [Restart] and press OK to restart the TV.See Figure 5-5.



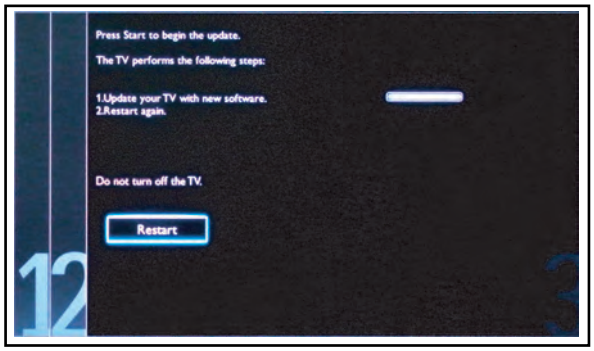
19080_207_110324.eps
110324

Figure 5-3 Update the TV software [1/3]



19080_208_110324.eps
110324

Figure 5-4 Update the TV software [2/3]



19080_209_110324.eps
110324

Figure 5-5 Update the TV software [3/3]

Note:

- Do not remove the USB flash drive during the software update.
- If a power failure occurs during the update, do not remove the USB flash drive from the TV. The TV will continue the software update as soon as the power comes up again.
- If an error occurs during the update retry the procedure or contact the dealer.
- We do not recommend downgrading to an older version.
- Once the upgrade is finished, use the PC to remove the TV software from the USB portable memory.

5.5.6 Content and Usage of the One-Zip Software File

Below you find a content explanation of the One-Zip file, and instructions on how and when to use it. Only files that are relevant for Service are mentioned here.

- **EDID_clustername.zip:** Contains the EDID content of the different EDID NVMs. See ComPair for further instructions.
- **FUS_clustername_version.zip:** Contains the file downloaded which is needed to upgrade the TV main software and the software download application.
- **NVM_clustername_version.zip:** Default NVM content. Must be programmed via ComPair.

5.5.7 How to Copy NVM Data to/from USB

When copying data to and from a USB memory stick, the folder “repair” is used. When inserting an empty USB memory stick, and downloading data to the stick, the TV will create this folder. When sending data from a USB memory stick to a TV, the intended data must be available in the “repair” folder.
Note that when copying EDID data to the TV, all necessary EDID files must be in this folder.
Service mode overview for your reference.

Table 5-3 Service mode overview

Service Modes	Description
SAM	Service alignment mode
Factory Mode	Used for extended alignments
CSM	3-page compact CSM pages. There will be CSM dump to USB-stick upon entering CSM-mode
USB SW upgradeable	SW-upgrading of flash memories can be done via USB. The main SW can be upgraded via the ZIP file downloaded.
NVM-Editor in SAM	NVM-editor will function as in the past: Address and Value field is a decimal value via digit entry
Service Data	New Service data in SAM for CTN, Prod. no., 12NC programming with virtual keyboard
USB copy/paste in SAM	Channel list, NVM data, Readable info, EDID
UART logging	There will be printout available in UART. No specifications of the printout, per platform provision/definition.
Blind SAM	RC sequence “062598” + “Menu” + “Panel code”
Clear Buffer	RC sequence “062599” + “OK” or via SAM

5.6 The Blinking LED Procedure

5.6.1 Introduction

The software is capable of identifying different kinds of errors. Because it is possible that more than one error can occur over time, an error buffer is available, which is capable of storing the last five errors that occurred. This is useful if the OSD is not working properly.
Errors can also be displayed by the blinking LED procedure. The method is to repeatedly let the front LED pulse with as many pulses as the error code number, followed by a period of 1.5 seconds in which the LED is “off”. Then this sequence is repeated.
Example (1): error code 4 will result in four times the sequence LED “on” for 0.25 seconds / LED “off” for 0.25 seconds. After this sequence, the LED will be “off” for 1.5 seconds. Any RC command terminates the sequence. Error code LED blinking is in red color.
Example (2): the content of the error buffer is “12 9 6 0 0” After entering SDM, the following occurs.

- 1 long blink of 5 seconds to start the sequence.
- 12 short blinks followed by a pause of 1.5 seconds.
- 9 short blinks followed by a pause of 1.5 seconds.
- 6 short blinks followed by a pause of 1.5 seconds.
- 1 long blink of 1.5 seconds to finish the sequence.
- The sequence starts again with 12 short blinks.

5.7 Fault Finding and Repair Tips

Note:

- It is assumed that the components are mounted correctly with correct values and no bad solder joints.
- Before any fault finding actions, check if the correct options are set.

5.7.1 NVM Editor

In some cases, it can be convenient if one directly can change the NVM contents. This can be done with the “NVM Editor” in SAM mode. With this option, single bytes can be changed.

Caution:

- Do not change these, without understanding the function of each setting, because incorrect NVM settings may seriously hamper the correct functioning of the TV set!
- Always write down the existing NVM settings, before changing the settings. This will enable you to return to the original settings, if the new settings turn out to be incorrect.

5.7.2 Load Default NVM Values

It is possible to upload the default values to the NVM with ComPair in case the SW is changed, the NVM is replaced with a new (empty) one, or when the NVM content is corrupted. After replacing an EEPROM (or with a defective/no EEPROM), default settings should be used to enable the set to start-up and allow the Service Default Mode and Service Alignment Mode to be accessed.

5.7.3 No Picture

When you have no picture, first make sure you have entered the correct display code. See paragraph 6.4 Option Settings for the instructions. See also back to div. table 6-3.

5.7.4 Unstable Picture via HDMI input

Check (via ComPair or factory mode) if HDMI EDID data is properly programmed.

5.7.5 No Picture via HDMI input

Check if HDCP key is valid. This can be done in CSM.

5.7.6 TV Will Not Start-up from Stand-by

Possible Stand-by Controller failure. Re-flash the software.

5.7.7 Audio Amplifier

The Class D-IC U606 has a powerpad for cooling. When the IC is replaced it must be ensured that the powerpad is very well pushed to the PWB while the solder is still liquid. This is needed to insure that the cooling is guaranteed, otherwise the Class D-IC could break down in short time.

5.7.8 CSM

When CSM is activated and there is a USB memory stick connected to the TV, the software will dump the complete CSM content to the USB memory stick. The file (Csm.txt) will be saved in the root of the USB memory stick.

5.7.9 Loudspeakers

Make sure that the volume is set to minimum during disconnecting the speakers in the ON-state of the TV. The audio amplifier can be damaged by disconnecting the speakers during ON-state of the set!

5.7.10 Display option code

Attention: In case the SSB is replaced, always check the Panel Code in CSM, even when picture is available. Performance with the incorrect display option code can lead to unwanted side-effects for certain conditions.

6. Alignments

Index of this chapter:

6.1 General Alignment Conditions
6.2 Hardware Alignments
6.3 Software Alignments
6.4 Option Settings
6.5 Reset of Repaired SSB

6.1 General Alignment Conditions

Perform all electrical adjustments under the following conditions:

- Power supply voltage: 90 - 264 V_{AC}, 50/ 60 ± 3 Hz.
- Connect the set to the mains via an isolation transformer with low internal resistance.
- Allow the set to warm up for approximately 15 minutes.
- Measure voltages and waveforms in relation to correct ground (e.g. measure audio signals in relation to AUDIO_GND).
  Caution: It is not allowed to use heat sinks as ground.
- Test probe: R_i > 10 MW, C_i < 20 pF.
- Use an isolated trimmer/screwdriver to perform alignments.

6.2 Hardware Alignments

Not applicable.

6.3 Software Alignments

Put the set in SAM mode (see Chapter 5. Service Modes and Fault Finding). The SAM menu will now appear on the screen. Select RGB Align and go to one of the sub menus. The alignments are explained below.
The following items can be aligned:

- White point.

To store the data:

- Press OK on the RC **before the cursor is moved to the left**.
- Select “Store” and press OK on the RC.
- Switch the set to stand-by mode.

For the next alignments, supply the following test signals via a video generator to the RF input:

- **EU/AP-PAL models:** a PAL B/G TV-signal with a signal strength of at least 1 mV and a frequency of 475.25 MHz
- **US/AP-NTSC models:** an NTSC M/N TV-signal with a signal strength of at least 1 mV and a frequency of 61.25 MHz (channel 3).
- **LATAM models:** an NTSC M TV-signal with a signal strength of at least 1 mV and a frequency of 61.25 MHz (channel 3).

6.3.1 RGB Alignment

Before alignment, set the picture as follows:

Picture Setting	
Dynamic backlight	Off
Dynamic Contrast	Off
Color Enhancement	Off
Picture Format	Unscaled
Light Sensor	Off
Brightness	50
Color	0
Contrast	100

White Tone Alignment:

- Activate SAM.
- Select “RGB Align.” and choose a color temperature.
- Use a 100% white screen as input signal and set the following values:
  – “Red BL Offset” and “Green BL Offset” to “7” (if present).
  – All “White point” values initial to “128”.

In case you have a colour analyser:

- Measure with a calibrated (phosphor- independent) color analyser (e.g. Minolta CA-210) in the centre of the screen. Consequently, the measurement needs to be done in a dark environment.
- Adjust the correct x, y coordinates (while holding one of the White point registers R, G or B on max. value) by means of decreasing the value of one or two other white points to the correct x, y coordinates (see Table 6-1 White D alignment values). Tolerance: dx: ± 0.003, dy: ± 0.003.
- Repeat this step for the other colour Temperatures that need to be aligned.
- When finished return to the SAM root menu and press STANDBY on the RC to store the aligned values to the NVM.

Table 6-1 White D alignment values

Value	Cool (11000 K)	Normal (9000 K)	Warm (6500 K)
x	0.276	0.287	0.313
y	0.282	0.296	0.329

If you do **not** have a colour analyser, you can use the default values. This is the next best solution. The default values are average values coming from production (statistics).

6.3.2 Display Adjustment

You can use the default values. The default values are average values coming from production.

- Enter SAM mode.
- Select a colour temperature (e.g. COOL, NORMAL, or WARM).
- Set the RED, GREEN and BLUE default values according to the values in back to div. table 6-2.
- When finished press OK on the RC, then press STORE to store the aligned values to the NVM.
- Restore the initial picture settings after the alignments.

Table 6-2 White tone default settings

Picture mode	Screen size	Colour temperature		
		Red	Green	Blue
Normal (9000K)	20PHH4109/88	83	90	123
	20PHH4109/60	92	89	121
	22PFH4109/88	86	89	128
	22PFK4109/12	87	92	128
	22PFT4109/12	91	94	128
	22PFK4209/12	103	95	128
	23PHH4009/88	86	89	128
	23PHK4009/12	91	94	128
	23PHT4009/12	87	90	128
	23PHH4109/60	92	93	128
	24PHH4109/88	85	93	128
	24PHH4109/60	90	86	128
	24PHK4109/12	112	84	128
	24PHT4109/12	86	89	128
	24PHH5219/88	103	95	128
	24PHT5219/12	103	95	128
	28PHH4109/88	128	120	126
	32PHH4009/88	128	124	118
	32PHK4009/12	127	125	118
	32PHT4009/12	128	120	119
	32PFH4009/88	128	113	115
	32PFK4009/12	128	114	117
	32PFT4009/12	126	115	120
	32PHH4009/60	128	110	121
	32PHH4109/88	128	119	126
	32PFH4109/88	126	117	123
	32PFT4109/12	128	121	113
	32PHT4109/12	128	109	121

Picture mode	Screen size	Colour temperature		
		Red	Green	Blue
Normal (9000K)	32PHH4109/60	121	127	128
	32PFK4109/12	96	120	128
	32PHK4109/12	121	96	128
	32PHH4309/88	128	114	116
	32PHK4309/12	128	114	116
	32PHT4309/12	126	112	114
	32PFH4309/88	128	114	116
	32PHH4309/60	126	115	120
	32PFK4309/12	128	125	110
	32PFT4309/12	128	126	114
	32PFT4309/60	128	128	115
	32PHH4319/88	127	113	115
	32PHT4319/12	126	111	113
	32PHH4329/88	128	115	116
	32PFH4399/88	128	116	117
	32PFK5109/12	128	117	119
	40PFH4009/88	128	115	116
	40PFK4009/12	128	119	120
	40PFT4009/12	127	128	105
	40PFT4009/60	128	127	109
	40PFH4109/88	91	99	128
	40PFT4109/12	127	120	121
	40PFK4109/12	126	112	128
	40PFT4109/60	96	120	128
	40PFH4309/88	128	114	116
	40PFK4309/12	128	111	113
	40PFT4309/12	128	120	98
	40PFT4309/60	128	121	102
	40PFH4319/88	125	117	95
	40PFT4319/12	128	123	103
	40PFH4329/88	126	121	97
	40PFH4399/88	127	119	95
	40PFK5109/12	128	118	96
	42PFH5209/88	128	128	124
	42PFK5208/12	128	126	122
	42PFT5209/12	128	122	113
	42PFT5209/60	128	125	115
	47PFH4109/88	91	99	128
	47PFT4109/12	96	120	128
	47PFK4109/12	96	121	127
	47PFH5209/88	128	110	108
	47PFK5209/12	124	114	112
	47PFT5209/12	126	109	104
	47PFT5209/60	128	110	105
	48PFK5109/12	128	114	116
	50PFH4009/88	128	119	121
	50PFK4009/12	128	120	111
	50PFT4009/12	127	118	119
	50PFH4109/88	128	92	73
	50PFT4109/12	127	96	84
	50PFK4109/12	128	92	73
	50PFH4309/88	128	114	116
	50PFK4309/12	128	115	116
	50PFT4309/12	128	113	114
	55PFH5109/88	128	92	73
	55PFK5109/12	126	90	76
	55PFT5109/12	128	88	71
	55PFH5209/88	128	124	120
	55PFK5209/12	126	120	118
	55PFT5209/12	128	128	124
Cool (11000K)	20PHH4109/88	72	96	128
	20PHH4109/60	84	73	128
	22PFH4109/88	68	76	128
	22PFK4109/12	97	68	124
	22PFT4109/12	65	94	128
	22PFK4209/12	82	81	128
	23PHH4009/88	68	76	128
	23PHK4009/12	70	74	128
	23PHT4009/12	74	72	128
	23PHH4109/60	73	81	128
	24PHH4109/88	76	68	126
	24PHH4109/60	93	75	123
	24PHK4109/12	77	96	121

Picture mode	Screen size	Colour temperature		
		Red	Green	Blue
Cool (11000K)	24PHT4109/12	68	76	128
	24PHH5219/88	82	81	128
	24PHT5219/12	82	81	128
	28PHH4109/88	107	105	128
	32PHH4009/88	117	119	128
	32PHK4009/12	120	115	128
	32PHT4009/12	117	120	128
	32PFH4009/88	115	114	127
	32PFK4009/12	116	108	128
	32PFT4009/12	119	106	128
	32PHH4009/60	121	113	128
	32PHH4109/88	107	103	128
	32PFH4109/88	112	107	128
	32PFT4109/12	103	112	128
	32PHT4109/12	112	106	128
	32PHH4109/60	120	127	128
	32PFK4109/12	96	128	120
	32PHK4109/12	86	121	128
	32PHH4309/88	119	109	128
	32PHK4309/12	119	109	128
	32PHT4309/12	117	106	128
	32PFH4309/88	119	109	128
	32PHH4309/60	120	113	128
	32PFK4309/12	128	127	128
	32PFT4309/12	128	126	128
	32PFT4309/60	128	125	128
	32PHH4319/88	118	107	126
	32PHT4319/12	116	105	127
	32PHH4329/88	119	104	125
	32PFH4399/88	120	105	128
	32PFK5109/12	121	111	128
	40PFH4009/88	119	110	128
	40PFK4009/12	120	109	128
	40PFT4009/12	112	128	117
	40PFT4009/60	116	128	122
	40PFH4109/88	73	89	128
	40PFT4109/12	96	74	128
	40PFK4109/12	97	121	120
	40PFT4109/60	96	120	128
	40PFH4309/88	119	109	128
	40PFK4309/12	128	106	126
	40PFT4309/12	128	128	116
	40PFT4309/60	128	126	120
	40PFH4319/88	128	126	113
	40PFT4319/12	126	127	119
	40PFH4329/88	127	125	115
	40PFH4399/88	125	128	117
	40PFK5109/12	128	128	118
	42PFH5209/88	116	118	128
	42PFK5209/12	120	121	128
	42PFT5209/12	124	121	128
	42PFT5209/60	128	124	128
	47PFH4109/88	73	89	128
	47PFT4109/12	96	120	121
	47PFK4109/12	121	90	128
	47PFH5209/88	128	116	128
	47PFK5209/12	128	112	126
	47PFT5209/12	126	120	127
	47PFT5209/60	128	123	128
	48PFK5109/12	119	109	128
	50PFH4009/88	120	113	127
	50PFK4009/12	118	110	128
	50PFT4009/12	123	115	128
	50PFH4109/88	128	92	90
	50PFT4109/12	123	96	128
	50PFK4109/12	128	92	90
	50PFH4309/88	119	109	128
	50PFK4309/12	120	109	128
	50PFT4309/12	121	110	128
	55PFH5109/88	128	92	90
	55PFK5109/12	127	89	88
	55PFT5109/12	128	95	93
	55PFH5209/88	119	119	128

back to div. table

Picture mode	Screen size	Colour temperature		
		Red	Green	Blue
Cool (11000K)	55PFK5209/12	123	120	127
	55PFT5209/12	115	116	128
Warm (6500K)	20PHH4109/88	102	117	128
	20PHH4109/60	116	121	128
	22PFH4109/88	124	120	128
	22PFK4109/12	96	87	127
	22PFT4109/12	101	120	123
	22PFK4209/12	128	110	109
	23PHH4009/88	124	120	128
	23PHK4009/12	123	120	128
	23PHT4009/12	124	119	127
	23PHH4109/88	125	117	128
	24PHH4109/88	103	94	121
	24PHH4109/60	121	126	128
	24PHK4109/12	117	123	128
	24PHT4109/12	124	120	128
	24PHH5219/88	128	110	109
	24PHT5219/12	128	110	109
	28PHH4109/88	128	111	82
	32PHH4009/88	128	105	73
	32PHK4009/12	128	105	76
	32PHT4009/12	127	103	72
	32PFH4009/88	128	107	79
	32PFK4009/12	128	97	69
	32PFT4009/12	128	98	70
	32PHH4009/60	128	106	79
	32PHH4109/88	128	111	81
	32PFH4109/88	123	121	96
	32PFT4109/12	120	113	86
	32PHT4109/12	125	120	121
	32PHH4109/60	123	96	128
	32PFK4109/12	123	120	128
	32PHK4109/12	121	128	127
	32PHH4309/88	128	102	74
	32PHK4309/12	128	103	74
	32PHT4309/12	126	105	77
	32PFH4309/88	128	102	77
	32PHH4309/60	126	106	78
	32PFK4309/12	128	109	64
	32PFT4309/12	128	114	65
	32PFT4309/60	128	104	60
	32PHH4319/88	125	100	71
	32PHT4319/12	128	104	76
	32PHH4329/88	128	98	72
	32PFH4399/88	128	102	75
	32PFK5109/12	128	101	13
	40PFH4009/88	128	103	74
	40PFK4009/12	128	121	70
	40PFT4009/12	128	123	69
	40PFT4009/60	128	127	76
	40PFH4109/88	127	121	120
	40PFT4109/12	87	96	128
	40PFK4109/12	121	120	128
	40PFT4109/60	96	121	128
	40PFH4309/88	128	102	74
	40PFK4309/12	126	100	76
	40PFT4309/12	128	101	58
	40PFT4309/60	128	105	80
	40PFH4319/88	128	104	75
	40PFT4319/12	127	103	71
	40PFH4329/88	124	105	80
	40PFH4399/88	123	99	72
	40PFK5109/12	128	100	73
	42PFH5209/88	128	112	74
	42PFK5209/12	128	116	78
	42PFT5209/12	128	114	73
	42PFT5209/12	128	115	76
	47PFH4109/88	127	121	120
	47PFT4109/12	126	120	128
	47PFK4109/12	128	121	124
	47PFH5209/88	128	96	64
	47PFK5209/12	127	100	68
	47PFT5209/12	128	92	60
Warm (6500K)	47PFT5209/12	128	95	65
	48PFK5109/12	128	102	74
	50PFH4009/88	128	101	74
	50PFK4009/12	128	100	74
	50PFT4009/12	127	97	76
	50PFH4109/88	128	81	38
	50PFT4109/12	128	83	96
	50PFK4109/12	128	81	38
	50PFH4309/88	128	102	74
	50PFK4309/12	127	102	74
	50PFT4309/12	128	105	76
	55PFH5109/88	128	81	38
	55PFK5109/12	125	84	42
	55PFT5109/12	126	79	35
	55PFH5209/88	128	113	77
	55PFK5209/12	128	115	79
	55PFT5209/12	128	110	74

This group setting of colour temperature will be applied automatically to the TV / VGA / HDMI / AV sources.

6.4 Option Settings

6.4.1 Introduction

The microprocessor communicates with a large number of I^2C ICs in the set. To ensure good communication and to make digital diagnosis possible, the microprocessor has to know which ICs to address. The presence / absence of these NT72567 ICs is made known by the option codes.

Notes:

- After changing the option(s), save them by pressing the OK button on the RC before the cursor is moved to the left, select STORE and press OK on the RC.
- The new option setting is only active after the TV is switched “off” / “stand-by” and “on” again with the mains switch (the NVM is then read again).

6.4.2 Option Code Overview

Enter SAM mode to check the option codes. they could not be edited in the NVM.

6.4.3 Display Code Overview

Press the following key sequence on a standard RC transmitter: “062598” directly followed by MENU and “xxx”, where “xxx” is a 3 digit decimal value of the panel type: see column “Display Code” in back to div. table 6-3. After resetting the Display Code, restart the set immediately.

Table 6-3 Display code overview

CTN_ALT BOM#	Panel Type	Display Code
20PHH4109/88	TPM195WD1-RTN01	017
20PHH4109/60	TPM195WD1-RTN01	017
22PFH4109/88	TPM215HW01-HGJL02	018
22PFK4109/12	TPM215HW01-HGJL02	018
22PFT4109/12	TPM215HW01-HGJL02	018
22PFK4209/12	TPM215HW01-HGJL02	018
22PFK4209/12	TPM215HW01-DT3A	018
23PHH4009/88	LTA230AN01-001 SZ SEC	028
23PHH4009/88	LTA230AN01 C01 SZ SEC	028
23PHK4009/12	LTA230AN01-001 SZ SEC	028
23PHK4009/12	LTA230AN01 C01 SZ SEC	028
23PHT4009/12	LTA230AN01-001 SZ SEC	028
23PHT4009/12	LTA230AN01 C01 SZ SEC	028
23PHH4109/60	LTA230AN01-001 SZ SEC	028

CTN_ALT BOM#	Panel Type	Display Code
23PHH4109/60	LTA230AN01 C01 SZ SEC	028
24PHH4109/88	TPM236H3-BJ1L02	019
24PHH4109/88	TPM236H3-BJ1L03	030
24PHH4109/60	TPM236H3-BJ1L02	019
24PHH4109/60	TPM236H3-BJ1L03	030
24PHK4109/12	TPM236H3-BJ1L02	019
24PHK4109/12	TPM236H3-BJ1L03	030
24PHT4109/12	TPM236H3-BJ1L02	019
24PHT4109/12	TPM236H3-BJ1L03	030
24PHH5219/88	TPM236H3-BJ1L03.N SC1A	029
24PHT5219/12	TPM236H3-BJ1L03.N SC1A	029
28PHH4109/88	TPT275B5-A014 S11C	020
32PHH4009/88	TPT315B5-XVN02 S900H	040
32PHH4009/88	TPT315B5-AN02 SC1L	044
32PHK4009/12	TPT315B5-XVN02 S900H	040
32PHK4009/12	TPT315B5-AN02 SC1L	044
32PHT4009/12	TPT315B5-XVN02 S900H	040
32PHT4009/12	TPT315B5-AN02 SC1L	044
32PHH4009/60	TPT315B5-XVN02 S900H	040
32PHH4009/60	TPT315B5-AN02 SC1L	044
32PFH4009/88	TPT315B5-HVN05 S520C	041
32PFK4009/12	TPT315B5-HVN05 S520C	041
32PFT4009/12	TPT315B5-HVN05 S520C	041
32PHH4109/88	TPT315B5-DXJSFE	006
32PFH4109/88	TPT315B-EUJFFA	007
32PFT4109/12	TPT315B-EUJFFA	007
32PHH4109/60	TPT315B5-DXJSFE	006
32PHT4109/12	TPT315B5-DXJSFE	006
32PFK4109/12	TPT315B-EUJFFA	007
32PHK4109/12	TPT315B5-DXJSFE	006
32PHH4309/88	TPT315B5-DXJSFE S1U	031
32PHH4309/88	TPT315B5-XVN02 S901A	032
32PHH4309/88	TPT315B5-AN02 SC1B	038
32PHK4309/12	TPT315B5-DXJSFE S1U	031
32PHK4309/12	TPT315B5-XVN02 S901A	032
32PHK4309/12	TPT315B5-AN02 SC1B	038
32PHT4309/12	TPT315B5-DXJSFE S1U	031
32PHT4309/12	TPT315B5-XVN02 S901A	032
32PHT4309/12	TPT315B5-AN02 SC1B	038
32PFH4309/88	TPT315B5-EUJFFE S1B	033
32PHH4309/60	TPT315B5-DXJSFE S1U	031
32PHH4309/60	TPT315B5-XVN02 S901A	032
32PHH4309/60	TPT315B5-AN02 SC1C	038
32PFK4309/12	TPT315B5-HVN05 S520A	033
32PFK4309/12	TPT315B5-EUJFFE S1A	039
32PFT4309/12	TPT315B5-HVN05 S520A	033
32PFT4309/12	TPT315B5-EUJFFE S1A	039
32PFT4309/60	TPT315B5-HVN05 S520A	033
32PFT4309/60	TPT315B5-EUJFFE S1A	039
32PHH4319/88	TPT315B5-DXJSFE S1U	031
32PHH4319/88	TPT315B5-XVN02 S901A	032
32PHH4319/88	TPT315B5-AN02 SC1B	038
32PHT4319/12	TPT315B5-DXJSFE S1U	031
32PHT4319/12	TPT315B5-XVN02 S901A	032
32PHT4319/12	TPT315B5-AN02 SC1B	038
32PHH4329/88	TPT315B5-DXJSFE S1U	031
32PHH4329/88	TPT315B5-XVN02 S901A	032
32PHH4329/88	TPT315B5-AN02 SC1B	038
32PFH4399/88	TPT315B5-HVN05 S520A	033
32PFH4309/88	TPT315B5-EUJFFE S1A	039
32PFK5109/12	TPT315B5-EUJFFA S1K	021
40PFH4009/88	TPT400LA-J6PE1 SC1L	042
40PFK4009/12	TPT400LA-J6PE1 SC1L	042
40PFT4009/12	TPT400LA-J6PE1 SC1L	042
40PFT4009/60	TPT400LA-J6PE1 SC1L	042
40PFH4109/88	TPT400LA-HM06	009
40PFT4109/12	TPT400LA-HM06	009
40PFK4109/12	TPT400LA-HM06	009
40PFT4109/60	TPT400LA-HM06	009
40PFH4309/88	TPT400LA-J6PE1 C1A	034
40PFK4309/12	TPT400LA-J6PE1 C1A	034
40PFT4309/12	TPT400LA-J6PE1 C1A	034
40PFT4309/60	TPT400LA-J6PE1 C1A	034
40PFH4319/88	TPT400LA-J6PE1 C1A	034
40PFT4319/12	TPT400LA-J6PE1 C1A	034
40PFH4329/88	TPT400LA-J6PE1 C1A	034
40PFH4399/88	TPT400LA-J6PE1 C1A	034
40PFK5109/12	TPT400LA-HM06 SC1D	022
42PFK5199/12	LC420DUN-PGA1	025
42PFH5209/88	LC420DUN-PGA1	025
42PFK5209/12	LC420DUN-PGA1	025
42PFT5209/12	LC420DUN-PGA1	025
42PFT5209/60	LC420DUN-PGA1	025
47PFH4109/88	TPT470H1-DUJFFE	011
47PFT4109/12	TPT470H1-DUJFFE	011
47PFK4109/12	TPT470H1-DUJFFE	011
47PFK5199/12	LC470DUN-PGA1	026
47PFH5209/88	LC470DUN-PGA1	026
47PFK5209/12	LC470DUN-PGA1	026
47PFT5209/12	LC470DUN-PGA1	026
47PFT5209/60	LC470DUN-PGA1	026
48PFK5109/12	TPT480LS-HN03 SC1C	023
50PFH4009/88	TPT500J1-LE8 SC1F	043
50PFK4009/12	TPT500J1-LE8 SC1F	043
50PFT4009/12	TPT500J1-LE8 SC1F	043
50PFH4109/88	TPT500J1-HVN07	012
50PFK4109/12	TPT500J1-HVN07	012
50PFT4109/12	TPT500J1-HVN07	012
50PFH4309/88	TPT500J1-LE8 SC1D	036
50PFH4309/88	TPT500J1-HVN04 S17TD	037
50PFK4309/12	TPT500J1-LE8 SC1D	036
50PFK4309/12	TPT500J1-HVN04 S17TD	037
50PFT4309/12	TPT500J1-LE8 SC1D	036
50PFT4309/12	TPT500J1-HVN04 S17TD	037
55PFH5109/88	TPT550J1-DUJSGE S1A	024
55PFK5109/12	TPT550J1-DUJSGE S1A	024
55PFT5109/12	TPT550J1-DUJSGE S1A	024
55PFK5199/12	LC550DUN-PGA1	027
55PFH5209/88	LC550DUN-PGA1	027
55PFK5209/12	LC550DUN-PGA1	027
55PFT5209/12	LC550DUN-PGA1	027

6.5 Reset of Repaired SSB

A very important issue towards a repaired SSB from a Service repair shop (SSB repair on component level) implies the reset of the NVM on the SSB.
A repaired SSB in Service should get the service Set type “00PF0000000000” and Production code “00000000000000”. Also the virgin bit is to be set. To set all this, you can use the ComPair tool or use the “NVM editor” and “Dealer options” items in SAM (do not forget to “store”).

After a repaired SSB has been mounted in the set (set repair on board level), the type number (CTN) and production code of the TV has to be set according to the type plate of the set. For this, you can use the NVM editor in SAM. The loading of the CTN and production code can also be done via ComPair (Model number programming).

In case of a display replacement, reset the “Operation hours display” to “0”, or to the operation hours of the replacement display.

back to div. table

Remark:
- After the NVM has been replaced, go to SAM and scroll to the <Reload MAC address> (see figure 1*).
- Select the item and press <OK> on the RC.

6.5.1 Reset of Repaired SSB

Instruction
After NVM replacement, reload MAC address via SAM menu.This ensures the correct MAC address to be available in CSM for future repair actions.

Way of working:
- After the NVM has been replaced, go to SAM and scroll to the <Reload MAC address> .
- Select the item and press <OK> on the RC.

Notes:
- Only applicable to all related models that are **"Smart TV level 0"**enabled (only YouTube access). For models without internet connection feature, **no action** is needed.
- HDCP keys are located in the NVM. If you are loading NVM with the ComPair tool, there is warning message displayed.

New NVM EEPROMs are shipped with pre-loaded HDCP keys.

6.5.2 SSB Identification

SSB's of this chassis are identified by a "715" code on the SSB.
715Axxxx-Nnn-MMM-OOOO
- **715** main category, Printed Wiring Board
- **Axxxx** sub category, sequential coding number
- **Nnn** Version code
  - **N** Development number
  - **nn** Production number
- **MMM** Mounting variation code
- **OOOO** Optional variation code

Make sure when replacing an SSB the SSB identification codes match the replacement panel.

7. Circuit Descriptions

Index of this chapter:

7.1 Introduction
7.2 Power Supply
7.3 DC/DC Converters
7.4 Front-End Analogue and DVB-T, DVB-C; ISDB-T reception
7.5 Front-End DVB-S(2) reception
7.6 HDMI
7.7 Video and Audio Processing - NT72567BG-BA
7.8 Ambilight

Notes:

- Only **new** circuits (circuits that are not published recently) are described.
- Figures can deviate slightly from the actual situation, due to different set executions.
- For a good understanding of the following circuit descriptions, please use the wiring, block (see chapter 9. Block Diagrams) and circuit diagrams (see chapter 10. Circuit Diagrams and PWB Layouts).Where necessary, you will find a separate drawing for clarification.

7.1 Introduction

The TPN14.1E LA is a new chassis launched in Europe in 2014. The whole range is covered by NT72567.
The major deltas versus its predecessor support DVB-TC; DVB-TC/T2; DVB-TC/S2 with also multi-media, CEC, DLNA, ARC,SPDIF output functionality.

The TPN14.1E LA chassis comes with the following stylings:

- series xxPxx4009
- series xxPxx4100
- series xxPxx4200
- series xxPxx4300
- series xxPxx5100
- series xxPxx5200

7.1.1 Implementation

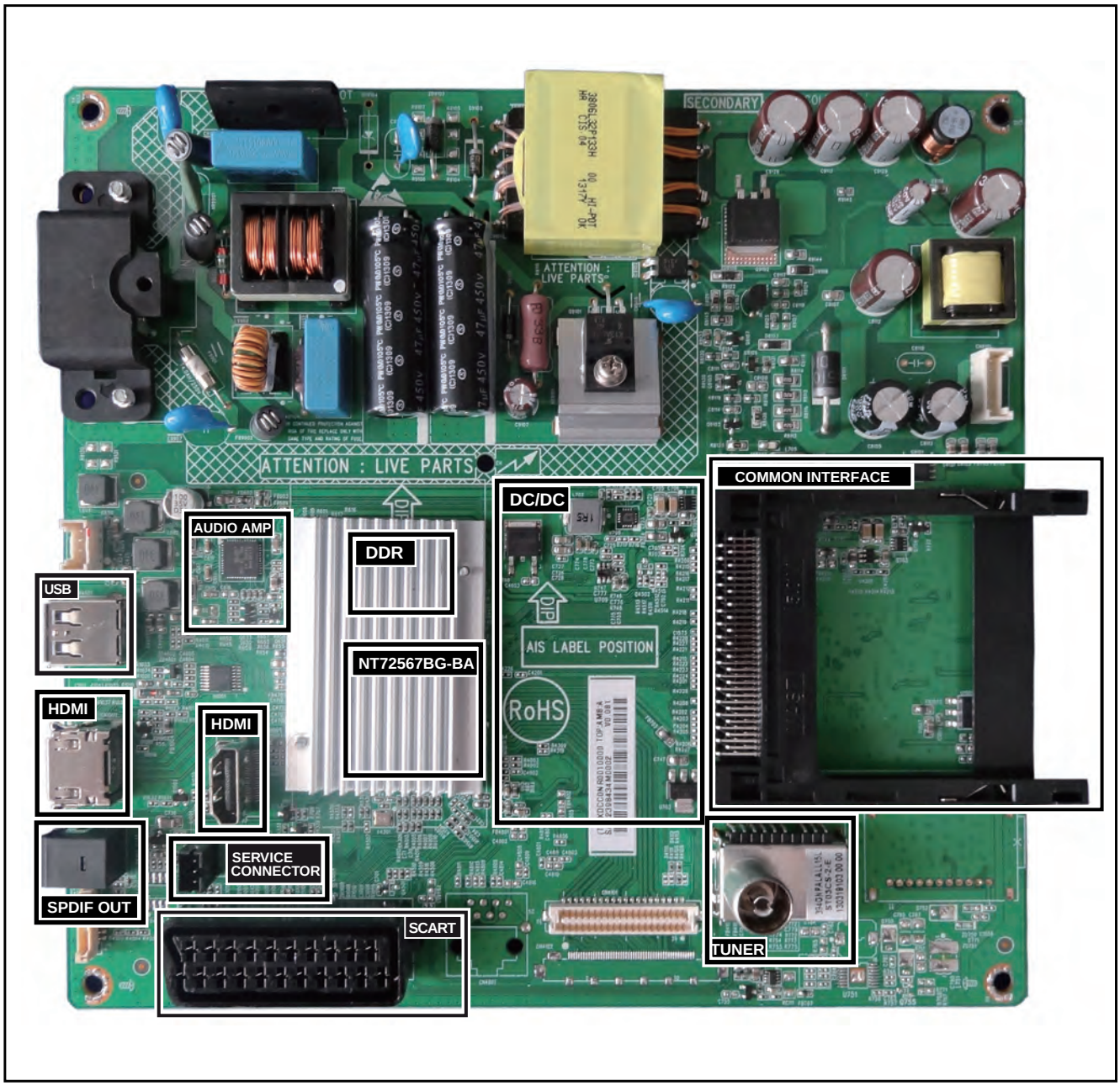
Key components of this chassis are:

- NT72567BG-BA LFBGA-576 TV Processor
- ST03CS-2-E Tuner for H/T series (DVB-T/C, T2 analogue)
- TUNER EUROPE TDQS-A801F for K series (DVB-S2)
- NT78820TL for T2 demond
- AVL6211LA LQFP-64 for S2 demond
- Si2166-B22-GMQFN-48 for S2 demond
- STA381BWTR 20W VQFN-48 for AUDIO Amplifier

7.1.2 TPN14.1E LA Architecture Overview

For details about the chassis block diagrams refer to 9. Block Diagrams. An overview architecture can be found in Figure 9.1.

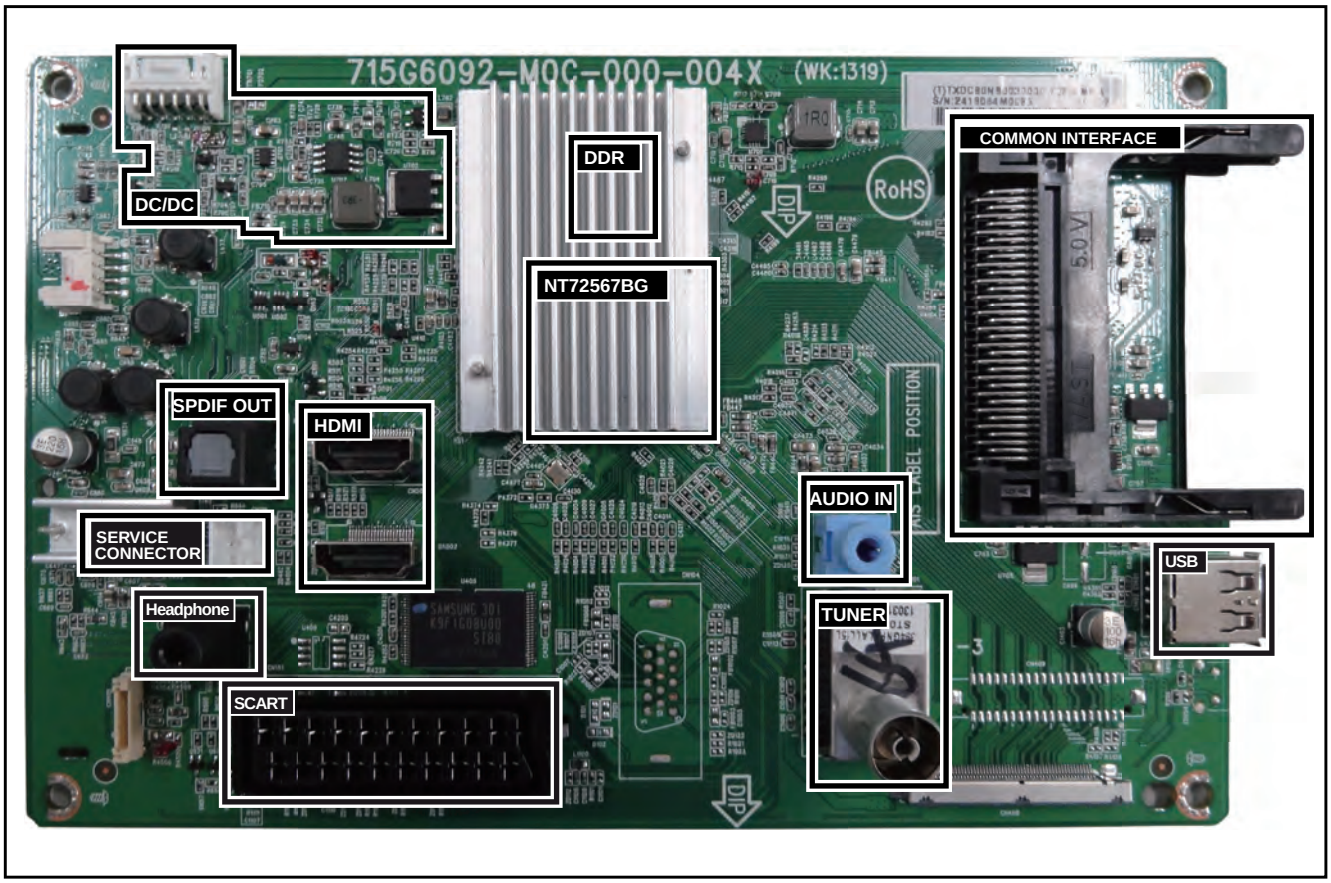
7.1.3 SSB Cell Layout



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130807

Figure 7-1 SSB layout cells (top view) (for 32")

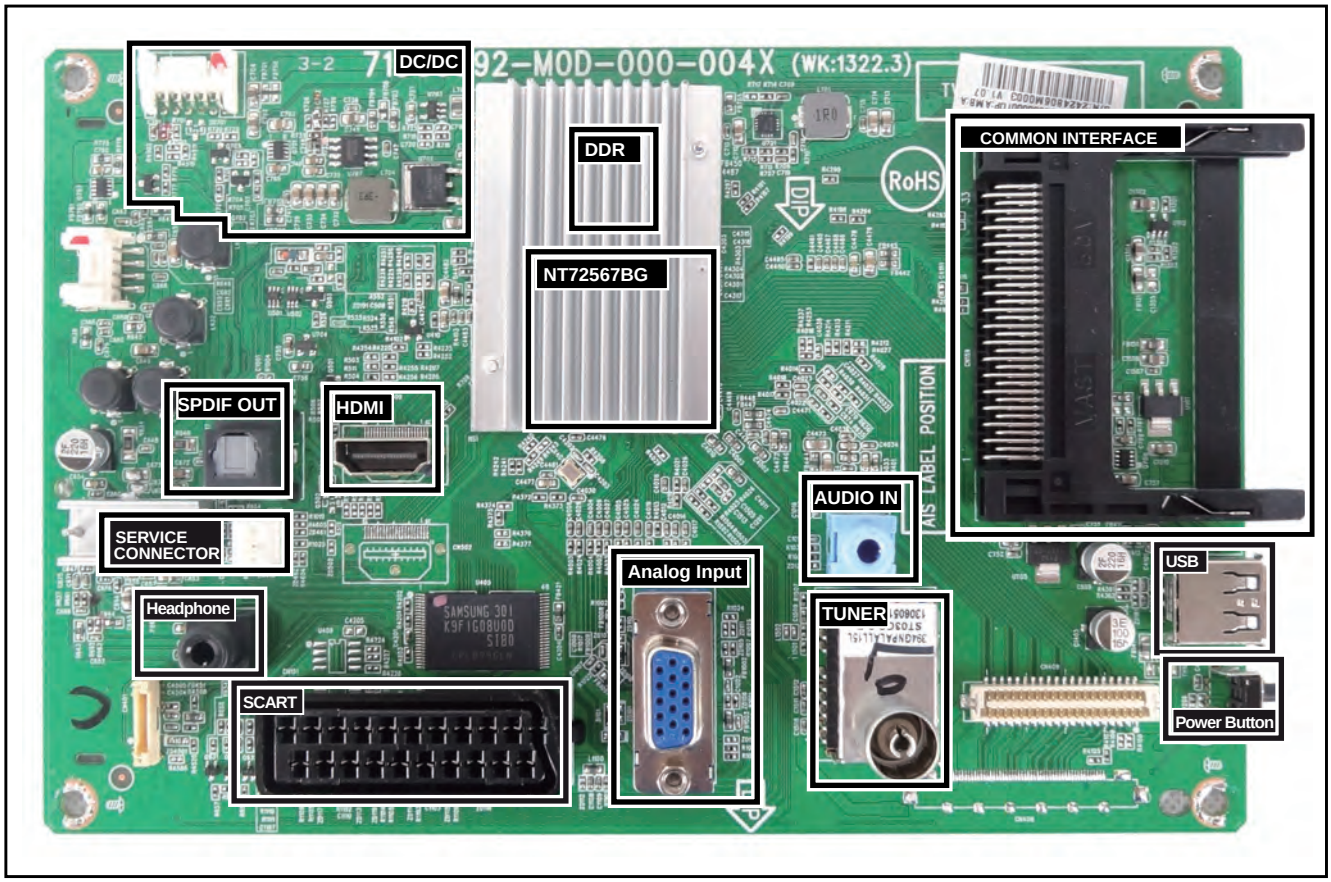
7.1.4 SSB Cell Layout



19530_201_130807.eps
130807

Figure 7-2 SSB layout cells (top view) (for 40/47/50Pxx4109/88 & 40PFx4300/88 & 50" 4300 series)

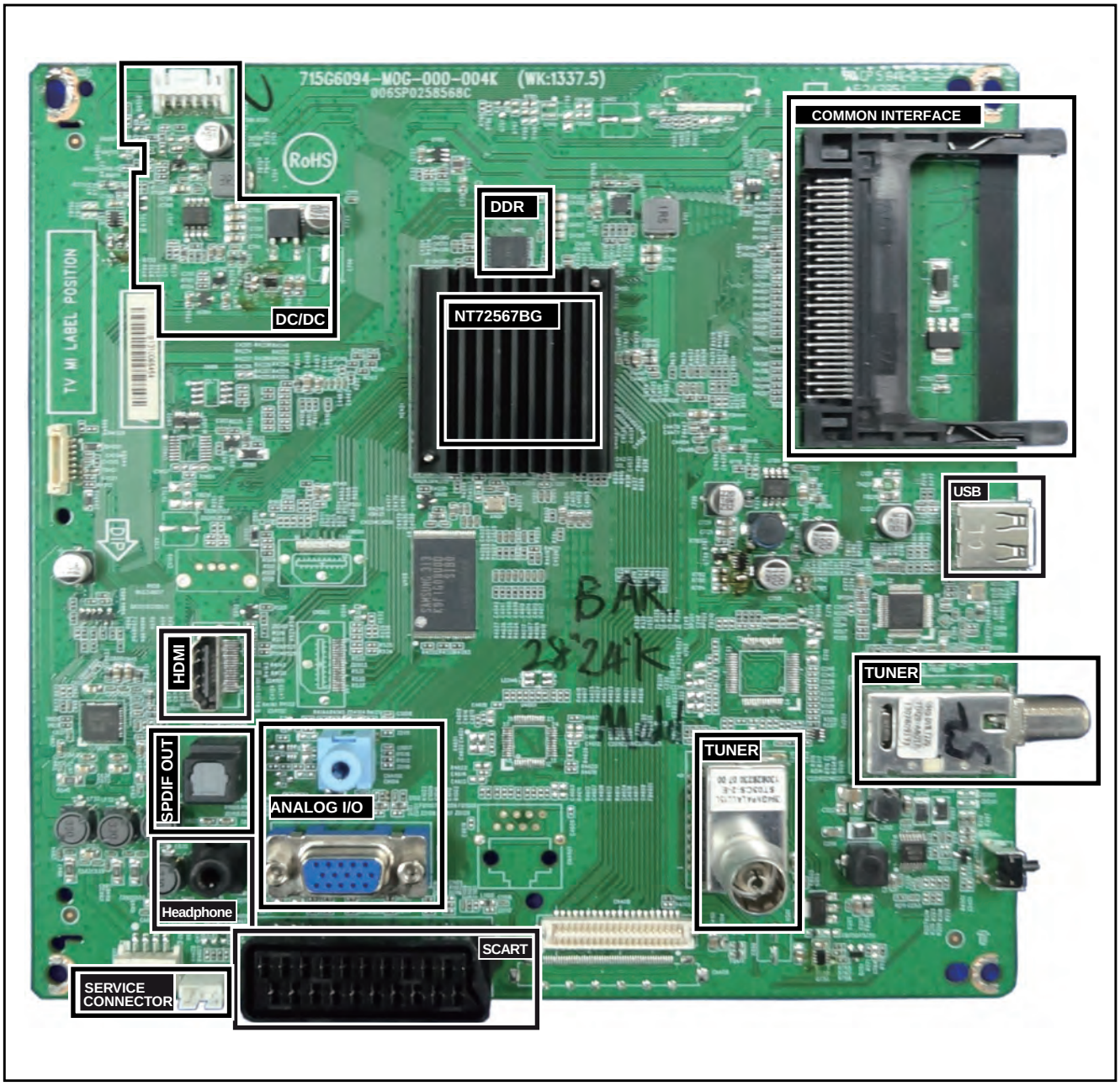
7.1.5 SSB Cell Layout



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130923

Figure 7-3 SSB layout cells (top view) (for 20"/22"/24"/28" PxH4109/88 & 20"/24"PxH4109/60 & 24PHx5219/88 & 55PFx5100/88)

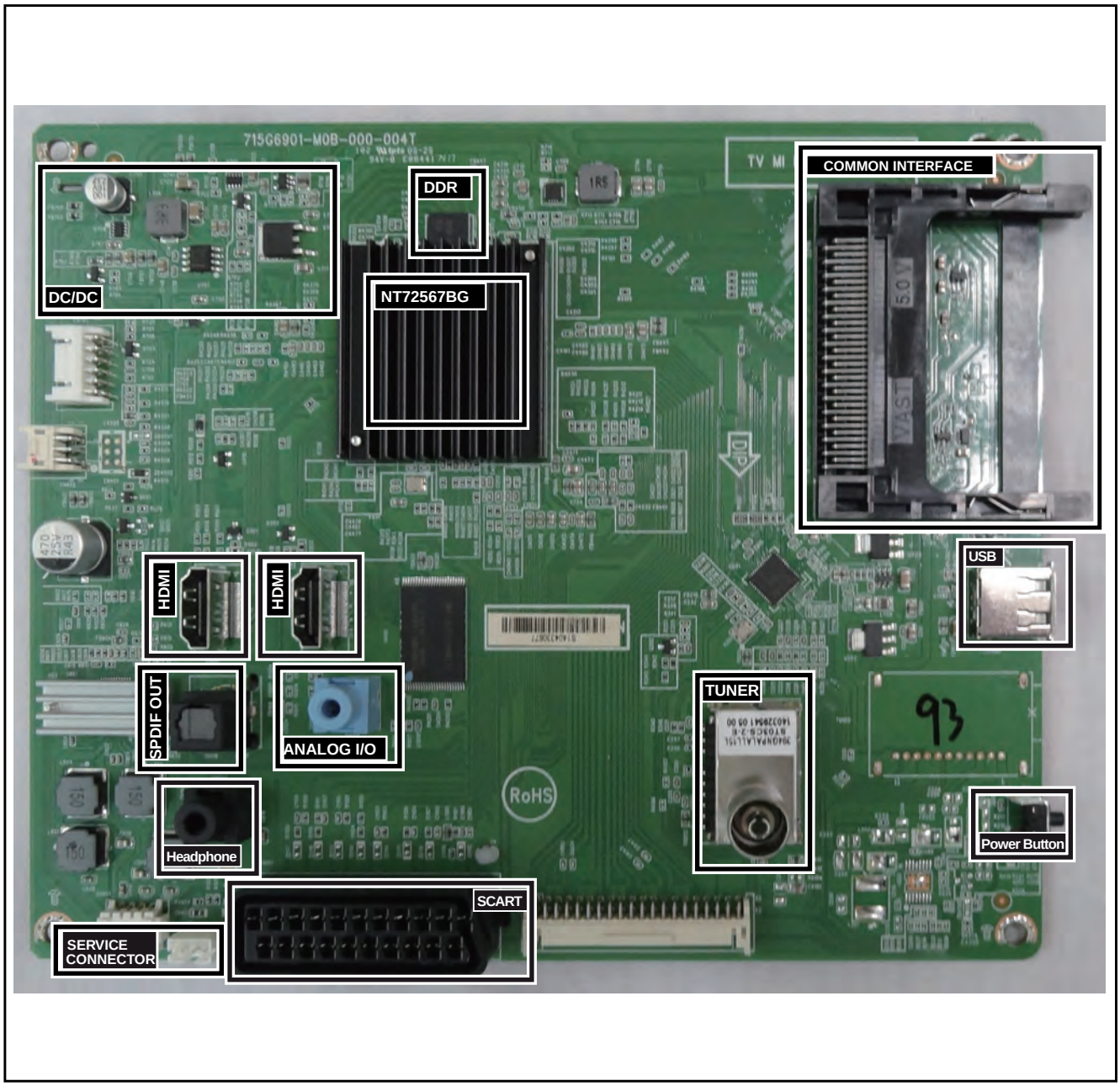
7.1.6 SSB Cell Layout



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140110

Figure 7-4 SSB layout cells (top view) (for 22"/24"/40"/47"/50" 4109/12 & 22" 4209/12 & 24" 5219/12 & 32/40/48/55PFx5100/12 & 42"/47"/55" 5200 series)

7.1.7 SSB Cell Layout

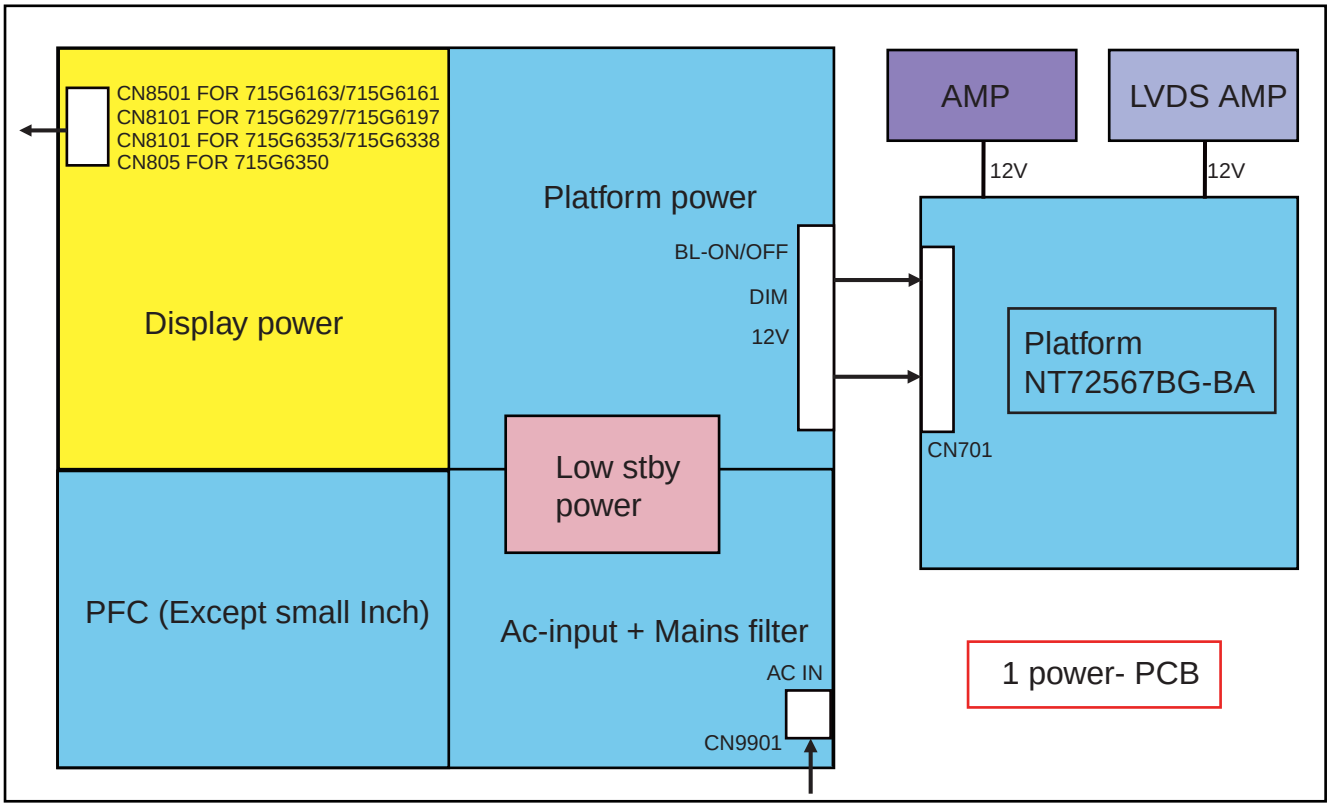


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Figure 7-5 SSB layout cells (top view) (for 32"/40"/50" 4009 series)

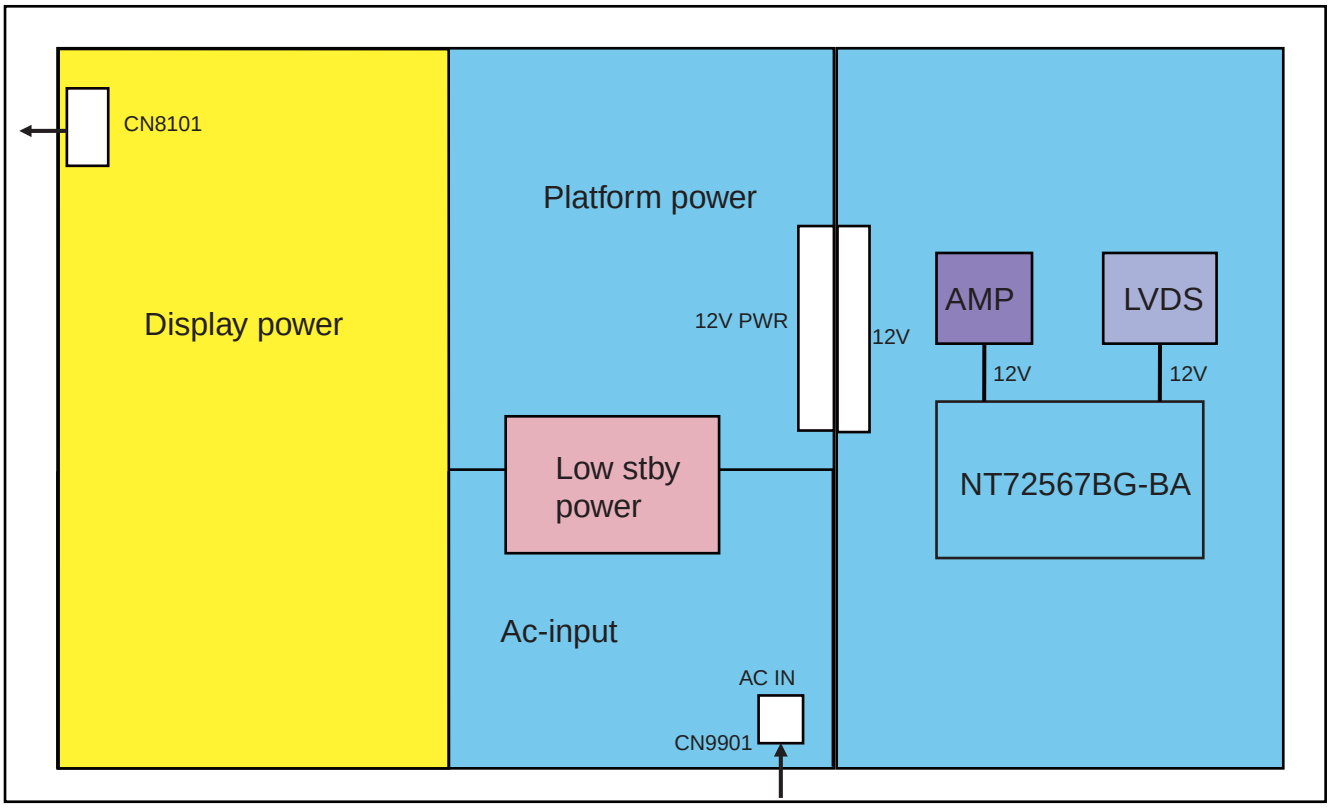
7.2 Power Supply

Refer to figure Figure 7-6 and Figure 7-7 for the power architecture of this platform.



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140110

Figure 7-6 Power Architecture (for 20" & 22" & 24" & 40" & 47" & 50" & 55" & 32" 4009 series)



19530_204_130810.eps
130810

Figure 7-7 Power Architecture (for 32")

7.2.1 Power Supply Unit

All power supplies are a black box for Service. When defective, a new board must be ordered and the defective one must be returned, unless the main fuse of the board is broken. Always replace a defective fuse with one with the correct specifications! This part is available in the regular market. Consult the Philips Service web portal for the order codes of the boards.

Important delta's with the TPN14.1E LA classis platform are:
- New power architecture for LED backlight
- "Boost"-signal is now a PWM-signal + continuous variable.

The control signals are:
- Stand-by
- Lamp "on/off"
- DIM (PWM) (not for PSDL)

In this manual, no detailed information is available because of design protection issues.

The output voltages to the chassis are:
- +4V7-STANDBY (Stand-by mode only)
- +12V (on-mode)
- +Vsnd (+12V) (audio power) (on-mode)
- +12V (bolt-on power) (on-mode)
- Output to the display; in case of
  - IPB: High voltage to the LCD panel
  - PSL and PSLS (LED-driver outputs)
  - PSDL (high frequent) AC-current.

7.2.2 Diversity

The diversity in power supply units is mainly determined by the diversity in displays.

The following displays can be distinguished:
- CCFL/EEFL backlight: power panel is conventional IPB
- LED backlight:
  - side-view LED without scanning: PSL power panel
  - side-view LED with scanning: PSLS power panel
  - direct-view LED without 2D-dimming: PSL power panel
  - direct-view LED with 2D-dimming: PSDL power panel.

PSL stands for **P**ower **S**upply with integrated **L**ED-drivers.
PSLS stands for a **P**ower **S**upply with integrated **L**ED-drivers with added **S**canning functionality (added microcontroller).
PSDL stands for a **P**ower **S**upply for **D**irect-view **L**ED backlight with 2D-dimming.

7.2.3 Connector overview

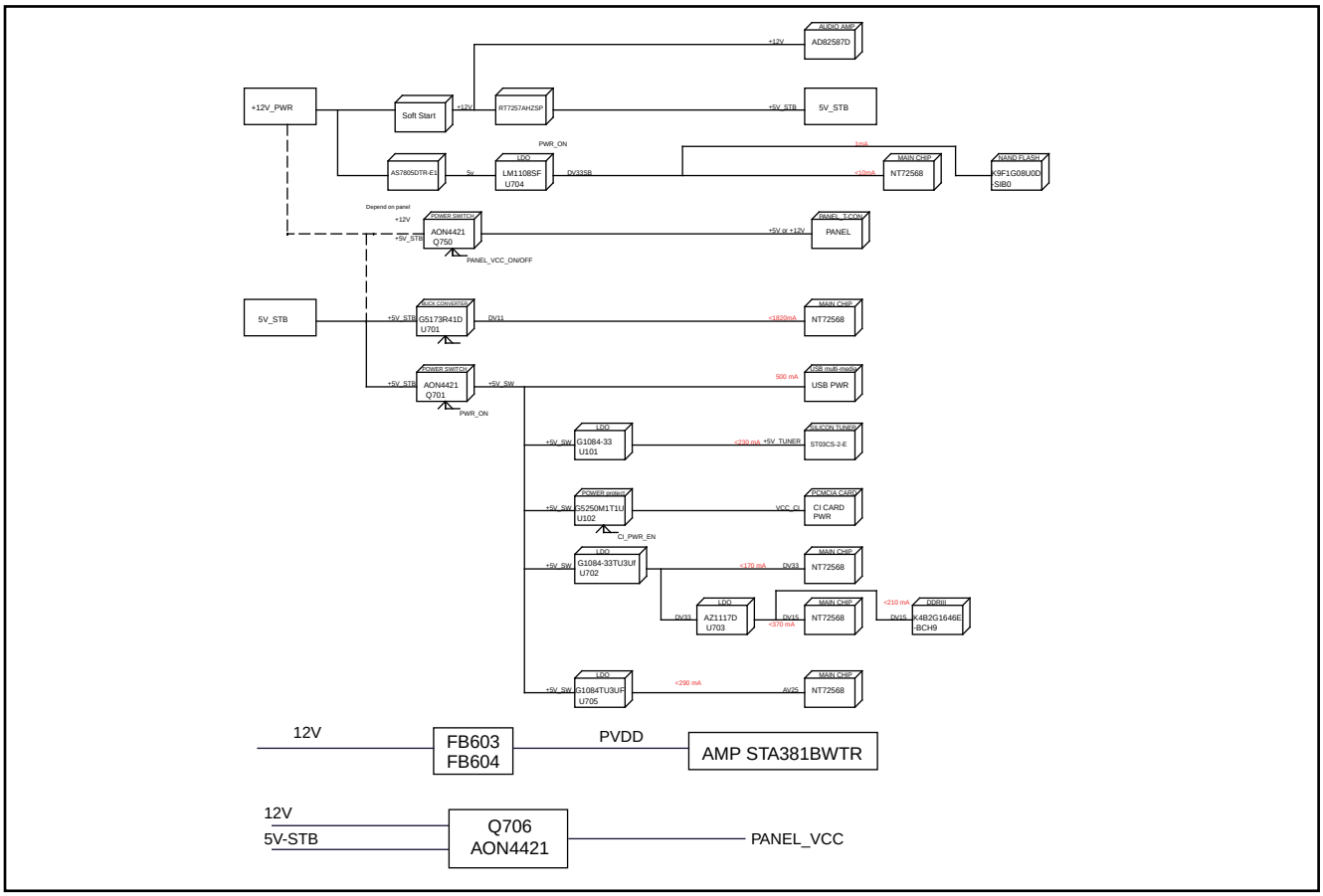
Table 7-1 Connector overview

	Connector											
Number	CN9101	CN8501	CN9904	CN8101	CN9301	CN9101	CN9101	CN8601	CN9101	CN8604	CN9101	CN8602
Description	to SSB	to panel	to SSB	to panel	to SSB	to panel	to SSB	to panel	to SSB	to panel	to SSB	to panel
Pin	14	12	14	6	14	14	16	12	14	6	16	6
1	DIM	LED1+	DIM	LED1	DIM	+36/+24V	DIM	VLED-	DIM	VLED+	DIM	VLED+
2	On/off	n.c.	ON/OFF	LED2	ON/OFF	+36/+24V	ON/OFF	n.c.	ON/OFF	VLED+	ON/OFF	VLED+
3	PS_ON	LED1-	n.c.	VLED+	PS_ON	+36/+24V	PS_ON	VLED-	n.c.	n.c.	PS_ON	n.c.
4	n.c.	LED1-	n.c.	VLED+	2D/3D	+36/+24V	n.c.	VLED-	n.c.	n.c.	n.c.	n.c.
5	GND	n.c.	GND	LED3	GND	+36/+24V	GND	n.c.	GND	LED_a	GND	VLED-
6	GND	n.c.	GND	LED4	GND	GND	GND	n.c.	GND	LED_a	GND	VLED-
7	GND	n.c.	GND	-	GND	GND	GND	n.c.	GND	-	GND	-
8	GND	n.c.	GND	-	GND	GND	GND	n.c.	GND	-	GND	-
9	+12V-AUDIO	LED1-	+12V-AUDIO	-	+12V-AUDIO	GND	+12V AL	VLED-	+12V-audio	-	+12V	-
10	+12V-AUDIO	LED1-	+12V-AUDIO	-	+12V-AUDIO	GND	+12V AL	VLED-	+12V-audio	-	+12V	-
11	+12V_AL	n.c.	+12V	-	+12V	n.c.	+12V	n.c.	+12V	-	+12V_A	-
12	+12V_AL	LED1+	+12V	-	+12V	ON/OFF	+12V	VLED+	+12V	-	+12V_A	-
13	+12_AL	-	+12_AL	-	+12_AL	2D/3D	+12V	-	+12V	-	+12V	-
14	+12_AL	-	+12_AL	-	+12_AL	DIM	+12V	-	+12V	-	+12V	-
15	-	-	-	-	-	-	+5V	-	-	-	+5.2V	-
16	-	-	-	-	-	-	+5V	-	-	-	+5.2V	-

7.3 DC/DC Converters

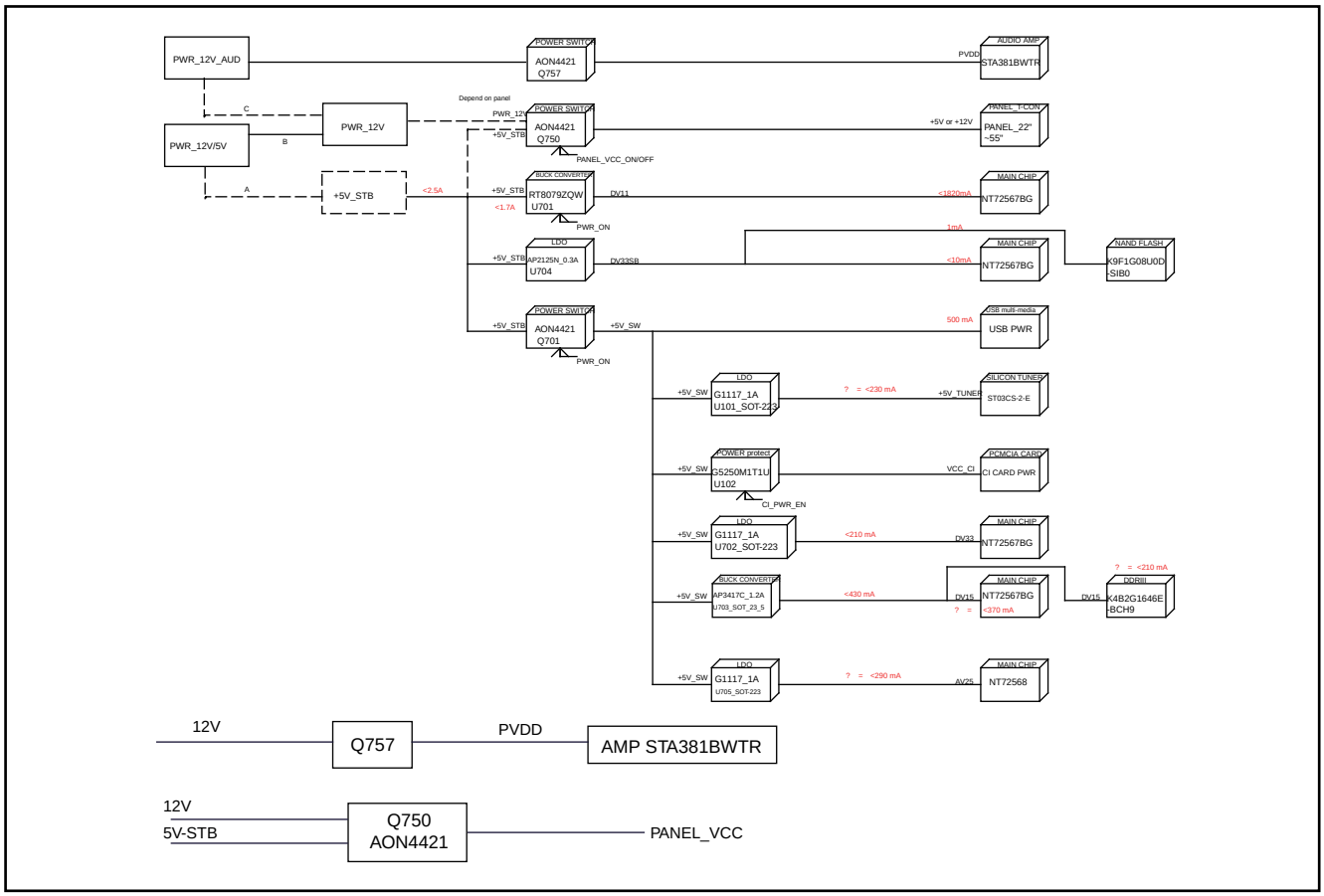
The on-board DC/DC converters deliver the following voltages (depending on set execution):
- +5V-STANDBY, permanent voltage for the Stand-by controller, LED/IR receiver and controls.
- 3V3, supply voltage for Keyboard.
- +12V, input from the power supply for the panel common(active mode)
- +12V, input from the power supply for the AMP
- +1V5, from the power supply for the scaler IC NT72567
- +1V1, from the power supply for the scaler IC NT72567
- +1V5, supply voltage for DDR2 (diagram B03B)
- +3V3, genenal supply voltage
- +5V, supply voltage for USB and CAM
- +3V3-TUN, supply voltage for tuner
- +3V3 from the power supply for the scaler IC NT72567
- +3V3-DVBS, clean voltage for DVB-S2 channel decoder
- +1V2-DVBS, core voltage for DVB-S2 channel decoder

Figures gives a graphical representation of the DC/DC converters with its current consumptions :



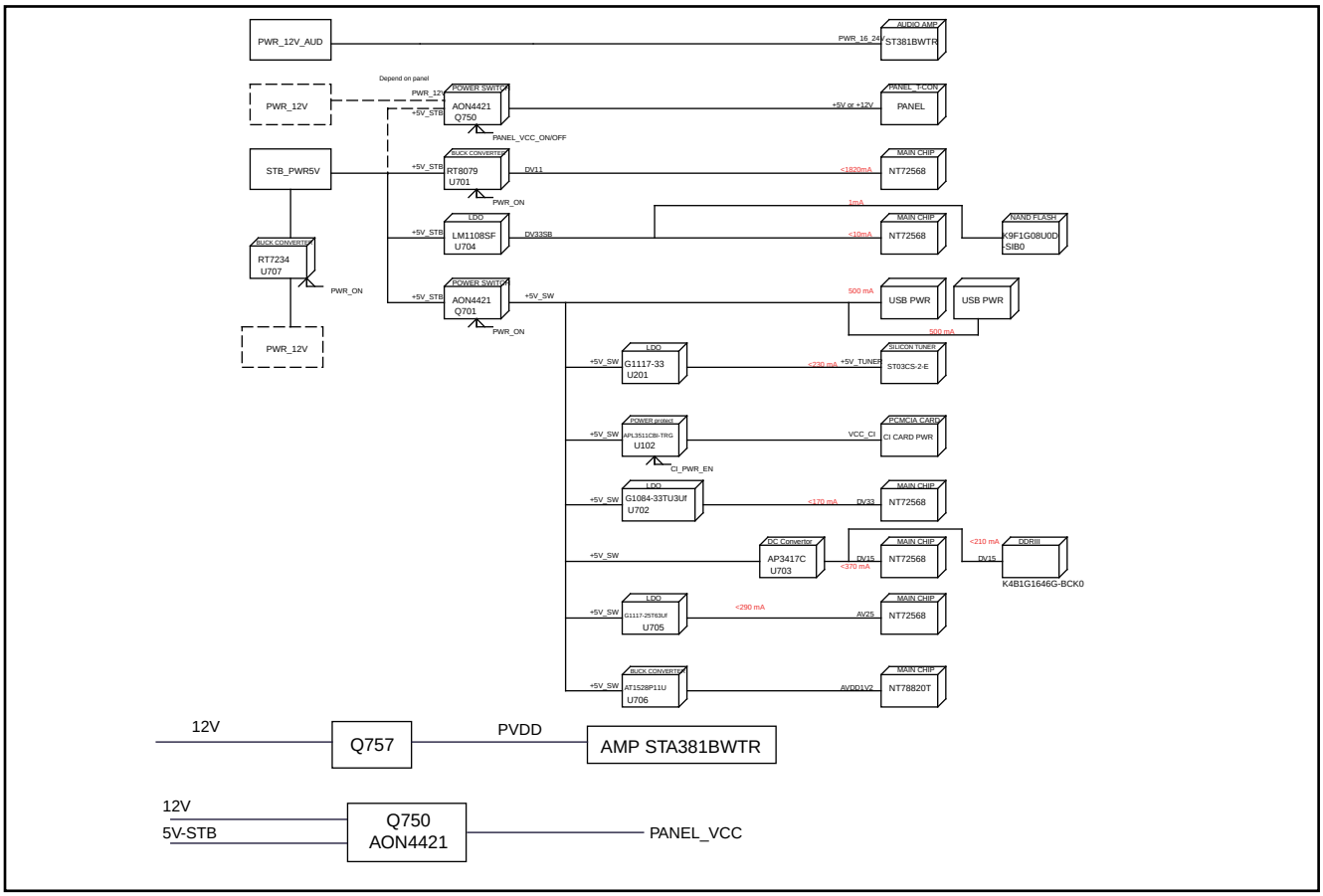
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130807

Figure 7-8 DC/DC converters (for 32")



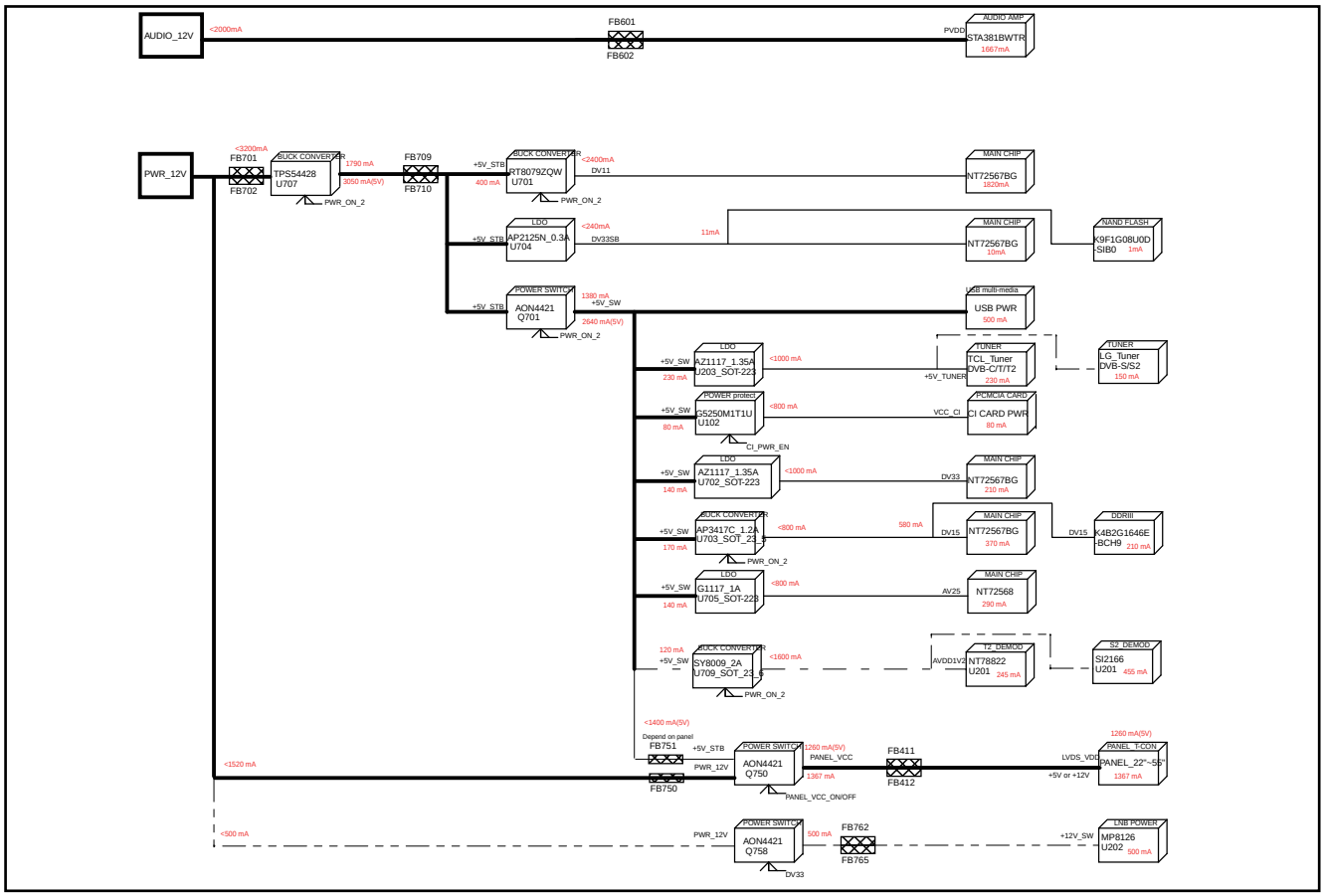
19530_206_130812.eps
130812

Figure 7-9 DC/DC converters (for 20"/22"/24"/28"/40"/47"/55"PxH4109/88 & 20"/24"PxH4109/60 & 32" 4300 series)



19530_207_130812.eps
130812

Figure 7-10 DC/DC converters (for 22"/24"/40"/47"/55"Pxx4109/12 & 22PFK4209/12 & 40" 4300 series & 42"/47"/55" 5200 series)



19597_201.eps

Figure 7-11 DC/DC converters (for 32"/40"/50" 4009 series)

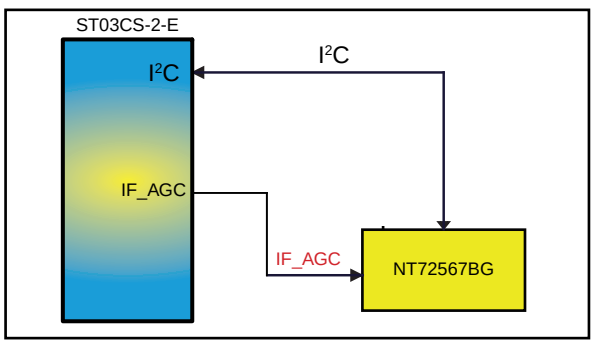
7.4 Front-End Analogue and DVB-T, DVB-C; ISDB-T reception

7.4.1 Front-End Analogue part

The Front-End for analogue tuner consist of the following key components:

- TUNER EUROPE system ST03CS-2-E
- SCALER NT72567BG-BA LFBGA-576

Below find a block diagram of the front-end application for analogue part.



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130810

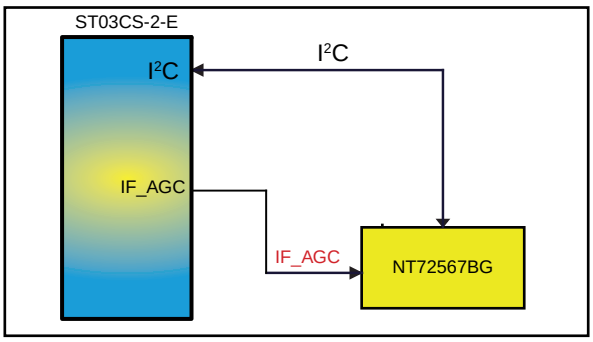
Figure 7-12 Front-End Analogue block diagram

7.4.2 DVB-T/C DTV part

The Front-End for DVB-T/C DTV part consist of the following key components:

- TUNER EUROPE system ST03CS-2-E
- SCALER NT72567BG-BA LFBGA-576

Below find a block diagram of the front-end application for DVB-T/C DTV part.



19530_208_130810.eps
130810

Figure 7-13 Front-End DVB-T2 DTV block diagram

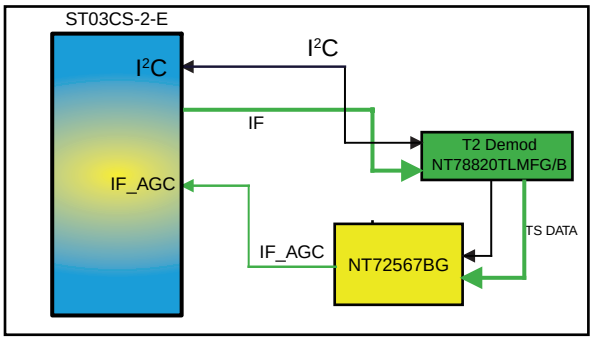
7.4.3 DVB-T2 DTV part

The Front-End for DVB-T2 DTV part consist of the following key components:

- TUNER EUROPE system ST03CS-2-E

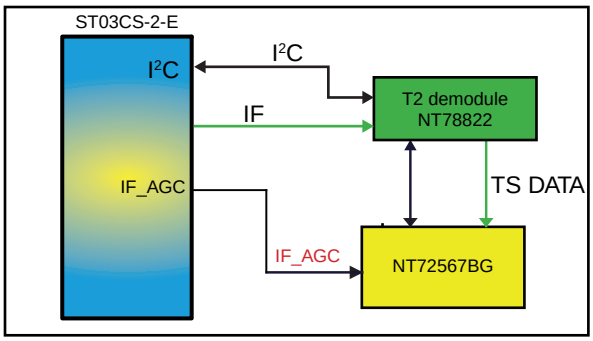
- SCALER NT72567BG-BA LFBGA-576
- DEMODULATOR NT78820TLMFG/B LQFP-64
- DEMODULATOR NT78822 QFN-48

Below find a block diagram of the front-end application for DVB-T2 DTV part.



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130810

Figure 7-14 Front-End DVB-T2 DTV block diagram



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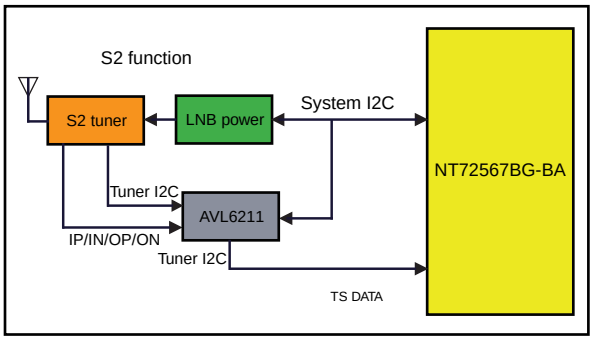
Figure 7-15 Front-End DVB-T2 DTV block diagram

7.5 Front-End DVB-S(2) reception

The Front-End for the DVB-S(2) application consist of the following key components:

- TUNER EUROPE TDQS-A801F
- SCALER NT72567BG-BA LFBGA-576
- AVL6211LA LQFP-64

Below find a block diagram of the front-end application for DVB-S(2) reception.



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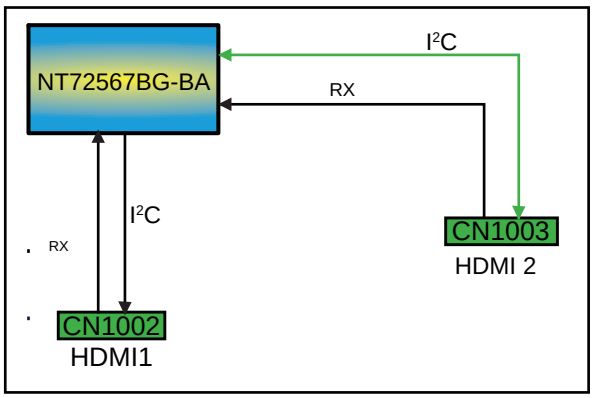
Figure 7-16 Front-End DVB-T2 DTV block diagram

The application supports the following protocols:

- Polarization selection via supply voltage (18V = horizontal, 13V = vertical)
- Band selection via “toneburst” (22kHz): tone “on” = “high” band, tone “off” = “low” band
- Satellite (LNB) selection via DiSEqC 1.0 protocol
- Reception of DVB-S (supporting QPSK encoded signals) and DVB-S2 (supporting QPSK, 8PSK, 16APSK and 32APSK encoded signals), introducing LDPC low-density parity check techniques

7.6 HDMI

Refer to figure 7-17 HDMI input configuration for the application.



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140110

Figure 7-17 HDMI input configuration

The following HDMI connector can be used:

- HDMI 1: HDMI input (TV digital interface support HDCP) with digital audio/PC DVI input/ARC
- HDMI 2: HDMI input (TV digital interface support HDCP) with digital audio/PC DVI input
- HDMI 3: HDMI input (TV digital interface support HDCP) with digital audio/PC DVI input
- +5V detection mechanism
- Stable clock detection mechanism
- Integrated EDID
- HPD control
- Sync detection
- TMDS output control
- CEC control

7.7 Video and Audio Processing - NT72567BG-BA

The NT72567BG-BA is the main audio and video processor (or System-on-Chip) for this platform. It has the following features:

- Multi-standard digital video decoder (MPEG-2, H.264, MPEG-4)
- Integrated DVB-T/DVB-C/DVB-S channel decoder
- Integrated CI+
- Integrated motion accurate picture processing
- High definition ME/MC
- Extended colour gamut and colour booster
- Integrated USB2.0 host controller
- Improved MPEG artefact reduction compared
- Security for customers own code/settings (secure flash)

The NT72567BG-BA/D is an integrated TV system-on-chip which complaints with variety ATV as NTSC,PAL and SECAM,and DTV standards as ISDB-T,DVB-T/C, integrates DTV and multi-media AV decoder,SIF demodulator,and support A/V post-processing. It also includes next generation Motion Accurate Picture Processing High flat panel screen resolutions and refresh rates are supported with formats including 1366 × 768 @ 60Hz and 1920 x 1080 @ 60Hz.The combination of Ethernet, CI+ and H.264 supports new TV experiences with IPTV and VOD. On top of that, optional

support is available for 2D dimming in combination roptimum contrast and power savings up to 50%.

For a functional diagram of the NT72567BG-BA, refer to Figure 8-2.

7.8 Ambilight

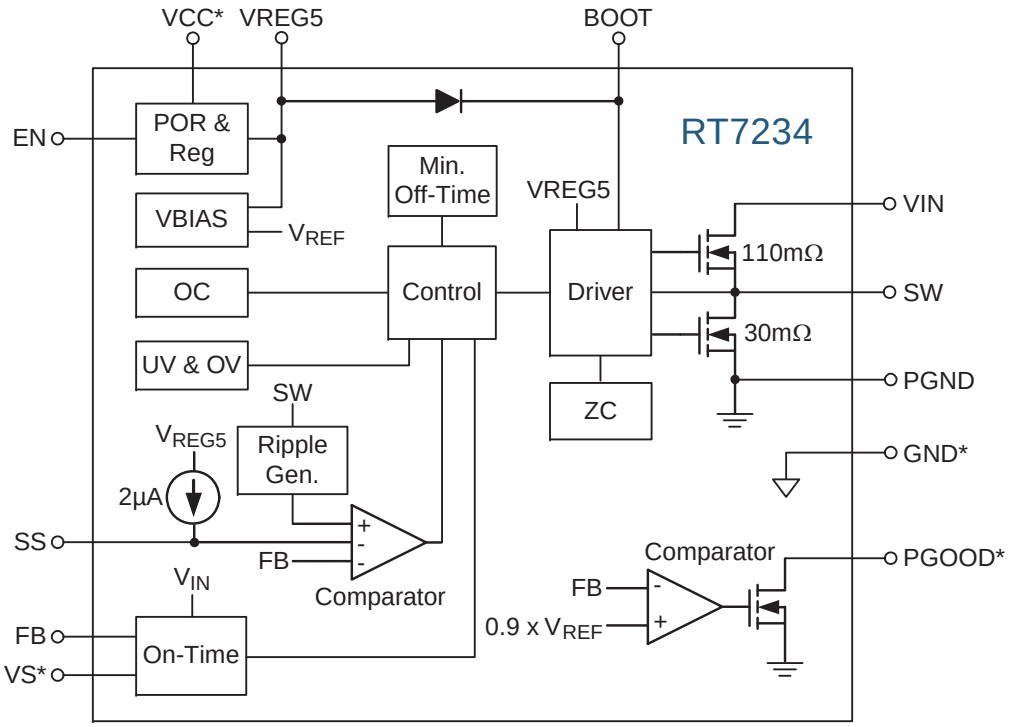
- The power supply voltage 12V
- Ambilight will adjust the TV lights around according to the picture changing color and brightness in order to create a sense of the effect of be personally on the screen

8. IC Data Sheets

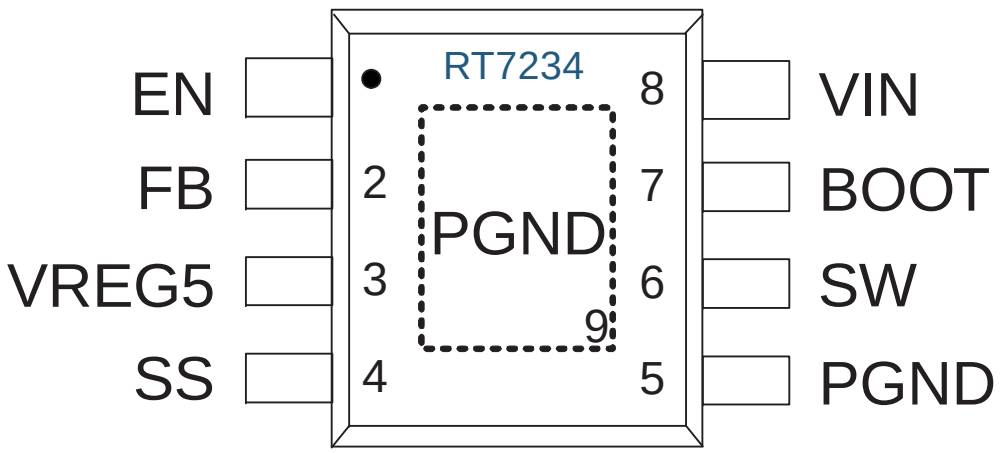
This chapter shows the internal block diagrams and pin configurations of ICs that are drawn as “black boxes” in the electrical diagrams (with the exception of “memory” and “logic” ICs).

8.1 Diagram 10-13-1 Power, B01, RT7234GSP (IC U701)

Block diagram



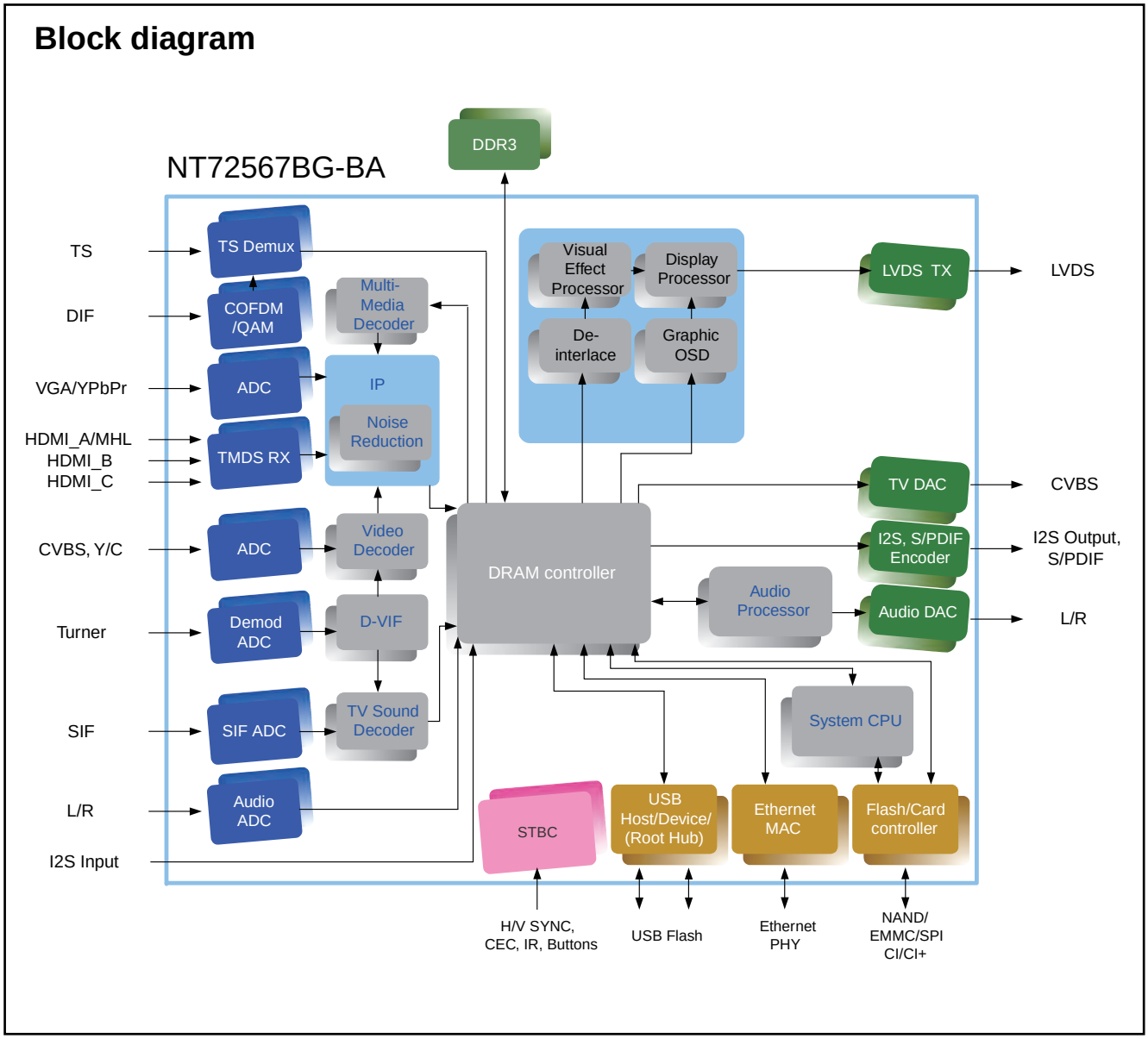
Pinning information



19530_300_130724.eps
130724

Figure 8-1 Internal block diagram and pin configuration

8.2 Diagram 10-13-3 NT72567_ADC/DAC/AUDIO/SIF, B03, NT72567BG-BA (IC U4001D)

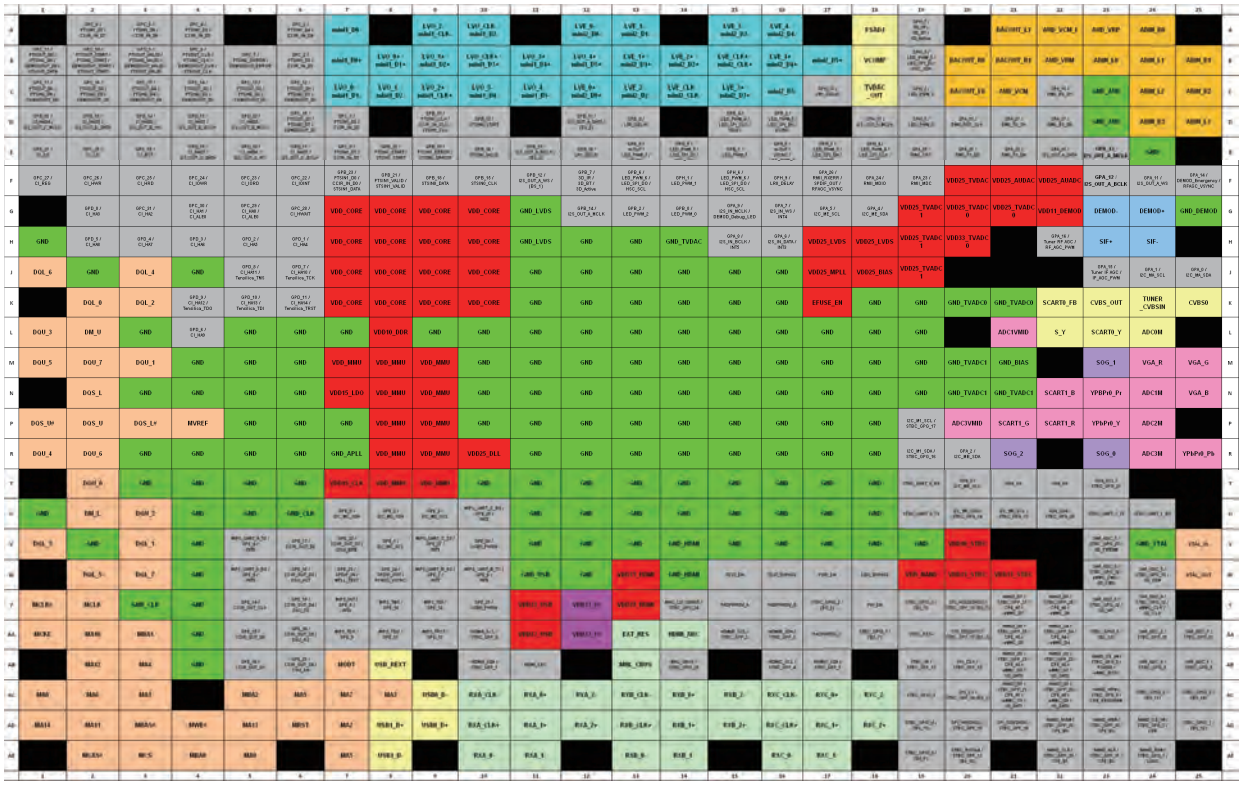


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130724

Figure 8-2 Internal block diagram

Pinning Information

NT72567BG-BA



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130724

Figure 8-3 Internal pin configuration [1/6]

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div. table

Pinning Information

NT72567BG-BA

	1	2	3	4	5	6	7	8
A		GPC_6 / PTSIN1_D7 / CCIR_IN_D7	GPC_5 / PTSIN1_D6 / CCIR_IN_D6	GPC_4 / PTSIN1_D5 / CCIR_IN_D5		GPC_3 / PTSIN1_D4 / CCIR_IN_D4	mini1_D0-	
B	GPC_11 / PTSOUT_D0 / PTSIN2_D0 / DEMODOUT_D0 / STSOUT_DATA	GPC_10 / PTSOUT_START / PTSIN2_START / DEMODOUT_START / STSOUT_START	GPC_9 / PTSOUT_VALID / PTSIN2_VALID / DEMODOUT_VALID / STSOUT_VALID	GPC_8 / PTSOUT_CLK / PTSIN2_CLK / DEMODOUT_CLK / STSOUT_CLK	GPC_7 / PTSIN2_ERROR / DEMODOUT_ERROR	GPC_2 / PTSIN1_D3 / CCIR_IN_D3	mini1_D0+	LVO_0+ / mini1_D1+
C	GPC_17 / PTSOUT_D6 / PTSIN2_D6 / DEMODOUT_D6	GPC_16 / PTSOUT_D5 / PTSIN2_D5 / DEMODOUT_D5	GPC_15 / PTSOUT_D4 / PTSIN2_D4 / DEMODOUT_D4	GPC_14 / PTSOUT_D3 / PTSIN2_D3 / DEMODOUT_D3	GPC_13 / PTSOUT_D2 / PTSIN2_D2 / DEMODOUT_D2	GPC_12 / PTSOUT_D1 / PTSIN2_D1 / DEMODOUT_D1	LVO_0- / mini1_D1-	LVO_1- / mini1_D2-
D	GPD_16 / CI_HAD4 / I2S_OUT_C_MCLK	GPD_15 / CI_HAD3 / I2S_OUT_B_DATA	GPD_14 / CI_HAD2 / I2S_OUT_B_WS	GPD_13 / CI_HAD1 / I2S_OUT_B_BCLK	GPD_12 / CI_HAD0 / I2S_OUT_B_MCLK	GPC_18 / PTSOUT_D7 / PTSIN2_D7 / DEMODOUT_D7	GPC_1 / PTSIN1_D2 / CCIR_IN_D2	
E	GPC_21 / CI_CE	GPC_20 / CI_CD	GPC_19 / CI_RST	GPD_19 / CI_HAD7 / I2S_OUT_C_DATA	GPD_18 / CI_HAD6 / I2S_OUT_C_WS	GPD_17 / CI_HAD5 / I2S_OUT_C_BCLK	GPC_0 / PTSIN1_D1 / CCIR_IN_D1	GPB_22 / PTSIN1_START / STSIN1_START
F	GPC_27 / CI_REG	GPC_26 / CI_HWR	GPC_25 / CI_HRD	GPC_24 / CI_IOWR	GPC_23 / CI_IORD	GPC_22 / CI_IOINT	GPB_23 / PTSIN1_D0 / CCIR_IN_D0 / STSIN1_DATA	GPB_21 / PTSIN1_VALID / STSIN1_VALID
G		GPD_0 / CI_HA3	GPC_31 / CI_HA2	GPC_30 / CI_HA1 / CI_ALE8	GPC_29 / CI_HA0 / CI_ALE0	GPC_28 / CI_HWAIT	VDD_CORE	VDD_CORE
H	GND	GPD_5 / CI_HA8	GPD_4 / CI_HA7	GPD_3 / CI_HA6	GPD_2 / CI_HA5	GPD_1 / CI_HA4	VDD_CORE	VDD_CORE
J	DQL_6	GND	DQL_4	GND	GPD_8 / CI_HA11 / Tensilica_TMS	GPD_7 / CI_HA10 / Tensilica_TCK	VDD_CORE	VDD_CORE
K		DQL_0	DQL_2	GPD_9 / CI_HA12 / Tensilica_TDO	GPD_10 / CI_HA13 / Tensilica_TDI	GPD_11 / CI_HA14 / Tensilica_TRST	VDD_CORE	VDD_CORE
L	DQU_3	DM_U	GND	GPD_6 / CI_HA9	GND	GND	GND	VDD10_DDR
M	DQU_5	DQU_7	DQU_1	GND	GND	GND	VDD_MMU	VDD_MMU

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Figure 8-4 Internal pin configuration [2/6]

Pinning Information

NT72567BG-BA

	9	10	11	12	13	14	15	16
A	LVO_2- / mini1_CLK-	LVO_CLK- / mini1_D3-		LVE_0- / mini2_D0-	LVE_1- / mini2_D1-		LVE_3- / mini2_D3-	LVE_4- / mini2_D4-
B	LVO_1+ / mini1_D2+	LVO_CLK+ / mini1_D3+	LVO_3+ / mini1_D4+	LVO_4+ / mini1_D5+	LVE_1+ / mini2_D1+	LVE_2+ / mini2_D2+	LVE_CLK+ / mini2_CLK+	LVE_4+ / mini2_D4+
C	LVO_2+ / mini1_CLK+	LVO_3- / mini1_D4-	LVO_4- / mini1_D5-	LVE_0+ / mini2_D0+	LVE_2- / mini2_D2-	LVE_CLK- / mini2_CLK-	LVE_3+ / mini2_D3+	mini2_D5-
D	GPB_20 / PTSIN1_CLK / CCIR_IN_CLK / STSIN1_CLK	GPB_17 / STSIN0_START		GPB_11 / I2S_OUT_A_DATA / (BS_0)	GPB_9 / LR0_DELAY		GPB_4 / LED_PWM_4 / LED_SPI_CLK / YDIO /	GPB_3 / LED_PWM_3 / LED_SPI_EN / VSYNC
E	GPB_19 / PTSIN1_ERROR / STSIN0_ERROR	GPB_16 / STSIN0_VALID	GPB_13 / I2S_OUT_A_BCLK / (BS_2)	GPB_10 / LR1_DELAY	GPB_8 / H-OUT / LED_PWM_7 / VSYNC	GPB_5 / LED_PWM_5 / LED_SPI_DI / HSC_SDA	GPB_1 / LED_PWM_1	GPH_8 / H-OUT / VSYNC / LED_PWM_7
F	GPB_18 / STSIN0_DATA	GPB_15 / STSIN0_CLK	GPB_12 / I2S_OUT_A_WS / (BS_1)	GPB_7 / 3D_IR / 3D_BT / 3D_Active	GPB_6 / LED_PWM_6 / LED_SPI_DO / HSC_SCL	GPH_1 / LED_PWM_1	GPH_6 / LED_PWM_6 / LED_SPI_DO / HSC_SCL	GPH_9 / LR0_DELAY
G	VDD_CORE	VDD_CORE	GND_LVDS	GPB_14 / I2S_OUT_A_MCLK	GPB_2 / LED_PWM_2	GPB_0 / LED_PWM_0	GPA_9 / I2S_IN_MCLK / DEMOD_Debug_LED	GPA_7 / I2S_IN_WS / INT4
H	VDD_CORE	VDD_CORE	GND_LVDS	GND	GND	GND_TVDAC	GPA_8 / I2S_IN_BCLK / INT5	GPA_6 / I2S_IN_DATA / INT3
J	VDD_CORE	VDD_CORE	GND	GND	GND	GND	GND	GND
K	VDD_CORE	VDD_CORE	GND	GND	GND	GND	GND	GND
L	GND	GND	GND	GND	GND	GND	GND	GND
M	VDD_MMU	GND	GND	GND	GND	GND	GND	GND

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Figure 8-5 Internal pin configuration [3/6]

back to div. table

Pinning Information

NT72567BG-BA

	9	10	11	12	13	14	15	16
N	VDD_MMU	GND	GND	GND	GND	GND	GND	GND
P	VDD_MMU	GND	GND	GND	GND	GND	GND	GND
R	VDD_MMU	VDD25_DLL	GND	GND	GND	GND	GND	GND
T	VDD_MMU	GND	GND	GND	GND	GND	GND	GND
U	GPE_3 / I2C_MD_SCL	MIPS_UART_C_RX / GPE_28 / INT2	GND	GND	GND	GND	GND	GND
V	MIPS_UART_C_TX / GPE_27 / INT1	GPE_26 / USB1_PWEN	GND	GND	GND	GND_HDMI	GND	GND
W	MIPS_UART_B_RX / GPE_7 / INT7	MIPS_UART_B_TX / GPE_6 / INT6	GND_USB	GND	VDD33_HDMI	GND_HDMI	TEST_EN	TEST_BYPASS
Y	MIPS_TDI / GPE_12	GPE_25 / USB0_PWEN	VDD33_USB	VDD33_IO	VDD33_HDMI	MHL_CD_SENSE / STBC_GPG_24	PADPWR5V_A	PADPWR5V_B
AA	MIPS_TRST / GPE_13	HDMIA_SCL / STBC_GPF_0	VDD33_USB	VDD33_IO	EXT_RES	HDMI_ARC	HDMIB_SCL / STBC_GPF_2	HDMIB_SDA / STBC_GPF_3
AB		HDMIA_SDA / STBC_GPF_1	HDMI_CEC		MHL_CBUS	MHL_VBUS / STBC_GPG_25		HDMIC_SCL / STBC_GPF_4
AC	USB0_D-	RXA_CLK-	RXA_0+	RXA_2-	RXB_CLK-	RXB_0+	RXB_2-	RXC_CLK-
AD	USB0_D+	RXA_CLK+	RXA_1+	RXA_2+	RXB_CLK+	RXB_1+	RXB_2+	RXC_CLK+
AE		RXA_0-	RXA_1-		RXB_0-	RXB_1-		RXC_0-

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130724

Figure 8-6 Internal pin configuration [4/6]

Pinning Information

NT72567BG-BA

	17	18	19	20	21	22	23	24	25
A		FSADJ	GPH_7 / 3D_IR / 3D_BT / 3D_Active		DACOUT_L1	AUD_VCM_I	AUD_VRP	ADIN_R0	
B	mini2_D5+	VCOMP	GPH_5 / LED_PWM_5 / LED_SPI_DI / HSC_SDA	DACOUT_R0	DACOUT_R1	AUD_VRM	ADIN_L0	ADIN_L1	ADIN_R1
C	GPH_10 / LR1_DELAY	TVDAC_OUT	GPH_2 / LED_PWM_2	DACOUT_L0	AUD_VCM	GPA_18 / RMII_RX_D1	GND_AUD	ADIN_L2	ADIN_R2
D		GPH_11 / I2S_OUT_A_MCLK	GPH_0 / LED_PWM_0	GPA_19 / RMII_REF_CLK	GPA_21 / RMII_TX_D1	GPA_17 / RMII_RX_D0	GND_AUD	ADIN_R3	ADIN_L3
E	GPH_3 / LED_PWM_3 / LED_SPI_EN / VSYNC	GPH_4 / LED_PWM_4 / LED_SPI_CLK / YDIO	GPA_25 / RMII_CRS	GPA_20 / RMII_TX_D0	GPA_22 / RMII_TX_EN	GPA_10 / I2S_OUT_A_DATA	GPA_13 / I2S_OUT_A_MCLK	GND	
F	GPA_26 / RMII_RXERR / SPDIF_OUT / RFAGC_VSYNC	GPA_24 / RMII_MDIO	GPA_23 / RMII_MDC	VDD25_TVDAC	VDD25_AUDAC	VDD25_AUADC	GPA_12 / I2S_OUT_A_BCLK	GPA_11 / I2S_OUT_A_WS	GPA_14 / DEMOD_Emergency / RFAGC_VSYNC
G	GPA_5 / I2C_ME_SCL	GPA_4 / I2C_ME_SDA	VDD25_TVADC1	VDD25_TVADC0	VDD25_TVADC0	VDD11_DEMOD	DEMOD-	DEMOD+	GND_DEMOD
H	VDD25_LVDS	VDD25_LVDS	VDD25_TVADC1	VDD33_TVADC0		GPA_16 / Tuner RF AGC / RF_AGC_PWM	SIF+	SIF-	
J	VDD25_MPLL	VDD25_BIAS	VDD25_TVADC1				GPA_15 / Tuner IF AGC / IF_AGC_PWM	GPA_1 / I2C_MA_SCL	GPA_0 / I2C_MA_SDA
K	EFUSE_EN	GND	GND	GND_TVADC0	GND_TVADC0	SCART0_FB	CVBS_OUT	TUNER_CVBSIN	CVBS0
L	GND	GND	GND		ADC1VMID	S_Y	SCART0_Y	ADC0M	
M	GND	GND	GND	GND_TVADC1	GND_BIAS		SOG_1	VGA_R	VGA_G

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Figure 8-7 Internal pin configuration [5/6]

Pinning Information

NT72567BG-BA

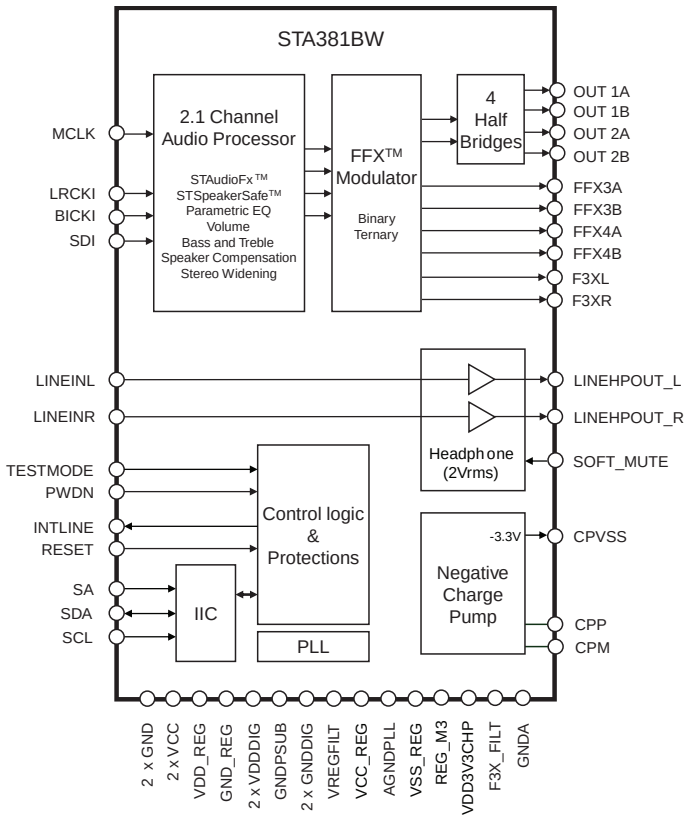
	17	18	19	20	21	22	23	24	25
N	GND	GND	GND	GND_TVADC1	GND_TVADC1	SCART1_B	YPBPr0_Pr	ADC1M	VGA_B
P	GND	GND	I2C_M1_SCL / STBC_GPG_17	ADC3VMID	SCART1_G	SCART1_R	YPbPr0_Y	ADC2M	
R	GND	GND	I2C_M1_SDA / STBC_GPG_16	GPA_2 / I2C_MB_SDA	SOG_2		SOG_0	ADC3M	YPbPr0_Pb
T	GND	GND	STBC_UART_0_RX	GPA_3 / I2C_MB_SCL	VGA_VS	VGA_HS	VGA_SCL / STBC_GPG_21		
U	GND	GND	STBC_UART_0_TX	I2C_M0_SDA / STBC_GPG_14	I2C_M0_SCL / STBC_GPG_15	VGA_SDA / STBC_GPG_20	STBC_UART_1_TX	STBC_UART_1_RX	
V	GND	GND	GND	VDD10_STBC			SAR_ADC_7 / STBC_GPG_23 / SD_PWEN#	GND_XTAL	XTAL_IN
W	POR_EN	LDO_BYPASS	VDD_NAND	VDD33_STBC	VDD33_STBC		SAR_ADC_8 / STBC_GPG_26 / eMMC_CMD / SD_CMD	SAR_ADC_5 / STBC_GPG_13 / SD_CD#	XTAL_OUT
Y	STBC_GPIO_2 / (BS_8)	PW_EN	STBC_GPIO_3 / (BS_9)	SPI_HOLD(DIO3) / STBC_GPF_19 (BS_5)	NAND_D7 / STBC_GPF_27 / CPE_A7 / eMMC_D7	NAND_D6 / STBC_GPF_26 / CPE_A6 / eMMC_D6	SAR_ADC_6 / STBC_GPG_22 / SD_WP	SAR_ADC_4 / STBC_GPG_12 / eMMC_CLK / SD_CLK	
AA	PADPWR5V_C	STBC_GPIO_1 / (BS_7)	STBC_RSTn	SPI_DO(DIO1) / STBC_GPF_17 (BS_4)	NAND_D5 / STBC_GPF_25 / CPE_A5 / eMMC_D5	NAND_D4 / STBC_GPF_24 / CPE_A4 / eMMC_D4	STBC_GPIO_8 / (BS_13)	SAR_ADC_2 / STBC_GPG_10	SAR_ADC_3 / STBC_GPG_11
AB	HDMIC_SDA / STBC_GPF_5		STBC_IR / STBC_GPF_12	SPI_CLK / STBC_GPF_15	NAND_D3 / STBC_GPF_23 / CPE_A3 / eMMC_D3 / SD_DAT3	NAND_D2 / STBC_GPF_22 / CPE_A2 / eMMC_D2 / SD_DAT2	NAND_CE_0# / STBC_GPG_2 / PGENB / eMMC_RSTn	SAR_ADC_0 / STBC_GPG_8	SAR_ADC_1 / STBC_GPG_9
AC	RXC_0+	RXC_2-	STBC_GPIO_5	SPI_CS / STBC_GPF_14 (BS_3)	NAND_D1 / STBC_GPF_21 / CPE_A1 / eMMC_D1 / SD_DAT1	NAND_D0 / STBC_GPF_20 / CPE_A0 / eMMC_D0 / SD_DAT0	NAND_WP# / STBC_GPG_0 / CPE_PROGRAM	STBC_GPIO_6 / (BS_11)	STBC_GPIO_9 / (BS_14)
AD	RXC_1+	RXC_2+	STBC_GPIO_4 / (BS_15)	SPI_WP(DIO2) / STBC_GPF_18	SPI_DIO(DIO0) / STBC_GPF_16	NAND_R\B# / STBC_GPF_28 / CPE_B0	NAND_WE# / STBC_GPF_30 / CPE_B2	NAND_CE_1# / STBC_GPG_3 / CSB	STBC_GPIO_7 / (BS_12)
AE	RXC_1-		STBC_GPIO_0 / (BS_6)	STBC_RSTout / STBC_GPF_13 (BS_10)		NAND_CLE / STBC_GPF_29 / CPE_B1	NAND_ALE / STBC_GPF_31 / CPE_B3	NAND_RE# / STBC_GPG_1 / LOAD	

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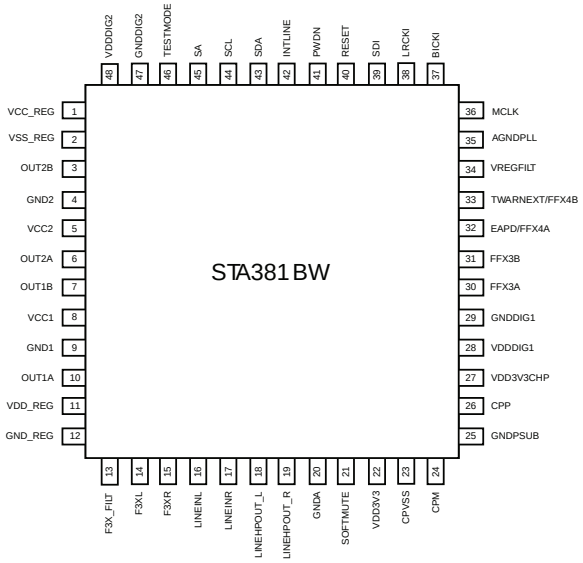
Figure 8-8 Internal pin configuration [6/6]

8.3 Diagram 10-13-11 SPEAKER AMPLIFER/HEADPHONE OUT, B11, STA381BWTR (IC U601)

Block diagram



Pinning information

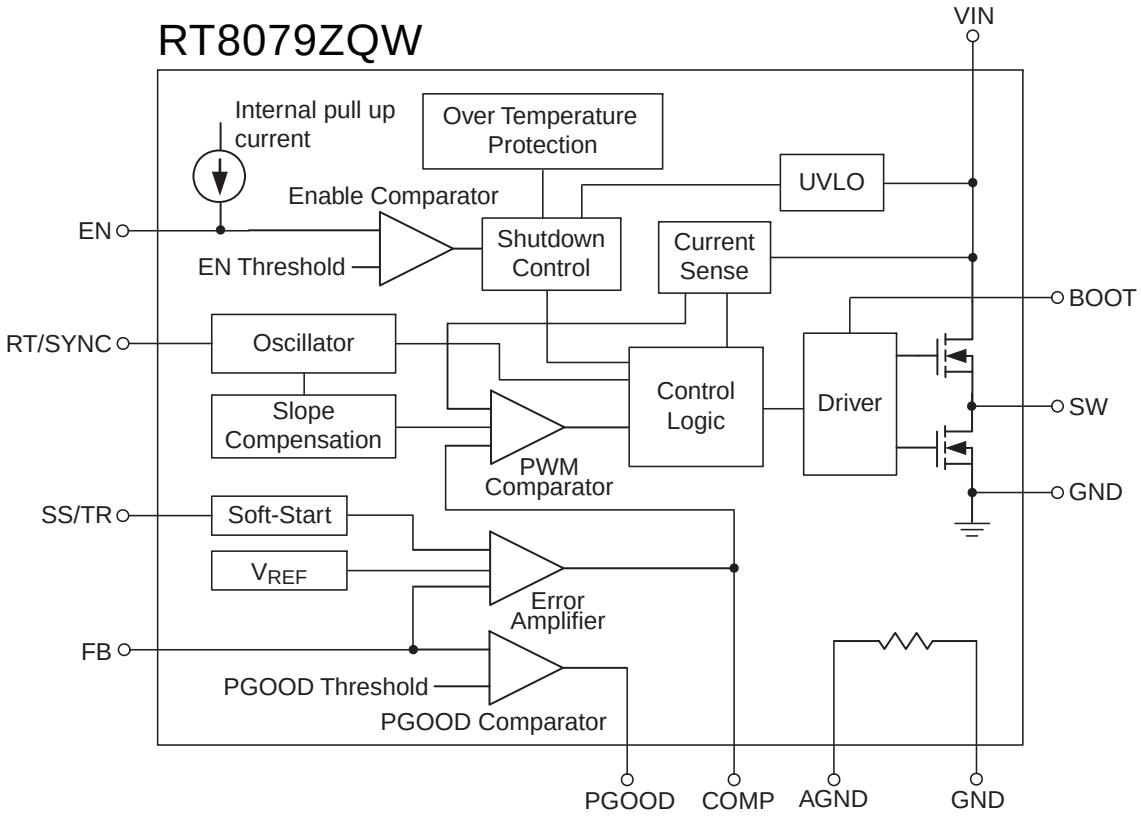


19470_302_130403.eps
130403

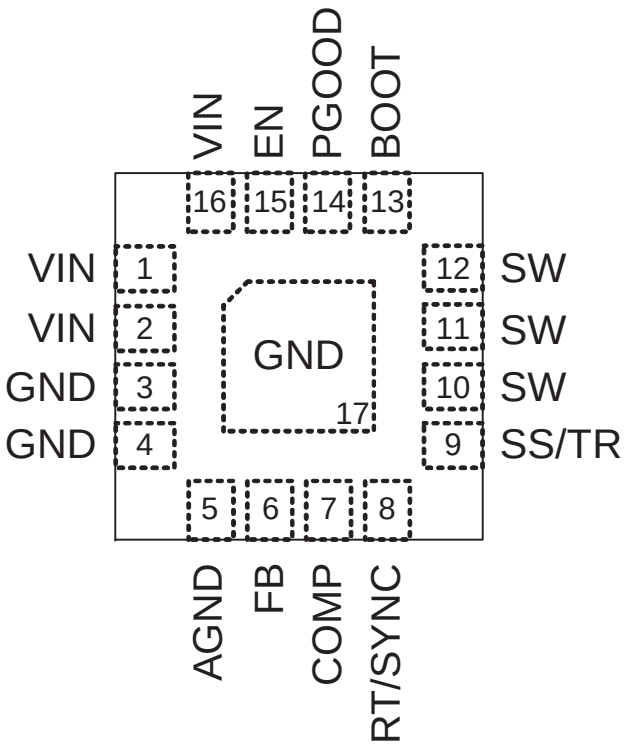
Figure 8-9 Internal block diagram and pin configuration

8.4 Diagram 10-14-1 Power-1, B01, RT8079ZQW (IC U701)

Block diagram



Pinning information

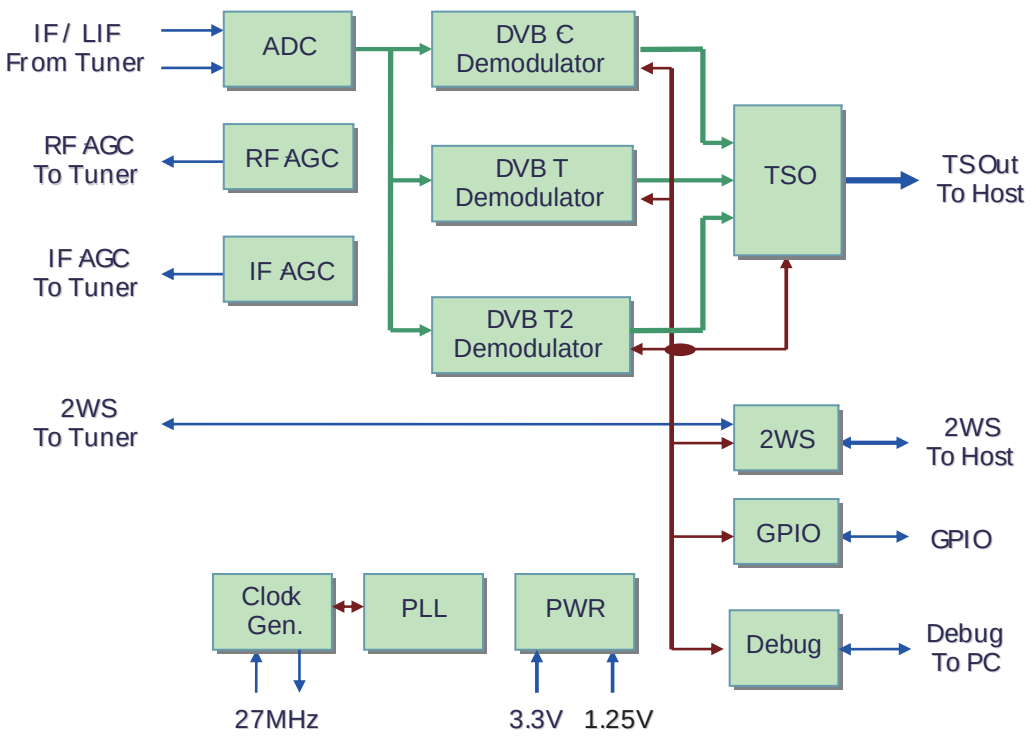


19530_309_130724.eps
130724

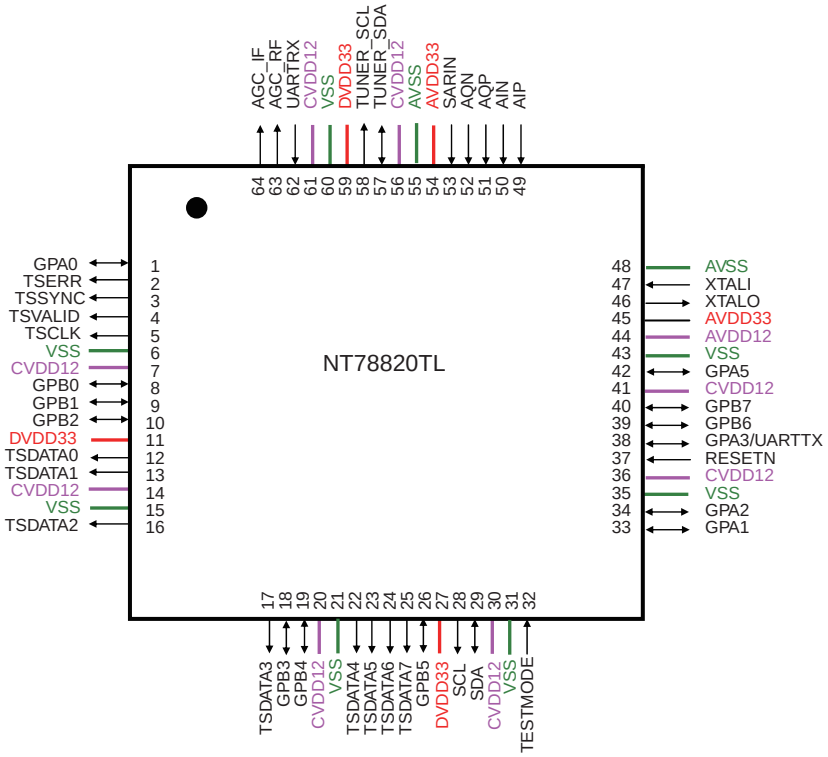
Figure 8-10 Internal block diagram and pin configuration

8.5 Diagram 10-15-14 T2/S2 Tuner/Demodulator, B14, NT78820TL (IC U203)

Block diagram



Pinning information



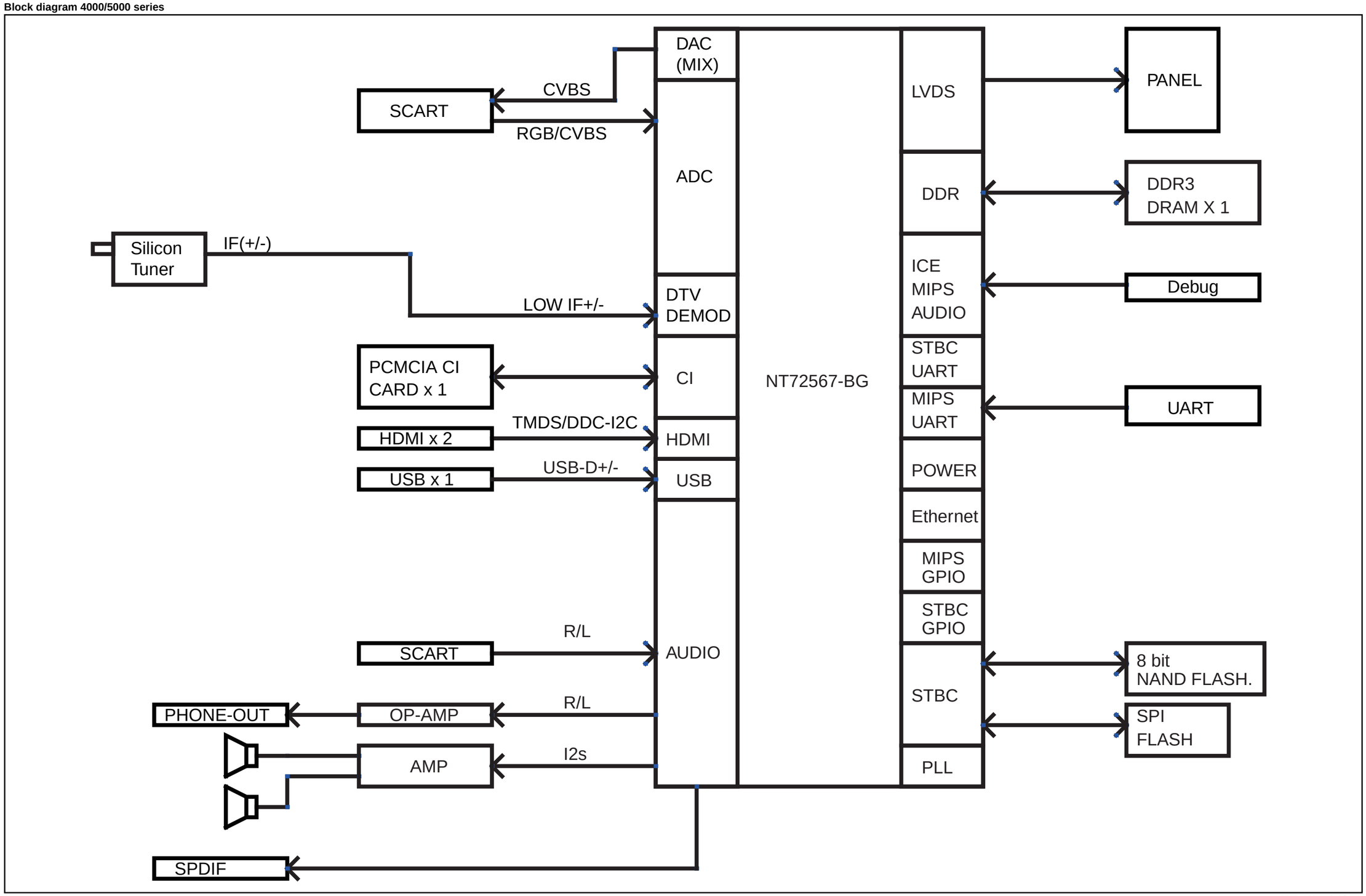
19530_310_130724.eps
130724

Figure 8-11 Internal block diagram and pin configuration

Personal Notes:

9. Block Diagrams

9.1 Block diagram 4000/5000 series

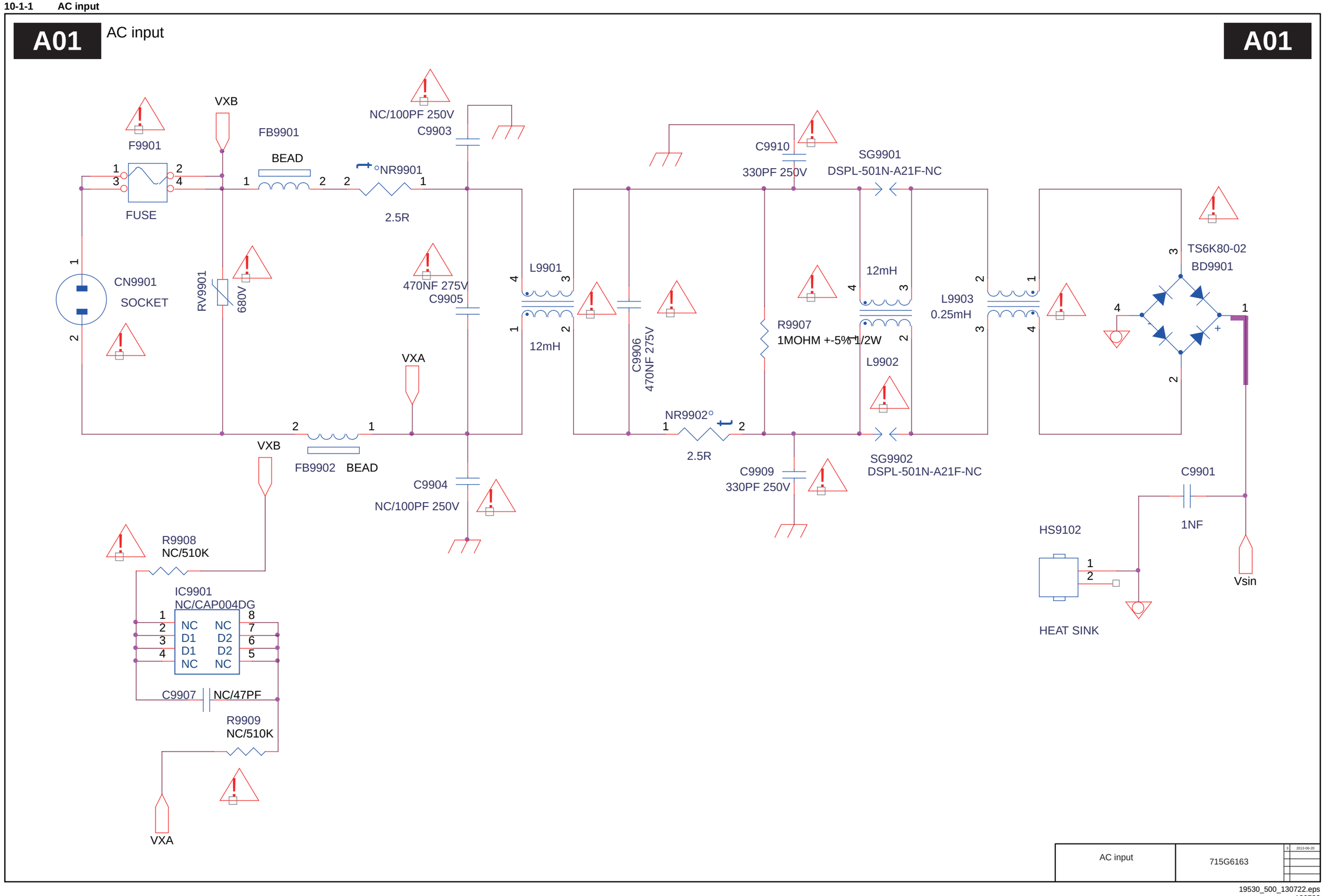


19590_400_140108.eps
140108

10. Circuit Diagrams and PWB Layouts

10.1 A 715G6163 PSU

10-1-1 AC input



19530_500_130722.eps
130722

10-1-2 PFC

A02 PFC

A02

Vsin
FB9804
FB9803
BEAD
BEAD
L9801
300uH
C9801
1UF 450V
D9801
IN5408G-04
C9817
NC/47PF
D9802
MUR460-28
FB9802
BEAD
HV
C9803
1NF
C9814
68UF 450V
C9815
68UF 450V
R9802
10R 1/8W 5%
D9803
RB160M
Q9801
TK15A60U
C9818
NC/47PF
C9802
1NF
R9805
47K 1/4W
R9803
33R 1/8W 5%
R9806
10K OHM +-5% 1/8W
FB9805
BEAD
R9804
1MOHM +-1% 1/4W
C9804
47P 50V
R9814
4.7K 1/8W
R9807
1MOHM +-1% 1/4W
R9808
0.15R
VCC_ON
C9806
100N 50V
IC9801
VCC
OUT
GND
ZCD
INV
COMP
RAMP
CS
LD7591T
R9810
470 OHM 1/4W
R9809
750K 1%
R9815
200K 1/8W 1%
C9807
470PF 50V
C9808
NC/100P 50V
C9812
NC/100P 50V
C9811
220pF 50V
R9818
18.7K 1/8W 1%
R9823
NC
R9813 10K OHM +-5% 1/8W
R9812
24K 1/8W 1%
C9809
47N 50V
C9810
0.47UF 50V

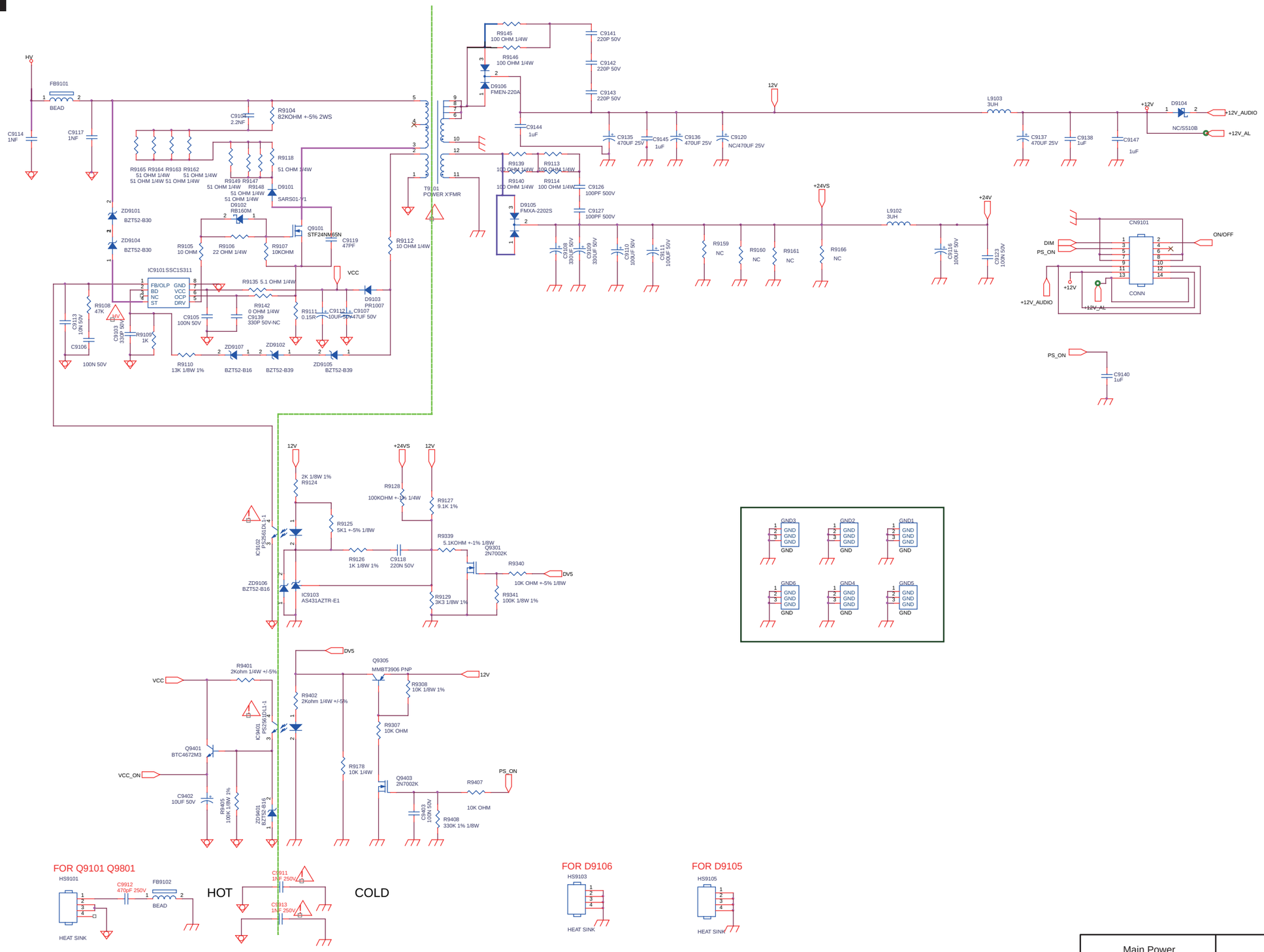
PFC	715G6163	3 2013-06-20

19530_501_130722.eps
130722

10-1-3 Main Power

A03 Main Power

A03



Main Power	715G6163	1 2013-06-20

19530_502_130722.eps
130722

10-1-4 LED Driver

A04 LED Driver

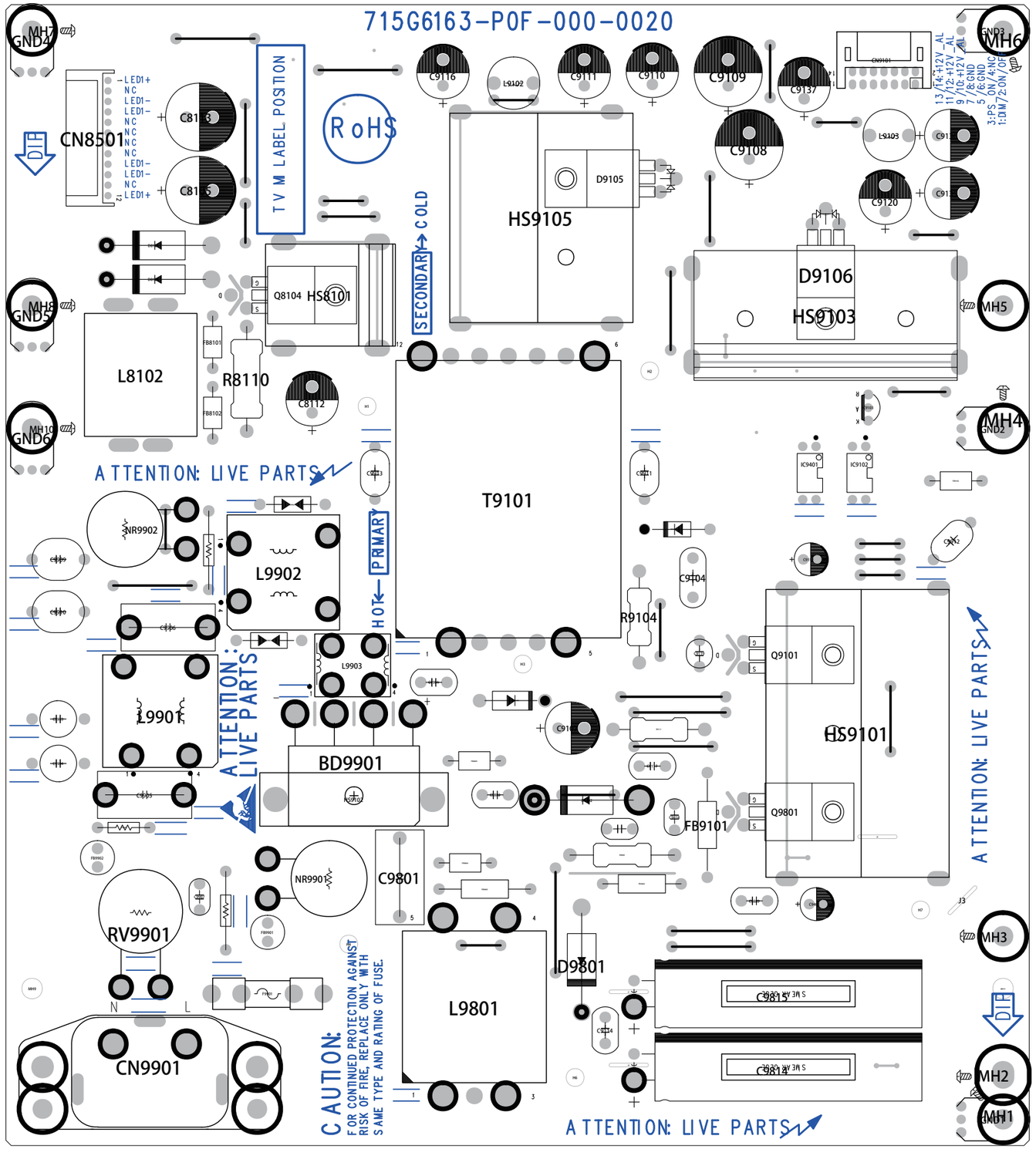
A04

+24V
LED1+
C8107 100N 50V
C8112 100UF 50V
FB8102 BEAD
R8106 NC/10 OHM
C8121 NC/100PF 200V
C8104 2.2uF 25V
VCC1
R8138 0 OHM +-5% 1/8W
C8117 NC/1uF
R8121 NC/100K
L8102 33uH
D8101 SR510-22
D8105 NC/SR510-22
FB8101 BEAD
C8105 100UF 63V
Q8104 AOTF4126
C8116 NC/100PF 200V
C8109 NC/100PF 200V
R8105 10K 1/10W 5%
R8109 NC
D8102 NC
R8104 10 OHM
R8116 82KOHM +-1% 1/8W
R8135 82KOHM +-1% 1/8W
R8154 NC/100K
R8155 NC/100K
R8156 NC/100K
C8113 100UF 63V
C8115 NC/1000pF 630V
LED1+
VCC1
DIM
R8118 10K 1/10W 5%
R8120 10K 1/10W 5%
Q8103 2N7002
Q8105 PMBT3904
R8119 10K 1/10W 5%
C8114 10N 50V
C8111 100pF 50V
R8130 220K 1/10W 5%
R8117 7K5 1/8W +/-1%
IC8501
1 DIMOUT
2 GM
3 FB
4 OVP/DIM
8 VCC
7 OUT
6 GND
5 CS
PF7903BS
R8127 1K 1/10W 5%
R8122 100K 1/10W 5%
C8118 NC
C8108 100N 50V
ZD8102 NC/BZT52-B22
R8108 1K 1/10W
C8110 1nF
R8110 0.05R
LED1-
Q8101
1 S
2 S
3 S
4 G
8 D
7 D
6 D
5 D
AO4486
R8128 100R 1/10W 5%
R8129 10K 1/10W 5%
R8123 1.3R 1%
R8124 1.5R
R8125 1.5R
R8126 0.47R 1%
R8136 6R2 1%
FOR Q8104
HS8101
1
2
3
4
HEAT SINK
D8103 1N4148W
Q8106 MMBT3906 PNP
+12V
C8119 2.2uF 25V
R8131 15K
C8120 NC/2.2uF 25V
VCC1
R8132 10K 1/10W
ON/OFF
R8133 33K
Q8107 PMBS3904
R8134 100K 1/10W 1%
C8122 100N 50V
CN8501
12
11
10
9
8
7
6
5
4
3
2
1
LED1+
LED1-
LED1+
CONN
LED1+
C8123 NC/100PF 500V
LED1-

LED Driver	715G6163	1 2013-06-20

19530_503_130722.eps
130722

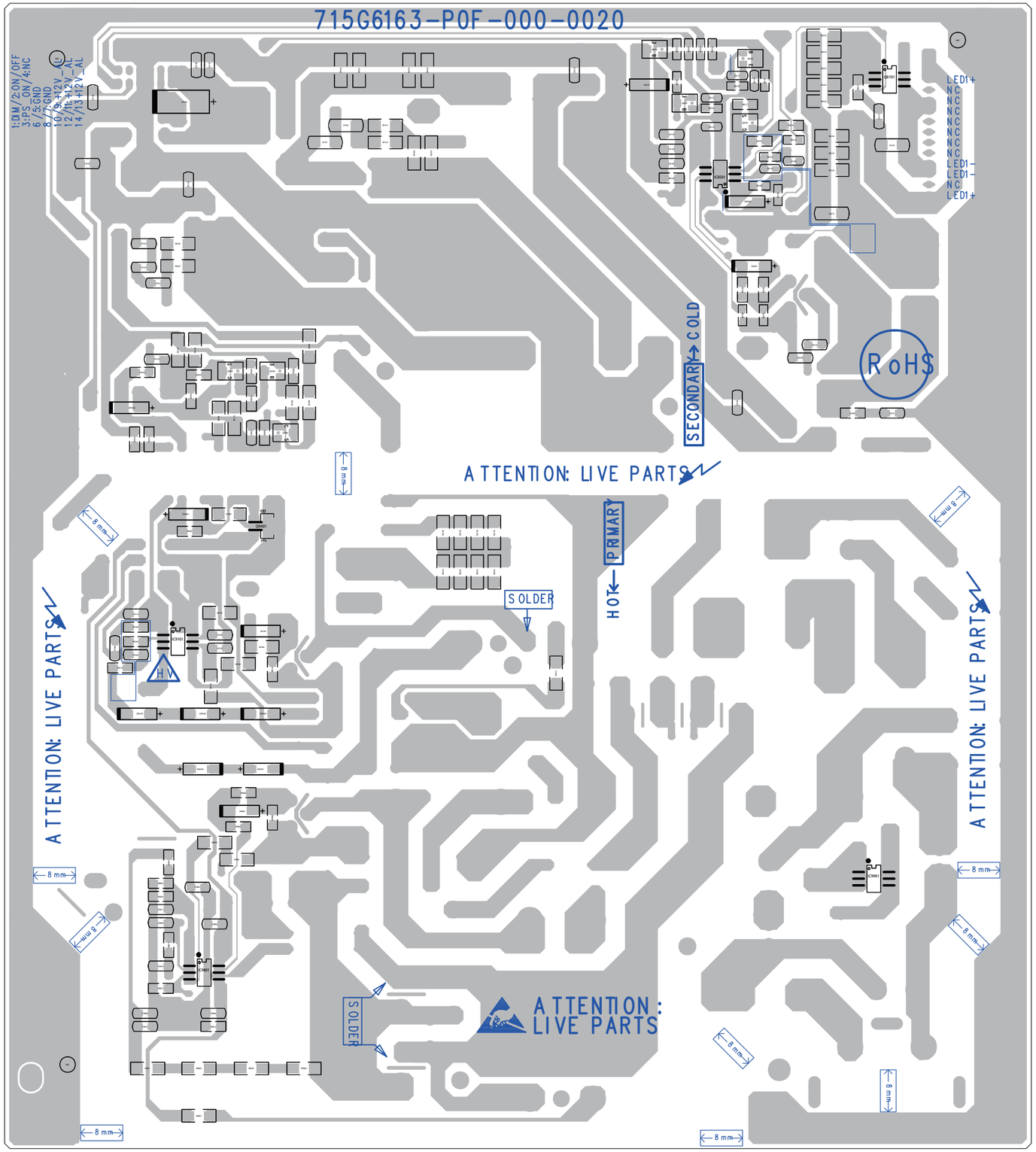
10-1-5 Power layout top



Power layout top	715G6163	3 2013-06-20

19530_504_130723.eps
130723

10-1-6 Power layout bottom

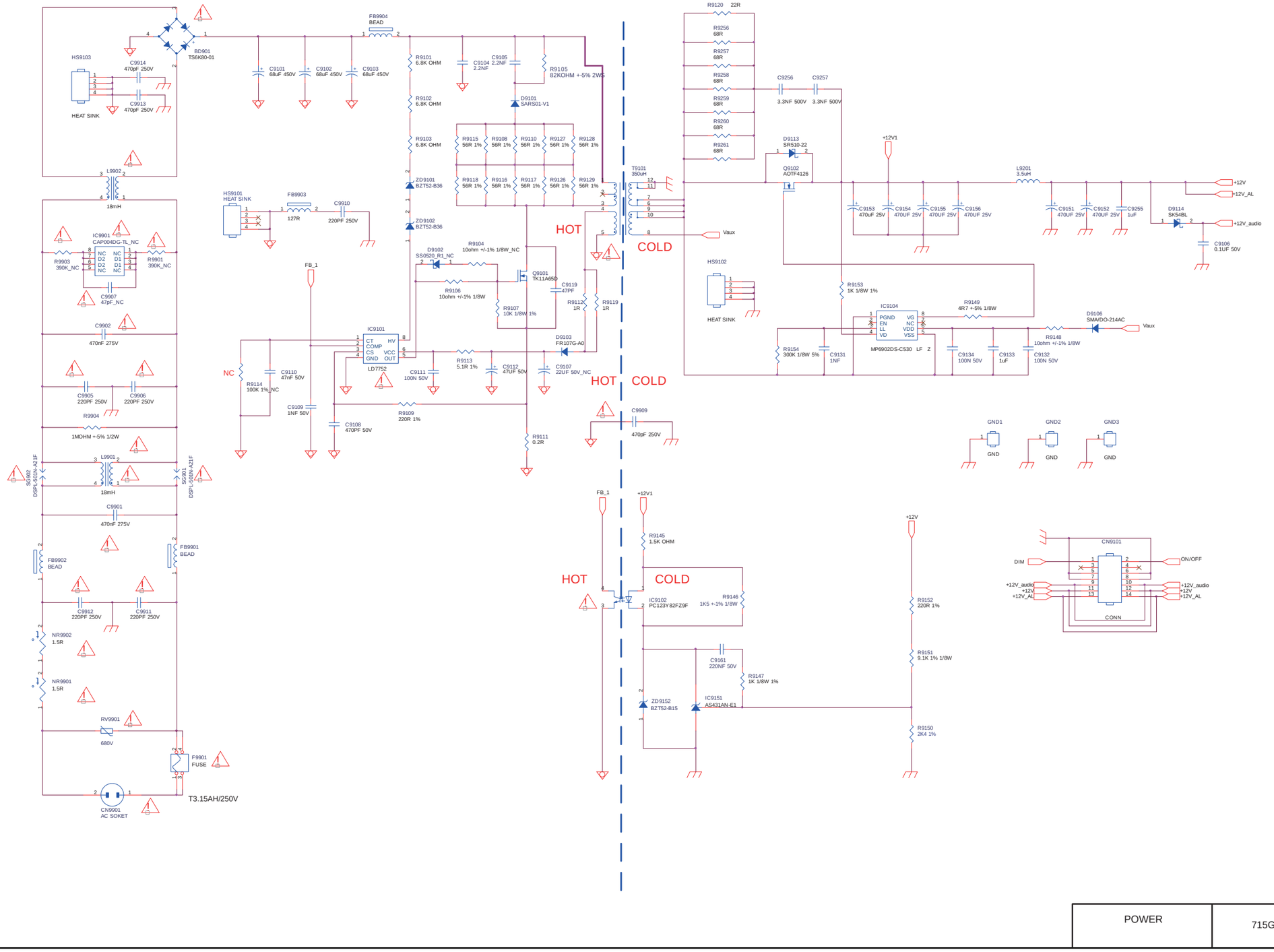


Power layout bottom	715G6163	3 2013-06-20

19530_505_130723.eps
130723

10.2 A 715G6161 PSU
10-2-1 POWER

A01 POWER **A01**



POWER	715G6161	2013-10-21

19602_500.eps

10-2-2 LED

A02 LED

A02

+12V1
C8501 100N 50V
C8517 470UF 25V
C8502 470UF 25V
L8501 33uH
L8502 33uH
D8502 NC
R8501 NC
R8503 22R 1/8W 1%
Q8501 AOTF4126
R8507 10 OHM 1/4W
D8501 MBRF20100CT
FB9905 BEAD
FB9906 BEAD
VLED+
C8504 330UF 50V
C8503 330UF 50V
C8505 1uF
C8506 1uF
CN8501 CONN
VCC1
R8505 10K 1/8W 1%
C8518 1N 50V
R8502 51K 1/4W
R8504 51K 1/4W
HS8501 HEAT SINK
VLED+
C8507 1uF_NC
R8515 100K 1% 1/8W_NC
C8508 100N 50V
IC8501
DIMOUT VCC
GM OUT
FB GND
OVP/DIM CS
PF7903BS
R8506 0.05R
R8510 10K 1/8W 1%
FB
R8516 100R 1%
R8517 330 OHM +-1% 1/8W
Q8502 AO4486
ZD8501 BZT52-B4V7_NC
R8518 10K 1/8W 1%
C8509 1NF 50V_NC
C8511 100N 50V
ZD8502 BZT52-B22_NC
R8519 100 OHM 1%
R8520 10K 1/8W 1%
C8510 1NF 50V
R8530 0.82R 1%
R8529 0.91R 1%
R8511 0.91R 1%
R8512 0.91R 1%
R8513 0.91R 1%
R8514 0.91R 1%

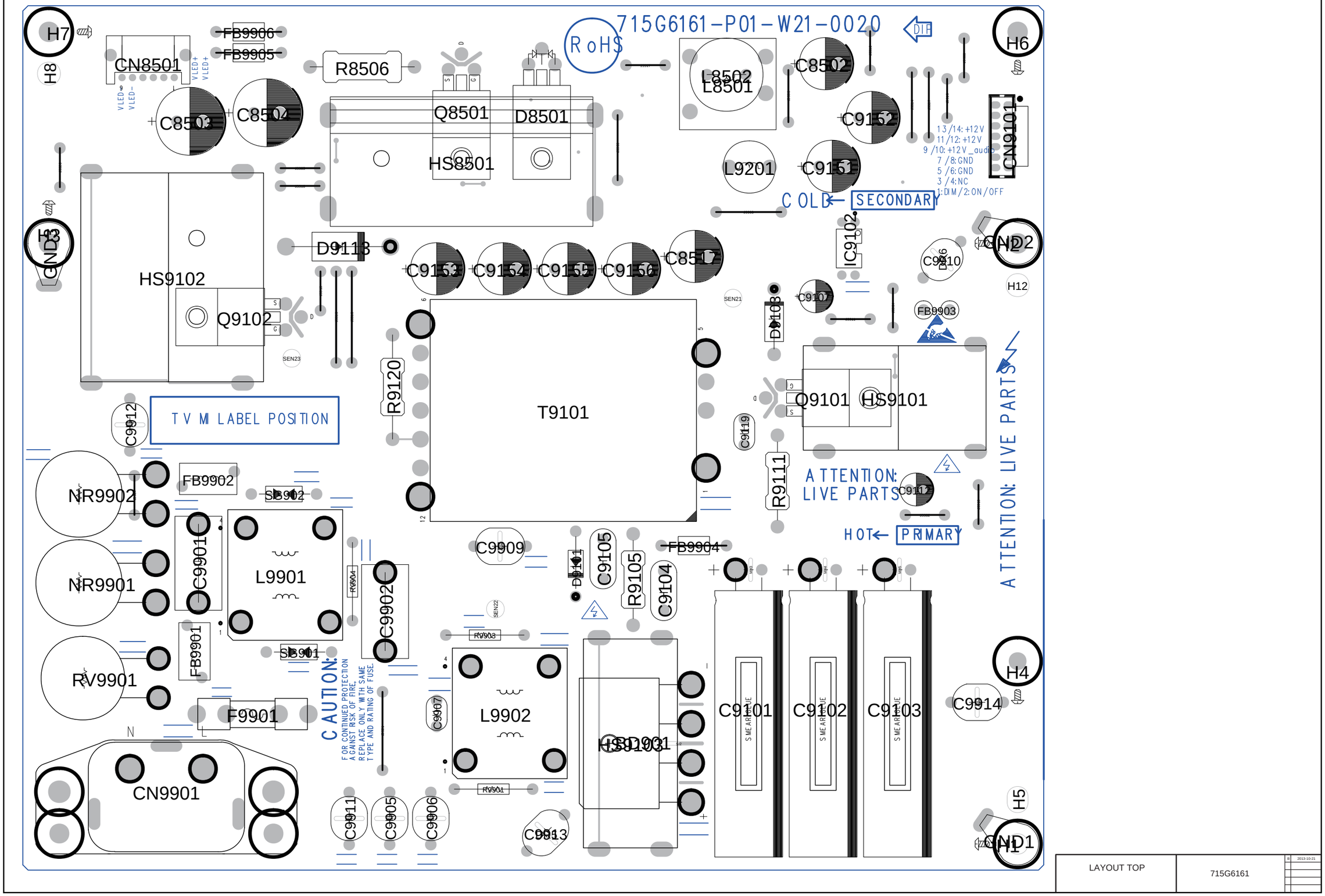
DVT --> EIT NC

D8503 1N4148W_NC
Q8503 PMBT3906
+12V
VCC1
C8512 2.2uF 25V
R8522 15K 1% 1/8W
C8513 2.2uF 25V_NC
R8526 51K 1/8W 1%
R8527 33K 1/8W 1%
ON/OFF
Q8506 PMBT3904
R8528 100K 1/8W 1%
C8516 100N 50V
Q8504 2N7002
R8521 10K OHM
C8514 10N 50V
R8523 10K 1/8W 1%
Q8505 PMBT3904
R8524 33K 1/8W 1%
DIM
C8515 100pF 50V
R8525 330K 1% 1/8W

LED	715G6161	B 2013-10-21

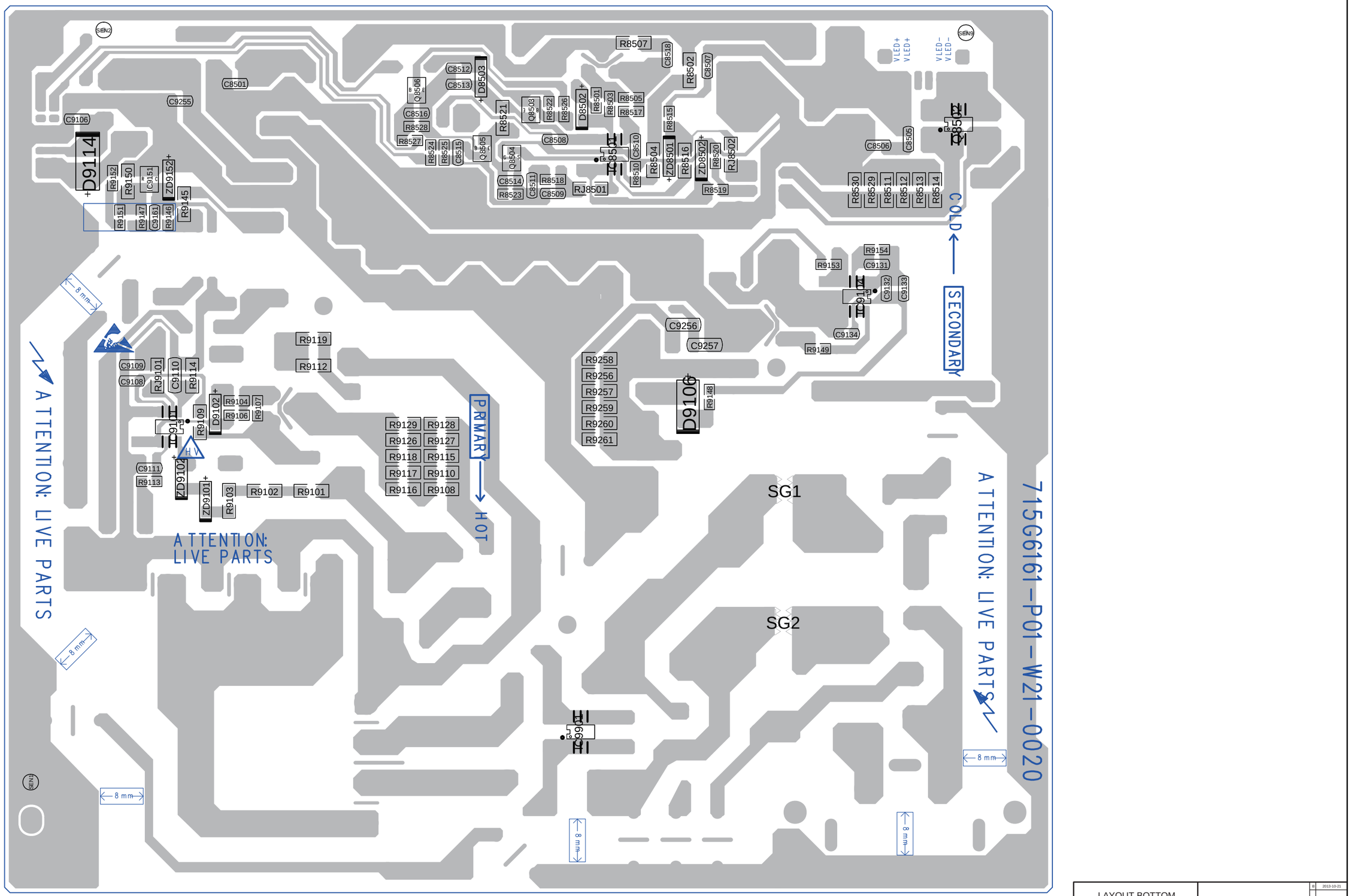
19602_501.eps

10-2-3 Power layout top



19602_502.eps

10-2-4 Power layout bottom

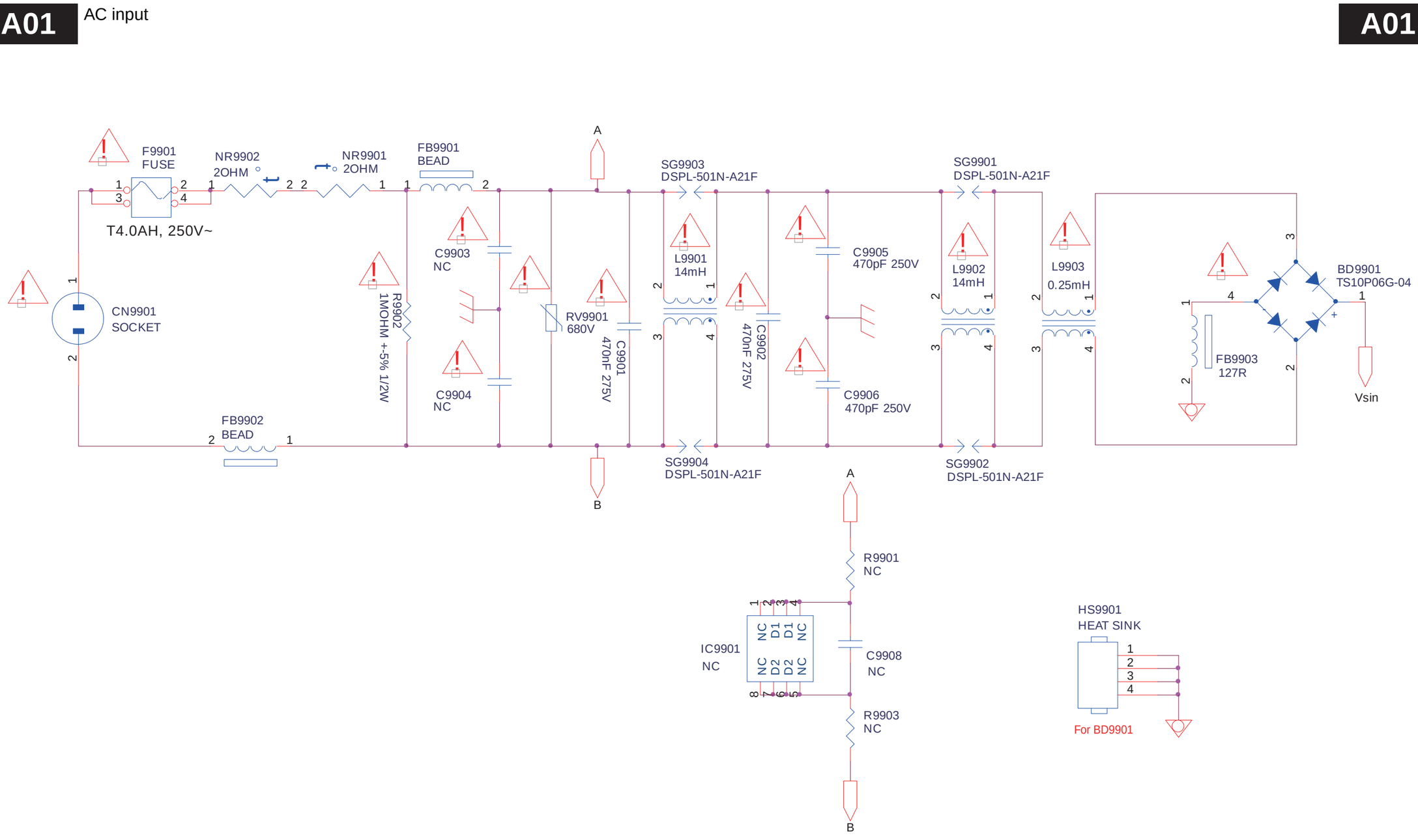


19602_503.eps

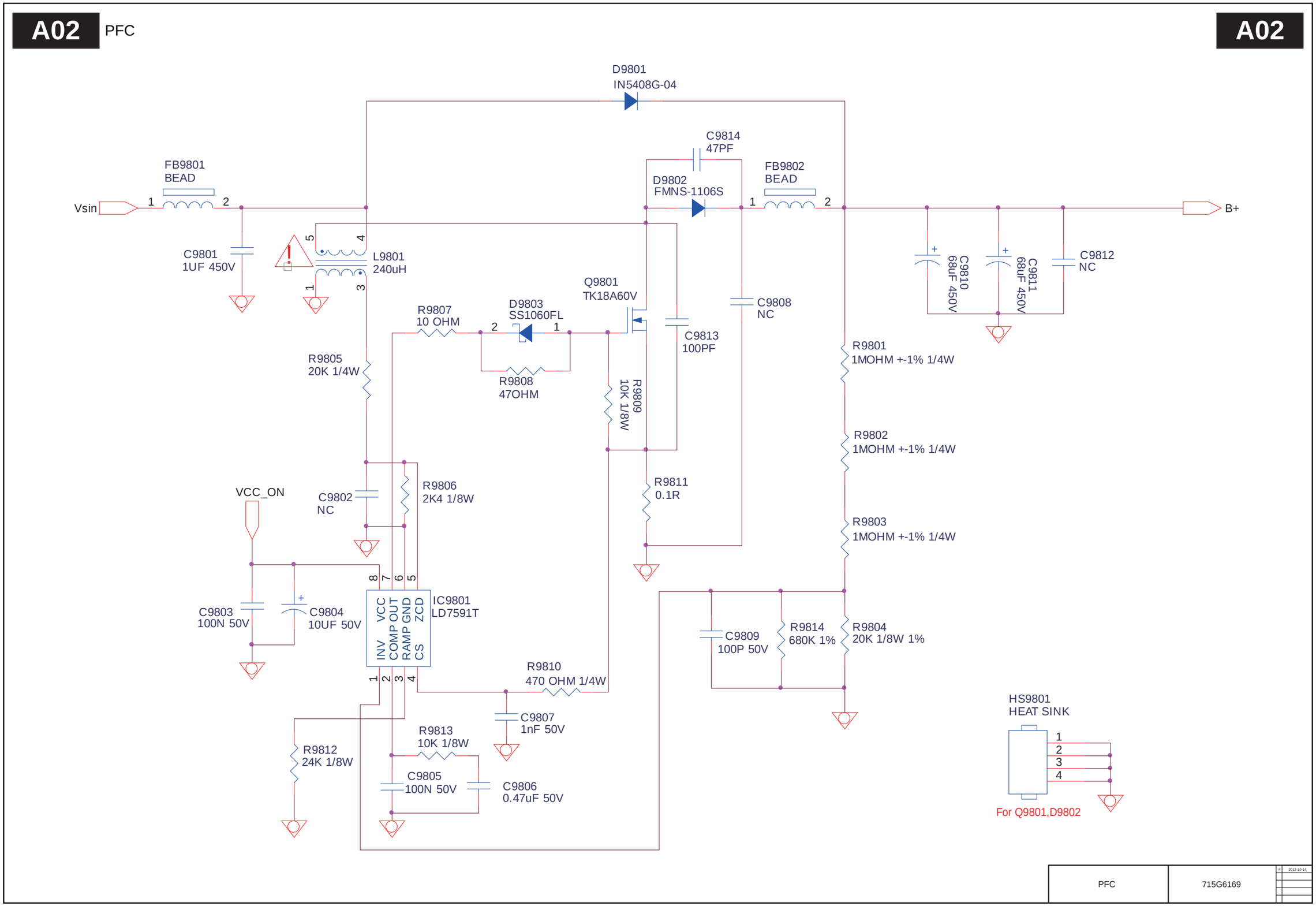
10.3 A 715G6169 PSU

10-3-1 AC input

A01 AC input



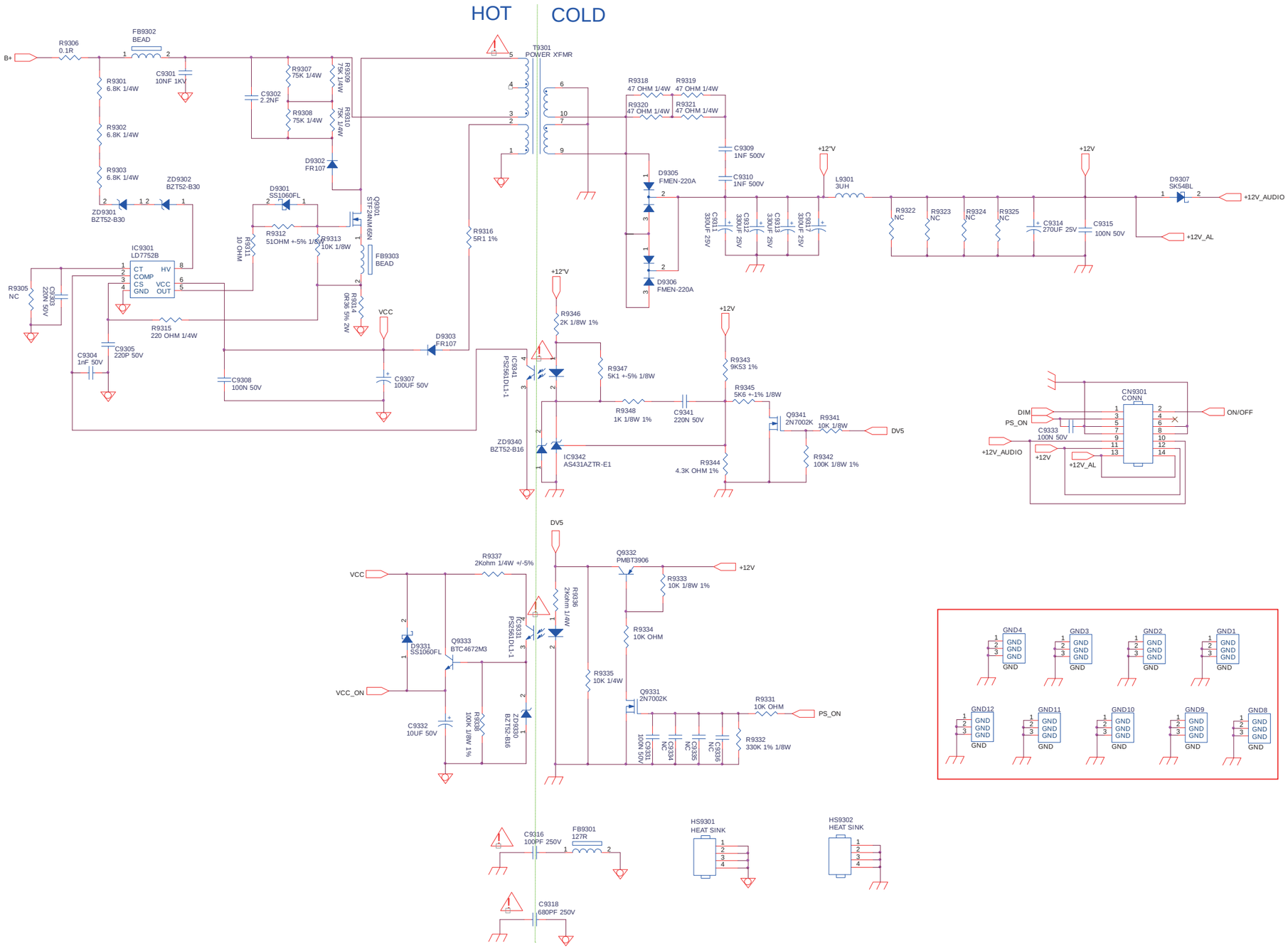
10-3-2 PFC


A02 PFC
A02
D9801
IN5408G-04
C9814
47PF
FB9801
BEAD
D9802
FMNS-1106S
FB9802
BEAD
Vsin
B+
C9801
1UF 450V
L9801
240uH
C9810
68uF 450V
C9811
68uF 450V
C9812
NC
Q9801
TK18A60V
C9808
NC
R9807
10 OHM
D9803
SS1060FL
C9813
100PF
R9801
1MOHM +-1% 1/4W
R9805
20K 1/4W
R9808
47OHM
R9809
10K 1/8W
R9802
1MOHM +-1% 1/4W
R9806
2K4 1/8W
R9811
0.1R
R9803
1MOHM +-1% 1/4W
VCC_ON
C9802
NC
C9803
100N 50V
C9804
10UF 50V
IC9801
LD7591T
INV
COMP
RAMP
CS
VCC
OUT
GND
ZCD
C9809
100P 50V
R9814
680K 1%
R9804
20K 1/8W 1%
R9810
470 OHM 1/4W
C9807
1nF 50V
R9813
10K 1/8W
R9812
24K 1/8W
C9805
100N 50V
C9806
0.47uF 50V
HS9801
HEAT SINK
For Q9801,D9802
PFC
715G6169
2013-10-14
19600_501.eps

10-3-3 Main Power 12V

A03 Main Power 12V

A03



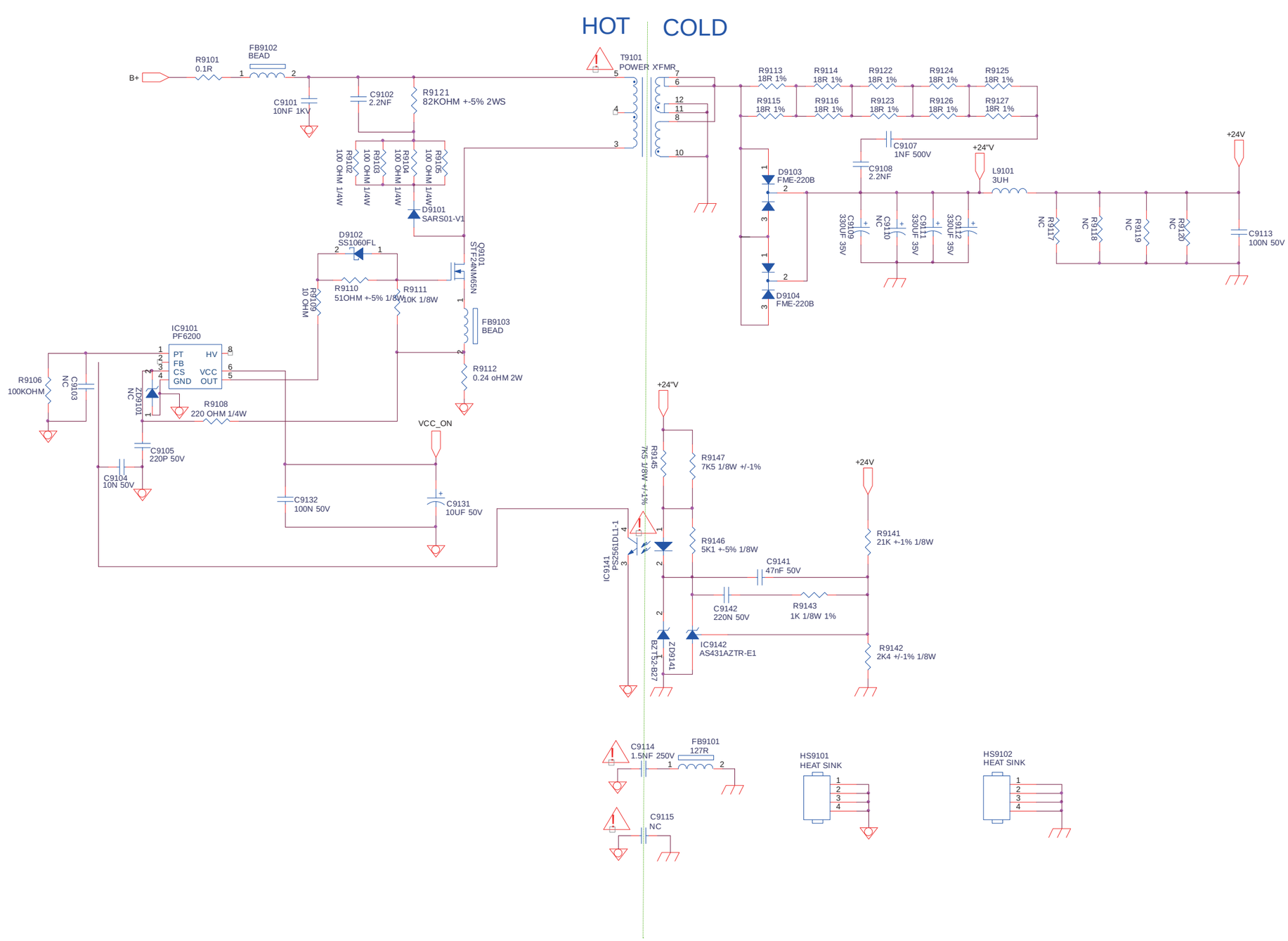
Main Power 12V	715G6169	# 2013-10-14

19600_502.eps

10-3-4 Flyback 24V

A04 Flyback 24V

A04



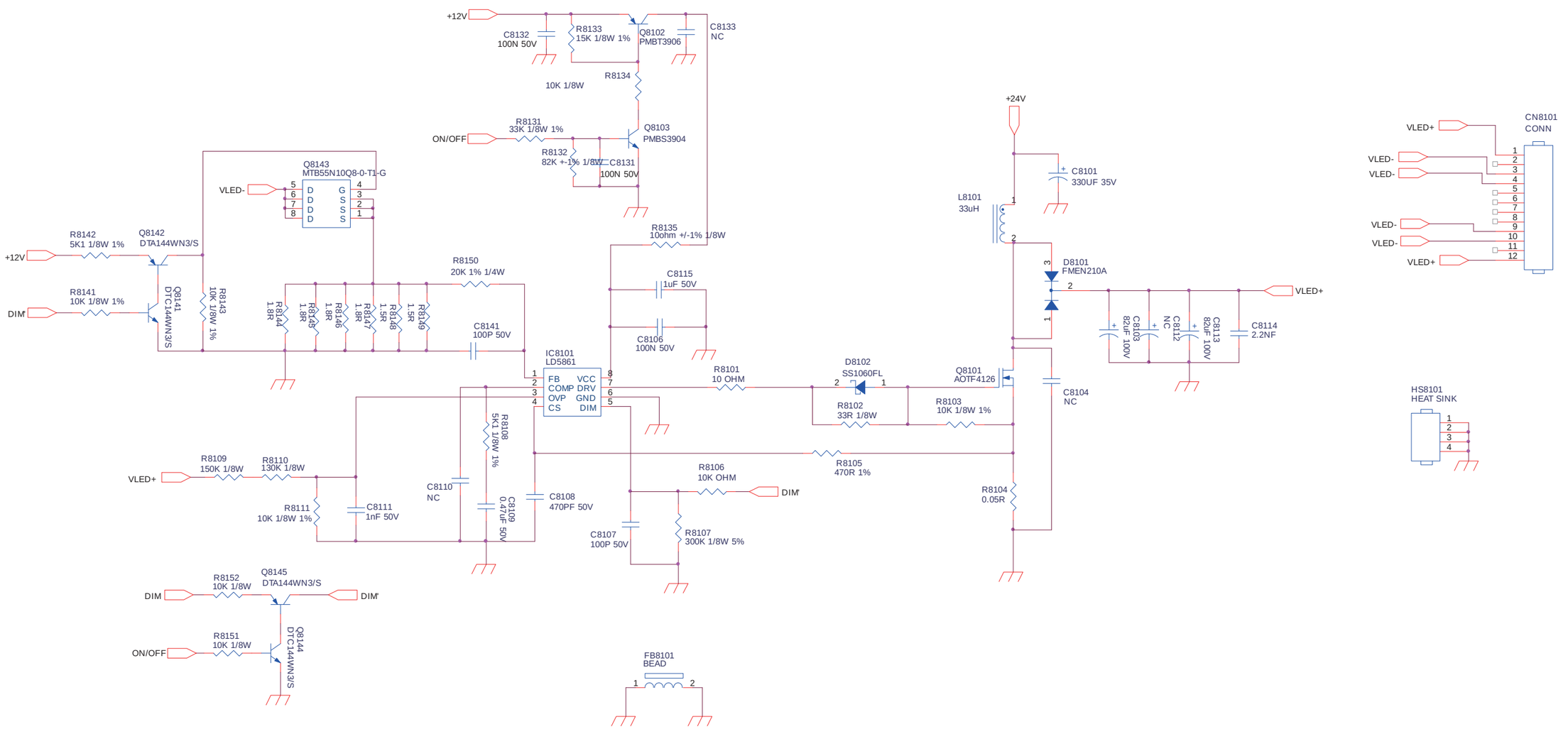
Flyback 24V	715G6169	# 2013-10-14

19600_503.eps

10-3-5 LED Driver

A05 LED Driver

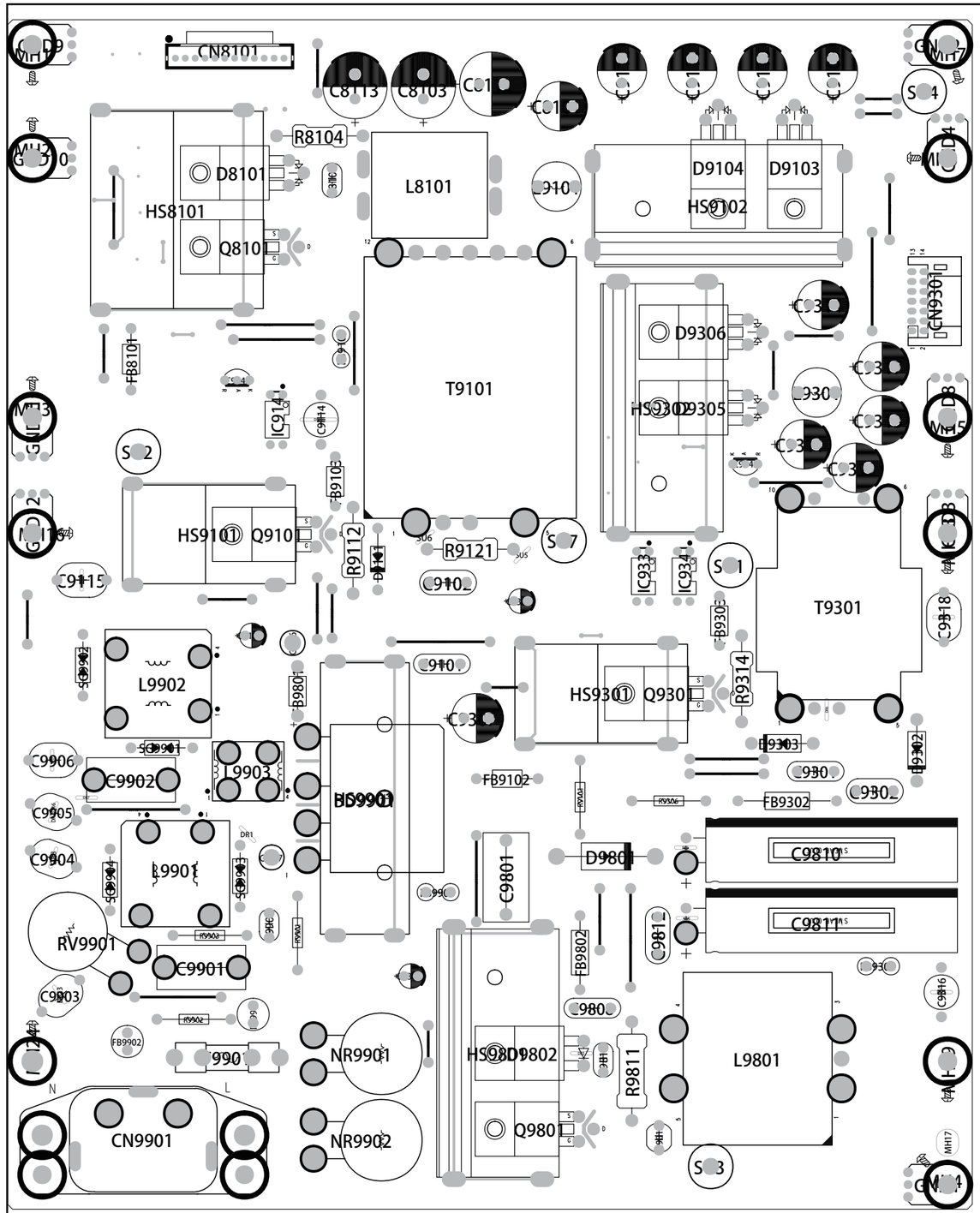
A05



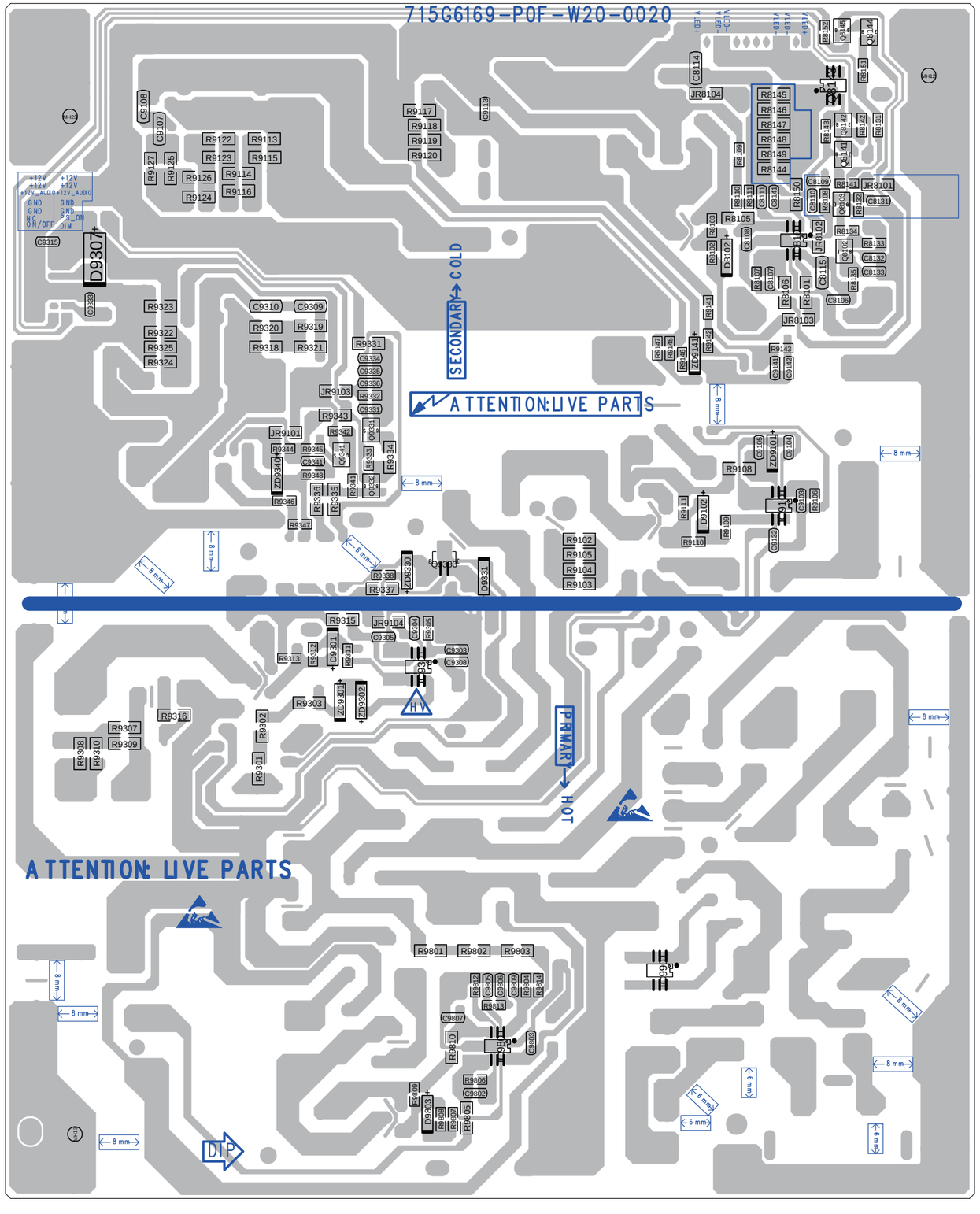
LED Driver	715G6169	# 2013-10-14

19600_504.eps

10-3-6 Power layout top


CN8101
C8113
C8103
C01
C01
C1
C1
C1
C1
S4
MH7
MH9
MH2
GND
R8104
D8101
HS8101
Q8101
L8101
C910
D9104
D9103
HS9102
D4
MH1
CN9301
C93
C93
C930
C93
C93
D9306
D9305
HS9302
T9101
FB810
IC914
C914
S2
MH3
GND
B910
R9112
R9121
S7
HS9101
Q910
C9115
C910
IC933
IC934
S1
T9301
B930
C9118
D8
MH5
D3
MH6
GND
L9902
C9906
C9902
L9903
C9905
C9904
L9901
RV9901
C9901
C9903
FB9902
C910
HS9301
Q9301
R9314
C93
B9303
C930
C930
FB9302
FB9102
C9810
C9811
C9801
D9801
C981
FB9802
C980
C9816
NR9901
NR9902
HS9801
Q9802
Q980
R9811
L9801
S3
MH4
CN9901
N
L
C9918
B9302
B9301
B9801
C9902
C9901
C9903
C9904
C9905
C9906
RV9902
RV9903
RV9906
FB9902
FB9102
FB9302
FB9303
C9901
C9902
C9903
C9904
C9905
C9906
C9801
C9810
C9811
C9816
C9918
C980
C981
C910
C930
C930
C930
C930
C930
C93
C93
C93
C93
C93
C914
C9115
C910
C910
C910

10-3-7 Power layout bottom



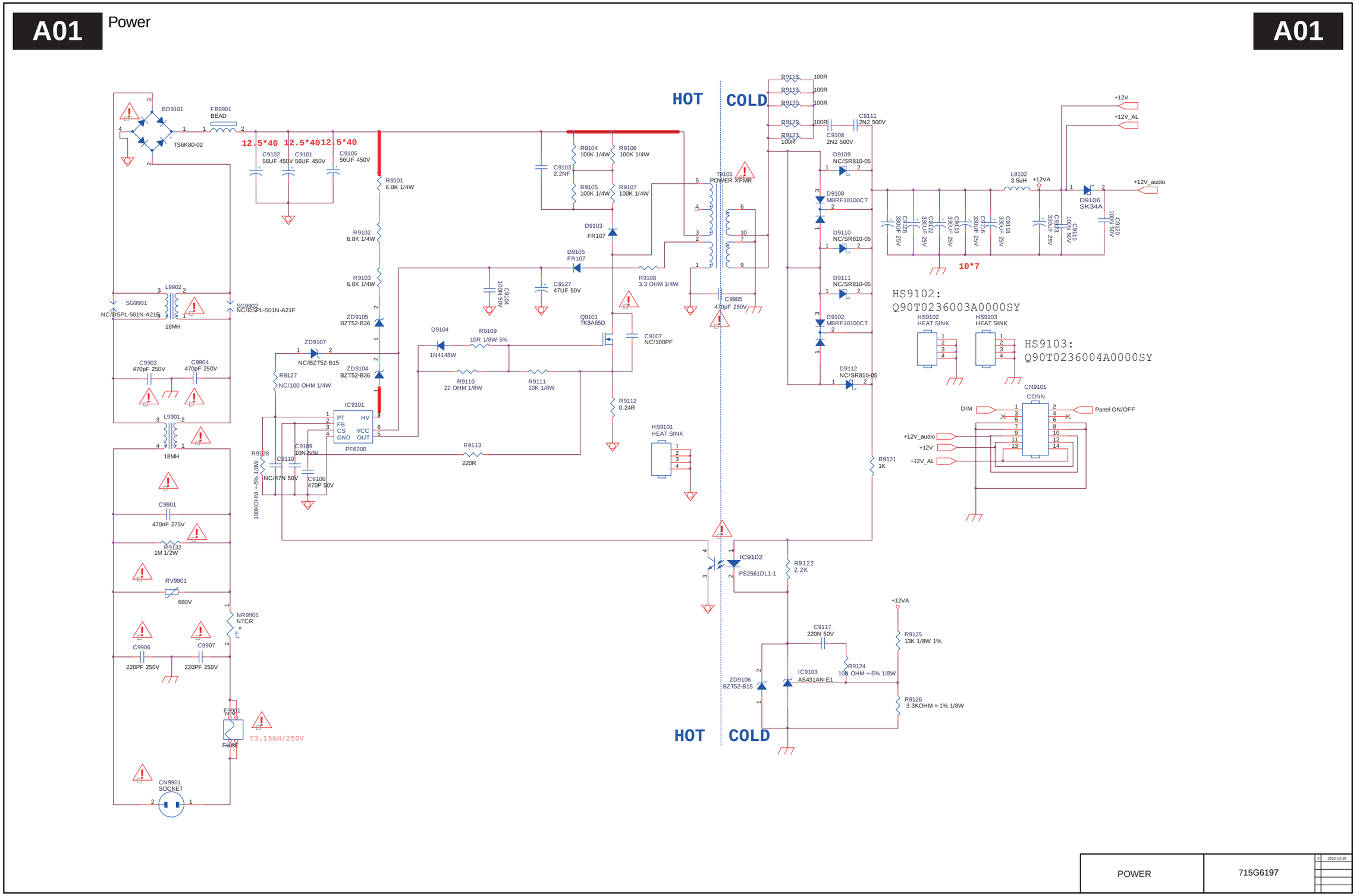
LAYOUT BOTTOM	715G6169	# 2013-10-14

19600_506.eps

10.4 A 715G6197 PSU

10-4-1 Power

A01 Power

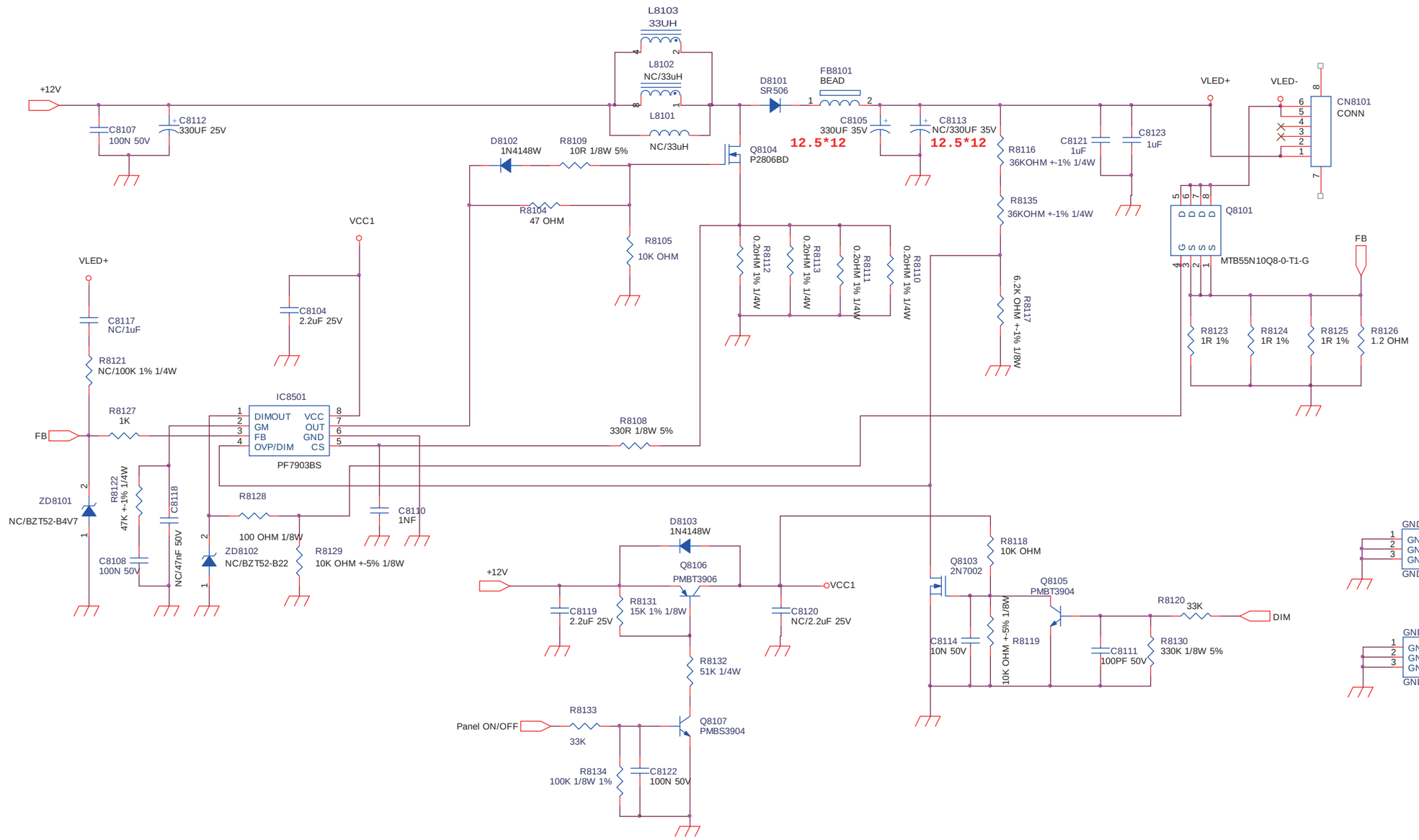


19620_500_140110.eps
140110

10-4-2 LED DRIVER

A02 LED DRIVER

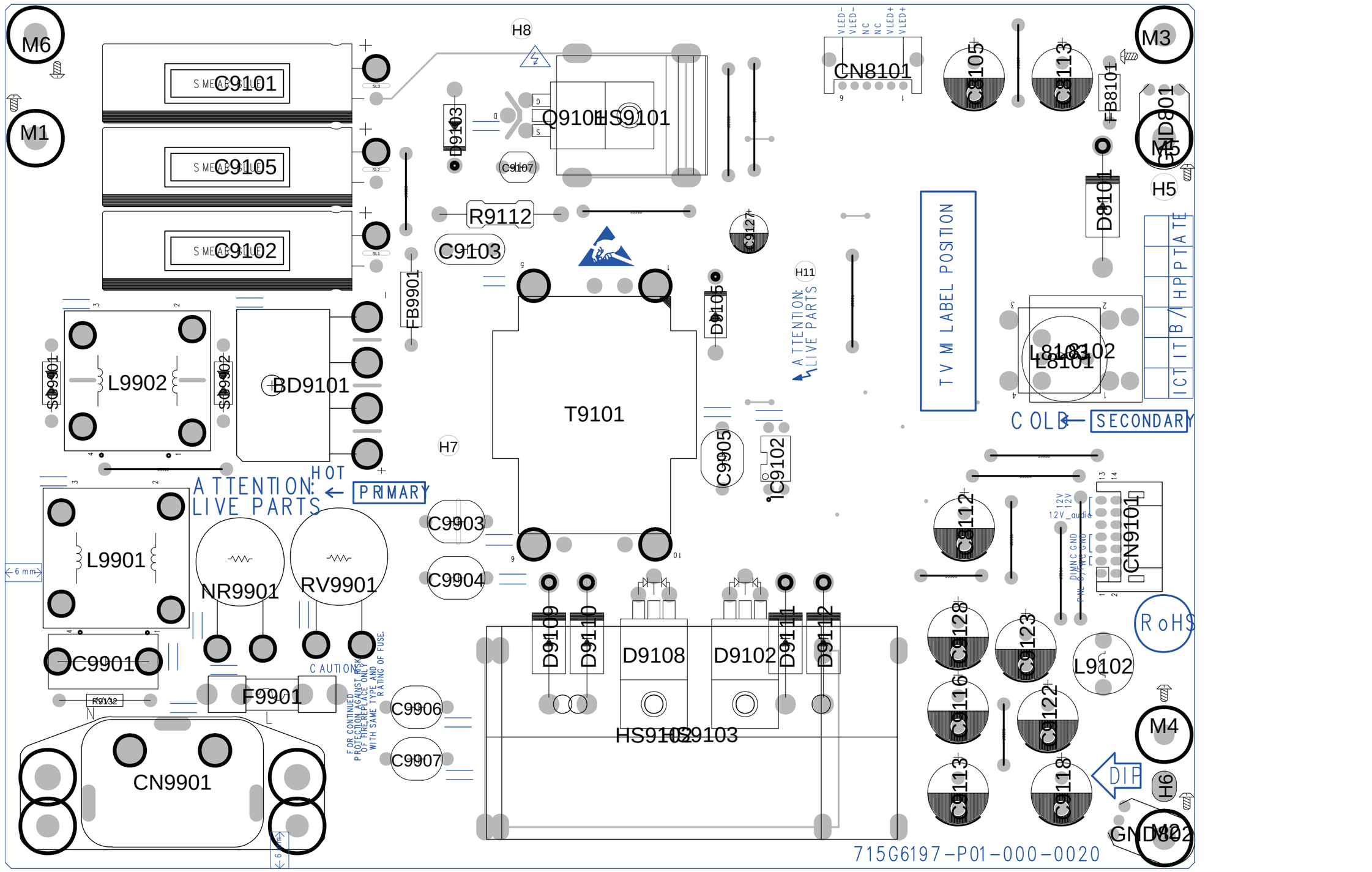
A02



LED DRIVER	715G6197	1 2013-10-09

19620_501_140110.eps
140110

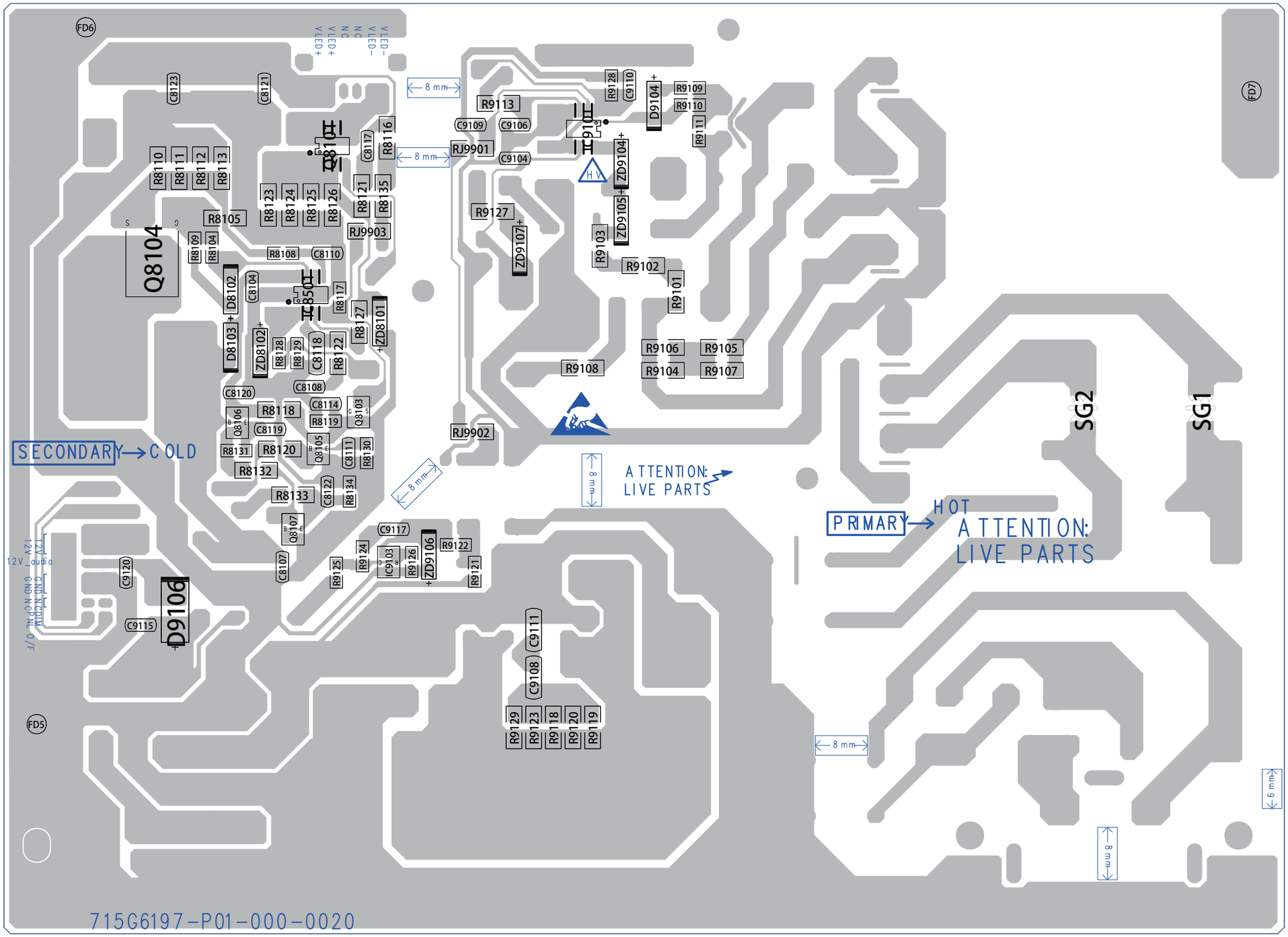
10-4-3 Power layout top



Power layout top	715G6197	1 2013-09-06

19620_522_140110.eps
140110

10-4-4 Power layout bottom



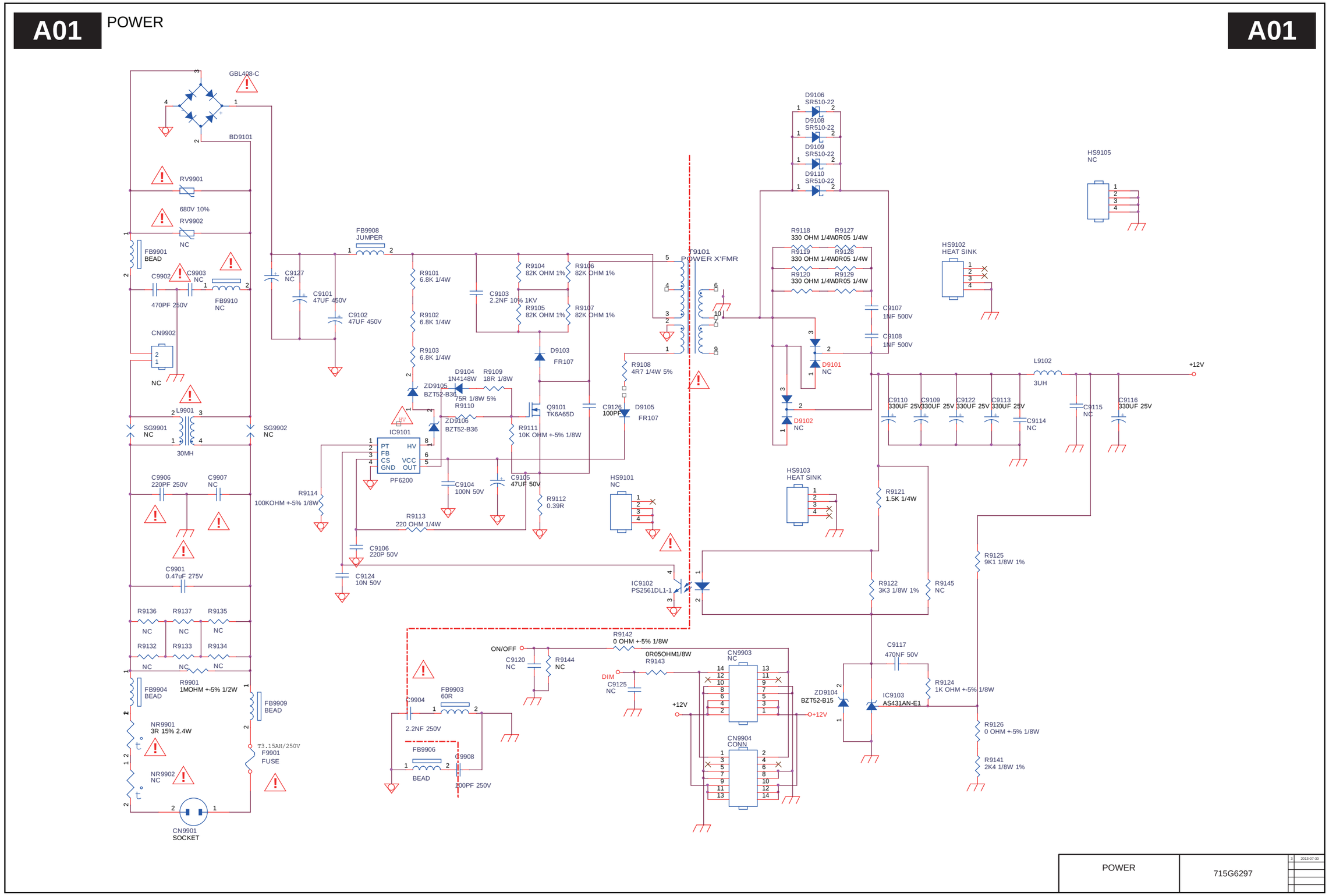
Power layout bottom	715G6197	3 2013-09-06

19620_523_140110.eps
140110

10.5 A 715G6297 PSU

10-5-1 POWER

A01 POWER

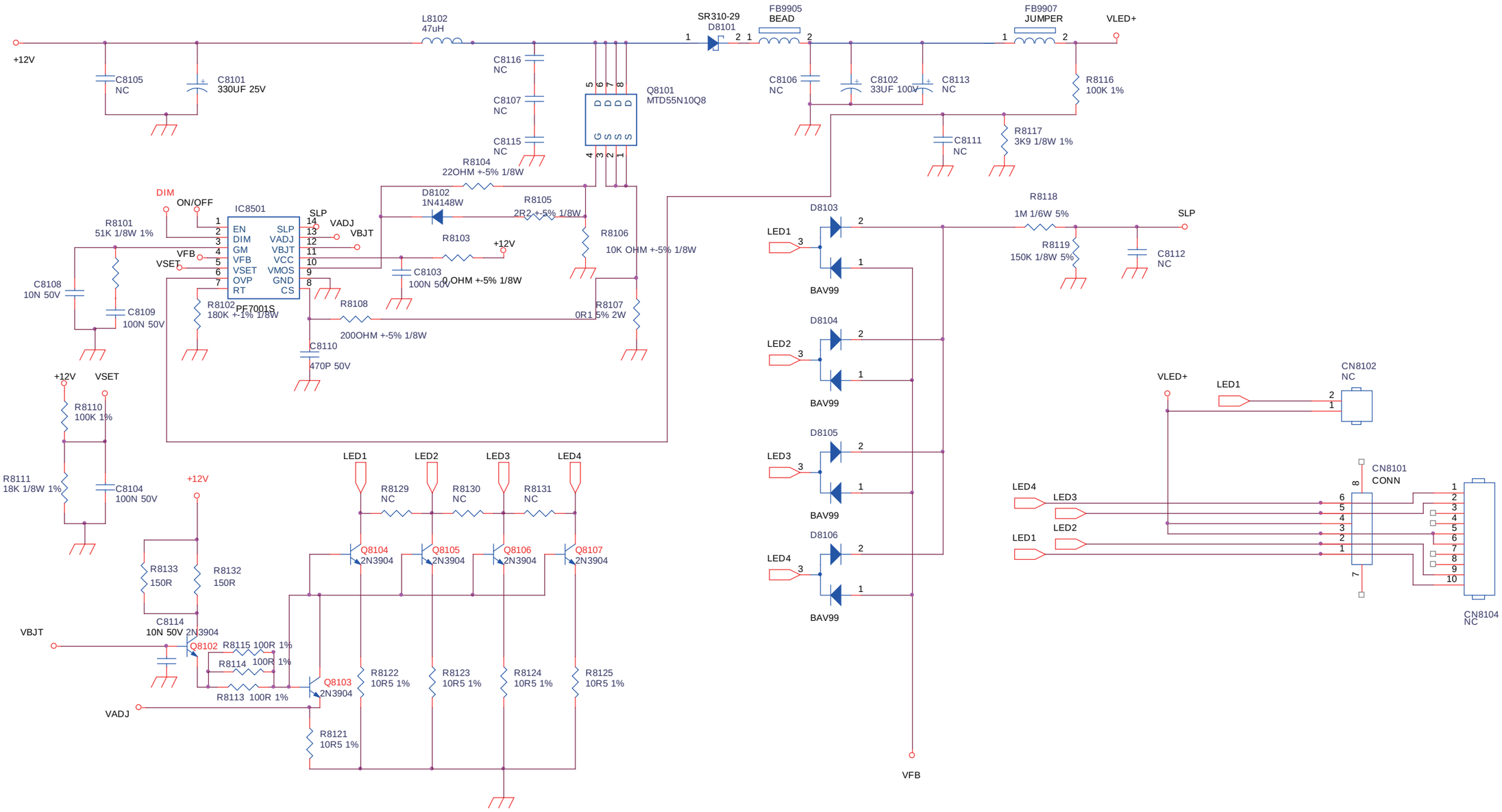


19531_500_130826.eps
130826

10-5-2 LED DRIVER

A02 LED DRIVER

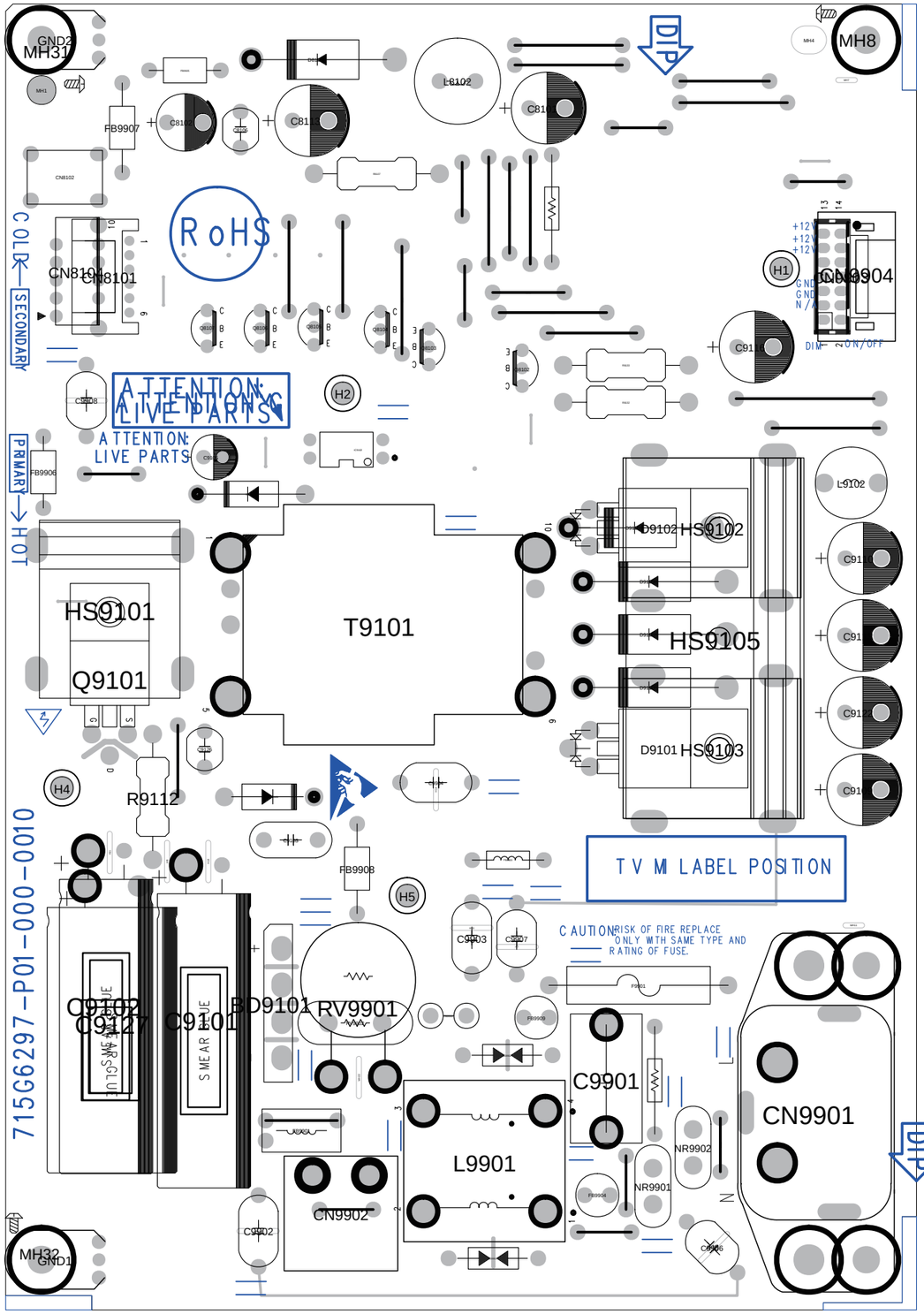
A02



LED DRIVER	715G6297	3 2013-08-01

19531_501_130826.eps
130826

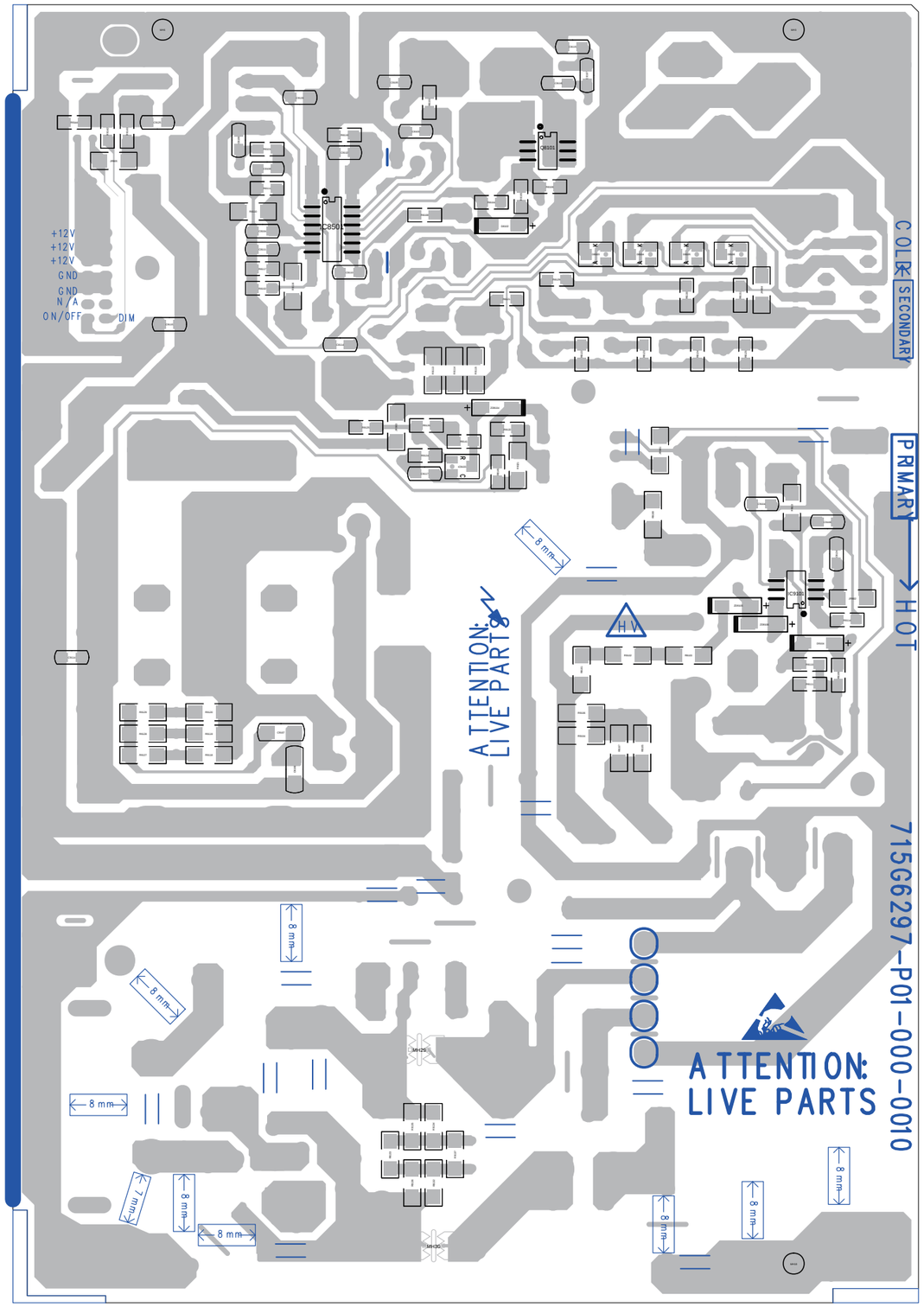
10-5-3 Power layout top



Power layout top	715G6297	3 2013-07-30

19531_502_130826.eps
130826

10-5-4 Power layout bottom

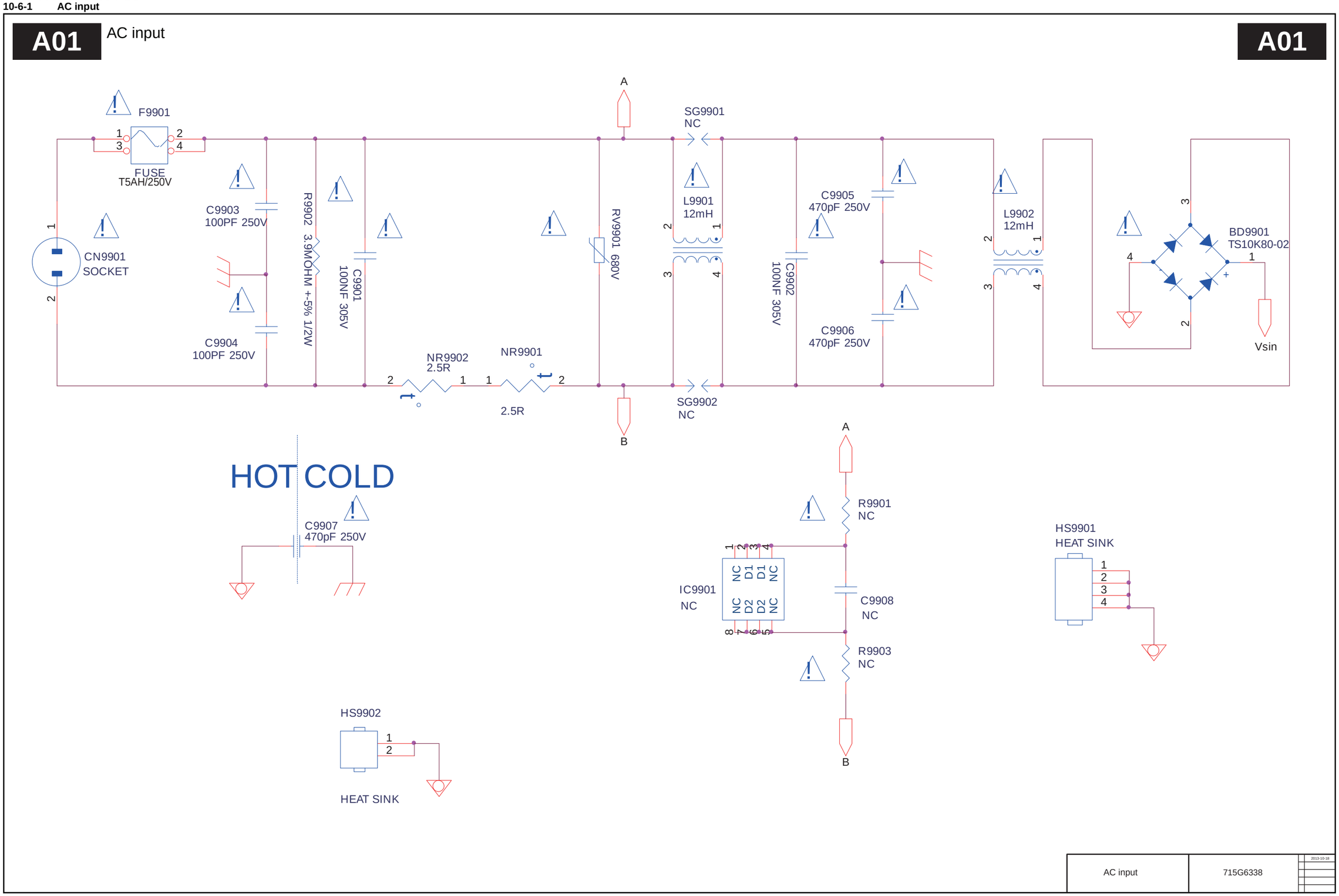


Power layout bottom	715G6297	3 2013-07-30

19531_503_130826.eps
130826

10.6 A 715G6338 PSU

10-6-1 AC input

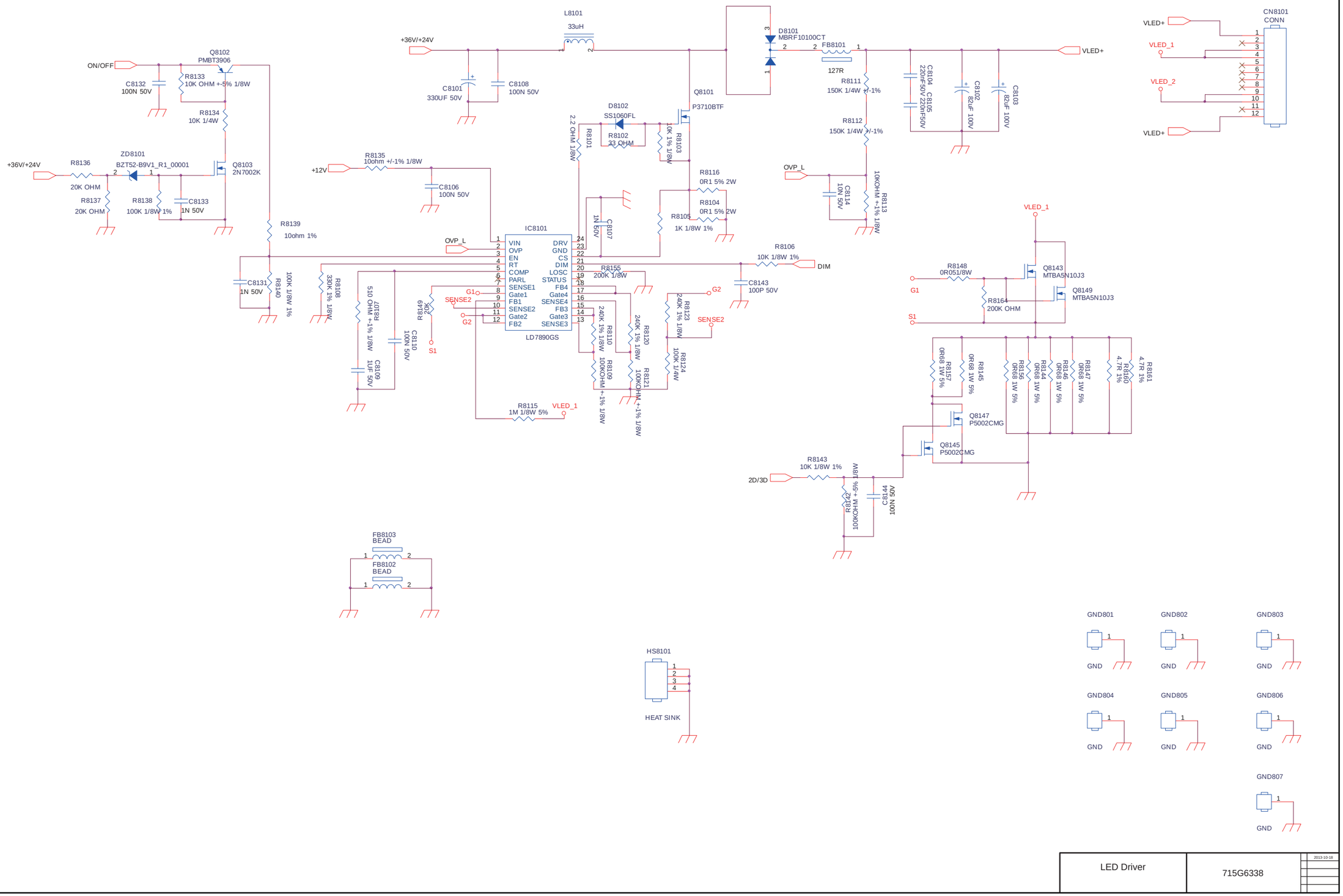


19610_500.eps

10-6-2 LED Driver

A02 LED Driver

A02

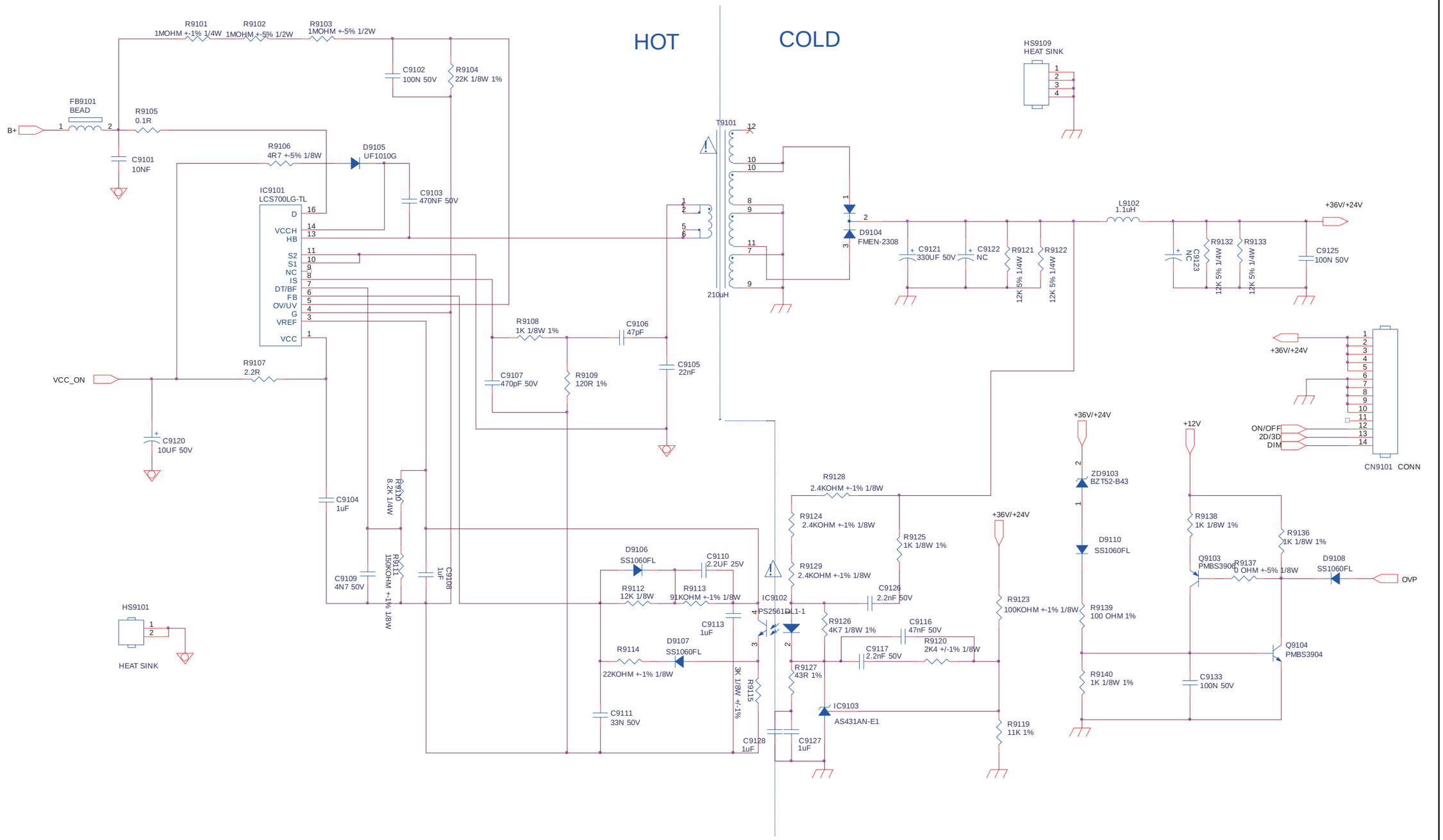


19610_501.eps

10-6-3 LLC 36V

A03 LLC 36V

A03

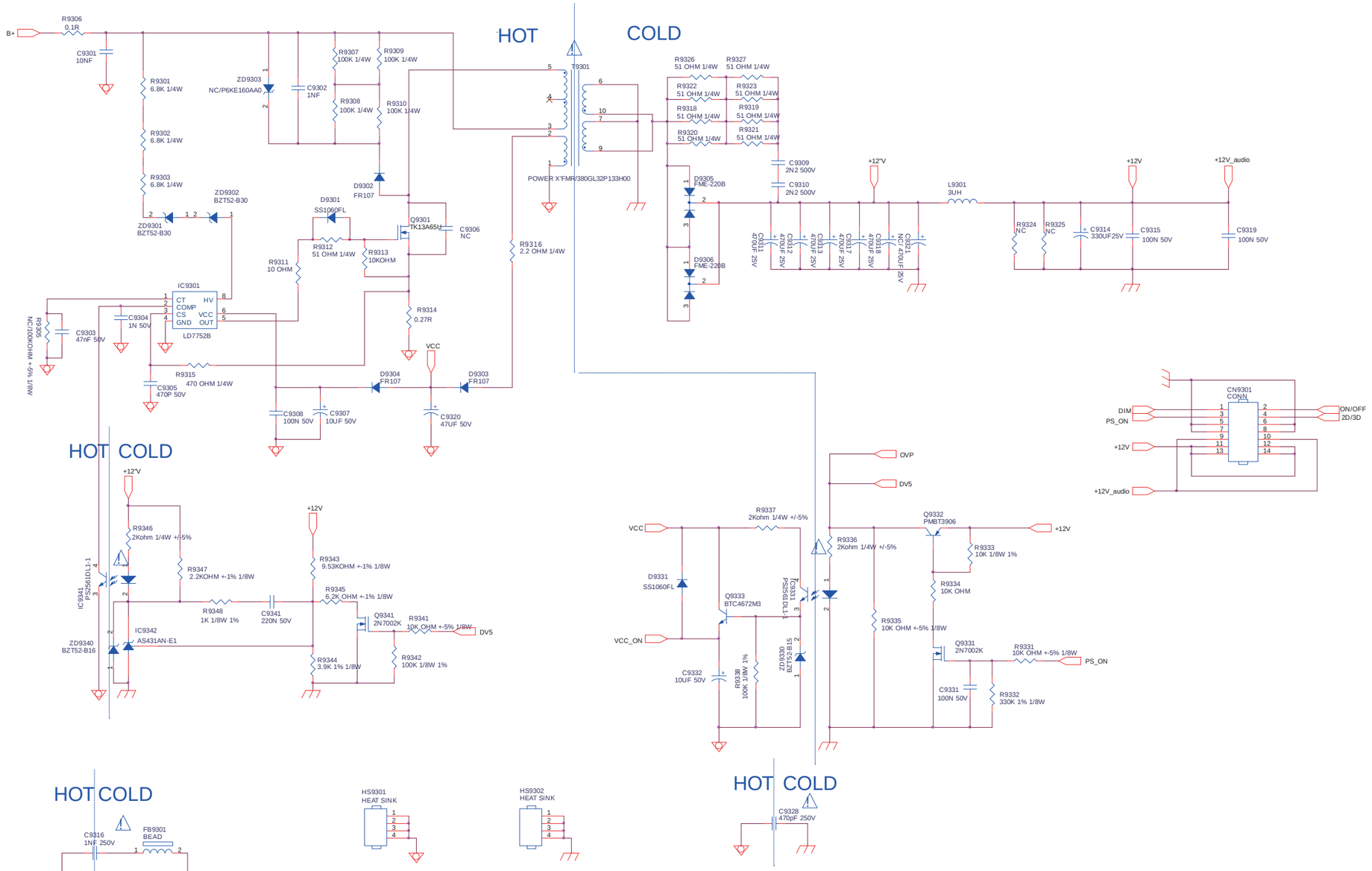


19610_502.eps

10-6-4 Main Power 12V

A04 Main Power 12V

A04



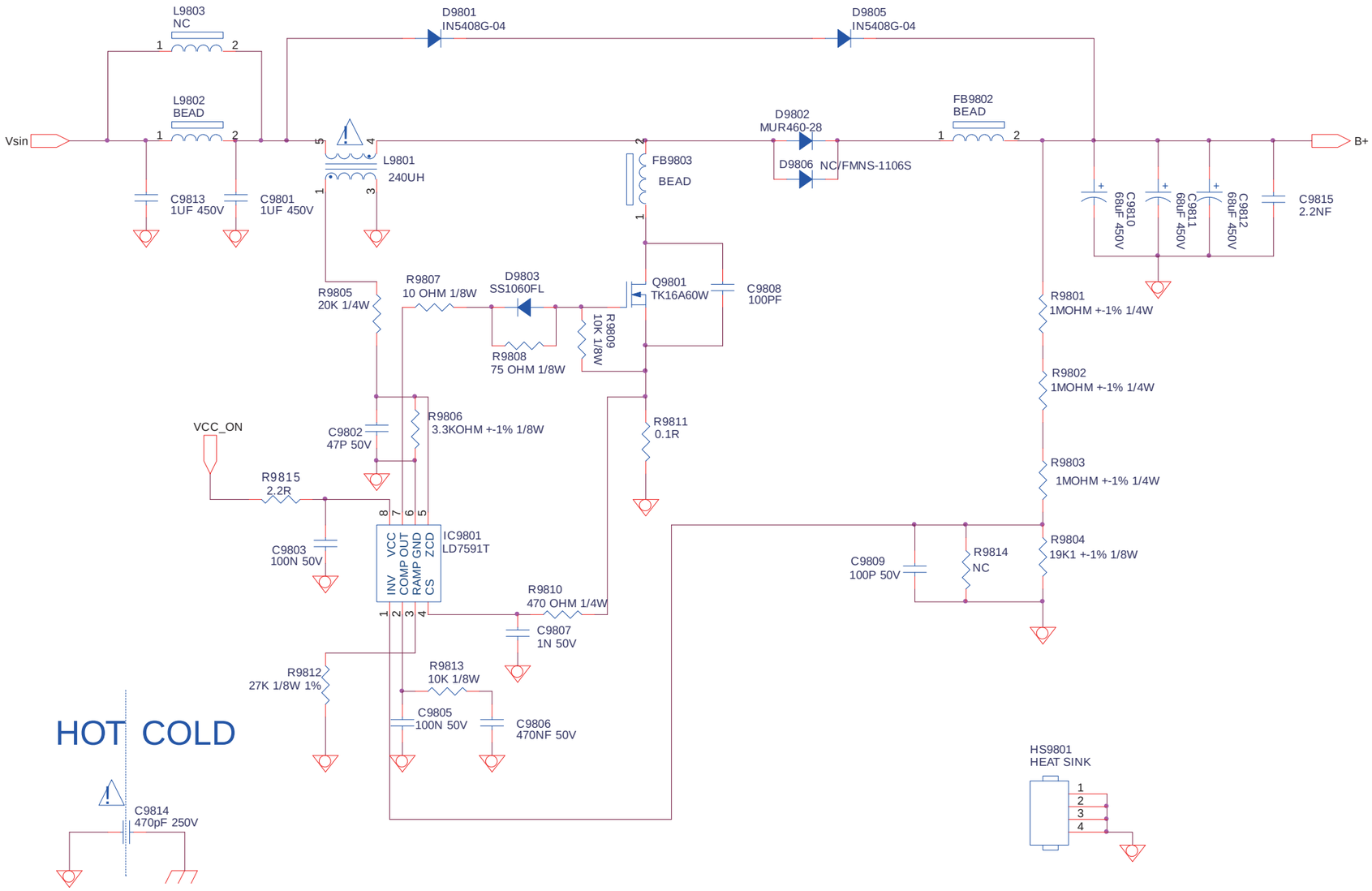
Main Power 12V	715G6338	A 2013-10-18

19610_503.eps

10-6-5 PFC

A05 PFC

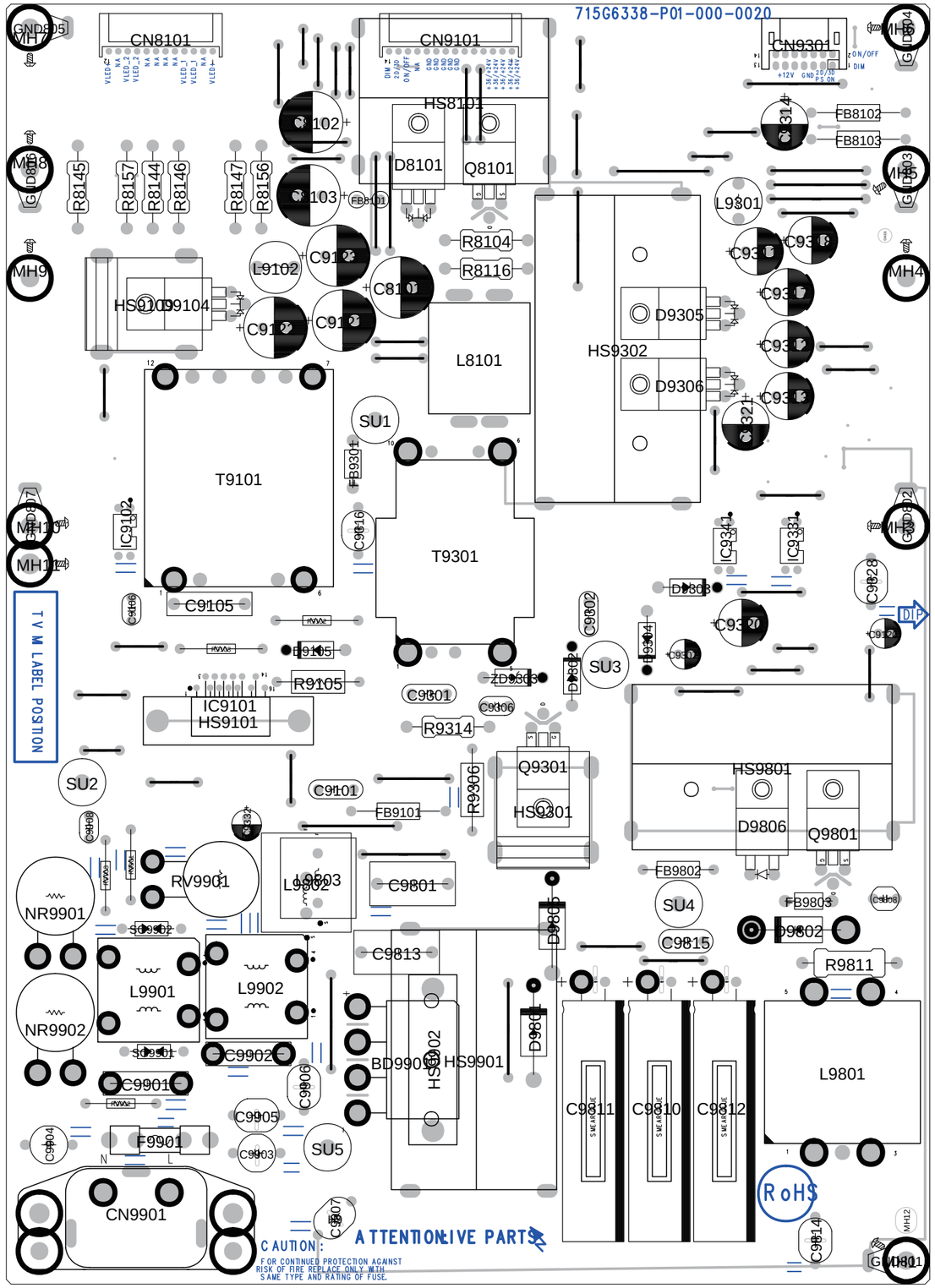
A05



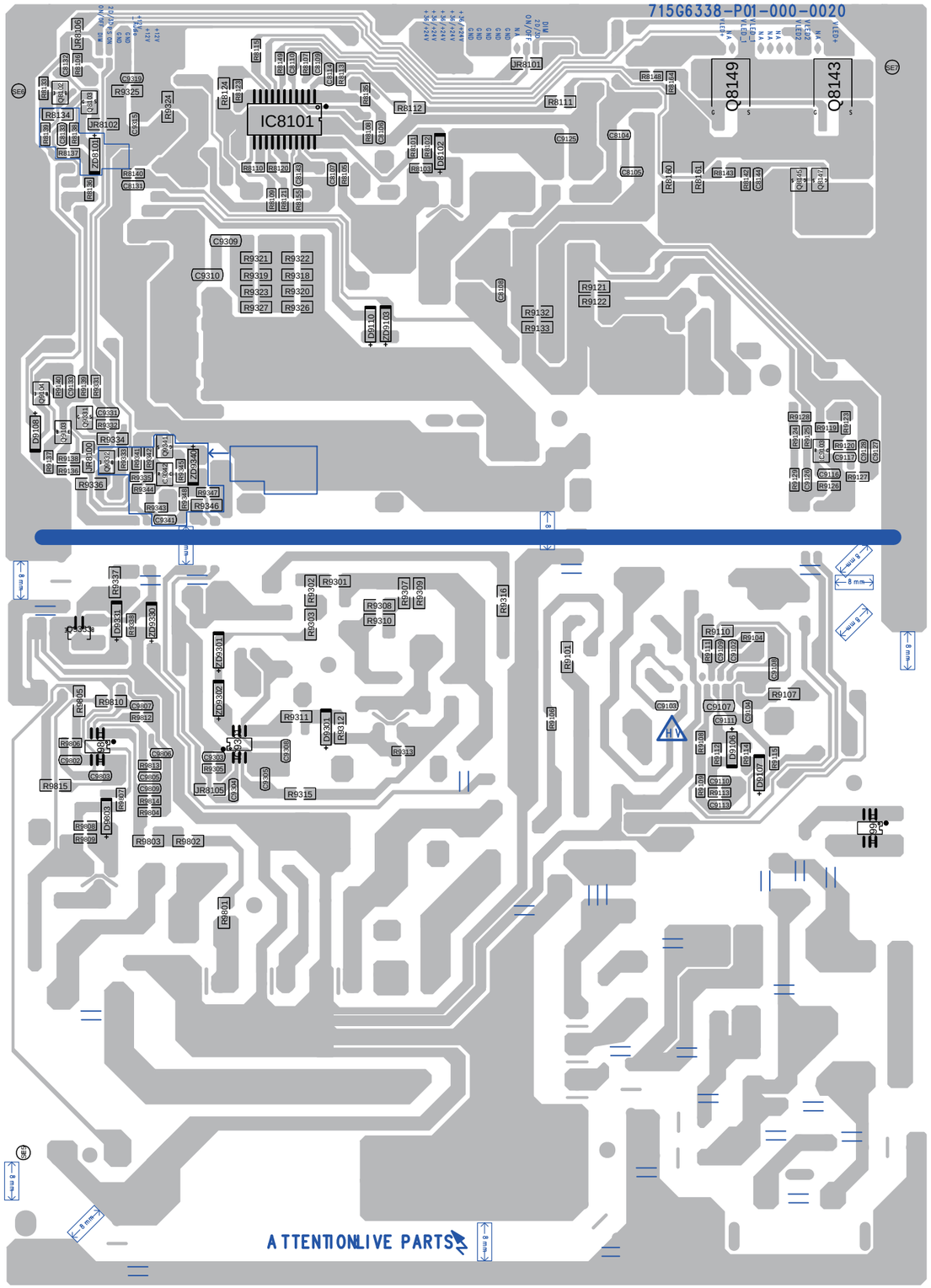
PFC	715G6338	A 2013-10-18

19610_504.eps

10-6-6 Power layout top



10-6-7 Power layout bottom

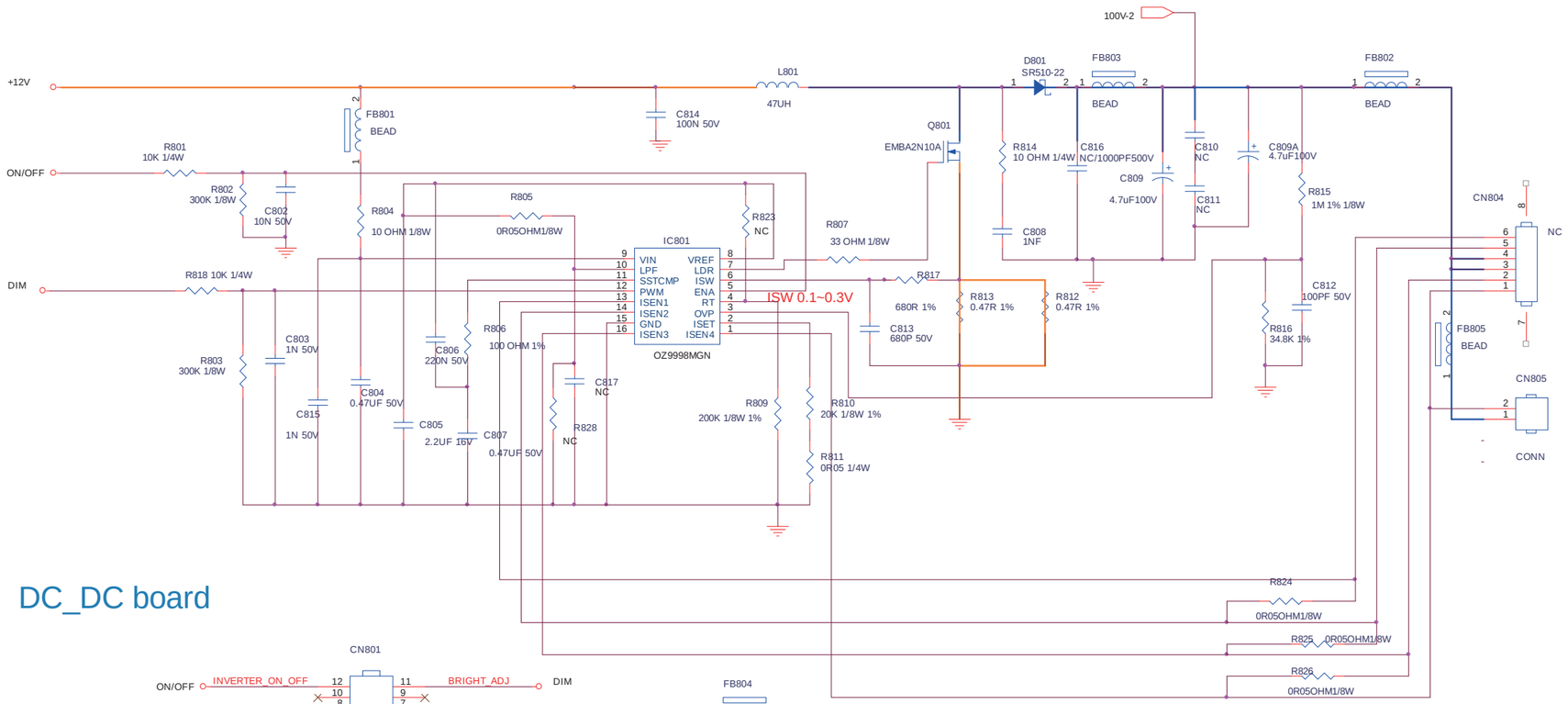


LAYOUT BOTTOM	715G6338	A 2013-10-18

19610_506.eps

10.7 A 715G6350 PSU
10-7-1 Converter

A01 Converter **A01**



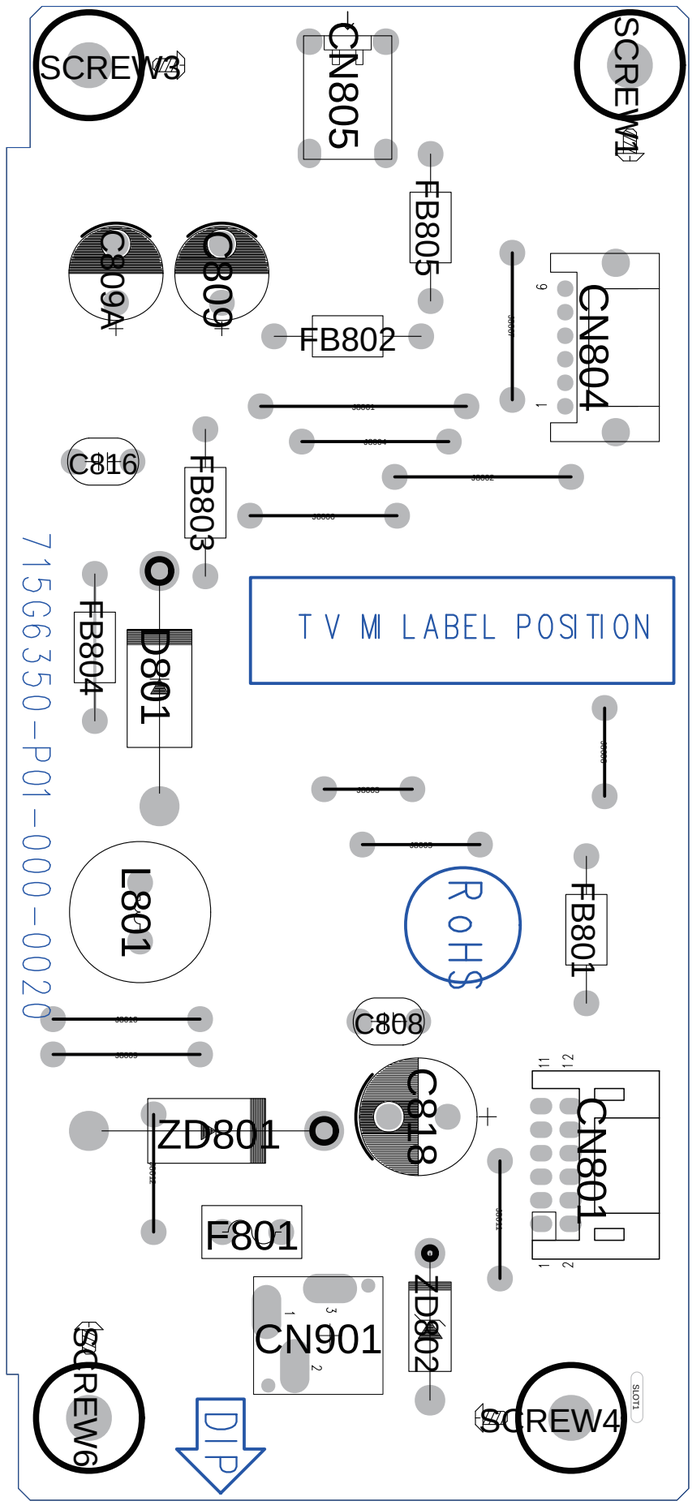
layout 銅箔耐壓與沿面間距標準			
序號	電壓值 (Vdc or Vrms)	最少銅泊間距 (mm)	線路圖顏色
1	40V ↓	0.30	無標示
2	40V-100V	0.75	
3	100V-200V	1.5	
4	200V-400V	2.0	
5	400V-600V	3.0	
6	600V-1000V	5.0	

Layout trace 電流與 trace 寬度，1A=最少 1mm 以上寬度 銅厚:1(0z)			
序號	電流值 (Idc or Irms)	最少銅寬(mm)	線路圖顏色
1		線路圖上標示	

Converter	715G6350	A 2014-01-26

19592_500.eps

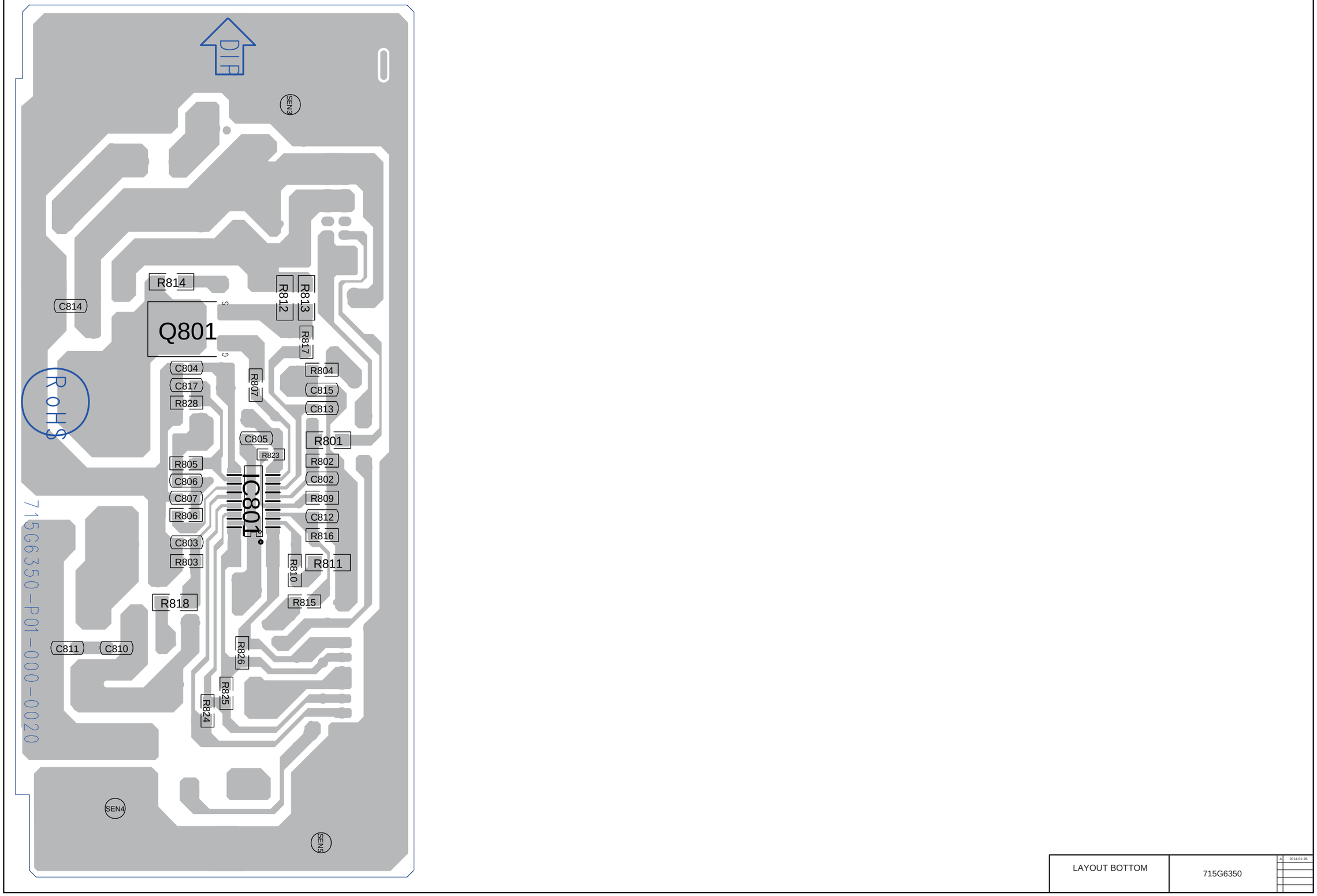
10-7-2 Power layout top



LAYOUT TOP | 715G6350 | A 2014-01-26

19592_501.eps

10-7-3 Power layout bottom

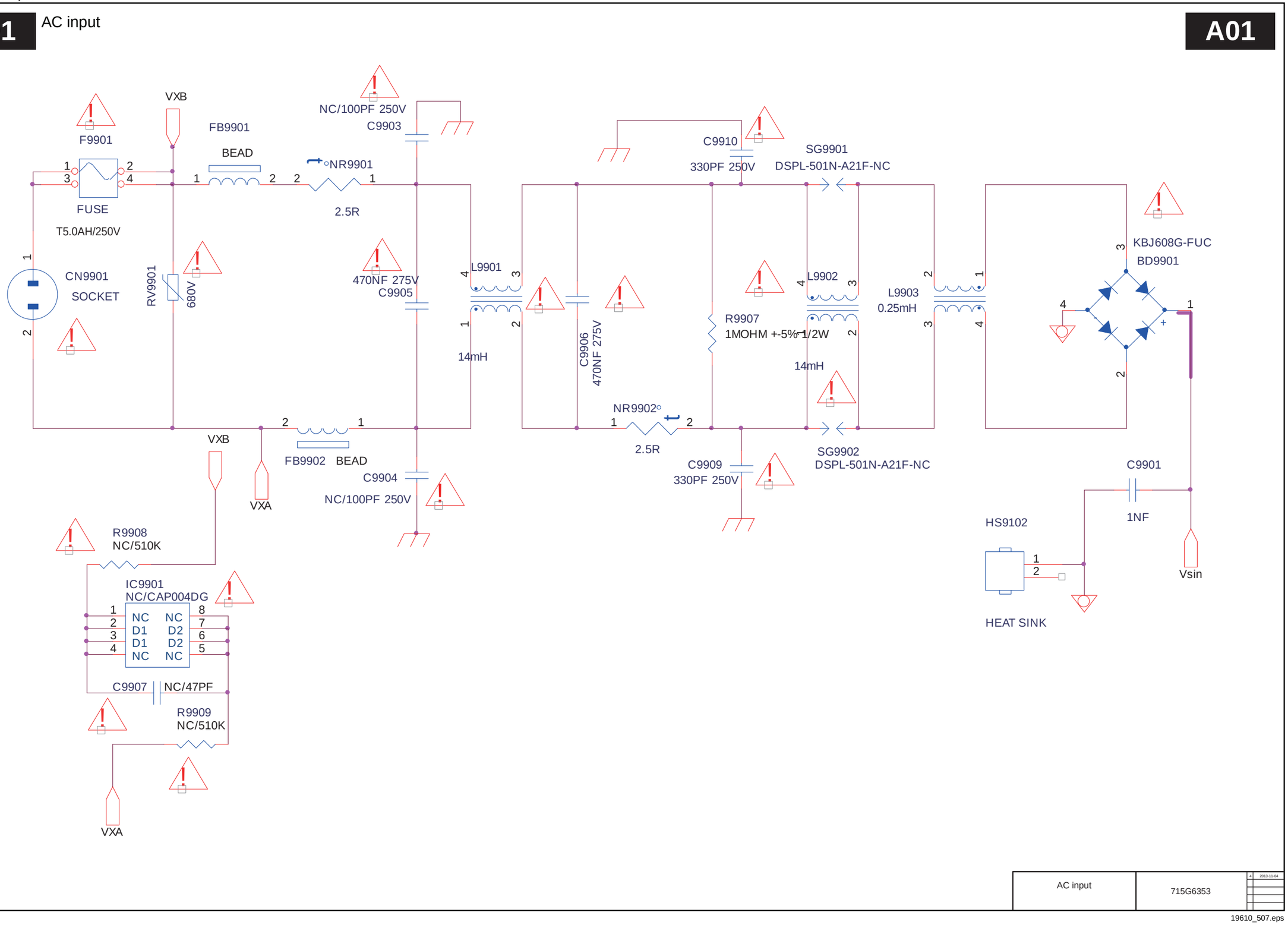


19592_502.eps

10.8 A 715G6353 PSU

10-8-1 AC input

A01 AC input

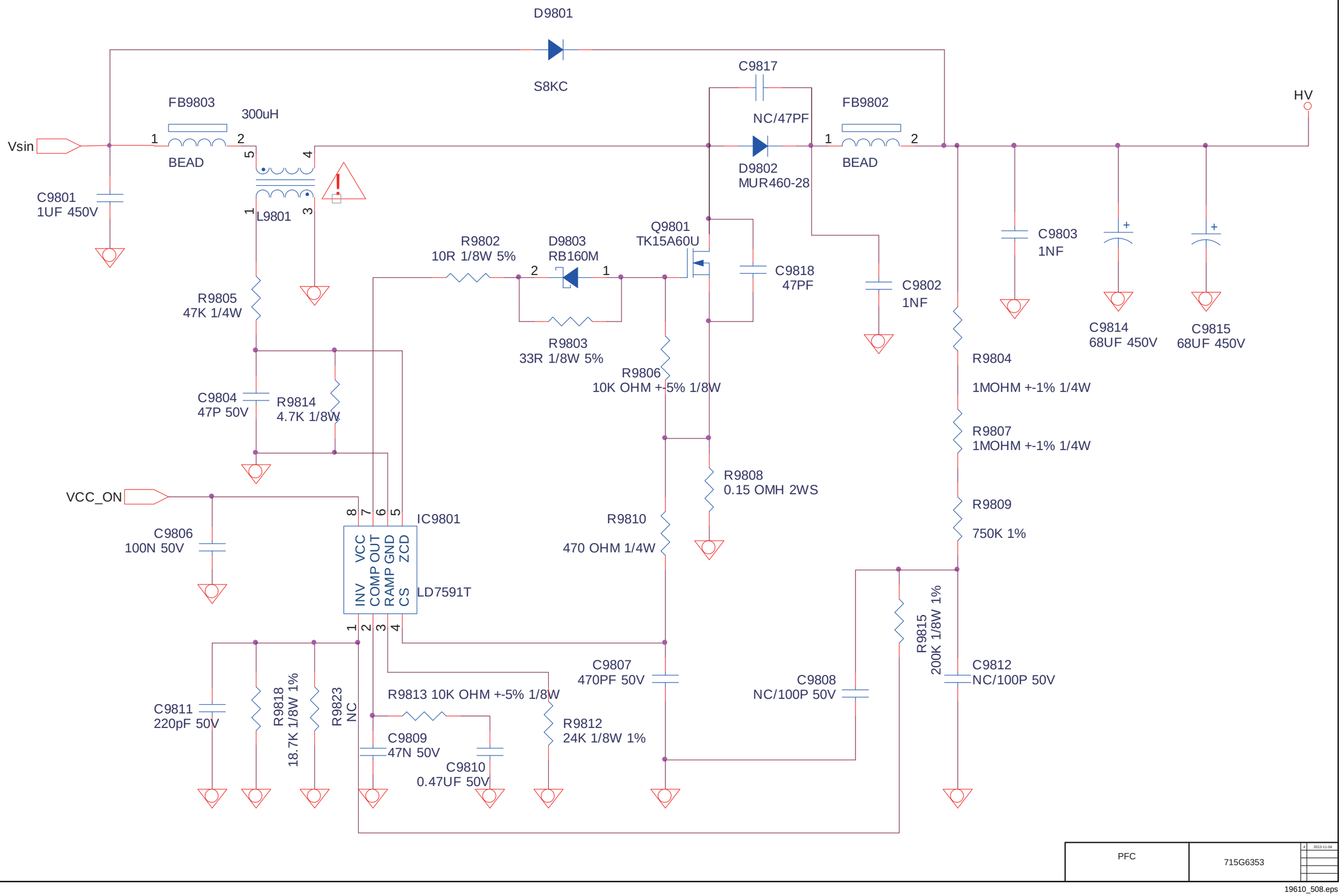


19610_507.eps

10-8-2 PFC

A02 PFC

A02



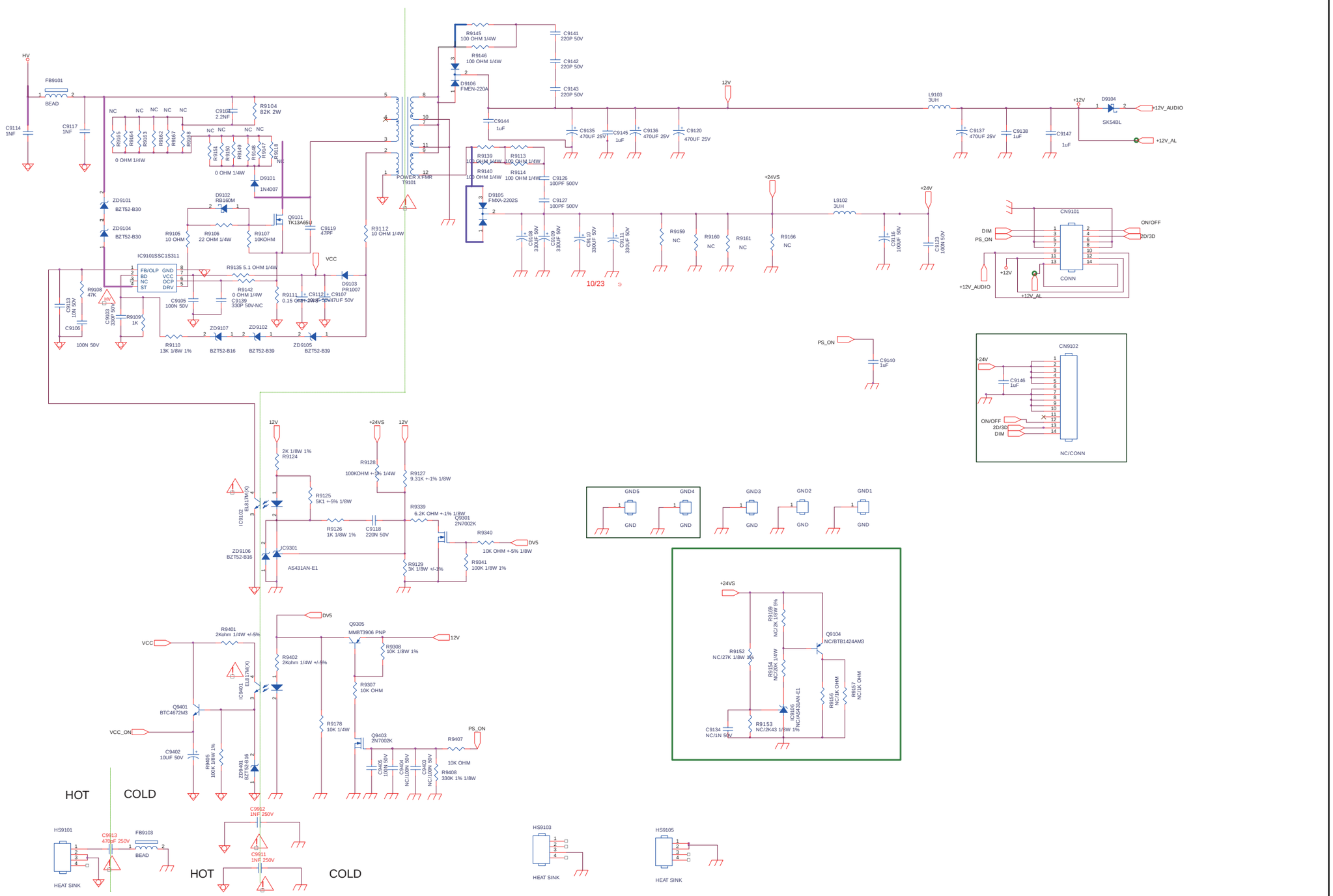
PFC	715G6353	4 2013-11-04

19610_508.eps

10-8-3 Main Power

A03 Main Power

A03



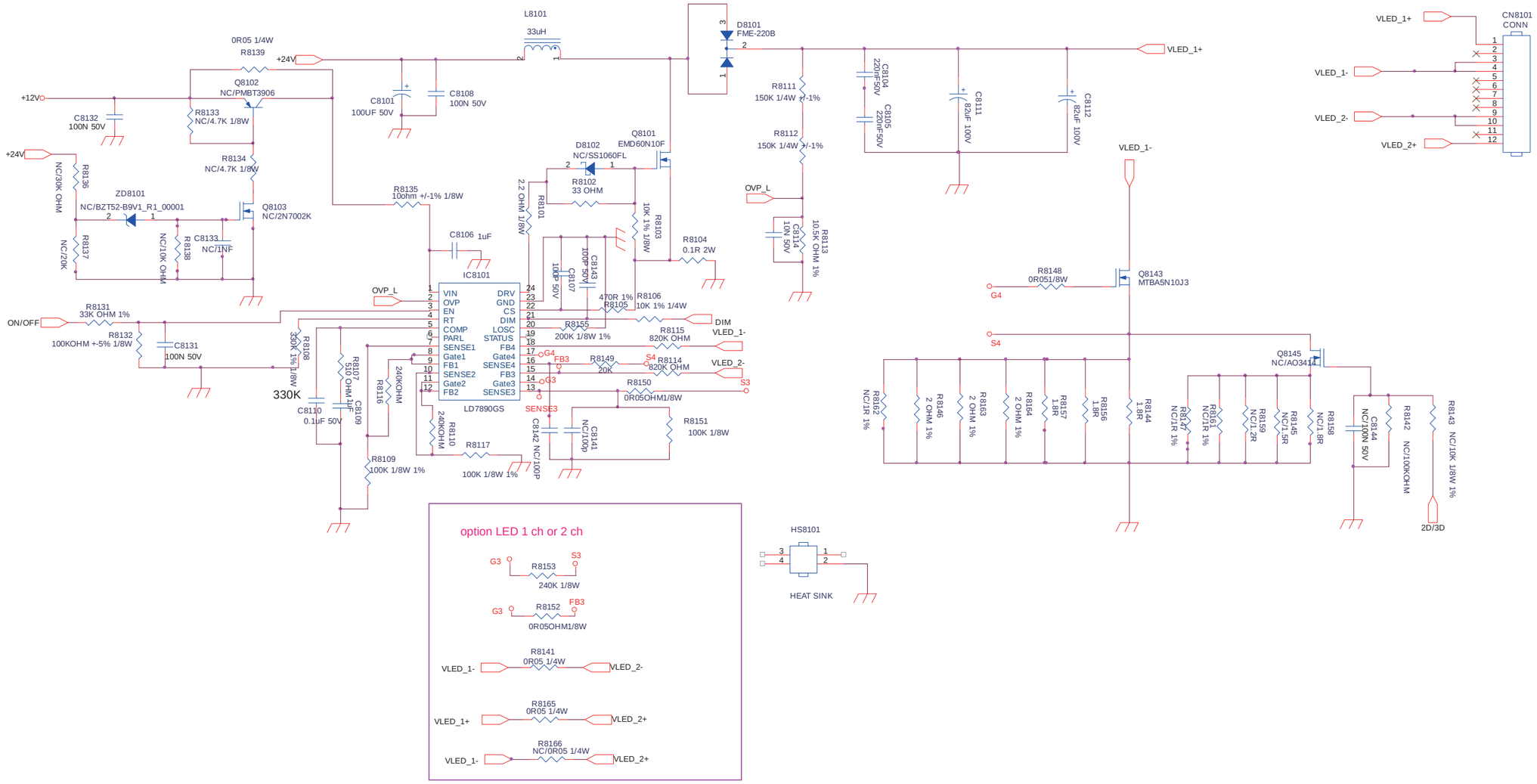
Main Power	715G6353	4	2013-11-04

19610_509.eps

10-8-4 LED Driver for A3D

A04 LED Driver for A3D

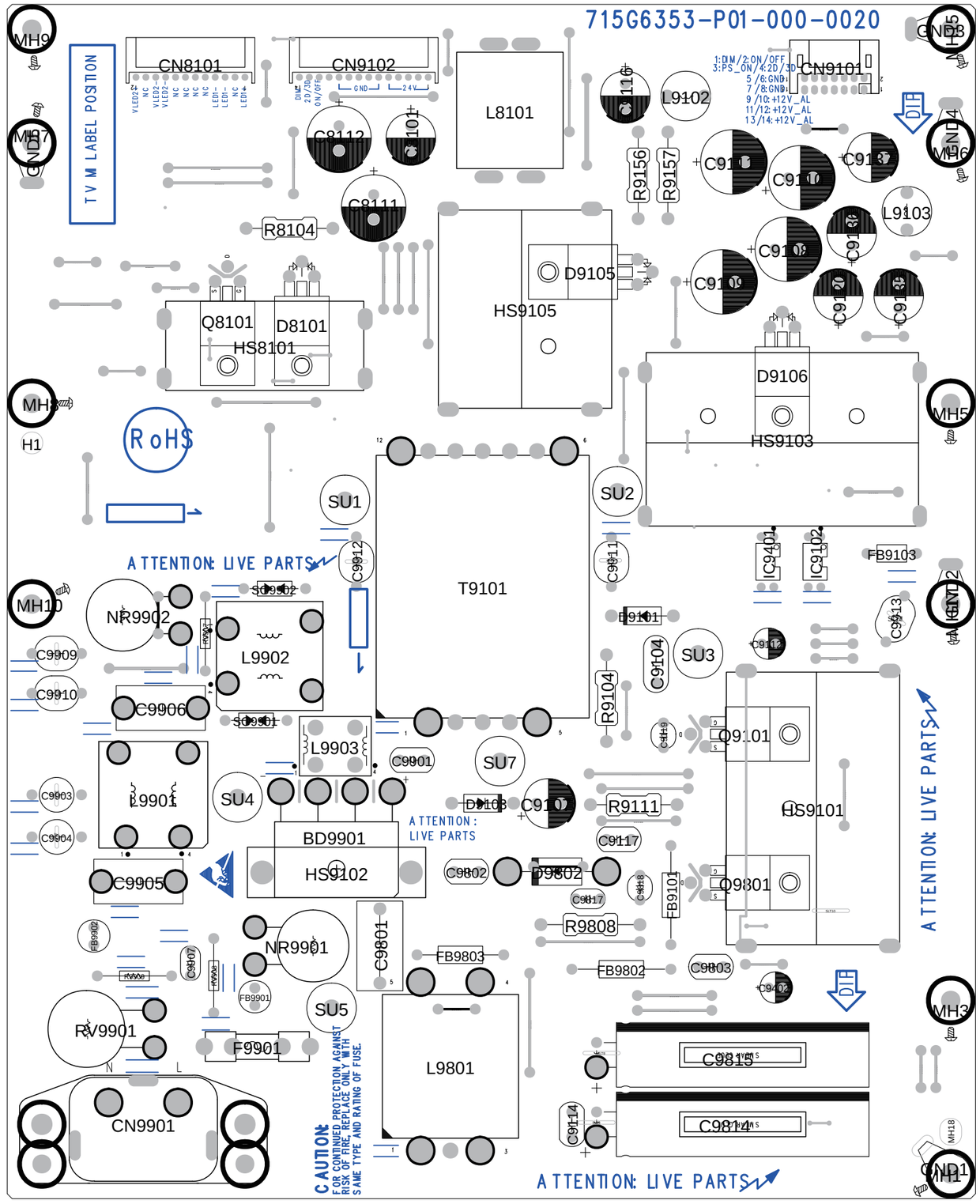
A04



LED Driver for A3D	715G6353	4 2013-11-04

19610_510.eps

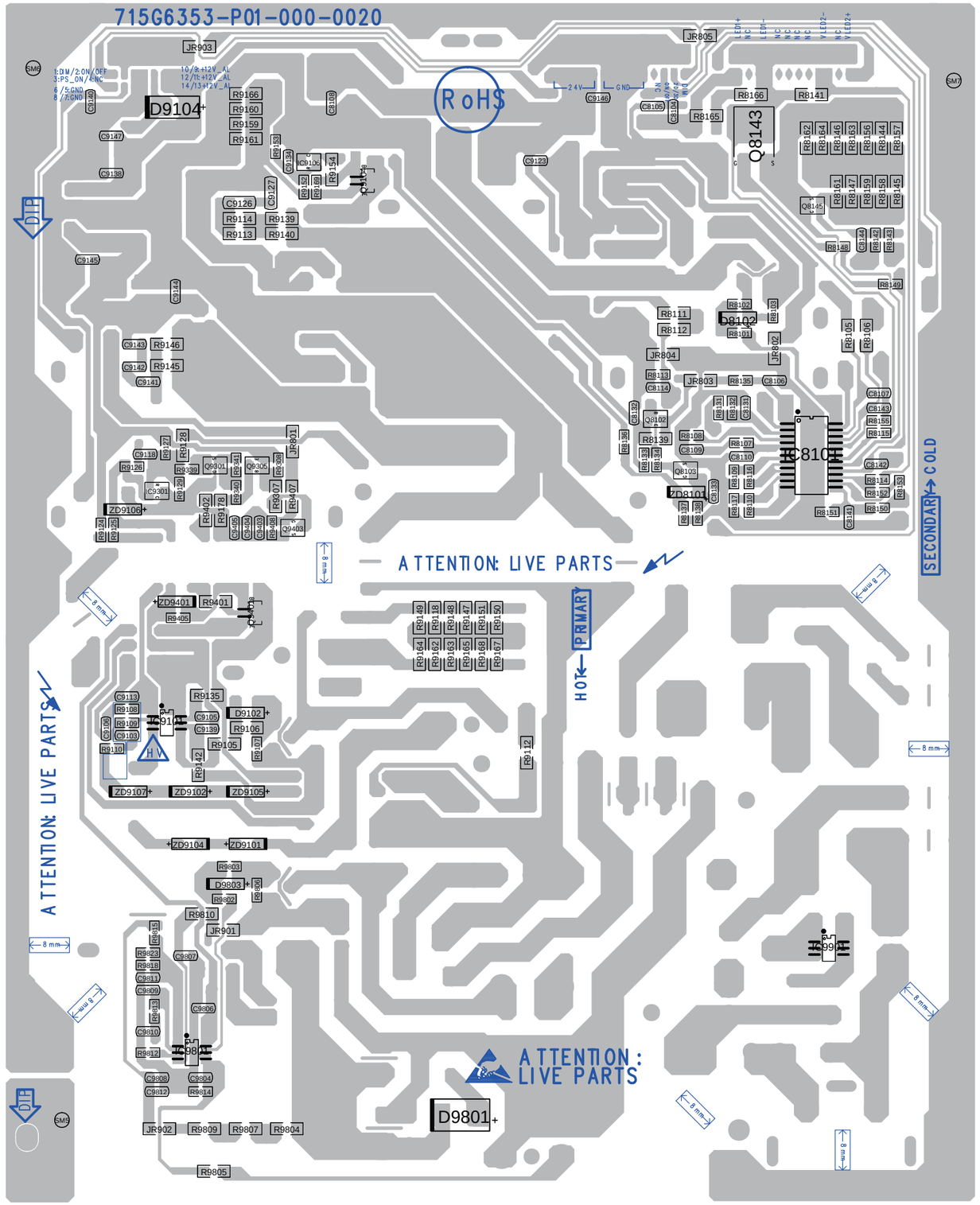
10-8-5 Power layout top



LAYOUT TOP	715G6353	4 2013-11-04

19610_511.eps

10-8-6 Power layout bottom



LAYOUT BOTTOM	715G6353	4 2013-11-04

19610_512.eps

10.9 A 715G6405 PSU
10-9-1 POWER

A01 AC input

A01

F9901
FUSE
T5AH/250V
CN9901
SOCKET
C9903
220PF 250V
C9904
220PF 250V
R9902 1MOHM +-5% 1/2W
C9901
470NF 275V
NR9902
2R
NR9901
2R
RV9901
680V
L9901
14mH
C9902
470NF 275V
SG9901
NC
SG9902
NC
C9905
220PF 250V
C9906
220PF 250V
L9902
14mH
FB9901
BEAD
FB9902
BEAD
BD9901
TS10K80-02
Vsin
FB9903
BEAD
C9907
470pF 250V
R9901
510k 1/2W
R9903
510k 1/2W
C9908
NC/47PF
IC9901
NC
HS9901
HEAT SINK
A
B

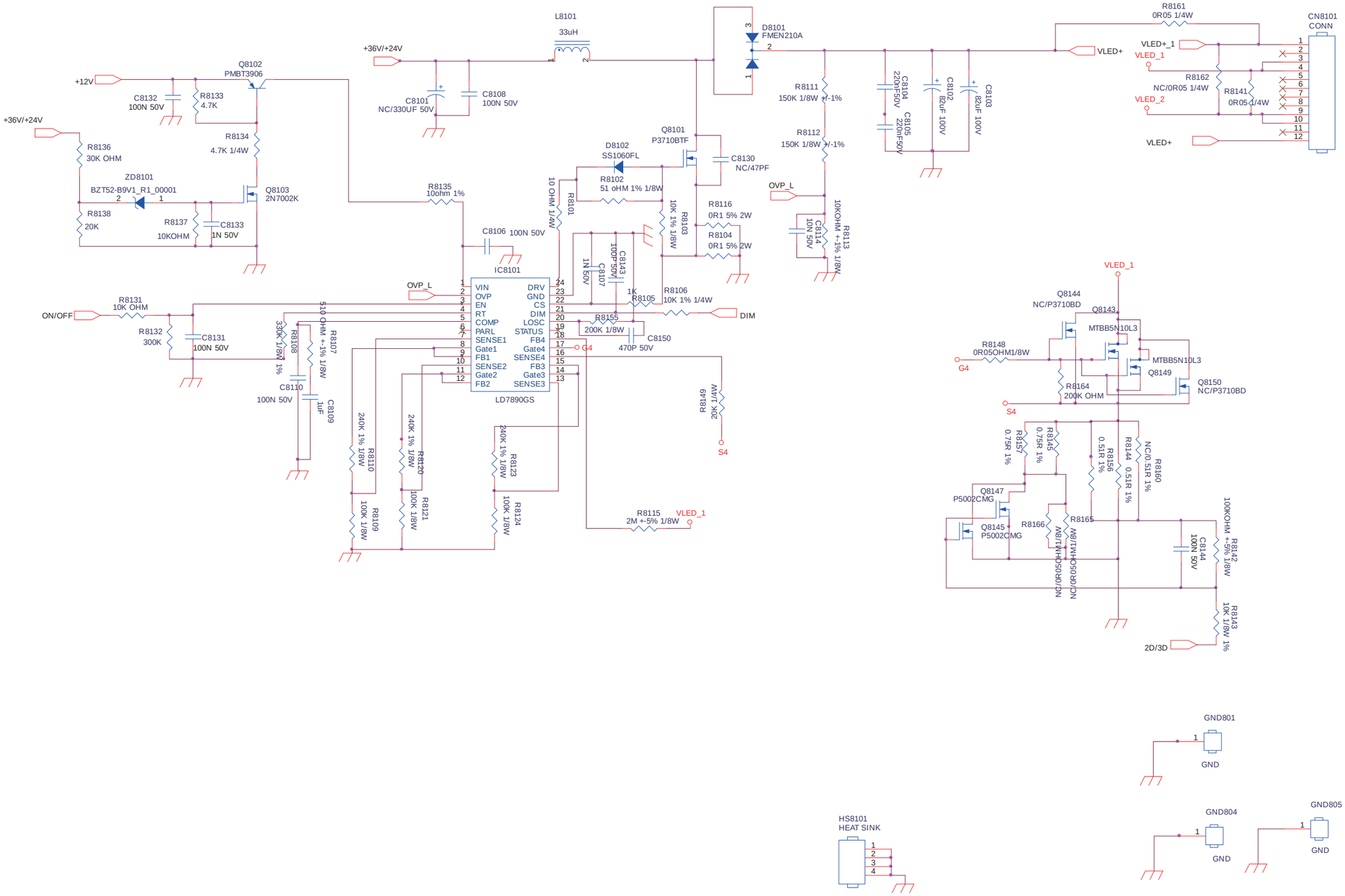
AC input	715G6405	2013-11-20

19602_504.eps

10-9-2 LED Driver

A02 LED Driver

A02



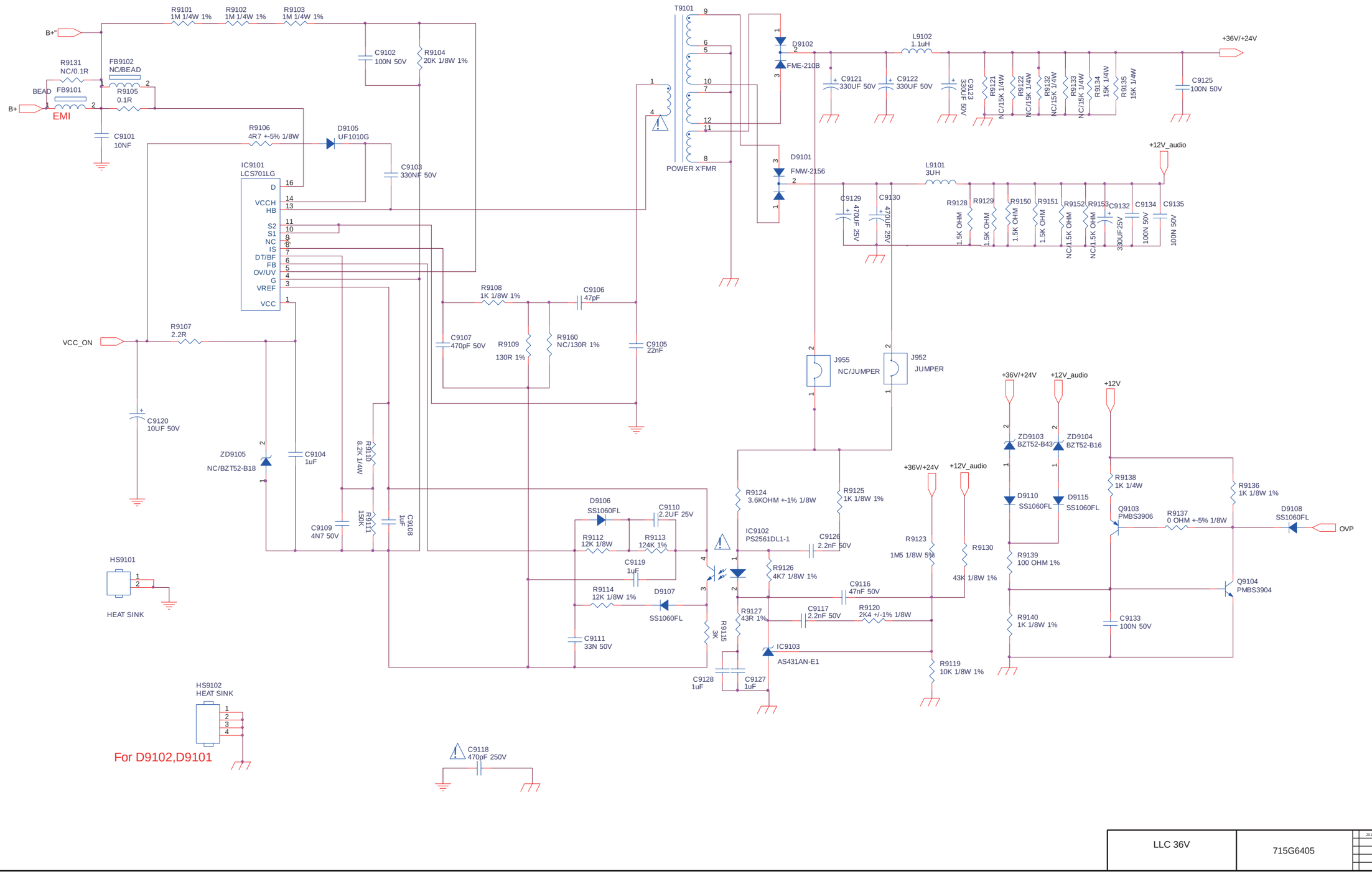
LED Driver	715G6405	2013-11-20

19602_505.eps

10-9-3 LLC 36V

A03 LLC 36V

A03



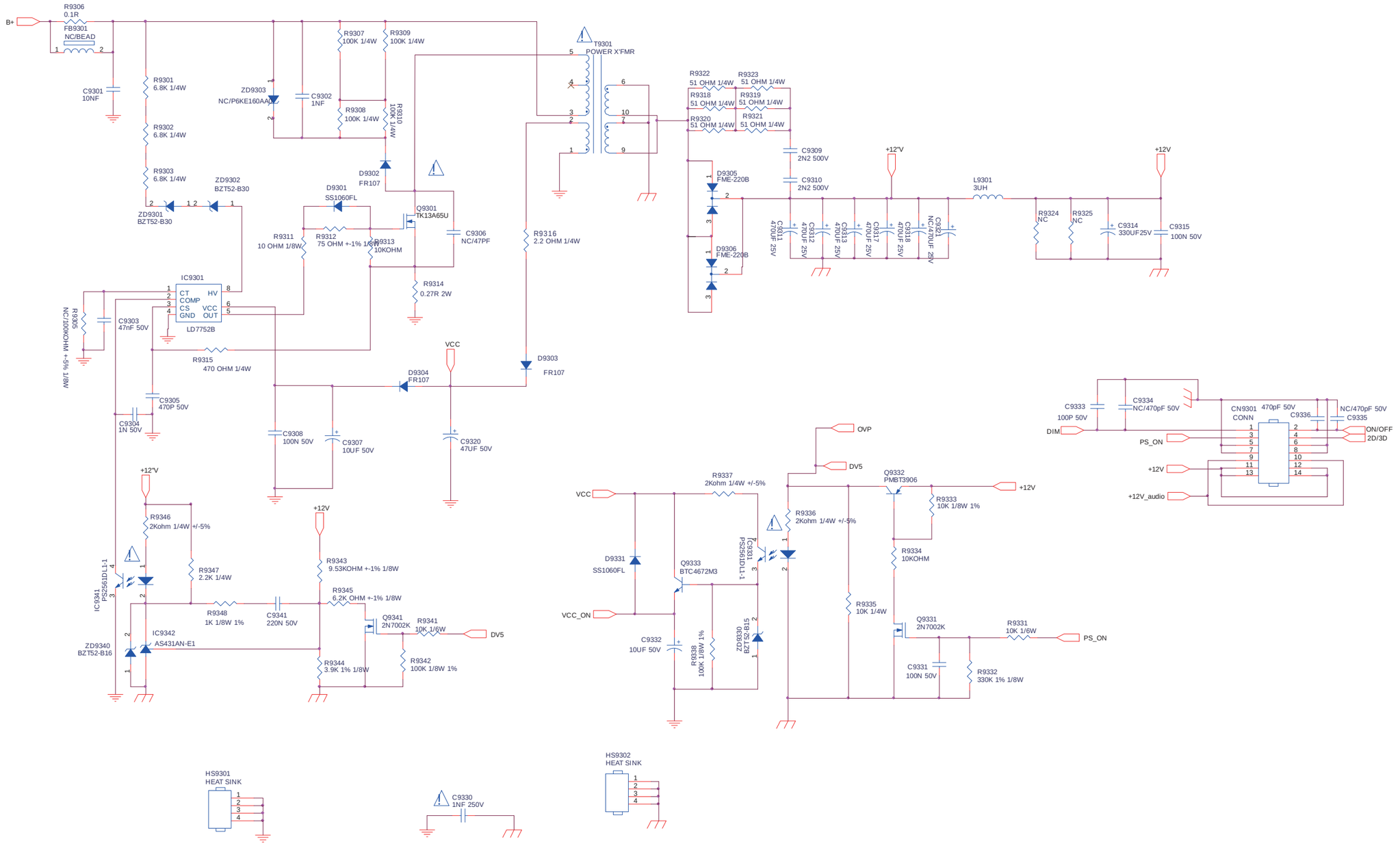
LLC 36V	715G6405	2013-11-20

19602_506.eps

10-9-4 Main Power 12V

A04 Main Power 12V

A04



Main Power 12V	715G6405	2013-11-20

19602_507.eps

A05 PFC

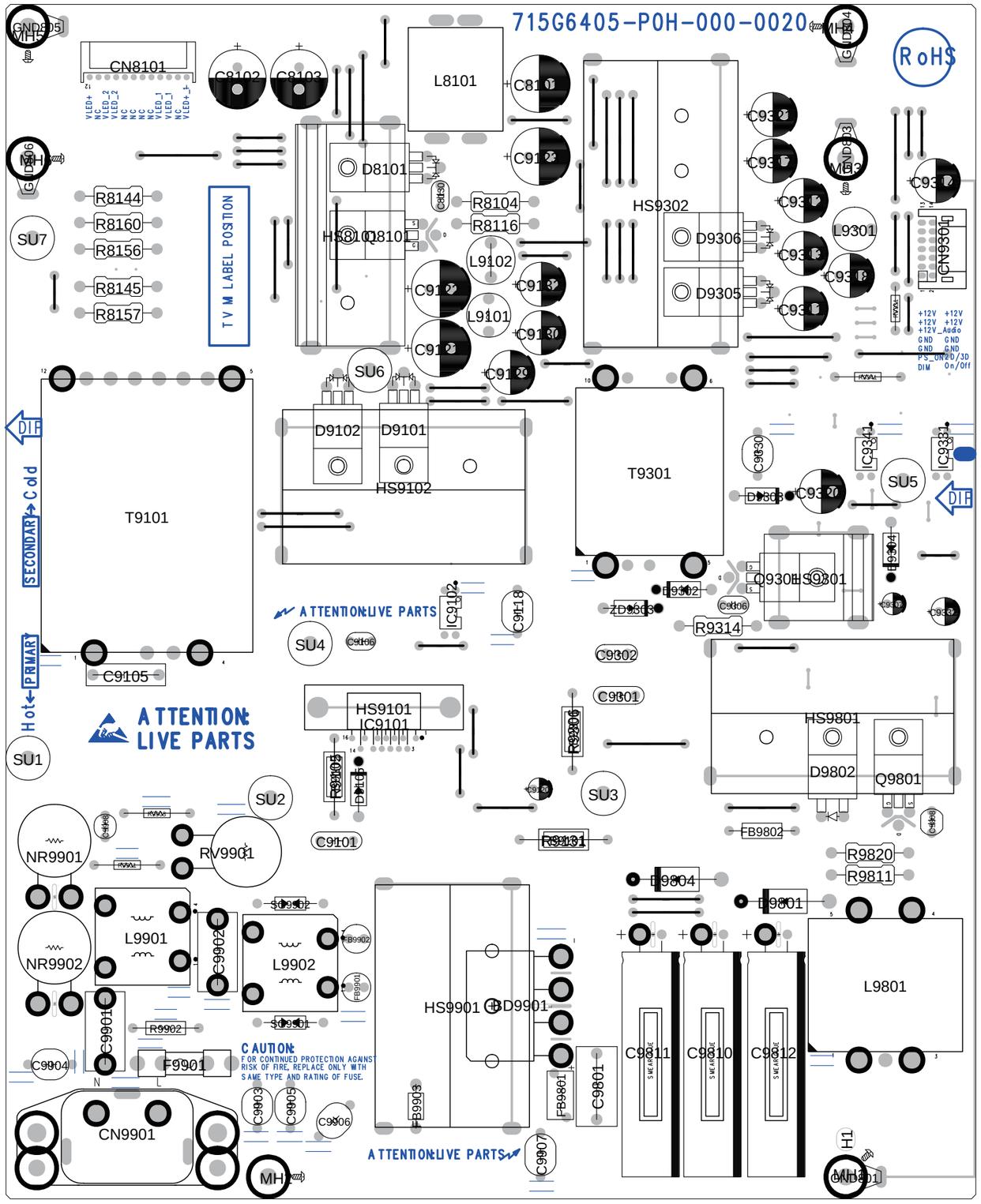
A05

D9801 IN5408G-04
D9804 IN5408G-04
D9802 FMNS-1106S
FB9801 BEAD
FB9802 BEAD
Vsin
B+
L9801
240uH
C9801 1UF 450V
C9810 68uF 450V
C9811 68uF 450V
C9812 68uF 450V
R9807 10 OHM 1/8W
D9803
SS1060FL
R9808 51 oHM 1% 1/8W
Q9801 TK16A60W
C9808 100PF
R9805 20K 1/4W
R9809 10K 1/8W
R9801 1M 1/4W 1%
R9802 1M 1/4W 1%
R9803 1M 1/4W 1%
R9804 19K1 +-1% 1/8W
R9806 2.4KOHM +-1% 1/8W
C9802 47P 50V
R9811 0.2R
R9820 0.2R
VCC_ON
R9815 2.2R
C9803 100N 50V
IC9801 LD7591T
INV COMP RAMP CS VCC OUT GND ZCD
R9810 470 OHM 1/4W
C9807 1N 50V
R9812 27K 1/8W 1%
R9813 10K 1/8W
C9805 100N 50V
C9806 470NF 50V
C9809 100P 50V
R9814 NC
HS9801 HEAT SINK

PFC | 715G6405 | 2013-11-20

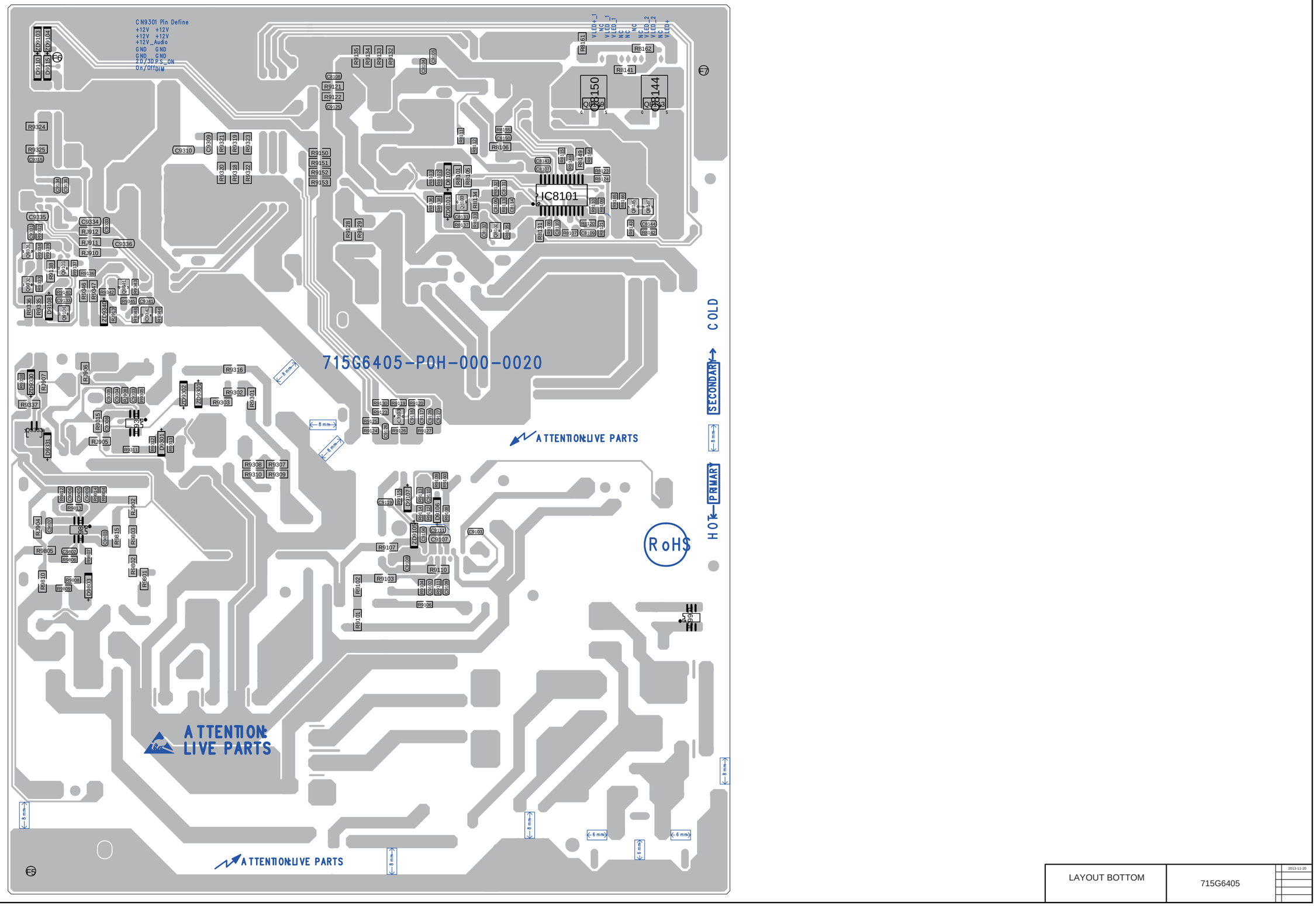
19602_508.eps

10-9-6 Power layout top



19602_509.eps

10-9-7 Power layout bottom



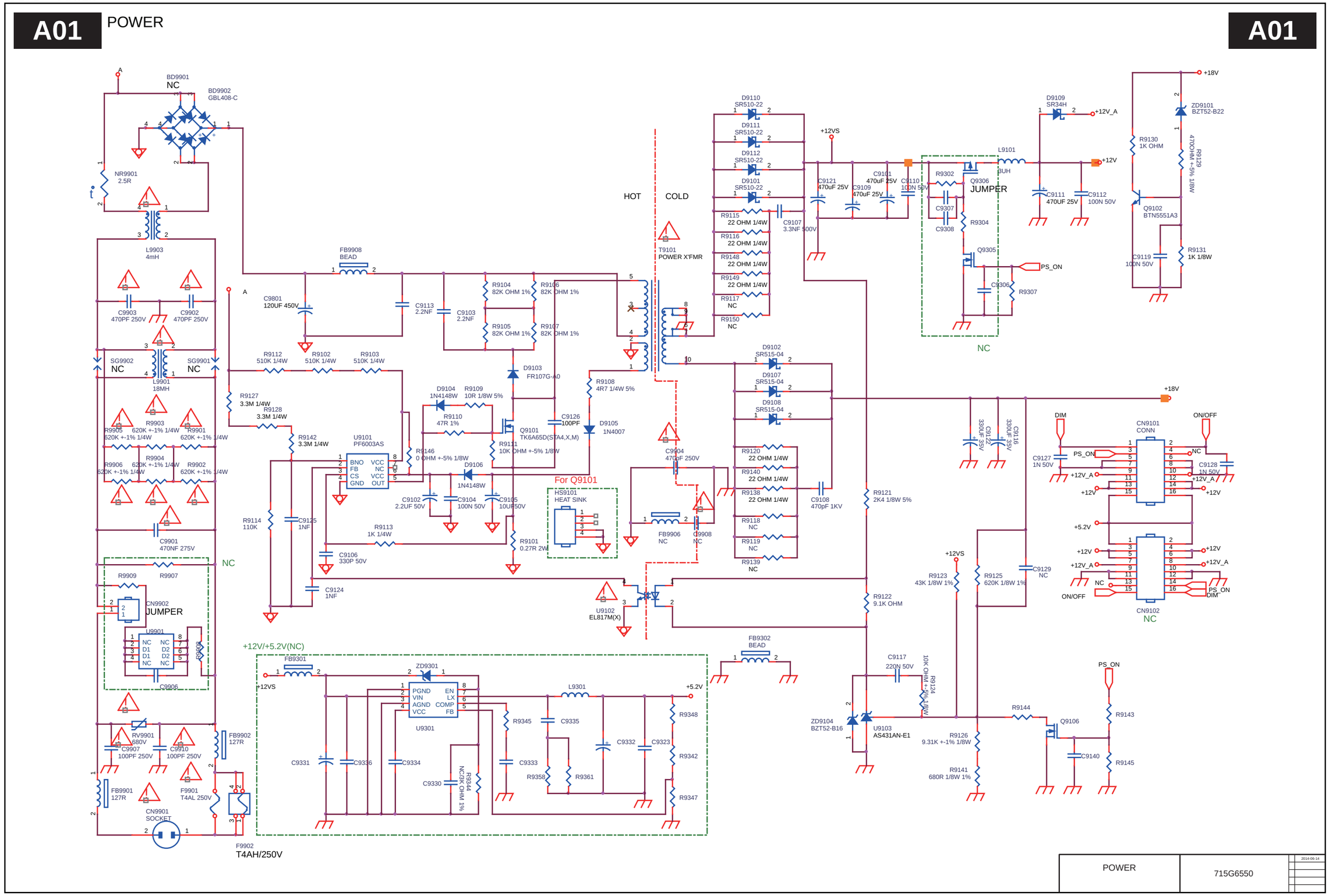
LAYOUT BOTTOM	715G6405	2013-11-20

19602_510.eps

10.10 A 715G6550 PSU

10-10-1 POWER

A01 POWER

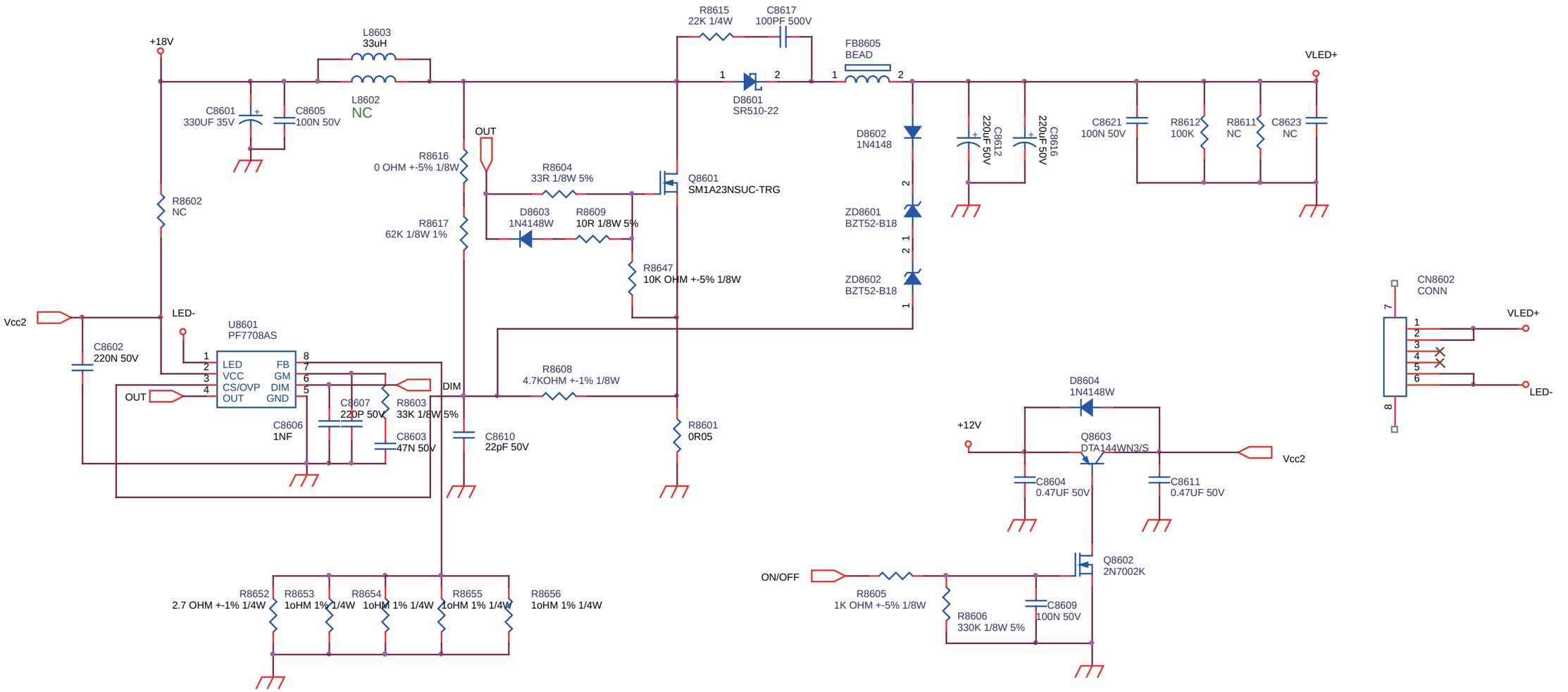


19597_500.eps

10-10-2 LED DRIVER

A02 LED DRIVER

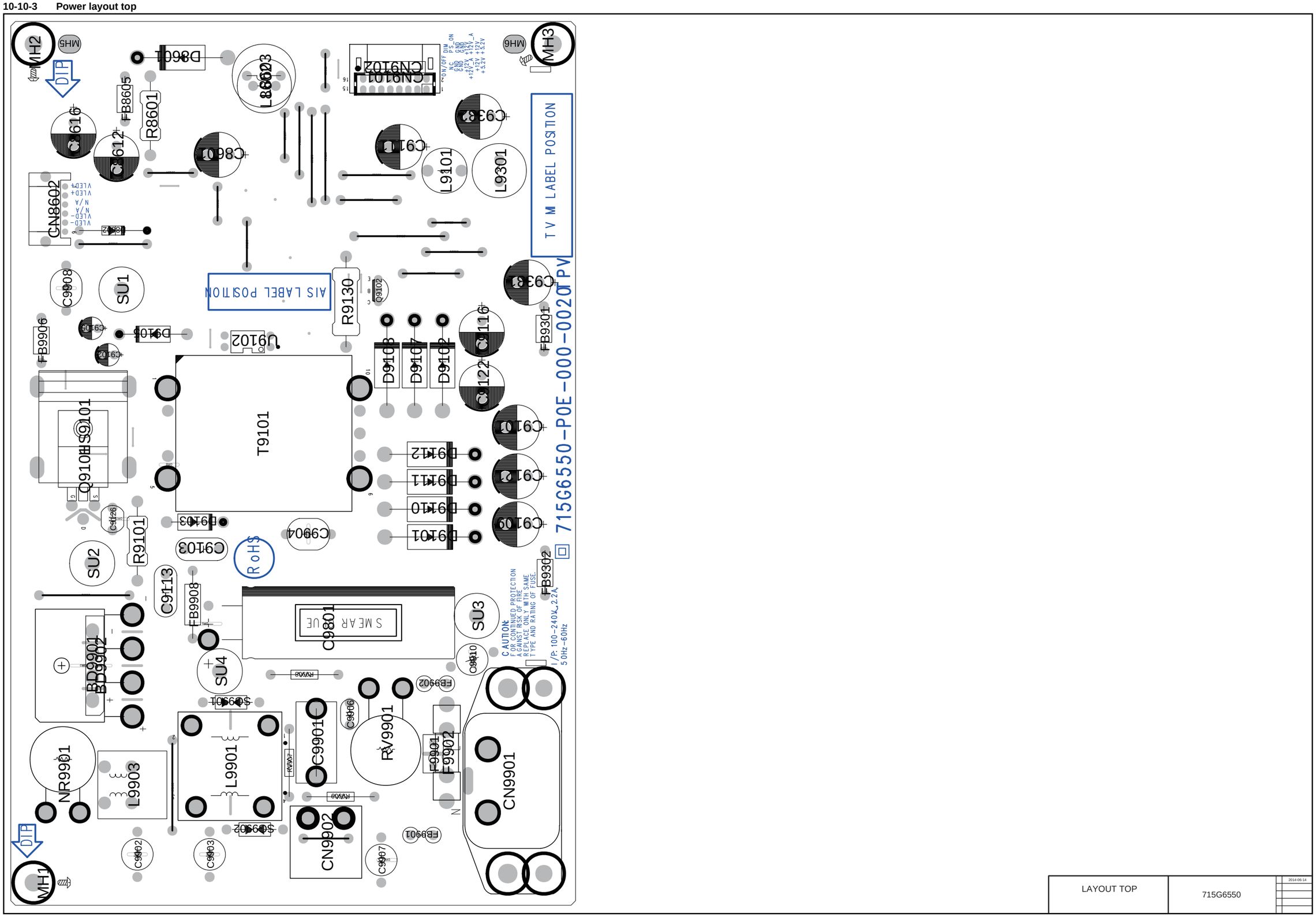
A02



LED DRIVER	715G6550	2014-06-14

19597_501.eps

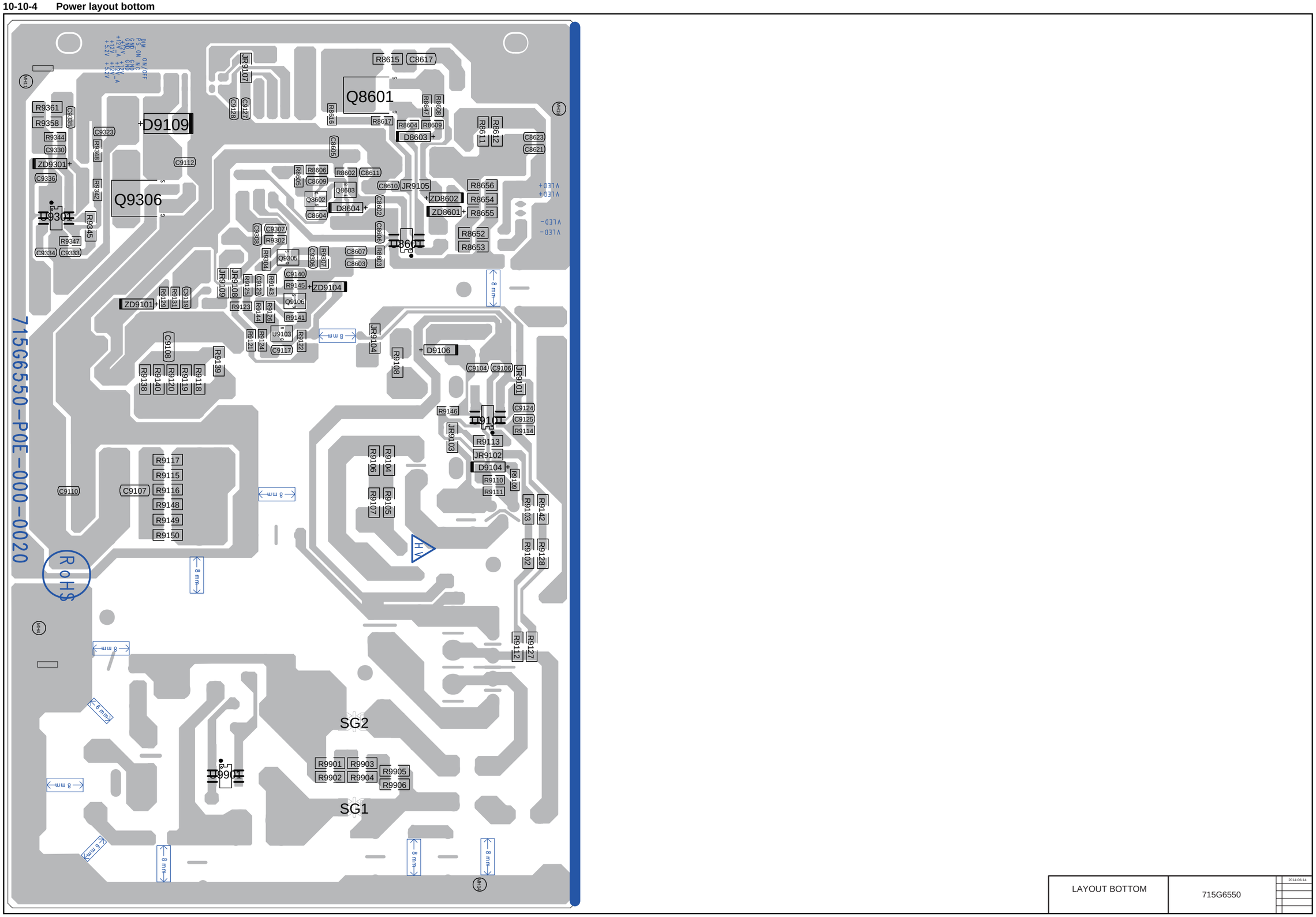
10-10-3 Power layout top



LAYOUT TOP	715G6550	2014-06-14

19597_502.eps

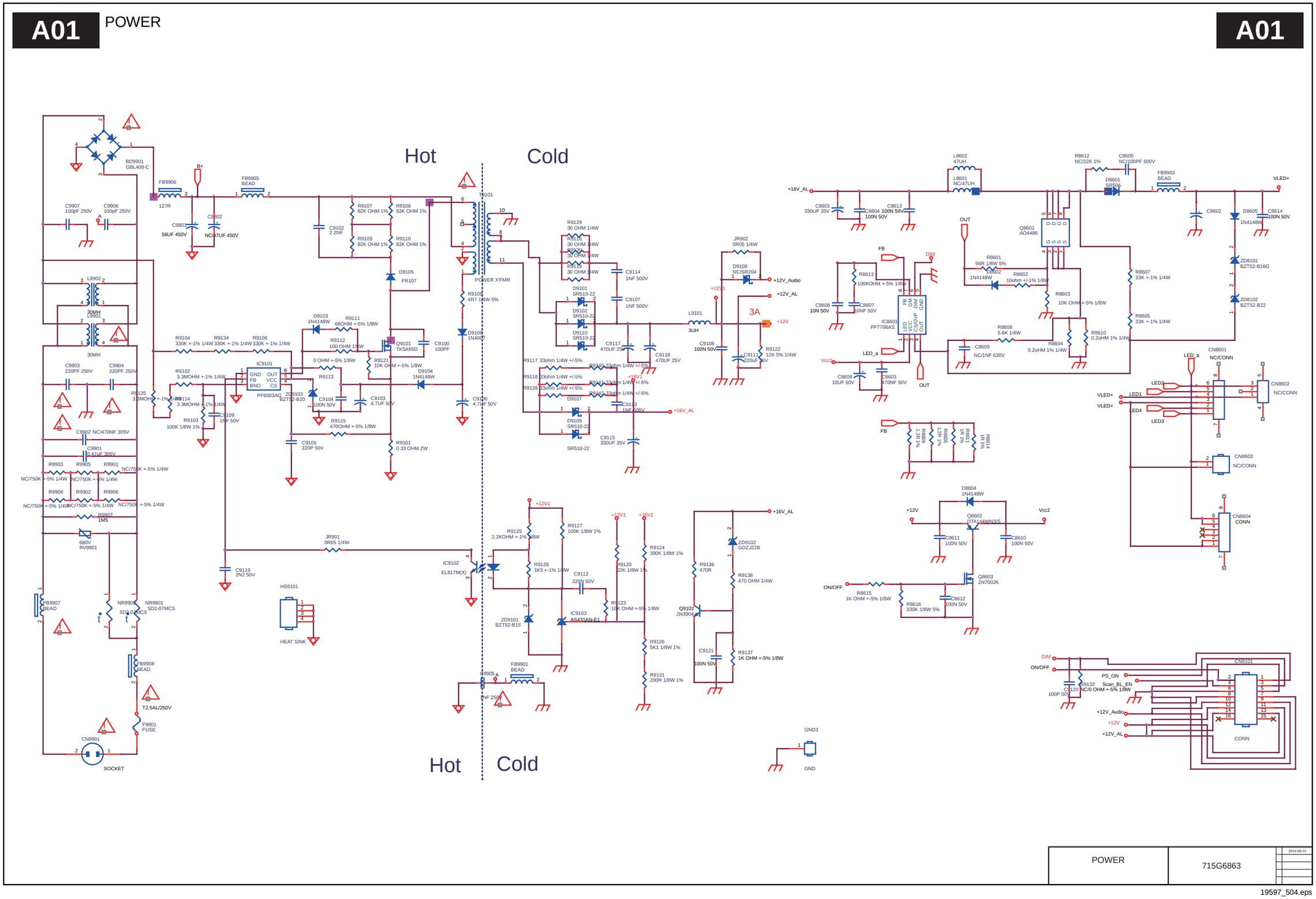
10-10-4 Power layout bottom



19597_503.eps

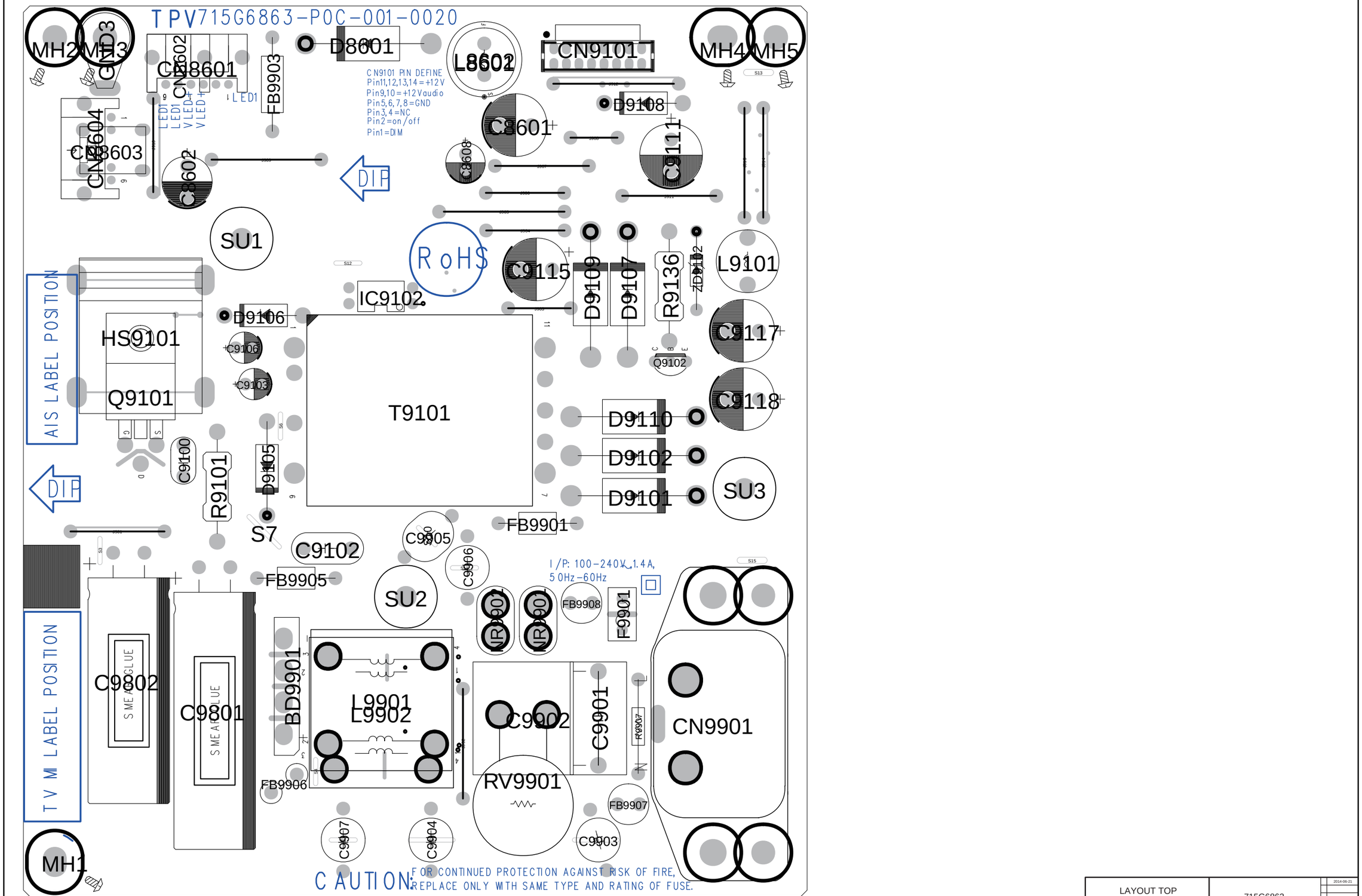
10.11 A 715G6863 PSU
10-11-1 POWER

A01 POWER



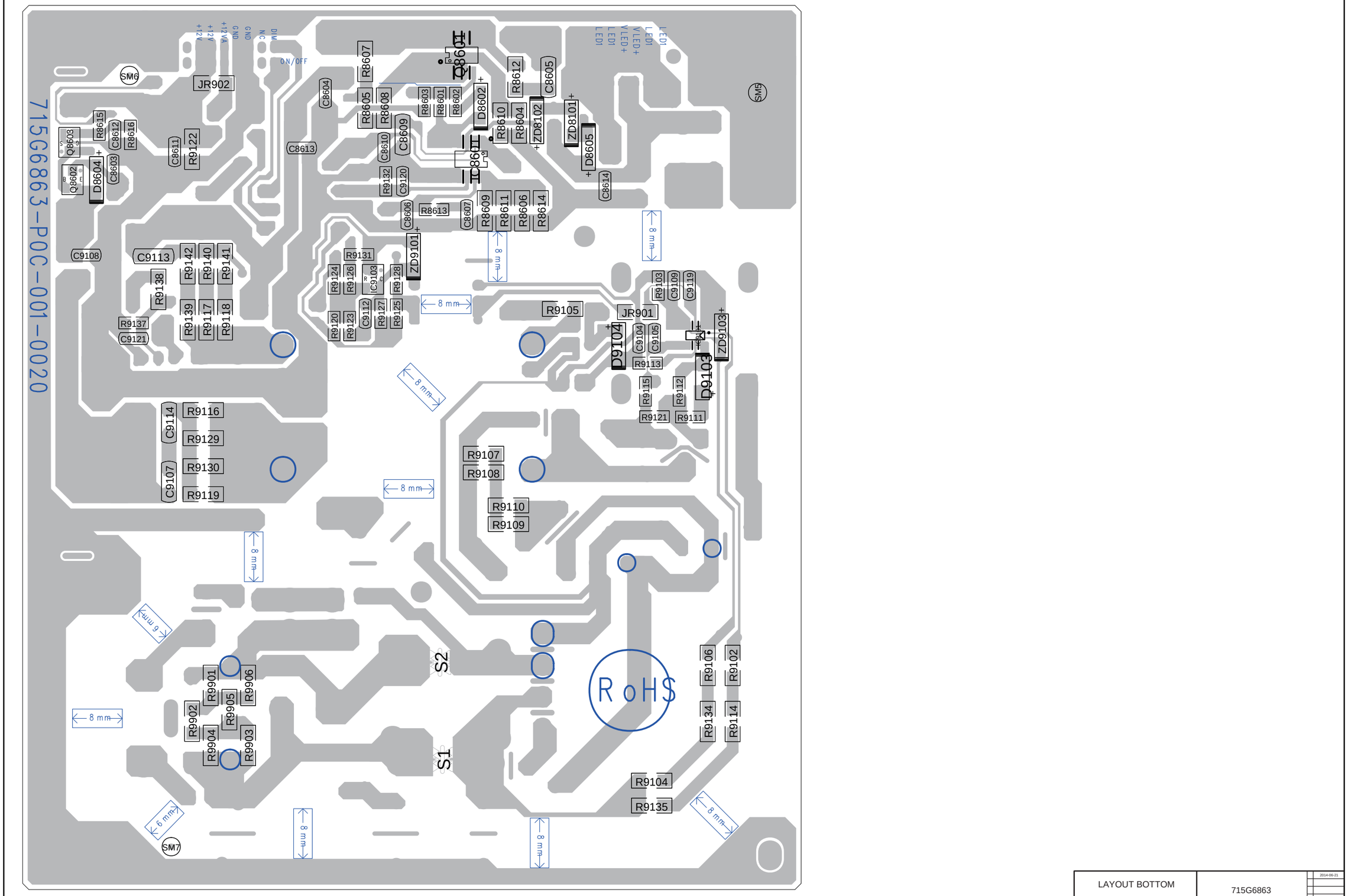
19597_504.eps

10-11-2 Power layout top



19597_505.eps

10-11-3 Power layout bottom

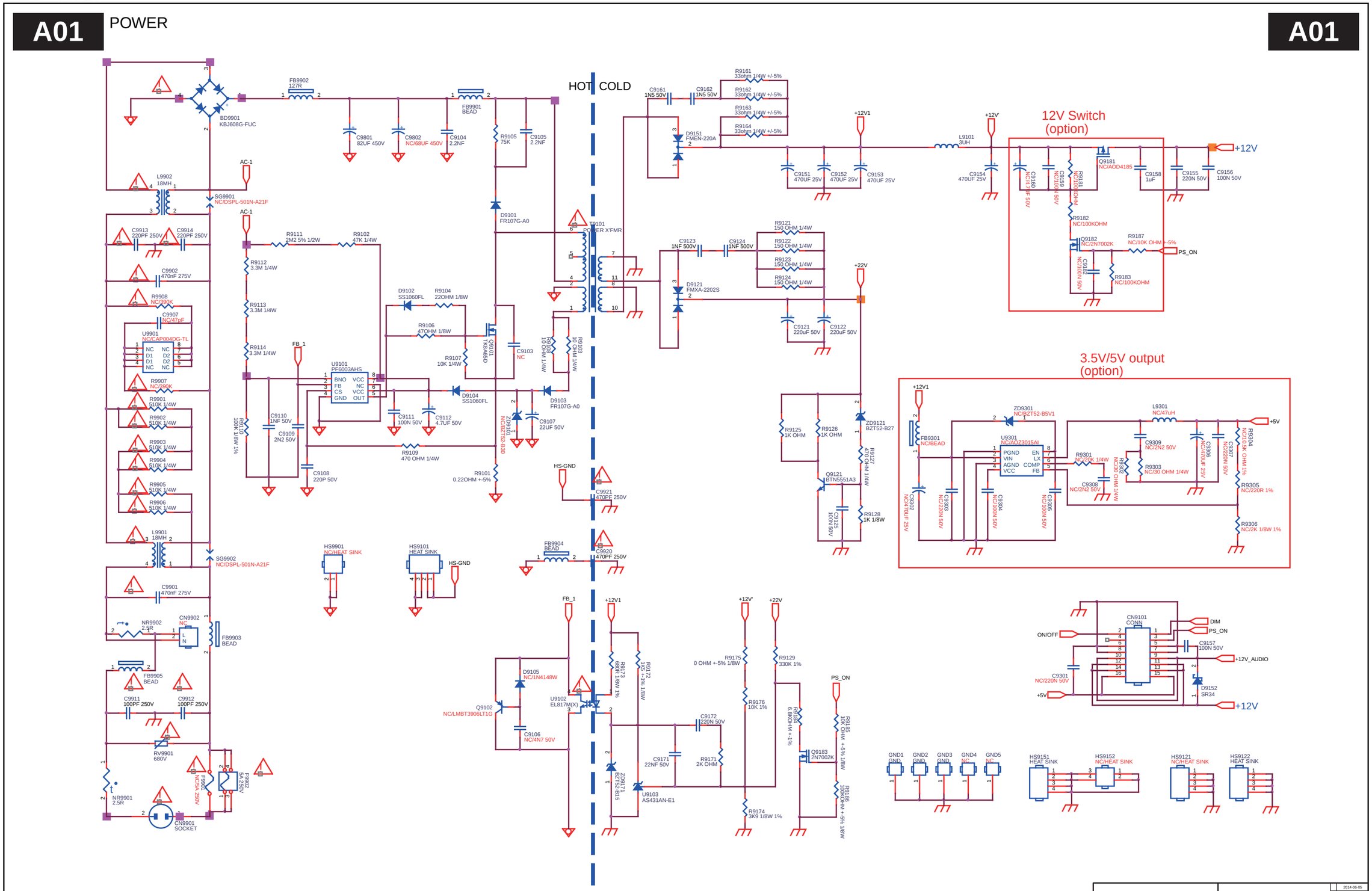


LAYOUT BOTTOM	715G6863	2014-06-21

19597_506.eps

10.12 A 715G6934 PSU
10-12-1 POWER

A01 POWER **A01**



19597_507.eps

10-12-2 LED DRIVER

A02 LED DRIVER

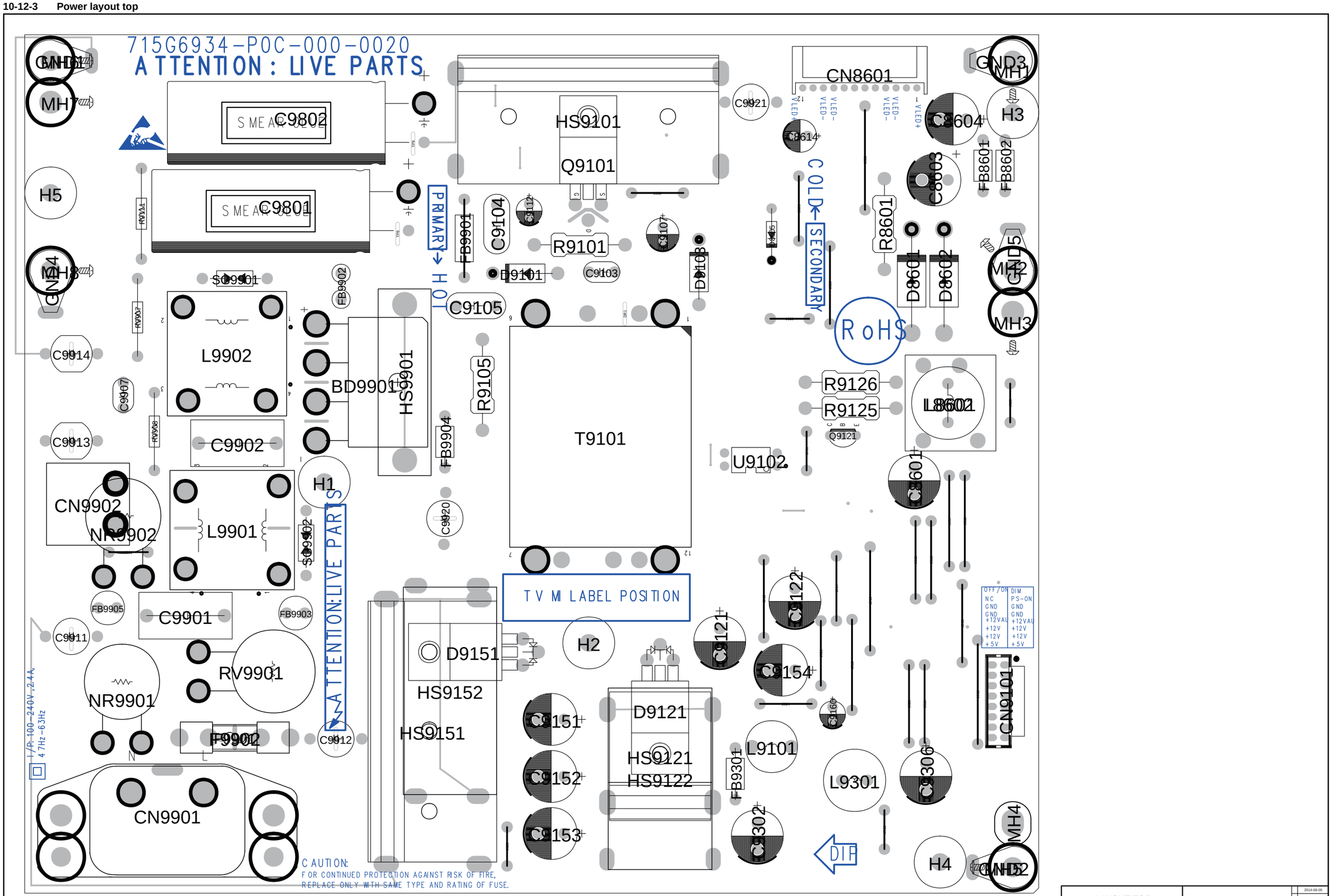
A02

+22V
L8602 NC
L8601 33uH
C8601 220uF 50V
D8605 NC/1N4148
ZD8601 NC/BZT52-B22
ZD8602 NC/BZT52-B22
VCC
R8609 10R 1/8W 5%
OUT
VLED-
U8601 PF7708AS
LED VCC CS/OVP OUT FB GM DIM GND
R8602 NC/0R05 1/4W
ON/OFF
DIM
C8608 220N 50V
C8614 NC/22UF 50V
C8610 1NF 50V
C8609 220P 50V
R8611 33K 1/8W 1%
C8612 47N 50V
R8612 33K 1/8W 1%
R8606 33K 1/8W 1%
OUT
R8605 10ohm +/-1% 1/8W
D8603 SS1060FL
R8607 5.1R 1/8W
R8608 10K 1/8W
Q8601 CYS9240
R8619 10 OHM
C8613 100pF 50V
R8610 4K3 1/8W 1%
R8601 0.05R
C8611 22pF 50V
D8602 NC/SR506
D8601 SR506
FB8602 NC/BEAD
FB8601 BEAD
VLED+
C8605 100N 50V
C8603 220uF 50V
C8604 220uF 50V
R8603 100K
R8604 NC
C8606 1uF
C8607 1uF
D8604 SS1060FL
Q8602 LMBT3906LT1G
+12V
VCC
C8615 100N 50V
R8620 2K2 1/8W
C8616 2.2UF 25V
R8621 1K 1/8W 1%
R8622 10K 1/8W 1%
ON/OFF
Q8603 LMBT3904LT1G
R8623 300K 1/8W 5%
C8617 100N 50V
R8613 1R2 1%
R8614 1R2 1%
R8615 1R2 1%
R8616 1R2 1%
R8617 1R2 1%
R8618 1R2 1%
CN8601 CONN
VLED+
VLED-
VLED-
VLED-
VLED-
VLED+
12 11 10 9 8 7 6 5 4 3 2 1

LED DRIVER	715G6934	2014-06-05

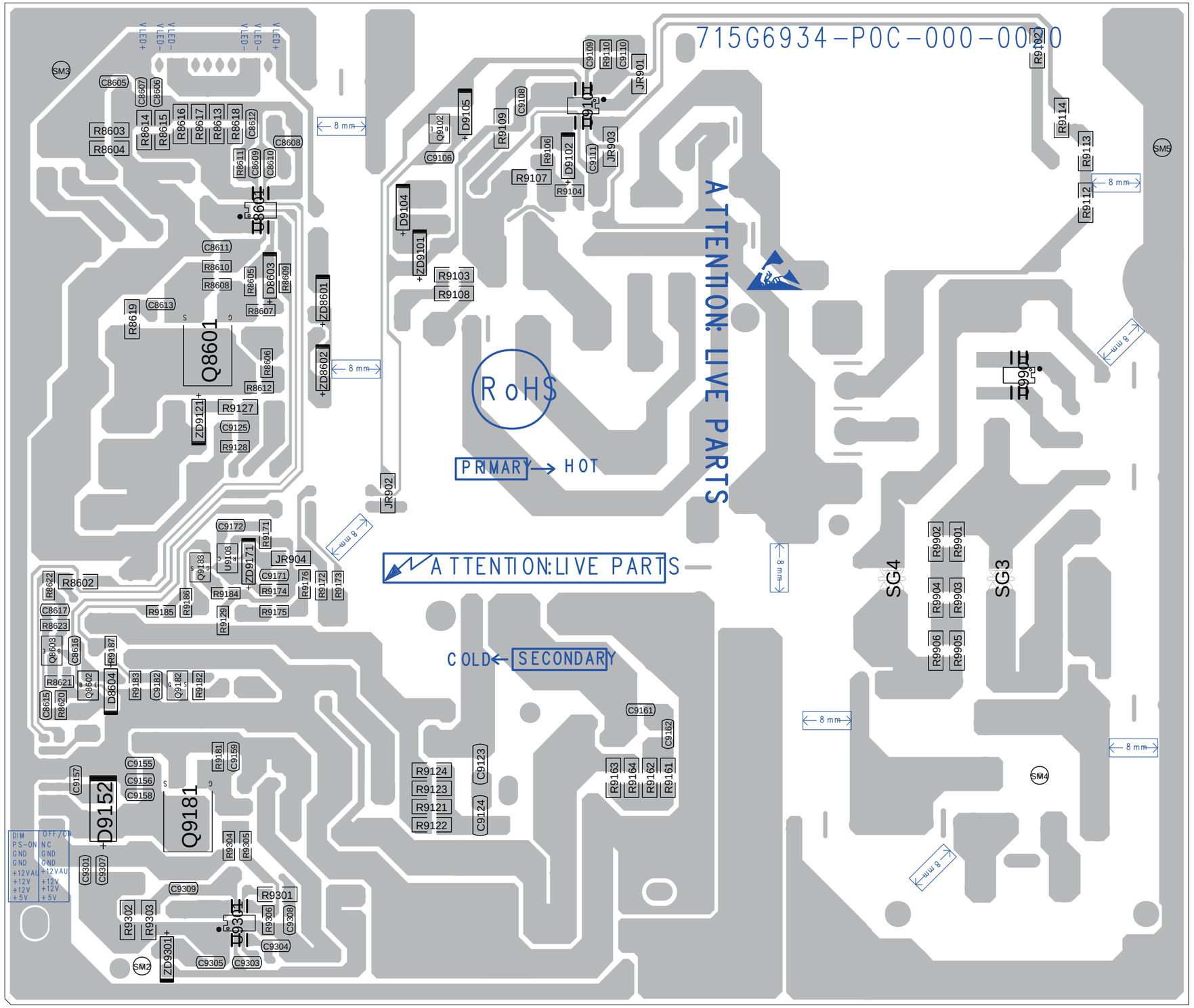
19597_508.eps

10-12-3 Power layout top



19597_509.eps

10-12-4 Power layout bottom



19597_510.eps

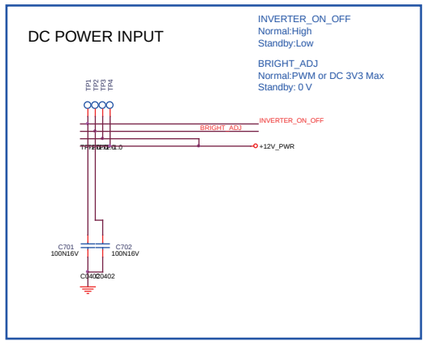
10.13 BA 715G6079 SSB+PSU combination panel

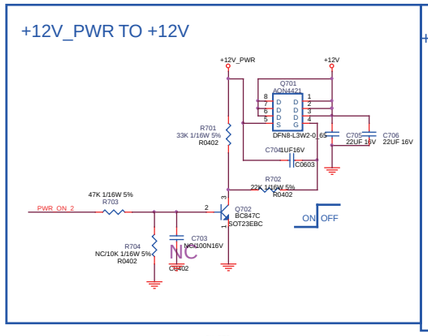
10-13-1 Power

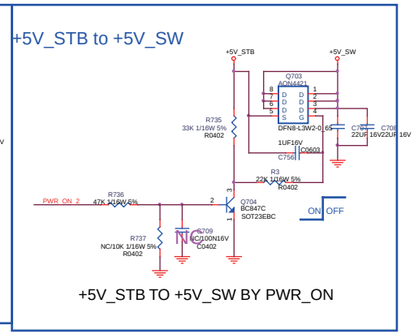
BA01 POWER

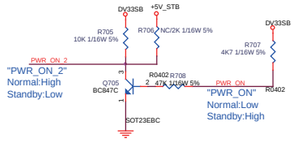
BA01

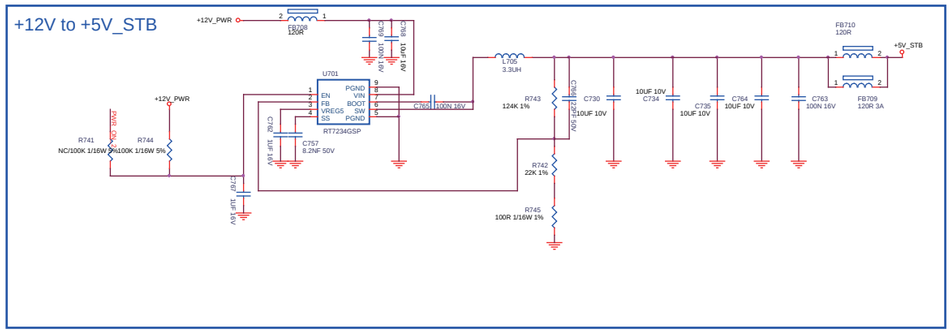
2K13 EU NT72567 - 2 Layers 125mm X 186mm

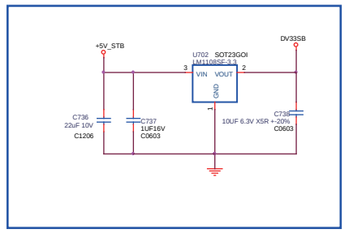


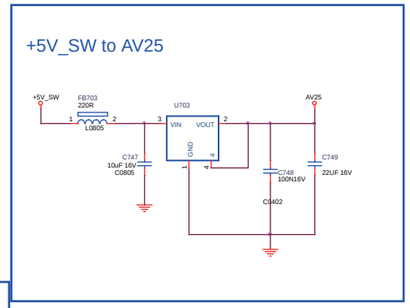


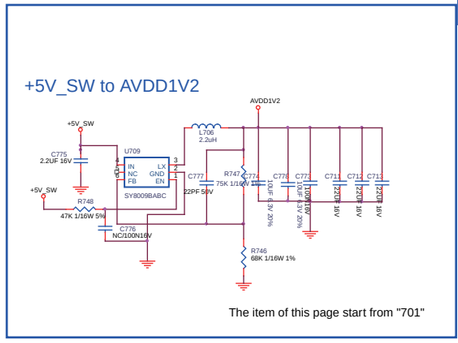




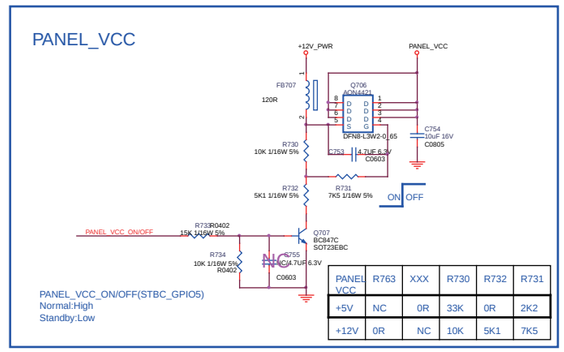




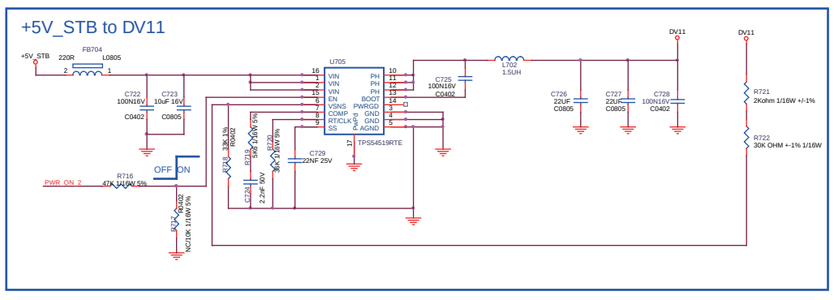


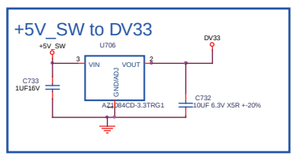


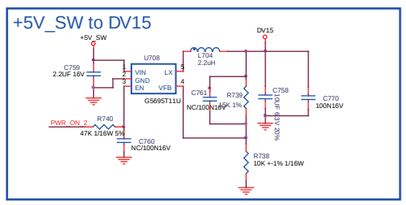


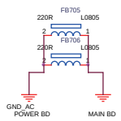


PANEL VCC	R763	XXX	R730	R732	R731
+5V	NC	0R	33K	0R	2K2
+12V	0R	NC	10K	5K1	7K5









POWER	715G6079	C 2013-06-04

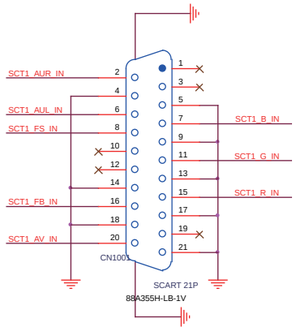
19530_506_130717.eps
130717

10-13-2 SCART/HDMI1/VGA INPUT

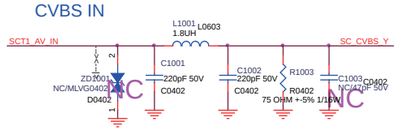
BA02 SCART/HDMI1/VGA INPUT

BA02

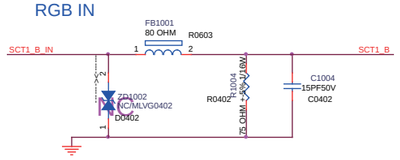
SCART(RGB+CVBS+L/R IN)



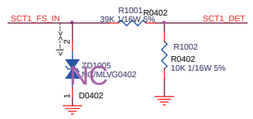
CVBS IN



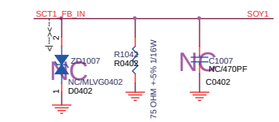
RGB IN



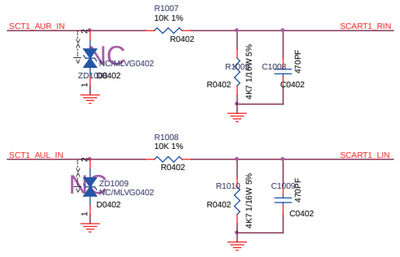
Function Select



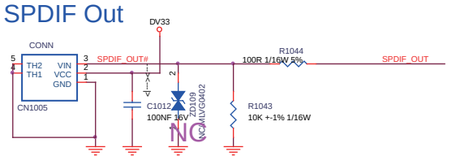
FAST BLANKING/SOY



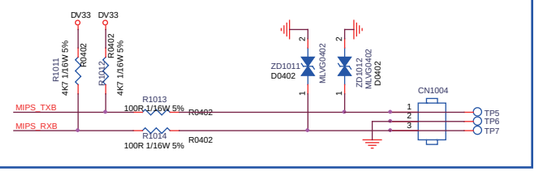
SCART Audio Input



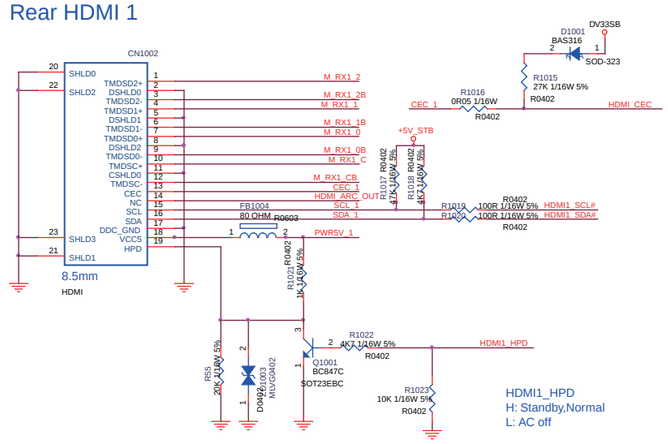
SPDIF Out



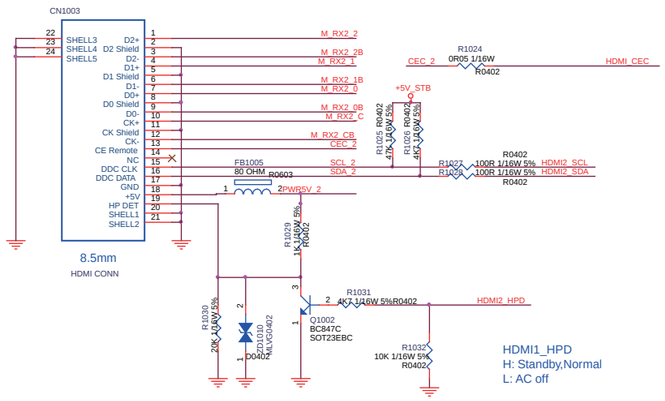
U-ART



Rear HDMI 1



Rear HDMI 2



PANEL_VCC +12V
+5V_STB
+5V_SW DV33
DV15
DV33SB PWR5V_1 PWR5V_2
GND 4,6,7,8,9,10,11,12,13,14,16,19

ADC/DAC

SC_CVBS_Y SOY1 → SC_CVBS_Y 6, SOY1 6
SCT1_B SCT1_G SCT1_R → SCT1_B 6, SCT1_G 6, SCT1_R 6

AUDIO /IF

SCART1_RIN SCART1_LIN → SCART1_RIN 6, SCART1_LIN 6

HDMI

M_RX1_2 → M_RX1_2 7
M_RX1_2B → M_RX1_2B 7
M_RX1_1 → M_RX1_1 7
M_RX1_1B → M_RX1_1B 7
M_RX1_0 → M_RX1_0 7
M_RX1_0B → M_RX1_0B 7
M_RX1_C → M_RX1_C 7
M_RX1_CB → M_RX1_CB 7
HDMI1_SDA# → HDMI1_SDA# 19
HDMI1_SCL# → HDMI1_SCL# 19
HDMI_ARC_OUT → HDMI_ARC_OUT 19
HDMI_CEC → HDMI_CEC 7
M_RX2_CB → M_RX2_CB 7
M_RX2_C → M_RX2_C 7
M_RX2_0B → M_RX2_0B 7
M_RX2_0 → M_RX2_0 7
M_RX2_1B → M_RX2_1B 7
M_RX2_1 → M_RX2_1 7
M_RX2_2B → M_RX2_2B 7
M_RX2_2 → M_RX2_2 7
HDMI2_SDA → HDMI2_SDA 7
HDMI2_SCL → HDMI2_SCL 7

GPIO

HDMI1_HPD → HDMI1_HPD 11
HDMI2_HPD → HDMI2_HPD 11

STB CONTORL

SCT1_DET → SCT1_DET 9

MIPS/UART/I2C/ICE

MIPS_TXB → MIPS_TXB 11,19
MIPS_RXB → MIPS_RXB 11,19

SPDIF

SPDIF_OUT → SPDIF_OUT 6

SCART/HDMI1/VGA INPUT	715G6079	C 2013-06-04

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130717

10-13-3 NT72567_ADC/DAC/AUDIO/SIF

BA03 NT72567_ADC/DAC/AUDIO/SIF

BA03

U4001D
NT72567BG-BA

M24 VGA_R
M25 VGA_G
M23 SOGIN1_STBC
N25 VGA_B
T22 VGA_HS_STBC
T21 VGA_VS_STBC
N23 YPBPR0_PR
P23 YPBPR0_Y
R23 SOGIN0_STBC
R25 YPBPR0_PB
K25 CVBS0
K24 TUNER_CVBSIN
L22 S_Y

B18 VCOMP — Delete
A18 FSADJ — R4001 2K2 1/16W 5% — R0402 — R4002 100R 1/16W 5% — R0402
C18 TVDAC_OUT — R4003 75 OHM +-5% 1/16W R0402 — R4004 75 OHM +-5% 1/16W R0402
K23 CVBS_OUT — CVBS_OUT — TP8

P22 SCART1_R — C63 47N16V C0402 — R4005 100R 1/16W 5% R0402 — SCT1_R
P21 SCART1_G — C64 47N16V C0402 — R4006 100R 1/16W 5% R0402 — SCT1_G
R21 SOGIN2_STBC
N22 SCART1_B — C65 47N16V C0402 — R4007 100R 1/16W 5% R0402 — SCT1_B
L23 SCART0_Y — C66 47N16V C0402 — R4008 100R 1/16W 5% R0402 — SC_CVBS_Y
K22 SCART0_FB — R4009 0R05 1/16WR0402 — SOY1

L21 ADC1VMID — C67 100N16V C0402
P20 ADC3VMID — C68 100N16V C0402

R4010 R0402 100R 1/16W 5% C69 100N16V C0402 — L24 ADC0M
R4011 R0402 100R 1/16W 5% C70 100N16V C0402 — N24 ADC1M
R4012 R0402 100R 1/16W 5% C71 100N16V C0402 — P24 ADC2M
R4013 R0402 100R 1/16W 5% C72 100N16V C0402 — R24 ADC3M

NT72567BG
ADC/DAC

U4001F
NT72567BG-BA

B23 ADIN_L0 — GPB_11/I2S_OUT_A_DATA(BS_0)
A24 ADIN_R0 — GPB_12/I2S_OUT_A_WS(BS_1)
B24 ADIN_L1 — GPB_13/I2S_OUT_A_BCLK(BS_2)
B25 ADIN_R1 — GPB_14/I2S_OUT_A_MCLK
C24 ADIN_L2
C25 ADIN_R2
D25 ADIN_L3
D24 ADIN_R3

SCART1_LIN C74 10UF 6.3V X5R +-20% C0603
SCART1_RIN C78 10UF 6.3V X5R +-20% C0603

D12 I2S_DATA — R4014 22R 1/16W 5% R0402 — I2SOUTC_DATA
F11 I2S_WS — R4015 22R 1/16W 5% R0402 — I2SOUTC_WS
E11 I2S_BCLK — R4016 47R 1/16W 5% — I2SOUTC_BCLK
G12 I2S_MCLK — R4017 47R 1/16W 5% — I2SOUTC_MCLK
BS0
BS1
BS2

Delete
C73 NC/22PF 50V C0402 — NC
C77 22PF 50V C0402

H16 I2SIN_DATA
G16 I2SIN_WS
H15 I2SIN_BCLK
G15 I2SIN_MCLK
W7 SPDIF_IN
W8 SPDIF_OUT — SPDIF_OUT
H23 SIF_IN+
H24 SIF_IN-
H22 Tuner RF AGC/GPA_16
J23 Tuner IF AGC/GPA_15
F25 RFAGC_VSYNC/GPA_14 — IFAGC_SW — R0402
G24 DEMOD_D+ — DEMOD_D+
G23 DEMOD_D- — DEMOD_D-

NT72567BG
AUDIO/IF

C20 DAOUT_L0
B20 DAOUT_R0
A21 DAOUT_L1
B21 DAOUT_R1
B22 AUD_VRM
A23 AUD_VRP
C21 AUD_VCM
A22 AUD_VCMI

AUOUT_L1 — R4019 470R 1/16W 5%
AUOUT_R1 — R4018 470R 1/16W 5%
C4022 3.3NF 50V
C4023 3.3NF 50V

2.2UF 16V C0603 C85
100N16V C0402 C86
2.2UF C0402 C87
100N16V C0603 C88
100N16V C0402 C89
2.2UF C0603 C90
100N16V C0402

FB10 120R L0603

R4023 R0402 NC/1KOHM +-1% 1/16W — NC
R4024 R0402 NC/1KOHM +-1% 1/16W — NC

R4020 1K 1/16W 5% R0402 — DV33
R4021 10K 1/16W 5% R0402 — IF_AGC
IF_AGC_1
C79 100N16V C0402
R4022 100R 1/16W 5%

DEMOD_D+ — C82 C0402 100N16V — DEMOD_D2+ — R4025 0R05 1/16W R0402 — TUN_DIF+
C91 NC/100N16V C0402 — NC
C83 NC/150pF 16V C0402 — NC
DEMOD_D- — C84 C0402 100N16V — DEMOD_D2- — R4026 0R05 1/16W R0402 — TUN_DIF-

HS1
NC/2k13 Big HEAT SINK
1
2
NC

PANEL_VCC 4,7
+12V 4,14,16
+5V_STB 4,5,19
+5V_SW 4,8,11,16,19
DV33 4,5,7,9,11,12,13,14,16
DV11 4,12
DV15 4,10
DV33SB 4,5,9,12,13
PWR5V_1 5,7
GND 4,5,7,8,9,10,11,12,13,14,16,19

ADC/DAC
SCT1_R 5
SCT1_G 5
SCT1_B 5
SC_CVBS_Y 5
SOY1 5

AUDIO /IF
IF_AGC 16
TUN_DIF+ 16
TUN_DIF- 16
IFAGC_SW 16
I2SOUTC_DATA 14
I2SOUTC_WS 14
I2SOUTC_BCLK 14
I2SOUTC_MCLK 14
AUOUT_L1 14
AUOUT_R1 14
SCART1_LIN 5
SCART1_RIN 5

BootStrap Optoin
BS0 9
BS1 9
BS2 9

SPDIF OUT
SPDIF_OUT 5

NT72567_ADC/DAC/AUDIO/SIF	715G6079	C 2013-06-04

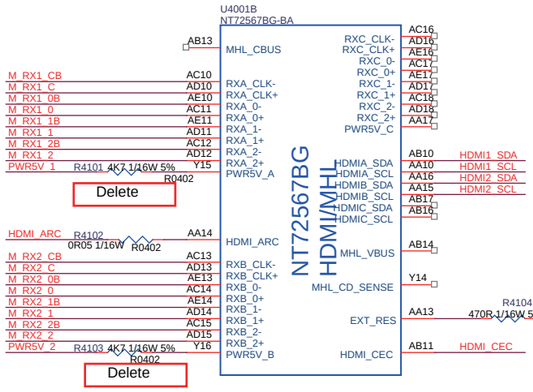
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130717

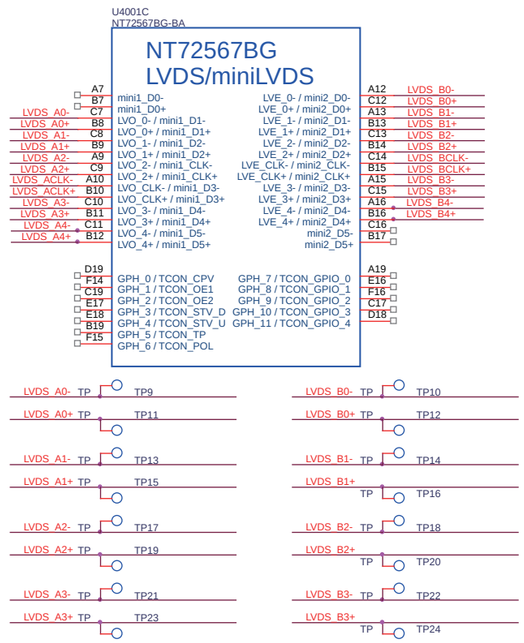
10-13-4 NT72567_HDMI/LVDS OUT

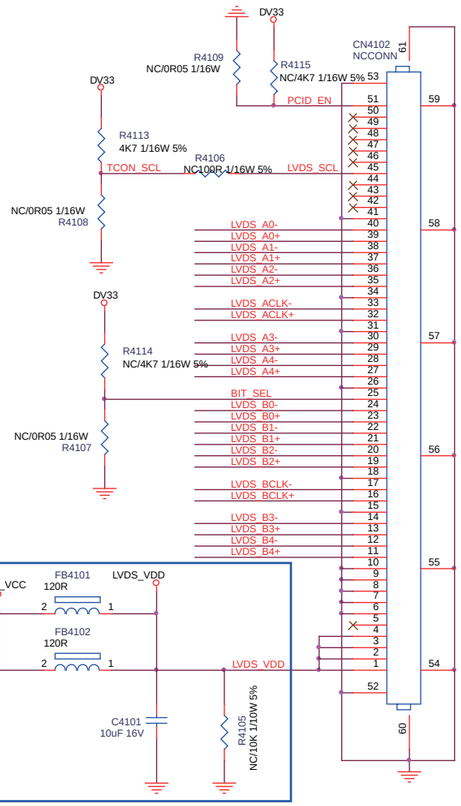
BA04 NT72567_HDMI/LVDS OUT

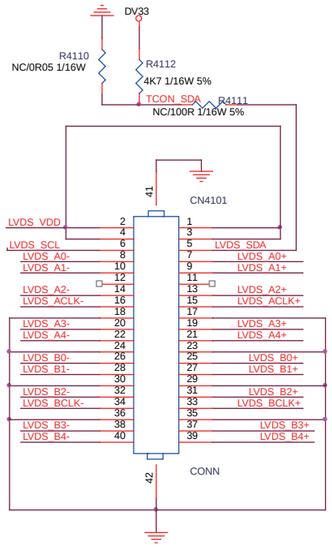
BA04

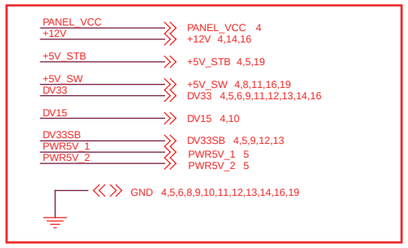
LVDS OUTPUT

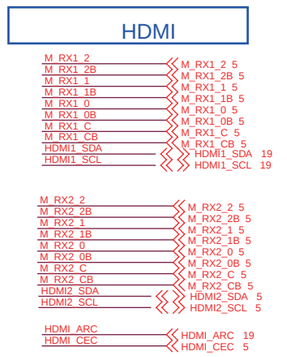














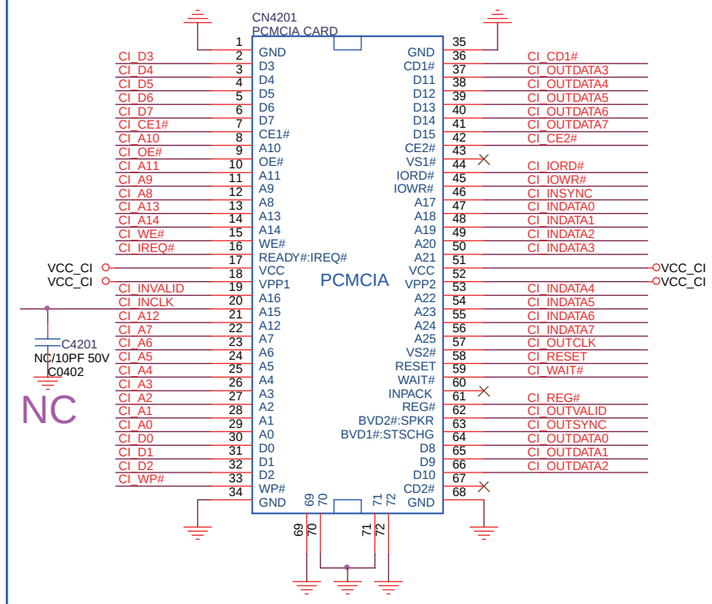
NT72567_HDMI/LVDS OUT	715G6079	C 2013-06-04

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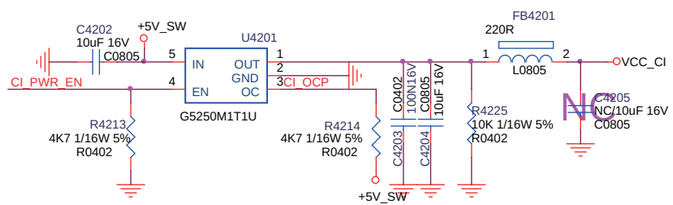
BA05 NT72567_CI

BA05

PCMCIA Slot



CI Bus Power Control



CI_OUTDATA2 — CI_OUTDATA_2
CI_D2 R4215 22R 1/16W 5%R0402 CI_D_2
CI_D1 R4216 22R 1/16W 5%R0402 CI_D_1

CI_OUTDATA1 — CI_OUTDATA_1
CI_D0 R4217 22R 1/16W 5%R0402 CI_D_0
CI_A0 — CI_A_0
CI_OUTDATA0 — CI_OUTDATA_0

CI_A1 — CI_A_1
CI_A2 — CI_A_2
CI_A3 — CI_A_3
CI_A4 — CI_A_4

CI_A5 — CI_A_5
CI_INDATA7 R4218 0R05 OHM CI_INDATA_7
CI_A6 — CI_A_6
CI_A7 — CI_A_7

CI_INDATA6 R4219 0R05 OHM CI_INDATA_6
CI_A12 — CI_A_12
CI_INDATA5 R4220 0R05 OHM CI_INDATA_5
CI_INDATA4 R4221 0R05 OHM CI_INDATA_4

CI_INDATA3 R4222 0R05 OHM CI_INDATA_3
CI_INDATA2 R4223 0R05 OHM CI_INDATA_2
CI_INDATA1 R4224 0R05 OHM CI_INDATA_1
CI_A14 — CI_A_14

CI_A13 — CI_A_13
CI_INDATA0 R4201 0R05 OHM CI_INDATA_0
CI_A8 — CI_A_8
CI_A9 — CI_A_9

CI_A11 — CI_A_11
CI_A10 — CI_A_10
CI_OUTDATA7 — CI_OUTDATA_7
CI_OUTDATA6 — CI_OUTDATA_6

CI_D7 R4202 22R 1/16W 5%R0402 CI_D_7
CI_D6 R4203 22R 1/16W 5%R0402 CI_D_6
CI_OUTDATA5 — CI_OUTDATA_5
CI_D5 R4204 22R 1/16W 5%R0402 CI_D_5

CI_D4 R4205 22R 1/16W 5%R0402 CI_D_4
CI_OUTDATA4 — CI_OUTDATA_4
CI_D3 R4206 22R 1/16W 5%R0402 CI_D_3
CI_OUTDATA3 — CI_OUTDATA_3

VCC_CI
R4207 10K 1/16W 5% R0402 — CI_CD1#
R4208 10K 1/16W 5% R0402 — CI_CE2#
R4209 10K 1/16W 5% R0402 — CI_WP#
R4210 10K 1/16W 5% R0402 — CI_IREQ#
R4211 10K 1/16W 5% R0402 — CI_RESET
R4212 10K 1/16W 5% R0402 — CI_WAIT#

BA05

+5V_STB — +5V_STB 4,5,19
+5V_SW — +5V_SW 4,11,16,19
DV33 — DV33 4,5,6,7,9,11,12,13,14,16
DV15 — DV15 4,10
DV11 — DV11 4,12
DV33SB — DV33SB 4,5,9,12,13
GND 4,5,6,7,9,10,11,12,13,14,16,19

GPIO

CI_PWR_EN — CI_PWR_EN 11

CI_INCLK — CI_INCLK 16
CI_INVALID — CI_INVALID 16
CI_INSYNC — CI_INSYNC 16
CI_INDATA7 — CI_INDATA7 16
CI_INDATA6 — CI_INDATA6 16
CI_INDATA5 — CI_INDATA5 16
CI_INDATA4 — CI_INDATA4 16
CI_INDATA3 — CI_INDATA3 16
CI_INDATA2 — CI_INDATA2 16
CI_INDATA1 — CI_INDATA1 16
CI_INDATA0 — CI_INDATA0 16

U4001G — NT72567BG-BA

CI_A_0 G5 — CI_A0/ALE0
CI_A_1 G4 — CI_A1/ALE8
CI_A_2 G3 — CI_A2
CI_A_3 G2 — CI_A3
CI_A_4 H6 — CI_A4
CI_A_5 H5 — CI_A5
CI_A_6 H4 — CI_A6
CI_A_7 H3 — CI_A7
CI_A_8 H2 — CI_A8
CI_A_9 L4 — CI_A9
CI_A_10 J6 — CI_A10/Tensilica_TCK
CI_A_11 J5 — CI_A11/Tensilica_TMS
CI_A_12 K4 — CI_A12/Tensilica_TDO
CI_A_13 K5 — CI_A13/Tensilica_TDI
CI_A_14 K6 — CI_A14/Tensilica_TRST

CI_D_0 D5 — CI_AD0
CI_D_1 D4 — CI_AD1
CI_D_2 D3 — CI_AD2
CI_D_3 D2 — CI_AD3
CI_D_4 D1 — CI_AD4
CI_D_5 E6 — CI_AD5
CI_D_6 E5 — CI_AD6
CI_D_7 E4 — CI_AD7

CI_RESET E3 — CI_RST#/GPC_19
CI_CD1# E2 — CI_CD#/GPC_20
CI_CE1# E1 — CI_CE#/GPC_21
CI_IREQ# F6 — CI_IOINT#/GPC_22
CI_OE# F3 — CI_HRD#/GPC_25
CI_WE# F2 — CI_HWR#/GPC_26
CI_REG# F1 — CI_REG#/GPC_27
CI_WAIT# G6 — CI_HWAIT#/GPC_28
CI_IORD# F5 — CI_IORD#/GPC_23
CI_IOWR# F4 — CI_IOWR#/GPC_24

NT72567BG
CI/TS

STSIN0_CLK/GPB_15 F10
STSIN0_VALID/GPB_16 E10
STSIN0_START/GPB_17 D10
STSIN0_DATA/GPB_18 F9
PTSIN1/STSIN0_ERROR/GPB_19 E9
PTSIN1/STSIN1_CLK/GPB_20 D9
PTSIN1/STSIN1_VALID/GPB_21 F8
PTSIN1/STSIN1_START/GPB_22 E8

PTSIN1_D0/STSIN1_DATA F7 — CI_OUTDATA_0
PTSIN1_D1 E7 — CI_OUTDATA_1
PTSIN1_D2 D7 — CI_OUTDATA_2
PTSIN1_D3 B6 — CI_OUTDATA_3
PTSIN1_D4 A6 — CI_OUTDATA_4
PTSIN1_D5 A4 — CI_OUTDATA_5
PTSIN1_D6 A3 — CI_OUTDATA_6
PTSIN1_D7 A2 — CI_OUTDATA_7

PTSIN2/DEMODOUT_ERROR B5
PTSOUT/PTSIN2/DEMODOUT/STSOUT_CLK B4 — R4226 47 OHM 1/16W — CI_INCLK
PTSOUT/PTSIN2/DEMODOUT/STSOUT_VALID B3 — R4227 22 OHM 1/16W — CI_INVALID
PTSOUT/PTSIN2/DEMODOUT/STSOUT_START B2 — R4228 22 OHM 1/16W — CI_INSYNC

PTSOUT/PTSIN2/DEMODOUT_D0 B1 — CI_INDATA_0
PTSOUT/PTSIN2/DEMODOUT_D1 C6 — CI_INDATA_1
PTSOUT/PTSIN2/DEMODOUT_D2 C5 — CI_INDATA_2
PTSOUT/PTSIN2/DEMODOUT_D3 C4 — CI_INDATA_3
PTSOUT/PTSIN2/DEMODOUT_D4 C3 — CI_INDATA_4
PTSOUT/PTSIN2/DEMODOUT_D5 C2 — CI_INDATA_5
PTSOUT/PTSIN2/DEMODOUT_D6 C1 — CI_INDATA_6
PTSOUT/PTSIN2/DEMODOUT_D7 D6 — CI_INDATA_7

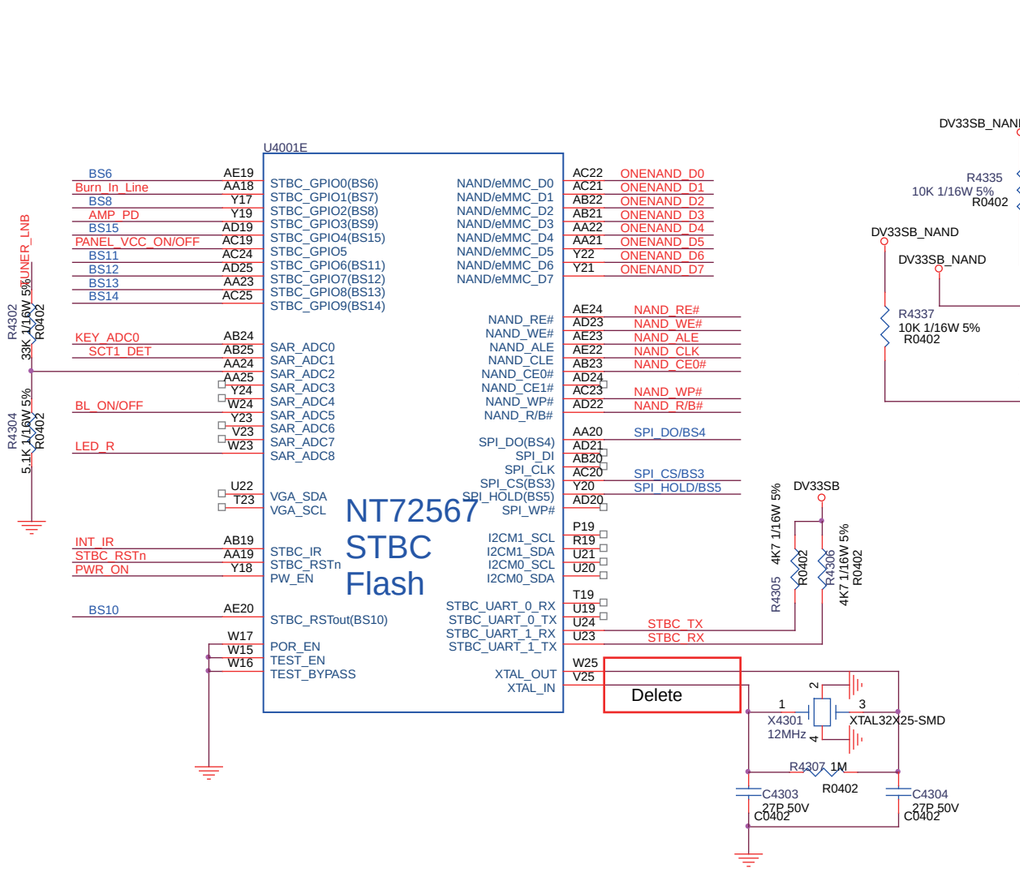
C4206 NC/10PF 50V C0402 NC
FB4202 1 2 30R CI_OUTCLK
CI_OUTVALID
CI_OUTSYNC

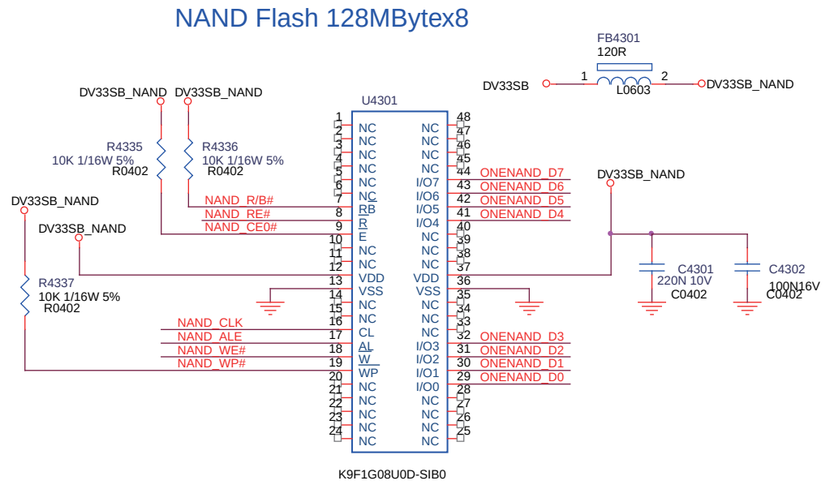
NT72567_CI	715G6079	C 2013-06-04

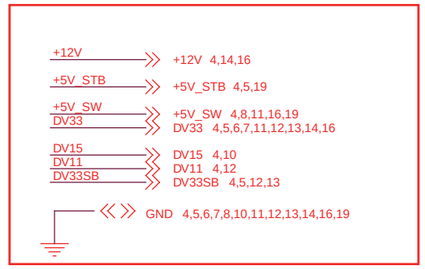
19530_510_130719.eps
130719

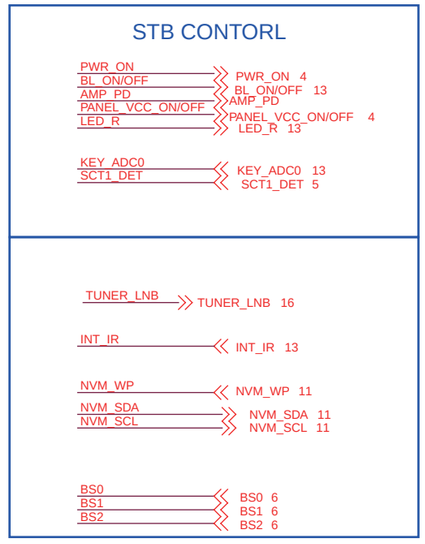
BA06 NT72567_STBC/FLASH

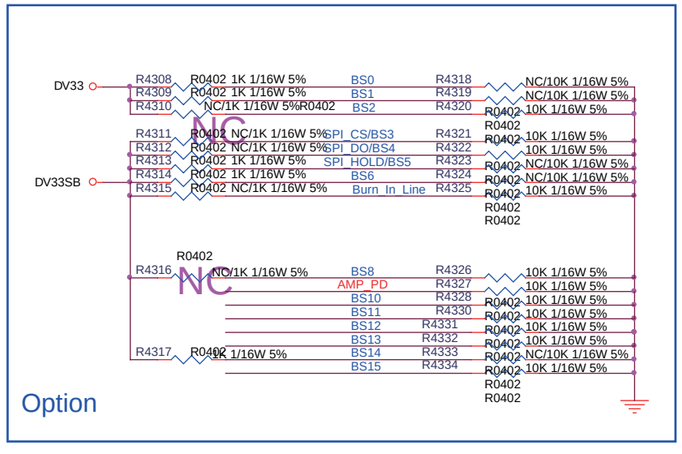
BA06

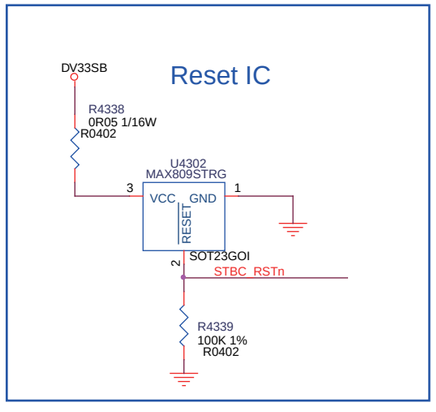


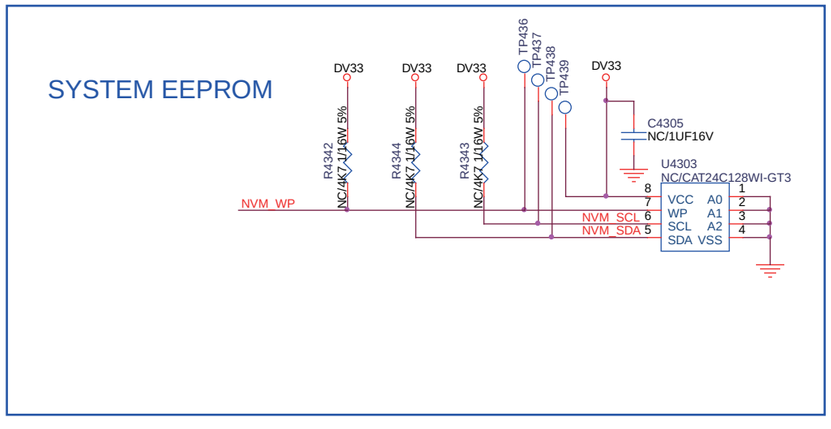












NT72567_STBC/FLASH	715G6079	C 2013-06-04

19530_511_130719.eps
130719

BA07 NT72567_DDR

BA07

U4001A
NT72567BG-BA

NT72567BG DDR

DDR_MA0	AE5	MA0	DDR_DQL0	K2	DDRA_DQL0
DDR_MA1	AC3	MA1	DDR_DQL1	V3	DDRA_DQL1
DDR_MA2	AD7	MA2	DDR_DQL2	K3	DDRA_DQL2
DDR_MA3	AC8	MA3	DDR_DQL3	V1	DDRA_DQL3
DDR_MA4	AB3	MA4	DDR_DQL4	J3	DDRA_DQL4
DDR_MA5	AE7	MA5	DDR_DQL5	W2	DDRA_DQL5
DDR_MA6	AC2	MA6	DDR_DQL6	J1	DDRA_DQL6
DDR_MA7	AC7	MA7	DDR_DQL7	W3	DDRA_DQL7
DDR_MA8	AC1	MA8			
DDR_MA9	AC6	MA9	DDR_DQU0	T2	DDRA_DQU0
DDR_MA10	AA2	MA10	DDR_DQU1	M3	DDRA_DQU1
DDR_MA11	AD2	MA11	DDR_DQU2	U3	DDRA_DQU2
DDR_MA12	AB2	MA12	DDR_DQU3	L1	DDRA_DQU3
DDR_MA13	AD5	MA13	DDR_DQU4	R1	DDRA_DQU4
DDR_MA14	AD1	MA14	DDR_DQU5	M1	DDRA_DQU5
			DDR_DQU6	R2	DDRA_DQU6
			DDR_DQU7	M2	DDRA_DQU7
DDR_BA0	AE4	MBA0			
DDR_BA1	AA3	MBA1			
DDR_BA2	AC5	MBA2			
			DDR_DQSL	N2	DDRA_DQSL
			DDR_DQSL#	P3	DDRA_DQSLn
DDR_WEn	AD4	MWE#	DDR_DQSU	P2	DDRA_DQSU
DDR_CASn	AE2	MCAS#	DDR_DQSU#	P1	DDRA_DQSUn
DDR_RASn	AD3	MRAS#			
DDR_MCKE	AA1	MCKE			
DDR_ODT	AB7	MODT			
			DDR_DML	U2	DDRA_DML
			DDR_DMU	L2	DDRA_DMU
DDR_CLKAn	Y1	MCLK#			
DDR_CLKA	Y2	MCLK			
DDR_CSn	AE3	MCS			
DDR_RSTn	AD6	MRST	MVREF	P4	

Del TP431

R4401 1KOHM +-1% 1/16W R0402 DDR1V5

C4401 100N16V C0402

C4402 1N 50V C0402

R4402 1KOHM +-1% 1/16W R0402

DDR_CLKAn — R4403 75R — DDR_CLKA

DDR1V5 — FB4401 30R (1 — 2) — DV15

100N16V C0402: C4420, C4405, C4406, C4407, C4408, C4409, C4410, C4412, C4411, C4413, C4414, C4416, C4415

4.7UF 6.3V C0603: C4419, C4417

C4418 10uF C0805

DDR3#1 — DDR3 128MBx16Bits /1.3GHz

U4401
K4B1G1646G-BCH9

DDRA_DQL0	E3	DQL0	A0	N3	DDR_MA0
DDRA_DQL1	F7	DQL1	A1	P7	DDR_MA1
DDRA_DQL2	F2	DQL2	A2	P3	DDR_MA2
DDRA_DQL3	F8	DQL3	A3	N2	DDR_MA3
DDRA_DQL4	H3	DQL4	A4	P8	DDR_MA4
DDRA_DQL5	H8	DQL5	A5	P2	DDR_MA5
DDRA_DQL6	G2	DQL6	A6	R8	DDR_MA6
DDRA_DQL7	H7	DQL7	A7	R2	DDR_MA7
DDRA_DQU0	D7	DQU0	A8	T8	DDR_MA8
DDRA_DQU1	C3	DQU1	A9	R3	DDR_MA9
DDRA_DQU2	C8	DQU2	A10/AP	L7	DDR_MA10
DDRA_DQU3	C2	DQU3	A11	R7	DDR_MA11
DDRA_DQU4	A7	DQU4	A12/BC#	N7	DDR_MA12
DDRA_DQU5	A2	DQU5	NC	T3	DDR_MA13
DDRA_DQU6	B8	DQU6		J1	
DDRA_DQU7	A3	DQU7	NC_0	J9	
			NC_1	L1	
DDRA_DQSU	C7		NC_2	L9	
DDRA_DQSUn	B7	UDQS	NC_3	M7	
DDRA_DQSL	F3	UDQS#	NC_4	T7	DDR_MA14
DDRA_DQSLn	G3	LDQS	NC_6		
DDRA_DMU	D3	LDQS#		M2	DDR_BA0
DDRA_DML	E7	UDM	BA0	N8	DDR_BA1
		LDM	BA1	M3	DDR_BA2
			BA2	J7	DDR_CLKA
DDR_RSTn	T2		CK	K7	DDR_CLKAn
		RESET#	CK#	L2	DDR_CSn
	L8		CS#	K3	DDR_CASn
		ZQ	CAS#	K1	DDR_ODT
			ODT	J3	DDR_RASn
			RAS#	L3	DDR_WEn
			WE#	K9	DDR_MCKE
			CKE		

VDDQ_0 A1, VDDQ_1 A8, VDDQ_2 C1, VDDQ_3 C9, VDDQ_4 D2, VDDQ_5 E9, VDDQ_6 F1, VDDQ_7 H2, VDDQ_8 H9

VSSQ_0 B1, VSSQ_1 B9, VSSQ_2 D1, VSSQ_3 D8, VSSQ_4 E2, VSSQ_5 E8, VSSQ_6 F9, VSSQ_7 G1, VSSQ_8 G9

VDD_0 B2, VDD_1 D9, VDD_2 G7, VDD_3 K2, VDD_4 K8, VDD_5 N1, VDD_6 N9, VDD_8 R9, VDD_7 R1

VSS_0 A9, VSS_1 B3, VSS_2 E1, VSS_3 G8, VSS_4 J2, VSS_5 J8, VSS_6 M1, VSS_7 M9, VSS_8 P1, VSS_9 P9, VSS_10 T1, VSS_11 T9

VREFDQ H1, VREFCA M8

FBGA-96-7_5X13_3

R4404 240 OHM +-1% 1/16W R0402 DDR1V5

New

R4409 300R 1/16W 1% R0402

DDR1V5 — R4405 1KOHM +-1% 1/16W R0402 — R4406 1KOHM +-1% 1/16W R0402 — C4403 100N16V C0402

DDR1V5 — R4407 1KOHM +-1% 1/16W R0402 — R4408 1KOHM +-1% 1/16W R0402 — C4404 100N16V C0402

+12V — +12V 4,14,16

+5V_STB — +5V_STB 4,5,19

+5V_SW — +5V_SW 4,8,11,16,19

DV33 — DV33 4,5,6,7,9,11,12,13,14,16

DV15 — DV15 4

DDR1V5 — DDR1V5 12

DV11 — DV11 4,12

DV33SB — DV33SB 4,5,9,12,13

GND 4,5,6,7,8,9,11,12,13,14,16,19

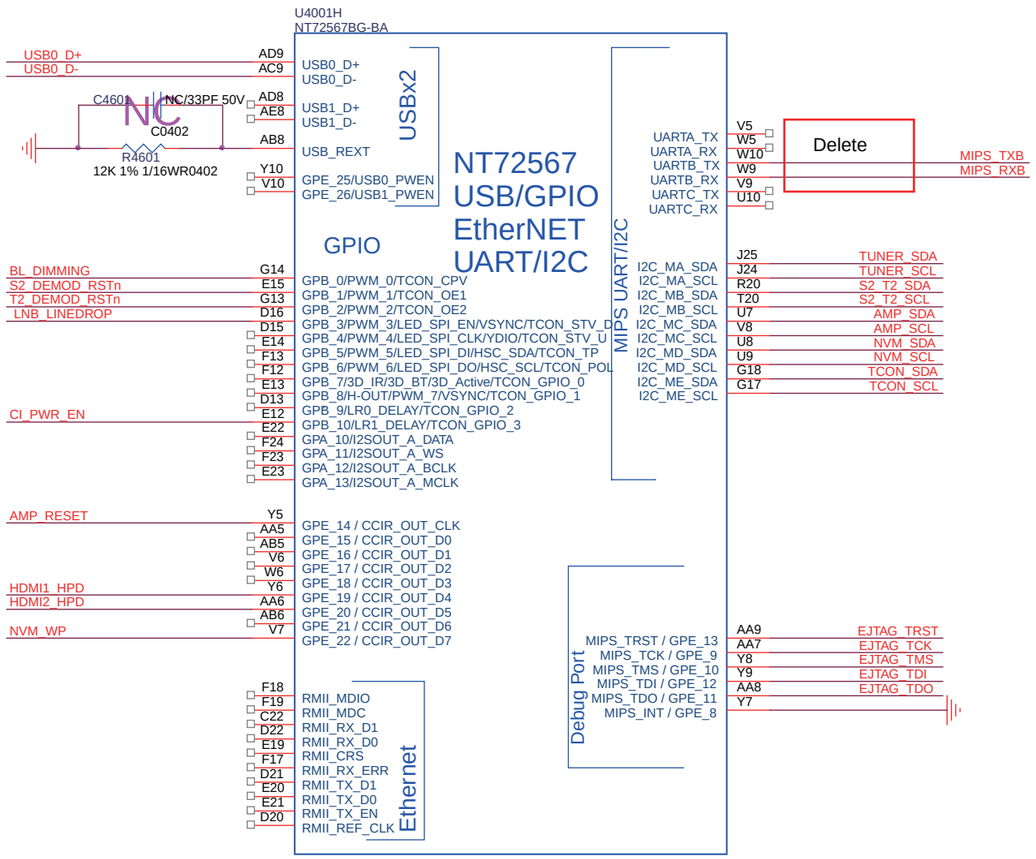
1st	56G 615151	k4B1G1646E-BCH9 1Gb fbga-96	Samsung
2nd	56G 615145	H5TQ1G63DFR--H9C 1Gb wbga-96	Hynix

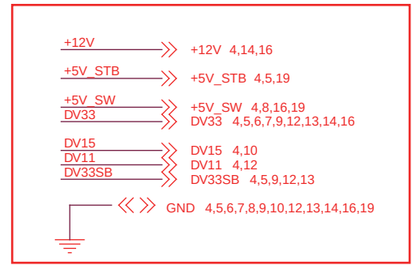
NT72567_DDR	715G6079	C 2013-06-04

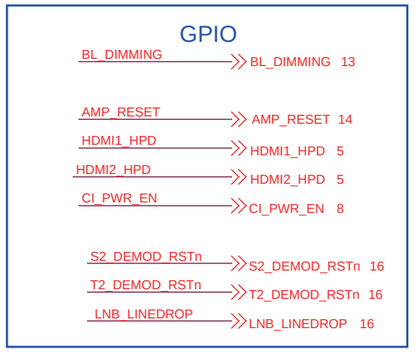
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130719

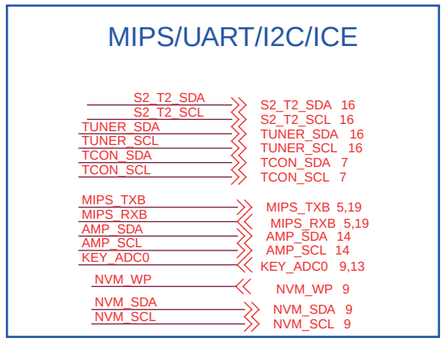
BA08 NT72567_USB/GPIO

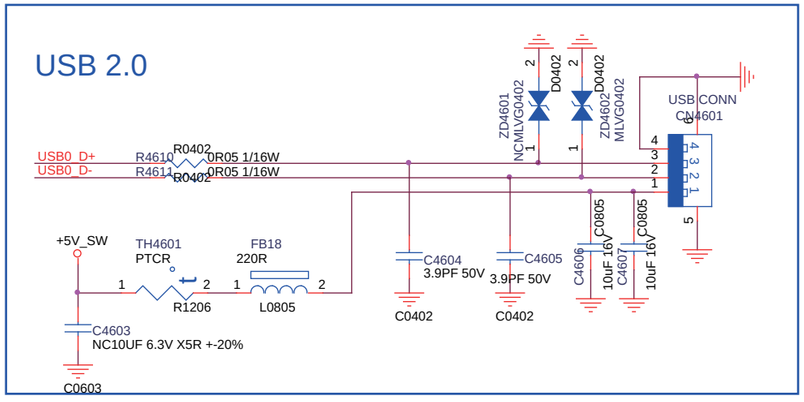
BA08

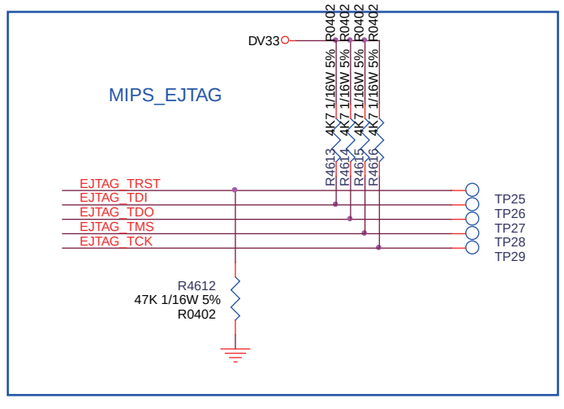












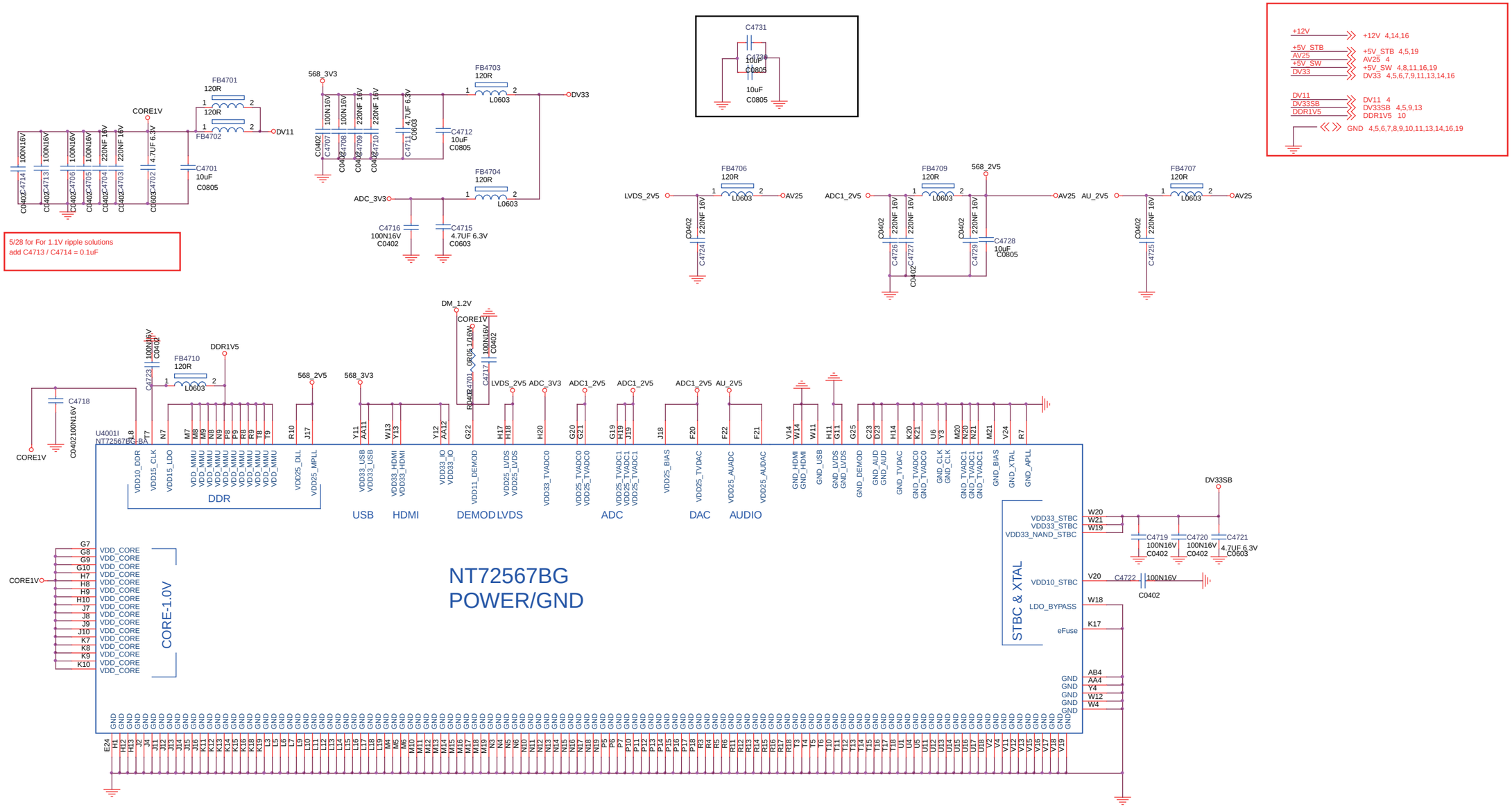
NT72567_USB/GPIO	715G6079	© 2013-06-04

19530_513_130719.eps
130719

10-13-9 NT72567_POWER

BA09 NT72567_POWER

BA09

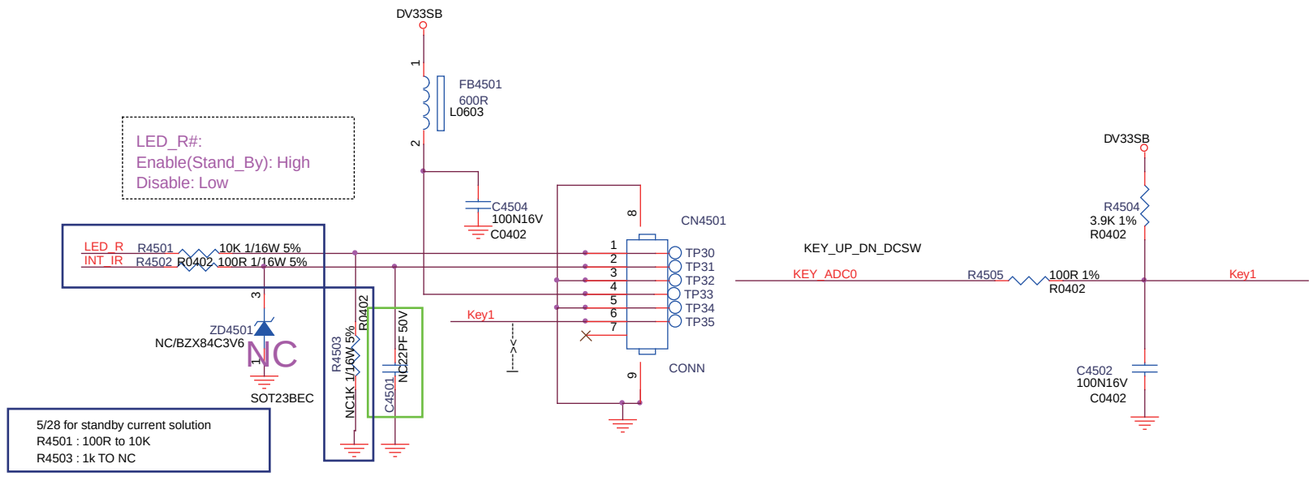


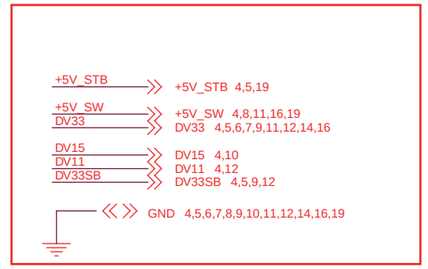
NT72567_POWER	715G6079	c 2013-06-04

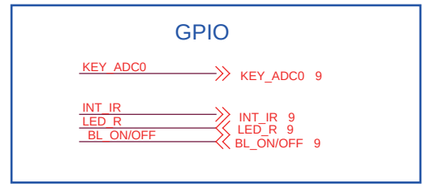
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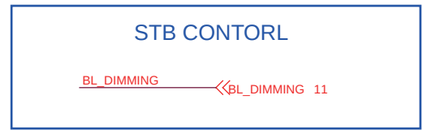
BA10 IR/KEY

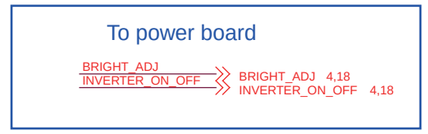
BA10



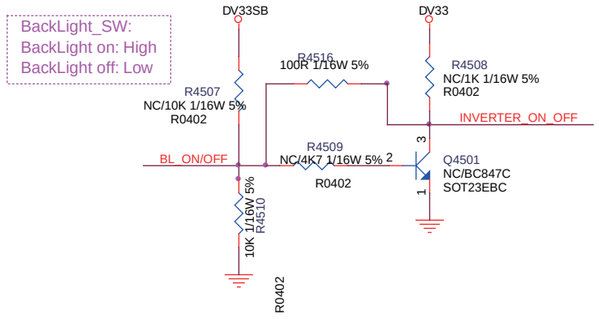




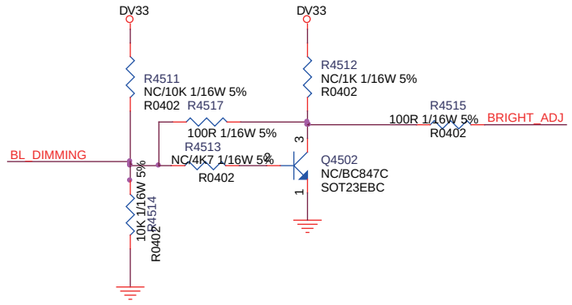




Backlight ON/OFF Control



Backlight Brightness Control



IR/KEY	715G6079	C 2013-06-04

19530_515_130719.eps
130719

10-13-11 SPEAKER AMPLIFER/HEADPHONE OUT

BA11 SPEAKER AMPLIFER/HEADPHONE OUT

BA11

Main Speak CKT

I2SOUTC_MCLK MCLK
I2SOUTC_BCLK BICKI
I2SOUTC_WS LRCLKI
I2SOUTC_DATA SDI

AUD_V33 R601 NC/4K7 1/16W 5% R0402 AMP_RESET_1 R602 100R 1/16W 5% R0402 AMP_RESET
AMP_RESET: Normal : High Reset : Low
NC C602 NC/1uF 10V C0402

+12V FB603 120R PVDD
FB604 120R
EC63 100uF 35V C601

+12V +12V 4,16
+5V_STB +5V_STB 4,5,19
+5V_SW DV33 +5V_SW 4,8,11,16,19 DV33 4,5,6,7,9,11,12,13,16
DV15 DV11 DV33SB DV15 4,10 DV11 4,12 DV33SB 4,5,9,12,13
GND 4,5,6,7,8,9,10,11,12,13,16,19

MIPS/UART/I2C/ICE
AMP_SDA AMP_SDA 11 AMP_SCL 11
GPIO
AMP_RESET AMP_RESET 11
STB CONTORL
AMP_PD AMP_PD 9

AUDIO /IF
I2SOUTC_DATA I2SOUTC_DATA 6
I2SOUTC_WS I2SOUTC_WS 6
I2SOUTC_BCLK I2SOUTC_BCLK 6
I2SOUTC_MCLK I2SOUTC_MCLK 6
AUOUT_L1 AUOUT_L1 6
AUOUT_R1 AUOUT_R1 6

AUOUT_L1 C674 1uF 10V R635 16K 1% R637 43K 1/16W C669 330PF 50V R661 18Kohm 1/16W +/-1% C675 68PF 50V
HPOUTL R643 10R 1/10W 5%
AUOUT_R1 C670 1uF 10V R636 16K 1% R662 43K 1/16W C652 330PF 50V R663 18Kohm 1/16W +/-1% C671 68PF 50V
HPOUTR R644 10R 1/10W 5%

HPOUTL HPOUTR CN604 PHONE JACK
C639 0.1uF 50V C640 0.1uF 50V
Close to STA381within 200mil

DV33 FB601 120R L0603 AUD_V33HP C603 4.7uF 10V C0805 A_GND
DV33 FB602 120R L0603 AUD_V33 C604 4.7uF 10V C0805 A_GND

Sound R/L CKT

AUD_V33HP C633 100NF 16V C0402
C635 1uF 10V C0402 A_GND
C634 1uF 10V C0402 A_GND
C636 1uF 10V C0402 A_GND
C677 NC/1uF 10V C676 NC/1uF 10V
C660 1uF 10V A_GND

U601 STA381BWTR

24	23	22	21	20	19	18	17	16	15	14	13	25	26	27	28	29	30	31	32	33	34	35	36
CPM	CPVSS	VDD3V3	SOFTMUTE	GNDA	LINEHPOUT_R	LINEHPOUT_L	LINEINR	LINEINL	F3XR	F3XL	F3X_FILT	GNDPSUB	CPP	VDD3V3CHP	VDDIG1	GNDDIG1	FFX3A	FFX3B	EAPD/FFX4B	TWARN/FFX4A	VREGFILT	AGNDPLL	MCLK

PWRDN-HP

A_GND C616 NC/0.1uF 50V C0603
GND_REG C615 0.1uF 50V C0603
VDD_REG
OUT1A
GND1 C613 0.1uF 50V C0603
VCC1 C614 C0805 1UF 50V PVDD
OUT1B
OUT2A
VCC2 C611 0.1uF 50V C0603 C612 C0805 1UF 50V
GND2
OUT2B
VSS_REG C610 0.1uF 50V C0603
VCC_REG

L601 33UH R613 22 OHM 1/4W R1206 C618 0.1uF 25V C0402 C619 0.1uF 25V C0402 R615 8.2 OHM 1/4W R1206 C617 330PF 50V C0402
L602 33UH C622 0.1uF 25V C0402 C623 0.1uF 25V C0402 R614 8.2 OHM 1/4W R1206
L603 33UH R610 22 OHM 1/4W R1206 C626 0.1uF 25V C0402 C627 0.1uF 25V C0402 R611 8.2 OHM 1/4W R1206 C625 330PF 50V C0402
L604 33UH C631 0.1uF 25V C0402 C632 0.1uF 25V C0402 R612 8.2 OHM 1/4W R1206
C0805 220PF50V C0805 220PF50V
R288 =>R8112

LR SPK
C621 1nF 50V C0402 C624 1nF 50V C0402 C629 C0402 1nF 50V C630 1nF 50V C0402
LSPK+ LSPK- RSPK+ RSPK- CN601 CONN

AUD_V33HP C605 100NF 16V C0402
AUD_V33 C606 100NF 16V C0402
C607 2.2uF C0805
R616 MCLK R0402 100R 1/16W 5%
C637 NC/1nF 50V C0402 C637 FOR EMI Solu.
R617 BICKI R0402 100R 1/16W 5% C638 NC/1nF 50V C0402
C608 1nF 50V C0402
C609 C0402 100NF 16V AUD_V33
R606 100R 1/16W 5% R0402 I2C R607 100R 1/16W 5% R0402
AMP_SDA AMP_SCL
I2S Input

DV33 R608 4K7 1/16W 5% R0402 R609 4K7 1/16W 5% R0402

Mute CKT

DV33 R652 10K 1/16W 5% R648 0R05 1/16W PWRDN Q632 BC847BW
R653 0R05 1/16W
+5V_STB R654 4K7 1/10W 5%
DV33 R655 22R 1/10W 5% Q631 BC857BW R657 1K 1/16W 5%
R659 NC/0R05 1/10W
R658 NC/100K 1/16W 5%
DV33 R666 10K 1/16W 5% R667 0R05 1/16W PWRDN-HP Q633 BC847BW
Anti-Pop CKT

R605 0R05 1/10W A_GND
Ground in bottom side need connector it togother, heat sink is also.

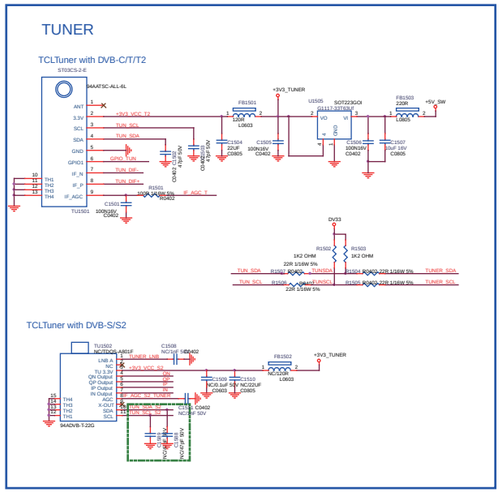
SPEAKER AMPLIFER/ HEADPHONE OUT	715G6079	c 2013-06-04

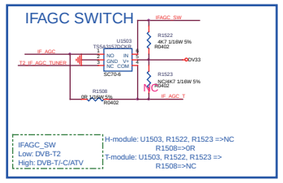
19530_516_130719.eps
130719

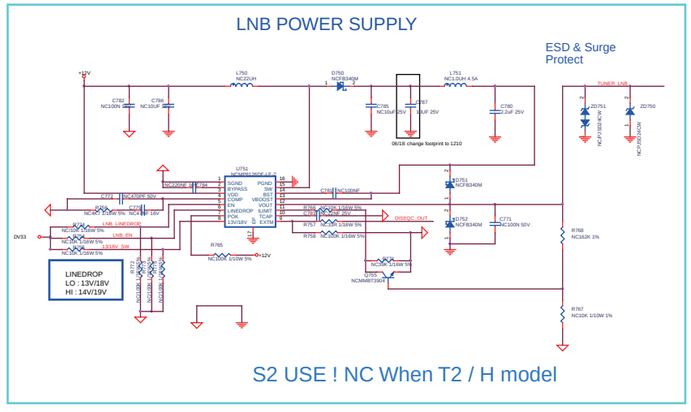
10-13-12 T2/S2 TUNER/DEMOD

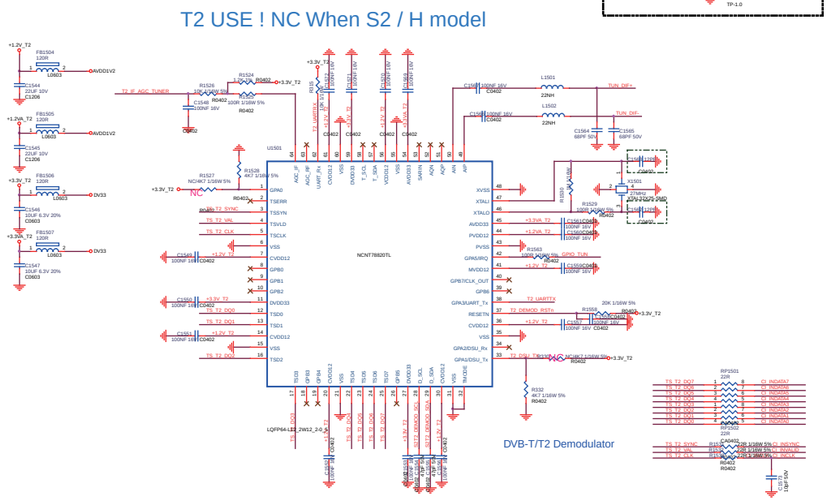
BA12 T2/S2 TUNER/DEMOD

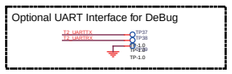
BA12

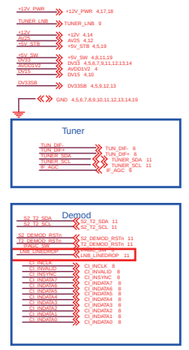


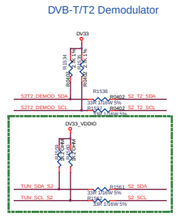


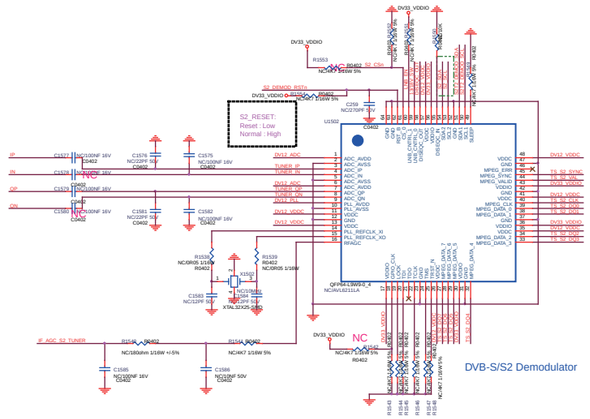


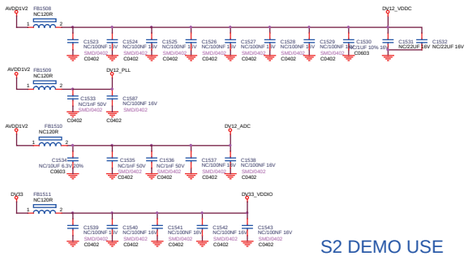












T2/S2 TUNER/DOMOD	715G6079	c 2013-06-04

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130719

10-13-13 AC POWER

BA13 AC POWER

BA13

C9101,C9102
32" use 47uF/450V=367G215X470PKZ002S
39" use 56uF/450V=367G215X560PKZ000S

BD9101 TS10KL80
GND_ACPOWER
C9101 56UF 450V
C9102 56UF 450V
ZD9104 NC
ZD9103 P6KE180A
HOT
COLD
T9101 POWER X'FMR
SR-EMI
4,9,14,16 +12V_PWR +12V_PWR
GND 5,6,7,8,9,10,11,12,13,14,16,17,19 GND_AC GND_AC 17,18,04

C9906 470pF 250V
FB9903 BEAD
FB9904 BEAD
SG9901 DSPL-501N-A21F
L9901 18MH
C9902 470NF 275V
R9132 1.5M 1/2W
C9907 470pF 250V
L9902 0.25mH
FB9901 BEAD
FB9902 BEAD
NR9901 1.5R
F9901 FUSE
CN9901 AC SOCKET
R9130 0 OHM 1/4W
R9131 0 OHM 1/4W

R9101 10K 1/4W
R9102 10K 1/4W
R9103 10K 1/4W
C9103 1.5NF
R9104 NC
R9105 NC
R9106 NC
R9107 NC
ZD9101 BZT52-B22
ZD9102 BZT52-B22
D9103 FR107G-A0
FB9906 BEAD
D9102 NC
R9109 NC
R9111 22 OHM 1/8W
Q9101 TK13A65U
R9123 4.7 OHM
R9108 4.7 OHM
C9104 10PF
FB_1
IC9101 LD7752B
R9114 10K 1/10W 5%
R9113 0 OHM 1/8W
D9105 FR107
C9111 0.22uF 50V
C9107 47UF 50V
R9115 NC
C9110 220NF 25V
C9109 NC 50V
C9108 470P 50V
R9110 470R
R9116 0.24R 5%

C9130 100NF 50V
IC9104 SP6018S8RGB
R9142 33K 1/10W 1%
C9131 68P 50V
C9132 100NF 50V
C9133 100P 50V
C9134 10UF 50V
R9146 5.1KOHM +5% 1/10W
R9148 0 OHM 1/8W
D9106 SS1060FL
Q9103 NC
Q9104 NC
R9145 10 OHM 1/8W
Q9102 AOB298L
D9108 SK510C
R9117 10K 1/10W 5%
R9112 47 OHM 1/4W
R9118 47 OHM 1/4W
R9119 47 OHM 1/4W
R9120 47 OHM 1/4W
R9128 47 OHM 1/4W
R9129 47 OHM 1/4W
C9135 1NF 500V
C9136 1NF 500V
R9144 18K 1/8W 5%
R9143 5K1 +-5% 1/8W
SYNC

L9102 3.5uH
C9128 470UF 25V
C9113 470UF 25V
C9129 470UF 25V
C9114 1uF
C9123 470UF 25V

C9128,C9113.C9129
32" use 470uF/25V=067G 5154714HT
39" use 100uF/25V=067G204V101 4K

R9121 2K OHM
R9122 1.5K 1/8W
C9117 0.47uF 16V
R9124 1K 1/10W 5%
R9125 14K 1/10W
R9127 NC
C9118 NC/0.47uF 16V
R9126 3.65K1/10W
ZD9106 BZT52-B15
IC9103 AS431AZTR-E1

(Q9101)
HS9101 HEAT SINK
C9908 470pF 250V
IC9102 EL817M(X)
C9905 2.2nF 250V

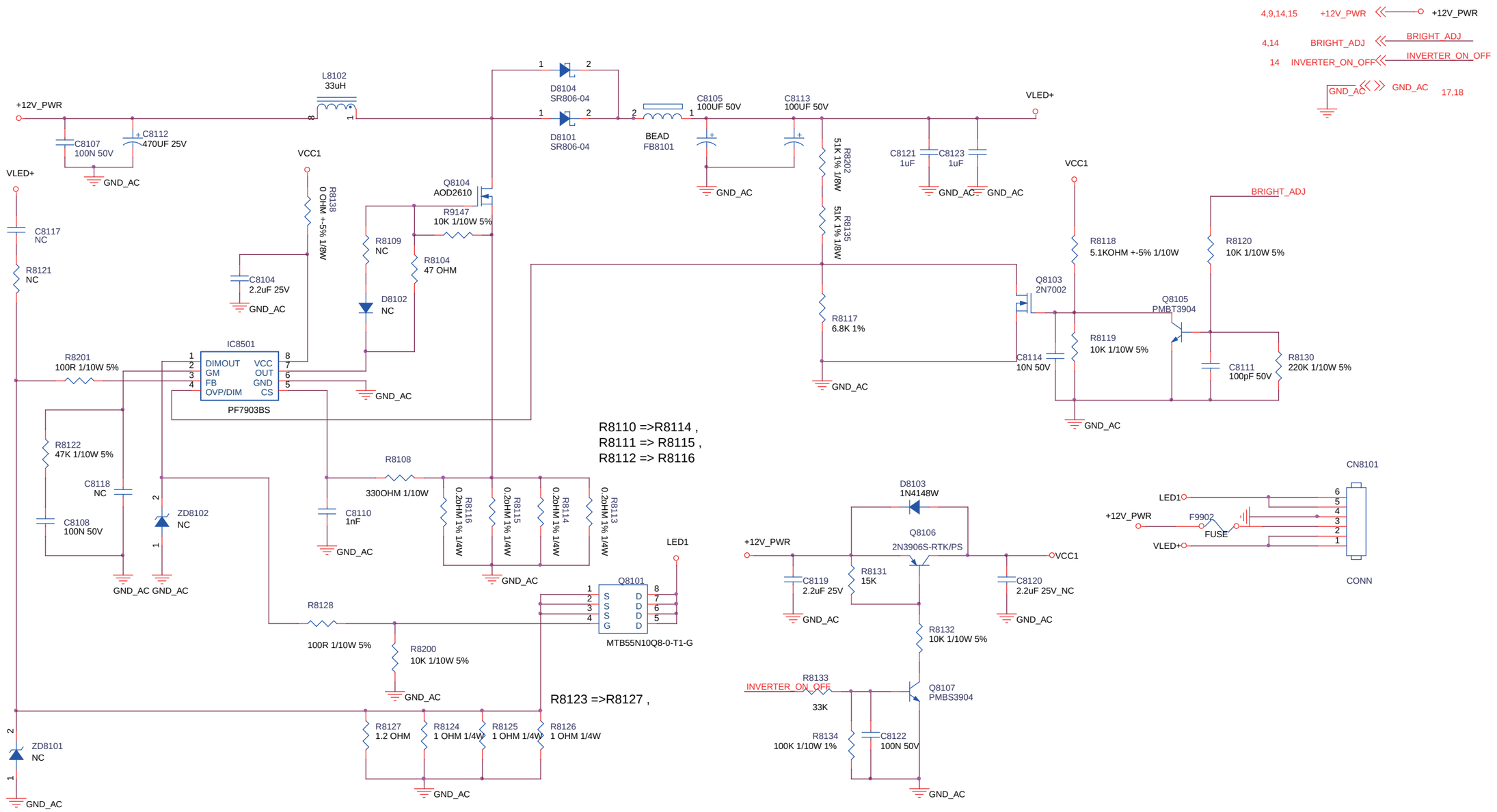
AC POWER | 715G6079 | C 2013-06-04

19530_518_130719.eps
130719

10-13-14 LED POWER

BA14 LED DRIVER

BA14

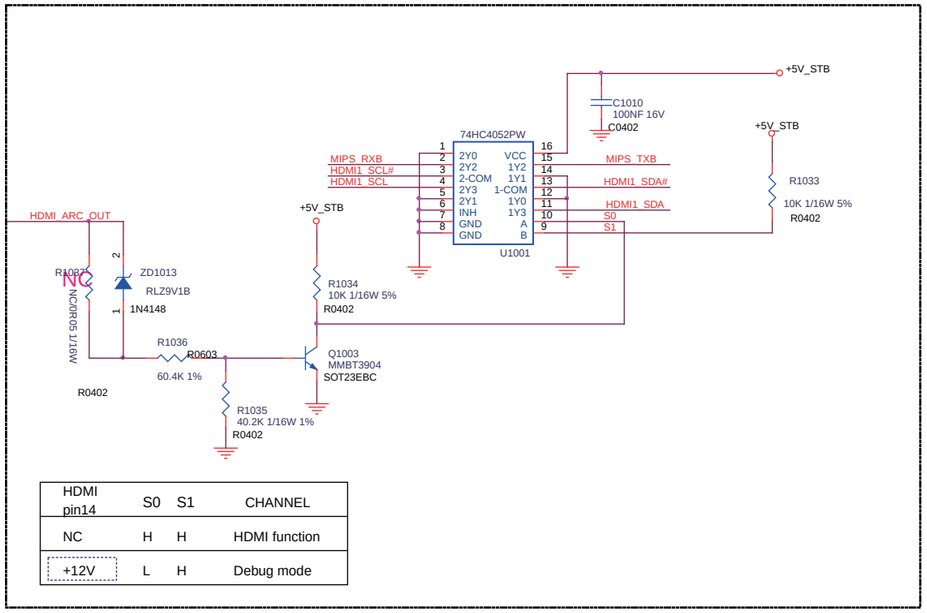


LED DRIVER	715G6079	c 2013-06-04

19530_519_130719.eps
130719

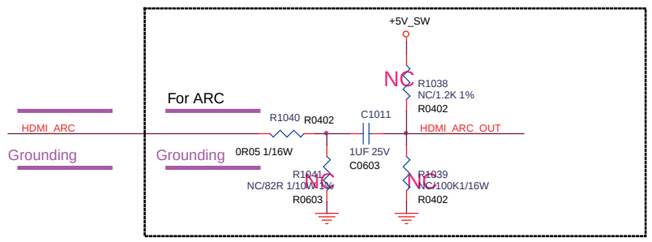
BA15 DEBUG INTERFACE

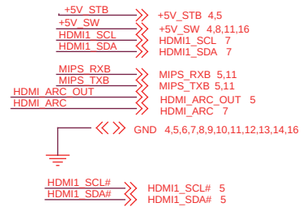
BA15



HDMI pin14	S0	S1	CHANNEL
NC	H	H	HDMI function
+12V	L	H	Debug mode

HDMI pin14	S0	S1	CHANNEL
NC	H	H	HDMI function
+12V	L	H	Debug mode

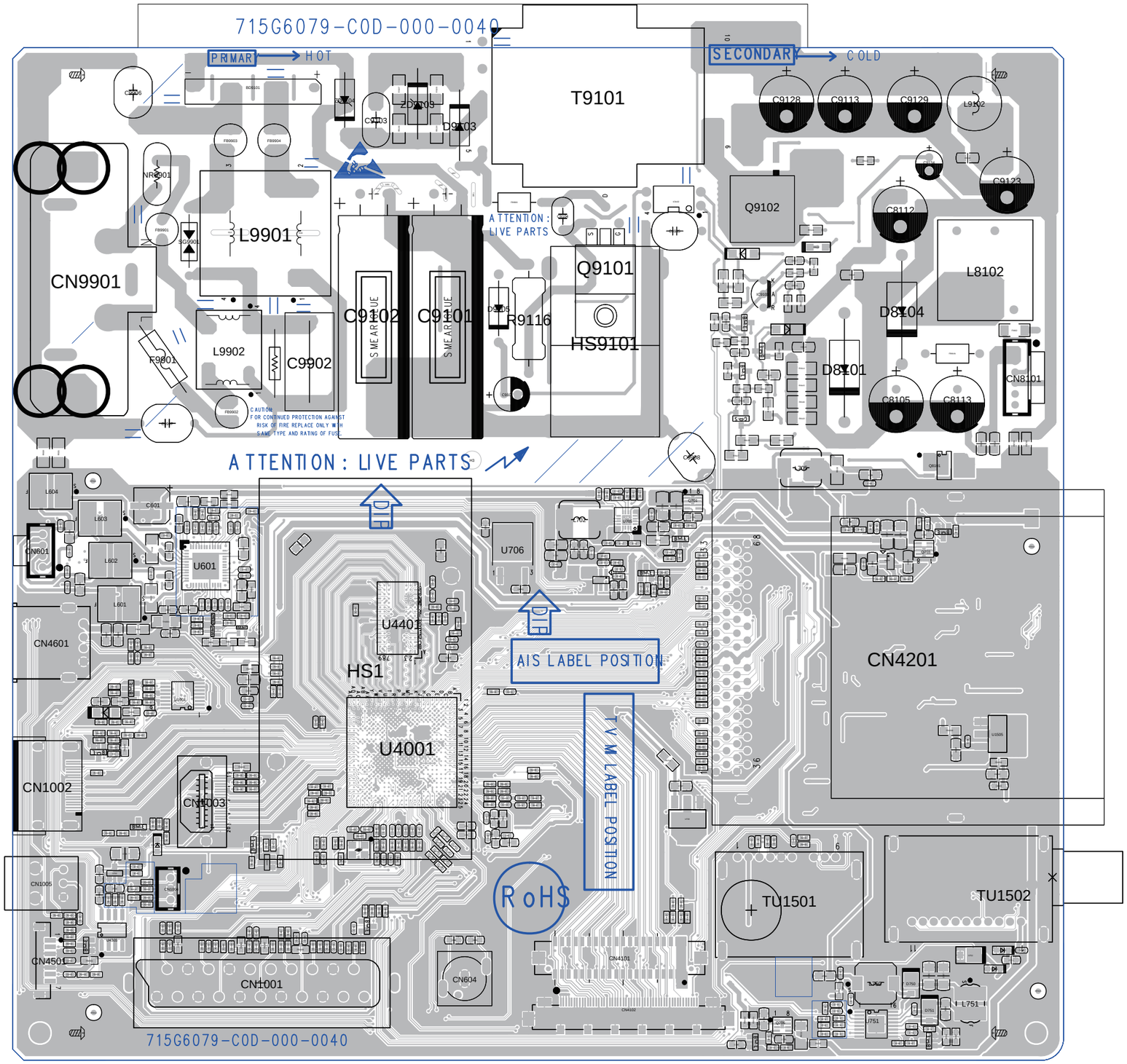




DEBUG INTERFACE	715G6079	c 2013-06-04

19530_520_130719.eps
130719

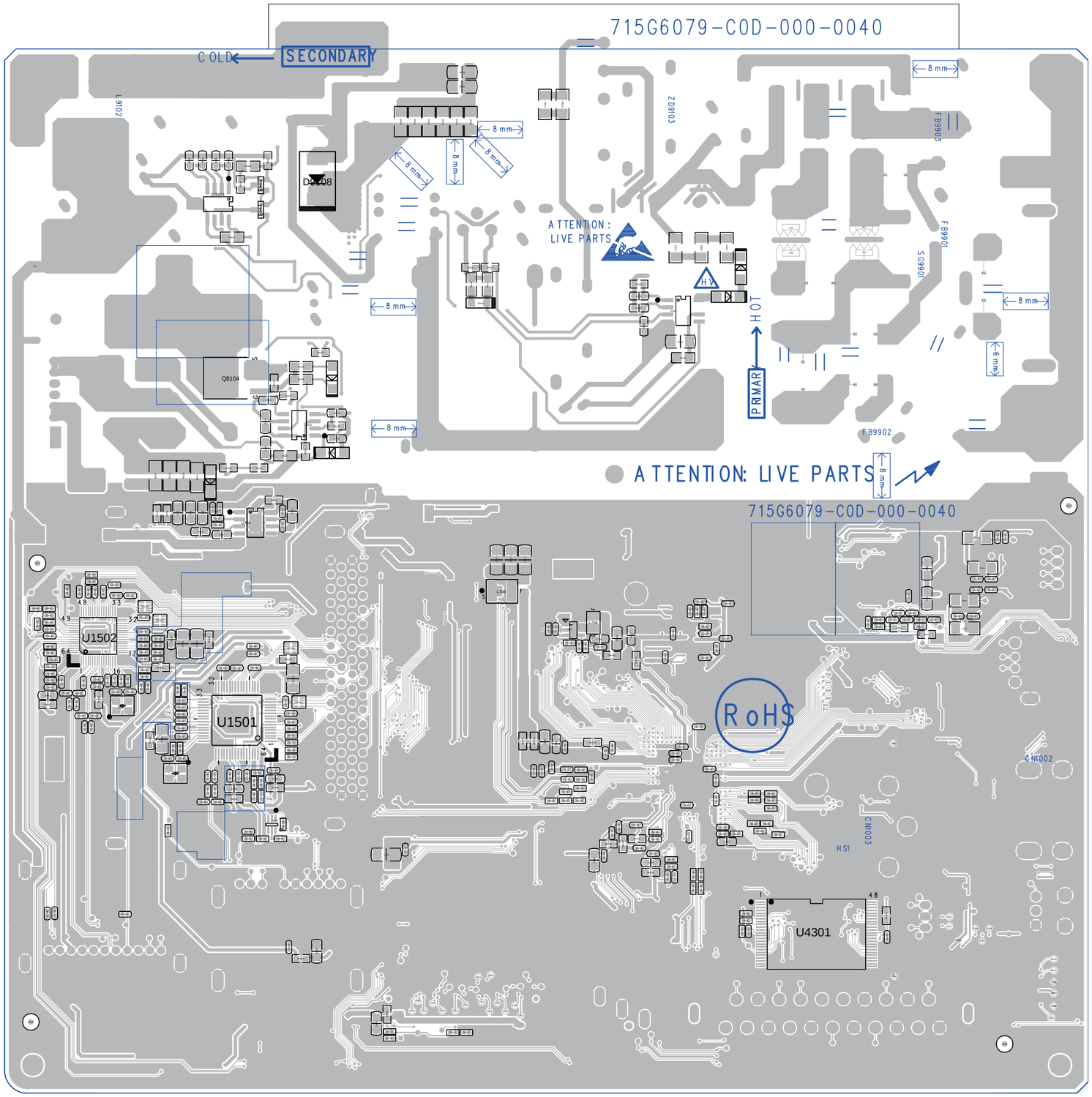
10-13-16 SSB+PSU combination panel layout top



SSB+PSU combination layout top	715G6079	C 2013-06-04

19530_521_130722.eps
130722

10-13-17 SSB+PSU combination panel layout bottom



SSB+PSU combination layout bottom	715G6079	C	2013-06-04

19530_522_130722.eps
130722

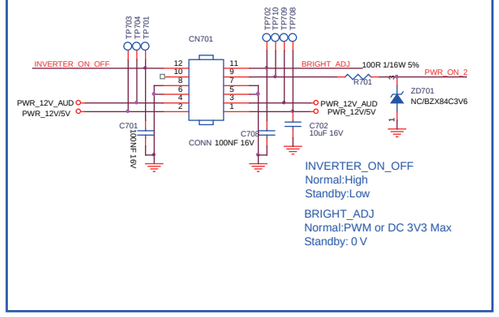
10.14 B 715G6092 SSB
10-14-1 Power-1

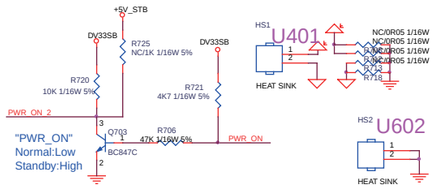
B01 POWER-1

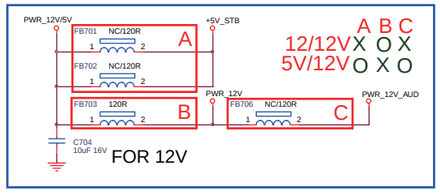
B01

2K13 EU NT72567 - 2 Layers 193mm X 125mm

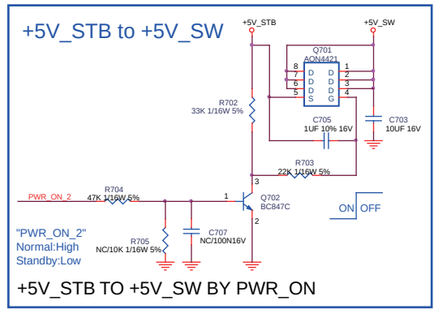
DC POWER INPUT

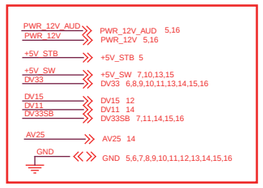


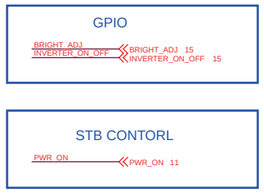




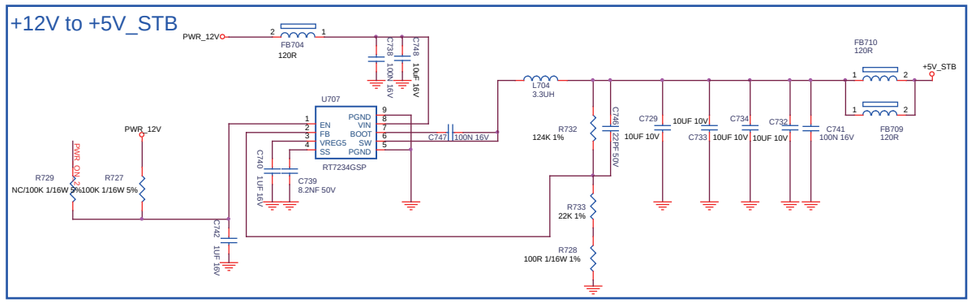
+5V_STB to +5V_SW



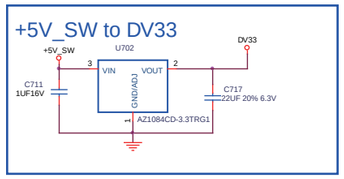




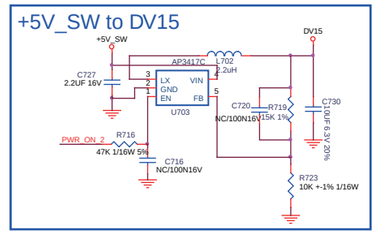
+12V to +5V_STB



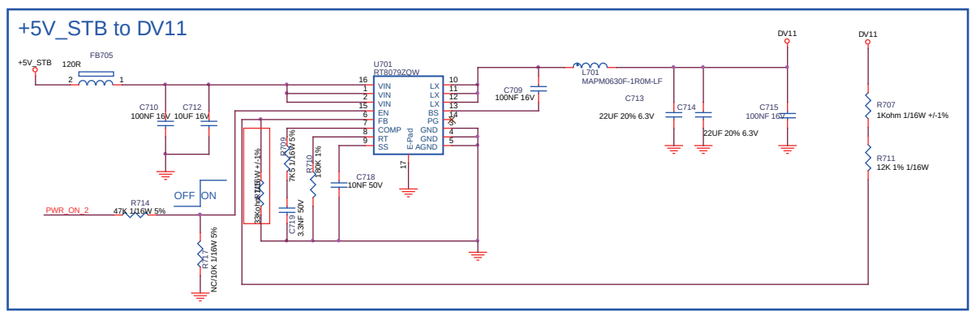
+5V_SW to DV33



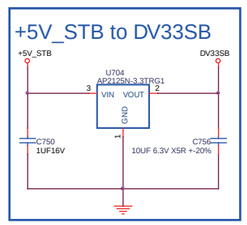
+5V_SW to DV15



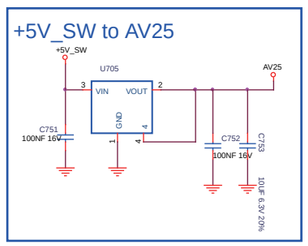
+5V_STB to DV11



+5V_STB to DV33SB



+5V_SW to AV25

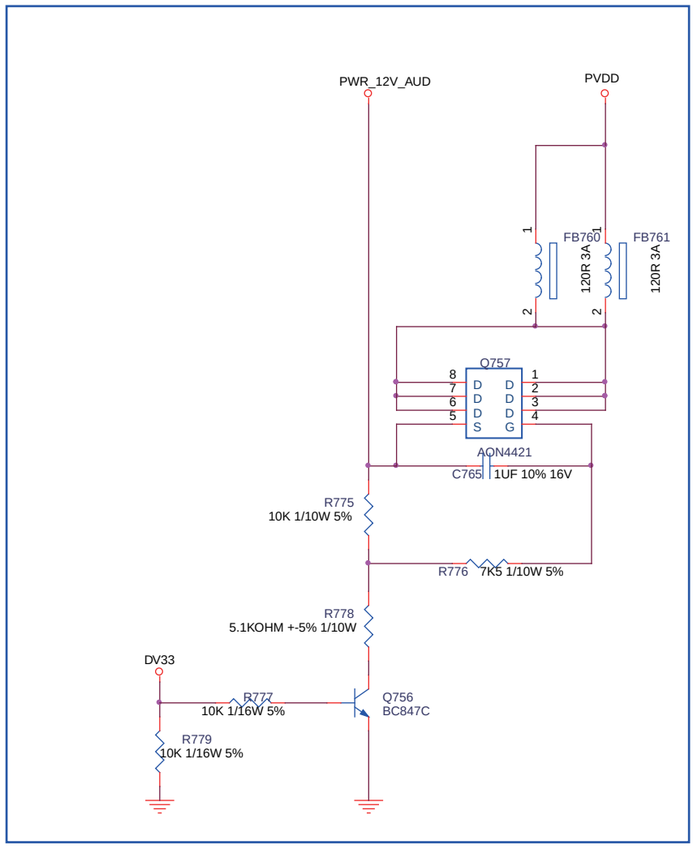


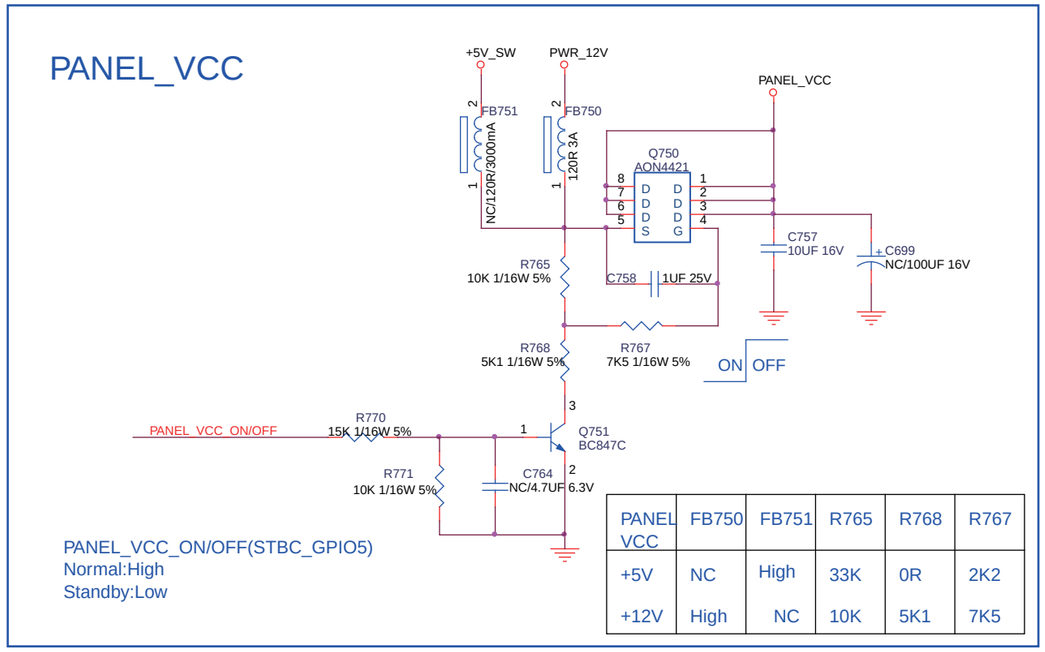
POWER-1	715G6092	1 2013-06-11

19530_523_130717.eps
130717

B02 POWER-2

B02





PANEL_VCC_ON/OFF(STBC_GPIO5)
Normal:High
Standby:Low

PANEL VCC	FB750	FB751	R765	R768	R767
+5V	NC	High	33K	0R	2K2
+12V	High	NC	10K	5K1	7K5

PANEL_VCC <<PWR_12V PANEL_VCC 9, PWR_12V 4,16
+5V_SW <<PWR_12V_AUD +5V_SW 4, PWR_12V_AUD 4,16
PVDD >> PVDD 16
DV33 >> DV33 4,6,8,9,10,11,13,14,15,16
GND <<>> GND 4,6,7,8,9,10,11,12,13,14,15,16

GPIO
PANEL_VCC_ON/OFF << PANEL_VCC_ON/OFF 11

POWER-2	715G6092	1 2013-05-29

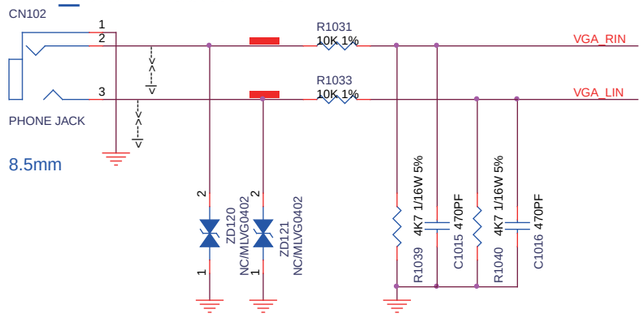
19530_524_130717.eps
130717

10-14-3 SPDIF/UART INPUT

B03 SPDIF/UART INPUT

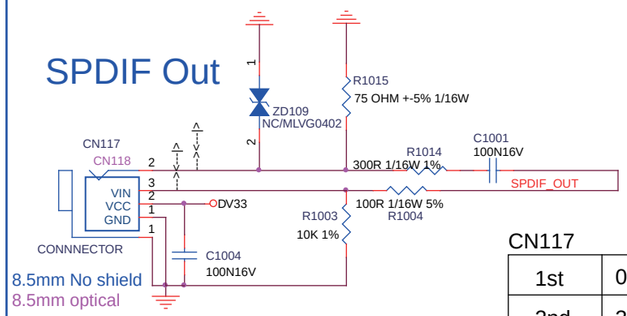
B03

PC_side Audio in



1st	088G302F311VCL
2nd	088G302F311VQS

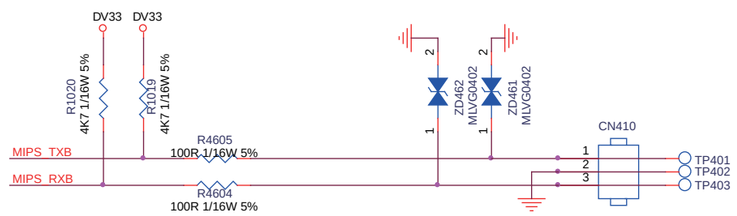
SPDIF Out



CN117

1st	088G 78F112VCL
2nd	388G078F118VQS

U-ART



B03

PANEL_VCC → PANEL_VCC 5,9
PWR_12V → PWR_12V 4,5,16
+5V_STB → +5V_STB 4,5
+5V_SW → +5V_SW 4,5,7,10,13,15
DV33 → DV33 4,8,9,10,11,13,14,15,16
DV15 → DV15 4,12
DV33SB → DV33SB 4,5,7,11,14,15,16
GND → GND 4,5,7,8,9,10,11,12,13,14,15,16

MIPS/UART/I2C/ICE

MIPS_TXB → MIPS_TXB 7,13
MIPS_RXB → MIPS_RXB 7,13

AUDIO /IF

VGA_LIN → VGA_LIN 8
VGA_RIN → VGA_RIN 8
SPDIF_OUT → SPDIF_OUT 8

SPDIF/UART INPUT	715G6092	1 2013-05-08

19530_525_130717.eps
130717

10-14-4 SCART/HDMI/VGA INPUT

B04 SCART/HDMI/VGA INPUT

B04

SCART(RGB+CVBS+L/R IN)

CVBS IN

RGB IN

Function Select

FAST BLANKING/SOY

SCART Audio Input

1st	388G355HLB1VVA
2nd	388G355HLB1VYG

Rear HDMI 1

HDMI1_HPD
H: Standby,Normal
L: AC off

VGA In

VGA IN

1st	088G353FFF3XDL
2nd	088G353FFF3XXH

HDMI/VGA/VGA INPUT

HDMI pin14	S0	CHANNEL
NC	H	HDMI function
+12V	L	Debug mode

Rear HDMI 2

HDMI2_HPD
H: Standby,Normal
L: AC off

UART SEL

for ARC

from Scaler ARC

Grounding

to HDMI Pin-14 for ARC

ADC/DAC

AUDIO /IF

HDMI

GPIO

STB CONTORL

MIPS/UART/I2C/ICE

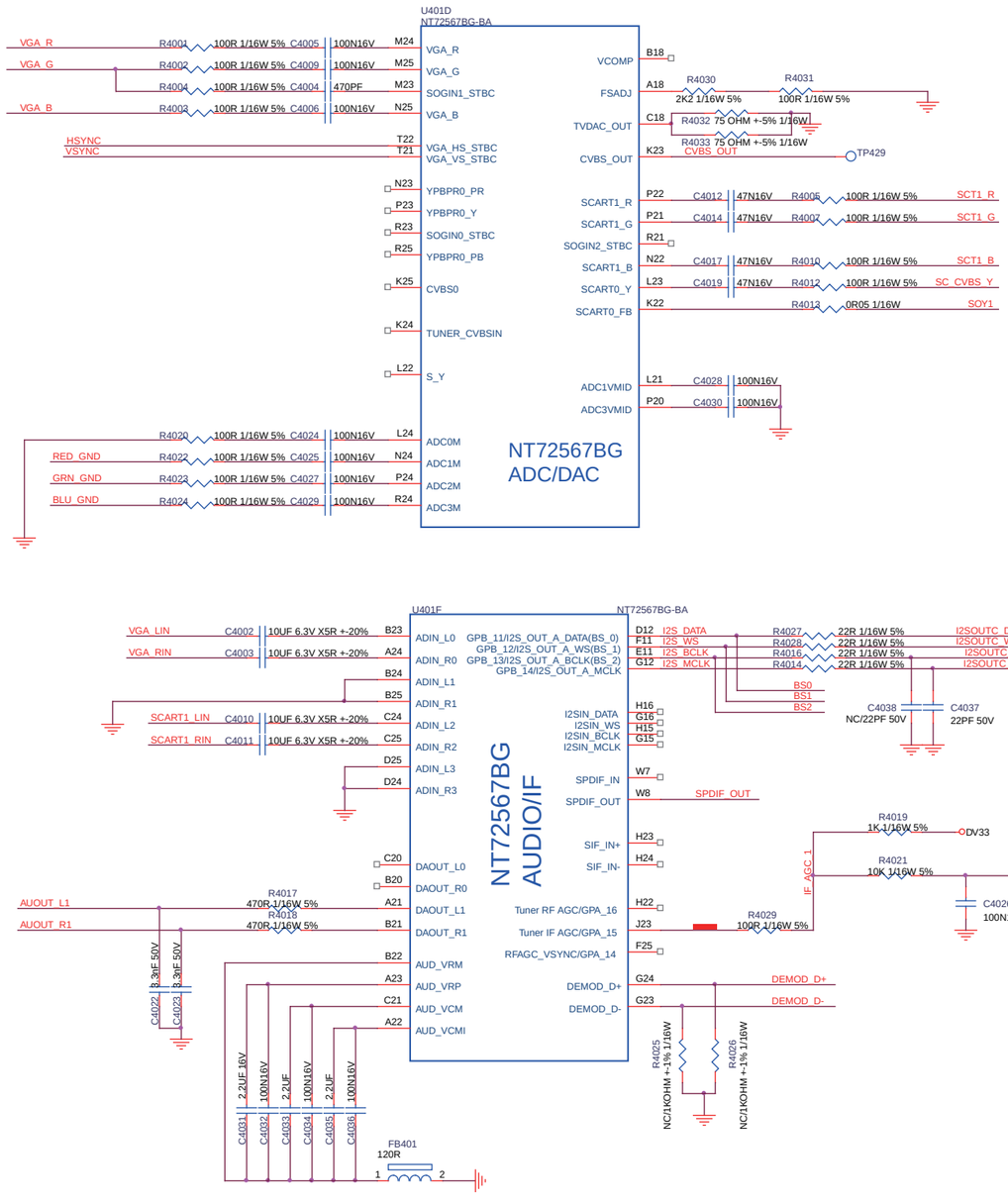
SCART/HDMI/VGA INPUT	715G6092

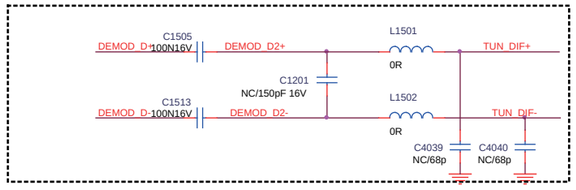
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130717

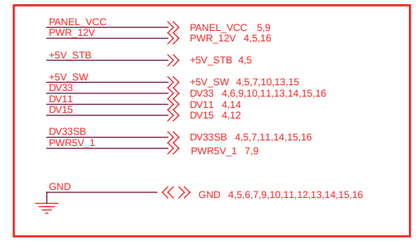
10-14-5 NT72567_ADC/DAC/AUDIO/SIF

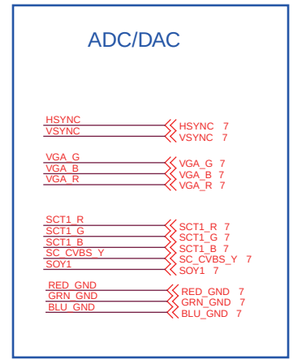
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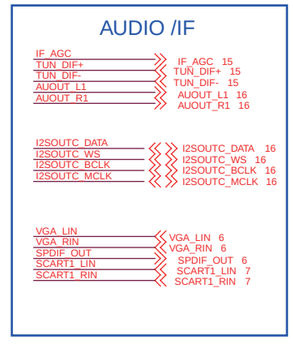
B05

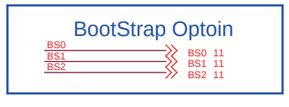












NT72567_ADC/DAC/AUDIO /SIF	715G6092	1 2013-06-11

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B06 NT72567_HDMI/LVDS OUT B06

LVDS OUTPUT

U401B NT72567BG-BA

NT72567BG HDMI/MHL

MHL_CBUS AB13
M_RX1_CB AC10
M_RX1_C AD10
M_RX1_0B AE10
M_RX1_0 AC11
M_RX1_1B AE11
M_RX1_1 AD11
M_RX1_2B AC12
M_RX1_2 AD12
PWR5V_1 Y15
R4102 4K7 1/16W 5%
RXA_CLK- RXA_CLK+ RXA_0- RXA_0+ RXA_1- RXA_1+ RXA_2- RXA_2+ PWR5V_A
HDMI_ARC AA14
M_RX2_CB AC13
M_RX2_C AD13
M_RX2_0B AE13
M_RX2_0 AC14
M_RX2_1B AE14
M_RX2_1 AD14
M_RX2_2B AC15
M_RX2_2 AD15
PWR5V_2 Y16
R4113 4K7 1/16W 5%
RXB_CLK- RXB_CLK+ RXB_0- RXB_0+ RXB_1- RXB_1+ RXB_2- RXB_2+ PWR5V_B
RXC_CLK- AC16
RXC_CLK+ AD16
RXC_0- AE16
RXC_0+ AC17
RXC_1- AE17
RXC_1+ AD17
RXC_2- AC18
RXC_2+ AD18
PWR5V_C AA17
HDMIA_SDA AB10 HDMI1_SDA
HDMIA_SCL AA10 HDMI1_SCL
HDMIB_SDA AA16 HDMI2_SDA
HDMIB_SCL AA15 HDMI2_SCL
HDMIC_SDA AB17
HDMIC_SCL AB16
MHL_VBUS AB14
MHL_CD_SENSE Y14
EXT_RES AA13
R4103 470R 1/16W 5%
568_3V3
HDMI_CEC AB11 HDMI_CEC

U401C NT72567BG-BA

NT72567BG LVDS/miniLVDS

	A7	mini1_D0-	LVE_0- / mini2_D0-	A12	LVDS_B0-
	B7	mini1_D0+	LVE_0+ / mini2_D0+	C12	LVDS_B0+
LVDS_A0-	C7	LVO_0- / mini1_D1-	LVE_1- / mini2_D1-	A13	LVDS_B1-
LVDS_A0+	B8	LVO_0+ / mini1_D1+	LVE_1+ / mini2_D1+	B13	LVDS_B1+
LVDS_A1-	C8	LVO_1- / mini1_D2+	LVE_2- / mini2_D2-	C13	LVDS_B2-
LVDS_A1+	B9	LVO_1+ / mini1_D2+	LVE_2+ / mini2_D2+	B14	LVDS_B2+
LVDS_A2-	A9	LVO_2- / mini1_CLK-	LVE_CLK- / mini2_CLK-	C14	LVDS_BCLK-
LVDS_A2+	C9	LVO_2+ / mini1_CLK+	LVE_CLK+ / mini2_CLK+	B15	LVDS_BCLK+
LVDS_ACLK-	A10	LVO_CLK- / mini1_D3-	LVE_3- / mini2_D3-	C15	LVDS_B3-
LVDS_ACLK+	B10	LVO_CLK+ / mini1_D3+	LVE_3+ / mini2_D3+	A16	LVDS_B4-
LVDS_A3-	C10	LVO_3- / mini1_D4-	LVE_4- / mini2_D4-	B16	LVDS_B4+
LVDS_A3+	B11	LVO_3+ / mini1_D4+	LVE_4+ / mini2_D4+	C16	
LVDS_A4-	C11	LVO_4- / mini1_D5-	mini2_D5-	B17	
LVDS_A4+	B12	LVO_4+ / mini1_D5+	mini2_D5+		

	D19	GPH_0 / TCON_CPV	GPH_7 / TCON_GPIO_0	A19
	F14	GPH_1 / TCON_OE1	GPH_8 / TCON_GPIO_1	E16
	C19	GPH_2 / TCON_OE2	GPH_9 / TCON_GPIO_2	F16
	E17	GPH_3 / TCON_STV_D	GPH_10 / TCON_GPIO_3	C17
	E18	GPH_4 / TCON_STV_U	GPH_11 / TCON_GPIO_4	D18
	B19	GPH_5 / TCON_TP		
	F15	GPH_6 / TCON_POL		

LVDS_A0- TP TP412
LVDS_A0+ TP TP411
LVDS_A1- TP TP414
LVDS_A1+ TP TP413
LVDS_A2- TP TP416
LVDS_A2+ TP TP415
LVDS_A3- TP TP418
LVDS_A3+ TP TP417
LVDS_A4- TP TP428
LVDS_A4+ TP TP427

LVDS_B0- TP TP420
LVDS_B0+ TP TP419
LVDS_B1- TP TP422
LVDS_B1+ TP TP421
LVDS_B2- TP TP424
LVDS_B2+ TP TP423
LVDS_B3- TP TP426
LVDS_B3+ TP TP425
LVDS_B4- TP TP436
LVDS_B4+ TP TP435

DV33
R4110 NC/4K7 1/16W 5%
TCON_SCL R4105 NC/100R 1/16W 5% LVDS_SCL
NC/0R05 1/16W R4107

CN408 CONN

	53		
	51	61	59
	50		
	49		
	48		
	47		
	46		
	45		
	44		
	43		
	42		
	41		
LVDS_A0-	40		
LVDS_A0+	39		58
LVDS_A1-	38		
LVDS_A1+	37		
LVDS_A2-	36		
LVDS_A2+	35		
	34		
LVDS_ACLK-	33		
LVDS_ACLK+	32		
	31		
LVDS_A3-	30		
LVDS_A3+	29		57
LVDS_A4-	28		
LVDS_A4+	27		
	26		
	25		
LVDS_B0-	24		
LVDS_B0+	23		
LVDS_B1-	22		
LVDS_B1+	21		56
LVDS_B2-	20		
LVDS_B2+	19		
	18		
LVDS_BCLK-	17		
LVDS_BCLK+	16		
	15		
LVDS_B3-	14		
LVDS_B3+	13		55
LVDS_B4-	12		
LVDS_B4+	11		
	10		
	9		
	8		
	7		
	6		
	5		
	4		
	3		
	2		
	1		54
	52		
		60	

PANEL_VCC
FB411 120R 3A
LVDS_VDD
FB412 120R 3A
LVDS_VDD
C4101 10uF 16V
R4104 NC/10K 1/10W 5%

DV33
R4108 NC/0R05 1/16W
R4111 4K7 1/16W 5%
TCON_SDA R4106 NC/100R 1/16W 5%

CN409

LVDS_VDD	2	1	
	4	3	
LVDS_SCL	6	5	LVDS_SDA
LVDS_A0-	8	7	LVDS_A0+
LVDS_A1-	10	9	LVDS_A1+
	12	11	
LVDS_A2-	14	13	LVDS_A2+
LVDS_ACLK-	16	15	LVDS_ACLK+
	18	17	
LVDS_A3-	20	19	LVDS_A3+
LVDS_A4-	22	21	LVDS_A4+
	24	23	
LVDS_B0-	26	25	LVDS_B0+
LVDS_B1-	28	27	LVDS_B1+
	30	29	
LVDS_B2-	32	31	LVDS_B2+
LVDS_BCLK-	34	33	LVDS_BCLK+
	36	35	
LVDS_B3-	38	37	LVDS_B3+
LVDS_B4-	40	39	LVDS_B4+

41
42
NC/CONN

PANEL_VCC PANEL_VCC 5
PWR_12V PWR_12V 4,5,16
AV25 AV25 5,14
+5V_STB +5V_STB 4,5
+5V_SW +5V_SW 4,5,7,10,13,15
DV33 DV33 4,6,8,10,11,13,14,15,16
DV15 DV15 4,12
DV33SB DV33SB 4,5,7,11,14,15,16
PWR5V_1 PWR5V_1 7
PWR5V_2 PWR5V_2 7
GND GND 4,5,6,7,8,10,11,12,13,14,15,16

HDMI

M_RX1_2 M_RX1_2 7
M_RX1_2B M_RX1_2B 7
M_RX1_1 M_RX1_1 7
M_RX1_1B M_RX1_1B 7
M_RX1_0 M_RX1_0 7
M_RX1_0B M_RX1_0B 7
M_RX1_C M_RX1_C 7
M_RX1_CB M_RX1_CB 7
HDMI1_SDA HDMI1_SDA 7
HDMI1_SCL HDMI1_SCL 7
M_RX2_2 M_RX2_2 7
M_RX2_2B M_RX2_2B 7
M_RX2_1 M_RX2_1 7
M_RX2_1B M_RX2_1B 7
M_RX2_0 M_RX2_0 7
M_RX2_0B M_RX2_0B 7
M_RX2_C M_RX2_C 7
M_RX2_CB M_RX2_CB 7
HDMI2_SDA HDMI2_SDA 7
HDMI2_SCL HDMI2_SCL 7
HDMI_ARC HDMI_ARC 7
HDMI_CEC HDMI_CEC 7

MIPS/UART/I2C/ICE

TCON_SDA TCON_SDA 13
TCON_SCL TCON_SCL 13

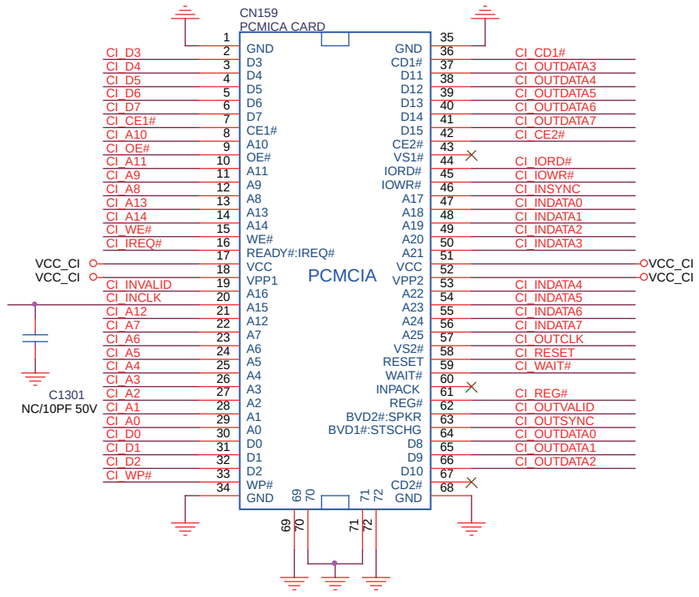
NT72567_HDMI/LVDS OUT	715G6092	1 2013-05-29

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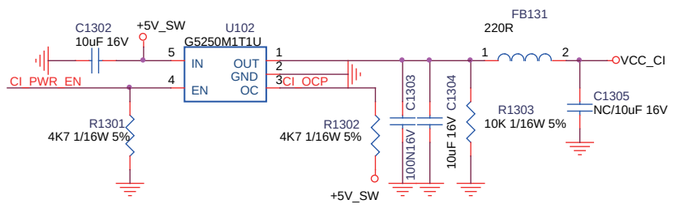
B07 NT72567_CI

B07

PCMCIA Slot



CI Bus Power Control



CI_A13 — R4191 22R 1/16W 5% — CI_A_13
CI_INDATA0 — CI_INDATA_0
CI_A8 — CI_A_8
CI_A9 — CI_A_9

CI_A11 — CI_A_11
CI_A10 — CI_A_10
CI_OUTDATA7 — CI_OUTDATA_7
CI_OUTDATA6 — CI_OUTDATA_6

CI_D7 — R4198 22R 1/16W 5% — CI_D_7
CI_D6 — R4199 22R 1/16W 5% — CI_D_6
CI_OUTDATA5 — CI_OUTDATA_5
CI_D5 — R4300 22R 1/16W 5% — CI_D_5

CI_D4 — R4299 22R 1/16W 5% — CI_D_4
CI_OUTDATA4 — CI_OUTDATA_4
CI_D3 — R4297 22R 1/16W 5% — CI_D_3
CI_OUTDATA3 — CI_OUTDATA_3

CI_OUTDATA2 — CI_OUTDATA_2
CI_D2 — R4294 22R 1/16W 5% — CI_D_2
CI_D1 — R4292 22R 1/16W 5% — CI_D_1

CI_OUTDATA1 — CI_OUTDATA_1
CI_D0 — R4183 22R 1/16W 5% — CI_D_0
CI_A0 — CI_A_0
CI_OUTDATA0 — CI_OUTDATA_0

CI_A1 — CI_A_1
CI_A2 — CI_A_2
CI_A3 — CI_A_3
CI_A4 — CI_A_4

CI_A5 — CI_A_5
CI_INDATA7 — R4291 22R 1/16W 5% — CI_INDATA_7
CI_A6 — CI_A_6
CI_A7 — CI_A_7

CI_INDATA6 — R4288 22R 1/16W 5% — CI_INDATA_6
CI_A12 — CI_A_12
CI_INDATA5 — R4286 22R 1/16W 5% — CI_INDATA_5
CI_INDATA4 — R4285 22R 1/16W 5% — CI_INDATA_4

CI_INDATA3 — R4284 22R 1/16W 5% — CI_INDATA_3
CI_INDATA2 — R4283 22R 1/16W 5% — CI_INDATA_2
CI_INDATA1 — R4282 22R 1/16W 5% — CI_INDATA_1
CI_A14 — CI_A_14

VCC_CI
R4161 10K 1/16W 5% — CI_CD1#
R4162 10K 1/16W 5% — CI_CE2#
R4163 10K 1/16W 5% — CI_WP#
R4164 10K 1/16W 5% — CI_IREQ#
R4165 10K 1/16W 5% — CI_RESET
R4166 10K 1/16W 5% — CI_WAIT#

PWR_12V — PWR_12V 4,5,16
+5V_STB — +5V_STB 4,5
+5V_SW — +5V_SW 4,5,7,13,15
DV15 — DV15 4,12
DV11 — DV11 4,14
DV33SB — DV33SB 4,5,7,11,14,15,16
GND — GND 4,5,6,7,8,9,11,12,13,14,15,16

GPIO

CI_PWR_EN — CI_PWR_EN 13

U401G — NT72567BG-BA

CI_A_0 G5 — CI_A0/ALE0
CI_A_1 G4 — CI_A1/ALE8
CI_A_2 G3 — CI_A2
CI_A_3 G2 — CI_A3
CI_A_4 H6 — CI_A4
CI_A_5 H5 — CI_A5
CI_A_6 H4 — CI_A6
CI_A_7 H3 — CI_A7
CI_A_8 H2 — CI_A8
CI_A_9 L4 — CI_A9
CI_A_10 J6 — CI_A10/Tensilica_TCK
CI_A_11 J5 — CI_A11/Tensilica_TMS
CI_A_12 K4 — CI_A12/Tensilica_TDO
CI_A_13 K5 — CI_A13/Tensilica_TDI
CI_A_14 K6 — CI_A14/Tensilica_TRST

CI_D_0 D5 — CI_AD0
CI_D_1 D4 — CI_AD1
CI_D_2 D3 — CI_AD2
CI_D_3 D2 — CI_AD3
CI_D_4 D1 — CI_AD4
CI_D_5 E6 — CI_AD5
CI_D_6 E5 — CI_AD6
CI_D_7 E4 — CI_AD7

CI_RESET E3 — CI_RST#/GPC_19
CI_CD1# E2 — CI_CD#/GPC_20
CI_CE1# E1 — CI_CE#/GPC_21
CI_IREQ# F6 — CI_IOINT#/GPC_22
CI_OE# F3 — CI_HRD#/GPC_25
CI_WE# F2 — CI_HWR#/GPC_26
CI_REG# F1 — CI_REG#/GPC_27
CI_WAIT# G6 — CI_HWAIT#/GPC_28
CI_IORD# F5 — CI_IORD#/GPC_23
CI_IOWR# F4 — CI_IOWR#/GPC_24

NT72567BG
CI/TS

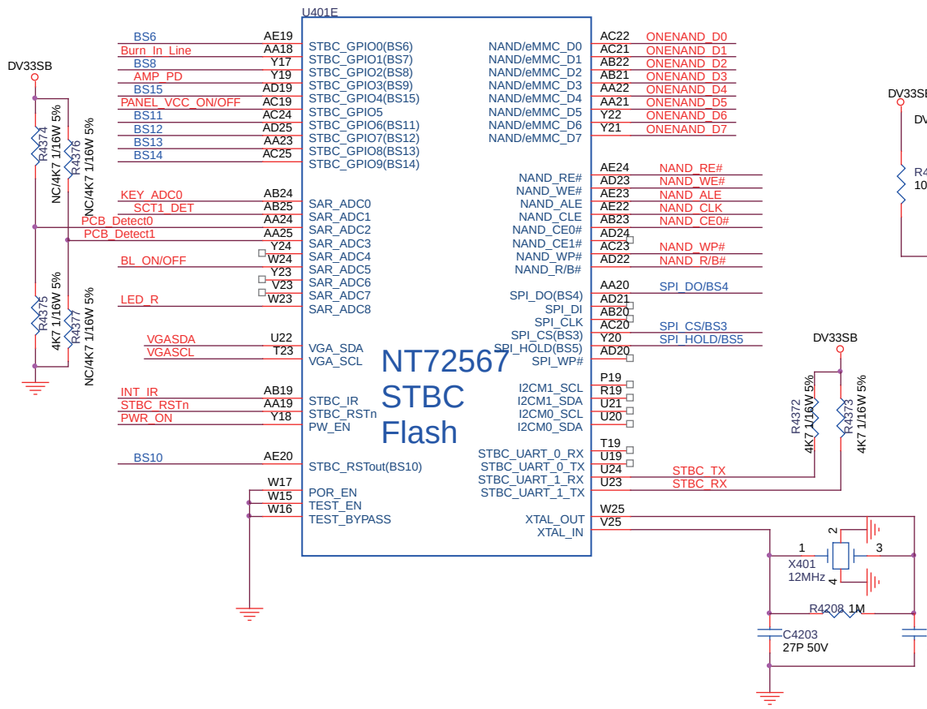
STSIN0_CLK/GPB_15 F10
STSIN0_VALID/GPB_16 E10
STSIN0_START/GPB_17 D10
STSIN0_DATA/GPB_18 F9
PTSIN1/STSIN0_ERROR/GPB_19 E9
PTSIN1/STSIN1_CLK/GPB_20 D9
PTSIN1/STSIN1_VALID/GPB_21 F8
PTSIN1/STSIN1_START/GPB_22 E8
PTSIN1_D0/STSIN1_DATA F7
PTSIN1_D1 E7
PTSIN1_D2 D7
PTSIN1_D3 B6
PTSIN1_D4 A6
PTSIN1_D5 A4
PTSIN1_D6 A3
PTSIN1_D7 A2
PTSIN2/DEMODOUT_ERROR B5
PTSOUT/PTSIN2/DEMODOUT/STSOUT_CLK B4
PTSOUT/PTSIN2/DEMODOUT/STSOUT_VALID B3
PTSOUT/PTSIN2/DEMODOUT/STSOUT_START B2
PTSOUT/PTSIN2/DEMODOUT_D0 B1
PTSOUT/PTSIN2/DEMODOUT_D1 C6
PTSOUT/PTSIN2/DEMODOUT_D2 C5
PTSOUT/PTSIN2/DEMODOUT_D3 C4
PTSOUT/PTSIN2/DEMODOUT_D4 C3
PTSOUT/PTSIN2/DEMODOUT_D5 C2
PTSOUT/PTSIN2/DEMODOUT_D6 C1
PTSOUT/PTSIN2/DEMODOUT_D7 D6

C4161 NC/10PF 50V
FB416 1 2 30R 1
CI_OUTCLK
CI_OUTVALID
CI_OUTSYNC
CI_OUTDATA_0
CI_OUTDATA_1
CI_OUTDATA_2
CI_OUTDATA_3
CI_OUTDATA_4
CI_OUTDATA_5
CI_OUTDATA_6
CI_OUTDATA_7
R4169 47R 1/16W 5% — CI_INCLK
R4168 22R 1/16W 5% — CI_INVALID
R4167 22R 1/16W 5% — CI_INSYNC
CI_INDATA_0
CI_INDATA_1
CI_INDATA_2
CI_INDATA_3
CI_INDATA_4
CI_INDATA_5
CI_INDATA_6
CI_INDATA_7

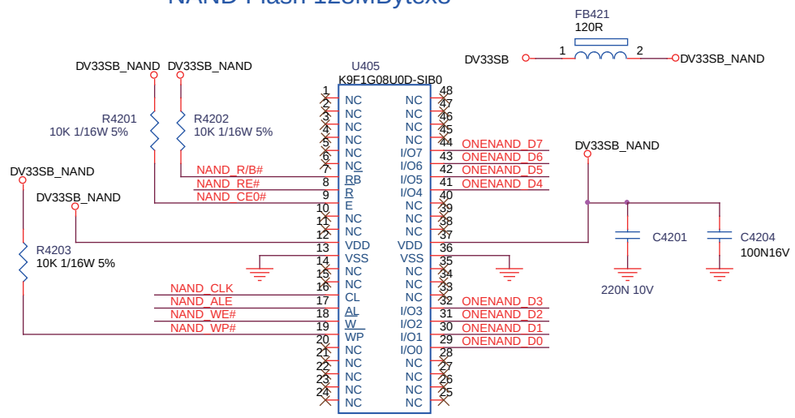
NT72567_CI	715G6092	1 2013-05-29

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130717

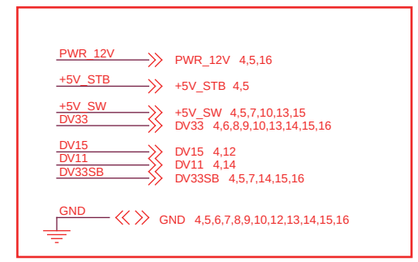
B08 NT72567_STBC/FLASH B08



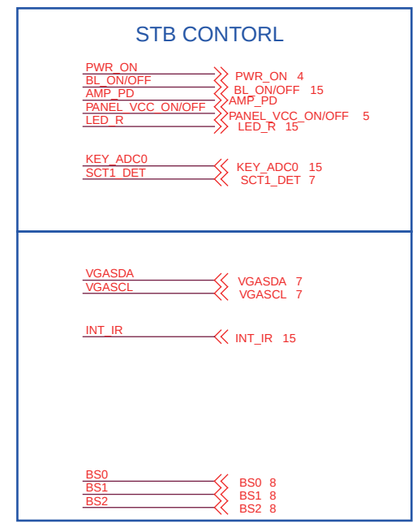
NAND Flash 128MBytex8

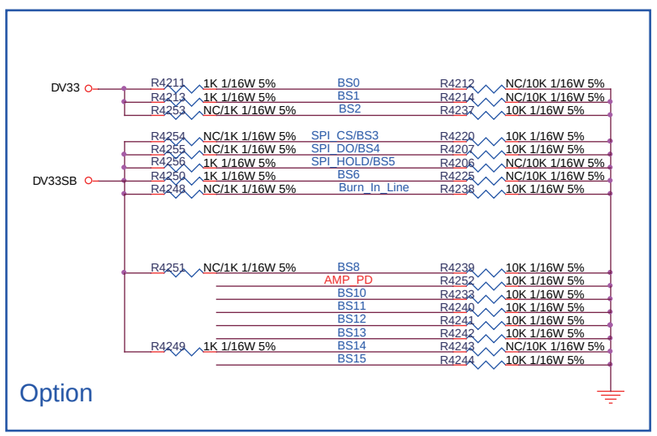


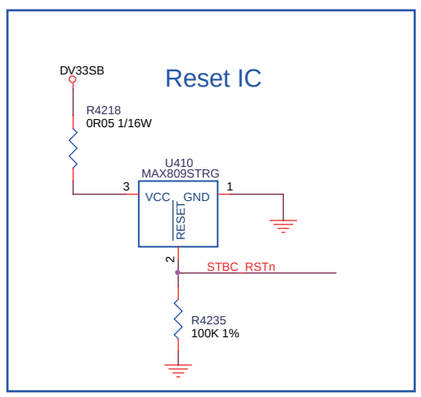
1st	056G2233 59	K9F1G08U0D-SIB0 1Gb TSOP1-48	Samsung
2nd			toshiba



STB CONTORL







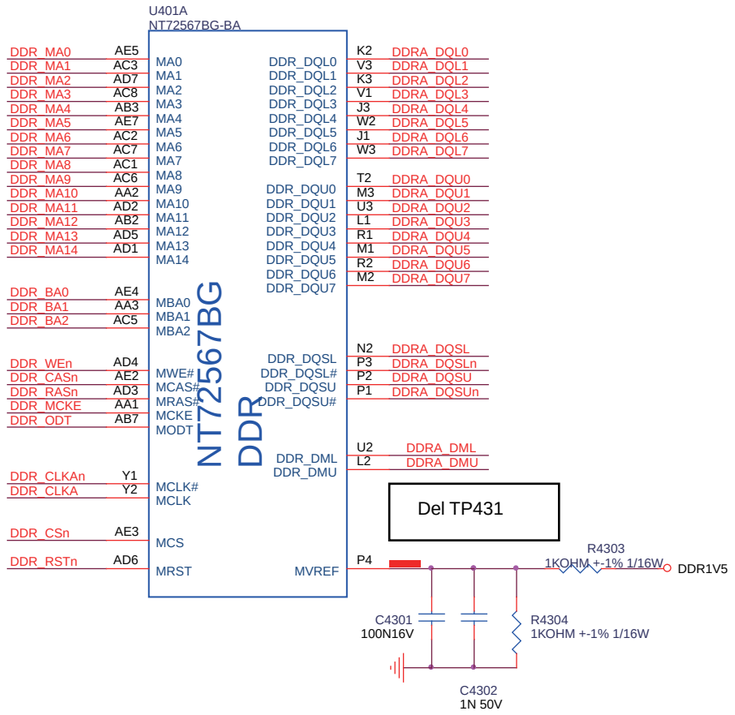
NT72567_STBC/FLASH	715G6092	1 2013-05-08

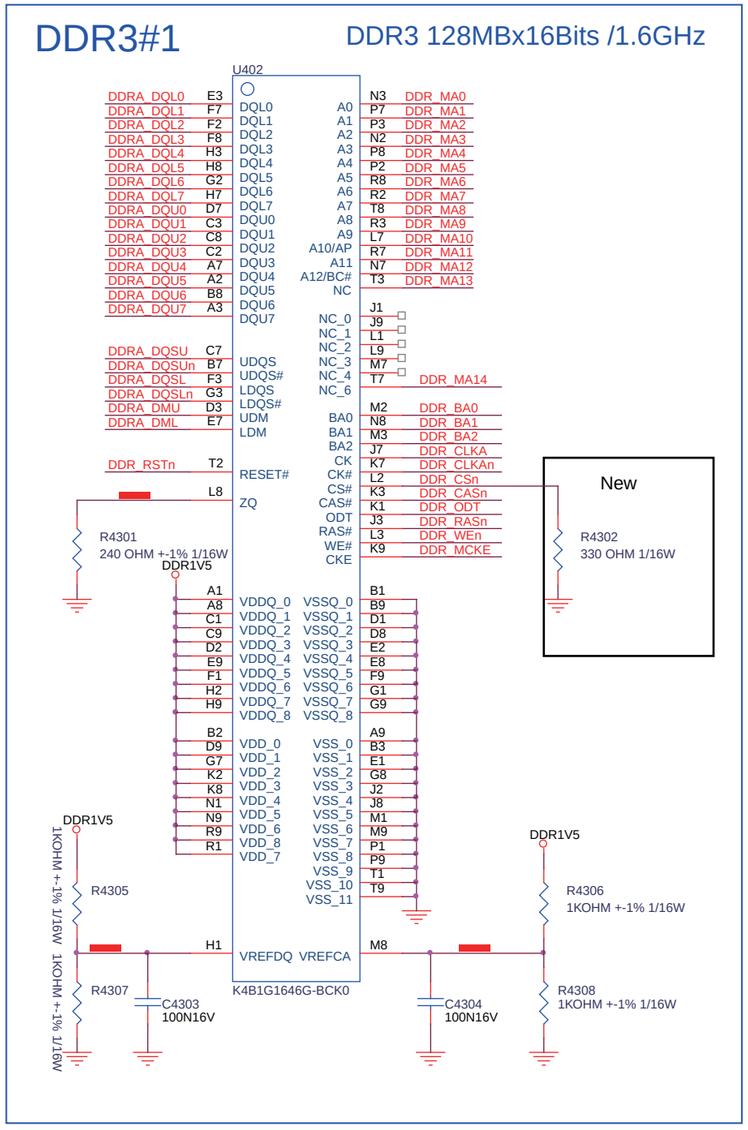
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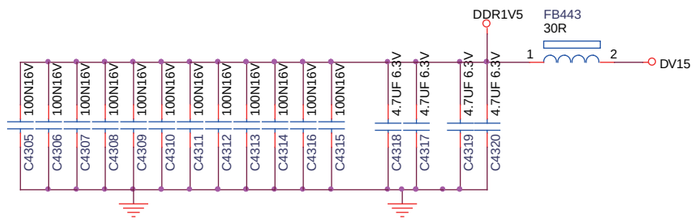
B09

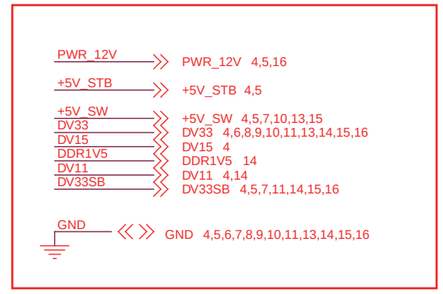
NT72567_DDR

B09







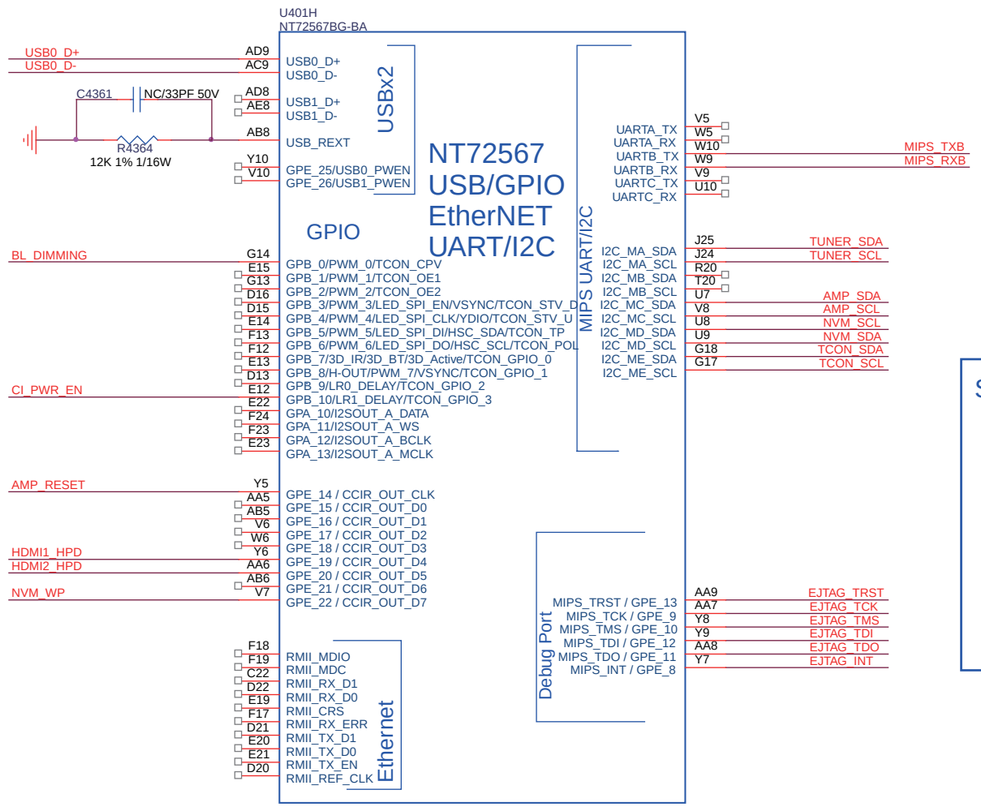


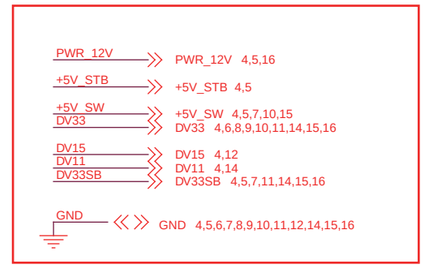
1st	56G 615151	k4B1G1646E-BCH9 1Gb fbga-96	Samsung
2nd	56G 615145	H5TQ1G63DFR--H9C 1Gb wbga-96	Hynix

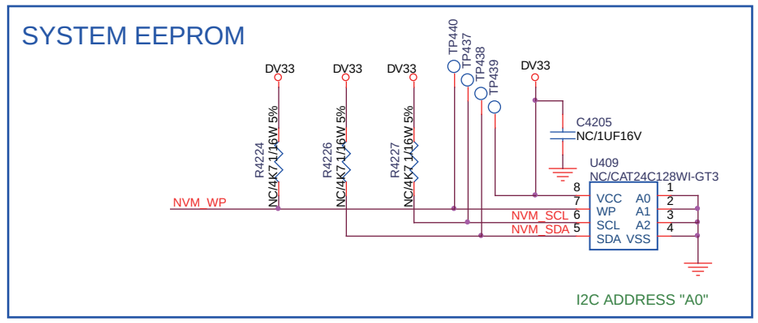
NT72567_DDR	715G6092	1 2013-05-29

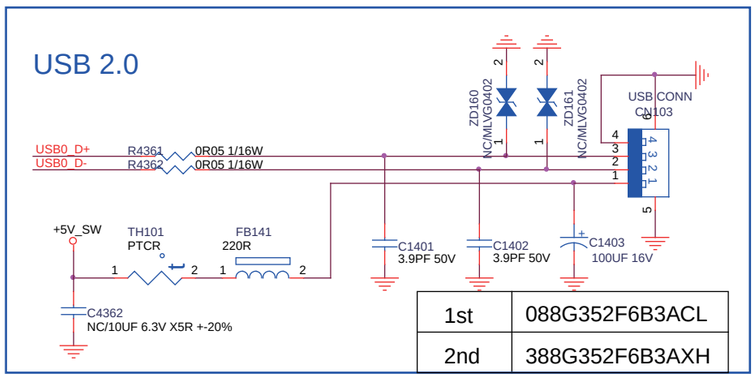
19530_531_130717.eps
130717

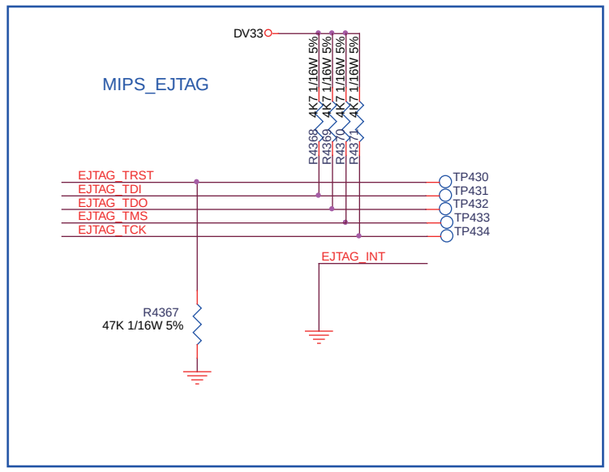
B10 NT72567_USB/GPIO **B10**

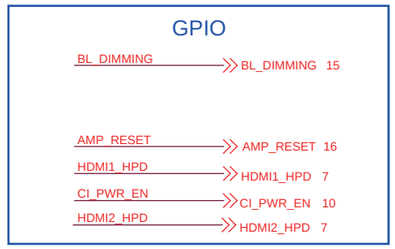


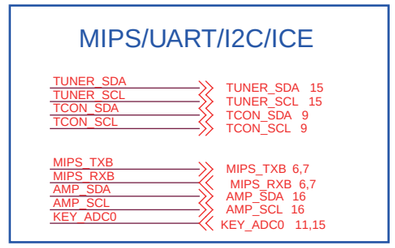








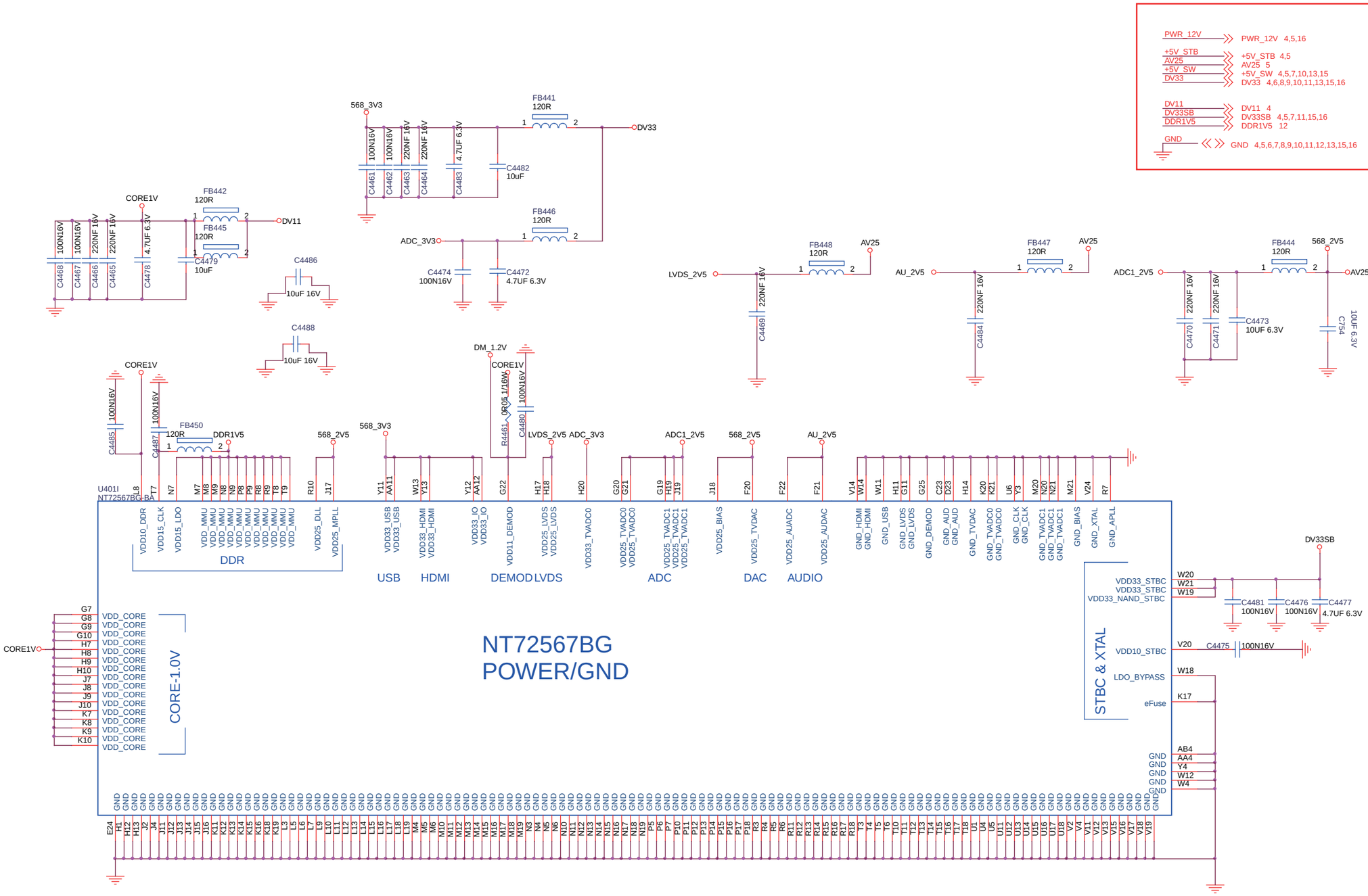




NT72567_USB/GPIO	715G6092	1 2013-05-29

19530_532_130717.eps
130717

B11 NT72567_POWER **B11**

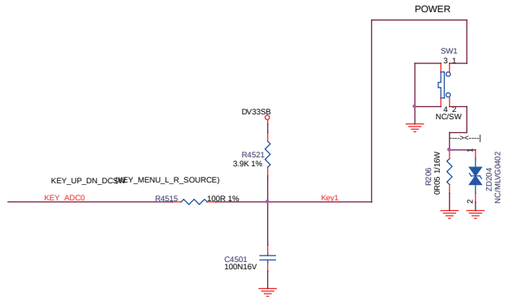


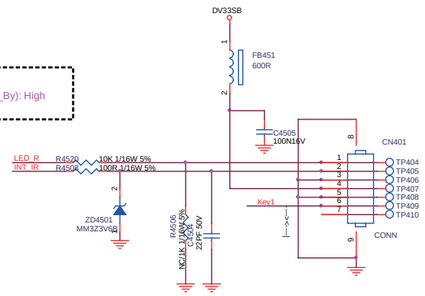
NT72567_POWER	715G6092	1 2013-05-29

19530_533_130717.eps
130717

B12 IR/KEY/Tuner

B12

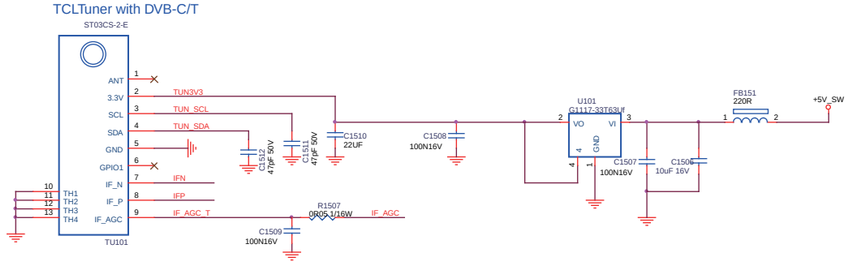




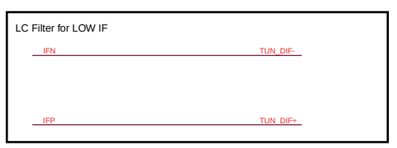
LED_R#:
Enable(Stand_By): High
Disable: Low

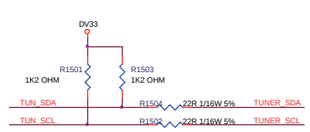
TUNER

TCLTuner with DVB-C/T



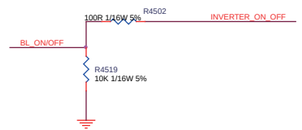
LC Filter for LOW IF





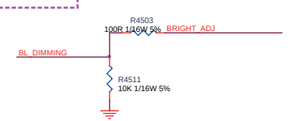
Backlight ON/OFF Control

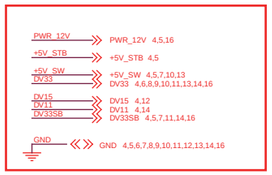
BackLight_SW:
BackLight on: Low
BackLight off: High

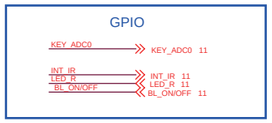


Backlight Brightness Control

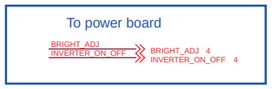
BL_DIM(PWM for Bright_Adj)
Max: 0V
Min: +3V3

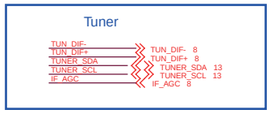












IR/KEY/Tuner	715G6092	1 2013-06-11

19530_534_130717.eps
130717

10-14-13 SPEAKER AMPLIFIER/HEADPHONE OUT

B13 SPEAKER AMPLIFIER/HEADPHONE OUT B13

Main Speak CKT

I2SOUTC_MCLK MCLK
I2SOUTC_BCLK BICKI
I2SOUTC_WS LRCLKI
I2SOUTC_DATA SDI

PVDD
C697 220uF 16V

AUOUT_L1 C674 1uF 10V R635 16K 1%
AUOUT_R1 C670 1uF 10V R636 16K 1%

R637 43K 1/16W
C669 330PF 50V
R661 18Kohm 1/16W +/-1%
C675 68PF 50V
HPOUTL R643 10R 1/10W 5%

R662 43K 1/16W
C652 330PF 50V
R663 18Kohm 1/16W +/-1%
C671 68PF 50V
HPOUTR R644 10R 1/10W 5%

AUD_V33
R659 NC/4K7 1/16W 5%
AMP_RESET_1
C644 NC/1uF 10V
R660 100R 1/16W 5%
AMP_RESET

AMP_RESET:
Normal : High
Reset : Low

HPOUTR
HPOUTL
PHONE JACK
CN604
C632 0.1uF 50V
C633 0.1uF 50V

1st	088G302F3B2VCL
2nd	088G302F3B2VQS

DV33 FB631 120R AUD_V33HP C645 4.7uF 10V
DV33 FB633 120R AUD_V33 C650 4.7uF 10V

Sound R/L CKT

AUD_V33HP C651 100NF 16V
C647 1uF 10V
C664 1uF 10V
C656 1uF 10V
C660 1uF 10V
PWDN/HP

U602 STA381BWTR

24	23	22	21	20	19	18	17	16	15	14	13	25	26	27	28	29	30	31	32	33	34	35	36
CPM	CPVSS	VDD3V3	SOFTMUTE	GNDA	LINEINPOUT_R	LINEINPOUT_L	LINEINR	LINEINL	F3XR	F3XL	F3X_FILT	GNDPSUB	CPP	VDD3V3CHP	VDDIG1	GNDDIG1	FFX3A	FFX3B	EAPD/FFX4B	TWARN/FFX4A	VREGFILT	AGNDPLL	MCLK

12	11	10	9	8	7	6	5	4	3	2	1	37	38	39	40	41	42	43	44	45	46	47	48	49
GND_REG	VDD_REG	OUT1A	GND1	VCC1	OUT1B	OUT2A	VCC2	GND2	OUT2B	VSS_REG	VCC_REG	BICKI	LRCKI	SDI	RESET	PWDN	INTLINE	SDA	SCL	SA	TEST_MODE	GNDDIG2	VDDDIG2	E-Pad

C654 0.1uF 50V
C643 0.1uF 50V
C672 1UF 50V
PVDD
C638 0.1uF 50V
C673 1UF 50V
C661 0.1uF 50V
C653 2.2uF
C658 100NF 16V
C657 100NF 16V
C637 100NF 16V
AUD_V33
C646 1nF 50V
R650 100R 1/16W 5%
R651 100R 1/16W 5%
I2C
R664 4K7 1/16W 5%
R665 4K7 1/16W 5%
AMP_SDA
AMP_SCL

STA381BWTR

I2S Input

Mute CKT

DV33
R652 10K 1/16W 5%
R648 0R05 1/16W PWRDN
Q632 BC847BW
R653 4K7 1/16W 5%
R666 10K 1/16W 5%
R667 0R05 1/16W PWRDN-HP
Q633 BC847BW
PWR_12V
R654 4K7 1/16W 5%
R655 6K8 1/16W 5%
R656 0R05 1/16W
Q631 BC857BW
R668 22R 1/16W 5%
R657 1K 1/16W 5%
R658 100K 1/16W 5%

Anti-Pop CKT

L630/631/632/633 2nd source : 073G253S102 X

L630 33uH
R634 22 OHM 1/4W
C685 0.1uF 25V
C679 0.1uF 25V
R638 4R7 1/10W 5%
C648 330PF 50V
C649 10.47UF 50V
C665 1nF 50V
OUT1A
L631 33uH
C686 0.1uF 25V
C680 0.1uF 25V
R645 4R7 1/10W 5%
C668 1nF 50V
OUT1B
OUT2A
L632 33uH
R640 22 OHM 1/4W
C681 0.1uF 25V
C682 0.1uF 25V
R646 4R7 1/10W 5%
C650 10.47UF 50V
C659 1nF 50V
C662 330PF 50V
L633 33uH
C683 0.1uF 25V
C684 0.1uF 25V
R647 4R7 1/10W 5%
C663 1nF 50V
OUT2B

LR SPK

CN601
LSPK+ 4
LSPK- 3
RSPK+ 2
RSPK- 1
CONN

Ground in bottom side need connector it togother, heat sink is also.

PWR_12V PWR_12V 4,5
PVDD PVDD 4,5
+5V_STB +5V_STB 4,5
+5V_SW +5V_SW 4,5,7,10,13,15
DV33 DV33 4,6,8,9,10,11,13,14,15
DV15 DV15 4,12
DV11 DV11 4,14
DV33SB DV33SB 4,5,7,11,14,15
GND GND 4,5,6,7,8,9,10,11,12,13,14,15

AUDIO /IF
AUOUT_L1 AUOUT_L1 8
AUOUT_R1 AUOUT_R1 8
I2SOUTC_DATA I2SOUTC_DATA 8
I2SOUTC_WS I2SOUTC_WS 8
I2SOUTC_BCLK I2SOUTC_BCLK 8
I2SOUTC_MCLK I2SOUTC_MCLK 8

MIPS/UART/I2C/ICE
AMP_SDA AMP_SDA 13
AMP_SCL AMP_SCL 13

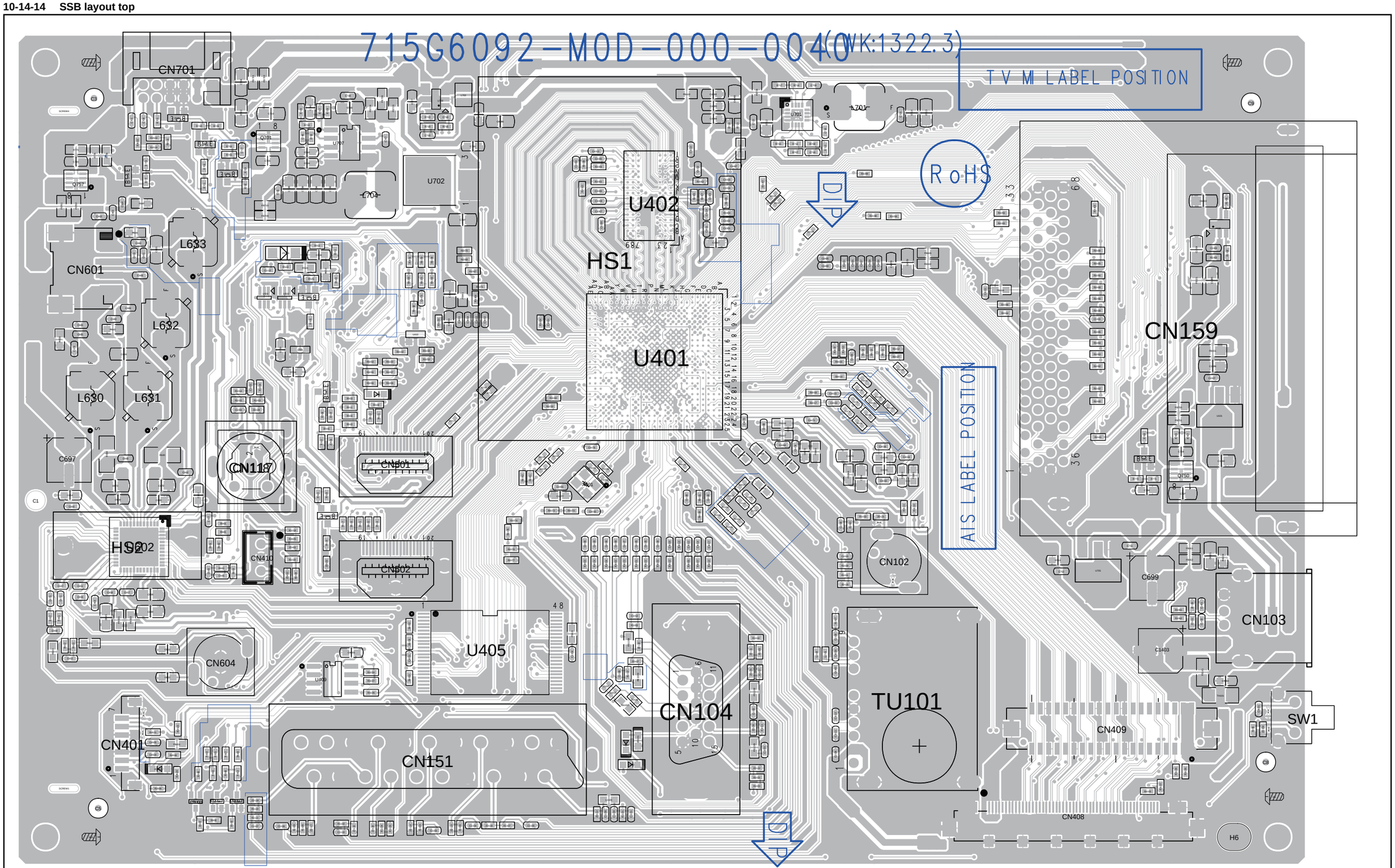
GPIO
AMP_RESET AMP_RESET 13

STB CONTORL
AMP_PD AMP_PD 11

SPEAKER AMPLIFIER/ HEADPHONE OUT	715G6092	1 2013-05-21

19530_535_130717.eps
130717

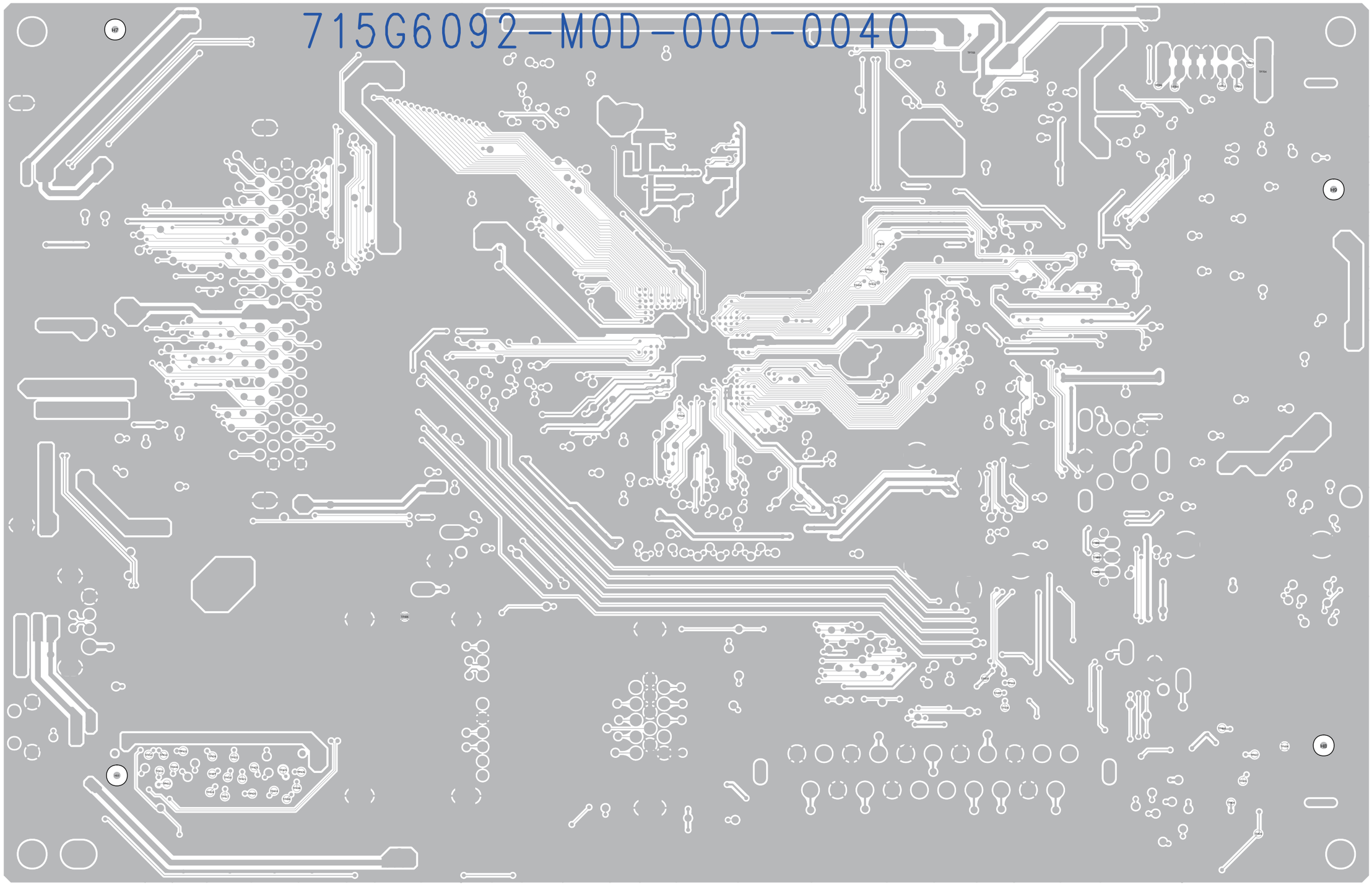
10-14-14 SSB layout top



SSB layout top	715G6092	1 2013-05-27

19530_536_130718.eps
130718

10-14-15 SSB layout bottom



SSB layout bottom	715G6092	1 2013-05-27

19530_537_130718.eps
130718

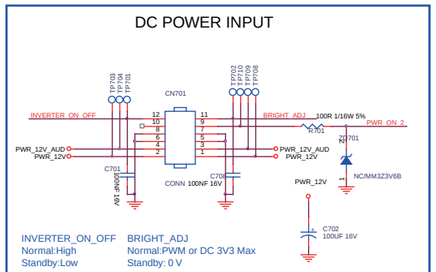
10.15 B 715G6094 SSB
10-15-1 Power-1

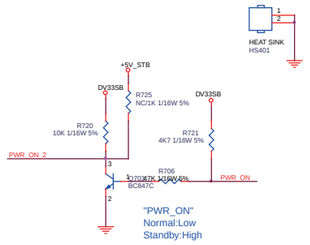
B01 POWER-1

B01

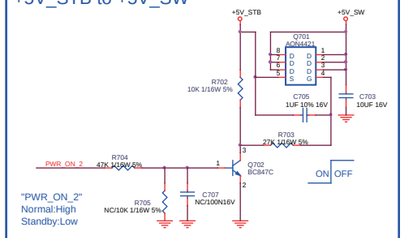
2K13 EU NT72567 - 2 Layers 193mm X 186mm

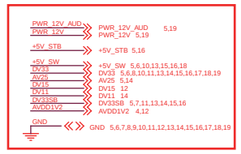
DC POWER INPUT





+5V_STB to +5V_SW

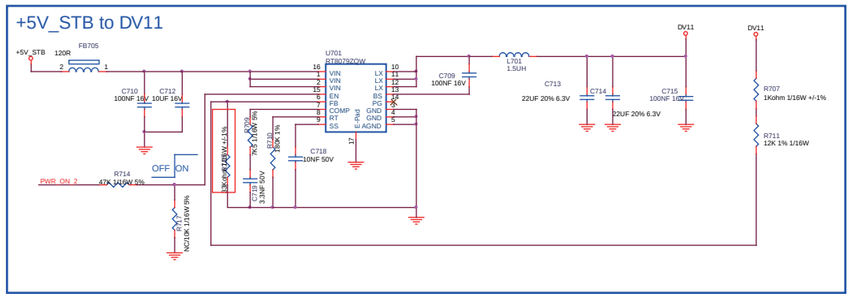




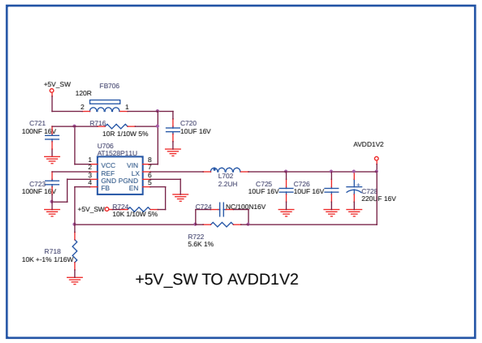




+5V_STB to DV11

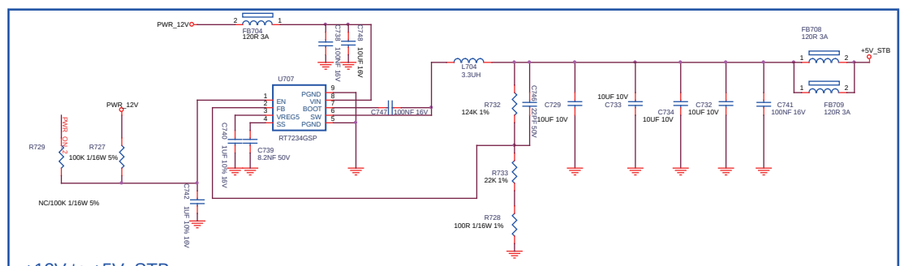


+5V_SW TO AVDD1V2

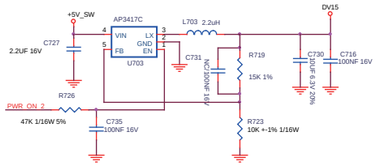


+12V to +5V_STB

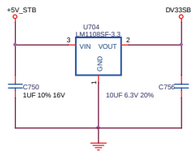
Synchronous buck for 4A output Current



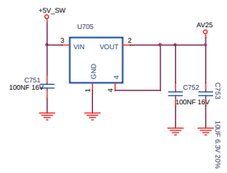
+5V_SW to DV15



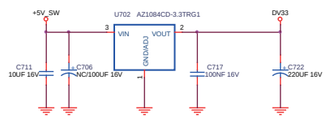
+5V_STB to DV33SB



+5V_SW to AV25



+5V_SW to DV33

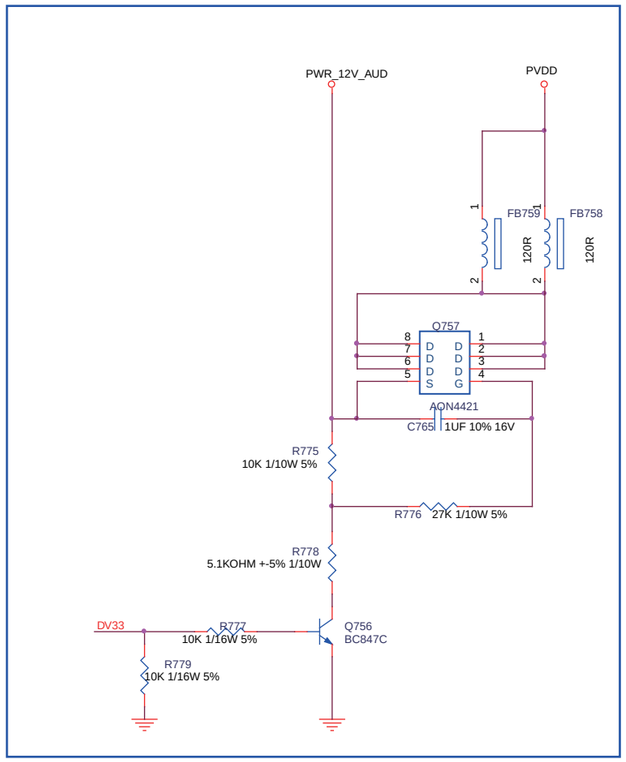


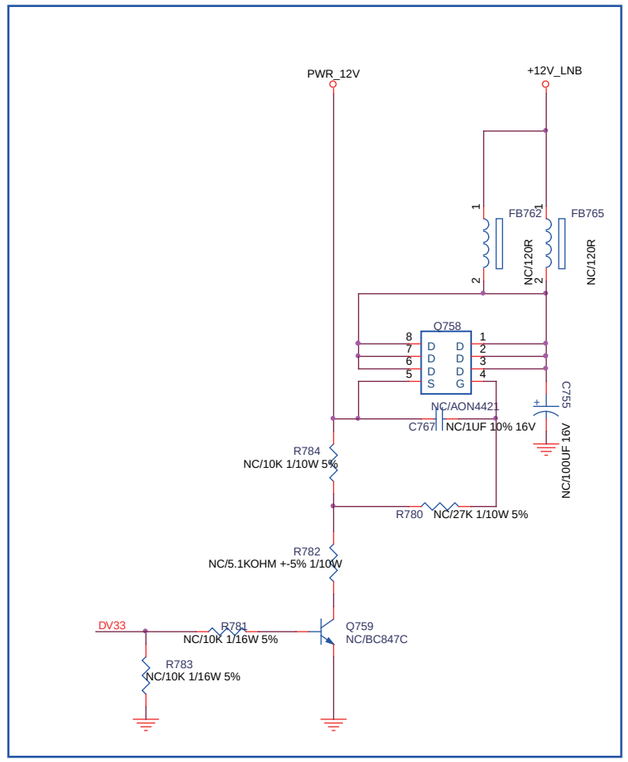
POWER-1	715G6094	1 2013-06-05

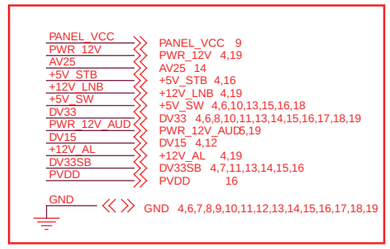
19530_538_130718.eps
130718

B02 POWER-2

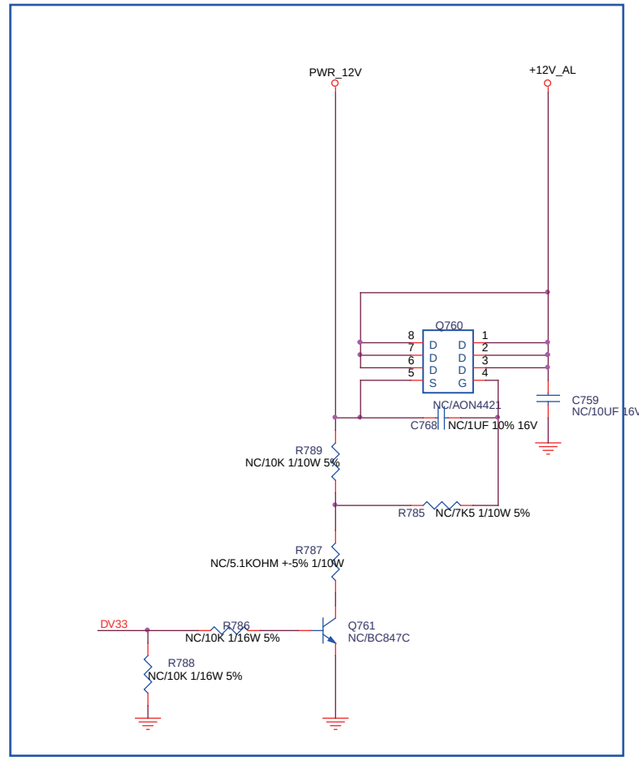
B02

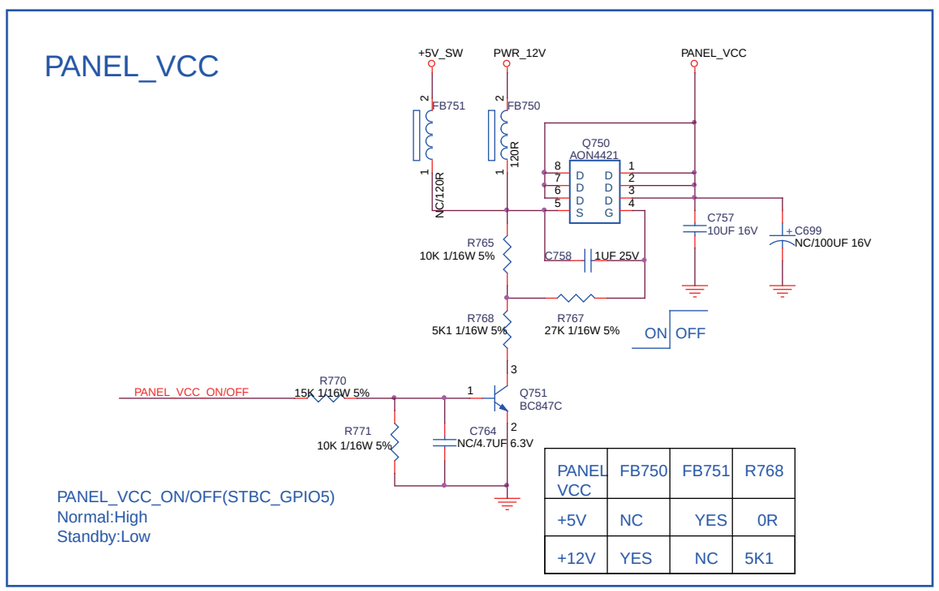












PANEL VCC	FB750	FB751	R768
+5V	NC	YES	0R
+12V	YES	NC	5K1

POWER-2	715G6094	1 2013-06-05

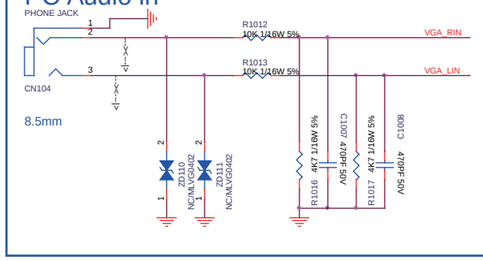
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130718

10-15-3 VGA/SPDIF/UART INPUT

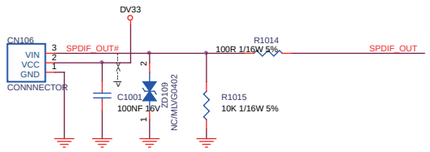
B03 VGA/SPDIF/UART INPUT

B03

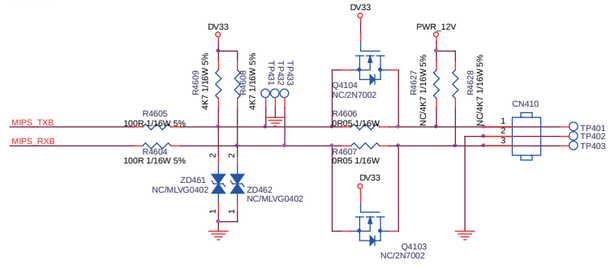
PC Audio in



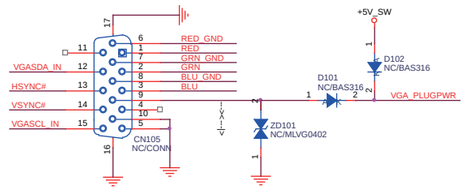
SPDIF Out

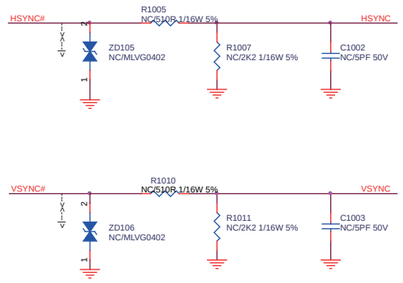


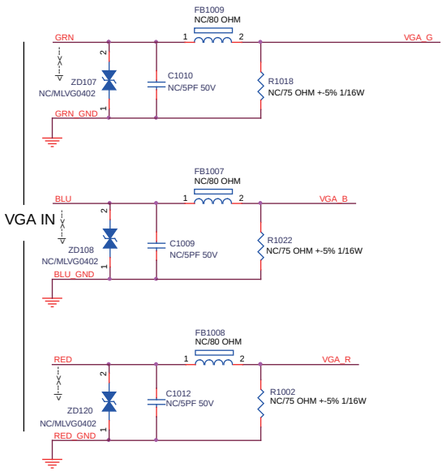
U-ART



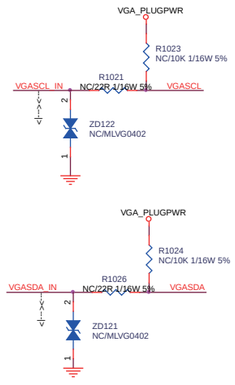
VGA In

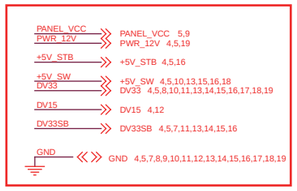




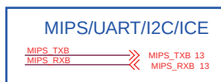


VGA IN

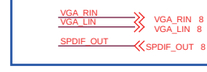




MIPS/UART/I2C/ICE

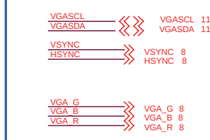


AUDIO /IF



GPIO

YPBPR+R/L+CVBS



VGA/SPDIF/UART INPUT	715G6094	1 2013-06-05

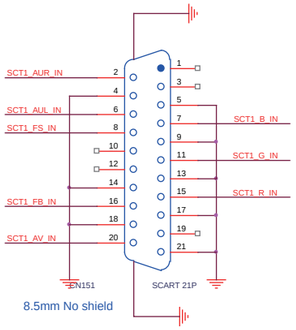
19530_540_130718.eps
130718

10-15-4 SCART/HDMI INPUT

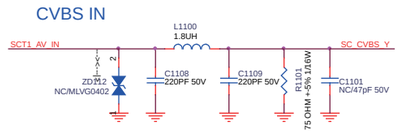
B04 SCART/HDMI INPUT

B04

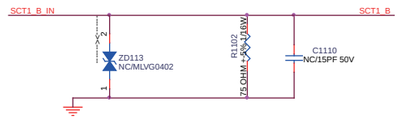
SCART(RGB+CVBS+L/R IN)



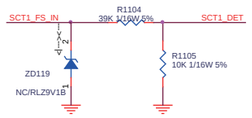
CVBS IN



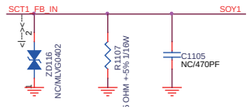
RGB IN



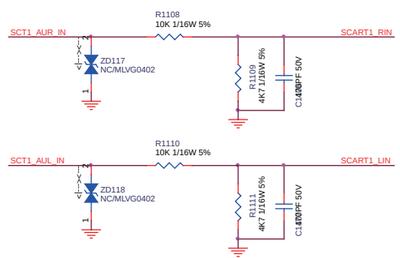
Function Select



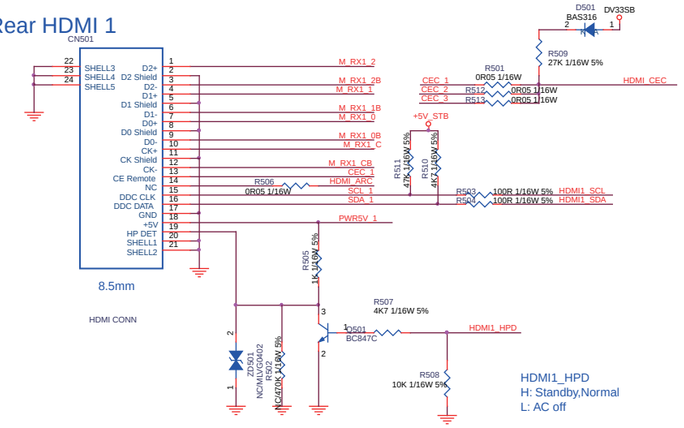
FAST BLANKING/SOY



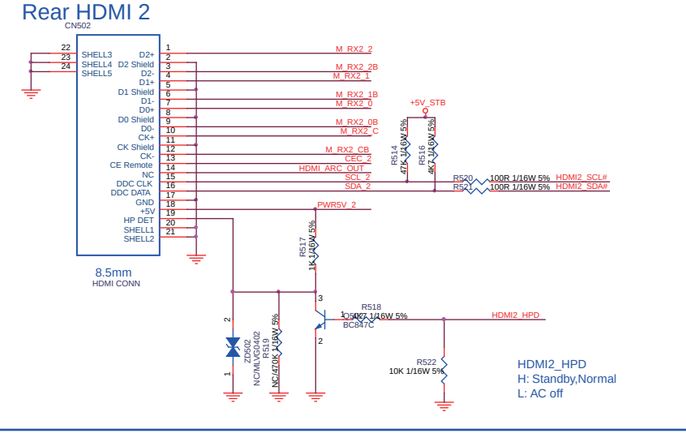
SCART Audio Input



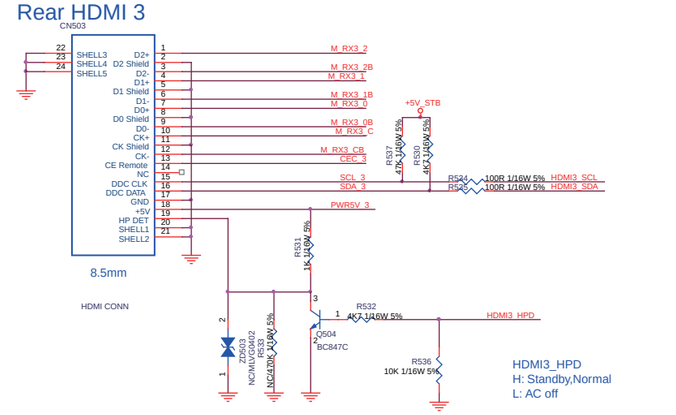
Rear HDMI 1



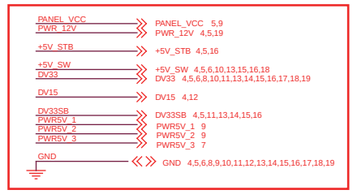
Rear HDMI 2



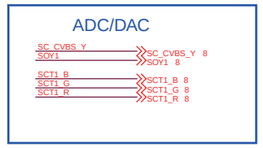
Rear HDMI 3



B04



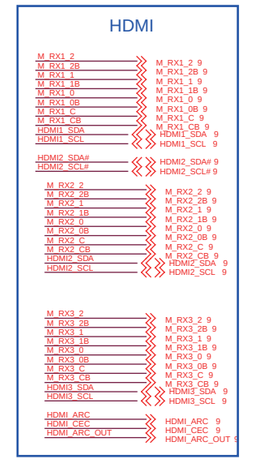
ADC/DAC



AUDIO /IF



HDMI



MIPS/UART/I2C/ICE



GPIO



STB CONTORL



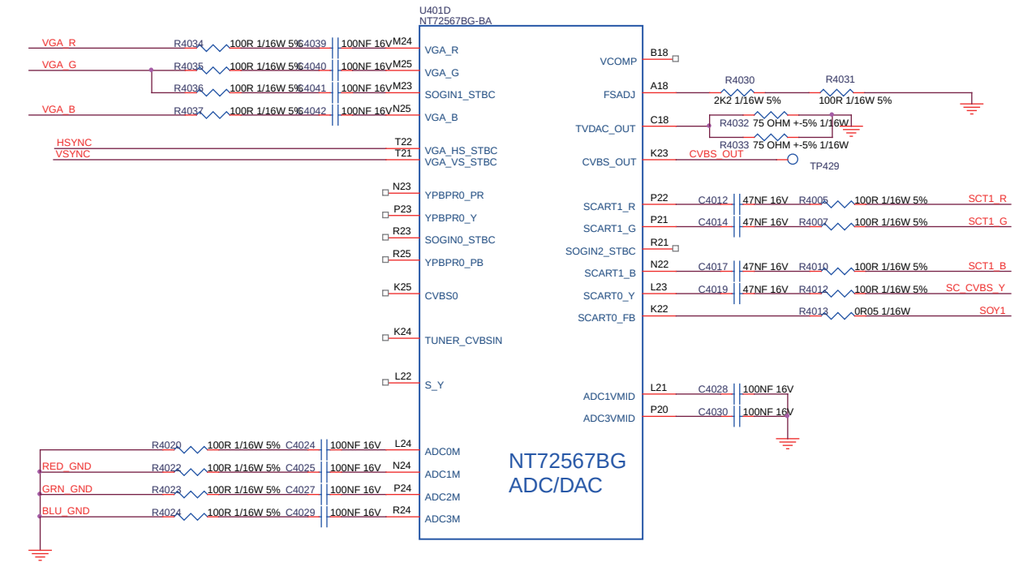
SCART/HDMI INPUT	715G6094	1 2013-06-05

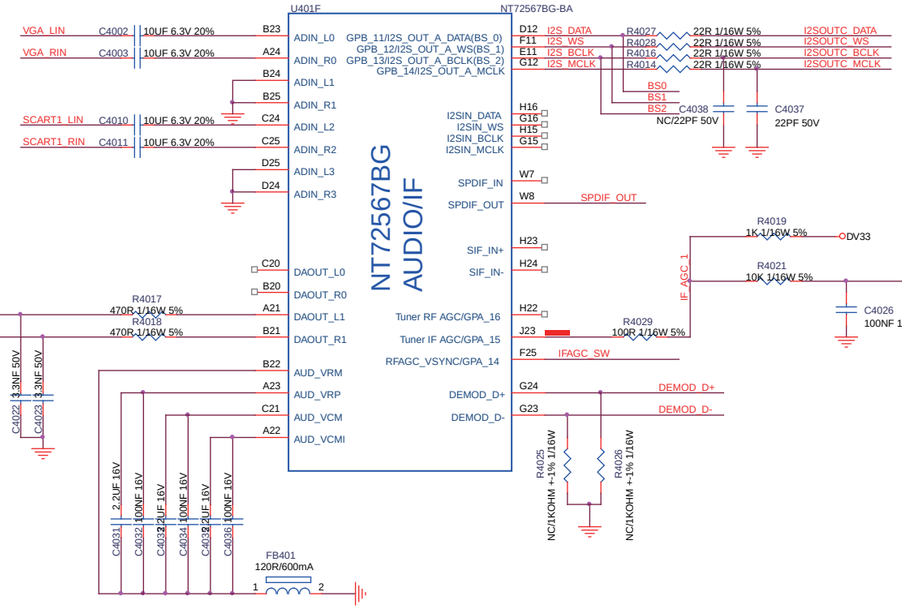
19530_541_130718.eps
130718

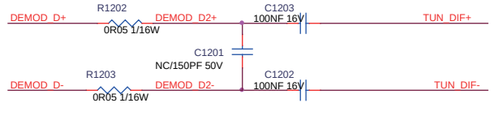
10-15-5 NT72567_ADC/DAC/AUDIO/SIF

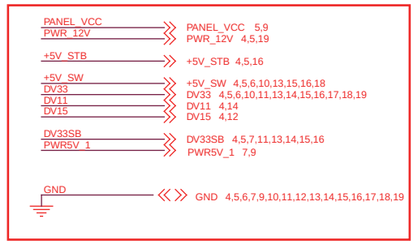
B05 NT72567_ADC/DAC/AUDIO/SIF

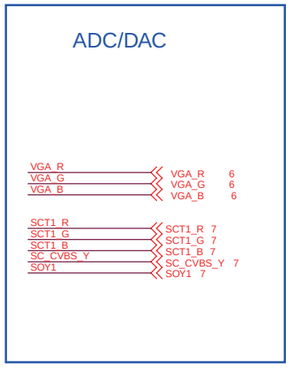
B05

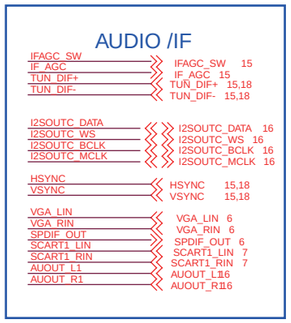


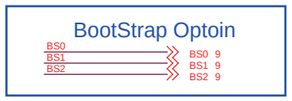












NT72567_ADC/DAC/AUDIO /SIF	715G6094	1 2013-06-05

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130718

B06 NT72567_HDMI/LVDS OUT B06

LVDS OUTPUT

U401B NT72567BG-BA

NT72567BG HDMI/MHL

M_RX1_CB AC10 RXA_CLK- RXC_CLK- AC16 M_RX3_CB
M_RX1_C AD10 RXA_CLK+ RXC_CLK+ AD16 M_RX3_C
M_RX1_0B AE10 RXA_0- RXC_0- AE16 M_RX3_0B
M_RX1_0 AC11 RXA_0+ RXC_0+ AC17 M_RX3_0
M_RX1_1B AE11 RXA_1- RXC_1- AE17 M_RX3_1B
M_RX1_1 AD11 RXA_1+ RXC_1+ AD17 M_RX3_1
M_RX1_2B AC12 RXA_2- RXC_2- AC18 M_RX3_2B
M_RX1_2 AD12 RXA_2+ RXC_2+ AD18 M_RX3_2
PWR5V_1 R4102 4K7 1/16W 5% Y15 PWR5V_A PWR5V_C AA17 4K7 1/16W 5% R4108 PWR5V_3

HDMIA_SDA AB10 HDMI1_SDA
HDMIA_SCL A10 HDMI1_SCL
HDMIB_SDA AA16 HDMI2_SDA
HDMIB_SCL AA15 HDMI2_SCL
HDMIC_SDA AB17 HDMI3_SDA
HDMIC_SCL AB16 HDMI3_SCL

HDMI_ARC R4109 0R05 1/16W AA14 HDMI_ARC
M_RX2_CB AC13 RXB_CLK-
M_RX2_C AD13 RXB_CLK+
M_RX2_0B AE13 RXB_0-
M_RX2_0 AC14 RXB_0+
M_RX2_1B AE14 RXB_1-
M_RX2_1 AD14 RXB_1+
M_RX2_2B AC15 RXB_2-
M_RX2_2 AD15 RXB_2+
PWR5V_2 R4111 4K7 1/16W 5% Y16 PWR5V_B

MHL_CBUS AB13
MHL_VBUS AB14
MHL_CD_SENSE Y14
EXT_RES AA13 R4103 470R 1/16W 5% DV33
HDMI_CEC AB11 HDMI_CEC

PANEL_VCC
FB411 120R
FB412 120R
LVDS_VDD
C4101 10UF 16V
R4104 NC/10K 1/10W 5%
DV33
R4105 NC/100R 1/16W 5%
R4107 NC/0R05 1/16W

LVDS_SEL
LVDS_A0- 8 LVDS_A0+
LVDS_A1- 10 LVDS_A1+
LVDS_A2- 14 LVDS_A2+
LVDS_ACLK- 16 LVDS_ACLK+
LVDS_A3- 20 LVDS_A3+
LVDS_A4- 22 LVDS_A4+
LVDS_B0- 26 LVDS_B0+
LVDS_B1- 28 LVDS_B1+
LVDS_B2- 32 LVDS_B2+
LVDS_BCLK- 34 LVDS_BCLK+
LVDS_B3- 38 LVDS_B3+
LVDS_B4- 40 LVDS_B4+

CN408 41 42 CONN

CN409 61 CONN 60

LVDS_SEL 53 51 50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 52
59 58 57 56 55 54

LVDS_A0- 40 LVDS_A0+ 39 LVDS_A1- 38 LVDS_A1+ 37 LVDS_A2- 36 LVDS_A2+ 35 LVDS_ACLK- 33 LVDS_ACLK+ 32 LVDS_A3- 30 LVDS_A3+ 29 LVDS_A4+ 27 LVDS_B0- 24 LVDS_B0+ 23 LVDS_B1- 22 LVDS_B1+ 21 LVDS_B2- 20 LVDS_B2+ 19 LVDS_BCLK- 17 LVDS_BCLK+ 16 LVDS_B3- 14 LVDS_B3+ 13 LVDS_B4- 12 LVDS_B4+ 11 LVDS_VDD 3 2 1

U401C NT72567BG-BA

NT72567BG LVDS/miniLVDS

LVDS_A0- A7 C7 mini1_D0- mini1_D0+ LVE_0- / mini2_D0- LVE_0+ / mini2_D0+ A12 LVDS_B0- C12 LVDS_B0+
LVDS_A0+ B8 LVO_0- / mini1_D1- LVE_1- / mini2_D1- A13 LVDS_B1- B13 LVDS_B1+
LVDS_A1- C8 LVO_0+ / mini1_D1+ LVE_1+ / mini2_D1+ C13 LVDS_B2- B14 LVDS_B2+
LVDS_A1+ B9 LVO_1- / mini1_D2- LVE_2- / mini2_D2- C14 LVDS_BCLK- C14 LVDS_BCLK-
LVDS_A2- A9 LVO_1+ / mini1_D2+ LVE_2+ / mini2_D2+ B15 LVDS_BCLK+ B15 LVDS_BCLK+
LVDS_A2+ C9 LVO_2- / mini1_CLK- LVE_CLK- / mini2_CLK- A15 LVDS_B3- C15 LVDS_B3+
LVDS_ACLK- A10 LVO_2+ / mini1_CLK+ LVE_CLK+ / mini2_CLK+ C15 LVDS_B3+ A16 LVDS_B4-
LVDS_ACLK+ B10 LVO_CLK- / mini1_D3- LVE_3- / mini2_D3- B16 LVDS_B4+ B16 LVDS_B4+
LVDS_A3- C10 LVO_CLK+ / mini1_D3+ LVE_3+ / mini2_D3+ C16
LVDS_A3+ B11 LVO_3- / mini1_D4- LVE_4- / mini2_D4- B17
LVDS_A4- C11 LVO_3+ / mini1_D4+ LVE_4+ / mini2_D4+
LVDS_A4+ B12 LVO_4- / mini1_D5- mini2_D5-
LVO_4+ / mini1_D5+ mini2_D5+

D19 GPH_0 / TCON_CPV GPH_7 / TCON_GPIO_0 A19
F14 GPH_1 / TCON_OE1 GPH_8 / TCON_GPIO_1 E16
C19 GPH_2 / TCON_OE2 GPH_9 / TCON_GPIO_2 F16
E17 GPH_3 / TCON_STV_D GPH_10 / TCON_GPIO_3 C17
E18 GPH_4 / TCON_STV_U GPH_11 / TCON_GPIO_4 D18
B19 GPH_5 / TCON_TP
F15 GPH_6 / TCON_POL

LVDS_A0- TP TP412
LVDS_A0+ TP TP411
LVDS_A1- TP TP414
LVDS_A1+ TP TP413
LVDS_A2- TP TP416
LVDS_A2+ TP TP415
LVDS_A3- TP TP418
LVDS_A3+ TP TP417
LVDS_B0- TP TP420
LVDS_B0+ TP TP419
LVDS_B1- TP TP422
LVDS_B1+ TP TP421
LVDS_B2- TP TP424
LVDS_B2+ TP TP423
LVDS_B3- TP TP426
LVDS_B3+ TP TP425

PANEL_VCC PANEL_VCC 5
PWR_12V PWR_12V 4,5,19
AV25 AV25 5,14
+5V_STB +5V_STB 4,5,16
+5V_SW +5V_SW 4,5,6,10,13,15,16,18
DV33 DV33 4,5,6,8,10,11,13,14,15,16,17,18,19
DV15 DV15 4,12
DV33SB DV33SB 4,5,7,11,13,14,15,16
PWR5V_1 PWR5V_1 7
PWR5V_2 PWR5V_2 7
PWR5V_3 PWR5V_3 7
GND GND 4,5,6,7,8,10,11,12,13,14,15,16,17,18,19

HDMI

M_RX1_2 M_RX1_2 7
M_RX1_2B M_RX1_2B 7
M_RX1_1 M_RX1_1 7
M_RX1_1B M_RX1_1B 7
M_RX1_0 M_RX1_0 7
M_RX1_0B M_RX1_0B 7
M_RX1_C M_RX1_C 7
M_RX1_CB M_RX1_CB 7
HDMI1_SDA HDMI1_SDA 7
HDMI1_SCL HDMI1_SCL 7

M_RX2_2 M_RX2_2 7
M_RX2_2B M_RX2_2B 7
M_RX2_1 M_RX2_1 7
M_RX2_1B M_RX2_1B 7
M_RX2_0 M_RX2_0 7
M_RX2_0B M_RX2_0B 7
M_RX2_C M_RX2_C 7
M_RX2_CB M_RX2_CB 7
HDMI2_SDA HDMI2_SDA 7
HDMI2_SCL HDMI2_SCL 7

M_RX3_2 M_RX3_2 9
M_RX3_2B M_RX3_2B 9
M_RX3_1 M_RX3_1 9
M_RX3_1B M_RX3_1B 9
M_RX3_0 M_RX3_0 9
M_RX3_0B M_RX3_0B 9
M_RX3_C M_RX3_C 9
M_RX3_CB M_RX3_CB 9
HDMI3_SDA HDMI3_SDA 9
HDMI3_SCL HDMI3_SCL 9

HDMI_ARC HDMI_ARC 7
HDMI_CEC HDMI_CEC 7
LVDS_SEL LVDS_SEL 16

NT72567_HDMI/LVDS OUT	715G6094	1 2013-06-05

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130718

B07 NT72567_CI

B07

PCMCIA Slot

CN159
PCMICA CARD

		1	GND	GND	35	
CI_D3		2	D3	CD1#	36	CI_CD1#
CI_D4		3	D4	D11	37	CI_OUTDATA3
CI_D5		4	D5	D12	38	CI_OUTDATA4
CI_D6		5	D6	D13	39	CI_OUTDATA5
CI_D7		6	D7	D14	40	CI_OUTDATA6
CI_CE1#		7	CE1#	D15	41	CI_OUTDATA7
CI_A10		8	A10	CE2#	42	CI_CE2#
CI_OE#		9	OE#	VS1#	43	
CI_A11		10	A11	IORD#	44	CI_IORD#
CI_A9		11	A9	IOWR#	45	CI_IOWR#
CI_A8		12	A8	A17	46	CI_INSYNC
CI_A13		13	A13	A18	47	CI_INDATA0
CI_A14		14	A14	A19	48	CI_INDATA1
CI_WE#		15	WE#	A20	49	CI_INDATA2
CI_IREQ#		16	READY#:IREQ#	A21	50	CI_INDATA3
VCC_CI	VCC_CI	17	VCC	VCC	51	
VCC_CI	VCC_CI	18	VPP1	VPP2	52	VCC_CI VCC_CI
CI_INVALID		19	A16	A22	53	CI_INDATA4
CI_INCLK		20	A15	A23	54	CI_INDATA5
CI_A12		21	A12	A24	55	CI_INDATA6
CI_A7		22	A7	A25	56	CI_INDATA7
CI_A6		23	A6	VS2#	57	CI_OUTCLK
CI_A5		24	A5	RESET	58	CI_RESET
CI_A4		25	A4	WAIT#	59	CI_WAIT#
CI_A3		26	A3	INPACK	60	
CI_A2		27	A2	REG#	61	CI_REG#
CI_A1		28	A1	BVD2#:SPKR	62	CI_OUTVALID
CI_A0		29	A0	BVD1#:STSCHG	63	CI_OUTSYNC
CI_D0		30	D0	D8	64	CI_OUTDATA0
CI_D1		31	D1	D9	65	CI_OUTDATA1
CI_D2		32	D2	D10	66	CI_OUTDATA2
CI_WP#		33	WP#	CD2#	67	
		34	GND	GND	68	
					69 70 71 72	

PCMCIA

C1301
NC/10PF 50V

CI Bus Power Control

C1302 10UF 16V
+5V_SW
U102
VIN VOUT
GND
EN OCB
APL3511CBI-TRG
CI_PWR_EN
CI_OCP
R1301 4K7 1/16W 5%
R1302 4K7 1/16W 5%
C1303 100NF 16V
C1304 10UF 16V
FB131 220R
R1303 10K 1/16W 5%
C1305 NC/10uF 16V
VCC_CI
+5V_SW

CI_OUTDATA2 — R4294 22R 1/16W 5% — CI_D_2 — CI_D_2
CI_D1 — R4293 22R 1/16W 5% — CI_D_1 — CI_D_1

CI_OUTDATA1 — R4183 22R 1/16W 5% — CI_D_0 — CI_D_0
CI_A0 — CI_A_0
CI_OUTDATA0 — CI_OUTDATA_0

CI_A1 — CI_A_1
CI_A2 — CI_A_2
CI_A3 — CI_A_3
CI_A4 — CI_A_4

CI_A5 — R4291 0R05 1/16W — CI_A_5
CI_INDATA7 — CI_INDATA_7
CI_A6 — CI_A_6
CI_A7 — CI_A_7

CI_INDATA6 — R4288 0R05 1/16W — CI_INDATA_6
CI_A12 — CI_A_12
CI_INDATA5 — R4286 0R05 1/16W — CI_INDATA_5
CI_INDATA4 — R4285 0R05 1/16W — CI_INDATA_4

CI_INDATA3 — R4284 0R05 1/16W — CI_INDATA_3
CI_INDATA2 — R4283 0R05 1/16W — CI_INDATA_2
CI_INDATA1 — R4282 0R05 1/16W — CI_INDATA_1
CI_A14 — CI_A_14

CI_A13 — CI_A_13
CI_INDATA0 — R4191 0R05 1/16W — CI_INDATA_0
CI_A8 — CI_A_8
CI_A9 — CI_A_9

CI_A11 — CI_A_11
CI_A10 — CI_A_10
CI_OUTDATA7 — CI_OUTDATA_7
CI_OUTDATA6 — CI_OUTDATA_6

CI_D7 — R4198 22R 1/16W 5% — CI_D_7
CI_D6 — R4199 22R 1/16W 5% — CI_D_6
CI_OUTDATA5 — CI_OUTDATA_5
CI_D5 — R4300 22R 1/16W 5% — CI_D_5

CI_D4 — R4299 22R 1/16W 5% — CI_D_4
CI_OUTDATA4 — CI_OUTDATA_4
CI_D3 — R4297 22R 1/16W 5% — CI_D_3
CI_OUTDATA3 — CI_OUTDATA_3

VCC_CI

R4161 10K 1/16W 5% — CI_CD1#
R4162 10K 1/16W 5% — CI_CE2#
R4163 10K 1/16W 5% — CI_WP#
R4164 10K 1/16W 5% — CI_IREQ#
R4165 10K 1/16W 5% — CI_RESET
R4166 10K 1/16W 5% — CI_WAIT#

B07

+5V_STB — +5V_STB 4
+5V_SW — +5V_SW 4,11,16
DV33 — DV33 4,5,6,7,9,11,12,13,14,15,16
DV15 — DV15 4,10
DV11 — DV11 4,12
DV33SB — DV33SB 4,5,9,12,13,14
GND — GND 4,5,6,7,9,10,11,12,13,14,15,16

GPIO

CI_PWR_EN — CI_PWR_EN 11

CI_INCLK	CI_INCLK 16
CI_INVALID	CI_INVALID 16
CI_INSYNC	CI_INSYNC 16
CI_INDATA7	CI_INDATA7 16
CI_INDATA6	CI_INDATA6 16
CI_INDATA5	CI_INDATA5 16
CI_INDATA4	CI_INDATA4 16
CI_INDATA3	CI_INDATA3 16
CI_INDATA2	CI_INDATA2 16
CI_INDATA1	CI_INDATA1 16
CI_INDATA0	CI_INDATA0 16

U401G NT72567BG-BA

CI_A_0	G5	CI_A0/ALE0	STSIN0_CLK/GPB_15	F10	
CI_A_1	G4	CI_A1/ALE8	STSIN0_VALID/GPB_16	E10	
CI_A_2	G3	CI_A2	STSIN0_START/GPB_17	D10	
CI_A_3	G2	CI_A3	STSIN0_DATA/GPB_18	F9	
CI_A_4	H6	CI_A4			
CI_A_5	H5	CI_A5		E9	
CI_A_6	H4	CI_A6	PTSIN1/STSIN0_ERROR/GPB_19	D9	
CI_A_7	H3	CI_A7	PTSIN1/STSIN1_CLK/GPB_20	F8	CI_OUTVALID
CI_A_8	H2	CI_A8	PTSIN1/STSIN1_VALID/GPB_21	E8	CI_OUTSYNC
CI_A_9	L4	CI_A9	PTSIN1/STSIN1_START/GPB_22		
CI_A_10	J6	CI_A10/Tensilica_TCK			
CI_A_11	J5	CI_A11/Tensilica_TMS	PTSIN1_D0/STSIN1_DATA	F7	CI_OUTDATA_0
CI_A_12	K4	CI_A12/Tensilica_TDO	PTSIN1_D1	E7	CI_OUTDATA_1
CI_A_13	K5	CI_A13/Tensilica_TDI	PTSIN1_D2	D7	CI_OUTDATA_2
CI_A_14	K6	CI_A14/Tensilica_TRST	PTSIN1_D3	B6	CI_OUTDATA_3
			PTSIN1_D4	A6	CI_OUTDATA_4
CI_D_0	D5	CI_AD0	PTSIN1_D5	A4	CI_OUTDATA_5
CI_D_1	D4	CI_AD1	PTSIN1_D6	A3	CI_OUTDATA_6
CI_D_2	D3	CI_AD2	PTSIN1_D7	A2	CI_OUTDATA_7
CI_D_3	D2	CI_AD3			
CI_D_4	D1	CI_AD4		B5	
CI_D_5	E6	CI_AD5		B4	CI_INCLK
CI_D_6	E5	CI_AD6	PTSIN2/DEMODOUT_ERROR	B3	CI_INVALID
CI_D_7	E4	CI_AD7	PTSOUT/PTSIN2/DEMODOUT/STSOUT_CLK	B2	CI_INSYNC
			PTSOUT/PTSIN2/DEMODOUT/STSOUT_VALID		
			PTSOUT/PTSIN2/DEMODOUT/STSOUT_START		
CI_RESET	E3	CI_RST#/GPC_19			
CI_CD1#	E2	CI_CD#/GPC_20	PTSOUT/PTSIN2/DEMODOUT_D0	B1	CI_INDATA_0
CI_CE1#	E1	CI_CE#/GPC_21	PTSOUT/PTSIN2/DEMODOUT_D1	C6	CI_INDATA_1
CI_IREQ#	F6	CI_IOINT#/GPC_22	PTSOUT/PTSIN2/DEMODOUT_D2	C5	CI_INDATA_2
CI_OE#	F3	CI_HRD#/GPC_25	PTSOUT/PTSIN2/DEMODOUT_D3	C4	CI_INDATA_3
CI_WE#	F2	CI_HWR#/GPC_26	PTSOUT/PTSIN2/DEMODOUT_D4	C3	CI_INDATA_4
CI_REG#	F1	CI_REG#/GPC_27	PTSOUT/PTSIN2/DEMODOUT_D5	C2	CI_INDATA_5
CI_WAIT#	G6	CI_HWAIT#/GPC_28	PTSOUT/PTSIN2/DEMODOUT_D6	C1	CI_INDATA_6
CI_IORD#	F5	CI_IORD#/GPC_23	PTSOUT/PTSIN2/DEMODOUT_D7	D6	CI_INDATA_7
CI_IOWR#	F4	CI_IOWR#/GPC_24			

NT72567BG
CI/TS

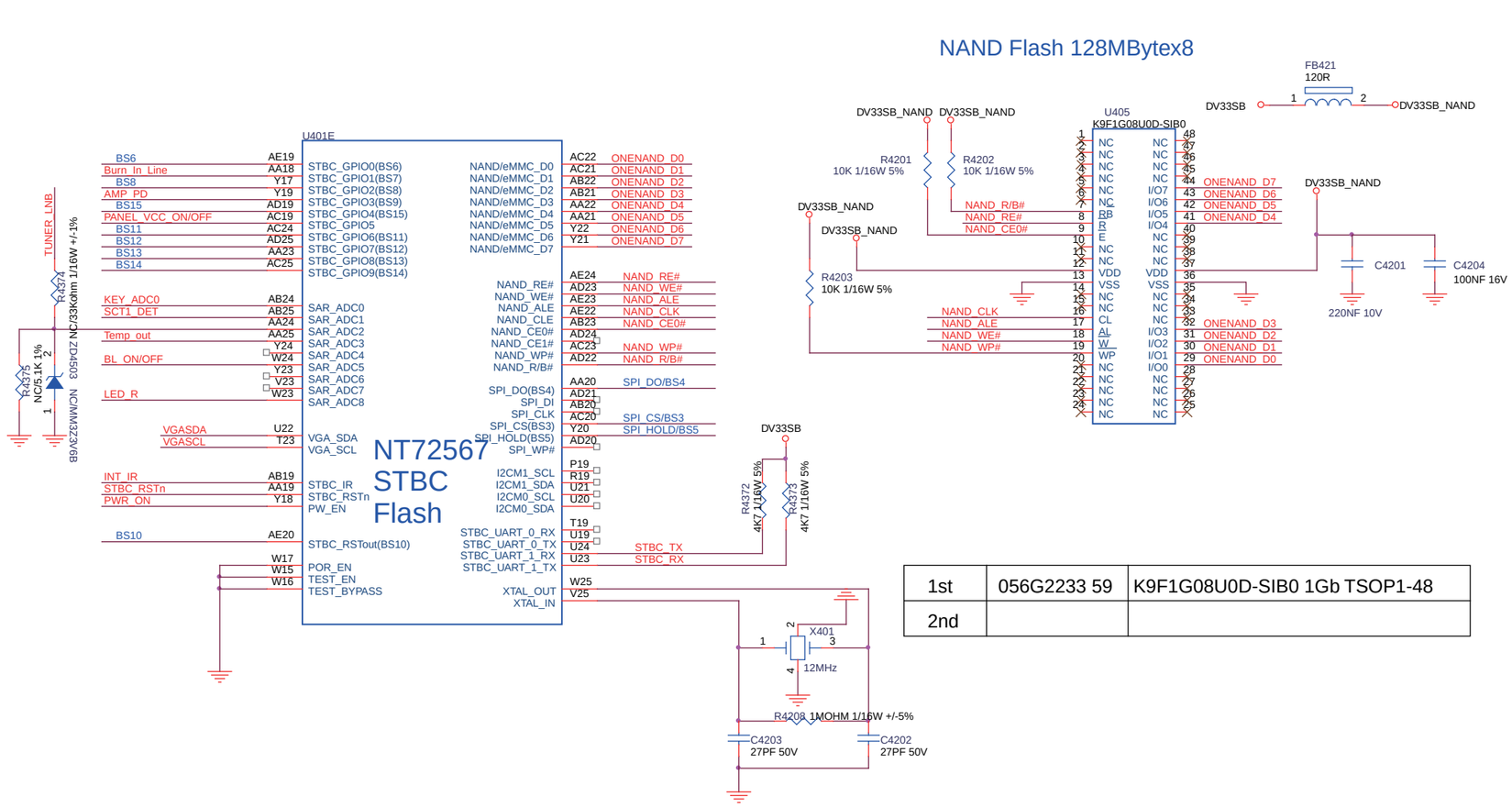
C4161 NC/10PF 50V
FB416 30R
CI_OUTCLK

NT72567_CI	715G6094	1 2013-06-05

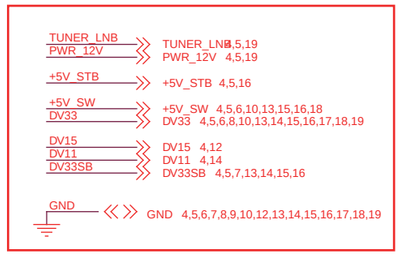
19530_544_130718.eps
130718

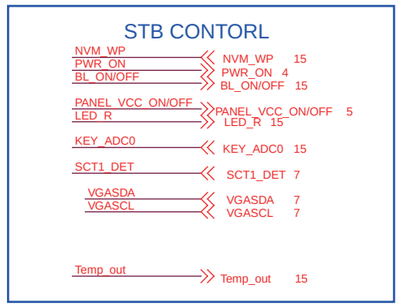
B08 NT72567_STBC/FLASH

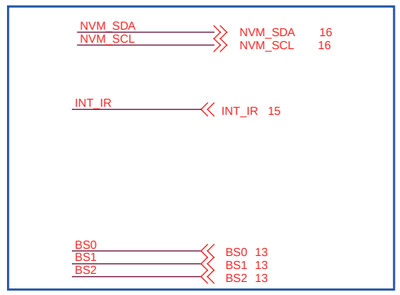
B08

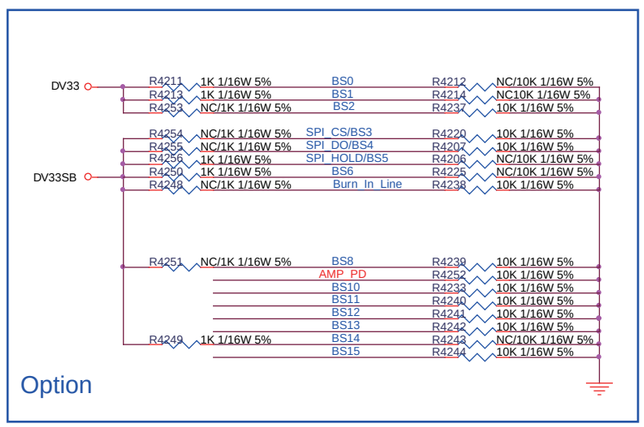


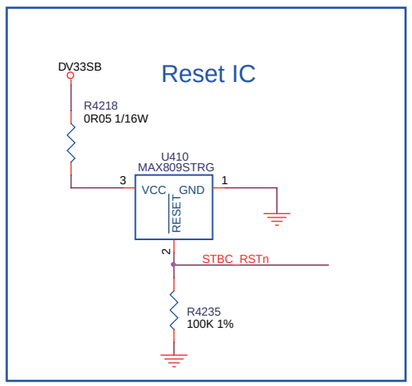
1st	056G2233 59	K9F1G08U0D-SIB0 1Gb TSOP1-48
2nd		

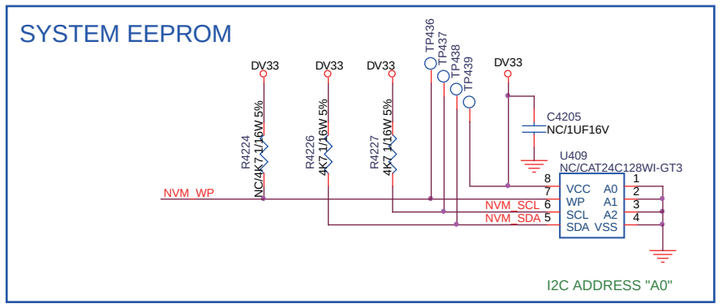










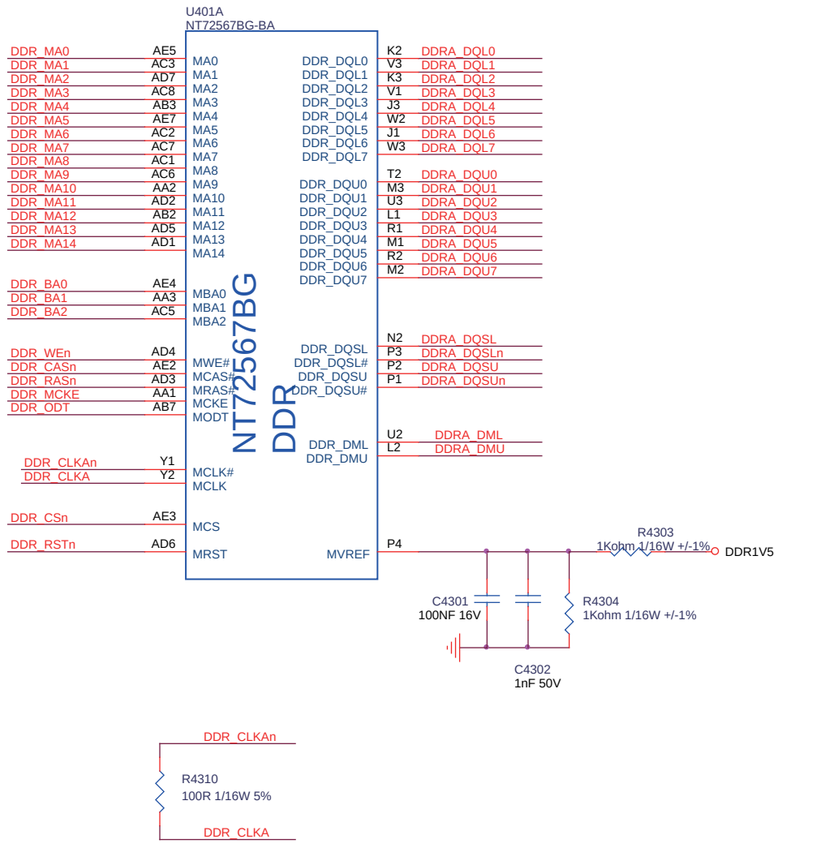


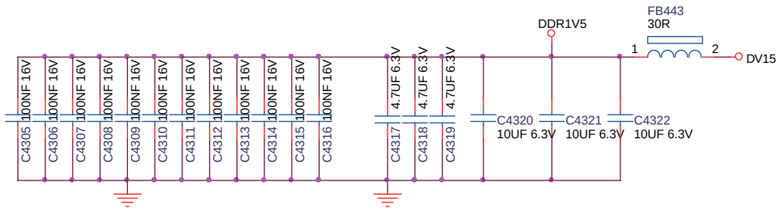
NT72567_STBC/FLASH	715G6094	1	2013-06-05

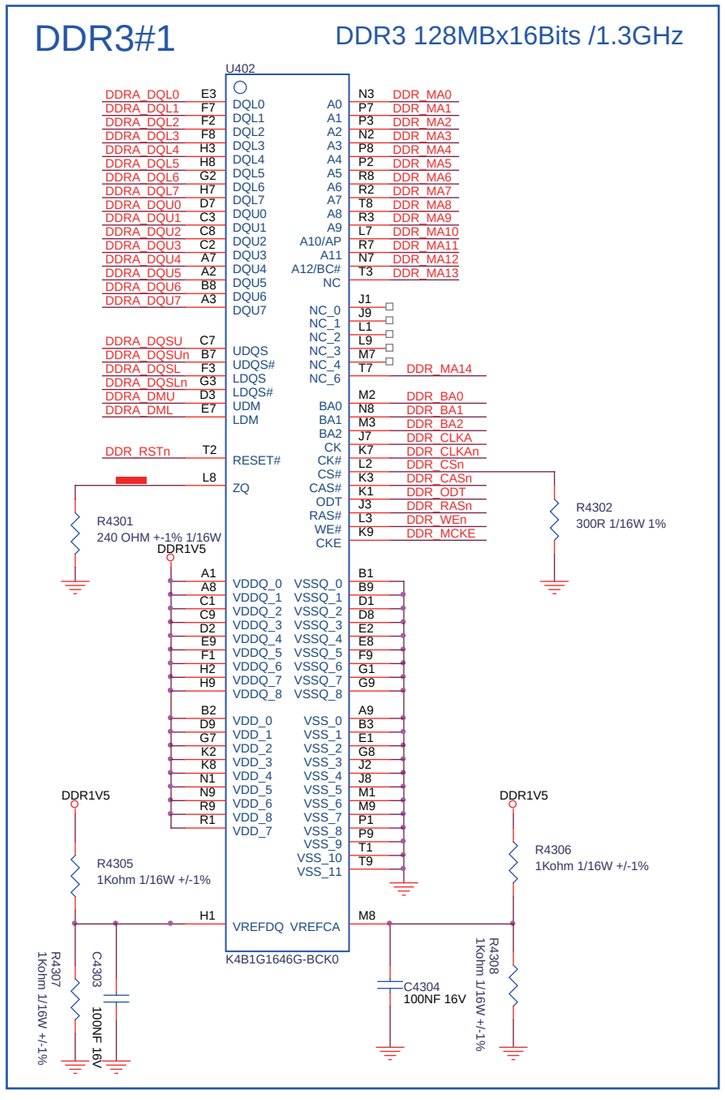
19530_545_130718.eps
130718

B09 NT72567_DDR

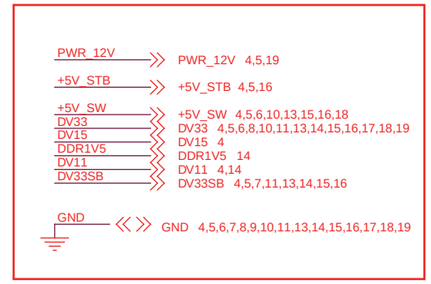
B09







B09



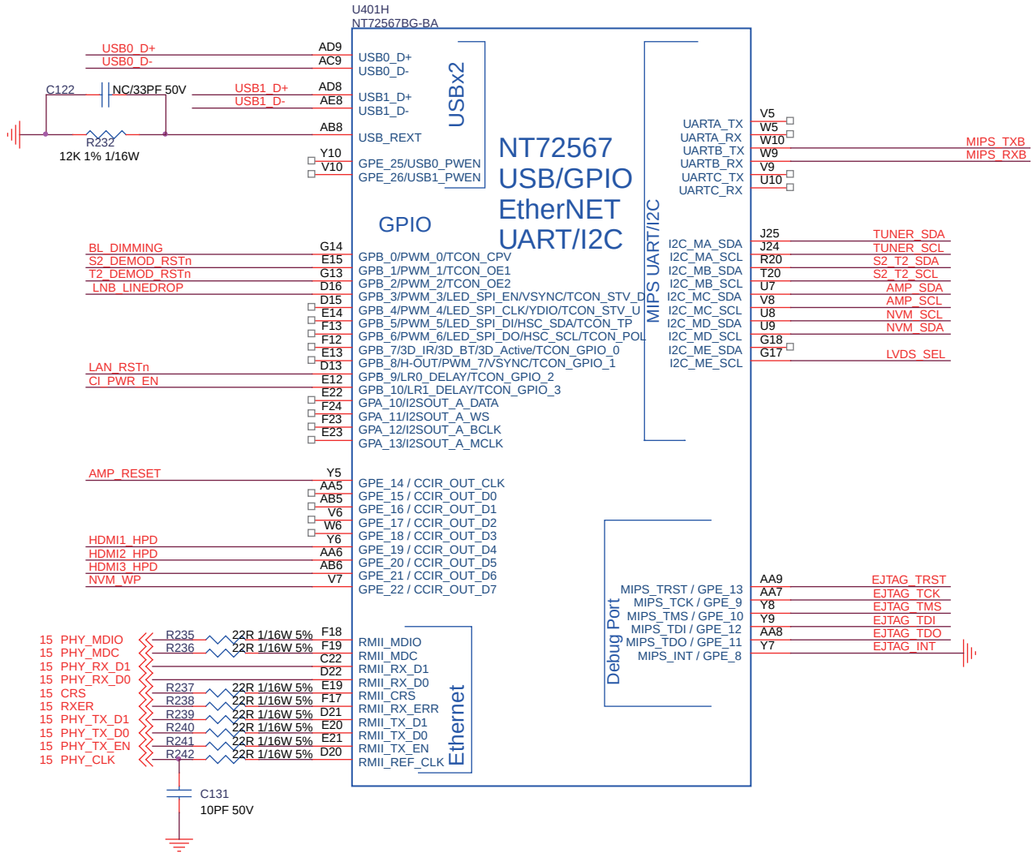
	056G 615515		Samsung
			Hynix

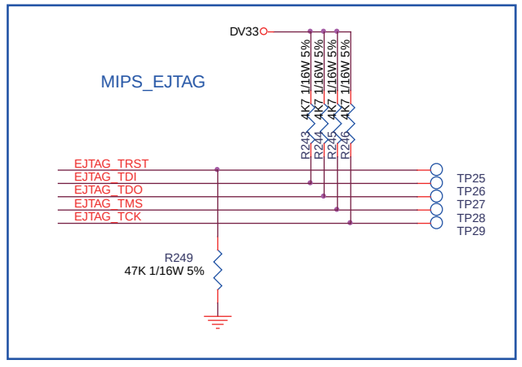
NT72567_DDR	715G6094	1 2013-06-05

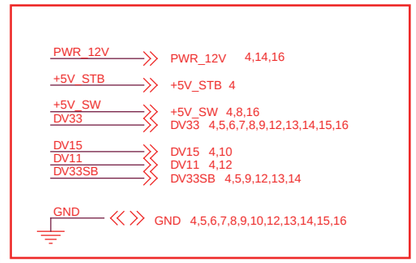
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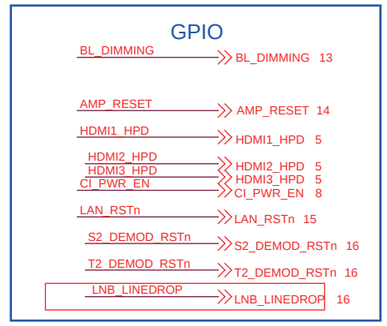
B10 NT72567_USB/GPIO

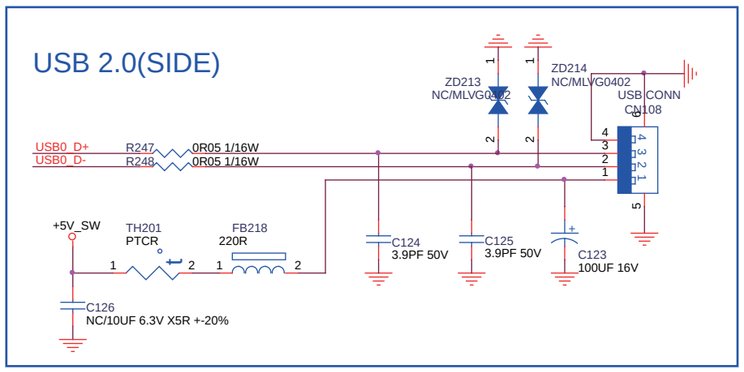
B10

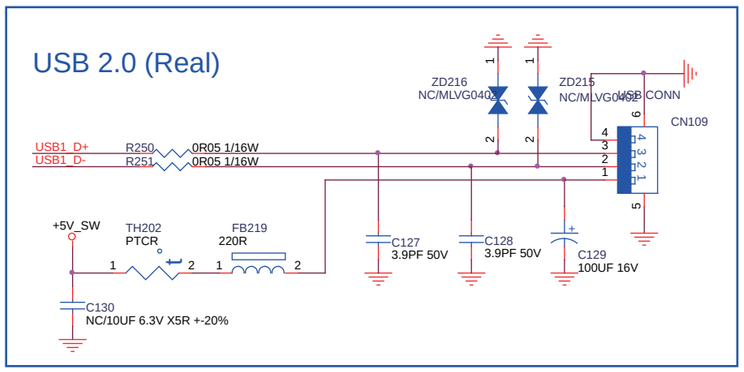








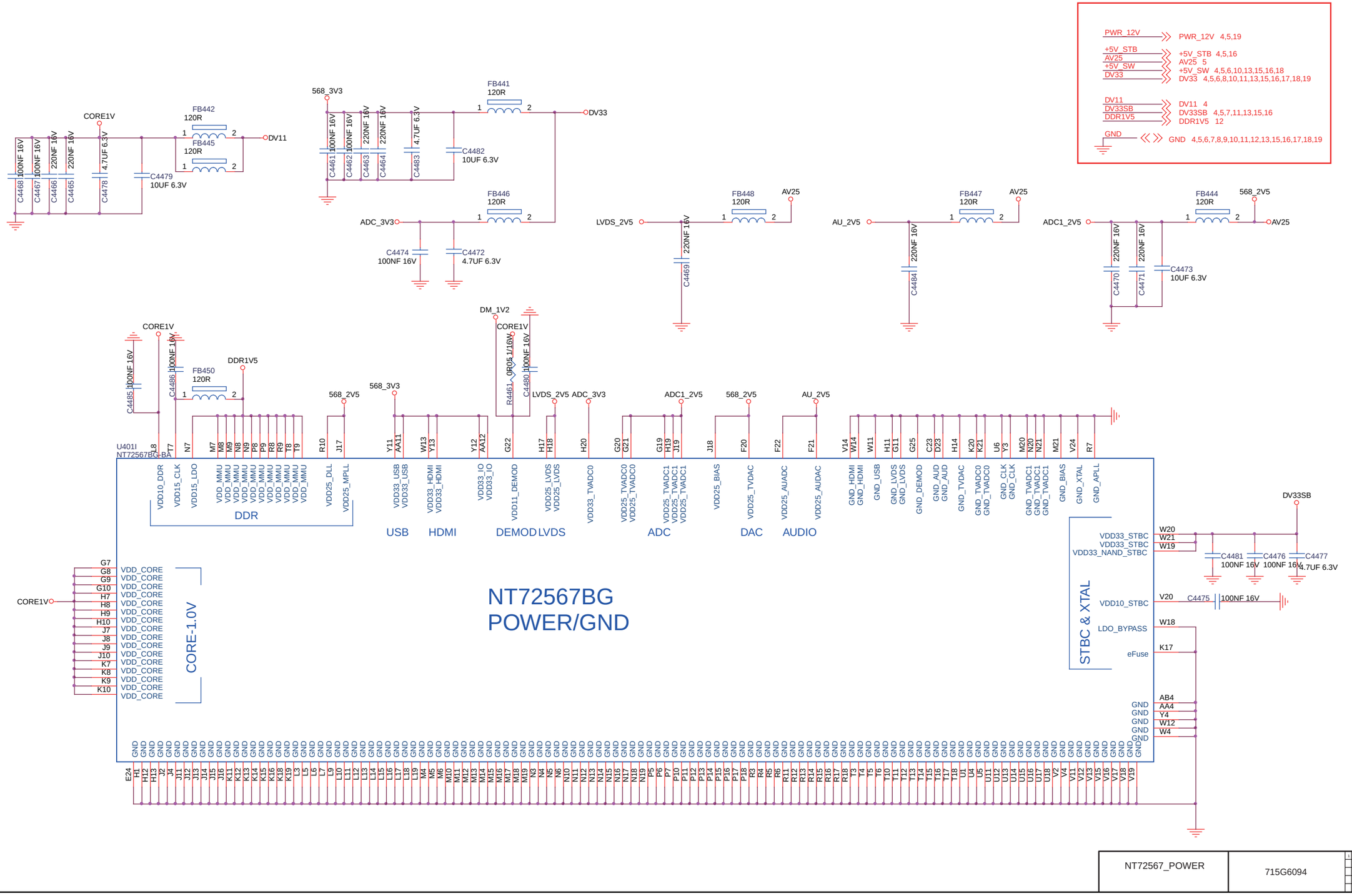




NT72567_USB/GPIO	715G6094	1 2013-06-05

19530_547_130718.eps
130718

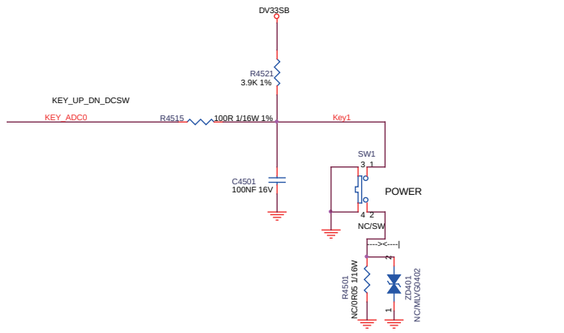
B11 NT72567_POWER **B11**

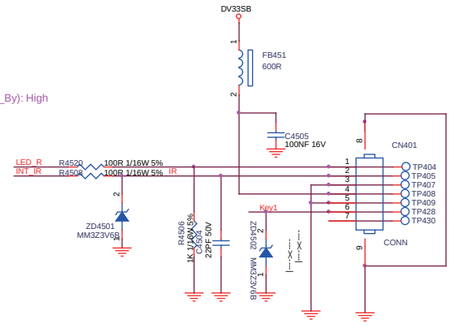


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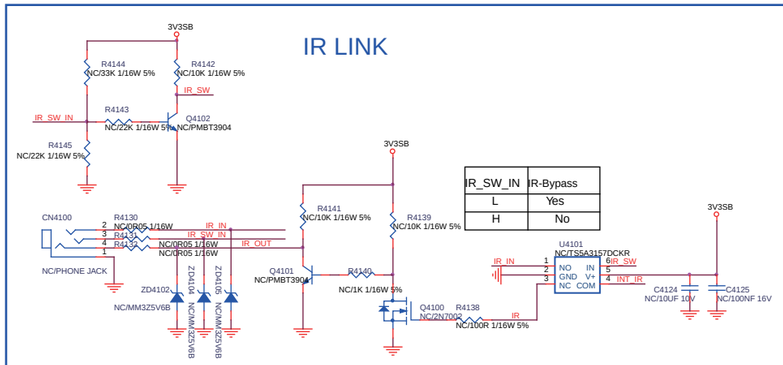
B12 IR/KEY

B12



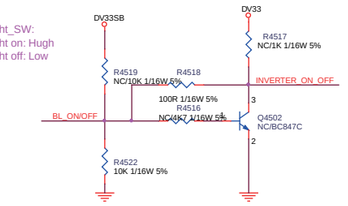


LED_R#:
Enable(Stand_By): High
Disable: Low



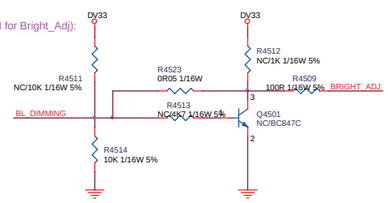
Backlight ON/OFF Control

BackLight_SW:
BackLight on: Hugh
BackLight off: Low

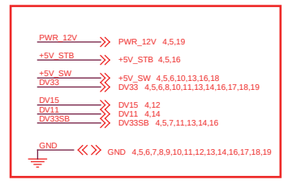


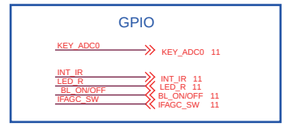
Backlight Brightness Control

BL_DIM(PWM for Bright_Adj):
Max: 0V
Min: +3V3

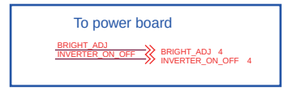


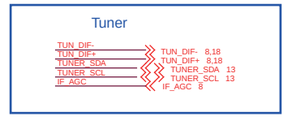
B12











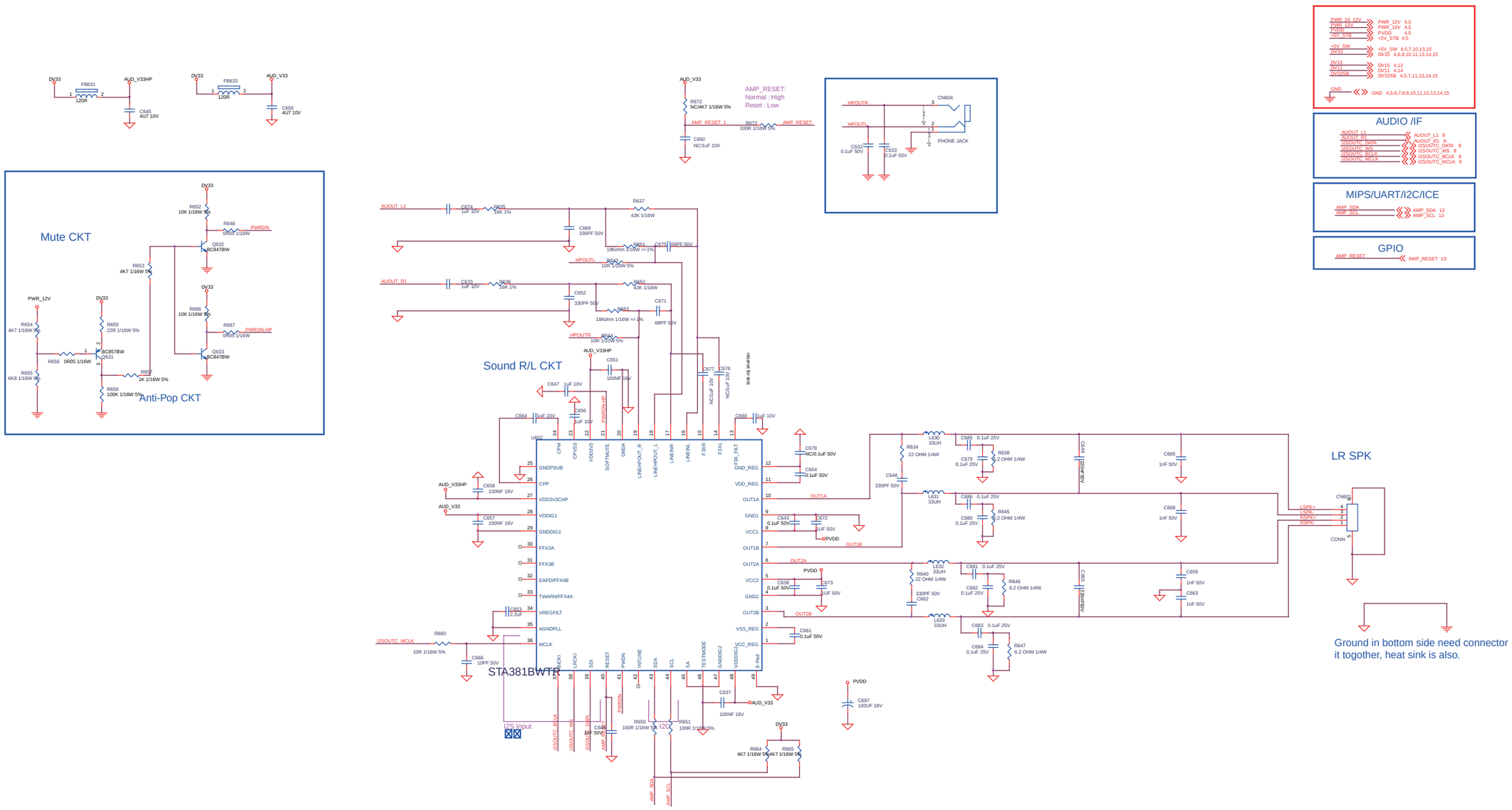
IR/KEY	715G6094	1 2013-06-05

19530_549_130718.eps
130718

10-15-13 SPEAKER AMPLIFIER/HEADPHONE OUT

B13 SPEAKER AMPLIFIER/HEADPHONE OUT

B13



SPEAKER AMPLIFIER/ HEADPHONE OUT	715G6094	1 2013-06-05

19530_550_130718.eps
130718

10-15-14 T2/S2 Tuner/Demodulator

B14 T2/S2 Tuner/Demodulator

B14

TUNER

TCLTuner with DVB-C/T/T2

TCLTuner with DVB-S/S2

LNB POWER SUPPLY

ESD & Surge Protect

NET LNB_LINEDROP Swap to LNB_EN Function.
NET LNB_EN Swap to LNB_LINEDROP Function.

LINEDROP: 13/18V_SW:
Low: 13/18V Low: 18V
High: 14/19V High: 13V

LNB_EN:
Low: disable
High: enable

IFAGC SWITCH

Optional UART Interface for DeBug

NT78820TL

DVB-T/T2 Demodulator

S2_RESET:
Reset : Low
Normal : High

NC/AVL6211LA

DVB-S/S2 Demodulator

Tuner

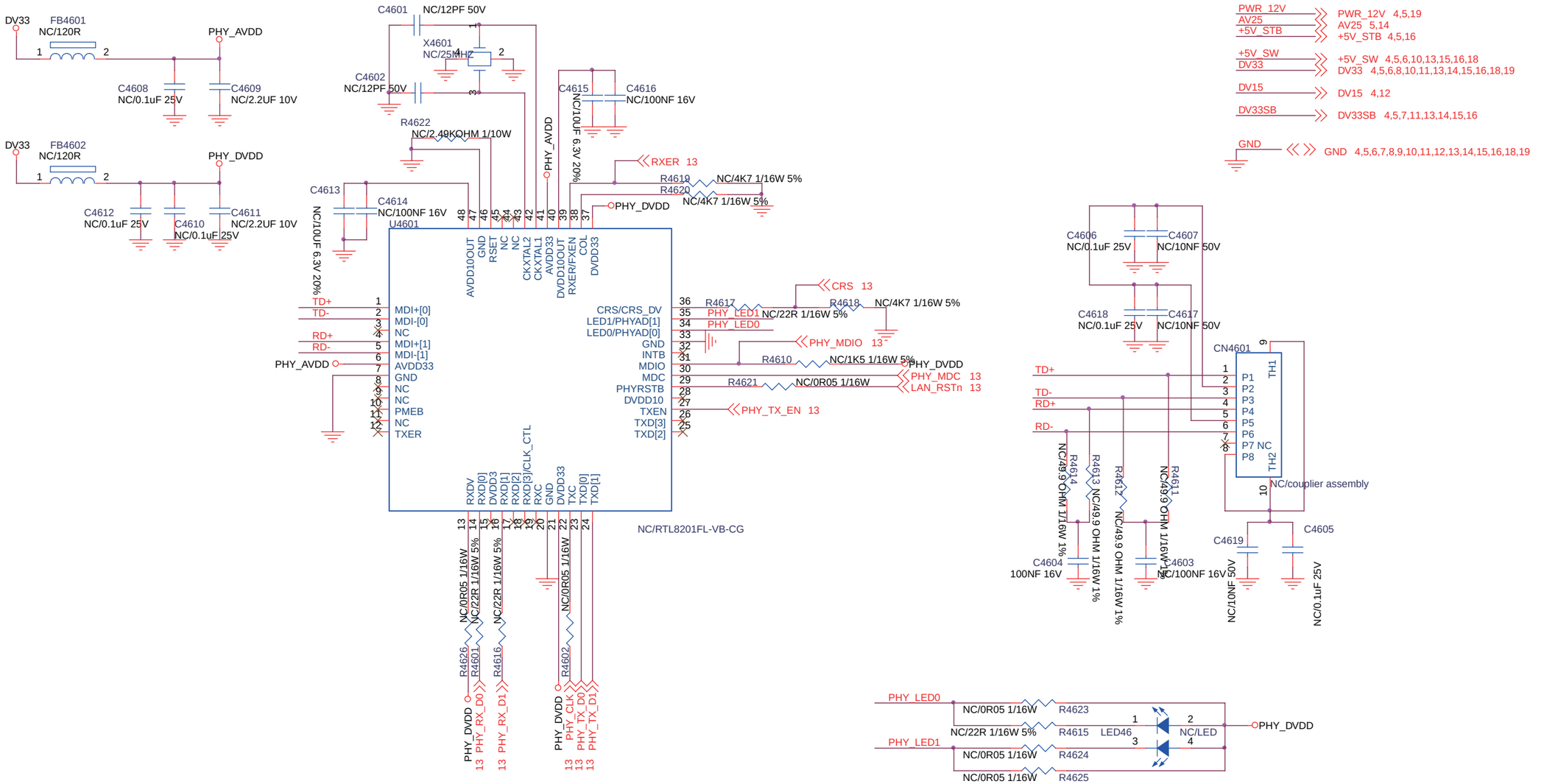
Demod

T2/S2 Tuner/Demodulator	715G6094	1 2013-06-05

19530_551_130718.eps
130718

B15 Enthernet

B15



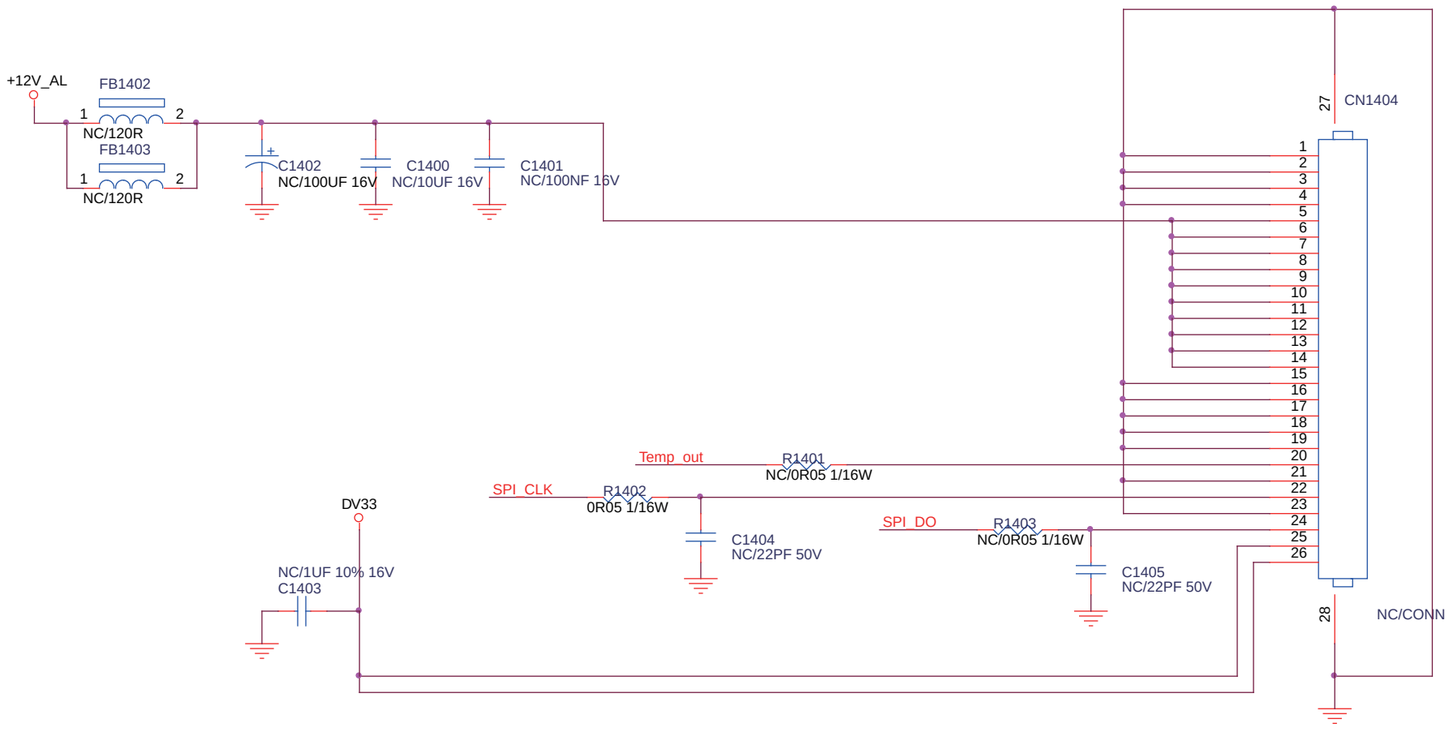
Enthernet	715G6094	1 2013-06-05

19530_552_130718.eps
130718

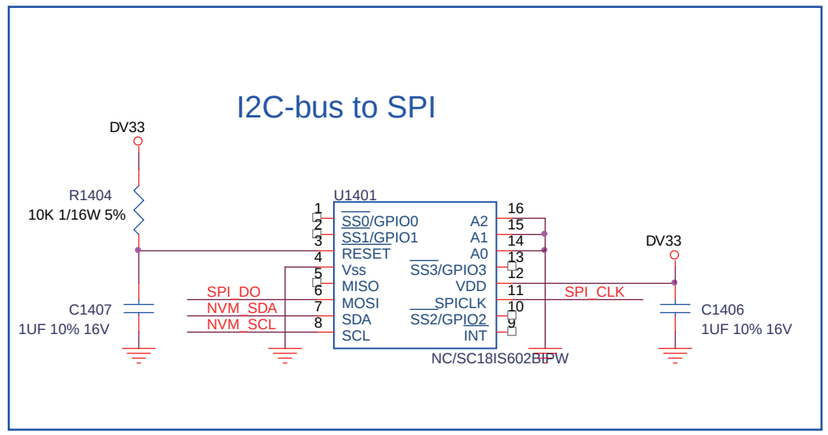
10-15-16 Ambient Light

B16 Ambient Light

B16



Item	Function	3200/4200/4500	5000
C1400 C1401 C1403 CN1404 FB1402 R1401 R1402 R1403	Ambient Light	NO	Yes

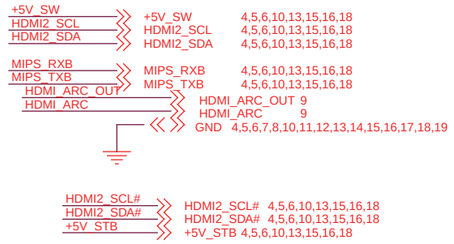


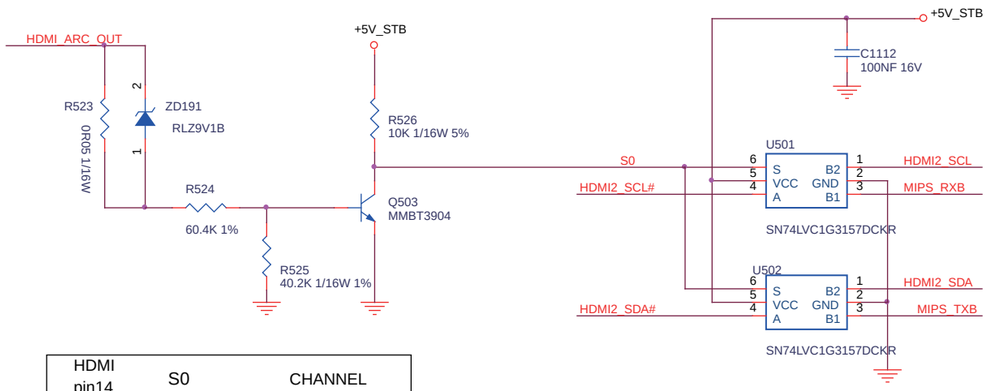
Ambient Light	715G6094	1 2013-06-05

19530_553_130718.eps
130718

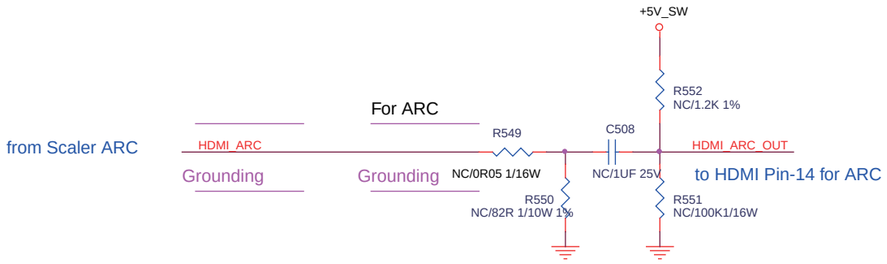
B17 Debug Interface

B17





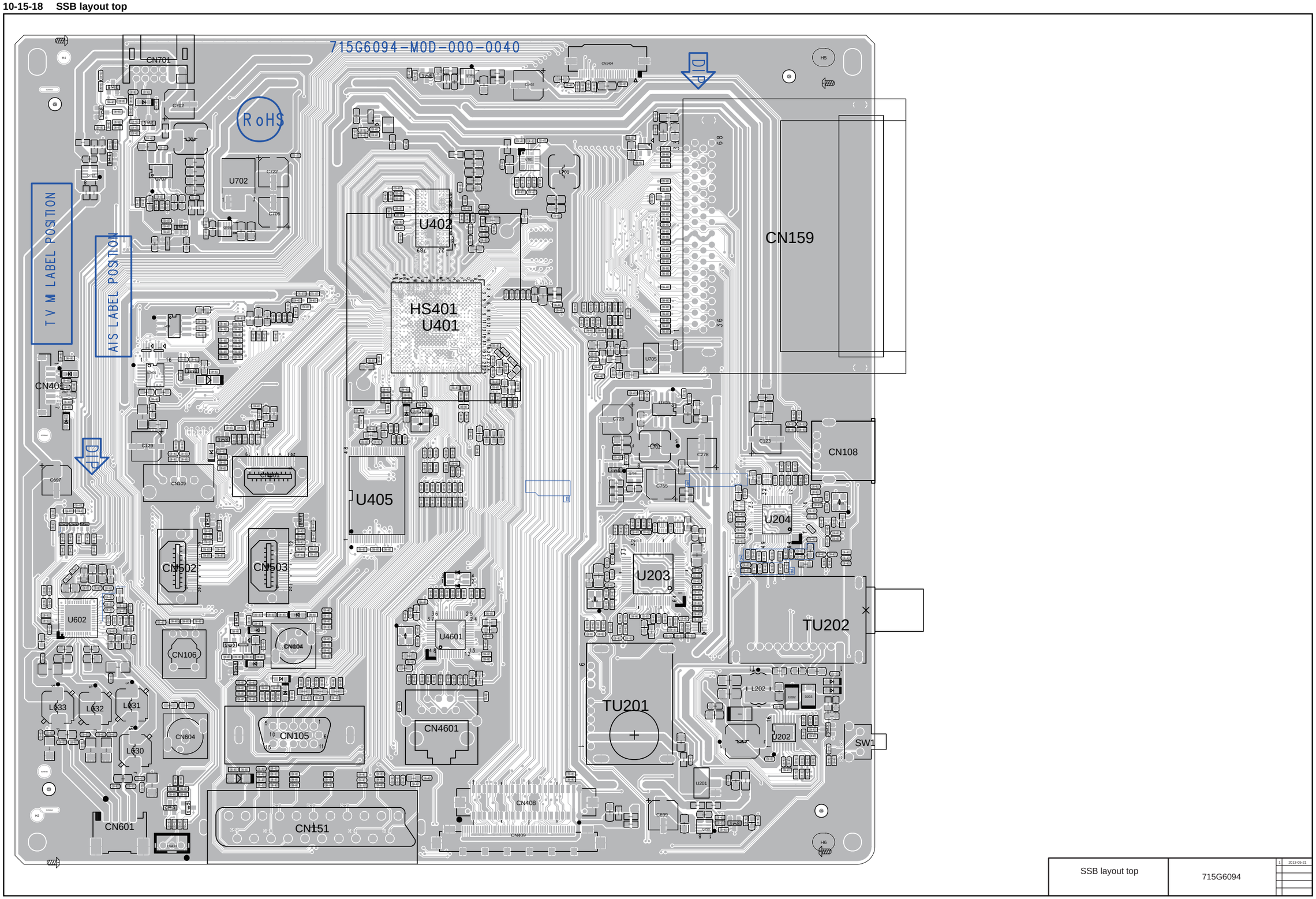
HDMI pin14	S0	CHANNEL
NC	H	HDMI function
+12V	L	Debug mode



Debug Interface	715G6094	1 2013-06-05

19530_554_130718.eps
130718

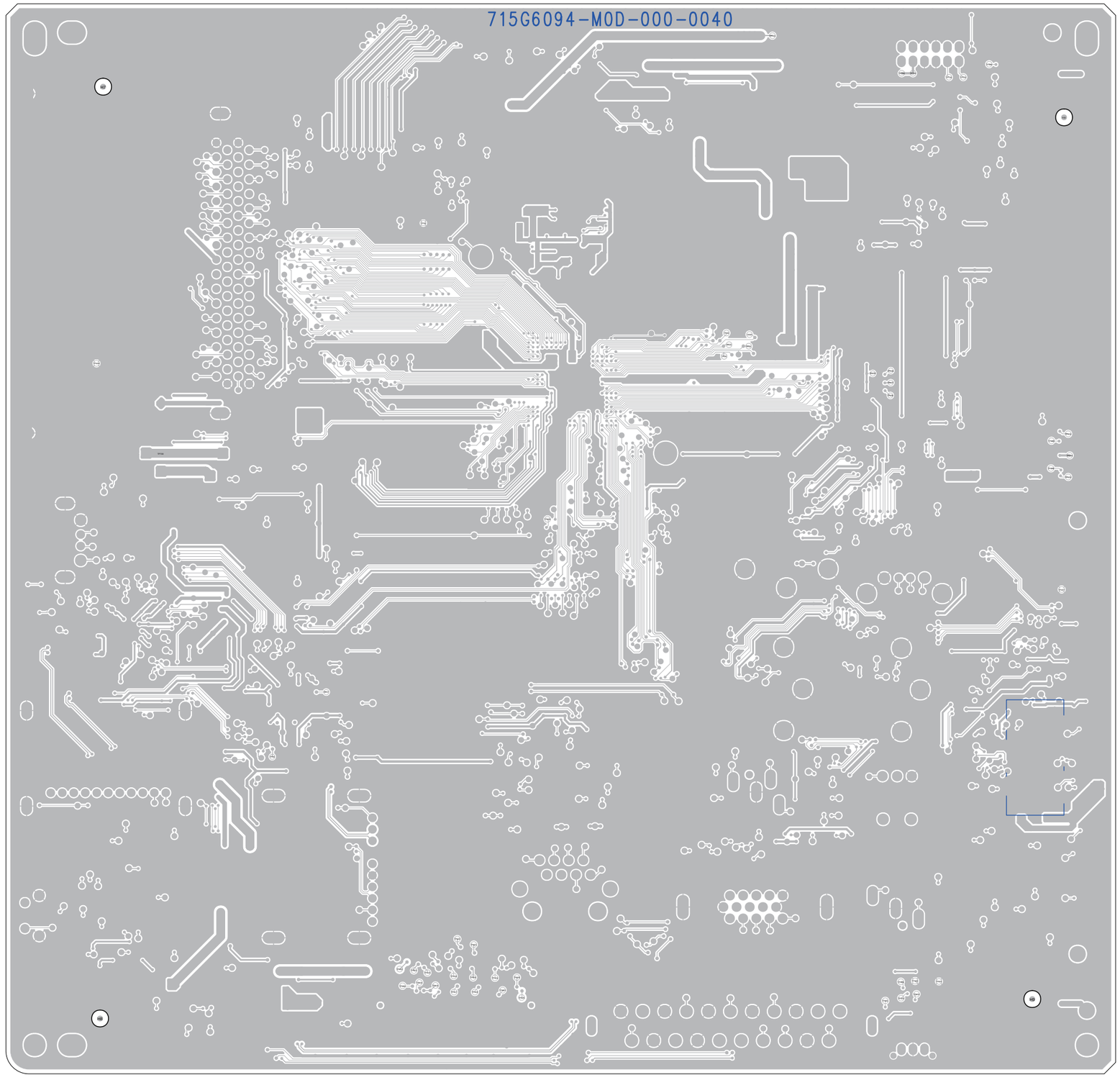
10-15-18 SSB layout top



SSB layout top	715G6094	1	2013-05-21

19530_555_130718.eps
130718

10-15-19 SSB layout bottom



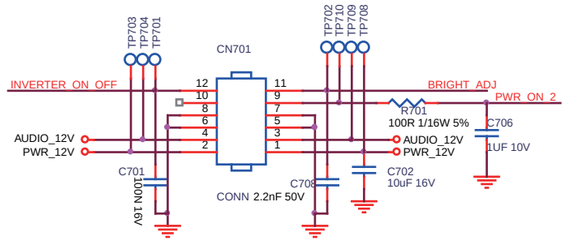
SSB layout bottom	715G6094	1 2013-05-21

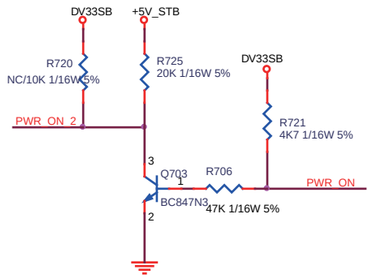
19530_556_130718.eps
130718

10.16 B 715G6901 SSB
10-16-1 Power-1

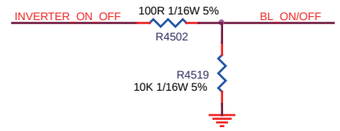
B01 POWER-1 **B01**

DC POWER INPUT

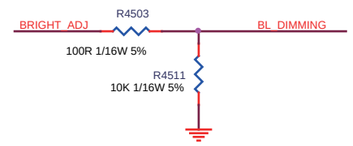


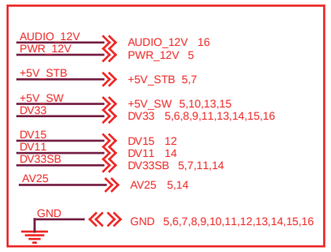


Backlight ON/OFF Control

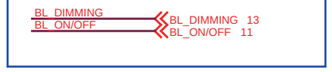


Backlight Brightness Control





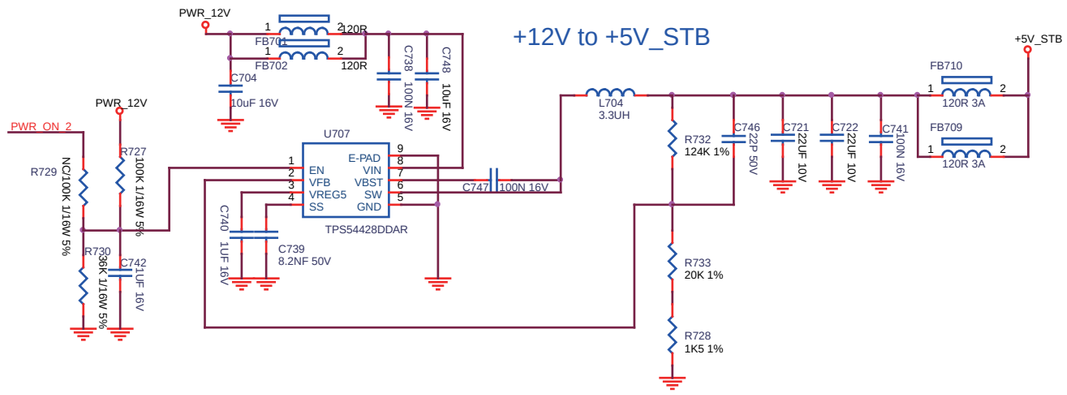
GPIO



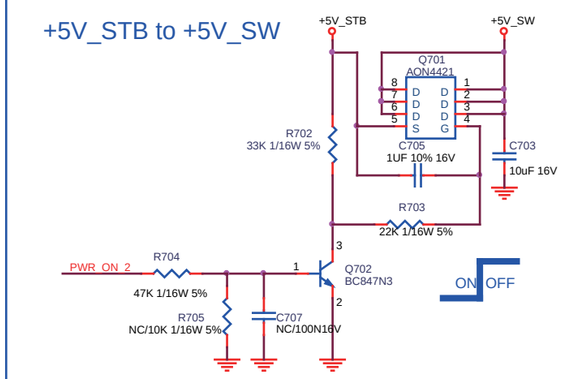
STB CONTORL



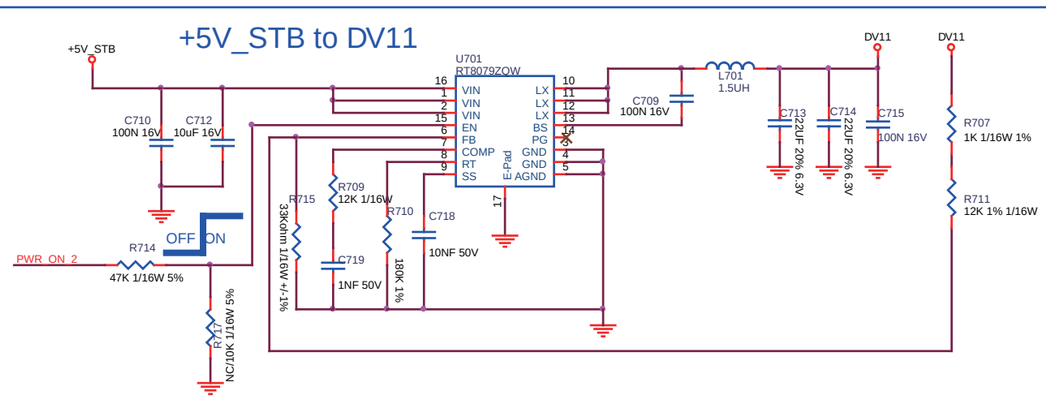
+12V to +5V_STB



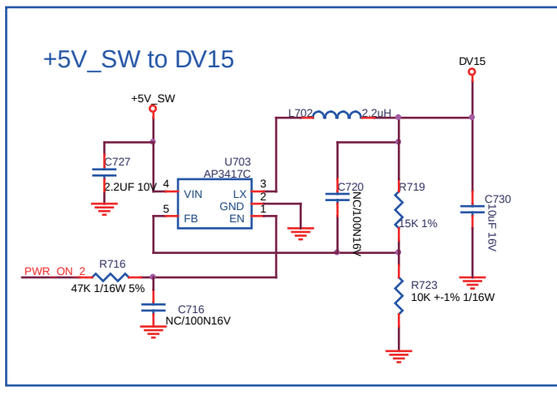
+5V_STB to +5V_SW



+5V_STB to DV11



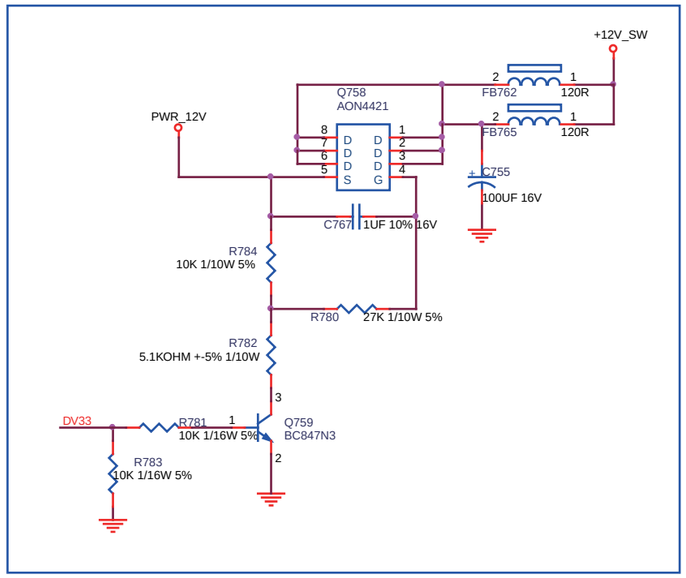
+5V_SW to DV15

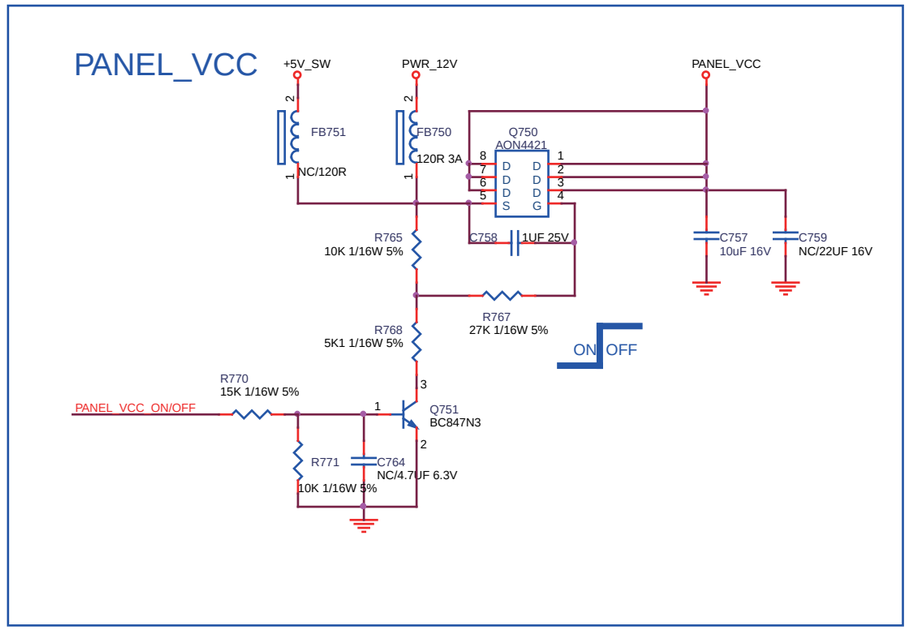


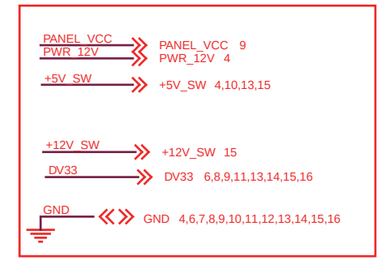
POWER-1	715G6901	1 2014-04-25

19597_511.eps

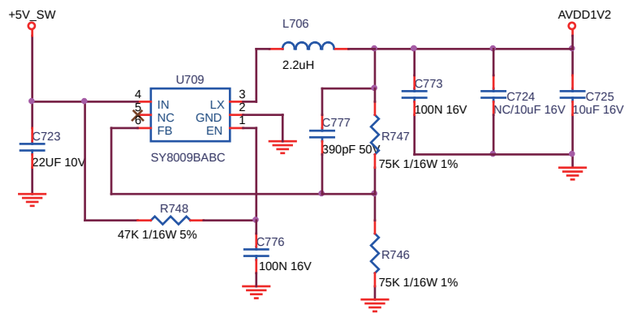
B02 POWER-2



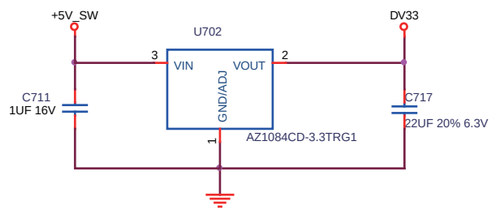




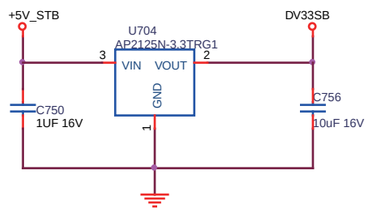
+5V_SW to AVDD1V2



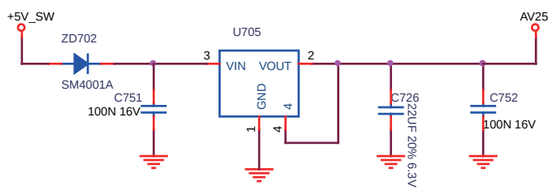
+5V_SW to DV33



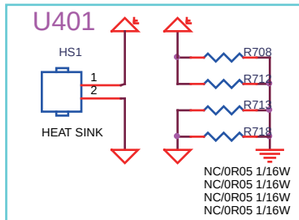
+5V_STB to DV33SB



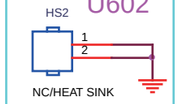
+5V_SW to AV25



U401



U602



POWER-2	715G6901	1 2014-04-25

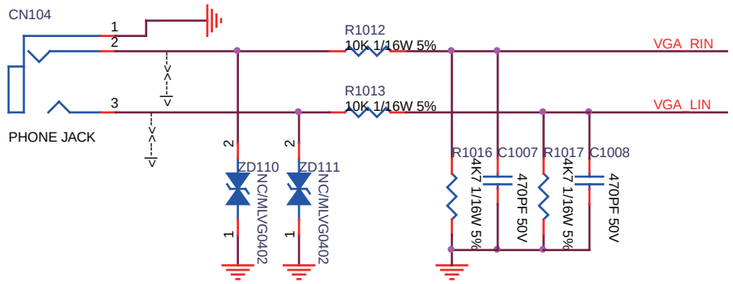
19597_512.eps

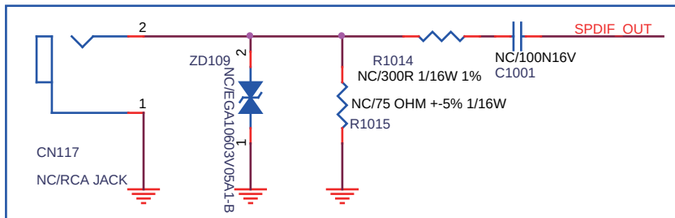
10-16-3 SPDIF/UART INPUT

B03 SPDIF/UART INPUT

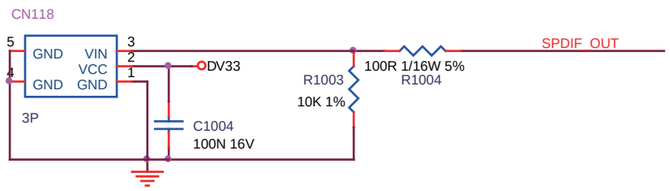
B03

PC Audio in

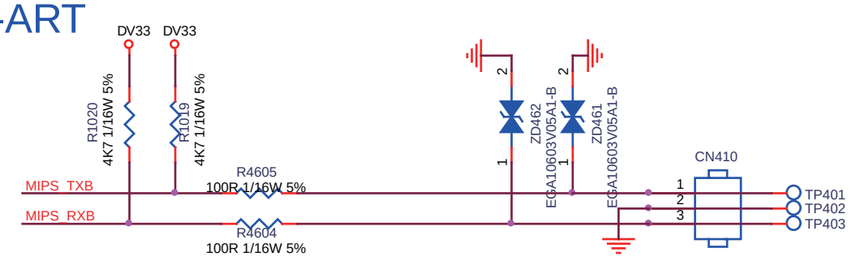




SPDIF Out(Co-Layout)



U-ART



B03

PANEL_VCC PWR_12V → PANEL_VCC 5,9 PWR_12V 4,5
+5V_STB → +5V_STB 4,5,7
+5V_SW DV33 → +5V_SW 4,5,10,13,15 DV33 5,8,9,11,13,14,15,16
DV15 → DV15 4,12
DV33SB → DV33SB 4,5,7,11,14
GND → GND 4,5,7,8,9,10,11,12,13,14,15,16

AUDIO /IF

VGA_RIN VGA_LIN → VGA_RIN 8 VGA_LIN 8

MIPS/UART/I2C/ICE

MIPS_TXB MIPS_RXB → MIPS_TXB 13 MIPS_RXB 13

AUDIO /IF

SPDIF_OUT → SPDIF_OUT 8

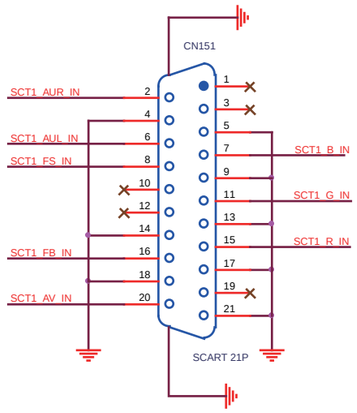
SPDIF/UART INPUT	715G6901	1 2014-04-25

19597_513.eps

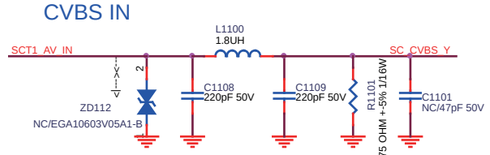
B04 SCART/HDMI INPUT

B04

SCART(RGB+CVBS+L/R IN)

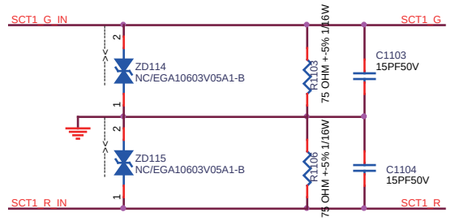


CVBS IN

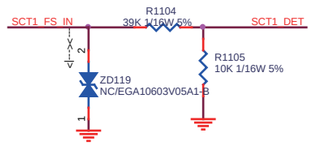


RGB IN

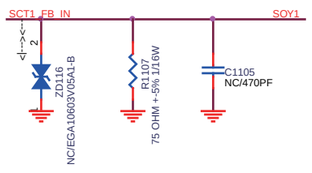




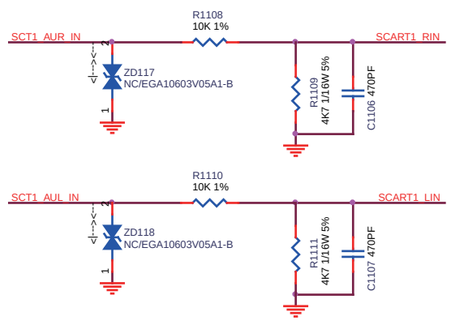
Function Select



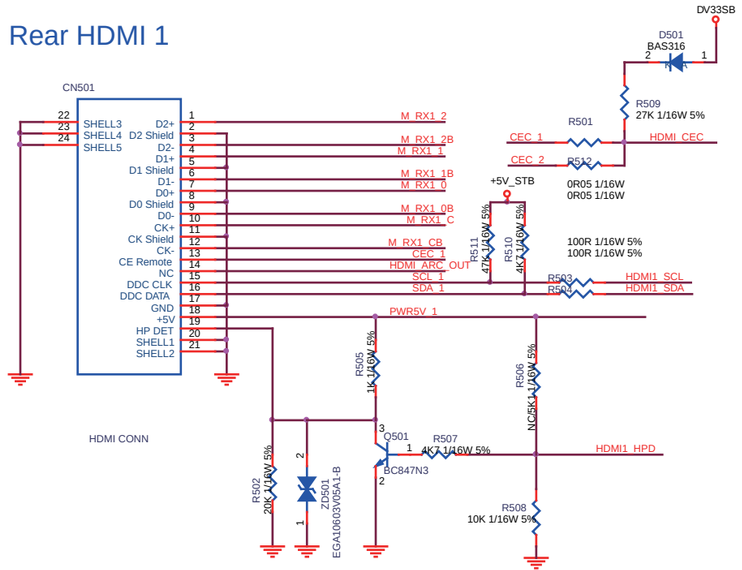
FAST BLANKING/SOY



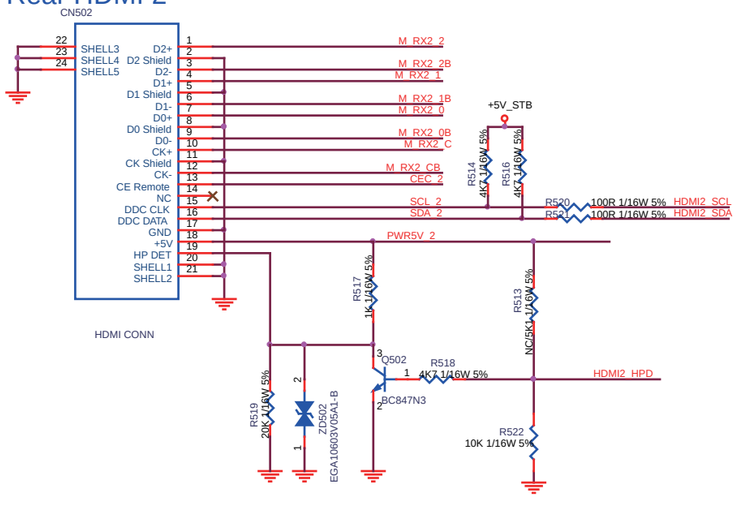
SCART Audio Input

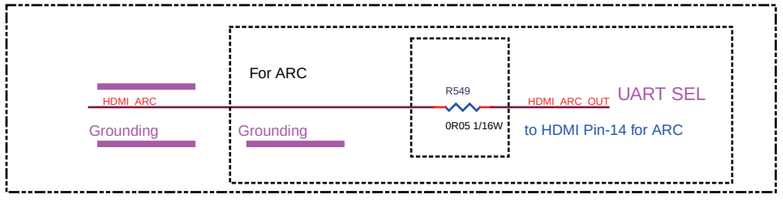


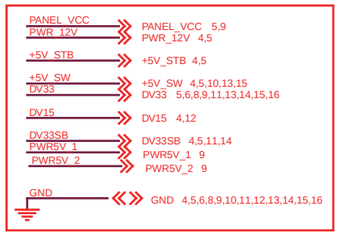
Rear HDMI 1



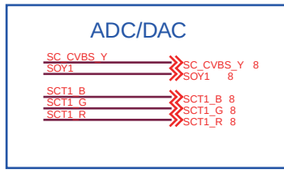
Rear HDMI 2







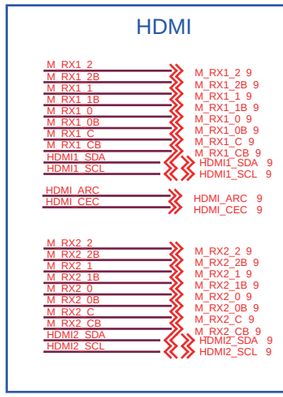
ADC/DAC



AUDIO /IF



HDMI



GPIO



STB CONTORL



MIPS/UART/I2C/ICE

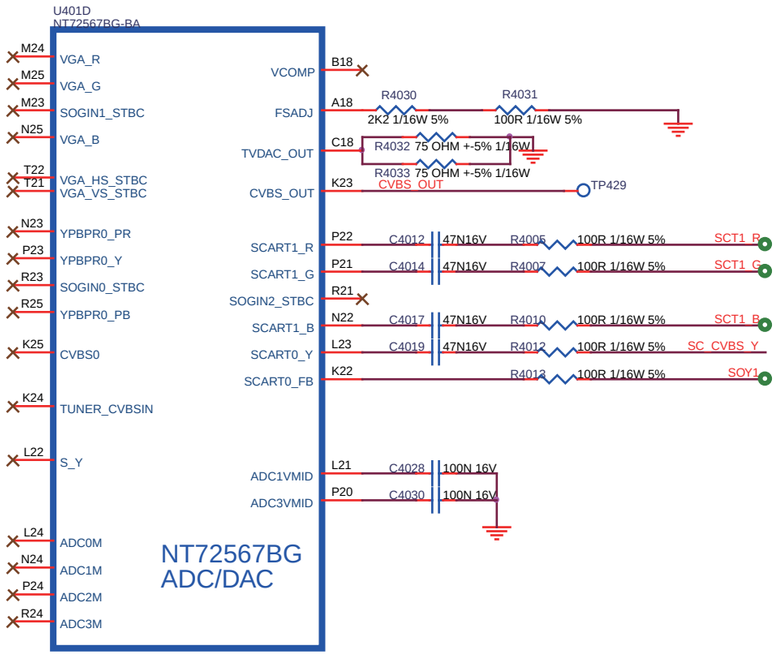


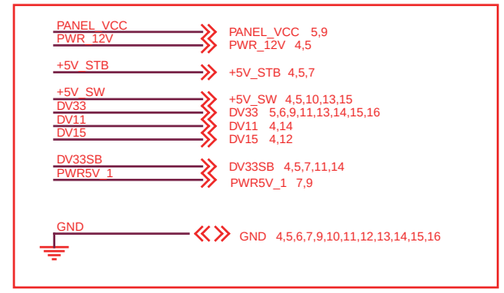
SCART/HDMI INPUT	715G6901	1 2014-04-25

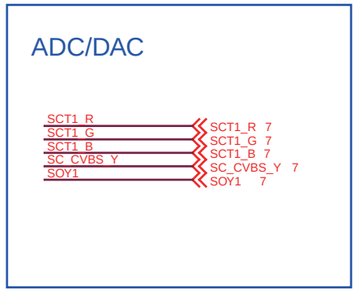
19597_514.eps

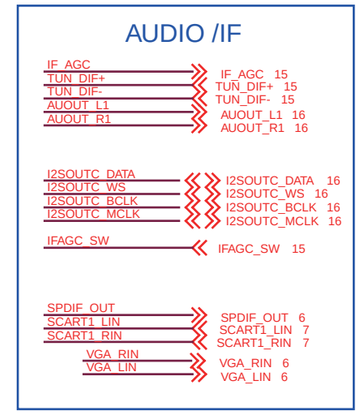
B05 NT72567_ADC/DAC/AUDIO/SIF

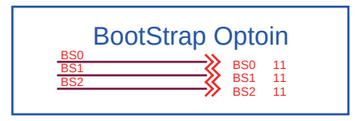
B05

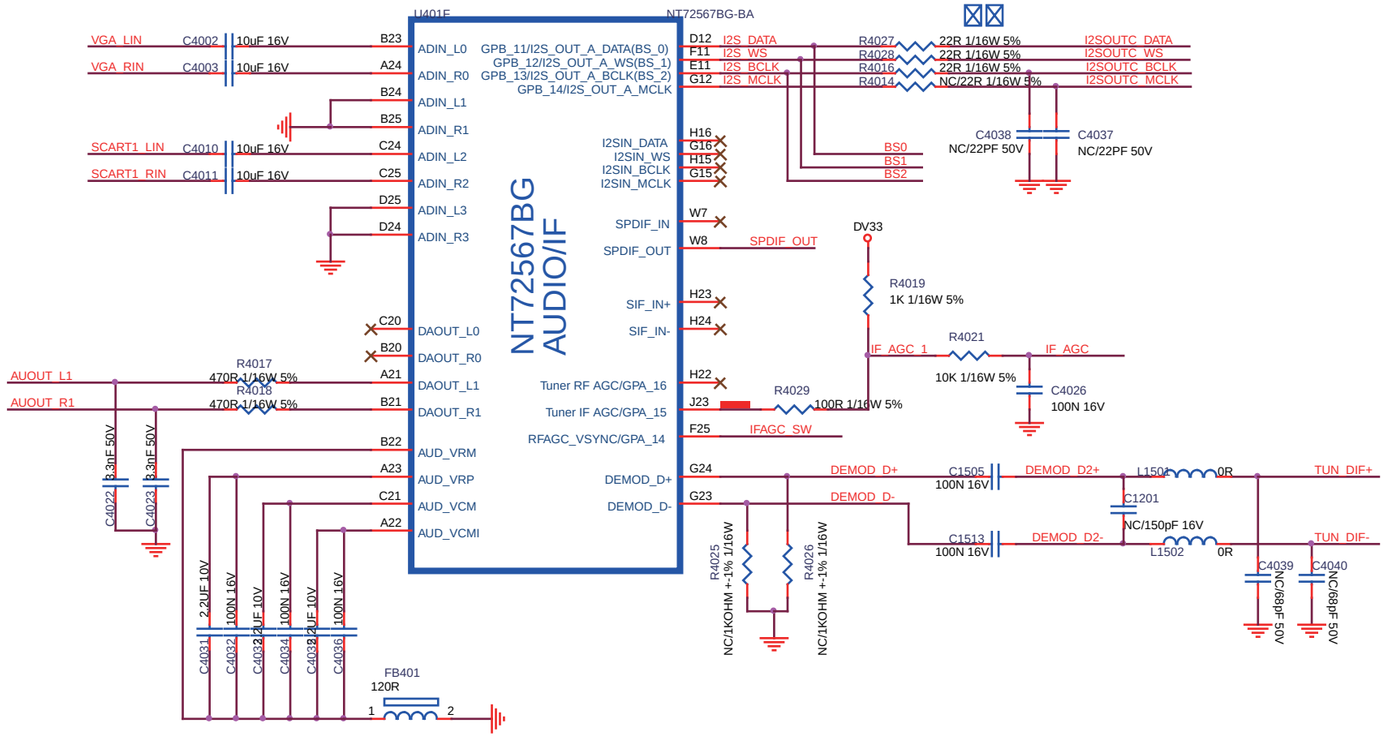












NT72567_ADC/DAC/ AUDIO/SIF	715G6901	1 2014-04-25

19597_515.eps

10-16-6 NT72567_HDMI/LVDS OUT

B06 NT72567_HDMI/LVDS OUT

B06

LVDS OUTPUT

U401B
NT72567BG-BA

NT72567BG
HDMI/MHL

AB13 MHL_CBUS
M_RX1_CB AC10
M_RX1_C AD10
M_RX1_0B AE10
M_RX1_0 AC11
M_RX1_1B AE11
M_RX1_1 AD11
M_RX1_2B AC12
M_RX1_2 AD12
PWR5V_1 R4102 4K7 1/16W 5% Y15
RXA_CLK- RXA_CLK+ RXA_0- RXA_0+ RXA_1- RXA_1+ RXA_2- RXA_2+ PWR5V_A

HDMI_ARC AA14 HDMI_ARC
M_RX2_CB AC13
M_RX2_C AD13
M_RX2_0B AE13
M_RX2_0 AC14
M_RX2_1B AE14
M_RX2_1 AD14
M_RX2_2B AC15
M_RX2_2 AD15
PWR5V_2 R4113 4K7 1/16W 5% Y16
RXB_CLK- RXB_CLK+ RXB_0- RXB_0+ RXB_1- RXB_1+ RXB_2- RXB_2+ PWR5V_B

RXC_CLK- AC16
RXC_CLK+ AD16
RXC_0- AE16
RXC_0+ AC17
RXC_1- AE17
RXC_1+ AD17
RXC_2- AC18
RXC_2+ AD18
PWR5V_C AA17

HDMIA_SDA AB10 HDMI1_SDA
HDMIA_SCL AA10 HDMI1_SCL
HDMIB_SDA AA16 HDMI2_SDA
HDMIB_SCL AA15 HDMI2_SCL
HDMIC_SDA AB17
HDMIC_SCL AB16

MHL_VBUS AB14
MHL_CD_SENSE Y14
EXT_RES AA13 R4103 470R 1/16W 5% 568_3V3
HDMI_CEC AB11 HDMI_CEC

U401C
NT72567BG-BA

NT72567BG
LVDS/miniLVDS

mini1_D0- A7
mini1_D0+ B7
LVDS_A0- C7
LVO_0- / mini1_D1- B8 LVDS_A0+
LVO_0+ / mini1_D1+ C8 LVDS_A1-
LVO_1- / mini1_D2- B9 LVDS_A1+
LVO_1+ / mini1_D2+ A9 LVDS_A2-
LVO_2- / mini1_CLK- C9 LVDS_A2+
LVO_2+ / mini1_CLK+ A10 LVDS_ACLK-
LVO_CLK- / mini1_D3- B10 LVDS_ACLK+
LVO_CLK+ / mini1_D3+ C10 LVDS_A3-
LVO_3- / mini1_D4- B11 LVDS_A3+
LVO_3+ / mini1_D4+ C11 LVDS_A4-
LVO_4- / mini1_D5- B12 LVDS_A4+
LVO_4+ / mini1_D5+

LVE_0- / mini2_D0- A12 LVDS_B0-
LVE_0+ / mini2_D0+ C12 LVDS_B0+
LVE_1- / mini2_D1- A13 LVDS_B1-
LVE_1+ / mini2_D1+ B13 LVDS_B1+
LVE_2- / mini2_D2- C13 LVDS_B2-
LVE_2+ / mini2_D2+ B14 LVDS_B2+
LVE_CLK- / mini2_CLK- C14 LVDS_BCLK-
LVE_CLK+ / mini2_CLK+ B15 LVDS_BCLK+
LVE_3- / mini2_D3- A15 LVDS_B3-
LVE_3+ / mini2_D3+ C15 LVDS_B3+
LVE_4- / mini2_D4- A16 LVDS_B4-
LVE_4+ / mini2_D4+ B16 LVDS_B4+
mini2_D5- C16
mini2_D5+ B17

D19 GPH_0 / TCON_CPV
F14 GPH_1 / TCON_OE1
C19 GPH_2 / TCON_OE2
E17 GPH_3 / TCON_STV_D
E18 GPH_4 / TCON_STV_U
B19 GPH_5 / TCON_TP
F15 GPH_6 / TCON_POL

GPH_7 / TCON_GPIO_0 A19 USB_OC 13
GPH_8 / TCON_GPIO_1 E16
GPH_9 / TCON_GPIO_2 F16
GPH_10 / TCON_GPIO_3 C17
GPH_11 / TCON_GPIO_4 D18

PANEL_VCC
FB411 120R
LVDS_VDD
FB412 120R
C4101 10uF 16V
R4104 NC/10K 1/10W 5%
C4106 NC/22UF 16V

DV33
R4106 NC/100R 1/16W 5%
R4107 NC/0R05 1/16W

LVDS_VDD
CONN CN408
C4102 12P 50V
C4103 12P 50V
C4104 12P 50V
C4105 12P 50V

LVDS_A0- LVDS_A1- LVDS_A2- LVDS_ACLK- LVDS_A3- LVDS_A4- LVDS_B0- LVDS_B1- LVDS_B2- LVDS_BCLK- LVDS_B3- LVDS_B4-
LVDS_A0+ LVDS_A1+ LVDS_A2+ LVDS_ACLK+ LVDS_A3+ LVDS_A4+ LVDS_B0+ LVDS_B1+ LVDS_B2+ LVDS_BCLK+ LVDS_B3+ LVDS_B4+

LVDS_A0- TP TP412
LVDS_A0+ TP TP411
LVDS_A1- TP TP414
LVDS_A1+ TP TP413
LVDS_A2- TP TP416
LVDS_A2+ TP TP415
LVDS_B0- TP TP420
LVDS_B0+ TP TP419
LVDS_B1- TP TP422
LVDS_B1+ TP TP421
LVDS_B2- TP TP424
LVDS_B2+ TP TP423
LVDS_A3- TP TP418
LVDS_A3+ TP TP417
LVDS_A4- TP TP428
LVDS_A4+ TP TP427
LVDS_B3- TP TP426
LVDS_B3+ TP TP425
LVDS_B4- TP TP436
LVDS_B4+ TP TP435

PANEL_VCC PANEL_VCC 5
PWR_12V PWR_12V 4,5
AV25 AV25 5,14
+5V_STB +5V_STB 4,5,7
+5V_SW +5V_SW 4,5,10,13,15
DV33 DV33 5,6,8,11,13,14,15,16
DV15 DV15 4,12
DV33SB DV33SB 4,5,7,11,14
PWR5V_1 PWR5V_1 7
PWR5V_2 PWR5V_2 7
GND GND 4,5,6,7,8,10,11,12,13,14,15,16

HDMI

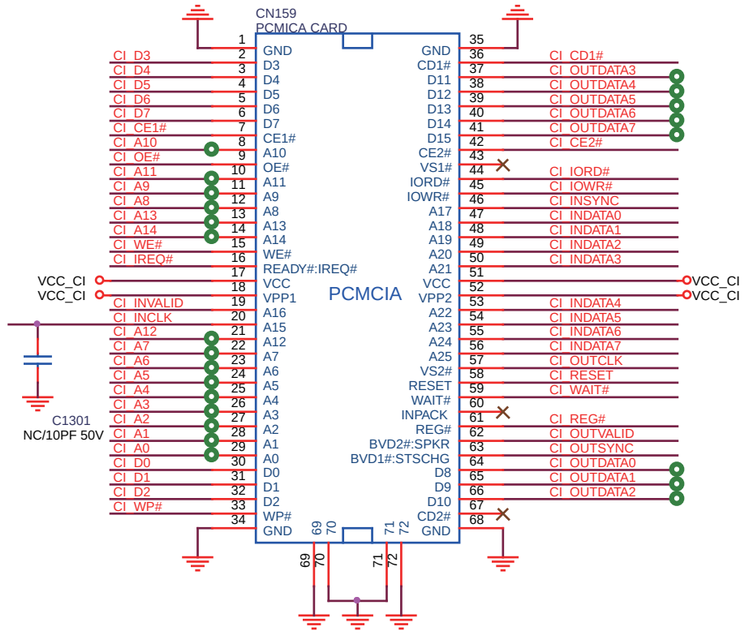
M_RX1_2 M_RX1_2 7
M_RX1_2B M_RX1_2B 7
M_RX1_1 M_RX1_1 7
M_RX1_1B M_RX1_1B 7
M_RX1_0 M_RX1_0 7
M_RX1_0B M_RX1_0B 7
M_RX1_C M_RX1_C 7
M_RX1_CB M_RX1_CB 7
HDMI1_SDA HDMI1_SDA 7
HDMI1_SCL HDMI1_SCL 7
M_RX2_2 M_RX2_2 7
M_RX2_2B M_RX2_2B 7
M_RX2_1 M_RX2_1 7
M_RX2_1B M_RX2_1B 7
M_RX2_0 M_RX2_0 7
M_RX2_0B M_RX2_0B 7
M_RX2_C M_RX2_C 7
M_RX2_CB M_RX2_CB 7
HDMI2_SDA HDMI2_SDA 7
HDMI2_SCL HDMI2_SCL 7
HDMI_ARC HDMI_ARC 7
HDMI_CEC HDMI_CEC 7

NT72567_HDMI/LVDS OUT	715G6901	1 2014-04-25

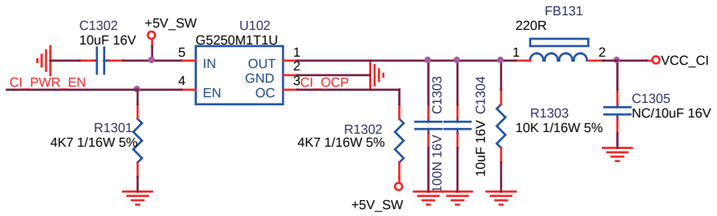
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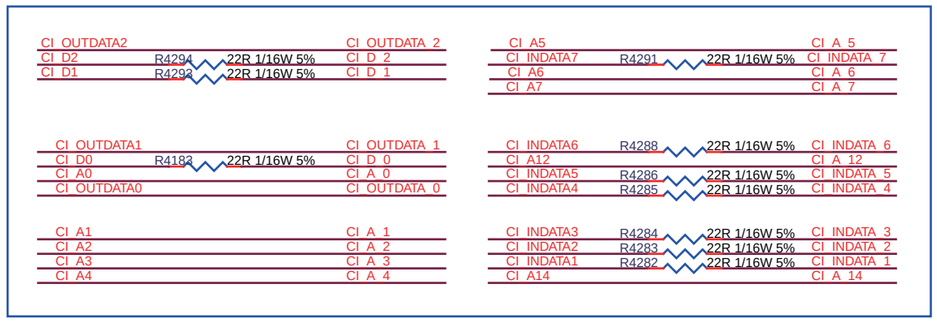
B07 NT72567_CI B07

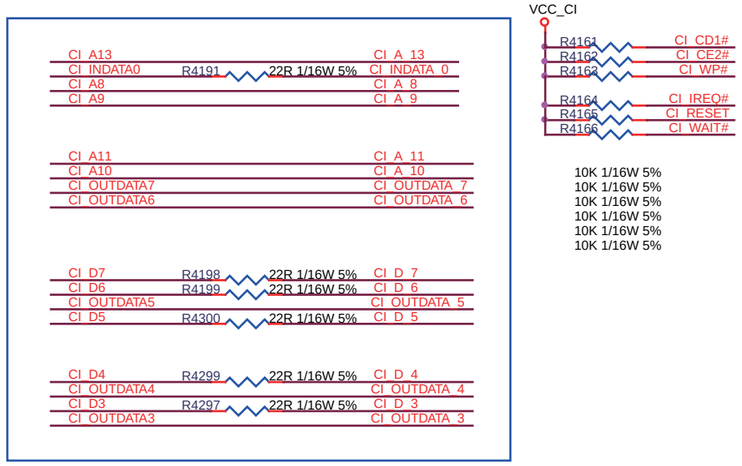
PCMCIA Slot

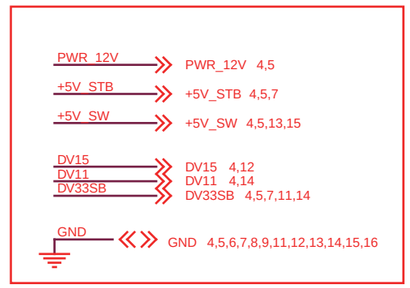


CI Bus Power Control

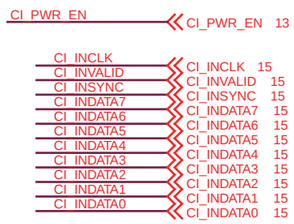


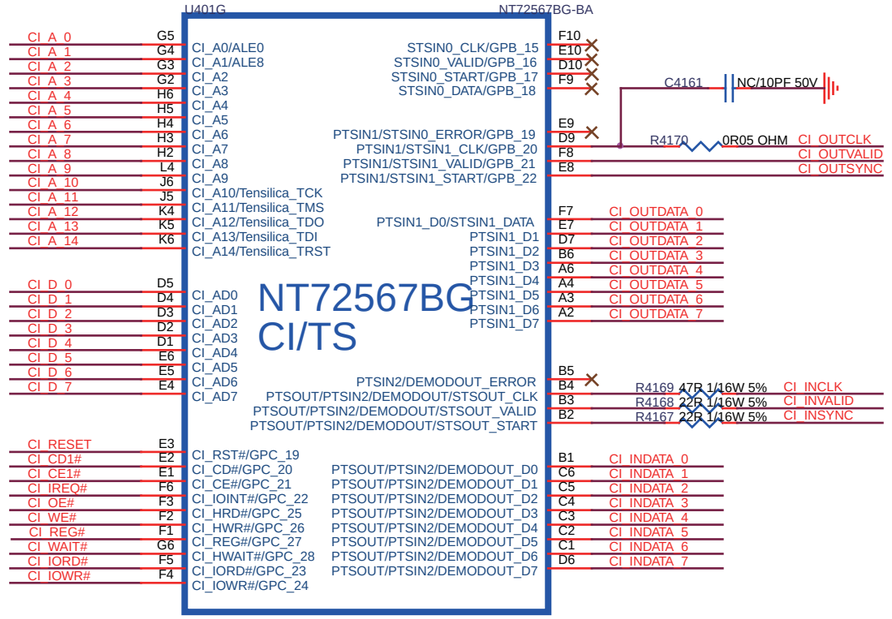






GPIO

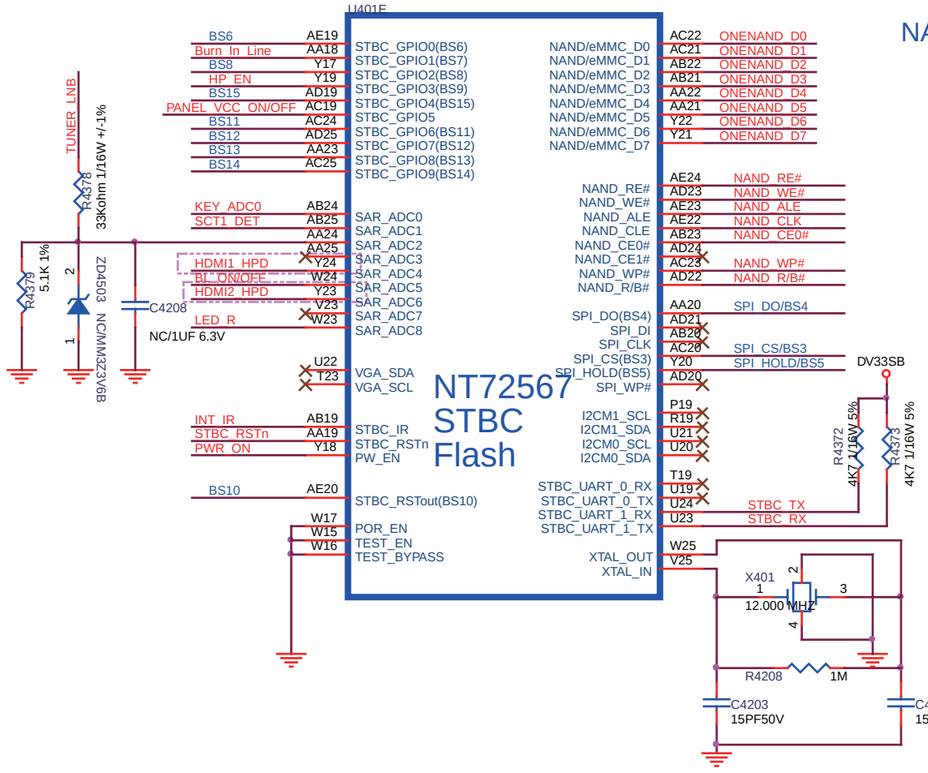


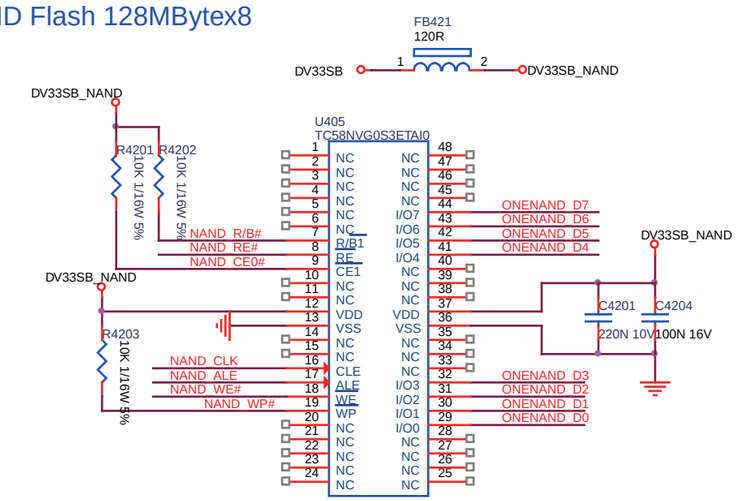


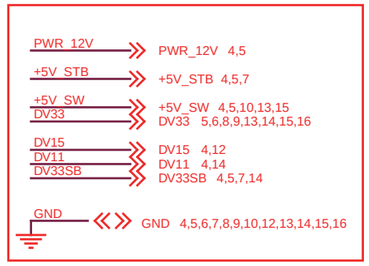
NT72567_CI	715G6901	1 2014-04-25

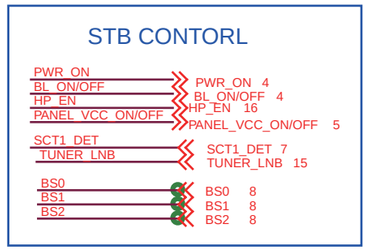
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B08 NT72567_STBC/FLASH B08

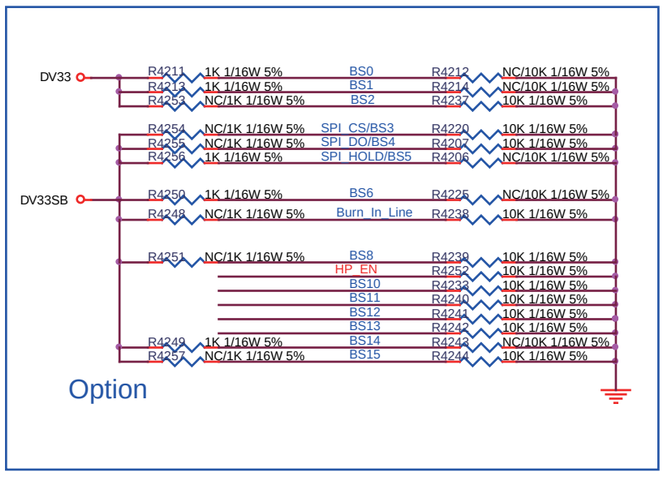


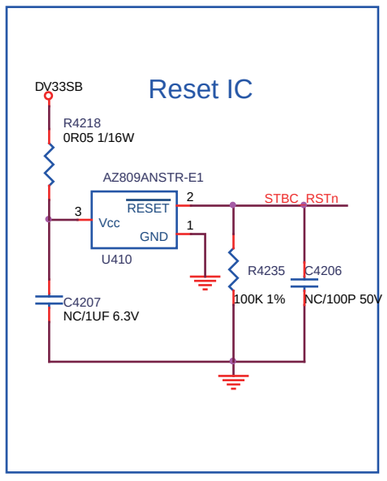


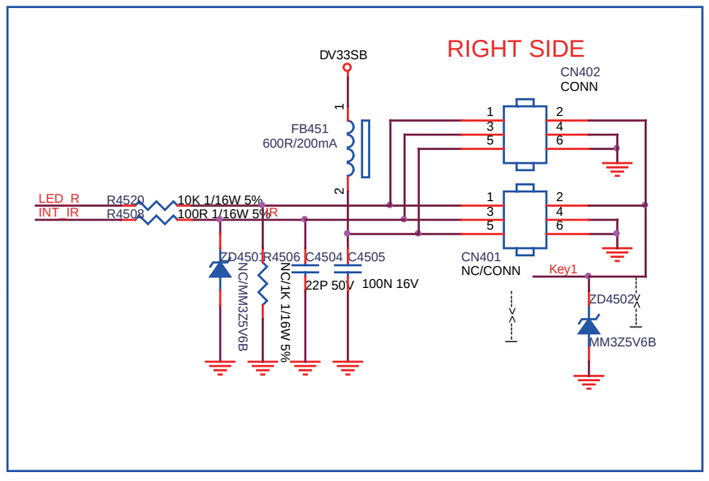


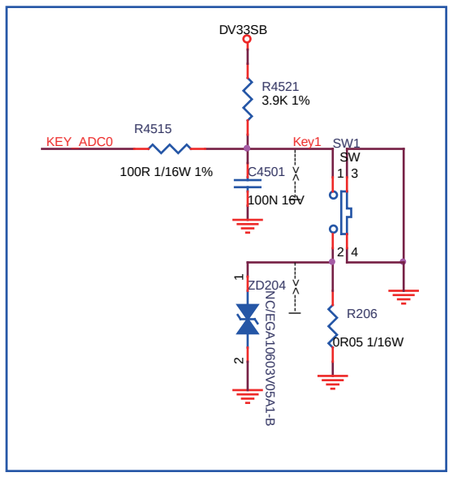












NT72567_STBC/FLASH	715G6901	1 2014-04-25

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B09 NT72567_DDR

B09

U401A
NT72567BG-BA

NT72567BG DDR

DDR_MA0 AE5 MA0
DDR_MA1 AC3 MA1
DDR_MA2 AD7 MA2
DDR_MA3 AC8 MA3
DDR_MA4 AB3 MA4
DDR_MA5 AE7 MA5
DDR_MA6 AC2 MA6
DDR_MA7 AC7 MA7
DDR_MA8 AC1 MA8
DDR_MA9 AC6 MA9
DDR_MA10 AA2 MA10
DDR_MA11 AD2 MA11
DDR_MA12 AB2 MA12
DDR_MA13 AD5 MA13
DDR_MA14 AD1 MA14

DDR_BA0 AE4 MBA0
DDR_BA1 AA3 MBA1
DDR_BA2 AC5 MBA2

DDR_WEn AD4 MWE#
DDR_CASn AE2 MCAS#
DDR_RASn AD3 MRAS#
DDR_MCKE AA1 MCKE
DDR_ODT AB7 MODT

DDR_CLKAn Y1 MCLK#
DDR_CLKA Y2 MCLK

DDR_CSn AE3 MCS
DDR_RSTn AD6 MRST

MVREF P4

DDR_DQL0 K2 DDRA_DQL0
DDR_DQL1 V3 DDRA_DQL1
DDR_DQL2 K3 DDRA_DQL2
DDR_DQL3 V1 DDRA_DQL3
DDR_DQL4 J3 DDRA_DQL4
DDR_DQL5 W2 DDRA_DQL5
DDR_DQL6 J1 DDRA_DQL6
DDR_DQL7 W3 DDRA_DQL7

DDR_DQU0 T2 DDRA_DQU0
DDR_DQU1 M3 DDRA_DQU1
DDR_DQU2 U3 DDRA_DQU2
DDR_DQU3 L1 DDRA_DQU3
DDR_DQU4 R1 DDRA_DQU4
DDR_DQU5 M1 DDRA_DQU5
DDR_DQU6 R2 DDRA_DQU6
DDR_DQU7 M2 DDRA_DQU7

DDR_DQSL N2 DDRA_DQSL
DDR_DQSL# P3 DDRA_DQSLn
DDR_DQSU P2 DDRA_DQSU
DDR_DQSU# P1 DDRA_DQSUn

DDR_DML U2 DDRA_DML
DDR_DMU L2 DDRA_DMU

R4303
1KOHM +-1% 1/16W
DDR1V5

C4301
100N 16V

R4304
1KOHM +-1% 1/16W

C4302
1N 50V

DDR_CLKAn
R4310
100R 1/16W 1%
DDR_CLKA

DDR1V5
FB443
30R
1
2
DV15

C4305 100N 16V
C4306 100N 16V
C4307 100N 16V
C4308 100N 16V
C4309 100N 16V
C4310 100N 16V
C4311 100N 16V
C4312 100N 16V
C4313 100N 16V
C4314 100N 16V
C4316 100N 16V
C4315 100N 16V
C4318 4.7UF 6.3V
C4317 4.7UF 6.3V
C4319 4.7UF 6.3V
C4320 4.7UF 6.3V

DDR3#1 DDR3 128MBx16Bits /1.6GHz

U402

DDRA_DQL0 E3 DQL0
DDRA_DQL1 F7 DQL1
DDRA_DQL2 F2 DQL2
DDRA_DQL3 F8 DQL3
DDRA_DQL4 H3 DQL4
DDRA_DQL5 H8 DQL5
DDRA_DQL6 G2 DQL6
DDRA_DQL7 H7 DQL7
DDRA_DQU0 D7 DQU0
DDRA_DQU1 C3 DQU1
DDRA_DQU2 C8 DQU2
DDRA_DQU3 C2 DQU3
DDRA_DQU4 A7 DQU4
DDRA_DQU5 A2 DQU5
DDRA_DQU6 B8 DQU6
DDRA_DQU7 A3 DQU7

DDRA_DQSU C7 UDQS
DDRA_DQSUn B7 UDQS#
DDRA_DQSL F3 LDQS
DDRA_DQSLn G3 LDQS#
DDRA_DMU D3 UDM
DDRA_DML E7 LDM

DDR_RSTn T2 RESET#

L8 ZQ

R4301
240 OHM +-1% 1/16W
DDR1V5

A0 N3 DDR_MA0
A1 P7 DDR_MA1
A2 P3 DDR_MA2
A3 N2 DDR_MA3
A4 P8 DDR_MA4
A5 P2 DDR_MA5
A6 R8 DDR_MA6
A7 R2 DDR_MA7
A8 T8 DDR_MA8
A9 R3 DDR_MA9
A10/AP L7 DDR_MA10
A11 R7 DDR_MA11
A12/BC# N7 DDR_MA12
NC T3 DDR_MA13

J1 NC_0
J9 NC_1
L1 NC_2
L9 NC_3
M7 NC_4
T7 NC_6 DDR_MA14

BA0 M2 DDR_BA0
BA1 N8 DDR_BA1
BA2 M3 DDR_BA2
CK J7 DDR_CLKA
CK# K7 DDR_CLKAn
CS# L2 DDR_CSn
CAS# K3 DDR_CASn
ODT K1 DDR_ODT
RAS# J3 DDR_RASn
WE# L3 DDR_WEn
CKE K9 DDR_MCKE

R4302
330 OHM 1/16W

VDDQ_0 A1
VDDQ_1 A8
VDDQ_2 C1
VDDQ_3 C9
VDDQ_4 D2
VDDQ_5 E9
VDDQ_6 F1
VDDQ_7 H2
VDDQ_8 H9

VSSQ_0 B1
VSSQ_1 B9
VSSQ_2 D1
VSSQ_3 D8
VSSQ_4 E2
VSSQ_5 E8
VSSQ_6 F9
VSSQ_7 G1
VSSQ_8 G9

VDD_0 B2
VDD_1 D9
VDD_2 G7
VDD_3 K2
VDD_4 K8
VDD_5 N1
VDD_6 N9
VDD_8 R9
VDD_7 R1

VSS_0 A9
VSS_1 B3
VSS_2 E1
VSS_3 G8
VSS_4 J2
VSS_5 J8
VSS_6 M1
VSS_7 M9
VSS_8 P1
VSS_9 P9
VSS_10 T1
VSS_11 T9

DDR1V5
R4305
1KOHM +-1% 1/16W

H1 VREFDQ
M8 VREFCA

R4307
1KOHM +-1% 1/16W

C4303
100N 16V

K4B2G1646Q-BCK0

C4304
100N 16V

DDR1V5
R4306
1KOHM +-1% 1/16W

R4308
1KOHM +-1% 1/16W

PWR_12V PWR_12V 4,5
+5V_STB +5V_STB 4,5,7
+5V_SW +5V_SW 4,5,10,13,15
DV33 DV33 5,6,8,9,11,13,14,15,16
DV15 DV15 4
DDR1V5 DDR1V5 14
DV11 DV11 4,14
DV33SB DV33SB 4,5,7,11,14
GND GND 4,5,6,7,8,9,10,11,13,14,15,16

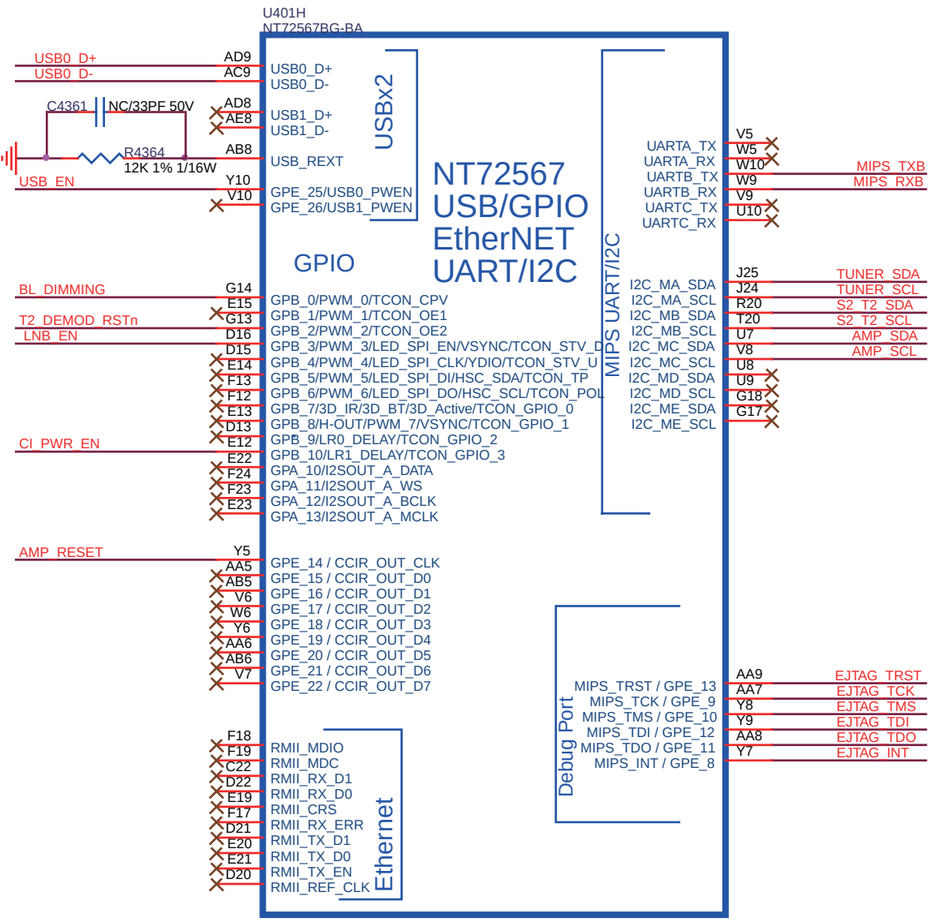
NT72567_DDR	715G6901	1 2014-04-25

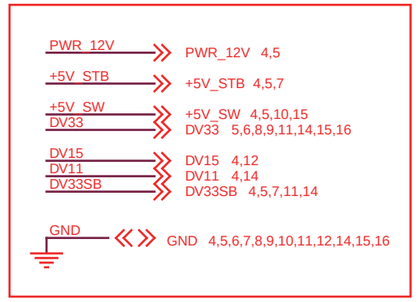
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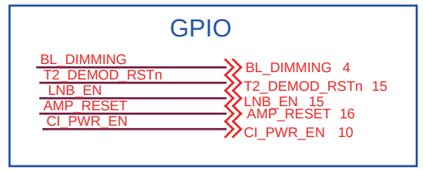
10-16-10 NT72567_USB/GPIO

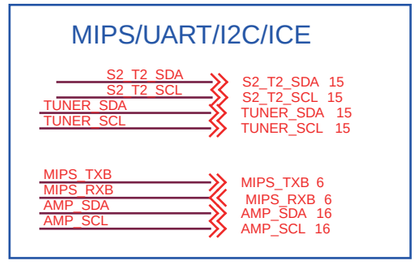
B10 NT72567_USB/GPIO

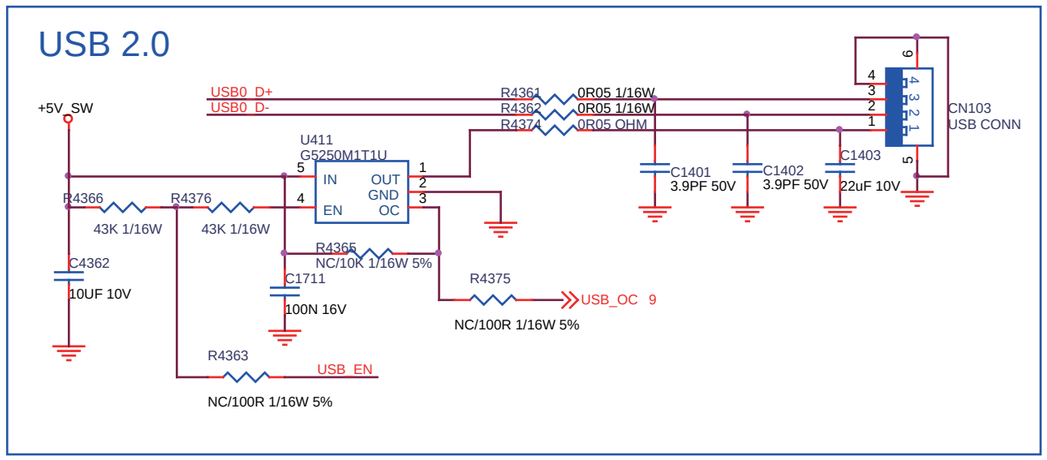
B10

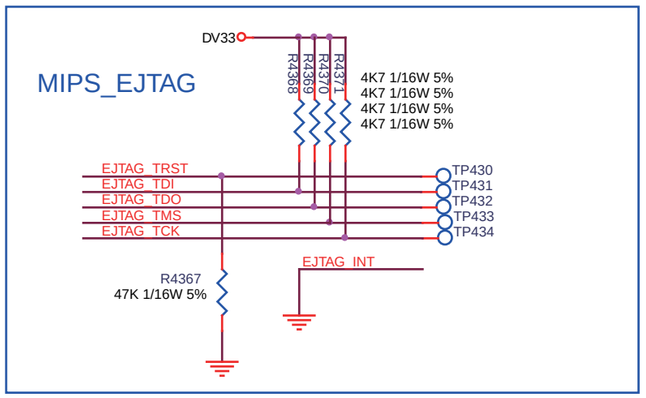












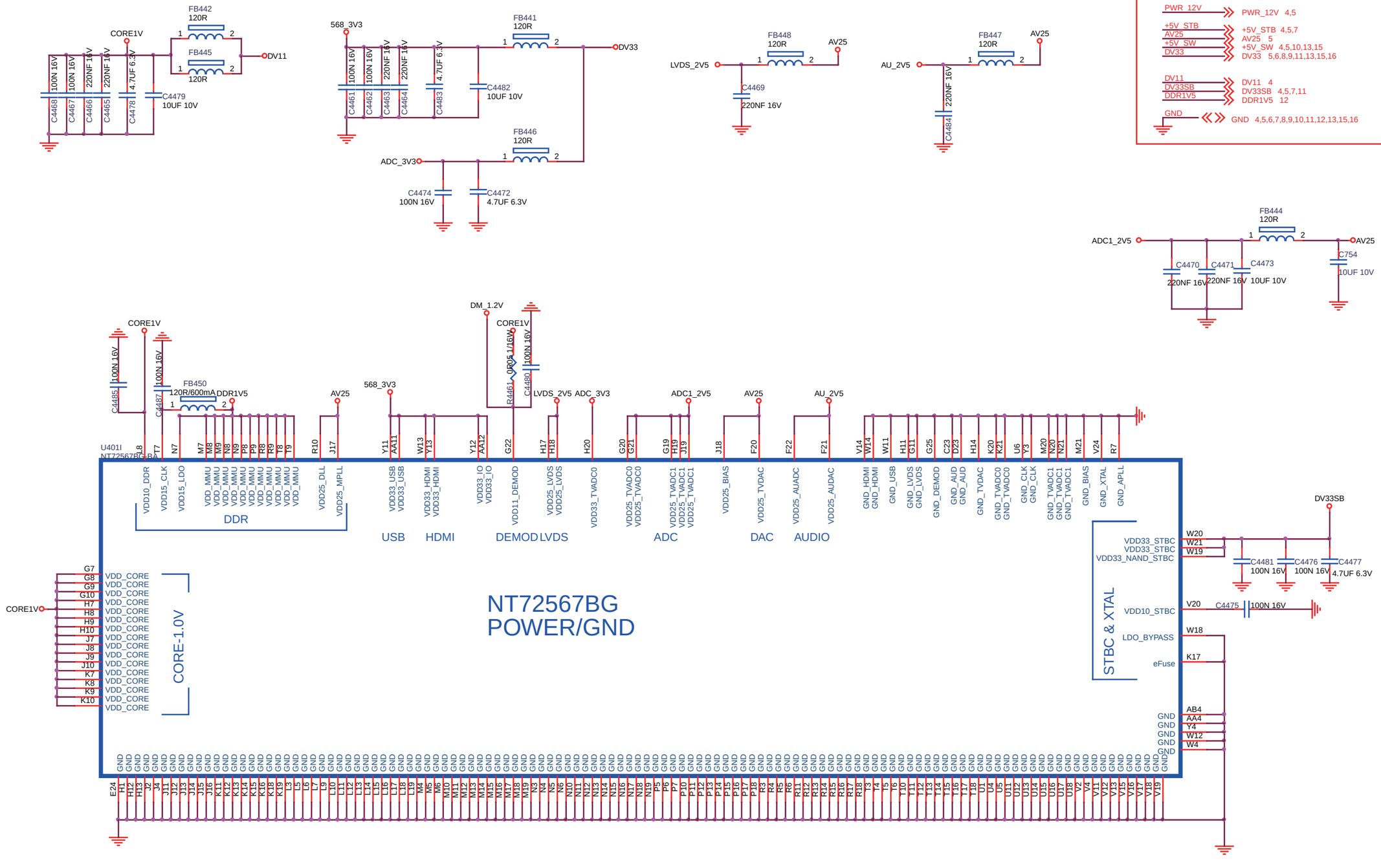
NT72567_USB/GPIO	715G6901	1 2014-04-25

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10-16-11 NT72567_POWER

B11 NT72567_POWER

B11



NT72567_POWER	715G6901	1 2014-04-25

19597_521.eps

10-16-12 Tuner/T2 demodule

B12 Tuner/T2 demodule

B12

DVB-T/T2 Demodulator

NT78822

Pin-to-Pin compatible with Si2166 (DVB_S/S2)

SI2166 DISEQC_OUT

TCLTuner with DVB-C/T/T2

ST03CS-2-E

TU101

S2 TUNER

TU102 NC/TDQS-A801F

LNB POWER SUPPLY

ESD & Surge Protect

1210 TYPE

NC/MP8126DF-LF-Z

LINEDROP: Low: 13/18V High: 14/19V

13/18V_SW: High: 18V Low : 13V

LNB_EN: Low: disable High: enable

IFAGC SWITCH

MMBT3906

GPIO

Demod

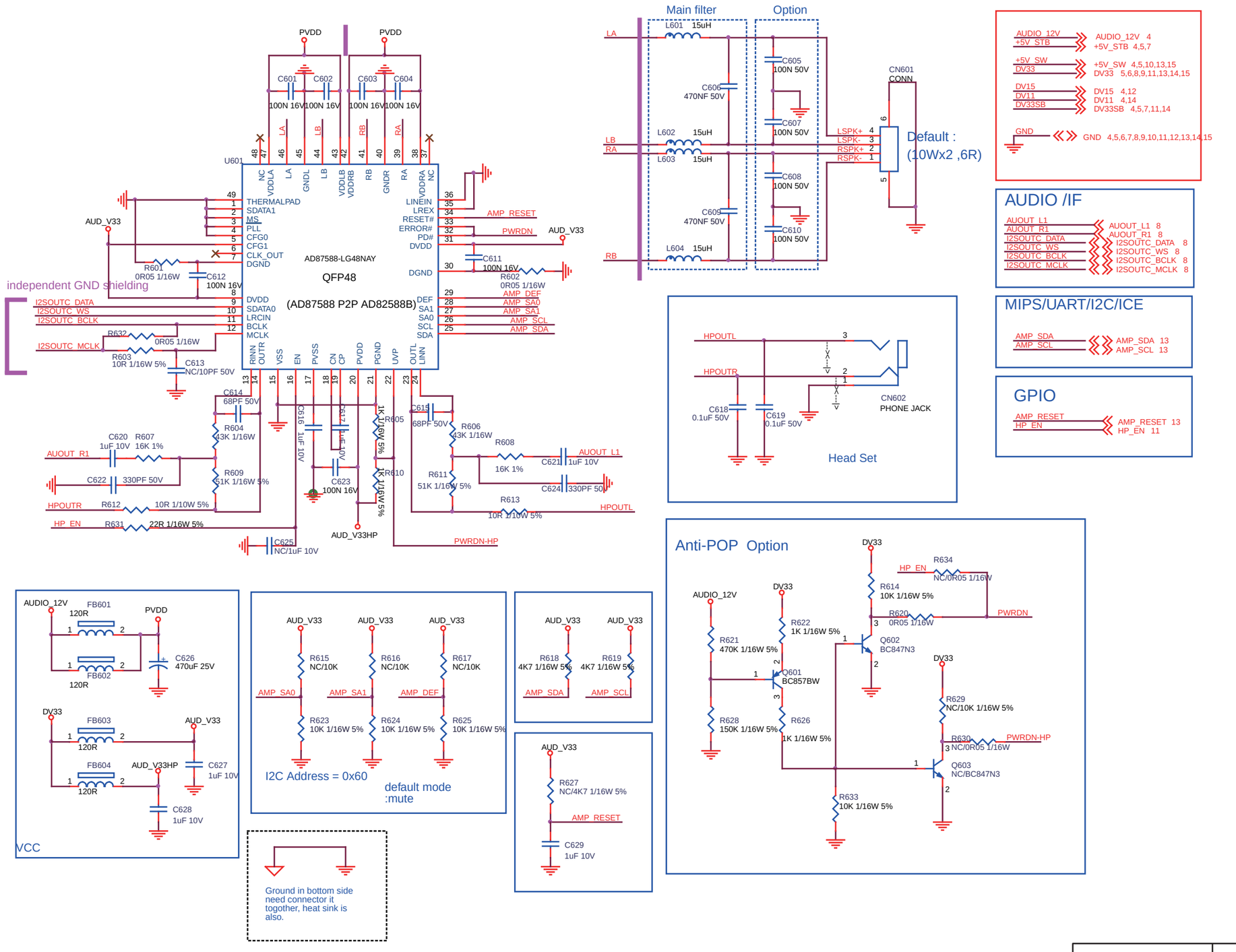
Tuner/T2 demodule	715G6901

19597_522.eps

10-16-13 Speaker Amplifier/Headphone OUT

B13 Speaker Amplifier/Headphone OUT

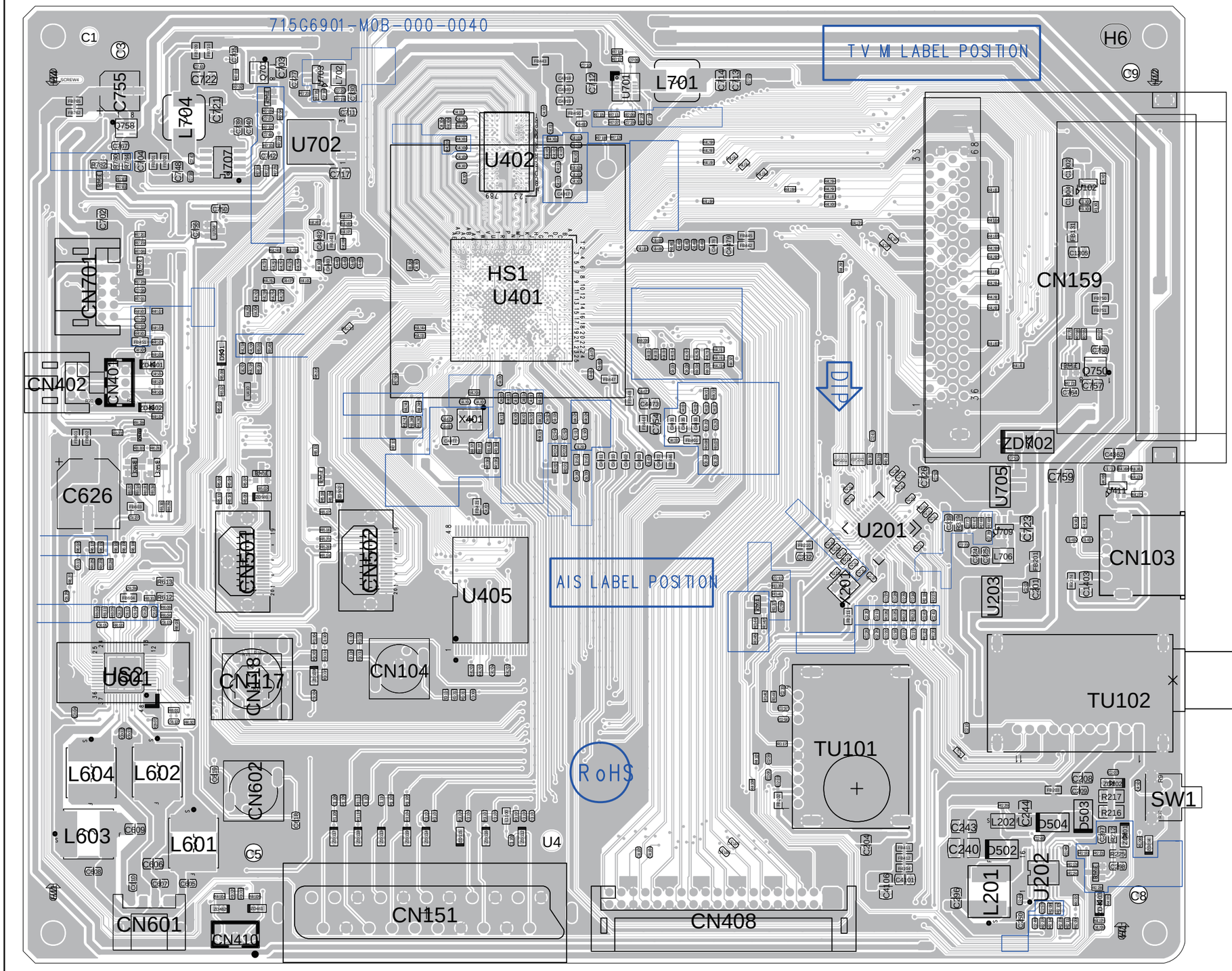
B13



Speaker Amplifier/ Headphone OUT	715G6901	1 2014-04-25

19597_523.eps

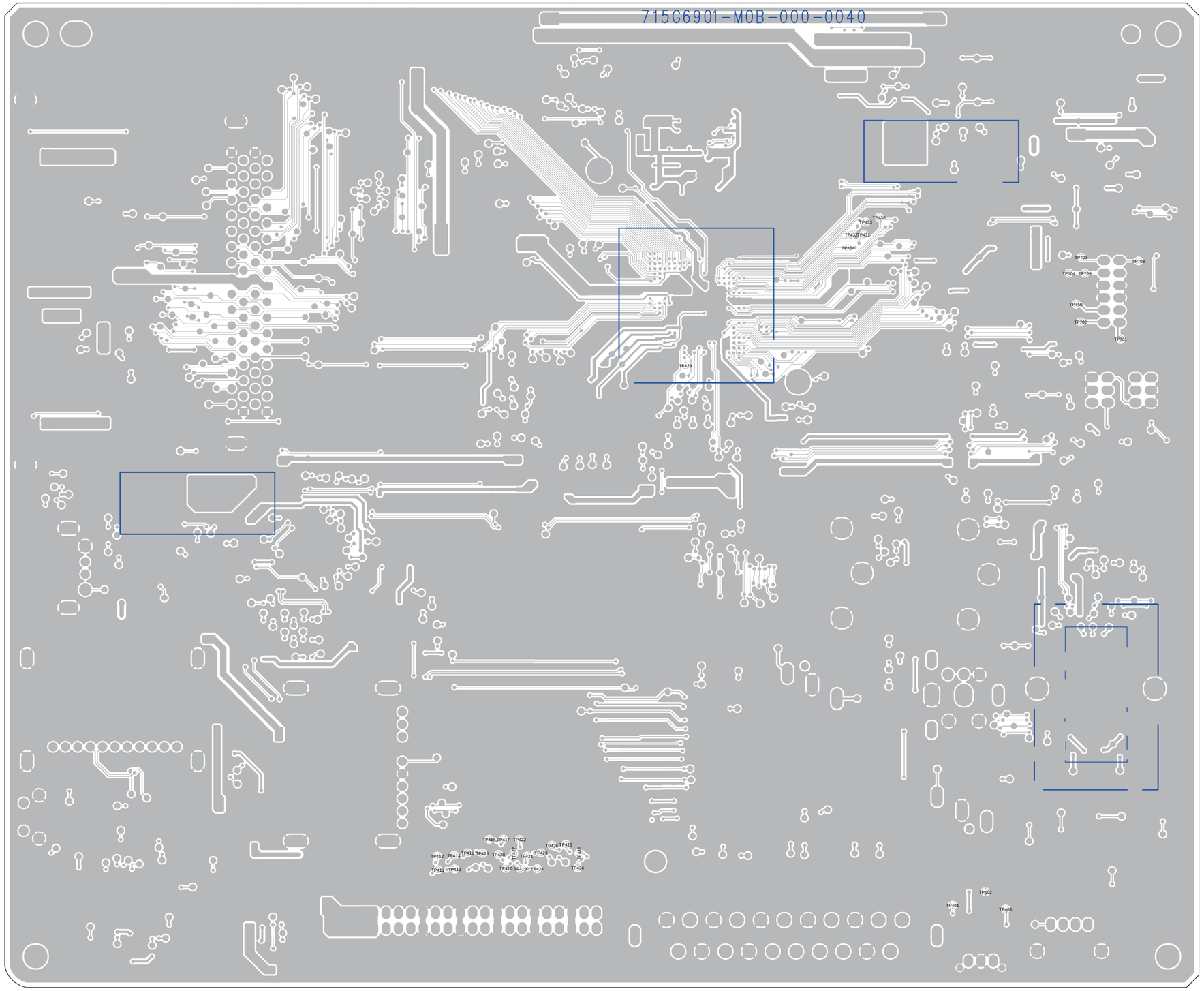
10-16-14 SSB layout top



LAYOUT TOP | 715G6901 | 2014-04-05

19597_524.eps

10-16-15 SSB layout bottom



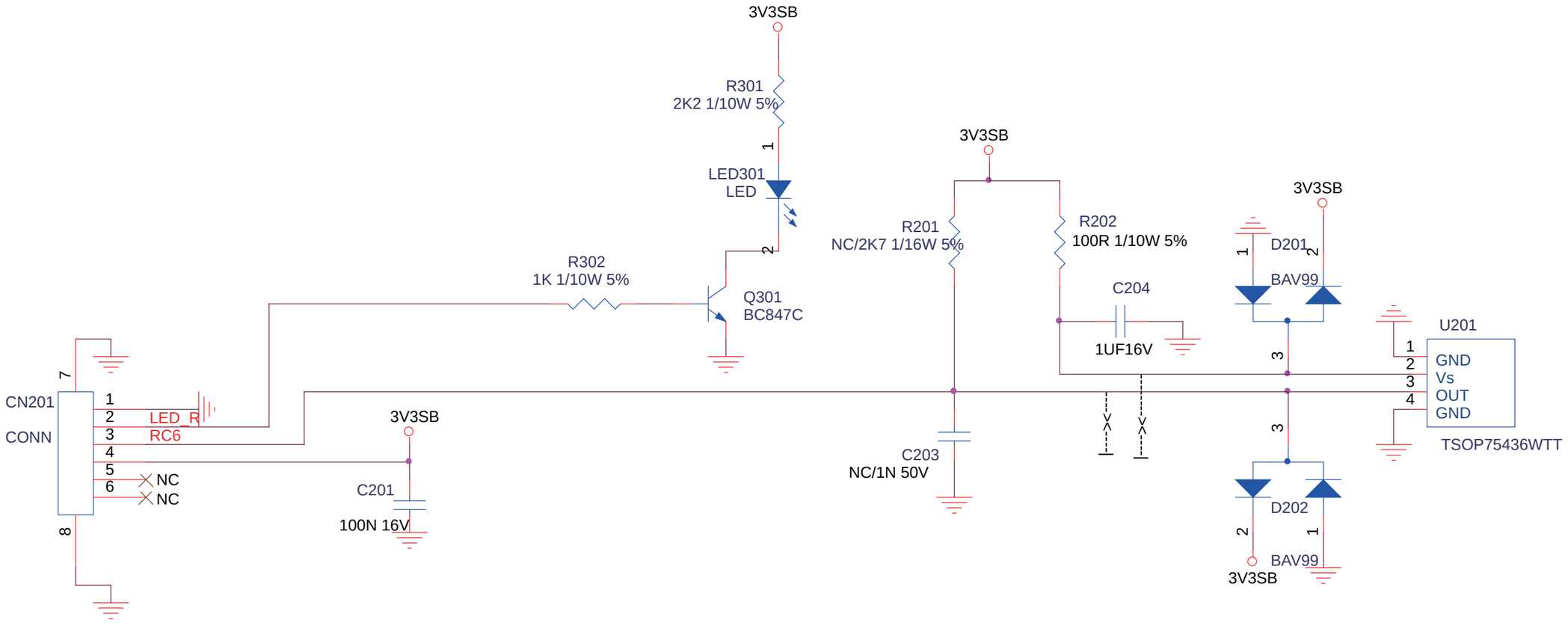
LAYOUT BOTTOM	715G6901	2014-04-05

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10.17 J 715G5772 IR/LED Panel

10-17-1 IR/LED Panel

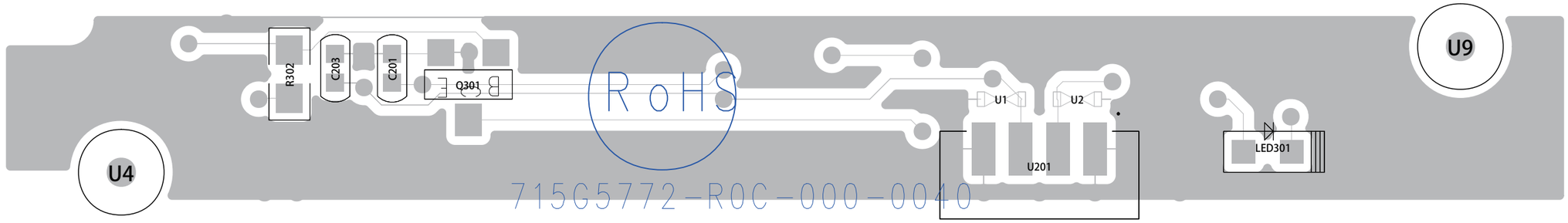
J IR/LED panel J



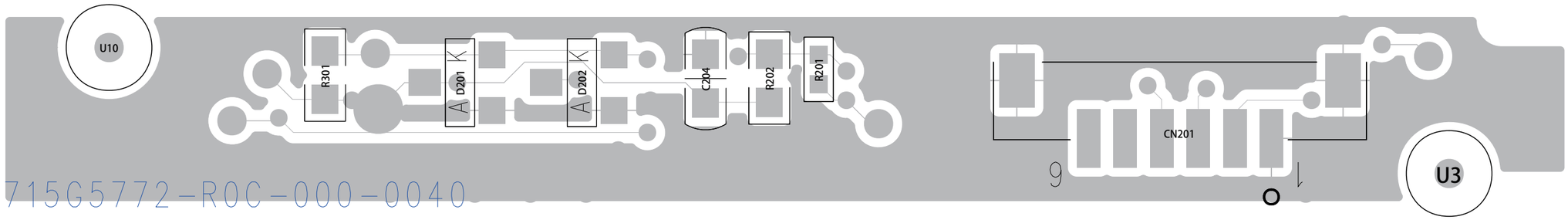
19431_525_130226.eps
130226

10-17-2 IR/LED board layout

Layout IR/LED panel (top side)



Layout IR/LED panel (bottom side)



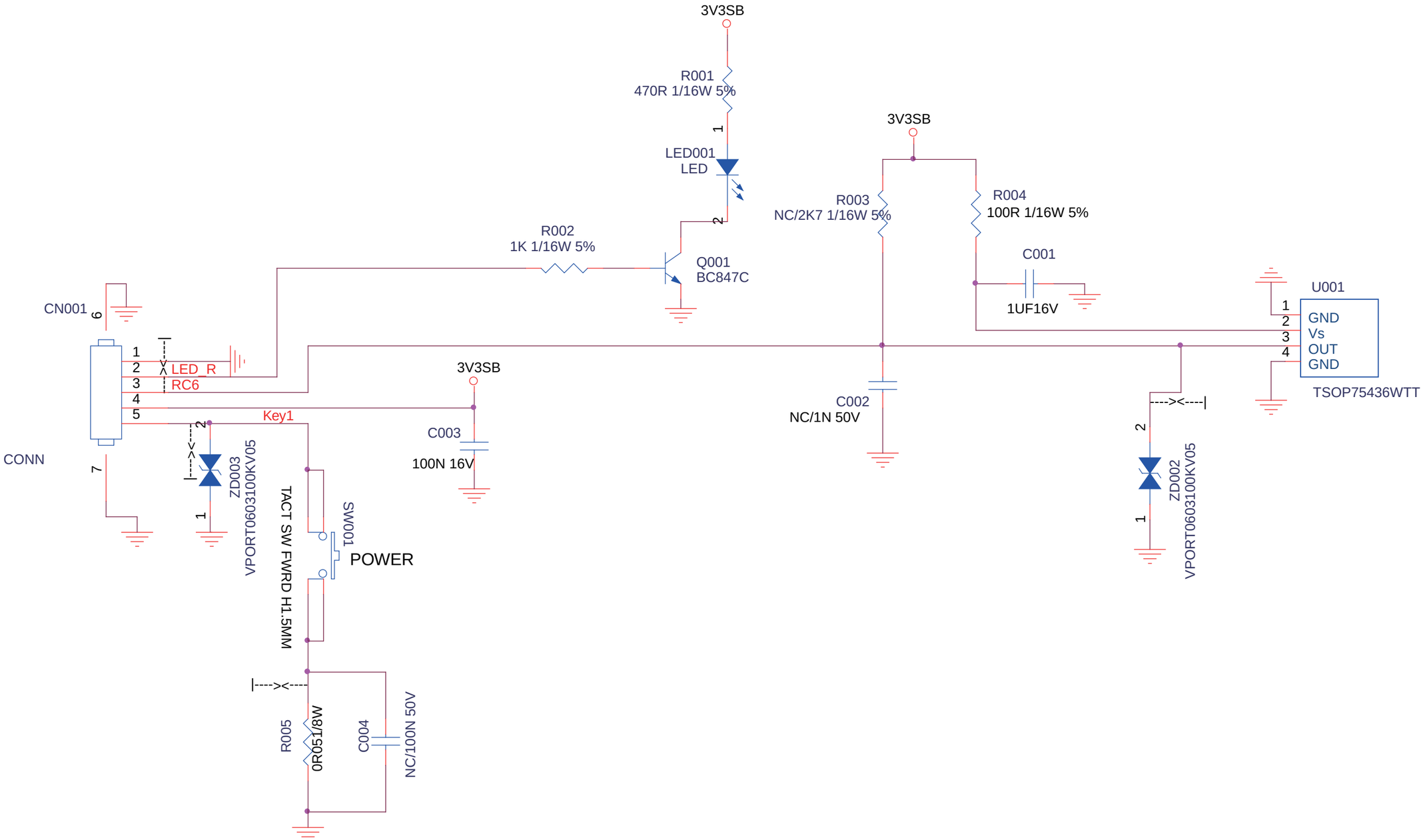
IR/LED panel layout top/bottom	715G5772	c 2012-09-20

19431_525_130226.eps
130226

10.18 EJ 715G6167 Control Board IR/LED Panel

10-18-1 Control Board IR/LED Panel

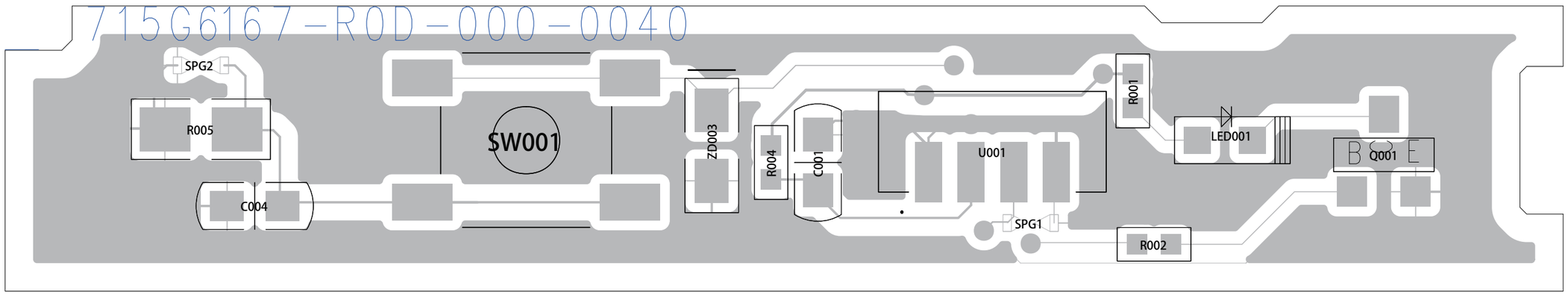
EJ Control Board IR/LED panel



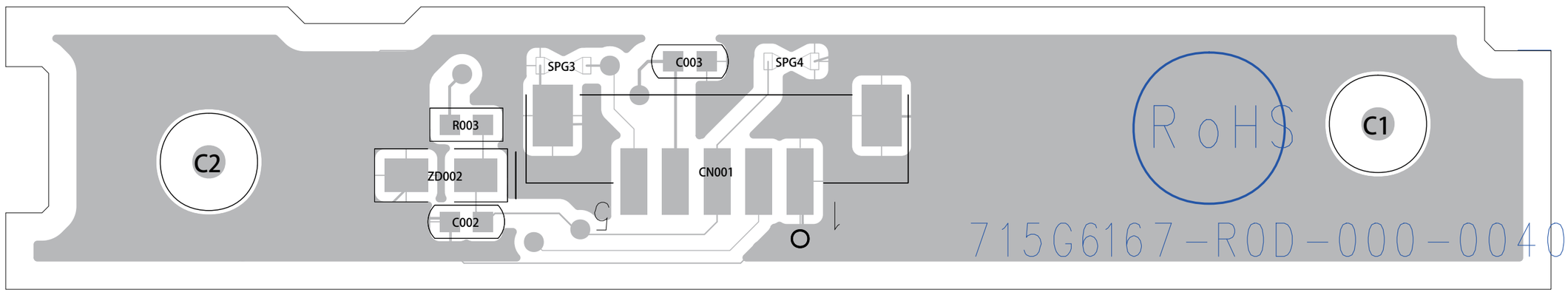
19530_557_130723.eps
130723

10-18-2 Control Board IR/LED board layout

Layout Control Board IR/LED panel (top side)



Layout Control Board IR/LED panel (bottom side)



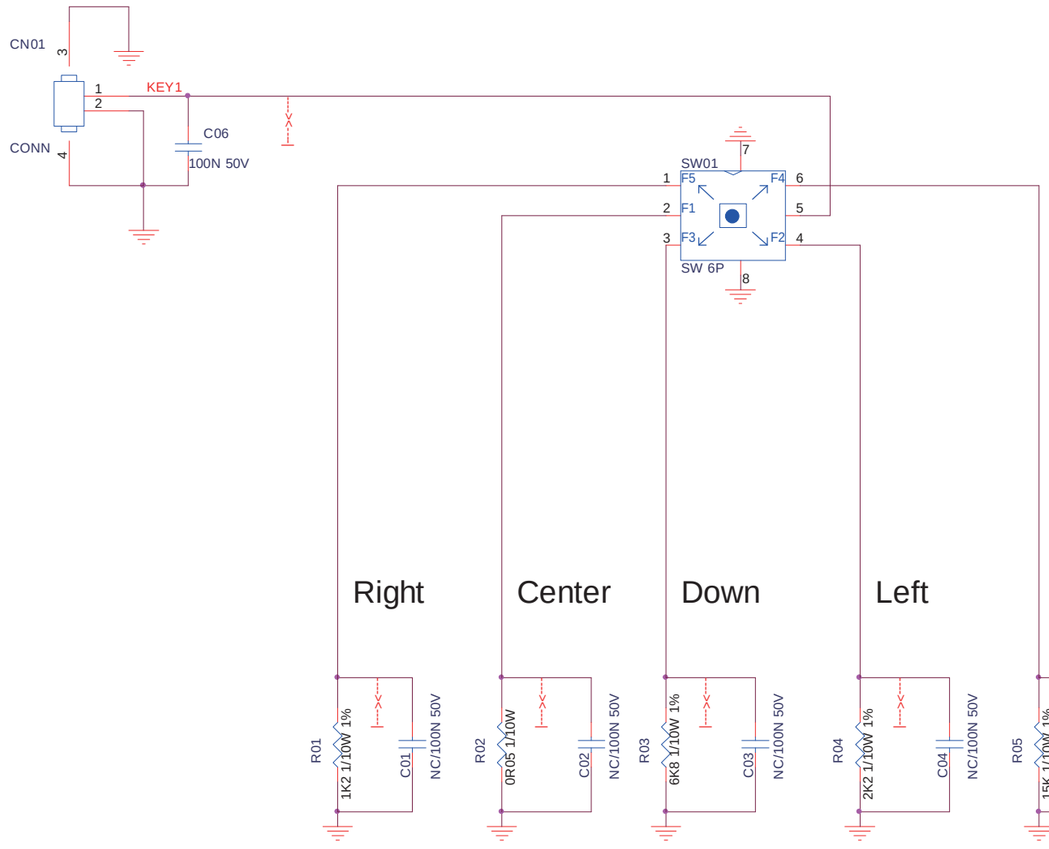
Control Board IR/LED panel layout top/bottom	715G6167	C 2013-04-29

19530_558_130723.eps
130723

10.19 E 715G6316 Keyboard control panel

10-19-1 Key

E Key



Direction	switch	Key function	Resistance	Voltage
Center	2-5 short	Menu	0R	0V
Right	1-5 short	CH+	1K2	0.5V
Left	4-5 short	CH-	2K2	0.81V
Down	3-5 short	VOL-	6K8	1.65V
Up	6-5 short	VOL+	15K	2.27V
		No function		3.3V

Joystick circuit diagram

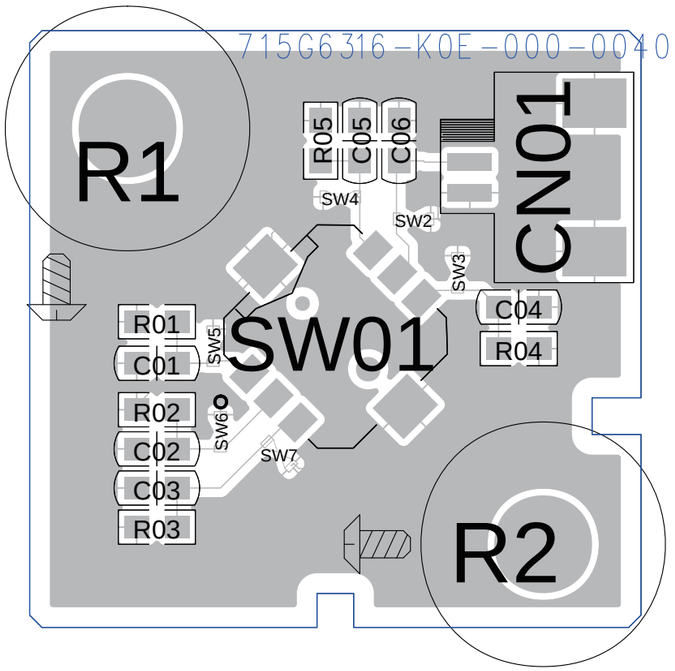
	pin1	pin2	pin3	pin4	pin5	pin6
F1		○			○	
F2				○	○	
F3			○		○	
F4					○	○
F5	○				○	

Keyboard control panel	715G6316	1 2013-09-17

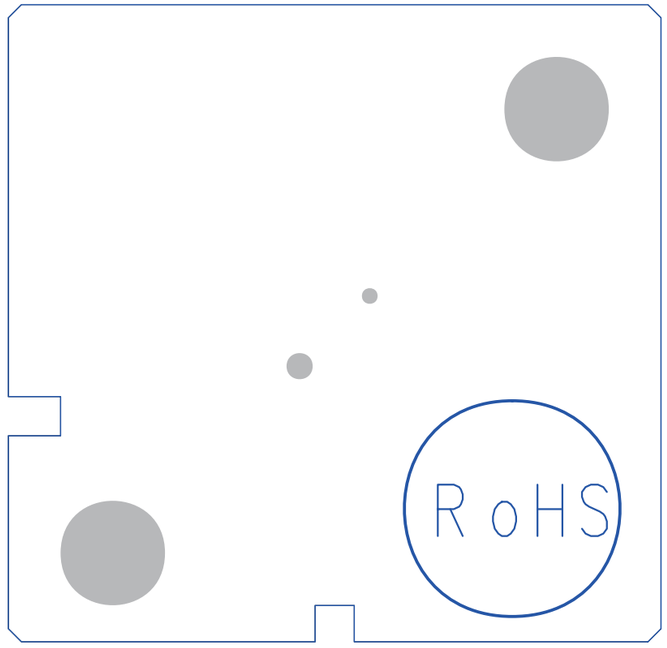
19610_545.eps

10-19-2 Key board layout

Layout Keyboard control panel (top side)



Layout Keyboard control panel (bottom side)



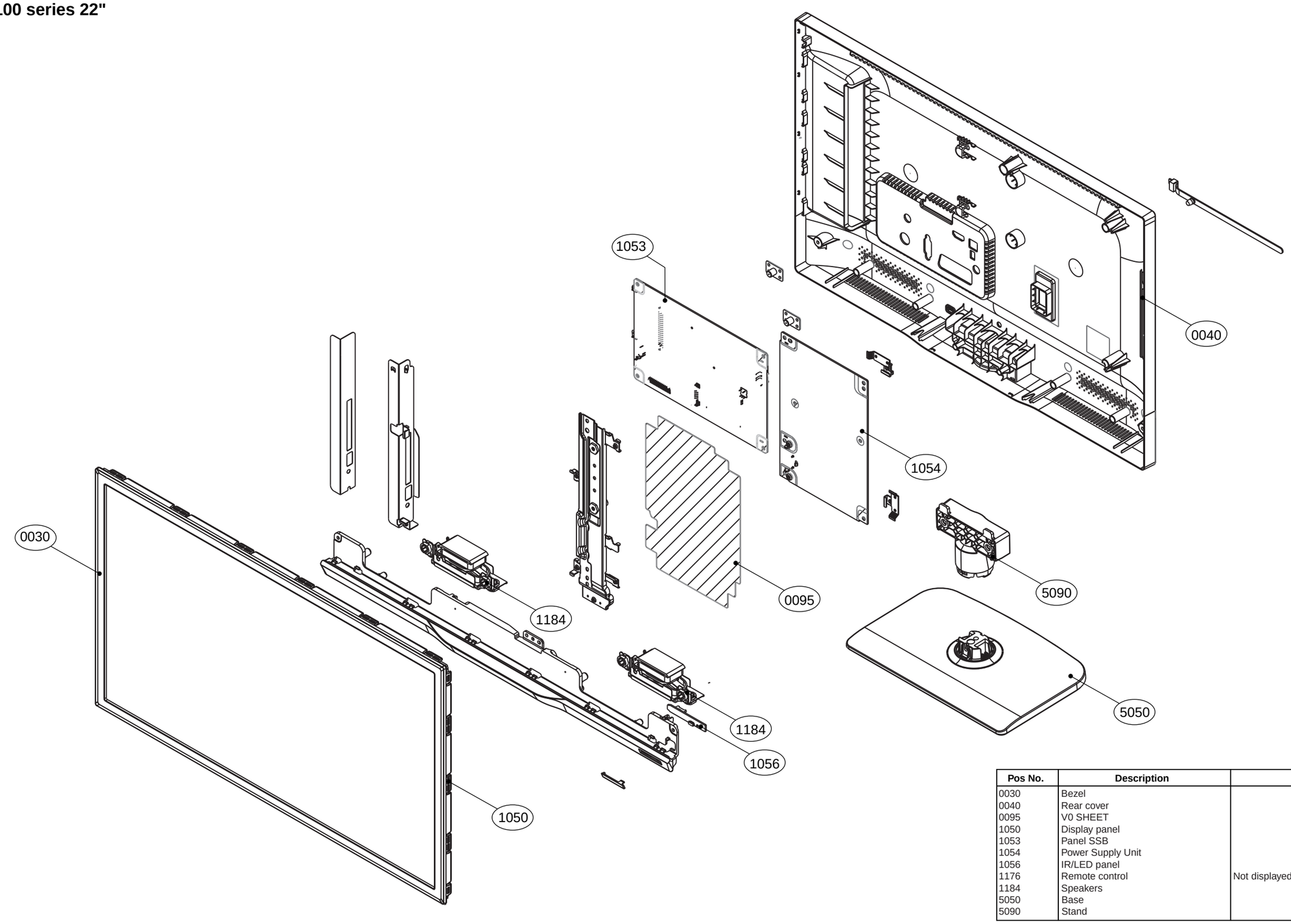
Keyboard control panel layout top/bottom	715G6316	1 2013-09-17

19610_546.eps

11. Styling Sheets

11.1 4100 series 22"

4100 series 22"



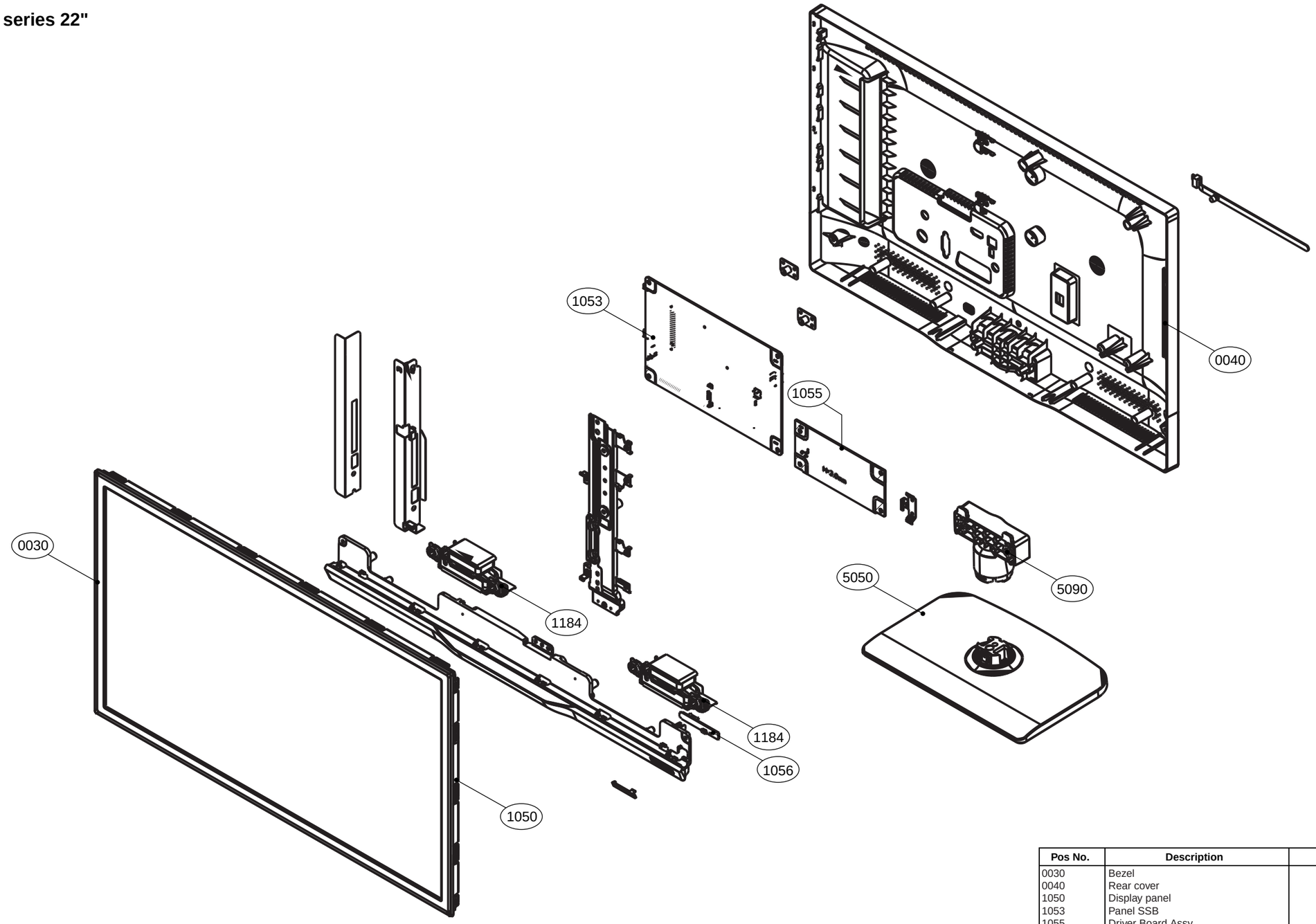
Pos No.	Description	Remarks
0030	Bezel	
0040	Rear cover	
0095	V0 SHEET	
1050	Display panel	
1053	Panel SSB	
1054	Power Supply Unit	
1056	IR/LED panel	
1176	Remote control	Not displayed
1184	Speakers	
5050	Base	
5090	Stand	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

19590_800_131230.eps
131230

11.2 4200 series 22"

4200 series 22"



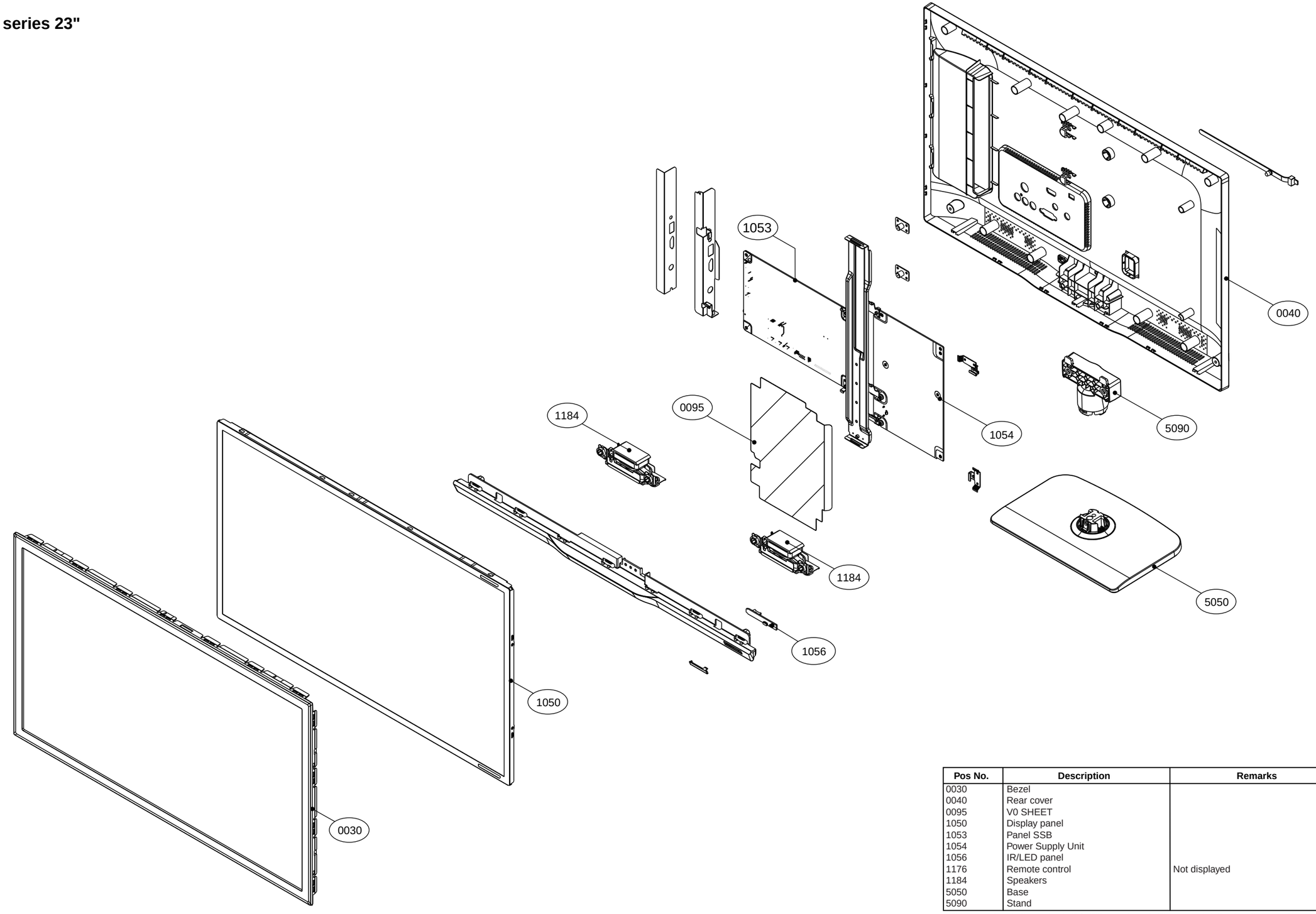
Pos No.	Description	Remarks
0030	Bezel	
0040	Rear cover	
1050	Display panel	
1053	Panel SSB	
1055	Driver Board Assy	
1056	IR/LED panel	
1176	Remote control	Not displayed
1184	Speakers	
5050	Base	
5090	Stand	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

19592_800.eps

11.3 4000 series 23"

4000 series 23"



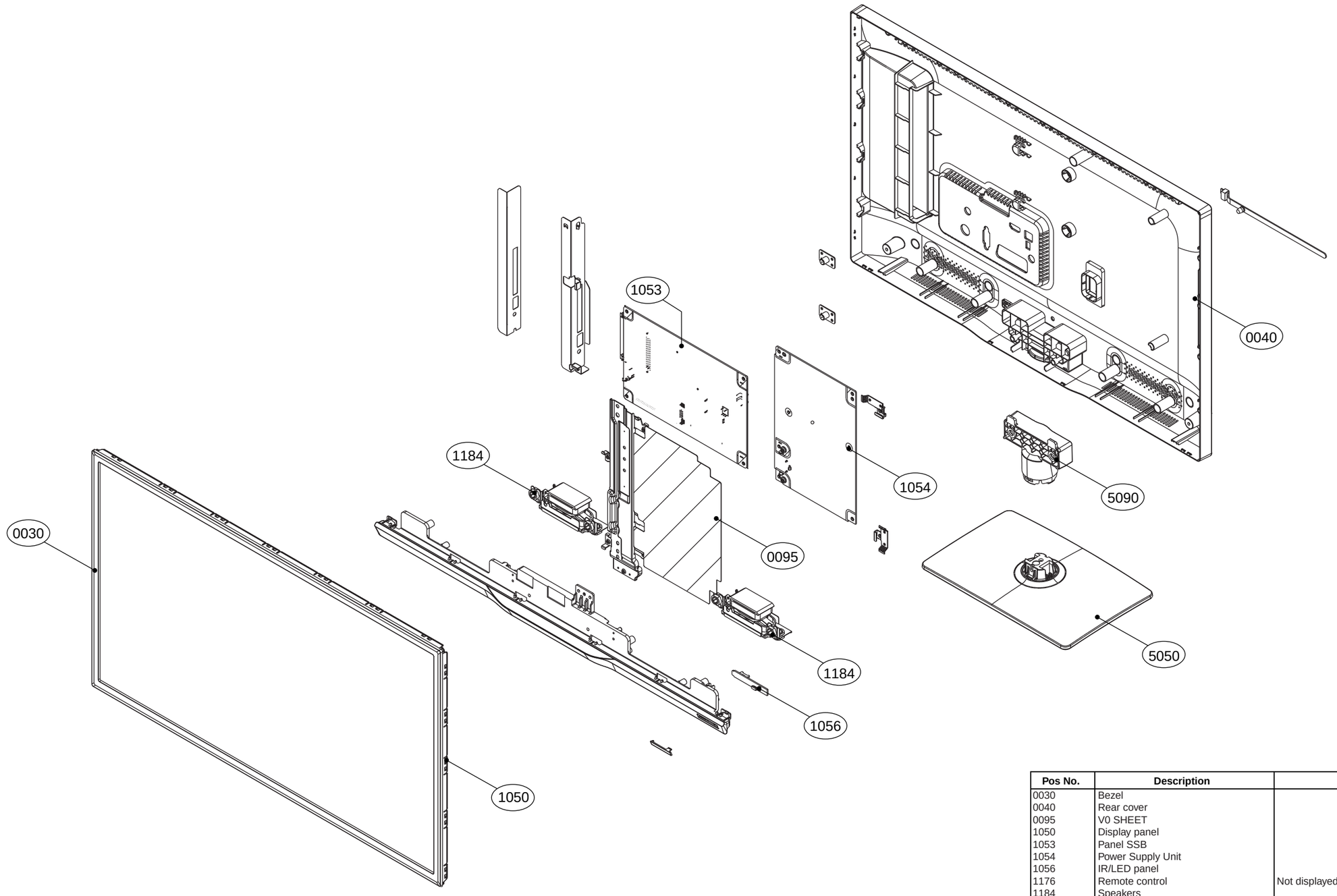
Pos No.	Description	Remarks
0030	Bezel	
0040	Rear cover	
0095	V0 SHEET	
1050	Display panel	
1053	Panel SSB	
1054	Power Supply Unit	
1056	IR/LED panel	
1176	Remote control	Not displayed
1184	Speakers	
5050	Base	
5090	Stand	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

19595_800.eps

11.4 4100 series 24"

4100 series 24"



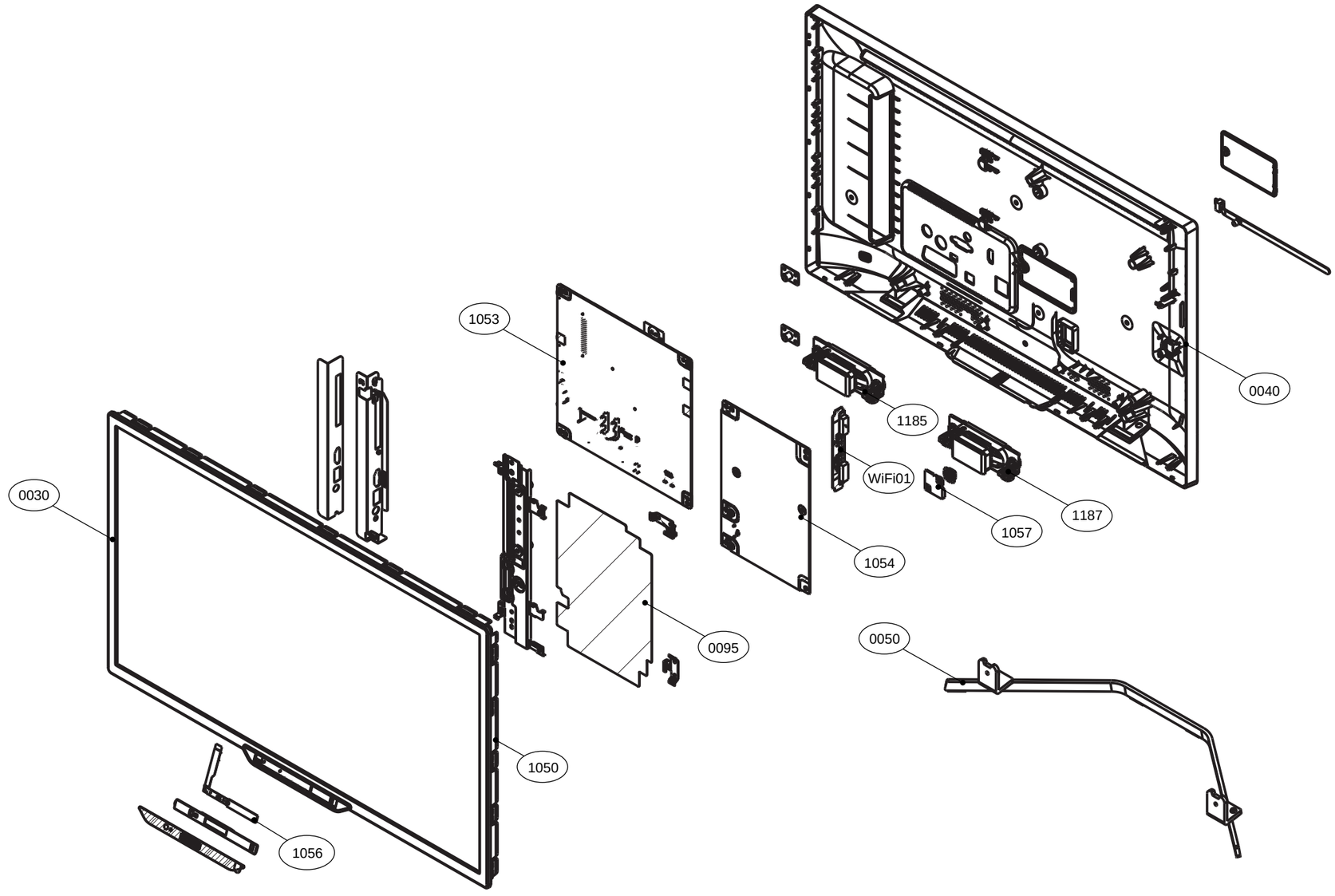
Pos No.	Description	Remarks
0030	Bezel	
0040	Rear cover	
0095	V0 SHEET	
1050	Display panel	
1053	Panel SSB	
1054	Power Supply Unit	
1056	IR/LED panel	
1176	Remote control	Not displayed
1184	Speakers	
5050	Base	
5090	Stand	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

19590_801_140108.eps
140108

11.5 5210 series 24"

5210 series 24"



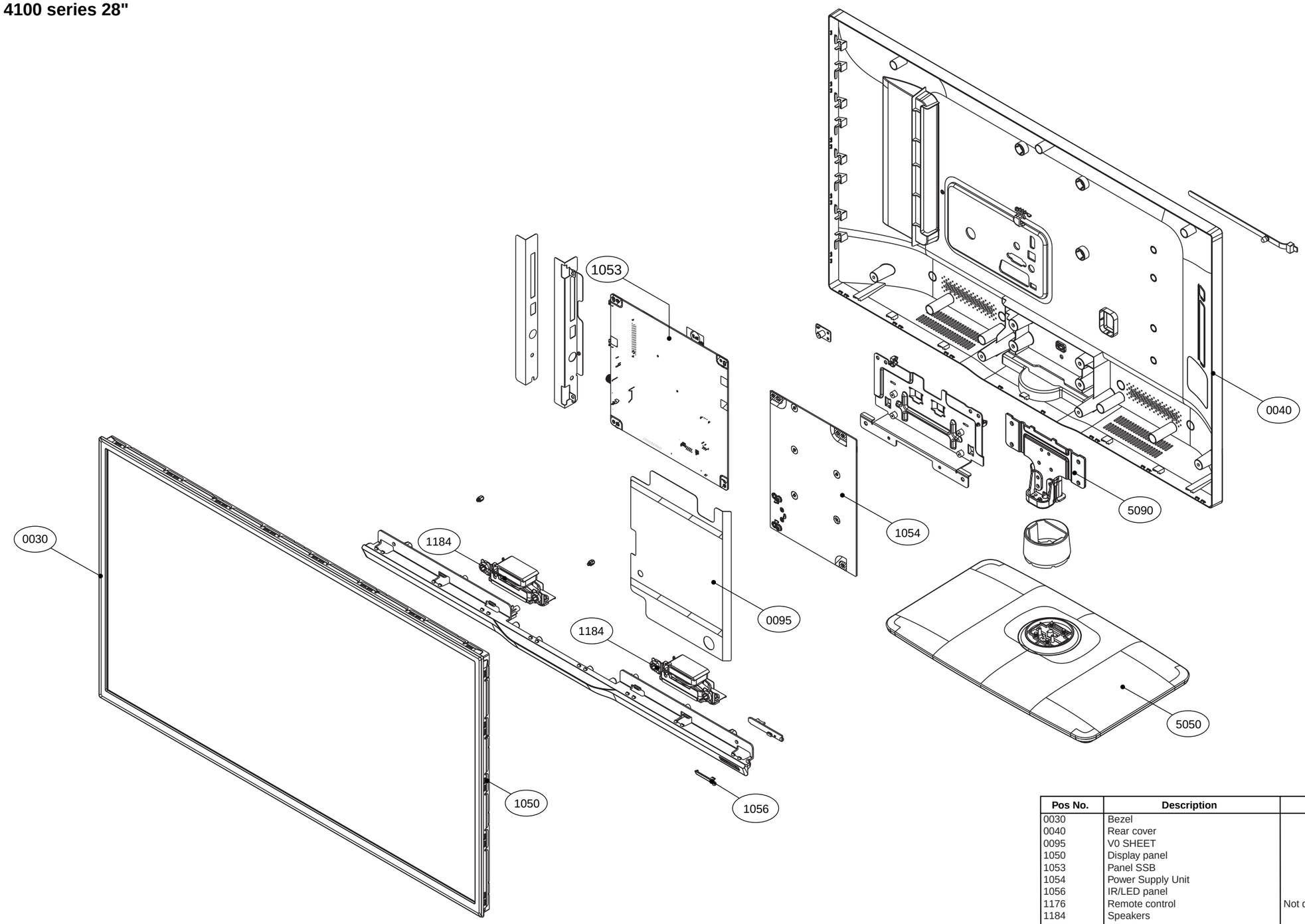
Pos No.	Description	Remarks
0030	Bezel	
0040	Rear cover	
0050	Stand Assembly	
0095	V0 SHEET	
1050	Display panel	
1053	Panel SSB	
1054	Power Supply Unit	
1056	IR/LED panel	
1057	Keyboard control panel	
1176	Remote control	Not displayed
1185	Speaker_R	
1187	Speaker_L	
WiFi01	WiFi_USB	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

19593_800.eps

11.6 4100 series 28"

4100 series 28"



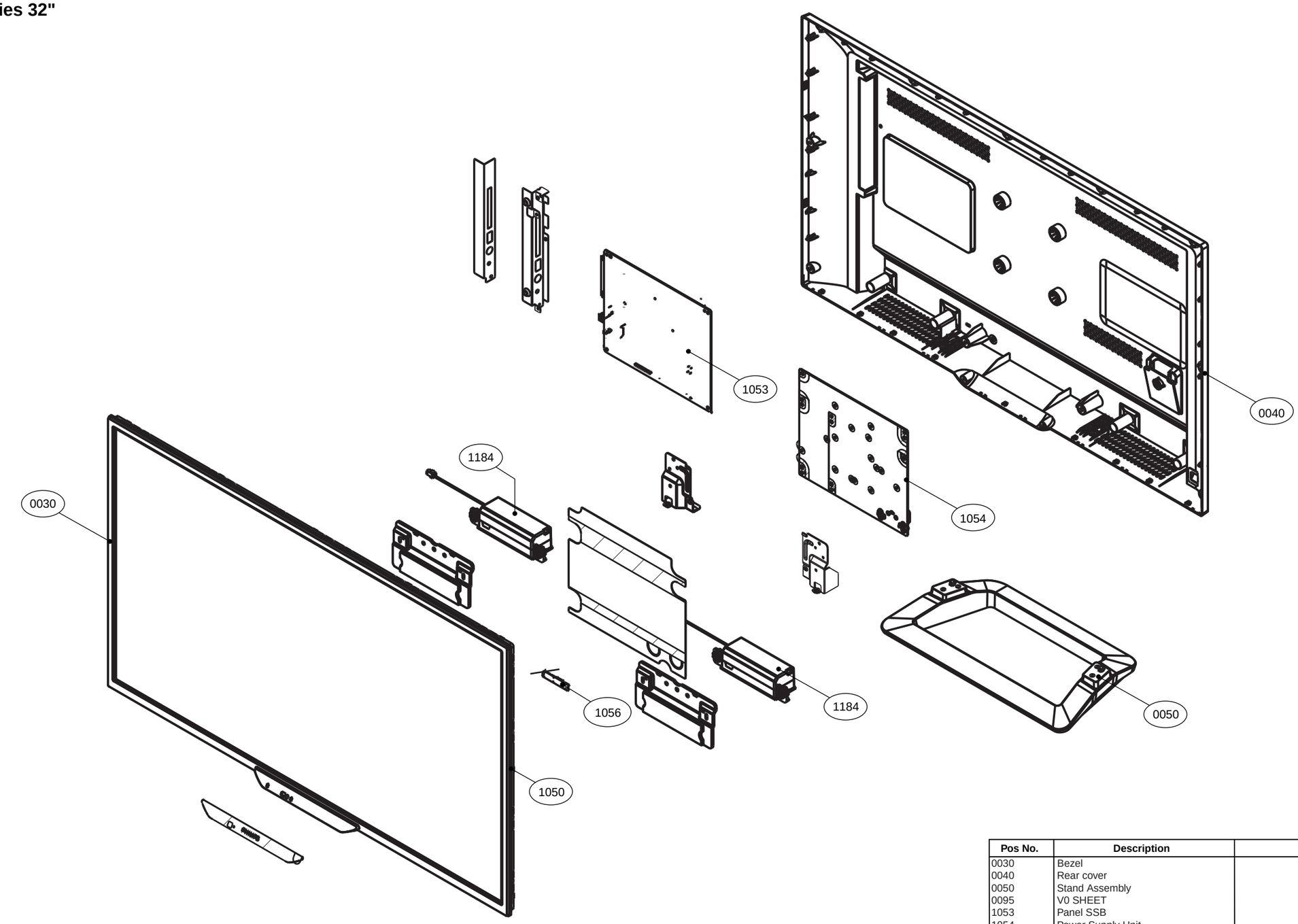
Pos No.	Description	Remarks
0030	Bezel	
0040	Rear cover	
0095	V0 SHEET	
1050	Display panel	
1053	Panel SSB	
1054	Power Supply Unit	
1056	IR/LED panel	
1176	Remote control	Not displayed
1184	Speakers	
5050	Base	
5090	Stand	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

19594_800.eps

11.7 4009 series 32"

4009 series 32"



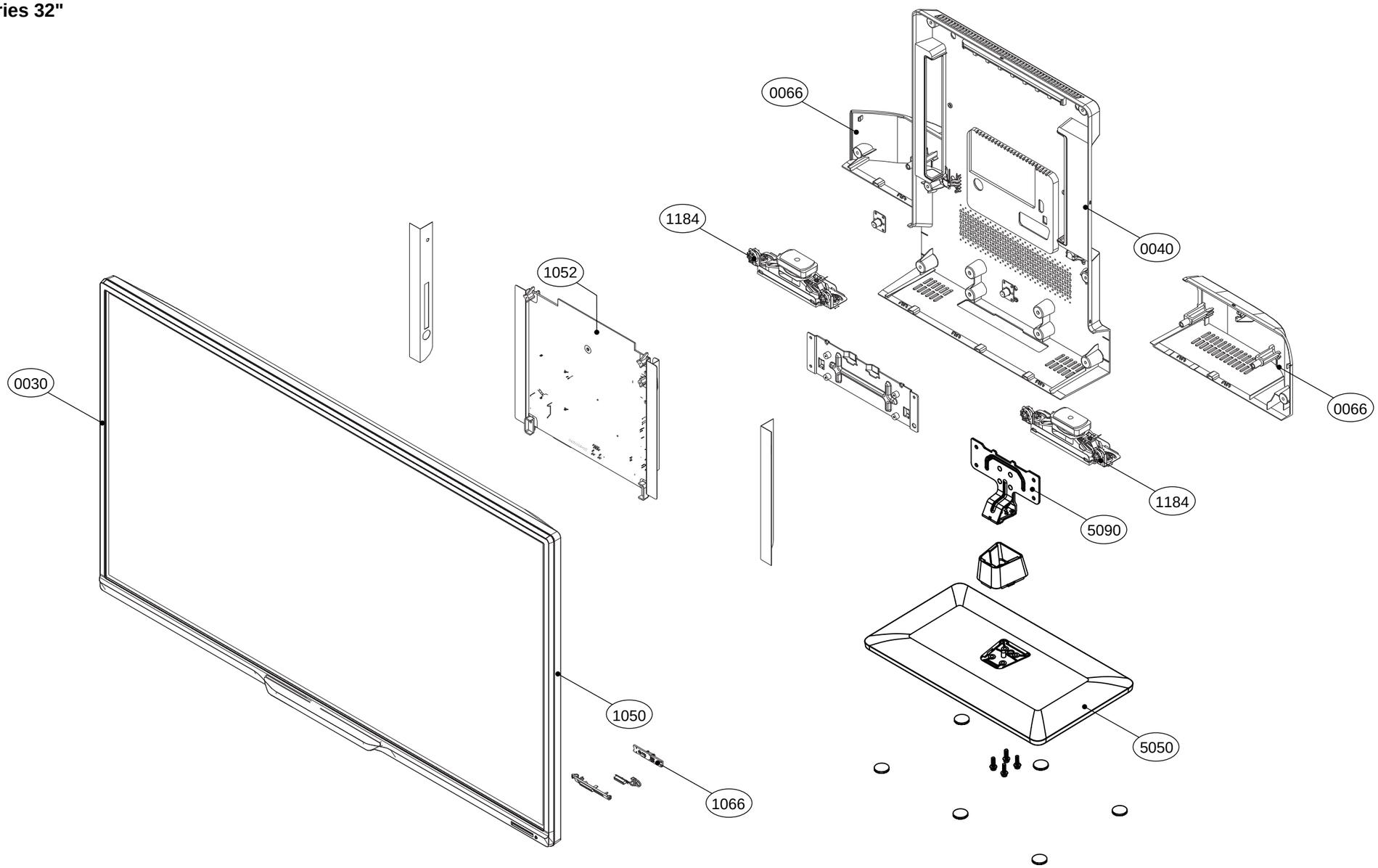
Pos No.	Description	Remarks
0030	Bezel	
0040	Rear cover	
0050	Stand Assembly	
0095	V0 SHEET	
1053	Panel SSB	
1054	Power Supply Unit	
1056	IR/LED panel	
1176	Remote control	Not displayed
1184	Speakers	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

19597_800.eps

11.8 4100 series 32"

4100 series 32"



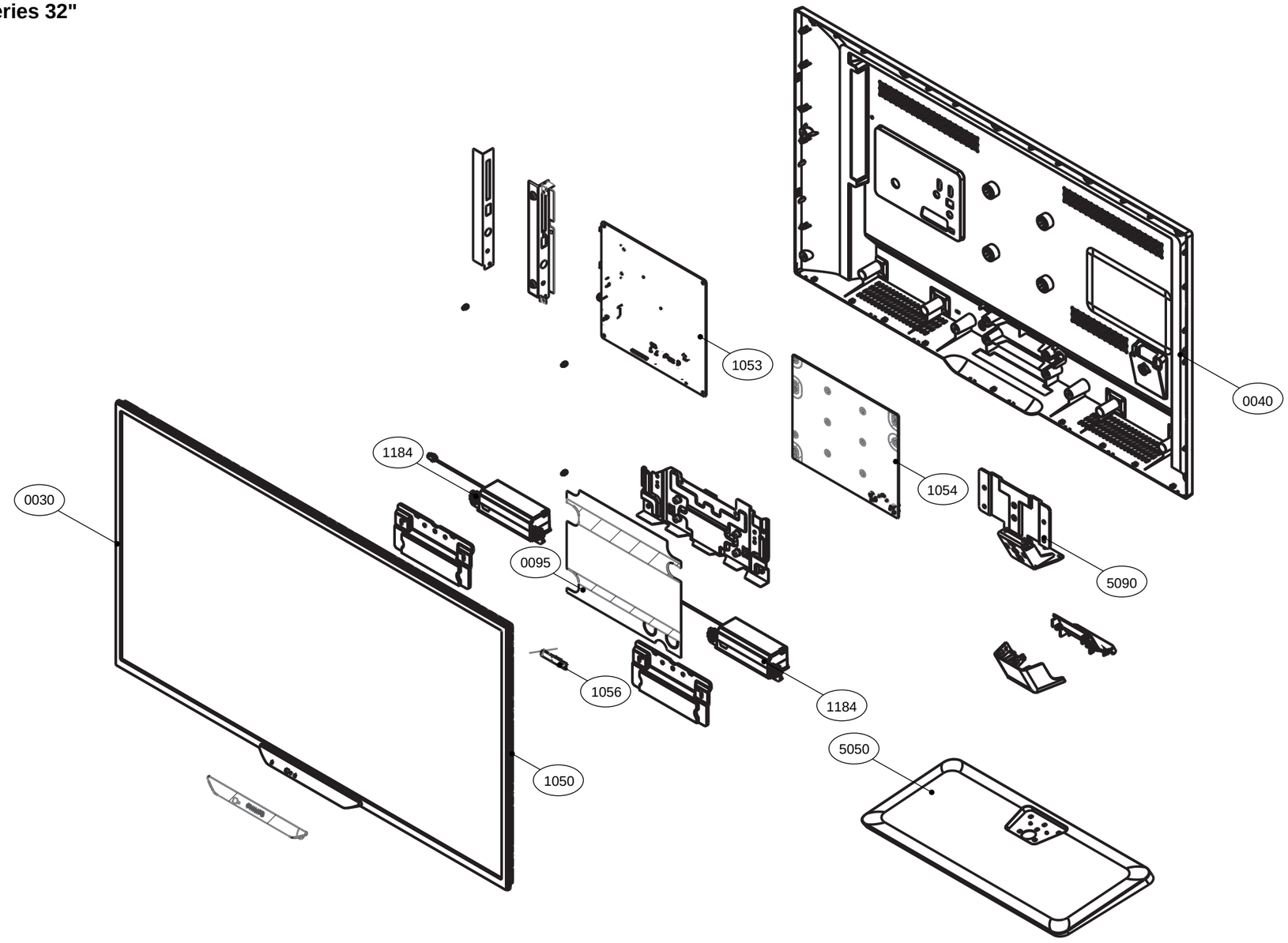
Pos No.	Description	Remarks
0030	Bezel	
0040	Rear cover	
0066	Cover Speaker	
1050	Display panel	
1052	SSB+PSU combination panel	
1066	Control board+IR/LED panel	
1176	Remote control	Not displayed
1184	Speakers	
5050	Base	
5090	Stand	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

19590_802_140109.eps
140109

11.9 4300 series 32"

4300 series 32"



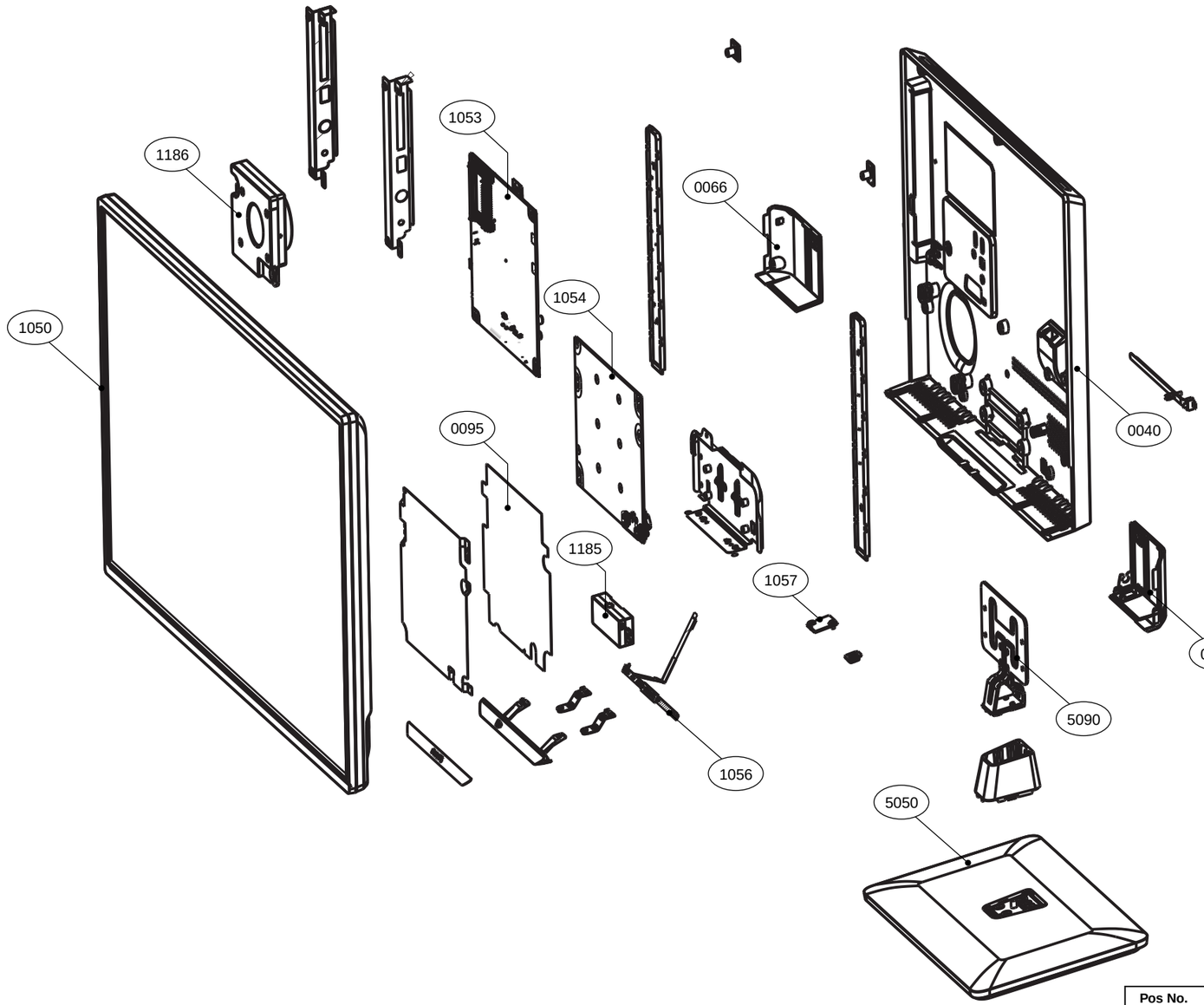
Pos No.	Description	Remarks
0030	Bezel	
0040	Rear cover	
0095	V0 SHEET	
1050	Display panel	
1053	Panel SSB	
1054	Power Supply Unit	
1056	IR/LED panel	
1176	Remote control	Not displayed
1184	Speakers	
5050	Base	
5090	Stand	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

19593_801.eps

11.10 5100 series 32"

5100 series 32"



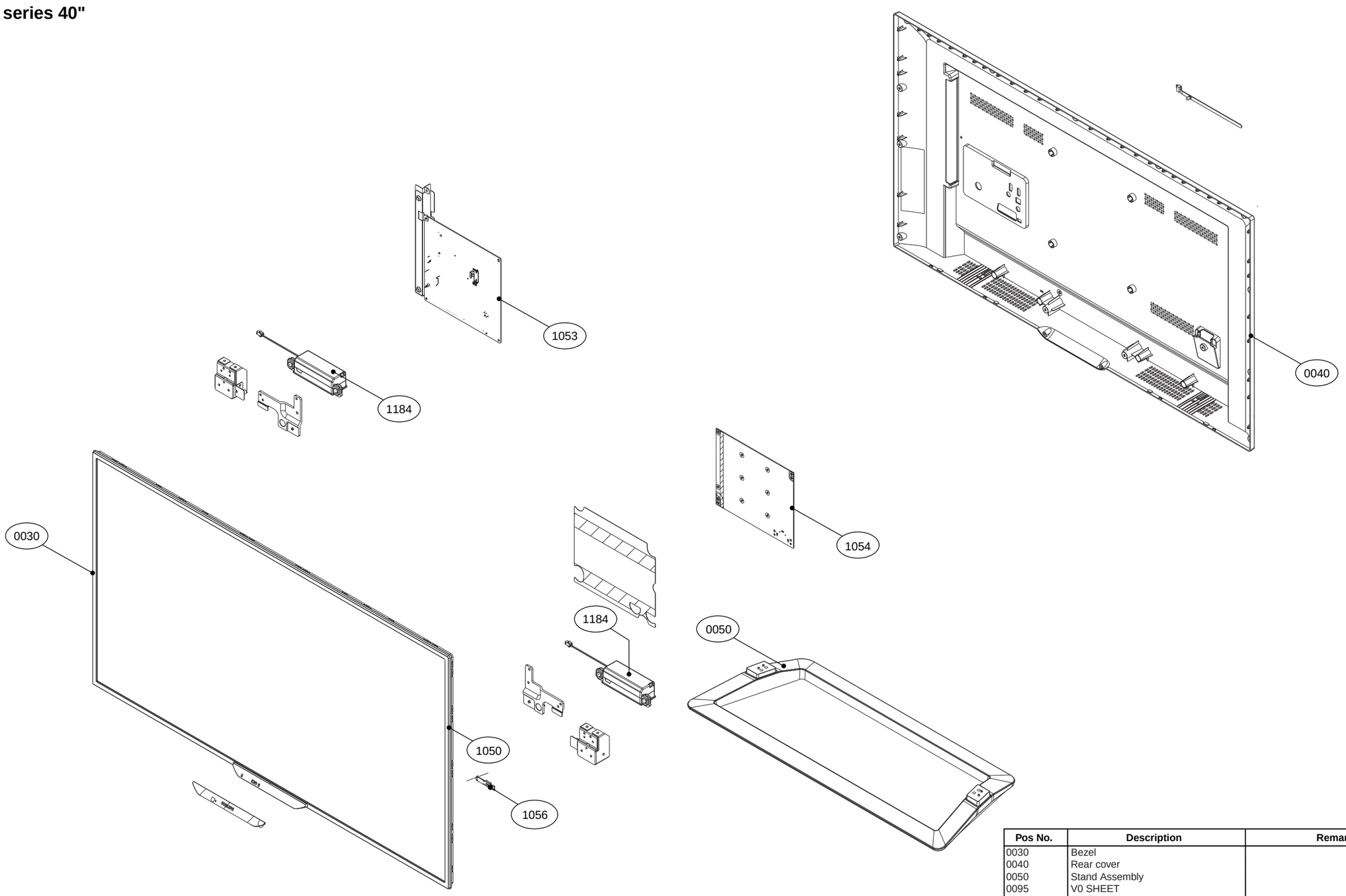
Pos No.	Description	Remarks
0040	Rear cover	
0066	Cover speaker	
0095	V0 SHEET	
1050	Display panel	
1053	Panel SSB	
1054	Power Supply Unit	
1056	IR/LED panel	
1057	Keyboard Control panel	
1176	Remote control	Not displayed
1185	Speaker_L	
1186	Speaker Sub_woofer	
5050	Base	
5090	Stand	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

19593_802.eps

11.11 4009 series 40"

4009 series 40"



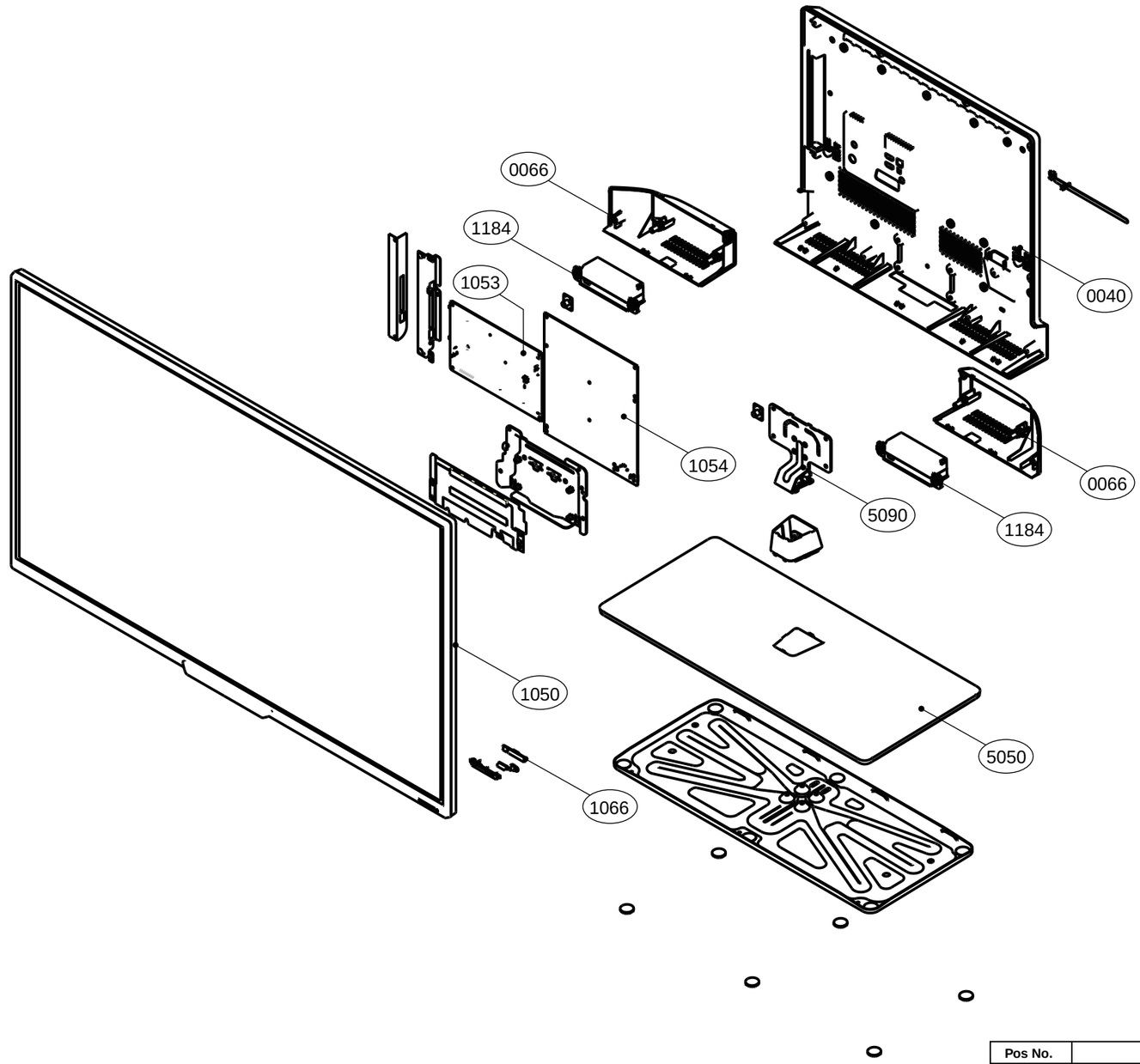
Pos No.	Description	Remarks
0030	Bezel	
0040	Rear cover	
0050	Stand Assembly	
0095	V0 SHEET	
1053	Panel SSB	
1054	Power Supply Unit	
1056	IR/LED panel	
1176	Remote control	Not displayed
1184	Speakers	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

19597_801.eps

11.12 4100 series 40"

4100 series 40"



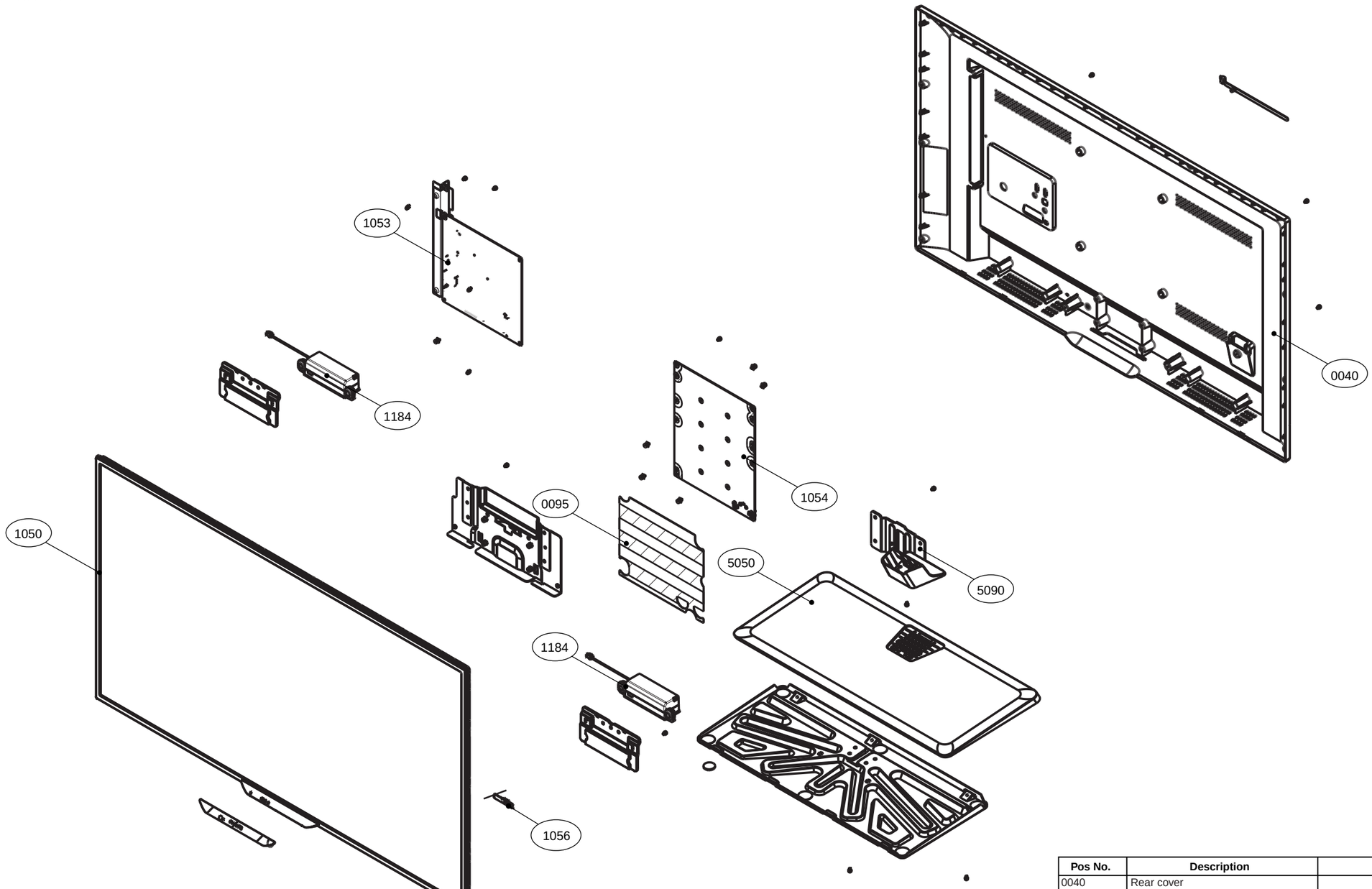
Pos No.	Description	Remarks
0040	Rear cover	
0066	Cover Speaker	
1050	Display panel	
1052	panel SSB	
1054	Power Supply Unit	
1066	Control board+IR/LED panel	
1176	Remote control	Not displayed
1184	Speakers	
5050	Base	
5090	Stand	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

19590_803_140109.eps
140109

11.13 4300 series 40"

4300 series 40"



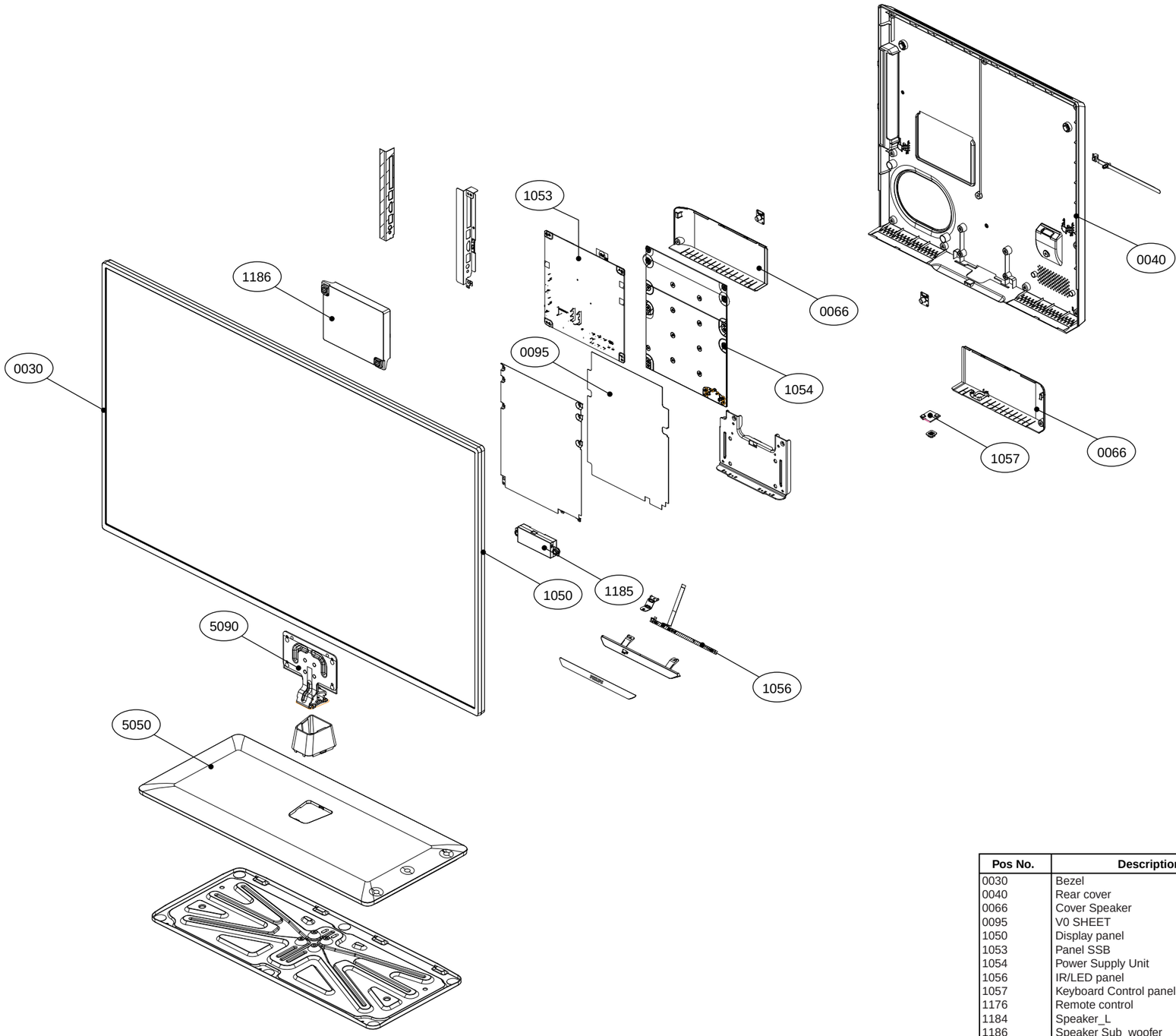
Pos No.	Description	Remarks
0040	Rear cover	
0095	V0 SHEET	
1050	Display panel	
1053	Panel SSB	
1054	Power Supply Unit	
1056	IR/LED panel	
1176	Remote control	Not displayed
1184	Speakers	
5050	Base	
5090	Stand	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

19593_803.eps

11.14 5100 series 40"

5100 series 40"



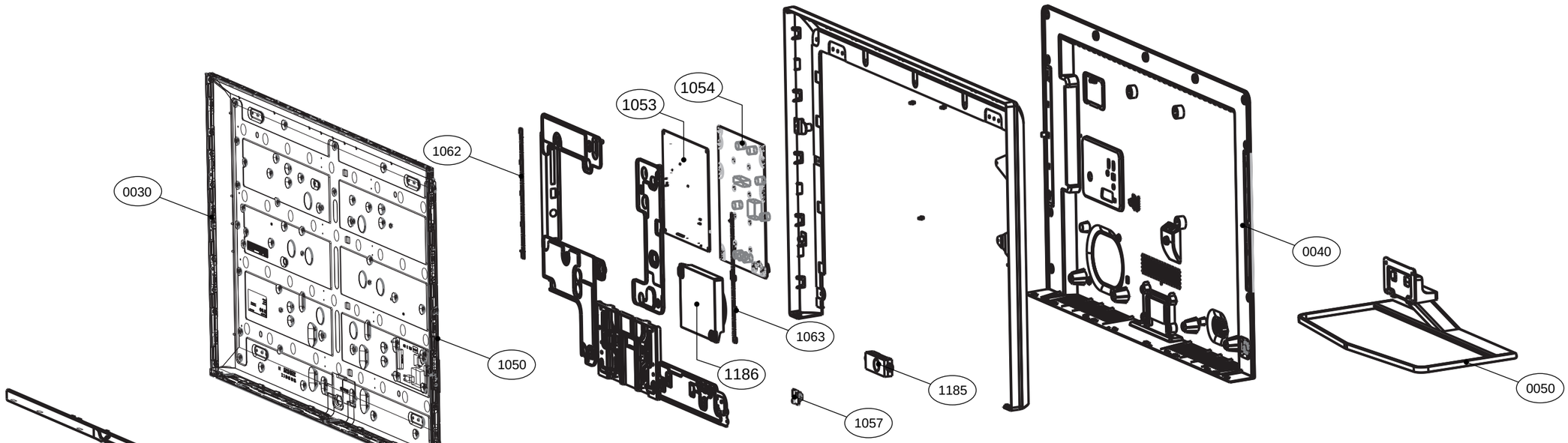
Pos No.	Description	Remarks
0030	Bezel	
0040	Rear cover	
0066	Cover Speaker	
0095	V0 SHEET	
1050	Display panel	
1053	Panel SSB	
1054	Power Supply Unit	
1056	IR/LED panel	
1057	Keyboard Control panel	
1176	Remote control	Not displayed
1184	Speaker_L	
1186	Speaker Sub_woofer	
5050	Base	
5090	Stand	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

19593_804.eps

11.15 5200 series 42"

5200 series 42"



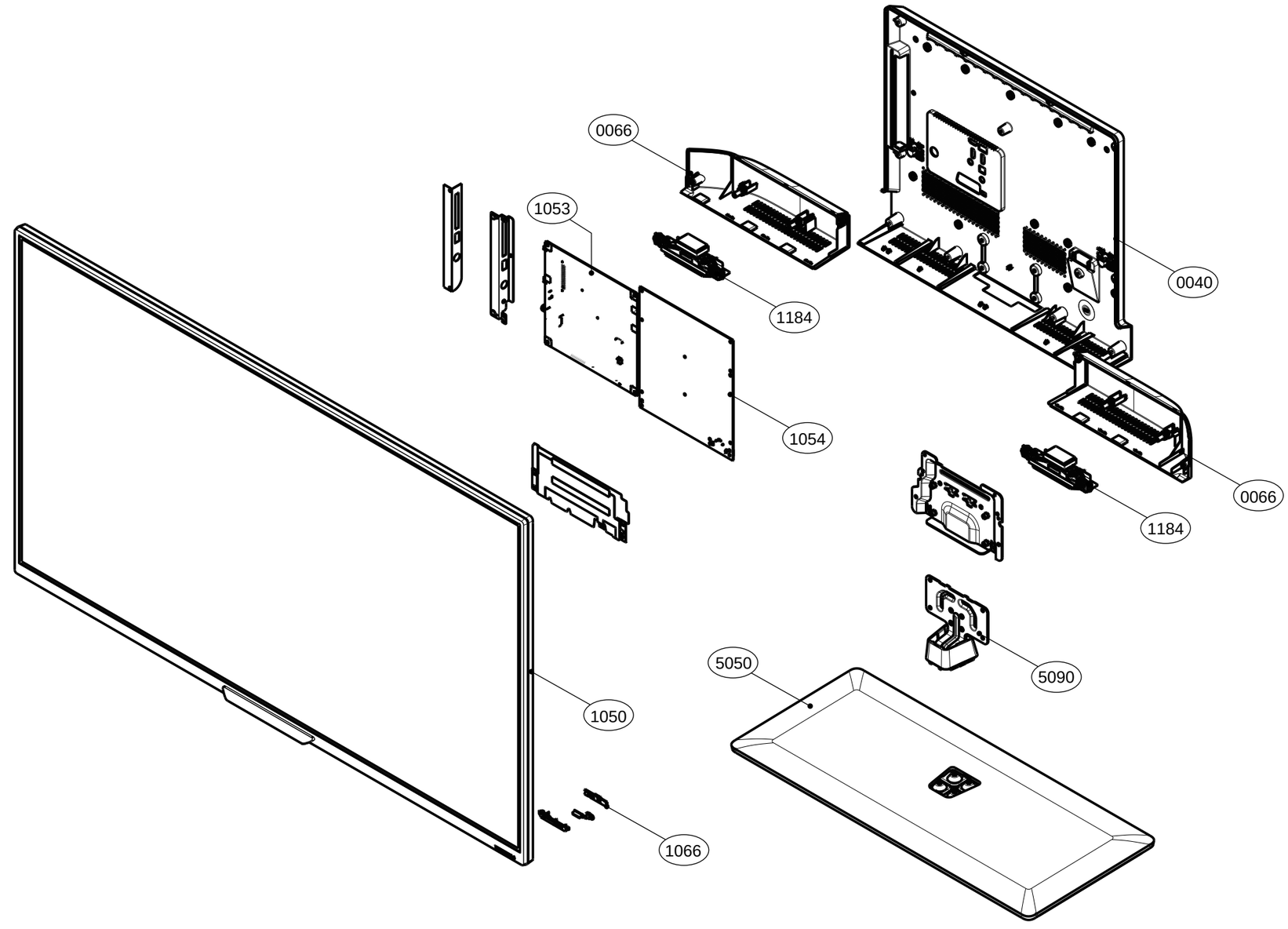
Pos No.	Description	Remarks
0030	Bezel	
0040	Rear cover	
0050	Stand Assy	
0095	V0 SHEET	
1050	Display panel	
1053	Panel SSB	
1054	Power Supply Unit	
1057	Keyboard control panel	
1062	LED Module_Master	
1063	LED Module_Slave	
1176	Remote control	Not displayed
1185	Speaker_L	
1186	Speaker_Sub woofer	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

19594_801.eps

11.16 4100 series 47"

4100 series 47"



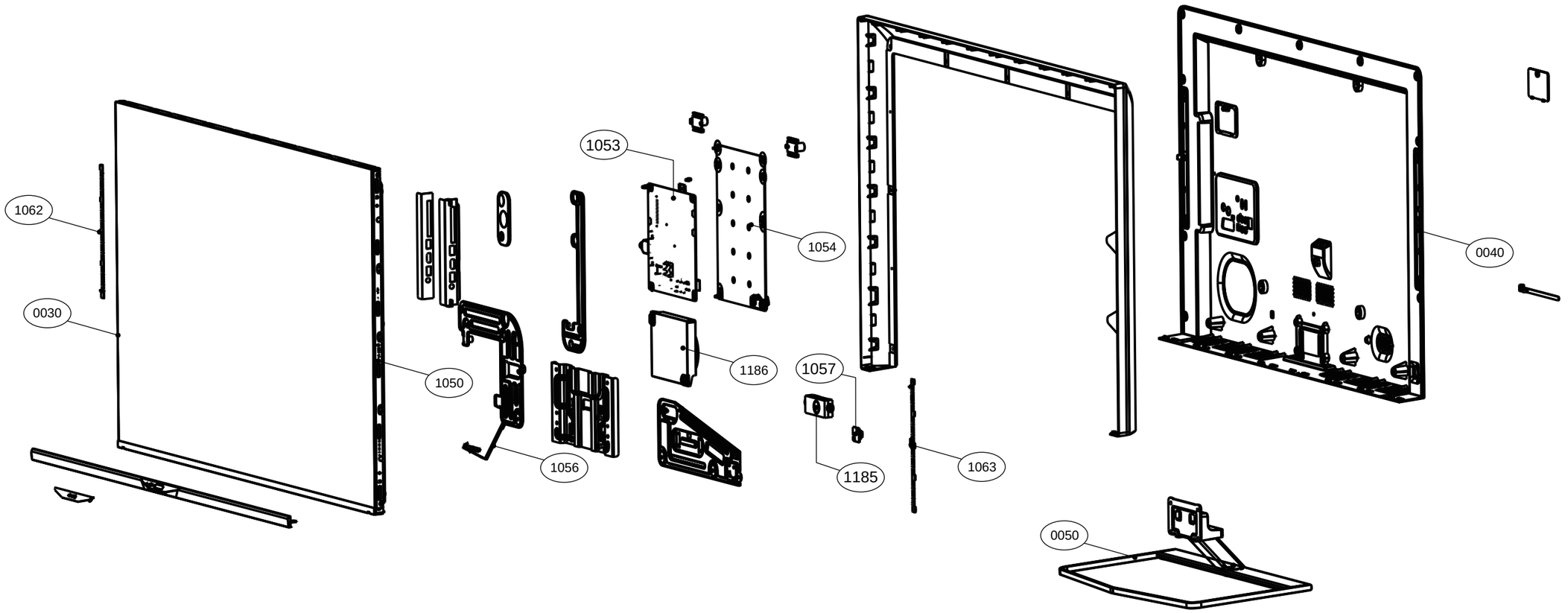
Pos No.	Description	Remarks
0040	Rear cover	
0066	Cover Speaker	
1050	Display panel	
1052	panel SSB	
1054	Power Supply Unit	
1066	Control board+IR/LED panel	
1176	Remote control	Not displayed
1184	Speakers	
5050	Base	
5090	Stand	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

19591 800.eps

11.17 5200 series 47"

5200 series 47"



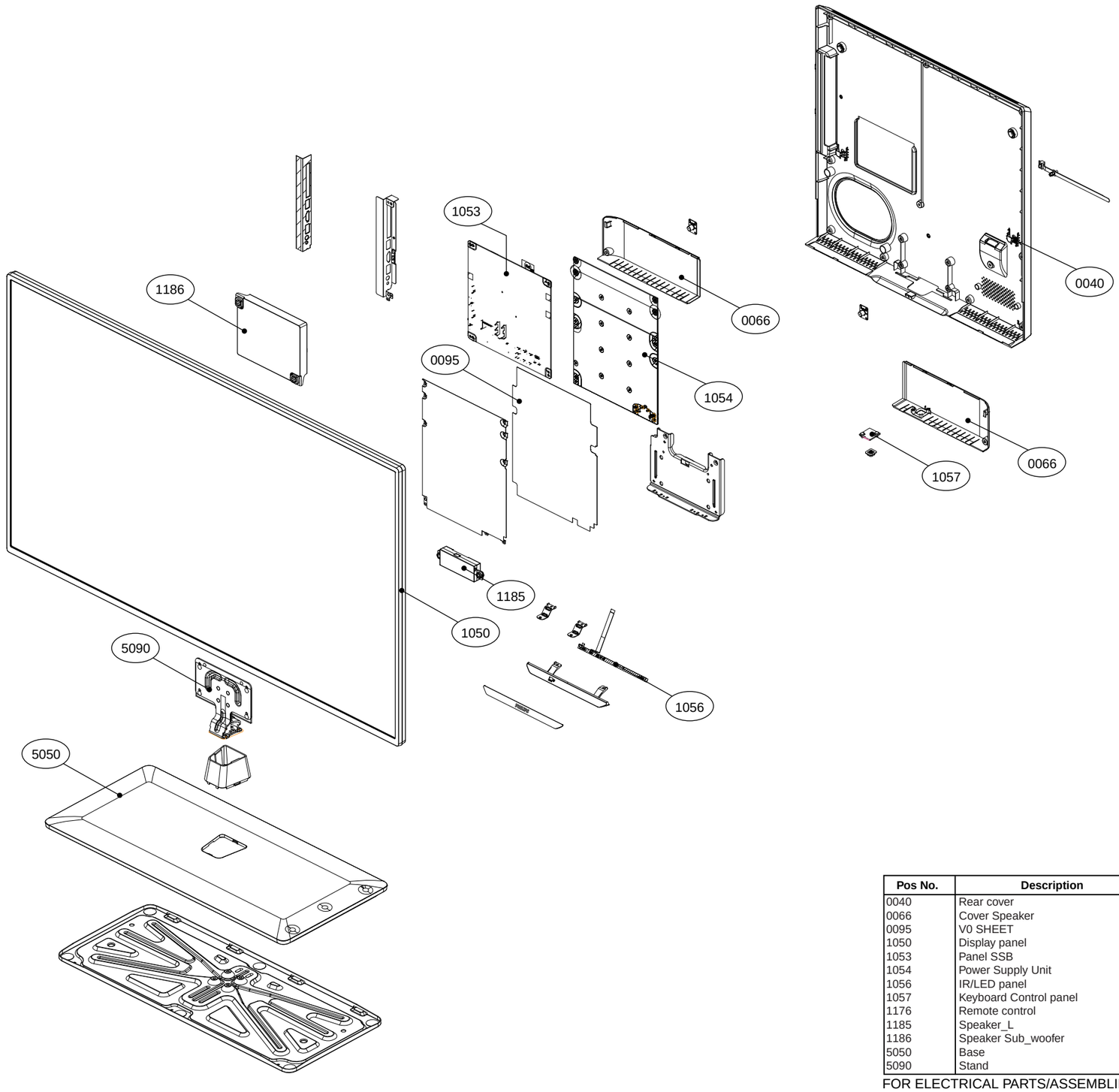
Pos No.	Description	Remarks
0030	Bezel	
0040	Rear cover	
0050	Stand Assy	
0095	V0 SHEET	
1050	Display panel	
1053	Panel SSB	
1054	Power Supply Unit	
1056	IR/LED panel	
1057	Keyboard control panel	
1062	LED Module_Master	
1063	LED Module_Slave	
1176	Remote control	Not displayed
1185	Speaker_L	
1186	Speaker_Sub woofer	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

19594_802.eps

11.18 5100 series 48"

5100 series 48"



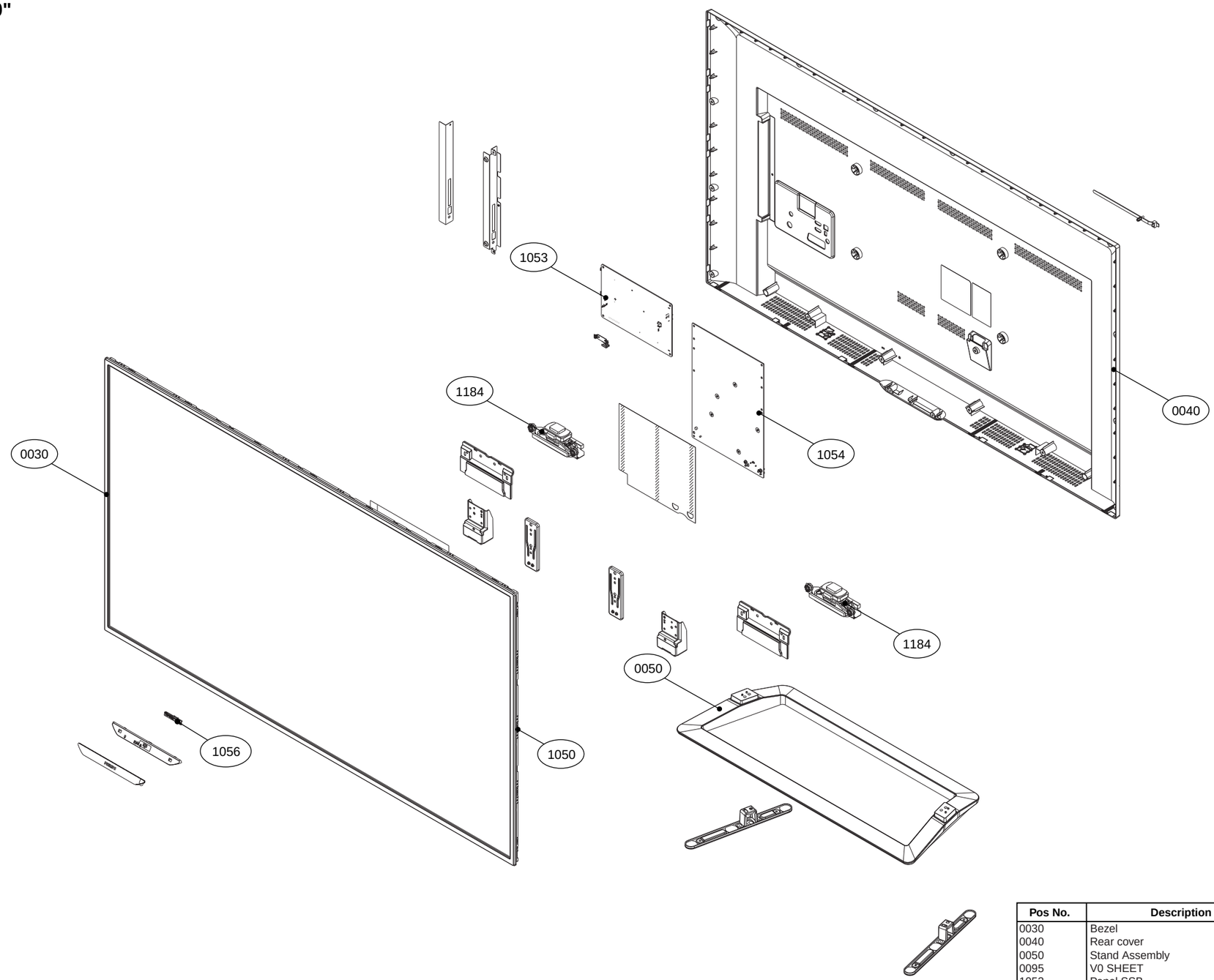
Pos No.	Description	Remarks
0040	Rear cover	
0066	Cover Speaker	
0095	V0 SHEET	
1050	Display panel	
1053	Panel SSB	
1054	Power Supply Unit	
1056	IR/LED panel	
1057	Keyboard Control panel	
1176	Remote control	Not displayed
1185	Speaker_L	
1186	Speaker Sub_woofer	
5050	Base	
5090	Stand	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

19593_805.eps

11.19 4009 series 50"

4009 series 50"



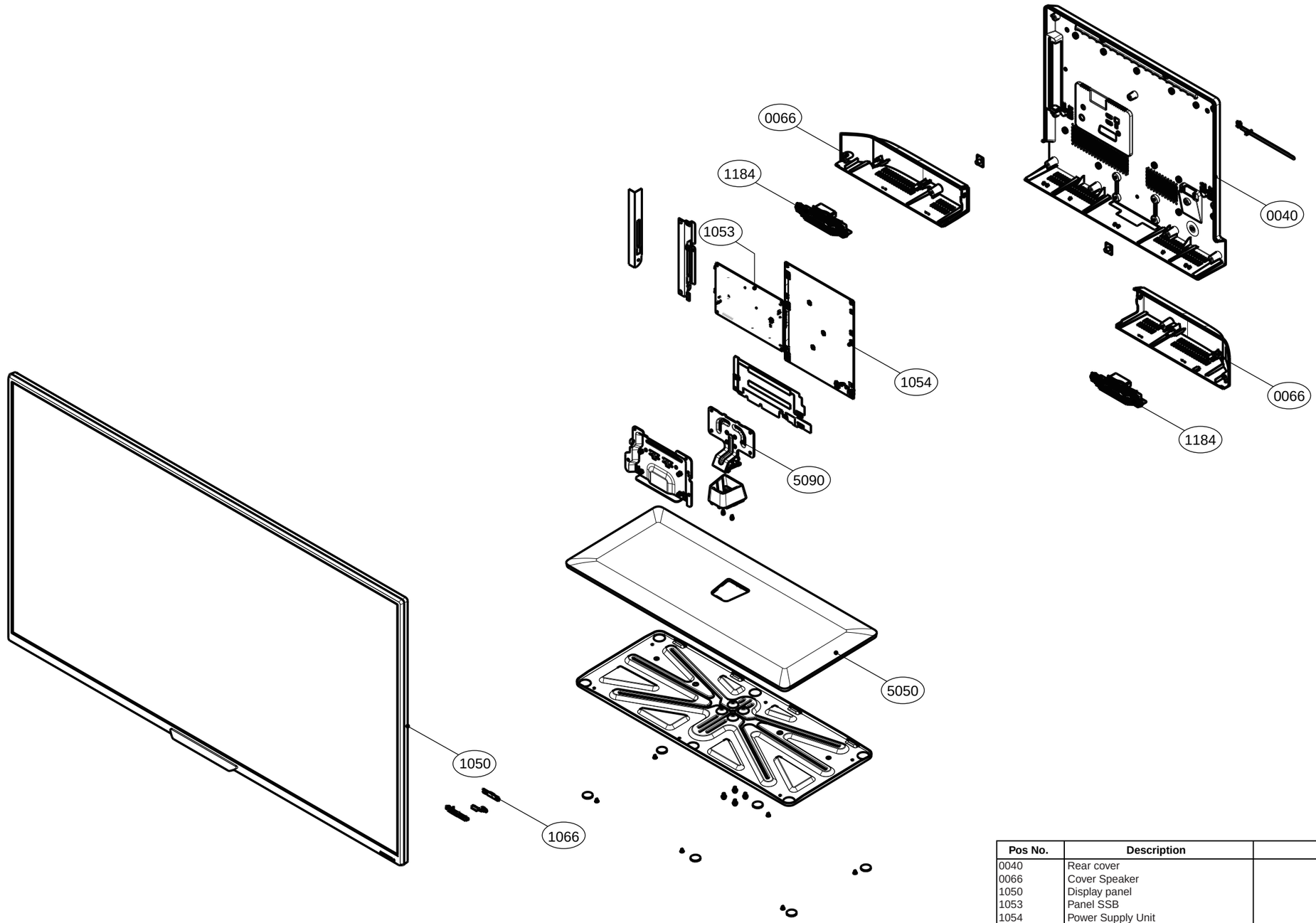
Pos No.	Description	Remarks
0030	Bezel	
0040	Rear cover	
0050	Stand Assembly	
0095	V0 SHEET	
1053	Panel SSB	
1054	Power Supply Unit	
1056	IR/LED panel	
1176	Remote control	Not displayed
1184	Speakers	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

19597_802.eps

11.20 4100 series 50"

4100 series 50"



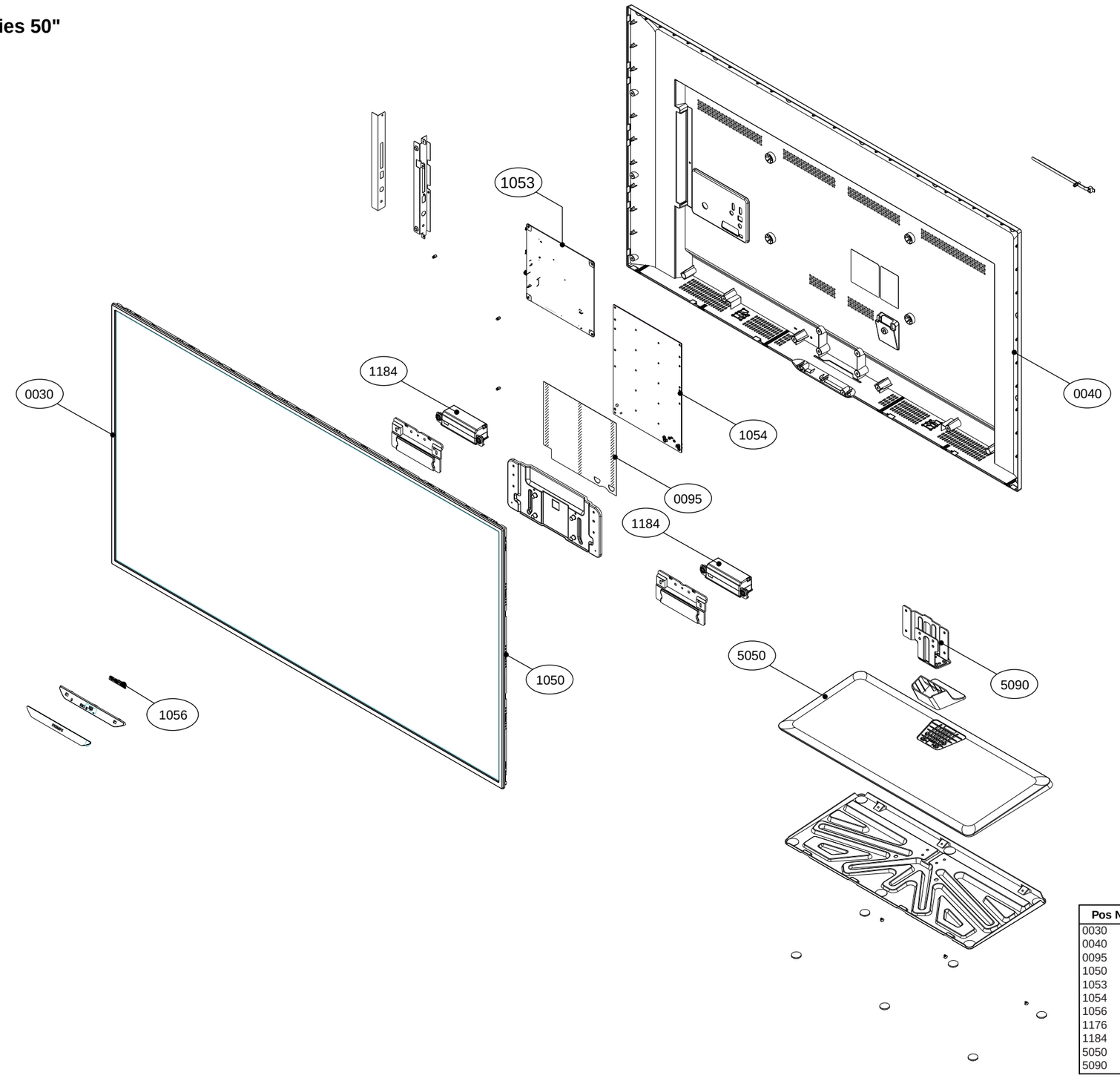
Pos No.	Description	Remarks
0040	Rear cover	
0066	Cover Speaker	
1050	Display panel	
1053	Panel SSB	
1054	Power Supply Unit	
1066	Control board IR/LED panel	
1176	Remote control	Not displayed
1184	Speakers	
5050	Base	
5090	Stand	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

19592_801.eps

11.21 4300 series 50"

4300 series 50"



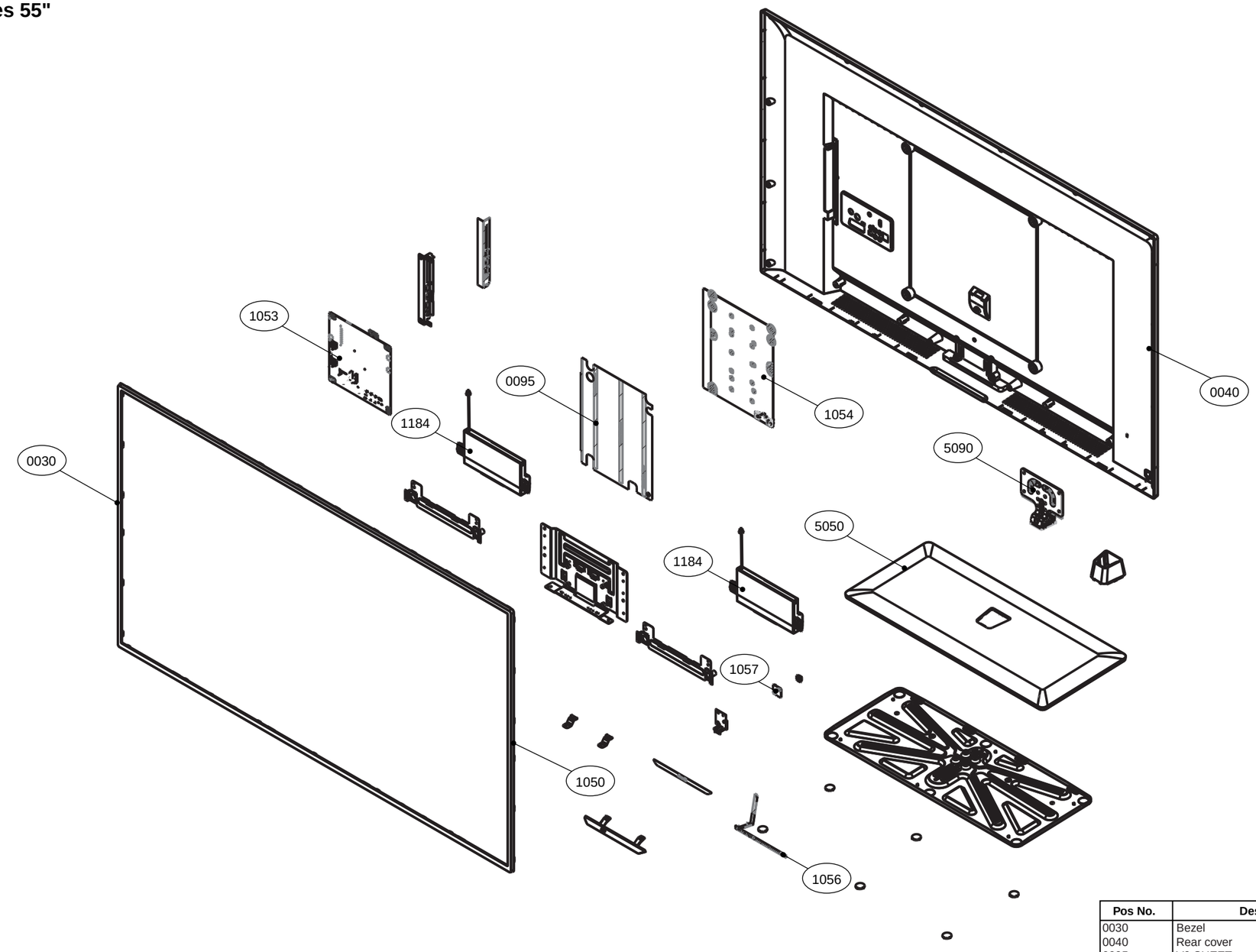
Pos No.	Description	Remarks
0030	Bezel	
0040	Rear cover	
0095	V0 SHEET	
1050	Display panel	
1053	Panel SSB	
1054	Power Supply Unit	
1056	IR/LED panel	
1176	Remote control	Not displayed
1184	Speakers	
5050	Base	
5090	Stand	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

19595_801.eps

11.22 5100 series 55"

5100 series 55"



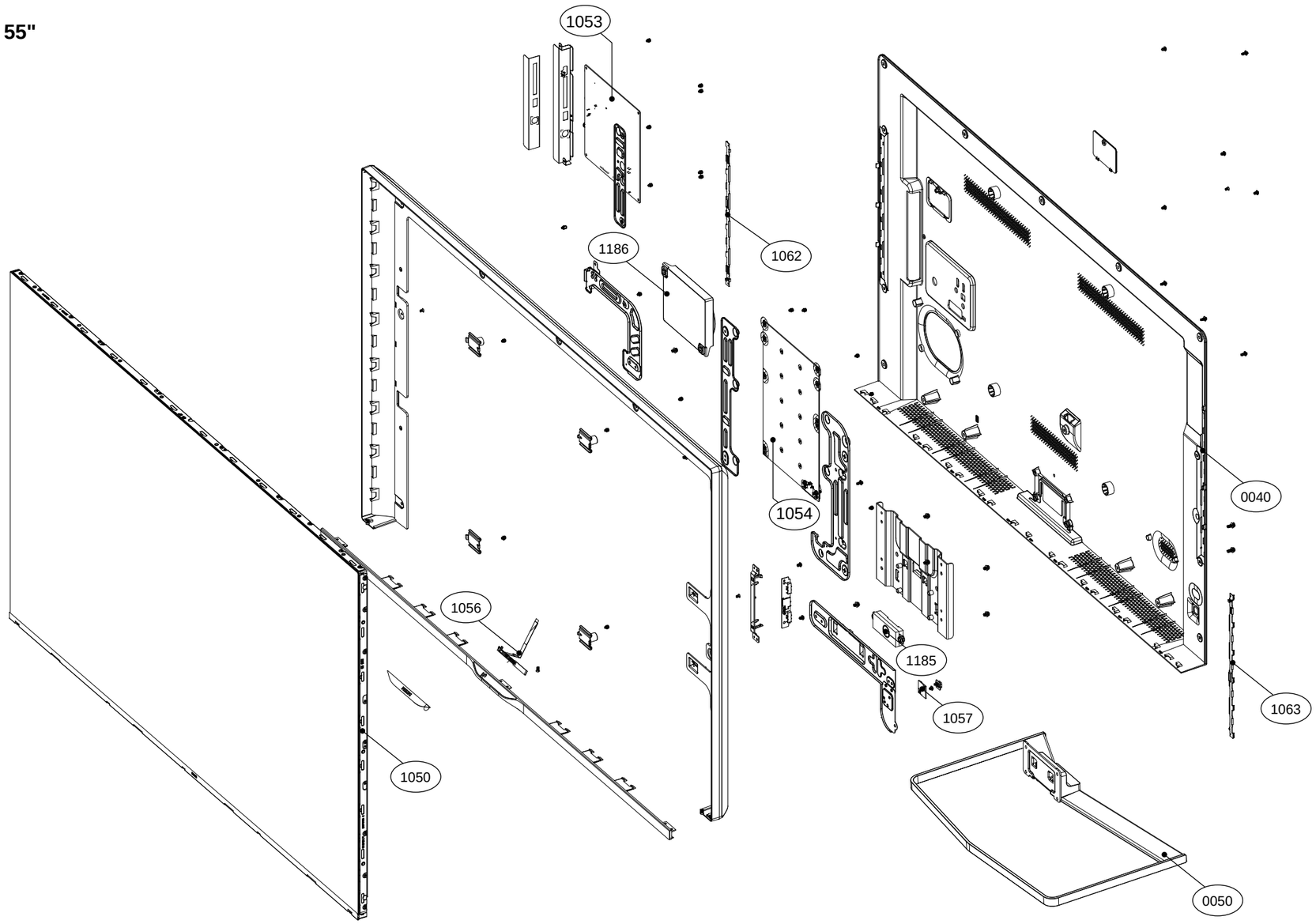
Pos No.	Description	Remarks
0030	Bezel	
0040	Rear cover	
0095	V0 SHEET	
1050	Display panel	
1053	Panel SSB	
1054	Power Supply Unit	
1056	IR/LED panel	
1057	Keyboard Control panel	
1176	Remote control	Not displayed
1184	Speakers	
5050	Base	
5090	Stand	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

19593_806.eps

11.23 5200 series 55"

5200 series 55"



Pos No.	Description	Remarks
0040	Rear cover	
0050	Stand Assy	
1050	Display panel	
1053	Panel SSB	
1054	Power Supply Unit	
1056	IR/LED panel	
1057	Keyboard control panel	
1062	LED Module_Master	
1063	LED Module_Slave	
1176	Remote control	Not displayed
1185	Speaker_L	
1186	Speaker_Sub woofer	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

19594_803.eps