POWERTIP TECH. CORP.

SPECIFICATIONS

CUSTOMER	:	**CTW1088**
SAMPLE CODE	:	**PE12848URF-007-L-Q**
MASS PRODUCTION CODE	:	**PE12848URF-007-L-Q**
SAMPLE VERSION	:	**03**
SPECIFICATIONS EDITION	:	**004**
DRAWING NO. (Ver.)	:	**LMD- PE12848URF-007-L-Q (Ver.002)**
PACKAGING NO. (Ver.)	:	**PKG- PE12848URF-007-L-Q (Ver.001)**

Customer Approved

Date:

POWERTIP
2013.02.05
JS RD APPROVED
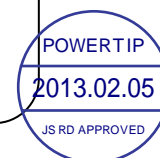
Approved	Checked	Designer
閻偉	劉進	趙冬冬

☐ Preliminary specification for design input

■ Specification for sample approval

POWERTIP TECH. CORP.

NO.PT-A-005-8

History of Version

Date	Ver.	Edi.	Description	Page	Design by
11/08/2006	-	-	Mass Production	-	Smith
06/30/2010	01	001	New Sample	-	Poly
10/28/2010	01	002	Modify LCM drawing (Add foam)	Appendix1	Poly
11/15/2010	02	003	Second Sample	-	Poly
2/1/2013	03	004	Third Sample	-	趙冬冬

Total：27 Page

Contents

Note : For detailed information please refer to IC data sheet : NOVATEK - NT7534H-BDT

1. SPECIFICATIONS

1.1 Features

Item	Standard Value
Display Type	128 * 48 Dots
LCD Type	FSTN, Positive, Transmissive
Driver Condition	LCD Module : 1/48 Duty, 1/8 Bias
Viewing Direction	12 O'clock
Backlight Type	Sky blue LED
Weight	11g
Interface	Serial data input
Controller / Driver IC	NOVATEK NT7534H-BDT
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	66.0 (L) * 31.1 (W) * 6.3Max (H)	mm
Viewing Area	63.0 (L) * 23.0 (W)	mm
Active Area	61.425 (L) * 21.585 (W)	mm
Dot Size	0.465 (L) * 0.435 (W)	mm
Dot Pitch	0.48 (L) * 0.45 (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	VDD	—	-0.3	+4.0	V
LCD Driver Supply Voltage	V0,VOUT	—	-0.3	+15.0	V
Input Voltage	V_{IN}	—	-0.3	$V_{DD} + 0.3$	V
Operating Temperature	T_{OP}	Exclude B/L	-30	+85	℃
Storage Temperature	T_{ST}	Exclude B/L	-40	+85	℃
Storage Humidity	H_D	Ta＜40 ℃	20	90	%RH

1.4 DC Electrical Characteristics

VDD = 3.3V, VSS = 0V, Ta = 25℃

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Logic Supply Voltage	V_{DD}	-	3.0	3.3	3.6	V
"H" Input Voltage	V_{IH}	-	$0.8V_{DD}$	-	V_{DD}	V
"L" Input Voltage	V_{IL}	-	V_{SS}	-	$0.2V_{DD}$	V
"H" Output Voltage	V_{OH}	-	$0.8V_{DD}$	-	V_{DD}	V
"L" Output Voltage	V_{OL}	-	V_{DD}	-	$0.2V_{DD}$	V
Supply Current	IDD	VDD= 3.3V; V_{OP}= 9.2V; Pattern= Horizontal line *1	-	0.8	1.2	mA
LCM Driver Voltage	Vop	-30°C	9.1	9.3	9.5	V
		+25°C	8.9	9.2	9.5	
		+85°C	8.4	8.6	8.8	

Note : *1. The Maximum current display.

*2. The V$_{OP}$ test point is VC9

1.5 Optical Characteristics

LCD Panel: 1/48 Duty, 1/8 Bias, VLCD = 9.2V, Ta = 25°C

Item		Symbol	Conditions	Min.	Typ.	Max.	Unit	Reference
Response Time	Rise	tr	C≥2.0, ∅ = 90°	-	80	120	ms	Note 2
	Fall	tf		-	160	240		
Viewing angle range	Top	⊖Y+	C≥2.0, ∅ = 90°	-	40	-	-	Notes 1
	Bottom	⊖Y-		-	40	-		
	Left	⊖X-		-	40	-		
	Right	⊖X+		-	40	-		
Contrast Ratio		CR	θ = 0°, ∅ = 90°	2	5	-	-	Note 3
Average Brightness (With B/L) *2		IV	If=75mA	85	100	-	cd/m^2	—
CIE Color Coordinate (With B/L)		X	If=75mA	0.13	0.18	0.23	-	Note A
		Y		0.10	0.15	0.20	-	
Uniformity *1 (With B/L)		△B		70	—	—	%	

Note A：

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.

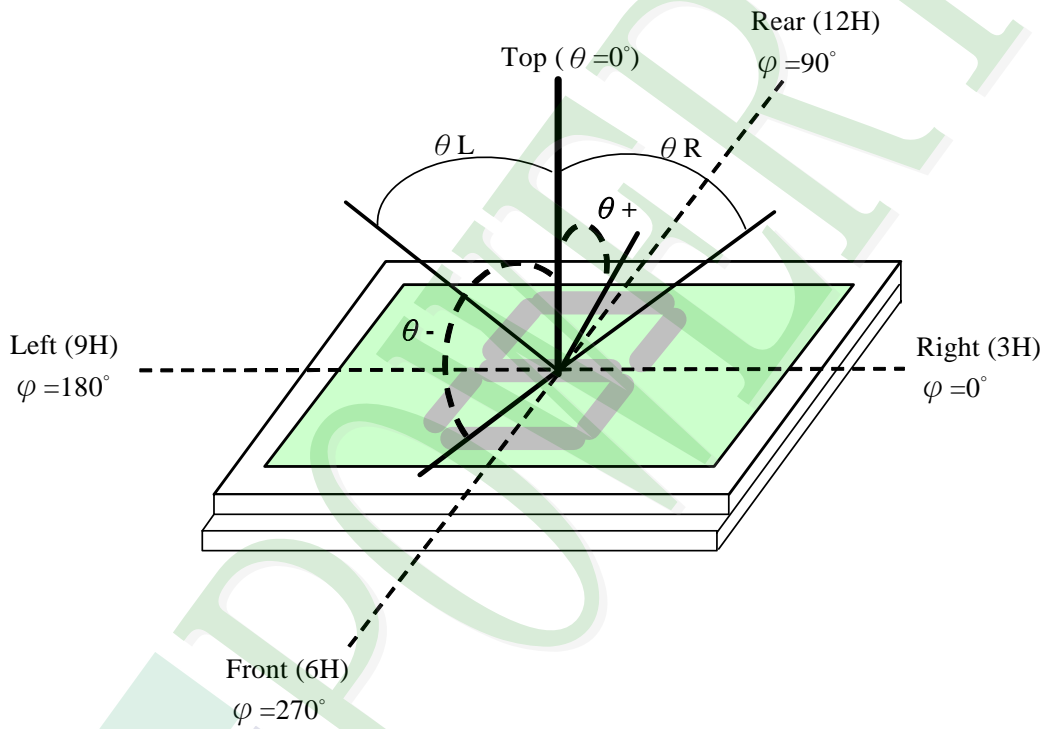   d：The uncertainty of the C.I.E coordinate measurement ±0.01，Average Brightness ± 4%

Colorimeter=BM-7 fast
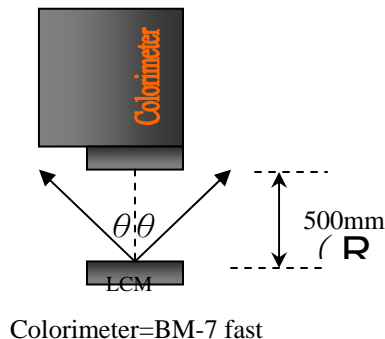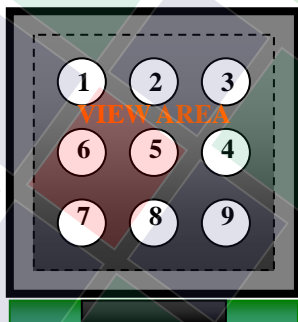
  3：This value will be changed while mass production.

Note 1.

Optical characteristics-2

Viewing angle

Rear (12H)
$\varphi = 90°$

Top ($\theta = 0°$)

θL θR

$\theta +$

Left (9H)
$\varphi = 180°$ $\theta -$ Right (3H)
$\varphi = 0°$

Front (6H)
$\varphi = 270°$

Viewing angle

Note 2.

Optical characteristics-3
    Fig.2 Definition of response time

Positive Type

No selected waveform → ← Selected waveform → ← No selected waveform

Transmittance

100%   90%   10%

Tr   Tf

Negative Type

No selected waveform → ← Selected waveform → ← No selected

Transmittance

100%   90%   10%

Tr   Tf
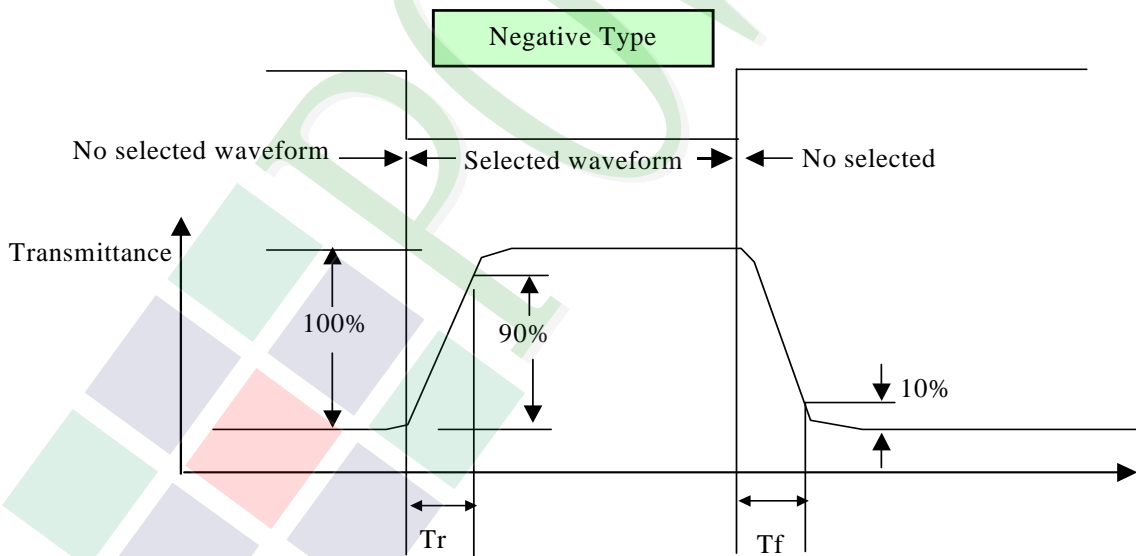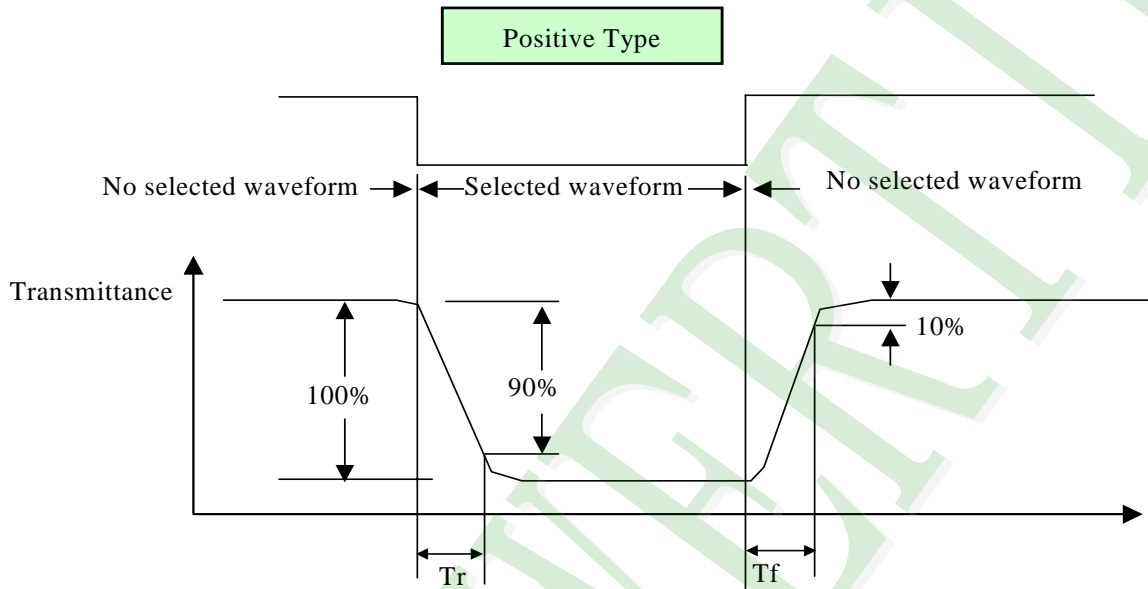
Electrical characteristics-2
※2 Drive waveform
Vop: Drive voltage   fF: Frame frequency
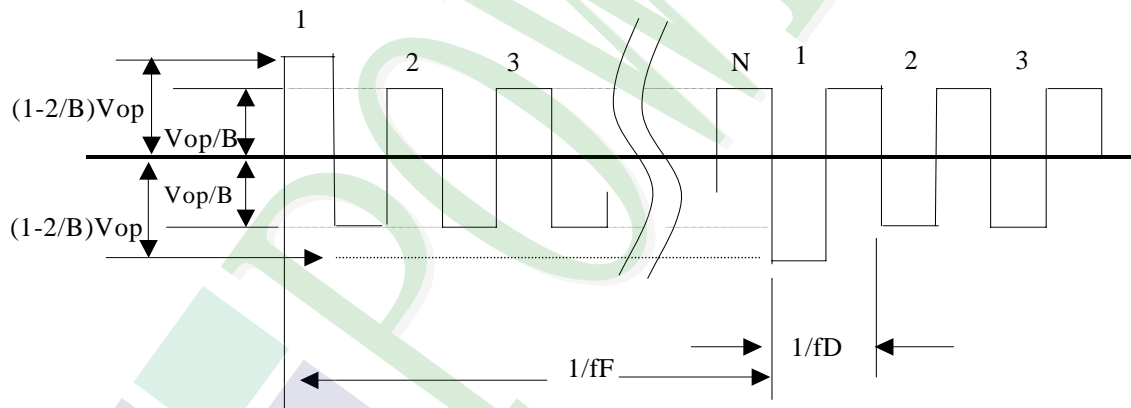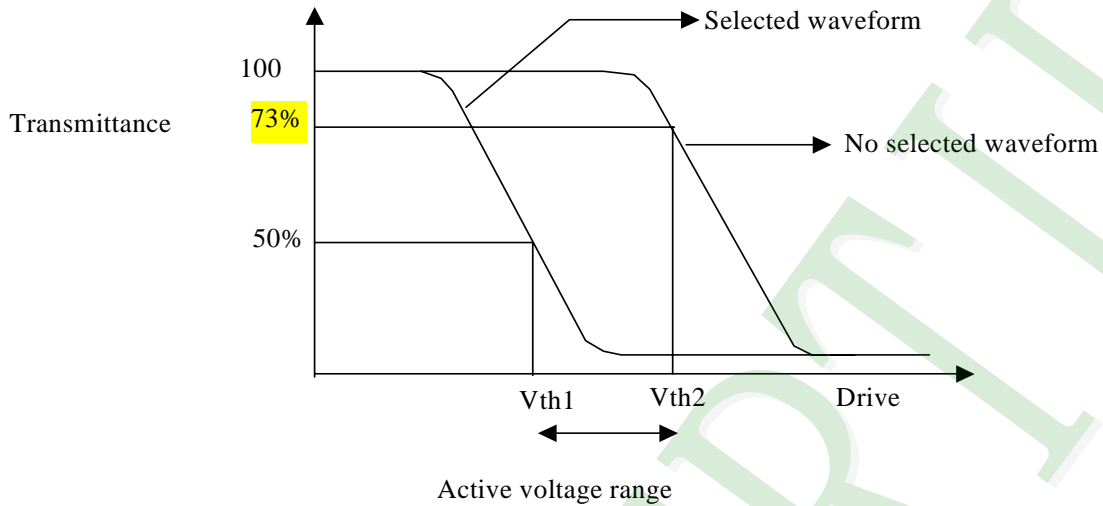1/B: Bias   fD: Drive frequency
N: Duty

(1) Selected waveform
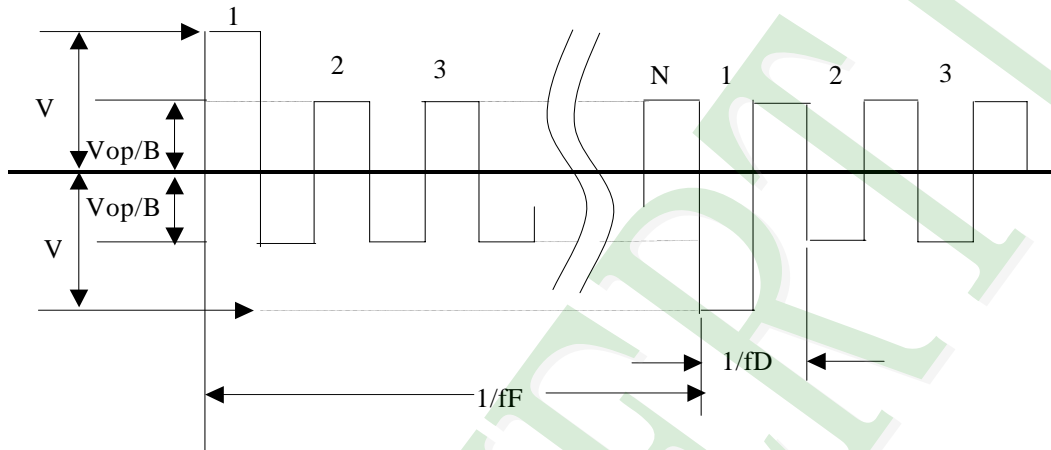
(2) Non- Selected wave form

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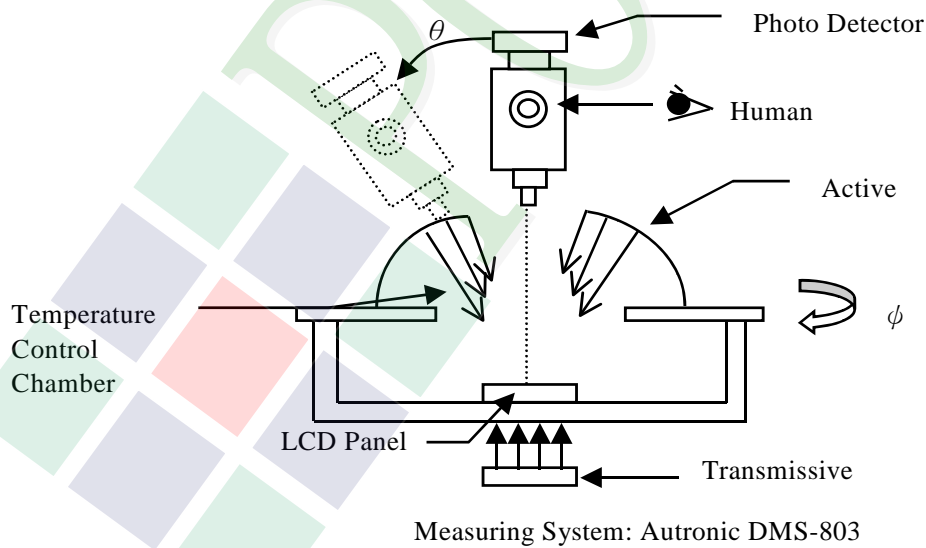voltage peak - to - peak /2 = 1 period

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

Maximum Ratings

Item	Symbol	Conditions	Min.	Max.	Unit
Peak forward current	Ifp		-	150	mA
Reverse Voltage	Vr	Ta =25℃	-	5	V
Power dissipation	Pd		-	680	mW

Electrical / Optical Characteristics

Ta =25℃

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	VF	IF= 75 mA	-	4.0	4.5	V
Reverse Current	IR	VR= 5 V	-	-	0.01	mA
Average Brightness (With LCD dot off) *1	IV	IF= 75 mA	100	120	-	cd/m^2
Average Brightness (Without LCD) *1	IV	IF= 75 mA	350	400	-	cd/m^2
CIE Color Coordinate (With LCD dot off) *1	X	IF= 75 mA	0.13	0.18	0.23	-
	Y		0.10	0.15	0.20	
Color		Sky Blue				

*1 This value will be changed while mass production.
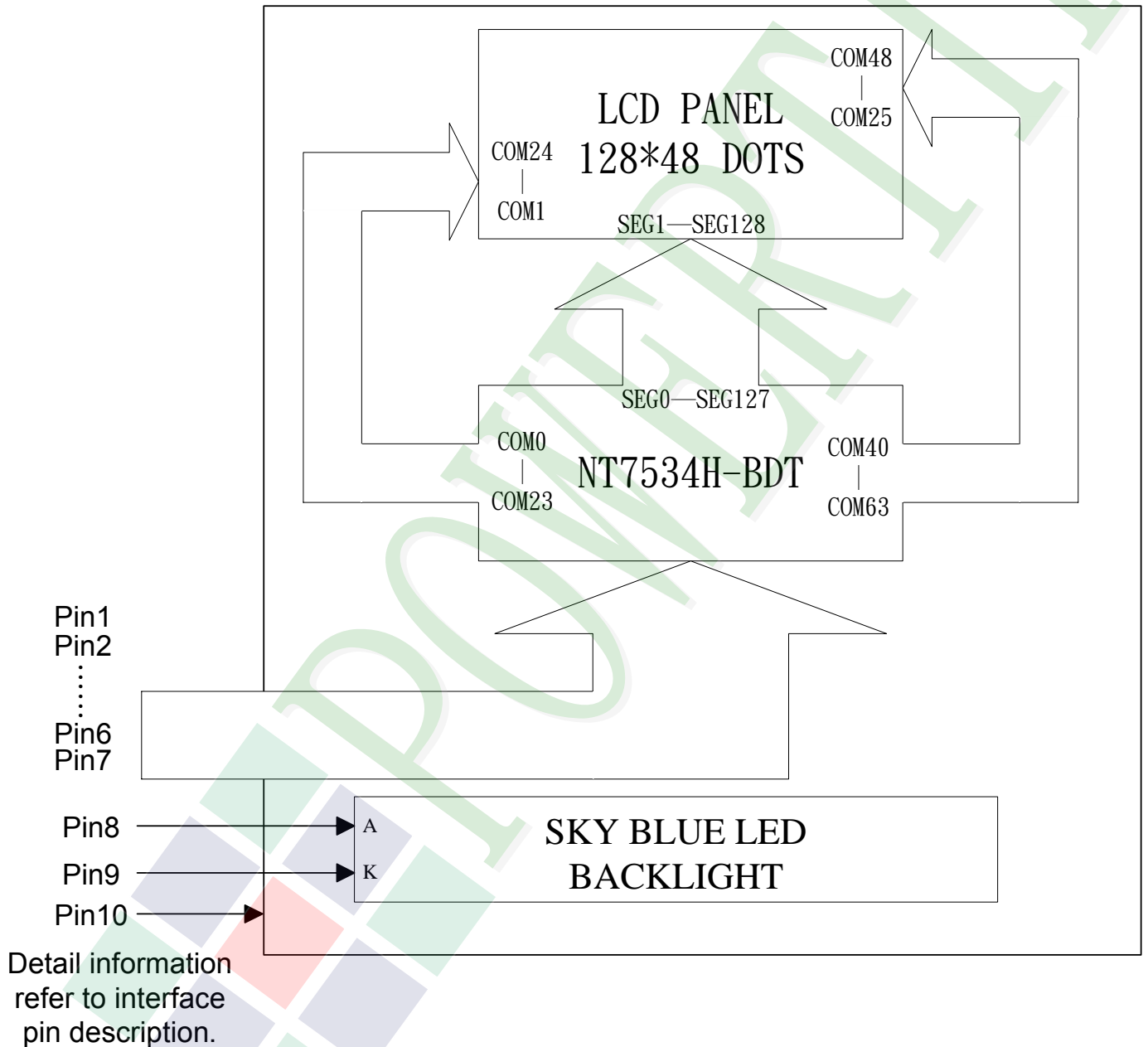
*2：△B=B(min) / B(max)*100%
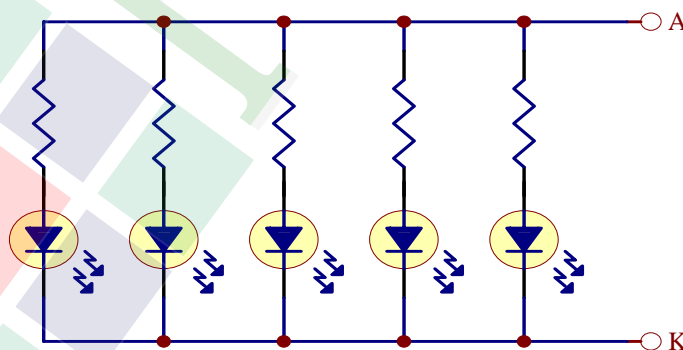
2. MODULE STRUCTURE

2.1 Counter Drawing

2.1.1   LCM Mechanical Diagram
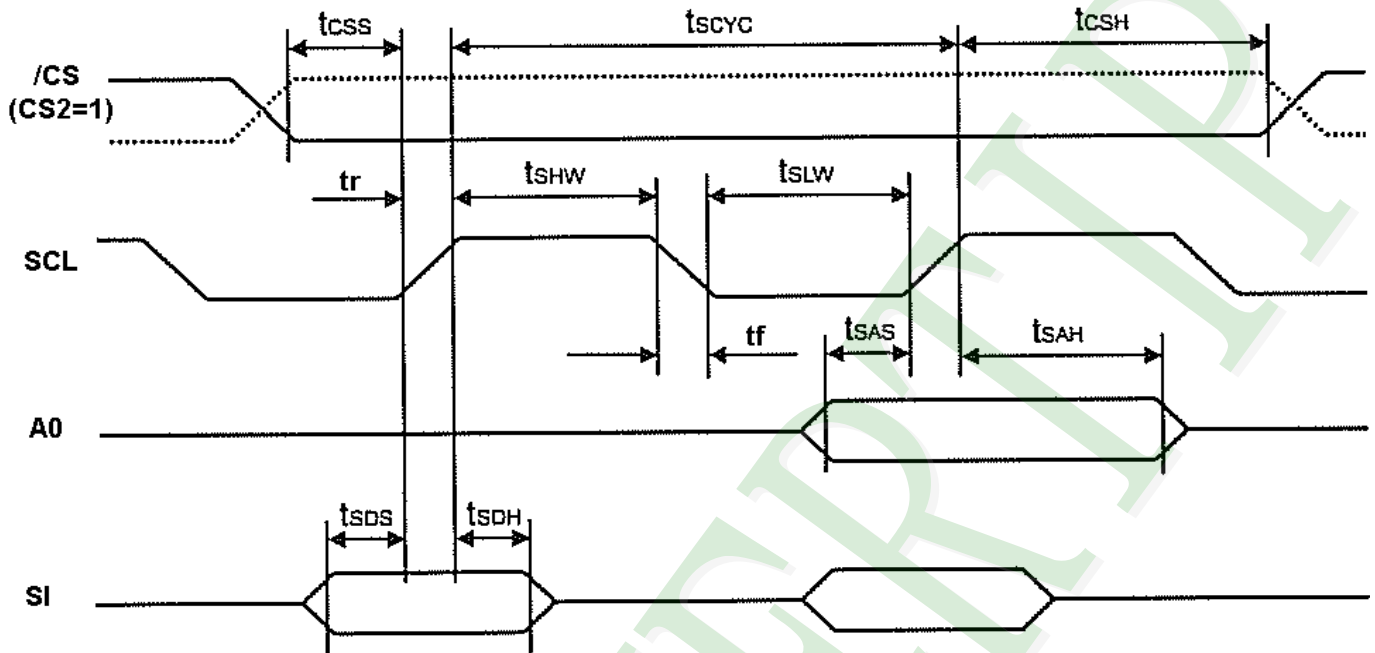
* See Appendix

2.1.2   Block Diagram

2.2 Interface Pin Description

Pin No.	Symbol	Function
1	/CS	Chip Select signal, Active "L".
2	/RES	When /RES is set to "L", the settings are initialized. The reset operation is performed by the /RES signal level.
3	A0	This is connected 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": Indicate that DB0 to DB7 are display data. A0 = "L": Indicates that DB0 to DB7 are control data.
4	SCL	The serial clock input.
5	SI	Serial data input.
6	VDD	Power supply for system.(V_{DD} = 3.3V)
7	VSS	Ground for logic circuit.(V_{SS} = 0V)
8	A	Power Supply for LED Backlight Anode input
9	K	Power Supply for LED Backlight Cathode input.
10	NC	No Connection, Must be open.

## 2.3 Timing Characteristics

For Serial Interface

V_{DD} = 3.3V , Ta = -30 to +85 ºC

Item	Signal	Symbol	Condition	Rating Min	Rating Max	Units
Serial clock cycle	SCL	t_{SCYC}	-	120	-	ns
Serial clock H pulse width		t_{SHW}	-	60	-	
Serial clock L pulse width		t_{SLW}	-	60	-	
Address setup time	A0	t_{SAS}	-	30	-	
Address hold time		t_{SAH}	-	20	-	
Data setup time	SI	t_{SDS}	-	30	-	
Data hold time		t_{SDH}	-	20	-	
Chip select setup time	/CS	t_{CSS}	-	20	-	
Chip select hold time		t_{CSH}	-	40	-	

*1. The input signal rise time and fall time (**tr**, **tf**) is specified as 15ns or less.

*2. All timing is specified using 20% and 80% of VDD as the standard.

Reset Timing
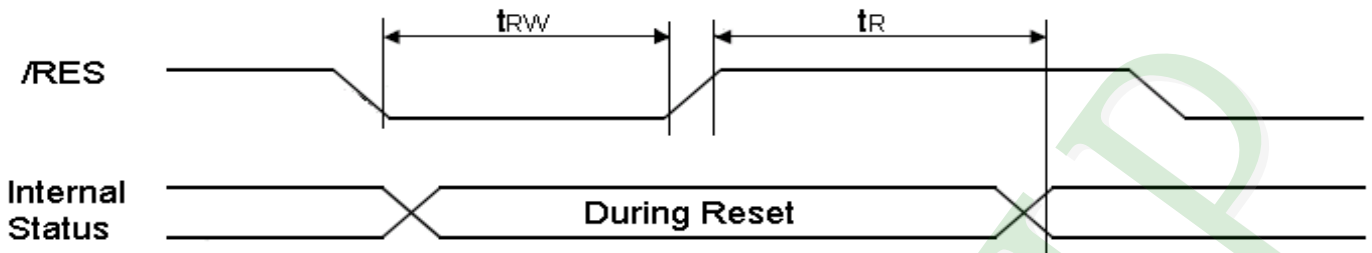
$V_{DD} = 3.3V$, Ta = -30 to +85 ºC

Item	Signal	Symbol	Condition	Rating			Units
				Min	Typ	Max	
Reset time	-	t_R	-	-	-	1.0	µs
Reset low pulse width	/RES	t_{RW}		1.0	-	-	µs

2.4 Display Command
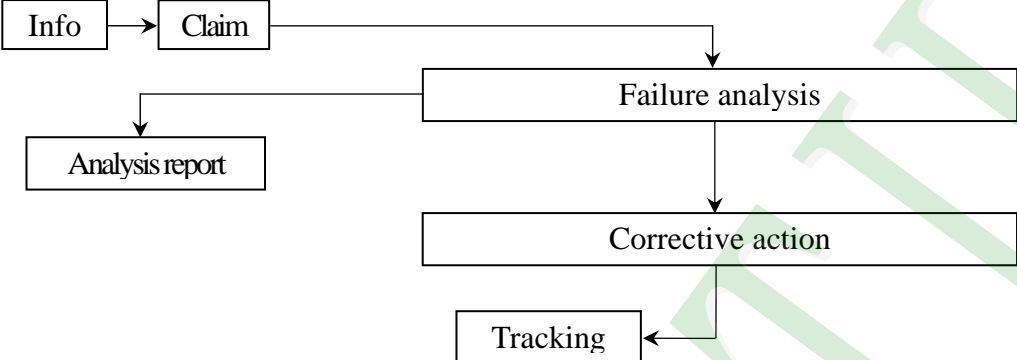
Command	Command Code											Function
	A0	$\overline{RD}$	$\overline{WR}$	D7	D6	D5	D4	D3	D2	D2	D0	
(1) Display ON/OFF	0	1	0	1	0	1	0	1	1	1	0	Turn on LCD panel when high, and turn off when low
											1	
(2) Display start line set	0	1	0	0	1	Display start address						Specifies RAM display line for COM0
(3) Page address set	0	1	0	1	0	1	1	Page address				Set the display data RAM page in page Address register
(4)Column address set up upper bit	0	1	0	0	0	0	1	Higher Column Address				Set 4 higher bits and 4 lower bits of column address of display data RAM in register
Column address set lower bit	0	1	0	0	0	0	0	Lower Column Address				
(5) Status read	0	0	1	Status				0	0	0	0	Reads the status information
(6) Display data write	1	1	0	Write data								Write data in display data RAM
(7) Display data read	1	0	1	Read data								Read data from display data RAM
(8) ADC select	0	1	0	1	0	1	0	0	0	0	0	Set the display data RAM address SEG output correspondence
											1	
(9) Normal/Reverse Display	0	1	0	1	0	1	0	0	1	1	0	Normal indication when low, but full indication when high
											1	
(10) Entire Display ON/OFF	0	1	0	1	0	1	0	0	1	0	0	Selects normal display (0) or entire display on
											1	
(11) LCD bias set	0	1	0	1	0	1	0	0	0	1	0	Sets LCD driving voltage bias ratio
											1	
(12) Read/modify/write	0	1	0	1	1	1	0	0	0	0	0	Increments column address counter during each write
(13) End	0	1	0	1	1	1	0	1	1	1	0	Releases the Read-Modify-Write
(14) Reset	0	1	0	1	1	1	0	0	0	1	0	Resets internal functions
(15) Common output mode select	0	1	0	1	1	0	0	0	*	*	*	Selects COM output scan direction *: invalid data
								1				
(16) Power control set	0	1	0	0	0	1	0	1	Operating mode			Selects the power circuit operation mode

Command												Description
(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	0	1	0	1	0	0	0	0	0	0	1	
Electronic volume register set	0	1	0	*	*	Electronic volume value						Sets the V0 output voltage electronic volume register.
(19) Static indicator ON/OFF	0	1	0	1	0	1	0	1	1	0	0	Sets static indicator ON/OFF 0: OFF, 1: ON
											1	
Static indicator register set	0	1	0	*	*	*	*	*	*	Mode		Sets the flash mode
(20) Power save	0	1	0	-	-	-	-	-	-	-	-	Compound command of Display OFF and Entire Display ON
(21) NOP	0	1	0	1	1	1	0	0	0	1	1	Command for non-operation
(22) Oscillation Frequency Select	0	1	0	1	1	1	0	0	1	0	0	Select the oscillation frequency
											1	
(23) Partial Display mode Set	0	1	0	1	0	0	0	0	0	1	0	Enter/Release the partial display mode
											1	
(24) Partial Display Duty Set	0	1	0	0	0	1	1	0	Duty Ratio			Sets the LCD duty ratio for partial display mode
(25) Partial Display Bias Set	0	1	0	0	0	1	1	1	Bias Ratio			Sets the LCD bias ratio for partial display mode
(26) Partial Start Line Set / Partial Start Line Set	0	1	0	1	1	0	1	0	0	1	1	Enter Partial Start Line Set
	0	1	0	1	1	Partial Start Lin						Sets the LCD Number of partial display start line
(27) N-Line Inversion Set / Number of Line Set	0	1	0	1	0	0	0	0	1	0	1	Enter N-Line inversion
	0	1	0	*	*	*	Number of Line					Sets the number of line used for N-Line inversion
(28) N-Line Inversion Release	0	1	0	1	0	0	0	0	1	0	0	Exit N-Line Inversion
(29) DC/DC Clock Set / DC/DC Clock Division Set	0	1	0	1	1	1	0	0	1	1	0	Set DC/DC Clock Frequency
	0	1	0	1	1	0	0	Clock Division				Set the Division of DC/DC Clock Frequency

3. QUALITY ASSURANCE SYSTEM

3.1 Quality Assurance Flow Chart

Item	Customer	Sales	R&D	Q.A	Manufacturing	Product control	Purchase	Inventory control
Marketing & Design	Info → Survey; Request → Inquiry		Project evaluation; Project Validation (NG/OK); Quote; Contract					
Sample Approval			Design check; Sample test; Verification (NG/OK); Sample approval (NG)					
Pilot Run & Mass Product			Pilot run & Reliability test; Verification (NG/OK); Specification preparation; Mass production; Inspection (OK/NG)					
Ship Out			Shipment; Ship out					

Item	Customer	Sales	R&D	Q.A	Manufact uring	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							

Flow within Sales Service row:

Info → Claim → Failure analysis → Analysis report

Failure analysis → Corrective action → Tracking

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

B area : Outside of viewing area

Fig. 2　A area : viewing area
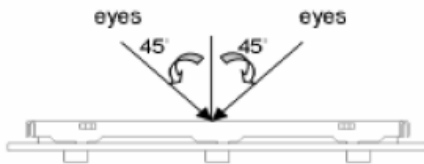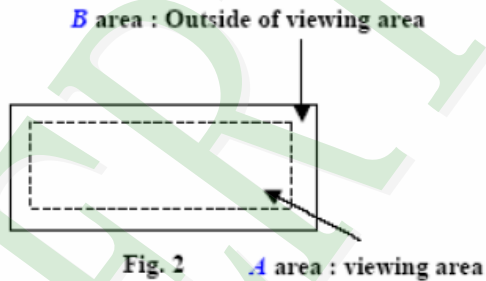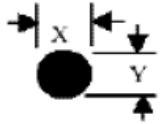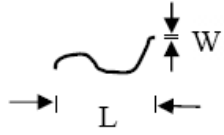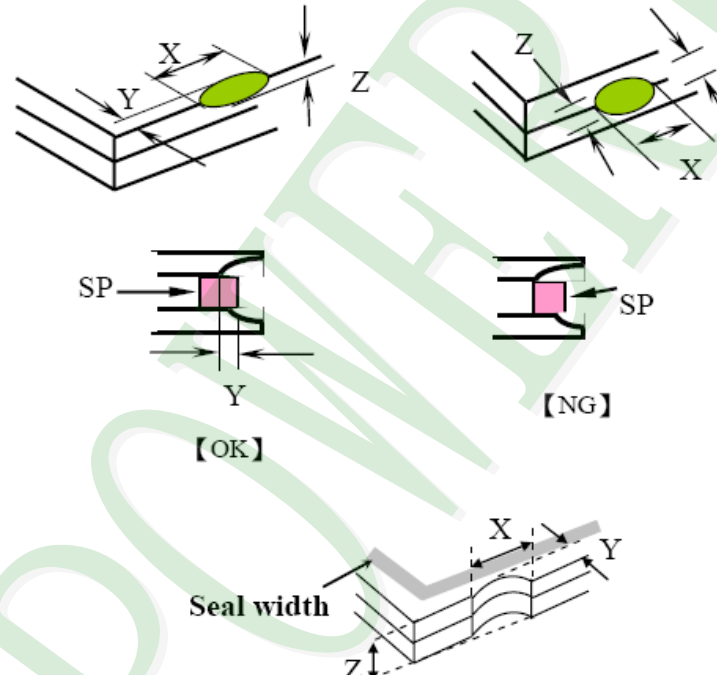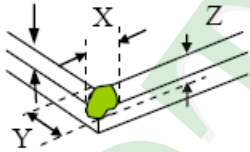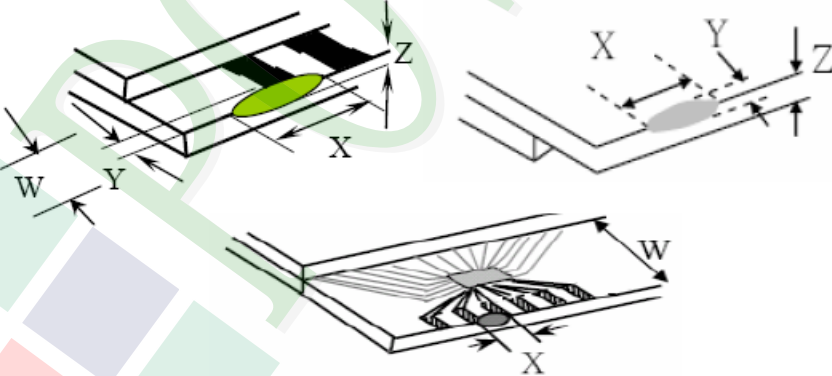
◆ **Specification:**

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
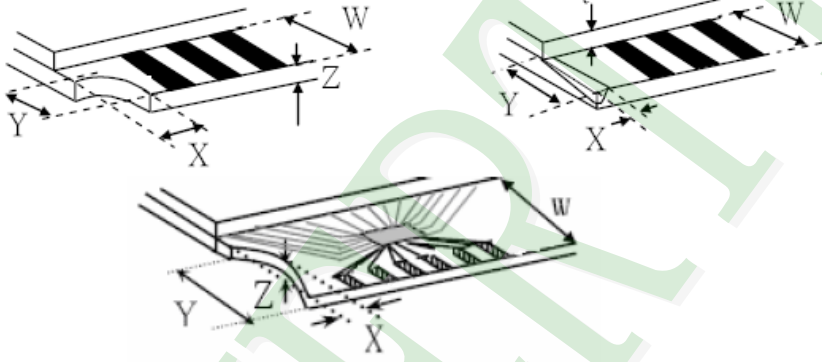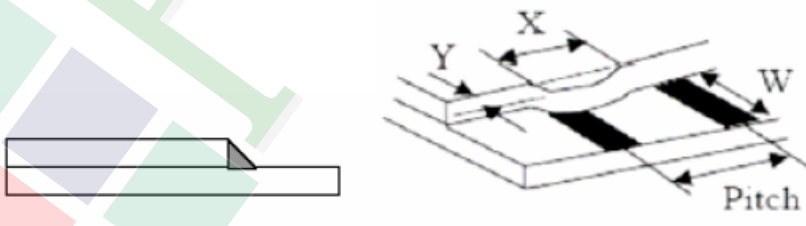
NO	Item	Criterion	Level
05	**Black or white dot、scratch、contamination** **Round type** Φ=(x+y)/2 **Line type** 	5.1 Round type: 　5.1.1 display only : 　　・White and black spots on display ≦ 0.30 mm , no more than 4 white or black spots present. 　　・Densely spaced : NO more than two spots or lines within 3 mm. 　5.1.2 Non-display : 5.1.3 Line type:	Minor

5.1.2 Non-display :

Dimension (diameter : Φ)	Acceptance (Q'ty)	
	A area	B area
Φ ≦ 0.10	Accept no dense	Ignore
0.10 ＜ Φ ≦ 0.20	3	
0.20 ＜ Φ ≦ 0.30	2	
Total quantity	4	

5.1.3 Line type:

Dimension		Acceptance (Q'ty)	
Length (L)	Width (W)	A area	B area
---	W ≦ 0.03	Accept no dense	Ignore
L ≦ 3.0	0.03 ＜ W ≦ 0.05	4	
L ≦ 2.5	0.05 ＜W ≦ 0.075		
---	W ＞0.075	As round type	

NO	Item	Criterion	Level
06	**Polarizer Bubble**	(table below)	Minor

Dimension (diameter : Φ)	Acceptance (Q'ty)	
	A area	B area
Φ ≦ 0.20	Accept no dense	Ignore
0.20 ＜Φ ≦ 0.50	3	
0.50 ＜Φ ≦ 1.00	2	
Φ ＞ 1.00	0	
Total quantity	4	

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
$\leqq a$	Crack can't enter viewing area	$\leqq 1/2\ t$
$\leqq a$	Crack can't exceed the half of SP width.	$1/2\ t < Z \leqq 2\ t$

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 7.1.2 Corner crack： (diagram) 7.2 Protrusion over terminal： 　7.2.1 Chip on electrode pad： (diagrams)	Minor

7.1.2 Corner crack table:

X	Y	Z
$\leqq 1/5\ a$	Crack can't enter viewing area	$Z \leqq 1/2\ t$
$\leqq 1/5\ a$	Crack can't exceed the half of SP width.	$1/2\ t < Z \leqq 2\ t$

7.2.1 Chip on electrode pad table:

	X	Y	Z
Front	$\leqq a$	$\leqq 1/2\ W$	$\leqq t$
Back	Neglect		

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	Y	Z | |---|---|---| | $\leqq 1/3$ a | $\leqq W$ | $\leqq t$ | ⊙ 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	Y	Z | |---|---|---| | $\leqq$ a | $\leqq 1/3$ W | $\leqq$ t |	Minor

POWERTIP

◆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 +85 ±2℃ 96 hrs** **Surrounding temperature, then storage at normal condition 4hrs.**	
2	**Low Temperature Storage Test**	**Keep in −40 ±2℃ 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**	**−40℃ → +25℃ → +85℃ → +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)**	<table><tr><td>**Packing Weight (Kg)**</td><td>**Drop Height (cm)**</td></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**	

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℃ and 3-5 sec.

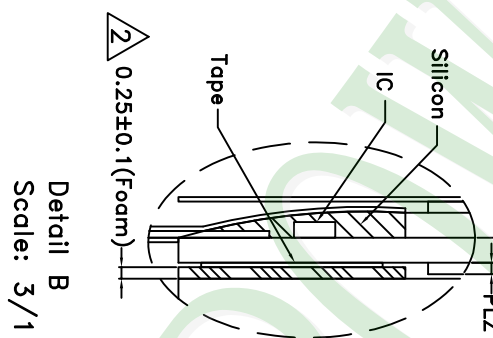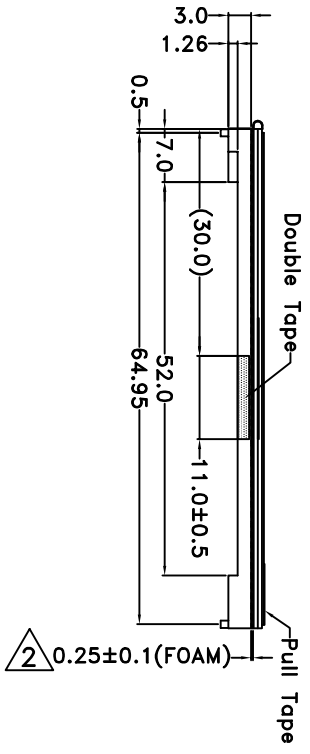5.2.9   To avoid liquid (include organic solvent) stained on LCM .

5.3 STORAGE

5.3.1   Store the panel or module in a dark place where the temperature is 25℃ ±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

Dots detail
Scale:10/1

0.435
0.015
0.465
0.015

1.0Max
10.0Max
9.25Min
66.0±0.2(LCD Outline)
63.0(V.A)
61.425(A.A)
128x48 DOTS
VIEWING DIRECTION

24.7±0.5
19.2±0.5
9.25
1
10
A
2.5
0.5
5.5±0.15
(26.25)

(1.5)
(2.29)
21.585(A.A)
(2.2)
23.0(V.A)
(1.5)
26.1±0.2(LCD)
31.1±0.2(LCD Outline)

3.0
1.26
0.5
7.0
(30.0)
52.0
64.95
11.0±0.5
Double Tape
Pull Tape
△2 0.25±0.1(FOAM)

VIEWING DIRECTION
1.6±0.2(LCD)
0.55±0.05
0.55±0.05
4.7
6.3Max
1.0
B
Stiffener
0.3±0.05
Conductor
Component area
5.0
5.5

Tape
IC
Silicon
Conductor
LCD
PLZ
△2 0.25±0.1(Foam)
Detail B
Scale: 3/1

2-φ1.0
30.0
0.55
7.0
64.95±0.1
52.0
φ0.9
4.5±0.5
16.0
12.6
18.55
5.5
7.0
0.5

Note:
1.The tolerance unless classified ±0.3mm
2.LCD type:FSTN
3.LCD mode: Positive / Transmissive
4.T_{op}=-30°C~85°C , T_{st}=-40°C~85°C
5.IC: NT7534(Novatek)
6.LED: Sky blue, 5pcs , 4V, 75mA
7.Anti-glare
8.Double Tape Mylar Tape
9.VIEW DIRECTION:12 O'CLOCK
10.A=P0.5x9=4.5±0.1,W=0.3±0.05

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

		Design	Check	Approve			Surface	Material	Precision Level
		Mag	Stone	Linda					
		Unit	Scale	Page			Thickness		
		MM	1:1	1/1	Quantity				

PART NO:
PE12848URF-007-L-Q
DRAWING NAME:
LMD-PE12848URF-007-L-Q
TITLE:
LCD MODULE DRAWING

006					
005					
004	Add foam	Mag	2010/10/27		
003		Mag	2010/06/09		
002	Modify frame drawing	Mag	2006/11/07		
001	NEW DRAWING				
0	NEW DRAWING				
REV		REV BY	REVISER	DATE	Approve

Tolerance Precision
Length(Min) 1 4 16 63
1 4 16 63
4 16 63 250
250 ~ 1000

PT-A-054-01

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

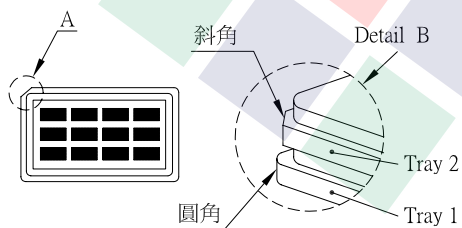| No.	Item	Model	Dimensions (mm)	1Pcs Weight	Quantity	Total Weight
1	成品 (LCM)	PE12848URF-007-L-Q	66.0 X 31.1	0.011	576	6.336
2	多層薄膜(1)POF	OTFILM0BA03ABA	19"X350X0.015	——	6	——
3	TRAY 盤 (2)Tray	TYPE12804807BA	352 X 260 X 15.8	0.1	42	4.2
4	內盒(3)Product Box	BX36627063ABBA	393 X 274 X 68	0.2692	6	1.6152
5	保利龍板(4)Polylon board	OTPLB00PL08ABA	550 X 393 X 20	0.0284	2	0.0568
6	外紙箱(5)Carton	BX57041027CCBA	570 X 410 X 265	1.4208	1	1.4208
7						
8						
9						

2.一 整箱總重量 (Total LCD Weight in carton) :　13.63　Kg±10%

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

(1)LCM quantity per box : no per tray　16　x no of tray　6　=　96

(2)Total LCM quantity in carton : quantity per box　96　x no of boxes　6　=　576

Use empty tray
空 盤

+

Put products into the tray

⇓

Tray stacking

A
B

(1)多層薄膜
POF

(2)TRAY 盤
Tray

⇓

(3)內盒
Product Box

(4)保利龍板
Polylon board

⇓

(5)外紙箱
Carton

C/N.

POWERTIP

P.O NO.:
ITEM NO.:
Q'TY:
N.W:
G.W:
PCS
KGS
KGS

特 記 事 項 (REMARK)

A

斜角　Detail B

圓角

Tray 2
Tray 1

1.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.
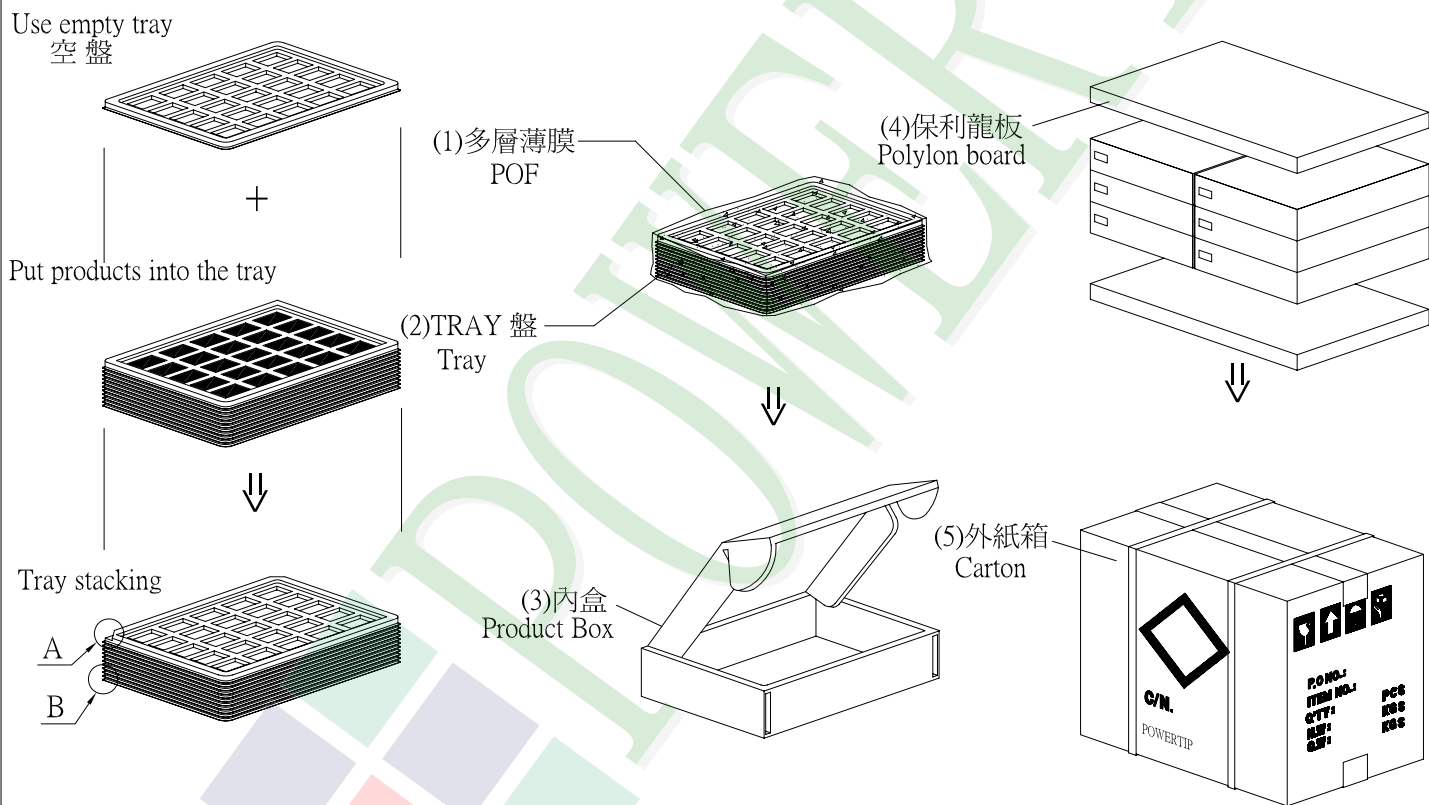
2.可適用於單品包裝
　It's also suitable to Panel

3.Tray料號: PT-PE12848-006
　Tray Number: PT-PE12848-006