POWERTIP TECH. CORP.

SPECIFICATIONS

CUSTOMER	:	CTW1304
SAMPLE CODE	:	SE12832LRF-002HL1Q
MASS PRODUCTION CODE	:	PE12832LRF-002HL1Q
SAMPLE VERSION	:	01
SPECIFICATIONS EDITION	:	002
DRAWING NO. (Ver.)	:	JLMD- PE12832LRF-002HL1Q _001
PACKAGING NO. (Ver.)	:	JPKG- PE12832LRF-002HL1Q _001

Customer Approved

Date:

POWERTIP
2011.04.01
JS RD APPROVED

Approved	Checked	Designer
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☐ Preliminary specification for design input

■ Specification for sample approval

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History of Version

Date (mm / dd / yyyy)	Ver.	Edi.	Description	Page	Design by
09/18/2011	0	001	Mass production Changed the backlight's resister is 75ohm based on the Powertip's mass production: PE12832LRF-002-H-Q	-	匡唐忠
3/28/2011	01	002	The second sample with second sourse's FPC	-	Violin

Total：page 27

Contents

1. SPECIFICATIONS

1.1 Features

Item	Standard Value
Display Type	128 * 32 Dots
LCD Type	FSTN , Positive, Transflective
Driver Condition	LCD Module：1/33 Duty, 1/6 Bias,
Viewing Direction	6 O'clock
Backlight	Yellow Green Backlight
Weight	2.7g
Interface	Parallel Interface
Other (controller / driver IC)	Stronix – ST7565R-G
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	38.8 (W) *17.65(L) * 3.05 (H)	mm
Viewing Area	32.0 (W) * 8.9 (L)	mm
Active Area	26.86 (W) * 7.34 (L)	mm
Dot Size	0.19 (W) * 0.21 (H)	mm
Dot Pitch	0.21 (W) * 0.23 (H)	mm

Note：For detailed information please refer to LCM drawing

1.3 Absolute Maximum Ratings

Item	Symbol	Condition	Min.	Max.	Unit
Power Supply Voltage	V_{DD}	-	-0.3	3.6	V
LCD Driver Supply Voltage	V_{LCD}	-	-0.3	13.5	V
Input Voltage	V_{IN}	-	-0.3	V_{DD}+0.5	V
Operating Temperature	T_{OP}	-	-20	70	℃
Storage Temperature	T_{ST}	-	-30	80	℃
Humiduty	H_D	Ta<40℃	20	90	%RH

1.4 DC Electrical Characteristics

Module V_{DD} = 3.0±0.3V, V_{SS} = 0V, Ta = 25°C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Logic Supply Voltage	V_{DD}	-	2.7	3.0	3.3	V
Input High Voltage	V_{IH}	-	0.8 V_{DD}	-	V_{DD}	V
Input Low Voltage	V_{IL}	-	V_{SS}	-	0.2 V_{DD}	V
Output High Voltage	V_{OH}	-	0.8 V_{DD}	-	V_{DD}	V
Output Low Voltage	V_{OL}	-	V_{SS}	-	0.2 V_{DD}	V
Supply Current	I_{DD}	V_{DD} =3.0 V；Vop=5.2 V Pattern= horizontal*1	-	0.08	0.15	mA
LCM Driver Voltage	V_{OP} *2	-20℃	5.3	5.5	5.7	V
		25℃	5.0	5.2	5.4	
		70℃	4.5	4.7	4.9	

NOTE：*1 The Maximum current display.

*2 The V_{OP} test point is V0-VSS.

1.5 Optical Characteristics

LCD Panel：Duty=1/33，Bias=1/6，V_{OP}=5.36V，Ta =25℃

Item		Symbol	Conditions	Min.	Typ.	Max.	Unit	Reference
Response Time	Rise	Tr	C≥2.0, ∅ = 270 °	-	80	120	ms	Note 2
	Fall	Tf		-	180	270		
Viewing angle range	Top	ΘY+		-	-	40	Deg.	Note 1
	Bottom	ΘY-		-	-	40		
	Left	ΘX-		-	-	40		
	Right	ΘX+		-	-	40		
Contrast Ratio (With BL)		CR	θ = 0°, ∅ = 270 °	1.5	2.0	-	-	Note 3
Average Brightness (With LCD) *2		IV	IF=10 mA	3	10	-	cd/m^2	-
CIE Color Coordinate (With LCD) *2		Hue		569	-	578	nm	-
Uniformity *1		△B	-	70	-	-	%	—

Note：

*1：△B=B(min) / B(max) * 100%

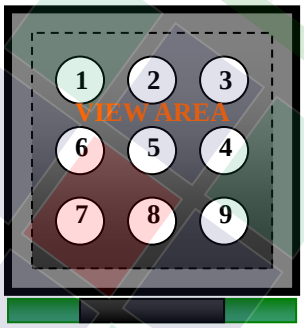
*2：Measurement Condition for Optical Characteristics:

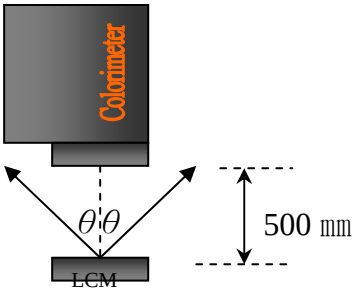
a：Environment: 25℃±5℃ / 60±20%R.H，no wind，dark room below 10 Lux at typical lamp current and typical operating frequency.

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

c：Equipment: TOPCON BM-7 fast，(field 0.2°)，after 10 minutes operation.

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



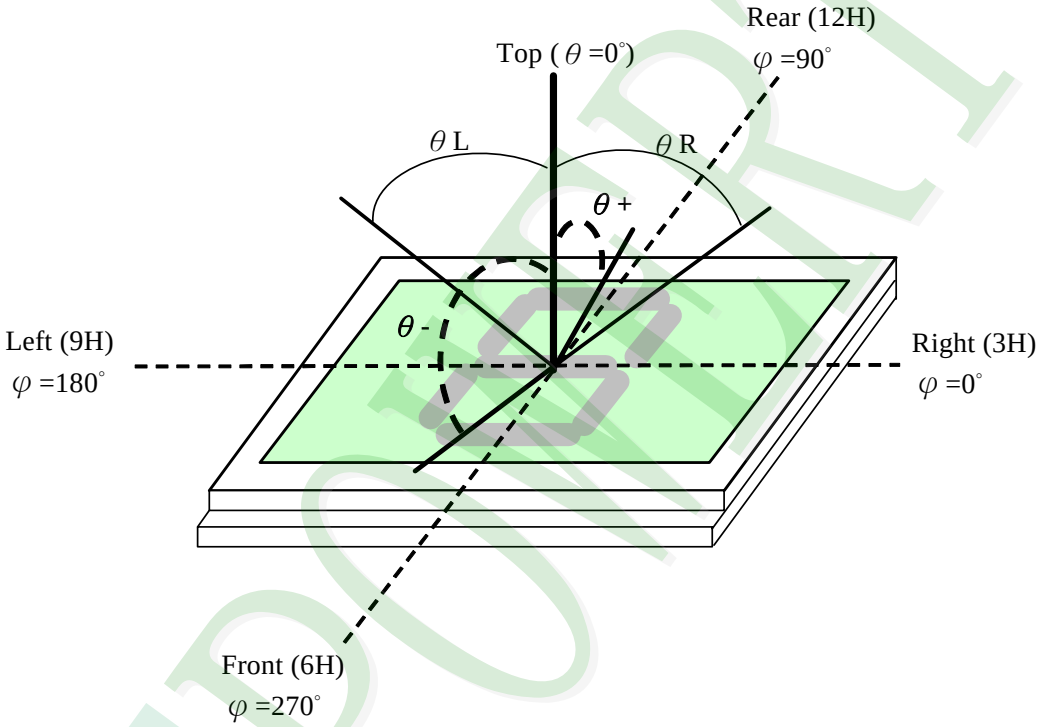


Colorimeter=BM-7 fast

Note 1.

Optical characteristics-2

Viewing angle

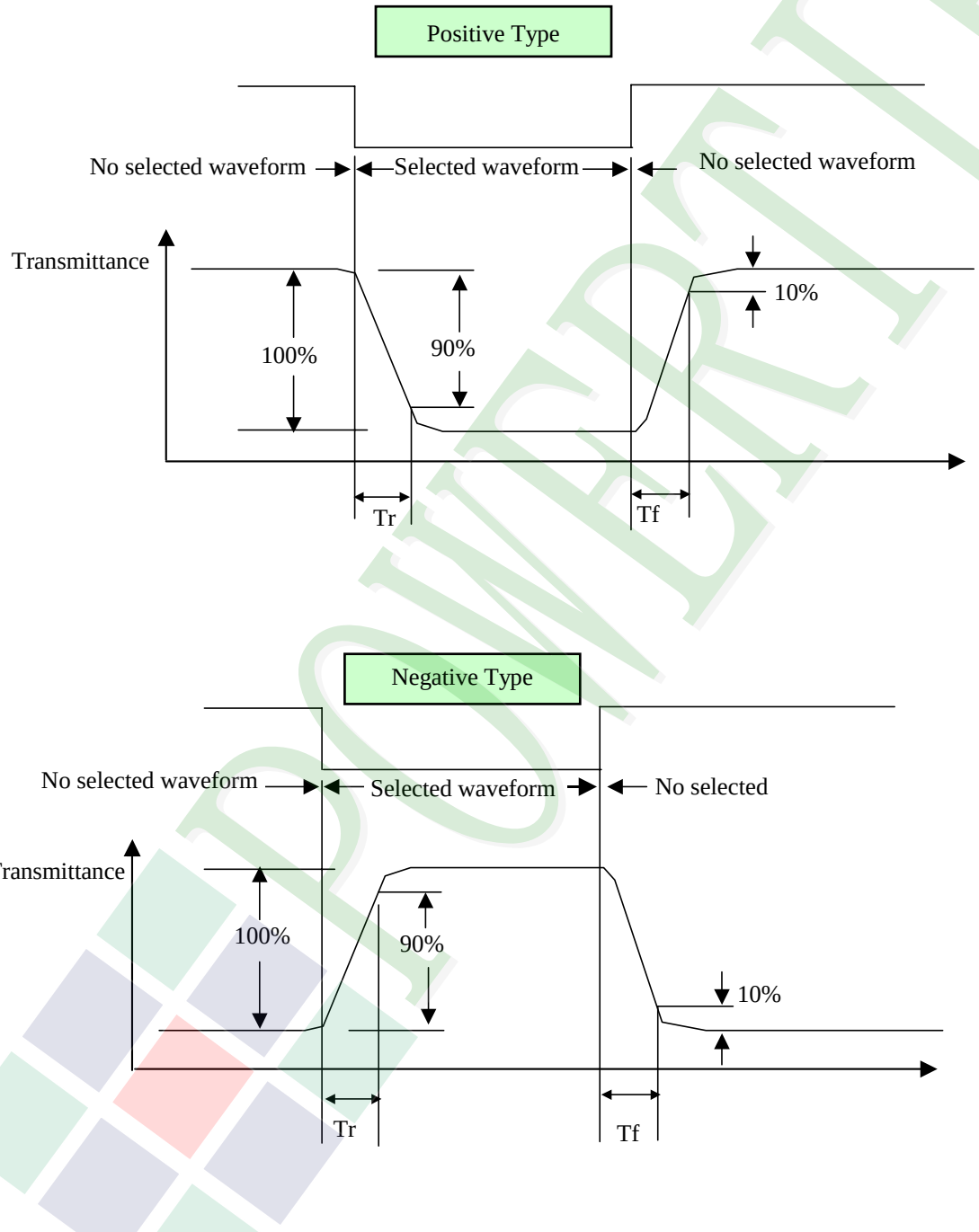


Viewing angle

Note 2.

Optical characteristics-3

Fig.2 Definition of response time



Electrical characteristics-2

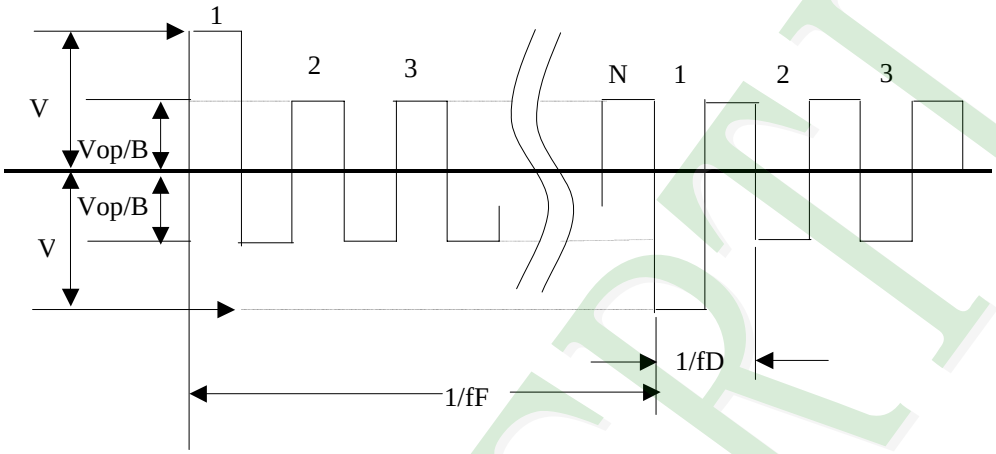
※2 Drive waveform

Vop: Drive voltage fF: Frame frequency

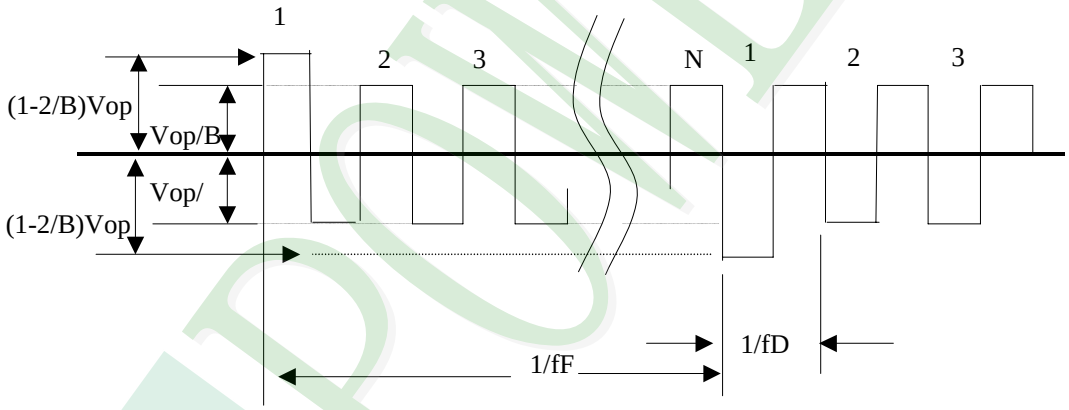
1/B: Bias fD: Drive frequency

N: Duty

(1) Selected waveform



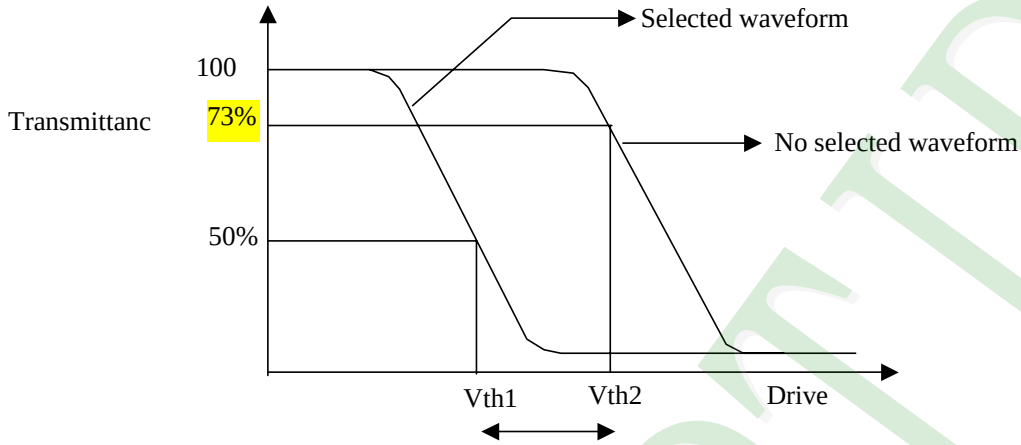
(2) Non- Selected wave form



Note:

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

Note 3. : Definition of Vth

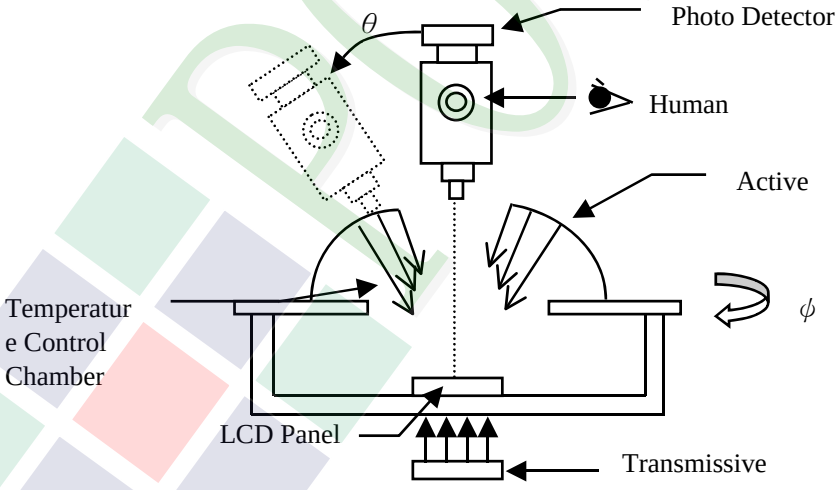


Active voltage range

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

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

Outline of Electro-Optical Characteristics Measuring System



Measuring System: Autronic DMS-803

Maximum Ratings

Item	Symbol	Conditions	Spec	Unit
Forward Current	IF	Ta =25°C	20	mA
Reverse Voltage	VR	Ta =25°C	5	V

Electrical / Optical Characteristics

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	VF	IF= 10 mA	2.6	2.8	3.0	V
Average Brightness (without LCD)	IV		8	12	-	cd/m^2
Reverse Current	IR	VR= 3 V	-	-	100	μA
Color	Yellow Green					

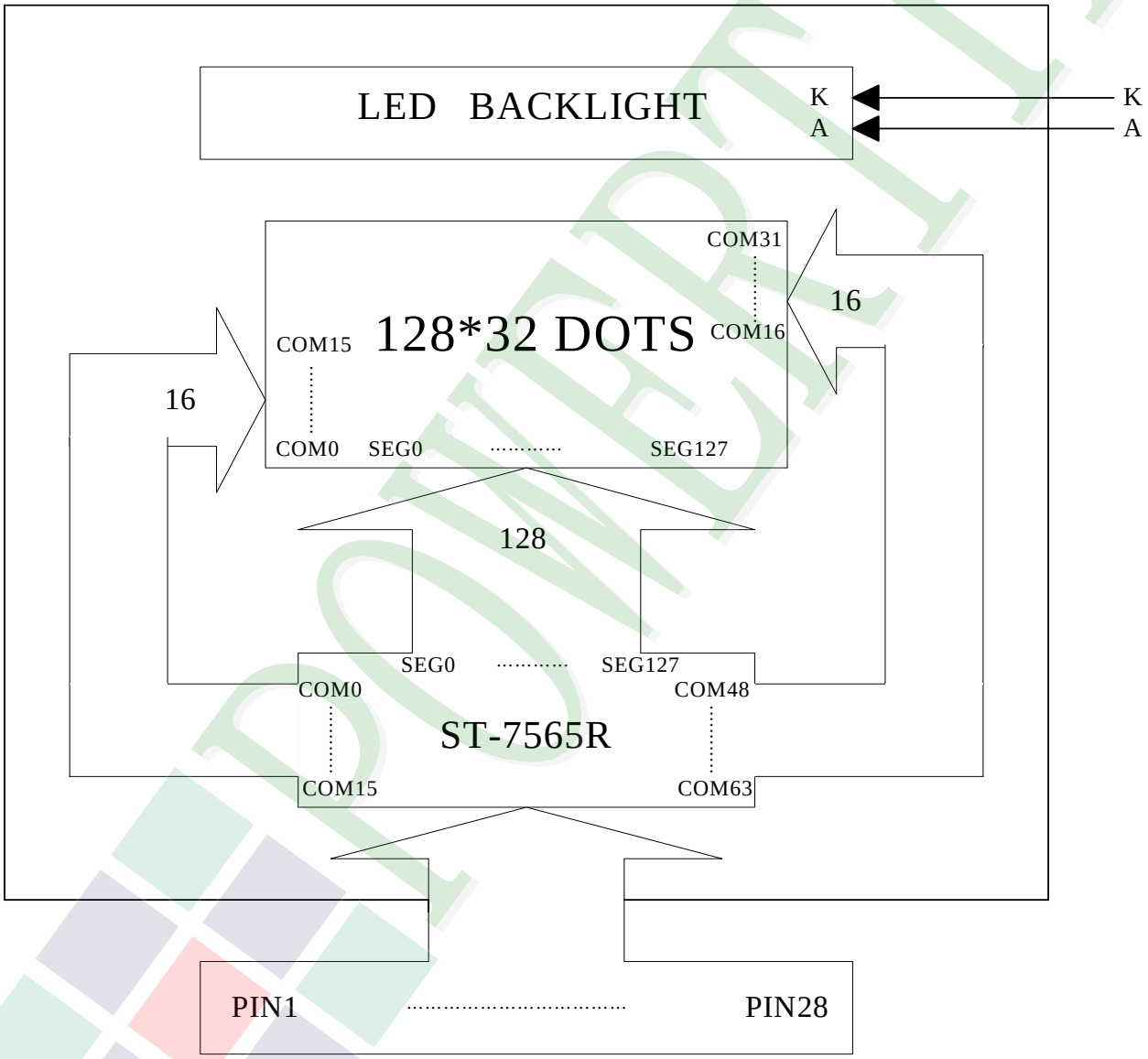
2. MODULE STRUCTURE

2.1 Counter Drawing

2.1.1 LCM Mechanical Diagram

* See Appendix

2.1.2 Block Diagram



Please refer interface pin description for detail

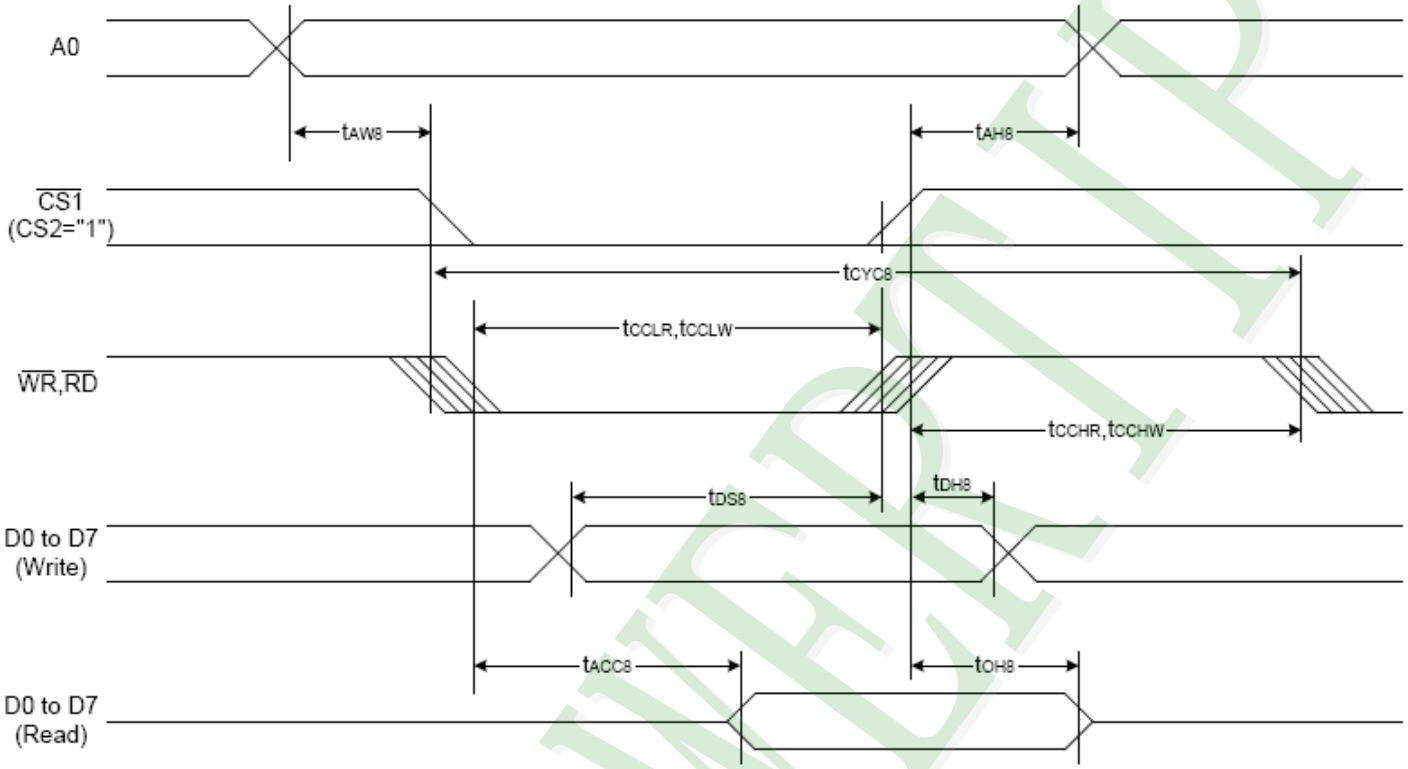
2.2 Interface Pin Description

Pin No.	Symbol	Function
1	VDD	Shared with the MPU power supply terminal Vcc.
2	C86	This is the MPU interface switch terminal. C86 = “H”: 6800 Series MPU interface. C86 = “L”: 8080 MPU interface.
3	NC	NC.
4	V0	This is a multi-level power supply for the liquid crystal drive. The voltage Supply applied is determined by the liquid crystal cell, and is changed through the use of a resistive voltage divided or through changing the impedance using an op. amp. Voltage levels are determined based on Vss, and must maintain the relative magnitudes shown below. V0 ≧V1 ≧V2 ≧V3 ≧V4 ≧ Vss When the power supply turns ON, the internal power supply circuits produce the V1 to V4 voltages shown below. The voltage settings are selected using the LCD bias set command .
5	V1	
6	V2	
7	V3	
8	V4	
9	CAP2N	DC/DC voltage converter. Connect a capacitor between this terminal and the CAP2P terminal.
10	CAP2P	DC/DC voltage converter. Connect a capacitor between this terminal and the CAP2N terminal.
11	CAP1P	DC/DC voltage converter. Connect a capacitor between this terminal and the CAP1N terminal.
12	CAP1N	DC/DC voltage converter. Connect a capacitor between this terminal and the CAP1P terminal.
13	CAP3P	DC/DC voltage converter. Connect a capacitor between this terminal and the CAP1N terminal.
14	VOUT	DC/DC voltage converter. Connect a capacitor between this terminal and VSS.
15	VSS	This is the reference power supply for the step-up voltage circuit for the liquid crystal drive.
16	D7	This is an 8-bit bi-directional data bus that connects to an 8-bit or16-bit standard MPU data bus.
17	D6	
18	D5	
19	D4	

20	D3	
21	D2	
22	D1	
23	D0	
24	/RD(E)	• When connected to an 8080 MPU, this is active LOW. (E) This pin is connected to the /RD signal of the 8080 MPU, and the ST7565S series data bus is in an output status when this signal is “L”. • When connected to a 6800 Series MPU, this is active HIGH. This is the 6800 Series MPU enable clock input terminal.
25	/WR(R/W)	• When connected to an 8080 MPU, this is active LOW. (R/W) This terminal connects to the 8080 MPU /WR signal. The signals on the data bus are latched at the rising edge of the /WR signal. • When connected to a 6800 Series MPU: This is the read/write control signal input terminal. When R/W = “H”: Read. When R/W = “L”: Write.
26	A0	This is connect to the least significant bit of the normal MPU address bus, and it determines whether the data bits are data or a command. A0 = “H”: Indicates that D0 to D7 are display data. A0 = “L”: Indicates that D0 to D7 are control data.
27	/RES	When /RES is set to “L,” the settings are initialized. The reset operation is performed by the /RES signal level.
28	/CS1	Chip Select signal. Active “L”.

2.3 Timing Characteristics

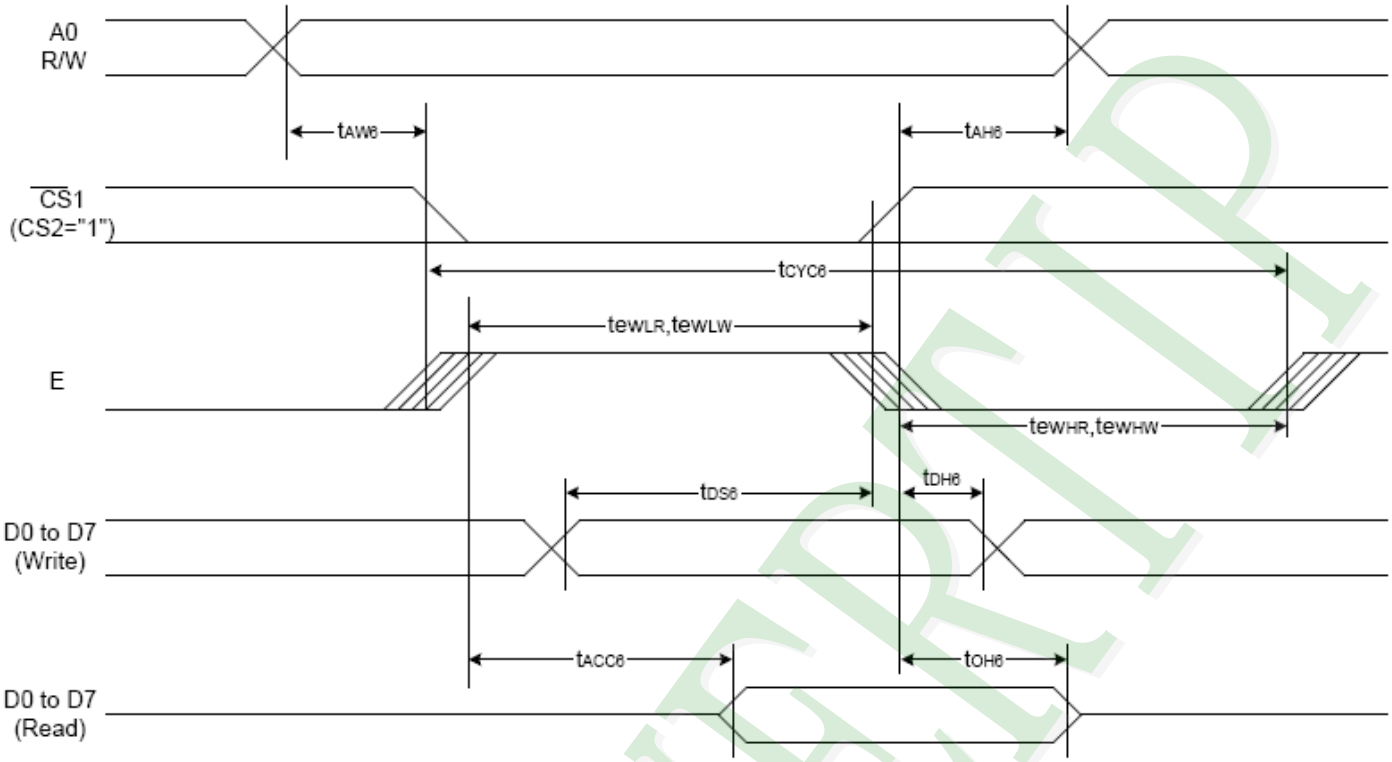
8080 INTERFACE



(VDD = 2.7V,Ta = –30 to 85°C)

Item	Signal	Symbol	Condition	Rating		Units
				Min.	Max.	
Address hold time	A0	t_{AH8}		0	—	ns
Address setup time		t_{AW8}		0	—	
System cycle time		t_{CYC8}		400	—	
Enable L pulse width (WRITE)	WR	t_{CCLW}		220	—	
Enable H pulse width (WRITE)		t_{CCHW}		180	—	
Enable L pulse width (READ)	RD	t_{CCLR}		220	—	
Enable H pulse width (READ)		t_{CCHR}		180	—	
WRITE Data setup time	D0 to D7	t_{DS8}		40	—	
WRITE Address hold time		t_{DH8}		0	—	
READ access time		t_{ACC8}	C_L = 100 pF	—	140	
READ Output disable time		t_{OH8}	C_L = 100 pF	10	100	

6800 INTERFACE



(V_{DD} = 2.7V, Ta = –30 to 85°C)

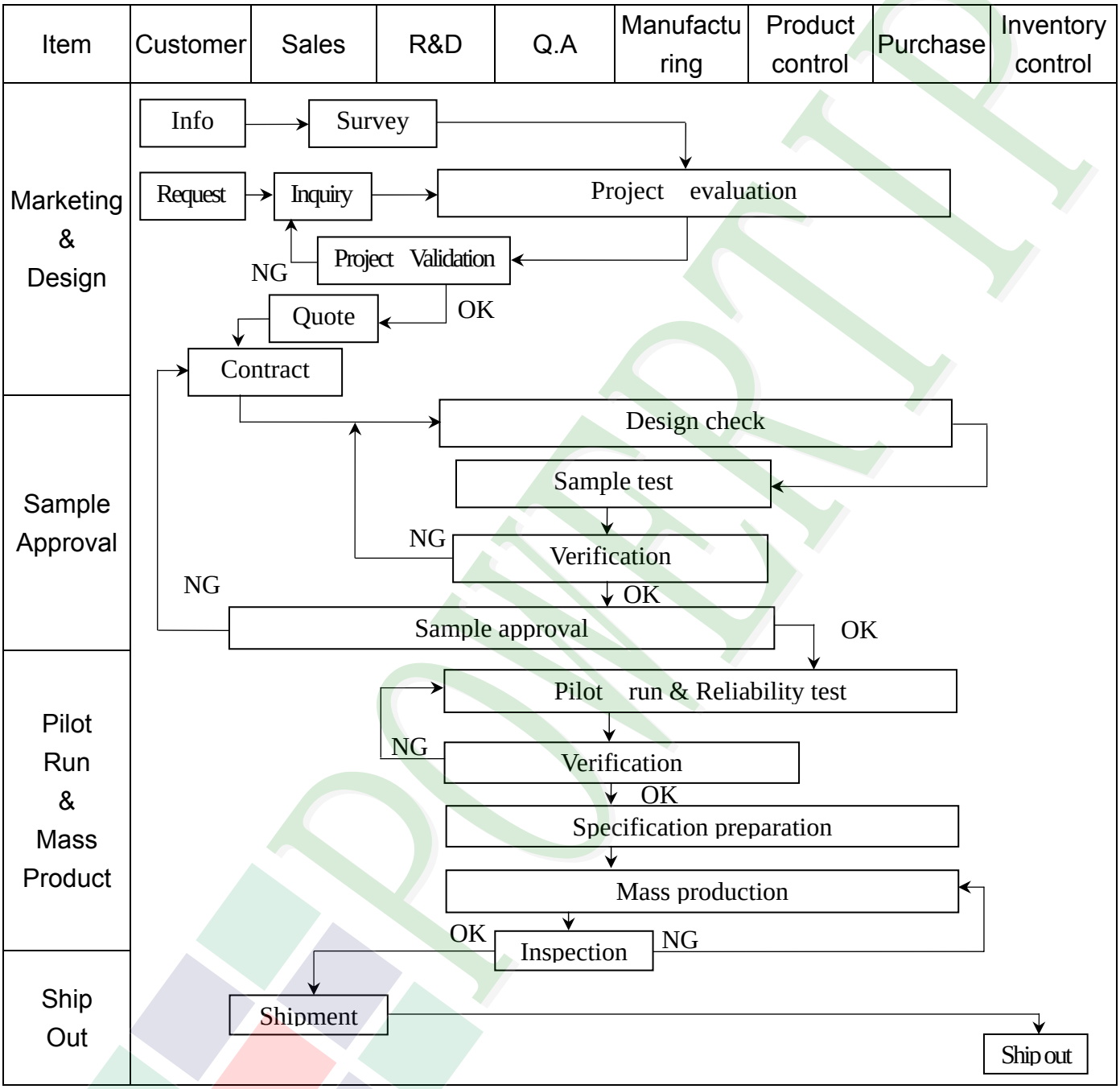
Item	Signal	Symbol	Condition	Rating		Units
				Min.	Max.	
Address hold time	A0	t_{AH6}		0	—	ns
Address setup time		t_{AW6}		0	—	
System cycle time		t_{CYC6}		400	—	
Enable L pulse width (WRITE)	WR	t_{EWLW}		220	—	
Enable H pulse width (WRITE)		t_{EWHW}		180	—	
Enable L pulse width (READ)	RD	t_{EWLR}		220	—	
Enable H pulse width (READ)		t_{EWHR}		180	—	
WRITE Data setup time	D0 to D7	t_{DS6}		40	—	
WRITE Address hold time		t_{DH6}		0	—	
READ access time		t_{ACC6}	C_L = 100 pF	—	140	
READ Output disable time		t_{OH6}	C_L = 100 pF	10	100	

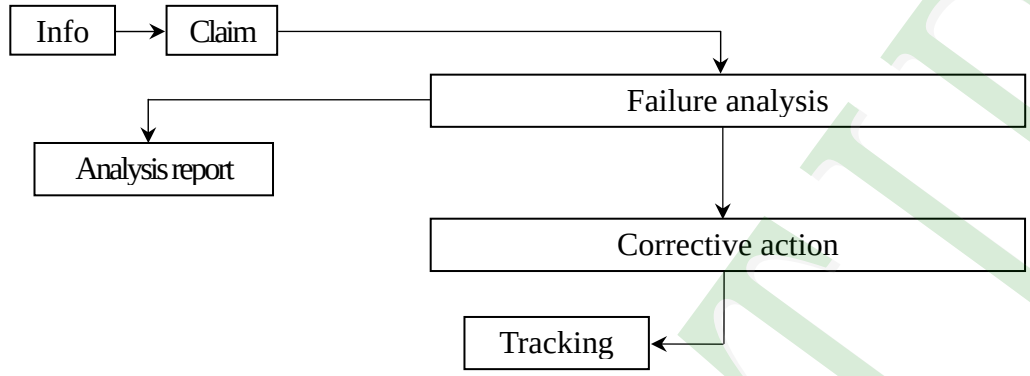
2.4 Display Command

Command	Command Code										Function
	A0	/RD	/WR	D7	D6	D5	D4	D3	D2	D1	D0	
(1) Display ON/OFF	0	1	0	1	0	1	0	1	1	1	0 1	LCD display ON/OFF 0: OFF, 1: ON
(2) Display start line set	0	1	0	0	1	Display start address						Sets the display RAM display start line address
(3) Page address set	0	1	0	1	0	1	1	Page address				Sets the display RAM page address
(4) Column address set upper bit Column address set lower bit	0	1	0	0	0	0	1	Most significant column address				Sets the most significant 4 bits of the display RAM column address. Sets the least significant 4 bits of the display RAM column address.
				0	0	0	0	Least significant column address				
(5) Status read	0	0	1	Status				0	0	0	0	Reads the status data
(6) Display data write	1	1	0	Write data								Writes to the display RAM
(7) Display data read	1	0	1	Read data								Reads from the display RAM
(8) ADC select	0	1	0	1	0	1	0	0	0	0	0 1	Sets the display RAM address SEG output correspondence 0: normal, 1: reverse
(9) Display normal/ reverse	0	1	0	1	0	1	0	0	1	1	0 1	Sets the LCD display normal/ reverse 0: normal, 1: reverse
(10) Display all points ON/OFF	0	1	0	1	0	1	0	0	1	0	0 1	Display all points 0: normal display 1: all points ON
(11) LCD bias set	0	1	0	1	0	1	0	0	0	1	0 1	Sets the LCD drive voltage bias ratio 0: 1/9 bias, 1: 1/7 bias (ST7565R)
(12) Read/modify/write	0	1	0	1	1	1	0	0	0	0	0	Column address increment At write: +1 At read: 0
(13) End	0	1	0	1	1	1	0	1	1	1	0	Clear read/modify/write
(14) Reset	0	1	0	1	1	1	0	0	0	1	0	Internal reset
(15) Common output mode select	0	1	0	1	1	0	0	0 1	*	*	*	Select COM output scan direction 0: normal direction 1: reverse direction
(16) Power control set	0	1	0	0	0	1	0	1	Operating mode			Select internal power supply operating mode
(17) V0 voltage regulator internal resistor ratio set	0	1	0	0	0	1	0	0	Resistor ratio			Select internal resistor ratio(Rb/Ra) mode
(18) Electronic volume mode set Electronic volume register set	0	1	0	1	0	0	0	0	0	0	1	Set the V0 output voltage electronic volume register
				0	0	Electronic volume value						
(19) Static indicator ON/OFF Static indicator register set	0	1	0	1	0	1	0	1	1	0	0 1	0: OFF, 1: ON Set the flashing mode
				0	0	0	0	0	0	0	Mode	
(20) Booster ratio set	0	1	0	1	1	1	1	1	0	0	0	select booster ratio 00: 2x,3x,4x 01: 5x 11: 6x
				0	0	0	0	0	0	step-up value		
(21) Power save	0	1	0									Display OFF and display all points ON compound command
(22) NOP	0	1	0	1	1	1	0	0	0	1	1	Command for non-operation
(23) Test	0	1	0	1	1	1	1	*	*	*	*	Command for IC test. Do not use this command

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 LCD Module for Monotype and Color STN(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 .

◆Manner of appearance test :

(1). The test be under 20W×2 fluorescent light ' and distance of view must be at 30 cm.

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

(3). The test direction is base on about around 45°of vertical line. (Fig. 1)

(4). Definition of area . (Fig. 2)

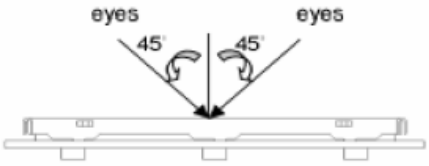


Fig.1

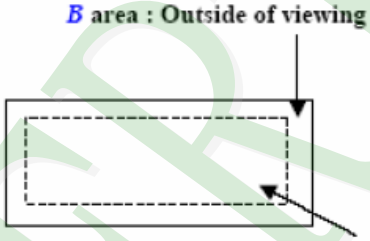


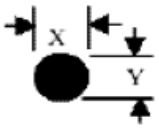
Fig. 2

◆ Specification:

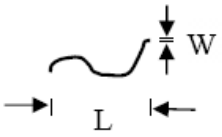
NO	Item	Criterion	Level
01	Product condition	1.1 The part number is inconsistent with work order of Production.	Major
		1.2 Mixed production types.	Major
		1.3 Assembled in inverse direction.	Major
02	Quantity	2.1 The quantity is inconsistent with work order of production.	Major
03	Outline dimension	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 Output data is error.	Major
		4.4 LCD viewing angle defect.	Major
		4.5 Current consumption exceeds product specifications.	Major

◆Specification For Monotype and Color STN：　(Ver. B01)

<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td>05</td><td>Black or white dot、scratch、contamination

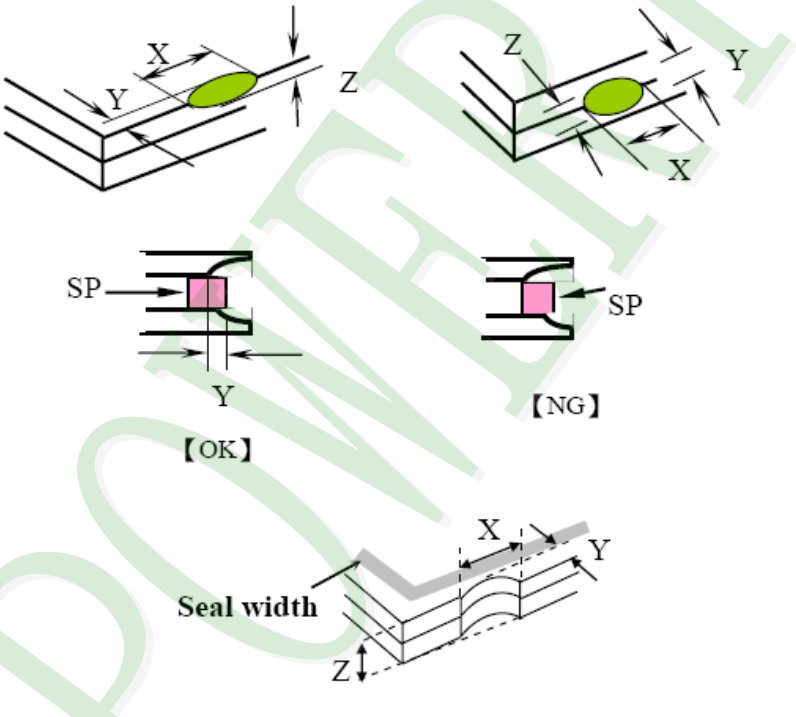
Round type
 

Φ=(x+y)/2

Line type
 
</td><td>5. 1 Round type:
5. 1. 1 display only :
• White and black spots on display ≦ 0. 30 mm , no more than 4 white or black spots present.
• Densely spaced : NO more than two spots or lines within 3 mm.

5. 1. 2 Non-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. 10</td><td>Accept no dense</td><td rowspan="4">Ignore</td></tr>
<tr><td>0. 10 ＜ Φ ≦ 0. 20</td><td>3</td></tr>
<tr><td>0. 20 ＜ Φ ≦ 0. 30</td><td>2</td></tr>
<tr><td>Total quantity</td><td>4</td></tr>
</table>
5. 1. 3 Line type:
<table>
<tr><th colspan="2">Dimension</th><th colspan="2">Acceptance (Q'ty)</th></tr>
<tr><th>Length (L)</th><th>Width (W)</th><th>A area</th><th>B area</th></tr>
<tr><td>---</td><td>W ≦ 0. 03</td><td>Accept no dense</td><td rowspan="3">Ignore</td></tr>
<tr><td>L ≦ 3. 0</td><td>0. 03 ＜ W ≦ 0. 05</td><td rowspan="2">4</td></tr>
<tr><td>L ≦ 2. 5</td><td>0. 05 ＜W ≦ 0. 075</td></tr>
<tr><td>---</td><td>W ＞0. 075</td><td colspan="2">As round type</td></tr>
</table></td><td>Minor</td></tr>
<tr><td>06</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. 20</td><td>Accept no dense</td><td rowspan="5">Ignore</td></tr>
<tr><td>0. 20 ＜Φ ≦ 0. 50</td><td>3</td></tr>
<tr><td>0. 50 ＜Φ ≦ 1. 00</td><td>2</td></tr>
<tr><td>Φ ＞ 1. 00</td><td>0</td></tr>
<tr><td>Total quantity</td><td>4</td></tr>
</table>
</td><td>Minor</td></tr>
</table>

◆Specification For Monotype and Color STN：　(Ver. B01)

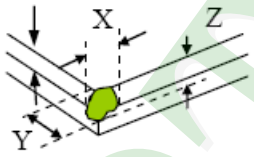
NO	Item	Criterion	Level
07	The crack of glass	Symbols： X : The length of crack　Y : The width of crack. Z : The thickness of crack　W : terminal length t : The thickness of glass　a : LCD side length 7.1 General glass chip： 7.1.1 Chip on panel surface and crack between panels:  	Minor

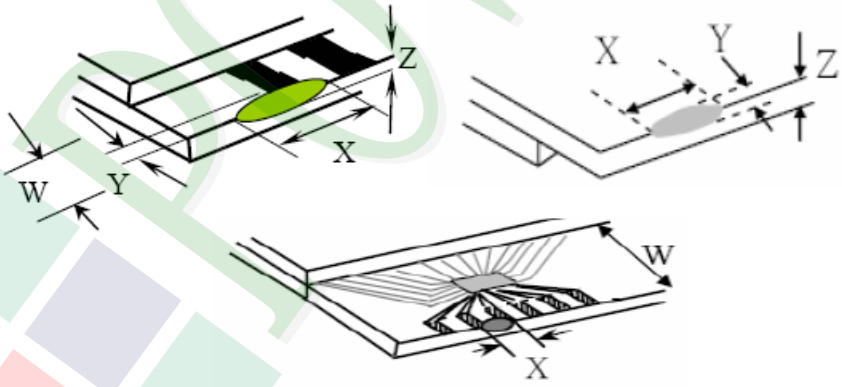
X	Y	Z
≦ a	Crack can't enter viewing area	≦1/2 t
≦ a	Crack can't exceed the half of SP width.	1/2 t < Z ≦2 t

◆Specification For Monotype and Color STN：　(Ver. B01)

<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td rowspan="2">07</td><td rowspan="2">The crack of glass</td><td>
Symbols：

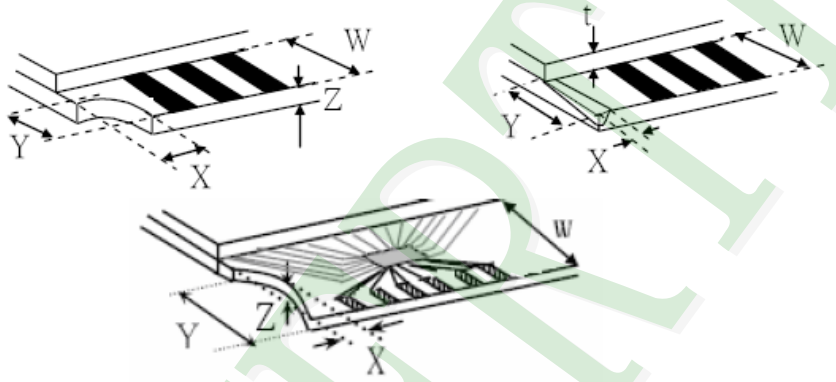
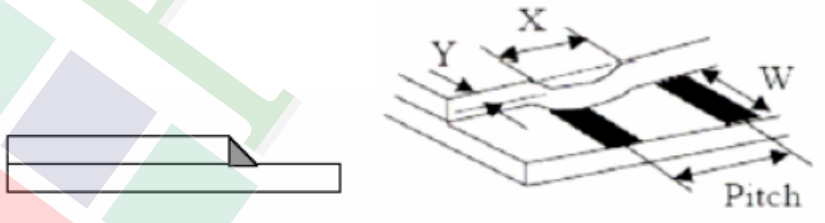
X : The length of crack　　Y : The width of crack.
Z : The thickness of crack　　W : terminal length
t : The thickness of glass　　a : LCD side length

7.1.2 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>
</td><td rowspan="2">Minor</td></tr>
<tr><td>
7.2 Protrusion over terminal：
7.2.1 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 colspan="3">Neglect</td></tr>
</table>
</td></tr>
</table>

◆Specification For Monotype and Color STN：　(Ver.B01)

NO	Item	Criterion	Level
07	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 7.2.2 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. 7.2.3 Glass remain：  X ≦ a　Y ≦ 1/3 W　Z ≦ t	Minor

◆Specification For Monotype and Color STN：　(Ver.B01)

NO	Item	Criterion	Level
08	Backlight elements	8.1 Backlight can't work normally.	Major
		8.2 Backlight doesn't light or color is wrong.	Major
		8.3 Illumination source flickers when lit.	Major
09	General appearance	9.1 Pin type must match type in specification sheet.	Major
		9.2 No short circuits in components on PCB or FPC.	Major
		9.3 Product packaging must the same as specified on packaging specification sheet.	Minor
		9.4 The folding and peeled off in polarizer are not acceptable.	Minor
		9.5 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)</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.

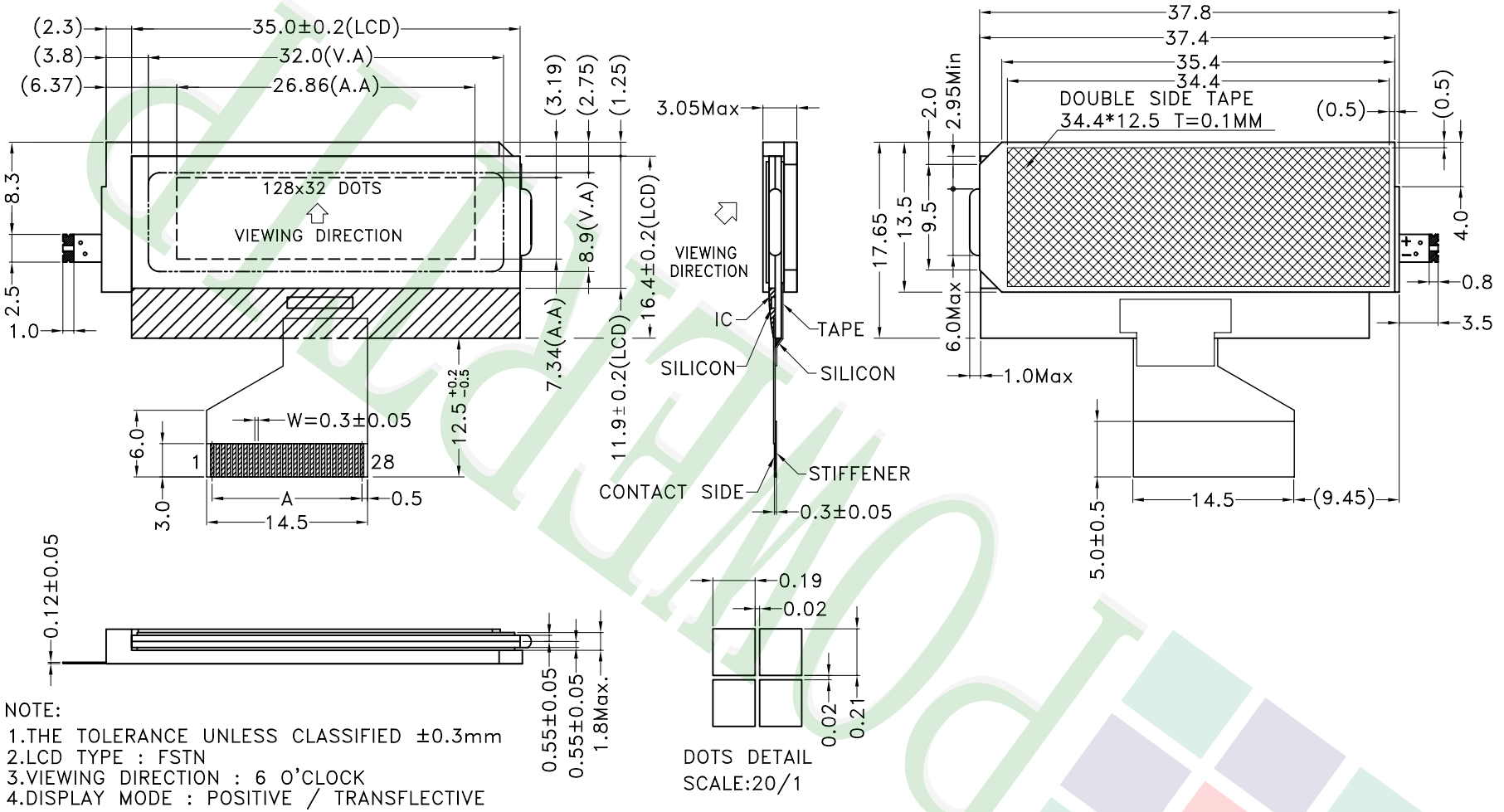
5.4 TERMS OF WARRANTY

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.



NOTE:

1.THE TOLERANCE UNLESS CLASSIFIED ±0.3mm
2.LCD TYPE : FSTN
3.VIEWING DIRECTION : 6 O'CLOCK
4.DISPLAY MODE : POSITIVE / TRANSFLECTIVE
5.Top:−20~70°C , Tst:−30~80°C
6.A=P0.5x27=13.5±0.1
7.IC= ST7565R
8.BL COLOR : Y/G
9.This product conforms ROHS.

REV	REV BY	REVISER	DATE
007			
006			
005			
004			
003			
002			
001	NEW DRAWING	Sally Hu	2011/03/25

PART NO: PE12832LRF-002HL1Q

DRAWING NAME : JLMD-PE12832LRF-002HL1Q

TITLE: LCD Module Drawing

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

Design	Sally Hu	⟨3⟩	Surface		
Check	Zhou Aimei	Unit	MM	Material	
Approve	Ryan Yan	Scale	1:1	Thickness	
		Page	1/1	Quantity	

最小長度 (mm)	公差等級 精度	精級
1 ~ 4		-
4 ~ 16		-
16 ~ 63		-
63 ~ 250		-
250 ~ 1000		-

PT-A-054-01

Ver.002

Documents NO.	JPKG-PE12832LRF-002HL1Q

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

Approve	Check	Design
Ryan Yan	ZHOU	Sally Hu

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

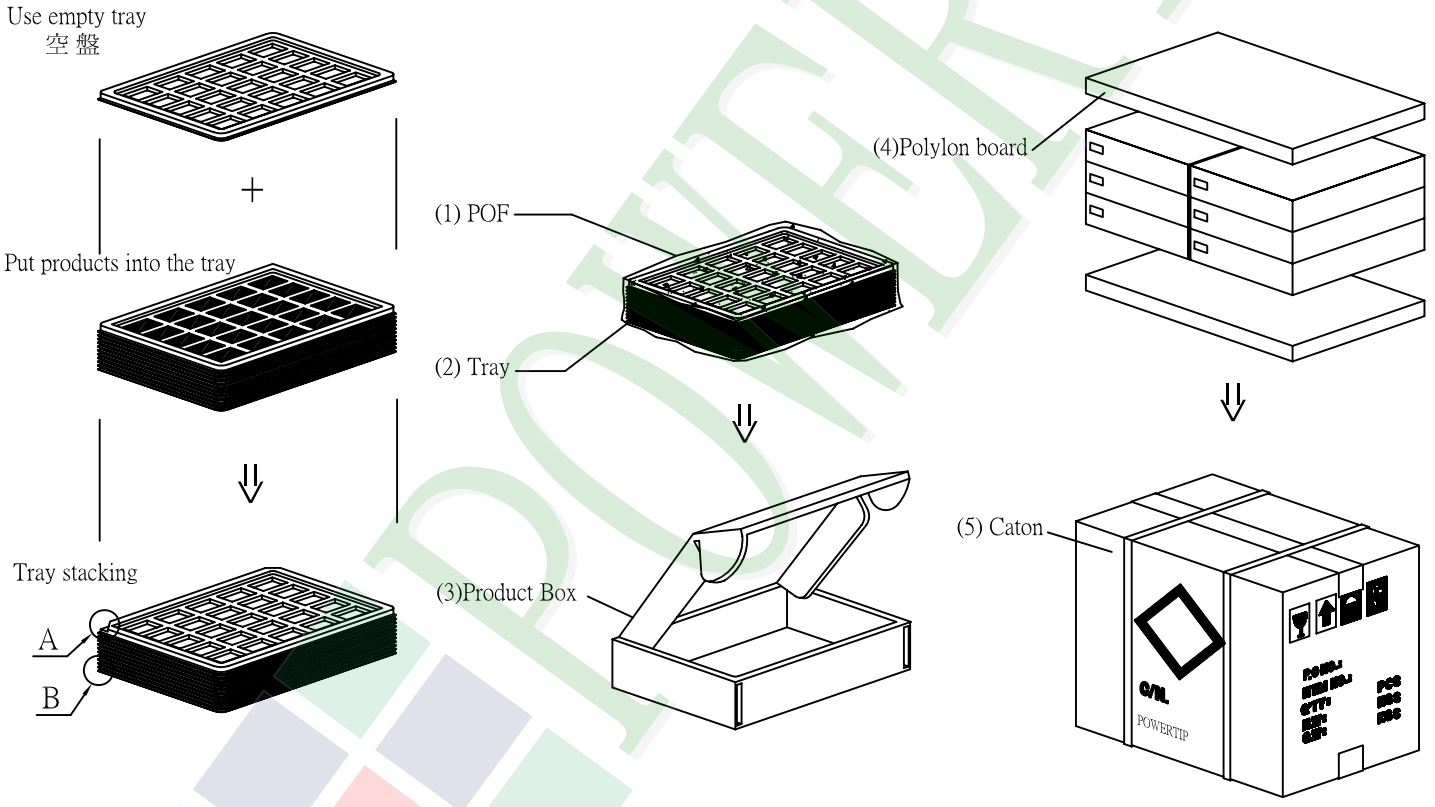
No.	Item	Model	Dimensions (mm)	1Pcs Weight	Quantity	Total Weight
1	成品 (LCM)	PE12832LRF-002HL1Q	37.8*17.65*3.05	0.0027	1728	4.6656
2	多層薄膜(2)POF	OTFILM0BA03ABA	19"X350X0.015	——	6	——
3	TRAY 盤 (3)	TYPE12803202BA	352 X 260 X10.8	0.0834	54	4.5036
4	內盒(4)Product Box	BX36627063ABBA	383 X 270 X 66	0.17	6	1.02
5	保力龍板(5)Polylon board	OTPLB00PL08ABA	550 X 393 X 20	0.0284	2	0.0568
6	外紙箱(6)Carton	BX57041027CCBA	570 X 410 X 265	1.39	1	1.39
7						
8						

2.一 整箱總重量 (Total LCD Weight in carton) : 11.64 Kg±10%

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

(1)LCD quantity per box : no per tray 36 x no of tray 8 = 288

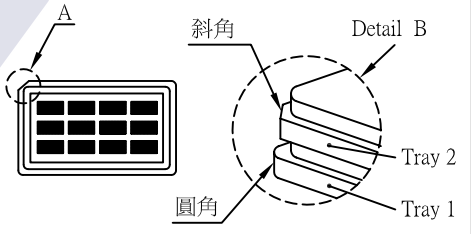
(2)Total LCD quantity in carton : no of boxes 288 x quantity per box 6 = 1728



特 記 事 項 (REMARK)

1. Label Specifications :

MODEL:
LOT NO:
QUANTITY:
CHECK:



Rotate tray 180 degrees and place on top of stack.
Check the tray stack using Fig. B.

TRAY盤相疊時,需旋轉180度,請詳見B視圖