POWERTIP TECH. CORP.

SPECIFICATIONS

CUSTOMER	:	PTC
SAMPLE CODE	:	SE12864WRF-042HC1Q
MASS PRODUCTION CODE	:	PE12864WRF-042HC1Q
SAMPLE VERSION	:	01
SPECIFICATIONS EDITION	:	004
DRAWING NO. (Ver.)	:	JLMD-PE12864WRF-042HC1Q_001
PACKAGING NO. (Ver.)	:	JPKG-PE12864WRF-042HC1Q_003

Customer Approved

Date:

POWERTIP
2013.02.27
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
06/1/2010	01	001	New Drawing	-	David Yang
12/21/2010	01	002	Correct LCD Type & VOP Test Point	4,5	Lori
08/02/2011	01	003	The Sample Specification	-	Jacob
02/26/2013	01	004	Modify Interface	4	Lori

Total: 28 Page

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Appendix: LCM Drawing
Packing Specification

1. SPECIFICATIONS

1.1 Features

Item	Standard Value
Display Type	128*64 dots
LCD Type	FSTN, Positive, Transflective, Extended Temp.
Driver Condition	LCD Module : 1/65Duty ,1/9Bias
Viewing Direction	6 O'clock
Backlight	White LED B/L
Weight	26g
Interface	8-bit parallel (6800,8080 mode)/4-line serial interface
Other(controller / driver IC)	ST7567-G4
ROHS	THIS PRODUCT CONFORMS THE ROHS OF PTC Detail information please refer web side : http://www.powertip.com.tw/news/LatestNews.asp

1.2 Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension	80.0 (L) * 54.0 (W) *9.7(H)	mm
Viewing Area	70.7(L) * 38.8(w)	mm
Active Area	66.545 (L) * 33.265(w)	mm
Characters Size	0.505 (L) * 0.505 (w)	mm
Characters Pitch	0.52 (L) * 0.52 (w)	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	16	V
Input Voltage	V_{IN}	-	-0.3	V_{DD}	V
Operating Temperature	T_{OP}	-	-20	70	℃
Storage Temperature	T_{ST}	-	-30	80	℃
Storage Humidity	H_D	Ta＜60 ℃	-	90	%RH

1.4 DC Electrical Characteristics

V_{DD} = 3.0V±0.3V, Vss= 0V, Ta = 25˚C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Logic Supply Voltage	V_{DD}	-	2.7	3.0	3.3	V
"H" Input Voltage	V_{IH}	-	0.7V_{DD}	-	V_{DD}	V
"L" Input Voltage	V_{IL}	-	Vss	-	0.3 V_{DD}	V
"H" Output Voltage	V_{OH}	I_{OH}=-0.5mA	0.8V_{DD}	-	V_{DD}	V
"L" Output Voltage	V_{OL}	I_{OL}=0.5mA	Vss	-	0.3 V_{DD}	V
Supply Current	I_{DD}	V_{DD}=3.0V;V_{OP}=8.5V; Pattern= Full display	-	0.3	-	mA
		V_{DD}=3.0V;V_{OP}=8.5V; Pattern= Horizontal line*1	-	0.8	1.5	
LCM Driver Voltage	V_{OP} *2	-20℃	8.5	8.7	8.9	V
		25℃	8.3	8.5	8.7	
		70℃	8.0	8.2	8.4	

NOTE: *1 The Maximum current display

*2 The VOP test point is V0-XV0.

1.5 Optical Characteristics

LCD Panel：1/65Duty，1/9Bias，V_{LCD} =8.5V，Ta =25℃

Item		Symbol	Conditions	Min.	Typ.	Max.	Unit	Reference
Response Time	Rise	tr	C≥2.0, ∅ =270°	-	100	150	Ms	Note2
	Fall	tf		-	250	375		
Viewing angle range	Top	ΘY+		-	40	-	Deg.	Notes 1
	Bottom	ΘY-		-	40	-		
	Left	ΘX-		-	45	-		
	Right	ΘX+		-	45	-		
Contrast Ratio*2		C	θ = 0°, ∅ = 270°	-	11	-	-	Note 4
Average Brightness (with LCD) *2		IV	IF=160mA	30	100	-	cd/m^2	
Uniformity *1		△B		70	-	-	%	

Note 4 ：

1：△B=B(min) / B(max) * 100%

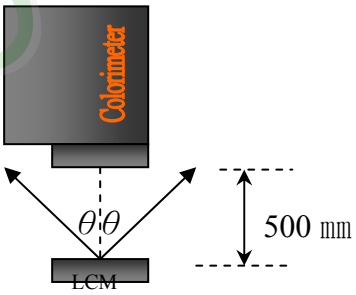
2：Measurement Condition for Optical Characteristics:

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%

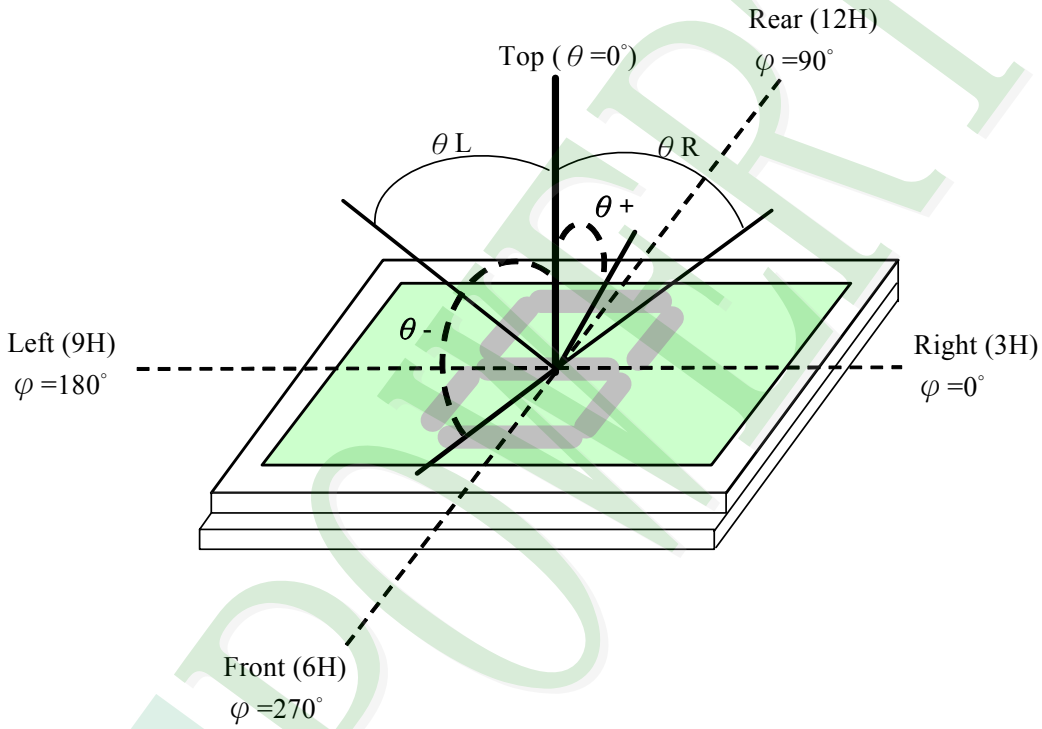


Colorimeter=BM-7 fast

Note 1.

Optical characteristics-2

Viewing angle

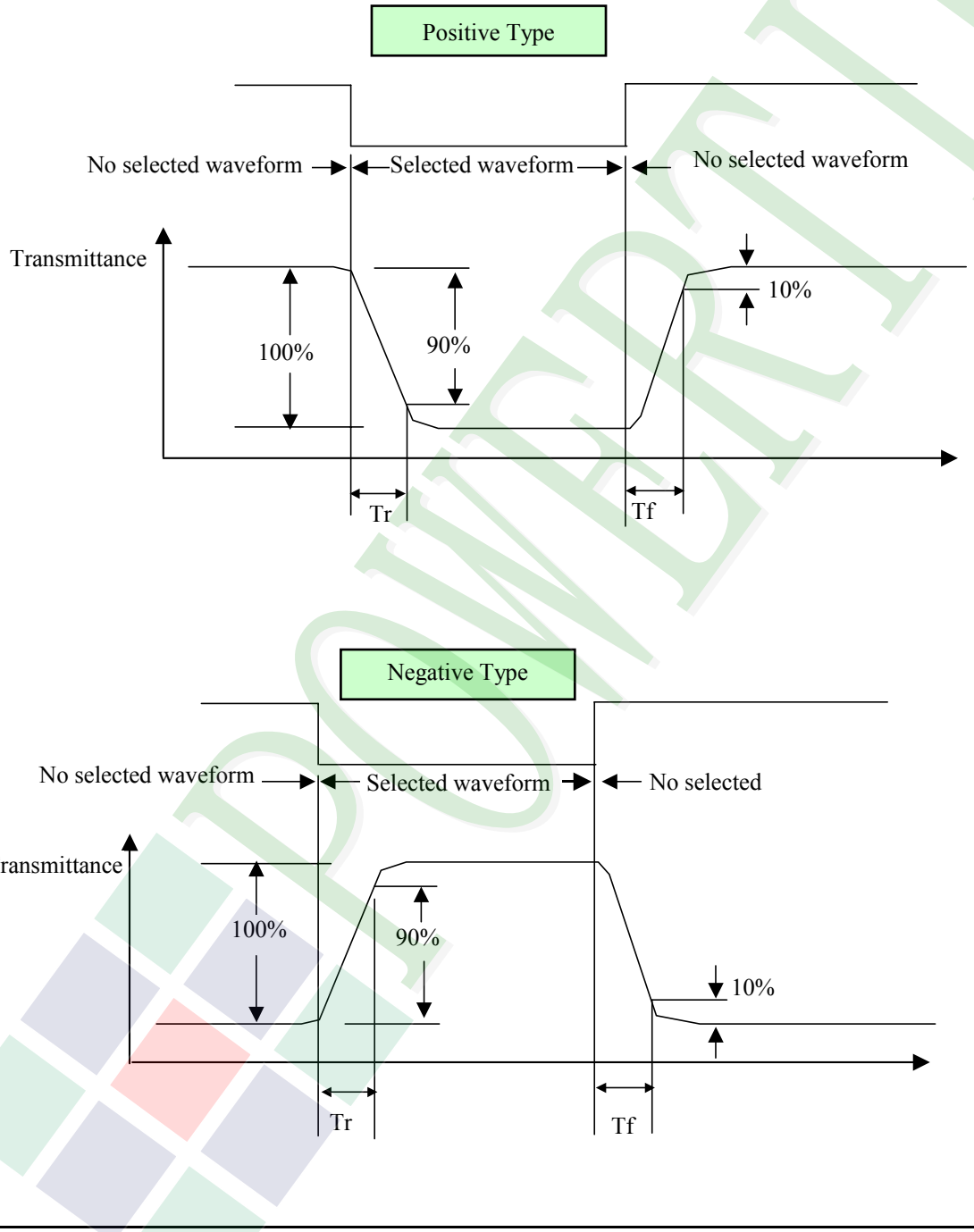


Viewing angle

Note 2.

Optical characteristics-3

Fig.2 Definition of response time



Electrical characteristics-2

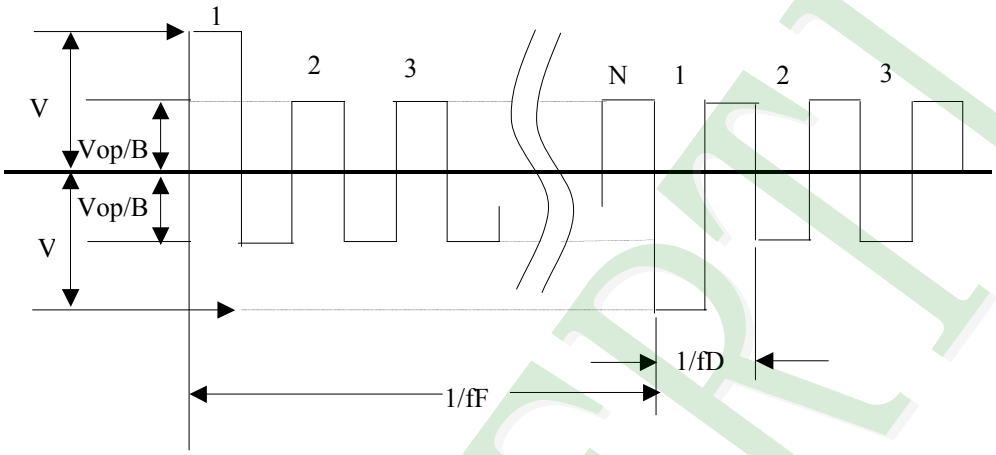
※2 Drive waveform

Vop: Drive voltage　　fF: Frame frequency

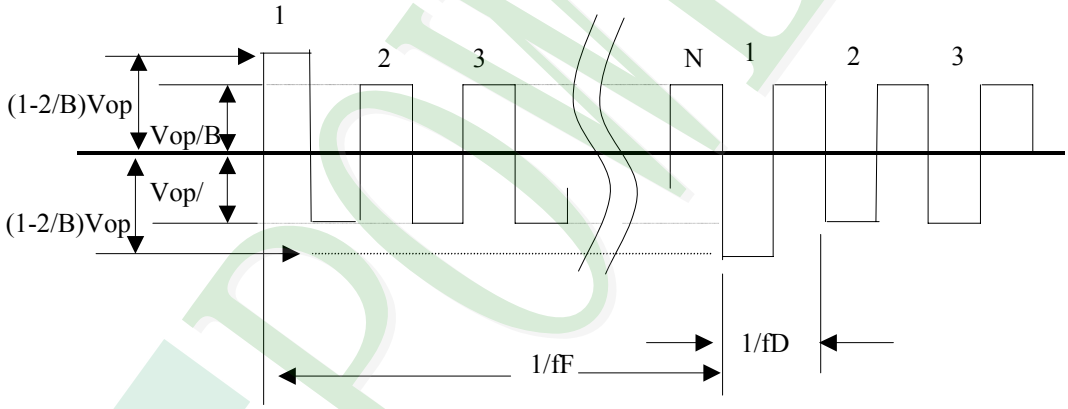
1/B: Bias　　fD: Drive frequency

N: Duty

(1) Selected waveform



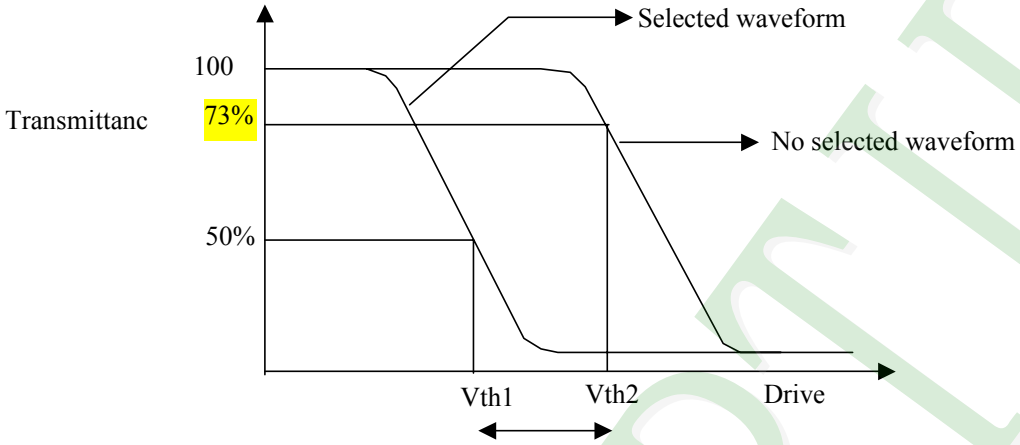
(2) Non- Selected wave form



Note:

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

Note 3. : Definition of Vth

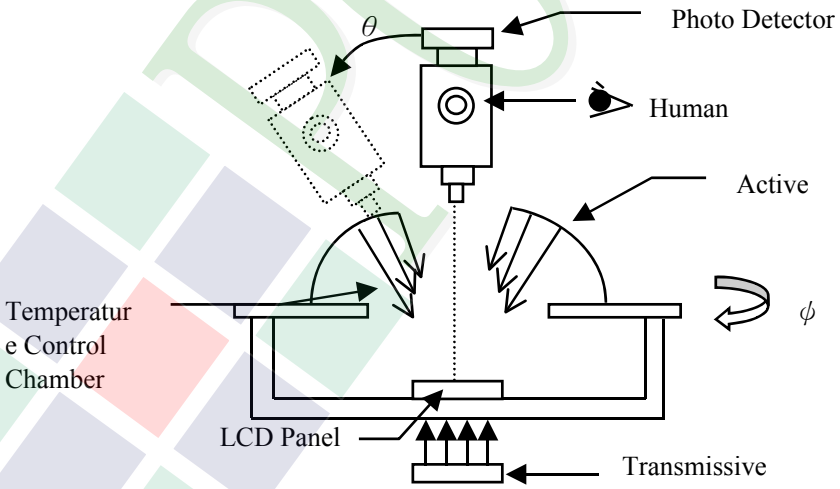


Active voltage range

	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

1.6 Backlight Characteristics

LCD Module with LED Backlight

Maximum Ratings

Item	Symbol	Conditions	Min.	Max.	Unit
Forward Current	IF	Ta =25℃	-	240	mA
Reverse Voltage	VR	Ta =25℃	-	6.95	V
Power Dissipation	PD	Ta =25℃	-	1.248	W

Electrical / Optical Characteristics

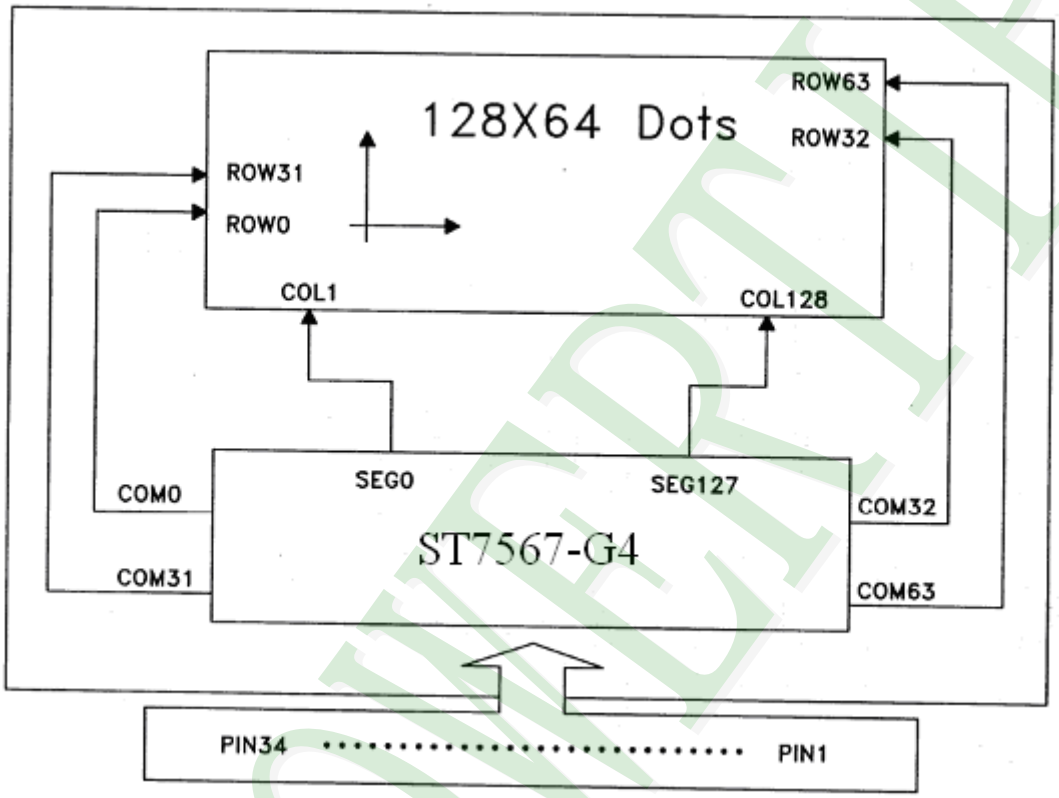
Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	VF	IF=160mA	-	5.0	5.2	V
Average Brightness (Without LCD)	IV		300	370	-	cd/m2
Color of CIE 1931 Coordinate (Without LCD)	X		0.255	-	0.340	-
	Y		0.265	-	0.350	
Color	White					

2. MODULE STRUCTURE

2.1.1 LCM Mechanical Diagram

* See Appendix

2.1.2 Block Diagram



2.2 Interface Pin Description

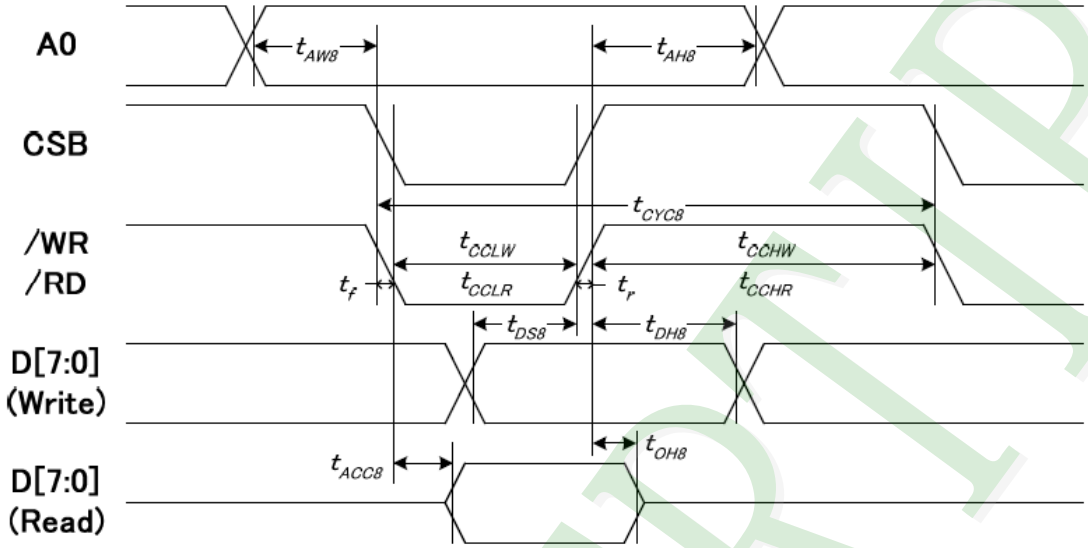
<table>
<tr><th>Pin No.</th><th>Symbol</th><th>Function</th></tr>
<tr><td>1</td><td>CSB</td><td>Chip select input pin. Interface access is enabled when CSB is “L”.
When CSB is non-active (CSB=”H”),D[7:0] pins are high impedance.</td></tr>
<tr><td>2</td><td>RSTB</td><td>Hardware reset input pin. When RSTB is “L”, internal initialization is executed and the internal registers will be initialized.</td></tr>
<tr><td>3</td><td>A0</td><td>It determines whether the access is related to data or command.
A0 = “H”: Indicates that signals on D[7:0] are display data.
A0 = “L”: Indicates that signals on D[7:0] are control data.</td></tr>
<tr><td>4</td><td>/WR</td><td>Read/Write execution control pin . When PSB is “H”,
<table>
<tr><th>C86</th><th>MPU Type</th><th>RWR</th><th>Description</th></tr>
<tr><td>H</td><td>6800 series</td><td>R/W</td><td>Read/Write control input pin.
R/W=”H”:read. R/w=”L”:write.</td></tr>
<tr><td>L</td><td>8080 series</td><td>/WR</td><td>Write enable input pin.
Signals on D[7:0] will be latched at the rising Edge of /WR signal</td></tr>
</table>
RWR is not used in serial interface and should fix to “H” by VDD.</td></tr>
<tr><td>5</td><td>/RD</td><td>Read/Write execution control pin . When PSB is “H”,
<table>
<tr><th>C86</th><th>MPU Type</th><th>RWR</th><th>Description</th></tr>
<tr><td>H</td><td>6800 series</td><td>E</td><td>Read/Write control input pin.
R/W=”H”:When E is “H”,D[7:0] are in output Mode.
R/w=”L”:Signals on D[7:0] are latched at the Falling edge of E signal.</td></tr>
<tr><td>L</td><td>8080 series</td><td>/RD</td><td>Read enable input pin.
When /RD is “L” , D[7:0] are in output mode.</td></tr>
</table>
ERD is not used in serial interface and should fix to “H” by VDD.</td></tr>
<tr><td>6</td><td>D0</td><td rowspan="8">When using 8-bit parallel interface:(6800 or 8080 mode)
8-bit bi-directional data bus. Connect to the data bus of 8-bit microprocessor.
When CSB is non-active (CSB=”H”), D[7:0] pins are high impedance.

When using serial interface : 4-LINE
D7=SDA: Serial data input.
D6=SCL: Serial clock input.
D[5:0] are not used and should connect to “H” by VDD.
When CSB is non-active (CSB=”H”),D[7:0] pins are high impedance.</td></tr>
<tr><td>7</td><td>D1</td></tr>
<tr><td>8</td><td>D2</td></tr>
<tr><td>9</td><td>D3</td></tr>
<tr><td>10</td><td>D4</td></tr>
<tr><td>11</td><td>D5</td></tr>
<tr><td>12</td><td>D6</td></tr>
<tr><td>13</td><td>D7</td></tr>
</table>

<table>
<tr><th>Pin No.</th><th>Symbol</th><th>Function</th></tr>
<tr><td>14</td><td>VDD</td><td>Shared with the MPU power supply terminal VDD. (3.3 V)</td></tr>
<tr><td>15</td><td>VSS</td><td>This is a 0V terminal connected to the system GND.</td></tr>
<tr><td>16</td><td>N.C</td><td>N.C</td></tr>
<tr><td>17</td><td>N.C</td><td>N.C</td></tr>
<tr><td>18</td><td>N.C</td><td>N.C</td></tr>
<tr><td>19</td><td>V0</td><td>V0 is the LCD driving voltage for common circuits at negative frame.
Be sure that: V0≥VG≥VM≥VSS≥XV0(under operation).
Connect a capacitor between this terminal and the XV0 terminal.</td></tr>
<tr><td>20</td><td>XV0</td><td>XV0 is the LCD driving voltage for common circuits at positive frame.
Connect a capacitor between this terminal and the V0 terminal.</td></tr>
<tr><td>21</td><td>N.C</td><td>N.C</td></tr>
<tr><td>22</td><td>N.C</td><td>N.C</td></tr>
<tr><td>23</td><td>N.C</td><td>N.C</td></tr>
<tr><td>24</td><td>N.C</td><td>N.C</td></tr>
<tr><td>25</td><td>VM</td><td>VM is the LCD driving voltage for common circuits.</td></tr>
<tr><td>26</td><td>N.C</td><td>N.C</td></tr>
<tr><td>27</td><td>N.C</td><td>N.C</td></tr>
<tr><td>28</td><td>N.C</td><td>N.C</td></tr>
<tr><td>29</td><td>VG</td><td>VG is the LCD driving voltage for segment circuits.
Connect a capacitor between this terminal and the VSS.</td></tr>
<tr><td>30</td><td>N.C</td><td>N.C</td></tr>
<tr><td>31</td><td>C86</td><td>C86 selects the microprocessor type in parallel interface mode.
<table>
<tr><th>PSB</th><th>C86</th><th>Selected Interface</th></tr>
<tr><td>“H”</td><td>“H”</td><td>Parallel 6800 Series MPU Interface</td></tr>
<tr><td>“H”</td><td>“L”</td><td>Parallel 8080 Series MPU Interface</td></tr>
<tr><td>“L”</td><td>“X”</td><td>Serial 4-Line SPI Interface</td></tr>
</table>
Please refer to “APPLICATION NOTES” and “Microprocessor Interface”
for detailed connection of the selected interface.</td></tr>
<tr><td>32</td><td>PSB</td><td>PSB selects the interface type : Serial or Parallel.</td></tr>
<tr><td>33</td><td>N.C</td><td>N.C</td></tr>
<tr><td>34</td><td>N.C</td><td>N.C</td></tr>
</table>

2.3 Timing Characteristics

System Bus Timing for 8080 Series MPU



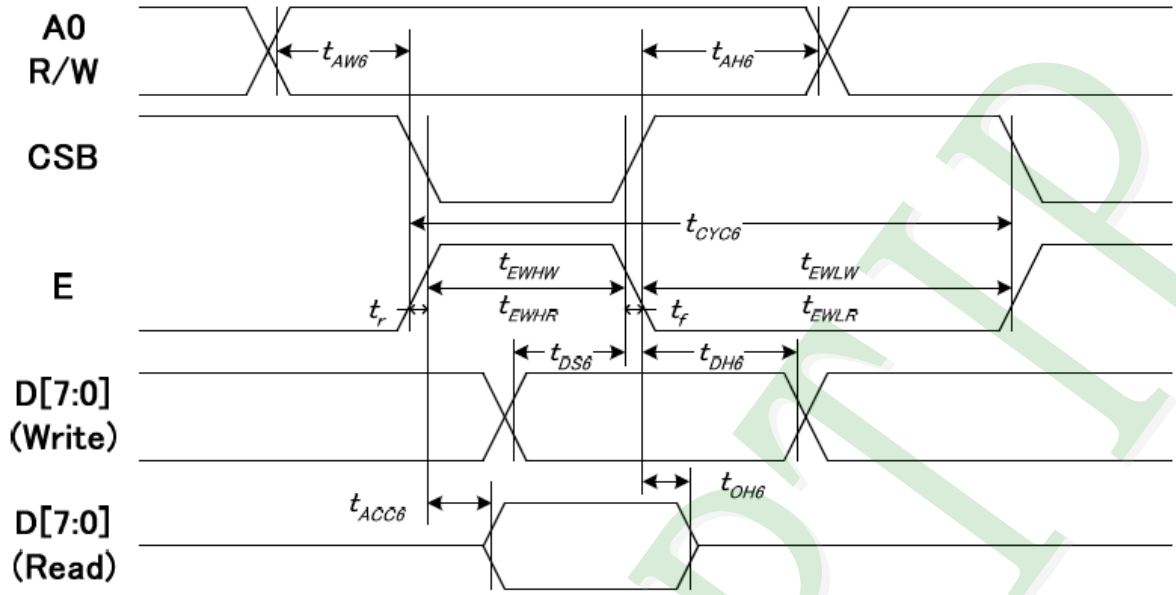
(VDD = 3.3V , Ta =-30~85°C)

Item	Signal	Symbol	Condition	Min.	Max.	Unit
Address setup time	A0	tAW8		0	—	ns
Address hold time		tAH8		10	—	
System cycle time	/WR	tCYC8		240	—	
Enable L pulse width (WRITE)		tCCLW		80	—	
Enable H pulse width (WRITE)		tCCHW		80	—	
Enable L pulse width (READ)	RD	tCCLR		140	—	
Enable H pulse width (READ)		tCCHR		80		
WRITE Data setup time	D[7:0]	tDS8		40	—	
WRITE Data hold time		tDH8		20	—	
READ access time		tACC8	CL = 16 pF	—	70	
READ Output disable time		tOH8	CL = 16 pF	5	50	

(VDD = 2.8V , Ta =-30~85°C)

Item	Signal	Symbol	Condition	Min.	Max.	Unit
Address setup time	A0	tAW8		0	—	ns
Address hold time		tAH8		0	—	
System cycle time	/WR	tCYC8		400	—	
Enable L pulse width (WRITE)		tCCLW		220	—	
Enable H pulse width (WRITE)		tCCHW		180	—	
Enable L pulse width (READ)	RD	tCCLR		220	—	
Enable H pulse width (READ)		tCCHR		180	—	
WRITE Data setup time	D[7:0]	tDS8		40	—	
WRITE Data hold time		tDH8		20	—	
READ access time		tACC8	CL = 16 pF	—	140	
READ Output disable time		tOH8	CL = 16 pF	10	100	

System Bus Timing for 6800 Series MPU



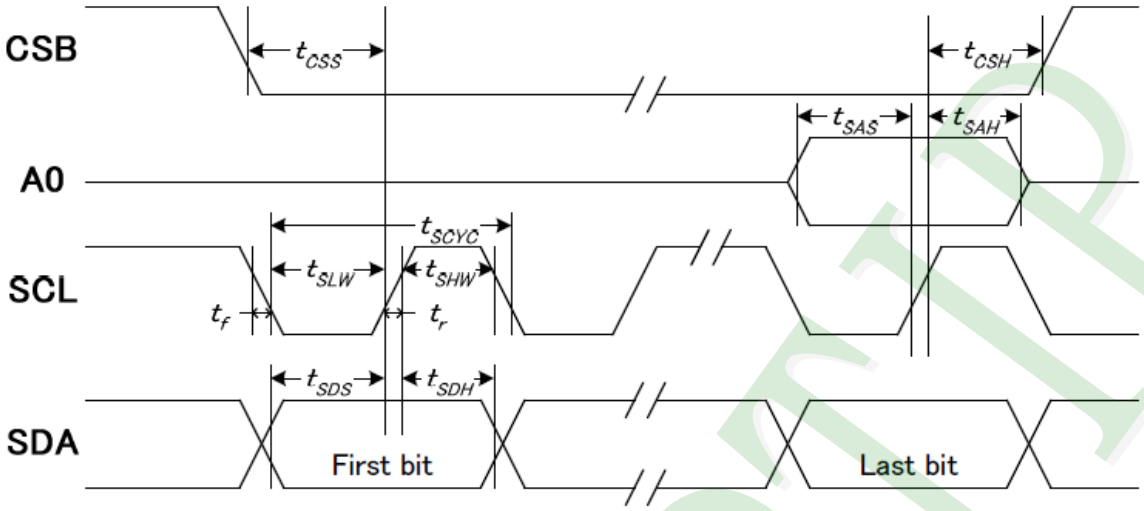
(VDD = 3.3V , Ta =-30~85°C)

Item	Signal	Symbol	Condition	Min.	Max.	Unit
Address setup time	A0	tAW6		0	—	ns
Address hold time		tAH6		10	—	
System cycle time	E	tCYC6		240	—	
Enable L pulse width (WRITE)		tEWLW		80	—	
Enable H pulse width (WRITE)		tEWHW		80	—	
Enable L pulse width (READ)		tEWLR		80	—	
Enable H pulse width (READ)		tEWHR		140		
Write data setup time	D[7:0]	tDS6		40	—	
Write data hold time		tDH6		10	—	
Read data access time		tACC6	CL = 16 pF	—	70	
Read data output disable time		tOH6	CL = 16 pF	5	50	

(VDD = 2.8V , Ta =-30~85°C)

Item	Signal	Symbol	Condition	Min.	Max.	Unit
Address setup time	A0	tAW6		0	—	ns
Address hold time		tAH6		0	—	
System cycle time	E	tCYC6		400	—	
Enable L pulse width (WRITE)		tEWLW		220	—	
Enable H pulse width (WRITE)		tEWHW		180	—	
Enable L pulse width (READ)		tEWLR		220	—	
Enable H pulse width (READ)		tEWHR		180	—	
Write data setup time	D[7:0]	tDS6		40	—	
Write data hold time		tDH6		20	—	
Read data access time		tACC6	CL = 16 pF	—	140	
Read data output disable time		tOH6	CL = 16 pF	10	100	

System Bus Timing for 4-Line Serial Interface



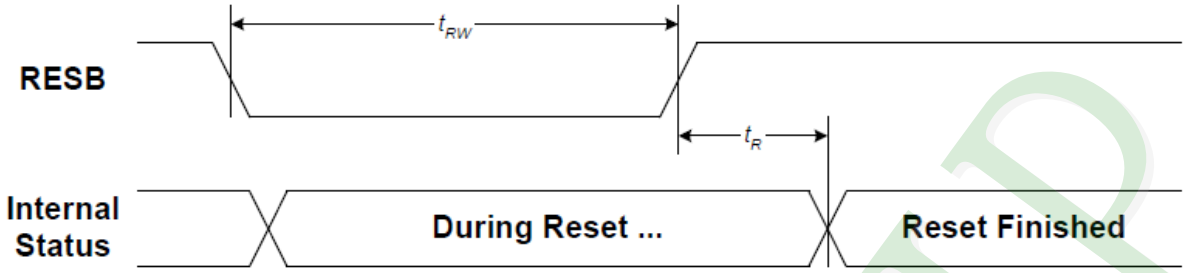
(VDD = 3.3V , Ta =-30~85°C)

Item	Signal	Symbol	Condition	Min.	Max.	Unit
Serial clock period	SCLK	tSCYC		50	—	ns
SCLK "H" pulse width		tSHW		25	—	
SCLK "L" pulse width		tSLW		25	—	
Address setup time	A0	tSAS		20	—	
Address hold time		tSAH		10	—	
Data setup time	SDA	tSDS		20	—	
Data hold time		tSDH		10	—	
CSB-SCLK time	CSB	tCSS		20	—	
CSB-SCLK time		tCSH		40	—	

(VDD = 2.8V , Ta =-30~85°C)

Item	Signal	Symbol	Condition	Min.	Max.	Unit
Serial clock period	SCLK	tSCYC		100	—	ns
SCLK "H" pulse width		tSHW		50	—	
SCLK "L" pulse width		tSLW		50	—	
Address setup time	A0	tSAS		30	—	
Address hold time		tSAH		20	—	
Data setup time	SDA	tSDS		30	—	
Data hold time		tSDH		20	—	
CSB-SCLK time	CSB	tCSS		30	—	
CSB-SCLK time		tCSH		60	—	

Hardware Reset Timing



(VDD = 3.3V , Ta =-30~85°C)

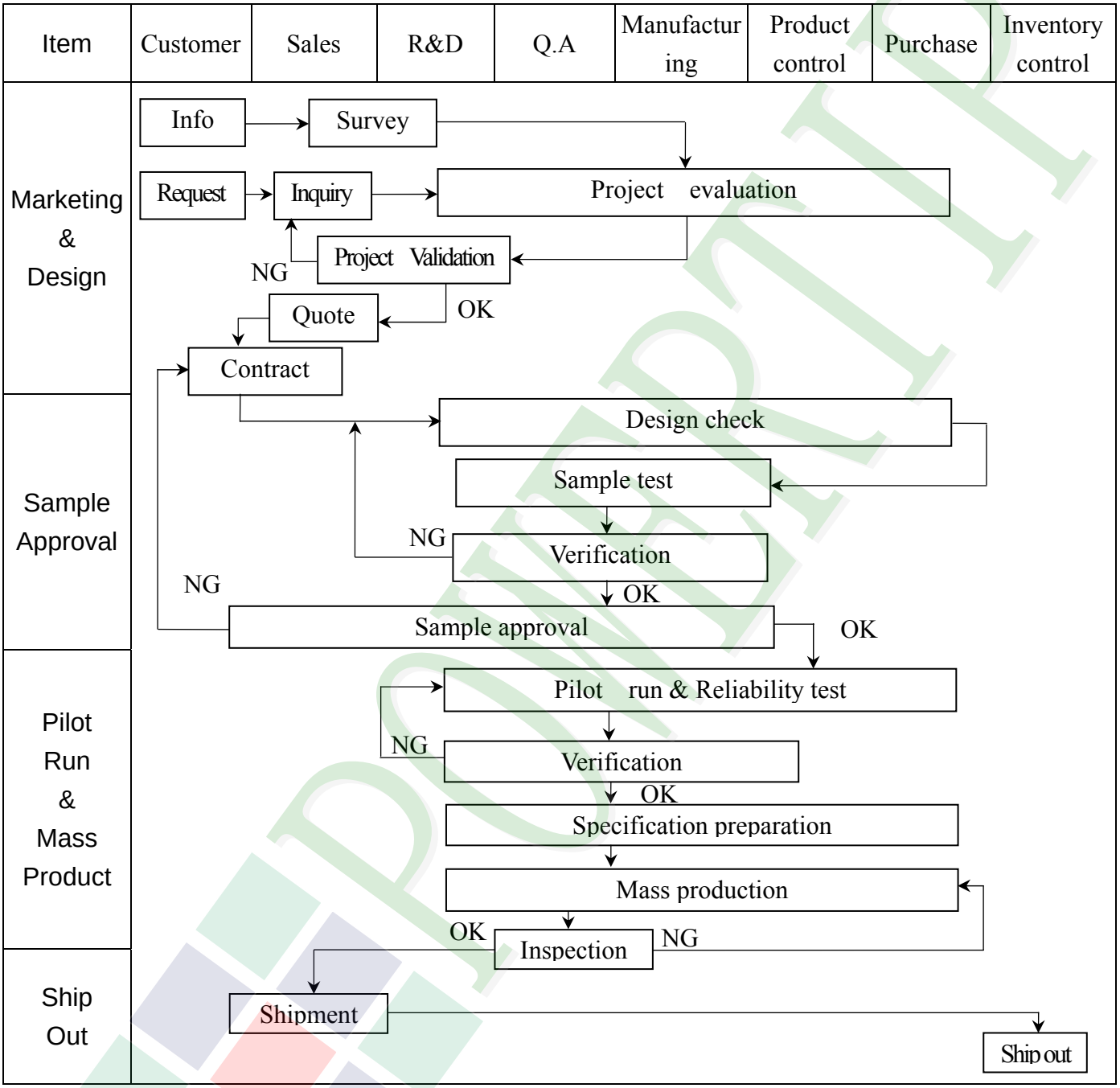
Item	Symbol	Condition	Min.	Max.	Unit
Reset time	tR		—	1.0	us
Reset "L" pulse width	tRW		1.0	—	

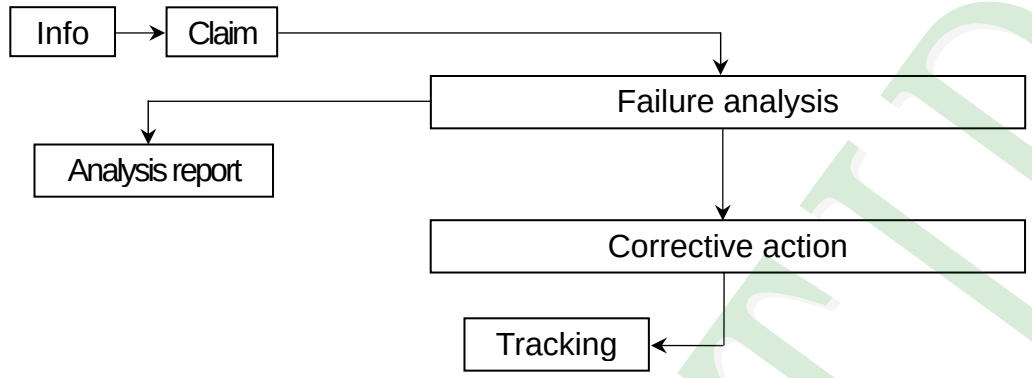
(VDD = 2.8V , Ta =-30~85°C)

Item	Symbol	Condition	Min.	Max.	Unit
Reset time	tR		—	2.0	us
Reset "L" pulse width	tRW		2.0	—	

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)

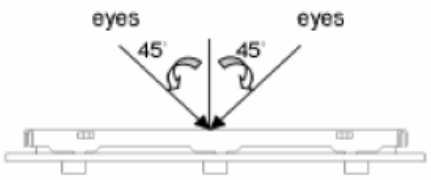


Fig.1

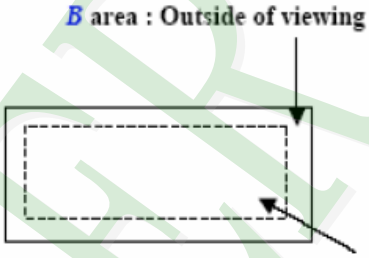


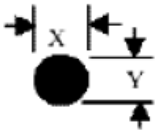
Fig. 2 A area : viewing area

◆ Specification:

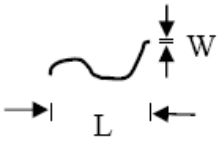
NO	Item	Criterion	Level
01	Product condition	1.1 The part number is inconsistent with work order of Production.	Major
		1.2 Mixed production types.	Major
		1.3 Assembled in inverse direction.	Major
02	Quantity	2.1 The quantity is inconsistent with work order of production.	Major
03	Outline dimension	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

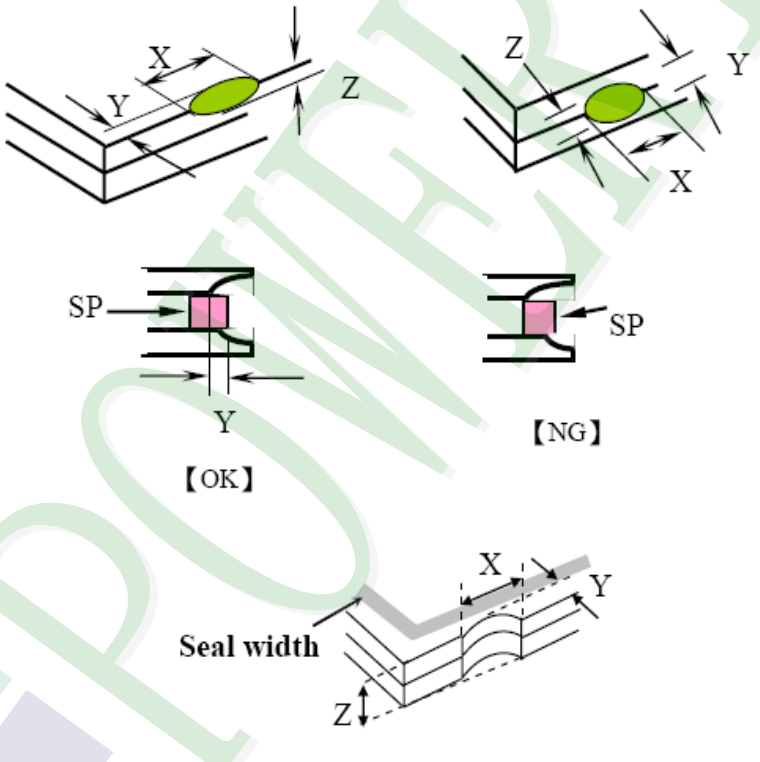
Round type
 

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)

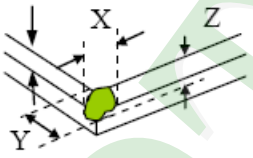
NO	Item	Criterion	Level
07	The crack of glass	Symbols： X : The length of crack　Y : The width of crack. Z : The thickness of crack　W : terminal length t : The thickness of glass　a : LCD side length 7.1 General glass chip： 7.1.1 Chip on panel surface and crack between panels:  	Minor

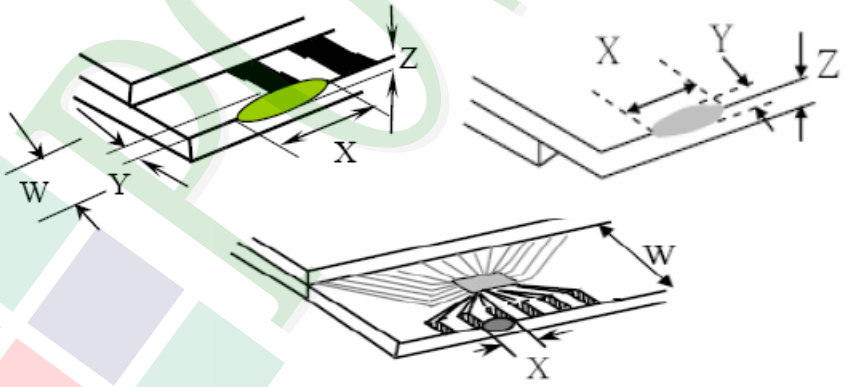
X	Y	Z
≦ a	Crack can't enter viewing area	≦1/2 t
≦ a	Crack can't exceed the half of SP width.	1/2 t < Z ≦2 t

◆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>07</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

7.1.2 Corner crack：


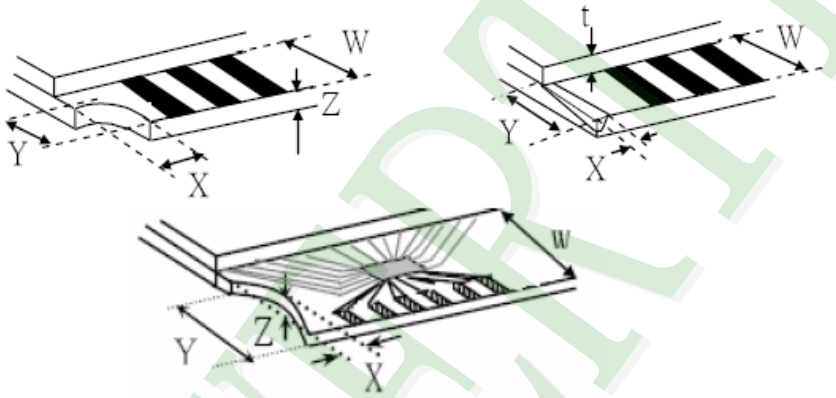
<table>
<tr><th>X</th><th>Y</th><th>Z</th></tr>
<tr><td>≦1/5 a</td><td>Crack can’t enter viewing area</td><td>Z ≦ 1/2 t</td></tr>
<tr><td>≦1/5 a</td><td>Crack can’t exceed the half of SP width.</td><td>1/2 t < Z ≦ 2 t</td></tr>
</table>
7.2 Protrusion over terminal：
7.2.1 Chip on electrode pad：


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

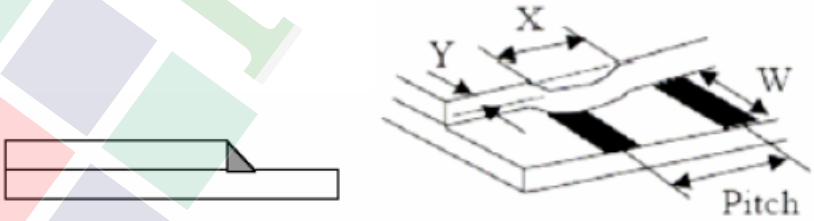
◆Specification For Monotype and Color STN：　(Ver.B01)

<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td>07</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

7.2.2 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.

7.2.3 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>
</td><td>Minor</td></tr>
</table>

◆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)

NO.	TEST ITEM	TEST CONDITION
1	High Temperature Storage Test	Keep in +80℃ 96 hrs Surrounding temperature, then storage at normal condition 4hrs.
2	Low Temperature Storage Test	Keep in -30℃ 96 hrs Surrounding temperature, then storage at normal condition 4hrs.
3	High Temperature / High Humidity Storage Test	Keep in +60℃ / 90% R.H duration for 96 hrs Surrounding temperature, then storage at normal condition 4hrs. (Excluding the polarizer)
4	Temperature Cycling Storage Test	-30℃ → +25℃ → +80℃ → +25℃ (30mins) (5mins) (30mins) (5mins) 10 Cycle Surrounding temperature, then storage at normal condition 4hrs.
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

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.

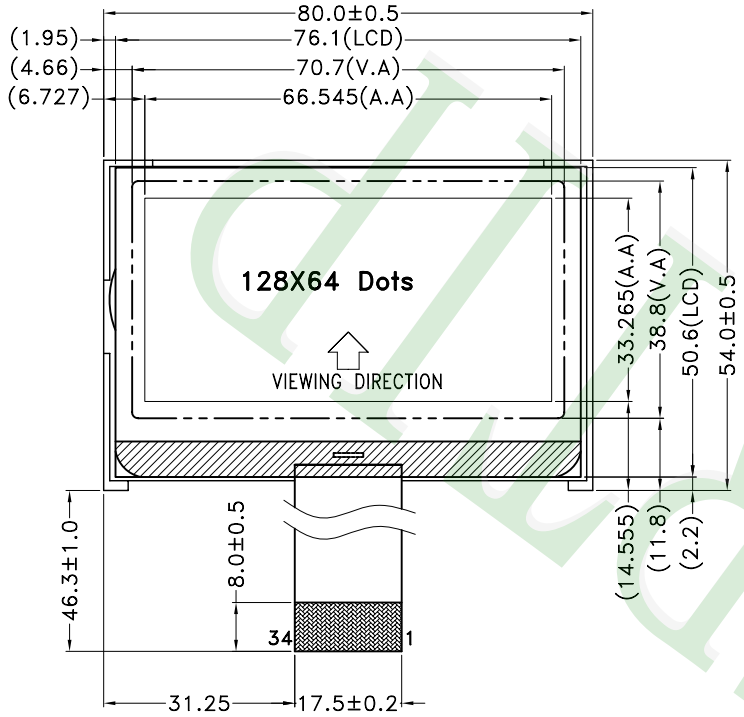
5.4 TERMS OF WARRANTY

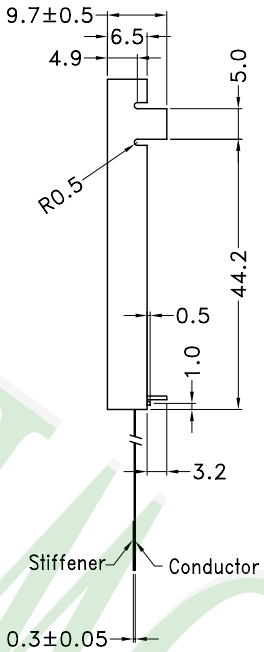
5.4.1 Applicable warrant period

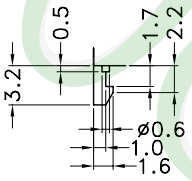
The period is within thirteen months since the date of shipping out under normal using and storage conditions.

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.

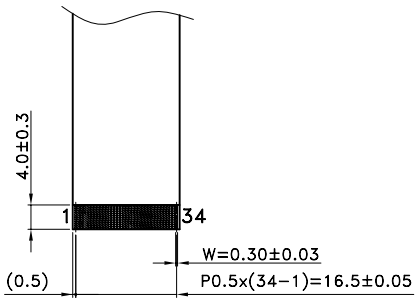


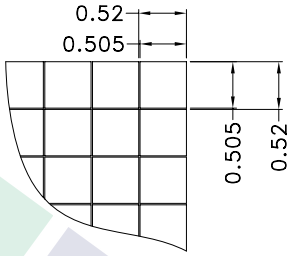




DETAIL B

SCALE:2/1





LCD DOTS
SCALE:15/1

NOTES:
1.LCD type:FSTN,Positive,Transflective.
2.Viewing direction:6H;
3.T_{OP}:−20°C~70°C, T_{ST}:−30°C~80°C;
4.IC:ST7567 or comparable driver IC
5.The tolerance unless classified ±0.3mm;
6.This product conforms ROHS.

REV	REV BY	REVISER	DATE
007			
006			
005			
004			
003			
002			
001	NEW DRAWING	Terry	2010/05/31

PART NO: PE12864WRF-042HC1Q

DRAWING NAME : JLMD-PE12864WRF-042HC1Q

TITLE: LCD MODULE DRAWING

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

Design	Terry	(3)	Surface		
Check	Zhouaimei	Unit	MM	Material	
Approve	Ryan	Scale	1:1	Thickness	
		Page	1/1	Quantity	

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

Ver.003	
Documents NO.	JPKG-PE12864WRF-042HC1Q

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

Approve	Check	Contact
Ryan	Eddy	Terry

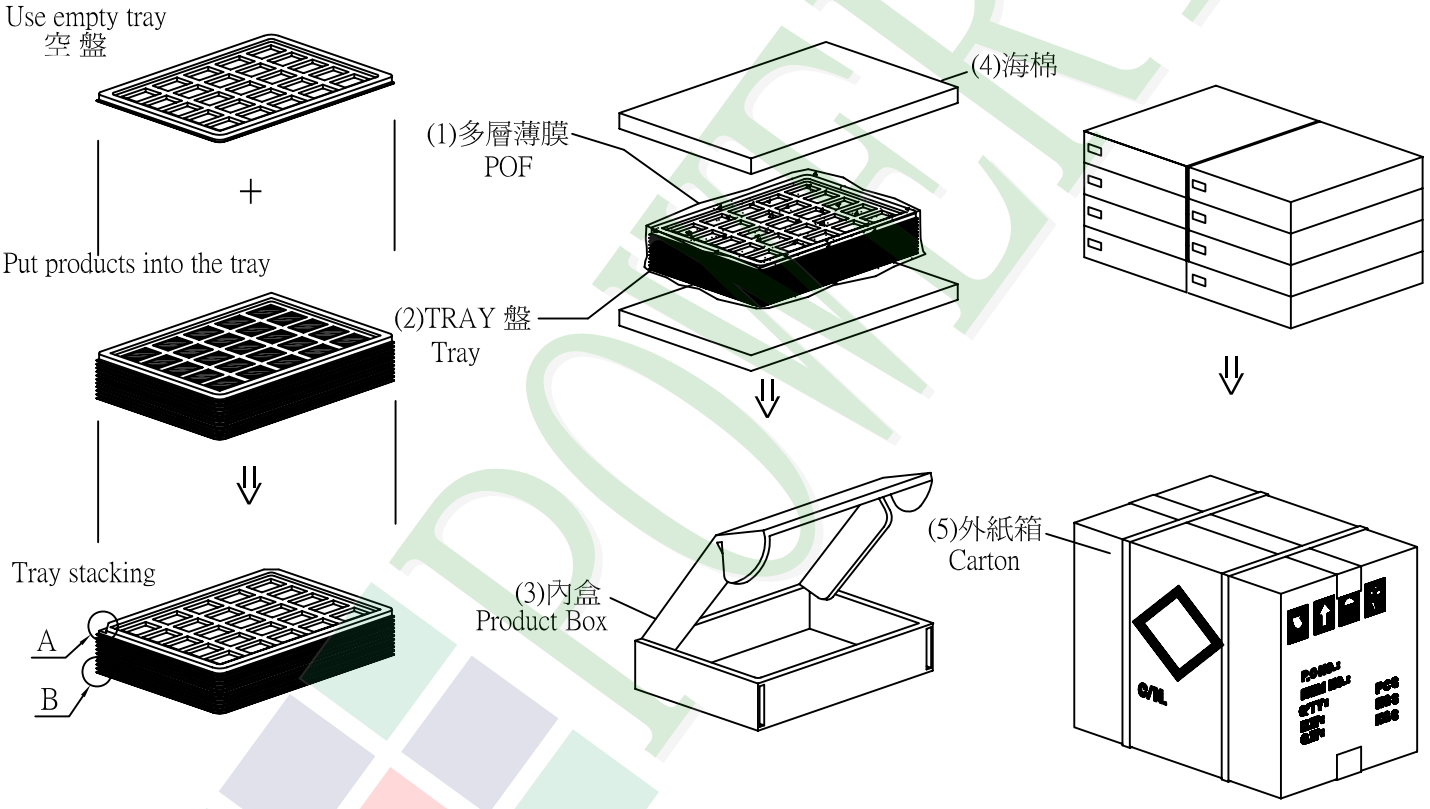
1.包裝材料規格表 (Packaging Material) : (per carton)

No.	Item	Model	Dimensions (mm)	1Pcs Weight	Quantity	Total Weight
1	成品 (LCM)	PE12864WRF-042HC1Q	80.0 X 54.0X9.7	0.0254	144	3.6576
2	多層薄膜(1)POF	OTFILM0BA03ABA	19"X350X0.015	——	8	——
3	TRAY 盤 (2)Tray	TY12806404TZBA	295X245 X 18.8	0.075	32	2.4
4	內盒(3)Product Box	BX31025580AABA	393 X 274 X 68	0.221	8	1.768
5	海棉(4)	OTFOAM00006ABA	290X 240X 10	0.01	16	0.16
6	外紙箱(5)Carton	BX52732536CCBA	570 X325 X360	1.092	1	1.092
7						
8						
9						

2.一 整箱總重量 (Total LCD Weight in carton) : 9.07 Kg±10%

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

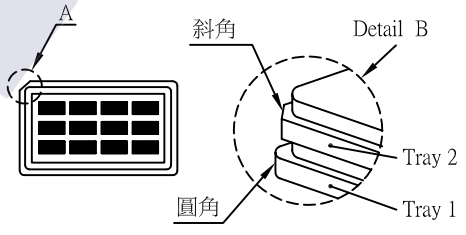
(1)LCM quantity per box : no per tray	6	x no of tray	3	=	18
(2)Total LCM quantity in carton : quantity per box	18	x no of boxes	8	=	144



特 記 事 項 (REMARK)

1. Label Specifications :

MODEL:
LOT NO:
QUANTITY:
CHECK:



2.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.

POWERTIP