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## SERVICE MANUAL

# LCD Color Television

**32AV933N**      Ver. 1.00

### Updating history

Currently there are no updates available.  
Please check back at a later time for any future updates.

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## 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.

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## 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.

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## SAFETY INSTRUCTION

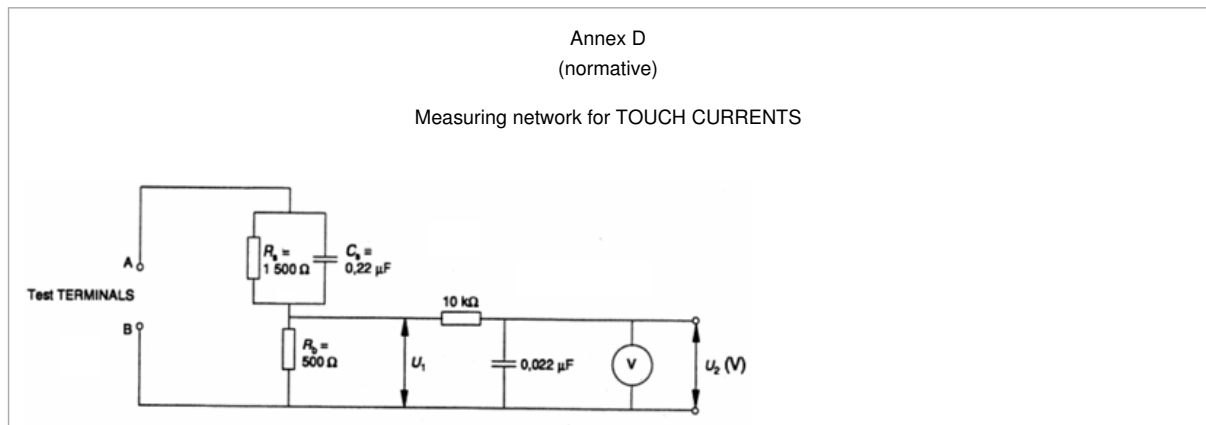
**WARNING:** BEFORE SERVICING THIS CHASSIS, READ THE "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" INSTRUCTIONS BELOW.

### Safety Precaution

**WARNING:** SERVICING 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.

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. Always disconnect the power plug before any disassembling of the product. It may result in electrical shock.
3. 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.
4. Always keep tools, components of the product, etc away from the children, These items may cause injury to children.
5. Depending on the model, use an isolation transformer or wear suitable 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 require special 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 indicated in the circuit diagram or parts list.

7. Parts mounting and routing dressing of wirings should be the same as that used originally. For safety purposes, insulating materials such as isolation tube or tape are sometimes used and printed circuit boards are sometimes mounted floating. Also make sure that wirings is routed and clamped to avoid parts that generate heat and which use high voltage. Always follow the manufactured wiring routes / dressings.
8. Always ensure that all internal wirings are in accordance before re-assembling the external casing after a repairing completed. 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.
10. Touch current check. (After completing the work, measure touch current to prevent an electric shock.)
  - Plug the AC cord directly into the AC outlet. Do NOT use an isolation transformer for this check.
  - Connect a measuring network for touch currents between each exposed metallic part on the set and a good earth ground such as a water pipe.



Resistance values in ohms ( $\Omega$ ).

IEC 60990

V: Voltmeter or oscilloscope  
(r.m.s. or peak reading)

Input resistance :  $\geq 1 \text{ M}\Omega$

Input capacitance :  $\leq 200 \text{ pF}$

Frequency range : 15 Hz to 1 MHz and d.c. respectively

**Note:** Appropriate measures should be taken to obtain the correct value in case of non sinusoidal waveforms.

The measuring instrument is calibrated by comparing the frequency factor of  $U_2$  with the solid line in figure F.2 of IEC 60990 at various frequencies. A calibration curve is constructed showing the deviation of  $U_2$  from the ideal curve as a function of frequency.

TOUCH CURRENT =  $U_2 / 500$  (peak value).

- The potential at any point (TOUCH CURRENT) expressed as voltage  $U_1$  and  $U_2$  does not exceed the following value:

The part or contact of a TERMINAL is not HAZARDOUS LIVE if:

- a) The open-circuit voltage should not exceed 35 V (peak) a.c. or 60 V d.c. or, if a) is not met.
- b) The measurement of the TOUCH CURRENT shall be carried out in accordance with IEC 60990, with the measuring network described in **Annex D** of this standard.

The TOUCH CURRENT expressed as voltages  $U_1$  and  $U_2$  does not exceed the following values:

- for a.c. :  $U_1 = 35 \text{ V}$  (peak) and  $U_2 = 0.35 \text{ V}$  (peak);

- for d.c. :  $U_1 = 1.0 \text{ V}$

**Note:** The limit values of  $U_2 = 0.35 \text{ V}$  (peak) for a.c. and  $U_1 = 1.0 \text{ V}$  for d.c. correspond to the values 0.7 mA (peak) a.c. and 2.0 mA d.c.



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## SAFETY INSTRUCTION

### Product Safety Notice

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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 electrical shock, fire, or other hazards.

## SAFETY INSTRUCTION

### Handling the LCD Module

#### Safety Precaution

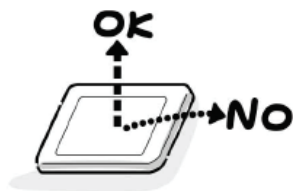
In the event that the screen is damaged or the liquid crystal (fluid) leaks, do not breathe in or drink this fluid. Also, never touch this fluid. Such actions could cause toxicity or skin irritation. If this fluid should enter the mouth, rinse the mouth thoroughly with water. If the fluid should contact 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

**CAUTION: The metal edges of the LCD module are sharp, handle it with care.**

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.



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 soiled, 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.



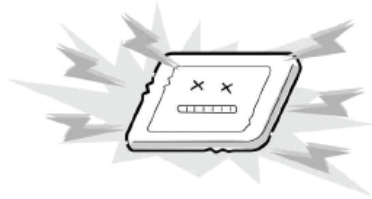
4. Leaving water or other fluids on the panel screen for an extended period of time can result in discoloration or stripes. Immediately remove any type of fluid from the screen.



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.

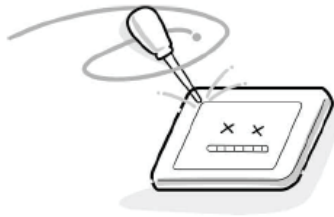


8. Do not store the LCD module below the temperature conditions described in the specifications. Failure to do so could result in freezing of the

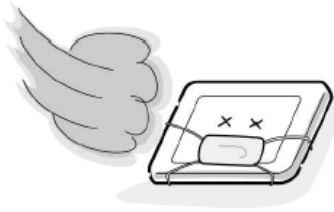
liquid crystal due to cold air or loss of resilience or other damage.



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

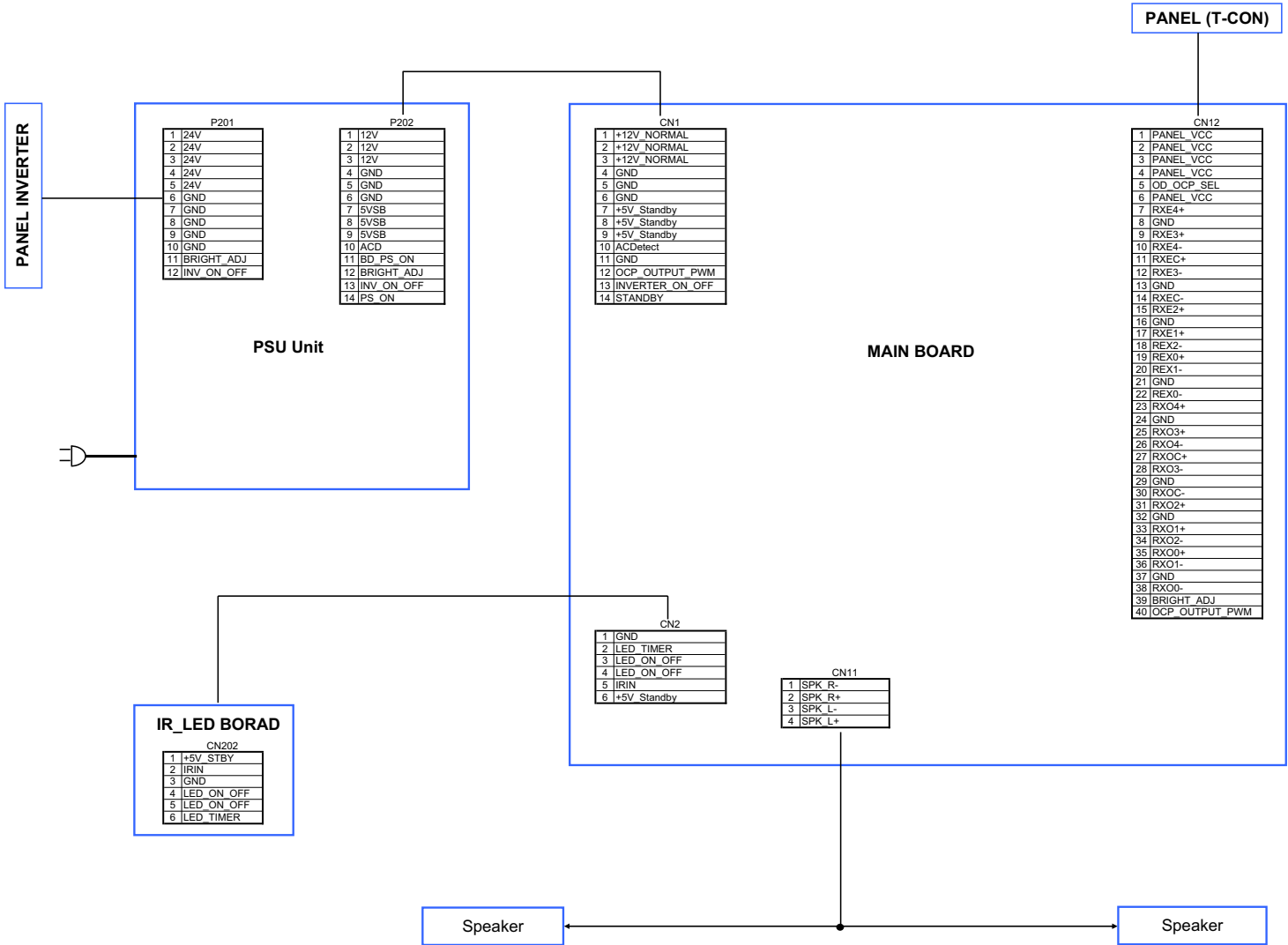


10. When transporting the LCD module, do not use packing containing epoxy resin (amine) or silicon resin (alcohol or oxim). The gas generated by these materials can cause loss of polarity.



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## TROUBLESHOOTING GUIDE

UNDER CONSTRUCTION

**Note:** Please check back in the future.

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## FIRMWARE UPDATING PROCEDURE

### Firmware Upgrade - USB

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USB upgrade flow

1. Firmware upgrade.  
Copy a Firmware BIN file to USB disk (root directory) with FAT 32.  
For example the naming as below.  
xx\_xV\_xL\_DB\_933x\_022\_REV00.bin, shall have difference version of firmware number show on red.
2. Plug USB disk into TV USB port.
3. IR key MENU → SETUP → Software Upgrade → USB Upgrade.  
During F/W upgrade will display percent on the screen when is finished will shown a message on LCD screen then unplug USB disk. TV will auto reset and power on again.

**Note:**

Not allow copy more then 1 versions of firmware in USB disk.



## MODEL ID and PANEL ID

### Panel ID in Global Serial No.

Total digits	YWK	Model ID	SERIAL	Panel ID
Max 14	YWK	xxx	*****	**
	<u>3 digits</u>	<u>3 digits</u>	<u>6 digits</u>	<u>2digits</u>
			(A00001~Z99999)	

### YWK

Y : Year	8	2008
	9	2009
	A	2010
	B	2011
	C	2012
	.	.
	.	.

WK : Week	01	WK01
	02	WK02
	03	WK03
	04	WK04

53  
 WK53

#### Model/Panel Information

Model	Model ID	Panel ID	Panel
19EL933RB	K86	L1	LC185EXE-TEA1
19EL934RB	K87	L1	LC185EXE-TEA1
23EL933RK	L22	K1	LTM230HT10
23EL934RK	L23	K1	LTM230HT10
26EL933B	K90	L1	LC260EXN-SDA3
26EL933G	K91	L1	LC260EXN-SDA3
26EL933RB	K93	L1	LC260EXN-SDA3
26EL934G	K94	L1	LC260EXN-SDA3
32EL933B	L27	L1	LC320EXN-SEA1
32EL933G	K96	L1	LC320EXN-SEA1
32EL933N	K98	L1	LC320EXN-SEA1
32EL933RB	K99	L1	LC320EXN-SEA1
32EL934G	L01	L1	LC320EXN-SEA1
32EL934RB	L02	L1	LC320EXN-SEA1
32HL933B	L17	K1	LTA320HN03

32HL933G	L16	K1	LTA320HN03
32HL933N	L30	K1	LTA320HN03
32HL933RK	L18	K1	LTA320HN03
40HL933B	L20	K1	LTA400HM22
40HL933G	L19	K1	LTA400HM22
40HL933N	L31	K1	LTA400HM22
40HL933RK	L21	K1	LTA400HM22

Model	Model ID	Panel ID	Panel
32AV933G	L03	L1	LC320WXN-SCC1
		K1	LTA320AP05-D
32AV933N	L28	L1	LC320WXN-SCC1
		K1	LTA320AP05-D
32AV933RB	L05	L1	LC320WXN-SCC1
		K1	LTA320AP05-D
32AV934G	L06	L1	LC320WXN-SCC1
		K1	LTA320AP05-D
32AV934RB	L07	L1	LC320WXN-SCC1
		K1	LTA320AP05-D
32LV933G	L08	A1	T315HW04 V4(REV.6)
32LV933N	L10	A1	T315HW04 V4(REV.6)
32LV933RB	L11	A1	T315HW04 V4(REV.6)
		K1	LTA400HM01-R

40LV933G	L12	C1	V400HJ2-L01
40LV933N	L29	K1	LTA400HM01-R
40LV933RB	L14	C1	V400HJ2-L01

---

#### Panel vendor Information (Panel ID)

Marking	Panel Vendor	Marking	Panel Vendor	Marking	Panel Vendor
A	AUO	J		S	SHARP
B		K	SAMSUNG	T	
C	CMO	L	LPL/LGD	U	
D		M		V	
E		N		W	
F		P	CPT	X	
G		Q		Y	
H	IPS	R		Z	

When the panel version is updated within the same panel vender, the last digit will be incremented by 1.

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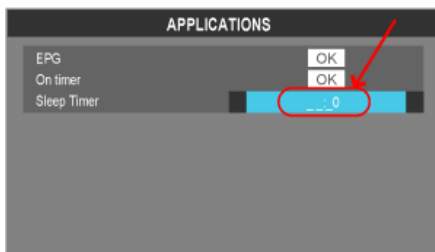
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## DESTINATION SETTING CHANGE

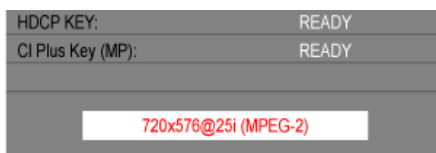
Whenever replacing the Main PCB with new one, perform this procedure.

1. IR Key MENU → APPLICATIONS → Sleep Timer → OK.
2. When display \_\_ : \_\_ 0 input 4 numbers 2766.

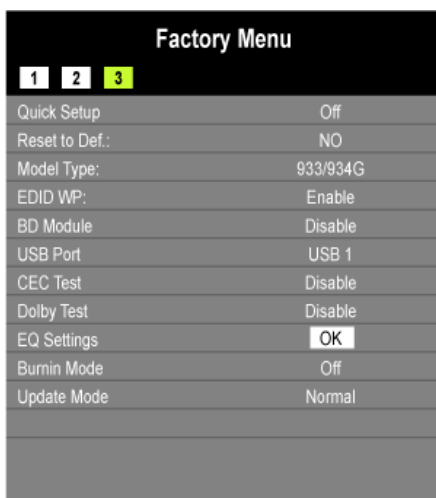


The Factory menu will display.

Factory Menu		
1	2	3
Brand:	TOSHIBA	
Model Name:	32LV933/934G	
Scaler:	MST3704	
Panel Type:	AUO T315HW04-V406	
PM Code:	Unknow	
F/W Version:	v0.24 (PR)	
Date:	Feb 17 2012, 10:25:17	
Backlight Time:	8 hrs	
Total Time:	9 hrs	



3. Move to Tag "3" by Right/Left Arrow key on the Remote.
4. Select "Model Type" cell.

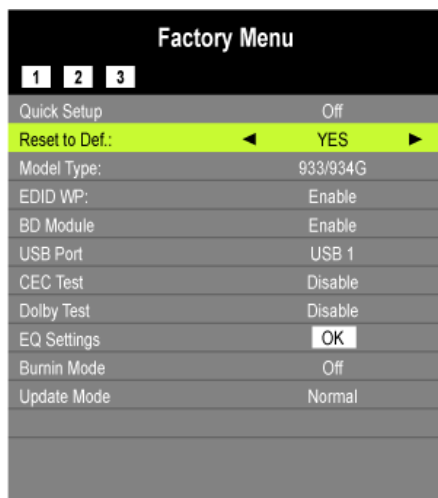


5. Select the appropriate model type by Right/Left Arrow key on the Remote. Model type is written on the rating label.





6. Select "Reset to Def".
7. Select "Yes" and press "OK" button on the Remote.




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## PARTS LIST

### Precaution

**WARNING:** BEFORE SERVICING THIS CHASSIS, READ THE "[SAFETY PRECAUTION](#)" AND "[PRODUCT SAFETY NOTICE](#)".

**CAUTION:** The international hazard symbols "" in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list.

The mounting position of replacements is to be identical with originals.

Before replacing any of these components, read carefully the "[SAFETY PRECAUTION](#)" AND "[PRODUCT SAFETY NOTICE](#)".

Do not degrade the safety of the receiver through improper servicing.

### Note:

- The part number must be used when ordering parts, in order to assist in processing, be sure to include the Model number and Description.
- The PC board assembly with \* mark is no longer available after the end of the production.

### Abbreviations

Capacitors CD : Ceramic Disk

Resistors CF : Carbon film  
OMF : Oxide Metal Film

PF : Plastic Film  
CC : Carbon Composition  
VR : Variable Resistor  
EL : Electrolytic  
MF : Metal Film  
FR : Fusible Resistor

All CD and PF capacitors are  $\pm 5\%$ , 50 V and all resistor,  $\pm 5\%$ , 1/6 W unless otherwise noted.

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## PARTS LIST

### Updating history

Currently there are no updates available.  
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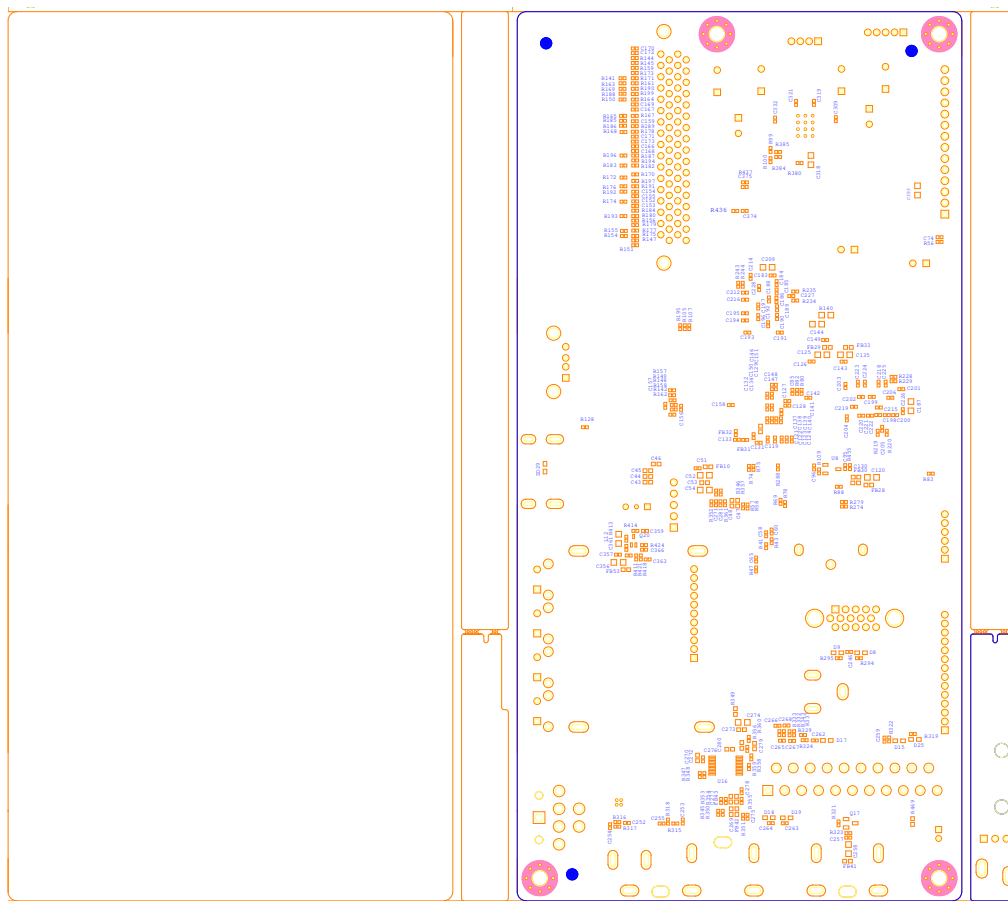
	Location	Parts No.	Description
	E200	75030330	PC BOARD ASSY, MAIN, 9C-EB40M00U0
	E250	75030266	PC BOARD ASSY, POWER, 0433-006T000
	E270	75030142	IR BOARD ASSY, 90-EB40S02X0
	E300A	75019248	LCD PANEL, LC320WXN-SCC1
	E300B	75026720	LCD PANEL, LTA320AP05-D
	E310A	75030331	LVDS CABLE, 30P-40P 365MM, 1414-071S000
	E310B	75031644	LVDS CABLE, 30P-40P 350MM, 1414-07JV000
	E320	75030269	POWER CORD, 1411-019X000
	E330	75029565	SPEAKER, 40LV933, 04A4-012X000
	E340	75030272	CABLE, SPEAKER, 1419-003Q000
	E342A	75030333	INVERTER CABLE, 14P-12P 275MM, 1414-0724000
	E342B	75031075	INVERTER CABLE, 1410-00AD000
	E344	75030276	CABLE, M/B TO P/B, 1414-072C000
	E346	75030278	CABLE, M/B TO I/R, 1414-078J000
	E400	75014827	REMOCON HAND UNIT, CT-90326
	E410	75031349	OWNERS MANUAL, 1506-0LHM000
	E420	75029590	INSTALLATION MANUAL, 40LV933B, 1506-0KGU000

E100A	75031860	FRONT BEZEL ASSY, 13EB-3DB0111
E100B	75031861	FRONT BEZEL ASSY, 13EB-3DB0P01
E110	75031061	BACK COVER ASSY, 13EB-3DQ0411
E120	75030261	STAND ASSY, 9C-EB40S01H0
E125	75029558	SCREW, FOR STAND, 4MX12MM, 40LV933, 13EB-3DB0801
E130	75030262	KEY PLATE ASSY, 13EB-3DB0501
E500	75031858	CARTON BOX, 1503-04GJ000
E510	75030282	PACKING, TOP RIGHT, 1505-02Q3000
E511	75030284	PACKING, TOP LEFT, 1505-02PT000
E512	75030286	PACKING, BOTTOM RIGHT, 1505-02PY000
E513	75030288	PACKING, BOTTOM LEFT, 1505-02PU000
E520	75031063	EPE BAG, 1516-01VL000
E530	75031348	PE BAG FOR STAND, 1516-01XJ000

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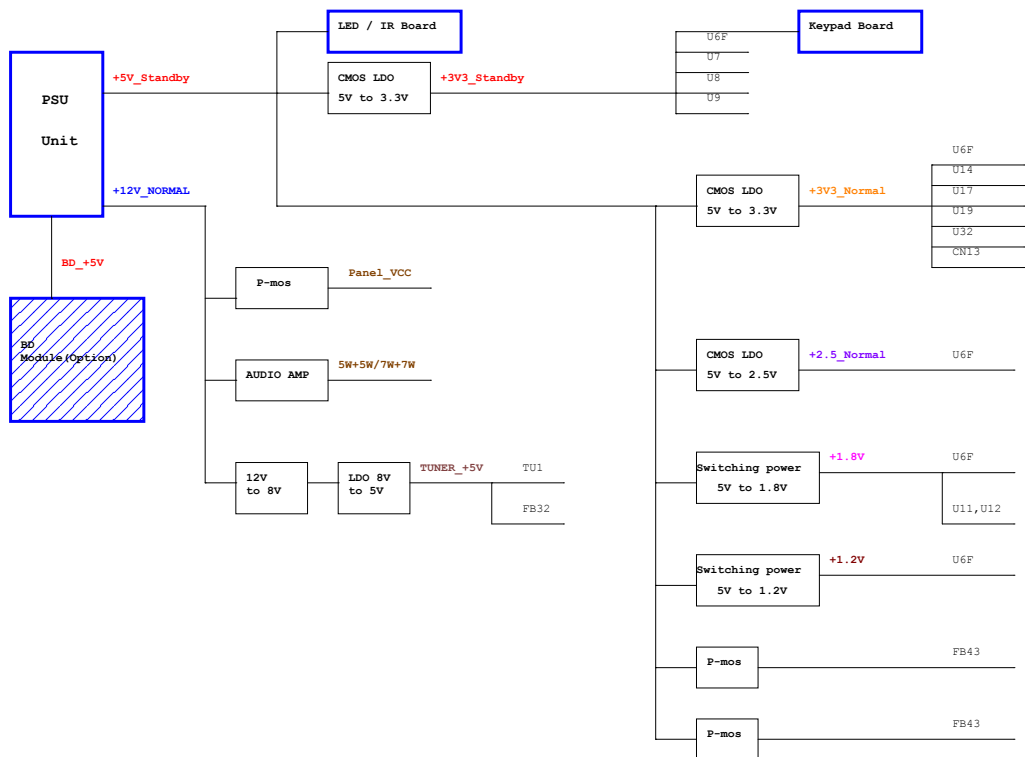
SCHEMATIC Name	SHEET
01.Contents	1
02.Power Budget	2
03.Block Diagram	3
04.DC to DC	4
05.03.MSD701PX-3A3D&USB&AUDIO-IN	5
06.MSD701PX-DDR2&LVDS&GPIO&DVD	6
07.MSD701PX-POWER	7
08.MSD701PX-PCMCIA&TFE	8
09.DDR2	9
10.HDMI	10
11.VGA	11
12.COMPONENT&Side AV	12
13.SCART	13
14.AUDIO AMP&HEADPHONE	14
15.Tuner	15
16.LVDS Interface	16
17.SPDIF OUT	17
18.USB	18

## REVISION HISTORY

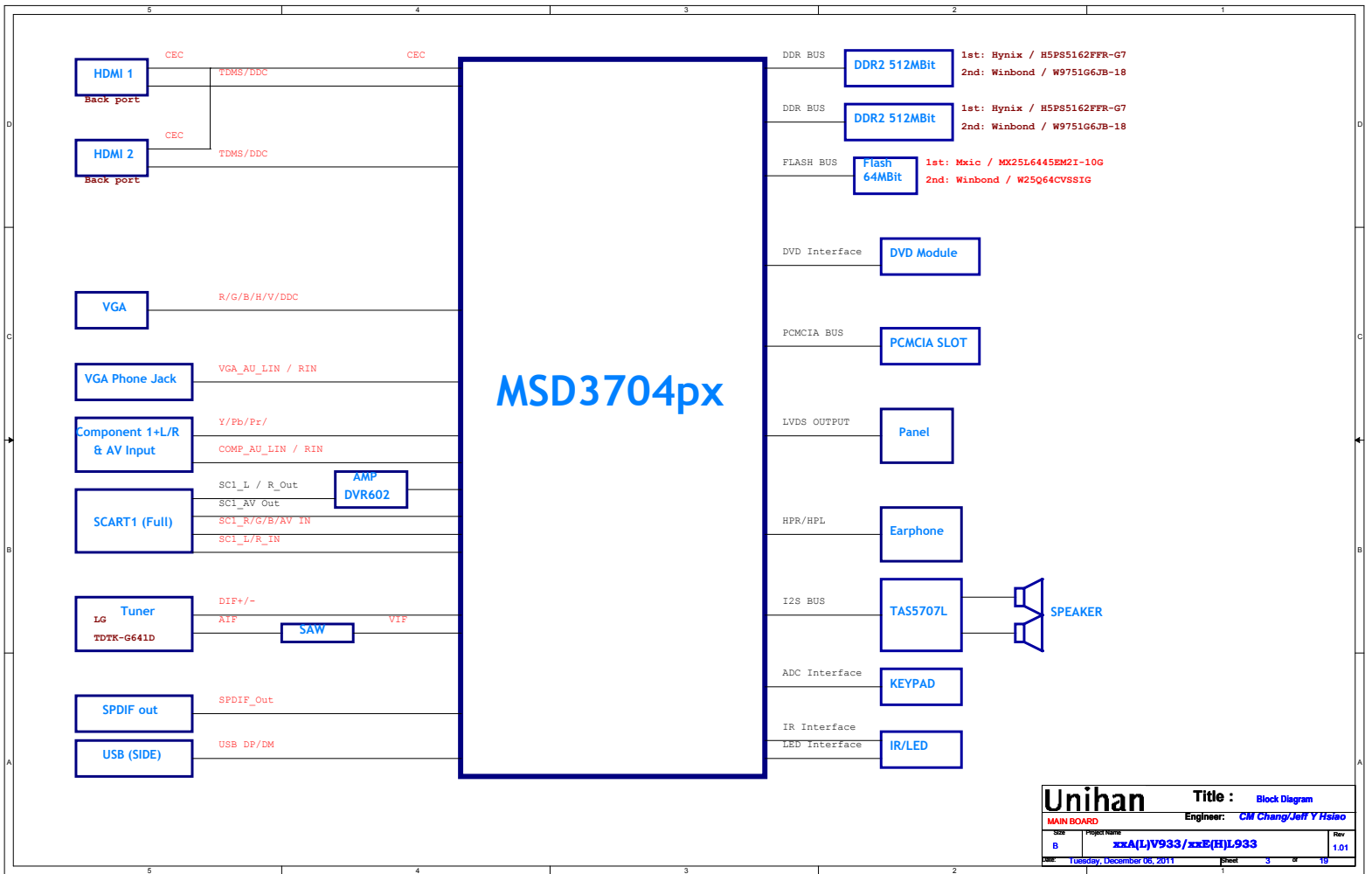
Date	Author	Ver	Comments
2011/09/07	CM/Jason	1.00	For SR stage.

<b>UniHan</b>		Title : Contents&History	
MAIN BOARD		Engineer:	
Size	Project Name		Rev
B	xxA(L)V933/xxB(H)L933		1.01
Date	Tuesday, December 06, 2011	Sheet	1 of 19

# Power Block Diagram



<b>UniHan</b>		Title : Power Budget	
MAIN BOARD		Engineer: CM Chang/Jeff Y Hsiao	
Size	Project Name		Rev
B	xxA(L)V933/xxB(H)L933		1.01
Date	Tuesday, December 06, 2011	Sheet	2 of 13



Unihan		Title : Block Diagram	
MAIN BOARD		Engineer: CM Chang/Jeff Y Hsiao	
Size	Project Name	Rev	
B	xxA(L)V933/xxB(H)L933	1.01	
Date	1/20/2011	Sheet	3 of 13

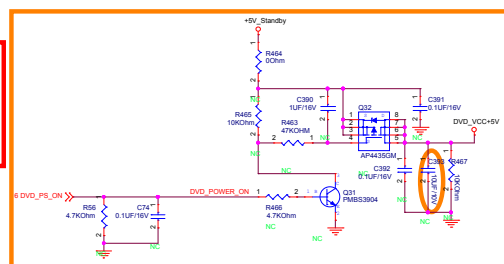
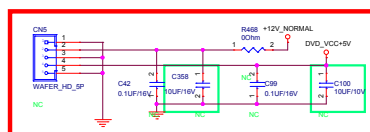
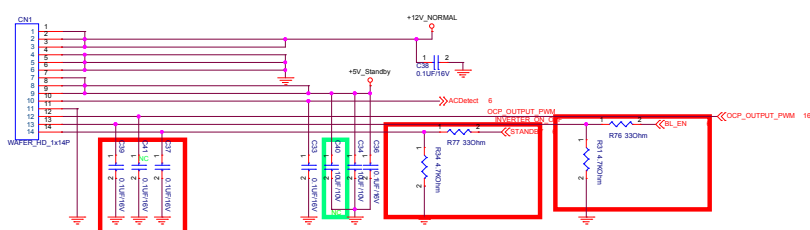
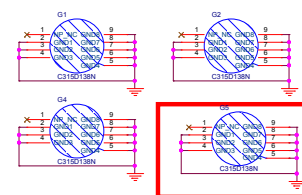
output voltage = 3.36V

The diagram shows a voltage divider circuit using an LTC4380. The input voltage is +5V\_Standby. The output voltage is 1.32V. The circuit includes a 100k resistor, a 300k resistor, and a 10k resistor. The LTC4380 is configured with its VIN pin to the input, its EN pin to ground, and its FOUT pin to the output. The output voltage is 1.32V.

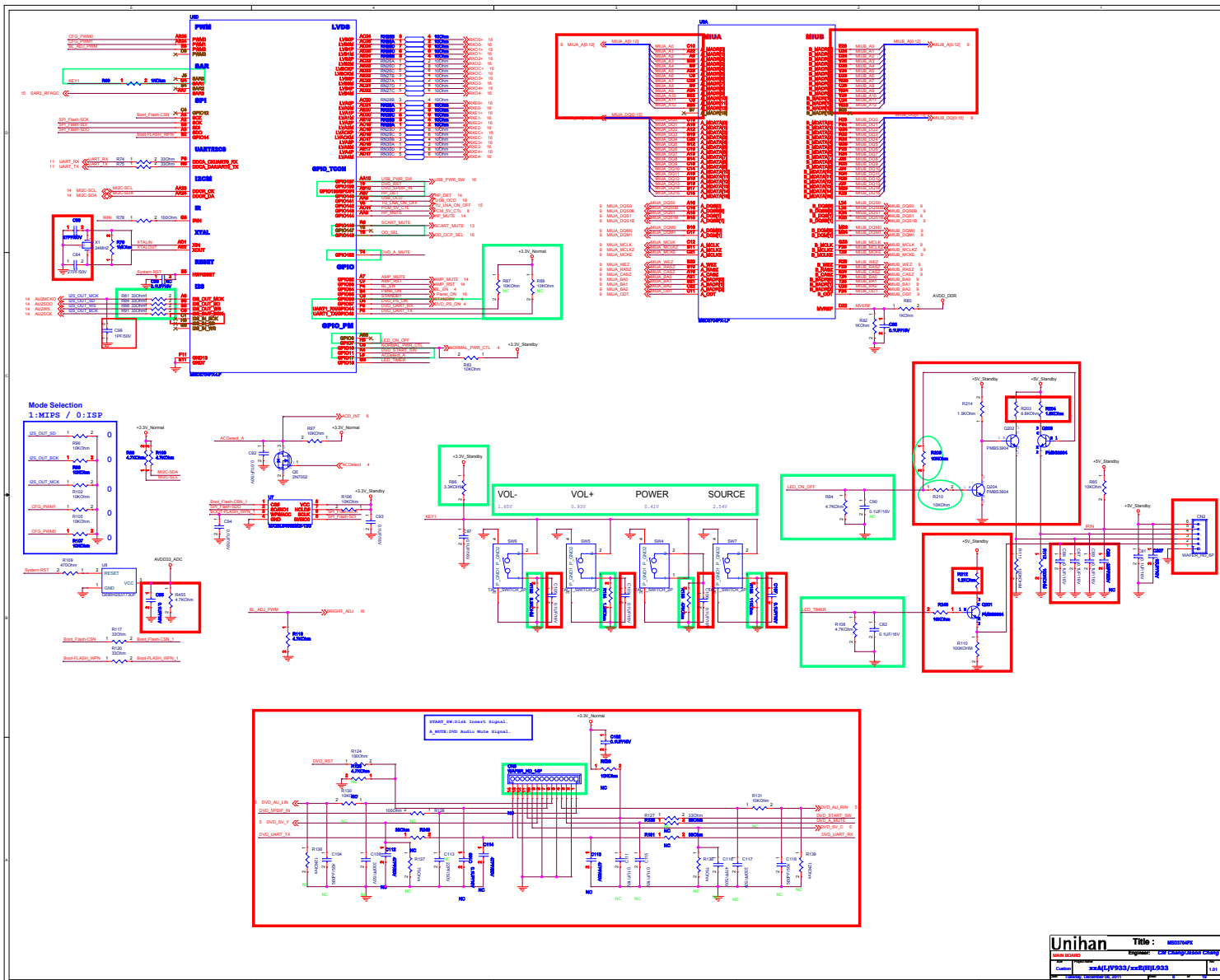
The diagram shows a voltage divider circuit. A +5V Standby input is connected to a network of resistors (C10, C17, R6, R7, C20) and a 2.2V reference. This network is connected to the VDN pin of an RT5090-05 voltage divider. The RT5090-05 is also connected to a +3.3V Normal input. The output of the RT5090-05 is connected to the L2 pin of an LM317HV adjustable regulator. The LM317HV is configured with its ADJ pin to ground and its OUT pin to the output. The output voltage is 1.80V. A 100mA current limit is indicated.

output voltage = 3.36V

output voltage = 2.52V

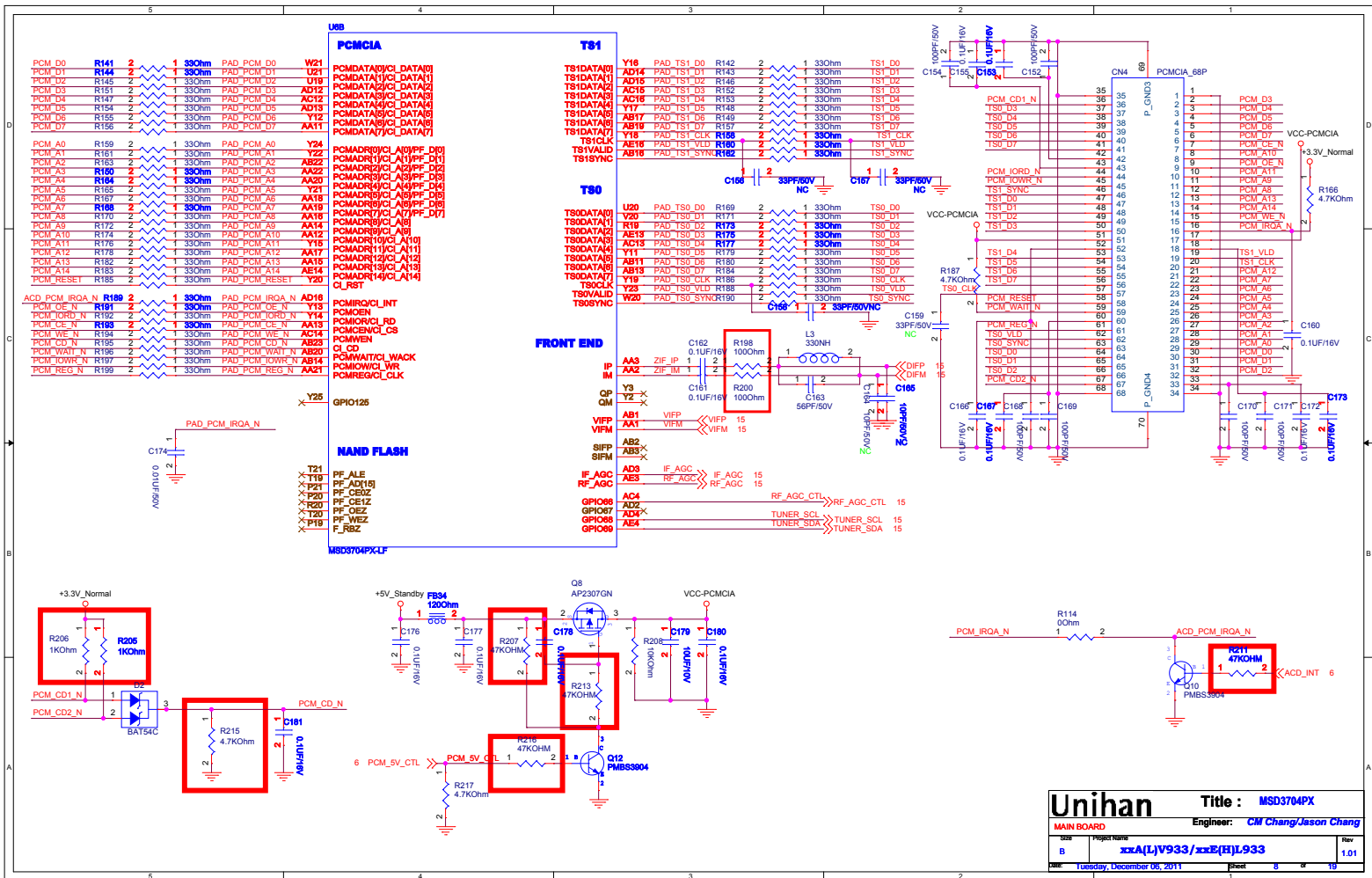






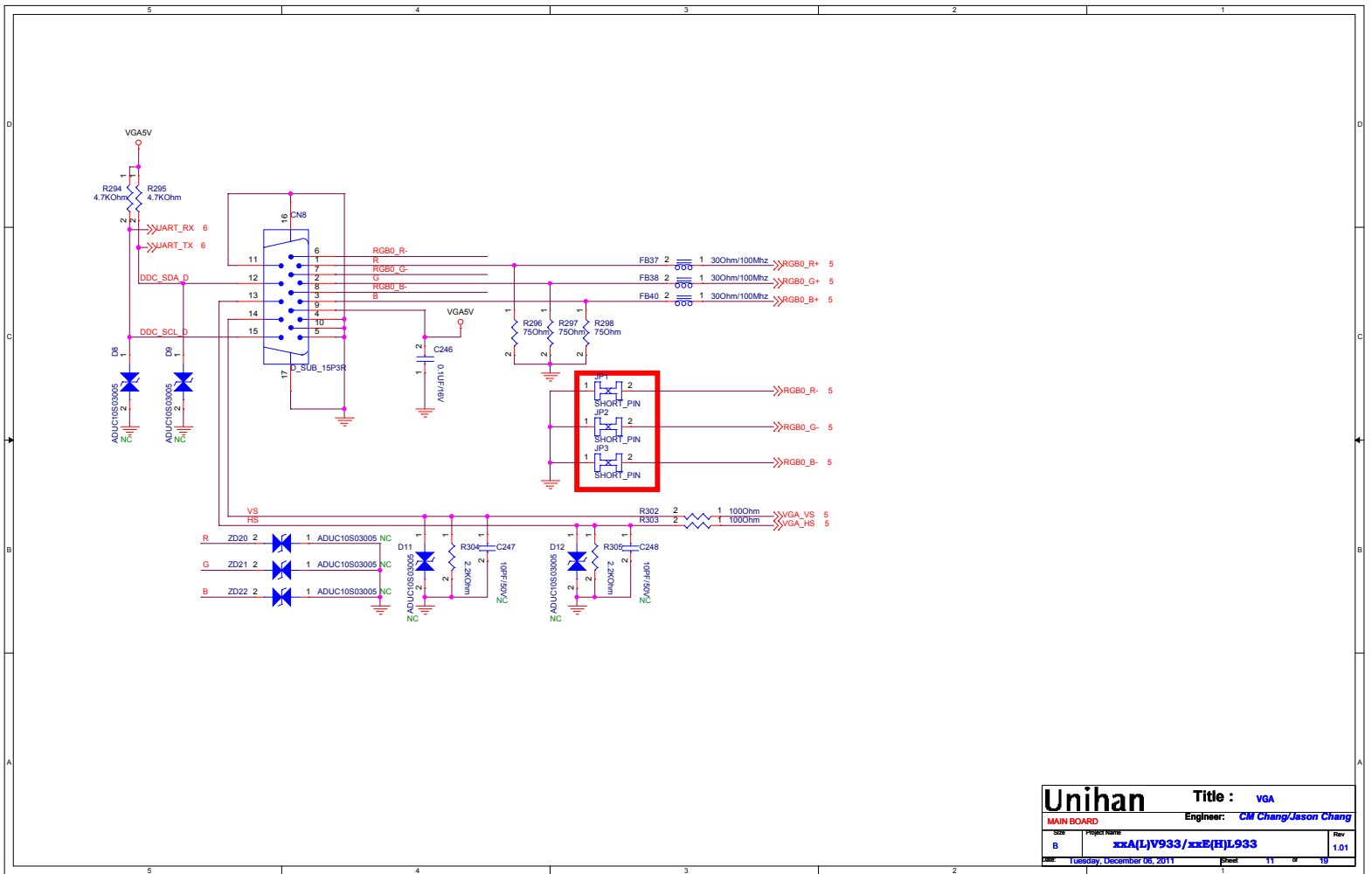






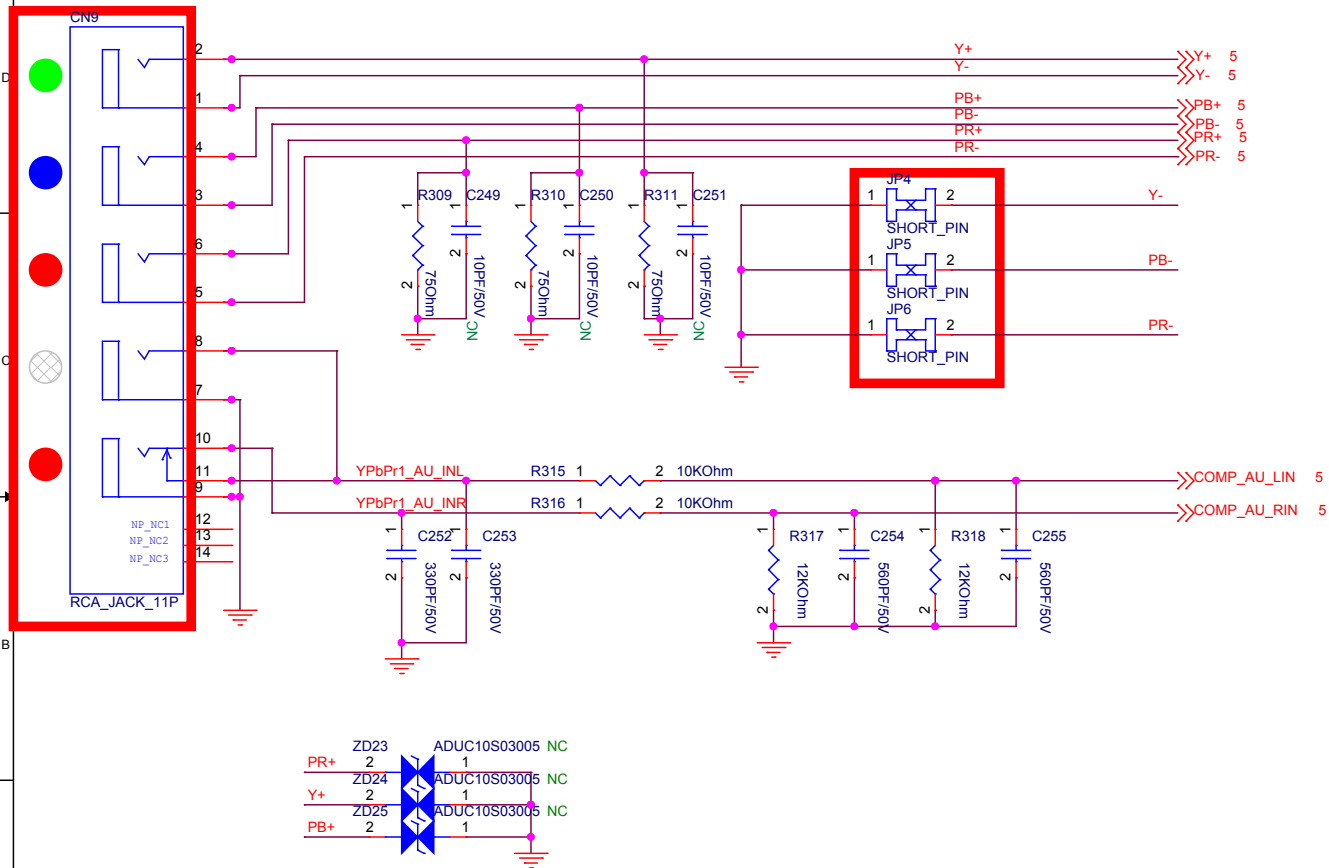






<b>UniHan</b>		Title : <b>VGA</b>	
MAIN BOARD		Engineer: <b>CM Chang/Jason Chang</b>	
Size	Project Name		Rev
B	<b>xxA(L)V933/xxB(H)L933</b>		1.01
Date	Tuesday, December 06, 2011	Sheet	11 of 13

### COMPONENT (Y Mix CVBS Input)



# Unihan

**Title :** COMPONENT& CVBS

Engineer: **CM Chang/Jason Chang**

**MAIN BOARD**

Size	Project Name
------	--------------

A

Project Name
--------------

xxA(L)V933/xxE(H)L933

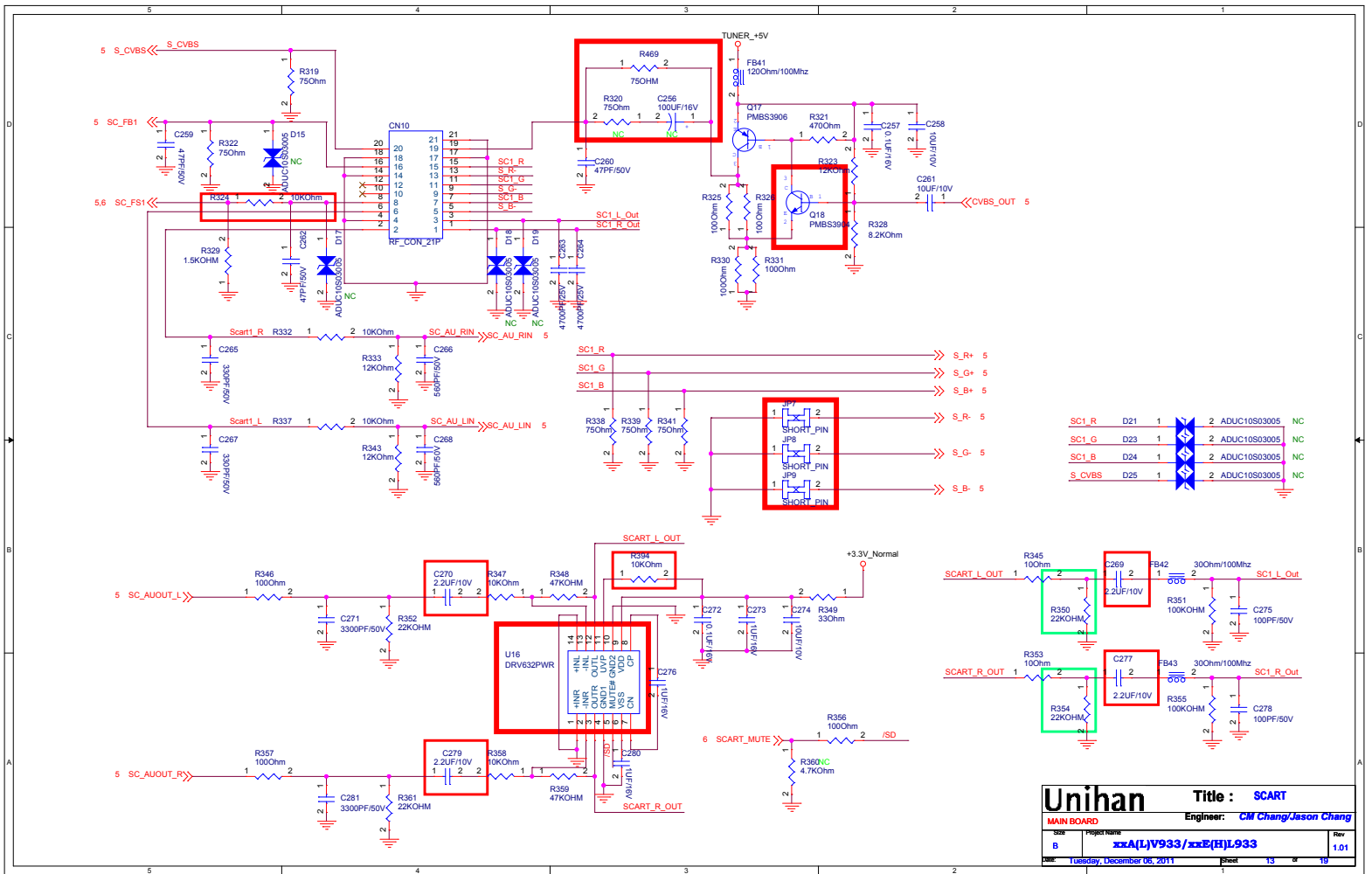
Rev
-----

1.01

Date: Tuesday, December 06, 2011

Sheet 12 of 19

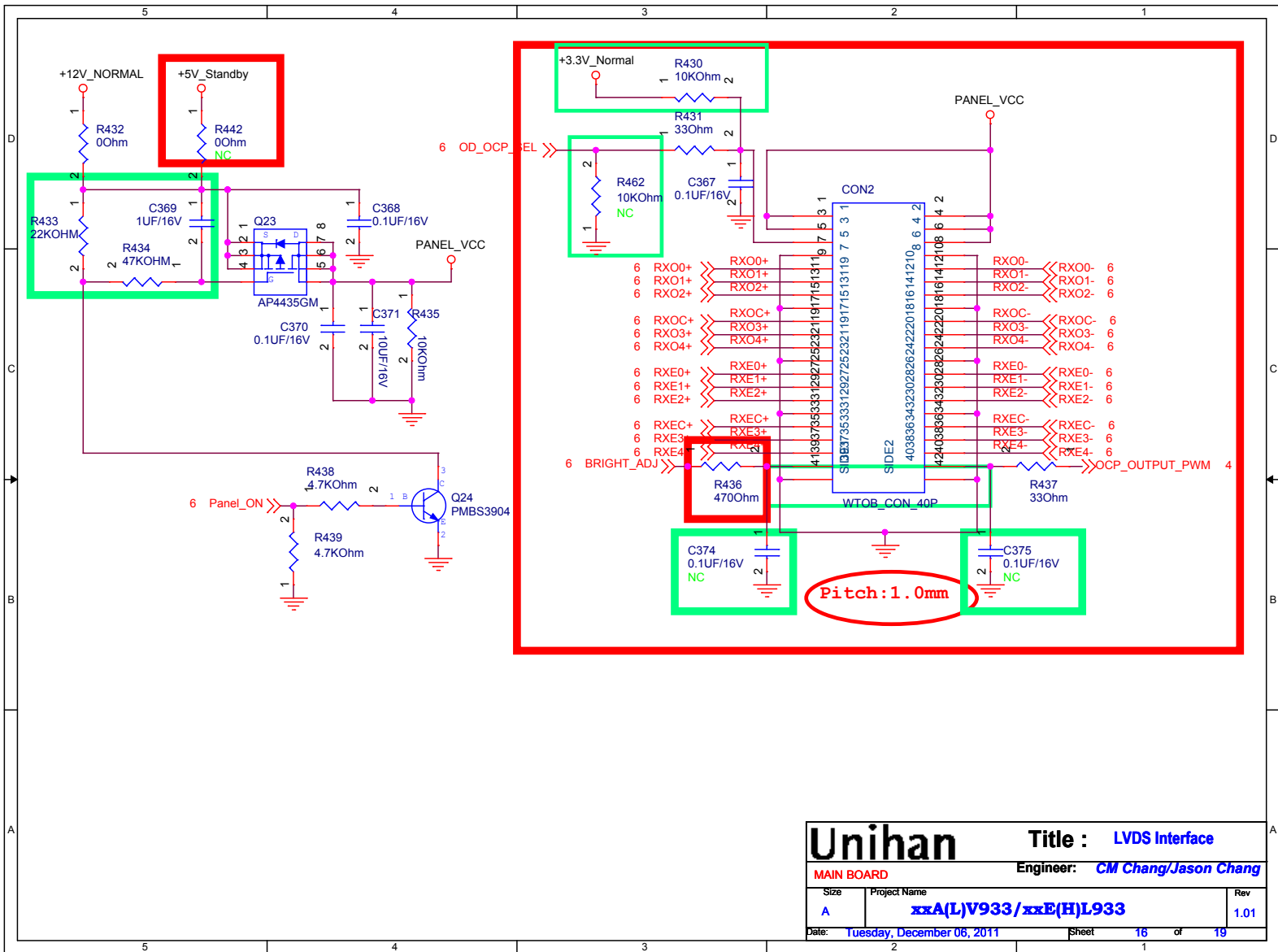
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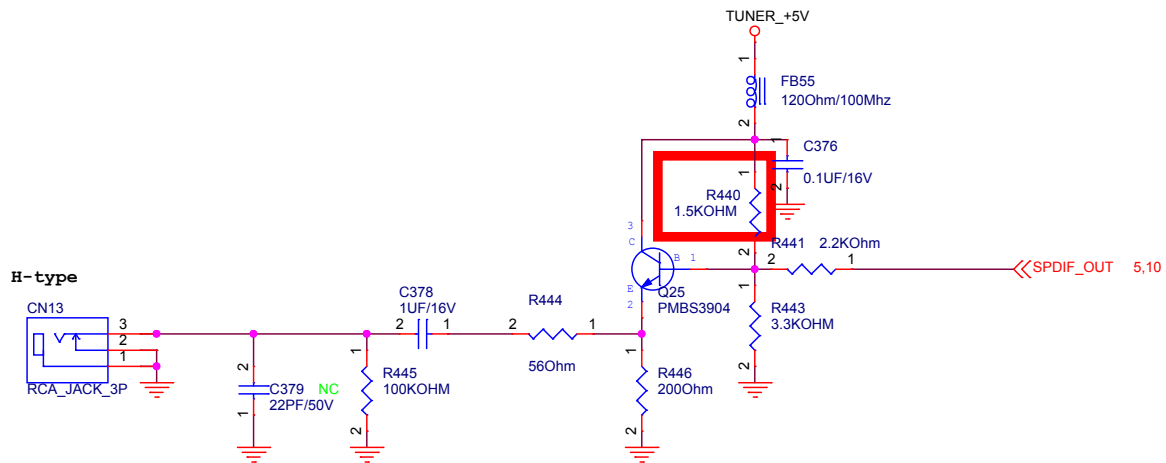




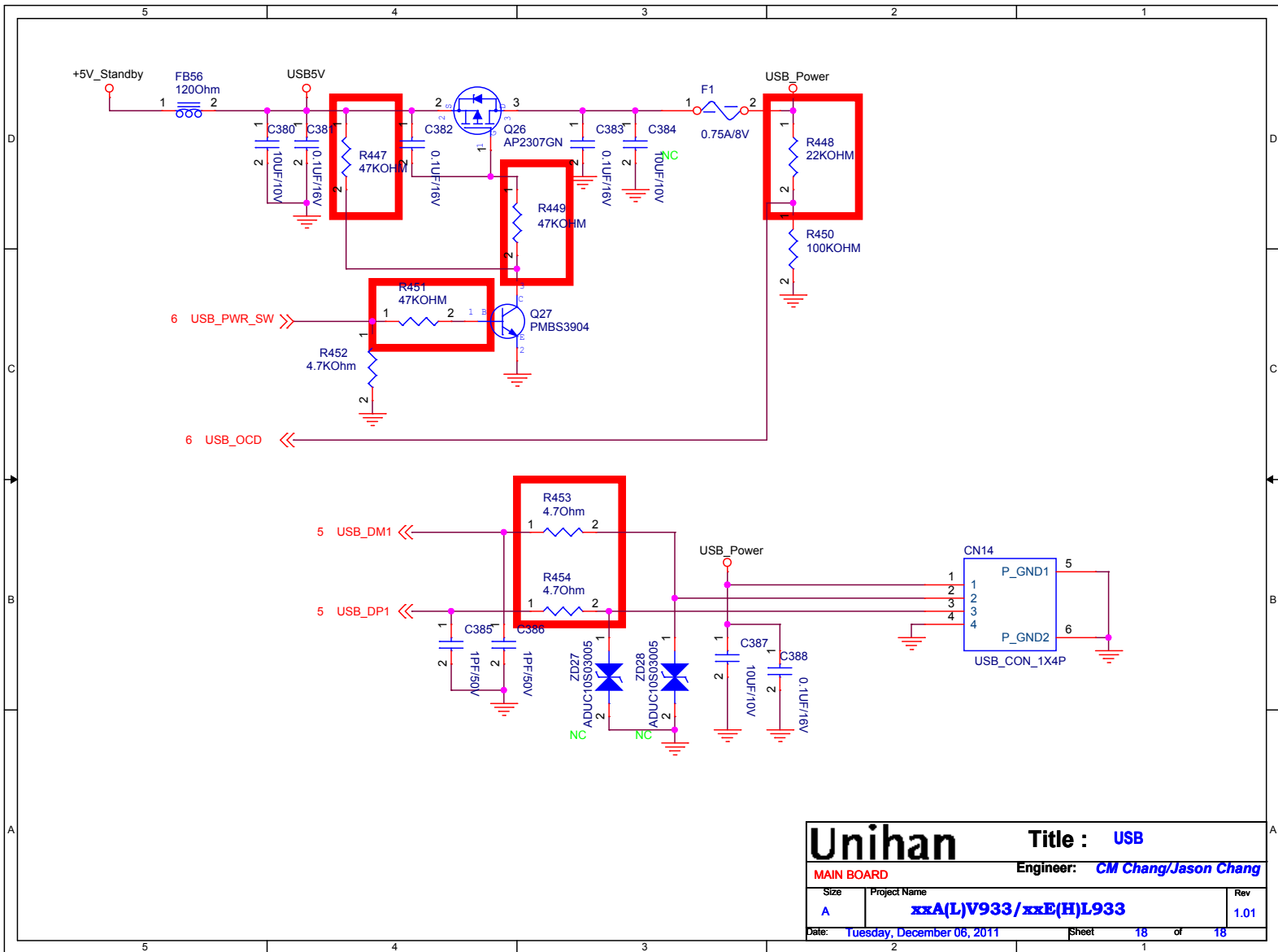


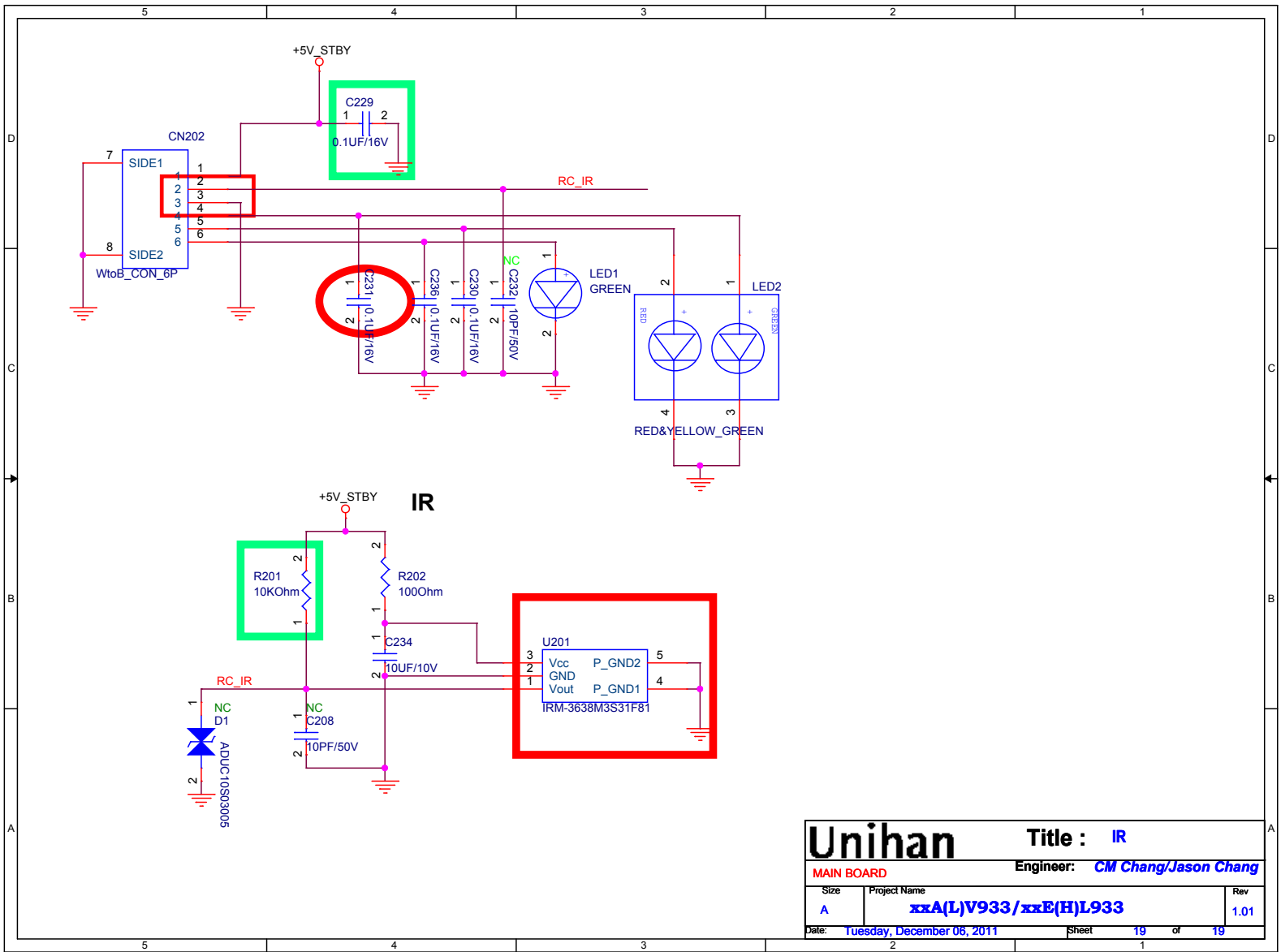


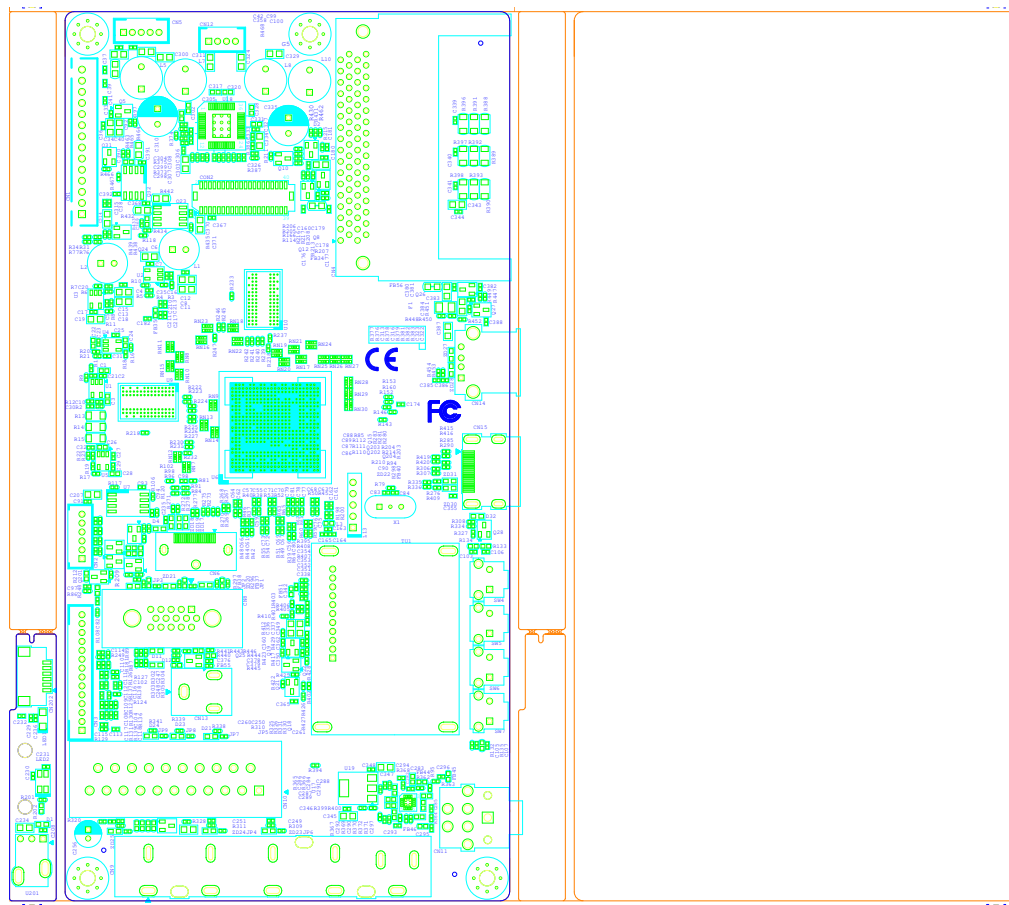


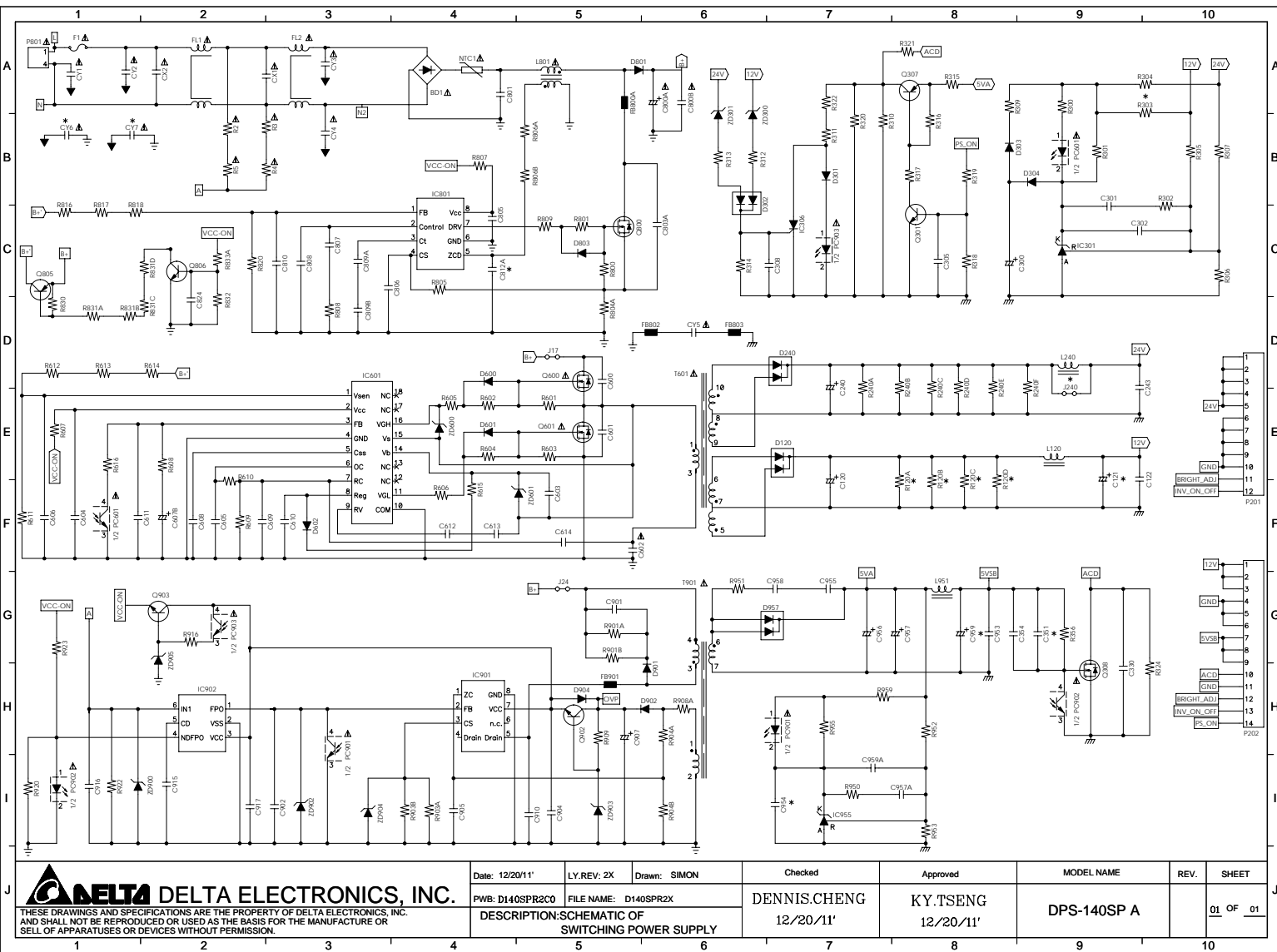


<b>UniHan</b>		Title : <b>SPDIF OUT</b>	
MAIN BOARD		Engineer: <b>CM Chang/Jason Chang</b>	
Size <b>A</b>	Project Name <b>xxA(L)V933/xxE(H)L933</b>		Rev <b>1.01</b>
Date: <b>Tuesday, December 06, 2011</b>		Sheet <b>17</b> of <b>18</b>	





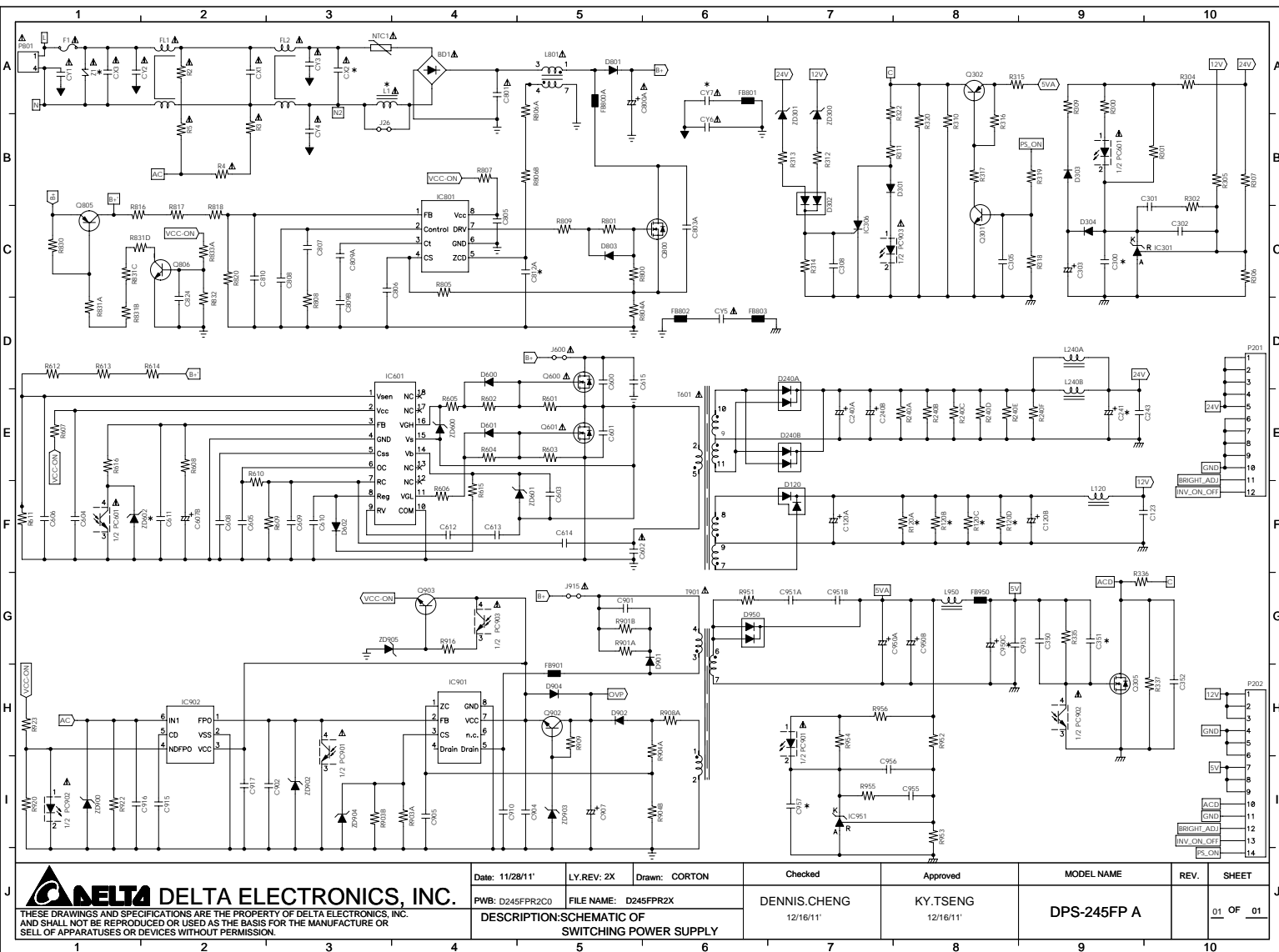




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Date: 12/20/11	LY.REV: 2X	Drawn: SIMON	Checked	Approved	MODEL NAME	REV.	SHEET
PWB: D140SPR2C0	FILE NAME: D140SPR2X		DENNIS.CHENG	KY.TSENG	DPS-140SP A	01	OF 01
DESCRIPTION: SCHEMATIC OF SWITCHING POWER SUPPLY			12/20/11	12/20/11			

Frame Name: DF-SCA2H-1R01.SCH



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 SELL OF APPARATUS OR DEVICES WITHOUT PERMISSION.

Date: 11/28/11	LY.REV: 2X	Drawn: CORTON	Checked	Approved	MODEL NAME	REV.	SHEET
PWB: D245FPR2C0	FILE NAME: D245FPR2X		DENNIS.CHENG	KY.TSENG	DPS-245FP A		01 OF 01
DESCRIPTION: SCHEMATIC OF SWITCHING POWER SUPPLY			12/16/11	12/16/11			

Frame Name:DF-SCA2H-1R01.SCH