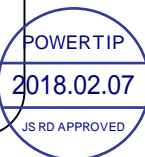


## SPECIFICATIONS

<b>CUSTOMER</b>	:	<b>PTC</b>
<b>SAMPLE CODE</b>	:	<b>SH480272T005-IAA01</b>
<b>MASS PRODUCTION CODE</b>	:	<b>PH480272T005-IAA01</b>
<b>SAMPLE VERSION</b>	:	<b>01</b>
<b>SPECIFICATIONS EDITION</b>	:	<b>003</b>
<b>DRAWING NO. (Ver.)</b>	:	<b>JLMD- PH480272T005-IAA01_002</b>
<b>PACKAGING NO. (Ver.)</b>	:	<b>JPKG- PH480272T005-IAA01_001</b>

**Customer Approved**

**Date:**



Approved	Checked	Designer
閻偉	劉進	徐明菲

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

## POWERTIP TECH. CORP.

### Headquarters:

No.8, 6<sup>th</sup> 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](mailto:sales@powertip.com.tw)  
[Http://www.powertip.com.tw](http://www.powertip.com.tw)



## **Contents**

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- 1.2 Mechanical Specifications
- 1.3 Absolute Maximum Ratings
- 1.4 DC Electrical Characteristics
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- 2.3 Timing Characteristics

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**Appendix : 1. LCM Drawing  
2. LCM Packaging**

**Note: For detailed information please refer to IC data sheet: Sitronix--- ST7257**

## 1.1 Features

Item	Standard Value
Display Type	480 * 3 (RGB) * 272 Dots
LCD Type	Normally white TN , Transmissive Type
Screen size(inch)	4.3"(Diagonal)
Viewing Direction	6 O'clock
Color configuration	R,G, B vertical stripe
Backlight	White LED B/L
Display Interface	Digital 24-bits RGB
Driver IC	ST7257
ROHS	THIS PRODUCT CONFORMS THE ROHS OF PTC Detail information please refer website : <a href="http://www.powertip.com.tw/news.php?area_id_view=1085560481/">http://www.powertip.com.tw/news.php?area_id_view=1085560481/</a>

## 1.2 Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension	105.5(W) x 67.1982 (L) x 3.0(H)	mm

### LCD panel

Item	Standard Value	Unit
Viewing Area	96.04 (W) * 54.856 (L)	mm
Active Area	95.04 (W) x 53.856 (L)	mm
Pixel Size	0.198 (W) * 0.198 (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	VDD	GND=0	-0.3	+4.6	V
Operating Temperature	T <sub>OP</sub>	-	-20	+70	°C
Storage Temperature	T <sub>ST</sub>	-	-30	+80	°C
Storage Humidity	H <sub>b</sub>	T <sub>a</sub> ≤ 60 °C	-	90	%RH

### 1.4 DC Electrical Characteristics

#### Module

GND = 0V, T<sub>a</sub> = 25°C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power supply	VDD	-	3.0	3.3	3.6	V
	VGH	-	12	15	16	V
	VGL	-	-12	-10	-7	V
“H” Input Voltage	VIH	-	0.7*VDD	-	VDD	V
“L” Input Voltage	VIL	-	GND	-	0.3* GND	V
“H” Output Voltage	VOH	-	VDD-0.4	-	VDD	V
“L” Output Voltage	VOL	-	GND	-	GND +0.4	V
Supply Current	IDD	VDD=3.3V	-	30	45	mA

## 1.5 Optical Characteristics

### TFT LCD Panel

VDD =3.3V, Ta=25°C

Item	Symbol	Condition	Min.	Typ.	Max.	unit	
Response time	Tr + Tf	-	-	26	39	ms	Note2
Viewing angle	Top	$\theta Y+$	-	60	-	Deg.	Note4
	Bottom	$\theta Y-$	-	60	-		
	Left	$\theta X-$	-	60	-		
	Right	$\theta X+$	-	60	-		
Contrast ratio	CR		500	600	-	-	-
Color of CIE Coordinate ( B/L & LCD )	White	X	0.26	0.31	0.36	-	Note1
		Y	0.28	0.33	0.38		
	Red	X	0.55	0.60	0.65		
		Y	0.31	0.36	0.41		
	Green	X	0.30	0.35	0.40		
		Y	0.53	0.58	0.63		
	Blue	X	0.10	0.15	0.20		
		Y	0.04	0.09	0.14		
Average Brightness Pattern=white display ( B/L & LCD )	IV	IF=20mA	220	330	-	cd/m <sup>2</sup>	Note1
Uniformity	$\Delta B$	IF=20mA	70	-	-	%	Note1

Note1:

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

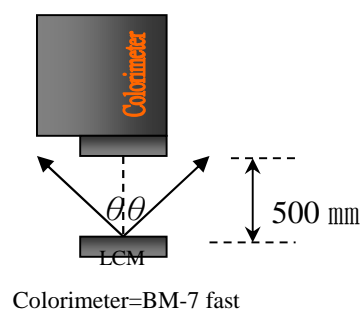
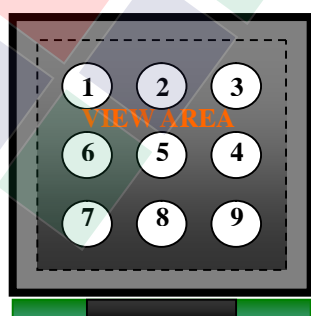
2 : Measurement Condition for Optical Characteristics:

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 , ( $\theta = 0^\circ$ )

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

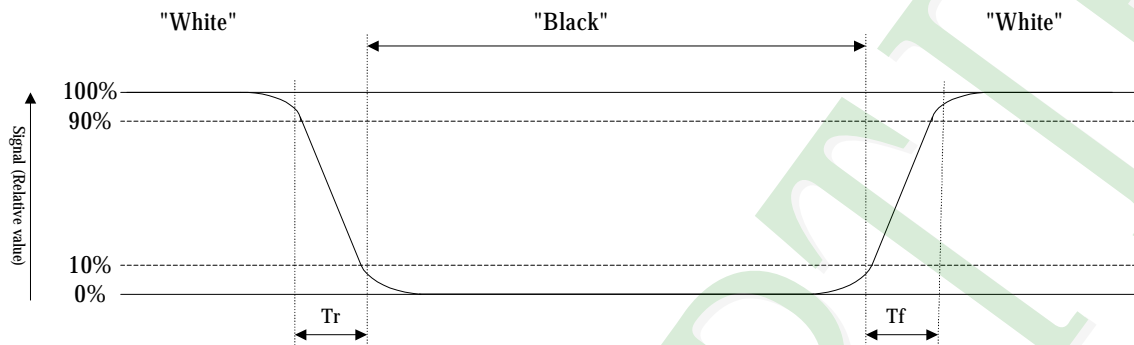
d : The uncertainty of the C.I.E coordinate measurement ±0.01 , Average Brightness ± 4%



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:



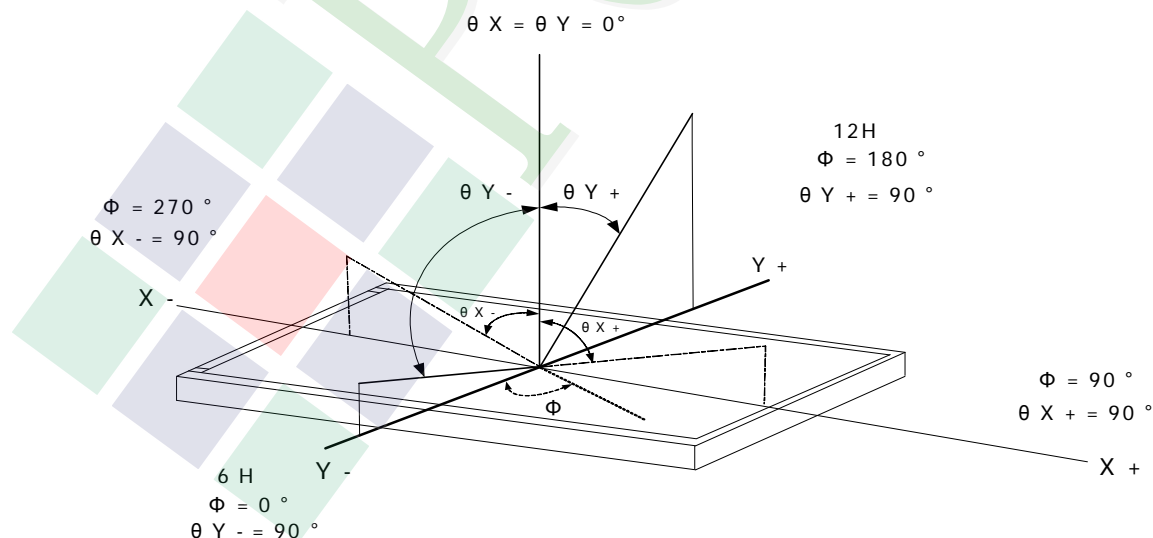
Note3: Definition of contrast ratio:

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 (Each LED)	IF	Ta =25℃	-	30	mA
LED Reverse Voltage (Each LED)	VR	Ta =25℃	-	5	V
Power Dissipation	PD	Ta =25℃	-	100	mW

### Electrical / Optical Characteristics

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	VF	IF=20mA	18.2	22.8	24.5	V
Average Brightness (Without LCD )	IV		4500	5400	-	cd/m <sup>2</sup>
CIE Color Coordinate (Without LCD )	X		0.26	0.29	0.32	-
	Y		0.26	0.29	0.32	
Color	White					

### Internal Circuit



### Other Description

Item	Conditions	Description
Life Time*1	Ta =25℃ IF= 20mA	50,000 hrs

\*1 : The “LED life time” is defined as the module brightness decrease to 50% original brightness at Ta=25℃ and IL=20mA. The LED lifetime could be decreased if operating IL is larger than 20 mA.



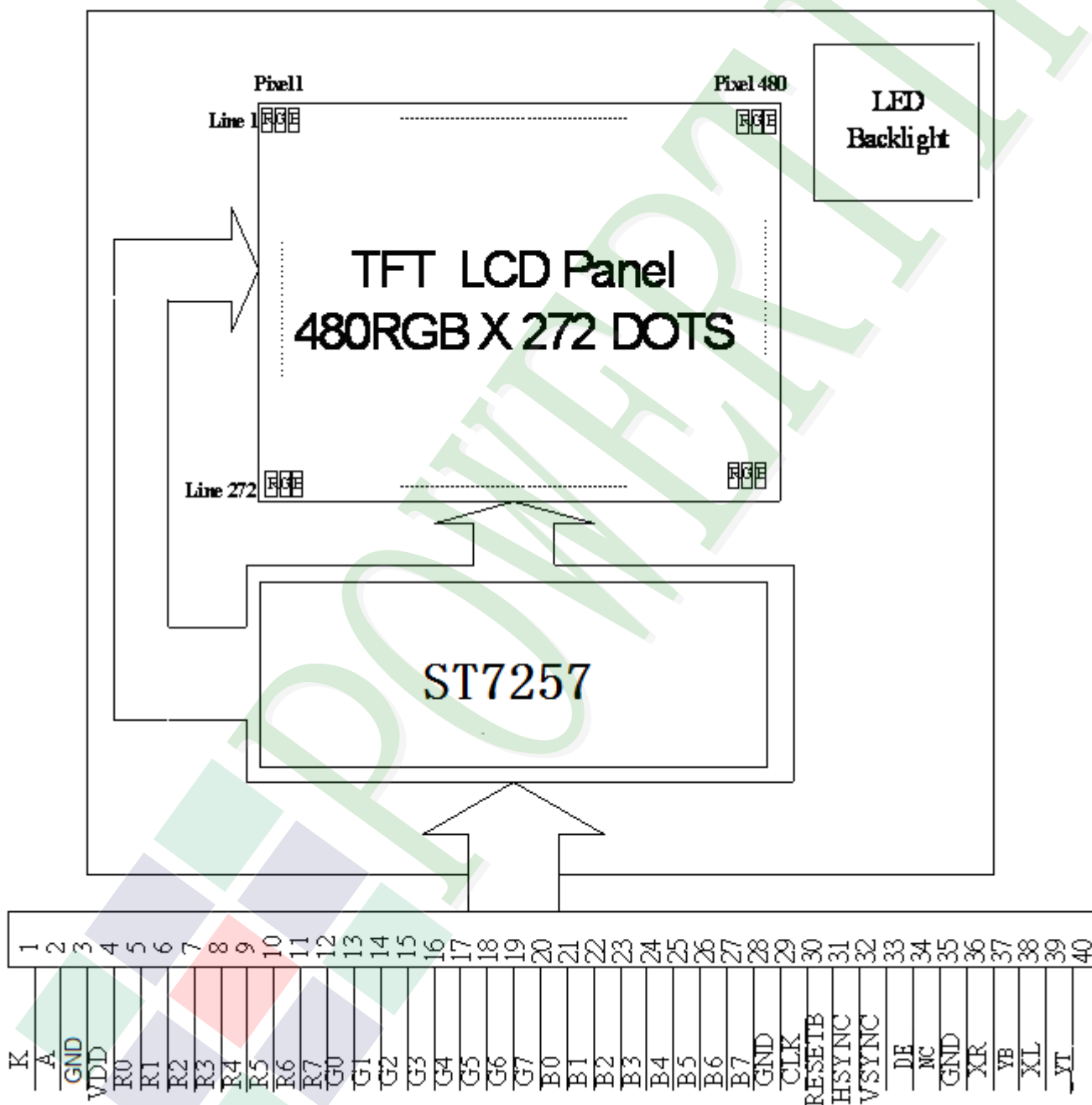
## 2. MODULE STRUCTURE

### 2.1 Counter Drawing

#### 2.1.1 LCM Mechanical Diagram

\* See Appendix

#### 2.1.2 Block Diagram



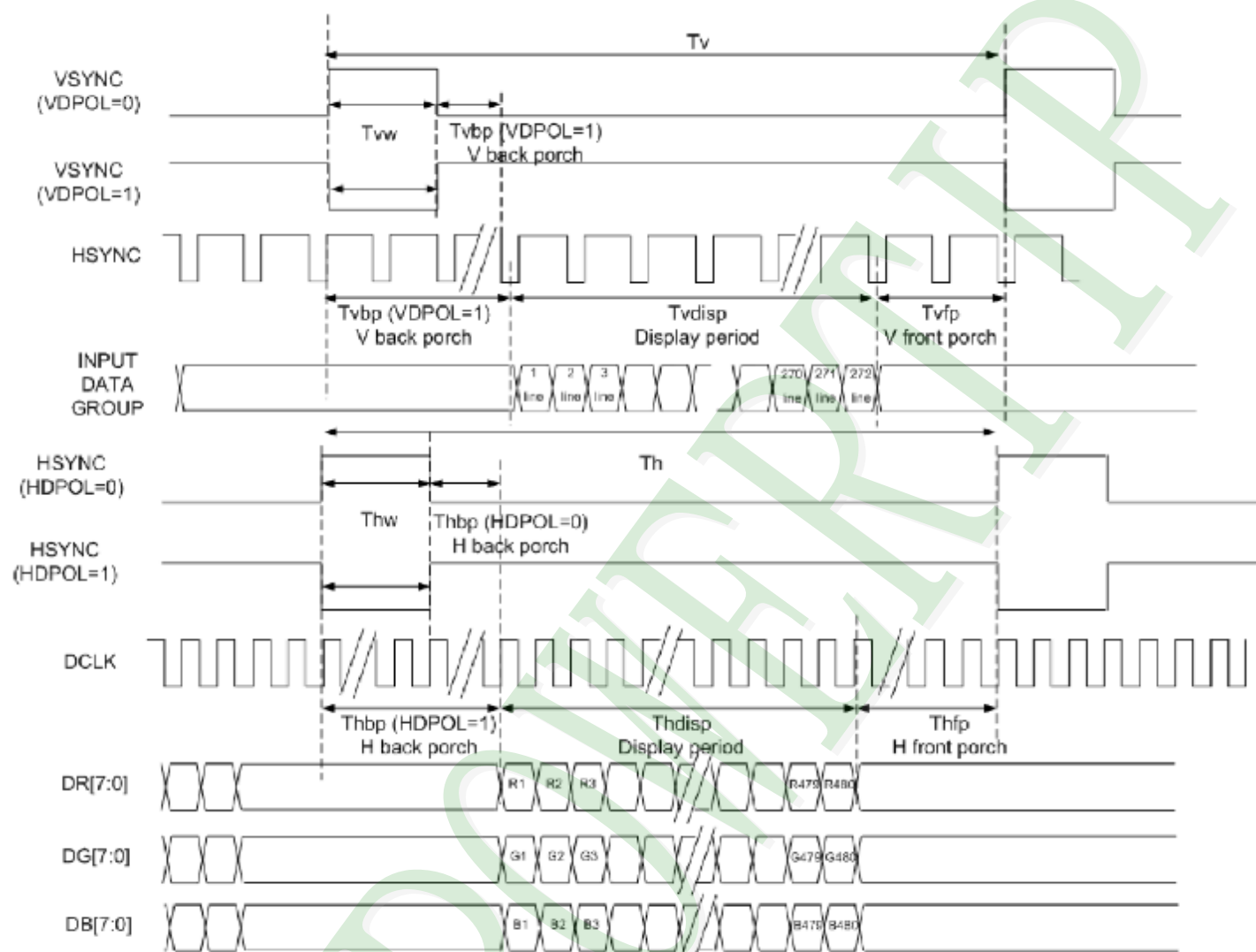
## 2.2 Interface Pin Description

Pin No.	Symbol	Function
1	K	Power supply for LED Backlight cathode input
2	A	Power supply for LED Backlight anode input
3	GND	Ground
4	VDD	Digital power
5	R0	Red data bit 0
6	R1	Red data bit 1
7	R2	Red data bit 2
8	R3	Red data bit 3
9	R4	Red data bit 4
10	R5	Red data bit 5
11	R6	Red data bit 6
12	R7	Red data bit 7
13	G0	Green data bit 0
14	G1	Green data bit 1
15	G2	Green data bit 2
16	G3	Green data bit 3
17	G4	Green data bit 4
18	G5	Green data bit 5
19	G6	Green data bit 6
20	G7	Green data bit 7

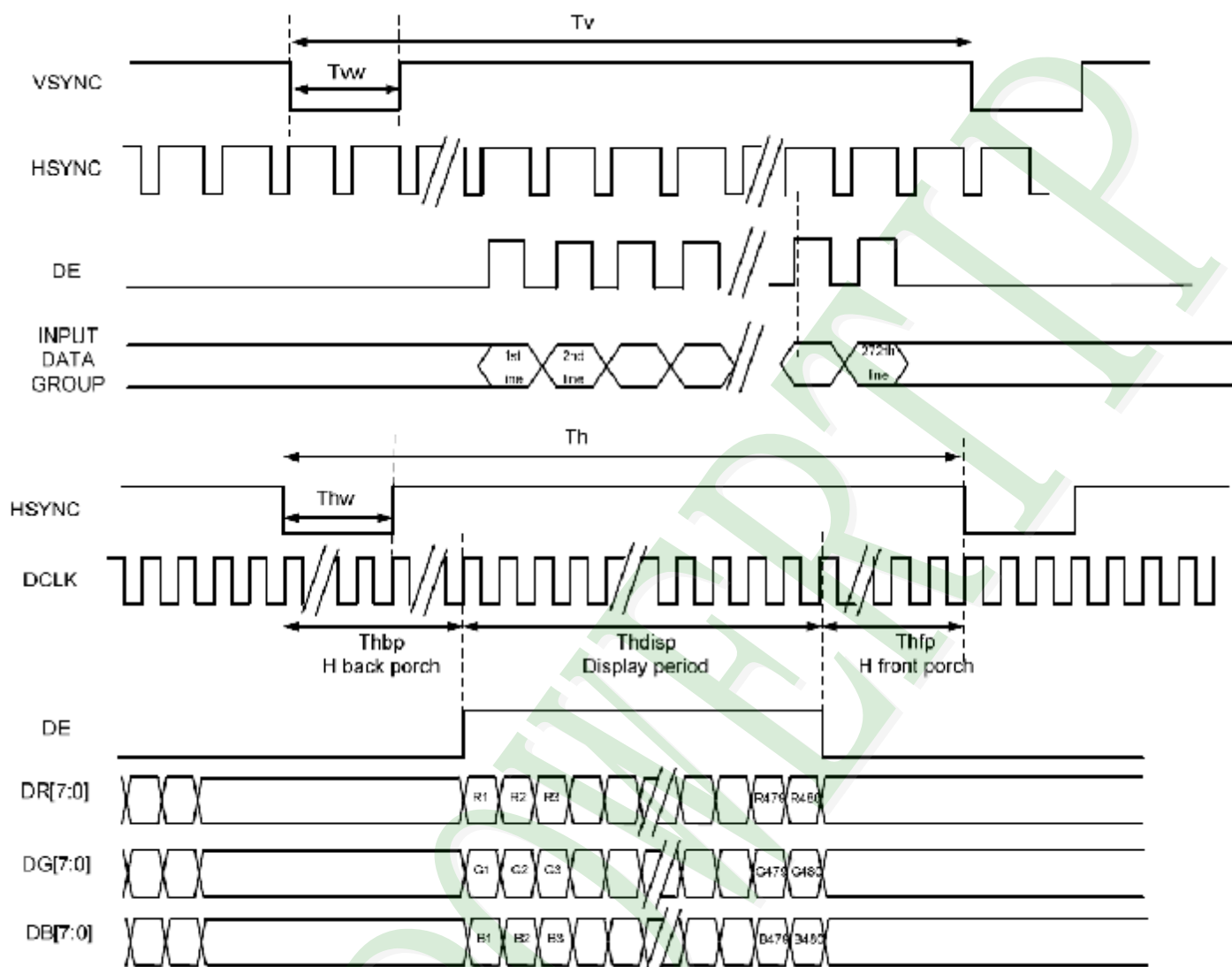
Pin No.	Symbol	Function
21	B0	Blue data bit 0
22	B1	Blue data bit 1
23	B2	Blue data bit 2
24	B3	Blue data bit 3
25	B4	Blue data bit 4
26	B5	Blue data bit 5
27	B6	Blue data bit 6
28	B7	Blue data bit 7
29	GND	Ground
30	CLK	Dot data clock
31	DISP	Display control / standby mode selection "High" : Normal display
32	HSYNC	Horizontal sync input
33	VSYNC	Vertical sync input
34	DE	Data input enable. Active High to enable the data input
35	N.C	Not Connect.
36	GND	Ground
37	XR	Not Connect.
38	YB	Not Connect.
39	XL	Not Connect.
40	YT	Not Connect.

## 2.3 Timing Characteristics

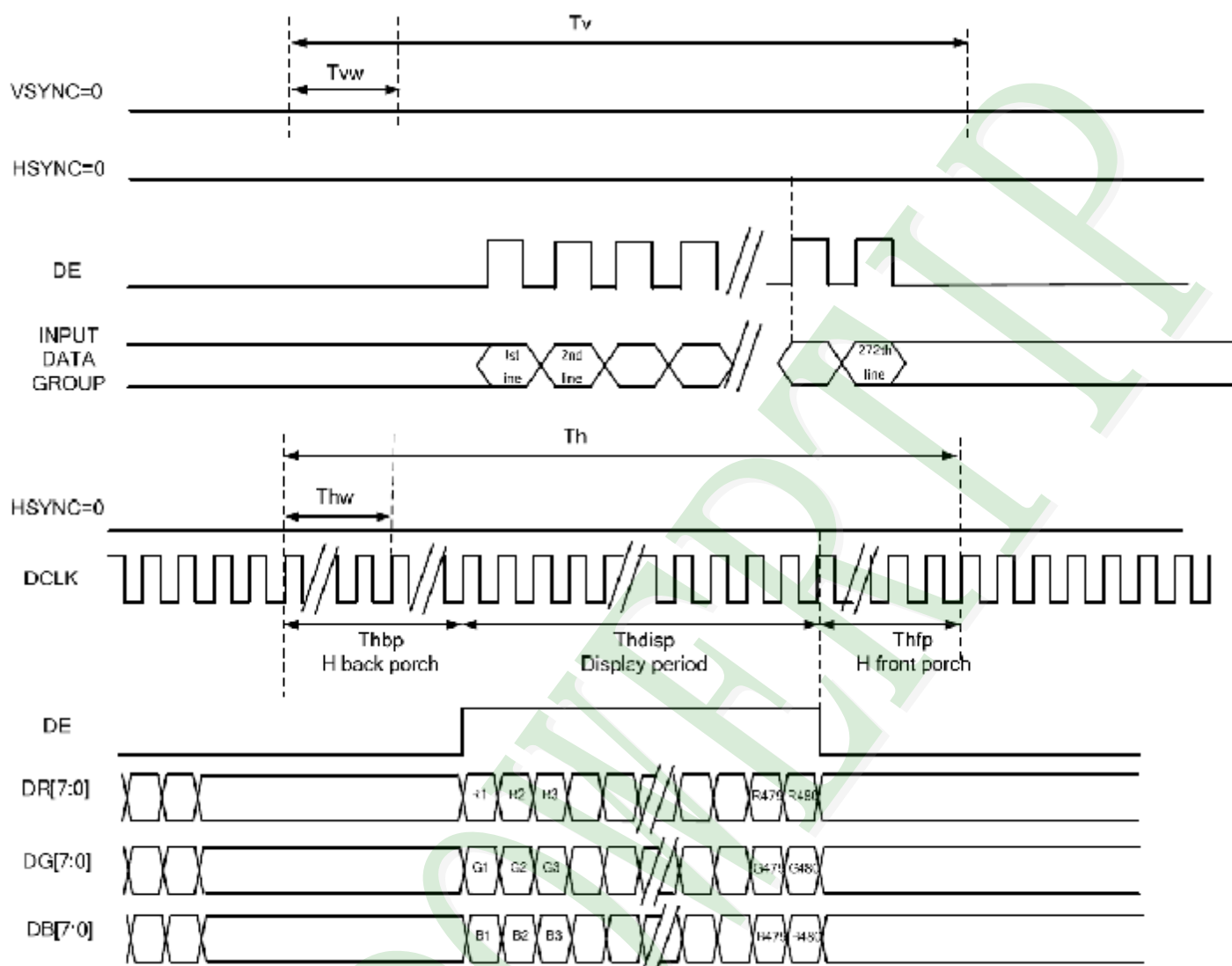
### 2.3.1 SYNC Mode



## 2.3.2 SYNC-DE Mode



### 2.3.3 DE Mode



### 2.3.4 Parallel 24-bit RGB Input Timing Table

480RGB X 272 Resolution Timing Table							
Item		Symbol	Min.	Typ.	Max.	Unit	Remark
DCLK Frequency		Fclk	8	9	12	MHz	
DCLK Period		Tclk	83	111	125	ns	
HSYNC	Period Time	Th	485	531	598	DCLK	
	Display Period	Thdisp		480		DCLK	
	Back Porch	Thbp	3	43	43	DCLK	By H_Blanking setting
	Front Porch	Thfp	2	8	75	DCLK	
	Pulse Width	Thw	2	4	75	DCLK	
VSYNC	Period Time	Tv	276	292	321	H	
	Display Period	Tvdisp		272		H	
	Back Porch	Tvbp	2	12	12	H	By V_Blanking setting
	Front Porch	Tvfp	2	8	37	H	
	Pulse Width	Tvw	2	4	37	H	

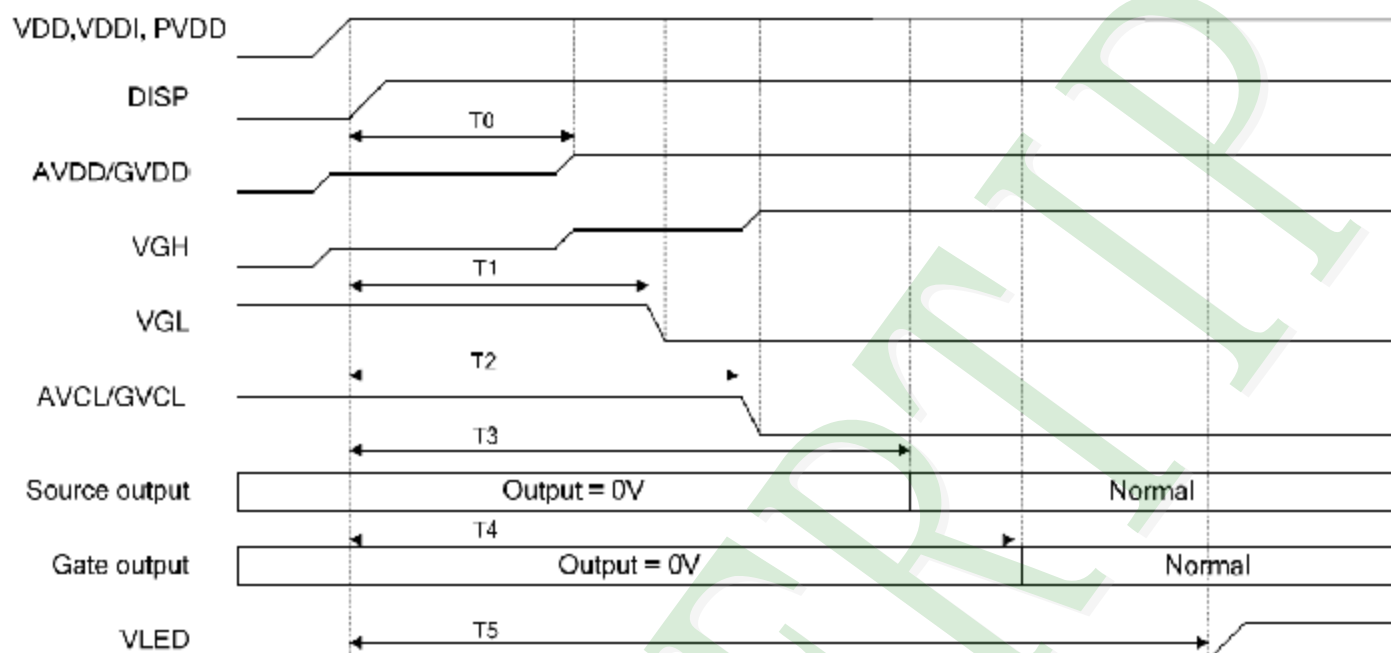
Note: It is necessary to keep Tvbp =12 and Thbp =43 in sync mode. DE mode is unnecessary to keep it.

480RGB X 240 Resolution Timing Table							
Item		Symbol	Min.	Typ.	Max.	Unit	Remark
DCLK Frequency		Fclk	8	9	12	MHz	
DCLK Period		Tclk	83	111	125	ns	
HSYNC	Period Time	Th	485	531	598	DCLK	
	Display Period	Thdisp		480		DCLK	
	Back Porch	Thbp	3	43	43	DCLK	By H_Blanking setting
	Front Porch	Thfp	2	8	75	DCLK	
	Pulse Width	Thw	2	4	75	DCLK	
VSYNC	Period Time	Tv	244	260	321	H	
	Display Period	Tvdisp		240		H	
	Back Porch	Tvbp	2	12	12	H	By V_Blanking setting
	Front Porch	Tvfp	2	8	37	H	
	Pulse Width	Tvw	2	4	37	H	

Note: It is necessary to keep Tvbp =12 and Thbp =43 in sync mode. DE mode is unnecessary to keep it.

## 2.3.5 Power Sequence

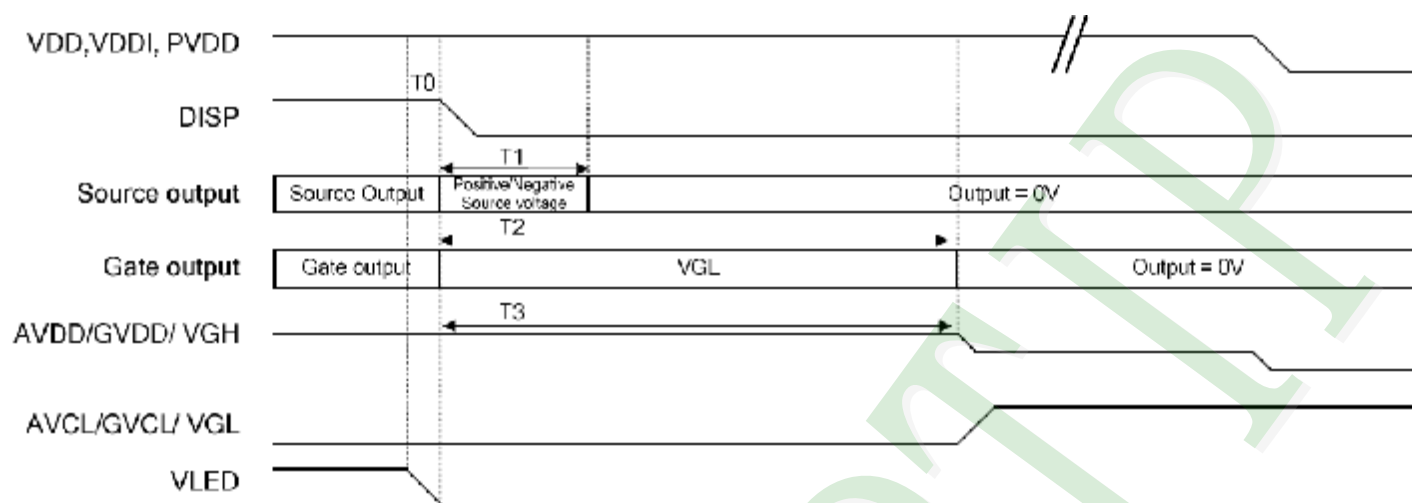
### POWER ON



Symbol	Description	Min. Time	Unit
T0	DISP="High" to AVDD/GVDD voltage stability	40	ms
T1	DISP="High" to VGL voltage stability	50	ms
T2	DISP="High" to AVCL/GVCL stability	70	ms
T3	DISP="High" to Source output	100	ms
T4	DISP="High" to Gate output	110	ms
T5	Black Turn on	130	ms



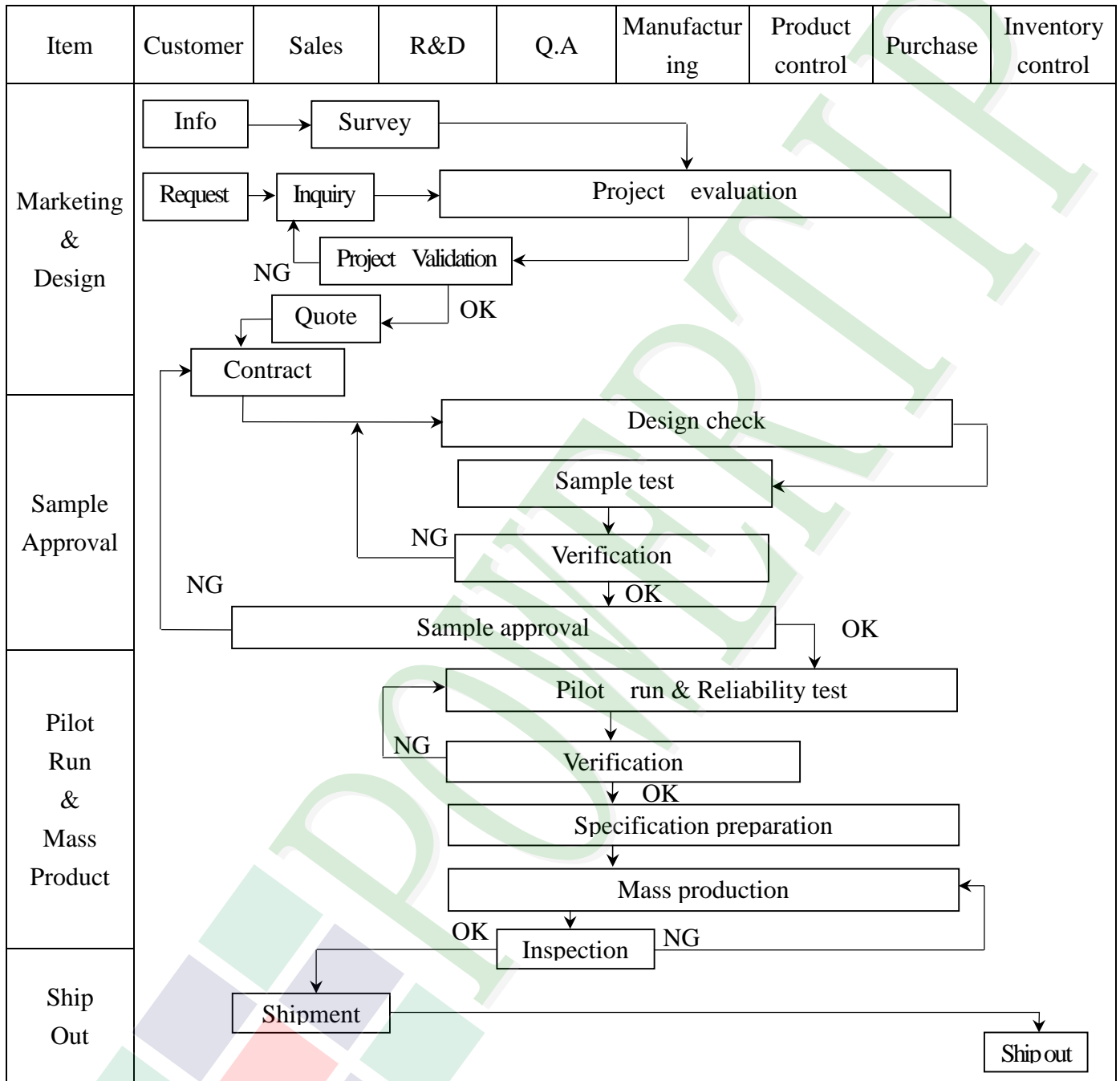
## POWER OFF

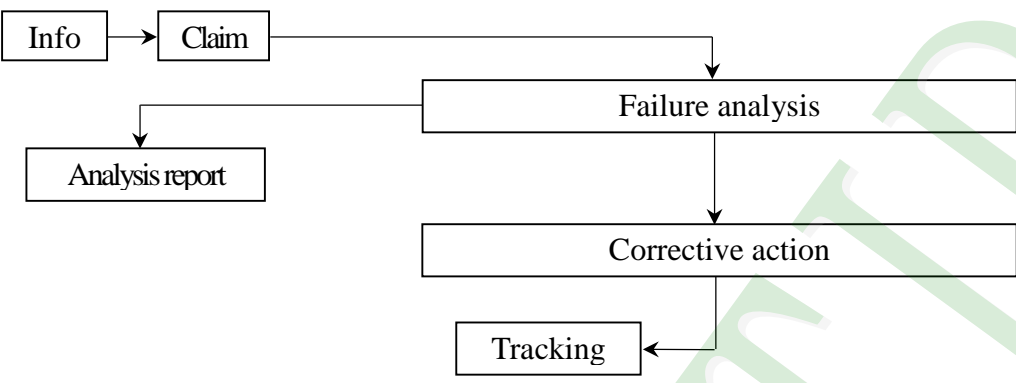


Symbol	Description	Min. Time	Unit
T0	Backlight turn off to DISP="Low"	5	ms
T1	DISP="Low" to Source output disable	20	ms
T2	DISP="Low" to Gate output disable	50	ms
T3	DISP="Low" to Gate output disable	50	ms

### 3. QUALITY ASSURANCE SYSTEM

#### 3.1 Quality Assurance Flow Chart



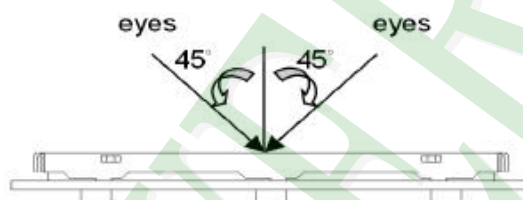
Item	Customer	Sales	R&D	Q.A	Manufacturing	Product control	Purchase	Inventory control
Sales Service	 <pre> graph TD     Info[Info] --&gt; Claim[Claim]     Claim --&gt; Failure[Failure analysis]     Failure --&gt; Analysis[Analysis report]     Failure --&gt; Corrective[Corrective action]     Corrective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

## 3.2. Inspection Specification

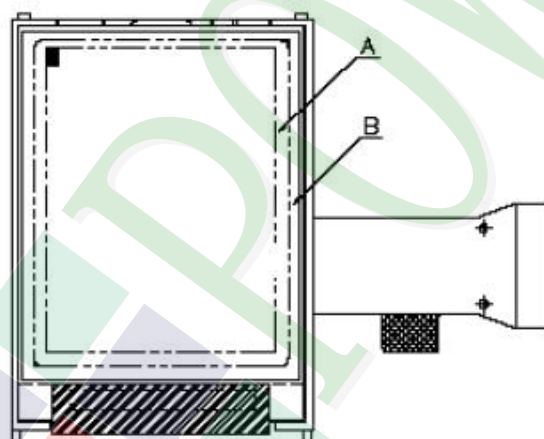
- ◆Scope : The document shall be applied to TFT-LCD Module for 3, 5" ~15" (Ver.B01).
- ◆Inspection Standard : MIL-STD-105E Table Normal Inspection Single Sampling Level II.
- ◆Equipment : Gauge 、 MIL-STD 、 Powertip Tester 、 Sample
- ◆Defect Level : Major Defect AQL : 0.4 ; Minor Defect AQL : 1.5
- ◆OUT 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 , and distance of view must be at 30 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" :**

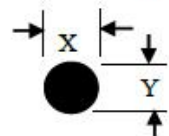
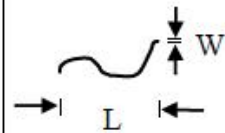
(Ver.B01)

NO	Item	Criterion	Level												
01	Product condition	1. 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 can not be seen through 5% ND filter. (Mura : Under the normal examination angle of view,the picture has the non-uniform phenomenon.)	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 that can not be seen through 5% ND filter.															



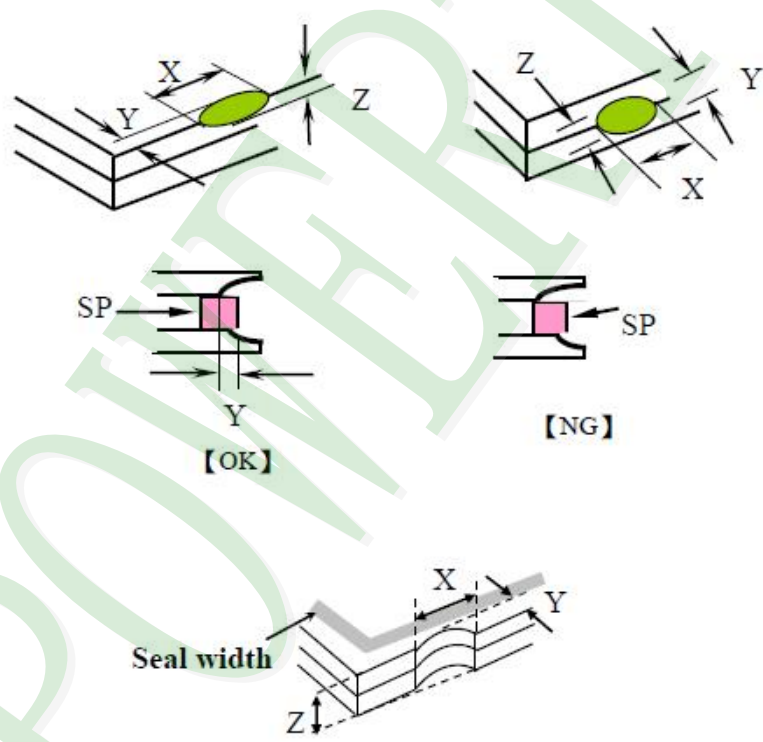
**◆ Specification For TFT-LCD Module 3.5" ~15" :**

(Ver.B01)

NO	Item	Criterion	Level																																																				
06	<div>Black or white dot 、 scratch 、 contamination</div> <div>Round type</div>  <div>Φ=(x+y) / 2</div> <div>Line type</div> 	<div>6.1 Round type ( Non-display or display) :</div> <table border="1"> <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 &lt; Φ ≤ 0.50</td> <td>5</td> </tr> <tr> <td>Φ &gt; 0.50</td> <td>0</td> </tr> <tr> <td>Total</td> <td>5</td> </tr> </table> <div>6.2 Line type( Non-display or display) :</div> <table border="1"> <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="4">Ignore</td> </tr> <tr> <td>L ≤ 10.0</td> <td>0.03 &lt; W ≤ 0.05</td> <td>4</td> </tr> <tr> <td>L ≤ 5.0</td> <td>0.05 &lt; W ≤ 0.10</td> <td>2</td> </tr> <tr> <td>---</td> <td>W &gt; 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 &lt; W ≤ 0.10</td> <td>5</td> </tr> <tr> <td>---</td> <td>W &gt; 0.10</td> <td>As round type</td> </tr> <tr> <td colspan="2">Total</td> <td>5</td> </tr> </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
		Dimension (diameter : Φ)		Acceptance (Q'ty)																																																			
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		0.25 < Φ ≤ 0.50	5																																																				
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		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																																																				
07	Polarizer Bubble	<table border="1"> <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 &lt; Φ ≤ 0.50</td> <td>4</td> </tr> <tr> <td>0.50 &lt; Φ ≤ 0.80</td> <td>1</td> </tr> <tr> <td>Φ &gt; 0.80</td> <td>0</td> </tr> <tr> <td>Total</td> <td>5</td> </tr> </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																																				
		Dimension (diameter : Φ)		Acceptance (Q'ty)																																																			
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		0.50 < Φ ≤ 0.80	1																																																				
		Φ > 0.80	0																																																				
Total	5																																																						

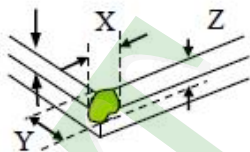
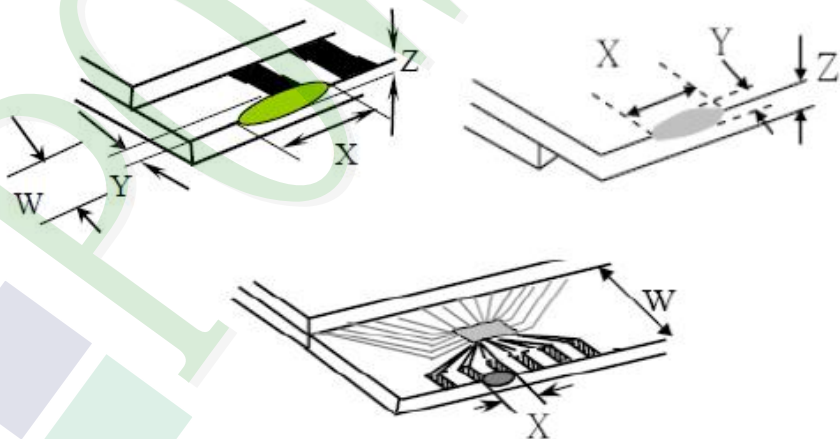
**◆ Specification For TFT-LCD Module 3.5" ~15" :**

(Ver.B01)

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>	Minor						
		<p>8.1 General glass chip :</p> <p>8.1.1 Chip on panel surface and crack between panels:</p>  <table><thead><tr><th>X</th><th>Y</th><th>Z</th></tr></thead><tbody><tr><td><math>\leq a</math></td><td>Crack can't enter viewing area</td><td><math>\leq 1/2 t</math></td></tr><tr><td><math>\leq a</math></td><td>Crack can't exceed the half of SP width.</td><td><math>1/2 t &lt; Z \leq 2 t</math></td></tr></tbody></table>		X	Y	Z	$\leq a$	Crack can't enter viewing area	$\leq 1/2 t$
X	Y	Z							
$\leq a$	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" :

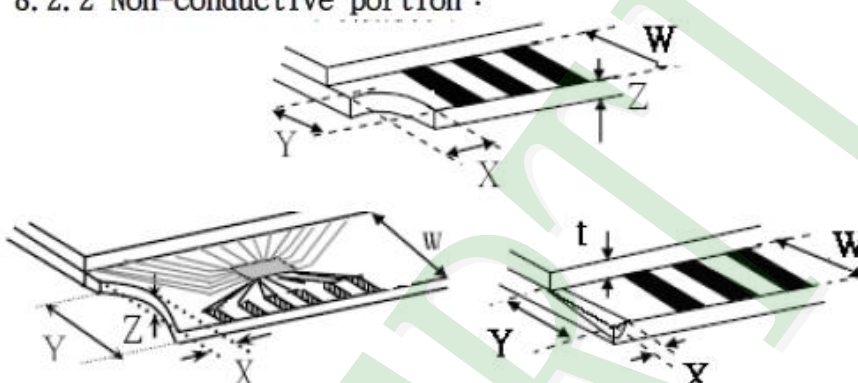
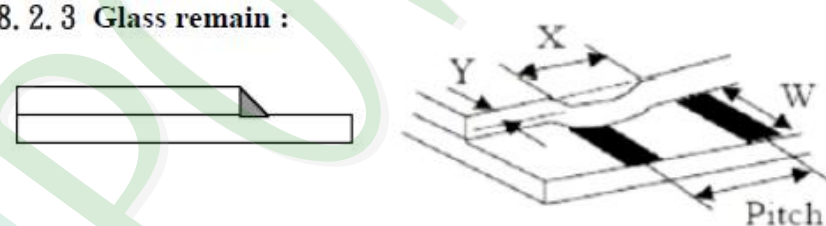
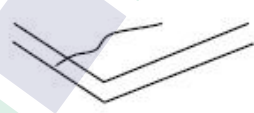
(Ver.B01)

NO	Item	Criterion	Level												
08	The crack of glass	<p><b>Symbols :</b></p> <p><b>X :</b> The length of crack <b>Z :</b> The thickness of crack <b>t :</b> The thickness of glass</p> <p><b>Y :</b> The width of crack. <b>W :</b> terminal length <b>a :</b> LCD side length</p>	Minor												
		<p>8.1.2 Corner crack :</p>  <table><tr><th>X</th><th>Y</th><th>Z</th></tr><tr><td><math>\leq 1/5 a</math></td><td>Crack can't enter viewing area</td><td><math>Z \leq 1/2 t</math></td></tr><tr><td><math>\leq 1/5 a</math></td><td>Crack can't exceed the half of SP width.</td><td><math>1/2 t &lt; Z \leq 2 t</math></td></tr></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.	$1/2 t < Z \leq 2 t$			
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><tr><th></th><th>X</th><th>Y</th><th>Z</th></tr><tr><td>Front</td><td><math>\leq a</math></td><td><math>\leq 1/2 W</math></td><td><math>\leq t</math></td></tr><tr><td>Back</td><td><math>\leq a</math></td><td><math>\leq W</math></td><td><math>\leq 1/2 t</math></td></tr></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	$\leq a$	$\leq W$	$\leq 1/2 t$												



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

(Ver.B01)

NO	Item	Criterion	Level						
08	The crack of glass	<p><b>Symbols :</b></p> <p><b>X :</b> The length of crack <b>Z :</b> The thickness of crack <b>t :</b> The thickness of glass</p> <p><b>Y :</b> The width of crack. <b>W :</b> terminal length <b>a :</b> LCD side length</p>	Minor						
		<p><b>8.2.2 Non-conductive portion :</b></p>  <table><tr><th>X</th><th>Y</th><th>Z</th></tr><tr><td><math>\leq 1/3 a</math></td><td><math>\leq W</math></td><td><math>\leq t</math></td></tr></table>		X	Y	Z	$\leq 1/3 a$	$\leq W$	$\leq t$
		X		Y	Z				
$\leq 1/3 a$	$\leq W$	$\leq t$							
<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><b>8.2.3 Glass remain :</b></p>  <table><tr><th>X</th><th>Y</th><th>Z</th></tr><tr><td><math>\leq a</math></td><td><math>\leq 1/3 W</math></td><td><math>\leq t</math></td></tr></table>	X	Y	Z	$\leq a$	$\leq 1/3 W$	$\leq t$			
X	Y	Z							
$\leq a$	$\leq 1/3 W$	$\leq t$							
<p><b>8.2.4 Cracking</b></p>  <p><b>Not Allowed</b></p>									

**◆ 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 $\leq 1.5$ 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 Surrounding temperature, then storage at normal condition 4hrs.											
2	Low Temperature Storage Test	Keep in -30 ±2℃ 240 hrs Surrounding temperature, then storage at normal condition 4hrs.											
3	High Temperature / High Humidity Storage Test	Keep in +60℃ / 90% R.H duration for 240 hrs Surrounding temperature, then storage at normal condition 4hrs.											
4	Temperature Cycling Storage Test	<div><div><div>-30℃</div><div>→</div><div>+25℃</div><div>→</div><div>+80℃</div><div>→</div><div>+25℃</div></div><div><div>(30mins)</div><div>(5mins)</div><div>(30mins)</div><div>(5mins)</div></div><div>←10 Cycle→</div></div> Surrounding temperature, then storage at normal condition 4hrs.											
5	ESD Test	Air Discharge: Apply 15 KV with 10 times Discharge for each polarity +/-	Contact Discharge: Apply 10 KV with 10 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> Drop Direction :※1 corner / 3 edges / 6 sides each 1time		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												

## 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 .

### 5.3 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	LCM包裝規格書		Approve	Check	Contact
Documents NO. JPKG-PH480272T005-IAA01	LCM Packaging Specifications (For Tray)		Ryan	Terry	Sally

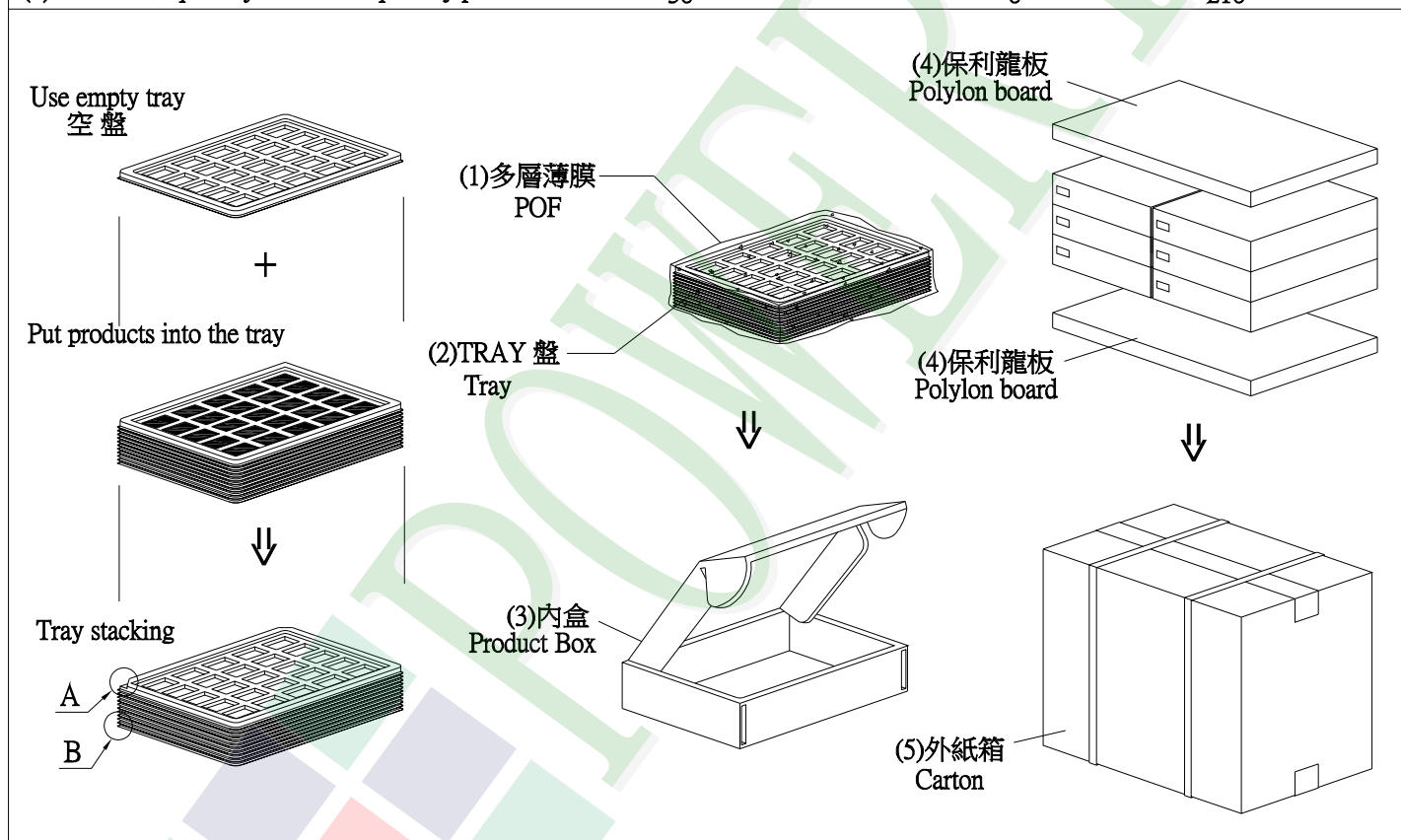
1.包裝材料規格表 (Packaging Material) : (per carton)

No.	Item	Model	Dimensions (mm)	1Pcs Weight	Quantity	Total Weight
1	成品 (LCM)	PH480272T005-IAA01	105.5 X 67.2 X 3.0	0.0465	216	10.044
2	多層薄膜(1)POF	OTFILM0BA03ABA	19"X350X0.015	——	6	——
3	TRAY 盤 (2)Tray	TY00000000392	352 X 260 X 2.6	0.1	60	6.0
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						
8						
9						

2.一整箱總重量 (Total LCD Weight in carton ) : 18.19 Kg±10%

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

(1)LCM quantity per box : no per tray	4	x no of tray	9	=	36
(2)Total LCM quantity in carton : quantity per box	36	x no of boxes	6	=	216



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>	
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