POWERTIP TECH. CORP.

SPECIFICATIONS

CUSTOMER	:	PTC
SAMPLE CODE	:	SH320240T028-ZEC03
MASS PRODUCTION CODE	:	PH320240T028-ZEC03
SAMPLE VERSION	:	01
SPECIFICATIONS EDITION	:	002
DRAWING NO. (Ver.)	:	JLMD-PH320240T028-ZEC03_001
PACKAGING NO. (Ver.)	:	JPKG-PH320240T028-ZEC03_001

Customer Approved

Date:

POWERTIP
2021.10.29
JS RD APPROVED

Approved	Checked	Designer
劉進	劉進	陳璐

☐ 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

Date (mm / dd / yyyy)	Ver.	Edi.	Description	Page	Design by
09/18/2021	01	001	New Drawing	-	陳璐
10/27/2021	01	002	New Sample	-	陳璐

Total: 33 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 Characteristics
   - 1.7 Touch Panel 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. Packaging

Note: For detailed information please refer to IC data sheet:
Primacy (TFT LCD): Sitronix: ST7272A

1. SPECIFICATIONS

1.1 Features

Item	Standard Value
Display Type	320 * 3 (RGB) *240 Dots
LCD Type	Full Viewing Angle, Negative/Normally Black, Transmissive type
Screen size(inch)	3.5 inch
Color configuration	RGB-Strip
Interface	24-bits RGB Interface
Other(controller/driver IC)	ST7272A (Or Compatible IC)
ROHS	THIS PRODUCT CONFORMS THE ROHS OF PTC Detail information please refer website : http://www.powertip.com.tw/news_detail.php?Key=1&Cid=1

1.2 Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension	84.02(W) * 75.36(L) *4.68(H)	mm

LCD Panel

Item	Standard Value	Unit
Active Area	70.08(W) * 52.56(L)	mm
Pixel Size	10.95(W) * 10.95(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	4.0	V
	VCI	GND=0	-0.3	4.0	V
Operating Temperature	T_{OP} (Ts)	Note 1	-20	70	°C
Storage Temperature	T_{ST} (Ta)	Note 2	-30	80	°C
Storage Humidity	H_D	Ta ≦ 60 °C	10	90	%RH

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

Module GND = 0V, Ta = 25°C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply Voltage	VDD	-	3.0	3.3	3.6	V
	VCI	-	3.0	3.3	3.6	V
Input H/L Level Voltage	VIH	-	0.7VCI	-	VCI	V
	VIL	-	GND	-	0.3VCI	V
	IDD	VDD &VCI=3.3V	-	25	40	mA

1.5 Optical Characteristics

TFT LCD Module VDD&VCI = 3.3 V, Ta=25°C

Item	Symbol		Condition	Min.	Typ.	Max.	unit	
Response time	Tr+Tf		-	-	42	63	ms	Note 2
Viewing angle	Top	θY+	CR ≥ 10	-	80	-	Deg.	Note 4
	Bottom	θY-		-	80	-		
	Left	θX-		-	80	-		
	Right	θX+		-	80	-		
Contrast ratio		CR	-	650	800	-		Note 3
Color of CIE Coordinate (With B/L & T/P)	White	X	IF= 20 mA	0.30	0.35	0.40	-	Note1
		Y		0.35	0.40	0.45		
	Red	X		0.59	0.64	0.69		
		Y		0.30	0.35	0.40		
	Green	X		0.32	0.37	0.42		
		Y		0.55	0.60	0.65		
	Blue	X		0.10	0.15	0.20		
		Y		0.04	0.09	0.14		
Average Brightness Pattern=white display (With LCD & T/P)*1	IF		IF= 20 mA	160	230	-	cd/m^2	Note1
Uniformity (With LCD & T/P)*2	ΔB		IF=20 mA	70	-	-	%	Note1

Note 1:

*1：△B=B(min) / B(max) * 100%

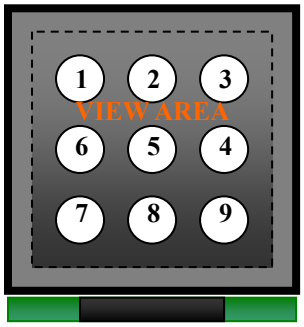
*2：Measurement Condition for Optical Characteristics:

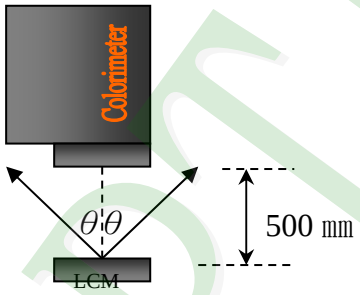
a：Environment: 25℃±5℃ / 60±20%R.H，no wind，dark room below 10 Lux at typical lamp current and typical operating frequency.

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

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

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





Colorimeter=BM-7 fast

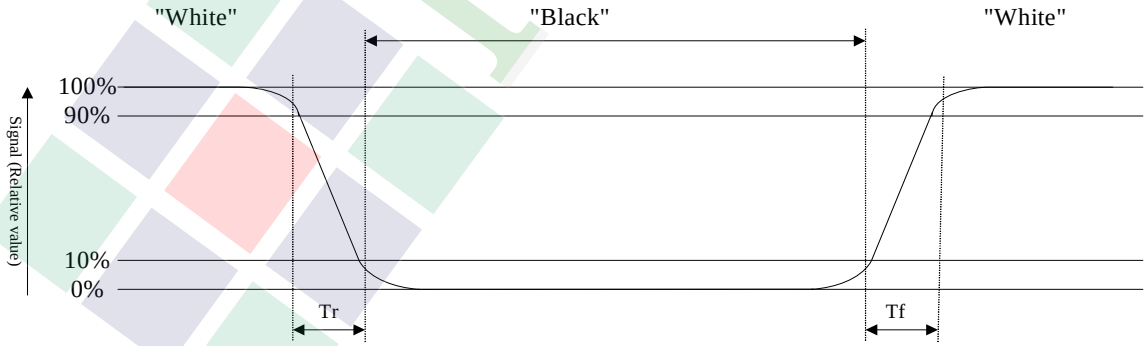
To be measured at the center area of panel with a viewing cone of 1° by Topcon luminance meter BM-7, after 10 minutes operation (module)

Note2: Definition of response time:

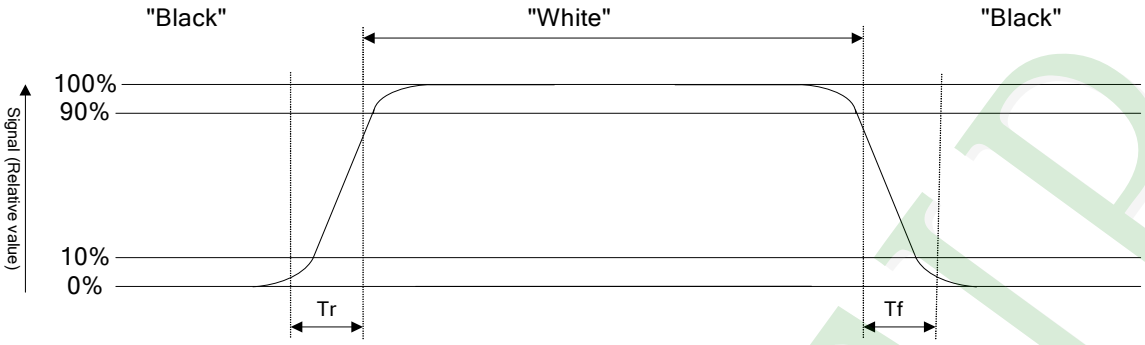
The output signals of photo detector are measured when the input signals are changed from “black” to “white”(falling time) and from “white” to “black”(rising time), respectively. The response time is defined as the time interval between the 10% and 90% of Amplitudes.

Refer to figure as below:

Normally White



Normally Black



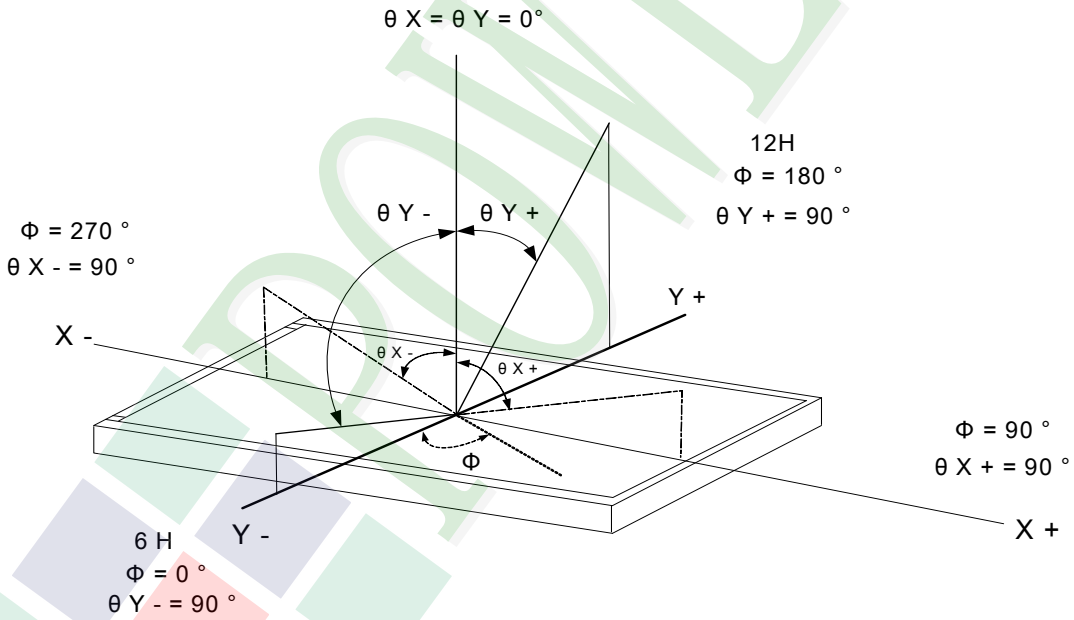
Note3: Definition of contrast ratio:

Contrast ratio is calculated with the following formula

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

Note4: Definition of viewing angle:

Refer to figure as below:



1.6 Backlight Characteristics

Maximum Ratings

Item	Symbol	Conditions	Min.	Max.	Unit
LED Forward Current (Each LED)	IF	Ta =25℃	-	30	mA
LED Reverse Voltage (Each LED)	VR		-	5	V
Power consumption	Pd		-	396	mW

Electrical / Optical Characteristics

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	VF	If= 20mA	18	19	19.8	V
Average Brightness (Without LCD & T/P)	IV		4100	5000	-	cd/m^2
CIE Color Coordinate (Without LCD & T/P)	X		0.280	0.310	0.330	-
	Y		0.300	0.325	0.350	
Color	White					

B/L Internal Circuit Diagram:

Other Description

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

1.7 Touch Panel Characteristics

Features

Item	Standard Value
Touch Panel Size	3.5”
Touch type	Projected Capacitive Touch True Multi-Touch Capacitive Touch Panel
Input Method	Finger / 5 Points touch Or Conductive Pen(Not Support Gesture)
Output Interface	I^2C
IC	ICNT8952

I^2C Address

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

Bit 0: 0 for Write / 1 for Read

Mechanical Specifications

Item	Standard Value	Unit
Viewing Area	71.08 (W) x 53.56 (H)	mm
Number of sensing channel	12 (W) x 9 (H)	mm

Absolute Maximum Ratings

Item	Symbol	Condition	Min.	Max.	Unit
Supply voltage	TPVDD	-	-0.3	3.6V	V
Operating Temperature	T_{OP}	-	-20	+70	°C
Storage Temperature	T_{ST}	-	-30	+80	°C

DC Electrical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
Power Supply Voltage	TPVDD	-	3.0	3.3	3.6	V

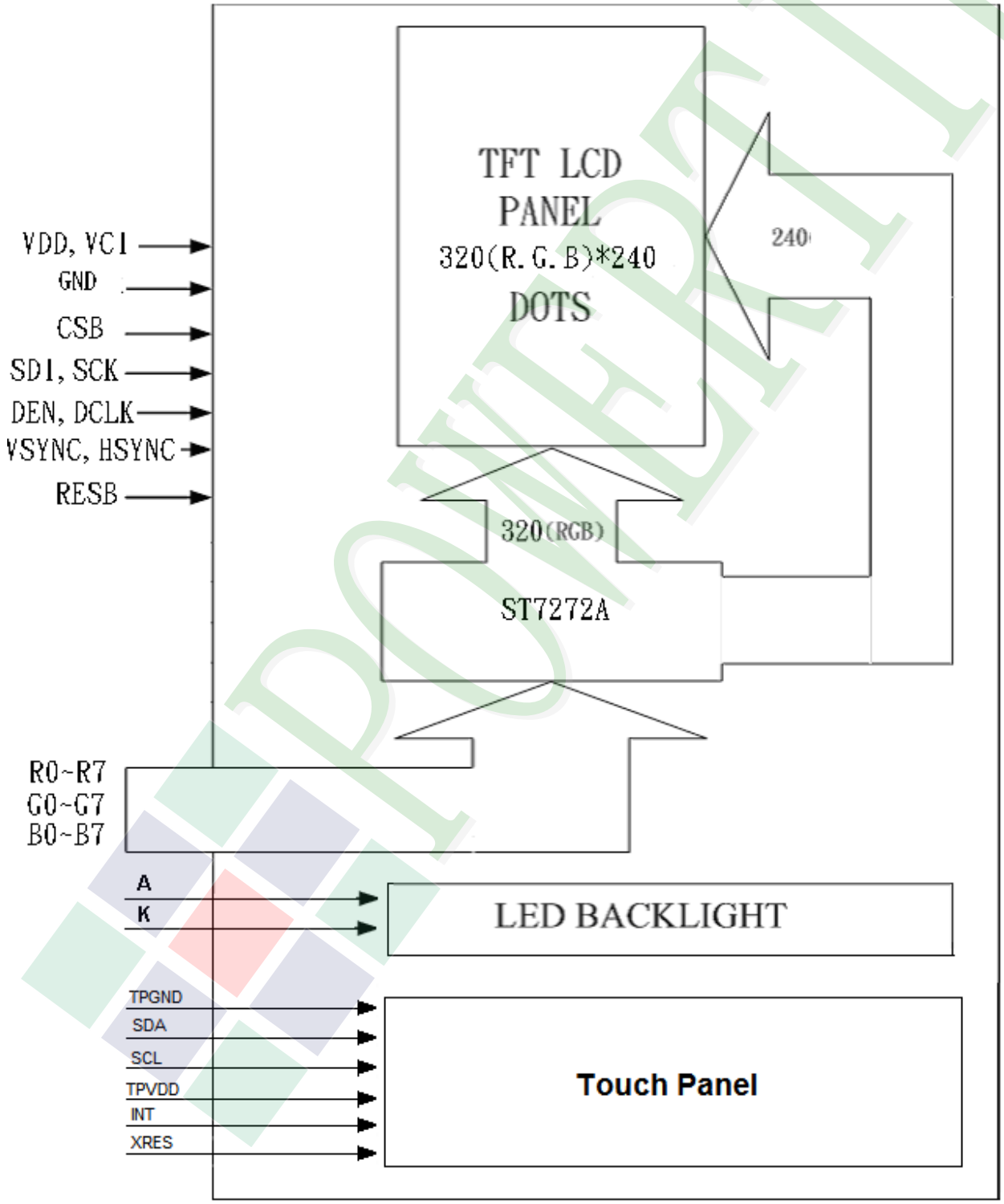
2. MODULE STRUCTURE

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	A	LED Anode.
2	K	LED Cathode.
3	GND	Ground.
4	VCI	Analog Power Supply Voltage.
5	NC	Not Used.
6	VDD	Digital Power Supply Voltage.
7	GND	Ground.
8	RESB	Reset.
9	CSB	Chip select Input: CSB = L - selected and accessible. CSB = H - is not selected and not accessible.
10	SCK	SPI Clock Input.
11	NC	Not Used.
12	SDI	SPI Data Input. The data is latched on the rising edge of the SCK signal.
13	GND	Ground.
14	B0	Graphic display Blue data.
15	B1	
16	B2	
17	B3	
18	B4	
19	B5	
20	B6	
21	B7	
22	G0	Graphic display Green data.
23	G1	
24	G2	
25	G3	
26	G4	

27	G5	Graphic display Green data.
28	G6	
29	G7	
30	R0	Graphic display Red data.
31	R1	
32	R2	
33	R3	
34	R4	
35	R5	
36	R6	
37	R7	
38	GND	Ground.
39	DCLK	Video Clock Input. The data is latched on the rising edge of DCLK.
40	HSYNC	Horizontal Sync Input.
41	VSYNC	Vertical Sync Input.
42	DEN	Video Data Enable Input. VSYNC+HSYNC mode - This pin is shorted to GND normally and the back/front porch is determined by the control register. VSYNC+HSYNC+DE mode - The valid data is determined by the VSYNC+HSYNC+DEN pin. DE mode - VSYNC and HSYNC are unused and shorted to GND. The valid input. Data is determined by DEN pin.
43	GND	Ground.
44	NC	Not Used.
45	NC	Not Used.
46	NC	Not Used.
47	Y+	Touch Panel Y_Top.(NC)
48	X+	Touch Panel X_Right.(NC)
49	Y-	Touch Panel Y_Bottom.(NC)
50	X-	Touch Panel X_Left.(NC)

Capacitive Touch Panel (CTP) Interface

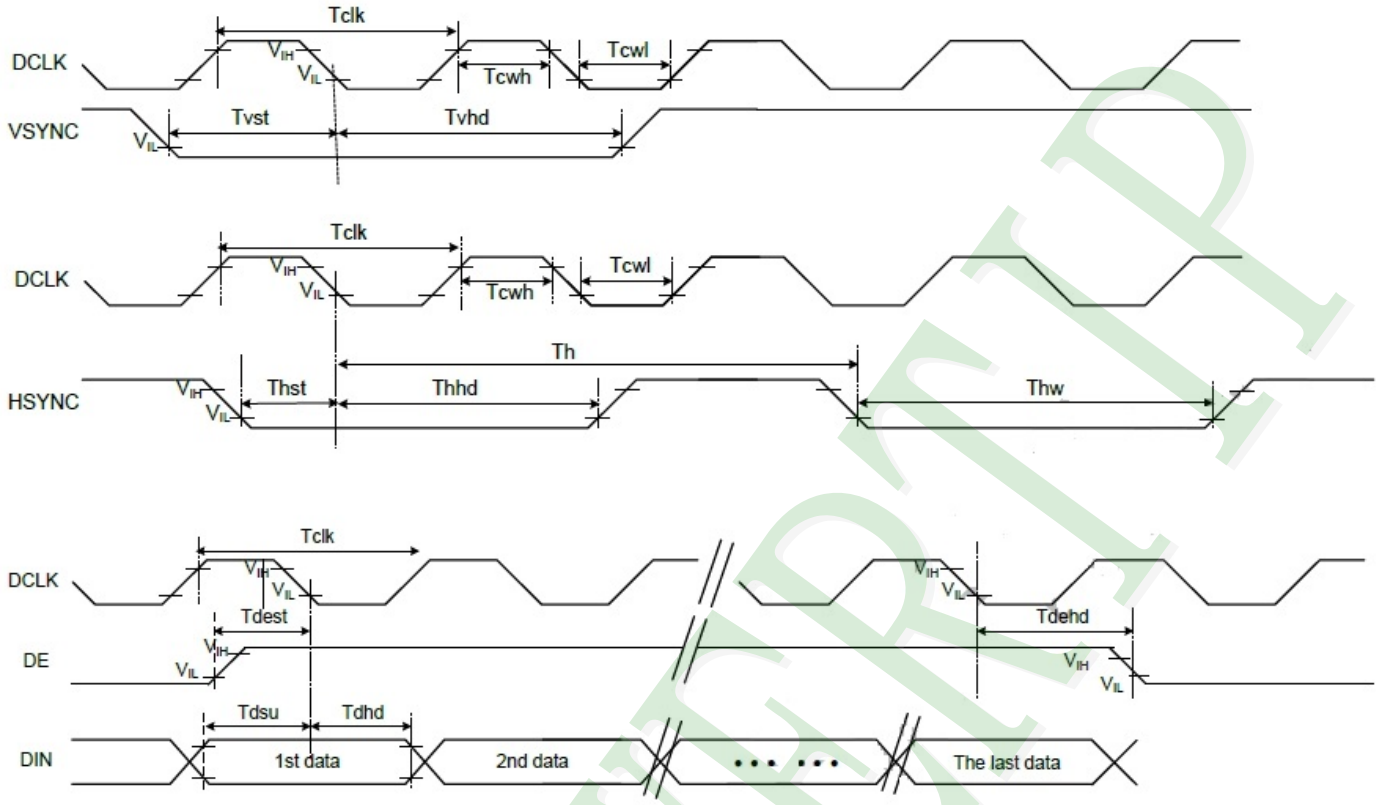
Pin No.	Symbol	Function
1	TPGND	Ground.(T/P)
2	SDA	I^2C Data.(T/P)
3	SCL	I^2C Clock. (T/P)
4	TPVDD	Power.(T/P)
5	INT	The interrupt from the CTP to the Host. H: CTP interrupt not requested. L: CTP request interrupt.
6	XRES	XRES. (T/P)

2.3 Timing Characteristics

2.3.1 RGB Mode Selection Table

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

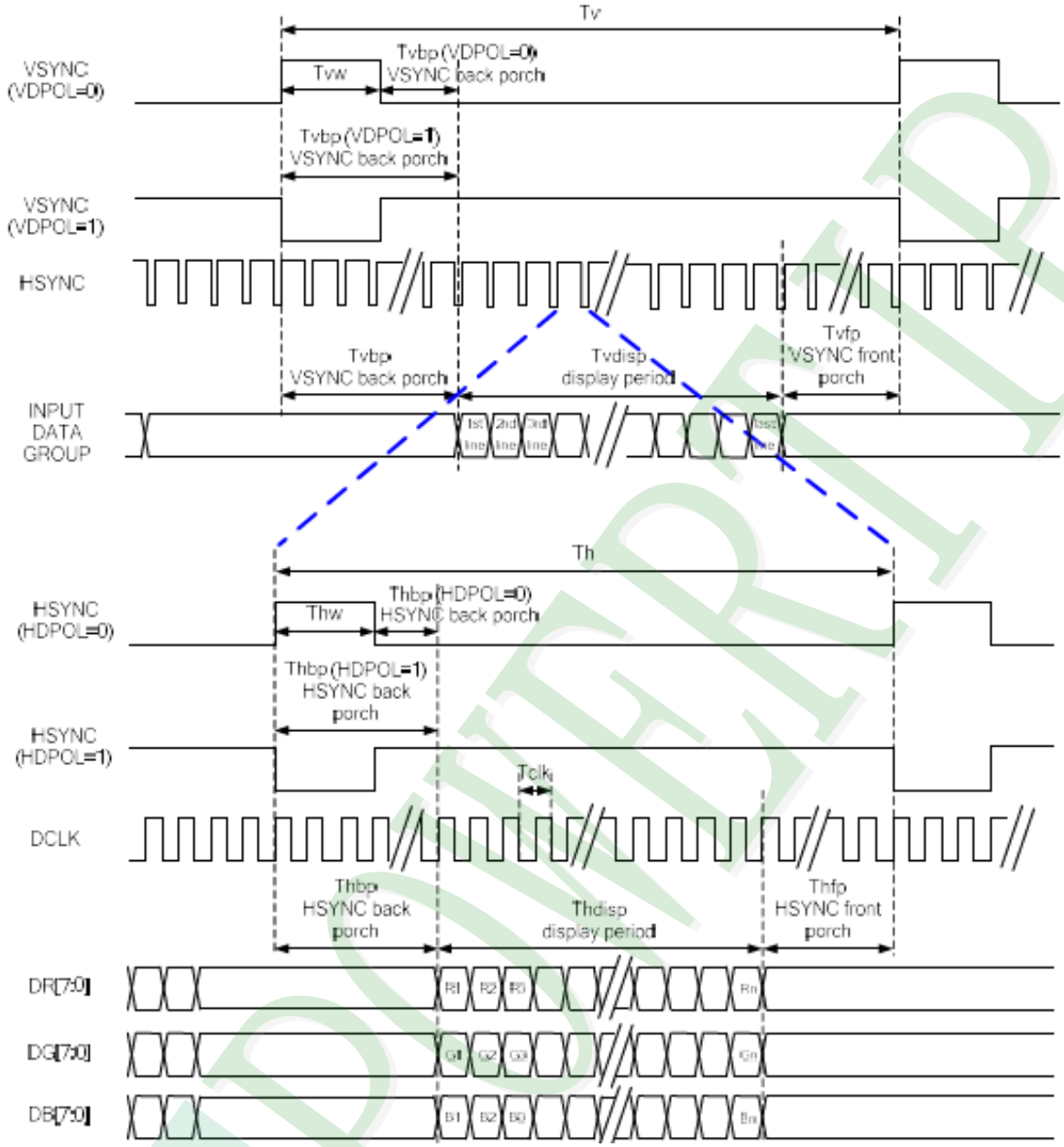
2.3.2 System Bus Timing for RGB Interface



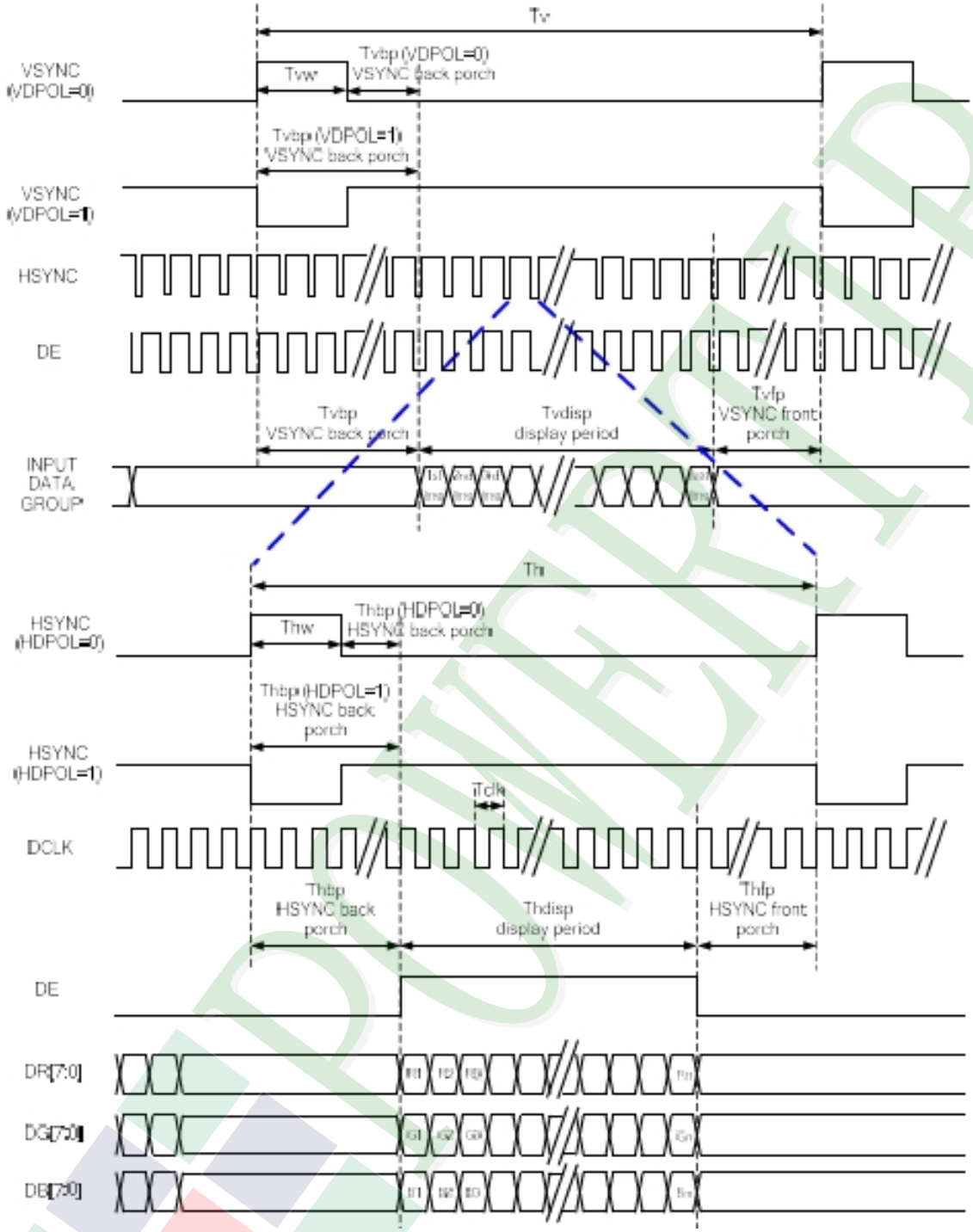
VDD&VCI = 3.3V, Ta=25℃

Item	Symbol	Min	Typ.	Max	Unit	Conditions
CLK Pulse Duty	Tclk	40	50	60	%	-
HSYNC Width	Thw	2	-	-	DCLK	-
HSYNC Period	Th	55	60	65	us	-
VSYNC Setup Time	Tvst	12	-	-	ns	-
VSYNC Hold Time	Tvhd	12	-	-	ns	-
HSYNC Setup Time	Thst	12	-	-	ns	-
HSYNC Hold Time	Thhd	12	-	-	ns	-
Data Setup Time	Tdsu	12	-	-	ns	-
Data Hold Time	Tdhd	12	-	-	ns	-
DE Setup Time	Tdest	12	-	-	ns	-
DE Hold Time	Tdehd	12	-	-	ns	-

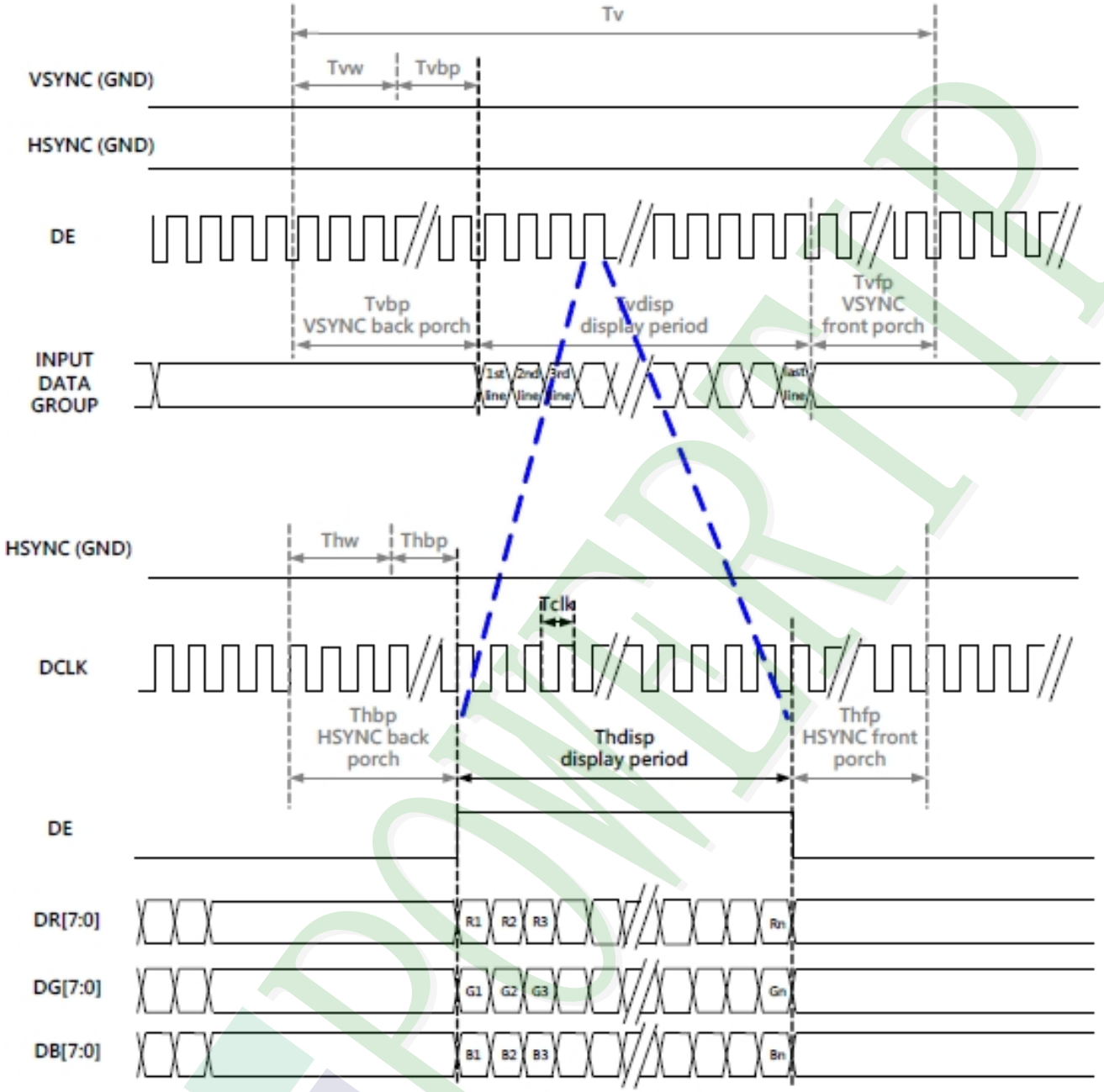
2.3.3 Parallel RGB SYNC Mode



2.3.4 Parallel RGB SYNC-DE Mode



2.3.5 Parallel RGB DE Mode

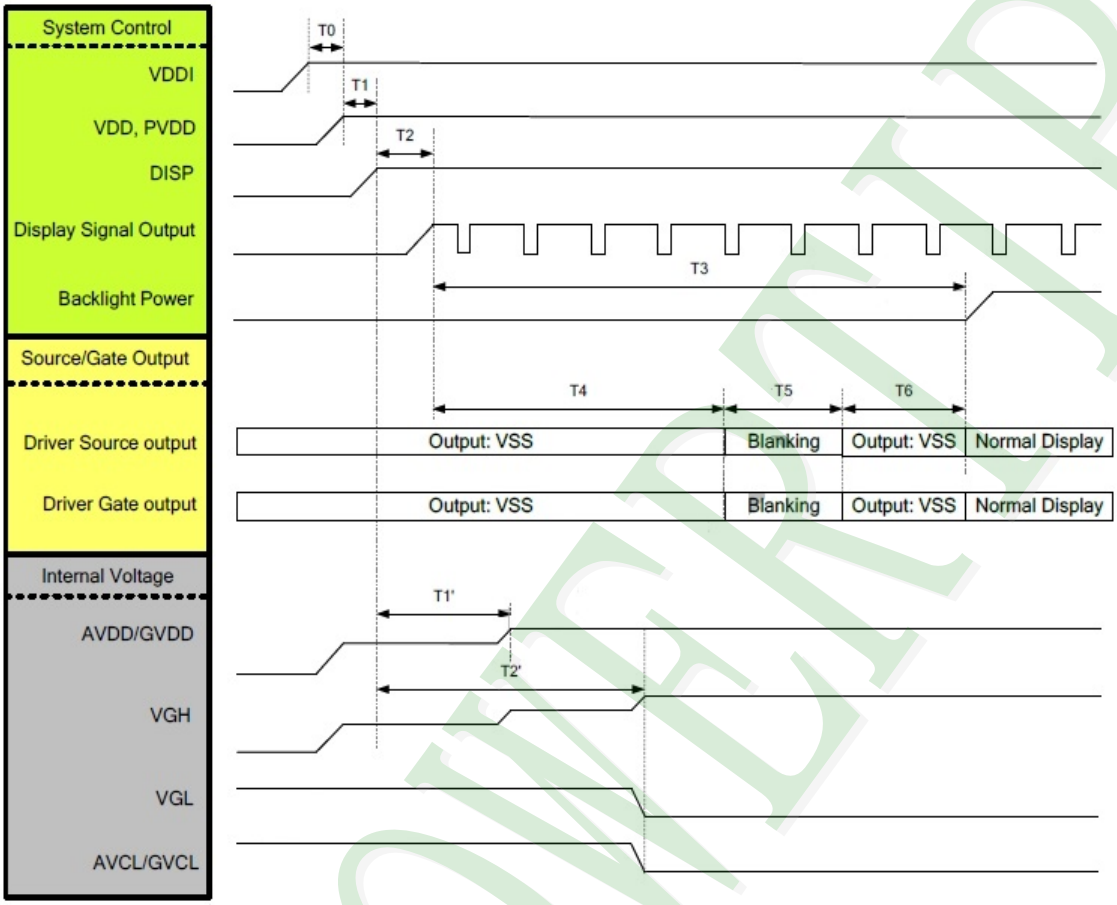


2.3.6 Parallel RGB Input Timing Table

Parallel 24-bit RGB Input Timing Table							
Parameter		Symbol	Min	Typ	Max	Unit	Note
DCLK frequency		Fclk	5	6	8	MHz	-
DCLK Period		Tclk	125	167	200	ns	-
HSYNC	Period Time	Th	325	371	438	DCLK	-
	Display Period	Thdisp		320			-
	Back Porch	Thbp	3	43	43		SYNC mode back porch control by H_BLANKING[7:0] setting Thbp= H_BLANKING[7:0]
	Front Porch	Thfb	2	8	75		-
	Pulse Width	Thw	2	4	43		-
VSYNC	Period Time	Tv	244	260	289	HSYNC	-
	Display Period	Tvdisp		240			-
	Back Porch	Tvbp	2	12	12		SYNC mode back porch control by V_BLANKING[7:0] setting Thbp= V_BLANKING[7:0]
	Front Porch	Tvfb	2	8	37		-
	Pulse Width	Tvw	2	4	12		-

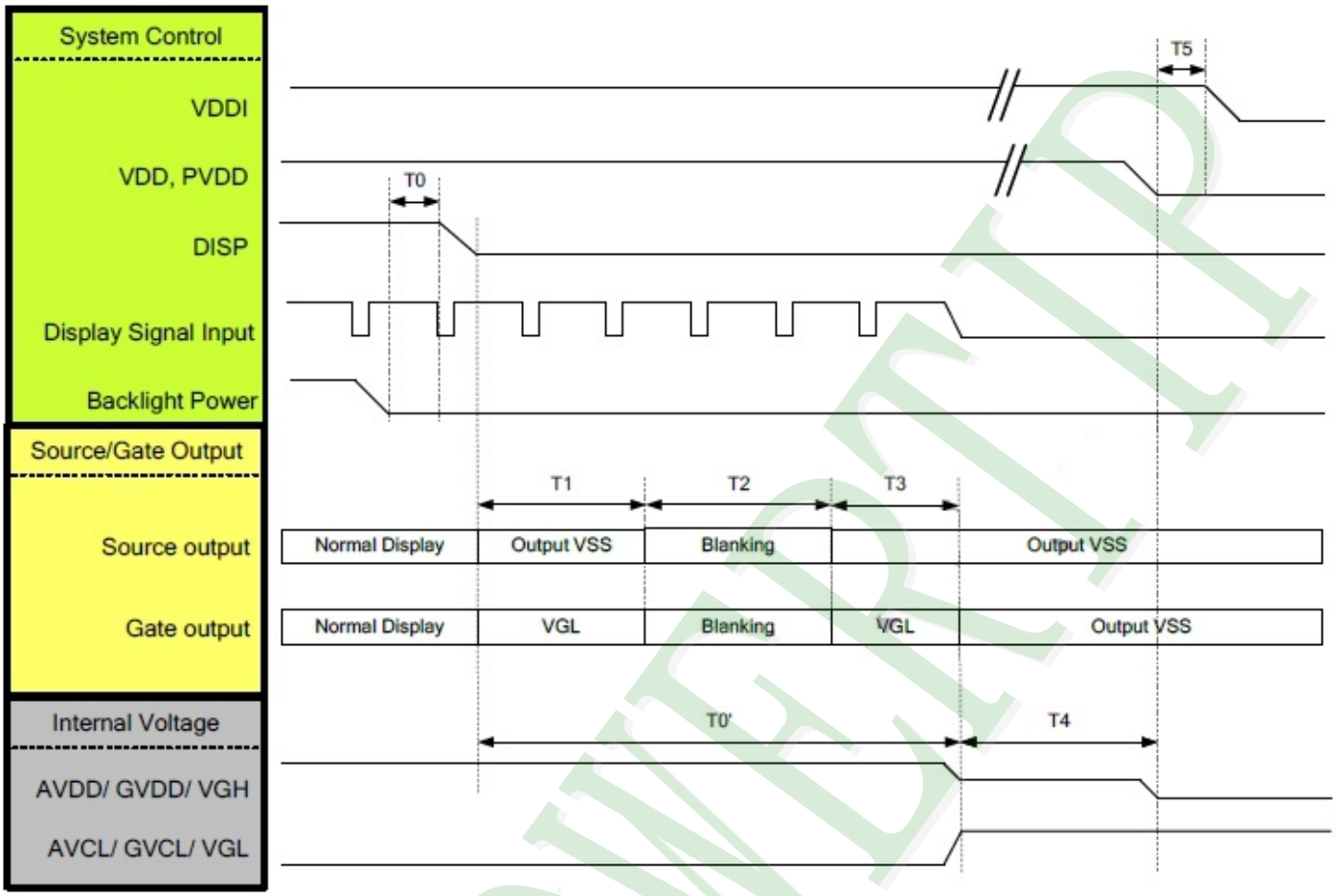
2.3.7 POWER ON/OFF SEQUENCE

Power ON Sequence



Symbol	Description	Min. Time	Unit
T0	Analog power on delay time	0	ms
T1	System power stability to DISP= “High”	0	ms
T2	DISP= “High” to display signal output	10	ms
T3	Display signal output to backlight power on	250	ms
T4	Display signal output to source output	100	ms
T5	Source/ Gate blanking time	30	ms
T6	Source/ Gate automatic output VSS	80	ms
T1’	DISP= “High” to AVDD/GVDD voltage stable time	20	ms
T2’	DISP= “High” to VGH/VGL/AVCL/GVCL voltage stable time	60	ms

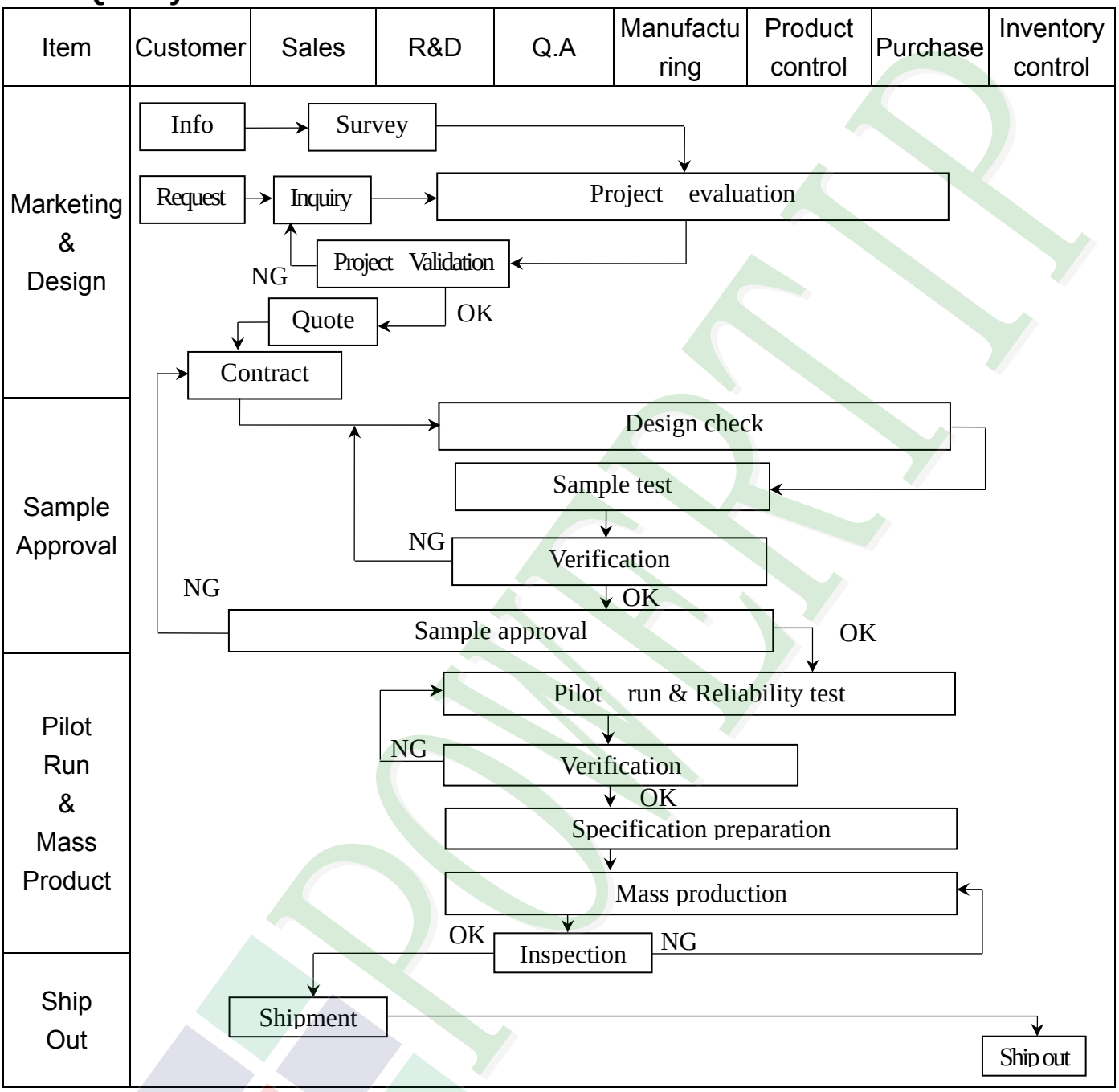
Power OFF Sequence

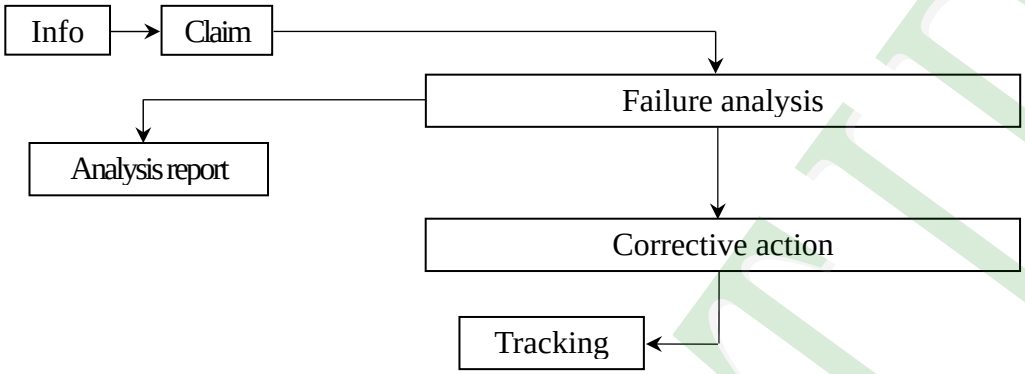


Symbol	Description	Min. Time	Unit
T0	Backlight power off to DISP off	5	ms
T1	Source voltage output VSS and Gate voltage output VGL	30	ms
T2	Source/ Gate blanking time	30	ms
T3	Source voltage output VSS and Gate voltage output VGL	20	ms
T4	AVDD/ GVDD/ VGH discharge time	5	ms
T5	Analog power off to digital power off time	0	ms
T0’	Source and Gate voltage discharge complete width	80	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								
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” -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.

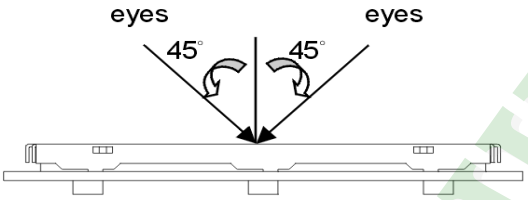
◆Standard of the product appearance test:

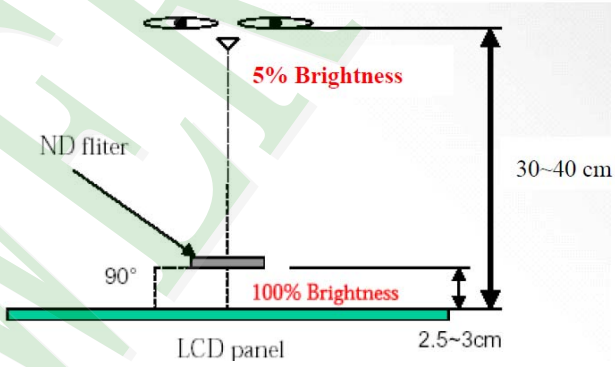
a. Manner of appearance test:

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

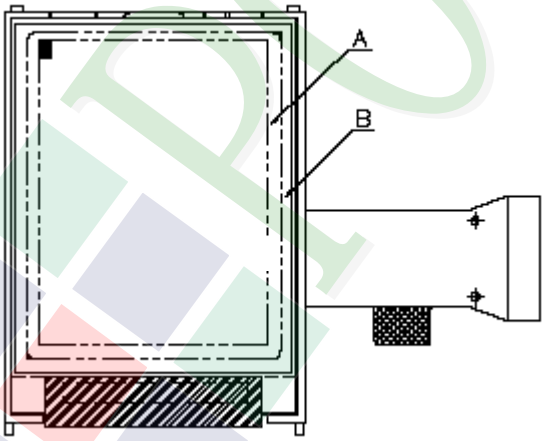
, and distance of view must be at 30~40 cm.

(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)

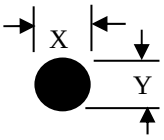
<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td rowspan="3">01</td><td rowspan="3">Product condition</td><td>1.1The part number is inconsistent with work order of production.</td><td>Major</td></tr>
<tr><td>1.2 Mixed product types.</td><td>Major</td></tr>
<tr><td>1.3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

(Bright dot, Dark dot)

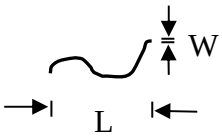
On -display</td><td>
<table>
<tr><th colspan="2">Item</th><th>Acceptance (Q’ty)</th></tr>
<tr><td rowspan="4">Dot Defect</td><td>Bright Dot</td><td>≦ 4</td></tr>
<tr><td>Dark Dot</td><td>≦ 5</td></tr>
<tr><td>Joint Dot</td><td>≦ 3</td></tr>
<tr><td>Total</td><td>≦ 7</td></tr>
</table>
5.1 Inspection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

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

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

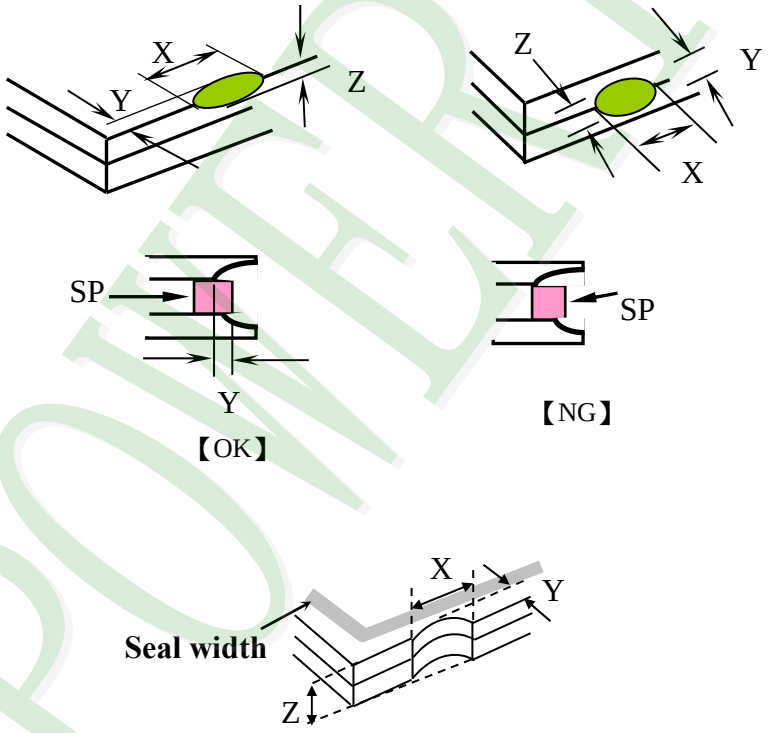
Round type
 

Φ＝(x＋y) / 2

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

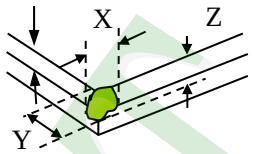
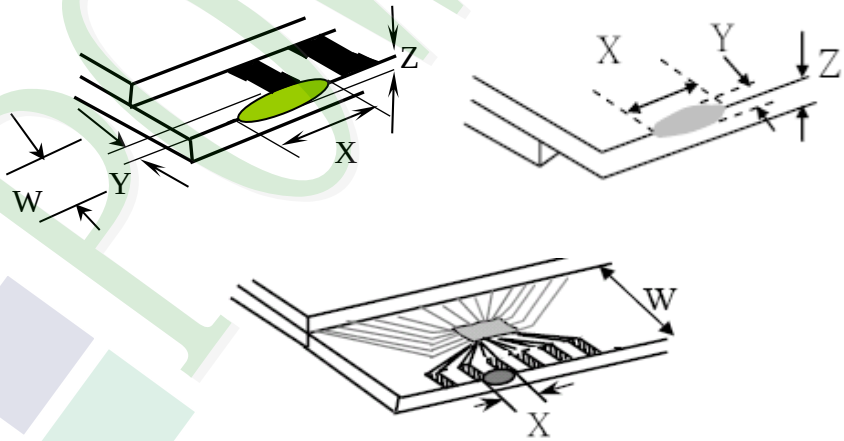
◆Specification For TFT-LCD Module 3.5″ ~15″：

(Ver.B01)

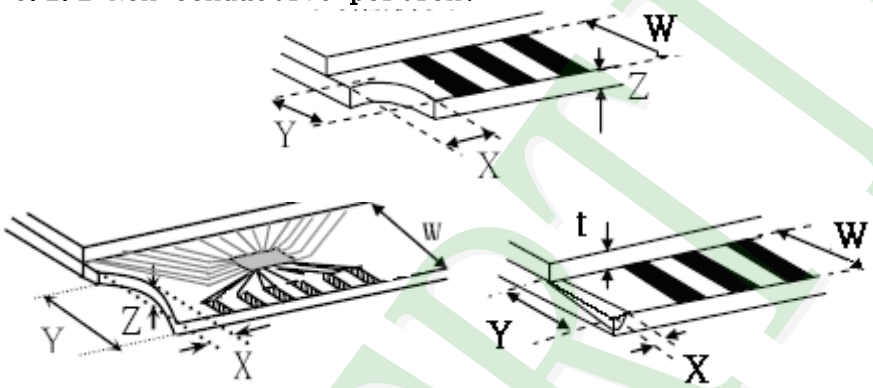
NO	Item	Criterion	Level
08	The crack of glass	**Symbols：** X: The length of crack　　Y: The width of crack. Z: The thickness of crack　　W: terminal length t: The thickness of glass　　a: LCD side length 8.1 General glass chip: 8.1.1 Chip on panel surface and crack between panels:  X: ≦ a; Y: Crack can't enter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

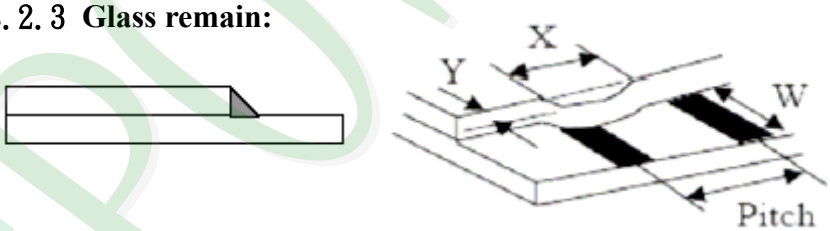
◆Specification For TFT-LCD Module 3.5″ ~15″：

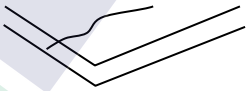
(Ver.B01)

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

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

<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td>08</td><td>The crack of glass</td><td>
Symbols:
X: The length of crack Y: The width of crack.
Z: The thickness of crack W: terminal length
t: The thickness of glass a: LCD side length
8.2.2 Non-conductive portion:


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


<table>
<tr><th>X</th><th>Y</th><th>Z</th></tr>
<tr><td>≦ a</td><td>≦ 1/3 W</td><td>≦t</td></tr>
</table>
8.2.4 Cracking:
 Not Allowed
</td><td>Minor</td></tr>
</table>

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

(Ver.B01)

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

4. RELIABILITY TEST

4.1 Reliability Test Condition (Ver.B01)

NO.	TEST ITEM	TEST CONDITION
1	High Temperature Storage Test	Keep in +80 ±5℃ 240 hrs
2	Low Temperature Storage Test	Keep in -30 ±5℃ 240 hrs
3	High Temperature / High Humidity Storage Test	Keep in +60 ℃ / 90% R.H duration for 240 hrs (Excluding the polarizer)
4	Temperature Cycling Storage Test	-30℃ → +25℃ → +80℃ → +25℃ (30mins) (5mins) (30mins) (5mins) 20 Cycle
5	ESD Test	Air Discharge: Apply 2 KV with 5 times Discharge for each polarity +/- Contact Discharge: Apply 250 V with 5 times discharge for each polarity +/- 1. Temperature ambiance : 15℃～35℃ 2. Humidity relative : 30%～60% 3. Energy Storage Capacitance(Cs+Cd) : 150pF±10% 4. Discharge Resistance(Rd) : 330Ω±10% 5. Discharge, mode of operation : Single discharge (time between successive discharges at least 1 sec) (Tolerance if the output voltage indication : ±5%)
6	Vibration Test (Packaged)	1. Sine wave 10～55 Hz frequency (1 min/sweep) 2. The amplitude of vibration :1.5 mm 3. Each direction (X、Y、Z) duration for 2 Hrs
7	Drop Test (Packaged)	Packing Weight (Kg) / Drop Height (cm) 0 ~ 45.4 / 122 45.4 ~ 90.8 / 76 90.8 ~ 454 / 61 Over 454 / 46 Drop Direction :※1 corner / 3 edges / 6 sides each 1time

◎Inspection conditions after test:

Temperature：+20~30℃

Humidity：50~70%

Atmospheric pressure：86~106Kpa

5. PRECAUTION RELATING PRODUCT HANDLING

5.1 SAFETY

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

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

5.2 HANDLING

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

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

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

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

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

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

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

5.2.8 To control temperature and time of soldering is 320 ± 10°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°C ± 5°C and the humidity is below 65% RH.

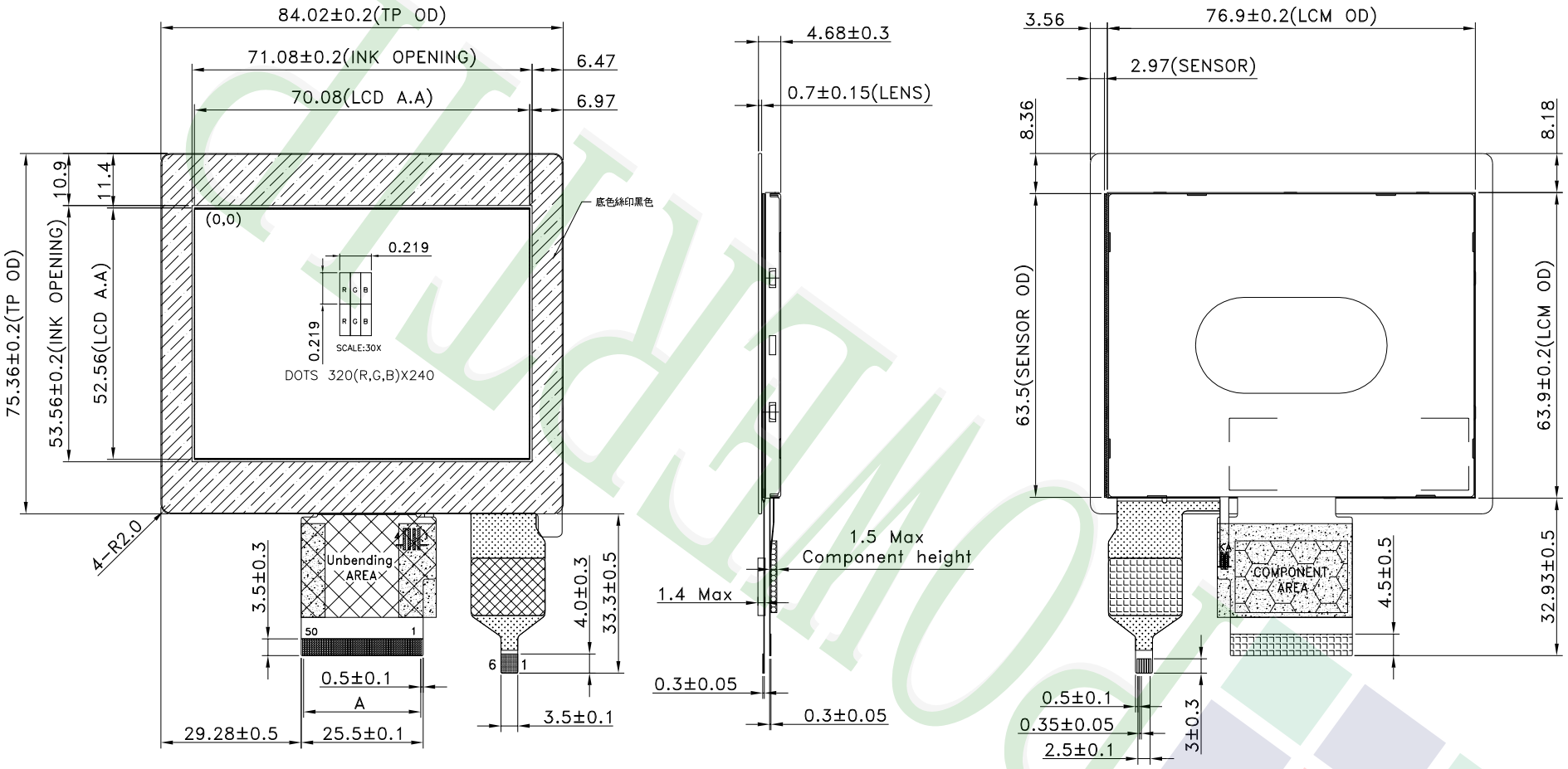
5.3.2 Do not place the module near organics solvents or corrosive gases.

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
2. LCD DISPLAY:Nomally Black/TRANSMISSIVE
3. A=0.5X49=24.5±0.05 ; W=0.35±0.05
4. The tolerance unless classified ±0.3mm
5. FPC Matching Connector : HIROSE FH12A-50S-0.5H OR EQUIVALENT
   TP FPC suggested connector : "Hirose" FH12-6S-0.5SH(1)(98) or compatible
6. Shielding tape

REV	REV BY	REVISER	DATE
007			
006			
005			
004			
003			
002			
001	NEW DRAWING	Sally	2021/09/17

PART NO: PH320240T028-ZEC03

DRAWING NAME : JLMD-PH320240T028-ZEC03

TITLE: LCD MODULE DRAWING

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

Design	Sally	(3)	Surface		
Check	Air	Unit	MM	Material	
		Scale	FIT	Thickness	
Approve	LiuJin	Page	1/1	Quantity	

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

PT-A-054-01

Ver.001	
Documents NO.	JPKG-PH320240T028-ZEC03

LCM包裝規格書

LCM Packaging Specifications
(For Tray)

Approve	Check	Contact
LiuJin	Air	Sally

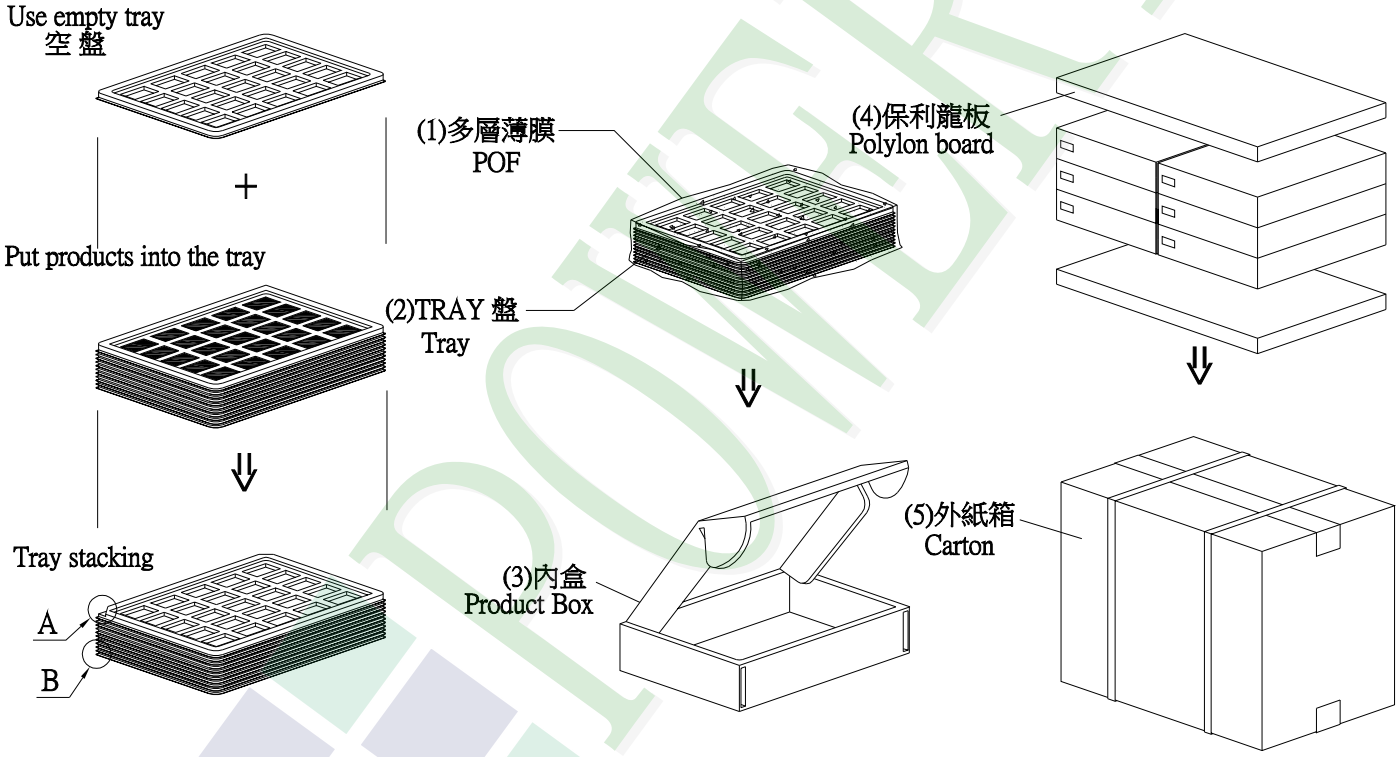
1.包裝材料規格表 (Packaging Material) : (per carton)

No.	Item	Model	Dimensions (mm)	1Pcs Weight	Quantity	Total Weight
1	成品 (LCM)	PH320240T028-ZEC03	84.02X75.36X4.68	0.0445	252	11.214
2	多層薄膜(1)POF	OTFILM0BA03ABA	19"X350X0.015	——	6	——
3	TRAY 盤 (2)Tray	TYSG000000137	352 X 260 X 12.3	0.1	48	4.8
4	內盒(3)Product Box	BX36627063ABBA	393 X 274 X 68	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						

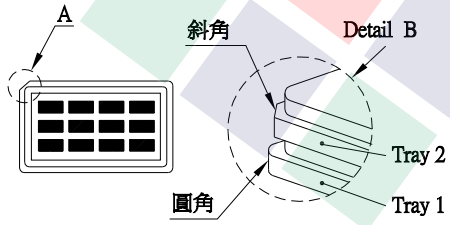
2.一 整箱總重量 (Total LCD Weight in carton) : 18.16 Kg±10%

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

(1)LCM quantity per box : no per tray	6	x no of tray	7	=	42
(2)Total LCM quantity in carton : quantity per box	42	x no of boxes	6	=	252



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.