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Service Manual

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PHILIPS

1. Technical Specifications, Connections, and Chassis Overview

Index of this chapter:

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

1.1 Technical Specifications

1.1.1 Vision

Display type	:	Rear projection, LCD
Screen size	:	55” (140 cm), 16:9
Resolution (HxV)	:	1280 x 720p, WXGA
Viewing angle (HxV)	:	160 x 120 deg.
Tuning system	:	PLL
Colour systems	:	PAL B/G, D/K, I
	:	SECAM B/G, D/K, L/L’
Add. systems Ext in	:	NTSC 3.58, 4.43
	:	576i (YPrPb)
	:	576p (YPrPb)
	:	720p
	:	1080i
	:	SECAM
	:	VGA (640 x 400)
	:	VGA (640 x 480)
	:	WVGA (848 x 480)
	:	WVGA (852 x 480)
	:	SVGA (800 x 600)
	:	XGA (1024 x 768)
	:	SXGA (1280 x 1024)
Channel selections	:	100 presets
	:	UVSH
Aerial input	:	75 ohm, IEC-type

1.1.2 Sound

Sound systems	:	AV stereo,
	:	FM/FM B/G (5.5-5.74)
	:	FM/FM Cz (6.5-6.25)
	:	NICAM B/G (5.5-5.85)
	:	NICAM D/K (5.5-5.85)
	:	NICAM I (6.0-6.52)
	:	NICAM L (6.5AM-5.85)
Maximum power	:	2 x 25 WRMS (int.)

1.1.3 Miscellaneous

Power supply:		
- Mains voltage	:	220 - 240 VAC
- Mains frequency	:	50 / 60 Hz.
Ambient conditions:		
- Temperature range	:	+5 to +40 deg. C
- Maximum humidity	:	90 % R.H.
Power consumption		
- Normal operation	:	ca. 270 W
- Standby	:	< 1 W
Dimensions (WxHxD)	:	1437 x 968 x 443 cm
Weight	:	40 kg

1.2.2 Rear Connections

1.2 Connections

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, and Ye= Yellow.

1.2.1 Side Connections / Top Control

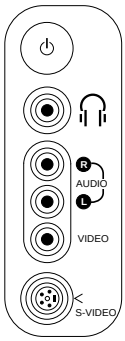

Figure 1-1 Side I/O connections

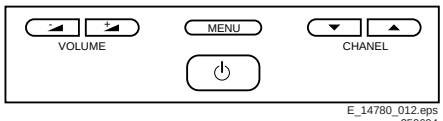

Figure 1-2 Top Control

Mini Jack: Audio Headphone - Out

Bk	- Headphone	32 - 600 ohm / 10 mW

Cinch: Audio - In, CVBS - In

Re	- Audio - R	0.5 VRMS / 10 kohm
Wh	- Audio - L	0.5 VRMS / 10 kohm
Ye	- CVBS	1 VPP / 75 ohm

Hosiden: SVHS - In

1	- Y	Ground
2	- C	Ground
3	- Y	1 VPP / 75 ohm
4	- C	0.3 VPP / 75 ohm

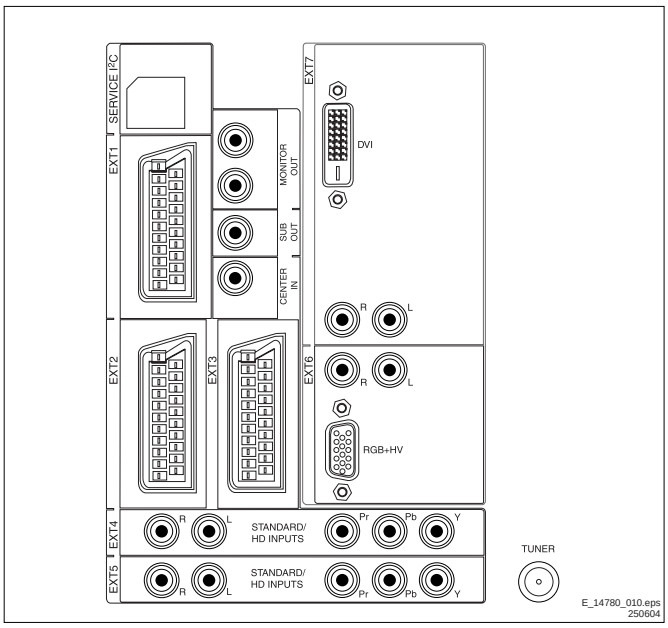

Figure 1-3 Rear connections

Service Connector (ComPair)

1	- SDA-S	I2C data (5 V)	⇔
2	- SCL-S	I2C clock (5 V)	⇒
3	- GND	Ground	⏚

External 1: Audio In/Out, RGB/YUV - In , CVBS - In/Out

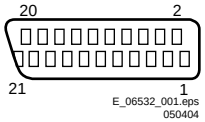

Figure 1-4 SCART connector

1	- Audio - R	0.5 VRMS / 1 kohm	⇒
2	- Audio - R	0.5 VRMS / 10 kohm	⇒
3	- Audio - L	0.5 VRMS / 1 kohm	⇒
4	- Audio - gnd	Ground	⏚
5	- Blue - gnd	Ground	⏚
6	- Audio - L	0.5 VRMS / 10 kohm	⇒
7	- Blue/U - in	0.7 VPP / 75 ohm	⇒
8	- CVBS-status	0 - 2 V: INT	
		4.5 - 7 V: EXT 16:9	
		9.5 - 12 V: EXT 4:3	⇒
9	- Green - gnd	Ground	⏚
10	- n.c.		
11	- Green/Y - in	0.7 VPP / 75 ohm	⇒
12	- n.c.		
13	- Red - gnd	Ground	⏚
14	- FBL - gnd	Ground	⏚
15	- Red/V - in	0.7 VPP / 75 ohm	⇒
16	- Status/FBL	0 - 0.4 V: INT	
		1 - 3 V: EXT / 75 ohm	⇒
17	- Video	Ground	⏚
18	- Video	Ground	⏚
19	- CVBS - out	1 VPP / 75 ohm	⇒
20	- CVBS - in	1 VPP / 75 ohm	⇒
21	- Shielding	Ground	⏚

External 2: Audio - In/Out, RGB/YUV - In, CVBS - In/Out

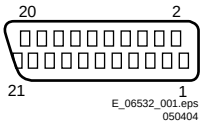

Figure 1-5 SCART connector

1	- Audio - R	0.5 VRMS / 1 kohm	⇒
2	- Audio - R	0.5 VRMS / 10 kohm	⇒
3	- Audio - L	0.5 VRMS / 1 kohm	⇒
4	- Audio - gnd	Ground	⏚
5	- Blue - gnd	Ground	⏚
6	- Audio - L	0.5 VRMS / 10 kohm	⇒
7	- Blue/U - in	0.7 VPP / 75 ohm	⇒
8	- CVBS-status	0 - 2 V: INT	
		4.5 - 7 V: EXT 16:9	
		9.5 - 12 V: EXT 4:3	⇒
9	- Green - gnd	Ground	⏚
10	- Easylink	P50	⇒
11	- Green/Y - in	0.7 VPP / 75 ohm	⇒
12	- n.c.		
13	- Red - gnd	Ground	⏚
14	- FBL - gnd	Ground	⏚
15	- Red/V - in	0.7 VPP / 75 ohm	⇒
16	- Status/FBL	0 - 0.4 V: INT	
		1 - 3 V: EXT / 75 ohm	⇒
17	- Video	Ground	⏚
18	- Video	Ground	⏚
19	- CVBS - out	1 VPP / 75 ohm	⇒
20	- CVBS - in	1 VPP / 75 ohm	⇒
21	- Shielding	Ground	⏚

External 3: Audio - In, CVBS - In

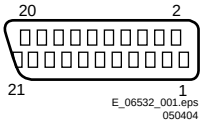

Figure 1-6 SCART connector

1	- n.c.		
2	- Audio - R	0.5 VRMS / 10 kohm	⇒
3	- n.c.		
4	- Audio - gnd	Ground	⏚
5	- Blue - gnd	Ground	⏚
6	- Audio - L	0.5 VRMS / 10 kohm	⇒
7	- n.c.		
8	- CVBS-status	0 - 2 V: INT	
		4.5 - 7 V: EXT 16:9	
		9.5 - 12 V: EXT 4:3	⇒
9	- Green - gnd	Ground	⏚
10	- n.c.		
11	- n.c.		
12	- n.c.		
13	- Red - gnd	Ground	⏚
14	- FBL - gnd	Ground	⏚
15	- n.c.		
16	- n.c.		
17	- Video	Ground	⏚
18	- Video	Ground	⏚
19	- n.c.		
20	- CVBS - in	1 VPP / 75 ohm	⇒
21	- Shielding	Ground	⏚

Cinch: Audio Centre - In

Gn	- Centre	0.5 VRMS / 10 kohm

Cinch: Audio Subwoofer - Out

Bk	- Subwoofer	0.5 VRMS / 1 kohm

Cinch: Audio Monitor - Out

Rd	- Audio - R	0.5 VRMS / 1 kohm
Wh	- Audio - L	0.5 VRMS / 1 kohm

External 4 (Cinch): YPbPr - In (2fH)

Gn	- Y	0.7 VRMS / 10 kohm
Bu	- Pb	0.7 VRMS / 10 kohm
Rd	- Pr	0.7 VRMS / 10 kohm
Rd	- Audio - R	0.5 VRMS / 10 kohm
Wh	- Audio - L	0.5 VRMS / 10 kohm

External 5 (Cinch): YPbPr - In (2fH)

Gn	- Y	0.7 VRMS / 10 kohm
Bu	- Pb	0.7 VRMS / 10 kohm
Rd	- Pr	0.7 VRMS / 10 kohm
Rd	- Audio - R	0.5 VRMS / 10 kohm
Wh	- Audio - L	0.5 VRMS / 10 kohm

External 6: VGA - In

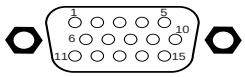

Figure 1-7 VGA Connector

1	- Red	0.7 VPP / 75 ohm
2	- Green	0.7 VPP / 75 ohm
3	- Blue	0.7 VPP / 75 ohm
4	- TXD	
5	-	Ground
6	- Red	Ground
7	- Green	Ground
8	- Blue	Ground
9	- RC	
10	-	Ground
11	- RXD	
12	- DDC_SDA	
13	- H-sync	0 - 5 V
14	- V-sync	0 - 5 V
15	- DDC_SCL	

External 6 (Cinch): VGA Audio - In

Rd	- Audio - R	0.5 VRMS / 10 kohm
Wh	- Audio - L	0.5 VRMS / 10 kohm

External 7: DVI-D: In

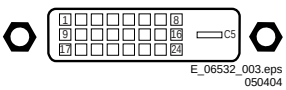

Figure 1-8 DVI-D connector

1	- RX2-	
2	- RX2+	
3	- Ground	GND
4	-	n.c.
5	-	n.c.
6	- SCL_DVI	
7	- SDA_DVI	
8	-	n.c.
9	- RX1-	
10	- RX1+	
11	- Ground	GND
12	-	n.c.
13	-	n.c.
14	- +5V	
15	- Ground	GND
16	- + 5V Hot Plug	
17	- RX0-	
18	- RX0+	
19	- Ground	GND
20	-	n.c.
21	-	n.c.
22	- Ground	GND
23	- RXC+	
24	- RXC-	
C5	- Ground	GND

External 7 (Cinch): DVI Audio - In

Rd	- Audio - R	0.5 VRMS / 10 kohm
Wh	- Audio - L	0.5 VRMS / 10 kohm

Aerial - In

	- IEC-type	Coax, 75 ohm

1.3 Chassis Overview

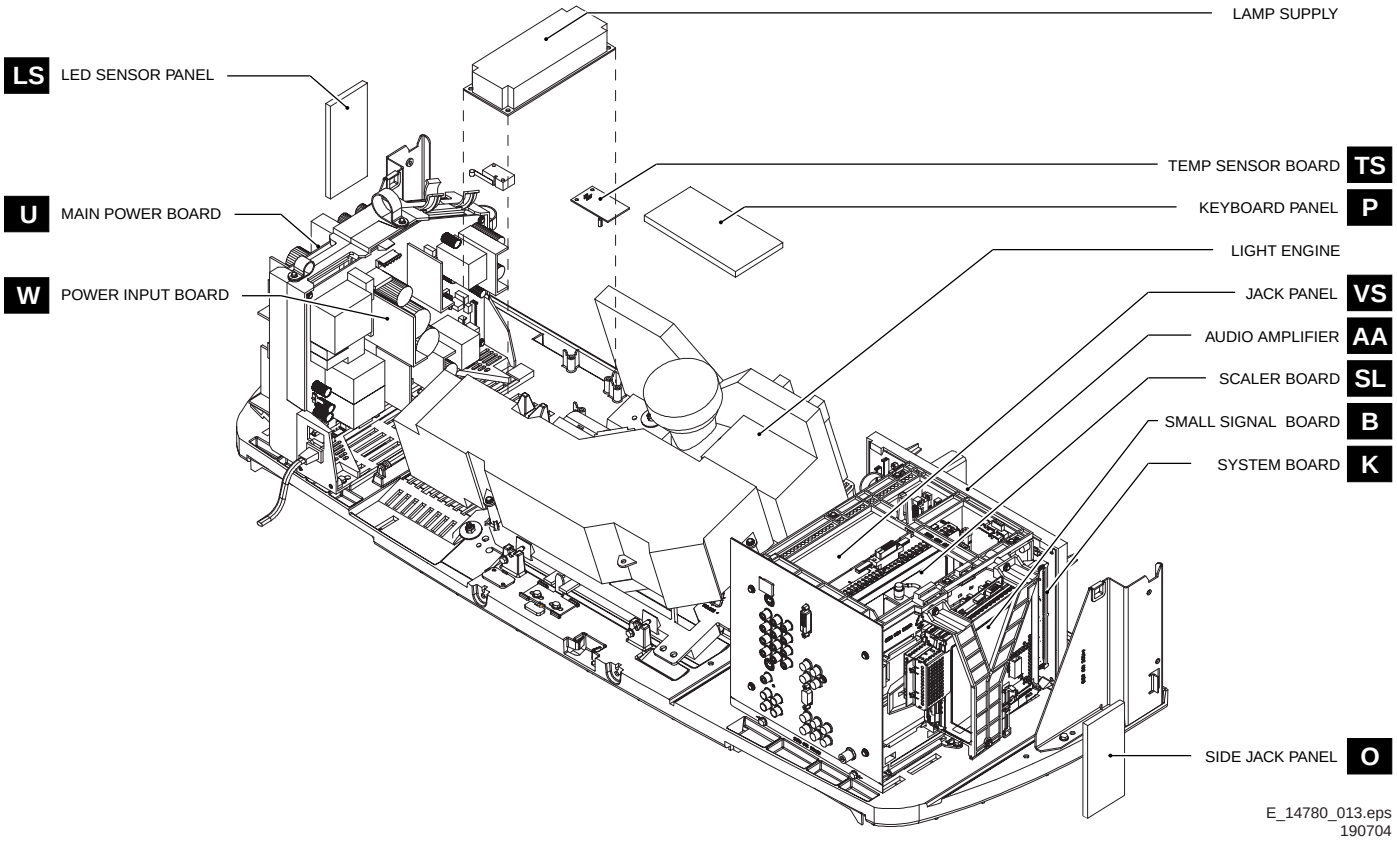

Figure 1-9 PWB location

2. Safety Instructions, Warnings, and Notes

2.1 Safety Instructions

Safety regulations require that **during** a repair:
- Connect the set to the mains 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 lead for external damage.
- Check the strain relief of the mains cord for proper function.
- Check the electrical DC resistance between the mains plug and the secondary side (only for sets which have a mains isolated power supply):
  1. Unplug the mains cord and connect a wire between the two pins of the mains plug.
  2. Set the mains switch to the "on" position (keep the mains cord unplugged!).
  3. Measure the resistance value between the pins of the mains plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 Mohm and 12 Mohm.
  4. Switch "off" the set, and remove the wire between the two pins of the mains plug.
- Check the cabinet for defects, to avoid touching of any inner parts by the customer.

2.2 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.
  Available ESD protection equipment:
  – Complete kit ESD3 (small tablemat, wristband, connection box, extension cable and earth cable) 4822 310 10671.
  – Wristband tester 4822 344 13999.
- 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.

2.3 Notes

2.3.1 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 (see chapter 5) 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 standby (⏻). These values are indicated by means of the appropriate symbols.
- The semiconductors indicated in the circuit diagram and in the parts lists, are interchangeable per position with the semiconductors in the unit, irrespective of the type indication on these semiconductors.
- Manufactured under license from Dolby Laboratories. “Dolby”, “Pro Logic” and the “double-D symbol”, are trademarks of Dolby Laboratories.

Figure 2-1 Dolby PL Symbol

2.3.2 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 kohm).
- Resistor values with no multiplier may be indicated with either an "E" or an "R" (e.g. 220E or 220R indicates 220 ohm).
- All capacitor values are given in micro-farads (μ= x10-6), nano-farads (n= x10-9), or pico-farads (p= x10-12).
- 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 in the Electrical Replacement Parts List. Therefore, always check this list when there is any doubt.

2.3.3 Rework on BGA (Ball Grid Array) ICs

General
Although (LF)BGA assembly yields are very high, there may still be a requirement for component rework. By rework, we mean the process of removing the component from the PWB and replacing it with a new component. If an (LF)BGA is removed from a PWB, the solder balls of the component are deformed drastically so the removed (LF)BGA has to be discarded.

Device Removal
As is the case with any component that, it is essential when removing an (LF)BGA, the board, tracks, solder lands, or surrounding components are not damaged. To remove an (LF)BGA, the board must be uniformly heated to a temperature close to the reflow soldering temperature. A uniform temperature reduces the chance of warping the PWB.
To do this, we recommend that the board is heated until it is certain that all the joints are molten. Then carefully pull the component off the board with a vacuum nozzle. For the appropriate temperature profiles, see the IC data sheet.

Area Preparation
When the component has been removed, the vacant IC area must be cleaned before replacing the (LF)BGA.
Removing an IC often leaves varying amounts of solder on the mounting lands. This excessive solder can be removed with either a solder sucker or solder wick. The remaining flux can be removed with a brush and cleaning agent.
After the board is properly cleaned and inspected, apply flux on the solder lands and on the connection balls of the (LF)BGA.
Note: Do not apply solder paste, as this has shown to result in problems during re-soldering.

Device Replacement

The last step in the repair process is to solder the new component on the board. Ideally, the (LF)BGA should be aligned under a microscope or magnifying glass. If this is not possible, try to align the (LF)BGA with any board markers. To reflow the solder, apply a temperature profile according to the *IC data sheet*. So as not to damage neighbouring components, it may be necessary to reduce some temperatures and times.

More Information

For more information on how to handle BGA devices, visit this URL: *http://www.atyourservice.ce.philips.com* (needs subscription). After login, select “Magazine”, then go to “Workshop Information”. Here you will find Information on how to deal with BGA-ICs.

2.3.4 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 - 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. Directions for Use

You can download this information from the following website:
http://www.philips.com/support

4. Mechanical Instructions

Index of this chapter:

Notes:

- Figures below can deviate slightly from the actual situation, due to the different set executions.
- Follow the disassemble instructions in described order.
- Use Torx T10 and T20 screwdrivers to dismantle the set.

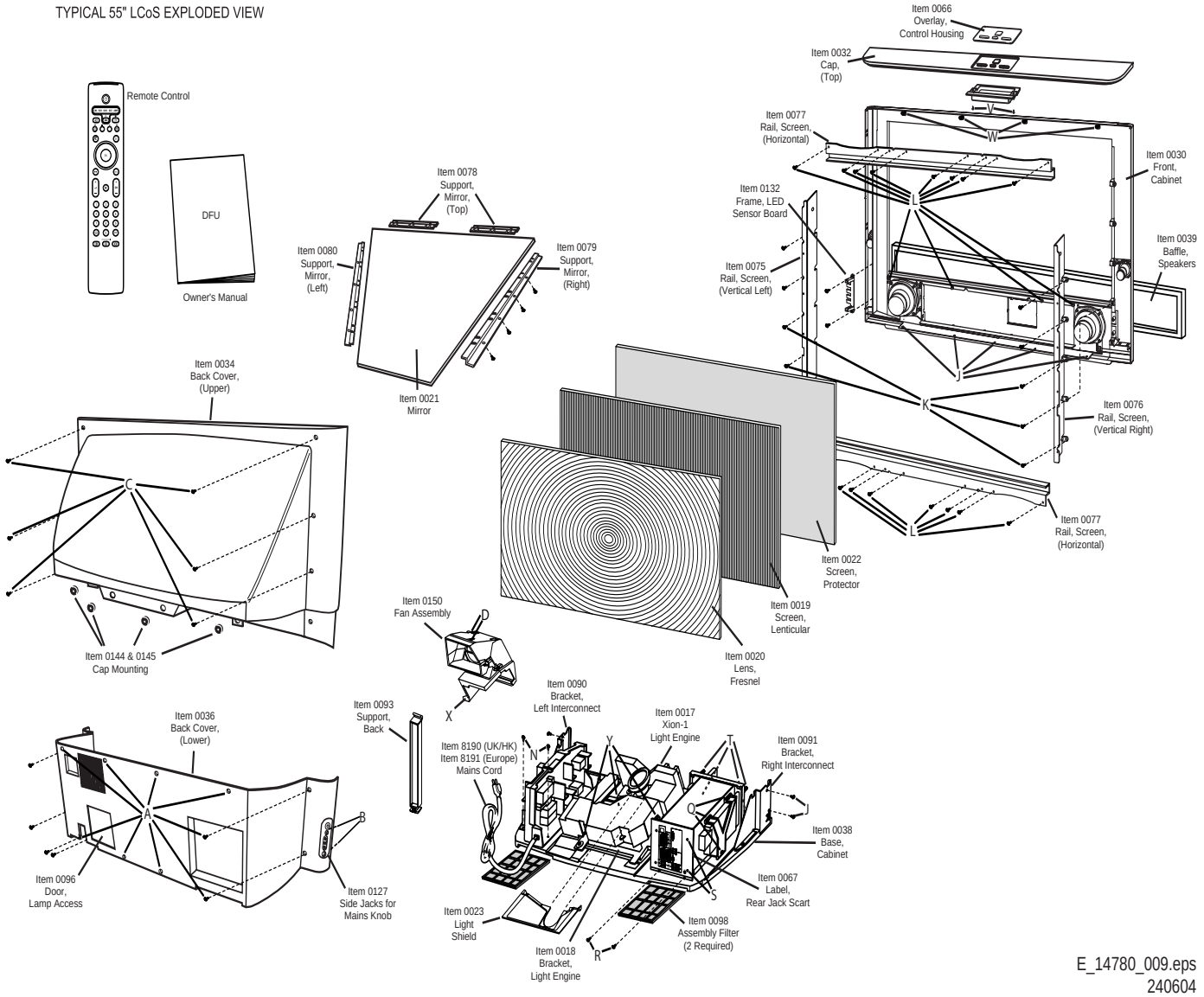

Figure 4-1 Exploded view

4.1 Dust Filter (Item 0098)

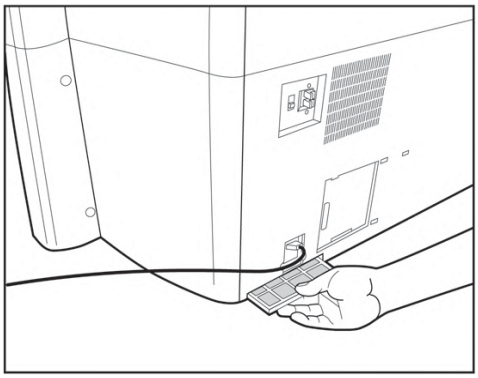

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Figure 4-2 Dust filter removal

One dust filter is located under the Power Cord another one under the Small Signal Package, to prevent dust buildup in the set.
Under certain conditions, if this filter becomes dirty, the set could overheat and shut down.
This item can be replaced by the customer.

4.2 Rear Covers

4.2.1 Lower Rear Cover (item 0036)

1. Make sure all power-, audio-, video-, coax-, and SCART cables are unplugged.
2. Remove all fixation screws (A) from the Rear Cover (lower part only).
3. Pull the Rear Cover a few inches away from the set. **Note**: It is clamped at the upper left and right side. Therefore you must e.g. insert a thin metal plate (do not use a screwdriver!) to release this clamp (see figure “Rear cover clamp”).
4. Now, unplug the Side Jack panel (B).
5. Remove the Rear Cover and set it aside.

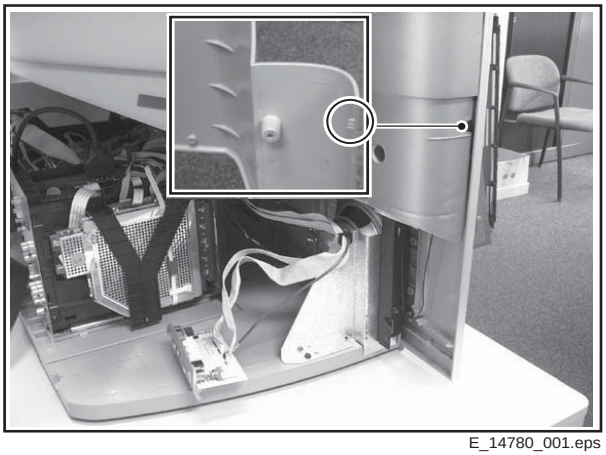

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Figure 4-3 Rear cover clamp

4.2.2 Upper Rear Cover (Item 0034)

Notes:
- The Lower Rear Cover must be removed before removing the Upper Rear Cover.
- The Upper Rear Cover holds the Mirror.
- It may be necessary to press on the sides of the upper back where it “snaps” into place at the front cabinet to get it to release.
- When replacing the Upper Cabinet Rear, care should be used to properly route the cable for theTop Control assembly.
- When re-installing the Upper Cabinet Rear, care should be taken to correctly position the Light Shield that is attached to the Upper Cabinet Rear.

1. Remove (8) T20 Torx screws (C).
2. Remove (2) T20 Torx screws (D) attaching the Fan Motor Assembly to the Upper Rear Cover.
3. Remove (4) T20 Torx screws (E) attaching the small signal cable assembly harness to the Upper Cabinet Rear (not shown).

4.3 Mirror (Item 0021)

1. Remove both Lower and Upper Rear Covers.
2. Remove both the Left and Right Vertical mirror support brackets (items 0079 and 0080).
3. Remove both Horizontal Mirror support brackets and remove the mirror (items 0078).

Note: Care should be taken **NOT** to place fingerprints or smudges on the mirror.

4.4 Top Control (Item 1032)

1. Remove (2) T20 Torx screws (V) holding the Keyboard and cover to the cabinet cap.
2. Remove (2) T6 Torx screws holding the circuit board to the control bracket.
3. Release (4) plastic clips holding the circuit board to the control bracket and lift the PWB from the bracket.
4. Disconnect connector 1201 and ground clip 1202.

4.5 Speakers

4.5.1 Woofer (Item 5213)

1. Remove Lower Rear Cover item 0034.
2. Remove (2) T20 Torx screws (R) to allow the small signal assembly to slide to the rear.
3. Remove (2) T20 Torx screws (N) to allow the power assembly to slide to the rear.
4. Remove (4) T20 Torx screws from the speakers and disconnect the speaker wires.

4.5.2 Tweeter (Item 5214)

1. Remove both the Lower and Upper Rear Covers.
2. Remove (2) T20 Torx screws and disconnect the speaker wires.

4.5.3 Speaker Baffle (Item 0039)

Note: There are no adjustments that require the removal of the speaker baffle.

Caution: Do **NOT** reposition the light engine to gain access to the speaker baffle tabs.

1. Remove the Lower Rear Cover.
2. Carefully release the (20) plastic tabs holding the speaker baffle in place.

4.6 Screen Assembly (Item 0030)

1. Remove the Lower and Upper Rear Covers.
2. Remove (4) T20 Torx screws (W) and remove the Top Cap with Customer Control Assembly (0032).
3. Disconnect the Tweeter speaker wiring.
4. Remove (9) T20 Torx screws (J).
5. Lay lens assembly on flat clean surface.
6. Remove (12) T20 Torx screws (K) from vertical side rails Item 0075 and 0076.
7. Remove (16) T20 Torx screws (L) from horizontal screen rails Item 0077.

4.7 Side Jack Panel (Item 0127)

- Make sure all cables of the Side Jack panel are unplugged.
- Remove the two mounting screws.
- Unlock the clamps, which secure the panel, and remove the Side Jack panel.

4.8 Small Signal Package

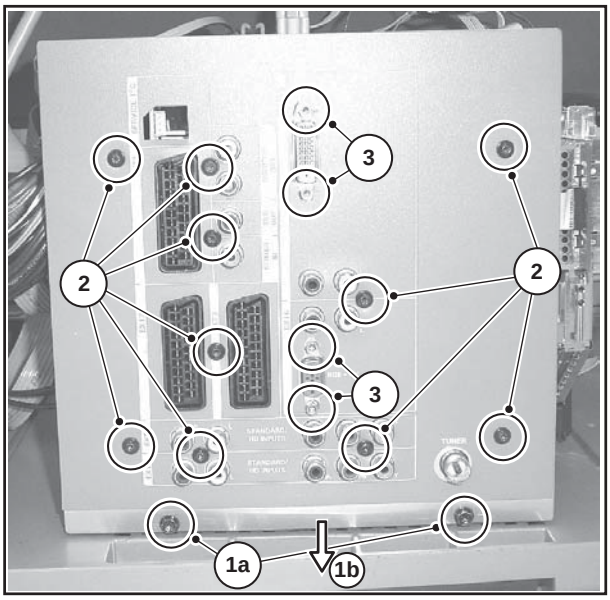

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Figure 4-4 Small Signal Package

1. Remove the two package mounting screws (1a).
1. Slide the Small Signal Package forward (1b).

4.8.1 Cover Plate

1. Remove all Cover Plate mounting screws (2). See Figure “Small Signal Package”.
2. Use a 5 mm socket screwdriver to remove the four connector distance bolts (3). See Figure “Small Signal Package”.
3. Remove the Cover Plate.

4.8.2 Jack Panel

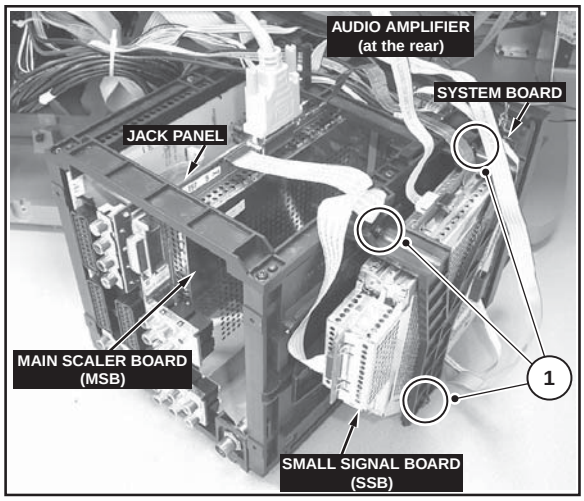

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Figure 4-5 Boards of the Small Signal Package

Pull out the Jack panel from the Small Signal Package, unplugging it from the System Board connector.
See Figure “Boards of the Small Signal Package”.
Note: For measurements it is sometimes necessary to place the Jack Panel in a service position. In this case it is necessary to use the specific “Extending card” (4835 310 57605)

4.8.3 Main Scaler Board (MSB)

1. Disconnect the DVI connector and all cables from the top of the MSB.
2. Pull out the MSB from the Small Signal package, unplugging it from the System Board connector.
3. Remove both cover shields from the MSB.
   See Figure “Boards of the Small Signal Package”.

Note: For measurements it is sometimes necessary to place the MSB in a service position. In this case it is necessary to use the specific “Extending card”, including two cables (4835 310 57605).

4.8.4 Small Signal Board (SSB)

1. Disconnect all cables from the SSB.
2. Remove the three mounting screws (1) from the SSB bracket. See Figure “Boards of the Small Signal package”.
3. Carefully pull out the SSB, unplugging it from the System Board connector.
4. Remove all shieldings from the SSB.

Note: For measurements sometimes it is necessary to place the SSB in a service position. In this case it is necessary to use the specific “Repair kit board” (order nr. 9965 000 14526)

4.8.5 Audio Amplifier Board

The Audio Amplifier is located at the rear of the System Board.
1. Disconnect all cables from the Audio Amplifier board.
2. Remove the four mounting board screws.
3. Remove the board.

4.8.6 System Board

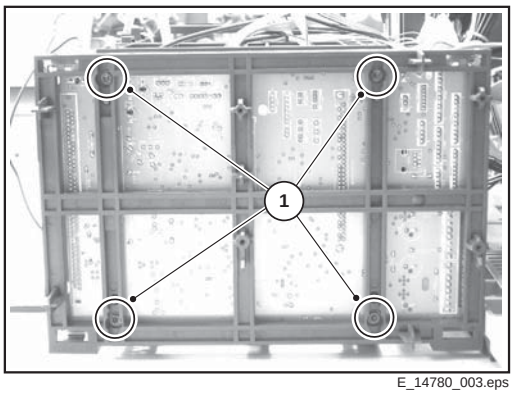

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Figure 4-6 Rear side of the Small Signal Package

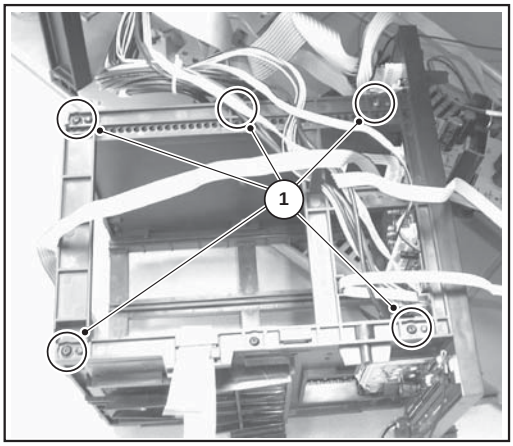

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Figure 4-7 Top side of the Small Signal Package

Note: The Audio, Jack, Scaler, and SSB panels should be removed prior to removal of the system board.

1. Disconnect all cables from the System Board.
2. Disconnect the Arial-In cable.
3. Remove the four mounting screws at the rear side of the Small Signal package (1). See Figure “Rear side of the Small SignalPpackage”.
4. Remove the six mounting screws at the top side of the Small Signal package (1). See Figure “Top side of the Small Signal Package”.
5. Remove the six mounting screws from the bottom side of the Small Signal Package (1). See Figure “Top side of the Small Signal Package”.
6. Remove the two side panels from the Small Signal Package.
7. Unlock the clamp, which secures the board at the bottom side, and remove the System Board.

4.9 Large Signal Package

1. Remove the two Large Signal Package mounting screws (1). See figure “Cable dressing part 1: PSU” further on.
2. Slide the package out of the set (2). Note: It may be necessary to release some of the cable holders first.

4.9.1 Main Power Board

1. Remove the six board mounting screws (1).
2. Disconnect all cables from the Main Power board.
3. Unlock the clamp, which secures the board at the topside, and remove the Main Power board.

4.9.2 Input Power Board

1. Remove the six board mounting screws.
2. Disconnect all cables from the Input Power Board.
3. Unlock the clamps, which secure the board at the topside, and remove the Input Power Board.

4.10 LED/Sensor Panel (Item 0132)

1. Remove the two Sensor panel mounting screws.
2. Remove the Sensor panel bracket.
3. Disconnect all cables from the Sensor panel. Unlock the two clamps, which secure the panel, and remove the Sensor panel.

4.11 Lamp Replacement

Caution: The light source lamp produces extreme heat. Allow a cool-down period before touching or replacing the lamp assembly.

Notes:
- The lamp is easy accesible via the sliding door in the lower rear cover.
- For protection, the lamp circuit contains a “normally closed” switch. Therefore, the lamp will not operate with the lamp access door in the open position.
- There are no tools required for this procedure.

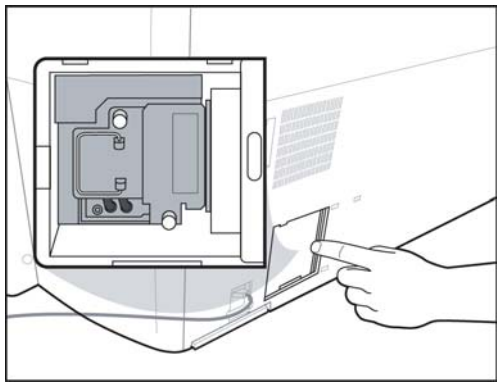

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Figure 4-8 Lamp replacement

To replace the lamp assembly:
1. Slide the Lamp Access Door on the rear of the unit to the right.
2. Unscrew the two silver thumbscrews holding the assembly in place.
3. Slide the old lamp assembly out by crisping the “metal handle” and pulling straight out.
4. Install the replacement lamp assembly by pushing into place and tightening the thumbscrews.
5. Slide the Lamp Access Door to the left to close (the unit will not operate with this door open).

4.12 Light Engine Replacement

Notes:
- The LCoS Light Engine comes pre-adjusted. No adjustment for focus should be required. In rare cases, the set may require a minor focus touch up (see chapter “Alignments”).
- Due to screw placement, to replace the Light Engine, it is necessary to remove the upper rear cover before beginning the replacement. Use care with the routing of the wiring for the Customer Keypad when replacing the upper-back. Also, note mounting direction of the Upper-back support bracket for proper re-installation.

Caution:
- Do **not** remove the three “silver” nuts and washers, as these hold the Light Engine support bracket and are **critical** adjustment points for focus and picture alignment.
- The Light Engine has an operating voltage of approximately **1,000 volts**. Always use caution when working in the vicinity of the Light Engine while the unit is in operation.

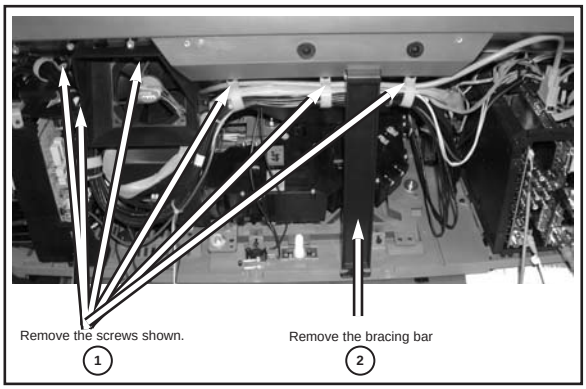

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Figure 4-9 Light engine removal (part 1)

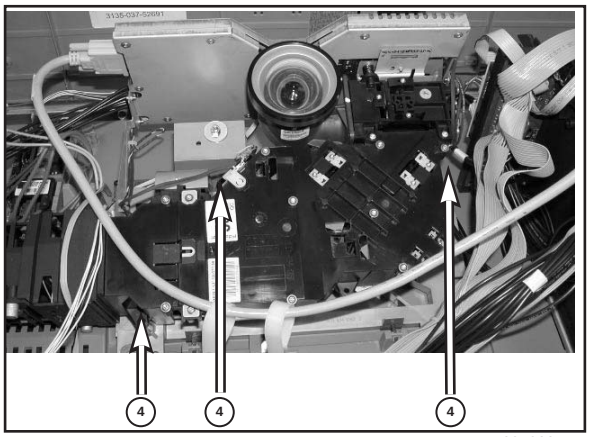

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Figure 4-10 Light engine removal (part 2)

1. First, disassemble the fan assy and the cable tree (1).
2. Then, remove the bracing bar (2).
3. Next, take out the screws (“C”, see exploded view) and remove the top cover
4. Remove the three “black” T-10 Torx screws (3) located in the vicinity of each of the three “silver” nuts and washers.
5. Re-install the Light Engine in reverse order

4.13 Re-assembly

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

Note: While re-assembling the set, make sure that:
- All cables are placed and connected in their original position (see next figures).
- All cables are routed such that contact with any PWB is prevented.
- All cables are dressed away from the Lamp Power Supply (located behind the lamp assy).
- All "grounding" wires are re-connected (Side I/O, Audio Amplifier, System Board, and PSU).

4.13.1 Cable Dressing

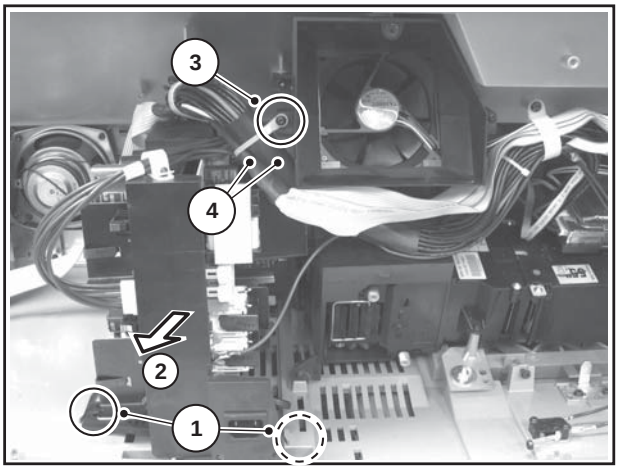

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Figure 4-11 Cable dressing part 1: PSU

- Screw mounted cable tie to the fan assy (3).
- Be sure that the wires between the fan assy and the PSU (4) are fitted with double insulation (heat shrink sleeve).

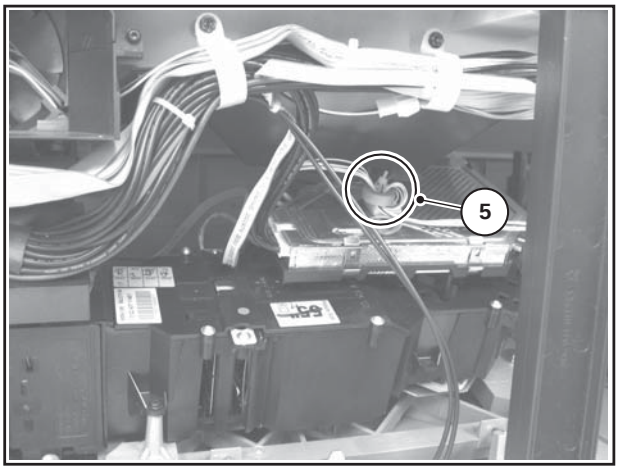

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Figure 4-12 Cable dressing part 2: Light Engine

- Attach the ferrite to the shield (5) with a cable tie.

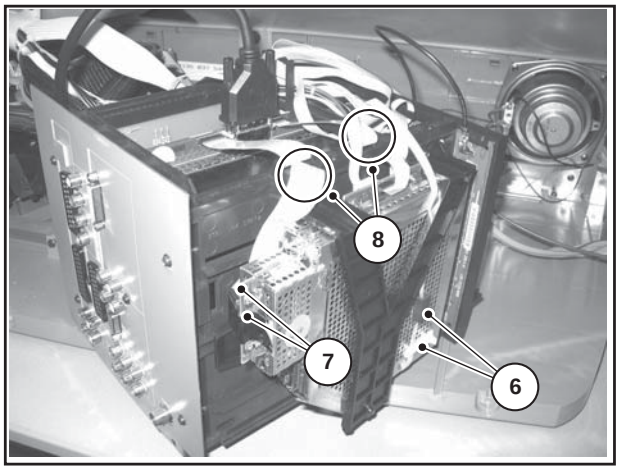

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Figure 4-13 Cable dressing part 3: SSP

- Route the flat foil cable through the clip and through the ferrite (6).
- Be sure that a ferrite (2422 549 00125) is mounted on the flat foil cable near the PWB connector (7). The flat foil cable must be secured with tape at this side (the tape must overlap both sides of the SSB shielding).
- Both flat foil cables from the SSB to the Scaler board must be routed through the strain reliefs (8) on the bracket.

5. Service Modes, Error Codes, and Fault Finding

Index of this chapter

5.1 Test Conditions

The chassis is equipped with test points, printed on the circuit board assemblies. They refer to the diagram letters. The numbering is in a logical sequence for diagnostics. Always start diagnosing (within a functional block), in the sequence of the relevant test points for that block.

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

5.2 Service Modes

Service Default Mode (SDM) and Service Alignment Mode (SAM) offer several features for the service technician, while the Customer Service Mode (CSM) is used for communication between a Philips Customer Care Centre (P3C) and a customer.

There is also the option of using ComPair, a hardware interface between a computer (see requirements below) and the TV chassis. It offers the ability of structured troubleshooting, test pattern generation, error code reading, software version readout, and software upgrading.

Minimum requirements: a Pentium processor, Windows 95/ 98, and a CD-ROM drive.

5.2.1 Service Default Mode (SDM)

Introduction
The Service default mode (SDM) is a technical aid for the service technician. The Service default mode (SDM) establishes fixed, repeatable settings of customer controls, which allow consistent measurements to be made. The SDM also initiates the blinking LED procedure and, if necessary, overrides the 5V protection.

The following functions are turned OFF while in SDM:
- Timer
- Sleep timer

The following functions are disabled during SDM (and enabled after leaving SDM):
- Parental lock
- Blue mute
- Hospitality mode
- No-ident timer (normally the set is automatically switched off when no video signal (IDENT) is received for 15 minutes).

All other controls operate normally.

How to enter
To enter the Service alignment mode (SAM), press the following key sequence on the standard remote control transmitter: 0-6-2-5-9-6-[MENU]. Do not allow the display to “time out” while entering the key sequence.
- **DEFECTIVE MODULE:** Displays “Unknown” if no defective module is found.

Upon entry into the Service default mode, the letters “SDM” will be displayed at the upper right corner of the screen.

Special SDM functions

Access to Normal user menu
Press the “MENU” button on the remote control to switch from the SDM to the normal user menu (with the SDM mode still active in the background).

How to exit
To exit the Service default mode, enter zero “0” twice.

Note: To save the error codes, “unplug” the AC power cord without turning the set "off".

5.2.2 Service Alignment Mode (SAM)

Purpose
The Service alignment mode (SAM) is used to align the set and/or adjust the option settings and to display/clear the error code buffer values.

How to activate SAM
Use one of the following methods:
- Via a standard RC transmitter: key in the code “062596” directly followed by the “OSD [i+]” button. After activating SAM with this method a service warning will appear on the screen, you can continue by pressing any digit key on the RC.
- Short for a moment the two solder pads on the SSP with the indication "SAM". Depending on the software version, it is possible that a service warning will appear. You can continue by pressing any digit key on the RC.
- Use the DST-emulation feature of ComPair.
- Press the ALIGN button on the DST while the set is in the normal operation

After activating this mode, “SAM” will appear in the upper right corner of the screen.

Contents of SAM
- **OPERATION HOURS (Run Timer).** Displays the accumulated total of operational hours (in hexadecimal format).
- **SW VERSION INFO (example):**
  - **ROM VERSION.** Displays the date of the software and the software version of the ROM (**e.g.:** EM8EU1_1.0_01234 = AAABBC_X.Y_NNNNN).
    - **AAA**= the chassis name.
    - **BB**= the region: EU= Europe, AP= Asia Pacific PAL/Multi, AN= Asia Pacific NTSC, US= USA, LT= LATAM.
    - **C=** the language cluster number.
    - **X.Y**= the software version, where X is the main version number (different numbers are not compatible with one another) and Y is the sub version number (a higher number is always compatible with a lower number).
    - **NNNNN**= last five digits of 12nc code software.
  - **SW VERSION MAIN SCALER:** Displays the software version of the MSP.
  - **SW VERSION EPLD**. Displays the software version of the EPLD.
  - **SW VERSION GDE:** Displays the software version of the System Board.
- **ERRORS (10 errors possible):** Displays the 10 most recent errors. The most recent error is displayed at the upper left.

- **RESET ERROR BUFFER:** Pressing the “OK” or RIGHT cursor clears the error buffer and the “Errors” level shows “No Errors.”
- **ALIGNMENTS:** Allows access to 6 alignment menus. General, Luminance Delay, MSB, GDE-Video, GDE-NVM, and Gamma.
- **DEALER OPTIONS:** Allows access to dealer “Personal Options” menu.
- **SERVICE OPTIONS:** Allows access to 6 service option menus. Dual Screen, Video repro, Source Select, Audio repro, Miscellaneous, Opt. No.
- **INITIALISE NVM:** Not Accessible (only after replacing the NVM).
- **STORE OPTIONS:** Select “OK” to save previously changed selections.
- **FUNCTIONAL TEST:** Finds module Errors and places the Error code in the “Errors” register and shows the module name at the “Defective Module” level. If this test finds no faults, the ERROR buffer is set to “No Errors” and the “Defective Module” level shows “NONE.”
- BROADCAST INFO. The purpose of this menu is to debug the broadcast, **NOT** the TV. The menu gives an overview of what is received on the current preset related to Time extraction, CNI codes, and NexTView transmission. Following items are displayed:
  - **Preset.** Shows the preset number.
  - **Local.** Local date and time from the selected preset.
  - **UTC** (Coordinated Universal Time). Extracted from the selected preset.
  - **LTO** (Local Time Offset). Extracted from the selected preset.
  - **CNI** (Country and Network Identification). Extracted from the current preset (displayed as a four digit hexadecimal number. The CNI number identifies the broadcaster.
  - **NexTView service** (optional). This item gives information about the type of NexTView service that is available for the current preset. The possible strings are:
    1. NexTView provider.
    2. NexTView data available from preset xx (where xx is the preset number).
    3. No NexTView data available.
  - **CNI Linking** (optional). 'Link' refers to the connection between the broadcasted NexTView programme information and the preset number. The possible strings are:
    1. Data available for preset xx xx xx (where xx xx xx is a list off all presets for which a CNI link is available).
    2. 'Automatic link' or ' Manual link', depending on what is read from the broadcast and from the CNI table in the NVM. 'Automatic' means that the link has been made based on broadcasted information, without user-interaction. 'Manual' means that the user has established this link by selecting a preset in the pop-up menu that you get after setting a reminder/recording/lock/watch in EPG. Erase a wrong 'Manual link' by entering the Manual Installation menu and (without changing anything) activate 'Store'.
    3. Nothing is shown.

How to navigate

- Use the Cursor UP/DOWN keys to select Menu items. The selected option will be highlighted. When not all menu options fit on the screen, press the Cursor UP/DOWN or LEFT/RIGHT keys on the remote transmitter, to display the next/previous menu.
- With the cursor LEFT/RIGHT keys, it is possible to:
  - activate/deactivate the selected menu (e.g. ALIGNMENTS/GENERAL)
  - change the value of the selected menu item (e.g. TUNER AGC)
  - activate the selected submenu (e.g. TEST PATTERN)

How to exit

Press the “MENU” button, enter zero “0” twice, or switch the set off with the power button.

Note: To save the error codes, “unplug” the AC power cord without turning the set off.

5.2.3 Customer Service Mode (CSM)

Purpose

When a customer is having problems with his TV-set, he can call his dealer. The service technician can than ask the customer to activate the CSM, in order to identify the status of the set. Now, the service technician can judge the severity of the complaint. In many cases, he can advise the customer how to solve the problem, or he can decide if it is necessary to visit the customer.
The CSM is a read only mode; therefore, modifications in this mode are not possible.

How to activate CSM

Use one of the following methods:

- Press the “MUTE” button on the RC-transmitter **simultaneously** with the “MENU” button on the TV (top control) for at least 4 seconds.
- Key in the code “123654” via the standard RC transmitter.

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

How to navigate

By means of the “CURSOR-DOWN/UP” knob on the RC-transmitter, you can navigate through the menus.

Contents of CSM

CUSTOMER SERVICE MENU 1

- **SW VERSION.** Displays the built-in software version of the SSB micrprocessor. In case of field problems related to software, software can be upgraded. You will find details of the software versions in the chapter “Software Survey” of the “Product Survey - Colour Television” publication. This publication is generated four times a year.
- **SW VERSION MAIN. Displays the built-in software version** for the Main Scaler Board.
- **SW VERSION EPLD. SW VERSION MAIN. Displays the built-in software version** of the EPLD.
- **SW VERSION GDE. SW VERSION MAIN. Displays the built-in software version** of the System Board.
- **LIGHT ENG SW VERSION.SW VERSION MAIN. Displays the built-in software version** of the LE.
- **LIGHT ENG HW VERSION. Displays the hardware version** of the LE.
- **MANUFACTURER’S ID.** Each Manufacturer that uses this Light Engine got an ID number assigned to them. This number shown in CSM is used to verify that a light engine for one mfgr did not get mixed up with another mfgr. Size is up to 5 characters
- **PRODUCT ID.** This is the product ID, basically the identification number for the given manufacturer, which light engine product is hooked up. It will tell if the engine is a Xion engine, or a Venus engine. For 2k4 based LCoS products, this means it will always see a XIon ID. For 2k5 with Jaguar, this may be Xion or Venus. Size is up to 5 characters.
- **ENGINE DRB SERIAL.** The serial number of the DRive module Board, the electronics of the light engine. Size is up to 10 characters.
- **ENGINE OPTICS SERIAL.** This is the serial number of the optics assemly of the light engine. The big black plastic part containing the prisms, mirrors, etc. Size is up to 10 characters

CUSTOMER SERVICE MENU 2

- **LAMP LIFETIME COUNTER.** This is the count of hours since the time the lamp lifetime reset was pressed. This reset is available to the customer. Range is 0 to 32,767.
- **LAMP EXPECTED.** This is the setting the customer chose as the type of lamp he is using, and then the number of hours based on that type of lamp. (e.g. customer selects lamp type X, and this is converted into hours) . Range is 0 to 32,767.
- **ENGINE LIFETIME.** This is the total number of hours the engine itself has been run with the lamp "on". This is important for later service as the Light Engine can be swapped from final TV to TV. Range is 0 to 32,767.
- **POLARIZE LIFETIME.** This is the total number of hours that the polarizer within this light engine has been active. Again, important because engines can be swapped, or polarizers repaired and replaced in an existing engine. Range is 0 to 32,767.
- **PANEL LIFETIME.** This is the total number of hours that the LCoS Panel itself within this light engine has been active. Again, important because engines can be swapped, or panels repaired and replaced in an existing engine. Range is 0 to 32,767.
- **SET TYPE.** This information is very helpful for a help desk/ 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.
- **CODE 1.** Gives the latest five errors of the error buffer. As soon as the built-in diagnose software has detected an error the buffer is adapted. The last occurred error is displayed on the left most position. Each error code is displayed as a 3-digit number. When less than 10 errors occur, the rest of the buffer is empty (000). See also paragraph Error Codes for a description.
- **CODE 2.** Gives the first five errors of the error buffer. See also paragraph Error Codes for a description.
- **VOLUME.** Gives the last status of the volume as set by the customer. The value can vary from 0 (volume is minimum) to 100 (volume is maximum). Volume values can be changed via the volume key on the RC-transmitter.

CUSTOMER SERVICE MENU 3

- **BRIGHTNESS.** Gives the last status of the brightness as set by the customer. The value can vary from 0 (brightness is minimum) to 100 (brightness is maximum). Brightness values can be changed via the "CURSOR LEFT" and "CURSOR RIGHT" keys on the RC-transmitter after pressing the "MENU" button and selecting "PICTURE" and "BRIGHTNESS".
- **CONTRAST.** Gives the last status of the contrast as set by the customer. The value can vary from 0 (contrast is minimum) to 100 (contrast is maximum). Contrast values can be changed via "CURSOR LEFT" and "CURSOR RIGHT" keys on the RC-transmitter after pressing the "MENU" button and selecting "PICTURE" and "CONTRAST".
- **COLOUR.** Gives the last status of the colour saturation, as set by the customer. The value can vary from 0 (colour is minimum) to 100 (colour is maximum). Colour values can be changed via "CURSOR LEFT" and "CURSOR RIGHT" keys on the RC-transmitter after pressing the "MENU" button and selecting "PICTURE" and "COLOUR".
- **HUE.** Only relevant for NTSC-signals (e.g. NTSC DVD discs)
- **SHARPNESS.** Gives the sharpness value. The value can vary from 0 (sharpness is minimum) to 7 (sharpness is maximum). In case of bad antenna signals, a too high value of the sharpness can result in a noisy picture. Sharpness values can be changed via the "CURSOR LEFT" and "CURSOR RIGHT" keys on the RC-transmitter after pressing the "MENU" button and selecting "PICTURE" and "SHARPNESS".
- **HEADPHONE VOLUME.** Gives the last status of the head phone volume, as set by the customer. The value can vary from 0 (volume is minimum) to 100 (volume is maximum). Head phone volume values can be changed via the "CURSOR LEFT" and "CURSOR RIGHT" keys on the RC-transmitter after pressing the "MENU" button and selecting "SOUND" and "HEADPHONE VOLUME".
- **TUNER FREQUENCY.** Indicates the frequency the selected transmitter is tuned to. The tuner frequency can be changed via the "CURSOR LEFT" and "CURSOR RIGHT" keys for fine tune after opening the installation menu and selecting "INSTALL" and "MANUAL INSTALL".
- **DIGITAL OPTION.** Gives the selected digital mode, "PROGRESSIVE SCAN", "MOVIE PLUS" or "PIXEL PLUS". Change via "MENU", "PICTURE", "DIGITAL OPTIONS".
- **TV SYSTEM.** Gives information about the video system of the selected transmitter.
  - BG: PAL BG signal received.
  - DK: PAL DK signal received.
  - I: PAL I signal received.
  - L/La: SECAM L/La signals received.
  - M: NTSC M signal received with video carrier on 38.9 MHz.
- **DNR.** Gives the selected DNR setting (Dynamic Noise Reduction), "OFF", "MINIMUM", "MEDIUM", or "MAXIMUM". Change via "MENU", "PICTURE", "DNR"

CUSTOMER SERVICE MENU 4

- **NOISE FIGURE.** Gives the noise ratio for the selected transmitter. This value can vary from 0 (good signal) to 127 (average signal) and to 255 (bad signal). For some software versions, the noise figure will only be valid when "Active Control" is set to "medium" or "maximum".
- **SOURCE.** Indicates which source is used and the video/ audio signal quality of the selected source. (Example: Tuner, Video/NICAM) Source: "TUNER", "EXT1", "EXT2", "EXT3", "EXT4", "SIDE", "AV1", "AV2", "AV3" or "AV4". Video signal quality: "VIDEO", "S-VIDEO", "RGB 1FH", "YPBPR 1FH 480P", "YPBPR 1FH 576P", "YPBPR 1FH 1080I", "YPBPR 2FH 480P", "YPBPR 2FH 576P", "YPBPR 2FH 1080I", "RGB 2FH 480P", "RGB 2FH 576P" or "RGB 2FH 1080I". Audio signal quality: "STEREO", "SPDIF 1", "SPDIF 2", or "SPDIF".
- **AUDIO SYSTEM.** Gives information about the audio system of the selected transmitter: "ANALOGUE MONO", "ANALOGUE STEREO", "PCM 2/0", "DD 1/0", "DD 2/0 LtRt", "DD 2/0 L0R0", "DD 2/1", "DD 2/2", "DD 3/0", "DD 3/ 1", "DD 3/2", "DD 1+1", "MPEG 1/0", "MPEG 2/0", "MPEG 2/0 LtRt", "MPEG 2/1", "MPEG 2/2", "MPEG 3/0", "MPEG 3/1", "MPEG 3/2", "MPEG 1+1" or "MPEG 2+2".
- **TUNED BIT.** Gives information about the tuning method of the stored pre-set. If a channel is found via "automatic installation", you will see the value "YES". When you change this (automatically found) frequency via "fine tune" adjustment (installation menu - manual installation), the displayed value will change to "NO". Therefore, when you see the value "NO" in this line, it is an indication that the received channel is a non-standard signal (e.g. of a VCR).
- **ON TIMER.** Indicates if the "On Timer" is set "ON" or "OFF" and if the timer is "ON" also displays start time, start day and program number. Change via "MENU", "TV", "FEATURES", and "ON TIMER".
- **PRESET LOCK.** Indicates if the selected preset has a child lock: "LOCKED" or "UNLOCKED". Change via "MENU", "TV", "FEATURES", "CHILD LOCK", and "CUSTOM LOCK".
- **CHILD LOCK.** Indicates the last status of the general child lock: "UNLOCK", "LOCK", or "CUSTOM LOCK". Change via "MENU", "TV", "FEATURES", "CHILD LOCK", and "LOCK".
- **AGE LOCK.** Indicates the last status of the EPG rating for child lock: "OFF", "4 YEARS", "6 YEARS", "8 YEARS", "10 YEARS", "12 YEARS", "14 YEARS" or "16 YEARS". This is only displayed if child lock is set to "CUSTOM LOCK"
- **LOCK AFTER.** Indicates at what time the child lock is set: "OFF" or e.g. "18:45" (lock time). This is only displayed if child lock is set to "CUSTOM LOCK"

- **CATEGORY LOCK.** Indicates the last status of the EPG theme child lock: “MOVIES”, “NEWS”, “SHOWS”, “SPORTS”, “CHILDREN”, “MUSIC”, “CULTURE”, or “SERIES”. This is only displayed if child lock is set to “CUSTOM LOCK”. It is possible that more than one value is shown.

CUSTOMER SERVICE MENU 5
- **PROGRAM CATEGORY.** Indicates the theme of the selected transmitter: “MOVIES”, “NEWS”, “SHOWS”, “SPORTS”, “CHILDREN”, “MUSIC”, “CULTURE”, or “SERIES”.
- **SW CODE 1.**
- **SW CODE 2.**
- **TV RATINGS LOCK.** Only applicable for US.
- **MOVIE RATINGS LOCK.** Only applicable for US.
- **V-CHIP TV STATUS.** Only applicable for US.
- **V-CHIP MOVIE STATUS.** Only applicable for US.
- **OPTIONS 1.** Gives the option codes of option group 1 as set in SAM (Service Alignment Mode).
- **OPTIONS 2.** Gives the option codes of option group 2 as set in SAM (Service Alignment Mode).
- **LAMP SERVICE COUNTER.**

CUSTOMER SERVICE MENU 6
- **BULB REPLACED INST. 1 - 5.** These each should be zero, unless a customer has replaced his bulb. This will show the last 5 run time hours of the set, where the customer has pressed the lamp replaced menu item to “yes”. Multiples are kept as a customer may errantly press the button, and these numbers, along with the lifetime of the engine, can be used in warranty claim questions as to whether a lamp has been replaced by customer or by service, or not. Or if a kid has pressed it just to see what it would do, etc. Range is 0 to 65,535.

SW EVENT - LOG
This item contains 'software event logging' information that can be delivered to the Philips development centre on special request.

How to exit CSM
Use one of the following methods:
- After you press a key on the RC-transmitter (with exception of the “CHANNEL”, “VOLUME” and digit (0-9) keys), or
- After you switch the TV-set “OFF” with the mains switch.

5.3 ComPair

5.3.1 Introduction

ComPair (Computer Aided Repair) is a service tool for Philips Consumer Electronics products. ComPair is a further development on the European DST (service remote control), which allows faster and more accurate diagnostics. ComPair has three big advantages:
- ComPair helps you to quickly get an understanding on how to repair the chassis in a short time by guiding you systematically through the repair procedures.
- ComPair allows very detailed diagnostics (on I2C level) and is therefore capable of accurately indicating problem areas. You do not have to know anything about I2C commands yourself because ComPair takes care of this.
- ComPair speeds up the repair time since it can automatically communicate with the chassis (when the microprocessor is working) and all repair information is directly available. When ComPair is installed together with the SearchMan electronic manual of the defective chassis, schematics and PWBs are only a mouse click away.

5.3.2 Specifications

ComPair consists of a Windows based faultfinding program and an interface box between PC and the (defective) product. The ComPair interface box is connected to the PC via a serial or RS232 cable.
For this chassis, the ComPair interface box and the TV communicate via a bi-directional service cable via the service connector.

The ComPair faultfinding program is able to determine the problem of the defective television. ComPair can gather diagnostic information in two ways:
- Automatic (by communication with the television): ComPair can automatically read out the contents of the entire error buffer. Diagnosis is done on I2C level. ComPair can access the I2C bus of the television. ComPair can send and receive I2C commands to the micro controller of the television. In this way, it is possible for ComPair to communicate (read and write) to devices on the I2C busses of the TV-set.
- Manually (by asking questions to you): Automatic diagnosis is only possible if the micro controller of the television is working correctly and only to a certain extends. When this is not the case, ComPair will guide you through the faultfinding tree by asking you questions (e.g. *Does the screen give a picture? Click on the correct answer: YES / NO*) and showing you examples (e.g. *Measure test-point I7 and click on the correct oscillogram you see on the oscilloscope*). You can answer by clicking on a link (e.g. text or a waveform picture) that will bring you to the next step in the faultfinding process.

By a combination of automatic diagnostics and an interactive question / answer procedure, ComPair will enable you to find most problems in a fast and effective way.

Beside fault finding, ComPair provides some **additional features** like:
- Up- or downloading of pre-sets.
- Managing of pre-set lists.
- Emulation of the Dealer Service Tool (DST).
- If both ComPair and SearchMan (Electronic Service Manual) are installed, all the schematics and the PWBs of the set are available by clicking on the appropriate hyperlink.
  Example: *Measure the DC-voltage on capacitor C2568 (Schematic/Panel) at the Mono-carrier*.
  – Click on the “Panel” hyperlink to automatically show the PWB with a highlighted capacitor C2568.
  – Click on the “Schematic” hyperlink to automatically show the position of the highlighted capacitor.

5.3.3 How To Connect

1. First, install the ComPair Browser software (see the Quick Reference Card for installation instructions).
2. Connect the RS232 interface cable between a free serial (COM) port of your PC and the PC connector (marked with “PC”) of the ComPair interface.
3. Connect the mains adapter to the supply connector (marked with “POWER 9V DC”) of the ComPair interface.
4. Switch the ComPair interface “OFF”.
5. Switch the television set “OFF” with the mains switch.
6. Connect the ComPair interface cable between the connector on the rear side of the ComPair interface (marked with “I2C”) and the ComPair connector at the rear side of the TV.
7. Plug the mains adapter in a mains outlet, and switch the interface “ON”. The green and red LEDs light up together. The red LED extinguishes after approx. 1 second while the green LED remains lit.
8. Start the ComPair program and read the “Introduction” chapter.

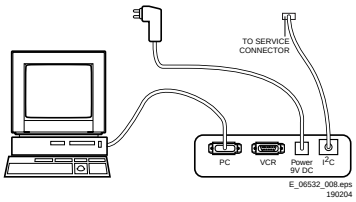


Figure 5-1 ComPair Interface connection

5.3.4 How To Order

ComPair order codes (EU/AP/LATAM):
- Starter kit ComPair32/SearchMan32 software and ComPair interface (excl. transformer): 3122 785 90450.
- ComPair interface (excluding transformer): 4822 727 21631.
- Starter kit ComPair32 software (registration version): 3122 785 60040.
- Starter kit SearchMan32 software: 3122 785 60050.
- ComPair32 CD (update): 3122 785 60070 (year 2002, 3122 785 60110 (year 2003).
- SearchMan32 CD (update): 3122 785 60080 (year 2002), 3122 785 60120 (2003), 3122 785 60130 (2004).
- ComPair interface cable: 3122 785 90004.
- ComPair firmware upgrade IC: 3122 785 90510 (only useful for TV-sets with flashable software).
- Transformer (non-UK): 4822 727 21632.
- Transformer UK: 4822 727 21633.

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

5.4 Error Codes

5.4.1 Introduction

The error code buffer contains all errors detected since the last time the buffer was erased. The buffer is written from the left to the right. When an error occurs, which is not yet in the error code buffer, the error code will appear at the left side and all other errors shift one position to the right.

5.4.2 How to clear the Error Buffer

Use one of the following methods:
- Activate “Reset Error Buffer” in SAM menu
- If the content of the error buffer was not changed for 50+ hours, it resets automatically.

By leaving SDM or SAM via the power switch, the error buffer will not be reset.

Examples:
ERROR: 000 000 000 : No errors detected
ERROR: 036 000 000 : Error code 036 is the last and only detected error
ERROR: 018 036 000 : Error code 036 was first detected and error code 018 is the last detected (newest) error

The contents of the error buffer can also be displayed by using of the “blinking LED” procedure, if no picture is available. See the chapter “The blinking LED procedure “below.

5.4.3 Error Code Definition

In case of non-intermittent faults, clear the error buffer before you begin the repair. Make sure “old” error codes are not present. If possible, check the entire content of the error buffers. In some situations an error code is only the result of another error code (and not the actual cause).

Note: A fault in the protection detection circuitry can also lead to a protection.

Error codes "01", "02", "03", and "04" are protection codes, and in this case the supplies of some circuits will be switched "off". Also in protection, the LED will blink the number of times equivalent to the most recent error code.

Table 5-1 Error codes

Error	Description
1 (1)	NVM (M24C32)
2	HFB protection
3	Picnic (SAA4978)
4	5VProtection
5	8V Protection
6 (2)	Slow I2C bus blocked
8	HIP I/O-video processing (TDA9320)
9	Wireless Expander (PCF8574)
12	Topic (LTP Peaking) (TDA9178)
13	Tuner Protection
14	ITT Sound Processor (MSP3411/3412/3452)
15	3D Combfilter protection (mPD64083)
16	Feature Box Protection (FBX)
17	I/O Expander HD Interface (M62320P)
18	Fast I2C bus blocked
19	Auto Scavem DAC (TDA8444)
21	PIP I/O Expander (M62320P)
22	PIP BOCMA (TDA888X)
23	PIP Tuner
24	PIP Muppet (SAB9081)
25	PIP V-Chip (Z86130)
26	Falconic (SAA4992)
27	Eagle device
28	Back Current loop
32	Flash Ram (EPG)
36	Light engine shutdown Protection Error
37	Light engine shutdown protection. Spontaneous blinking 37-37-37.
38	Lamp Failure.
39	Light engine polarizer fan failure, protection error.
41	Shutdown protection error, spontaneous blinking 41-41-41. GDE not responding
42	Not protection error. GDE NVM error
43	Fan Fault. Not protection error. Shut down if error exists continuously for 2 minutes
44	Ambient Temperature Warning. Not protection error. Message should be displayed for 6 seconds and every 15 minutes as long as temp is above ambient temp. warning
45	High temperature alert. Not protection error. Shut down message should be displayed and system should enter standby after 1 minute if the temperature exceeds this limit.
46	Audio fault (audio board). Not protection error.
47	Audio fault (audio board). Not protection error.
48	Thermo cutoff SW. Protection error
49	Engine Fault Lamp Off. Unexpected Lamp Off. System should enter into standby.
51	Main scaler not working. Communication via EPLD is ok, scaler not responding. Not a protection error.
52	NVM error MSB Pixelworks (local error number MSB=3),
53	Video switch. Local error number MSB=4
54	Audio switch (local error number MSB=5) (TEA6422D)
55	EPLD (local error number MSB=6)
56	ADC error (local error number MSB=7) (AD9888)
57	MSB I2C error. Not protection error
59	Reserved error codes for NAFTA Digital TV

(1) This error should start the Blinking LED procedure when it occurs.
(2) This error has the highest priority, so if other errors occur simultaneously, this should go first.

5.5 The Blinking LED Procedure

NOTE: Perform this procedure **without** any signal applied. This is necessary because making any adjustment, such as lowering the volume, will render the Blinking LED procedure inoperative.

The contents of the error buffer can also be made visible through the “blinking LED” procedure. This is especially useful when there is no picture.

When the SDM is entered, the LED will blink the number of times, equal to the value of any error codes.
The ON/OFF indicator turning orange for 500 ms precedes all error code sequences (there is a possibility of up to 10).
After the 500 ms delay, the ON/OFF indicator will turn green for 1500 ms before the first code begins. If an error code is smaller than 10, the ON/OFF indicator will rapidly flash orange 1-9 times to indicate the code (EXP. Six rapid flashes indicates an error code of 6.)
There will be a delay, green light, of approximately 3 seconds between codes.
For error codes of 10 and higher, the ON/OFF indicator will slowly flash orange the correct number of times to indicate the first digit, and then will rapidly flash orange the correct number of times to indicate the second digit (EXP. Three slow orange flashes followed by 6 rapid orange flashes indicate an error code of 36.)
When all error-codes are displayed, the sequence is finished and the ON/OFF indicator turns green for 3 seconds. At this point the sequence will begin again as indicated by the ON/OFF indicator turning orange for 500 ms.

Table 5-2 Example of the blinking LED procedure

Error code position	1	2	3	4	5
Error buffer:	018	006	036	0	0

After entering SDM: The sequence will begin with 1 long blink of 500 ms, then pause 1500 ms, then slowly blink once followed by 8 rapid blinks (indicating error code 18), next the LED will pause for 3 seconds followed by 6 rapid blinks (indicating error code 6), next the LED will pause for 3 seconds, then slowly blink 3 times followed by 6 rapid blinks (indicating error code 36), then pause 3 seconds ending the sequence in this example. If there were error codes in positions 4 and 5, those sequences would also be given.

5.6 Fault Finding

5.6.1 Troubleshooting a Dead Set

If the status lamp is Red, the 5 V supply is present and the OTC is working. If the indicator LED is "Off", the Standby Supply may not be working. The Standby Supply is located on the Main Power Board. This voltage can be measured on Pin 2 of connector 1312.
This voltage is then fed to the Input Power board on 1403, Pin 1. The 5 V Standby voltage is also fed to the Side Jack Panel via Pin 4 of 1344. It is then fed back to the System board on Pin 5 of 1344 and then to the Input Power board on Pin 11 of 1403. If the voltage on Pin 5 of 1344 is High, the +5V_STBY_SW voltage is switched "On" and fed to the SSB via Pin 40 of connector 1205.
The ON/OFF LED voltage is fed to the System board via Pin 77 of 1205. It is then fed to the LED Sensor Panel via Pin 5 of 1214. In the Standby mode, the Standby line will be approximately 3.3 V. This voltage can be measured on Pin 36 of 1205.
When the set is turned "On", the OTC will pull the Standby Line Low. The relay on the Input Power board will then turn "On", providing RAW_DC voltage to the Main Power board via Pin 1 of 1311. If 5 V is present on Pin 11 of 1403, Pin 1 and 3 of 1460, and Pins 1 and 2 of 1410, the Standby line on Pin 9 of 1403 is Low, RAW_DC should be present on Pin 1 of 1311. If it is not, the Input Power board should be repaired or replaced.
When the RAW_DC voltage is applied to the Main Power board, +36 V should appear on Pin 4 of 1312.
Additional voltage are 5 V on Pins 3, 4 and 5 of 1313, +9 V on Pins 1 and 2 of 1314, +3.3 V on Pins 5 and 6 of 1314, and +12 V on 1314.
Operating voltages are applied to the Light Engine on connector 1315.

5.6.2 Troubleshooting Audio Problems

The Audio Power supply is located on the Input Power board. A positive 25 V should be present on Pin 1 of 1316 and a minus 25 V on Pin 4. An audio signal should be present on Pins 1 and 4 of 1700. The SOUND_ENABLE line should be High to switch the Audio Amplifier "On".

5.6.3 Troubleshooting Video Problems

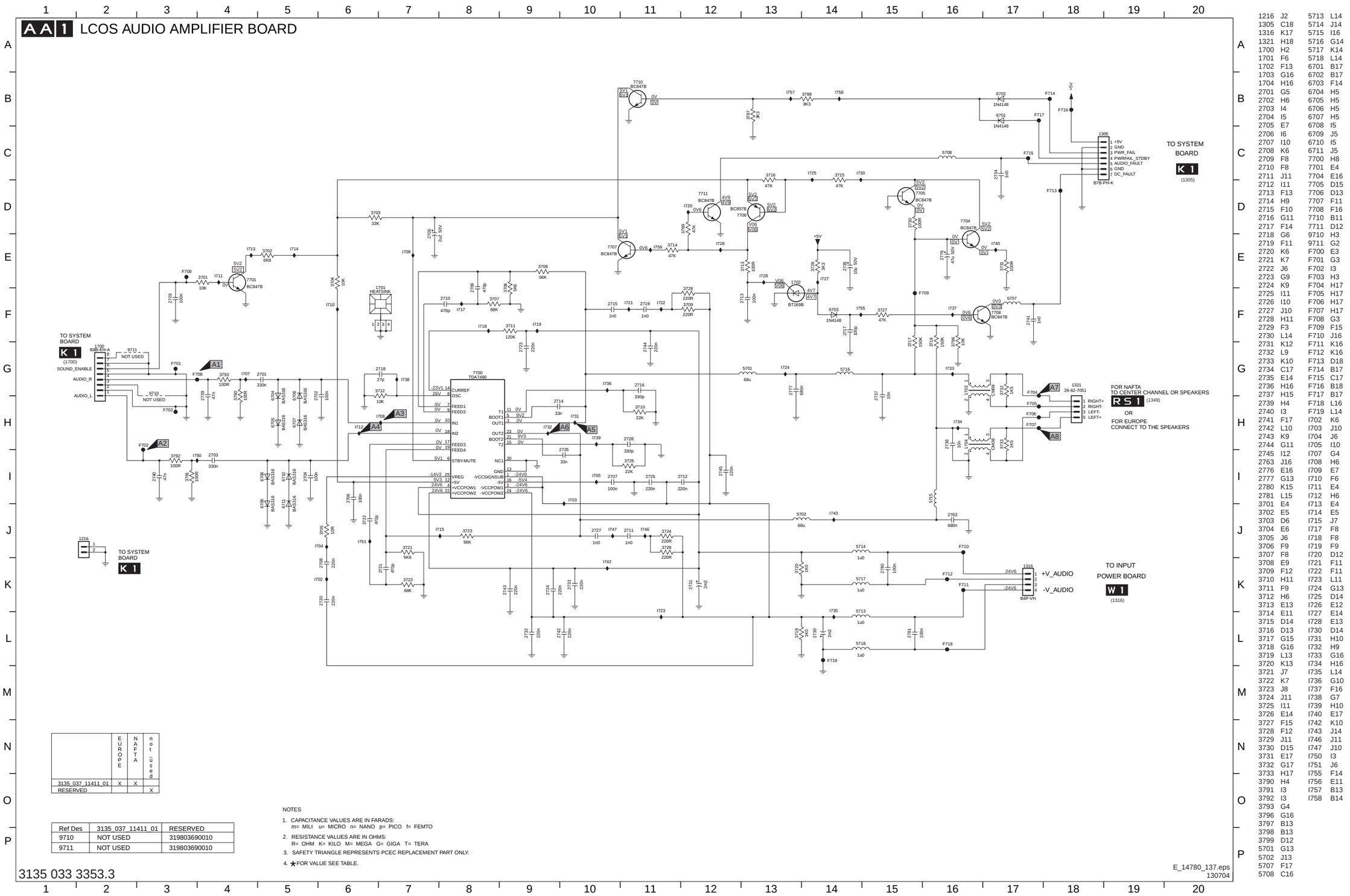
The 1fH signals from the SCART panel or Side Jack panel are fed to the SSB for processing. The signal is fed to the Scaler board in a digital format via 1401. (Figure 75) After processing, the signal is fed to the Light Engine via connector 1200. The SSB can be bypassed by selecting the inputs on the Scaler board.

6. Block Diagrams, Testpoint Overview, and Waveforms

Not applicable yet

7. Circuit Diagrams and PWB Layouts

LCoS Audio Amplifier Board



	EUROPE	NAFTA	not used
3135_037_11411_01	X	X	
RESERVED			X

Ref Des	3135_037_11411_01	RESERVED
9710	NOT USED	319803690010
9711	NOT USED	319803690010

NOTES

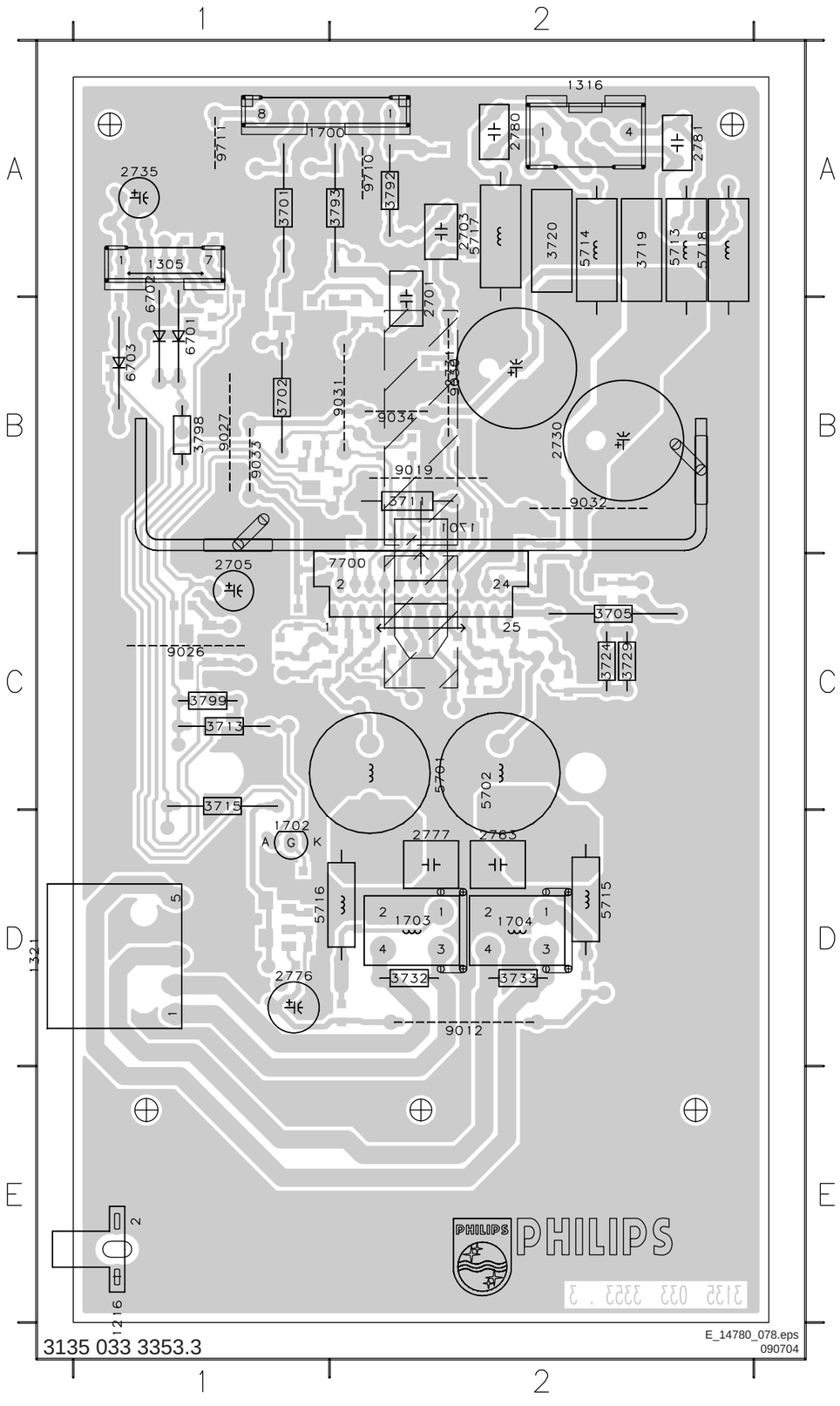
1. CAPACITANCE VALUES ARE IN FARADS:
   m= MILI u= MICRO n= NANO p= PICO f= FEMTO
2. RESISTANCE VALUES ARE IN OHMS:
   R= OHM K= KILO M= MEGA G= GIGA T= TERA
3. SAFETY TRIANGLE REPRESENTS PCEC REPLACEMENT PART ONLY.
4. ✱ FOR VALUE SEE TABLE.

3135 033 3353.3

E_14780_137.eps
130704

1216	J2	5713	L14
1305	C18	5714	J14
1316	K17	5715	I16
1321	H18	5716	G14
1700	H2	5717	K14
1701	F6	5718	L14
1702	F13	6701	B17
1703	G16	6702	B17
1704	H16	6703	F14
2701	G5	6704	H5
2702	H6	6705	H5
2703	I4	6706	H5
2704	I5	6707	H5
2705	E7	6708	I5
2706	I6	6709	J5
2707	I10	6710	I5
2708	K6	6711	J5
2709	F8	7700	H8
2710	F8	7701	E4
2711	J11	7704	E16
2712	I11	7705	D15
2713	F13	7706	D13
2714	H9	7707	F11
2715	F10	7708	F16
2716	G11	7710	B11
2717	F14	7711	D12
2718	G6	9710	H3
2719	F11	9711	G2
2720	K6	F700	E3
2721	K7	F701	G3
2722	J6	F702	I3
2723	G9	F703	H3
2724	K9	F704	H17
2725	I11	F705	H17
2726	I10	F706	H17
2727	J10	F707	H17
2728	H11	F708	G3
2729	F3	F709	F15
2730	L14	F710	J16
2731	K12	F711	K16
2732	L9	F712	K16
2733	K10	F713	D18
2734	C17	F714	B17
2735	E14	F715	C17
2736	H16	F716	B18
2737	H15	F717	B17
2739	H4	F718	L16
2740	I3	F719	L14
2741	F17	I702	K6
2742	L10	I703	J10
2743	K9	I704	J6
2744	G11	I705	I10
2745	I12	I707	G4
2763	J16	I708	H6
2776	E16	I709	E7
2777	G13	I710	F6
2780	K15	I711	E4
2781	L15	I712	H6
3701	E4	I713	E4
3702	E5	I714	E5
3703	D6	I715	J7
3704	E6	I717	F8
3705	J6	I718	F8
3706	F9	I719	F9
3707	F8	I720	D12
3708	E9	I721	F11
3709	F12	I722	F11
3710	H11	I723	L11
3711	F9	I724	G13
3712	H6	I725	D14
3713	E13	I726	E12
3714	E11	I727	E14
3715	D14	I728	E13
3716	D13	I730	D14
3717	G15	I731	H10
3718	G16	I732	H9
3719	L13	I733	G16
3720	K13	I734	H16
3721	J7	I735	L14
3722	K7	I736	G10
3723	J8	I737	F16
3724	J11	I738	G7
3725	I11	I739	H10
3726	E14	I740	E17
3727	F15	I742	K10
3728	F12	I743	J14
3729	J11	I746	J11
3730	D15	I747	J10
3731	E17	I750	I3
3732	G17	I751	J6
3733	H17	I755	F14
3790	H4	I756	E11
3791	I3	I757	B13
3792	I3	I758	B14
3793	G4		
3796	G16		
3797	B13		
3798	B13		
3799	D12		
5701	G13		
5702	J13		
5707	F17		
5708	C16		

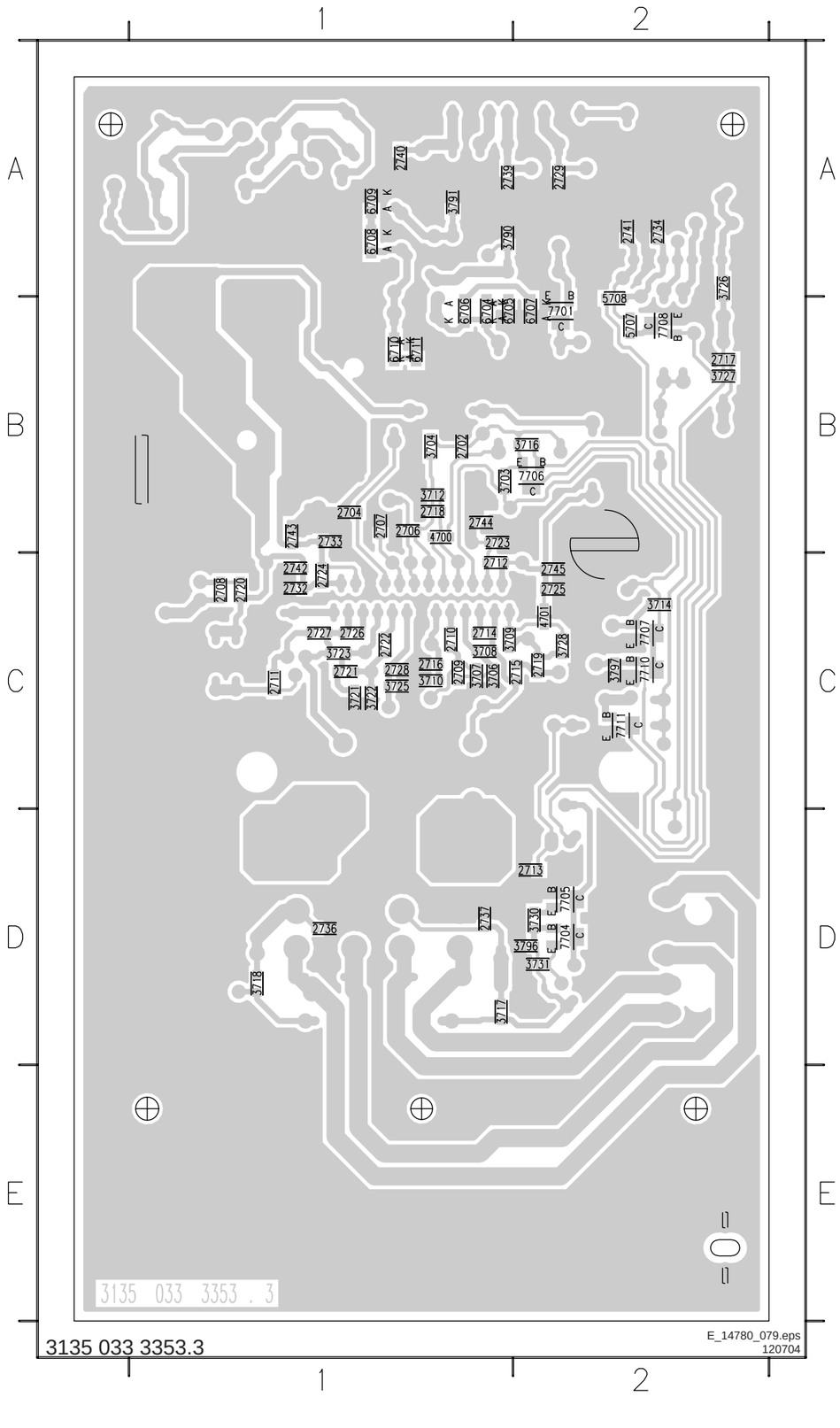
Layout LCoS Audio Amplifier Board (Top Side)



1216 E1
1305 A1
1316 A2
1700 A1
1701 B2
1702 D1
1703 D2
1704 D2
2701 B2
2703 A2
2705 C1
2730 B2
2731 B2
2735 A1
2763 D2
2776 D1
2777 D2
2780 A2
2781 A2
3701 A1
3702 B1
3705 C2
3711 B2
3713 C1
3715 C1
3719 A2
3720 A2
3724 C2
3729 C2
3732 D2
3733 D2
3792 A2
3793 A2
3798 B1
3799 C1
5701 C2
5702 C2
5713 A2
5714 A2
5715 D2
5716 D1
5717 A2
5718 A2
6701 B1
6702 A1
6703 B1
7700 C2
9012 D2
9019 B2
9026 C1
9027 B1
9030 B2
9031 B2
9032 B2
9033 B1
9034 B2
9710 A2
9711 A1

3135 033 3353.3
E_14780_078.eps
090704

Layout LCoS Audio Amplifier Board (Bottom Side)



2702 B1
2704 B1
2706 B1
2707 B1
2708 C1
2709 C1
2710 C1
2711 C1
2712 C1
2713 D2
2714 C1
2715 C2
2716 C1
2717 B2
2718 B1
2719 C2
2720 C1
2721 C1
2722 C1
2723 B1
2724 C1
2725 C2
2726 C1
2727 C1
2728 C1
2729 A2
2732 C1
2733 B1
2734 A2
2736 D1
2737 D1
2739 A1
2740 A1
2741 A2
2742 C1
2743 B1
2744 B1
2745 C2
3703 B1
3704 B1
3706 C1
3707 C1
3708 C1
3709 C1
3710 C1
3712 B1
3714 C2
3716 B2
3717 D1
3718 D1
3721 C1
3722 C1
3723 C1
3725 C1
3726 A2
3727 B2
3728 C2
3730 D2
3731 D2
3790 A1
3791 A1
3796 D2
3797 C2
4700 B1
4701 C2
5707 B2
5708 B2
6704 B1
6705 B1
6706 B1
6707 B2
6708 A1
6709 A1
6710 B1
6711 B1
7701 B2
7704 D2
7705 D2
7706 B2
7707 C2
7708 B2
7710 C2
7711 C2

3135 033 3353.3
E_14780_079.eps
120704

LCoS System Board

K 1 LCoS SYSTEM BOARD (1 OF 4)

REAR JACK PANEL

V 1 1fH CINCH

SL6 SCALER (MSB)

B1 EMG*SSB

Note: See SSB Schematic B1 for Voltages and Waveforms for Connector 1205

O 1 SIDE JACK

I T V

LS1 LED SENSOR

CB1 3D COMB

U1 MAIN POWER

C3 PIP MOD

C4 PIP MOD

W1 INPUT POWER

TUNER

B2 EMG* 3D COMB

B5 EMG* SCART3

B6 EMG* SCART3

B6 EMG*

B6 EMG* AUDIO DELAY

AA1 AUDIO AMPLIFIER

P1 KEYBOARD

I I C

NOTES

1. CAPACITANCE VALUES ARE IN FARADS:
   m=MILI u=MICRO n=NANO p=PICO f=FEMTO
2. RESISTANCE VALUES ARE IN OHMS:
   R=OHM K=KILO M=MEGA G=GIGA T=TERA
3. SAFETY TRIANGLE REPRESENTS PCEC REPLACEMENT PART ONLY.
4. ✱FOR VALUE SEE TABLE.

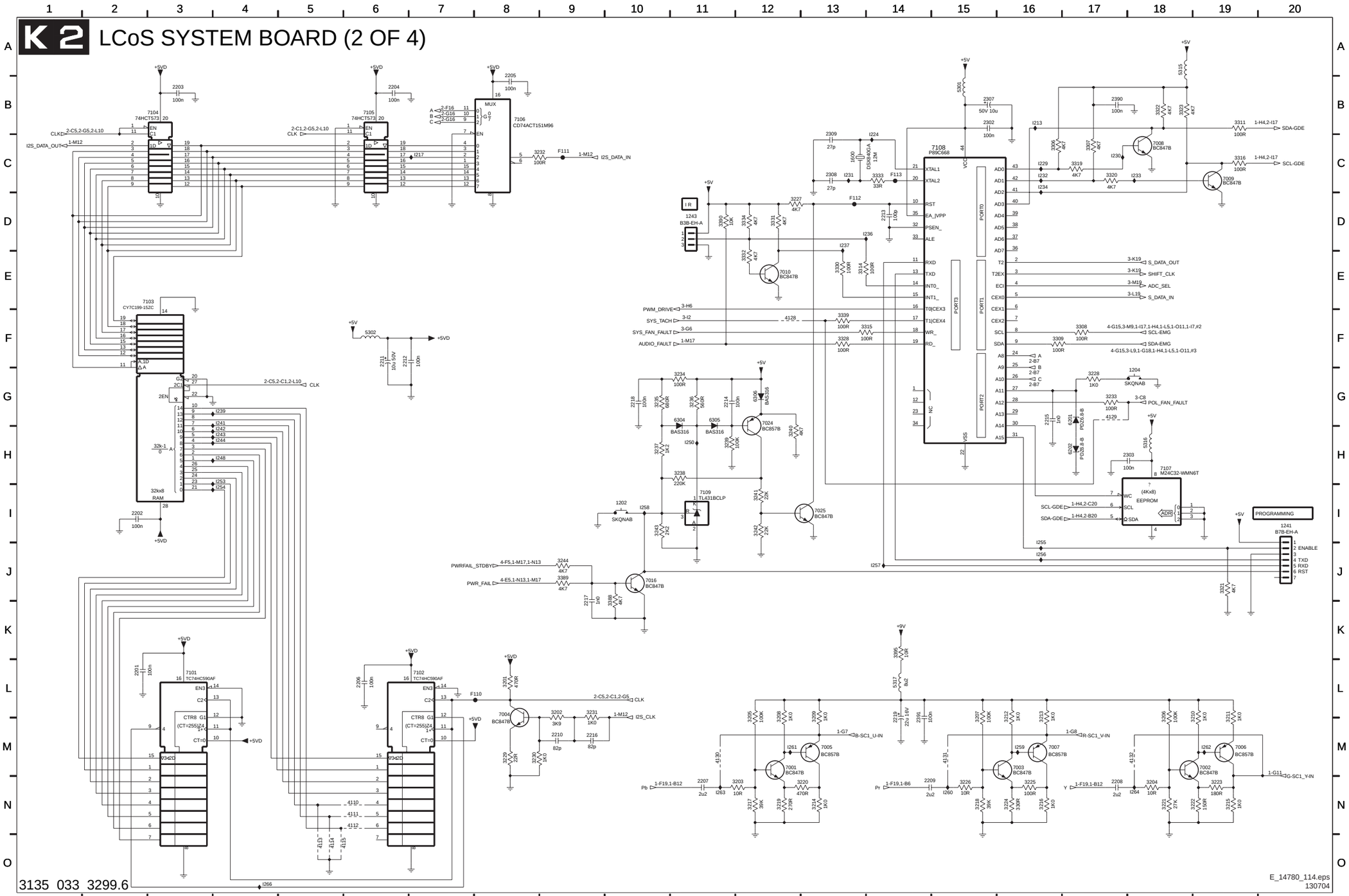
3135 033 3299.6

E_14780_113.eps
130704

1008	E14	4104	K4
1009	H14	4117	B19
1200	D20	4122	J8
1201	H20	4123	J11
1203	K2	4125	J9
1205-A	G9	4126	J10
1205-B	G10	5101	K4
1207	F20	5102	H15
1210-1	E2	5103	J16
1210-2	E3	5104	K15
1214	E18	5106	I6
1215	N10	5108	G6
1216	N9	5109	H6
1217	N6	5307	E4
1218	N7	5308	F4
1220-1	B9	5309	F4
1220-2	B9	6101	J3
1244	N13	6102	J3
1245	D17	6105	J15
1303	M7	6112	N3
1305	M18	6113	H19
1312	M15	6114	H18
1313	H16	7019	C2
1314	J16	7022	G19
1335	B15	7023	H18
1337	D16	7115	N3
1344	B19	7119	C3
1402	M8	9001	F17
1403	J20	9002	C4
1680	M10		
1681	M11		
1683	M13		
1700	M20		
2101	J6		
2102	K3		
2103	M4		
2104	M3		
2105	O3		
2108	J15		
2109	J15		
2110	J14		
2111	J14		
2112	I15		
2113	K14		
2114	I15		
2115	K14		
2116	J6		
2123	G6		
2124	I6		
2125	N17		
2126	N17		
2127	N17		
2128	C3		
2129	N17		
2130	J4		
2351	E4		
2352	E4		
2353	F4		
2354	D14		
2355	D14		
2356	D14		
2357	D14		
2358	D15		
2359	D15		
2360	C19		
2361	C18		
2362	C17		
2363	C17		
2364	G18		
2365	G17		
2366	G17		
2367	G17		
2368	G16		
2369	G16		
2370	I16		
2371	I16		
2372	L19		
2374	L19		
2375	L19		
2376	L19		
2377	L18		
2378	L18		
2379	L16		
2380	L16		
2381	L15		
2382	N19		
2383	N19		
2384	N19		
2385	N15		
2386	N14		
2387	N14		
2388	N14		
3101	I6		
3103	C2		
3104	C2		
3105	C3		
3106	J4		
3107	J4		
3108	N4		
3109	O4		
3110	L4		
3111	L3		
3112	O4		
3113	K9		
3114	B18		
3115	B18		
3116	B18		
3117	C18		
3118	G18		
3119	H18		
3120	H17		
3121	H17		
3122	I5		
4103	L4		

LCoS System Board

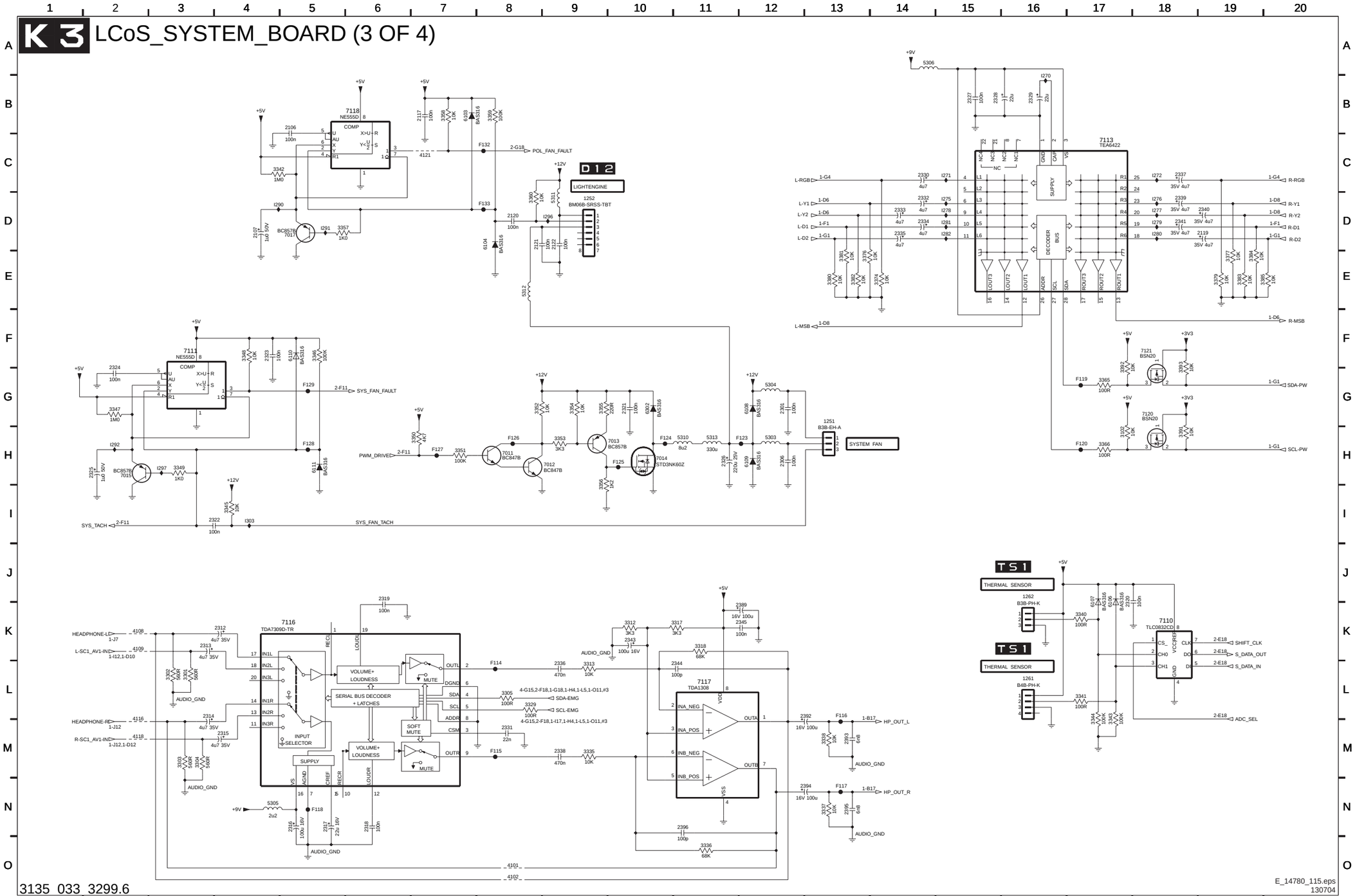
K 2 LCoS SYSTEM BOARD (2 OF 4)



1202	I10	5301	B15
1204	G17	5302	F6
1241	I20	5315	B18
1243	D11	5316	H17
1600	C13	5317	L14
2201	L2	6201	H16
2202	I2	6202	H16
2203	B3	6304	G10
2204	B6	6305	G11
2205	B8	6306	G12
2206	L6	7001	M12
2207	M11	7002	M18
2208	M17	7003	M16
2209	M14	7004	L8
2210	M9	7005	M13
2211	G6	7006	M19
2212	G6	7007	M16
2213	D14	7008	C18
2214	G11	7009	C19
2215	H16	7010	E12
2216	M9	7016	J10
2217	K9	7024	H12
2218	G10	7025	I13
2219	L14	7101	L3
2302	C15	7102	L7
2303	H17	7103	E3
2307	B15	7104	B3
2308	C13	7105	B6
2309	C13	7106	B8
2390	B17	7107	H18
2391	L14	7108	C14
3201	L8	7109	I11
3202	L9		
3203	M11		
3204	M18		
3205	L12		
3206	L18		
3207	L15		
3208	L12		
3209	L13		
3210	L18		
3211	L19		
3212	L15		
3213	L16		
3214	N13		
3215	N19		
3216	N16		
3217	N12		
3218	N15		
3219	N12		
3220	M12		
3221	N18		
3222	N18		
3223	M18		
3224	N15		
3225	M16		
3226	M15		
3227	D12		
3228	G17		
3229	M8		
3230	M8		
3231	L9		
3232	C8		
3233	G17		
3234	G10		
3235	G10		
3236	G11		
3237	H10		
3238	H10		
3239	H11		
3240	H12		
3241	I12		
3242	I12		
3243	I10		
3244	J9		
3306	C16		
3307	C17		
3308	F16		
3309	F16		
3311	C19		
3314	E13		
3315	F13		
3316	C19		
3319	C16		
3320	C17		
3321	J19		
3322	B18		
3323	B18		
3328	F13		
3330	E13		
3331	D12		
3332	E11		
3333	C13		
3339	F13		
3388	K9		
3389	J9		
3390	D11		
3395	K14		
4110	N6		
4111	N6		
4112	N6		
4113	O5		
4114	O5		
4115	O6		
4128	F12		
4129	G17		
4130	M11		
4131	M14		
4132	M17		

LCoS System Board

K 3 LCoS_SYSTEM_BOARD (3 OF 4)



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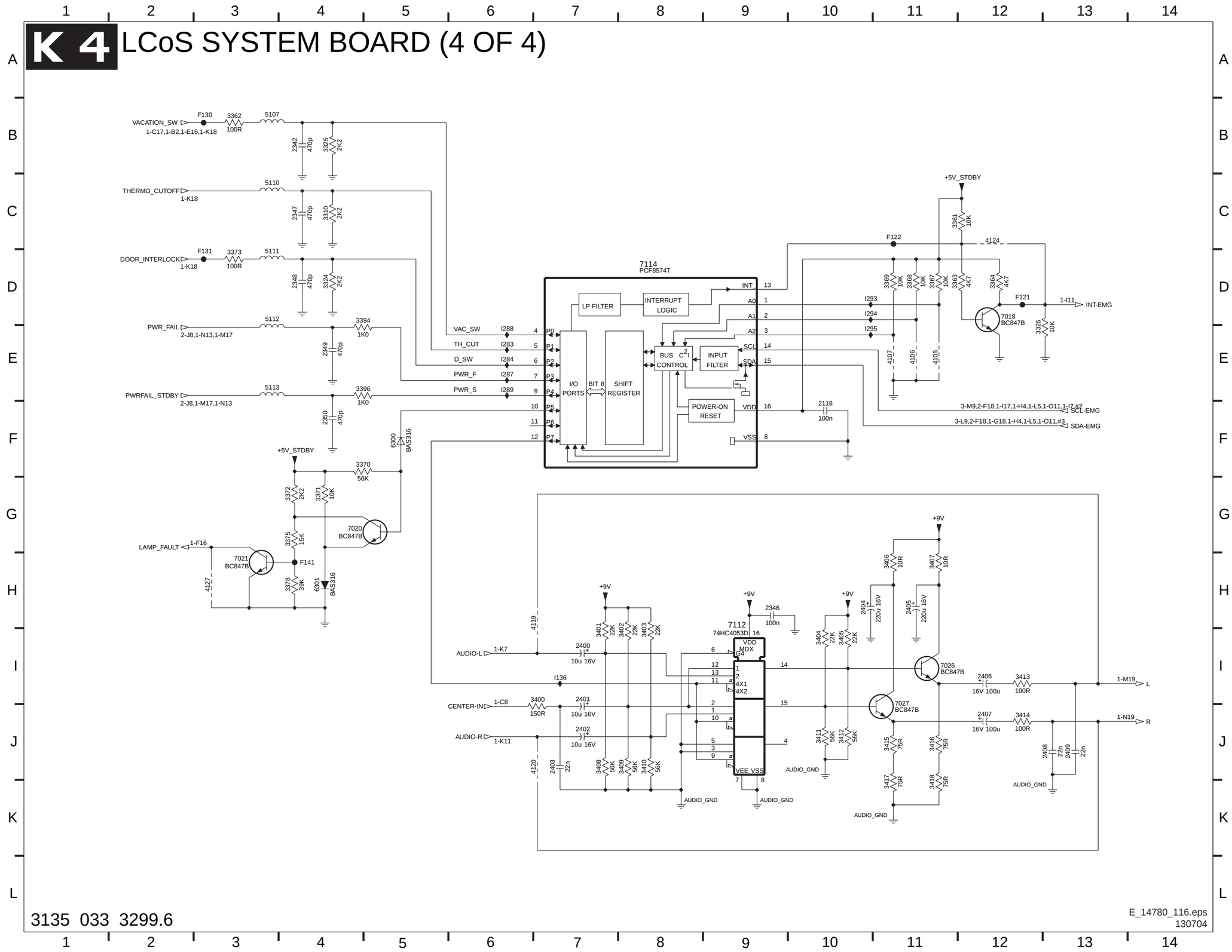
1251	G13	4121	C7
1252	D9	5303	H12
1261	L16	5304	G12
1262	J16	5305	N4
2106	C5	5306	B14
2107	D4	5310	H10
2117	B7	5311	D9
2119	D18	5312	E8
2120	D8	5313	H11
2121	E8	6103	B7
2122	E9	6104	E8
2301	G12	6106	K17
2306	H12	6107	K17
2312	K4	6108	G11
2313	K3	6109	H11
2314	L3	6110	F5
2315	M4	6111	H5
2316	N5	6302	G10
2317	N5	7011	H8
2318	N6	7012	H8
2319	J6	7013	H9
2320	K17	7014	H10
2321	G10	7015	H2
2322	I4	7017	D5
2323	F4	7110	K18
2324	G2	7111	F3
2325	H2	7113	C17
2326	H11	7116	K5
2327	B15	7117	L11
2328	B15	7118	B6
2329	B16	7120	G17
2330	C14	7121	F17
2331	M8		
2332	D14		
2333	D14		
2334	D14		
2335	D14		
2336	K9		
2337	C18		
2338	M9		
2339	D18		
2340	D18		
2341	D18		
2343	K10		
2344	K10		
2345	K11		
2389	K11		
2392	L12		
2393	M13		
2394	M12		
2395	N13		
2396	N10		
3102	H17		
3301	L3		
3302	L3		
3303	M3		
3304	M3		
3305	L8		
3312	K10		
3313	K9		
3317	K10		
3318	K11		
3329	L8		
3335	M9		
3336	N11		
3337	N13		
3338	M13		
3340	K16		
3341	L16		
3342	C4		
3343	L17		
3344	L17		
3345	I4		
3346	F5		
3347	G2		
3348	F4		
3349	H3		
3350	H7		
3351	H7		
3352	G8		
3353	H9		
3354	G9		
3355	G9		
3356	I9		
3357	D5		
3358	B7		
3359	B8		
3360	D8		
3365	G17		
3366	H17		
3374	E13		
3376	E13		
3377	E19		
3379	E18		
3380	E13		
3381	E13		
3382	E13		
3383	E19		
3384	E19		
3385	E19		
3391	H18		
3392	G17		
3393	G18		
4101	O8		
4102	O8		
4108	K2		
4109	K2		
4116	L2		
4118	M2		

LCoS System Board

K 4 LCoS SYSTEM BOARD (4 OF 4)



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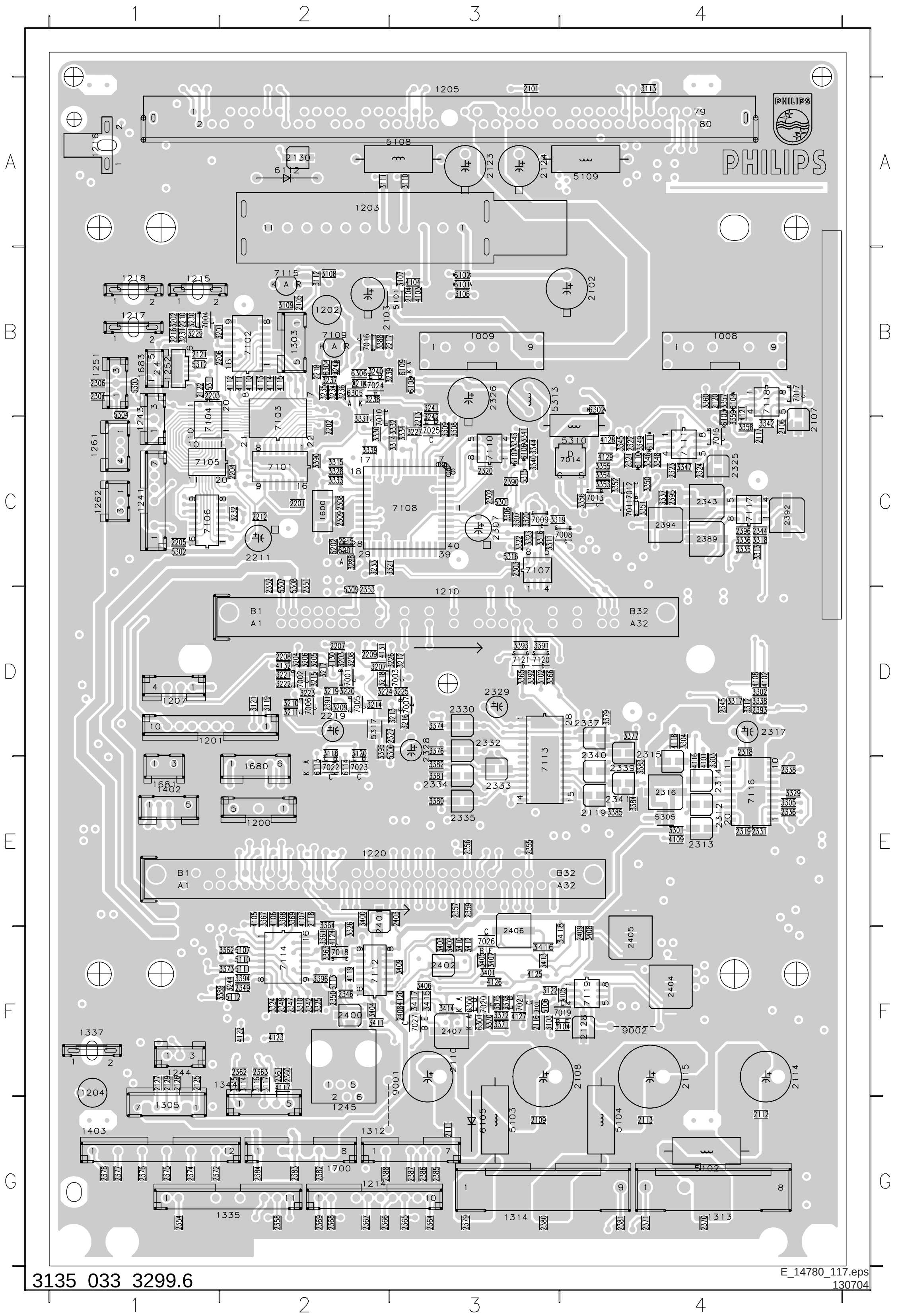
A															A
B															B
C															C
D															D
E															E
F															F
G															G
H															H
I															I
J															J
K															K
L															L
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	

2118 F10
2342 B4
2346 H9
2347 C4
2348 D4
2349 E4
2350 F4
2400 I7
2401 I7
2402 J7
2403 J7
2404 H10
2405 H11
2406 I12
2407 J12
2408 J12
2409 J13
3310 C4
3324 D4
3325 B4
3326 E12
3361 C11
3362 B3
3363 D11
3364 D12
3367 D11
3368 D11
3369 D11
3370 F4
3371 G4
3372 G4
3373 D3
3375 G4
3378 H4
3394 E4
3396 E4
3400 I6
3401 I7
3402 I7
3403 I8
3404 I10
3405 I10
3406 H11
3407 H11
3408 J7
3409 J7
3410 J8
3411 J10
3412 J10
3413 I12
3414 J12
3415 J11
3416 J11
3417 J11
3418 J11
4105 E11
4106 E11
4107 E11
4119 H6
4120 J6
4124 D12
4127 H3
5107 B3
5110 C3
5111 D3
5112 E3
5113 E3
6300 F5
6301 H4
7018 E12
7020 G4
7021 H3
7026 I11
7027 I11
7112 H9
7114 D8

Layout LCoS System Board (Top Side)

1008	B4	1217	B1	1312	G2	2101	A3	2114	F4	2127	F1	2210	B1	2306	B1	2321	C4	2334	E3	2347	F2	2360	F2	2374	G1	2387	G3	2403	E3	3107	B3	3120	D2
1009	B3	1218	B1	1313	G4	2102	B4	2115	F4	2128	F4	2211	C2	2307	C3	2322	C4	2335	E3	2348	F2	2361	F2	2375	G1	2388	G2	2404	F4	3108	B2	3121	D2
1200	E2	1220	E2	1314	G3	2103	B2	2116	F3	2129	F1	2212	C2	2308	C2	2323	C4	2336	E4	2349	F2	2362	F2	2376	G1	2389	C4	2405	F4	3109	B2	3122	F3
1201	D1	1241	C1	1335	G2	2104	B3	2117	C4	2130	A2	2213	C3	2309	C2	2324	C4	2337	D4	2350	F2	2363	F2	2377	G1	2390	C3	2406	F3	3110	A3	3201	B1
1202	B2	1243	C1	1337	F1	2105	B2	2118	E2	2201	C2	2214	B2	2312	E4	2325	C4	2338	E4	2351	C2	2364	G3	2378	G1	2391	D2	2407	F3	3111	A2	3202	B1
1203	A2	1244	F1	1344	F2	2106	C4	2119	E4	2202	C2	2215	C2	2313	E4	2326	B3	2339	E4	2352	C2	2365	G3	2379	G3	2392	C4	2408	F3	3112	B2	3203	D2
1204	F1	1245	G2	1402	E1	2107	C4	2120	B4	2203	B1	2216	B1	2314	E4	2327	D3	2340	D4	2353	D2	2366	G2	2380	G3	2393	D4	2409	F4	3113	A4	3204	D2
1205	A3	1251	B1	1403	G1	2108	F4	2121	B1	2204	C2	2217	B2	2315	D4	2328	D3	2341	E4	2354	G1	2367	G2	2381	G4	2394	C4	3101	F3	3114	F2	3205	D2
1207	D1	1252	B1	1600	C2	2109	G3	2122	B1	2205	C1	2218	B2	2316	E4	2329	D3	2342	F2	2355	E3	2368	G2	2382	G2	2395	C4	3102	D3	3115	F2	3206	D2
1210	D3	1261	C1	1680	E2	2110	F3	2123	A3	2206	B1	2219	D2	2317	D4	2330	D3	2343	C4	2356	E3	2369	G2	2383	G2	2396	C4	3103	F3	3116	F2	3207	D2
1214	G2	1262	C1	1681	E1	2111	G3	2124	A3	2207	D2	2301	B1	2318	D4	2331	E4	2344	C4	2357	E3	2370	G4	2384	G2	2400	F2	3104	F4	3117	F2	3208	D2
1215	B1	1303	B2	1683	B1	2112	G4	2125	F1	2208	D2	2302	C3	2319	E4	2332	D3	2345	D4	2358	G2	2371	G4	2385	G3	2401	E2	3105	F4	3118	D2	3209	D2
1216	A1	1305	G1	1700	G2	2113	G4	2126	F1	2209	D2	2303	C3	2320	C3	2333	E3	2346	F2	2359	E3	2372	G1	2386	G3	2402	F3	3106	B3	3119	D2	3210	D2

3211	D2	3393	D3	7019	F4
3212	D3	3394	F2	7020	F3
3213	D3	3395	D2	7021	F3
3214	D2	3396	F2	7022	E2
3215	D2	3400	E2	7023	E2
3216	D3	3401	F3	7024	B2
3217	D2	3402	F3	7025	C3
3218	D2	3403	F3	7026	F3
3219	D2	3404	F2	7027	F3
3220	D2	3405	F3	7101	C2
3221	D2	3406	F3	7102	B2
3222	D2	3407	F3	7103	C2
3223	D2	3408	F4	7104	C1
3224	D2	3409	F3	7105	C1
3225	D3	3410	F3	7106	C1
3226	D3	3411	F2	7107	C3
3227	C3	3412	F3	7108	C3
3228	C2	3413	F3	7109	B2
3229	B1	3414	F3	7110	C3
3230	B1	3415	F3	7111	C4
3231	B1	3416	F3	7112	F2
3232	C2	3417	F3	7113	E3
3233	C2	3418	F4	7114	F2
3234	B2	4101	E4	7115	B2
3235	B2	4102	D4	7116	E4
3236	B2	4103	B3	7117	C4
3237	B2	4104	B3	7118	B4
3238	B2	4105	E2	7119	F4
3239	B2	4106	E2	7120	D3
3240	B2	4107	E2	7121	D3
3241	B3	4108	D4	9001	F3
3242	C3	4109	E4	9002	F4
3243	B2	4110	B2		
3244	F2	4111	B2		
3301	E4	4112	B2		
3302	D4	4113	B2		
3303	E4	4114	B2		
3304	D4	4115	B2		
3305	E4	4116	E4		
3306	C3	4117	F2		
3307	C3	4118	D4		
3308	C3	4119	F2		
3309	C3	4120	F3		
3310	F2	4121	B4		
3311	C3	4122	F2		
3312	D4	4123	F2		
3313	C4	4124	F2		
3314	C3	4125	F3		
3315	C2	4126	F3		
3316	C3	4127	F3		
3317	D4	4128	C4		
3318	C4	4129	C4		
3319	C3	4130	D2		
3320	C3	4131	D2		
3321	C3	4132	D2		
3322	C3	5101	B3		
3323	C3	5102	G4		
3324	F2	5103	G3		
3325	F2	5104	G4		
3326	F2	5106	F3		
3328	C2	5107	F2		
3329	E4	5108	A3		
3330	C2	5109	A4		
3331	C2	5110	F2		
3332	C3	5111	F2		
3333	C2	5112	F2		
3334	C3	5113	F2		
3335	C4	5301	C3		
3336	C4	5302	C1		
3337	C4	5303	B1		
3338	D4	5304	B1		
3339	C2	5305	E4		
3340	C3	5306	D3		
3341	C3	5307	C2		
3342	C4	5308	C2		
3343	C3	5309	D2		
3344	C3	5310	C4		
3345	C4	5311	B1		
3346	C4	5312	B1		
3347	C4	5313	B3		
3348	C4	5315	C3		
3349	C4	5316	C3		
3350	C4	5317	D2		
3351	C4	6101	B3		
3352	C4	6102	B3		
3353	C4	6103	C4		
3354	C4	6104	B4		
3355	C4	6105	G3		
3356	C4	6106	C3		
3357	B4	6107	C3		
3358	C4	6108	B3		
3359	C4	6109	B3		
3360	B4	6110	C4		
3361	F2	6111	C4		
3362	F2	6112	A2		
3363	F2	6113	E2		
3364	E2	6114	E2		
3365	D3	6201	C2		
3366	D3	6202	C2		
3367	E2	6300	F3		
3368	E2	6301	F3		
3369	E2	6302	B4		
3370	F3	6304	B2		
3371	F3	6305	B2		
3372	F3	6306	B2		
3373	F2	7001	D2		
3374	D3	7002	D2		
3375	F3	7003	D3		
3376	D3	7004	B1		
3377	D4	7005	D2		
3378	F3	7006	D2		
3379	D4	7007	D3		
3380	E3	7008	C4		
3381	E3	7009	C3		
3382	E3	7010	C2		
3383	E4	7011	C4		
3384	E4	7012	C4		
3385	E4	7013	C4		
3388	B2	7014	C4		
3389	F2	7015	C4		
3390	C2	7016	B2		
3391	D3	7017	B4		
3392	D3	7018	F2		



Personal Notes:

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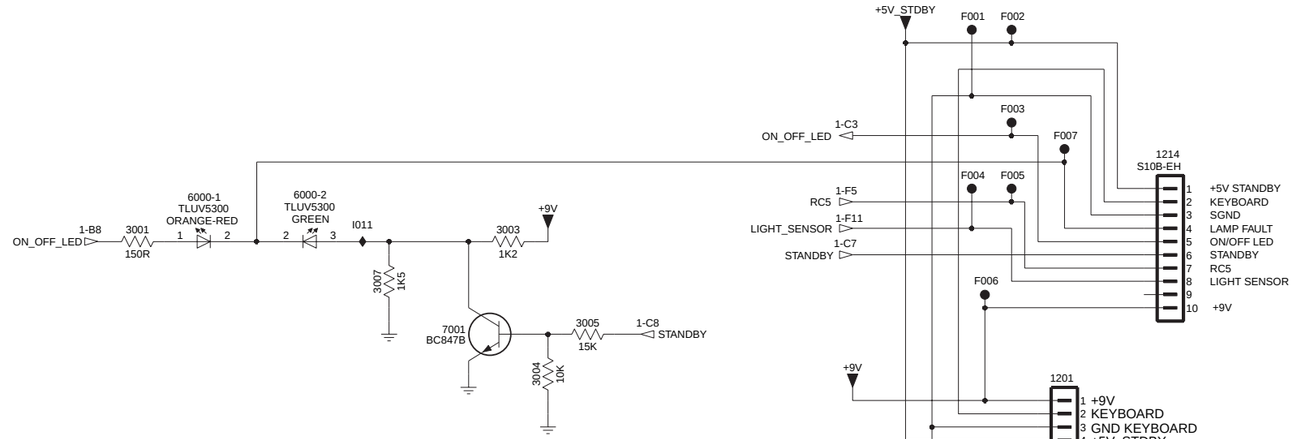
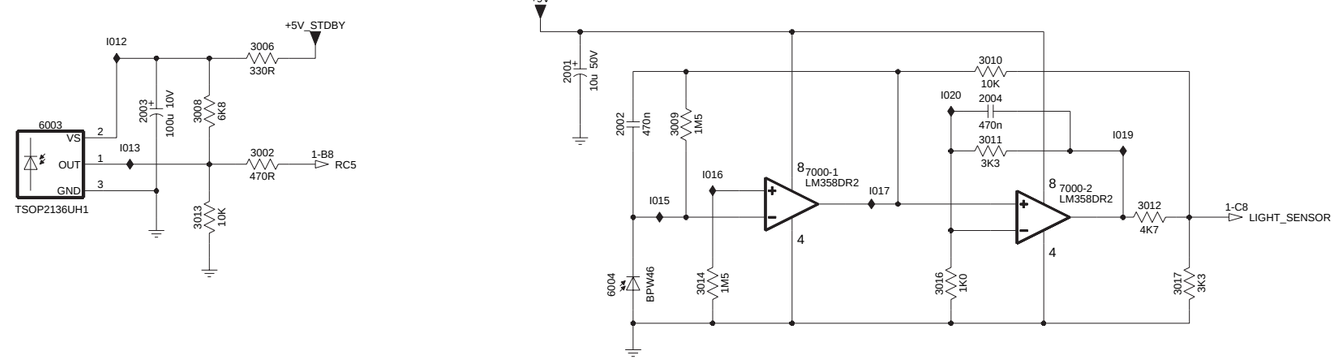
LED Sensor Panel

LS LED SENSOR PANEL





NOTES

1. CAPACITANCE VALUES ARE IN FARADS:
   m=MILI u=MICRO n=NANO p=PICO f=FEMTO
2. RESISTANCE VALUES ARE IN OHMS:
   R=OHM K=KILO M=MEGA G=GIGA T=TERA
3. SAFETY TRIANGLE REPRESENTS PCEC REPLACEMENT PART ONLY.
4. ✱FOR VALUE SEE TABLE.

1201	D9
1214	B10
2001	E7
2002	F7
2003	F4
2004	F9
3001	C3
3002	F5
3003	C6
3004	D6
3005	C6
3006	E5
3007	C5
3008	F4
3009	F7
3010	E9
3011	F9
3012	F10
3013	F4
3014	G8
3015	G9
3016	G9
3017	G11
6000-1	C4
6000-2	C4
6003	F3
6004	G7
7000-1	F8
7000-2	F10
7001	C6
F001	A9
F002	A9
F003	B9
F004	B9
F005	B9
F006	C9
F007	B9
I011	C5
I012	E4
I013	F4
I015	F7
I016	F8
I017	F9
I019	F10
I020	F9

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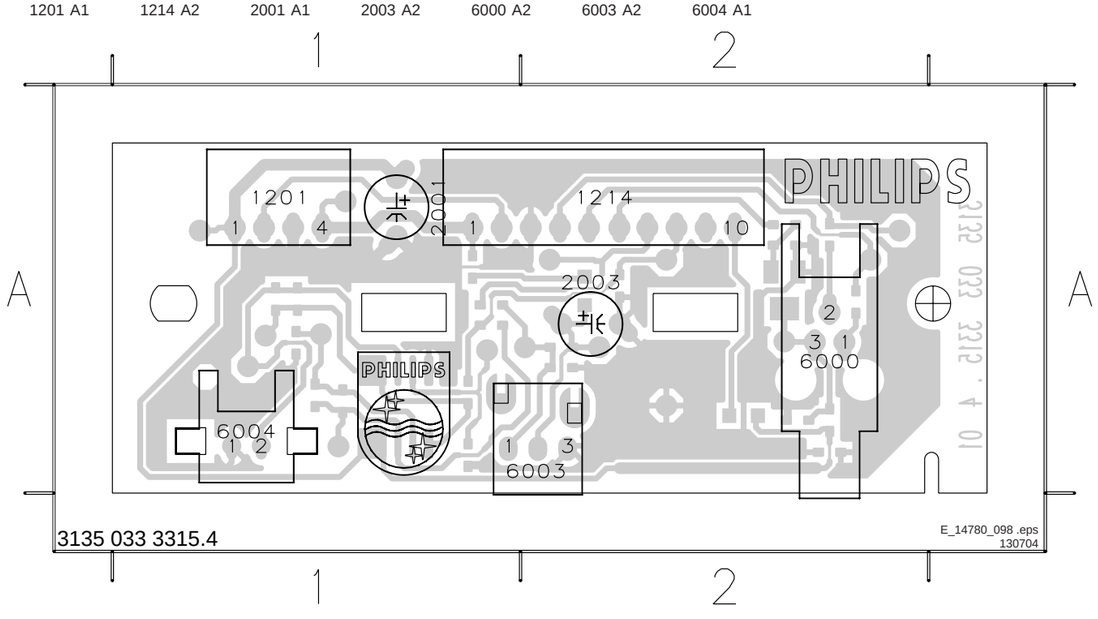
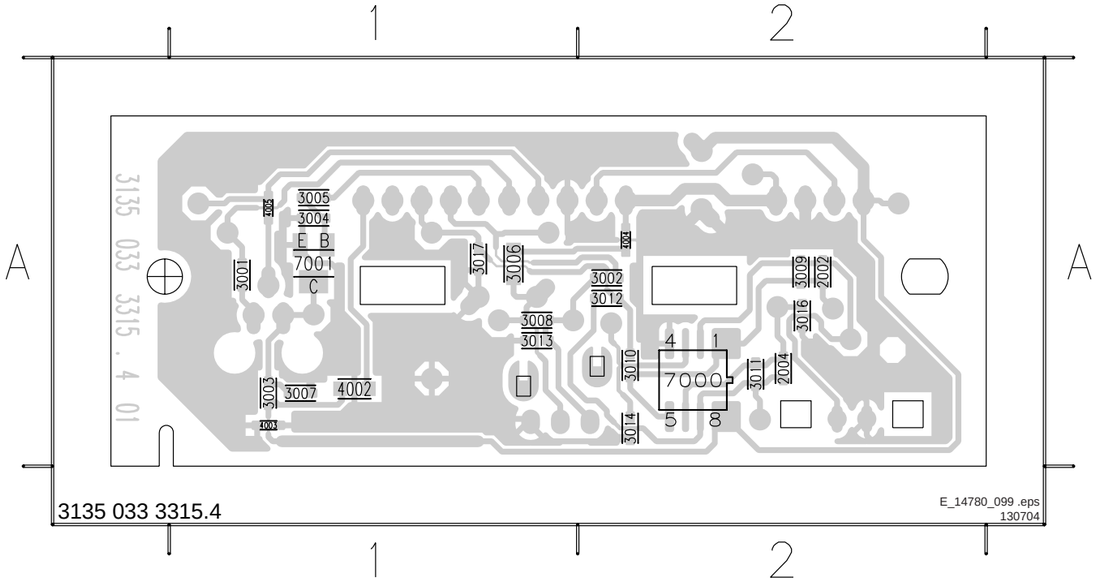
Layout LED Sensor Panel (Top Side)

1201 A1 1214 A2 2001 A1 2003 A2 6000 A2 6003 A2 6004 A1



Layout LED Sensor Panel (Bottom Side)

2002 A2	3002 A2	3005 A1	3008 A1	3011 A2	3014 A2	4002 A1	4005 A1
2004 A2	3003 A1	3006 A1	3009 A2	3012 A2	3016 A2	4003 A1	7000 A2
3001 A1	3004 A1	3007 A1	3010 A2	3013 A1	3017 A1	4004 A2	7001 A1



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Personal Notes:

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130204

LCoS Side Jack Panel

LCoS SIDE JACK PANEL

1302-1
YELLOW
YKC21-5834
F016
F017
F018
F019
F020
TCS7959-14-201
1301
5001
270n
5002
270n
6001 BZX284-C6V8
6002 BZX284-C6V8
6003 BZX284-C6V8
6004 BZX284-C6V8
3106 75R
3107 75R
1302-2
WHITE
YKC21-5834
1302-3
RED
YKC21-5834
F014
F015
3116 1K0
3118 1K0
2107 680p
2108 100p
2109 680p
2110 100p
3117 47K
3119 47K
6005 BZX284-C6V8
6006 BZX284-C6V8
6007 BZX284-C6V8
6008 BZX284-C6V8
F001
F002
F003
F004
F005
1335
B11B-EH-A
Y-FRONT-IN
C-FRONT-IN
L-FRONT-IN
FRONT-DETECT
R-FRONT-IN
TO SYSTEM BOARD
K 1
1337
106957
F006
TO SYSTEM BOARD
K 1
3115 100R
F013
1303
YKB21-5101A
F012
F011
3120 10R
3121 10R
3122 10K
3123 10R
3124 10R
3125 10K
2111 680p
2112 10n
2113 680p
2114 10n
F007
F008
F009
F010
1344
B5B-EH-A
HP_OUT_L
HP_OUT_R
+5VSTBY
VACATION-SW
TO SYSTEM BOARD
K 1
1300
SPUL
2115
100n
6009 BZX284-C6V8
6010 BZX284-C6V8
6011 BZX284-C6V8
6012 BZX284-C6V8

NOTES

1. CAPACITANCE VALUES ARE IN FARADS:
   m=MILI u=MICRO n=NANO p=PICO f=FEMTO
2. RESISTANCE VALUES ARE IN OHMS:
   R=OHM K=KILO M=MEGA G=GIGA T=TERA
3. SAFETY TRIANGLE REPRESENTS PCEC REPLACEMENT PART ONLY.
4. * FOR VALUE SEE TABLE.

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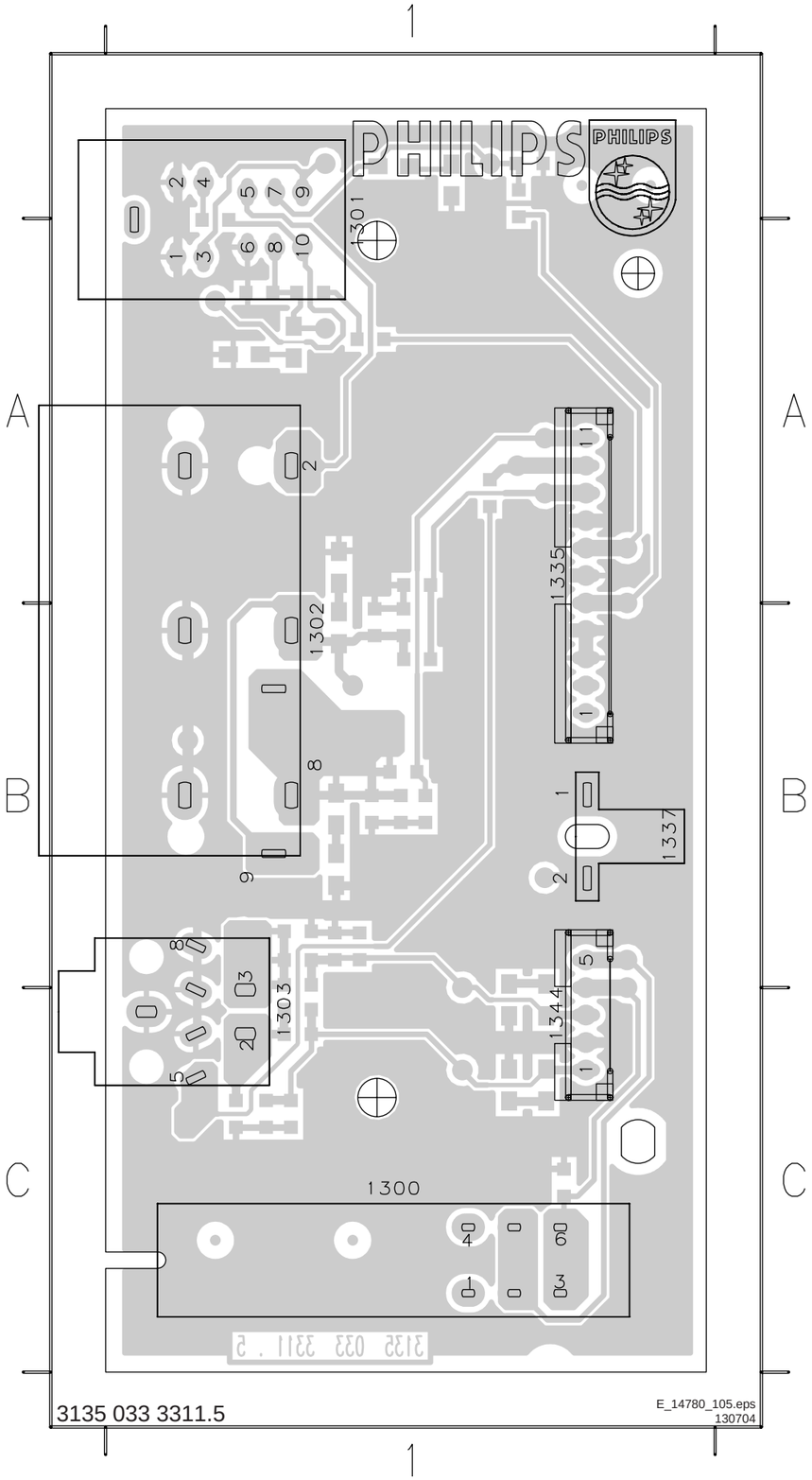
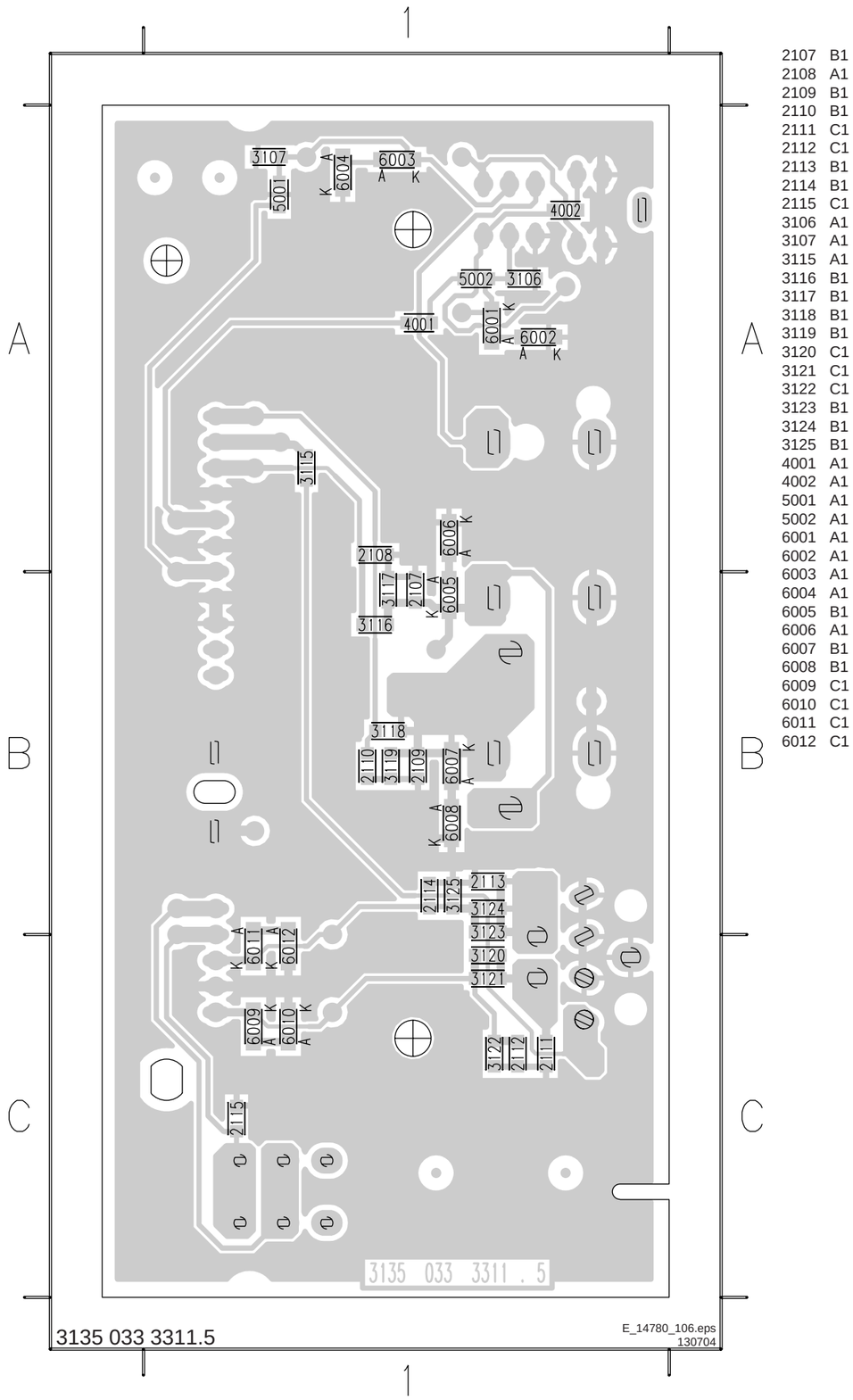
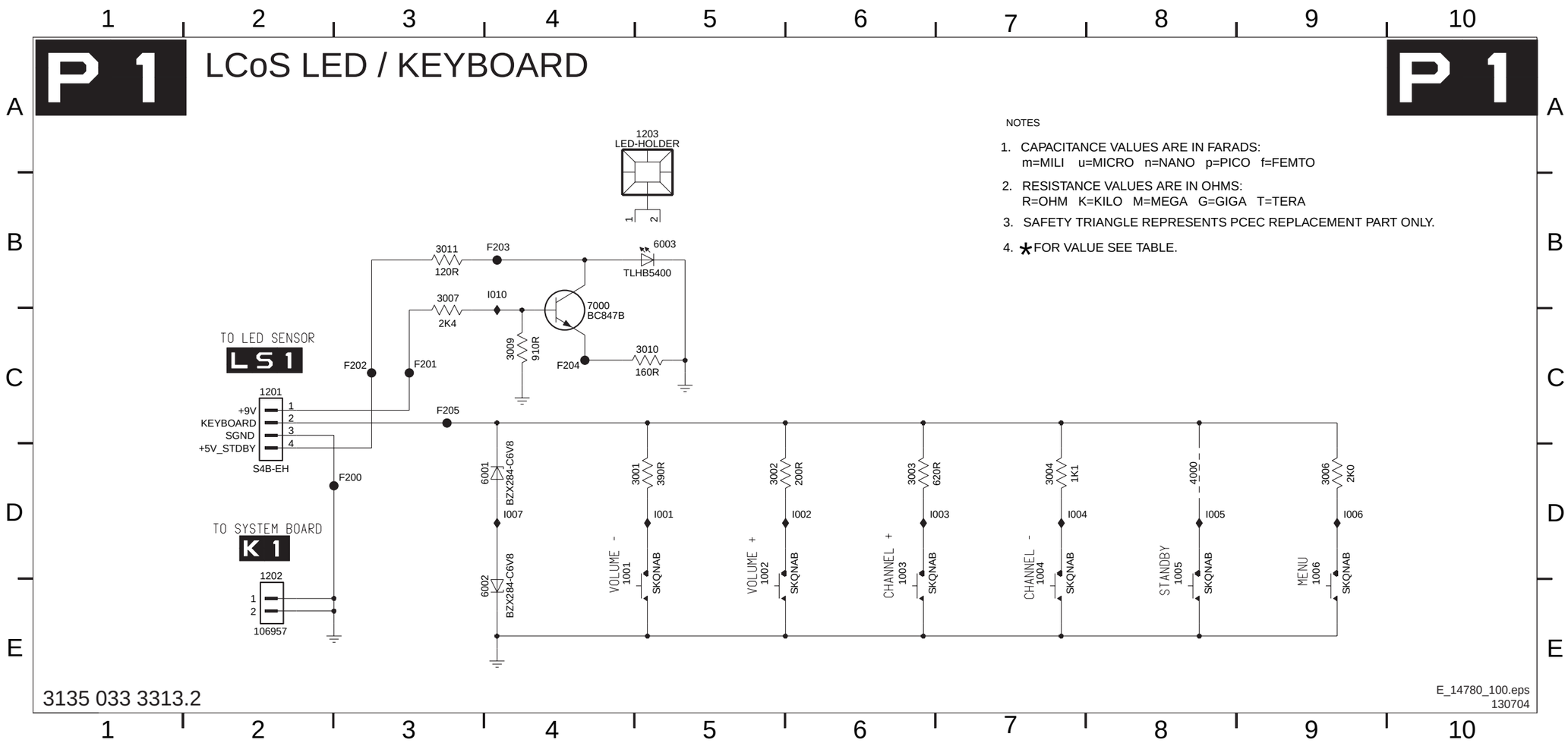
Layout LCoS Side Jack Panel (Top Side)



Layout LCoS Side Jack Panel (Bottom Side)

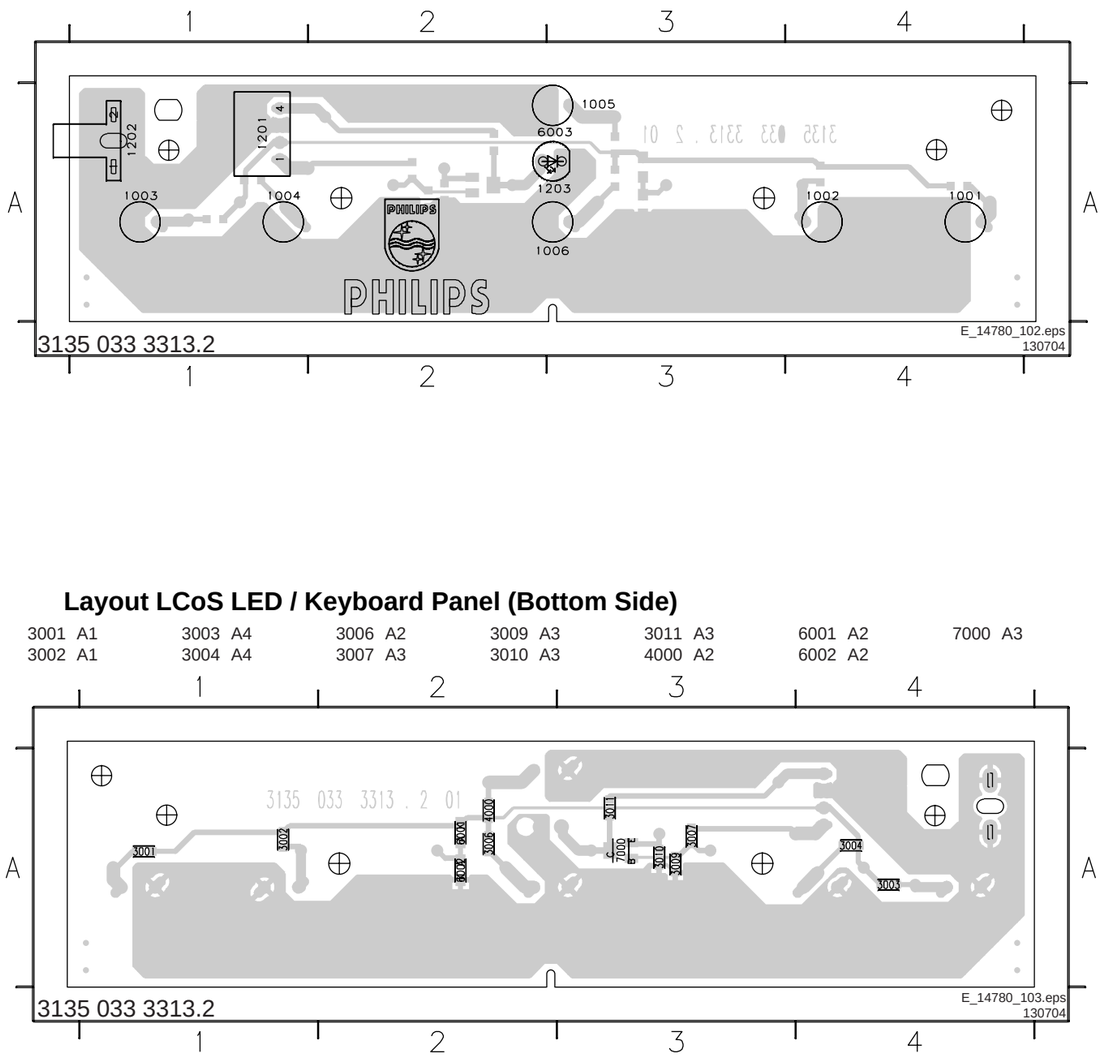


LCoS LED / Keyboard Panel



Layout LCoS LED / Keyboard Panel (Top Side)

1001 A4
1002 A4
1003 A1
1004 A1
1005 A3
1006 A3
1201 A1
1202 A1
1203 A3
6003 A3



Layout LCoS LED / Keyboard Panel (Bottom Side)

3001 A1
3002 A1
3003 A4
3004 A4
3006 A2
3007 A3
3009 A3
3010 A3
3011 A3
4000 A2
6001 A2
6002 A2
7000 A3

Personal Notes:

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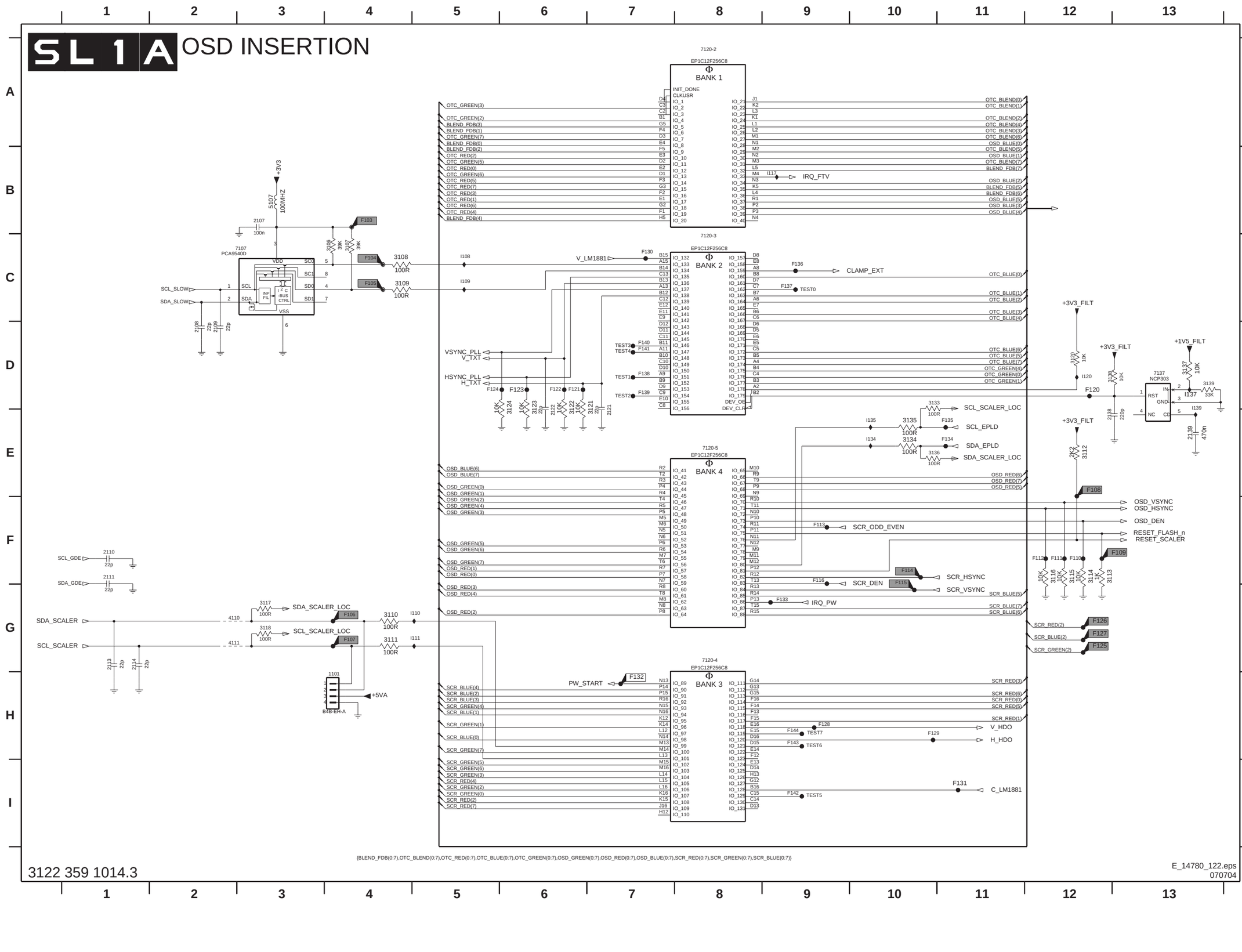
LCoS MSB: OSD Insertion

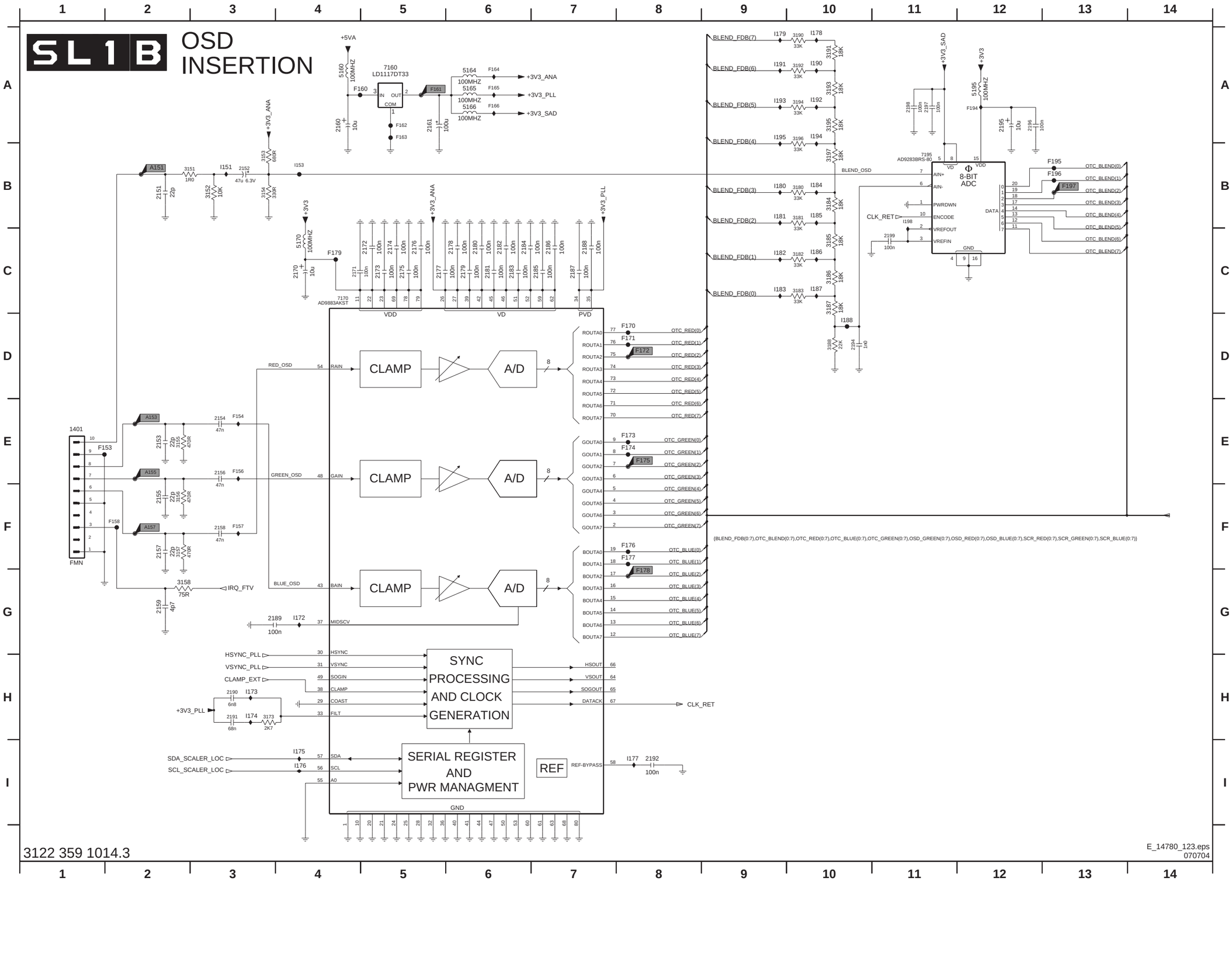
SL 1 A OSD INSERTION



1101 H4
2107 B3
2108 D2
2109 D2
2110 F1
2111 F1
2113 G1
2114 G1
2121 E7
2122 E6
2138 E12
2139 E13
3106 C4
3107 C4
3108 C4
3109 C4
3110 G4
3111 G4
3112 E12
3113 F12
3114 F12
3115 F12
3116 F12
3117 G3
3118 G3
3120 D12
3121 D7
3122 D6
3123 D6
3124 D6
3133 D10
3134 E10
3135 E10
3136 E10
3137 D13
3138 D12
3139 D13
4110 G2
4111 G2
5107 B3
7107 C3
7120-2 A8
7120-3 C8
7120-4 G8
7120-5 E8
7137 D13
F103 B4
F104 C4
F105 C4
F106 G4
F107 G4
F108 E12
F109 F13
F110 F12
F111 F12
F112 F12
F113 F9
F114 F10
F115 F10
F116 F9
F120 D12
F121 D6
F122 D6
F123 D6
F124 D5
F125 G12
F126 G12
F127 G12
F128 H9
F129 H10
F130 C7
F131 I11
F132 H7
F133 G9
F134 E11
F135 E11
F136 C9
F137 C9
F138 D7
F139 D7
F140 D7
F141 D7
F142 I9
F143 H9
F144 H9
I108 C5
I109 C5
I110 G5
I111 G5
I117 B9
I120 D12
I134 E10
I135 E10
I137 D13
I139 D13

LCoS MSB: OSD Insertion

SL1B OSD INSERTION



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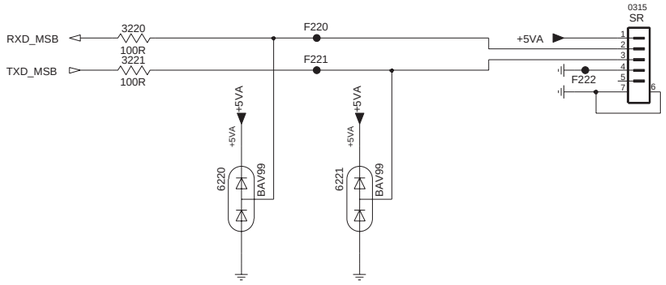
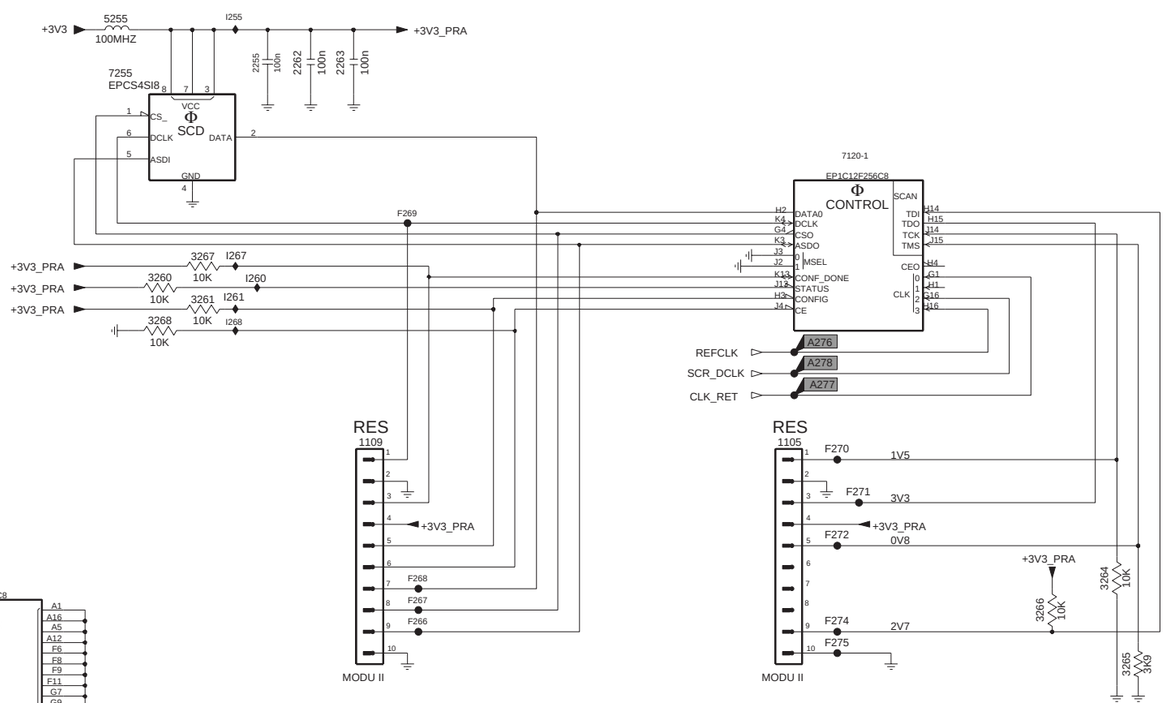
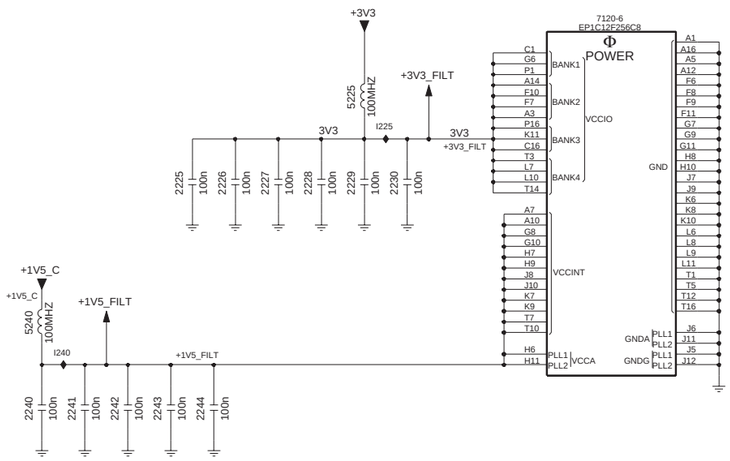
1401 E1
2151 B2
2152 B3
2153 E2
2154 E3
2155 F2
2156 E3
2157 F2
2158 F3
2159 G2
2160 A4
2161 A5
2170 C4
2171 C4
2172 C5
2173 C5
2174 C5
2175 C5
2176 C5
2177 C5
2178 C6
2179 C6
2180 C6
2181 C6
2182 C6
2183 C6
2184 C6
2185 C7
2186 C7
2187 C7
2188 C7
2189 G3
2190 H3
2191 H3
2192 I8
2194 D10
2195 A12
2196 A12
2197 A11
2198 A11
2199 C11
3151 B2
3152 B3
3153 B3
3154 B3
3155 E2
3156 F2
3157 F2
3158 G2
3173 H3
3180 B10
3181 B10
3182 C10
3183 C10
3184 B10
3185 C10
3186 C10
3187 C10
3188 D10
3190 A10
3191 A10
3192 A10
3193 A10
3194 A10
3195 A10
3196 A10
3197 B10
5160 A4
5164 A6
5165 A6
5166 A6
5170 C4
5195 A12
7160 A5
7170 C4
7195 B11
A151 B2
A153 E2
A155 E2
A157 F2
F153 E1
F154 E3
F156 E3
F157 F3
F158 F2
F160 A4
F161 A5
F162 A5
F163 A5
F164 A6
F165 A6
F166 A6
F170 D8
F171 D8
F172 D8
F173 E8
F174 E8
F175 E8
F176 F8
F177 F8
F178 G8
F179 C4
F194 A12
F195 B13
F196 B13
F197 B13
I151 B3
I153 B4
I172 G4
I173 H3
I174 H3
I175 I4
I176 I4
I177 I8
I178 A10
I179 A9
I180 B9
I181 B9
I182 C9
I183 C9
I184 B10
I185 B10
I186 C10
I187 C10
I188 D10
I190 A10
I191 A9
I192 A10
I193 A9
I194 A10
I195 A9
I198 B11

LCoS MSB: OSD Insertion

SL1C OSD INSERTION







0315 B5
1105 E11
1109 E8
2225 G2
2226 G2
2227 G3
2228 G3
2229 G3
2230 G4
2240 I1
2241 I1
2242 I2
2243 I2
2244 I2
2255 C7
2262 C7
2263 C7
3220 B2
3221 C2
3260 D6
3261 D7
3264 F13
3265 G13
3266 F12
3267 D7
3268 D6
5225 G3
5240 H1
5255 B6
6220 C2
6221 C3
7120-1 C11
7120-6 F5
7255 C6
A276 E11
A277 E11
A278 E11
F220 B3
F221 C3
F222 C5
F266 F8
F267 F8
F268 F8
F269 D8
F270 E11
F271 F11
F272 F11
F274 F11
F275 G11
I225 G4
I240 H1
I255 B7
I260 D7
I261 D7
I267 D7
I268 D7

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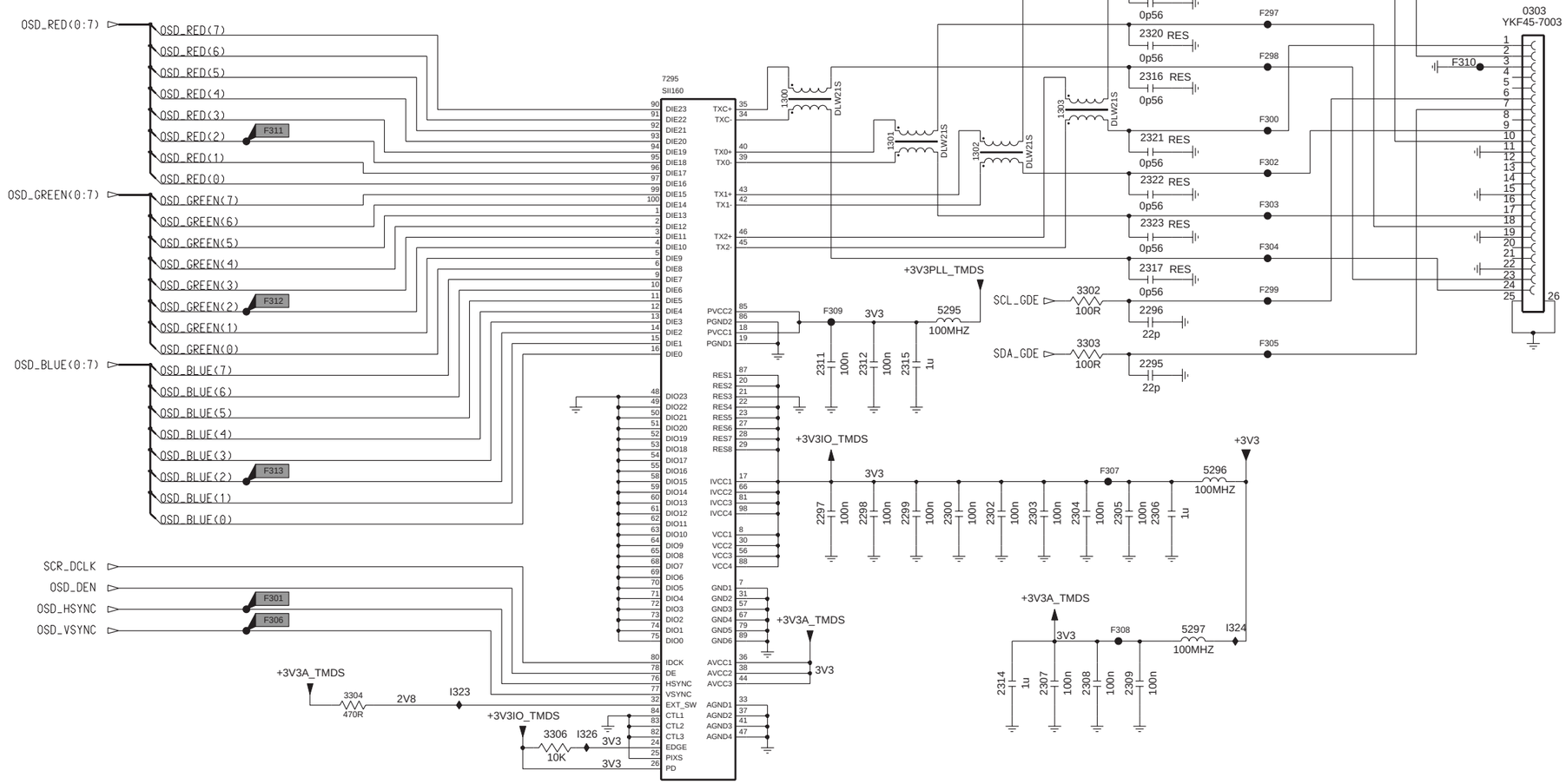
LCoS MSB: TMDS-TX

SL2 TMDS - TX



0303 B12
1300 C7
1301 C7
1302 C8
1303 C8
2295 D9
2296 D9
2297 E7
2298 E7
2299 E7
2300 E8
2302 E8
2303 E8
2304 E9
2305 E9
2306 E9
2307 F8
2308 F9
2309 F9
2311 D7
2312 D7
2314 F8
2315 D7
2316 B9
2317 D9
2318 B9
2319 B9
2320 B9
2321 C9
2322 C9
2323 C9
3302 D9
3303 D9
3304 G4
3306 G5
5295 D8
5296 E9
5297 F9
7295 B6
F295 A10
F296 B10
F297 B10
F298 B10
F299 D10
F300 C10
F301 F3
F302 C10
F303 C10
F304 D10
F305 D10
F306 F3
F307 E9
F308 F9
F309 D7
F310 B11
F311 C3
F312 D3
F313 E3
I323 G4
I324 F10
I326 G5

3122 359 1015.3

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LCoS MSB: Scaler 1

SL3A SCALER - 1

7345 AD9888KS

SYNC PROCESSING AND CLOCK GENERATION

SERIAL REGISTER AND POWER MANAGMENT

A/D

CLAMP

REF

3122 359 1016.3

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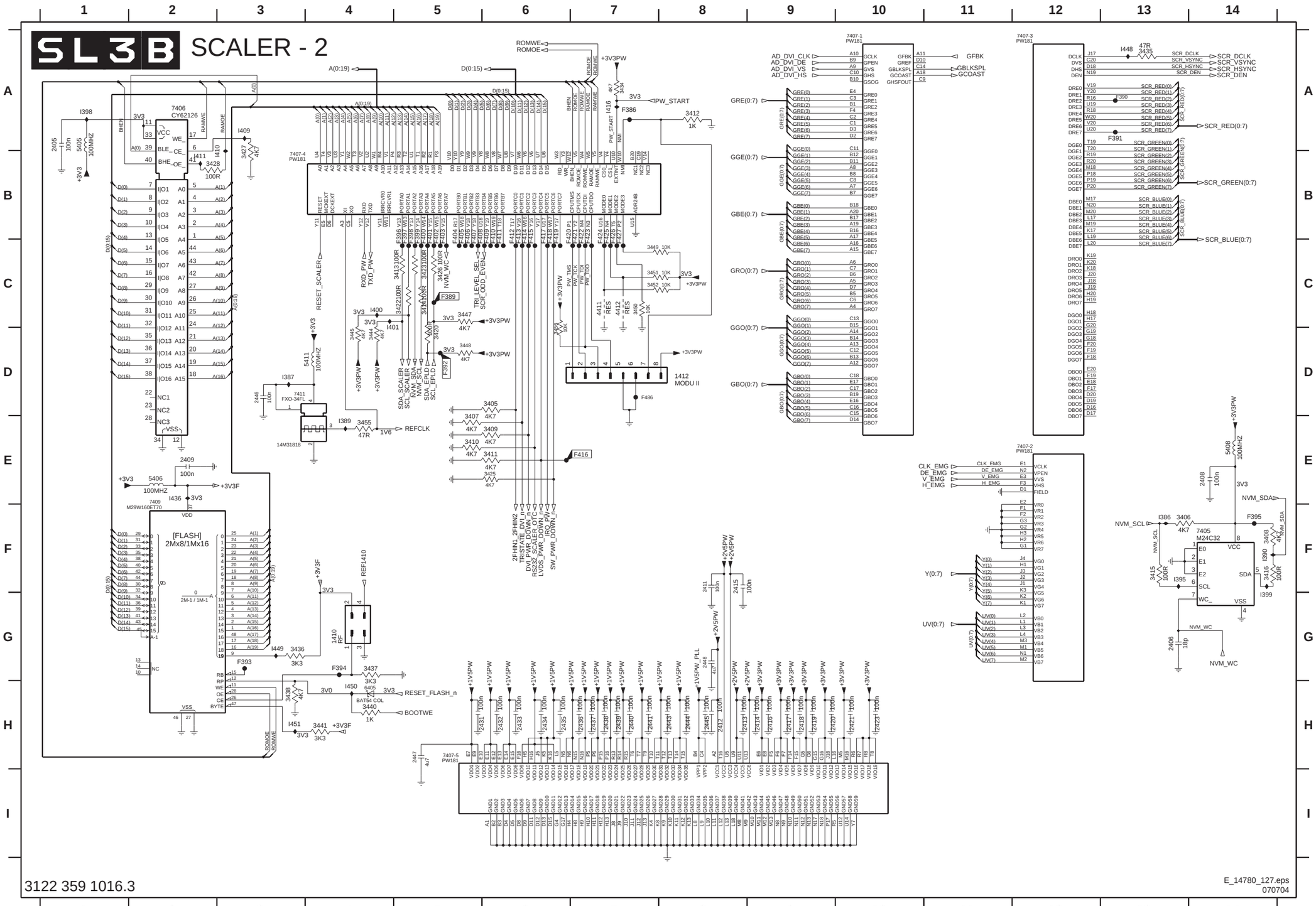
2345 B12
2346 B12
2347 B12
2348 C3
2349 C3
2350 C3
2352 D3
2354 E3
2355 E3
2357 E3
2358 E3
2359 E3
2360 E3
2361 B3
2362 F3
2363 F3
2364 F3
2365 F3
2366 F3
2367 G3
2368 G3
2369 G3
2370 G3
2371 G3
2372 H6
2373 H7
2374 H5
2375 H9
2377 H2
2378 H3
2379 H7
2380 H8
2381 H6
2382 H9
2383 H10
2384 I10
2385 I4
2386 I4
3345 B11
3346 B11
3347 B11
3348 B11
3349 H9
3350 H10
3351 H10
3352 H10
4349 H3
5345 H1
5346 H3
5347 I3
5348 I3
7345 B3
7346 H2
7347-A A12
7347-B A1
7347-C A2
7347-D A3
A352 H5
A354 H6
A356 H7
F345 H2
F346 H3
F347 I4
F348 I10
F349 I10
F350 I4
F351 I8
F353 H6
F355 H7
F357 H8
F358 I8
I345 B11
I346 B11
I347 B11
I348 B11
I349 B12
I350 B12
I351 B12
I358 H9
I359 H9
I360 H9
I361 H10
I362 H10
I363 H10
I364 H10
I365 A11
I366 A11
I367 A11
I368 A11
I370 H4
I371 H4

LCoS MSB: Scaler 2

SL3B SCALER - 2



3122 359 1016.3

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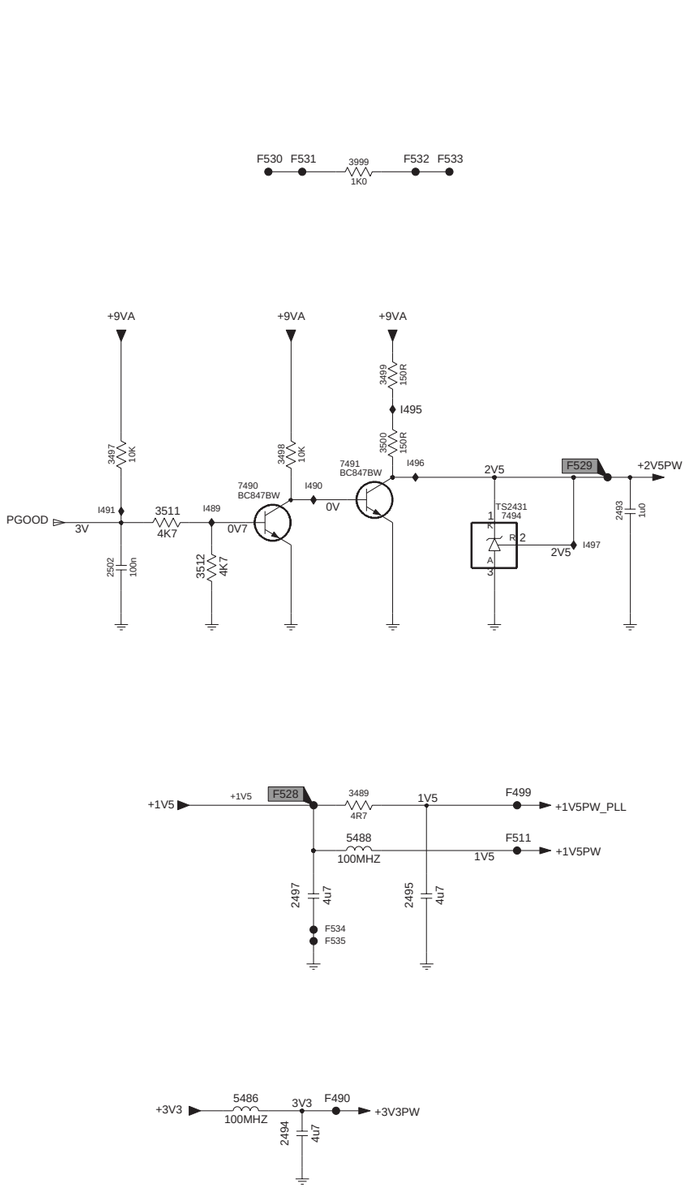
1410 G4
1412 D8
2405 A1
2406 G13
2408 E14
2409 E2
2411 F8
2412 H8
2413 H8
2414 H9
2415 F8
2416 H9
2417 H9
2418 H9
2419 H9
2420 H9
2421 H10
2423 H10
2431 H5
2432 H6
2433 H6
2434 H6
2435 H6
2436 H7
2437 H7
2438 H7
2439 H7
2440 H7
2441 H7
2443 H8
2444 H8
2445 H8
2446 D3
2447 H5
2448 G8
3405 D6
3406 F13
3407 E5
3408 F14
3409 E6
3410 E5
3411 E6
3412 A8
3413 C5
3414 C5
3415 F13
3416 F14
3420 D5
3422 C5
3423 C5
3425 E6
3426 C5
3427 B3
3428 B2
3434 A7
3435 A13
3436 G3
3437 G4
3438 H3
3440 H4
3441 H4
3444 D4
3445 D4
3447 C5
3448 D5
3449 C7
3450 C7
3451 C7
3452 C7
3455 E4
3456 D6
4411 C7
4412 C7
5405 A1
5406 E2
5408 E14
5411 D4
6405 H4
7405 F14
7406 A2
7407-1 A10
7407-2 E12
7407-3 A12
7407-4 B4
7407-5 H5
7409 E2
7411 D4
F386 A7
F389 C5
F390 A13
F391 A13
F392 D5
F393 G3
F394 G4
F395 F14
F396 B5
F397 B5
F398 B5
F399 B5
F400 B5
F401 B5
F402 B5
F403 B5
F404 B5
F405 B5
F406 B5
F407 B5
F408 B6
F409 B6
F410 B6
F411 B6
F412 B6
F413 B6
F414 B6
F415 B6
F416 E7
F417 B6
F418 B6
F419 B6
F420 B7
F421 B7
F422 B7
F423 B7
F424 B7
F425 B7
F426 B7
F427 B7
F486 D7
I386 F13
I387 D3
I389 E4
I390 F14
I395 F13
I398 A1
I399 G14
I400 C4
I401 C4
I409 A3
I410 B3
I411 B2
I416 A7
I436 E2
I448 A13
I449 G3
I450 H4
I451 H3

LCoS MSB: Scaler 3

SL3C SCALER - 3



1486 E7
2492 C7
2493 D5
2494 H2
2495 G3
2497 G2
2502 D1
3484 B7
3485 B8
3486 C6
3487 C7
3488 C8
3489 F3
3490 C8
3492 C7
3497 D1
3498 D2
3499 C3
3500 D3
3505 F8
3506 F8
3507 F8
3508 G8
3511 D2
3512 D2
3999 B3
4484 A7
4485 A7
5486 H2
5488 F3
6485 C8
7484 A7
7486 C7
7487 C8
7490 D2
7491 D3
7494 D4
F428 E6
F471 B6
F473 C6
F480 E6
F481 E8
F482 E6
F483 E8
F484 E6
F485 E8
F487 E8
F488 E6
F489 E8
F490 H3
F491 E6
F492 E8
F493 F6
F494 F8
F495 F6
F496 F8
F497 F6
F498 F8
F499 F4
F500 F8
F501 F6
F502 F8
F503 F6
F504 F8
F505 F8
F506 G8
F507 G6
F508 G8
F509 G7
F511 F4
F512 G6
F513 G8
F514 G6
F515 G8
F516 G8
F517 G6
F518 G8
F519 H6
F520 H8
F521 H6
F522 H8
F523 H7
F524 H6
F525 H8
F526 H6
F527 H8
F528 F2
F529 D4
F530 B2
F531 B2
F532 B3
F533 B3
F534 G3
F535 G3
I478 C7
I479 C8
I481 C7
I489 D2
I490 D3
I491 D1
I495 C3
I496 D3
I497 D4
I498 B8
I499 C9

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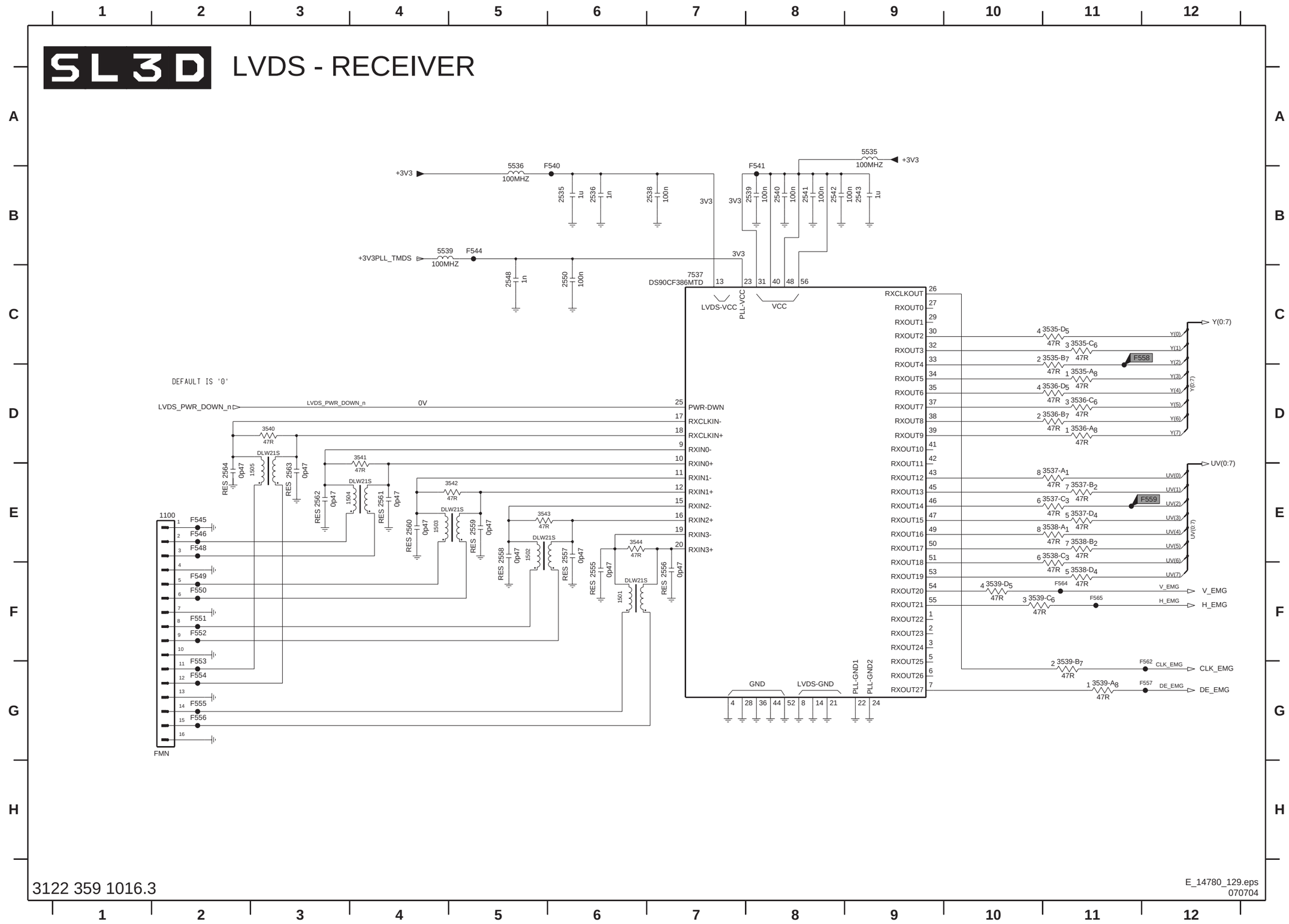
LCoS MSB: LVDS Receiver

LVDS - RECEIVER



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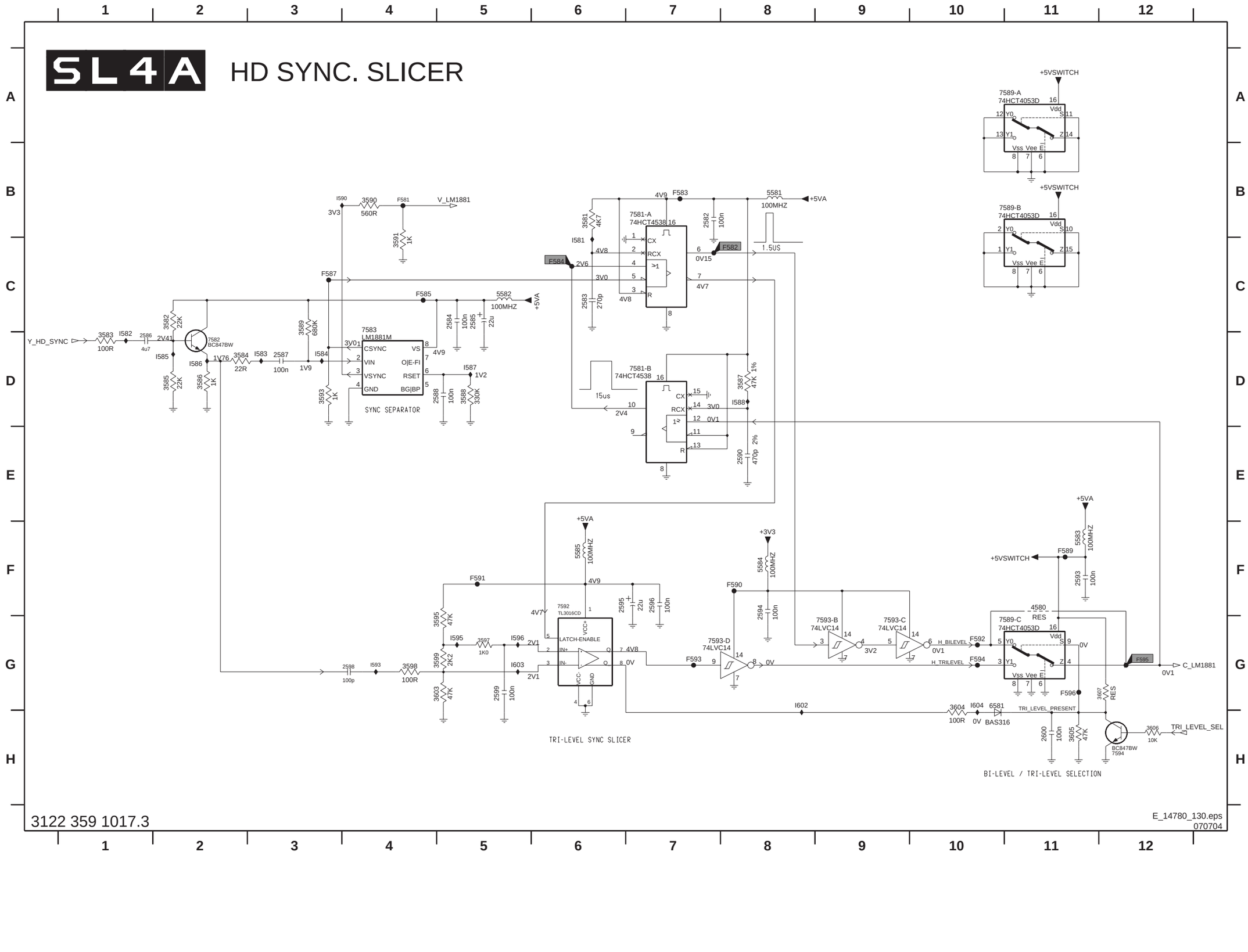
1100 E2
1501 F6
1502 E5
1503 E4
1504 E3
1505 E2
2535 B6
2536 B6
2538 B7
2539 B8
2540 B8
2541 B8
2542 B8
2543 B9
2548 C5
2550 C6
2555 F6
2556 F7
2557 E6
2558 E5
2559 E5
2560 E4
2561 E4
2562 E3
2563 E3
2564 E2
3535-A D11
3535-B C11
3535-C C11
3535-D C11
3536-A D11
3536-B D11
3536-C D11
3536-D D11
3537-A E11
3537-B E11
3537-C E11
3537-D E11
3538-A E11
3538-B E11
3538-C E11
3538-D F11
3539-A G11
3539-B G11
3539-C F10
3539-D F10
3540 D3
3541 D4
3542 E5
3543 E5
3544 E6
5535 A9
5536 B5
5539 B4
7537 C7
F540 B6
F541 B8
F544 B5
F545 E2
F546 E2
F548 E2
F549 F2
F550 F2
F551 F2
F552 F2
F553 G2
F554 G2
F555 G2
F556 G2
F557 G12
F558 C11
F559 E12
F562 G12
F564 F11
F565 F11

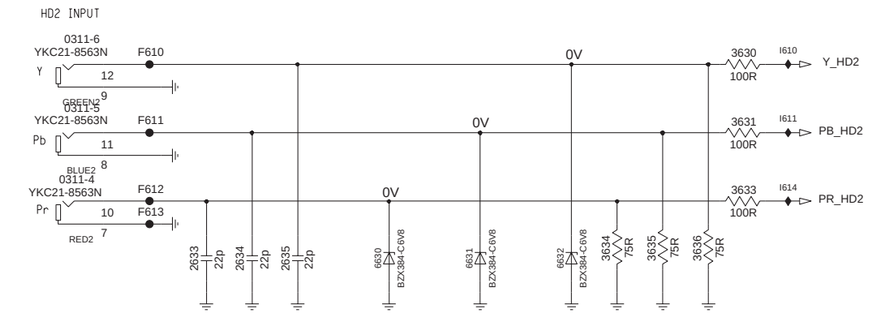
LCoS MSB: HD Sync Slicer

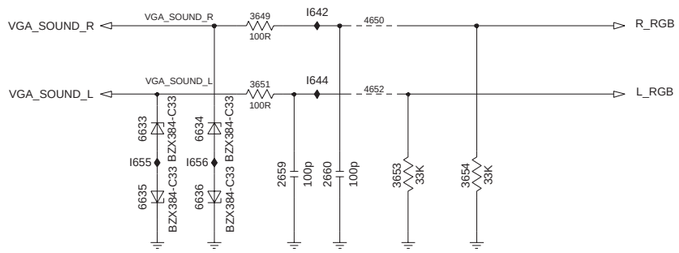


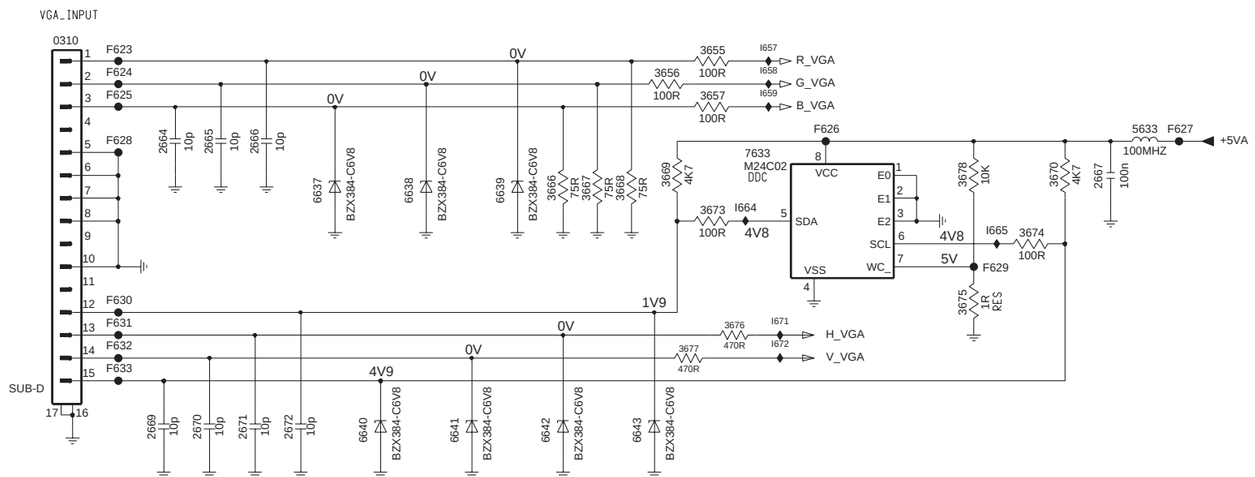
2582 B7
2583 C6
2584 C5
2585 C5
2586 D1
2587 D3
2588 D5
2590 E8
2593 F11
2594 F8
2595 F6
2596 F7
2598 G4
2599 G5
2600 H11
3581 B6
3582 C2
3583 D1
3584 D2
3585 D2
3586 D2
3587 D8
3588 D5
3589 C3
3590 B4
3591 C4
3593 D3
3595 G5
3597 G5
3598 G4
3599 G5
3603 G5
3604 G10
3605 H11
3606 H12
3607 G12
4580 F11
5581 B8
5582 C5
5583 F11
5584 F8
5585 F6
6581 G10
7581-A A11
7581-B B11
7589-C G11
7592 F6
7593-B G9
7593-C G9
7593-D G7
7594 H12
F581 B4
F582 C8
F583 B7
F584 C6
F585 C4
F587 C3
F589 F11
F590 F8
F591 F5
F592 G10
F593 G7
F594 G10
F595 G12
F596 G11
I581 C6
I582 D1
I583 D3
I584 D3
I585 D2
I586 D2
I587 D5
I588 D8
I590 B3
I593 G4
I595 G5
I596 G5
I602 G8
I603 G5
I604 G10

LCoS MSB: HD2 + VGA Input

SL4B HD2 + VGA INPUT



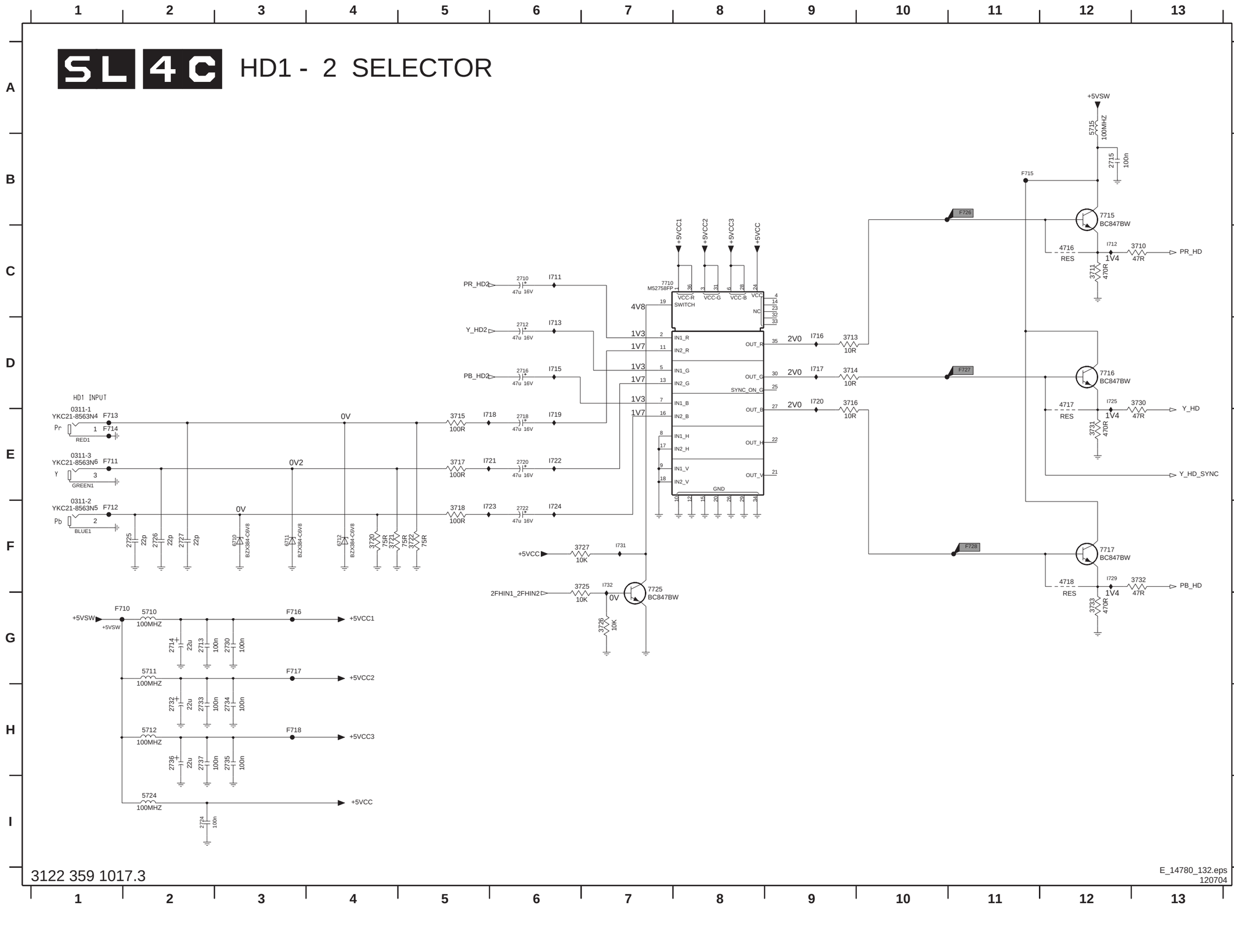




E_14780_131.eps
070704

0310 F4
0311-4 B4
0311-5 B4
0311-6 A4
2633 C5
2634 C5
2635 C6
2659 E6
2660 E6
2664 G5
2665 G5
2666 G5
2667 G11
2669 I5
2670 I5
2671 I5
2672 I6
3630 A8
3631 B8
3633 B8
3634 C8
3635 C8
3636 C8
3649 D6
3651 E6
3653 E7
3654 E7
3655 F8
3656 F8
3657 G8
3666 G7
3667 G7
3668 G8
3669 G8
3670 G10
3673 G8
3674 G10
3675 H10
3676 H8
3677 H8
3678 G10
4650 D7
4652 E7
5633 G11
6630 C6
6631 C7
6632 C7
6633 E5
6634 E5
6635 E5
6636 E5
6637 G6
6638 G6
6639 G7
6640 I6
6641 I7
6642 I7
6643 I8
7633 G8
F610 A5
F611 B5
F612 B5
F613 B5
F623 F4
F624 F4
F625 G4
F626 G9
F627 G11
F628 G4
F629 H10
F630 H4
F631 H4
F632 H4
F633 H4
I610 A9
I611 B9
I614 B9
I642 D6
I644 E6
I655 E5
I656 E5
I657 F9
I658 F9
I659 G9
I664 G8
I665 G10
I671 H9
I672 H9

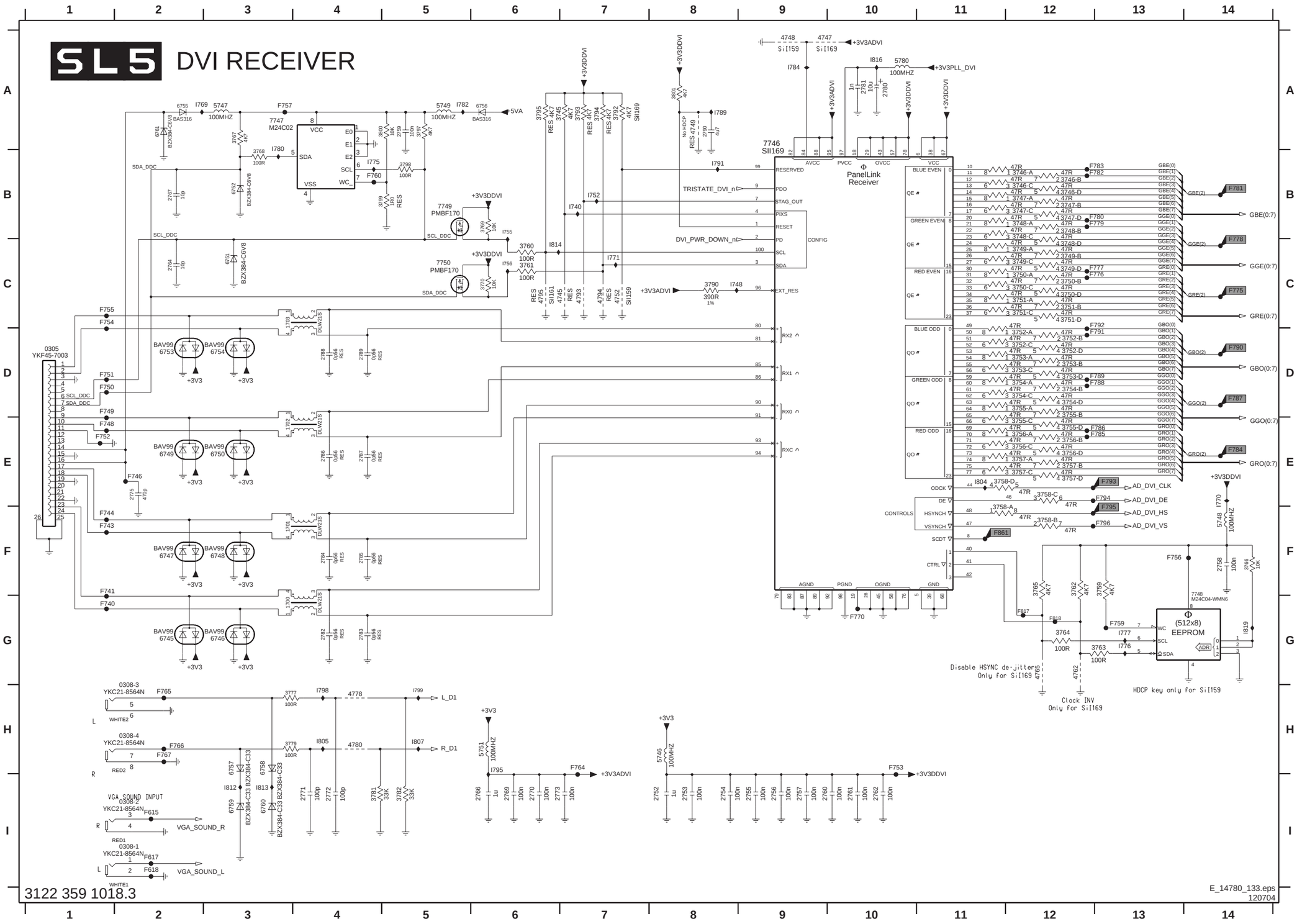
LCoS MSB: HD1 - 2 Selector



0311-1 D1
0311-2 E1
0311-3 E1
2710 C6
2712 D6
2713 G2
2714 G2
2715 B12
2716 D6
2718 E6
2720 E6
2722 F6
2724 I2
2725 F2
2726 F2
2727 F2
2730 G3
2732 H2
2733 H2
2734 H3
2735 H3
2736 H2
2737 H2
3710 C13
3711 C12
3713 D9
3714 D9
3715 E5
3716 D9
3717 E5
3718 F5
3720 F4
3721 F4
3722 F5
3725 F6
3726 G7
3727 F6
3730 D13
3731 E12
3732 F13
3733 G12
4716 C12
4717 D12
4718 F12
5710 G2
5711 G2
5712 H2
5715 A12
5724 I2
6710 F3
6711 F3
6712 F4
7710 C7
7715 B12
7716 D12
7717 F12
7725 F7
F710 G1
F711 E1
F712 F1
F713 E1
F714 E1
F715 B11
F716 G3
F717 G3
F718 H3
F726 B11
F727 D11
F728 F11
I711 C6
I712 C12
I713 D6
I715 D6
I716 D9
I717 D9
I718 E5
I719 E6
I720 D9
I721 E5
I722 E6
I723 F5
I724 F6
I725 D12
I729 F12
I731 F7
I732 F7

LCoS MSB: DVI Receiver

SL5 DVI RECEIVER



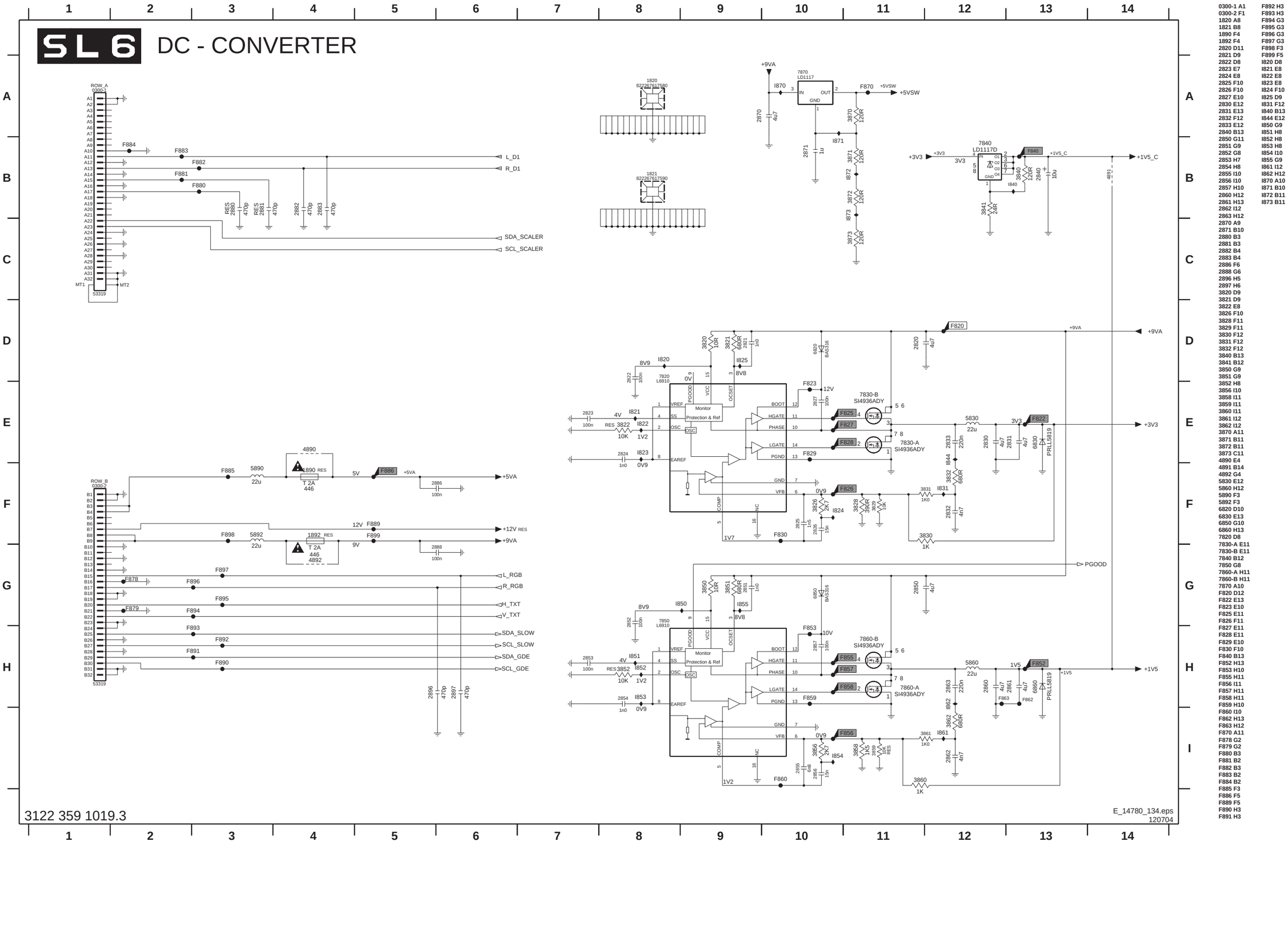
3122 359 1018.3

E_14780_133.eps
120704

0305 D1	4745 C6	3746-A B12	F617 I2
0308-1 I2	4747 A9	3746-B B12	F618 I2
0308-2 I2	4748 A9	3746-C B12	F740 G1
0308-3 G2	4749 A8	3746-D B12	F741 F1
0308-4 H2	4752 C7	3747-A B12	F743 F1
1700 G3	4762 G12	3747-B B12	F744 F1
1701 F3	4765 G12	3747-C B12	F746 E2
1702 E3	4778 H4	3747-D B12	F748 E1
1703 C3	4780 H4	3748-A B12	F749 D1
2752 I8	4793 C7	3748-B B12	F750 D1
2753 I8	4794 C7	3748-C B12	F751 D1
2754 I8	4795 C6	3748-D C12	F752 E1
2755 I9	5746 H8	3749-A C12	F753 H10
2756 I9	5747 A3	3749-B C12	F754 C1
2757 I9	5748 F14	3749-C C12	F755 C1
2758 F14	5749 A5	3749-D C12	F756 F13
2759 A5	5751 H6	3750-A C12	F757 A3
2760 I9	5780 A10	3750-B C12	F759 G13
2761 I10	6745 G2	3750-C C12	F760 B4
2762 I10	6746 G3	3750-D C12	F764 H7
2764 C2	6747 F2	3751-A C12	F765 H2
2766 I6	6748 F3	3751-B C12	F766 H2
2767 B2	6749 E2	3751-C C12	F767 H2
2769 I6	6750 E3	3751-D C12	F770 G10
2770 I6	6751 C3	3752-A D12	F775 C14
2771 I4	6752 B3	3752-B D12	F776 C13
2772 I4	6753 D2	3752-C D12	F777 C13
2773 I6	6754 D3	3752-D D12	F778 C14
2775 E2	6755 A2	3753-A D12	F779 B13
2780 A10	6756 A6	3753-B D12	F780 B13
2781 A10	6757 H3	3753-C D12	F781 B14
2782 G4	6758 H3	3753-D D12	F782 B13
2783 G4	6759 I3	3754-A D12	F783 B13
2784 F4	6760 I3	3754-B D12	F784 E14
2785 F4	6761 A2	3754-C D12	F785 E13
2786 E4	7746 A9	3754-D D12	F786 E13
2787 E4	7747 A3	3755-A D12	F787 D14
2788 D4	7748 G14	3755-B D12	F788 D13
2789 D4	7749 B5	3755-C E12	F789 D13
2790 A8	7750 C5	3755-D E12	F790 D14
3745 A7	F615 I2	3756-A E12	F791 D13
		3756-B E12	F792 C13
		3756-C E12	F793 E13
		3756-D E12	F794 E13
		3757-A E12	F795 F13
		3757-B E12	F796 F13
		3757-C E12	F817 G12
		3757-D E12	F818 G12
		3758-A F11	F861 F11
		3758-B F12	I740 B7
		3758-C E12	I748 C8
		3758-D E11	I752 B7
		3759 F13	I755 B6
		3760 C6	I756 C6
		3761 C6	I769 A2
		3762 F12	I770 E14
		3763 G13	I771 C7
		3764 G12	I775 B4
		3765 F12	I776 G13
		3766 F14	I777 G13
		3767 A3	I780 A3
		3768 B3	I782 A5
		3769 B6	I784 A9
		3770 C6	I789 A8
		3777 H3	I791 B8
		3779 H3	I795 H6
		3781 I4	I798 H4
		3782 I5	I799 H5
		3790 C8	I804 E11
		3792 A7	I805 H4
		3793 A7	I807 H5
		3794 A7	I812 I3
		3795 A6	I813 I3
		3797 A5	I814 C6
		3798 B5	I816 A10
		3799 B5	I819 G14
		3800 A5	
		3801 A8	

LCoS MSB: DC-Converter

SL6 DC - CONVERTER



3122 359 1019.3

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0300-1 A1
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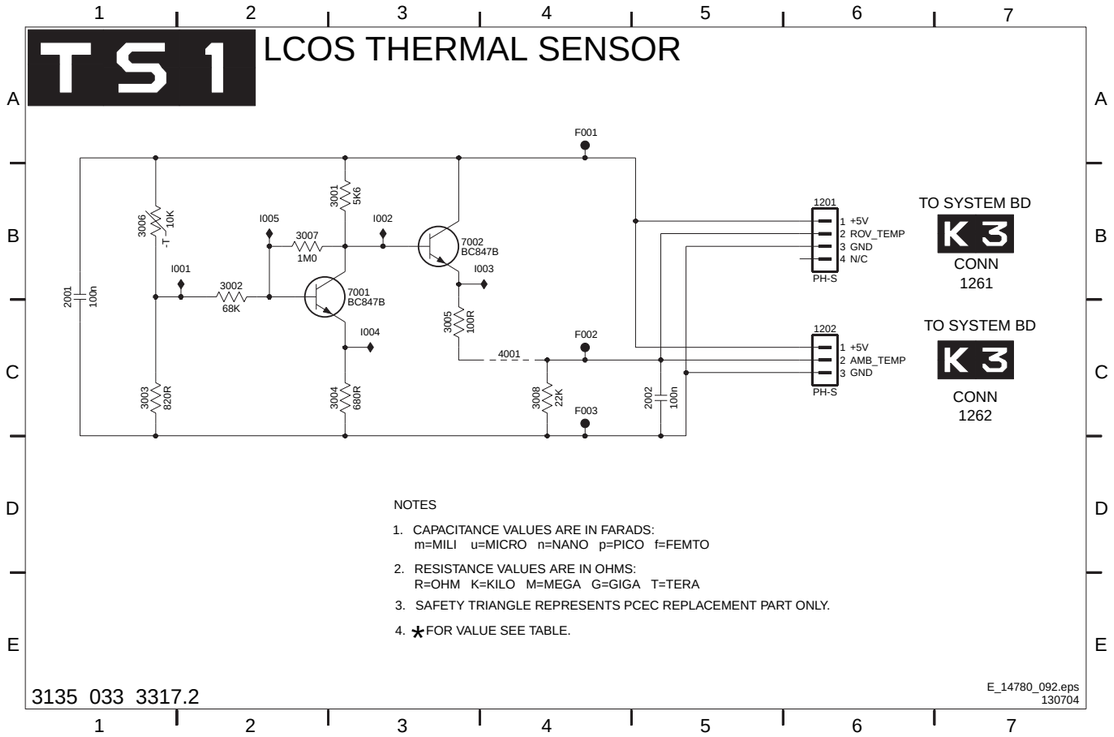
1821 B8
1890 F4
1892 F4
2820 D11
2821 D9
2822 D8
2823 E7
2824 E8
2825 F10
2826 F10
2827 E10
2830 E12
2831 E13
2832 F12
2833 E12
2840 B13
2850 G11
2851 G9
2852 G8
2853 H7
2854 H8
2855 I10
2856 I10
2857 H10
2860 H12
2861 H13
2862 I12
2863 H12
2870 A9
2871 B10
2880 B3
2881 B3
2882 B4
2883 B4
2886 F6
2888 G6
2896 H5
2897 H6
3820 D9
3821 D9
3822 E8
3826 F10
3828 F11
3829 F11
3830 F12
3831 F12
3832 F12
3840 B13
3841 B12
3850 G9
3851 G9
3852 H8
3856 I10
3858 I11
3859 I11
3860 I11
3861 I12
3862 I12
3870 A11
3871 B11
3872 B11
3873 C11
4890 E4
4891 B14
4892 G4
5830 E12
5860 H12
5890 F3
5892 F3
6820 D10
6830 E13
6850 G10
6860 H13
7820 D8
7830-A E11
7830-B E11
7840 B12
7850 G8
7860-A H11
7860-B H11
7870 A10
F820 D12
F822 E13
F823 E10
F825 E11
F826 F11
F827 E11
F828 E11
F829 E10
F830 F10
F840 B13
F852 H13
F853 H10
F855 H11
F856 I11
F857 H11
F858 H11
F859 H10
F860 I10
F862 H13
F863 H12
F870 A11
F878 G2
F879 G2
F880 B3
F881 B2
F882 B3
F883 B2
F884 B2
F885 F3
F886 F5
F889 F5
F890 H3
F891 H3
F892 H3
F893 H3
F894 G3
F895 G3
F896 G3
F897 G3
F898 F3
F899 F5
I820 D8
I821 E8
I822 E8
I823 E8
I824 F10
I825 D9
I831 E12
I840 B13
I844 E12
I850 G9
I851 H8
I852 H8
I854 I10
I855 G9
I861 I12
I862 H12
I870 A10
I871 B10
I872 B11
I873 B11

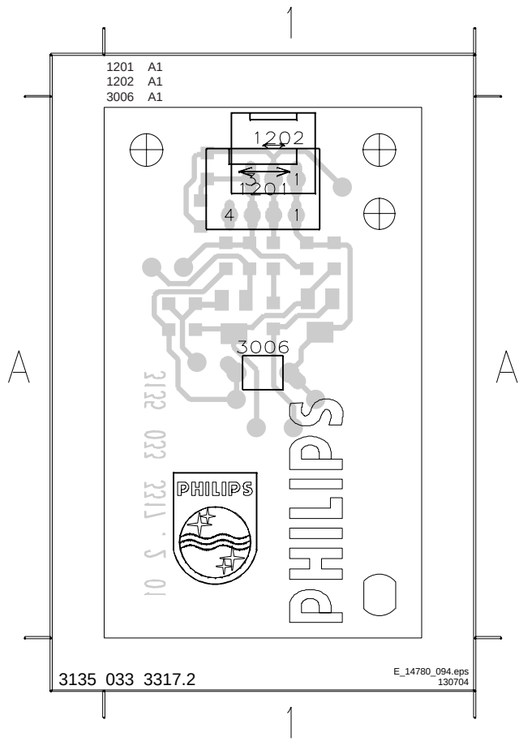
Thermo Sensor Panel

1201 E9
1202 E9
2001 E5
2002 F9
3001 D6
3002 E6
3003 F5
3004 F6
3005 E7
3006 E5
3007 E6
3008 F8
4001 F8
7001 E6
7002 E7
F001 D8
F002 E8
F003 F8
I001 E5
I002 E7
I003 E7
I004 E7
I005 E6



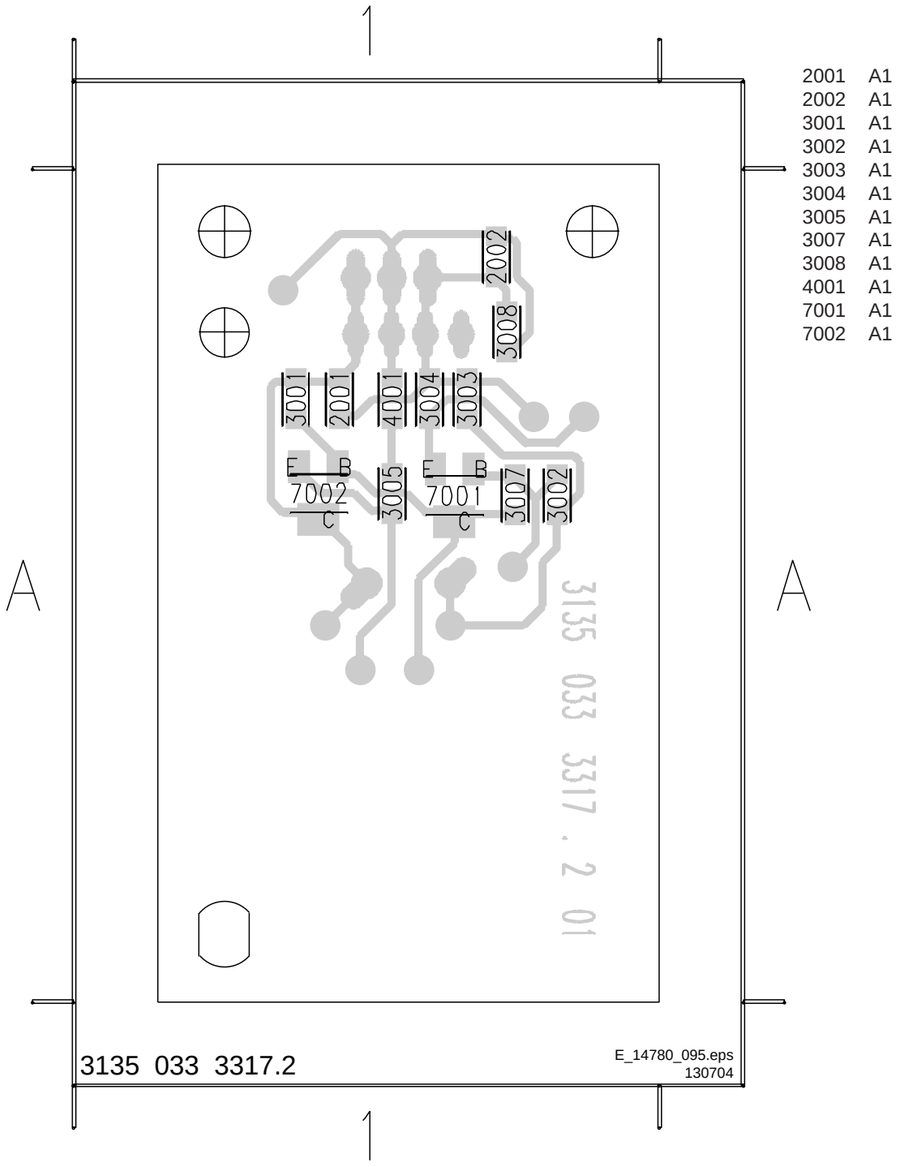
Layout Thermo Sensor Panel (Top Side)

1201 A1
1202 A1
3006 A1



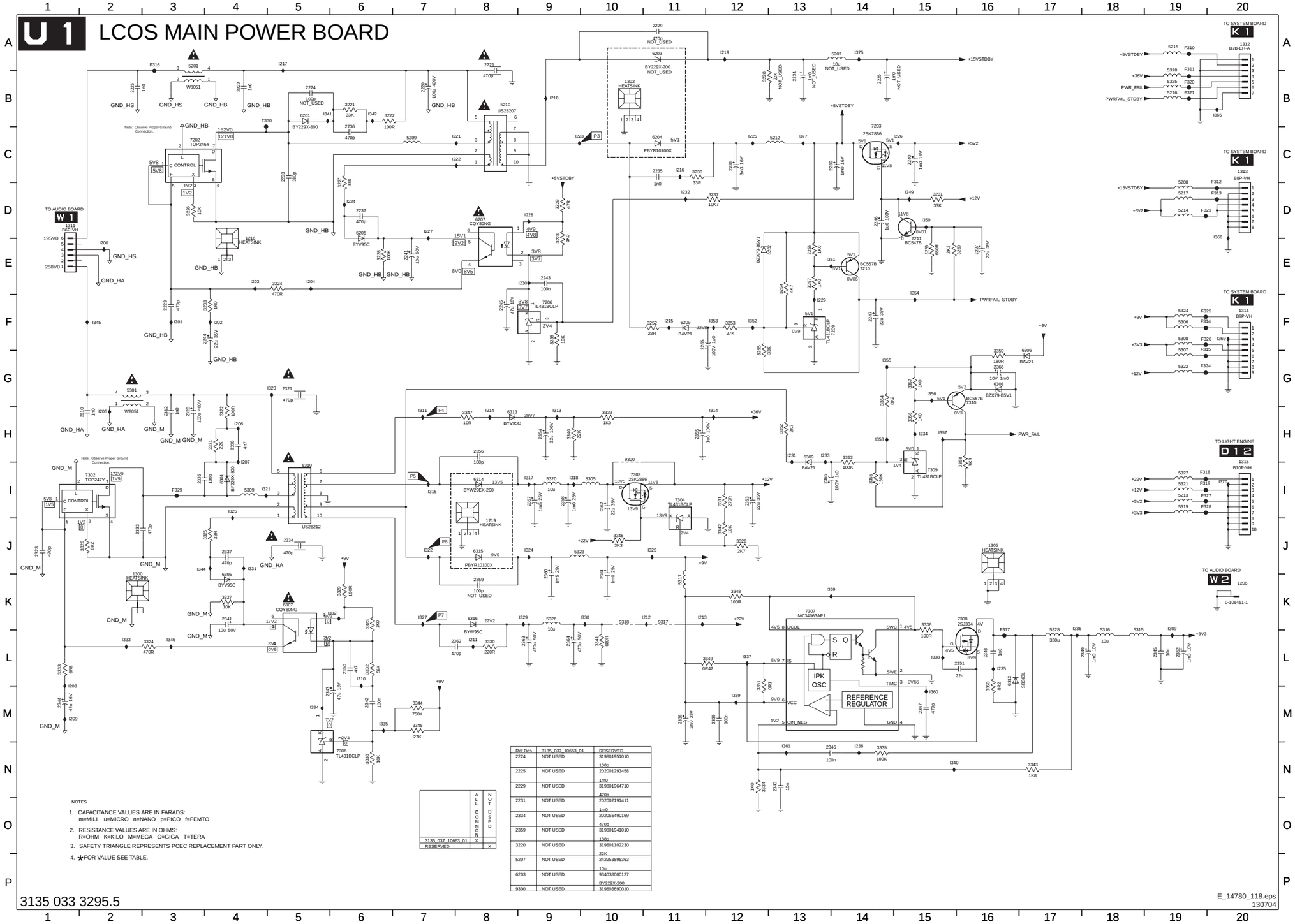
Layout Thermo Sensor Panel (Bottom Side)

2001 A1
2002 A1
3001 A1
3002 A1
3003 A1
3004 A1
3005 A1
3007 A1
3008 A1
4001 A1
7001 A1
7002 A1



LCoS Main Power Board

U 1 LCOS MAIN POWER BOARD



NOTES

1. CAPACITANCE VALUES ARE IN FARADS:
   m=MILI u=MICRO n=NANO p=PICO f=FEMTO
2. RESISTANCE VALUES ARE IN OHMS:
   R=OHM K=KILO M=MEGA G=GIGA T=TERA
3. SAFETY TRIANGLE REPRESENTS PCEC REPLACEMENT PART ONLY.
4. ★ FOR VALUE SEE TABLE.

	ALL COMMON	NOT USED
3135_037_10663_01	X	
RESERVED		X

Ref Des	3135_037_10663_01	RESERVED
2224	NOT USED	319801951010 100p
2225	NOT USED	202001293458 1m0
2229	NOT USED	319801964710 470p
2231	NOT USED	202002191411 1m0
2334	NOT USED	202055490169 470p
2359	NOT USED	319801941010 100p
3220	NOT USED	319801102230 22K
5207	NOT USED	242253595363 10u
6203	NOT USED	934038000127 BY229X-200
9300	NOT USED	319803690010

3135 033 3295.5

1206	K20	3327	K4	F314	F19
1218	E4	3328	J12	F315	G19
1219	I8	3329	K6	F316	B3
1300	K20	3330	L8	F317	L16
1302	B10	3331	I12	F318	I19
1305	J16	3332	L6	F319	I19
1311	E2	3333	L1	F320	B19
1312	A20	3334	N12	F321	B19
1313	D20	3335	N14	F323	D19
1314	F20	3336	L15	F324	G19
1315	I20	3338	N6	F325	F19
2220	B7	3339	H10	F326	F19
2221	B8	3340	H9	F327	I19
2222	B4	3341	L10	F328	I19
2223	F3	3342	J12	F329	I3
2224	B5	3343	N17	F330	C4
2225	B14	3344	M7	I200	E2
2226	B2	3345	M7	I201	F3
2227	E16	3346	J10	I202	F4
2229	A11	3347	H8	I203	E4
2231	B13	3348	K12	I204	E5
2233	C5	3349	L11	I205	H2
2235	C11	3350	M16	I206	H4
2236	C6	3351	M12	I207	I4
2237	D6	3352	H13	I208	M1
2238	C12	3353	I14	I209	M1
2239	C13	3354	G14	I210	M6
2240	C15	3355	I14	I211	L8
2241	E7	3356	H15	I212	K10
2243	E9	3357	G15	I213	K11
2244	F4	3358	I16	I214	H8
2245	F8	3359	G16	I215	F11
2246	D14	5201	B3	I216	C11
2247	F14	5207	A13	I217	B5
2265	F11	5208	D19	I218	B9
2310	H2	5209	C7	I219	A12
2312	H3	5210	C8	I221	C7
2320	H3	5212	C13	I222	C7
2321	G5	5213	I19	I223	C9
2323	J16	5214	D19	I224	D6
2333	J3	5215	A19	I225	C12
2334	J5	5216	B19	I226	C14
2335	I3	5217	D19	I227	E7
2336	H4	5301	G2	I228	D9
2337	J4	5305	I10	I229	F13
2338	M11	5306	F19	I230	E9
2339	M12	5307	G19	I231	I13
2340	N13	5308	F19	I232	D11
2341	K4	5309	I4	I233	I13
2342	M6	5310	I5	I234	H15
2345	L19	5315	L18	I235	L16
2346	N13	5316	L18	I236	N14
2345	L19	5317	K11	I309	L19
2346	N13	5318	B19	I311	H7
2347	M15	5319	I19	I313	H9
2348	L16	5320	I9	I314	H12
2349	L17	5321	I19	I315	I7
2350	L6	5322	G19	I317	I9
2351	L15	5323	J9	I318	I9
2352	L19	5324	F19	I320	G5
2353	I12	5325	B19	I321	I4
2354	H9	5326	K9	I322	J7
2355	H11	5327	I19	I324	J9
2356	H8	5328	L17	I325	J11
2357	I9	6201	B5	I326	J4
2358	I9	6202	E12	I327	K7
2359	K8	6203	A11	I329	K9
2361	K10	6204	C11	I330	K10
2362	L7	6205	E6	I331	J4
2363	L9	6207	E8	I332	K6
2364	L9	6209	F11	I333	L2
2365	I13	6301	I4	I334	M5
2366	G16	6305	K4	I335	M6
2367	I10	6306	G17	I336	L17
3220	B12	6307	L5	I337	L12
3221	B6	6308	G16	I338	L15
3222	B6	6309	I13	I339	M12
3223	E9	6312	L16	I340	N15
3224	E5	6313	H8	I341	B5
3226	D3	6314	I8	I342	B6
3227	D6	6315	J8	I344	J4
3228	E6	6316	K8	I345	F2
3229	D9	7202	C3	I346	L3
3230	C11	7203	C14	I349	D15
3231	D15	7206	F9	I350	D15
3233	F4	7209	F13	I351	E13
3237	D12	7210	E14	I352	F12
3238	F9	7211	D15	I353	F12
3252	F11	7302	I2	I354	F15
3253	F12	7303	I10	I355	G14
3254	E13	7304	J11	I356	G15
3256	E13	7306	N5	I357	H15
3257	E13	7307	L14	I358	H14
3259	E15	7308	I16	I359	K13
3260	E15	7309	I15	I360	M15
3321	H4	7310	G15	I361	N13
3322	H4	9300	I10	I365	B20
3323	K6	9317	K11	I368	E20
3324	L3	9318	K10	I369	F20
3325	J4	F310	A19	I370	I20
3326	J2	F311	B19	I375	A14
		F312	D20	I377	C13
		F313	D20		

Layout LCoS Main Power Board (Top Side)

1206	G4	2226	A3	2247	E5	2344	B3	2362	C3	3252	C5	3339	C1	3359	E3	5308	F2	5328	F3
1218	A5	2227	F5	2265	D5	2346	E3	2363	D3	3253	E5	3340	C1	5201	A4	5309	B2	6201	B5
1219	C5	2229	C5	2310	A2	2348	F2	2364	D3	3255	E5	3341	D4	5207	D5	5310	C2	6202	E5
1300	A2	2231	D5	2312	B2	2349	F3	2365	D3	3256	E5	3342	F4	5208	F5	5315	F2	6203	D5
1302	C2	2233	B5	2320	B1	2350	C4	2366	E4	3257	E5	3344	C3	5209	B5	5316	F2	6204	D4
1305	E3	2235	C5	2321	C1	2351	E3	2367	F3	3259	F5	3346	E4	5210	C5	5317	E2	6205	B5
1311	A3	2236	B5	2333	B2	2352	F2	3220	D5	3260	F5	3347	C1	5212	D5	5318	G5	6207	C5
1312	G5	2237	B5	2334	C4	2353	E4	3221	B5	3321	B2	3348	E3	5213	F4	5319	F3	6209	D5
1313	G5	2238	D4	2335	B2	2354	C1	3222	B4	3322	B2	3349	E2	5214	F5	5320	D1	6301	B3
1314	G2	2239	E4	2336	B2	2355	G5	3224	A5	3324	B3	3350	E2	5215	F5	5321	G3	6305	B3
1315	G4	2240	E4	2337	B3	2356	D1	3227	B5	3325	C3	3351	E2	5216	F5	5322	G2	6306	E3
2220	B4	2241	B5	2338	E2	2357	D1	3230	C4	3329	C3	3352	D2	5217	F5	5323	D2	6307	C3
2221	B4	2243	C5	2339	E2	2358	E1	3231	F5	3330	C3	3355	E3	5301	A1	5324	F3	6308	E3
2222	B4	2244	A5	2341	B3	2359	D2	3233	A5	3333	B3	3356	E3	5305	F1	5325	G5	6309	D2
2224	B5	2245	C5	2342	C4	2360	D2	3237	D5	3336	E3	3357	E3	5306	F3	5326	D3	6312	F2
2225	E5	2246	E5	2343	C4	2361	E2	3238	C5	3338	C3	3358	E3	5307	F2	5327	F4	6313	C1

6314	D1	7310	E3	9029	E2
6315	D2	9001	A4	9030	G4
6316	D3	9003	E5	9031	E3
7202	A5	9005	D5	9032	F2
7203	E5	9012	F5	9033	F4
7206	C5	9013	F4	9300	F4
7209	D5	9014	D2	9317	E4
7210	E5	9016	D3	9318	D4
7211	E5	9017	D3		
7302	B2	9018	G3		
7303	F4	9019	E5		
7304	E4	9020	E5		
7306	C3	9024	G4		
7307	E3	9025	E4		
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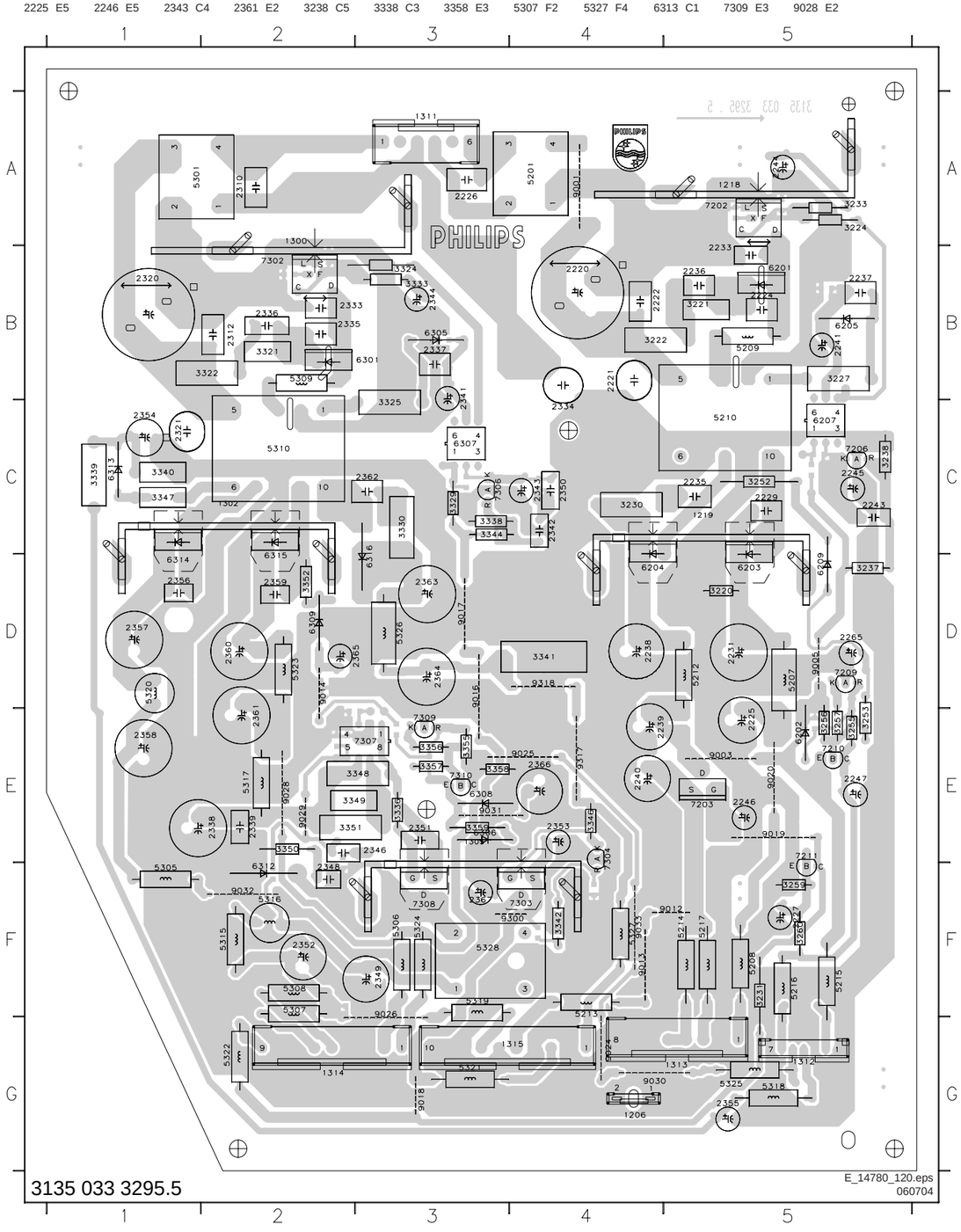
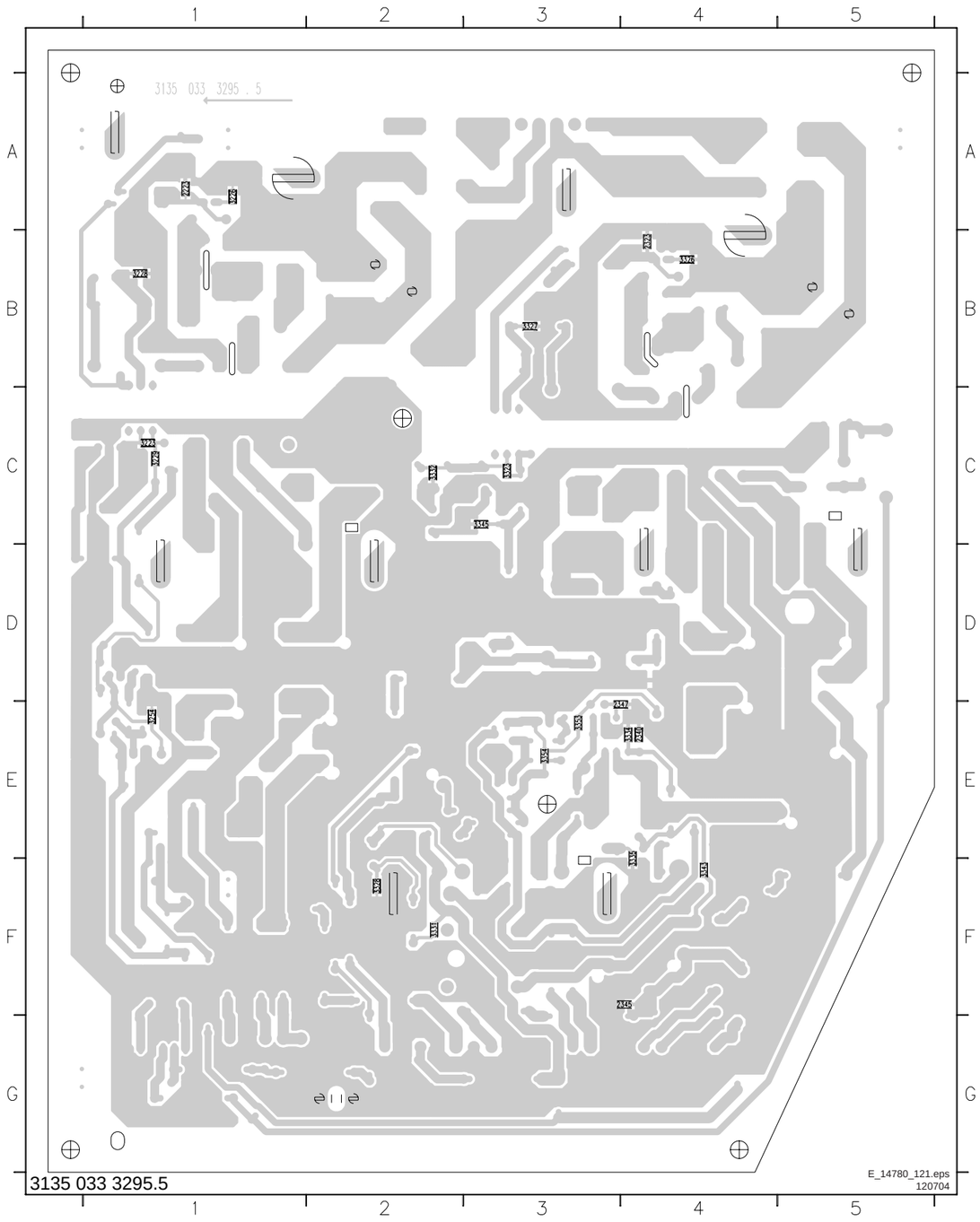
7309	E3	9028	E2		



Layout LCoS Main Power Board (Bottom Side)

2223	A1	2340	E4	2347	E4	3226	A1	3229	C1	3323	C3	3327	B3	3331	F2	3334	E4	3343	F4	3353	E3
2323	B4	2345	F4	3223	C1	3228	B1	3254	E1	3326	B4	3328	F2	3332	C2	3335	F4	3345	C3	3354	E3

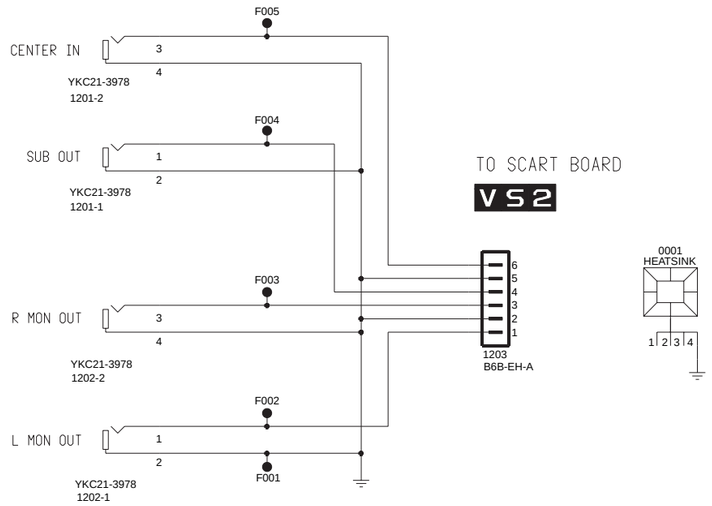


LCoS SCART Daughter Board

VDS1 LCoS SCART DAUGHTER BOARD

VDS1

0001 E8
1201-1 D5
1201-2 C5
1202-1 F5
1202-2 E5
1203 E7
F001 F6
F002 F6
F003 E6
F004 D6
F005 C6



NOTES

1. CAPACITANCE VALUES ARE IN FARADS:
   m=MILI u=MICRO n=NANO p=PICO f=FEMTO
2. RESISTANCE VALUES ARE IN OHMS:
   R=OHM K=KILO M=MEGA G=GIGA T=TERA
3. SAFETY TRIANGLE REPRESENTS PCEC REPLACEMENT PART ONLY.
4. ✱FOR VALUE SEE TABLE.

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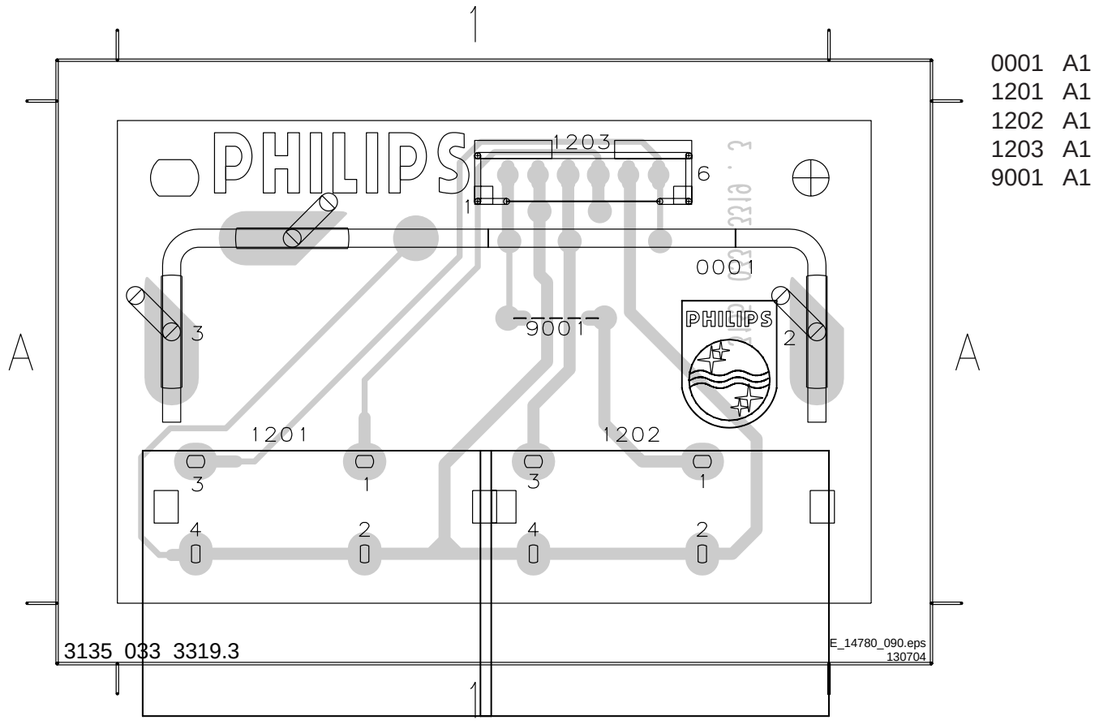
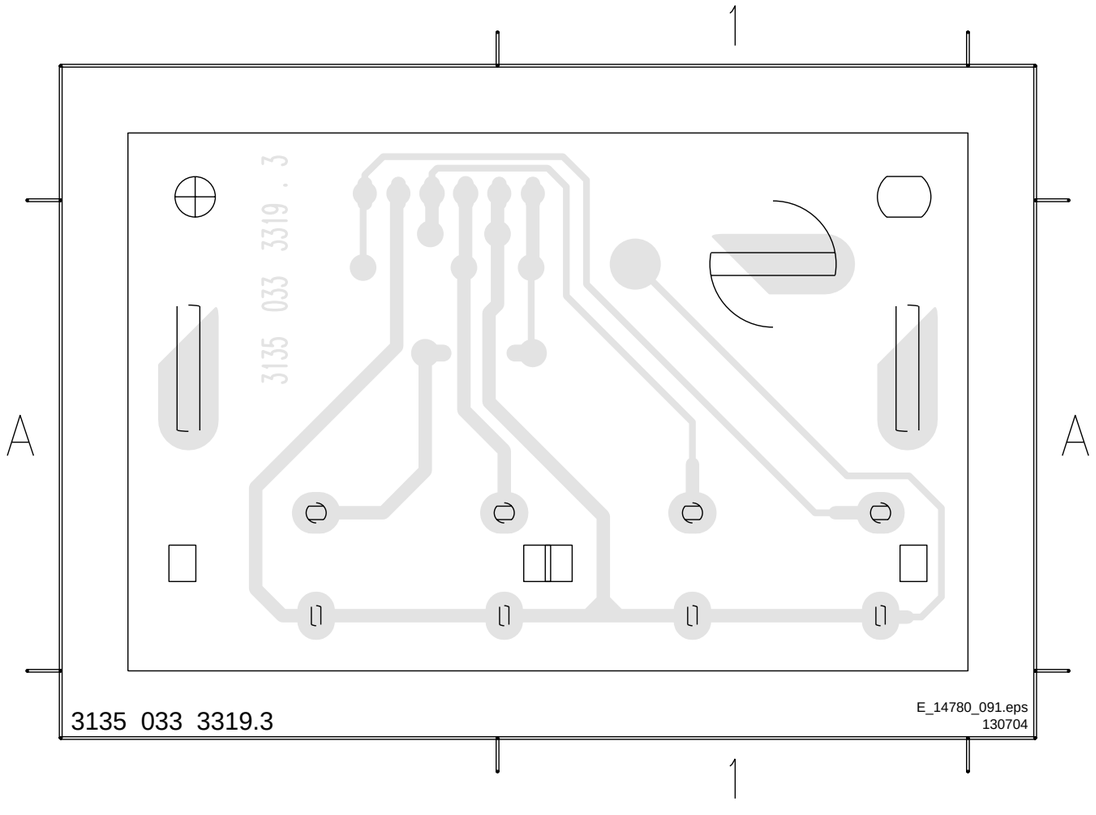
Layout LCoS SCART Daughter Board (Top Side)



0001 A1
1201 A1
1202 A1
1203 A1
9001 A1

Layout LCoS SCART Daughter Board (Bottom Side)



Personal Notes:

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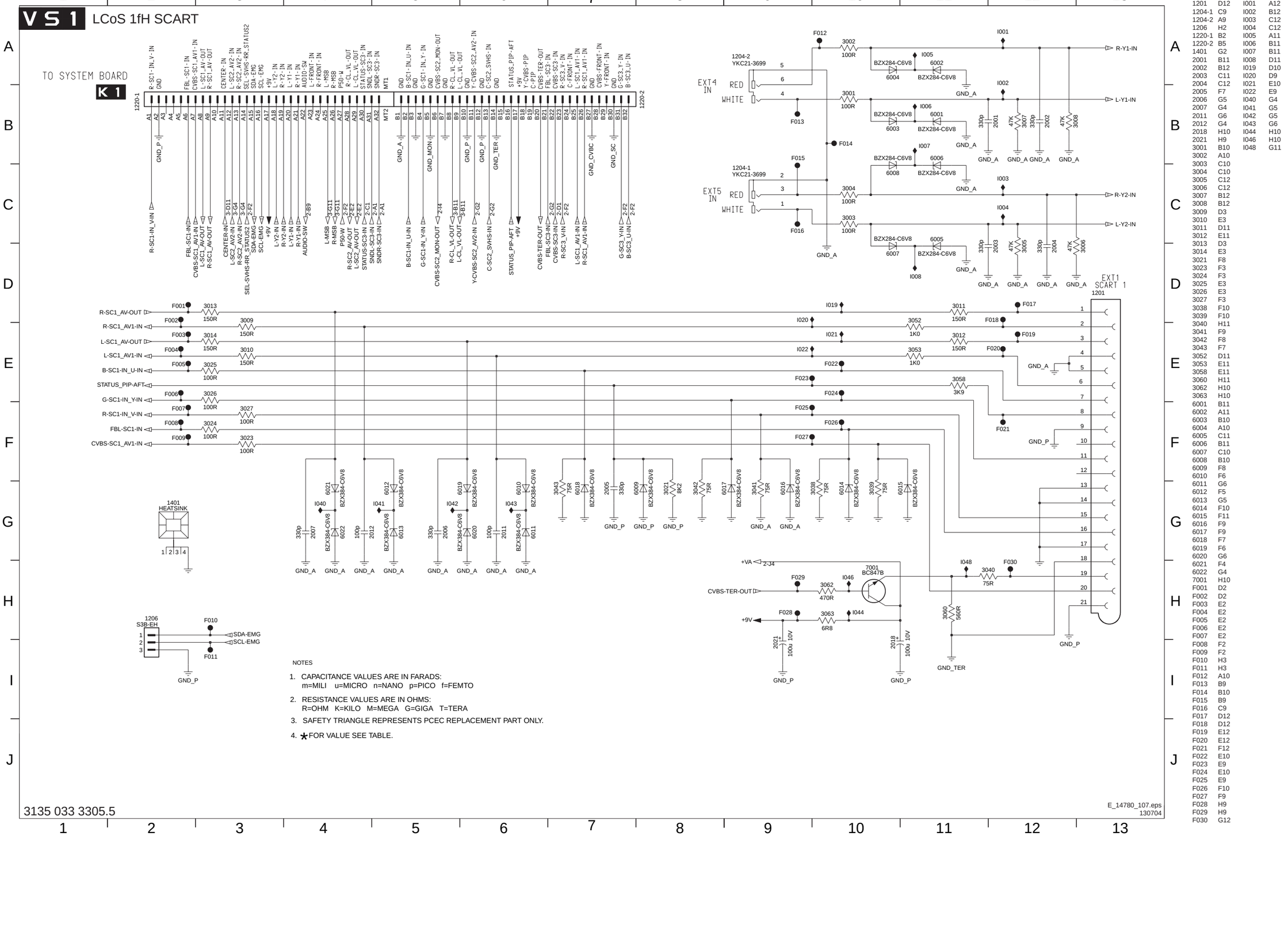
130204

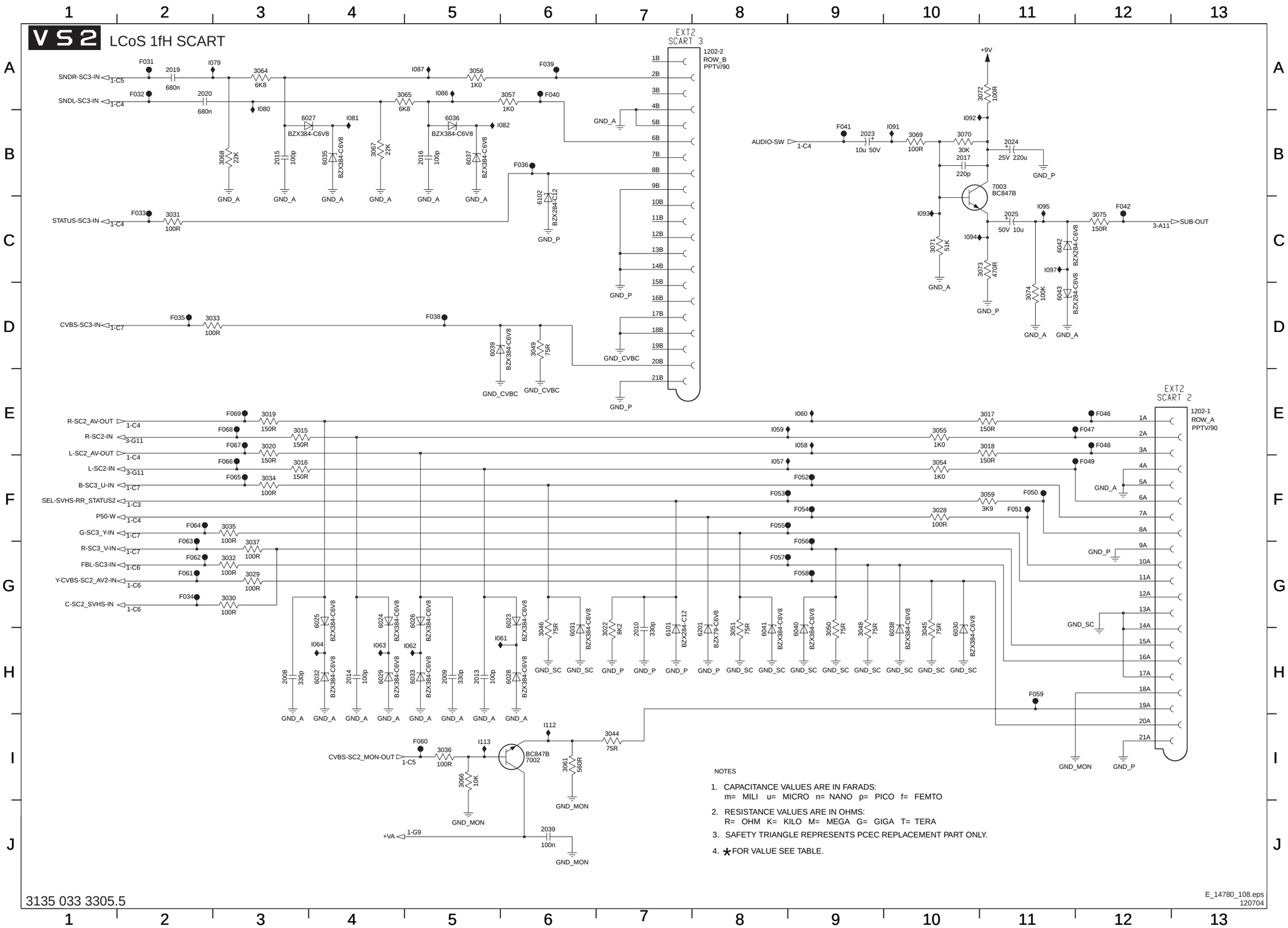
LCoS 1fH SCART Panel

VS1 LCoS 1fH SCART



1201	D12	I001	A12
1204-1	C9	I002	B12
1204-2	A9	I003	C12
1206	H2	I004	C12
1220-1	B2	I005	A11
1220-2	B5	I006	B11
1401	G2	I007	B11
2001	B11	I008	D11
2002	B12	I019	D10
2003	C11	I020	D9
2004	C12	I021	E10
2005	F7	I022	E9
2006	G5	I040	G4
2007	G4	I041	G5
2011	G6	I042	G5
2012	G4	I043	G6
2018	H10	I044	H10
2021	H9	I046	H10
3001	B10	I048	G11
3002	A10		
3003	C10		
3004	C10		
3005	C12		
3006	C12		
3007	B12		
3008	B12		
3009	D3		
3010	E3		
3011	D11		
3012	E11		
3013	D3		
3014	E3		
3021	F8		
3023	F3		
3024	F3		
3025	E3		
3026	E3		
3027	F3		
3038	F10		
3039	F10		
3040	H11		
3041	F9		
3042	F8		
3043	F7		
3052	D11		
3053	E11		
3058	E11		
3060	H11		
3062	H10		
3063	H10		
6001	B11		
6002	A11		
6003	B10		
6004	A10		
6005	C11		
6006	B11		
6007	C10		
6008	B10		
6009	F8		
6010	F6		
6011	G6		
6012	F5		
6013	G5		
6014	F10		
6015	F11		
6016	F9		
6017	F9		
6018	F7		
6019	F6		
6020	G6		
6021	F4		
6022	G4		
7001	H10		
F001	D2		
F002	D2		
F003	E2		
F004	E2		
F005	E2		
F006	E2		
F007	E2		
F008	F2		
F009	F2		
F010	H3		
F011	H3		
F012	A10		
F013	B9		
F014	B10		
F015	B9		
F016	C9		
F017	D12		
F018	D12		
F019	E12		
F020	E12		
F021	F12		
F022	E10		
F023	E9		
F024	E10		
F025	E9		
F026	F10		
F027	F9		
F028	H9		
F029	H9		
F030	G12		

LCoS 1fH SCART Panel



1202-1	E12	F052	F9
1202-2	A7	F053	F8
2008	H3	F054	F9
2009	H5	F055	F8
2010	G7	F056	F9
2013	H5	F057	G8
2014	H4	F058	G9
2015	B3	F059	H11
2016	B5	F060	I5
2017	B10	F061	G2
2019	A2	F062	G2
2020	A2	F063	F2
2023	B9	F064	F2
2024	B11	F065	F3
2025	C11	F066	E3
2039	J6	F067	E3
3015	E3	F068	E3
3016	F3	F069	E3
3017	E11	I057	E8
3018	E11	I058	E9
3019	E3	I059	E8
3020	E3	I060	E9
3022	G7	I061	H5
3028	F10	I062	H5
3029	G3	I063	H4
3030	G3	I064	H4
3031	C2	I079	A2
3032	G3	I080	A3
3033	D2	I081	B4
3034	F3	I082	B5
3035	F3	I086	A5
3036	I5	I087	A5
3037	F3	I091	B10
3044	I7	I092	B10
3045	G10	I093	C10
3046	G6	I094	C10
3048	G9	I095	C11
3049	D6	I097	C11
3050	G9	I112	I6
3051	G8	I113	I5
3054	F10		
3055	E10		
3056	A5		
3057	A6		
3059	F11		
3061	I6		
3064	A3		
3065	A4		
3066	I5		
3067	B4		
3068	B3		
3069	B10		
3070	B10		
3071	C10		
3072	A11		
3073	C11		
3074	D11		
3075	C12		
6023	G6		
6024	G4		
6025	G4		
6026	G5		
6027	B3		
6028	H6		
6029	H4		
6030	G10		
6031	G6		
6032	H4		
6033	H5		
6035	B4		
6036	B5		
6037	B5		
6038	G10		
6039	D5		
6040	G9		
6041	G8		
6042	C11		
6043	D11		
6101	G7		
6102	B6		
6201	G8		
7002	I6		
7003	B10		
F031	A2		
F032	A2		
F033	C2		
F034	G2		
F035	D2		
F036	B6		
F037	B3		
F038	D5		
F039	A6		
F040	A6		
F041	B9		
F042	C12		
F046	E12		
F047	E11		
F048	E12		
F049	E11		
F050	F11		
F051	F11		

LCoS 1fH SCART Panel

VS3 LCoS 1fH SCART

TO SCART DAUGHTER BOARD

VDS1

B6B-EH-A 1210

7004 MC78L05ACD-R2

7005 PCF8574T

7006 74HC4053D

7007 BC847B

	NOT USED
3135_037_10701	
RESERVED	X

Ref Des	3135_037_10701	RESERVED FNO
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9101	NOT USED	319803690010
9102	NOT USED	319803690010

1210 B6
2022 B10
2026 B8
2027 B10
2028 D3
2029 F7
2030 G9
2031 G10
2032 G9
2033 G10
2034 G6
2035 G6
2036 C8
2037 E9
2038 E9
2040 B10
3076 B8
3077 B9
3078 B8
3079 B7
3080 D1
3081 D2
3082 C2
3083 C3
3084 C3
3085 H9
3086 H9
3087 H8
3088 H8
3089 H6
3090 H6
3091 C9
3092 D9
3093 D8
3094 E8
3095 D9
3096 D7
6044 B9
6045 C9
6046 B10
6047 C10
7004 B2
7005 D5
7006 G7
7007 D8
9100 D2
9101 D3
9102 D3
F043 B7
F044 B7
F045 C7
F070 D9
F071 G5
F072 G5
F073 G10
F074 H10
I101 B8
I102 B8
I103 B9
I104 B10

3135 033 3305.5

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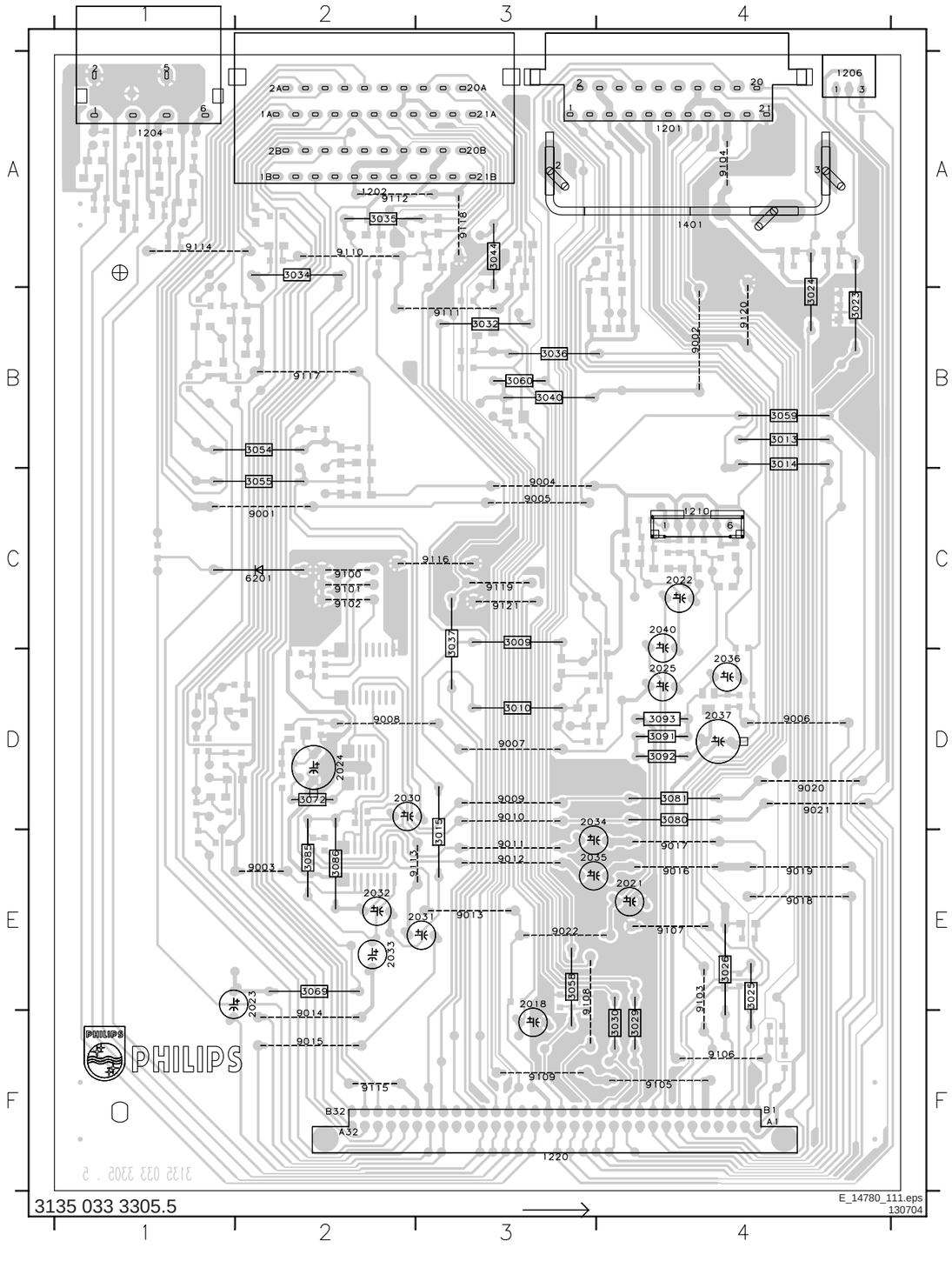
Layout LCoS 1fH SCART Panel (Top Side)

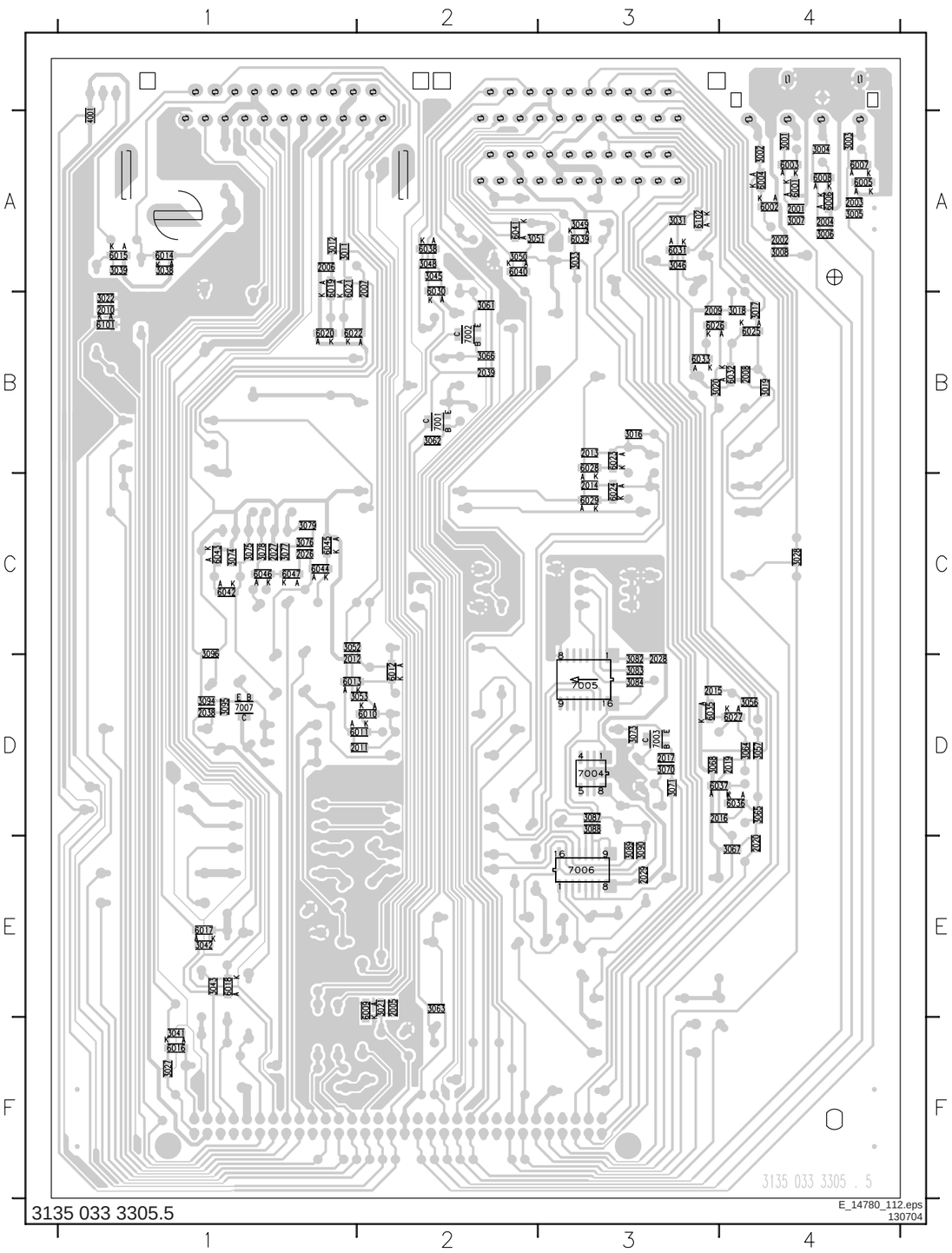
1201 A4 2021 E4 2033 E2 3013 B4 3030 F4 3054 B2 3081 D4 9002 B4 9010 D3 9018 E4 9103 E4 9111 B3 9119 C3
1202 A2 2022 C4 2034 D3 3014 B4 3032 B3 3055 C2 3085 E2 9003 E2 9011 E3 9019 E4 9104 A4 9112 A2 9120 B4
1204 A1 2023 E2 2035 E3 3015 E3 3034 A2 3058 E3 3086 E2 9004 C3 9012 E3 9020 D4 9105 F4 9113 E2 9121 C3
1206 A4 2024 D2 2036 D4 3023 B4 3035 A2 3059 B4 3091 D4 9005 C3 9013 E3 9021 D4 9106 F4 9114 A1
1210 C4 2025 D4 2037 D4 3024 B4 3036 B3 3060 B3 3092 D4 9006 D4 9014 F2 9022 E3 9107 E4 9115 F2
1220 F3 2030 D2 2040 C4 3025 E4 3037 C3 3069 E2 3093 D4 9007 D3 9015 F2 9100 C2 9108 E3 9116 C3
1401 A4 2031 E3 3009 C3 3026 E4 3040 B3 3072 D2 6201 C2 9008 D2 9016 E4 9101 C2 9109 F3 9117 B2
2018 E3 2032 E2 3010 D3 3029 F4 3044 A3 3080 D4 9001 C2 9009 D3 9017 E4 9102 C2 9110 A2 9118 A3



3135 033 3305.5

Layout LCoS 1fH SCART Panel (Bottom Side)

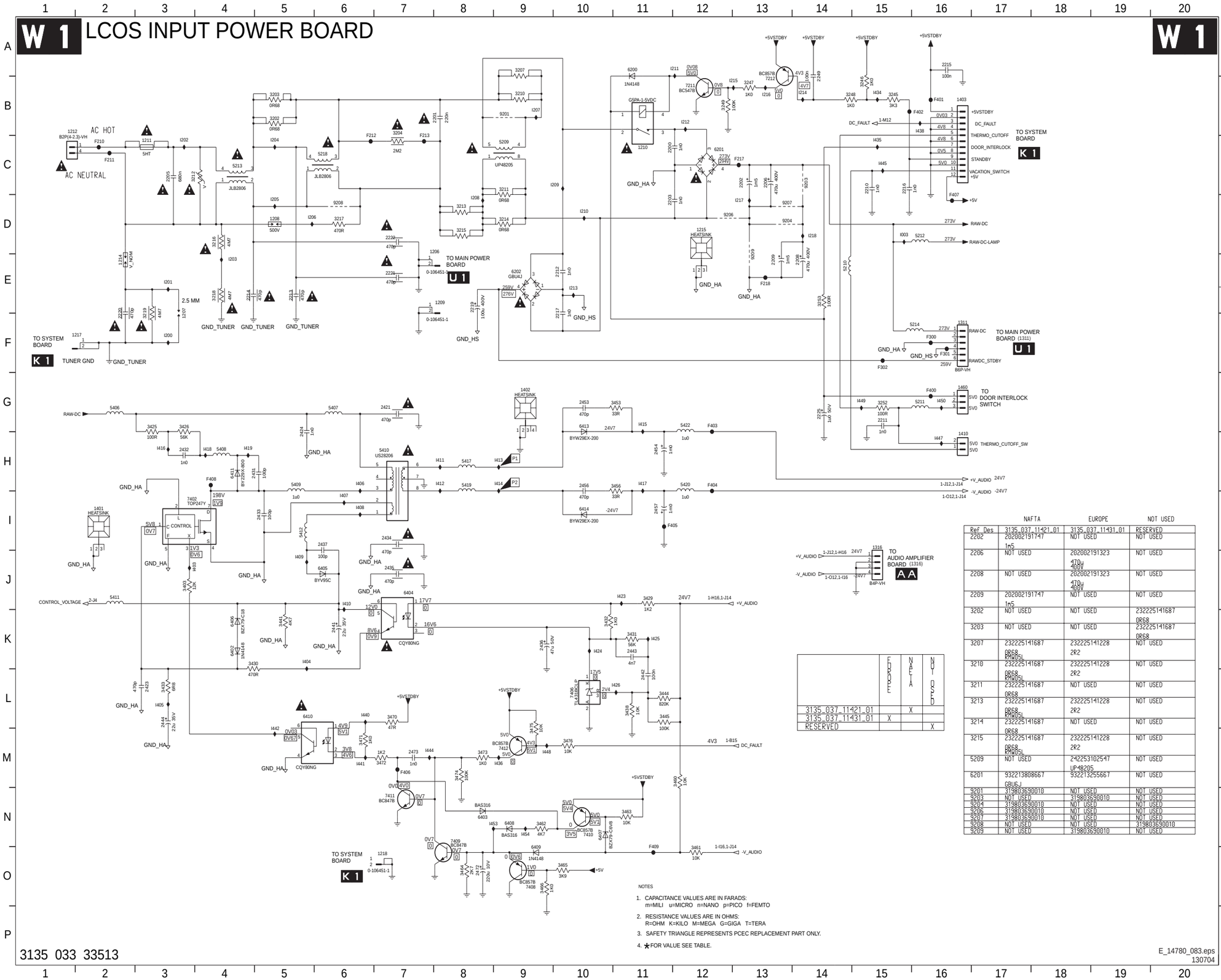
2001 A4 2011 D2 2027 C1 3006 A4 3021 E2 3043 E1 3057 D4 3071 D3 3084 D3 6002 A4 6012 D2 6022 B1 6032 B4 6043 C1 7004 D3
2002 A4 2012 D1 2028 D3 3007 A4 3022 B1 3045 A2 3061 B2 3073 D3 3087 D3 6003 A4 6013 D1 6023 B3 6033 B3 6044 C1 7005 D3
2003 A4 2013 B3 2029 E3 3008 A4 3027 F1 3046 A3 3062 B2 3074 C1 3088 D3 6004 A4 6014 A1 6024 C3 6035 D3 6045 C1 7006 E3
2004 A4 2014 C3 2038 D1 3011 A1 3028 C4 3048 A2 3063 E2 3075 C1 3089 E3 6005 A4 6015 A1 6025 B4 6036 D4 6046 C1 7007 D1
2005 E2 2015 D3 2039 B2 3012 A1 3031 A3 3049 A3 3064 D4 3076 C1 3090 E3 6006 A4 6016 F1 6026 B3 6037 D3 6047 C1
2006 A1 2016 D3 3001 A4 3016 B3 3033 A3 3050 A2 3065 D4 3077 C1 3094 D1 6007 A4 6017 E1 6027 D4 6038 A2 6101 B1
2007 A2 2017 D3 3002 A4 3017 B4 3038 A1 3051 A2 3066 B2 3078 C1 3095 D1 6008 A4 6018 E1 6028 B3 6039 A3 6102 A3
2008 B4 2019 D4 3003 A4 3018 B4 3039 A1 3052 C1 3067 E4 3079 C1 3096 C1 6009 E2 6019 A1 6029 C3 6040 A2 7001 B2
2009 B3 2020 E4 3004 A4 3019 B4 3041 F1 3053 D2 3068 D3 3082 D3 4001 A1 6010 D2 6020 B1 6030 A2 6041 A2 7002 B2
2010 B1 2026 C1 3005 A4 3020 B3 3042 E1 3056 D4 3070 D3 3083 D3 6001 A4 6011 D2 6021 A1 6031 A3 6042 C1 7003 D3



3135 033 3305.5

LCoS Input Power Board

W 1 LCOS INPUT POWER BOARD



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2206	NOT USED	202002191323 470u 400V	NOT USED
2208	NOT USED	202002191323 470u 400V	NOT USED
2209	202002191747 1n5	NOT USED	NOT USED
3202	NOT USED	NOT USED	232225141687 0R68
3203	NOT USED	NOT USED	232225141687 0R68
3207	232225141687 0R68 RMW5SL	232225141228 2R2	NOT USED
3210	232225141687 0R68 RMW5SL	232225141228 2R2	NOT USED
3211	232225141687 0R68	NOT USED	NOT USED
3213	232225141687 0R68 RMW5SL	232225141228 2R2	NOT USED
3214	232225141687 0R68	NOT USED	NOT USED
3215	232225141687 0R68 RMW5SL	232225141228 2R2	NOT USED
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6201	932213808667 GBU6J	932213255667 GBU6J	NOT USED
9201	3198036390010	NOT USED	NOT USED
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9206	3198036390010	NOT USED	NOT USED
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9209	NOT USED	3198036390010	NOT USED

	EUROPE	NAFTA	NOT USED
3135_037_11421_01		X	
3135_037_11431_01	X		
RESERVED			X

1206	E7	3471	M6	I412	I8
1207	F3	3472	M7	I413	H9
1208	D5	3473	M8	I414	I9
1209	F7	3474	M8	I415	H11
1210	B11	3475	M9	I416	H3
1211	C3	3476	M10	I417	I11
1212	C2	5209	C9	I418	H4
1214	E2	5210	E14	I419	H4
1215	D12	5211	G16	I423	J11
1217	F2	5212	D16	I424	K10
1218	O7	5213	C4	I425	K11
1311	F16	5214	F15	I426	L10
1316	J15	5218	C6	I434	B15
1401	I2	5406	G2	I435	C15
1402	G9	5407	G6	I436	M9
1403	B16	5408	H4	I438	B16
1410	H16	5409	I5	I440	L6
1460	G16	5410	I7	I441	M6
2200	C11	5411	J2	I442	M5
2201	B8	5412	I5	I444	M7
2202	C13	5417	H8	I445	C15
2203	D11	5419	I8	I447	H16
2205	C3	5420	I12	I448	M9
2206	C13	5422	H12	I449	G15
2208	E14	6200	B11	I450	G16
2209	E13	6201	C12	I453	N8
2210	C15	6202	E9	I454	N9
2211	G15	6402	K4		
2212	E10	6403	N8		
2213	E5	6404	K7		
2214	E4	6405	J6		
2215	A16	6406	K4		
2216	C15	6407	N10		
2217	F10	6408	N9		
2219	E8	6409	O9		
2220	F2	6410	M6		
2221	E7	6411	H4		
2222	D7	6413	H10		
2225	G14	6414	I10		
2249	B14	7211	B12		
2421	G7	7212	B13		
2423	L3	7402	I3		
2424	H5	7406	L10		
2431	H5	7408	O9		
2432	H3	7409	O8		
2433	I5	7410	N10		
2434	I7	7411	N7		
2435	J7	7412	M9		
2436	K9	9201	B9		
2437	J6	9203	C14		
2441	K6	9204	D13		
2442	L11	9206	D12		
2443	K11	9207	D13		
2444	L3	9208	D6		
2453	G10	9209	E13		
2454	H11	F210	C2		
2456	I10	F211	C2		
2457	I11	F212	C6		
2472	O8	F213	C7		
2473	M7	F217	C13		
3202	B5	F218	E13		
3203	B5	F300	F16		
3204	C7	F301	F16		
3207	B9	F302	F15		
3210	B9	F400	G16		
3211	D9	F401	B16		
3212	C4	F402	B15		
3213	D8	F403	H12		
3214	D9	F404	I12		
3215	D8	F405	I11		
3216	D4	F406	M7		
3217	D6	F407	D16		
3218	E4	F408	H4		
3219	F3	F409	O11		
3245	B15	I003	D15		
3246	B15	I200	F3		
3247	B13	I201	E3		
3248	B14	I202	C3		
3249	B12	I203	E4		
3252	G15	I204	C5		
3253	E14	I205	D5		
3403	J3	I206	D5		
3425	H3	I207	B9		
3426	H3	I208	D8		
3429	J11	I209	C10		
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3441	K5	I215	B12		
3444	L11	I216	B13		
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3453	G10	I218	D14		
3456	I10	I403	J3		
3460	M12	I404	L5		
3461	O12	I405	L3		
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3463	N11	I407	I6		
3464	O8	I408	I6		
3465	O10	I409	J5		
3466	O9	I410	K6		
3470	L7	I411	H8		

3135 033 33513

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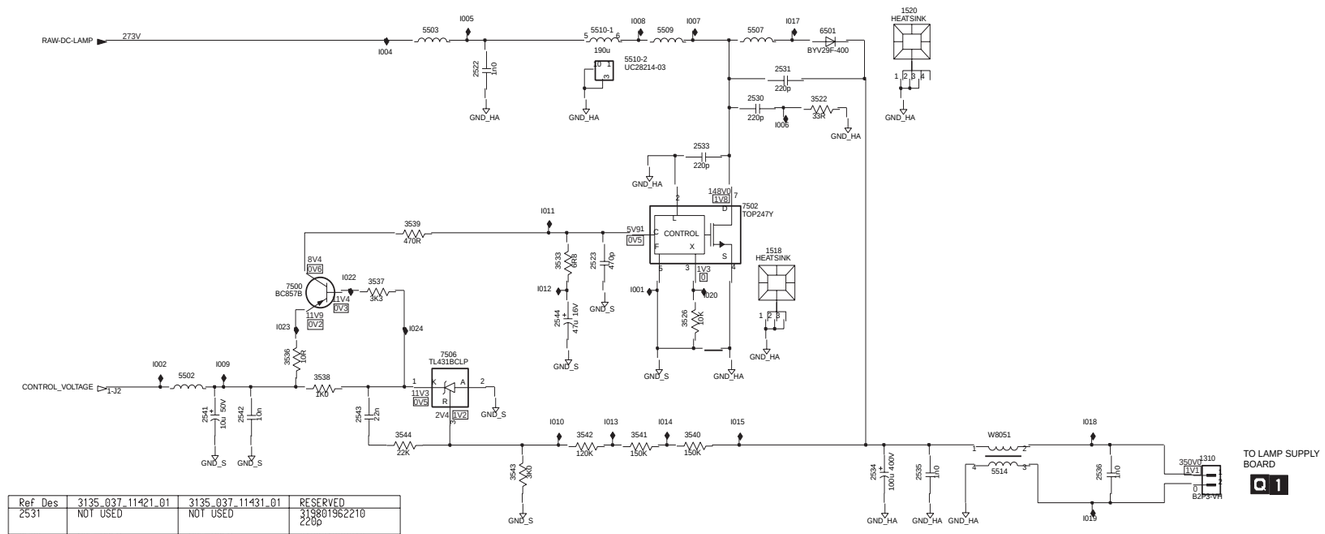
LCoS Input Power Board

W2 LCOS INPUT POWER BOARD



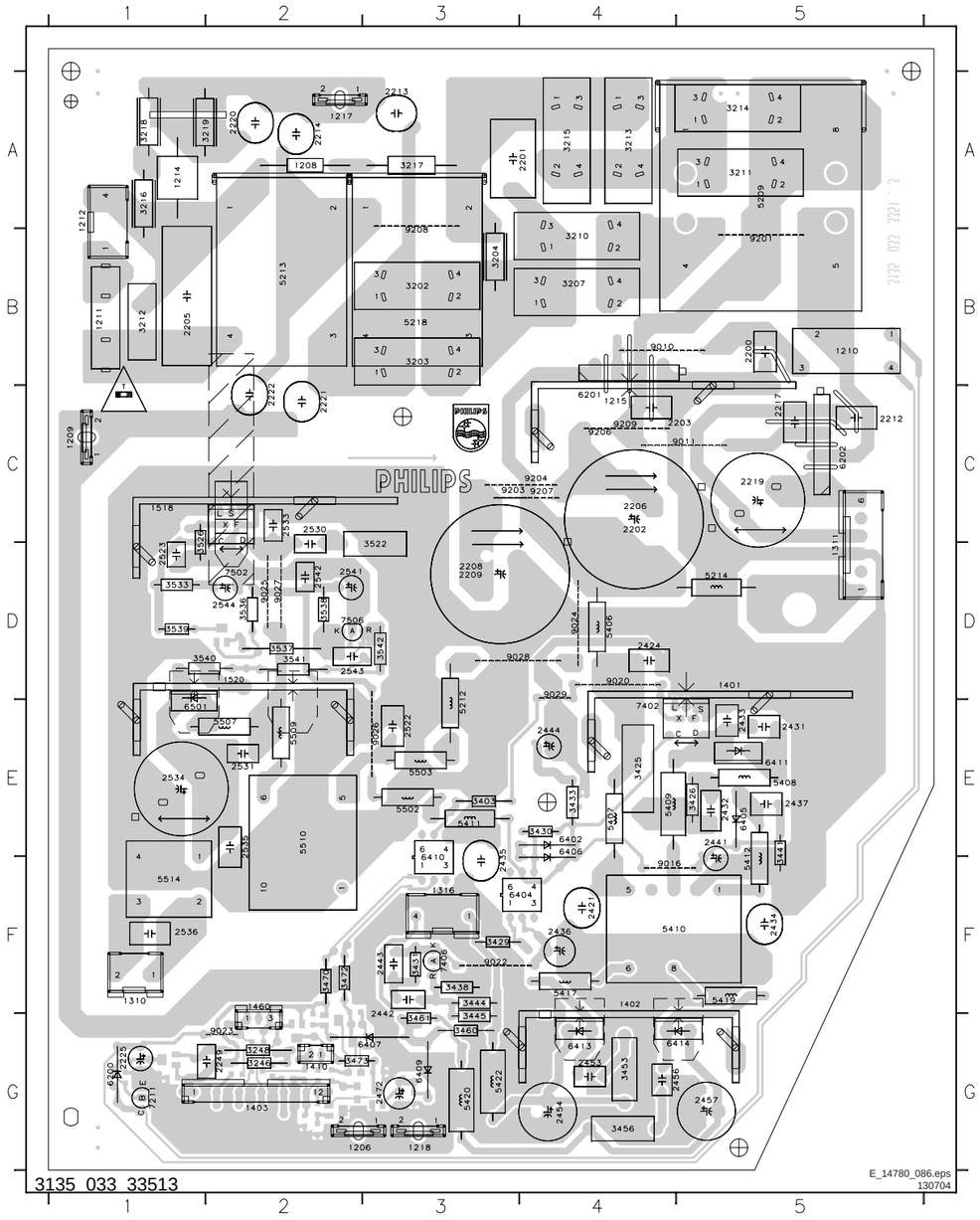
Ref. Des	3135_037_11421_01	3135_037_11431_01	RESERVED
2531	NOT USED	NOT USED	313801962210 220p
2533	NOT USED	NOT USED	313801962210 220p

1310	J15
1518	H11
1520	F12
2522	F8
2523	H9
2530	G11
2531	F11
2533	G10
2534	J12
2535	J12
2536	J14
2541	J5
2542	J6
2543	J7
2544	I9
3522	G11
3526	I10
3533	H9
3536	I6
3537	I7
3538	J6
3539	H7
3540	J10
3541	J9
3542	J9
3543	J8
3544	J7
5502	J5
5503	F7
5507	F11
5509	F10
5510-1	F9
5510-2	F9
5514	J13
6501	F11
7500	I6
7502	H10
7506	J8
C0001	I10
I001	I10
I002	I5
I004	F7
I005	F8
I006	G11
I007	F10
I008	F9
I009	I5
I010	J9
I011	H9
I012	I9
I013	J9
I014	J10
I015	J10
I017	F11
I018	J14
I019	K14
I020	I10
I022	I7
I023	I6
I024	I7

3135 033 33513

E_14780_084.eps
130704

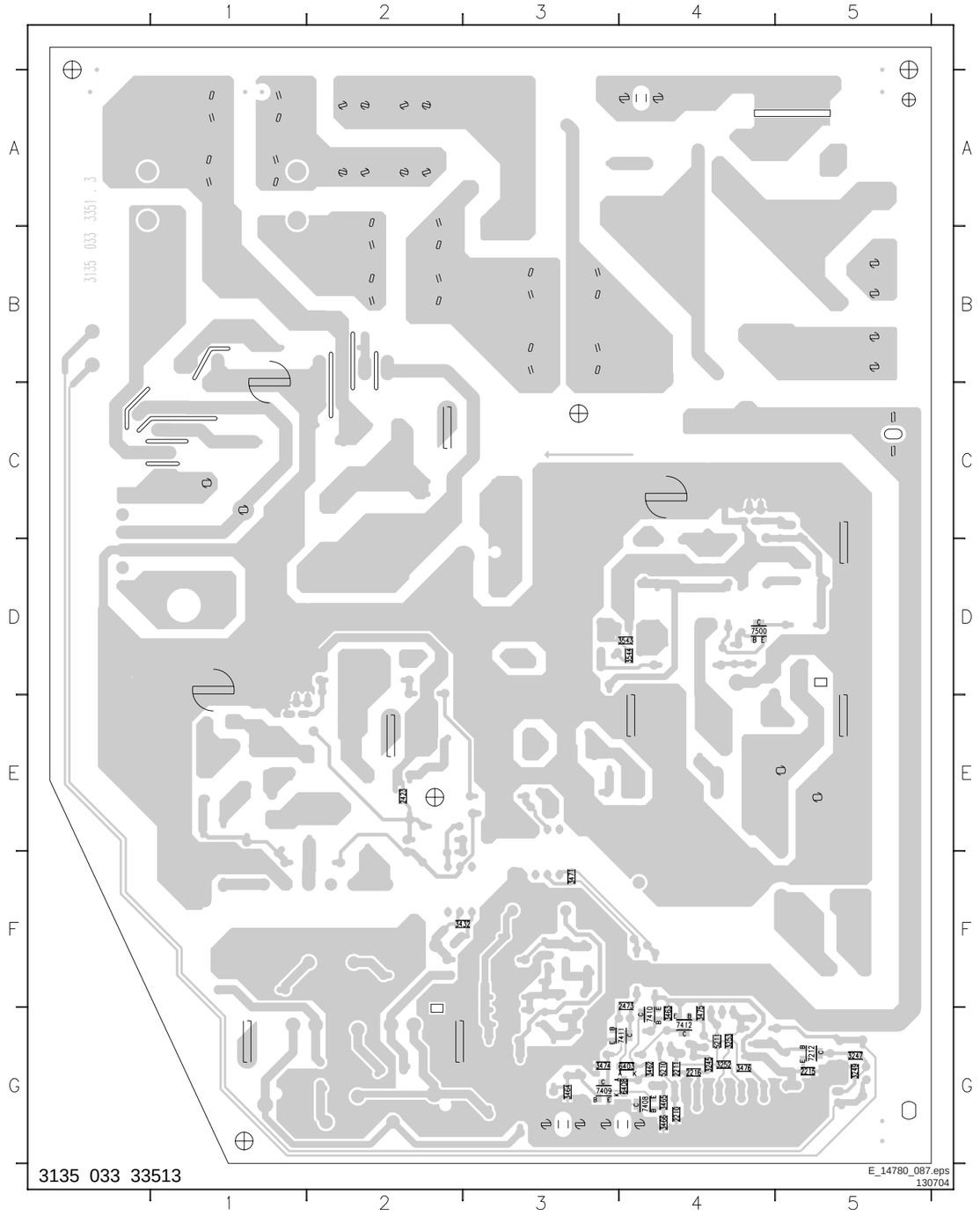
Layout LCoS Input Power Board (Top Side)



1206 G2 5218 B3
1208 A2 5406 D4
1209 C1 5407 E4
1210 B5 5408 E5
1211 B1 5409 E4
1212 A1 5410 F4
1214 A1 5411 E3
1215 C4 5412 F5
1217 A2 5417 F4
1218 G3 5419 F5
1310 F1 5420 G3
1311 D5 5422 G3
1316 F3 5502 E3
1401 D5 5503 E3
1402 F4 5507 E2
1403 G2 5509 E2
1410 G2 5510 E2
1460 F2 5514 F1
1518 C1 6200 G1
1520 D2 6201 C4
2200 B5 6202 C5
2201 A4 6402 E4
2202 C4 6404 F4
2203 C5 6405 E5
2205 B1 6406 E4
2206 C4 6407 G3
2208 D3 6409 G3
2209 D3 6410 F3
2212 C5 6411 E5
2213 A3 6413 G4
2214 A2 6414 G5
2217 C5 6501 E1
2219 C5 7211 G1
2220 A2 7402 E4
2221 C2 7406 F3
2222 C2 7502 D2
2225 G1 7506 D2
2249 G2 9010 B4
2421 F4 9011 C5
2424 D4 9016 F4
2431 E5 9020 D4
2432 E5 9022 F3
2433 E5 9023 G2
2434 F5 9024 D4
2435 F3 9025 D2
2436 F4 9026 E3
2437 E5 9027 D2
2441 E5 9028 D3
2442 G3 9029 D4
2443 F3 9201 B5
2444 E4 9203 C3
2453 G4 9204 C4
2454 G4 9206 C4
2456 G4 9207 C4
2457 G5 9208 B3
2472 G3 9209 C4
2522 E3
2523 D1
2530 C2
2531 E2
2533 C2
2534 E1
2535 E2
2536 F1
2541 D2
2542 D2
2543 D2
2544 D2
3202 B3
3203 B3
3204 B3
3207 B4
3210 B4
3211 A5
3212 B1
3213 A4
3214 A5
3215 A4
3216 A1
3217 A3
3218 A1
3219 A1
3246 G2
3248 G2
3403 E3
3425 E4
3426 E5
3429 F3
3430 E4
3431 F3
3433 E4
3438 F3
3441 E5
3444 F3
3445 G3
3453 G4
3456 G4
3460 G3
3461 G3
3470 F2
3472 F2
3473 G2
3522 D3
3526 C1
3533 D1
3536 D2
3537 D2
3538 D2
3539 D1
3540 D1
3541 D2
3542 D3
5209 A5
5212 E3
5213 B2
5214 D5

Layout LCoS Audio Amplifier Board (Bottom Side)

2210 G4 2216 G4 3245 G4 3252 G4 3462 G4 3465 G4 3474 G3 3543 D4 5211 G4 7212 G5 7410 G4 7500 D4
2211 G4 2423 E2 3247 G5 3253 G4 3463 G4 3466 G4 3475 G4 3544 D4 6403 G4 7408 G4 7411 G4
2215 G5 2473 F4 3249 G5 3432 F2 3464 G3 3471 F3 3476 G4 5210 G4 6408 G4 7409 G3 7412 G4



Personal Notes:

E_06532_013.eps
200204

8. Alignments

Index of this chapter:

8.1 General Alignment Conditions

8.1.1 Start Conditions

Perform all electrical adjustments under the following conditions:
- Power supply voltage: 230 V_{AC} (+/- 10%)
- Connect the set to the mains via an isolation transformer with low internal resistance.
- Allow the set to warm up for approximately 20 to 30 minutes.
- Measure the voltages and the waveforms in relation to chassis ground (with the exception of the voltages on the primary side of the power supply).
  Caution: Never use the cooling fins/plates as ground.
- Test probe: Ri > 10 Mohm, Ci < 20 pF.
- Use an isolated trimmer/screwdriver to perform the alignments.

Perform all electrical adjustments with the following start settings (for all CRTs):
- Set LIGHT SENSOR "off", by setting ACTIVE CONTROL to "off" with the remote control.
- Set CONTRAST to "75", BRIGHTNESS and COLOUR to "40" (via PICTURE menu).
- Set COLOUR ENHANCEMENT to "off" (via PICTURE menu).
- Set DIGITAL OPTIONS to "Pixel Plus" (via PICTURE menu), unless otherwise stated (for sets without "Pixel Plus" (= Eagle), set to "Natural Motion").
- Set DYNAMIC CONTRAST to "off" (via PICTURE menu).

8.1.2 Adjustment Sequence

Use the following adjustment sequence:
1. Set the correct TV-set "Options" (after storing, re-start the set!).
2. Rough adjustment of "Geometry".
3. Allow the set to warm up.
4. Accurate adjustment of "Geometry".
5. Software alignments.

8.2 Hardware Alignments

8.2.1 Light Engine Focus Adjustment

The Light Engine comes pre-adjusted. No adjustment for focus should be required. In rare cases, the set may require a minor focus touch up.

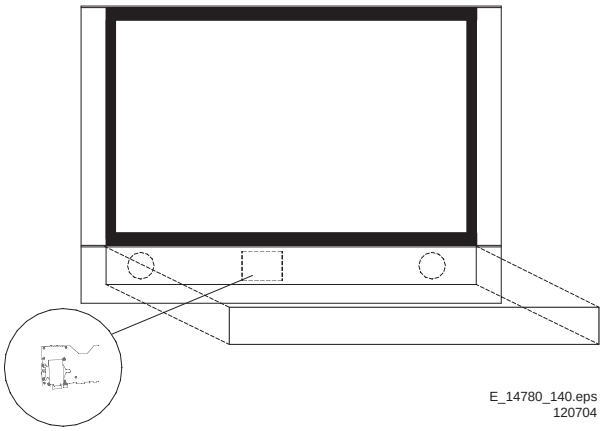


Figure 8-1 Focus access

- To access the Focus adjustments on the Light Engine, it will first be necessary to remove the front Speaker Cover. This cover snaps in place. In some models, the Speaker Cover has additional screws to hold the cover tightly against the cabinet. To prevent damage to the cabinet, unsnap as many tabs as possible from the back of the set, before removing the Speaker Cover.
- Use an inverted 4.5 mm hex socket for these adjustments.

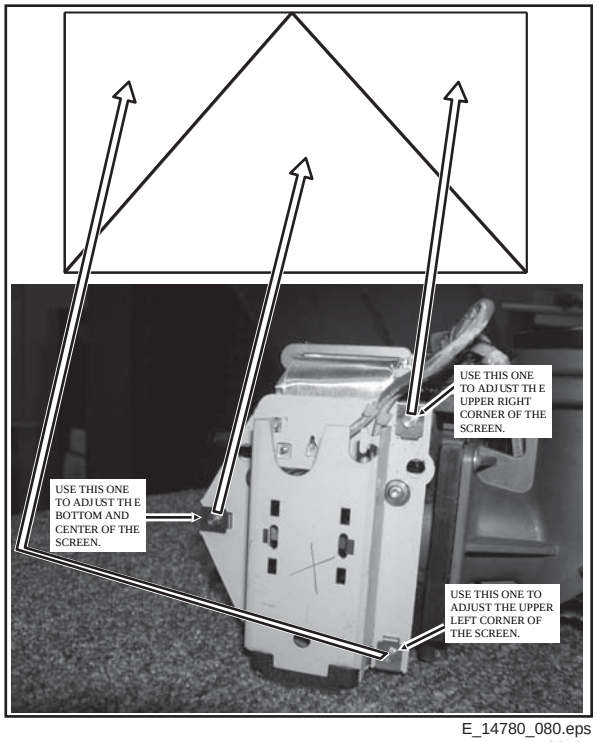


Figure 8-2 Focus adjustments

- The upper screw adjusts the upper right portion of the screen. The thumbwheel, located on the right-hand end of the Light Engine module, adjusts the lower part of the screen, and the lower screws adjust the upper left part of the screen.
- No more than two complete turns should be required to correct the focus.

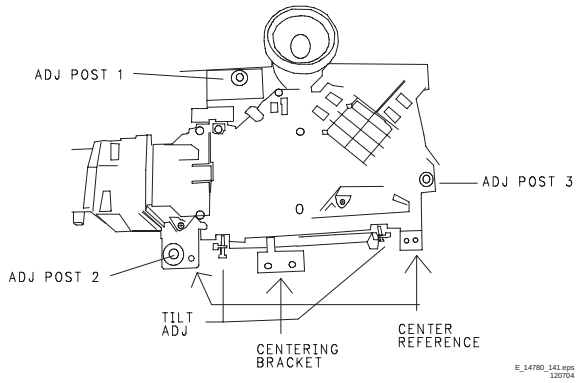


Figure 8-3 Light Engine adjustment points

1. Use a 4 mm wrench to loosen the lock nut on each adjustment post.
2. Use a #15 Torx to loosen the Centring Bracket.
3. Place a 6 mm rod (or 1/4 inch) in the Centre Reference to keep the Light Engine centred.
4. Adjust the Tilt adjustment screws to make the Light Engine parallel with the cabinet.
5. Turn the set "on" and apply a crosshatch pattern to the set.
6. If the picture is tilted, use adjustment post "2" to correct the picture. Use a 4.5 mm inverted hex to adjust the post.
7. If the picture is high or low, use adjustment post "1" to correct the picture.
8. If the picture is shifted to the left or right, use adjustment post "3" to correct the picture.
9. If the picture is still shifted to the left or right, remove the Centring rod and slide the assembly to correct the picture.
10. Tighten the Centring bracket.
11. Tighten the Lock nut on each of the adjustment post. To prevent the post from turning, place the inverted hex over each post.
12. Remove the Centring rod.

8.3 Software Alignments

8.3.1 Introduction

With the software alignments, it is possible to align the Geometry, White Tone, and Tuner IF settings.
Put the set in the SAM (see chapter 5). The SAM menu will now appear on the screen. Select, via "**Alignments**", one of the sub-menus. They are explained below in the sequence of the sub-menus.

Notes:
- All changes to menu items and alignments are stored automatically, except the option codes. They must be stored manually.
- If the Option codes have been changed **and stored**, the set has to be switched "OFF" and "ON" using the mains switch to activate the new settings (when switching via Standby, the option code settings are NOT read by the microprocessor).
- If an empty EAROM (permanent memory) is detected, all settings are set to pre-programmed default values.

8.3.2 GENERAL

LUMA GAIN
Fixed setting is “1”.

IF AFC
Supply, via an external video generator (e.g. PM5518), a TV signal with strength of at least 1 mV and a frequency of 475.25 MHz. Use system BG if possible, otherwise match the system of your generator with the received signal in the set.

Alignment procedure:
1. Go to the user "Installation" menu.
2. Select "Manual Installation".
3. Tune the TV-set to the system and frequency described above via "Search" - "475" - "OK".
4. If the frequency, showed in the line "Fine tune", is between 475.18 MHz and 475.31 MHz, you **do not** need to re-adjust the "IF AFC".
5. If not, adjust the frequency in the "Fine tune" line to 475.25 MHz and "Store" the program (this is **very important** because this will disable the AFC algorithm).
6. Now go to the SAM and select ALIGNMENTS - GENERAL - IF AFC.
7. During the IF AFC parameter adjustment, one can see OSD feedback in the top of the screen.
8. This OSD feedback can give 4 kind of messages:

Table 8-1 AFC

AFC-window	AFC-frequency vs. reference
Out	High
In	High
[In]	[Low]
Out	Low

1. The first item (IN or OUT) informs you whether you are in or out the AFC-window.
2. The second item (HIGH or LOW) informs you about whether the AFC-frequency is too high or too low.
3. First, you must align the IF AFC parameter such that you come into the AFC-window (= IN).
4. Then you must look for the point where the IF AFC parameter changes from HIGH to LOW. This level is the value you are looking for.
5. After adjustment, STORE the value.
6. Now return to the user "Installation" menu.
7. Select "Manual Installation" - "Search" - "475" - "OK" and "Store". This will set the AFC "on" again.

Service tip: If you do not trust the frequency accuracy of your service generator, connect it to a "good" TV set and check it with the "Fine tune"-line.

IF LPRIME AFC
Use the same procedure as for the IF AFC alignment, but set the video generator to SECAM L/L" (only necessary for countries that have or can receive this system).

TUNER AGC
1. Set the external pattern generator to a colour bar video signal and connect the RF output to the aerial input. Set the amplitude to 10 mV and set the frequency to 475.25 MHz.
2. Connect a DC multimeter between pin 1 and the shielding of the Tuner (item 1200 on the LSP).
3. Adjust the TUNER AGC value (default value is "20") with the LEFT/RIGHT cursor keys until the voltage at pin 1 of the tuner lies between 3.8 and 2.3 V.
4. STORE the alignment.

BLEND INTENSITY
Use this alignment when you replace the microcontroller. It aligns the level of transparency of the menu-picture blended into the main-picture.
Position the "BRIGHTNESS", "CONTRAST", and "COLOUR" setting in the middle position (via the user PICTURE menu).
1. Apply a signal with a 100 % white video-pattern.
2. Align the BLEND INTENSITY parameter such, that the blended signal is 65 % of the black-white amplitude. In practice, this is about 1.3 V (blended signal) versus 2 V (full white signal).

3. The parameter can be adjusted in between "0" and "31" (default value= "31").

8.3.3 LUM. DEL. (Luminance Delay)

With this alignment, you place the luminance information exactly on the chrominance information (brightness is pushed onto the colour). Use a colour bar/grey scale pattern as test signal.

- **LUM. DELAY PAL BG:** Apply a PAL BG colour bar/grey scale pattern as a test signal. Adjust this parameter until the transients of the colour part and black and white part of the test pattern are at the same position. Default value= "9".
- **LUM. DELAY PAL I:** Apply a PAL I colour bar/grey scale pattern as a test signal. Adjust this parameter until the transients of the colour part and black and white part of the test pattern are at the same position. Default value= "10".
- **LUM. DELAY SECAM:** Apply a SECAM colour bar/grey scale pattern as a test signal. Adjust this parameter until the transients of the colour part and black and white part of the test pattern are at the same position. Default value= "11".
- **LUM. DELAY BYPASS:** apply a NTSC colour bar/ greyscale pattern as a test signal. Adjust this value until the transients of the colour and black & white part of the test area are at the same position. Default value= "7".

8.3.4 MSB (Main Scaler Board)

TEST PATTERN

To check the correct functioning of the MSB board (and its following circuitry). When set to "on" it will display a colour bar on the screen with eight colours (left= white, right= black).

ALIGN ADC

Required Equipment

- Digital Video Generator (e.g. VG-828D Astro).
- One YPbPr Cinch-to-BNC cable.
- One VGA-to-BNC cable.

Note: When such a (expensive) generator is not available, it is possible to align the **VGA ADC** via a Personal Computer as a "next best" solution. This requires a PC, a test pattern file (see figure "VGA test pattern"), and a VGA cable from PC to TV. The test pattern file (filename= "ADC alignment.bmp") is available at your NSO (refer to Service Info HE-01/0040).
Perform the "*ADC Alignment Procedure (with Personal Computer)*" as described further on.

Initial Setup

1. In the on-screen menu, place the TV in WIDE SCREEN mode.
2. Activate the SAM mode by entering "0 6 2 5 9 6 [i+]" on the remote.
3. Setup the Digital Video Generator programs as indicated in the table and text below.

Table 8-2 Digital video generator setup

Program #	Program description	Pattern
500	480p ADC Alignment	Six Color Bar, (see figure)
501	720p ADC Alignment	Six Color Bar, (see figure)
502	480i ADC Alignment	Six Color Bar, (see figure)
503	VGA ADC Alignment	Black-White, (see figure)

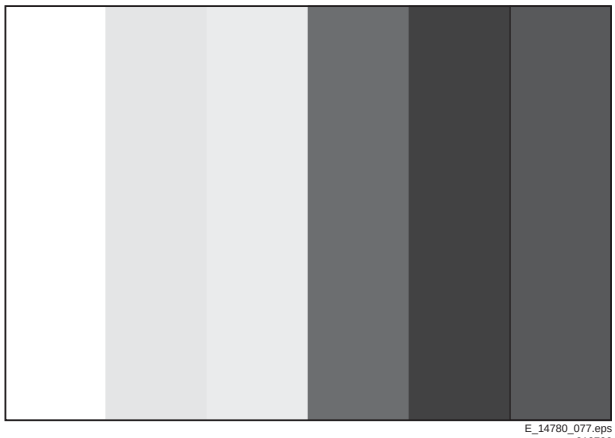


Figure 8-4 YPbPr test pattern

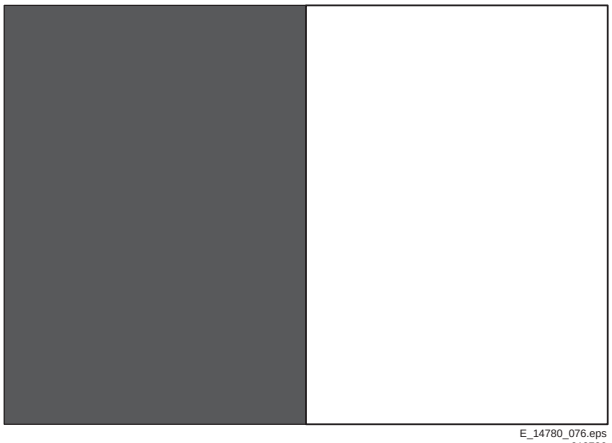


Figure 8-5 VGA test pattern

- 480p Signal Source Setup (Program #500):
  - YPbPr amplitude: minimum 690 mV, maximum 710 mV from a 75-ohm source.
  - YPbPr brightness: lowest level = black.
  - Sync included on YPbPr - bi-level, -300 mV on Y only.
  - Horizontal frequency: 31.47 kHz.
  - Vertical frequency: 59.94 Hz.
  - H_divider number (H_total): 858.
  - H_active video: 720 pixels.
  - H_back porch: 59 pixels.
  - H_sync duration: 63 pixels.
  - V_total line number: 525.
  - V_back porch: 30 lines.
  - V_active video: 483 lines.
  - V_sync duration: 6 lines.

- 720p Signal Source Setup (Program #501):
  - YPbPr amplitude: minimum 690 mV, maximum 710 mV from a 75-ohm source.
  - YPbPr brightness: lowest level = black.
  - Sync included on YPbPr - tri-level, -300 mV on Y only.
  - Horizontal frequency: 45 kHz.
  - Vertical frequency: 60 Hz.
  - H_divider number (H_total): 1650.
  - H_active video: 1280 pixels.
  - H_back porch: 260 pixels.
  - H_sync duration: 40 pixels.
  - V_total line number: 750.
  - V_back porch: 20 lines.
  - V_active video: 720 lines.
  - V_sync duration: 5 lines.

- 480i Signal Source Setup (Program #502):
  - YPbPr amplitude: minimum 690 mV, maximum 710 mV from a 75-ohm source.
  - YPbPr brightness: lowest level = black.
  - Sync included on YPbPr - bi-level, -300 mV on Y only.
  - Horizontal frequency: 31.47 kHz
  - Vertical frequency: 29.97 Hz
  - H_divider number (H_total): 858
  - H_active video: 720 pixels
  - H_back porch: 59 pixels
  - H_sync duration: 63 pixels
  - V_total line number: 525
  - Start V_sync field 1 line 4 on H sync.
  - V_sync duration: 6 lines.
  - V_backporch: 13 lines.
  - V_active video field 1: 240 lines.
  - Start V_sync field 2: line 266 in between H syncs.
  - V_sync duration: 51/2 lines.
  - V_back porch: 14 lines.
  - V_active video field 2: 240 lines.

- VGA Signal Source Setup (Program #503):
  - RGB amplitude: minimum 760 mV, maximum 780 mV from a 75-ohm source.
  - RGB brightness: lowest level = black.
  - Separate H and V sync, 5 V amplitude, both negative polarity.
  - Horizontal frequency: 31.469 kHz.
  - Vertical frequency: 59.940 Hz.
  - H_divider number (H_total): 800.
  - H_active video: 640 pixels.
  - H_back porch: 40 pixels.
  - H_sync duration: 96 pixels.
  - V_total line number: 525.
  - V_back porch: 25 lines.
  - V_active video: 480 lines.
  - V_sync duration: 2 lines.

ADC Alignment Procedure (with Digital Video Generator)

- 480p Alignment Procedure:
  1. Perform the initial setup.
  2. Set the Digital Video Generator to "Program #500".
  3. Connect the YPbPr Cinch-to-BNC cable between the Digital Video Generator and an MSB input (EXT4 or EXT5).
  4. Set the source to the chosen MSB input (EXT4 or EXT5) by pressing the source bottom on the remote repeatedly until the screen changes to a vertical colour band pattern. The MSB input is now selected.
  5. In the SAM menu go to ALIGNMENT -> MSB -> ALIGN ADC and press OK on the remote. The screen will flicker. Once the flickering stops, the alignment is ready.

- 720p Alignment Procedure:
  1. Perform the initial setup.
  2. Set the Digital Video Generator to "Program #501".
  3. Connect the YPbPr Cinch-to-BNC cable between the Digital Video Generator and an MSB input (EXT4 or EXT5).
  4. Set the source to the chosen MSB input (EXT4 or EXT5) by pressing the source bottom on the remote repeatedly until the screen changes to a vertical colour band pattern. The MSB input is now selected.
  5. In the SAM menu go to ALIGNMENT -> MSB -> ALIGN ADC and press OK on the remote. The screen will flicker. Once the flickering stops, the alignment is ready.

- 480i Alignment Procedure:
  1. Perform the initial setup.
  2. Set the Digital Video Generator to "Program #502".
  3. Connect the YPbPr Cinch-to-BNC cable between the Digital Video Generator and an MSB input (EXT4 or EXT5).
  4. Set the source to the chosen MSB input (EXT4 or EXT5) by pressing the source bottom on the remote repeatedly until the screen changes to a vertical colour band pattern. The MSB input is now selected.
  5. In the SAM menu go to ALIGNMENT -> MSB -> ALIGN ADC and press OK on the remote. The screen will flicker. Once the flickering stops, the alignment is ready.

- VGA Alignment Procedure:
  1. Perform the initial setup.
  2. Set the Digital Video Generator to "Program #503".
  3. Connect the VGA cable between the TV EXT6 input and the RED, GREEN, BLUE, HS, and VS Digital Video Generator output.
  4. Set the source to EXT6 by pressing the source bottom on the remote repeatedly until the screen changes to black on the left and white on the right. EXT6 is now selected.
  5. In the SAM menu go to ALIGNMENT -> MSB -> ALIGN ADC and press OK on the remote. The screen will flicker. Once the flickering stops, the alignment is ready.

ADC Alignment Procedure (with Personal Computer)

- VGA Alignment Procedure:
  1. Supply, via a Personal Computer in VGA-mode (640x480), the "ADC alignment" test pattern. The test pattern file (filename= "ADC alignment.bmp") is available at your NSO (refer to Service Info HE-01/ 0040, the bmp-file is attached to this Service Information). This is a half black and half white picture: black has the value 17, and white 235 on a full scale of 255 (= 700 mV).
     Note: use e.g. the program MS Paint, and display the picture in "full screen" mode (CTRL-F).
  2. In the SAM menu go to ALIGNMENT -> MSB -> ALIGN ADC and press OK on the remote. The screen will flicker. Once the flickering stops, the alignment is ready.

RECALL Factory
This will restore the factory alignment values as saved in the NVM.

8.3.5 GDE-NVM

RESET LAMP SVC (SERVICE) COUNTER
This will reset the lamp counter (line 50) in the CSM menu, and must be activated after the lamp has been replaced.

SAVE TO FACTORY
This will save the GDE settings in the NVM.

RESTORE FACTORY
This will restore the factory alignment values as saved in the NVM.

8.3.6 GAMMA

The gamma correction factor is linked to the incidence of light on the light sensor. Use the default values:

- Light Sensor Index: "0"
- Gamma: "24"

8.4 Option Settings

8.4.1 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 specific ICs (or functions) is made known by the option codes.

Notes:

- After changing the option(s), save them with the STORE command.
- The new option setting is only active after the TV is switched "off" and "on" again with the AC power switch (the EAROM is then read again).

8.4.2 DEALER OPTIONS

Select this sub-menu to set the initialisation codes (= options) of the set via text menu's.

Table 8-3 Dealer options overview

Menu name	Subjects	Options	Description
Personal Options	Picture Mute	Yes	Picture (blue) mute active in case no picture detected
		No	Noise in case of no picture detected
	Virgin Mode	Yes	TV starts up (once) with language selection menu after mains switch "on" for the first time (virgin mode)
		No	TV does not starts up (once) with language selection menu after mains switch "on" for the first time (virgin mode)
	Auto Store Mode	None	Autostore mode disabled (not in installation menu)
		PDC-VPS	Autostore mode via ATS (PDC/VPS) enabled
		TXT page	Autostore mode via ACI enabled
		PDC-VPS-TXT	Autostore mode via ACI or ATS enabled
	TXT Preference	TOP	Preference to TOP Teletext
		FLOF	Preference to FLOF Teletext
	DVD door lock (only for sets with integrated DVD)	Yes	To disable the DVD tray opening function
		No	To enable the DVD tray opening function

8.4.3 SERVICE OPTIONS

Select this sub-menu to set the initialisation codes (= options) of the set via text menu's.

Table 8-4 Service options overview

Menu-item	Subjects	Options	Description
Chassis/Region	Region	Europe	Select your region
		AP PalMulti	Select your region
Dual Screen	PIP/Dual Screen	No	Not selectable
	Text/EPG DS	Yes / No	Feature present / not present
Teletext	NexTView type	Flash RAM	Flash RAM present / not present
Video Repro	Featurebox type		Not selectable
	Lightsensor	Yes / No	Feature present / not present
	2D Combfilter	Yes / No	Feature present / not present
	Picture Impr.	Yes / No	LTP (TOPIC) present / not present
	PixelPlus	Yes / No	Eagle IC present / not present
	Signalling bits	Yes / No	For 16:9 / 4:3 sets
Source Sel.	AV3 2Fh	Yes	Not selectable
	AV4 2Fh	Yes	Not selectable
Audio Repro	Acoustic System	4 Speakers	Cabinet design (Matchline)
		2 Speakers	Cabinet design (Epic)
	Vitual Dolby	Yes	Not selectable
	AVL	On / Off	Enable / disable Automatic Volume Limiter
Miscellaneous	Home Cinema	Yes / No	Model with / without Home Cinema Link (EU only)
	Integrated RC	Yes / No	Control pheripheral equipment via TV IR receiver (EU only)
	Tuner type	UV1316 / TEDE9	Model with Philips tuner / Alps tuner
	P50 DVD menu line	Yes / No	Enable / disable DVD control via user menu with TV RC (EU only)
	VGA Data Graphic	Yes / No	Set with / without VGA input
Option no.	Group 1		Group 1 option code overview (see set sticker)
	Group 2		Group 2 option code overview (see set sticker)

OPT. NO. (Option numbers)
Select this sub menu to set all options at once (expressed in two long strings of numbers).

An option number (or option byte) represents a number of different options. When you change these numbers directly, you can set all options very fast. All options are controlled via eight option numbers.
When the EAROM is replaced, all options will require a re-setting. To be certain that the factory settings are reproduced exactly, you must set both option number lines. You can find the correct option numbers on a sticker inside the TV set.

Example: The sticker in the 55PL9874/12 gives the following option numbers:
53835 40992 49472 00064
04182 00001 00000 03971
Every 5-digit number represents 16 bits (so maximum number can be 65536 if all options are set).
When all the correct options are set, the sum of the decimal values of each Option Byte (OB) will give the option number

9. Circuit Description, List of Abbreviations, and IC Data Sheets

Index of this chapter:

9.1 Introduction

9.1.1 General

The EM8E chassis is a rear projector television, based on LCoS (Liquid Crystal on Silicon) technology. LCoS is a reflective LCD technology. The light source is an ARC projection lamp, which is replaceable by the customer. This projector is lighter and more compact, than comparable size projection sets using tubes.

The model has Pixel Plus for the 1fH inputs. The EM8E is a High Definition Ready set with a screen resolution of 1280x720. The tuning system is capable of tuning all the PAL and SECAM systems. The 1fH EXT inputs can accept PAL, SECAM, or NTSC.

A timer in the set will inform the customer when the Lamp should be changed. Under the Setup/General title, the Bulb Replaced selection will reset the timer when the OK button on the Remote is pressed. The Timer is set for 6000 hours. When the set is turned on, it takes approximately 30 seconds before the lamp will turn on. There is an approximate 30 second shutdown time before the set turns off and can be turned on again.

9.1.2 Set Operation

The set has three 1fH SCART inputs and one Side Jack panel. Component or Composite video can be input into SCART 1. RGB or Composite video can be input into SCART 2 while SCART 3 is only wired for Composite video. Composite video or SVHS can be input into the Side Jack panel. The SCART and Side jack panel will accept PAL, SECAM, or NTSC signals. AV4 or AV5 can accepts either 1fH or 2fH signals. AV6 is a DB15 RGB input. AV7 is a DVI 1080i input connector. Inputs from 1h sources should be connected to SCART 1, SCART2, SCART 3, or the Side Jack panel for best results.

The indicator LEDs and the Remote Control Receiver are located on the front of the set. When the set is turned "on", the Amber LED will turn "on". After the Lamp in the set has switched "on", the Green LED will turn "on".
The Control Panel is located at the top of the set. The "Power on" button is lighted with a blue LED whenever power is applied to the set.

When the set is turned "on" via the Keyboard or Remote Control, the set will take approximately 30 seconds to display a picture. By using the SELECT button, the Remote can be used to control other devices. A list of setup codes for other devices is located in the customer's operators manual. The customer can select the MENU button on the Remote to make additional selections and adjustments as desired. Use the cursor right and cursor down buttons on the Remote to select the desired topic.

When PICTURE is selected, use the cursor down button to select the desired subtopic. For example, press the cursor down button to select CONTRAST then use the cursor left and cursor right buttons to change the values. Additional dots on the lower part of the line indicate that additional selections are present. Continue to press the cursor down button to make these selections.

Under COLOR TEMPERATURE, there are three selections: NORMAL, WARM, and COOL. With the NORMAL selection, the picture displays a normal Gray Scale. If the customer desires a reddish tint to the picture, WARM is selected. COOL shifts the picture's gray scale in the direction of Blue.

With sets with Pixel Plus, the customer can select between Progressive Scan and Pixel Plus. Pixel Plus provides additional picture enhancement.

9.1.3 Picture Formats

There are seven different Picture Formats: Super Zoom, Panoramic, 4:3, Movie Expand 14:9, Movie expand 16:9, 16:9 Subtitle, or Wide screen, which can be selected by the customer.

- Super Zoom enlarges the picture vertically without distortion. Some of the top and bottom portions of the picture will be deleted.
- The Panoramic format evenly stretches the edges while keeping the center of the picture linear to display a 4:3 picture on a 16:9 screen.
- The 4x3 format displays a 4:3 picture without change. Black or gray bars will show at the left and right sides. There is no loss of picture on the top and bottom.
- Movie Expand 14:9 displays the picture in a 14:9 aspect ratio. Some of the top and bottom portions of the picture will be deleted. Black or gray bars will show at the left and right sides. This would be used by the viewer if the original material was in the 14x9 letterbox format.
- Movie Expand 16:9 format stretches the picture horizontally and vertically to fill the 16:9 screen. Some of the top and bottom portions of the picture will be deleted. This format would be used by the viewer if the original material was in the 16x9 letterbox format.
- The 16:9 Subtitle format zooms the picture for a full view of subtitles or other information displayed at the bottom of the screen. The top portion of the picture will be deleted in this mode. This format digitally stretches the picture vertically, then shifts it up.
- The Wide Screen format evenly stretches the width of a 4:3 picture to fill the screen. The viewer would use this format if the original material was in a 16x9 compressed Format.

When portions of the picture are deleted, the cursor buttons on the Remote can shift the picture to select the area to be deleted.

Under the Channels title, is the channel guide lock selection. The customer can lock out selected channels or channels that are transmitting a selected rating code. These channels can only be view when the code selected by the customer is entered. If the customer forgets the code, a code of "8888", entered twice, can be used to unlock the set.

9.1.4 Reflective LCD Projection System

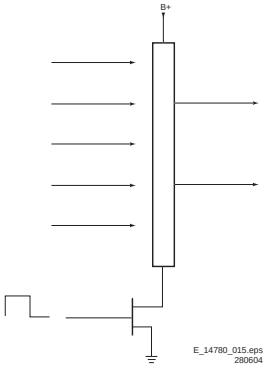


Figure 9-1 LCD cell

The LCoS (Liquid Crystal on Silicon) uses a single LCD device with multiple LCD cells. Since a single panel is used, it is necessary to scan the panel with the primary colours to obtain a colour picture. A LCD is a light valve, which allows more or less light pass through it, depending on the applied voltage.

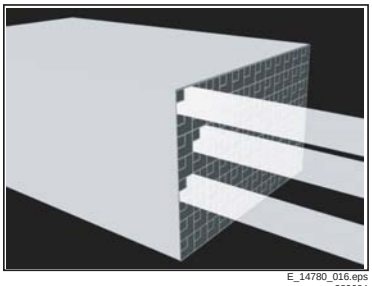


Figure 9-2 Transmissive LCD

The LCD used in most projectors and direct view LCD TVs uses a transmissive type of LCD. Light is projected to pass through the LCD panel. One of the disadvantages of this type of system is that the electronics to control the LCD cells limit the surface area in which light can pass. This limits the resolution of the picture and brightness.

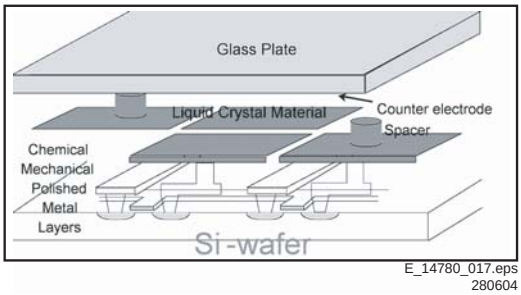


Figure 9-3 Reflective LCD

The reflective type of LCD, like the one used in the LCoS, has the electronics beneath the LCD cells, allowing greater resolution. The LCD cells are turned on, switching the individual cells. Beneath each cell is a reflective surface. The amount of light reflected from each cell depends on the applied voltage. Since the LCD may be illuminated by all three primary colors at one time, several cells are addressed at once.

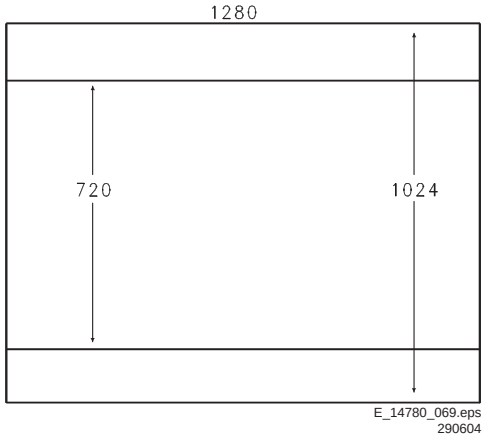


Figure 9-4 LCD surface area

The reflective LCD used in the LCoS projector uses a 1280x1024 device with 20 micron pixels. Since the aspect ratio of the TV is 16x9, the actual area used is 1280x720. Regardless of the input format, the LCD displays the picture in a 1280x720 format.
The Philips LCoS projector uses a single LCD device. To obtain a colour picture, the LCD is scanned with strips of Red, Green, and Blue light. Splitting the light from the Lamp and directing it to three colour filters, which produces Red, Green, and Blue light, develop the strips of colour. The output from the filters is directed to three rotating prisms to produce the colour strips and direct them to the correct parts of the LCD. Data is directed to the LCD in such a way, that the correct data for colour, illuminating to that portion of the LCD will be displayed. The LCD is being scanned a rate of 180 Hz. The phase of each prism is offset by 30 degrees, to provide colour separation. The reflected light from the LCD is fed to a projection lens, the mirror, and finally the screen.

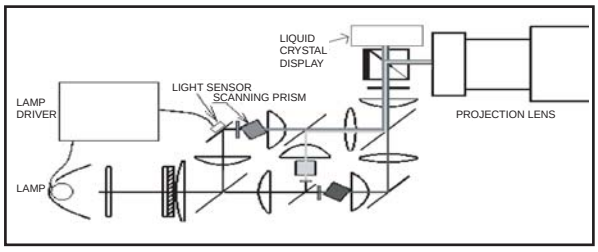


Figure 9-5 Light engine path

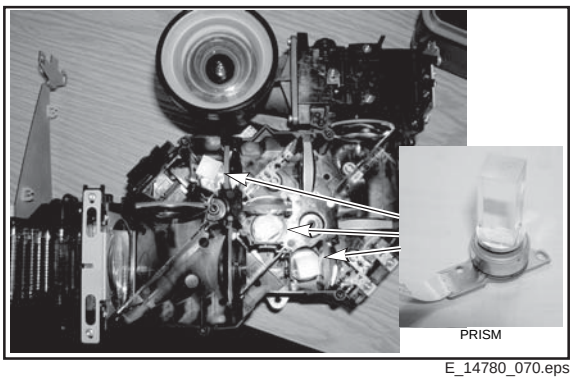


Figure 9-6 Light engine without lamp and PWB

9.2 Power Supply Block

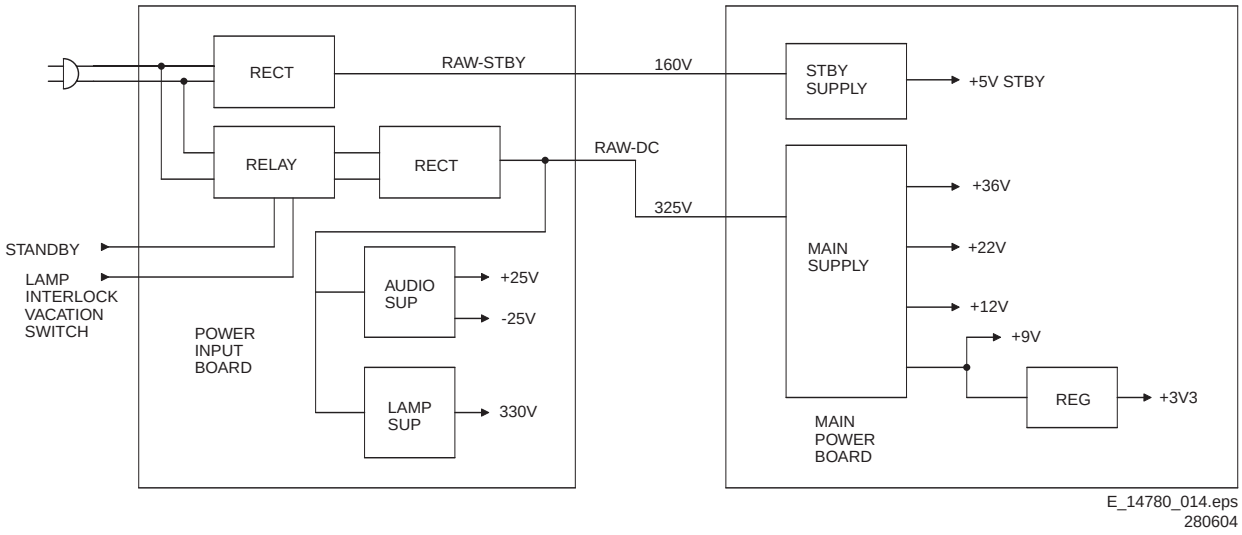


Figure 9-7 Power supply block

The Bridge Rectifiers, on/off Relay, Audio Power supply, and Lamp supply are located on the Power Input board. The Standby and Main supplies are located on the Main Power board.

9.2.1 AC Input

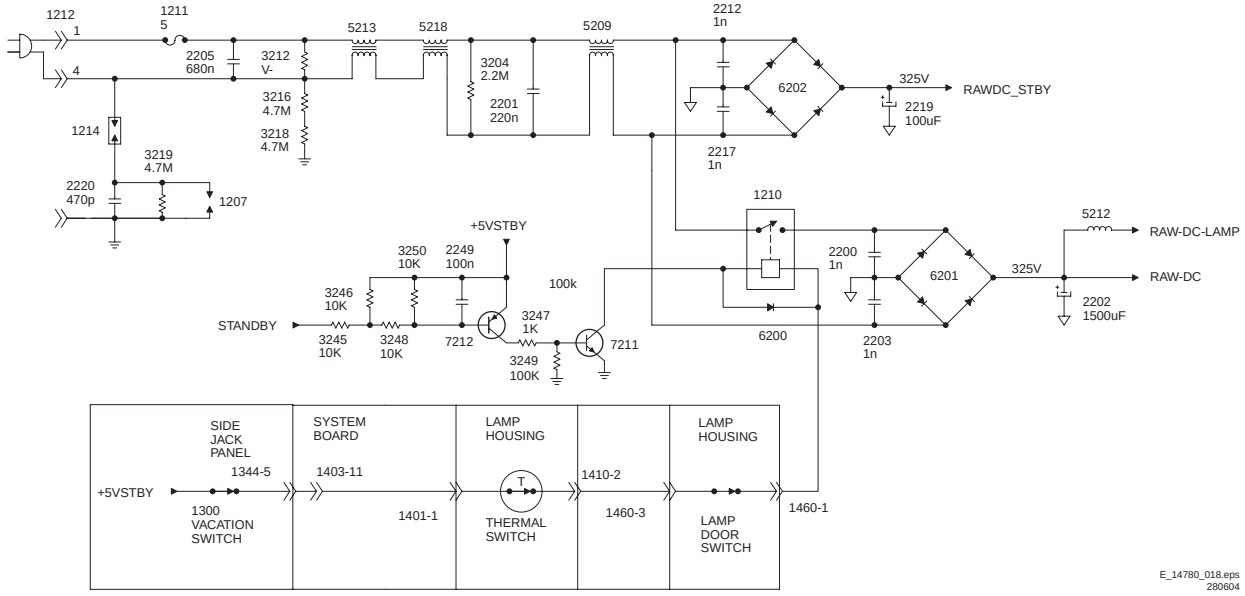


Figure 9-8 AC input

AC is applied to the Power Input Board via connector 1212. This voltage is rectified to produce the RAWDC-STBY and is fed to the Main Power Board. This feeds the Standby Supply that produces a 5 V Standby and a switched +5 V2 supply. This supply feeds the Power Relay on the Power Input board and the SSB to power the Microprocessor.

The AC input voltage is also fed to a Relay Switch controlled by the Microprocessor on the SSB via the System Board. When the set is turned "on", the Standby line goes Low, switching the Relay "on". The Relay B+ goes through a Thermal Lamp switch, Door Interlock switch, and Vacation Switch. Voltage from the Relay is fed to a rectifier that supplies RAW_DC to the Audio Supply and Lamp Supply located on the Power Input Board. The rectifier is connected as a voltage doubler. It also supplies RAW_DC to the Main Supply located on the Main Power Board. The Audio Supply provides a positive and negative voltage to the Audio Amplifier Board. The Lamp Supply is a Boost regulator that supplies 330 V to the Lamp Driver board.

The Main Supply produces a +36 V, a +12 V, a +22 V and a +9 V supply. The +9 V supply is also fed to a 3.3 V regulator.

Fuse 1211 provides protection against over current. Spark gaps 1214 and 1216 provide protection against excessive voltage spikes on the AC line. Resistors 3207, 3210, 3213, and 3215 limit the current when power is first applied to the set. Bridge 6202 rectifies the AC voltage to produce the RAWDC_STBY for the Standby regulator.

Bridge 6201 provides power for the Lamp Supply and the Main Power supply. When the set is turned "on", Relay 1210 switches "on" to provide power to 6201. Bridge 6201, Capacitors 2202 and 2209 constitute a voltage doubler circuit. When the set is turned "on", the Standby line goes Low.

Transistor 7212 turns "on" turning transistor 7211 "on", switching the Relay 7210 "on". The 5 V Standby supply for the Relay is connected to the Lamp Door Interlock switch, the Thermal switch which is located on the Lamp Housing, and the Vacation switch located on the Side Jack panel. If the Projection Lamp Door is open, the Vacation switch is open, or the Lamp Housing has overheated, the set cannot be turned "on".

9.2.2 Standby Supply

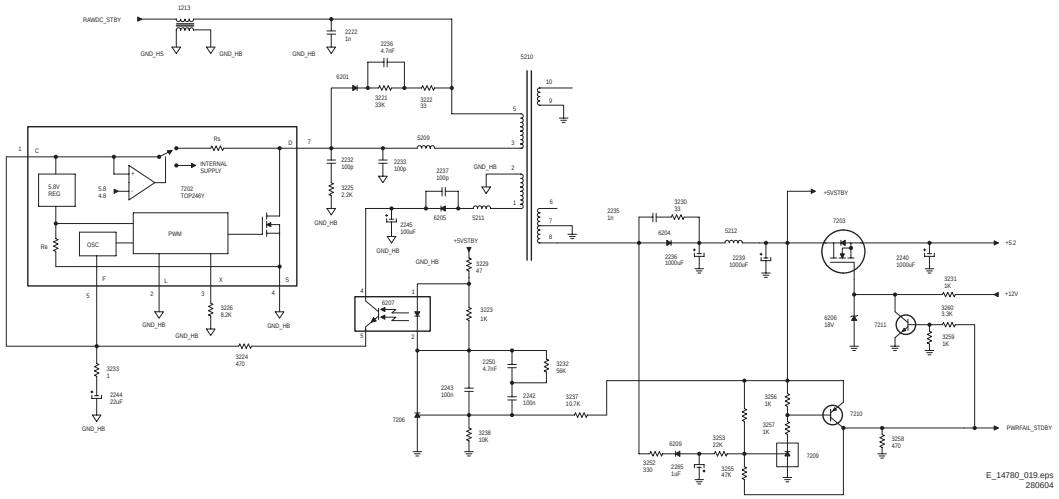


Figure 9-9 Standby supply

The Standby supply is located on the Main Power board. It provides the +5 V STBY supply to the set whenever power is applied.

When power is first applied, the RAWDC_STBY is applied to the primary winding of 5210 and to Pin 7 of 7202. Current through resistor Rs charges Capacitor 2244 connected to Pin 1 of 7202. When the charge on 2244 reaches 5.8 V, the Internal Supply switch is switched to internal. The Oscillator and PWM turn "on" to drive the internal FET. The PWM will continue to drive the FET until the charge on Capacitor 2244 drops below 4.8 V. Capacitor 2244 will again charge and the process will repeat. With each start-up cycle, energy is transferred to the secondary windings of 5210. When the +5 V STBY supply reaches 5 V, the input of 7206 will go to 2.5 V. This will turn Shunt Regulator 7206 "on", causing current to flow through opto insulator or 6207. Voltage from Pins 1 and 2 of 5210 is rectified by 6205 to produce the operating voltage for 7202. When opto insulator 6207 turns "on", the operating voltage is applied to Pin 1 of 7202. The supply is in a normal operating mode.

Regulation of the secondary is accomplished by monitoring the reference voltage via Shunt Regulator 7206 and opto insulator 6207. The +5 V STBY is the reference voltage for the Standby supply. If the 5-V standby supply should increase, Shunt Regulator 7206 will conduct harder, causing the LED in Opto insulator 6207 to get brighter. The internal resistance of the transistor inside 6207 will be reduced. The internal regulator inside 7202 connected to Pin 1 works to keep Pin 1 at 5.8 V. If the current through 6207 increases, the current flow through the 5.8-V regulator will increase. This increase in current will cause the voltage across the sensing resistor Re to increase. The PWM will then reduce the "on" time of the internal FET, reducing the secondary voltage. If the 5-V standby voltage should decrease, the current through the sensing resistor Re will decrease, reducing the voltage across the resistor. This will cause the PWM to turn the internal FET "on" for a longer period of time, increasing the secondary voltage.

FET 7203 switches the +5.2 V supply, when the +12 V supply from the Main Power supply is switched "on". If the Standby Supply should fail, or Power is removed from the set, the Standby Power Fail circuit will signal the Microprocessor in time to allow it to shut down. Voltage from Pin 8 of 5210 is rectified by 6209 to produce a negative voltage. This voltage and the +5 V standby voltage are applied to the input of Shut Regulator 7209. The combined voltage keeps the input to 7209 below the turn "on" voltage of 2.5 V. A small Capacitor, 2265, filters the negative voltage that is rectified by 6209. If power is removed from the set, 2265 will discharge quickly because of its small value. The input to 7209 will then go above 2.5 V, turning it "on". This will turn transistor 7210 "on", switching the Standby Power Fail line High. Transistor 7210 will also turn "on", turning the +5.2 V supply "off".

9.2.3 Main Power Supply

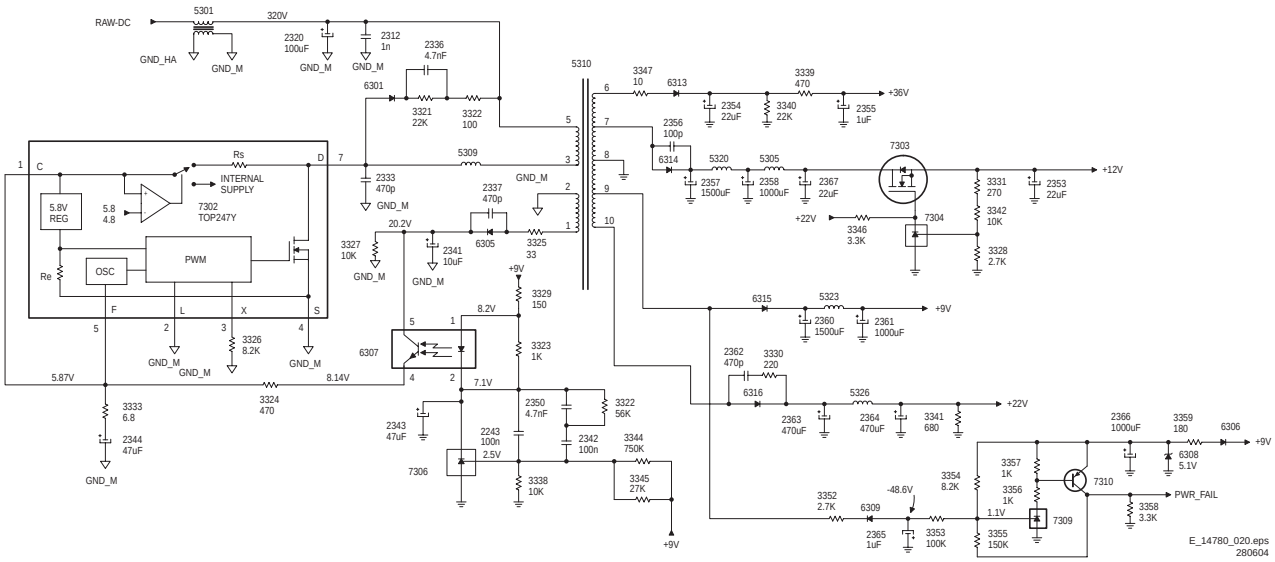


Figure 9-10 Main power supply

Power is applied to the Main Power supply when the set is turned "on". The RAW-DC is switched to the Main Power supply located on the Main Power supply board. Voltage is applied to the Primary winding of 5310 via Pins 5 and 3. Voltage is then applied to Pin 7 of 7302. In the Start-up mode, voltage from the internal current limiting resistor Rs is routed to Pin 1 where it charges Capacitor 2344. When the charge on Capacitor 2344 reaches 5.8 V, Pin 1 is switched to the Internal Supply connection. The Oscillator and PWM drive are switched "on" to drive 5310. IC 7302 will continue to drive the Transformer, 5310, until the charge on 2344 drops below 4.8 V. The Start-up cycles will continue until the secondary reference voltage, the 9 V supply, reaches the correct level. When the 9-V supply reaches the correct level, 2.5 V will be applied to the input of Shunt Regulator 7306. Shunt Regulator 7306 will then turn "on" causing current to flow through the LED in Opto insulator 6307. This will turn the transistor inside 6307 to turn "on". Voltage from Pins 1 and 2 of the Hot secondary is rectified by 6305 and filtered by 2341. Opto insulator 6307 switches this voltage to Pin 1 of 7302 to provide the operating voltage for the IC.

The secondary produces +36 V, +12 V, +9 V, and +22 V supplies. Shunt Regulator 7304 and FET 7303 regulate the +12 V supply.

The PWR_FAIL Main Power Fail detection circuit signals the Microprocessor when power is about to be lost to the set while it is "on". Voltage from Pin 9 of 5310 is rectified by 6309 to produce a negative voltage, which is filtered by Capacitor 2365. This voltage along with the +9 V supply is applied to the input of Shunt regulator 7309 via resistor network of 3354, 3355, and 3353. As long as the negative voltage is present on 2365, the voltage on the input of 7309 will be less than the 2.5 V necessary to turn it "on". Transistor 7310 will be turned "off", keeping the PWR_FAIL line Low. When the switched mode supply ceases operation, Capacitor 2365 will discharge quickly, due to its low value, allowing the voltage on the input of 7309 to increase to 2.5 V from the 9 V supply via resistors 3359 and 3357. Shunt Regulator 7309 will turn "on", turning transistor 7310 "on", causing the PWR_FAIL line to go High. This will signal the Microprocessor to shut everything down before the main supply voltage drops.

Regulation of the secondary is accomplished by monitoring the reference voltage, the +9 V supply, to control the "on" time of the internal FET of 7302. If the +9 V supply increases, Shunt Regulator 7306 will conduct harder increasing the amount of current through 6307. This will cause the LED to increase in brightness, reducing the internal resistance of the transistor inside the IC. The increase in current will cause the voltage across the internal sensing resistor Re inside 7302 to increase. The PWM will then reduce the "on" time of the internal FET, decreasing the secondary voltage. If the +9 V supply should decrease, 7306 will conduct less, the transistor inside 6307 will conduct less, causing less current to flow through the sensing resistor Re. The PWM will sense the lower voltage across Re, increasing the "on" time of the internal FET to increase the secondary voltage. During normal operation, the voltage on Pin 1 of 7302 will stay at 5.8 V due to the internal regulator.

9.2.4 3.3 Volt Regulator

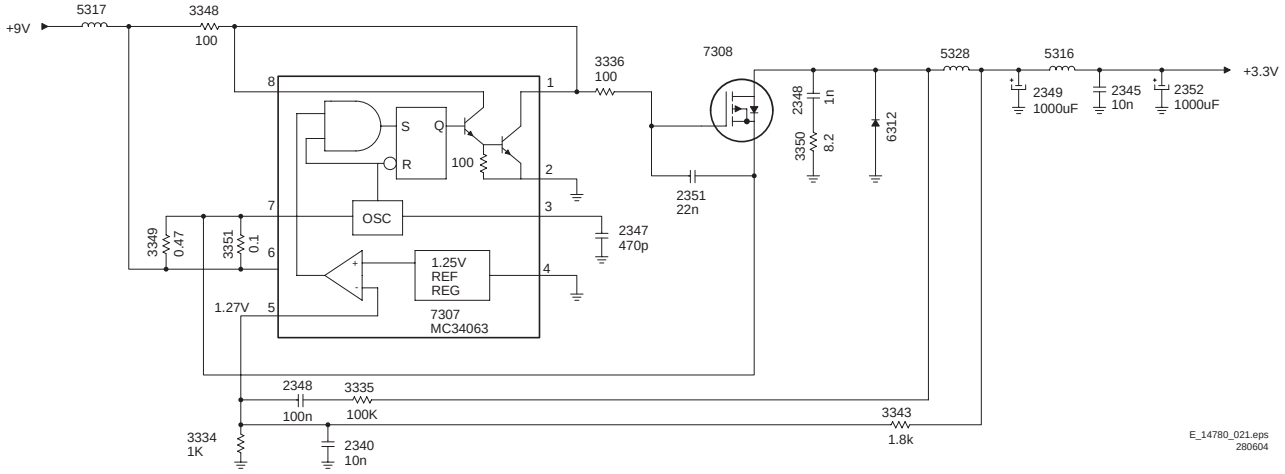


Figure 9-11 3.3 Volt regulator

IC 7307 and transistor 7308 make up the 3.3-V regulator located on the Main Power Supply board. When the Oscillator in 7307 goes Low, the flip-flop is reset causing Q to go Low and the output to go High. When the Feedback voltage on Pin 5 is below 1.25 V, the comparator outputs a High. When the Oscillator goes High, the flip-flop is Set, causing Q to go High. This causes Pin 1 to go Low, turning Transistor 7308 "on". 7308 will stay on until the Oscillator goes Low, resetting the flip-flop. If the output voltage monitored on Pin 5 goes below 3.3 V, the voltage on Pin 5 will drop below the 1.25 V reference. The flip-flop will then Set when the Oscillator goes High. If the output voltage goes above 3.3 V, the reference voltage on Pin 5 will be above the 1.25 V internal reference. The flip-flop will not Set when the Oscillator goes High until the feedback reference voltage on Pin 5 drops below the 1.25 V internal reference. This method controls the "on" time of 7308 to regulate the 3.3-V supply. Pin 7 monitors the current by reading the voltage drop across resistors 3349 and 3351. If the output current is excessive, the Oscillator will go Low to shorten the "on" time of 7308.

9.2.5 Audio Power Supply

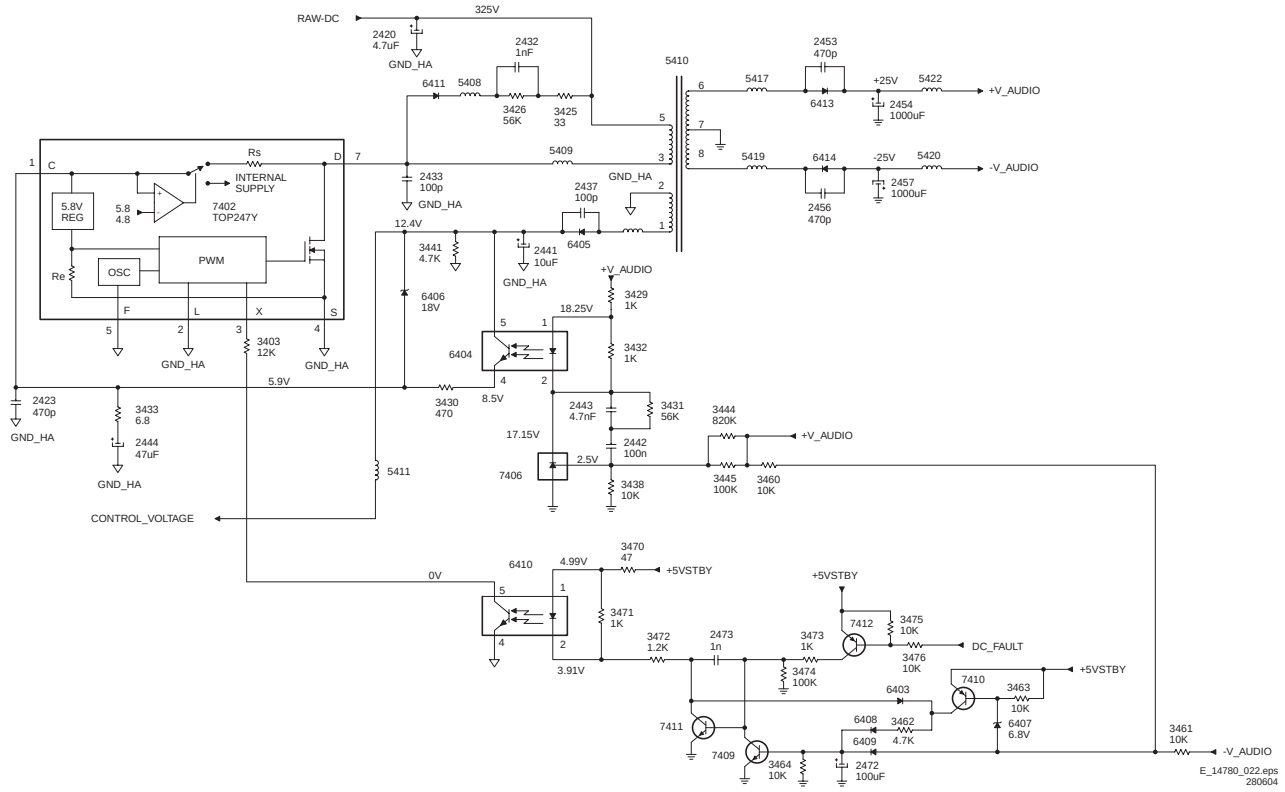


Figure 9-12 Audio power supply

The Audio supply produces a plus and minus 23 V. This supply is located on the Power Input board. The Audio supply also produces the control voltage or operating voltage for the Lamp supply.

RAW-DC voltage is applied to the Audio Power supply circuit when the set is turned "on". This voltage is applied to primary windings, Pins 5 and 3, of Transformer 5410. It is also applied to Pin 7 of the Switching Regulator, IC 7402. Start-up occurs when the voltage applied to Pin 7 is fed to the current limiting resistor Rs and to Pin 1 of the IC. This voltage charges Capacitor 2444. When the voltage on this Capacitor reaches 5.8 V, Pin 1 is switched to the Internal Supply. The Oscillator and PWM drive turns "on" to drive the internal FET. This drives 5410 to produce the secondary voltages. The IC will continue to operate until the charge on 2444 drops below 4.8 V. The Start-up cycle will then repeat. When the secondary voltages have reached the correct level, the input to Shunt Regulator 6404 will increase to 2.5 V. Shut Regulator 7406 will then turn "on", switching Opto insulator 6404 "on". The voltage on Pin 1 and 2 of 5410 is rectified by 6405 and filtered by Capacitor 2441. Opto insulator 6404 then switches this voltage to Pin 1 of 7402 to provide the operating voltage. The supply is then operating in a normal mode. The operating voltage from 6405 is also used to supply the CONTROL-VOLTAGE supply to the Lamp supply.

Regulation is accomplished by monitoring the Positive Audio supply. This voltage is fed to resistor network, 3444, 3445, and 3438. It is then fed to the input of Shunt Regulator 7406. If the secondary voltage should increase, Shut Regulator 7406 will conduct harder, increasing the current through the LED in Opto insulator 6404. This will decrease the internal resistance of the Transistor inside 6404. The 5.8-V regulator inside 7402 keeps Pin 1 at 5.8 V. To maintain this Pin at the correct voltage, the Regulator will increase the current through the sensing resistor Re. The voltage across Re is fed to the PWM which reduces the "on" time of the Internal FET, which reduces the output voltage. If the secondary voltage should decrease, the voltage across Re would decrease via the same path. The PWM would then increase the "on" time of the internal FET to increase the secondary voltage. In some cases, the secondary load could become excessive on the positive supply causing the voltage on the other windings of 5410 to increase. If the voltage from Pin 1 of 5410 should exceed 23.8 volts, Zener diode 6404 will conduct, increasing the current through the sensing resistor Re to reduce the "on" time of the internal FET to prevent damage to the supply.

The Audio supply can also be shut down if a DC-FAULT is detected in the Audio Output circuit or if the positive and negative supplies become unbalanced. In normal operation, the DC-FAULT line is Low, turning Transistor 7412 "on". This turns Transistor 7411 "on", which turns on Opto insulator 6410. This connects resistor 3403 and Pin 3 of 7402 to ground. This enables the Switching Regulator IC 7402. If Pin 3 is open, 7402 will shut down. If the DC_FAULT line should go High, 7412 will turn "off", turning 7411 and the Opto insulator 6410 "off". This will shut the supply down. The positive supply is connected to diodes 6407 and 6409 via resistor 3460. The negative supply is also connected to the same point. When the supplies are equal, the voltage at this point is zero. If the voltage becomes unbalanced in the negative direction by -2.5 V, Transistor 7410 will turn "on", turning Transistor 7409 "on". This will turn Transistor 7411 "off", shutting the supply "off". If the voltage becomes unbalanced in the positive direction by 1.2 V, Diode 6409 will conduct, turning Transistor 7409 "on", turning 7411 "off", shutting the supply down.

9.2.6 Lamp Supply

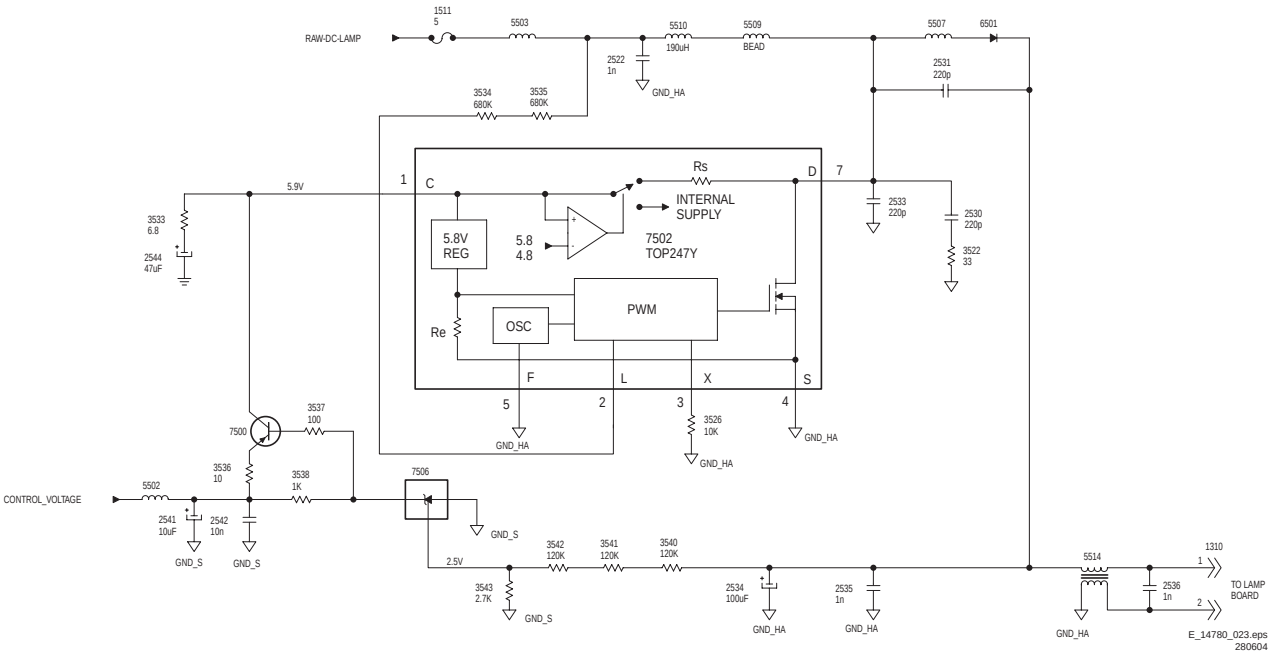


Figure 9-13 Lamp supply

The Projection requires a minimum of 330 V to operate. To ensure that sufficient voltage is present, a Boost Regulator is used. A Boost Regulator has a higher output voltage than the input voltage. The Lamp supply is located on the Power Input board.

RAW-DC-LAMP is applied to the Boost circuit via Fuse 1511. Voltage is applied to Pin 1 and Capacitor 2544 via the current limiting resistor Rs in 7502. When the charge on 2544 reaches 5.8 V, the PWM circuit drives the internal FET. When the FET is "on", a field builds up in Coil 5510. 5509 is a Ferrite bead to reduce RFI. When the FET turns "off", the field in 5510 reverses polarity. This voltage is rectified by Diode 6501, which charges Capacitor 2534. This will continue until the charge on 2544 drops below 4.8 volts. The Start-up cycle will then repeat. When the voltage across 2534 reaches 330 volts, Shunt Regulator 7506 turns "on", turning Transistor 7500 "on". The

Control Voltage from the Audio Power supply now becomes the operating voltage for Pin 1 of 7502.

Regulation is accomplished by the monitoring of the 330 V Lamp voltage by Shunt Regulator 7506. If the 330 V supply increases, 7506 will turn "on" harder, turning Transistor 7500 "on" harder. The increase in current will increase the voltage across the sensing resistor Re inside 7502. The Regulator connected to Pin 1 will keep Pin 1 at a constant 5.8 V. The voltage across Re will be fed to the PWM, reducing the "on" time of the internal FET to reduce the output voltage. If the 330 V supply decreases, the voltage across Re will decrease, causing the PWM to increase the "on" time of the internal FET. If the RAW-DC-LAMP voltage is 330 V or higher, the "on" time of the internal FET in 7502 will be to small for it to have an effect on the output voltage.

If the Switch mode circuit for the Lamp supply fails to operate, the voltage to the Lamp would be equal to the RAW-DC-LAMP voltage. The symptom is this case would be that the lamp would not ignite. Another possibility would be that 7502 might short. There would not be Lamp voltage in this case. The feedback circuit might cause a Low output voltage, 7506 and 7500, failing to operate. A Scope reading on Pin 1 of 7502 would indicate that the voltage would be changing between 4.8 and 5.8 V. Pin 7 of 7502 would be pulsing "on" and "off".

9.3 Video Signal Flow Block

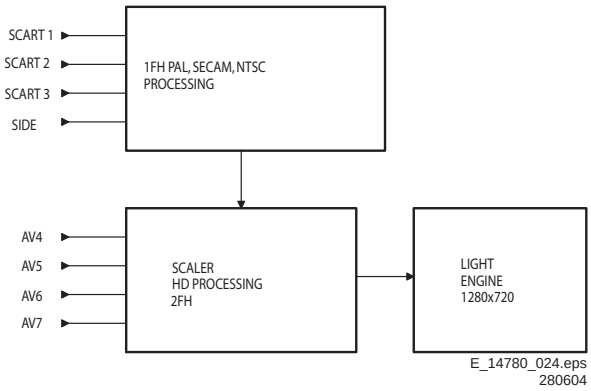


Figure 9-14 Video signal flow block

The LCoS projector has three sections: the 1fH PAL, SECAM, and NTSC processing, Scaler HD Processing, and the Light Engine.

The 1fH PAL, SECAM, and NTSC section has four video inputs, SCART 1, SCART 2, SCART 3, and Side Jack panel, which are for 1h Y Pr Pb, RGB, SVHS, or Composite video only. This section has Line Doubling and Pixel Plus functions. This section generates a 2fh signal, which is fed to the Scaler HD Processing section.

The Scaler HD Processing section has two YPbPr inputs, AV3 and AV4. AV5 is a RGB input, while AV6 is a DVI input. AV3 and AV4 can accept either a 1fH PAL, SECAM, NTSC, 480P, 576P, or a 1080I HD signal. For best results, the 1fH signals should be connected to SCART 1, SCART 2, SCART 3, or the Side input. It also processes the 2fH signal from the 1fH section. The signal is processed to output a 1280x720 pixel to the Light Engine. The Light Engine contains all of the display circuits used to project the picture to the screen.

Notes:

- 1fH processing is for PAL, SECAM, and NTSC only.
- Pixel Plus processing in the 1fH section.
- Either 1fH or 2fH signal can be applied to the Scaler.
- Regardless of the source, all signals are displayed in a 1280x720 format.

9.3.1 1fH Section Block

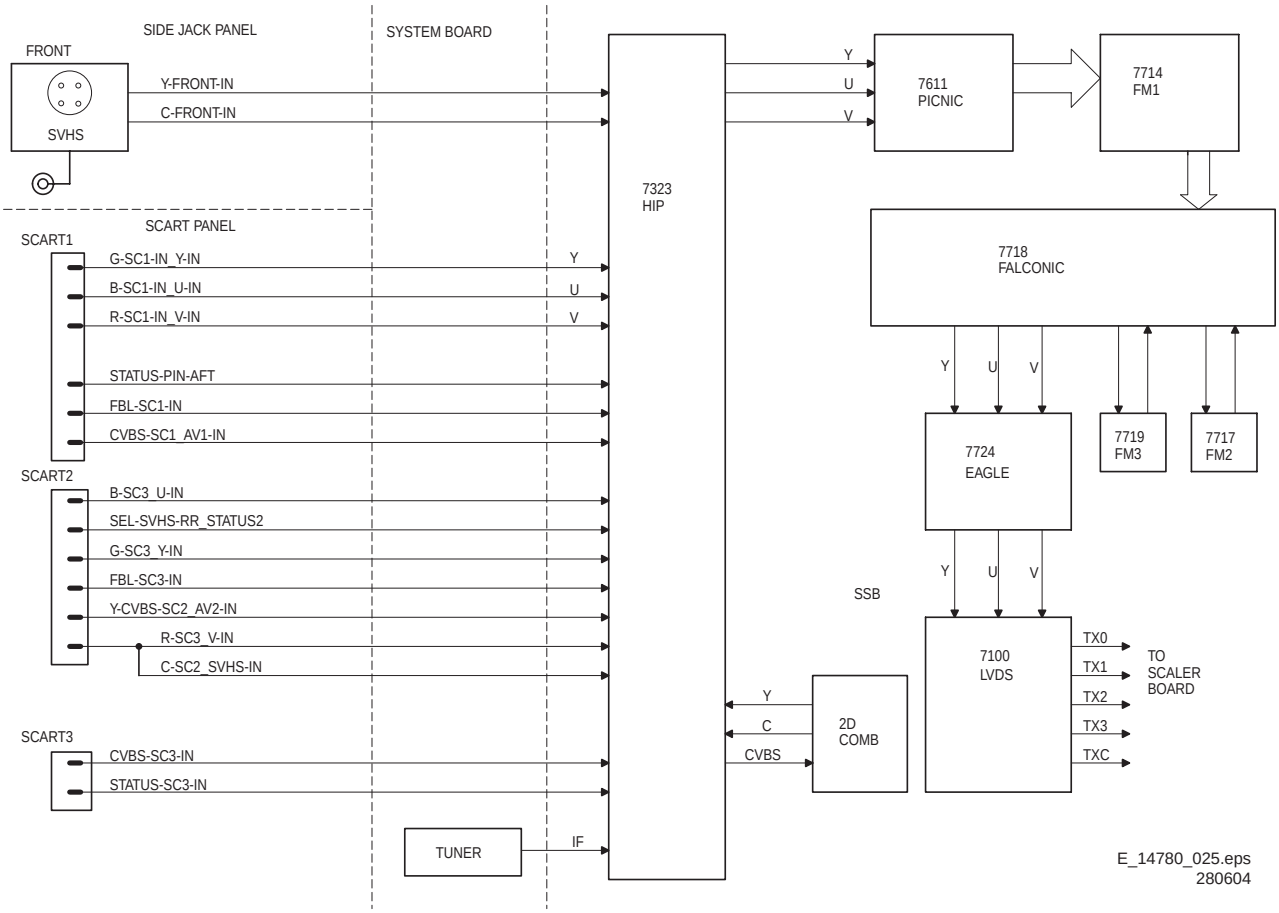


Figure 9-15 1fH section block

The inputs for the 1fH section are for PAL/SECAM or NTSC Composite or Component signals only. The Side Jack panel can accept either composite video or SVHS video. The Composite video or YC from the Side Jack Panel is fed to the HIP on the SSB. SCART1 and SCART2 YUV/RGB or Composite signals are fed to the HIP for switching and processing. The YPbPr to YUV converter is bypassed for the European version of the LCoS. Only Composite video can be applied to SCART3.

The HIP IC on the SSB selects between the internal Tuner video or from one of the inputs from the SCART panel. If the signal is Composite video, it is fed to a 2D Comb filter panel for processing. YC from the 2D Comb filter is fed back to the HIP. The HIP then outputs YUV to the Feature Box, which performs the line doubling and zooming features. YUV from the Feature Box is then fed to the Eagle circuit, which enhances the picture. The Pixel Plus feature is performed in the Eagle if the set is programmed for the Pixel Plus feature. The YUV output from the Eagle is then fed to the LVDS transmitter before being sent to the Scaler board. The video signal is digitised in the Feature Box and remains digitised from that point on.

Side Jack Panel

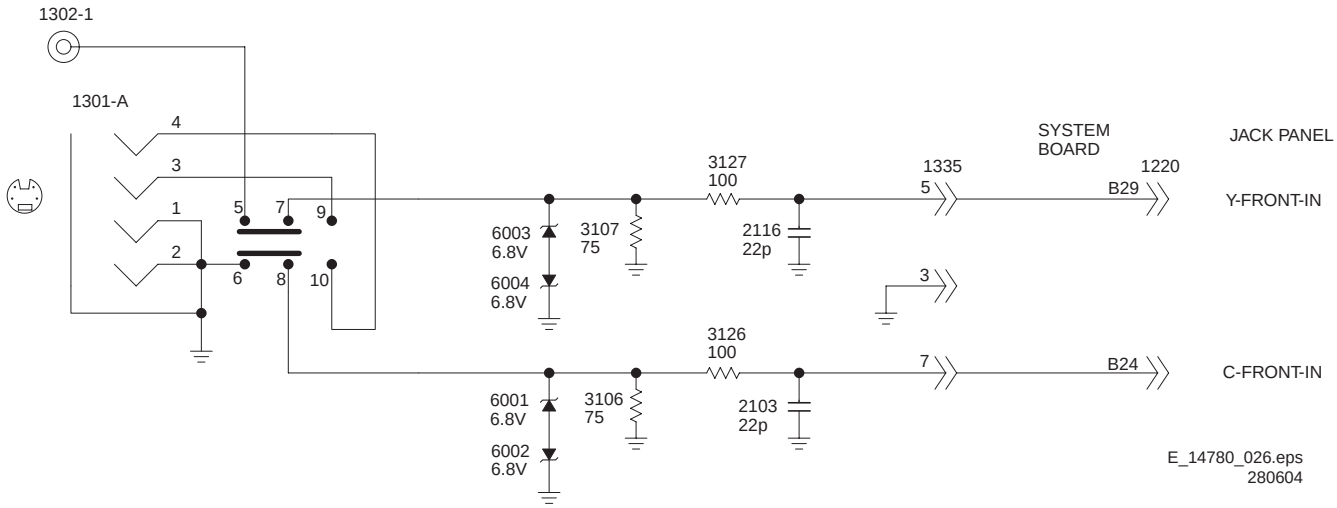


Figure 9-16 Side jack panel

The Side Jack panel can have either a composite or SVHS input. When a connector is inserted into the SVHS input, the composite input is disconnected. Zener diodes are connected to both the Y/Composite and the C lines to limit the applied voltage to 7.4 V. A 75-ohm resistor on both lines provides the correct impedance matching. The Y/composite and C signals are output to the Jack panel via the System board.

1fH SCART Input

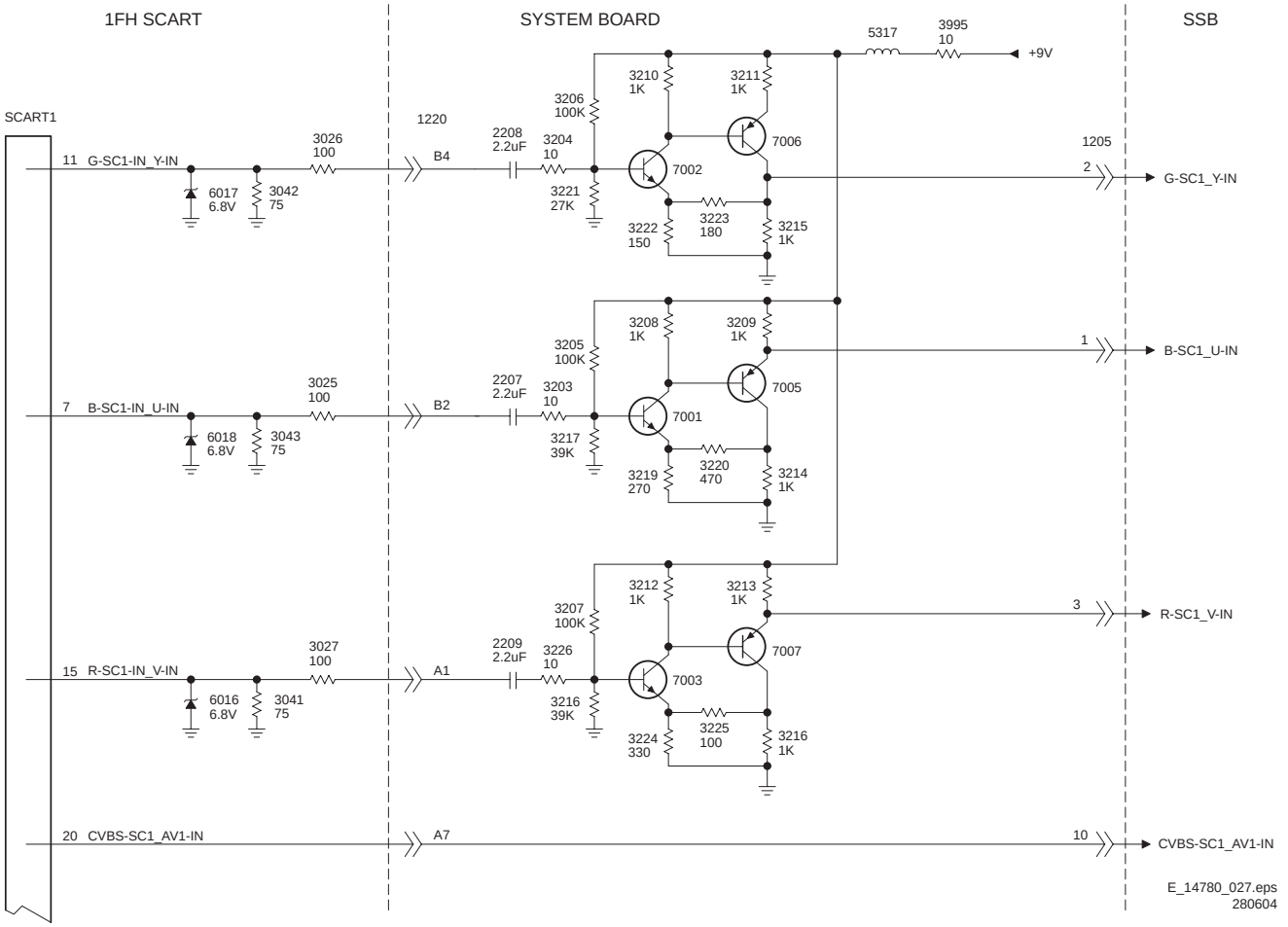


Figure 9-17 1fH SCART input

The G-SC1-IN_Y-IN, B-SC1-IN_U-IN, and R-SC1-IN_V-IN are routed to the SSB via the System board. A 75-ohm resistor located on each line provides impedance matching. To prevent an excessive signal from being applied to the signal lines, a 6.8 V zener is placed on each signal line.

Main Tuner

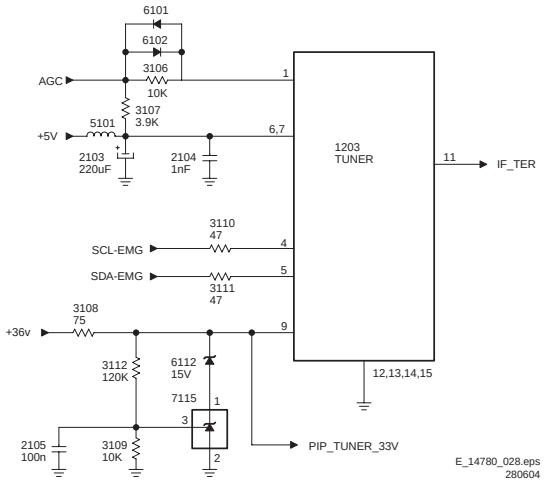


Figure 9-18 Main tuner

The Main tuner is located on the System board. The IF output from this Tuner is fed to the SSB for processing. The 36 V supply from the Main Power supply board supplies the tuning voltage. This voltage is regulated by Zener diode 6112 and Shunt Regulator 7115 to produce 33 V. The 33 V supply is also fed to the PIP/DW panel to supply the tuning voltage for that Tuner. The +5 V supply is also fed to Pin 6 and 7 of the Tuner.

HIP (High end Input Processor) Circuit

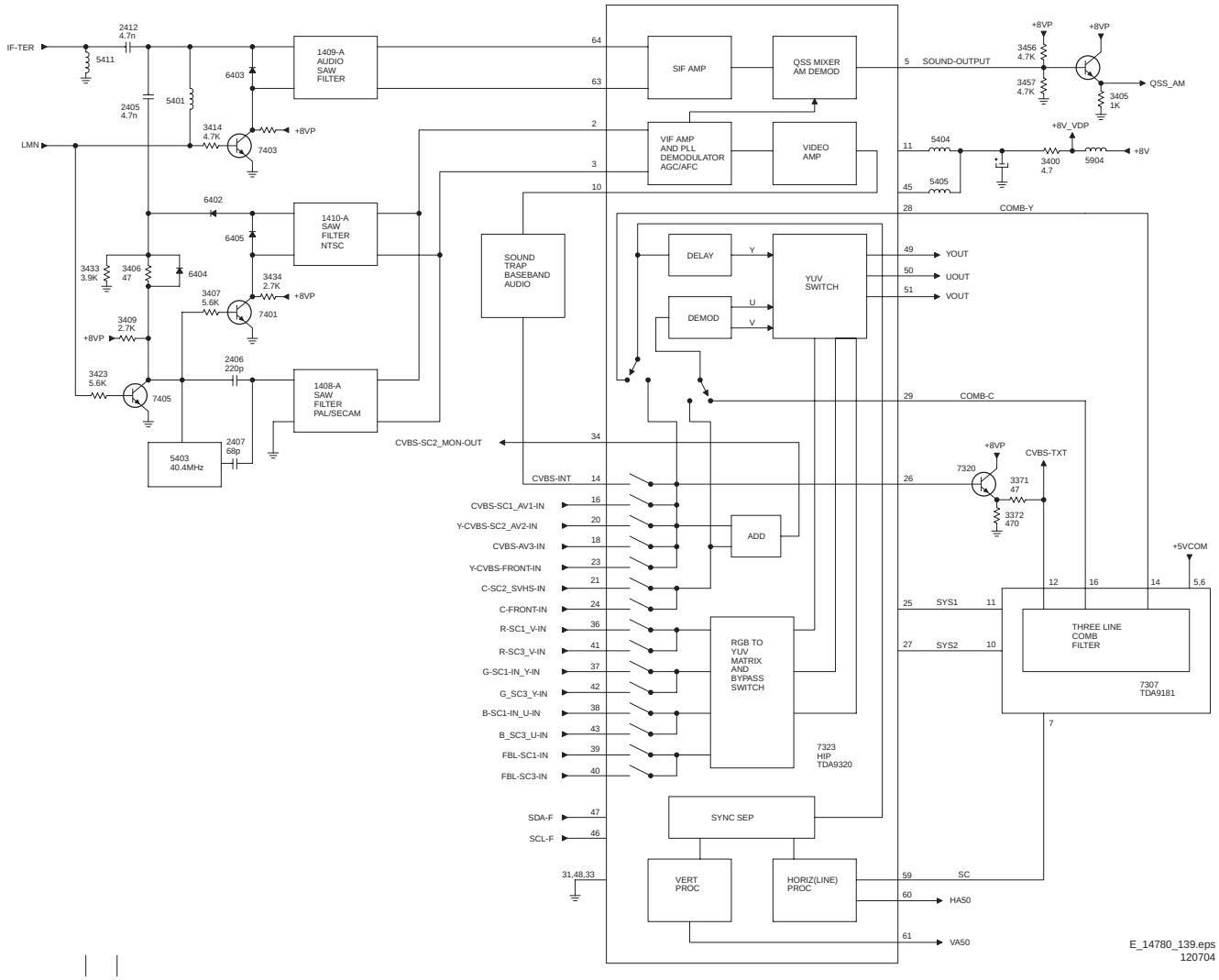


Figure 9-19 HIP (High-end Input Processor) circuit

The High-end Input Processor circuit is located on the Small Signal Board (SSB). The IF-TER signal from the Tuner on the System board is fed to the SSB. If the set is a multi-system version (PAL, SECAM, and NTSC), there will be two video SAW filters present, 1410-A and 1408-A. The LMN line selects the correct SAW filter depending on the selection by the user. The LMN line will go High for NTSC and Low for PAL or SECAM. If the set is a multi-system PAL-SECAM only, only 1410-A will be present. SAW filter 1409-A detects the Sound Carrier.

Video IF is fed to Pins 2 and 3 of the HIP IC. It is Amplified and detected, fed to an internal Video amplifier, and output on Pin 10. The signal is fed to a Sound trap circuit and fed to Pin 14. The Video switch selects composite video from Pin 14, the SCART inputs, or the Side Jack panel. The selected video is output on Pin 26 where it is buffered by 7320 before being fed to Pin 12 of 7307, the 2D comb filter. The Luminance Y signal is output on Pin 14 and the C Chroma signal is output on Pin 29. The internal switch connected to Pin 28 selects between Y from the Comb filter or from the selected Y signal from the SCART or Side Jack panel. The selected Y signal is fed to a delay and then to a YUV switch. The Chroma switch connected to Pin 29 selects between the Chroma signal from the Comb filter or one of the selected Chroma inputs. The YUV switch selects between the YUV from the Delay and Demodulator, and the selected YUV from SCART1 or SCART2. The selected YUV signal is output on Pins 49, 50, and 51 to the PICNIC IC.

The selected Y signal is then fed to the internal Sync Separator. Line Sync is output on Pin 60 and Frame sync is output on Pin 61. These signals are fed to the PICNIC IC. Horizontal sync is also output on Pin 59 to sync the Comb filter.

Sound Trap Switching

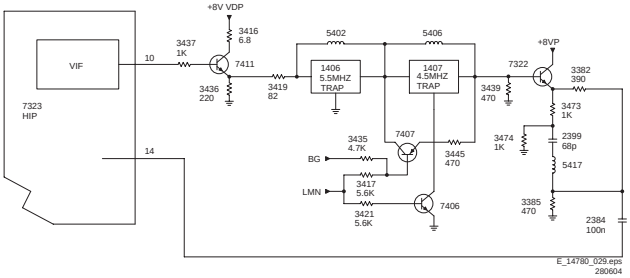


Figure 9-20 Sound trap switching

Composite video is output on Pin 10 of 7323 and buffered by transistor 7411. The signal is then applied to the 5.5 MHz trap, 1406. In the PAL/SECAM mode, the LMN line is Low, switching transistor 7407 "on", causing the signal to bypass 1407, the 4.5 MHz filter. The video is then buffered by transistor 7322 before being applied to Pin 14 of 7323.

In the NTSC mode, the LMN line goes High, turning transistor 7406 "on", switching the 4.5 MHz SAW filter "on". Transistor 7407 is turned "off", forcing the signal through 1407.

Feature Box

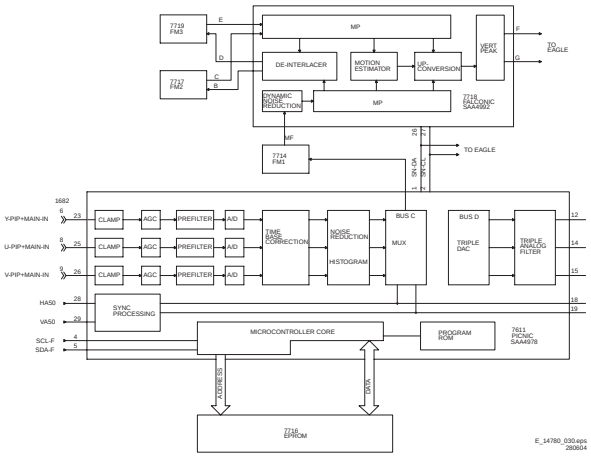


Figure 9-21 Feature box

The circuit located on the SSB labelled the Feature Box performs the digitising, line doubling, and picture resizing. The main functions are performed by 7611, PICNIC (PICture improvement Network IC), and 7718, FALCONIC (Field And Line COnverter and Noise reduction IC). The PICNIC IC performs the A/D Analogue-to-Digital conversion while the FALCONIC performs the Line Doubling. The FALCONIC also performs the Super Zoom, Panoramic, 4:3, Movie Expand 14:9, Movie Expand 16:9, 16:9 Subtitle, and Wide screen picture format conversions.

The YUV signal is fed to the PICNIC on Pins 23, 25, and 26. Horizontal and Vertical Sync is fed to the IC on Pins 28 and 29. The signals are fed to a Clamping circuit to limit the sampling range, an AGC, and a pre-filter circuit. It is then fed to a triple A/D converter, Time Base Corrector, Noise Reduction and Histogram circuit, and a Multiplexer. The pre-filter circuit limits the bandwidth of the signals to prevent aliasing. Aliasing shows up as artefacts in the picture, which is caused by under sampling. The Multiplexer combines the three data streams into one.

Data is output from the PICNIC to FM1 (Field Memory), IC 7714. The Fields are read by 7718 to the Dynamic Noise Reduction circuit and to the processor. The De-Interlace writes the Field data to Field Memory 2, 7717 and Field Memory 2, 7719. The Processor then reads the Field memories to convert the signal to a progressive scan signal. A Motion Estimator processes moving blocks in the picture to produce a natural motion. The processors resize the picture to fit the format selected by the user. However the picture appears to be formatted, the output is always a 480P format. The Signal is output on two 16-bit busses, F and G, to the Eagle processor.

The FALCONIC is controlled by the Microprocessor in the PICNIC. The Fast clock and data line from the OTC controls the PICNIC. The PICNIC communicates with the FALCONIC and the Eagle via the SN clock and data line. This is called a SNERT interface. SNERT is a No parity Eight-bit Reception and Transmission interface.

Eagle

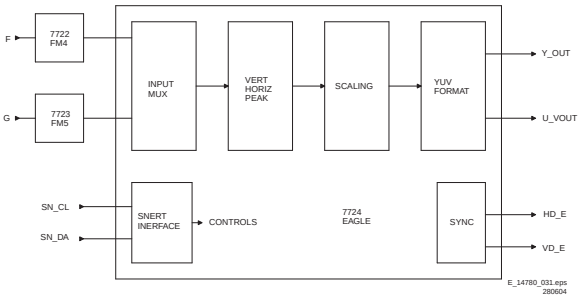


Figure 9-22 Eagle

The Eagle circuit provides Skin tone correction, Blue stretch, and Green Enhancement. In versions equipped with the Pixel Plus feature, the Eagle IC performs the corrections for this mode.

The video frames are sent to FM4 and FM5, 7722 and 7723, memories from the FALCONIC IC. These memory ICs hold the frame data until they are required for processing by the Eagle. The Input Multiplexer selects which frame is to be read. The Vertical and Horizontal Peaking circuit sharpens the edges and adds blue pixels to enhance the picture. This circuit is part of the Pixel Plus processing.

The Scaling circuit scales the picture to 1280x720 pixels to conform to the Light Engine display. The YUV format circuit converts the picture to conform to the MSB (Main Scaler Board) input. The Eagle is controlled by the Microprocessor in the PICNIC IC via the SNERT interface. The Eagle outputs an 8-bit digital Y and UV signal to the LVDS transmitter.

LVDS Transmitter

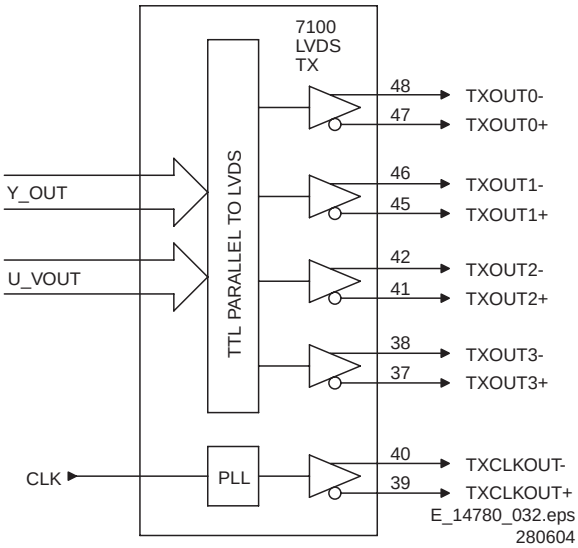


Figure 9-23 LVDS transmitter

The 8-bit digital Y and UV signal is fed to the LVDS (Low Voltage Differential Signalling) Transmitter, 7100. IC 7100 converts the parallel 16-bit signal to a serial data output. The output of the LVDS is held a 345mv to prevent RFI (Radio Frequency Interference). There are four data pairs and one clock pair. This circuit uses an 85MHz clock and is able to transfer data up to 300 Mbytes per second. The LVDS data is then sent to the MSB (Main Scaler Board) for further processing.

9.3.2 2fH Section Block

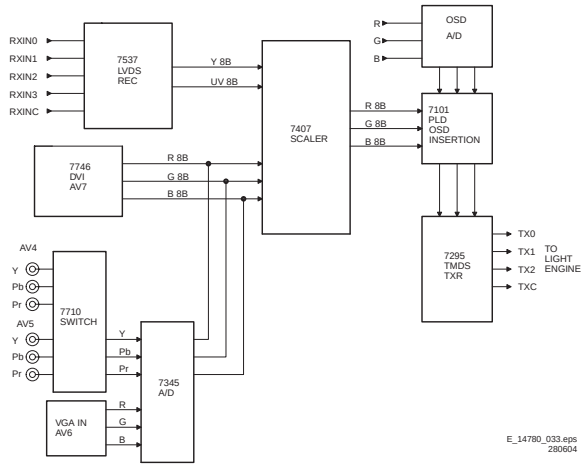


Figure 9-24 2fH section block

The 2fH processing section is located on the MSB (Main Scaler Board). Signal if fed to this board via the SSB via the LVDS line, VGA connector, DVI connector, or the 2fH Component inputs.

LVDS Line

The serial LVDS data is decoded back into Y 8-bit and UV 8-bit parallel data. This data is fed to the Scaler IC. The two 2fH YPbPr analogue inputs, AV3 and AV4 are fed to a selection switch, 7710. The selected YPbPr is fed to 7345 that selects between the selected YPbPr and the AV5 RGB input. IC 7345 selects the desired input and performs an Analogue to Digital conversion. The three 8-bit parallel data lines are fed to the Scaler IC along with the three 8-bit lines from the DVI (Digital Video Interface) connector. The Scaler can perform a 1fH to 2fH conversion. It can also produce a split screen between two inputs. Therefore it is possible to have a split screen with the NTSC signal on one side and an HD input on the other side. The Scaler also formats the video signal to fit the 1280x720 pixel Light Engine display. The Scaler outputs the video data signal via three 8-bit data lines to the OSD insertion circuit. The analogue OSD (On Screen Display) signal from the OTC is digitised and inserted into the signal from the Scaler. The signal is then output from the OSD circuit to the TMDS where the signal is converted from three 8-bit lines to three serial and one clock line before being fed to the Light Engine.

VGA Input

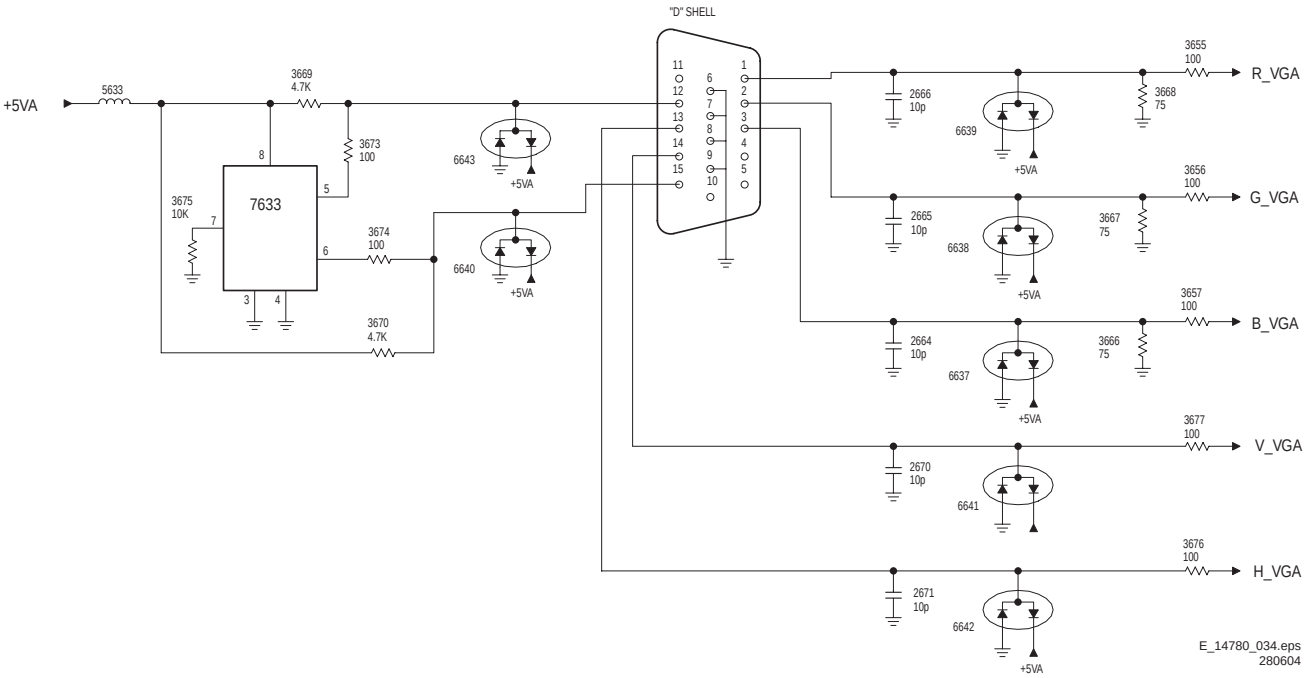


Figure 9-25 VGA input

RGB is fed to the set via AV5 using a DB15 connector. IC 7633 is loaded with the possible settings that are read by the computer when it is connected. Some of the possible inputs to AV5 are VGA (640x480), SVGA (800x600), XGA (1024x768), SXGA (1280x1024), HD60p (1280x720), WVGA (848x480), and WXGA (1368x768). The RGB drive, Vertical, and Horizontal Sync are all clamped to prevent excessive signal levels from being applied to the set. The input signal is clamped to 5.6 V in the positive direction and 0.6 V in the negative direction.

AV4 and AV5 Inputs

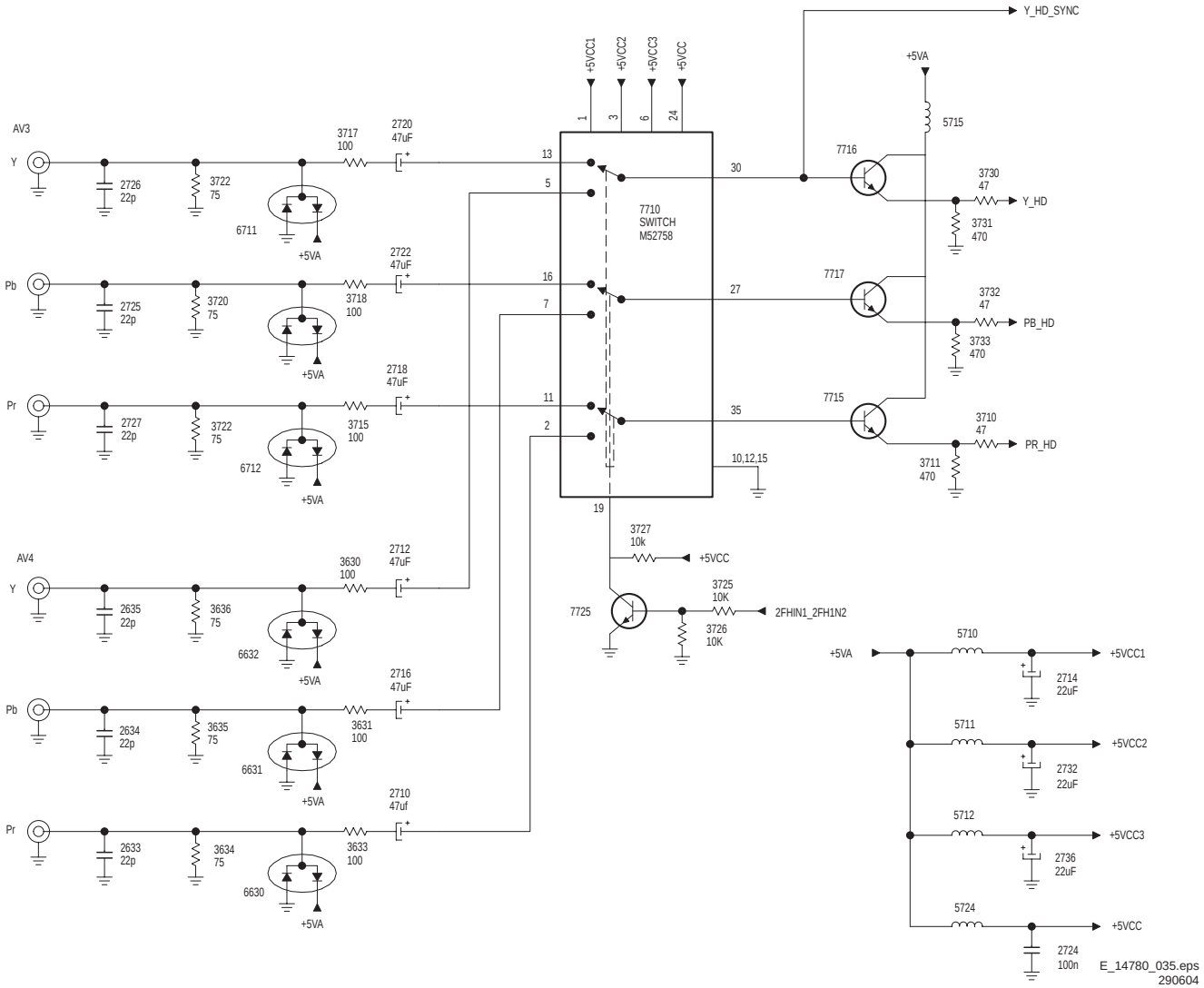


Figure 9-26 AV4 and AV5 inputs

The AV4 and AV5 inputs allow the input of Component YPbPr signals from a 1080I, 480p, PAL/SECAM or NTSC source. Better results are obtained by inserting the PAL, SECAM, or NTSC Component source into SCART1 or SCART2. Each of the AV3 and AV4 inputs are clamped to limit the level of the signals applied. This is accomplished by using diode arrays, 6711, 6710, 6712, 6632, 6631, and 6630. The positive portion of the signal is clamped to 5.6 V and 0.6 V in the negative direction.

IC 7710 selects the two AV sources. This is a High Frequency switching IC with minimal cross talk. Pixelworks IC controls the IC via the 2fHIN1_2FH1N2 line. The Control line is inverted by Transistor 7725, which is connected to Pin 19. When the Control line is High, 7725 turns "on" to pull Pin 19 Low. This selects input AV4. When the Control line goes Low, Pin 19 goes High and AV3 is selected. To reduce interference, each section of the IC is powered by a different 5-V supply. The YPbPr signals are output on Pins 30, 27, and 35. The signals are then buffered by Transistors 7716, 7717, and 7715.

Analogue Input A/D Conversation

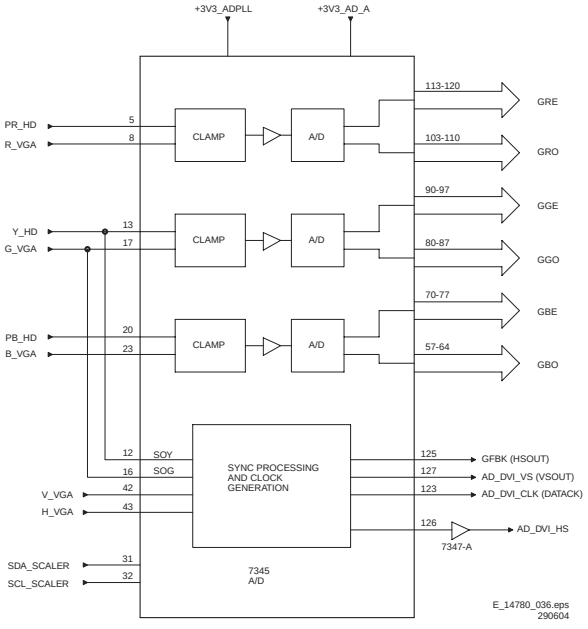


Figure 9-27 Analogue input A/D conversation

The selected YPbPr signal and the RGB signals from the VGA connector are fed to IC 7345. IC 7345 converts the signals from

Analogue to Digital. There are two triple 8-bit lines. The GRO, GBO, and GGO lines carry the Odd field data while the GRE, GBE, and GGE line carry the Even field data. Sync on Y is fed to Pin 12, Sync on Green is fed to Pin 16, while Horizontal and Vertical Sync is fed to Pins 43 and 42. The IC outputs Horizontal Sync on Pins 125 and 126. Vertical Sync is output on Pin 127. Clock information for the data is output on Pin 123. The IC is controlled by the SDA_SCALER and SCL_SCALER lines from the Pixel works (Scaler) IC.

DVI Input

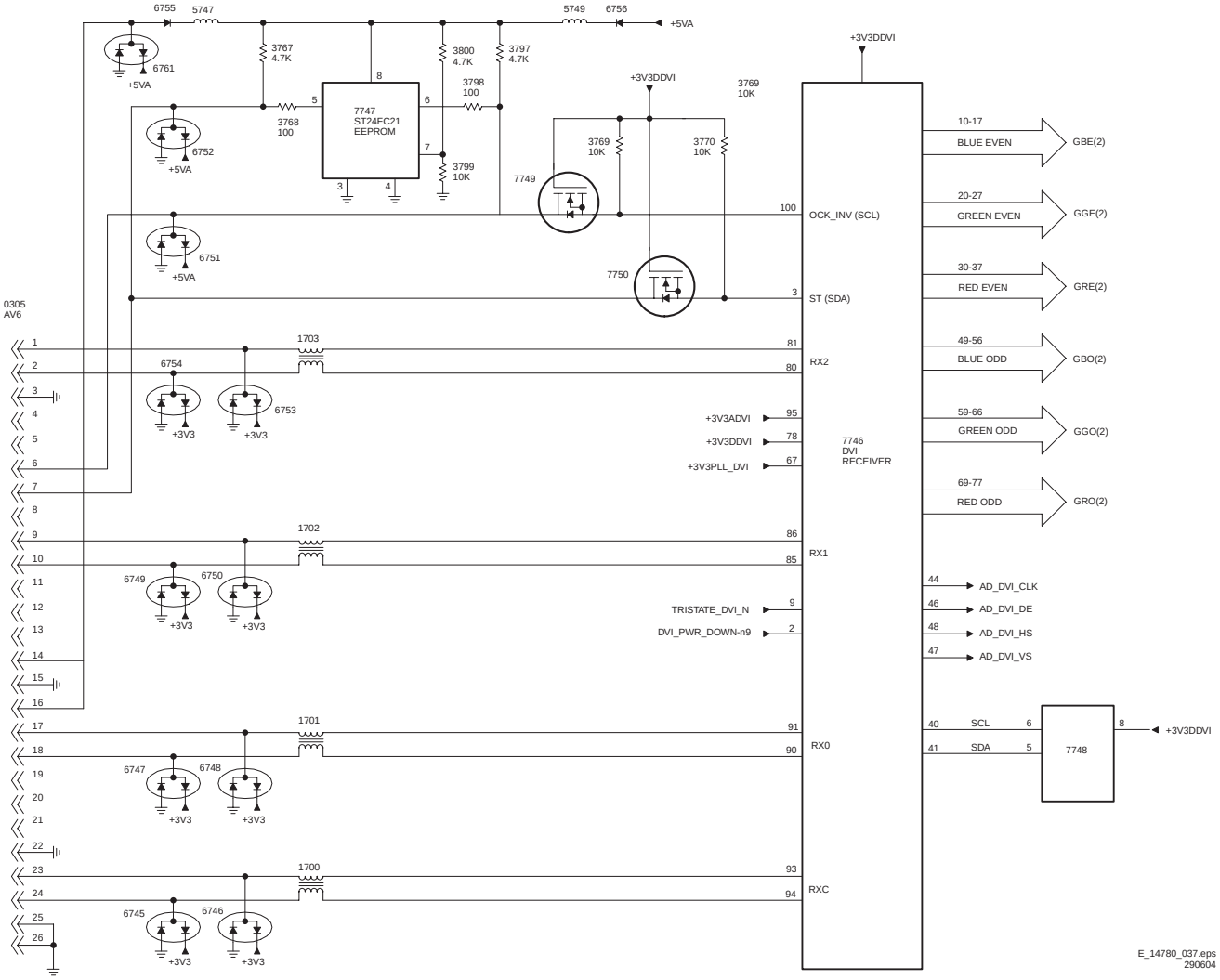


Figure 9-28 DVI input

AV6 is the DVI (Digital Video Interface) input. This type interface is used on some computer video cards and Set Top boxes. This is digital transmission based on the TMDS (Transition-Minimized Differential-Signalling) format. The TMDS system provides a high-speed reduced RFI (Radio Frequency Interference) transmission system. IC 7746 is the DVI receiver processor.

IC 7747 stores plug and play information for the device transmitting data to the set. IC 7747 is powered by the +5VA supply when the set is operating. The connecting device can also supply power to read the setup information from 7747. The connecting device also communicates with 7746 (DVI receiver) when the set is turned "on". The connecting device provides the format settings to 7746 via Pins 3 and 100. When the set is turned "off", Transistors 7749 and 7750 are turned "off" to prevent the signal from reaching 7746. When the set is turned "on", those Transistors are turned "on" to connect the signal. The B+ line to 7747 and the Data lines are clamped to 5.6 V Positive and 0.6 V Negative with Diode Arrays 6761, 6752, and 6751.

There are three data pairs to 7746: RX0, RX1, and RX2. There is also a Clock line RXC connected to Pins 93 and 94. Each of these lines is clamped to prevent an excessive signal from being applied to this circuit. The lines are clamped to 0.6 V in the negative direction and 3.9 V in the positive direction. When AV6 is selected, Pins 2 and 9 are switched High (3.3 volts). This turns 7746 "on", making all of the logic circuits active. When some other input other than AV6 is selected, all of the Outputs are put into a high impedance tri-state mode. All of the logic circuits are powered down and the inputs are disabled in this mode. Pin 44 transmits clock information to the Scaler IC. Pin 46 is a Data Enable line to signal the Scaler IC that data is being output on the data lines. This line is switched High when data is present. Pins 47 and 48 output Sync to the Scaler IC.

LVDS Receiver

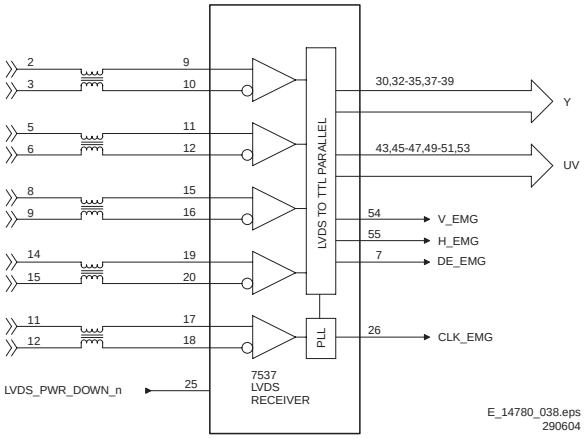


Figure 9-29 LVDS receiver

Picture data from the SSB is transmitted to the MSB (Main Scaler Board) via the LVDS (Low Voltage transmission system) to IC 7537. The LVDS receiver has four data lines and one clock line.

The IC is switched "on" or "off" by the Scaler IC via the LVDS_PWR_DOWN_n line connected to Pin 25. When SCART1, SCART2, SCART3, or the Front (Side) input is selected, the Scaler IC switches Pin 25 High to switch IC 7537 "on". The Signal from the Eagle is output to the Scaler as digital Y and UV. Vertical and Horizontal Sync is output on Pin 54 and 55. The Clock data signal is output on Pin 26. The DE_EMG line goes High when the IC is switched "on" to signal the Scaler IC that data is present from this IC.

Scaler

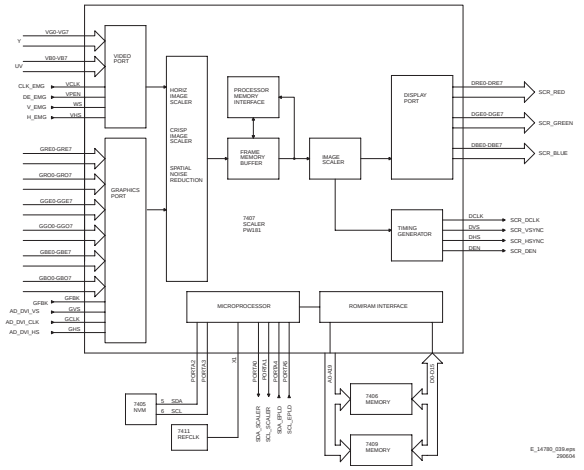


Figure 9-30 Scaler

IC 7407 is a highly integrated system on a chip that interfaces the YUV signal from the SSB, the DVI interface, or the Analogue HD inputs to the 1280x720 Light Engine. The Scaler, 7407, is a 352 Pin Ball Grid array device.

Video Data from the Eagle for the 1fH signal is already scaled correctly in the Eagle. The inputs from the DVI or 2fH Inputs may require some Scaling. This function is performed by the Scaler. The Scaler can also perform a 1fH to 2fH conversion allowing PAL, SECAM or NTSC inputs into AV3 and AV4. However, the Scaler is not as efficient as the Feature Box and Eagle on the SSB. Therefore, 1fH inputs should be applied only to SCART1, SCART2, SCART3, or the Side input for best results. The Scaler can also display two different inputs in a Split-Screen format. This can be done between the 1fH inputs or one of the 2fH inputs. This is not possible between two of the 2fH inputs or 2 1fH inputs. There are two video data inputs to 7407. The YUV input goes to the Video Port. This is the digital video information from the SSB. AV3, AV4, AV5, and AV6 are applied to the Graphics Port. Among the inputs that 7407 can process from the Graphics Port are VGA, SVGA, XGA, and 1080I. The Horizontal Image Scaler, Crisp Image Scaler, and Spatial Noise Reduction circuits, perform part of the scaling functions, create the Spit Screen if selected by the user, and make picture enhancements. The other Scaler scales the picture to 1280x720 to meet the requirements of the Light Engine. The Scaler IC has its own internal memory to store the frames while they are being processed.

The Microprocessor in the Scaler controls the operation of the Scaler and several external devices. This is a slave Microprocessor of the OTC located on the SSB. The OTC communicates with the Scaler via the PLD IC. Two external memory ICs, 7406 and 7409, store the program information for the Scaler. The NVM, 7405, stores the settings for the IC. The Display Port outputs the processed video data on three 8-bit lines, SCR_RED, SCR_GREEN, and SCR_BLUE.

OSD and Output Circuit

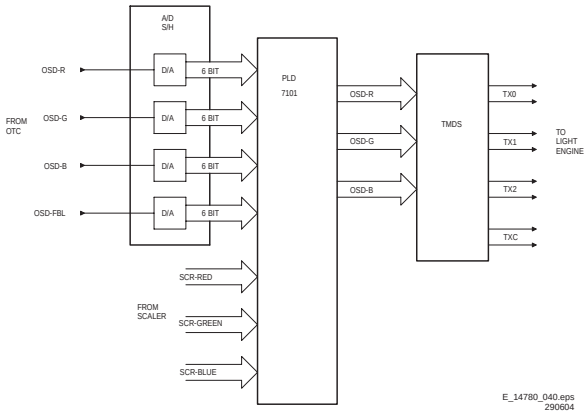


Figure 9-31 OSD and output circuit

The SCR_RED, SCR_GREEN, and SCR_BLUE data is sent to the PLD (Programmed Logic Device). The PLD inserts the digitised OSD information onto the video information. The signal from the PLD is output to the TMDS transmitter and then to the Light Engine.

The OSD information from the OTC on the SSB is in an Analogue format. This information is fed to A/D (Analogue to Digital) and S/H (Sample and Hold) circuits. These circuits convert the OSD into four 6-bit data lines before feeding the information to the PLD. As will be shown later, the PLD is also a slave Processor that communicates with the OTC and the Scaler.

OTC OSD Input

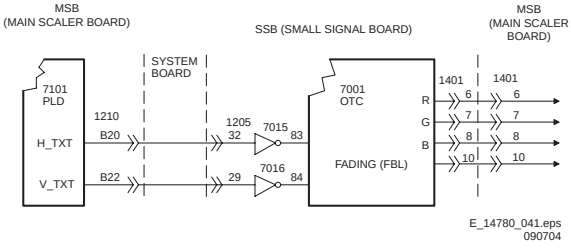


Figure 9-32 OTC OSD input

The OSD (On Screen Display) signals are generated by the OTC (Microprocessor) located on the SSB. These are Analogue RGB signals with a Fast Blanking line. The OSD signals are sent to the MSB via connector 1401. Sync for the text is generated by the PLD located on the MSB. This Sync is fed to the OTC via the System Board.

OSD Scaler Input

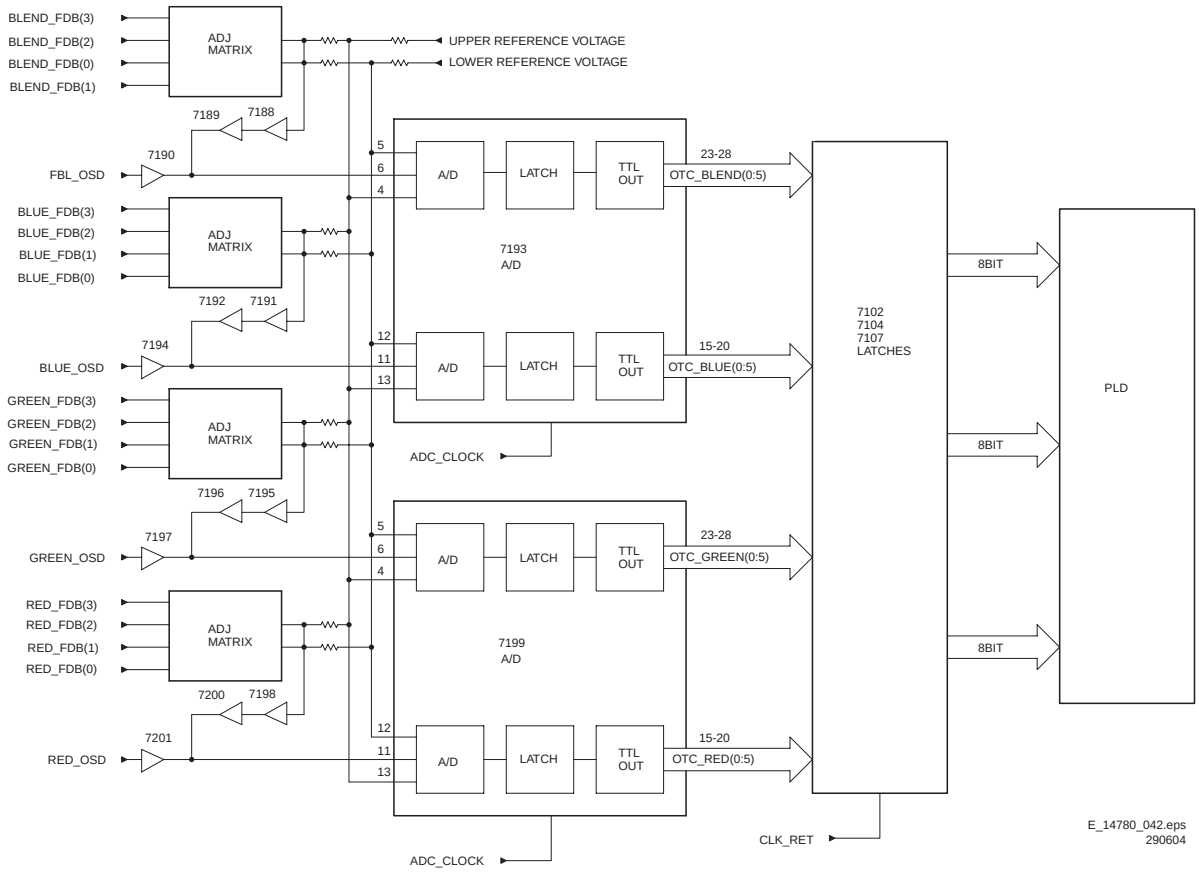


Figure 9-33 OSD Scaler Input

The OSD and Fast Blanking signals are converted to a digital signal and fed to the PLD (Programmed Logic Device) to be inserted into the Picture Data. The Red, Green, and Blue OSD is buffered and fed to two A/D (Analogue to Digital) converters, 7193 and 7199. A Data reference signal, FDB, from the PLD, along with an Upper Reference Voltage and a Lower Reference Voltage is used to set the voltage level in which sampling will begin and end. The ADC_CLOCK is used to clock the sampled data out of 7193 and 7199. Data is output on two 6-bit data lines to latches, 7102, 7104, and 7107 before being fed to the PLD. The CLK_RET line clocks the data out of the Latches.

Reference Voltage and A/D Converters

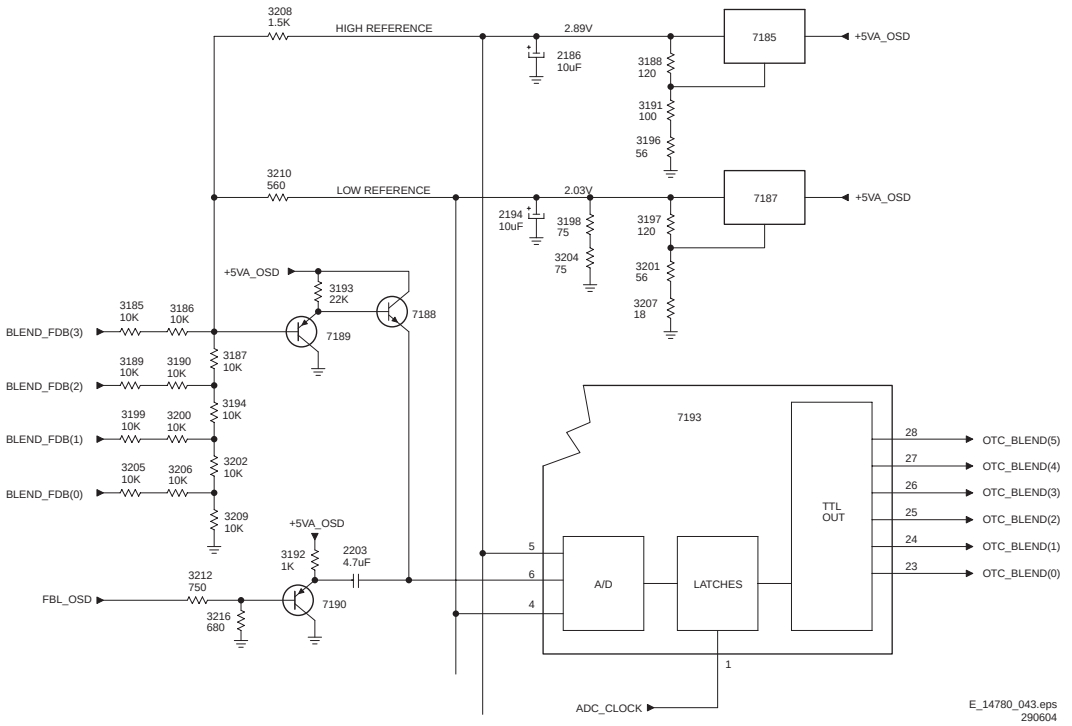


Figure 9-34 Reference voltage and A/D converters

The BLEND_FDB signals are fed to a resistor matrix to set the DC reference voltage for the A/D converters. The signals are buffered by Transistors 7189 and 7188 to add bias to the Analogue FBL_OSD signal. The output of the matrix is also added to the High and Low Reference voltages. Regulator 7185 sets the Upper Reference voltage while 7187 sets the Lower Reference voltage. The output of the A/D converter is clocked out by the ADC_CLOCK signal to the TTL outputs. The signal is output on a 6-bit data line. The Red, Green, and Blue circuits work the same as this one.

Input Latch and PLD Sync

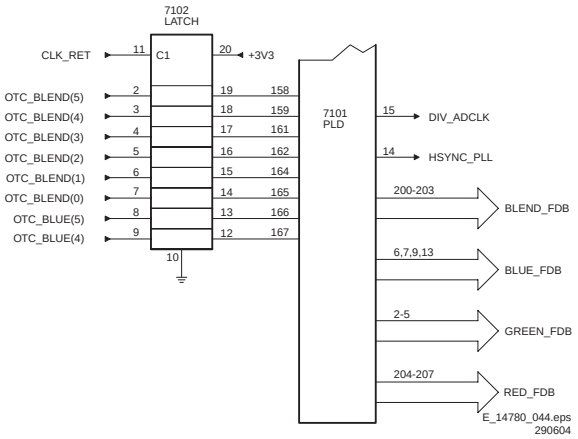


Figure 9-35 Input latch and PLD Sync

One of the three latches that are used to clock data to the PLD is shown. The OTC_BLEND (FBLK) and two bits of the Blue are fed to the Latch 7102. This data is clocked out to the PLD by the CLK_RET line. The reference *_FDB lines are output from the PLD to set the sample reference voltage as described earlier. The DIV_ADCLK and HSYNC_PLL sync lines are used to set the CLK_RET and ADC_CLOCK signals.

ADC Clock Circuit

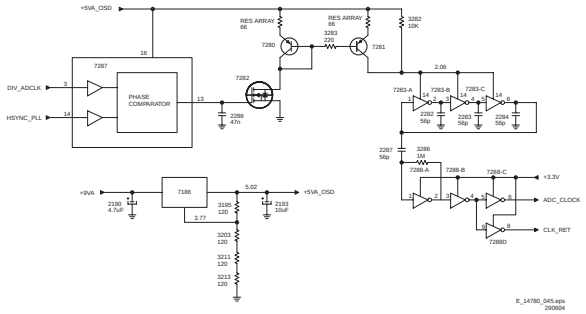


Figure 9-36 ADC clock circuit

The DIV_ADCLK and HSYNC_PLL signals are fed to a Phase Comparator, 7287. The Phase Comparator drives Transistor 7282, 7280, and 7281. This circuit sets the reference voltage for the amplifiers in 7283. IC 7283, A, B, and C make up a phase oscillator circuit. The Frequency of this circuit is set by the value of Capacitors 2282, 2283, 2284, and the voltage applied to the circuit. The output of the Oscillator feeds a series of buffer amplifiers in 7288 to produce the ADC_CLOCK and CLK_RET signals.

TMDS Transmitter

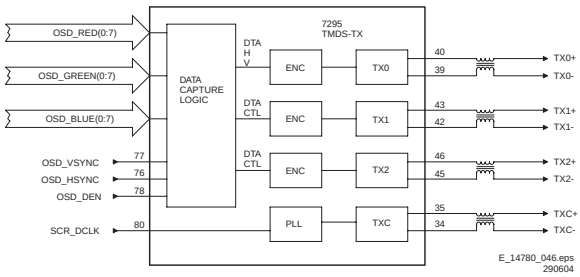


Figure 9-37 TMDS transmitter

The three 8-bit video data lines, OSD_RED, OSD_GREEN, and OSD_BLUE are fed to the TMDS Transmitter, 7295. IC 7295 converts the Parallel data into DVI formatted serial data lines to drive the Light Engine. Data and Sync are output on TX0. TX1 and TX2 are encoded with video data. TXC is the clock line.

MSB Clock and Sync Lines

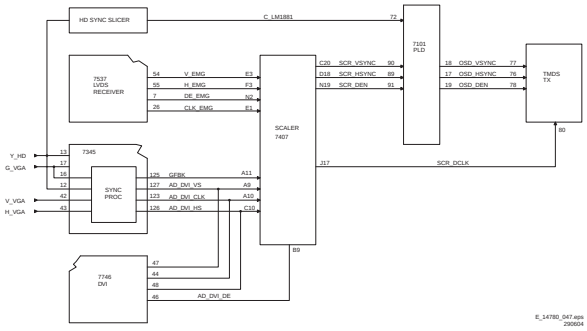


Figure 9-38 MSB clock and Sync lines

If the input signal is a 1080I Analogue signal, the Sync will most likely be Tri-Level sync. This Sync is fed to a Sync Slicer circuit and then to the PLD. Horizontal, Vertical, Clock, and an Enable line are fed from the LVDS Receiver to the Scaler. Horizontal Sync, Vertical Sync, and Clock from the A/D converter and DVI receiver are also fed to the Scaler. The A/D converter or the DVI Receiver is selected by the Scaler IC. The output of the one selected is turned "on". The output of the other one is turned "off". Sync is then fed to the PLD and then to the TMDS Transmitter. Sync is transmitted to the Light Engine via data lines.

9.4 Light Engine Block

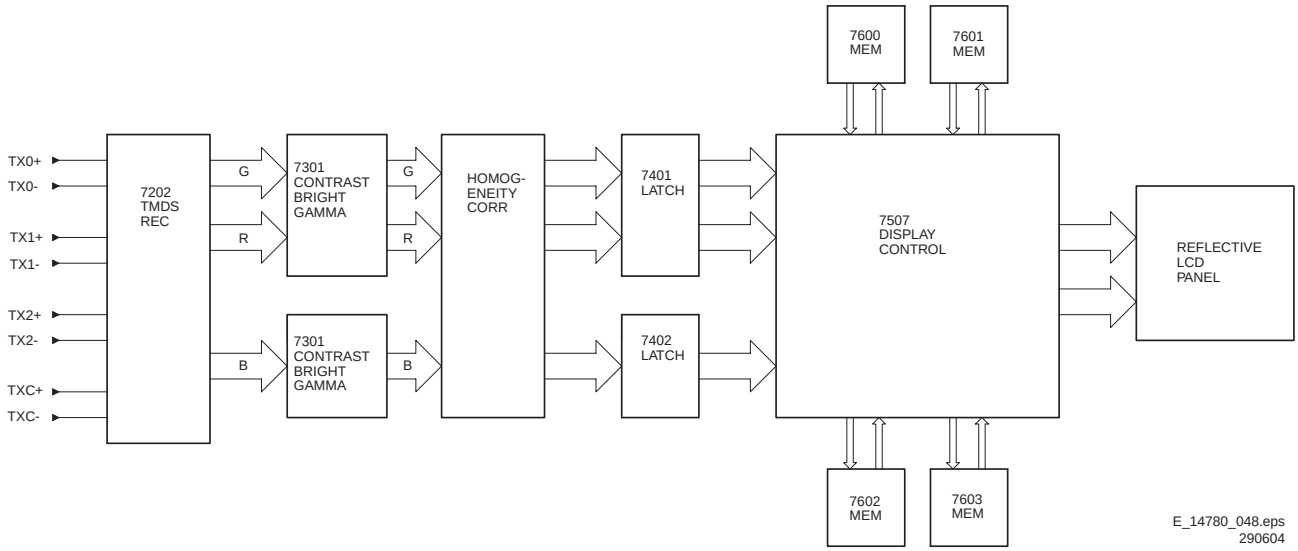


Figure 9-39 Light Engine Block

TMDS data from the MSB is fed to the TMDS Receiver on the Light Engine. Red, Green, and Blue data is fed to IC 7301 for Contrast, Brightness, and Gamma correction. The Signal is then output to a Homogeneity correction circuit. This circuit corrects for uneven brightness and contrast spots in the picture. This output is then fed to a latch circuit and then to the Display Control circuit. This circuit addresses the rows and columns of the Reflective LCD Panel.

9.5 Audio Signal Flow Block

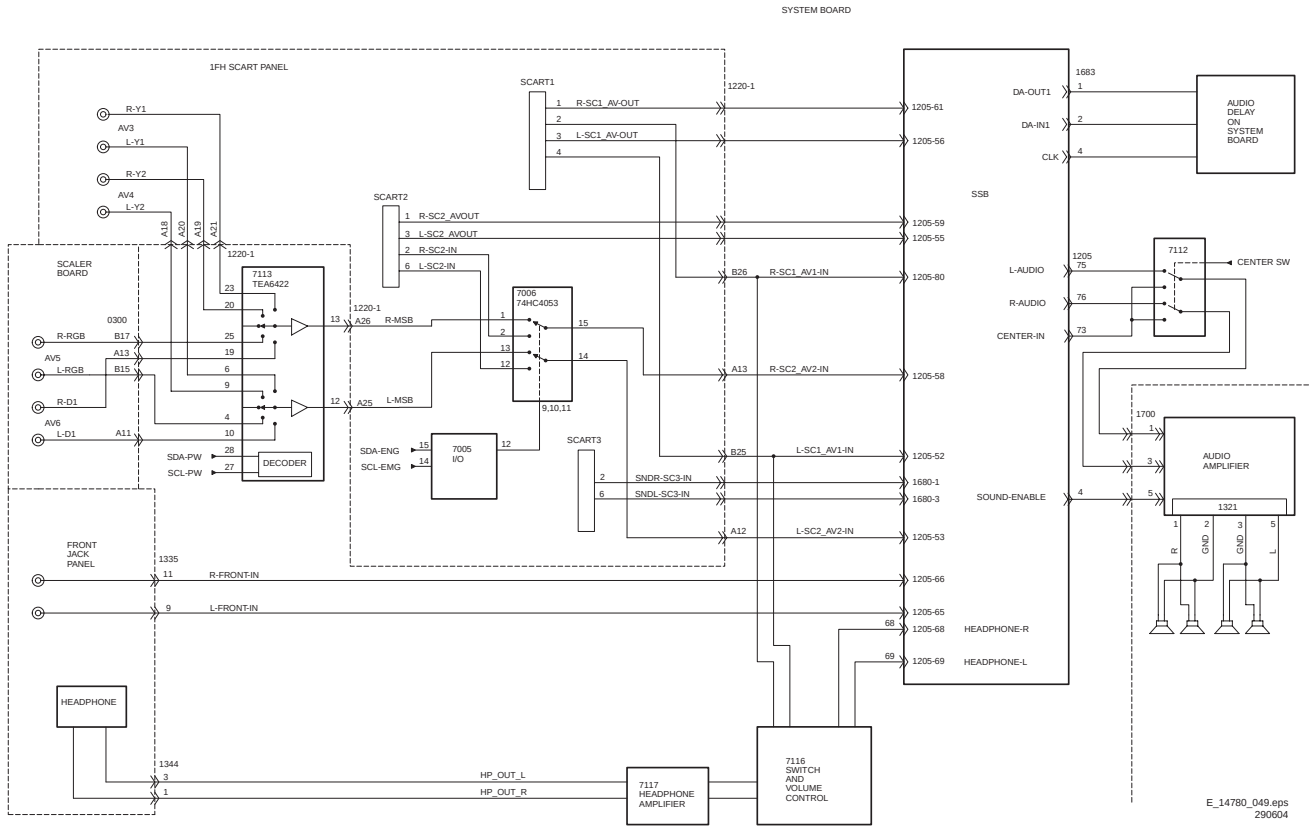


Figure 9-40 Audio signal flow block

9.5.1 Introduction

The LCoS projector has a two-channel (20 W per channel) audio system. The Picture and Audio source can be selected from any one of seven inputs. The AV inputs are located on the Jack Panel, Scaler board, or Front Jack panel. The Audio processing for the Tuner is located on the SSB. The Audio Amplifier is located on a board behind the System board.

AV4 and AV5 inputs are located on the SCART Panel. AV6 and AV7 audio inputs are located on the Scaler board. These inputs are fed to switch 7113 located on the System board. The selected output from the System board is fed to the SCART panel. IC 7006 on the SCART panel selects between the output of 7113 and SCART2. The selected outputs are fed to the SSB (Small Signal Board) along with SCART1 and SCART3. The Audio Processor on the SSB outputs the audio in a digital form via connector 1683 to an Audio Delay circuit located on the System board. Due to the time required to process the video signal, it is necessary to delay the audio to ensure proper sync. Left and Right audio is output to the System board via connector 1205. IC 7112 on the System board Left and Right audio or Centre channel audio from the SSB. The selected audio from 7112 is fed to the Audio Amplifier via connector 1700. The Audio Amplifier drives the speakers via connector 1321.

Monitor audio is output from the Audio Processor on the SSB to SCART1 and SCART2. Headphone audio from the SSB is output to a switch 7116, located on the System board. In addition, L-SC1_AV1-IN and R-SC1_AV2-IN are also fed to the switch. IC 7116 is a combination switch and volume control. The output of 7116 is fed to IC 7117, Headphone Amplifier, before being fed to the Side Jack panel. IC 7116 controls headphone volume via the I2C bus.

9.5.2 SSB Audio Processing

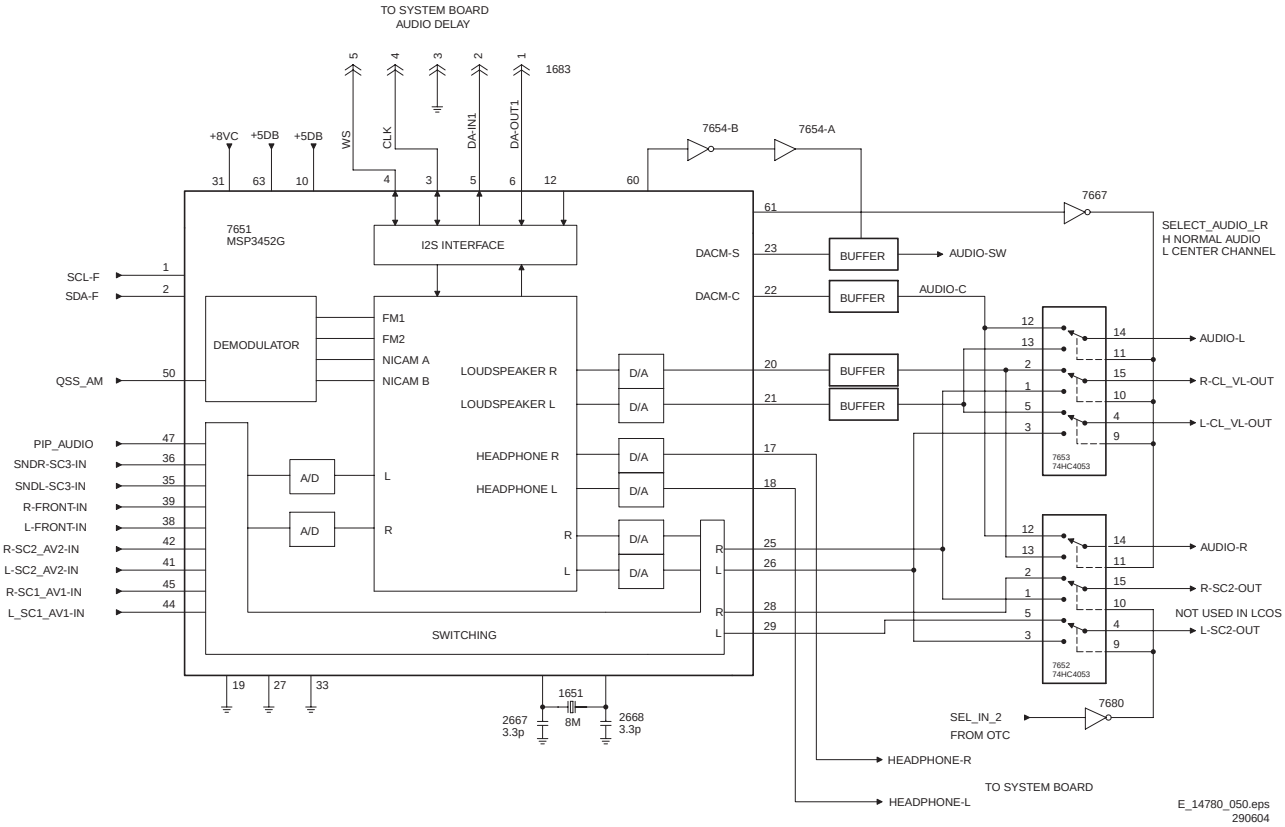


Figure 9-41 SSB audio processing

Audio processing is performed by IC 7651, which is located on the SSB (Small Signal Board). Base band audio is fed to the signal processor on Pin 50. R-SC1_AV1-IN, L-SC1_AV1-IN, R-SC2_AV2-IN, L-SC2_AV2-IN, SNDR-SC3-IN, SNDL-SC3-IN, and R-FRONT-IN, L-FRONT-IN are fed to the IC on Pins 44, 45, 41, and 42. PIP audio from the PIP/DW board is input on Pin 47. The selected AV inputs can be output on Pins 25 and 26 or can be sent to the Sound processor via the Left and Right A/D (Analogue to Digital) converters. The Sound processor selects between the output of the Demodulator or the selected AV input for processing. The Sound processing includes Volume, Equalizer, Balance, Loudness, Incredible Sound, and Virtual Dolby. The digitised audio is output on Pin 5 to the System board to an Audio Delay circuit. The signal is returned to the IC on Pin 6. Due to the time required for the video processing, it is necessary to delay the audio to obtain the proper sync. The Main Speaker signal is output on Pins 20 and 21. The signal is buffered and fed to ICs 7653 and 7652. ICs 7653 and 7652 connect the Speaker Amplifier to the Centre Channel audio from Pin 22 or the Main audio from Pins 20 and 21. If the Centre Channel audio has been selected for the Main Speakers, the MON-OUT (R-CL_VL-OUT and L-CL_VL-OUT) are connected to Pins 20 and 21. If the output on Pins 20 and 21 is selected, the MON-OUT is connected to the outputs on Pins 25 and 26. Selected Headphone signal is output on Pins 17 and 18. SW (Sub Woofer) audio is output on Pin 23.

9.5.3 Audio Signal Delay Circuit

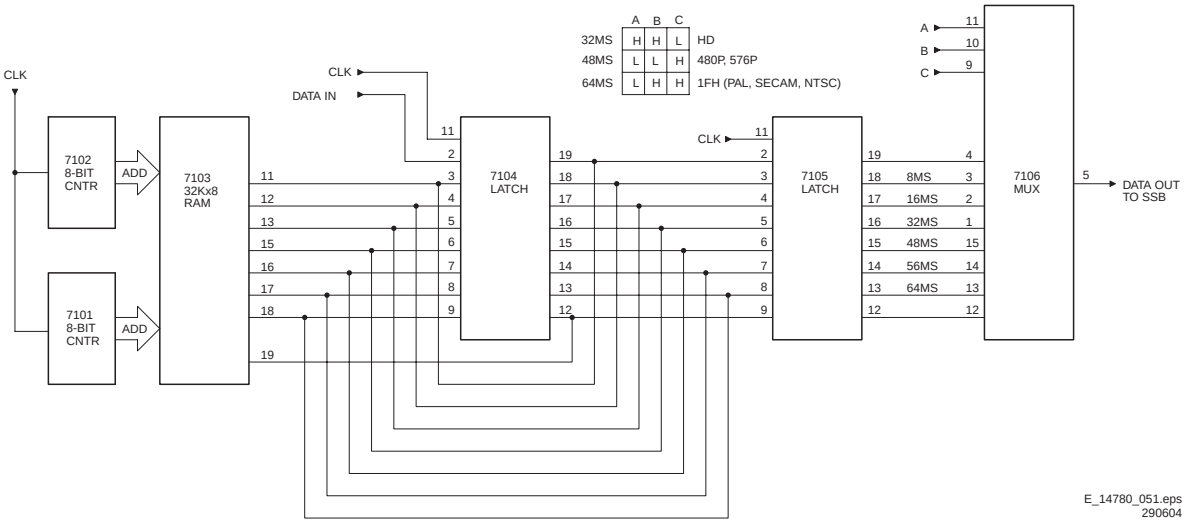


Figure 9-42 Audio signal delay circuit

The delay circuit for the Audio is located on the System board. The clock signal from I2S bus is fed to two 8-bit counters. The output of these counters addresses a RAM IC, 7103. Data from the Audio processor is fed to Pin 2 and is output on Pin 19. The addressing of the RAM and the data signal to the 7104 latch shifts the data from Pin 18 of 7104 down to Pin 12. Each time it is shifted, it is delayed. The output of 7104 is fed to a second latch (7105), which is controlled by the Clock signal. The output of 7105 is fed to a Multiplexer, 7106, that is controlled by switching lines, A, B, and C. A, B, and C switching lines are generated by the System Microprocessor. The delayed data is output on Pin 5 of 7106. If the selected signal to the set is applied to the Scaler board, the delay is set for 32ms. If the selected signal is applied to the 1fH input (SSB), the delay is set for 48ms.

9.5.4 Power ON Muting

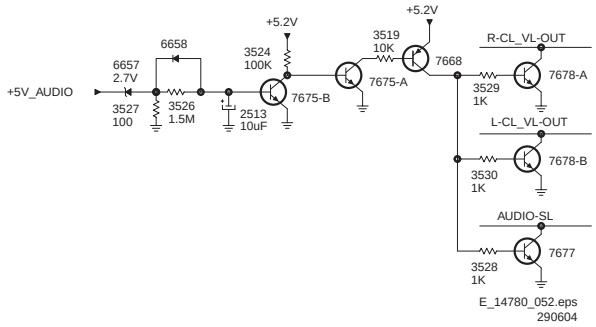


Figure 9-43 Power ON muting

During power up, when the set is turned "on", the MON output and the Subwoofer output are muted momentarily to prevent turn on noise in any external amplifiers. When the set is turned "on", Transistor 7675-A is turned "on" by the +5.2 V supply via Resistor 3524. This turns Transistor 7668 "on", which turns "on" Transistors 7678A, 7678B, and 7677. This mutes the R-CL_VL-OUT and L-CL_VL-OUT, which are the MON output lines. Transistor 7677 mutes the AUDIO-SL (SUB OUT) line. When the charge on Capacitor 2513 reaches 0.7 volts, Transistor 7675-B is turned "on", which turns the other Transistors "off", removing the mute.

9.5.5 Audio Power Amplifier

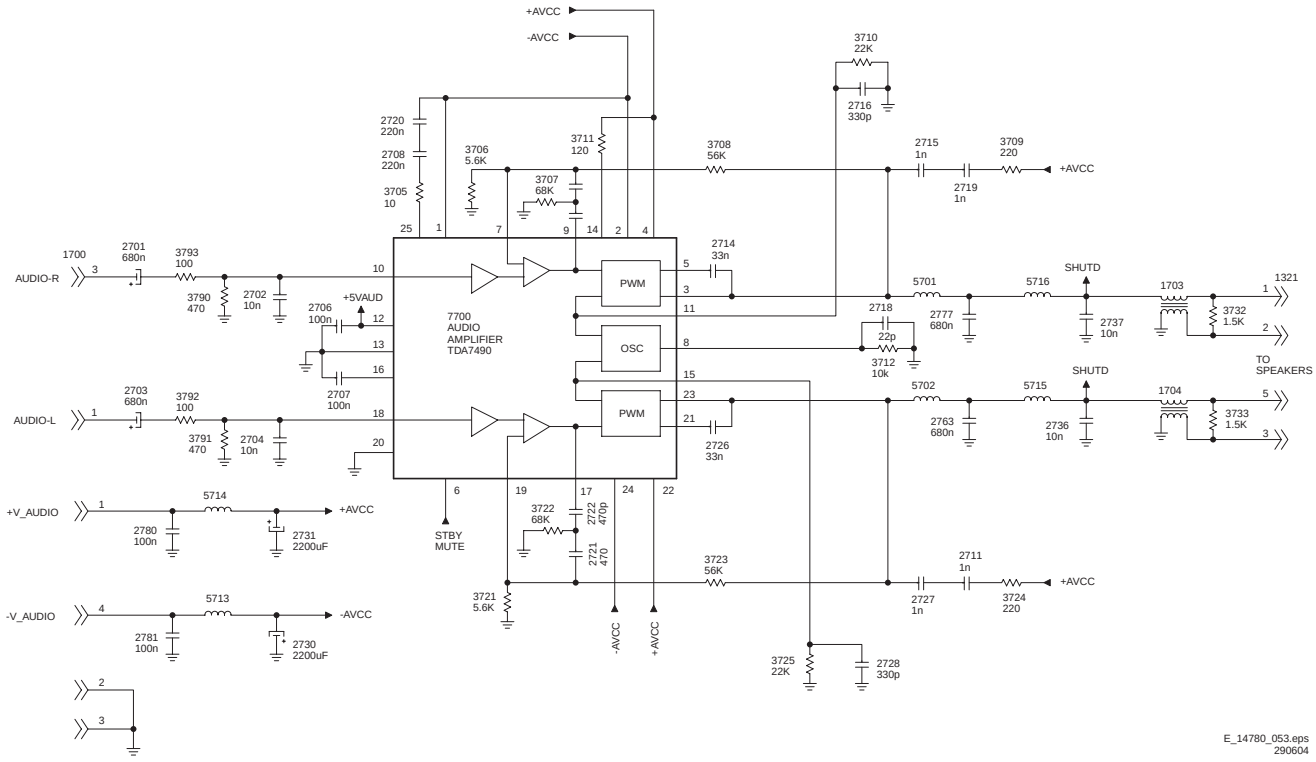


Figure 9-44 Audio power amplifier

The Audio rower amplifier is located on a board behind the System board. The Amplifier outputs 25 watts per channel. This is a class D amplifier.

The signal is applied to the Amplifier on Pins 3 and 1 of connector 1700. The signal is applied to Pins 10 and 18 of IC 7700. The output stages are basically switch mode supplies that are driven by a 200 kHz oscillator. The pulse width of the output signal is determined by the amplitude of the audio signal at that instant. The Left channel output is filtered by 5702, 2763, 5715, and 2736. The Right channel is filtered by 5701, 2777, 5716, and 2737. Final filtering is performed by chokes 1703 and 1704. The DC voltage on the output lines is monitored by SHUTD. Since the speakers are direct coupled, no DC voltage can be allowed on the output lines.

The Amplifier is powered by the +V_AUDIO and -V_AUDIO supply lines. These are a +25 and -25 V supplies.

The Audio from the amplifier is output to the Centre Channel switch.

9.5.6 Audio Protection Circuit

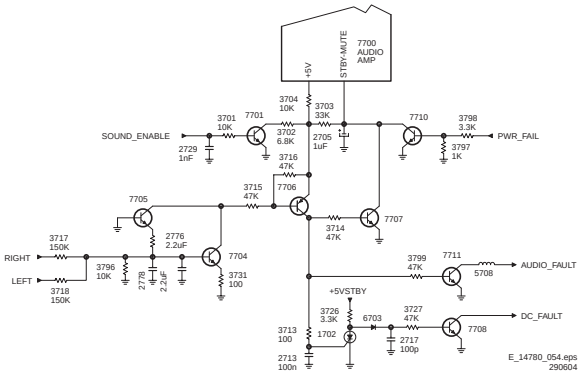


Figure 9-45 Audio protection circuit

The Left and Right channels are monitored for the presence of a DC voltage. The Right and Left channels are connected to Transistors 7704 and 7705 via Resistors 3717 and 3718. The signal is filtered by Capacitor 2778. If the DC voltage goes 0.7 V positive, Transistor 7704 will turn "on". If the voltage goes -0.7 volts, Transistor 7705 will turn "on". This will turn Transistors 7706 and 7707 "on", which will mute the audio amplifier by pulling the STBY-MUTE line Low. Transistor 7711 will turn "on", signalling the System Microprocessor via the AUDIO_FAULT line that there is a problem with the Audio circuit. It will also turn "on" SCR 1702 which will turn Transistor 7708 "off". The DC_FAULT line will go Low, which will result in the Audio Power supply shutting down. Since the SCR is powered by the +5V STBY line, power must be removed from the set, to reset the device.

9.5.7 Headphone Switch and Amplifier Circuit

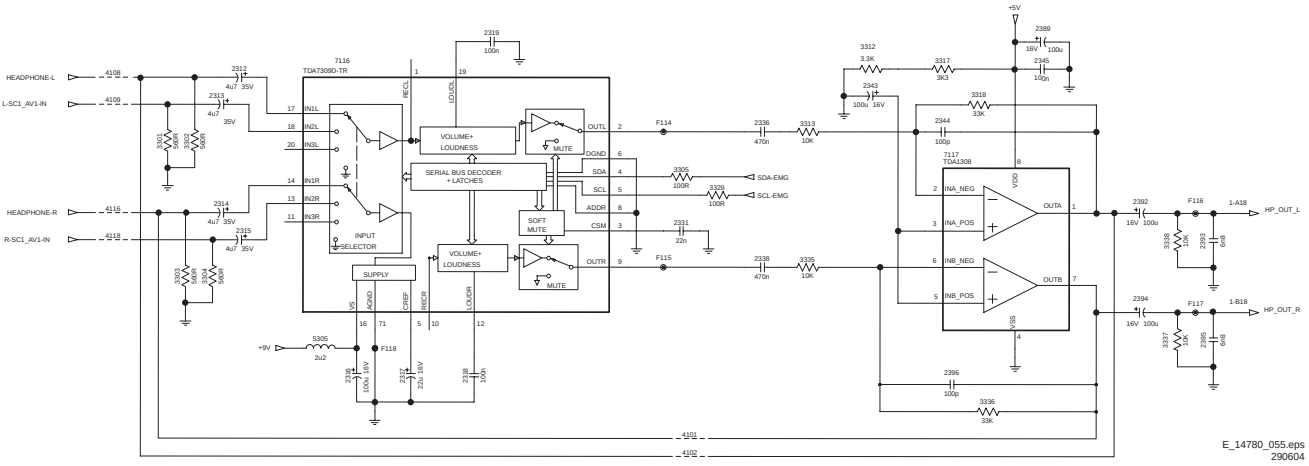


Figure 9-46 Headphone switch and amplifier circuit

The Headphone Amplifier circuit is located on the System board. AV1 audio or Headphone audio selected by the Audio processor is applied to IC 7116. The volume for the Headphones is controlled by IC 7116. This IC is controlled by the SDA and SCL line's I2C bus from the OTC located on the SSB. Left and Right audio is output on Pins 2 and 9 to the Headphone amplifier, IC 7117. The Headphone amplifier is powered by the +5 V supply.

9.6 OTC Microprocessor Block

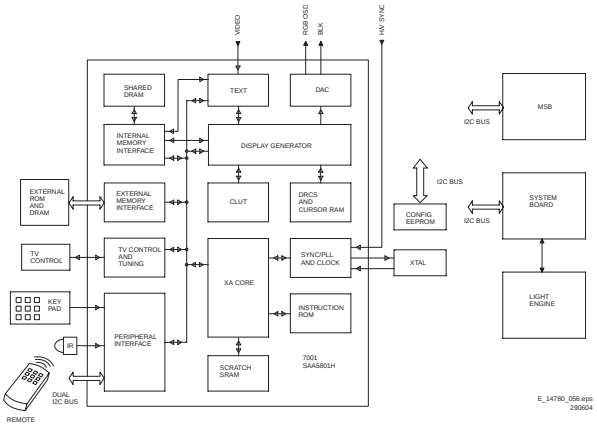


Figure 9-47 OTC microprocessor block

9.6.1 Introduction

The OTC (On-screen display Text Control) is located on the SSB. This is the main Microprocessor for the set. The User communicates with the OTC via the Keyboard or Remote Control. It communicates with the rest of the set via a dual I2C bus. The start-up program is located in the Instruction ROM inside the IC. The Main program is located in external DRAM. An internal Text decoder removes the Closed Caption text and Teletext information. There are three other Microprocessors in the set, located on the MSB (Main Scaler Board), on the System board, and in the Light Engine.

9.6.2 OTC Microprocessor Block

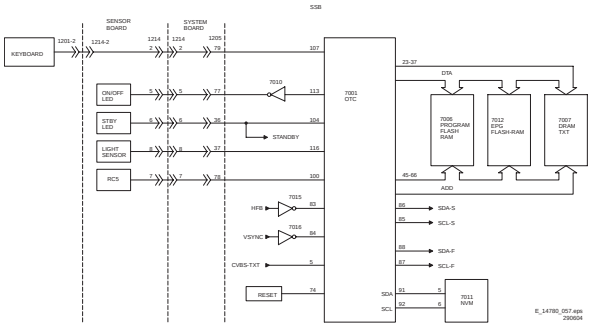


Figure 9-48 OTC microprocessor block

The Keyboard is connected to the OTC via the Sensor board and System board to Pin 107. The Standby line on Pin 104 goes Low when the set is turned "on". It also turns "on" the Standby LED. The On/Off line, Pin 113, goes Low turning "on" 7010, which output a High to the Orange LED when the set is turned "on". Once all of the circuits are turned "on", this line turns that LED "off". The Standby line then goes Low, which turns the Green LED "on". A Light Sensor connected to Pin 116 senses the ambient light to allow the set to change the brightness for optimum viewing. The NVM, 7011, stores the customer settings, operation hours, and option codes. The program to run the OTC is stored in IC 7006. IC 7012 is used by the OTC as a temporary storage. There are two I2C busses, the Slow bus and the Fast bus.

9.7 SSB Standby Supply

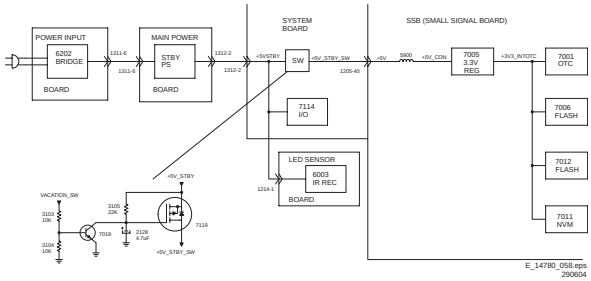


Figure 9-49 SSB Standby Supply

The 5 V Standby voltage is fed to the System board where it supplies the I/O, 7114, and a Standby switch. The Standby 5 V

supply is also fed to the Power Input board where it is looped through the Side Jack panel, Thermal Switch, and Door Interlock Switch.The VACATION_SW voltage is then used to switch the 5 V Standby voltage to the OTC located on the SSB. Transistor 7019 is switched "on" when the VACATION_SW voltage goes High (5 V), turning transistor 7119 "on". The +5 V_STBY_SW voltage is then fed to a 3.3 V regulator, 7005, located on the SSB. This then supplies the operating voltage to the OTC and memory ICs. When the Vacation switch is switched "off", the VACATION_SW voltage goes Low, turning 7019 and 7119 "off". This removes the 5 V supply to the SSB.

9.8 Keyboard

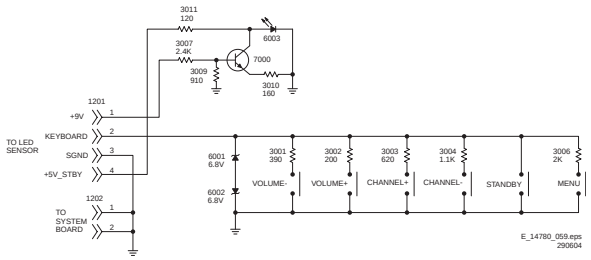


Figure 9-50 Keyboard

The Keyboard is located at the top of the set's cabinet. The resistors connected to each switch cause a different voltage to be applied to the keyboard line when pressed. A LED is mounted under the Standby switch.

9.9 Light Sensor

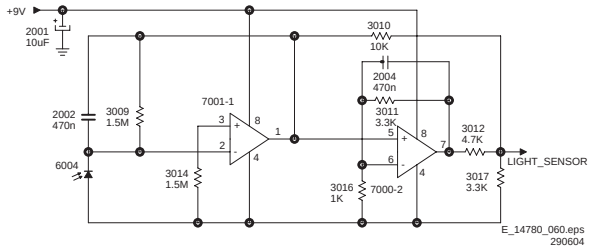


Figure 9-51 Light sensor

The Light Sensor, 6004, is amplified by two OpAmps, 7001 and 7000. This senses the ambient light. The output of 7000 is fed to the OTC to make adjustments in the picture brightness to compensate for the changes in ambient light.

9.10 LED Circuit

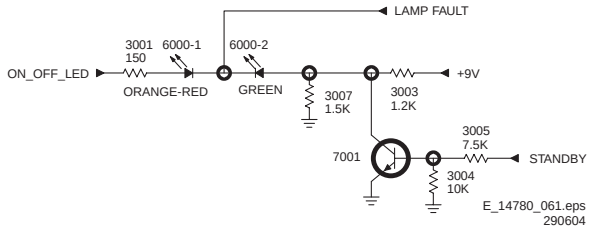


Figure 9-52 LED Circuit

The indicator LED has three states, which are Red, Orange, and Green. When the set is in the Semi-Standby mode, the set is downloading Teletext data, the indicator LED is Orange. To accomplish this, the ON_OFF_LED is High, the LAMP FAULT line is Low, and the Standby line is Low. In the Standby mode, the LED is Red. To accomplish this, the ON_OFF_LED is High, the LAMP FAULT line is Low, and the Standby line is High. When the set is "on", the LED is Green. The Standby line is Low, turning 7001 "off", switching the Green LED "on". The On_Off_LED line is Low. When the Lamp requires replacement, the LED blinks Orange. The LAMP FAULT line pulses "on" and "off".

9.11 I²C Interconnect

9.11.1 I²C Interconnect Part One

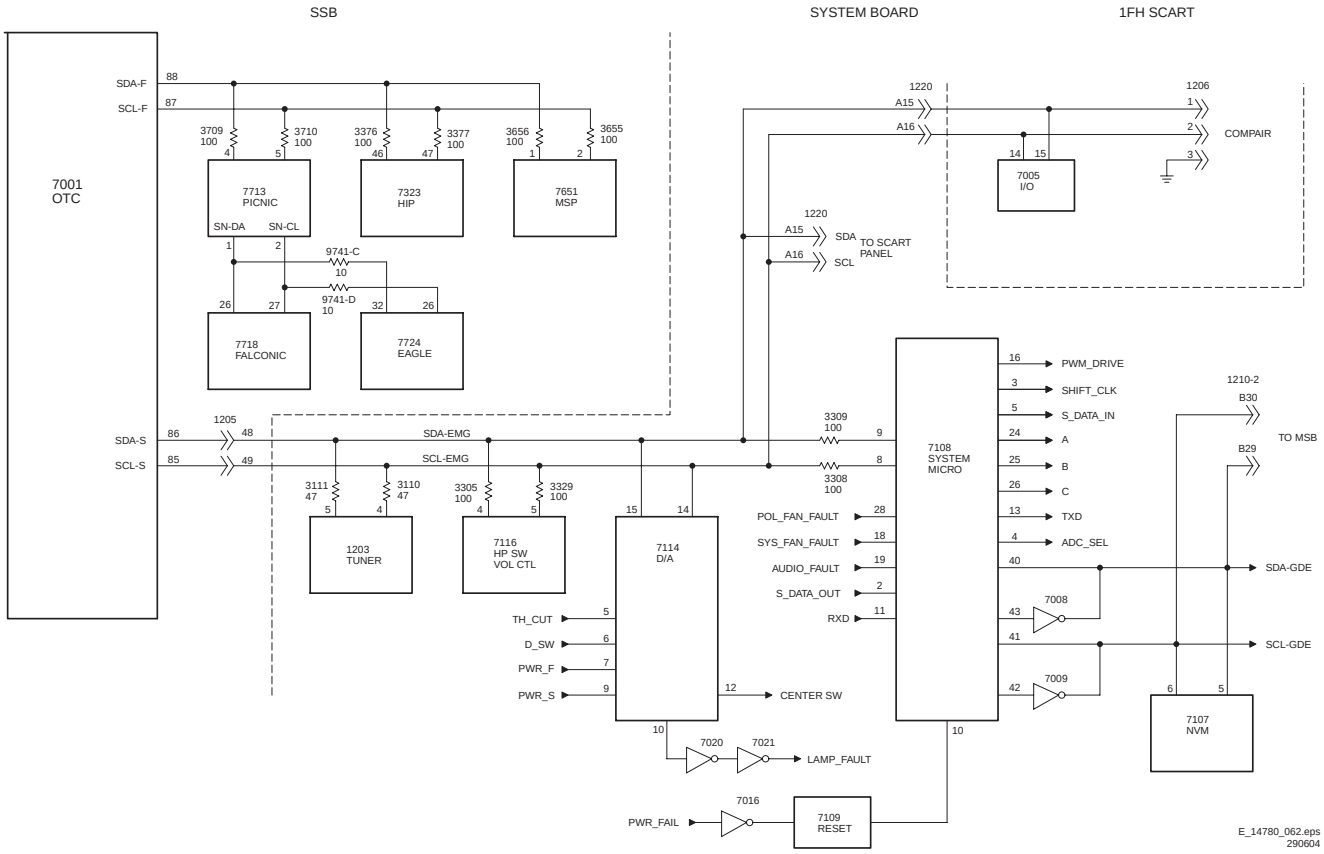


Figure 9-53 I2C Interconnect Part One

The OTC communicates with the set via two I²C busses. The SDA-F, Fast bus communicates with the PICNIC, HIP, and MSP (Audio Processor). The SN-DA line from the processor in the PICNIC communicates with the FALCONIC and EAGLE.

The SDA-S Slow bus communicates with the devices on the System board, Jack Panel, PIP/DW board, MSB, and 3D Comb filter board. The ComPair interface communicates with the set via the Slow I²C bus. The ComPair connector is located on the Jack Panel. All of the devices on the Jack Panel, PIP/DW, and 3D Comb are controlled directly by the OTC. The System Microprocessor, 7108, is a slave of the OTC. The System Microprocessor controls the Processor on the Light Engine. The MSB also has its own Microprocessors, which receive instructions from the OTS via the Slow I2C bus.

9.11.2 I²C Interconnect Part Two

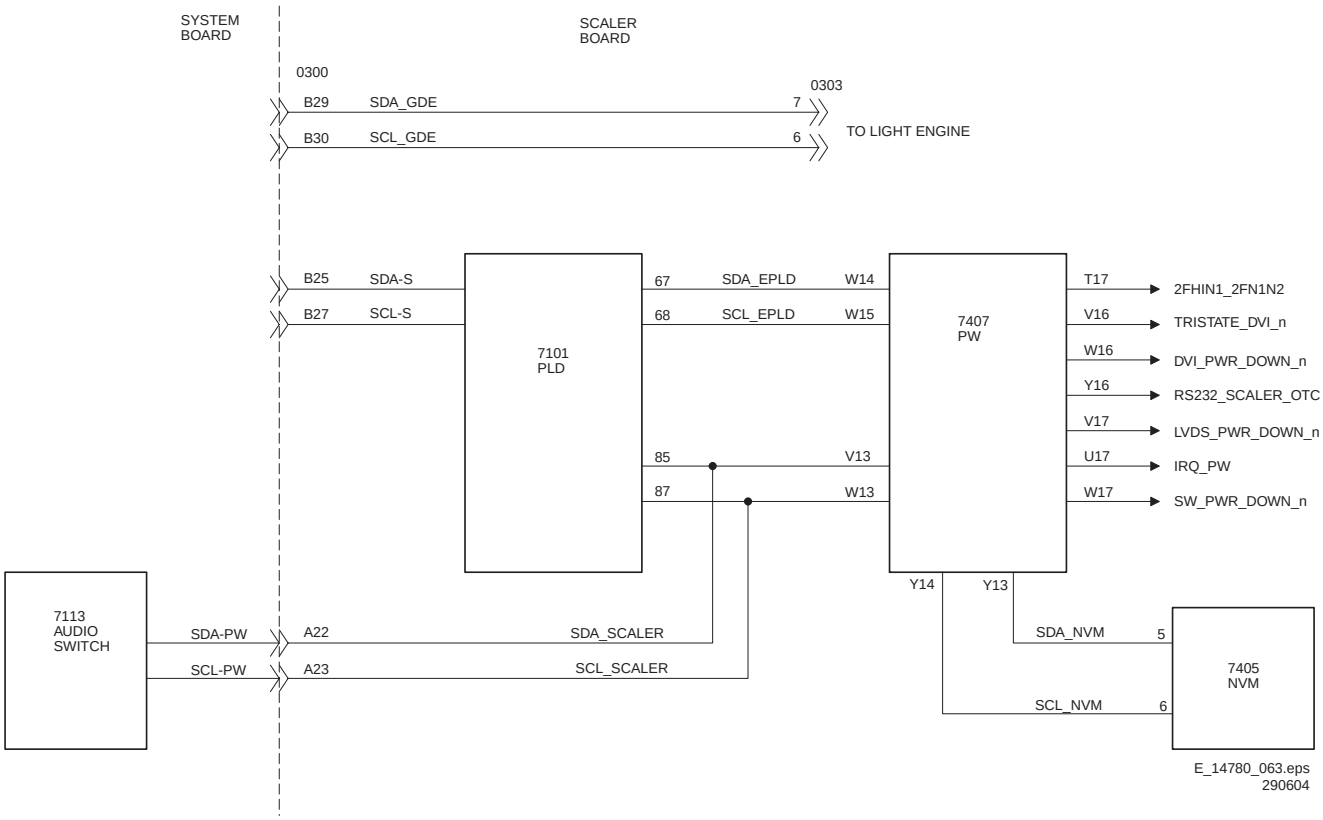


Figure 9-54 I2C Interconnect Part Two

The MSB has two Microprocessors, 7101 and 7407. The PLD (Programmed Logic Device) mixes the digital OSD from the OTC with the digital video signal from the Pixelworks IC, 7407. The OTC sends and receives commands to and from the PLD via the I2C Slow bus. These commands are then relayed to the main Microprocessor on the MSB, 7407. IC 7407 controls its internal video processing functions as well as external switching. IC 7407 has its own NVM, 7405, which stores format and video switching commands.

9.12 Fan Drive

The fan cools the Light Engine, while the set is in operation. A sensing circuit increases the speed of the fan, when the temperature increases, and decreases the speed, when the temperature drops. There are two fans, which are mounted on the Light Engine.

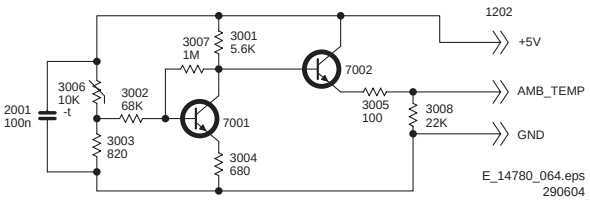


Figure 9-55 Temperature sensor board

The Temperature Sensor Board is located on the bottom of the sets cabinet. When the temperature increases, the resistance of 3006 increases. This reduces the drive to Transistor 7001, allowing more current to feed Transistor 7002 via Resistor 3001. When Transistor 7002 turns on harder, the voltage on the AMP-TEMP line increases. The Sensor Board is powered by the +5 V supply from the System Board.

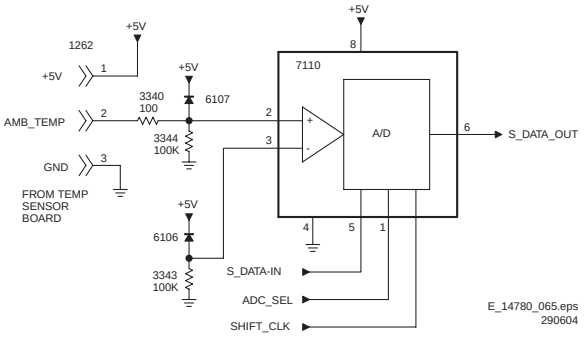


Figure 9-56 Temperature sensing A/D converter

The voltage represents the ambient temperature of the set from the Sensor Board, which is fed to the System Board via connector 1262. The voltage is fed to the positive input of IC 7110. This IC converts the voltage into an 8-bit data signal, which is fed to the System Microprocessor, 7108. See Figure for 7108. The ADC_SEL line from 7108 signals 7110 to sample the voltage on Pin 2. This line is held Low during the sampling period. The SHIFT_CLK reads the data out to 7108. The S_DATA_IN line sends configuration data to 7110.
The System Control Microprocessor provides a PWM drive to the Fan drive circuit. The PWM_DRIVE signal is amplified by Transistors 7011, 7012, 7013, and 7014. The Fan is powered by the +12 V supply, which is fed to the Fan via connector 1251. The return side of the Fans is fed to Transistor 7014, which provides speed control drive. A Hall Effect sensor on the System Fan feeds drive back to the System Board via connector 1251, Pin 3. Feedback from the Light Engine Fan is fed back on connector 1251, Pin 2.

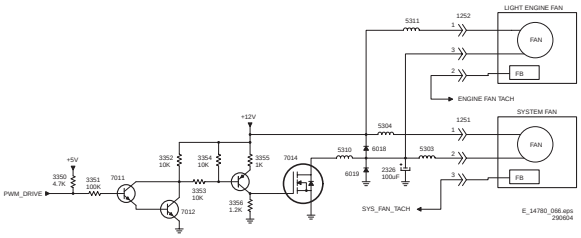


Figure 9-57 Fan drive circuit

The SYS_FAN_TACH for the System Fan and the ENGINE FAN TACH signals are fed to a Fan Failure detection circuit, which signals the System Microprocessor, 7108, if the Fan should stop. When the signal line goes High, the Comparator connected to Pin 2 will output a High, which will Set the Latch. The Output on Pin 3 will go Low. When the signal goes Low, Transistor 7015 turns "on", discharging Capacitor 2325. If the Fan stops turning, the signal will cease. Capacitor 2325 will charge via Resistor 3347. The output of Comparator connected to Pin 6 will go High, resetting the Latch, causing Pin 3 to go High. This will signal the System Microprocessor that the Fan has failed. The set will then shut down. IC 7118 monitors the ENGINE FAN TECH in the same manner to signal the System Microprocessor is the Light Engine fan should fail.

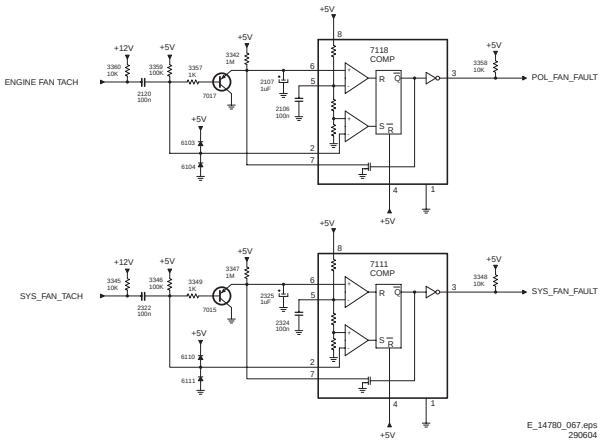


Figure 9-58 Fan failure detection circuit

9.13 Abbreviation list

2DNR	Spatial (2D) Noise Reduction
3DNR	Temporal (3D) Noise Reduction
AARA	Automatic Aspect Ratio Adaptation: algorithm that adapts aspect ratio to remove horizontal black bars; keeping up the original aspect ratio
ACI	Automatic Channel Installation: algorithm that installs TV sets directly from 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
ANR	Automatic Noise Reduction: one of the algorithms of Auto TV
AR	Aspect Ratio: 4 by 3 or 16 by 9
Artistic	See OTC 2.5: main processor
ASF	Auto Screen Fit: algorithm that adapts aspect ratio to remove horizontal black bars but without throwing away video information
ATV	See Auto TV
AUDIO_C	Audio Centre
AUDIO_L	Audio Left
AUDIO_R	Audio Right
AUDIO_SL	Audio Surround Left
AUDIO-SR	Audio surround right
AUDIO_SW	Audio Subwoofer
Auto TV	A hardware and software control system that measures picture content, and adapts image parameters in a dynamic way
BG	System B and G
B-SC1-IN	Blue SCART1 in
B-SC2-IN	Blue SCART2 in
B-TXT	Blue teletext
CL	Constant Level: audio output to connect with an external amplifier
ComPair	Computer aided rePair
CRT	Cathode Ray Tube or picture tube
CSM	Customer Service Mode
CTI	Colour Transient Improvement: manipulates steepness of chroma transients
CVBS	Composite Video Blanking and Synchronisation
CVBS-TER	CVBS terrestrial
DAC	Digital to Analogue Converter
DBE	Dynamic Bass Enhancement: extra low frequency amplification
DFU	Direction For Use: description for the end user
DNR	Digital Noise Reduction: noise reduction feature of the box
DPL	Dolby ProLogic
DSP	Digital Signal Processing
DST	Dealer Service Tool: special remote control designed for dealers to enter e.g. service mode
DVD	Digital Versatile Disc
Eagle	Feature box IC performing peaking, zooming and sub pixel LTI in both horizontal and vertical direction, CTI and other colour features
EHT	Extra High Tension

EPG	Electronic Program Guide: system used by broadcasters to transmit TV guide information (= NexTView)
EXT	External (source), entering the set via SCART or via cinches
FALCONIC	SAA4992H, Feature Box IC performing Digital Natural Motion, 3DNR, and vertical zoom and vertical peaking
FBL	Fast Blanking: DC signal accompanying RGB signals
FBL-PIP	The fast blanking signal for PIP
FBL-TXT	The fast blanking signal for TXT. It has a higher priority than FBL-PIP
FBX	Feature Box: part of small signal / separate module which contains 100 Hz processing, extra featuring and AutoTV algorithms (FBX6= based on PICNIC, FBX7= based on PICNIC and Eagle)
FDS	Full Dual Screen
FHP	Fujitsu Hitachi Plasma display Ltd.
FLASH	Flash memory
FM	Field Memory or Frequency Modulation
G-TXT	Green teletext
GND-DRIVE	A separate ground for the line drive towards the line driver
HA50	Horizontal Acquisition 1fh: horizontal sync pulse coming out of the HIP
HD100	Horizontal Drive 2fh: horizontal sync pulse coming out of the feature-box
HD at HOME	A signal from the OTC, to switch the HOP to the Pixel Plus standard (75 Hz frame)
HIP	High-end video Input Processor (TDA9320): video and chroma decoder of EM5E
HOP	High-end video Output Processor (TDA9330): video, sync, and geometry controller of EM5E
HP	Headphone
Interlaced	Scan mode where two fields are used to form one frame. Each field contains half the number of the total amount of lines. The fields are written in 'pairs', causing line flicker
Last Status	The settings last chosen by the customer, read, and stored in RAM or in the NVM. They are called at start-up of the set to configure it according the customers wishes
LCD	Liquid Crystal Display
LCoS	Liquid Crystal on Silicon
LPL	LG-Philips LCD
LED	Light Emitting Diode
LINE DRIVE	Line drive signal (for the Line transistor)
LNA	Low Noise Adapter
LSP	Large signal panel
MSP	Multi-standard Sound Processor: ITT sound decoder of EM5E
MUTE	Mute-Line
NC	Not Connected
NVM	Non Volatile Memory: IC containing TV related data e.g. alignments
O/C	Open Circuit
ON/OFF LED	On/Off control signal for the LED
OSD	On Screen Display
OTC	On screen display Teletext and Control; also named Artistic (SAA5800)
P50	Project 50 communication: protocol between TV and peripherals
PCB	Printed Circuit Board
PDP	Plasma Display Panel
PICNIC	Peripheral Integrated Combined Network IC (SAA4978): main IC for 100 Hz featuring and feature processing
PIP	Picture In Picture
Progressive Scan	Scan mode where all scan lines are displayed in one frame at the same time, creating a double vertical resolution.
PTP	Picture Tube Panel
PWB	Printed Wiring Board
RAM	Random Access Memory
R-TXT	Red teletext
RC	Remote Control
RC5 / RC6	Signal protocol from the remote control receiver
RESET	Reset signal
RGB-PIP	RGB-input for PIP
RGB-TXT	RGB-input for Teletext and OSD
RGB-VC	RGB-input to the Picture Tube Panel
ROM	Read Only Memory
SAM	Service Alignment Mode
SC	Sandcastle: two-level pulse derived from sync signals
S/C	Short Circuit
SCAVEM	Scan Velocity Modulation
SCL-F	Clock signal on fast I2C bus
SD	Standard Definition
SDA-F	Data signal on fast I2C bus
SDI	Samsung Display Industry
SIF	Sound Intermediate Frequency
SNERT	Synchronous No parity Eight bit Reception and Transmit
SSB/SSP	Small Signal Board/Panel
STBY	Standby
SW	Subwoofer
TXT	Teletext
TXT-DS	Teletext Dual Screen
TXT-KILL	To kill the TXT picture to insert a PIP. It has a higher priority than FBL-TXT.
uP	Microprocessor
U100	U from Feature Box
V100	V from Feature Box
VA50	Vertical Acquisition 1Fh
VD100	Vertical Drive 2fh: vertical sync pulse from deflection
VDPOS	One of the symmetrical drive signals for the DC frame output stage.
VDNEG	One of the symmetrical drive signals for the DC frame output stage.
VDS	Virtual Dolby Surround
VFB	Vertical Flyback Pulse: vertical sync pulse coming from the Feature Box
VL	Variable Level out: processed audio output towards external amplifier
WYSIWYR	What You See Is What You Record: record selection that follows main picture and sound
XTAL	Quartz crystal
Y100	Y from Feature Box
Y-OUT	Luminance-signal to HOP IC
YUV-Feat	The YUV input for the main picture, coming from the Feature box or the HI

10. Spare Parts List

Set Level

Various

0009	3135 038 70071	Cable 600/2P
8192	3135 031 01501	Cable 4P2/120
8210	3135 031 01301	CBLE HR 6P/85/6P HR
8215	3135 031 01751	Cable 4P
8252	3135 031 02131	CBLE SH 6P/650/6P SH
8253	3104 311 00131	Cable 3p/560/3p
8305	3135 031 01311	Cable 7P/200/7P
8310	3135 031 01461	Cable 3P2/300/3P2
8311	3135 031 01121	Cable 6P/350/6P
8313	3135 031 02151	Cable 3P
8335	3135 031 01101	Cable 11P/800/11P
8344	3135 031 01111	CBLE HR 5P/800/5P HR
8402	3104 311 03221	Cable 5p/400/5p KR Wh
8460	3135 031 01241	Cable 3P/1050/2P
8500	3135 031 01691	CBLE SH 7P/530/7P SH
8601	3135 031 01601	Cable (m)1P/250/1P(f)
8680	3135 031 01181	Cable 6P/525/6P
8681	3135 031 00811	CBLE KR 3P/450/3P KR
8700	3135 031 01421	CBLE HR 8P/200/8P HR

Audio Amplifier [AA]

Various

1216	4822 265 11517	Connector 1p m
1305	4822 267 10618	Connector 7p
1316	2422 025 10647	Connector 4p m
1321	4822 265 11557	Connector 5p
1700	4822 267 10574	Connector 8p
1702	4822 130 20297	BT169B
1703	2422 549 43778	Line filter 50V 2A4
1704	2422 549 43778	Line filter 50V 2A4

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2701	5322 121 42498	680nF 5% 63V
2702	5322 122 34098	10nF 10% 63V X7R
2703	5322 121 42498	680nF 5% 63V
2704	5322 122 34098	10nF 10% 63V X7R
2705	4822 124 22652	2.2µF 20% 50V
2706	4822 126 14585	100nF 10% 0805 50V
2707	4822 126 14585	100nF 10% 0805 50V
2708	4822 126 14076	220nF +80/-20% 25V
2709	5322 122 32268	470pF 5% 50V 0805 NP0
2710	5322 122 32268	470pF 5% 50V 0805 NP0
2711	5322 126 10511	1nF 5% 50V
2712	4822 126 13473	220nF +80%/-20% 50V
2713	4822 126 14585	100nF 10% 0805 50V
2714	4822 126 12105	33nF 5% 50V 0805
2715	5322 126 10511	1nF 5% 50V
2716	5322 122 31863	330pF 5% 63V 0805
2717	5322 122 32531	100pF 5% 50V
2718	5322 122 32658	22pF 5% 50V
2719	5322 126 10511	1nF 5% 50V
2720	4822 126 14076	220nF +80/-20% 25V
2721	5322 122 32268	470pF 5% 50V 0805 NP0
2722	5322 122 32268	470pF 5% 50V 0805 NP0
2723	4822 126 13473	220nF +80%/-20% 50V
2724	4822 126 13473	220nF +80%/-20% 50V
2725	4822 126 13473	220nF +80%/-20% 50V
2726	4822 126 12105	33nF 5% 50V 0805
2727	5322 126 10511	1nF 5% 50V
2728	5322 122 31863	330pF 5% 63V 0805
2729	4822 126 14585	100nF 10% 0805 50V
2730	4822 124 81168	2200 µF 20% 35V
2731	4822 124 81168	2200 µF 20% 35V
2732	4822 126 13473	220nF +80%/-20% 50V
2733	4822 126 13473	220nF +80%/-20% 50V
2734	5322 126 10511	1nF 5% 50V
2735	4822 124 40248	10µF 20% 63V
2736	5322 122 34098	10nF 10% 63V X7R
2737	5322 122 34098	10nF 10% 63V X7R
2739	5322 126 10511	1nF 5% 50V
2740	5322 126 10511	1nF 5% 50V
2741	5322 126 10511	1nF 5% 50V
2742	4822 126 13473	220nF +80%/-20% 50V
2743	4822 126 13473	220nF +80%/-20% 50V
2744	4822 126 13473	220nF +80%/-20% 50V
2745	4822 126 13473	220nF +80%/-20% 50V
2763	5322 121 42498	680nF 5% 63V
2776	4822 124 40248	10µF 20% 63V
2777	5322 121 42498	680nF 5% 63V
2780	5322 121 42386	100nF 5% 63V
2781	5322 121 42386	100nF 5% 63V

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3701	4822 050 21003	10kΩ 1% 0.6W
3702	4822 116 83961	6.8kΩ 5%
3703	4822 051 20333	33kΩ 5% 0.1W
3704	4822 117 10833	10kΩ 1% 0.1W
3705	4822 116 52176	10Ω 5% 0.5W
3706	4822 051 20562	5.6kΩ 5% 0.1W 0805
3707	4822 051 20683	68kΩ 5% 0.1W
3708	4822 117 11148	56kΩ 1% 0.1W
3709	4822 117 11503	220Ω 1% 0.1W
3710	4822 051 20223	22kΩ 5% 0.1W
3711	4822 050 21204	120kΩ 1% 0,6W
3712	4822 117 10833	10kΩ 1% 0.1W
3713	4822 116 52175	100Ω 5% 0.5W
3714	4822 117 10834	47kΩ 1% 0.1W
3715	4822 116 83884	47kΩ 5% 0.5W
3716	4822 117 10834	47kΩ 1% 0.1W
3717	4822 051 20154	150kΩ 5% 0.1W
3718	4822 051 20154	150kΩ 5% 0.1W
3719	2120 105 93428	1kΩ 5% 2W
3720	2120 105 93428	1kΩ 5% 2W
3721	4822 051 20562	5.6kΩ 5% 0.1W 0805
3722	4822 051 20683	68kΩ 5% 0.1W
3723	4822 117 11148	56kΩ 1% 0.1W
3724	4822 116 83872	220Ω 5% 0.5W
3725	4822 051 20223	22kΩ 5% 0.1W
3726	4822 051 20332	2.3kΩ 5% 0.1W
3727	4822 117 10834	47kΩ 1% 0.1W
3728	4822 117 11503	220Ω 1% 0.1W
3729	4822 116 83872	220Ω 5% 0.5W
3730	4822 117 11373	100Ω 1% 0805
3731	4822 117 11373	100Ω 1% 0805
3732	4822 116 52243	1.5kΩ 5% 0.5W
3733	4822 116 52243	1.5kΩ 5% 0.5W
3734	4822 117 10837	100kΩ 1% 0.1W
3790	4822 117 11373	100Ω 1% 0805
3791	4822 117 11373	100Ω 1% 0805
3792	4822 116 52175	100Ω 5% 0.5W
3793	4822 116 52175	100Ω 5% 0.5W
3796	4822 117 10833	10kΩ 1% 0.1W
3797	4822 051 20332	2.3kΩ 5% 0.1W
3798	4822 116 52269	3.3kΩ 5% 0.5W
3799	4822 116 83884	47kΩ 5% 0.5W
4700	4822 051 20008	Jumper 0805
4701	4822 051 20008	Jumper 0805

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5701	2422 536 00504	68µH 10%
5702	2422 536 00504	68µH 10%
5707	4822 157 11716	Bead 30Ω at 100MHz
5708	4822 157 11716	Bead 30Ω at 100MHz
5713	2422 535 95387	1µH 5%
5714	2422 535 95387	1µH 5%
5715	4822 157 11411	Bead 80Ω at 100MHz
5716	4822 157 11411	Bead 80Ω at 100MHz

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6701	4822 130 30621	1N4148
6702	4822 130 30621	1N4148
6703	4822 130 30621	1N4148
6704	4822 130 11397	BAS316
6705	4822 130 11397	BAS316
6706	4822 130 11397	BAS316
6707	4822 130 11397	BAS316
6708	4822 130 11397	BAS316
6709	4822 130 11397	BAS316
6710	4822 130 11397	BAS316
6711	4822 130 11397	BAS316

7700	9322 147 50667	TDA7490
7701	5322 130 60159	BC846B
7704	5322 130 60159	BC846B
7705	5322 130 60159	BC846B
7706	4822 130 60373	BC856B
7707	5322 130 60159	BC846B
7708	5322 130 60159	BC846B
7710	5322 130 60159	BC846B
7711	5322 130 60159	BC846B

Small Signal Board [B]

Various

0600	3135 037 02881	Softw. (check Prod.Surv.)
1001	2422 543 89022	Xtal 6MHz 20p
1100	2422 025 16388	Connector 16P f
1101	2422 549 45325	Bead 67Ω at 100MHz
1102	2422 549 45325	Bead 67Ω at 100MHz
1103	2422 549 45325	Bead 67Ω at 100MHz
1104	2422 549 45325	Bead 67Ω at 100MHz
1105	2422 549 45325	Bead 67Ω at 100MHz
1305	2422 543 01184	Xtal 4.433619MHz 20p
1308	2422 543 01183	Xtal 3.579545MHz 16p
1401	2422 025 16729	Connector 10p f foil
1402	2422 025 16966	Connector 5p m SMD
1403▲	2422 086 11092	Fuse 500mA 50V F SMD
1407	2422 549 44324	Filt. 5.5/5.74MHz
1408	2422 549 44372	SAW 38.9MHz K3953L
1409	2422 549 44369	SAW 38.9MHz K9656L
1651	2422 543 89019	Xtal 18.432MHz 12p
1680	2422 025 16961	Connector 6p m SMD
1683	2422 025 16793	Connector 5p f
1702	2422 540 98456	Resonator 12MHz

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2001	2222 867 15339	33pF 5% 50V 0603
2002	4822 126 11669	27pF 5% 50V 0603
2003	4822 126 13879	220nF +80-20% 16V
2004	4822 126 13879	220nF +80-20% 16V
2005	2238 586 59812	100nF 20% 50V 0603
2006	2238 586 59812	100nF 20% 50V 0603
2007	2238 586 59812	100nF 20% 50V 0603
2008	2238 586 59812	100nF 20% 50V 0603
2010	4822 126 11785	47pF 5% 50V 0603
2011	4822 126 11785	47pF 5% 50V 0603
2012	4822 126 11785	47pF 5% 50V 0603
2013	4822 124 12095	100µF 20% 16V
2016	4822 124 12095	100µF 20% 16V
2017	2238 586 59812	100nF 20% 50V 0603
2019	2238 586 59812	100nF 20% 50V 0603
2020	4822 126 13883	220pF 5% 50V
2022	2238 586 59812	100nF 20% 50V 0603
2023	2238 586 59812	100nF 20% 50V 0603
2024	2238 586 59812	100nF 20% 50V 0603
2025	2238 586 59812	100nF 20% 50V 0603
2026	2238 586 59812	100nF 20% 50V 0603
2027	2238 586 59812	100nF 20% 50V 0603
2028	2238 586 59812	100nF 20% 50V 0603
2029	2238 586 59812	100nF 20% 50V 0603
2031	2238 586 59812	100nF 20% 50V 0603
2033	4822 126 14226	82pF 5% 50V 0603
2034	4822 126 14226	82pF 5% 50V 0603
2035	4822 126 14226	82pF 5% 50V 0603
2036	4822 126 14226	82pF 5% 50V 0603
2037	4822 126 14226	82pF 5% 50V 0603
2038	2238 586 59812	100nF 20% 50V 0603
2039	2238 586 59812	100nF 20% 50V 0603
2040	2238 586 59812	100nF 20% 50V 0603
2052	4822 122 33741	10pF 10% 50V
2053	4822 122 33741	10pF 10% 50V
2054	4822 122 33741	10pF 10% 50V
2055	4822 122 33741	10pF 10% 50V
2056	4822 122 33741	10pF 10% 50V
2057	4822 122 33741	10pF 10% 50V
2100	2238 586 59812	100nF 20% 50V 0603
2101	2238 586 59812	100nF 20% 50V 0603
2102	2238 586 59812	100nF 20% 50V 0603
2103	2020 021 91854	10µF 20% 16V
2104	2238 586 59812	100nF 20% 50V 0603
2105	5322 126 11578	1nF 10% 50V 0603
2106	2238 586 59812	100nF 20% 50V 0603
2107	5322 126 11578	1nF 10% 50V 0603
2108	5322 126 11578	1nF 10% 50V 0603
2109	2238 586 59812	100nF 20% 50V 0603
2110	2020 021 91854	10µF 20% 16V
2111	5322 126 11578	1nF 10% 50V 0603
2112	2238 586 59812	100nF 20% 50V 0603
2302	2238 586 59812	100nF 20% 50V 0603
2303	2022 552 05679	1µF 10% 16V 0805
2305	2238 586 59812	100nF 20% 50V 0603
2312	2020 552 96659	33µF 5% 50V 1206
2316	2238 586 59812	100nF 20% 50V 0603
2322	2238 586 59812	100nF 20% 50V 0603
2340	4822 124 12095	100µF 20% 16V
2350	2238 586 59812	100nF 20% 50V 0603

2351	2238 586 59812	100nF 20% 50V 0603
2352	2238 586 59812	100nF 20% 50V 0603
2353	2238 586 59812	100nF 20% 50V 0603
2354	2238 586 59812	100nF 20% 50V 0603
2356	2238 586 59812	100nF 20% 50V 0603
2357	2238 586 59812	100nF 20% 50V 0603
2358	5322 126 11579	3.3nF 10% 63V
2359	4822 122 33752	15pF 5% 50V
2360	3198 016 31280	1.2pF 0.25pF 50V 0603
2361	3198 016 31280	1.2pF 0.25pF 50V 0603
2362	4822 126 11663	12pF 5% 50V 0603
2365	2238 586 59812	100nF 20% 50V 0603
2366	2238 586 59812	100nF 20% 50V 0603
2367	2238 586 59812	100nF 20% 50V 0603
2368	2238 586 59812	100nF 20% 50V 0603
2369	2238 586 59812	100nF 20% 50V 0603
2370	2238 586 59812	100nF 20% 50V 0603
2371	4822 126 13193	4.7nF 10% 63V
2372	4822 126 14043	1µF +80-20% 16V 0805
2373	2238 586 59812	100nF 20% 50V 0603
2374	4822 126 14491	2.2µF 10V 0805
2375	2238 916 15641	22nF 10% 25V 0603
2376	2238 586 59812	100nF 20% 50V 0603
2377	4822 124 12095	100µF 20% 16V
2378	2238 586 59812	100nF 20% 50V 0603
2384	2238 586 59812	100nF 20% 50V 0603
2385	2238 586 59812	100nF 20% 50V 0603
2390	2238 586 59812	100nF 20% 50V 0603
2391	2238 586 59812	100nF 20% 50V 0603
2394	4822 126 14491	2.2µF 10V 0805
2404	2022 552 05679	1µF 10% 16V 0805
2405	4822 126 13193	4.7nF 10% 63V
2406	4822 126 13883	220pF 5% 50V
2407	4822 126 14221	68pF 5% 50V 0603 NP0
2408	3198 016 32780	2.7pF 10% 50V 0603
2409	4822 126 14491	2.2µF 10V 0805
2411	2238 586 59812	100nF 20% 50V 0603
2412	4822 126 13193	4.7nF 10% 63V
2417	3198 017 44740	470nF 10V 0603
2418	4822 126 13956	6.8pF 5% 63V 0603
2420	4822 122 33753	150pF 5% 50V NP0
2422	2238 586 59812	100nF 20% 50V 0603
2424	2238 586 59812	100nF 20% 50V 0603
2425	4822 124 12095	100µF 20% 16V
2501	4822 126 11785	47pF 5% 50V 0603
2502	4822 126 14107	330nF +-80/-20% 25V
2503	4822 126 14107	330nF +-80/-20% 25V
2504	4822 126 14107	330nF +-80/-20% 25V
2505	4822 126 14107	330nF +-80/-20% 25V
2506	4822 126 14107	330nF +-80/-20% 25V
2507	4822 126 14107	330nF +-80/-20% 25V
2508	4822 124 12095	100µF 20% 16V
2510	2022 552 05679	1µF 10% 16V 0805
2511	2022 552 05679	1µF 10% 16V 0805
2512	4822 126 13879	220nF +80-20% 16V
2513	4822 124 23002	10µF 16V
2515	2020 552 94427	100pF 5% 50V
2520	2238 586 59812	100nF 20% 50V 0603
2521	2238 586 59812	100nF 20% 50V 0603
2522	4822 126 13881	470pF 5% 50V
2523	3198 016 31020	1nF 25V 0603
2524	2238 586 59812	100nF 20% 50V 0603
2525	4822 126 13881	470pF 5% 50V
2526	3198 016 31020	1nF 25V 0603
2528	4822 126 14491	2.2µF 10V 0805
2529	4822 126 14472	1µF 10% 10V 0805
2530	4822 126 14472	1µF 10% 10V 0805
2546	4822 124 23002	10µF 16V
2547	4822 124 23002	10µF 16V
2548	4822 124 23002	10µF 16V
2549	4822 124 23002	10µF 16V
2550	4822 126 14241	330pF 0603 50V
2551	5322 126 11579	3.3nF 10% 63V
2552	4822 126 13881	470pF 5% 50V
2553	4822 126 13881	470pF 5% 50V
2554	4822 126 13881	470pF 5% 50V
2555	4822 126 13881	470pF 5% 50V
2562	3198 016 31020	1nF 25V 0603
2563	3198 016 31020	1nF 25V 0603
2564	3198 016 31020	1nF 25V 0603
2565	3198 016 31020	1nF 25V 0603
2566	3198 016 31020	1nF 25V 0603
2567	3198 016 31020	1nF 25V 0603
2568	3198 016 31020	1nF 25V 0603
2569	3198 016 31020	1nF 25V 0603
2570	3198 016 31020	1nF 25V 0603
2571	2020 552 94427	100pF 5% 50V
2574	3198 016 31020	1nF 25V 0603
2575	3198 016 31020	1nF 25V 0603
2576	3198 016 31020	1nF 25V 0603
2577	3198 016 31020	1nF 25V 0603
2578	2020 552 94427	100pF 5% 50V
2579	2020 552 94427	100pF 5% 50V
2580	3198 016 31020	1nF 25V 0603
2581	3198 016 31020	1nF 25V 0603
2582	3198 016 31020	1nF 25V 0603
2583	3198 016 31020	1nF 25V 0603
2584	2020 552 94427	100pF 5% 50V
2585	2020 552 94427	100pF 5% 50V
2586	2020 552 94427	100pF 5% 50V
2590	2020 552 94427	100pF 5% 50V
2592	5322 126 11578	1nF 10% 50V 0603
2593	3198 016 31020	1nF 25V 0603
2594	3198 016 31020	1nF 25V 0603
2595	3198 016 31020	1nF 25V 0603
2609	3198 016 31020	1nF 25V 0603
2610	4822 126 14238	2.2nF 50V 0603
2611	3198 016 31020	1nF 25V 0603
2632	4822 126 14107	330nF +-80/-20% 25V
2634	3198 016 31020	1nF 25V 0603
2640	4822 126 13879	220nF +80-20% 16V
2643	4822 126 14107	330nF +-80/-20% 25V
2644	3198 016 31020	1nF 25V 0603
2645	4822 126 14107	330nF +-80/-20% 25V
2646	4822 126 14491	2.2µF 10V 0805
2649	4822 126 14491	2.2µF 10V 0805
2651	2238 586 59812	100nF 20% 50V 0603
2652	4822 126 11785	47pF 5% 50V 0603
2653	4822 126 14107	330nF +-80/-20% 25V
2654	4822 126 13881	470pF 5% 50V
2659	4822 126 13881	470pF 5% 50V
2660	4822 126 13881	470pF 5% 50V
2661	4822 126 14107	330nF +-80/-20% 25V
2662	4822 126 14107	330nF +-80/-20% 25V
2663	4822 126 13881	470pF 5% 50V
2664	4822 126 13881	470pF 5% 50V
2665	4822 124 12095	100µF 20% 16V
2666	4822 124 12095	100µF 20% 16V
2667	3198 016 33380	3.3pF 50V 0603
2668	3198 016 33380	3.3pF 50V 0603
2670	2238 586 59812	100nF 20% 50V 0603
2673	3198 016 31020	1nF 25V 0603
2674	3198 016 31020	1nF 25V 0603
2677	4822 124 23002	10µF 16V
2678	4822 124 23002	10µF 16V
2679	2238 586 59812	100nF 20% 50V 0603
2680	4822 124 23002	10µF 16V
2681	2238 586 59812	100nF 20% 50V 0603
2682	4822 124 23002	10µF 16V
2686	3198 016 31020	1nF 25V 0603
2687	3198 016 31020	1nF 25V 0603
2690	2238 586 59812	100nF 20% 50V 0603
2691	2238 586 59812	100nF 20% 50V 0603
2693	4822 126 13883	220pF 5% 50V
2694	3198 016 31020	1nF 25V 0603
2695	4822 124 12095	100µF 20% 16V
2697	2238 586 59812	100nF 20% 50V 0603
2698	4822 126 14491	2.2µF 10V 0805
2709	2238 586 59812	100nF 20% 50V 0603
2710	2238 586 59812	100nF 20% 50V 0603
2711	2238 586 59812	100nF 20% 50V 0603
2712	2238 586 59812	100nF 20% 50V 0603
2713	4822 122 33761	22pF 5% 50V
2714	4822 122 33761	22pF 5% 50V
2716	2238 586 59812	100nF 20% 50V 0603
2718	4822 122 33752	15pF 5% 50V
2719	4822 122 33752	15pF 5% 50V
2720	4822 122 33752	15pF 5% 50V
2721	2020 552 94427	100pF 5% 50V
2722	2020 552 94427	100pF 5% 50V
2728	2020 021 91854	10µF 20% 16V
2729	2238 586 59812	100nF 20% 50V 0603
2730	2020 021 91557	100µF 20% 16V
2731	2238 586 59812	100nF 20% 50V 0603
2732	2238 586 59812	100nF 20% 50V 0603
2733	2238 586 59812	100nF 20% 50V 0603
2734	2238 586 59812	100nF 20% 50V 0603
2735	2238 586 59812	100nF 20% 50V 0603
2740	2238 916 15641	22nF 10% 25V 0603
2741	2238 916 15641	22nF 10% 25V 0603
2742	2238 916 15641	22nF 10% 25V 0603
2743	2238 586 59812	100nF 20% 50V 0603
2744	2238 586 59812	100nF 20% 50V 0603
2745	2238 586 59812	100nF 20% 50V 0603
2746	2238 586 59812	100nF 20% 50V 0603
2747	2238 586 59812	100nF 20% 50V 0603
2748	2238 586 59812	100nF 20% 50V 0603
2749	2020 021 91854	10µF 20% 16V
2750	2238 586 59812	100nF 20% 50V 0603
2751	2238 586 59812	100nF 20% 50V 0603
2752	2238 586 59812	100nF 20% 50V 0603
2753	2238 586 59812	100nF 20% 50V 0603
2754	2238 586 59812	100nF 20% 50V 0603
2755	2238 586 59812	100nF 20% 50V 0603
2756	2238 586 59812	100nF 20% 50V 0603
2757	2238 916 15641	22nF 10% 25V 0603
2760	2238 586 59812	100nF 20% 50V 0603
2761	2238 586 59812	100nF 20% 50V 0603
2762	2238 586 59812	100nF 20% 50V 0603
2763	2238 586 59812	100nF 20% 50V 0603
2764	2238 586 59812	100nF 20% 50V 0603
2765	2238 586 59812	100nF 20% 50V 0603
2766	2238 586 59812	100nF 20% 50V 0603
2767	2238 586 59812	100nF 20% 50V 0603
2768	2238 586 59812	100nF 20% 50V 0603
2769	2238 586 59812	100nF 20% 50V 0603
2770	2020 021 91854	10µF 20% 16V
2771	2238 586 59812	100nF 20% 50V 0603
2772	2020 021 91557	100µF 20% 16V
2773	2238 586 59812	100nF 20% 50V 0603
2774	2238 586 59812	100nF 20% 50V 0603
2775	2238 586 59812	100nF 20% 50V 0603
2776	2238 586 59812	100nF 20% 50V 0603
2777	2238 586 59812	100nF 20% 50V 0603
2778	2238 586 59812	100nF 20% 50V 0603
2779	2238 586 59812	100nF 20% 50V 0603
2780	2238 586 59812	100nF 20% 50V 0603
2781	2238 586 59812	100nF 20% 50V 0603
2782	2238 586 59812	100nF 20% 50V 0603
2784	2238 586 59812	100nF 20% 50V 0603
2785	2238 586 59812	100nF 20% 50V 0603
2786	2238 586 59812	100nF 20% 50V 0603
2787	2238 586 59812	100nF 20% 50V 0603
2788	2238 586 59812	100nF 20% 50V 0603
2789	2238 586 59812	100nF 20% 50V 0603
2790	2238 586 59812	100nF 20% 50V 0603
2791	2238 586 59812	100nF 20% 50V 0603
2792	2020 021 91854	10µF 20% 16V
2793	2238 586 59812	100nF 20% 50V 0603
2794	2020 021 91854	10µF 20% 16V
2795	2238 586 59812	100nF 20% 50V 0603
2796	2238 586 59812	100nF 20% 50V 0603
2797	2238 586 59812	100nF 20% 50V 0603
2798	2238 586 59812	100nF 20% 50V 0603
2799	2238 586 59812	100nF 20% 50V 0603
2800	2238 586 59812	100nF 20% 50V 0603
2801	2238 586 59812	100nF 20% 50V 0603
2802	2238 586 59812	100nF 20% 50V 0603
2803	2238 586 59812	100nF 20% 50V 0603
2805	2238 586 59812	100nF 20% 50V 0603
2807	2238 586 59812	100nF 20% 50V 0603
2809	2238 586 59812	100nF 20% 50V 0603
2810	2238 586 59812	100nF 20% 50V 0603
2811	2238 586 59812	100nF 20% 50V 0603
2812	2238 586 59812	100nF 20% 50V 0603
2813	2238 586 59812	100nF 20% 50V 0603
2817	2238 586 59812	100nF 20% 50V 0603
2819	2238 586 59812	100nF 20% 50V 0603
2820	2238 586 59812	100nF 20% 50V 0603
2821	2238 586 59812	100nF 20% 50V 0603
2822	2238 586 59812	100nF 20% 50V 0603
2823	5322 126 11578	1nF 10% 50V 0603
2824	5322 126 11578	1nF 10% 50V 0603
2825	2238 586 59812	100nF 20% 50V 0603
2826	2238 586 59812	100nF 20% 50V 0603
2829	2238 586 59812	100nF 20% 50V 0603
2831	4822 126 14221	68pF 5% 50V 0603 NP0
2832	2238 586 59812	100nF 20% 50V 0603
2833	2238 586 59812	100nF 20% 50V 0603
2835	2238 586 59812	100nF 20% 50V 0603
2836	2238 586 59812	100nF 20% 50V 0603
2838	2238 586 59812	100nF 20% 50V 0603
2843	2238 586 59812	100nF 20% 50V 0603
2845	2238 586 59812	100nF 20% 50V 0603
2846	2238 586 59812	100nF 20% 50V 0603
2847	2238 586 59812	100nF 20% 50V 0603
2848	2238 586 59812	100nF 20% 50V 0603
2851	2238 586 59812	100nF 20% 50V 0603
2853	2238 586 59812	100nF 20% 50V 0603
2854	2238 586 59812	100nF 20% 50V 0603
2857	2238 586 59812	100nF 20% 50V 0603
2859	2238 586 59812	100nF 20% 50V 0603
2860	2238 586 59812	100nF 20% 50V 0603
2861	2238 586 59812	100nF 20% 50V 0603
2864	2238 586 59812	100nF 20% 50V 0603
2865	2238 586 59812	100nF 20% 50V 0603
2866	2238 586 59812	100nF 20% 50V 0603
2867	2238 586 59812	100nF 20% 50V 0603
2870	2020 021 91854	10µF 20% 16V
2871	2020 021 91854	10µF 20% 16V
2872	2238 586 59812	100nF 20% 50V 0603
2874	2020 021 91854	10µF 20% 16V
2875	2020 021 91854	10µF 20% 16V
2876	2238 586 59812	100nF 20% 50V 0603
2880	2020 021 91557	100µF 20% 16V
2881	4822 126 11669	27pF 5% 50V 0603
2884	2238 586 59812	100nF 20% 50V 0603
2896	2238 586 59812	100nF 20% 50V 0603
2899	2238 586 59812	100nF 20% 50V 0603
2908	2238 586 59812	100nF 20% 50V 0603
2909	2238 586 59812	100nF 20% 50V 0603
2910	2238 586 59812	100nF 20% 50V 0603

2911	2238 586 59812	100nF 20% 50V 0603
2912	3198 017 44740	470nF 10V 0603

–WW–

3001	4822 051 30472	4.7Ω 5% 0.062W
3002	4822 051 30472	4.7Ω 5% 0.062W
3003	4822 117 13525	24kΩ 1% 0.62W 0603
3006	4822 051 30471	47Ω 5% 0.062W
3007	3198 031 14710	4 x 470Ω 5% 1206
3008	4822 117 13523	220Ω 5% 0.63W
3009	4822 051 30008	Jumper 0603
3011	4822 051 30471	47Ω 5% 0.062W
3012	3198 031 11010	4 x 100Ω 5% 1206
3013	4822 051 30103	10kΩ 5% 0.062W
3014	4822 051 30682	6.8Ω 5% 0.062W
3015	4822 051 30474	470kΩ 5% 0.062W
3016	4822 051 30152	1.5Ω 5% 0.062W
3017	4822 051 30472	4.7Ω 5% 0.062W
3018	4822 051 30103	10kΩ 5% 0.062W
3019	4822 051 30472	4.7Ω 5% 0.062W
3020	4822 051 30103	10kΩ 5% 0.062W
3021	4822 051 30103	10kΩ 5% 0.062W
3024	4822 051 30273	27kΩ 5% 0.062W
3025	4822 051 30221	220Ω 5% 0.062W
3026	4822 051 30472	4.7Ω 5% 0.062W
3027	4822 117 12925	47kΩ 1% 0.063W 0603
3029	4822 051 30103	10kΩ 5% 0.062W
3031	4822 051 30103	10kΩ 5% 0.062W
3033	4822 051 30103	10kΩ 5% 0.062W
3034	3198 031 11010	4 x 100Ω 5% 1206
3035	3198 031 11010	4 x 100Ω 5% 1206
3039	4822 051 30181	180Ω 5% 0.062W
3040	4822 051 30472	4.7Ω 5% 0.062W
3041	4822 051 30472	4.7Ω 5% 0.062W
3042	4822 051 30472	4.7Ω 5% 0.062W
3044	4822 051 30272	2.7kΩ 5% 0.062W
3045	4822 051 30101	100Ω 5% 0.062W
3046	3198 031 11010	4 x 100Ω 5% 1206
3048	3198 031 11010	4 x 100Ω 5% 1206
3049	3198 031 11010	4 x 100Ω 5% 1206
3050	3198 031 11010	4 x 100Ω 5% 1206
3051	3198 031 11010	4 x 100Ω 5% 1206
3052	3198 031 11010	4 x 100Ω 5% 1206
3053	4822 051 30101	100Ω 5% 0.062W
3054	3198 031 11010	4 x 100Ω 5% 1206
3055	3198 031 11010	4 x 100Ω 5% 1206
3056	3198 031 11010	4 x 100Ω 5% 1206
3057	3198 031 11010	4 x 100Ω 5% 1206
3059	2322 704 66201	620Ω 1% 0603
3061	4822 051 30103	10kΩ 5% 0.062W
3062	4822 051 30103	10kΩ 5% 0.062W
3064	3198 031 11010	4 x 100Ω 5% 1206
3065	4822 051 30472	4.7Ω 5% 0.062W
3066	4822 117 12925	47kΩ 1% 0.063W 0603
3067	4822 051 30474	470kΩ 5% 0.062W
3068	4822 051 30272	2.7kΩ 5% 0.062W
3069	4822 051 30272	2.7kΩ 5% 0.062W
3073	3198 031 14710	4 x 470Ω 5% 1206
3074	3198 031 14710	4 x 470Ω 5% 1206
3076	3198 031 14710	4 x 470Ω 5% 1206
3078	3198 031 14710	4 x 470Ω 5% 1206
3079	4822 051 30472	4.7Ω 5% 0.062W
3080	4822 051 30472	4.7Ω 5% 0.062W
3081	4822 051 30008	Jumper 0603
3088	4822 051 30472	4.7Ω 5% 0.062W
3090	3198 031 14710	4 x 470Ω 5% 1206
3093	4822 051 30103	10kΩ 5% 0.062W
3094	4822 117 12925	47kΩ 1% 0.063W 0603
3095	4822 117 12925	47kΩ 1% 0.063W 0603
3096	4822 117 12925	47kΩ 1% 0.063W 0603
3097	4822 051 30008	Jumper 0603
3098	4822 051 30101	100Ω 5% 0.062W
3099	3198 031 14710	4 x 470Ω 5% 1206
3169	4822 051 30102	1kΩ 5% 0.062W
3170	4822 051 30102	1kΩ 5% 0.062W
3171	4822 051 30102	1kΩ 5% 0.062W
3172	4822 051 30102	1kΩ 5% 0.062W
3173	4822 051 30102	1kΩ 5% 0.062W
3174	4822 051 30102	1kΩ 5% 0.062W
3176	4822 051 30102	1kΩ 5% 0.062W
3180	4822 117 12917	1Ω 5% 0.062W
3181	4822 117 12917	1Ω 5% 0.062W
3182	4822 117 12917	1Ω 5% 0.062W
3183	4822 117 12917	1Ω 5% 0.062W
3184	4822 117 12917	1Ω 5% 0.062W
3185	4822 117 12917	1Ω 5% 0.062W
3186	4822 117 12917	1Ω 5% 0.062W
3187	4822 117 12917	1Ω 5% 0.062W
3188	4822 117 12917	1Ω 5% 0.062W
3189	4822 117 12917	1Ω 5% 0.062W
3301	4822 117 13632	100kΩ 1% 0603 0.62W
3303	4822 117 13632	100kΩ 1% 0603 0.62W
3304▲	2322 750 63908	3.9Ω 5% Fuse 1206
3308	4822 051 20154	150kΩ 5% 0.1W
3324	4822 051 30008	Jumper 0603
3329▲	4822 117 13568	6.8Ω 5% 1206
3370	4822 051 30101	100Ω 5% 0.062W
3371	4822 051 30479	47Ω 5% 0.062W
3372	4822 051 30471	47Ω 5% 0.062W
3373	4822 051 30008	Jumper 0603
3374	4822 051 30008	Jumper 0603
3375	4822 051 30008	Jumper 0603
3376	4822 051 30101	100Ω 5% 0.062W
3377	4822 051 30101	100Ω 5% 0.062W
3378	4822 051 30153	15kΩ 5% 0.062W
3379	4822 051 30008	Jumper 0603
3380	4822 051 30101	100Ω 5% 0.062W
3382	4822 051 30561	560Ω 5% 0.062W
3385	4822 051 30471	47Ω 5% 0.062W
3393	4822 117 13632	100kΩ 1% 0603 0.62W
3400▲	4822 117 11152	4.7Ω 5%
3402▲	2322 750 63908	3.9Ω 5% Fuse 1206
3403	4822 051 30101	100Ω 5% 0.062W
3404	4822 051 30561	560Ω 5% 0.062W
3405	4822 051 30102	1kΩ 5% 0.062W
3406	2322 702 60279	27Ω 5% 0.1W 0603
3408	4822 051 30101	100Ω 5% 0.062W
3411	4822 051 30272	2.7kΩ 5% 0.062W
3412	4822 051 30102	1kΩ 5% 0.062W
3414	4822 051 30472	4.7Ω 5% 0.062W
3415	4822 051 30222	2.2kΩ 5% 0.062W
3418	4822 051 30391	390Ω 5% 0.062W
3419	4822 051 30339	33Ω 5% 0.062W
3435	4822 051 30472	4.7Ω 5% 0.062W
3436	4822 051 30181	180Ω 5% 0.062W
3437	4822 051 30471	47Ω 5% 0.062W
3439	4822 051 30471	47Ω 5% 0.062W
3441	4822 051 30562	5.6kΩ 5% 0.063W 0603
3445	4822 051 30271	270Ω 5% 0.062W
3446	4822 051 30101	100Ω 5% 0.062W
3463	4822 051 30472	4.7Ω 5% 0.062W
3468	4822 117 13632	100kΩ 1% 0603 0.62W
3500	4822 051 30153	15kΩ 5% 0.062W
3501	2422 549 43769	Bead 30Ω at 100MHz
3504	4822 051 30123	12kΩ 5% 0.1W
3505	4822 051 30153	15kΩ 5% 0.062W
3506	2422 549 43769	Bead 30Ω at 100MHz
3509	4822 051 30123	12kΩ 5% 0.1W
3510	4822 117 12925	47kΩ 1% 0.063W 0603
3511	4822 117 13632	100kΩ 1% 0603 0.62W
3512	4822 051 30154	150kΩ 5% 0.062W
3513	4822 117 12889	270kΩ 1% 0.063W 0603
3514	4822 117 12925	47kΩ 1% 0.063W 0603
3515	4822 117 13632	100kΩ 1% 0603 0.62W
3516	4822 051 30392	3.9Ω 5% 0.063W 0603
3519	4822 051 30103	10kΩ 5% 0.062W
3521	4822 117 13632	100kΩ 1% 0603 0.62W
3522	4822 117 13632	100kΩ 1% 0603 0.62W
3523	4822 117 13632	100kΩ 1% 0603 0.62W
3524	4822 117 13632	100kΩ 1% 0603 0.62W
3525	4822 051 30684	680kΩ 5% 0.062W
3526	4822 051 30105	1MΩ 5% 0.062W
3527	4822 051 30221	220Ω 5% 0.062W
3529	4822 051 30103	10kΩ 5% 0.062W
3530	4822 051 30103	10kΩ 5% 0.062W
3531	4822 117 12902	8.2kΩ 1% 0.063W 0603
3532	4822 051 30102	1kΩ 5% 0.062W
3533	4822 051 30103	10kΩ 5% 0.062W
3540	4822 051 30103	10kΩ 5% 0.062W
3546	4822 051 30102	1kΩ 5% 0.062W
3551	4822 051 30102	1kΩ 5% 0.062W
3554	4822 051 30223	22kΩ 5% 0.062W
3558	4822 051 30101	100Ω 5% 0.062W
3559	4822 051 30101	100Ω 5% 0.062W
3560	4822 051 30101	100Ω 5% 0.062W
3561	4822 051 30101	100Ω 5% 0.062W
3562	4822 051 30101	100Ω 5% 0.062W
3563	4822 051 30101	100Ω 5% 0.062W
3564	4822 051 30101	100Ω 5% 0.062W
3567	4822 051 30101	100Ω 5% 0.062W
3568	4822 051 30101	100Ω 5% 0.062W
3569	4822 051 30101	100Ω 5% 0.062W
3570	4822 051 30101	100Ω 5% 0.062W
3571	4822 051 30101	100Ω 5% 0.062W
3572	4822 051 30101	100Ω 5% 0.062W
3573	4822 051 30101	100Ω 5% 0.062W
3574	4822 051 30101	100Ω 5% 0.062W
3575	4822 051 30101	100Ω 5% 0.062W
3576	4822 051 30272	2.7kΩ 5% 0.062W
3577	4822 051 30101	100Ω 5% 0.062W
3578	4822 051 30103	10kΩ 5% 0.062W
3579	4822 051 30103	10kΩ 5% 0.062W
3612	4822 117 12925	47kΩ 1% 0.063W 0603
3613	4822 117 12925	47kΩ 1% 0.063W 0603
3614	4822 117 12925	47kΩ 1% 0.063W 0603
3615	4822 117 12925	47kΩ 1% 0.063W 0603
3616	4822 051 30272	2.7kΩ 5% 0.062W
3624	4822 117 11817	1.2kΩ 1% 0.0625W
3626	4822 051 30154	150kΩ 5% 0.062W
3627	4822 051 30103	10kΩ 5% 0.062W
3628	4822 051 30223	22kΩ 5% 0.062W
3630	4822 051 30563	56kΩ 5% 0.062W
3634	4822 051 30121	120Ω 5% 0.062W
3636	4822 051 30271	270Ω 5% 0.062W
3637	4822 117 12864	82kΩ 5% 0.6W
3639	4822 051 30102	1kΩ 5% 0.062W
3640	4822 051 30101	100Ω 5% 0.062W
3641	4822 051 30101	100Ω 5% 0.062W
3642	4822 051 30101	100Ω 5% 0.062W
3643	4822 051 30101	100Ω 5% 0.062W
3644▲	4822 117 11152	4.7Ω 5%
3653	4822 051 30008	Jumper 0603
3654	4822 051 30008	Jumper 0603
3655	4822 051 30101	100Ω 5% 0.062W
3656	4822 051 30101	100Ω 5% 0.062W
3657	4822 051 30563	56kΩ 5% 0.062W
3658	4822 051 30154	150kΩ 5% 0.062W
3666	4822 051 30154	150kΩ 5% 0.062W
3667	4822 117 12864	82kΩ 5% 0.6W
3668	4822 051 30563	56kΩ 5% 0.062W
3669	4822 051 30271	270Ω 5% 0.062W
3670	4822 051 30102	1kΩ 5% 0.062W
3671	4822 117 11817	1.2kΩ 1% 0.0625W
3673	4822 051 30103	10kΩ 5% 0.062W
3683	4822 051 30223	22kΩ 5% 0.062W
3684	4822 051 30008	Jumper 0603
3685	4822 051 30008	Jumper 0603
3688	4822 051 30008	Jumper 0603
3689	4822 051 30008	Jumper 0603
3692	4822 051 30008	Jumper 0603
3693	4822 051 30008	Jumper 0603
3698	4822 117 11817	1.2kΩ 1% 0.0625W
3699	2322 702 60184	180kΩ 5% 0603
3709	4822 051 30101	100Ω 5% 0.062W
3710	4822 051 30101	100Ω 5% 0.062W
3711	4822 117 12925	47kΩ 1% 0.063W 0603
3712	4822 117 12925	47kΩ 1% 0.063W 0603
3713	4822 051 30181	180Ω 5% 0.062W
3714	4822 051 30181	180Ω 5% 0.062W
3715	4822 051 30181	180Ω 5% 0.062W
3716	4822 117 13632	100kΩ 1% 0603 0.62W
3717	4822 117 13632	100kΩ 1% 0603 0.62W
3718	4822 117 13632	100kΩ 1% 0603 0.62W
3719	4822 051 30332	3.3Ω 5% 0.062W
3720	4822 051 30103	10kΩ 5% 0.062W
3725	4822 051 30332	3.3Ω 5% 0.062W
3726	4822 117 11817	1.2kΩ 1% 0.0625W
3727	4822 051 30151	150Ω 5% 0.062W
3728	4822 051 30151	150Ω 5% 0.062W
3730	4822 051 30681	680Ω 5% 0.062W
3736	4822 051 30101	100Ω 5% 0.062W
3737	4822 051 30102	1kΩ 5% 0.062W
3738	4822 051 30102	1kΩ 5% 0.062W
3739	4822 051 30153	15kΩ 5% 0.062W
3740	4822 051 30102	1kΩ 5% 0.062W
3741	4822 051 30183	18kΩ 5% 0.062W
3742	4822 051 30183	18kΩ 5% 0.062W
3744	4822 051 30222	2.2kΩ 5% 0.062W
3745	4822 051 30102	1kΩ 5% 0.062W
3746	4822 051 30392	3.9Ω 5% 0.063W 0603
3747	4822 051 30154	150kΩ 5% 0.062W
3748	4822 117 12891	220kΩ 1%
3749	4822 051 30392	3.9Ω 5% 0.063W 0603
3750	4822 051 30332	3.3Ω 5% 0.062W
3751	4822 051 30472	4.7Ω 5% 0.062W
3752	4822 117 12917	1Ω 5% 0.062W
3753	4822 117 12917	1Ω 5% 0.062W
3754	4822 051 30101	100Ω 5% 0.062W
3755	4822 051 30472	4.7Ω 5% 0.062W
3756	4822 117 12902	8.2kΩ 1% 0.063W 0603
3757	4822 051 30479	47Ω 5% 0.062W
3758	4822 051 30472	4.7Ω 5% 0.062W
3759	4822 051 30221	220Ω 5% 0.062W
3762	4822 051 30101	100Ω 5% 0.062W
3763	4822 117 12139	22Ω 5% 0.062W
3764	4822 051 30109	10Ω 5% 0.062W
3771	4822 117 12971	15Ω 5% 0603 0.62W
3772	4822 117 12971	15Ω 5% 0603 0.62W
3773	4822 117 12925	47kΩ 1% 0.063W 0603
3774	4822 117 12925	47kΩ 1% 0.063W 0603
3781	4822 117 12925	47kΩ 1% 0.063W 0603
3782	4822 117 12925	47kΩ 1% 0.063W 0603
3783	4822 117 12925	47kΩ 1% 0.063W 0603
3792	4822 051 30102	1kΩ 5% 0.062W
3793	4822 051 30222	2.2kΩ 5% 0.062W
3794	4822 117 12971	15Ω 5% 0603 0.62W
3795	4822 051 30339	33Ω 5% 0.062W
3804	4822 051 30102	1kΩ 5% 0.062W
9008	4822 051 30008	Jumper 0603
9009	4822 051 30008	Jumper 0603

9010	4822 051 30008	Jumper 0603
9011	4822 051 30008	Jumper 0603
9012	4822 051 30008	Jumper 0603
9013	4822 051 30008	Jumper 0603
9015	4822 051 30008	Jumper 0603
9302	4822 051 30008	Jumper 0603
9303	4822 051 30008	Jumper 0603
9304	4822 051 30008	Jumper 0603
9313	4822 051 30008	Jumper 0603
9318	4822 051 30008	Jumper 0603
9322	4822 051 30008	Jumper 0603
9406	4822 051 30008	Jumper 0603
9410	4822 051 30008	Jumper 0603
9413	4822 051 30008	Jumper 0603
9416	4822 051 30008	Jumper 0603
9417	4822 051 30008	Jumper 0603
9418	4822 051 30008	Jumper 0603
9419	4822 051 30008	Jumper 0603
9420	4822 051 30008	Jumper 0603
9520	4822 051 30008	Jumper 0603
9522	4822 051 30008	Jumper 0603
9603	4822 051 30008	Jumper 0603
9604	4822 051 30008	Jumper 0603
9607	4822 051 30008	Jumper 0603
9608	4822 051 30008	Jumper 0603
9609	4822 051 30008	Jumper 0603
9610	4822 051 30008	Jumper 0603
9611	4822 051 30008	Jumper 0603
9642	4822 051 30008	Jumper 0603
9645	4822 051 30008	Jumper 0603
9688	4822 051 30008	Jumper 0603
9689	4822 051 30008	Jumper 0603
9691	4822 051 30008	Jumper 0603
9692	4822 051 30008	Jumper 0603
9702	4822 051 30008	Jumper 0603
9703	4822 051 30008	Jumper 0603
9704	4822 051 30008	Jumper 0603
9712	4822 051 30008	Jumper 0603
9714	4822 051 30008	Jumper 0603
9716	4822 051 30008	Jumper 0603
9717	4822 051 30008	Jumper 0603
9718	4822 051 30008	Jumper 0603
9719	4822 051 30008	Jumper 0603
9721	4822 051 30008	Jumper 0603
9723	4822 051 30008	Jumper 0603
9725	4822 051 30008	Jumper 0603
9729	4822 051 30008	Jumper 0603
9731	4822 051 30008	Jumper 0603
9733	4822 051 30008	Jumper 0603
9735	4822 051 30008	Jumper 0603
9739	4822 051 30008	Jumper 0603
9740	4822 051 30008	Jumper 0603
9741	4822 117 12662	4 x 10Ω 5%
9744	4822 051 30008	Jumper 0603
9747	4822 051 30008	Jumper 0603
9754	4822 051 30008	Jumper 0603
9760	4822 051 30008	Jumper 0603
9761	4822 051 30008	Jumper 0603
9762	4822 051 30008	Jumper 0603
9763	4822 051 30008	Jumper 0603
9764	4822 051 30008	Jumper 0603
9765	4822 051 30008	Jumper 0603
9768	4822 051 30008	Jumper 0603
9769	4822 051 30008	Jumper 0603
9901	4822 051 30008	Jumper 0603
9902	4822 051 30008	Jumper 0603
9903	4822 051 30008	Jumper 0603
9904	4822 051 30008	Jumper 0603
9905	4822 051 30008	Jumper 0603
9906	4822 051 30008	Jumper 0603
9907	4822 051 30008	Jumper 0603
9908	4822 051 30008	Jumper 0603
9909	4822 051 30008	Jumper 0603
9919	4822 051 30008	Jumper 0603
9920	4822 051 30008	Jumper 0603
9921	4822 051 30008	Jumper 0603
9925	4822 051 30008	Jumper 0603
9927	4822 051 30008	Jumper 0603
9928	4822 051 30008	Jumper 0603
9929	4822 051 30008	Jumper 0603
9935	4822 051 30008	Jumper 0603
9937	4822 051 30008	Jumper 0603
9938	4822 051 30008	Jumper 0603
9939	4822 051 30008	Jumper 0603
9944	4822 051 30008	Jumper 0603
9945	4822 051 30008	Jumper 0603
9946	4822 051 30008	Jumper 0603
9947	4822 051 30008	Jumper 0603
9948	4822 051 30008	Jumper 0603
9949	4822 051 30008	Jumper 0603
9950	4822 051 30008	Jumper 0603
9951	4822 051 30008	Jumper 0603
9952	4822 051 30008	Jumper 0603
9953	4822 051 30008	Jumper 0603
9954	4822 051 30008	Jumper 0603

5150	4822 156 21729	Bead 1kΩ 100MHz 0805
5151	4822 156 21729	Bead 1kΩ 100MHz 0805
5152	4822 156 21729	Bead 1kΩ 100MHz 0805
5153	4822 156 21729	Bead 1kΩ 100MHz 0805
5154	4822 156 21729	Bead 1kΩ 100MHz 0805
5155	4822 156 21729	Bead 1kΩ 100MHz 0805
5401	3198 018 56880	6.8µH 10% 0603
5403	2422 549 44461	Trimmer 40MHz 5CCE
5404	2422 535 95427	Bead 120Ω at 100MHz
5405	2422 535 95427	Bead 120Ω at 100MHz
5406	4822 157 10586	2.2µH 10% 0805
5408	2422 549 44983	Trimmer 78MHz 5CCB
5409	2422 549 42896	Bead 120Ω 100MHz
5411	4822 157 11892	0.22µH 10% 0805
5415	4822 157 11716	Bead 30Ω at 100MHz
5416	4822 157 11716	Bead 30Ω at 100MHz
5651	2422 549 43769	Bead 30Ω at 100MHz
5652	2422 549 43769	Bead 30Ω at 100MHz
5653	2422 549 43769	Bead 30Ω at 100MHz
5654	4822 157 11716	Bead 30Ω at 100MHz
5655	4822 157 11828	22µH 20% 0805
5656	4822 157 11876	6.8µH 10% 0805
5663	2422 549 43769	Bead 30Ω at 100MHz
5664	2422 549 43769	Bead 30Ω at 100MHz
5665	2422 549 43769	Bead 30Ω at 100MHz
5669	2422 549 43769	Bead 30Ω at 100MHz
5670	2422 549 43769	Bead 30Ω at 100MHz
5671	4822 157 11716	Bead 30Ω at 100MHz
5672	4822 157 11716	Bead 30Ω at 100MHz
5706	4822 157 11716	Bead 30Ω at 100MHz
5707	4822 156 21729	Bead 1kΩ 100MHz 0805
5710	4822 156 21729	Bead 1kΩ 100MHz 0805
5711	4822 156 21729	Bead 1kΩ 100MHz 0805
5712	4822 156 21729	Bead 1kΩ 100MHz 0805
5713	4822 157 11716	Bead 30Ω at 100MHz
5714	4822 157 71206	Bead 600Ω 100MHz
5716	4822 156 21729	Bead 1kΩ 100MHz 0805
5717	4822 156 21729	Bead 1kΩ 100MHz 0805
5718	4822 157 11716	Bead 30Ω at 100MHz
5719	4822 156 21729	Bead 1kΩ 100MHz 0805
5721	4822 157 71206	Bead 600Ω 100MHz
5722	4822 156 21729	Bead 1kΩ 100MHz 0805
5724	4822 156 21729	Bead 1kΩ 100MHz 0805
5726	4822 156 21729	Bead 1kΩ 100MHz 0805
5727	4822 156 21729	Bead 1kΩ 100MHz 0805
5728	4822 157 11716	Bead 30Ω at 100MHz
5729	4822 157 11716	Bead 30Ω at 100MHz
5731	4822 156 21729	Bead 1kΩ 100MHz 0805
5736	4822 157 11876	6.8µH 10% 0805
5737	4822 156 21729	Bead 1kΩ 100MHz 0805
5738	4822 157 11716	Bead 30Ω at 100MHz
5742	4822 157 11716	Bead 30Ω at 100MHz
5743	4822 156 21729	Bead 1kΩ 100MHz 0805
5744	4822 157 11716	Bead 30Ω at 100MHz
5900	4822 157 11716	Bead 30Ω at 100MHz
5901	4822 157 11716	Bead 30Ω at 100MHz
5902	4822 157 11716	Bead 30Ω at 100MHz
5903	4822 157 11716	Bead 30Ω at 100MHz
5904	4822 157 11716	Bead 30Ω at 100MHz
5910	2422 549 43062	Bead 600Ω at 100MHz
5911	2422 549 43062	Bead 600Ω at 100MHz
5912	2422 549 43062	Bead 600Ω at 100MHz
5913	2422 549 43062	Bead 600Ω at 100MHz
5914	2422 549 43062	Bead 600Ω at 100MHz
5915	2422 549 43062	Bead 600Ω at 100MHz
5917	2422 549 43062	Bead 600Ω at 100MHz
5918	2422 549 43062	Bead 600Ω at 100MHz
5919	2422 549 43062	Bead 600Ω at 100MHz
5920	2422 549 43062	Bead 600Ω at 100MHz

6001	4822 130 80622	BAT54
6002	4822 130 11397	BAS316
6003	4822 130 80622	BAT54
6004	4822 130 80622	BAT54
6005	4822 130 11422	PLVA2650A
6403	9340 552 30115	BA591
6652	4822 130 11551	UDZS10B
6657	9322 102 64685	UDZ2.7B
6658	4822 130 11397	BAS316
6926	4822 130 10837	UDZS8.2B
6956	4822 130 10837	UDZS8.2B
6957	4822 130 10837	UDZS8.2B

7001	9352 684 81557	SAA5801H/015
7002	3198 010 42320	BC857BW
7003	3198 010 42310	BC847BW
7004	3198 010 42310	BC847BW
7005	9322 116 74668	LD1117D33
7006		For softw. see item 0600
7007	9322 200 55668	IS41LV16100-50K
7008	3198 010 42310	BC847BW
7009	3198 010 42310	BC847BW
7010	3198 010 42320	BC857BW
7011	9322 156 81668	M24C32-WMN6TNKSA
7012	9322 156 72668	M29W400BT-90N1
7013	3198 010 42310	BC847BW
7014	3198 010 42320	BC857BW
7015	4822 209 73852	PMBT2369
7016	4822 209 73852	PMBT2369
7100	9322 159 45668	DS90C385MTD
7307	9352 630 99118	TDA9181T
7312	9340 310 30215	PDTC144ET
7320	3198 010 42310	BC847BW
7322	3198 010 42310	BC847BW
7323	9352 625 24518	TDA9321H/N2
7402	3198 010 42310	BC847BW
7403	5322 130 60159	BC846B
7404	3198 010 42310	BC847BW
7407	4822 130 60373	BC856B
7410	3198 010 42310	BC847BW
7411	5322 130 60159	BC846B
7651	9322 180 61702	MSP3411G-FH-B8-V3
7652	9351 869 40118	74HC4053PW
7654	9340 425 20115	BC847BS
7664	9340 425 30115	BC847BPN
7665	9340 425 30115	BC847BPN
7666	9340 425 30115	BC847BPN
7668	3198 010 42320	BC857BW
7674	3198 010 42310	BC847BW
7675	9340 425 20115	BC847BS
7678	9340 425 20115	BC847BS
7679	9340 425 20115	BC847BS
7680	3198 010 42310	BC847BW
7681	9322 060 73668	MC33178DR2
7682	5322 130 60159	BC846B
7706	9322 142 88668	LF25CDT
7707	5322 130 60159	BC846B
7708	5322 130 60159	BC846B
7709	5322 130 60159	BC846B
7710	5322 130 60159	BC846B
7711	2422 486 80938	Socket 32p.f
7711		For softw. see item 7999
7712	9351 870 00118	74HC573PW
7713	9352 688 09557	SAA4978H/V204
7714	9965 000 02179	MS81V04160-25TB
7715	4822 209 73852	PMBT2369
7717	9322 183 81668	MSM54V12222B-25JS
7718	9352 695 58557	SAA4993H/V1
7719	9322 183 81668	MSM54V12222B-25JS
7722	9965 000 02179	MS81V04160-25TB
7723	9965 000 02179	MS81V04160-25TB
7724	9322 188 08702	T8F24EF-0002
7725	4822 209 73852	PMBT2369
7726	4822 209 17398	LD1117DT33
7727	9322 170 14668	LF15ABDT
7734	9352 684 56115	74LVC1G04GW
7735	9352 686 75125	74LVC1G79GW
7999	3104 317 45301	Softw.(check Prod.Surv.)

System Board [K]

Various

1202	4822 276 13775	Switch
1203	3139 147 18851	UV1316/A I X U-3
1204	4822 276 13775	Switch
1205	2422 025 16599	Connector 80p f
1210	2422 025 17715	Connector 64P F
1214	4822 267 10557	Connector 10p
1215	4822 267 10973	Connector 1p
1216	4822 265 11517	Connector 1p m
1217	4822 267 10973	Connector 1p
1218	4822 267 10973	Connector 1p
1220	2422 025 17715	Connector 64P F
1241	2422 025 11244	Connector 7p m
1244	4822 267 10735	Connector 3p
1251	4822 267 10735	Connector 3p
1252	2422 025 17955	Connector 6P m
1262	2422 025 10768	Connector 3p m
1305	4822 267 10618	Connector 7p
1312	2422 025 11244	Connector 7p m
1313	2422 025 10648	Connector 8p m
1314	2422 025 12827	Connector 9p m
1335	2422 025 12485	Connector 11p m
1337	4822 267 10973	Connector 1p
1344	4822 267 10734	Connector 5p

1402	4822 267 10637	Connector 5p
1403	2422 025 08333	Connector 12p m
1600	2422 543 01095	Res. 12MHz DSX840
1680	2422 025 08149	Connector 6p m
1681	2422 025 10768	Connector 3p m
1683	2422 025 16563	connector 5P f
1700	4822 267 10574	Connector 8p

⊣⊢

2101	5322 122 32268	470pF 5% 50V 0805 NP0
2102	4822 124 40255	100µF 20% 63V
2103	4822 124 40196	220µF 20% 16V
2104	5322 126 10511	1nF 5% 50V
2105	4822 126 14585	100nF 10% 0805 50V
2106	4822 126 14585	100nF 10% 0805 50V
2107	4822 124 12084	1µF 20% 50V
2108	2020 021 91551	2200µF 20% 25V
2109	4822 126 14585	100nF 10% 0805 50V
2110	2020 021 91687	470µF 20% 16V
2111	4822 126 14585	100nF 10% 0805 50V
2112	4822 126 14585	100nF 10% 0805 50V
2113	4822 126 14585	100nF 10% 0805 50V
2114	4822 124 81144	1000µF 16V
2115	2020 021 91668	2200µF 20% 10V
2116	5322 126 10511	1nF 5% 50V
2117	4822 126 14585	100nF 10% 0805 50V
2118	4822 126 14585	100nF 10% 0805 50V
2119	2020 021 91729	4.7µF 20% 35V
2120	4822 126 14585	100nF 10% 0805 50V
2121	4822 126 14585	100nF 10% 0805 50V
2122	4822 126 14585	100nF 10% 0805 50V
2123	4822 124 40849	330UF 20% 16V
2124	2020 021 91569	ELCO 470UF 10V
2125	5322 126 10511	1nF 5% 50V
2126	5322 126 10511	1nF 5% 50V
2127	5322 126 10511	1nF 5% 50V
2128	2020 021 91729	4.7µF 20% 35V
2129	5322 126 10511	1nF 5% 50V
2130	4822 124 12084	1µF 20% 50V
2201	4822 126 14585	100nF 10% 0805 50V
2202	4822 126 14585	100nF 10% 0805 50V
2203	4822 126 14585	100nF 10% 0805 50V
2204	4822 126 14585	100nF 10% 0805 50V
2205	4822 126 14585	100nF 10% 0805 50V
2206	4822 126 14585	100nF 10% 0805 50V
2207	4822 126 14491	2.2µF 10V 0805
2208	4822 126 14491	2.2µF 10V 0805
2209	4822 126 14491	2.2µF 10V 0805
2210	4822 126 13695	82pF 1% 63V
2211	4822 124 40248	10µF 20% 63V
2212	4822 126 14585	100nF 10% 0805 50V
2213	5322 122 32531	100pF 5% 50V
2214	4822 126 14585	100nF 10% 0805 50V
2215	5322 126 10511	1nF 5% 50V
2216	4822 126 13695	82pF 1% 63V
2218	4822 126 14585	100nF 10% 0805 50V
2301	4822 126 14585	100nF 10% 0805 50V
2302	4822 126 14585	100nF 10% 0805 50V
2303	4822 126 14585	100nF 10% 0805 50V
2306	4822 126 14585	100nF 10% 0805 50V
2307	4822 124 40248	10µF 20% 63V
2308	4822 126 13691	27pF 1% 63V
2309	4822 126 13691	27pF 1% 63V
2320	4822 126 14585	100nF 10% 0805 50V
2321	4822 126 14585	100nF 10% 0805 50V
2322	4822 126 14585	100nF 10% 0805 50V
2323	4822 126 14585	100nF 10% 0805 50V
2324	4822 126 14585	100nF 10% 0805 50V
2325	4822 124 12084	1µF 20% 50V
2326	4822 124 12379	220µF 25V
2327	4822 126 14585	100nF 10% 0805 50V
2328	4822 124 11946	22µF 20% 16V
2329	4822 124 11946	22µF 20% 16V
2330	2020 021 91729	4.7µF 20% 35V
2332	2020 021 91729	4.7µF 20% 35V
2333	2020 021 91729	4.7µF 20% 35V
2334	2020 021 91729	4.7µF 20% 35V
2335	2020 021 91729	4.7µF 20% 35V
2337	2020 021 91729	4.7µF 20% 35V
2339	2020 021 91729	4.7µF 20% 35V
2340	2020 021 91729	4.7µF 20% 35V
2341	2020 021 91729	4.7µF 20% 35V
2342	5322 122 32268	470pF 5% 50V 0805 NP0
2346	4822 126 14585	100nF 10% 0805 50V
2347	5322 122 32268	470pF 5% 50V 0805 NP0
2348	5322 122 32268	470pF 5% 50V 0805 NP0
2349	5322 122 32268	470pF 5% 50V 0805 NP0
2350	5322 122 32268	470pF 5% 50V 0805 NP0
2351	4822 126 14585	100nF 10% 0805 50V
2352	4822 126 14585	100nF 10% 0805 50V
2353	4822 126 14585	100nF 10% 0805 50V
2354	5322 126 10511	1nF 5% 50V
2355	5322 122 32531	100pF 5% 50V
2356	5322 122 32531	100pF 5% 50V
2357	5322 126 10511	1nF 5% 50V
2358	5322 126 10511	1nF 5% 50V
2359	5322 126 10511	1nF 5% 50V
2360	5322 126 10511	1nF 5% 50V
2361	5322 126 10511	1nF 5% 50V
2362	5322 126 10511	1nF 5% 50V
2363	5322 126 10511	1nF 5% 50V
2364	5322 126 10511	1nF 5% 50V
2365	5322 126 10511	1nF 5% 50V
2366	5322 126 10511	1nF 5% 50V
2367	5322 126 10511	1nF 5% 50V
2368	5322 126 10511	1nF 5% 50V
2369	5322 126 10511	1nF 5% 50V
2370	5322 126 10511	1nF 5% 50V
2371	5322 126 10511	1nF 5% 50V
2372	5322 126 10511	1nF 5% 50V
2374	5322 126 10511	1nF 5% 50V
2375	5322 126 10511	1nF 5% 50V
2376	5322 126 10511	1nF 5% 50V
2377	5322 126 10511	1nF 5% 50V
2378	5322 126 10511	1nF 5% 50V
2379	5322 126 10511	1nF 5% 50V
2380	5322 126 10511	1nF 5% 50V
2381	5322 126 10511	1nF 5% 50V
2382	5322 126 10511	1nF 5% 50V
2383	5322 126 10511	1nF 5% 50V
2384	5322 126 10511	1nF 5% 50V
2385	5322 126 10511	1nF 5% 50V
2386	5322 126 10511	1nF 5% 50V
2387	5322 126 10511	1nF 5% 50V
2388	5322 126 10511	1nF 5% 50V
2390	4822 126 14585	100nF 10% 0805 50V
2392	4822 124 12095	100µF 20% 16V
2393	5322 122 31866	6.8nF 10% 63V
2394	4822 124 12095	100µF 20% 16V
2395	5322 122 31866	6.8nF 10% 63V
2400	4822 124 23002	10µF 16V
2401	4822 124 23002	10µF 16V
2402	4822 124 23002	10µF 16V
2403	5322 122 32654	22nF 10% 63V 0805
2404	2020 021 91832	220µF 20% 16V
2405	2020 021 91832	220µF 20% 16V
2406	4822 124 12095	100µF 20% 16V
2407	4822 124 12095	100µF 20% 16V
2408	5322 122 32654	22nF 10% 63V 0805
2409	5322 122 32654	22nF 10% 63V 0805

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3101	4822 117 11373	100Ω 1% 0805
3102	4822 117 10833	10kΩ 1% 0.1W
3103	4822 117 10833	10kΩ 1% 0.1W
3104	4822 117 10833	10kΩ 1% 0.1W
3105	3198 021 52240	220kΩ 5% 0805
3106	4822 117 10833	10kΩ 1% 0.1W
3108	4822 117 11927	75Ω 1% 0.1W
3109	4822 117 10833	10kΩ 1% 0.1W
3110	4822 051 20479	47kΩ 5% 0.1W
3111	4822 051 20479	47kΩ 5% 0.1W
3112	4822 117 11374	120K 1% RC12H 0805
3113	4822 051 20109	10Ω 5% 0.1W
3114	4822 051 20569	56Ω 5% 0,1W
3115	4822 051 20569	56Ω 5% 0,1W
3116	4822 051 20569	56Ω 5% 0,1W
3117	4822 051 20569	56Ω 5% 0,1W
3122	4822 117 10833	10kΩ 1% 0.1W
3201	4822 051 20471	470Ω 5% 0.1W
3202	4822 051 20392	2.9kΩ 5% 0.1W
3227	4822 051 20472	4.7kΩ 5% 0.1W
3228	4822 051 10102	1kΩ 2% 0.25W
3229	4822 051 20229	22kΩ 5% 0.1W
3230	4822 051 10102	1kΩ 2% 0.25W
3231	4822 051 10102	1kΩ 2% 0.25W
3232	4822 117 11373	100Ω 1% 0805
3234	4822 117 11373	100Ω 1% 0805
3235	4822 117 10361	680Ω 1% 0.1W
3236	4822 051 20561	560Ω 5% 0.1W
3237	4822 051 20122	1.2kΩ 5% 0.1W
3238	3198 021 52240	220kΩ 5% 0805
3239	4822 117 10837	100kΩ 1% 0.1W
3240	4822 051 20472	4.7kΩ 5% 0.1W
3241	4822 051 20223	22kΩ 5% 0.1W
3242	4822 051 20223	22kΩ 5% 0.1W
3243	4822 117 11449	2.2kΩ 5% 0.1W 0805
3306	4822 051 20472	4.7kΩ 5% 0.1W
3307	4822 051 20472	4.7kΩ 5% 0.1W
3308	4822 117 11373	100Ω 1% 0805
3309	4822 117 11373	100Ω 1% 0805
3310	4822 117 11449	2.2kΩ 5% 0.1W 0805
3311	4822 117 11373	100Ω 1% 0805
3314	4822 117 11373	100Ω 1% 0805
3315	4822 117 11373	100Ω 1% 0805
3316	4822 117 11373	100Ω 1% 0805
3319	4822 051 20472	4.7kΩ 5% 0.1W
3320	4822 051 20472	4.7kΩ 5% 0.1W
3321	4822 051 20472	4.7kΩ 5% 0.1W
3322	4822 051 20472	4.7kΩ 5% 0.1W
3323	4822 051 20472	4.7kΩ 5% 0.1W
3324	4822 117 11449	2.2kΩ 5% 0.1W 0805
3325	4822 117 11449	2.2kΩ 5% 0.1W 0805
3326	4822 117 10833	10kΩ 1% 0.1W
3328	4822 117 11373	100Ω 1% 0805
3330	4822 117 11373	100Ω 1% 0805
3331	4822 051 20472	4.7kΩ 5% 0.1W
3332	4822 051 20472	4.7kΩ 5% 0.1W
3333	2322 734 63309	33Ω 1% 0.1W 0805
3334	4822 051 20472	4.7kΩ 5% 0.1W
3337	4822 117 10833	10kΩ 1% 0.1W
3338	4822 117 10833	10kΩ 1% 0.1W
3339	4822 117 11373	100Ω 1% 0805
3340	4822 117 11373	100Ω 1% 0805
3341	4822 117 11373	100Ω 1% 0805
3342	4822 051 20105	1MΩ 5% 0.1W
3343	4822 117 10837	100kΩ 1% 0.1W
3344	4822 117 10837	100kΩ 1% 0.1W
3345	4822 117 10833	10kΩ 1% 0.1W
3346	4822 117 10837	100kΩ 1% 0.1W
3347	4822 051 20105	1MΩ 5% 0.1W
3348	4822 117 10833	10kΩ 1% 0.1W
3349	4822 051 10102	1kΩ 2% 0.25W
3350	4822 051 20472	4.7kΩ 5% 0.1W
3351	4822 117 10837	100kΩ 1% 0.1W
3352	4822 117 10833	10kΩ 1% 0.1W
3353	4822 051 20332	2.3kΩ 5% 0.1W
3354	4822 117 10833	10kΩ 1% 0.1W
3355	4822 117 11503	220Ω 1% 0.1W
3356	4822 051 20122	1.2kΩ 5% 0.1W
3357	4822 051 10102	1kΩ 2% 0.25W
3358	4822 117 10833	10kΩ 1% 0.1W
3359	4822 117 10837	100kΩ 1% 0.1W
3360	4822 117 10833	10kΩ 1% 0.1W
3361	4822 117 10833	10kΩ 1% 0.1W
3362	4822 117 11373	100Ω 1% 0805
3363	4822 051 20472	4.7kΩ 5% 0.1W
3364	4822 051 20472	4.7kΩ 5% 0.1W
3365	4822 117 11373	100Ω 1% 0805
3366	4822 117 11373	100Ω 1% 0805
3370	4822 117 11148	56kΩ 1% 0.1W
3371	4822 117 10833	10kΩ 1% 0.1W
3372	4822 117 11449	2.2kΩ 5% 0.1W 0805
3373	4822 117 11373	100Ω 1% 0805
3374	4822 117 10833	10kΩ 1% 0.1W
3375	4822 116 83933	15kΩ 1% 0.1W
3376	4822 117 10833	10kΩ 1% 0.1W
3377	4822 117 10833	10kΩ 1% 0.1W
3378	4822 051 20393	39kΩ 5% 0.1W
3379	4822 117 10833	10kΩ 1% 0.1W
3380	4822 117 10833	10kΩ 1% 0.1W
3381	4822 117 10833	10kΩ 1% 0.1W
3382	4822 117 10833	10kΩ 1% 0.1W
3383	4822 117 10833	10kΩ 1% 0.1W
3384	4822 117 10833	10kΩ 1% 0.1W
3385	4822 117 10833	10kΩ 1% 0.1W
3390	4822 117 10833	10kΩ 1% 0.1W
3391	4822 117 10833	10kΩ 1% 0.1W
3392	4822 117 10833	10kΩ 1% 0.1W
3393	4822 117 10833	10kΩ 1% 0.1W
3394	4822 051 10102	1kΩ 2% 0.25W
3396	4822 051 10102	1kΩ 2% 0.25W
3400	4822 117 10353	150Ω 1% 0.1W
3401	4822 051 20223	22kΩ 5% 0.1W
3402	4822 051 20223	22kΩ 5% 0.1W
3403	4822 051 20223	22kΩ 5% 0.1W
3404	4822 051 20223	22kΩ 5% 0.1W
3405	4822 051 20223	22kΩ 5% 0.1W
3406	4822 051 20109	10Ω 5% 0.1W
3407	4822 051 20109	10Ω 5% 0.1W
3408	4822 117 11148	56kΩ 1% 0.1W
3409	4822 117 11148	56kΩ 1% 0.1W
3410	4822 117 11148	56kΩ 1% 0.1W
3411	4822 117 11148	56kΩ 1% 0.1W
3412	4822 117 11148	56kΩ 1% 0.1W
3413	4822 117 11373	100Ω 1% 0805
3414	4822 117 11373	100Ω 1% 0805
3415	5322 117 13078	100Ω 1% 0.125W 1206
3416	5322 117 13078	100Ω 1% 0.125W 1206
3417	5322 117 13078	100Ω 1% 0.125W 1206
3418	5322 117 13078	100Ω 1% 0.125W 1206
4101	4822 051 20008	Jumper 0805
4102	4822 051 20008	Jumper 0805
4104	4822 051 20008	Jumper 0805
4105	4822 051 20008	Jumper 0805
4106	4822 051 20008	Jumper 0805
4107	4822 051 20008	Jumper 0805
4108	4822 051 20008	Jumper 0805

4109	4822 051 20008	Jumper 0805
4110	4822 051 20008	Jumper 0805
4114	4822 051 20008	Jumper 0805
4115	4822 051 20008	Jumper 0805
4116	4822 051 20008	Jumper 0805
4118	4822 051 20008	Jumper 0805
4121	4822 051 20008	Jumper 0805
4122	4822 051 20008	Jumper 0805
4123	4822 051 20008	Jumper 0805
4125	4822 051 20008	Jumper 0805
4126	4822 051 20008	Jumper 0805
4129	4822 051 20008	Jumper 0805
4130	4822 051 20008	Jumper 0805
4131	4822 051 20008	Jumper 0805
4132	4822 051 20008	Jumper 0805

5101	2422 535 94819	6.8µH 20% 1210
5102	2422 535 95387	1µH 5%
5103	2422 535 95387	1µH 5%
5104	2422 535 95387	1µH 5%
5106	4822 157 11716	Bead 30Ω at 100MHz
5107	4822 157 11716	Bead 30Ω at 100MHz
5108	2422 535 95387	1µH 5%
5109	2422 535 95387	1µH 5%
5110	4822 157 11716	Bead 30Ω at 100MHz
5111	4822 157 11716	Bead 30Ω at 100MHz
5112	4822 157 11716	Bead 30Ω at 100MHz
5113	4822 157 11716	Bead 30Ω at 100MHz
5301	4822 157 11716	Bead 30Ω at 100MHz
5302	4822 157 11716	Bead 30Ω at 100MHz
5303	4822 157 11716	Bead 30Ω at 100MHz
5304	4822 157 11716	Bead 30Ω at 100MHz
5306	4822 157 11716	Bead 30Ω at 100MHz
5307	4822 157 11716	Bead 30Ω at 100MHz
5308	4822 157 11716	Bead 30Ω at 100MHz
5309	4822 157 11716	Bead 30Ω at 100MHz
5310	4822 157 70436	8,2UH
5311	4822 157 11716	Bead 30Ω at 100MHz
5312	4822 157 11716	Bead 30Ω at 100MHz
5313	2422 535 94649	330µH 10%
5315	4822 157 11716	Bead 30Ω at 100MHz
5316	4822 157 11716	Bead 30Ω at 100MHz

6101	4822 130 11397	BAS316
6102	4822 130 11397	BAS316
6103	4822 130 11397	BAS316
6104	4822 130 11397	BAS316
6105	5322 130 81917	SB140
6106	4822 130 11397	BAS316
6107	4822 130 11397	BAS316
6108	4822 130 11397	BAS316
6109	4822 130 11397	BAS316
6110	4822 130 11397	BAS316
6111	4822 130 11397	BAS316
6112	9335 006 90133	BZV85-C
6201	4822 130 11416	PDZ6.8B
6202	4822 130 11416	PDZ6.8B
6300	4822 130 11397	BAS316
6301	4822 130 11397	BAS316
6302	4822 130 11397	BAS316
6304	4822 130 11397	BAS316
6305	4822 130 11397	BAS316
6306	4822 130 11397	BAS316

7004	5322 130 60159	BC846B
7008	5322 130 60159	BC846B
7009	5322 130 60159	BC846B
7010	5322 130 60159	BC846B
7011	5322 130 60159	BC846B
7012	5322 130 60159	BC846B
7013	4822 130 60373	BC856B
7014	9322 195 38668	STD3NK60Z
7015	4822 130 60373	BC856B
7017	4822 130 60373	BC856B
7018	5322 130 60159	BC846B
7019	5322 130 60159	BC846B
7020	5322 130 60159	BC846B
7021	5322 130 60159	BC846B
7024	4822 130 60373	BC856B
7025	5322 130 60159	BC846B
7026	5322 130 60159	BC846B
7027	5322 130 60159	BC846B
7101	9322 167 76668	TC74HC590AF
7102	9322 167 76668	TC74HC590AF
7103	9322 153 66668	CY7C199-15ZC
7104	9351 869 80118	74HCT573DB
7105	9351 869 80118	74HCT573DB
7106	9322 195 64668	CD74ACT151M
7107	9322 156 81668	M24C32-WMN6TNKSA
7108	9352 654 18112	P89C668HBA
7109	4822 209 81397	TL431CLPST
7110	9322 185 44668	TLC0832CD
7111	9322 208 05668	SM NE555D
7112	4822 209 60792	74HC4053D
7113	9322 116 87668	TEA6422D
7114	5322 209 11578	PCF8574T
7115	4822 209 81397	TL431CLPST
7118	9322 208 05668	SM NE555D
7119	9322 160 69668	SI4431ADY
7120	9965 000 04199	Connector 2p
7121	9965 000 04199	Connector 2p

LED Sensor Panel [LS]

Various

0207	4822 256 10336	LED HOLDER
0209	4822 256 10562	Photo diode holder
1201	4822 267 10567	Connector 4p
1214	2422 025 12493	Connector 10p m h 2.50

2001	4822 124 40248	10µF 20% 63V
2002	3198 017 44740	470nF 10V 0603
2003	4822 124 41584	100µF 20% 10V
2004	3198 017 44740	470nF 10V 0603

3001	4822 051 30151	150Ω 5% 0.062W
3002	4822 051 30471	47Ω 5% 0.062W
3003	4822 117 11817	1.2kΩ 1% 0.0625W
3004	4822 051 30103	10kΩ 5% 0.062W
3005	4822 116 83933	15kΩ 1% 0.1W
3006	4822 117 13577	330Ω 1% 1.25W 0805
3007	4822 051 30152	1.5Ω 5% 0.062W
3008	4822 051 30682	6.8Ω 5% 0.062W
3009	4822 051 30155	1.5MΩ 5% 0.062W
3010	4822 051 30103	10kΩ 5% 0.062W
3011	4822 051 30332	3.3Ω 5% 0.062W
3012	4822 051 30472	4.7Ω 5% 0.062W
3013	4822 051 30103	10kΩ 5% 0.062W
3014	4822 051 30155	1.5MΩ 5% 0.062W
3016	4822 051 30102	1kΩ 5% 0.062W
3017	4822 051 30332	3.3Ω 5% 0.062W
4002	4822 051 20008	Jumper 0805
4003	4822 051 30008	Jumper 0603
4004	4822 051 30008	Jumper 0603
4005	4822 051 30008	Jumper 0603

6000	4822 209 72895	TLUV5320
6003	9322 159 21667	IR RECEIVER TSOP2136UH1(VISH)L
6004	4822 130 11595	BPW46

7000	5322 209 82941	LM358D
7001	5322 130 60159	BC846B

Side I/O [O]

Various

1300	2422 128 03068	Switch PUSH
1301	2422 026 05157	Connector 4P f
1302	2422 026 05493	Con. Cinch 3P f
1303	4822 267 31014	Socket headphone
1335	2422 025 12485	Connector 11p m
1337	4822 267 10973	Connector 1p
1344	4822 267 10734	Connector 5p

2107	5322 126 10733	680pF 5% 50V
2108	5322 122 32531	100pF 5% 50V
2109	5322 126 10733	680pF 5% 50V
2110	5322 122 32531	100pF 5% 50V
2111	5322 126 10733	680pF 5% 50V
2112	4822 122 33177	10nF 20% 50V
2113	5322 126 10733	680pF 5% 50V
2114	4822 122 33177	10nF 20% 50V
2115	4822 126 14585	100nF 10% 0805 50V

3106	4822 117 11927	75Ω 1% 0.1W
3107	4822 117 11927	75Ω 1% 0.1W
3115	4822 117 11373	100Ω 1% 0805
3116	4822 051 10102	1kΩ 2% 0.25W
3117	4822 117 10834	47kΩ 1% 0.1W
3118	4822 051 10102	1kΩ 2% 0.25W
3119	4822 117 10834	47kΩ 1% 0.1W
3120	4822 051 20109	10Ω 5% 0.1W
3121	4822 051 20109	10Ω 5% 0.1W
3122	4822 117 10833	10kΩ 1% 0.1W
3123	4822 051 20109	10Ω 5% 0.1W
3124	4822 051 20109	10Ω 5% 0.1W
3125	4822 117 10833	10kΩ 1% 0.1W
4001	4822 051 20008	Jumper 0805
4002	4822 051 20008	Jumper 0805

5001	3198 018 32770	0.27µH 10% 0805
5002	3198 018 32770	0.27µH 10% 0805

6001	4822 130 10852	BZX284-C6V8
6002	4822 130 10852	BZX284-C6V8
6003	4822 130 10852	BZX284-C6V8
6004	4822 130 10852	BZX284-C6V8
6005	4822 130 10852	BZX284-C6V8
6006	4822 130 10852	BZX284-C6V8
6007	4822 130 10852	BZX284-C6V8
6008	4822 130 10852	BZX284-C6V8
6009	4822 130 10852	BZX284-C6V8
6010	4822 130 10852	BZX284-C6V8
6011	4822 130 10852	BZX284-C6V8
6012	4822 130 10852	BZX284-C6V8

LED Keyboard [P]

Various

1001	4822 276 13775	Switch
1002	4822 276 13775	Switch
1003	4822 276 13775	Switch
1004	4822 276 13775	Switch
1005	4822 276 13775	Switch
1006	4822 276 13775	Switch
1201	4822 267 10567	Connector 4p
1202	4822 265 11517	Connector 1p m
1203	3135 034 00711	HOLDER-LED

3001	4822 117 11596	390Ω 1% 0.1W
3002	4822 117 13528	200Ω 1% 0.125W 0805
3003	4822 117 10845	620Ω 1% 0.1W
3004	4822 117 11534	1.1kΩ 1% 0.1W
3006	4822 117 11951	2kΩ 1% 0.1W
3007	4822 117 11142	2K40 1% 0,1W
3009	2322 734 69101	910Ω 1% 0805
3010	4822 117 12974	16OR 1% 0,1W
3011	4822 051 20121	120Ω 5% 0.1W
4000	4822 051 20008	Jumper 0805

6001	4822 130 10852	BZX284-C6V8
6002	4822 130 10852	BZX284-C6V8
6003	9322 188 10682	LED VS TLHB5400

7000	5322 130 60159	BC846B

Main Scaler Board [SL]

Various

0300	2422 025 17714	Connector 64P m
0303	2422 033 00484	Soc DVI 24p f
0305	2422 033 00484	Soc DVI 24p f
0308	2422 026 05422	Con. cinch 4P6 F
0310	2422 025 17027	Connector 15p f

0311	2422 026 05421	Con. cinch 6P
0315	2422 025 17931	Connector 5P m
0600	3122 357 00564	Softw.(check Prod.Surv.)
0601	3122 357 00462	Softw.(check Prod.Surv.)
0602	3122 357 00472	Softw.(check Prod.Surv.)
0603	3122 357 00558	Softw.(check Prod.Surv.)
1100	2422 025 16388	Connector 16P f
1101	4822 267 10565	Connector 4p
1105	2422 021 98888	Connector 10P m
1300	2422 549 45325	Bead 67Ω at 100MHz
1301	2422 549 45325	Bead 67Ω at 100MHz
1302	2422 549 45325	Bead 67Ω at 100MHz
1303	2422 549 45325	Bead 67Ω at 100MHz
1401	2422 025 16729	Connector 10p f foil
1501	2422 549 45325	Bead 67Ω at 100MHz
1502	2422 549 45325	Bead 67Ω at 100MHz
1503	2422 549 45325	Bead 67Ω at 100MHz
1504	2422 549 45325	Bead 67Ω at 100MHz
1505	2422 549 45325	Bead 67Ω at 100MHz
1700	2422 549 45325	Bead 67Ω at 100MHz
1701	2422 549 45325	Bead 67Ω at 100MHz
1702	2422 549 45325	Bead 67Ω at 100MHz
1703	2422 549 45325	Bead 67Ω at 100MHz

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2107	2238 586 59812	100nF 20% 50V 0603
2108	4822 122 33761	22pF 5% 50V
2109	4822 122 33761	22pF 5% 50V
2110	4822 122 33761	22pF 5% 50V
2111	4822 122 33761	22pF 5% 50V
2113	4822 122 33761	22pF 5% 50V
2114	4822 122 33761	22pF 5% 50V
2121	4822 122 33761	22pF 5% 50V
2122	4822 122 33761	22pF 5% 50V
2138	4822 126 13883	220pF 5% 50V
2139	3198 017 44740	470nF 10V 0603
2151	4822 122 33761	22pF 5% 50V
2152	4822 124 11131	47µF 6.3V
2153	4822 122 33761	22pF 5% 50V
2154	3198 017 34730	47nF 16V 0603
2155	4822 122 33761	22pF 5% 50V
2156	3198 017 34730	47nF 16V 0603
2157	4822 122 33761	22pF 5% 50V
2158	3198 017 34730	47nF 16V 0603
2159	4822 126 13887	4.7pF 50V
2160	4822 124 23002	10µF 16V
2161	2020 012 93793	100µF 20% 6V3
2170	4822 124 23002	10µF 16V
2171	2238 586 59812	100nF 20% 50V 0603
2172	2238 586 59812	100nF 20% 50V 0603
2173	2238 586 59812	100nF 20% 50V 0603
2174	2238 586 59812	100nF 20% 50V 0603
2175	2238 586 59812	100nF 20% 50V 0603
2176	2238 586 59812	100nF 20% 50V 0603
2177	2238 586 59812	100nF 20% 50V 0603
2178	2238 586 59812	100nF 20% 50V 0603
2179	2238 586 59812	100nF 20% 50V 0603
2180	2238 586 59812	100nF 20% 50V 0603
2181	2238 586 59812	100nF 20% 50V 0603
2182	2238 586 59812	100nF 20% 50V 0603
2183	2238 586 59812	100nF 20% 50V 0603
2184	2238 586 59812	100nF 20% 50V 0603
2185	2238 586 59812	100nF 20% 50V 0603
2186	2238 586 59812	100nF 20% 50V 0603
2187	2238 586 59812	100nF 20% 50V 0603
2188	2238 586 59812	100nF 20% 50V 0603
2189	2238 586 59812	100nF 20% 50V 0603
2190	5322 126 11582	6.8nF 10% 63V
2191	3198 017 36830	68nF 10% 16V 0603
2192	2238 586 59812	100nF 20% 50V 0603
2194	3198 016 31020	1nF 25V 0603
2195	4822 124 23002	10µF 16V
2196	2238 586 59812	100nF 20% 50V 0603
2197	2238 586 59812	100nF 20% 50V 0603
2198	2238 586 59812	100nF 20% 50V 0603
2199	2238 586 59812	100nF 20% 50V 0603
2225	2238 586 59812	100nF 20% 50V 0603
2226	2238 586 59812	100nF 20% 50V 0603
2227	2238 586 59812	100nF 20% 50V 0603
2228	2238 586 59812	100nF 20% 50V 0603
2229	2238 586 59812	100nF 20% 50V 0603
2230	2238 586 59812	100nF 20% 50V 0603
2240	2238 586 59812	100nF 20% 50V 0603
2241	2238 586 59812	100nF 20% 50V 0603
2242	2238 586 59812	100nF 20% 50V 0603
2243	2238 586 59812	100nF 20% 50V 0603
2244	2238 586 59812	100nF 20% 50V 0603
2255	2238 586 59812	100nF 20% 50V 0603
2262	2238 586 59812	100nF 20% 50V 0603
2263	2238 586 59812	100nF 20% 50V 0603
2295	4822 122 33761	22pF 5% 50V
2296	4822 122 33761	22pF 5% 50V
2297	2238 586 59812	100nF 20% 50V 0603
2298	2238 586 59812	100nF 20% 50V 0603
2299	2238 586 59812	100nF 20% 50V 0603
2300	2238 586 59812	100nF 20% 50V 0603
2302	2238 586 59812	100nF 20% 50V 0603
2303	2238 586 59812	100nF 20% 50V 0603
2304	2238 586 59812	100nF 20% 50V 0603
2305	2238 586 59812	100nF 20% 50V 0603
2306	4822 126 14472	1µF 10% 10V 0805
2307	2238 586 59812	100nF 20% 50V 0603
2308	2238 586 59812	100nF 20% 50V 0603
2309	2238 586 59812	100nF 20% 50V 0603
2311	2238 586 59812	100nF 20% 50V 0603
2312	2238 586 59812	100nF 20% 50V 0603
2314	4822 126 14472	1µF 10% 10V 0805
2315	4822 126 14472	1µF 10% 10V 0805
2316	3198 016 33380	3.3pF 50V 0603
2317	3198 016 33380	3.3pF 50V 0603
2318	3198 016 33380	3.3pF 50V 0603
2319	3198 016 33380	3.3pF 50V 0603
2320	3198 016 33380	3.3pF 50V 0603
2321	3198 016 33380	3.3pF 50V 0603
2322	3198 016 33380	3.3pF 50V 0603
2323	3198 016 33380	3.3pF 50V 0603
2345	2238 586 59812	100nF 20% 50V 0603
2346	2238 586 59812	100nF 20% 50V 0603
2347	2238 586 59812	100nF 20% 50V 0603
2348	2238 586 59812	100nF 20% 50V 0603
2349	2238 586 59812	100nF 20% 50V 0603
2350	2238 586 59812	100nF 20% 50V 0603
2352	2238 586 59812	100nF 20% 50V 0603
2354	2238 586 59812	100nF 20% 50V 0603
2355	2238 586 59812	100nF 20% 50V 0603
2357	2238 586 59812	100nF 20% 50V 0603
2358	2238 586 59812	100nF 20% 50V 0603
2359	2238 586 59812	100nF 20% 50V 0603
2360	2238 586 59812	100nF 20% 50V 0603
2361	2238 586 59812	100nF 20% 50V 0603
2362	2238 586 59812	100nF 20% 50V 0603
2363	2238 586 59812	100nF 20% 50V 0603
2364	2238 586 59812	100nF 20% 50V 0603
2365	2238 586 59812	100nF 20% 50V 0603
2366	2238 586 59812	100nF 20% 50V 0603
2367	2238 586 59812	100nF 20% 50V 0603
2368	2238 586 59812	100nF 20% 50V 0603
2369	2238 586 59812	100nF 20% 50V 0603
2370	2238 586 59812	100nF 20% 50V 0603
2371	2238 586 59812	100nF 20% 50V 0603
2372	3198 017 34730	47nF 16V 0603
2373	3198 017 34730	47nF 16V 0603
2374	3198 017 34730	47nF 16V 0603
2375	3198 016 31020	1nF 25V 0603
2377	2238 586 59812	100nF 20% 50V 0603
2378	4822 124 23002	10µF 16V
2379	3198 017 34730	47nF 16V 0603
2380	3198 017 34730	47nF 16V 0603
2381	3198 017 34730	47nF 16V 0603
2382	3198 016 31020	1nF 25V 0603
2383	5322 126 11581	3.9nF 10% 63V 0603
2384	4822 126 14127	39nF 10% 50V 0805
2385	4822 126 14472	1µF 10% 10V 0805
2386	4822 126 14472	1µF 10% 10V 0805
2405	2238 586 59812	100nF 20% 50V 0603
2406	4822 126 14507	18pF 5% 50V 0603
2408	2238 586 59812	100nF 20% 50V 0603
2409	2238 586 59812	100nF 20% 50V 0603
2411	2238 586 59812	100nF 20% 50V 0603
2412	2238 586 59812	100nF 20% 50V 0603
2413	2238 586 59812	100nF 20% 50V 0603
2414	2238 586 59812	100nF 20% 50V 0603
2415	2238 586 59812	100nF 20% 50V 0603
2416	2238 586 59812	100nF 20% 50V 0603
2417	2238 586 59812	100nF 20% 50V 0603
2418	2238 586 59812	100nF 20% 50V 0603
2419	2238 586 59812	100nF 20% 50V 0603
2420	2238 586 59812	100nF 20% 50V 0603
2421	2238 586 59812	100nF 20% 50V 0603
2423	2238 586 59812	100nF 20% 50V 0603
2431	2238 586 59812	100nF 20% 50V 0603
2432	2238 586 59812	100nF 20% 50V 0603
2433	2238 586 59812	100nF 20% 50V 0603
2434	2238 586 59812	100nF 20% 50V 0603
2435	2238 586 59812	100nF 20% 50V 0603
2436	2238 586 59812	100nF 20% 50V 0603
2437	2238 586 59812	100nF 20% 50V 0603
2438	2238 586 59812	100nF 20% 50V 0603
2439	2238 586 59812	100nF 20% 50V 0603
2440	2238 586 59812	100nF 20% 50V 0603
2441	2238 586 59812	100nF 20% 50V 0603
2443	2238 586 59812	100nF 20% 50V 0603
2444	2238 586 59812	100nF 20% 50V 0603
2445	2238 586 59812	100nF 20% 50V 0603
2446	2238 586 59812	100nF 20% 50V 0603
2447	2022 552 05616	4.7µF 5% 6.3V
2448	2022 552 05616	4.7µF 5% 6.3V
2492	4822 126 14507	18pF 5% 50V 0603
2493	3198 017 41050	1µF 10V 0603
2494	2022 552 05616	4.7µF 5% 6.3V
2495	2022 552 05616	4.7µF 5% 6.3V
2497	2022 552 05616	4.7µF 5% 6.3V
2502	2238 586 59812	100nF 20% 50V 0603
2535	4822 126 14472	1µF 10% 10V 0805
2536	3198 016 31020	1nF 25V 0603
2538	2238 586 59812	100nF 20% 50V 0603
2539	2238 586 59812	100nF 20% 50V 0603
2540	2238 586 59812	100nF 20% 50V 0603
2541	2238 586 59812	100nF 20% 50V 0603
2542	2238 586 59812	100nF 20% 50V 0603
2543	4822 126 14472	1µF 10% 10V 0805
2548	3198 016 31020	1nF 25V 0603
2550	2238 586 59812	100nF 20% 50V 0603
2582	2238 586 59812	100nF 20% 50V 0603
2583	4822 126 14506	270pF 5% 50V 0603
2584	2238 586 59812	100nF 20% 50V 0603
2585	5322 124 41945	22µF 20% 35V
2586	2022 552 05616	4.7µF 5% 6.3V
2587	2238 586 59812	100nF 20% 50V 0603
2588	2238 586 59812	100nF 20% 50V 0603
2590	2238 867 14471	CER1 0603 NP0 50V 470P PM0P1 R
2593	2238 586 59812	100nF 20% 50V 0603
2594	2238 586 59812	100nF 20% 50V 0603
2595	5322 124 41945	22µF 20% 35V
2596	2238 586 59812	100nF 20% 50V 0603
2598	2020 552 94427	100pF 5% 50V
2599	2238 586 59812	100nF 20% 50V 0603
2600	2238 586 59812	100nF 20% 50V 0603
2633	4822 122 33761	22pF 5% 50V
2634	4822 122 33761	22pF 5% 50V
2635	4822 122 33761	22pF 5% 50V
2659	2020 552 94427	100pF 5% 50V
2660	2020 552 94427	100pF 5% 50V
2664	4822 122 33741	10pF 10% 50V
2665	4822 122 33741	10pF 10% 50V
2666	4822 122 33741	10pF 10% 50V
2667	2238 586 59812	100nF 20% 50V 0603
2669	4822 122 33741	10pF 10% 50V
2670	4822 122 33741	10pF 10% 50V
2671	4822 122 33741	10pF 10% 50V
2672	4822 122 33741	10pF 10% 50V
2710	4822 124 80151	47µF 16V
2712	4822 124 80151	47µF 16V
2713	2238 586 59812	100nF 20% 50V 0603
2714	5322 124 41945	22µF 20% 35V
2715	2238 586 59812	100nF 20% 50V 0603
2716	4822 124 80151	47µF 16V
2718	4822 124 80151	47µF 16V
2720	4822 124 80151	47µF 16V
2722	4822 124 80151	47µF 16V
2724	2238 586 59812	100nF 20% 50V 0603
2725	4822 122 33761	22pF 5% 50V
2726	4822 122 33761	22pF 5% 50V
2727	4822 122 33761	22pF 5% 50V
2730	2238 586 59812	100nF 20% 50V 0603
2732	5322 124 41945	22µF 20% 35V
2733	2238 586 59812	100nF 20% 50V 0603
2734	2238 586 59812	100nF 20% 50V 0603
2735	2238 586 59812	100nF 20% 50V 0603
2736	5322 124 41945	22µF 20% 35V
2737	2238 586 59812	100nF 20% 50V 0603
2752	4822 126 14472	1µF 10% 10V 0805
2753	2238 586 59812	100nF 20% 50V 0603
2754	2238 586 59812	100nF 20% 50V 0603
2755	2238 586 59812	100nF 20% 50V 0603
2756	2238 586 59812	100nF 20% 50V 0603
2757	2238 586 59812	100nF 20% 50V 0603
2759	2238 586 59812	100nF 20% 50V 0603
2760	2238 586 59812	100nF 20% 50V 0603
2761	2238 586 59812	100nF 20% 50V 0603
2762	2238 586 59812	100nF 20% 50V 0603
2764	4822 122 33741	10pF 10% 50V
2766	4822 126 14472	1µF 10% 10V 0805
2767	4822 122 33741	10pF 10% 50V
2769	2238 586 59812	100nF 20% 50V 0603
2770	2238 586 59812	100nF 20% 50V 0603
2771	2020 552 94427	100pF 5% 50V
2772	2020 552 94427	100pF 5% 50V
2773	2238 586 59812	100nF 20% 50V 0603
2775	4822 126 13881	470pF 5% 50V
2780	4822 124 23002	10µF 16V
2781	3198 016 31020	1nF 25V 0603
2790	2022 552 05616	4.7µF 5% 6.3V
2820	2022 552 05618	4.7µF 10% 10V 1206
2821	5322 126 11578	1nF 10% 50V 0603
2822	2238 586 59812	100nF 20% 50V 0603
2823	2238 586 59812	100nF 20% 50V 0603
2824	5322 126 11578	1nF 10% 50V 0603
2825	4822 126 14247	1.5nF 50V 0603

2826	3198 017 31530	15nF 20% 50V 0603
2827	2238 586 59812	100nF 20% 50V 0603
2830	2022 552 05616	4.7µF 5% 6.3V
2831	2022 552 05616	4.7µF 5% 6.3V
2832	4822 126 13193	4.7nF 10% 63V
2833	4822 126 13879	220nF +80-20% 16V
2850	2022 552 05618	4.7µF 10% 10V 1206
2851	5322 126 11578	1nF 10% 50V 0603
2852	2238 586 59812	100nF 20% 50V 0603
2853	2238 586 59812	100nF 20% 50V 0603
2854	5322 126 11578	1nF 10% 50V 0603
2855	5322 126 11582	6.8nF 10% 63V
2856	3198 017 31530	15nF 20% 50V 0603
2857	2238 586 59812	100nF 20% 50V 0603
2860	2022 552 05616	4.7µF 5% 6.3V
2861	2022 552 05616	4.7µF 5% 6.3V
2862	4822 126 13193	4.7nF 10% 63V
2863	4822 126 13879	220nF +80-20% 16V
2870	2022 552 05616	4.7µF 5% 6.3V
2871	4822 126 14472	1µF 10% 10V 0805
2882	4822 126 13881	470pF 5% 50V
2883	4822 126 13881	470pF 5% 50V
2886	2238 586 59812	100nF 20% 50V 0603
2888	2238 586 59812	100nF 20% 50V 0603
2896	4822 126 13881	470pF 5% 50V
2897	4822 126 13881	470pF 5% 50V

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3106	4822 051 30393	39kΩ 5% 0.062W
3107	4822 051 30393	39kΩ 5% 0.062W
3108	4822 051 30101	100Ω 5% 0.062W
3109	4822 051 30101	100Ω 5% 0.062W
3110	4822 051 30101	100Ω 5% 0.062W
3111	4822 051 30101	100Ω 5% 0.062W
3112	4822 051 30222	2.2kΩ 5% 0.062W
3113	4822 051 30102	1kΩ 5% 0.062W
3114	4822 051 30103	10kΩ 5% 0.062W
3115	4822 051 30103	10kΩ 5% 0.062W
3116	4822 051 30103	10kΩ 5% 0.062W
3120	4822 051 30103	10kΩ 5% 0.062W
3121	4822 051 30103	10kΩ 5% 0.062W
3122	4822 051 30103	10kΩ 5% 0.062W
3123	4822 051 30103	10kΩ 5% 0.062W
3124	4822 051 30103	10kΩ 5% 0.062W
3133	4822 051 30101	100Ω 5% 0.062W
3134	4822 051 30101	100Ω 5% 0.062W
3135	4822 051 30101	100Ω 5% 0.062W
3136	4822 051 30101	100Ω 5% 0.062W
3137	4822 051 30103	10kΩ 5% 0.062W
3138	4822 051 30103	10kΩ 5% 0.062W
3139	4822 051 30333	33kΩ 5% 0.062W
3151	4822 117 12917	1Ω 5% 0.062W
3152	4822 051 30331	330Ω 5% 0.062W
3153	4822 051 30332	3.3Ω 5% 0.062W
3154	4822 051 30152	1.5Ω 5% 0.062W
3155	5322 117 13049	470Ω 1% 0.063W 0603
3156	5322 117 13049	470Ω 1% 0.063W 0603
3157	5322 117 13049	470Ω 1% 0.063W 0603
3158	4822 051 30759	75Ω 5% 0.062W
3173	4822 051 30272	2.7kΩ 5% 0.062W
3180	4822 051 30333	33kΩ 5% 0.062W
3181	4822 051 30333	33kΩ 5% 0.062W
3182	4822 051 30333	33kΩ 5% 0.062W
3183	4822 051 30333	33kΩ 5% 0.062W
3184	4822 051 30183	18kΩ 5% 0.062W
3185	4822 051 30183	18kΩ 5% 0.062W
3186	4822 051 30183	18kΩ 5% 0.062W
3187	4822 051 30183	18kΩ 5% 0.062W
3188	4822 051 30223	22kΩ 5% 0.062W
3190	4822 051 30333	33kΩ 5% 0.062W
3191	4822 051 30183	18kΩ 5% 0.062W
3192	4822 051 30333	33kΩ 5% 0.062W
3193	4822 051 30183	18kΩ 5% 0.062W
3194	4822 051 30333	33kΩ 5% 0.062W
3195	4822 051 30183	18kΩ 5% 0.062W
3196	4822 051 30333	33kΩ 5% 0.062W
3197	4822 051 30183	18kΩ 5% 0.062W
3220	4822 051 30101	100Ω 5% 0.062W
3221	4822 051 30101	100Ω 5% 0.062W
3260	4822 051 30103	10kΩ 5% 0.062W
3261	4822 051 30103	10kΩ 5% 0.062W
3264	4822 051 30103	10kΩ 5% 0.062W
3265	4822 051 30392	3.9Ω 5% 0.063W 0603
3266	4822 051 30103	10kΩ 5% 0.062W
3267	4822 051 30103	10kΩ 5% 0.062W
3268	4822 051 30103	10kΩ 5% 0.062W
3302	4822 051 30101	100Ω 5% 0.062W
3303	4822 051 30101	100Ω 5% 0.062W
3304	4822 051 30471	47Ω 5% 0.062W
3306	4822 051 30103	10kΩ 5% 0.062W
3345	4822 051 30101	100Ω 5% 0.062W
3346	4822 051 30479	47Ω 5% 0.062W
3347	4822 051 30101	100Ω 5% 0.062W
3348	4822 051 30101	100Ω 5% 0.062W
3349	4822 051 30103	10kΩ 5% 0.062W
3350	4822 051 30332	3.3Ω 5% 0.062W
3351	4822 051 30101	100Ω 5% 0.062W
3352	4822 051 30101	100Ω 5% 0.062W
3405	4822 051 30472	4.7Ω 5% 0.062W
3406	4822 051 30472	4.7Ω 5% 0.062W
3407	4822 051 30472	4.7Ω 5% 0.062W
3408	4822 051 30472	4.7Ω 5% 0.062W
3409	4822 051 30472	4.7Ω 5% 0.062W
3410	4822 051 30472	4.7Ω 5% 0.062W
3411	4822 051 30472	4.7Ω 5% 0.062W
3412	4822 051 30102	1kΩ 5% 0.062W
3413	4822 051 30101	100Ω 5% 0.062W
3414	4822 051 30101	100Ω 5% 0.062W
3415	4822 051 30101	100Ω 5% 0.062W
3416	4822 051 30101	100Ω 5% 0.062W
3420	4822 051 30101	100Ω 5% 0.062W
3422	4822 051 30101	100Ω 5% 0.062W
3423	4822 051 30101	100Ω 5% 0.062W
3425	4822 051 30472	4.7Ω 5% 0.062W
3426	4822 051 30101	100Ω 5% 0.062W
3427	4822 051 30472	4.7Ω 5% 0.062W
3428	4822 051 30101	100Ω 5% 0.062W
3434	4822 051 30472	4.7Ω 5% 0.062W
3435	4822 051 30479	47Ω 5% 0.062W
3436	4822 051 30332	3.3Ω 5% 0.062W
3437	4822 051 30332	3.3Ω 5% 0.062W
3438	4822 051 30472	4.7Ω 5% 0.062W
3440	4822 051 30102	1kΩ 5% 0.062W
3441	4822 051 30332	3.3Ω 5% 0.062W
3444	4822 051 30472	4.7Ω 5% 0.062W
3445	4822 051 30472	4.7Ω 5% 0.062W
3447	4822 051 30472	4.7Ω 5% 0.062W
3448	4822 051 30472	4.7Ω 5% 0.062W
3449	4822 051 30103	10kΩ 5% 0.062W
3450	4822 051 30103	10kΩ 5% 0.062W
3451	4822 051 30103	10kΩ 5% 0.062W
3452	4822 051 30103	10kΩ 5% 0.062W
3455	4822 051 30479	47Ω 5% 0.062W
3456	4822 051 30103	10kΩ 5% 0.062W
3484	4822 117 13632	100kΩ 1% 0603 0.62W
3485	4822 051 30103	10kΩ 5% 0.062W
3486	4822 051 30472	4.7Ω 5% 0.062W
3487	4822 051 30103	10kΩ 5% 0.062W
3488	4822 051 30474	470kΩ 5% 0.062W
3489	4822 117 13608	4.7Ω 5% 0603 0.62W
3490	4822 051 30333	33kΩ 5% 0.062W
3492	4822 051 30102	1kΩ 5% 0.062W
3497	4822 051 30103	10kΩ 5% 0.062W
3498	4822 051 30103	10kΩ 5% 0.062W
3499	4822 051 30151	150Ω 5% 0.062W
3500	4822 051 30151	150Ω 5% 0.062W
3505	4822 051 30332	3.3Ω 5% 0.062W
3506	4822 051 30332	3.3Ω 5% 0.062W
3507	4822 051 30332	3.3Ω 5% 0.062W
3508	4822 051 30332	3.3Ω 5% 0.062W
3511	4822 051 30472	4.7Ω 5% 0.062W
3512	4822 051 30472	4.7Ω 5% 0.062W
3535	4822 117 13573	4 x 47Ω 5%
3536	4822 117 13573	4 x 47Ω 5%
3537	4822 117 13573	4 x 47Ω 5%
3538	4822 117 13573	4 x 47Ω 5%
3539	4822 117 13573	4 x 47Ω 5%
3540	4822 051 30479	47Ω 5% 0.062W
3541	4822 051 30479	47Ω 5% 0.062W
3542	4822 051 30479	47Ω 5% 0.062W
3543	4822 051 30479	47Ω 5% 0.062W
3544	4822 051 30479	47Ω 5% 0.062W
3581	4822 051 30472	4.7Ω 5% 0.062W
3582	4822 051 30223	22kΩ 5% 0.062W
3583	4822 051 30101	100Ω 5% 0.062W
3584	4822 117 12139	22Ω 5% 0.062W
3585	4822 051 30223	22kΩ 5% 0.062W
3586	4822 051 30102	1kΩ 5% 0.062W
3587	4822 117 12925	47kΩ 1% 0.063W 0603
3588	4822 051 30334	330kΩ 5% 0.062W
3589	4822 051 30684	680kΩ 5% 0.062W
3590	4822 051 30561	560Ω 5% 0.062W
3591	4822 051 30102	1kΩ 5% 0.062W
3593	4822 051 30102	1kΩ 5% 0.062W
3595	4822 117 12925	47kΩ 1% 0.063W 0603
3597	4822 051 30102	1kΩ 5% 0.062W
3598	4822 051 30101	100Ω 5% 0.062W
3599	4822 051 30222	2.2kΩ 5% 0.062W
3603	4822 117 12925	47kΩ 1% 0.063W 0603
3604	4822 051 30101	100Ω 5% 0.062W
3605	4822 117 12925	47kΩ 1% 0.063W 0603
3606	4822 051 30103	10kΩ 5% 0.062W
3630	4822 051 30101	100Ω 5% 0.062W
3631	4822 051 30101	100Ω 5% 0.062W
3633	4822 051 30101	100Ω 5% 0.062W
3634	4822 117 11927	75Ω 1% 0.1W
3635	4822 117 11927	75Ω 1% 0.1W
3636	4822 117 11927	75Ω 1% 0.1W
3649	4822 051 30101	100Ω 5% 0.062W
3651	4822 051 30101	100Ω 5% 0.062W
3653	4822 051 30333	33kΩ 5% 0.062W
3654	4822 051 30333	33kΩ 5% 0.062W
3655	4822 051 30101	100Ω 5% 0.062W
3656	4822 051 30101	100Ω 5% 0.062W
3657	4822 051 30101	100Ω 5% 0.062W
3666	4822 117 11927	75Ω 1% 0.1W
3667	4822 117 11927	75Ω 1% 0.1W
3668	4822 117 11927	75Ω 1% 0.1W
3669	4822 051 30472	4.7Ω 5% 0.062W
3670	4822 051 30472	4.7Ω 5% 0.062W
3673	4822 051 30101	100Ω 5% 0.062W
3674	4822 051 30101	100Ω 5% 0.062W
3676	4822 051 30471	47Ω 5% 0.062W
3677	4822 051 30471	47Ω 5% 0.062W
3678	4822 051 30103	10kΩ 5% 0.062W
3710	4822 051 30479	47Ω 5% 0.062W
3711	4822 051 30471	47Ω 5% 0.062W
3713	4822 051 30109	10Ω 5% 0.062W
3714	4822 051 30109	10Ω 5% 0.062W
3715	4822 051 30101	100Ω 5% 0.062W
3716	4822 051 30109	10Ω 5% 0.062W
3717	4822 051 30101	100Ω 5% 0.062W
3718	4822 051 30101	100Ω 5% 0.062W
3720	4822 117 11927	75Ω 1% 0.1W
3721	4822 117 11927	75Ω 1% 0.1W
3722	4822 117 11927	75Ω 1% 0.1W
3725	4822 051 30103	10kΩ 5% 0.062W
3726	4822 051 30103	10kΩ 5% 0.062W
3727	4822 051 30103	10kΩ 5% 0.062W
3730	4822 051 30479	47Ω 5% 0.062W
3731	4822 051 30471	47Ω 5% 0.062W
3732	4822 051 30479	47Ω 5% 0.062W
3733	4822 051 30471	47Ω 5% 0.062W
3745	4822 051 30472	4.7Ω 5% 0.062W
3746	4822 117 13573	4 x 47Ω 5%
3747	4822 117 13573	4 x 47Ω 5%
3748	4822 117 13573	4 x 47Ω 5%
3749	4822 117 13573	4 x 47Ω 5%
3750	4822 117 13573	4 x 47Ω 5%
3751	4822 117 13573	4 x 47Ω 5%
3752	4822 117 13573	4 x 47Ω 5%
3753	4822 117 13573	4 x 47Ω 5%
3754	4822 117 13573	4 x 47Ω 5%
3755	4822 117 13573	4 x 47Ω 5%
3756	4822 117 13573	4 x 47Ω 5%
3757	4822 117 13573	4 x 47Ω 5%
3758	4822 117 13573	4 x 47Ω 5%
3760	4822 051 30101	100Ω 5% 0.062W
3761	4822 051 30101	100Ω 5% 0.062W
3767	4822 051 30472	4.7Ω 5% 0.062W
3768	4822 051 30101	100Ω 5% 0.062W
3769	4822 051 30103	10kΩ 5% 0.062W
3770	4822 051 30103	10kΩ 5% 0.062W
3777	4822 051 30101	100Ω 5% 0.062W
3779	4822 051 30101	100Ω 5% 0.062W
3781	4822 051 30333	33kΩ 5% 0.062W
3782	4822 051 30333	33kΩ 5% 0.062W
3790	5322 117 13062	390Ω 1% 0.063W 0603
3792	4822 051 30472	4.7Ω 5% 0.062W
3797	4822 051 30472	4.7Ω 5% 0.062W
3798	4822 051 30101	100Ω 5% 0.062W
3800	4822 051 30103	10kΩ 5% 0.062W
3801	4822 051 30472	4.7Ω 5% 0.062W
3820	4822 051 30109	10Ω 5% 0.062W
3821	4822 051 30681	680Ω 5% 0.062W
3826	4822 051 30272	2.7kΩ 5% 0.062W
3828	5322 117 13062	390Ω 1% 0.063W 0603
3829	4822 051 30103	10kΩ 5% 0.062W
3830	2322 704 61002	1kΩ 1%
3831	4822 051 30102	1kΩ 5% 0.062W
3832	4822 051 30681	680Ω 5% 0.062W
3850	4822 051 30109	10Ω 5% 0.062W
3851	4822 051 30681	680Ω 5% 0.062W
3856	4822 051 30272	2.7kΩ 5% 0.062W
3858	5322 117 13034	1.5kΩ 1% 0.063W 0603
3860	2322 704 61002	1kΩ 1%
3861	4822 051 30102	1kΩ 5% 0.062W
3862	4822 051 30681	680Ω 5% 0.062W
3870	2322 704 61201	120Ω 1% 0.063W 0603
3871	2322 704 61201	120Ω 1% 0.063W 0603
3872	2322 704 61201	120Ω 1% 0.063W 0603
3873	2322 704 61201	120Ω 1% 0.063W 0603
3999	4822 051 30222	2.2kΩ 5% 0.062W
4110	4822 051 30008	Jumper 0603
4111	4822 051 30008	Jumper 0603
4349	4822 051 30008	Jumper 0603
4485	4822 051 30008	Jumper 0603
4650	4822 051 30008	Jumper 0603
4652	4822 051 30008	Jumper 0603
4747	4822 051 30008	Jumper 0603

4762	4822 051 30008	Jumper 0603
4765	4822 051 30008	Jumper 0603
4778	4822 051 30008	Jumper 0603
4780	4822 051 30008	Jumper 0603
4793	4822 051 30008	Jumper 0603
4890	4822 051 20008	Jumper 0805
4891	4822 051 30008	Jumper 0603
4892	4822 051 20008	Jumper 0805

5107	2422 549 43769	Bead 30Ω at 100MHz
5160	2422 549 43769	Bead 30Ω at 100MHz
5164	2422 549 43769	Bead 30Ω at 100MHz
5165	2422 549 43769	Bead 30Ω at 100MHz
5166	2422 549 43769	Bead 30Ω at 100MHz
5170	2422 549 43769	Bead 30Ω at 100MHz
5195	2422 549 43769	Bead 30Ω at 100MHz
5225	2422 549 43769	Bead 30Ω at 100MHz
5240	2422 549 43769	Bead 30Ω at 100MHz
5255	2422 549 43769	Bead 30Ω at 100MHz
5295	2422 549 43769	Bead 30Ω at 100MHz
5296	2422 549 43769	Bead 30Ω at 100MHz
5297	2422 549 43769	Bead 30Ω at 100MHz
5345	2422 549 43769	Bead 30Ω at 100MHz
5346	2422 549 43769	Bead 30Ω at 100MHz
5347	2422 549 43769	Bead 30Ω at 100MHz
5348	2422 549 43769	Bead 30Ω at 100MHz
5405	2422 549 43769	Bead 30Ω at 100MHz
5406	2422 549 43769	Bead 30Ω at 100MHz
5408	2422 549 43769	Bead 30Ω at 100MHz
5411	2422 549 43769	Bead 30Ω at 100MHz
5486	2422 549 43769	Bead 30Ω at 100MHz
5488	2422 549 43769	Bead 30Ω at 100MHz
5535	2422 549 43769	Bead 30Ω at 100MHz
5536	2422 549 43769	Bead 30Ω at 100MHz
5539	2422 549 43769	Bead 30Ω at 100MHz
5581	2422 549 43769	Bead 30Ω at 100MHz
5582	2422 549 43769	Bead 30Ω at 100MHz
5583	2422 549 43769	Bead 30Ω at 100MHz
5584	2422 549 43769	Bead 30Ω at 100MHz
5585	2422 549 43769	Bead 30Ω at 100MHz
5633	2422 549 43769	Bead 30Ω at 100MHz
5710	2422 549 43769	Bead 30Ω at 100MHz
5711	2422 549 43769	Bead 30Ω at 100MHz
5712	2422 549 43769	Bead 30Ω at 100MHz
5715	2422 549 43769	Bead 30Ω at 100MHz
5724	2422 549 43769	Bead 30Ω at 100MHz
5746	2422 549 43769	Bead 30Ω at 100MHz
5747	2422 549 43769	Bead 30Ω at 100MHz
5749	2422 549 43769	Bead 30Ω at 100MHz
5751	2422 549 43769	Bead 30Ω at 100MHz
5780	2422 549 43769	Bead 30Ω at 100MHz
5830	4822 157 71461	22µH 10%
5860	4822 157 71461	22µH 10%
5890	4822 157 71461	22µH 10%
5892	4822 157 71461	22µH 10%

6220	5322 130 34337	BAV99
6221	5322 130 34337	BAV99
6405	4822 130 80622	BAT54
6485	4822 130 80622	BAT54
6581	4822 130 11397	BAS316
6630	4822 130 11416	PDZ6.8B
6631	4822 130 11416	PDZ6.8B
6632	4822 130 11416	PDZ6.8B
6633	9340 548 71115	PDZ33B
6634	9340 548 71115	PDZ33B
6635	9340 548 71115	PDZ33B
6636	9340 548 71115	PDZ33B
6637	4822 130 11416	PDZ6.8B
6638	4822 130 11416	PDZ6.8B
6639	4822 130 11416	PDZ6.8B
6640	4822 130 11416	PDZ6.8B
6641	4822 130 11416	PDZ6.8B
6642	4822 130 11416	PDZ6.8B
6643	4822 130 11416	PDZ6.8B
6710	4822 130 11416	PDZ6.8B
6711	4822 130 11416	PDZ6.8B
6712	4822 130 11416	PDZ6.8B
6745	5322 130 34337	BAV99
6746	5322 130 34337	BAV99
6747	5322 130 34337	BAV99
6748	5322 130 34337	BAV99
6749	5322 130 34337	BAV99
6750	5322 130 34337	BAV99
6751	4822 130 11416	PDZ6.8B
6752	4822 130 11416	PDZ6.8B
6753	5322 130 34337	BAV99
6754	5322 130 34337	BAV99
6755	4822 130 11397	BAS316
6756	4822 130 11397	BAS316
6757	9340 548 71115	PDZ33B
6758	9340 548 71115	PDZ33B
6759	9340 548 71115	PDZ33B
6760	9340 548 71115	PDZ33B
6761	4822 130 11416	PDZ6.8B
6820	4822 130 11397	BAS316
6830	9339 680 20115	PRLL5819
6850	4822 130 11397	BAS316
6860	9339 680 20115	PRLL5819

7107	9352 666 74118	IC SM PCA9540 (PHSE)
7120		For softw. see item 0600
7137	9322 186 29685	NCP303LS09
7160	4822 209 17398	LD1117DT33
7170	9322 181 72671	AD9883AKST-110
7195	9322 197 13668	AD9283BRS-80
7255	9322 201 06668	EPCS4SI8
7295	9322 171 04671	SII160CT100
7345	9322 179 30671	AD9888KS-140
7346	9322 116 74668	LD1117D33
7347	9352 317 00118	74LVC125AD
7405	9322 156 81668	M24C32-WMN6TNKSA
7406	9322 164 75682	CY62126BVLL-70ZI
7407	9322 184 01671	PW181-10Q
7409		For softw. see item 0603
7411	2722 171 08787	FXO-34FL 14M31818
7484	4822 130 10629	PMBF170
7486	3198 010 42310	BC847BW
7487	3198 010 42310	BC847BW
7490	3198 010 42310	BC847BW
7491	3198 010 42310	BC847BW
7494	9322 192 16685	TS2431AI
7537	9322 164 41668	DS90CF386MTD
7581	4822 209 71585	74HCT4538N
7582	3198 010 42310	BC847BW
7583	4822 209 60767	LM1881M
7589	5322 209 11598	PC74HCT4538T
7592	9322 125 63668	TL3016CD
7593	9352 607 39118	74LVC14APW
7594	3198 010 42310	BC847BW
7633		For softw. see item 0601
7710	9322 185 90668	M52758FP
7715	3198 010 42310	BC847BW
7716	3198 010 42310	BC847BW
7717	3198 010 42310	BC847BW
7725	3198 010 42310	BC847BW
7746	9322 185 79668	SII169CT100
7747		For softw. see item 0602
7749	4822 130 10629	PMBF170
7750	4822 130 10629	PMBF170
7820	9322 182 77668	L6910
7830	9322 160 70668	SI4936ADY
7850	9322 182 77668	L6910
7860	9322 160 70668	SI4936ADY
7870	9322 144 97668	LD1117DT

Thermal Sensor [TS]

Various

1202	4822 267 10459	Connector 3p

2001	4822 126 14585	100nF 10% 0805 50V
2002	4822 126 14585	100nF 10% 0805 50V

3001	4822 117 13085	5.6kΩ 1% 0.1W 0805
3002	2322 734 66803	68kΩ 1% 0.1W 0805
3003	4822 117 11454	820Ω 1% 0.1W
3004	4822 117 10361	680Ω 1% 0.1W
3005	4822 117 11373	100Ω 1% 0805
3006	4822 117 12063	NTC DC 5W 10K 5%
3007	4822 051 20105	1MΩ 5% 0.1W
3008	4822 051 20223	22kΩ 5% 0.1W
4001	4822 051 20008	Jumper 0805

7001	5322 130 60159	BC846B
7002	5322 130 60159	BC846B

Power Supply [U]

Various

0220	4822 492 70289	IC fix
0221	4822 492 70289	IC fix
0302	4822 492 70289	IC fix
0305	4822 492 70289	IC fix
0306	4822 492 70289	IC fix
1206	4822 267 10973	Connector 1p
1311	2422 025 14044	Connector 6p m
1312	2422 025 11244	Connector 7p m
1313	2422 025 10648	Connector 8p m
1314	2422 025 12827	Connector 9p m
1315	2422 025 15085	Connector 10p m

2220	2020 021 91759	100µF 20% 400V
2221▲	2020 554 90169	470pF 10% 250V
2222	4822 126 13449	1nF 10% 2kV
2223	5322 122 32268	470pF 5% 50V 0805 NP0
2226	4822 126 13449	1nF 10% 2kV
2233	3198 019 63310	330pF 10% 1000V
2235	4822 122 33799	1nF 10% 1kV
2236	4822 126 12267	470PF10%R(HR) 2KV
2237	3198 019 54710	470pF 10% 1kV
2238	2020 021 91816	3300µF 20% 16V
2239	2020 021 91803	1000µF 20% 16V
2240	2020 021 91803	1000µF 20% 16V
2241	2020 021 91808	10µF 20% 50V
2243	5322 121 42386	100nF 5% 63V
2244	2020 021 91811	22µF 20% 35V
2245	2020 021 91804	47µF 20% 16V
2246	2020 021 91812	1µF 20% 100V
2247	2020 021 91811	22µF 20% 35V
2265	2020 021 91812	1µF 20% 100V
2310	4822 126 13449	1nF 10% 2kV
2312	4822 126 13449	1nF 10% 2kV
2320	2020 021 91759	100µF 20% 400V
2321▲	2020 554 90169	470pF 10% 250V
2323	5322 122 32268	470pF 5% 50V 0805 NP0
2333	4822 126 12267	470PF10%R(HR) 2KV
2335	4822 126 13682	100pF 5% 1kV
2336	4822 121 43343	4.7nF 10% 400V
2337	3198 019 54710	470pF 10% 1kV
2338	2020 021 91805	1000µF 20% 25V
2339	5322 121 42386	100nF 5% 63V
2340	4822 122 33177	10nF 20% 50V
2341	2020 021 91808	10µF 20% 50V
2342	5322 121 42386	100nF 5% 63V
2343	2020 021 91804	47µF 20% 16V
2344	2020 021 91804	47µF 20% 16V
2345	4822 122 33177	10nF 20% 50V
2346	5322 121 42386	100nF 5% 63V
2347	5322 122 32268	470pF 5% 50V 0805 NP0
2348	5322 122 32331	1nF 10% 100V
2349	2020 021 91814	1000µF 20% 10V
2350	5322 122 32261	4.7nF 10% 100V X7R
2351	4822 122 30103	22nF +80%/-20% 63V
2352	2020 021 91814	1000µF 20% 10V
2353	2020 021 91811	22µF 20% 35V
2354	2020 021 91813	22µF 20% 100V
2355	2020 021 91812	1µF 20% 100V
2356	4822 122 31211	100pF 10% 500V
2357	2020 021 91806	1500µF 20% 25V
2358	2020 021 91805	1000µF 20% 25V
2360	2020 021 91806	1500µF 20% 25V
2361	2020 021 91805	1000µF 20% 25V
2362	3198 019 54710	470pF 10% 1kV
2363	2020 021 91809	470µF 20% 50V
2364	2020 021 91809	470µF 20% 50V
2365	2020 021 91812	1µF 20% 100V
2366	2020 021 91814	1000µF 20% 10V
2367	2020 021 91811	22µF 20% 35V

3221	4822 053 10333	33kΩ 5% 1W
3222	4822 053 11101	100Ω 5% 2W
3223	4822 051 10102	1kΩ 2% 0.25W
3224	4822 116 83883	470Ω 5% 0.5W
3226	4822 117 10833	10kΩ 1% 0.1W
3227	4822 053 11339	33R00 5% 2W
3228	4822 117 10837	100kΩ 1% 0.1W
3229	4822 051 20479	47kΩ 5% 0.1W
3230	4822 053 11339	33R00 5% 2W
3231	4822 050 23303	33kΩ 1% 0.6W
3233	4822 116 80176	1Ω 5% 0.5W
3237	2312 915 11073	10.7kΩ 1%
3238	4822 050 21003	10kΩ 1% 0.6W

3252	2312 915 12209	22Ω 1%
3253	4822 050 22703	27kΩ 1% 0.6W
3254	4822 117 11145	4.7kΩ 1% 0.1W
3255	4822 050 23303	33kΩ 1% 0.6W
3256	4822 050 11002	1kΩ 1% 0.4W
3257	4822 050 11002	1kΩ 1% 0.4W
3259	4822 116 52228	680Ω 5% 0.5W
3260	4822 116 52256	2.2kΩ 5% 0.5W
3321	4822 053 10223	22K00 1% 1W
3322	4822 053 11101	100Ω 5% 2W
3323	4822 051 10102	1kΩ 2% 0.25W
3324	4822 116 83883	470Ω 5% 0.5W
3325	4822 053 11339	33R00 5% 2W
3326	4822 051 20822	8.2kΩ 5% 0.1W
3327	4822 117 10833	10kΩ 1% 0.1W
3328	4822 117 12955	2.7kΩ 1% 0.1W 0805
3329	4822 116 83868	150Ω 5% 0.5W
3330	4822 053 11221	220R00 5% 2W
3331	4822 117 11504	270Ω 1% 0.1W
3332	4822 117 11148	56kΩ 1% 0.1W
3333	4822 050 26808	6.8Ω 1% 0.6W
3334	4822 051 10102	1kΩ 2% 0.25W
3335	4822 117 10837	100kΩ 1% 0.1W
3336	4822 116 52175	100Ω 5% 0.5W
3338	4822 050 21003	10kΩ 1% 0.6W
3339	2120 105 93428	1kΩ 5% 2W
3340	4822 053 10223	22K00 1% 1W
3341	3198 012 36810	680Ω 5% 3W
3342	4822 050 21003	10kΩ 1% 0.6W
3343	2120 108 92618	1.8kΩ 1% 0805
3344	4822 050 27501	750R00 1% 0,6W
3345	4822 117 12024	27K 1% 0.1W
3346	4822 116 52269	3.3kΩ 5% 0.5W
3347	4822 053 10109	10Ω 5% 1W
3348	4822 053 11101	100Ω 5% 2W
3349	2120 106 90556	0.47Ω 5% 1W
3350	4822 117 12798	8.2Ω 5% 0.25W
3351	2120 106 90565	0.1Ω 5% 1W
3352	4822 050 22702	2.7kΩ 1% 0.6W
3353	4822 117 10837	100kΩ 1% 0.1W
3354	4822 051 20822	8.2kΩ 5% 0.1W
3355	4822 116 52245	150kΩ 5% 0.5W
3356	4822 050 11002	1kΩ 1% 0.4W
3357	4822 050 11002	1kΩ 1% 0.4W
3358	4822 116 52269	3.3kΩ 5% 0.5W
3359	4822 116 52213	180Ω 5% 0.5W

5201▲	2422 549 44101	Line filter 100µH 2.2A
5208	4822 157 11411	Bead 80Ω at 100MHz
5209	4822 157 11411	Bead 80Ω at 100MHz
5210▲	2422 531 02555	Transf. US28207-00
5212	4822 157 11411	Bead 80Ω at 100MHz
5213	4822 157 11411	Bead 80Ω at 100MHz
5214	4822 157 11411	Bead 80Ω at 100MHz
5215	4822 157 11411	Bead 80Ω at 100MHz
5216	4822 157 11411	Bead 80Ω at 100MHz
5217	4822 157 11411	Bead 80Ω at 100MHz
5301▲	2422 549 44101	Line filter 100µH 2.2A
5305	4822 157 11411	Bead 80Ω at 100MHz
5306	4822 157 11411	Bead 80Ω at 100MHz
5307	4822 157 11411	Bead 80Ω at 100MHz
5308	4822 157 11411	Bead 80Ω at 100MHz
5309	4822 157 11411	Bead 80Ω at 100MHz
5310▲	2422 531 02594	Transf. US28212-02
5315	4822 157 11411	Bead 80Ω at 100MHz
5316	2422 535 94639	10µH 20%
5317	4822 157 11411	Bead 80Ω at 100MHz
5318	4822 157 11411	Bead 80Ω at 100MHz
5319	4822 157 11411	Bead 80Ω at 100MHz
5320	2422 535 94639	10µH 20%
5321	4822 157 11411	Bead 80Ω at 100MHz
5322	4822 157 11411	Bead 80Ω at 100MHz
5323	4822 157 11411	Bead 80Ω at 100MHz
5324	4822 157 11411	Bead 80Ω at 100MHz
5325	4822 157 11411	Bead 80Ω at 100MHz
5326	4822 157 71736	10µH 5%
5327	4822 157 11411	Bead 80Ω at 100MHz
5328	2422 535 94863	330µH

6201	4822 130 10218	BY229X-800
6204	9340 555 24127	PBYR10100X
6205	4822 130 41487	BYV95C
6207▲	4822 130 91451	CQY80NG
6209	4822 130 30842	BAV21
6301	4822 130 10218	BY229X-800
6305	4822 130 41487	BYV95C
6306	4822 130 30842	BAV21
6307▲	4822 130 91451	CQY80NG
6308	3198 010 55180	BZX79-B5V1
6309	4822 130 30842	BAV21
6312	9322 161 78682	SB360L-7024
6313	4822 130 41487	BYV95C
6314	4822 130 11596	BYW29EX-200
6315	9340 555 24127	PBYR10100X
6316	9340 559 53112	BYW95C-24

7202	9322 166 44687	TOP246Y
7203	9322 199 01687	FET POW 2SK2886
7206	4822 209 81397	TL431CLPST
7209	4822 209 81397	TL431CLPST
7210	4822 130 44568	BC557B
7211	4822 130 40959	BC547B
7302	9322 181 88687	IC TOP247Y
7303	9322 199 01687	FET POW 2SK2886
7304	4822 209 81397	TL431CLPST
7306	4822 209 81397	TL431CLPST
7307	4822 209 60059	MC34063AP1
7308	9322 199 02687	FET POW 2SJ334
7309	4822 209 81397	TL431CLPST
7310	4822 130 44568	BC557B

SCART Panel [VS]

Various

1201	4822 267 60385	Connector 21P f
1202	4822 267 10771	Socket 2 x SCART
1204	4822 265 11151	YKC21-3699
1206	4822 267 10748	Connector 3p
1210	2422 025 12482	Connector 6p m
1220	2422 025 17714	Connector 64P m

2001	5322 122 31863	330pF 5% 63V 0805
2002	5322 122 31863	330pF 5% 63V 0805
2003	5322 122 31863	330pF 5% 63V 0805
2004	5322 122 31863	330pF 5% 63V 0805
2005	5322 122 31863	330pF 5% 63V 0805
2006	5322 122 31863	330pF 5% 63V 0805
2007	5322 122 31863	330pF 5% 63V 0805
2008	5322 122 31863	330pF 5% 63V 0805
2009	5322 122 31863	330pF 5% 63V 0805
2010	5322 122 31863	330pF 5% 63V 0805
2011	5322 122 32531	100pF 5% 50V
2012	5322 122 32531	100pF 5% 50V
2013	5322 122 32531	100pF 5% 50V
2014	5322 122 32531	100pF 5% 50V
2015	5322 122 32531	100pF 5% 50V
2016	5322 122 32531	100pF 5% 50V
2017	4822 122 33575	220pF 5% 63V 0805
2018	4822 124 41584	100µF 20% 10V
2019	2020 552 95344	680nF 20-80% 16V 0805
2020	2020 552 95344	680nF 20-80% 16V 0805
2021	4822 124 22833	10µF 50V
2022	4822 124 22833	10µF 50V
2023	4822 124 22833	10µF 50V
2024	4822 124 12379	220µF 25V
2025	4822 124 22833	10µF 50V
2026	5322 122 31863	330pF 5% 63V 0805
2027	5322 122 31863	330pF 5% 63V 0805
2028	4822 126 14585	100nF 10% 0805 50V
2029	4822 126 14585	100nF 10% 0805 50V
2030	4822 124 22833	10µF 50V
2031	4822 124 22833	10µF 50V
2032	4822 124 22833	10µF 50V
2033	4822 124 22833	10µF 50V
2034	4822 124 22833	10µF 50V
2035	4822 124 22833	10µF 50V
2036	4822 124 22833	10µF 50V
2037	4822 124 12379	220µF 25V
2038	4822 122 33177	10nF 20% 50V
2039	4822 124 22833	10µF 50V
2040	4822 124 22833	10µF 50V

3001	4822 117 11373	100Ω 1% 0805
3002	4822 117 11373	100Ω 1% 0805
3003	4822 117 11373	100Ω 1% 0805
3004	4822 117 11373	100Ω 1% 0805
3005	4822 117 10834	47kΩ 1% 0.1W
3006	4822 117 10834	47kΩ 1% 0.1W
3007	4822 117 10834	47kΩ 1% 0.1W
3008	4822 117 10834	47kΩ 1% 0.1W
3009	4822 116 83868	150Ω 5% 0.5W
3010	4822 116 83868	150Ω 5% 0.5W
3011	4822 117 10353	150Ω 1% 0.1W
3012	4822 117 10353	150Ω 1% 0.1W
3013	4822 116 83868	150Ω 5% 0.5W
3014	4822 116 83868	150Ω 5% 0.5W
3015	4822 116 83868	150Ω 5% 0.5W
3016	4822 117 10353	150Ω 1% 0.1W
3017	4822 117 10353	150Ω 1% 0.1W
3018	4822 117 10353	150Ω 1% 0.1W
3019	4822 117 10353	150Ω 1% 0.1W
3020	4822 117 10353	150Ω 1% 0.1W
3021	4822 051 20822	8.2kΩ 5% 0.1W
3022	4822 051 20822	8.2kΩ 5% 0.1W
3023	4822 117 11373	100Ω 1% 0805
3024	4822 117 11373	100Ω 1% 0805
3025	4822 117 11373	100Ω 1% 0805
3026	4822 116 52175	100Ω 5% 0.5W
3027	4822 117 11373	100Ω 1% 0805
3028	4822 117 11373	100Ω 1% 0805
3029	4822 117 11373	100Ω 1% 0805
3030	4822 117 11373	100Ω 1% 0805
3031	4822 117 11373	100Ω 1% 0805
3032	4822 116 52175	100Ω 5% 0.5W
3033	4822 117 11373	100Ω 1% 0805
3034	4822 116 52175	100Ω 5% 0.5W
3035	4822 116 52175	100Ω 5% 0.5W
3036	4822 116 52175	100Ω 5% 0.5W
3037	4822 116 52175	100Ω 5% 0.5W
3038	4822 117 11927	75Ω 1% 0.1W
3039	4822 117 11927	75Ω 1% 0.1W
3040	4822 116 52201	75Ω 5% 0.5W
3041	4822 117 11927	75Ω 1% 0.1W
3042	4822 117 11927	75Ω 1% 0.1W
3043	4822 117 11927	75Ω 1% 0.1W
3044	4822 116 52201	75Ω 5% 0.5W
3045	4822 117 11927	75Ω 1% 0.1W
3046	4822 117 11927	75Ω 1% 0.1W
3048	4822 117 11927	75Ω 1% 0.1W
3049	4822 117 11927	75Ω 1% 0.1W
3050	4822 117 11927	75Ω 1% 0.1W
3051	4822 117 11927	75Ω 1% 0.1W
3052	4822 051 10102	1kΩ 2% 0.25W
3053	4822 051 10102	1kΩ 2% 0.25W
3054	4822 050 11002	1kΩ 1% 0.4W
3055	4822 050 11002	1kΩ 1% 0.4W
3056	4822 051 10102	1kΩ 2% 0.25W
3057	4822 051 10102	1kΩ 2% 0.25W
3058	4822 116 52276	3.9Ω 5% 0.5W
3059	4822 116 52276	3.9Ω 5% 0.5W
3060	4822 051 20561	560Ω 5% 0.1W
3061	4822 051 20561	560Ω 5% 0.1W
3062	4822 051 20471	470Ω 5% 0.1W
3063	2322 734 66808	6.8Ω 1% 0805
3064	4822 117 11507	6.8kΩ 1% 0.1W
3065	4822 117 11507	6.8kΩ 1% 0.1W
3066	4822 117 10833	10kΩ 1% 0.1W
3067	4822 051 20223	22kΩ 5% 0.1W
3068	4822 051 20223	22kΩ 5% 0.1W
3069	4822 116 52175	100Ω 5% 0.5W
3070	4822 117 11456	30K 1% 0,1W
3071	4822 117 13623	51kΩ 1% 0.1W 0805
3072	4822 116 52175	100Ω 5% 0.5W
3073	4822 051 20471	470Ω 5% 0.1W
3074	4822 117 10837	100kΩ 1% 0.1W
3075	4822 117 10353	150Ω 1% 0.1W
3076	4822 051 10102	1kΩ 2% 0.25W
3077	4822 051 10102	1kΩ 2% 0.25W
3078	4822 117 10353	150Ω 1% 0.1W
3079	4822 117 10353	150Ω 1% 0.1W
3080	4822 116 52175	100Ω 5% 0.5W
3081	4822 116 52175	100Ω 5% 0.5W
3082	4822 117 10833	10kΩ 1% 0.1W
3083	4822 117 10833	10kΩ 1% 0.1W
3084	4822 117 10833	10kΩ 1% 0.1W
3085	4822 050 21003	10kΩ 1% 0.6W
3086	4822 050 21003	10kΩ 1% 0.6W
3087	4822 117 10833	10kΩ 1% 0.1W
3088	4822 117 10833	10kΩ 1% 0.1W
3089	4822 117 10833	10kΩ 1% 0.1W
3090	4822 117 10833	10kΩ 1% 0.1W
3091	4822 116 52257	22kΩ 5% 0.5W
3092	4822 116 52186	22Ω 5% 0.5W
3093	4822 117 13623	51kΩ 1% 0.1W 0805
3094	4822 117 11143	3kΩ 1% 0.1W
3095	4822 051 20229	22kΩ 5% 0.1W
3096	4822 117 10833	10kΩ 1% 0.1W
3097	4822 117 10833	10kΩ 1% 0.1W
3098	4822 050 11002	1kΩ 1% 0.4W
3099	4822 117 10833	10kΩ 1% 0.1W
3100	4822 050 11002	1kΩ 1% 0.4W
3101	4822 117 10833	10kΩ 1% 0.1W
3102	4822 117 10833	10kΩ 1% 0.1W
3103	4822 117 10833	10kΩ 1% 0.1W
3104	4822 117 10965	18kΩ 1% 0.1W

3105	4822 116 83883	470Ω 5% 0.5W
4001	4822 051 20008	Jumper 0805

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6001	4822 130 10852	BZX284-C6V8
6002	4822 130 10852	BZX284-C6V8
6003	4822 130 10852	BZX284-C6V8
6004	4822 130 10852	BZX284-C6V8
6005	4822 130 10852	BZX284-C6V8
6006	4822 130 10852	BZX284-C6V8
6007	4822 130 10852	BZX284-C6V8
6008	4822 130 10852	BZX284-C6V8
6009	4822 130 11416	PDZ6.8B
6010	4822 130 11416	PDZ6.8B
6011	4822 130 11416	PDZ6.8B
6012	4822 130 11416	PDZ6.8B
6013	4822 130 11416	PDZ6.8B
6014	4822 130 11416	PDZ6.8B
6015	4822 130 11416	PDZ6.8B
6016	4822 130 11416	PDZ6.8B
6017	4822 130 11416	PDZ6.8B
6018	4822 130 11416	PDZ6.8B
6019	4822 130 11416	PDZ6.8B
6020	4822 130 11416	PDZ6.8B
6021	4822 130 11416	PDZ6.8B
6022	4822 130 11416	PDZ6.8B
6023	4822 130 11416	PDZ6.8B
6024	4822 130 11416	PDZ6.8B
6025	4822 130 11416	PDZ6.8B
6026	4822 130 11416	PDZ6.8B
6027	4822 130 11416	PDZ6.8B
6028	4822 130 11416	PDZ6.8B
6029	4822 130 11416	PDZ6.8B
6030	4822 130 11416	PDZ6.8B
6031	4822 130 11416	PDZ6.8B
6032	4822 130 11416	PDZ6.8B
6033	4822 130 11416	PDZ6.8B
6035	4822 130 11416	PDZ6.8B
6036	4822 130 11416	PDZ6.8B
6037	4822 130 11416	PDZ6.8B
6038	4822 130 11416	PDZ6.8B
6039	4822 130 11416	PDZ6.8B
6040	4822 130 11416	PDZ6.8B
6041	4822 130 11416	PDZ6.8B
6042	4822 130 10852	BZX284-C6V8
6043	4822 130 10852	BZX284-C6V8
6044	4822 130 10852	BZX284-C6V8
6045	4822 130 10852	BZX284-C6V8
6046	4822 130 10852	BZX284-C6V8
6047	4822 130 10852	BZX284-C6V8
6101	4822 130 11031	BZX284-C12
6102	4822 130 11031	BZX284-C12
6201	4822 130 11416	PDZ6.8B

7001	5322 130 60159	BC846B
7002	5322 130 60159	BC846B
7003	5322 130 60159	BC846B
7004	4822 209 33411	MC78L05ACD
7005	5322 209 11578	PCF8574T
7006	4822 209 60792	74HC4053D
7007	5322 130 60159	BC846B
7008	5322 130 60159	BC846B
7009	5322 130 60159	BC846B

Input Power Supply [W]

Various

0013	4822 492 70289	IC fix
0014	4822 492 70289	IC fix
0020	4822 492 70289	IC fix
1206	4822 267 10973	Connector 1p
1208	4822 252 60151	Surge protect
1209	4822 267 10973	Connector 1p
1210	2422 132 07411	Relay 1p 5V 5A G5PA-1
1211	4822 253 30474	Fuse 5A 19181I1
1212	4822 267 10966	Connector 2p
1214	2422 549 43369	Prot. dev. 5.5kV
1217	4822 267 10973	Connector 1p
1218	4822 267 10973	Connector 1p
1310	4822 265 20723	Connector 2p
1311	2422 025 14044	Connector 6p m
1316	2422 025 10647	Connector 4p m
1403	2422 025 08333	Connector 12p m
1410	2412 020 00724	Connector 2p m
1460	4822 267 10735	Connector 3p

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2200	4822 126 13449	1nF 10% 2kV
2201	4822 121 10512	220nF 20% 275V
2203	4822 126 13449	1nF 10% 2kV
2205	4822 121 43819	0.68µF 10% 250V
2206	2020 021 91323	470µF 20% 400V
2208	2020 021 91323	470µF 20% 400V
2210	5322 126 10511	1nF 5% 50V
2211	5322 126 10511	1nF 5% 50V
2212	4822 126 13449	1nF 10% 2kV
2213	2020 554 90169	470pF 10% 250V
2214	2020 554 90169	470pF 10% 250V
2215	4822 126 14585	100nF 10% 0805 50V
2216	5322 126 10511	1nF 5% 50V
2217	4822 126 13449	1nF 10% 2kV
2219	2020 021 91759	100µF 20% 400V
2220	2020 554 90169	470pF 10% 250V
2225	4822 124 21913	1µF 20% 63V
2249	5322 121 42386	100nF 5% 63V
2421	2020 554 90169	470pF 10% 250V
2423	5322 122 32268	470pF 5% 50V 0805 NP0
2424	4822 126 13449	1nF 10% 2kV
2431	2252 711 95001	100pF 10% 1kV
2432	4822 126 13449	1nF 10% 2kV
2433	2252 711 95001	100pF 10% 1kV
2435	2020 554 90169	470pF 10% 250V
2436	2020 021 91521	47µF 20% 50V
2437	2252 711 95001	100pF 10% 1kV
2441	2020 021 91811	22µF 20% 35V
2442	5322 121 42386	100nF 5% 63V
2443	5322 122 32261	4.7nF 10% 100V X7R
2444	2020 021 91811	22µF 20% 35V
2453	4822 126 12267	470PF10%R(HR) 2KV
2454	2020 021 91411	1000µF 20% 35V
2456	4822 126 12267	470PF10%R(HR) 2KV
2457	2020 021 91411	1000µF 20% 35V
2472	4822 124 40196	220µF 20% 16V
2473	5322 126 10511	1nF 5% 50V
2522	4822 126 13449	1nF 10% 2kV
2523	5322 122 32311	470pF 10% 100V
2530	4822 126 12263	220pF 10% 2kV
2534	2020 021 91759	100µF 20% 400V
2535	4822 126 13449	1nF 10% 2kV
2536	4822 126 13449	1nF 10% 2kV
2541	2020 021 91808	10µF 20% 50V
2542	4822 122 30043	10nF 80% 63V
2543	4822 122 30103	22nF +80%/-20% 63V
2544	2020 021 91804	47µF 20% 16V

⊣WW⊢

3204	4822 053 21225	2.2MΩ 5% 0.5W
3207	4822 116 82776	2R2
3210	4822 116 82776	2R2
3212	2322 595 90021	VDR 1mA/495V
3213	4822 116 82776	2R2
3215	4822 116 82776	2R2
3216	4822 053 21475	4.7MΩ 5% 0.5W
3217	2120 103 90042	220Ω 2% 0.5W
3218	4822 053 21475	4.7MΩ 5% 0.5W
3219	4822 053 21475	4.7MΩ 5% 0.5W
3245	4822 051 20332	2.3kΩ 5% 0.1W
3246	4822 050 11002	1kΩ 1% 0.4W
3247	4822 051 10102	1kΩ 2% 0.25W
3248	4822 050 11002	1kΩ 1% 0.4W
3249	4822 117 10837	100kΩ 1% 0.1W
3252	4822 117 11373	100Ω 1% 0805
3253	4822 117 11373	100Ω 1% 0805
3403	4822 116 52238	12kΩ 5% 0.5W
3425	3198 012 31010	100Ω 5% 3W
3426	4822 050 25603	56kΩ 1% 0.6W
3429	4822 116 52207	1.2kΩ 5% 0.5W
3430	4822 116 83883	470Ω 5% 0.5W
3431	4822 116 52291	56kΩ 5% 0.5W
3432	4822 051 10102	1kΩ 2% 0.25W
3433	4822 050 26808	6.8Ω 1% 0.6W
3438	4822 050 21003	10kΩ 1% 0.6W
3441	4822 116 52283	4.7kΩ 5% 0.5W
3444	4822 050 28204	820kΩ 1% 0.6W
3445	4822 050 21004	100kΩ 1% 0.6W
3453	4822 053 11339	33R00 5% 2W
3456	4822 053 11339	33R00 5% 2W
3460	4822 050 21003	10kΩ 1% 0.6W
3461	4822 050 21003	10kΩ 1% 0.6W
3462	4822 051 20472	4.7kΩ 5% 0.1W
3463	4822 117 10833	10kΩ 1% 0.1W
3464	4822 117 12955	2.7kΩ 1% 0.1W 0805
3465	4822 051 20392	2.9kΩ 5% 0.1W
3466	4822 051 10102	1kΩ 2% 0.25W
3470	4822 116 52195	47Ω 5% 0.5W
3471	4822 051 10102	1kΩ 2% 0.25W
3472	4822 116 52207	1.2kΩ 5% 0.5W
3473	4822 050 11002	1kΩ 1% 0.4W
3474	4822 117 10837	100kΩ 1% 0.1W
3475	4822 117 10833	10kΩ 1% 0.1W
3476	4822 117 10833	10kΩ 1% 0.1W
3522	4822 053 11339	33R00 5% 2W
3526	4822 050 21003	10kΩ 1% 0.6W
3533	4822 050 26808	6.8Ω 1% 0.6W
3536	4822 116 52176	10Ω 5% 0.5W
3537	4822 116 52269	3.3kΩ 5% 0.5W
3538	4822 050 21002	1kΩ 1% 0.6W
3539	4822 116 83883	470Ω 5% 0.5W
3540	4822 050 21504	150kΩ 1% 0.6W
3541	4822 050 21504	150kΩ 1% 0.6W
3542	4822 050 21204	120kΩ 1% 0,6W
3543	4822 117 11143	3kΩ 1% 0.1W
3544	4822 051 20223	22kΩ 5% 0.1W

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5209	2422 531 02633	FIL MAINS HARM 30MH
5210	4822 157 11716	Bead 30Ω at 100MHz
5211	4822 157 11716	Bead 30Ω at 100MHz
5212	4822 157 11411	Bead 80Ω at 100MHz
5213	2422 549 44591	Line filter JLB2806
5214	4822 157 11411	Bead 80Ω at 100MHz
5218	2422 549 44591	Line filter JLB2806
5406	4822 157 11411	Bead 80Ω at 100MHz
5407	4822 157 11411	Bead 80Ω at 100MHz
5408	4822 157 11411	Bead 80Ω at 100MHz
5409	2422 535 95387	1µH 5%
5410	2422 531 02553	Transf. US28206-01
5411	4822 157 11411	Bead 80Ω at 100MHz
5412	4822 157 11411	Bead 80Ω at 100MHz
5417	4822 157 11411	Bead 80Ω at 100MHz
5419	4822 157 11411	Bead 80Ω at 100MHz
5420	2422 535 95387	1µH 5%
5422	2422 535 95387	1µH 5%
5502	4822 157 11411	Bead 80Ω at 100MHz
5503	4822 157 11411	Bead 80Ω at 100MHz
5507	4822 157 11411	Bead 80Ω at 100MHz
5509	4822 157 11411	Bead 80Ω at 100MHz
5510	2422 536 00594	190µH UC28214-03
5514	2422 549 44101	Line filter 100µH 2.2A

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6200	4822 130 30621	1N4148
6201	3198 010 10640	Bridge cell GBU4K
6202	3198 010 10640	Bridge cell GBU4K
6402	4822 130 30621	1N4148
6403	4822 130 11397	BAS316
6404	4822 130 91451	CQY80NG
6405	4822 130 41487	BYV95C
6406	4822 130 31024	BZX79-B18
6407	4822 130 34278	BZX79-B6V8
6408	4822 130 11397	BAS316
6409	4822 130 30621	1N4148
6410	4822 130 91451	CQY80NG
6411	4822 130 10218	BY229X-800
6413	4822 130 11596	BYW29EX-200
6414	4822 130 11596	BYW29EX-200
6501	4822 130 82512	BYV29F-400

7211	4822 130 40959	BC547B
7212	4822 130 60373	BC856B
7402	9322 181 88687	IC TOP247Y
7406	4822 209 81397	TL431CLPST
7408	4822 130 60373	BC856B
7409	5322 130 60159	BC846B
7410	4822 130 60373	BC856B
7411	5322 130 60159	BC846B
7412	4822 130 60373	BC856B
7500	4822 130 60373	BC856B
7502	9322 181 88687	IC TOP247Y
7506	4822 209 81397	TL431CLPST

11. Revision List

First release