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# AL 922 TFT LCD MONITOR

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# 1. INTRODUCTION

## *1.1 Scope*

This specification defines the requirements for the 19" MICRO-PROCESSOR based Multi-mode supported high resolution color LCD monitor, This monitor can be directly connected to general 15 pin D-sub VGA connector and DVI-D digital connector, eliminates the requirement of optional special display card. It also supports VESA DPMS power management and plug & play function. There is a build-in stereo audio amplifier with volume control to drive a pair of speakers.

## *1.2 Description*

The LCD monitor is designed with the latest LCD technology to provide a performance oriented product with no radiation. This will alleviate the growing health concerns. It is also a space saving design, allowing more desktop space, and comparing to the traditional CRT monitor, it consumes less power and gets less weight in addition MTBF target is 20k hours or more.

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## 2. ELECTRICAL REQUIREMENTS

### 2.1 Standard Test Conditions

All tests shall be performed under the following conditions, unless otherwise specified.

<u>Ambient light:</u>	225 lux
<u>Viewing distance :</u>	50 cm in front of LCD panel
<u>Warm up time</u>	
All specifications:	30 minutes
Fully functional:	5 seconds
<u>Measuring Equipment:</u>	Chroma 2250 signal generator or equivalent, directly Connected to the monitor under test. Minolta CA100 photometer, or equivalent
<u>Control settings</u>	
User brightness control:	Maximum (unless otherwise specified )
User contrast control:	Typical (unless otherwise specified )
User red/white balance, Green/white balance and Blue/white balance control:	In the center (unless otherwise specified )
<u>Power input :</u>	110Vac or 230Vac
<u>Ambient temperature :</u>	20 ± 5 °C ( 68 ± 9 ° F)
<u>Analog input mode :</u>	1280 x1024 /60 Hz

#### 2.1.1 MEASUREMENT SYSTEMS

The units of measure stated in this document are listed below:

1 gamma = 1 nano tesla

1 tesla = 10,000 gauss

cm = in x 2.54

lb = kg x 2.2

degrees F = [°C x 1.8] + 32

degrees C = [°F - 32]/1.8

$u' = 4x/(-2x + 12y + 3)$

$v' = 9y/(-2x + 12y + 3)$

$x = (27u'/4)/[(9u'/2) - 12v' + 9]$

$y = (3v')/[(9u'/2) - 12v' + 9]$

nits = cd/(m<sup>2</sup>) = Ft-L x 3.426

lux = foot-candle x 10.76

### 2.2 LCD monitor General specification

Panel Type : 19 “ active matrix color TFT LCD

1). FUJITSU FLC48SXC8V

Display size : 376.32mm(H) x 301.056mm(V)

Display mode : VGA 720 X 400 (70 Hz)

VGA 640 X 480 (60/66/70/72/75 Hz)

SVGA 800 X 600 (60/70/72/75 Hz)

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	XGA	1024 X 768	(60/70/75 Hz)	
	SXGA	1280 X 1024	(60/70/75 Hz)	standard resolution
Pixel pitch :		0.098x3mm(H) x 0.294mm(V)		
Display Dot :		1280 x (RGB) x 1024		
Pixel Clock :		25.2 – 135.0MHz		
Contrast ratio: $\theta = 0^\circ$		500 : 1	(typical)	
Brightness:		250	cd/m <sup>2</sup> (typical)	
Response time (Tr/Tf) :		15 /10	msec	
Display color :		16777216	(8 bite color)	
Viewing angle: L / R	$\geq 85$	/	$\geq 85$	( $\geq 170$ degrees horizontal typical)
U / D	$\geq 85$	/	$\geq 85$	( $\geq 170$ degrees vertical typical)
Luminance Uniformity :		> 70	%	
Pc interface: 1). Video :		RGB analog	0.7V peak to peak	
Sync :		TTL positive or negative		
	2).	Digital TMDS		
Signal connector :		15 pin Mini D type,	(standard VGA video)	
		DVI-D connector		
Audio power :		1Wrms + 1Wrms	( 300Hz – 10kHz (S.P.L. – 10 dB))	
Front control :		power on/off with LED select	(up, down) adjustment (+,-)	
Interface frequency				
	•	Horizontal Frequency	24KHz --80KHz(analog), 31.5– 80KHz(digital)	
	•	Vertical Frequency	56Hz ----75Hz	
Plug & play :		Support VESA DDC2B functions		
Power Input voltage :		Single phase, 50/60HZ,	100VAC to 240VAC $\pm 10\%$	
Total output power :		60 Watt max.		

## 2.3 LCD Panel Specification

### 2.3.1 LCD Panel Model (FUJITSU FLC48SXC8V)

- Display Type active matrix color TFT LCD
- Resolution 1280 x 1024 pixels
- Display Dot 1280 x (RGB) x 1024
- Display Area 376.32mm(H) x 301.056mm(V)
- Pixel Pitch 0.098x3mm(H) x 0.294mm(V)
- Display Color 16777216

- Lamp Voltage 700 Vrms typ.
- Lamp Current 7mA rms.( typ). 4 Lamp
- Weight 3200g .

- Optical Specifications

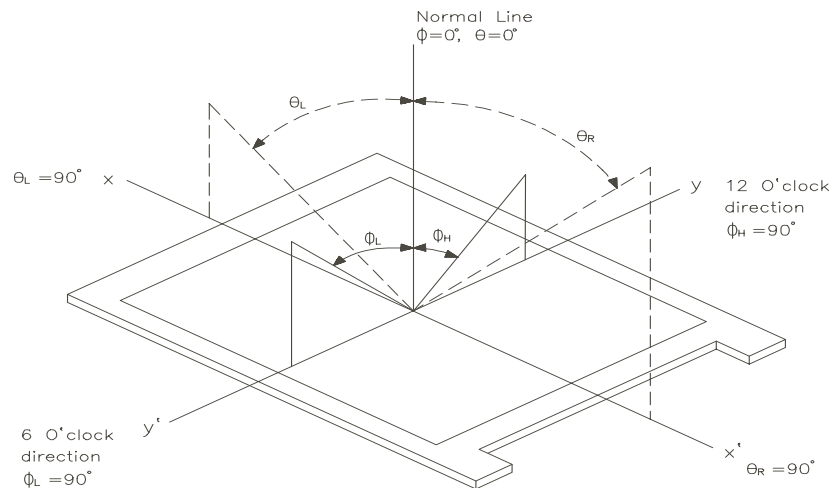
The following items are measured under stable conditions. The optical characteristics should be measured in a dark room or equivalent state with the methods shown in Note(4).

◆Measuring equipment : TOPCON BM-5A, BM-7, PHOTO RESEARCH PR650

(Inverter Freq. : 54kHz) \*Ta =25 ± 2°C, VDD=5V, fv=60 Hz, fDCLK=54 MHz, IL= 6.5mArms

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Note	
Contrast Ratio (Center of screen)	CR	Normal $\phi = 0^\circ$ $\theta = 0^\circ$  Viewing Angle	T.B.D	500	-		(1)(2)(4) BM-5A	
Response Time	Rising		TR	-	15	30	msec	(1)(3) BM-7
	Falling		TF	-	10	25		
Luminance of White (Center of screen)	YL			200	250	-	cd/m2	(5) BM-5A
Color Chromaticity (CIE 1931)	Red		Rx	TYP. -0.03	0.648	TYP. +0.03		(1)(4) PR650
			Ry		0.346			
	Green		Gx		0.292			
			Gy		0.602			
	Blue		Bx		0.150			
			By		0.130			
	White	Wx	0.313					
		Wy	0.329					
Viewing Angle	Hor.	$\theta_L$	85	-	-	Degrees	(1)(4) BM-5A	
		$\theta_R$	85	-	-			
	Ver.	$\phi_H$	85	-	-			
		$\phi_L$	85	-	-			
Brightness Uniformity (9 points)	BUNI		70	-	-	%	(6) BM-5A	

Note 1) Definition of Viewing Angle: Viewing angle range ( $10 \leq CR$ )

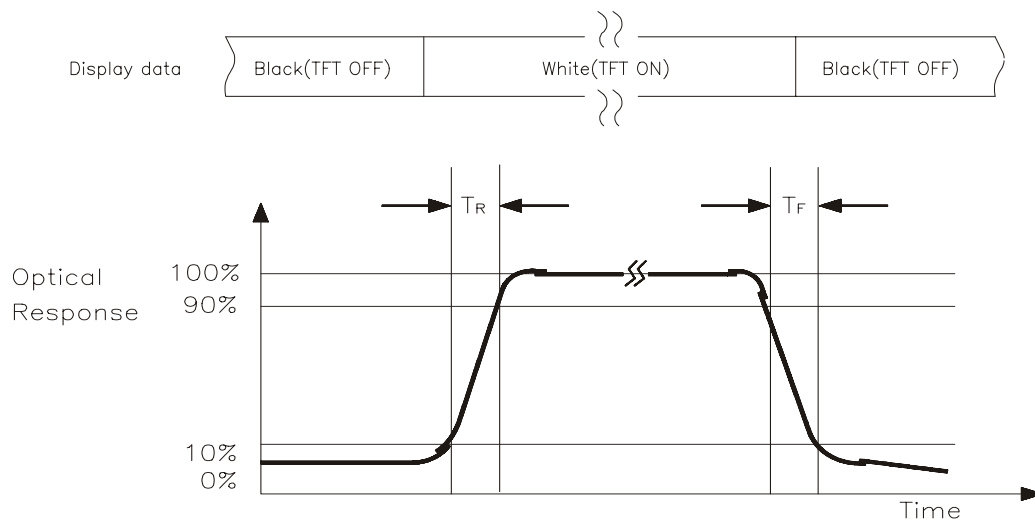


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Note 2) Definition of Contrast Ratio (CR): Ratio of gray max(Gmax),gray min(Gmin) at the center point of panel.

$$CR = \frac{\text{Luminance with all pixels white (Gmax)}}{\text{Luminance with all pixels black (Gmin)}}$$

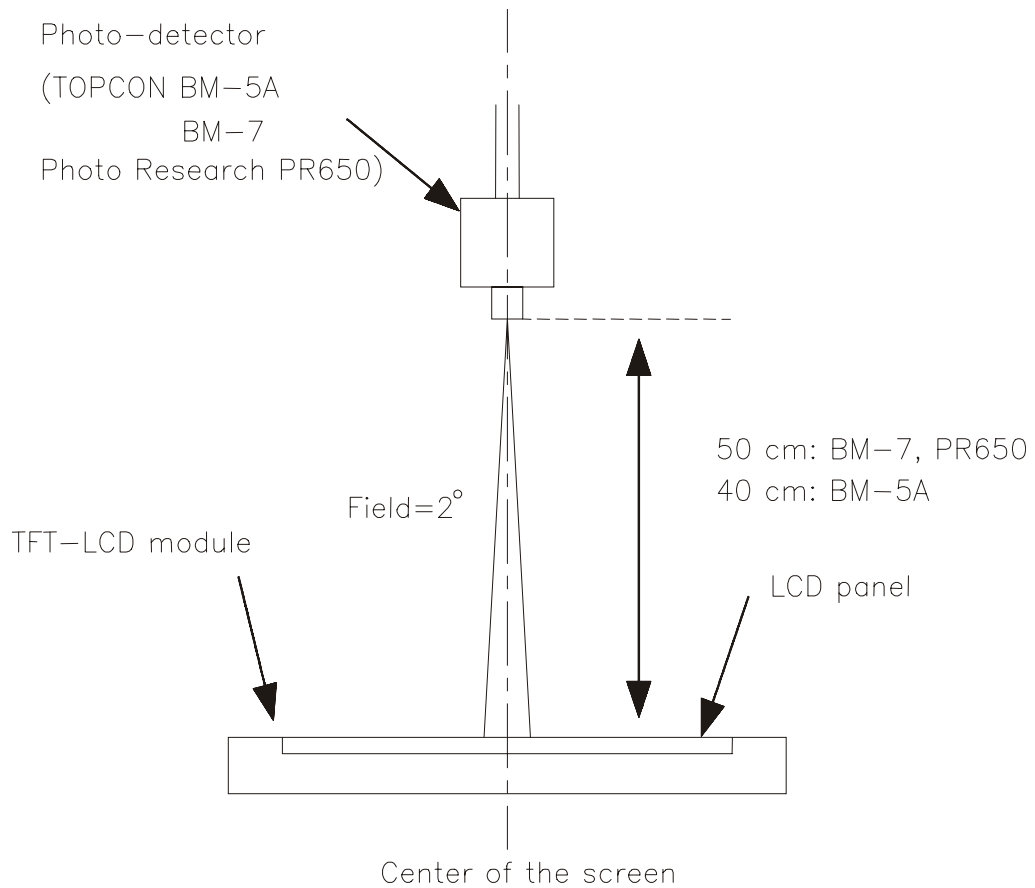
Note 3) Definition of Response time: Sum of  $T_R$ ,  $T_F$



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Note 4) After stabilizing and leaving the panel alone at a given temperature for 30 min, the measurement should be executed .Measurement should be executed n a stable, windless ,and dark room.30 min after lighting the back-light. This should be measured in the center of screen. Dual lamp current :13.0mA(6.5mA x2)(Refer to the note(1) in the page 14 for more information ).

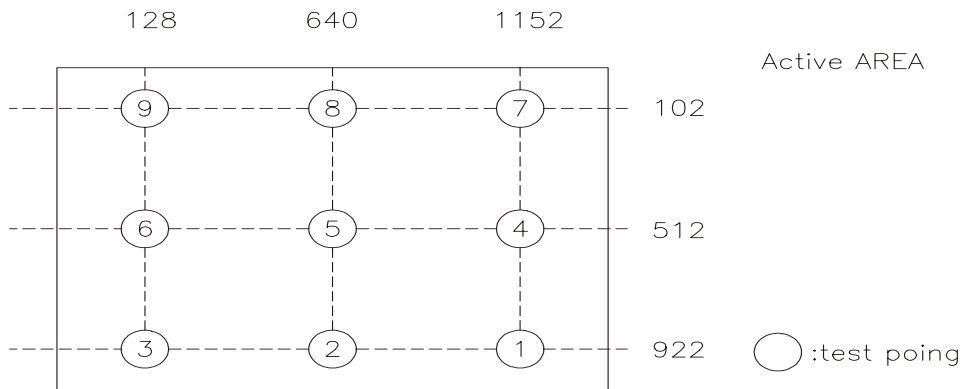
Environment condition : $T_a=25\pm 2^{\circ}\text{C}$



### **Optical characteristics measurement setup**



Notes 5) Definition of Luminance of White : measure the luminance of white at center point.



Notes 6) Definition of 9 points brightness uniformity (Measuring points: Refer to the Note 5)

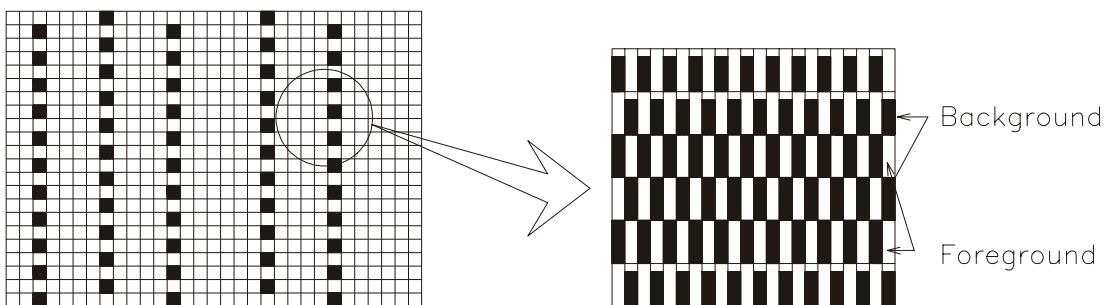
$$B_{UNI} = 100 * \frac{B_{min}}{B_{max}}$$

Bmax: Maximum brightness  
Bmin: Minimum brightness

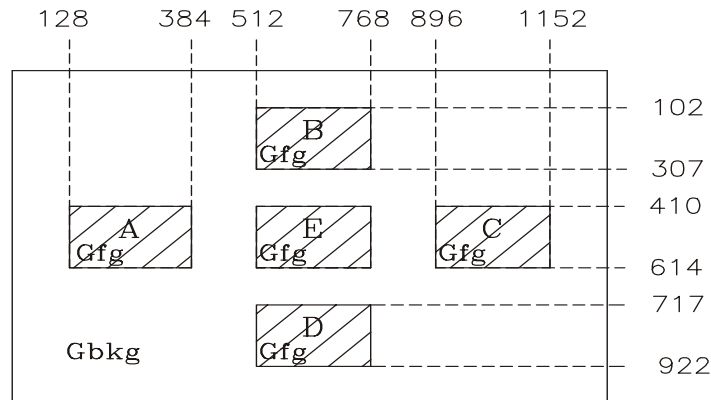
Notes 7) Definition of Flicker level

$$F = \frac{\text{Flicker Voltage}_{pp}}{\text{LMD Voltage}_{dc}} \times 100 \%$$

- ◆ One maximum value of three estimated values.
- ◆ For this test ,an LMD(Light Measurement Device)is needed with adequate response time to track any visible rate flicker component and with a voltage level output proportional To luminance intensity.
- ◆ Test Pattern: For dot inversion Driving(Gray levels of foreground dots on the test panel Are G22,G32,and G45)
- ◆ Test Point :Center point of the display area



Note 8) Definition of Crosstalk (Refer to the VESA STD)



The calculation for shadowing is made from the 2 luminance measurements Gbkg and Lsh, as follows:

$$C_T = \frac{L_{max} - L_{min}}{L_{min}} \times 100 \%$$

Where Lmax is the larger value of Gbkg or Lsh , and Lmin is the smaller of the two.

- ◆ To determine background and foreground levels (colors), first set the background to any gray scale or color level suitable for shadowing determination. (Note that it may take several iterations of adjusting background level and box levels to determine the proper value for the background. Next display the box levels to determine the proper value for the background level. Look for shadowing in any direction from box E. Independently vary the gray level (or color) of the background and box E until the worst case shadowing is observed. This defines the background (Gbkg) and foreground (Gfg) levels to be maintained for the remainder of the test.
- ◆ One point only (the target) will be measured. To determine that point proceed as follows Using the background and foreground gray levels of step 1 (Gbkg and Gfg). Turn on each box at a time. Look for the case with the worst shadowing. The box causing the worst case is the shadowing source, or Bsrc. Use Bsrc and the box opposite from it that lies directly in the shadow path. That is the target box, or Btgt. Note that box Eight be either Bsrc or Btgt, depending on the shadowing conditions, but typically Bsrc and Btgt will be a pair of opposite boxes, A&C or B&D. Btgt will only be displayed for aligning the LMD. It will be turned off for the actual measurement.
- ◆ The target box point (Btgt) will be measured with the source box (Bsrc) turned on then off. (Btgt is for alignment purpose only) Display the background only at level Gbkg. Display Btgt determined in step 2 above. Using the correct distance, angle, and measurement aperture, align the LMD to the center of the Btgt. Turn off Btgt. With Gbkg set to its proper level, measure the luminance (or color). Next, turn on the source box Bsrc. Again measure at the center point of Btgt (without Btgt present.). In this case the LMD will be measuring the shadowing level, Lsh.

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## 2.4 Input Signals

### 2.4.1 Video input

- Type Analog R, G, B., Digital TMDS
- Input Impedance 75 ohm +/- 2%
- Polarity Positive
- Amplitude 0 - 0.7 +/- 0.05 Vp
- Display Color same as LCD panel

### 2.4.2 Sync input

- Signal separate horizontal and vertical sync, or composite sync which are TTL compatible
- Polarity positive and negative.

### 2.4.3 Interface frequency

The following frequency range is generalized by supported timing. If the entered mode does not match the supported timing the display optimization will not be assured.

- Horizontal Frequency 24KHz --80KHz(analog), 31.5– 80KHz(digital)
- Vertical Frequency 56Hz -----75Hz

#### DISPLAY MODES

MONITOR MODE NO.	SCREEN RESOLUTION	HORIZONTAL SYNC RATE (kHz)	VERTICAL SYNC RATE (Hz)	VIDEO CLK (MHz)	STANDARD
1	640x350	31.5 +	70.0 -	25.0	VGA
2	640X400	24.83 -	56.4 -	21.05	NEC
3	640X400	31.5-	70.0+	25.0	VGA
4	640X400	31.5-	70.1-	25.19	NEC
5	640X480	31.5 -	60.0 -	25.0	Defacto
6	640X480	35.0-	66.67-	30.24	MAC
7	640X480	37.86-	72.80-	31.5	VESA
8	640X480	37.5-	75.0-	31.5	VESA
9	720X400	31.5 -	70.0 +	28.0	Text Defacto
10	832X624	49.72-	74.55 -	57.28	MAC
11	800X600	35.16+	56.25+	36.0	SVGA
12	800X600	37.8 +	60.0 +	40.0	VESA
13	800X600	48.07 +	72.18 +	50.0	VESA
14	800X600	46.87+	75.0+	49.5	VESA
15	1024X768	48.4 -	60.0 -	65.0	VESA
16	1024X768	53.96 +	66.13 +	71.66	XGA
17	1024X768	56.47 -	70.07 -	75.0	VESA
18	1024X768	60.0 +	75.0 +	78.75	VESA
19	1024x768	60.24-	75.02-	80.0	MAC-768
20	1280X1024	64.0 +	60.0 +	108.5	SXGA
21	1280X1024	80.0 +	75.0 +	135.0	Defacto

## *Supported Timing*

TIMING	FH(KHZ)	SYNC	TOTAL	ACTIVE	SYNC	FRONT	BACK	PIXEL
	FV(HZ)	POLARITY	(DOT/LINE)	(DOT/LINE)	WIDTH (DOT/LINE)	PORCH (DOT/LINE)	PORCH (DOT/LINE)	FOREQ.(MHZ)
640x350 VGA-350	31.469 70.087	+ -	800 449	640 350	96 2	16 37	48 60	25.175
640x400 NEC PC9801	24.83 56.42	- -	848 440	640 400	64 8	64 7	80 25	21.05
640x400 VGA-GRAPH	31.469 70.087	- +	800 449	640 400	96 2	16 12	48 35	25.175
640x400 NEC PC9821	31.5 70.15	- -	800 449	640 400	64 2	16 13	80 34	25.197
640x480 VGA-480	31.469 59.94	- -	800 525	640 480	96 2	16 10	48 33	25.175
640x480 APPLE MAC-480	35.00 66.67	- -	864 525	640 480	64 3	64 3	96 39	30.24
640x480 VESA-480-72Hz	37.861 72.809	- -	832 520	640 480	40 3	16 1	120 20	31.5
640x480 VESA-480-75Hz	37.5 75	- -	840 500	640 480	64 3	16 1	120 16	31.5
720x400 VGA-400-TEXT	31.469 70.087	- +	900 449	720 400	108 2	18 12	54 35	28.322
832x624 APPLE MAC-800	49.725 74.55	- -	1152 667	832 624	64 3	32 1	224 39	57.2832
800x600 SVGA	35.156 56.25	+ +	1024 625	800 600	72 2	24 1	128 22	36
800x600 VESA-600-60Hz	37.879 60.317	+ +	1056 628	800 600	128 4	40 1	88 23	40
800x600 VESA-600-72Hz	48.077 72.188	+ +	1040 666	800 600	120 6	56 37	64 23	50
800x600 VESA-600-75Hz	46.875 75	+ +	1056 625	800 600	80 3	16 1	160 21	49.5
1024x768 XGA	48.363 60.004	- -	1344 806	1024 768	136 6	24 3	160 29	65
1024x768 COMPAQ-XGA	53.964 66.132	+ +	1328 816	1024 768	176 4	16 8	112 36	71.664
1024x768 VESA-768-70Hz	56.476 70.069	- -	1328 806	1024 768	136 6	24 3	144 29	75
1024x768 VESA-768-75Hz	60.023 75.029	+ +	1312 800	1024 768	96 3	16 1	176 28	78.75
1024x768 APPLE MAC-768	60.24 75.02	- -	1328 803	1024 768	96 3	32 3	176 29	80
1280x1024 VESA-1024-60Hz	64 60	+ +	1688 1066	1280 1024	112 3	48 1	248 38	108
1280x1024 VESA-1024-75Hz	80 75	+ +	1688 1066	1280 1024	144 3	16 1	248 38	135

If the input timing is not a supported timing listed above but within the supported frequency range (Horizontal: 80KHz, Vertical: 75Hz), this monitor will select a closest mode instead. But the display quality may not be optimized.

If the input timing over the supported frequency range, a message "Input Signal Out of Range" will be shown.

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#### 2.4.4 85Hz refresh rate Support

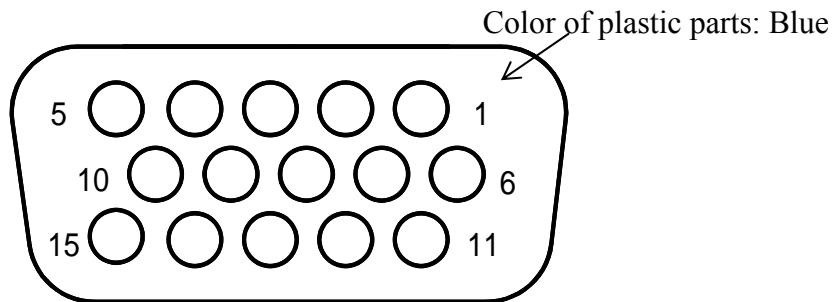
Monitor should display 85Hz refresh rate mode as emergency mode.  
Monitor should display “Out of Range” warning menu at this mode.

#### 2.4.5 Video input Connector

Analog Video input Connector: 15pins mini D-Sub

Table 2.4.5. Pin assignment for D-sub connector

PIN NO.	Separate Sync
1	RED VIDEO
2	GREEN VIDEO
3	BLUE VIDEO
4	GROUND
5	GROUND
6	RED GROUND
7	GREEN GROUND
8	BLUE GROUND
9	PC5V (+5V DDC)
10	CABLE DETECTION
11	GROUND
12	SDA
13	H.SYNC
14	V.SYNC
15	SCL

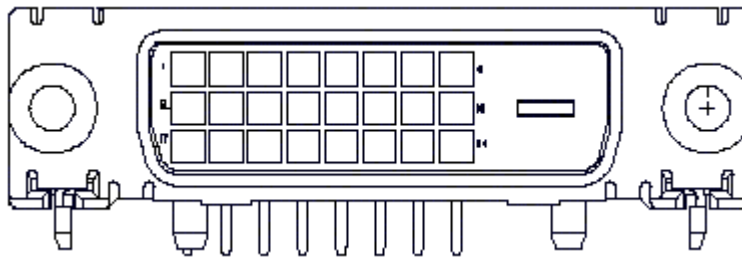


D-sub connector

Table 4-3-3. Pin assignment for DVI-D (24pin) connector

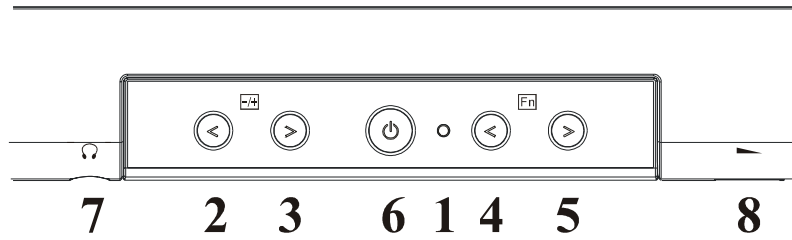
Pin – Assignment of DVI –D connector :					
1	TX2-	9	TX1-	17	TX0-
2	TX2+	10	TX1+	18	TX0+
3	Shield (TX2 / TX4)	11	Shield (TX1 / TX3)	19	Shield (TX0 / TX5)
4	NC	12	NC	20	NC
5	NC	13	NC	21	NC
6	DDC-Serial Clock	14	+5V power *)	22	Shield (TXC)
7	DDC-Serial Data	15	Ground (+5V)	23	TXC+
8	No Connect	16	Hot plug detect	24	TXC-

\*) In case, the power of the PC unit is switched off and the power of the monitor is switched on, no voltage may occur at pin 14.



---

## 2.5 CONTROLS



### 2.5.1 Control panel (monitor front panel)

1. Power LED, will be green when monitor is on; be amber when in power saving mode.
2. Adjust decrease.
3. Adjust increase.
4. Function select counter-clockwise.
5. Function select clockwise.
6. Power ON/OFF switch, push to ON and push to OFF. (toggle switch)
7. Ear phone jack.
8. Volume Control.

Note: When OSD Menu is off, press button 2 can activate “Auto Adjustment” immediately.

### 2.5.2 OSD Functions

- OSD Format: Refer to following figure.
- OSD Border: Cyan color
- OSD Tunable Item: The 16 icons that around the border.
- Selected Item: Yellow background
- Comment: Magenta foreground, Blue background

page format :



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*Description:*

- Brightness: Brightness adjustment, the range from 0 to 100.
- Contrast: Contrast adjustment, the range from 0 to 100.
- H. Position: Horizontal position adjustment.
- V. Position: Vertical position adjustment.
- Phase: Focus adjustment, the range from 0 to 31,32 steps.
- OSD position: OSD position adjustment.
- Auto Adjustment: This feature will automatically adjust size, position, clock and phase.  
It takes 3-5 seconds to finish. When auto start, it shows “Auto Adjusting....” message.
- Clock: Frequency tracking adjustment. The max range from -48 to +48, but some modes the range will be limited.
- Graph Text: 640x400(GRAPH) or 720x400(TEXT) mode select.
- Language: 5 kinds of language for description, including (English, German, French, Spanish, Italian)
- Recall: Recall the default value.
- Color Temp: Color temperature for standard 9300,6500, 7500 or user defined.
  - User:
    - User R: Red signal gain by user defined.
    - User G: Green signal gain by user defined.
    - User B: Blue signal gain by user defined.
  - 7500: Set CIE coordinate at 7500°K color temperature.
  - 6500: Set CIE coordinate at 6500°K color temperature.
  - 9300: Set CIE coordinate at 9300°K color temperature.
- Exit: Exit OSD menu function.

Sharpness : Adjust the scale-up effect(smoothed or sharper.)

OSD Transparency: Adjust the transparency level of OSD. The range is from 0 to 100 scales.

*Comment:*

- 1280x1024: Current mode resolution.
- 60 HZ: Current mode vertical frequency±1Hz.
- VER 1.00: Firmware revision.



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- Other features:

- Intellectual-Auto AL922(AM999) can start the Auto-Adjustment automatically when input a new display mode at first time. After the adjustment, AL922(AM999) will remember this mode and switch to optimized condition automatically for this mode whenever encounter this mode again. Total 21 recent used modes are recorded into AL922(AM999)
- VESA DPMS Functionality When signaled by the host CPU, AL922(AM999) show a black screen about 3 seconds. If no further signal, then it shows “No Signal” and enter power saving mode.

## 2.6 White Color Temperature

White color temperature is 4 preset as 9300, 7500,6500 and User,  
Default value of user color should be user which is maximum setting for panel.

Target of color setting

Color Temp.	Color Coordinate		Tolerance	Color Coordinate		Tolerance
	x	y		u'	v'	
9300K	0.283	0.297	$\pm 0.03$	0.189	0.446	$u'v' \leq 0.01^*$
7500K	0.299	0.315	$\pm 0.03$	0.194	0.459	$u'v' \leq 0.01^*$
6500K	0.313	0.329	$\pm 0.03$	0.198	0.469	$u'v' \leq 0.01^*$
User	-	-		-	-	-

\*) TCO'0X A.2.6.1 requirement

User should follow “Microsoft Windows Color Quality Specification for Liquid Crystal Display OEM’s”.  
(<http://www.microsoft.com/hwdev/tech/color/ColorTest.asp>)

---

## 2.7 POWER SUPPLY

### 2.7.1 input Voltage Range

The monitor shall operate within specification over the range of 90 to 265 VAC power supply.

### 2.7.2 Input Frequency Range

Input power frequency range shall be from 47.5 to 63 Hz over the specified input voltage range.

### 2.7.3 Quick specification review

- Input current  
1.5A (max) at 90VAC input and full load ,  
0.75A (max) at 264 VAC input and full load.
- Inrush current @ cold start  
30A(0-peak)@ 110Vac ,50A(0-peak) @ 220Vac  
(measured when switched off for at least 10 mins.)
- Output

Output Volt	Tolerance	Output Current		Volt Tolerance
		MIN	MAX	
+12Vdc	±5%	0A	5A	11.4~12.6Vdc

- Total output power: 60 Watt max.
- Withstanding voltage : 1.5Kvac or 2.2KVdc for 1 minute.
- Leakage current : < 0.25mA/100Vac , <3.5mA/230Vac
- Efficiency : 80% min. @115V/230VAC, maximum load.

### 2.7.4 Power Management

#### 2.7.4.1 Meet VESA DPMS proposal

The monitor must comply with the Microsoft On Now specification, with a minimum of three power management states, as defined by the VESA DPMS document. The front panel of the monitor must appropriately display the DPMS state, For example:

DPMS ON : The power LED is Green  
DPMS OFF : The power LED is Amber

### 2.7.5 Power Consumption

On mode	56 Wmax	Green
Off mode	4 Wmax	Amber
DC power off	4 Wmax	Dark
disconnection	4 Wmax	Dark (DC power off) Amber (DC power on)

- ◆ Power saving states are measured with speakers attached but not worked.
- ◆ The recovery time from off mode to on mode is 3 seconds maximum.

### 2.7.6 Power Connector

All units shall have an IEC/CEE-22 type male power receptacle.

## 2.8 Plug & Play(EDID)

The monitor will be capable of sending a VESA standardized EDID file through the DDC (pins 12, 15 of the VGA connector).

---

## 2.9 Audio Technical specification

### 2.9.1 General Description:

Output power	: 1W + 1W maximum
Total harmonic distortion	: Less than 1 % (except speakers distortion)
Input signal sensitivity	: 0.5 Vrms for full output
Input impedance	: 47 Kohm +/- 5 %
Frequency response range	: 20Hz – 20kHz (except speakers response)
Difference of L and R output	: Less than 2 dB

### 2.9.2 Electrical characteristics ( $T_{amb}=25^{\circ}$ )

**Audio amplifier(USE Panasonic VP-7723A Audio Analyzer. )**

Item	Audio Input	Freq.	Spec.			Comment
			Min.	Typ.	Max.	
Input Voltage(V)			-	5	-	
Input Current(m A)			-	500	800	
Audio Voltage Gain	500m Vrms	1KHz	-	-	6 d B	Volume Max.,load 4 $\Omega$
Frequency Response	500m Vrms	300Hz-20KHz	-10dB	-	+10d B	Volume Max.,load 4 $\Omega$
Signal to Noise ratio	500m Vrms	1KHz	-	-	-40dB	Volume Max.,load 4 $\Omega$
Total harmonic distortion	500m Vrms	1KHz			1%	except speakers distortion
Cross talk	500m Vrms	1KHz	-	-	-30dB	Volume Max.,load 4 $\Omega$
Output Watt.	500m Vrms	1KHz	-	-	1W	Volume Max.,load 4 $\Omega$
Volume Control			-	-	-	Analog

### 2.9.3 Speakers

Maximum power	: 2 W per speaker(max)
Impedance	: 4 ohm +/- 15 % @ 1kHz 1.0Hz
Frequency response range	: 350 Hz – 15 kHz (S.P.L. – 10 dB)
Total harmonic distortion	: Less than 5 % @ 0.125 W 1kHz

### 2.9.4 Headphone output

Output power	: 1.6 mW for 32 ohms Headphone
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## 3. VL-901 DISPLAY CONTROL BOARD

### 3.1 Description

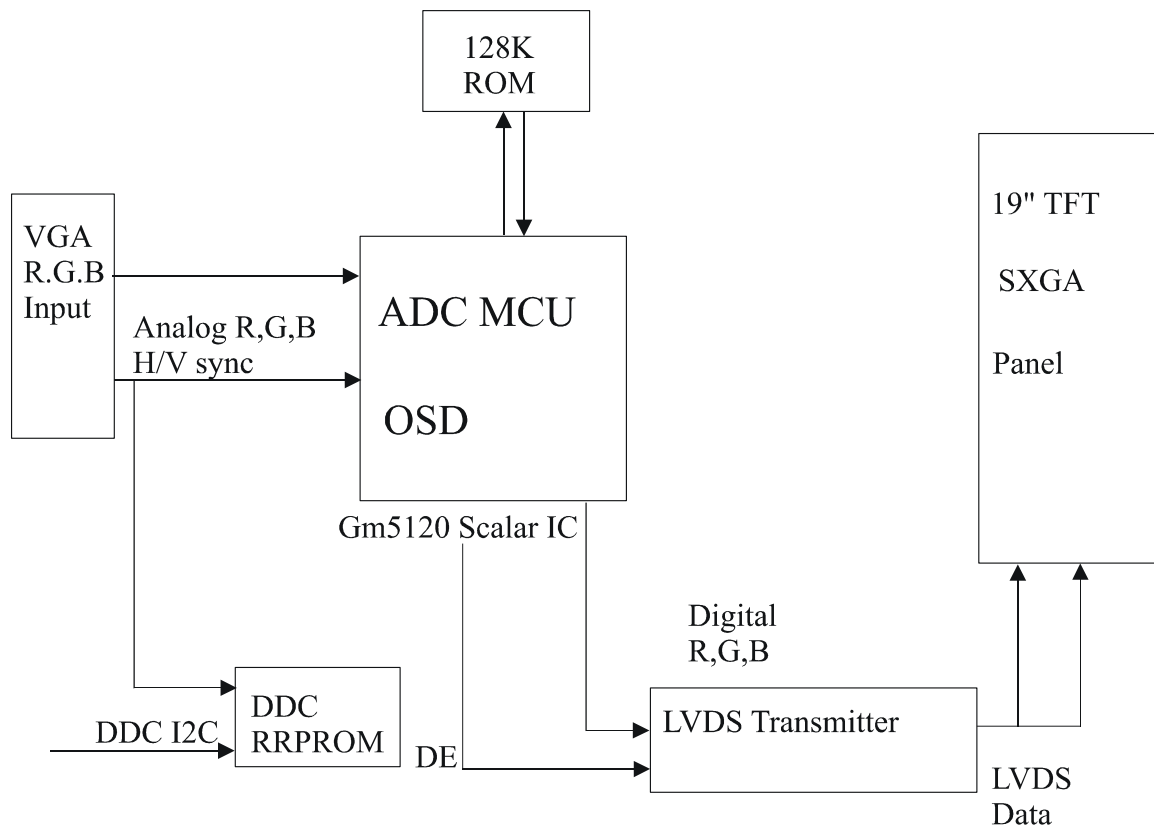
The VL-901 display control board is design to directly convert the analog RGB signals from standard VGA display card to optimum LCD timing signals so as to construct a high display quality LCD monitor.

### 3.2 Features

- On board embedded micro-processor to detect display timings and control user functions.
- Using Genesis gm5120 design to generate optimum LCD timings.
- Using E<sup>2</sup> PROM to memorize every adjusted parameter.
- support up to 22 display modes from VGA to SXGA.
- Offer full screen expansion function on non-SXGA mode (automatic).
- flexible color temperature selection function including 9300,6500,7500 and user mode.
- Support OSD functions.
- Support VESA DPMS function.
- Support DDC2B functions.
- Support 5 languages for OSD description.
- The longest time for mode change is 3 seconds.

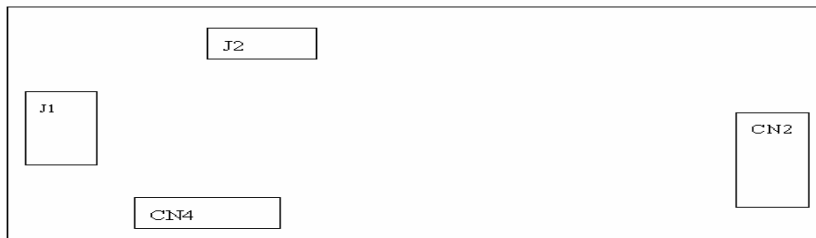
---

### 3.3 BLOCK DIAGRAM



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### 3.4 Connector Locations



### 3.5 Connector Type

Location	Type	Maker	Number of pins
CN1	74320-4004	MOLEX	24
CN2	1211-15	E&T	15
CN4	6905-40	E&T	40
J1	4300-10	E&T	10
J2	4500-07	E&T	07

### 3.6 Connector pin assignment

#### 3.6.1 CN2

Pin NO.	Signal	Comment
1	R-Video	Red Video Input.
2	G-Video	Green Video Input.
3	B-Video	Blue Video Input.
4	N. C.	
5	Ground	Ground.
6	Ground	Ground.
7	Ground	Ground.
8	Ground	Ground
9	5VCC	DDC Power Input.
10	PCDETECT	PCDETECT Input.
11	NC	NC
12	SDA	DDC 2B
13	HS	Horizontal Sync Input.
14	VS	Vertical Sync Input.
15	SCL	DDC 2B

### 3.6.2 CN4

Terminal No.	Symbol	Function
36,37,38	VDD	5V POWER SUPPLY
1	TXE0-	LVDS EVEN OUTPUT DATA PAIRS
2	TXE0+	LVDS EVEN OUTPUT DATA PAIRS
4	TXE1-	LVDS EVEN OUTPUT DATA PAIRS
5	TXE1+	LVDS EVEN OUTPUT DATA PAIRS
7	TXE2-	LVDS EVEN OUTPUT DATA PAIRS
8	TXE2+	LVDS EVEN OUTPUT DATA PAIRS
10	TXECLK-	LVDS EVEN OUTPUT DATA PAIRS
11	TXECLK+	LVDS EVEN OUTPUT DATA PAIRS
13	TXE3-	LVDS EVEN OUTPUT DATA PAIRS
14	TXE3+	LVDS EVEN OUTPUT DATA PAIRS
16	TXO0-	LVDS ODD OUTPUT DATA PAIRS
17	TXO0+	LVDS ODD OUTPUT DATA PAIRS
19	TXO1-	LVDS ODD OUTPUT DATA PAIRS
20	TXO1+	LVDS ODD OUTPUT DATA PAIRS
22	TXO2-	LVDS ODD OUTPUT DATA PAIRS
23	TXO2+	LVDS ODD OUTPUT DATA PAIRS
25	TXOCLK-	LVDS ODD OUTPUT DATA PAIRS
26	TXOCLK+	LVDS ODD OUTPUT DATA PAIRS
28	TXO3-	LVDS ODD OUTPUT DATA PAIRS
29	TXO3+	LVDS ODD OUTPUT DATA PAIRS
03,06,09, 12	GND	Ground
15, 18, 21, 24	GND	Ground
27, 30, 34, 35	GND	Ground
39,40	GND	Ground

### 3.6.3 J2

<i>Pin NO.</i>	<i>Signal</i>	<i>Comment</i>
1,2	5 VCC	5V Power Input
3,4,5	GND	GND
6	BLON	Bright Light ON/OFF.
7	BRIGHT	Brightness Adjustment.

---

### 3.6.4 J1

<i>Pin NO.</i>	<i>Signal</i>	<i>Comment</i>
1	NC	NC
2	LED-Y	Power saving mode
3	LED-G	Monitor is ON
4	GND	GND
5	KEY-POWER	Power ON/OFF key
6	KEY-DOWN	Function select counter-clockwise key
7	KEY-R	Adjust up key
8	KEY-L	Adjust down key
9	KEY-UP	Function select counter-clockwise key
10	GND	GND

### 3.6.5 CN1 Digital Video input Connector: DVI-D

<i>Pin-Assignment of DVI-D(24 pin) connector</i>					
1	TX2-	9	TX1-	17	TX0-
2	TX2+	10	TX1+	18	TX0+
3	Shield (TX2 / TX4)	11	Shield (TX1 / TX3)	19	Shield (TX0 / TX5)
4	NC	12	NC	20	NC
5	NC	13	NC	21	NC
6	DDC-Serial Clock	14	-5V Power *)	22	Shield (TXC)
7	DDC-Serial Data	15	Ground (+5V)	23	TXC-
8	No Connect	16	Hot plug detect	24	TXC+

\*)In case, the power of the PC unit is switched off and the power the monitor is switched on, no voltage may occur at pin 14.

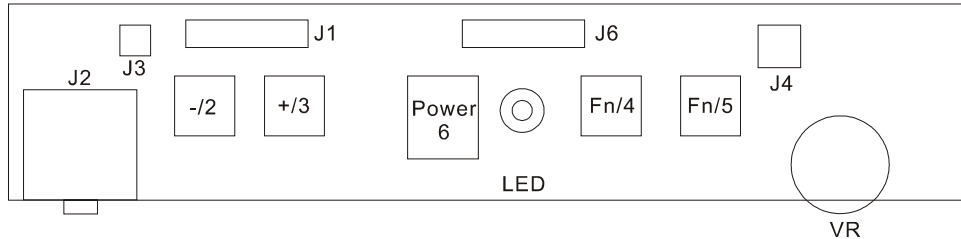


## 4. VK901 Control Panel Board

### 4.1 Description

The VT-901 is designed to offer a user interfaced control panel which passes and receives signals to and from VL-901 display control board.

### 4.2 Connector and Switch Locations



### 4.3 Connector type

Location	Type	Maker	Number of pins
J1	4500-10	E&T	10
J6	4500-11	E&T	11
J3	87502-0200	ACER	2
J4	87502-0200	ACER	2
J2	SCJ-0348-C	SC	9

### 4.4 Connector pin Assignment

#### 4.4.1 J1

Pin NO.	Signal	Comment
1	NC	NC
2	LED-Y	Power saving mode
3	LED-G	Monitor is ON
4	GND	GND
5	KEY-POWER	Power ON/OFF key
6	KEY-DOWN	Function select counter-clockwise key
7	KEY-R	Adjust up key
8	KEY-L	Adjust down key
9	KEY-UP	Function select counter-clockwise key
10	GND	GND

#### 4.4.2 J6

Pin NO.	Signal	Comment
1	VOL	Volume ON/OFF Control
2	GND	GND
3	LIN1	Audio Volume Adjust Line INL
4	RIN1	Audio Volume Adjust Line INR
5	RIN2	Audio Volume Adjust Line OUTR

---

6	<i>LIN2</i>	<i>Audio Volume Adjust Line OUTL</i>
7	<i>GND</i>	
8	<i>R-EAR</i>	<i>EAR Phone Out R</i>
9	<i>L-EAR</i>	<i>EAR Phone Out L</i>
10	<i>ROUT</i>	<i>Speaker Out R</i>
11	<i>LOUT</i>	<i>Speaker Out L</i>

#### **4.5 Switch definition**

<i>Location</i>	<i>Definition</i>
<i>S5</i>	<i>Power ON/OFF</i>
<i>S1</i>	<i>Function select by clockwise direction</i>
<i>S4</i>	<i>Function select by counter-clockwise direction</i>
<i>S3</i>	<i>Adjust up</i>
<i>S2</i>	<i>Adjust down</i>

#### **4.6 LED definition**

<i>Location</i>	<i>Definition</i>
<i>D1</i>	<i>Green for ON mode; Yellow for OFF mode; yellow for Power Saving mode; Dark for DC power OFF mode.</i>

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## 5. INVERTER BOARD

### 5.1 Description

The Inverter board is designed for lighting up the back-lights of LCD module.

### 5.2 Electrical characteristics

#### 5.2.1 FOR Fujitsu PANEL FLC48SXC8V

	MIN.	TYP.	MAX.	COMMENT
INPUT VOLTAGE	11.4V	12.0V	12.6V	12V±5%
INPUT CURRENT	-----	2A	—	Vin=12V, Vbrite=3.3V
Normal BACKLIGHT VOLTAGE	-----	700V rms.	-----	
LAMP CURRENT	-----.	7mA rms	8mA rms	
DRIVING FREQUENCY	40KHz	50KHZ	60KHz	
EFFICIENCY	-----	80%	-----	Vin = 12V,max brightness
Vin ON/OFF sequence	-----	1S	-----	
OLP TIME	-----	3S	—	Open lamp protection time
BRIGHTNESS RANGE	10%	-----	100%	
Brightness control	0V	—	3.3V	3.3V, brightness Max.
Brightness	—	220cd/m <sup>2</sup>	—	
Strike voltage at 0°C	1600 Vrms	—	—	
Operating life time	20,000 hrs	—	—	(note)

Note:

Life time (hr) can be defined as the time in which it continues to operate under the condition:

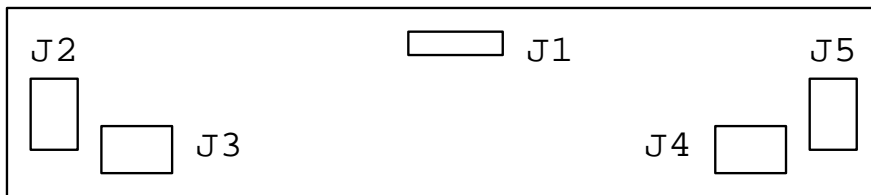
Ta=25±2°C, IL =7 mArms until one of the following event occurs:

1. When the brightness becomes 50 %
2. When the startup voltage (Vs) at 0°C becomes higher than the maximal value of Vs specified above.

---

## 5.3 Connector locations

### 5.3.1 Connector type



Location	Type	Maker	Number of pins
JN2, JN3, JN4, JN5	SM02 (8.0)B-BHS	ST	2
JN1	85205-1200	E&T	12

### 5.3.2 Connector pin assignment

#### 5.3.2.1 J2,J3,J4,J5

Pin NO.	Signal	Comment
1	HV	High voltage for lamp
3	LV	Low voltage (common)

#### 5.3.2.2 JN1

Pin NO.	Signal	Comment
1, 2, 3,4	BP+	+12V
7	BLT_ON	Back-light ON/OFF control, high active (3.3V)
5, 6, 10, 11, 12	GND	
8	+5VS	+5VS
9	BRITE	BRITE Brightness (0-3.3V) control from I/F 3.3 V for max. brightness (for Fujitsu model)

## 6. DC/DC POWER and Audio CKT VM-902

### 6.1 Input:

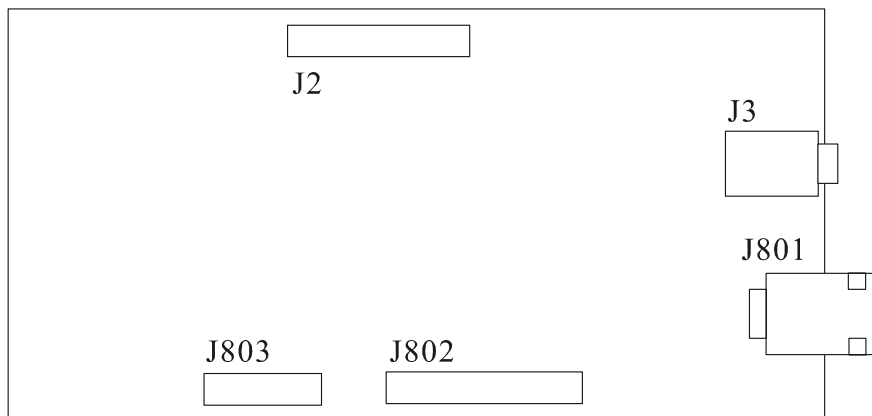
+12V/5A from AC adapter

### 6.2 Output:

ITEM	Output Voltage	Max Load.	Min Load	Tolerance	Ripple & Noise(max)
VCC	+5V	2.1A	0.1A	±5 %	200mVpp

### 6.3 Efficiency: 80 % min at Maximum Load.

### 6.4 Connector Locations



#### 6.4.1 Connector type for VM-902

Location	Type	Maker	Number of pins
J801	DC-IN	SC	2
J802	4500-12	E&T	12
J803	4500-07	E&T	7 (for LCM999 only)
J2	4500-11	E&T	11

#### 6.4.2 Connector pin Assignment

#### 6.4.3 J801 DC 12V Input

Pin No	Signal	Comment
Pin 1	+12V	From adapter output cable
Pin 2	GND	From adapter output cable

---

#### 6.4.3.1 J802 FOR I/F CKT

Pin No	Signal	Comment
Pin 1,2,3,4	+12V	From adapter +12V power
Pin 5,6,10,11,12	GND	GND
Pin 8	+5V	Supply for I/F CKT
Pin 7	ON/OFF	ON/OFF Control ON>3.0V OFF <2.0V
Pin 9	BRIGHT	Lamp Current Control (0V to 3.3V) , 3.3V for max brightness

#### 6.4.3.2 J803 FOR M/B CKT

Pin No	Signal	Comment
Pin 1,2	+5V	For M/B +5V power
Pin 3,4,5	GND	GND
Pin 6	BLON	Bright Light On/ Off
Pin 7	BRIGHT	Brightness Adjustment

#### 6.4.3.3 J3 FOR Audio input(for AM999 only)

Pin No	Signal	Comment
Pin 1	GND	GND
Pin 2	Audio IN (1)	From Audio output (1)
Pin 3	Audio IN (2)	From Audio output (2)

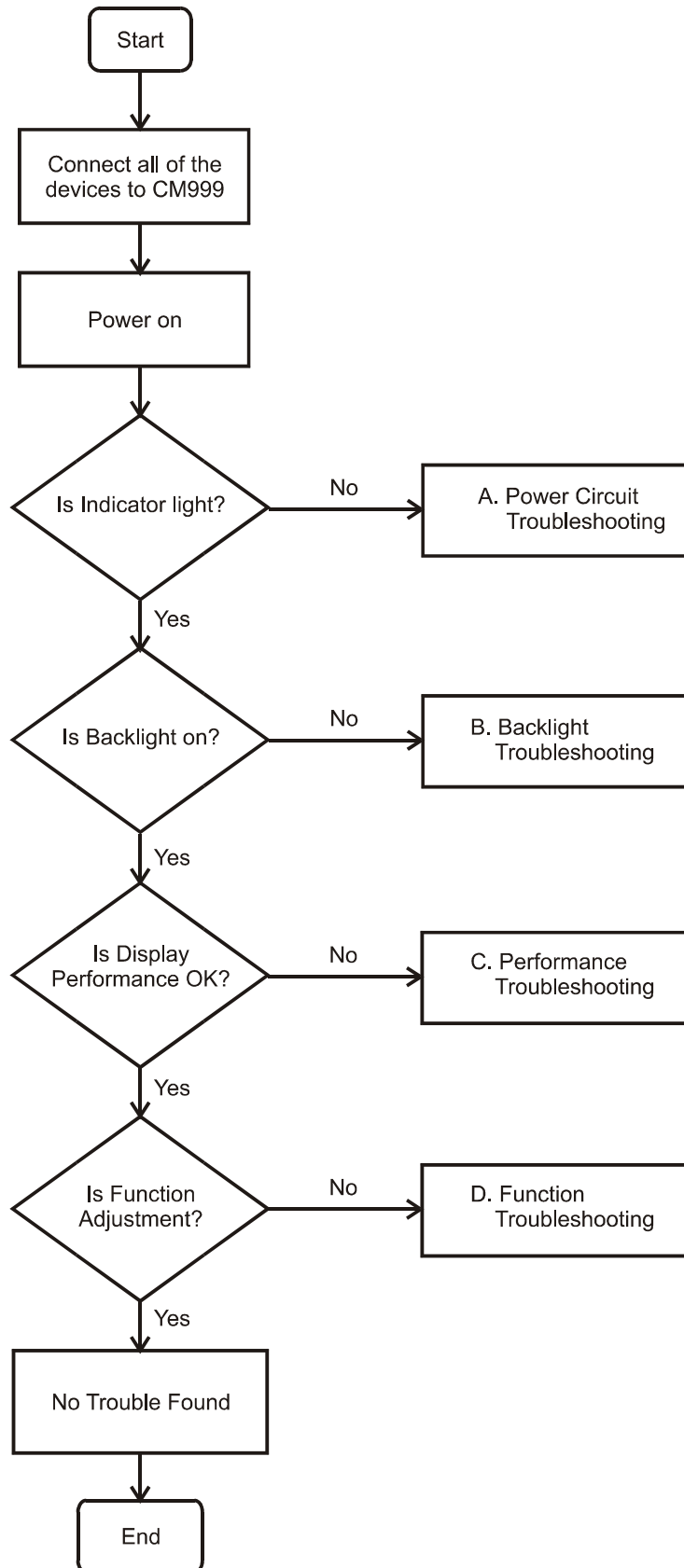
#### 6.4.3.4 J2 TO Speaker CKT(for AM999 only)

Pin No	Signal	Comment
Pin 1	VOL	Volume ON/OFF control
Pin 2	GND	GND
Pin 3	LIN1	Audio volume adjust line INL
Pin 4	RIN1	Audio volume adjust line INR
Pin 5	RIN2	Audio volume adjust line OUTF
Pin 6	LIN2	Audio volume adjust line OUTL
Pin 11	GND	
Pin 7	R-EAR	EAR phone out R
Pin 8	L-EAR	EAR phone out L
Pin 9	ROUT	Speaker out R
Pin 10	LOUT	Speaker out L

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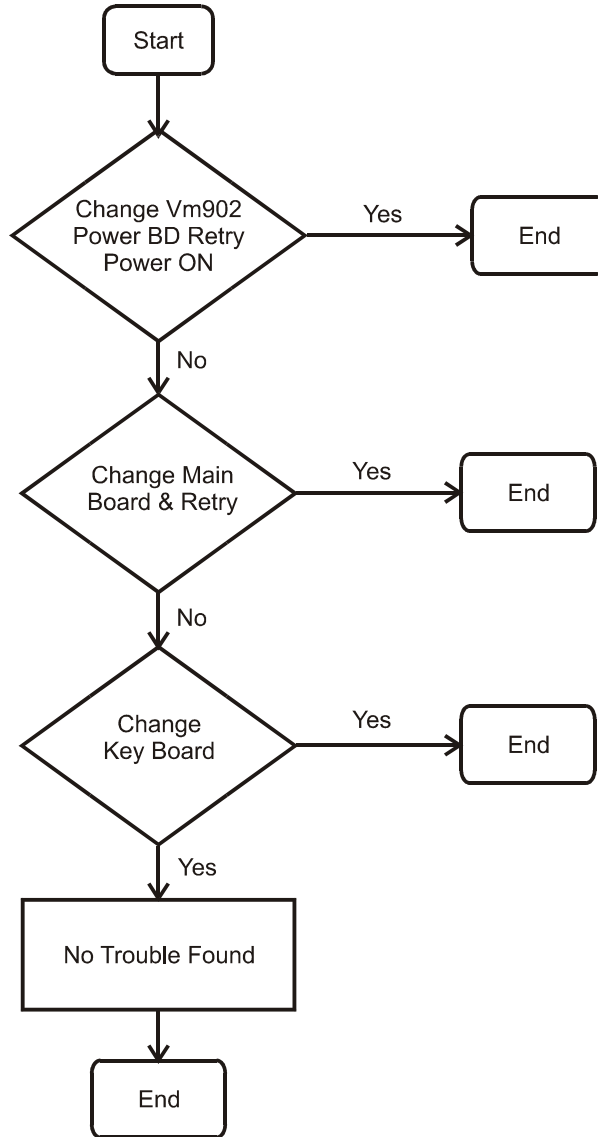
## 7. TROUBLESHOOTING

### 7.1 Main Procedure



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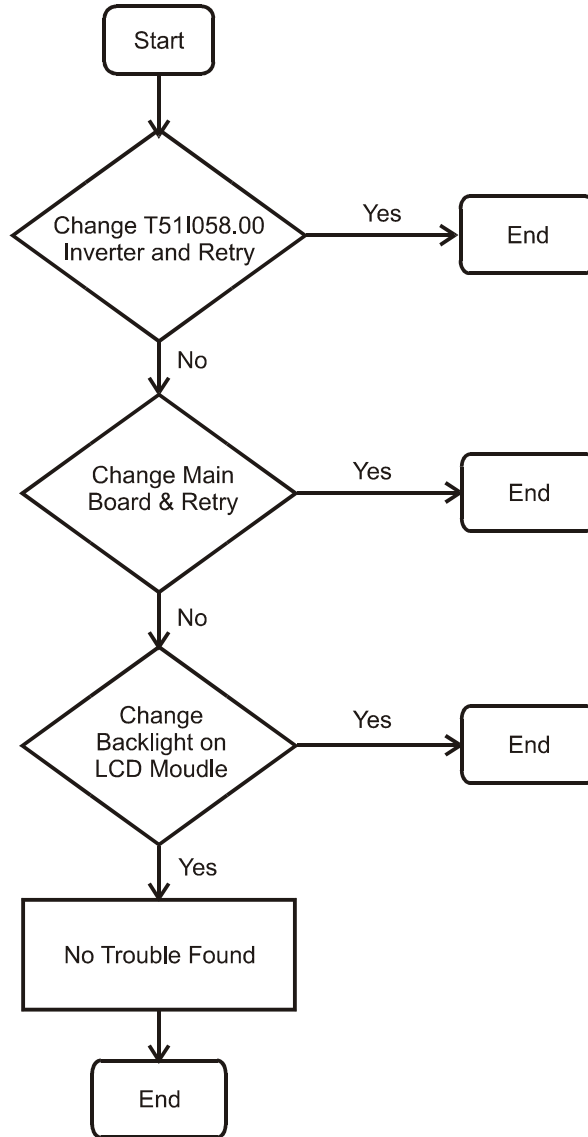
### 7.1.1 Power Circuit Troubleshooting



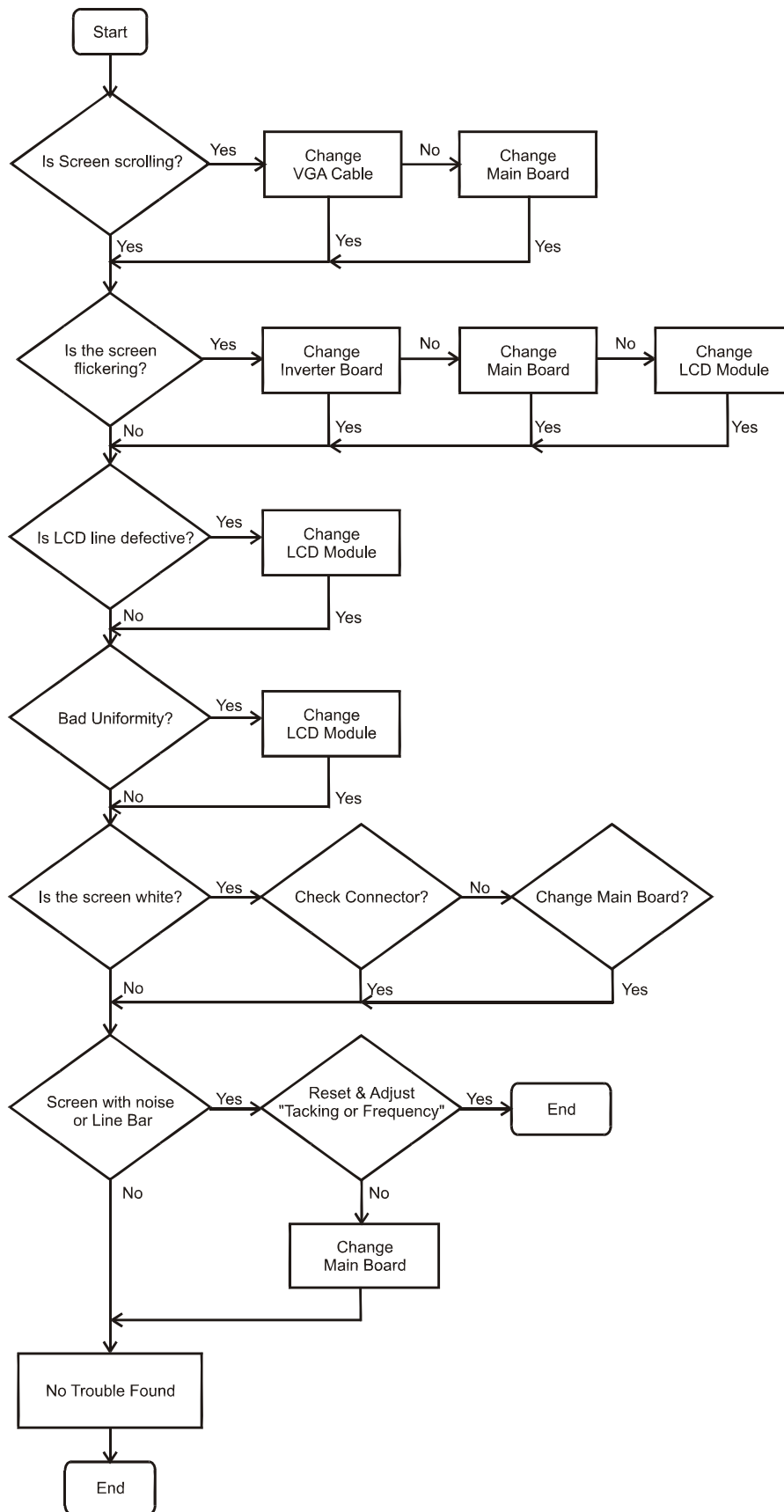


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### 7.1.2 Backlights Troubleshooting

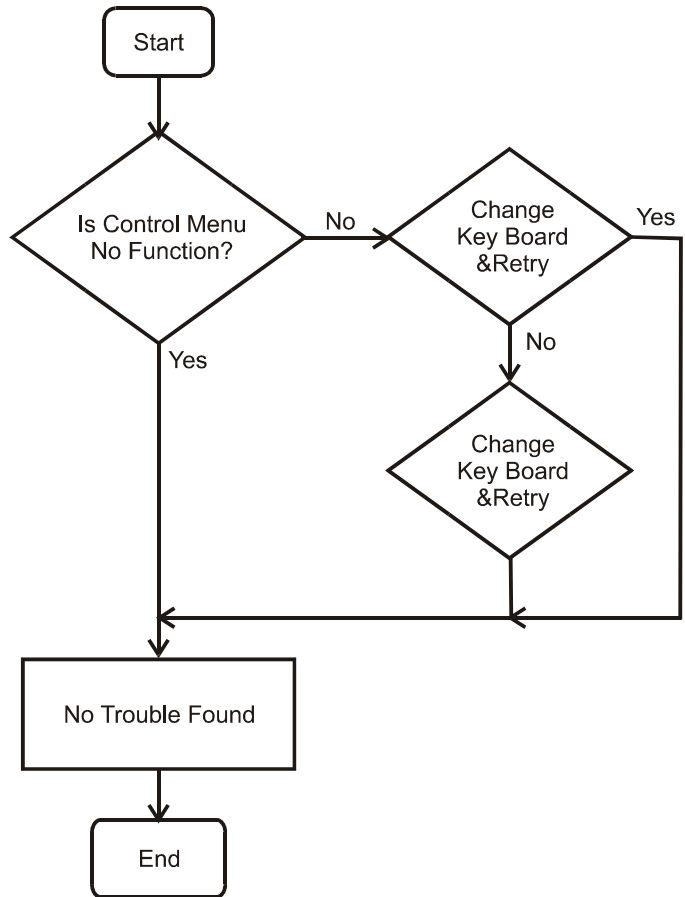


### 7.1.3 Performance Troubleshooting



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7.1.4 *Function Troubleshooting*



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## 8. MECHANICAL REQUIREMENTS

### 8.1 *Vibration and Shock*

All testing shall be done in each of three mutually perpendicular axes, referenced to the position of the system as it is in front of the user (i.e., front-to back, side-to-side, and top-to-bottom).

#### 8.1.1 *Non-Operating*

The unit should suffer minimal visible cosmetic damage or damage that presents a safety hazard, or impairs the setup and operation of the system after testing.

**Sinusoidal Vibration:** 0.75 G zero-to-peak, 10 to 500Hz, 0.5 octave / minute sweep rate. This requires one sweep, 10 to 500 to 10Hz, along each of the three axes.

**Random Vibration:** 0.008 G<sup>2</sup>/Hz, 10 to 500 Hz, nominal 2 GRMS. The test shall be for one hour for each of the three axes.

**Half Sine Wave Shock:** 120 G peak, half sine pulse, 2 ms pulse duration. Testing shall consist of one shock in each direction in each axis, for a total of 6 shock inputs.

**Square Wave Shock:** 40 G peak acceleration, 160 inches / second velocity change. There shall be one shock in each direction in each axis, for a total of 6 shock inputs.

### 8.2 *Package Drop Specification*

Listed below are standards of drop heights for monitor product

Product Weight	height Specs
<9.1 kg	0.76 m
9.2~18.2 kg	0.66 m
18.3~27.2 Kg	0.61 m
27.3~45.4 Kg	0.46 m

#### 8.2.1 *Drop Test Sequence*

<i>Drop Order</i>	<i>Drop point</i>	<i>Drop Times</i>
1	<i>Right Front Bottom Corner</i>	1
2	<i>Right Bottom Edge</i>	1
3	<i>Right Front Edge</i>	1
4	<i>Front Bottom Edge</i>	1
5	<i>Bottom Side</i>	1
6	<i>Top Side</i>	1
7	<i>Front Side</i>	1
8	<i>Back Side</i>	1
9	<i>Left Side</i>	1
10	<i>Right Side</i>	1

---

### 8.3 Dimension Size and Weight

Dimension size	433 (W) x 447 (H) x 235 (D)
Net Weight	6.5Kg
Gross Weight	9 Kg

### 8.4 Gap Spec.

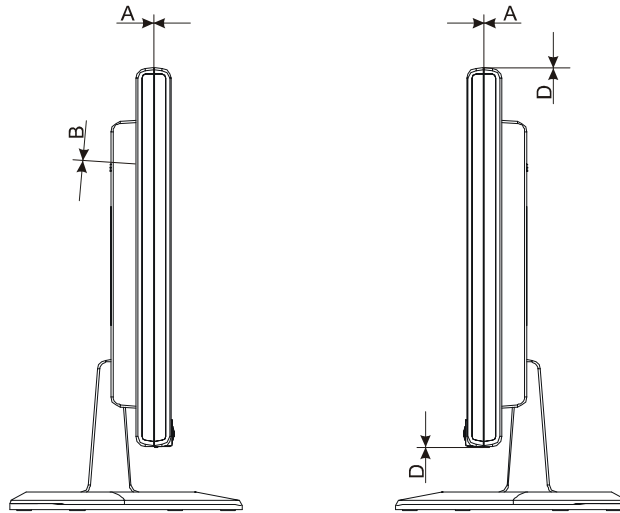
#### 8.4.1 The step between front bezel and back cover shall be within specification.

Back Cover & Bezel Gap

$$0.8 \text{ mm} \leq A \leq 1.2 \text{ mm}$$

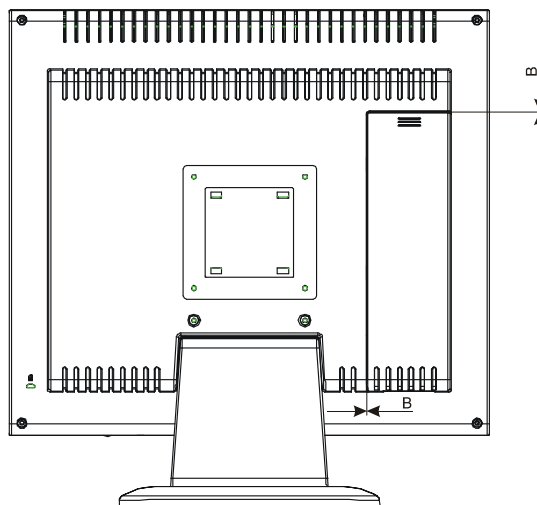
Back Cover & Bezel Alignment

$$0 \text{ mm} \leq D \leq 0.8 \text{ mm}$$



Back Cover & Cable Cover Gap

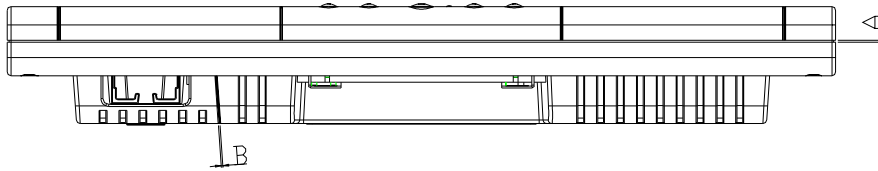
$$0.8 \text{ mm} \leq B \leq 1.2 \text{ mm}$$



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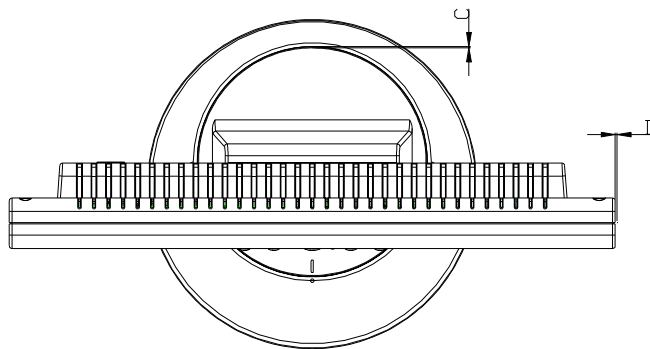
Back Cover & Cable Cover Gap

$$0.8 \text{ mm} \leq B \leq 1.2 \text{ mm}$$



Base Cover & Neck Cover Gap

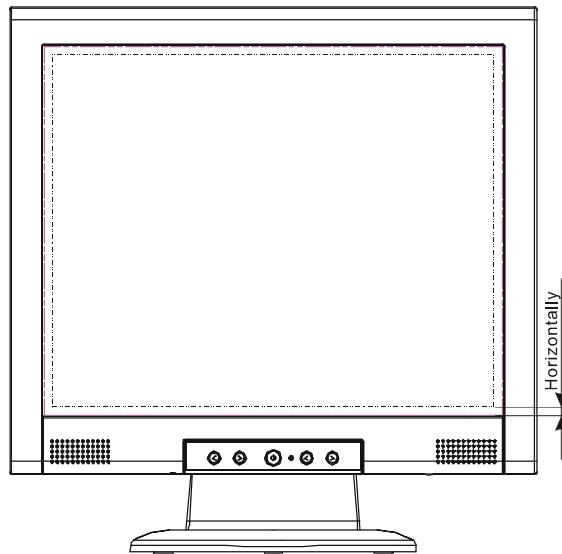
$$0.8 \text{ mm} \leq C \leq 1.2 \text{ mm}$$



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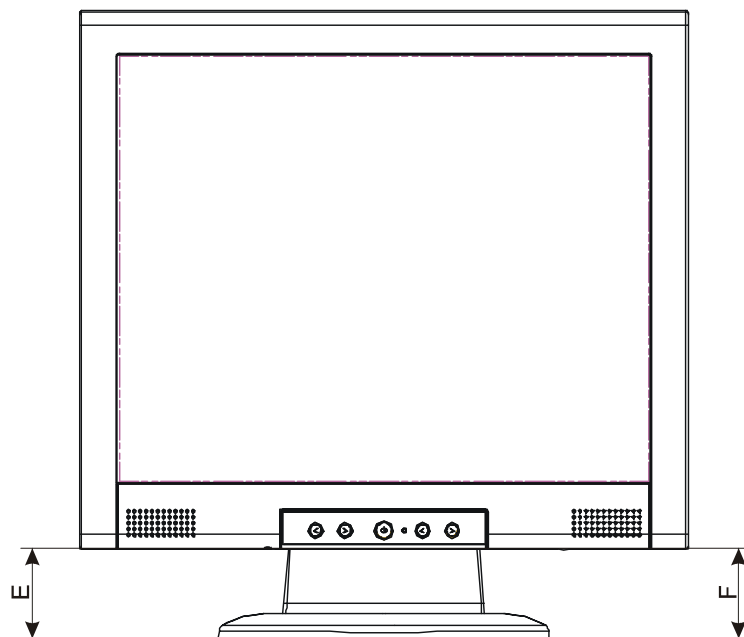
### 8.4.2 LCD Horizontally

The angle between front bezel and LCD unit in bottom side should not large than 1.0mm.



The distance of the LCD display unit from left side to right side should not large than

$$| E - F | \leq 4.0\text{mm.}$$



### 8.5 Tilt Base Rotation

Tilt up  $25 \pm 1^\circ$  / down  $5 \pm 1^\circ$

### 8.6 Swivel Base Rotation

Swivel Right  $45 \pm 1^\circ$  / Left  $45 \pm 1^\circ$

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## 8.7 Plastic Material

Front Bezel ABS 94HB, 94V-0

Back Cover ABS 94HB, 94V-0

The Others ABS 94HB

TCO' 99(Optional)

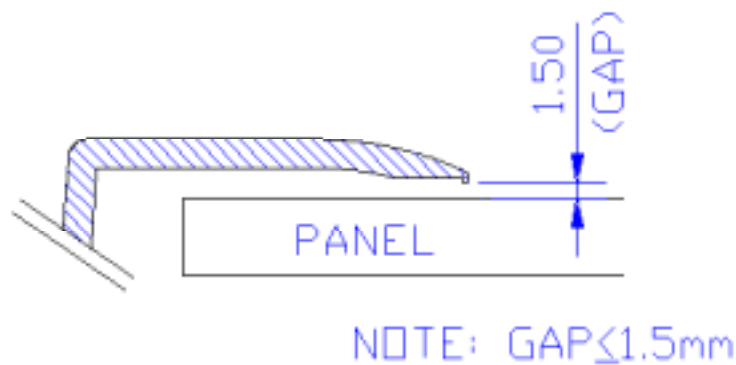
Front Bezel PC + ABS 94 - V0

BACK COVER PC + ABS 94 - V0

The others ABS 94 HB

## 8.8 GAP Spec.

Gap between panel with bezel is  $0 \text{ mm} < \text{gap} < 1.5 \text{ mm}$



## 9. Power Line Transient Test (IEC 61000-4-4 Fast Transients/Burst)

TEST CONDITIONS & PROCEDURE: (Follow IEC 61000-4-4)

Test Condition :

The condition is base on operating with 50Ω load.

### 9.1 Peak Voltage:

2 KV (applies the Level 3 typical Industrial Environment” of IEC 61000-4-4)

### 9.2 Polarity : +/-

### 9.3 Repetition Frequency of the impulse : 5 KHz.



---

**9.4 Rise-Time : 5ns  $\pm$ 30%**

**9.5 Impulse Duration: 50 nS  $\pm$ 30%**

**9.6 Relation to Power Supply: Asynchronous**

**9.7 Burst Duration: 15 ms  $\pm$ 20%**

**9.8 Burst Period: 300 ms  $\pm$ 20%**

**9.9 Climatic Conditions:**

- Ambient Temperature: 15°C to 35°C
- Relative Humidity: 45% to 75%
- Atmospheric Pressure: 86 kPa to 106 kPa

**9.10 Test Procedure:**

The monitor Display set high-resolution mode, AC input use AC 240V.

Note :

**9.10.1**

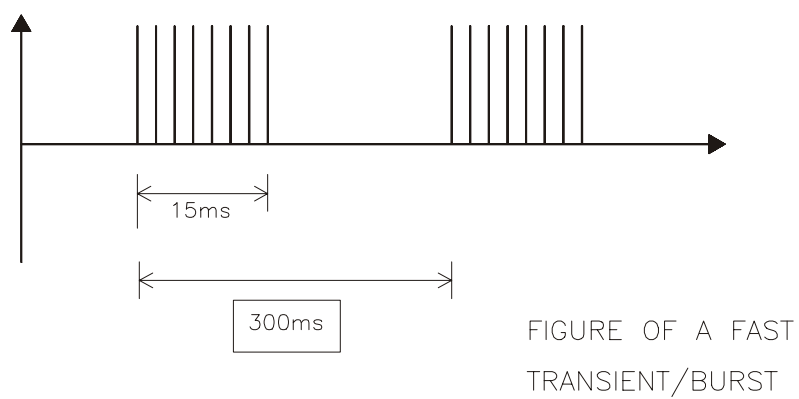
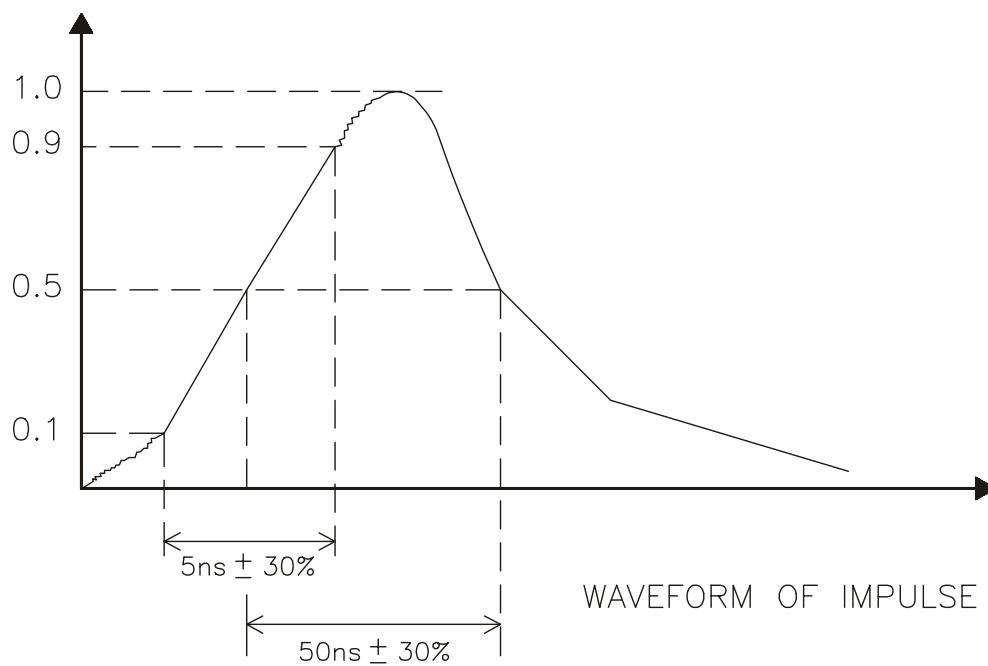
*IEC 61000-4-4 defines that power supply, I/O line, and control line all shall be performed the transient test, but the I/O line and control line is applied with only half of peak voltage (1 KV).*

**9.10.2**

*For the comparison of wave-shape generated by different generator, so the test must uses a scope with at least 400 MHz bandwidth, and coupled to 50  $\Omega$  to monitor the rise-time, impulse, duration, and repetition rate of the impulses within one burst.*

---

# WAVESHAPE



---

## **10. Power Line Surge Test (IEC 61000-4-5 Surge)**

### ***10.1 Climatic Condition***

The climatic conditions shall be within the following ranges:

***10.1.1 Ambient Temperature: 15 °C to 35 °C***

***10.1.2 Relative Humidity: 10% to 75%***

***10.1.3 Atmospheric Pressure 86kPa(860 mbar)to 106kPa (1060mbar)***

*Note: The temperature and relative humidity should be recorded in the test report.*

### ***10.2 Test Conditions:***

***10.2.1 Wave-shape of the current surge: (refer to IEC 61000-4-5)***

*Open circuit voltage: (1.2 / 50 μs)*

*Short circuit current: (8 / 20 μs)*

***10.2.2 Polarity: positive / negative***

***10.2.3 Phase shifting:in a range between 0° to 270° versus the AC line phase angle***

***10.2.4 Repetition rate:at least 1 per minute***

***10.2.5 Number of tests:at least 5 positive and 5 negative at the selected points.***

### **10.3**

The surge will be applied between lines and between lines and ground.

### **10.4**

If not otherwise specified, the surge to power supply circuits shall be applied synchronized to the voltage phase at the zero crossing and the peak value of the AC voltage wave. (Positive and negative)

### **10.5**

The surge voltage for test is from 1 KV and increases 1 kV for each step.

### **10.6**

The recommended severity levels for the surge voltage test is 2.0 KV, and without any degradation or loss of function that is not recoverable due to damage of component or software allowed.

**10.7** Display set high-resolution mode, AC input use AC 240V.

---

## 11. ENVIROMENT REQUIREMENT

### 11.1 *Operating*

Temperature	5°C ~ 40°C
Relative Humidity	20% to 80%
Altitude	Sea level to 8000ft

### 11.2 *Storage or Shipment*

Temperature	-20°C ~ +60°C
Relative Humidity	5% to 85%
Altitude	Sea level to 40,000ft

#### 11.2.1 *TEST PROCEDURE:*

- Put in temperature chamber under 60°C      Time:24 hours
- Back to room temperature      Time: 4 hours
- Put in temperature chamber under -20°C      Time:24 hours
- Back to room temperature      Time:4 hours
- The process repeat 2 times.

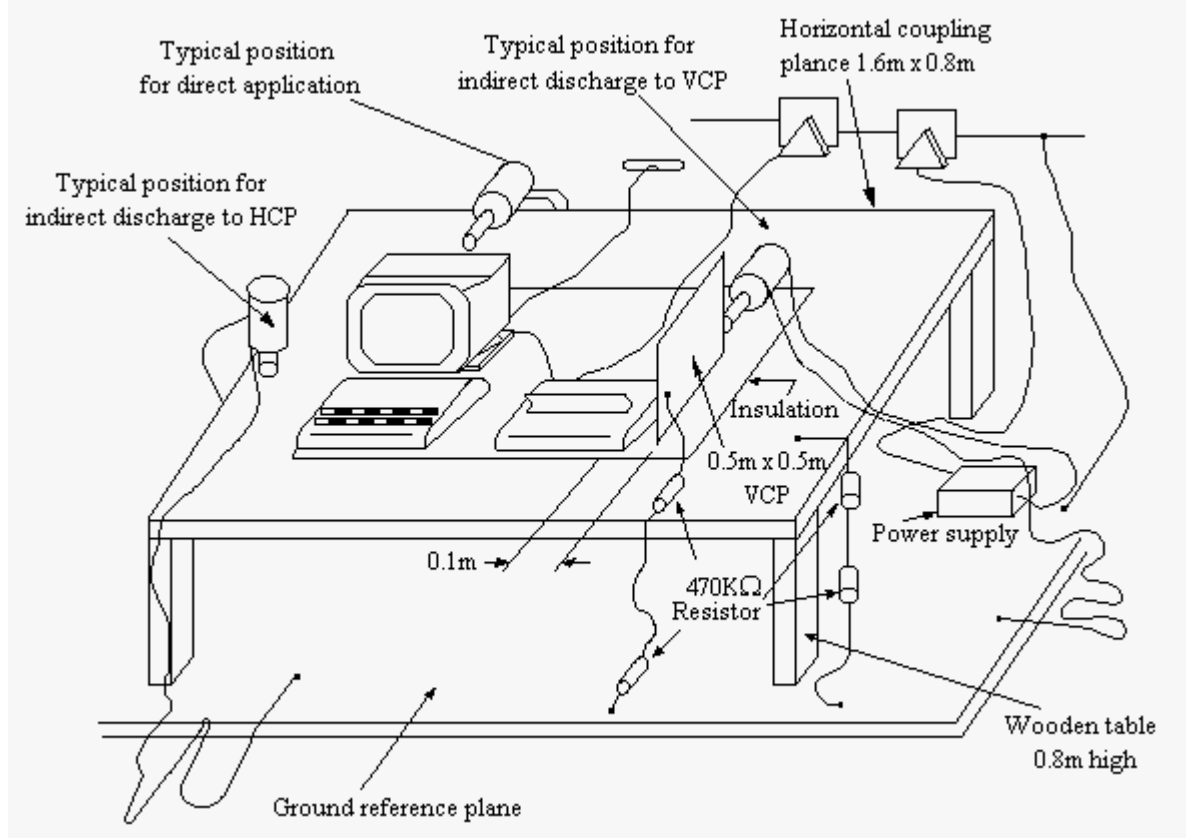
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## 12. REGULATION COMPLIANCE

### *12.1 This product comply to the most current revisions of following regulations:*

UL/CUL {UL 1950/ CSA C22.2 NO950}	Standard for Safety of Information Technology Equipment including Electrical Business Equipment
EN 60950/CB Scheme	Safety of Information Technology Equipment including Electrical Business Equipment
MPR 1990:8	Test methods for visual display units.
MPR 1990:10	User handbook for evaluation visual display units.
ISO 9241-3:	Ergonomic requirements for office work with visual display terminals (VDTs)-Visual display requirements.
ISO 9241-7:	Ergonomic requirements for office work with visual display terminals (VDTs)-Requirements for display with reflections.
ISO 9241-8:	Ergonomic requirements for office work with visual display terminals (VDTs)-Requirements for displayed colours.
NUTEK/EPA	Requirements of power saving according to NUTEK Spec. 803299/94/96, EPA Energy star.
TCO 1999 (option)	Requirements for Environmental Labeling of Personal Computers. Test methods for Ergonomic, Emission, Energy Efficiency, safety.
TUV/GS	Safety regulation for displays work places in the office sector.
FCC 47 CFR, Chapter 1, Subchapter A, Part 15, Subpart B	A digital device that is marketed for use in a residential environment not withstanding use in commercial, business and industrial environments.
CISPR 22	Limits and methods of measurements of radio interference characteristics of information technology equipment.
CE LVD Directive (73/23/EEC)	Safety: EN60950
CE EMC Directive (89/336/EEC)	EMI: EN55022 class B Harmonics: EN61000-3-2 Voltage Fluctuation/Flicker: EN61000-3-3 Immunity: EN55024
IEC 61000-4	IEC 61000-4-2 Electrostatic Discharge IEC 61000-4-3 Radiated Electromagnetic Field IEC 61000-4-4 Fast Transients/Burst IEC 61000-4-5 Surge IEC 61000-4-6 Conducted Disturbance, Induced by Radio Frequency Fields IEC 61000-4-8 Power Frequency Magnetic Field IEC 61000-4-11 Voltage DIP/Interruption
VCCI (option)	Specification for limits and methods of measurement of radio interference characteristics of information technology equipment. Class B conformity verification report from the VCCI
BSMI (option)	CNS 13438, Class B





***Ambient temperature : 15°C to 35°C***  
***Relative humidity : 30% to 60%***

## 13. QUALITY AND RELIABILITY

### 13.1 Quality Assurance

Unless otherwise specified in this specification or the applicable purchase order, the supplier shall be responsible for maintaining a statistical process program or performing inspections that are sufficient to assure that the parts supplied meet the requirements specified herein.

### 13.2 Reliability

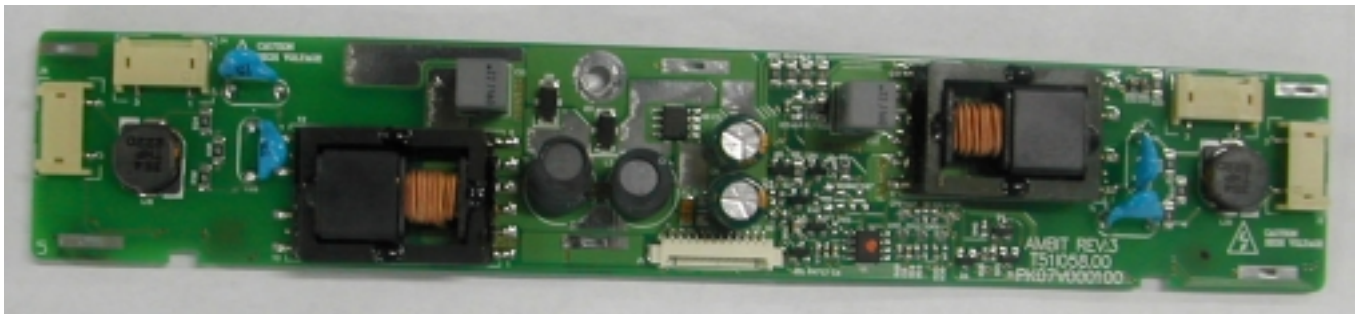
The product shall have a designed MTBF of greater than 20,000 hours during its useful life.

## **APPENDIX A: PARTS LISTS**

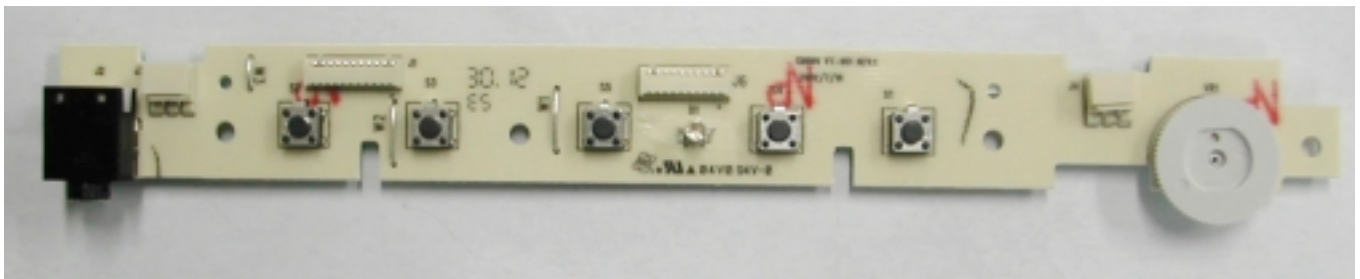


## A. FRU Board

### A-1 PCBA Inverter board



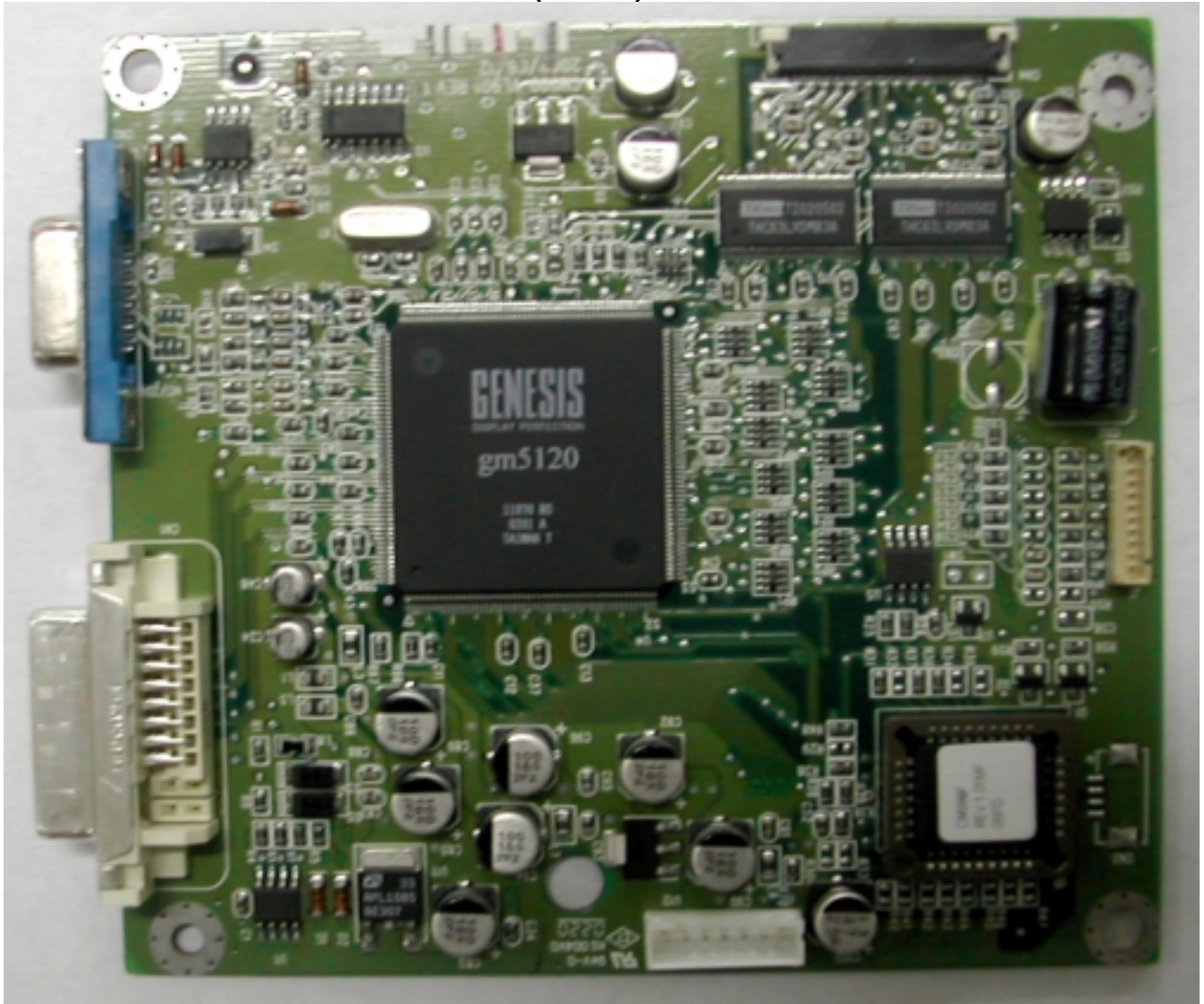
### A-2 454A7830001 –PCBA Key Board (VT-901)



### A-3 455A7830001 –PCBA Audio & D/D Board (VM-902)



A-4 461A7830011–Firmware Ctrl Board (VL-901)



# A. FRU BOM LIST

Product Line: Monitor System

Product Family:

System Model: ABO\_AL922(ET.92202.00X),X=1,4,5,9.

LEVEL	Acer F/G P/N	Compal F/G P/N	CATEGORY	PARTNAME	DESCRIPTION	ACER PART NO.	Compal PART NO.	Common/Unique	TAT	2 months Rolling Forecast	COMMENT FOR REFERENCE/MB LOCATION	Unit Price (US)	Action Code	SUGGEST MINIMAL ORDER Q'TY	DEFECT PARTS RETURN/SCRAP/ VENDOR S/N COLLECT	LOCAL BUY (YES/NO)	INDIVIDUAL PACK(YES/NO)
1	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	BOARDS	INVERTER/POWER BOARD	PCBA INVERTER&POWER		PK07V000100	U	4WKS	REQUIRED	SYSTEM	16.56		30	LOCAL SCRAP	NO	NO
1	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	BOARDS	KEY BOARD	PCBA KEY		454A7930001	U	4WKS	REQUIRED	SYSTEM	3.02		30	LOCAL SCRAP	NO	NO
1	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	BOARDS	FIRMWARE CONTROL BOARD(M/B)	FIRMWARE CTRL (M/B)		461A7830011	U	4WKS	REQUIRED	SYSTEM	25.78		30	LOCAL REPAIR/LOCAL SCRAP	NO	NO
1	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	BOARDS	PCBA AUDIO BOARD	PCBA AUDIO		455A7830021	U	4WKS	REQUIRED	SYSTEM	18.36		30	LOCAL SCRAP	NO	NO
1	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	CABLE	LCD NET WIR SET	NET WIR SET		NA200800200	U	4WKS	REQUIRED		0.08		50	LOCAL SCRAP	NO	NO
	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	CABLE	KEY BOARD CABLE	H-CON SET		DC020200450	U	4WKS	REQUIRED		1.04		50	LOCAL SCRAP	NO	NO
1	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	CABLE	CABLE	CB ASY		DC190013720	U	4WKS	REQUIRED		0.76		50	LOCAL SCRAP	NO	NO
1	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	CABLE	SINGLE CABLE	CB ASY		DC190019270	U	4WKS	REQUIRED		8.08		50	LOCAL SCRAP	NO	NO
1	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	CABLE	SINGLE CABLE	CB ASY		DC190020440	U	4WKS	REQUIRED		4.35		50	LOCAL SCRAP	NO	NO
1	ET.92202.001/1009	LAM999F1002/1009	CABLE	POWER CORD	POWER CORD( EU)		GA020000100	U	4WKS	REQUIRED		1.60		50	LOCAL SCRAP	NO	NO
1	ET.92202.1005	LAM999F1005	CABLE	POWER CORD	POWER CORD( AU)		GA060000510	U	4WKS	REQUIRED		2.28		50	LOCAL SCRAP	NO	NO
1	ET.92202.1005	LAM999F1009	CABLE	POWER CORD	POWER CORD( EU)		GA040080300	U	4WKS	REQUIRED		3.53		50	LOCAL SCRAP	NO	NO
1	ET.92202.1009	LAM999F1009	CABLE	POWER CORD	POWER CORD( EU)		GA070030300	U	4WKS	REQUIRED		3.06		50	LOCAL SCRAP	NO	NO
1	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	CASE/COVER/BRACKET ASSEMBLY	LCD COVER ASSY	LCD COVER		FACM991B200	U	4WKS	REQUIRED		4.56		50	LOCAL SCRAP	NO	NO
1	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	CASE/COVER/BRACKET ASSEMBLY	LCD BEZEL A'SSY (ACER)	LCD BEZEL A'SSY (ACER)		FAAM991A200	U	4WKS	REQUIRED		8.53		50	LOCAL SCRAP	NO	NO
1	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	CASE/COVER/BRACKET ASSEMBLY	CHASSIS	CHASSIS		ECCM9915100	U	4WKS	REQUIRED		8.35		50	LOCAL SCRAP	NO	NO
1	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	CASE/COVER/BRACKET ASSEMBLY	EMI COVER	EMI COVER		EECM9916100	U	4WKS	REQUIRED		1.86		50	LOCAL SCRAP	NO	NO
1	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	CASE/COVER/BRACKET ASSEMBLY	STAND NECK(BASE)	STAND NECK(BASE)		ECCM9924000	U	4WKS	REQUIRED		2.91		50	LOCAL SCRAP	NO	NO
1	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	CASE/COVER/BRACKET ASSEMBLY	HINGE	HINGE		ECCM9933000	U	4WKS	REQUIRED		4.61		50	LOCAL SCRAP	NO	NO
1	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	LCD	FLC48SXC8V 19" FUJ	FLC48SXC8V 19" FUJ		AC600022700	C	4WKS	REQUIRED		558.60		20	RETURN	NO	NO
3	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	PCB COMPONENT	CRTSTAL	14.31818MHZ HC-49/		BD114P3M020	C	2WKS		X1	0.44		20	LOCAL SCRAP	NO	NO
3	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	PCB COMPONENT	FPC	CM999 VS-901 REV1		DA3M999V010	C	2WKS		FPC	8.85		20	LOCAL SCRAP	NO	NO
3	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	PCB COMPONENT	SM IC	EE 128X8 SOP-8 24L		SA024210300	C	2WKS		U1	1.04		50	LOCAL SCRAP	NO	NO
3	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	PCB COMPONENT	LED	LYG2093 YEL/GRN 3D		BC5G2093000	C	2WKS		LED	0.25		20	LOCAL SCRAP	NO	NO
3	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	PCB COMPONENT	IC	SI-8051S LF1102		AB080510100	C	2WKS		U801	2.10		50	LOCAL SCRAP	NO	NO
3	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	PCB COMPONENT	VR RES	3/100W RK10F12U013		CF150021300	C	2WKS		VR	0.45		20	LOCAL SCRAP	NO	NO
3	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	PCB COMPONENT	SM IC	SN74LVC14 SOP-14 I		SA074140400	C	2WKS		U3	0.45		50	LOCAL SCRAP	NO	NO
3	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	PCB COMPONENT	S IC	EEPROM PLCC-32 SST		SA390100000	C	2WKS		U6	2.45		50	LOCAL SCRAP	NO	NO

3	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	PCB COMPONENT	S IC	GM5120 PQFP-208		SA051200100	C	2WKS		U4	13.05		20	LOCAL SCRAP	NO	NO
3	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	PCB COMPONENT	SM IC	EE 16K SO-8 C		SA024160008	C	2WKS		U5	0.68		50	LOCAL SCRAP	NO	NO
3	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	PCB COMPONENT	SM TRANSISTOR	SI9435 (SO-8)		SBX94350109	C	2WKS		U8	0.94		50	LOCAL SCRAP	NO	NO
3	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	PCB COMPONENT	S IC	THC63LVDM83A TSSOP		SA063830000	C	2WKS		U9	3.75		50	LOCAL SCRAP	NO	NO
3	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	PCB COMPONENT	S IC	APL1085-33CE TO252		SA010850500	C	2WKS		U11	0.84		20	LOCAL SCRAP	NO	NO
3	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	PCB COMPONENT	S IC	APL1117-25 SOT-223		SA011170200	C	2WKS		U12	0.56		50	LOCAL SCRAP	NO	NO
3	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	PCB COMPONENT	SM TRANSISTOR	MMBT3906 (SOT-23)		SB7390601T6	C	2WKS		Q1	0.07		20	LOCAL SCRAP	NO	NO
3	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	PCB COMPONENT	S IC	MCP809-2.93 SIT-23		SA008090600	C	2WKS		U7	0.60		20	LOCAL SCRAP	NO	NO
3	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	PCB COMPONENT	WAFER CONN.	E&T 96113-1013 10P		DC03E000500	C	2WKS		J6	0.48		20	LOCAL SCRAP	NO	NO
3	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	PCB COMPONENT	ZENER DIODE	HZ6B-2		BC40HZ6B2T7	C	2WKS		ZD801	0.05		20	LOCAL SCRAP	NO	NO
3	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	PCB COMPONENT	WAFER CONN.	E&T 96113-1113 11P		DC03E001000	C	2WKS		J1	1.60		20	LOCAL SCRAP	NO	NO
3	ET.92202.001/004/005/009	LAM999F1002/1004/1005/1009	PCB COMPONENT	IC	TDA1517 SIL-9 AUDI		AB015170002	C	2WKS		U1	1.96		50	LOCAL SCRAP	NO	NO

Spare Parts Level 1: Stands for FRU( Field Replaceable Unit) and CRU( Customer Replaceable Unit) which are used for first tier system service use and in LOW stock level and RTV items.

Spare Parts Level 2: Stands for subassemblies of FRU and consumed parts which should be in HIGH stock level and scrap items.

Spare parts Level 3: Mainboard Components

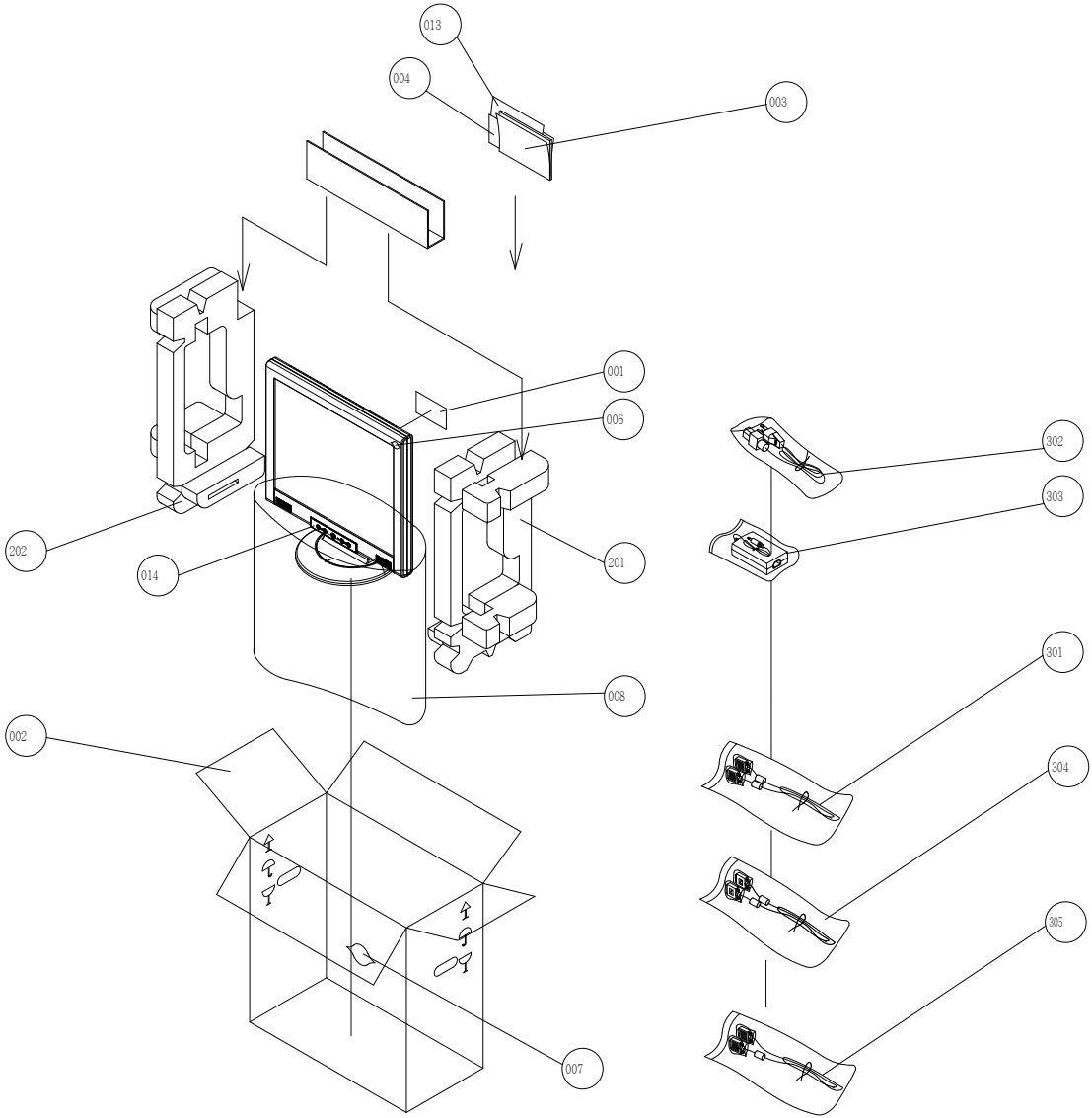
Option items: "MFG" is responsible for 1st year support after product phase-out. CSD only provides FRU(plain package) instead of whole option item(marketing package) accordingly.

\* RETURN/SCRAP" : the choice made for high dollar valued item to be returned for repair and low dollar valued item to be scrapped locally.

\* VENDOR S/N COLLECT : which the item may not be returned local but with vendor S/N collect for pass-through warranty claim. The details please do follow AIH/RTV process procedures.

## **APPENDIX B: DISPLAY UNIT ASSEMBLY**

For Standard



FOR REVISIONS SEE SHEET 1

SIZE	SHEET	REVISION NO.	DATE
A3	2	LAN999	01



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MANUAL\service\AB

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C NO.	PART NO.	DESCRIPTION	SPECIFICATION	QUANTITY REQUIRED	DWG.NO. LAM999	REV. 0A
-----						
			F1			
			001			REMARKS
-----						
#	LAM999F1001	LAM999F ABO-USA	UR+TCO99 110V MSV16 19"FUJITSU			
1	DC190020440	CB ASY	CM999 SIG/2CORE 1.8M BLK90DSUB	1	- - - -	301
2	GA050000400	POWER CORD SET	SP305X1.8MXIS14 SVT BLK	1	- - - -	302
3	PK10V000000	AC ADAP	LAE LAD6019AB5 12V/5A BLK	1	- - - -	303
4	DC190019270	CB ASY	CM999 20276/CORE 1.8M BLK90DVI	1	- - - -	304
5	DC190013720	CABLE ASSY	CM35H AUDIO IN 3P BLK-GRN	1	- - - -	305
6	58290330001	DIS ABO	LAM999F TCO99 19"FUJ 1280X1024	1	- - - -	351
7	68006530001	PACKING ABO-USA	LAM999F UR+TCO99 MSV16	1	- - - -	352
8	X66AI830001	MEC PACKING ABO	LAM999F TCO99	1	- - - -	353

End of Report

=====						
C NO.	PART NO.	DESCRIPTION	SPECIFICATION	QUANTITY REQUIRED	DWG.NO. 680065	REV. 0A
-----						
			30			
			001			REMARKS
-----						
#	68006530001	PACKING ABO-USA	LAM999F UR+TCO99 MSV16			
1	EJ4AM999000	RATING NP	N-AM999-ABO UFGC 99 W/W	1	- - - -	001
2	HB4AM999000	CARTON	C-AM999-ABO W/W CHN	1	- - - -	002
3	HDABOAM9900	USER'S MANUAL	U-AM999-ABO EFGSIDPJC/CS 99	1	- - - -	003
4	HF6TCO99000	TCO99 (NOTICE SHEET)	FOR TCO99	1	- - - -	004
5	HGTCO990000	TCO99 LABEL	TCO99 FOR BEZEL/MANUAL	1	- - - -	006
6	HGTCO990100	TCO99 LABEL	TCO99 FOR CARTON	1	- - - -	007
7	HK3CM870100	PE BAG	CM870-K001 FOR MAC LCDMONITOR	1	- - - -	008
8	HF6VS558110	WARRANTY CARD	F-VS558-ABO USA LCD/CRT R1	1	- - - -	013
9	EJ1AM999000	FRONT PLATE	N-AM999-ABO FOR BEZEL	1	- - - -	014

End of Report

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C NO.	PART NO.	DESCRIPTION	SPECIFICATION	QUANTITY REQUIRED	DWG.NO. X66AI8	REV. 0A
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				30		
				001		REMARKS

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# X66AI830001 MEC PACKING ABO LAM999F TCO99

1	FJCM9917000	EPS FOAM-L	CM9917	1	-	-	-	-	201
2	FJCM9918000	EPS FOAM-R	CM9918	1	-	-	-	-	202

End of Report



8 7 6 5 4 3 2 1

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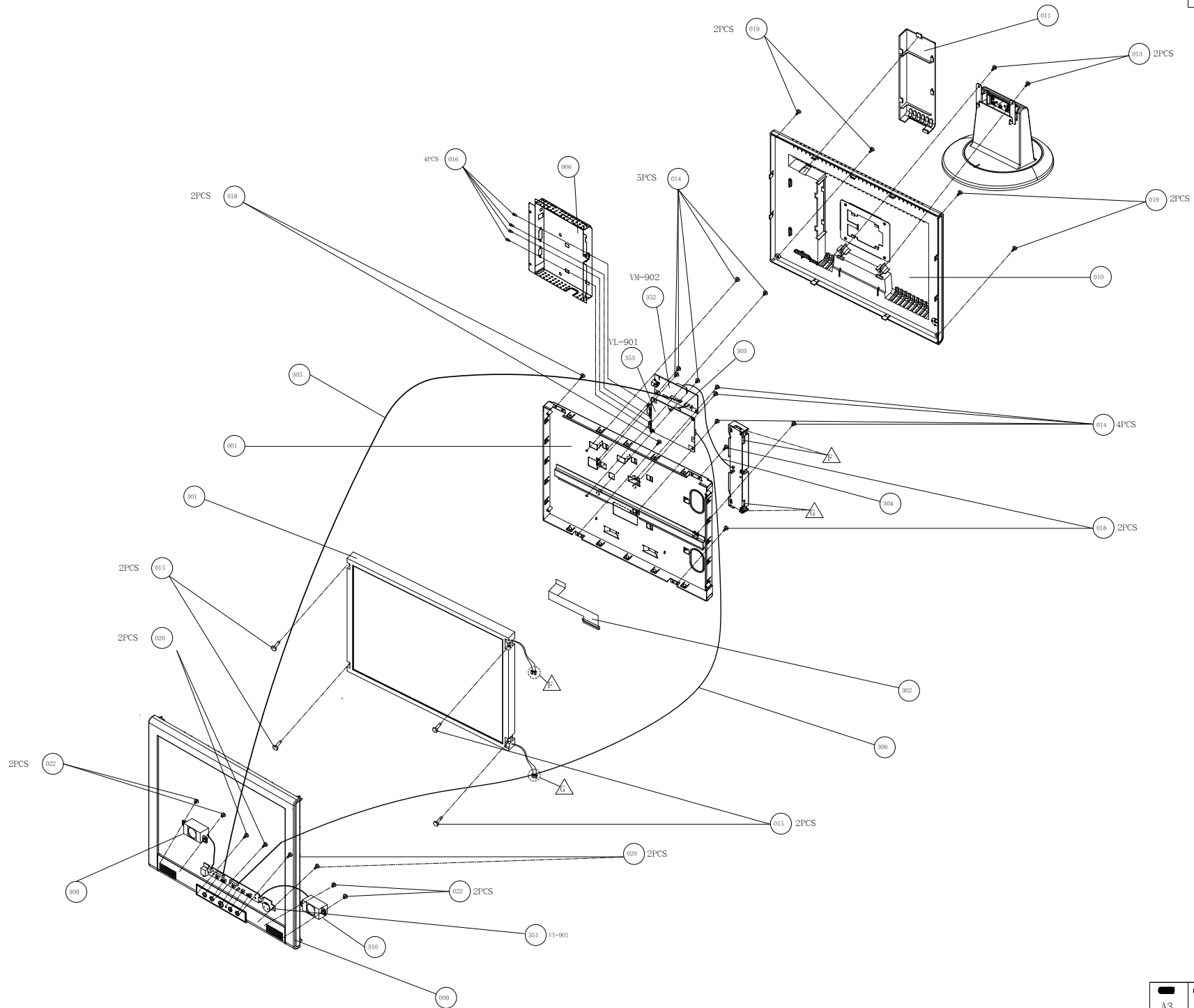
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A



8 7 6 5 4 3 2 1

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FOR REV RECORD SEE SHEET 1

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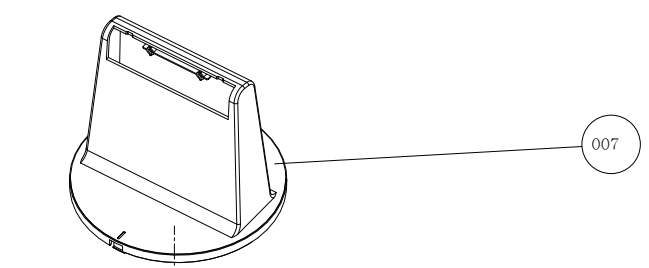
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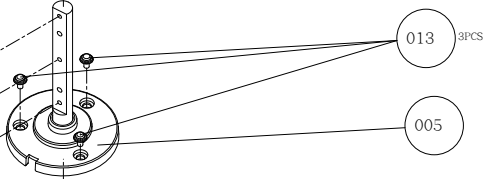
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007

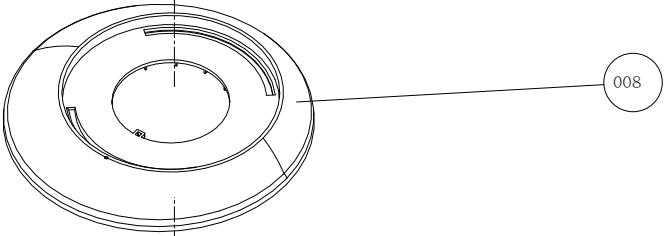


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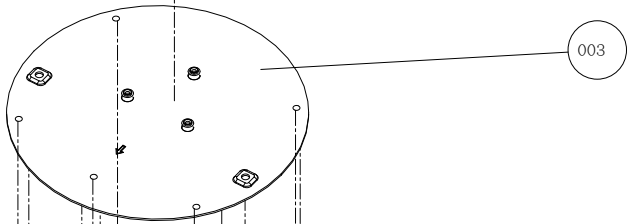


013 3PCS

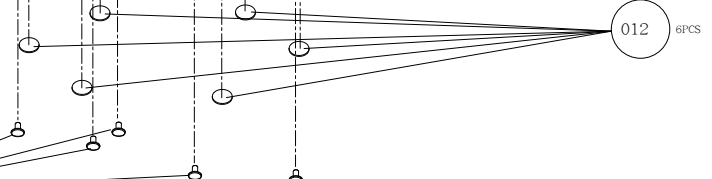
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008

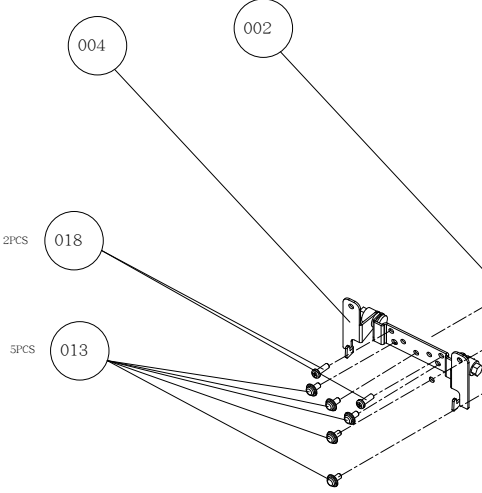


003



012 6PCS

017 5PCS



004

002

018 2PCS

013 5PCS

SIZE	SHEET	DRAWING NO.	REV
A3	3	582903	0A

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1



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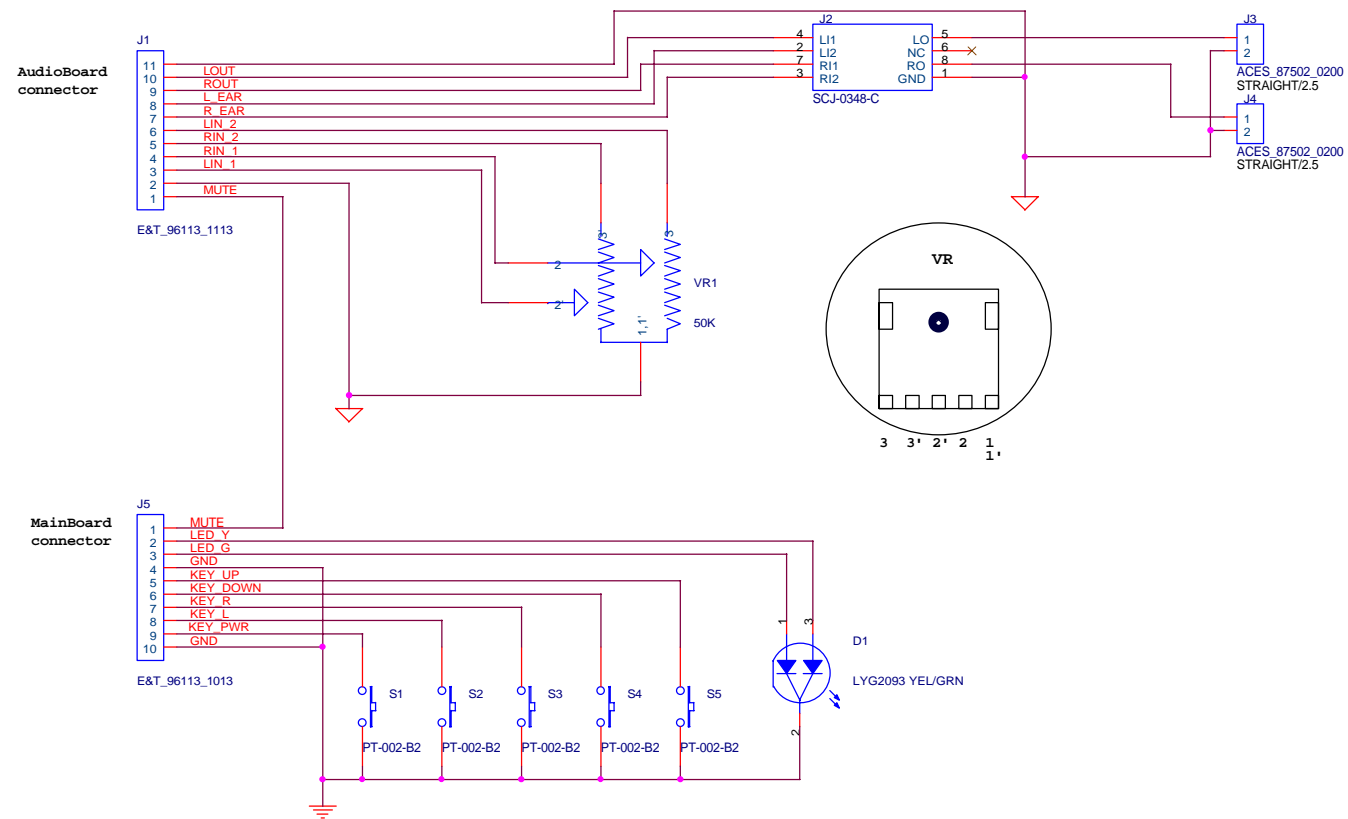
=====						
C NO.	PART NO.	DESCRIPTION	SPECIFICATION	QUANTITY REQUIRED	DWG.NO. 582903	REV. 0A
-----						
				30		
				001		REMARKS
-----						
#	58290330001	DIS ABO	LAM999F TCO99 19"FUJ 1280X1024			
1	AC600022700	LCD MODU	FLC48SXC8V 19" FUJITSU	1	- - - -	301
2	DA3M999V010	FPC	CM999 VS-901 REV1	1	- - - -	302
3	DC020200420	H-CON SET	CM999 CTRL-DC 7P	1	- - - -	303
4	DC020200430	H-CON SET	CM999 DC-INV 12P	1	- - - -	304
5	DC020200440	H-CON SET	AM999 KEY-AMP 11P SHELLD	1	- - - -	305
6	DC020200450	H-CON SET	AM999 KEY-CTRL 10P	1	- - - -	306
7	454A7930001	PCBA KEY/B	VT-901 LAM999F	1	- - - -	351
8	455A7830021	PCBA AUDIO&D/D BD.	VM-902 LAM999F	1	- - - -	352
9	461A7830011	FIRMWARE CTRL/B	VL-901 LAM999F ABO	1	- - - -	353
10	X66AI930001	MEC PARTS ABO	LAM999F TCO99 MSV16/MBK17	1	- - - -	354

End of Report

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C NO.	PART NO.	DESCRIPTION	SPECIFICATION	QUANTITY REQUIRED	DWG.NO. X66AI9	REV. 0A				
				30						
				001	REMARKS					
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#	X66AI930001	MEC PARTS ABO	LAM999F TCO99 MSV16/MBK17							
1	ECCM9915100	CHASSIS	CM9915 (FOR POWER SW)	1	-	-	-	-	001	
2	ECCM9922000	NECK BRACKET	CM9922	1	-	-	-	-	002	
3	ECCM9924000	BASE BRACKET	CM9924	1	-	-	-	-	003	
4	ECCM9933000	HINGE ASSY	CM9933	1	-	-	-	-	004	
5	ECCM9934000	SWIVEL HINGE	CM9934	1	-	-	-	-	005	
6	ECCM9916100	EMI COVER	CM9916	1	-	-	-	-	006	
7	FACM9913200	NECK COVER	CM9913 ABS94HB MBK17	1	-	-	-	-	007	
8	FACM9914400	BASE COVER	CM9914 ABS94HB MSV15	1	-	-	-	-	008	
9	FAAM991A200	BEZEL ASSY	AM991A ABS94HB MSV15 ACER	1	-	-	-	-	009	
10	FACM991B200	BACK COVER ASSY	CM9991B ABS94HB MBK17(AUDIO)	1	-	-	-	-	010	
11	FBCM9921200	CABLE COVER	CM9921 ABS94HB MBK17	1	-	-	-	-	011	
12	FHST3545100	RUBBER FOOT	ST3545	6	-	-	-	-	012 012 012 012 012 012	
13	MAA70002204	SCREW	M4X0.7+10P-NI DIM 8.0	10	-	-	-	-	013 013 013 013 013 013	
									013 013 013 013	
14	MAA70003100	SCREW	M3X0.5+4C-NI (NL)	9	-	-	-	-	014 014 014 014 014 014	
									014 014 014	
15	MAA70007209	SCREW	M3X0.5+10P-NI & WASHER DIM 6	4	-	-	-	-	015 015 015 015	
16	MAAA0019300	SCREW SPECIAL	4#-40UNCX12.7 WASHER D=5.0	4	-	-	-	-	016 016 016 016	
17	MAB10003400	SCREW	TPP-4+10F-MC	5	-	-	-	-	017 017 017 017	
18	MAB20009200	SCREW	TPB-4+12P-NI	6	-	-	-	-	018 018 018 018 018 018	
19	MAB20076200	TAPING SCREW	TPP-4.0+16P-NI	4	-	-	-	-	019 019 019 019	
20	MAB80007400	SCREW	TPP2X3+12B-MC	4	-	-	-	-	020 020 020 020	
21	DC150V00000	CORE	KC K5B T 36X6X23-G	1	-	-	-	-	021	
22	MAB7T002419	SCREW	TPB-4+10C-MC	4	-	-	-	-	022 022 022 022	

End of Report

## **APPENDIX C: P.C.B.A ASSEMBLY**



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SCHEMATIC, KEY/B VT-901 LAM999		
Size	Document Number	Rev
A3	404A79	1A
Date:	Thursday, July 18, 2002	Sheet 2 of 2



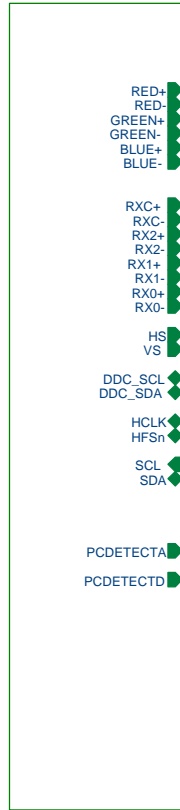
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				001		REMARKS
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#	454A7930001	PCBA KEY/B	VT-901 LAM999F	1A		
1	BC5G2093000	LED	LYG2093 YEL/GRN 3D 3P	1 - - - -	D1	
2	CF150021100	VR RES	1/100W 50KB EVUTV6B28C54	1 - - - -	VR1	
3	DA1M999V110	PCB	CM999 VT-901 REV1	1 - - - -	ZZZ	
4	DC030040000	WAFER CONN	ACES 87502-0200 2P P2.25	2 - - - -	J3 J4	
5	DC03E000500	WAFER CONN.	E&T 96113-1013 10P P1.25	1 - - - -	J6	
6	DC03E001000	WAFER CONN.	E&T 96113-1113 11P P1.25	1 - - - -	J1	
7	DC230201307	CONNECTOR	SC SCJ-0348-C 3.65D	1 - - - -	J2	
8	DE611000607	SWITCH	PT-002-B2	5 - - - -	S1 S2 S3 S4 S5	
9	XX0900T2119	JUMPER WIRE	D=0.6MM P5.0	1 - - - -	W3	
10	XX0900T2135	JUMPER WIRE	D=0.6MM P10	2 - - - -	W1 W2	

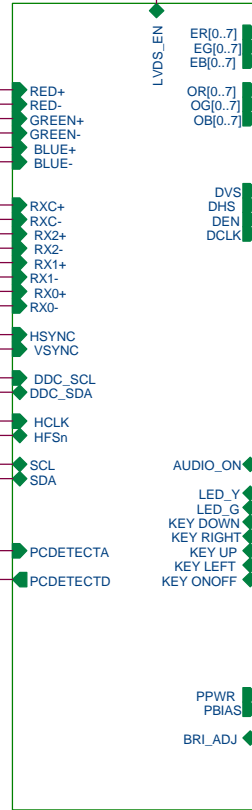
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Sheet 3

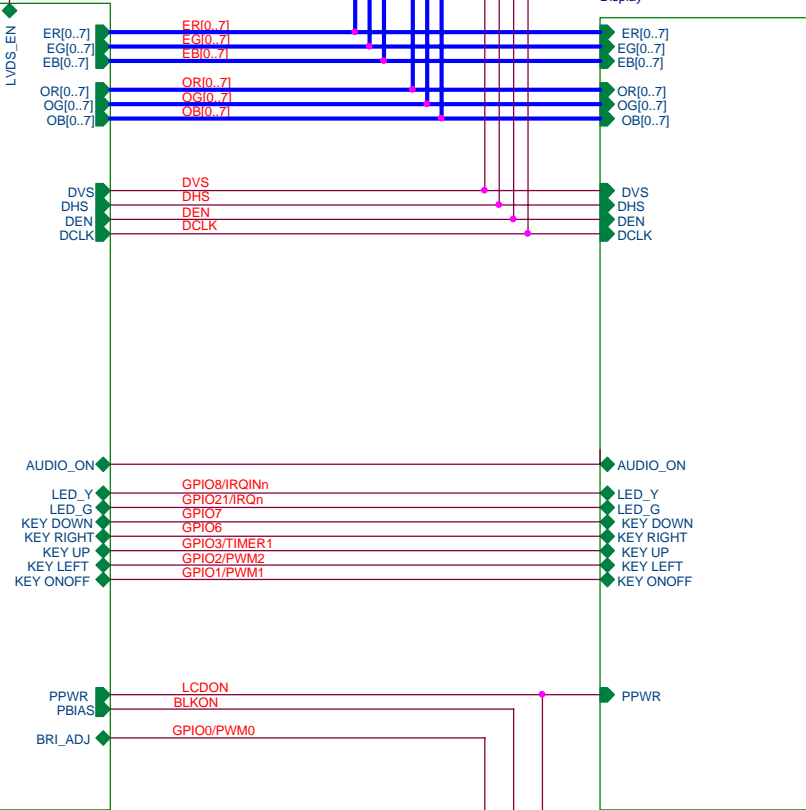
gm5115



3. Input Connectors

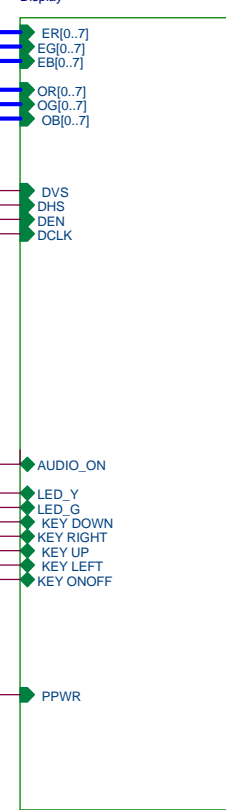


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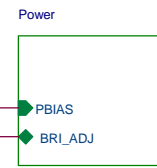


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6. LVDS\_IF

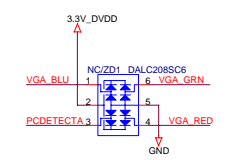
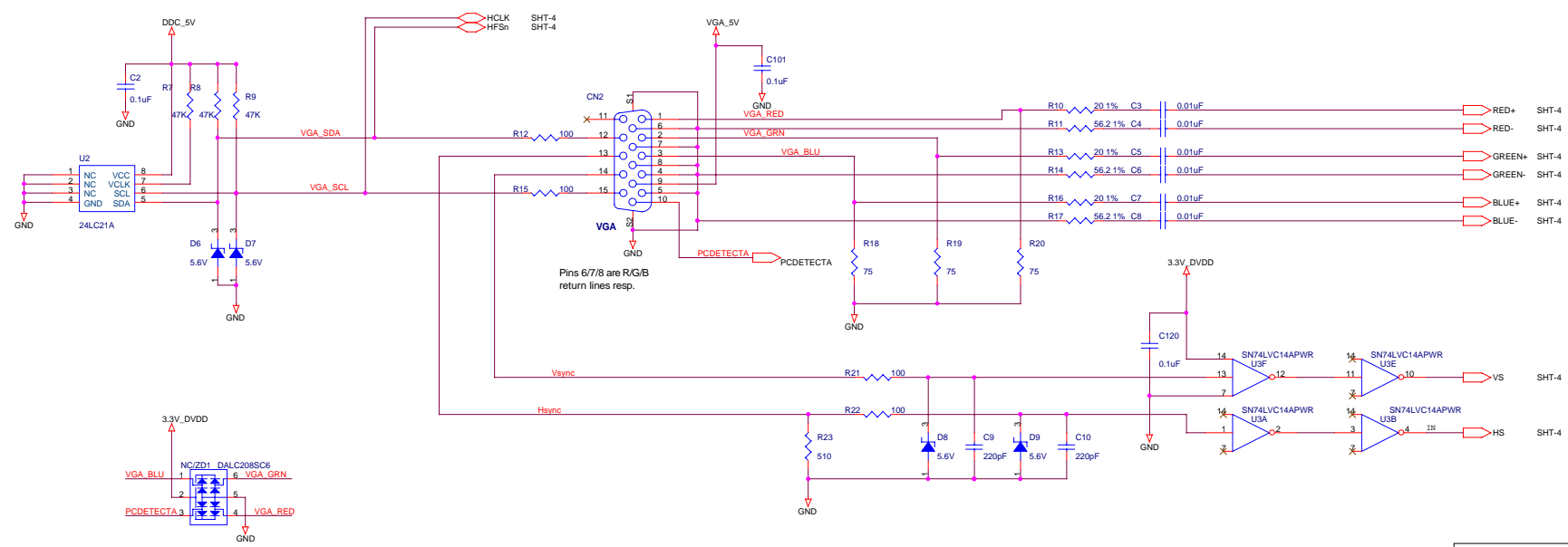
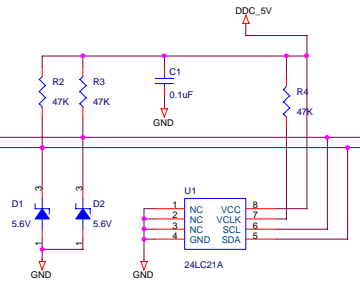
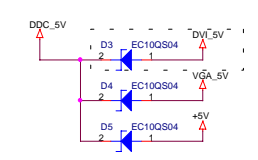
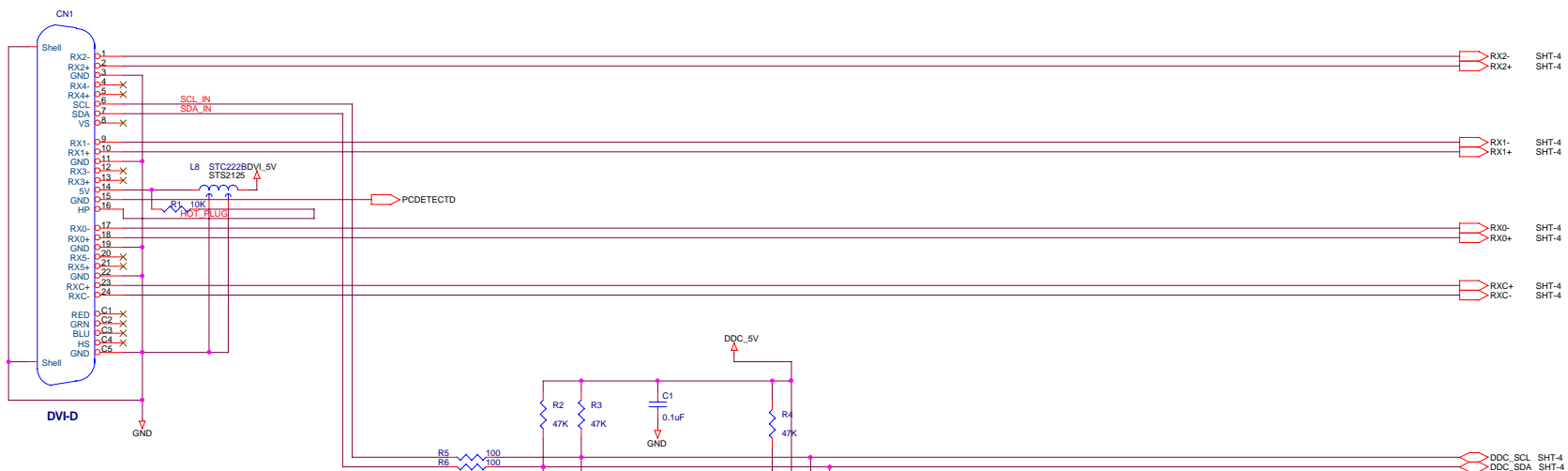


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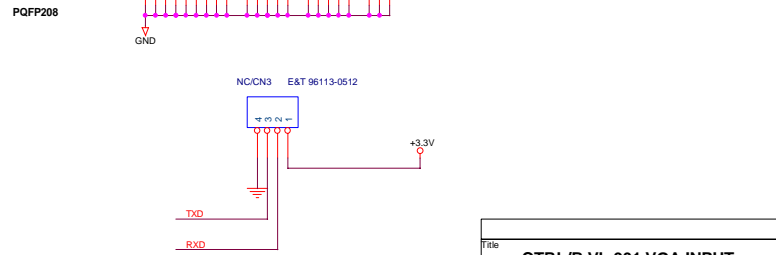
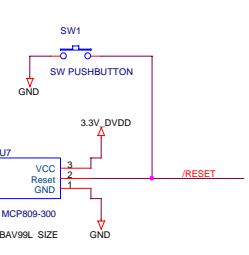
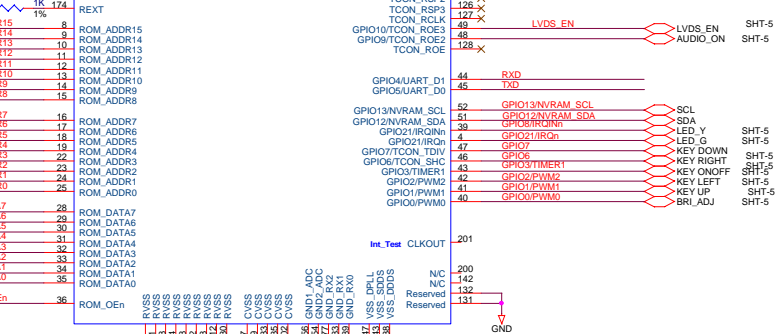
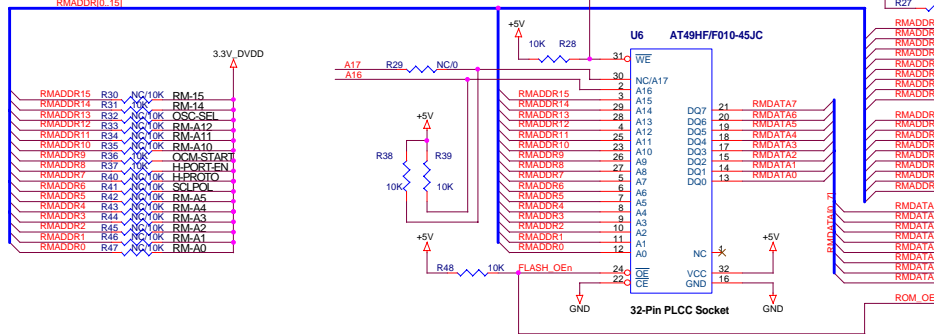
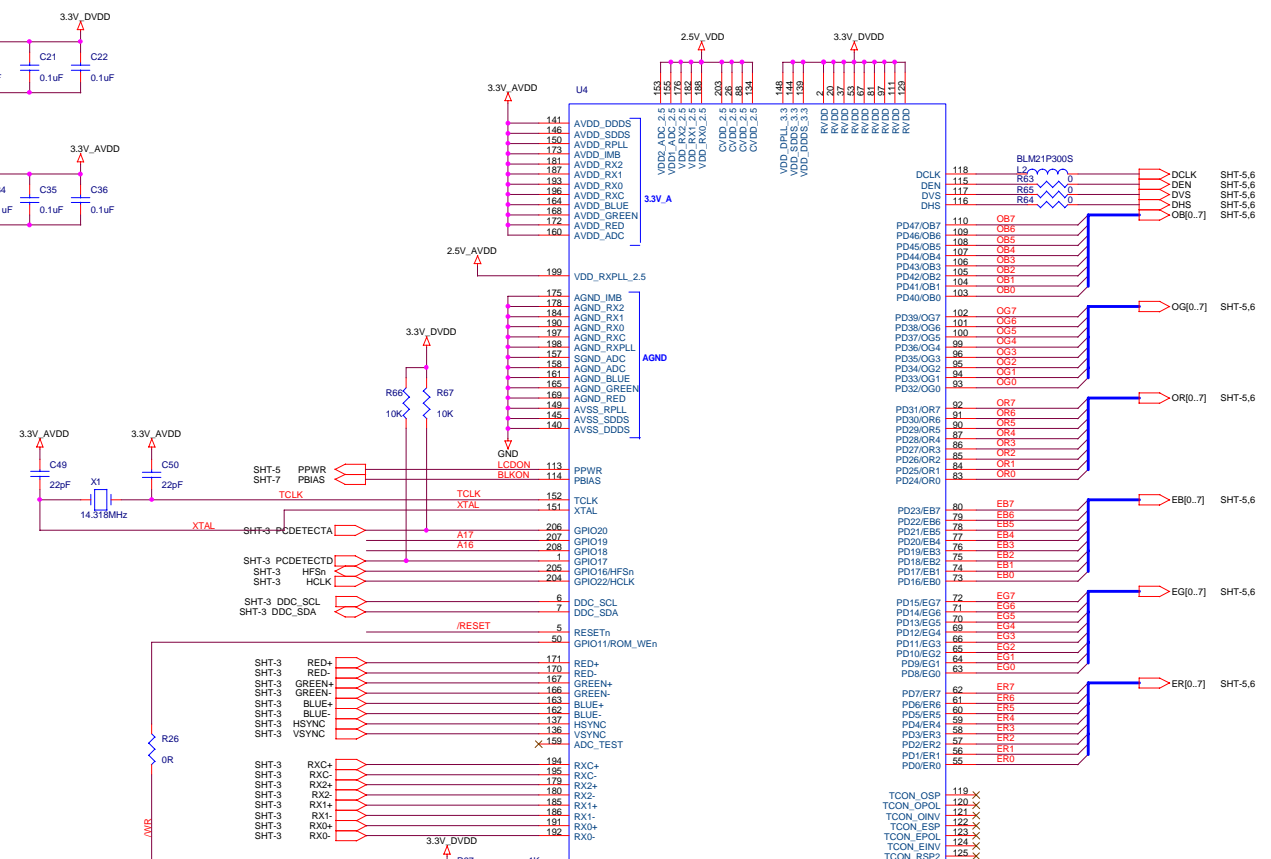
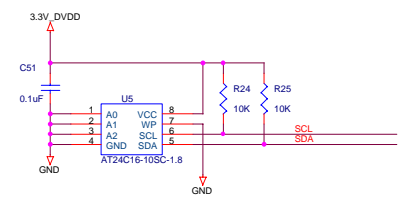
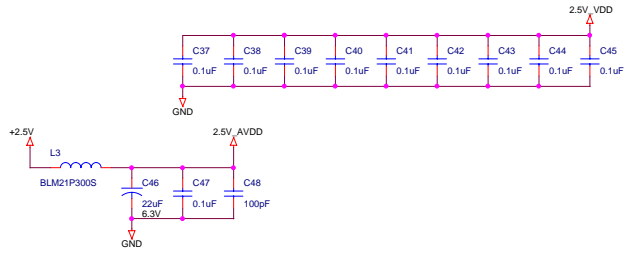
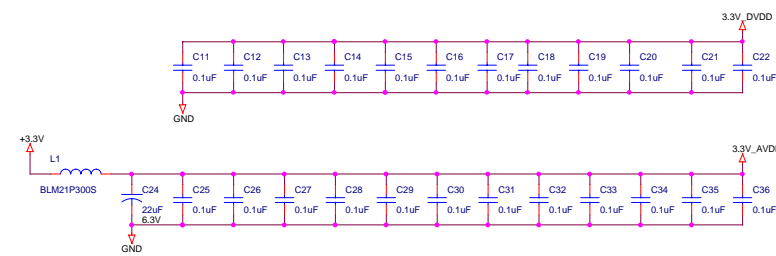


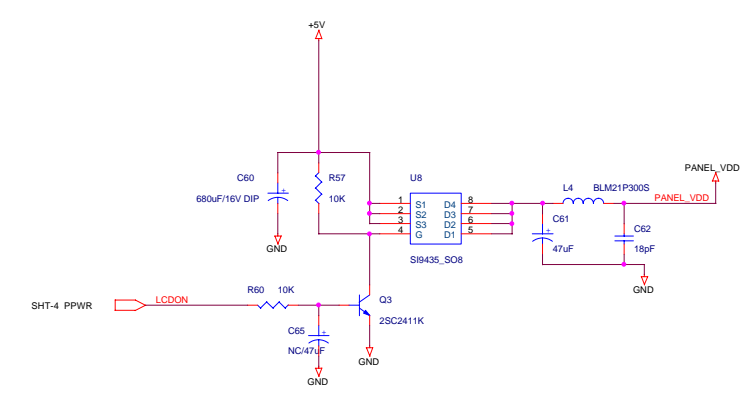
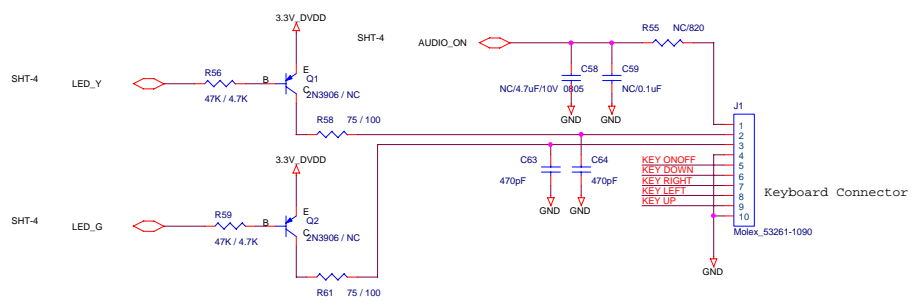
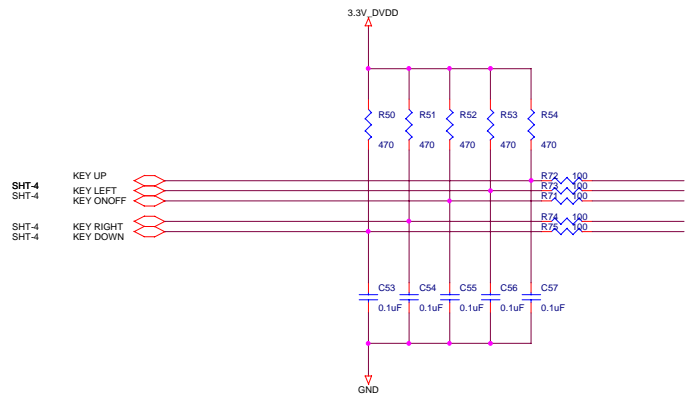
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<b>CTRL/B VL-901,VGA INPUT</b>		
Size	Document Number	Rev
B	<b>401A78</b>	1B
Date:	Thursday, July 04, 2002	Sheet 2 of 7



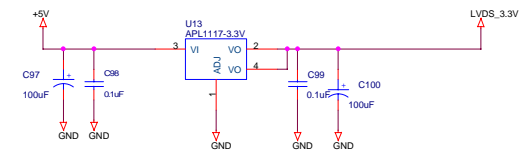
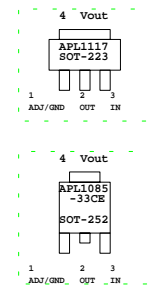
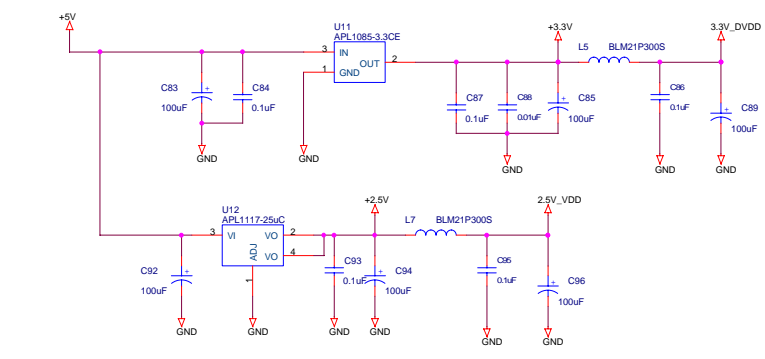
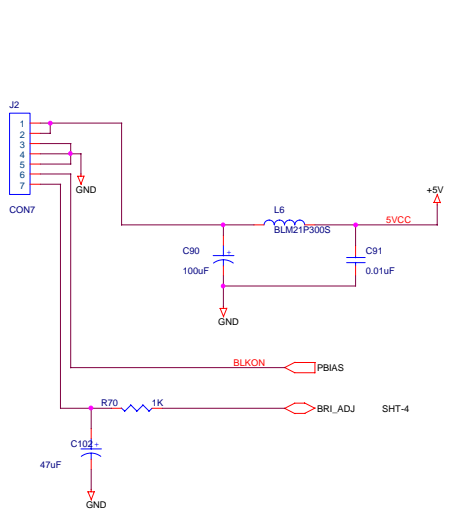


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Size	Document Number	401A78	
C			
Date:	Thursday, July 04, 2002	Sheet	3 of 7
			1B











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				001 011 002	REMARKS
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#	461A7830001	FIRMWARE CTRL/B	VL-901 LCM999F COMPAL		
#	461A7830011	FIRMWARE CTRL/B	VL-901 LAM999F ABO		
#	461A7888002	FIRMWARE CTRL/B	VL-901 LCM999F J88		
1	451A7830001	PCBA CTRL/B	VL-901 LCM999F	1 - 1 - -	ZZZ
2	451A7830011	PCBA CTRL/B	VL-901 LAM999F	- 1 - - -	ZZZ
3	31A394	SYSTEM EDID, LCM999 (C-E) DIGITAL		REF - - - -	U1
		REV:1.3			
		CHECKSUM:00			
4	31A425	SYSTEM EDID, LCM999 (C-E) ANALOG		REF - - - -	U2
		REV:1.3			
		CHECKSUM:00			
5	31A436	SYSTEM EDID, LCM999 (J88) ANALOG		- - REF - -	U2
		REV:1.3			
		CHECKSUM:00			
6	31A437	SYSTEM EDID, LCM999 (J88) DIGITAL		- - REF - -	U1
		REV:1.3			
		CHECKSUM:00			
*7	31A441	SYSTEM EDID (DIGITAL), LAM999 (ABO)		- REF - - -	U1
		REV:1.3			
		CHECKSUM:00			
*8	31A442	SYSTEM EDID (ANALOG), LAM999 (ABO)		- REF - - -	U2
		REV:1.3			
		CHECKSUM:00			

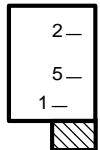
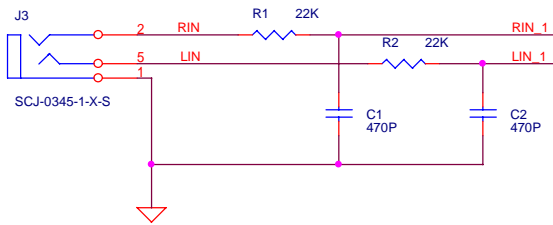
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#	451A7830001	PCBA CTRL/B	VL-901 LCM999F	1C	
#	451A7830011	PCBA CTRL/B	VL-901 LAM999F	1D	
1	431A7830001	SMT CTRL/B	VL-901 LCM999F	1 - - - -	ZZZ
2	431A7830011	SMT CTRL/B	VL-901 LAM999F	- 1 - - -	ZZZ
3	BD114318014	CRYSTAL	14.31818MHZ (2 PIN) (S)	1 1 - - -	X1
4	CB68003M010	CAPACITOR	680U 16V M B P5 L10.5	1 1 - - -	C60
5	DC03E000200	WAFER CONN.	E&T 96113-1003 10P P1.25	1 1 - - -	J1
6	DC03E002600	WAFER	E&T 4500-07 7P P2.0	1 1 - - -	J2
7	DC060014010	CONN.	30P FEMALE 74320-4004	1 1 - - -	CN1
8	DC060015000	D-CONN	15P FEMALE 1211-15	1 1 - - -	CN2
9	SA390100000	S IC	EEPROM PLCC-32 SST39SF010-90	1 1 - - -	U6

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			REV. 1D
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			REMARKS
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# 431A7830001	SMT CTRL/B	VL-901 LCM999F	30 30
# 431A7830011	SMT CTRL/B	VL-901 LAM999F	001 011
1	DA4M999V010	PCB	CM999 VL-901 REV1 1 1 - - - ZZZ
2	SA008090600	S IC	MCP809-2.93 SIT-23 RST 2.9V 1 1 - - - U7
3	SA010850500	S IC	APL1085-33CE TO252-3 REG.3A 1 1 - - - U11
4	SA011170200	S IC	APL1117-25 SOT-223 2.5V 1 1 - - - U12
5	SA011170300	S IC	APL1117-33VC-TR SOT-223 3.3V 1 1 - - - U13
6	SA024160008	SM IC	EE 16K SO-8 C 1 1 - - - U5
7	SA024210300	SM IC	EE 128X8 SOP-8 24LC21A 2 2 - - - U1 U2
8	SA051200100	S IC	GM5120 PQFP-208 1 1 - - - U4
9	SA063830000	S IC	THC63LVDM83A TSSOP-56 LVDS 2 2 - - - U10 U9
10	SA074140400	SM IC	SN74LVC14 SOP-14 INV. 1 1 - - - U3
11	SB3241100T8	SM TRANSISTOR	2SC2411K (SOT-23) 1 1 - - - Q3
12	SB7390601T6	SM TRANSISTOR	MMBT3906 (SOT-23) 2 2 - - - Q1 Q2
13	SBX94350109	SM TRANSISTOR	SI9435 (SO-8) 1 1 - - - U8
14	SC10QS041T4	SM DIODE	EC10QS04 3 3 - - - D3 D4 D5
15	SC4LZ56B0T5	SM ZENER DIODE	RLZ5.6B (LL-34) 6 6 - - - D1 D2 D6 D7 D8 D9
16	SD0130000T4	CHIP RES.	1/16W 0 +5% 0603 4 4 - - - R26 R63 R64 R65
17	SD0131001T6	CHIP RES.	1/16W 1K +-5% 0603 S9 2 2 - - - R27 R70
18	SD0131002T3	CHIP RES.	1/16W 10K +-5% 0603 S9 14 14 - - - R1 R24 R25 R28 R31 R36 R37 R38 R39 R48 R57 R60 R66 R67
19	SD0134700T1	CHIP RES.	1/16W 470 +-5% 0603 S9 5 5 - - - R50 R51 R52 R53 R54
20	SD0134702T5	CHIP RES.	1/16W 47K +-5% 0603 S9 8 8 - - - R2 R3 R4 R56 R59 R7 R8 R9
21	SD013510009	CHIP RES.	1/16W 510 +-5% 0603 S9 1 1 - - - R23
22	SD013750AT3	CHIP RES.	1/16W 75 +-5% 0603 S9 5 5 - - - R18 R19 R20 R58 R61
23	SD013820000	CHIP RES.	1/16W 820 +-5% 0603 - 1 - - - R55
24	SD014100009	CHIP RES.	1/16W 100 +-1% 0603 S9 12 12 - - - R12 R15 R21 R22 R5 R6 R62 R71 R72 R73 R74 R75
25	SD014200A00	CHIP RES.	1/16W 20 +-1% 0603 3 3 - - - R10 R13 R16
26	SD014562A00	CHIP RES.	1/16W 56.2 +-1% 0603 3 3 - - - R11 R14 R17
27	SD302220A00	CHIP NETWORK RES.	1/16W 22 +-5% 8P-4R SA 12 12 - - - RP1 RP10 RP11 RP12 RP2 RP3 RP4 RP5 RP6 RP7 RP8 RP9
28	SE024100FT1	CHIP CERAMIC CAP.	10P 50V +-1PF NPO 0603 S8 1 1 - - - C74
29	SE024101JT8	CHIP CERAMIC CAP.	100P 50V +-5% NPO 0603 S8 1 1 - - - C48
30	SE024180Z01	CHIP CERAMIC CAP.	18P 50V Z NPO 0603 3 3 - - - C49 C50 C62
31	SE024221JT3	CHIP CERAMIC CAP.	220P 50V +-5% NPO 0603 S8 2 2 - - - C10 C9
32	SE025103KT4	CHIP CERAMIC CAP.	.01U 50V +-10% X7R 0603 S8 12 12 - - - C3 C4 C5 C6 C7 C71 C73 C8 C80 C82 C88 C91
33	SE025471KT3	CHIP CERAMIC CAP.	470P 50V +-10% X7R 0603 S8 2 2 - - - C63 C64
34	SE027104NT0	CHIP CERAMIC CAP.	.1U 16V -20+80% Y5V 0603 S8 64 64 - - - C1 C101 C11 C12 C120 C13 C14 C15 C16 C17 C18 C19

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					C33	C34	C35	C36	C37	C38
					C39	C40	C41	C42	C43	C44
					C45	C47	C51	C52	C53	C54
					C55	C56	C57	C66	C67	C68
					C69	C70	C72	C75	C76	C77
					C78	C79	C81	C84	C86	C87
					C93	C95	C98	C99		
35	SE053475Z05	CHIP CERAMIC CAP.	4.7U 10V Z Y5V 0805	-	1	-	-	-	C58	
36	SF02202M000	CHIP ELE. CAP.	22U 10V M A (4X5.4)	2	2	-	-	-	C24	C46
37	SF04704M000	CHIP ELE. CAP.	47U 25V M B (6.3X5.4) CV-GS7	2	2	-	-	-	C102	C61
38	SF1000340T2	CHIP ELE. CAP.	100U 16V M 85C (6.3X5.4)	9	9	-	-	-	C100	C83 C85 C89 C90 C92
					C94	C96	C97			
39	SM010006300	CHIP EMI SUPPRESSOR	MURATA BLM21P300S (0805)	7	7	-	-	-	L1	L2 L3 L4 L5 L6
					L7					
40	SM060000500	CHIP EMI SUPPRESSOR	NWE STC222B	1	1	-	-	-	L8	
41	SP02E002100	S W-CONN	E&T 98210-4011 40P	1	1	-	-	-	CN4	
42	SP070001600	S SOCKET	ACES 85218-3200 PLCC-32 H=3.83	1	1	-	-	-	&U6	

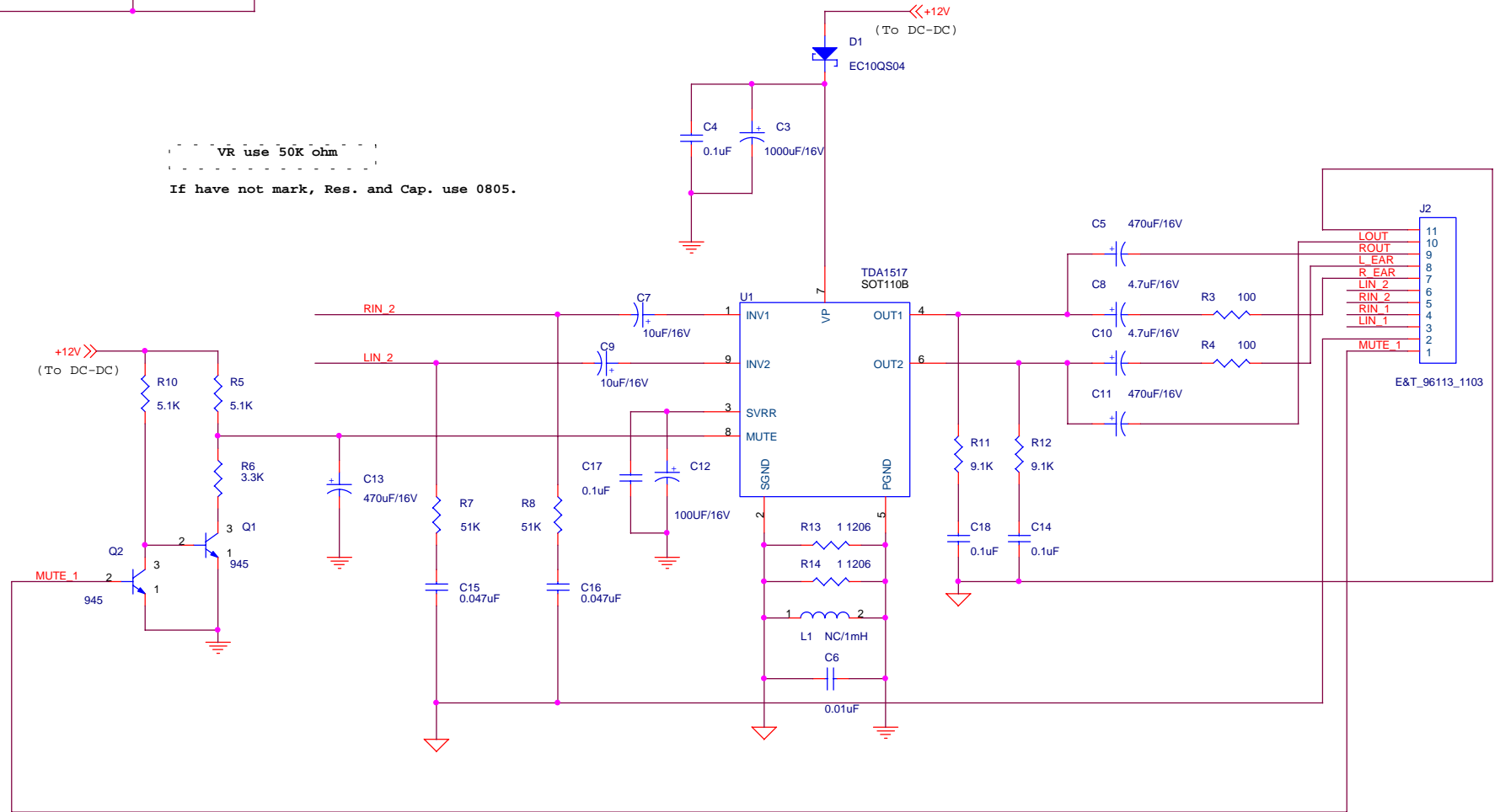
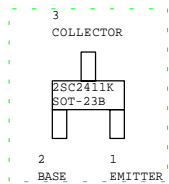
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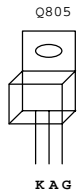
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BOTTOM VIEW

VR use 50K ohm  
If have not mark, Res. and Cap. use 0805.

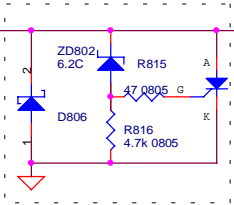


FOR AM999 ONLY

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Date:	Friday, July 19, 2002	Sheet	2 of 3



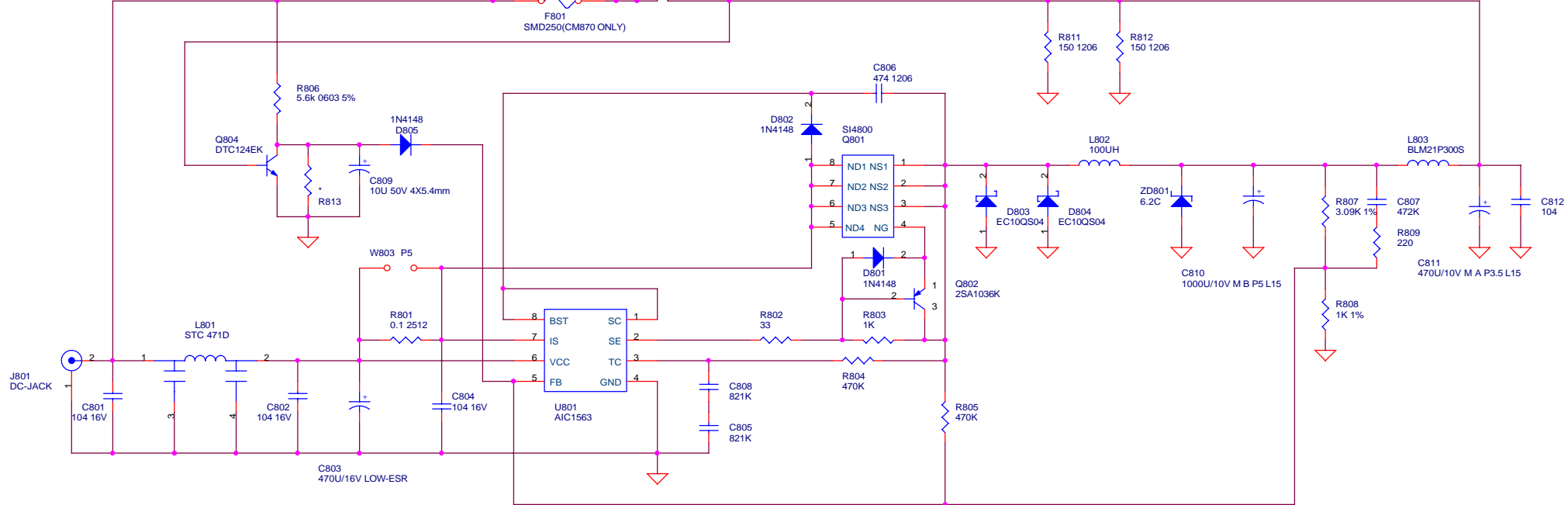
+12V (To Audio AMP)



J802 JST B4B-XH-A

PAD

F801 SMD250(CM870 ONLY)



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<b>SCHEMATIC, AUDIO&amp;D/D BD. VM-902</b>		
Size	Document Number	Rev
A3	<b>405A78</b>	0B
Date:	Friday, July 19, 2002	Sheet 3 of 3



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				001 021	REMARKS
-----					
#	455A7830001	PCBA AUDIO&D/D BD.	VM-902 LCM999F	0C	
#	455A7830021	PCBA AUDIO&D/D BD.	VM-902 LAM999F	0C	
1	445A7830001	AIS AUDIO&D/D BD.	VM-902 LCM999F	1 - - - -	ZZZ
2	445A7830021	AIS AUDIO&D/D BD.	VM-902 LAM999F	- 1 - - -	ZZZ
3	AB015170002	IC	TDA1517 SIL-9 AUDIO AMP.	- 1 - - -	U1
4	AB080510100	IC	SI-8051S LF1102	1 1 - - -	U801
5	CB10012M100	CAPACITOR	1000U 10V M B P5 L10.5 (L-ESR)	1 1 - - -	C810
6	CB10013M310	ELE CAP	1000U 16V M B P5 L10.5	- 1 - - -	C3
7	CB47003M205	CAPACITOR	470U 16V M A P3.5	- 3 - - -	C11 C13 C5
8	CB47003M300	CAPACITOR	470U 16V M B P5 L10.5 (L-ESR)	1 1 - - -	C803
* 9	CL310012100	CHOK COIL	CM999 56uH K 10X8X5 35.5TS	1 1 - - -	L802
10	DC020200460	H-CON SET	AM999 J804-SW	- 1 - - -	&J804
11	DC030000110	WAFER	JST B2P3S-VH 3.96 90D W/O PIN2	- 1 - - -	J804
12	DC03E002600	WAFER	E&T 4500-07 7P P2.0	1 1 - - -	J803
13	DC03E002640	WAFER	E&T 4500-12 12P P2.0	1 1 - - -	J802
14	DC03E002650	WAFER	E&T 4500-11 11P P2.0	- 1 - - -	J2
15	DC150001204	BEAD	BL02RN2-R62 (MURATA)	1 1 - - -	L801
16	DC230201200	CONNECTOR	SC SCJ-0345-1-X-S 3.6D	- 1 - - -	J3
17	DC231100300	CONNECTOR	SC SCD-014-1 PIN2.0 6.3D JACK	1 1 - - -	J801
18	ECCM9943000	DC-DC HEAT SINK	CM9943	1 1 - - -	H801
* 19	ECCM9923000	INVERT SHIELD	CM9923	1 1 - - -	ZZZ
20	MAA70007209	SCREW	M3X0.5+10P-NI & WASHER DIM 6	1 1 - - -	&H801
21	MD2T0001109	NUT	ITT 701453-101 M3XB5.5XH1.8-NI	1 1 - - -	&H801
* 22	PK07V000100	INVERTER	CM999 19" T51I058.00 AMBIT	1 1 - - -	ZZZ

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C NO.	PART NO.	DESCRIPTION	SPECIFICATION
			30 30
			001 021
			REMARKS
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#	445A7830001	AIS AUDIO&D/D BD.	VM-902 LCM999F
#	445A7830021	AIS AUDIO&D/D BD.	VM-902 LAM999F
1	BB30945P1T5	TRANSISTOR	2SC945-P - 2 - - - Q1 Q2
2	BC1SB1401T0	DIO	SB140 DO-41 PANJIT - 1 - - - D1
3	BC1SB2400T0	DIO	SB240 DO-15 PANJIT 2 2 - - - D803 D804
4	BC40HZ6B2T7	ZENER DIODE	HZ6B-2 1 1 - - - ZD801
5	CA001A601T8	CERAMIC CAP.	.1U 50V Z Y5V P5 - 4 - - - C14 C17 C18 C4
			4 4 - - - C801 C802 C804 C805
6	CA001B631T8	CERAMIC CAP.	.01U 50V -20 +80% Z5V P5 - 1 - - - C6
7	CA047C6Z0T0	CERAMIC CAP.	.047U 50V Z Y5V P5 - 2 - - - C15 C16
8	CA047D601T2	CERAMIC CAP.	470P 50V +-5% Z5P P5 - 2 - - - C1 C2
9	CB0100341T4	CAPACITOR	10U 16V M B P5 - 2 - - - C7 C9
10	CB047A442T1	CAPACITOR	4.7U 25V +-20% 85C P5 - 2 - - - C10 C8
11	CB1000341T3	CAPACITOR	100U 16V M B P5 - 1 - - - C12
12	CC0010211T0	RESISTOR	1/8W 1 +-5% S1 - 2 - - - R13 R14
13	CC1000211T8	RESISTOR	1/8W 100 +-5% S1 - 2 - - - R3 R4
14	CC2202225T0	RESISTOR (M.F.)	1/8W 22K +-1% S2 - 2 - - - R1 R2
15	CC3301211T4	RESISTOR	1/8W 3.3K +-5% S1 - 1 - - - R6
16	CC5101211T2	RESISTOR	1/8W 5.1K +-5% S1 - 2 - - - R10 R5
17	CC5102211T7	RESISTOR	1/8W 51K +-5% S1 - 2 - - - R7 R8
18	CC9101211T0	RESISTOR	1/8W 9.1K +-5% S1 - 2 - - - R11 R12
19	DA1M988P001	PCB	CM988 VM-902 REV0E 1 1 - - - ZZZ
20	DC1510009T0	BEAD	NWE W5 3.5X6X1.0+T 1 1 - - - L803
21	XX0900T1180	JUMP WIRE	1BX*10000PCS 52MM 4 4 - - - W1 W2 W4 W5
			2 - - - - W10 W6
			- 2 - - - - W3 W9

End of Report