



产 品 规 格 书

PRODUCT SPECIFICATION

产品名称
(Model Name)

TFT-LCD Module

产品型号
(Part Number)

STI236FHD01-ELED10

项目 (Item)	拟制 (Prepared)	审核 (Checked)	批准 (Approved)
签名 (Signature)			
日期 (Date)			
备注 (Note)			

客户 (Customer):

签名 (Signature):

日期 (Date):

版本介绍 (Version is introduced)				
版本 (Version)	发行日期 (Release date)	原版描述 (Old description)	更新描述 (New description)	页码 (Page)
V.0	2020/10/26	首版		/

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1. GENERAL DESCRIPTION

1.1 OVERVIEW

STI236FHD01-ELED10 is a 23.6" TFT Liquid Crystal Display module white-LED back-light unit and 30 pins 2 channels LVDS interface. This module supports 1920x1080 native resolutions and can display up to 16.7 millions colors. The converter module for Backlight is not built in.

1.2 GENERAL SPECIFICATIONS

Item	Specification	Unit	
Active Area Size	23.6" real diagonal		
Driver Element	a-si TFT active matrix	-	
Pixel Number	1920 x R.G.B. x 1080	pixel	
Pixel Pitch	0.2715(H) x 0.2715(V)	mm	
Pixel Arrangement	RGB vertical stripe	-	
Display Colors	16.7M	color	
Transmissive Mode	Normally black	-	
Luminance, White	1000	cd/m ²	
Color Gamut	72% of NTSC(Typ.)	-	
TCO	TCO 6.0	-	
Surface Treatment	AG type, 3H hard coating, Haze :25%		
Power Consumption	Total=32.25W@ cell=5.05W, BL=27.2 (W)	(1)	

Note (1) The specified power consumption: Total= cell(reference 4.3.1)+BL(reference 4.3.3)

2. MECHANICAL SPECIFICATIONS

Item			Typ.	Max.	Unit	Note
Module Size	Horizontal	544.3	544.8	545.3	mm	(1)
	Vertical	320	320.5	321	mm	
	Thickness	12.5	13.5	14.0	mm	
Bezel Area	Horizontal	524.92	525.22	525.52	mm	
	Vertical	296.92	297.22	297.52	mm	
Active Area	Horizontal	-	521.28	-		
	Vertical	-	293.22	-	mm	
Weight		4950	5000	5050		

Note (1) Please refer to the attached drawings for more information of front and back outline dimensions.

3. ABSOLUTE MAXIMUM RATINGS

3.1 ABSOLUTE RATINGS OF ENVIRONMENT

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Storage Temperature	TST	-20	60	°C	(1)
Operating Ambient Temperature	TOP	0	50	°C	(1), (2)

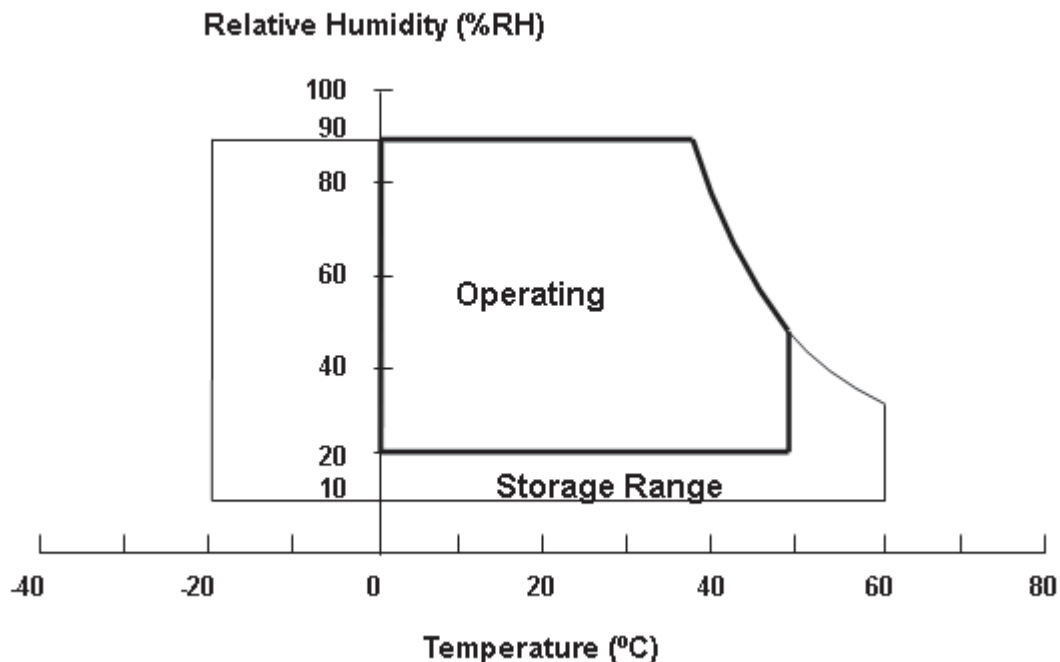
Note (1)

(a) 90 %RH Max. (Ta < 40 °C).

(b) Wet-bulb temperature should be Ta < 40 °C

(c) No condensation.

Note (2) Panel surface temperature should be 0°C min. and 65°C max under Vcc=5.0V, fr =60Hz, typical LED string current, 25°C ambient temperature, and no humidity control . Any condition of ambient operating temperature ,the surface of active area should be keeping not higher than 65°C.



3.2 ELECTRICAL ABSOLUTE RATINGS

3.2.1 TFT-LCD MODULE

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Power Supply Voltage	VCCS	-0.3	6.0	V	(1)
Logic Input Voltage	V _{IN}	-0.3	3.6	V	

4. ELECTRICAL SPECIFICATIONS

4.1 FUNCTION BLOCK DIAGRAM

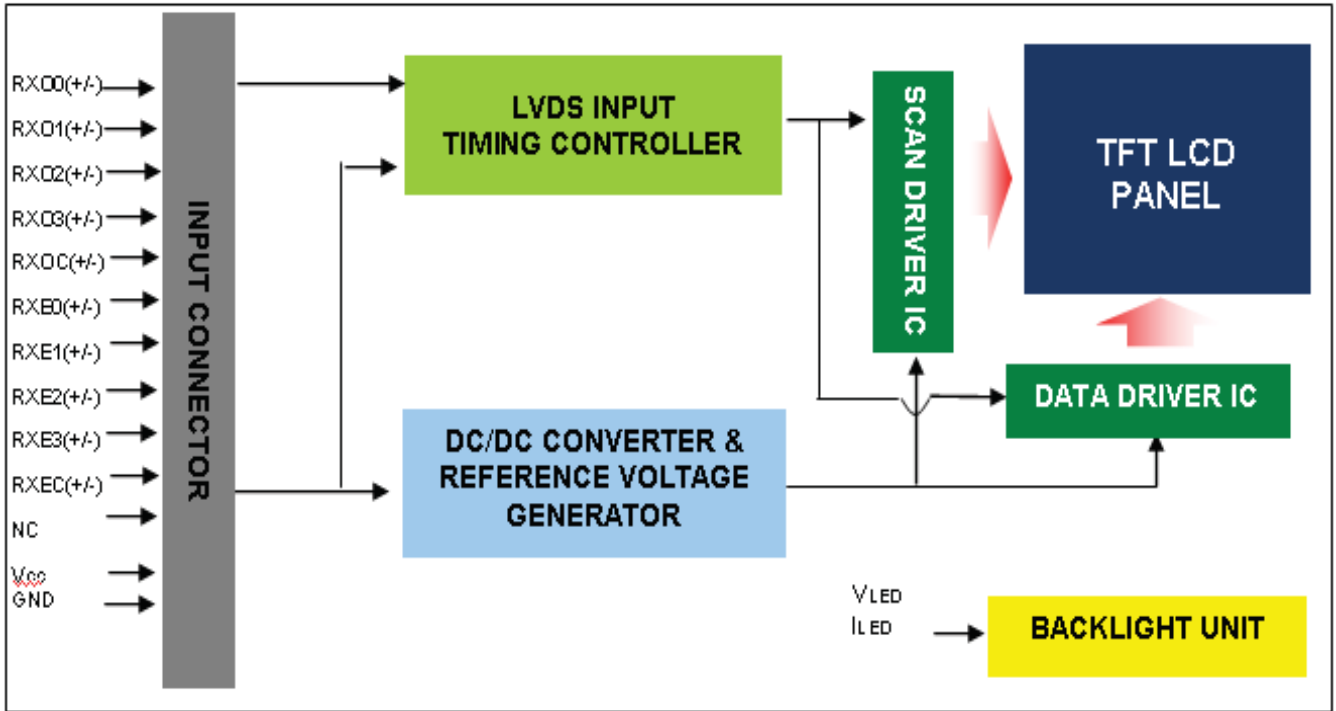


Fig. 4-1 Module Function Block Diagram

4.2. INTERFACE CONNECTIONS

4.2.1 Module LCD PIN ASSIGNMENT

Pin		Description
1	RXO0-	Negative LVDS differential data input. Channel O0 (odd)
2	RXO0+	Positive LVDS differential data input. Channel O0 (odd)
3	RXO1-	Negative LVDS differential data input. Channel O1 (odd)
4	RXO1+	Positive LVDS differential data input. Channel O1 (odd)
5	RXO2-	Negative LVDS differential data input. Channel O2 (odd)
6	RXO2+	Positive LVDS differential data input. Channel O2 (odd)
7	GND	Ground
8	RXOC-	Negative LVDS differential clock input. (odd)
9	RXOC+	Positive LVDS differential clock input. (odd)
10	RXO3-	Negative LVDS differential data input. Channel O3(odd)
11	RXO3+	Positive LVDS differential data input. Channel O3 (odd)
12	RXE0-	Negative LVDS differential data input. Channel E0 (even)
13	RXE0+	Positive LVDS differential data input. Channel E0 (even)
14	GND	Ground
15	RXE1-	Negative LVDS differential data input. Channel E1 (even)
16	RXE1+	Positive LVDS differential data input. Channel E1 (even)
17	GND	Ground
18	RXE2-	Negative LVDS differential data input. Channel E2 (even)
19	RXE2+	Positive LVDS differential data input. Channel E2 (even)
20	RXEC-	Negative LVDS differential clock input. (even)
21	RXEC+	Positive LVDS differential clock input. (even)
22	RXE3-	Negative LVDS differential data input. Channel E3 (even)
23	RXE3+	Positive LVDS differential data input. Channel E3 (even)

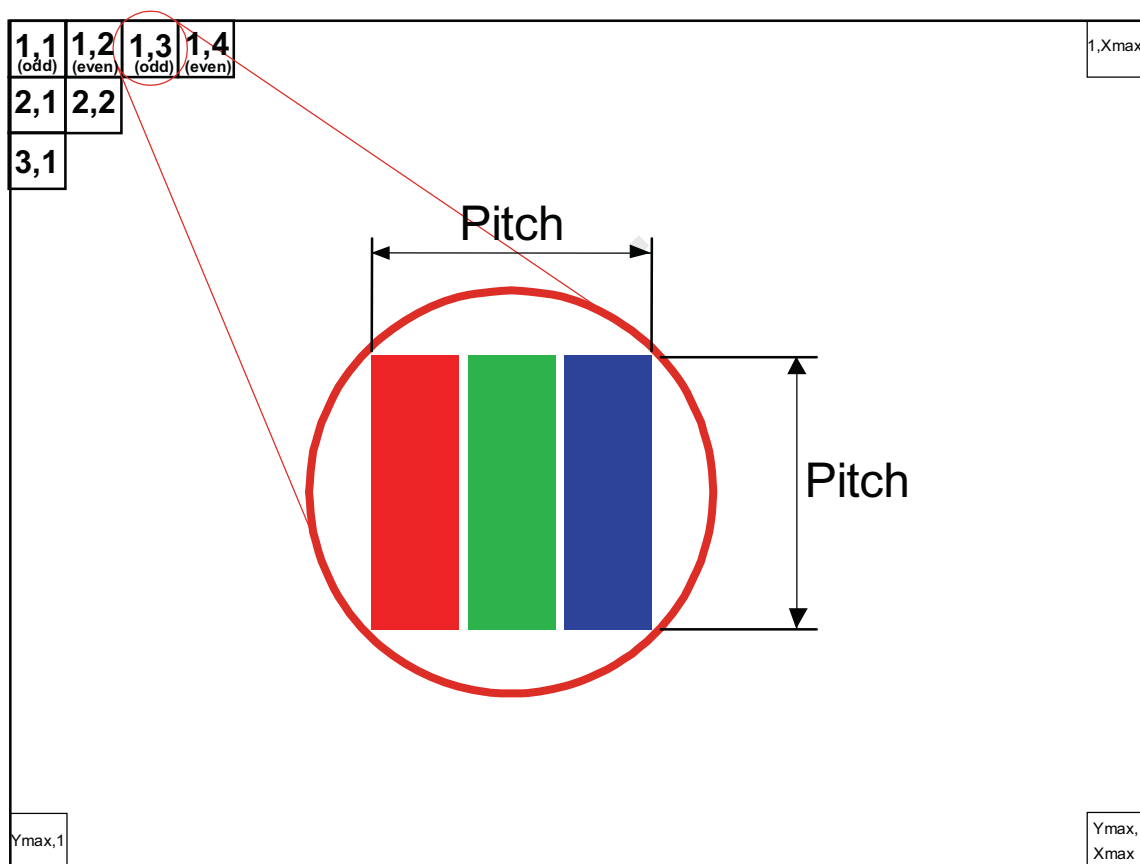
24	GND	Ground
25	NC	For LCD internal use only, Do not connect
26	NC	For LCD internal use only, Do not connect
27	NC	For LCD internal use only, Do not connect
28	Vcc	+5.0V power supply
29	Vcc	+5.0V power supply
30	Vcc	+5.0V power supply

4.2.2 Module Panel Connector Information

Item	Description
Manufacturer	P-TWO
Type part number	P-TWO:187098-30091
Mating housing part number	FI-X30H(JAE)

Note (1) The first pixel is odd

Note (2) Input signal of even and odd clock should be the same timing.



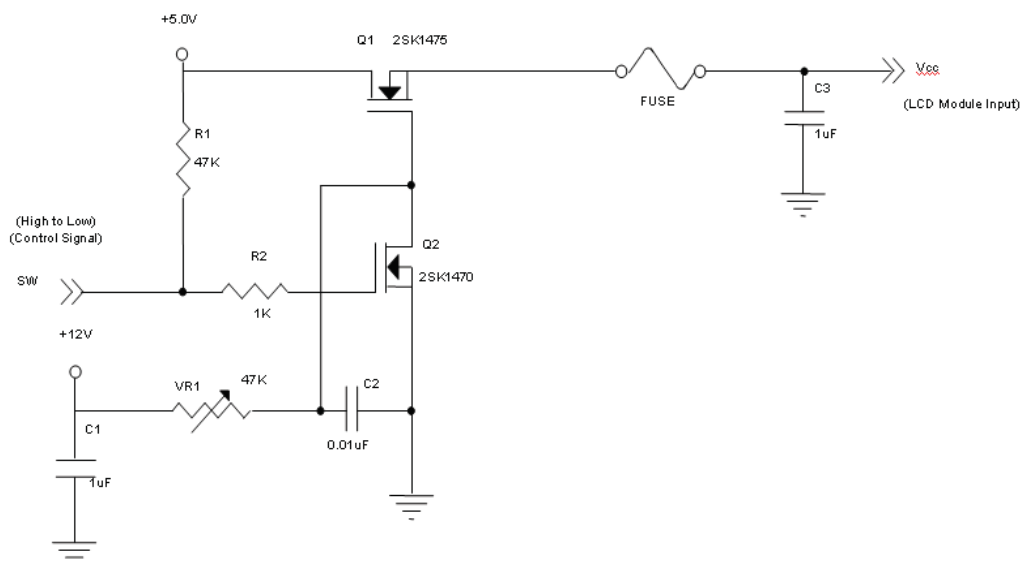
4.3 ELECTRICAL CHARACTERISTICS

4.3.1 LCD ELETRONICS SPECIFICATION

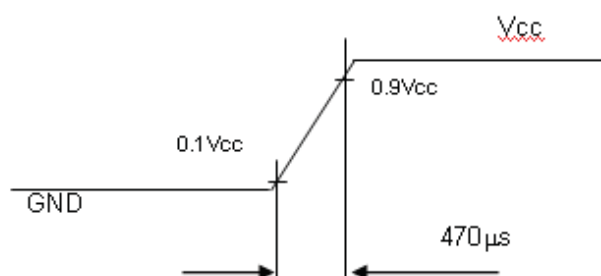
Parameter		Symbol	Value			Unit	Note
			Min.	Typ.	Max.		
Power Supply Voltage		V _{CC}	4.5	5.0	5.5	V	-
Ripple Voltage		V _{RP}	-	-	300	mV	-
Rush Current		I _{RUSH}	-	-	3	A	(2)
Power Supply Current	White	-	-	1.01	1.22	A	(3)a
	Black	-	-	0.6	0.78	A	(3)b
	Vertical Stripe	-	-	0.93	1.11	A	(3)c
Power Consumption		PLCD	-	5.05	6.11	Watt	(4)
LVDS interface	Differential Input Voltage	V _{ID}	100	-	600	mV	
	Common Input Voltage	V _{CM}	1.0	1.2	1.4	V	
	Differential Input High Threshold Voltage	V _{TH}	-	-	+100	mV	
	Differential Input Low Threshold Voltage	V _{TL}	-100	-	-	mV	

Note (1) The ambient temperature is $T_a = 25 \pm 2$ °C.

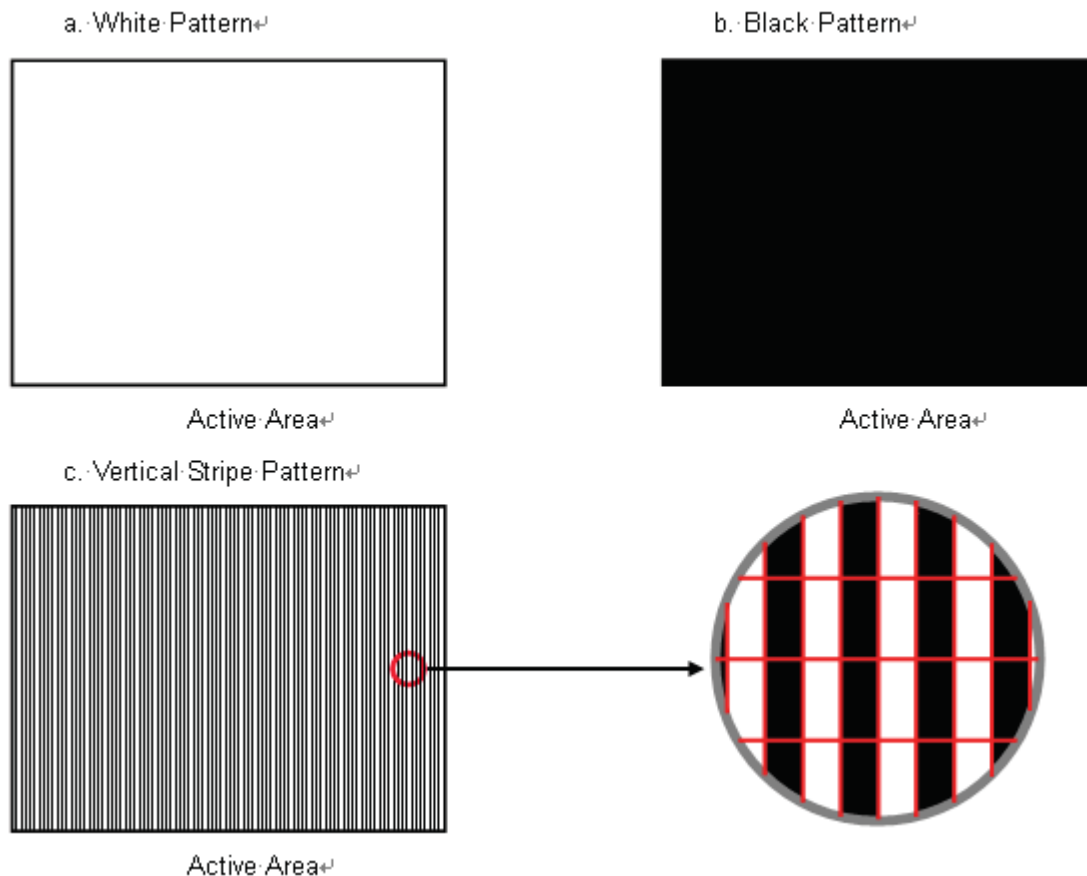
Note (2) Measurement Conditions:



Vcc rising time is 470μs



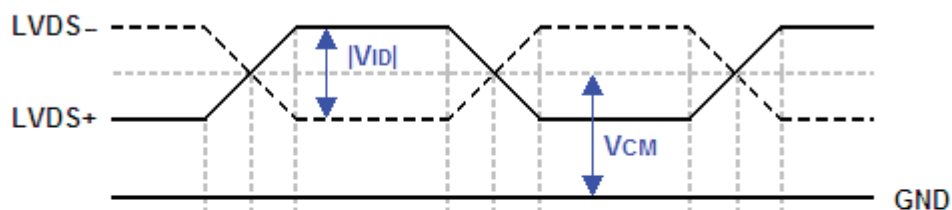
Note (3) The specified power supply current is under the conditions at $V_{CC} = 5.0\text{ V}$, $T_a = 25 \pm 2\text{ }^{\circ}\text{C}$, $F_r = 60\text{ Hz}$, whereas a power dissipation check pattern below is displayed.



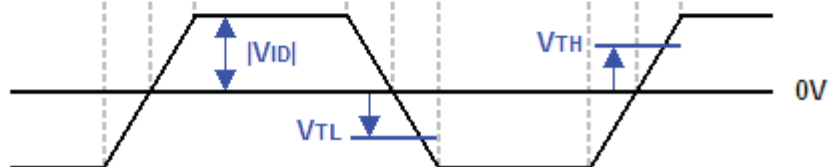
Note (4) The power consumption is specified at the pattern with the maximum current.

Note (5) The LVDS input characteristics are as follows:

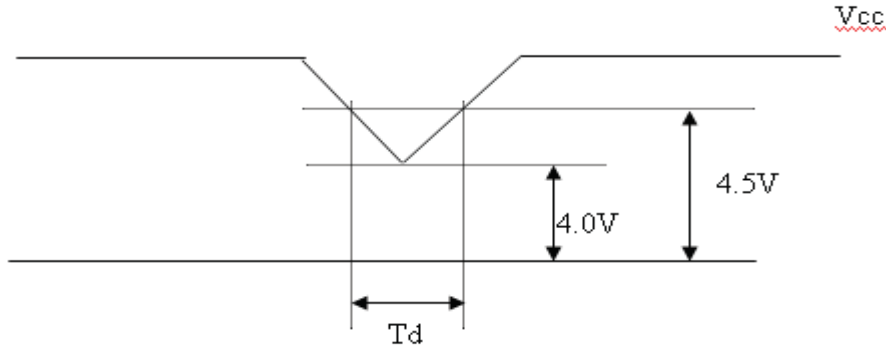
Single-end Signals



Differential Signal



4.3.2 Vcc Power Dip Condition



Dip condition: $4.0 \leq V_{cc} \leq 4.5$, $T_d \leq 20\text{ms}$

4.3.3 BACKLIGHT UNIT (第26页附件) (Annex to page 26)

$T_a = 25 \pm 2^\circ\text{C}$

Parameter			Symbol	Values			Unit	notes
				Min	Typ	Max		
LED Driver :								
Power Supply Input Voltage			VBL	10.8	12.0	13.2	Vdc	1
Power Supply Input Current			IBL	-	2.27		A	1
Power Supply Input Current (In-Rush)			In-rush	-	-	(TBD)	A	VBL = 24.0V ExtV _{BR-B} = 100% 3
Power Consumption			PBL	-	27.2		W	1
Input Voltage for Control System Signals	On/Off	On	V on	2.5	-	5.5	Vdc	
		Off	V off	-0.3	0.0	0.5	Vdc	
	Brightness Adjust		ExtV _{BR-B}	30	-	100	%	On Duty 5
				30	-	100	%	
	ExtV _{BR-B} Frequency		f _{PWM}	500	-	1500	Hz	HIGH : on duty LOW : off duty
	Pulse Duty Level (PWM)		High Level	2.5	-	5.5	Vdc	
			Low Level	0.0	-	0.5	Vdc	
LED :								
Life Time				30,000	50,000		Hrs	2

notes :

- Electrical characteristics are determined after the unit has been 'ON' and stable for approximately 60 minutes at $25 \pm 2^\circ\text{C}$. The specified current and power consumption are under the typical supply Input voltage 24V and VBR (ExtV_{BR-B} : 100%), it is total power consumption.
- The life time (MTTF) is determined as the time which luminance of the LED is 50% compared to that of initial value at the typical LED current (ExtV_{BR-B} : 100%) on condition of continuous operating in LCM state at $25 \pm 2^\circ\text{C}$.
- The duration of rush current is about 200ms. This duration is applied to LED on time.
- Even though inrush current is over the specified value, there is no problem if I²T spec of fuse is satisfied. ExtV_{BR-B} signal have to input available duty range and sequence.
- After Driver ON signal is applied, ExtV_{BR-B} should be sustained from 30% to 100% more than 500ms. After that, ExtV_{BR-B} 30% and 100% is possible

4.4 LVDS INPUT SIGNAL SPECIFICATIONS

4.4.1 LVDS DATA MAPPING TABLE

LVDS Channel O0	LVDS output	D7	D6	D4	D3	D2	D1	D0
	Data order	OG0	OR5	OR4	OR3	OR2	OR1	OR0
LVDS Channel O1	LVDS output	D18	D15	D14	D13	D12	D9	D8
	Data order	OB1	OB0	OG5	OG4	OG3	OG2	OG1
LVDS Channel O2	LVDS output	D26	D25	D24	D22	D21	D20	D19
	Data order	DE	NA	NA	OB5	OB4	OB3	OB2
LVDS Channel O3	LVDS output	D23	D17	D16	D11	D10	D5	D27
	Data order	NA	OB7	OB6	OG7	OG6	OR7	OR6
LVDS Channel E0	LVDS output	D7	D6	D4	D3	D2	D1	D0
	Data order	EG0	ER5	ER4	ER3	ER2	ER1	ER0
LVDS Channel E1	LVDS output	D18	D15	D14	D13	D12	D9	D8
	Data order	EB1	EB0	EG5	EG4	EG3	EG2	EG1
LVDS Channel E2	LVDS output	D26	D25	D24	D22	D21	D20	D19
	Data order	DE	NA	NA	EB5	EB4	EB3	EB2
LVDS Channel E3	LVDS output	D23	D17	D16	D11	D10	D5	D27
	Data order	NA	EB7	EB6	EG7	EG6	ER7	ER6

4.4.2 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

4.5 DISPLAY TIMING SPECIFICATIONS

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

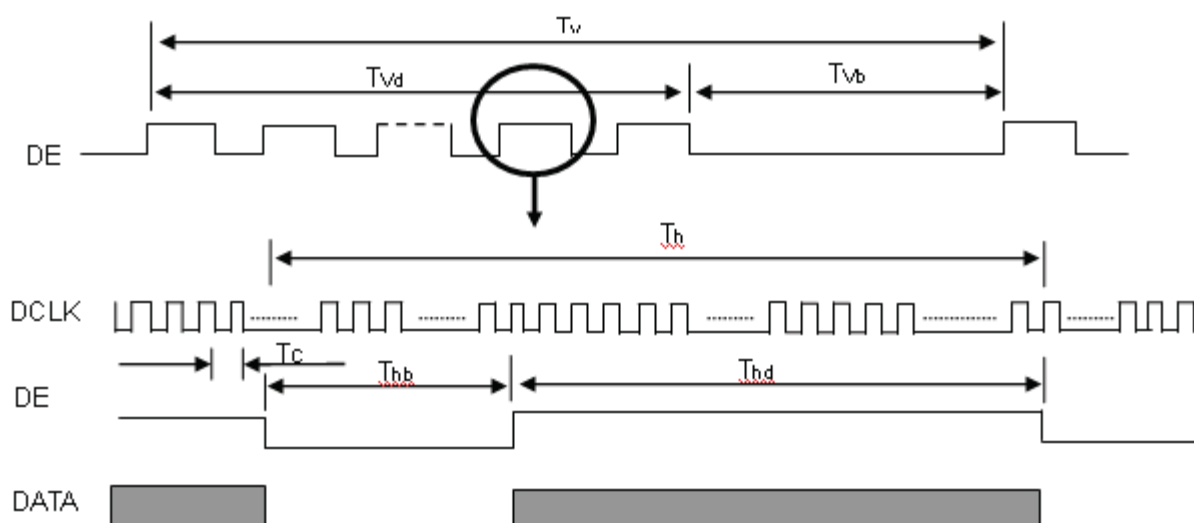
Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
LVDS Clock	Frequency	F _c	58.54	74.25	97.98	MHz	-
	Period	T _c	-	13.47		ns	
	Input cycle to cycle jitter	T _{rcj}	-0.02*TC	-	0.02*TC	ns	(2)
	Input Clock to data skew	TLVCC S	-0.02*TC		0.02*TC		(3)
	Spread spectrum modulation range	F _{ckin_mod}	0.97*FC	-	1.03*FC	MHz	(4)
	Spread spectrum modulation frequency	F _{SSM}	-	-	100	KHz	
Vertical Display Term	Frame Rate	Fr	50	60	75	Hz	
	Total	T _v	1115	1125	1136	Th	T _v =T _{vd} +T _{vb}
	Active Display	T _{vd}	1080	1080	1080	Th	-
	Blank	T _{vb}	T _v -T _{vd}	T _v -T _{vd}	T _v -T _{vd}	Th	-
Horizontal Display Term	Total	T _h	1050	1100	1150	Tc	T _h =T _{hd} +T _{hb}
	Active Display	T _{hd}	960	960	960	Tc	-
	Blank	T _{hb}	T _h -T _{hd}	T _h -T _{hd}	T _h -T _{hd}	Tc	-

Note (1) Please make sure the range of pixel clock has follow the below equation and F_c, Fr, T_v, T_h not allowed to get beyond the min or max spec.

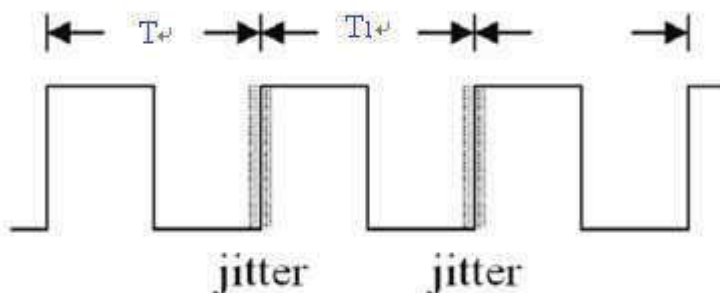
$$F_c = Fr \times T_v \times T_h$$

Because this module is operated by DE only mode, Hsync and Vsync input signals are ignored.

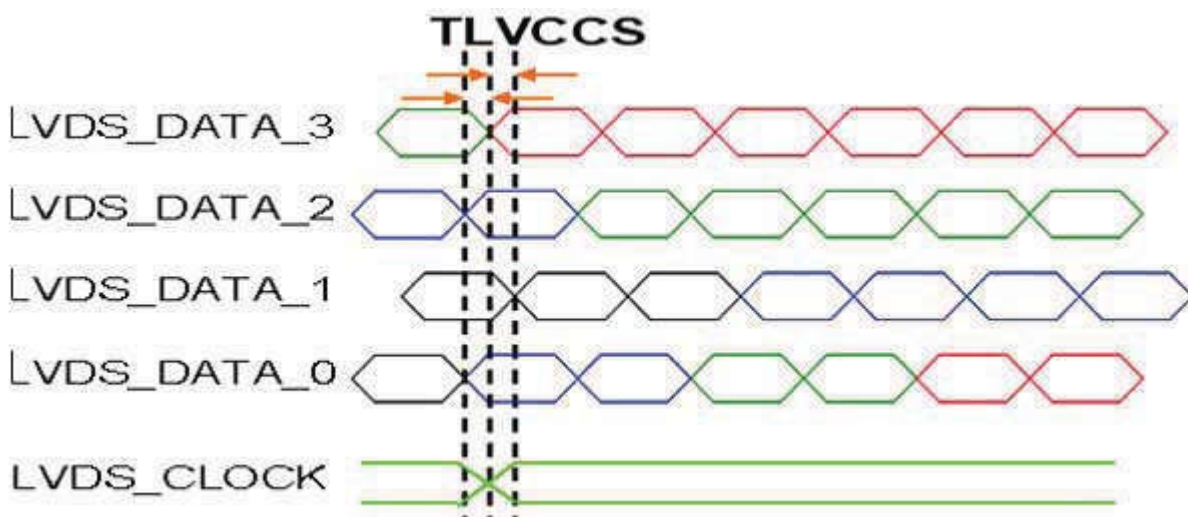
INPUT SIGNAL TIMING DIAGRAM



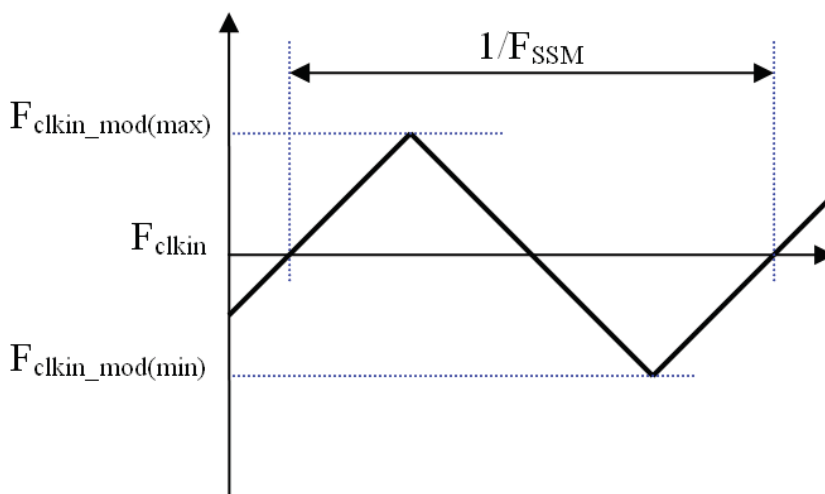
Note (2) The input clock cycle-to-cycle jitter is defined as below figures. $Trcl = |T_1 - T_1|$



Note (3) Input Clock to data skew is defined as below figures.



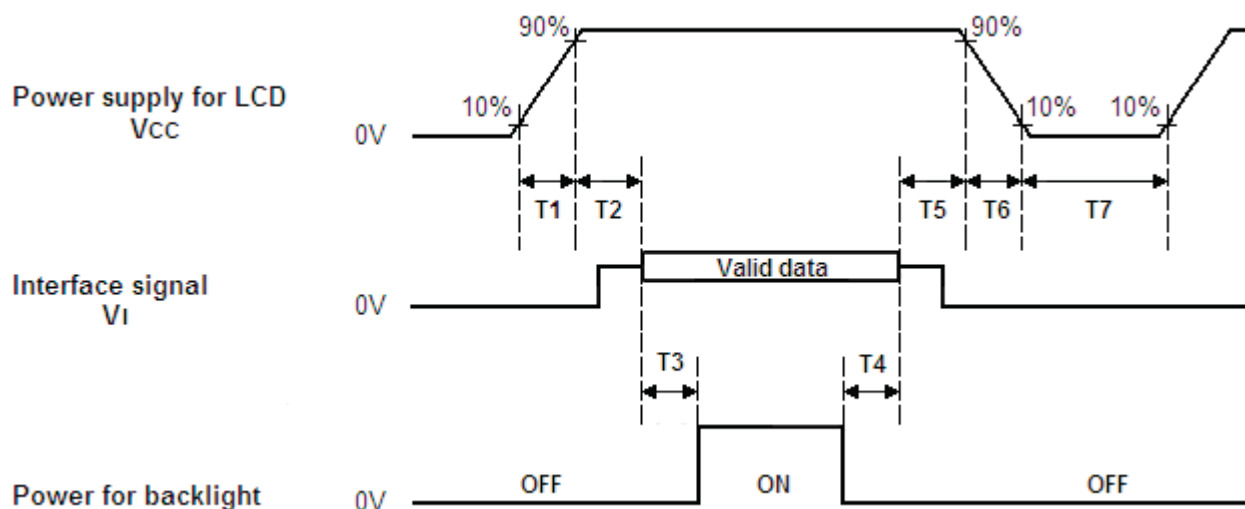
Note (4) The SSCG (Spread spectrum clock generator) is defined as below figures.



Note(5) The DCLK range at last line of V-blank should be set in 0 to Hdisplay/2

4.6 POWER ON/OFF SEQUENCE

The power sequence specifications are shown as the following table and diagram.



Timing Specifications:

Parameters	Values			Units
	Min	Typ.	Max	
T1	0.5	--	10	ms
T2	0	30	50	ms
T3	450	--	--	ms
T4	100	250	--	ms
T5	0	20	50	ms
T6	0.1	--	100	ms
T7	1000	--	--	ms

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

Note (2) When the backlight turns on before the LCD operation of the LCD turns off, the display may momentarily become abnormal screen.

Note (3) In case of VCC = off level, please keep the level of input signals on the low or keep a high

Note (4) T7 should be measured after the module has been fully discharged between power off and on

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

Note (6) INX won't take any responsibility for the products which are damaged by the customers not following the Power Sequence.

Note (7) There might be slight electronic noise when LCD is turned off (even backlight unit is also off). To avoid this symptom, we suggest "Vcc falling timing" to follow "t6 spec".

5. OPTICAL CHARACTERISTICS

5.1 TEST CONDITIONS

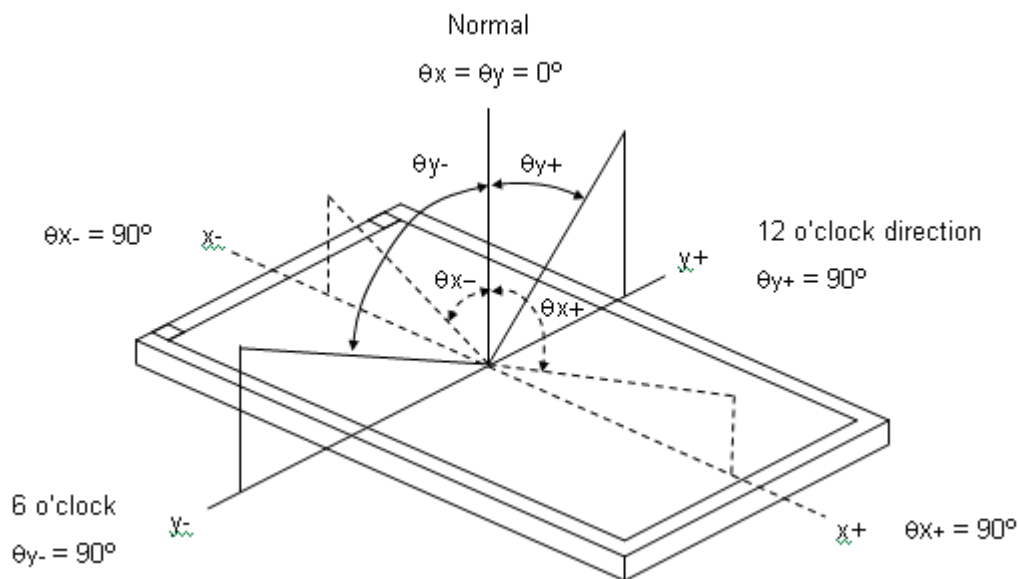
Item	Symbol	Value	Unit
Ambient Temperature	Ta	25 ± 2	°C
Ambient Humidity	Ha	50 ± 10	%RH
Supply Voltage	V _{CC}	5	V
Input Signal	According to typical value in "3. ELECTRICAL CHARACTERISTICS"		
LED Light Bar Input Current Per Input Pin	I _{PIN}	--	mA
PWM Duty Ratio	D	100	%
LED Light Bar Test Converter			

5.2 OPTICAL SPECIFICATIONS

The relative measurement methods of optical characteristics are shown in 5.2. The following items should be measured under the test conditions described in 5.1 and stable environment shown in Note (5).

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Color Chromaticity (CIE 1931)	Red		Typ – 0.03	0.633	Typ + 0.03	-	(1), (5)
	Ry			0.340			
	Green			0.314			
	Gy			0.632			
	Blue			0.159			
	By			0.060			
	Wx			0.313			
	Wy			0.329			
Center Luminance of White (Center of Screen)	L _C		1350	1500	-		(4), (5)
Contrast Ratio	CR		2000	3000			(2), (5)
Response Time	T _R	$\theta_x=0^\circ, \theta_y=0^\circ$		20	25	ms	(3)
	T _F			5	10		
	T _{GtG_AVE}			25	35		
White Variation	W		72	75	-	-	(5), (6)
Viewing Angle	Horizontal	CR ≥ 10	160	178	---	Deg.	(1), (5)
	Vertical		160	178	---		

Note (1) Definition of Viewing Angle (θ_x , θ_y):



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

The contrast ratio can be calculated by the following expression.

$$\text{Contrast Ratio (CR)} = L_{255} / L_0$$

L255: Luminance of gray level 255

L 0: Luminance of gray level 0

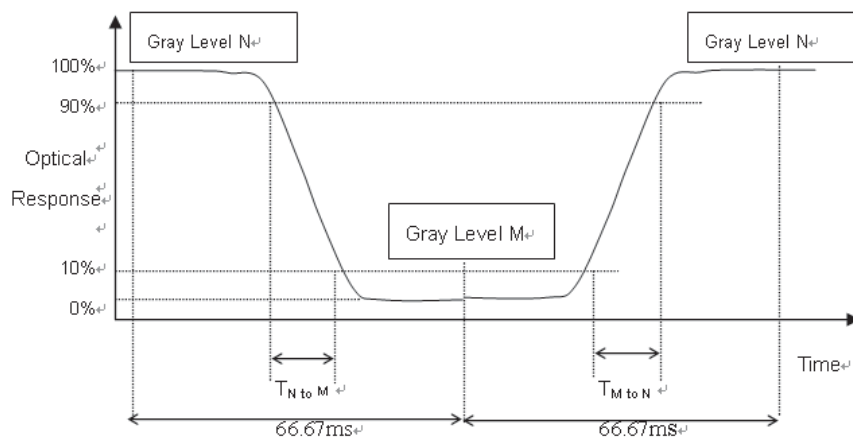
$$\text{CR} = \text{CR} (5)$$

CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note (6).

Note (3) Definition of Response Time

-The T_R is the rising-time means the transition time from “Full-Black (gray 0)” to “Full-White (gray 255)” and the T_F is the falling-time means the transition time from “Full-White (gray 255)” to “Full-White (gray 0)” as the following figure. (Measured by TEKTRONIX TDS3054B).

-The T is the response time means the transition time from “Gray N” to “Gray M” ($N, M=0 \sim 255$).



- $T_{\text{GTG_AVE}}$ is the total average of the T_{GTG} data (Measured by INX GTG instrument)
- The gray (N,M) stands for the (0,31,63,~255) as the following table.
- If system uses ODC (Over Driving Circuit) function, $T_{\text{GTG_AVE}}$ may be 5ms~10ms.
- * It depends on Overshoot rate.

Gray to Gray		Rising time								
		0	31	63	95	127	159	191	223	255
Falling time	0									
	31									
	63									
	95									
	127									
	159									
	191									
	223									
	255									

Note (4) Definition of Luminance of White (L_c):

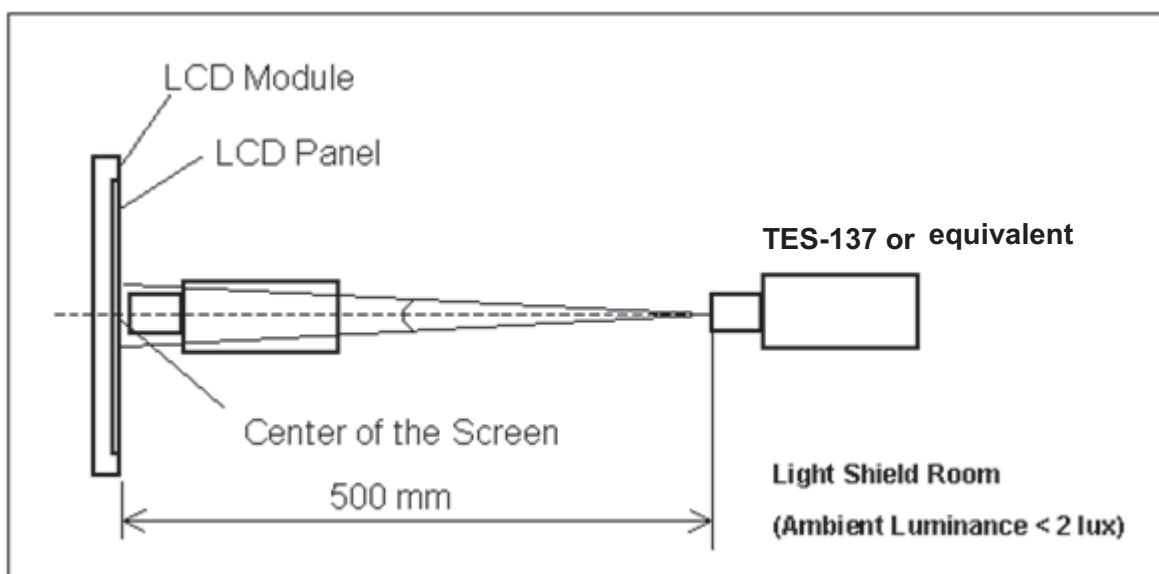
Measure the luminance of gray level 255 at center point

$$L_c = L(5)$$

$L(x)$ is corresponding to the luminance of the point X at Figure in Note (6).

Note (5) Measurement Setup:

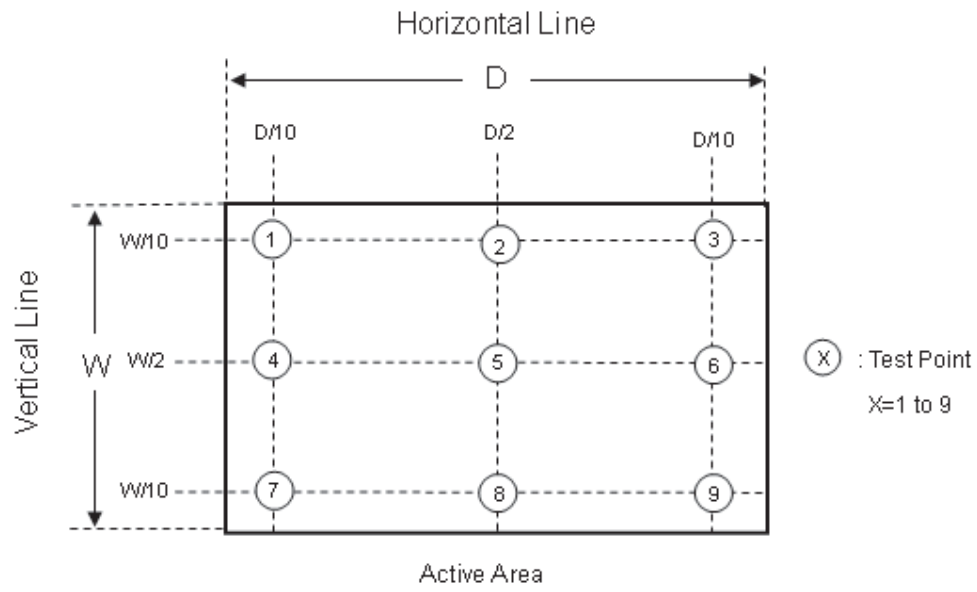
The LCD module should be stabilized at given temperature for 40 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 40 minutes in a windless room.



Note (6) Definition of White Variation (δW):

Measure the luminance of gray level 255 at 9 points

$$\delta W = (\text{Minimum } [L(1) \sim L(9)] / \text{Maximum } [L(1) \sim L(9)]) * 100\%$$



6. RELIABILITY TEST ITEM

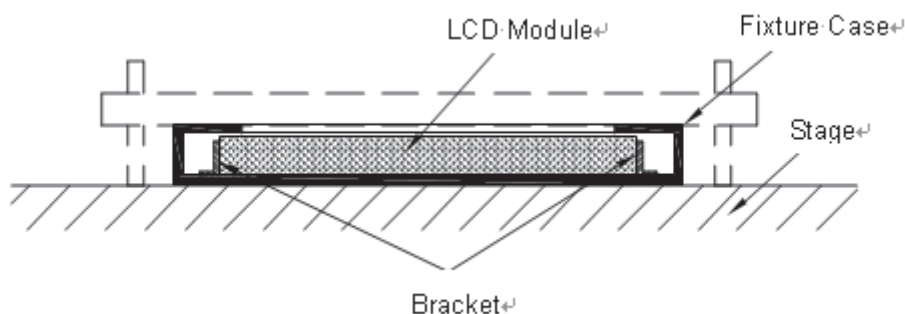
Items	Required Condition	Note
Temperature Humidity Bias (THB)	Ta= 50℃ , 80%RH, 240hours	
High Temperature Operation (HTO)	Ta= 50℃ , 240hours	
Low Temperature Operation (LTO)	Ta= 0℃ , 240hours	
High Temperature Storage (HTS)	Ta= 60℃ , 240hours	
Low Temperature Storage (LTS)	Ta= -20℃ , 240hours	
Vibration Test (Non-operation)	Acceleration: 1.5 G Wave: Sine Frequency: 10 - 300 Hz Sweep: 30 Minutes each Axis (X, Y, Z)	
Shock Test (Non-operation)	Acceleration: 50 G Wave: Half-sine Active Time: 11 ms Direction : ± X, ± Y, ± Z.(one time for each Axis)	
Thermal Shock Test (TST)	-20℃/30min , 60℃ / 30min , 100 cycles	
On/Off Test	25℃ ,On/10sec , Off /10sec , 30,000 cycles	
ESD (Electro Static Discharge)	Contact Discharge: ± 8KV, 150pF(330	
	Air Discharge: ± 15KV, 150pF(330Ω)	
Altitude Test	Operation:10,000 ft / 24hours Non-Operation:30,000 ft / 24hours	

Note (1) criteria : Normal display image with no obvious non-uniformity and no line defect.

Note (2) Evaluation should be tested after storage at room temperature for more than two hour

Note (3) 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.

The fixing condition is shown as below:



7. PACKING

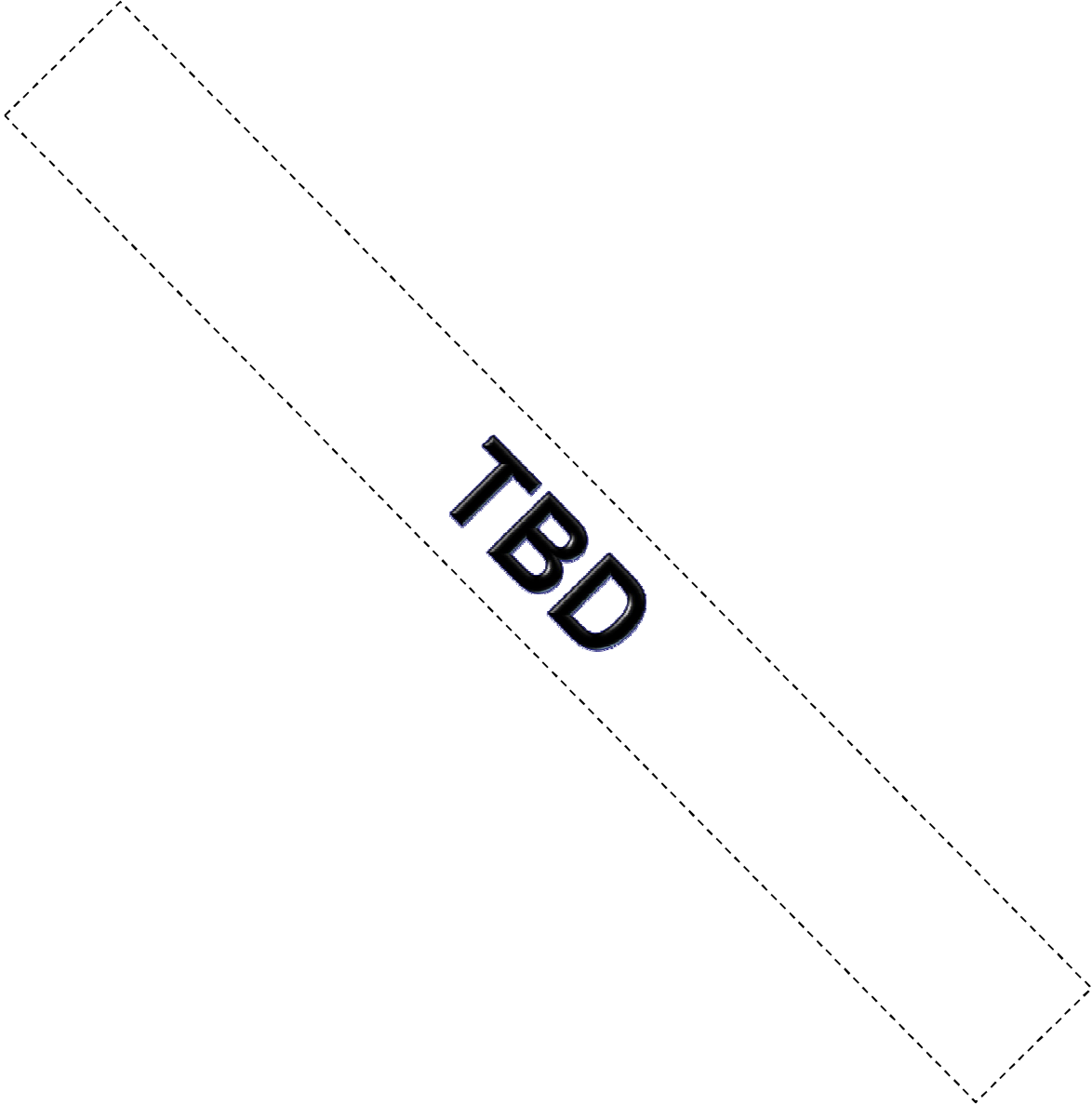
7.1 PACKING SPECIFICATIONS

- (1) LCD 11 modules / 1 Box
- (2) Box dimensions: TBD(L) X TBD(W) X TBD(H) mm
- (3) Weight: approximately: TBDkg

7.2 PACKING METHOD

7.3 PALLET

7.4 UN-PACKAGING METHOD



TBD

8. INX MODULE LABEL

TBD

9. PRECAUTIONS

9.1 ASSEMBLY AND HANDLING PRECAUTIONS

- (1) Do not apply rough force such as bending or twisting to the module during assembly.
- (2) To assemble or install module into user's system can be only in clean working areas. The dust and oil may cause electrical short or worsen the polarizer.
- (3) It's not permitted to have pressure or impulse on the module because the LCD panel and Backlight will be damaged.
- (4) Always follow the correct power sequence when LCD module is connecting and operating. This can prevent damage to the CMOS LSI chips during latch-up.
- (5) Do not pull the I/F connector in or out while the module is operating.
- (6) Do not disassemble the module.
- (7) Use a soft dry cloth without chemicals for cleaning, because the surface of polarizer is very soft and easily scratched.
- (8) It is dangerous that moisture come into or contacted the LCD module, because moisture may damage LCD module when it is operating.
- (9) High temperature or humidity may reduce the performance of module. Please store LCD module within the specified storage conditions.
- (10) When ambient temperature is lower than 10°C may reduce the display quality. For example, the response time will become slowly.
- (11) Do not press or scratch the surface harder than a HB pencil lead on the panel because the polarizer is very soft and easily scratched.
- (12) While touching the panel surface under the patterns with higher grey levels, a shadow or mura phenomenon would be seen.
This phenomenon is totally recoverable by switching the patterns to lower grey levels.
It is a product feature.

9.2 STORAGE PRECAUTIONS

- (1) Do not leave the module in high temperature, and high humidity for a long time. It is highly recommended to store the module with temperature from 0°C to 35°C and relative humidity of less than 70%
- (2) Do not store the TFT – LCD module in direct sunlight
- (3) The module should be stored in dark place. It is prohibited to apply sunlight or fluorescent light in storing

9.3 OPERATION PRECAUTIONS

- (1) The LCD product should be operated under normal condition.

Normal condition is defined as below :

Temperature : $20\pm 15^{\circ}\text{C}$

Humidity: $65\pm 20\%$

Display pattern : continually changing pattern(Not stationary)

- (2) If the product will be used in extreme conditions such as high temperature, high humidity, high altitude, display pattern or operation time etc... It is strongly recommended to contact INX for application engineering advice. Otherwise, its reliability and function may not be guaranteed.

9.4 SAFETY PRECAUTIONS

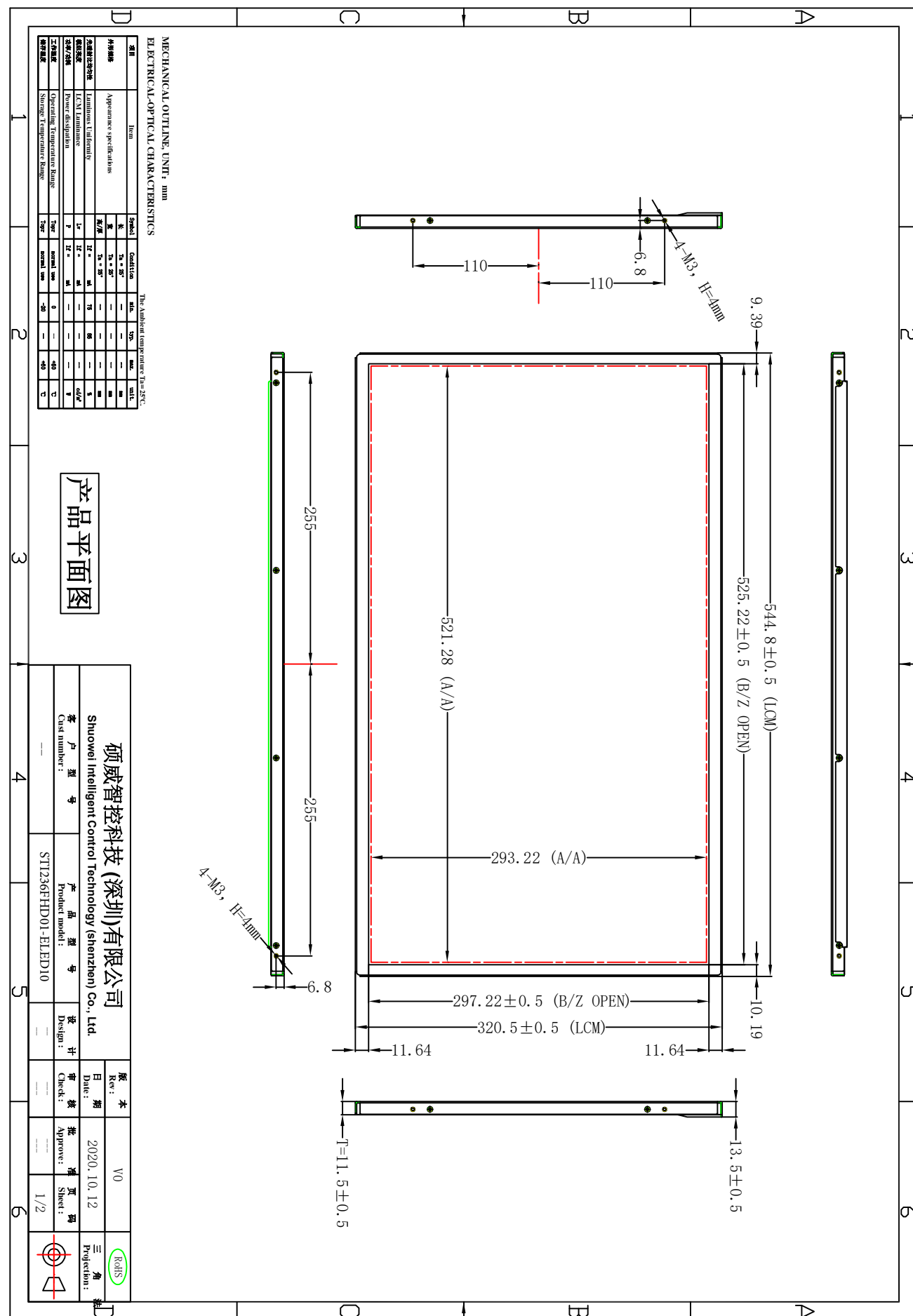
- (1) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, skin or clothes, it has to be washed away thoroughly with soap.
- (2) After the module's end of life, it is not harmful in case of normal operation and storage.

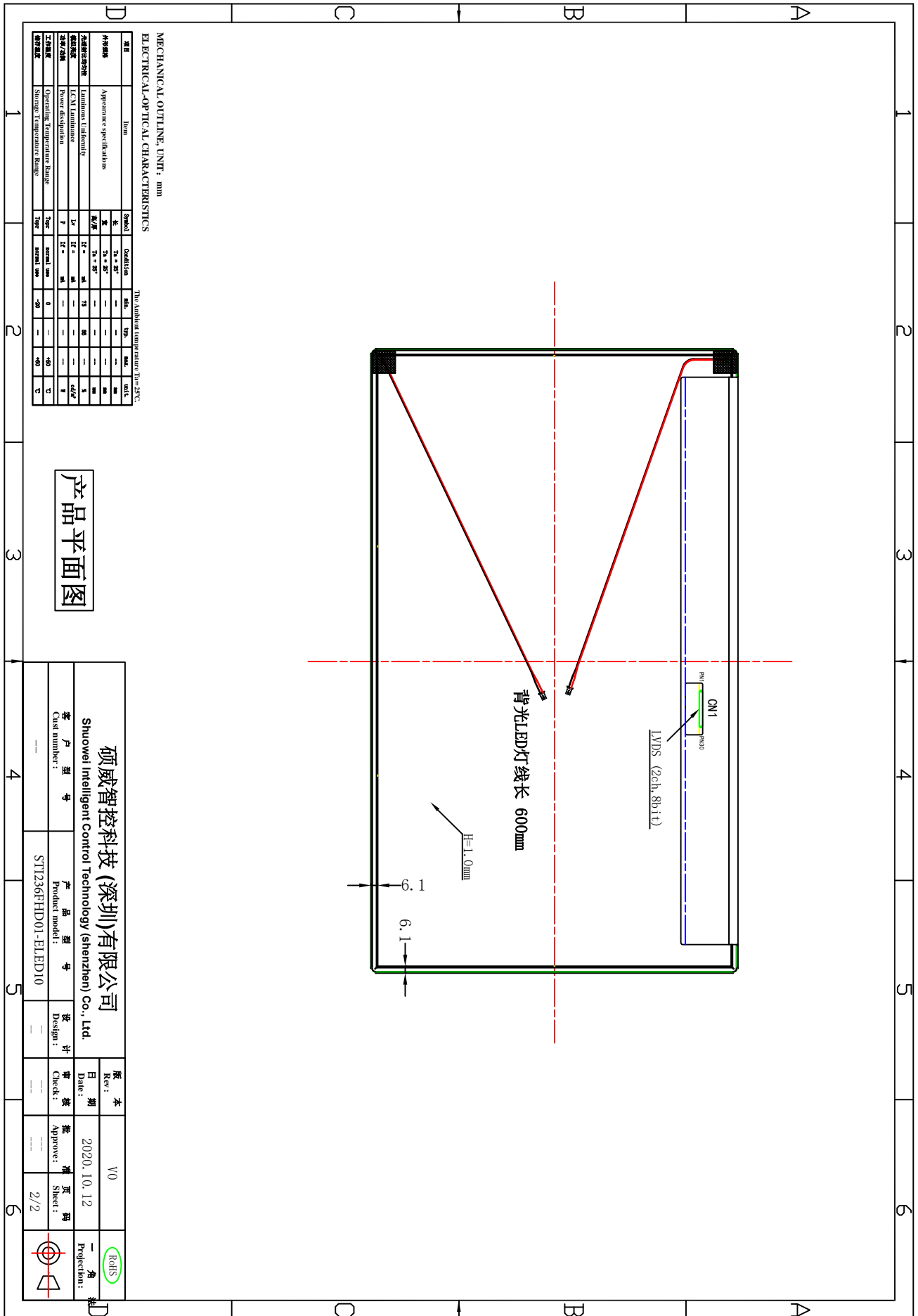
9.5 SAFETY STANDARDS

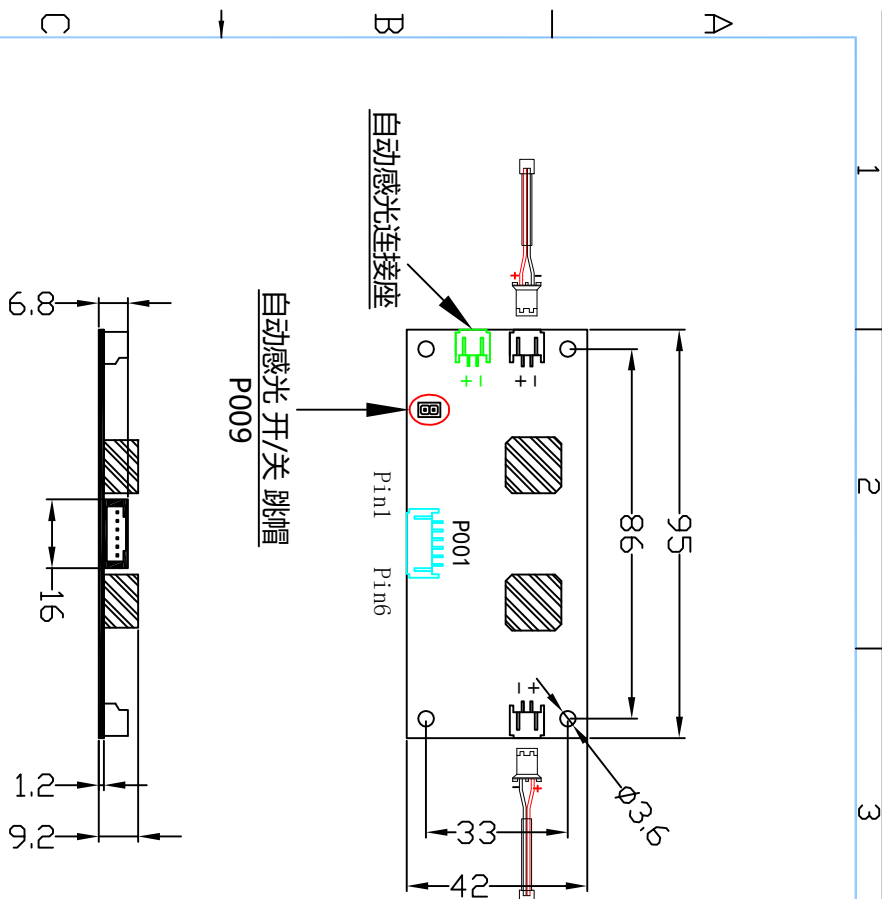
The LCD module should be certified with safety regulations as follows:

- (1) UL60950-1 or updated standard.
- (2) IEC60950-1 or updated standard.

Appendix 2. OUTLINE DRAWING







配套26号红黑线，长度：1000mm
Mechanical outline, unit:mm
Material Specification

项目	Item	尺寸/规格	公差	材料	备注
外形尺寸	Appearance specifications	长	±0.3	—	—
		宽	±0.3	—	—
		厚	±0.05	—	—
材料规格	Material specification	—	—	—	—
表面处理	Surface treatment	—	—	—	—
包装规格	Packing specification	—	—	—	—

LED恒流板+感光头 外形尺寸

物料型号/料号	LED-0202	供应商型号/料号	—	设计	—	审核	—	批准	—	日期	2020.10.26	页码	1/1	投影	三视图
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光感头外形平面图

PIN	Symbol	Description	note
1	VCC	Power supply voltage +12V	
2	VCC	Power supply voltage +12V	
3	ON/OFF	Output enable signal	
4	DIM	Dimming signal	
5	GND	Power ground	
6	GND	Power ground	