SPECIFICATION

For

APPROVAL

(♦) Preliminary Specification

( ) Final Specification

Title	22.0” TFT LCD

BUYER NAME	LG MNT OBU, Apple
MODEL NAME	

SUPPLIER	LG LCD Inc.
MODEL NAME	LM220W1-A2MN

SIGNATURE	DATE
/	
/	
/	

APPROVED BY	DATE
S.H. Kang/G.Manager	
REVIEWED BY	
G.T. Kim/S.Engineer	
PREPARED BY	
J. HER /Engineer	

Please return 1 copy for our confirmation with your signature and comments.

Product Engineering Dept.
LCD Division LG Electronics Inc.

CONTENTS

Record of Revisions

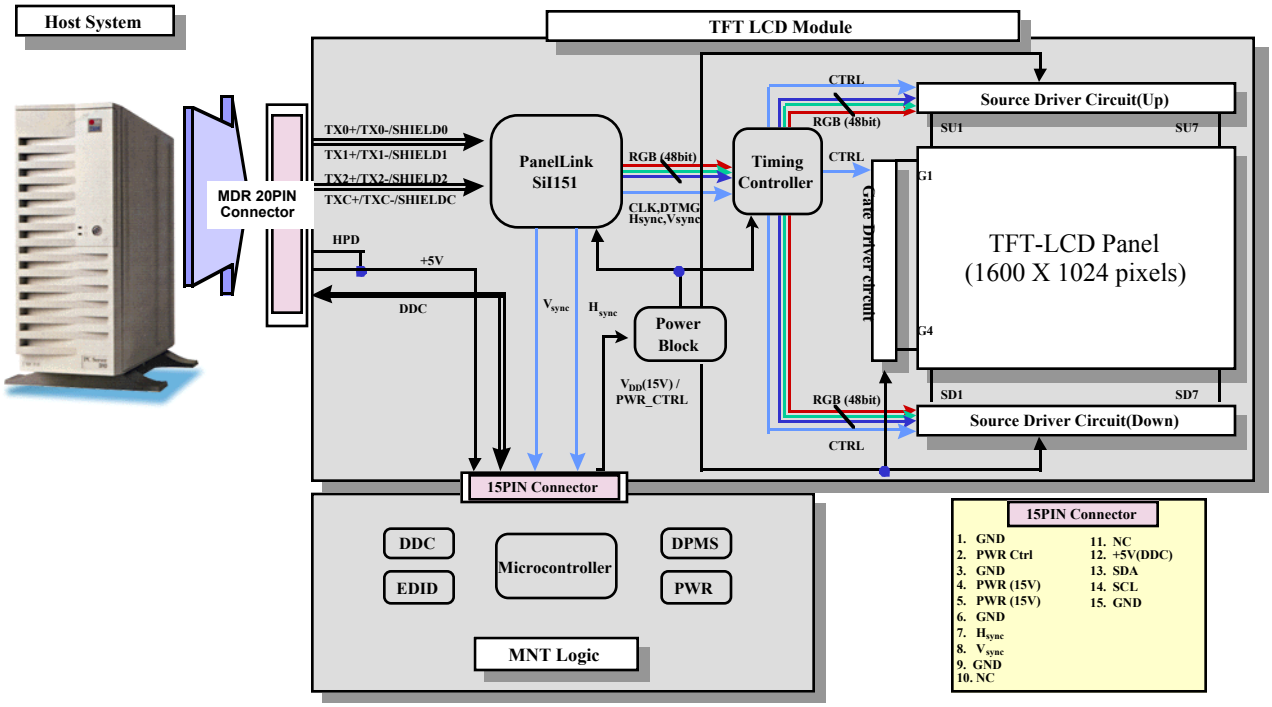
Revision Version	Date	Descriptions
0.0	September 20, 1998	First Draft, Preliminary
0.1	May 29, 1999	Second Draft, Preliminary
0.2	September 21, 1999	Preliminary update. -Changed input voltage,15V(-5%,+10%) -Changed gray curve specification -Changed random vibration specification -Changed mechanical drawings

1. General Descriptions

The LG Electronics model LM220W1 LCD is a Color Active Matrix Liquid Crystal Display with an integral Cold Cathode Fluorescent Tube(CCFT) back light system. The matrix employs a-Si Thin Film Transistor as the active element. It is a transmissive type display operating in the normally black mode. This TFT-LCD has a 22.0 inch diagonally measured active display area with wide-SXGA resolution(1024 vertical by 1600 horizontal pixel array). Each pixel is divided into Red, Green and Blue sub-pixels or dots which are arranged in vertical stripes. Gray scale or the luminance of the sub-pixel color is determined with a 8-bit gray scale signal for each dot, thus, presenting a palette of more than 16,777,216 colors.

LM220W1 has been designed to apply the TMDS™(Transition Minimized differential Signaling) as the interface method to enables a simple and low-cost implementation in both the host and monitor.

The LM220W1 LCD is intended to support applications where high brightness, wide viewing angle, high color saturation, and high color depth are very important. In combination with the vertical arrangement of the sub-pixels, the LM220W1 characteristics provide an excellent flat panel display for office automation products such as monitors.



General Display Characteristics

Followings are general features of the model LM220W1 LCD;

Active display area	22.0 inches(56cm) diagonal
Outsize dimensions	542.0w * 375.0h * 35.3t(typ)mm(Without Inverter)
Pixel pitch	0.294 mm °ø0.294 mm
Pixel format	1600 horiz. By 1024 vert. pixels RGB vertical stripe arrangement
Color depth	8-bit, 16,777,216 colors
Display operating mode	transmissive mode, normally black
Surface treatments	hard coating(3H), anti-glare treatment of the front polarizer
Interface method	TMDS™ interface using Sil151 chips and DFP connector
Lamps	Four CCFL's

2. Absolute Maximum Ratings

Followings are maximum values which, if exceeded, may cause faulty operation or damage to the unit.

Table 1 Absolute Maximum Ratings

Parameter	symbol	Values		Units	Notes
		Min.	Max.		
Power Input Voltage	V_{DD}	0	+17.0	V_{DC}	at 25°…
Control Logic Voltage	V_I	0	+5.5V	V_{DC}	
Operating Temperature	T_{OP}	5	+50	°…	1
Storage Temperature	T_{ST}	-20	+60	°…	1

Note: 1. The Relative Humidity must not exceed 90% non-condensing at temperatures of 40°.or less. At temperatures greater than 40°, the wet bulb temperature must not exceed 39°…

3. Electrical Specifications

The LM220W1 requires two power inputs. One input is employed to power the LCD electronics and to drive the voltages to drive the TFT array and liquid crystal. And the second input which powers the backlight CCFL, is typically generated by an inverter. The inverter is an external unit to the LCD.

Table 2 Electrical Characteristics:

Parameter	Symbol	Values			Units	Notes
		Min.	Typ.	Max.		
MODULE:						
Power Supply Input Voltage	V_{DD}	14.25	15.0	16.5	V_{DC}	
Power Supply Input Current	I_{DD}	-	1.0	1.2	A	1
Control Logic Input High	V_{IH}	2.6	-	-	V_{DC}	
Control Logic Input Low	V_{IL}	-	-	0.8	V_{DC}	
Control Logic Output High	V_{OH}	2.5	-	-		
Control Logic Output Low	V_{OL}	-	-	0.5		
BACK LIGHT						2
Backlight Input voltage	V_{BL}	1070	860	830	V_{RMS}	
Backlight Input Current	I_{BL}	3.0	8.0	9.0	MA	3
Established Starting Voltage						4
		1400	-	-	V_{RMS}	At 25°±2°…
		2100	-	-	V_{RMS}	At 0°±2°…
Operating Frequency		40	50	60	KHz	
Life time	F_{BL}	15000	20000	-	hours	5

Notes: 1. The input current shall be measured at V_{DD} of 15.0Vdc at 25°…refresh rate of 60Hz, and pixel clock frequency of 112.2MHz under full white pattern(256gray).
2. These specifications of back light are for 1 CCFL.
3. The backlight input current shall be measured at the ground cable and does not include loss of external inverter.
4. This value is measured at both end of lamp and is for reference for inverter design.
5. The life time is defined as the time at which brightness of lamp is 50% compare to that of initial value at the typical lamp current.

4. Optical Specifications

Optical characteristics are determined after the unit has been 'ON' and stable for approximately 30 minutes in a dark environment at 25°….The values specified are at an approximate distance 50cm from the LCD surface at a viewing angle of Φ and θ equal to 0° and aperture 1 degree. The test equipment is PhotoResearch Prichard SpectroRadiometer Model 1980B-SC or equivalent. The input signal voltage and timing specifications are V_{DD} of 15.0Vdc, and typical values respectively. The input current of backlight is 8mA(F_{BL} = 50KHz) at the ground terminals.

Table 3 Optical Characteristics

Parameter	Symbol	Values			Units	Notes
		Min.	Typ.	Max.		
Contrast Ratio	CR	150	200	-		1
Average Luminance, white	SB_{WH}	150	170	-	cd/m^2	2
Luminance Variation	SB_V	-	-	30	%	3
Response Time	Tr	-	-	60	msec	4
Rise Time	Tr_R	-	-	25		
Decay Time	Tr_D	-	-	35		
CIE Color Coordinates						
Red	x_R	0.610	0.640	0.670		
	y_R	0.310	0.340	0.370		
Green	x_G	0.270	0.300	0.330		
	y_G	0.570	0.600	0.630		
Blue	x_B	0.120	0.150	0.180		
	y_B	0.070	0.100	0.130		
White	x_W	0.283	0.313	0.343		
	y_W	0.299	0.329	0.359		
Viewing Angle by CR ≥ 10					degree, °Δ	5
x axis, right (•'=0º)	•Ë	65	70	-		
x axis, left(•'=180º)	•Ë	65	70	-		
y axis, up(•'=90º)	•Ë	65	70	-		
y axis, down (•'=270º)	•Ë	65	70	-		
Half Luminance Angle						
x axis, right (•'=0º)					degree, °Δ	6
x axis, left(•'=180º)	•Ë	45	-	-		
y axis, up(•'=90º)	•Ë	45	-	-		
y axis, down (•'=270º)	•Ë	35	-	-		
	•Ë	35	-	-		
Cross talk		-	-	4	%	7
Flicker		-	-	-30	dB	8
Relative luminance		-	-	-		9

Notes 1. Contrast Ratio (CR) is defined mathematically as:

$$\frac{\text{(Surface Luminance with all white pixels)}}{\text{(Surface Luminance with all black pixels)}}$$

Contrast ratio shall be measured at the center of the display (Location 1).

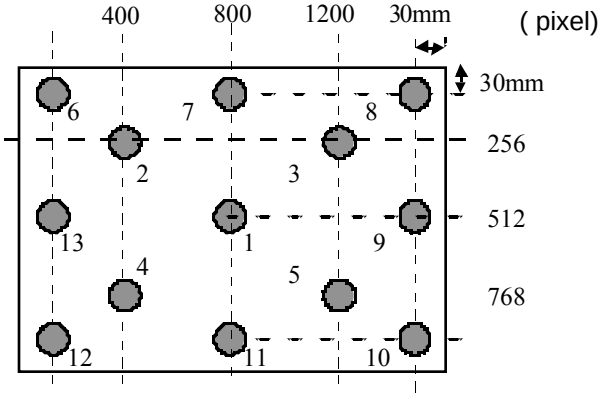
2. Average luminance is the average of luminance value at location 1 to 5 with all pixels displaying white.

$$B(AVE) = \frac{B1 + B2 + B3 + B4 + B5}{5}$$

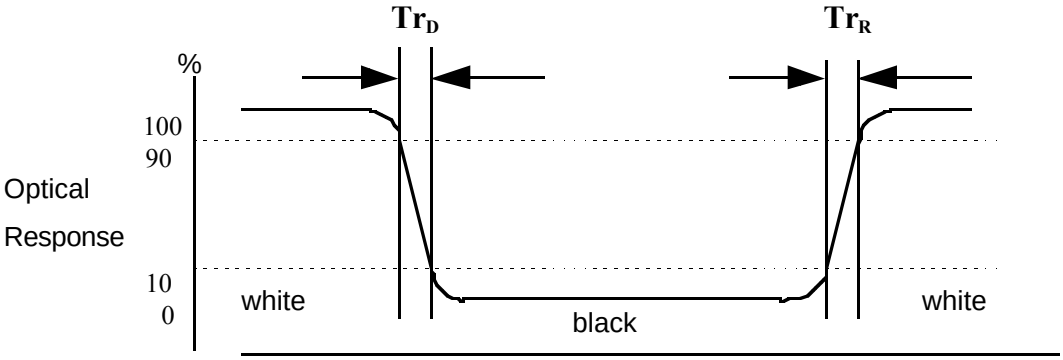
3. The variation in surface luminance, SB_V is defined as :

$$\frac{\text{Maximum } (B_1, B_2, \ldots B_{13}) - \text{Minimum } (B_1, B_2, \ldots B_{13})}{\text{Average } (B_1, B_2, \ldots B_5)} \times 100(\%)$$

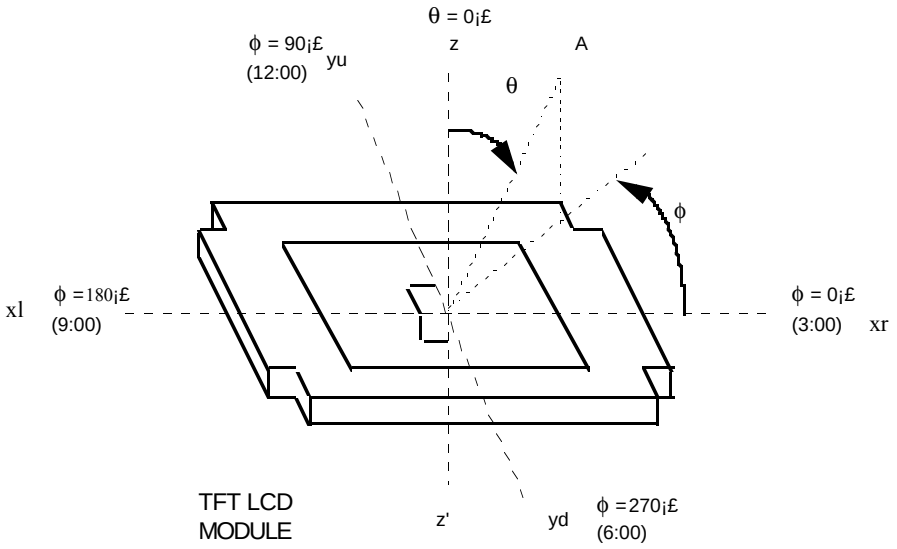
Where B1 to B13 are the luminance with all pixels displaying white at 13 locations.



4. The response time is defined as the following figure and shall be measured by switching the input signal for "black" and "white".



5. Viewing angle is the angle at which the contrast ratio is greater than 10.



6. Half Luminance Angles

Half Luminance angles are defined as the up, down, left, and right angular boundaries at which the luminance value is 50% of the luminance value measured on-axis.

Measurements shall be done at the center of the display area (Location 1) with an all white image.

7. Cross talk shall be measured at center location.

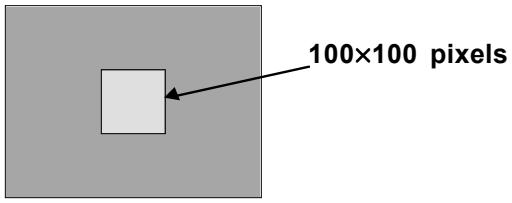
$$\text{Crosstalk Ratio} = \frac{\text{Luminance at pattern A - Luminance at pattern B}}{\text{Luminance at pattern A}}$$

Pattern A

(Mid-gray : Gs(S)=127)

Pattern B

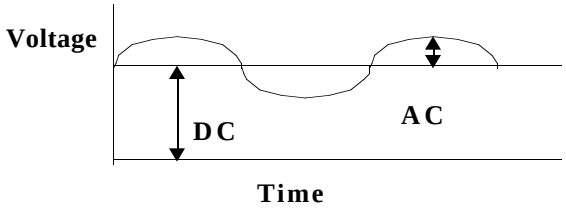
(Background:Gs(S)=0, Rectangular:Gs(S)=127)



8. Flicker shall be measured at the center location.

Test pattern : Pixel pattern
Background RGB gray (0, 0, 0)
Foreground RGB gray (127,127,127)

Test equation : $20 \log \frac{\text{AC(at 30Hz)}}{\text{DC level}}$



9. Relative Luminance

n	Gs(S)	Relative Luminance(%)		Remark
		min	Max	
0	0	-	0.4	
1	31	-	1.14	
2	63	2.2	4.7	
3	95	6.4	13.5	
4	127	13.6	25.8	
5	159	23.7	40.8	
6	191	41.0	60.6	
7	223	63.0	81.0	
8	255	100	100	

5. Interface Connections

Interface chip in host side, must be used TMDS™, part No. Sil150, designed by Silicon Image Inc., or its equivalent.

This LCD employs three kinds of interface connections. A 20 pin connector called by DFP connector, is used for TMDS signals from the host computer. This connector is fully compatible with DFP standard. Please, refer to Digital Flat Panel(DFP) standard for the detailed descriptions. A 15-pin connector is used for LCD module power and LCM controls signal from external monitor control circuits. And four connectors, a two pin connector, are used for the integral backlight system.

The pin configuration for the 20 pin DFP connector is shown in the table below.

Table 4 DFP CONNECTOR PIN CONFIGURATION (DFP Standard)

Pin	Symbol	Description	Pin	Symbol	Description
1	TX1+	TMDS positive differential output (channel1)	11	TX2+	TMDS positive differential output (channel2)
2	TX1-	TMDS negative differential output	12	TX2-	TMDS negative differential output
3	SHLD1	(channel1)	13	SHLD2	(channel2)
4	SHLDC	Shield for TMDS channel 1	14	SHLD0	Shield for TMDS channel 2
5	TXC+	Shield for TMDS clock	15	TX0+	Shield for TMDS channel 0
6	TXC-	TMDS positive differential output (reference clock)	16	TX0-	TMDS positive differential output (channel 0)
7	GND	TMDS negative differential output	17	NC	TMDS negative differential output
8	+5V	(reference clock)	18	HPD	(channel 0)
9	NC	Logic Ground	19	DDC_DAT	Logic Ground
10	NC	Logic +5V Supply (See note 2)	20	DDC_CLK	Hot Plug Detection (See note 3)
		No Connection			DDC2B Data (See note 4)
		No Connection			DDC2B Clock (See note 5)

Notes: 1. All shield pins and GND(ground) pin should be connected together and should also be connected to the LCD's metal frame.
2. This +5V is only for external monitor control circuits and directly connected to 15 pin connector. The specifications for this source are the same as those defined in the VESA DDC Standard V3.0(+5V°æ5%, 50mA minimum, 1.0A maximum).
3. This pin is internally connected to pin 8 (+5V) in LCM circuits.
4, 5. These pins are only for external monitor control circuits and directly connected to 15 pin connector.
6. Refer to appendix 1 regarding TMDS signal mapping.

The following is a preliminary list of DFP compatible connectors.

1. 3M - Mini Delta Ribbon(MDR) Connector .050" series
   a) Receptacle : P/N 10220-55G3 VC
   b) Plug : P/N 10120-6000 EC
2. AMP
   a) Receptacle : P/N 917738-2
   b) Plug : P/N 2-175677-2
3. Molex
   a) Receptacle : P/N 52515-2011
   b) Plug : P/N 52316-2011

Please, contact connector manufacturer for detail description of this connector.

A 15 pin connector for external monitor control circuits, is a model 53261 manufactured by Molex. The mating connector part number is 51021 or its equivalent. The pin configuration for this connector is shown in the table below.

Table 5 15 PIN CONNECTOR PIN CONFIGURATION

Pin	Symbol	Description	Notes
1	GND	Ground	1
2	PWR_CTRL	LCM power control input signal Low : LCM power down except Sil151 receiver High : Normal operation mode	2
3	GND	Ground	
4	V_{DD}	LCM power supply, +15V±5%	
5	V_{DD}	LCM power supply, +15V±5%	
6	GND	Ground	
7	H_{SYNC}	H_{SYNC} out from Sil151 receiver	
8	V_{SYNC}	V_{SYNC} out from Sil151 receiver	
9	GND	Ground	
10	NC	No connection (Reserved)	
11	NC	No connection (Reserved)	
12	+5V_DDC	+5V out for DDC	3
13	SDA	DDC data line out	
14	SCL	DDC clock line out	
15	GND	Ground	

Notes: 1. All GND(ground) pins should be connected together and should also be connected to the LCD's metal frame.
2. LCM power control input signal for power saving mode. If this pin is held low state, LCM goes to power saving mode except Sil151 receiver.
3. Pin 12, 13, 14 are for DDC2B communication between host computer and external monitor control circuits. These pins are directly connected to 20 pin DFP connector.

The backlight interface connector is a model BHSR-02VS-1, manufactured by JST. The mating connector part number is SM02B-BHS-1 or equivalent. The pin configuration for the connector is shown in the table below.

Table 6 BACKLIGHT CONNECTOR PIN CONFIGURATION

Pin	Symbol	Description	Notes
1	HV	Lamp power input	1
2	LV	Ground	2

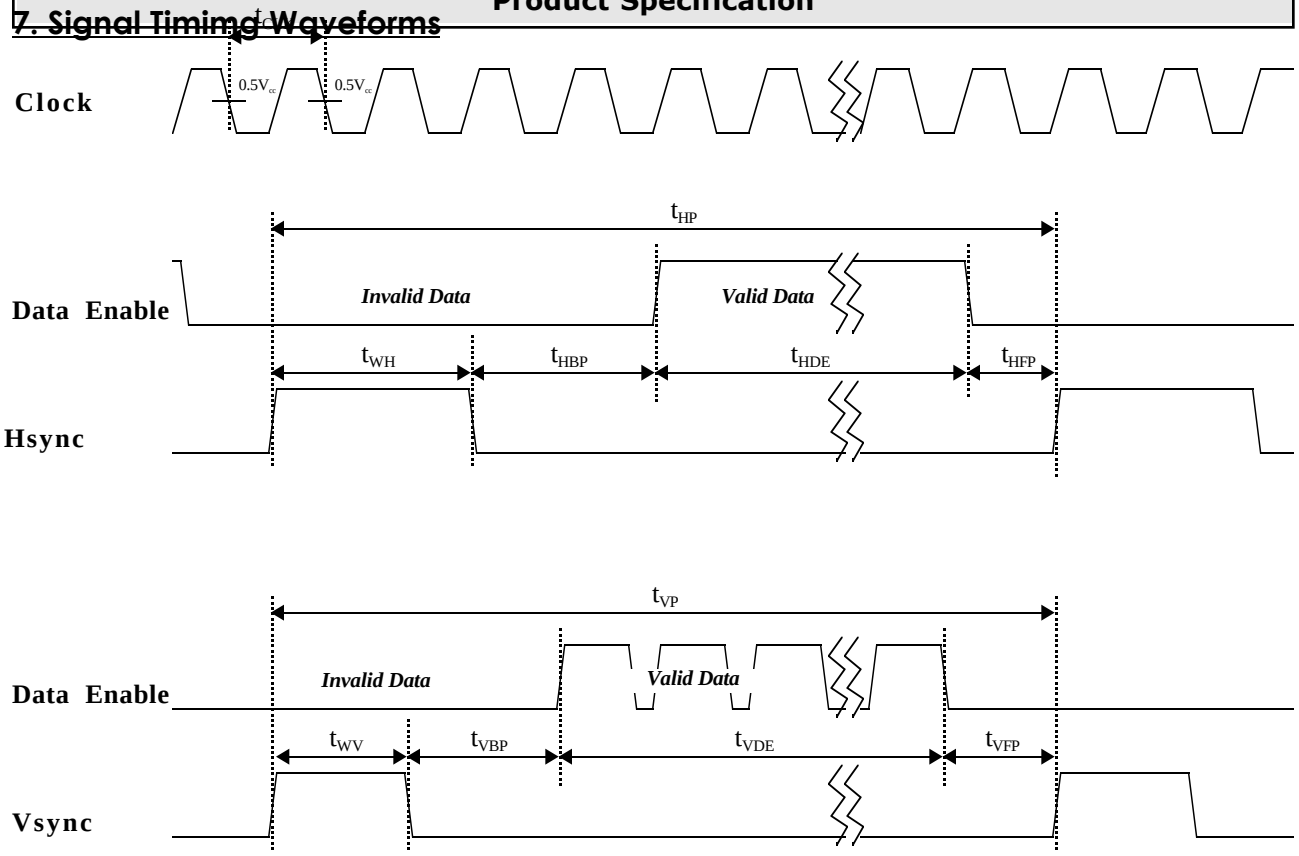
Notes: 1. The input power terminal is colored pink. Ground pin color is light pink.
2. The backlight ground should be common with LCD metal frame.

6. Signal Timing Specifications

Parameter		Symbol	Value			Units	Notes
			Min.	Typ.	Max.		
Main Clock	Frequency	f_{CLK} t_{CLK}	- -	112.27 8.91	- -	MHz ns	1
Hsync	Period Pulse Width	t_{HP} t_{WH}	- 1799 16	16.1 1808 16	- 1817 -	ßi clock clock	2
Vsync	Period Pulse Width	t_{VP} t_{WV}	- 1031 1	16.68 1036 1	- 1041 -	msec lines lines	3
Data Enable	Horizontal Back Porch Horizontal Active Data Horizontal Front porch	t_{HBP} t_{HDE} t_{HFP}	32 1600 32	88 1600 104	- 1600 -	clock clock clock	4
	Vertical Back Porch Vertical Active Data Vertical Front porch	t_{VBP} t_{VDE} t_{VFP}	1 1024 2	1 1024 10	- 1024 -	lines lines lines	

Notes: 1. Please, refer Sil150 data sheets for the detailed timing condition (required setup, hold time and etc.) between video processor and Sil150 TMDS transmitter.
2. Horizontal sync shall be active high.
3. Vertical sync shall be active high.
4. Data enable shall be active high

7. Signal Timing Waveforms



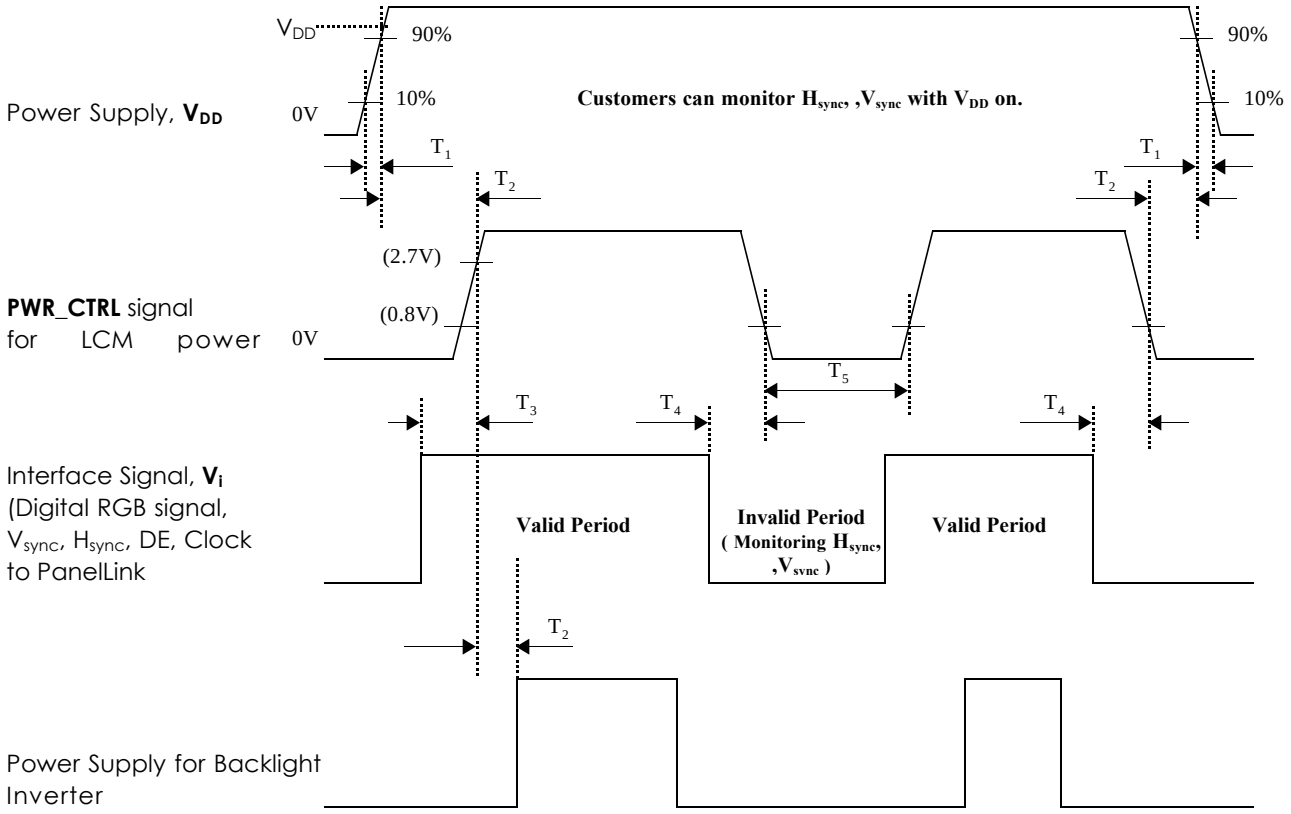
8. Color Input Data References

The brightness of each primary color(red, green and blue) is based on the 8-bit gray scale data input for the color; the higher the binary input, the brighter the color. The table below provides a reference for color versus data input.

Table 7 Color Data Reference

Color		Input Color Data																							
		Red								Green								Blue							
		MSB							LSB	MSB							LSB	MSB							LSB
		R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
Basic Colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(255)	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green(255)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	Blue(255)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Cyan	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Magenta	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Red	Red(0) Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(1)	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(2)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Red(253)	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(254)	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(255) Bright	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green	Green(0) Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	Green(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Green(253)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0
	Green(254)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	Green(255) Bright	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Blue	Blue(0) Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Blue(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Blue(253)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1
	Blue(254)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0
	Blue(255) Bright	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

9. Power Sequences



- **T_1** : 10 ns ~ 20 ms (Rise time, Fall time of power supplies)
- **T_2** : 100 ms (min.)
- **T_3** : 100 ms (max.)
- **T_4** : 100 ms (max.)
- **T_5** : 500 ms (min.)

Notes: 1. Please avoid floating state of interface signal at invalid period.

2. When the interface signal is invalid or no signal, be sure to pull down the power supply, **V_{DD}** to 0V or to pull down the **PWR_CTRL** signal under 0.8V. Invalid signal with V_{DD} and on state of PWR_CTRL signal for a long period of time, causes permanent damage to LCD panel.

3. BackLight inverter power must be turn on after power supply for LCD and interface signal are valid.

4. Power supply, **V_{DD}** shall be start under 0.8V.

10. Mechanical Characteristics

The chart below provides general mechanical characteristics for the model LM220W1 LCD. Please refer to appendix 2 regarding the detailed mechanical drawing of the LCD module.

Table 8 Mechanical Specifications

Parameter	Value	Symbol	Notes
Outside dimension Width Height Thickness	 542.0 (typ) 375.0 (typ) 35.3 (typ)	mm	
Bezel area Width Height	 474.4 306.1	mm	
Active area Width Height	 470.4 301.1	mm	
Weight	5000(typ) 5200(max)	gram	
Front surface of LCD	Hard coating 3H. Anti-glare treatment of the front polarizer	-	

11. Reliability Test Conditions

No	Test ITEM	Conditions
1	High temperature operating test	50°C, 80% RH, 240 hour
2	High temperature storage test	60°C, 50% RH, 240 hour
3	Low temperature operating test	5°C, 240 hours
4	Thermal Shock Test (non-operating)	-20°C/30mininute, 60°C/30minutes, 50cycle
5	Altitude	Operating : 12,000ft Storage : 40,000ft
6	Vibration test (non-operating)	Waveform : Random Vibration level : 1.0 G RMS Bandwidth : 5 ~500Hz Duration : X, Y, Z, 10 min one time each direction
7	Shock test (non-operating)	Shock level : 100G Waveform: half sine wave, 2ms Direction : ±X, ±Y, ±Z one time each direction

Result Evaluation Criteria
There should be no changes, which might affect the practical display function when the display quality test is conducted under normal operating condition.

12. Designation of Lot Mark

a) Lot Mark

A	B	C	D	E	F	G	H	I	J	K	L	M

A, B, C : MODEL CODE
D : YEAR
E : MONTH
F, G : DIVISION CODE
H : MODULE LINE
I, J, K, L , M : SERIAL NO.

Note : 1. YEAR

YEAR	89	90	91	92	93	94	95	96	97	98	99
Mark	9	0	1	2	3	4	5	6	7	8	9

2. MONTH

MONTH	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jun.	Aug.	Sep.	Oct.	Nov.	Dec.
Mark	1	2	3	4	5	6	7	8	9	A	B	C

b) Location of Lot Mark

Serial NO. Is printed on the label. The label is attached to the backside of the LCD module. This is subject to change without prior notice.

13. Packing Form

a) Package quantity in one box : pcs

b) Box Size : mm°ømm°ømm

Note : 1. Please, refer to appendix 3 regarding the detailed packing assembly drawing.

14. PRECAUTIONS

Please pay attention to the followings when you use this TFT-LCD module with Back-light unit.

1)You must mount Module using mounting holes arranged in 4 corners.

2) Be sure to turn off the power when connecting or disconnecting the circuit.

3) Note that the polarizers are easily damaged. Pay attention not to scratch or press this surface with any hard object.

4) When the LCD surface become dirty, please wipe it off with a soft material. (ie. cotton ball)

5) Protect the module from the ESD as it may damage the electronic circuit (C-MOS). Make certain that treatment person's body are grounded through wrist bend.

6) Do not disassemble the module and be careful not to incur a mechanical shock that might occur during installation. It may cause permanent damage.

7) Do not leave the module in high temperatures, particularly in areas of high humidity for a long time.

8) The module not be expose to the direct sunlight.

9) Avoid contact with water as it may a short circuit within the module.

10) If the LCM displays the same pattern continuously for a long period of time, it can be the image sticking to the screen.

11) Do not operate at condensing condition. If not, it makes the critical damage to LCD panel (ex : line defect)

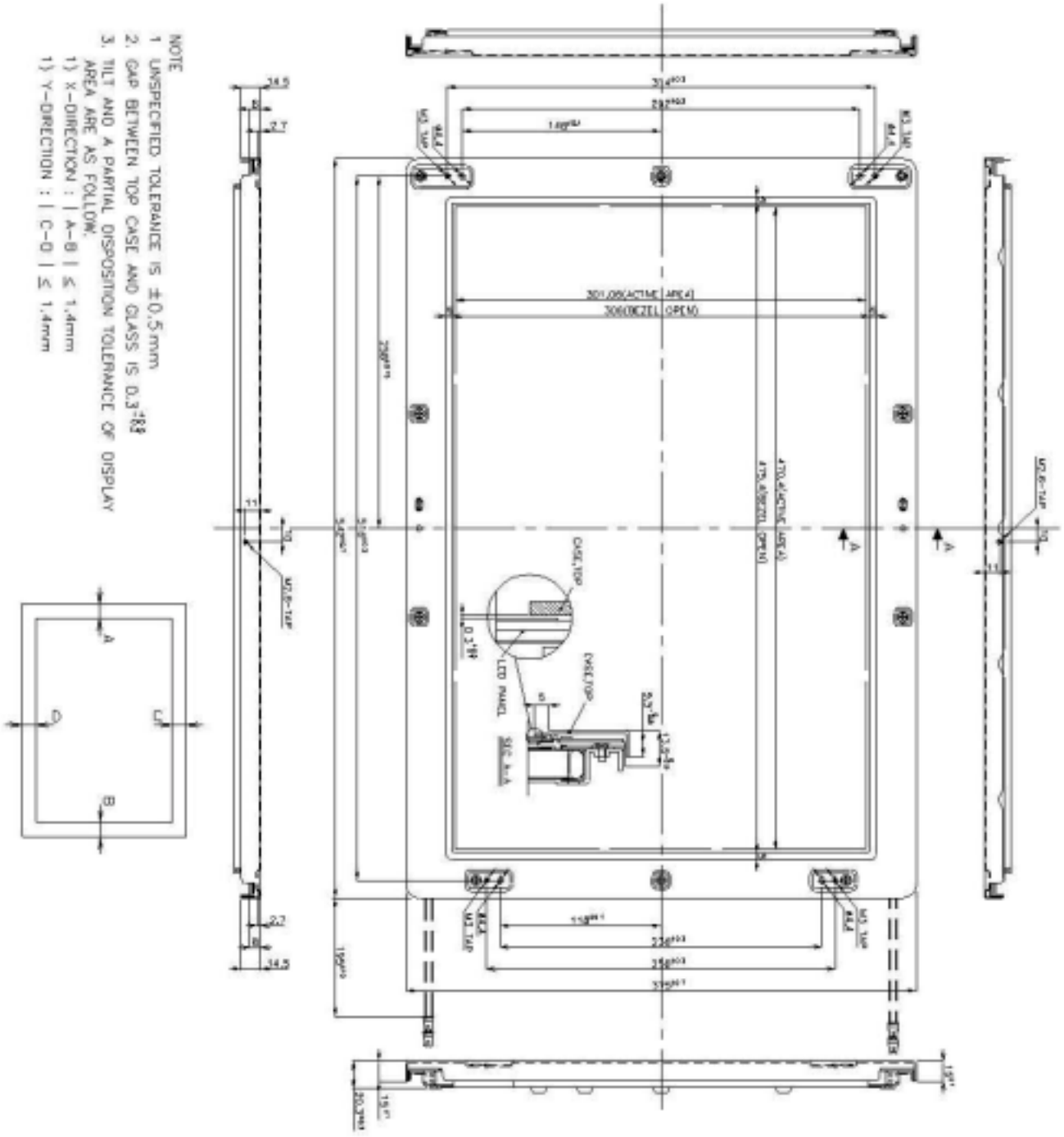
12) If the LCM display other resolution mode except 1600*1024 mode, it can be the damage to screen.

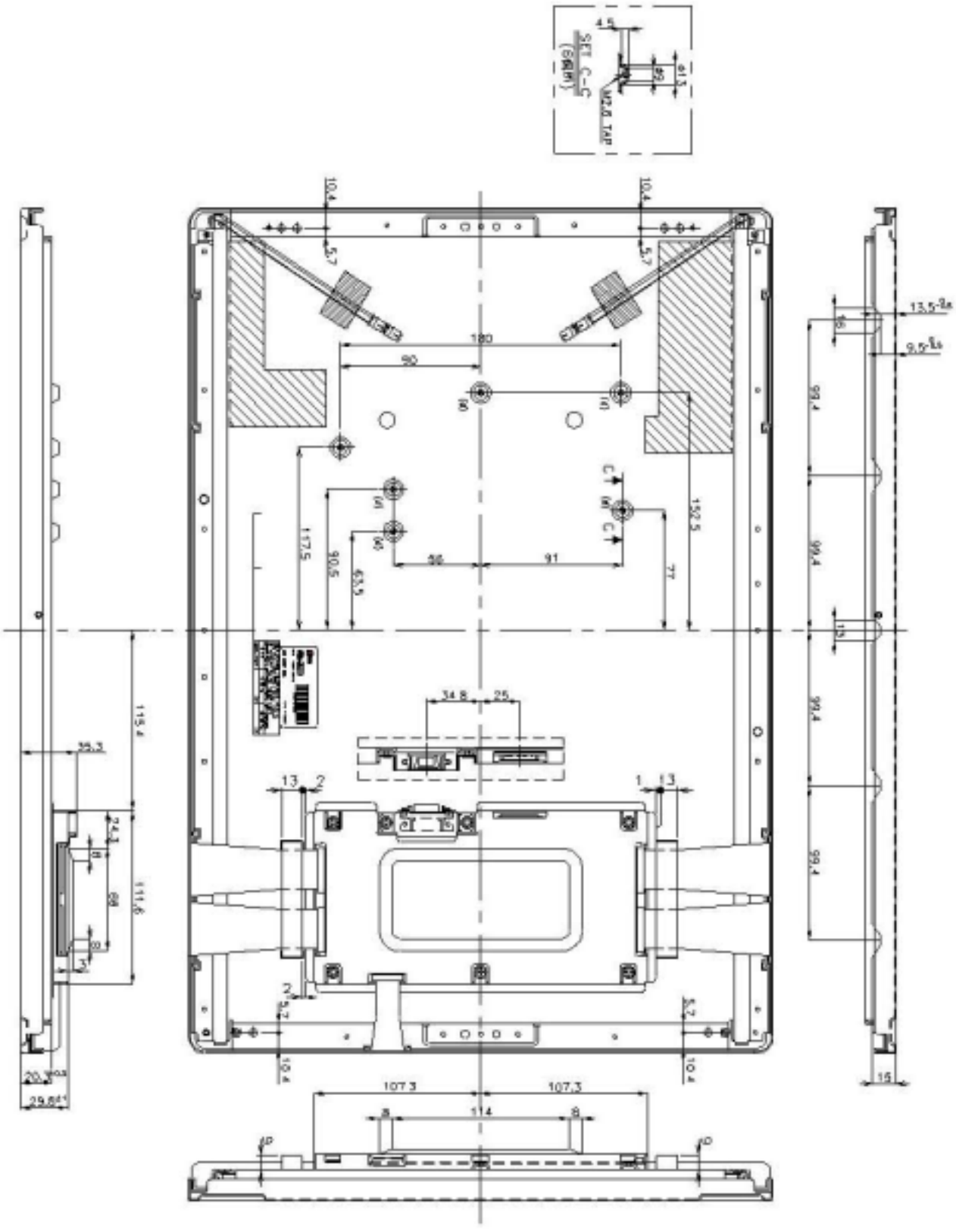
15. APPENDIX 1 : Required Signal Assignment for Sil150 TMDS Receiver

Signal Name of Sil150	Pin Number of Sil150	Required Signals	
		1 pixel / clock	2 pixel / clock
DIE7 ~ DIE0	9, 10, 11, 12, 13, 14, 15, 16	Blue[7:0]	Even Blue[7:0]
DIE15 ~ DIE8	99, 100, 1, 2, 3, 4, 5, 6	Green[7:0]	Even Green[7:0]
DIE23 ~ DIE16	90, 91, 92, 93, 94, 95, 96, 97	Red[7:0]	Even Red[7:0]
DIO7 ~ DIO0	68, 69, 70, 71, 72, 73, 74, 75	N/A	Odd Blue[7:0]
DIO15 ~ DIO8	58, 59, 60, 61, 62, 63, 64, 65	N/A	Odd Green[7:0]
DIO23 ~ DIO16	48, 49, 50, 51, 52, 53, 54, 55	N/A	Odd Red[7:0]
H_{sync}	76	Horizontal Sync	Horizontal Sync
V_{sync}	77	Vertical Sync	Vertical Sync
DE	78	Data Enable	Data Enable
IDCK	80	Input Clock(112MHz)	Input Clock(56MHz)
PIXS	25	Low level	High level

Notes : 1. Input data shall be followed by $D_0(R_0G_0B_0)$, $D_1(R_1G_1B_1)$, $D_2(R_2G_2B_2)$, $D_3(R_3G_3B_3)$, $D_4(R_4G_4B_4)$.
2. Refer to Sil150 Data Sheet or application notes for detail descriptions.

16. APPENDIX 2 : Outline Drawings




SEE C-C
(SCALE)
M2.6 TAP
10.4
5.7
180
90
150.5
117.5
90.5
63.5
91
77
34.8
25
115.4
111.6
24.3
35.3
107.3
114
99.4
13.5
9.5
15

17. APPENDIX 3 : Packing Assembly Drawings