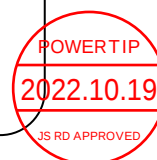


SPECIFICATIONS

CUSTOMER	:	CCH014
SAMPLE CODE	:	SH800480T013-IHF56
MASS PRODUCTION CODE	:	PH800480T013-IHF56
SAMPLE VERSION	:	01
SPECIFICATIONS EDITION	:	002
DRAWING NO. (Ver.)	:	JLMD-PH800480T013-IHF56_001
PACKAGING NO. (Ver.)	:	JPKG-PH800480T013-IHF56_001

Customer Approved

Date:



Approved	Checked	Designer
劉進 Jin Liu	劉進 Jin Liu	陳璐 Lu Chen

- ☐ Preliminary specification for design input
☒ Specification for sample approval

POWERTIP TECH. CORP.

Headquarters:

No.8, 6th Road, Taichung Industrial Park,
 Taichung, Taiwan
 台中市 407 工業區六路 8 號

TEL: 886-4-2355-8168
 FAX: 886-4-2355-8166

E-mail: sales@powertip.com.tw
 Http://www.powertip.com.tw

History of Version

[illegible]

Total: 31 Page

Contents

1. SPECIFICATIONS

- 1.1 Features
- 1.2 Mechanical Specifications
- 1.3 Absolute Maximum Ratings
- 1.4 DC Electrical Characteristics
- 1.5 Optical Characteristics
- 1.6 Backlight Unit Characteristics
- 1.7 Touch Panel Unit Characteristics

2. MODULE STRUCTURE

- 2.1 Counter Drawing
- 2.2 Interface Pin Description
- 2.3 Timing Characteristics

3. QUALITY ASSURANCE SYSTEM

- 3.1 Quality Assurance Flow Chart
- 3.2 Inspection Specification

4. RELIABILITY TEST

- 4.1 Reliability Test Condition

5. PRECAUTION RELATING PRODUCT HANDLING

- 5.1 Safety
- 5.2 Handling
- 5.3 Storage
- 5.4 Terms of Warranty

Appendix : 1. LCM Drawing
2. LCM Packaging

1. SPECIFICATIONS

1.1 Features

<u>Item</u>	<u>Standard Value</u>
Display Type	800 * (RGB) * 480
LCD Type	TN (TFT LCD) , Normally white , Transmissive type
Screen size(inch)	7.0 inch
Viewing Direction	6 O'clock
Interface	RGB Interface
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	192.96(L)*110.76(W)*7.79(H)	mm

LCD panel& Touch Panel

<u>Item</u>	<u>Standard Value</u>	<u>Unit</u>
Active Area	154.08 (W) * 85.92 (L)	mm

Note : For detailed information please refer to LCM drawing.

1.3 Absolute Maximum Ratings

Item	Symbol	Condition	Min.	Max.	Unit	Remark
Power Supply Voltage	DV _{DD}	GND=0	-0.3	5.0	V	-
	AV _{DD}		6.5	13.5	V	
	V _{GH}		-0.3	40	V	
	V _{GL}	AGND=0	-20	0.3	V	
	V _{GH} - V _{GL}	-	-	40	V	
Operating Temperature	T _{OP} (Ts)	Note 1	-20	70	°C	
Storage Temperature	T _{ST} (Ta)	Note 2	-30	85	°C	

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

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

Note 2 : Ta is the ambient temperature of samples

1.4 DC Electrical Characteristics

GND = 0V, Ta = 25°C

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Supply Voltage	DV _{DD}	3.0	3.3	3.6	V	-
	V _{GH}	15.3	16.0	16.7		
	V _{GL}	-7.7	-7.0	-6.3		
	AV _{DD}	10.2	10.4	10.6		
VCOM	V _{COM}	3.0	3.6	4.2	V	-
Input signal Voltage	V _{IH}	0.7DV _{DD}	-	DV _{DD}	V	-
	V _{IL}	0	-	0.3DV _{DD}		
Supply Current	I (DV _{DD})	-	8.0	15	mA	DVDD=3.3V
	I (AVDD)	-	20	50		AVDD=10.4V
	I (IGH)	-	0.2	1.0		VGH=16.0V
	I (IGL)	-	0.2	1.0		VGL=-7.0V

1.5 Optical Characteristics

DV_{DD} = 3.3 V, Ta=25°C

Item		Symbol	Condition	Min.	Typ.	Max.	unit	Remark
Response time	Rise	Tr	Ta = 25°C θX, θY = 0°	-	10	20	ms	Note 2
	Fall	Tf		-	15	30		
Viewing angle	Top	θ+	CR ≥ 10	-	80		Deg.	Note 1
	Bottom	θ-		-	80			
	Left	θL		-	80			
	Right	θR		-	80			
Contrast ratio		CR	Ta = 25°C θX, θY = 0°	400	500	-		Note 3
Color of CIE Coordinate	White	X		0.26	0.31	0.36	-	Note4
		Y		0.28	0.33	0.38		
	Red	X		0.53	0.58	0.63		
		Y		0.29	0.34	0.39		
	Green	X		0.29	0.34	0.39		
		Y		0.55	0.60	0.65		
	Blue	X		0.10	0.15	0.20		
		Y		0.02	0.07	0.12		
Average Brightness Pattern=white display (With LCD & TP)*1		IV		If=270mA	630	720	-	cd/m ²
Uniformity (With LCD & TP)*2		△B	If=270mA	70	-	-	%	Note1

Note 4 :

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

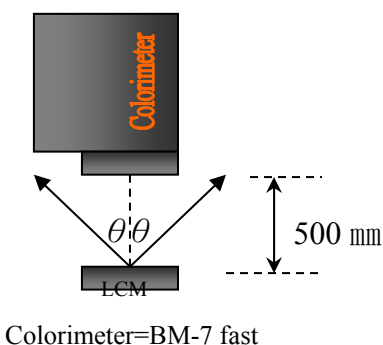
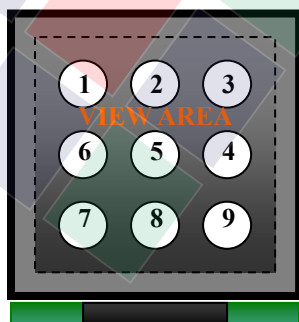
2 : Measurement Condition for Optical Characteristics:

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

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

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

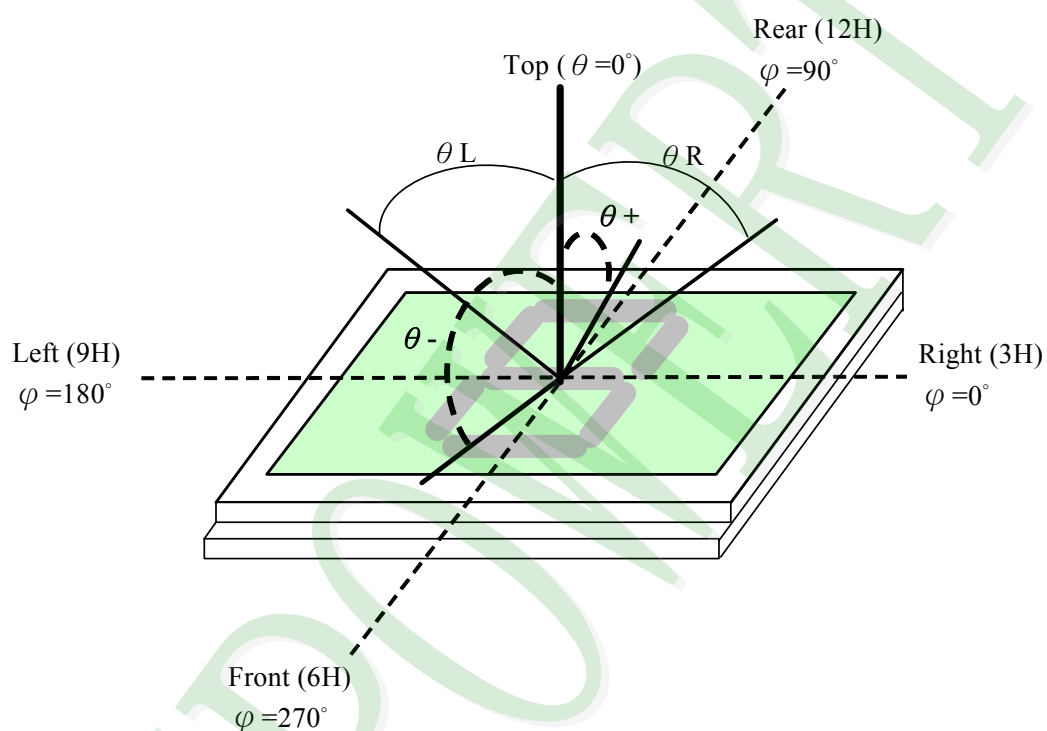
d : The uncertainty of the C.I.E coordinate measurement ±0.01 , Average Brightness ± 4%



Note 1.

Optical characteristics-2

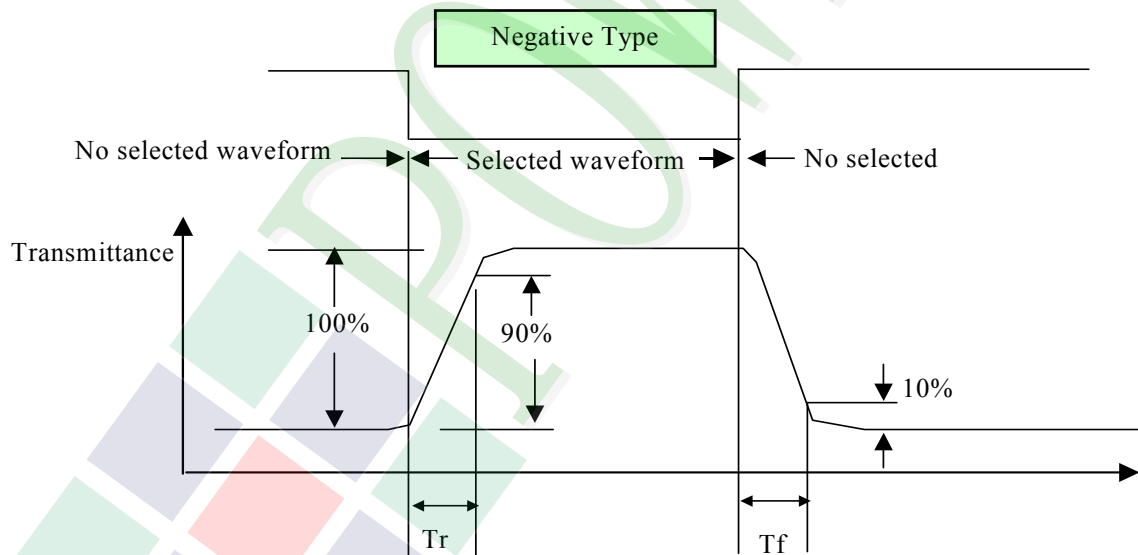
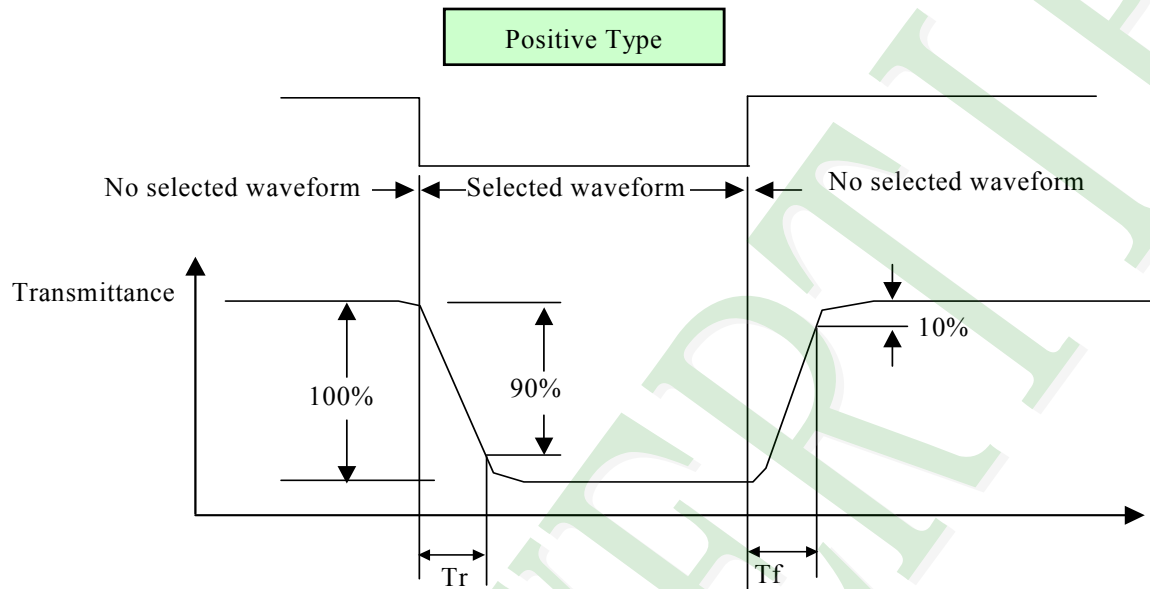
Viewing angle



Note 2.

Optical characteristics-3

Fig.2 Definition of response time



Electrical characteristics-2

※2 Drive waveform

V_{op} : Drive voltage

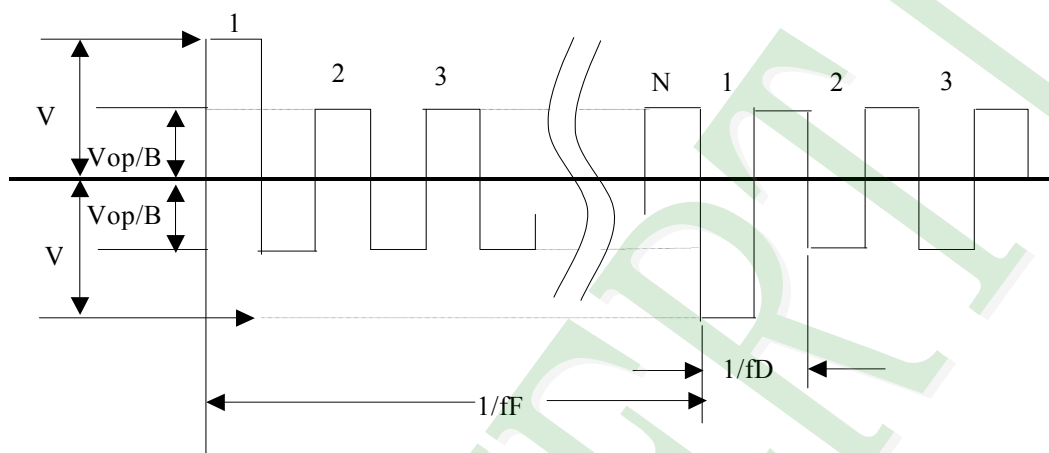
$1/B$: Bias

N : Duty

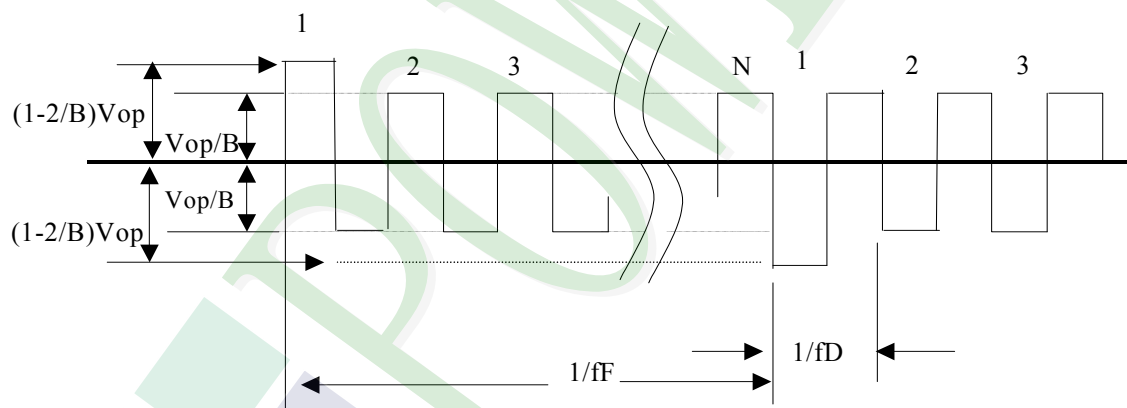
f_F : Frame frequency

f_D : Drive frequency

(1) Selected waveform



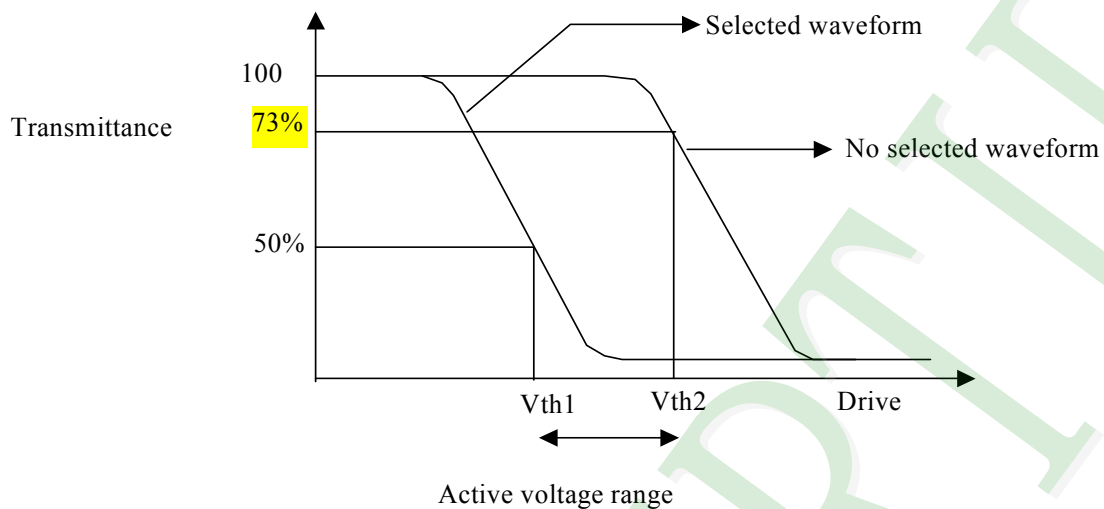
(2) Non- Selected wave form



Note:

Frame frequency is defined as follows: Common side supply voltage peak - to - peak / 2 = 1 period

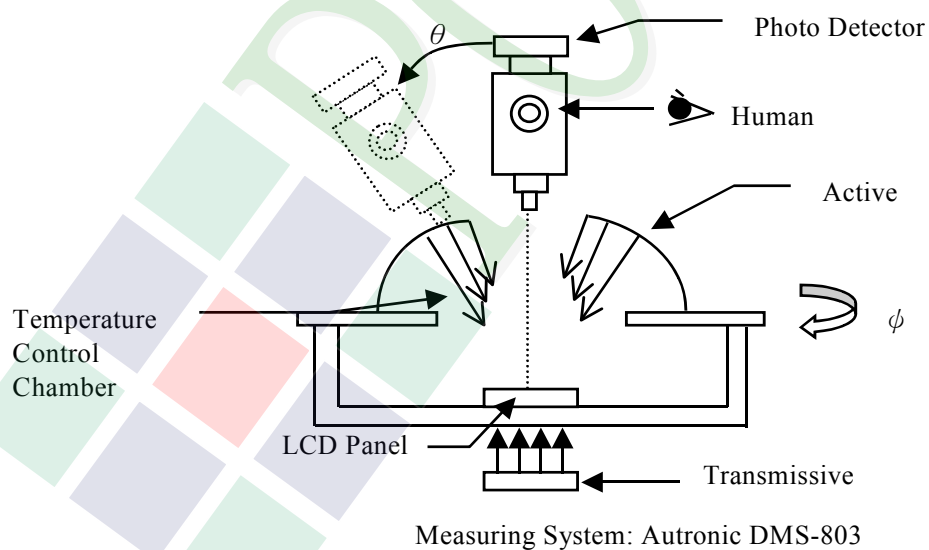
Note 3. : Definition of Vth



	Vth1	Vth2
View direction	10°	40°
Drive waveform	(Selected waveform)	(No selected waveform)
Transmittance	50%	73%

※1 Contrast ratio
= (Brightness in OFF state) / (Brightness in ON state)

Outline of Electro-Optical Characteristics Measuring System

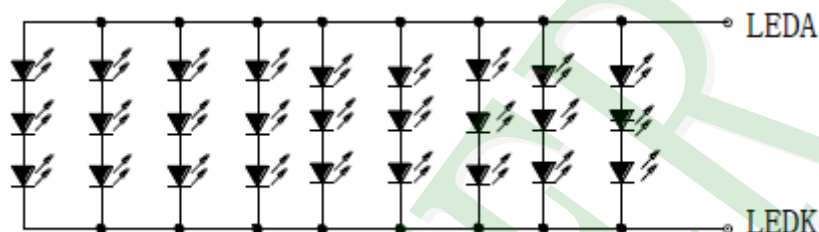


1.6 Backlight Unit Characteristics

Electrical / Optical Characteristics

<u>Item</u>	<u>Symbol</u>	<u>Conditions</u>	<u>Min.</u>	<u>Typ.</u>	<u>Max.</u>	<u>Unit</u>
Forward Voltage	VF	If=270mA	8.4	9.6	10.5	V
Supply Current	IF	-	-	270	-	mA
Color	White					

Circuit diagram



Other Description

<u>Item</u>	<u>Conditions</u>	<u>Description</u>
Life Time	Ta =25℃ IF= 270mA	50000 hrs

1.7 Touch Panel Unit Characteristics

Features

<u>Item</u>	<u>Standard Value</u>
Touch Panel Size	7"
Touch type	Projective Capacitive Touch Panel
Input Method	Finger / 10 Points touch
Output Interface	I ² C
IC	ICNT8952

I²C Address

<u>Bit 7</u>	<u>Bit 6</u>	<u>Bit 5</u>	<u>Bit 4</u>	<u>Bit 3</u>	<u>Bit 2</u>	<u>Bit 1</u>	<u>Bit 0</u>
1	0	0	1	0	0	0	R/W

Mechanical Specifications

<u>Item</u>	<u>Standard Value</u>	<u>Unit</u>
Viewing Area	154.88 (W) x 86.72 (H)	mm

Absolute Maximum Ratings

<u>Item</u>	<u>Symbol</u>	<u>Condition</u>	<u>Min.</u>	<u>Max.</u>	<u>Unit</u>
Supply voltage	VDD	-	-0.3	3.6	V
Operating Temperature	T _{OP}	-	-20	+70	°C
Storage Temperature	T _{ST}	-	-30	+80	°C

DC Electrical Characteristics

<u>Item</u>	<u>Symbol</u>	<u>Condition</u>	<u>Min.</u>	<u>Typ.</u>	<u>Max.</u>	<u>Unit</u>
Power Supply Voltage	TPVDD	-	2.8	3.3	3.6	V
Input High Voltage	VIH	-	0.85*TPVDD	-	-	V
Input Low Voltage	VIL	-	-	-	0.15*TPVDD	V

PIN Definition

<u>Pin No.</u>	<u>Symbol</u>	<u>Function</u>
1	GND	Ground.
2	VDD	Power supply.
3	SCL	I2C serial clock.
4	SDA	I2C serial data.
5	INT	Indicate coordinate data ready.
6	RESET	System reset signal input, active low.

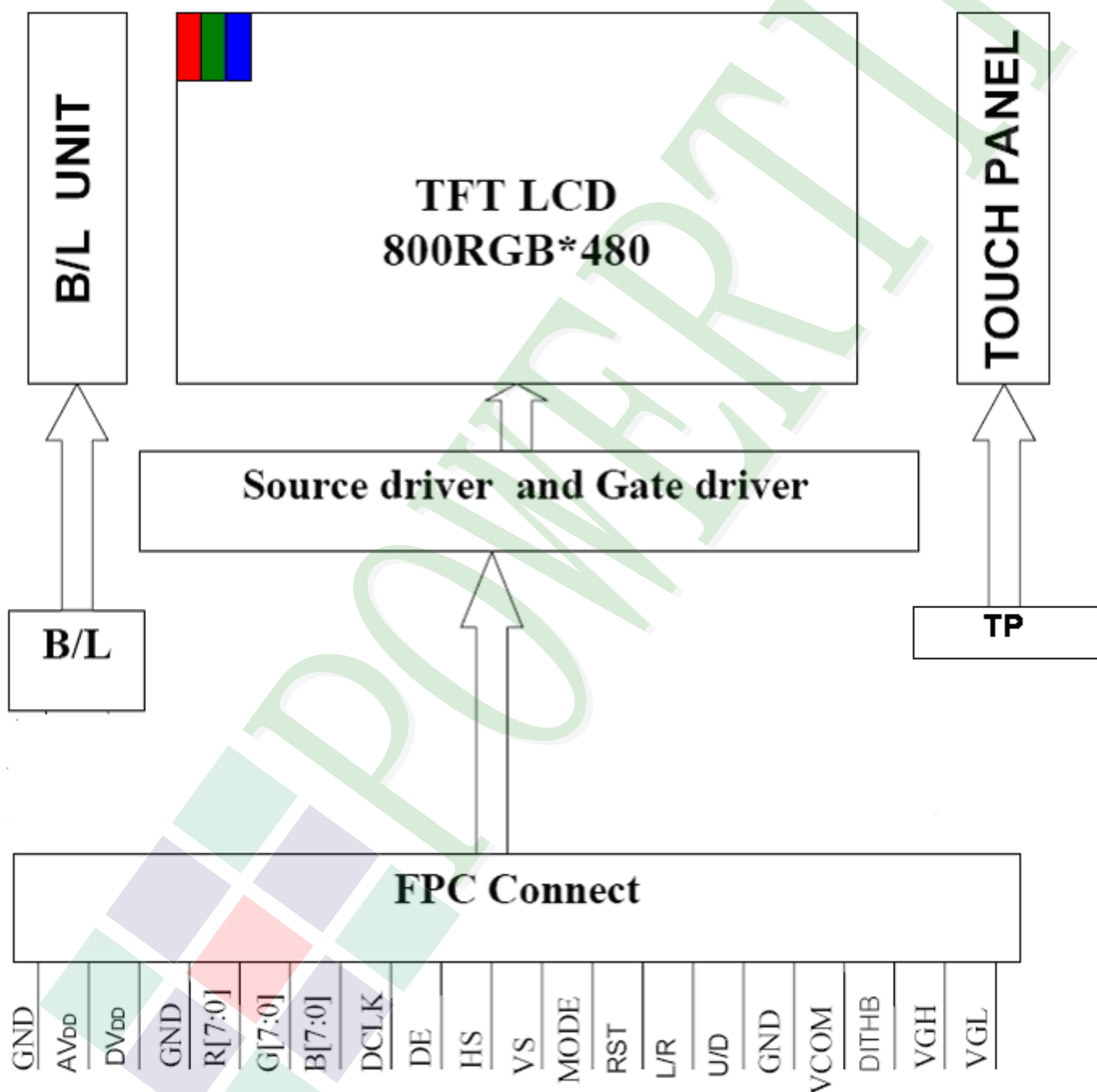
2. MODULE STRUCTURE

2.1 Counter Drawing

2.1.1 LCM Mechanical Diagram

* See Appendix

2.1.2 Block Diagram



2.2 Interface Pin Description

Pin NO.	SYMBOL	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.
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.
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

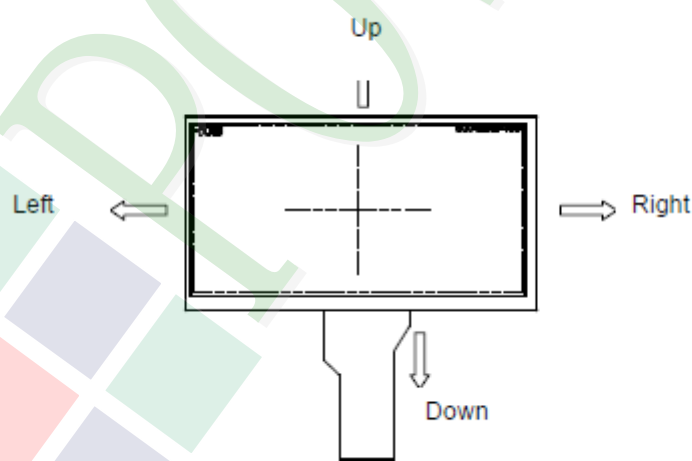
Pin NO.	SYMBOL	DESCRIPTION
38	GND	Power Ground.
39	L/R	Left / right selection.
40	U/D	Left / right selection.
41	V _{GH}	Gate On Voltage.
42	V _{GL}	Gate OFF Voltage.
43	AV _{DD}	Power for Analog Circuit.
44	RESET	Global reset pin.
45	NC	No connection.
46	V _{COM}	Common Voltage.
47	DITHB	Dithering Function.
48	GND	Power Ground.
49	NC	No connection.
50	NC	No connection.

【Note1】 L/R : left or right setting

U/D : up or down setting

<u>L/R</u>	<u>U/D</u>	<u>Data shifting</u>
DVDD	GND	Left → Right , Up → Down(default)
GND	GND	Right → Left , Up → Down
DVDD	DVDD	Left → Right , Down → Up
GND	DVDD	Right → Left , Down → Up

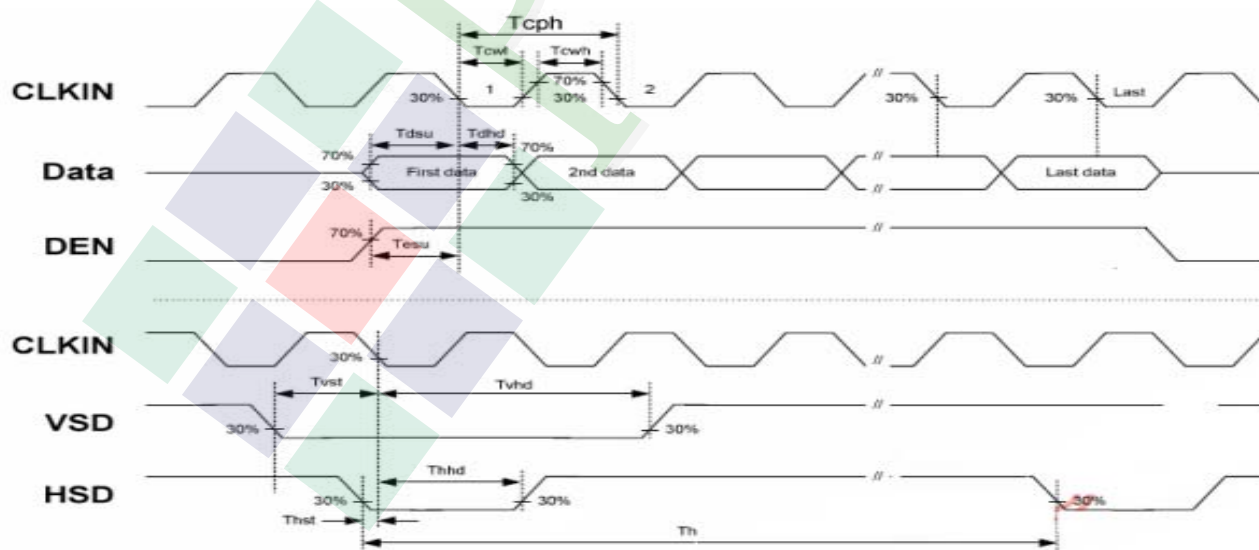
Definition of scanning direction:



2.3 Timing Characteristics

2.3.1 AC Electrical Characteristics

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
HS setup time	T_{hst}	8	-	-	ns	
HS hold time	T_{hhd}	8	-	-	ns	
VS setup time	T_{vst}	8	-	-	ns	
VS hold time	T_{vhd}	8	-	-	ns	
Data setup time	T_{dsu}	8	-	-	ns	
Data hole time	T_{dhd}	8	-	-	ns	
DE setup time	T_{esu}	8	-	-	ns	
DE hole time	T_{ehd}	8	-	-	ns	
DV _{DD} Power On Slew rate	T_{POR}	-	-	20	ms	From 0 to 90% DV _{DD}
RESET pulse width	T_{Rst}	1	-	-	ms	
DCLK cycle time	T_{coh}	20	-	-	ns	
DCLK pulse duty	T_{cwh}	40	50	60	%	

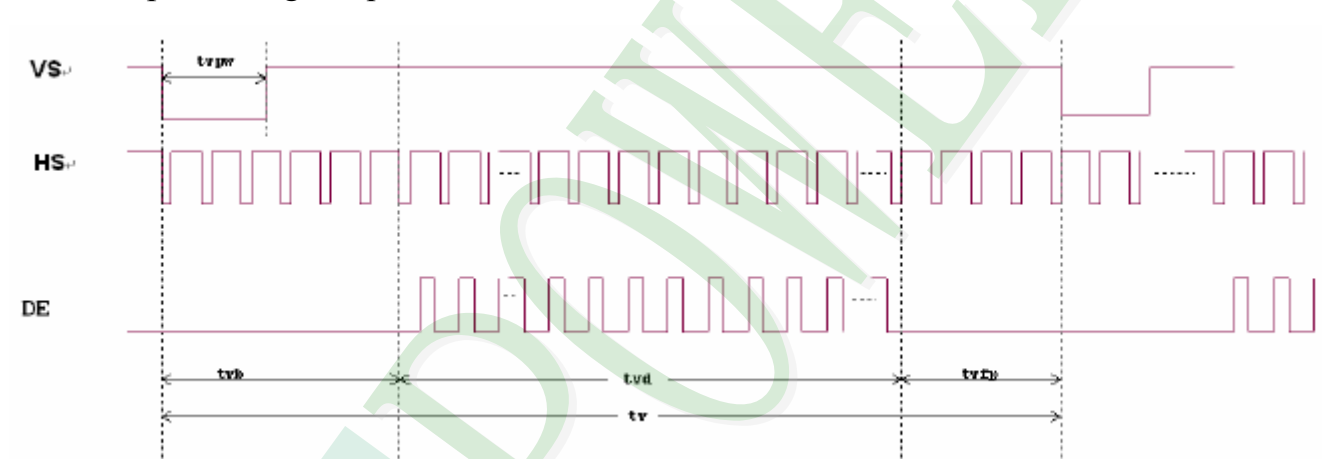


2.3.2 Data Input Format

Horizontal input timing diagram



Vertical input timing diagram

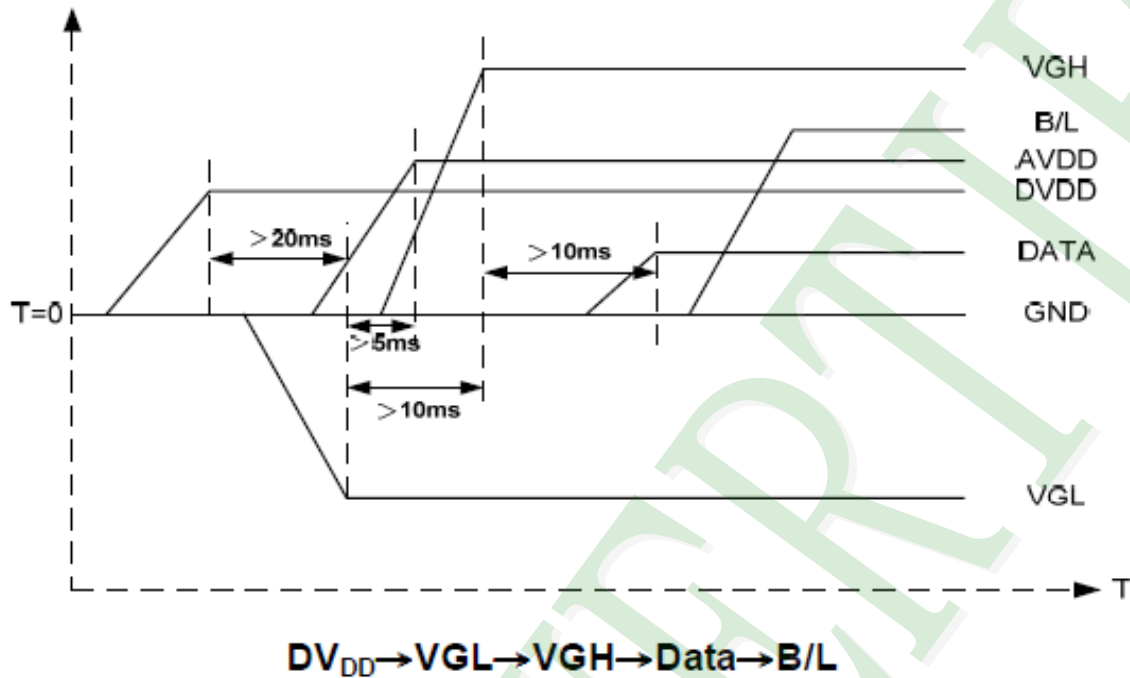


Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Horizontal Display Area	thd	-	800	-	DCLK	
DCLK Frequency	fclk	26.4	33.3	46.8	MHz	
One Horizontal Line	th	862	1056	1200	DCLK	
HS pulse width	thpw	1	-	40	DCLK	
HS Blanking	thb	46	46	46	DCLK	
HS Front Porch	thfp	16	210	354	DCLK	

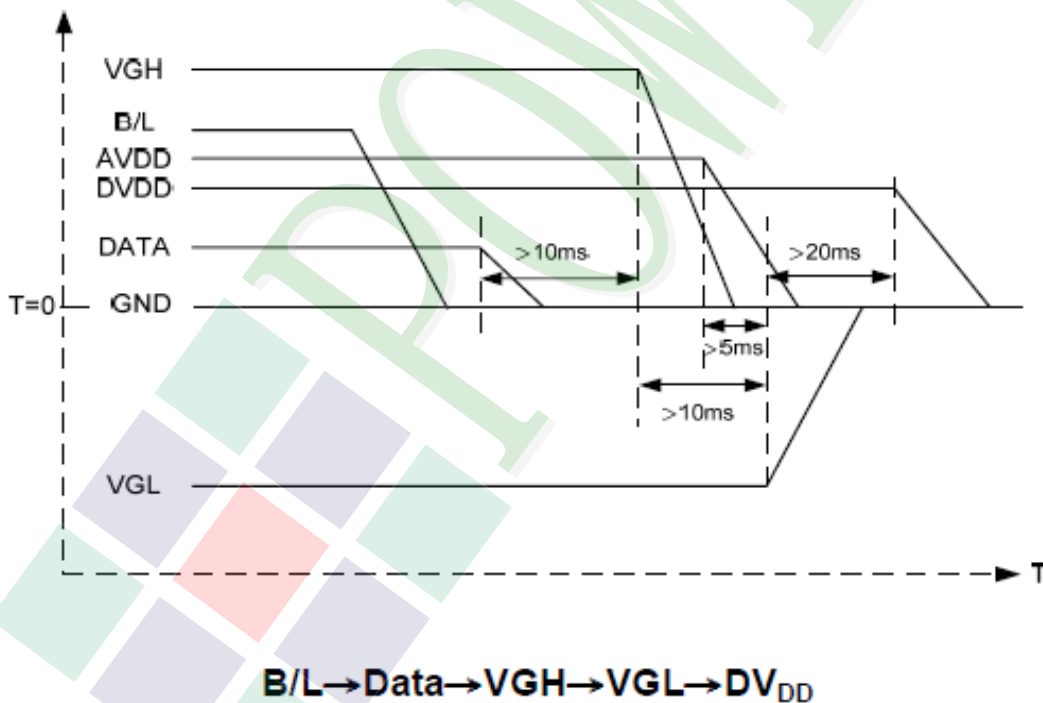
Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Vertical Display Area	tvd	-	480	-	TH	
VS period time	tv	510	525	650	TH	
VS pulse width	tpw	1	-	20	TH	
VS Blanking	tvb	23	23	23	TH	
VS Front Porch	tvfp	7	22	147	TH	

2.3.3 Power On/Off Characteristics

a. Power on:



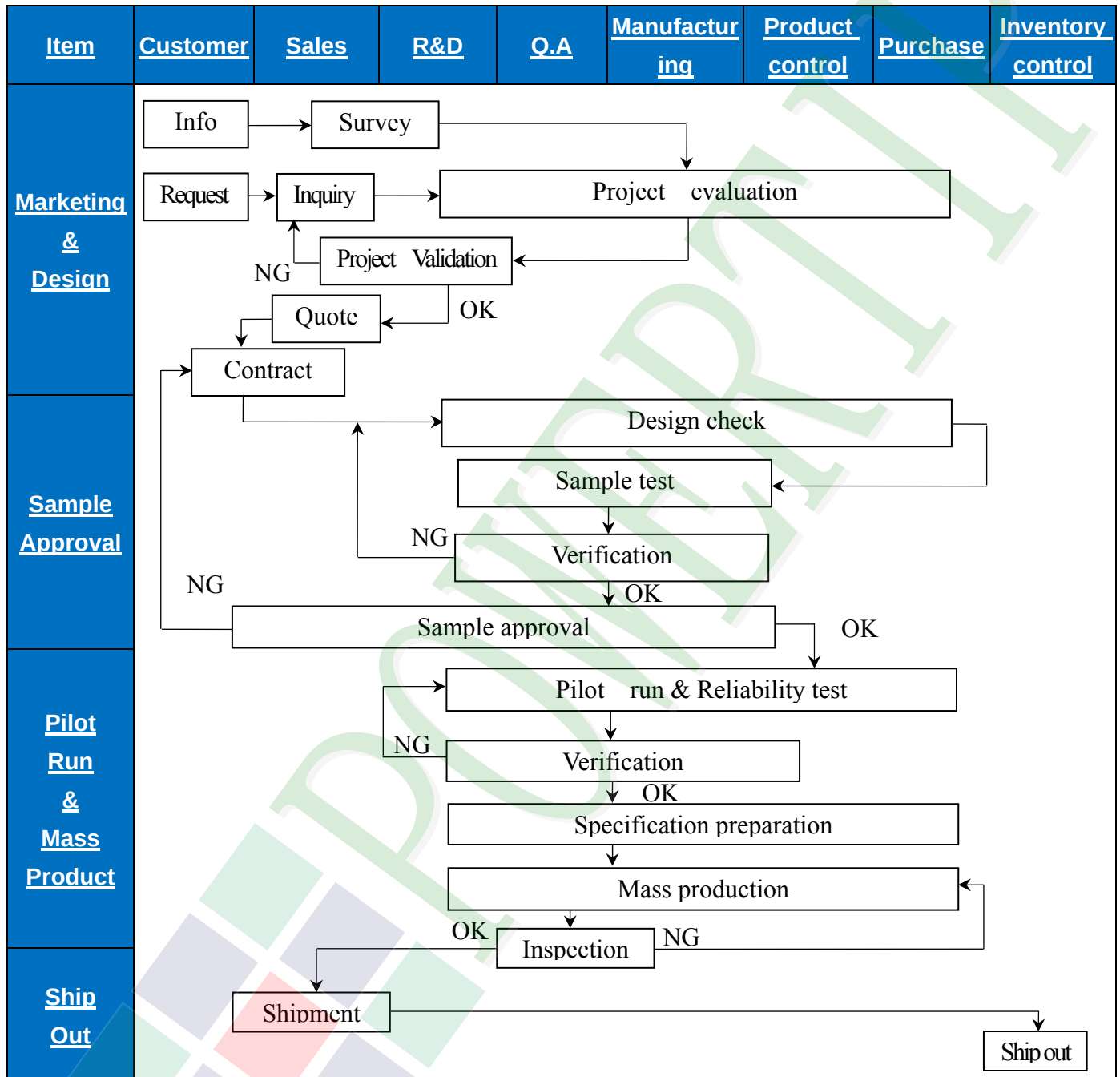
b. Power off:

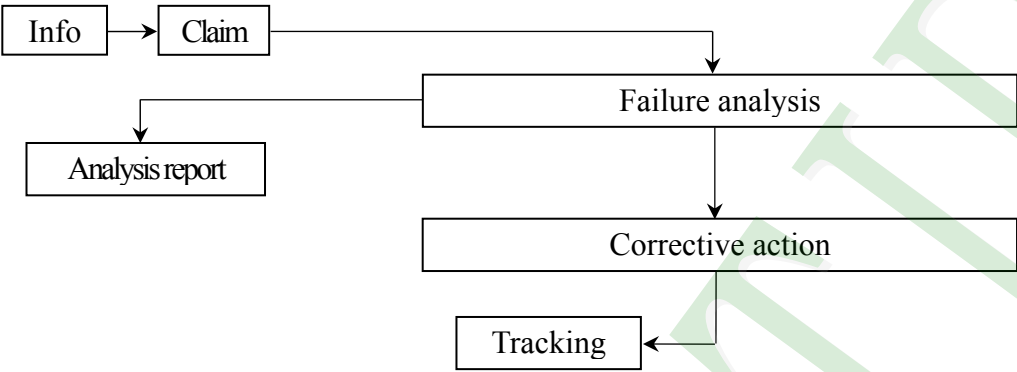


Note: Data include R0~R7, B0~B7, GO~G7, U/D, L/R, DCLK, HS, VS, DE.

3. QUALITY ASSURANCE SYSTEM

3.1 Quality Assurance Flow Chart



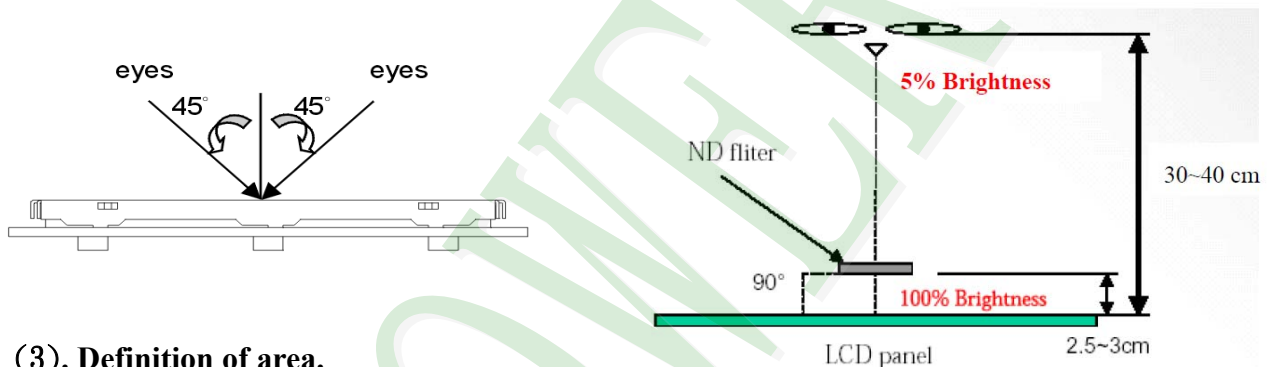
Item	Customer	Sales	R&D	Q.A	Manufacturing	Product control	Purchase	Inventory control
Sales Service	 <pre> graph TD Info[Info] --> Claim[Claim] Claim --> Failure[Failure analysis] Claim --> Report[Analysis report] Failure --> Action[Corrective action] Action --> Tracking[Tracking] </pre>							
Q.A Activity	1. ISO 9001 Maintenance Activities 3. Equipment calibration 5. Standardization Management				2. Process improvement proposal 4. Education And Training Activities			

3.2. Inspection Specification

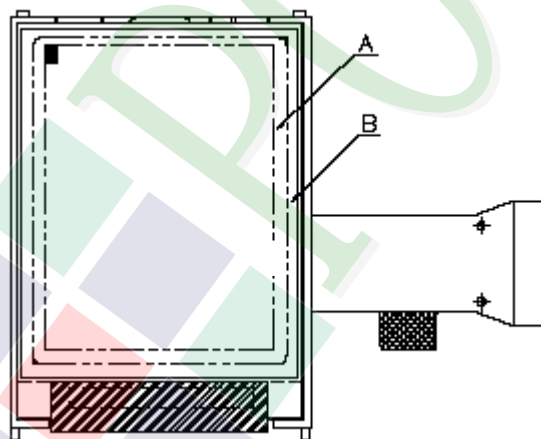
- ◆Scope: The document shall be applied to TFT-LCD Module for 3.5" -15" (Ver.B01).
- ◆Inspection Standard: MIL-STD-105E Table Normal Inspection Single Sampling Level II.
- ◆Equipment: Gauge, MIL-STD, Powertip Tester, Sample
- ◆Defect Level: Major Defect AQL: 0.4; Minor Defect AQL: 1.5
- ◆OUT Going Defect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

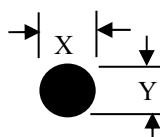
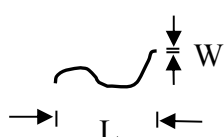
(4). Standard of inspection : (Unit : mm)

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

NO	Item	Criterion	Level										
01	Product condition	1. 1The 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. 1The quantity is inconsistent with work order of production.	Major										
03	Outline dimension	3. 1Product 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. 6Mura 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>Item</th><th>Acceptance (Q'ty)</th></tr><tr><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)	Bright Dot	≤ 4	Dark Dot	≤ 5	Joint Dot	≤ 3	Total	≤ 7	Minor
		Item	Acceptance (Q'ty)										
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 that can not be seen through 5% ND filter.													

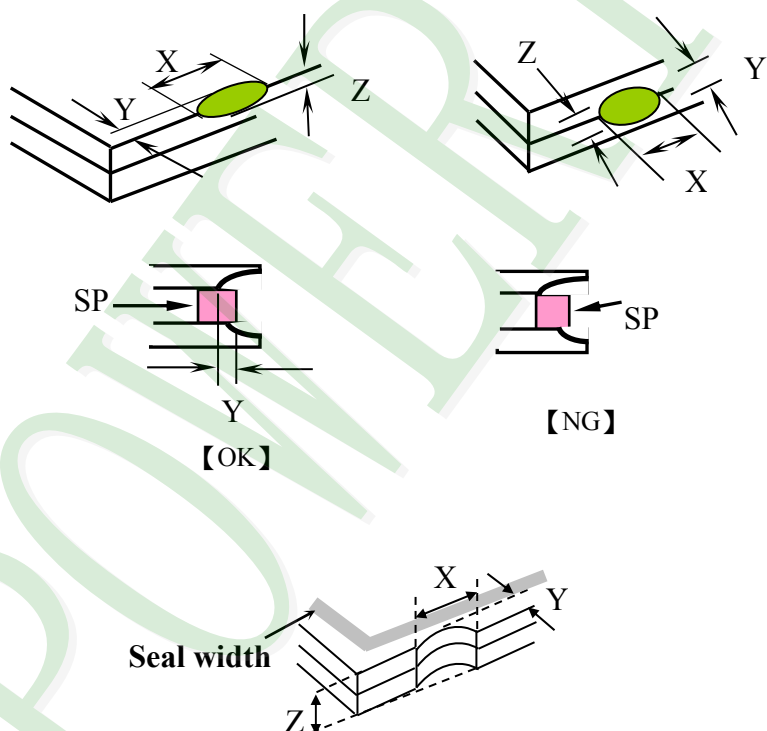
◆Specification For TFT-LCD Module 3.5" ~15" :

(Ver.B01)

NO	Item	Criterion	Level																																																		
06	Black or white Dot, scratch, contamination Round type  $\Phi = (x + y) / 2$ Line type 	6. 1 Round type (Non-display or display): <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>$\Phi \leq 0.25$</td><td>Ignore</td><td rowspan="4">Ignore</td></tr><tr><td>$0.25 < \Phi \leq 0.50$</td><td>5</td></tr><tr><td>$\Phi > 0.50$</td><td>0</td></tr><tr><td>Total</td><td>5</td></tr></tbody></table> 6. 2 Line type(Non-display or display): <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>$W \leq 0.03$</td><td>Ignore</td><td rowspan="5">Ignore</td></tr><tr><td>$L \leq 10.0$</td><td>$0.03 < W \leq 0.05$</td><td>4</td></tr><tr><td>$L \leq 5.0$</td><td>$0.05 < W \leq 0.10$</td><td>2</td></tr><tr><td>---</td><td>$W > 0.10$</td><td>As round type</td></tr><tr><td>Total</td><td>5</td></tr><tr><td rowspan="5">9" to 15"</td><td>---</td><td>$W \leq 0.05$</td><td>Ignore</td><td rowspan="5">Ignore</td></tr><tr><td>$L \leq 10.0$</td><td>$0.05 < W \leq 0.10$</td><td>5</td></tr><tr><td>---</td><td>$W > 0.10$</td><td>As round type</td></tr><tr><td>Total</td><td>5</td></tr></tbody></table>	Dimension (diameter : Φ)	Acceptance (Q'ty)		A area	B area	$\Phi \leq 0.25$	Ignore	Ignore	$0.25 < \Phi \leq 0.50$	5	$\Phi > 0.50$	0	Total	5	module size	Length (L)	Width (W)	Acceptance (Q'ty)		A area	B area	3.5" to less 9"	---	$W \leq 0.03$	Ignore	Ignore	$L \leq 10.0$	$0.03 < W \leq 0.05$	4	$L \leq 5.0$	$0.05 < W \leq 0.10$	2	---	$W > 0.10$	As round type	Total	5	9" to 15"	---	$W \leq 0.05$	Ignore	Ignore	$L \leq 10.0$	$0.05 < W \leq 0.10$	5	---	$W > 0.10$	As round type	Total	5	Minor
Dimension (diameter : Φ)	Acceptance (Q'ty)																																																				
	A area	B area																																																			
$\Phi \leq 0.25$	Ignore	Ignore																																																			
$0.25 < \Phi \leq 0.50$	5																																																				
$\Phi > 0.50$	0																																																				
Total	5																																																				
module size	Length (L)	Width (W)	Acceptance (Q'ty)																																																		
			A area	B area																																																	
3.5" to less 9"	---	$W \leq 0.03$	Ignore	Ignore																																																	
	$L \leq 10.0$	$0.03 < W \leq 0.05$	4																																																		
	$L \leq 5.0$	$0.05 < W \leq 0.10$	2																																																		
	---	$W > 0.10$	As round type																																																		
	Total	5																																																			
9" to 15"	---	$W \leq 0.05$	Ignore	Ignore																																																	
	$L \leq 10.0$	$0.05 < W \leq 0.10$	5																																																		
	---	$W > 0.10$	As round type																																																		
	Total	5																																																			
	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>$\Phi \leq 0.25$</td><td>Ignore</td><td rowspan="5">Ignore</td></tr><tr><td>$0.25 < \Phi \leq 0.50$</td><td>4</td></tr><tr><td>$0.50 < \Phi \leq 0.80$</td><td>1</td></tr><tr><td>$\Phi > 0.80$</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	$\Phi \leq 0.25$	Ignore	Ignore	$0.25 < \Phi \leq 0.50$	4	$0.50 < \Phi \leq 0.80$	1	$\Phi > 0.80$	0	Total	5	Minor																																
Dimension (diameter: Φ)	Acceptance (Q'ty)																																																				
	A area	B area																																																			
$\Phi \leq 0.25$	Ignore	Ignore																																																			
$0.25 < \Phi \leq 0.50$	4																																																				
$0.50 < \Phi \leq 0.80$	1																																																				
$\Phi > 0.80$	0																																																				
Total	5																																																				

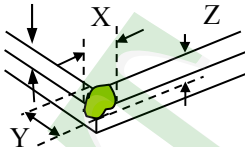
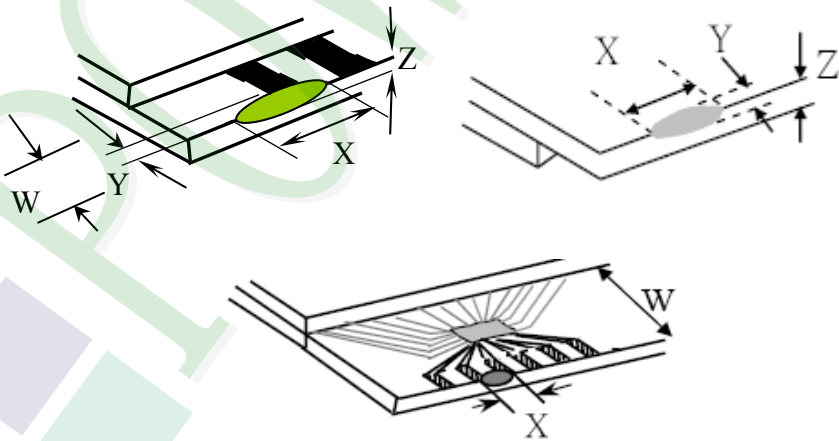
◆Specification For TFT-LCD Module 3.5" ~15" :

(Ver.B01)

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

◆ 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 Z: The thickness of crack t: The thickness of glass Y: The width of crack. W: terminal length a: LCD side length 8.1.2 Corner crack:  <table><thead><tr><th><u>X</u></th><th><u>Y</u></th><th><u>Z</u></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>	<u>X</u>	<u>Y</u>	<u>Z</u>	$\leq 1/5 a$	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
		<u>X</u>	<u>Y</u>	<u>Z</u>								
$\leq 1/5 a$	Crack can't enter viewing area	$Z \leq 1/2 t$										
$\leq 1/5 a$	Crack can't exceed the half of SP width.	$1/2 t < Z \leq 2 t$										
8.2 Protrusion over terminal: 8.2.1 Chip on electrode pad:  <table><thead><tr><th></th><th><u>X</u></th><th><u>Y</u></th><th><u>Z</u></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>		<u>X</u>	<u>Y</u>	<u>Z</u>	Front	$\leq a$	$\leq 1/2 W$	$\leq t$	Back	$\leq a$	$\leq W$	$\leq 1/2 t$
	<u>X</u>	<u>Y</u>	<u>Z</u>									
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	Symbols: X: The length of crack Z: The thickness of crack t: The thickness of glass Y: The width of crack. W: terminal length a: LCD side length 8.2.2 Non-conductive portion: <table> <tr> <th><u>X</u></th> <th><u>Y</u></th> <th><u>Z</u></th> </tr> <tr> <td>$\leq 1/3 \ a$</td> <td>$\leq W$</td> <td>$\leq t$</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><u>X</u></th> <th><u>Y</u></th> <th><u>Z</u></th> </tr> <tr> <td>$\leq a$</td> <td>$\leq 1/3 \ W$</td> <td>$\leq t$</td> </tr> </table> 8.2.4 Cracking:	<u>X</u>	<u>Y</u>	<u>Z</u>	$\leq 1/3 \ a$	$\leq W$	$\leq t$	<u>X</u>	<u>Y</u>	<u>Z</u>	$\leq a$	$\leq 1/3 \ W$	$\leq t$	Minor
<u>X</u>	<u>Y</u>	<u>Z</u>													
$\leq 1/3 \ a$	$\leq W$	$\leq t$													
<u>X</u>	<u>Y</u>	<u>Z</u>													
$\leq a$	$\leq 1/3 \ W$	$\leq t$													

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

<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

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.

Ver.001	包裝規格書 Packaging Specifications (For Tray)		Approve	Check	Contact
Documents NO. JPKG-PH800480T013-IHF56			Liujin	Air	Maeve

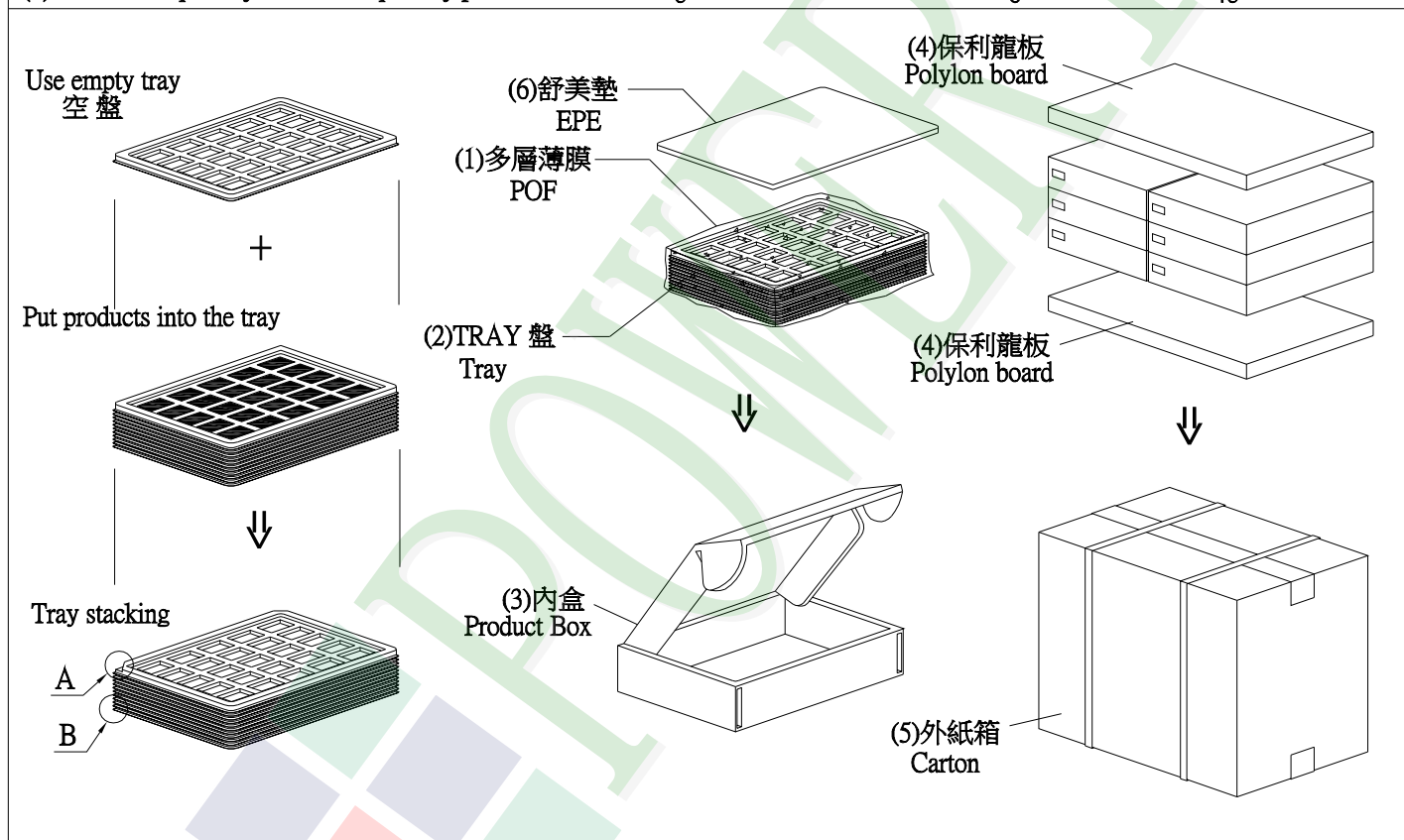
1.包裝材料規格表 (Packaging Material) : (per carton)

No.	Item	Model	Dimensions (mm)	1Pcs Weight	Quantity	Total Weight
1	成品 (LCM)	PH800480T013-IHF56	192.96 X 110.76X7.79	0.2176	48	10.4448
2	多層薄膜(1)POF	OTFILM0BA03ABA	19"X350X0.015	—	6	—
3	TRAY 盤 (2)Tray	TYSG000000228	352 X 260 X 16.5	0.1	30	3.0
4	內盒(3)Product Box	BX36627063ABBA	383 X 270 X 66	0.182	6	1.092
5	保利龍板(4)Polylon board	OTPLB00PL08ABA	550 X 393 X 20	0.0284	2	0.0568
6	外紙箱(5)Carton	BX57041027CCBA	570 X 410 X 265	1.0	1	1.0
7	舒美墊(6)EPE	FOAM000000047	350 X 255 X 5	0.011	6	0.066
8						
9						

2.一 整箱總重量 (Total LCD Weight in carton) : 15.66 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)

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.	
---	--