



SHENZHEN APTUS TECHNOLOGY CO., LIMITED

PRODUCT SPECIFICATION

49” UHD Curved R1500 Touch Monitor

MODEL NAME: DJ490R15L51V50A

DOC VERSION: 1.0

TOTAL PAGES: 28

DATE: 2024.08.15

FOR CUSTOMER	
CUSTOMER APPROVED	

NOTE: THE CONTENT OF THIS SPECIFICATION IS SUBJECT TO CHANGE WITHOUT NOTICE.

ALL RIGHTS STRICTLY RESERVED. ANY PORTION OF THIS PATER SHALL NOT BE REPRODUCED, COPIED, OR TRANSFORMED TO ANY OTHER FORMS WITHOUT PERMISSION FROM APTUS INTERNATIONAL CO., LIMITED.

Catalogue	
1.0 Cover Page	1
2.0 Contents	2-3
3.0 Amendant Record	4
4.0 General Information	5
4.1 Essential Information	5
4.2 Absolute Rating	6
5.0 Electrical Characteristics	7
5.1. Electrical Performance Parameter	7
5.2 Backlight Parameter	8
5.3 Interface Connection Mode	9
5.3.1 LCD Module	9-10
5.4 Signal Timing Specification	10
5.5 Input Signal Characteristic	11
5.5.1 Input Signal Timing Diagram	11
5.5.2 Description of Input Signal Characteristics	12
5.6 Internal Interface Signal Specification	13
5.6.1 EPI Signal Specification	13
5.7 Color Data Reference	14
5.8 Power on Sequence	14
5.8.1 LCD Drive Circuit	15
5.9 Optical Property	16
5.9.1 Optical Data	16-17
5.9.2 Table 10. Gray Scale Specification	17
6.0 Mechanical Characteristics	17-19
6.1 Mechanical Parameter	19-20
7.0 Outgoing inspection specification	20
7.1 Range of Application	20

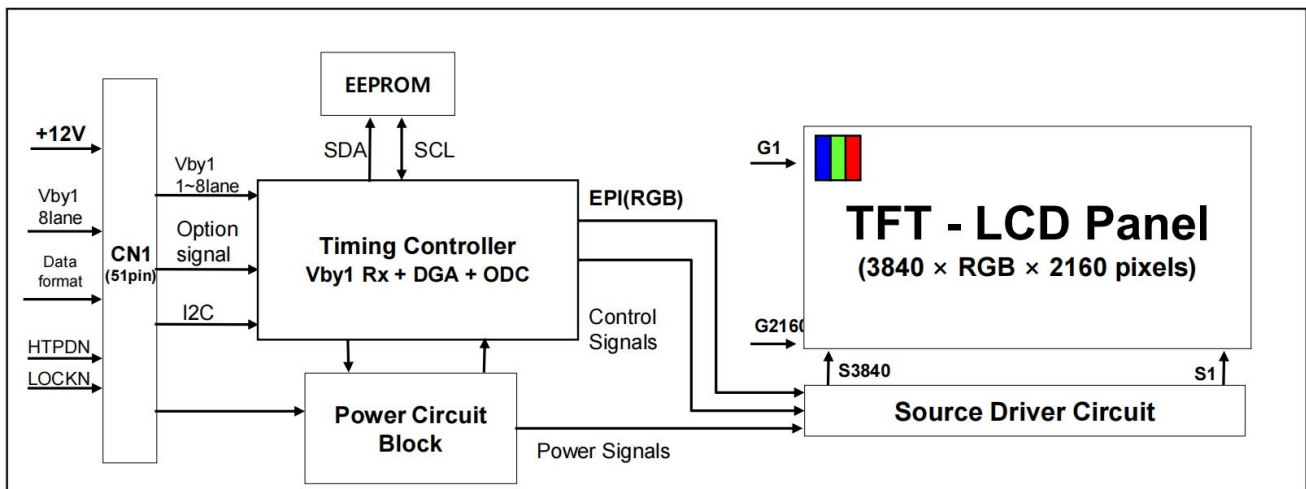
7.2 Responsibility	20
7.3 Safety Requirements	21
7.4 Environmental Conditions	21
8.0 Specification Test Standard	21
8.1 Optical Test Standard	21
8.2 Test Condition	21
8.3 Backlight Inspection Specifications	22
8.4 Cosmetic Inspection Standard	22-23
9.0. Reliability Test Items and Conditions	24-25
10.0 International Standard	25
10.1 Security	25
10.2 Environment	25
11.0 Package Labels	26
11.1 Label Information Description	26
11.2 Packing Method	26
11.3 Storage Condition	26
12.0 Matters Need Attention	27
12.1 Protective Film	27
12.2 Precautions For Pretreatment of B/A box	27
12.3 Storage precautions	27
12.4 Suitable For Commercial Display Conditions	28
12.4.1 Normal Operating Condition	28
12.4.2 Operating Usages Under Abnormal Condition	28

4.0 General Information

The Opencell is a Color Active Matrix Liquid Crystal Display with an integral the Source PCB and Gate implanted on Panel (GIP). The matrix employs a-Si Thin Film Transistor as the active element. It is a transmissive type display operating in the normally black mode. It has a 48.51 inch diagonally measured active display area with QW UXGA resolution (2160 vertical by 3840 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 10-bit gray scale signal for each dot. Therefore, it can present a palette of more than 16.7M(true) colors.

It has been designed to apply the 10-bit(D) 8 Lane VbyOne interface.

It is intended to support LCD TV, PCTV where high brightness, super wide viewing angle, high color gamut, high color depth and fast response time are important.



4.1 Essential Information

Active Screen Size	48.5 inches diagonal
Outline Dimension	1099(H) x643 (V) x 26 mm(D)
Pixel Pitch	0.27963 mm x 0.27963 mm
Pixel Format	3840 horiz. by 2160 vert. Pixels, RGB stripe arrangement
Display Mode	IPS
Color Depth	10-bit(D), 1.07 Billion colors
Interface	Vby1 8 Lane
Luminance, White	500cd/m ² (Typ)
Radius	R1500(±100)
OC. Transmittance(with POL)	4.82%(Typ)
Viewing Angle (CR>10)	Viewing angle free (R/L 178(Min.), U/D 178 (Min.))
Power Consumption	88.3W (Typ.)
Weight	10.5Kg (Typ.)
Display Mode	Transmissive mode, Normally black
Surface Treatment (Top)	Hard coating(2H), Anti-glare low reflection treatment of the front polarizer (Haze 3%(Typ)
Possible Display Type	Landscape Only Enable

4.2 Absolute Rating

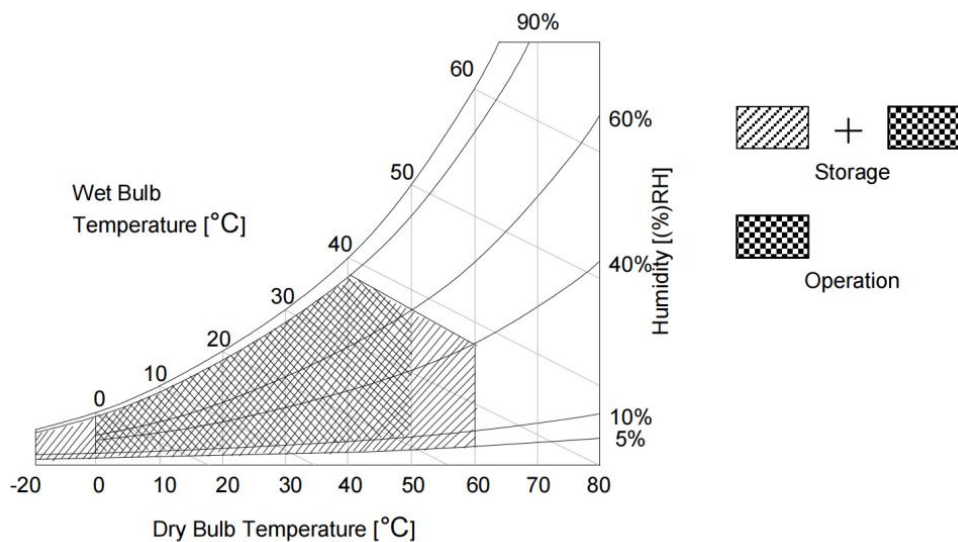
The following items are maximum values which, if exceeded, may cause faulty operation or permanent damage to the LCD module.

Table1. ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Value		Unit	Note
			Min	Max		
Power Input Voltage	LCD Circuit	V _{LCD}	-0.3	+14.0	V _{DC}	1
T-Con Option Selection Voltage		V _{LOGIC}	-0.3	+4.0	V _{DC}	
Operating Temperature		T _{OP}	0	+50	°C	2, 3
Storage Temperature(without packing)		T _{ST}	-20	+60	°C	
Panel Front Temperature (Considering L/C PhaseTransition Temperature)		T _{PT}	-	+68	°C	4
Operating Ambient Humidity		H _{OP}	10	90	%RH	2, 3
Storage Humidity		H _{ST}	5	90	%RH	

Notes:

1. Ambient temperature condition ($T_a = 25 \pm 2 \text{ }^\circ\text{C}$)
2. Temperature and relative humidity range are shown in the figure below. Wet bulb temperature should be Max 39°C, and no condensation of water.
3. Gravity mura can be guaranteed below 40°C and under backlight luminance 350nit condition.
4. The maximum operating temperatures is based on the test condition that the surface temperature of display area is less than or equal to 68°C 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 68°C. The range of operating temperature may be degraded in case of improper thermal management in final product design.
5. Prevent products from being exposed to the direct sunlight. Otherwise, its reliability and function may not be guaranteed.



5.0 Electrical Characteristics

5.1 Electrical Performance Parameter

Table2. ELECTRICAL CHARACTERISTICS

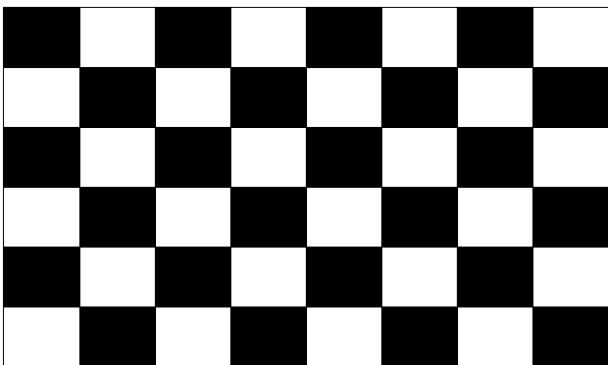
Parameter	Symbol	Value			Unit	Note	
		Min	Typ	Max			
Circuit :							
Power Input Voltage	V _{LCD}	10.8	12.0	13.2	VDC		
Power Input Current	I _{LCD}	-	880	1145	mA	1	
		-	1325	1725	mA	2	
T-CON Option Selection Voltage	Input High Voltage	V _{IH}	2.7	-	3.6	VDC	
	Input Low Voltage	V _{IL}	0	-	0.7	VDC	
Power Consumption	P _{LCD}	-	10.6	13.8	Watt	1	
		-	15.9	20.7	Watt	2	
Rush current	I _{RUSH}	-	-	10	A	3	

Notes:

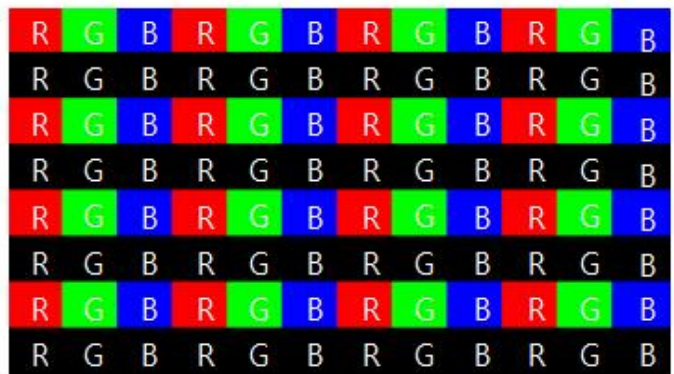
1. The specified current and power consumption are under the VLCD=12.0V, Ta=25 ± 2oC, fV=60Hz condition, and mosaic pattern(8 x 6) is displayed and fV is the frame frequency.
2. The current and power consumption are specified at the maximum current patter.
3. The duration of rush current is about 2ms and rising time of power input is 0.5ms (min.).
4. Ripple voltage level is recommended under ±5% of typical voltage

White : 255 Gray

Black : 0 Gray



Mosaic Pattern(8 x 6)



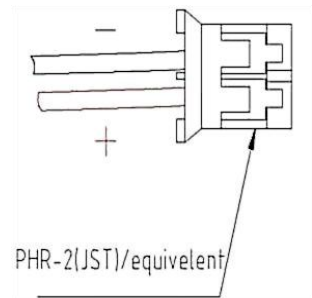
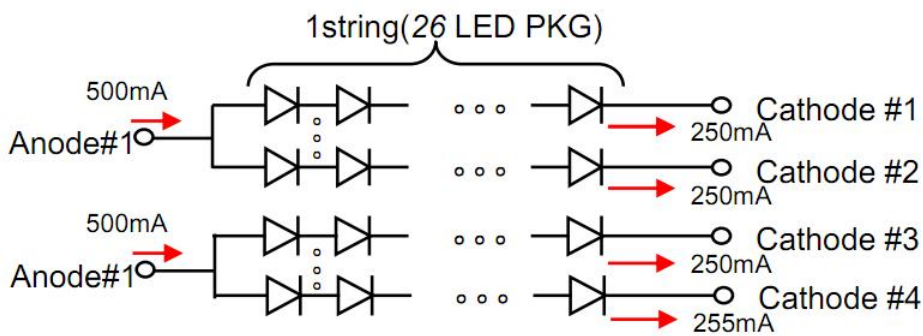
Max Current Pattern

5.2 Backlight Parameter

Item	Symbol	Condition	Values			Unit	Remark		
			MIN	TYP	MAX				
Input lightbar vottage	V_{pin}	single	-----	68	78	V	NOTE 1/2		
Input lightbar current	I_{pin}	single	-----	250	300	mA	250*4=1000mA		
Led life Time	Hours	-----	30000	-----	-----				
Brightnes gear(Beyond standard values)	Forward Voltage	71	71.3	71.9	72.8	74	74.2	V	NOTE3
	Forward Current (one array)	540	600	720	900	1000	1200	mA	NOTE3
	Luminance, White	280	300	350	450	500	550	cd/m ²	NOTE3
	Power Consumption	36.94	41.46	50.55	64.29	75.6	88.3	W	NOTE3

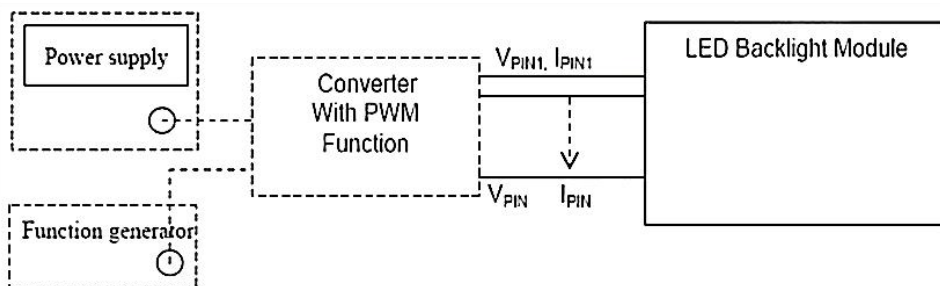
NOTE 1:

Light bar definition: single 23 strings of 4 parallel (45mA)*4 2pin terminal wires length 1m red is positive



lectric current: 1000mA

NOTE 2:



NOTE3 :

If the voltage and current exceed the standard value, it is necessary to ensure sufficient heat dissipation methods to avoid damage to the LCD module due to excessive temperature.

5.3 Interface Connection Mode

This LCD module employs two kinds of interface connection, 5-pin connector and 51 pin connector are used for the module electronics

5.3.1 LCD Module

LCD Connector(CN11): FI-RE51S-HF(manufactured by JAE) or FI-RXE51S-HFS(manufactured by JAE) or GT05S-51S-H38(manufactured by LS)

Mating Connector : FI-R51HL(manufactured by JAE) or compatible

Table3. MODULE CONNECTOR(CN11) PIN CONFIGURATION

No	Symbol	Description	No	Symbol	Description
1	VLCD	Power Supply +12.0V	27	GND	Ground
2	VLCD	Power Supply +12.0V	28	Rx0n	V-by-One HS Data Lane 0
3	VLCD	Power Supply +12.0V	29	Rx0p	V-by-One HS Data Lane 0
4	VLCD	Power Supply +12.0V	30	GND	Ground
5	VLCD	Power Supply +12.0V	31	Rx1n	V-by-One HS Data Lane 1
6	VLCD	Power Supply +12.0V	32	Rx1p	V-by-One HS Data Lane 1
7	VLCD	Power Supply +12.0V	33	GND	Ground
8	VLCD	Power Supply +12.0V	34	Rx2n	V-by-One HS Data Lane 2
9	NC	NO CONNECTION	35	Rx2p	V-by-One HS Data Lane 2
10	GND	Ground	36	GND	Ground
11	GND	Ground	37	Rx3n	V-by-One HS Data Lane 3
12	GND	Ground	38	Rx3p	V-by-One HS Data Lane 3
13	GND	Ground	39	GND	Ground
14	NC	NO CONNECTION	40	Rx4n	V-by-One HS Data Lane 4
15	NC	NO CONNECTION	41	Rx4p	V-by-One HS Data Lane 4
16	NC	NO CONNECTION	42	GND	Ground
17	NC	NO CONNECTION	43	Rx5p	V-by-One HS Data Lane 5
18	SDA	SDA (For I2C)	44	Rx5p	V-by-One HS Data Lane 5
19	SCL	SCL (For I2C)	45	GND	Ground
20	NC	NO CONNECTION	46	Rx6n	V-by-One HS Data Lane 6
21	Bit SEL	‘H’ or NC= 10bit(D) , ‘L’ = 8bit	47	Rx6p	V-by-One HS Data Lane 6
22	Data format	‘L’:Non division,‘H’ 2 division	48	GND	Ground
23	AGP or NSB	‘H’ : AGP ‘H’ or NC: NSB (No signal Black)	49	Rx7n	V-by-One HS Data Lane 7
24	NC	NO CONNECTION	50	Rx7p	V-by-One HS Data Lane 7
25	HTPDN	Hot plug detect	51	GND	Ground
26	LOCKN	Lock detect	-	-	-

Notes:

1. All GND (ground) pins should be connected together to the LCD module's metal frame.
2. All Input levels of V-by-One signals are based on the V-by-One-HS Standard Version 1.4
3. #9, #14, #15, #16, #17, #20, #24 NC(No Connection) : These pins are used only for LGD (Do not connect)
4. About specific pin (#22) , Please see the Appendix IV.
5. Specific pin No. #23 is used for "No signal detection" of system signal interface.
It should be GND or NC for NSB (No Signal Black) while the system interface signal is not. If this pin is "H", LCD Module displays AGP (Auto Generation Pattern).

5.4 Signal Timing Specification

shows the signal timing required at the input of the Vx1 transmitter. All of the interface signal timings should be satisfied with the following specification for normal operation.

Table4. TIMING TABLE (DE Only Mode)

ITEM		Symbol	Min	Typ	Max	Unit	Note
Horizontal	Display Period	t_{HV}	480	480	480	t_{CLK}	3840/8
	Blank	t_{HB}	60	70	120	t_{CLK}	1
	Total	t_{HP}	540	550	600	t_{CLK}	
Vertical	Display Period	t_{VV}	2160	2160	2160	Lines	
	Blank	t_{VB}	40	90	600	Lines	1
	Total	t_{VP}	2200	2250	2760	Lines	

ITEM		Symbol	Min	Typ	Max	Unit	Note
Frequency	DCLK	f_{CLK}	60	74.25	78.00	MHz	594/8
	Horizontal	f_H	121.8	135	140	KHz	2
	Vertical	f_V	47	60	63	Hz	2

Notes:

- 1.The input of HSYNC & VSYNC signal does not have an effect on normal operation (DE Only Mode). If you use spread spectrum of EMI, add some additional clock to minimum value for clock margin.
- 2.The performance of the electro-optical characteristics may be influenced by variance of the vertical refresh rate and the horizontal frequency
- 3.Spread Spectrum Rate (SSR) is limited to $\pm 0.5\%$ center spread at 30KHz

※ Timing should be set based on clock frequency

5.5 Input Signal Characteristic

5.5.1 Input Signal Timing Diagram

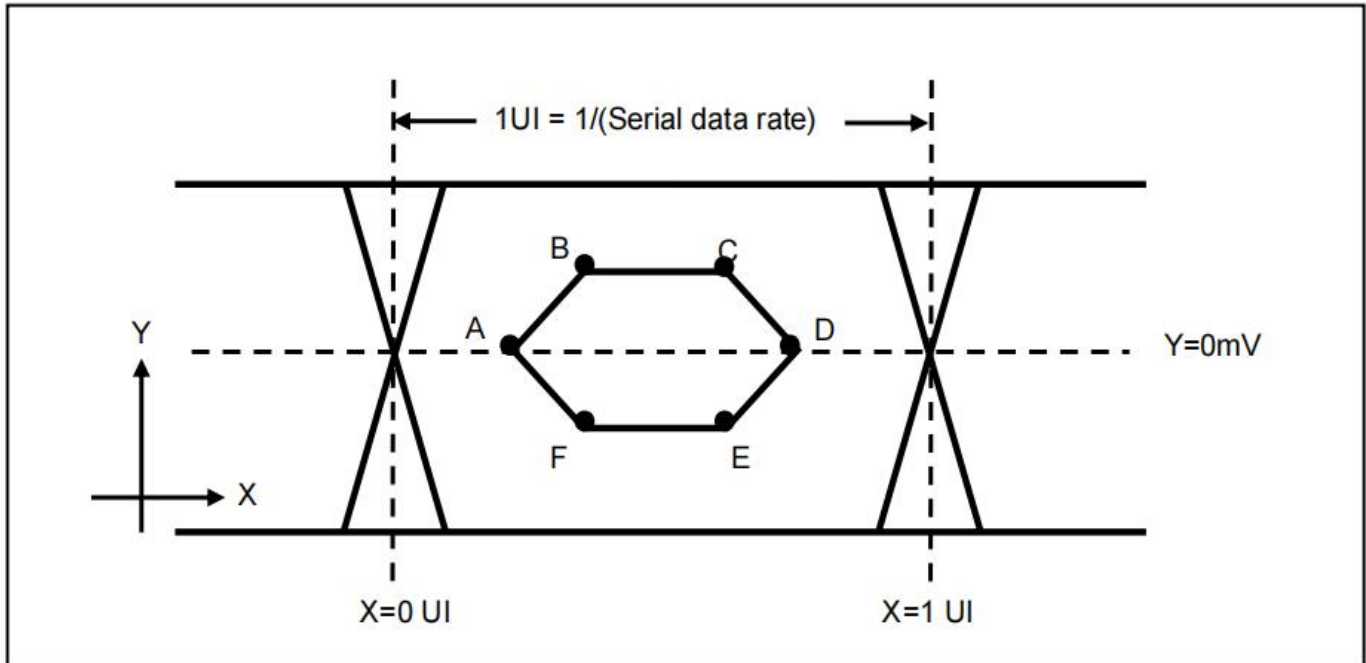


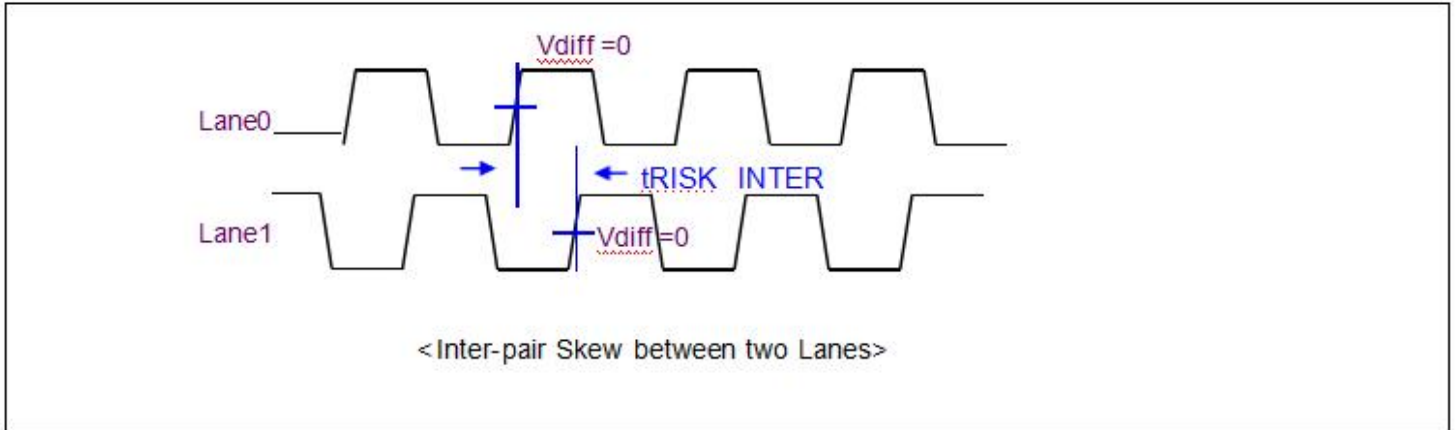
Table5. Eye Mask Specification

NO	X[UI]	Note	Y[mV]	Note
A	0.25 (max)	2	0	-
B	0.3 (max)	2	50	3
C	0.7(min)	3	50	3
D	0.75(min)	3	0	-
E	0.7(min)	3	1-50 l	3
F	0.3(max)	2	1-50 l	3

Notes:

1. All Input levels of V by One signals are based on the V by One HS Standard Ver. 1.4
2. This is allowable maximum value.
3. This is allowable minimum value.
4. The eye diagram is measured by the oscilloscope and receiver CDR characteristic must be emulated.
 - PLL bandwidth : 15MHz
 - Damping Factor : 1

5.5.2 Description of Input Signal Characteristics



Description	Symbol	Min	Max	Unit	notes
Allowable inter-pair skew between lanes	TRISK-INTER	-	5	UI	1,2

Notes: 1. $1.1UI = 1/\text{serial data rate}$

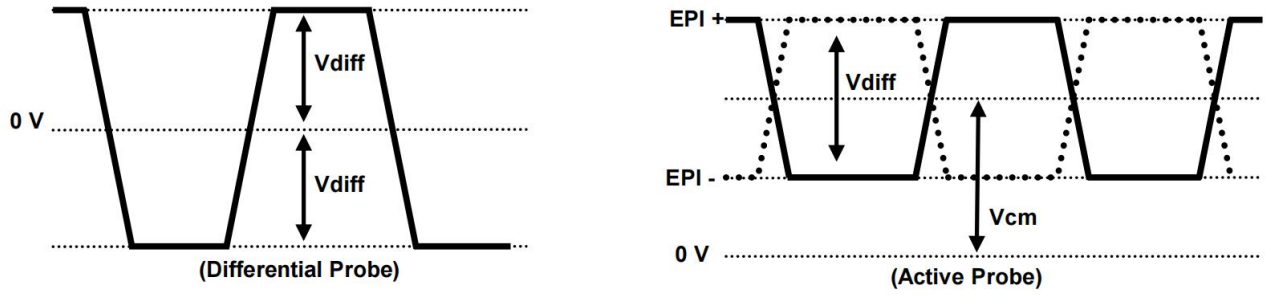
2. it is the time difference of the differential voltage between any two lanes in one sub block .

5.6 Internal Interface Signal Specification

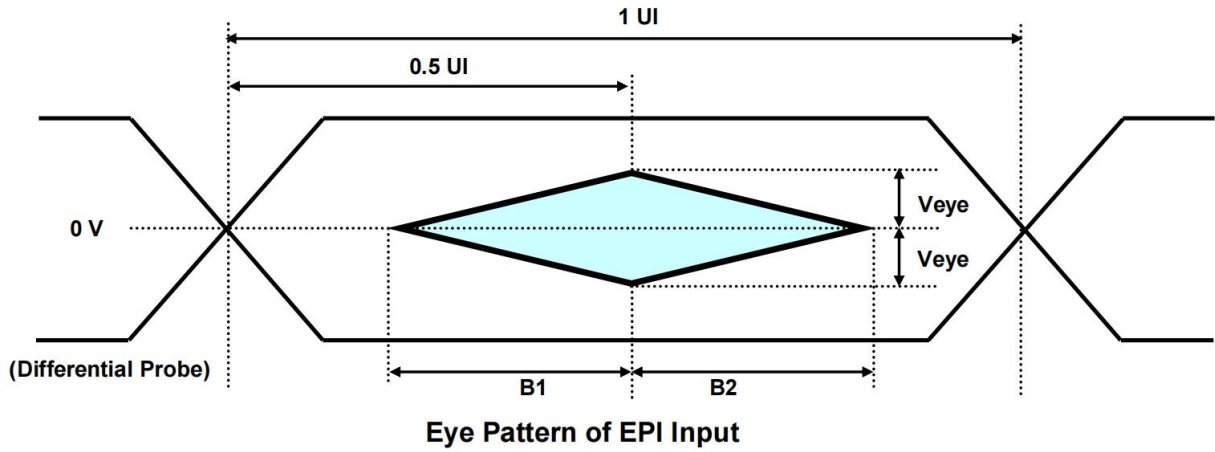
5.6.1 EPI Signal Specification

Table6. ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Condition	MIN	TYP	MAX	Unit	notes
Logic & EPI Power Voltage	VCC	-	1.62	1.8	1.98	VDC	
EPI input common voltage	VCM	CML Type	0.65	-	$1.2 - VID/2$	V	
EPI input differential voltage	Vdiff	-	150	-	500	mV	
EPI Input eye diagram	Veye	-	90	-	-	mV	
Effective Veye width time	B1&B2		0.25	-	-	UI	



EPI Differential signal characteristics



*Source PCB

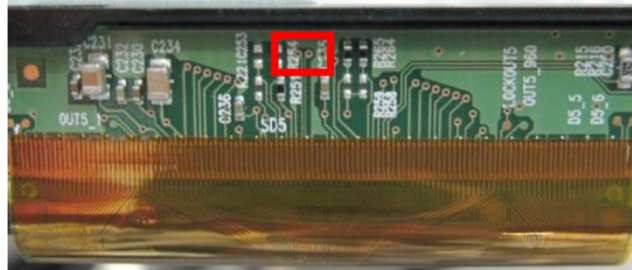


FIG.1 Measure point

5.7 Color Data Reference

The brightness of each primary color (red, green, blue) is based on the 10bit or 8bit gray scale data input for the color. The higher binary input, the brighter the color. Table 7 provides a reference for color versus data input.

Table7. COLOR DATA REFERENCE

Packer input & Unpacker output		30bpp RGB (10bit)	24bpp RGB (8bit)
Byte0	D[0]	R[2]	R[0]
	D[1]	R[3]	R[1]
	D[2]	R[4]	R[2]
	D[3]	R[5]	R[3]
	D[4]	R[6]	R[4]
	D[5]	R[7]	R[5]

	D[6]	R[8]	R[6]
	D[7]	R[9]	R[7]
Byte1	D[8]	G[2]	G[0]
	D[9]	G[3]	G[1]
	D[10]	G[4]	G[2]
	D[11]	G[5]	G[3]
	D[12]	G[6]	G[4]
	D[13]	G[7]	G[5]
	D[14]	G[8]	G[6]
	D[15]	G[9]	G[7]
Byte2	D[16]	B[2]	B[0]
	D[17]	B[3]	B[1]
	D[18]	B[4]	B[2]
	D[19]	B[5]	B[3]
	D[20]	B[6]	B[4]
	D[21]	B[7]	B[5]
	D[22]	B[8]	B[6]
	D[23]	B[9]	B[7]
Byte3	D[24]	Don't care	
	D[25]	Don't care	
	D[26]	B[0]	
	D[27]	B[1]	
	D[28]	G[0]	
	D[29]	G[1]	
	D[30]	R[0]	
	D[31]	R[1]	

5.8 Power on Sequence

5.8.1 LCD Drive Circuit

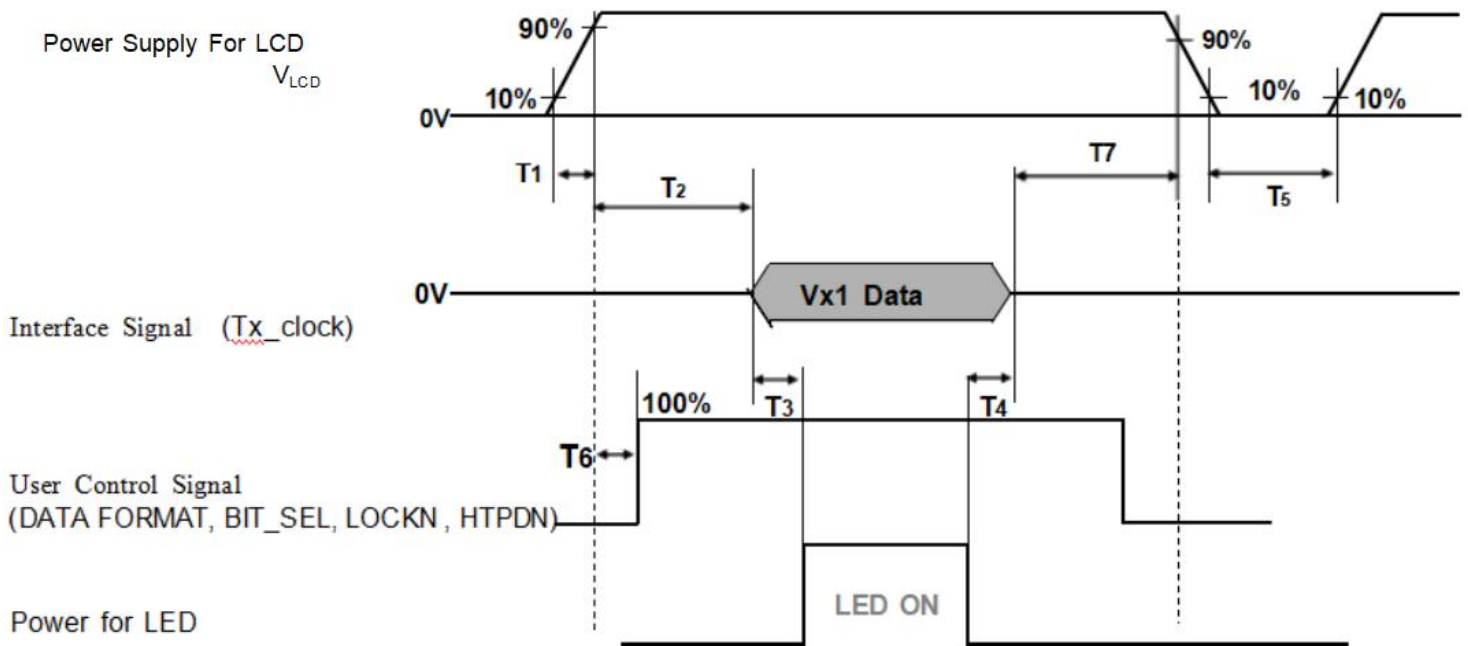


Table8 POWER SEQUENCE

Parameter	Value			Unit	Note
	Min	Typ	Max		
T1	0.5	-	20	ms	1
T2	0	-	-	ms	2
T3	400	-	-	ms	3
T4	100	-	-	ms	3
T5	1.0	-	-	s	4
T6	0	-	T2	ms	5
T7	0	-	-	ms	6

Notes:

1. Even though T1 is over the specified value, there is no problem if I2T spec of fuse is satisfied.
2. If T2 is satisfied with specification after removing LVDS Cable, there is no problem.
3. The T3 / T4 is recommended value, the case when failed to meet a minimum specification, abnormal display would be shown. There is no reliability problem.
4. T5 should be measured after the Module has been fully discharged between power off and on period.
5. If the on time of signals (Interface signal and user control signals) precedes the on time of Power (VLCD), it will be happened abnormal display. When T6 is NC status, T6 doesn't need to be measured.
6. It is recommendation specification that T7 has to be 0ms as a minimum value. ※ Please avoid floating state of interface signal at invalid period.

※ When the power supply for LCD (VLCD) is off, be sure to pull down the valid and invalid data to 0V.

5.9 Optical Property

Optical characteristics are determined after the unit has been „ON“ and stable in a dark environment at $25\pm 2^{\circ}\text{C}$. The values are specified at 50cm from the LCD surface at a viewing angle of ϕ and 9 equal to 0°

FIG. 1 shows additional information concerning the measurement equipment and method

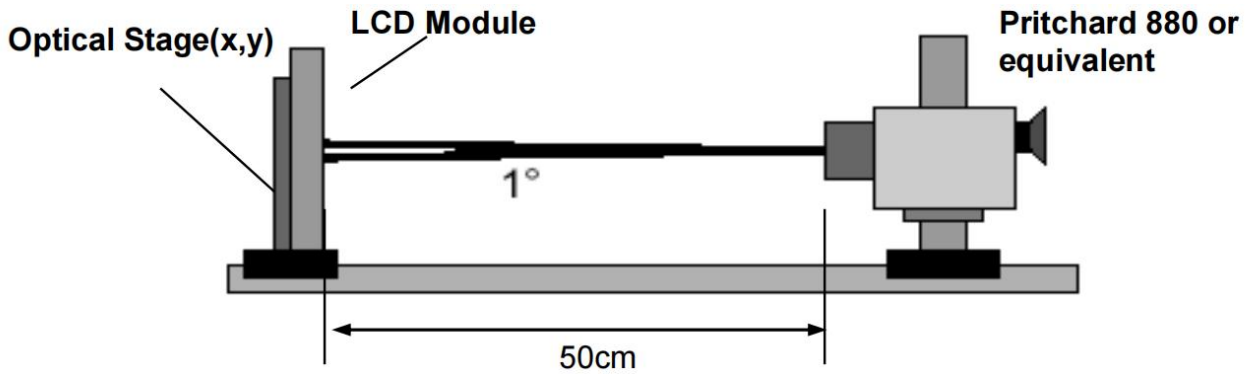


FIG.2 Optical Characteristic Measurement Equipment and Method

$T_a = 25\pm 2^{\circ}\text{C}$, $V_{\text{LCD}} = 12.0\text{V}$, $f_v = 60\text{Hz}$, $D_{\text{clk}} = 74.25\text{MHz}$,

Light Source : D65 Standard

5.9.1 Optical Data

Parameter	Symbol		Value			Unit	Note	
			Min	Typ	Max			
Contrast Ratio	CR		800	1100	-		1	
Surface Luminance, white	L _{WH}	2D	500	550	-	cd/m ²	2	
Luminance Variation	δ_{WHITE}	9P	75	-	-		3	
Response Time	Variation	G to G _o	-	6	9		4	
	Gray to Gray (BW)	G to G BW	-	9	13	ms	5	
Color Coordinates [CIE1931]	RED	R _x	Typ -0.03	0.658	Typ +0.03		2	
		R _y		0.326				
	GREEN	G _x		0.278				
		G _y		0.588				
	BLUE	B _x		0.133				
		B _y		0.123				
Color Temperature				7300		K		
Viewing Angle	2D (CR>10)	right($\phi=0^{\circ}$)	r (x axis)	89	-	-	degree	6
		left ($\phi=180^{\circ}$)	l (x axis)	89	-	-		
		up ($\phi=90^{\circ}$)	u (y axis)	89	-	-		
		down ($\phi=270^{\circ}$)	d (y axis)	89	-	-		
Gray Scale				-	-	-		7

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

$$\text{Contrast Ratio} = \frac{\text{Surface Luminance with all white pixels}}{\text{Surface Luminance with all black pixels}}$$

It is measured at center 1 - point.

2. Optical characteristic is determined after the unit has been 'ON' and 1 Hour after lighting the backlight in a dark environment at 25±2°C. Surface luminance is the luminance value at center 1-point across the LCD surface 50cm from the surface with all pixels displaying white.
3. The variation in surface luminance , WHITE is defined as : WHITE(9P) = Minimum Luminance(Lon1,Lon2,...,Lon9) / Maximum Luminance(Lon1,Lon2,...,Lon9)*100 Where Lon1 to Lon9 are the luminance with all pixels displaying white at 9 locations . For more information, see the FIG. 2.
4. Response time is the time required for the display to transit from any gray to white (Rise Time, TrR) and from any gray to black (Decay time, TrD). For additional information see the FIG. 3.

※ G to GBW Spec stands for average value of all measured points.

Photo Detector : RD-80S / Field : 2 °

5. G to G σ is Variation of Gray to Gray response time composing a picture

$$G \text{ to } G (\sigma) = \sqrt{\frac{\sum(X_i - u)^2}{N}} \quad \begin{array}{l} X_i = \text{Individual Data} \\ u = \text{Data average} \end{array}$$

N : The number of Data

6. Viewing angle is the angle at which the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD module surface. For more information, see the FIG. 4.
7. Gray scale specification
Gamma Value is approximately 2.2. For more information, see the Table 10.

5.9.2 Table 10. Gray Scale Specification

Gray Level	Luminance [%] (Typ)
L0	0.091
L15	0.27
L31	1.04
L47	2.49
L63	4.68
L79	7.66
L95	11.5
L111	16.1
L127	21.6
L143	28.1
L159	35.4
L175	43.7
L191	53.0
L207	63.2
L223	74.5
L239	86.7
L255	100

Measuring point for surface luminance & measuring point for luminance variation.

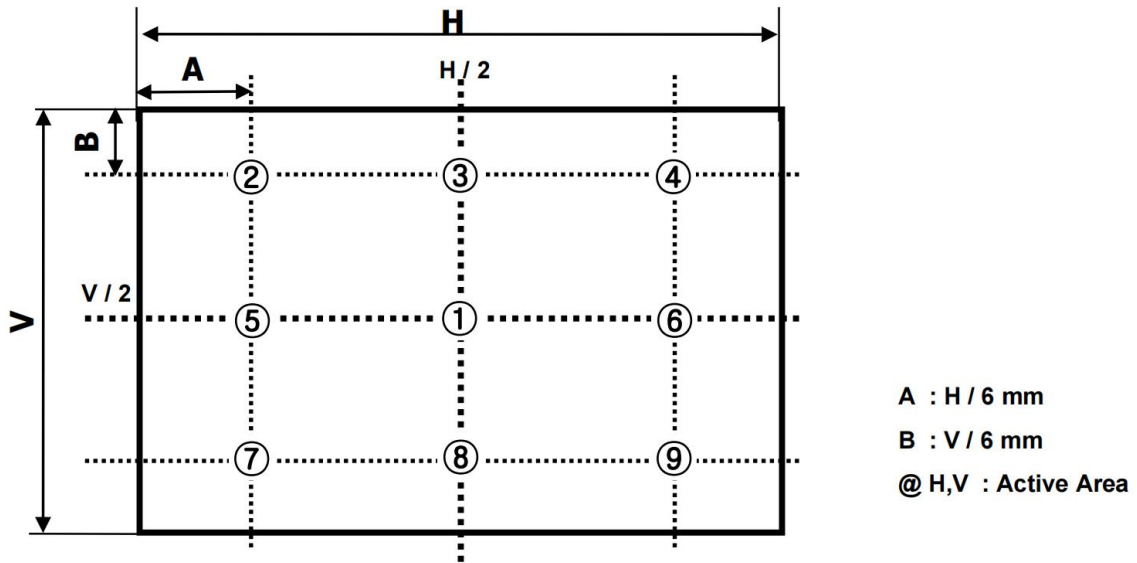


FIG.3 5Points for Contrast Ratio Measure

Response time is defined as the following figure and shall be measured by switching the input signal for “Gray(N)” and “Gray(M)”.

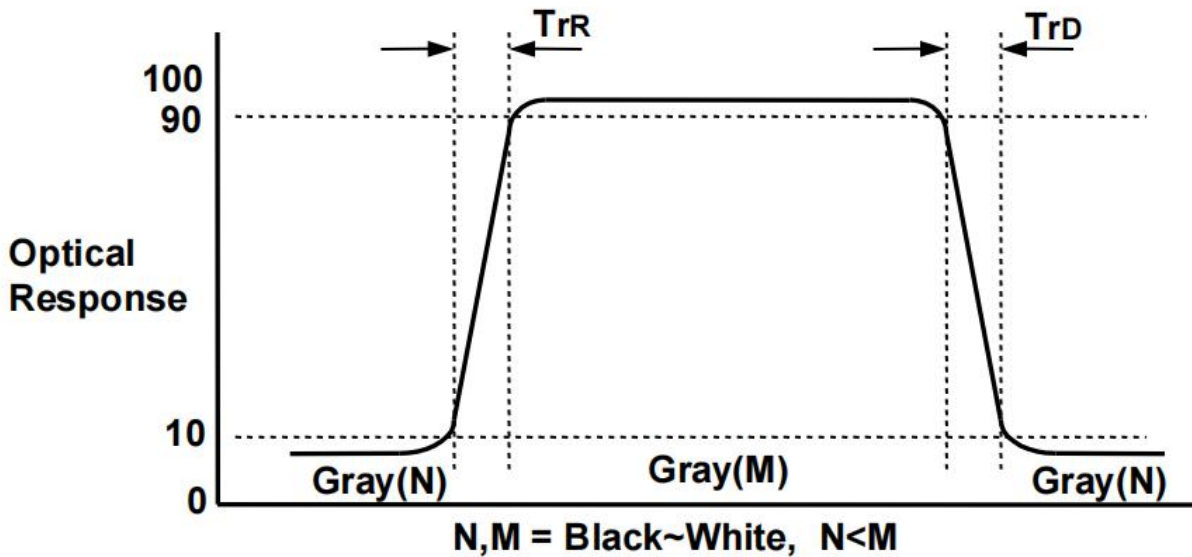


FIG. 4 Response Time

Dimension of viewing angle range

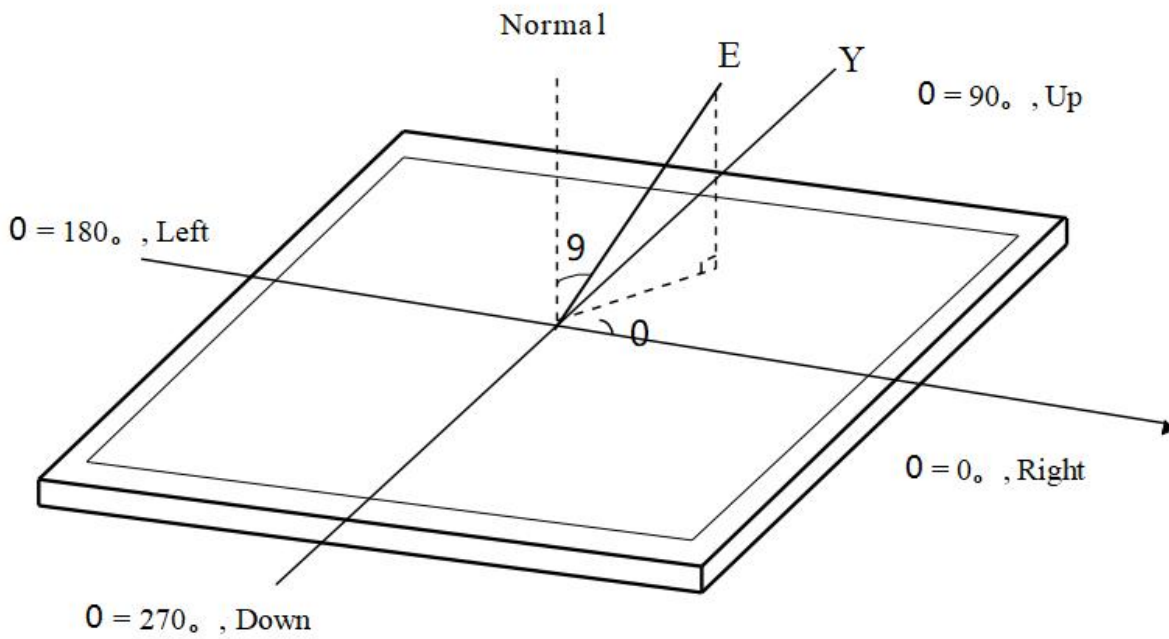


FIG.5 Viewing Angle

6.0 Mechanical Characteristics

6.1 Mechanical Parameter

Item	Value	
Outline Dimension	Horizontal	1099mm
	Vertical	643mm
	Thickness	276mm
Active Display Area	Horizontal	1051.2mm
	Vertical	608.8 mm

Notes: Please refer to a mechanical drawing in terms of tolerance at the next page.



7.0 Outgoing inspection specification

Purpose: In order to make the LCD module have a standard basis in the procurement and inspection, this specification document is specially formulated

7.1 Range of Application

Used in LCD module 43 "curved C430E side entry LED

7.2 Responsibility

Purchase: This specification shall be the basis for procurement

R D: Formulation and modification of this specification

Q A: Perform testing according to this specification

7.3 Safety Requirements

ROHS standard Baseline for control of environmental substances

7.4 Environmental Conditions

Item	Specification	Remark
Operating temperature (°C)	0—50	
Operating humidity (%RH)	10—90	Maximum temperature 50(°C)
Storage temperature (°C)	-10—60	
Storage humidity (%RH)	5—90	Maximum temperature 60(°C)

8.0 Specification Test Standard

8.1 Optical Test Standard:

brightness photometer: TOPCON-7A

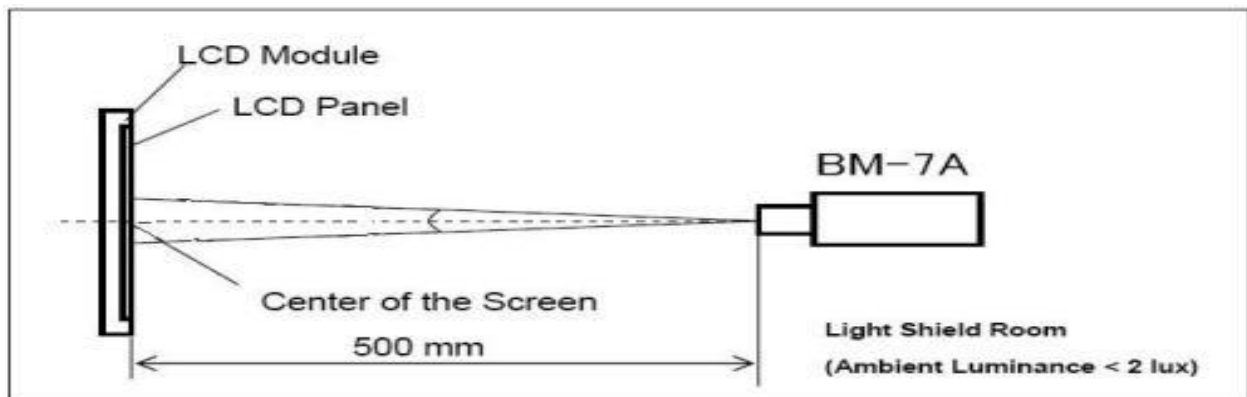
Viewing Angle :1° illuminometer and object to be measured

distance: 500±50mm TOPCON-7A

Angle:1° Distance:500±50mm

8.2 Test Condition:

the ambient temperature is 25C ±2C, humidity 65±10%, the ambient brightness ≤ 2Lux, 20 minutes after lighting.



8.3 Backlight Inspection Specifications

Serial	inspection item	specification	Determine	inspection tool
Module	foreign matter	$D \leq 0.3$	lose sight of	Film calipers
		$0.3 \leq D \leq 0.6$	$N \leq 5$ $S \geq 100$	
		$D \geq 0.6$	Not allow	
	water ripple	—	Sample by limit	visual
	Uneven light and dark	—	Sample by limit	visual
	Linear foreign body, no scratches	$W \leq 0.1$	lose sight of	Film calipers
		$0.1 \leq W \leq 0.3$ $L \leq 30$	Zone A: Do Not allow Zone B: $N \leq 3$ $S \geq 100$	
		$0.3 \leq W$ $30 \leq L$	Not allow	
There is a feeling scratch		—	Not allow	

8.4 Cosmetic Inspection Standard

Serial	Item	Test project	Specifications	Determinant	inspection tool
1	metal plate	Scratches/indentations	$W \leq 0.15$	lose sight of	Film calipers
			$0.15 < W \leq 0.3$ $L \leq 20\text{mm}$	$n \leq 8$	
			$0.15 < W \leq 0.5$ $20 < L \leq 50$	$n \leq 5$	
		No inductive scratch	-----	lose sight of	eye
		Rough edge	$L > 0.3\text{mm}$	Not allow	eye
		Oxidation rusting	-----	Not allow Section by sample limit	eye
		Dirt/oil	-----	Not allow	eye
2	wire rod	wire rod	-----	Not allow	eye
3	connector	Rupture/deformation	-----	Not allow	eye

4	connector	Offset/float	-----	Not allow	eye
5	Lable	not have	-----	Not allow	eye
		smudginess	-----	Not allow	eye
		smudginess	Be able to recognize	OK	eye
		fuzziness	Be able to recognize	OK	eye
		content mistake	-----	Not allow	eye

Be able to recognize

Note 1:

Inspection distance: 30±5cm ,

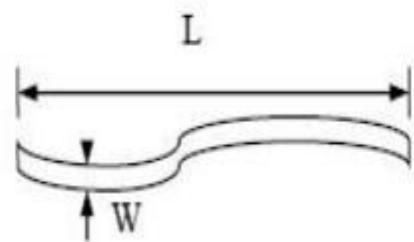
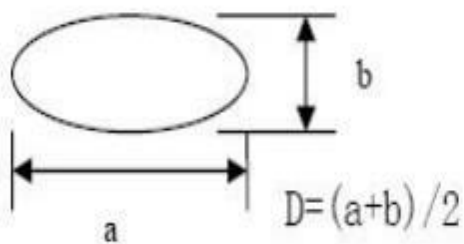
Inspection Angle: ±30 degrees up and down the left ± 45 degrees

Note 2:

The “S” definition: The distance between the defect dot

Note 3:

The a,b,D,W,L definition, for the next:



9.0 Reliability Test Items and Conditions

Item		Test condition	standard of criterion
Movement experiment	High humidity high humidity	+45°C,85%RH,120Hrs	A,B,C,D,E,F
	High temperature operation	Ta=60°C,120Hrs	A,B,C,D,E
	low temperature storage	0±2°C 、 120Hrs	A,B,C,D,E
	Continuous lighting	25±2°C,65±10%RH/10000Hrs	A,B,C,D,E
	turn on/off the lights	On(30sec)/Off(30sec) 、 10000 cycles	A,B,G
	Thermal Shock	-20°C/30min-70°C/30min for a total 200 cycles,Start with cold temperature and end with high temperature	A,B,C,D,E,F
	High temperature	60±2°C,120Hrs,	A,B,C,D,E
	Low temperature	-20±2°C 、 120Hrs	A,B,C,D,E
Vibration experiment	vibration	Sinusoidal Vibration level: 1.5G Bandwidth: 10~300Hz Waveform: sine wave 30min for each direction X,Y,Z(1.5Hrs in total)	A,B
Package drop test		/	/
wire-rod mill train	wire rod	Wire bending force: 0.6kgf±90°, 10 times; 0.6kgf±180°, 10 times	A,B
	terminal	Static load: the directional tension is maintained at 3kgf for 1min	A,B
	Strength	Tensile strength greater than 1.5kgf	A,B

NOTE 1:

After testing, it should be placed at room temperature and tested after 2 hours at room temperature

After testing,shall be placed at normal room temperature and Humidity after 2 huors for judgment

Standard of Criterion :

- A. There is no abnormality in the lighting screen
- B. No abnormal appearance (damaged, cracked, scratched, rusted, severely deformed, etc.)
- C. The brightness value remains above 60% of the initial value
- D. The variation rate of brightness uniformity is less than 30%
- E. Chroma change X,Y less than 0.2

10.0 International Standard

10.1 Safety

1. IEC 62368-1, The International Electro-technical Commission(IEC).
Audio/video, Information and Communication Technology Equipment - Safety - Safety Requirements.
2. EN 62368-1, European Committee for Electro-technical Standardization (CENELEC)
Audio/video, Information and Communication Technology Equipment - Safety Requirements
3. UL 62368-1, UL LLC.
Audio/video, Information and Communication Technology Equipment - Safety Requirements
3. CAN/CSA C22.2 No.62368-1, Canadian Standards Association (CSA).
Audio/video, Information and Communication Technology Equipment - Safety Requirements
4. IEC 60950-1, The International Electro technical Commission (IEC).
Information Technology Equipment - Safety - Part 1 : General Requirements

10.2 Environment

RoHS, Commission Delegated Directive (EU) 2015/863 of 31 March 2015 amending Annex II to Directive 2011/65/EU of the European Parliament and of the Council

11.0 Package Labels

11.1 Label Information Description

Tag Content:

NO: X.XX.XX.XXX
Model: XXXXXXXXX-X

XXXXL
V=XXXV~XXXV
A=XXXmA



SN:XXXXXXXXXXXXXXXXXX

ROHS
MADE IN CHINA

11.2 Packing Method

11.3 Storage Conditions:

Temperature: 18°C~24°C; Humidity: 50%-70%RH

12.0 Matters Need Attention

12.1 Protection Film

- (1) Please don't remove the protection film before assembly.
- (2) Please peel off the protection film slowly.
- (3) Please peel off the protection film just like shown in the Fig.1
- (4) Ionized air should be blown over during the peeling.
- (5) Source PCB should be connected to the ground when peel off the protection film.
- (6) The protection film should not be contacted to the source D-IC during peeling it off.

12.2 Precautions For Pretreatment of B/A box

In winter season , in particular, please be aware of the following precautions.

- (1) Before putting B/A boxes on the line, aging process is required to make the temperature of products similar to the temperature of workplace.
- (2) Place the lid open on the B/A box and allowed to stand for 24 hours in the similar environment of work place. It was shown in



12.3 Storage Precautions

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

- (1) The mold should be stored in a dark room, and the room temperature is required to be $25\pm 10^{\circ}\text{C}$, the humidity is $65\pm 10\%\text{RH}$, and can not be exposed to sunlight
- (2) Control of ventilation and temperature is necessary.
- (3) Please make sure to protect the product from strong light exposure, water or moisture. Be careful for condensation.

12.4 Suitable For Commercial Display Conditions

Generally large-sized LCD modules are designed for consumer applications (TV). Accordingly, a long-term display like in Commercial Display application, can cause uneven display including image sticking. To optimize module's lifetime and function, several operating usages are required.

12.4.1 Normal Operating Condition

- Temperature: 0 ~ 50°C
- Operating Ambient Humidity : 10 ~ 90 %
- Display pattern: dynamic pattern (Real display)
- Long-term static display can cause image sticking.

12.4.2 Operating Usages Under Abnormal Condition

- Ambient condition
 - Well-ventilated place is recommended to set up Commercial Display system.
- Power and screen save
 - Periodical power-off for screen save is needed after long-term display.
- Operating usages to protect against image sticking due to long-term static display

Suitable operating time on static image : Under 18(or 24) hours a day under the condition of 400nit B/L. (The moving picture can be allowed for 24 hours a day)