MODEL NO. : P1210SVF1MB00

SPEC VERSION: 1.0

ISSUED DATE: 2021/5/6

■Preliminary Specification

□Final Product Specification

Customer :_____

Approv d by	Notes

TIANMA Confirmed :

Prepared by	Checked by	Approved by
Anna Huang	ZhuGuanchen	DingXiaoxing

This technical specification is subjected to change without notice

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RECORD OF REVISION

Rev	Issued Date	Description	Editor
1.0	2021-5-6	Preliminary Specification release	Anna Huang

1 GENERAL SPECIFICATIONS

Feature		Spec
Display Spec.	Size	12.1 inch
	Resolution	800xRGBx600
	Technology Type	SFT
	Pixel Configuration	RGB vertical stripe
	Pixel pitch(mm)	0.3075(H) × 0.3075(V)
	Display Mode	TM with Normally Black
	Surface Treatment	Anti Glare
	Viewing Direction	All
Mechanical Characteristics	LCM (W x H x D) (mm)	279.0 (H) ×209.0 (V) ×9.0 (D)
	Active Area(mm)	246.0 (H) × 184.5 (V) (typ.)
	With /Without TSP	Without TSP
	Connection Type	Socket
	Weight (kg)	TBD
Electrical Characteristics	Interface	LVDS 1 port
	Color Depth	16.7M/262K

Note 1: Requirements on Environmental Protection: RoHS

Note 2: LCM weight tolerance: ± 5%

2 Input/Output Terminals

2.1 LVDS

CN1: MSB240420HE (Produced by STM) or equivalent.

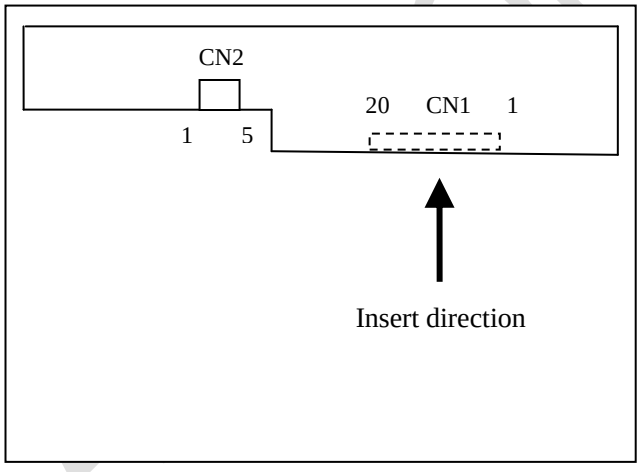
Pin	Name	Description
1	VCC	3.3V Power Supply
2	VCC	3.3V Power Supply
3	GND	Ground
4	6-8Bit SET	Select 6 or 8 Bits LVDS Input (VCC:8Bits ; GND/NC: 6Bits)
5	RIN0-	Negative(-) LVDS differential data input
6	RIN0+	Positive(+) LVDS differential data input
7	GND	Ground
8	RIN1-	Negative(-) LVDS differential data input
9	RIN1+	Positive(+) LVDS differential data input
10	GND	Ground
11	RIN2-	Negative(-) LVDS differential data input
12	RIN2+	Positive(+) LVDS differential data input
13	GND	Ground
14	CLKIN-	Clock Signal(-)
15	CLKIN+	Clock Signal(+)
16	GND	Ground
17	RIN3-	Negative(-) LVDS differential data input (Used for 8Bits LVDS Input; NC for 6Bits)
18	RIN3+	Positive(+) LVDS differential data input (Used for 8Bits LVDS Input; NC for 6Bits)
19	REVERSE	Display Reversed Function (VCC: Display Reverse; GND/NC: Normal Display)
20	NC/GND	Test Function Pin(Do not set this pin to High)

2.2 BACKLIGHT

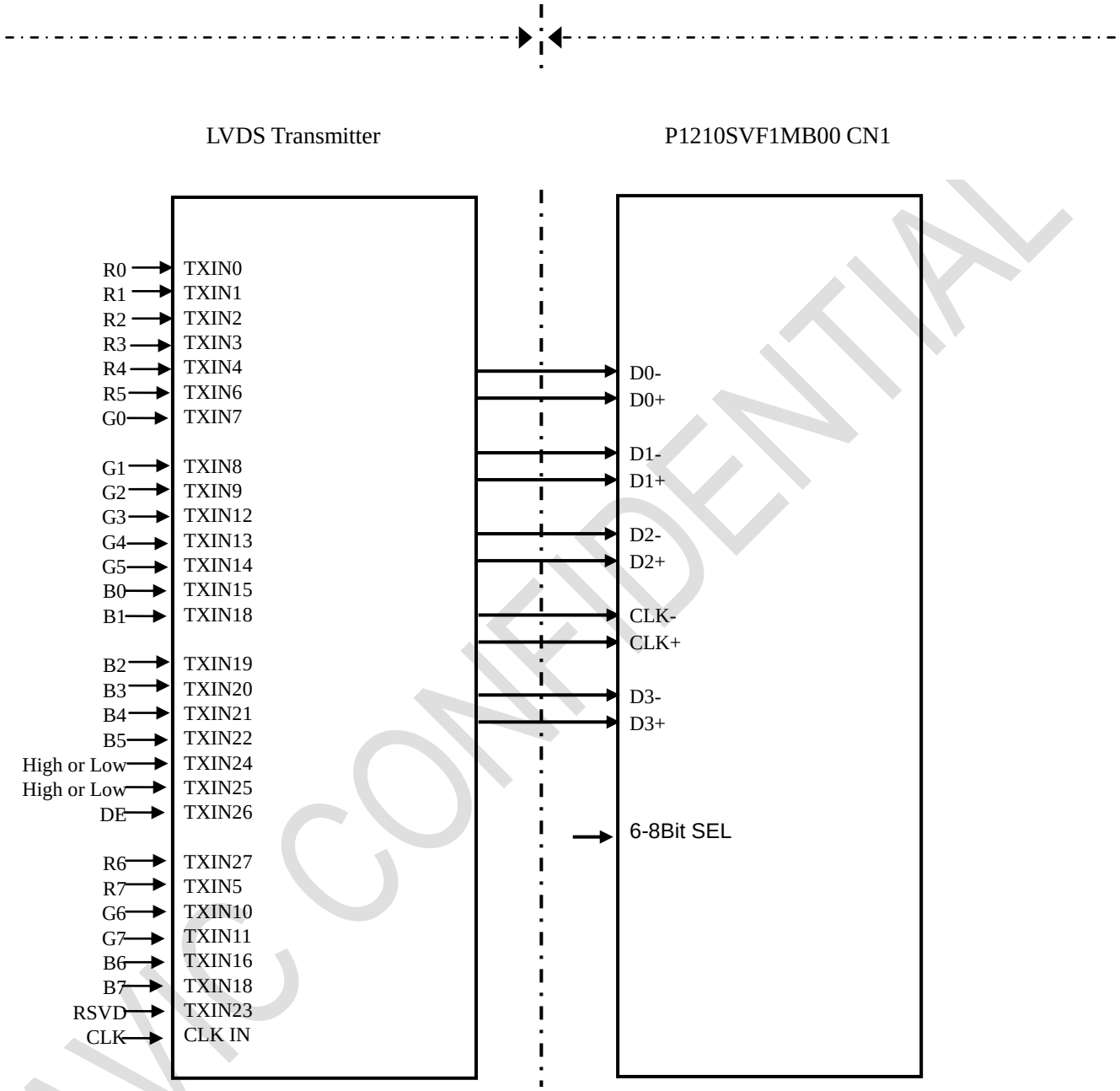
CN2: MSB24038P5 (Produced by STM) or equivalent.

Pin	Symbol	Signal Name
1	VDD	12V
2	GND	GND
3	Enable	5V-On / 0V-Off
4	Dimming	PWM Dimming
5	NC	NC

2.3 POSITION OF PLUGS AND A SOCKET



2.4 CONNECTION BETWEEN RECEIVER AND TRANSMITTER FOR LVDS



Note1: The lowest bit (R0, G0, B0), the upper bit (R7, G7, B7)

Note2:Connecting cable between LCD panel's connector and transmitter should use 100Ω twisted line.

Note3: If only Hsync and Vsync, the product don't work. Make sure DE signal has been input.

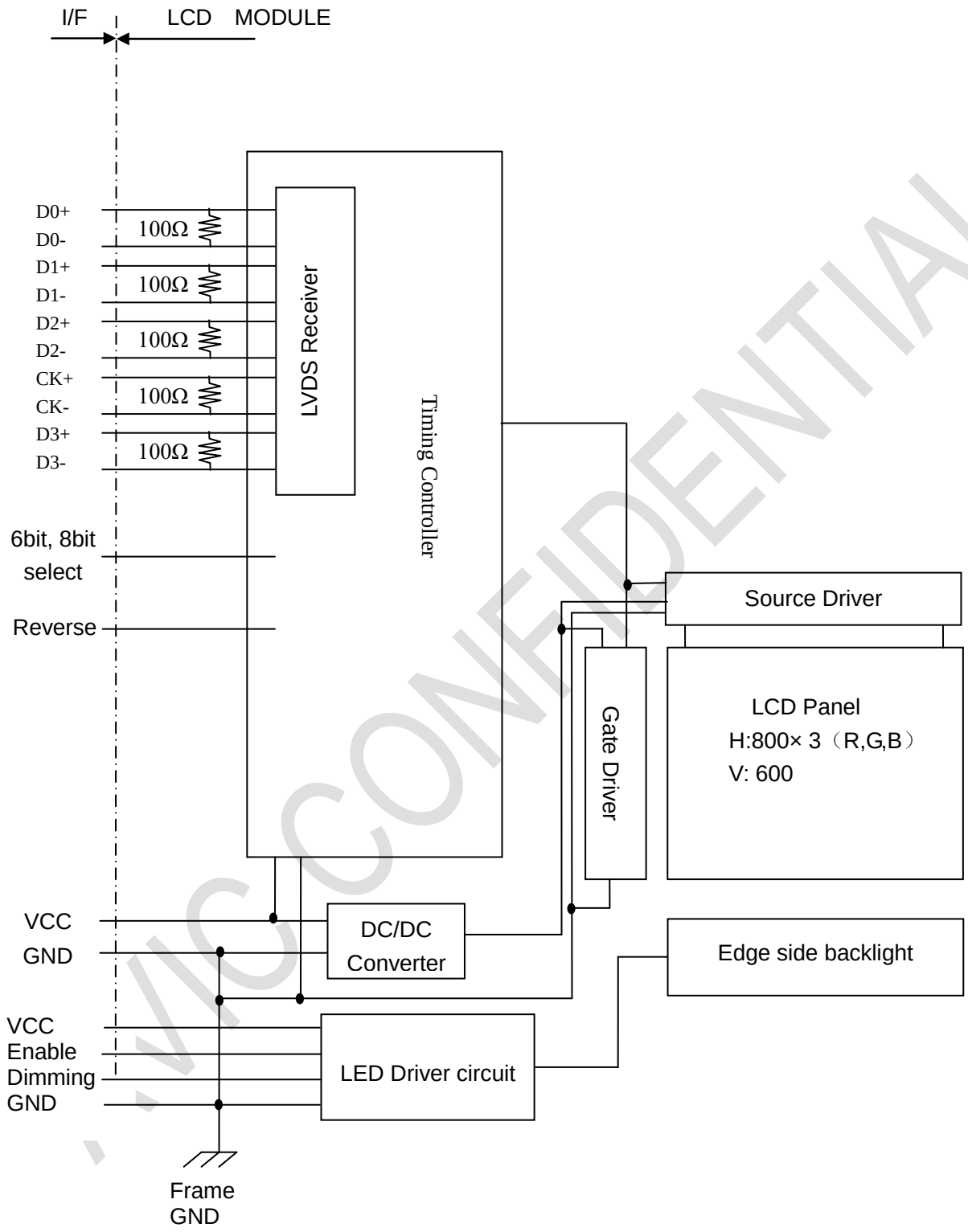
3 ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Min	Max	Unit	Remark
LCD Power Voltage	VCC	-0.5	5.0	V	
Backlight Power Voltage	VDD	-0.3	33	V	
Backlight Input Voltage	V_{IN_BL}	-0.3	5.5	V	Note1
Operating Temperature	T_{OPR}	-20	70	℃	
Storage Temperature	T_{STG}	-30	80	℃	

Table 3.1 absolute maximum rating

Note1: Backlight Input voltage include Dimming, Enable.

4 Electrical Characteristics(TBD)



Note1: System ground (GND), Frame ground in the product should be connected together in customer equipment.

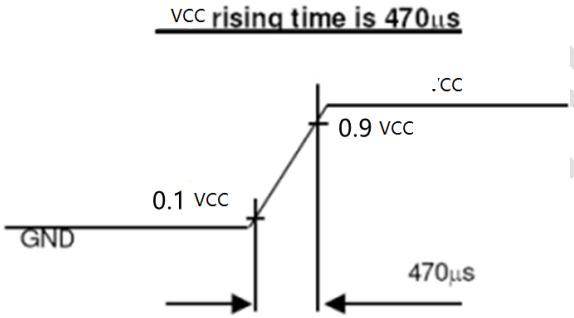
4.1 DRIVING FOR LCD

Parameter	Symbol	min.	typ.	max.	Unit	Remarks
Power supply voltage	VCC	(3.0)	3.3	(3.6)	V	-
Power supply current	ICC	-	(300)	TBD	mA	at VCC = 3.3V Note 1
Permissible ripple voltage	VRP			200	mV	VCC
Rush current	I_{rush}			TBD	A	Note3

Note 1: All white pattern

Note 2: Common mode voltage for LVDS receiver

Note 3: Measurement Conditions:



4.2 DRIVING FOR BACKLIGHT

(Ta=25℃) Note1

Item		Symbol	Min	Typ	Max	Unit	Remark
Backlight power supply voltage		VDD	11.8	12	13.2	V	
Backlight power supply current		I_Total	-	(1000)	-	mA	Note1
Backlight power consumption		P_Total	-	(12)	-	W	
Input voltage for Dimming	High level	-	1.5	-	5	V	Input voltage for Dimming
	Low level	-	-	-	0.8	V	
Input voltage for Enable	High level	-	1.2	-	5	V	Input voltage for Enable
	Low level	-	-	-	0.35	V	
Dimming frequency		Fpwm	200	-	10K	HZ	
Dimming duty		D	5	-	100	%	Note2
Inrush current		Inrush	-	-	TBD	A	Note5
LED Life Time				50000		H	Note6

Note 1: I_Total is the power supply current of LED driver, P_Total is the power consumption of LED driver and backlight.

Note 2: According to LED driver IC characteristics, the minimum value of VBR duty may vary with VBR frequency, higher the frequency, bigger the duty.

Note 3: Optical performance should be evaluated at Ta=70℃ only with 100%PWM.

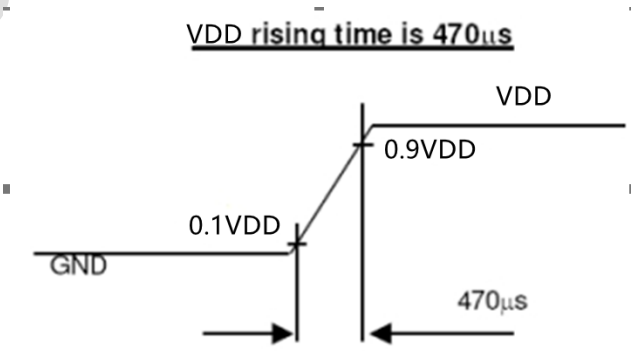
If LED is driven by high current, high ambient temperature & humidity condition. The life time of LED will be reduced.

Operating life means brightness goes down to 50% of initial brightness.

Operating life time is estimated data.

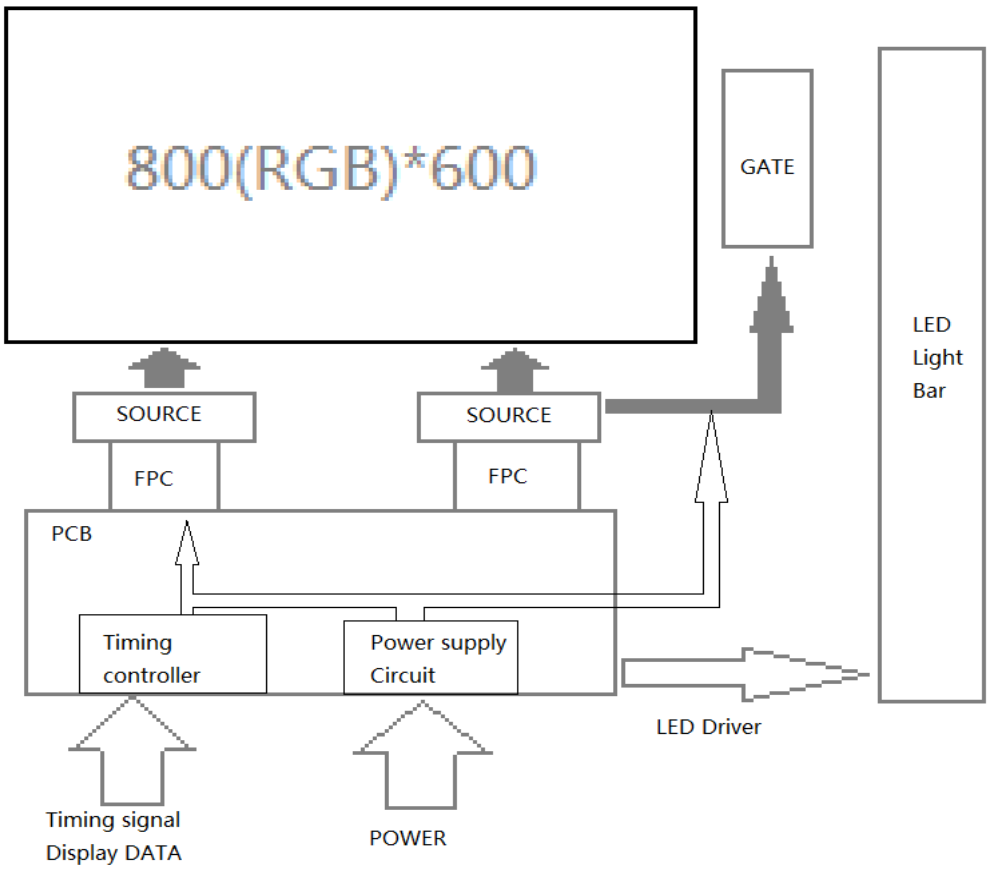
Note 4: Ta=25℃ only with 100%PWM, the other condition should follow Note3.

Note 5: In-rush current test conditions:



Note6: Optical performance should be evaluated at Ta=25℃.Only If LED is driven by high current, high ambient temperature & humidity condition. The life time of LED will be reduced. Operating life means brightness goes down to 50% of initial brightness. Typical operating life time is an estimated data.

4.3 TFT Block Diagram



5 DISPLAY COLORS AND INPUT DATA SIGNALS

This product can display in equivalent to 16.7M colors in 256 scales. Also the relation between display colors and input data signals is as the following table.

Display colors		Data signal （0:Low level，1:High Level）																							
		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 Color	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
	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
	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
	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
	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
	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
	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 grayscale	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
		0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Dark	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	↑	:								:								:							
	↓	:								:								:							
	Bright	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		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	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 grayscale	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
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	↑	:								:								:							
	↓	:								:								:							
	Bright	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0
		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	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 grayscale	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
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	↑	:								:								:							
	↓	:								:								:							
	Bright	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1
		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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

6 TIMING Chart

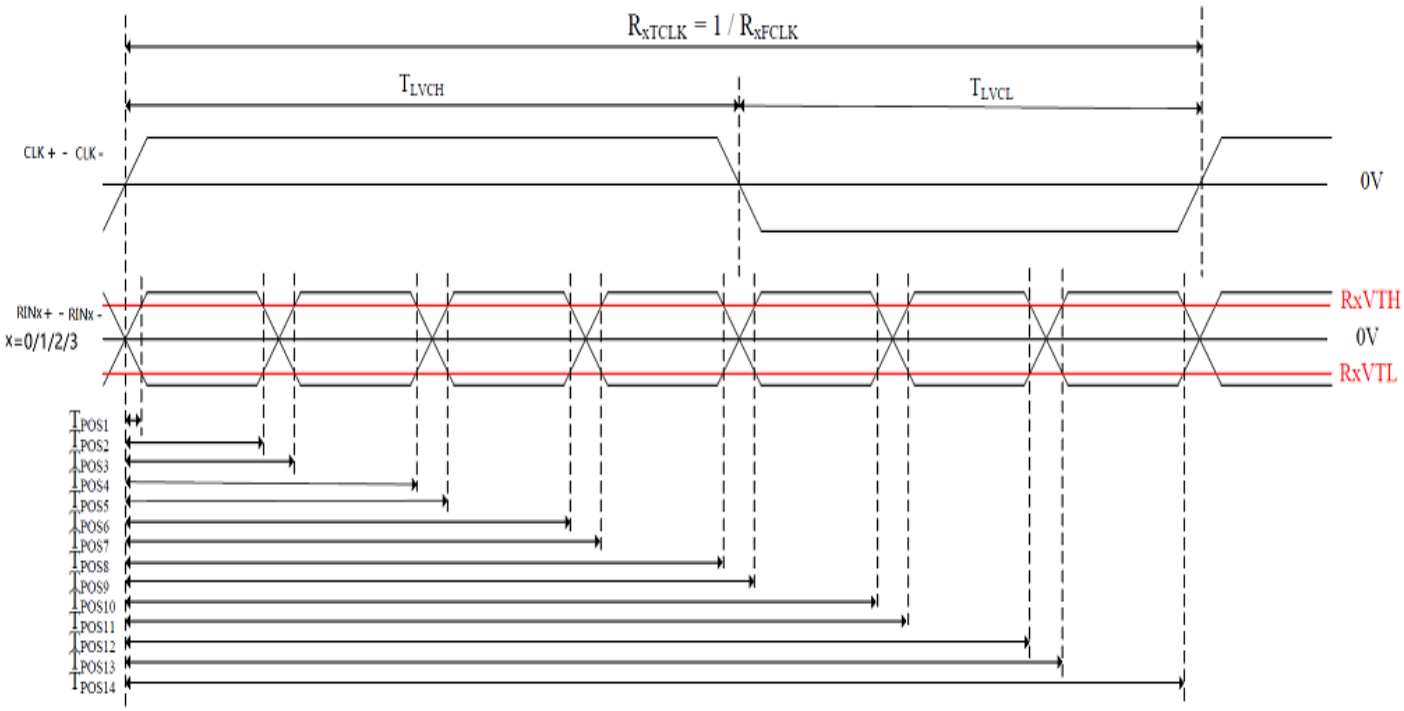
6.1 DC Characteristics

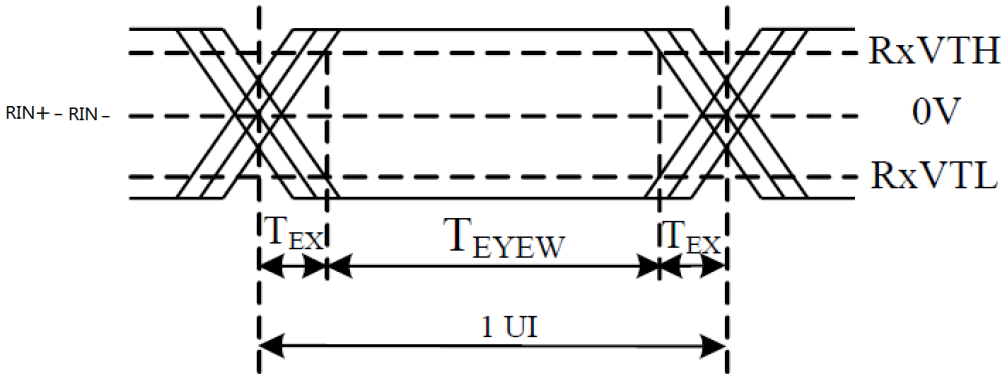
Parameter	Symbol	Min	Typ.	Max.	Unit	Conditions
Power supply voltage	VCC	3.0	3.3	3.6	V	
Low level input voltage	VIL	0	-	0.3x VCC	V	CMOS I/F digital circuit
High level input voltage	VIH	0.7x VCC	-	VCC	V	CMOS I/F digital circuit
Input leakage current	ILEAK	-	-	+/-1	uA	CMOS I/F digital circuit
Pull low/high resistor	RPULL	180K	250K	320K	ohm	For the digital input pin @VCC=3.3V
Digital operation Current	IVCC	-	24	36	mA	F_{CLK}=45MHz, F_{LD}=48K @VCC=3.3V Data pattern=55/H -> AA/H (loop)

6.2 LVDS AC Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Clock Frequency	R_{xFCLK}	20		80	MHz	
Clock Period	R_{xTCLK}	12.5		50	ns	
1 data bit time	UI	-	1/7	-	R_{xTCLK}	
Clock high time	T_{LVCH}		4		UI	
Clock low time	T_{LVCL}		3		UI	
Position 1	T_{POS1}	-0.25	0	0.25	UI	
Position 2	T_{POS2}	0.75	-	1.25	UI	
Position 3	T_{POS3}	0.75	1	1.25	UI	
Position 4	T_{POS4}	1.75	-	2.25	UI	
Position 5	T_{POS5}	1.75	2	2.25	UI	
Position 6	T_{POS6}	2.75	-	3.25	UI	
Position 7	T_{POS7}	2.75	3	3.25	UI	
Position 8	T_{POS8}	3.75	-	4.25	UI	

Position 9	T_{POS9}	3.75	4	4.25	UI	
Position 10	T_{POS10}	4.75	-	5.25	UI	
Position 11	T_{POS11}	4.75	5	5.25	UI	
Position 12	T_{POS12}	5.75	-	6.25	UI	
Position 13	T_{POS13}	5.75	6	6.25	UI	
Position 14	T_{POS14}	6.75	-	7.25	UI	
Input eye width	T_{EYEW}	0.5	-	-	UI	
Input eye border	T_{EX}	-	-	0.25	UI	



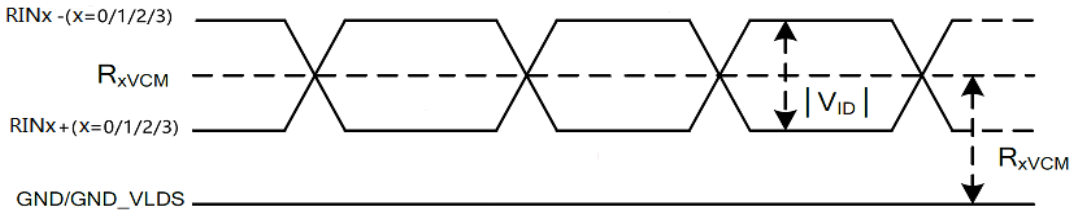


6.3 LVDS DC Electrical Characteristics

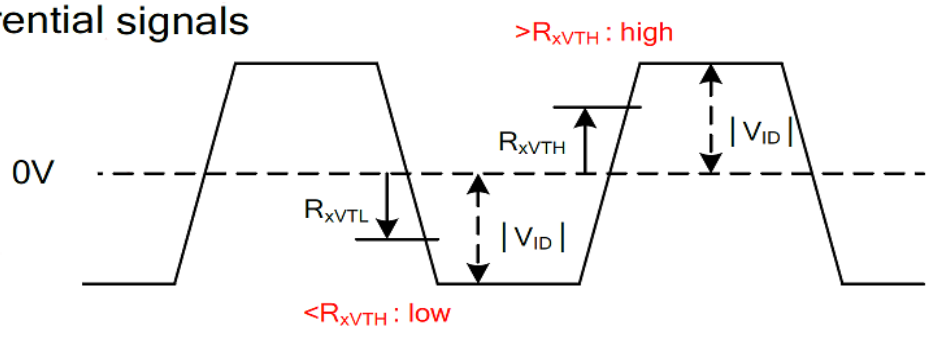
VCC=3.3V, GND=0V, Ta=25℃

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Differential input high Threshold voltage	R_{XVTH}			0.1	V	
Differential input Low Threshold voltage	R_{XVTL}	-0.1			V	
Input voltage range(single-end)	R_{XVIN}	0		VCC-1.0	V	
Differential input common Mode voltage	R_{XVCM}	0.6	1.2	2.4-|VID|/2	V	
Differential input voltage	$\|V_{ID}\|$	0.2	0.4	0.6	V	
Differential input leakage current	RVxliz	-10		10	uA	

Single end signals



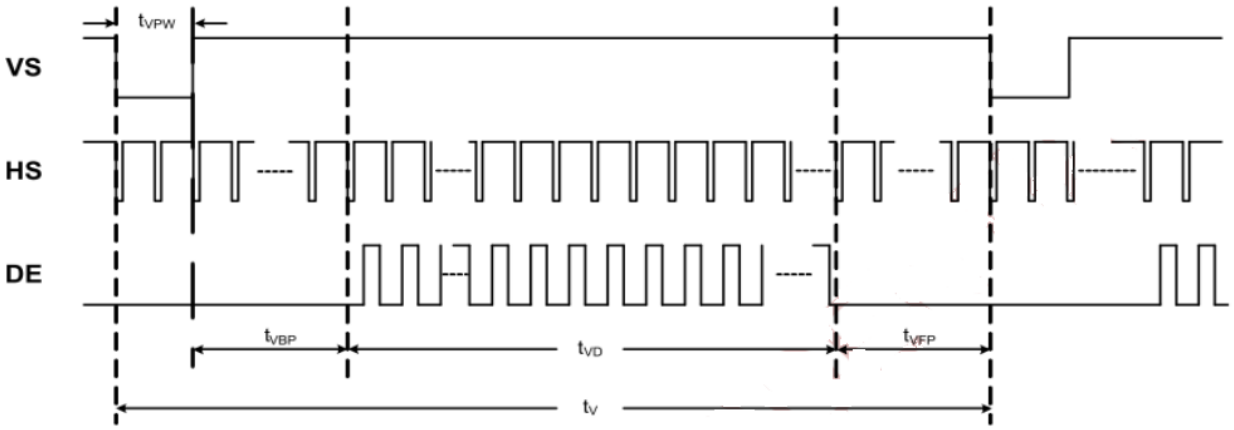
Differential signals



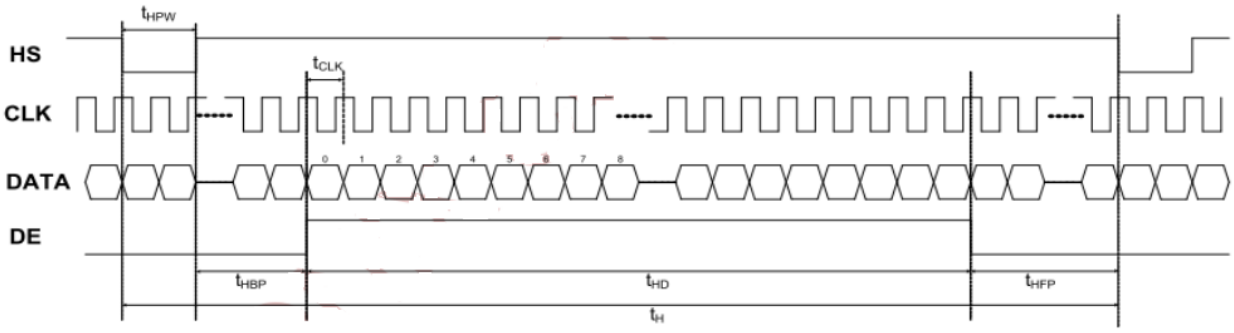
6.4 Input timing

Parameter	Symbol	MIN	Typ	MAX	Unit	Remark
CLK frequency	tclk	30.38	31.63	40.27	MHz	
Horizontal display area	thd		800		tclk	
Horizontal pulse width	thpw	2	2	8	tclk	
Horizontal back porch	thbp	8	16	40	tclk	
Horizontal front porch	thfp	16	16	100	tclk	
HSYNC period	th	826	834	948	tclk	
Vertical display area	tvd		600		th	
Vertical plus width	tvpw	2	2	8	th	
Vertical back porch	tvbp	3	10	40	th	
Vertical front porch	tvfp	8	20	60	th	
VSD period	tv	613	632	708	th	
Frame rate	FR		60		Hz	

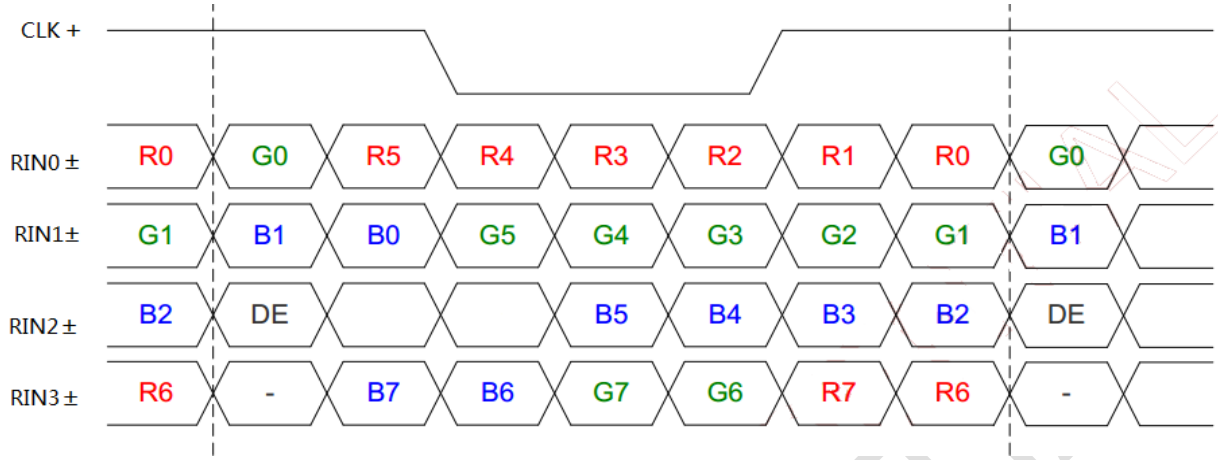
Vertical input timing



Horizontal input timing

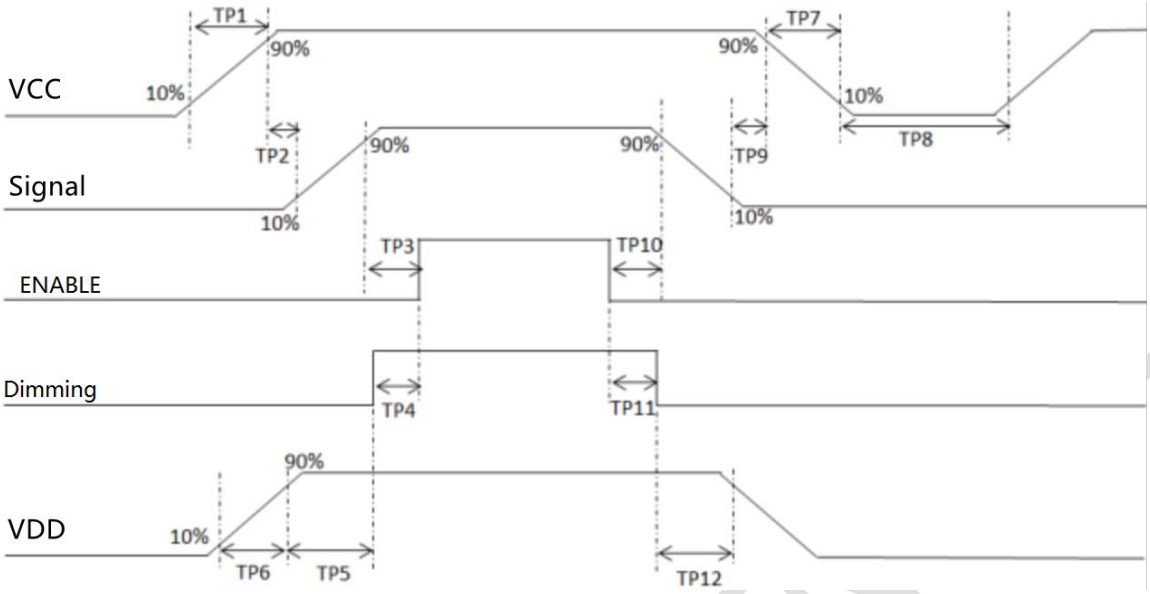


6.5 Data Input Format VESA Data Mapping



6.6 Power On/Off Timing

Item	Symbol	MIN	Typ	MAX	Unit	Remark
VCC on to VCC stable	Tp1	0.5	-	3	ms	
VCC stable to signal on	Tp2	(20)	-	100	ms	
Signal stable to ENABLE(BL_EN) on	Tp3	200	-	-	ms	
Dimming(BL_ PWM) on to ENABLE(BL_EN) on	Tp4	0	-	200	ms	
VDD to Dimming(BL_ PWM) on	Tp5	10	-	-	ms	
VDD on to VDD stable	Tp6	TBD（0.5）	-	TBD（10）	ms	
VCC off time	Tp7	0.5	-	10	ms	
VCC off to next VCC on	Tp8	500	-	-	ms	
Signal off before VCC off	Tp9	123	-	500	ms	
ENABLE(BL_EN) off before signal off	Tp10	200	-	-	ms	
ENABLE(BL_EN) off before Dimming(BL_ PWM) off	Tp11	0	-	200	ms	
Dimming(BL_ PWM)off before VDD off	Tp12	10	-	-	ms	



interface power on/off sequence

6.4.3 Fuse

Parameter	Fuse		Rating	Fusing current	Remarks
	Type	Supplier			
VCC	(FCC16152ABTP)	KAMAYA	1.5A 32V	3.0A/5smax	Note1
VDD	(FCC16202ABTP)	KAMAYA	2A 32V	4.0A/5smax	Note1

Note1: There are different power supply systems from the power input terminal. The power supply capacity should be less than the fusing current. If the power supply capacity is above the fusing current, the fuse may blow in a short time, and then nasty smell, smoking and so on may occur.

7 Optical Characteristics

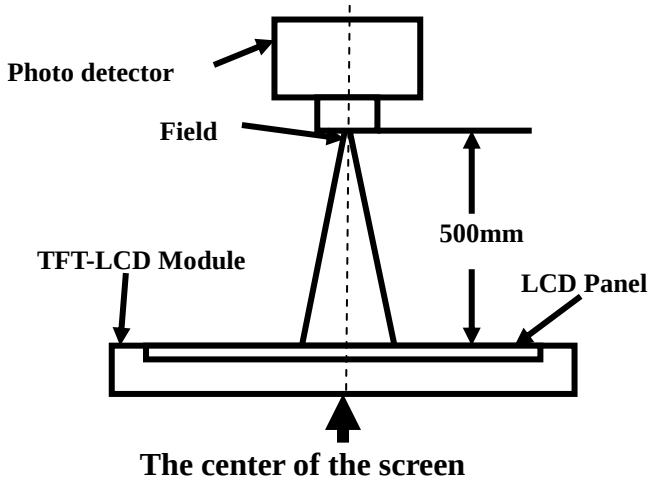
Item		Symbol	Condition	Min	Typ.	Max	Unit	Remark
View Angles		θT	CR≧10	80	88	-	Degree	Note 2
		θB		80	88	-		
		θL		80	88	-		
		θR		80	88	-		
Contrast Ratio		CR	θ=0°		1000	-	-	Note1 Note3
Luminance uniformity		U		70		%	-	Note6
Response Time		T_{ON}	25℃	-	25	35	ms	Note1 Note4
		T_{OFF}						
Chromaticity	White	x	Backlight is on		（0.298）		-	Note5 Note1
		y			（0.321）			
	Red	x			（0.634）			
		y			（0.333）			
	Green	x			（0.289）			
		y			（0.622）			
	Blue	x			（0.152）			
		y			（0.060）			
NTSC					72	-	%	Note5
Luminance		L			500	-	cd/㎡	Note7

Test Conditions:

1. The ambient temperature is 25℃. VDD= 3.3V, VCC=12V, 100% brightness,
2. The test systems refer to Note 1 and Note2.

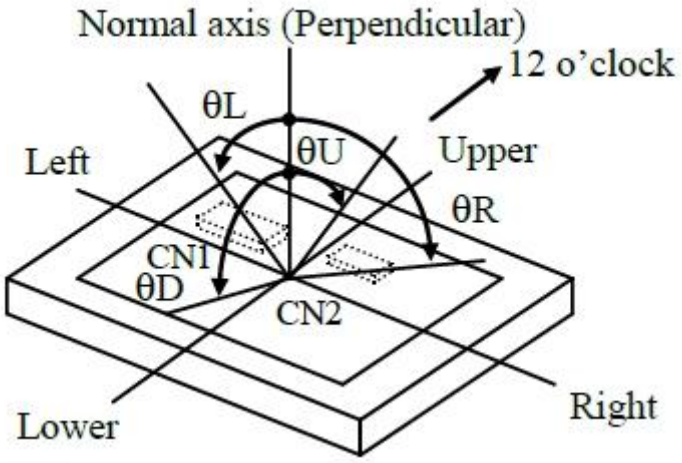
Note 1: Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 5 Minutes operation, the optical properties are measured at the center point of the LCD screen. All input terminals LCD panel must be ground when measuring the center area of the panel.



Note 2: Definition of viewing angle range and measurement system.

viewing angle is measured at the center point of the LCD by CONOSCOPE(ergo-80)。



Note 3: Definition of contrast ratio

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD is on the "White" state}}{\text{Luminance measured when LCD is on the "Black" state}}$$

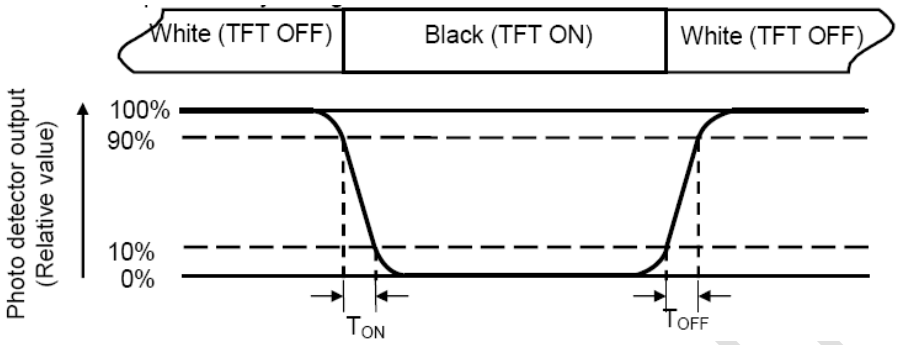
"White state ": The state is that the LCD should drive by Vwhite.

"Black state": The state is that the LCD should drive by Vblack.

Vwhite: To be determined Vblack: To be determined.

Note 4: Definition of Response time

The response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time (T_{ON}) is the time between photo detector output intensity changed from 90% to 10%. And fall time (T_{OFF}) is the time between photo detector output intensity changed from 10% to 90%.



Note 5: Definition of color chromaticity (CIE1931)

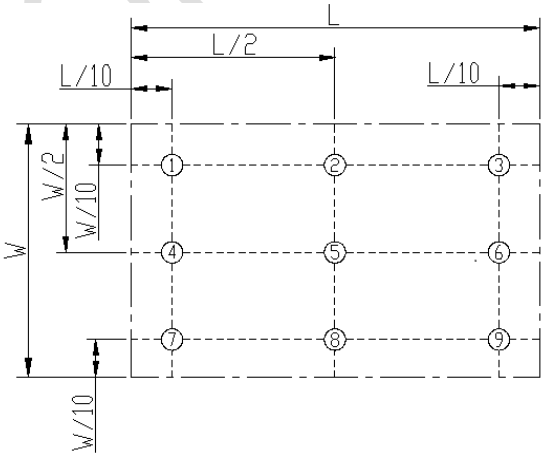
Color coordinates measured at center point of LCD.

Note 6: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas (Refer Fig. 2). Every measuring point is placed at the center of each measuring area.

Luminance Uniformity (U) = Lmin/ Lmax

L-------Active area length W----- Active area width



Lmax: The measured Maximum luminance of all measurement position.

Lmin: The measured Minimum luminance of all measurement position.

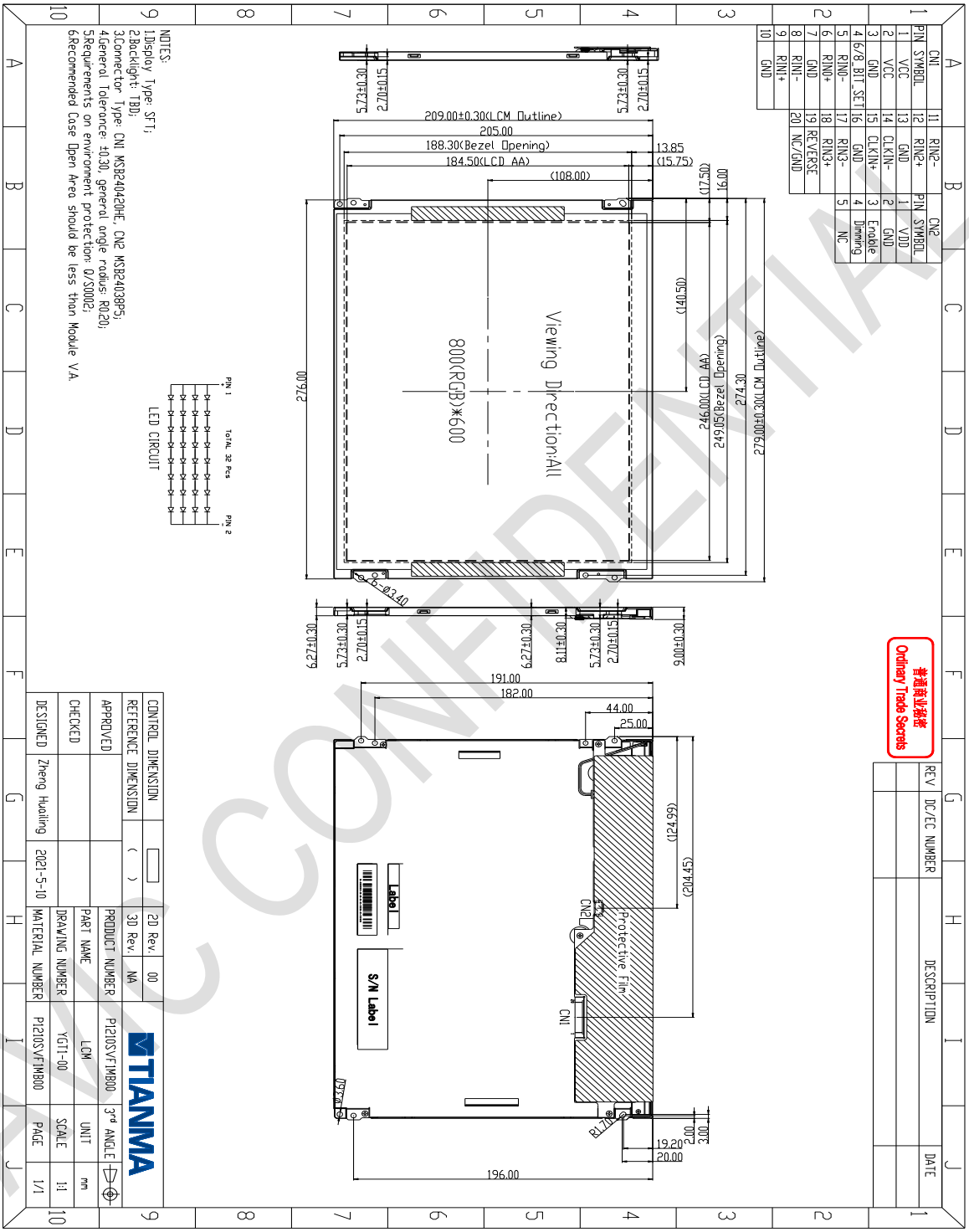
Note 7: Definition of Luminance:

Measure the luminance of white state at center point.

8 Environmental / Reliability Test

No.	Test Item	Condition	Remark
1	High Temperature & High Humidity Operation	60℃，90%RH，240hrs	IEC60068-2-78 GB/T2423.3
2	High Temperature Storage	+80℃, 240hrs	IEC60068-2-1 GB2423.2
3	Low Temperature Storage	-30℃, 240hrs	EC60068-2-1 GB2423.1
4	High Temperature Operation	+70℃， 240hrs	IEC60068-2-1,GB2423.2
5	Low Temperature Operation	-20℃， 240hrs	IEC60068-2-1 GB2423.1
6	Thermal Shock (Non-operation)	-30℃,30min;80℃,30min;1H/cycle, Change time:5min, 100 Cycles	Start with cold temperature nd with high temperature, EC60068-2-14,GB2423.22
7	Vibration	10~55HZ Stroke:1.5mm Sweep:10HZ~55HZ~10HZ 2H For X\Y\Z	IEC60068-2-6:1982 GB/T2423.10—1995
8	Package condition	5-20 -200HZ， PSD ：0.01-0.01 -0.001 Total:0.781g2/HZ, ,x/y/z every direction every direction 30min）	
9	ESD	150PF、330Ω 5 点、5 次 Air：±8KV Connect：±4KV	IEC61000-4-2 GB/T17626.2

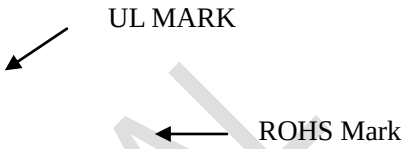
9 Mechanical Drawing



10 MARKINGS

The various markings are attached to this product. See “11.2 INDECATION LOCATIONS” for attachment positions.

10.1 PRODUCT LABEL (TBD)



Note1: The meaning of OEM number, Example: S190M50A12SA1SA109A0001

S190M50A	12	SA1SA1	09A	0001
Module Number	**Source & Gate Driver IC Code**	**Location Line#**	**Date code**	**Serial Number**

Date code:

1st Character Year Codes

Month	2010	2011	2012	2013	2014	2015	2016	2017	2018	So on
Code	0	1	2	3	4	5	6	7	8	

2nd Character Month Codes

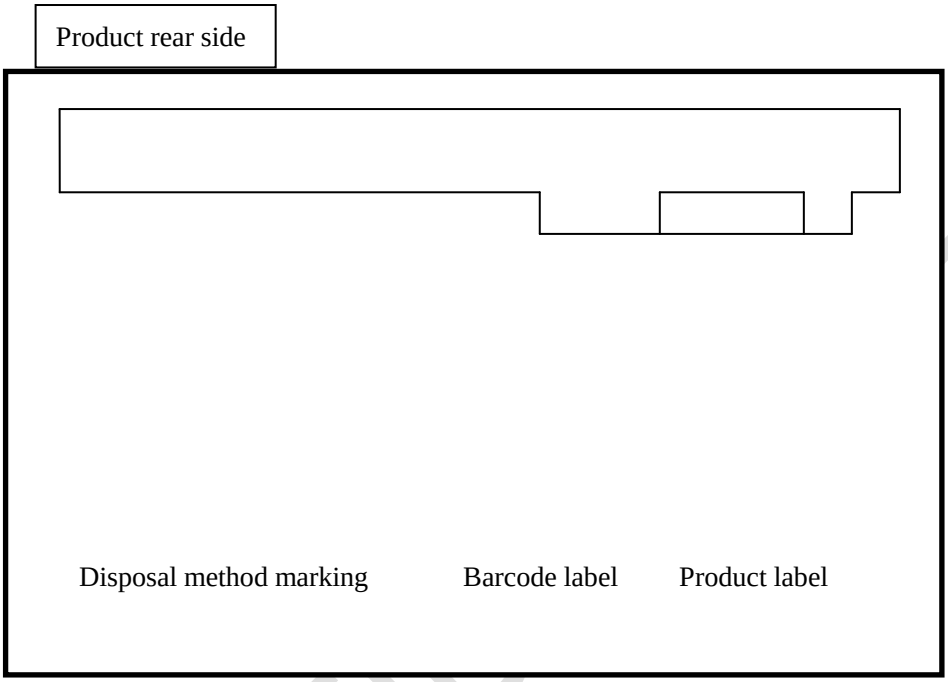
Month	January	February	March	April	May	June	July	August	September	October	November	December
Code	1	2	3	4	5	6	7	8	9	A	B	C

3rd Character Day Codes

Day	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11st
Code	1	2	3	4	5	6	7	8	9	A	B
Day	12nd	13rd	14th	15th	16th	17th	18th	19th	20th	21st	22nd
Code	C	D	E	F	G	H	I	J	K	L	M
Day	23rd	24nd	25st	26nd	27rd	28th	29th	30th	31st		
Code	N	O	P	Q	R	S	T	U	V		

Note2: Do not attach anything such as label and so on, on the product label! In case repair the product, AVIC needs the contents of product label such as the lot number, inspection date and so on, to identify the warranty period with individual product. If AVIC cannot decipher the contents of product label, such repair shall be entitled to charge. Also AVIC may give a new lot number to reconditioned products.

10.2 INDICATION LOCATIONS



11 PACKING, TRANSPORTATION AND DELIVERY

AVIC will pack products to deliver to customer in accordance with AVIC packing specifications, and will deliver products to customer in such a state that products will not suffer from a damage during transportation .The delivery conditions are as follows.

11.1 PACKING

(1) Packing box

8 products are packed up with the maximum in a packing box(See "**12.5 OUTLINE FIGURE FOR PACKING** "). Products are put into a plastic bag for prevention of moisture with cushion, and then the bag is sealed up with heat sealing.

The type name and quality are shown on outside of the packing box, either labeling or printing.

(2) Pallet Packing (See"**12.5 OUTLINE FIGURE FOR PACKING** ")

① Packing boxes are tired on a cardboard pallet.(8 boxes×4 tiers maximum)

② Cardboard sleeve and top cap are attached to the packing boxes, then they are fixed by a band.

11.2 INSPECTION RECORD SHEET

Inspection record sheets are included in the packing box with delivery products to customer. It is summarized to a number of products for pass/fail assessment.

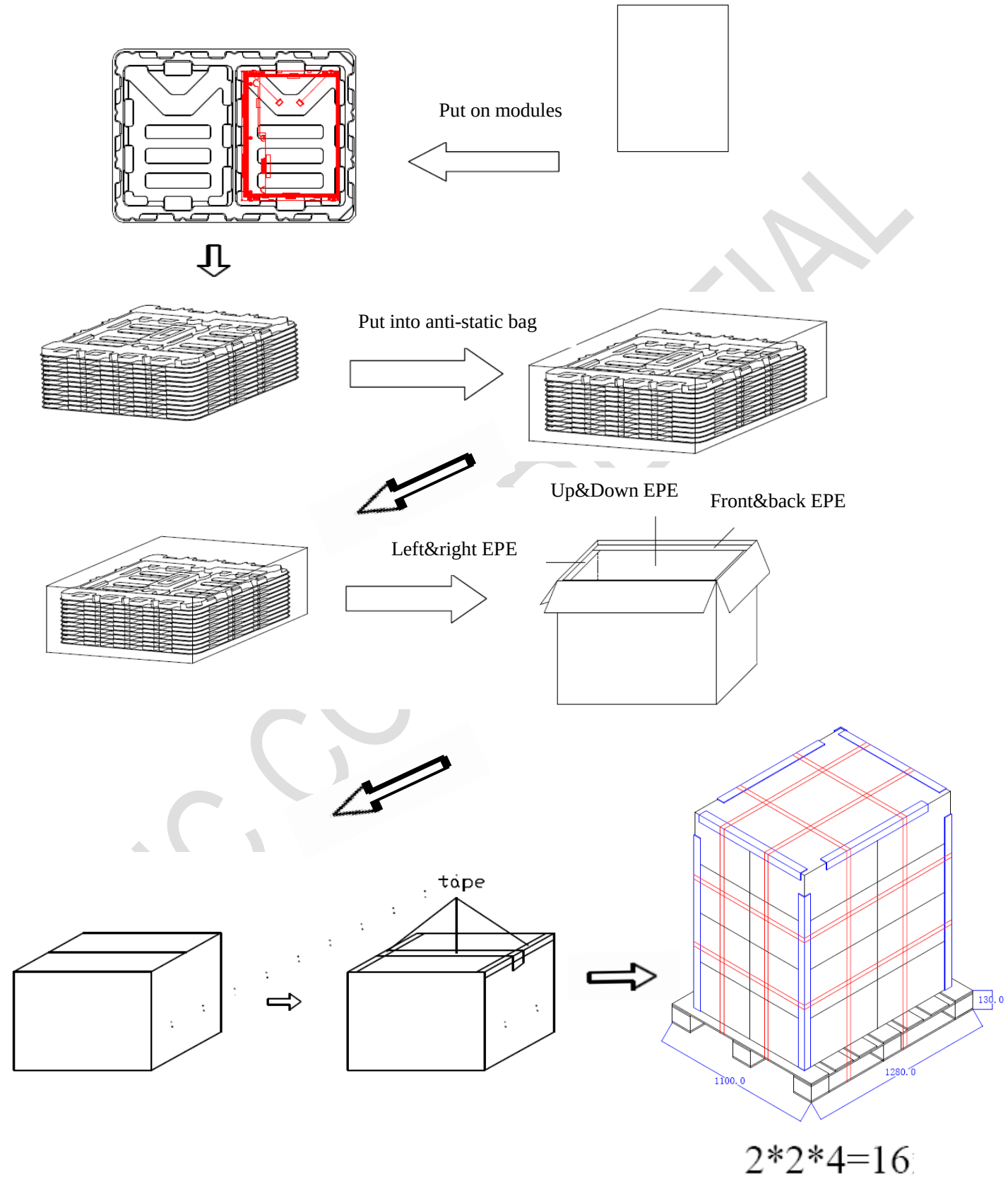
11.3 TRANSPORTATION

The product is transported by vehicle, aircraft or shipment in the state of pallet packing.

11.4 SIZE AND WEIGHT FOR PACKING BOX

Parameter	Packing box	Unit
Size	577（L）×421（W）×326（H）（typ.）	mm
LCD Weight	TBD ±5%（typ.）	kg
Total weight	TBD（typ.）	kg

11.5 OUTLINE FIGURE FOR PACKING



12 PRECAUTIONS

12.1 Handling Precautions

12.1.1The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.

12.1.2 If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.

12.1.3 Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.

12.1.4 The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.

12.1.5 If the display surface is contaMinated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:

- Isopropyl alcohol
- Ethyl alcohol

Solvents other than those mentioned above may damage the polarizer. Especially, do not use the following:

- Water
- Ketone
- Aromatic solvents

12.1.6 Do not attempt to disassemble the LCD Module.

12.1.7 If the logic circuit power is off, do not apply the input signals.

12.1.8 To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

12.1.8.1 Be sure to ground the body when handling the LCD Modules.

12.1.8.2 Tools required for assembly, such as soldering irons, must be properly ground.

12.1.8.3 To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.

12.1.8.4 The LCD Module is coated with a film to protect the display surface. Be care when peeling off this protective film since static electricity may be generated.

12.2 Storage precautions

12.2.7 When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.

12.2.8 The LCD modules should be stored under the storage temperature range. If the LCD modules will be

stored for a long time, the recommend condition is:

Temperature : 0℃ ～ 40℃ Relatively humidity: ≤80%

12.2.9 The LCD modules should be stored in the room without acid, alkali and harmful gas.

12.3 Transportation Precautions

12.3.7 The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.

12.4 Do not display the fixed pattern for a long time because it may cause image sticking. Use a screen saver, if the fixed pattern is displayed on the screen

12.5 SAFETY PRECAUTIONS

12.5.1. When you waste damaged or unnecessary LCDs, it is recommended to crush LCDs into pieces and wash them off with solvents such as acetone and ethanol, which should later be burned.

12.5.2. If any liquid leaks out of a damaged glass cell and comes in contact with the hands, wash off thoroughly with soap and water.

12.5.3. Be sure to turn off the power supply when inserting or disconnecting the LED backlight cable.

d. LED driver should be designed carefully to limit or stop its function when over current is detected on the LED.