FANNAL ELECTRONICS

FN1180W001A

Product Specification Rev.V0

BUYER	
SUPPLIER	FANNAL Electronics CO., LTD
FG-Code	FN1180W001A

☐ Preliminary Specification
■ Approval Specification

ITEM	BUYER SIGNATURE	DATE
Quality		
R&D		
Approved		

ITEM	SUPPLIER SIGNATURE	DATE
Prepared	DONG	2023-03-22
Reviewed	XIONG	2023-03-22
Approved	JACK	2023-03-22

REVISION HISTORY

REV.	Page.	DESCRIPTION OF CHANGES	DATE	PREPARED
V0		Initial Release	2023-03-22	JACK

Contents

1.0 General Description /一般说明

1.1 Application /应用

☐ Industrial ■ Automotive ☐ Medical

■ Outdoor highlight ☐ Smart Home

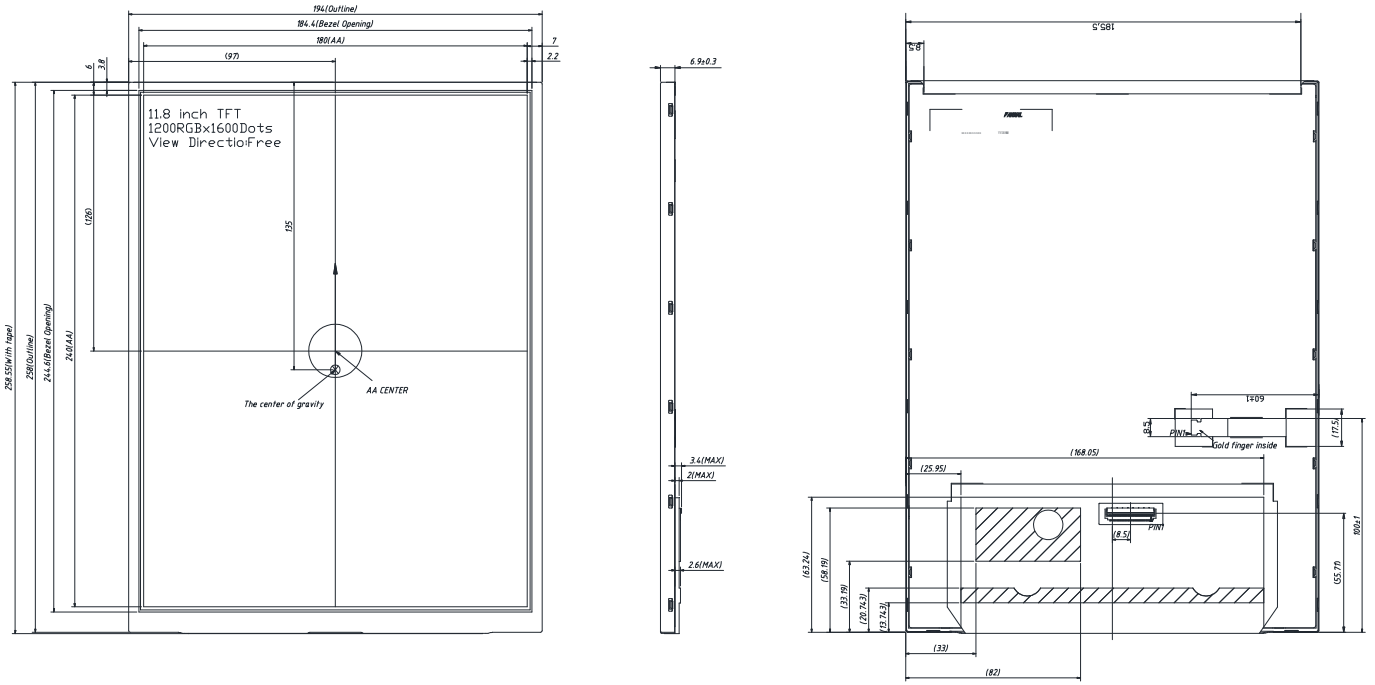
1.2 General Specification /通用技术条件

Parameter	Specification	Unit
LCD size	11.8 (Diagonal)	inch
Resolution Ratio	1200(H)×1600(V)	pixels
Pixel Pitch	0.150x0.150(V)	mm
Active Area	180.0(H)×240.0(V)	mm
Module Size	194.0(W)×258.55(H)×10.6(D)	mm
Display Mode	Normally Black	
Interface	LVDS	
Pixel arrangement	RGB-Vertical Stripe	
View Direction	ALL	
Power Supply	3.3	V
Power Consumption	9.8(Max) @White pattern, FV=60Hz	W
Weight	560	g
Luminance	750 (TYP.)	cd/m²
Driver IC	/	

2.0 Mechanical Drawing /机械制图

TECHNOLOGY CHARACTERISTICS LCM	
SIZE	11.8 inch
Resolution ratio	1200x1600
Display mode	Tranflective Normally Black
Display direction	□ 6 □ 12 □ 3 □ 9 ■ Free
Contrast ratio	1000:1
Luminance	750TYP 650MIN
Uniformity	75% MIN
Interface	LVDS
Power supply	■ 3.3 □ 5.0
Operation temperature	-30~+85
Storage temperature	-40~+95
Driver IC	/
Connection mode	□FPC Plug-in □FPC Welded ■Connector
Environmental requirements	■RoHS-2.0 □REACH
Unmarked tolerance	±0.2mm

TOP VIEW SIDE VIEW BOTTOM VIEW



PIN FUNCTION	
PIN	SYMBOL
1	GND
2	GND
3	RxOIN0-
4	RxOIN0+
5	GND
6	RxOIN1-
7	RxOIN1+
8	GND
9	RxOIN2-
10	RxOIN2+
11	GND
12	RxOCLK-
13	RxOCLK+
14	GND
15	RxOIN3-
16	RxOIN3+
17	GND
18	RxEIN0-
19	RxEIN0+
20	GND
21	RxEIN1-
22	RxEIN1+
23	GND
24	RxEIN2-
25	RxEIN2+
26	GND
27	RxECLK-
28	RxECLK+
29	GND
30	RxEIN3-
31	RxEIN3+
32	GND
33	STVD
34	RESET
35	VDD
36	VDD
37	VDD
38	VDD
39	GND
40	GND

Backlight	
PIN	SYMBOL
1	THERMISTORS
2	NC
3	THERMISTORS
4	CATHODE 4
5	CATHODE 3
6	CATHODE 2
7	CATHODE 1
8	NC
9	ANODE 1
10	ANODE 1

VER.	SYMBOL	AMENDMENT	SIGN	DATE
A		First issue	JACK	2023-3-22

DRAWN	JACK
CHECKED	JACK
APPROVED	JACK
CSR APPROVED	
Customer No:	
SHEET 1 OF 1	

TITLE

MODULE SPEC.

Drawing NO: FN1180W001A

Project No: /

FANNAL ELECTRONICS CO., LTD

3.0 ABSOLUTE MAXIMUM RATINGS /绝对最大额定值

The followings are maximum values which, if exceed, may cause faulty operation or damage to the unit.

Parameter	Symbol	Min.	Max.	Unit
Logic Supply Voltage	V_{DD}	-0.3	4.0	V
Logic Input Signal Voltage	V_{signal}	-0.3	1.9	V
Operating Temperature	T_{OP}	-30	85	℃
Storage Temperature	T_{ST}	-40	95	℃
Operating Ambient Humidity	H_{OP}	10	60℃ 90%RH	RH
Storage Humidity	H_{ST}	10	60℃ 90%RH	RH

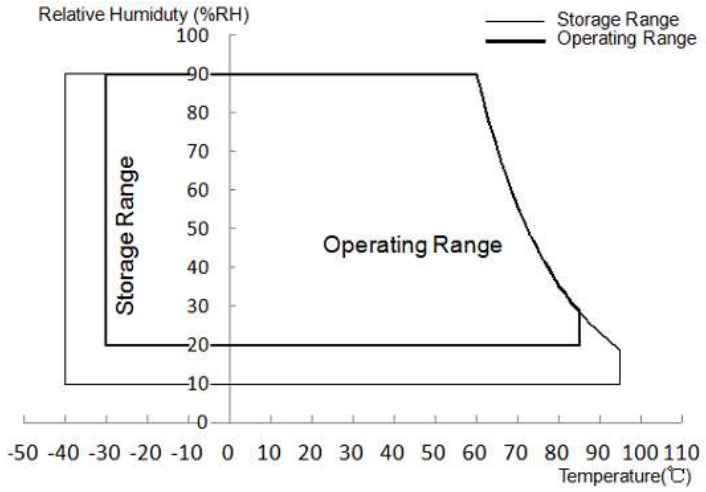
Note (1) All the parameters specified in the table are absolute maximum rating values that may cause faulty operation or unrecoverable damage, if exceeded. It is recommended to follow the t ypical value.

Note (2) All the contents of electro-optical specifications and display fineness are guaranteed un der Normal Conditions. All the display fineness should be inspected under normal conditions. N ormal conditions are defined as follow: Temperature: 25℃, Humidity: 55± 10%RH.

Note (3) Unpredictable results may occur when it was used in extreme conditions. Ta= Ambient Temperature, Tgs= Glass Surface Temperature. All the display fineness should be inspected un der normal conditions.

Note (4) Temperature and relative humidity range are shown in the figure below. Wet bulb temp erature should be lower than 57.8℃, and no condensation of water. Besides, protect the modul e from static electricity.

Absolute Ratings of Environment of the LCD Module



4.0 ELECTRICAL SPECIFICATIONS/电气规范

4.1 TFT LCM Module

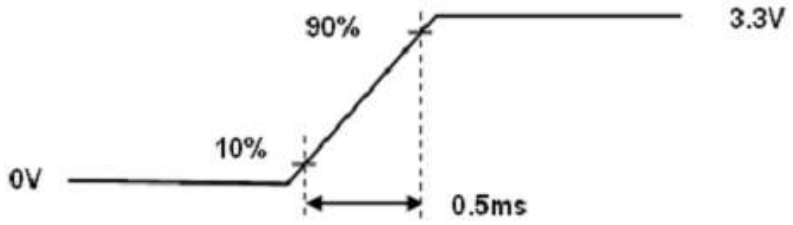
Parameter		Symbol	Min.	Typ.	Max.	Unit	Note
System Power Supply							
LCD Drive Voltage (Logic)		V_{DD}	3	3.3	3.6	V	(1),(2)
VDD Current	White Pattern	I_{DD}	-	-	0.17	A	(1),(4)
VDD Power Consumption	White Pattern	P_{DD}	-	-	0.56	W	
STVD	VIH	V_{STVD}	VDD-0.4	-	VDD	V	(1)
	VIL		GND	-	GND+0.4	V	
RESET	VIH	V_{RST}	0.7VDD	-	VDD	V	(1)
	VIL		GND	-	0.3VDD	V	
Rush Current		I_{Rush}	-	-	2	A	(1),(5)
Allowable Logic/LCD Drive Ripple Voltage		V_{VDD-RP}	-	-	200	mV	(1),(3)
LED Power Supply							
LED Input Voltage		V_{LED}	-	-	28	V	(1),(2),(10)
LED Power Consumption		P_{LED}	-	-	9.24	W	(1),(6),(10)
LED Forward Voltage		V_F	2.6	-	3.5	V	(1),(2),(11)
LED Forward Current	@25℃	I_{F1}	-	82.5	-	mA	
	@85℃	I_{F2}	-	27.5	-	mA	(2),(11)
LED Life Time		LT	30,000	-	-	Hours	(1),(9)

Note (1) All of the specifications are guaranteed under normal conditions. Normal conditions ar e defined as follow: Temperature: 25℃, Humidity: 55± 10%RH.

Note (2) All of the absolute maximum ratings specified in the table, if exceeded, may cause fau lty operation or unrecoverable damage. It is recommended to follow the typical value.

Note (3) The specified VDD current and power consumption are measured under the VDD = 3. 3 V, FV= 60 Hz condition and White pattern.

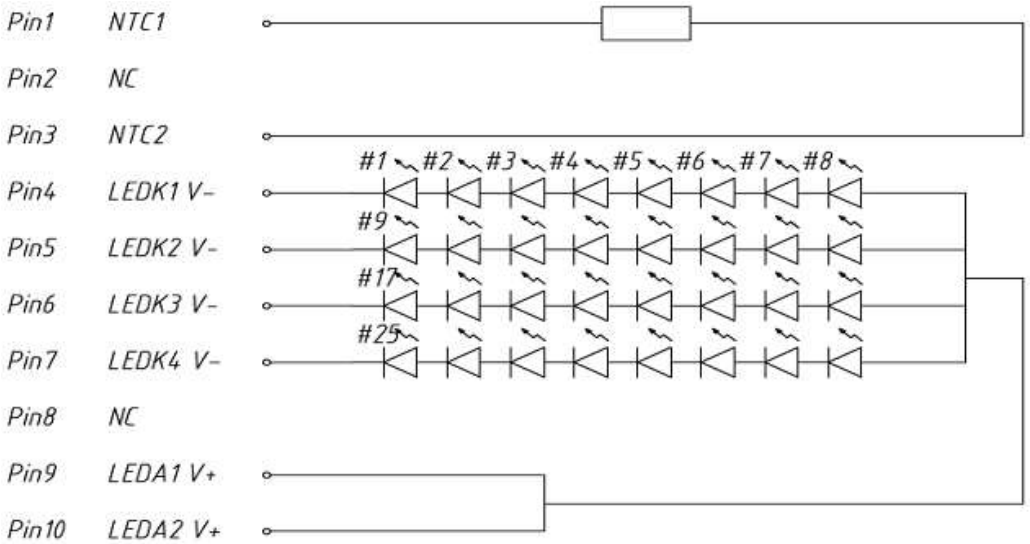
Note (4) The figures below is the measuring condition of VDD. Rush current can be measured when TRUSH is 0.5 ms.



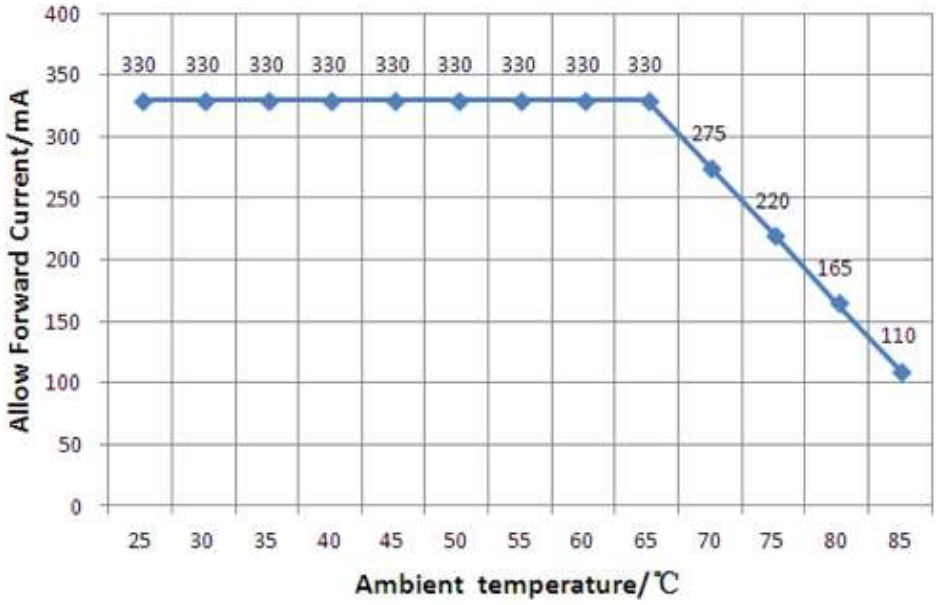
Note (9) The life time is determined as the sum of the lighting time till the luminance of LCD at t he typical LED current reducing to 50% of the minimum value under normal operating condition.

Note (10) Definition of VLED and PLED

VLED =VF×8, ILED =IF×4, PLED = VLED×ILED



Note (11) Backlight operation must be follow diagram of Ambient temperature and Allowed forw ard current.



Note (12) NTC Thermistor Specification (Type:NCP18XH103F03RC)

Temperature/℃	Resistance/Kohm	Temperature/℃	Resistance/Kohm
-40	195.652	45	4.917
-35	148.171	50	4.161
-30	113.347	55	3.535
-25	87.559	60	3.014
-20	68.237	65	2.586
-15	53.65	70	2.228
-10	42.506	75	1.925
-5	33.892	80	1.669
0	27.219	85	1.452
5	22.021	90	1.268
10	17.926	95	1.11
15	14.674	100	0.974
20	12.081	105	0.858
25	10	110	0.758
30	8.315	115	0.672
35	6.948	120	0.596
40	5.834	125	0.531

5.0 Interface Description/接口说明

5.1 Pin assignment for LCM module /模组引脚分配

Connector Name/Designation	Interface Connector/Interface Card
Type Part Number	FH41-40S-0.5SH(05)
Mating Housing Part Number	FFC 0.5PITCH 40PIN

Pin No.	Symbol	Description	Note.
1-2	GND	Power Ground	
3	RxOIN0-	Negative LVDS differential data input (Odd data)	
4	RxOIN0+	Positive LVDS differential data input (Odd data)	
5	GND	Power Ground	
6	RxOIN1-	Negative LVDS differential data input (Odd data)	
7	RxOIN1+	Positive LVDS differential data input (Odd data)	
8	GND	Power Ground	
9	RxOIN2-	Negative LVDS differential data input (Odd data)	
10	RxOIN2+	Positive LVDS differential data input (Odd data)	
11	GND	Power Ground	
12	RxOCLK-	Negative LVDS differential data input (Odd clock)	
13	RxOCLK+	Positive LVDS differential data input (Odd clock)	
14	GND	Power Ground	
15	RxOIN3-	Negative LVDS differential data input (Odd data)	
16	RxOIN3+	Positive LVDS differential data input (Odd data)	
17	GND	Power Ground	
18	RxEIN0-	Negative LVDS differential data input (Even data)	
19	RxEIN0+	Positive LVDS differential data input (Even data)	
20	GND	Power Ground	
21	RxEIN1-	Negative LVDS differential data input (Even data)	
22	RxEIN1+	Positive LVDS differential data input (Even data)	
23	GND	Power Ground	
24	RxEIN2-	Negative LVDS differential data input (Even data)	
25	RxEIN2+	Positive LVDS differential data input (Even data)	

Pin No.	Symbol	Description	Note.
26	GND	Power Ground	
27	RxECLK-	Negative LVDS differential data input (Even clock)	
28	RxECLK+	Positive LVDS differential data input (Even clock)	
29	GND	Power Ground	
30	RxEIN3-	Negative LVDS differential data input (Even data)	
31	RxEIN3+	Positive LVDS differential data input (Even data)	
32	GND	Power Ground	
33	STVD	Feedback signal	
34	RESET	Global reset pin	
35-38	VDD	Power input	
39-40	GND	Power Ground	

5.2 Pin assignment for Backlight

Connector Name/Designation	Interface Connector/Interface Card
Type Part Number	FPC 0.5PITCH 10PIN
Mating Housing Part Number	FH52-10S-0.5SH(05)

Pin No.	Symbol	Description	Note.
1	THERMISTORS	Thermistor	
2	NC	No Use	
3	THERMISTORS	Thermistor	
4	CATHODE 4	LED Cathode (Negative)	
5	CATHODE 3	LED Cathode (Negative)	
6	CATHODE 2	LED Cathode (Negative)	
7	CATHODE 1	LED Cathode (Negative)	
8	NC	No Use	
9-10	ANODE 1	LED Power Supply Voltage	

5.3 Signal Electrical Characteristics

5.3.1 Signal Electrical Characteristics For LVDS Receiver

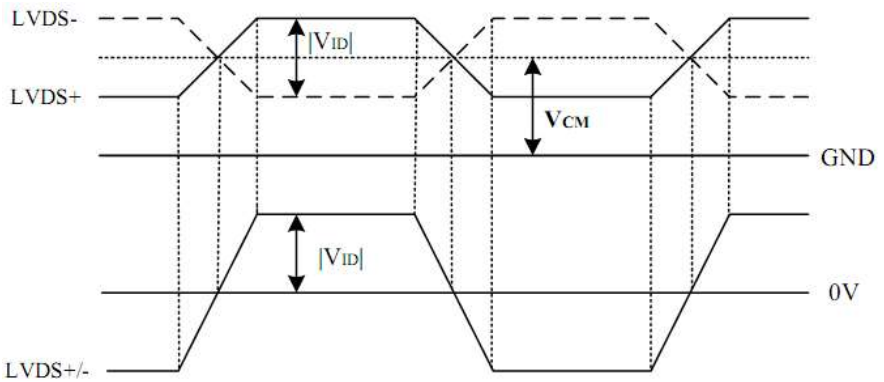
The built-in LVDS receiver is compatible with (ANSI/TIA/TIA-644) standard.

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Differential Input High Threshold	Vth		-	+150	mV	V_{CM}=+1.2V
Differential Input Low Threshold	Vtl	--150	-		mV	V_{CM}=+1.2V
Magnitude Differential Input	$\|V_{ID}\|$	150	-	600	mV	-
Strobe Width	TSW	0.4	-	-	UI	FLVCLK≤65MHz
Common Mode Voltage	V_{CM}	1.0	1.2	1.7-|VID|/2	V	-
Common Mode Voltage Offset	ΔV_{CM}	-	-	50	mV	V_{CM}=+1.2V

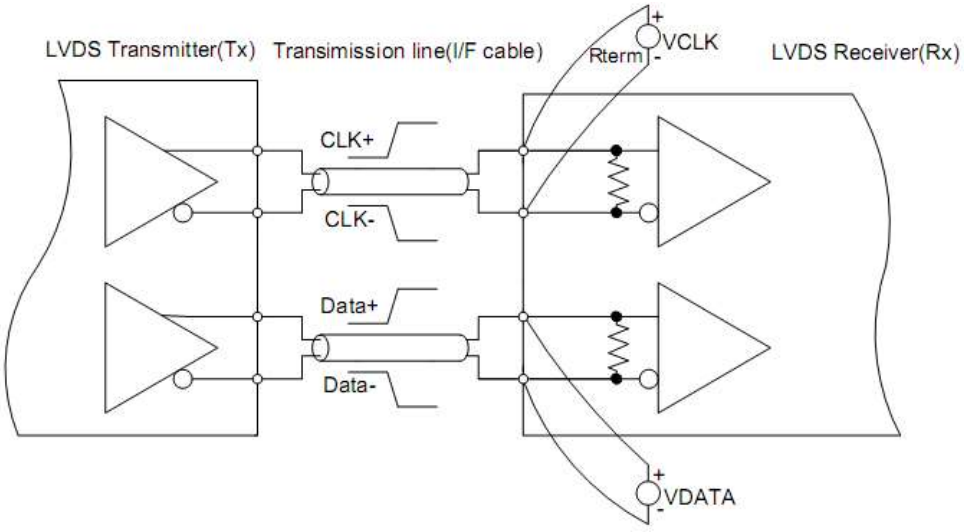
Note (1) Input signals shall be low or Hi- resistance state when VDD is off.

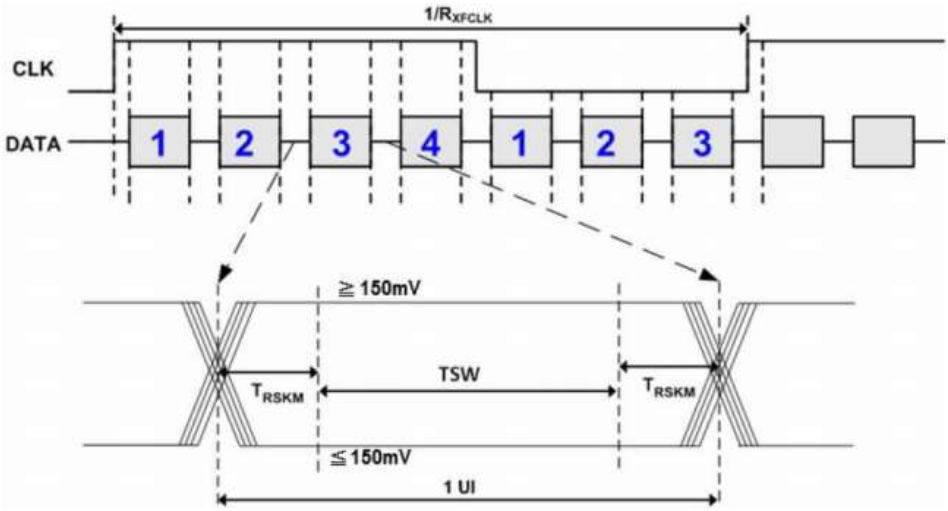
Note (2) All electrical characteristics for LVDS signal are defined and shall be measured at the LVDS terminal resistor of LCD.

Voltage Definitions

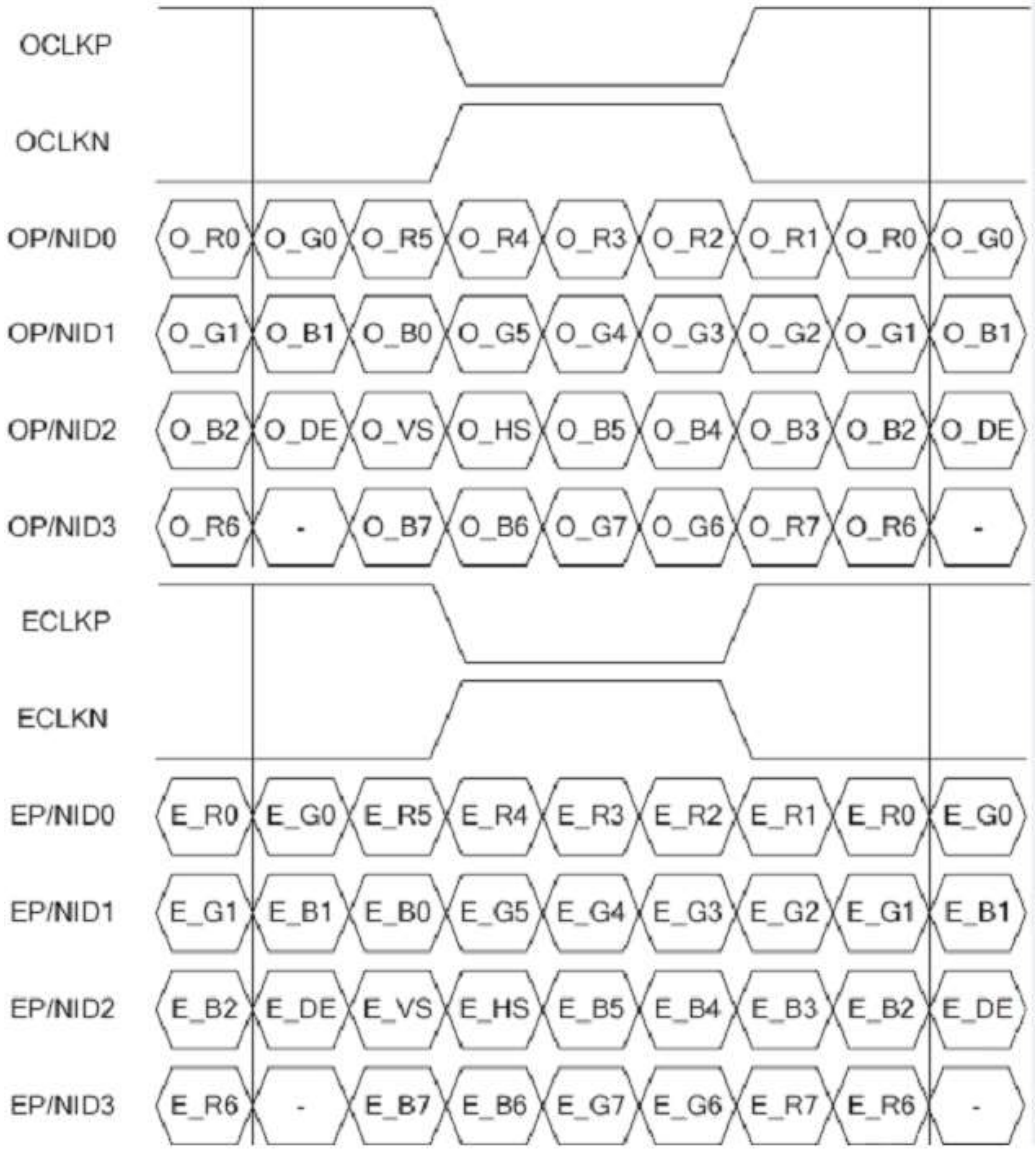


Measurement System



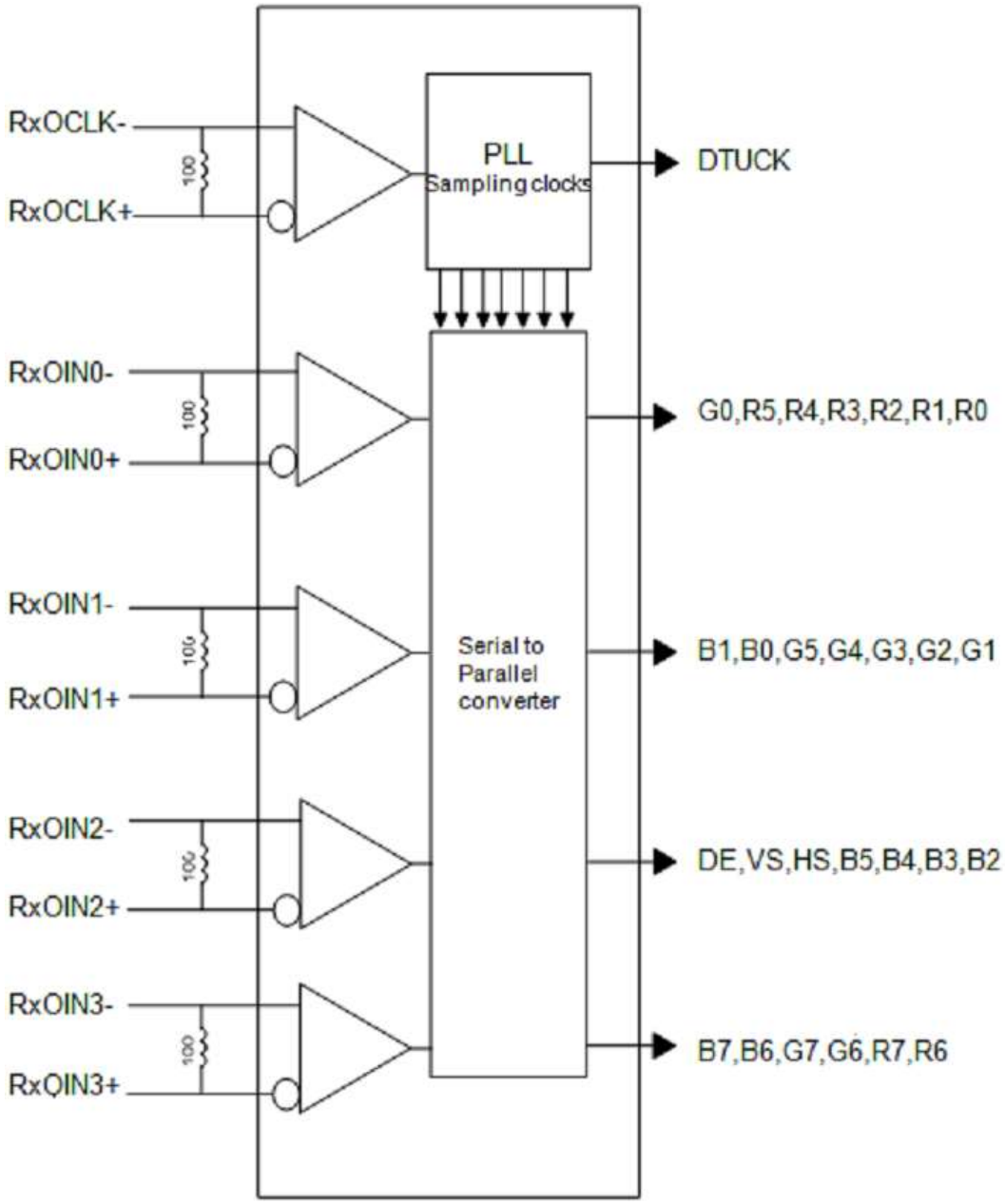


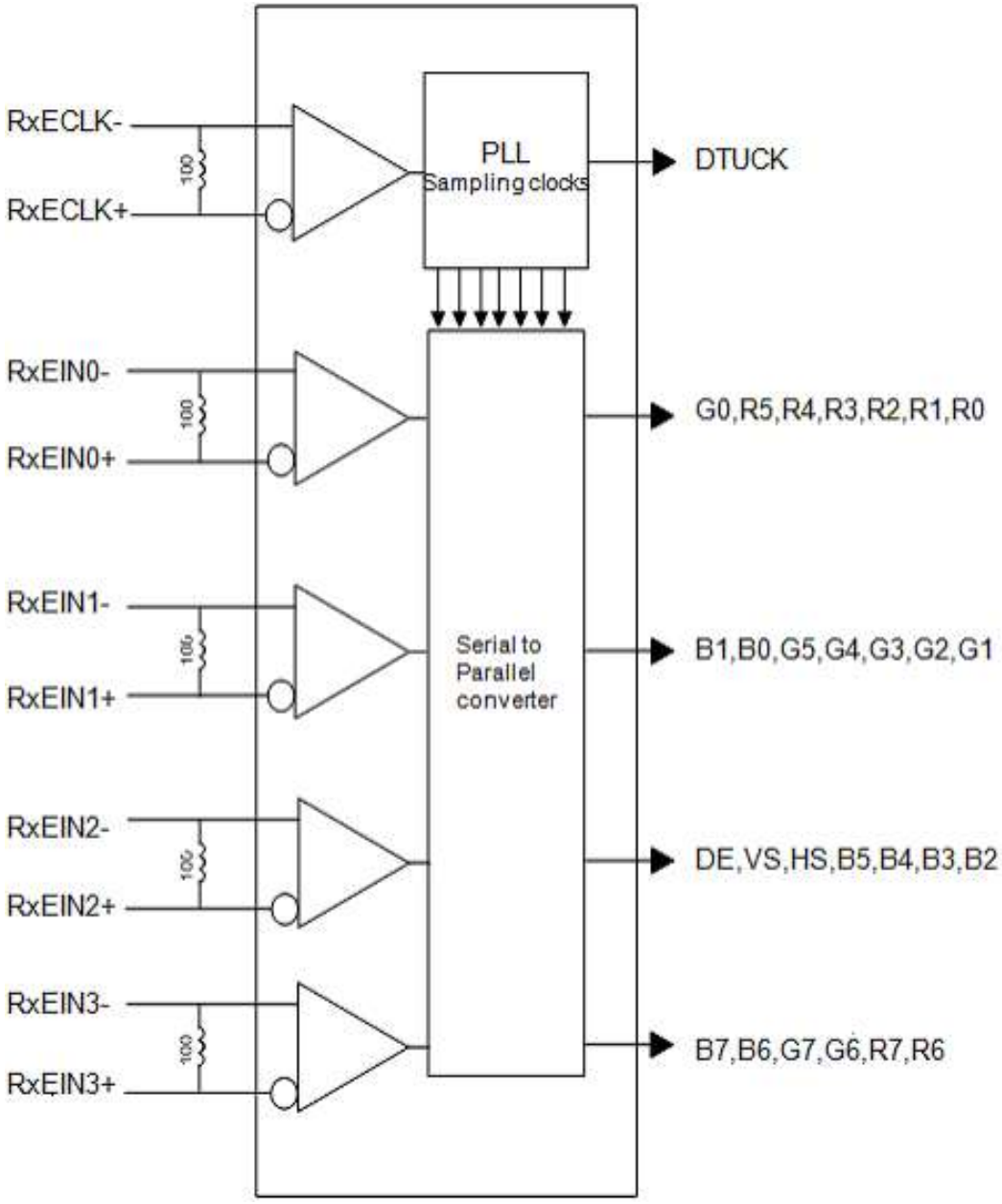
Data Mapping Single 8 bit LVDS input



5.3.2 LVDS Receiver Internal Circuit

Figure 11 shows the internal block diagram of the LVDS receiver. This LCD module equips ter mination resistors for LVDS link.




RxECLK-
RxECLK+
100
PLL
Sampling clocks
DTUCK
RxEIN0-
RxEIN0+
G0,R5,R4,R3,R2,R1,R0
RxEIN1-
RxEIN1+
Serial to
Parallel
converter
B1,B0,G5,G4,G3,G2,G1
RxEIN2-
RxEIN2+
DE,VS,HS,B5,B4,B3,B2
RxEIN3-
RxEIN3+
B7,B6,G7,G6,R7,R6

5.4 Interface Timings

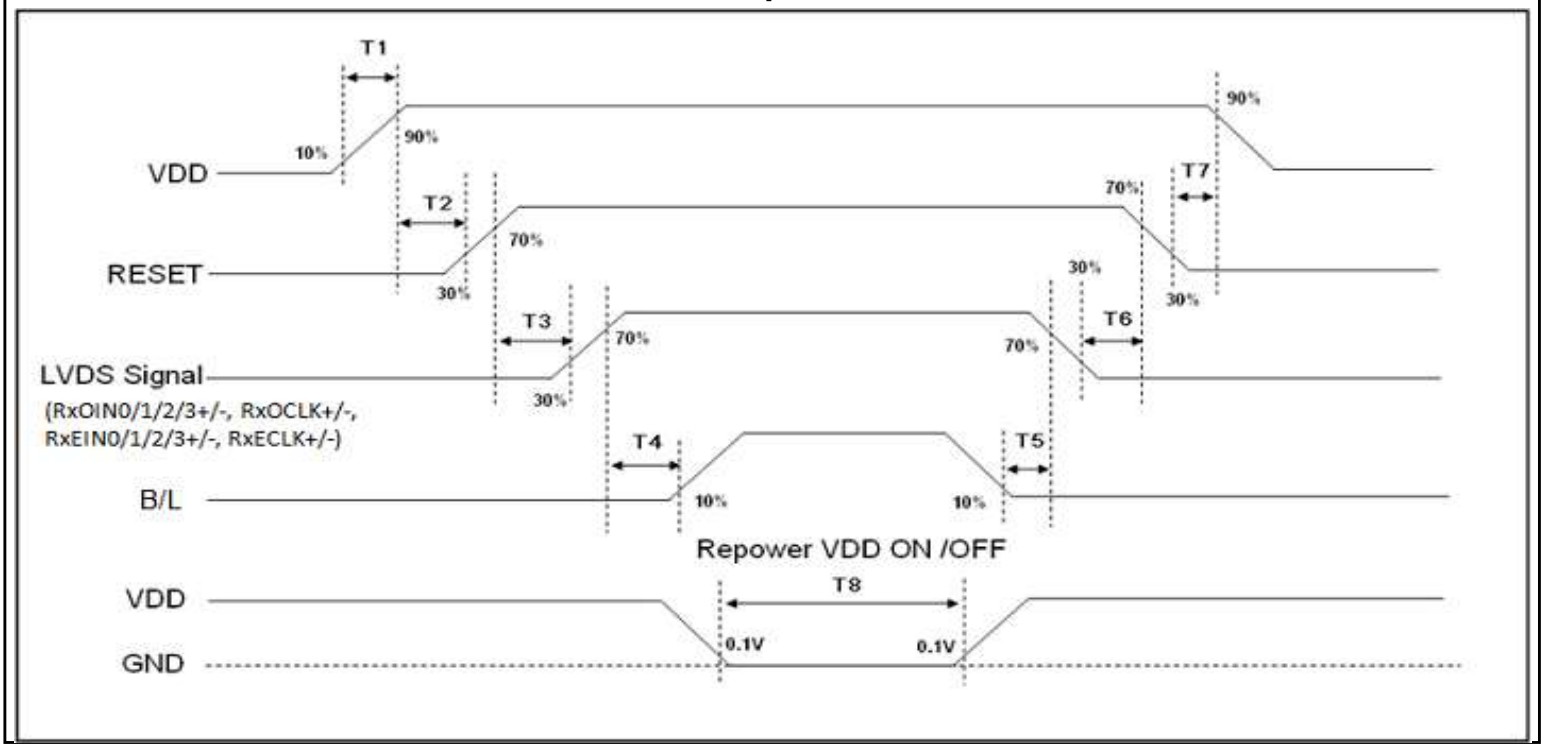
Parameter	Symbol	Min.	Typ.	Max.	Unit
LVDS Clock Frequency	Fclk	63.7	64.1	76.2	MHz
H Total Time	HT	660	664	790	Clocks
H Active Time	HA		600		Clocks
V Total Time	VT	1,606	1,608	1,729	Lines
V Active Time	VA		1,600		Lines
Frame Rate	FV	55	60	65	Hz

Note1：HT * VT *Frame Frequency≤76.2 MHz
Note2：Dual link LVDS
Note3: All reliabilities are specified for timing specification based on refresh rate of 60Hz. FN1180W001A is secured only for function under lower refresh rate; 60Hz at Normal mode, 55Hz at Power save mode. Don’t care flicker level (power save mode).

5. Power On/Off Sequence

1. Interface signals are also shown in the chart. Signals from any system shall be Hi- resistance state or low level when VDD voltage is off.
2. When system first start up, should keep the VDD high time longer than 200ms, otherwise may cause image sticking when VDD drop off.

Power Sequence



Power Sequencing Requirements

Parameter	Symbol	Unit	Min.	Typ.	Max.
VDD Rising Time	T1	ms	--	--	15
VDD ready to RESET Rising	T2	ms	1	--	20
RESET ready to LVDS Rising	T3	ms	0	--	20
LVDS ready to LED Power Rising	T4	ms	500	--	--
LED Power shut down over to LVDS off	T5	ms	200	--	--
LVDS shut down over to RESET off	T6	ms	0	--	20
RESET shut down over to VDD off	T7	ms	1	--	20
Repower VDD ON/ OFF time	T8	ms	1000	--	--

6.0 OPTICAL SPECIFICATIONS /光学规格

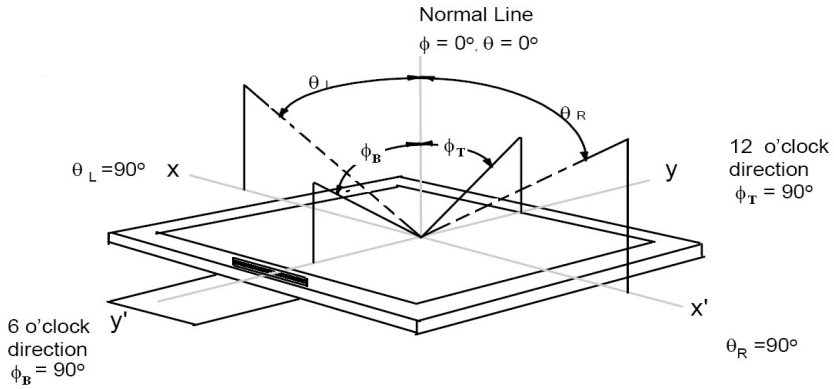
6.1 Overview /概述

The test of optical specifications shall be measured in a dark room (ambient luminance ≤1lux and temperature = 25±2℃) with the equipment of Luminance meter system (Goniometer system and TOPCON BM-5) and test unit shall be located at an approximate distance 50cm from the LCD surface at a viewing angle of θ and Φ equal to 0°. We refer to θØ=0 (=θ3) as the 3 o'clock direction (the "right"), θØ=90 (= θ12) as the 12 o'clock direction ("upward"), θØ=180 (= θ9) as the 9 o'clock direction ("left") and θØ=270(= θ6) as the 6 o'clock direction ("bottom"). While scanning θ and/or Ø, the center of the measuring spot on the display surface shall stay fixed.

6.2 Optical Specifications /光学规格

Item	Symbol	Condition		Min	Typ.	Max	Unit	Note
Viewing Angle	θL	Cr≥10		80	85	-	deg	Note 1
	θ_R			80	85	-		
	ψ_T			80	85	-		
	ψ_B			80	85	-		
Contrast Ratio	Cr	θ=0° FF=0°		700	1000	-	-	Note 2
Response Time	Tr+Tf		25℃	--	25	35	ms	Note 3
			-20℃	--	150	200		
			-30℃	--	300	350		
Color Coordinate of CIE1931	Wx	θ=0°		0.277	0.307	0.337	-	Note 4
	Wy			0.297	0.327	0.357		
	Rx			0.622	0.652	0.682		
	Ry			0.309	0.339	0.369		
	Gx			0.285	0.315	0.345		
	Gy			0.600	0.630	0.660		
	Bx			0.115	0.145	0.175		
	By			0.039	0.069	0.099		
Uniformity	U			75	80	--	%	Note 5
Color Gamut				70	72	--	%	
Luminance	L			650	750	--	cd/m²	Note 6

Note 1:**The definition of Viewing Angle**
Refer to the graph below marked by θ and Φ.



Note2:**ThedefinitionofContrastRatio**

$$\text{Contrast Ratio(CR)} = \frac{\text{Luminance When LCD is at “White” state}}{\text{Luminance When LCD is at “Black” state}}$$

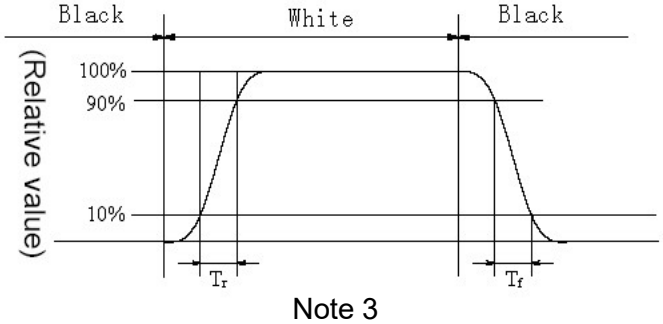
(Contrast Ratio is measured in optimum common electrode voltage)

Note3:**DefinitionofResponse time.**(Test LCD using RD80S or similar equipments):
The output sign also photo detector are measured when the input sign also are changed from “black ” to “white” (Voltage falling time)and from “white” to “black” (Voltage rising time), respectively . The response time is defined as the time interval between the 10% and 90% of amplitudes . Refer to fi gures below.

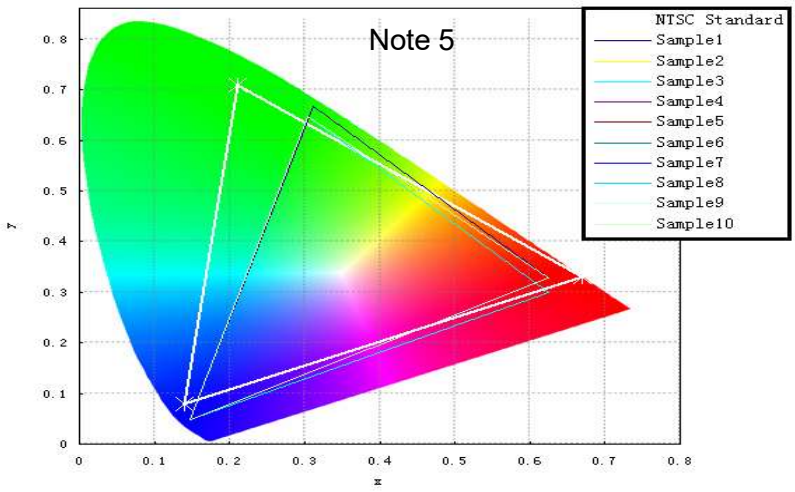
Note 4: Color Coordinates of CIE 1931
The test condition is at ILED=20mA and measured on the surface of LCD module at 25℃.
Measurement equipment:CS2000 or similar equipments
The Color Coordinate (CIE 1931) is the measurement of the center of the display shown in below figure.

Note 5: Definition of Color of CIE Coordinate and NTSC Ratio.

$$S = \frac{\text{area of RGB triangle}}{\text{area of NTSC triangle}} \times 100\%$$



Note 3



7.0 RELIABLITY TEST /可靠性测试

The Reliability test items and its conditions are shown in below.

No	Test Items	Conditions	Testing standard
1	High temperature storage test	Ta=+95℃, 240 hours	IEC60068-2-1:2007 GB2423.2-2008
2	Low temperature storage test	Ta=-40℃, 240 hours	IEC60068-2-1:2007 GB2423.1-2008
3	High temperature operation test	Ta=+85℃, 240 hours	IEC60068-2-1:2007 GB2423.2-2008
4	Low temperature operation test	Ta=-30℃, 240 hours	IEC60068-2-1:2007 GB2423.1-2008
5	High temperature & humidity (storage test)	Ta=+60℃, 90%RH max, 240 hours	IEC60068-2-78:2001 GB/T2423.3-2006
6	Thermal Shock Test	-40℃ 30min~95℃ 30min, Change time:5min 20cycle	Start with cold temperature End with high temperature IEC60068-2-14:1984,GB2423.22-2002
7	Vibration Test	Frequency range:8Hz-33Hz Stroke:1.3mm Sweep:8Hz~33Hz~8Hz 2 hours for each direction of X.Y.Z (6 hours for total)	IEC60068-2-6 GB/T17626.2
8	Mechanical shock	Half Sine Wave 100G 6ms,+X,+Y,+Z 3times for each direction	IEC60068-2-27 GB/T2423.5
9	Dropping test	Height: 60 cm, 1 corner, 3 edges, 6 surfaces	IEC60068-2-32:1990 GB/T2423.8-1995
10	ESD test	C=150pF, R=330 Ω, 5 points/panel Air:±15KV, 5 times; Contact: ±8KV, 5times; (Environment:15℃~35℃，30%~60%RH,86Kpa~106Kpa)	IEC61000-4-2:2001 GB/T17626.2-2006 Class C

• 8.0 Precautions /注意事项

• Please pay attention to the followings when you use this TFT LCD Panel.

• 8.1 Mounting Precautions /安装注意事项

• (1) Use fingerstalls with soft gloves in order to keep display clean during the incoming inspection and assembly process.

• (2) You must mount a module using specified mounting holes (Details refer to the drawings).

• (3) Please make sure to avoid external forces applied to the Source PCB or FPC and D-IC during the process of handling or assembling. If not, It causes panel damage or malfunction.

• (4) Note that polarizers are very fragile and could be easily damaged. Do not touch, push or rub the exposed polarizers with glass, tweezers or anything harder than HB pencil lead. And please do not rub with dust clothes with chemical treatment.

• (5) Do not pull or fold the source D-IC which connect the source PCB or FPC and the panel.

• Do not pull or fold the LED wire.

• (6) After removing the protective film, when the surface becomes dusty, please wipe gently with absorbent cotton or other soft materials like chamois soaks with alcohol or purified water.

• Do not strong polar solvent because they cause chemical damage to the polarizer.

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

• (8) Protection film for polarizer on the module shall be slowly peeled off just before use so that the electrostatic charge can be minimized.

• (9) Since the LCD is made of glass, do not apply strong mechanical impact or static load onto it. Handling with care since shock, vibration, and careless handling may seriously affect the product. If it f alls from a high place or receives a strong shock, the glass may be broken.

• (10) Do not disassemble the module.

• (11) To determine the optimum mounting angle, refer to the viewing angle range in the specification for each model.

• (12) If the customer's set presses the main parts of the LCD, the LCD may show the abnormal display. But this phenomenon does not mean the malfunction of the LCD and should be pressed by the way of mutual agreement.

• (13)Do not drop water or any chemicals onto the LCD’s surface.

8.2 Operating Precautions /操作注意事项

- (1) Be careful for condensation at sudden temperature change. Condensation makes damage to polarizer or electrical contacted parts. And after fading condensation, smear or spot will occur.
- (2) Module has high frequency circuits. Sufficient suppression to the electromagnetic interference shall be done by system manufacturers. Grounding and shielding methods may be important to minimized the interference.
- (3) The electrochemical reaction caused by DC voltage will lead to LCD degradation, so DC drive should be avoided.
- (4) The LCD modules use C-MOS LSI drivers, so customers are recommended that any unused input terminal would be connected to Vdd or Vss, do not input any signals before power is turn on, and ground you body, work/assembly area, assembly equipments to protect against static electricity.
- (5) Do not exceed the absolute maximum rating value. (supply voltage variation, input voltage variation, variation in part contents and environmental temperature, and so on) Otherwise the Module may be damaged.
- (6) Design the length of cable to connect between the connector for back-light and the converter as short as possible and the shorter cable shall be connected directly.
The longer cable between that of back-light and that of converter may cause the luminance of LED to lower and need a higher startup voltage(Vs).
- (7) Connectors are precise devices for connecting PCB and transmitting electrical signals. Operators should insert and unplug MDL in parallel when assembling MDL.
- (8) Do not connect or disconnect the cable to/ from the module at the "Power On" condition.
- (9) When the module is operating, do not lose CLK, ENAB signals. If any one these signals is lost, the LCD panel would be damaged.
- (10) Obey the supply voltage sequence. If wrong sequence is applied, the module would be damaged.
- (11) Do not re-adjust variable resistor or switch etc.
- (12) For the Q/Single/OC Product, If the LED designed side view, LED bar should be putted in the L ong/short side；Otherwise, its reliability and function may not be guaranteed.

注:
①(1)涉及到Pol相关条目适用于OC/MDL出货产品,
②(6)(7)涉及到connector相关适用于OC/MDL出货产品
③ (12) 涉及到客户进行BLU设计，LED Bar位置需要避开GOA位置;

8.3 Electrostatic Discharge Control /静电放电控制

- (1) Since a module is composed of electronic circuits, it is not strong to electrostatic discharge. Make certain that treatment persons are connected to ground through wrist band etc. And don't touch interface pin directly. Keep products as far away from static electricity as possible.
- (2) Avoid the use work clothing made of synthetic fibers. We recommend cotton clothing or other conductivity-treated fibers.

8.4 Precautions for Strong Light Exposure /强光照射注意事项

It is not allowed to store or run directly in strong light or in high temperature and humidity for a long ti me; Strong light exposure causes degradation of polarizer and color filter.

8.5 Storage Precautions /存储注意事项

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

•(1) The polarizer surface should not come in contact with any other object.
It is recommended that they be stored in the container in which they were shipped.
Temperature : 5 ~ 40 ℃

•(2) Humidity : 35 ~ 75 %RH

•(3) Period : 6 months

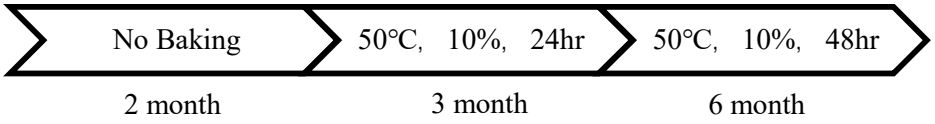
•(4) Control of ventilation and temperature is necessary.

•(5) Please make sure to protect the product from strong light exposure, water or moisture.
Be careful for condensation.

•(6) Store in a polyethylene bag with sealed so as not to enter fresh air outside in it.

•(7)Do not store the LCD near organic solvents or corrosive gasses.

•(8) Please keep the Modules/OC/FOG at a circumstance shown below Fig.



8.6 Precautions for Protection Film /保护膜注意事项

• (1) Remove the protective film slowly, keeping the removing direction approximate 30-degree not vertical from panel surface, If possible, under ESD control device like ion blower, and th e humidity of working room should be kept over 50%RH to reduce the risk of static charge.

• (2) In handling the LCD, wear non-charged material gloves. And the conducting wrist to the earth and the conducting shoes to the earth are necessary.

8.7 Appropriate Condition for Display /适当的显示条件

•(1) Normal operating condition
- Temperature: 0 ~ 40℃
- Operating Ambient Humidity : 10 ~ 90 %
- Display pattern: dynamic pattern (Real display)
- Suitable operating time: under 12 hours a day.

•(2) Special operating condition

If the product will be used in extreme conditions such as high temperature, humidity, display patterns or 7*24hrs operation time etc.., It is strongly recommended to contact us for Application engineering advi ce. Otherwise, its reliability and function may not be guaranteed.

•(3)Black image or moving image is strongly recommended as a screen save.

- (4) Lifetime in this spec. is guaranteed only when commercial display is used according to operating usages.
- (5) Please contact us in advance when you display the same pattern for a long time.
- (6) If the Module keeps displaying the same pattern for a long period of time, the image may be "sticked" or "turn off" to the screen. To avoid image sticking, it is recommended to use a screen saver.
- (7) Do not exceed the absolute maximum rating value. (supply voltage variation, input voltage variation, variation in part contents and environmental temperature, and so on) Otherwise the Module may be damaged.
- (8) Dew drop atmosphere should be avoided.
- (9) The storage room should be equipped with a good ventilation facility and avoid to expose to corrosive gas , which has a temperature controlling system.
- (10) The LCD should be avoided to expose to corrosive gas for long time, ,the LCD may be affected by the gas as SO2 ,H2S etc.
- (11) When expose to drastic fluctuation of temperature (hot to cold or cold to hot) ,the LCD may be affected; Specifically, drastic temperature fluctuation from cold to hot ,produces dew on the LCD's surface which may affect the operation of the polarizer and the LCD.
- (12) Response time will be extremely delayed at lower temperature than the operating temperature range and on the other hand at higher temperature LCD may turn black at temperature above its operational range. However those phenomena do not mean malfunction or out of order with the LCD. The LCD will revert to normal operation once the temperature returns to the recommended temperature range for normal operation

8.8 Others /其他

A. LC Leak /液晶泄露

- If the liquid crystal material leaks from the panel, it is recommended to wash the LC with acetone or ethanol and then burn it.
- In case of contact with hands, skin or clothes, it has to be washed away thoroughly with soap.
- If LC in mouth, mouth need to be washed, drink plenty of water to induce vomiting and follow medical advice.
- If LC touch eyes, eyes need to be washed with running water at least 15 minutes.

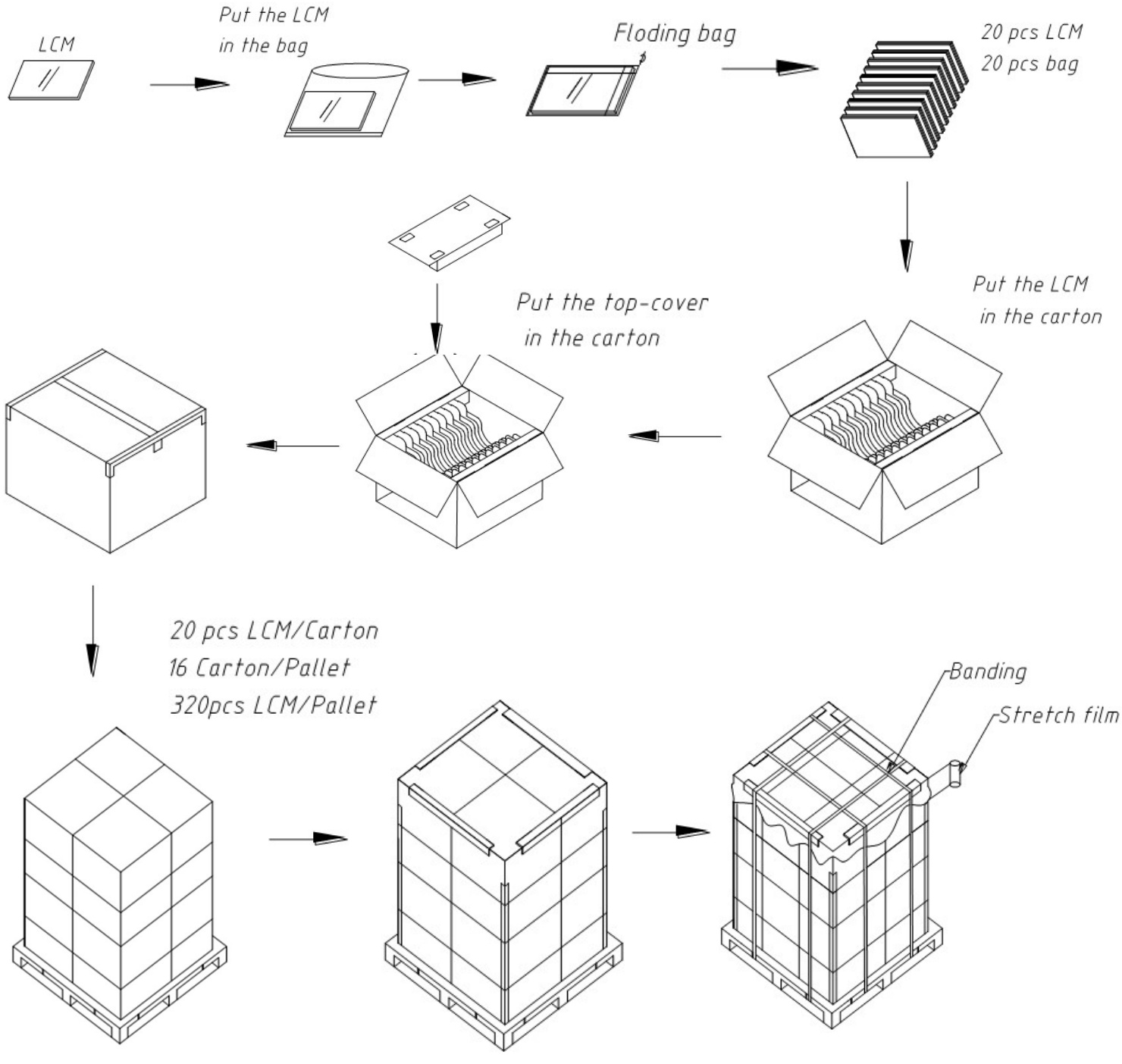
B. Rework /返工

- When returning the module for repair or etc., Please pack the module not to be broken. We recommend to use the original shipping packages.

C. In order to prevent potential problems, flicker should be adjusted by optimizing the Vcom value in customer LCM Line (适用于Q/Single/OC出货产品)

9.0 PACKING INFORMATION(产品形态： LCM)

LCM MODEL	LCM Qty. in the Box	LCM Qty. in the Pallet
FN1180W001A	20	320

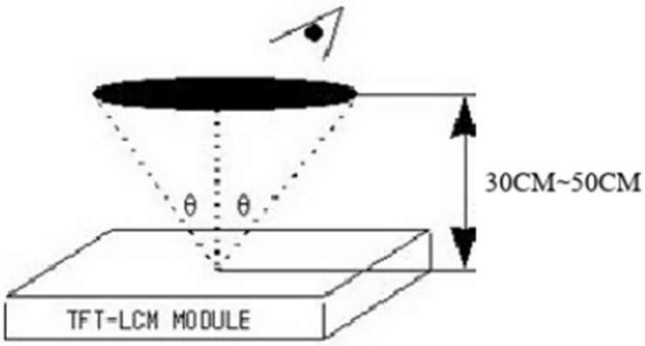


10.0 VISUAL INSPECTION CRITERIA FOR ALL CUSTMERS /所有客户的目视检查标准

10.1 Sampling Method /抽样方法

Unless otherwise agreed upon in writing, the sampling insepction shall be applied to t he Customers incoming inspection.

10.1.1 Lot size：1 pallet per same model
10.1.2 Sampling type：Random sampling
10.1.3 Inspection level：II
10.1.4 Sampling table：MIL-STD-105E



10.2 Inspection Environment /检验环境

10.2.1 Ambient conditions
a. Ambient Temperature:25±3℃
b. Relative Humidity:65±20%RH
c. Ambient Illumination:300-700LUX(Normal:500LUX)

10.2.2 Viewing Distance
The distance between the LCM and the inspector's eyes shall be at least 30cm-50cm

10.2.3 Viewing Angle
performing in front of the panel
[Vertical]：±25degree
[Horizontal]：±40degree

10.2.4 Inspection Area:
Display Area(Active Area)

10.3 Definitions /定义

10.3.1 Dark / Bright Spots
Points on display which appear dark/bright and usually result form the contamination. These defects do not vary in size or intensity(contrast)when contrast is varied.
10.3.2 Dark / Bright Lines
Lines on display which appear dark/bright and usually result from the contamination.
10.3.3 Polarizer Scratch
Lines on display which are seen across a darker background and do not vary in size.
10.3.4 Polarizer Dent
White spots on display which appear againse a darker backgound and do not vary in size.
103.5 Bright Dot Defects
Dots(sub-pixels)on display which appear bright in the display area and visible throug h the 5%ND filter at Black Pattern.

10.3.6 Dark Dot Defects

Dots(sub-pixels)on display which appear dark in the display area at R.G.B Color Pattern.

10.3.7 Line Defects

All line defects on display which appear brigh/dark such as vertical,horizontal,or cross lines.

10.3.8 Mura

Mura on display which appears darker/brighter against background birghtness on parts of display area.

10.3.9 BM Defects

Bright(white)Points on display which are off BM(Black Matrix).

10.3.10 Visual Inspection

Inspection for LCM when the unit turns on.

10.3.11 Appearance Inspection

External inspection for LCM when the unit turns off.

10.3.12 Other

Defects which cannot be classified into the above defect definitions.

Note 1: Bright& Dark dots are not smaller than a sub-pixel(Dots smaller than a sub-pixel are not counted as defect dots)

10.4 Inspectin Criteria /检验标准

Refer to 《TFT LCM general inspection standard》

10.5 Verification /验证

The supplier can verify the defective LCMs to segregate the responsibilities at customer's facility or can request the Customer to ship the defective LCMs to assigned place for verification

This verificatin result shall be agreed mutually buy the Customer and Supplier. This result can be corrected/changed after detail failure analysis at Supplier's facilities.

10.6 Supplier Induced Defects /供应商引起的缺陷

All of the Supplier induced defective LCMs shall be returned to the Supplier for repair or replacement.

Bfore return the defective LCMs, the Customer needs Supplier's confirmatin with RMA Number.

All of the returned LCMs shall be returned to the Customer within agreed time period.

10.7 Customer Induced Defects /顾客引起的缺陷

The Customer can return the custmoer induced defective LCMs to the Supplier for repair.

The repair cost for Customer induced defective LCMs shall be agreed with both parties, Customer and Supplier.

10.8 Warranty Period /质量保证期

In-warranty period is Eighteen(18)Months from manufacturing month of LCM

Note：

a. Eighteen months are composed of twelfth months in-warranty period and sixth months distribution period

b. The manufacturing Month is on the LCMs as Supplier's serial No.

10.9 Repair Warranty /维修保证书

Repair warranty is Twelve(12)Months from repaired month for repaired LCMs

Note：a. The Label for repair will be added after repairing.

10.10 Warranty avoidance /避免担保

The warranty will be avoided in cases of below:

a. When the warranty period is expired.

b. The Customer induced defective LCMs.

c. When the LCMs were repaired by 3rd party without Suppolier's approval.

d.When the LCMs were treated like Disassemble and Rework by the Customer and/or Customer's representatives without Supplier's approval.

10.11 Others /其他

If any problems arise with the LCMs supplied by supplier, the customer and supplier will coopeate and make ettorts to solve it with mutual contidence and respect