TOSHIBA

SERVICE MANUAL

LCD Color Television

20VL64B

20VL64G

The above models are classified as green products (*1), as indicated by underlined serial numbers.
This Service Manual describes replacement parts for the green products. When repairing these green Products, use the parts described in this manual and lead-free solder (*2)
For (*1) and (*2), see the next page.

TABLE OF CONTENS

(*1) GREEN PRODUCT PROCUREMENT

The EC is actively promoting the WEEE & RoHS Directives that define standards for recycling and reuse of Waste Electrical and Electronic Equipment and for the Restriction of the use of certain Hazardous Substances. From July 1, 2006, the RoHS Directive will prohibit any marketing of new products containing the restricted substances.

Increasing attention is given to issues related to the global environmental. Toshiba Corporation recognizes environmental protection as a key management tasks, and is doing its utmost to enhance and improve the quality and scope of its environmental activities. In line with this, Toshiba proactively promotes Green Procurement, and seeks to purchase and use products, parts and materials that have low environmental impacts.

Green procurement of parts is not only confined to manufacture. The same green parts used in manufacture must also be used as replacement parts.

(*2) LEAD-FREE SOLDER

This product is manufactured using lead-free solder as a part of a movement within the consumer products industry at large to be environmentally responsible. Lead-free solder must be used in the servicing and repair of this product.

WARNING

This product is manufactured using lead free solder.

DO NOT USE LEAD BASED SOLDER TO REPAIR THIS PRODUCT !

The melting temperature of lead-free solder is higher than that of leaded solder by 86°F to 104°F (30°C to 40°C). Use of a soldering iron designed for lead-based solders to repair product made with lead-free solder may result in damage to the component and or PCB being soldered. Great care should be made to ensure high-quality soldering when servicing this product — especially when soldering large components, through-hole pins, and on PCBs — as the level of heat required to melt lead-free solder is high.

SERVICE INSTRUCTIONS

CHAPTER 1 GENERAL ADJUSTMENTS

SAFETY INSTRUCTIONS

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" INSTRUCTIONS BELOW.

1.An isolation transformer should be connected in the power line between the receiver and the AC line before any service is performed on the receiver.
2. When replacing a chassis in the cabinet, always be certain that all the protective devices are put back in place, such as; nonmetallic control knobs, insulating covers, shields, isolation resistor–capacitor network etc.
3. Always advise users to keep children away. There is danger of injury to children from tools, disassembled products, etc.
4. Always disconnect the power plug before starting work whenever power is not required. Failure to disconnect the power plug before starting work can result in electrical shock.
5. Depending on the model, use an insulation transformer or wear gloves when servicing with the power on, and disconnect the power plug to avoid electrical shock when replacing parts. In some cases, alternating current is also impressed in the chassis, so electrical shock is possible if the chassis is contacted with the power on.

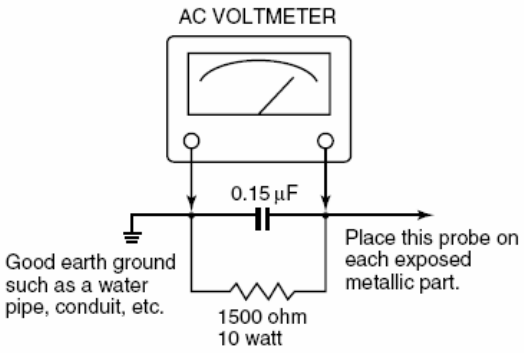
6. Always use the replacement parts specified for the particular model when making repairs. The parts used in products have the necessary safety characteristics such as inflammability, voltage resistance, etc.; therefore, use only replacement parts that have these same characteristics. Use only the specified parts when the mark is included in a circuit diagram or parts list.
7. Parts mounting and routing of the wiring should be the same as that used originally. For safety purposes, insulating materials such as tubing or tape is sometimes used and printed circuit boards are sometimes mounted floating. Also make sure that wiring is routed and clamped to avoid parts that generate heat and which use high voltage. Always follow the original scheme.
8. After a repair has been completed, reassemble all disassembled parts, and route and reconnect the wiring, in accordance with the original scheme. Do not allow internal wiring to be pinched by cabinets, panels, etc. Any error in reassembly or wiring can result in electrical leakage, flame, etc., and may be hazardous.
9. Never remodel the product in any way. Remodeling can result in improper operation, malfunction, or electrical leakage and flame, which may be hazardous

SAFETY PRECAUTION

WARNING : Service should not be attempted by anyone unfamiliar with the necessary precautions on this receiver. The following are the necessary precautions to be observed before servicing this chassis.

10. Before returning the set to the customer, always perform an AC leakage current check on the exposed metallic parts of the cabinet, such as antennas, terminals, screwheads, metal overlays, control shafts etc. to be sure the set is safe to operate without danger of electrical shock. Plug the AC line cord directly into a 120V AC outlet (do not use a line isolation transformer during this check). Use an AC voltmeter having 5000 ohms per volt or more sensitivity in the following manner:

Connect a 1500 ohm 10 watt resistor, paralleled by a 0.15 µF,AC type capacitor, between a known good earth ground (water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination of 1500 ohm resistor and 0.15 µF capacitor. Reverse the AC plug at the AC outlet and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 0.675 volts rms. This corresponds to 0.45 milliamp. AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.



PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual and its supplements; electrical components having such features are identified by the international hazard symbols on the schematic diagram and the parts list.
Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create shock, fire, or other hazards.

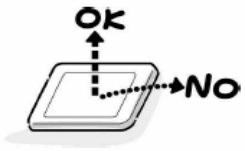
HANDLING THE LCD MODULE

HANDLING THE LCD MODULE

Safety Precautions
In the event that the screen is damaged or the liquid crystal (fluid) leaks, do not breathe in or drink this fluid. Also, never touch this fluid.
Such actions could cause toxicity or skin irritation. If this fluid should enter the mouth, rinse the mouth thoroughly with water. If the fluid should contact the skin or clothing, wipe off with alcohol, etc., and rinse thoroughly with water. If the fluid should enter the eyes, immediately rinse the eyes thoroughly with running water.

Precautions for Handling the LCD Module
The LCD module can easily be damaged during disassembly or reassembly; therefore, always observe the following precautions when handling the module.

1. When attaching the LCD module to the LCD cover, position it appropriately and fasten at the position where the display can be viewed most conveniently.



2. Carefully align the holes at all four corners of the LCD module with the corresponding holes in the LCD cover and fasten with screws. Do not strongly push on the module because any impact can adversely affect the performance. Also use caution when handling the polarized screen because it can easily be damaged.

CAUTION	The metal edges of the LCD module are sharp, so use caution to avoid injury.

3. If the panel surface becomes soiled, wipe with cotton or a soft cloth. If this does not remove the soiling, breathe on the surface and then wipe again.
If the panel surface is extremely solied, use a CRT cleaner as a cleaner. Wipe off the panel surface by drop the cleaner on the cloth. Do not drop the cleaner on the panel. Pay attention not to scratch the panel surface.

4. Leaving water or other fluids on the panel screen for an extended period of time can result in discoloration or stripes. Immediately remove any type of fluid from the screen.

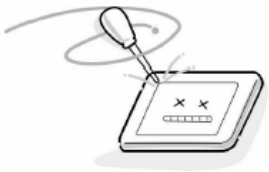
5. Glass is used in the panel, so do not drop or strike with hard objects. Such actions can damage the panel.

6. CMOS-LSI circuitry is used in the LCD module, so avoid damage due to static electricity. When handling the module, use a wrist ground or anchor ground.

7. Do not expose the LCD module to direct sunlight or strong ultraviolet rays for an extended period of time.

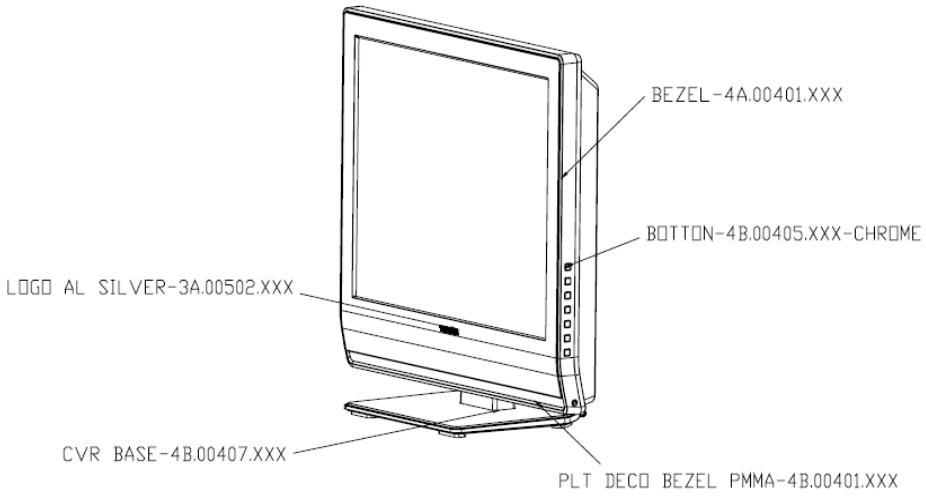
8. Do not store the LCD module below the temperature conditions described in the specifications. Failure to do so could result in freezing of the liquid crystal due to cold air or loss of resilience or other damage.

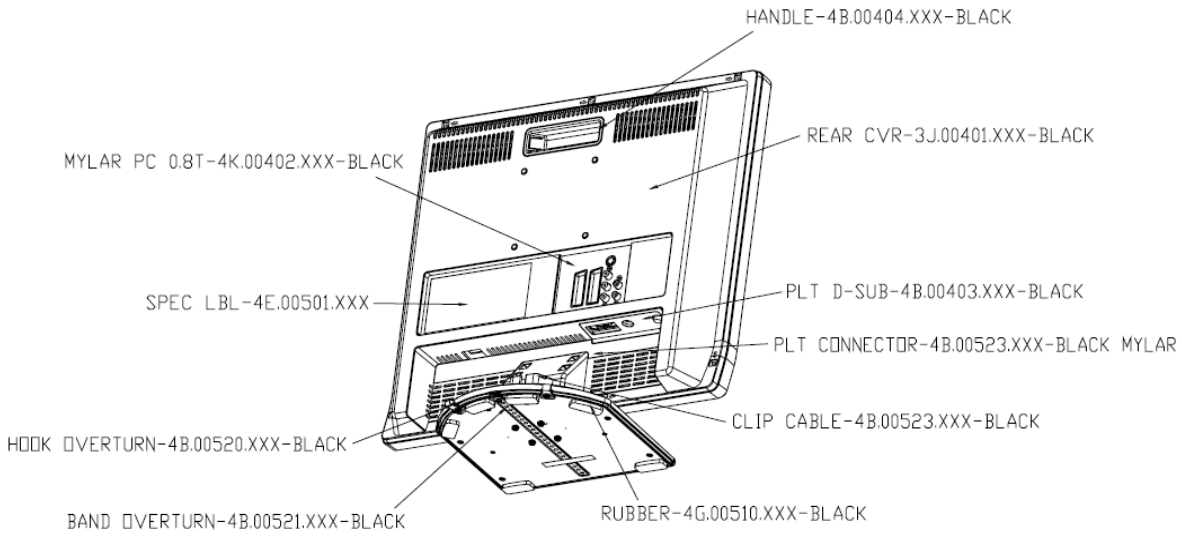
9. Do not disassemble the LCD module. Such actions could result in improper operation.



10. When transporting the LCD module, do not use packing containing epoxy resin (amine) or silicon resin (alcohol or oxim). The gas generated by these materials can cause loss of polarity.

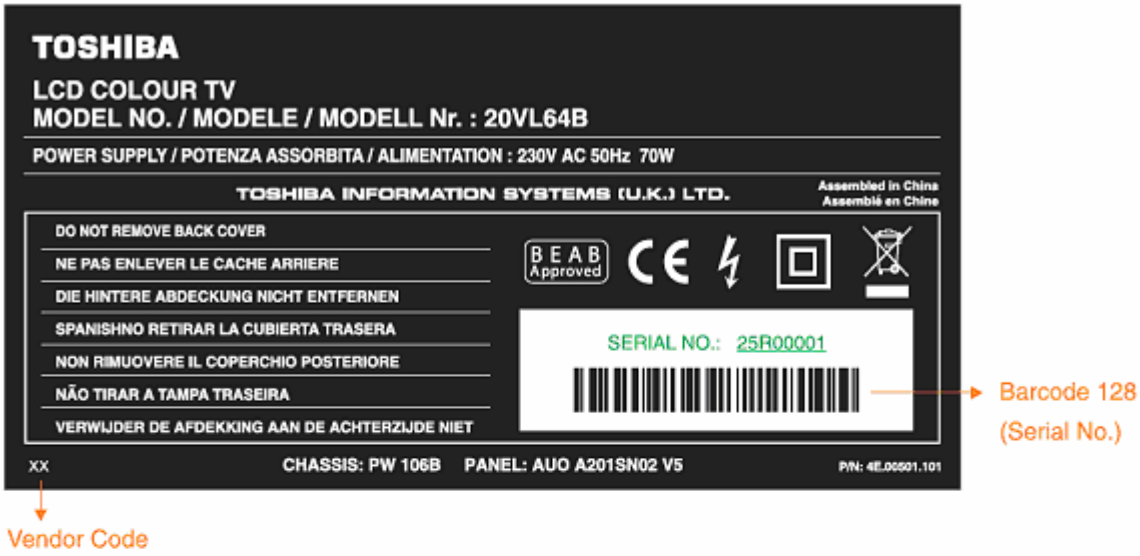
Appearance Description





- **20VL64B**

RATING LABEL PRINTING:



** Font: Switzerland , H=8 point

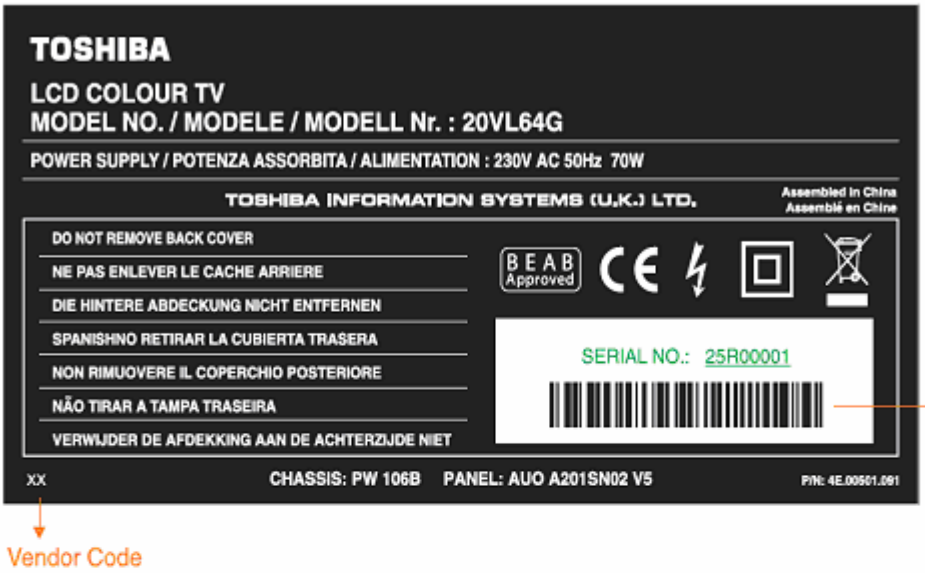
■ Serial number define:

Year / Month of Production

				JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1990	1996	2002	2008	70	42	11	84	62	91	97	49	82	87	83	96
1991	1997	2003	2009	99	88	67	35	90	72	81	78	93	85	95	54
1992	1998	2004	2010	38	16	92	80	66	47	94	86	10	68	79	12
1993	1999	2005	2011	30	74	89	34	51	77	65	41	98	71	63	40
1994	2000	2006	2012	69	26	23	76	48	13	50	25	58	29	17	64
1995	2001	2007	2013	21	75	14	39	18	20	60	19	31	22	15	37

- **20VL64G**

RATING LABEL PRINTING:



** Font: Switzerland , H=8 point

■ Serial number define:

25R00001

0001~9999
Up to 9999, Reture to 0001, R0 change to R1
R1 change to R2

Year / Month of Production

				JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1990	1996	2002	2008	70	42	11	84	62	91	97	49	82	87	83	96
1991	1997	2003	2009	99	88	67	35	90	72	81	78	93	85	95	54
1992	1998	2004	2010	38	16	92	80	66	47	94	86	10	68	79	12
1993	1999	2005	2011	30	74	89	34	51	77	65	41	98	71	63	40
1994	2000	2006	2012	69	26	23	76	48	13	50	25	58	29	17	64
1995	2001	2007	2013	21	75	14	39	18	20	60	19	31	22	15	37

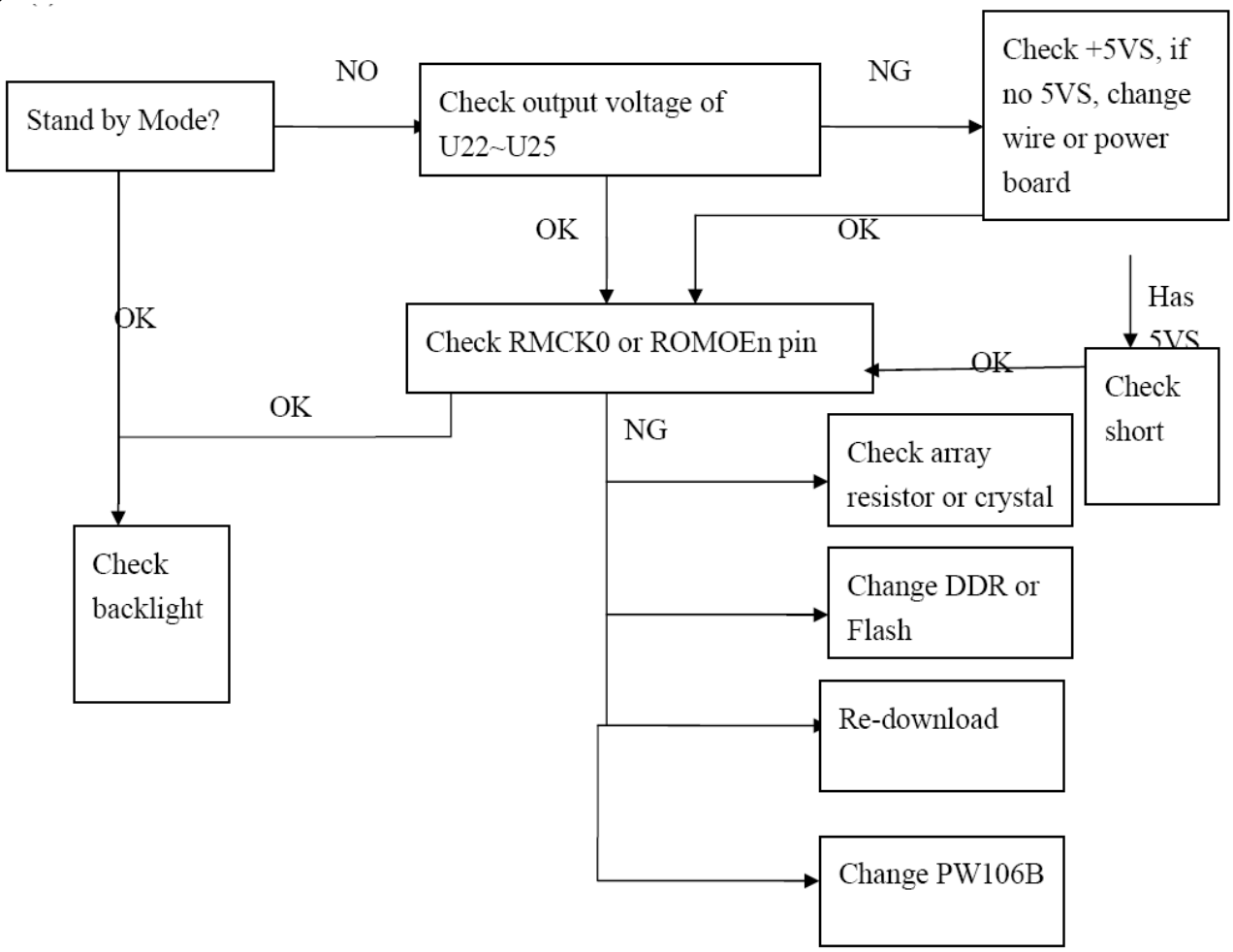
Trouble Shooting Guide

1. Introduction

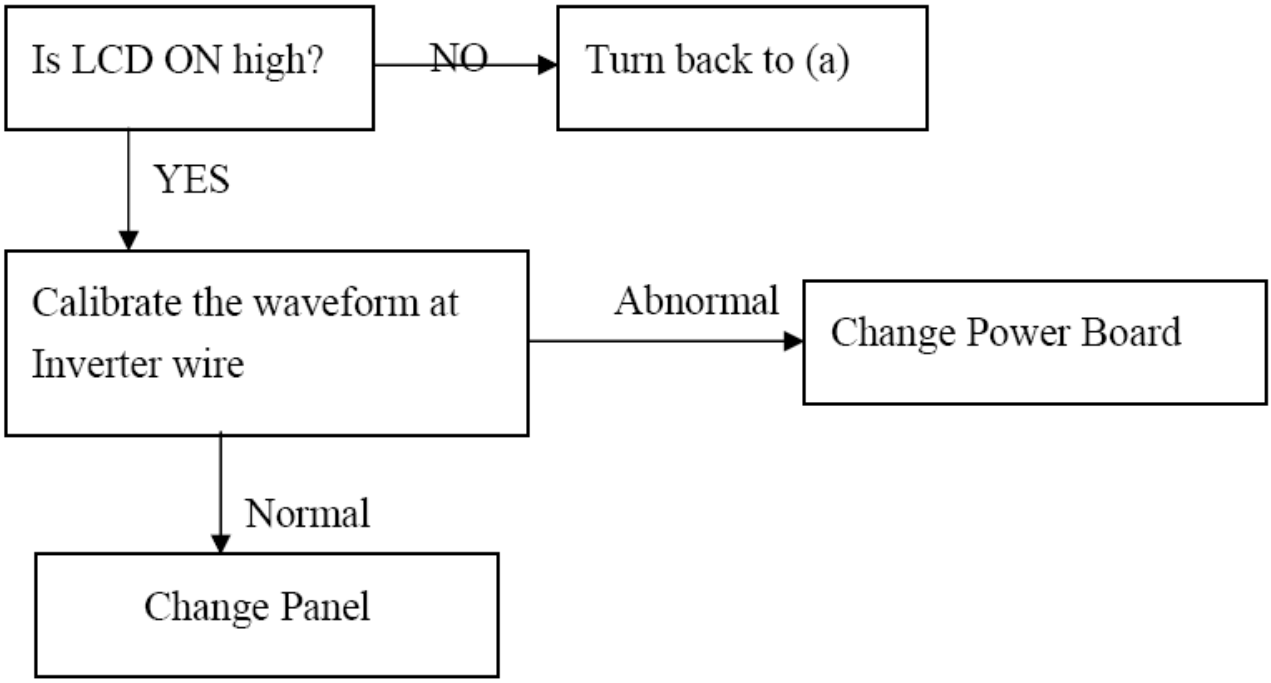
This document is prepared to be a guide to repair trouble sets, some problems happen more frequently are taken as example in it. Those are turn on fail, no signal, no sound, etc.

2. Problems

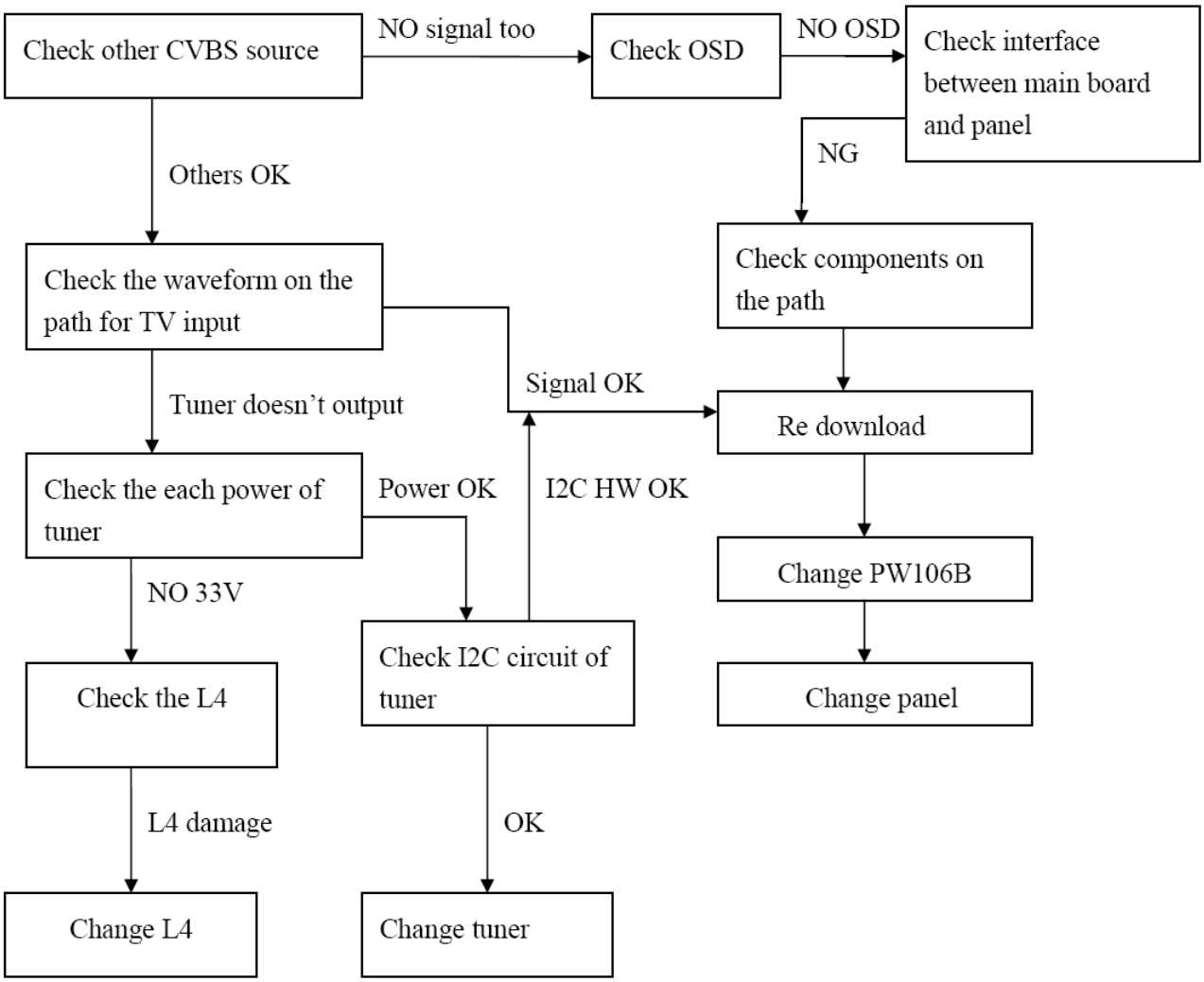
(a) Turn on fail



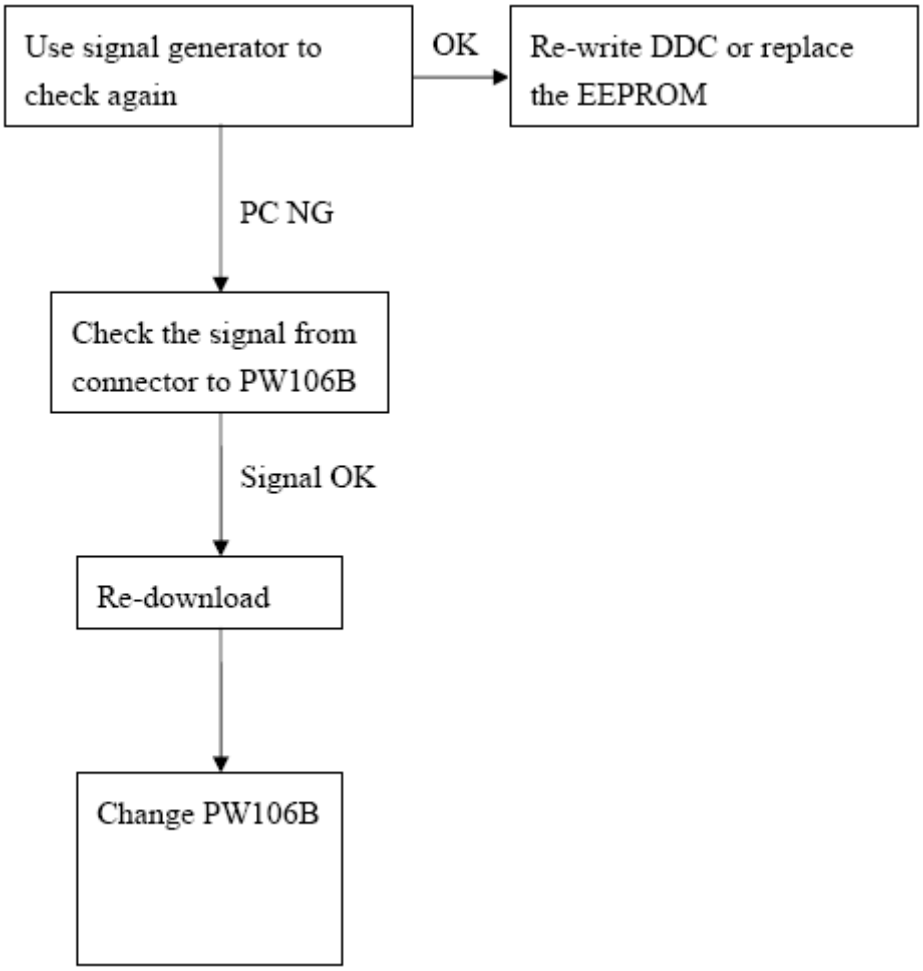
(b) NO backlight



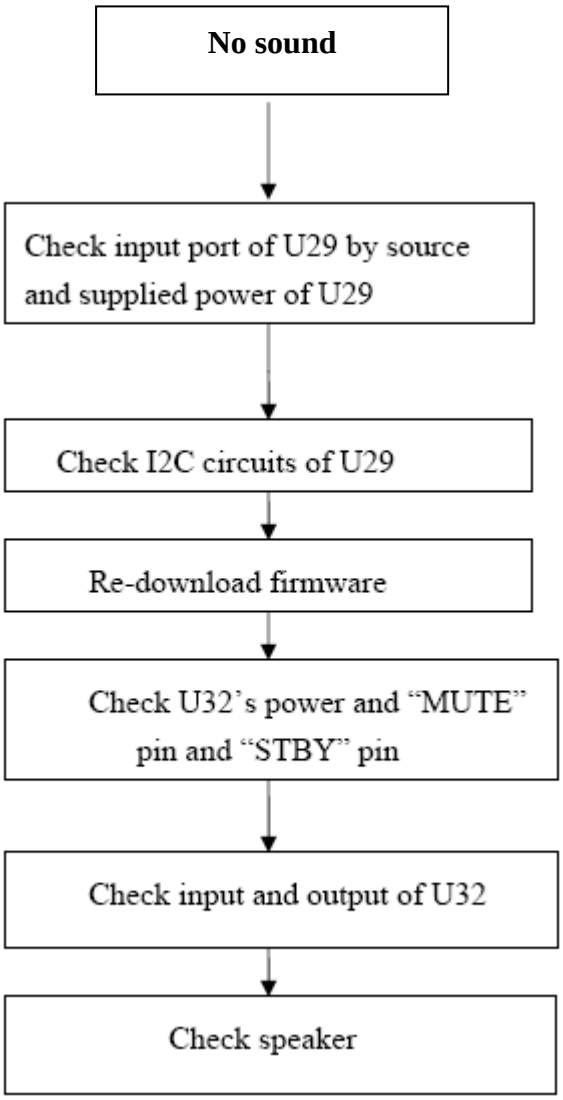
(C) TV no signal



(D) PC no signal

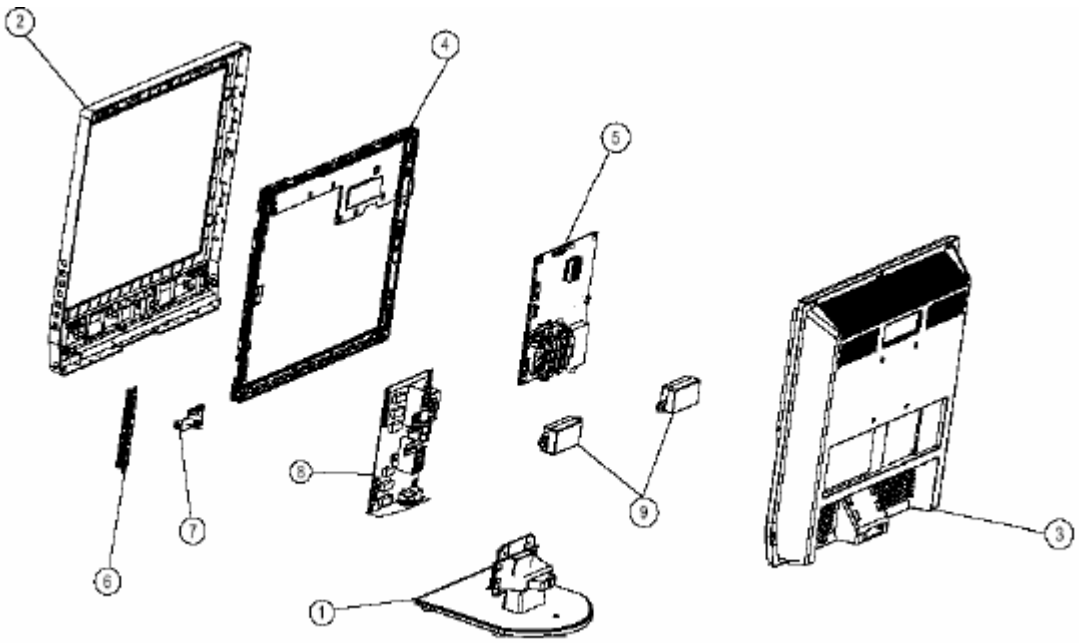


(E) No sound

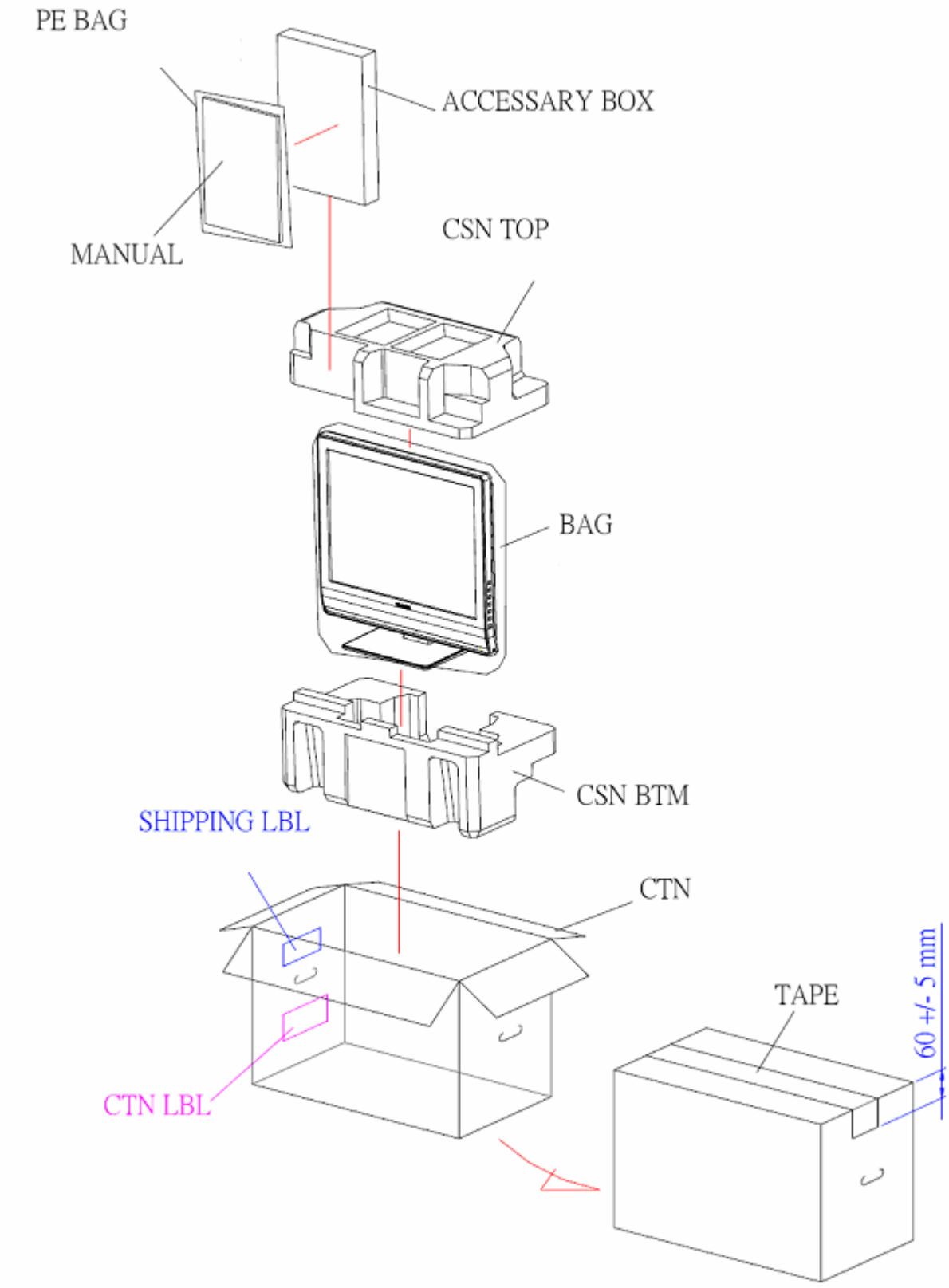

No sound
Check input port of U29 by source and supplied power of U29
Check I2C circuits of U29
Re-download firmware
Check U32's power and "MUTE" pin and "STBY" pin
Check input and output of U32
Check speaker

PACKING EXPLODED VIEW

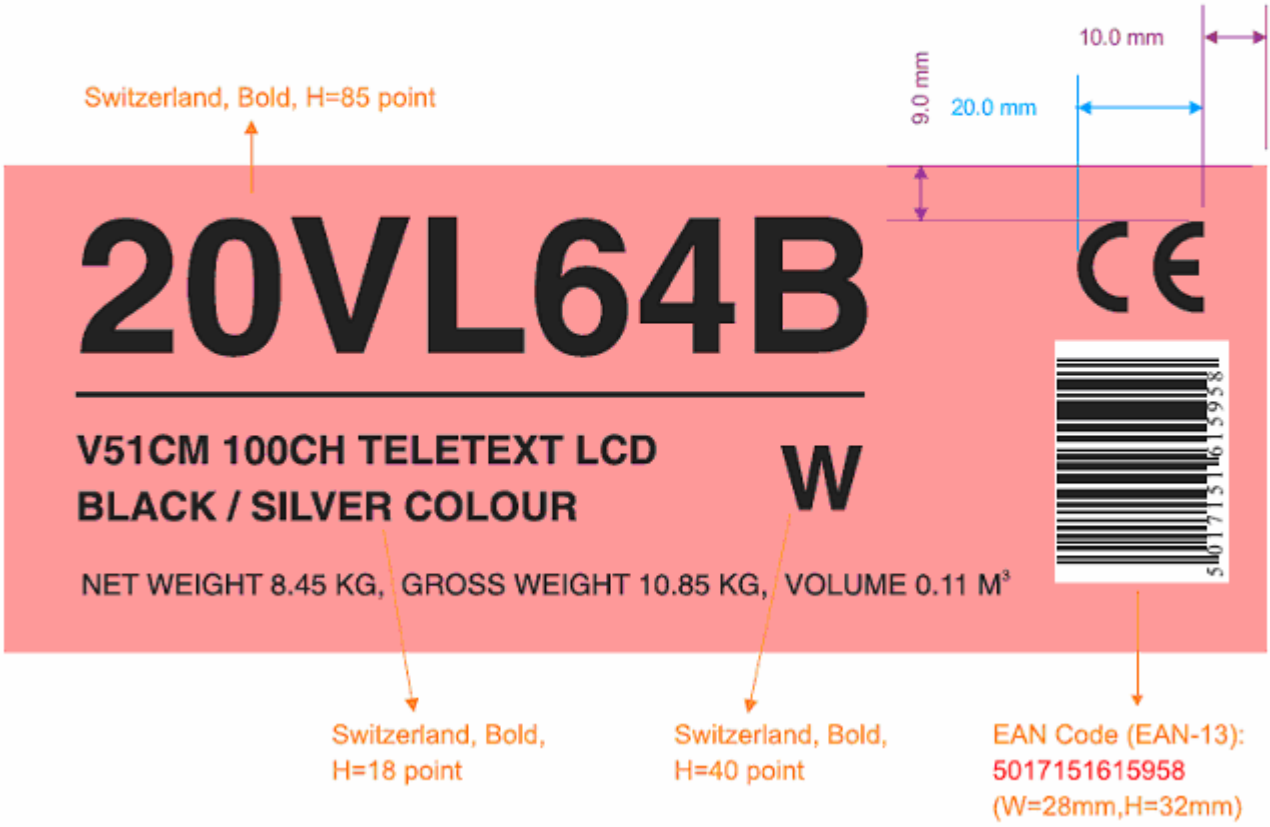
ITEM	Description
1	ASSY BASE T20VV6
2	ASSY BEZEL T20VV6
3	ASSY REAR CVR T20VV6
4	LCDM A201SN02-V5 AUO
5	PCBA MAIN BD MI T20VV8 GA/CN
6	PCBA KEYPAD BD T20WH8 MI
7	PCBA IR BD T20WHB MI
8	PCBA PWR BD 70W EADP-70AF
9	SPK*2 160HM 235/590MM PS-000



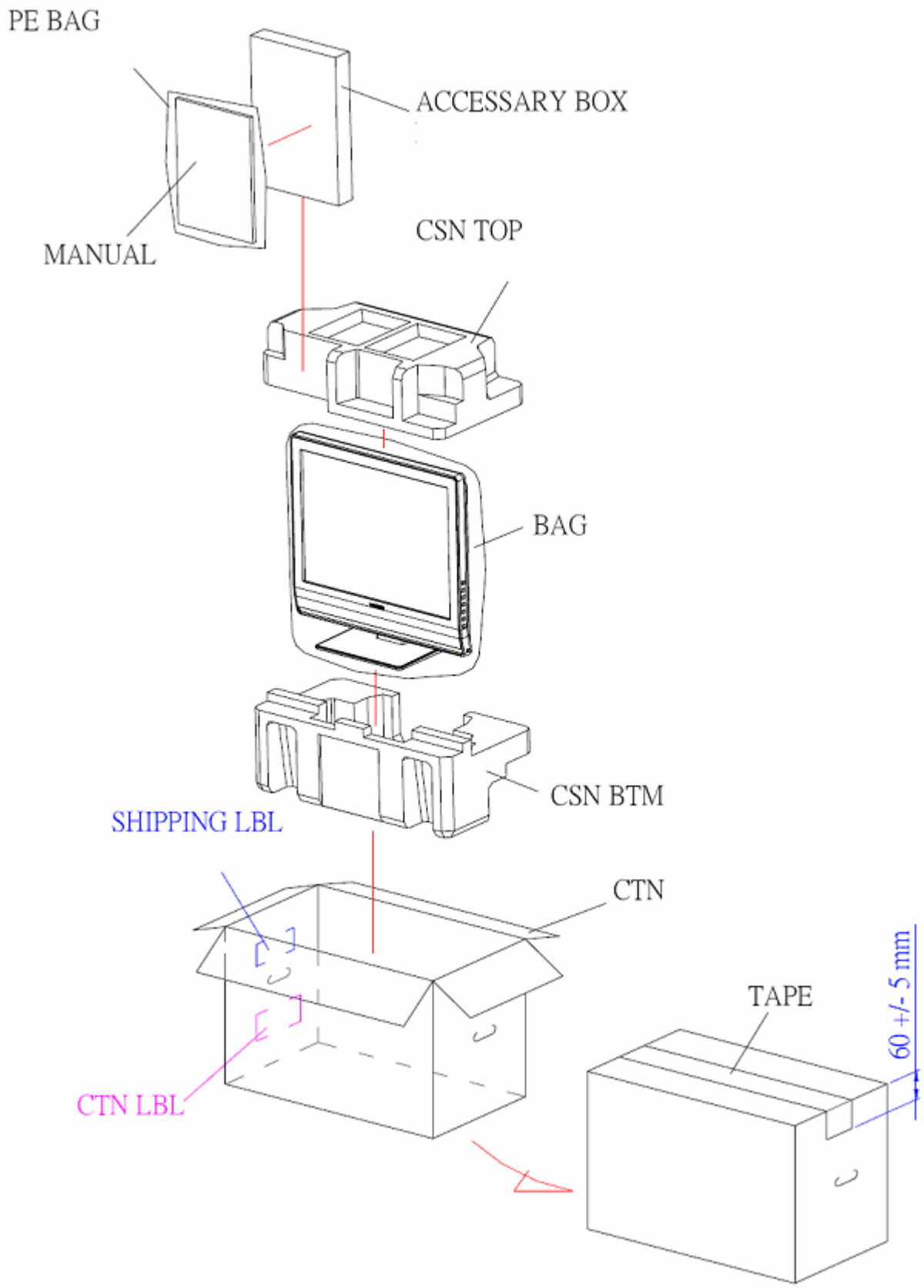
- **20VL64B**


PE BAG
ACCESSARY BOX
MANUAL
CSN TOP
BAG
CSN BTM
SHIPPING LBL
CTN
TAPE
60 +/- 5 mm
CTN LBL

1. CARTON LABEL PRINTING

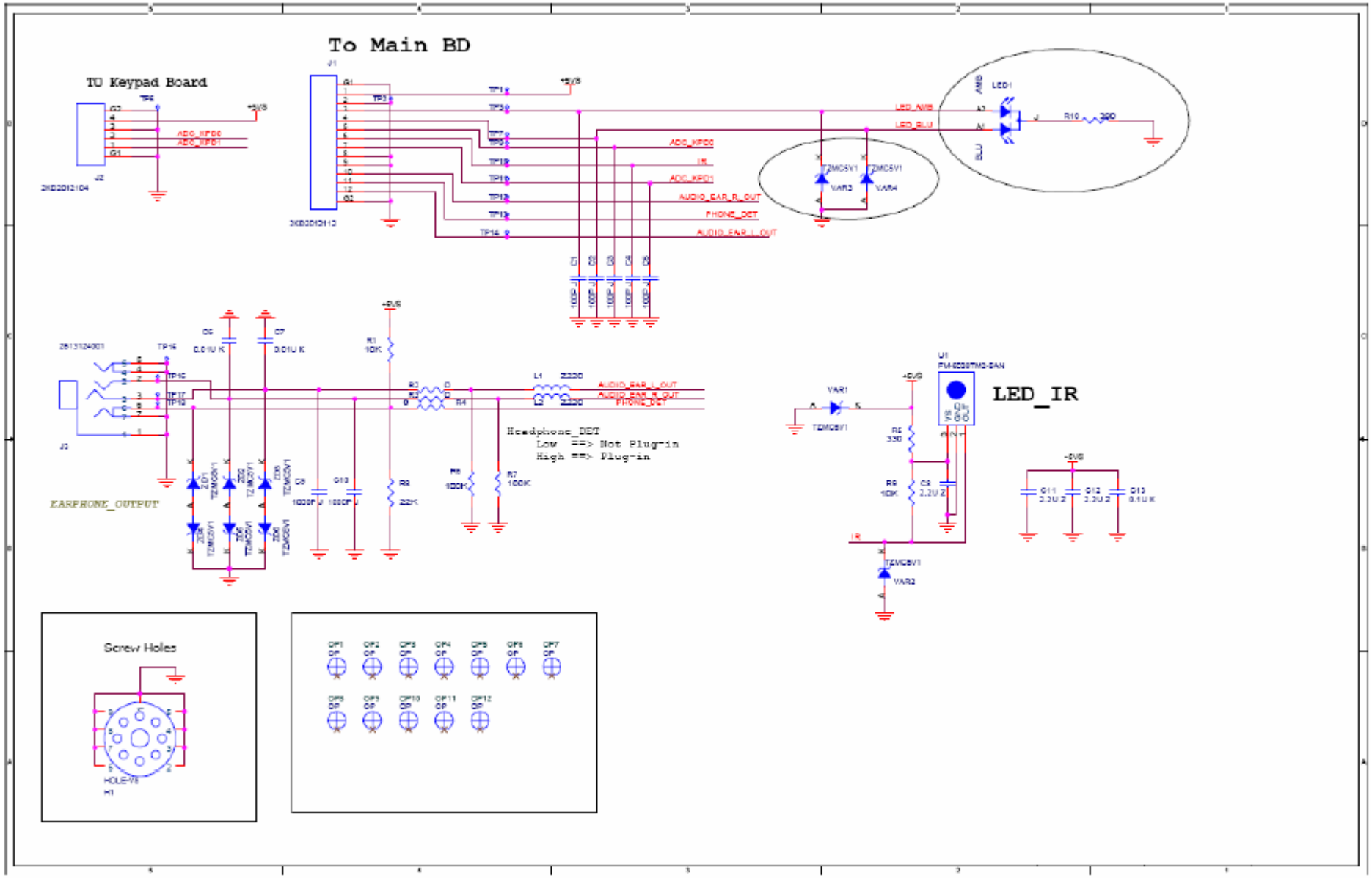


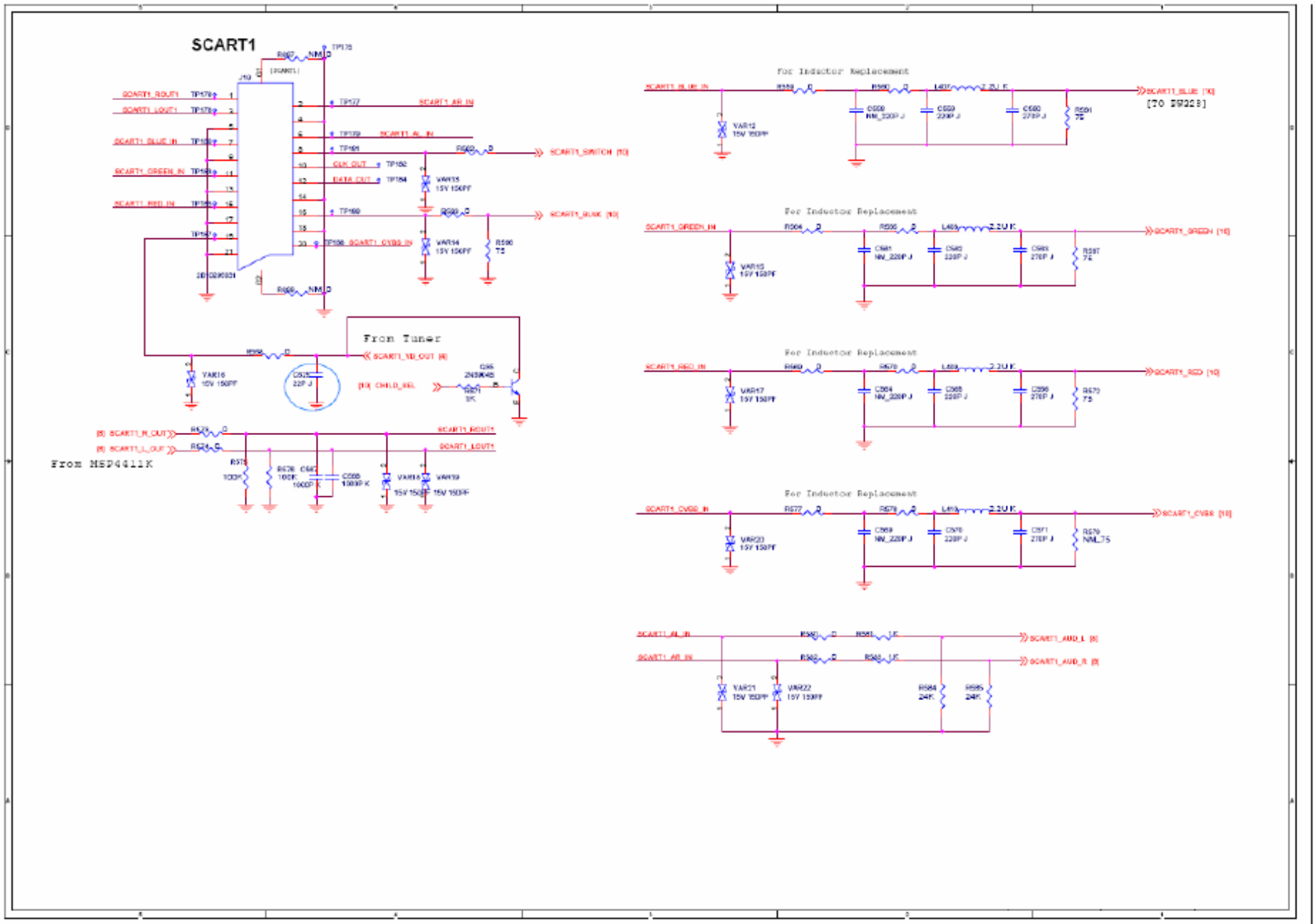
- **20VL64G**

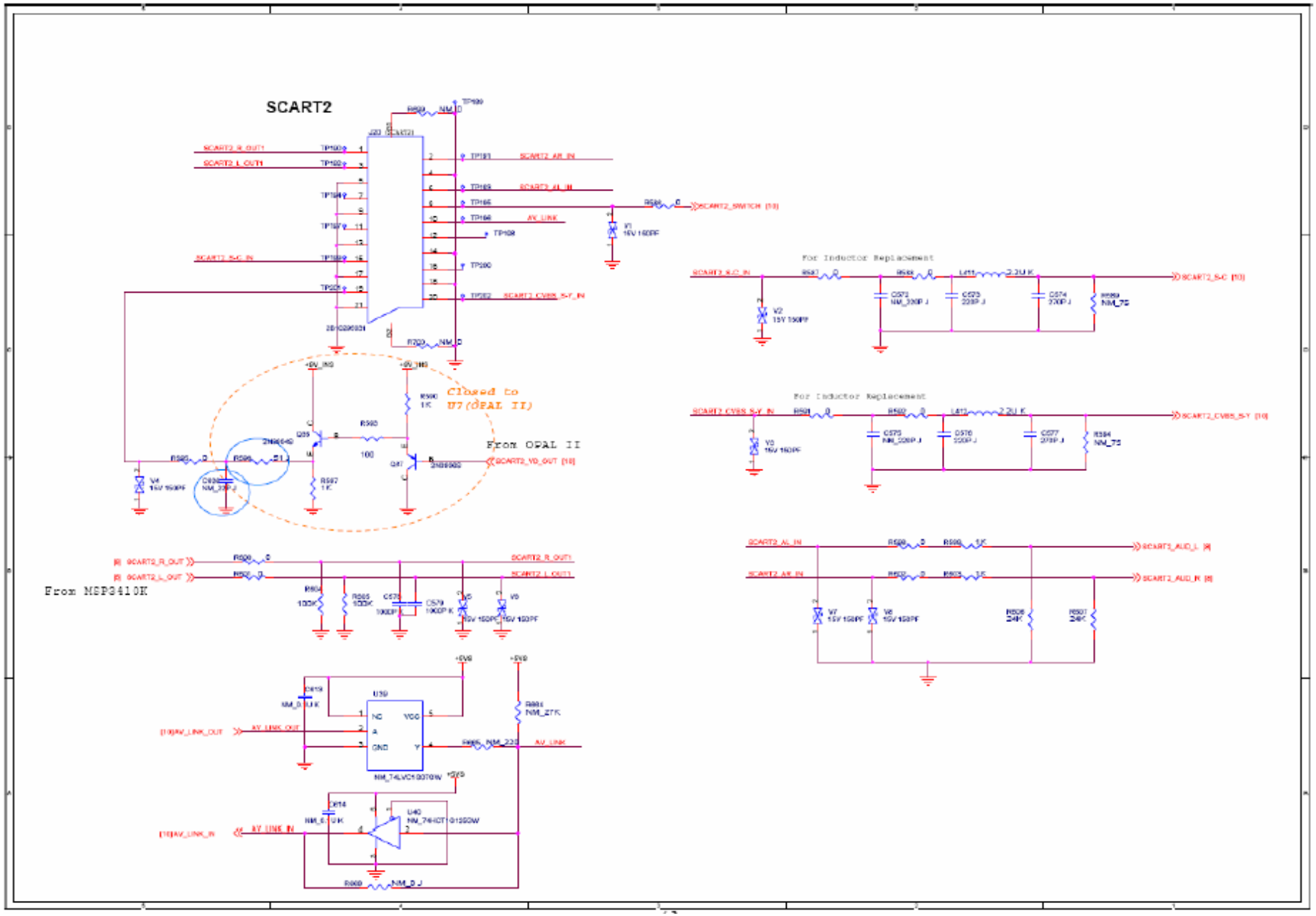

PE BAG
ACCESSARY BOX
MANUAL
CSN TOP
BAG
CSN BTM
SHIPPING LBL
CTN
TAPE
60 +/- 5 mm
CTN LBL

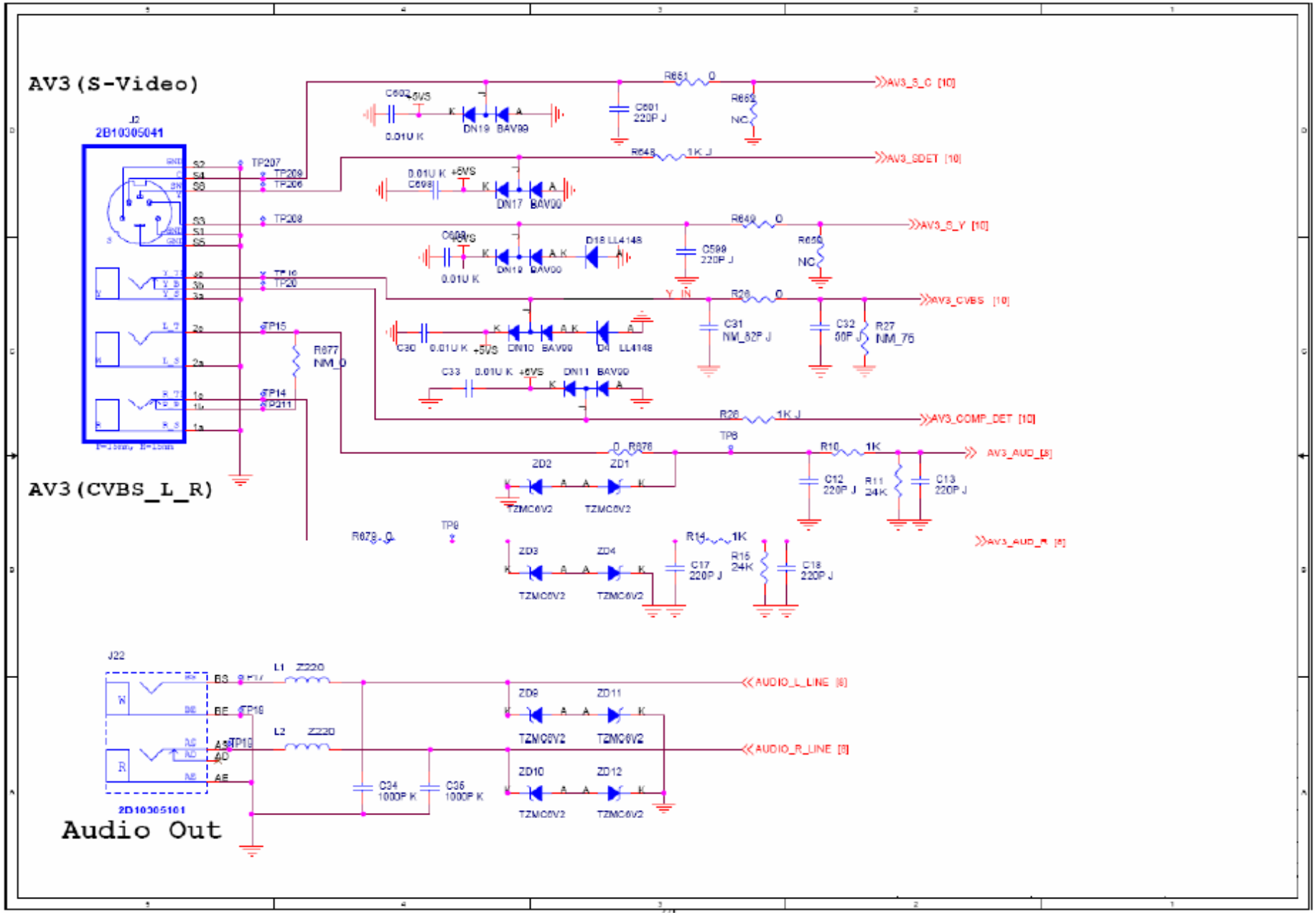
1. CARTON LABEL PRINTING

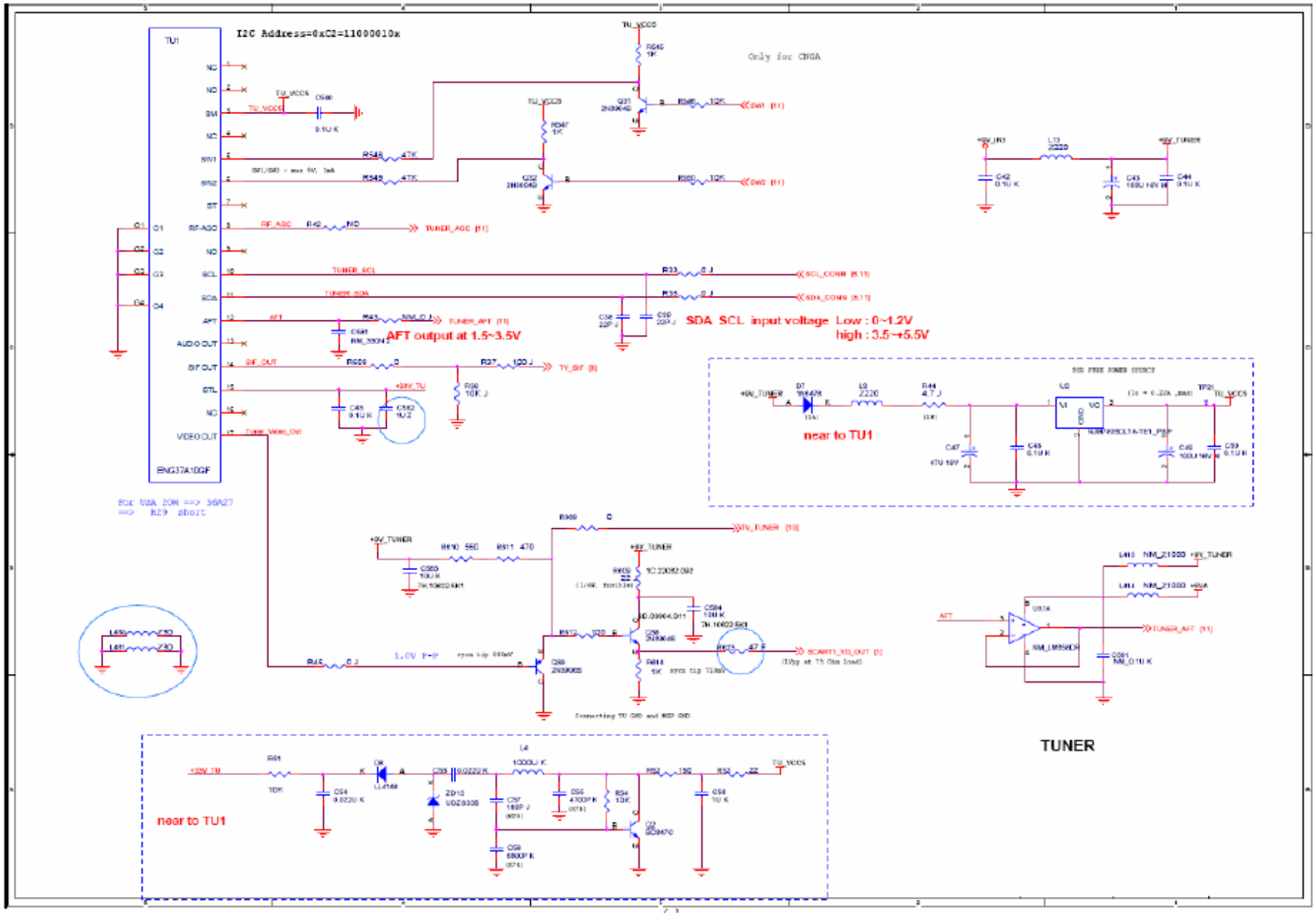
CIRCUIT BLOCK DIAGRAM

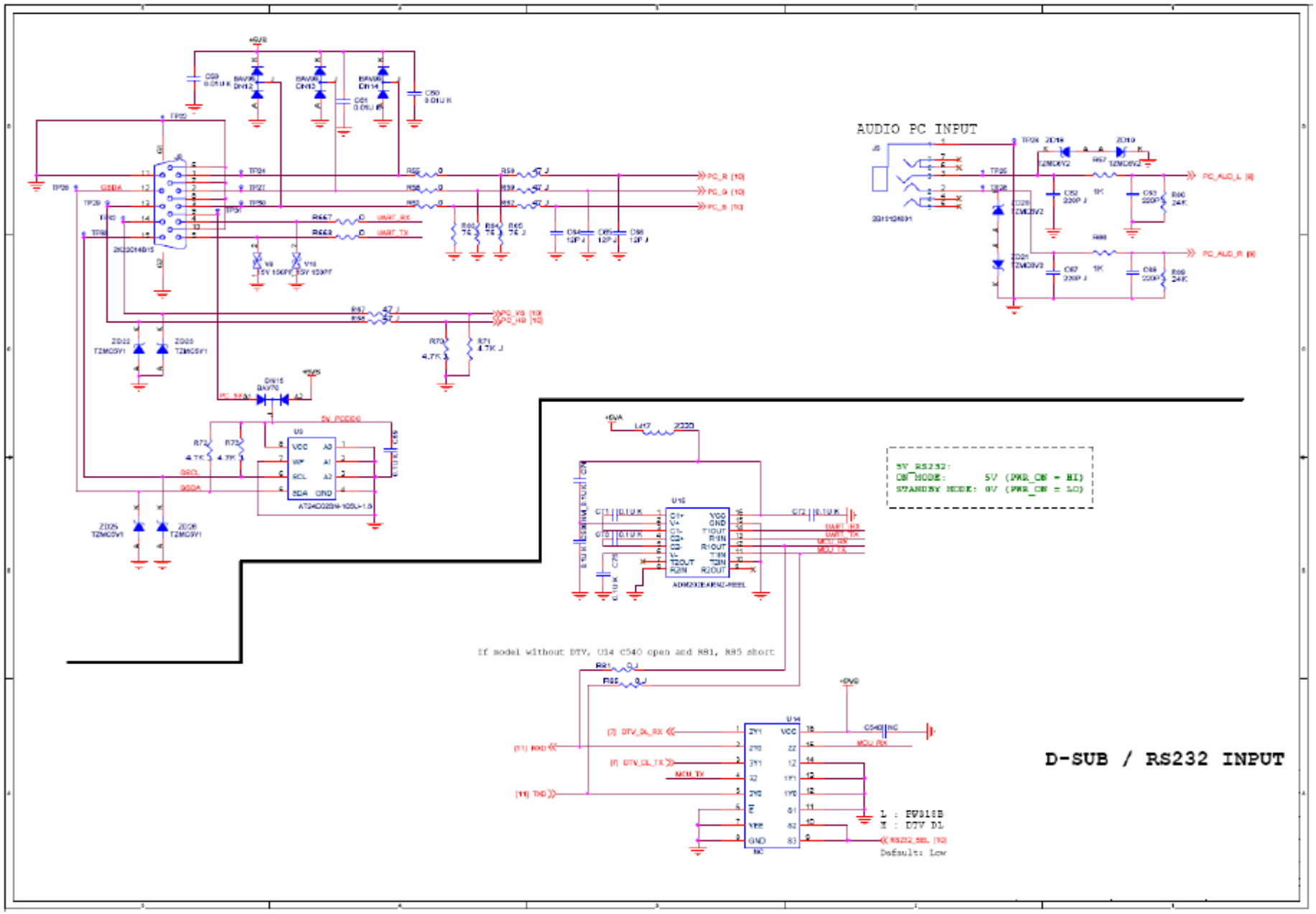

To Main BD
TO Keypad Board
LED_IR
Headphone_DET
Low ==> Not Plug-in
High ==> Plug-in
EARPHONE_OUTPUT
Screw Holes

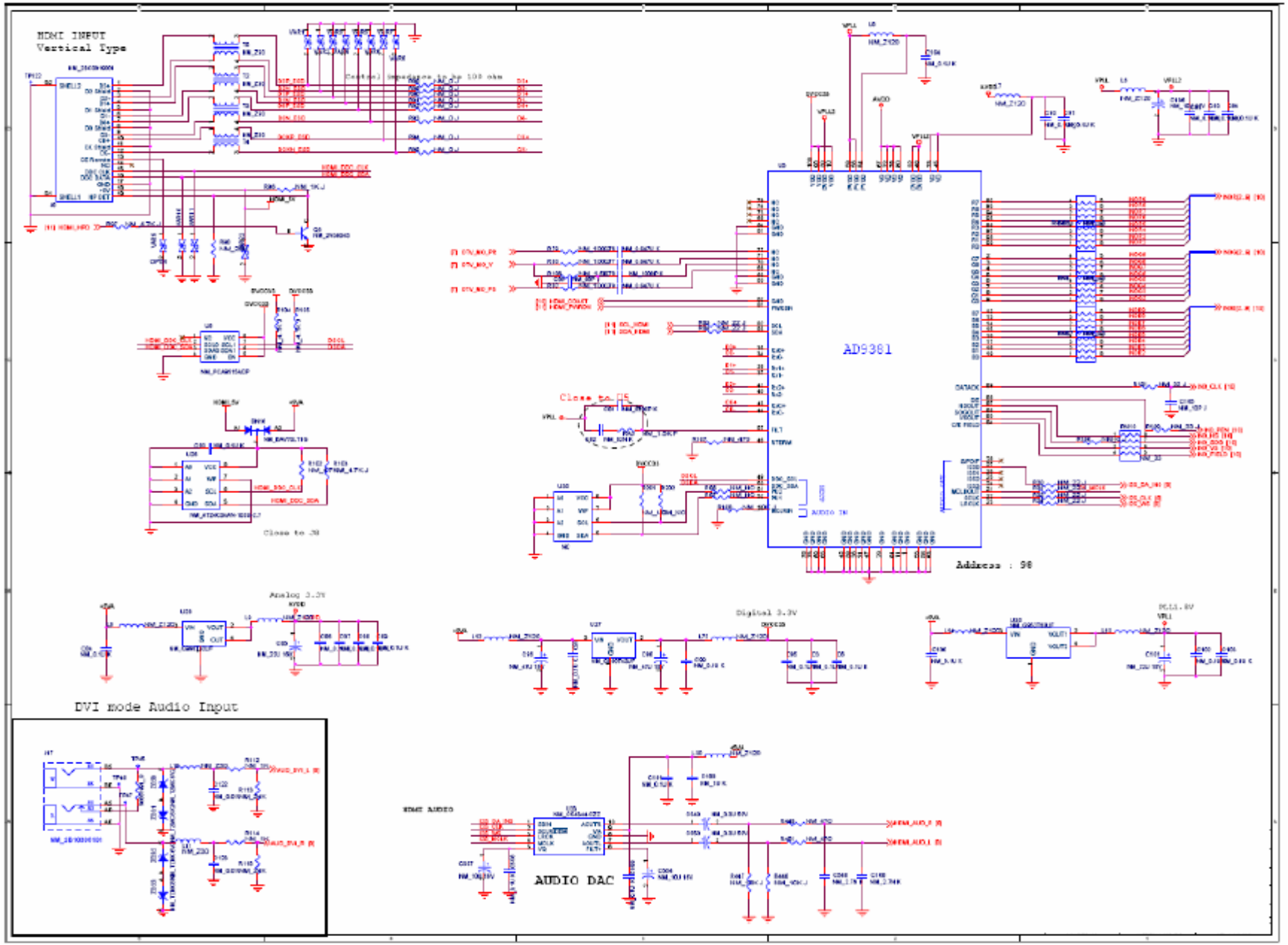

SCART1
From Tuner
From MSP4411K
For Inductor Replacement
For Inductor Replacement
For Inductor Replacement
For Inductor Replacement

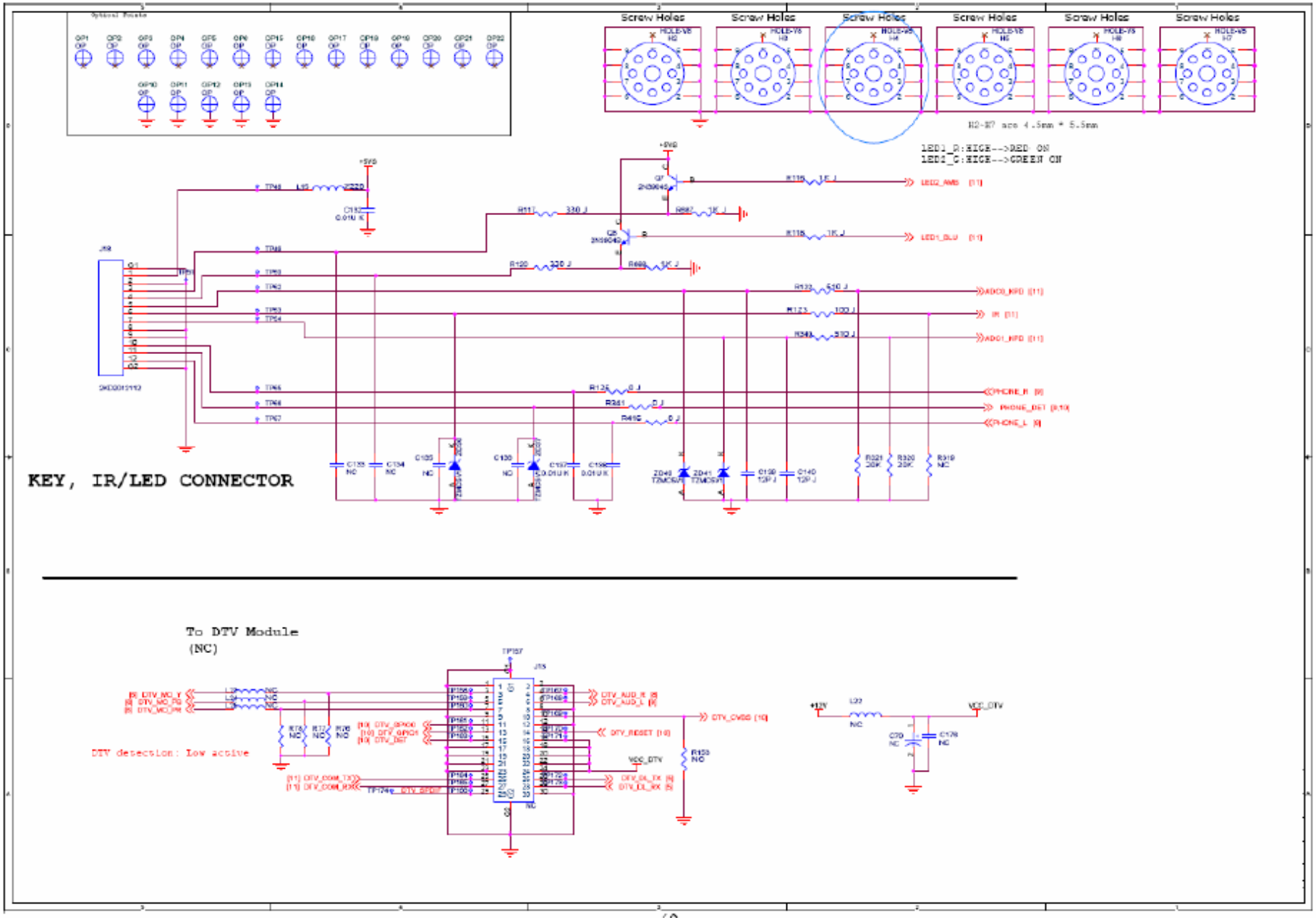

SCART2
Closed to U7(OPAL II)
From OPAL II
From MSP3410K
For Inductor Replacement
For Inductor Replacement

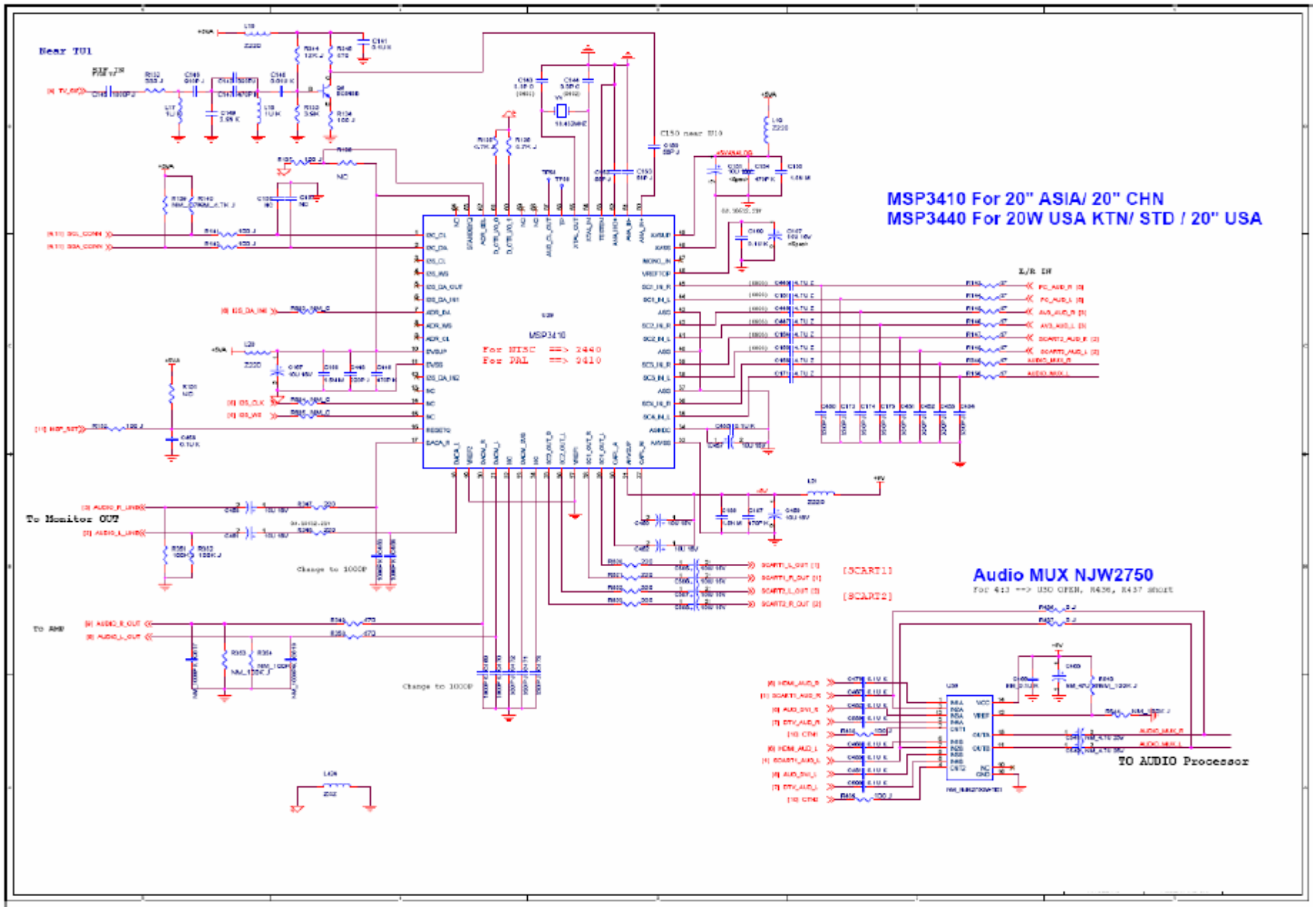

AV3 (S-Video)
AV3 (CVBS_L_R)
Audio Out
J2
2B10305041
J22
2B10305101
AV3_S_C [10]
AV3_SDET [10]
AV3_S_Y [10]
AV3_CVBS [10]
AV3_COMP_DET [10]
AV3_AUD_L [8]
AV3_AUD_R [8]
AUDIO_L_LINE [8]
AUDIO_R_LINE [8]
TZMC6V2
BAV99
LL4148

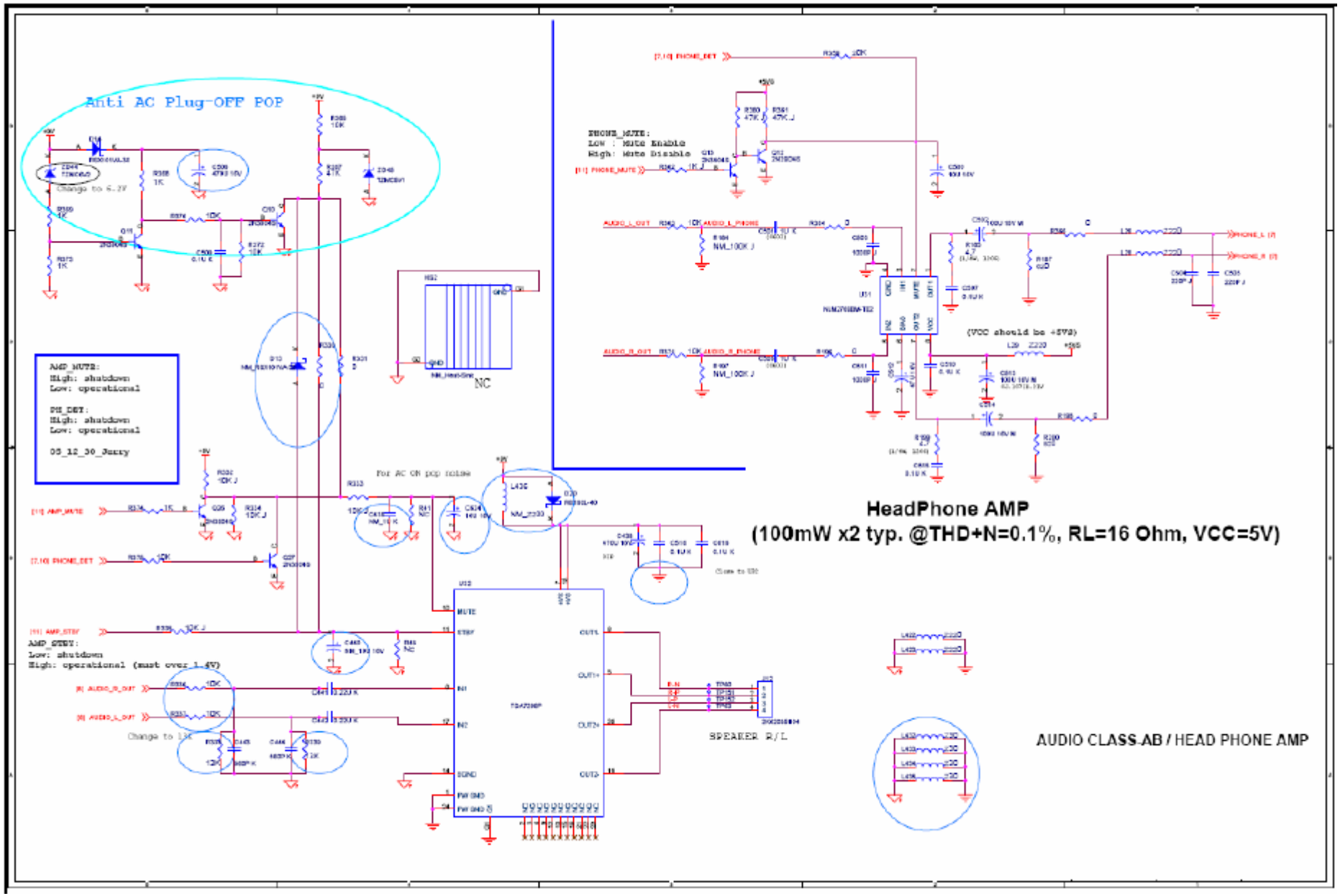

I2C Address=0xC2=11000010x
TU1
ENG37A10GF
AFT output at 1.5~3.5V
SDA SCL input voltage Low : 0~1.2V
high : 3.5~5.5V
near to TU1
near to TU1
TUNER

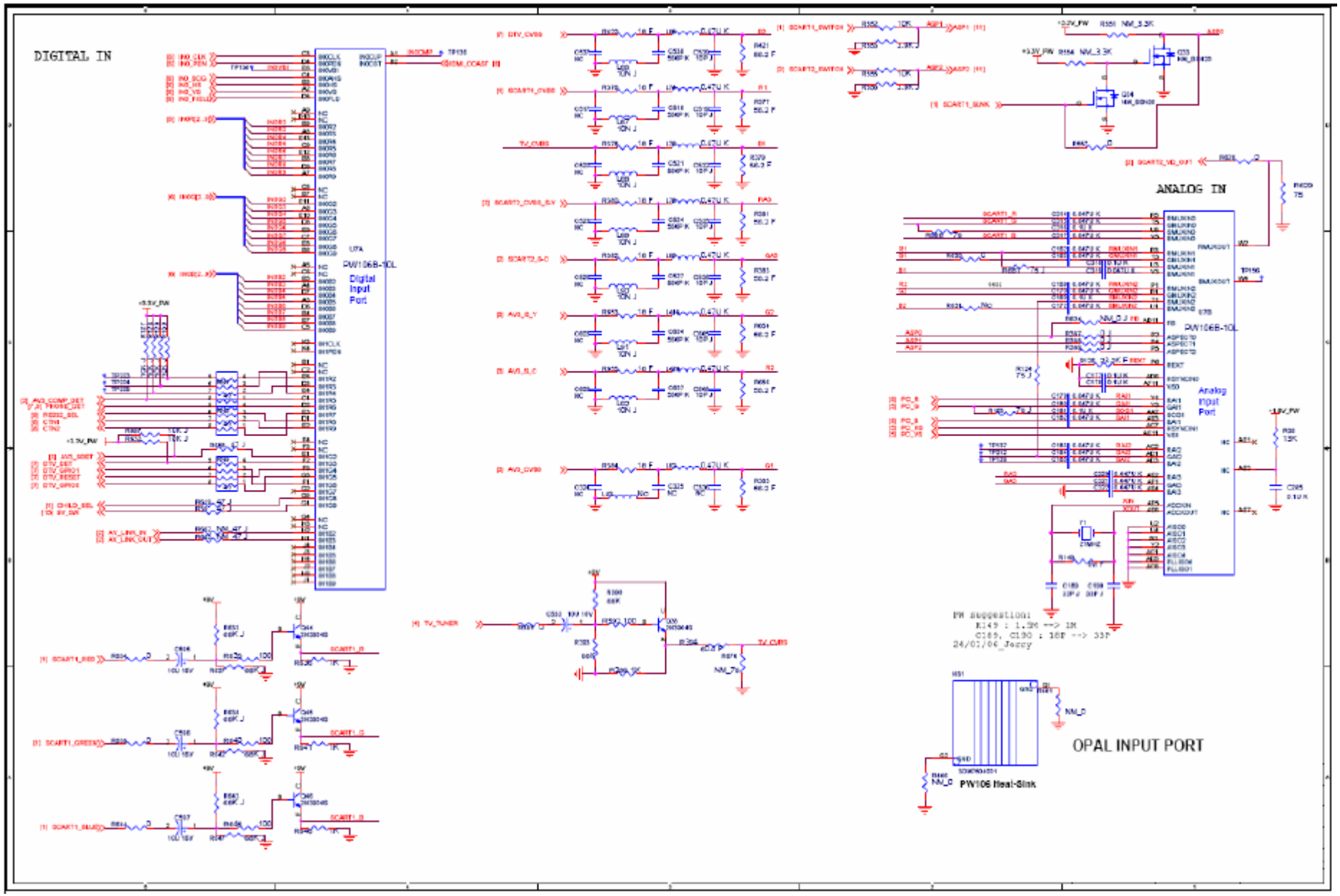

AUDIO PC INPUT
D-SUB / RS232 INPUT
5V RS232:
ON MODE: 5V (PWR_ON = HI)
STANDBY MODE: 0V (PWR_ON = LO)
If model without DTV, U14 C540 open and R81, R85 short
L : EV818B
H : DTV DL
Default: Low

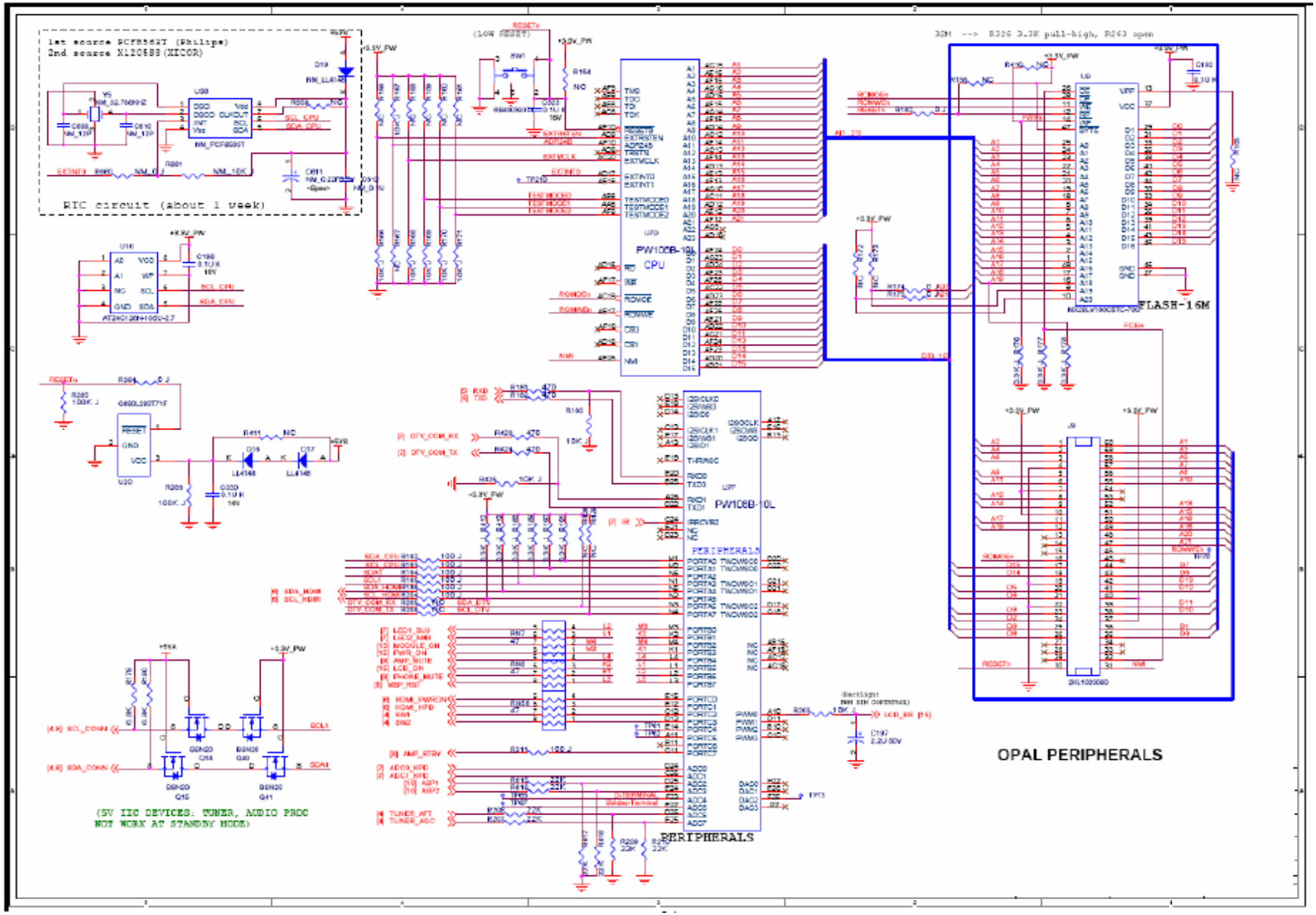

HDMI INPUT
Vertical Type
AD9381
Address : 98
Analog 3.3V
Digital 3.3V
DVI mode Audio Input
AUDIO DAC

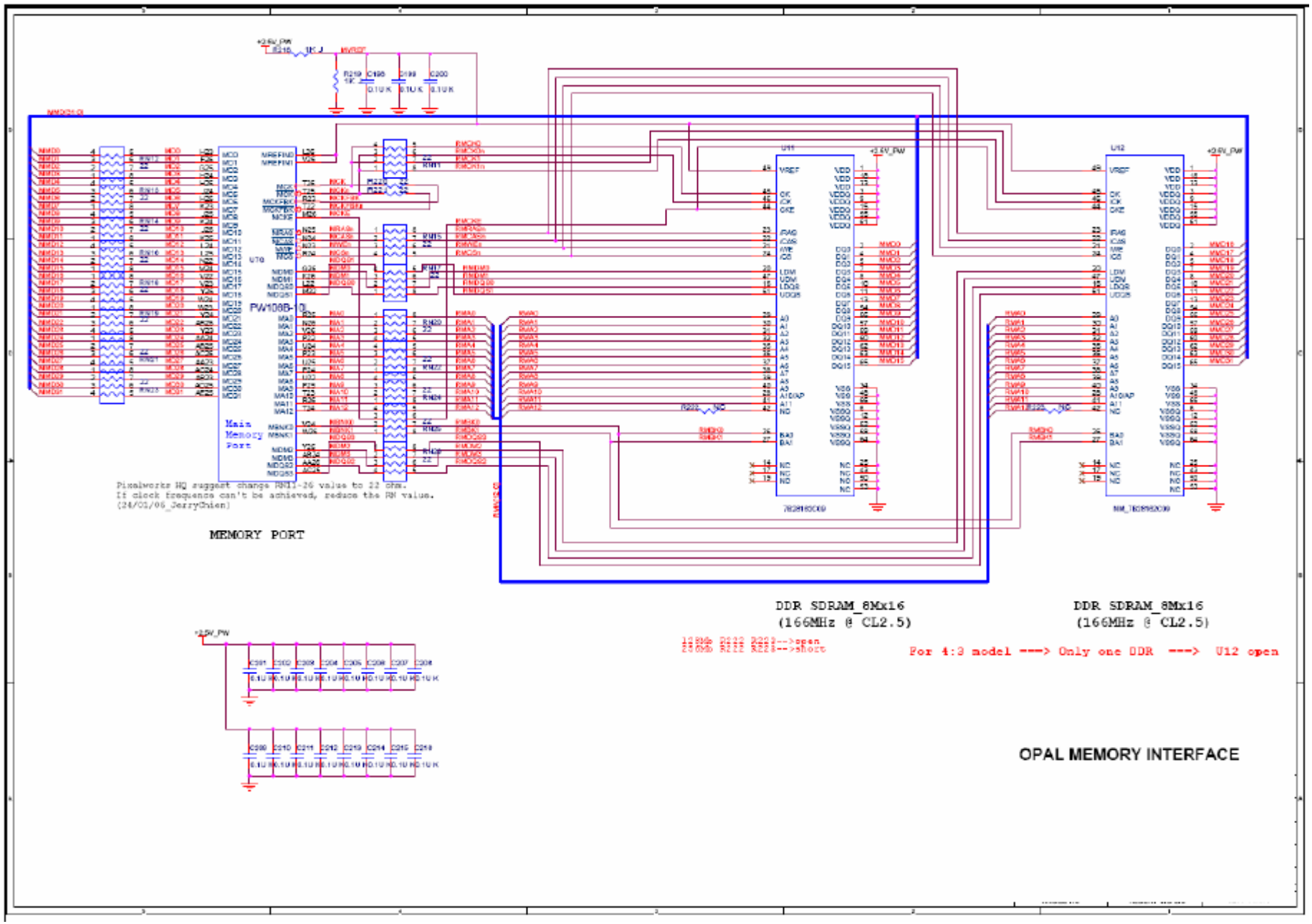

Screw Holes
Screw Holes
Screw Holes
Screw Holes
Screw Holes
Screw Holes
LED1_R:HIGE-->RED ON
LED2_G:HIGE-->GREEN ON
KEY, IR/LED CONNECTOR
To DTV Module
(NC)
DTV detection: Low active

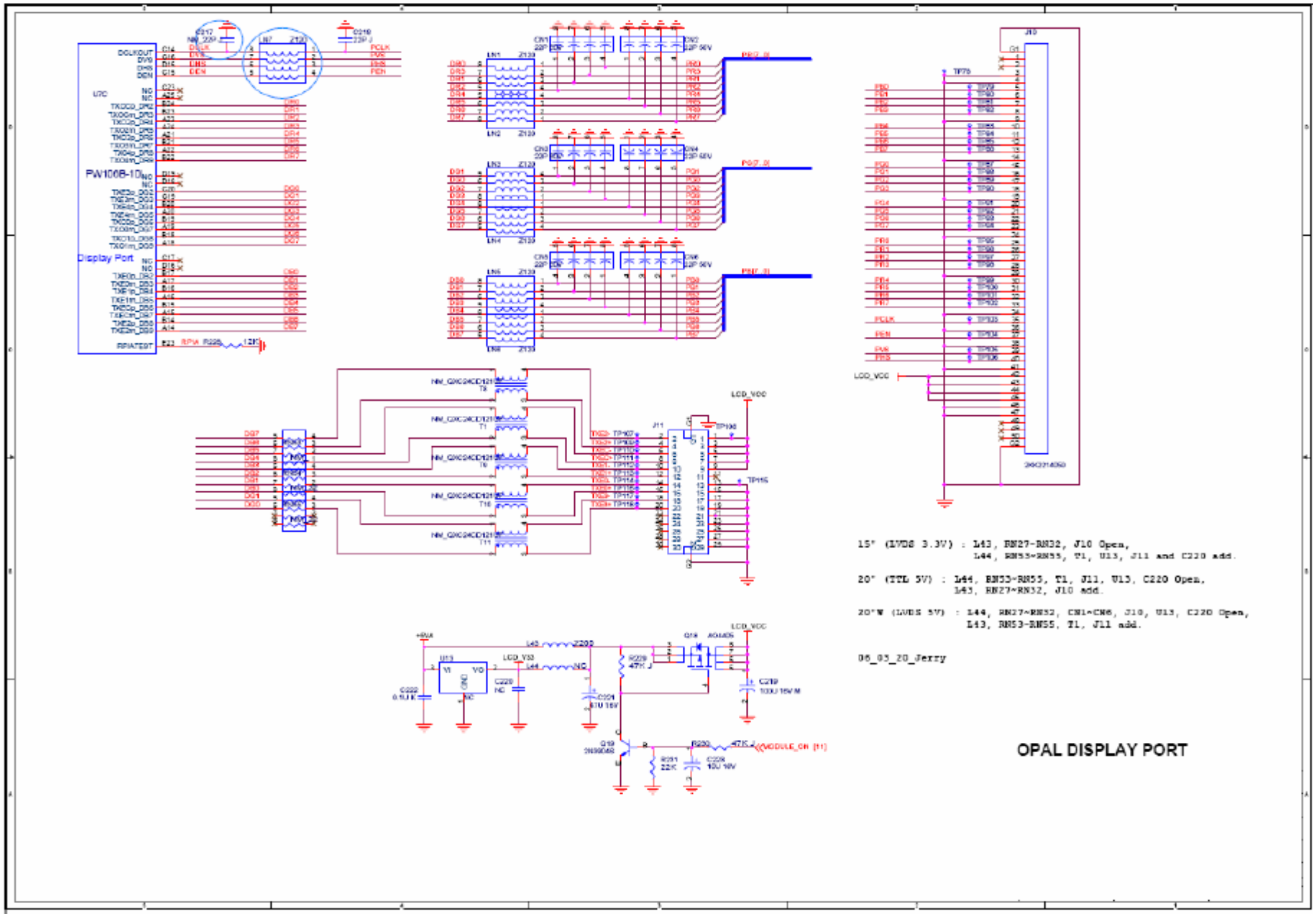

Near TU1
MSP3410 For 20" ASIA/ 20" CHN
MSP3440 For 20W USA KTN/ STD / 20" USA
MSP3410
For NTSC ==> 3440
For PAL ==> 3410
To Monitor OUT
To AMP
Change to 1000P
Change to 1000P
[SCART1]
[SCART2]
Audio MUX NJW2750
For 413 ==> USO OPEN, R436, R437 short
TO AUDIO Processor

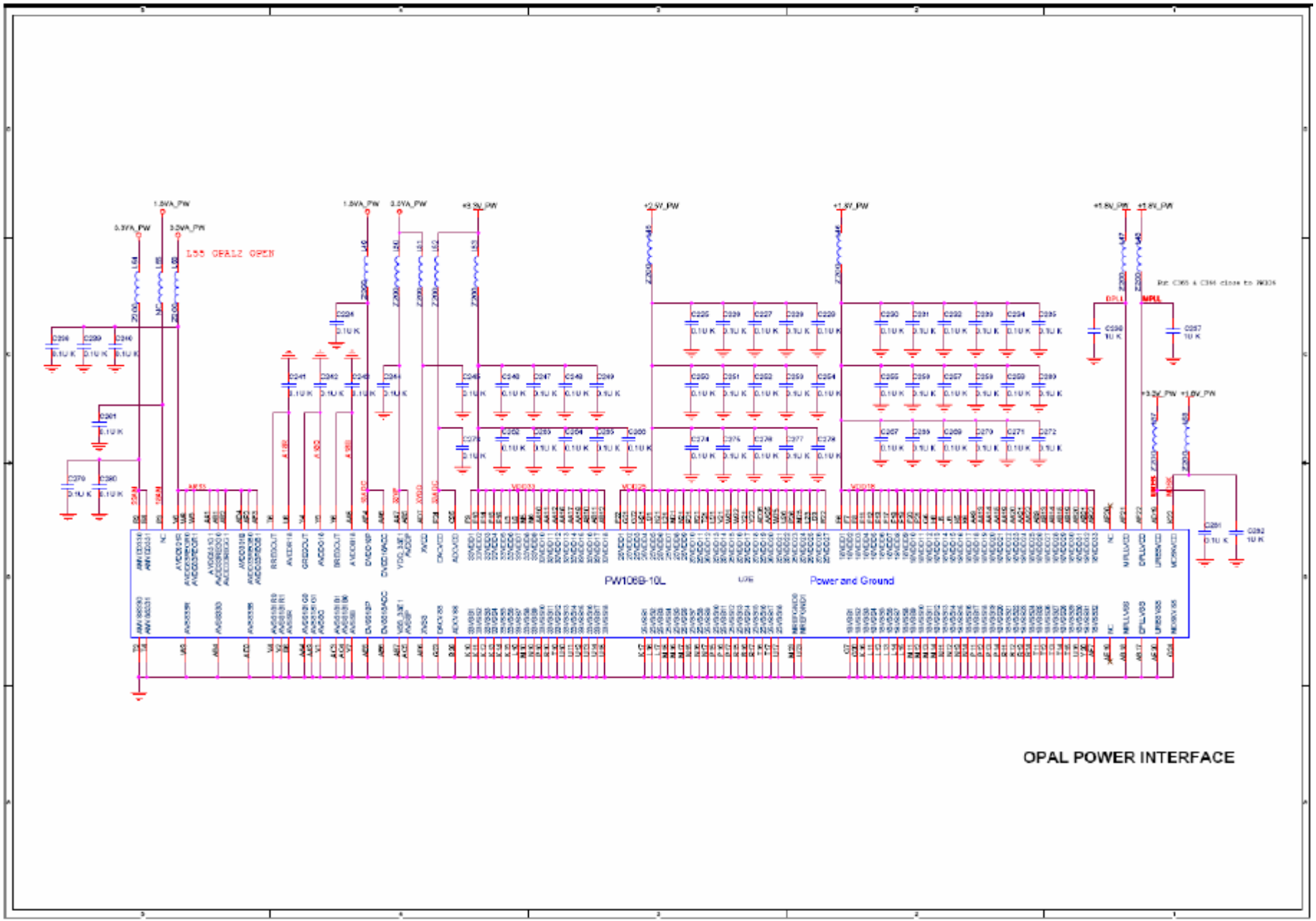

Anti AC Plug-OFF POP
HeadPhone AMP
(100mW x2 typ. @THD+N=0.1%, RL=16 Ohm, VCC=5V)
AUDIO CLASS-AB / HEAD PHONE AMP
SPEAKER R/L
(VCC should be +5V)
NC

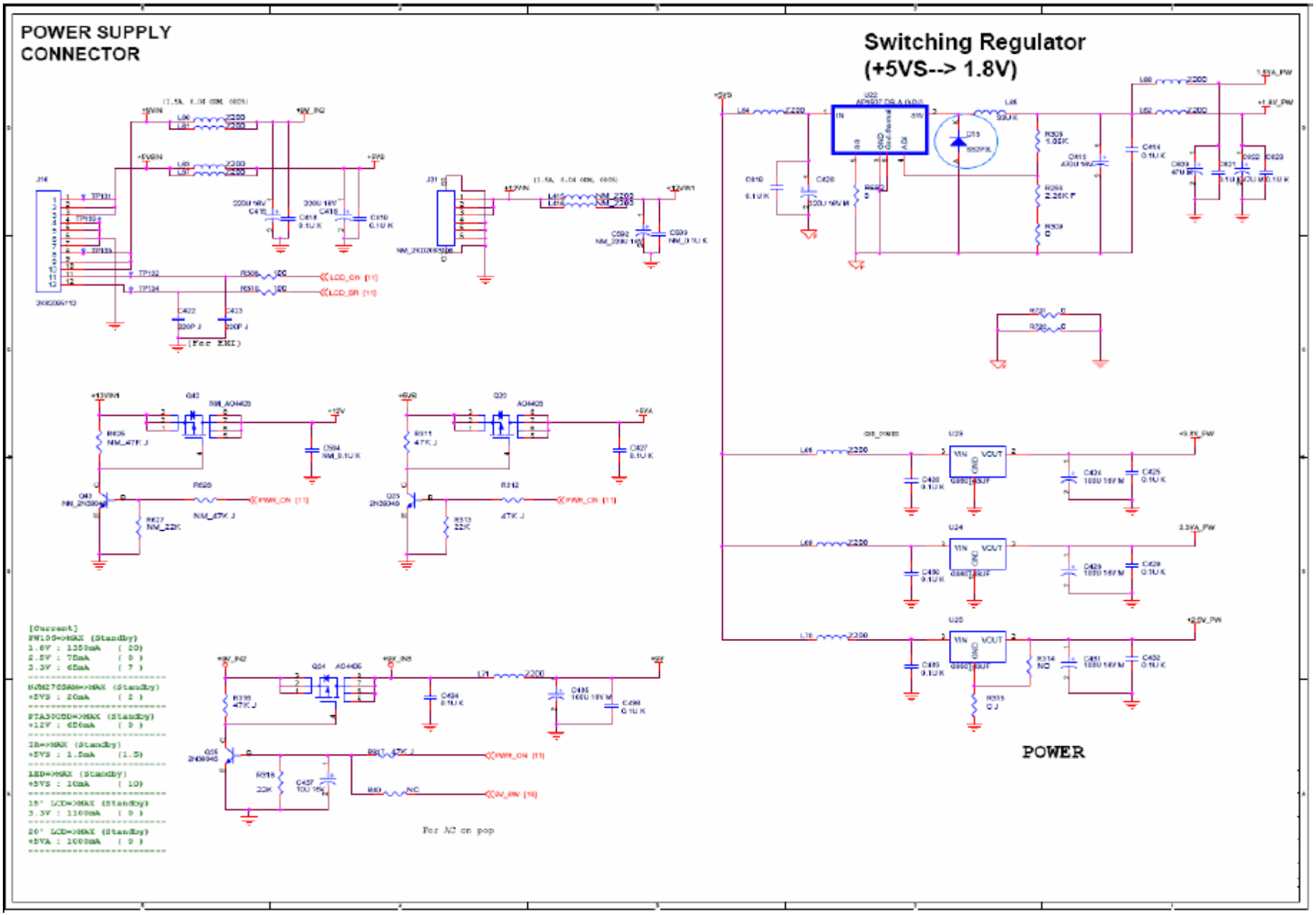

DIGITAL IN
PW106B-10L
Digital Input Port
ANALOG IN
PW106B-10L
Analog Input Port
OPAL INPUT PORT
PW106 Heat-Sink


RIC circuit (about 1 week)
PW108B-10L
CPU
PERIPHERALS
FLASH-16M
OPAL PERIPHERALS
(5V IIC DEVICES: TUNER, AUDIO PROC
NOT WORK AT STANDBY MODE)


PW108B-
Main
Memory
Port
Pixelworks HQ suggest change RN13-26 value to 22 ohm.
It clock frequence can't be achieved, reduce the RN value.
(24/05/06 JerryChien)
MEMORY PORT
DDR SDRAM 8Mx16
(166MHz @ CL2.5)
DDR SDRAM 8Mx16
(166MHz @ CL2.5)
For 4:3 model ---> Only one DDR ---> U12 open
OPAL MEMORY INTERFACE


PW166B-10
Display Port
15" (LVDS 3.3V) : L43, RN27~RN32, J10 Open,
L44, RN53~RN55, T1, U13, J11 and C220 add.
20" (TTL 5V) : L44, RN53~RN55, T1, J11, U13, C220 Open,
L43, RN27~RN32, J10 add.
20"W (LVDS 5V) : L44, RN27~RN32, CN1~CN6, J10, U13, C220 Open,
L43, RN53~RN55, T1, J11 add.
06_05_20_Jerry
OPAL DISPLAY PORT

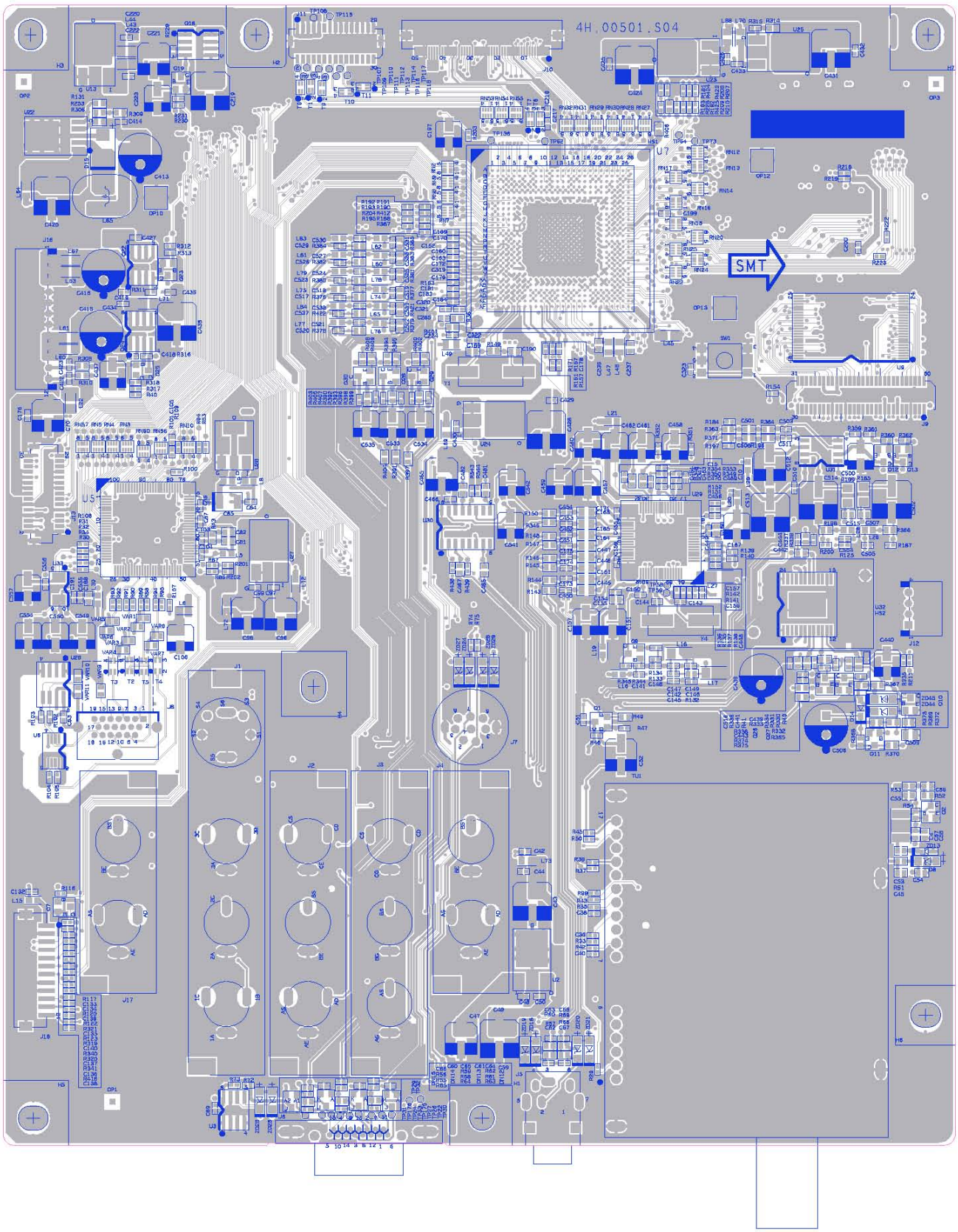

L55 0BALZ OPEN
PW106B-10L
Power and Ground
OPAL POWER INTERFACE


POWER SUPPLY
CONNECTOR
Switching Regulator
(+5VS--> 1.8V)
POWER
[Current]
5W105=>MAX (Standby)
1.8V : 1350mA (20)
2.5V : 75mA (0)
3.3V : 65mA (7)
W83627SSG=>MAX (Standby)
+5VS : 20mA (2)
RTA5058=>MAX (Standby)
+12V : 650mA (0)
IR=>MAX (Standby)
+5VS : 1.5mA (1.5)
LED=>MAX (Standby)
+5VS : 10mA (10)
15" LCD=>MAX (Standby)
3.3V : 1100mA (0)
20" LCD=>MAX (Standby)
+5VA : 1000mA (0)
For AC on pop

24/07'06	Add screw hole H4 for EMI issue	[P07]
24/07'06	Change RN61 to LN7	[P13]
24/07'06	Change R338, R339 package type from 0402 to 0603 for audio issue	[P09]
24/07'06	Add L430-L435 for EMI issue	[P04, P09]
24/07'06	Change C438, C516, C616 GND from GND_AUO to GUD	[P09]
24/07'06	Change D15 from 8C.2R004.08G to 8C.2R003.080	[P15]
27/07'06	Change C582 from 0J.47614.08W to 7H.10594.421	[P04]
27/07'06	NM RTC circuit	[P11]
03/08'06	Add D13, D20, C624, L436 & Open C439, C440 & Change R330 from open to 0ohm & Change C506 from 220u to 470u for AC ON/OFF pop noise	[P09]
03/08'06	Add C625, C626 & Change R596, R613 type from 0603 to 0005	[P06]

PCB Drawing

This chapter is to show you the PCB drawing of mainboard of 20VL64B and 20VL64G, which share the same design of mainboard PCB.

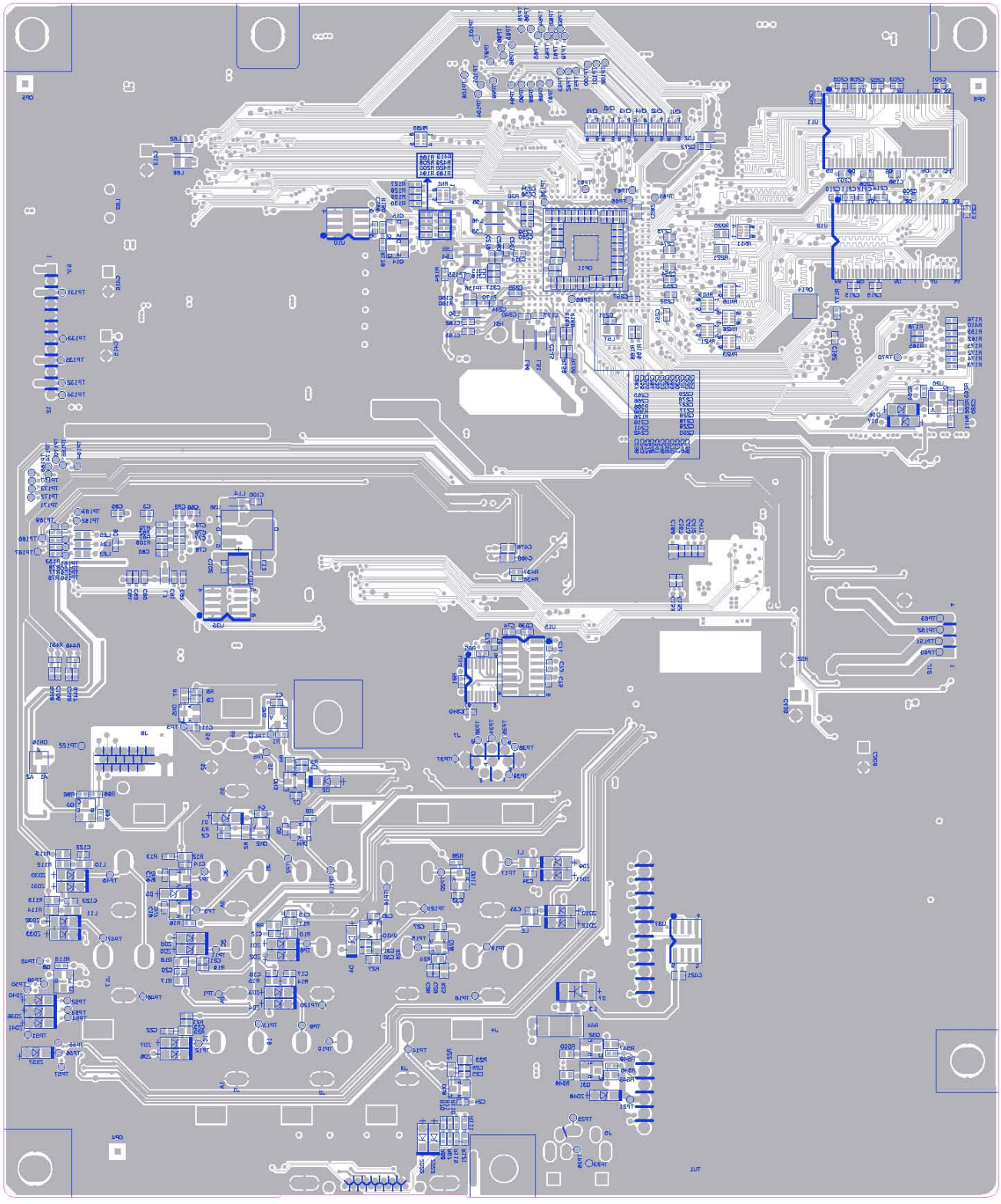


Impedance	
50 Ω	X mil
80 Ω	X mil
100 Ω	X mil

Layer: SILKSCREEN_TOP	Part No.: 4H.00501.S04	
Filename: Main BOARD	Date: 26/May/06	Rev.: XXX
Model No.: T20WH8	Sheet 3 of 11	
Doc. No.:		

L1:COMP
L2:GND
L3:IN1
L4:BOTTOM

PCS:175 X 210 mm
PNL:350 X 220 mm (+/-0.127mm)
V-CUTX3



Impedance	
50 Ω	X mil
80 Ω	X mil
100 Ω	X mil

BenQ	Layer:SILKSCREEN BOTTOM	Part No.:4H.00501.S04
	Filename: Main BOARD	Date:26/May/06 Rev.:XXX
	Model No.: T20WH8	Sheet 4 of 11
	Doc. No.:	

L1:COMP
L2:GND
L3:IN1
L4:BOTTOM

PCS:175 X 210 mm
PNL:350 X 220 mm (+/-0.127mm)
V-CUTX3

Spare Parts List

Toshiba Model Name				20VL64G	20VL64B
BenQ Model T20VV6 9J.00401 T20WH8 9J.00501				UKS	EUS
Estimated Shipment Q'ty					
Type	Parts Description	Toshiba PN	BenQ PN		
PCB PWR	PCBA PWR BD 70W EADP-70AFAA V1	75004843	5D.00501.021	◎	◎
PCB MAIN	PCBA MAIN BD MI T20VV6 EU	75005643	5E.00401.031	◎	◎
PCB Key	PCBA KEYPAD BD T20WH8 MI	75003706	5E.00502.001	◎	◎
PCB IR	PCBA IR BD T20WH8 MI	75003707	5E.00503.001	◎	◎
Panel	LCDM A201SN02-V5 AUO	75004548	5F.91M64.011	◎	◎
ME WIR	WIRE 4/4P 1571#28B 100MM+S+2G	75005644	5K.00401.001	◎	◎
ME WIR	WIRE 12/12P 1571#28 320MM	75003710	5K.00501.001	◎	◎
ME WIR	WIRE 12/12P 1007#26 120MM	75003711	5K.00502.001	◎	◎
ME SPK	SPK*2 12OHM 235/590MM PS-0000	75005645	2C.40050.051	◎	◎
ME RC	ASSY REAR CVR T20VV6-EUS V1	75005647	6K.00404.022	◎	◎
ME HIG	ASSY HINGE T20VV6	75003714	6E.00401.001	◎	◎
ME BEZ	ASSY BEZEL T20VV6-EU	75005646	6K.00402.032	◎	◎
ME BAS	ASSY BASE T20VV6	75004552	6K.00403.001	◎	◎
ME	FFC 50P P0.5 65MM+S T/T T20WH8	75004568	5K.00506.001	◎	◎
ME	ASSY PLT D-SUB T20VV6	75004554	6K.00406.001	◎	◎
ACC RCU	REMOTE CTRL CT-8013 EU	75005653	5F.26004.021	◎	◎
ACC MNL	MANUAL TSB EU ENG VER.2 T20VV6	75005649	4J.00403.002	◎	◎
ACC MNL	MANUAL TSB EU W VER.2 T20VV6	75005650	4J.00403.012		◎
ACC MNL	MANUAL TSB EU E VER.2 T20VV6	75005651	4J.00403.022		◎
ACC MNL	MANUAL TSB EU NS VER.2 T20VV6	75005652	4J.00403.032		◎
ACC CTN	CTN AB T20VV6/EU	75005655	4D.00401.031	◎	◎
ACC CTN	CTN ASSY 350*240*48 T20WH8	75004543	4D.J0501.041	◎	◎
ACC CSN	CSN TOP EPS T20VV6	75004544	4G.00401.001	◎	◎
ACC CSN	CSN BTM EPS T20VV6	75004564	4G.00402.001	◎	◎
ACC COD	CORD H03VVH2-F 2.5A250V1.8M EU	75005654	2G.00950.001		◎
ACC COD	CORD H03VVH-2 5A 250V 1.8M UK	75004562	2G.03135.001	◎	
ACC BAG	BAG PE T20VV6	75003698	4B.00531.001	◎	◎

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