Specifications (Preliminary)

Doc. No1.

Module Type	**TXQ033/TXQ034 26”HD_60Hz**
Date	**2010-07-01**
Revision number	**Ver. 00**
Code	**TBD**

Customer Approved

CHILIN TECHNOLOGY				
QRA	**Manufacture**	**Approved**	**Checked**	**Design**
黃立元	黃進益	余鴻文	洪明鴻	李佳璋

Specifications (Preliminary)

Revision History

Version	Date	Page	Section	Description
00	2010/07/01	All	All	
01	2010/7/13	15	2.0	Modify Brightness

Specifications (Preliminary)

CONTENTS OF White LED MODULE for 26" LCM

Specifications (Preliminary)

1.0 APPLIED TYPE

This model adopts : CMI V260B2-P01 (OPEN CELL）.

Therefore, please refer to specifications of 26”wide TFT-LCD module for a drive method and an electrical characteristic of cell.

1.1 GENERAL SPECIFICATIONS

Item	Specification	Unit	Note
Active Area	575.769(H) x 323.712 (V) (26" diagonal)	mm	
Bezel Opening Area	578.4(L) x 327.6 (W)	mm	
Driver Element	a-si TFT active matrix	-	
Pixel Number	1366 x R.G.B. x 768	pixel	
Pixel Pitch	0.4215 (per one triad) x 0.4215	mm	
Pixel Arrangement	RGB vertical stripe	-	
Display Colors	16.7M	color	
Display Operation Mode	Normal White	-	
Surface Treatment	Anti Glare + 3H	-	

1.2 MECHANICAL SPECIFICATIONS

Item		Typ.	Unit	Note
Module Size	Horizontal(H)	613	mm	
	Vertical(V)	361	mm	
	Depth(D)	16.6	mm	To Frame Rear
Weight		2.74	Kg	

1.3 ABSOLUTE MAXIMUM RATING

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Storage Temperature	T_{ST}	-20	+60	ºC	(1)
Operating Ambient Temperature	T_{OP}	0	+50	ºC	(1), (2)
Shock (Non-Operating)	S_{NOP}	—	50	G	(3), (5)
Vibration (Non-Operating)	V_{NOP}	—	1.0	G	(4), (5)

Note (1) Temperature and relative humidity range is shown in the figure below.

(a) 90 %RH Max. (Ta ≦ 40 ºC).

(b) Wet-bulb temperature should be 39 ºC Max. (Ta > 40 ºC).

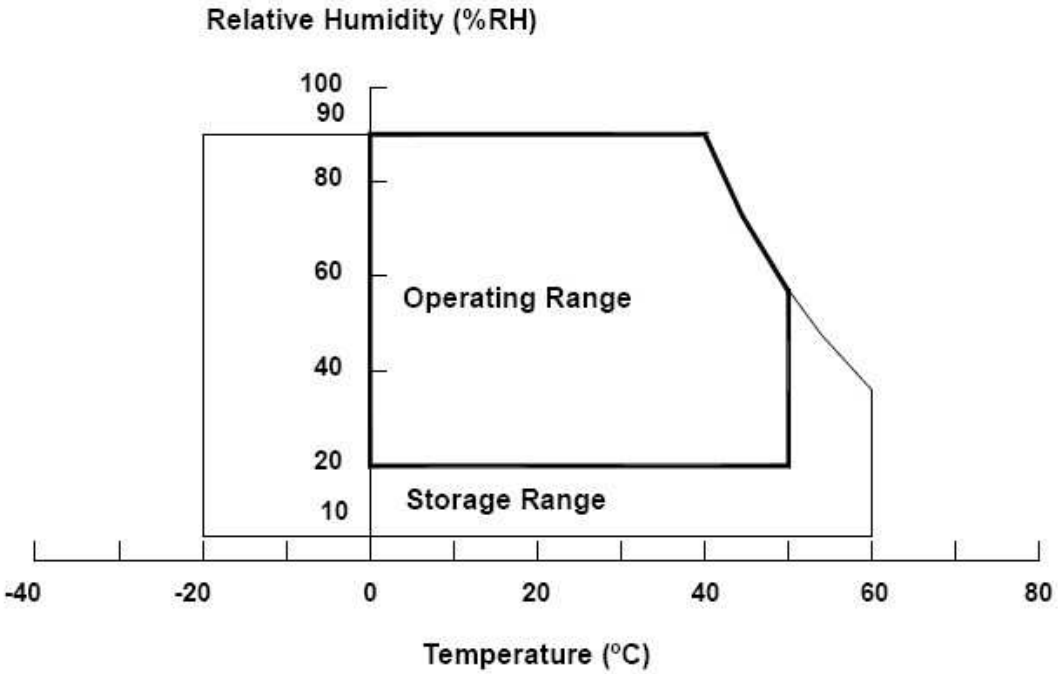
(c) No condensation.

Note (2) The maximum operating temperature is based on the test condition that the surface temperature of display area is less than or equal to 65 ºC with LCD module alone in a temperature controlled chamber. Thermal management should be considered in final product design to prevent the surface temperature of display area from being over 65 ºC. The range of operating temperature may degrade in case of improper thermal management in final product design.

Note (3) 11 ms, half sine wave, 1 time for ± X, ± Y, ± Z.

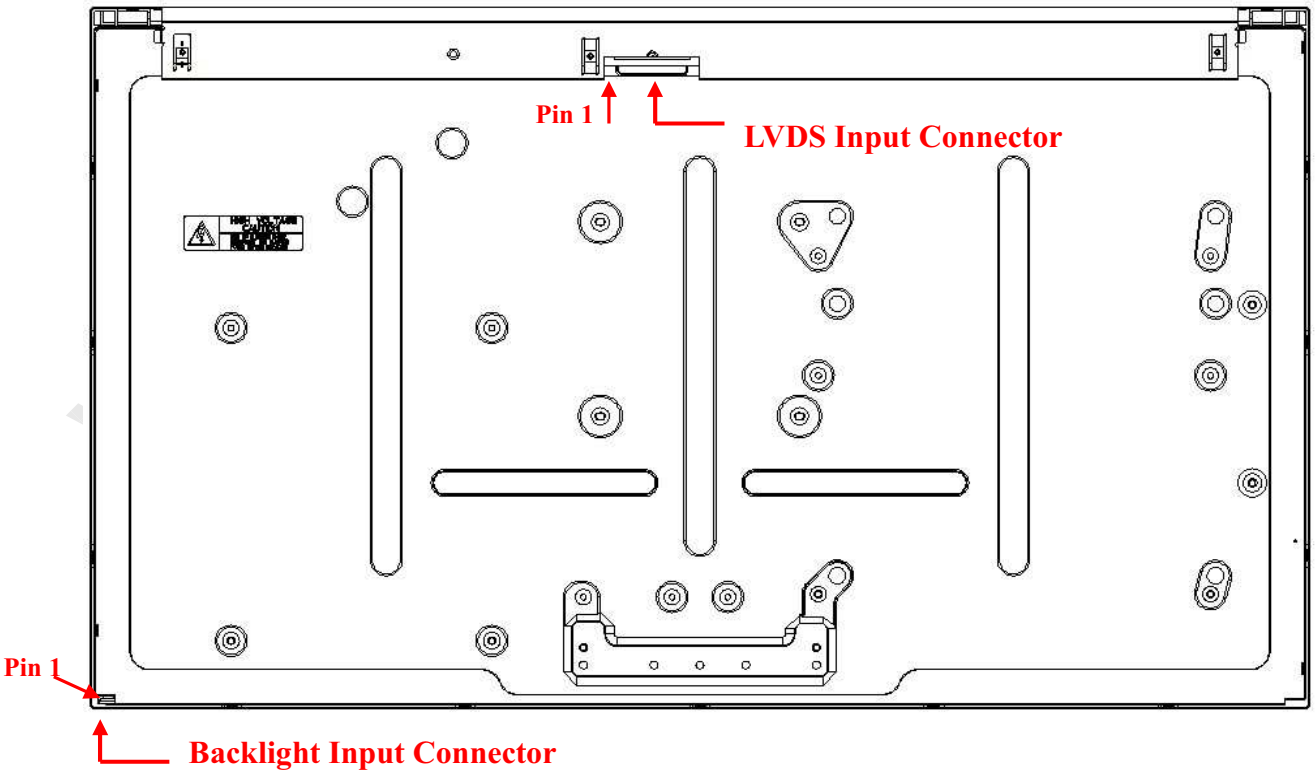
Note (4) 10 ~ 500 Hz, 10 min, 1 time each X, Y, Z.

Note (5) At testing Vibration and Shock, the fixture in holding the module has to be hard and rigid enough so that the module would not be twisted or bent by the fixture.



LED Backlight Rating : VL=30.0~36.0V,IL=720mA

1.4 LCM MODULE INTERFACE DEFINITION



1.4.1 CELL INFORMATION

1.4.1.1 REFERENCE TO CMI V260B2-P01 SPECIFICATION

1.4.1.2 LVDS INPUT CONNECTOR PIN ASSIGNMENT

Pin No.	Symbol	Description	Note
1	VCC	Power supply: +12V	
2	VCC	Power supply: +12V	
3	VCC	Power supply: +12V	
4	VCC	Power supply: +12V	
5	GND	Ground	
6	GND	Ground	
7	GND	Ground	
8	GND	Ground	
9	SELLVDS	Select LVDS data format	(2)
10	NC	No connection	(3)
11	GND	Ground	
12	RX0-	Negative transmission data of pixel 0	
13	RX0+	Positive transmission data of pixel 0	
14	GND	Ground	
15	RX1-	Negative transmission data of pixel 1	
16	RX1+	Positive transmission data of pixel 1	
17	GND	Ground	
18	RX2-	Negative transmission data of pixel 2	
19	RX2+	Positive transmission data of pixel 2	
20	GND	Ground	
21	RXCLK-	Negative of clock	
22	RXCLK+	Positive of clock	
23	GND	Ground	
24	RX3-	Negative transmission data of pixel 3	
25	RX3+	Positive transmission data of pixel 3	
26	GND	Ground	
27	NC	No connection	(3)
28	NC	No connection	(3)
29	GND	Ground	
30	GND	Ground	

Note (1) Connector Part No.: FCI, 10041195-001 or compatible

Note (2) Ground or OPEN: Normal, High: JEIDA LVDS format

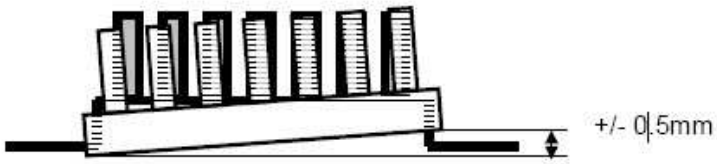
Please refer to LVDS INTERFACE

Note (3) Reserved for internal use. Please leave it open.

1.4.1.3 CONNECTOR EMECHANICAL SPECIFICATIONS

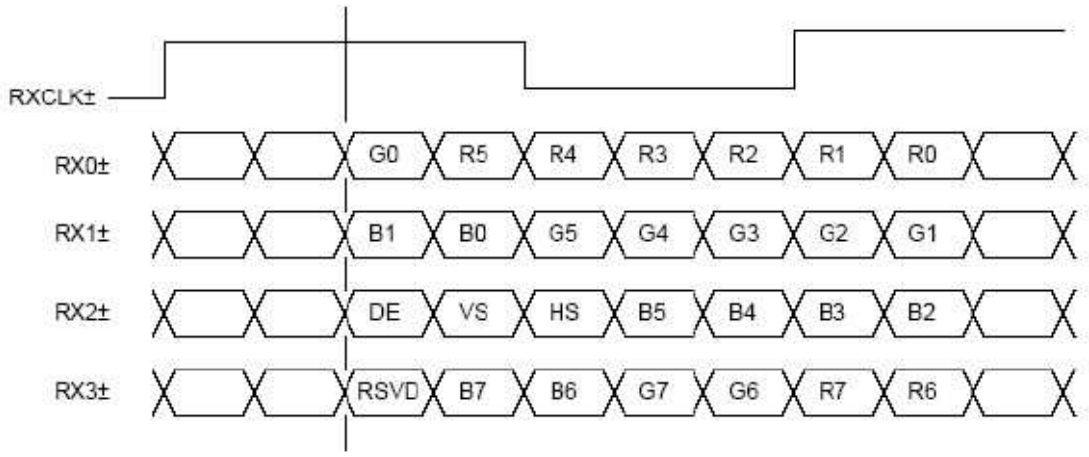
Item	Min.	Typ.	Max.	Unit	Note
Weight		850		g	
I/F connector mounting position	The mounting inclination of the connector makes the screen center within ±0.5mm as the horizontal.				(1)

Note (1) Connector mounting position

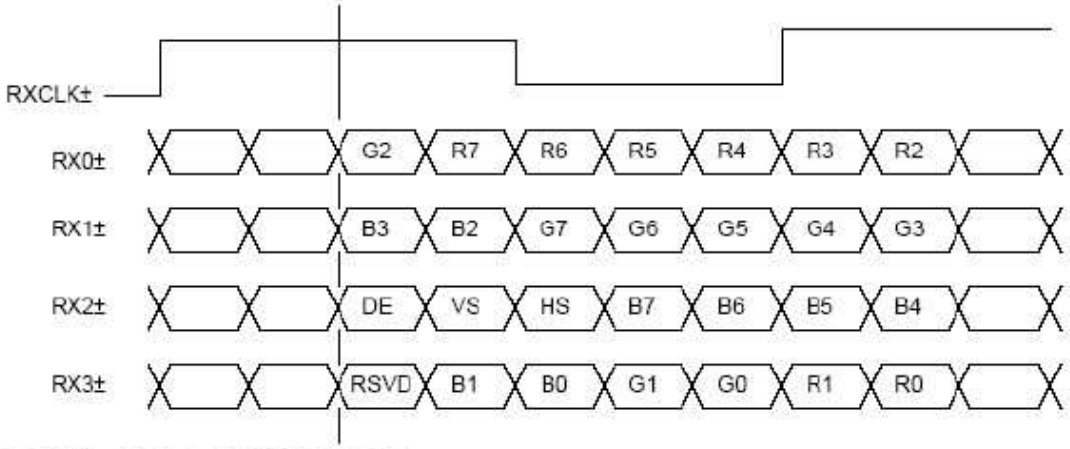


1.4.1.4 LVDS INTERFACE

SELLVDS = L or Open (VESA)



SELLVDS = H (JEIDA)



R0~R7: Pixel R Data (7; MSB, 0; LSB)

G0~G7: Pixel G Data (7; MSB, 0; LSB)

B0~B7: Pixel B Data (7; MSB, 0; LSB)

DE : Data enable signal

Notes(1) RSVD(reserved)pins on the transmitter shall be "H" or "L".

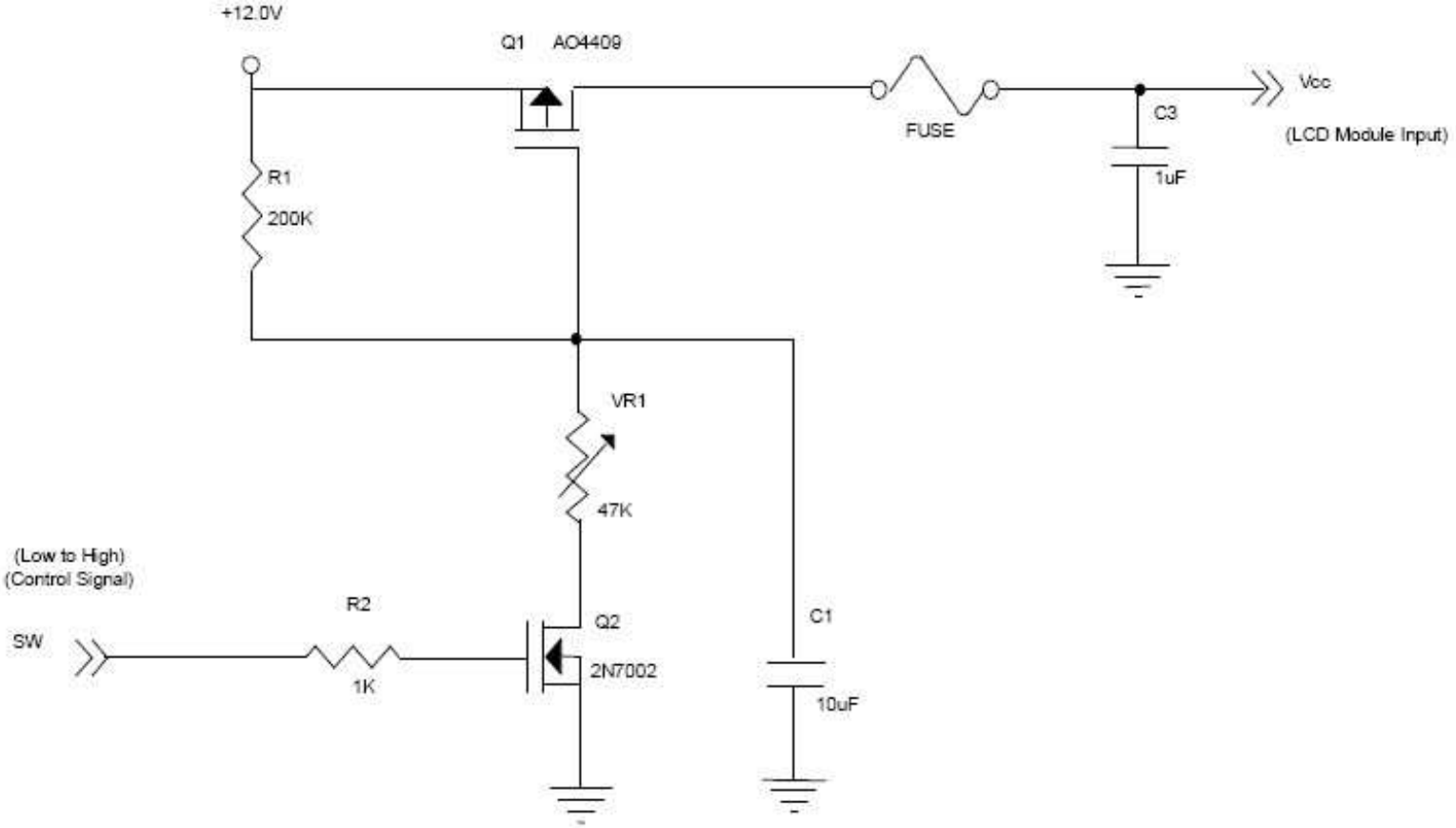
1.4.1.5 ELECTRICAL CHARACTERISTICS FOR LVDS RECEIVER

Ta = 25 ± 2 °C

Parameter		Symbol	Value			Unit	Note
			Min.	Typ.	Max.		
Power Supply Voltage		V_{CC}	11.4	12.0	12.6	V	(1)
Power Supply Ripple Voltage		V_{RP}	–	–	300	mV	
Rush Current		I_{RUSH}	–	–	3.0	A	(2)
Power Supply Current	White	I_{CC}	–	0.25	0.30	A	(3)
	Black		–	0.35	0.40	A	
	Vertical Stripe		–	0.35	0.40	A	
LVDS Interface	Differential Input High Threshold Voltage	V_{LVTH}	+100	–	–	mV	
	Differential Input Low Threshold Voltage	V_{LVTL}	–	–	-100	mV	
	Common Input Voltage	V_{LVC}	1.125	1.25	1.375	V	
	Terminating Resistor	R_T	–	100	–	ohm	
CMOS interface	Input High Threshold Voltage	V_{IH}	2.7	–	3.3	V	
	Input Low Threshold Voltage	V_{IL}	0	–	0.7	V	

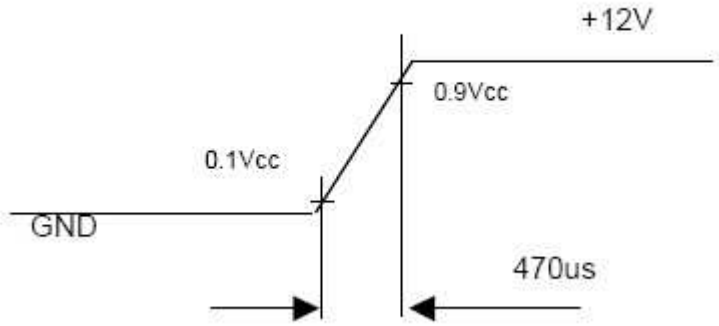
Note (1) The module should be always operated within above ranges.

Note (2) Measurement Conditions:



Specifications (Preliminary)

Vcc rising time is 470us



Note (3) The specified power supply current is under the conditions at Vcc = 12 V, Ta = 25 ± 2 °C, f_v = 60 Hz, whereas a power dissipation check pattern below is displayed.

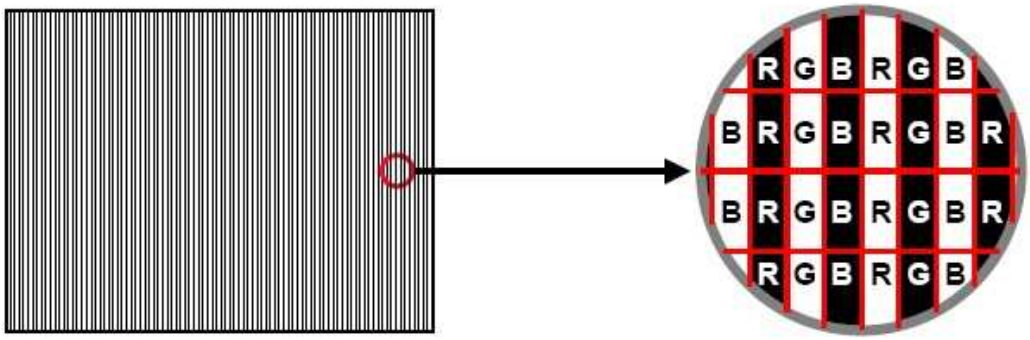
a. White Pattern

Active Area

b. Black Pattern

Active Area

c. Vertical Stripe Pattern



Active Area

1.4.1.6 COLOR DATA INPUT ASSIGNMENT

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 the assignment of color versus data input.

Color		Data Signal																							
		Red								Green								Blue							
		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	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	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	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
Gray Scale Of 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)	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gray Scale Of 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)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Gray Scale Of 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)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

Note (1) 0: Low Level Voltage, 1: High Level Voltage

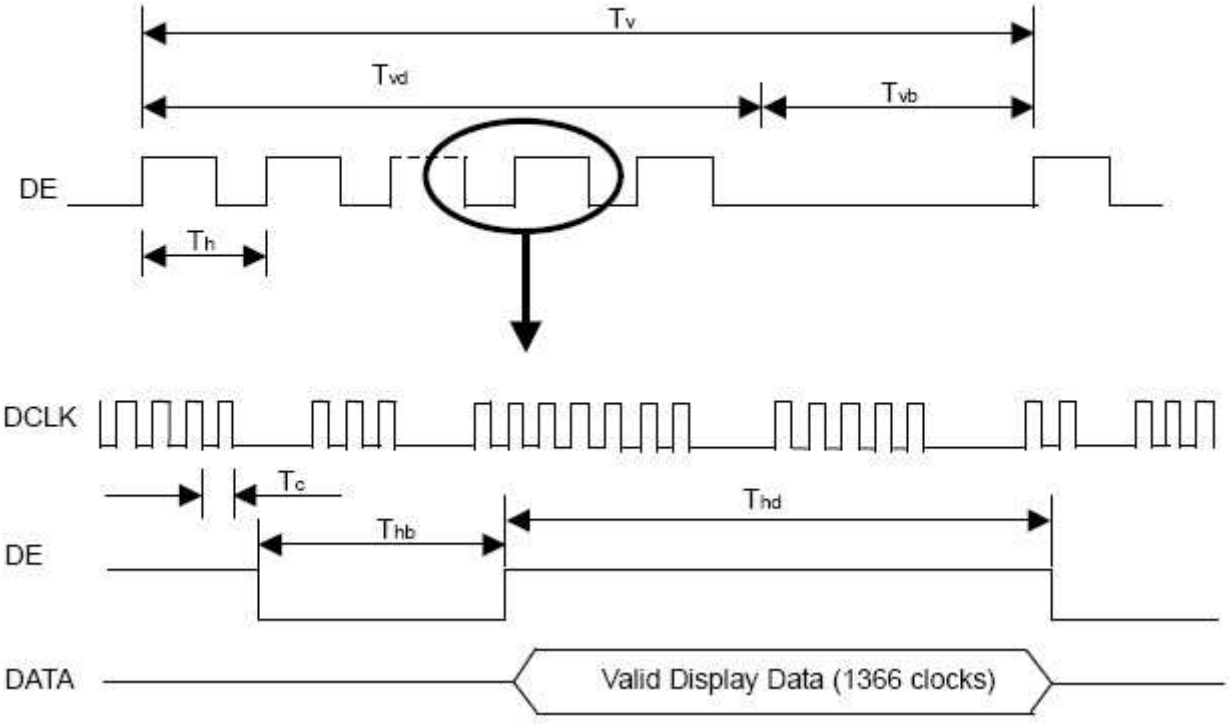
1.4.1.7 INPUT SIGNAL TIMING SPECIFICATIONS

The input signal timing specifications are shown as the following table and timing diagram.

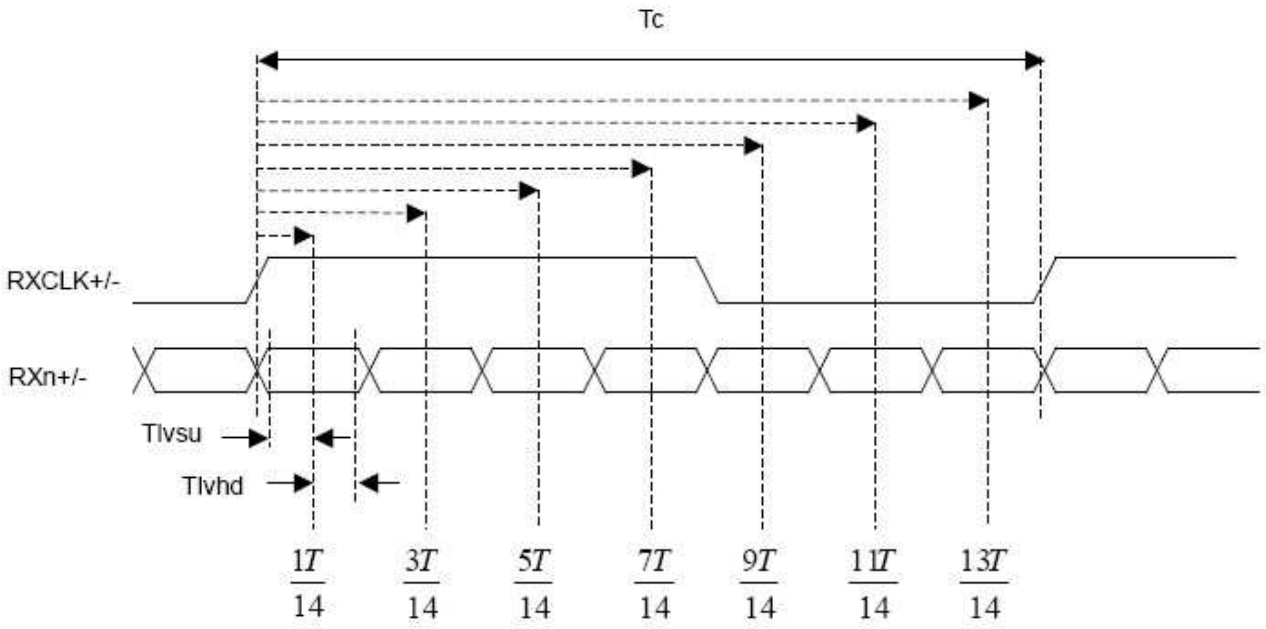
Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
LVDS Receiver Clock	Frequency	1/Tc	60	76	82	MHz	
	Input cycle to cycle jitter	Trcl	—	—	200	ps	
LVDS Receiver Data	Setup Time	Tlvsu	600	—	—	ps	
	Hold Time	Tlvhd	600	—	—	ps	
Vertical Active Display Term	Frame Rate	Frs	47	50	53	Hz	
		Fr6	57	60	63	Hz	
	Total	Tv	778	806	888	Th	Tv=Tvd+Tvb
	Display	Tvd	768	768	768	Th	-
	Blank	Tvb	10	38	120	Th	-
Horizontal Active Display Term	Total	Th	1442	1560	1936	Tc	Th=Thd+Thb
	Display	Thd	1366	1366	1366	Tc	-
	Blank	Thb	76	194	570	Tc	-

Note (1) Since this module is operated in DE only mode, Hsync and Vsync input signals should be set to low logic level. Otherwise, this module would operate abnormally.

INPUT SIGNAL TIMING DIAGRAM

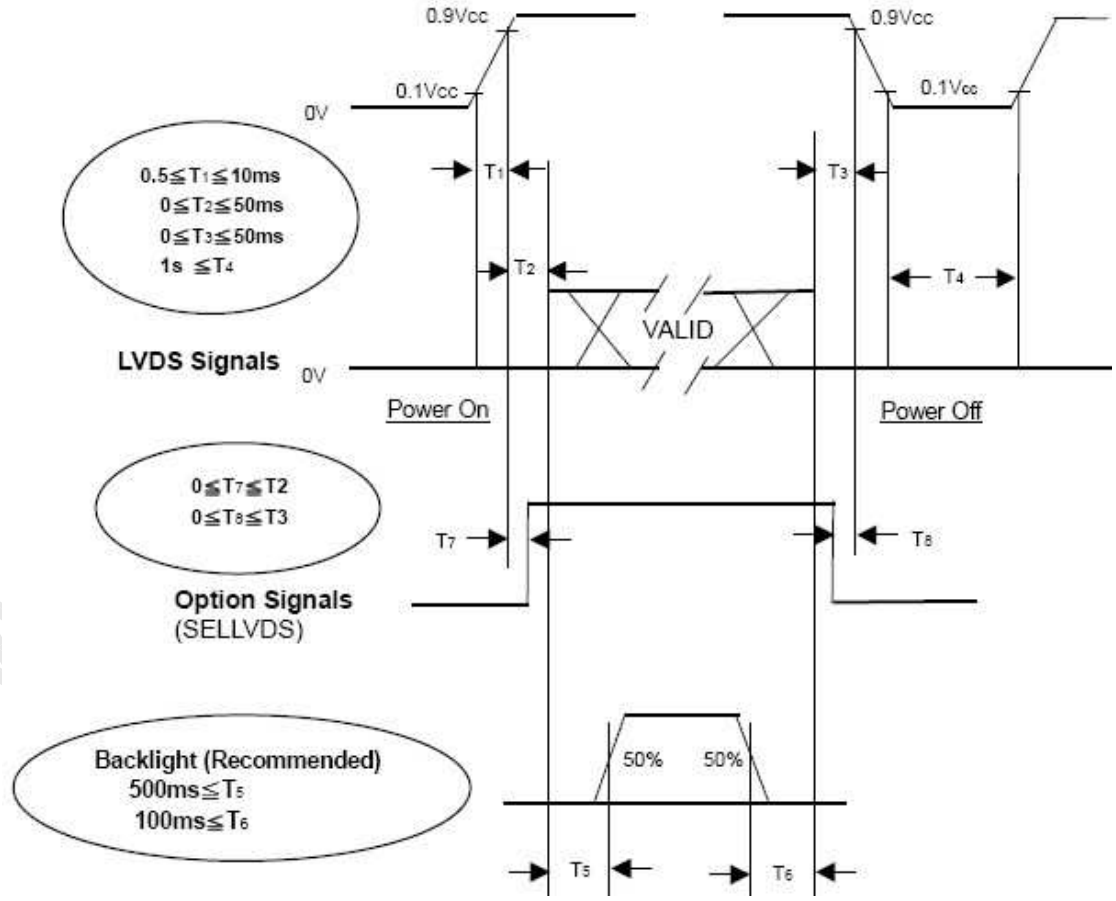


LVDS RECEIVER INTERFACE TIMING DIAGRAM



1.4.1.8 CELL ON/OFF SEQUENCE

To prevent a latch-up or DC operation of LCD module, the power on/off sequence should be as the diagram below.



CELL ON/OFF SEQUENCE

Note (1) The supply voltage of the external system for the module input should follow the definition of Vcc.

Note (2) Apply the lamp voltage within the LCD operation range. When the backlight turns on before the LCD operation or the LCD turns off before the backlight turns off, the display may momentarily become abnormal screen.

Note (3) In case of Vcc is in off level, please keep the level of input signals on the low or high impedance. If T2<0,that maybe cause electrical overstress failure.

Note (4) T4 should be measured after the module has been fully discharged between power off and on period.

Note (5) Interface signal shall not be kept at high impedance when the power is on.

1.4.2 LED BACKLIGHT MODULE

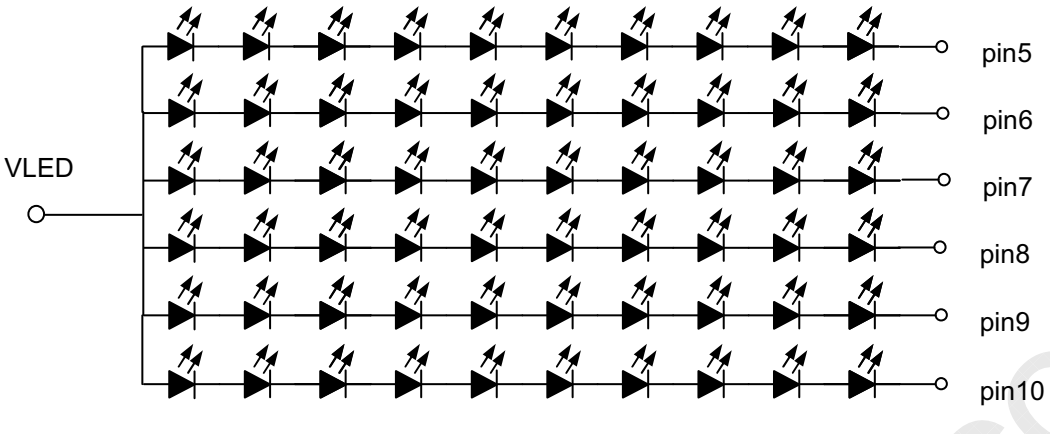
1.4.2.1 LED BACKLIGHT LIGHT ON CONNECTOR PIN DEFINITION AND SCHEMATIC

Connector : Molex 51281-1094

Pin No.	Symbol	Feature
1	VLED+	Positive of LED String
2	VLED+	
3	VLED+	
4	NC	No Connection
5	VLED-	Negative of LED String
6	VLED-	
7	VLED-	
8	VLED-	
9	VLED-	
10	VLED-	

Specifications (Preliminary)

VL=30.0~36.0V,IL=720mA



Schematic

1.4.2.2 LED BACKLIGHT LED RATING SPECIFICATION

Ta=25°C

Item	Min.	Typ.	Max.	Unit	Remark
Input Voltage	30.0	-	36.0	V	Constant Current = 120mA
Input Current (Per Pin)	115	120	125	mA	

1.4.3 ABSOLUTE MAXIMUM RATING (ELECTRICAL)

Ta=25°C

Item	Min.	Typ.	Max.	Unit	Remark
LED Forward Voltage	3.0	-	3.6	V	
LED Forward Current		120	150	mA	
LED Reverse Voltage	5			V	
LED Power Dissipation	600			mW	
ESD(HBM)	>1500			V	Note(1)
ESD(MM)	>150			V	Note(1)

Note (1) : **Static electricity or surge voltage can damage the LEDs.** All equipment, machinery and the treatment persons must be properly grounded. It is recommended to use a wristband or anti-electrostatic glove when handling the LED.

And don't touch interface pin directly.

Specifications (Preliminary)

2.0 OPTICAL SPECIFICATIONS

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Contrast Ratio		CR	θx=0°, θy=0° Viewing Normal Angle	600	800	—	—	(1),(2),(7)
Response Time		Rising Time(Tr)		—	1.5	3	ms	(1), (6) ,(7)
		Falling Time(Tf)		—	3.5	5		
Brightness		B1		280	310	—	cd/m2	(1),(3) Center point5 at LCM
Uniformity		△B		70	75	—	%	(1),(4)
Color Chromaticity	White	Wx		Typ –0.03	0.279	Typ +0.03	—	(1),(3) , Center point5 at LCM
		Wy			0.292			
	Red	Rx			0.632		—	
		Ry			0.344			
	Green	Gx			0.339		—	
		Gy			0.657			
	Blue	Bx			0.146		—	
		By			0.046			
Viewing Angle	Horizontal	θx+	Brightness(θ) Equal to 1/3 B1	—	40	—	Deg.	(1),(5)
		θx-		—	40	—		
	Vertical	θy+		—	35	—		
		θy-		—	35	—		

Note (1) Measurement Setup: The LCD module should be stabilized at given temperature for 1 hour to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 1 hour in a windless room.

Any outstanding stain (or mura) and/or any outstanding difference of Chromaticity between any parts of the active area will cause Backlight Assembly and LCM to be rejected.

Note (2) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L255 / L0

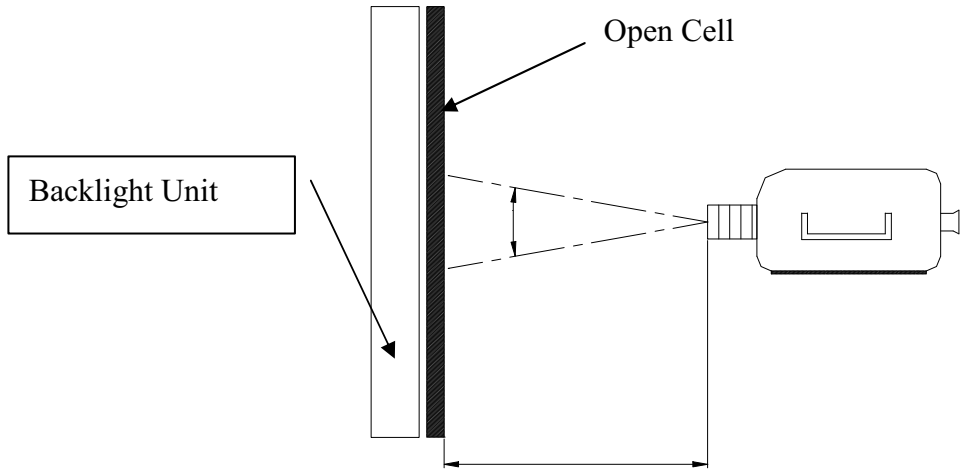
L255: Luminance of gray level 255

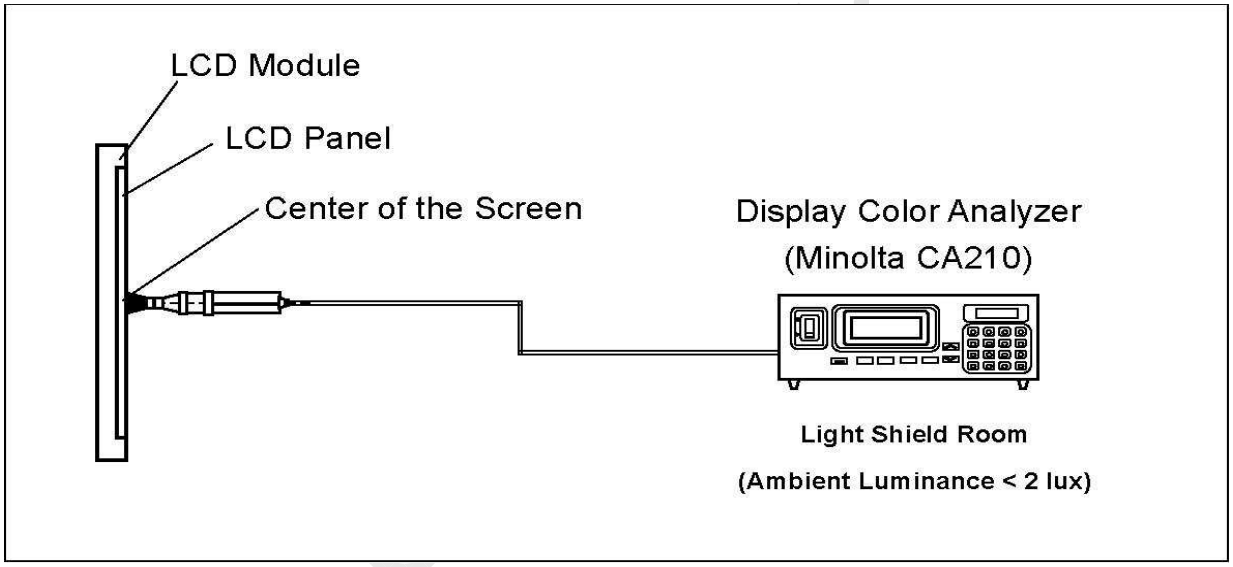
L 0: Luminance of gray level 0

CR = CR (5), where CR (X) is corresponding to the Contrast Ratio of the point X at the figure in Note (4)

Specifications (Preliminary)

Note（3）Measurement Method





E / Item	CA210
Angle Θ	±2.5°
Distance L	3cm

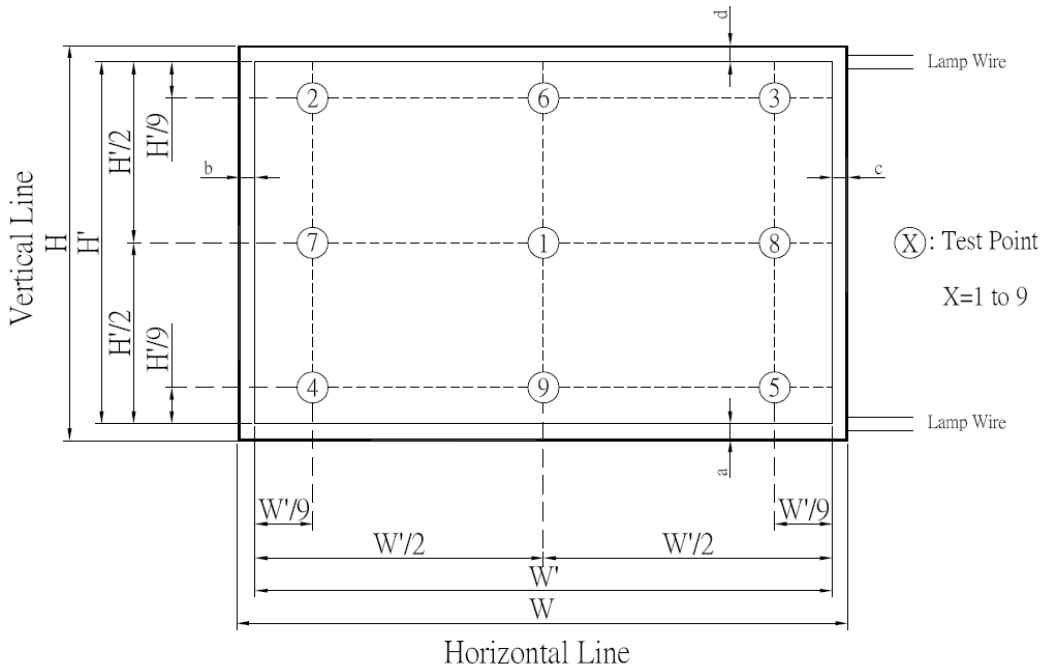
Note (4) Definition of White Uniformity (△B):

Measure the brightness of white at 9 points

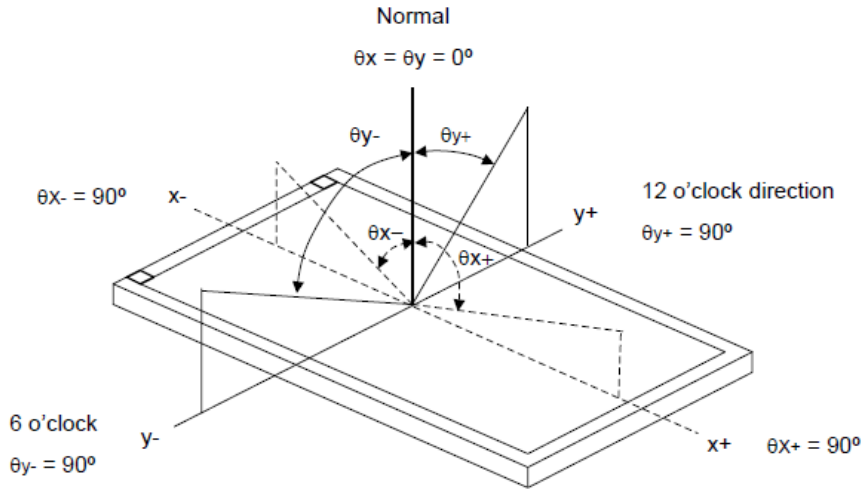
△B = Minimum [B (1) ~ B (9)] / Maximum [B(1) ~ B (9)]

where B (X) is corresponding to the brightness of the point X at the figure below.

Specifications (Preliminary)



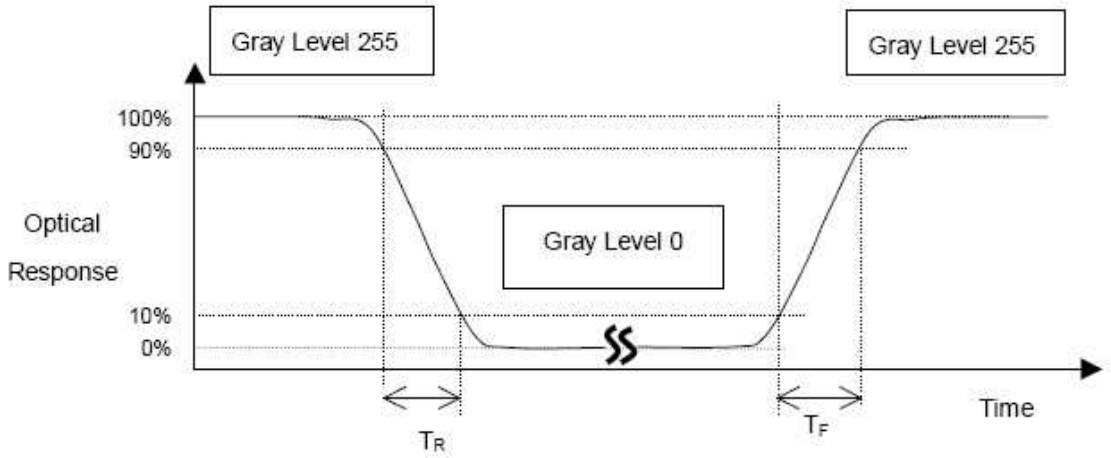
Note（5）Definition of Viewing Angle（θx, θy）：



This measurement method is referred to methods of Part 5.12 SJ/T 11348-2006(measurement for digital television flat panel displays).

Note (6) Definition of Response Time(T_R，T_F)

Specifications (Preliminary)



Note (7)

Contrast ratio and response time is corresponding to the original cell specification of V260B2-P01 defined by CMI.

3.0 RELIABILITY TEST ITEM

	Test Items	Q'ty	Condition
1	High Temperature Operation	3	50℃，300hrs
2	High Temperature And High Humidity Operation	3	50℃/ 80%RH，300hrs
3	ESD Contact Mode	3	'+/-8,10KV, 1sec/cycle, class C , 2hrs
4	ESD Air Mode	3	'+/-15KV, 1sec/cycle, class C , 2hrs
5	Mechanical Shock (non-operation)	3	50G, 11ms, half sine wave, 1 times for each direction of ±X,±Y, 35G, 11ms, half sine wave, 1 times for each direction of ±Z
6	Panel Vibration	3	10-200Hz, 1G, 30mm is Max., 30min/cycle, 1cycles for each X,Y,Z.

Specifications (Preliminary)

4.0 PACKING

4.1 PACKING SPECIFICATIONS

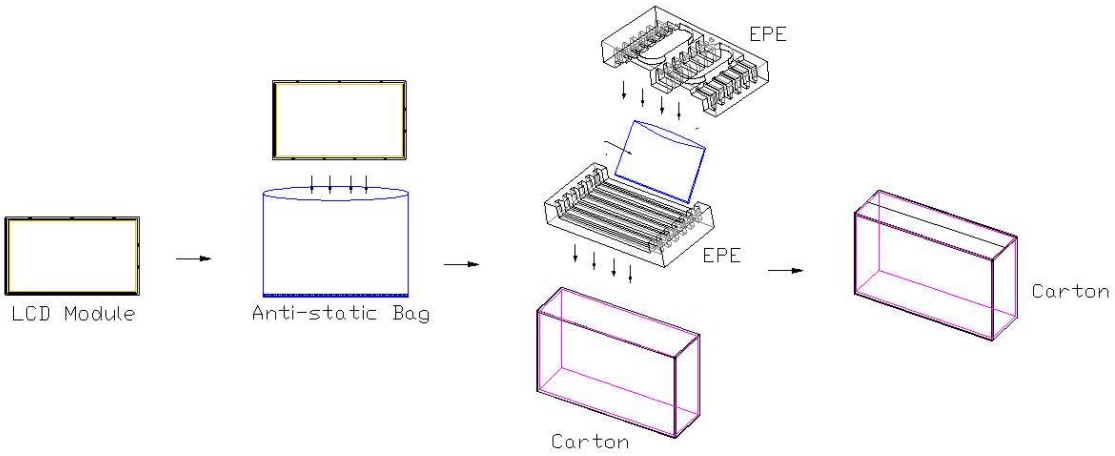
Carton SPECIFICATIONS

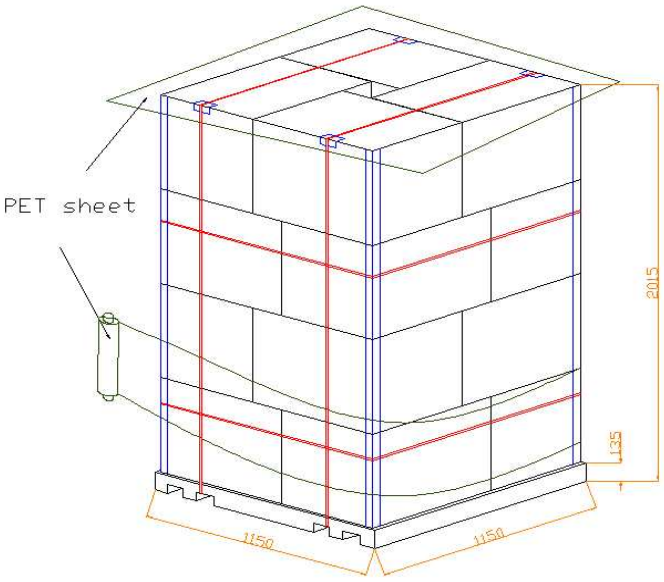
（1） 6 LCD modules / 1Box

（2） Box dimensions： 726（L）× 380 （W）× 467（H）mm

（3） Weight : approximately： 21.2 kg (6 modules per box，packaging materials including pallet)

4.2 PACKING METHOD



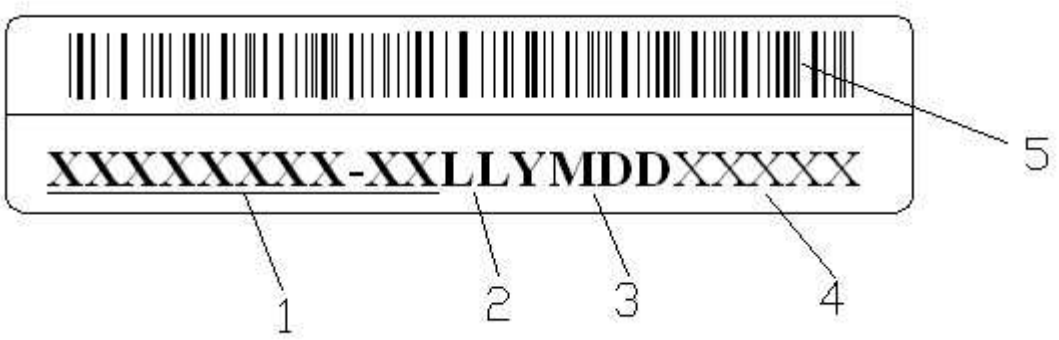


Sea/Land transportation
Pallet:1150*1150*135mm
Pallet stock dim:1150*1150*2015mm

4.3 PACKAGING LABEL

LCM Label

The barcode nameplate is pasted on each backlight as illustration, and its definitions are as following explanation.



1 : LCM Part No : 10190110-A0

2 : Make Spaces: TY:C4

3 : Year 2010 : A, 2011 : B, 2012 : C,..... not include I,O,U,V
Month : 1 2 3 4 5 6 7 8 9 X Y Z
Date : 01,02,03,04 ~30,31

4 : Serial No 00001~99999 (Reset every day)

5 : Barcode Format (CODE 93)

5.0 PRECAUTIONS

5.1 MOUNTING PRECAUTIONS

(1) You must mount a module using holes arranged in four corners or four sides.

(2) You should consider the mounting structure so that uneven force (ex. twisted stress) is not applied to module. And the case on which a module is mounted should have sufficient strength so that external force is not transmitted directly to the module.

(3) Please attach the surface transparent protective plate to the surface in order to protect the polarizer. Transparent protective plate should have sufficient strength in order to the resist external force.

(4) You should adopt radiation structure to satisfy the temperature specification.

(5) Acetic acid type and chlorine type materials for the cover case are not desirable because the former generates corrosive gas of attacking the polarizer at high temperature and the latter cause circuit broken by electro-chemical reaction.

(6) Do not touch, push or rub the exposed polarizer with glass, tweezers or anything harder than HB pencil lead. And please do not rub with dust clothes with chemical treatment. Do not touch the surface of polarizer for bare hand or greasy cloth. (Some cosmetics are detrimental to the polarizer.)

(7) When the surface becomes dusty, please wipe gently with absorbent cotton or other soft materials like chamois soaks with petroleum benzene. Normal-hexane is recommended for cleaning the adhesives used to attach front/ rear polarizer. Do not use acetone, toluene and alcohol because they cause chemical damage to the polarizer.

(8) Wipe off saliva or water drops as soon as possible. Their long time contact with polarizer causes deformations and color fading.

(9) Do not open the case because inside circuits do not have sufficient strength.

5.2 OPERATING PRECAUTONS

(1) The device listed in the product specification sheets was designed and manufactured for TV application

(2) The spike noise causes the mis-operation of circuits. It should be lower than following voltage: V=±200mV(Over and under shoot voltage)

(3) Response time depends on the temperature. (In lower temperature, it becomes longer..)

(4) Be careful for condensation at sudden temperature change. Condensation makes damage to polarizer or electrical contacted parts. And after fading condensation, smear or spot will occur.

(5) When fixed patterns are displayed for a long time, remnant image is likely to occur.

(6) Module has high frequency circuits. Sufficient suppression to the electromagnetic interference shall be done by system manufacturers. Grounding and shielding methods may be important to minimize the interface.

5.3 ELECTROSTATIC DISCHARGE CONTROL

Since a module is composed of electronic circuits, it is not strong to electrostatic discharge. Make certain that treatment persons are connected to ground through wristband etc. And don't touch interface pin directly.

5.4 PRECAUTIONS FOR STRONG LIGHT EXPOSURE

Strong light exposure causes degradation of polarizer and color filter.

5.5 STORAGE

When Storing modules as spares for a long time, the following precautions are necessary.

(1) Store them in a dark place. Do not expose the module to sunlight or fluorescent light. Keep the temperature between 20℃and 30℃ at Humidity between 25% and 75%

(2) The polarizer surface should not come in contact with any other object. It is recommended that they be stored in the container in which they were shipped.

5.6 HANDLING PRECAUTIONS FOR PROTECTION FILM

(1) The protection film is attached to the bezel with a small masking tape. When the protection film is peeled off, static electricity is generated between the film and polarizer. This should be peeled off slowly and carefully by people who are electrically grounded and with well ion-blown equipment or in such a condition, etc.

(2) When the module with protection film attached is stored for a long time, sometimes there remains a very small amount of glue still on the bezel after the protection film is peeled off.

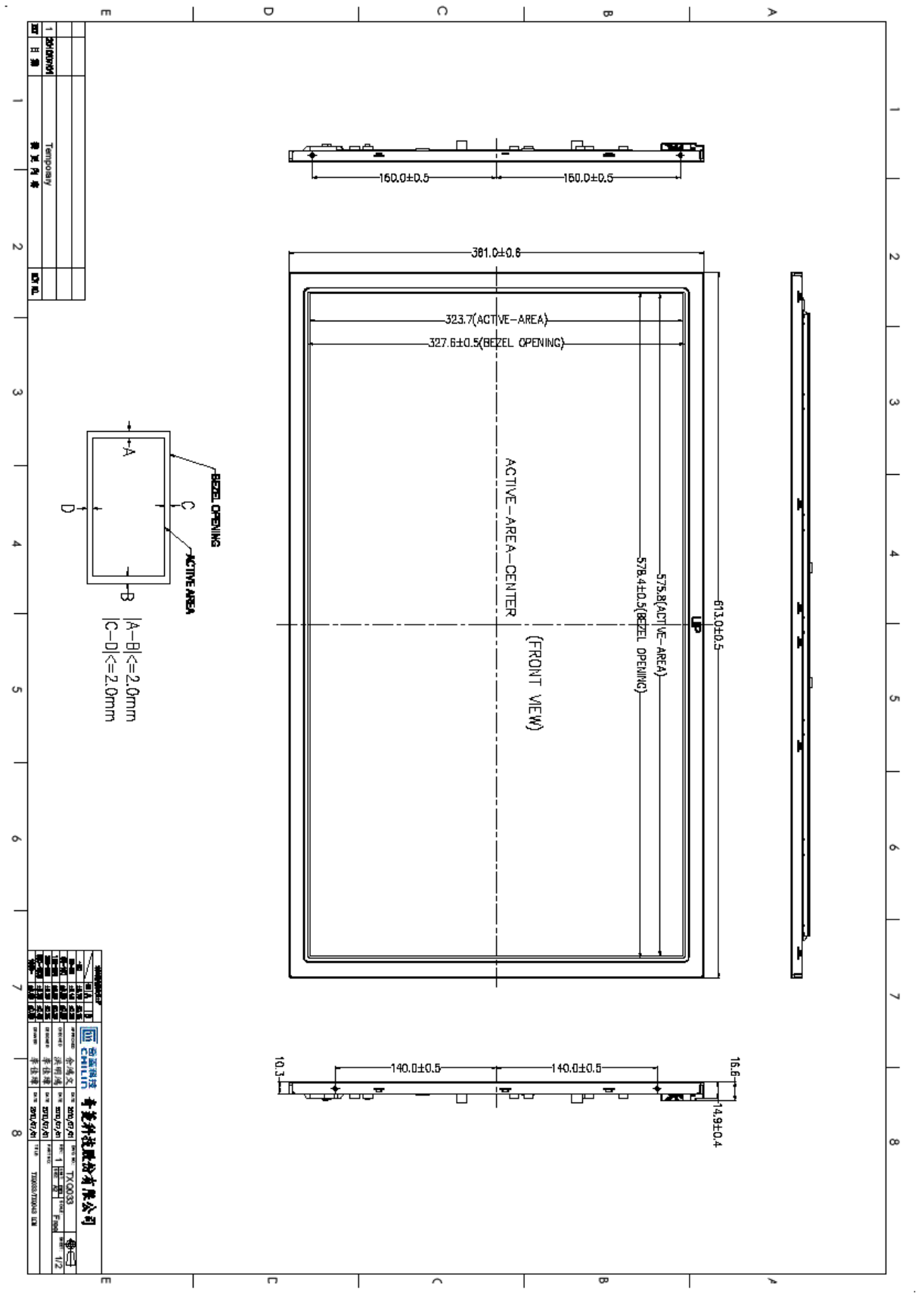
(3) You can remove the glue easily. When the glue remains on the bezel or its vestige is recognized, please wipe them off with absorbent cotton waste or other soft material like chamois soaked with normal-hexane.

6.0 LOT NO. GENERATION

According to the customer supply specification

Specifications (Preliminary)

7.0 MECHANICAL CHARACTERISTICS



Specifications (Preliminary)