LCD MODULE SPECIFICATION

P/N: 8.0

Model Name:

Version:

Date: 2022/03/18

Material code：

For Customer's Acceptance

Approved by	Comment

DESIGN	CHECK	REVIEW

CONTENTS:

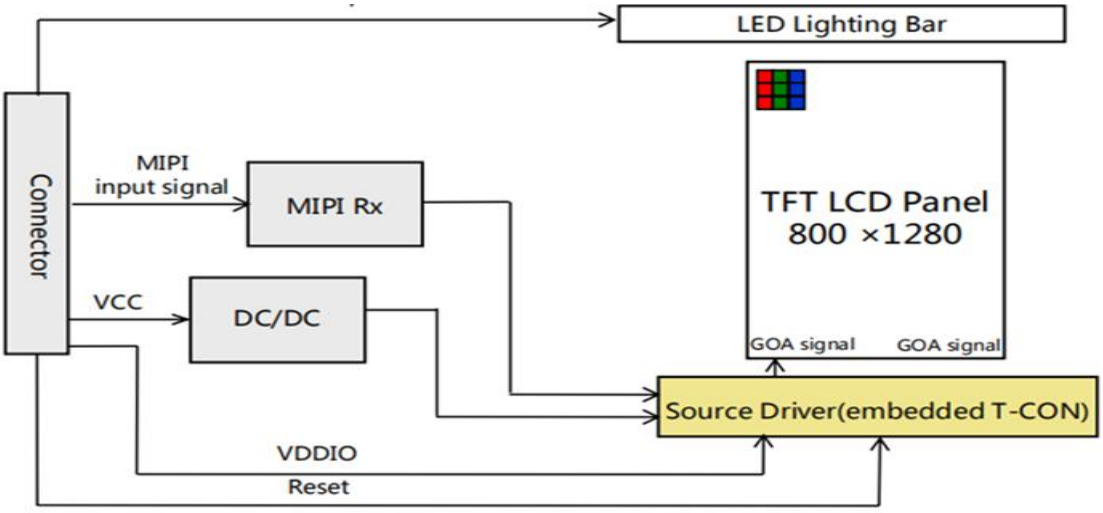
1 VERSION HISTORY

SAMPLE VERSION	DATE	DESCRIPTION	REVISED BY
A0	2022.03.18		

2 GENERAL INFORMATION

Item	Contents	Unit
LCD Size	8.0	inch
Driver element	a-Si TFT active matrix	--
Viewing direction	Normally Black	--
TP+LCM	123.46(W)*201.26(H)*3.93(T)mm	
Module size	114.6(W)*184.1(H)*2.45(T)mm	mm
Panel Active Area	107.64(W)*172.224(H)	mm
Pixel Pitch	0.13455(W)X0. 13455 (H)	mm
Number of Dots	800*RGB*1280	pixel
Colors	16.7M	--
Surface Treatment	TBD	
Interface	MIPI (4 Lane)	--
Brightness	380cd/㎡(typ)	--
NTSC	60%(typ)	--

3 BIOCK DIAGRAM



4 OPERATION SPECIFTCATIONS

4.1 ABSOLUTE MAXIMUM RATINGS

Item		Symbol	Values			Unit	Remark
			Min	Typ	Max		
Power Supply Voltage		VDD-3V3	3	3.3	3.6	V	
		IOVCC-1V8	1.7	1.8	3.6	V	
		VSP		-		V	
		VSN		-		V	
Ripple Voltage		VRP			300	MV	
LEDPWMOUT	High Level	VOH	0.8VDD	\	VDD	V	VDD=3.0-3.6V
	Low Level	VOL	0		0.2VDD	V	
Frame frequency		fFrame		60		HZ	

Input Signal Voltage	V_I	-0.3	VDD3V3	V
Backlight forward current	I_{LED}	0	25	mA(For each LED)
Operating temperature	TOP	0	50	℃
Storage temperature	TST	-20	60	℃
Humidity	RH	-	90%(Max50℃)	RH

Note :The absolute maximum rating values of this product are not allowed to be exceeded at any times.Should a module be used with any of the absolute maximum ratings exceeded,the characteristics of the module may not be recovered,or in an extreme case,the module may be permanently destroyed.

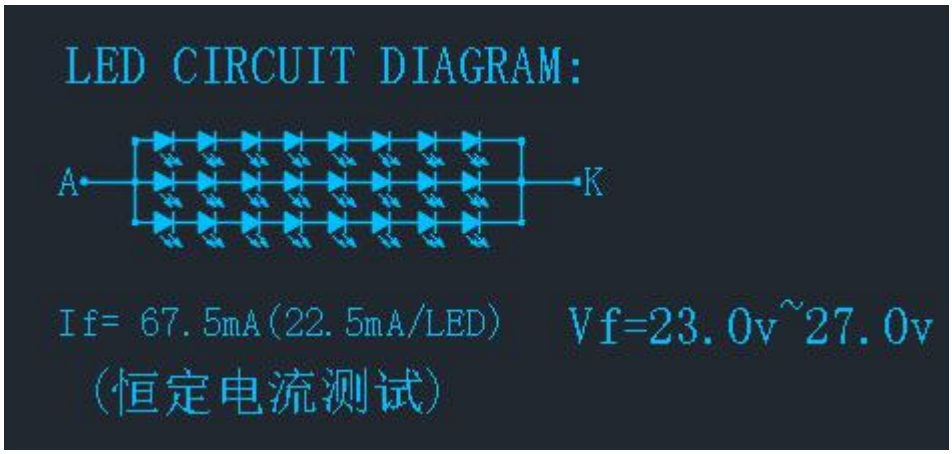
4.2 Typical Operation Conditions

Parameter	Symbol	Values			Unit
		Min	Typ	Max	
Power Voltage	VDD-3V3	3.0	3.3	3.6	V
Input Current	I_{VDD3V3}	-	70	120	mA
Power Consumption	P_{LCD}	-	-	-	W
	P_{BL}	-	-	-	W

Note :1.Frame Rate=60Hz,VDDIN=3.3V,DC Current; Operating at 25℃ at white pattern.

5 BACKLIGHT CHARACTERISTICS

Item	Symbol	Min	Typ	Max	Unit	Condition
Forward voltage	Vf	-	25.6	27	V	If=67.5mA
Luminance	LV	330	380	-	cd/㎡	
Number of LED	-	24			Piece	-
Connection mode	p	8 Series and 3 parallel			-	-



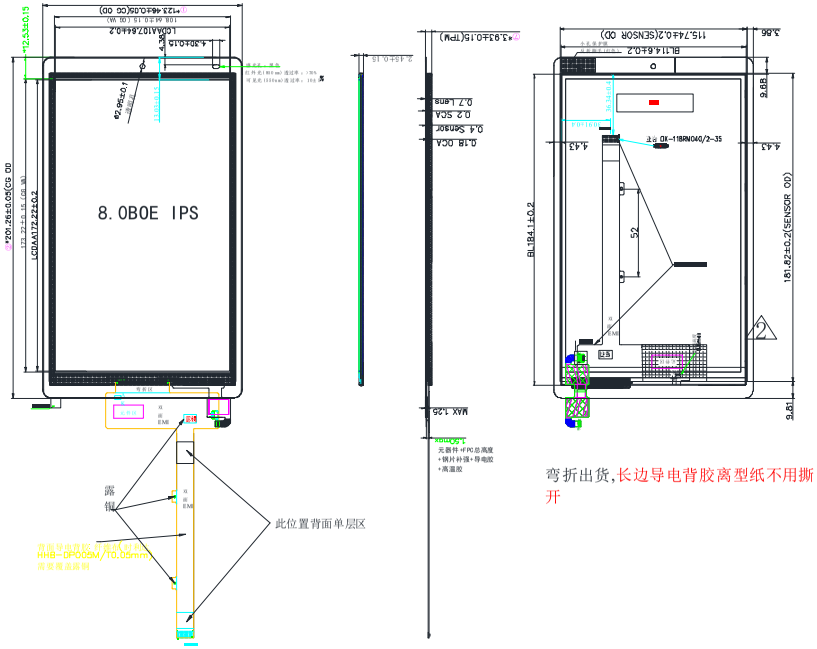
6 EXTERNAL DIMENSIONS

Approved By Customer

注：标注 △L1 请重点确认

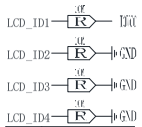
REV	DATE	REVISE APERSON	REVISED DESCRIPTIONS
A	2022-2-24	HZG	First issue

PIN DESCRIPTION



弯折出货,长边导电背胶离型纸不用撕开

NO.	SYMBOL	NO.	SYMBOL
1	TP_VDD	21	LCD_VDD_3P3
2	LCD_ID4	22	NC
3	TS_RESET_N	23	NC/VDISP_M_OUT
4	TS_INT_N	24	NC
5	LCD_ID3	25	GND
6	TS_I2C_SDA	26	MIPI_DSI0_L2_CONN_P
7	TS_I2C_SCL	27	MIPI_DSI0_L2_CONN_M
8	LCD_ID2	28	GND
9	LCD_ID1	29	MIPI_DSI0_L3_CONN_P
10	LCD_TE	30	MIPI_DSI0_L3_CONN_M
11	LCD_RESET_N	31	GND
12	GND	32	MIPI_DSI0_CLK_CONN_P
13	IOVCC_1V8	33	MIPI_DSI0_CLK_CONN_M
14	NC	34	GND
15	LCM_LEDK	35	MIPI_DSI0_L1_CONN_M
16	LCM_LEDK	36	MIPI_DSI0_L1_CONN_P
17	LCM_LEDK	37	GND
18	NC	38	MIPI_DSI0_L0_CONN_M
19	LCM_LEDA	39	MIPI_DSI0_L0_CONN_P
20	LCM_LEDA	40	GND



NO.	TP
1	TP-SCL
2	TP-SDA
3	TP-EINT
4	TP-RST
5	GND
6	TP_VDD

DISPLAY MODE	a-SI TFT LCD,16.7M
	NORMALLY BLACK
	TRANSMISSIVE
VIEWING ANGLE	IPS
DRIVE IC	
OPERATING VOLTAGE	VDDI0:1.8V
BACKLIGHT	JD9365DA
SURFACE LUMINANCE	
OPERATING TEMP.	-10° C~+50° C
STORAGE TEMP.	-20° C~+60° C
GENERAL TOLERANCE	±0.20
CRITICAL DIMENSION	*
REFERENCE DIMENSION	
CONNECTOR	
EP REQUIREMENT	ROHS
NOTE:	

LED CIRCUIT DIAGRAM:

If= 67.5mA(22.5mA/LED)
(恒定电流测试)
Vf=23.0v~27.0v

REV	TITLE	ASSEMBLY-OUTLINE		
A	FILE NAME			
SCALE	Customer NO	TTS0331-080026021AA	DO NOT SCALE THIS DRAWING, GENERAL TOLERANCE:±0.2	
1:1	PART No.		APPROVED BY	CHECKED BY / DRAWN BY
PRO. (3)	UNIT mm	PAGE 1/1		

7 Interface Signal

Pin No.	Symbol	Description
1	TP-VDD	Power SUPPLY
2	ID4	ID4
3	TP-RESET	TP Global reset signal
4	INT	I2C Interrupt Signal
5	ID3	ID3
6	SDA	I2C Data Signal
7	SCL	I2C Clock Signal
8	ID2	ID2
9	ID1	ID1
10	TE	Serves TE (Tearing Effect) pin on MPU interface
11	LCD-RESET	Global reset signal
12	GND	Ground
13	IOVCC-1V8	Power SUPPLY 1.8V
14	NC	OPEN
15	LEDK	Cathode
16	LEDK	Cathode
17	LEDK	Cathode
18	NC	OPEN
19	LEDA	Anode

20	LEDA	Anode
21	LCD-VDD-3V3	Power SUPPLY 3.3V
22	NC	OPEN
23	NC	OPEN
24	NC	OPEN
25	GND	Ground
26	D2P	MIPI Differential Data Input
27	D2N	MIPI Differential Data Input
28	GND	Ground
29	D3P	MIPI Differential Data Input
30	D3N	MIPI Differential Data Input
31	GND	Ground
32	CLKP	MIPI Differential Clock Input
33	CLKN	MIPI Differential Clock Input
34	GND	Ground
35	D1N	MIPI Differential Data Input
36	D1P	MIPI Differential Data Input
37	GND	Ground
38	D0N	MIPI Differential Data Input
39	D0P	MIPI Differential Data Input
40	GND	Ground

TP PIN		
1	SCL	I2C Clock Signal
2	SDA	I2C Data Signal
3	INT	I2C Interrupt Signal
4	RESET	Reset Signal
5	GND	Ground
6	VDD	Power Supply(2.8V)

8 SIGNAL TIMING CHARACTERISTICS

8.1 Power On/Off Sequence

2.0 ABSOLUTE MAXIMUM RATINGS

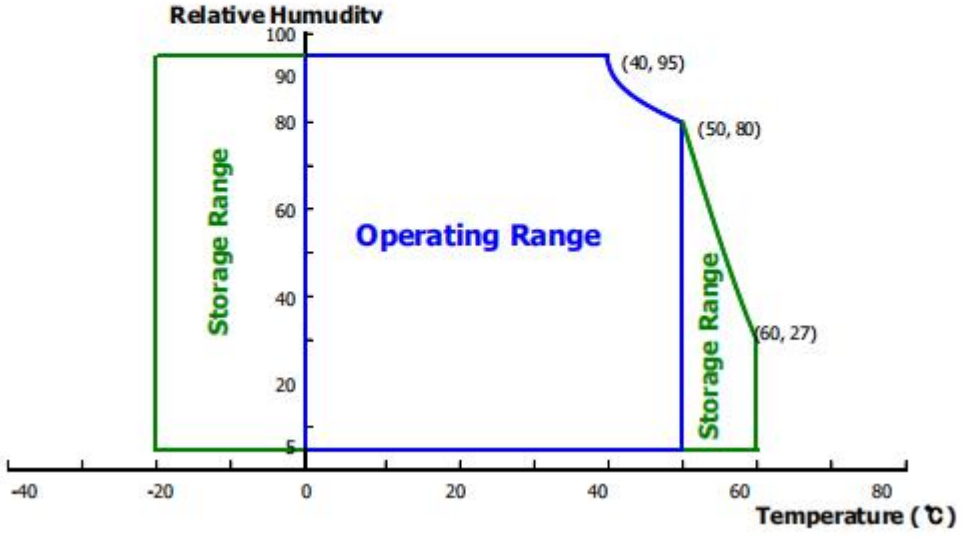
The followings are maximum values which, if exceed, may cause faulty operation or damage to the unit. The operational and non-operational maximum voltage and current values are listed in Table 2.

< Table 2. Absolute Maximum Ratings>

Parameter	Symbol	Min.	Max.	Unit	Remarks
Power Supply Voltage	VDD	-0.3	5.0	V	Note 1
Operating Temperature	TOP	-20	+60	°C	Note 2
Storage Temperature	TST	-20	+60	°C	

Notes : 1. Permanent damage to the device may occur if maximum values are exceeded functional operation should be restricted to the condition described under normal operating conditions.

2. Temperature and relative humidity range are shown in the figure below.
95 % RH Max. (40 OC ≥ Ta)
Maximum wet - bulb temperature at 39 OC or less. (Ta > 40 OC) No condensation.



8.2 Video input timing for Multi-Drop type

Parameter	Symbol	Values			Unit	Notes
		Min	Typ	Max		
Power Supply Input Voltage	VDD	3.0	3.3	3.6	Vdc	
Logic Power Supply Input Voltage	VLOG	1.7	1.8	1.9	Vdc	
Power Supply Ripple Voltage	VRP		300		mV	
Power Supply Current	IDD	-	50	126	mA	1
Power Consumption	PDD		0.20	0.45	Watt	
Logic Power Supply Current	ILOG	16	18	20	mA	
Logic Power Consumption	PLOG		33		mW	
Rush current	IRUSH	-	1		A	2

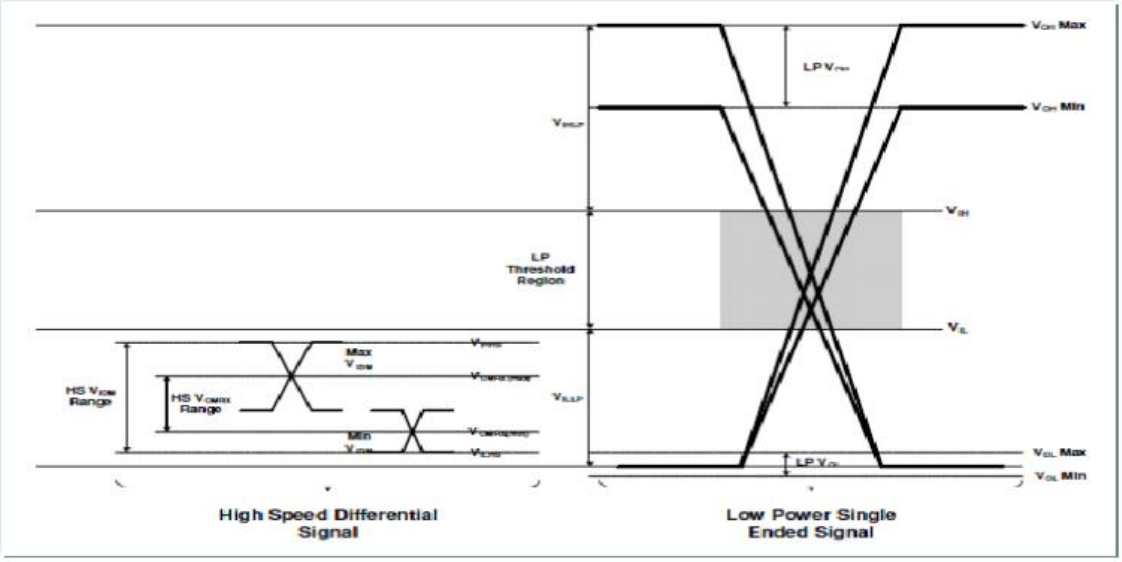
Notes : 1. The supply voltage is measured and specified at the interface connector of LCM.
The current draw and power consumption specified is for VDD=3.3V, Frame rate f_v=60Hz and Clock frequency = 68.4MHz. Test pattern of power supply current is : typ@White, max@R/G/B
2. The duration of rush current is about 2ms and rising time of Power input is 1ms(min)

8.3 MIPI Interface Characteristic

8.3.1 MIPI Input Signal SPEC

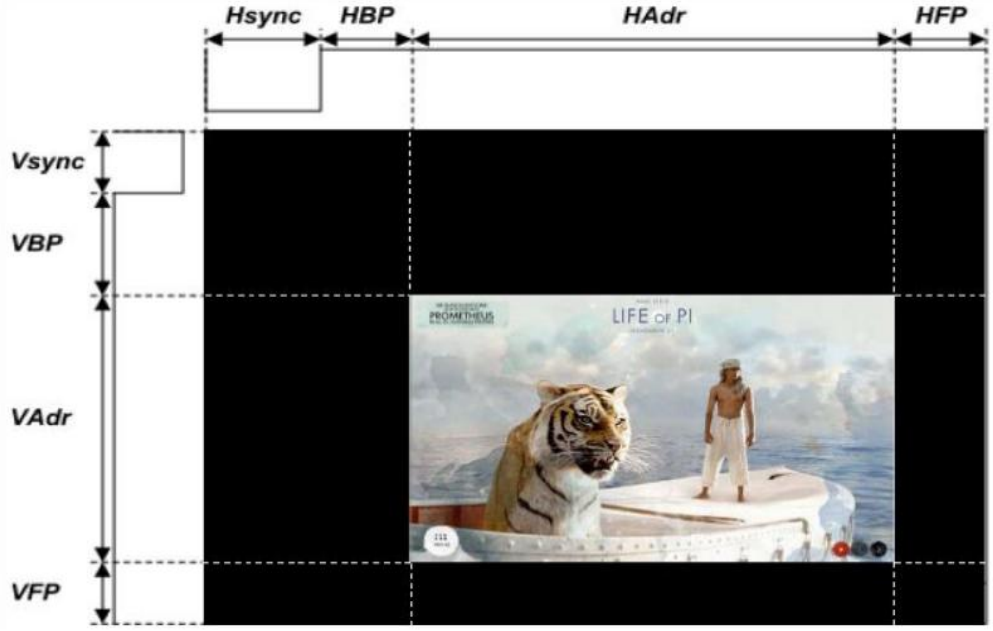
<Table 5 MIPI Input Signal Spec>

Parameter	Symbol	Min	Typ	Max	Unit	Condition
MIPI digital operation current	I_{VCCIF}	16	18	20	mA	-
MIPI digital stand-by current	$I_{VCCIFST}$	-	200	-	uA	-
MIPI Characteristics for High Speed Receiver						
Single-ended input low voltage	V_{ILHS}	-40	-	-		
Single-ended input high voltage	V_{IHHS}	-	-	460	mV	
Common-mode voltage	V_{CMRXDC}	155	-	330	mV	
Differential input impedance	Z_{ID}	80	100	125	Ω	
HS transmit differential voltage($V_{OD}=V_{DP}-V_{DN}$)	$\|V_{OD}\|$	140	200	250	mV	
MIPI Characteristics for Low Power Receiver						
Pad signal voltage range	V_I	-50	-	1350	mV	
Ground shift	V_{GNDSH}	-50	-	50	mV	
Output low level	V_{OL}	-50	-	50	mV	
Output high level	V_{OH}	1.1	1.2	1.3	V	



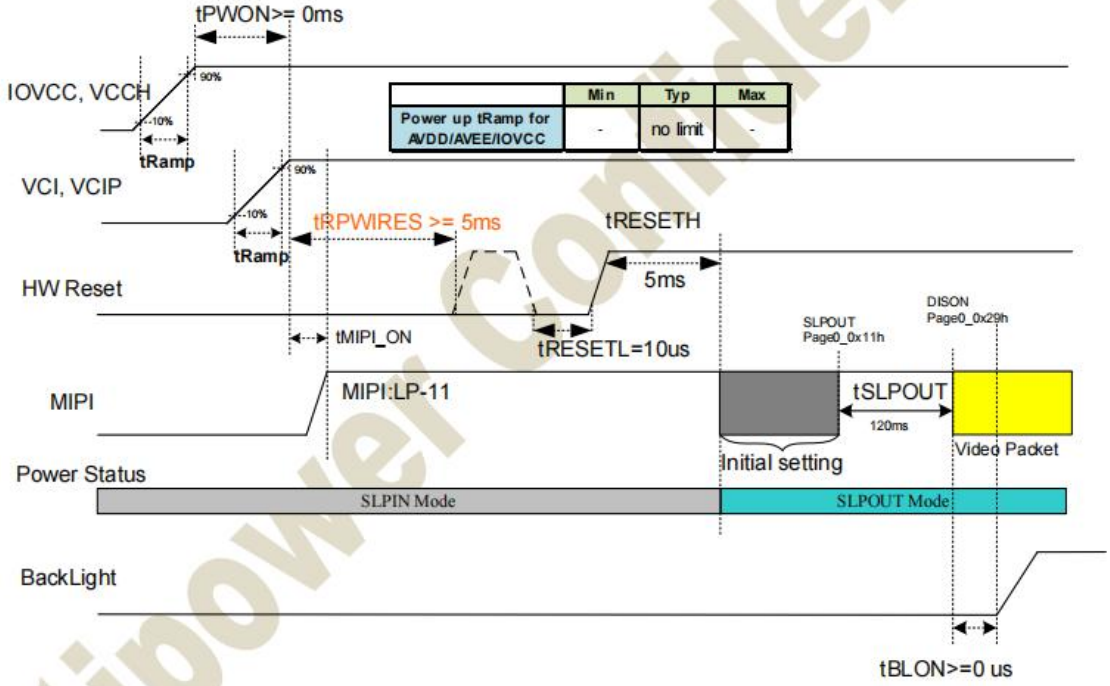
Signal Timing Spec

Item	Symbol	Min	Typ	Max	Unit
Pixel CLK	Tpixclk	-	68	-	MHZ
MIPI CLK	Frequency	-	-	-	MHZ
Horizonntal Active Display Term	Hadr	-	800	-	tpclk
	HBP	-	20	-	tpclk
	HFP	-	40	-	tpclk
	HS	-	20	-	tpclk
Vertical Active Display Term	Vadr	-	1280	-	Line
	VBP	-	12	-	Line
	VFP	-	30	--	Line
	VS	-	4	-	Line



8.3.2 Power Squence

BOOSTM[1:0]=10 / 11 (Internal DC/DC power mode : PFM, Charge Pump, JD5001)
VCCD=IOVCC=VCCH=1.65V ~ 3.6V, VCI=VCIP=2.5V ~ 4.8V.
Power on:

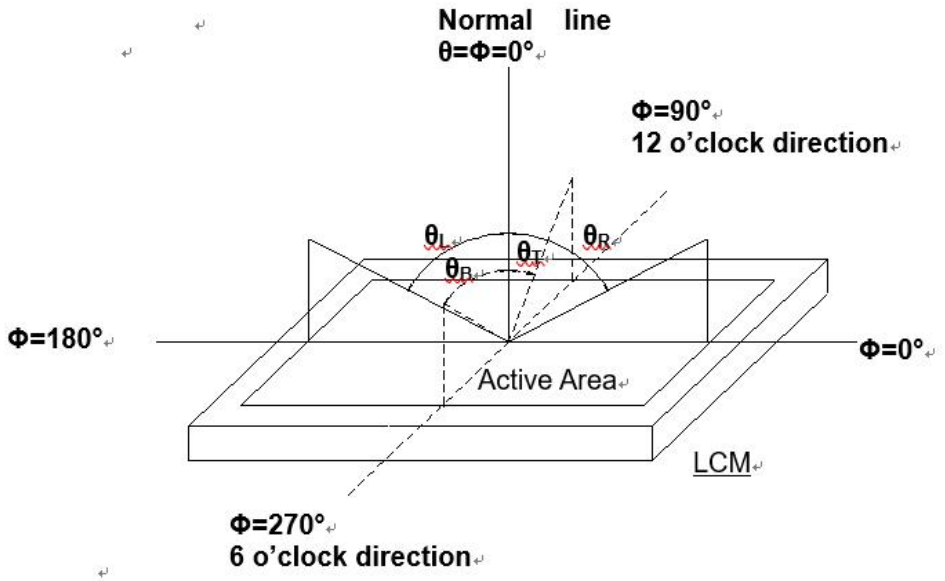


Symbol	Min	Typ	Max	Unit	Remark
tRamp	-	no limit	-	us	
tPWON	0	-	-	ms	
tON1	0	-	-	ms	
tMIPI-ON	0	-	tRPWIRES	ms	
tRPWIRES	5	-	-	ms	
tRESETL	10	-	-	us	
tRESETH	5	-	-	ms	
tSLPOUT	120	-	-	ms	
tBLON	0	-	-	ms	

9 ELECTRO-OPTICAL CHARACTERISTICS

Item		Symbol	Condition	Min	Typ	Max	Unit	Remark
Response time		Tr+Tf	θ=0° Ta=25℃	-	30	35	ms	Note 2 Note 3
Contrast ratio		Cr		900	1200	-	-	Note 2 Note 4
Luminance uniformity		δ WHITE		75	-	-	%	Note 2 Note 6
Surface Luminance		LV		330	380	--	cd/㎡	Note 2
Color temperature		Tcp		-	TBD	-	K	
Viewing angle range		θ	=90°	80	85	-	deg	Note1
			=270°	80	85	-	deg	
			=0°	80	85	-	deg	
			=180°	80	85	-	deg	
CIE(x,y) chromaticity	Red	x	θ=0° Ta=25℃		TBD			Note 2 Note 5
		y			TBD			
	Green	x			TBD			
		y			TBD			
	Blue	x			TBD			
		y			TBD			
	White	x		0.26	-	0.36		
		y		0.26	-	0.36		

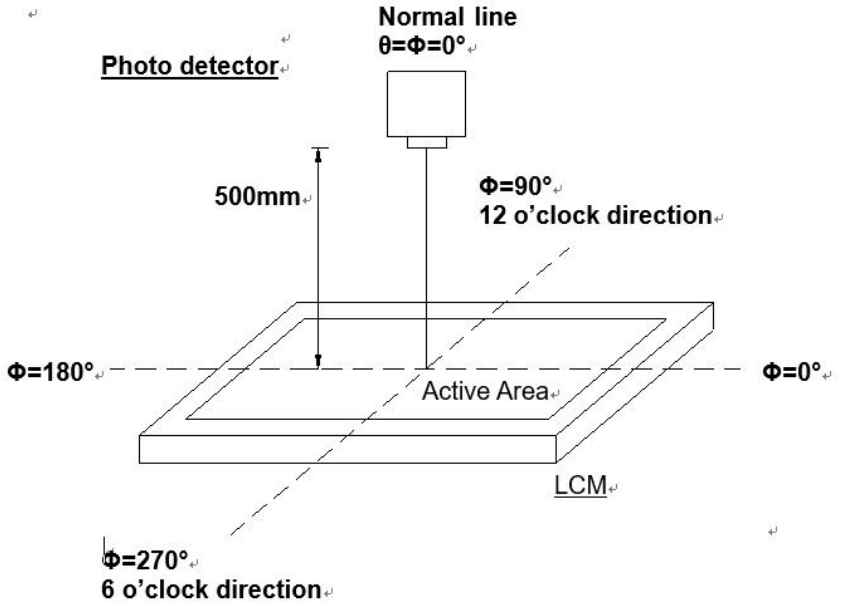
Note 1: Definition of viewing angle range
Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing angles are determined for the horizontal or 3, 9 o'clock direction and the vertical or 6, 12 o'clock direction with respect to the optical axis which is normal to the LCD surface



Definition of viewing angle

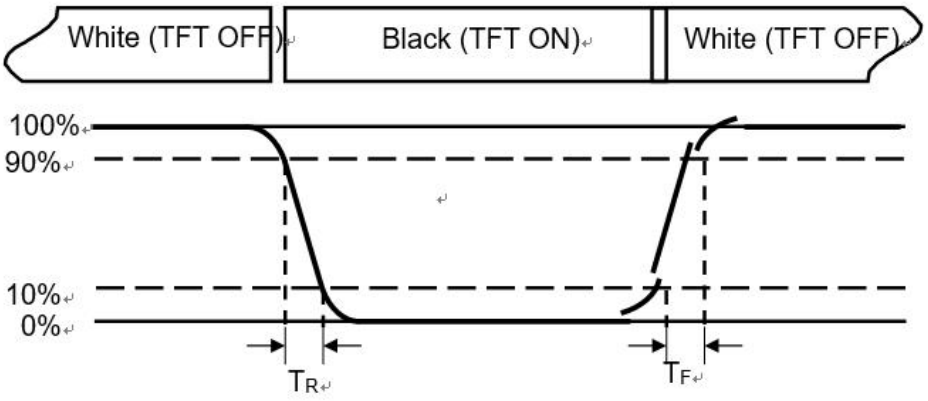
Note 2: Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 30 minutes operation, the optical properties are measured at the center point of the LCD screen. (Viewing angle is measured by ELDIM-EZ contrast/Height :1.2mm ,Response time is measured by Photo detector TOPCON BM-7, other items are measured by BM-5A/ Field of view: 1° /Height: 500mm.)



Note 3: 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_R) is the time between photo detector output intensity changed from 90% to 10%. And fall time (T_F) is the time between photo detector output intensity changed from 10% to 90%.



Definition of response time

Note 4: Definition of contrast ratio

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

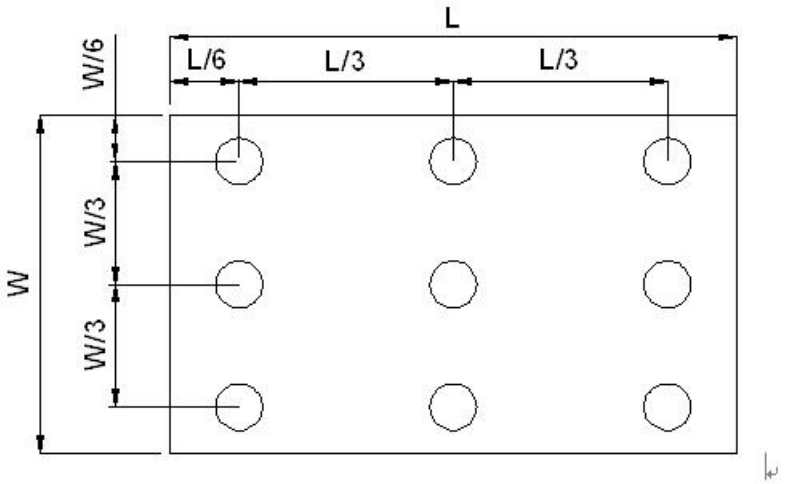
Note 5: Definition of color chromaticity (CIE1931)

Color coordinates measured at center point of LCD.

Note 6: Definition of Luminance Uniformity (“White” state)

Active area is divided into 9 measuring areas.Every measuring point is placed at the center of each measuring area.

$$\textit{Luminance Uniformity (Yu)} = \frac{B_{min}}{B_{max}}$$



Definition of measuring points

B_{max}: The measured maximum luminance of all measurement position.

B_{min}: The measured minimum luminance of all measurement position.

10 RELIABILITY TEST

Reliability test conditions (Polarizer characteristics null)

No.	Test Items	Test Condition	Remarks
1	High Temperature Storage	T = 60℃ for 96hr	Module (Without Contamination)
2	Low Temperature Storage	T = -20℃ for 96hr	
3	High Temperature Operating	T = 50℃ for 96hr	
4	Low Temperature Operating	T = 0℃ for 96hr (But no condensation of dew)	
5	High Temp. and High Humidity Operating	T = 50℃ /90% for 96hr (But no condensation dew)	
6	Thermal Shock	-10±2°C~25~60±2°C×10cycles (30min.) (5min.) (30min.)	
7	Packing Shock	1corner, 3edge, 6face / 76cmDrop	Packing
8	Packing Vibration	Random 1.06Grms XYZ 30min for each direction	
9	Electrostatic Discharge	Contact: ±4KV Air: ±8KV 150PF/330Ω,5Points/panel,5times	Class B.Note1

※ 1) No.1~ No.6 : No guarantee for panel, only for module with the above test conditions.
※2) No.7~ No.8 : Refer to 7-1) Packing Ass'y on page 14.

Note1

Class	Performance
A	All functions perform as designed during and after exposure to interference
B	Temporary degradation or less of performance which is self-recoverable
C	Degradation or less of performance which requires operator intervention or system reset to recover
D	Degradation or less of function which is not recoverable

Result Evaluation Criteria
TFT- LCD Panel should be at room temperature for 2 hours when the display quality test is over. There should be no particular change which might affect the practical display function and the display quality test should be conducted under normal operating condition.