SPECIFICATIONS

CUSTOMER	:	MIE
SAMPLE CODE	:	SG12864WRF-JCNHP5Q
MASS PRODUCTION CODE	:	PG12864WRF-JCNHP5Q
SAMPLE VERSION	:	04
SPECIFICATIONS EDITION	:	009
DRAWING NO. (Ver.)	:	JLMD-PG12864WRF-JCNHP5Q_001
PACKAGING NO. (Ver.)	:	JPKG-PG12864WRF-JCNHP5Q_001

Customer Approved

Date:

POWERTIP
2020.09.14
JS RD APPROVED

Approved	Checked	Designer
李昀	劉進	俞承澤

☐ Preliminary specification for design input

■ Specification for sample approval

POWERTIP TECH. CORP.

NO.PT-A-005-8

History of Version

Date (mm / dd / yyyy)	Ver.	Edi.	Description	Page	Design by
11/02/2007	0	-	The sample has changed IC,which was based on Powertip's mass production sample:PG12864WRF-JNN-HP5Q	-	張恒
11/14/2007	0	-	It has changed the sample code: PS12864WRF-JCN-H02 into the mass production code: PG12864WRF-JCNHP5Q	-	張恒
07/02/2013	01	001	Update Specification Version	-	趙冬冬
02/18/2014	01	002	Update Specification Version	-	周志仙
04/11/2014	01	003	Modify the IDD	5	周志仙
08/26/2016	02	004	Change LCM Average Brightness Change LCM CIE Color Coordinate Change Backlight Forward Voltage Change Backlight Average Brightness	6 6 11 11	陳璐
06/09/2017	03	005	Third Sample(Change BL)	-	陳璐
07/04/2018	03	006	Change LCM Average Brightness Change Backlight Average Brightness	6,11	陳璐
04/16/2020	04	007	Modify LCD	-	陳璐
07/03/2020	04	008	Modify IDD(Typ and Max)	5	俞承澤
09/10/2020	04	009	Modify Internal Circuit Diagram	12	俞承澤

Total：29 Pages

Contents

Note：for detailed information please refer to IC data sheet : <u>NT7107,NT7108</u>

1. SPECIFICATIONS

1.1 Features

Item	Standard Value
Display Type	128 * 64 Dots
LCD Type	FSTN , white, Transflective , Positive, Extended Temp
Driver Condition	LCD Module : 1/64 Duty, 1/9 Bias
Viewing Direction	6 O'clock
Weight	34.7 g
Interface	-
Controller / Driver IC	NT7107, NT7108
ROHS	THIS PRODUCT CONFORMS THE ROHS OF PTC Detail information please refer web site : http://www.powertip.com.tw/news.php?area_id_view=1085560481/

1.2 Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension	75.0(L) *52.7(w) * 8.4(H)	mm
Viewing Area	60.0(L) * 32.6(w)	mm
Active Area	55.0(L) * 27.48 (w)	mm
Dot Size	0.39(L) *0.39(w)	mm
Dot Pitch	0.43(L) * 0.43(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	7.0	V
LCD Driver Supply voltage	VDD-VEE	-	VDD-19.0	VDD+0.3	V
Input Voltage	V_{IN}	-	-0.3	VDD+0.3	
Operating Temperature	T_{OP}	-	-20	+70	°C
Storage Temperature	T_{ST}	-	-30	+80	°C
Storage Humidity	H_D	Ta < 60 °C	10	90	%RH

1.4 DC Electrical Characteristics

VDD = 5.0±0.5V, VSS = 0V, Ta = 25℃

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Logic Supply Voltage	VDD	-	4.5	5.0	5.5	V
"H" Input Voltage	V_{IH}	-	0.7VDD	-	VDD	V
"L" Input Voltage	V_{IL}	-	VSS	-	0.3VDD	V
"H" Output Voltage	V_{OH}	I_{OH}=-0.4mA	VDD-0.4	-	-	V
"L" Output Voltage	V_{OL}	I_{OL}=0.4mA	-	-	0.4	V
Supply Current	IDD*1	VDD= 5.0V; VOP=7.6V;	-	3.0	4.5	mA
LCM Driver Voltage	V_{op}*1	-20°C	7.5	7.7	7.9	V
		+25°C	7.4	7.6	7.8	
		+70°C	7.2	7.4	7.6	

Note : *1. The V_{OP} test point is VDD – V0.

1.5 Optical Characteristics
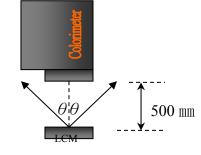
LCD Panel：1/64Duty，1/9Bias,V_{LCD}=8.5V，Ta =25℃

Item		Symbol	Conditions	Min.	Typ.	Max.	Unit	Reference
Response Time	Rise	tr	-	-	160	240	ms	Note 2
	Fall	tf		-	300	450		
Viewing angle range	Top	θ+	C>2.0	-	40	-	Deg.	Note 1
	Bottom	θ-		-	40	-		
	Left	θL		-	40	-		
	Right	θR		-	40	-		
Contrast Ratio		C	-	-	5	-	-	Note 3
Average Brightness (with LCD) *1		IV	IF= 60mA	110	200	-	cd/m2	Note 4
CIE Color Coordinate (with LCD)		X		0.26	0.31	0.36	-	
		Y		0.28	0.33	0.38		
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%
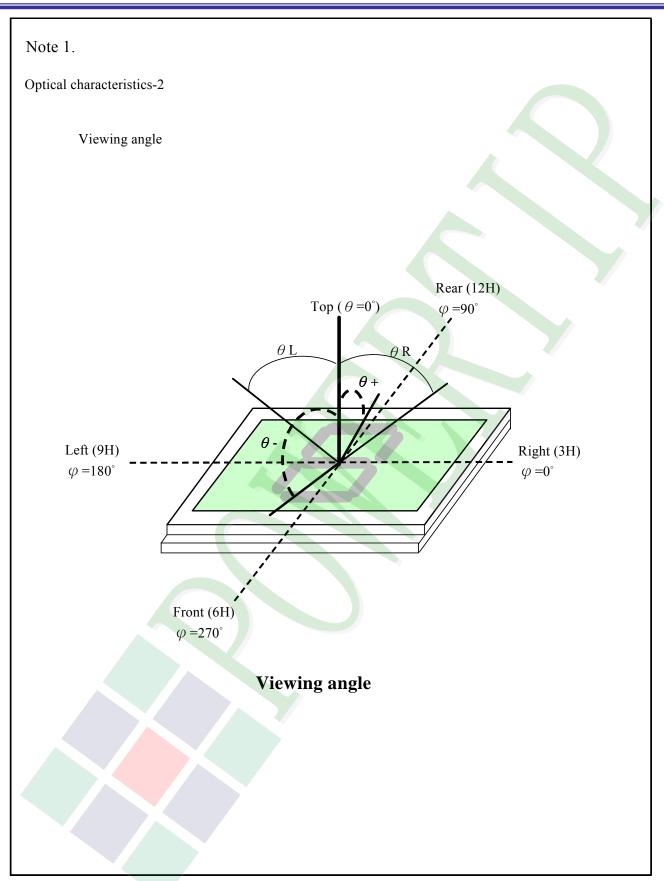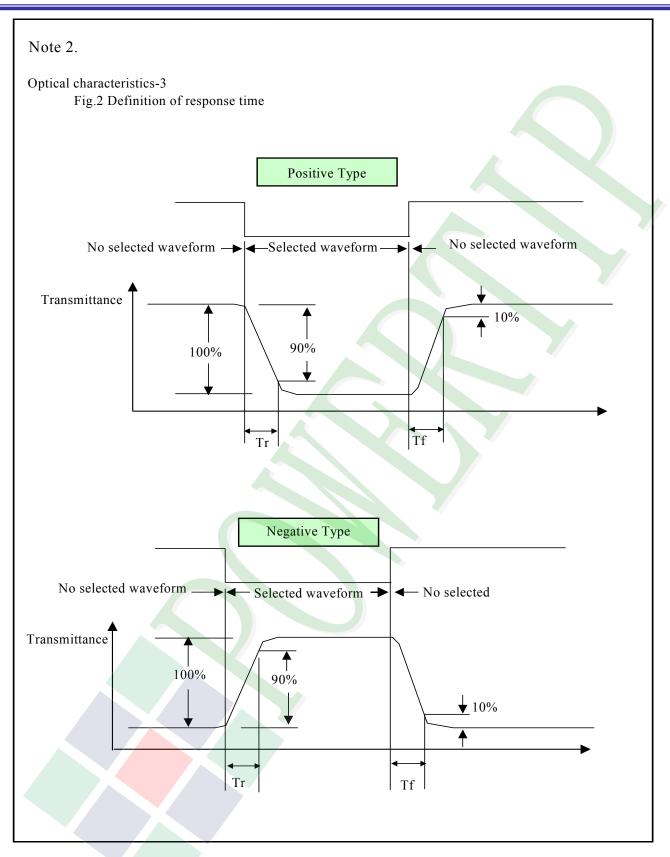
Colorimeter=BM-7 fast

Note 1.

Optical characteristics-2

Viewing angle

Rear (12H)
$\varphi = 90°$

Top ($\theta = 0°$)

θ L

θ R

$\theta +$

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
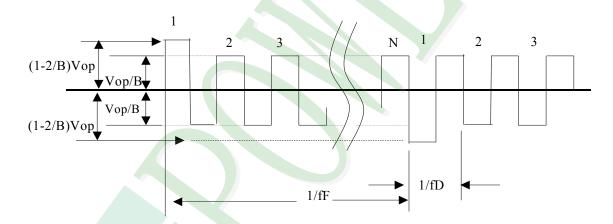
　　Vop: Drive voltage　　fF: Frame frequency
　　1/B: Bias　　　　　　　fD: Drive frequency
　　N: Duty

(1) Selected waveform
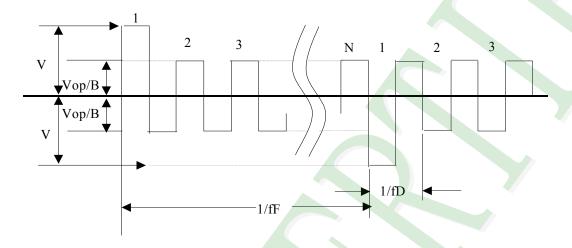

(2) Non- Selected wave form
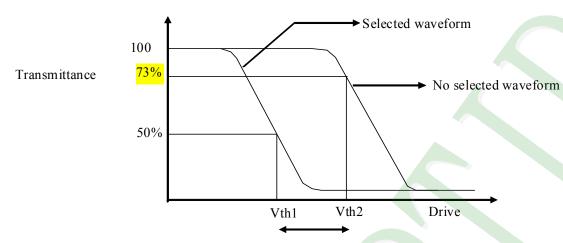
Note:
Frame frequency is defined as follows: Common side supply
voltage peak - to - peak /2 = 1 period

Note 3. : Definition of Vth
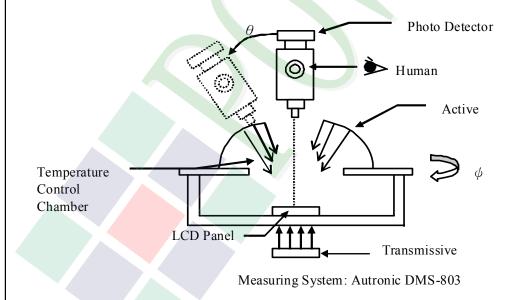
Active voltage range

	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
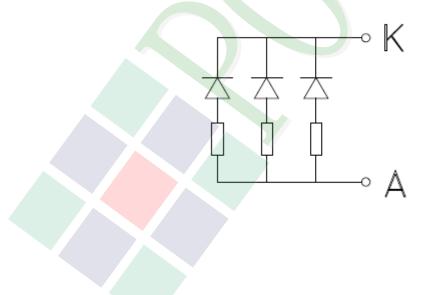
Item	Symbol	Conditions	Min.	Max.	Unit
Forward Current	IF	Ta =25℃	-	90	mA
Reverse Voltage	VR	Ta =25℃	-	5.0	V
Power Dissipation	PO	Ta =25℃	-	0.3	W

Electrical / Optical Characteristics

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	VF	IF= 60mA	3.0	3.3	4.0	V
Reverse Current	IR	VR=5V	-	-	10	uA
Chromaticity Coordinate (without LCD)	X	IF=60mA	0.25	0.29	0.33	-
	Y		0.26	0.30	0.34	
Average Brightness (without LCD)	IV		735	1100	-	cd/m2
Color	White					

Internal Circuit Diagram:
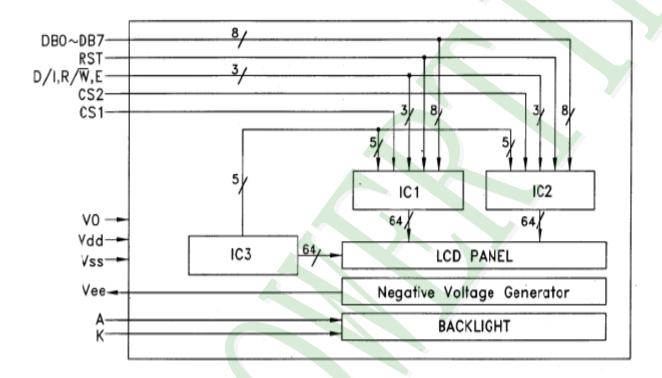
2. MODULE STRUCTURE

2.1 Counter Drawing

2.1.1 LCM Mechanical Diagram

* See Appendix

2.1.2 Block Diagram

2.2 Interface Pin Description
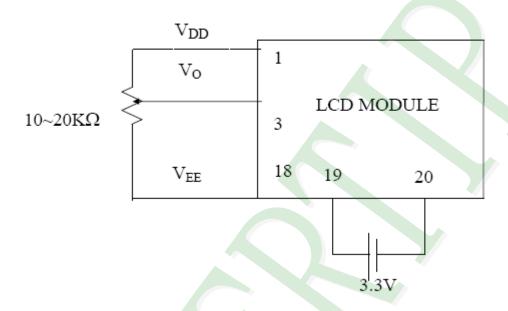
Pin No.	Symbol	Function
1	V_{DD}	Power Supply ($V_{DD} > V_{SS}$)
2	V_{SS}	Power Supply ($V_{SS} = 0$)
3	V_O	Operating Voltage for LCD (variable)
4 -11	DB0~DB7	Data bus line
12	CS1	Chip enable for D2 (segment 1 to segment 64)
13	CS2	Chip enable for D3 (segment 65 to segment 128)
14	RST	Reset signal
15	R/$\overline{W}$	R/W signal input is used to select the read/write mode High =Read mode, Low =Write mode
16	D/I	Register selection input High =Data register Low =Instruction register (for write) 　　　Busy flag address counter (for read)
17	E	Start enable signal to read or write the data
18	V_{EE}	Negative voltage Power Supply
19	A	Power supply for LED B/L (+)
20	K	Power supply for LED B/L (-)

2.2.1 Application Notes:

Contrast Adjust
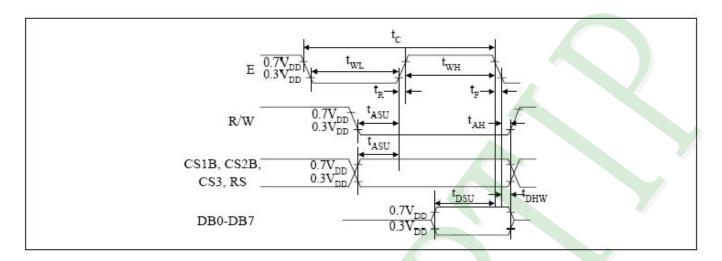
2.2.2 Refer Initial code:

```
void int_NT7108()
{
    write_com(0x3f);          //display on
    write_com(0xc0);          //Start line
}
```
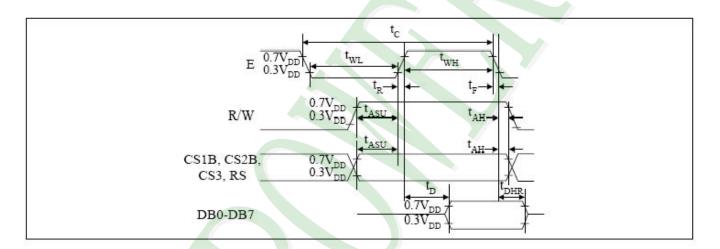
2.3 Timing Characteristics

MPU Write Timing

MPU Read Timing
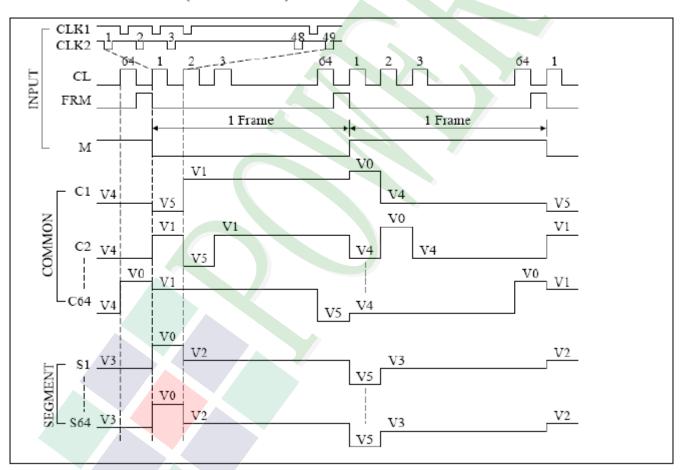
MPU Interface

Characteristic	Symbol	Min	Type	Max	Unit
E cycle	tC	1000	-	-	
E high level width	tWH	450	-	-	
E low level width	tWL	450	-	-	
E rise time	tR	-	-	25	
E fall time	tF	-	-	25	
Address set-up time	tASU	140	-	-	ns
Address hold time	tAH	10	-	-	
Data set-up time	tDSU	200	-	-	
Data delay time	tD	-	-	320	
Data hold time (write)	tDHW	10	-	-	
Data hold time (read)	tDHR	20	-	-	

TIMING DIAGRAM (1/64 DUTY)

2.4 Display command

The display control instructions control the internal state of the NT7108. Instruction is received from MPU to NT7108 for the display control. The following table shows various instructions.

Instruction	RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0	Function
Display on/off	L	L	L	L	H	H	H	H	H	L/H	Controls the display on or off. Internal status and display RAM data is not affected. L:OFF, H:ON
Set address (Y address)	L	L	L	H	Y address (0-63)						Sets the Y address in the Y address counter.
Set page (X address)	L	L	H	L	. H	H	H	Page (0-7)			Sets the X address at the X address register.
Display Start line (Z address)	L	L	H	H	Display start line (0-63)						Indicates the display data RAM displayed at the top of the screen.
Status read	L	H	Busy	L	On/Off	Reset	L	L	L	L	Read status. BUSY L: Ready H: In operation ON/OFF L: Display ON H: Display OFF RESET L: Normal H: Reset
Write display data	H	L	Write data								Writes data (DB0: 7) into display data RAM. After writing instruction, Y address is increased by 1 automatically.
Read display data	H	H	Read data								Reads data (DB0: 7) from display data RAM to the data bus.

DISPLAY ON/OFF

RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
0	0	0	0	1	1	1	1	1	D

The display data appears when D is 1 and disappears when D is 0. Though the data is not on the screen with D=0, it remains in the display data RAM. Therefore, you can make it appear by changing D=0 into D=1.

SET ADDRESS (Y ADDRESS)

RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
0	0	0	1	AC5	AC4	AC3	AC2	AC1	AC0

Y address (AC0-AC5) of the display data RAM is set in the Y address counter. An address is set by instruction and increased by 1 automatically by read or write operations of display data.

SET PAGE (X ADDRESS)

RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
0	0	1	0	1	1	1	AC2	AC1	AC0

X address (AC0-AC2) of the display data RAM is set in the X address register. Writing or reading to or from MPU is executed in this specified page until the next page is set.

DISPLAY START LINE (Z ADDRESS)

RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
0	0	1	1	AC5	AC4	AC3	AC2	AC1	AC0

Z address (AC0-AC5) of the display data RAM is set in the display start line register and displayed at the top of the screen. When the display duty cycle is 1/64 or others (1/32-1/64), the data of total line number of LCD screen, from the line specified by display start line instruction, is displayed.

STATUS READ

RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
0	1	BUSY	0	ON/OFF	RESET	0	0	0	0

· BUSY

  When BUSY is 1, the Chip is executing internal operation and no instructions are accepted.

  When BUSY is 0, the Chip is ready to accept any instructions.

· ON/OFF

  When ON/OFF is 1, the display is OFF.

  When ON/OFF is 0, the display is ON.

· RESET

  When RESET is 1, the system is being initialized.

  In this condition, no instructions except status read can be accepted.

  When RESET is 0, initializing has finished and the system is in usual operation condition.

WRITE DISPLAY DATA

RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
1	0	D7	D6	D5	D4	D3	D2	D1	D0

Writes data (D0-D7) into the display data RAM. After writing instruction, Y address is increased by 1 automatically.

READ DISPLAY DATA

RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
1	1	D7	D6	D5	D4	D3	D2	D1	D0

Reads data (D0-D7) from the display data RAM. After reading instruction, Y address is increased by 1 automatically.

2.5 Jumper(setting different use)
    SHORT:J1,J5,J6,JV(2,3),JE(2,3)
    OPEN:The other unnoted jumpers
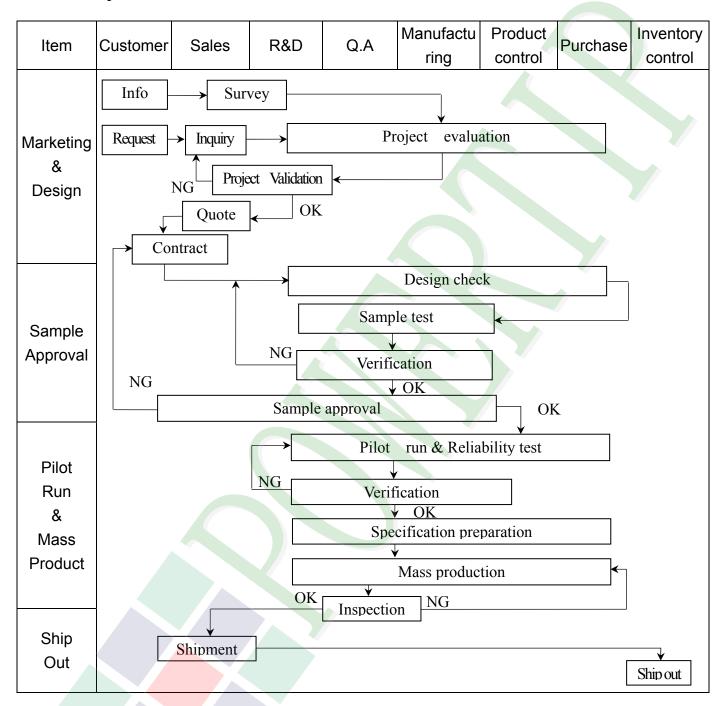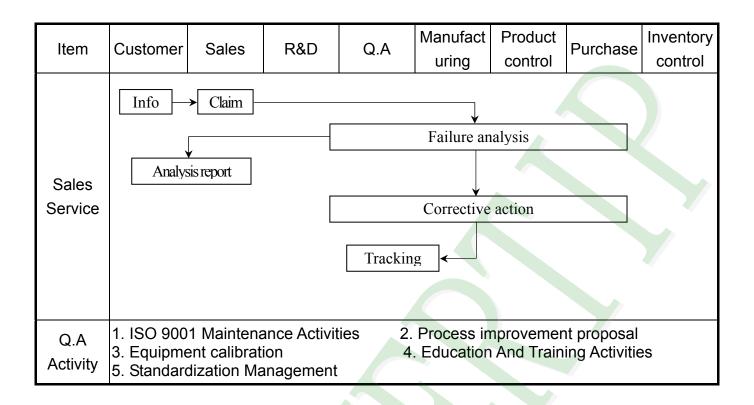
3. QUALITY ASSURANCE SYSTEM

3.1 Quality Assurance Flow Chart

Item	Customer	Sales	R&D	Q.A	Manufacturing	Product control	Purchase	Inventory control
Marketing & Design								
Sample Approval								
Pilot Run & Mass Product								
Ship Out								

Info → Survey

Request → Inquiry → Project evaluation

NG — Project Validation

Quote ← OK

Contract

Design check

Sample test

NG — Verification

OK

NG — Sample approval — OK

Pilot run & Reliability test

NG — Verification

OK

Specification preparation

Mass production

OK — Inspection — NG

Shipment

Ship out

Item	Customer	Sales	R&D	Q.A	Manufacturing	Product control	Purchase	Inventory control
Sales Service	Info → Claim → Analysis report	Failure analysis → Corrective action → Tracking						
Q.A Activity	1. ISO 9001 Maintenance Activities 2. Process improvement proposal 3. Equipment calibration 4. Education And Training Activities 5. Standardization Management							

![POWERTIP]

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
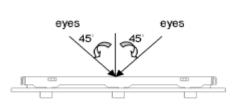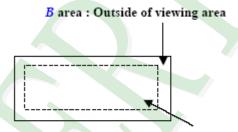
Fig. 2　A area : viewing area

◆ **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**

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

NO	Item	Criterion	Level
05	**Black or white dot、scratch、contamination** **Round type** Φ＝(x+y)/2 **Line type** 	**5.1 Round type (Non-display or display):** 	Dimension (diameter : Φ)	Acceptance (Q'ty) A area	Acceptance (Q'ty) B area
---	---	---
Φ ≦ 0.10	Accept no dense	Ignore
0.10 ＜ Φ ≦ 0.20	3	
0.20 ＜ Φ ≦ 0.30	2	
Total quantity	4	| **5.2 Line type (Non-display or display):** | Dimension Length (L)	Dimension Width (W)	Acceptance A area	Acceptance 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		 **5.3 Non display define : Power off and Backlight off.** **5.4 Display define : Initial code finish and full display data.**	**Minor**
06	**Polarizer Bubble**		Dimension (diameter : Φ)	Acceptance (Q'ty) A area	Acceptance (Q'ty) 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			**Minor**

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:** 【OK】 【NG】 **Seal width** 	**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： <table><tr><td>X</td><td>Y</td><td>Z</td></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><td></td><td>X</td><td>Y</td><td>Z</td></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>	Minor

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： 	Minor

7.2.2 Non-conductive portion：

X	Y	Z
≦1/3 a	≦W	≦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
≦ a	≦ 1/3 W	≦ t

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 ±2℃ 96 hrs** **Surrounding temperature, then storage at normal condition 4hrs.**
2	**Low Temperature Storage Test**	**Keep in −30 ±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**	**−30℃→ +25℃ → 80℃ → +25℃** **(30mins) (5mins) (30mins) (5mins)** **← 10 Cycle →** **Surrounding temperature, then storage at normal condition 4hrs.**
5	**ESD Test**	**Air Discharge:** **Contact Discharge:** **Apply 2 KV with 5 times** **Apply 250 V with 5 times** **Discharge for each polarity +/-** **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

5.2.10   Caution!(LCM products with Capacitive Touch Panel)
Strong EMI-sources such as switch-mode power supplies (SMPS) can lead to touch malfunction (e.g. ghost-touches).
Therefore, the touch needs to be thoroughly tested inside the target application.

5.2.11   Do not let the LCD screen display static images (text, logos or pictures) for a prolonged period of time to prevent possible image burn-in.

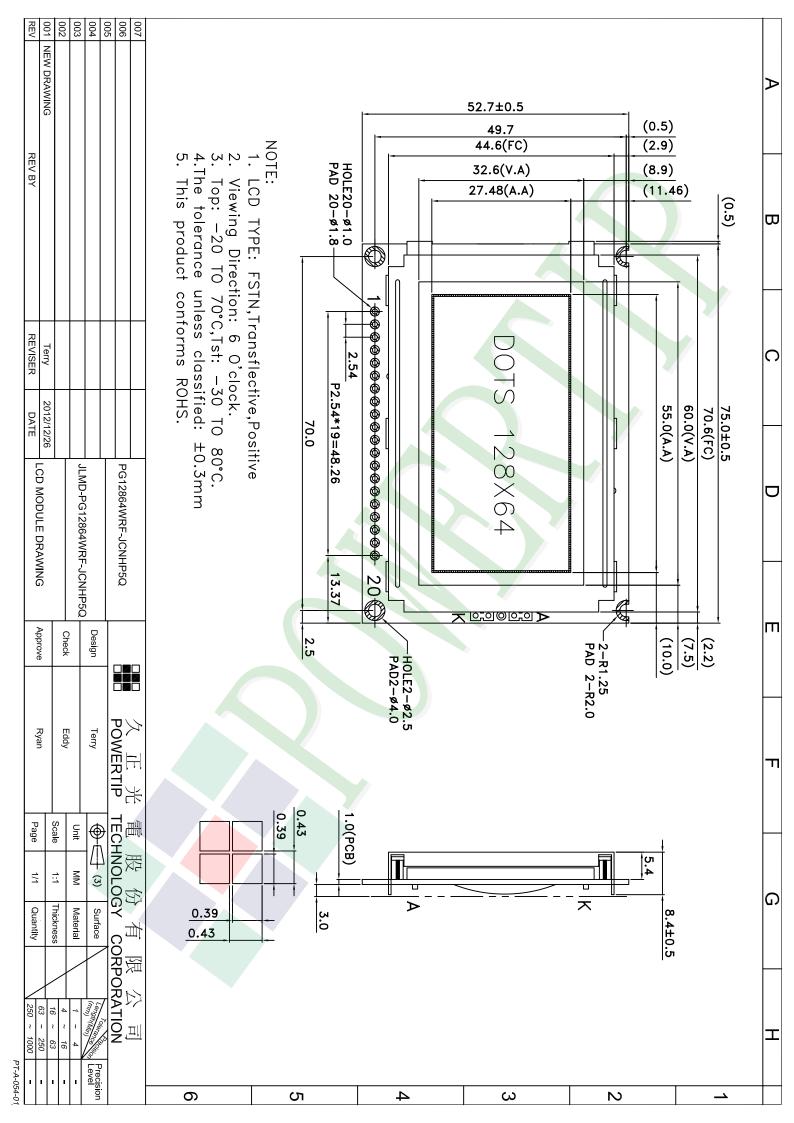## 5.3 STORAGE

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. LCD TYPE: FSTN,Transflective,Positive
2. Viewing Direction: 6 O'clock.
3. Top: -20 TO 70°C,Tst: -30 TO 80°C.
4.The tolerance unless classified: ±0.3mm
5. This product conforms ROHS.

DOTS 128X64

HOLE20-ø1.0
PAD 20-ø1.8

HOLE2-ø2.5
PAD2-ø4.0

2-R1.25
PAD 2-R2.0

52.7±0.5
49.7
44.6(FC)
32.6(V.A)
27.48(A.A)

(0.5)
(2.9)
(8.9)
(11.46)

(0.5)

75.0±0.5
70.6(FC)
60.0(V.A)
55.0(A.A)

(2.2)
(7.5)
(10.0)

70.0

2.54
P2.54*19=48.26

13.37

2.5

1.0(PCB)

0.43
0.39

0.39
0.43

5.4

3.0

8.4±0.5

007					
006					
005					
004					
003					
002					
001	NEW DRAWING	Terry	2012/12/26		
REV		REV BY	DATE		

REVISER

PG12864WRF-JCNHP5Q

JLMD-PG12864WRF-JCNHP5Q

LCD MODULE DRAWING

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

	Design	Terry		Check	Eddy		Approve	Ryan

Page	Scale	Unit	Surface	Material	Thickness	Quantity
1/1	1:1	MM	(3)			

Length(Min) (mm)	Tolerance Precision	Precision Level
1 ~ 4	-	-
4 ~ 16	-	-
16 ~ 63	-	-
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)	PG12864WRF-JCNHP5Q	75X52.7X8.4	0.0347	468	16.2396
2	靜電袋(1)Antistatic Bag	BAG100100ARABA	100 X 100	0.0011	468	0.5148
3	A1-1隔板(3)A1-1 Partition	BX29500047BZBA	295 X 47 X 3	0.0078	168	1.3104
4	B1-1隔板(4)B1-1 Partition	BX24500047BZBA	245 X 47 X 3	0.0065	48	0.312
5	氣泡紙(5)Bubble Sheet	BAG290240BRBBA	290 X 240	0.006	24	0.144
6	C1內盒(6)Product Box	BX31025555AABA	310 X 255 X 55	0.13	12	1.56
7	外紙箱(7)Carton	BX52732536CCBA	527 X 325 X 360	0.83	1	0.83
8						
9						

2.一 整箱總重量 (Total LCD Weight in carton) :　20.91 Kg±10%

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

　(1)Quantity Of Spacer :　A1-1隔板　X　14　, B1-1隔板　X　4

　(2)Total LCM quantity in carton : quantity per box　39　x no of boxes　12　=　468

(5) 氣泡紙 Bubble Sheet

(1)靜電袋+LCM Antistatic Bag+LCM

(4) B1-1隔板 B1-1 Partition

(3) A1-1隔板 A1-1 Partition

(5) 氣泡紙 Bubble Sheet

(6) C1內盒 Product Box

(7)外紙箱 Carton

特 記 事 項 (REMARK)

4. Label Specifications :

TYPE			
ID.NO		S/O	
Q'TY	Pcs	Date	
Lot.NO			
Note			

參照"成品包裝點檢作業標準書"內容

5.LCM排放示意圖(前後間隔不放置):

5. LCM placed as figure showing:
(First and last slot should be empty)

▨ 模組(LCM) X 1pcs.

POWERTIP TECH. CORP.