POWERTIP TECH. CORP.

SPECIFICATIONS

CUSTOMER	:	**CHC300**
SAMPLE CODE	:	**SH480272T-007-I01Q**
MASS PRODUCTION CODE	:	**PH480272T-007-I01Q**
SAMPLE VERSION	:	**02**
SPECIFICATIONS EDITION	:	**003**
DRAWING NO. (Ver.)	:	**LMD-PH480272T-007-I01Q (Ver.001)**
PACKAGING NO. (Ver.)	:	**PKG-PH480272T-007-I01Q (Ver.001)**

Customer Approved

Date:

Approved	Checked	Designer
黃秋源 **Oliver Huang**	黃秋源 **Oliver Huang**	黃俊清 **Ackey Huang**

POWERTIP
2012.03.30
TW RD APR

☐ Preliminary specification for design input

■ Specification for sample approval

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History of Version

Date	Ver.	Edi.	Description	Page	Design by
03/02/2012	01	001	New Sample.	-	Ackey
03/23/2012	02	002	Second Sample(Modify PLZ Type).	6	Ackey
03/29/2012	02	003	Update Inspection Specification.	21-27	Ackey

Total: 29 Page

Contents

Note: For detailed information please refer to IC data sheet: ILI6482C

1.1 Features

Item	Standard Value
Display Type	480 * 3 (RGB) * 272 Dots
LCD Type	normally white TN , Transmissive Type
Screen size(inch)	5”(Diagonal)
Color configuration	R,G, B vertical stripe
Backlight	White LED B/L
Display Interface	Parallel RGB Mode Data format
Driver IC	ILI6482C
ROHS	THIS PRODUCT CONFORMS THE ROHS OF PTC Detail information please refer web side : http://www.powertip.com.tw/news.php?area_id_view=1085560481/

1.2 Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension(T/P)	120.7(W) x 75.8 (L) x 4.45(H)	mm

LCD panel

Item	Standard Value	Unit
Active Area	110.88 (W) x 62.832 (L)	mm

Note : For detailed information please refer to LCM drawing

Touch panel

Item	Standard Value	Unit
Viewing Area	113.9 (W) * 65.85 (L)	mm
Active Area	111.9 (W) * 63.9 (L)	mm

Note : For detailed information please refer to LCM drawing

1.3 Absolute Maximum Ratings

Module

Item	Symbol	Condition	Min.	Max.	Unit
Logic operating voltage	AVDD ~ GND	-	-0.5	+5.0	V
Operating Temperature	T_{OP}	-	-20	+70	°C
Storage Temperature	T_{ST}	-	-30	+80	°C
Storage Humidity	H_D	Ta ≦ 40 °C	20	90	%RH

1.4 DC Electrical Characteristics

Module GND = 0V, Ta = 25°C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Digital Power supply	DVDD	-	1.8	3.3	3.4	V
Analog Power supply	AVDD	-	3.2	3.3	3.4	V
“H” Input Voltage	V_{IH}	-	0.7*VDD	-	VDD	V
“L” Input Voltage	V_{IL}	-	GND	-	0.3* GND	V
“H” Output Voltage	V_{OH}	-	VDD-0.4	-	VDD	V
“L” Output Voltage	V_{OL}	-	GND	-	GND +0.4	V
Supply Current	DIDD=AIDD	DVDD=AVDD=3.3V Pattern= Black *1	-	14	22	mA

Note1: Maximum current display.

1.5 Optical Characteristics

TFT LCD Panel DVDD=AVDD =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	Note2
Viewing angle	Top	θY+	CR ≥ 10	-	50	-	Deg.	Note4
	Bottom	θY-		-	50	-		
	Left	θX-		-	50	-		
	Right	θX+		-	50	-		
Contrast ratio		CR	Ta = 25°C θX , θY = 0°	200	250	-	-	-
Color of CIE Coordinate	White	X		0.24	0.29	0.34	-	Note1
		Y		0.27	0.32	0.37		
	Red	X		0.54	0.59	0.64		
		Y		0.28	0.33	0.38		
	Green	X		0.29	0.34	0.39		
		Y		0.53	0.58	0.63		
	Blue	X		0.09	0.14	0.19		
		Y		0.03	0.08	0.13		
Average Brightness Pattern=white display		IV	IF= 40 mA	220	250	-	cd/m^2	Note1
Uniformity		△B	IF= 40 mA	70	-	-	%	Note1

Note1:

1：△B=B(min) / B(max) × 100%

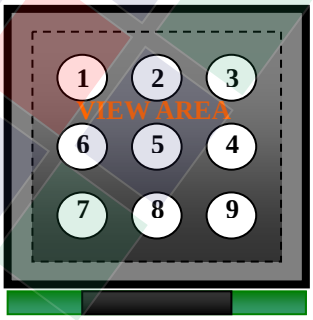
2：Measurement Condition for Optical Characteristics:

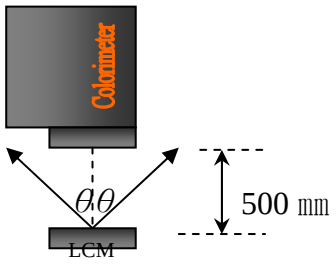
a：Environment: 25℃±5℃ / 60±20%R.H，no wind，dark room below 10 Lux at typical lamp current and typical operating frequency.

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

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:

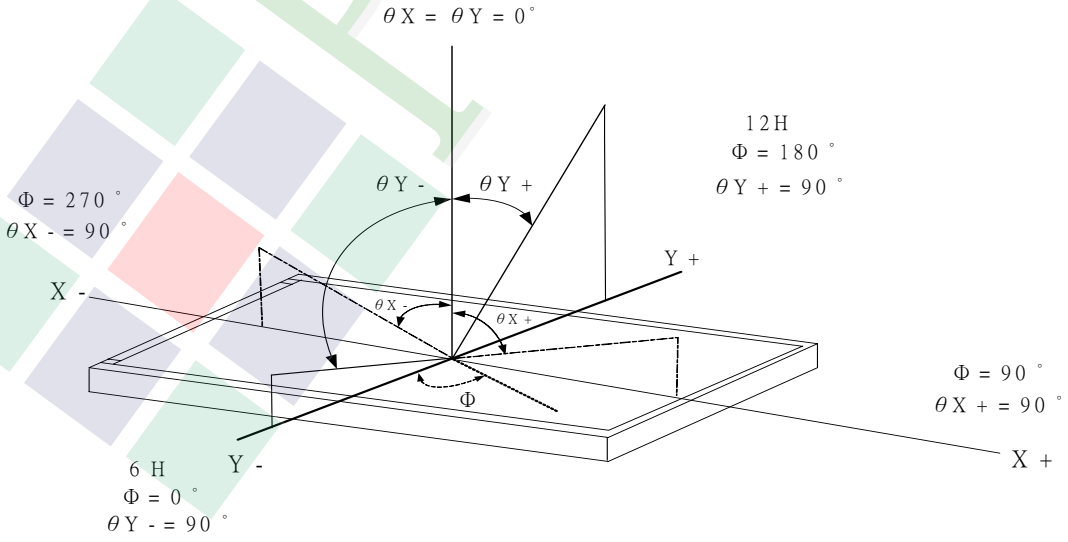
Note3: Definition of contrast ratio:

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

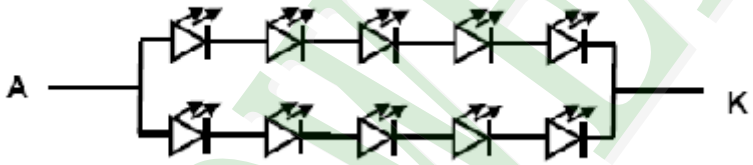
Maximum Ratings

Item	Symbol	Conditions	Min.	Max.	Unit
Forward Current	IF	Ta =25℃	-	80	mA
Power Dissipation	PD	Ta =25℃	-	525	mW

Electrical / Optical Characteristics

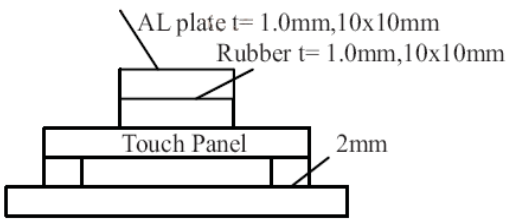
Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	VF	IF= 40 mA	14.5	16.0	17.5	V
Color	White					

Internal Circuit Diagram



1.7 Touch Panel Specification

1.7.1 General Standard Specification

Item	Specification
Input Method	Finger or stylus pen
ITO Glass	T=0.7mm , 500Ω/□ ±150Ω
ITO Film	T=0.18mm , 400Ω/□ ±150Ω Clear Type
Operating Temperature Range	-20℃~40℃,90%RH↓,41℃~75℃,60%RH↓ (Except for dew gathering.)
Operating Temperature Range	-40℃~40℃,90%RH↓,41℃~85℃,60%RH↓ (Except for dew gathering.)
Surface Hardness	3H
Hitting Durability	1,000,000 times min. (Tip R 8 mm & R0.8mm)
Pen Sliding Durability	100,000 times min. (Tip R0.8mm)
Insulation Impedance	DC25V 1min,20MΩ↑
Light Transparency	80%min
Linearity	±1.5% (±1.5% After environmental and life test)
Linearity Force	130gf less input with stylus pen (R0.8mm) Activation force guarantee area: 3.0mm inside of Active Area.
Activation Force	40gf(Typical 20gf) less individual point on with stylus pen(R0.8mm). Activation force guarantee area: 3.0mm inside of Active Area.
Bouncing	<10ms
Impact Resistance	No damage when φ9mm steel ball is dropped on the surface from 30 cm height at 1 time.
Flexible Pattern Heat Seal Peeling Strength	Bending 3 times by bending radius R1.0 mm. The requirements in 4-2 shall be satisfied
Flexible Pattern Bending Resistance	1 times at least. The requirements in 4-2 shall be satisfied.
Vibration Resistance	Not in operation: The requirements in 3 to 4 shall be satisfied after sweep vibration of 2G 15~55Hz(1 min.) is given for 30 min. each in the directions of X, Y, Z.
Package Drop	No damage to the product.(1corner edge, 2 ridges, 4 surfaces, drop from 50 cm height)
Static load resistance	After 4.5Kg load for 1 min is applied to the center area ($1.0cm^2$) of the Touch panel, the requirements in 3 and 4, shall be satisfied. 

1.7.2 Optical Characteristic.

1.7.2.1 test by light measure device and the result should be 80%min.

1.7.3 Electrical Characteristics.

1.7.3.1 Insulation Resistance.

10 MΩ or more (DC 25V 1min)

1.7.3.2 Resistance Between Terminals.

Direction X (Film side): 300Ω~ 900Ω

Direction Y (Glass side): 200Ω~ 800Ω

1.7.3.3 Linearity.

± 1.5% Measuring method, Linearity(%) = $\frac{\triangle V}{EV\text{-}SV}$ X 100

± 1.5%(after environmental and life test)

△V: The difference between the ideal voltage and measured voltage on the each measuring line.

SV: Voltage of starting Points

EV: Voltage of Ending Points

1.7.3.4 Operating Voltage.

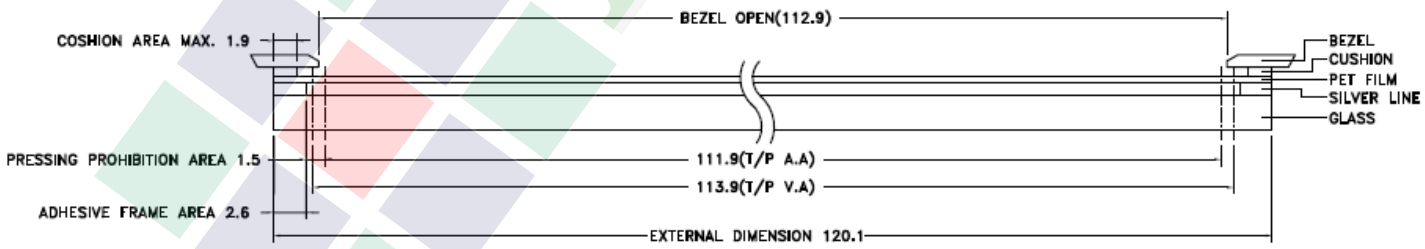
5V DC.

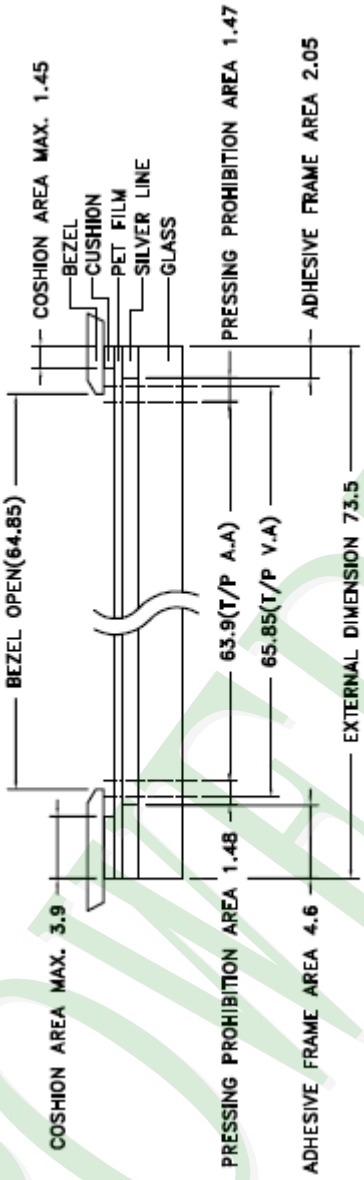
Max Voltage : 7V DC.

1.7.3.5 Bouncing

<10ms

Tip R 3.75mm, hardness 10°~20° ,silicon rubber ,500gf operation : 40 mm/sec.




COSHION AREA MAX. 1.45
BEZEL
CUSHION
PET FILM
SILVER LINE
GLASS
PRESSING PROHIBITION AREA 1.47
ADHESIVE FRAME AREA 2.05
BEZEL OPEN(64.85)
63.9(T/P A.A)
65.85(T/P V.A)
EXTERNAL DIMENSION 73.5
COSHION AREA MAX. 3.9
PRESSING PROHIBITION AREA 1.48
ADHESIVE FRAME AREA 4.6

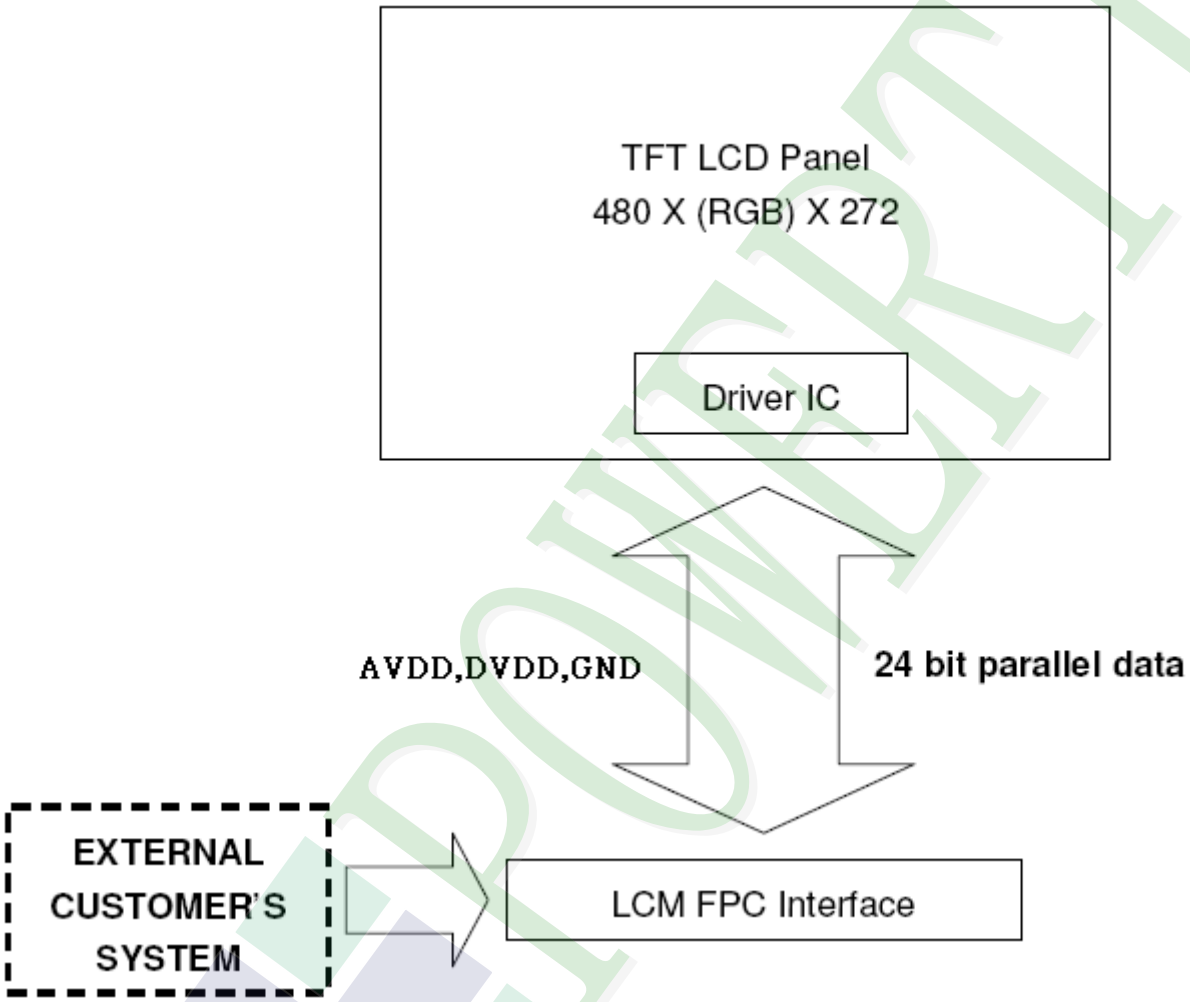
2. MODULE STRUCTURE

2.1 Counter Drawing

2.1.1 LCM Mechanical Diagram

* See Appendix

2.1.2 Block Diagram



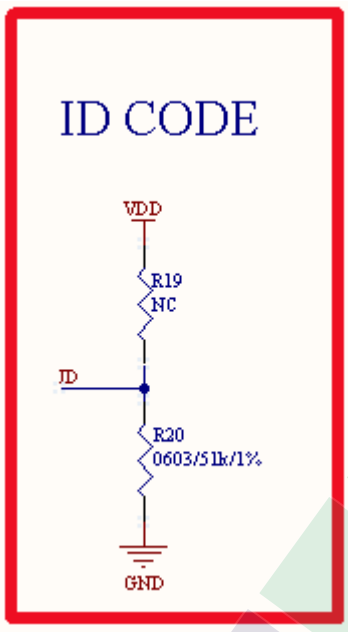
2.2 Interface Pin Description

Pin No.	Symbol	Function
1	GND	Power ground.
2	GND	Power ground.
3	AVDD	Power supply for analog circuit.
4	DVDD	Power supply for digital interface.
5	R0	Red data (LSB).
6	R1	Red data.
7	R2	Red data.
8	R3	Red data.
9	R4	Red data.
10	R5	Red data.
11	R6	Red data.
12	R7	Red data (MSB).
13	G0	Green data (LSB).
14	G1	Green data.
15	G2	Green data.
16	G3	Green data.
17	G4	Green data.
18	G5	Green data.
19	G6	Green data.
20	G7	Green data (MSB).
21	B0	Blue data (LSB).
22	B1	Blue data.
23	B2	Blue data.

Pin No.	Symbol	Function
24	B3	Blue data.
25	B4	Blue data.
26	B5	Blue data.
27	B6	Blue data.
28	B7	Blue data (MSB).
29	GND	Power ground.
30	DCLK	Clock Signal.
31	CSB	3-wire I/F chip select pin.
32	HSYNC	Horizontal Sync signal.
33	VSYNC	Vertical Sync signal.
34	DE	Data input Enable.
35	GND	Power Ground.
36	HVDSL	HVmode or DE mode control signal HVDSL = “H”: set under HV mode, VSD and HSD signal must be provided by system. HVDSL= “L”: Set under DE mode, DE signal must e provided by system
37	GND	Power ground.
38	SCL	3-wire I/F clock input pin.
39	SDA	3-wire I/F data input pin.
40	GND	Power ground.
41	TP_R	Touch Panel right side signal.
42	TP_B	Touch Panel bottom side signal.
43	TP_L	Touch Panel Left side signal.

Pin No.	Symbol	Function
44	TP_U	Touch Panel Up side signal.
45	GND	Power ground.
46	K	Power for LED backlight cathode.
47	ID	Vendor ID (On FPC, ID resistor as specified in vendor table shall be connected to this pin, and other side of the resistor shall be connected to GND)
48	A	Power for LED backlight anode.
49	GND	Power ground.
50	GND	Power ground.

Note: ID code Circuit

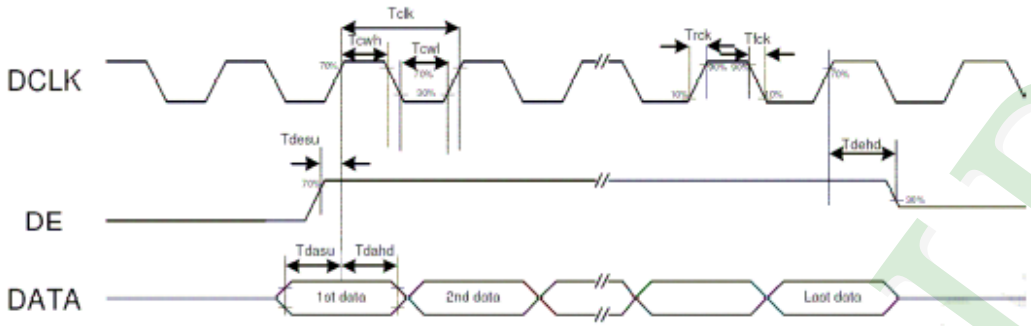


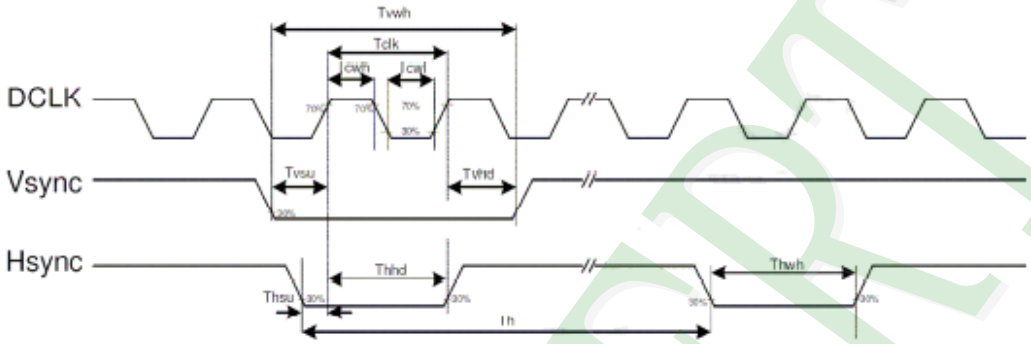
R1=51KΩ

2.3 Timing Characteristics

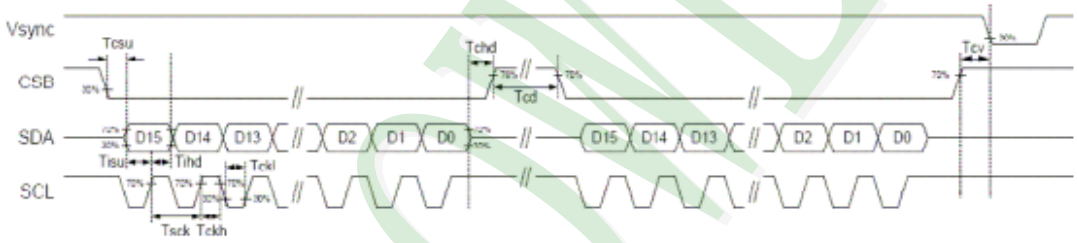
AC Electrical Characteristics

Parameters	Symbol	Min.	Typ.	Max.	Unit	Conditions
System operation timing						
VDD power source slew time	TPOR	-	-	20	ms	From 0V to 99% VDD
GRB pulse width	tRSTW	10	50	-	us	R=10Kohm, C=1uF
Input Output timing						
DCLK clock time	Tclk	33.3	-	-	ns	DCLK=30MHz
DCLK clock low period	Tcwl	40	-	60	%	
DCLK clock high period	Tcwh	40	-	60	%	
Clock rising time	Trck	9	-	-	ns	
Clock falling time	Tfck	9	-	-	ns	
HSD width	Thwh	1	-	-	DCLK	
HSD period time	Th	55	60	65	us	
HSD setup time	Thsu	12	-	-	ns	
HSD hold time	Thhd	12	-	-	ns	
VSD width	Tvwh	1	-	-	Th	
VSD setup time	Tvsu	12	-	-	ns	
VSD hold time	Tvhd	12	-	-	ns	
Data setup time	Tdasu	12	-	-	ns	
Data hold time	Tdahd	12	-	-	ns	
DE setup time	Tdesu	12	-	-	ns	
DE hold time	Tdehd	12	-	-	ns	
Source output setting time	Tsst	-	-	12	us	10% to 90% CL=60pF, RL=2Kohm
Gate output setting time	Tgst	-	-	1200	ns	10% to 90%, CL=60pF
VCOM output setting time	Tcst	-	-	12	us	10% to 90%, CL=40nF, RL=50ohm
Time from VSD to 1st line data input	Tvs	3	8	31	Th	HV mode By HDL[4:0] setting
3-wire serial communication AC timing						
Serial clock	Tsck	200	-	-	ns	For SCL pin
SCL pulse low period	Tckl	40	-	60	%	
SCL pulse low period	Tckh	40	-	60	%	
Serial data setup time	Tisu	50	-	-	ns	
Serial data hold time	Tihd	50	-	-	ns	
Serial clock high/low	Tssw	50	-	-	ns	
CSB to VSD	Tcv	1			us	
CSB distinguish time	Tcd	400	-	-	ns	
CSB input setup time	Tcsu	50	-	-	ns	
CSB input hold time	Tchd	50	-	-	ns	





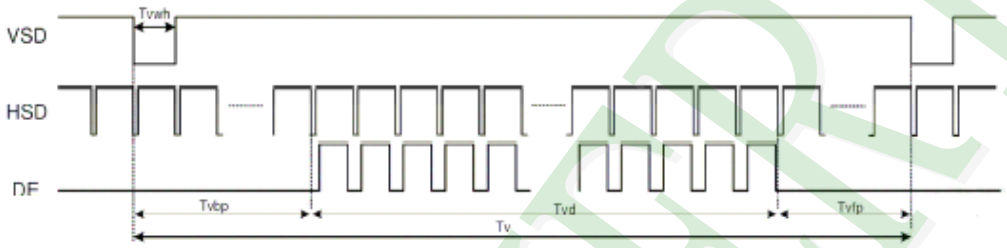
3-wire Timing Diagram



Parallel RGB input timign table

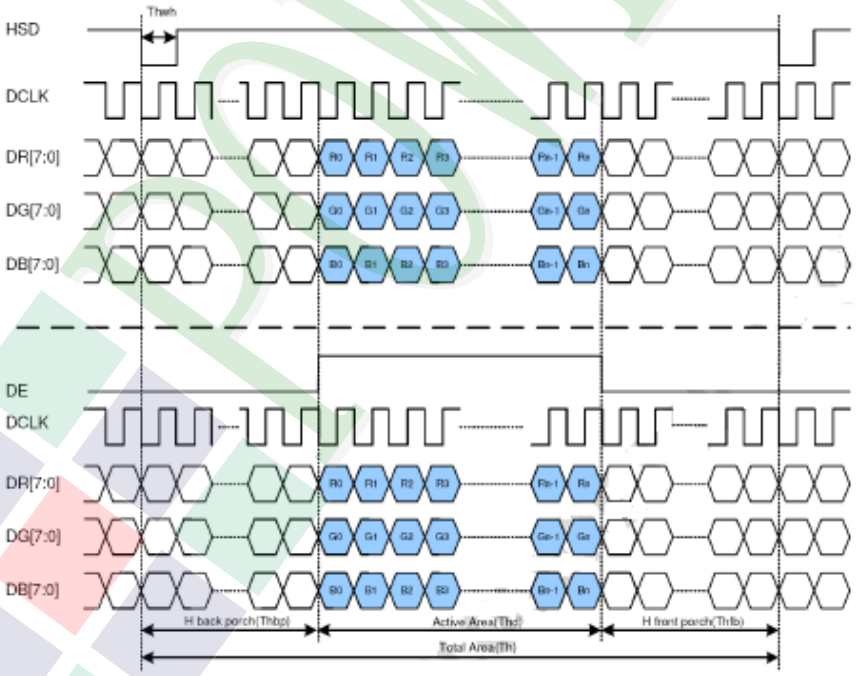
Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
DCLK frequency	fclk	5	9	12	MHz
VSD period time	Tv	277	288	400	H
VSD display area	Tvd		272		H
VSD back porch	Tvb	3	8	31	H
VSD front porch	Tvfp	2	8	93	H
HSD period time	Th	520	525	800	DCLK
HSD display area	Thd		480		DCLK
HSD back porch	Thbp	36	40	255	DCLK
HSD front porch	Thfp	4	5	65	DCLK

Vertical input timing



Parallel RGB Mode Data format

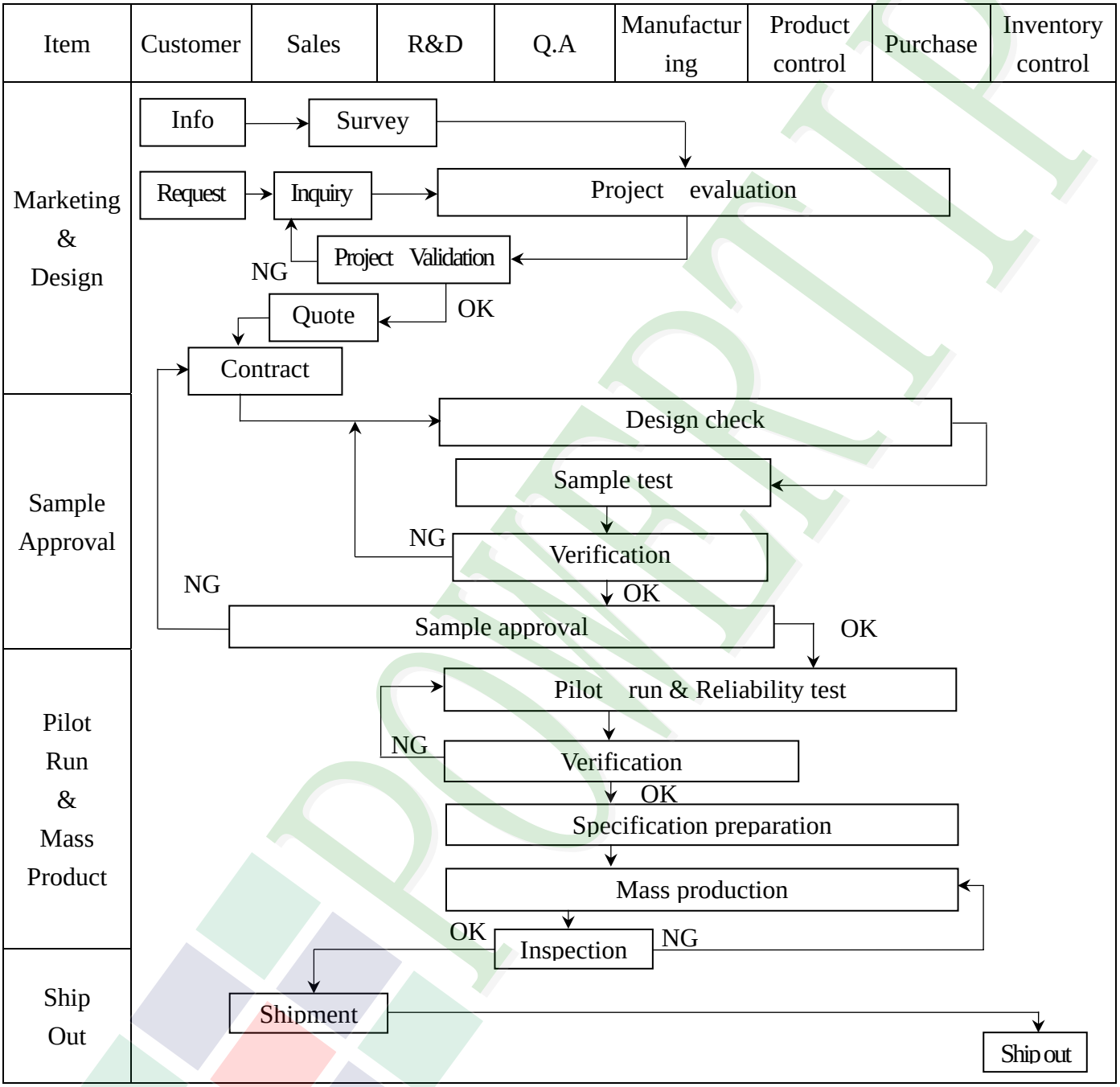
(HV Mode)

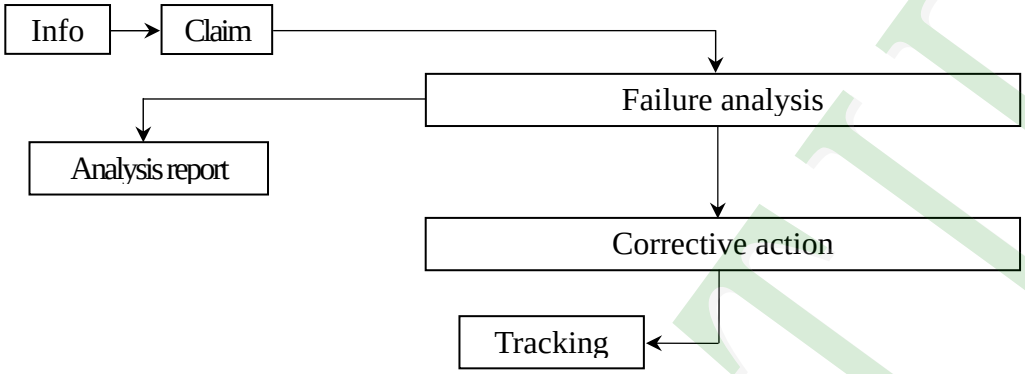


(DE Mode)

3. QUALITY ASSURANCE SYSTEM

3.1 Quality Assurance Flow Chart



Item	Customer	Sales	R&D	Q.A	Manufactu ring	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

◆Scope：The document shall be applied to TFT-LCD Module for 3.5″ ~10″ (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

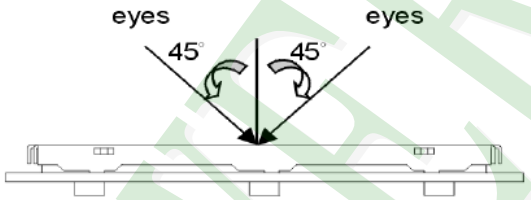
◆OUT Going Defect Level：Sampling.

◆Standard of the product appearance test：

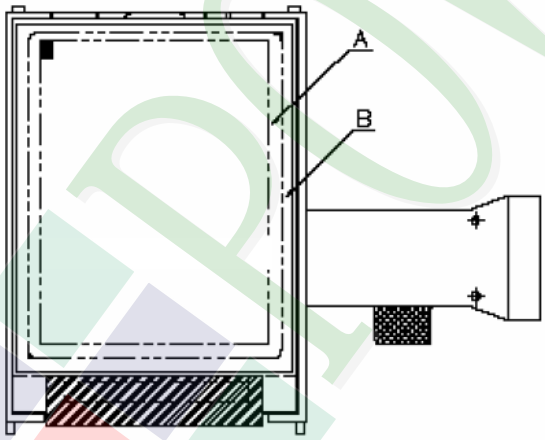
a. Manner of appearance test：

(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

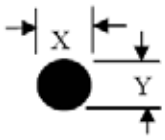
B area : Outside of viewing area

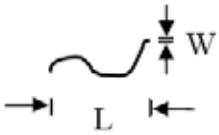
(4). Standard of inspection： (Unit：mm)

◆Specification For TFT-LCD Module 3.5″ ~10″ : (Ver.B01)

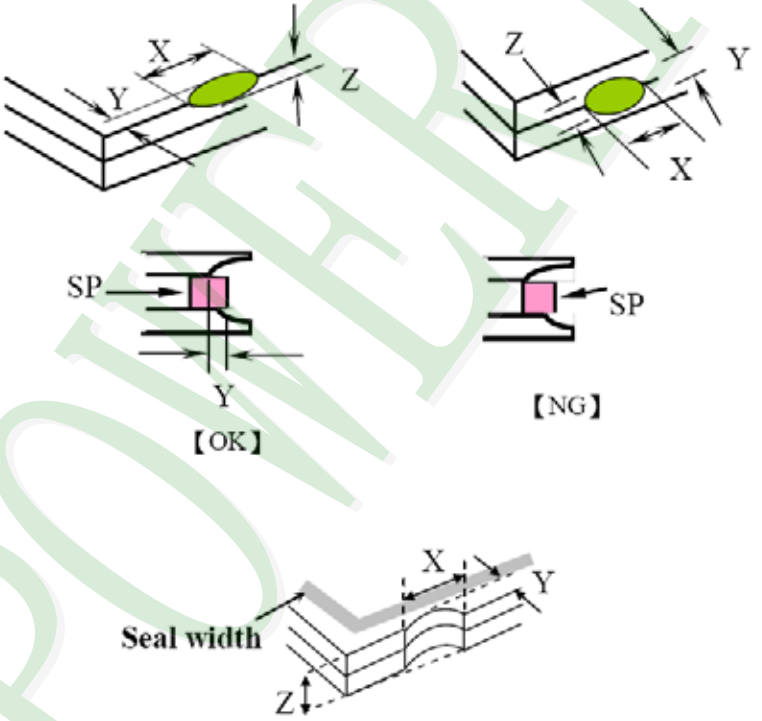
<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td rowspan="3">01</td><td rowspan="3">Product condition</td><td>1.1The part number is inconsistent with work order of production.</td><td>Major</td></tr>
<tr><td>1.2 Mixed product types.</td><td>Major</td></tr>
<tr><td>1.3 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="5">04</td><td rowspan="5">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>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.
</td><td>Minor</td></tr>
</table>

◆Specification For TFT-LCD Module 3.5″ ~10″ : (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">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>---</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></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="4">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″ ~10″ : (Ver:B01)

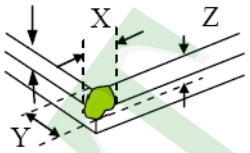
NO	Item	Criterion	Level
08	The crack of glass	Symbols : X : The length of crack Y : The width of crack. Z : The thickness of crack W : terminal length t : The thickness of glass a : LCD side length 8.1 General glass chip : 8.1.1 Chip on panel surface and crack between panels: 	Minor

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

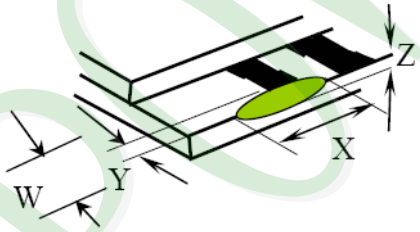
◆Specification For TFT-LCD Module 3.5″ ~10″ : (Ver.B01)

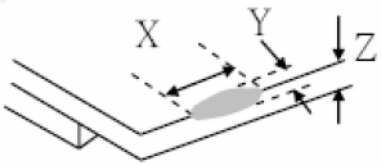
<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td>08</td><td>The crack of glass</td><td>
Symbols :

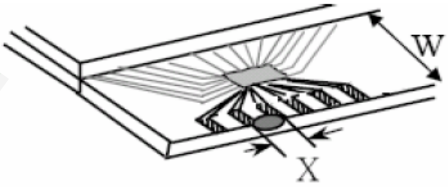
X : The length of crack　　Y : The width of crack.
Z : The thickness of crack　　W : terminal length
t : The thickness of glass　　a : LCD side length

8.1.2 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>

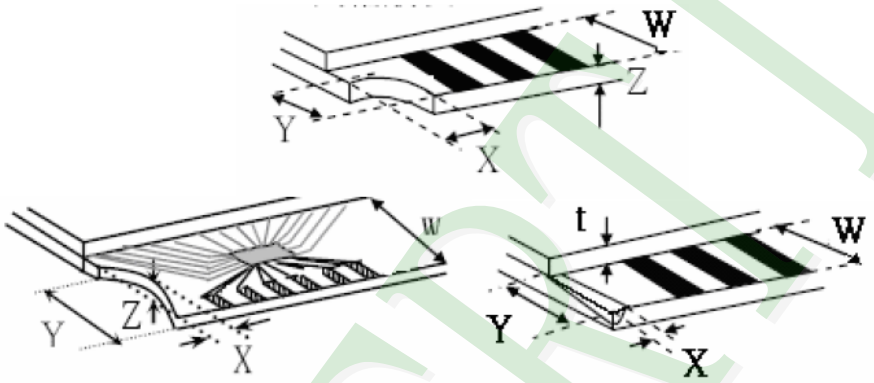
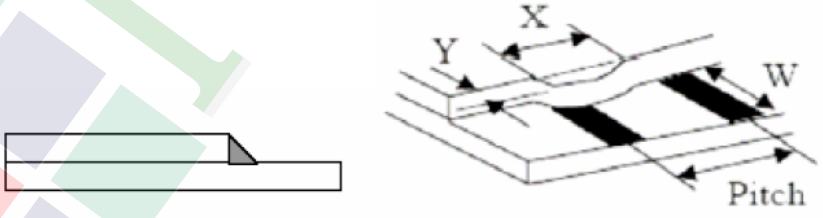
8.2 Protrusion over terminal :
8.2.1 Chip on electrode pad :






<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><td>Minor</td></tr>
</table>

◆Specification For TFT-LCD Module 3.5″ ~10″ : (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 8.2.2 Non-conductive portion :  X ≦ 1/3 a; Y ≦ W; Z ≦t ⊙ 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 :  X ≦ a; Y ≦ 1/3 W; Z ≦t	Minor

◆Specification For TFT-LCD Module 3.5″ ~10″ : (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)

<table>
<tr><th>NO.</th><th>TEST ITEM</th><th>TEST CONDITION</th></tr>
<tr><td>1</td><td>High Temperature Storage Test</td><td>Keep in +80 ±2℃ 96 hrs
Surrounding temperature, then storage at normal condition 4hrs.</td></tr>
<tr><td>2</td><td>Low Temperature Storage Test</td><td>Keep in -30 ±2℃ 96 hrs
Surrounding temperature, then storage at normal condition 4hrs.</td></tr>
<tr><td>3</td><td>High Temperature / High Humidity Storage Test</td><td>Keep in +60℃ / 90% R.H duration for 96 hrs
Surrounding temperature, then storage at normal condition 4hrs.
(Excluding the polarizer & T/P)</td></tr>
<tr><td>4</td><td>Temperature Cycling Storage Test</td><td>-30℃ → +25℃ → +80℃ → +25℃
(30mins) (5mins) (30mins) (5mins)
10 Cycle
Surrounding temperature, then storage at normal condition 4hrs.</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">ESD Test</td><td>Air Discharge:
Apply 2 KV with 5 times
Discharge for each polarity +/-</td><td>Contact Discharge:
Apply 250 V with 5 times
discharge for each polarity +/-</td></tr>
<tr><td colspan="2">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%)</td></tr>
<tr><td>6</td><td>Vibration Test (Packaged)</td><td colspan="2">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</td></tr>
<tr><td>7</td><td>Drop Test (Packaged)</td><td colspan="2"><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</td></tr>
</table>

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°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°C ± 5°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.

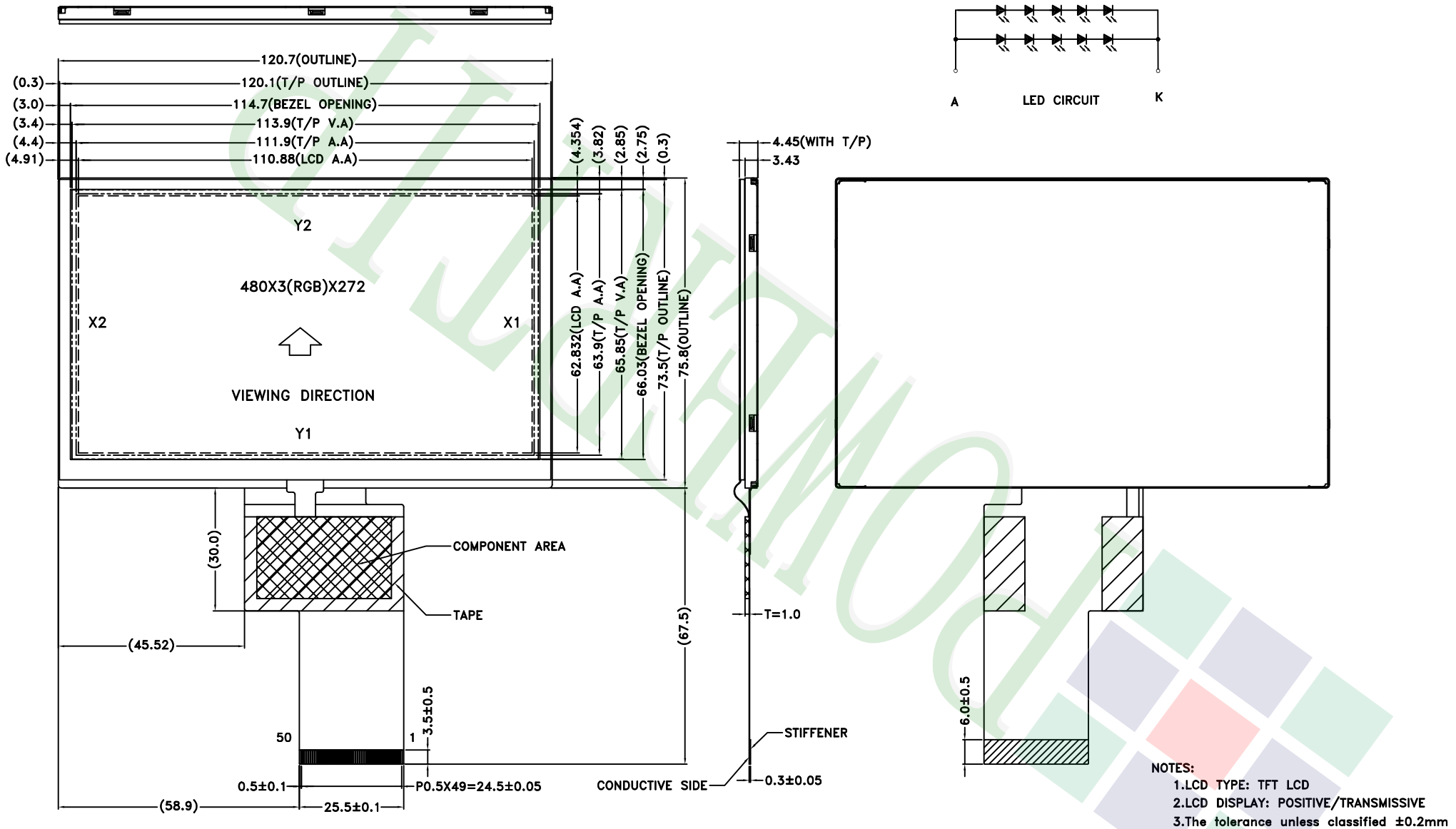
5.4 TERMS OF WARRANTY

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.



NOTES:
1. LCD TYPE: TFT LCD
2. LCD DISPLAY: POSITIVE/TRANSMISSIVE
3. The tolerance unless classified ±0.2mm

REV	REV BY	REVISER	DATE
007			
006			
005			
004			
003			
002			
001	NEW DRAWING	Stone	2012/03/02

PART NO: PH480272T-007-I01Q

DRAWING NAME : LMD-PH480272T-007-I01Q

TITLE: LCD MODULE DRAWING

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

Design	Stone	(3)	Surface		
Check	Sam	Unit	MM	Material	
Approve	Oliver	Scale	1:1	Thickness	
		Page	1/1	Quantity	

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

PT-A-054-01

Ver.001

Documents NO.	PKG-PH480272T-007-I01Q

LCM包裝規格書
LCM Packaging Specifications (For Tray)

Approve	Check	Contact
Oliver	Sam	Stone

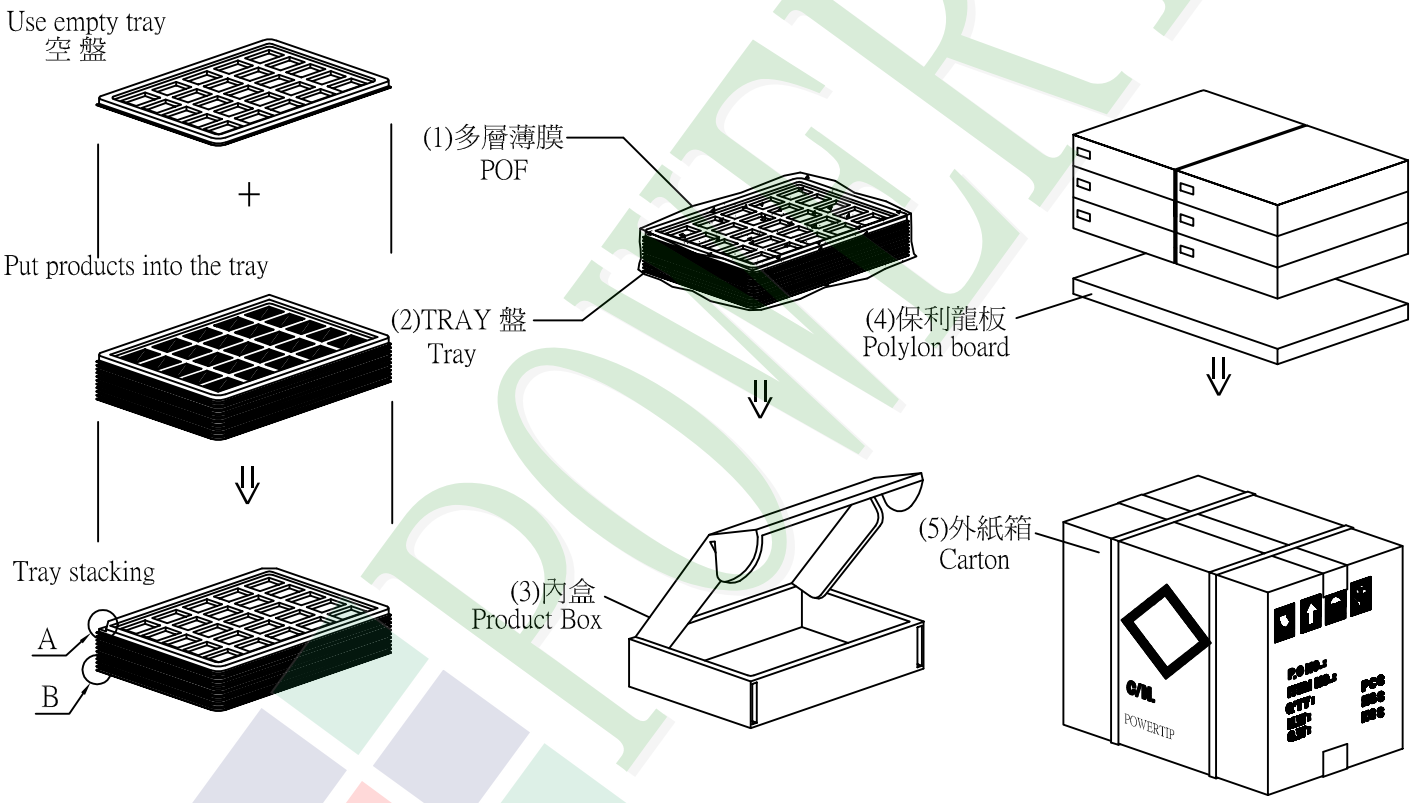
1.包裝材料規格表 (Packaging Material) : (per carton)

No.	Item	Model	Dimensions (mm)	1Pcs Weight	Quantity	Total Weight
1	成品 (LCM)	PH480272T-007-I01Q	120.7 X 75.8	0.0815	144	11.736
2	多層薄膜(1)POF	OTFILM0BA03ABA	19"X350X0.015	——	6	——
3	TRAY 盤 (2)Tray	TY00000000205	352 X 260 X 12.8	0.1	42	4.2
4	內盒(3)Product Box	BX36627063ABBA	393 X 274 X 68	0.2692	6	1.6152
5	保利龍板(4)Polylon board	OTPLB00PL08ABA	550 X 393 X 20	0.0284	1	0.0284
6	外紙箱(5)Carton	BX57041027CCBA	570 X 410 X 265	1.4208	1	1.4208
7						
8						
9						

2.一 整箱總重量 (Total LCD Weight in carton) : 19.0 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	6	=	24
(2)Total LCM quantity in carton : quantity per box	24	x no of boxes	6	=	144

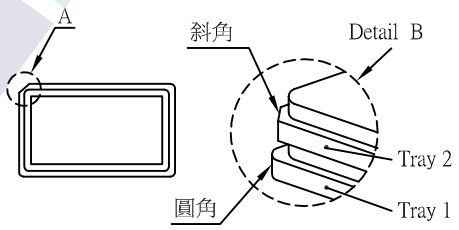


特 記 事 項 (REMARK)

4. Label Specifications :

參照"成品包裝點檢作業標準書"內容

TYPE			
ID.NO		S/O	
Q'TY	Pcs	Date	
Lot.NO			
Note			



5. 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.