POWERTIP TECH. CORP.

SPECIFICATIONS

CUSTOMER	:	
SAMPLE CODE	:	SH800480T028-ZFC
MASS PRODUCTION CODE	:	PH800480T028-ZFC
SAMPLE VERSION	:	01
SPECIFICATIONS EDITION	:	002
DRAWING NO. (Ver.)	:	LMD-PH800480T028-ZFC(Ver.002)
PACKAGING NO. (Ver.)	:	PKG-PH800480T028-ZFC(Ver.001)

Customer Approved

Date:

Approved	Checked	Designer
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POWERTIP
2019.09.02
TW RD APR

☐ Preliminary specification for design input

■ Specification for sample approval

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History of Version

Date (mm / dd / yyyy)	Ver.	Edi.	Description	Page	Design by
07/22/2019	**01**	**001**	**New Drawing**	--	**Howard**
08/27/2019	**01**	**002**	**New Sample** **Modify Outline Dimension** **Modify TP label & Kapton tape**	**--** **5** **Appendix**	**Howard**

Total: 29 Page

Contents

Note : For detailed information please refer to IC data sheet :

Primacy (TFT LCD): ILITEK: ILI6128B & ILI5960

1. SPECIFICATIONS

1.1 Features

Item	Standard Value
Display Type	800 * 3 (RGB) * 480 Dots
LCD Type	Full Viewing Angle, Normally Black, Transmissive type
Screen size(inch)	4.3 inch
Color configuration	RGB-Strip
Backlight Type	White LED B/L
Interface	Digital 24-bits RGB Interface
Other (controller/driver IC)	ILI6128B (Source IC) & ILI5960 (Gate IC) (Or Compatible IC)
ROHS	THIS PRODUCT CONFORMS THE ROHS OF PTC Detail information please refer website: http://www.powertip.com.tw/news_detail.php?Key=1&cID=1

1.2 Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension	115.1(W) * 78.94(L) * 4.55(H)	mm

LCD Panel

Item	Standard Value	Unit
Active Area	95.04(W) * 53.856(L)	mm
Pixel Size	0.1188(W) *0.1122 (H)	mm

Note : For detailed information please refer to LCM drawing

1.3 Absolute Maximum Ratings

Module

Item	Symbol	Condition	Min.	Max.	Unit
System Power Supply Voltage	DVDD	GND=0	-0.5	5.0	V
Operating Temperature	T_{OP}	-	-20	70	℃
Storage Temperature	T_{ST}	-	-30	80	℃
Storage Humidity	H_D	Ta ≦60 ℃	20	90	%RH

1.4 DC Electrical Characteristics

Module GND = 0V, Ta = 25℃

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Power Supply Voltage	DVDD	-	3.3	-	V	-
	V_{GH}	14.5	15.0	15.5		
	V_{GL}	-9.5	-10.0	-10.5		
	AV_{DD}	12.0	12.5	13.0		
VCOM*2	V_{COM}	3.5	4.5	5.5	V	
Input H/L Level Voltage	VIH	0.7DVDD	-	DVDD	V	
	VIL	GND	-	0.3DVDD	V	
Supply Current	I (DV_{DD})	-	40	60	mA	Pattern= Photo *1
	I (AV_{DD})	-	25	40		Pattern= R, G, B
	I_{GH}		1	1.5		Pattern= R, G, B
	I_{GL}		1.5	2.5		Pattern= R, G, B

Note1: Maximum current display

Note2: Vcom must be adjusted to optimize display quality_crosstalk, Contrast Ratio and etc.

1.5 Optical Characteristics

TFT LCD Module DVDD = 3.3 V, Ta=25℃

Item	Symbol		Condition	Min.	Typ.	Max.	unit	
Response time	Tr+Tf		Ta = 25℃ θX, θY = 0°	-	41	62	ms	Note 2
Viewing angle	Top	θY+	CR ≥ 10	-	80	-	Deg.	Note 4
	Bottom	θY-		-	80	-		
	Left	θX-		-	80	-		
	Right	θX+		-	80	-		
Contrast ratio		CR	Ta = 25℃ θX , θY = 0°	650	800	-		Note 3
Color of CIE Coordinate (With B/L)	White	X		0.28	0.33	0.38	-	Note1
		Y		0.31	0.36	0.41		
	Red	X		0.56	0.61	0.66		
		Y		0.31	0.36	0.41		
	Green	X		0.31	0.36	0.41		
		Y		0.54	0.59	0.64		
	Blue	X		0.09	0.14	0.19		
		Y		0.08	0.13	0.18		
Average Brightness Pattern=white display (With B/L) *1	IF		IF= 40 mA	360	420	-	cd/m^2	Note1
Uniformity (With B/L) *2	ΔB		IF= 40 mA	70	-	-	%	Note1

Note 1:

*1：△B=B(min) / B(max) * 100%

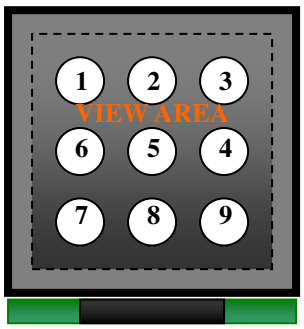
*2：Measurement Condition for Optical Characteristics:

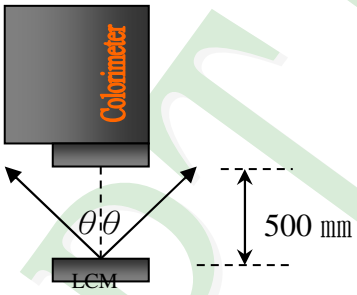
a：Environment: 25℃±5℃ / 60±20%R.H，no wind，dark room below 10 Lux at typical lamp current and typical operating frequency.

b：Measurement Distance: 500 ± 50 ㎜ ，(θ= 0°)

c：Equipment: TOPCON BM-7 fast，(field 1°)，after 10 minutes operation.

d：The uncertainty of the C.I.E coordinate measurement ±0.01，Average Brightness ± 4%





Colorimeter=BM-7 fast

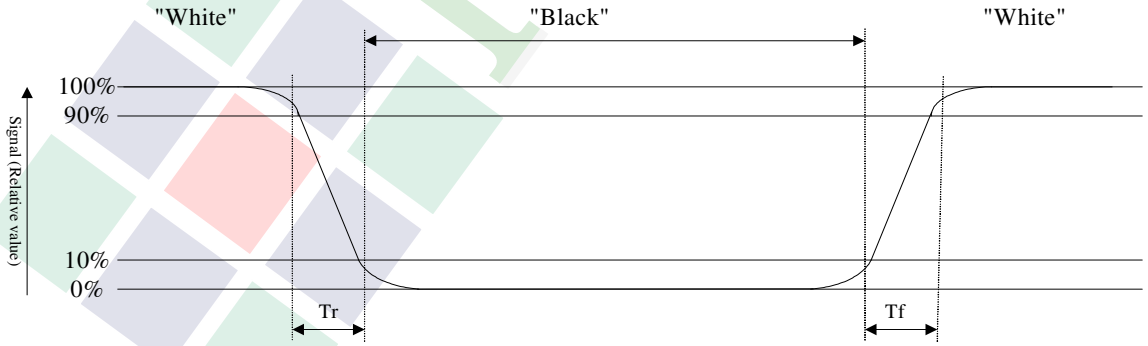
To be measured at the center area of panel with a viewing cone of 1° by Topcon luminance meter BM-7, after 10 minutes operation (module)

Note2: Definition of response time:

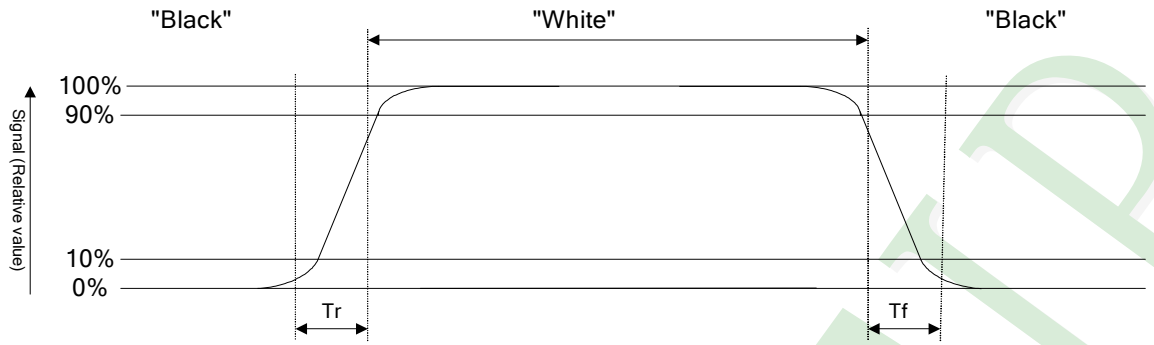
The output signals of photo detector are measured when the input signals are changed from “black” to “white”(falling time) and from “white” to “black”(rising time), respectively. The response time is defined as the time interval between the 10% and 90% of Amplitudes.

Refer to figure as below:

Normally White



Normally Black



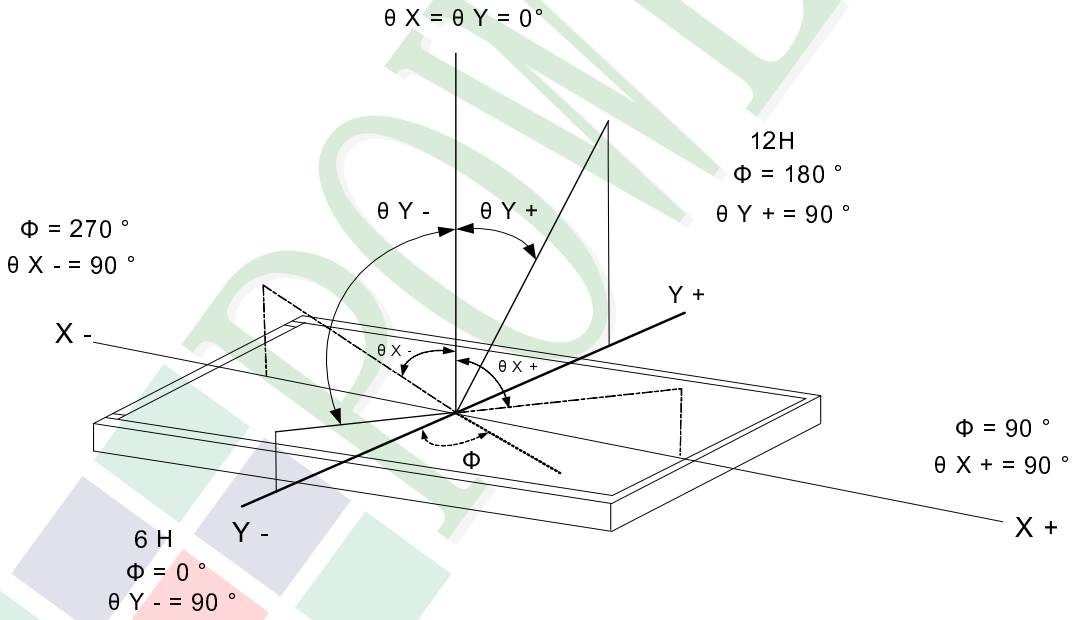
Note3: Definition of contrast ratio:

Contrast ratio is calculated with the following formula

$$\text{Contrast ratio (CR)} = \frac{\text{Photo detector output when LCD is at “White” state}}{\text{Photo detector output when LCD is at “Black” state}}$$

Note4: Definition of viewing angle:

Refer to figure as below:



1.6 Backlight Characteristics

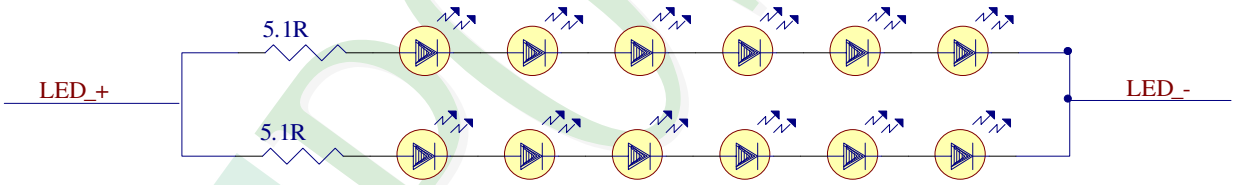
Maximum Ratings

Item	Symbol	Conditions	Min.	Max.	Unit
LED Forward Current	IF	Ta =25℃	-	60	mA
LED Reverse Voltage	VR		-	1.2	V
Power consumption	Pd			1224	mW

Electrical / Optical Characteristics

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	VF	If= 40 mA	17.6	19.2	20.4	
Average Brightness (Without LCD)	IV		9500	11000	-	cd/m^2
CIE Color Coordinate (Without LCD)	X			0.29		-
	Y			0.29		
Color	White					

B/L Internal Circuit Diagram:



Other Description

Item	Conditions	Description
Life Time	Ta =25℃ IF= 40mA	50,000 hrs

1.7 Touch Panel Characteristics

Features

Item	Standard Value
Touch Panel Size	4.3”
Touch type	Capacitive Touch Panel
Input Method	True Multi-Touch Capacitive Touch Panel True Multi-touch with up to 5 Points of Absolution
Output Interface	I²C
IC	FocalTech----FT5426

I²C Address

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	1	1	1	0	0	0	**R/W**

Bit 0: 0 for Write / 1 for Read

Absolute Maximum Ratings

Item	Symbol	Condition	Min.	Max.	Unit
Supply voltage	TPVDD	-	2.7	3.6	V
Operating Temperature	T_{OP}	Non condensing	-20	70	℃
Storage Temperature	T_{ST}	Non condensing	-30	80	℃

DC Electrical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply voltage	TPVDD	25°C	-	3.3	-	V
Input high-level voltage	VIH	--	0.7 x TPVDD	-	TPVDD	V
Input low -level voltage	VIL	--	-0.3	-	0.3 x TPVDD	V
Output high -level voltage	VOH	--	0.7 x TPVDD	-	-	V
Output low -level voltage	VOL	--	-	-	0.3 x TPVDD	V

Touch Panel IC Read/Write description & Register Mapping

Reference: FTS_AN_CTPM_Standard_eng_ver1.1.

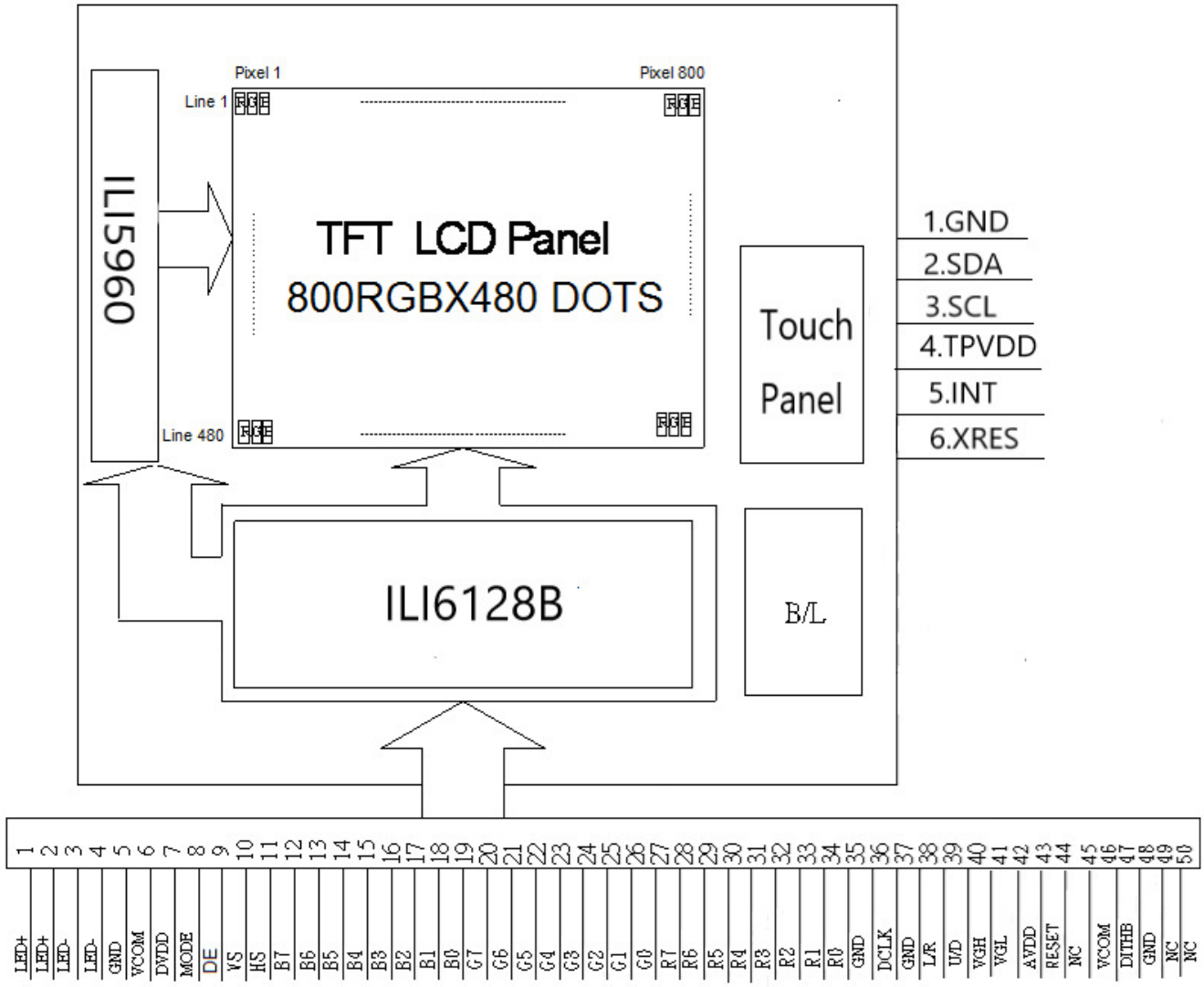
2. MODULE STRUCTURE

2.1 Counter Drawing

2.1.1 LCM Mechanical Diagram

* See Appendix

2.1.2 Block Diagram



2.2 Interface Pin Description

Pin#	Name	DESCRIPTION
1	V_{LED+}	Power for LED backlight (+).
2	V_{LED+}	Power for LED backlight (+).
3	V_{LED-}	Power for LED backlight (-).
4	V_{LED-}	Power for LED backlight (-).
5	GND	Power ground.
6	V_{com}	Common voltage.
7	DV_{DD}	Power for Digital Circuit.
8	MODE	DE/SYNC mode select. “H”: For DE mode, “L”: For SYNC mode
9	DE	Data Input Enable.
10	VS	Vertical Sync Input.
11	HS	Horizontal Sync Input.
12	B7	Blue Data (MSB).
13	B6	Blue Data.
14	B5	Blue Data.
15	B4	Blue Data.
16	B3	Blue Data.
17	B2	Blue Data.
18	B1	Blue Data.
19	B0	Blue Data (LSB).
20	G7	Green Data (MSB).
21	G6	Green Data.
22	G5	Green Data.
23	G4	Green Data.
24	G3	Green Data.
25	G2	Green Data.
26	G1	Green Data.
27	G0	Green Data (LSB).
28	R7	Red Data (MSB).
29	R6	Red Data.

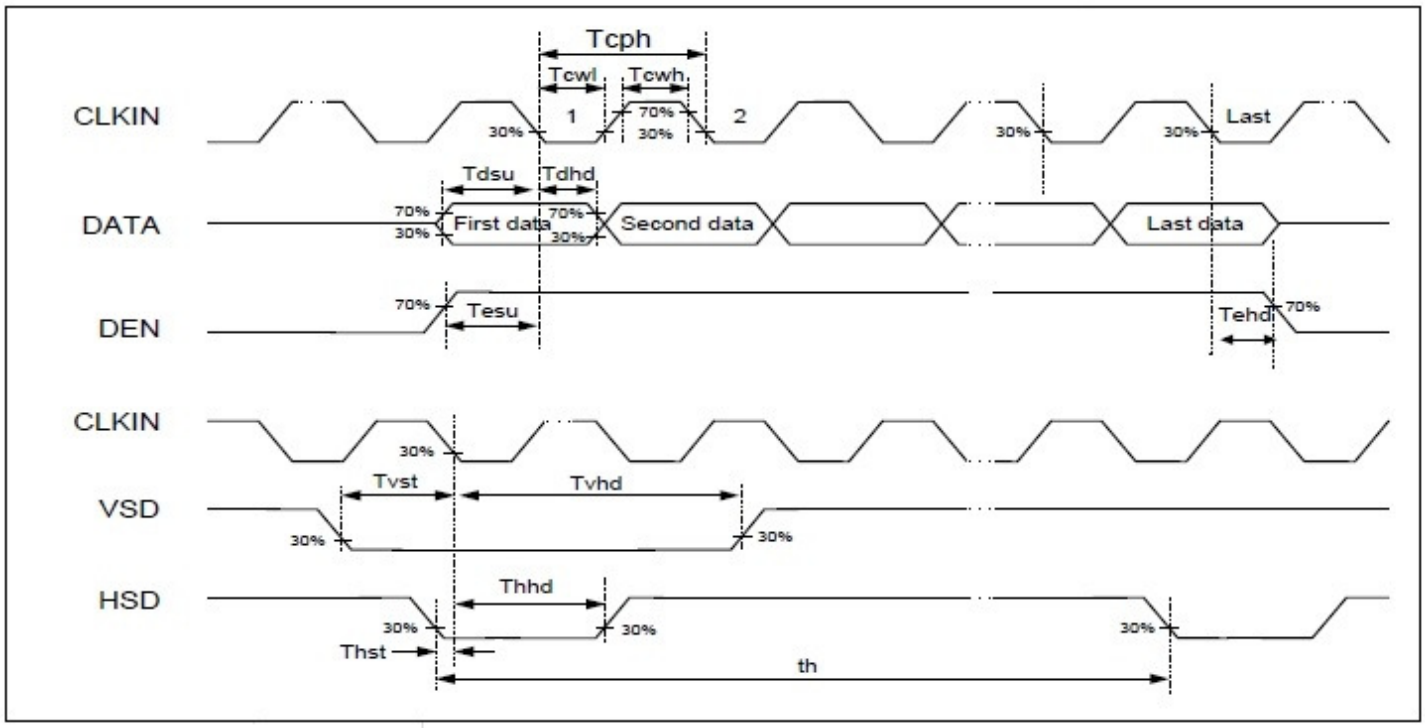
Pin#	Name	DESCRIPTION
30	R5	Red Data.
31	R4	Red Data.
32	R3	Red Data.
33	R2	Red Data.
34	R1	Red Data.
35	R0	Red Data (LSB).
36	GND	Power Ground
37	DCLK	Sample clock, latch data at falling edge
38	GND	Power Ground.
39	L/R	Left / right selection.
40	U/D	Up / Down selection.
41	V_{GH}	Gate on Voltage.
42	V_{GL}	Gate OFF Voltage.
43	AV_{DD}	Power for Analog Circuit.
44	RESET	Global reset pin.
45	NC	No connection.
46	V_{COM}	Common Voltage.
47	DITHB	Dithering Function.
48	GND	Power Ground.
49	NC	No connection.
50	NC	No connection.

Touch Panel Driving

Pin No.	Symbol	Function
1	GND	Touch Panel Ground.
2	SDA	I2C Data
3	SCL	I2C Clock
4	TPVDD	Power Supply Voltage (3.3V)
5	INT	Active Low
6	XRES	Active low global reset signal input.

2.3 Timing Characteristics

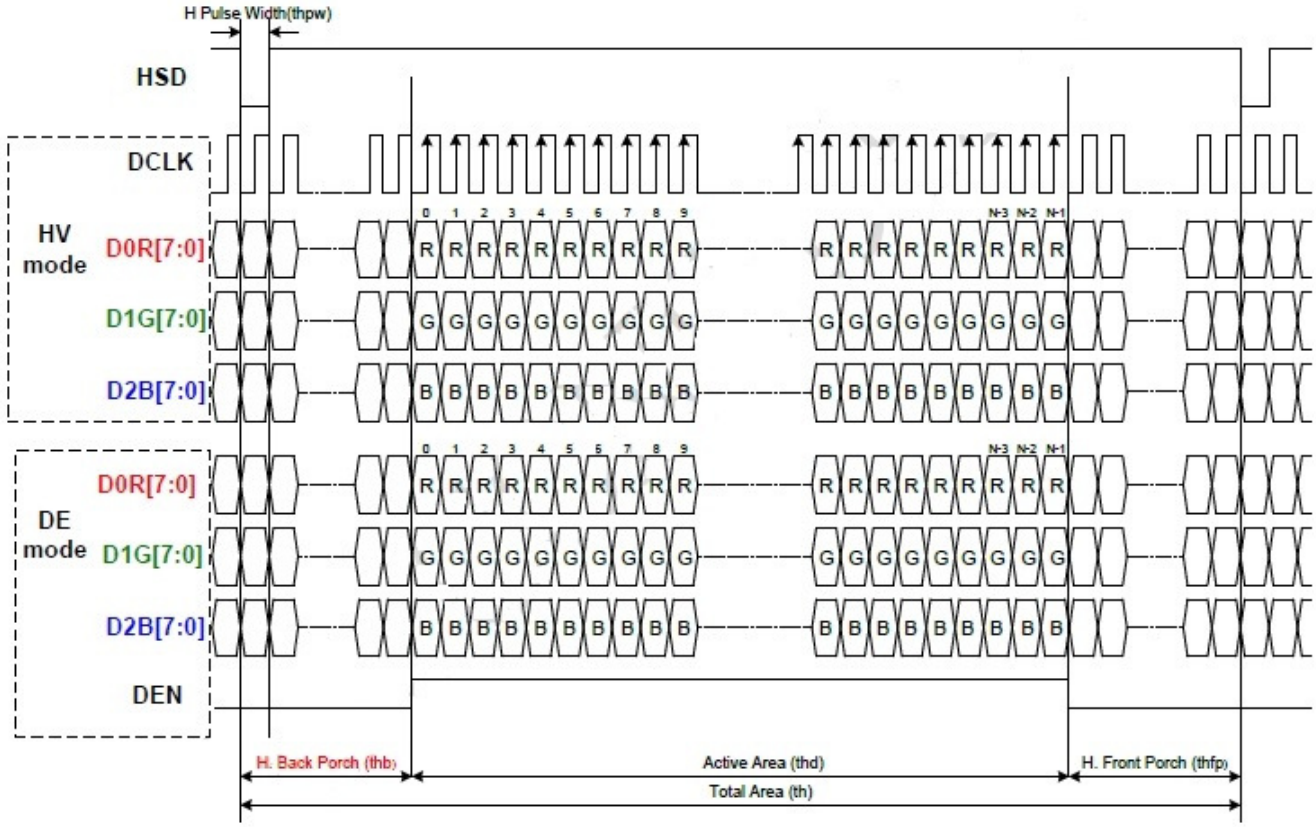
2.3.1 Input Clock and Data Timing Diagram



Parameter	Symbol	Min	Typ	Max	Unit	
CLKIN Frequency	Fclk	--	33	50	MHz	DVDD = 2.7V ~3.6V
CLKIN Cycle Time	Tclk	20	30		ns	
CLKIN Pulse Duty	Tcwh	40	50	60	%	Tclk
Time from HSD to Source Output	Thso		37		CLKIN	
Time from HSD to LD	Thld		20		CLKIN	
Time from HSD to STV	Thstv		2		CLKIN	
Time from HSD to CKV	Thckv		20		CLKIN	
Time from HSD to OEV	Thoev		4		CLKIN	
LD Pulse Width	Twld		16		CLKIN	
CKV Pulse Width	Twckv		66		CLKIN	
OEV Pulse Width	Twoev		74		CLKIN	

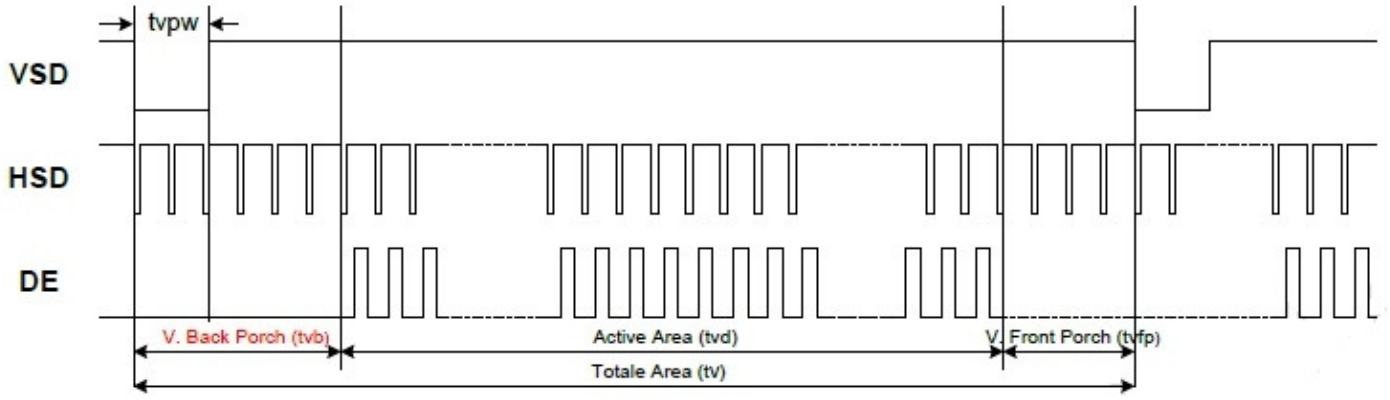
2.3.2 Timing Characteristic

Horizontal input timing



Parameter	Symbol	Value			Unit
		Min	Typ.	Max	
Horizontal display area	thd		800		DCLK
DCLK frequency	fclk	-	30	50	MHz
One Horizontal Line	th	862	1056	1200	DCLK
HS pulse width	thpw	1	--	40	
HS Back Porch (Blacking)	thp		46		
HS Front Proch	thfb	16	210	354	
DE mode Blanking	th-thd	85	256	400	

Vertical input timing



Parameter	Symbol	Value			Unit
		Min	Typ.	Max	
Vertical display area	tvd		480		th
VS period time	tv	513	525	650	th
VS pulse width	tvpw	3	-	20	th
VS ack Porch (Blanking)	tvb		23		th
VS Front Proch	tvfb	7	22	147	th
DE mode Blanking	tv-tvd	30	45	170	th

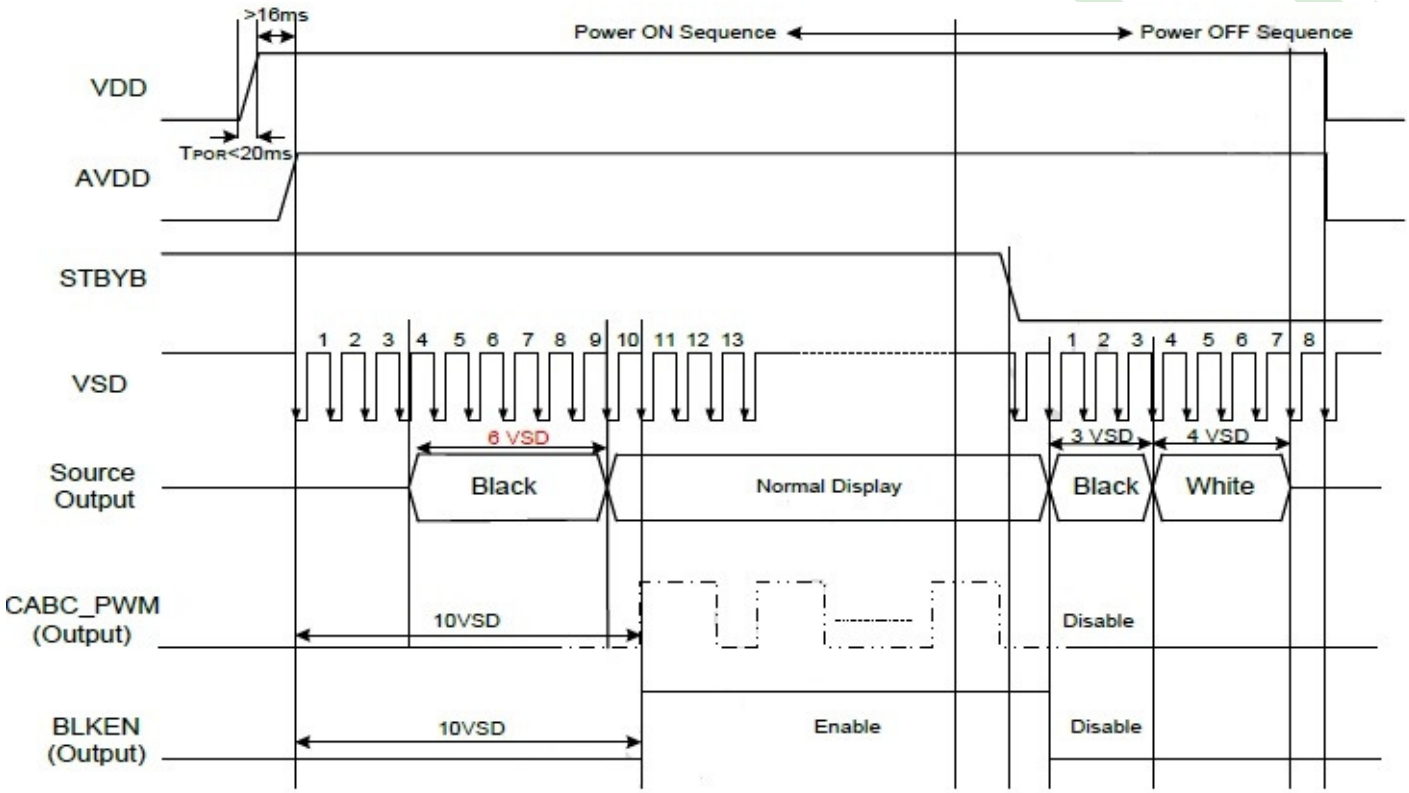
2.3.3 Power On/Off Sequence

To prevent device damage from latch up, the power ON/OFF sequence shown below must be followed.

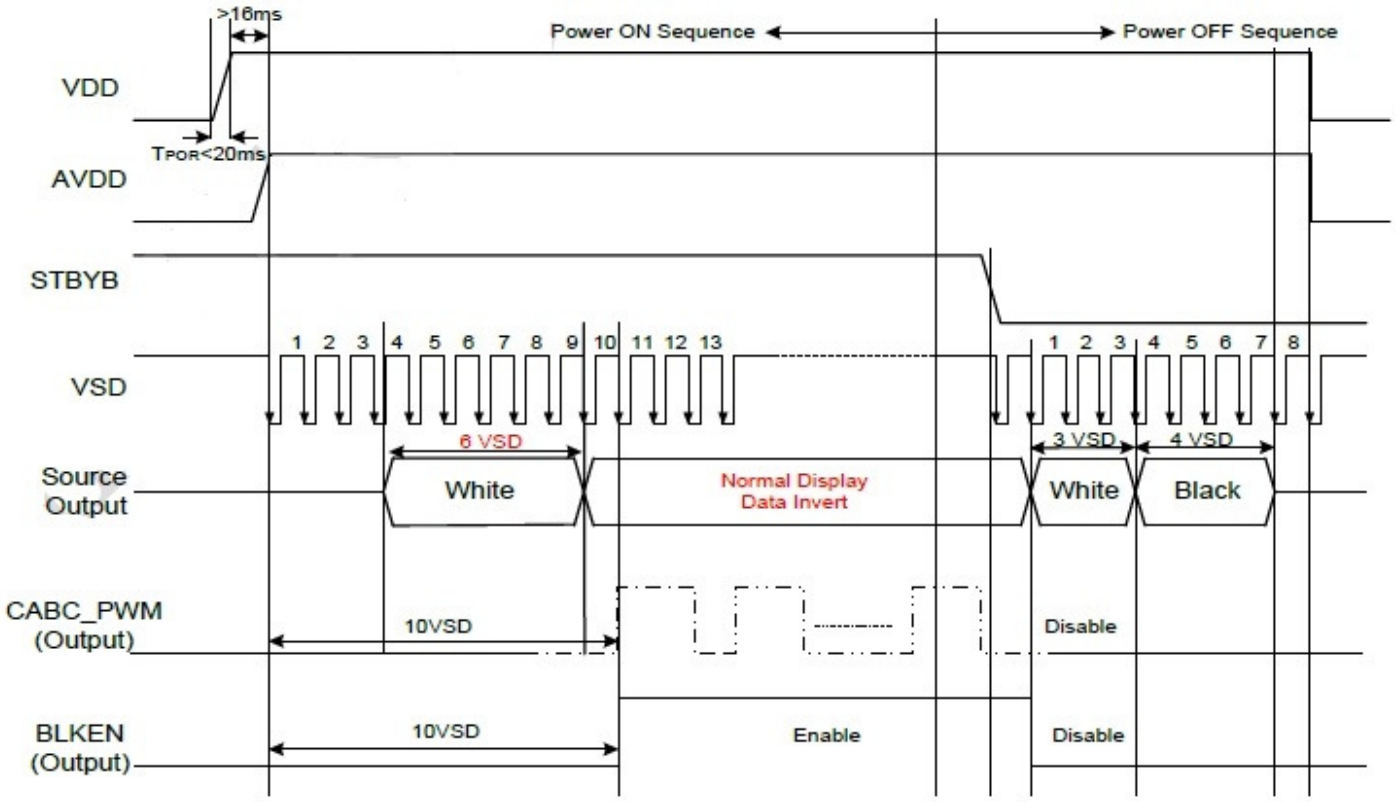
Power ON: VDD, DGND→AVDD, AGND

Power OFF: AVDD, AGND→VDD, DGND

Case1: REV = L (Default)

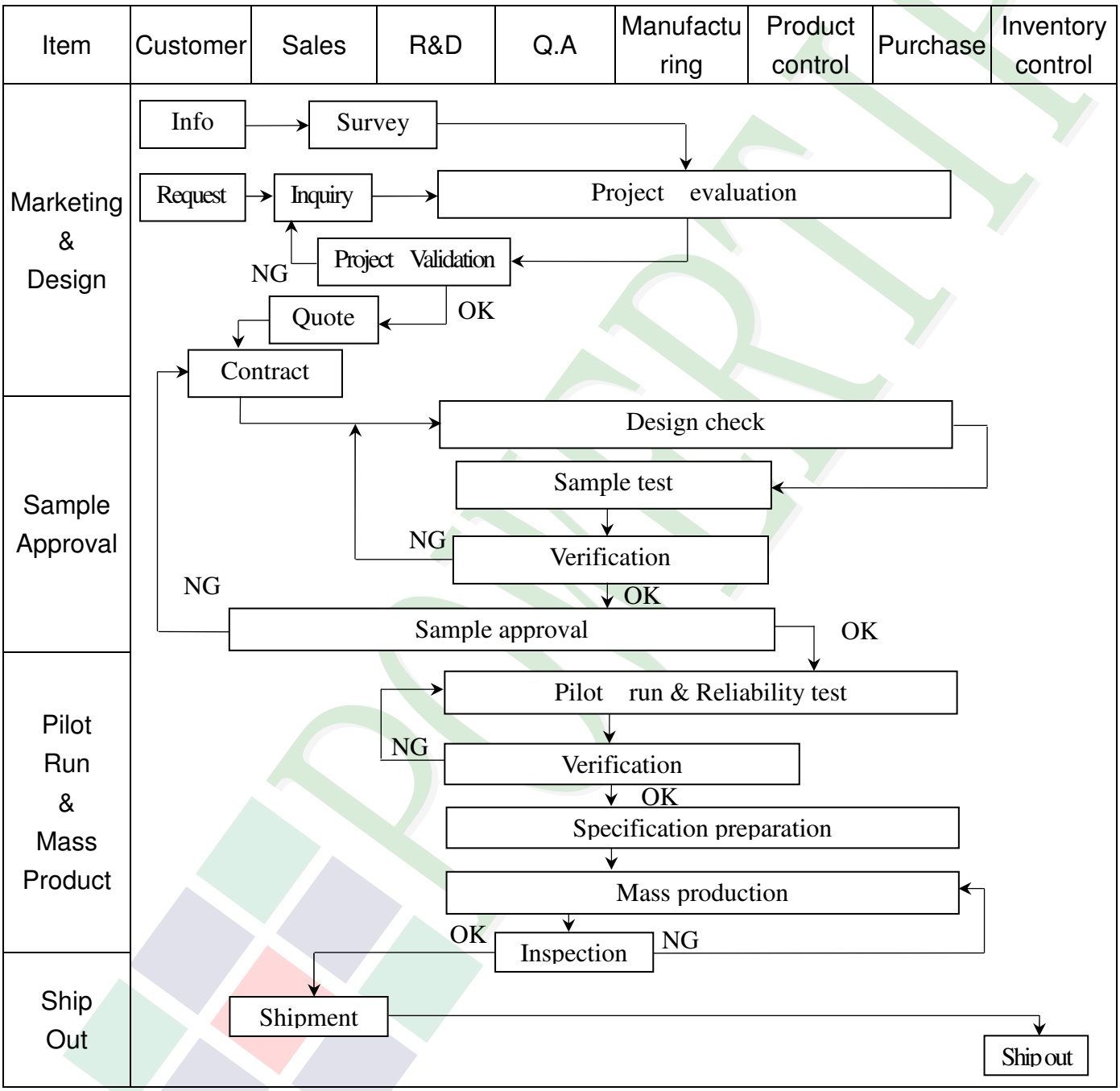


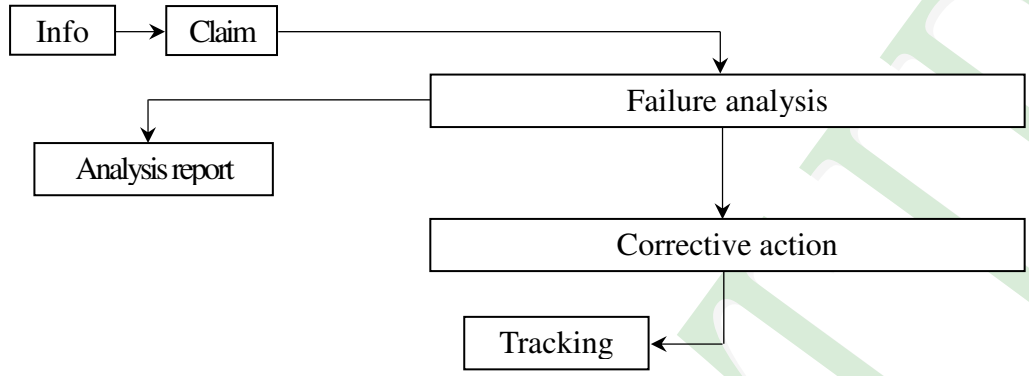
Case2: REV = H


>16ms
Power ON Sequence
Power OFF Sequence
VDD
TPOR<20ms
AVDD
STBYB
1 2 3 4 5 6 7 8 9 10 11 12 13
1 2 3 4 5 6 7 8
VSD
6 VSD
3 VSD
4 VSD
Source Output
White
Normal Display Data Invert
White
Black
CABC_PWM (Output)
10VSD
Disable
BLKEN (Output)
10VSD
Enable
Disable

3. QUALITY ASSURANCE SYSTEM

3.1 Quality Assurance Flow Chart



Item	Customer	Sales	R&D	Q.A	Manufacturing	Product control	Purchase	Inventory control
Sales Service								
Q.A Activity	1. ISO 9001 Maintenance Activities 2. Process improvement proposal 3. Equipment calibration 4. Education And Training Activities 5. Standardization Management							

3.2. Inspection Specification

[redacted]The document shall be applied to TFT-LCD Module for 3.5″ ~15″ (Ver.B01).

[redacted]ion Standard：MIL-STD-105E Table Normal Inspection Single Sampling Level Ⅱ.

[redacted]ment：Gauge、MIL-STD、Powertip Tester、Sample

[redacted]Level：Major Defect AQL： 0.4 ； Minor Defect AQL： 1.5

[redacted]oing Defect Level：Sampling.

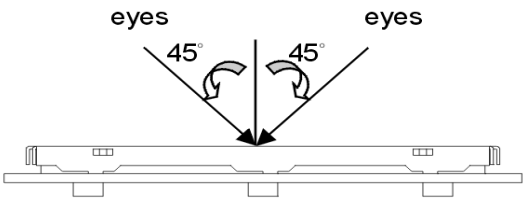
Standard of the product appearance test：

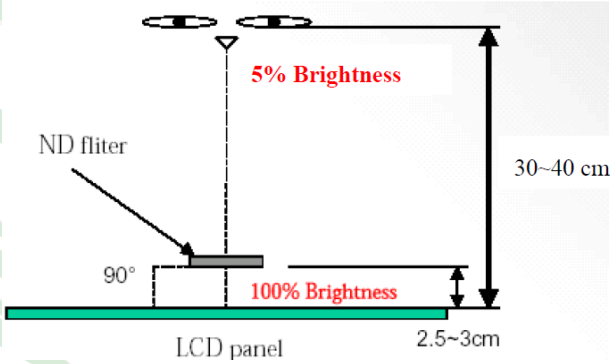
a. Manner of appearance test：

(1). The test best be under 20W×2 fluorescent light(about 300lux ～500lux)

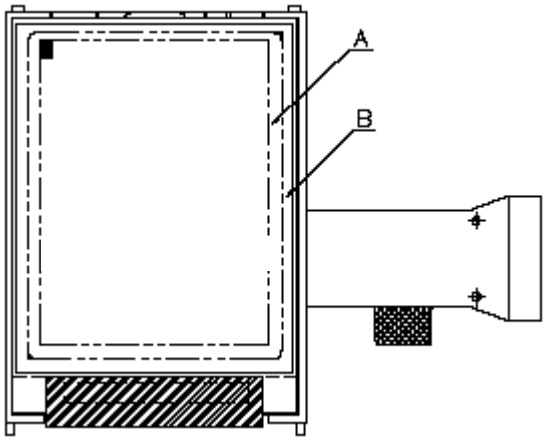
，and distance of view must be at 30~40 cm.

(2). The test direction is base on about around 45° of vertical line.





(3). Definition of area.



A area : viewing area

B area : Outside of viewing area

(4). Standard of inspection： (Unit：mm)

◆Specification For TFT-LCD Module 3.5″ ~15″：　(Ver.B01)

<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td rowspan="3">01</td><td rowspan="3">Product condition</td><td>1.1The part number is inconsistent with work order of production.</td><td>Major</td></tr>
<tr><td>1.2 Mixed product types.</td><td>Major</td></tr>
<tr><td>1.3 Assembled in inverse direction.</td><td>Major</td></tr>
<tr><td>02</td><td>Quantity</td><td>2.1The quantity is inconsistent with work order of production.</td><td>Major</td></tr>
<tr><td>03</td><td>Outline dimension</td><td>3.1 Product dimension and structure must conform to structure diagram.</td><td>Major</td></tr>
<tr><td rowspan="6">04</td><td rowspan="6">Electrical Testing</td><td>4.1 Missing line character and icon.</td><td>Major</td></tr>
<tr><td>4.2 No function or no display.</td><td>Major</td></tr>
<tr><td>4.3 Display malfunction.</td><td>Major</td></tr>
<tr><td>4.4 LCD viewing angle defect.</td><td>Major</td></tr>
<tr><td>4.5 Current consumption exceeds product specifications.</td><td>Major</td></tr>
<tr><td>4.6 Mura can not be seen through 5% ND filter at 50% Gray screen , should be judged by the viewing angle of 90 degree.</td><td>Minor</td></tr>
<tr><td>05</td><td>Dot defect

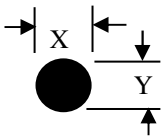
(Bright dot、Dark dot)

On -display</td><td>
<table>
<tr><th colspan="2">Item</th><th>Acceptance (Q’ty)</th></tr>
<tr><td rowspan="4">Dot Defect</td><td>Bright Dot</td><td>≦ 4</td></tr>
<tr><td>Dark Dot</td><td>≦ 5</td></tr>
<tr><td>Joint Dot</td><td>≦ 3</td></tr>
<tr><td>Total</td><td>≦ 7</td></tr>
</table>
5.1 Inspection pattern：full white , full black , Red , Green and blue screens.
5.2 It is defined as dot defect if defect area ＞1/2 dot.
5.3 The distance between two dot defect ≧5 mm.
5.4 Bright dot that can not be seen through 5% ND filter.
</td><td>Minor</td></tr>
</table>

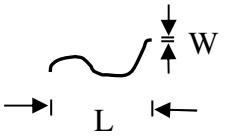
◆Specification For TFT-LCD Module 3.5″ ~15″：

(Ver.B01)

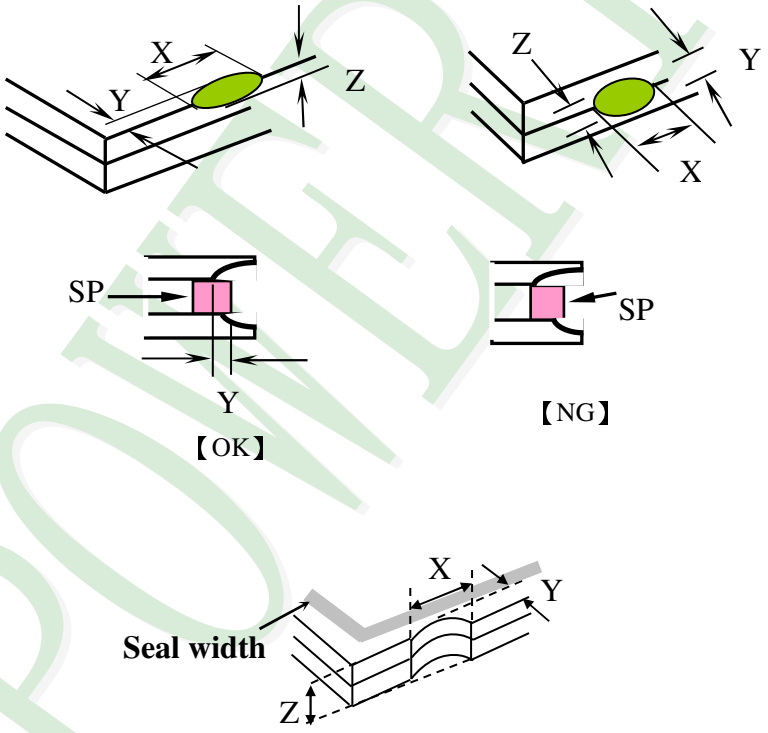
<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td>06</td><td>Black or white dot、scratch、contamination

Round type
 

Φ＝(x＋y) / 2

Line type
 
</td><td>6.1 Round type (Non-display or display)：
<table><tr><th rowspan="2">Dimension (diameter：Φ)</th><th colspan="2">Acceptance (Q’ty)</th></tr><tr><th>A area</th><th>B area</th></tr><tr><td>Φ ≦ 0.25</td><td>Ignore</td><td rowspan="4">Ignore</td></tr><tr><td>0.25 ＜ Φ ≦ 0.50</td><td>5</td></tr><tr><td>Φ ＞ 0.50</td><td>0</td></tr><tr><td>Total</td><td>5</td></tr></table>
6.2 Line type(Non-display or display)：
<table><tr><th rowspan="2">module size</th><th rowspan="2">Length (L)</th><th rowspan="2">Width (W)</th><th colspan="2">Acceptance (Q’ty)</th></tr><tr><th>A area</th><th>B area</th></tr><tr><td rowspan="5">3.5” to less 9”</td><td>---</td><td>W ≦ 0.03</td><td>Ignore</td><td rowspan="5">Ignore</td></tr><tr><td>L ≦10.0</td><td>0.03 ＜W ≦ 0.05</td><td>4</td></tr><tr><td>L ≦5.0</td><td>0.05 ＜W ≦ 0.10</td><td>2</td></tr><tr><td>---</td><td>W ＞0.10</td><td>As round type</td></tr><tr><td colspan="2">Total</td><td>5</td></tr><tr><td rowspan="4">9” to 15”</td><td>---</td><td>W ≦ 0.05</td><td>Ignore</td><td rowspan="4">Ignore</td></tr><tr><td>L ≦10.0</td><td>0.05 ＜W ≦ 0.10</td><td>5</td></tr><tr><td>---</td><td>W ＞0.10</td><td>As round type</td></tr><tr><td colspan="2">Total</td><td>5</td></tr></table></td><td>Minor</td></tr>
<tr><td>07</td><td>Polarizer Bubble</td><td><table><tr><th rowspan="2">Dimension (diameter：Φ)</th><th colspan="2">Acceptance (Q’ty)</th></tr><tr><th>A area</th><th>B area</th></tr><tr><td>Φ ≦ 0.25</td><td>Ignore</td><td rowspan="5">Ignore</td></tr><tr><td>0.25 ＜ Φ ≦ 0.50</td><td>4</td></tr><tr><td>0.50 ＜ Φ ≦ 0.80</td><td>1</td></tr><tr><td>Φ ＞ 0.80</td><td>0</td></tr><tr><td>Total</td><td>5</td></tr></table></td><td>Minor</td></tr>
</table>

◆Specification For TFT-LCD Module 3.5″ ~15″ : (Ver.B01)

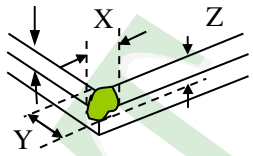
NO	Item	Criterion	Level
08	The crack of glass	Symbols : X : The length of crack Y : The width of crack. Z : The thickness of crack W : terminal length t : The thickness of glass a : LCD side length 8.1 General glass chip : 8.1.1 Chip on panel surface and crack between panels: 	Minor

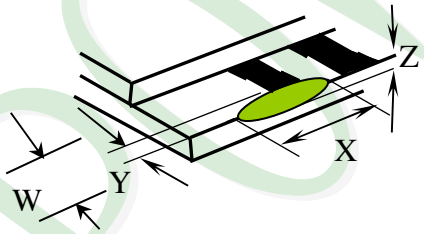
X	Y	Z
≦ a	Crack can't enter viewing area	≦1/2 t
≦ a	Crack can't exceed the half of SP width.	1/2 t < Z ≦2 t

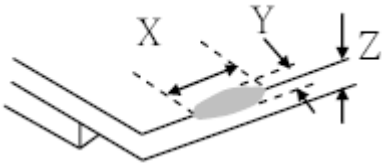
◆Specification For TFT-LCD Module 3.5″ ~15″ : (Ver.B01)

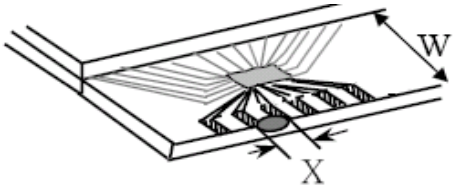
<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td rowspan="2">08</td><td rowspan="2">The crack of glass</td><td>
Symbols :

X : The length of crack　　Y : The width of crack.
Z : The thickness of crack　　W : terminal length
t : The thickness of glass　　a : LCD side length

8.1.2 Corner crack :


<table>
<tr><th>X</th><th>Y</th><th>Z</th></tr>
<tr><td>≦1/5 a</td><td>Crack can’t enter viewing area</td><td>Z ≦ 1/2 t</td></tr>
<tr><td>≦1/5 a</td><td>Crack can’t exceed the half of SP width.</td><td>1/2 t ＜ Z ≦ 2 t</td></tr>
</table>
</td><td rowspan="2">Minor</td></tr>
<tr><td>
8.2 Protrusion over terminal :
8.2.1 Chip on electrode pad :




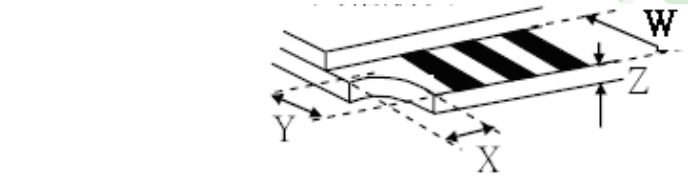


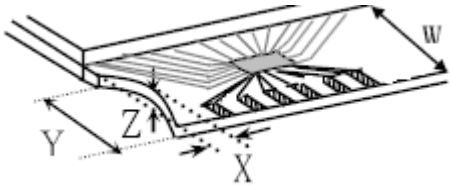
<table>
<tr><th></th><th>X</th><th>Y</th><th>Z</th></tr>
<tr><td>Front</td><td>≦ a</td><td>≦ 1/2 W</td><td>≦ t</td></tr>
<tr><td>Back</td><td>≦ a</td><td>≦ W</td><td>≦ 1/2 t</td></tr>
</table>
</td></tr>
</table>

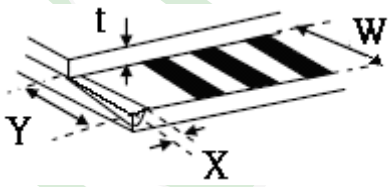
◆Specification For TFT-LCD Module 3.5″ ~15″ : (Ver.B01)

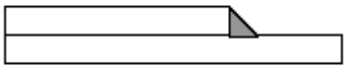
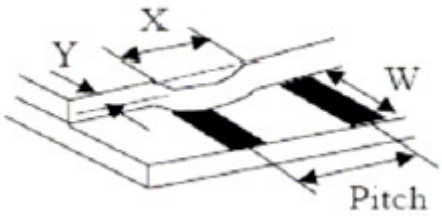
<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td>08</td><td>The crack of glass</td><td>
Symbols :

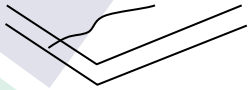
X : The length of crack Y : The width of crack.
Z : The thickness of crack W : terminal length
t : The thickness of glass a : LCD side length

8.2.2 Non-conductive portion :






<table>
<tr><th>X</th><th>Y</th><th>Z</th></tr>
<tr><td>≦ 1/3 a</td><td>≦ W</td><td>≦t</td></tr>
</table>
⊙ If the chipped area touches the ITO terminal, over 2/3 of
● the ITO must remain and be inspected according to electrode terminal specifications.
8.2.3 Glass remain:



<table>
<tr><th>X</th><th>Y</th><th>Z</th></tr>
<tr><td>≦ a</td><td>≦ 1/3 W</td><td>≦t</td></tr>
</table>
8.2.4 Cracking

Not Allowed
</td><td>Minor</td></tr>
</table>

◆Specification For TFT-LCD Module 3.5″ ~15″ : (Ver.B01)

NO	Item	Criterion	Level
09	Backlight elements	9.1 Backlight can't work normally.	Major
		9.2 Backlight doesn't light or color is wrong.	Major
		9.3 Illumination source flickers when lit.	Major
10	General appearance	10.1 Pin type、quantity、dimension must match type in structure diagram.	Major
		10.2 No short circuits in components on PCB or FPC.	Major
		10.3 Parts on PCB or FPC must be the same as on the production characteristic chart. There should be no wrong parts , missing parts or excess parts.	Major
		10.4 Product packaging must the same as specified on packaging specification sheet.	Minor
		10.5 The folding and peeled off in polarizer are not acceptable.	Minor
		10.6 The PCB or FPC between B/L assembled distance (PCB or FPC) is ≦1.5 mm.	Minor

4. RELIABILITY TEST

4.1 Reliability Test Condition (Ver.B01)

NO.	TEST ITEM	TEST CONDITION
1	High Temperature Storage Test	Keep in +80 ±2℃ 240 hrs.
2	Low Temperature Storage Test	Keep in -30 ±2℃ 240 hrs.
3	High Temperature / High Humidity Storage Test	Keep in +60℃ / 90% R.H duration for 240 hrs.
4	Temperature Cycling Storage Test	-30℃ → +25℃ → +80℃ → +25℃ (30mins) (5mins) (30mins) (5mins) 10 Cycle Surrounding temperature, then storage at normal condition 4hrs.
5	ESD Test	Air Discharge: Apply 2 KV with 5 times Discharge for each polarity +/- ; Contact Discharge: Apply 250 V with 5 times discharge for each polarity +/- 1. Temperature ambiance : 15℃～35℃ 2. Humidity relative : 30%～60% 3. Energy Storage Capacitance(Cs+Cd) : 150pF±10% 4. Discharge Resistance(Rd) : 330Ω±10% 5. Discharge, mode of operation: Single Discharge (time between successive discharges at least 1 sec) (Tolerance if the output voltage indication : ±5%)
6	Vibration Test (Packaged)	1. Sine wave 10～55 Hz frequency (1 min/sweep) 2. The amplitude of vibration :1.5 mm 3. Each direction (X、Y、Z) duration for 2 Hrs.
7	Drop Test (Packaged)	Packing Weight (Kg) / Drop Height (cm): 0 ~ 45.4 / 122; 45.4 ~ 90.8 / 76; 90.8 ~ 454 / 61; Over 454 / 46 Drop Direction :※1 corner / 3 edges / 6 sides each 1time

◎Result Evaluation Criteria :

Under the display quality test conditions with normal operations with normal operation state. Do not change these conditions as such changes may affect practical display function.

(Normal operation state)

Temperature：+20~30℃

Humidity：50~70%

Atmospheric pressure：86~106Kpa

5. PRECAUTION RELATING PRODUCT HANDLING

5.1 SAFETY

5.1.1 If the LCD panel breaks, be careful not to get the liquid crystal to touch your skin.

5.1.2 If the liquid crystal touches your skin or clothes, please wash it off immediately by using soap and water.

5.2 HANDLING

5.2.1 Avoid any strong mechanical shock which can break the glass.

5.2.2 Avoid static electricity which can damage the CMOS LSI—When working with the module, be sure to ground your body and any electrical equipment you may be using.

5.2.3 Do not remove the panel or frame from the module.

5.2.4 The polarizing plate of the display is very fragile. So, please handle it very carefully, do not touch, push or rub the exposed polarizing with anything harder than an HB pencil lead (glass, tweezers, etc.)

5.2.5 Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the surface of plate.

5.2.6 Do not touch the display area with bare hands, this will stain the display area.

5.2.7 Do not use ketonics solvent & aromatic solvent. Use with a soft cloth soaked with a cleaning naphtha solvent.

5.2.8 To control temperature and time of soldering is 320±10℃and 3-5 sec.

5.2.9 To avoid liquid (include organic solvent) stained on LCM.

5.3 STORAGE

5.3.1 Store the panel or module in a dark place where the temperature is 25℃ ±5℃ and the humidity is below 65% RH.

5.3.2 Do not place the module near organics solvents or corrosive gases.

5.3.3 Do not crush, shake, or jolt the module.

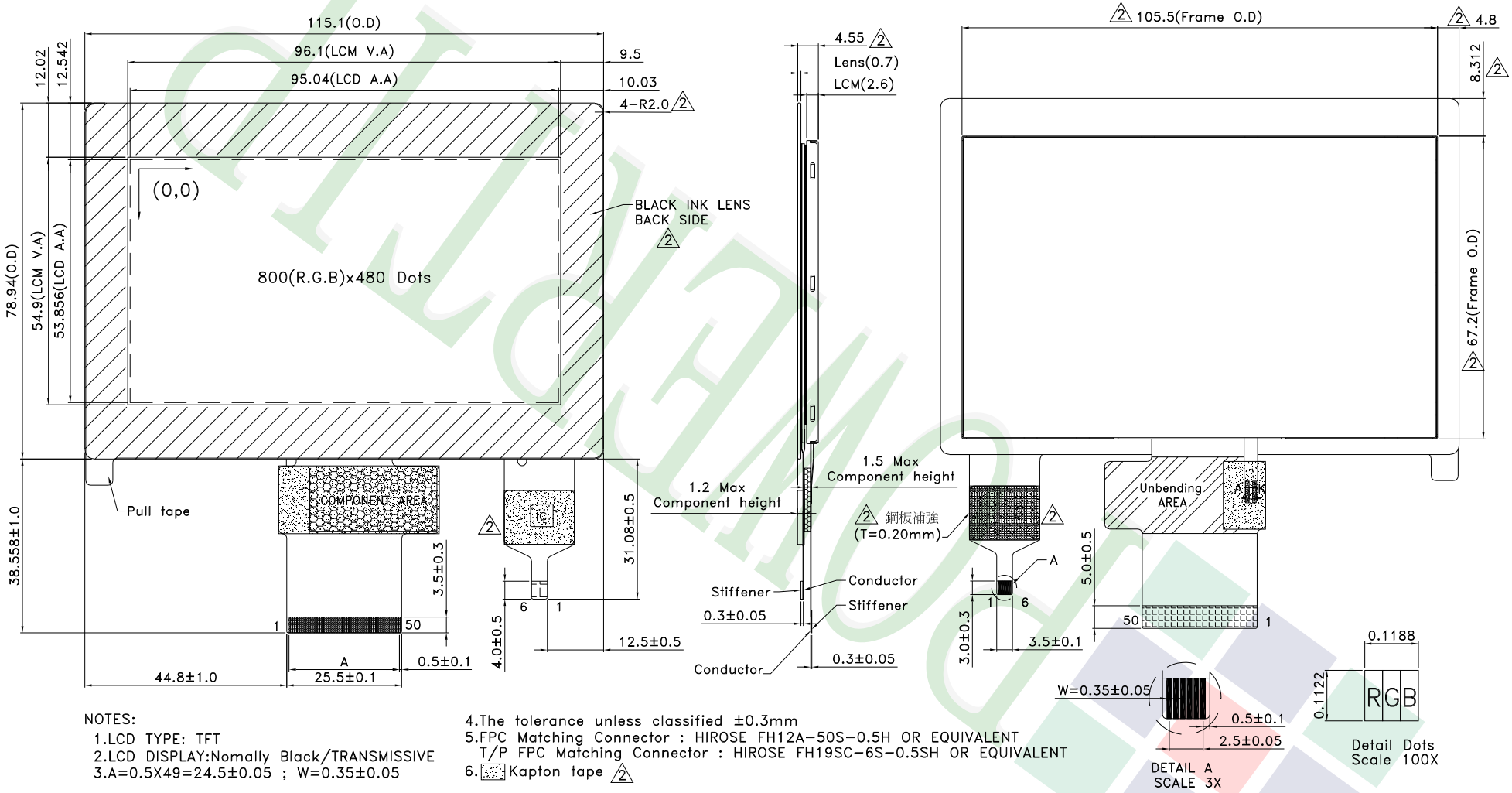
5.4 TERMS OF WARRANTY

5.4.1 Applicable warrant period

The period is within thirteen months since the date of shipping out under normal using and storage conditions.

5.4.2 Unaccepted responsibility

This product has been manufactured to your company's specification as a part for use in your company's general electronic products. It is guaranteed to perform according to delivery specifications. For any other use apart from general electronic equipment, we cannot take responsibility if the product is used in nuclear power control equipment, aerospace equipment, fire and security systems or any other applications in which there is a direct risk to human life and where extremely high levels of reliability are required.



NOTES:

1.LCD TYPE: TFT
2.LCD DISPLAY:Nomally Black/TRANSMISSIVE
3.A=0.5X49=24.5±0.05 ; W=0.35±0.05
4.The tolerance unless classified ±0.3mm
5.FPC Matching Connector : HIROSE FH12A-50S-0.5H OR EQUIVALENT
T/P FPC Matching Connector : HIROSE FH19SC-6S-0.5SH OR EQUIVALENT
6. Kapton tape

REV	REV BY	REVISER	DATE
007			
006			
005			
004			
003			
002	Add TP label & Kapton tape	Kevin Lin	2019/07/30
001	NEW DRAWING	Kevin Lin	2019/07/19

PART NO: PH800480T028-ZFC

DRAWING NAME : LMD-PH800480T028-ZFC

TITLE: LCD MODULE DRAWING

久正光電股份有限公司
POWERTIP TECHNOLOGY CORPORATION

Design	Kevin Lin	(3)	Surface	
Check	Clare	Unit	MM	Material
Approve	Rex	Scale	1:1.1	Thickness
		Page	1/1	Quantity

Precision Level	Length(Min) (mm)	Tolerance
-	1 ~ 4	
-	4 ~ 16	
-	16 ~ 63	
-	63 ~ 250	
-	250 ~ 1000	

PT-A-054-01

Ver.001		LCM包裝規格書	Approve	Check	Contact
Documents NO.	PKG-PH800480T028-ZFC	LCM Packaging Specifications	Rex	Clare	Kevin Lin

1.包裝材料規格表(Packaging Material) : (per carton)

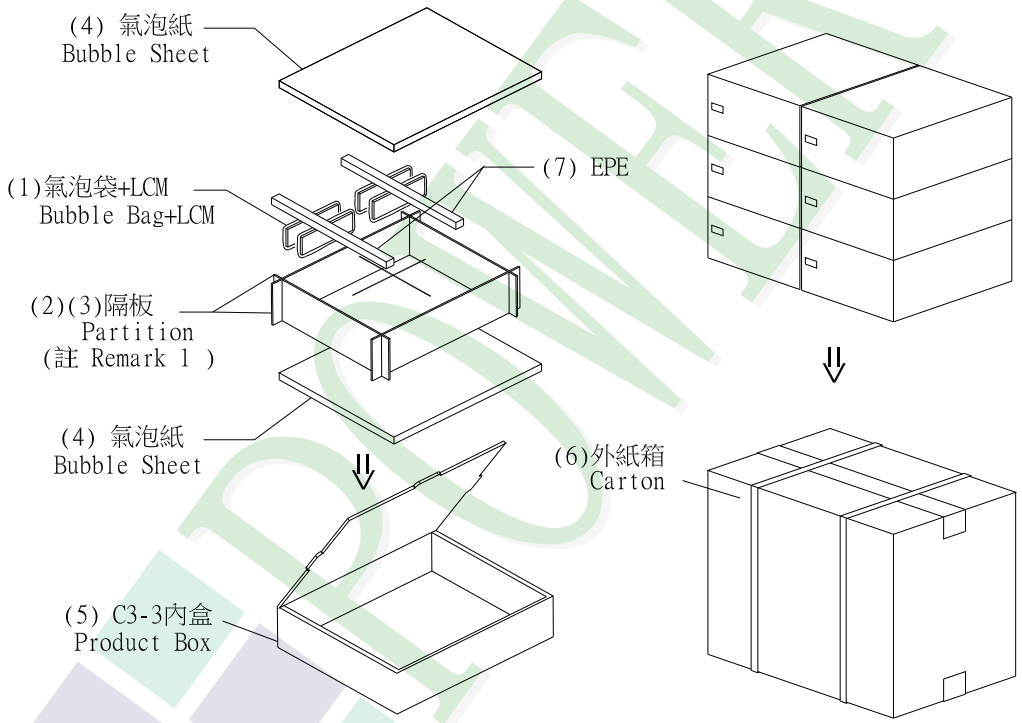
No.	Item	Model	Dimensions (mm)	1Pcs Weight	Quantity	Total Weight
1	成品 (LCM)	PH800480T028-ZFC	115.1X78.94X4.55	0.065	144	9.36
2	氣泡袋(1)Bubble Bag	BAG0000000005	150 X 120	0.002	144	0.288
3	A7隔板(2)A7 Partition	BX29500010BZBA	295 X 105 X 3	0.0169	78	1.3182
4	B7隔板(3)B7 Partition	BX24500010BZBA	245 X 105 X 3	0.0137	18	0.2466
5	氣泡紙(4)Bubble Sheet	BAG280240BWABA	280 X 240	0.006	12	0.072
6	C3-3內盒(5)Product Box	BX31025511AABA	310 X 255 X 116	0.17	6	1.02
7	外紙箱(6)Carton	BX52732536CCBA	527 X 325 X 360	0.83	1	0.83
8	EPE(7)EPE	OTFOAMEP0005BA	333 X 218 X 20	0.006	1	0.006
9						

2.一 整箱總重量 (Total LCD Weight in carton) : 13.14 Kg±10% 取小數2位

3.單箱數量規格表(Packaging Specifications and Quantity) :

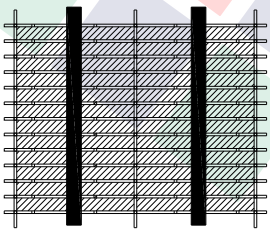
(1)Quantity Of Spacer : A7隔板13 X , B7隔板 X 3

(2)Total LCM quantity in carton : quantity per box 24 x no of boxes 6 = 144



特 記 事 項 (REMARK)

1. LCM排放示意圖(前後間隔不放置):
1. LCM placed as figure showing:
(First and last slot should be empty)



模組(LCM) X 1pcs. EPE(7) X 1pcs.

2. EPE(7)裁切218X25X20mm約12條，
1內盒使用2條，阻止產品滑動。