

Acer AL2416W

Service Guide

Service guide files and updates are available on the CSD web: for more information, Please refer to <http://csd.acer.com.tw/>

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Monitor Feature

INTRODUCTION

Scope

This specification defines the requirements for the 24" 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 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.

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.

Comparison Chart of AL2416W

Comparison Chart of AA668 & AA868

	AA668	AA868
Panel	Normal 24" panel LTM240M1-L01	Normal 24" panel LTM240M1-L01
Signal Interface	D-SUB	D-SUB & DVI-D
Sync Type for analog input	Separate / compatible /	Separate / compatible /
Color Temp user adjust	Support	Support
DDC	DDC2B	DDC2B
Speaker	NO	NO
Headphone Jack	NO	NO
Microphone Jack	No	No
USB Hub	Not support	Not support
Tilt / Swivel	No / No	No / No
Height Adjust	Option	Option

ELECTRICAL REQUIREMENTS

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
<u>Digital input mode:</u>	1920x1200/60Hz (For AA868)

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/(m²) = Ft-L x 3.426

lux = foot-candle x 10.76

LCD Panel Specification

LCD Panel Model (LTM240M1-L01-L00)

Mechanical information

Item		Min.	Typ.	Max.	Note
Module size	Horizontal(H)	-	546.4	-	mm
	Vertical(V)	-	352.0	-	mm
	Depth(D)	-	-	36.3	mm
Weight		-	-	3,550	g

General information

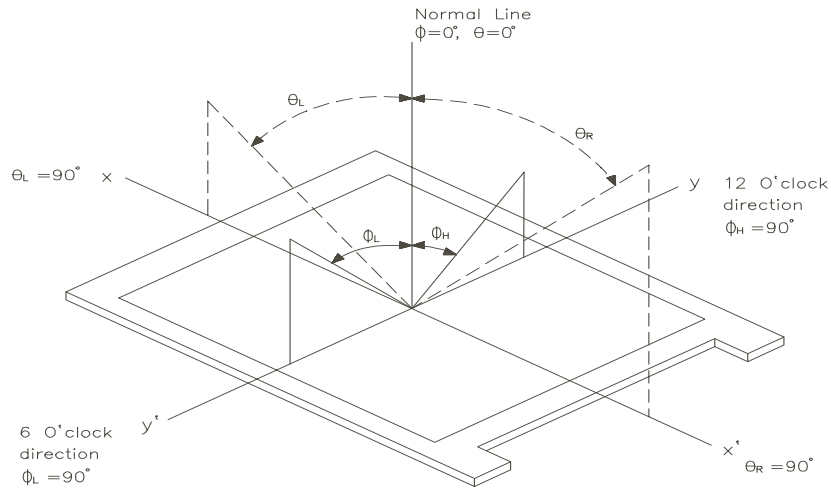
Items	Specification	Unit	Note
Display area	518.4(H) x 324.0(V)	mm	
Driver element	a-Si TFT active matrix		
Display colors	16.7M(true 8-bit)	colors	
Number of pixels	1920 x 1200	pixel	
Pixel arrangement	RGB vertical stripe		
Pixel pitch	0.270(H) x 0.270(W)	mm	
Display mode	Normally Black		
Surface treatment	Haze 25%, Hard - coating (3H)		

Optical Information

(Inverter Freq. : 50kHz) * Ta = 25 ± 2°C, VDD=5V, fv= 60Hz, fmax= 77MHz, IL = 6.0mA_{rms}

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Contrast Ratio (Center of screen)	C/R		-	1000	-		(3) BM-5A
Response Time	On/Off	T _R +T _F	-	16	-	msec	(4) BM-7
	G to G	T _{G-G,AVG}	-	6	-		
		T _{G-G,Long}	-	8	-		
Luminance of White (Center of screen)	YL		-	500	-	cd/m ²	(5) BM-5A
Color Chromaticity (CIE 1931)	Red	R _x	Normal φ = 0 θ = 0 Viewing Angle	0.640	-	-	(6) PR650
		R _y		0.330			
	Green	G _x		0.300			
		G _y		0.608			
	Blue	B _x		0.150			
		B _y		0.060			
	White	W _x		0.313			
		W _y		0.329			
Color Chromaticity (CIE 1976)	Red	R _{u'}	-	0.451	-	-	(7) Ez-Contrast
		R _{v'}		0.523			
	Green	G _{u'}		0.124			
		G _{v'}		0.564			
	Blue	B _{u'}		0.175			
		B _{v'}		0.158			
	White	W _{u'}		0.198			
		W _{v'}		0.468			
Viewing Angle	Hor.	θ L	C/R≥10	-	89	-	Degrees
		θ R		-	89	-	
	Ver.	φ H		-	89	-	
		φ L		-	89	-	
Viewing Angle	Hor.	θ L	CR≥100	-	75	-	
		θ R		-	75	-	
	Ver.	φ H		-	65	-	
		φ L		-	65	-	
Brightness Uniformity (9 points)	B _{umi}		-	-	25	%	(8) BM-5A

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

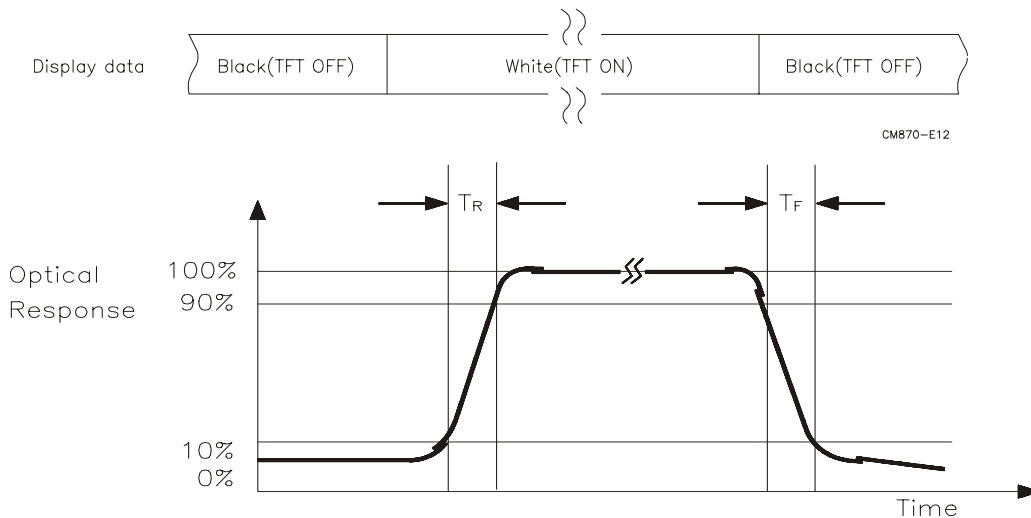


ST350-E01

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

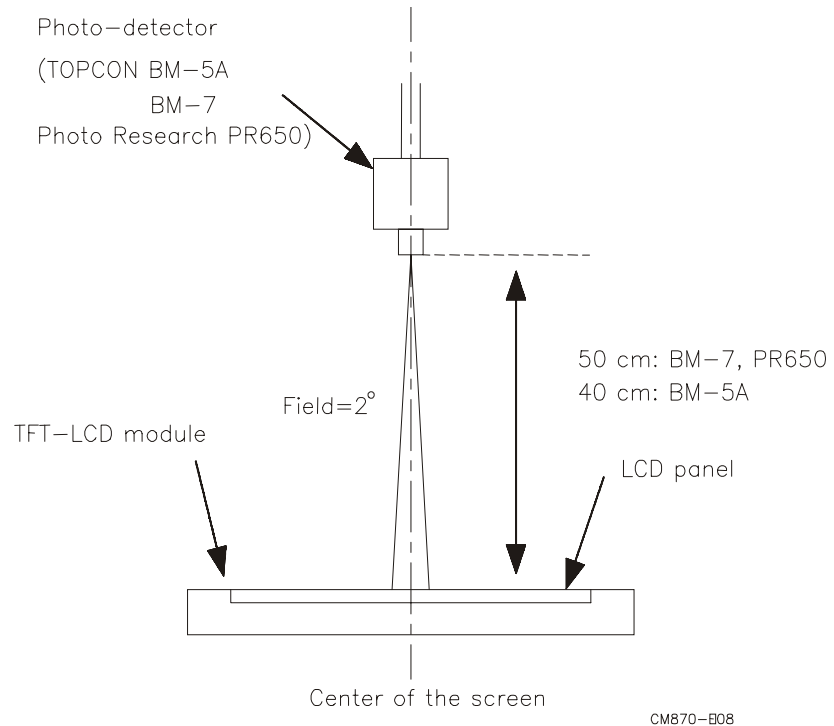


CM870-E12

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 in 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 : $T_a = 25 \pm 2^\circ C$

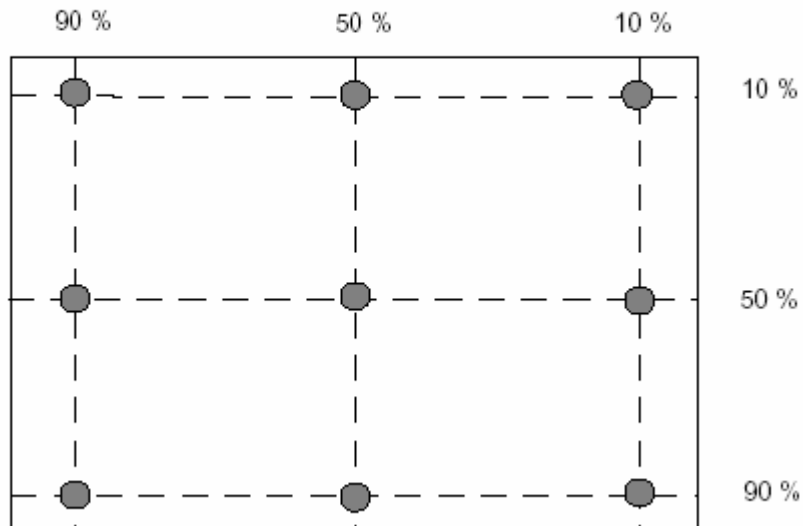
CM870-E12



Optical characteristics measurement setup

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

Brightness uniformity of these 9 points is defined as below



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

AU

$$B_{UNI} = \frac{B_{min}}{B_{max}} \times 100\%$$

Samsung

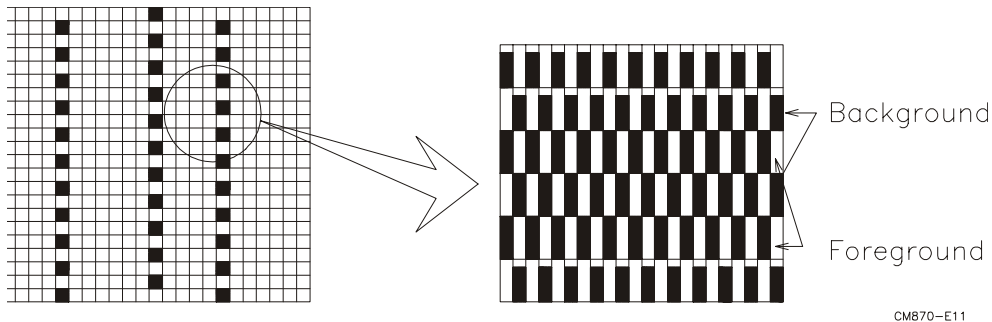
$$B_{UNI} = \frac{B_{max} - B_{min}}{B_{max}} \times 100\%$$

Bmax: Maximum brightness
 Bmin: Minimum brightness

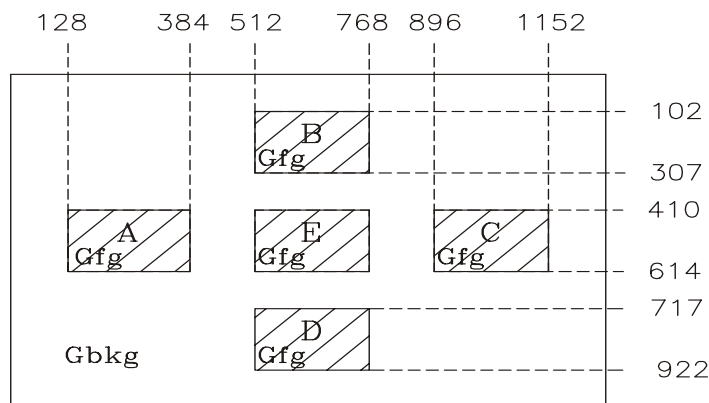
Notes 7) Definition of Flicker level

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

- ◆ 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:

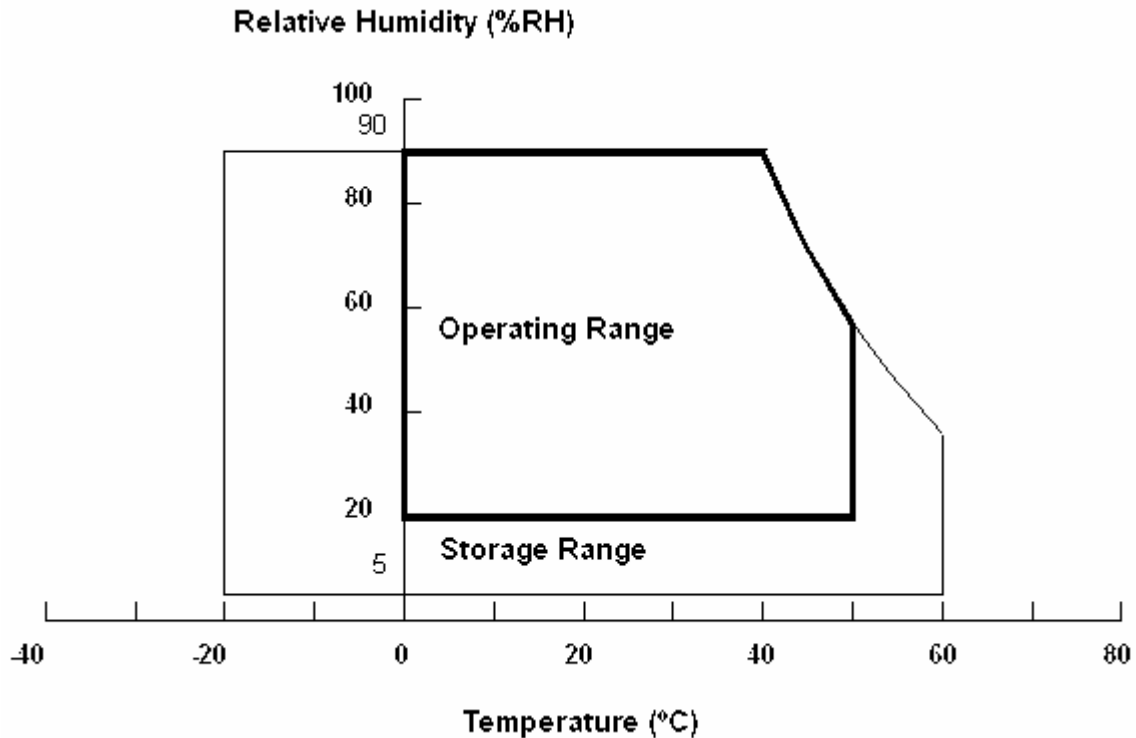
$$L_{max} - L_{min}$$

$$C_T = \frac{\text{Lmax}}{\text{Lmin}} \times 100 \%$$

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 E may 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.

Panel Relative Humidity



JP777-E02

Input Signals

Video input

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

Sync input

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

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
- Vertical Frequency 49Hz -----75Hz

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	31.469	+	800	640	96	16	48	25.175
VGA-350	70.087	-	449	350	2	37	60	
640x400	24.83	-	848	640	64	64	80	21.05
NEC PC9801	56.42	-	440	400	8	7	25	
640x400	31.469	-	800	640	96	16	48	25.175
VGA-GRAPH	70.087	+	449	400	2	12	35	
640x400	31.5	-	800	640	64	16	80	25.197
NEC PC9821	70.15	-	449	400	2	13	34	
640x480	31.469	-	800	640	96	16	48	25.175
VESA-PAL	50.030	-	629	480	2	62	85	
640x480	31.469	-	800	640	96	16	48	25.175
VGA-480	59.94	-	525	480	2	10	33	
640x480	35.00	-	864	640	64	64	96	30.24
APPLE MAC-480	66.67	-	525	480	3	3	39	
640x480	37.861	-	832	640	40	16	120	31.5
VESA-480-72Hz	72.809	-	520	480	3	1	20	
640x480	37.5	-	840	640	64	16	120	31.5
VESA-480-75Hz	75	-	500	480	3	1	16	
720x400	31.469	-	900	720	108	18	54	28.322
VGA-400-TEXT	70.087	+	449	400	2	12	35	
832x624	49.725	-	1152	832	64	32	224	57.2832
APPLE MAC-800	74.55	-	667	624	3	1	39	
800x600	35.156	+	1024	800	72	24	128	36
SVGA	56.25	+	625	600	2	1	22	
800x600	37.879	+	1056	800	128	40	88	40
VESA-600-60Hz	60.317	+	628	600	4	1	23	
800x600	48.077	+	1040	800	120	56	64	50
VESA-600-72Hz	72.188	+	666	600	6	37	23	
800x600	46.875	+	1056	800	80	16	160	49.5
VESA-600-75Hz	75	+	625	600	3	1	21	
1024x768	48.363	-	1344	1024	136	24	160	65
XGA	60.004	-	806	768	6	3	29	
1024x768	53.964	+	1328	1024	176	16	112	71.664
COMPAQ-XGA	66.132	+	816	768	4	8	36	
1024x768	56.476	-	1328	1024	136	24	144	75
VESA-768-70Hz	70.069	-	806	768	6	3	29	
1024x768	60.023	+	1312	1024	96	16	176	78.75
VESA-768-75Hz	75.029	+	800	768	3	1	28	
1024x768	60.24	-	1328	1024	96	32	176	80
APPLE MAC-768	75.02	-	803	768	3	3	29	
1152x864	54.054	+	1480	1152	96	40	192	80
60Hz	59.270	+	912	864	3	13	32	
1152x864	63.851	+	1480	1152	96	32	200	94.499
60Hz	70.012	+	912	864	3	1	44	
1152x864	67.50	+	1600	1152	128	64	256	108.00
60Hz	75.00	+	900	864	2	2	32	
1280x960	60.00	+	1800	1280	112	96	312	108.00
60Hz	60.00	+	1000	960	3	1	36	
1280x960	70.00	+	1800	1280	112	96	312	126.00
70Hz	70.00	+	1000	960	3	1	36	
1280x960	75.00	+	1800	1280	112	96	312	135.00
75Hz	75.00	+	1000	960	3	1	36	
1280x1024	64	+	1688	1280	112	48	248	108
VESA-1024-60Hz	60	+	1066	1024	3	1	38	
1280x1024	80	+	1688	1280	144	16	248	135
VESA-1024-75Hz	75	+	1066	1024	3	1	38	
1600x1200	75	+	2160	1600	192	64	304	162
VGSA-1200-60Hz	60	+	1250	1200	50	1	46	
1920x1200	74.6	+	2592	1920	200	136	336	193
VGSA-1200-60Hz	60	+	1245	1200	6	3	36	

Note: Mode 640x350, 640x400 and 720x400 will locate on middle position but cannot be expanded to full screen on vertical direction

Support Modes

There will be 28 total support modes to accommodate the above mode and other video modes within the frequency range of the monitor.

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.

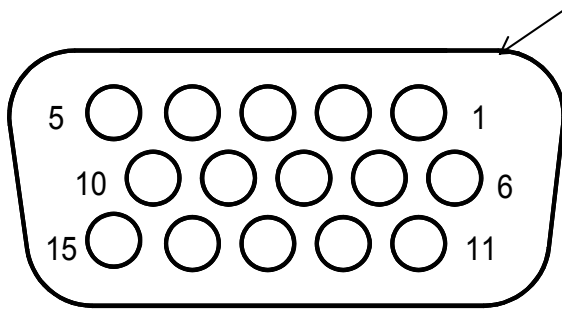
Video input Connector

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

Color of plastic parts: Blue (PC99)



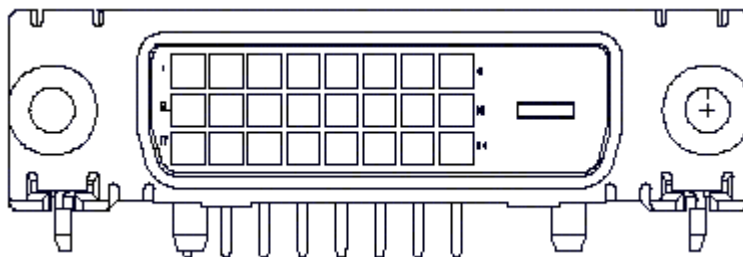
D-sub connector

Digital Video input Connector: DVI-D (For AA868 only)

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,



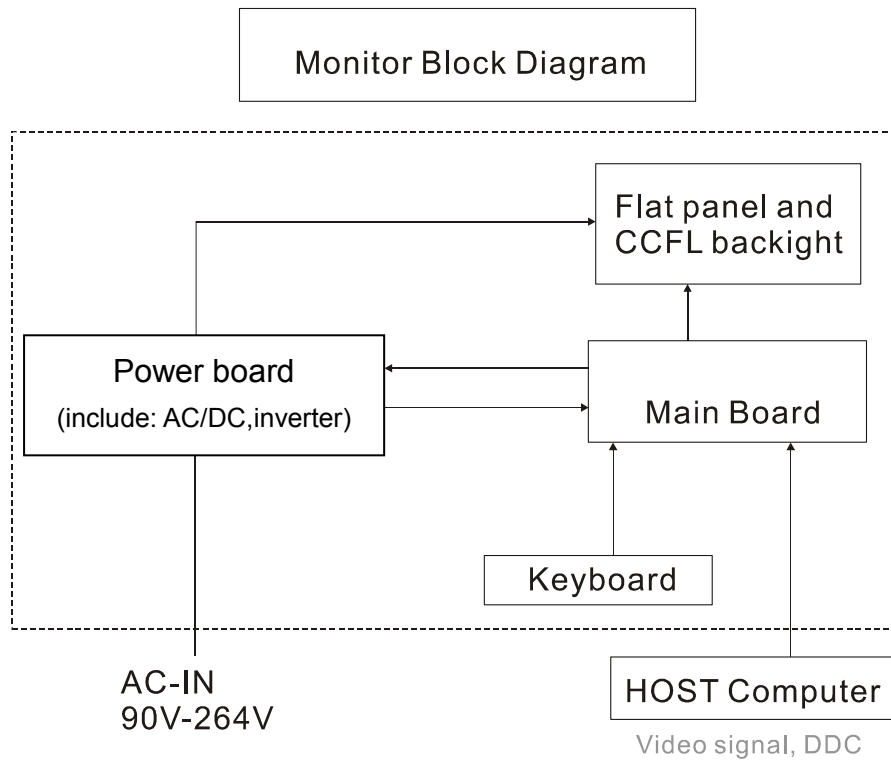
no voltage may occur at pin 14.

MONITOR BLOCK DIAGRAM

The LCD monitor will contain an main board, an inverter/ power board, key board and internal adapter which house the flat panel control logic, brightness control logic and DDC.

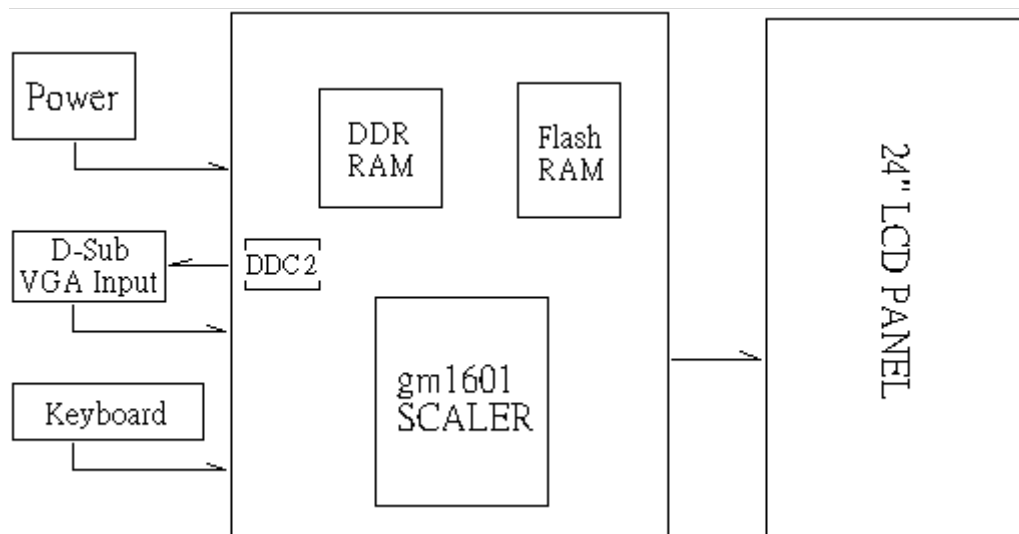
The inverter board will drive the backlight of panel and the DC-DC conversion.

The Adapter will provide thr 12V DC-power to inverter/ power board.

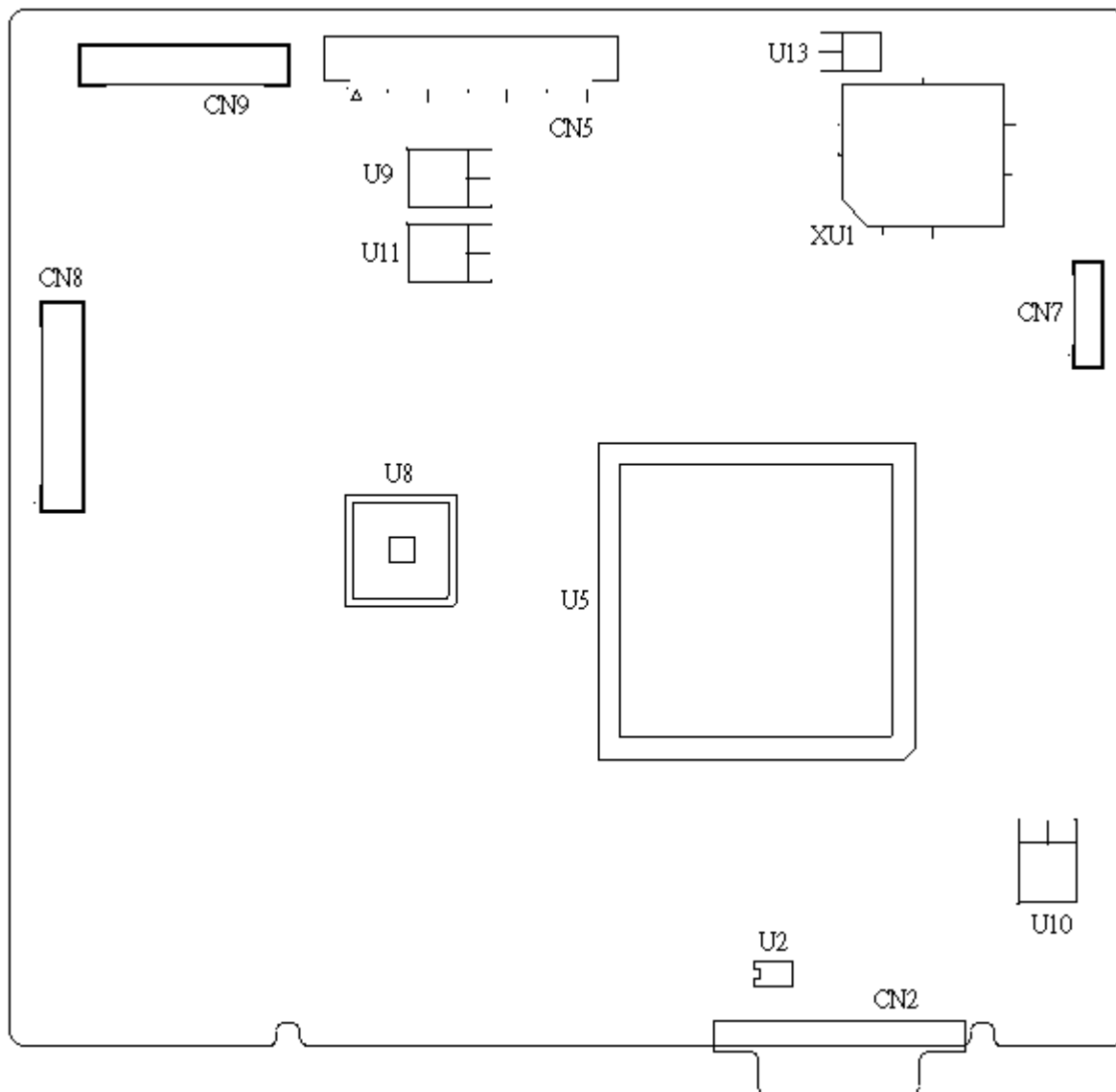


BLOCK DIAGRAM

System Block Diagram

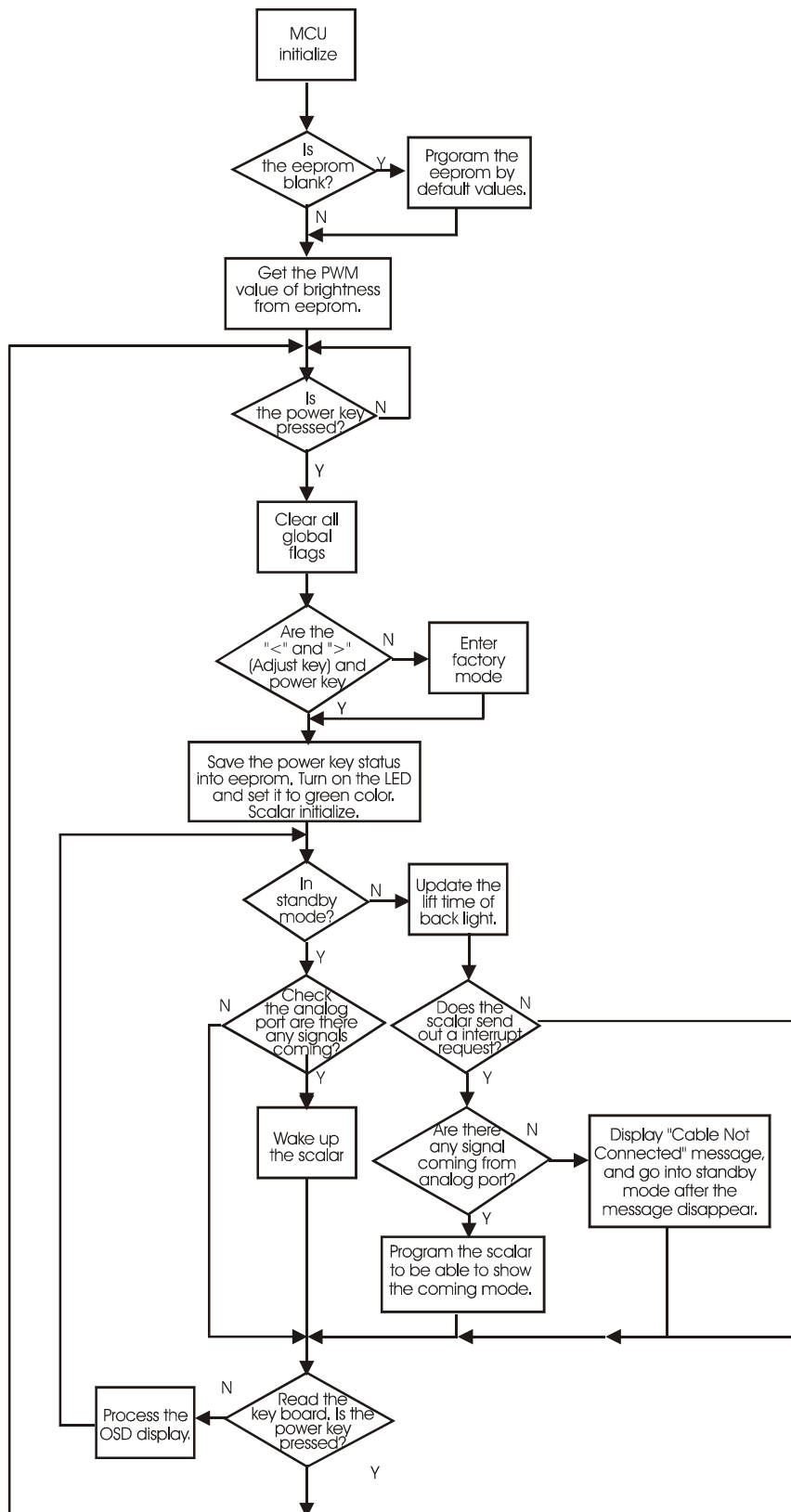


Monitor board layout



LABEL	Component	LABEL	Component
U2	EEPROM SOIC-8 24C02	CN2	D-SVB 15 PIN
U5	GM1601	CN5	P-TWO AFN300-N2G1Z 30P P1 90D
U8	HY5DU283222AF	CN7	E&T 4300-09 9P P1.25
U9	AIC 1084-33V	CN8	E&T 4500-12 12P P2.0
U10	APL1117-1.8V	CN9	E&T 4500-12 12P P2.0
U11	APL1117-25V		
U13	APL5883-33DC		
XU1	FL 512K8 PLSST39VF040		

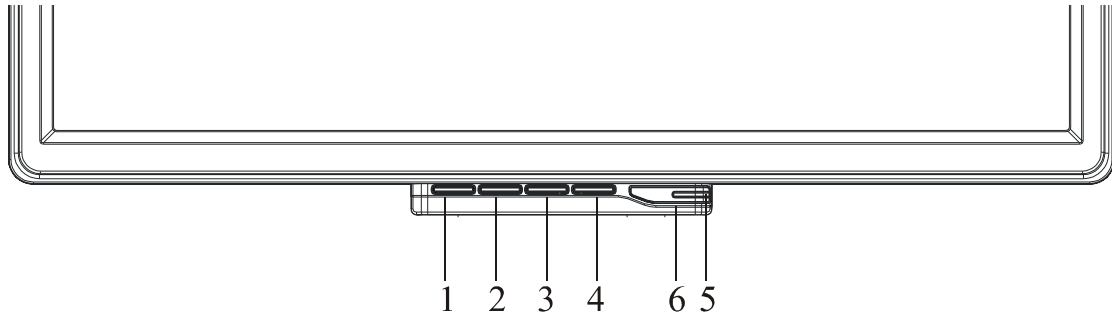
Software flow chart



General Instructions

Press the power button to turn the monitor on or off. The other control buttons are located at front panel of the monitor. By changing these settings, the picture can be adjusted to your personal preferences.

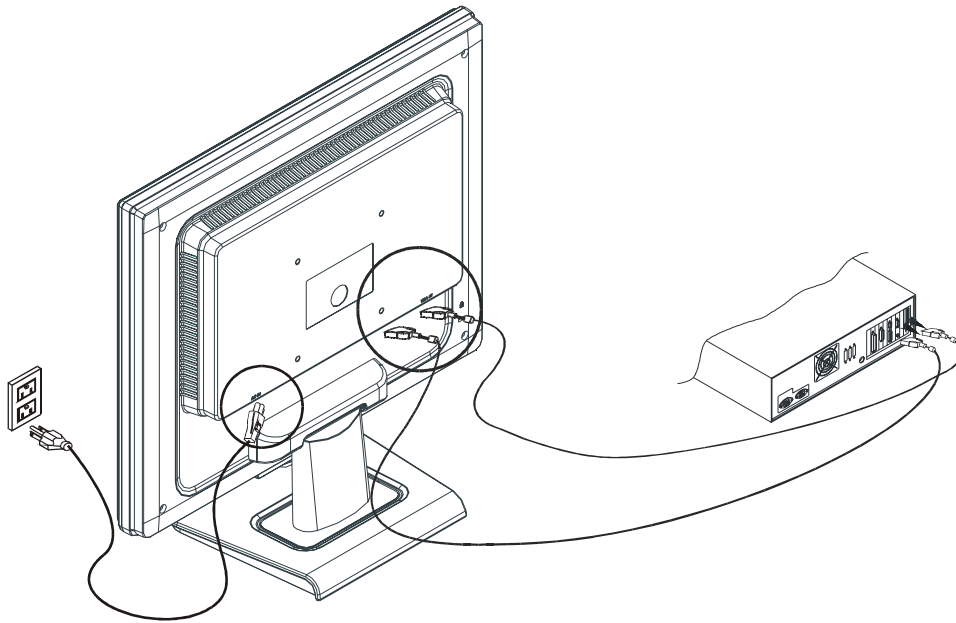
- The power cord should be connected.
- Connect the video cable from the monitor to the video card.
- Press the power button to turn on the monitor position. The power indicator will light up.



External Controls

1	Auto Adjust Key/Exit	4	MENU/ENTER
2	<	5	LED
3	>	6	⏻ / Power Key

System Installation



Connecting the Display

- Power off your computer.
- Connect one end of the signal cable to the LCD Monitor's VGA port.
- Connect the other end of the signal cable to the VGA port on your PC.
- Make sure connections are secure.

Connecting the AC Power

- Connect the power cord to the LCD Monitor.
- Connect the power cord to an AC power source.

Gap Spec.

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

Top and Bottom

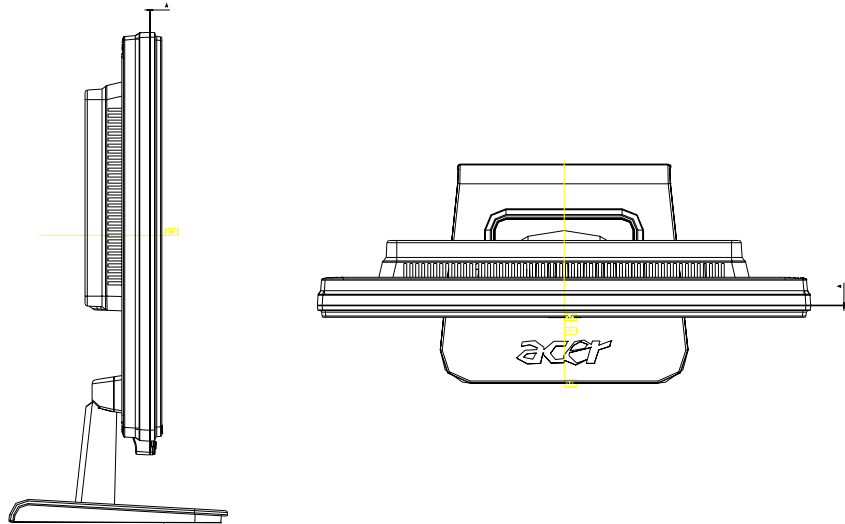
Back cover & Bezel concavity

$0.8\text{mm} \leq A \leq 1.3 \text{ mm}$

Left and Right

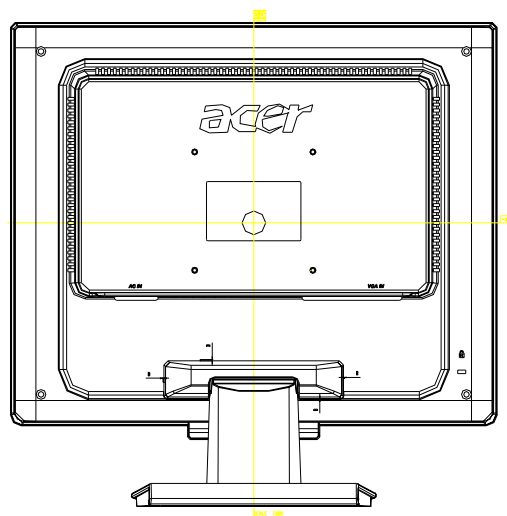
Back cover & Bezel concavity

$0.8\text{mm} \leq A \leq 1.3 \text{ mm}$



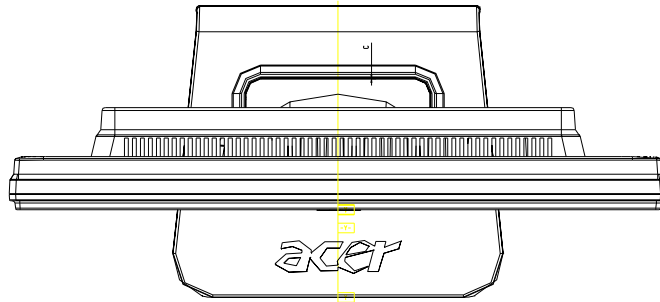
Back Cover & Hinge Cover concavity

$0\text{mm} \leq B \leq 0.5\text{mm}$



Base & Neck concavity

$$0\text{mm} \leq C \leq 0.6\text{mm}$$



Top and Bottom

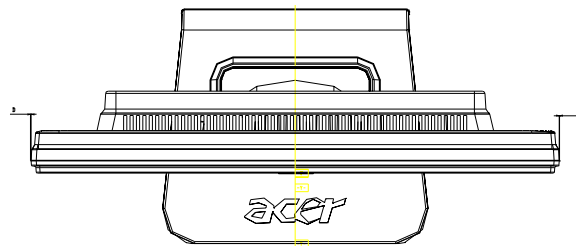
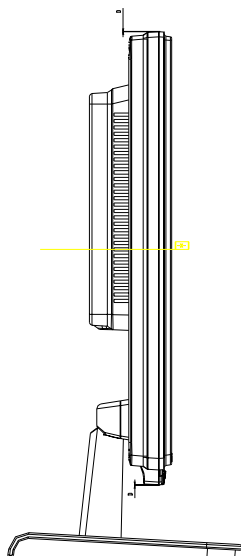
Back cover & Bezel step

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

Left and Right

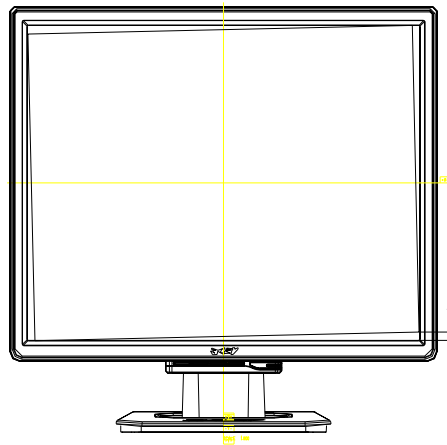
Back cover & Bezel step

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

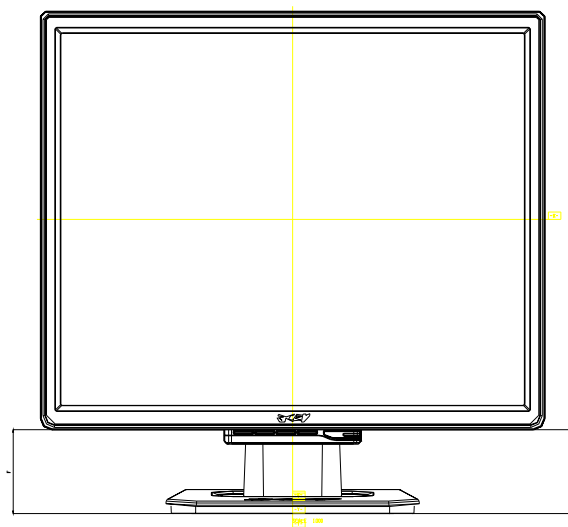


LCD Horizontally

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 should not large than 4.0mm.



Tilt Base Rotation

Tilt up $15 \pm 2^\circ$ / down $5 \pm 2^\circ$

Plastic Material

For TCO99

Front Bezel PC+ABS

Back Cover PC+ABS

The Others ABS 94HB

For MPRII

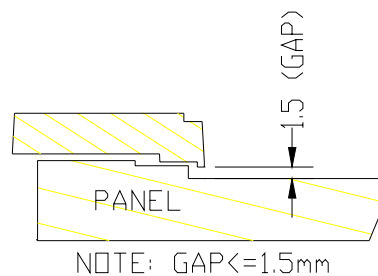
Front Bezel ABS 94V-0

Back Cover ABS 94V-0

The Others ABS 94HB

GAP Spec.

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



Swivel title noise spec.

When adjust the monitor angle, the range should be limited $-5^\circ \sim +15^\circ$ and it should not have any noise.

POWER/Inverter Board

Description

This specification defined the performance and characteristic of power/inverter board.

It supplies the following outputs :

- 1). 5Vdc: Logic power.
- 2). 24Vinv: Inverter power.

Features

Input Voltage: 100 ~ 240 $\pm 10\%$ Vac

Input Frequency: 47 ~ 63Hz

Total output power: 110Wmax

Inverter brightness adjustment: Burst mode

Protection function: auto-recovery type

Interface Signals

Input

AC Inlet: HUAJIE SA-4S-066 or compatible.

Output Connector & Pin Assignment:

1.CNS1 (to logic board),type :E&T 4500 or equivalent.

PIN NO.	Function	Function
1	+5Vstb	+5Vdc for standby output
2	GND	Power Ground
3	GND	Power Ground
4	GND	Power Ground
5	+5Vcc	+5Vdc, connected to main board
6	+5Vcc	+5Vdc, connected to main board
7	+5Vcc	+5Vdc, connected to main board
8	+12Vcc	Audio power (N/A option)
9	GND	Signal ground
10	Power on	(24V/5Vcc)Enable signal , Active : 2V~5V, off<1V
11	Backlight on/off	Backlight On/Off control signal, connected to CNS3#12
12	Dimmer	Brightness control, connected to CN3#13,bright max.=3.3V,min.=0V.

2.CNS3 (to Inverter board),type :E&T 4500 or equivalent.

PIN NO.	Function	Function
1	+24Vcc	Inverter Vcc
2	+24Vcc	Inverter Vcc
3	+24Vcc	Inverter Vcc
4	+24Vcc	Inverter Vcc
5	+24Vcc	Inverter Vcc
6	GND	Inverter GND
7	GND	Inverter GND
8	GND	Inverter GND
9	GND	Inverter GND
10	GND	Inverter GND
11	N.C	N.C
12	Backlight on/off	Backlight On/Off control signal, connected to CNS1#11
13	Dimmer	Brightness control, connected to CN1#12,bright max.=3.3V,min.=0V.
14	N.C	N.C

2.Inverter-side connector : YEONHO 20015 HS-04L or equivalent.

PIN NO.	Function	Comment
1-1	Hot1	High voltage
1-2	N.C	
1-3	N.C	
1-4	Hot2	High voltage

PIN NO.	Function	Function
1	+5Vaudio	Audio power (optional).
2	GND	Audio ground
3	GND	Ground
4	GND	Ground
5	Vbri	Brightness control from logical board (0V to 3.3V)
6	----	-----
7	Ven	Inverter enable signal from logical board (high active , >3V)
8	+5Vdc	+5Vdc supply for logical board
9	+5Vdc	+5Vdc supply for logical board
10	+5Vdc	+5Vdc supply for logical board

Output Requirement

Output Voltage	Total Regulation* ¹	Output Current		
		MIN.	TYP.	MAX.
+5Vstb (VCC)	+5 %/ -5%	0.05A	1.0A	1.2A
+5Vcc	+5 %/ -5%	0.0A	2.0A	2.2A
+24VINverter	+5 %/ -5%	0.0A	3.3A	3.5A

*¹ Total Regulation includes (1) Line Regulation (2) Load Regulation (3) Cross Regulation

Output Ripple/Noise: +/- 3% maximum

3.4.1.3 Protection function

- 1) SCP: Short circuit protection must be acted on both outputs
- 2) OPP: Should be protected when output power consumption is within 130W .

3.4.1.4 Overshoot: +10% or less Full Load

3.4.1.5 Dynamic Loading: +5% or less Full Load

3.4.1.6 Efficiency: 75% min. at full load condition.

INVERTER BOARD

DESIGNED FOR SAMSUNG LTM240M!-L01

	MIN.	TYP.	MAX.	COMMENT
INPUT VOLTAGE	22.8V	24V	25.2V	24V+/-5%
INPUT CURRENT	-----	3.3A	-----	Vin=24V,Vbrite=3.3V
Normal BACKLIGHT VOLTAGE	-----	1800Vrms	-----	
LAMP CURRENT (every lamp)	-----	6mArms	7mArms	Each CCFL
DRIVING FREQUENCY	40KHz	-----	60KHz	
EFFICIENCY	-----	75%	-----	Vin = 24V,max
Vin ON/OFF sequence	-----	0.5S	-----	
OLP TIME	-----	1S	-----	Open lamp protection
BRIGHTNESS RANGE	30%	-----	100%	
Brightness control	0V	-----	3.3V	3.3V, brightness max.
Brightness	-----	500cd/m ²	-----	
Strike voltage at 0°C	3540Vrms	-----	-----	
Strike voltage at 25°C	2830Vrms	-----	-----	
Operating life time	30,000 hrs	-----	-----	

SAFETY

Leakage Current: 0.25mA @ 100Vac

Insulation Resistance: more than 3M ohms while withstanding a voltage of 500Vac

Hi-Pot: 3Kvac with using 3mA cut off current

Power Consumption

The monitor is equipped with a power-management according to the below.

There is a delay of 5s ... 7s before the transition from On-state to any power saving state to avoid unintentionally entering of a power saving stage during display resolution and timing mode changes.

Transition from any power saving state to another can be instantaneous.

The recovery from Off-state requires no manual power on.

Mode	H-Sync.	V-Sync.	Video	Pw-cons.	Indicator	Rec. time*
Power-On	on	on	active	< 110W	Green LED	--
DPMS-off	off	off	blanked	< 2 W	Orange LED	< 5S
DC-Switch-off				< 1 W@100VAC	Dark LED	

SYNC. On means: Normal operation

SYNC. Off means: H sync. F < 10KHz duty cycle > 25%

V sync. F < 10Hz duty cycle > 25%

CONNECTORS / CONTROLS

Connectors

- Power : Monitor rear side : AC Inlet
- Analog RGB : Monitor rear side / Data Cable : 15-pin D-sub female / male

Pin – Assignment of 15-pin D-sub:

1	Red Video	9	+5V FOR DDC
2	Green Video	10	Detect
3	Blue Video	11	Serial Data for ISP
4	Serial Clock for ISP	12	Serial Data for DDC
5	Ground	13	H-Sync.
6	Red Ground	14	V-Sync.
7	Green Ground	15	Serial Clock for DDC
8	Blue Ground		

- Audio : Monitor rear side :
-PC I/P for PC : 3.5mm Stereo female

Monitor Control Keys

KEY : Power , Menu , Adjust +/- , Vol +/-, Auto

Position Of Controls

Position of all switches : Bottom side of front bezel

Position of LED : Bottom side of front bezel

Chapter 2

Operating Instructions

CONTROLS

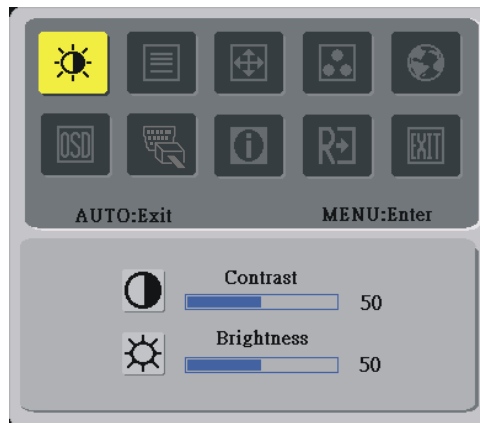


Control panel (monitor front panel)

1. Power ON/OFF switch, push to ON and push to OFF. (toggle switch)
2. Power LED, will be green when monitor is on; be amber when in power saving mode.
3. Function select.
4. Adjust increase.
5. Adjust decrease.
6. Auto adjust.

Main OSD Menu:











Outline:



(option)

The description for control function :

Main Menu Icon	Sub Menu Item	Sub Menu Icon	Description	Adjustment Range	Reset Value
	Contrast		Contrast from Digital-register.	0-100	Recall Cool Contrast Value
	Brightness		Backlight Adjustment	0-100	Recall Cool Brightness Value
	Focus		Adjust Picture Phase to reduce Horizontal-Line noise	0-100	Do Auto Config
	Clock		Adjust picture Clock to reduce Vertical-Line noise.	0-100	Do Auto Config
	H. Position		Adjust the horizontal position of the picture.	0-100	Do Auto Config
	V. Position		Adjust the vertical position of the picture.	0-100	Do Auto Config
	Warm	N/A	Recall Warm Color Temperature from EEPROM.	N/A	The Color Temperature will be set to Cool.
	Cool	N/A	Recall Cool Color Temperature from EEPROM.	N/A	
	User / Red		Red Gain from Digital-register.	0-100	100
	User / Green		Green Gain Digital-register.	0-100	100
	User / Blue		Blue Gain from Digital-register.	0-100	100

	English	N/A	Set OSD display language to English.	N/A	The Language will be set to English.
	繁體中文	N/A	Set OSD display language to Traditional Chinese.	N/A	
	Deutsch	N/A	Set OSD display language to German.	N/A	
	Français	N/A	Set OSD display language to French.	N/A	
	Español	N/A	Set OSD display language to Spain.	N/A	
	Italiano	N/A	Set OSD display language to Italian.	N/A	
	简体中文	N/A	Set OSD display language to Simplified Chinese.	N/A	
	日本語	N/A	Set OSD display language to Japanese.	N/A	
	H. Position		Adjust the horizontal position of the OSD.	0-100	50
	V. Position		Adjust the vertical position of the OSD.	0-100	50
	OSD Timeout		Adjust the OSD timeout.	10-120	10
	Auto Config	N/A	Auto Adjust the H/V Position, Focus and Clock of picture.	N/A	N/A
	N/A	Source Change	Analog and Digital source change.(option)	N/A	N/A
	Information	N/A	Show the resolution, H/V frequency and input port of current input timing.	N/A	N/A
	Reset	N/A	Clear each old status of Auto-configuration and set the color temperature to Cool.	N/A	N/A
	Exit	N/A	Exit OSD	N/A	N/A

OSD Message:

Outline:



The description for OSD Message :

Item	Description
Auto Config Please Wait	When User Press Hot-Key "Auto", will show this message, and the monitor do the auto config function.
Input Not Supported	When the Hsync Frequency, Vsync Frequency or Resolution is out of the monitor support range, will show this message. This message will be flying.
Cable Not Connected	When the video cable is not connected, will show this message. This message will be flying.
No Signal	When the video cable is connected, but there is no active signal input, will show this message, then enter power saving.

LOGO:

When the monitor is power on, the LOGO will be showed in the center.



Item of Factory menu

Vendor may customize design and add adjustment items Factory menu as far as all required items are included.

1) Bright

Adjust Brightness and Contrast value to Max.

2) Auto Balance

Adjust each R, G, B contrast (gain) and offset.

Method of auto adjust is depends on hardware.

Adjusted value of R, G, B gain shall be used for initial value of Contrast in user menu.

All value shall be adjustable manually.

This function shall be located in 3. tag of Factory menu.

3) Factory color temp data edit

Following data for color temp shall be editable manually.

-color temp default preset No.

Plug and play

Plug & play DDC2B feature

This monitor is equipped with VESA DDC2B capabilities according to the VESA DDC STANDARD. It allows the monitor to inform the host system of its identity and, depending on the level of DDC used, communicate additional information about its display capabilities. The communication channel is defined in two levels, DDC2B.

The DDC2B is a bidirectional data channel based on the I²C protocol. The host can request EDID information over the DDC2B channel.

THIS MONITOR WILL APPEAR TO BE NON-FUNCTIONAL IF THERE IS NO VIDEO INPUT SIGNAL. IN ORDER FOR THIS MONITOR TO OPERATE PROPERLY, THERE MUST BE A VIDEO INPUT SIGNAL.

This monitor meets the Green monitor standards as set by the Video Electronics Standards Association (VESA) and/or the United States Environmental Protection Agency (EPA) and The Swedish Confederation Employees (NUTEK). This feature is designed to conserve electrical energy by reducing power consumption when there is no video-input signal present. When there is no video input signal this monitor, following a time-out period, will automatically switch to an OFF mode. This reduces the monitor's internal power supply consumption. After the video input signal is restored, full power is restored and the display is automatically redrawn. The appearance is similar to a "Screen Saver" feature except the display is completely off. The display is restored by pressing a key on the keyboard, or clicking the mouse.

Using The Right Power Cord

The accessory power cord for the Northern American region is the wallet plug with NEMA 5-15 style and is UL listed and CSA labeled. The voltage rating for the power cord shall be 125 volt AC.

Supplied with units intended for connection to power outlet of personal computer: Please use a cord set consisting of a minimum No. 18 AWG, type SJT or SVT three conductors flexible cord. One end terminates with a grounding type attachment plug, rated 10A, 250V, CEE-22 male configuration. The other end terminates with a molded-on type connector body, rated 10A, 250V, having standard CEE-22 female configuration.

Please note that power supply card needs to use VDE 0602, 0625, 0821 approval power cord in European countries.

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	± 0.03	0.189	0.446	$u'v' \leq 0.01^*$
6500K	0.313	0.329	± 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>)

Electrical characteristics (Tamb=25°)

Audio amplifier(USE Panasonic VP-7723A Audio Analyzor.)

Item	Audio Input	Freq.	Spec.			Comment
			Min.	Typ.	Max.	
Input Voltage(V)			-	0.5Vrms	-	
Input Current(m A)			-	500	800	
Audio Voltage Gain	500m Vrms	1KHz	-	-	6 d B	Volume Max.,load 4 Ω
Frequency Response	500m Vrms	300Hz-20KHz	-10dB	-	+10d B	Volume Max.,load 4 Ω
Signal to Noise ratio	500m Vrms	1KHz	-	-	-40dB	Volume Max.,load 4 Ω
Total harmonic distortion	500m Vrms	1KHz			1%	except speakers distortion
Cross talk	500m Vrms	1KHz	-	-	-30dB	Volume Max.,load 4 Ω
Output Watt.	500m Vrms	1KHz	-	-	0.5W	Volume Max.,load 4 Ω
Volume Control			-	-	-	Analog

Machine Disassembly and Replacement

Disassembly Procedure

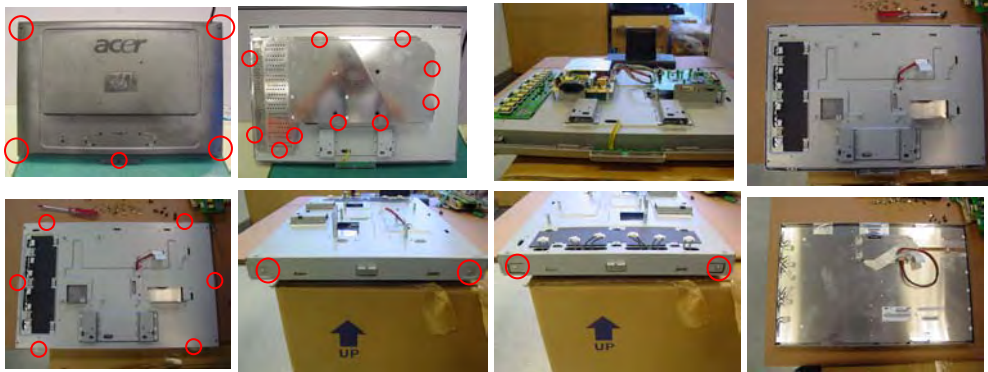
Disassemble the base

1. Remove the neck cover.
2. Remove the four screws to release the hinge.
3. Remove the base



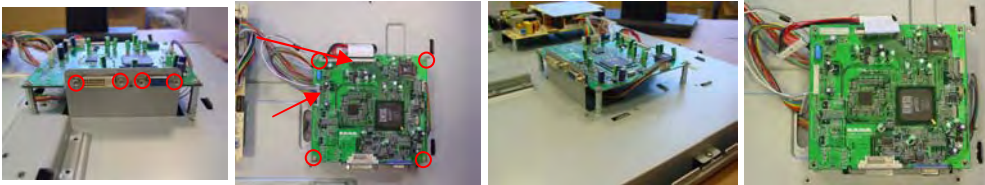
Disassemble the chassis

1. Remove the five screws to release the back cover.
2. Remove the two screws to release the EMI cover from chassis.
3. Remove the Main Board, Power Board, Inverter and Key Board. (See the next page for detail.)
4. Remove the six screws from chassis then take the chassis.
5. Remove the four screws from chassis and release the panel.



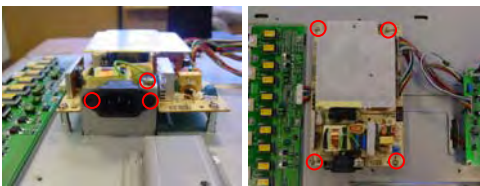
Disassemble the main board

1. After remove EMI cover from chassis.
2. Remove the four screws from chassis.
3. Remove the four screws from chassis and release the main board.
4. Disassemble audio line from power board.
5. Disassemble two VL-VK lines from VL board.
6. Disassemble power line from VL board.
7. Disassemble FPC line from VL board.



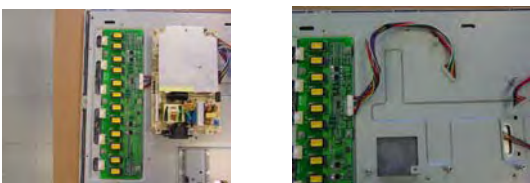
Disassemble the power board

1. After remove main board then disassembly the power board.
2. Remove the three screws from **power**.
3. Remove the four screws from **power**.
- 4.
5. Disassemble two voltage lines from power board.
6. Remove the one screw to release line from Chassis.
7. Remove the three screws from Chassis.
8. Remove the two screws to release power board from Chassis.
9. Then take the power board from the chassia.



Disassemble the Inverter and key board

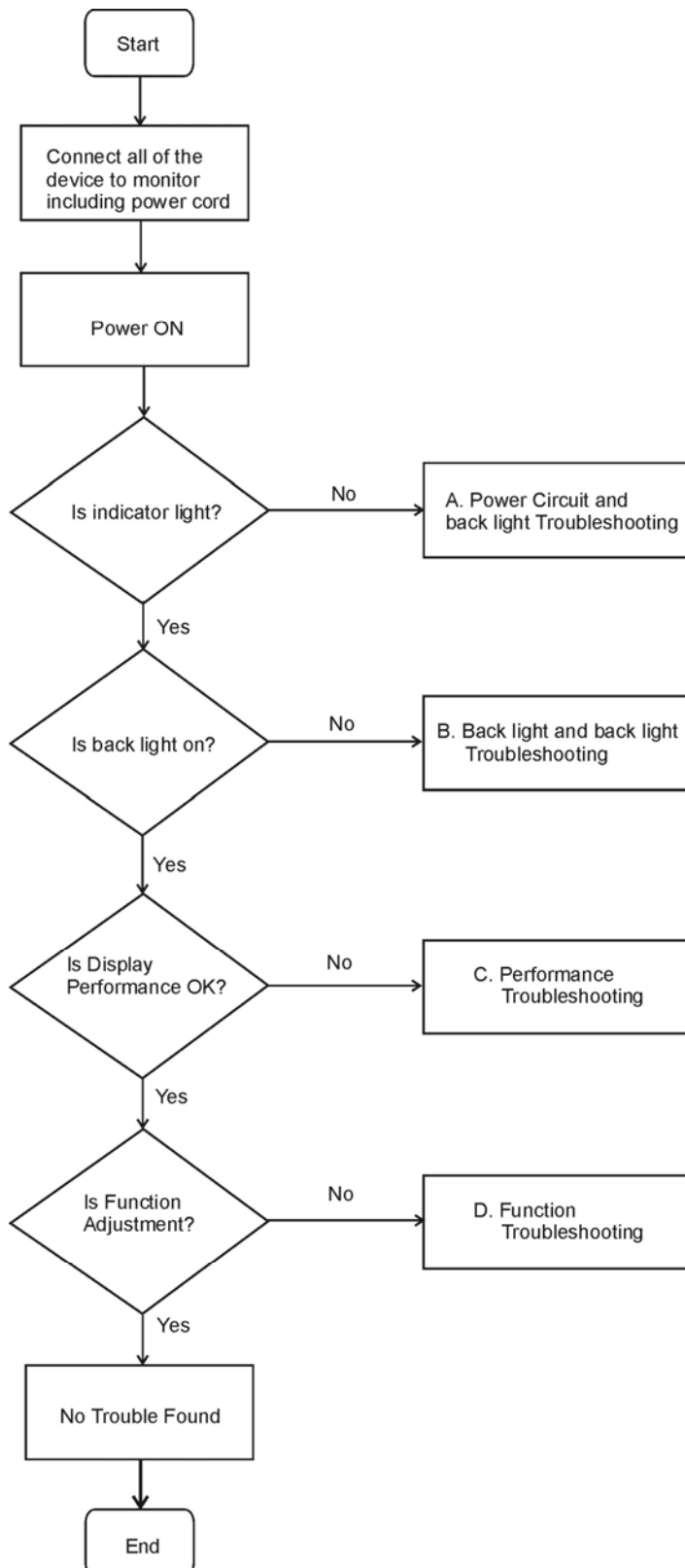
1. Remove the one screw to release VK board from bezel.
2. Disassemble the two speaker lines from VK board.



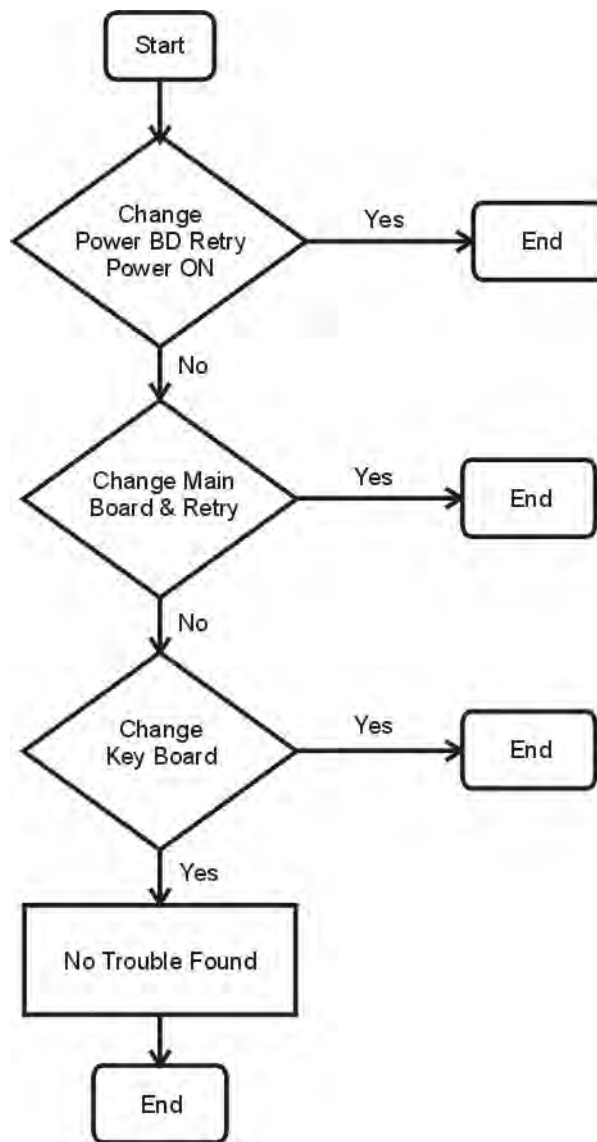


Troubleshooting

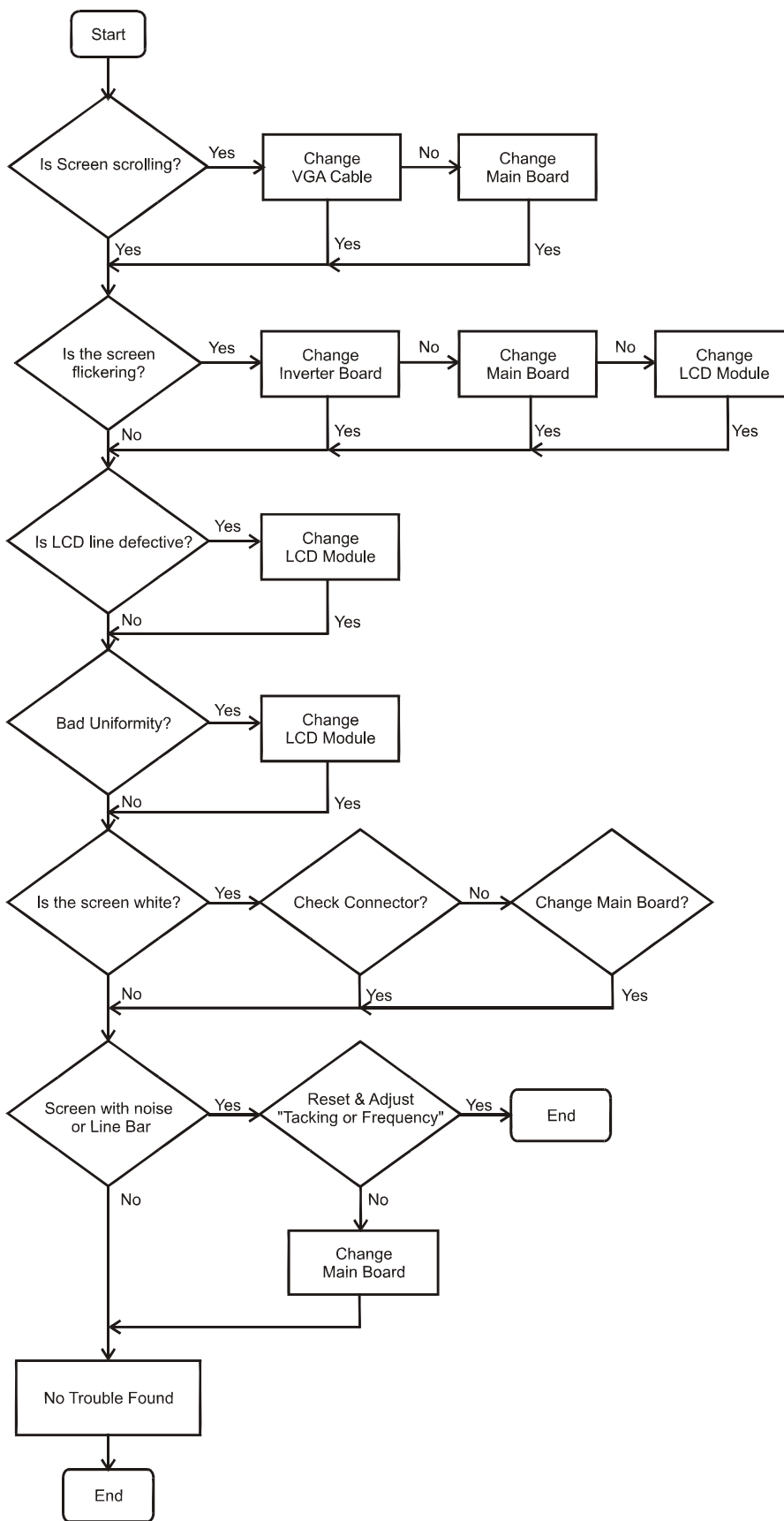
Main Procedure



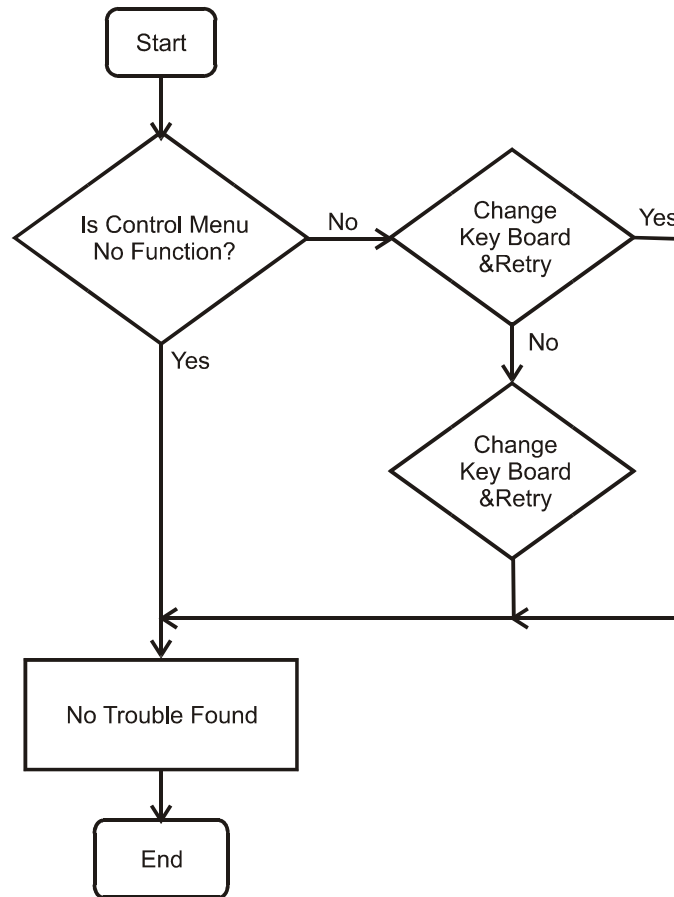
Power Circuit and Backlights Troubleshooting



Performance Troubleshooting



Function Troubleshooting

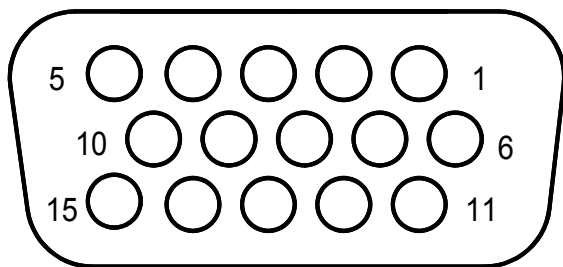


Connector Information

Video input Connector

Analog Video input Connector: 15pins mini D-Sub

Table 2.4.5. Pin assignment for D-sub connector



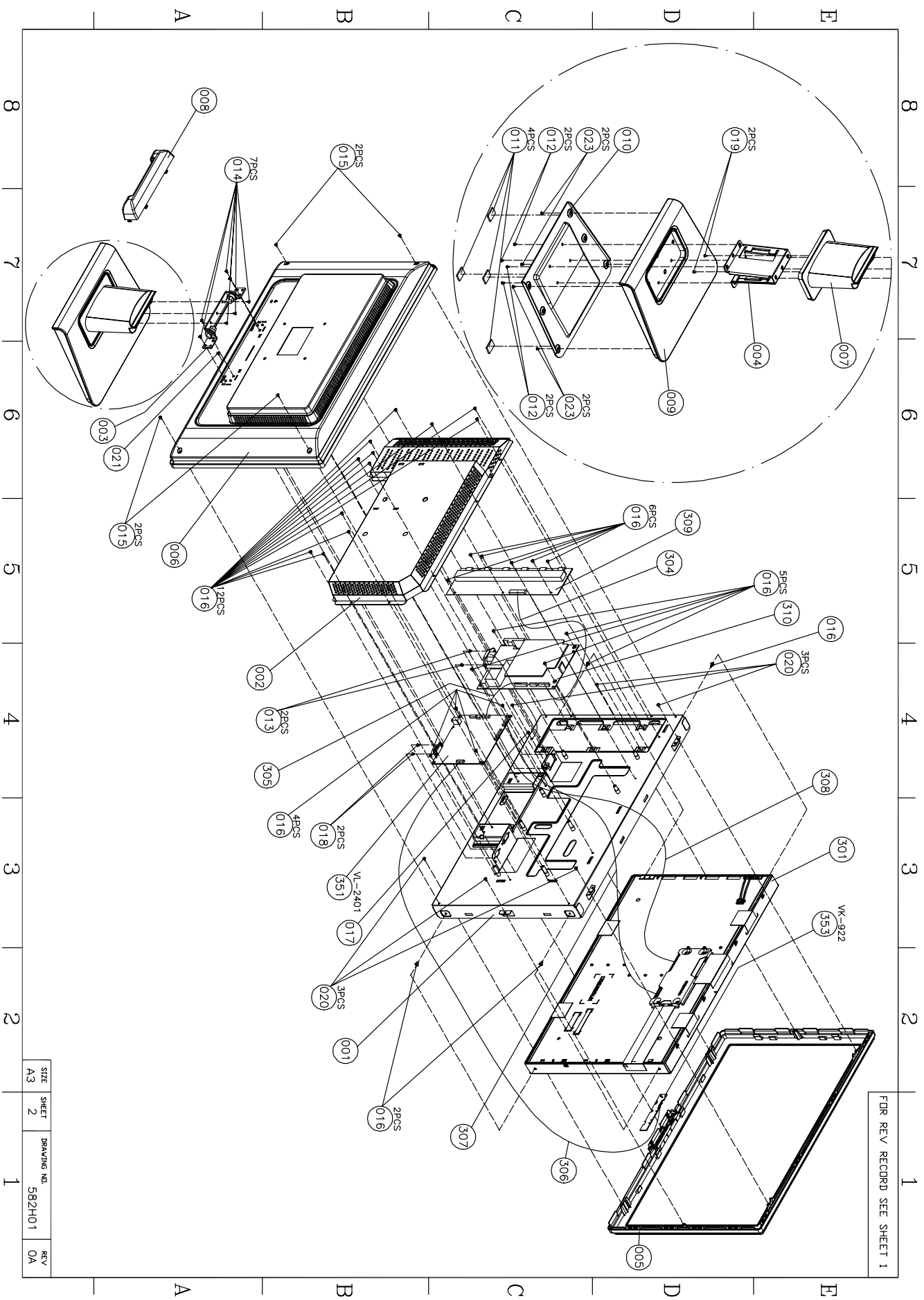
PIN NO.	Separate Sync
1	RED VIDEO
2	GREEN VIDEO
3	BLUE VIDEO
4	GROUND
5	GROUND
6	RED GROUND
7	GREEN GROUND
8	BLUE GROUND
9	PC5V (+5V DDC)
10	CABLE DETECTION
11	GROUND
12	SDA
13	H.SYNC
14	V.SYNC
15	SCL

FRU (Field Replaceable Unit) list

This chapter gives you the FRU (Field Replaceable Unit) listing in global configurations of AL1916. Refer to this chapter whenever ordering for parts to repair or for RMA (Return Merchandise Authorization).

NOTE : Please note WHEN ORDERING FRU PARTS, that you should check the most up-to-date information available on your regional web or channel(<http://aicsl.acer.com.tw/spl/>). For whatever reasons a part number change is made, it will not be noted in the printed Service Guide. For ACER-AUTHORIZED SERVICE PROVIDERS, your Acer office may have a DIFFERENT part number code to those given in the FRU list of this printed Service Guide. You MUST use the local FRU list provided by your regional Acer office to order FRU parts repair and service of customer machines.

NOTE: To scrap or to return the defective parts, you should follow the local government ordinance or regulations on how best to dispose it, or follow the rules set by your regional Acer office on how to return it.



FOR REV RECORD SEE SHEET 1

SIZE	SHEET	DRAWING NO.	REV
A3	2	SB2H01	0A

13.1.11.4 Material List by Location

Date: 05/31/05

Time: 19:39:25

R/N:ydr6069j - D1H

=====

582H01	REV. 0A			QUANTITY	REQUIRED	DWG.NO.
C NO.	PART NO.	DESCRIPTION	SPECIFICATION	-----		
				30		
				001		






REMARKS




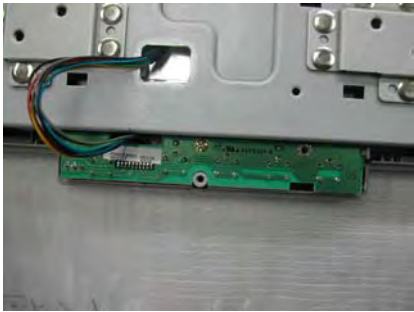
 # 582H0130001 DIS UNIT ABO LAA668 24"SAM 1920X1200

1	AC6VA2400R0	LCD MODU	LTM240M1-L01-L00 24"B A Acer	1	- - - -	- 301
2	DC0201933R0	H-CON SET	AA668 POW-INV 14P	1	- - - -	- 304
3	DC0201934R0	H-CON SET	AA668 POW-LOG 12P	1	- - - -	- 305
4	DC020193500	H-CON SET	AA668 CTRL-KEY 9P-8P	1	- - - -	- 306
5	DC020193700	H-CON SET	AA668 CTRL-PANEL POWER 12P	1	- - - -	- 307
6	NBX30000263	FFC	30P F P1.0 PAD1.0 AA668 SUM24"	1	- - - -	- 308
7	PK07V0033R0	INVERTER	AA668 24" TBD292LF TDK	1	- - - -	- 309
8	PK101V0110I	PWR MODU	FSP130-4F01GP 5V/12V/24V DV89A	1	- - - -	- 310
9	461ACY30001	FIRMWARE CTRL/B	VL-2401 LAA668A ABO	1	- - - -	- 351
10	454AC830011	PCBA KEY/B	VK-922 LAA668	1	- - - -	- 353
11	X66AUV30001	MEC PARTS ABO	LAA668	1	- - - -	- 355

End of Report

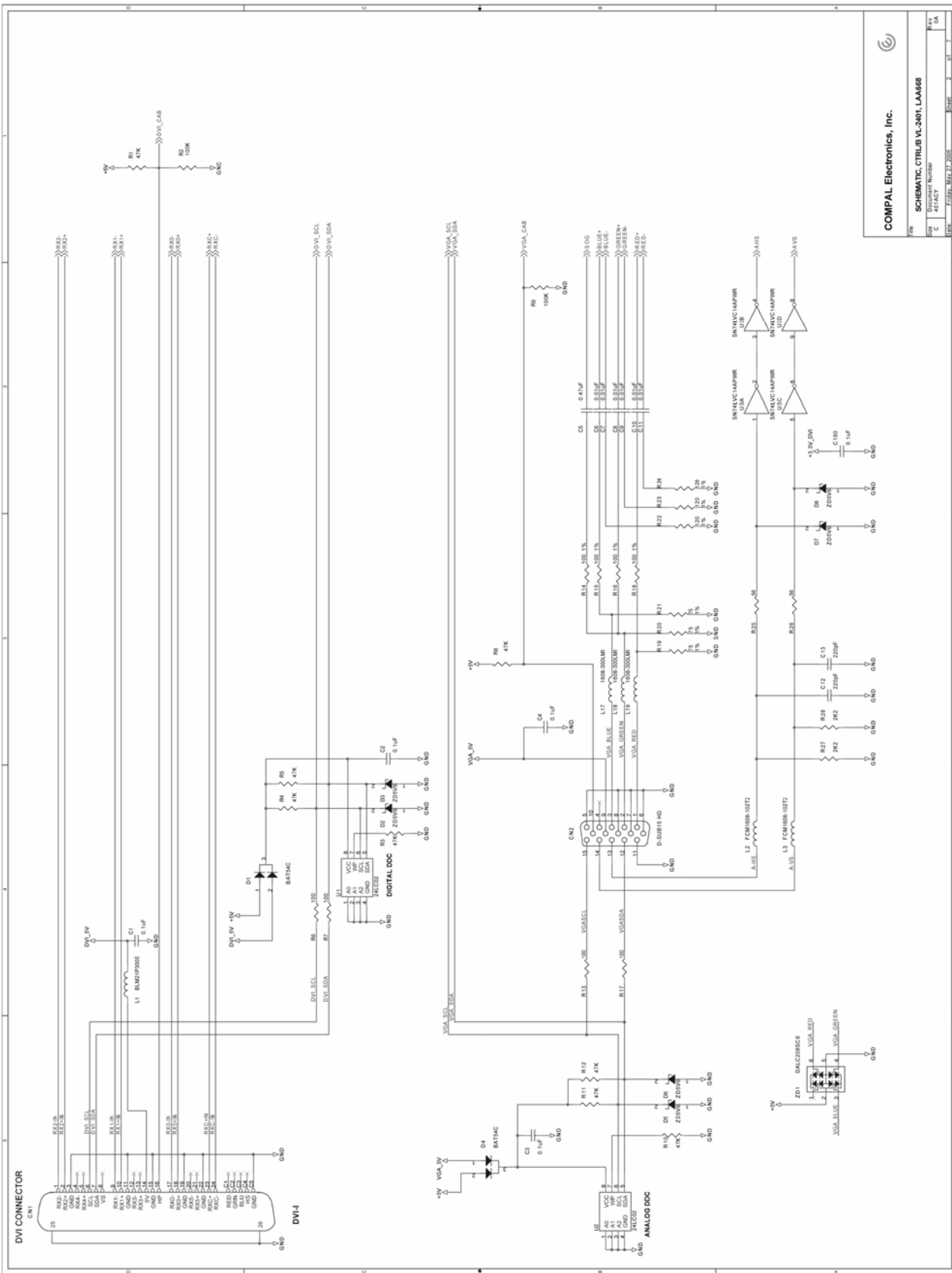
Part list

No.	Photo	Part Name	Part No.
1		Hinge Cover	FAAA6622000
2		Base	FAAA661A000
3		BACK Cover ASSY	FAAA6613000
4		STAND	FAAA6610000
5		EMI COVER ASSY	EEAA6617000

6		MB	461ACY30001
9		Power Board to MB cable	AU: 453AC530051 Samsung: 453AC530051
7		Power Board	PK101V0110I
8		Inverter Board	PK07V003310
9		Front Bezel ASSY	FAAA6611000
10		Keyboard to MB Cable	DC020193500

13		Frame	ECAR9915A00
14		LCD (R)	AC6VA2400R0
15		Panel to MB cable	NBX30000263
16		Function Board	454AC830011

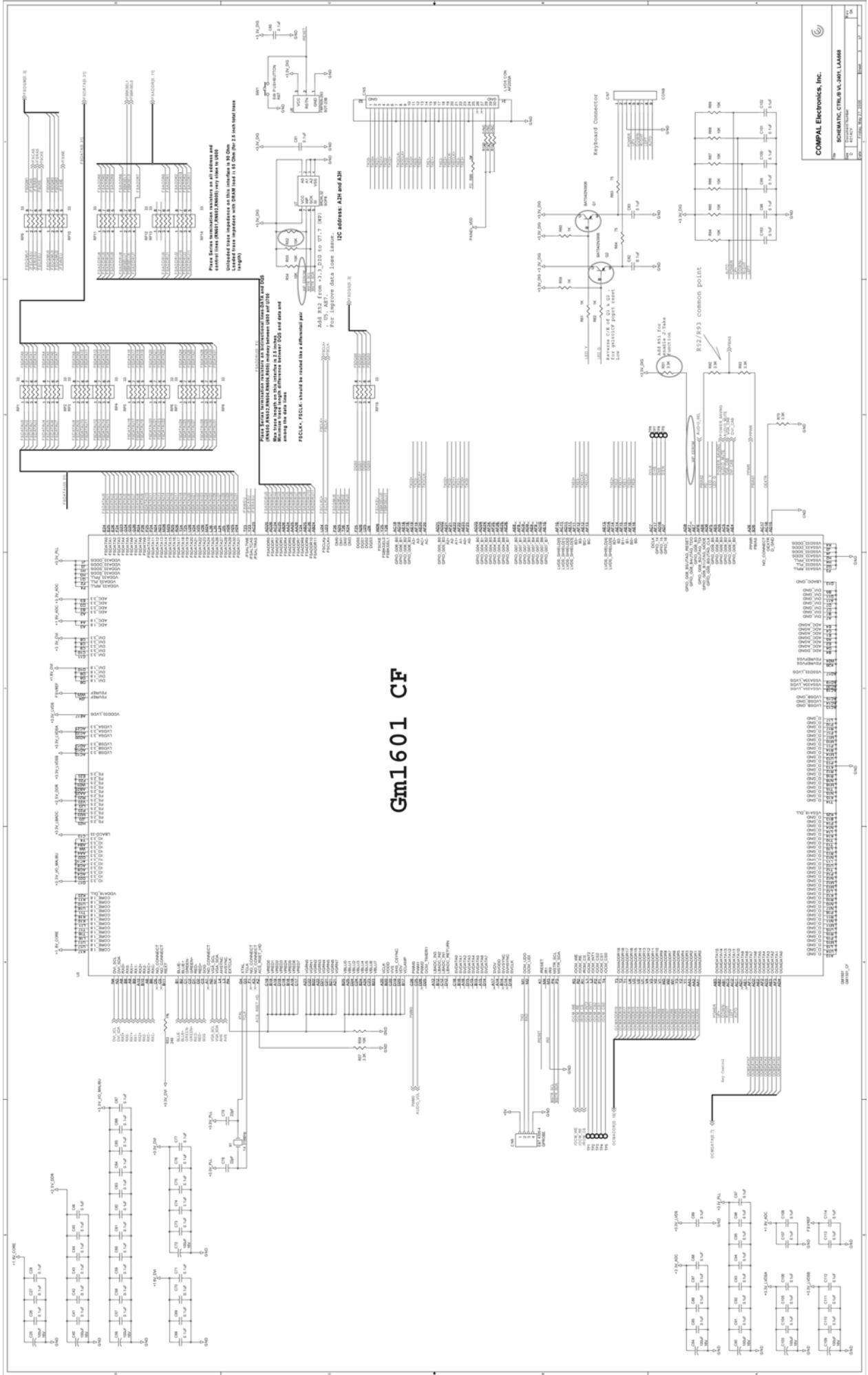
Schematic Diagram

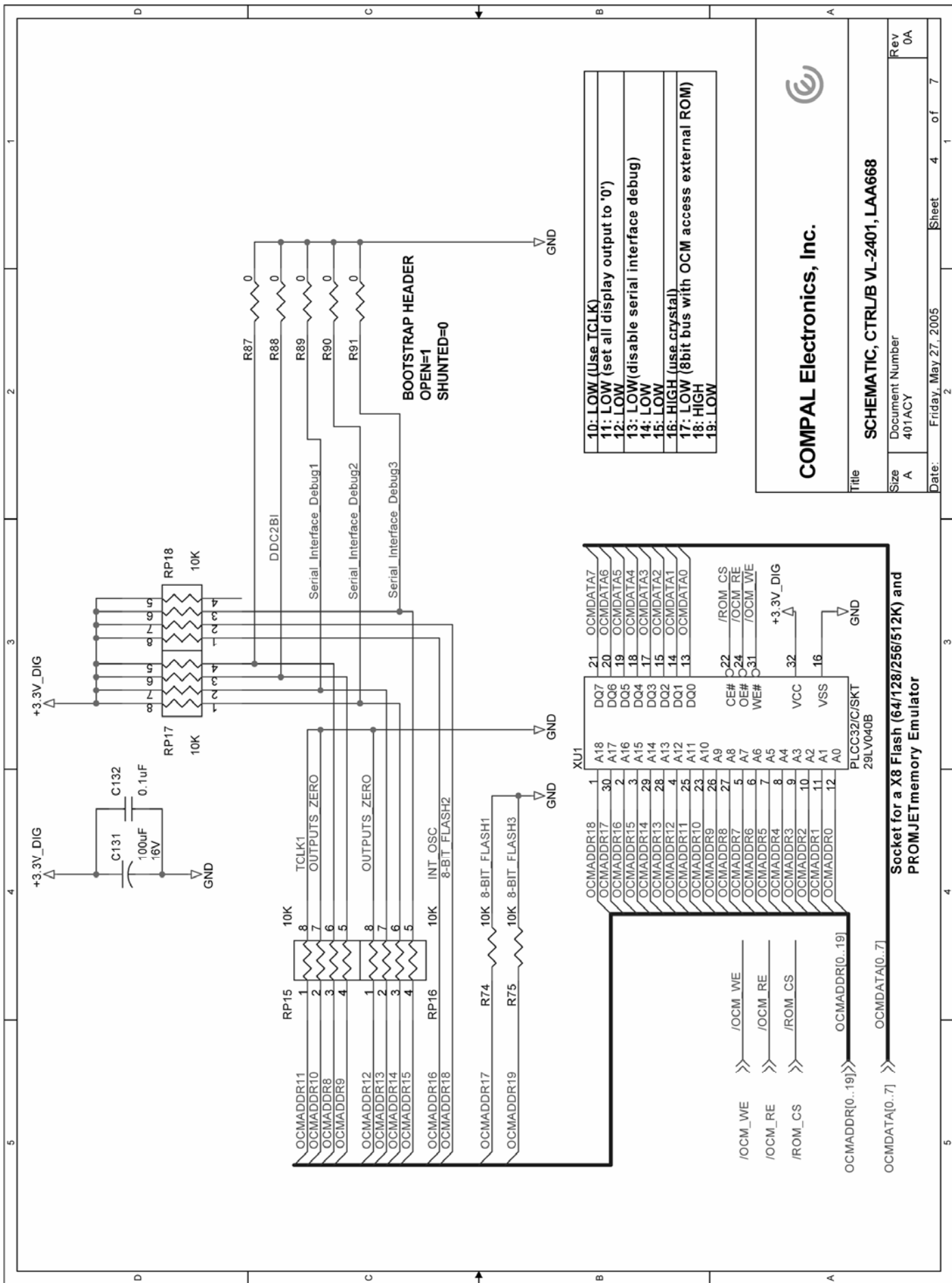


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File	SCHMATIC_CTRLB_VL-2401_LAA688
Doc	Document Number
C	475421
Date	2008.03.27.2008
Sheet	2 of 27

Gm1601 CF





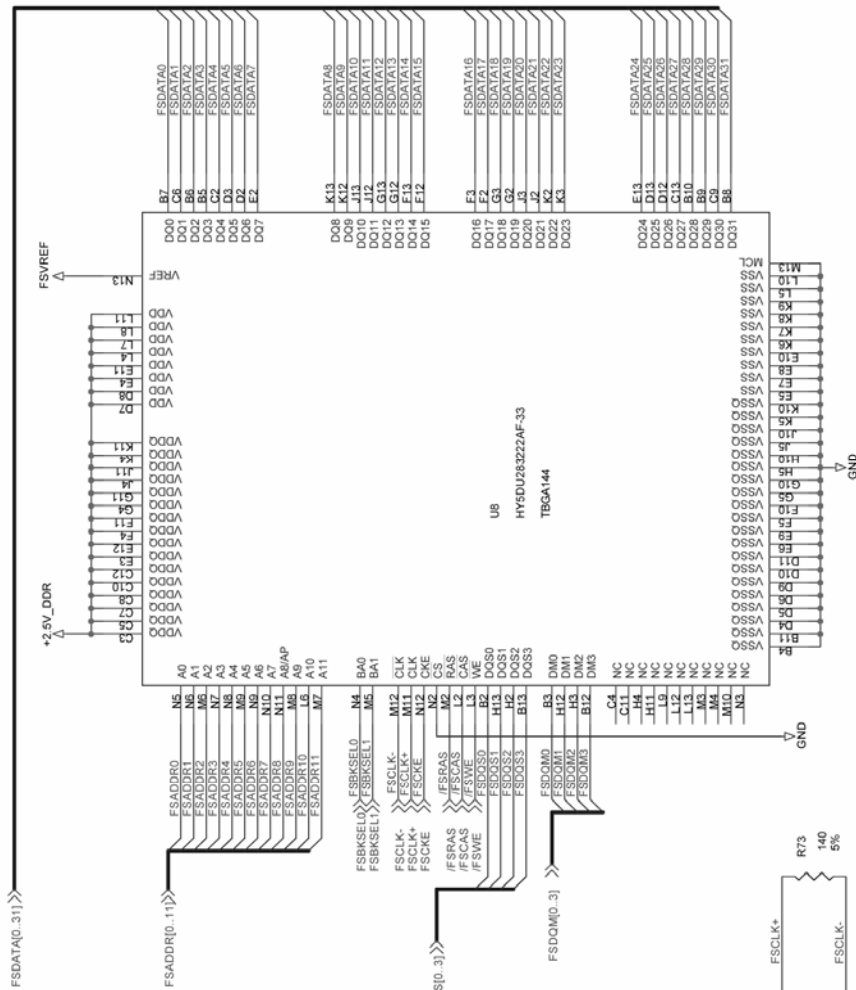
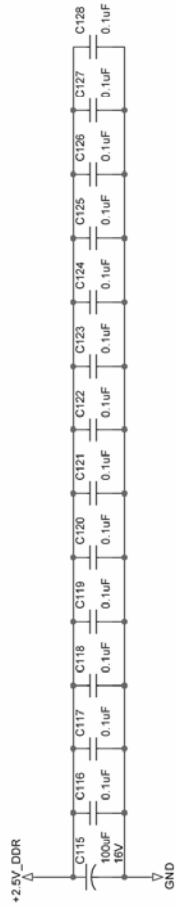
10: LOW (Use ICLK)
11: LOW (set all display output to '0')
12: LOW
13: LOW(disable serial interface debug)
14: LOW
15: LOW
16: HIGH (use crystal)
17: LOW (8bit bus with OCM access external ROM)
18: HIGH
19: LOW



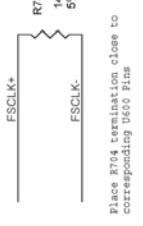
COMPAL Electronics, Inc.

Title	
SCHEMATIC, CTRL/B VL-2401, LAA668	
Size	Document Number
A	401ACY
Date:	Friday, May 27, 2005
Sheet	4 of 7
Rev	0A

Socket for X8 Flash (64/128/256/512K) and PROMJETmemory Emulator



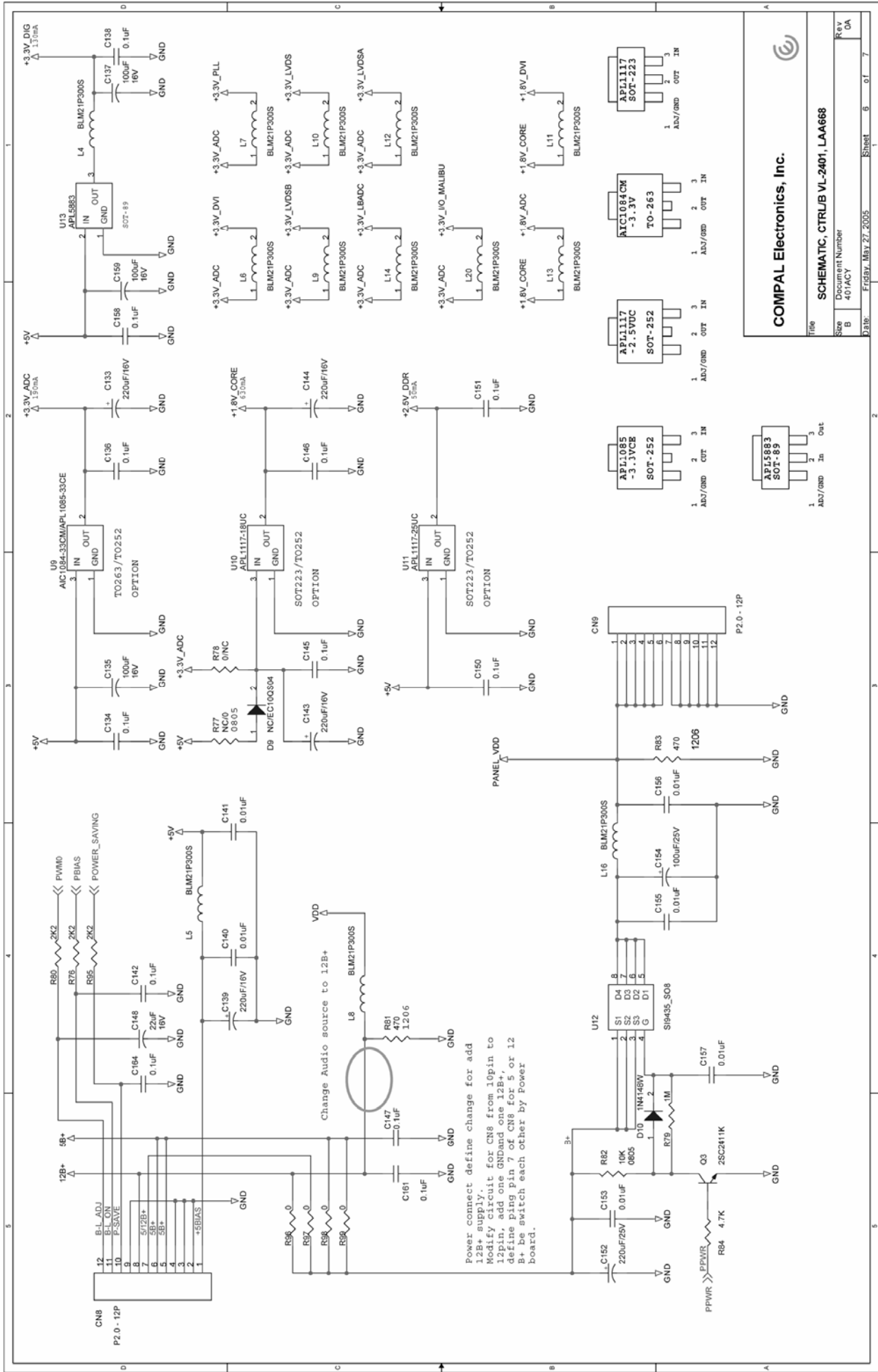
Place series termination resistances very close to 0600



Place R704 termination close to corresponding U600 Pins

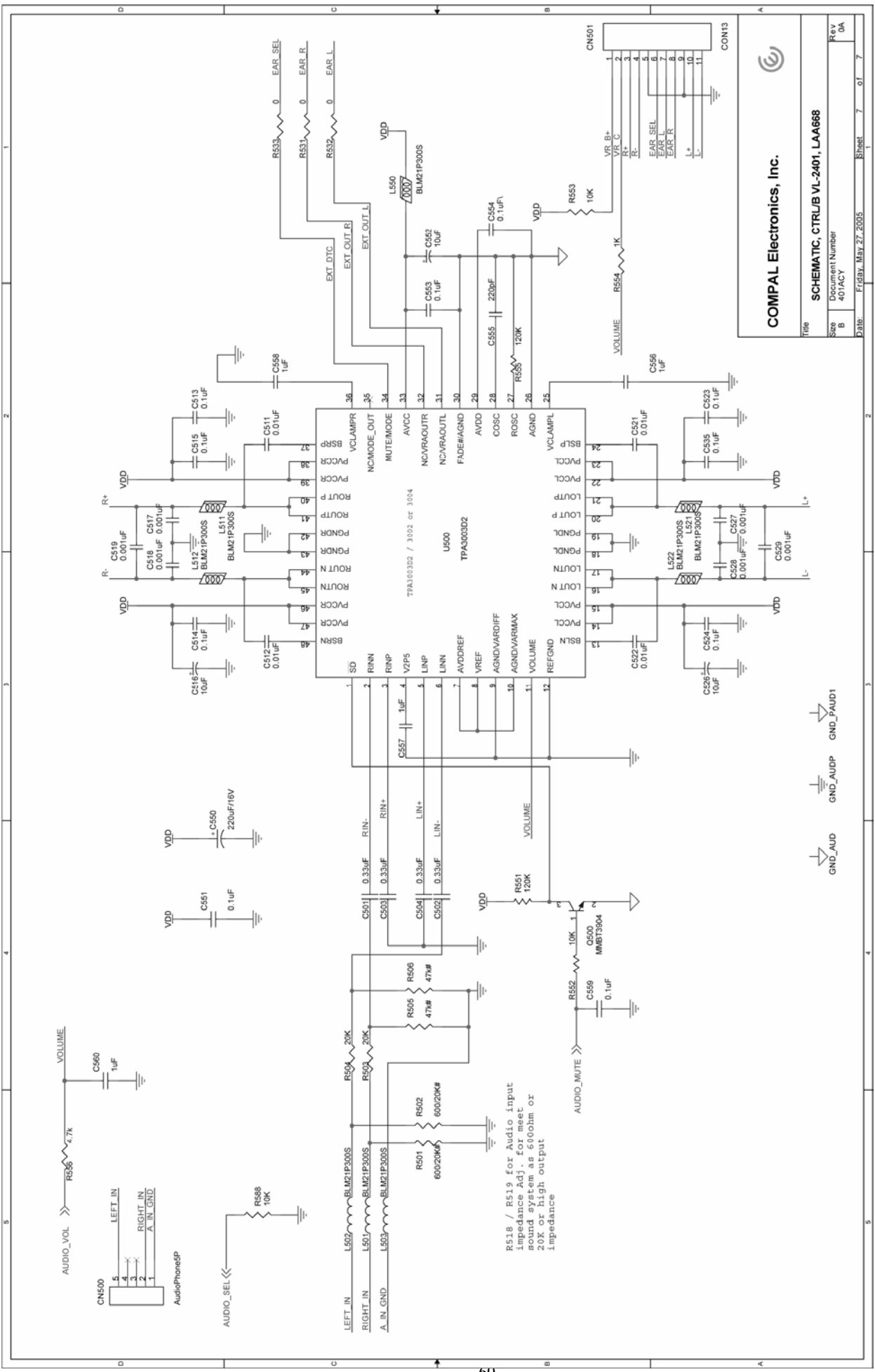
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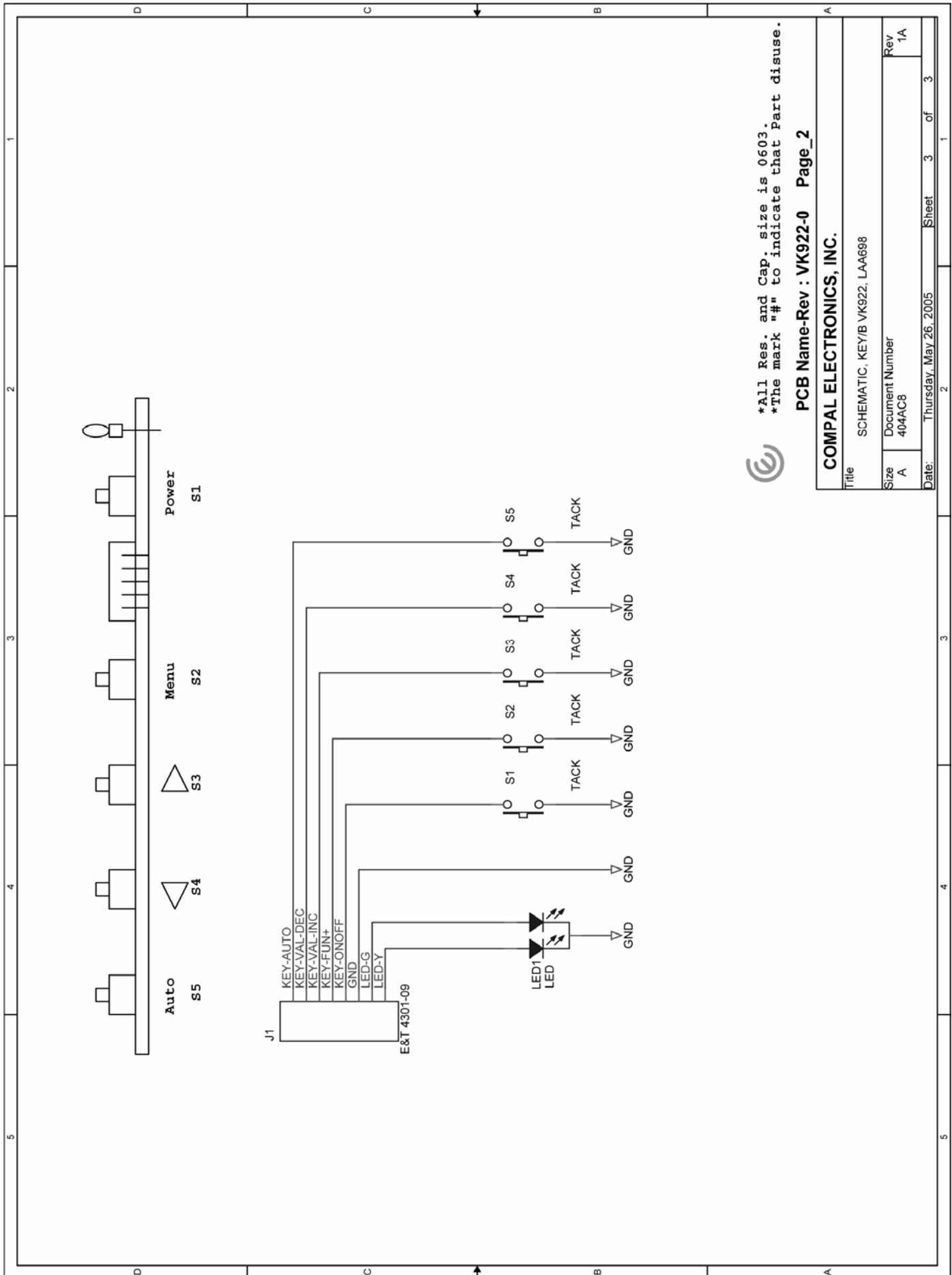
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*All Res. and Cap. size is 0603.
 *The mark "#" to indicate that Part disuse.

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