

Diamond View LCD Monitor

DV154 / DV154B

February 2003

Manual Contents

Section

1. Engineering Specifications
2. Circuit Operation Theory
3. Alignment procedure
4. Trouble Shooting
5. DV154 Parts List
6. DV154B Parts List
7. Schematic Diagrams
8. Assembly

Service Guide

Table of Contents

1. INTRODUCTION	2
2. OPERATIONAL SPECIFICATION.....	3
2.1 POWER SUPPLY	3
2.2 SIGNAL INTERFACE	3
2.3 VIDEO PERFORMANCE	4
2.4 SCAN RANGE	4
2.5 PLUG & PLAY DDC2B SUPPORT	4
2.6 SUPPORT TIMINGS.....	4
3. OPERATIONAL & FUNCTIONAL SPECIFICATION.....	5
3.1 VIDEO PERFORMANCE	5
3.2 BRIGHTNESS ADJUSTABLE RANGE.....	5
3.3 ACOUSTICAL NOISE	5
3.4 ENVIRONMENT.....	5
3.5 AUDIO PERFORMANCE	6
4. LCD CHARACTERISTICS.....	6
4.1 THE PHYSICAL DEFINITION & TECHNOLOGY SUMMARY OF LCD PANEL	6
5. USER CONTROLS	7
5.1 USER’S HARDWARE CONTROL DEFINITION	7
5.2 OSD CONTROL FUNCTION DEFINITION	7
6. MECHANICAL CHARACTERISTICS	8
6.1 DIMENSION	8
6.2 WEIGHT	8
6.3 PLASTIC	8
6.4 CARTON.....	8
7. CERTIFICATION.....	9
APPENDIX: PHYSICAL DIMENSION FRONT VIEW AND SIDE VIEW	10

1. Introduction

This specification describes DV154, a 15.0" analog interface color TFT LCD monitor with speakers supported.

The display supports up to 1024x768/75Hz resolution & refresh rate and 262,144 colors with dithering.

The features summary is as below,

Feature items	Specifications	Remark
Panel supplier & Panel type of supplier	AUO M150XN05	TN with Film type
Actual Size Diagonal display	15.0"	Panel display size
Actual Resolution display	XGA(1024x768)	Panel display resolution
Viewing Angle (at Contrast Ratio = 10)	+/- 60 degrees Horizontal (typ.) 40(up),60(down) Vertical	Panel spec
Analog interface with Scaling supported	Yes	With 15 pin D-sub connector
DVI interface with Scaling supported	No	N.A.
Video interface with Scaling supported	No	N.A.
Max resolution mode supported	1024 x 768 at 75Hz	
Number of Display Colors supported	262,144 (with dithering)	Panel driver is 6 bit
Contrast Ratio	400:1 (typ.)	
Luminance	200 cd/m2 (min.)	At R,G,B saturated condition (Default "User" color setting)
AC power input	Yes	90-264 Volts, 47-63 Hz.
DC power input(with AC power adapter)	No	N.A.
DPMS supported	Yes	< 3 watts
LED indicator for power status showed	Yes	Green/Amber/Non
OSD for control & information supported	Yes	
Multi-language supported for OSD	Yes	8languages
Buttons control supported	Yes	6 buttons including 1 monitor power on/off control button.
Flywheel control supported	No	N.A.
Scaling function supported	Yes	MRT VZ
Auto adjustment function supported	Yes	"Auto key" function
DDC function supported(EDID ver. 1.3)	Yes	DDC2B only
Audio speakers supported	Yes	
Audio Jack(input connector) supported	Yes	
Earphone Jack(input connector) supported	No	N.A.
Microphone function supported	No	N.A.
Mechanical Tilt base design	Yes	From 0 to +20 degree
VESA wall mounting design	Yes	
Mechanical Rotate design	No	N.A.
Mechanical Lift base design	No	N.A.
Kensington compatible lock design	Yes	

2. Operational Specification

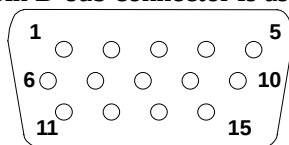
2.1 Power supply

Item	Condition	Spec	OK	N.A	Remark
Input Voltage range	Universal input full range	90~264VAC /47~63Hz	√		
Input Current range	90 ~ 264VAC	≤ 2.0 Arms	√		
Power Consumption	Normal “On” operation	≤ 40 Watts	√		LED: Green
DPMS	DPMS “Off” state	< 3 Watts	√		LED: Amber
Inrush Current	110 VAC 220 VAC	< 30 A (peak) < 60 A (peak)	√		Cold-start
Earth Leakage Current	264 VAC/50Hz	< 3.5 mA	√		
Hi-Pot	1. 1500VAC, 1 sec 2. Ground test: 30A, 1sec	Without damage < 0.1 ohm	√		(on-line test) (in-lab test)
Power Line Transient	IEC1000-4-4	1KV	√		
	IEC1000-4-5 (Surge)	Common: 2KV, Differential: 1KV	√		
CCFL operation range	90 ~ 264VAC	4mA ~ 7.5mA	√		Each connector
CCFL Frequency	90 ~ 264VAC	40KHz ~ 60KHz	√		
Power cord		Color: White or Black Length: 1800 +/- 20 mm	√		Depends on shipping requirement (99 level)

2.2 Signal interface

Item	Condition	Spec	OK	N.A	Remark
Signal Cable	15 pin D-Sub	Color: White or Black Length: 1770 +/- 30 mm	√		Depends on shipping requirement (99 level)
	DVI			√	
Pin assignment	15 pin D-sub connector	See Note-1	√		For 15 pin D-sub
Video input	Signal type	Separate analog R,G,B	√		For 15 pin D-sub
	Level	700 mV (peak to peak)	√		
	Impedance	75 Ohms +/- 1.5 Ohms	√		
Sync input	Signal type	Separate H/V-sync Composite H/V-sync (Positive/Negative)	√		For 15 pin D-sub
	Level	Logic High: 2.4V ~ 5.5V Logic Low: 0V ~ 0.5V (TTL level)	√		Refer to VESA VSIS Standard V1R1
	Impedance	Minimum 2.2K Ω (pull down)	√		10K Ω for application
	Sync Pulse Width(SPW)	0.7 μs < H-SPW 1H < V-SPW	√		

Note-1: The pin assignment of 15 pin D-sub connector is as below,



Pin	Signal Assignment	Pin	Signal Assignment
1	Red video	9	PC5V (+5 volt power)
2	Green video	10	Sync Ground
3	Blue video	11	Ground
4	Ground	12	SDA
5	Ground	13	H-Sync (or H+V)
6	Red Ground	14	V-sync
7	Green Ground	15	SCL
8	Blue Ground		

2.3 Video performance

Item	Condition	Spec	OK	N.A	Remark
Max. support Pixel rate		80 MHz	√		
Max. Resolution		1024X768	√		
Rise time + Fall time		<6.25 ns (50% of minimum pixel clock period)	√		1024x768 @ 75Hz (max. support timing)
Settling Time after overshoot /undershoot		< 5% final full-scale value	√		Refer to VESA VSIS Standard V1R1
Overshoot/Undershoot		< 12% of step function voltage level over the full voltage range	√		Refer to VESA VSIS Standard V1R1

2.4 Scan range

Item	Condition	Spec	OK	N.A	Remark
Horizontal		31 ~ 63KHz	√		
Vertical		56 ~ 75 Hz	√		Without Frame buffer

2.5 Plug & Play DDC2B Support

Item	Condition	Spec	OK	N.A	Remark
DDC channel type		DDC2B	√		
EDID		Version 1.3	√		Refer to FP557A-MEA DV154 C212 S/W spec document to see the detailed EDID data definition..

2.6 Support Timings

Input Timing				Actual Output			
Resolution	Horizontal Frequency (KHz)	Vertical Frequency (Hz)	Dot Clock Frequency (MHz)	Actual display Resolution	OK	N.A	Remark
640x350	31.47(P)	70.08(N)	25.17	1024X675	√		DOS
720x400	31.47(N)	70.08(P)	28.32	1024X768	√		DOS
640x480	31.47(N)	60.00(N)	25.18	1024X768	√		DOS
640x480	37.86(N)	72.80(N)	31.5	1024X768	√		VESA
640x480	37.50(N)	75.00(N)	31.5	1024X768	√		VESA
800x600	35.16(P)	56.25(P)	36.00	1024X768	√		VESA

800x600	37.88(P)	60.32(P)	40.00	1024X768	√	VESA
800x600	48.08(P)	72.19(P)	50.00	1024X768	√	VESA
800x600	46.86(P)	75.00(P)	49.50	1024X768	√	VESA
1024x768	48.36(N)	60.00(N)	65.00	1024X768	√	VESA
1024x768	56.48(N)	70.10(N)	75.00	1024X768	√	VESA
1024x768	60.02(P)	75.00(P)	78.75	1024X768	√	VESA

Note-2: “P”, “N” stands for “Positive”, “Negative” polarity of incoming H-sync/V-sync (input timing)

3. Operational & Functional Specification

3.1 Video performance

Item	Condition	Spec	OK	N.A	Remark
Resolution	Any input resolution modes which are under 1024X768	1024X786	√		
Contrast ratio		400:1	√		
Brightness	At R,G,B saturated condition (Default “User” color setting)	250 cd/m2(typ.) 200 cd/m2(min.)	√		
Response time	Rising + Falling time	16 ms(typ.), 23ms(max.)	√		
Viewing angle	At Contrast ratio = 10	R/L: 60 degrees (typ.)	√		
	At Contrast ratio = 10	U: 40 degrees (typ.) D: 60 degrees (typ)	√		
CIE coordinate of White		(0.31, 0.33) +/- (0.03, 0.03)	√		
Display colors		262,144 color with dithering	√		18 bits with dithering

3.2 Brightness Adjustable Range

Item	Condition	Spec	OK	N.A	Remark
Brightness adjustable range	At Max. Contrast level & Full-white color pattern	(Max. brightness value – Min. brightness value) 100 cd/m ²	√		

3.3 Acoustical Noise

Item	Condition	Spec	OK	N.A	Remark
Acoustical Noise	At 1 meter distance & “Audio” function disabled	40 dB/A	√		

3.4 Environment

Item	Condition	Spec	OK	N.A	Remark
Temperature	Operating	+5 ~ +40	√		
	Non-operating	-20 ~ +60	√		
Humidity	Operating	20 ~ 80%	√		Non-condensing
	Non-operating	10 ~ 85%	√		Non-condensing
Altitude	Operating	0~3658m (10,000ft)	√		Without packing
	Non-operating	0~12,192m (40,000ft)	√		With packing

3.5 Audio performance

Item	Condition	Spec	OK	N.A	Remark
Preamp + Power amp					
(1)Output power		1 Wrms/CH @ 1KHz	√		Real output
(2)THD (@ 1W)		<10%	√		
(3)S/N ratio		40dB	√		
Speaker Driver					
(1)Nominal impedance		8 ohm	√		
(2)Maximum input power		2W/CH	√		
(3)Frequency response		12KHz	√		
(4)Mean sound pressure level		83 ± 3 dB	√		
(5)Size		28x 40 mm	√		
Audio Control					
(1)Volume range		0 ~100 levels	√		
(2)Mute		On/Off		√	

4. LCD Characteristics

4.1 The Physical definition & Technology summary of LCD panel

Item	Condition	Spec	OK	N.A	Remark
LCD Supplier		AUO	√		
Panel type of Supplier		M150XN05	√		
Screen Diagonal		381mm(17.0")	√		
Display area	Unit=mm	304.128(H) x 228.096(V)	√		
Physical Size	Unit=mm	326(W) x 249.0(H) x 12.05(V)	√		
Weight	Unit=gram	1100 (typ.)	√		
Technology		TN without Film	√		
Pixel pitch	Unit=mm	0.297 x 0.297	√		Per one triad
Pixel arrangement		R,G,B vertical stripe	√		
Display mode		Normally white	√		
Support color		262K colors(R,G, B 6-bit data)	√		

5. User Controls

5.1 User's hardware control definition

Item	Condition	Spec	OK	N.A	Remark
Monitor Power button			√		
Enter button			√		
Right/Inc. button			√		
Left/Dec. button			√		
Exit button			√		
Auto key button			√		
Mute button				√	
Input source select button				√	

5.2 OSD control function definition

Item	Condition	Spec	OK	N.A	Remark
Contrast			√		See Table 3
Brightness			√		
Horizontal Position			√		
Vertical Position			√		
Pixel Clock			√		
Phase			√		
Color Temperature		C1: 9300 C2: 6500 C3: 5800 User: Separate R,G,B adjustment	√		
OSD Position		OSD Horizontal position OSD Vertical position	√		
Language		6 languages	√		
OSD Time		From 5 sec to 60 sec	√		
Volume			√		
Hot key for Contrast			√		
Hot key for Brightness			√		
Hot key for Volume			√		
Auto adjustment		Auto-Geometry/Color	√		
Information		For input timing	√		
Mute				√	
Input Source select				√	

* The detailed Firmware functions' specification, please refer to C212, S/W spec document.

6. Mechanical Characteristics

6.1 Dimension

Item	Condition	Spec	OK	N.A	Remark
Bezel opening		304.1x228.1 mm	√		Refer to Table 6
Monitor without Stand	L x W x H mm	354.1 x 316 x 64.5 mm	√		
Monitor with Stand	L x W x H mm	354.1 x 190 x 361 mm	√		
Carton Box (outside)	L x W x H mm	440 x 416 x 135 mm	√		
Tilt and Swivel range		Tilt : 0/+20 degree	√		

6.2 Weight

Item	Condition	Spec	OK	N.A	Remark
Monitor (Net)		3.5 Kg	√		
Monitor with packing (Gross)		4.7 Kg	√		

6.3 Plastic

Item	Condition	Spec	OK	N.A	Remark
Flammability		UL 94-HB	√		
Heat deflection To	ABS	65	√		
UV stability	ABS	Delta E < 8	√		MPR2/TCO
Resin		MPR2 : ABS (VW55/VE0856/D350)	√		
Texture		MT11020	√		
Color		Pearl White	√		

6.4 Carton

Item	Condition	Spec	OK	N.A	Remark
Color		Kraft	√		
Material		B Flute	√		
Compression strength		360 KGF	√		
Burst Strength		16KGF/cm2	√		
Stacked quantity		15 Layers	√		

7. Certification

Item	Condition	Spec	OK	N.A	Remark
Environment	Green design	API Doc. 715-C49	√		ISO14000 Requirement
	Blue Angel	German Standard		√	
	E-2000	Switzerland		√	
	EPA	USA Standard	√		
	EN61000-3-2 Harmonics			√	
	TCO92/95		√		
	TCO99		√		
PC-Monitor	Microsoft Windows	PC98/99	√		
	DPMS	VESA	√		
	DDC 2B	Version 1.3	√		
	USB	External		√	
Safety	UL (USA)	UL 1950 3 rd edition	√		
	CSA (Canada)	C22.2 No. 950-M95	√		
	FIMKO	EN60950	√		
	IEC950		√		
	EN60950		√		
	73/23/EEC		√		
	CB		√		
	TUV/GS	EN60950	√		
	CCIB (China)		√		
	EIAJ/JEIDA (Japan)			√	
EMC	CE Mark	89/336/EEC	√		
	FCC (USA)	Class B	√		
	EN55022	Class B	√		
	CISPR 22	Class B	√		
	VCCI (Japan)	Class B	√		
	BSMI (Taiwan)		√		
	C-Tick (Australia)	AS3548	√		
X- Ray Requirement	DHHS (21 CFR)	USA X- Ray Standard		√	
	DNHW			√	
	PTB	German X- Ray standard		√	
	MPRII		√		
	MPRIII			√	
Ergonomics	ZH1/618	German ergonomic		√	
	ISO 9241-3 -7 & 8		√		

Appendix: Physical Dimension Front View and Side view

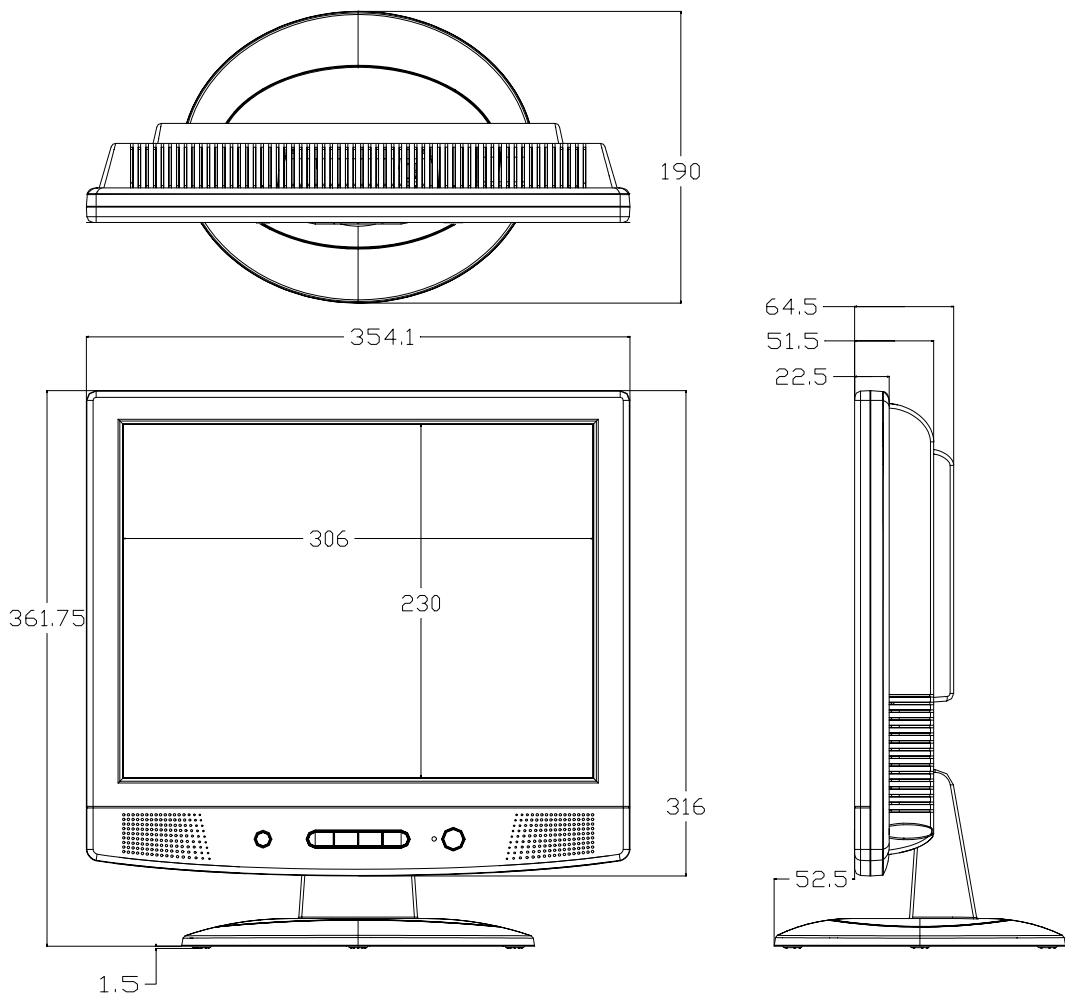


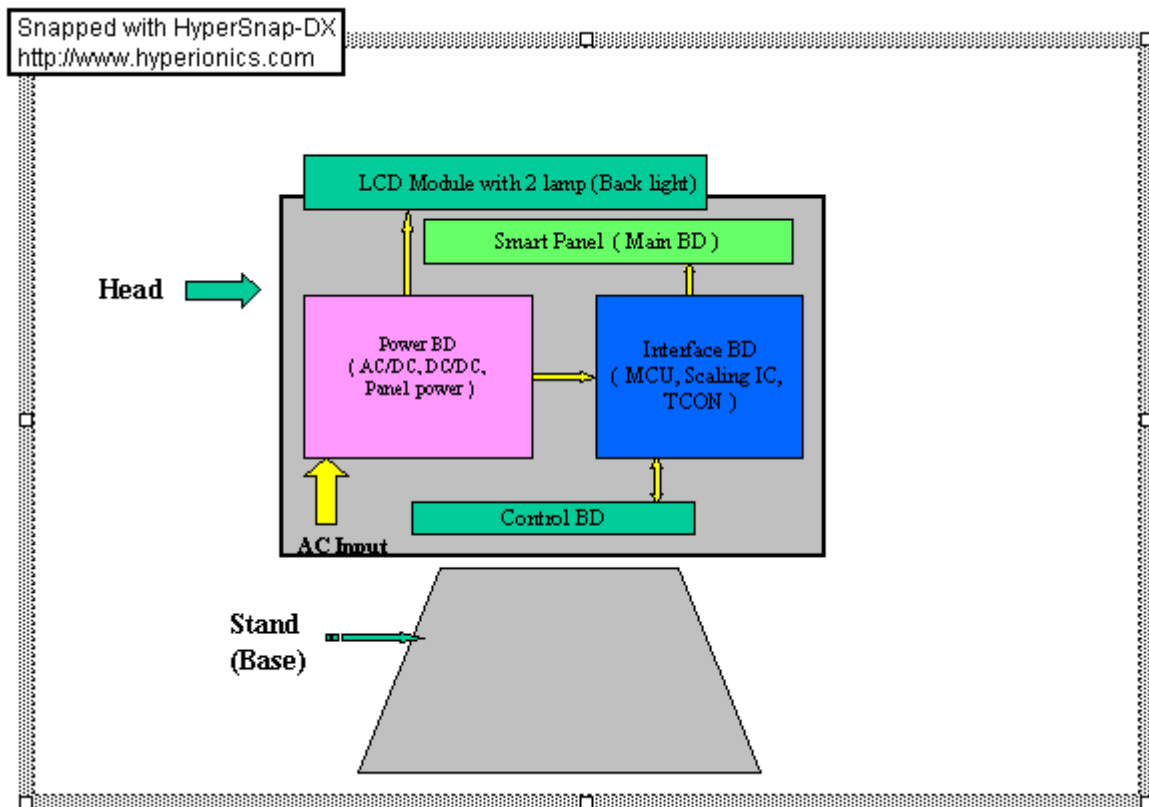
FIG. 1 PHYSICAL DIMENSION FRONT VIEW AND SIDE VIEW

I. Introduction:

The DV154 is a 15" XGA (1024x768) 18 bits color TFT LCD monitor with multi-media function. It's an analog interface LCD monitor with a 15 pins D-sub signal cable and it's compliant with VESA specification to offer a smart power management and power saving function. It also offers OSD menu for users to control the adjustable items and get some information about this monitor, and the best function is to offer users an easy method to set all adjustable items well just by pressing one key, we called it "i-key"(intelligent key) which can auto adjusting all controlled items. DV154 also offer DDC2 function to meet VESA standard. DV154 offers audio function with 2 speakers.

II. Block diagram

The DV154 consists of a head and a stand (base). The head consists of a LCD module with 2 lamps, a power board (include AC/DC, DC/DC, inverter and panel power), a control board and interface BD. The block diagram is shown as below.

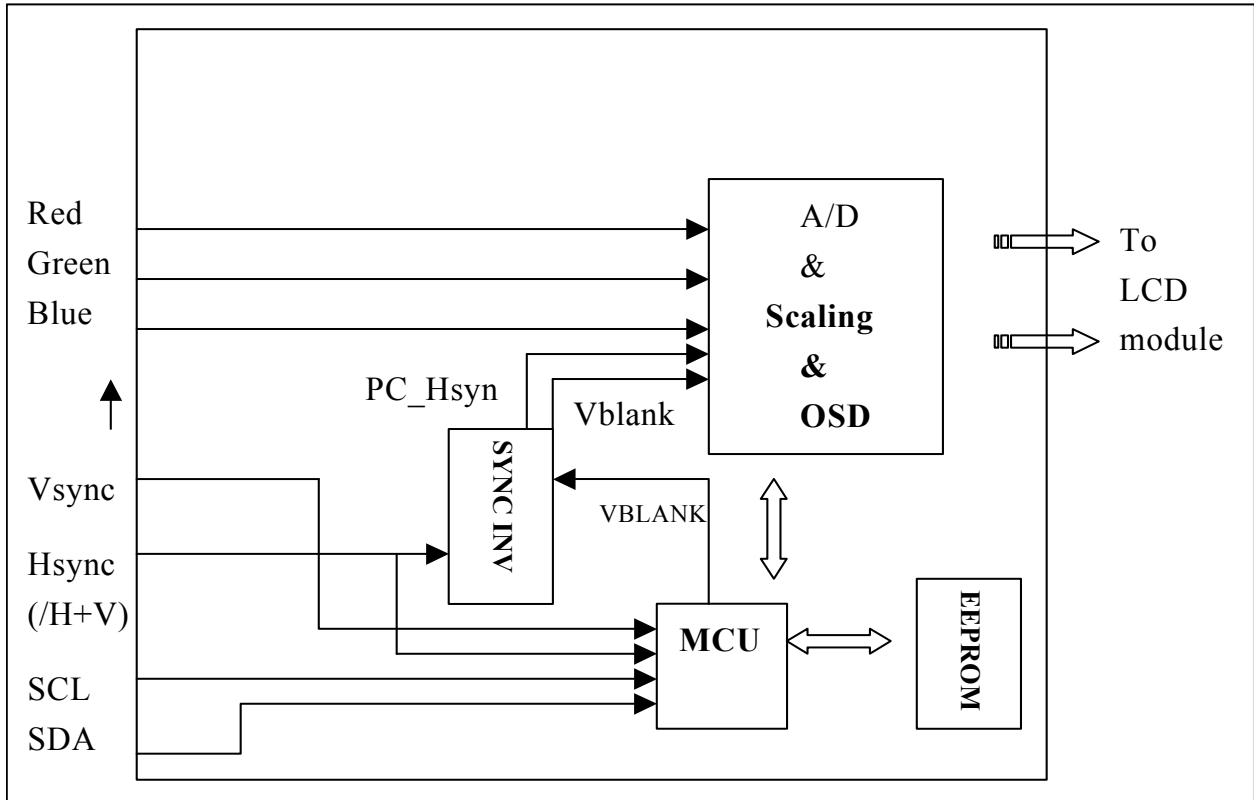


III. Circuit operation theory:

A.) HEAD:

A-1.) Interface board diagram:

Interface Board



(a) Circuit operation theory:

A basic operation theory for this interface board is to convert analog signals of Red, Green and Blue to digital signals of Red, Green and Blue. The scaling IC has internal A/D converter, internal OSD and auto detect input timing functions. A/D converter is convert analog signal to digital data. OSD is offering adjustable functions to end-user. Detect timing is for detect change mode. Finally the scaling IC outputs the digital R, G, B data, the H-sync, V-sync, data enable and pixel clock to TCON (Timing controller). After TCON processing data, data will output to driver of panel. MCU offers H/W DDC2 function & controls system processing. EEPROM is stored DDC data, OSD common data and user mode data.

(b) IC introduction:

1.) DDC (Display Data Channel) function: We use MYSON MTV312 to support DDC/2B function.

DDC data is store in 24C04(EEPROM). When MCU working, it will read DDC data from 24C04 then put those data to DDC RAM of MTV312. Those data related to LCD monitor specification. PC can read them by “SDA” and “SCL” serial communication for I²C communication for DDC2B.

2.) Sync Inverter: we use to tune the PC H-sync and the PC V-sync from PC. H-sync will effect performance of phase.

3.) Scaling IC: We use MASCOT VZ of MRT .The MASCOT VZ is revolutionary scaling engine, capable of expanding any source resolution to a highly uniform and sharp image or down scaling form XSGA, combined with the critically proven integrated 8 bit triple-ADC and patented Rapid-lock digital clock recovery system. It also support detect mode and DPMS control.

4.) MCU: We use MTV312 control unit, it controls all the functions of this interface board, just like the OSD display setting, the adjustable items, adjusted data storage, the external IIC communication, support DDC2B.

5.) EEPROM: We use 24C04 to store all the adjustable data except zoom on/off control, and we divided it into two parts for the storage of DDC data and user settings.

A-2.) Power board digram:

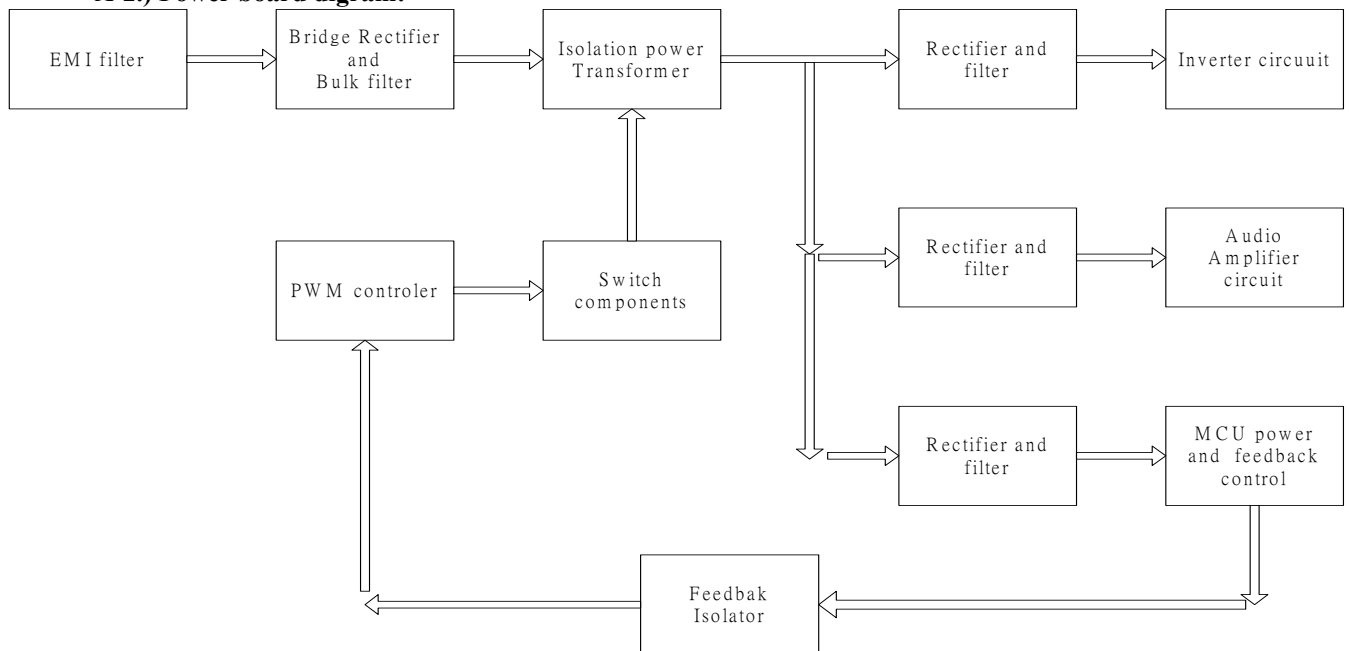


Fig.1

#1 EMI Filter

This circuit (fig. 2) is designed to inhibit electrical and magnetic interference for meeting FCC, VDE, VCCI standard requirements.

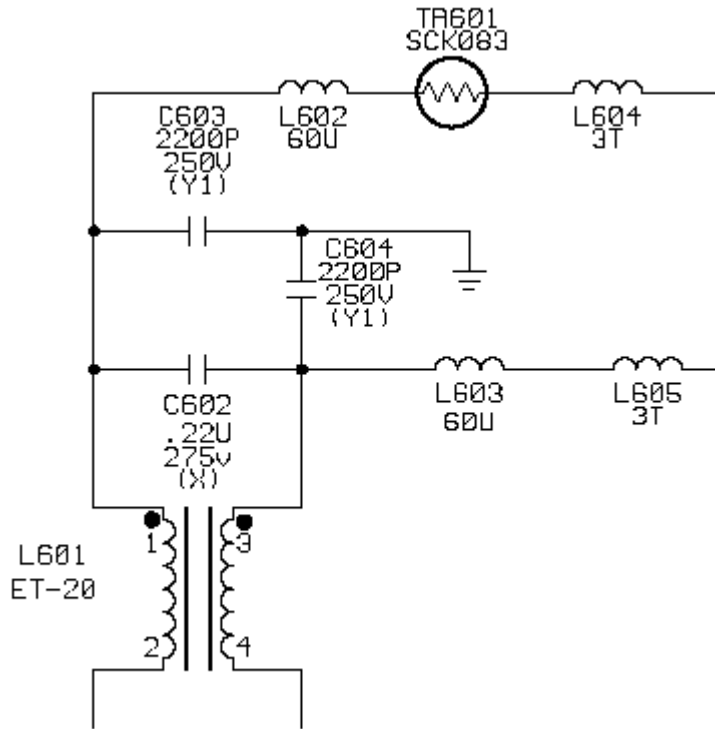


Fig. 2

#2 Rectifier and filter

AC Voltage (90-264V) is rectified and filtered by BD601, C605 (See Fig 3) and the DC Output voltage is $1.4 \times (\text{AC input})$. (See Fig.3)

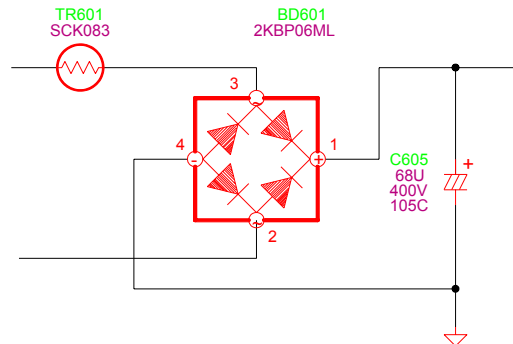
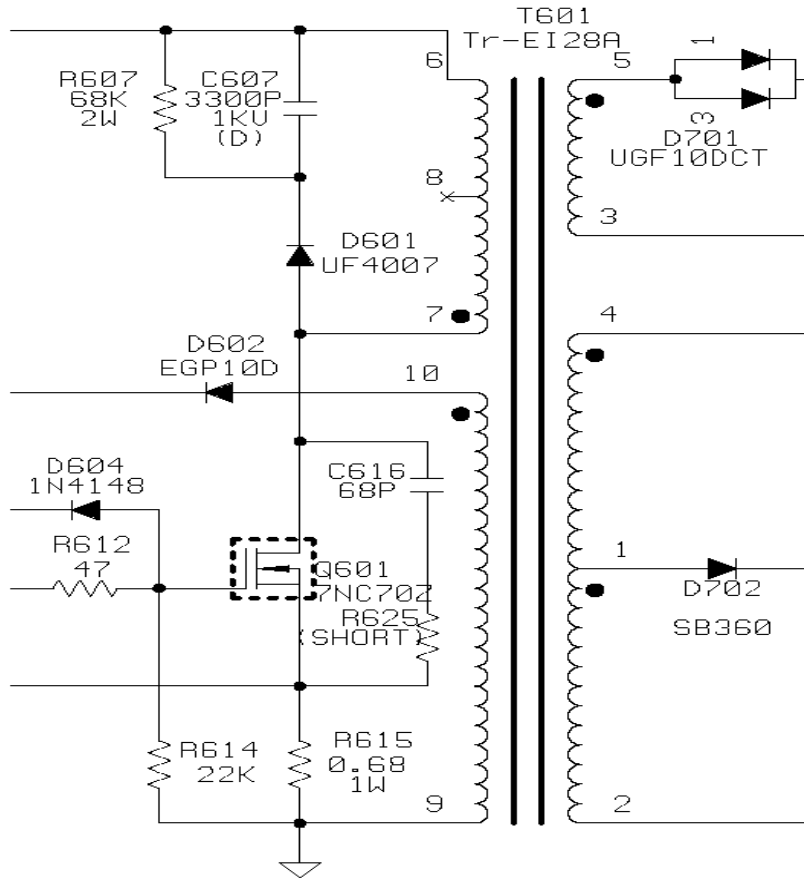


Fig. 3

#3 Switching element and Isolation power transformer

When the Q601 turns on, energy is stored in the transformer. During Q601 turn-off period, the stored energy is delivered to the secondary of transformer. R607, C607 and D601 is a snubber circuit. R615 is current sense resistor to control output power. (See Fig.4)

**Fig. 4**

#4 Rectifier and filter

D702 and C707 are to produce DC output. L702 and C708 are to suppress high Frequency switching spikes. R704 is a dummy load. (See Fig.5)

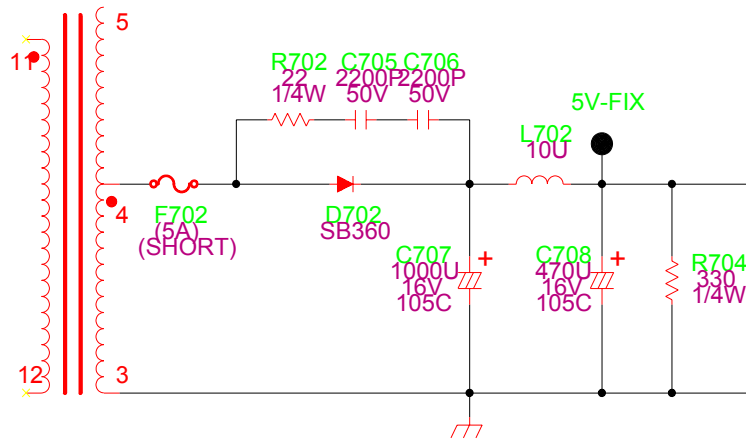


Fig. 5

#5 PWM Controller

The current mode control IC UC3842B is used to control PWM. When the VCC terminal of it gets 16V, IC601 turns on. +5V will

be set up at Pin8 through soft start circuit, which includes R617, C611, D606 and D605. R616 and C610 generate a fixed frequency saw-tooth wave at Pin4.

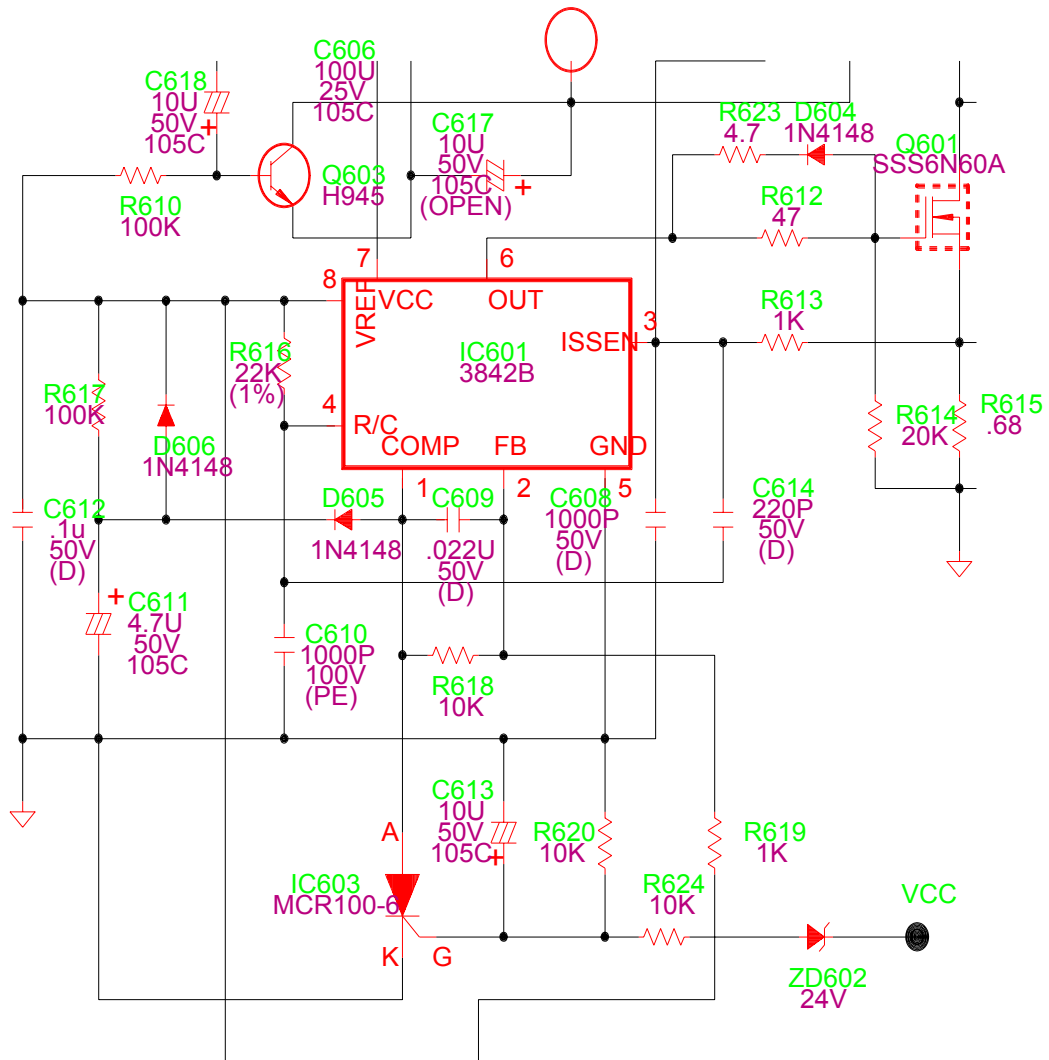


Fig. 6

#6 Feedback circuit

PC123 is a photo-coupler and TL431 is a shunt regulation. They are used to detect the output voltage change and be the primary and secondary isolation. When output voltage changes, the feedback voltage will be compared and duty cycle will be decided to control the correct output voltage. (See Fig.7)

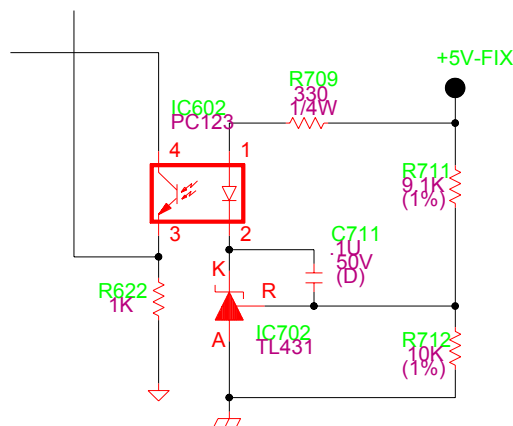
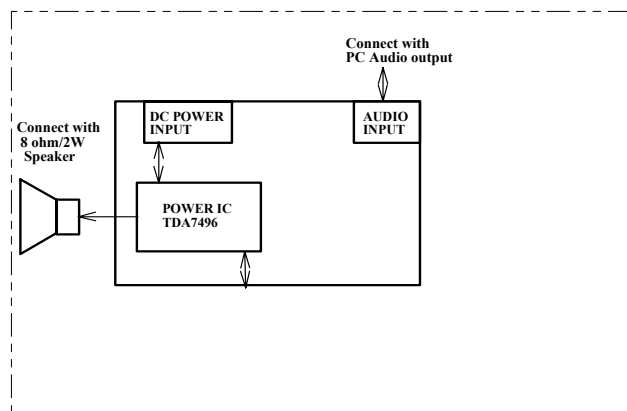


Fig. 7

#7. Audio Speaker:



The Audio Speaker is consisting of an Audio board. The Audio Speaker has DC Volume control, use 28mmX40mm Speaker (2W/per channel), power supply from AC-DC board and Audio input from PC Audio output (Line Out).

- (A) **Power IC:** Use ST POWER IC TDA7496. The IC are stereo Class AB output amplifiers with DC Volume control. The devices are designed for use in TV and monitor, but are also suitable for battery-Fed portable recorders and radios. Use +12V from AC-DC Board and connect speaker to offer 1W per channel.
- (B) **DC Power Input:** To supply +12V to be VCC source Voltage for TDA7496 and built-in AC-DC board.
- (C) **Audio Input:** connect with PC Audio output in 3.5mm to 3.5mm signal line.
- (D) **Speaker:** Use 8 ohm and 28mmX40mm speaker (2W/per channel)
- (E) **DC Volume Control:** The voltage range is 1 – 5 V (From MC)

A-3.) Control board introduction:

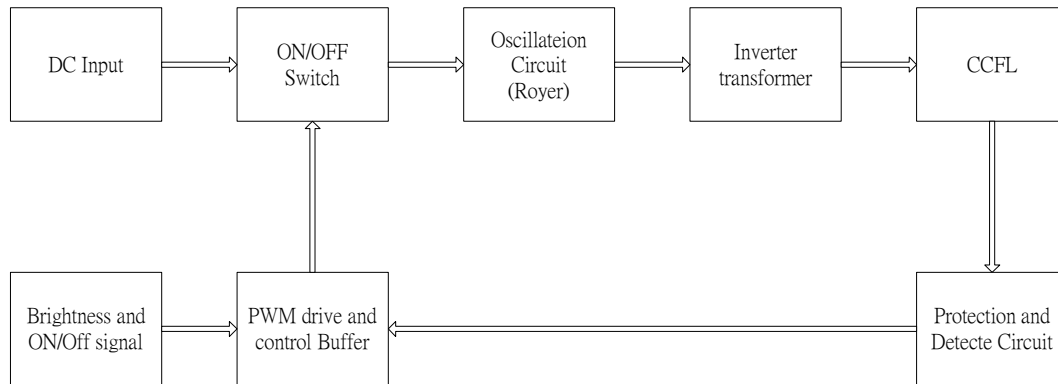
The main parts of the control board are a push button, and a led.

(a) **Push button:** It's a simple switch function, pressing it for "ON" to do the auto adjustment function, releasing it for "OFF" to do nothing.

(c) Led: It indicates the DPMS status of this LCD monitor; green light means DPMS on (Normal operating condition). Amber light means DPMS off (Power off condition).

Inverter Circuit Operation Theory

Block Diagram:



2. General Specification

Input Voltage: 12V

Input Current: 1.5A max.

ON/OFF Voltage: 3.3V

PWM Duty: 3.3V/47KHz

Output Requirement:

Max. Output Current: 15mA

Min. Output Current: 8mA

Lamp Working Voltage: 600Vrms

Open Lamp Voltage: 1000Vrms

Frequency: 47KHz

3. Inverter Circuit Operation Theorem

3.1 PWM controller

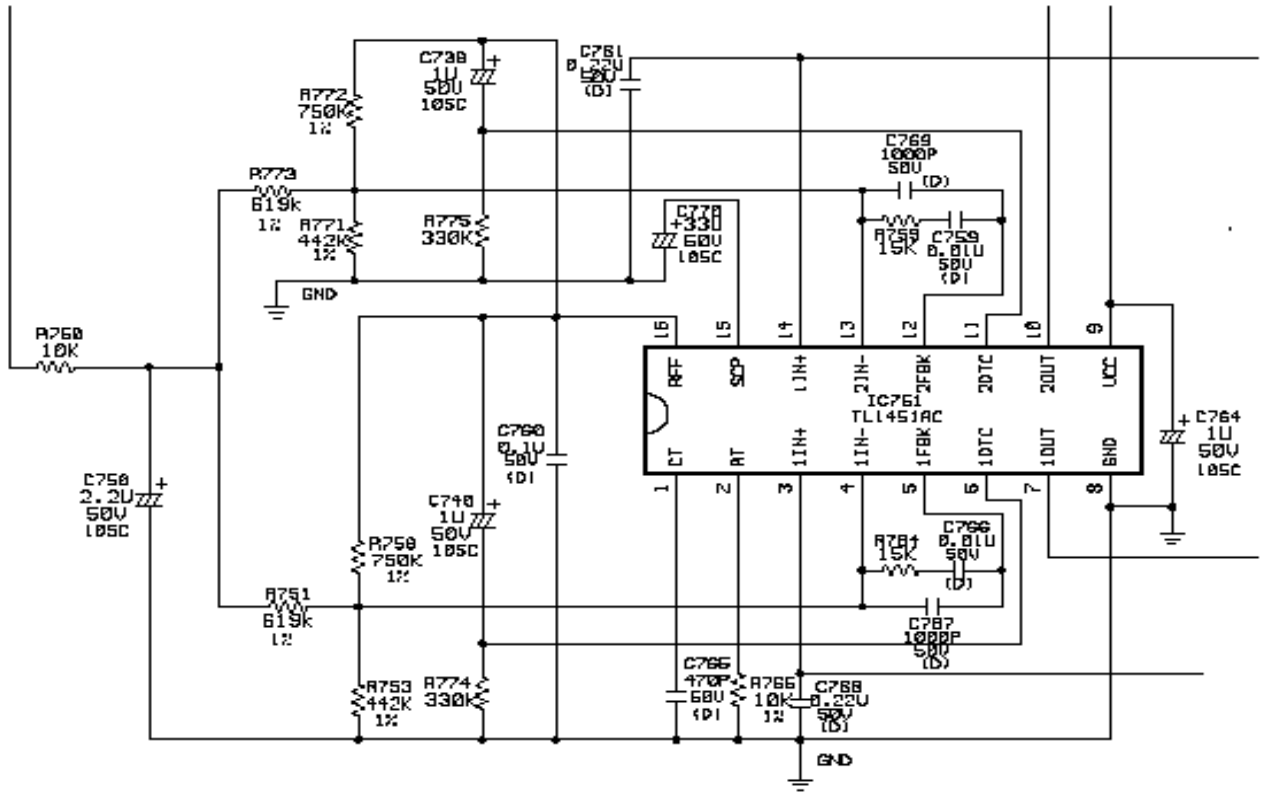


Fig. 8

The TL1451AC incorporates on a single monolithic chip all the functions required in the construction of two pulse-width modulation control circuits. Designed primarily for power supply control, the TL1451AC contains an on-chip 2.5V regulator, two error amplifiers, an adjustable oscillator, two dead-time comparators, undervoltage lockout circuitry, and dual common-emitter output transistor circuits. The uncommitted output transistors provide common-emitter output capability for each controller. The internal amplifiers exhibit a common-mode voltage range from 1.04V to 1.45V. The dead-time control comparator has no offset unless externally altered and can provide 0% to 100% dead time. The on-chip oscillator can be operated by modulating RT and CT. During low Vcc conditions, the undervoltage lockout control circuit feature locks the outputs off until the internal circuitry is operational.

3.2 Royer Circuit

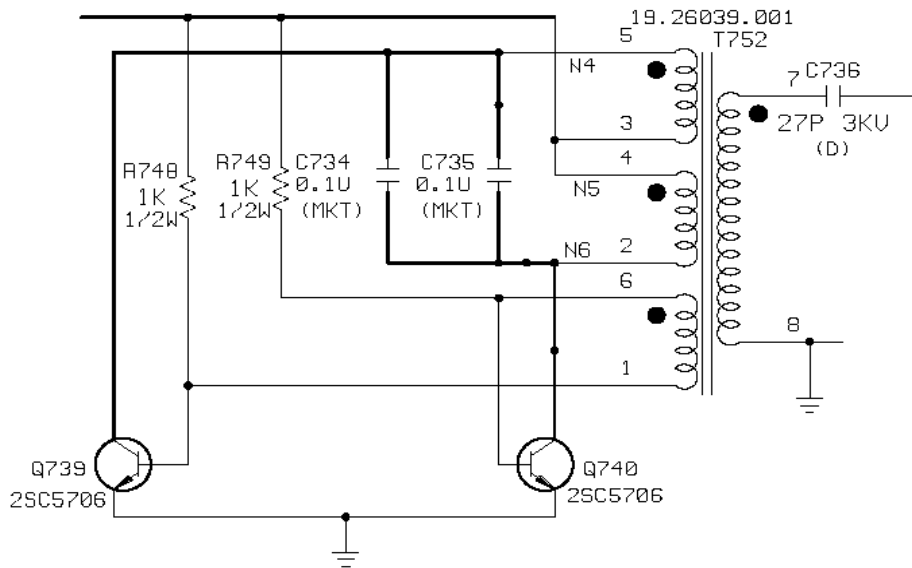


Fig. 9

Royer circuit use the characteristic of transformer saturation to oscillate. When the DC power inject, Q739 or Q740 will turns on, and the current I_c increases. After a period, the transistor will leave the saturation status and V_{ce} increase. The result cause the voltage of primary coil get lower. Finally the transistor turn off, and another transistor turn on. These status are repeated and the pin7 and pin8 of T752 will get a Sin Wave to turn on CCFL.

3.3 Feed-back Circuit

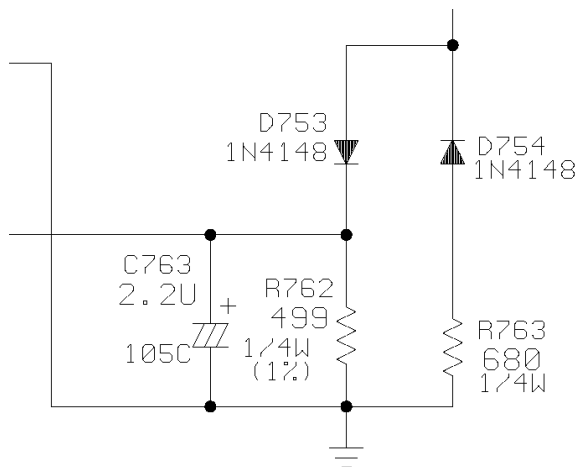


Fig. 10

Fig. 10 is the feedback circuit of inverter. It get the voltage of Lamp-Current to be the feedback signal and PWM IC (IC751) will adjust the duty-cycle according to the signal to control the lamp brightness.

1. Alignment procedure (for function adjustment)

The list of necessary alignment for a LCD monitor:

Items	Description	Remark
1	Timing adjustment	Preset timing
2	Auto color balance adjustment	
3	Color temperature adjustment	C1, C2 & C3
4	Writing EDID file	Analog

A. Preparation :

1. Setup input timing to any preset mode (UVGA7), any pattern.
2. Enter factory setting area (press “EXIT” & ”ENTER” then “power on”).
3. Move blue cursor into “BURN IN MODE” tag and select “YES” to enable burn-in mode.
4. Power off the monitor, then power on again.
5. Setup unit and keep it warm up at least 20 minutes.

B. Timing adjustment :

6. Enter factory setting area (press “EXIT” & “ENTER” then “power on”).
7. Select timing from figure 1. The timing marked with star sign (*) have to be adjusted.
8. Press i-key to run “AUTO adjustment” function.
9. Clear user area in EEPROM.
10. Check the phase of the image; if phase is not perfect adjust it to the best condition.
11. Adjust the settings to following values:
CONTRAST = 50
BRIGHTNESS = 90
OSD TIME = 20
VOLUME = 20
COLOR = USER
12. Press “EXIT” key until the “SAVE” shows on the OSD to save factory parameters and turn off the monitor power.
13. Turn on the power enter user area.

C. Auto color balance adjustment :

1. Setup input timing UVGA7, 5-DISC pattern.
2. Enter factory setting area (press “EXIT” & “ENTER” then “power on”).
3. Move blue cursor into “BURN IN MODE” tag and select “YES” to enable burn-in mode.
4. Set color pointer to USER mode
5. Press “DEC” to do white balance for auto color balance adjustment.

D. Color adjustment :

1. Setup input timing UVGA7, white pattern .
2. Enter factory setting area (press “EXIT” & “Enter” plus “power on”).
3. Confirm auto color balance adjustment had already done.
4. Measure color temperature by Minolta CA-110 (or equivalent equipment).
5. Manually adjust RED, GREEN, BLUE value of each color temperature, C1, C2 & C3 to meet following spec requirement,

Color temperature (C1, 9300K set on OSD)	X+-	0.283+(-) 0.03
	Y+-	0.297+(-) 0.03
Color temperature (C2, 6500K set on OSD)	X+-	0.313+(-) 0.03
	Y+-	0.329+(-) 0.03
Color temperature (C3, 5800K set on OSD)	X+-	0.326+(-) 0.03
	Y+-	0.342+(-) 0.03

6. Turns off the monitor power.

E. Writing EDID file :

1. Setup a PC with DDC card.
2. Connect PC to monitor with a D-sub signal cable.
3. Please refer to the C212 for the correct EDID file.
4. Runs the writing program to write the EDID file into EEPROM for analog input, ie. 15-pin D-sub.
5. Read both EEPROM data and confirm it to match with the C212 definition.

F. Command definition :

MCU COMMAND LIST					
FUNCTION	BYTE1	BYTE2	BYTE3	BYTE4	
write EEPROM bank0	AA				
write EEPROM bank1	AC				
read EEPROM bank0	A3				
read EEPROM bank1	A5				
enter factory mode	1A	5A			
exit factory mode	1E	5A			
clear(including auto phase)	1F	5A			
Change color temperature	CC				
B/I mode off	CE	2	0		

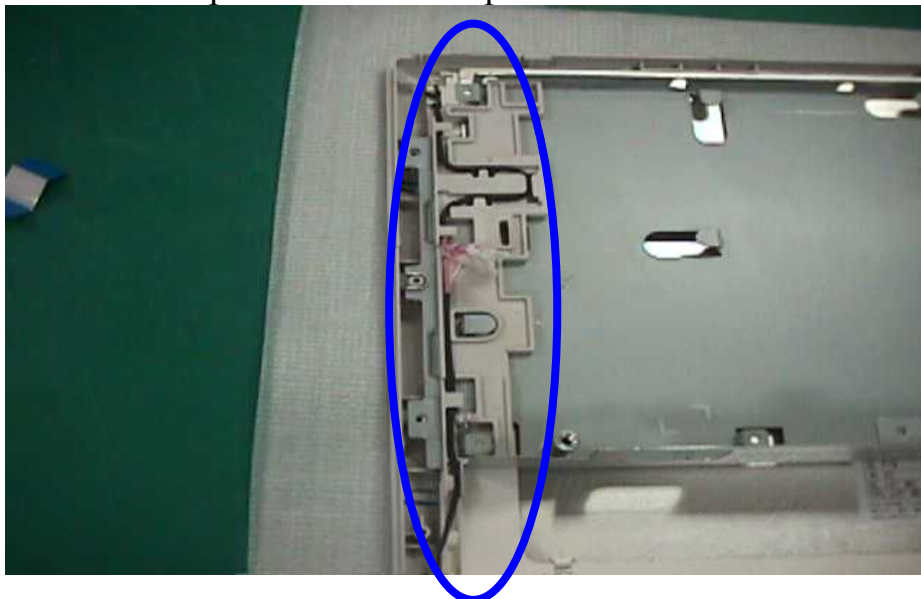
Table 1.

Resolution	Horizontal Frequency (KHz)	Vertical Frequency (Hz)	Dot Clock Frequency (MHz)	Remark
640x350	31.47(P)	70.08(N)	25.17	DOS
720x400	31.47(N)	70.08(P)	28.32	DOS
640x480	31.47(N)	60.00(N)	25.18	DOS
640X480	37.86(N)	72.80(N)	31.5	VESA
640X480	37.50(N)	75.00(N)	31.5	VESA
800x600	35.16(P)	56.25(P)	36.00	VESA
800x600	37.88(P)	60.32(P)	40.00	VESA
800x600	48.08(P)	72.19(P)	50.00	VESA
800X600	46.87(P)	75.00(P)	49.5	VESA
1024x768	48.36(N)	60.00(N)	65.00	VESA
1024x768	56.48(N)	70.10(N)	75.00	VESA
1024x768	60.02(P)	75.00(P)	78.75	VESA

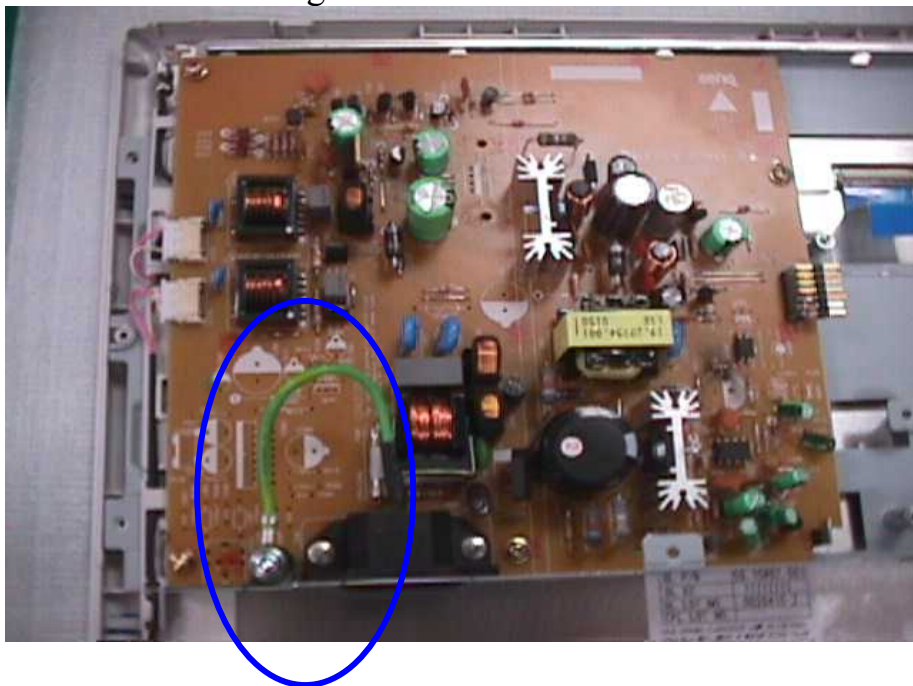
Figure 1.

2. Wire Dressing and assembling concern

A. Lamp wire into holder panel wire :



B. AC socket ground wire fix at standoff:



C. D-sub wire fix at standoff :

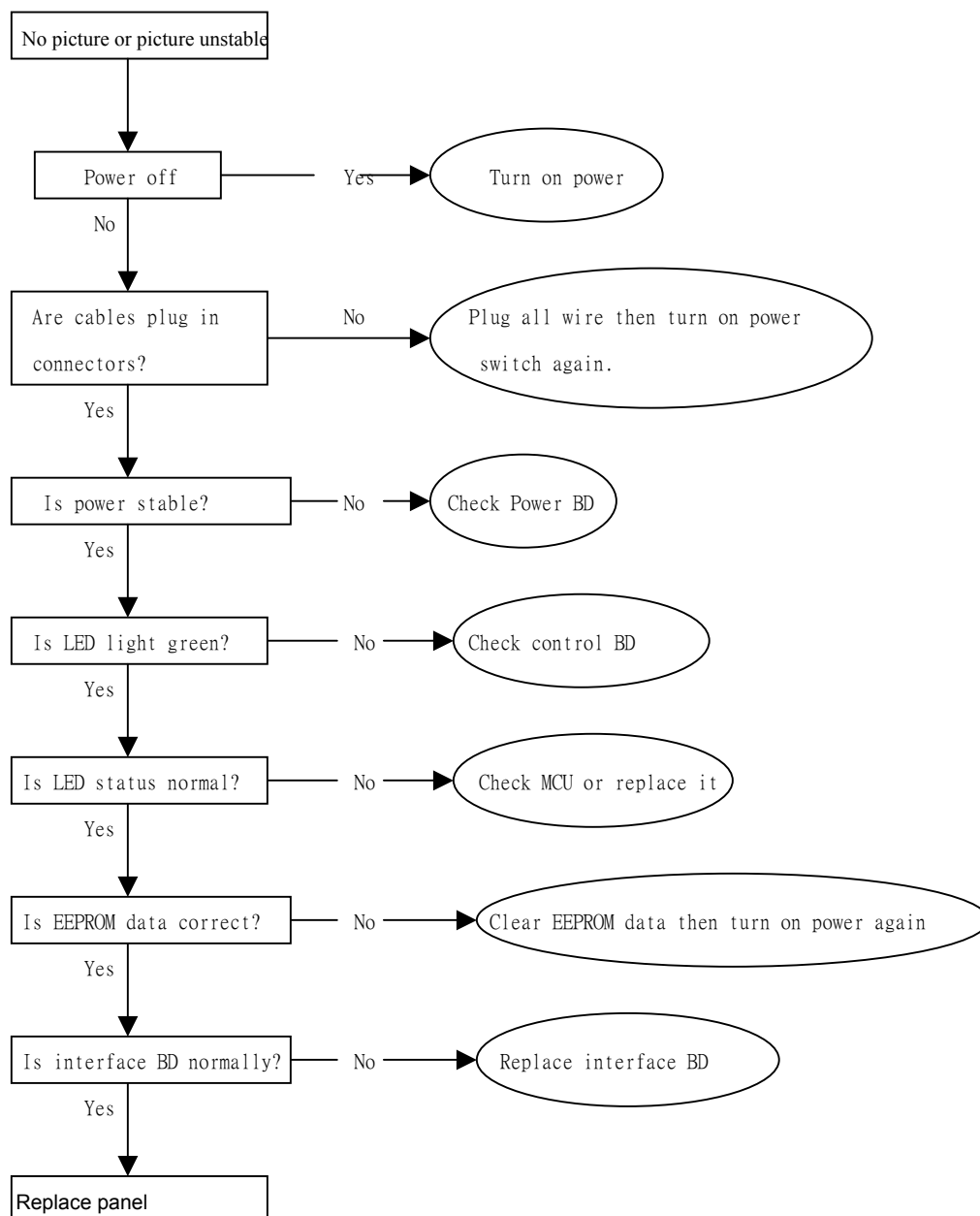


D. Control board touch bracket-panel :

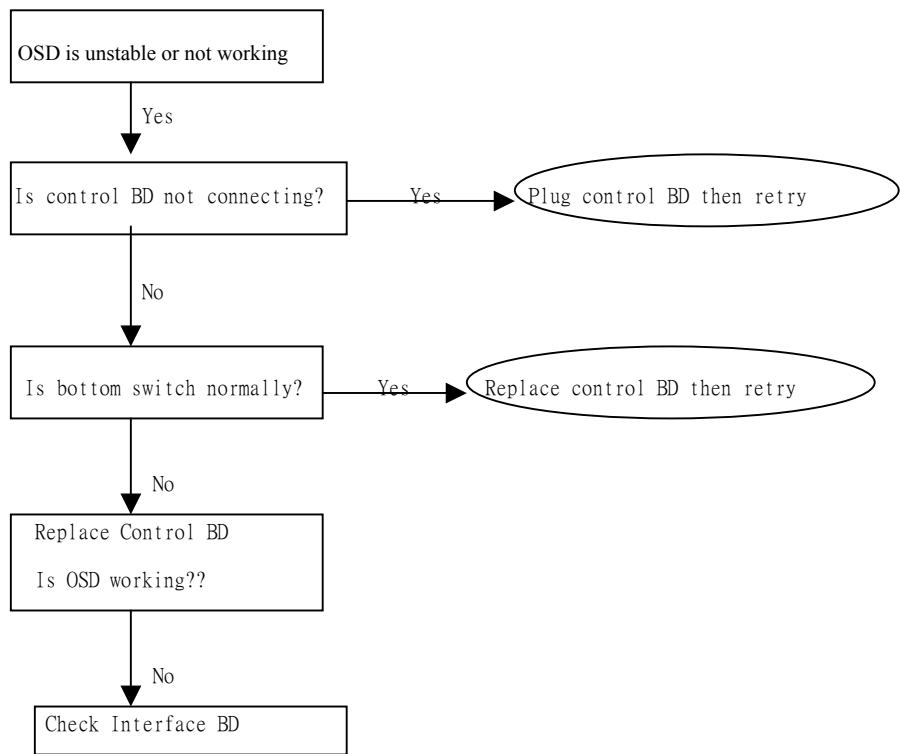


E. Add a gasket for TCO99

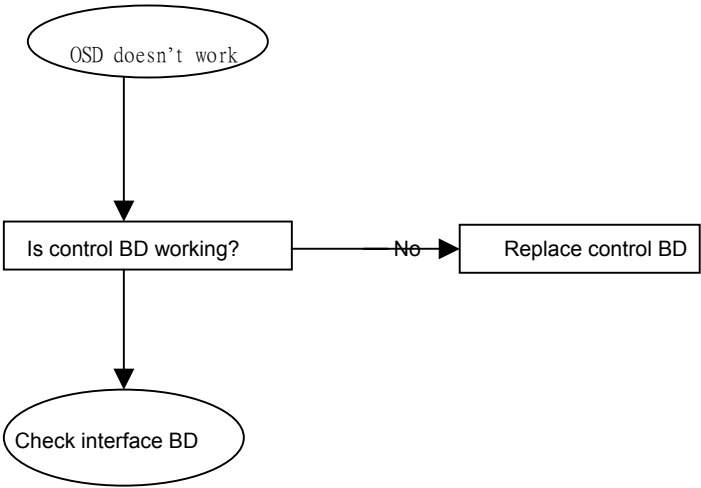


1. No Display or display is unstable:**1.1 Interface Board:**

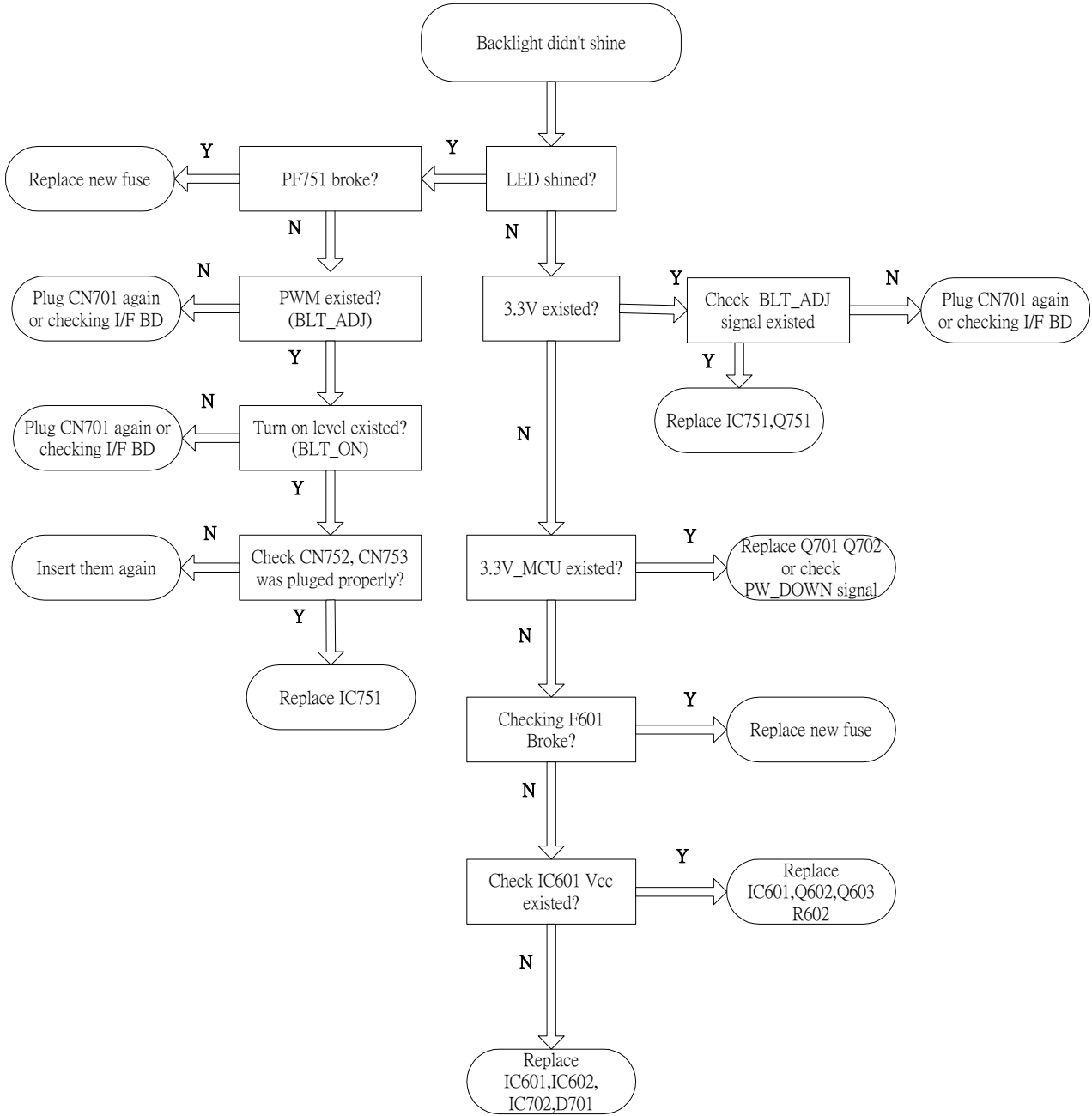
2. BUTTON function:
2.1 Control Board



3. OSD function:



4. Power Board



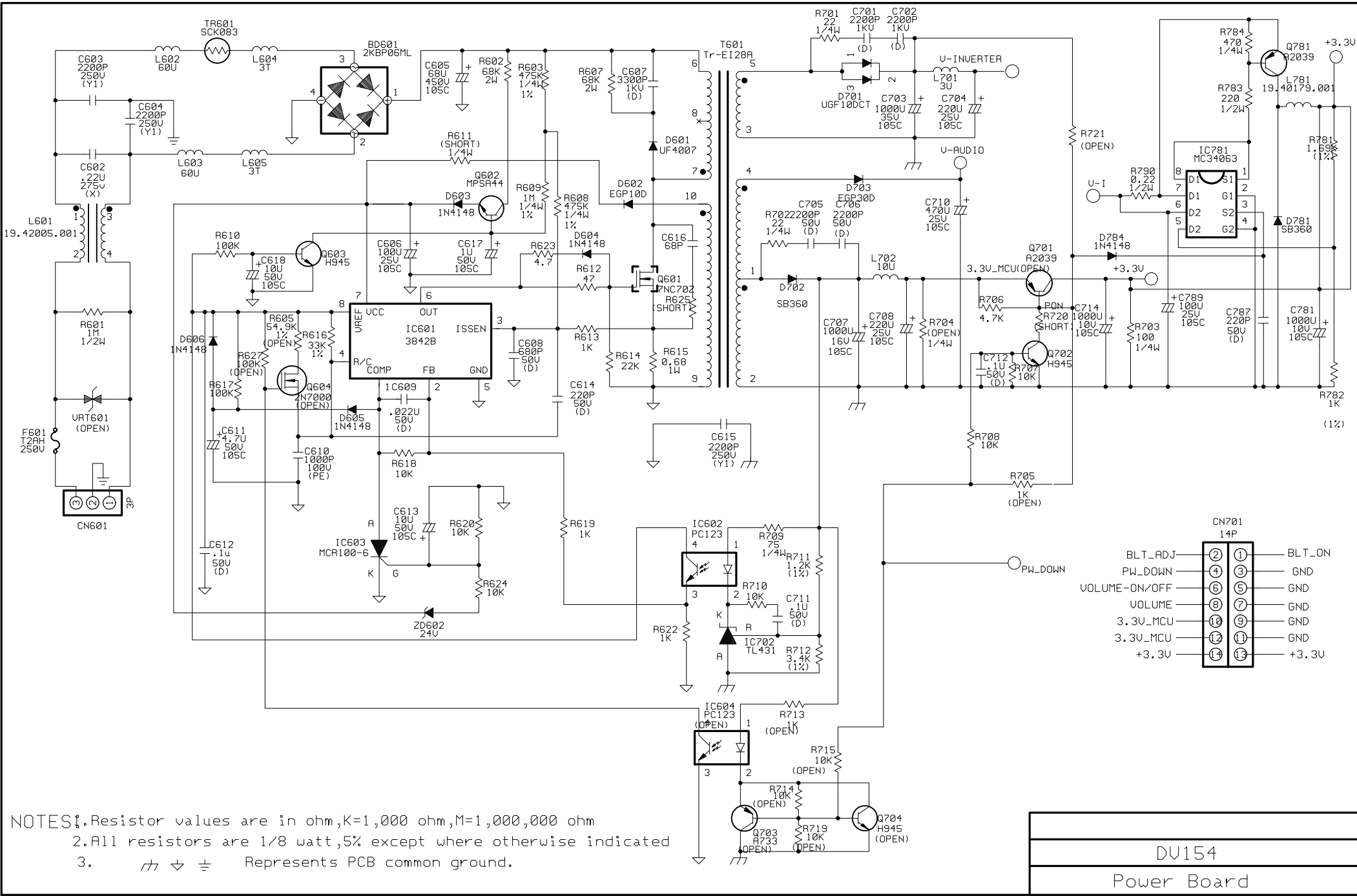
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1	55.L6301.001	FP557A XN05/MRT MV I/F BD-MI	
2	02.02404.002	IC EEPROM AT24C04-10PI-2.7 DI	U3
3	04.00431.030	IC V.R. TL431C TO-92T 3P	DA1
4	09.1061D.01C	CAP EL 10U 16V M RF5	C64
5	09.10712.01C	CAPACITOR EL 100U 25V M RF5	C33
6	09.22514.01C	CAP EL 2.2U 50V M RF5	C48
7	09.22713.01C	CAP EL 220U 35V M RF5	C15
8	09.47612.08C	CAP EL 47U M 25V RF5 105C10*1	C11 C13
9	09.47711.02C	CAP EL 470U 10V M RF5 6.3*11	C65
10	23.30008.733	XTAL 12MHZ 30PF 30PPM 49U	Y1 Y2
11	45.10101.071	LABEL(B)SERIAL ART 12*5 ALL	
12	55.L6301.M01	PCBA I/F XN05/MRT MV SMD 557A	
13	71.31264.003	IC FLASH MTV312M64 PLCC44P	U4
14	55.L6302.001	PCBA PWR XN05/MRT MV MI	
15	04.01451.070	IC PWM CTRL TL1451ACN DIP 16P	IC751
16	04.03842.044	IC VR UC3842BN DIP 8P	IC601
17	04.07496.010	IC AMP TDA7496 SIP 15P	IC501
18	05.00123.010	IC OPTO PC123F1 DIP 4P	IC602
19	06.00485.020	FET MOS 2SJ485 PC TP	Q701
20	06.05706.010	XTOR 2SC5706 NPN TP 3P	Q739 Q740 Q759 Q760
21	06.09024.020	FET MOS IRFU9024 PC TO-251AA	Q743 Q751
22	06.2R060.151	DIODE BRI 2KBP06ML-530 600V 2	BD601
23	06.3R006.110	DIODE S.B. SB360 60V 3A DO-20	D702
24	06.3R020.121	DIODE FAST EGP30DL-5301 200V3	D703
25	08.22216.354	CAP DISC Y1 2200P 250V RF10 D	C615
26	08.2703M.34D	CAP DISC 27P3KV J SL 125 RF7.	C756 C736
27	08.33216.354	CAP DISC Y1 3300P 250V RF10 D	C603 C604
28	09.10813.L9C	CAP EL 1000U35V RF5 L 13*25EL	C703
29	09.1081D.09C	CAP EL1000U16V RF5 105C 10*20	C508
30	09.1081D.L9C	CAP EL 1000U16V RF5 L 10*20EL	C707
31	09.47712.08C	CAP EL 470U25V M RF5 105C10*1	C710 C502 C752 C751
32	09.6861M.084	CAP EL 68U 450V M 25*20 105 S	C605
33	11.2241N.11E	CAP X 0.22U U/V/FI 275V RF15	C602
34	13.3R335.07E	RES MOFM 3.3 J 2W AF15 MINI	R513
35	13.68335.07E	RES MOFM 68K J 2W AF15 MINI	R607 R602
36	13.R6834.03E	RES MOF 0.68 J 1W AF15	R615
37	17.60021.8R0	THERM 8 NTC 11.5D	TR601
38	19.20254.001	XFORM PWR EI-28 600UH	T601
39	19.26039.001	XFORM INVERT 9.0U EE-19	T751 T752
40	19.40054.031	CHOK 60UH T50-26 W/H	L602 L603
41	19.40155.001	CHOK 2.7UH DR6*10	L701 L702
42	19.40179.001	CHOKE 71UH DR10*8	L751 L752
43	19.42005.001	LINE FILTER UU-15 15MH	L601
44	20.62089.104	HEAD BLK ML 1R4P ST D2 3S H6	CN502
45	20.63174.103	HEAD ML 1R3P(-1#2) RT D4 4S H	CN752 CN753

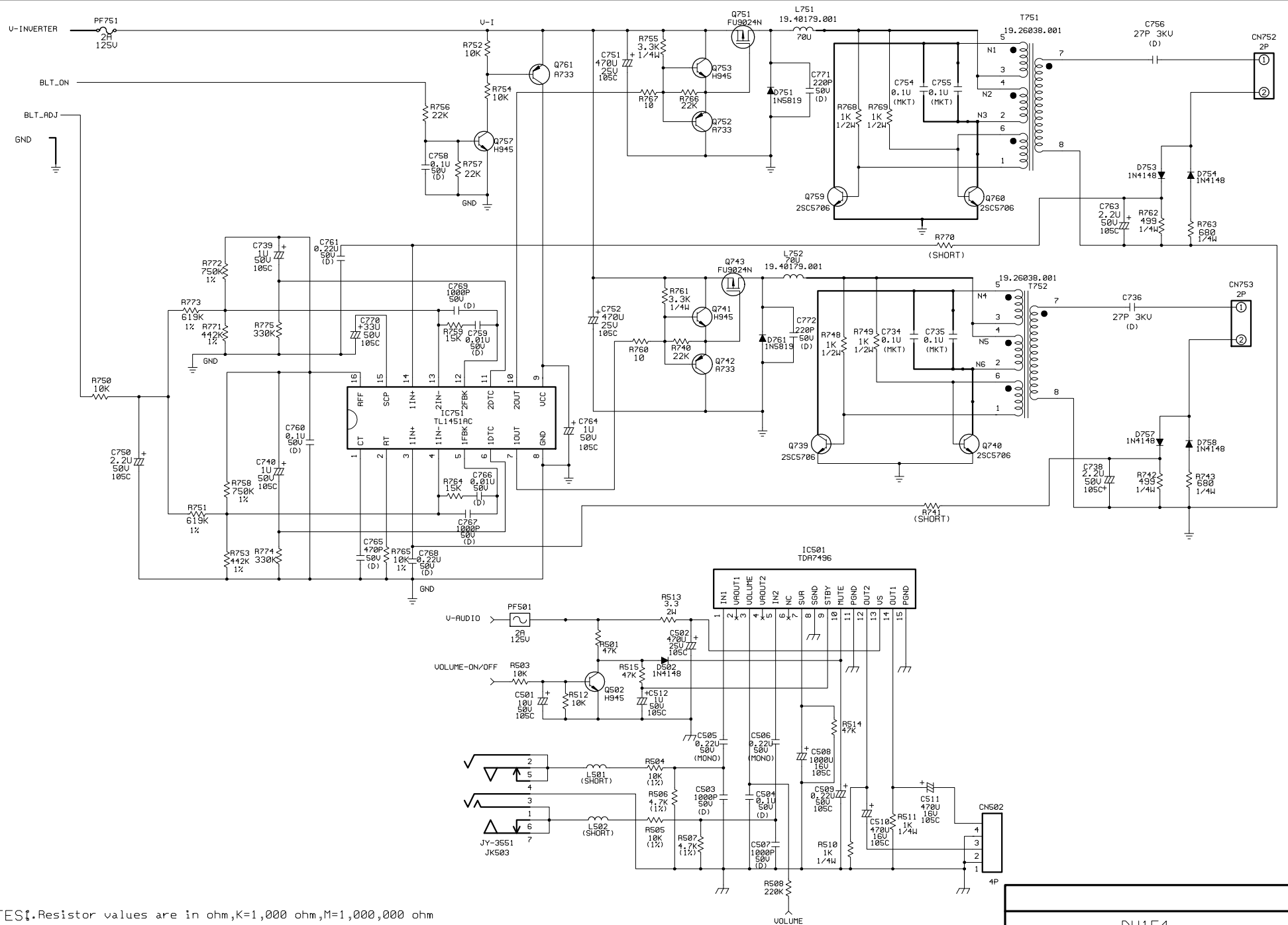
46 21.62052.207	HEAD ML 2R14P L RT D2.54 L10.	CN701
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48 25.70029.001	BEAD 3T D6*10 Z580/100M	L605 L604
49 26.12001.932	FUSE2A250V CERA ST20 T/LA RF2	F601
50 55.L6302.A01	PCBA PWR XN05/MRT MV AI	
51 60.L2910.001	ASSY SKT+WIRE	CN601
52 60.L4605.001	ASSY HSK+STP7NC70ZFP	Q601
53 60.L4606.001	ASSY HSK+UGF10DCT	D701
54 55.L6303.001	PCBA CTRL BD FP557A MI	
55 06.066GY.14X	LED D5*8.3 GRN/YEL KTL-66GY-1	LD8601
56 22.40069.431	SW TACT 4.75MM RT TSVR-2	SW8601 SW8602 SW8603 SW8604 SW8605 SW8606
57 48.L4603.A03	PCB CTRL BD FR1 AU	
58 50.L6301.001	WIRE 9/10P 1007 #26 230MM	CN8601
59 23.4L630.001	SPK*2 2W 8 OHM 400MM	
60 34.L4602.022	WAIT FOR FUTURE USAGE	
61 34.L5501.021	SHD-MAIN SPTE 0.3T	
62 40.L3303.171	LBL SPEC LR DIAMOND	
63 42.L4604.001	CVR HINGE ABS-HB 002	
64 42.L4612.001	CLIP TA-7 NY66	
65 42.L4617.002	HLD PNL WIRE FR-ABS	
66 46.L4601.021	SHEET BASE INSTALLATION	
67 47.L7306.001	GASKET 10L*8W*15H	
68 47.L7308.001	L-AL-TAPE 58.5L*40W	
69 50.L6302.001	CABLE FFC P0.5 45P 40MM Z TYP	
70 50.L6303.001	CABLE FFC P0.5 30P 40MM Z TYP	
71 50.L6304.201	SIGNAL/C 20276 1560MM	
72 56.91L63.001	LCDM 15" M150XN05/AUO	
73 60.L4610.002	ASSY UC 002 WM75/AU/CPT	
74 60.L5507.003	ASSY COLUMN TCO	
75 60.L6306.001	ASSY BKT-PNL(AU) AUDIO	
76 60.L6309.001	ASSY BZLMEA/AU 002 AUDIO	
77 27.81318.011	CORD SAA #18*3C 10A 250V AUS	
78 42.20019.002	BAG PE 250*350 LD	
79 42.L0001.001	BAG PE 550*450*0.05 24LAG	
80 44.L4604.021	CTN B DIAMOND(DV153)	
81 45.00050.002	LABEL CTN ART 105*82 ALL(KB)	
82 46.L0301.001	CARD WARR TFT LCD	
83 47.L5502.002	CNS LEFT EPS CPT 2100	
84 47.L5503.002	CNS RIGHT EPS CPT 2100	
85 49.L6303.001	MANUAL DV154	
86 50.74405.501	CABLE AUD PC99PT284C/PT577C B	
87 53.L6302.001	FDISK MEA DV154	
88 60.L6310.001	ACCESSARY BASE-PLT MEA	
89 60.L4619.002	ASSY BASE PLATE 002	

Model: DV154B

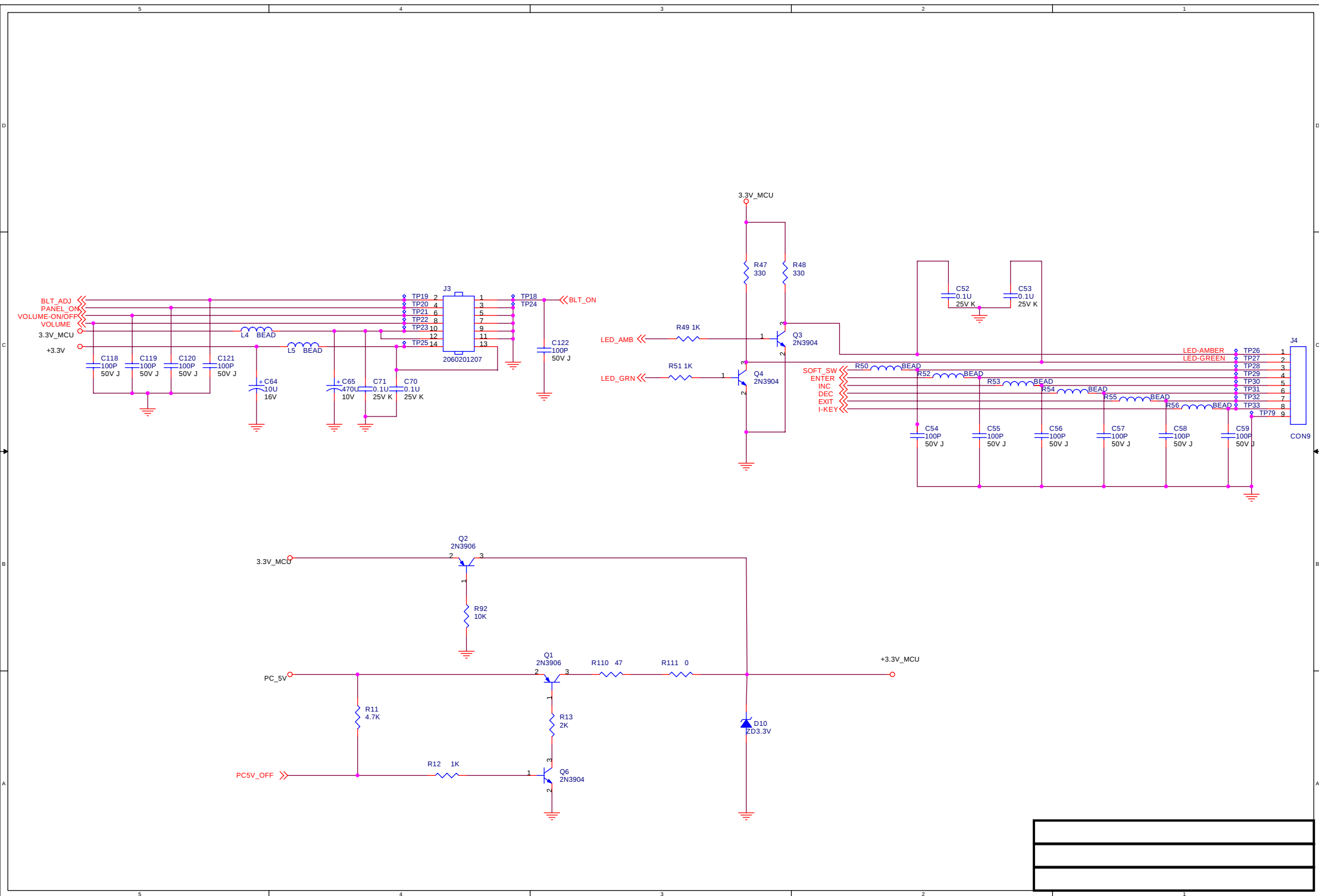
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2	02.02404.002	IC EEPROM AT24C04-10PI-2.7 DI	U3
3	04.00431.030	IC V.R. TL431C TO-92T 3P	DA1
4	09.1061D.01C	CAP EL 10U 16V M RF5	C64
5	09.10712.01C	CAPACITOR EL 100U 25V M RF5	C33
6	09.22514.01C	CAP EL 2.2U 50V M RF5	C48
7	09.22713.01C	CAP EL 220U 35V M RF5	C15
8	09.47612.08C	CAP EL 47U M 25V RF5 105C10*1	C11 C13
9	09.47711.02C	CAP EL 470U 10V M RF5 6.3*11	C65
10	20.60089.109	HEAD BLK 1R9P ST D2 3S H6	J4
11	20.61106.208	HEAD BLK 2R16P ST D2.0 4S H6.	J1
12	20.72060.207	HEAD FML 2R14P D2.54 H8.4	J3
13	23.30008.733	XTAL 12MHZ 30PF 30PPM 49U	Y1 Y2
14	45.10101.071	LABEL(B)SERIAL ART 12*5 ALL	
15	55.L6301.M01	PCBA I/F XN05/MRT MV SMD 557A	
16	71.MASCO.A0E	IC IMAGECTRL MASCOT-VZ PQFP16	U2
17	73.02781.091	IC EMI P2781A SOIC 8P	U6
18	73.07414.061	IC CMOS 74LVC14A SO-N 14P	U1
19	71.31264.003	IC FLASH MTV312M64 PLCC44P	U4
20	55.L6302.001	PCBA PWR XN05/MRT MV MI	
21	04.01451.070	IC PWM CTRL TL1451ACN DIP 16P	IC751
22	04.03842.044	IC VR UC3842BN DIP 8P	IC601
23	04.07496.010	IC AMP TDA7496 SIP 15P	IC501
24	05.00123.010	IC OPTO PC123F1 DIP 4P	IC602
25	06.00485.020	FET MOS 2SJ485 PC TP	Q701
26	06.05706.010	XTOR 2SC5706 NPN TP 3P	Q739 Q740 Q759 Q760
27	06.09024.020	FET MOS IRFU9024 PC TO-251AA	Q743 Q751
28	06.2R060.151	DIODE BRI 2KBP06ML-530 600V 2	BD601
29	06.3R006.110	DIODE S.B. SB360 60V 3A DO-20	D702
30	06.3R020.121	DIODE FAST EGP30DL-5301 200V3	D703
31	08.22216.354	CAP DISC Y1 2200P 250V RF10 D	C615
32	08.2703M.34D	CAP DISC 27P3KV J SL 125 RF7.	C756 C736
33	08.33216.354	CAP DISC Y1 3300P 250V RF10 D	C603 C604
34	09.10813.L9C	CAP EL 1000U35V RF5 L 13*25EL	C703
35	09.1081D.09C	CAP EL1000U16V RF5 105C 10*20	C508
36	09.1081D.L9C	CAP EL 1000U16V RF5 L 10*20EL	C707
37	09.47712.08C	CAP EL 470U25V M RF5 105C10*1	C710 C502 C752 C751
38	09.6861M.084	CAP EL 68U 450V M 25*20 105 S	C605
39	11.2241N.11E	CAP X 0.22U U/V/FI 275V RF15	C602
40	13.3R335.07E	RES MOFM 3.3 J 2W AF15 MINI	R513
41	13.68335.07E	RES MOFM 68K J 2W AF15 MINI	R607 R602
42	13.R6834.03E	RES MOF 0.68 J 1W AF15	R615
43	17.60021.8R0	THERM 8 NTC 11.5D	TR601
44	19.20254.001	XFORM PWR EI-28 600UH	T601
45	19.26039.001	XFORM INVERT 9.0U EE-19	T751 T752

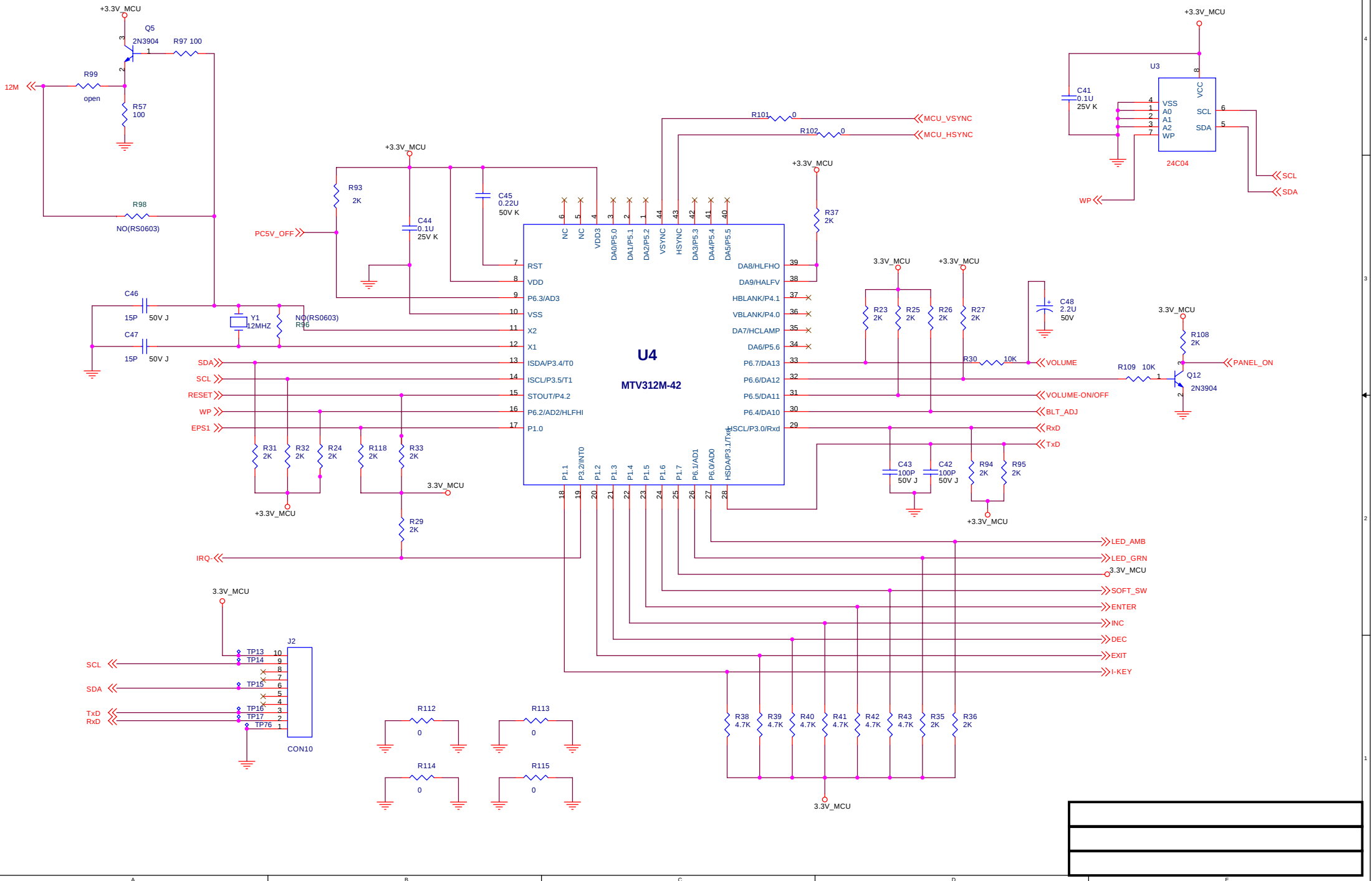
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47 19.40155.001	CHOK 2.7UH DR6*10 FP850	L701 L702
48 19.40179.001	CHOKE 71UH DR10*8	L751 L752
49 19.42005.001	LINE FILTER UU-15 15MH	L601
50 20.62089.104	HEAD BLK ML 1R4P ST D2 3S H6	CN502
51 20.63174.103	HEAD ML 1R3P(-1#2) RT D4 4S H	CN752 CN753
52 21.62052.207	HEAD ML 2R14P L RT D2.54 L10.	CN701
53 22.10165.081	SKT EARJACK RT7P/PT284C BLU	JK503
54 25.70029.001	BEAD 3T D6*10 Z580/100M	L605 L604
55 26.12001.932	FUSE2A250V CERA ST20 T/LA RF2	F601
56 55.L6302.A01	PCBA PWR XN05/MRT MV AI	
57 60.L2910.001	ASSY SKT+WIRE	CN601
58 60.L4605.001	ASSY HSK+STP7NC70ZFP	Q601
59 60.L4606.001	ASSY HSK+UGF10DCT	D701
60 55.L6303.001	PCBA CTRL BD MI	
61 23.4L630.001	SPK*2 2W 8 OHM 400MM	
62 34.L4602.022	WAIT FOR FUTURE USAGE	
63 34.L5501.021	SHD-MAIN SPTE 0.3T	
64 40.L3303.171	LBL SPEC LR DIAMOND	
65 42.L4604.001	CVR HINGE ABS-HB 002	
66 42.L4612.001	CLIP TA-7 NY66	
67 42.L4617.002	HLD PNL WIRE FR-ABS	
68 46.L4601.021	SHEET BASE INSTALLATION	
69 47.L7306.001	GASKET 10L*8W*15H	
70 47.L7308.001	L-AL-TAPE 58.5L*40W	
71 50.L6302.001	CABLE FFC P0.5 45P 40MM Z TYP	
72 50.L6303.001	CABLE FFC P0.5 30P 40MM Z TYP	
73 50.L6304.501	SIGNAL/C 20276 1560MM	
74 56.91L63.001	LCDM 15" M150XN05/AUO	
75 60.L4610.012	ASSY UC ABS 861 WM75	
76 60.L5507.014	ASSY COLUMN-EY 861	
77 60.L6306.001	ASSY BKT-PNL(AU) AUDIO	
78 60.L6309.011	ASY BZL-MEA/AU 861 AUDIO	
79 86.1A356.100	SCRW MACH PAN M4*10L B-ZN NYL	
80 86.VG434.6R0	SCRW TAP PAN F/WSH M3*6L C-ZN	
81 86.VZ226.100	SCRW TAP FLAT+EXT M4*10L ZN	
82 86.WA314.8R0	SCRW TAP CAP M3*1.34P*8L B-ZN	
83 27.01318.031	CORD SAA#18*3C 10A250V AUS(BL	
84 44.L4604.021	CTN B DIAMOND(DV153)	
85 47.L5502.002	CNS LEFT EPS CPT 2100	
86 47.L5503.002	CNS RIGHT EPS CPT 2100	
87 49.L6303.001	MANUAL DV154 (FP567A)	
88 50.74405.501	CABLE AUD PC99PT284C/	
89 53.L6302.001	FDISK MEA DV154	
90 60.L6310.011	ACCESSARY BASE-PLT P861	
91 60.L4619.013	ASSY BASE-EASY 861	

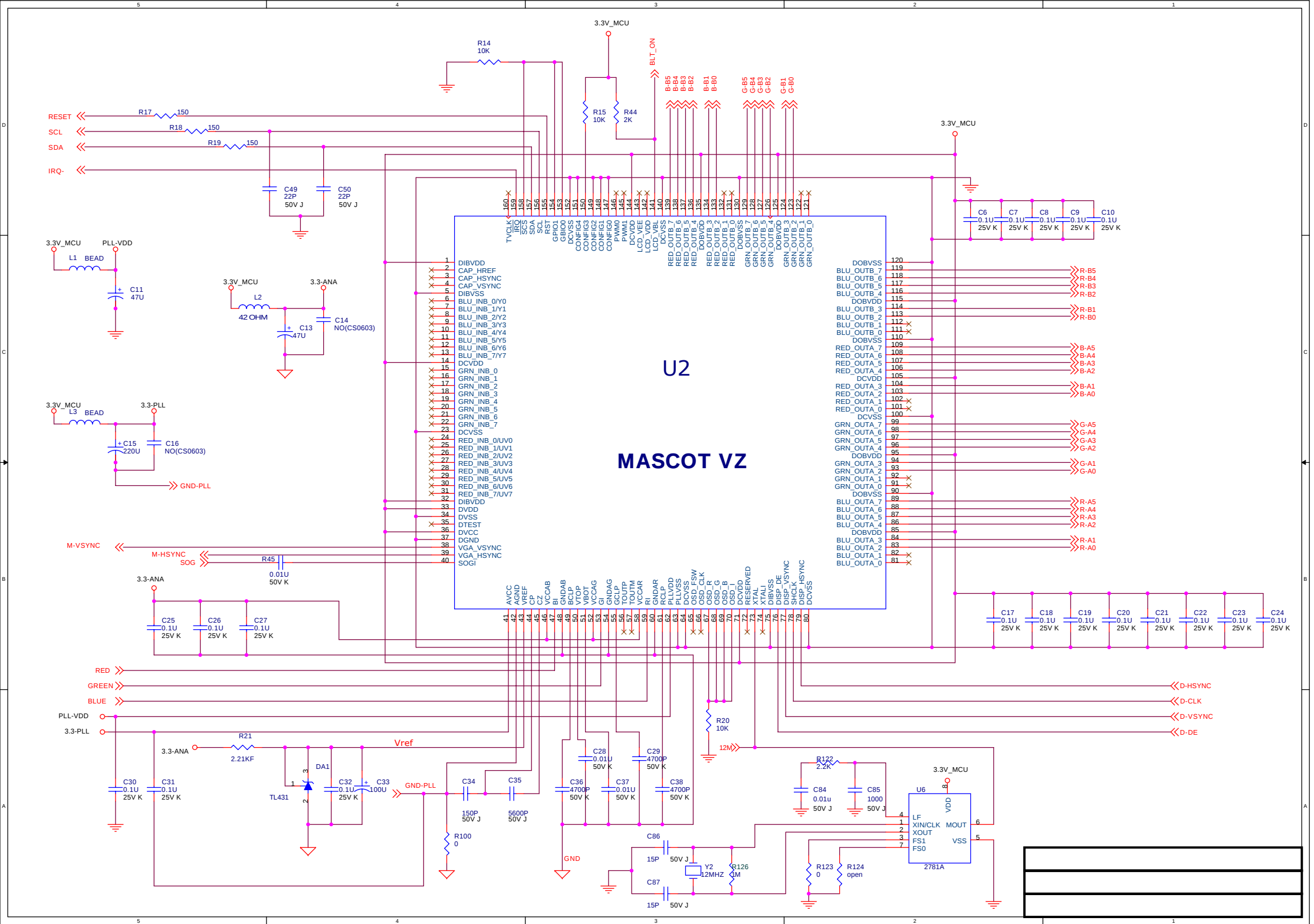


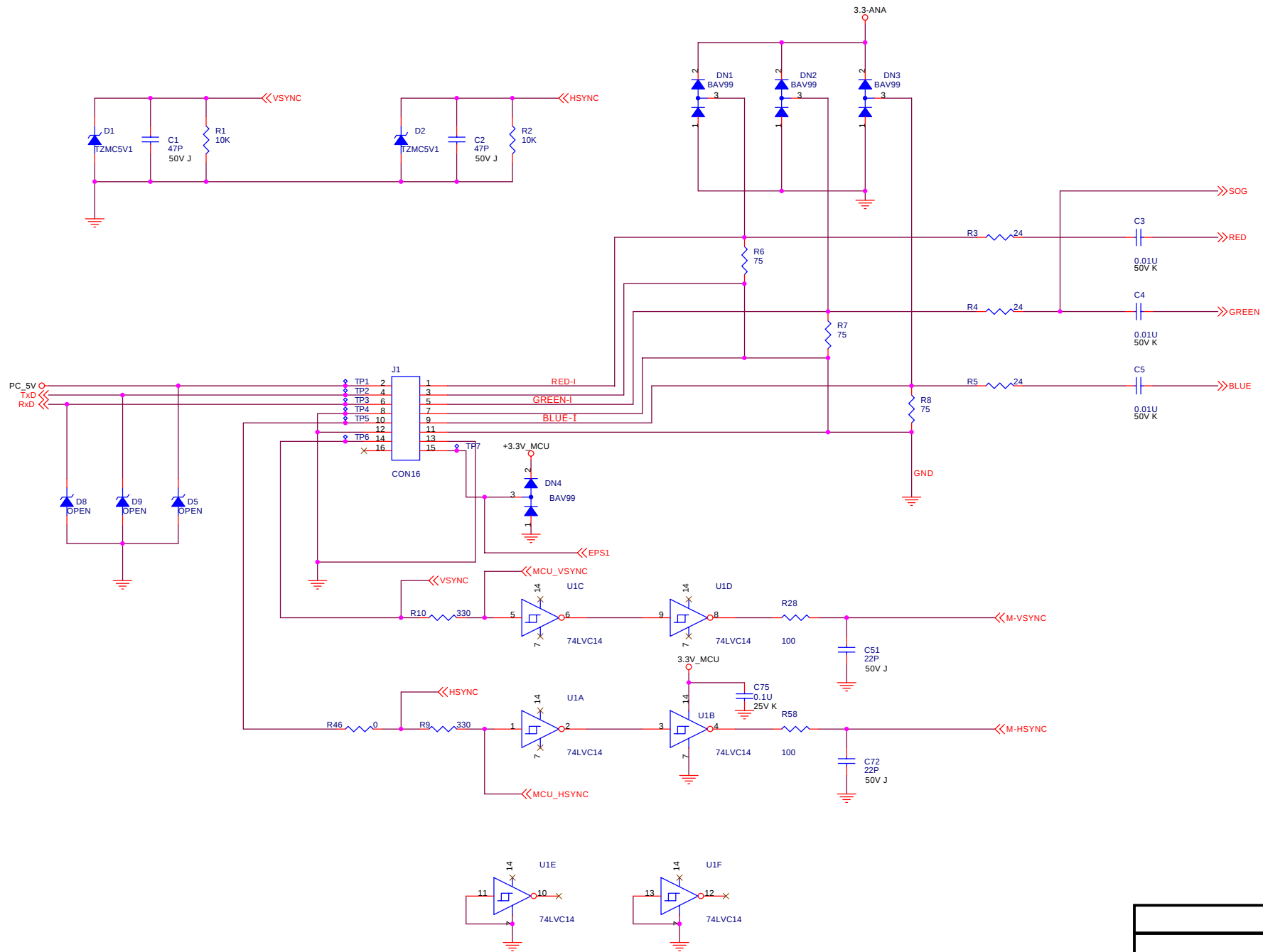


NOTES: 1. Resistor values are in ohm, K=1,000 ohm, M=1,000,000 ohm
 2. All resistors are 1/8 watt, 5% except where otherwise indicated
 3. $\nabla \rightarrow \pm$ Represents PCB common ground.

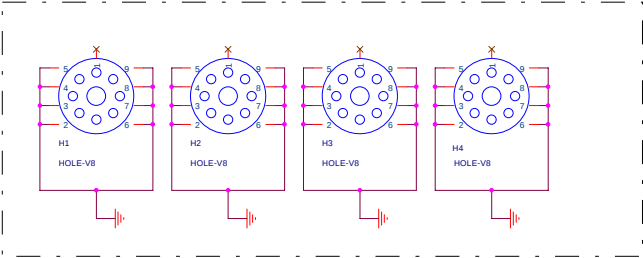




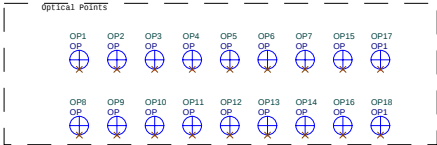




Screw Holes



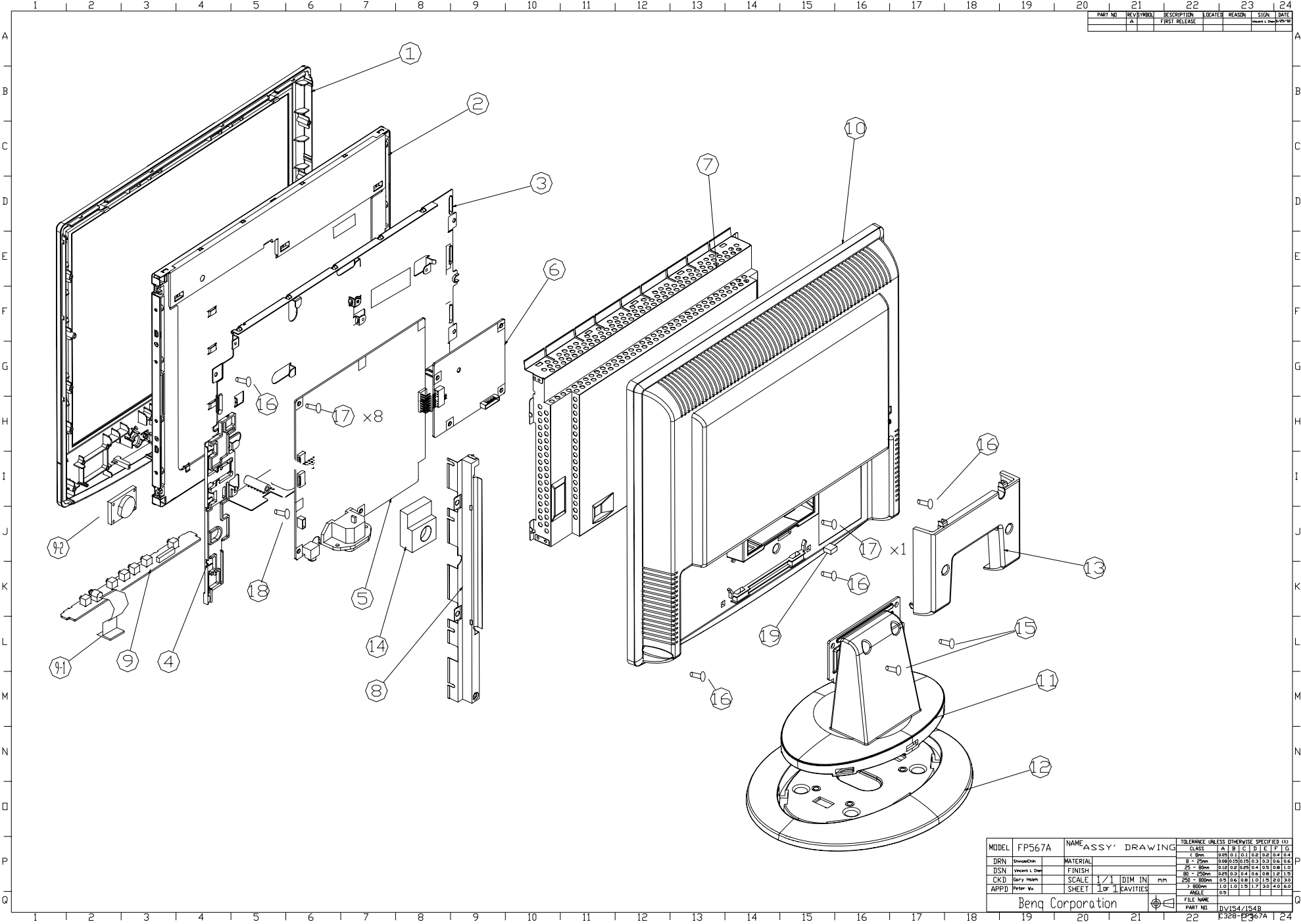
Optical Points



Diamond View DV154 assy drawing

ITEM	Part number	Description	Qty.	
1	60.L6309.001	ASSY BZLMEA/AU 002 AUDIO FP557	1	
2	56.07L67.011	LCDM 17" M170E5-L01/CMO	1	
3	60.L6306.002	ASSY BKT-PNL(AU) AUDIO FP567	1	
4	42.L4617.002	HLD PNL WIRE FR-ABS FP557A	1	
5	55.L7302.XXX	PCBA SPS BD E151FPB CMO	1	
6	55.L7301.XXX	PCBA I/F BD E151FPB CMO	1	
7	34.L5501.021	SHD-MAIN SPTE 0.3T FP557A	1	
8	34.L4602.022	SHD MPRII SPTE 0.3T FP557A	1	
9	55.L6303.XXX	PCBA CTRL BD FP557A AI	1	
9-1	34.L7301.001	SPG-CTRL SUS301 0.2T FP557D	1	
9-2	23.4L630.001	SPK*2 2W 8 OHM 410MM FP557A	2	
10	60.L4610.002	ASSY UC 002 FP557/WM75/AU/CPT	1	
11	60.L5507.004	ASSY COLUMN-EY 002 FP557	1	
12	60.L4619.003	ASSY BASE PLATE 002 FP557	1	
13	42.L4604.XXX	CVR HINGE ABS-HB 517 FP557	1	
14	42.L7305.001	HOLDER PANEL CMO CPT ABS FP557	1	
15	86.00075.120	SCRW MACH PAN M4*0.7*12L C-ZN	2	HINGE COVER - HIGNE TO U/C
			2	HINGE TO COLUMN
16	86.WA314.8R0	SCREW TAP CAP M3*8	4	BKT-PNLTO BEZEL
			3	U/CTO BEZEL
			4	SPK-BEZEL
17	86.VG434.6R0	SCRW TAP PAN F/WSH M3*6L C-ZN	8	PCB TO BKT-PNL
			1	SHD MAIN TO BKT-PNL
			1	SIGNAL CABLE TO BKT-PNL
			1	PCB TO LCD-PANEL
18	86.VZ226.100	SCRW TAP FLAT+EXT M4*10L ZN	1	AC Socket TO BKT-PNL
19	47.L4612.001	GASKET 10L*10W*15H FP557.	1	Conductive sponge.

ITEM	Part number	Description	Qty.	
1	60.L6309.011	ASSY BZL-MEA/AU 861 AUDIO FP557	1	
2	56.07L67.011	LCDM 17" M170E5-L01/CM0	1	
3	60.L6306.002	ASSY BKT-PNL(AU) AUDIO FP567	1	
4	42.L4617.002	HLD PNL WIRE FR-ABS FP557A	1	
5	55.L7302.XXX	PCBA SPS BD E151FPB CM0	1	
6	55.L7301.XXX	PCBA I/F BD E151FPB CM0	1	
7	34.L5501.021	SHD-MAIN SPTE 0.3T FP557A	1	
8	34.L4602.022	SHD MPRII SPTE 0.3T FP557A	1	
9	55.L6303.XXX	PCBA CTRL BD FP557A AI	1	
9-1	34.L7301.001	SPG-CTRL SUS301 0.2T FP557D	1	
9-2	23.4L630.001	SPK*2 2W 8 OHM 410MM FP557A	2	
10	60.L4610.012	ASSY UC ABS 861 FP557/WM75	1	
11	60.L5507.014	ASSY COLUMN-EY 861 FP557/BENQ	1	
12	60.L4619.013	ASSY BASE-EASY 861 FP557G	1	
13	42.L4604.012	CVR-HINGE-RIB ABS 861 FP557G	1	
14	42.L7305.001	HOLDER PANEL CM0 CPT ABS FP557	1	
15	86.00075.120	SCRW MACH PAN M4*0.7*12L C-ZN	2	HINGE COVER – HIGNE TO U/C
			2	HINGE TO COLUMN
16	86.WA314.8R0	SCREW TAP CAP M3*8	4	BKT-PNL TO BEZEL
			3	U/CTO BEZEL
			4	SPK-BEZEL
17	86.VG434.6R0	SCRW TAP PAN F/WSH M3*6L C-ZN	8	PCB TO BKT-PNL
			1	SHD MAIN TO BKT-PNL
			1	SIGNAL CABLE TO BKT-PNL
			1	PCB TO LCD-PANEL
18	86.VZ226.100	SCRW TAP FLAT+EXT M4*10L ZN	1	AC Socket TO BKT-PNL
19	47.L4612.001	GASKET 10L*10W*15H FP557.	1	Conductive sponge.



PART NO	REV	SYMBOL	DESCRIPTION	LOCATOR	REASON	SIGN	DATE
A			FIRST RELEASE				2000.1.1

MODEL	FP567A	NAME	ASSY' DRAWING	TOLERANCE UNLESS OTHERWISE SPECIFIED (1)
DRN	Shencklin	MATERIAL		CLASS A B C D E F G
DSN	Vince L. Ong	FINISH		1 - 2mm 0.05 0.1 0.1 0.2 0.2 0.4 0.4
CKD	Gary Hsien	SCALE	1/1 DIM IN mm	25 - 50mm 0.10 0.2 0.25 0.4 0.5 0.8 1.0
APPD	Peter Wu	SHEET	1 OF 1 CAVITIES	50 - 100mm 0.25 0.3 0.4 0.6 0.8 1.2 1.5
				100 - 300mm 0.5 0.6 0.8 1.0 1.5 2.0 3.0
				300mm 1.0 1.0 1.5 1.7 3.0 4.0 6.0
				ANGLE 0.5
				FILE NAME
				PART NO
				Benq Corporation
				DV154/154B
				E388-FP567A