

***SP716***

***SP916***

***Service Manual***

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# WARNING

To prevent from fire or shock hazard,do not expose monitor to any rain or any form of water.High voltage is inside the monitor so please do not remove the back cover of the cabinet if you are not a qualified monitor engineer.Contact the local dealer or the nearest **Proview** branch office if you need help.

## A. IMPORTANT SAFETY INSTRUCTION

Prior to using this service manual,please ensure that you have carefully followed all the procedures outlined in the user's manual for this product.

1. Read all of these instructions.
2. Save these instructions.
3. Follow all warnings and instructions marked on the product.
4. Unplug this product from the wall outlet before cleaning.Do not use liquid cleaner or aerosol cleaner, use a damp cloth for cleaning.
5. Do not use this product near water.
6. Do not place this product on an unstable cart,stand or table.The product may fall,causing serious damage to the product.
7. Slots and openings in the cabinet and the back or bottom are provided for ventilation,to ensure reliable operation of the product and to protect it from overheating.Those openings must not be blocked or covered.The openings should never be blocked by placing the product on a bed,sofa, rug, or other similar surface.This product should not be placed in a built-in installation,since proper ventilation is provided.
8. This products should be operated with the type of power source indicated on the marked label. If you are not sure of the type of power is available, consult with your dealer or local power company.
9. This product is equipped with a 3-wire grounding type plug,a plug having a third (grounding) pin.This plug will only fit into a grounding-type power outlet.This is a safety feature.If you are unable to insert the plug into the outlet,contact your electrician to replace your obsolete outlet.Do not damage the purpose of the grounding-type plug.
10. Do not allow anything to rest on the power cord.Do not locate this product where persons will walk on the cord.
11. Never push any kinds of objects into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock.Never spill any kinds of liquid on the product.
12. Do not attempt to service this product yourself,as opening or removing covers may expose you to dangerous voltage points or other risk.Refer all servicing to service personnel.
13. Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions.
  - a. When the power cord or plug is damaged or frayed.
  - b. If liquid has been spilled into the product.
  - c. If the product has been exposed to rain or water.
  - d. If the product does not operate normally,when the operating instructions are followed.Adjust only those controls involved in the operating instructions ,since improper adjustment of other controls may result in damage and will often require extra work by a qualified technician to restore the product to normal operation.
  - e. If the product has been dropped or the cabinet has been damaged.
  - f. If the product exhibits a distinct change in performance,indicating a need for service.

## B. SPECIFICATIONS

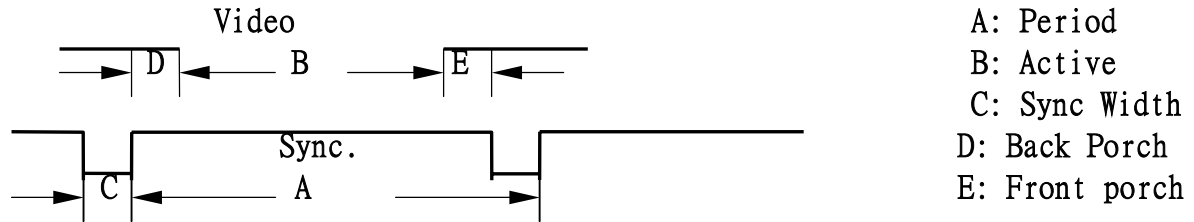
### SP716

<b>Panel General Specification</b>																
Screen Diagonal	17" TFT															
Model Name	<b>CMO M170E5-P01</b>															
Active Display Area	337.92(H) × 270.34(V) mm															
Pixel Pitch	0.264(H) × 0.264(V) mm															
Number of Colors	16.2M colors															
View Angle																
Horizontal	+/-70 degree															
Vertical	+/-60 degree Typical															
Luminance of White	250cd/m <sup>2</sup> (Min.)															
Contrast Ratio (Typical)	450:1															
Maximum Resolution	1280 x 1024 @ 75Hz															
Recommend Resolution	1280 x 1024 @ 75Hz															
Synchronization Range																
Horizontal	30 – 80 KHz															
Vertical	60– 75 Hz															
Pixel Rate	135 MHz															
User Control	5 Key Switch															
OSD Function	Auto, Brightness, Contrast, H-position, V-position, H-size, Phase, Reset, Color selection (R, G, B, cool, warm), OSD , Language, Exit.															
Power Source	90 – 264 Vac 60 / 50 Hz															
Power Consumption	48 W (max.)															
Connection Type	15 Pin D-Sub Type;															
Input Signal																
Video	D-Sub: Analog R.G.B. , 0.7Vp-p / 75 Ohms															
Sync.	TTL level, positive or negative polarity															
Color Temperature	Cool / Warm / user mode															
Dimension (WxHxD)	378.4x382x192 (mm)															
Monitor Weight	3.8 kg															
Base Operation																
Tilt	-5 / + 15 degree															
Power Saving																
ON	< 48W															
STAND BY	< 3W															
OFF	< 3W															
Signal Connector Pin Assignment																
D-SUB Pin No.	<table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">1. Red Video</td> <td style="width: 33%;">6. Red Ground</td> <td style="width: 33%;">11. GND</td> </tr> <tr> <td>2.Green Video</td> <td>7. Green Ground</td> <td>12. SDA For DDC2B</td> </tr> <tr> <td>3.Blue Video</td> <td>8. Blue Ground</td> <td>13. H-sync.</td> </tr> <tr> <td>4.GND</td> <td>9. VGA +5V</td> <td>14. V-sync-DDC1</td> </tr> <tr> <td>5.Self Test</td> <td>10. Sync. GND</td> <td>15. SCL For DDC2B</td> </tr> </table>	1. Red Video	6. Red Ground	11. GND	2.Green Video	7. Green Ground	12. SDA For DDC2B	3.Blue Video	8. Blue Ground	13. H-sync.	4.GND	9. VGA +5V	14. V-sync-DDC1	5.Self Test	10. Sync. GND	15. SCL For DDC2B
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4.GND	9. VGA +5V	14. V-sync-DDC1														
5.Self Test	10. Sync. GND	15. SCL For DDC2B														
Sound Output	No Audio															

# SP916

<b>Panel General Specification</b>																
Panel Model	Hannstar HSD190ME12-A00															
Screen Diagonal	19" TFT															
Active Display Area	376.32mm (H) x 301.056mm (V)															
Pixel Pitch	0.294(H) x 0.294(V) mm															
Number of Colors	16.2M colors															
View Angle																
Horizontal	+/-70 degree															
Vertical	-60/+70 degree Typical															
Luminance of White	250cd/m <sup>2</sup> (Typical)															
Contrast Ratio (Typical)	500:1															
Maximum Resolution	1280 x 1024 @ 75Hz															
Recommend Resolution	1280 x 1024 @ 75Hz															
Synchronization Range																
Horizontal	30 – 80 KHz															
Vertical	60– 75 Hz															
Pixel Rate	135 MHz															
User Control	5 Key Switch															
OSD Function	Auto, Brightness, Contrast, H-position, V-position, H-size, Phase, Reset, Color selection (R, G, B, cool, warm), OSD , Language, Exit.															
Power Source	90 – 264 Vac 60 / 50 Hz															
Power Consumption	50 W (max.)															
Connection Type	15 Pin D-Sub Type;															
Input Signal																
Video	D-Sub: Analog R.G.B. , 0.7Vp-p / 75 Ohms															
Sync.	TTL level,positive or negative polarity															
Color Temperature	Cool / Warm / user mode															
Dimension (WxHxD)	426.4x 417x210 (mm)															
Monitor Weight	4.6 kg															
Base Operation																
Tilt	-5 / + 15 degree															
Power Saving																
ON	< 50W															
STAND BY	< 3W															
OFF	< 3W															
Signal Connector Pin Assignment																
D-SUB Pin No.	<table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">1. Red Video</td> <td style="width: 33%;">6. Red Ground</td> <td style="width: 33%;">11. GND</td> </tr> <tr> <td>2.Green Video</td> <td>7. Green Ground</td> <td>12. SDA For DDC2B</td> </tr> <tr> <td>3.Blue Video</td> <td>8. Blue Ground</td> <td>13. H-sync.</td> </tr> <tr> <td>4.GND</td> <td>9. +5V from PC</td> <td>14. V-sync-DDC1</td> </tr> <tr> <td>5.Self Test</td> <td>10. Sync. GND</td> <td>15. SCL For DDC2B</td> </tr> </table>	1. Red Video	6. Red Ground	11. GND	2.Green Video	7. Green Ground	12. SDA For DDC2B	3.Blue Video	8. Blue Ground	13. H-sync.	4.GND	9. +5V from PC	14. V-sync-DDC1	5.Self Test	10. Sync. GND	15. SCL For DDC2B
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5.Self Test	10. Sync. GND	15. SCL For DDC2B														
Sound Output	No Audio															

## C . TIMING CHART



Preset Modes	VGA 640X400	VGA 640X480	VESA 640X480	VESA 640X480	VGA 720X400	VESA 800X600	VESA 800X600	VESA 800X600
<b>Dot Rate</b>	25.175MHz	25.175MHz	31.500MHz	31.500MHz	28.322MHz	36.000MHz	40.000MHz	50.000MHz
<b>F.H</b>	31.469KHz	31.469KHz	37.861KHz	37.500KHz	31.469KHz	35.156KHz	37.879KHz	48.077KHz
<b>A-period</b>	31.778us	31.778us	26.413us	26.667us	31.777us	28.444us	26.400us	20.800us
<b>B-Active</b>	25.422us	25.422us	20.317us	20.317us	25.422us	22.222us	20.000us	16.000us
<b>C-Syn</b>	3.813us	3.813us	1.270us	2.032us	3.813us	2.000us	3.200us	2.400us
<b>D-Back Porch</b>	1.907us	1.589us	3.810us	3.810us	1.907us	3.556us	2.200us	1.280us
<b>E-Front Porch</b>	0.636us	0.954us	1.016us	0.508us	0.635us	0.666us	1us	1.12us
<b>F . V</b>	70.087Hz	59.941Hz	72.810Hz	75.000Hz	70.087Hz	56.250Hz	60.317Hz	72.188Hz
<b>A-Period</b>	14.268ms	16.683ms	13.734ms	13.333ms	14.268ms	17.778ms	16.579ms	13.853ms
<b>B-Active</b>	12.711ms	15.253ms	12.678ms	12.800ms	12.711ms	17.067ms	15.840ms	12.480ms
<b>C-Syn</b>	0.064ms	0.064ms	0.079ms	0.080ms	0.064ms	0.057ms	0.106ms	0.125ms
<b>D-Back Porch</b>	1.112ms	0.794ms	0.528ms	0.427ms	1.112ms	0.626ms	0.607ms	0.478ms
<b>E-Front Porch</b>	0.381ms	0.572ms	0.449ms	0.026ms	0.381ms	0.028ms	0.026ms	0.77ms
<b>H/V SYNC</b>	- +	- -	- -	- -	- +	+ +	+ +	+ +
<b>Interlaced</b>	NON	NON	NON	NON	NON	NON	NON	NON

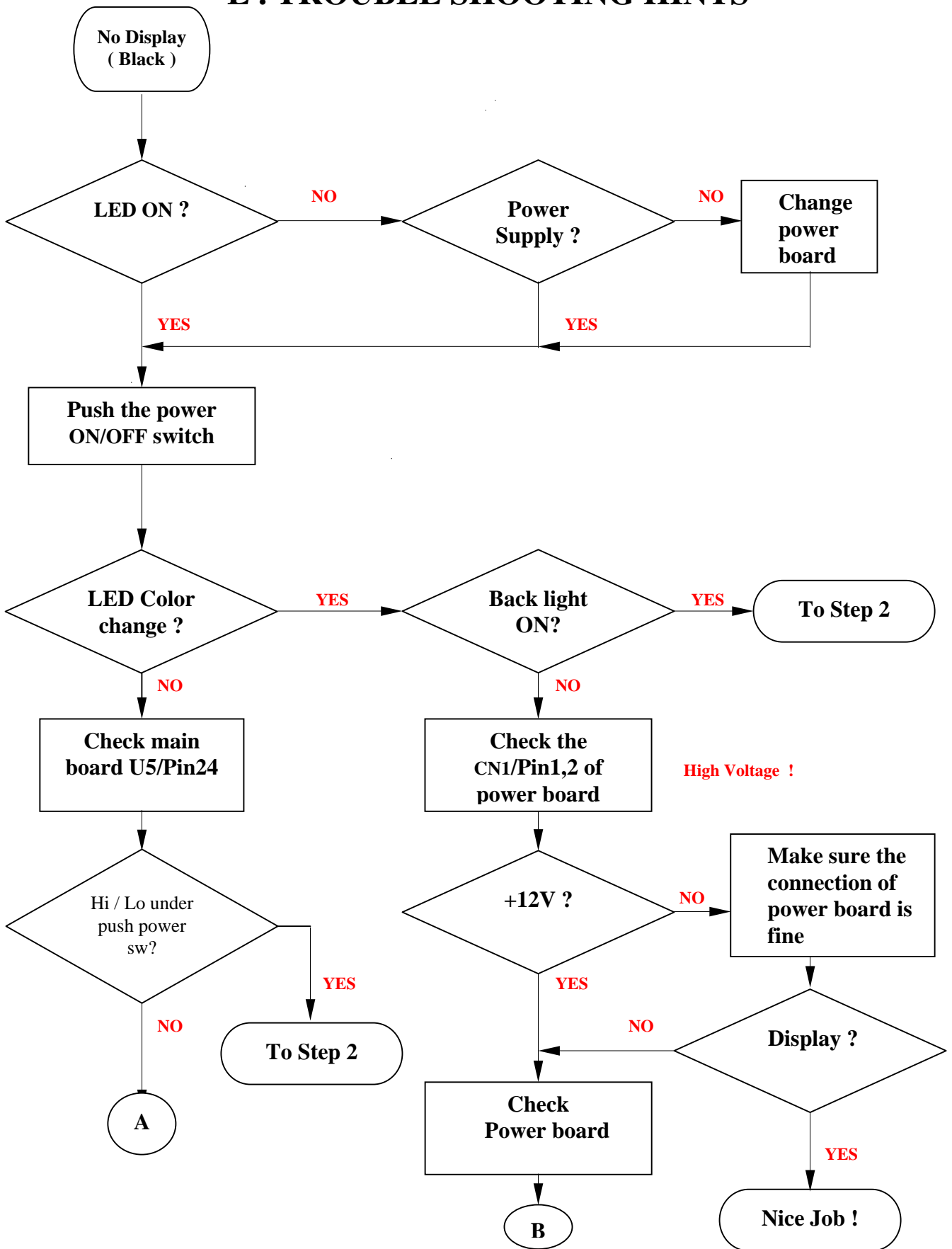
Preset Modes	VESA 800X600	VESA 1024X768	VESA 1024X768	VESA 1024X768	VESA 1280X1024	VESA 1280X1024			
<b>Dot Rate</b>	49.500MHz	65.000MHz	75.000MHz	78.750MHz	108.00MHz	135.00MHz			
<b>F.H</b>	46.875KHz	48.363KHz	56.476KHz	60.023KHz	63.98KHz	79.976KHz			
<b>A-period</b>	21.333us	20.677us	17.707us	16.660us	15.630us	12.504us			
<b>B-Active</b>	16.162us	15.754us	13.653us	13.003us	11.852us	9.481us			
<b>C-Syn</b>	1.616us	2.092us	1.813us	1.219us	1.037us	1.067us			
<b>D-Back Porch</b>	3.232us	2.462us	1.920us	2.235us	2.296us	1.837us			
<b>E-Front Porch</b>	0.323us	0.369us	0.321us	0.203us	0.444us	0.119us			
<b>F . V</b>	75.000Hz	60.004Hz	70.069Hz	75.029Hz	60.020Hz	75.025Hz			
<b>A-Period</b>	13.333ms	16.666ms	14.272ms	13.328ms	16.661ms	13.329ms			
<b>B-Active</b>	12.800ms	15.880ms	13.599ms	12.795ms	16.005ms	12.804ms			
<b>C-Syn</b>	0.064ms	0.124ms	0.106ms	0.050ms	0.047ms	0.038ms			
<b>D-Back Porch</b>	0.448ms	0.600ms	0.513ms	0.466ms	0.594ms	0.475ms			
<b>E-Front Porch</b>	0.021ms	0.062ms	0.054ms	0.017ms	0.016ms	0.013ms			
<b>H/V SYNC</b>	+ +	- -	- -	+ +	+ +	+ +			
<b>Interlaced</b>	NON	NON	NON	NON	NON	NON			

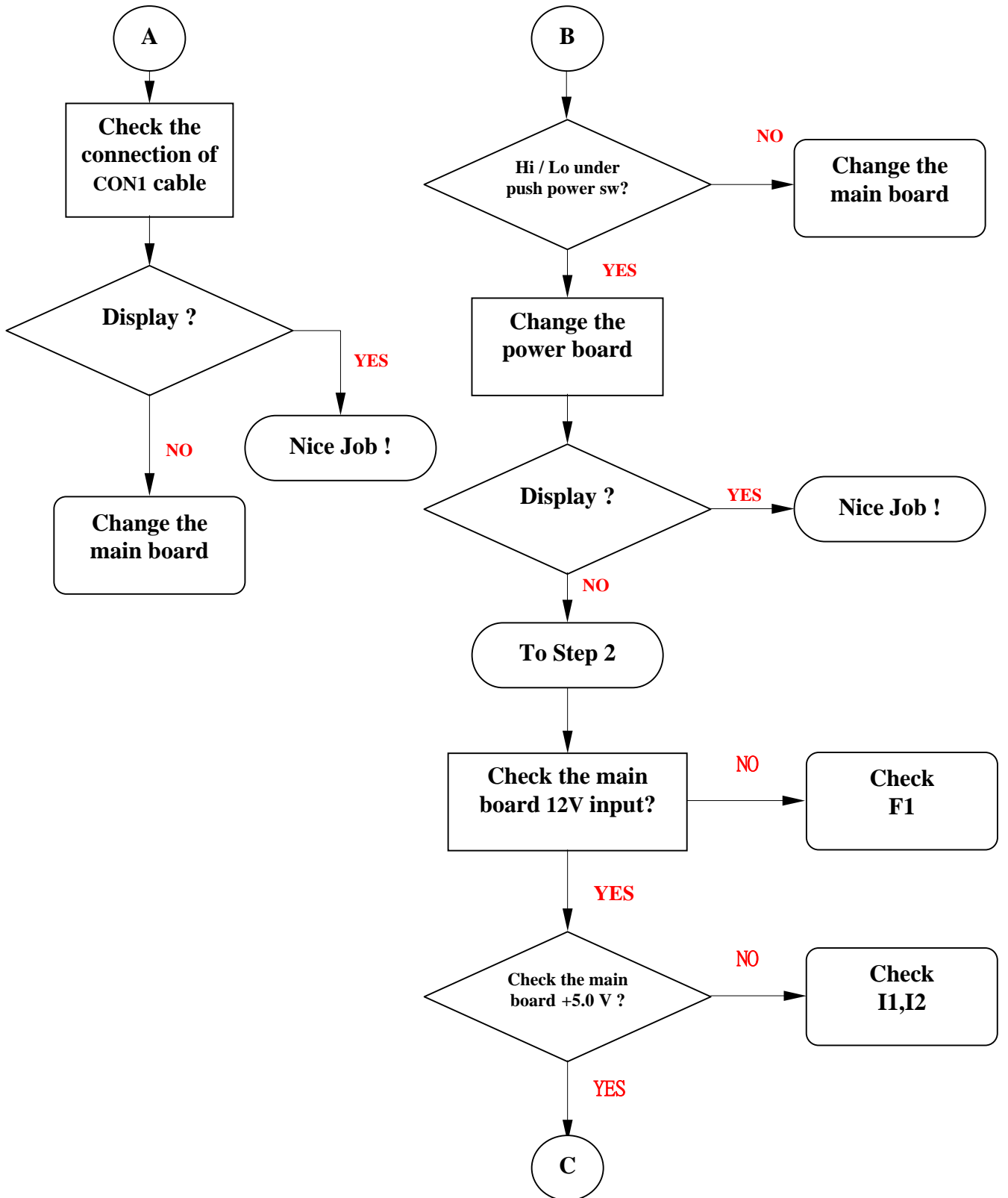
## D. ADJUSTMENT PROCEDURE

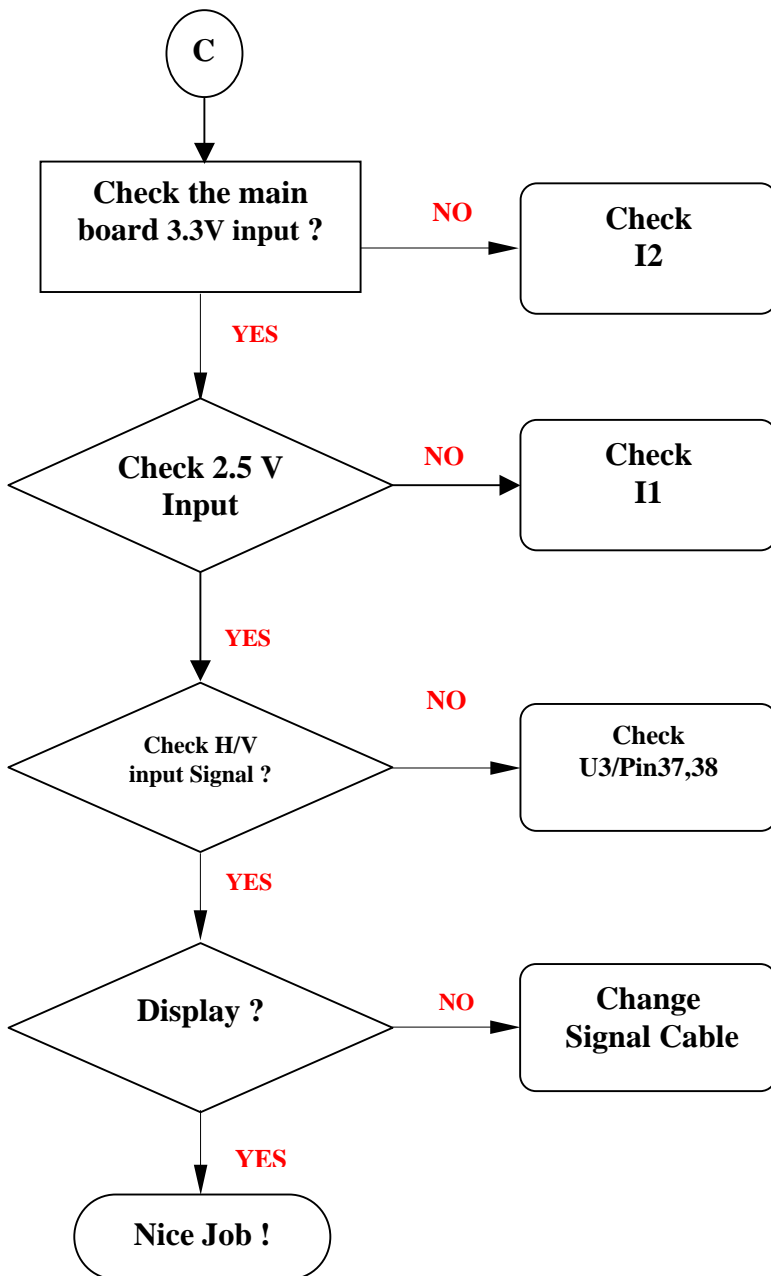
ITEM Program Menu.	# Test Meter * Test Point @ Pattern	Operation	Check Value
<b>A</b>	<b>Power supply Check</b> # Digital Voltmeter * CON 001 @ Crosshatch Pattern (1280x768, 60Hz)	<ol style="list-style-type: none"> <li>1. Plug power cable into the LCD monitor directly.</li> <li>2. Make sure the voltage of the power plug (CON001) on the Power Board to the value shown at right.</li> </ol>	220Vac ±0.2V
<b>B</b>	<b>Power Saving Check</b> # Wattmeter # PC or Pattern generator @ Crosshatch Pattern (1280x768, 60Hz)	<ol style="list-style-type: none"> <li>1. Unplug the signal cable into the monitor.</li> <li>2. Turn the power switch of the monitor ON.</li> <li>3. Check monitor power indicator light up blue flashing every other second.</li> <li>4. Make sure the wattmeter value shown at right.</li> <li>5. OSD will be display "NO SIGNAL" Picture.</li> </ol>	< 3W
<b>C</b>	<b>Into Factory mode</b> # PC or Pattern generator @ Crosshatch Pattern (1280x768, 60Hz)	<ol style="list-style-type: none"> <li>1. Hold <b>Down</b> key, then turn the power switch of the monitor off.</li> <li>2. Hold <b>Up</b> key, then turn the power switch of the monitor on.</li> <li>3. You can enter factory adjustment mode.</li> </ol>	
<b>D</b>	<b>Auto mode Check</b> # PC or Pattern generator @ Crosshatch Pattern (1280x768, 60Hz)	<ol style="list-style-type: none"> <li>1. Press and release the <b>Auto</b> key to adjust display mode to its utmost performance according to VGA setting.</li> </ol>	
<b>E</b>	<b>White Balance Adjust</b> # PC or Pattern generator @ White Pattern (1280x768, 60Hz)	<ol style="list-style-type: none"> <li>1. Move the OSD to the <b>COLOR</b> mode (AUTO COLOR).</li> <li>2. set color is <b>Cool</b> using the OSD, Check the value shown at right.  <math>Y = 200 \pm 20 \text{cd/m}^2</math>   <math>x = 0.283 \pm 0.02</math>   <math>y = 0.297 \pm 0.02</math></li> <li>3. set color is <b>Warm</b> using the OSD, Check the value shown at right.  <math>Y = 200 \pm 20 \text{cd/m}^2</math>   <math>x = 0.313 \pm 0.02</math>   <math>y = 0.329 \pm 0.02</math></li> </ol>	
<b>F</b>	<b>OSD Language Setting</b> # PC or Pattern generator	<ol style="list-style-type: none"> <li>1. Move the OSD to the <b>OSD setting</b> mode</li> <li>2. Move the OSD to the <b>LANGUAGE</b> mode.</li> <li>3. You can choose one of the language you need.</li> </ol>	

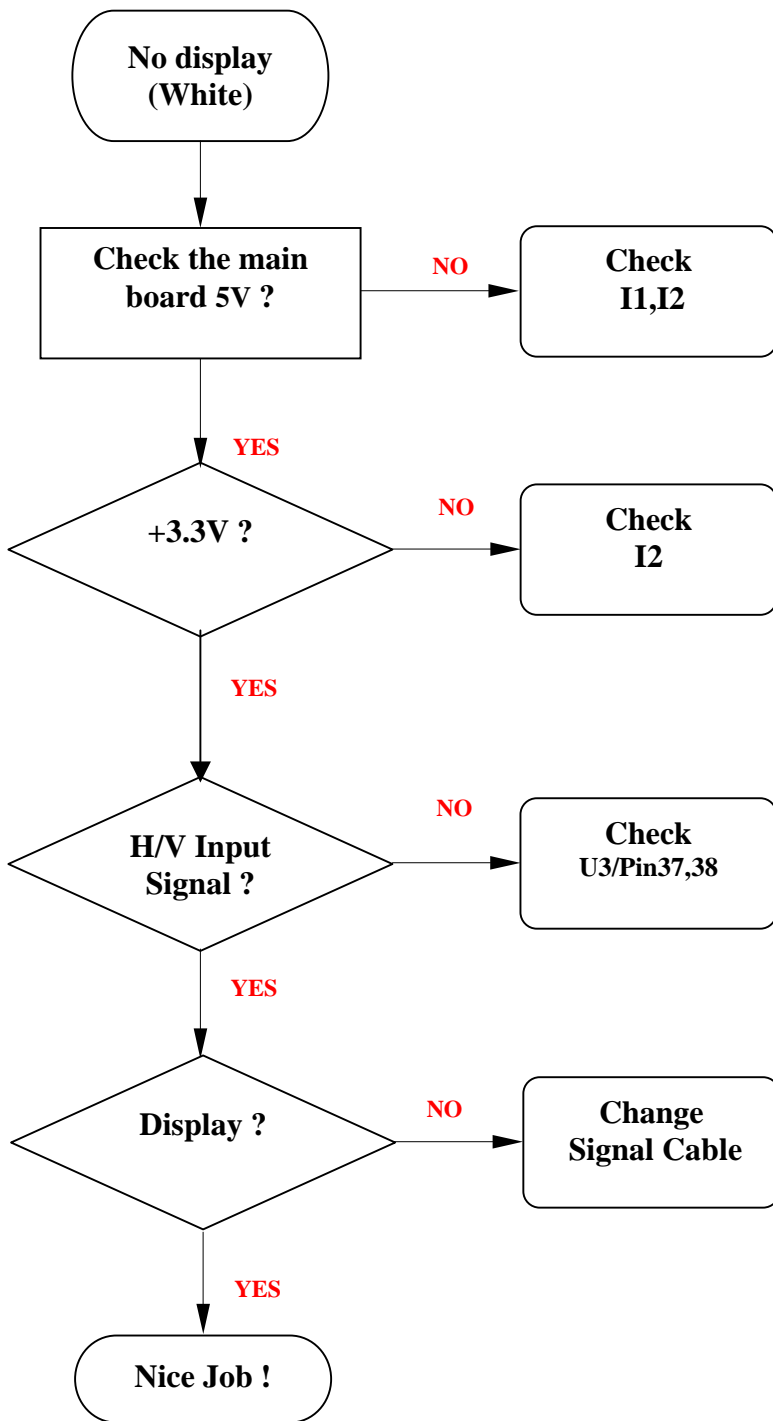


## E . TROUBLE SHOOTING HINTS

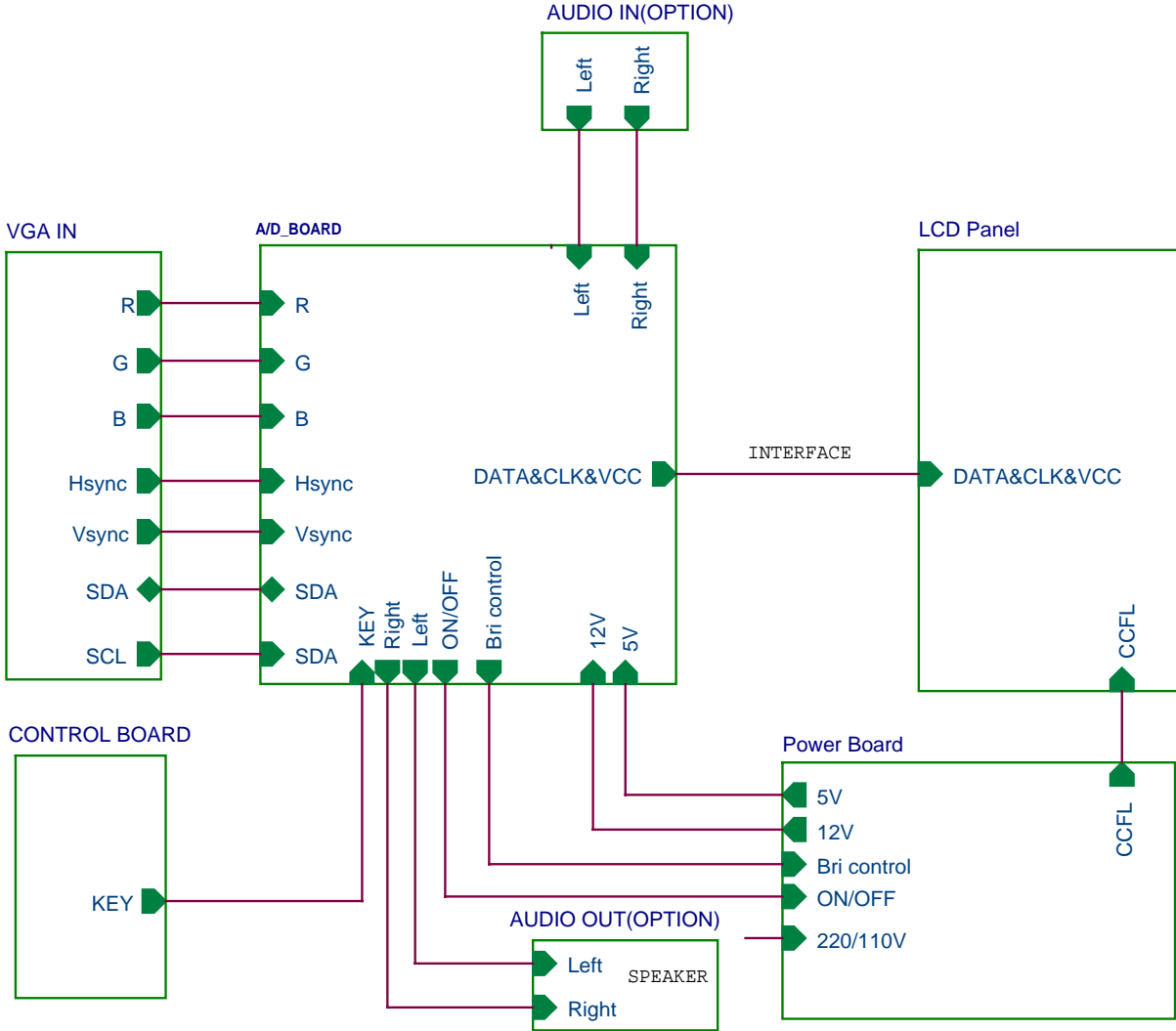






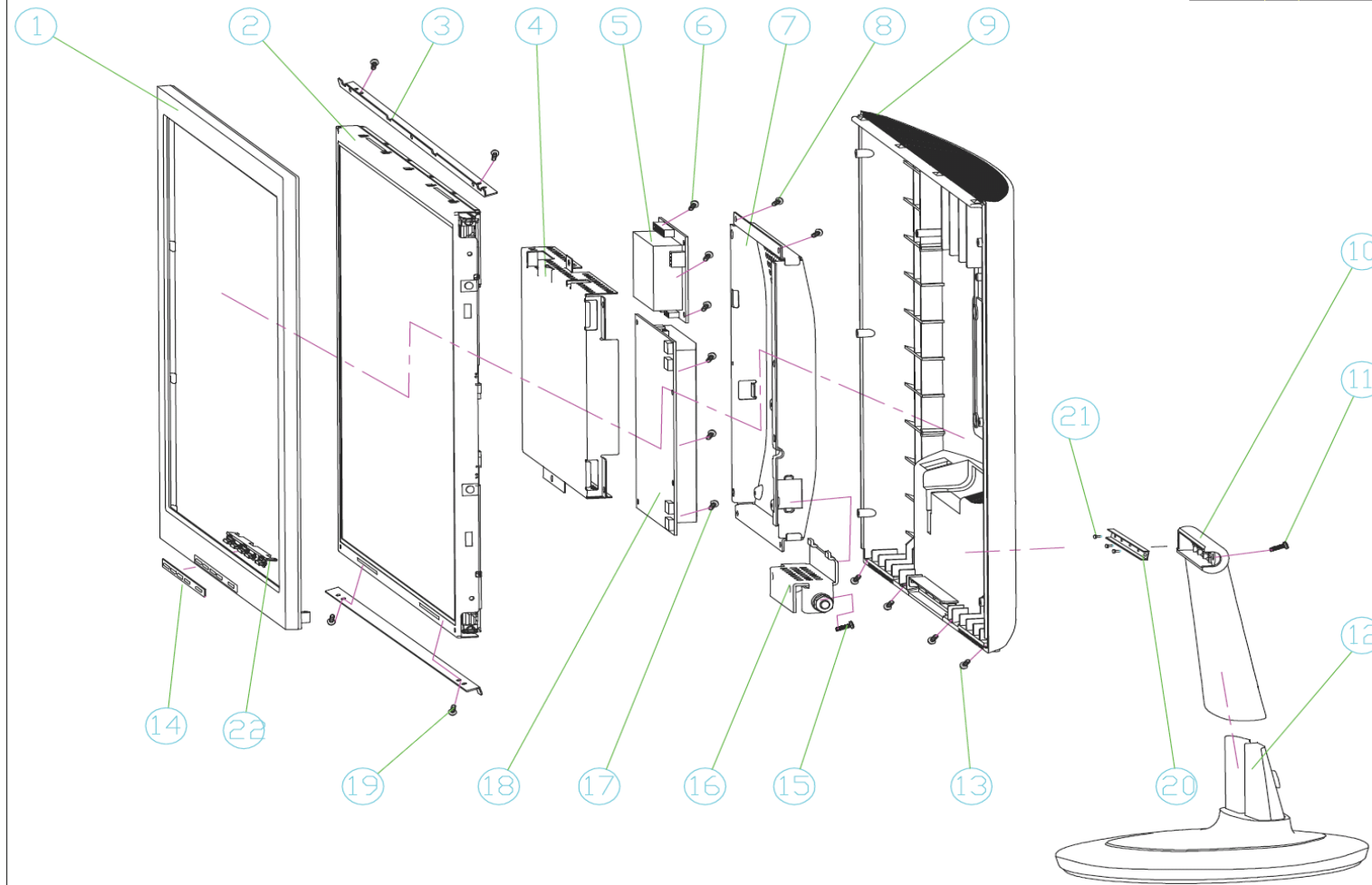


# F. BLOCK DIAGRAM



# G. EXPLODED DIAGRAM

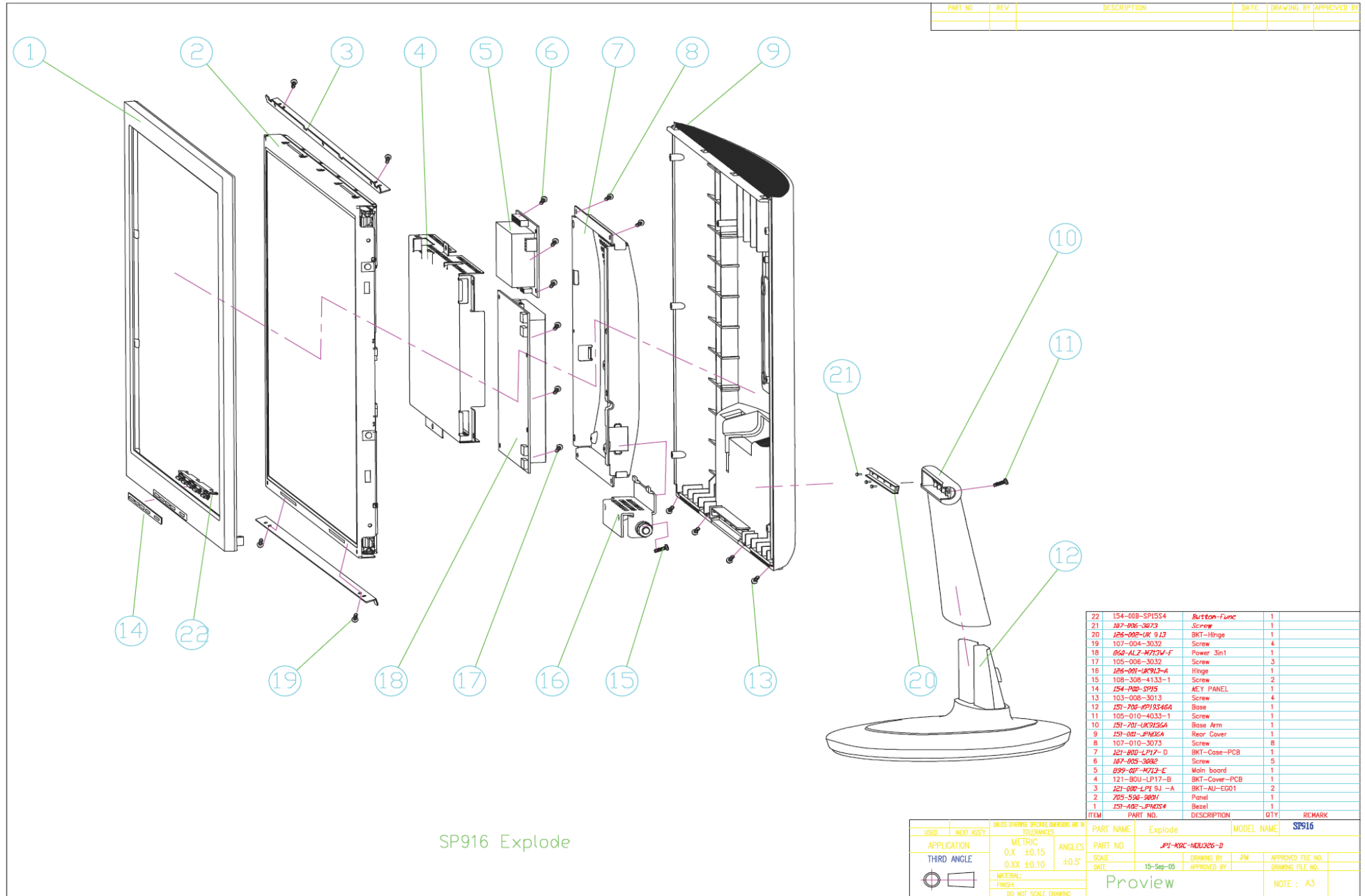
PART NO.	REV.	DESCRIPTION	DATE	DRAWING BY	APPROVED BY



ITEM	PART NO.	DESCRIPTION	QTY	REMARK
22	154-008-SP1554	Button-Func	1	
21	107-006-3073	Screw	1	
20	126-002-UK713	BKT-Hinge	1	
19	107-004-3032	Screw	4	
18	050-AL2-N713-FB	Power Sin1	1	
17	105-006-3032	Screw	3	
16	126-001-UK713-A	Hinge	1	
15	106-308-4133-1	Screw	2	
14	154-000-SP15	KEY PANEL	1	
13	103-008-3013	Screw	4	
12	151-700-SP17346A	Base	1	
11	105-010-4033-1	Screw	1	
10	151-701-UK713GA	Base Arm	1	
9	151-001-SP106A	Rear Cover	1	
8	107-010-3073	Screw	8	
7	121-800-LP17-D	BKT-Cover-PCB	1	
6	107-000-3026	Screw	5	
5	099-01F-N713-E	Main board	1	
4	121-800-LP17-B	BKT-Cover-PCB	1	
3	121-800-LP17-J-A	BKT-AU-EG01	2	
2	705-570-6040	Panel	1	
1	151-002-SP105A	Bezel	1	

SP716 Explode

USED	INDEX ASSY	UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN TOLERANCES:	PART NAME	Explode	MODEL NAME	SP716
		METRIC	PART NO.	SP716-MK326-ED		
		0.X ±0.15	SCALE			
		0.XX ±0.10	DATE	15-Sep-05	APPROVED BY	JIM
		ANGLES ±0.5°	DRAWING FILE NO.			
		THIRD ANGLE	DRAWING FILE NO.			
		MATERIAL:	PROVIEW			
		FINISH:				
		DO NOT SCALE DRAWING	NOTE : A3			



PART NO	REV	DESCRIPTION	DATE	DRAWING BY	APPROVED BY

SP916 Explode

22	154-008-SP1554	Button-Func	1	
21	107-006-3073	Screw	1	
20	106-002-UK 913	BKT-Hinge	1	
19	107-004-3032	Screw	4	
18	060-ALZ-M712V-F	Power 3in1	1	
17	105-008-3032	Screw	3	
16	105-001-UK913-A	Hinge	1	
15	108-308-4133-1	Screw	2	
14	154-000-SP15	KEY PANEL	1	
13	103-008-3013	Screw	4	
12	151-700-KP13146A	Base	1	
11	105-010-4033-1	Screw	1	
10	151-701-UK913GA	Base Arm	1	
9	151-001-PM26A	Rear Cover	1	
8	107-010-3073	Screw	8	
7	121-B00-LP12-D	BKT-Cose-PCB	1	
6	107-005-3000	Screw	5	
5	099-001-M712-E	Main board	1	
4	121-B0U-LP17-B	BKT-Cover-PCB	1	
3	121-000-LP1 9J -A	BKT-AU-EG01	2	
2	705-590-9001	Panel	1	
1	151-102-PM254	Bezel	1	
ITEM	PART NO.	DESCRIPTION	QTY	REMARK

USED	NEXT ASSY	UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN TOLERANCES		PART NAME	Explode	MODEL NAME	SP916
		APPLICATION	METRIC	PART NO			
			0.X ±0.15	SCALE			
		THIRD ANGLE	ANGLES ±0.5°	DATE	15-Sep-05	DRAWING BY	JIM
				APPROVED BY		APPROVED FILE NO.	
		MATERIAL:				DRAWING FILE NO.	
		FINISH:					
		DO NOT SCALE DRAWING					

## H. SCHEMATIC DIAGRAM

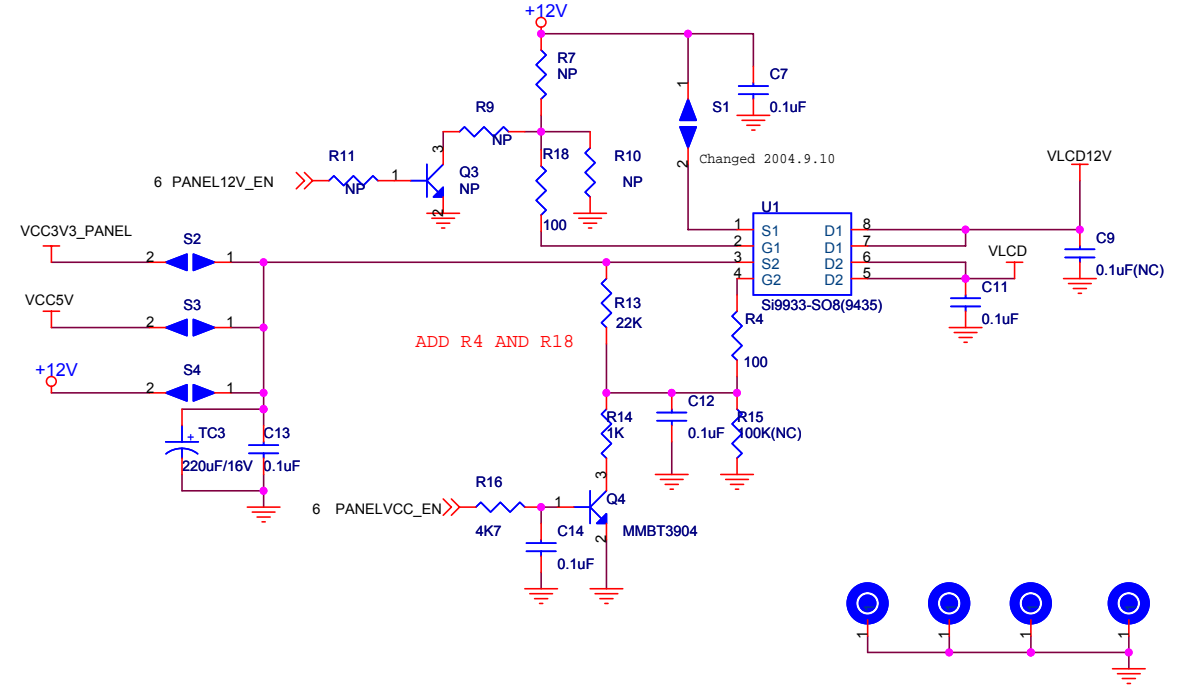
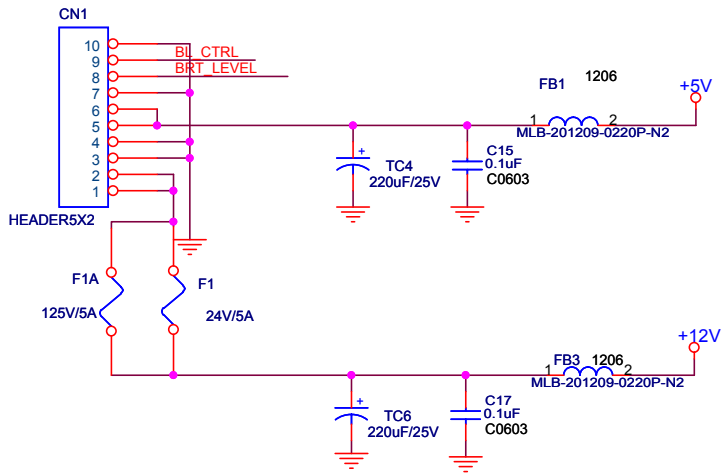
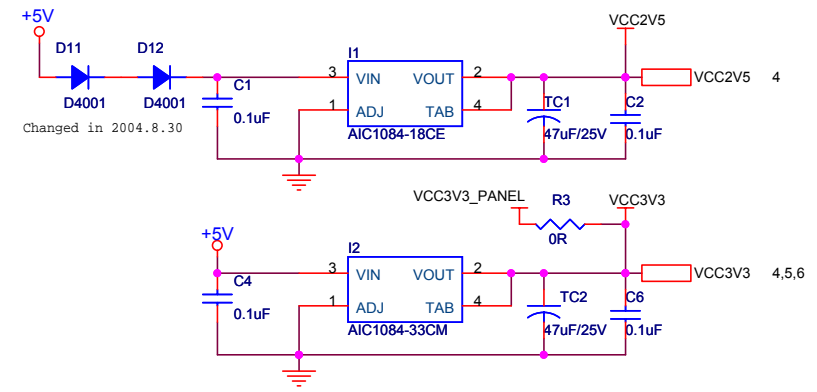
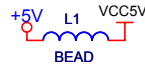
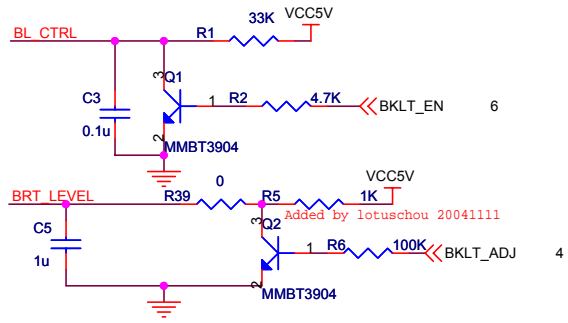


## TOP LEVEL

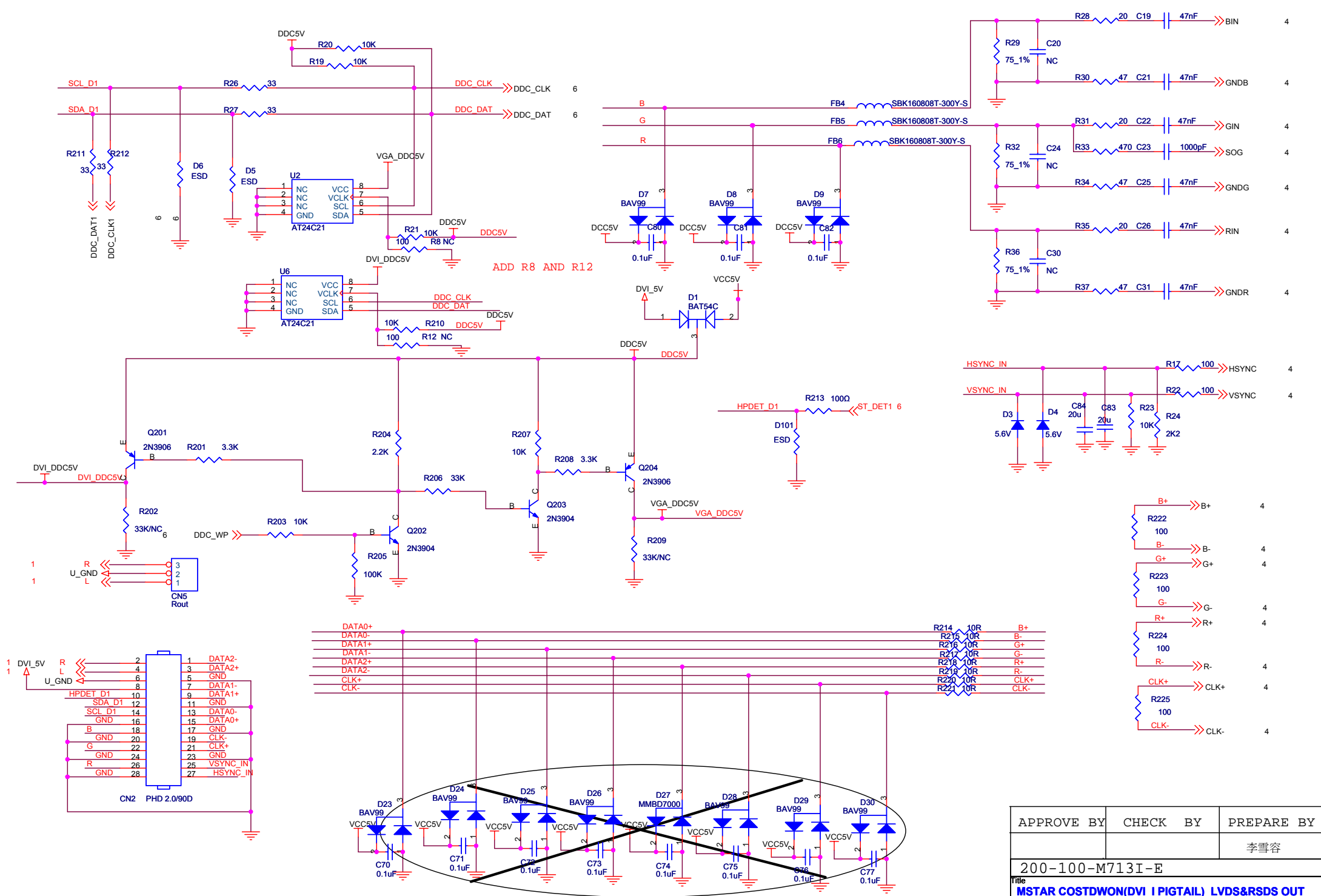
1. S1:THE FIRST VERSION OF THE COST DOWN MODEL,MSTAR SOLUTION
- 2.change note:audio schematic add D13 \ D2'power schematic add R4'C101 change TC5
- 3.DVI schmatic add R8,R12.power schmatic add R18.

APPROVE BY	CHECK BY	PREPARE BY
		李雪容
200-100-M713I-E		
Title <b>MSTAR COSTDWON(DVI_I PIGTAIL) LVDS&amp;RSDS OUT</b>		
Size Custom	Document Number <b>TOP LEVEL</b>	Rev <b>E</b>
Date: Tuesday, June 28, 2005	Sheet 1	of 7

To Inverter



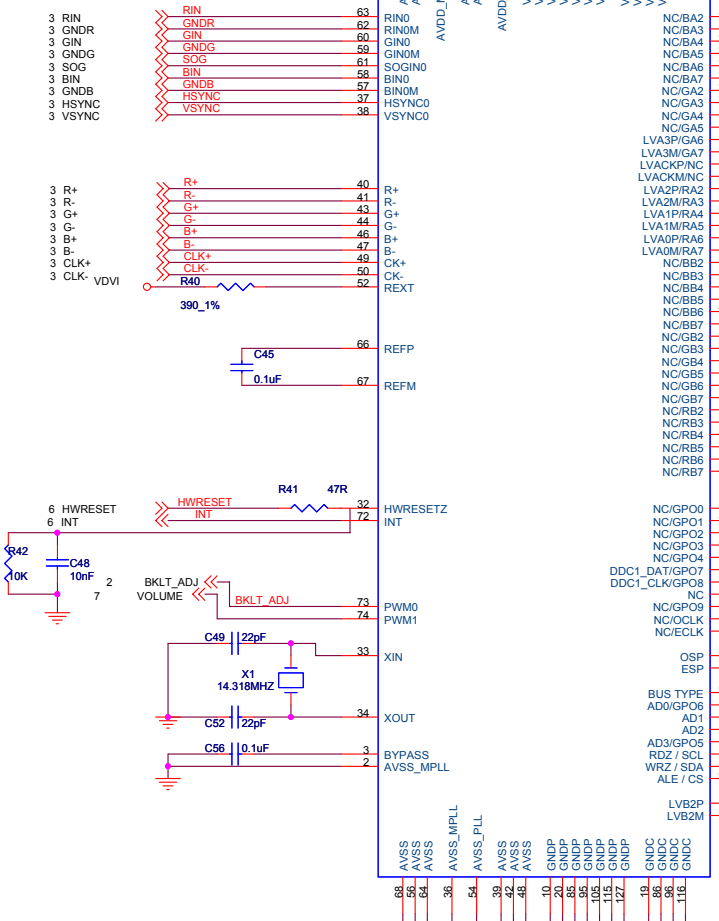
APPROVE BY	CHECK BY	PREPARE BY
		李雪容
200-100-M713I-E		
Title MSTAR COSTDWON(DVI_I PIGTAIL) LVDS&RSDS OUT		
Size Custom	Document Number POWER	Rev E
Date: Tuesday, June 28, 2005	Sheet 2	of 7



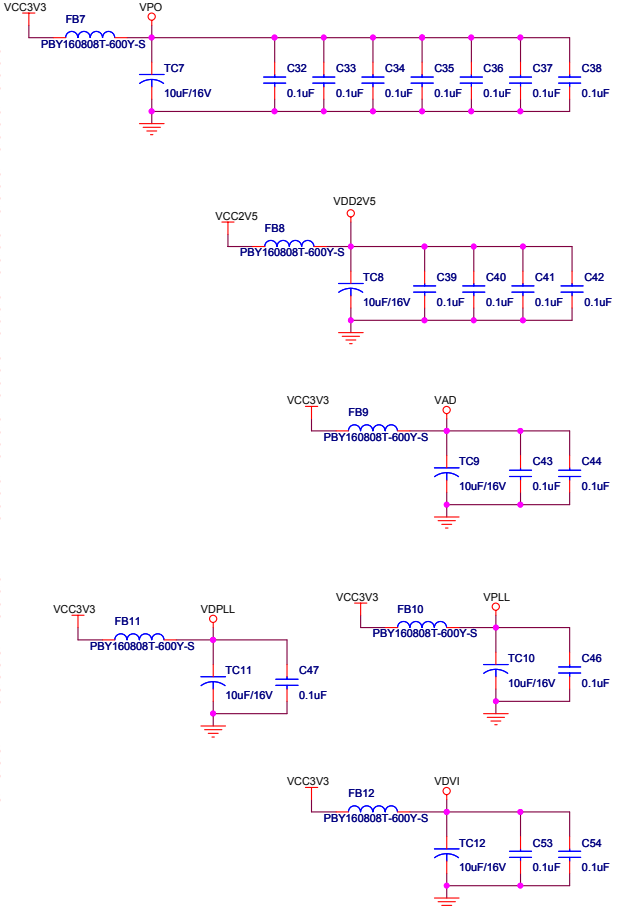
ADD R8 AND R12

APPROVE BY	CHECK BY	PREPARE BY
		李雪容
200-100-M713I-E		
Title MSTAR COSTDWON(DVI_I PIGTAIL) LVDS&RSDS OUT		
Size Custom	Document Number VGA IN(DVI PIGTAIL)	Rev E
Date: Tuesday, June 28, 2005	Sheet 3	of 7

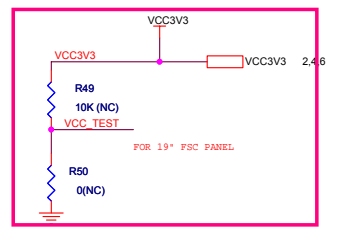
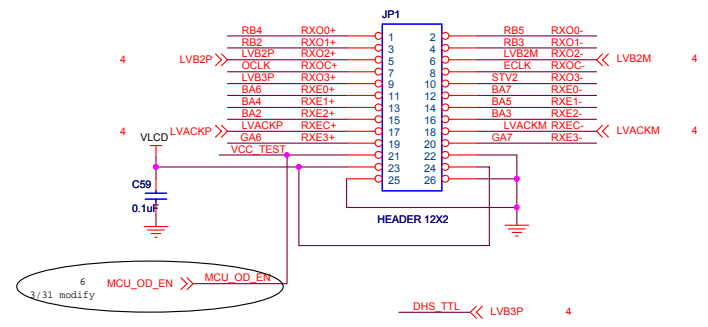
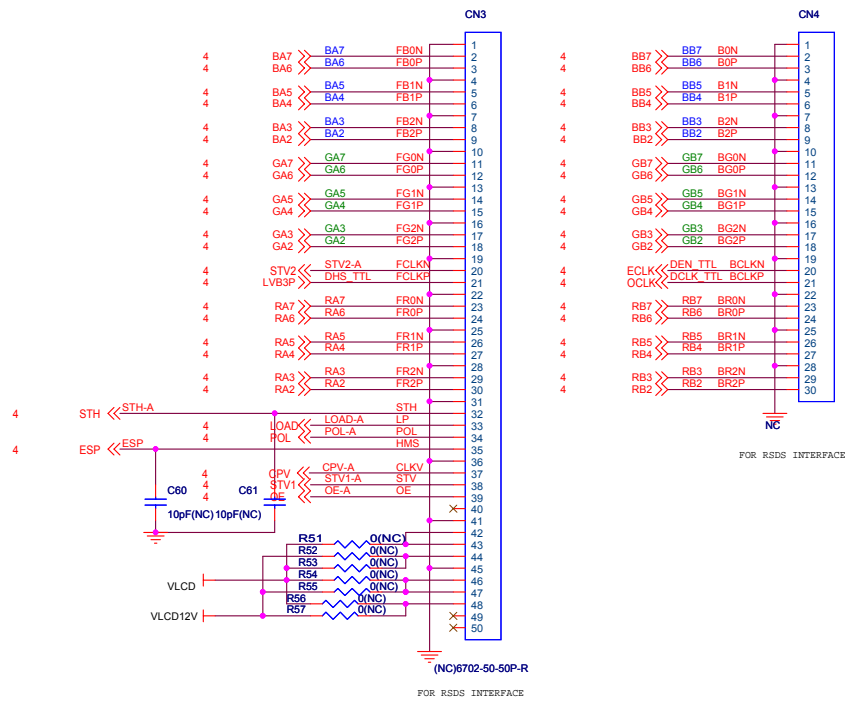
# MST TSU16AK/TSU56AK



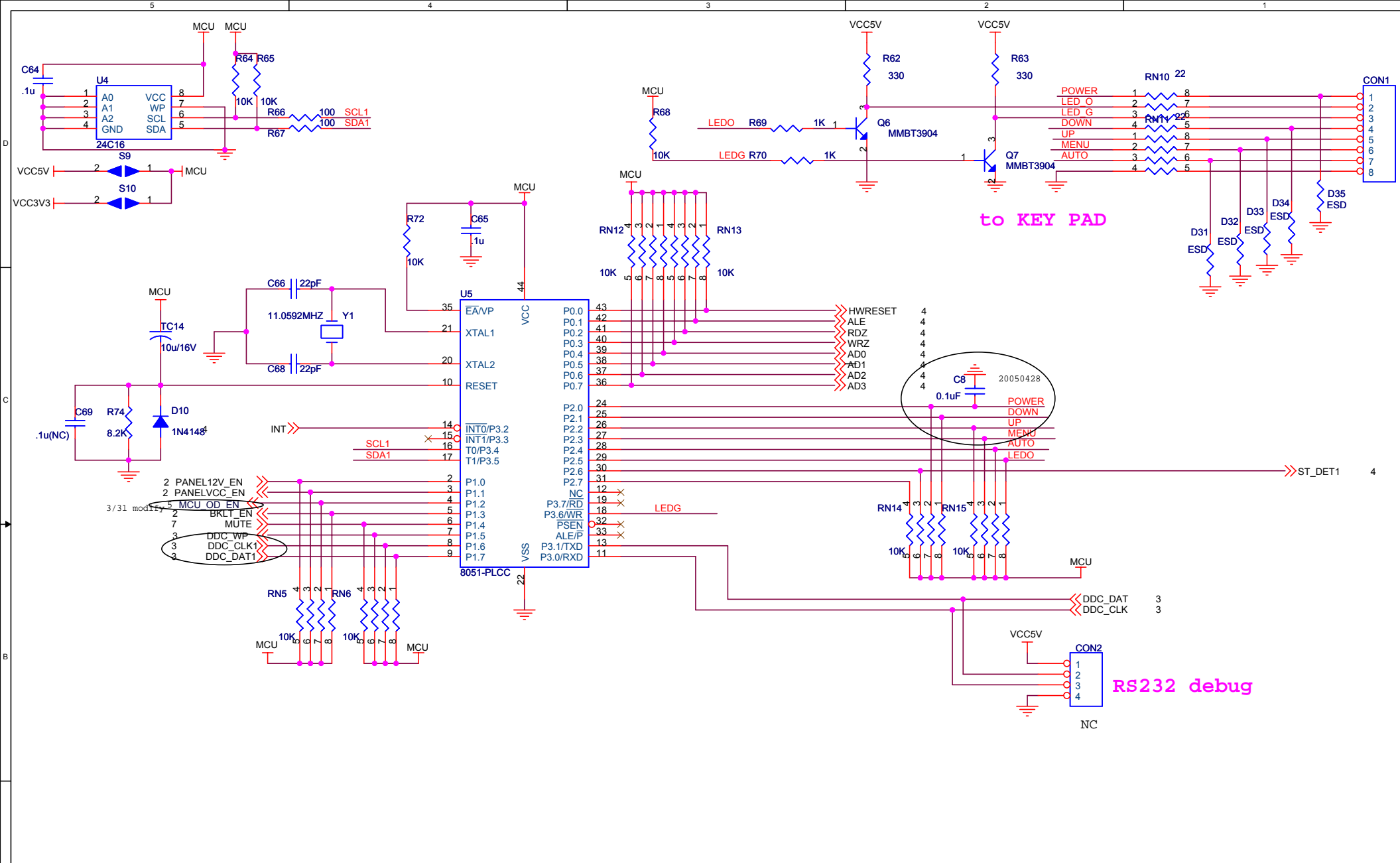
Pin 6:LOW- SERIAL BUS  
Pin 6:HIGH- DIRECT BUS



APPROVE BY	CHECK BY	PREPARE BY
		李雪容
200-100-M713I-E		
Title <b>MSTAR COSTDOWN(DVI_I PIGTAIL) LVDS&amp;RSDS OUT</b>		
Size Custom	Document Number <b>MST SCALER</b>	Rev <b>E</b>
Date: Tuesday, June 28, 2005	Sheet 4	of 7



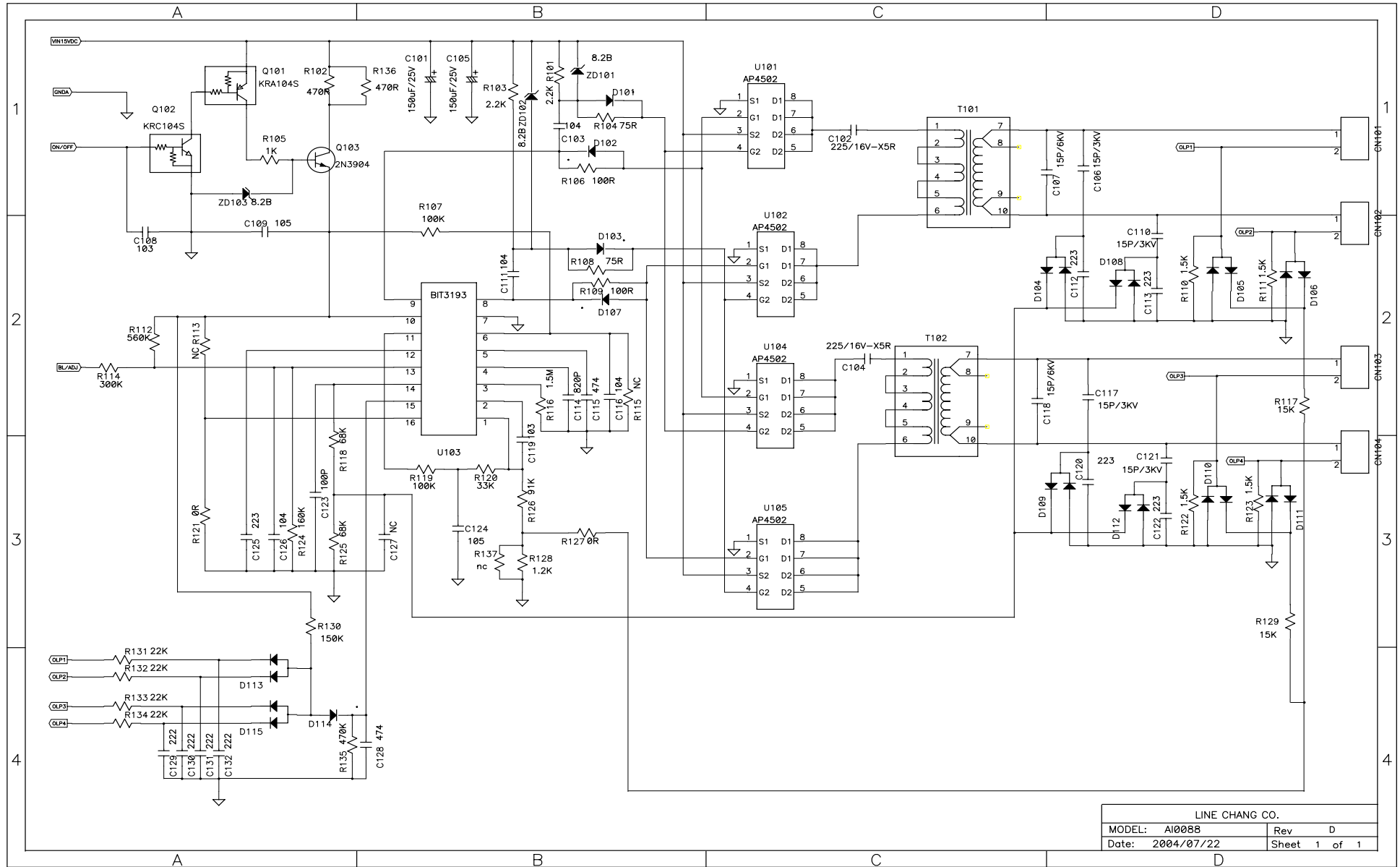
APPROVE BY	CHECK BY	PREPARE BY
		李雪容
200-100-M713I-E		
Title MSTAR COSTDOWN(DVI_I PIGTAIL) LVDS&RSDS OUT		
Size	Document Number	Rev
Custom	PANEL INTERFACE	E
Date:	Tuesday, June 28, 2005	Sheet 5 of 7



to KEY PAD

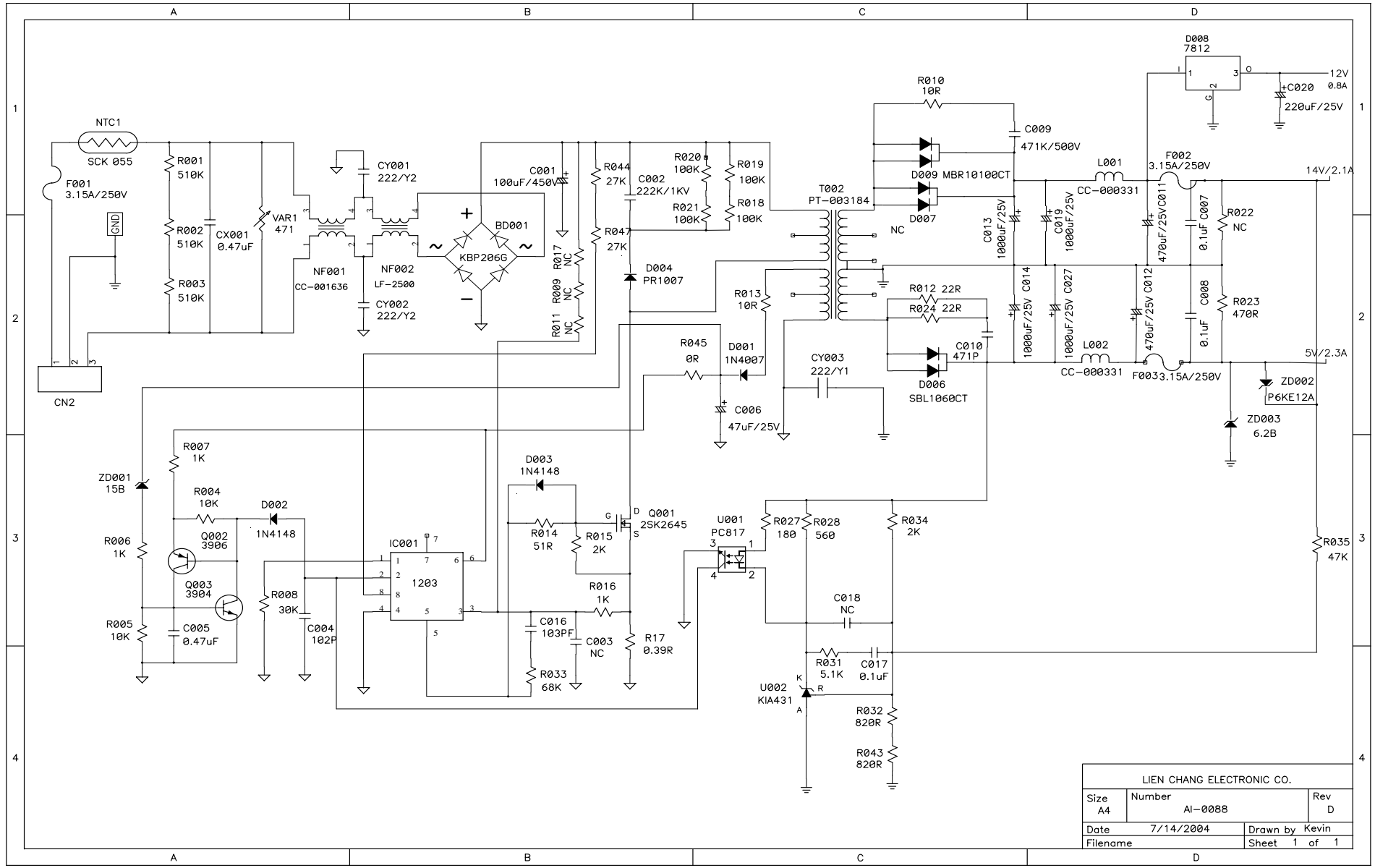
RS232 debug

APPROVE BY	CHECK BY	PREPARE BY
		李雪容
200-100-M713I-E		
Title MSTAR COSTDWON(DVI_I PIGTAIL) LVDS&RSDS OUT		
Size Custom	Document Number MCU(SYNC&MYSON 512&MX)	Rev E
Date: Tuesday, June 28, 2005	Sheet 6	of 7



MODEL: AI-0088FAI-0088AF (Spec No.: 01)

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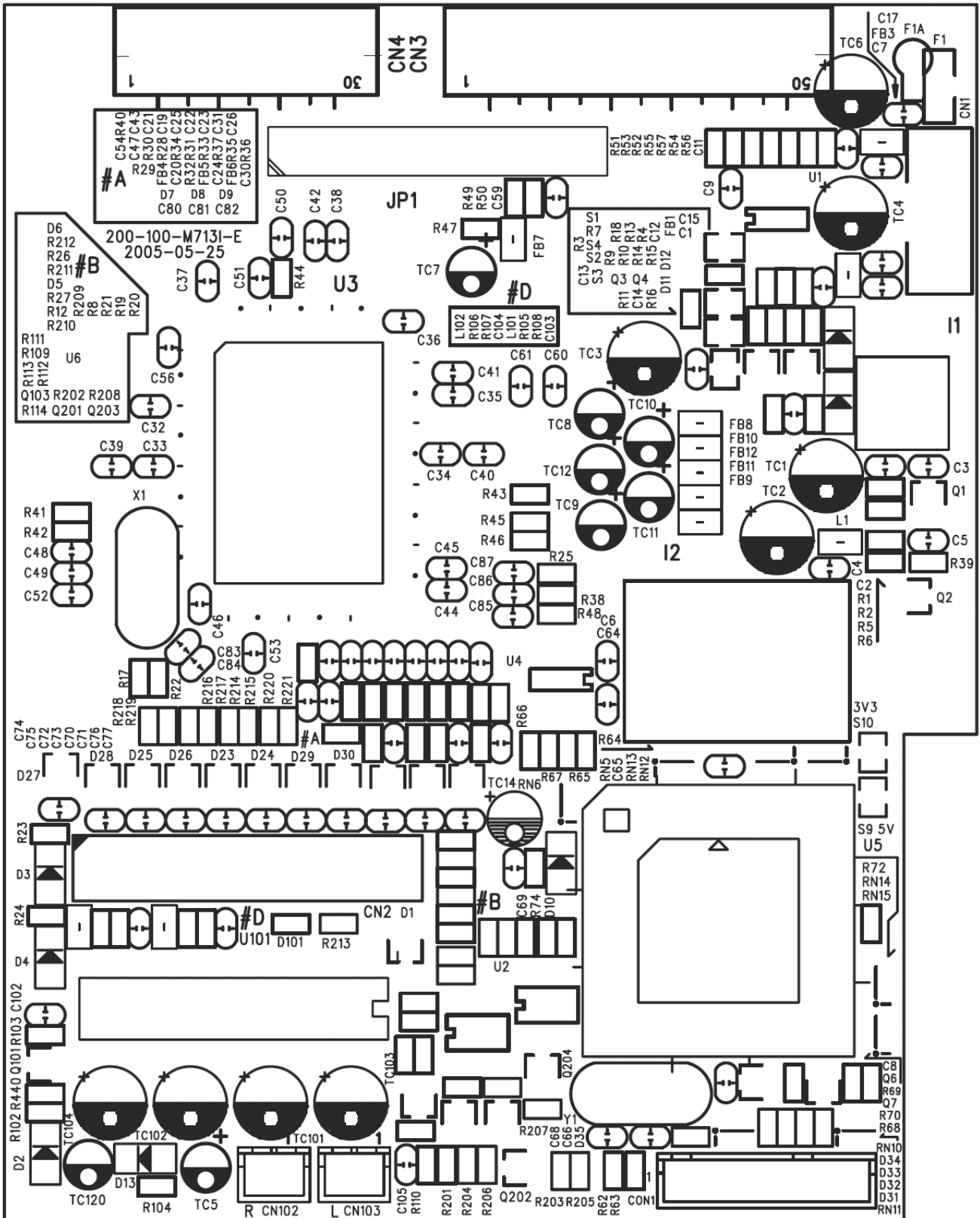
MODEL:AI-0088FAI-0088AF(Spec No.:01)

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# I. PCB LAYOUT DIAGRAM

## Main Board

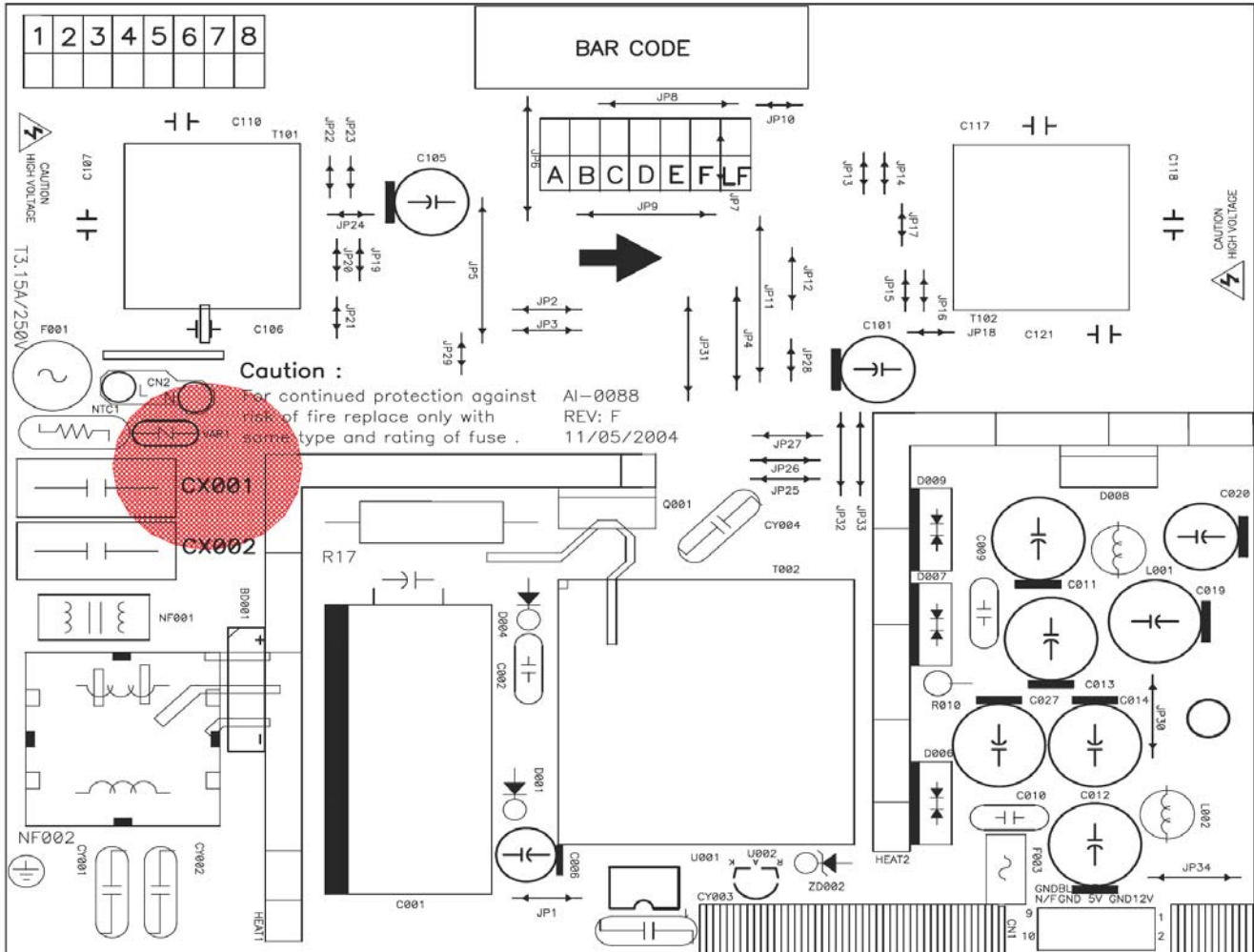


# Control Board

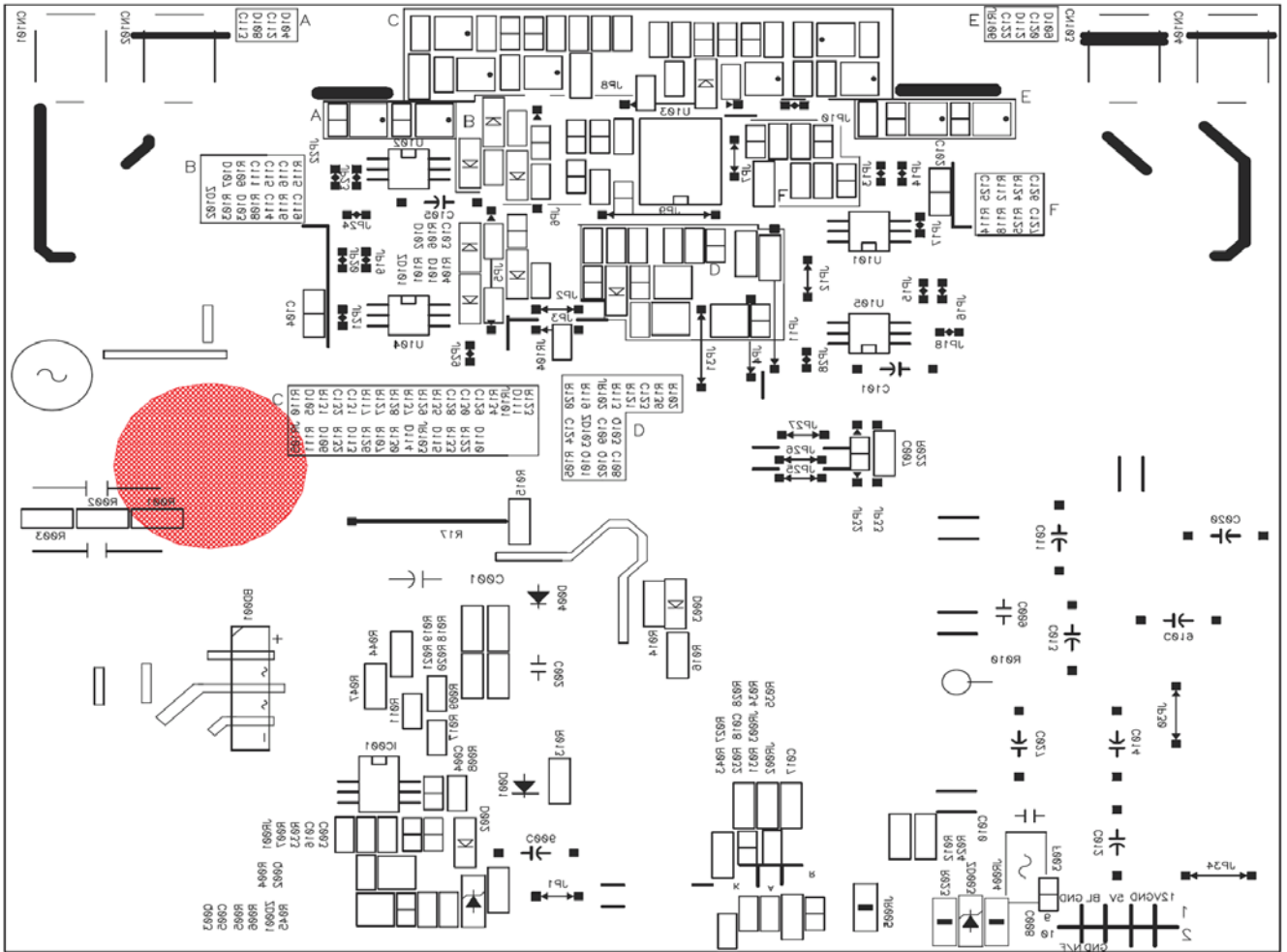


# Inverter + Power Board

Top layer



# Bottom layer



# MEMO

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