



SPECIFICATIONS

CUSTOMER : CDE012

SAMPLE CODE : SH800480T032-ZHA07

MASS PRODUCTION CODE : PH800480T032-ZHA07

SAMPLE VERSION : 01

SPECIFICATIONS EDITION : 002

DRAWING NO. (Ver.) : LMD-PH800480T032-ZHA07 (Ver.002)

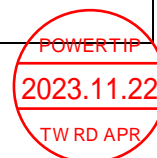
PACKAGING NO. (Ver.) : PKG-PH800480T032-ZHA07 (Ver.001)

Customer Approved

Date:

Approved	Checked	Designer
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- ☐ Preliminary specification for design input
- ☒ Specification for sample approval



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History of Version

<u>Date</u> (mm / dd / yyyy)	<u>Ver.</u>	<u>Edi.</u>	<u>Description</u>	<u>Page</u>	<u>Design by</u>
11/17/2023	01	001	Preliminary.	-	Yuan
11/22/2023	01	002	Frist Sample ADD DIM	- Appendix	Yuan

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1. SPECIFICATIONS

1.1 Features

<u>Item</u>	<u>Standard Value</u>
Display Resolution	800 *3 (RGB) * 480 Dots
LCD Type	IPS, Normally Black, Transmissive type
Screen size(inch)	7 inch
Surface treatment	Anti-Glare
Color configuration	R.G.B. Vertical Stripe
Weight	186g
Interface	Parallel RGB (Data), SPI (Configuration), DE mode
Driver IC	Himax---HX8249-A02 Himax---HX8678-C
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

<u>Item</u>	<u>Standard Value</u>	<u>Unit</u>
Outline Dimension	164.4 (W) * 105.9 (L) * 5.7 (H)	mm

LCD panel

<u>Item</u>	<u>Standard Value</u>	<u>Unit</u>
View Area	153.40 (W) * 92.44 (L)	mm
Active Area	152.40 (W) * 91.44 (L)	mm

Note: For detailed information please refer to LCM drawing.

1.3 Absolute Maximum Ratings

Module

Item	Symbol	Condition	Min.	Max.	Unit	Remark
Power Supply for TFT Panel	V _{DD}	GND=0V	-0.3	3.96	V	-
Power Supply for Backlight Unit	V _{CC}	GND=0V	-0.3	+20.0	V	
Operating Temperature	T _{OP}	-	-20	+70	°C	
Storage Temperature	T _{ST}	-	-30	+80	°C	

The absolute maximum rating values of this product are not allowed to be exceeded at any time. 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.

Note 1: Ts is the temperature of panel's surface

Note 2: Ta is the ambient temperature of samples

1.4 DC Electrical Characteristics

Module

GND = 0V, Ta = 25°C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply for TFT Panel	V _{DD}	GND=0V	3.0	3.3	3.6	V
Power Supply for Backlight Unit	V _{CC}	GND=0V	5	12	15	V
Input Voltage for TFT Panel	V _{IH}	GND=0V	0.7V _{DD}	-	V _{DD}	V
	V _{IL}	GND=0V	0	-	0.3V _{DD}	
Supply Current for TFT Panel	I _{DD}	I _{DD} @V _{DD} =3.3V	-	30	45	mA
Supply Current for Backlight Unit	I _{CC}	I _{CC} @V _{CC} =5V	-	0.8	1.2	A
Supply Current for Backlight Unit	I _{CC}	I _{CC} @V _{CC} =12V	-	0.3	0.45	
Input Voltage for PWM Signal	V _{PH}	GND=0V	1.2	-	-	V
	V _{PL}	GND=0V	-	-	0.4	V
Dimming Clock Rate	f _P	GND=0V	0.1	-	8	KHz

1.5 Optical Characteristics

VDD=3.3V, Ta=25°C

Item	Symbol		Condition	Min.	Typ.	Max.	unit	
Response time	Tr+Tf		Ta = 25°C θX, θY = 0°	-	30	45	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°C θX, θY = 0°	650	800	-	-	Note 3
Color of CIE Coordinate (With B/L)	White	X		0.25	0.30	0.35	-	Note1
		Y		0.29	0.34	0.39		
	Red	X		0.59	0.64	0.69		
		Y		0.30	0.35	0.40		
	Green	X		0.26	0.31	0.36		
		Y		0.59	0.64	0.69		
	Blue	X		0.08	0.13	0.18		
		Y		0.01	0.06	0.11		
Average Brightness Pattern=white display (With LCD)*1	IV		VCC=12.0V PWM="High" (Duty=100%)	800	1000	-	cd/m ²	Note1
Uniformity (With LCD)*2	ΔB		VCC=12.0V PWM="High" (Duty=100%)	70	-	-	%	Note1

Note 1:

*1: $\Delta B = B(\min) / B(\max) * 100\%$

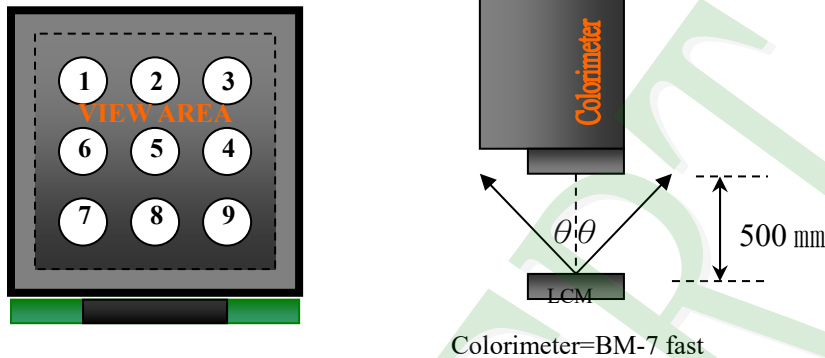
*2: Measurement Condition for Optical Characteristics:

a: Environment: $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ / $60 \pm 20\%$ R.H, no wind, dark room below 10 Lux at typical lamp current and typical operating frequency

b: Measurement Distance: 500 ± 50 mm, ($\theta = 0^{\circ}$)

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 $\pm 4\%$



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)

Note 2: Definition of response time:

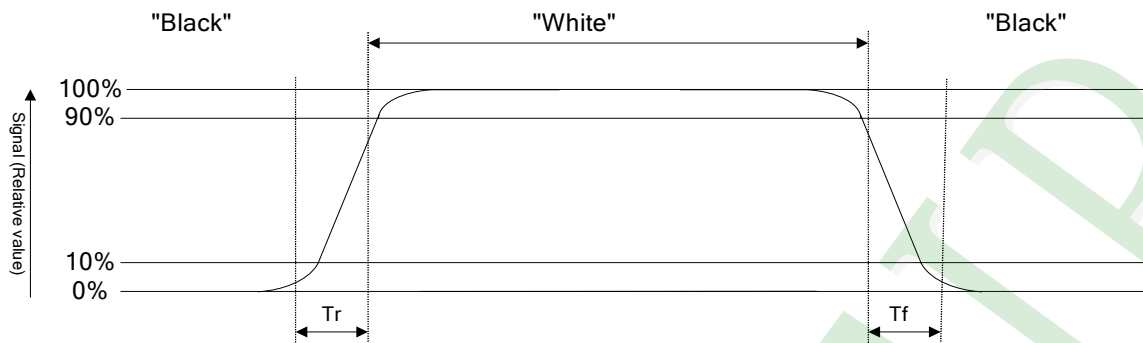
The output signals of photo detector are measured when the input signals are changed from "black" to "white" (falling time) and from "white" to "black" (rising time), respectively. The response time is defined as the time interval between the 10% and 90% of Amplitudes.

Refer to figure as below:

Normally White



Normally Black



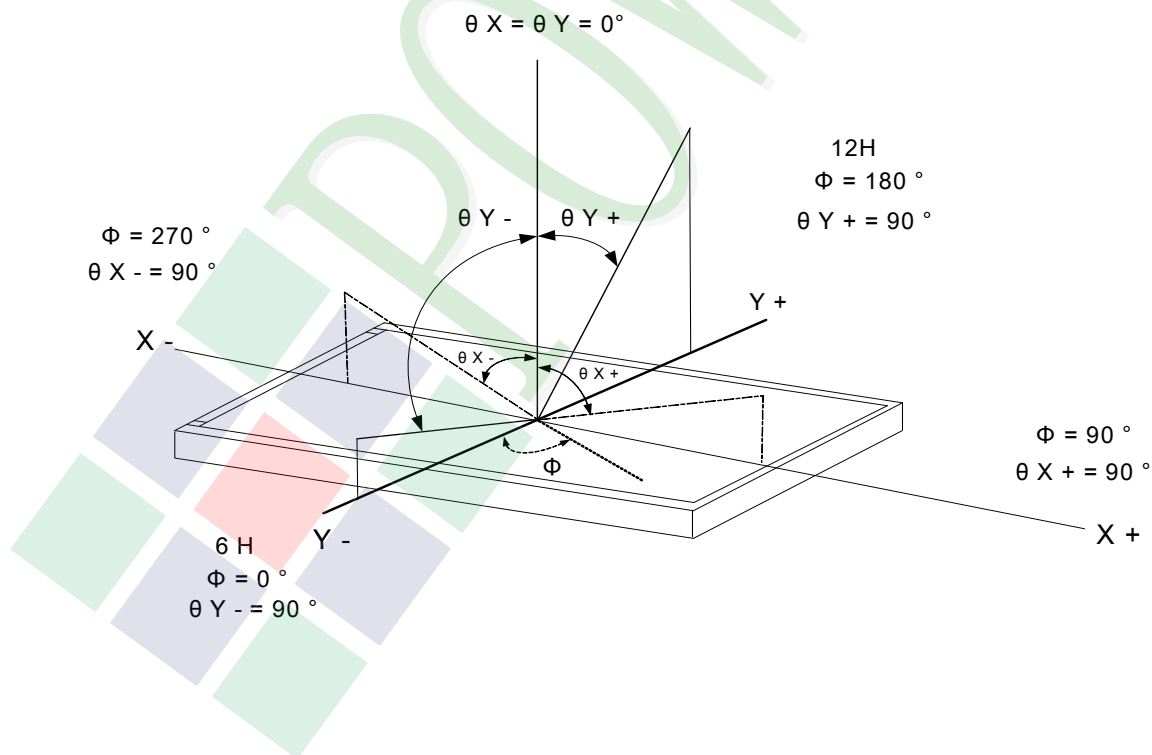
Note 3: Definition of contrast ratio:

Contrast ratio is calculated with the following formula

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

Note 4: Definition of viewing angle:

Refer to figure as below:



1.6 Backlight Characteristics

Maximum Ratings

<u>Item</u>	<u>Symbol</u>	<u>Min.</u>	<u>Max.</u>	<u>Unit</u>	<u>Remark</u>
LED Forward Current	I_F	-	600	mA	Per
LED Reverse Voltage	V_R	-	1.2	V	

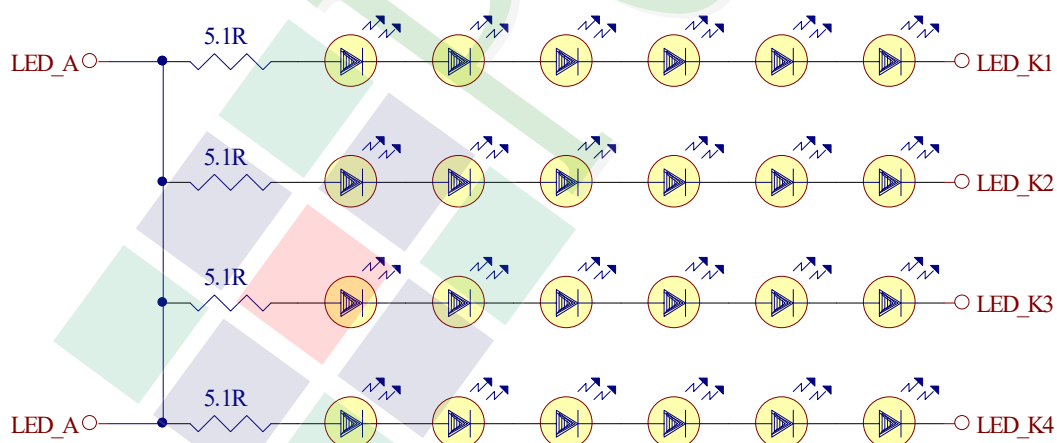
Electrical / Optical Characteristics

<u>Item</u>	<u>Symbol</u>	<u>Min.</u>	<u>Typ.</u>	<u>Max.</u>	<u>Unit</u>	<u>Remark</u>
LED Voltage	V_L	14.9	16.6	19.1	V	Note1
LED Current	I_L	-	200	-	mA	-
LED life time	-	50,000	-	-	Hr	Note2

Note 1: The LED Supply Voltage is defined by the number of LED at $T_a=25^{\circ}\text{C}$ and $I_L=200\text{ mA}$

Note 2: The “LED life time” is defined as the module brightness decrease to 50% original brightness at

$T_a=25^{\circ}\text{C}$ and $I_L=200\text{ mA}$. The LED life time could be decreased if operating I_L is larger than 200mA



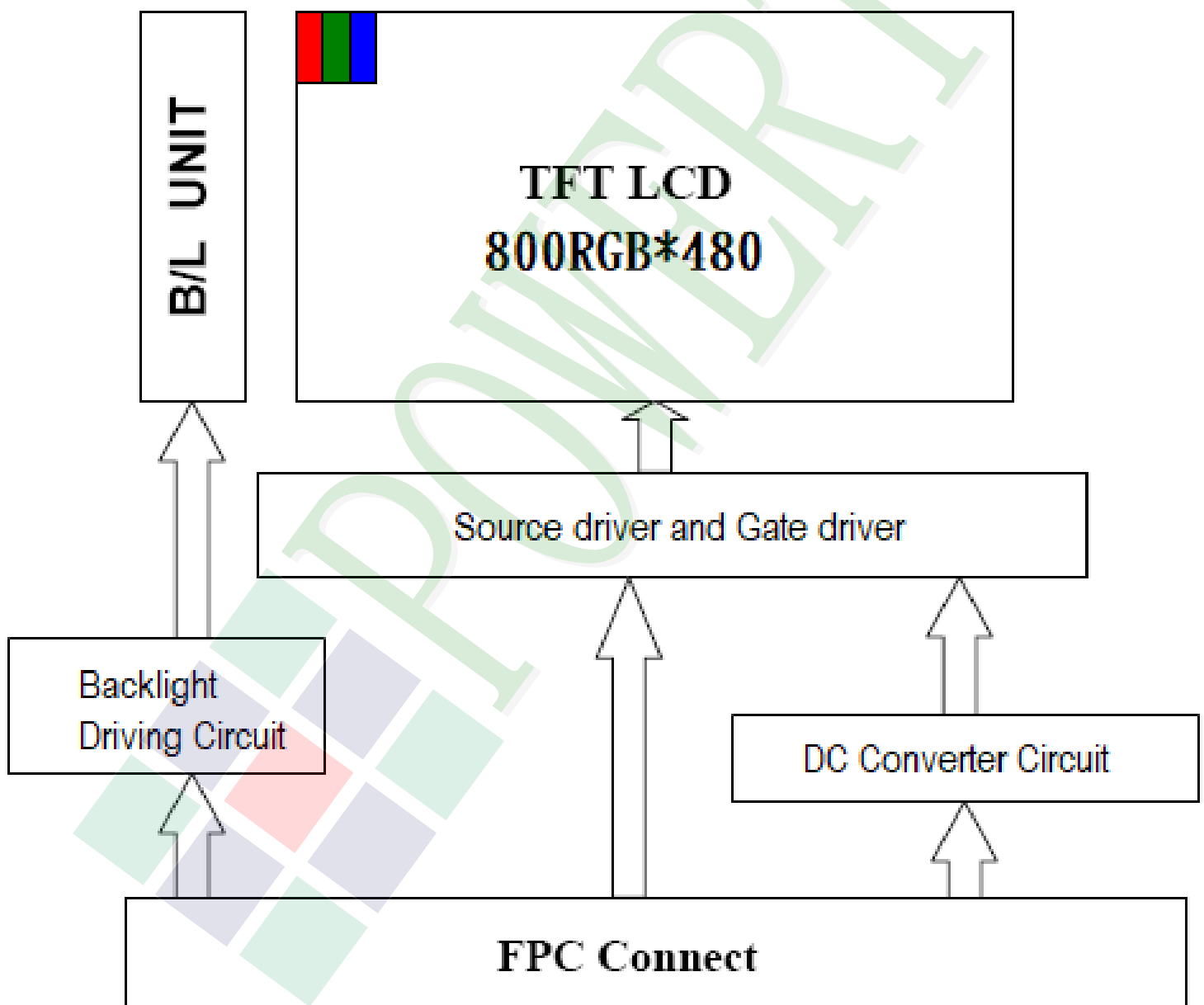
2. Module Structure

2.1 Counter Drawing

2.1.1 LCM Mechanical Diagram

* See Appendix

2.1.2 Block Diagram



2.2 Interface Pin Description

TFT LCM Interface

<u>Pin#</u>	<u>Name</u>	<u>Description</u>
1	GND	Power ground.
2	VDD	Power for Digital Circuit.
3	VDD	Power for Digital Circuit.
4	VCC	Power For LED backlight.
5	VCC	Power For LED backlight.
6	PWM	Shutdown & Dimming control input for backlight. Do not allow this pin to float. "Hi" =100%, "Low" = 0%.
7	GND	Power ground.
8	R0	Red Data.
9	R1	Red Data.
10	R2	Red Data.
11	R3	Red Data.
12	GND	Power ground.
13	R4	Red Data.
14	R5	Red Data.
15	R6	Red Data.
16	R7	Red Data.
17	GND	Power ground.
18	G0	Green Data.
19	G1	Green Data.
20	G2	Green Data.
21	G3	Green Data.
22	GND	Power ground.
23	G4	Green Data.
24	G5	Green Data.
25	G6	Green Data.
26	G7	Green Data.
27	GND	Power ground.
28	B0	Blue Data.
29	B1	Blue Data.

Pin#	Name	Description
30	B2	Blue Data.
31	B3	Blue Data.
32	GND	Power ground.
33	B4	Blue Data.
34	B5	Blue Data.
35	B6	Blue Data.
36	B7	Blue Data.
37	GND	Power ground.
38	HS	Line synchronization signal. Horizontal Sync Input.
39	VS	Frame synchronization signal. Vertical Sync Input.
40	GND	Power ground.
41	DE	Data Enable
42	GND	Power ground.
43	DCLK	Sample clock. Data will be latched at the falling edge of DCLK.
44	GND	Power ground.
45	CS / ID1	Serial communication chip selection/ID[4:1]These pins select LCM type. See NOTE1
46	SDIN / ID2	Serial communication data/ ID[4:1]These pins select LCM type. See NOTE1
47	SCK / ID3	Serial communication clock/ ID[4:1]These pins select LCM type. See NOTE1
48	DISPLAY CONTROL / ID4	Display Enable(Hi Active)./ ID[4:1]These pins select LCM type. See NOTE1
49	/RESET	Global Reset (Low Active).
50	GND	Power ground.

Note1:

ID Pins Definition:

	PIN 45 ID1	PIN 46 ID2	PIN 47 ID3	PIN 48 ID4
3.5" Module	X	0	0	X
4.3" Module	X	1	0	X
5.0" Module	X	0	1	X
7.0" Module	X	1	1	X

1. Resistor = 10k ohm

2. "X" = No use

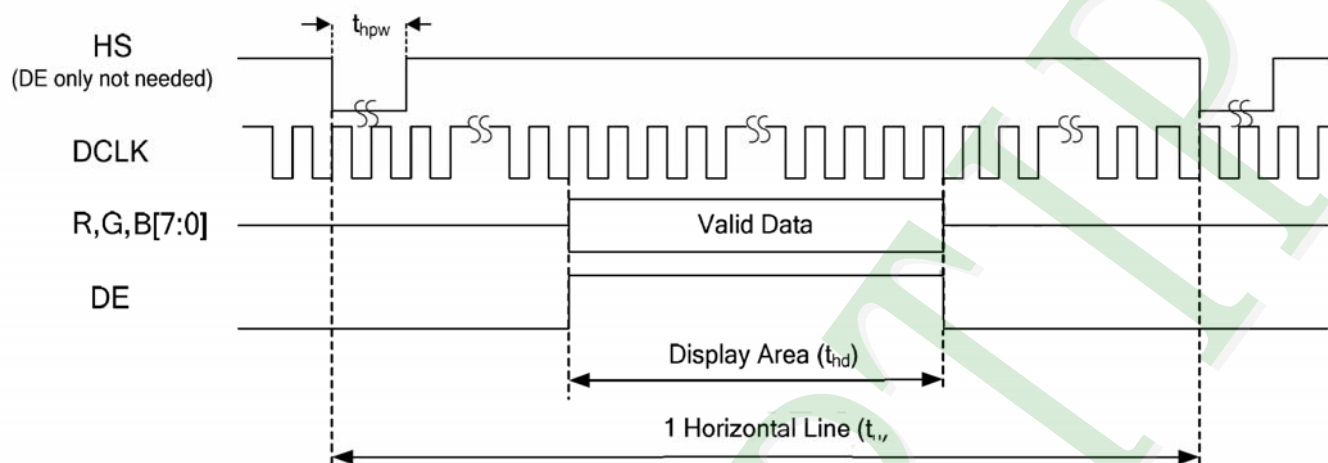
2.3 Timing Characteristics

2.3.1 RGB Mode Selection Table

RGB Mode Selection Table	DCLK	HSYNC	VSYNC	DE
DE Mode	Input	GND	GND	Input

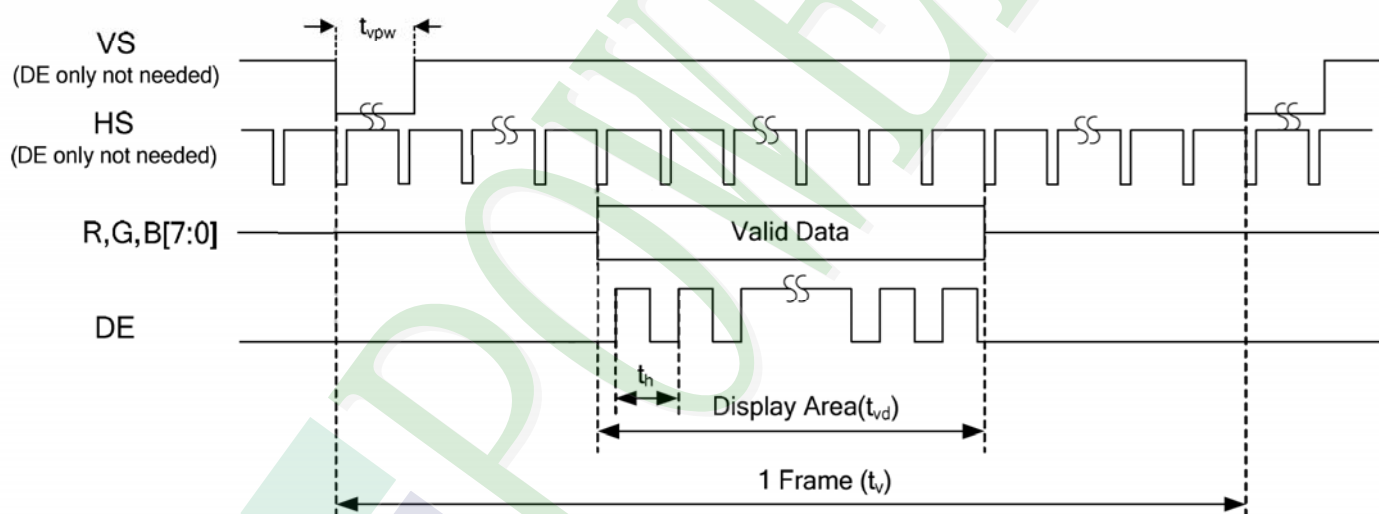
2.3.2 Parallel RGB DE Mode

• Horizontal



Horizontal input timing at DE only mode

• Vertical



Vertical input timing at DE only mode

2.3.3 Parallel 24-bit RGB Input Timing

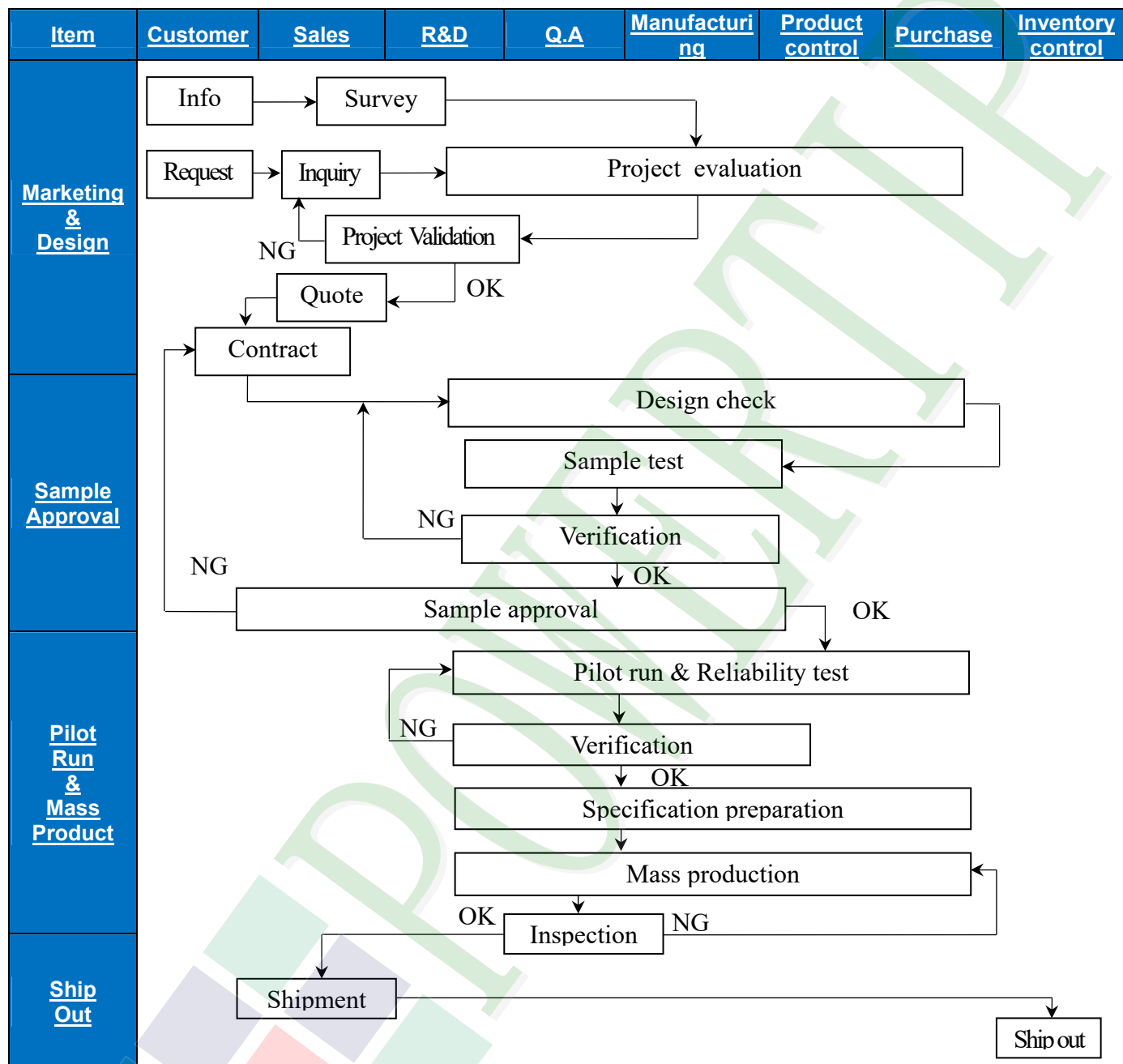
Item	Symbol	Min	Typ.	Max	Unit	Note
DCLK Frequency	FDCLK	25.2	27.2	30.5	MHz	-
Horizontal valid data	thd	800			-	-
1 horizontal line	th	856	860	920	DCLK	-
Vertical valid data	tvd	480			-	-
1 vertical field	tv	490	528	552	H	-

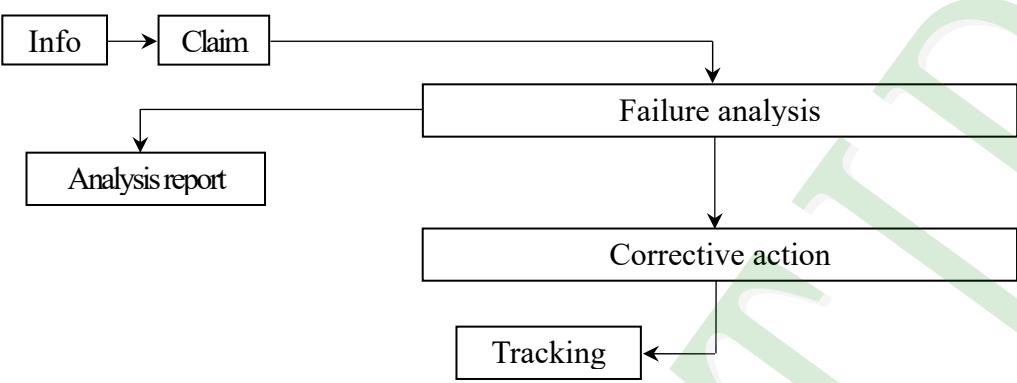
Note:

- (1) thd is same to Hactive, and tvd is same to Vactive in chapter 5.1.
- (2) DCLK frequency min/max value is base on frame rate 60 Hz

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	 <pre> graph TD Info[Info] --> Claim[Claim] Claim --> Failure[Failure analysis] Failure --> Analysis[Analysis report] Failure --> Corrective[Corrective action] Corrective --> Tracking[Tracking] </pre>							
Q.A Activity	<ol style="list-style-type: none"> 1. ISO 9001 Maintenance Activities 2. Process improvement proposal 3. Equipment calibration 4. Education And Training Activities 5. Standardization Management 							

3.2 Inspection Specification

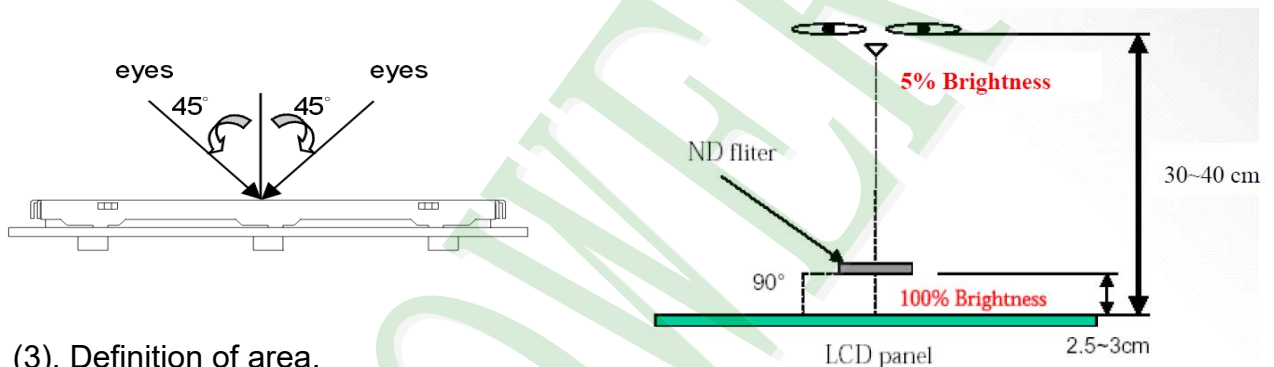
- ◆Scope: The document shall be applied to TFT-LCD Module for 3.5"-15" (Ver.B01).
- ◆Inspection Standard: MIL-STD-105E Table Normal Inspection Single Sampling Level II.
- ◆Equipment: Gauge, MIL-STD, Powertip Tester, Sample
- ◆Defect Level: Major Defect AQL: 0.4; Minor Defect AQL: 1.5
- ◆OUT Going Defect Level: Sampling
- ◆Standard of the product appearance test:

a. Manner of appearance test:

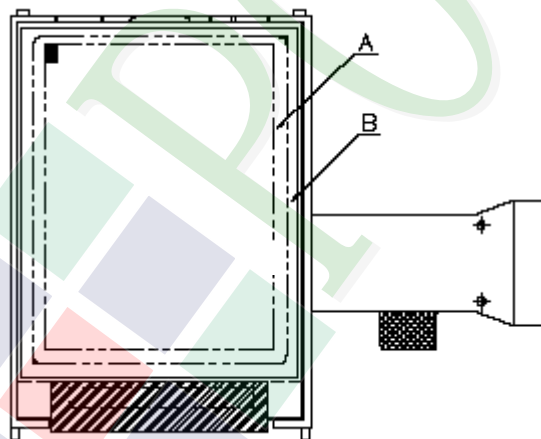
(1). The test best be under 20W×2 fluorescent light(about 300lux ~500lux)

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

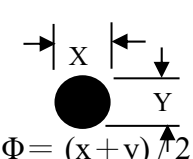
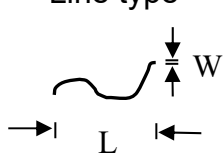
(4). Standard of inspection : (Unit : mm)

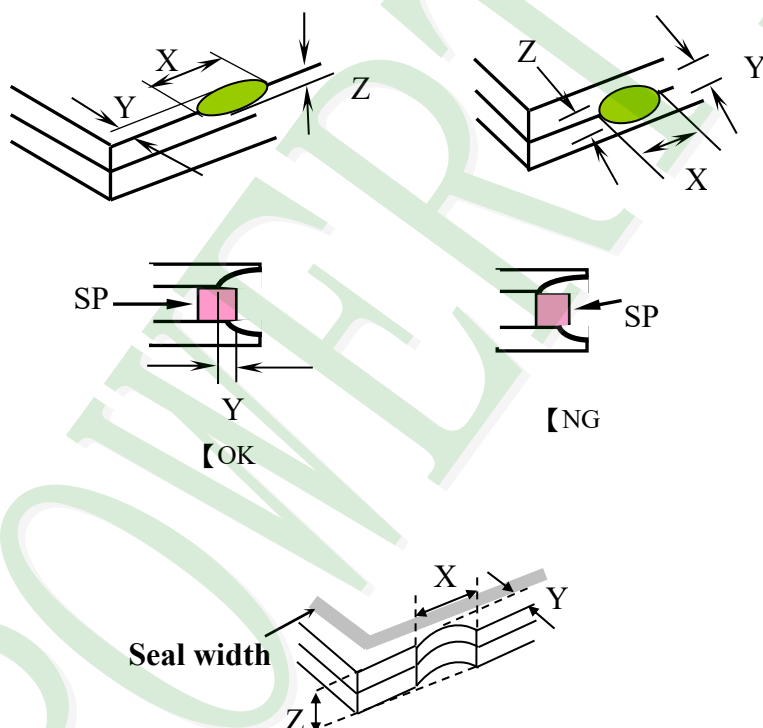
◆Specification For TFT-LCD Module 3.5"~15":

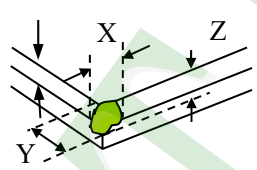
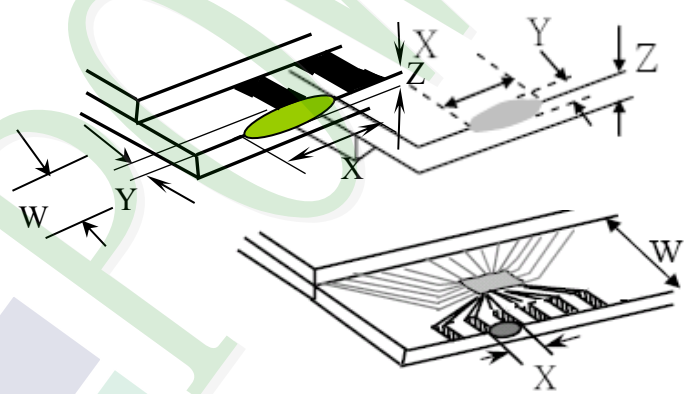
(Ver.B01)

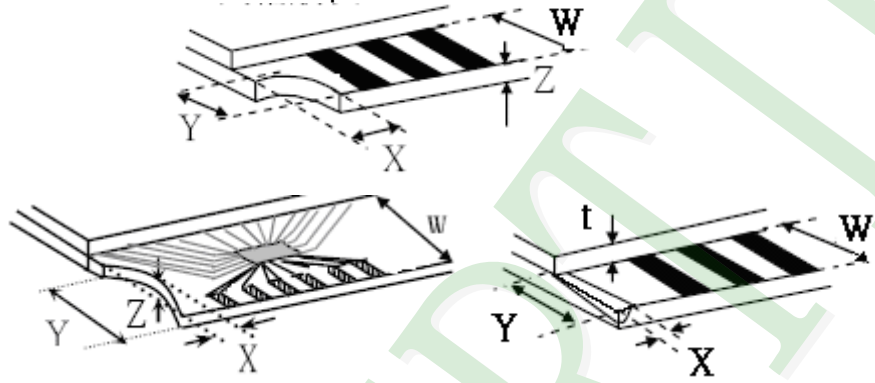
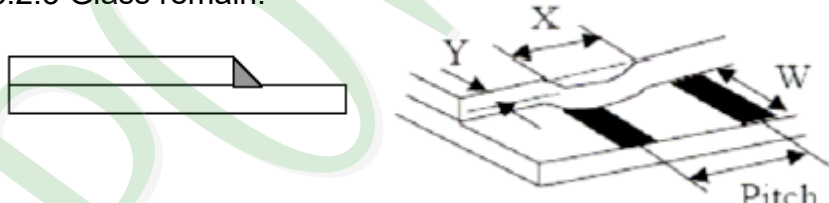

Specification for 11.1 LED Module size 10.1 (10.2017)

NO	Item	Criterion	Level												
01	Product condition	1.1 The part number is inconsistent with work order of production.	Major												
		1.2 Mixed product types.	Major												
		1.3 Assembled in inverse direction.	Major												
02	Quantity	2.1 The quantity is inconsistent with work order of production.	Major												
03	Outline dimension	3.1 Product dimension and structure must conform to structure diagram.	Major												
04	Electrical Testing	4.1 Missing line character and icon.	Major												
		4.2 No function or no display.	Major												
		4.3 Display malfunction.	Major												
		4.4 LCD viewing angle defect.	Major												
		4.5 Current consumption exceeds product specifications.	Major												
		4.6 Mura cannot be seen through 5% ND filter at 50% Gray, should be judged by the viewing angle of 90 degree.	Minor												
05	Dot defect (Bright dot, Dark dot) On -display	<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>	Item		Acceptance (Q'ty)	Dot Defect	Bright Dot	≤ 4	Dark Dot	≤ 5	Joint Dot	≤ 3	Total	≤ 7	Minor
		Item		Acceptance (Q'ty)											
Dot Defect	Bright Dot	≤ 4													
	Dark Dot	≤ 5													
	Joint Dot	≤ 3													
	Total	≤ 7													
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 : Dots appear bright and unchanged in visible with 5% ND filter is defined. 5.5 Tiny bright dot: bright dot area ≤ 1/2 dot. a. Dots appear bright and unchanged in visible with 5% ND filter is defined defect and is judged in accordance with 6.1 b. Dots invisible with 5% ND Filter is Ignored															

NO	Item	Criterion	Level																																																					
06	<p>Black or white Dot, scratch, contamination</p> <p>Round type</p>  <p>Φ = (x + y) * 2</p> <p>Line type</p> 	<p>6.1 Round type (Non-display or display):</p> <table><thead><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></thead><tbody><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></tbody></table> <p>6.2 Line type(Non-display or display):</p> <table><thead><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></thead><tbody><tr><td rowspan="5">3.5" to less 9"</td><td>---</td><td>W ≤ 0.03</td><td>Ignore</td><td rowspan="4">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><td></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></tbody></table>	Dimension (diameter: Φ)	Acceptance (Q'ty)		A area	B area	Φ ≤ 0.25	Ignore	Ignore	0.25 < Φ ≤ 0.50	5	Φ > 0.50	0	Total	5	module size	Length (L)	Width (W)	Acceptance (Q'ty)		A area	B area	3.5" to less 9"	---	W ≤ 0.03	Ignore	Ignore	L ≤ 10.0	0.03 < W ≤ 0.05	4	L ≤ 5.0	0.05 < W ≤ 0.10	2	---	W > 0.10	As round type	Total		5		9" to 15"	---	W ≤ 0.05	Ignore	Ignore	L ≤ 10.0	0.05 < W ≤ 0.10	5	---	W > 0.10	As round type	Total		5	Minor
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07	Polarizer Bubble	<table><thead><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></thead><tbody><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></tbody></table>	Dimension (diameter: Φ)	Acceptance (Q'ty)		A area	B area	Φ ≤ 0.25	Ignore	Ignore	0.25 < Φ ≤ 0.50	4	0.50 < Φ ≤ 0.80	1	Φ > 0.80	0	Total	5	Minor																																					
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Total	5																																																							

NO	Item	Criterion	Level						
08	The crack of glass	<p>Symbols :</p> <p>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</p> <p>8.1 General glass chip: 8.1.1 Chip on panel surface and crack between panels:</p> <div></div>	Minor						
		<table><tr><th>X</th><th>Y</th><th>Z</th></tr><tr><td>$\leq \leq a$</td><td>Crack can't enter viewing area</td><td>$\leq 1/2 t$</td></tr><tr><td>$\leq a$</td><td>Crack can't exceed the half of SP width.</td><td>$1/2 t < Z \leq 2 t$</td></tr></table>		X	Y	Z	$\leq \leq a$	Crack can't enter viewing area	$\leq 1/2 t$
X	Y	Z							
$\leq \leq a$	Crack can't enter viewing area	$\leq 1/2 t$							
$\leq a$	Crack can't exceed the half of SP width.	$1/2 t < Z \leq 2 t$							

NO	Item	Criterion	Level									
08	The crack of glass	<p>Symbols :</p> <p>X: The length of crack Z: The thickness of crack t: The thickness of glass</p> <p>Y: The width of crack. W: terminal length a: LCD side length</p> <p>8.1.2 Corner crack:</p>  <table><thead><tr><th>X</th><th>Y</th><th>Z</th></tr></thead><tbody><tr><td>$\leq 1/5 a$</td><td>Crack can't enter viewing area</td><td>$Z \leq 1/2 t$</td></tr><tr><td>$\leq 1/5 a$</td><td>Crack can't exceed the half of SP width.</td><td>$1/2 t < Z \leq 2 t$</td></tr></tbody></table>	X	Y	Z	$\leq 1/5 a$	Crack can't enter viewing area	$Z \leq 1/2 t$	$\leq 1/5 a$	Crack can't exceed the half of SP width.	$1/2 t < Z \leq 2 t$	Minor
		X	Y	Z								
$\leq 1/5 a$	Crack can't enter viewing area	$Z \leq 1/2 t$										
$\leq 1/5 a$	Crack can't exceed the half of SP width.	$1/2 t < Z \leq 2 t$										
<p>8.2 Protrusion over terminal:</p> <p>8.2.1 Chip on electrode pad:</p>  <table><thead><tr><th></th><th>X</th><th>Y</th><th>Z</th></tr></thead><tbody><tr><td>Front</td><td>$\leq a$</td><td>$\leq 1/2 W$</td><td>$\leq t$</td></tr><tr><td>Back</td><td>$\leq a$</td><td>$\leq W$</td><td>$\leq 1/2 t$</td></tr></tbody></table>		X	Y	Z	Front	$\leq a$	$\leq 1/2 W$	$\leq t$	Back	$\leq a$	$\leq W$	$\leq 1/2 t$
	X	Y	Z									
Front	$\leq a$	$\leq 1/2 W$	$\leq t$									
Back	$\leq a$	$\leq W$	$\leq 1/2 t$									

NO	Item	Criterion	Level									
08	The crack of glass	<p>Symbols:</p> <p>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</p> <hr/>	Minor									
		<p>8.2.2 Non-conductive portion:</p>  <table><thead><tr><th>X</th><th>Y</th><th>Z</th></tr></thead><tbody><tr><td>$\leq 1/3 a$</td><td>$\leq W$</td><td>$\leq t$</td></tr></tbody></table> <p>If the chipped area touches the ITO terminal, over 2/3 of the ITO must remain and be inspected according to electrode terminal specifications.</p> <p>8.2.3 Glass remain:</p>  <table><thead><tr><th>X</th><th>Y</th><th>Z</th></tr></thead><tbody><tr><td>$\leq a$</td><td>$\leq 1/3 W$</td><td>$\leq t$</td></tr></tbody></table> <p>8.2.4 Cracking:</p>  <p>Not Allowed</p>		X	Y	Z	$\leq 1/3 a$	$\leq W$	$\leq t$	X	Y	Z
X	Y	Z										
$\leq 1/3 a$	$\leq W$	$\leq t$										
X	Y	Z										
$\leq a$	$\leq 1/3 W$	$\leq t$										

<u>NO</u>	<u>Item</u>	<u>Criterion</u>	<u>Level</u>
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: 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 ±5℃ 240 hrs											
2	Low Temperature Storage Test	Keep in -30 ±5℃ 240 hrs											
3	High Temperature / High Humidity Storage Test	Keep in 60 °C / 90% R.H duration for 240 hrs (Excluding the polarizer)											
4	Temperature Cycling Storage Test	<div>-30℃ → +25℃ → 80℃ → +25℃</div> <div>(30mins) (5mins) (30mins) (5mins)</div> <div>← 20 Cycle →</div>											
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 ambience: 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)	<table><tr><th>Packing Weight (Kg)</th><th>Drop Height (cm)</th></tr><tr><td>0 ~ 45.4</td><td>122</td></tr><tr><td>45.4 ~ 90.8</td><td>76</td></tr><tr><td>90.8 ~ 454</td><td>61</td></tr><tr><td>Over 454</td><td>46</td></tr></table>		Packing Weight (Kg)	Drop Height (cm)	0 ~ 45.4	122	45.4 ~ 90.8	76	90.8 ~ 454	61	Over 454	46
		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 $320 \pm 10^{\circ}\text{C}$ and 3-5 sec.
- 5.2.9 To avoid liquid (include organic solvent) stained on LCM
- 5.2.10 Caution!(LCM products with Capacitive Touch Panel)
Strong EMI-sources such as switch-mode power supplies (SMPS) can lead to touch malfunction (e.g. ghost-touches).
Therefore, the touch needs to be thoroughly tested inside the target application.
- 5.2.11 CAUTION: Continuously displaying same static image will result in high possibility of image sticking/image burn-in effect due to TFT panel characteristic.
- 5.2.12 Double-sided tape designed to be attach with the customer's mechanical device, please follow up the rules and regulations published by the original manufacturer of double-sided tape for the attachment operation.

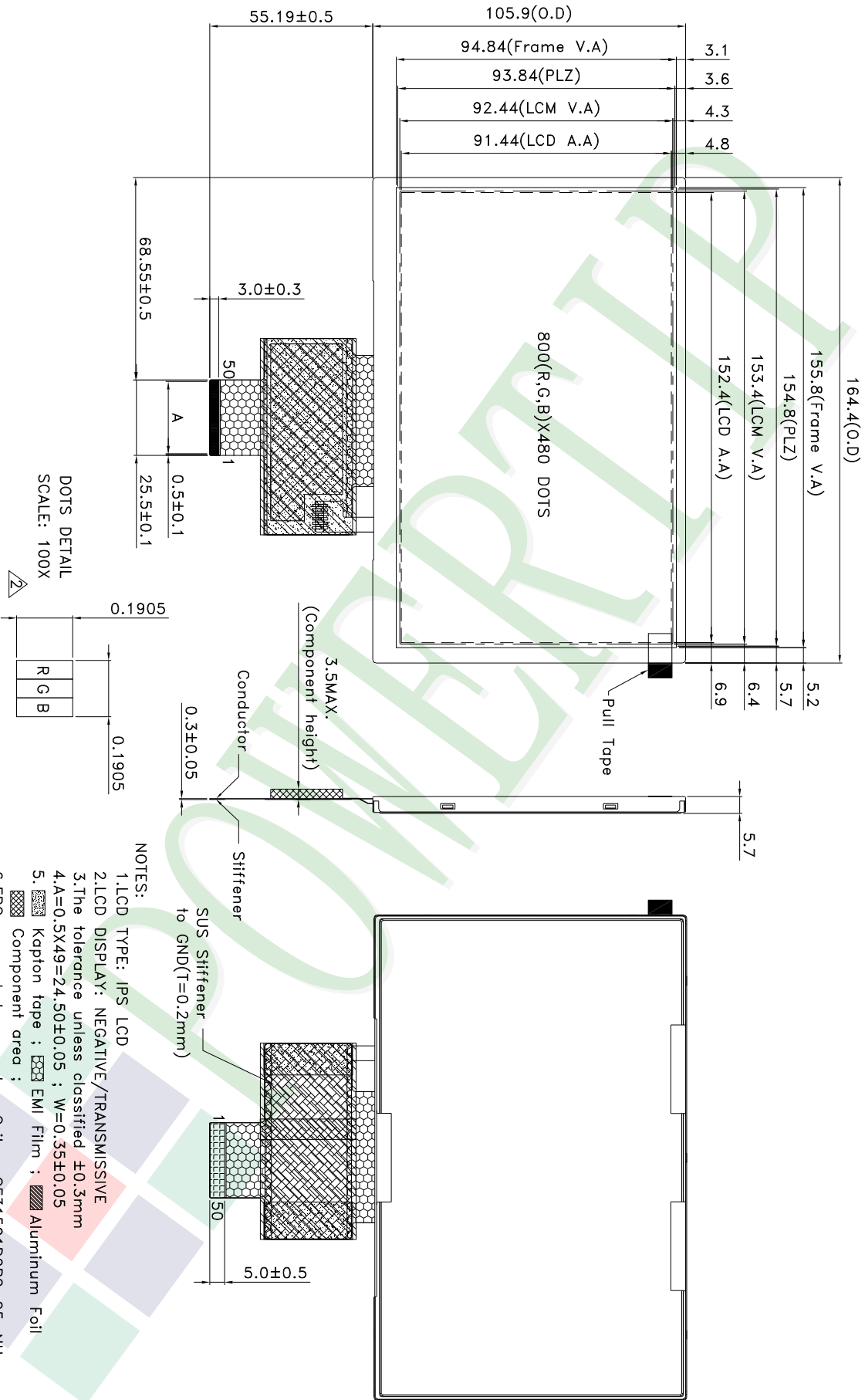
5.3 STORAGE

- 5.3.1 Store the panel or module in a dark place where the temperature is $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 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.

A	B	C	D	E	F	G	H
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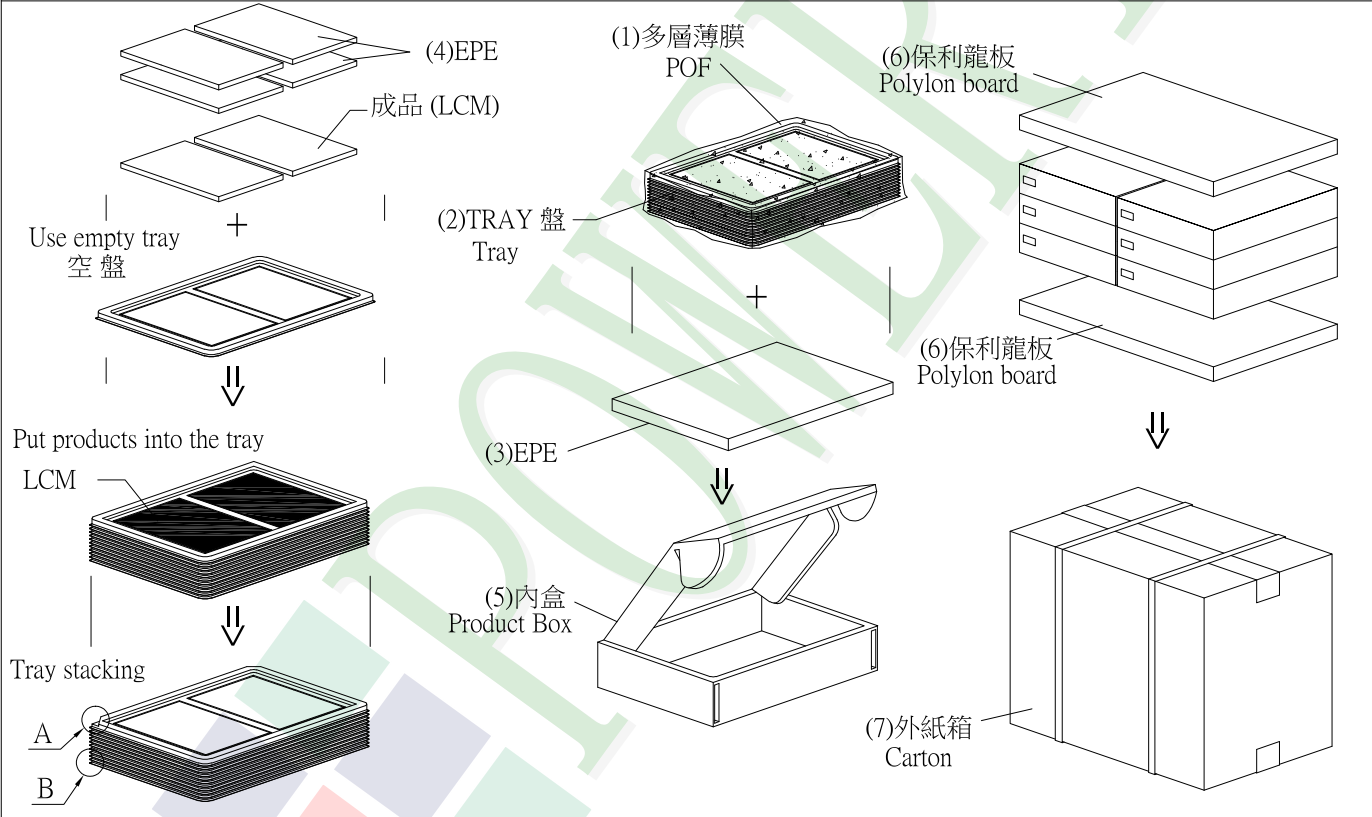


007				PART NO:	PH800480T032-ZHA07	Design	Tina	Unit	MM	Surface	Material	Thickness	Quantity	250 ~ 1000	Precision Level
006						Check	Claire	Scale	FIT						-
005						Approve	Bright	Page	1/1	Quantity					-
004															-
003															-
002	ADD DIM														-
001	NEW DRAWING														-
REV															-

Ver.001			Approve	Check	Contact
Documents NO.	PKG-PH800480T032-ZHA07	Packaging Specifications	Bright	Clare	Tina

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)	PH800480T032-ZHA07	164.4X105.9X5.7	0.1853	48	8.8944
2	多層薄膜(1)POF	OTFILM0BA03ABA	19"X350X0.015	——	6	——
3	TRAY 盤 (2)Tray	TYSG000000490	352 X 260 X 15.8	0.099	30	2.97
4	舒美墊(3) EPE	FOAM000000047	350 X 255 X 5	0.011	6	0.066
5	舒美墊(4) EPE	FOAM000000091	160X 118 X 1	0.0005	96	0.048
6	內盒(5)Product Box	BX36627063ABBA	383 X 270 X 66	0.182	6	1.092
7	保利龍板(6)Polylon board	OTPLB00PL08ABA	550 X 393 X 20	0.0284	2	0.0568
8	外紙箱(7)Carton	BX57041027CCBA	570 X 410 X 265	1.0	1	1.0
9						

2.一整箱總重量 (Total LCD Weight in carton) : 14.13 Kg±10%						
3.單箱數量規格表 (Packaging Specifications and Quantity) :						
(1)LCM quantity per box : no per tray	2	x no of tray	4	=	8	
(2)Total LCM quantity in carton : quantity per box	8	x no of boxes	6	=	48	



特 記 事 項 (REMARK)		
<p>4. TRAY盤相疊時,需旋轉180度,請詳見B視圖 Rotate tray 180 degrees and place on top of stack. Check the tray stack using Fig. B.</p>		