



# APPROVAL SHEET

## 承認書

Customer 客戶名稱	
Part No. 產品型號	GPM745A0
Product type 產品內容	TFT module : Transmissive and Normally white Type 3.2" a-Si color TFT LCD Module
RoHS	<input type="checkbox"/> Non-compliance <input checked="" type="checkbox"/> Compliance
Remarks 備註欄	
<input type="checkbox"/> Preliminary Specification 暫行規格 <input checked="" type="checkbox"/> Final Specification 正式規格	
Signature by Customer: 客戶確認簽章:	

Issued by QA	Checked by QA		Checked by PM	Approved By	
				QA	BU



## Specification of LCD Module

Product No.: GPM745A0

Issue date: 2007/12/18

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## 1. GENERAL DESCRIPTION

GPM745A0 is a transmissive type color active matrix liquid crystal display (LCD), which uses amorphous thin film transistor (TFT) as switching devices. This product is composed of a TFT LCD panel, driver IC, and FPC, backlight and Touch Panel unit.

## 2. FEATURES

Display Mode	Transmissive Type
	a-Si color TFT LCD, Normally white type
Screen Size	3.2 inch
Display Format	Graphic 240*RGB*320 Stripe type
Color	16.7M color
Interface	CPU 80 - system 16 bit Interface
Driver IC	ILI9320
Viewing Direction	9 O'clock

## 3. MECHANICAL SPECIFICATION

Item	Specifications	Unit
Dimensional outline	57.54(W)×79.2(H)×4.6(D)*	mm
Resolution	240X(R, G, B)×320	dot
Active area	48.6(W)×64.8(H)	mm
Pixel pitch	0.2025 (W)×0.2025(H)	mm

\* Without FPC

\* Without T/P the total thickness is 3.35 mm

## 4. MECHANICAL DIMENSION

[illegible]



## 5. MAXIMUM RATINGS

If the operating condition exceeds the following absolute maximum ratings, the TFT LCD module may be damaged permanently.

Item	Symbol	Values		Unit	Condition
		Min.	Max.		
Power Supply for Logic	V <sub>CI</sub> -GND	-0.3	4.6	V	
Storage Temperature	T <sub>ST</sub>	-20	70	°C	
Operating Temperature (Ambient Temperature)	T <sub>OP</sub>	-10	60	°C	
Humidity	-	-	90	%RH	Note1

Note1: T<sub>A</sub> ≤ 40°C Without dewing

## 6. ELECTRICAL CHARACTERISTIC

A. Typical operating conditions (GND=AV<sub>SS</sub>=0V)

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
IC Power Voltage	V <sub>CI</sub>	2.5	2.8	3.3	V	
High-level Input Voltage	V <sub>IHC</sub>	0.8V <sub>DD</sub>	-	V <sub>DD</sub>	V	
Low-level Input Voltage	V <sub>ILC</sub>	-0.3	-	0.2V <sub>DD</sub>	V	
TFT Gate Voltage	V <sub>GH</sub>	10	-	20	V	
TFT Gate Voltage	V <sub>GL</sub>	-4.5	-	-13.5	V	
Consumption current of V <sub>CI</sub>	I <sub>DD</sub>	-	8.5	17	mA	
Consumption current of V <sub>LED-A</sub>	I <sub>LED</sub>	-	75	-	mA	

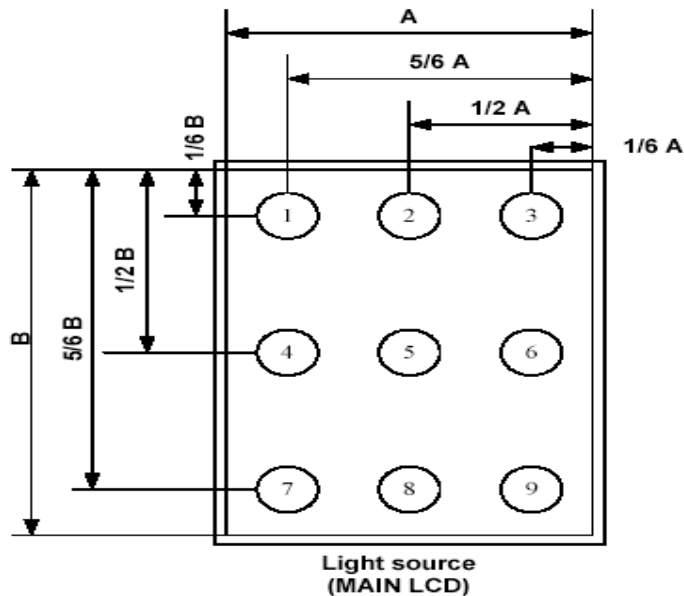


## 7. BACKLIGHT CHARACTERISTIC

### 7.1.Characteristic

Item	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Forward voltage	$V_f$	$I_f=75\text{mA}$	3.0	-	3.5	V
Forward current	$I_f$	5-chip parallel	75			mA
POWER CONSUMPTION	$P_{BL}$	$I_f=75\text{mA}$	225	-	262.5	mW
Luminous color	White					
Chip connection	5-chip parallel connection					

### 7.2.Lightguide Specification



- a. Test Instrument: BM-7 (Distance =500mm; Field = 1°)
- b. Light Source: LED \* 5 (White)
- c. Conditions:  $V_F=3.0\text{V}\sim 3.5\text{V}$ ;  $I_F=75\text{mA}$
- d. Measure Brightness: 1 ~ 9
- e. Uniformity = (Min. Brightness / Max. Brightness)\*100%
- f. Uniformity  $\geq 80\%$





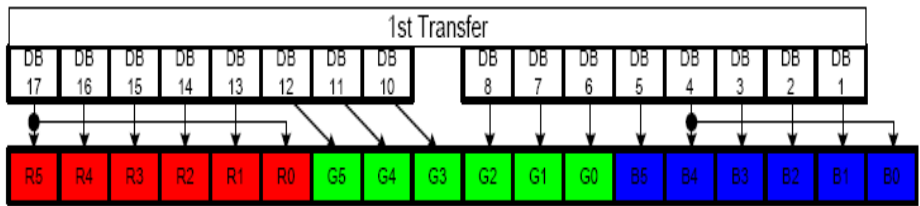
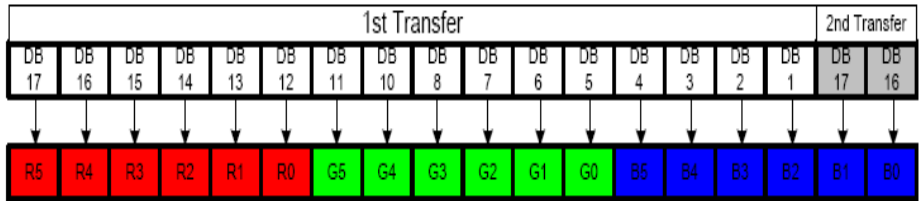
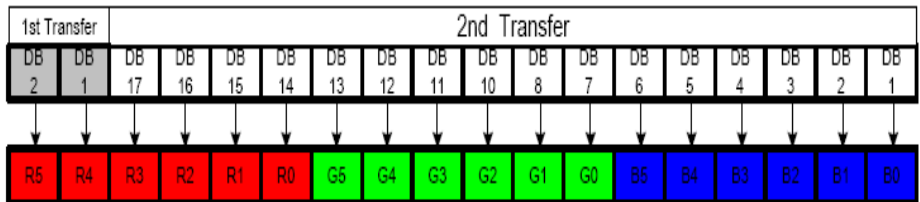
## 8. MODULE FUNCTION DESCRIPTION

### 8.1.PIN Description

Pin NO.	Terminal	Functions
1	GND	Ground
2	VDD	Power input
3	VDD	Power input
4	CS	Chip Select Input PIN
5	RS	Register Select Input PIN
6	WR	Write Data Select Input PIN
7	RD	Read Data Select Input PIN
8	RESET	Chip reset Select Input PIN
9~24	DB0~DB15	Data Bus for 16-bits, 80-parallel MPU ( 16-bit I/F:DB 【17:10】 and DB 【8:1】 is used )
25	GND	Ground
26	Y-	Touch Panel Input PIN
27	X-	Touch Panel Input PIN
28	Y+	Touch Panel Input PIN
29	X+	Touch Panel Input PIN
30	LED_K1	B/L Power input PIN negative
31	LED_K2	B/L Power input PIN negative
32	LED_K3	B/L Power input PIN negative
33	LED_K4	B/L Power input PIN negative
34	LED_K5	B/L Power input PIN negative
35	LED_A	B/L Power input PIN anode
36	LED_A	B/L Power input PIN anode
37	GND	Ground

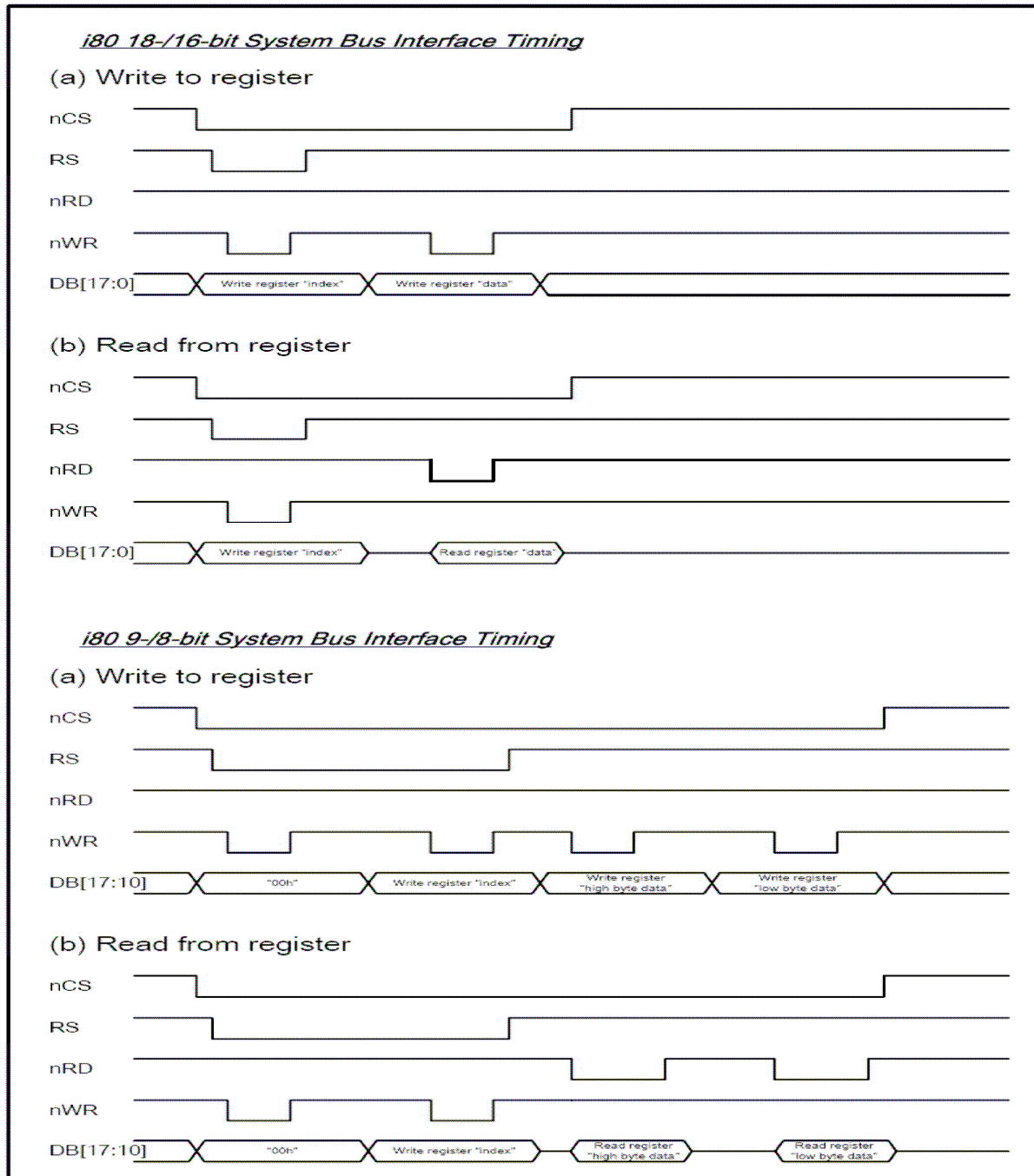


## 8.2. MPU System Interface Data Format

TRI	DFM	16-bit MPU System Interface Data Format
0	*	<p>system 16-bit interface (1 transfers/pixel) 65,536 colors</p> 
1	0	<p>80-system 16-bit interface (2 transfers/pixel) 262,144 colors</p> 
1	1	<p>80-system 16-bit interface (2 transfers/pixel) 262,144 colors</p> 

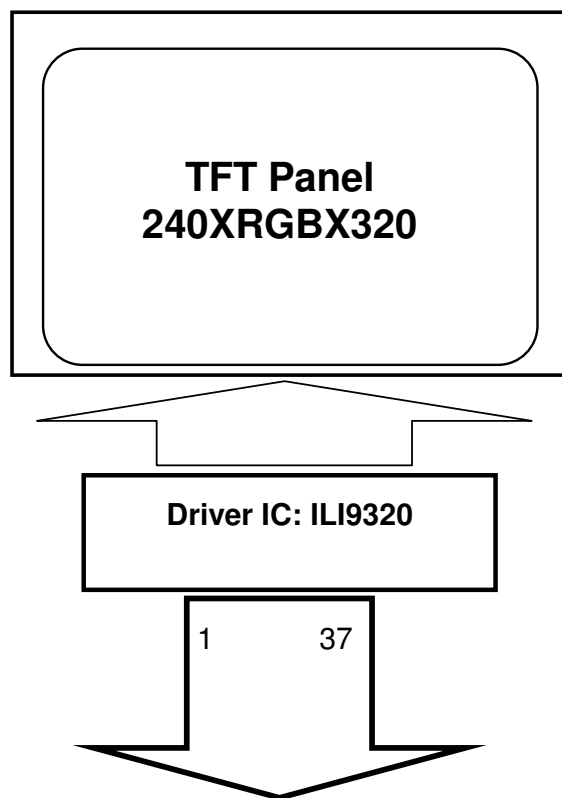


### 8.3.Timing Characteristics



## 8.4. Block diagram of LCD

### 8.4.1. Block diagram





## 9. ELECTRO-OPTICAL CHARACTERISTICS

### 9.1. Optical characteristics

LED backlight transmissive module:

Item	Symbol	Temp.	Min.	Typ.	Max.	Unit	Conditions
Response time	Tr	25°C	-	10	20	ms	$\theta = 0^\circ$ , $\phi = 0^\circ$ (Note 2)
	Tf	25°C	-	20	30	ms	
Contrast ratio	CR	25°C	(150)	(200)	-	-	$\theta = 0^\circ$ , $\phi = 0^\circ$ LED:ON,LIGHT:OFF (Note 4)
Transmittance	T	25°C	-	(4.7)	-	%	
Visual angle range front and rear	$\theta$	25°C	( $\theta$ f)75 ( $\theta$ b)45			Degree	$\phi = 0^\circ$ , CR $\geq$ 10 LED:ON, LIGHT:OFF (Note 3)
Visual angle range left and right	$\theta$	25°C	( $\theta$ f)75 ( $\theta$ b)75			Degree	$\phi = 90^\circ$ , CR $\geq$ 10 LED:ON, LIGHT:OFF (Note 3)
Visual angle direction priority			12:00				(Note 5)
Brightness				(250)	-	Cd/m <sup>2</sup>	V <sub>LED</sub> =3.4V, 75mA full White pattern

### 9.2.C/F CIE (x, y) chromaticity

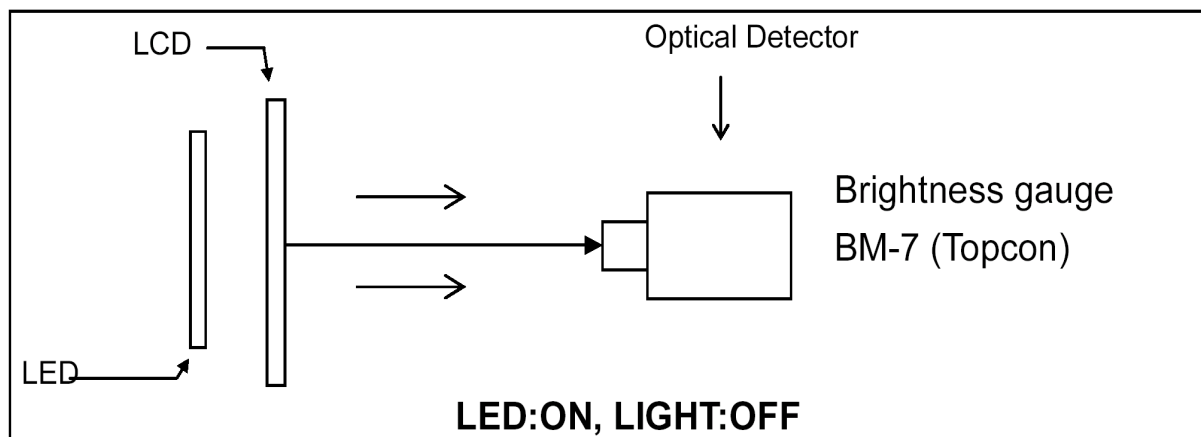
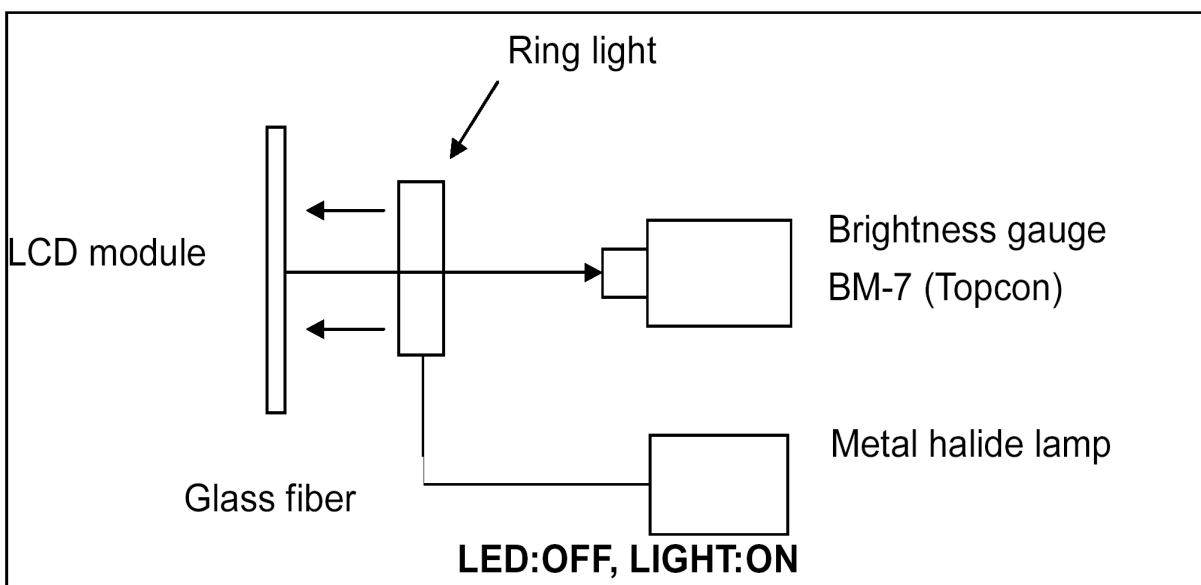
Item	Symbol	Transmissive			Conditions
		Min.	Typ.	Max.	
Red	X	(0.621)	(0.641)	(0.661)	$\theta = 0^\circ$ , $\phi = 0^\circ$
	y	(0.327)	(0.347)	(0.367)	
Green	X	(0.284)	(0.304)	(0.324)	$\theta = 0^\circ$ , $\phi = 0^\circ$
	y	(0.553)	(0.573)	(0.593)	
Blue	X	(0.115)	(0.135)	(0.155)	$\theta = 0^\circ$ , $\phi = 0^\circ$
	y	(0.101)	(0.121)	(0.141)	
White	X	(0.292)	(0.312)	(0.332)	$\theta = 0^\circ$ , $\phi = 0^\circ$
	y	(0.321)	(0.341)	(0.361)	



### 9.3.Light source

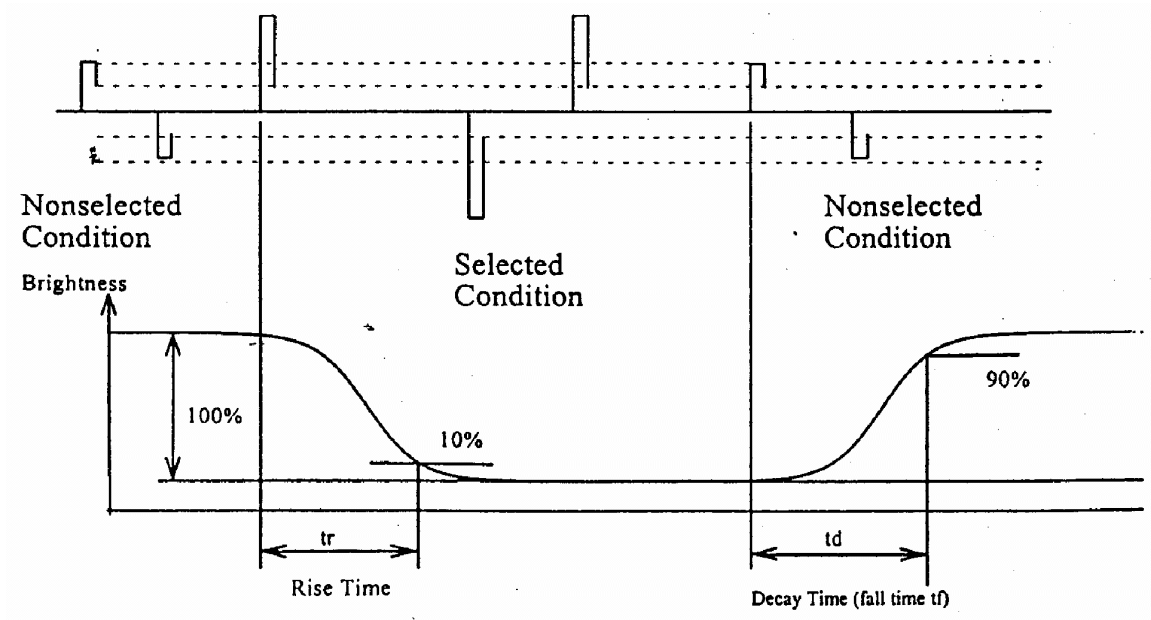
Item	Symbol	Value			Conditions
		Min.	Typ.	Max.	
Light source	X	0.26	-	0.30	$\theta = 0^\circ$ , $\phi = 0^\circ$
	y	0.26	-	0.30	

#### NOTE 1 :Optical characteristic measurement system

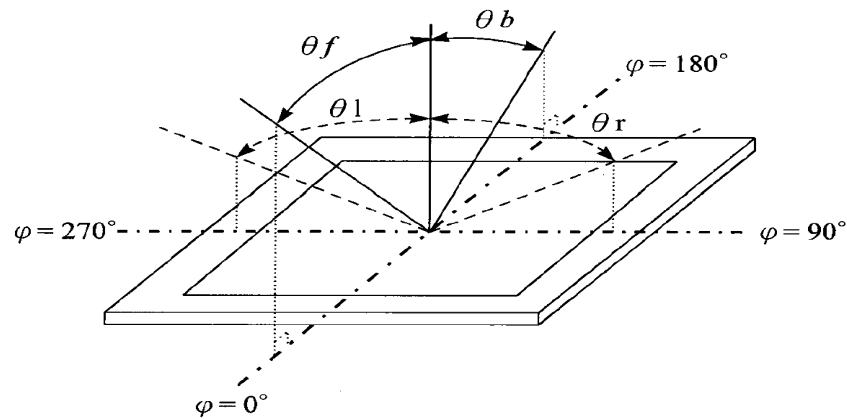




**NOTE 2: Response time definition**

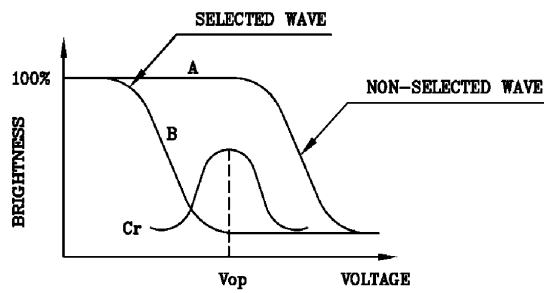


**NOTE 3 :  $\phi$  、 $\theta$  definition**

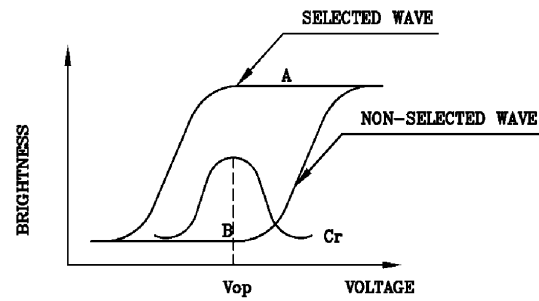




**NOTE 4: Contrast Definition**



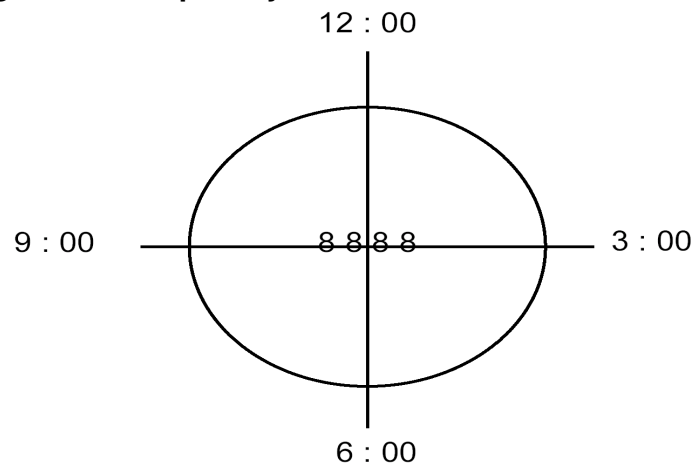
(positive type)



(negative type)

Contrast Ratio :  $Cr=A/B$

**NOTE 5: Visual angle direction priority**







## 10. TOUCH PANEL CRITERIAS

### 10.1. Range Of Application

This specification shall apply to analog type pen or finger input transparent touch panel.

### 10.2. Shape

Shape, structure and dimension please refer to attached drawing or table.

### 10.3. Rating

#### 10.3.1 Operating Voltage

DC 5 Volt, 35mA at contact point between upper and lower layer.

#### 10.3.2 Operating temperature range

From 0°C to 50°C (60% RH, No dew condensation),

#### 10.3.3 Storage temperature range

From -10°C to 60°C (60% RH, No dew condensation), but continually excess 240hrs is not allowed when the storage temperature in -10°C ; and continually excess 240hrs is not allowed when the storage temperature in 60°C.

### 10.4. Electric Performance

#### 10.4.1 Terminal resistance

Direction "X" : (145~380) ohm ; Direction "Y" : (240~625) ohm

Use 0.8R stylus at 35gm, measuring 4 corners of touch panel, 5mm inside the active area, each corner must blow 900Ω

#### 10.4.2 Linearity

Direction "X" 1.5% or less

Direction "Y" 1.5% or less

#### 10.4.3 Insulation resistance

20 Mohm or more with DC 25 Volt applied.

#### 10.4.4 Response time

15 msec or less



## 10.5.Mechanical Performance

### 10.5.1 Input

Through 0.8R stylus or finger

### 10.5.2 Activation force

Input with stylus : Stylus : <90gf

### 10.5.3 Surface hardness

3H pencil or more according to JIS-K5400

## 10.6.Optical Performance

### 10.6.1 Optical Transparency

Total Transmission : Over 75%

Haze : min 1% haze(scattering rate)

Newton ring : specified level or less(arrange in advance with acceptable sample)

Inspected under (500) Lux incandescent daylight.



## 10.7. Standard Reliability Test Procedure (Or Arrange In Advance)

### 10.7.1. Tests

NO.	ITEM	CONDITION	CRITERION
1	High Temperature Non-Operating	60°C 120 hrs	◦ No Defect of Operational Functions In Room Temperature Are Allowable.  ◦ Room Temperature : 23±5°C, 50±20%RH.
2	Low Temperature Non-Operating	-10°C 120 hrs	
3	High Temperature/ Humidity Non-Operating	50°C ,80%RH 240 hrs	
4	Temperature Shock Non-Operating	-10°C ↔ 60°C (30min) (5min) (30min) (5min) 10 CYCLES	

- Resistance between terminals : According to Section 10.4.1
- Linearity :  $\leq 2\%$
- Insulation resistance : According to Section 10.4.3
- Test after 24 hours in room temperature.

## 10.8. Durability

### 10.8.1 Line Drawing Life :

It takes 100,000, times min., with 0.8 mm(R) polyacetal stylus 250g, 300mm/sec.

### 10.8.2 Pen Hitting Life :

It takes 1,000,000, times min., with 0.8 mm(R) polyacetal stylus 250g, 2 times/sec.



## 11.RELIABILITY

### 11.1.MTTF

The LCD module shall be designed to meet a minimum MTTF value of 50,000 hours with normal condition. (25°C in the room without sunlight; not include life time of backlight and Touch Panel).

### 11.2.Tests

NO.	ITEM	CONDITION	CRITERION
1	High Temperature Operating	60°C 240 hrs	<ul style="list-style-type: none"> <li>◦ No defect of Operational function in room temperature are allowable.</li> <li>◦ Leakage current should be below double of initial value.</li> </ul>
2	Low Temperature Operating	-10°C 240 hrs	
3	High Temperature Non-Operating	70°C 240 hrs	
4	Low Temperature Non-Operating	-20°C 240 hrs	
5	High Temperature/ Humidity Non-Operating	50°C,90%RH 240 hrs	
6	Temperature Shock Non-Operating	-20°C ↔ 70°C (30min) (5min) (30min) 10 CYCLES	
7	Electro-static Discharge	HBM: ±2kv	

Note 1: Test after 24 hours in room temperature.

Note 2: The sampling above is individually for each reliability testing condition.

Note 3: The color fading of polarizing filter should not care.

Note 4: All of the reliability testing chamber above, is using D.I. water.(Min value: 1.0 MΩ-cm)

Note 5: In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judged as a good part.

### 11.3.Color performance

No.	ITEM	Criterion (initial)
1	Luminance	>50%
2	NTSC	>70%
3	Contrast Ratio	>50%



## 12.INSPECTION CRITERIA

### 12.1.Inspection Conditions

#### 12.1.1.Environmental conditions

The environmental conditions for inspection shall be as follows

Room temperature:  $23\pm 5^{\circ}\text{C}$

Humidity:  $50\pm 20\%\text{RH}$

#### 12.1.2.The external visual inspection

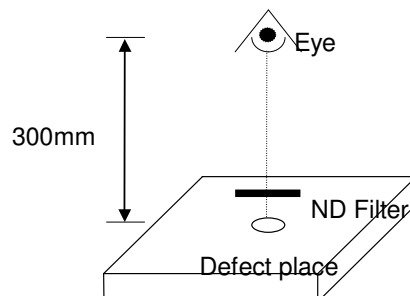
With a single  $1000\pm 200\text{lux}$  fluorescent lamp as the light source, the inspection was in the distance of 30cm or more from the LCD to the inspector's eyes.

### 12.2.Light Method

#### 12.2.1.Environment lamp under $1000\pm 200\text{ lux}$ , Viewing direction for inspection over $30^{\circ}$

#### 12.2.2.The distance from eye to defect around 300mm, the distance from ND Filter to

defect around 25~30mm



### 12.3.Classification Of Defects

#### 12.3.1.Major defect

A major defect refers to a defect that may substantially degrade usability for



product applications.

#### 12.3.2.Minor defect

A minor defect refers to a defect which is not considered to be able substantially degrade the product application or a defect that deviates from existing standards almost unrelated to the effective use of the product or its operation.

Notes: If the LCD/LCM 's cosmetic and display performance do not specify in "inspection criterion", it should be based on these delivered samples.

### 12.4.Sampling & Acceptable Quality Level

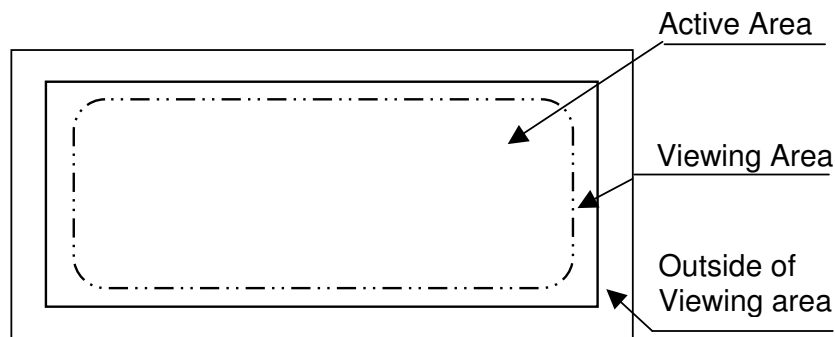
Level II, MIL-STD-105E

	Major	Minor
Cosmetic	1.0 %	1.5 %
Electrical-display	0.4%	0.65 %

### 12.5.Definition Of Inspection Area

V.A: Viewing Area

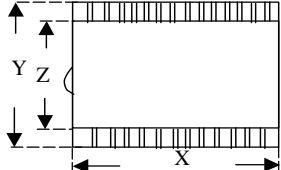
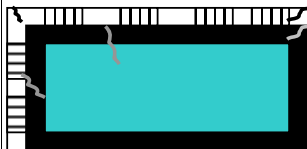
A.A: Active Area

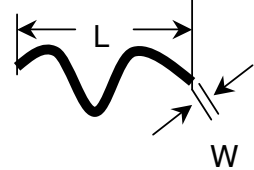
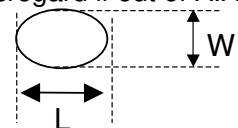
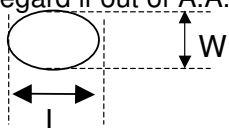




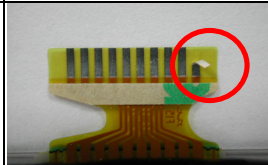
## 12.6.Items and Criteria

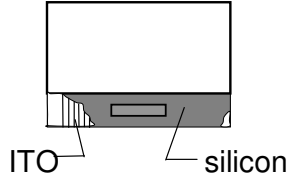
### 12.6.1.Visual inspection criterion in cosmetic

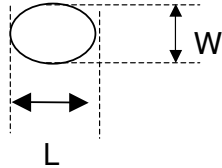
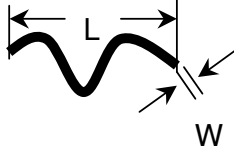
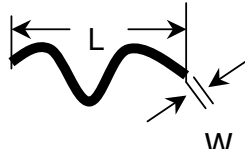
Glass defect			
No	Defect	Criteria	Remark
1	Dimension (Minor)	By engineering diagram	
2	Cracks (Major)	Extensive crack 【Reject】	

LCD appearance defect with in V.A				
No	Defect	Criteria		Remark
1	Fiber, scratches (Major)	Spec.	Permissible Qty	1. L: Length, W: Width 2. Disregard if out of A.A. 
		$W \leq 0.03\text{mm}$	Disregard	
		$0.03\text{mm} < W \leq 0.05\text{mm}$ , $L \leq 3.0\text{mm}$	2	
		$0.05\text{mm} < W \leq 0.10\text{mm}$ , $L \leq 3.0\text{mm}$	1	
		$W > 0.10\text{mm}$ or $L > 3.0\text{mm}$	0	
2	Dirty Spots, round type (Major)	Spec.	Permissible Qty	1. $\phi = (L+W)/2$ , L: Length, W: Width 2. Disregard if out of A.A. 
		$\phi \leq 0.10\text{mm}$	Disregard	
		$0.10\text{mm} < \phi \leq 0.20\text{mm}$	3	
		$0.20\text{mm} < \phi$	0	
3	Polarizer dent (Major)	Spec.	Permissible Qty	1. $\phi = (L+W)/2$ , L: Length, W: Width 2. Disregard if out of A.A. 
		$\phi \leq 0.20\text{mm}$	Disregard	
		$0.20\text{mm} < \phi \leq 0.30\text{mm}$	2	
		$0.30\text{mm} < \phi \leq 0.50\text{mm}$	1	
		$0.50\text{mm} < \phi$	0	



FPC			
No	Item	Criteria	Remark
1	Copper peeling (Minor)	Copper peeling 【Reject】	

Silicon			
No	Defect	Criteria	Remark
1	Amount of silicon (Minor)	ITO exposed 【Reject】	

Touch Panel				
No	Defect	Criteria		Remark
1	Dirty Spots, Round type (Minor)	Defect Spec.	Permissible Q'ty	1: $\phi = (L+W)/2$ , L: Length, W: Width 2: Disregard if out of V.A. 
		$\phi \leq 0.1\text{mm}$	Disregard	
		$0.1\text{mm} < \phi \leq 0.2\text{mm}$	5	
		$0.2\text{mm} < \phi \leq 0.3\text{mm}$	3	
		$\phi > 0.3\text{mm}$	0	
2	Scratches (Minor)	Defect Spec.	Permissible Q'ty	1: L: Length, W: Width 2: Disregard if out of V.A. 
		$L \leq 5.0\text{mm}, W \leq 0.03\text{mm}$	Disregard	
		$L \leq 2.0\text{mm}, W \leq 0.1\text{mm}$	2	
		$L > 2.0\text{mm}, W > 0.1\text{mm}$	0	
3	Line defect (Minor)	Defect Spec.	Permissible Q'ty	1: L: Length, W: Width 2: Disregard if out of V.A. 
		$L < 10\text{mm}, W < 0.05\text{mm}$	Disregard	
		$L < 10\text{mm}, 0.05\text{mm} \leq W \leq 0.10\text{mm}$	4	
		$0.10\text{mm} \leq W$	0	



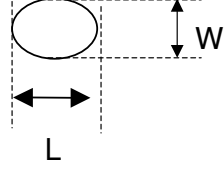
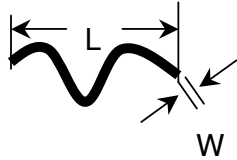
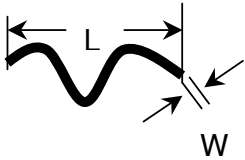


No	Defect	Criteria		Remark
4	Corner chip (Minor)	$X \leq 3.0\text{mm}, Y \leq 3.0\text{mm}, Z \leq T$		
5	Edge chip (Minor)	$X \leq 3.0\text{mm}, Y \leq 3.0\text{mm}, Z \leq T$		
6	Crack (Minor)	Not allowed		
7	Newton's ring (Minor)	Defect Spec.	Permissible Q'ty	Under day light 
		$\phi \leq 7\text{mm}$	Disregard	
		$\phi > 7\text{mm}$	0	

#### 12.6.2. Visual inspection criterion in electrical display

LCM Electrical defect				
No	Defect	Criteria		Remark
1	No display (Major)	Not allowable		
2	Missing line (Major)	Not allowable		
3	Darker or lighter line (Major)	By limited sample		



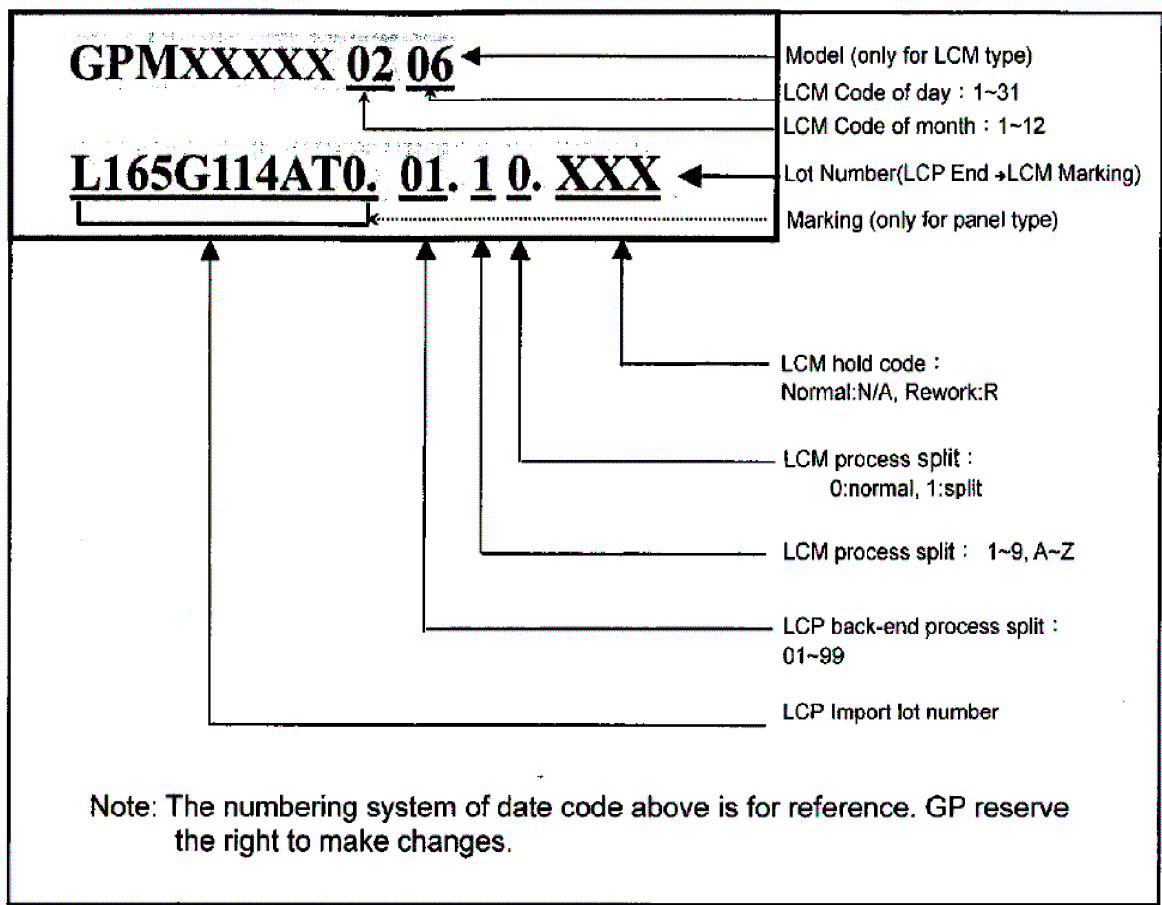
No	Defect	Criteria		Remark
4	Dot defect (Major)	Spec.	Permissible Qty	1: 1dot=1R or 1G or 1B 2: Dot defect area $\geq 1/2$ dot 3: Disregard if out of AA area
		Bright dot	1	
		Dark dot	2	
5	Mura (Minor)	By limited sample		
6	Dirty Spots, Round type (Minor)	Defect Spec.	Permissible Q'ty	1: $\phi = (L+W)/2$ , L: Length, W: Width 2: Disregard if out of V.A. 
		$\phi \leq 0.1\text{mm}$	Disregard	
		$0.1\text{mm} < \phi \leq 0.2\text{mm}$	5	
		$0.2\text{mm} < \phi \leq 0.3\text{mm}$	3	
		$\phi > 0.3\text{mm}$	0	
7	Scratches (Minor)	Defect Spec.	Permissible Q'ty	1: L: Length, W: Width 2: Disregard if out of V.A. 
		$L \leq 5.0\text{mm}, W \leq 0.03\text{mm}$	Disregard	
		$L \leq 2.0\text{mm}, W \leq 0.1\text{mm}$	2	
		$L > 2.0\text{mm}, W > 0.1\text{mm}$	0	
8	Line defect (Minor)	Defect Spec.	Permissible Q'ty	1: L: Length, W: Width 2: Disregard if out of V.A. 
		$L < 10\text{mm}, W < 0.05\text{mm}$	Disregard	
		$L < 10\text{mm}, 0.05\text{mm} \leq W \leq 0.10\text{mm}$	4	
		$0.10\text{mm} \leq W$	0	

### 12.6.3.Others

1. Issues that are not defined in this document shall be discussed and agreed with both parties. (Customer and supplier)
2. Unless otherwise agreed upon in writing, the criteria shall be applied to both parties. (Customer and supplier)

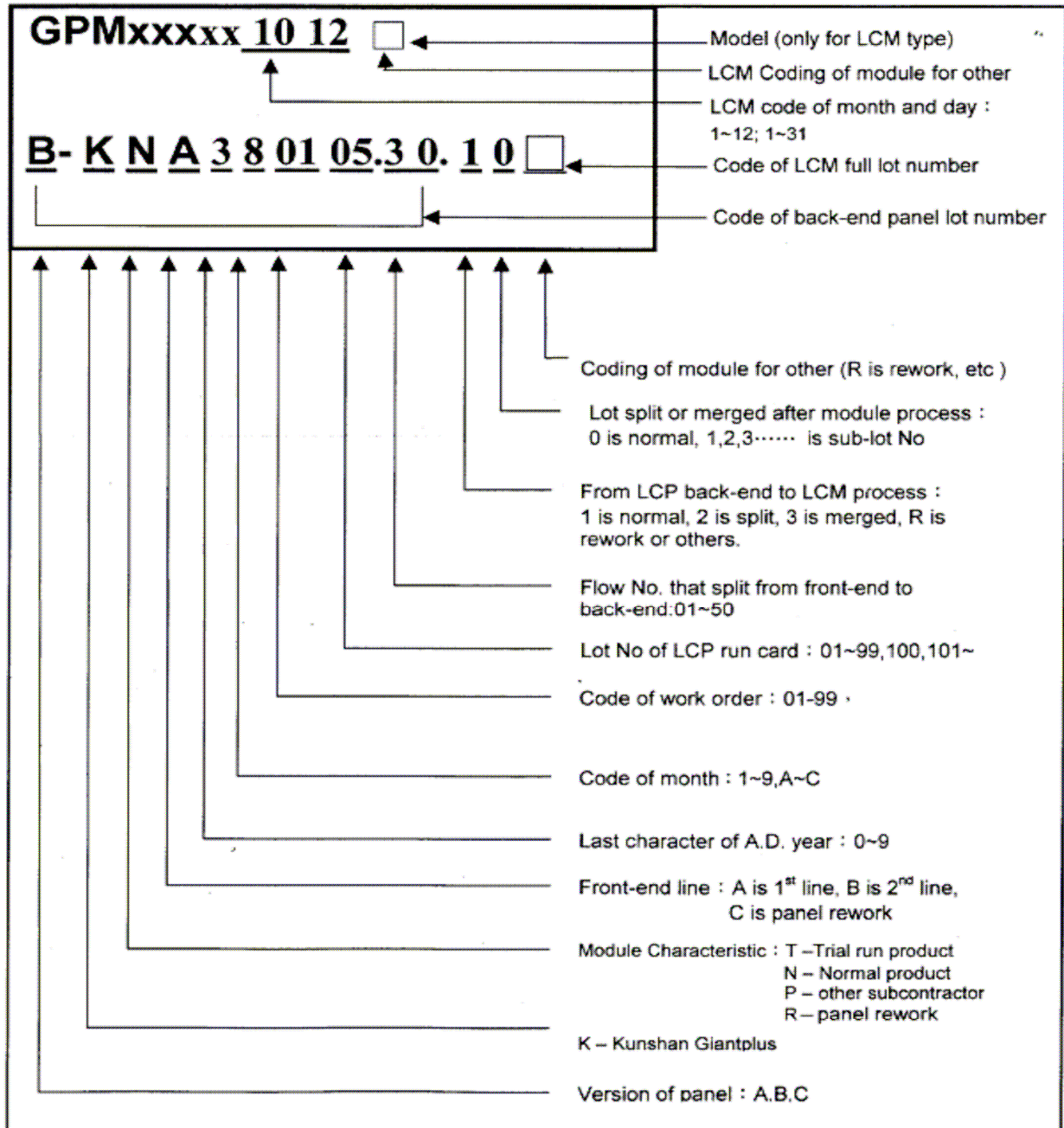


### 13.ILLUSTRATION OF LCD DATE CODE(GP)





## 14. ILLUSTRATION OF LCD DATE CODE (KGP)





## 15. RoHS COMPLIANT WARRANTY

RoHS Hazardous substances including:

- Cd < 100 ppm
- Pb < 1000 ppm
- Hg < 1000 ppm
- Cr +6 < 1000 ppm
- PBDE < 1000 ppm
- PBB < 1000 ppm

## 16. PRECAUTIONS FOR USE

### 16.1. Safety

- (1) Do not swallow any liquid crystal, even if there is no proof that liquid crystal is poisonous.
- (2) If the LCD panel breaks, be careful not to get liquid crystal to touch your skin.
- (3) If skin is exposed to liquid crystal, wash the area thoroughly with alcohol or soap.

### 16.2. Storage Conditions

- (1) Store the panel or module in a dark place where the temperature is  $23 \pm 5^{\circ}\text{C}$  and the humidity is below  $50 \pm 20\% \text{RH}$ .
- (2) Store in anti-static electricity container.
- (3) Store in clean environment, free from dust, active gas, and solvent.
- (4) Do not place the module near organics solvents or corrosive gases.
- (5) Do not crush, shake, or jolt the module.
- (6) Do not exposed to direct sun light of fluorescent lamps.

### 16.3. Installing LCD Module

Attend to the following items when installing the LCM.

- (1) Cover the surface with a transparent protective plate or touch panel to protect the polarizer and LC cell.
- (2) When assembling the LCM into other equipment, the spacer to the bit between the LCM and the fitting plate should have enough height to avoid causing stress to the module surface, refer to the individual specifications for measurements. The measurement tolerance should be  $\pm 0.1 \text{mm}$ .



## 16.4.Precautions For Operation

- (1) Viewing angle varies with the change of liquid crystal driving voltage ( $V_o$ ). Adjust  $V_o$  to show the best contrast.
- (2) Driving the LCD in the voltage above the limit will shorten its lifetime.
- (3) Response time is greatly delayed at temperature below the operating temperature range. However, this does not mean the LCD will be out of the order. It will recover when it returns to the specified temperature range.
- (4) When turning the power on, input each signal after the positive/negative voltage becomes stable.
- (5) Do not apply water or any liquid on product which composed of T/P.

## 16.5.Handling Precautions

- (1) Avoid static electricity which can damage the CMOS LSI; please wear the wrist strap when handling.
- (2) The polarizing plate of the display is very fragile. so, please handle it very carefully.
- (3) Do not give external shock.
- (4) Do not apply excessive force on the surface; it may cause display abnormal .
- (5) Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the surface of plate.
- (6) Do not use ketonics solvent & Aromatic solvent, use with a soft cloth soaked with a cleaning naphtha solvent.
- (7) Do not operate it above the absolute maximum rating.
- (8) Do not remove the panel or frame from the module.
- (9) Do not apply water or any liquid on product, which composed of T/P.

## 16.6.Warranty

- (1) The period is within 12 months since the date of shipping out under normal using and storage conditions.
- (3) The warranty will be avoided in case of defect induced by customer.



## 17.FACTORY

For the consideration of mass production convenience, this model will be manufactured in the factories listed below.

FACTORY NAME: GIANTPLUS TECHNOLOGY CO., LTD

FACTORY ADDRESS: 15 Industrial Rd., Lu-Chu Li, Toufen Town  
351 Miao-Li County, Taiwan, R.O.C..

FACTORY PHONE: TEL: 886-37-611-611 FAX: 886-37-613-166

FACTORY NAME: KUNSHAN GIANTPLUS OPTOELECTRONICS  
TECHNOLOGY CO., LTD.

FACTORY ADDRESS: KunShan City, JiangShu Province, China.

FACTORY PHONE: TEL:86-512-57780-988 FAX : 86-512-57780-503

FACTORY NAME: SHENZHEN GIANTPLUS OPTOELEC. DISPLAY CO., LTD.

FACTORY ADDRESS: Building A, Distict A ,MinZhu99 Industrial City,  
ShaJing Industrial Park, BaoAn District, ShenZhen, China

FACTORY PHONE: TEL: 86-755-29720-088 FAX : 86-755-29720-828

## 18.REVISION HISTORY

Version	Revise record	Date
A	New version	2007/12/18