

Service Manual

LCD Monitor Acer B243HL

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Appendix : User’s manual

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Acer B243HL Service Manual

Important Safety Notice

1. Safety precautions

This monitor is manufactured and tested on a ground principle that a user's safety comes first. However, improper used or installation may cause damage to the monitor as well as to the user.

Warning:

- This monitor should be operated only at the correct power sources indicated on the label on the rear of the monitor. If you're unsure of the power supply in you residence, consult your local dealer or Power Company.
- Do not try to repair the monitor by yourself, as it contains no user-serviceable parts. This monitor should only be repaired by a qualified technician.
- Do not remove the monitor cabinet. There are high-voltage parts inside that may cause electric shock to human bodies.
- Stop using the monitor if the cabinet is damaged. Have it checked by a service technician.
- Put your monitor only in a lean, cool, dry environment. If it gets wet, unplug the power cable immediately and consult your closed dealer.
- Always unplug the monitor before cleaning it. Clean the cabinet with a clean, dry cloth. Apply non-ammonia based cleaner onto the cloth, not directly onto the class screen.
- Do not place heavy objects on the monitor or power cord.

2. Product safety notice

Many electrical and mechanical parts in this chassis have special safety visual inspections and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Before replacing any of these components read the parts list in this manual carefully. The use of substitute replacement parts, which do not have the same safety characteristics as specified in the parts list, may create shock, fire, or other hazards.

3. Service notes

- When replacing parts or circuit boards, clamp the lead wires around terminals before soldering.
- Keep wires away from high voltage, high temperature components and sharp edges.
- Keep wires in their original position so as to reduce interference.
- Adjustment of this product please refers to the user' manual.

01 Product Specification

1. General:

Acer B243HL is designed with LVDS interface and VGA/DVI-D input, it featured with embedded universal AC power supplies and audio input. It's a green product and meets all ROHS standard. The power button and display control buttons are on the front of the monitor. The monitors shall automatically to display lower resolution video modes into 1920x1080 full screen display. The image can be adjusted through OSD control. It support HDCP and color management function.

1.1 Main Features

1.1.1 For AUO M240HW01-V0 panel

Maximum resolution	: 1920(x3) x 1080 @ 60Hz
Back light system	: 2 bar Led
Pixel pitch	: 276.75 um (H) x 276.75 um (V)
Display area	: 531.36mm (H) x 298.89mm (V)
Brightness	: 250cd/m ² (TYP.)
Contrast ratio	: 1000:1 (TYP.)
ACM	:80000:1 (Max)
Response time (Tr+Tf)	: 5ms (TYP. ON/OFF)
Viewing angle	: 170° (H)/ 160°(V), (TYP.)
Input interface	: Analog (D-sub 15 pin) Digital Option (DVI-D 24 pin)
Power management	: Compatible with VESA DPMS
Plug & Play	: VESA DDCCI
OSD language	: English, French, Spanish, Italian, Deutsch, Simplified Chinese, Traditional Chinese, Japanese (Dutch, Finnish, Russian depend on sale region)
Universal AC power supply	

1.1.2 Other main function features

- Input interface : VGA/DVI/USB upstream
- VGA input : D-Sub
- DVI input : DVI-D
- USB : Support USB2.0 (optional function)

1.2 Accessories

AC Power Cord	: 1.8 m. (Black. Cord type depend on sale region)
VGA cable	: 1.8 m. (15 pin D-SUB, black cable with blue male connector)
User manual	: English (640Mb CD)
DVI cable (option)	: 1.8 m. (18+1 pin, black cable with white connector)

USB cable(option) : 1.8m.(4pin, black cable with white connector)

Audio cable(option) : 1.8m.(green cable with white connector)

2. Operation Specifications

The unit should suffer no visible cosmetic damage and should operate with no degradation in display quality during exposure to the operating conditions and after exposure to the non-operating conditions, in any sequence.

2.1 Environmental conditions

Operating	Specification
Low Temperature	0°C (Relative Humidity is as low as possible), 12 hrs.
High Temperature	+40°C / 20% R.H., 12 hrs.
High Humidity	+32°C/ 80% R.H., 12 hrs
Altitude	12,000 feet at 25°C (hold 3.5 hrs)
Storage	
Low Temperature	-30°C / humidity not controlled
High temperature & low humidity	+65°C/ 10% R.H.
Test Profile	+25°C/ 50%R.H.(2hrs)-> -30°C/ No R.H.(12hrs).-> +41°C/ 90% R.H.(12hrs)->+65°C/ 10% R.H.(12 Hrs)->+25°C/ 50% R.H.(2hr)
Max. Wet Bulb Temp	39°C
Altitude	40,000 feet at -30 °C (hold 1 hr)

Notice:1.Altitude Ramp rate: <= 3,500 feet per minute

2. Packed properly with PE bag, cushion material, carton & seal tape
3. power off when test storage

2.2 Safety, EMC, Ergonomics and Compatibility Requirements

Items	Description						
	UL/c	CB	TUV/G	CCC			Other
Safety	•	•	•	•			
EMC	FCC	CE	CCC	VCCI-B			
	•	•	•	•			
Ergonomics	TCO	TCO03					
	•	•					
Compatibility	Windows		Windows 2000		Windows	Windows	
	•		•		•	•	
Power Management	Energy Star						
	•						

2.3 Electrostatic Discharge Requirements

Item	Condition	Spec	
Electrostatic Discharge	IEC61000-4-2(EN55024)	Contact discharge: 4KV	
		Contact discharge: 8KV	•
		Air discharge : 8KV	
		Air discharge : 15KV	•

2.4 Reliability

Items	Condition	Spec	Note
MTBF	Operating condition is 25°C	>15,000 Hours	
LED Life time	Stable condition at 25°C	15,000 Hours(Typ)	Note1

Note1. Operating with fixed driving current.

3. Electrical and Optical Characteristics and Performance

3.1 Main Power Supply

3.1.1 Input characteristics

Items	Condition	Spec	Note
AC Input Voltage range	Universal input full range	90~264Vac	
AC Input Voltage rating	Universal input full range	100~240Vac	
AC input frequency range	90~264Vac	47~63Hz	
AC input frequency rating	100~240Vac	50~60Hz	
AC Input Current	100Vac	1.5A(max)	
	240Vac	0.6A(max)	
Inrush Current	115Vac,cold star,25°C	35A (max)	See Note2
	230Vac,cold star,25°C	70A(max)	
AC-DC power Efficiency	DC output full loading	≥80%	

Note2. Before each test, the buck capacitor need to be discharged.
 Before each test, it must be 10 minutes at least after the latest test.
 Hot star not component be damaged.

3.1.2 Output characteristics

Items	Condition	Spec	Note	
Ripple and Noise	+25V output	<1500mv	With system See note 3	
	+5V output	<300mv		
	Audio 5V output	<500mv		
	USB +5V output	<150mv		
		+25V output	<480mv	With dummy Load
		+5V output	<100mv	
		Audio 5V output	<100mv	
		USB +5V output	<100mv	
DC Output Voltage	25V loading:0.1A~0.8A 5V loading:0.75A~3.2A Audio 5V: 0A~1A USB 5V: 0A~2A	Vcc25V: 23.5V~29V Vcc5V: 4.85V~5.35V Audio 5V: 4.5V~5.5V USB 5V: 4.75V~5.25V	For system active	
	25v loading:0A 5V loading: 0.1A	Vcc25V: 23.5V~30V Vcc5V: 4.85V~5.35V	For power saving or DC off	
DC output loading capability		Vcc5V/3.2A, Vcc25V/0.8A Audio 5V: 1A USB 5V: 2A		
Rise Time		<50mS		
Dynamic load change				
Hold-up time	AC input: 100V~240V	>10mS		
Overshoot		<10%		
Turn on delay time		2S		
Power management			See Table-1	

Note3: Paralleled a 0.1uF ceramic Cap. And 47uF aluminum Cap. Between the end of DC loading side,
 Measured band-width=20MHz. Ripple voltage of +25V is less than 1500mv when enter into burst mode.

3.1.3 Protection characteristics

Protection	Condition	Spec
OPP(Over current protection)	nominal AC input	60W (min)
SCP(short circuit protection)	with auto-recovery function	
OVP(Over voltage protection)	Auto recovery	<output capacitor voltage
OTP(Over temperature protection)	NA	
Fuse protection	NA	

Table-1

Status	H-sync	V-sync	Video	Power	LED
Power on	on	on	active	≤ 50W	Blue
Power Saving	off	on	blanked	< 2W	Amber
	on	off	blanked	< 2W	Amber
	off	off	blanked	< 2W	Amber
Power Off	--	--	--	< 1W	Off

3.2 Backlight Power Supply

Panel: M240HW01-V6

Items	Specification
Lamp	2 Bar LED
Input Voltage	23.5---29V
Input current	0.6A (Typ.),0.8A (Max.)
On/Off switch level	3.6V V on 2.0 V (on) -0.3v ≤ V off ≤ 0.8 V (off)
Brightness PWM Duty (ACM Off)	30%~100%
Brightness PWM Duty (ACM On)	1%~100%
LED Voltage	42.9Vrms (Typ.), 44.2Vrms(Max)
LED Current	20mA (Type.)
	25mA (Max.)
Efficiency	>75%

Note: Other panels please refer to the reference panel specs.

3.3 Brightness output

The test to verify specifications in this section shall be performed under the following standard conditions unless otherwise noted.

Temperature	: 25 ± 5°C
Test pattern	: white
Video Resolution	: 1920 x 1080
Video input level	: 700 mV ± 2%
Warm-up time	: 30 minutes

Set brightness control and also contrast control at maximum, to measure the screen center, the light output shall $BL \geq 200 \text{ cd/m}^2$.

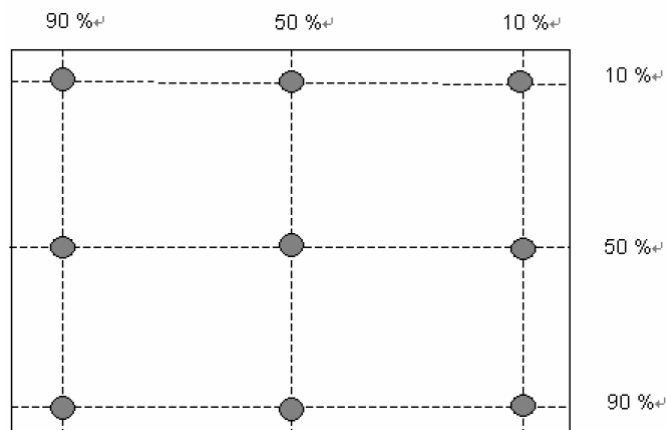
3.4 White balance

The test standard conditions refer to Sec 3.3. (Brightness and contrast are under default value)

Mode		Chromaticity Coordinate	
		x	y
Cool	9300K	0.283 ± 0.030	0.297 ± 0.030
Warm	6500K	0.313 ± 0.030	0.329 ± 0.030
User		Panel While x	Panel While y

3.5 Brightness uniformity

The test standard conditions refer to Sec 3.3.



$$\frac{\text{Min. luminance of nine points (backlight)}}{\text{Max. luminance of nine points (backlight)}} \geq 75\%$$

4. Input / Output Signal Specifications

4.1 AC in

- 4.1.1 AC Input Voltage: 100~240VAC
- 4.1.2 AC Input Current: 1.2A @100Vac, 0.6A @240Vac
- 4.1.3 AC Frequency Range: 50~60Hz

4.2 Audio in

- 4.2.1 Input impedance : 10K ohm
- 4.2.2 Frequency response range : 200Hz ~ 10kHz

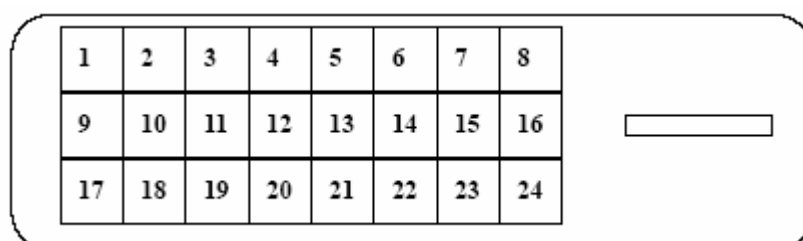
4.3 USB in

The USB 2.0 includes 4 pins:

pin1:VBUS; pin2:DM; pin3:DP; pin4:GND

4.4 DVI-D in

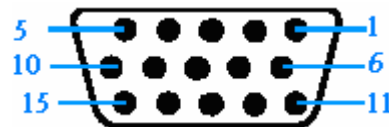
DVI-D Connector Pin assignment:



Pin	Symbol	Pin	Symbol
1	TMDS Data 2-	16	Hot Plug Detect
2	TMDS Data 2+	17	TMDS Data 0-
3	TMDS Data 2/4 shield	18	TMDS Data 0+
4		19	TMDS Data 0/5 shield
5		20	
6	DDC Clock	21	
7	DDC Data	22	Clock shield
8	Analog Vertical Sync	23	Clock +
9	TMDS Data 1-	24	Clock -
10	TMDS Data 1+		
11	TMDS Data 1/3 shield		
12	TMDS Data 3-		
13	TMDS Data 3+		
14	+5V Power		
15	GND		

4.5 VGA in

4.5.1 D-sub Connector Pin assignment:



Pin	Symbol
1	Red Video
2	Green Video
3	Blue Video
4	N/C
5	Ground
6	Red Ground
7	Green Ground
8	Blue Ground
9	PC +3.3/+5V
10	Sync. Ground
11	N/C
12	DDC SDA
13	H sync
14	V sync
15	DDC SCL

4.5.2 Signal SPEC:

Items	Condition	Specification
Analog RGB signal	Input impedance =75 Ohm	0.7Vp-p
Sync	Input impedance 1k Ohm	TTL level, Separate H/V-sync(+/-)
H-Sync Frequency		30K~80KHz
V-Sync Frequency		55~75Hz

4.6 Timing table

Mode	Resolution (active dot)	Resolution (total dot)	Horizontal Frequency (KHz)	Vertical Frequency (Hz)	Nominal Pixel Clock (MHz)	Write in EDID
	640x480@60Hz	800 x 525	31.469	59.941	25.175	23H
	640x480@72Hz	832 x 520	37.861	72.809	31.500	N/A
MAC	640x480@66.66Hz	864x525	35	66.66	30.24	23H
VESA	720x400@70Hz	900x449	31.469	70.087	28.322	23H
SVGA	800x600@56Hz	1024 x 625	35.156	56.250	36.000	23H
	800x600@60Hz	1056 x 628	37.879	60.317	40.000	23H
	800x600@72Hz	1040 x 666	48.077	72.188	50.000	N/A
	1024x600@60Hz	1312x622	37.320	60.000	48.964	N/A
XGA	1024x768@60Hz	1344x806	48.363	60.004	65.000	24H
	1024x768@70Hz	1328x806	56.476	70.069	75.000	24H
VESA	1152x864@75Hz	1600x900	67.5	75	108	26H~27H
	1280x960@60Hz	1800x1000	60	60	108	N/A
SXGA	1280x1024@60Hz	1688x1066	63.981	60.020	108.000	2EH~2FH
VESA	1280x720@60Hz	1650x750	44.955	59.940	74.176	N/A
WXGA	1280x800@60Hz	1680x831	49.702	59.810	83.500	28H~29H
	1360x768@60Hz	1792x795	47.712	60.015	85.500	N/A
WXGA+	1440x900@60Hz	1904x931	55.935	59.887	106.500	2AH~2BH
WSXGA+	1680x1050@60Hz	2240*1089	65.290	59.954	146.250	N/A
UXGA	1600x1200@60Hz	2160x1250	75.000	60.000	162.000	N/A
	1920x1080@60Hz	2576x1120	67.158	59.963	173.000	2C~2D
	1920x1080@60Hz	2200x1125	67.500	60.000	148.500	36H~46H
	1920x1080@60Hz	2080x1111	66.587	59.934	138.500	

- Note:
1. Non-interlace signals only (An interlace signal cannot be display)
 2. Please refer to F/W specification for more detail
 3. Each frequency of Power Macintosh and Sun Ultra is a reference value

4.7 Audio output SPEC

Items	Specification			TEST CONDITIONS
	Min	TYP	MAX	
Output power (W)	1.6	2.0	2.4	THD+N = 10%, T 1KHz 1Vrms
Output impedance (Ω)	3.4	4	4.6	AT 1KHz 1Vrms
Total harmonic distortion plus noise	---	---	10%	$P_o \leq 2.0W$
Signal to noise ratio (dB)	40	---	---	THD+N \leq 5%
PWM frequency (KHz)	200	250	300	

Note: The low pass RC Filter (R=100 Ω / C=0.047 μ F) for Class-D Output Power and THD+N Measurement

4.8 DDC data

EDID File Format : VESA's EDID Standard Version #3, Revision #0,

EDID Structure : Version #1, Revision #3.

EDID Data Table : See the attached table (for example)

4.8.1 VGA EDID table

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	04	72	D3	00	40	85	40	85
1	36	12	01	03	08	35	1D	78	EA	60	85	A6	56	4A	9C	25
2	12	50	54	B3	0C	00	71	4F	81	00	95	00	D1	C0	81	80
3	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
4	45	00	13	2A	21	00	00	1A	00	00	00	FC	00	42	32	34
5	33	48	4C	0A	20	20	20	20	20	20	00	00	00	FD	00	37
6	4B	1E	50	12	00	0A	20	20	20	20	20	20	00	00	00	FF
7	00	4C	38	35	34	4C	38	35	34	34	30	31	30	0A	00	CS

4.8.2 DVI EDID table

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	04	72	D3	00	40	85	40	85
1	36	12	01	03	80	35	1D	78	EA	60	85	A6	56	4A	9C	25
2	12	50	54	B3	0C	00	71	4F	81	00	95	00	D1	C0	81	80
3	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
4	45	00	13	2A	21	00	00	1A	00	00	00	FC	00	42	32	34
5	33	48	4C	0A	20	20	20	20	20	20	00	00	00	FD	00	37
6	4B	1E	50	12	00	0A	20	20	20	20	20	20	00	00	00	FF
7	00	4C	38	35	34	4C	38	35	34	34	30	31	30	0A	00	CS

5. Function Specifications

All the tests to verify specifications in this section shall be performed under the following standard conditions unless otherwise noted. The standard conditions are:

Temperature	: 25 ± 5°C
Warm-up time	: 30 minutes minimum
Checking display modes	: All the specified modes

5.1 Panel general specifications

5.1.1 General specifications

Item	Describe
Supplier	AUO
Model name	M240HW01-V6
Display Area	531.36 × 298.89
Pixel Pitch	276.75(Per one triad) × 276.75
Display Colors:	16.7M colors (RGB 6-bit + Hi_FRC)
Number of Pixel	1920 × 1080
Pixel Arrangement	R.G.B. Vertical Stripe
Brightness	250 cd/m ² (TYP.)
Contrast Ratio	1000 (TYP.)
Viewing Angle	170(Horizontal) / 160(Vertical)
Display Mode	Normally White
Frame rate	75
Response Time	5ms (TYP. ON/OFF)
Surface Treatment	Anti-Glare, 3H
Lamp	2 Bar LED
Outline Dimension	556.0(W) × 323.2(H) × 9.9(D) (TYP.)

5.1.2 LCD module defects

LCD module defects check follow to the IIS.

5.2 Keypad Function

5.2.1 Control buttons

[POWER]	Power on or power off the monitor
[▶], [◀]	A. When “Main OSD” displays, press these keys to change the contents of an adjustment item, or change an adjustment value B. When “Main OSD” un-displays, press [▶] to show “Audio” OSD and increase the volume, press [◀] to show “Audio” OSD and decrease the volume .
[MENU]	A. When “Main OSD” un-displays, press [MENU] to enter OSD interface. B. When “Main OSD” displays, press [MENU] to perform function of menu icon that is highlight or enter next level menu.
[AUTO]	A. When “Main OSD” un-displays, press [AUTO] to perform auto-adjustment B. When “Main OSD” displays, press [AUTO] to return to previous level menu C. When “Empowering Technology OSD” displays, press [AUTO] to exit the OSD
[e Color]	A. When “Main OSD” un-displays, press [e Color] to show “Empowering Technology OSD”. B. When “Main OSD” displays, press [e Color] to exit the OSD, and to show “Empowering Technology OSD”

5.2.2 Hot Key Operation

FUNCTION	HOT KEY OPERATION						DESCRIPTION
	e Color	AUTO	MENU	◀	▶	POWER	
FACTORY MODE	•					ON	Press [e], and then press [POWER] for DC power on. OSD menu will be shown with “F” on the left top. Select “F” for entering factory mode.

5.3 OSD Structure

The On-Screen Display (OSD) shall be an easy to use icon based menu through keypad OSD buttons or remote control unit. The unit shall leave the factory with all OSD controls set to their default values.

First	Second		Third	Control Range	Default Value	
Brightness	ACER eColor Management		e mpowering Technology	---	Standard mode	
	User		Contrast	0 ~ 100	User mode	50
					Text mode	50
					Standard mode	50
					Graphics mode	60
					Movie mode	56
			Brightness	0 ~ 100	User mode	77
					Text mode	44
					Standard mode	77
					Graphics mode	97
Movie mode	77					
ACM		OFF				
Image	Focus		---	0 ~ 100	Depend on each timing	
	Clock		---	0 ~ 100	50 ①	
Position	H. Position		---	0 ~ 100	50	
	V. Position		---	0 ~ 100	Depend on each timing	
Color	Warm (6500K)		---	---		
	Cool (9300K)		---	---		
	User	Red		0 ~ 100	80	
		Green		0 ~ 100	80	
Blue		0 ~ 100	80			
Language	NO-EMEA	EMEA				
	English	English	---	---	English	
	Deutsch	Deutsch	---	---		
	Español	Español	---	---		
	简体中文	Dutch	---	---		
	繁體中文	Russian	---	---		
	Français	Français	---	---		
	Italiano	Italiano	---	---		
日本語	Finnish	---	---			
OSD	H. Position		---	0 ~ 100	50	
	V. Position		---	0 ~ 100	50	
	OSD Timeout		---	10~ 120	20	
Input Source (Dual)	Analog		---	---	---	
	Digital		---	---	---	

	Wide Mode Full/ Aspect			Full
	DDC/CI ON/OFF			ON
Input Source (Analg only)	Wide Mode Full/ Aspect			Full
	DDC/CI ON/OFF			ON
Info	Resolution	---	---	---
	H. Freq	---	---	---
	V. Freq	---	---	---
	Analog/Digital Input	---	---	---
	S/N			ETL000....0000(22)
Reset	---	---	---	---
Exit	---	---	---	---

Notes: (1) Clock default 50 is for Visa timing. Others depend on timing.

(2) Depend on timing & S/N

6. SOP of firmware upgrade (Manufacturer of Scaler is Mstar)

6.1 Operational condition:

Equipment: PC, ISP card, signal cable and power cable.

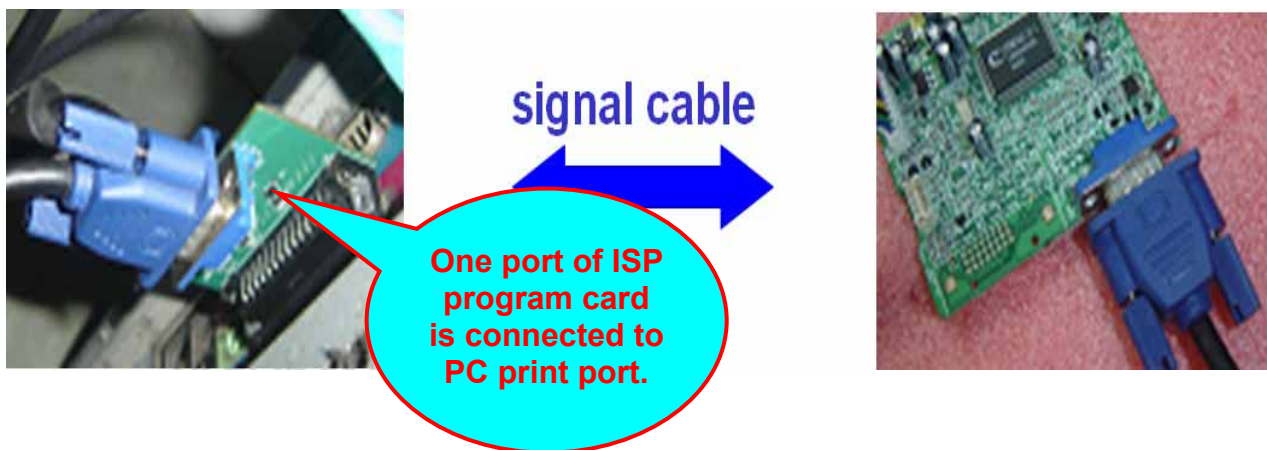
ESD requirements: antistatic wrists, antistatic gloves (fingers), and connecting cable

Name of ISP program: ISP_Tool_v3.7.5.exe

Manufacture of FW IC : PMC/SST/MX

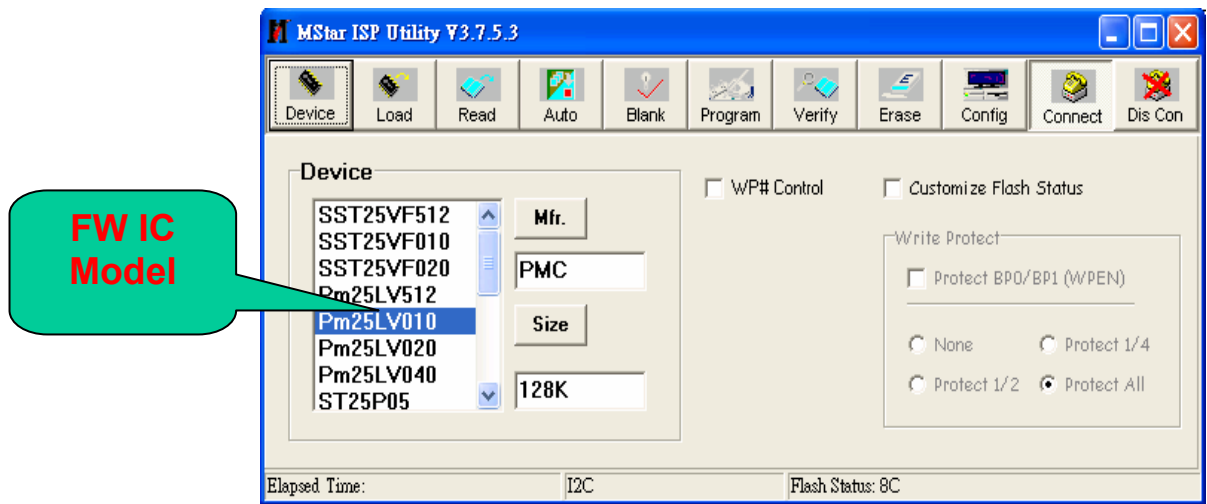
6.2 Operational steps:

1. Connection: connect PC to PCBA with signal cable, and then keep AC and DC in open state.



2. Adjust ISP programming

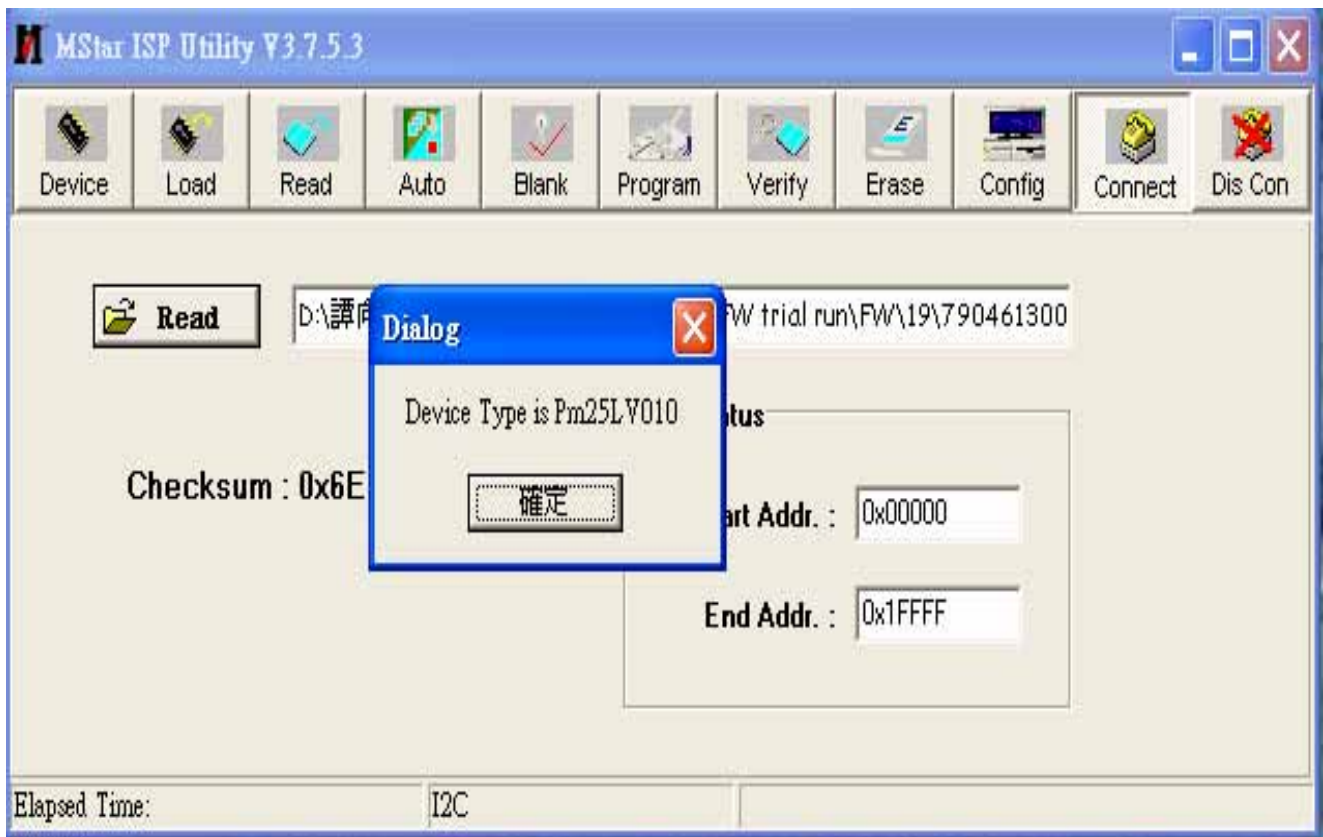
Firstly, double click ISP_Tool_v3.7.5EXE and open ISP program, then select "Device", next select manufacturer model of FW IC, which should be correspondent with that of PCBA FW IC. Double click Figure One.



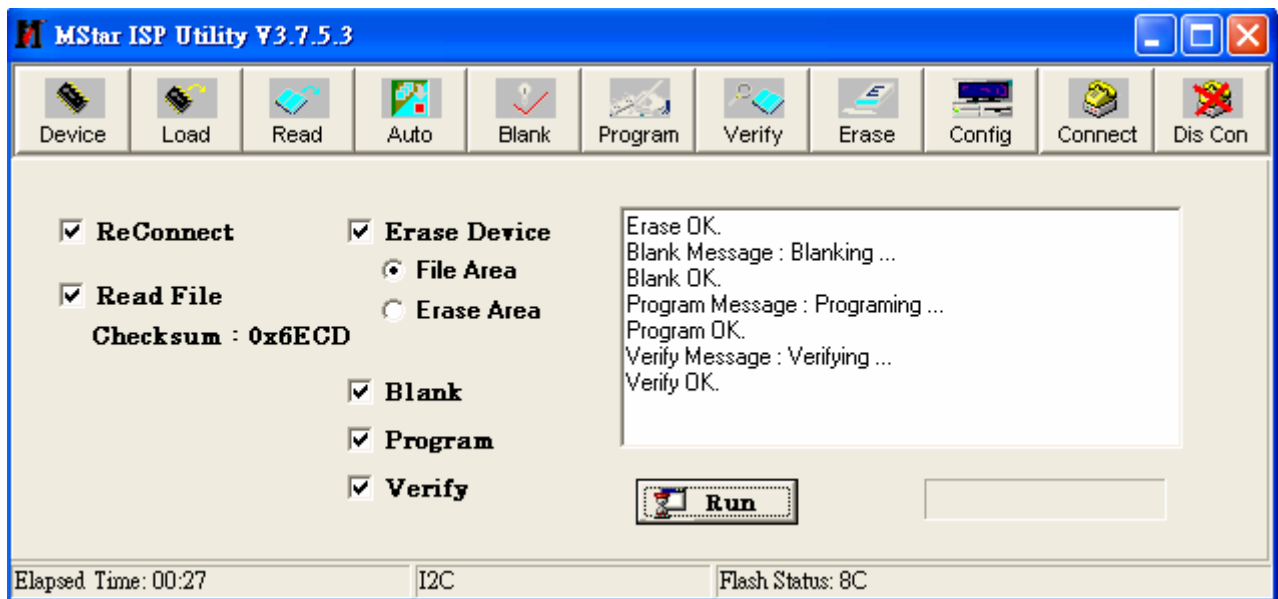
Secondly , download FW software: first select “READ”, and then load FW software in Router (Fig.2).



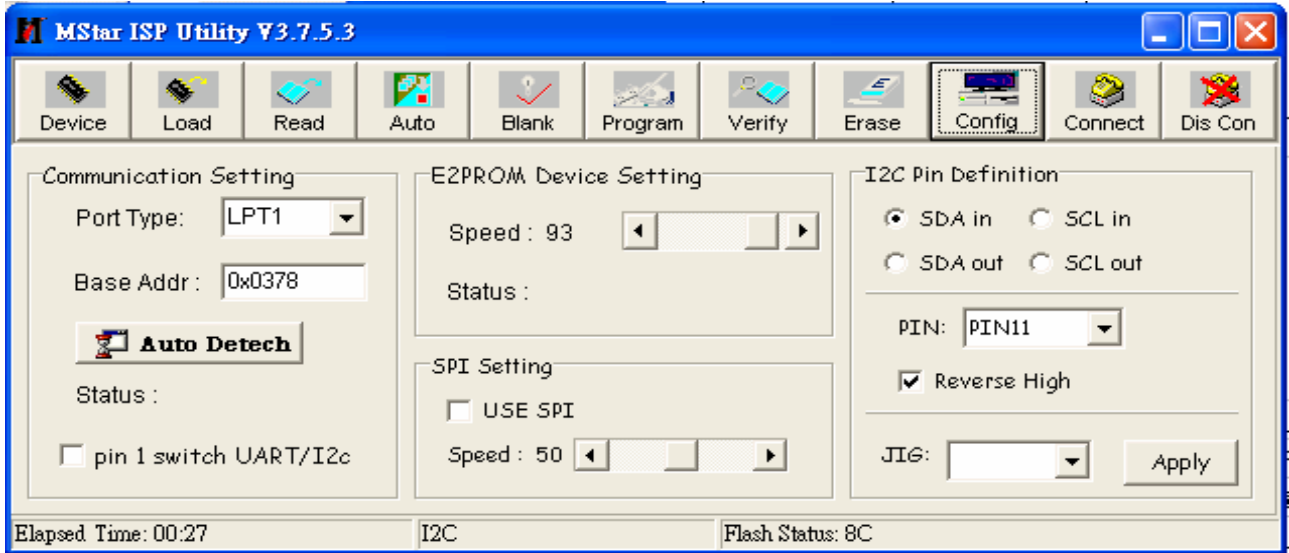
Thirdly, select “Connect” and enter ISP MODE as in the following Figure 3.



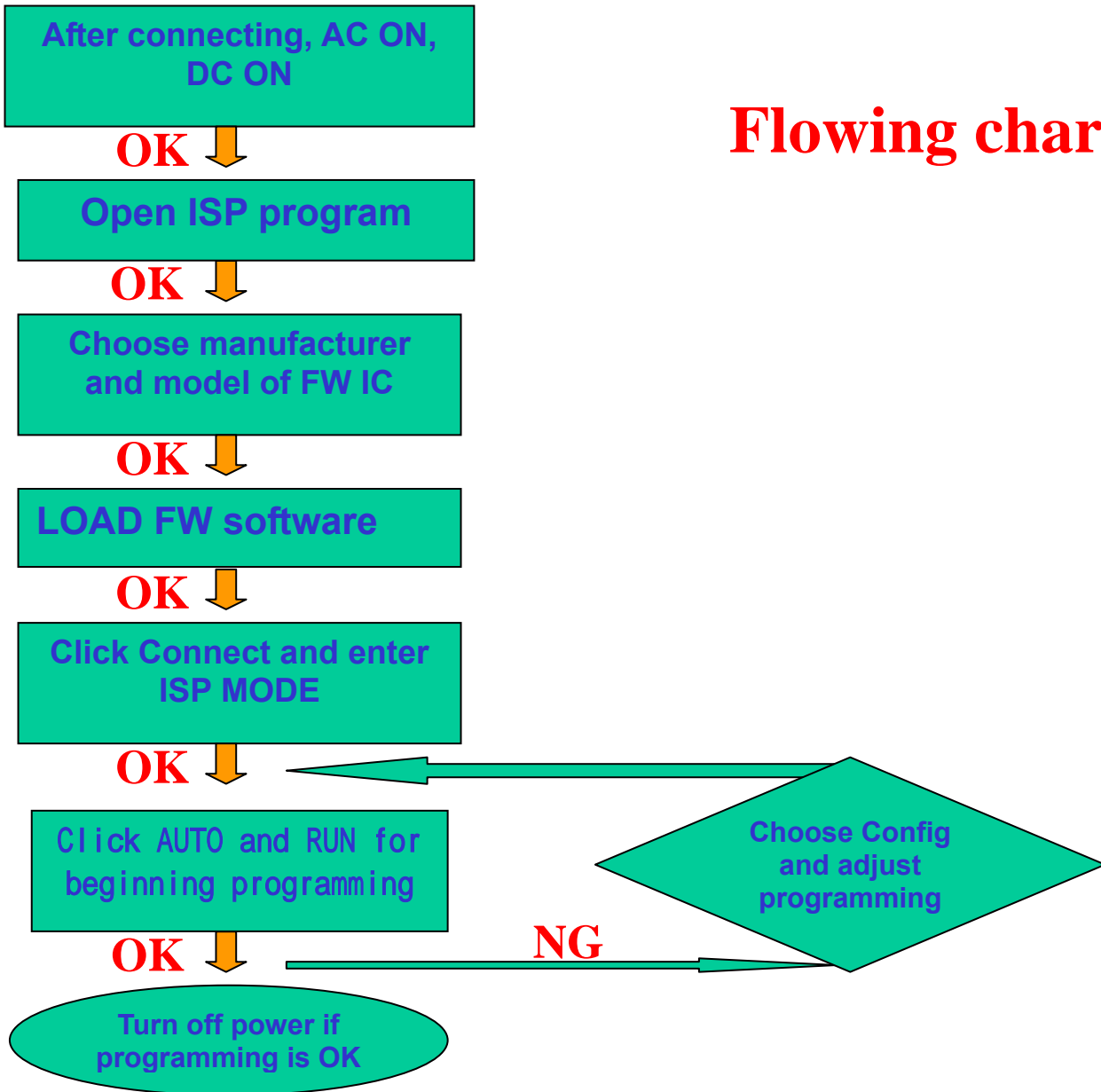
Fourthly, select “AUTO”, and keep its default value. Click “RUN” for beginning programming. There will be prompting if programming is OK.



Note: if programming fails or success rate is not high, click “Config” and adjust its speed in “E2PROM DEVICE SETTING”



Flowing chart



02. Flat Panel Specification



Product Specification

M240HW01 V6

AU OPTRONICS CORPORATION

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Product Specification

M240HW01 V6

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2.0 General Description

This specification applies to the 24 inch-FHD Color a-Si TFT-LCD Module M240HW01. The display supports the FHD - 1920(H) x 1080(V) screen format and 16.7M colors (RGB 6-bits + Hi-FRC data). The light source of this TFT-LCD module is W-LED. All input signals are 2-channel LVDS interface and this module doesn't contain a driver for backlight.

2.1 Display Characteristics

The following items are characteristics summary on the table under 25°C condition:

ITEMS	Unit	SPECIFICATIONS
Screen Diagonal	[mm]	609.7(24.0")
Active Area	[mm]	531.36 (H) x 298.89 (V)
Pixels H x V		1920(x3) x 1080
Pixel Pitch	[um]	276.75 (per one triad) x 276.75
Pixel Arrangement		R.G.B. Vertical Stripe
Display Mode		TN Mode, Normally White
White Luminance (Center)	[cd/m ²]	250 cd/m ² (Typ.)
Contrast Ratio		1000(Typ.)
Optical Response Time	[msec]	5ms (Typ., on/off)
Nominal Input Voltage VDD	[Volt]	+5.0 V (Typ)
Power Consumption (VDD line + LED line)	[Watt]	21W
Weight	[Grams]	2190 Typ.
Physical Size	[mm]	556.0(H)x323.2(V)x9.90(D)
Electrical Interface		Dual channel LVDS
Support Color		16.7M colors (RGB 6-bit + Hi_FRC)
Surface Treatment		Anti-Glare, 3H
Temperature Range		
Operating	[°C]	0 to +50
Storage (Shipping)	[°C]	-20 to +60
RoHS Compliance		RoHS Compliance

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2.2 Optical Characteristics

The optical characteristics are measured under stable conditions at 25°C:

Item	Unit	Conditions	Min.	Typ.	Max.	Note
Viewing Angle	[degree]	Horizontal (Right) CR = 10 (Left)	150	170	-	2
		Vertical (Up) CR = 10 (Down)	140	160	-	
Contrast ratio		Normal Direction	600	1000	-	3
Response Time	[msec]	Raising Time (T_{R})	-	3.5	7.4	4
		Falling Time (T_{F})	-	1.5	2.6	
		Raising + Falling	-	5	10	
Color / Chromaticity Coordinates (CIE)		Red x	0.608	0.638	0.668	5
		Red y	0.318	0.348	0.378	
		Green x	0.304	0.334	0.364	
		Green y	0.578	0.608	0.638	
		Blue x	0.120	0.150	0.180	
		Blue y	0.027	0.057	0.087	
Color Coordinates (CIE) White		White x	0.283	0.313	0.343	
		White y	0.299	0.329	0.359	
Central Luminance	[cd/m ²]		200	250	-	6
Luminance Uniformity	[%]		70	75	-	7
Crosstalk (in 60Hz)	[%]				1.5	8
Flicker	dB				-20	9

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1.0 Handling Precautions

- 1) Since front polarizer is easily damaged, pay attention not to scratch it.
- 2) Be sure to turn off power supply when inserting or disconnecting from input connector.
- 3) Wipe off water drop immediately. Long contact with water may cause discoloration or spots.
- 4) When the panel surface is soiled, wipe it with absorbent cotton or other soft cloth.
- 5) Since the panel is made of glass, it may break or crack if dropped or bumped on hard surface.
- 6) Since CMOS LSI is used in this module, take care of static electricity and insure human earth when handling.
- 7) Do not open or modify the Module Assembly.
- 8) Do not press the reflector sheet at the back of the module to any directions.
- 9) In case if a Module has to be put back into the packing container slot after once it was taken out from the container, do not press the center of the LED lightbar edge. Instead, press at the far ends of the LED light bar edge softly. Otherwise the TFT Module may be damaged.
- 10) At the insertion or removal of the Signal Interface Connector, be sure not to rotate nor tilt the Interface Connector of the TFT Module.
- 11) After installation of the TFT Module into an enclosure, do not twist nor bend the TFT Module even momentary. At designing the enclosure, it should be taken into consideration that no bending/twisting forces are applied to the TFT Module from outside. Otherwise the TFT Module may be damaged.
- 12) Small amount of materials having no flammability grade is used in the LCD module. The LCD module should be supplied by power complied with requirements of Limited Power Source (IEC60950 or UL1950), or be applied exemption.

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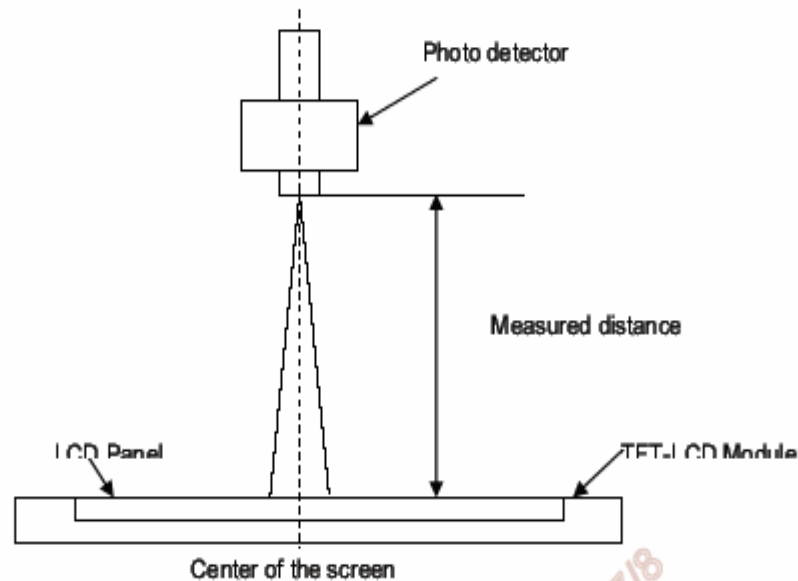
Product Specification

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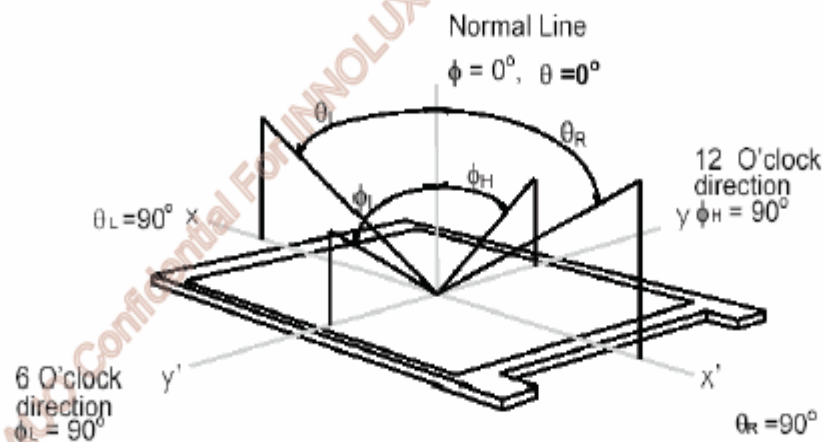
Note 1: Measurement method

The LCD module should be stabilized at given temperature for 30 minutes to avoid abrupt temperature change during measuring (at surface 35°C). In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 30 minutes in a stable, windless and dark room.



Note 2: Definition of viewing angle measured by ELDIM (EZContrast 88)

Viewing angle is the measurement of contrast ratio ≥ 10 , at the screen center, over a 180° horizontal and 180° vertical range (off-normal viewing angles). The 180° viewing angle range is broken down as follows; 90° (θ) horizontal left and right and 90° (ϕ) vertical, high (up) and low (down). The measurement direction is typically perpendicular to the display surface with the screen rotated about its center to develop the desired measurement viewing angle.

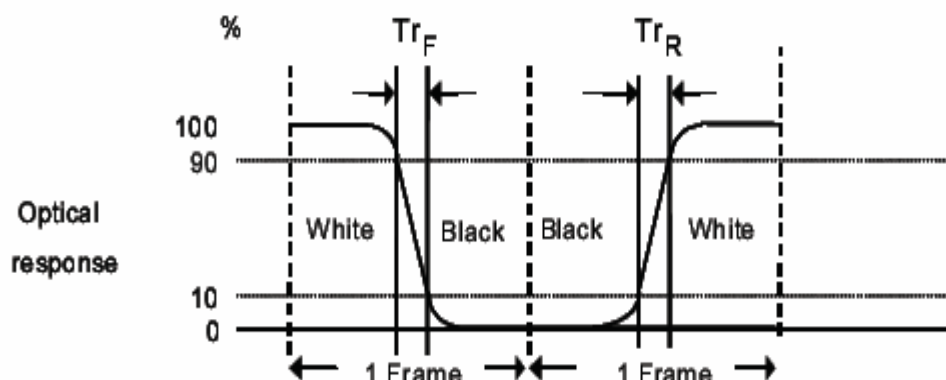




Note 3: Contrast ratio is measured by TOPCON SR-3

Note 4: Definition of Response time measured by Westar TRD-100A

The output signals of photo detector are measured when the input signals are changed from "Full Black" to "Full White" (rising time, T_{rR}), and from "Full White" to "Full Black" (falling time, T_{fF}), respectively. The response time is interval between the 10% and 90% (1 frame at 60 Hz) of amplitudes.

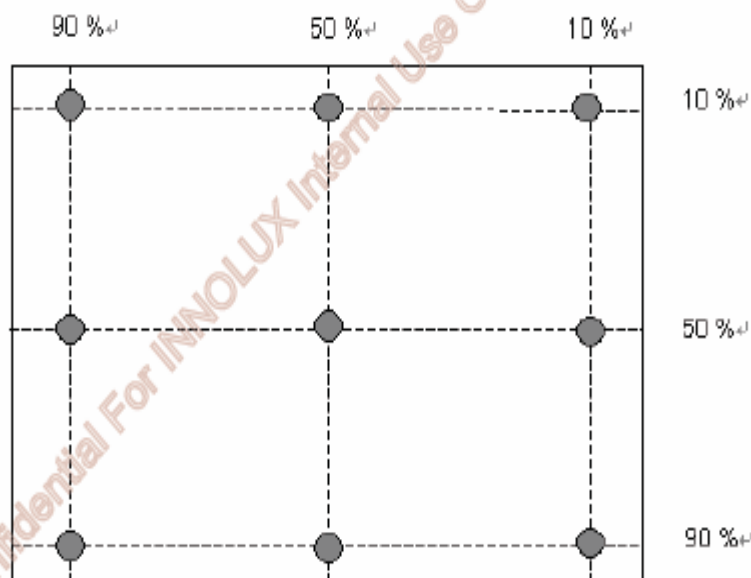


$T_{rR} + T_{fF} = 5 \text{ msec (typ.)}$.

Note 5: Color chromaticity and coordinates (CIE) is measured by TOPCON SR-3

Note 6: Central luminance is measured by TOPCON SR-3

Note 7: Luminance uniformity of these 9 points is defined as below and measured by TOPCON SR-3



$$\text{Uniformity} = \frac{\text{Minimum Luminance in 9 points (1-9)}}{\text{Maximum Luminance in 9 Points (1-9)}}$$



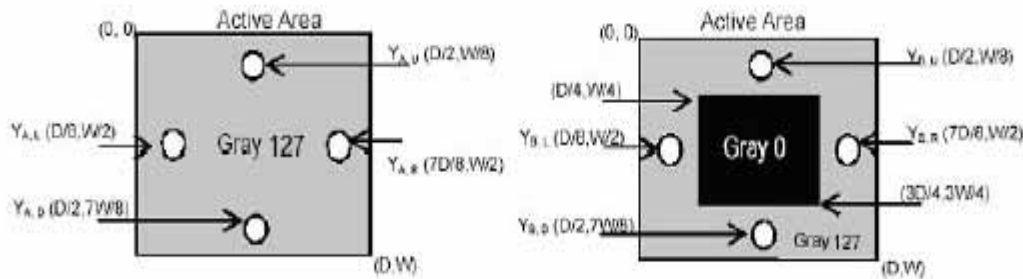
Note 8: Crosstalk is defined as below and measured by TOPCON SR-3

$$CT = |YB - YA| / YA \times 100 (\%)$$

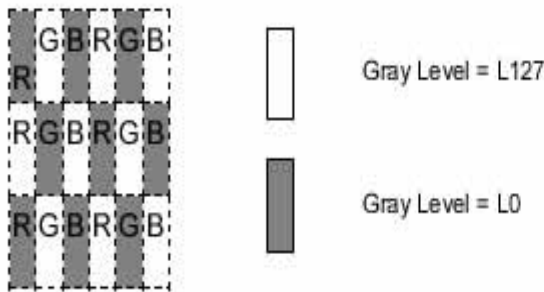
Where

YA = Luminance of measured location without gray level 0 pattern (cd/m²)

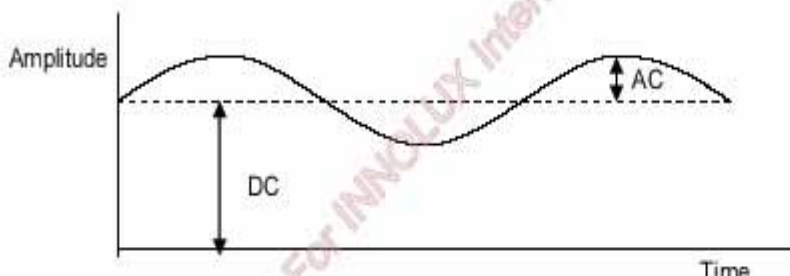
YB = Luminance of measured location with gray level 0 pattern (cd/m²)



Note 9: Test Pattern: Subchecker Pattern measured by TOPCON SR-3



Method: Record dBV & DC value with TRD-100



$$\text{Flicker (dB)} = 20 \log \frac{\text{AC Level (at 30 Hz)}}{\text{DC Level}}$$



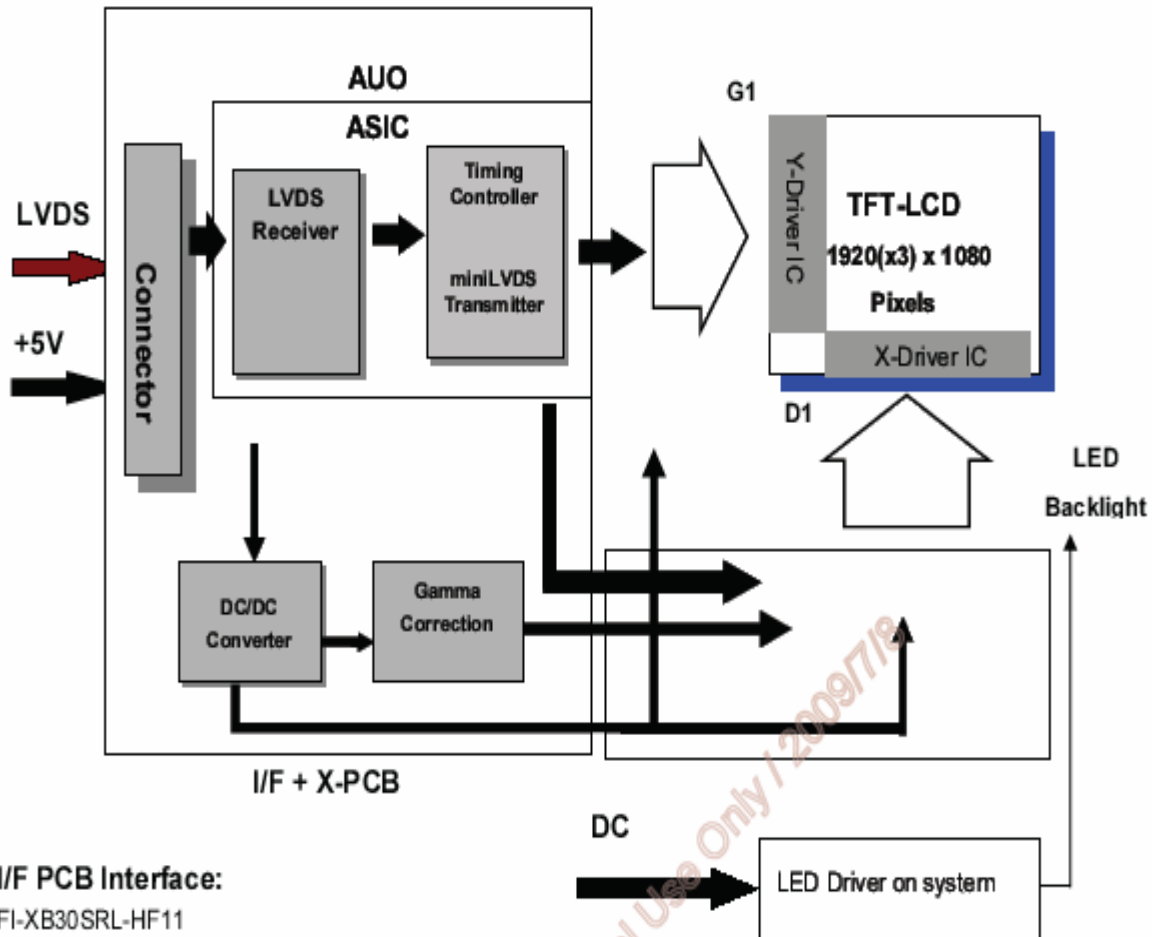
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3.0 Functional Block Diagram

The following diagram shows the functional block of the 24.0 inch Color TFT-LCD Module:



I/F PCB Interface:

FI-XB30SRL-HF11

093F30-B0T01A

Mating Type:

FI-X30HL(Locked Type)

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4.0 Absolute Maximum Ratings

Absolute maximum ratings of the module are as following:

4.1 TFT LCD Module

Item	Symbol	Min	Max	Unit	Conditions
Logic/LCD Drive Voltage	VDD	0	6.0	[Volt]	Note 1,2

4.2 Backlight Unit

Item	Symbol	Min	Max	Unit	Conditions
LED Current	ILED	NA	20	[mA]	Note 1,2

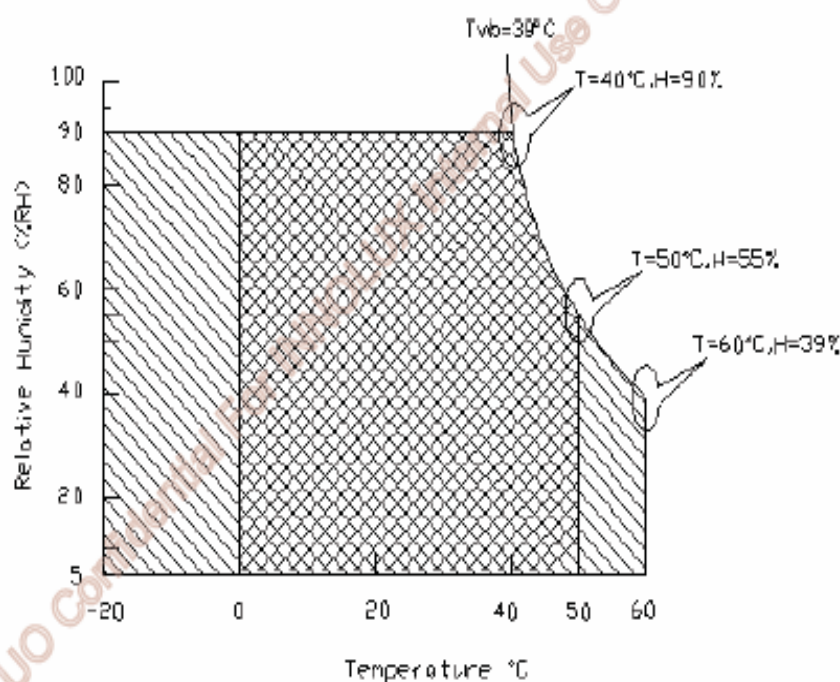
4.3 Absolute Ratings of Environment

Item	Symbol	Min.	Max.	Unit	Conditions
Operating Temperature	TOP	0	+50	[°C]	Note 3
Operation Humidity	HOP	5	90	[%RH]	
Storage Temperature	TST	-20	+60	[°C]	
Storage Humidity	HST	5	90	[%RH]	

Note 1: With in Ta (25°C)

Note 2: Permanent damage to the device may occur if exceeding maximum values

Note 3: For quality performance, please refer to AUO IIS(Incoming Inspection Standard).





5.0 Electrical characteristics

5.1 TFT LCD Module

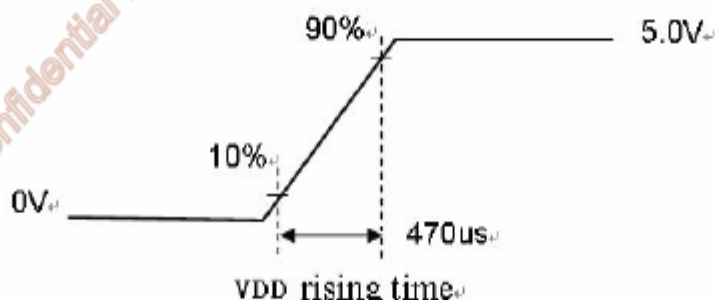
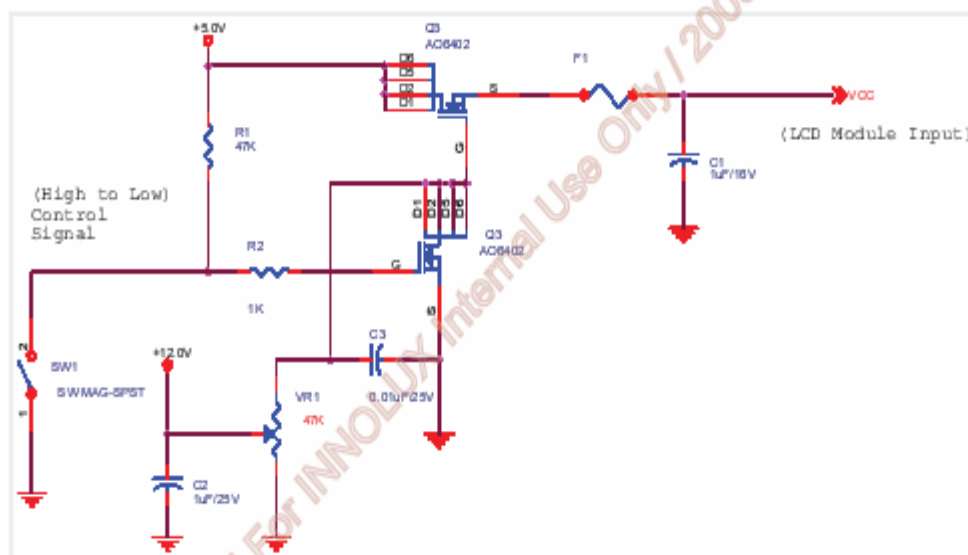
5.1.1 Power Specification

Input power specifications are as following:

Symbol	Parameter	Min	Typ	Max	Unit	Conditions
VDD	Logic/LCD Drive Voltage	4.5	5.0	5.5	[Volt]	+/-10%
IDD	Input Current	-	0.6	1.2	[A]	VDD= 5.0V, All black Pattern, At 60Hz
PDD	VDD Power	-	3	6	[Watt]	VDD= 5.0V, All black Pattern, At 60Hz
IRush	Inrush Current	-	-	3	[A]	Note 1
VDDrp	Allowable Logic/LCD Drive Ripple Voltage	-	-	300	[mV] p-p	VDD= 5.0V, All Black Pattern At 75Hz

Note 1: Measurement conditions:

The duration of rising time of power input is 470us.





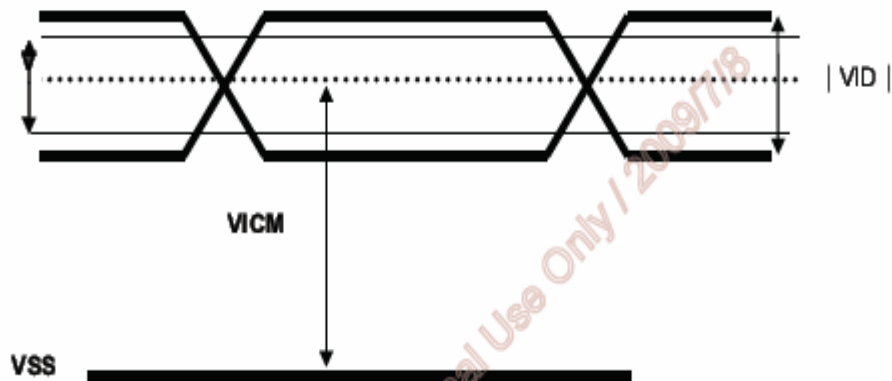
5.1.2 Signal Electrical Characteristics

Input signals shall be low or Hi-Z state when VDD is off. Please refer to specifications of SN75LVDS82DGG (Texas Instruments) in detail.

Characteristics of each signal are as following:

Symbol	Parameter	Min	Typ	Max	Units	Condition
VTH	Differential Input High Threshold	-	+50	+100	[mV]	VICM = 1.2V <i>Note 1</i>
VTL	Differential Input Low Threshold	-100	-50	-	[mV]	VICM = 1.2V <i>Note 1</i>
VID	Input Differential Voltage	100	-	600	[mV]	<i>Note 1</i>
VICM	Differential Input Common Mode Voltage	+1.0	+1.2	+1.5	[V]	VTH-VTL = 200mV (max) <i>Note 1</i>

Note 1: LVDS Signal Waveform





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5.2 Backlight Unit

Parameter guideline for LED driving is under stable conditions at 25°C (Room Temperature):

Symbol	Parameter	Min.□	Typ.	Max.	Unit	Note
$I_{R_{LED}}$	LED Operation Current	-	20	20	[mA]	Operating with fixed driving current
V_{LB}	Light Bar Operation Voltage (for reference)	-	42.9	44.2	[Volt]	
P_{BLU}	BLU Power consumption (for reference)	-	13.73	14.14	[Watt]	
LT_{LED}	LED life Time	-	15,000	-	[Hour]	

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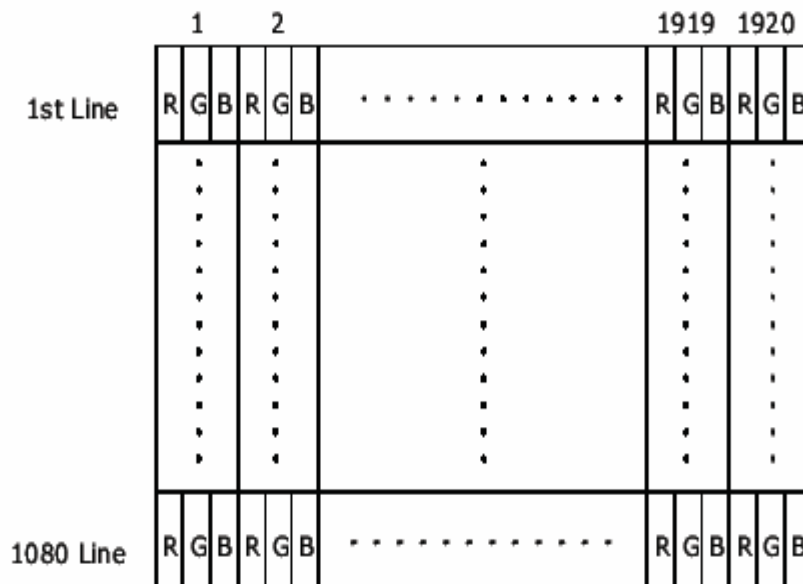
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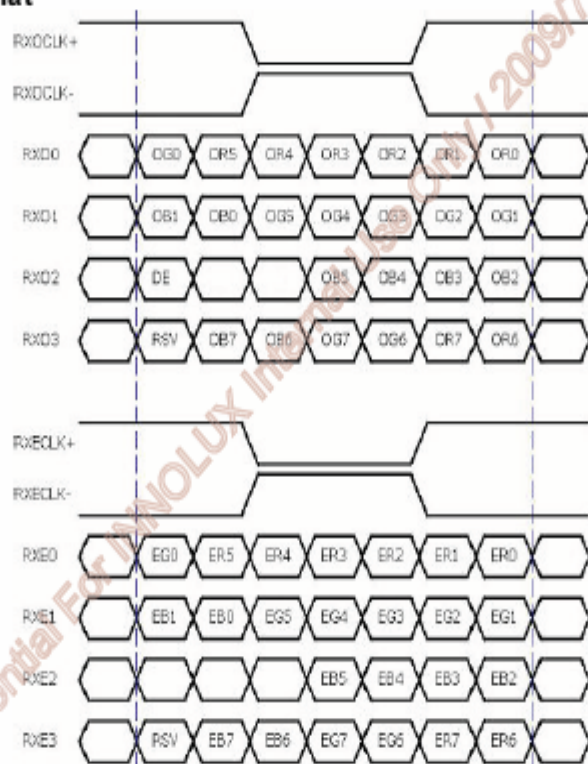
6.0 Signal Characteristic

6.1 Pixel Format Image

Following figure shows the relationship of the input signals and LCD pixel format.



6.2 The input data format



Note 1: R/G/B data 7:MSB, R/G/B data 0:LSB O = "Odd Pixel Data" E = "Even Pixel Data"



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6.3 Signal Description

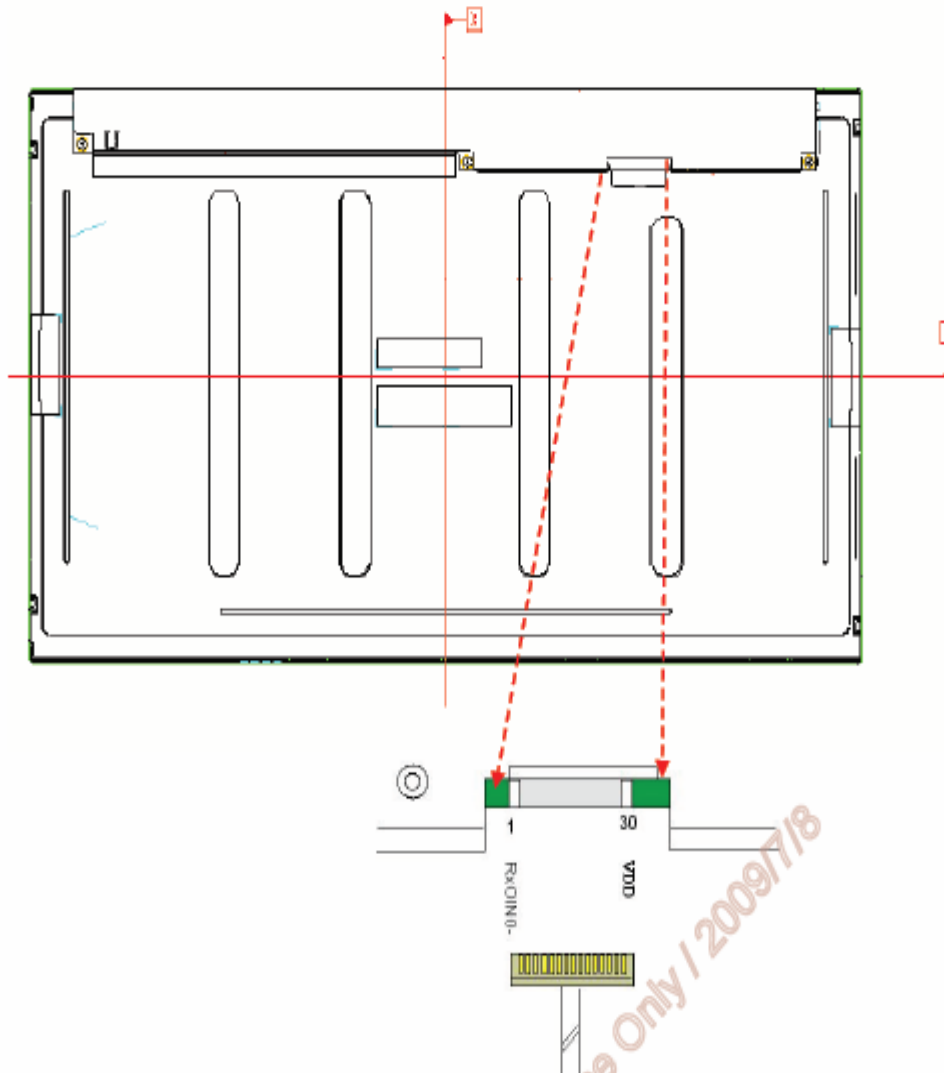
The module using one LVDS receiver SN75LVDS82(Texas Instruments). LVDS is a differential signal technology for LCD interface and high speed data transfer device. LVDS transmitters shall be SN75LVDS83(negative edge sampling). The first LVDS port(RxOxxx) transmits odd pixels while the second LVDS port(RxExxx) transmits even pixels.

PIN #	SIGNAL NAME	DESCRIPTION
1	RxOIN0-	Negative LVDS differential data input (Odd data)
2	RxOIN0+	Positive LVDS differential data input (Odd data)
3	RxOIN1-	Negative LVDS differential data input (Odd data)
4	RxOIN1+	Positive LVDS differential data input (Odd data)
5	RxOIN2-	Negative LVDS differential data input (Odd data, DSPTMG)
6	RxOIN2+	Positive LVDS differential data input (Odd data, DSPTMG)
7	GND	Power Ground
8	RxOCLK-	Negative LVDS differential clock input (Odd clock)
9	RxOCLK+	Positive LVDS differential clock input (Odd clock)
10	RxOIN3-	Negative LVDS differential data input (Odd data)
11	RxOIN3+	Positive LVDS differential data input (Odd data)
12	RxEIN0-	Negative LVDS differential data input (Even data)
13	RxEIN0+	Positive LVDS differential data input (Even data)
14	GND	Power Ground
15	RxEIN1-	Positive LVDS differential data input (Even data)
16	RxEIN1+	Negative LVDS differential data input (Even data)
17	GND	Power Ground
18	RxEIN2-	Negative LVDS differential data input (Even data)
19	RxEIN2+	Positive LVDS differential data input (Even data)
20	RxECLK-	Negative LVDS differential clock input (Even clock)
21	RxECLK+	Positive LVDS differential clock input (Even clock)
22	RxEIN3-	Negative LVDS differential data input (Even data)
23	RxEIN3+	Positive LVDS differential data input (Even data)
24	GND	Power Ground
25	NC	No connection (for AUO test only. Do not connect)
26	NC	No connection (for AUO test only. Do not connect)
27	VDD	Power +5V
28	VDD	Power +5V
29	VDD	Power +5V
30	VDD	Power +5V



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Note2: Input signals of odd and even clock shall be the same timing.



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6.4 Timing Characteristics

Basically, interface timing described here is not actual input timing of LCD module but close to output timing of SN75LVDS82DGG (Texas Instruments) or equivalent.

Item	Symbol	Min	Typ	Max	Unit	
Data CLK	Tclk	40	75	90	[MHz]	
H-section	Period	Th	1034	1060	2047	[Tclk]
	Display Area	Tdisp(h)	960	960	960	[Tclk]
	Blanking	Tblk(h)	74	100	1087	[Tclk]
V-section	Period	Tv	1088	1120	2047	[Th]
	Display Area	Tdisp(v)	1080	1080	1080	[Th]
	Blanking	Tblk(v)	8	40	967	[Th]
Frame Rate	F	50	60	75	[Hz]	

Note : DE mode only

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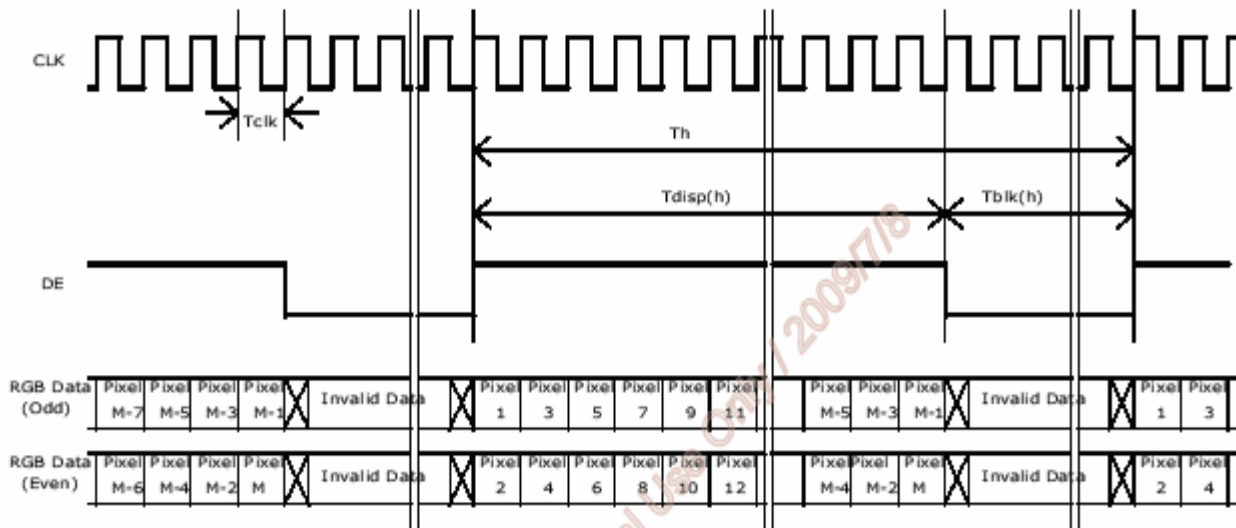
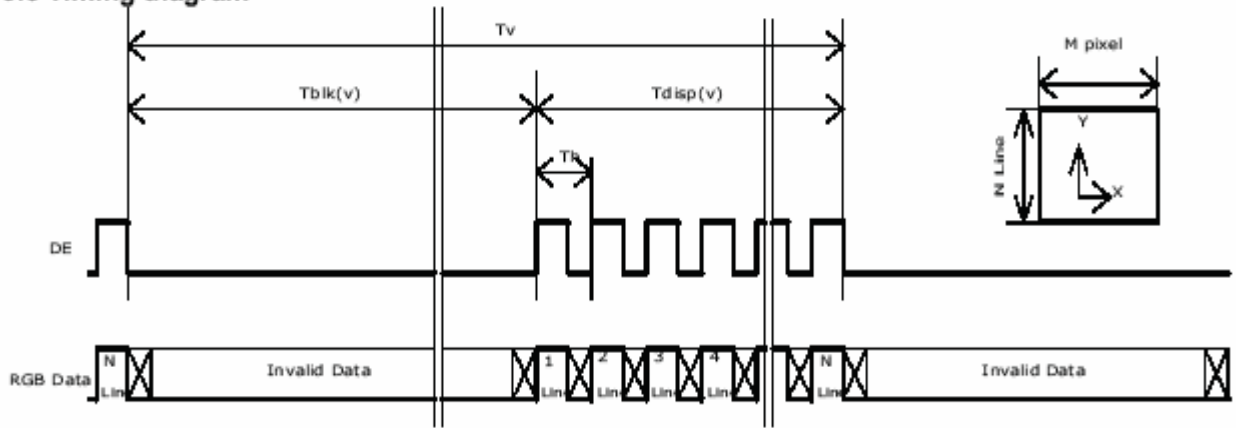


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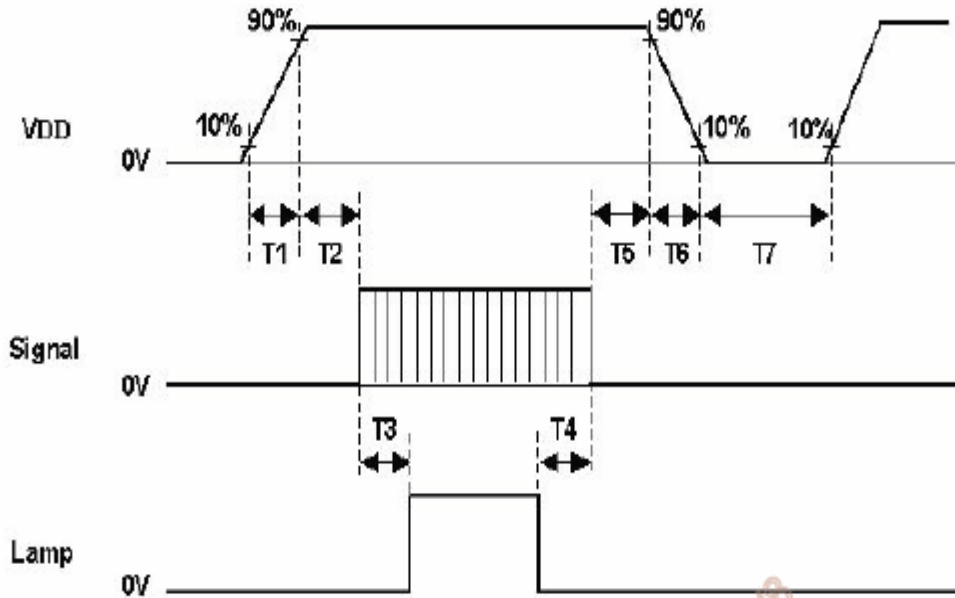
6.5 Timing diagram





6.6 Power ON/OFF Sequence

VDD power and lamp on/off sequence are as follows. Interface signals are also shown in the chart. Signals from any system shall be Hi-Z state or low level when VDD is off.



Parameter	Value			Unit
	Min.	Typ.	Max.	
T1	0.5	-	10	[msec]
T2	0	-	15	[msec]
T3	300	-	-	[msec]
T4	200	-	-	[msec]
T5	0	16	50	[msec]
T6	-	-	100	[msec]
T7	1000	-	-	[msec]

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7.0 Connector & Pin Assignment

Physical interface is described as for the connector on module. These connectors are capable of accommodating the following signals and will be following components.

7.1 TFT LCD Module

Connector Name / Designation	Interface Connector / Interface card
Manufacturer	JAE Starconn
Type Part Number	FI-XB30SRL-HF11 093F30-B0T01A
Mating Housing Part Number	FI-X30HL (Locked Type)

7.1.1 Pin Assignment

Pin#	Signal Name	Pin#	Signal Name
1	RxOIN0-	2	RxOIN0+
3	RxOIN1-	4	RxOIN1+
5	RxOIN2-	6	RxOIN2+
7	GND	8	RxOCLKIN-
9	RxOCLKIN+	10	RxOIN3-
11	RxOIN3+	12	RxEIN0-
13	RxEIN0+	14	GND
15	RxEIN1-	16	RxEIN1+
17	GND	18	RxEIN2-
19	RxEIN2+	20	RxECLKIN-
21	RxECLKIN+	22	RxEIN3-
23	RxEIN3+	24	GND
25	NC (for AUO test only. Do not connect)	26	NC (for AUO test only. Do not connect)
27	VDD	28	VDD
29	VDD	30	VDD



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7.2 Recommend connector for Backlight Unit

This connector is mounted on the monitor system board for LED light-bar FFC mating.

Connector Name / Designation	Driver Board Connector
Manufacturer	ENTERY INDUSTRIAL CO., LTD
Mating Type Part Number	6712K-F10N-02R

7.2.1 Pin assignment

Pin no.	Signal name
1	IRLED (current out)
2	IRLED (current out)
3	IRLED (current out)
4	IRLED (current out)
5	VLED (voltage in)
6	VLED (voltage in)
7	IRLED (current out)
8	IRLED (current out)
9	IRLED (current out)
10	IRLED (current out)

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8.0 Reliability Test

Environment test conditions are listed as following table.

Items	Required Condition	Note
Temperature Humidity Bias (THB)	Ta= 50°C , 80%RH, 300hours	
High Temperature Operation (HTO)	Ta= 50°C , 50%RH, 300hours	
Low Temperature Operation (LTO)	Ta= 0°C , 300hours	
High Temperature Storage (HTS)	Ta= 60°C , 300hours	
Low Temperature Storage (LTS)	Ta= -20°C , 300hours	
Vibration Test (Non-operation)	Acceleration: 1.5 Grms Wave: Random Frequency: 10 - 200 Hz Duration: 30 Minutes each Axis (X, Y, Z)	
Shock Test (Non-operation)	Acceleration: 50 G Wave: Half-sine Active Time: 20 ms Direction: ±X, ±Y, ±Z (one time for each Axis)	
Drop Test	Height: 46 cm, package test	
Thermal Shock Test (TST)	-20°C/30min, 60°C/30min, 100 cycles	1
On/Off Test	On/10sec, Off/10sec, 30,000 cycles	
ESD (Electro Static Discharge)	Contact Discharge: ± 8KV, 150pF(330Ω) 1sec, 15 points, 25 times/ point.	2
	Air Discharge: ± 15KV, 150pF(330Ω) 1sec 15 points, 25 times/ point.	
Altitude Test	Operation:10,000 ft Non-Operation:30,000 ft	

Note 1: The TFT-LCD module will not sustain damage after being subjected to 100 cycles of rapid temperature change. A cycle of rapid temperature change consists of varying the temperature from -20°C to 60°C, and back again. Power is not applied during the test. After temperature cycling, the unit is placed in normal room ambient for at least 4 hours before power on.

Note 2: EN61000-4-2, ESD class B: Certain performance degradation allowed
No data lost
Self-recoverable
No hardware failures.



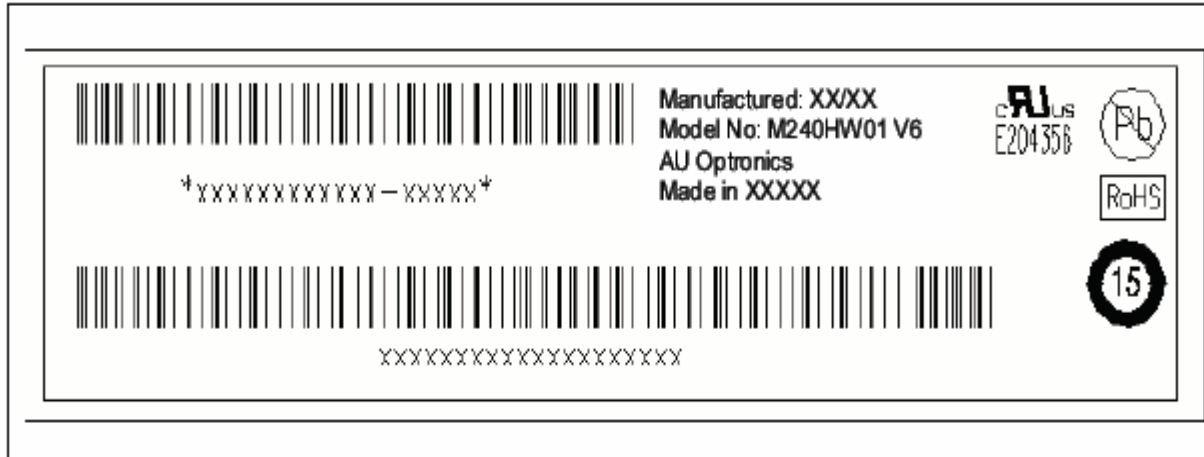
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9.0 Shipping Label

The label is on the panel as shown below:



Note 1: For Pb Free products, AUO will add  for identification.

Note 2: For RoHS compatible products, AUO will add  for identification.

Note 3: For China RoHS compatible products, AUO will add  for identification.

Note 4: The Green Mark will be presented only when the green documents have been ready by AUO Internal Green Team.

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03 Exploded Diagram




3.1 B243HL_SCREW_LIST




Item	Part No.	Description	Qty	Fixed T(kg*cm)	Remark
1	50914630610 2R	SCREW P CROSS W/W-SPR M3*6 Zn	1	3.75±0.25	FOR POWER
2	50900000070 0R	BOLT,#4-40x11.8,Ni	4	4.0 ± 0.25	D-SUB CON&DVI
3	50921660811 0R	SCREW,F,CROSS,M4*8,Zn,ROHS(NYLO K,35F)	4	10.5±0.25	For back-cover to STAND ASSY
4	509412610500 R	SCREW,B,CROSS,T.T-4*10,BLK ,ROHS	2	9.0±0.25	For hinge to stand-BACK
5	50911260610 0R	SCREW,P,CROSS,T.T4*6,Zn,ROHS	1	6.0±0.25	Plate base to Base
6	50914630620 0R	SCREW P CROSS W/WAS M3*6 ZN-Cc	6	3.75±0.25	FOR POWER&IF

3.2. LCD Exploded drawing (All)

05 Spare Pare parts List

ACER PART NO.	OEM PART NO	DESCRIPTION	8241Q172A120H NA
55.LH40J.001	793111300700H	PCBA,IF/B(V6,W/SPK,EMEA),LE24Q1-729	
19.LH40J.001	793111400720H	PCBA,P/I BOARD,W/SPK,LE24Q1-729	
19.LBN0J.001	791401500000R	PCBA,KEYPAD BOARD,LE9D0-612 ROHS	
55.LGK0J.003	792680300000H	PCBA,USB BOARD,LE24Q2	

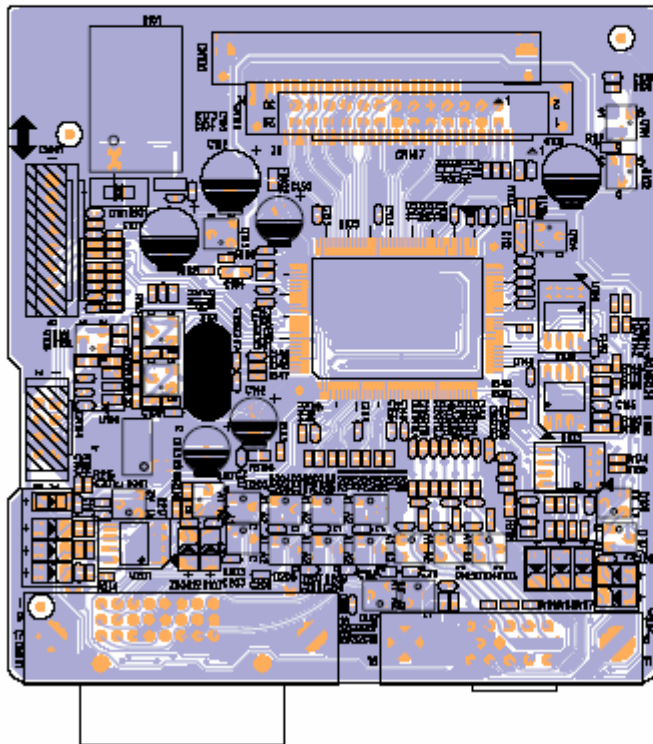
50.L63VF.003	453030300120R	CABLE AUDIO 1P 6FT BLACK/GREEN CP03B06P0	
50.LA10J.003	453030300370R	CABLE,DVI-D 18+1P MALE 6FT BLACK , ROHS	
50.LBQ0J.001	453010100380R	CABLE,D-SUB 15P MALE 6FT BLACK/BLUE, ROH	
50.D030J.001	453030300360R	CABLE,USB 6FT BLACK ,	
50.LGK0J.001	430303002440H	HRN LVDS FFC 30P 166.5MM W/ALUMINUM FO	
50.LGK0J.002	430300802940H	HRN ASSY 2x4P to 8P 275mm UL3302#28 Con	
50.LBP0J.001	430300801800R	HRN ASSY 2x4P 75mm UL1571#28,ROHS	
60.LH40J.001	714030030100R	ASSY,BEZEL,FRONT,B,PRINTING,LE24Q1	

60.LDPOJ.006	501020220030R	COVER HINGE,BLACK ,RIGHT,FOR ADJUST,LE19D	
60.LDPOJ.005	501020220031R	COVER HINGE,BLACK ,LEFT,FOR ADJUST,LE19D	
60.LH40J.002	501020236213R	BACK COVER,B,AUO THIN LED,W/DVI+VGA+USB,	
60.LH40J.003	501260214700R	STAND,B,,LE24Q1	
60.LH40J.004	701000018213R	ASSY,CHASSIS,B,AUO THIN LED,W/DVI+VGA+US	
LK.24005.016	631102240320HA	LCP 24"M240HW01-V6-00(A)(AUO)HF	

06 Schematics and Layouts

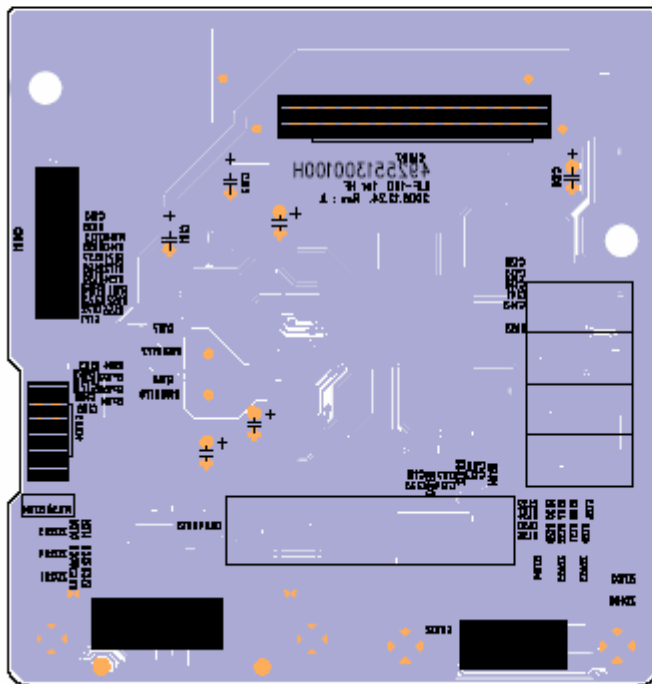
6.1 IF BD Layout

LAYER	SILKSCREEN TOP			
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FILE NAME :	ILIF-100 for HF	DATE :	2008.12.24.	

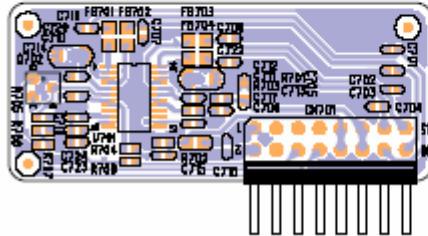


I/F BD Layout

LAYER	SILKSCREEN BOTTOM			
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FILE NAME :	ILIF-100 for HF	DATE :	2008.12.24.	



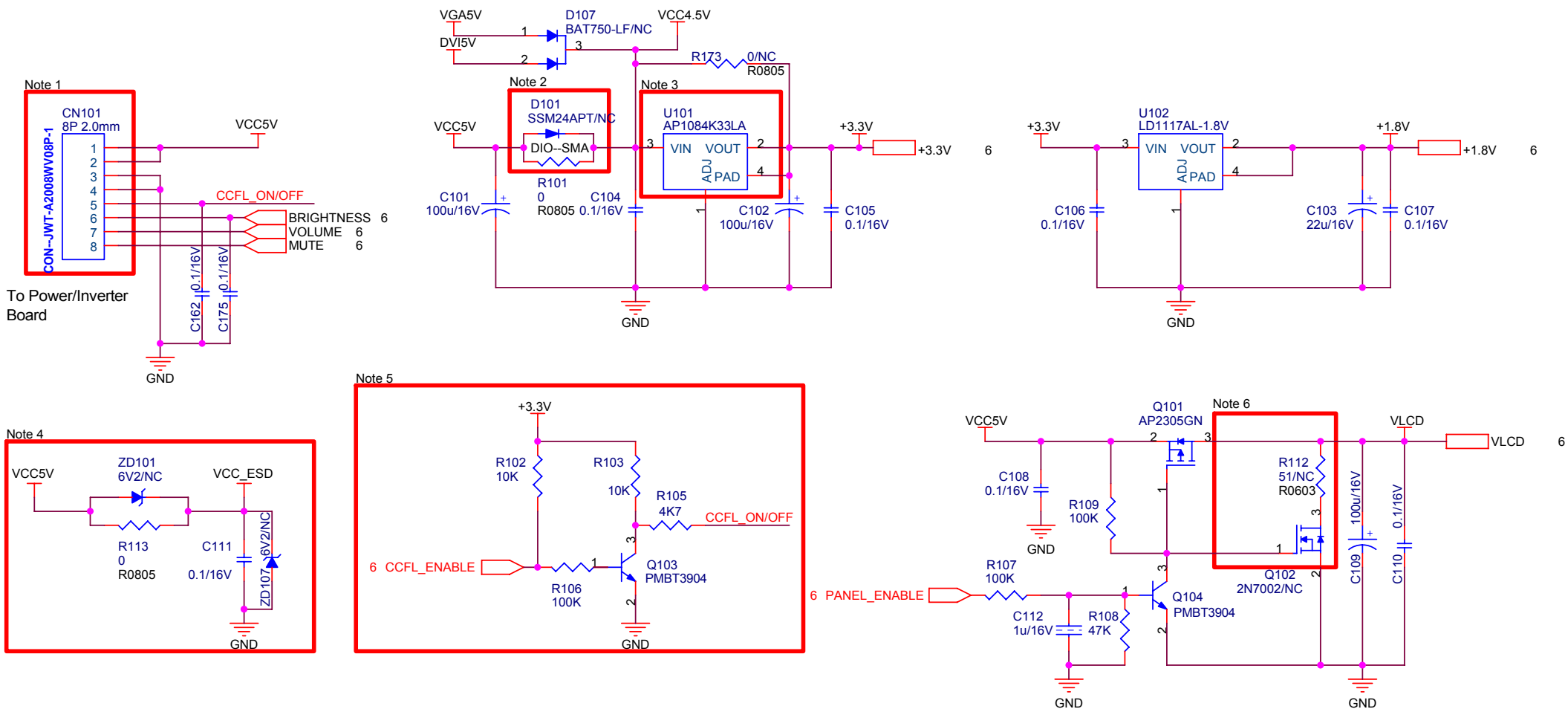
LAYER	SILKSCREEN TOP		
PCB NO :	492032300000H	REV :	A DESIGNER: LIU HUA
FILE NAME :	ILA-004 for HF .PCB	DATE :	2009.01.09.



LAYER	SILKSCREEN BOTTOM		
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FILE NAME :	ILA-004 for HF .PCB	DATE :	2009.01.09.

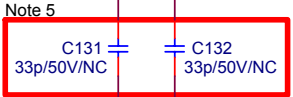
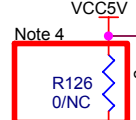
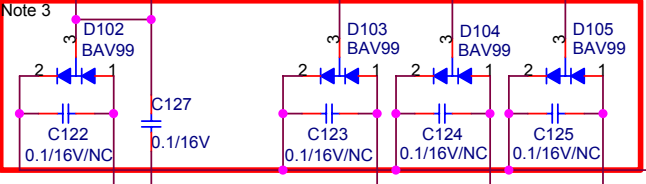
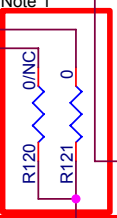
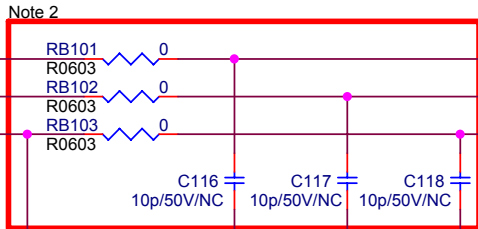
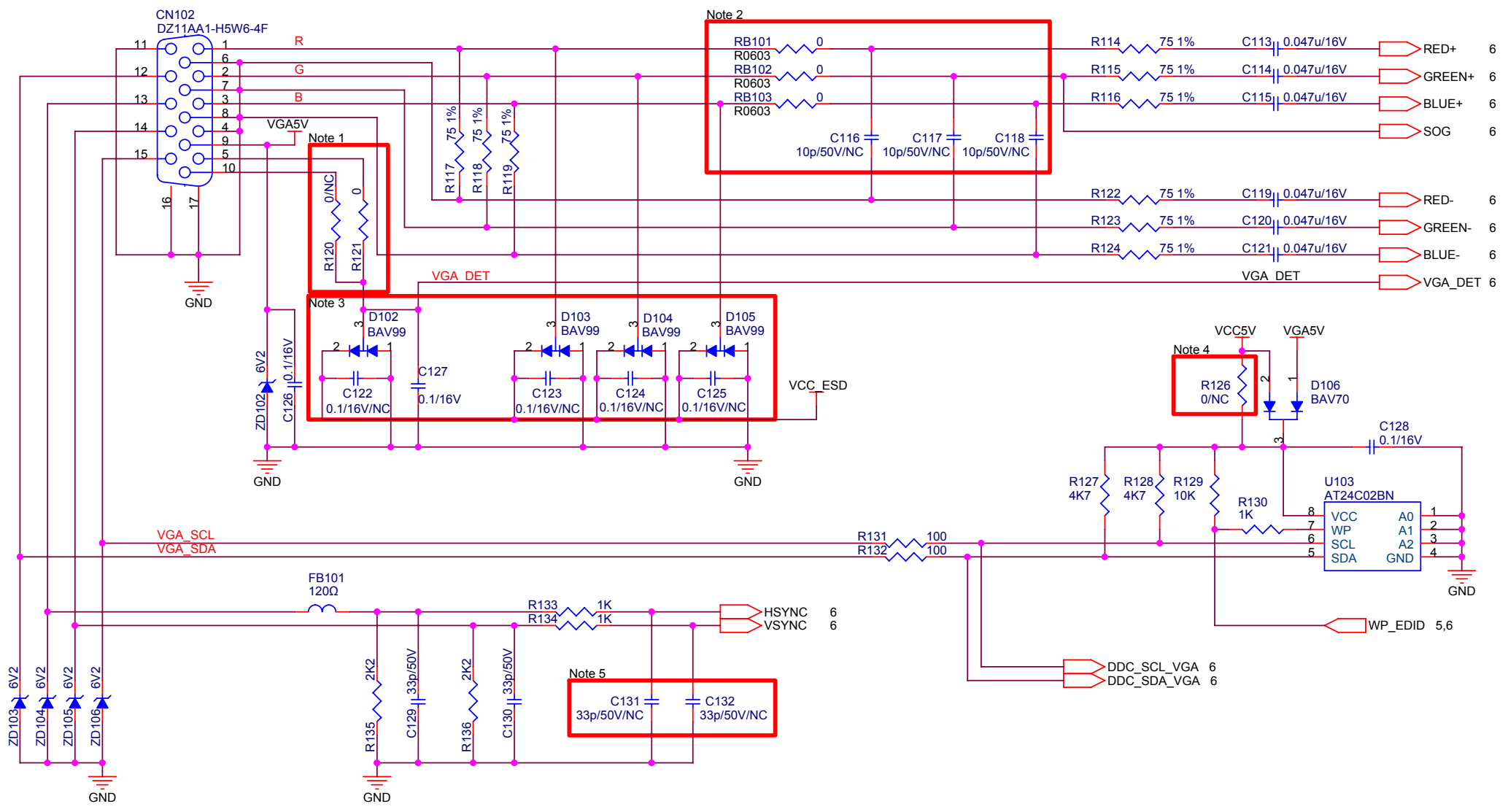


6.2 Switching Mode Power Supply circuit



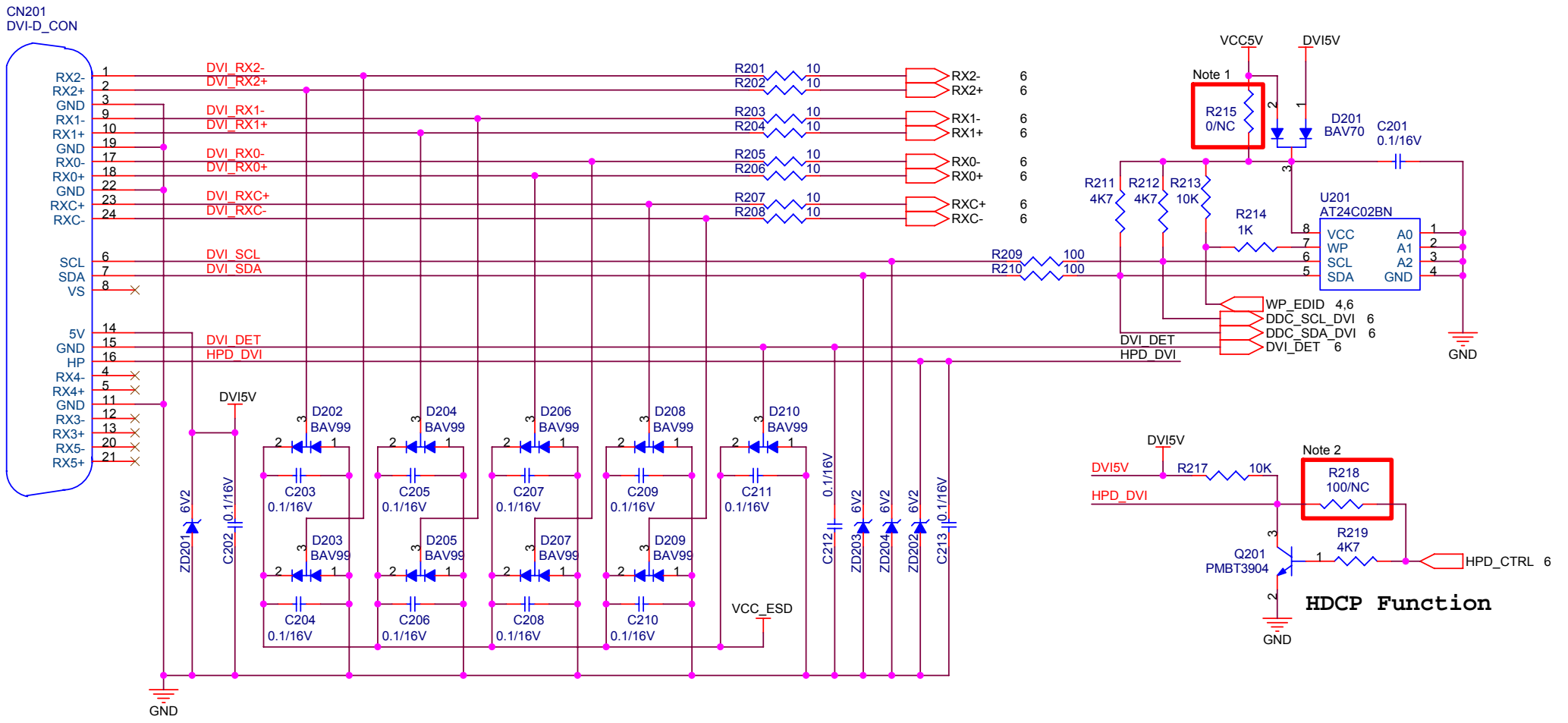
- Note:
1. CN101 is no locked packgae for normal model.CN101 is locked packgae for special model(Dell).
 2. D101 must be co-layed with R101
 3. U101 must contain TO263, TO252 and SOT223 package
 4. ZD101 must be co-layed with R113. ZD101 is used for ESD back drive.Reserved C111 for EMI issue.
 5. P/I Board High Enable.
 6. Reserved R111,R112,Q102 for panel power discharge.

InnoLux		MSTAR_TSUMU5PEHJ	
Document Number : COMMON		SIZE : A4	APPRO BY :
TITLE : POWER (DC TO DC)			CHECK BY :
DATE : 2008-1-30		DRAWN BY :	
SHEET 3	OF 6	Rev : V01	STONE



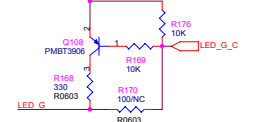
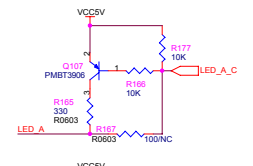
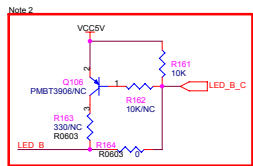
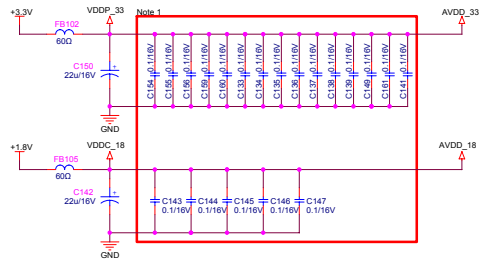
- Note:
1. R120 is reserved for Samsung model.
 2. R0603 package for Bead. C116,C117,C118 are reserved for EMI or performance issue.
 3. C122,C123,C124,C125 are reserved for ESD or EMI issue.
 4. R126 is reserved for Samsung model.
 5. C131,C132 are reserved for tuning performance issue.

InnoLux		MSTAR_TSUMU5PEHJ	
Document Number : COMMON		SIZE : A4	APPRO BY :
TITLE : VGA-INPUT			CHECK BY :
DATE : 2008-1-30		DRAWN BY :	
SHEET 4	OF 6	Rev : V01	

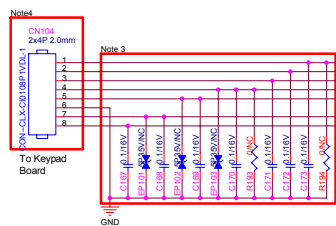


Note:
 1. R215 is reserved for Samsung model.
 2. R218 is reserved for some model.

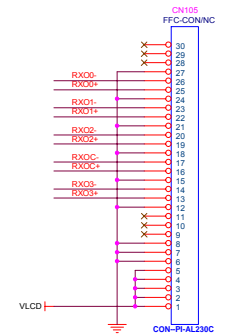
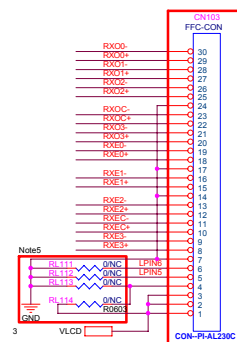
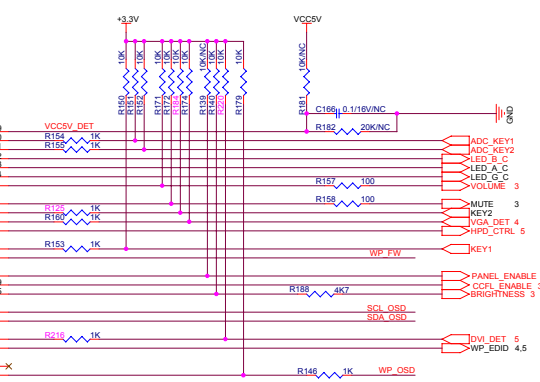
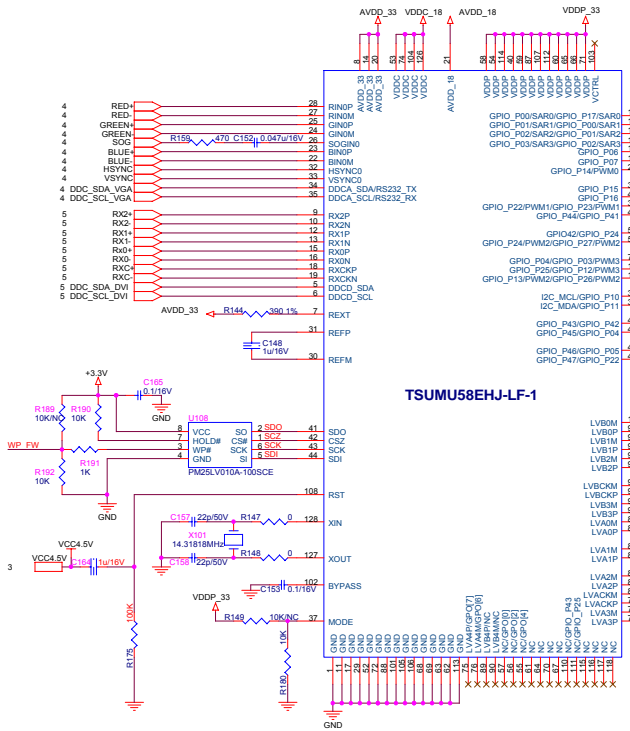
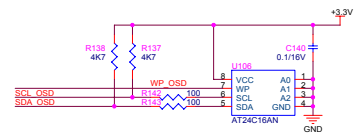
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DATE : 2008-1-30			DRAWN BY :
SHEET 5	OF 6	Rev : V01	STONE



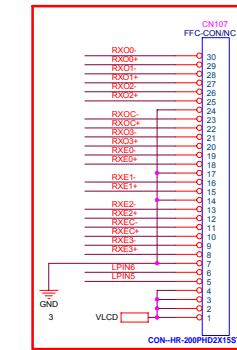
PLUS-MINUS



Define for X203H

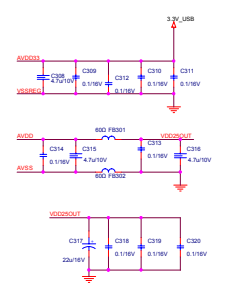
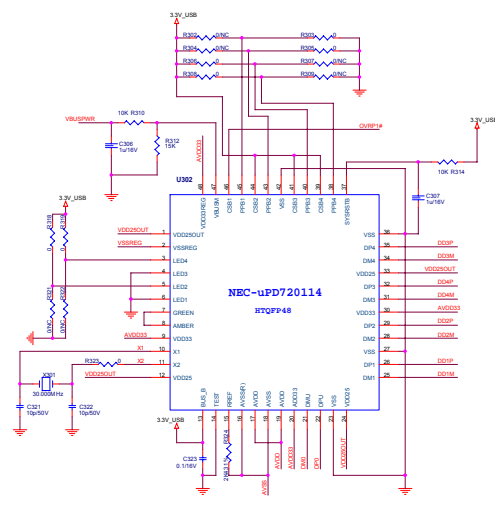
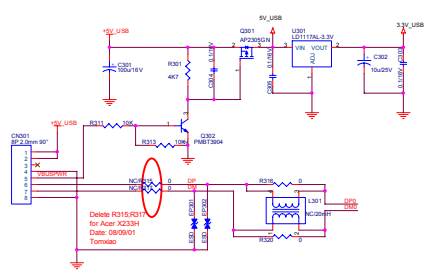
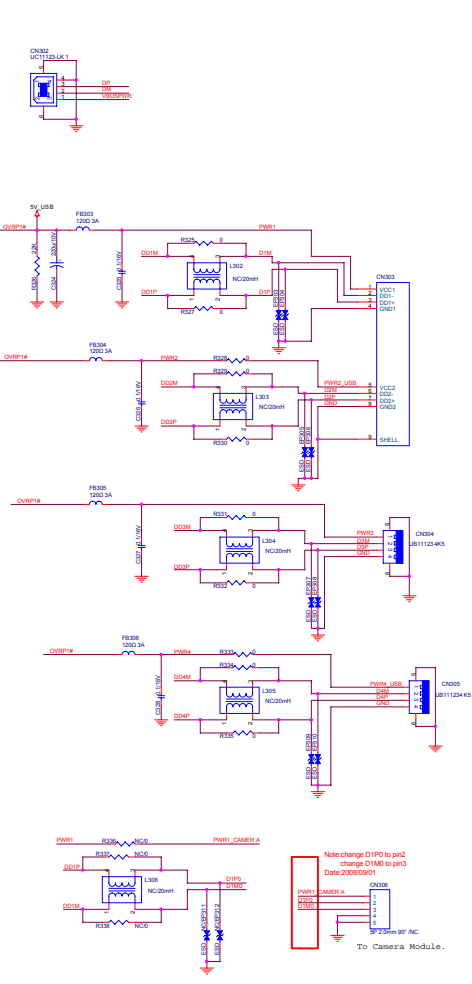


FOR SINGLE LVDS INPUT



- Note:
- Each bypass capacitor (0.1μF/16V) must be respectively closed to pin that is DC power input of scaler IC.
 - LED blue driving circuit is reserved for BenQ model.
 - Bypass capacitor C167,C168,C169,C170,C171,C172,C173 are for ESD and EMI issue. ESD component EP101,EP102,EP103 are for GPIO direct driving LED. Reserved R193&R194 for Dell 18.5W
 - CN104 is no locked package for normal model.CN104 is locked package for special model(Dell).
 - RL111,RL112,RL113,RL114 are reserved for some panel spec.
 - CN103 is no locked package for normal model.CN103 is locked package for special model(Dell).

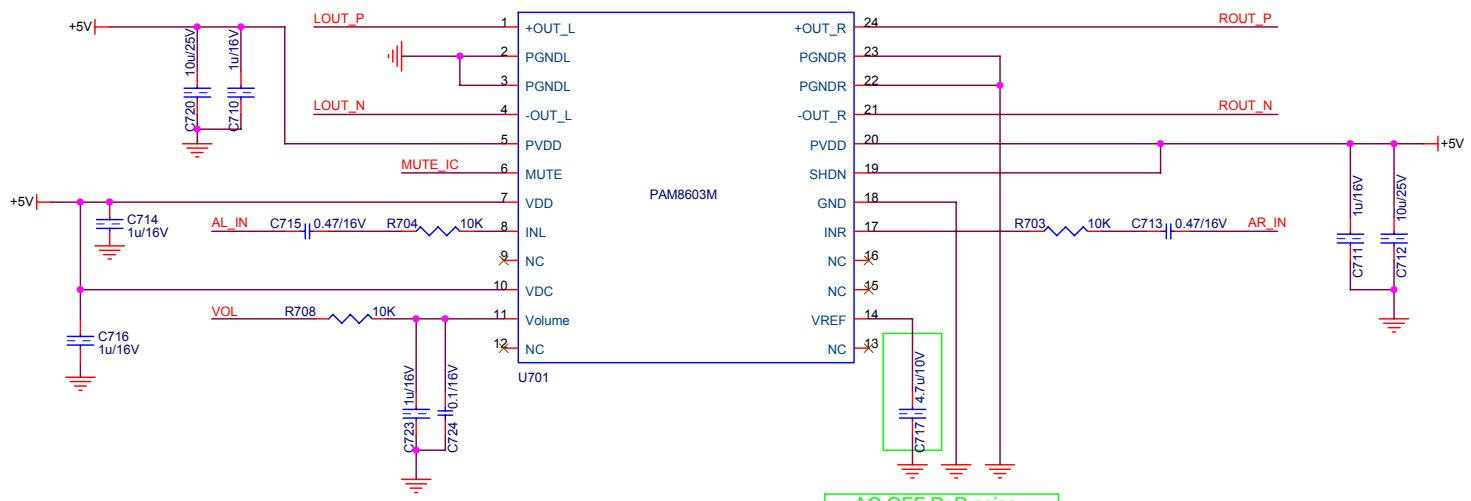
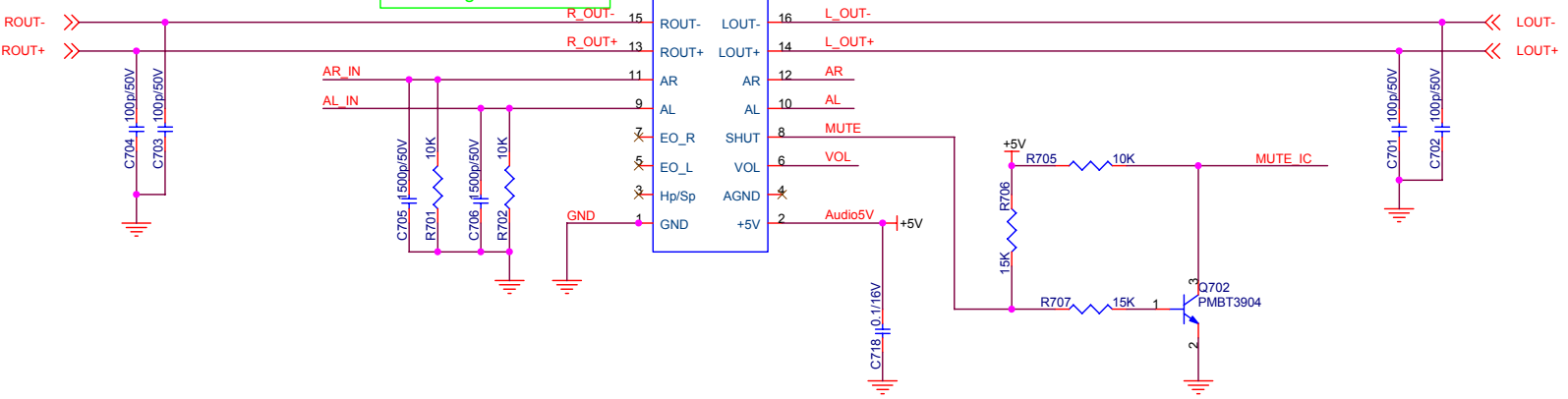
InnoLux		MSTAR_TSUM5PEHJ	
Document Number :	COMMON	SIZE :	Custom
TITLE :	SCALER		CHECK BY :
DATE :	2008-1-30	DRAWN BY :	
SHEET	6 OF 6	Rev :	V01



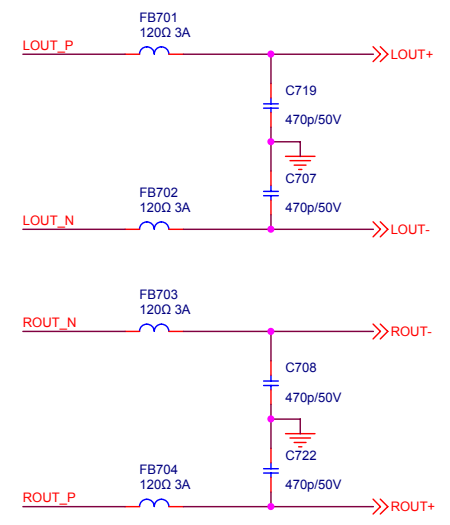
InnoLux X233H		APPRO BY :
Document Number :	SIZE : A1	CHECK BY :
TITLE : USB HUB		DRAWN BY :
DATE : 2008-09-01	Rev : V01	
SHEET 1 OF 1		

change for FHD2102
ID from 90 degree to
180 degree

CN701
2*8P 2.54mm 180°




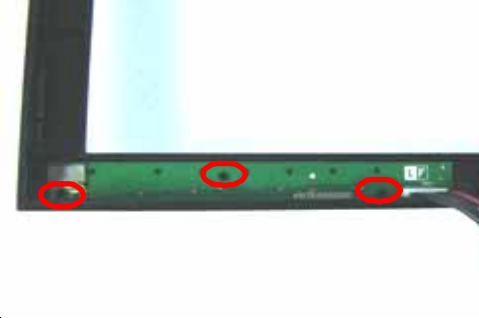

AC OFF PoP noise
solution change C717
form 0.1u to 4.7u



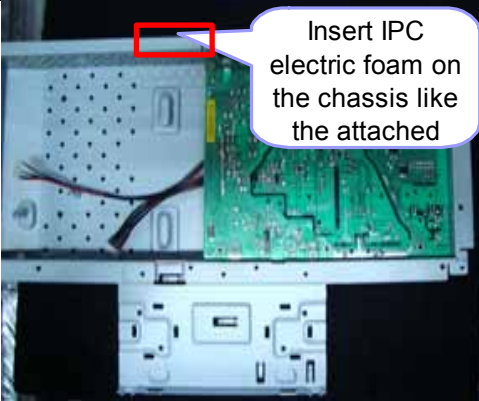
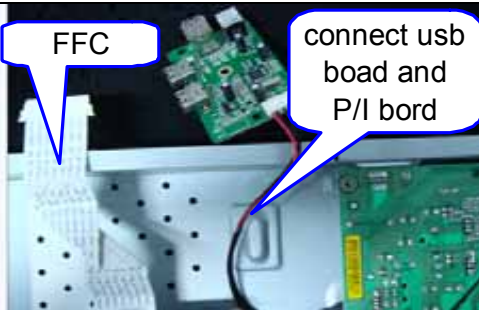
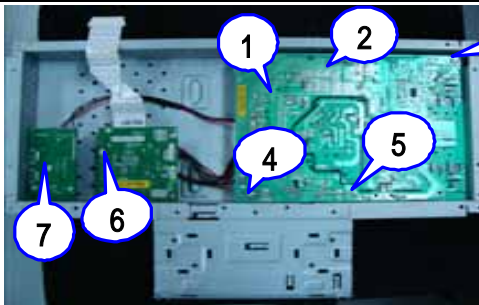
InnoLux		PAM8603M	
Document Number :	AUDIO COMMON BOARD	SIZE :	B
TITLE :	Audio	APPRO BY :	
DATE :	2008-10-07	CHECK BY :	
SHEET	2 OF 2	Rev :	V05
		DRAWN BY :	

7.0 Assembly and Disassembly

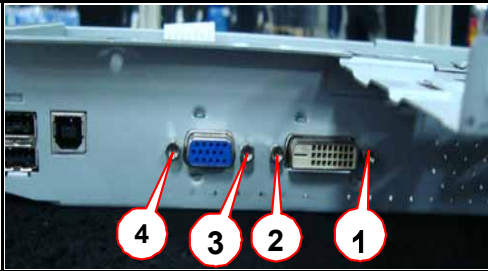

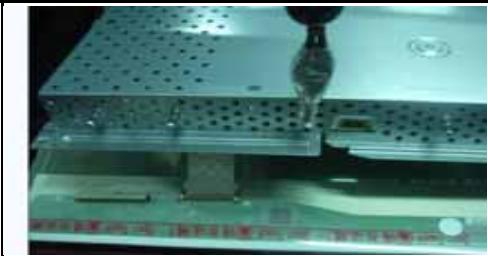

The tool of Assembly and disassembly : 1) Electrostatic gloves 2) Electric screwdriver: the length of screwdriver top is $6\pm 0.5\text{cm}$ and $15\pm 0.5\text{cm}$; the diameter of screwdriver top is $\Phi 5\text{H}5\text{mm}$

Sequence	Item	Photo	Procedures	PN	Description
S1	Place panel		<p>1. Take panel out of box and place it on the foam;</p> <p>2. Tear open the PE bag and put it in the designated carton;</p> <p>3. Place panel on the foam like the attached picture.</p> <p>Remark: Do not touch the lamp cord and place the surface of panel downsides on the cushion.</p>	631102240320H A	LCP 24"M240HW01-V6-00(A)(AUO)HF
S2	Assemble Keypad Pad and Bezel		Assemble the key board designated location on the Bezel , like the attached picture	791401500000R	PCBA,KEYPAD BOARD,LE9D0-612 ROHS
S3	Assemble front bezel		<p>1. Put the bezel on the form,withing it's key board is on the right hands.</p> <p>2. Put the panel with two hands and put into the bezel carefully , without scratching the panel</p>	714030030100R	ASSY,BEZEL,FRONT,B,PRINTING,LE24 Q1

Assembly and Disassembly (continue)

<p>S4</p>	<p>Assemble chassis and PI board</p>		<p>1.Place the chassis on the cushion after check, like the attached picture. 2.Insert power board into the designated location of chassis,like the attached picture.</p>	<p>701000018213R</p>	<p>ASSY,CHASSIS,B,A UO THIN LED,W/DVI+VGA+U S</p>
<p>S5</p>	<p>Insert FFC cable into mainboard and Connect USB board mainboard and power board</p>		<p>1. Take FFC cable & main board, check the board if OK; 2. Insert FFC cables into designated location ; 3.connect USB board ,I/Fboard P/I board and like the picture location 4.Check the FFC cable if OK</p>	<p>430303002440H</p>	<p>HRN LVDS FFC 30P 166.5MM W/ALUMINUM FO</p>
<p>S6</p>	<p>Fix USB board mainboard and power board</p>		<p>Fix USB board mainboard and power board like the picture.</p>	<p>792680300000H</p>	<p>PCBA,USB BOARD,LE24Q2</p>

Assembly and Disassembly (continue)

<p>S7</p>	<p>Twist hexagonal screws</p>		<ol style="list-style-type: none"> 1. Handle hexagonal screws and electric opener; 2. Twist screw in the interface as attached picture; 3. Place cushion on the designated location after iron frame is taken away. 		
<p>S8</p>	<p>Fix chassis</p>		<p>fix chassis into bezel hook as attached picture.</p>	<p>701000018213R</p>	<p>ASSY,CHASSIS,B,A UO THIN LED,W/DVI+VGA+U S</p>
<p>S9</p>	<p>Insert FFCcable</p>		<ol style="list-style-type: none"> 1. Insert FFC cable into desiganted connector and use jig to insert it;; 2. Tear off foil to stick the cable for fix. 		
<p>S10</p>	<p>Insert lamp wire</p>		<p>Insert 4pcs lamp wire into the relevant position and make sure the red one is on the left and the blue is on the right as attached picture.</p>		

<p>S11</p>	<p>Assemble the speaker</p>		<p>1.insert the speaker cable into the PIN location of chassis like the attached picture 2.be sure the red cable is on the left and the green one is on the right. 3.be sure the cable is outside of the speaker.</p>		
<p>S12</p>	<p>Insert keypad cable</p>		<p>Insert keypad cable into designated location as attached picture.</p>	<p>430300802940H</p>	<p>HRN ASSY 2x4P to 8P 275mm UL3302#28 Con</p>
<p>S13</p>	<p>Assemble back cover</p>		<p>Buckle back cover according to the sequence as attached picture and check if the cover is fixed properly.</p>	<p>501020236213R</p>	<p>BACK COVER,B,AUO THIN LED,W/DVI+VGA+USB,</p>
<p>S14</p>	<p>Fix stand</p>		<p>1.Place stand on the location ,tear open the PE bag ,check if ok and take 4pcs screws to lock the stand as attached picture</p>	<p>501260214700R</p>	<p>STAND,B,,LE24Q1</p>
<p>S15</p>	<p>Packing</p>		<p>Release monitor the packing like and pack it like attached picture</p>		