POWERTIP TECH. CORP.

SPECIFICATIONS

CUSTOMER	:	
SAMPLE CODE	:	SH192108T004-ZAC
MASS PRODUCTION CODE	:	PH192108T004-ZAC
SAMPLE VERSION	:	01
SPECIFICATIONS EDITION	:	002
DRAWING NO. (Ver.)	:	LMD-PH192108T004-ZAC (Ver.001)
PACKAGING NO. (Ver.)	:	PKG-PH192108T004-ZAC (Ver.001)

Customer Approved

Date:

Approved	Checked	Designer
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POWERTIP
2023.11.14
TW RD APR

☐ Preliminary specification for design input

■ Specification for sample approval

POWERTIP TECH. CORP.

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History of Version

Date (mm / dd / yyyy)	Ver.	Edi.	Description	Page	Design by
06/01/2022	01	001	Preliminary	-	Hans
02/27/2023	01	002	First Sample	-	Yuan

CONTENTS

1. SPECIFICATIONS

1.1 Features

Item	Standard Value
Screen Size (Inch)	23.8” (Real Diagonal)
Resolution	1920* (R、G、B) * 1080 Dots
Display Mode	Transmissive, Normally Black
Display Colors	16.7M
Display Interface	Dual-Channel LVDS, 4-lane per Channel
Touch type	Projective capacitive touch panel
Touch Method	Finger / 10 Points touch
Touch Interface	USB
Touch IC	ILI2521
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	570.0(W) * 334.3 (L) * 20 (H)Max	mm

LCD panel

Item	Standard Value	Unit
Active Area	527.04 (W) * 296.46 (L)	mm

Note: For detailed information please refer to LCM drawing.

1.3 Absolute ratings of environment

Item	Symbol	Condition	Min.	Max.	Unit	Note
Operating Temperature	TOP	-	0	+50	℃	(1)
Storage Temperature	TST	-	-20	+60	℃	(1), (2)

Note (1) Temperature and relative humidity range is shown in the figure below
(a) 90 %RH Max.
(b) Wet-bulb temperature should be 39 ºC Max.
(c) No condensation.
Note (2) The absolute maximum rating values of this product are not allowed to be exceeded at any times.
The module should not be used over the function fail in such a condition.

1.4 TFT LCD Characteristics

Absolute Maximum Ratings

Item	Symbol	Condition	Min.	Max.	Unit
Power Supply Voltage for TFT LCD Module	VCC	-	-0.3	+6.0	V
Logic Input Voltage for TFT LCD Module	VIN	-	-0.3	+3.6	V

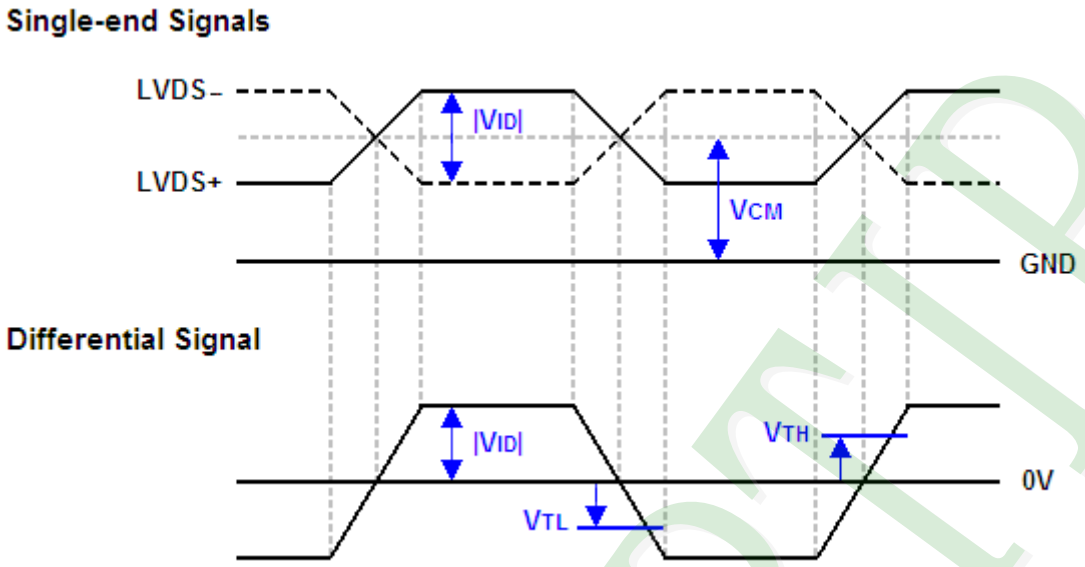
The absolute maximum rating values of this product are not allowed to be exceeded at any times. Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

LCD ELETRONICS SPECIFICATION

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Power Supply Voltage	VCC	4.5	5.0	5.5	V	-
Ripple Voltage	VRP	-	-	300	mV	-
Rush Current	IRUSH	-	-	3	A	-
Power Supply Current	-	-	0.6	0.77	A	-
Power Consumption	PLCD	-	3.0	4.3	Watt	(1)
LVDS differential input voltage	VID	100	-	600	mV	(2)
LVDS common input voltage	VCM	1.0	1.2	1.4	V	(2)
LVDS Logic High Input Voltage	VTH	-	-	0.1	V	(2)
LVDS Logic Low Input Voltage	VTL	-0.1	-	-	V	(2)

Note (1) The power consumption is specified at the pattern with the maximum current.

Note (2) The LVDS input characteristics are as follows:



1.5 Optical Characteristics

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	-
Response time		$T_r + T_f$	-	-	15	25	ms	Note2
Viewing angle	Top	ΘY+	CR ≥ 10	-	89	-	Deg.	Note4
	Bottom	ΘY-		-	89	-		
	Left	ΘX-		-	89	-		
	Right	ΘX+		-	89	-		
Contrast ratio		CR	Ta = 25°C ΘX , ΘY = 0°	700	1000	-	-	Note3
Color of CIE Coordinate (With B/L and TP)	White	X		0.26	0.31	0.36	-	Note1
		Y		0.28	0.33	0.38		
	Red	X		0.60	0.65	0.70		
		Y		0.29	0.34	0.39		
	Green	X		0.26	0.31	0.36		
		Y		0.57	0.62	0.67		
	Blue	X		0.10	0.15	0.20		
		Y		0.01	0.06	0.11		
Average Brightness Pattern=white display (With TP)		IV	ILED=80mA	200	250	-	cd/m2	Note1
Uniformity (With TP) *2		ΔB	ILED=80mA	70	-	-	%	Note1

Note1:

1：△ B=B(min) / B(max) × 100%

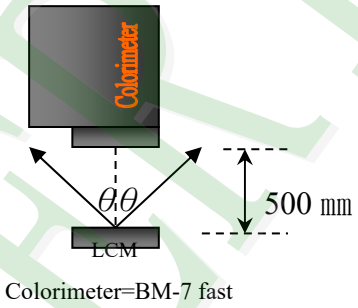
2：Measurement Condition for Optical Characteristics:

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%



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:

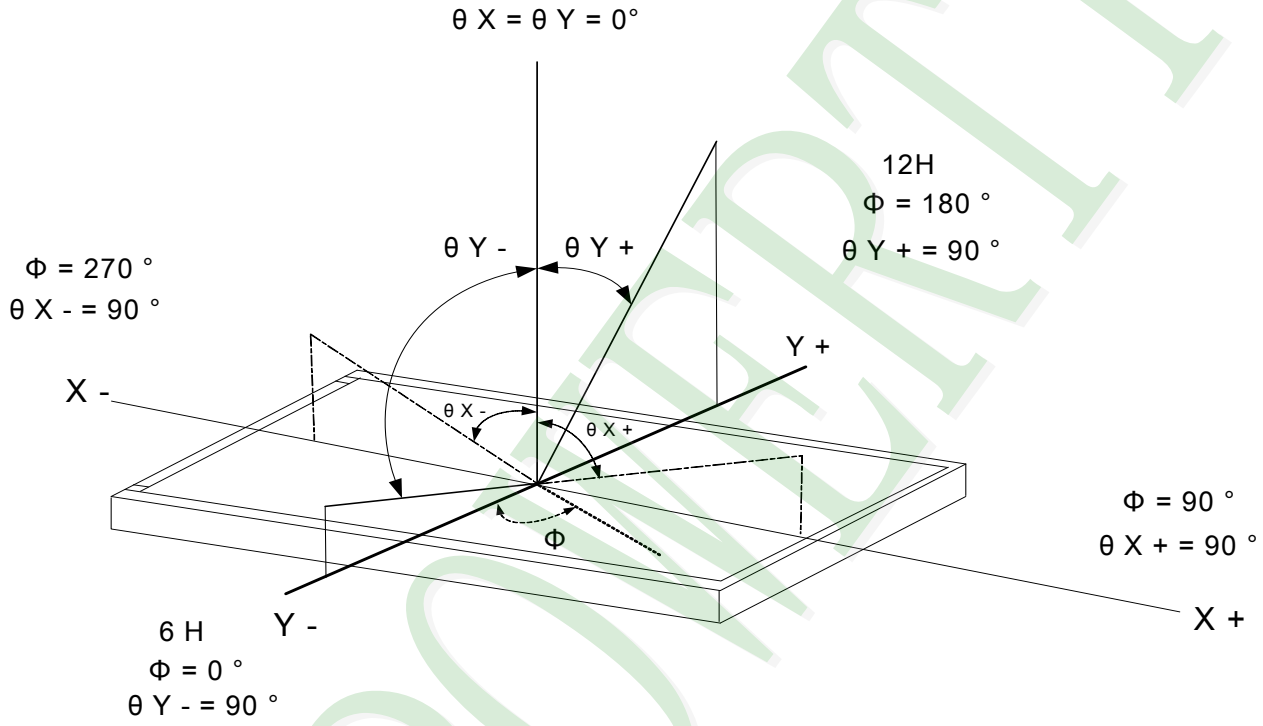
Note3: Definition of contrast ratio:

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

Absolute Maximum Ratings

Item	Symbol	Min.	Typ.	Max.	Unit	Note
LED Pulse Forward Current Per Input Pin	I_P	-	-	500	mA	(1), (2) Pulse Width≦10msec. And Duty≦25%

Note (1) Permanent damage to the device may occur if maximum values are exceeded. Function operation should be restricted to the conditions described under Normal Operating Conditions.

Note (2) Specified values are for input pin of LED light bar at Ta=25±2 ℃

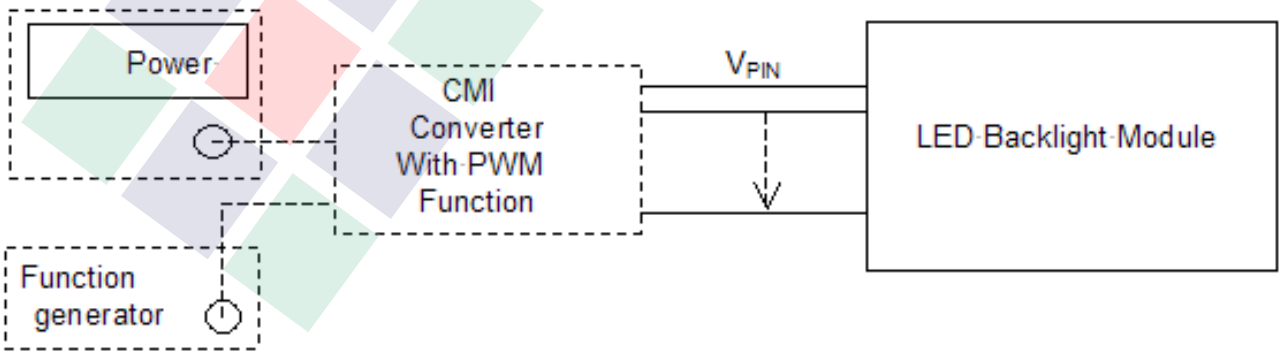
Electrical Characteristics

Item	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
LED Light Bar Input Voltage Per Input Pin	VLED	48.6	54	59.4	V	ILED=80mA
LED Light Bar Current Per Input Pin	ILED	-	70	73.5	mA	-
LED Life Time	LLED	30000	-	-	Hrs	-
Power Consumption	PBL	-	15.12	16.632	W	ILED=80mA

Note (1) LED light bar input voltage and current are measured by utilizing a true RMS multimeter as shown below:

Note (2) PBL(Typ) = IPIN(Typ) × VPIN(Typ) × (4) PBL(Max) = IPIN(TYP) × VPIN(Max) × (4) input pins..

Note (3) The lifetime of LED is defined as the time when LED packages continue to operate under the conditions at Ta = 25 ±2 ℃ and I= (90)mA (per chip) until the brightness becomes ≦ 50% of its original value.



1.7 Touch Panel Characteristics

Features

Item	Standard Value
Touch Panel Size	23.8”
Touch type	Projective capacitive touch panel
Input Method	Finger or Conductive Pen
Support Operation	10 Points touch
Output Interface	USB
IC	ILI2521

Absolute Maximum Ratings

Item	Symbol	Condition	Min.	Max.	Unit
Supply voltage	VDD	-	-0.3	+6.0	V

Electrical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply Voltage for USB	VBUS	-	-	5.0	-	V

Optical Characteristics

Item	Standard Value	Unit
Total light transmittance	85% or more	-
Hardness	⩾7H	

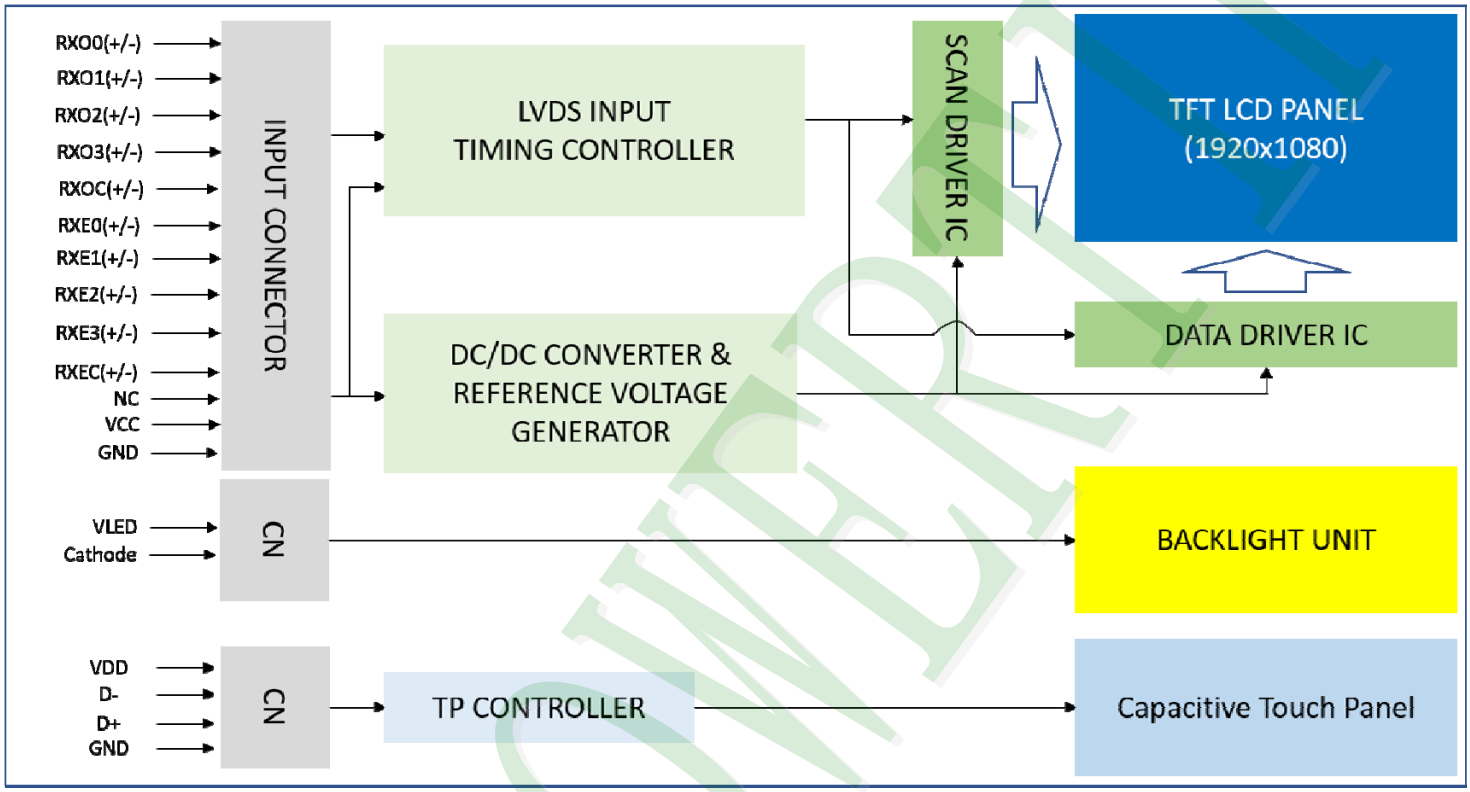
2. MODULE STRUCTURE

2.1 Counter Drawing

LCM Mechanical Diagram

* See Appendix

Block Diagram



2.2 Interface Pin Description

- **LCM**

Pin No.	Symbol	Description	Note
1	RXO0-	Negative LVDS differential data input. Channel O0 (odd)	-
2	RXO0+	Positive LVDS differential data input. Channel O0 (odd)	-
3	RXO1-	Negative LVDS differential data input. Channel O1 (odd)	-
4	RXO1+	Positive LVDS differential data input. Channel O1 (odd)	-
5	RXO2-	Negative LVDS differential data input. Channel O2 (odd)	-
6	RXO2+	Positive LVDS differential data input. Channel O2 (odd)	-
7	GND	Ground	-
8	RXOC-	Negative LVDS differential clock input. (odd)	-
9	RXOC+	Positive LVDS differential clock input. (odd)	-
10	RXO3-	Negative LVDS differential data input. Channel O3(odd)	-
11	RXO3+	Positive LVDS differential data input. Channel O3 (odd)	-
12	RXE0-	Negative LVDS differential data input. Channel E0 (even)	-
13	RXE0+	Positive LVDS differential data input. Channel E0 (even)	-
14	GND	Ground	-
15	RXE1-	Negative LVDS differential data input. Channel E1(even)	-
16	RXE1+	Positive LVDS differential data input. Channel E1(even)	-
17	GND	Ground	-
18	RXE2-	Negative LVDS differential data input. Channel E2 (even)	-
19	RXE2+	Positive LVDS differential data input. Channel E2 (even)	-
20	RXEC-	Negative LVDS differential clock input. (even)	-
21	RXEC+	Positive LVDS differential clock input. (even)	-
22	RXE3-	Negative LVDS differential data input. Channel E3 (even)	-
23	RXE3+	Positive LVDS differential data input. Channel E3 (even)	-
24	GND	Ground	-
25	NC	For LCD internal use only. Do not connect	-
26	NC	For LCD internal use only. Do not connect	-
27	NC	For LCD internal use only. Do not connect	-
28	Vcc	+5.0V power supply	-
29	Vcc	+5.0V power supply	-
30	Vcc	+5.0V power supply	-

Note (1): Connector Part No.:

Foxconn; GS23301-0321R-7H

Or FCN: WF13-422-3033 or P-TWO: 187098-30091 or equivalent.

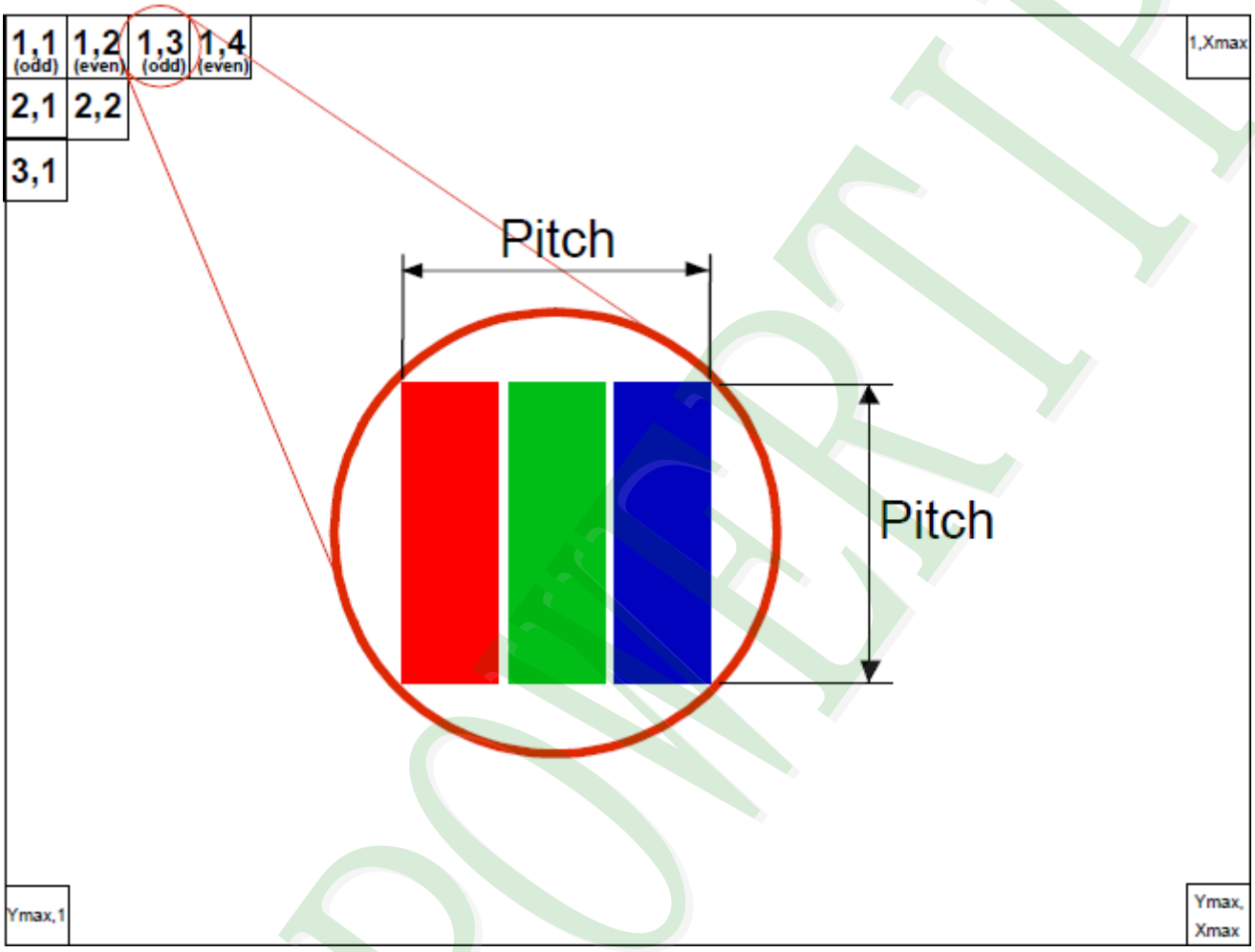
Note (2): User's connector Part No:

Mating Wire Cable Connector Part No.:FI-X30H(JAE) or FI-X30HL(JAE)

Mating FFC Cable Connector Part No.:217007-013001 (P-TWO) or JF05X030-1 (JAE).

Note (3): The first pixel is odd.

Note (4): Input signal of even and odd clock should be the same timing.



- **CN1**

Pin No.	Symbol	Description
1	Cathode	Cathode of LED string
2	Cathode	Cathode of LED string
3	VLED	Anode of LED string
4	VLED	Anode of LED string
5	Cathode	Cathode of LED string
6	Cathode	Cathode of LED string

Note (1) Connector (wire type): FCN(WM13-406-063N) or equivalent.

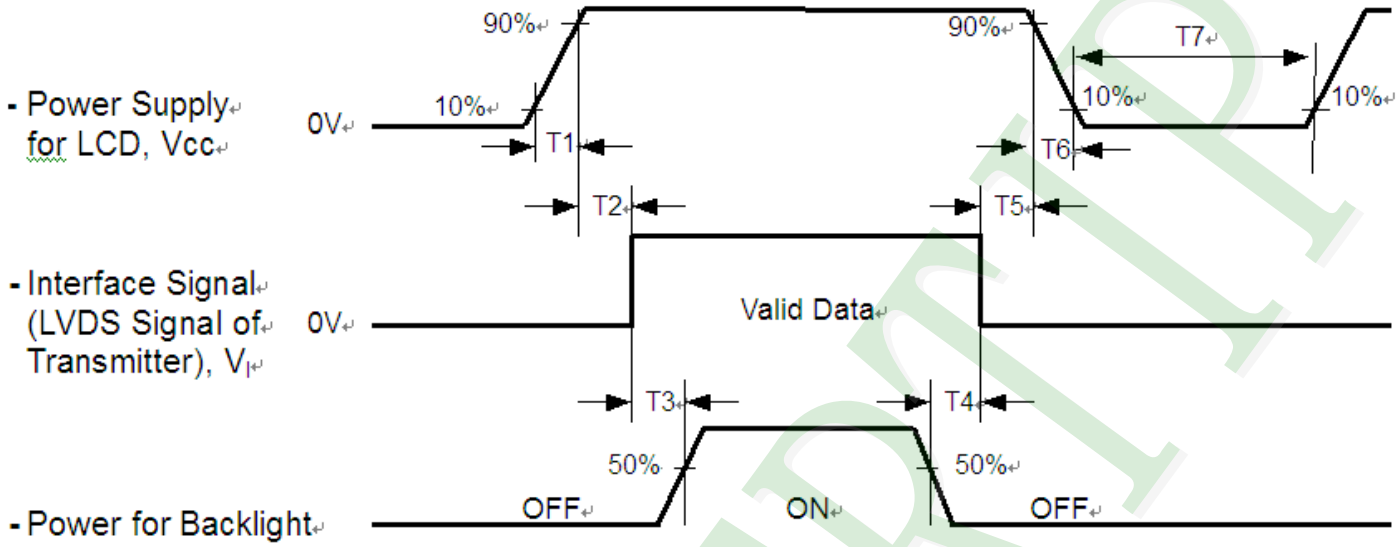
Note (2) User's mating connector part No.: FCN(WF1300106-B) and hook width must be less than 4.5mm.

Capacitive Touch Panel (CTP) Interface

Pin No.	Symbol	Description
1	VDD	Power Supply. (+5.0V)
2	D-	D- Differential Data Input.
3	D+	D+ Differential Data Input.
5	GND	Ground.

2.3 Power Supply Characteristics

POWER ON/OFF SEQUENCE



Timing Specifications:

Item	Min.	Typ.	Max.	Units
T1	0.5	-	10	ms
T2	0	30	50	ms
T3	450	-	-	ms
T4	100	250	-	ms
T5	0	20	50	ms
T6	0.1	-	100	ms
T7	1000	-	-	ms

Note (1) The supply voltage of the external system for the module input should be the same as the definition of Vcc.

Note (2) When the backlight turns on before the momentarily become abnormal screen.

Note (3) In case of VCC = off level, please keep the level of input signals on the low or keep a high impedance.

Note (4) T7 should be measured after the module has been fully discharged between power of period.

Note (5) Interface signal shall not be kept at high impedance when the power is on.

Note (6) INX won't take any responsibility for the products which are following the Power Sequence.

Note (7) There might be slight electronic noise when LCD is turned off (even backlight unit is also off). To avoid this symptom, we suggest "Vcc falling timing" to follow "t6 spec".

2.4 Timing Characteristics

LVDS DATA MAPPING TABLE

LVDS Channel O0	LVDS output	D7	D6	D4	D3	D2	D1	D0
	Data order	OG0	OR5	OR4	OR3	OR2	OR1	OR0
LVDS Channel O1	LVDS output	D18	D15	D14	D13	D12	D9	D8
	Data order	OB1	OB0	OG5	OG4	OG3	OG2	OG1
LVDS Channel O2	LVDS output	D26	D25	D24	D22	D21	D20	D19
	Data order	DE	NA	NA	OB5	OB4	OB3	OB2
LVDS Channel O3	LVDS output	D23	D17	D16	D11	D10	D5	D27
	Data order	NA	OB7	OB6	OG7	OG6	OR7	OR6
LVDS Channel E0	LVDS output	D7	D6	D4	D3	D2	D1	D0
	Data order	EG0	ER5	ER4	ER3	ER2	ER1	ER0
LVDS Channel E1	LVDS output	D18	D15	D14	D13	D12	D9	D8
	Data order	EB1	EB0	EG5	EG4	EG3	EG2	EG1
LVDS Channel E2	LVDS output	D26	D25	D24	D22	D21	D20	D19
	Data order	DE	NA	NA	EB5	EB4	EB3	EB2
LVDS Channel E3	LVDS output	D23	D17	D16	D11	D10	D5	D27
	Data order	NA	EB7	EB6	EG7	EG6	ER7	ER6

DISPLAY TIMING SPECIFICATIONS

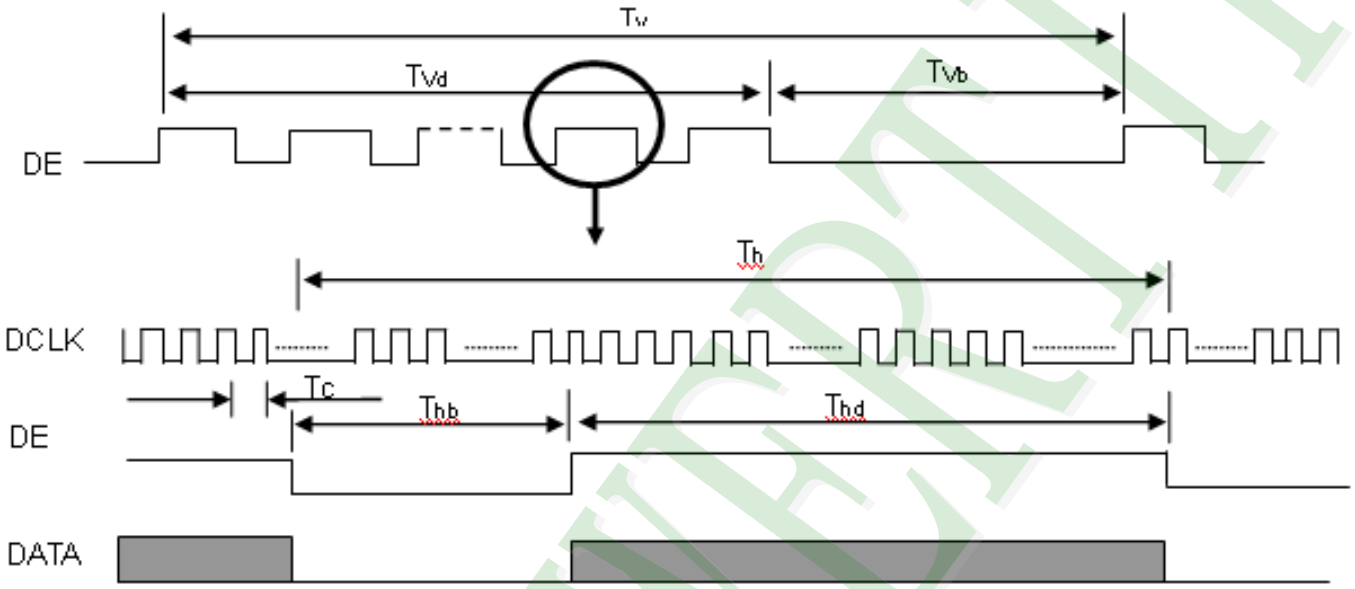
Signal	Item	Symbol	Min.	Typ.	Max	Unit	Note
LVDS Clock	Frequency	F_C	58.54	74.25	97.98	MHz	-
	Period	T_C	-	13.47	-	ns	
	Input cycle to cycle jitter	T_{rcl}	-0.02* T_C	-	0.02* T_C	ns	(1)
	Input clock to data skew	TLVCCS	-0.02* T_C	-	0.02* T_C	ns	(2)
	Spread spectrum modulation range	Fclkin_mod	0.97*Fc	-	1.03*Fc	MHz	(3)
	Spread spectrum modulation frequency	F_{SSM}	-	-	100	KHz	
Vertical Display Term	Frame Rate	Fr	50	60	75	Hz	Tv=Tvd+Tvb
	Total	Tv	1115	1125	1136	Th	-
	Active Display	Tvd	1080	1080	1080	Th	-
	Blank	Tvb	35	45	56	Th	-
Horizontal Display Term	Total	Th	1050	1100	1150	Tc	Th=Thd+Thb
	Active Display	Thd	960	960	960	Tc	-
	Blank	Thb	90	140	190	Tc	-

Note: Because this module is operated by DE only mode, Hsync and Vsync input signals are ignored.

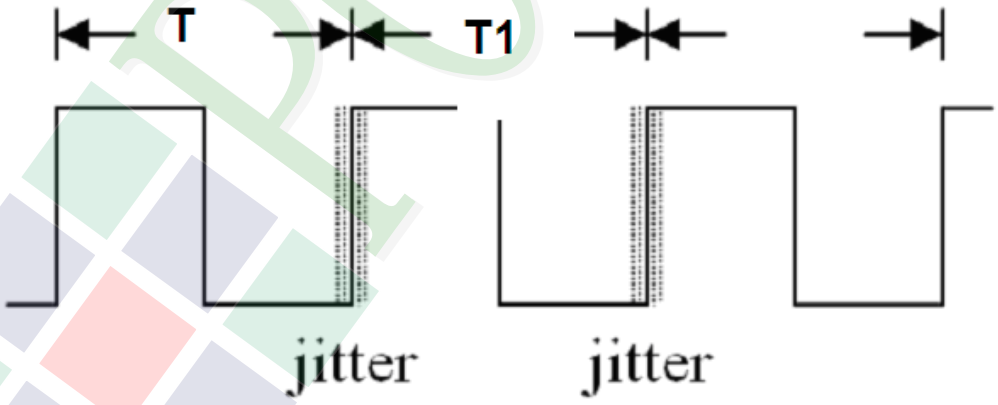
Fc = Fr * Tv * Th

Please make sure the range of pixel clock has follow the below equation and Fc, Fr, Tv, Th not allowed to get beyond the min and max spec.

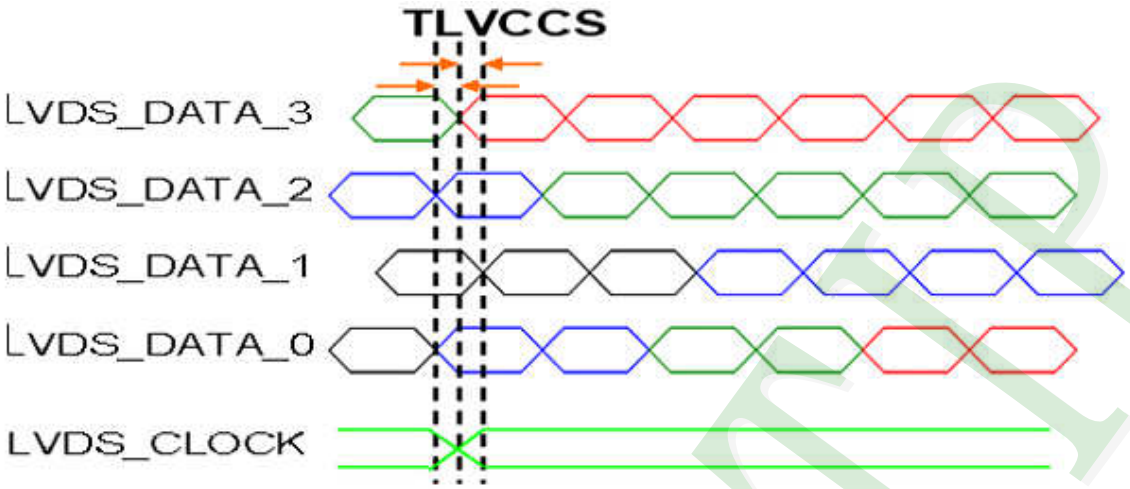
INPUT SIGNAL TIMING DIAGRAM



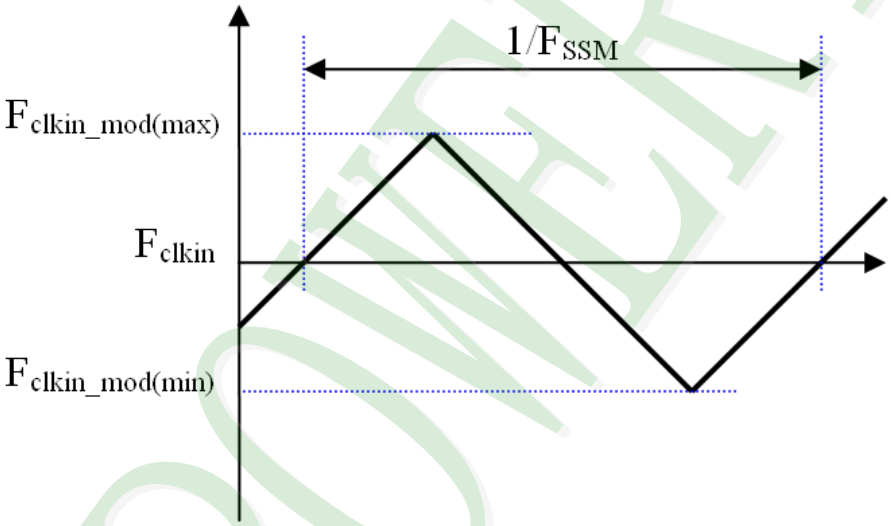
Note (1) The input clock cycle-to-cycle jitter is defined as below figures. Trcl = I T1 – TI



Note (2) Input Clock to data skew is defined as below figures.



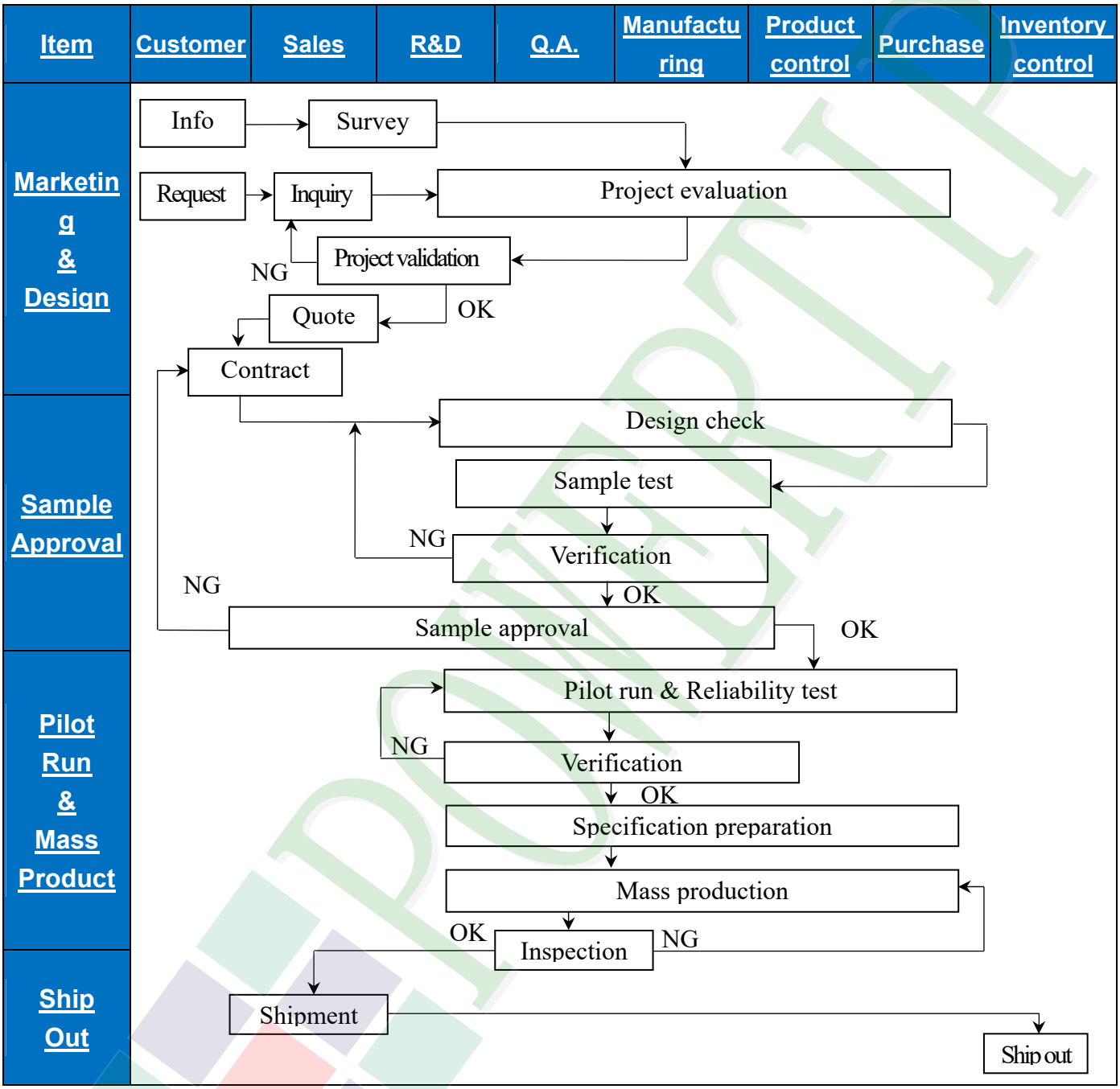
Note (3) The SSCG (Spread spectrum clock generator) is defined as below figures.

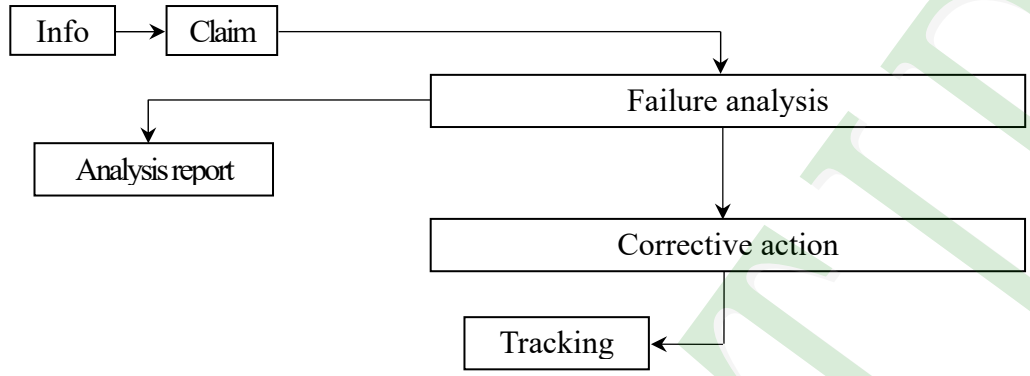


Note (4) The DCLK range at last line of V-blank should be set in 0 to Hdisplay/2

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 3. Equipment calibration 5. Standardization Management				2. Process improvement proposal 4. Education and Training Activities			

3.2. Inspection Specification

◆Scope: The document shall be applied to TFT-LCD Module for 23.8″ (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:

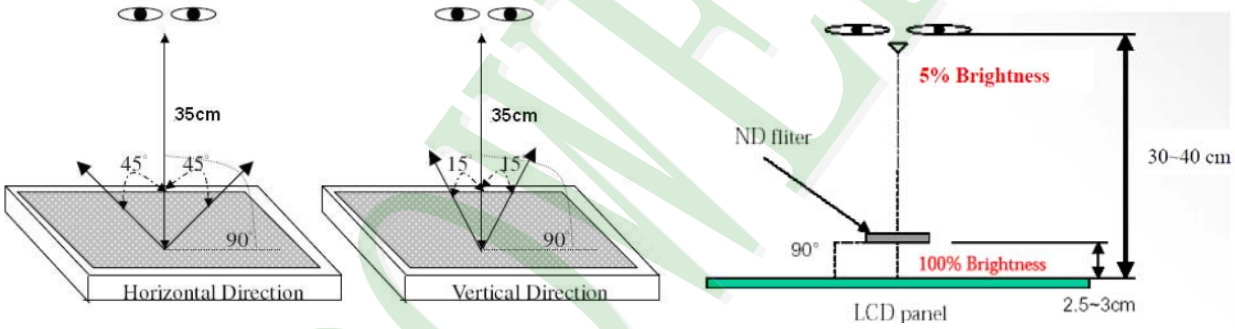
a. Manner of appearance test:

(1). The test best be under 20W×2 fluorescent light(about 300lux ～500lux) , and distance of view must be at 35~40 cm.

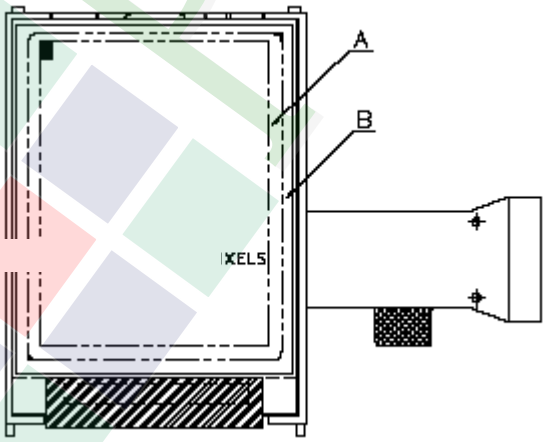
(2). The viewing angle：

＊15 degree to the front surface of display panel in vertical direction.

＊ 45 degree to the front surface of display panel in horizontal direction.



(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 23.8" : (Ver.B01)

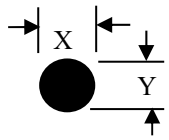
<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td rowspan="3">01</td><td rowspan="3">Product condition</td><td>1.1The part number is inconsistent with work order of production.</td><td>Major</td></tr>
<tr><td>1.2 Mixed product types.</td><td>Major</td></tr>
<tr><td>1.3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

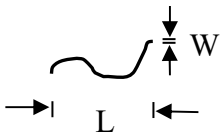
On -display</td><td>
<table>
<tr><th colspan="2">Item</th><th>Acceptance (Q'ty)</th></tr>
<tr><td rowspan="5">Dot Defect</td><td>Bright Dot</td><td>≦ 4</td></tr>
<tr><td>Dark Dot</td><td>≦ 5</td></tr>
<tr><td>2 Dots Joint Dot</td><td>≦ 3</td></tr>
<tr><td>3 Dots Joint Dot</td><td>≦ 1</td></tr>
<tr><td>Total</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 : Dots appear bright and unchanged in visible with 5% ND filter is defined.
</td><td>Minor</td></tr>
</table>

◆Specification For TFT-LCD Module 23. 8” ： (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 ≦ 0.05</td><td>Ignore</td><td rowspan="4">Ignore</td></tr><tr><td>0.05 ＜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 23.8” : (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: 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

NO.	TEST ITEM	TEST CONDITION
1	High Temperature Operation Test	Keep in +50 ±2℃ 240 hrs ,Display ON Surrounding temperature, then storage at normal condition 4hrs.
2	Low Temperature Operation Test	Keep in 0 ±2℃ 240 hrs ,Display ON Surrounding temperature, then storage at normal condition 4hrs.
3	High Temperature Storage Test	Keep in +60 ±2℃ 240 hrs Surrounding temperature, then storage at normal condition 4hrs.
4	Low Temperature Storage Test	Keep in -20 ±2℃ 240 hrs Surrounding temperature, then storage at normal condition 4hrs.
5	High Temperature / High Humidity Storage Test	Keep in +50℃ / 80% R.H duration for 240 hrs Surrounding temperature, then storage at normal condition 4hrs. (Excluding the polarizer)
6	Temperature Cycling Storage Test	-20℃ → +25℃ → +60℃ → +25℃ (30mins) (5mins) (30mins) (5mins) 20 Cycle Surrounding temperature, then storage at normal condition 4hrs.
7	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%)
8	Vibration Test (Packaged)	1. Sine wave 10～300 Hz frequency 2. The amplitude of vibration :1.5 mm 3. Each direction (X、Y、Z) duration for 10min

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 ketonic 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℃ 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 (SPS) 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 attached with the customer's mechanical device, please follow up the rules and regulations published by the original manufacturer of double-side 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℃ ± 5℃ and the humidity is below 65% RH.

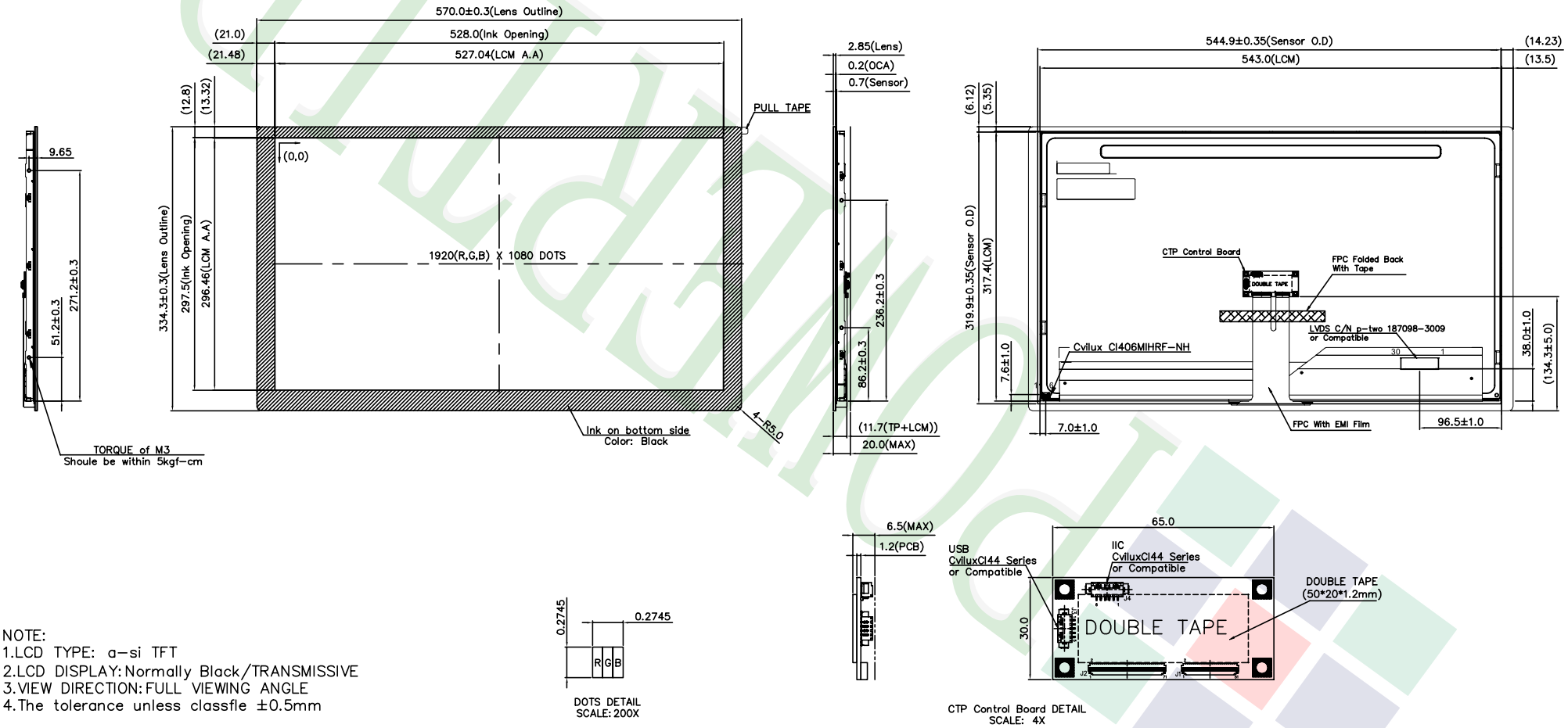
5.3.2 Do not place the module near organics solvents or corrosive gases.

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.



NOTE:
1.LCD TYPE: a-si TFT
2.LCD DISPLAY: Normally Black/TRANSMISSIVE
3.VIEW DIRECTION: FULL VIEWING ANGLE
4.The tolerance unless classfle ±0.5mm

REV	REV BY	REVISER	DATE
007			
006			
005			
004			
003			
002			
001	NEW DRAWING	Nini	2022/05/31

PART NO: PH192108T004-ZAC

DRAWING NAME : LMD-PH192108T004-ZAC

TITLE: LCD MODULE DRAWING

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

Design	Nini	(3)	Surface		
Check	Bright	Unit	MM	Material	
Approve	Marcs	Scale	FIT	Thickness	
		Page	1/1	Quantity	

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

Ver.001

Documents NO.	PKG-PH192108T004-ZAC

Packaging Specifications

Approve	Check	Contact
Bright	Tina	Jason

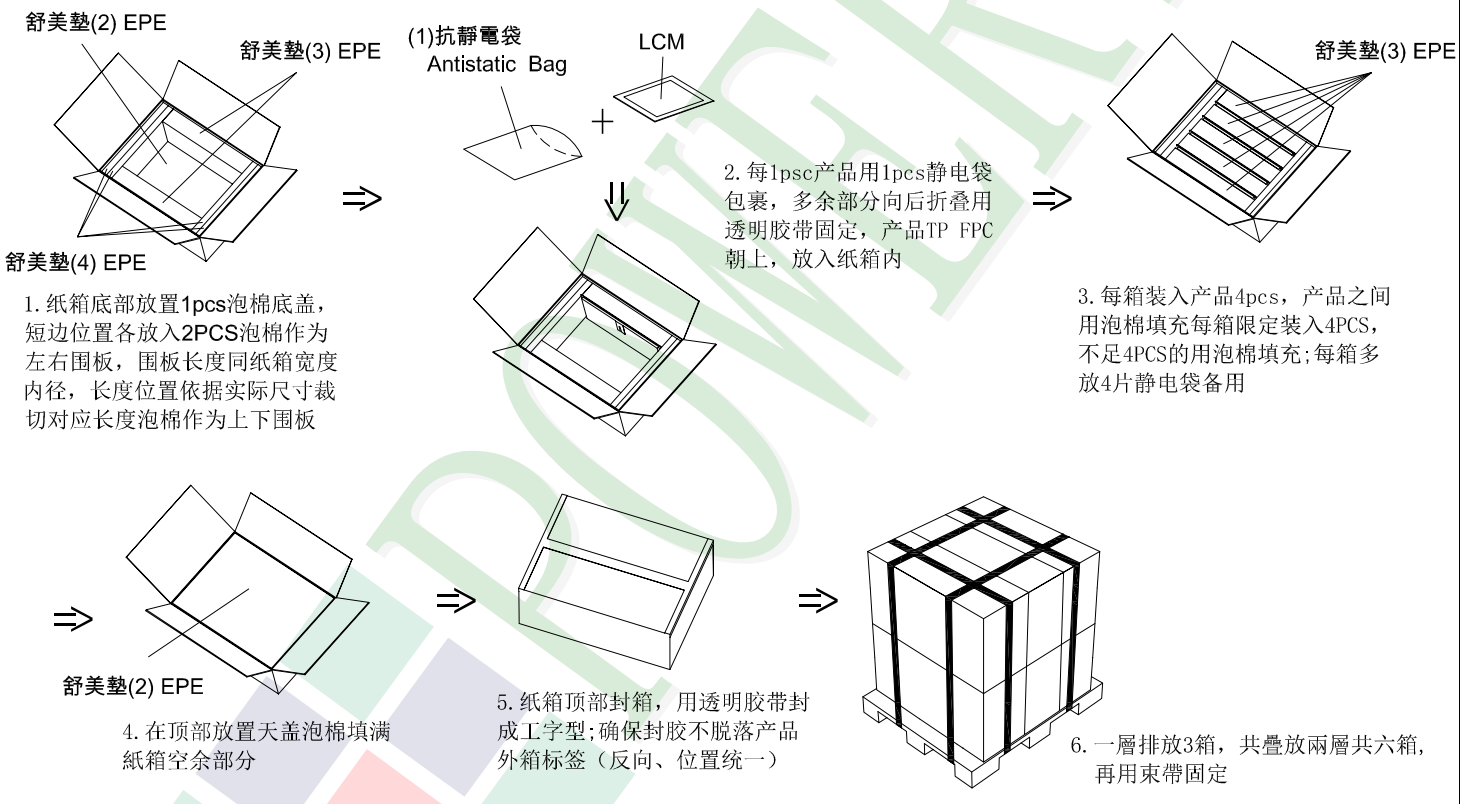
1.包裝材料規格表 (Packaging Material) : (per carton)

No.	Item	Model	Dimensions (mm)	1Pcs Weight	Quantity	Total Weight
1	成品 (LCM)	PH192108T004-ZAC	570 x 334.3 x 20.0	4.0	24	96.0
2	抗靜電袋(1)Antistatic Bag	-	-	-	-	-
3	舒美墊(2) EPE	-	(770 x 390 x 40)	(0.178)	(12)	(2.136)
4	舒美墊(3) EPE	-	(590 x 310 x 40)	(0.108)	(42)	(4.536)
5	舒美墊(4) EPE	-	(390 x 310 x 45)	(0.08)	(24)	(1.92)
6	外紙箱(5)Carton	-	780 X 400 X 530	2.15	6	12.9
7	棧板(6)PALLET	OTPALLET005ABA	1200 X 1000 X 140	8.0	1	8.0
8						
9						

2.一 整箱總重量 (Total Weight) : 125.49 Kg±10%

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

(1)LCM quantity per box : no per bag	1	x no of bag	1	=	1
(2)Total LCM quantity in carton : quantity per box	1	x no of boxes	4	=	4
(3)Total LCM quantity in pallet : quantity per carton	4	x no of cartons	6	=	24



1. 纸箱底部放置1pcs泡棉底盖，短边位置各放入2PCS泡棉作为左右围板，围板长度同纸箱宽度内径，长度位置依据实际尺寸裁切对应长度泡棉作为上下围板

2. 每1pscj产品用1pcs静电袋包裹，多余部分向后折叠用透明胶带固定，产品TP FPC朝上，放入纸箱内

3. 每箱装入产品4pcs，产品之间用泡棉填充每箱限定装入4PCS，不足4PCS的用泡棉填充;每箱多放4片静电袋备用

4. 在顶部放置天盖泡棉填满紙箱空余部分

5. 纸箱顶部封箱，用透明胶带封成工字型;确保封胶不脱落产品外箱标签（反向、位置统一）

6. 一層排放3箱，共疊放兩層共六箱，再用束帶固定

特 記 事 項 (REMARK)