US Micro Products
Electronic Products for the OEM

TFT-LCD PRODUCT SPECIFICATION

PART NUMBER:	**USMP-TT022TR-01C-TP**
DESCRIPTION:	2.2" TFT LCD with 176 x 220 resolution, White LED B/L, 8 bits data bus(80-system) Interface & Touch Panel.

ISSUE DATE	APPROVED BY (Customer Use Only)	CHECKED BY	PREPARED BY
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History of Version

Date (mm / dd / yyyy)	Ver.	Edi.	Description	Page	Design by
08/08/2008	01	001	New Drawing	-	Zhou zili
09/09/2008	01	002	First sample	-	Yangdongli
10/16/2008	01	003	Modify The TP Characteristics	10	Yangdongli
10/22/2008	01	004	Mass production	-	Yangdongli

Total: 27Page

Contents

1. SPECIFICATIONS

1.1 Features

Main LCD panel

Item	Standard Value
Display Type	176*(RGB)*220 DOTS
LCD Type	a-si TFT,Positive,Transmissive Type
Screen size(inch)	2.2″(Diagonal)
Viewing Direction	12H
Color configuration	R,G,B vertical stripe
Backlight	White LED B/L
Interface	8 bits data bus(80-system)
Other(controller/driver IC)	HX8340B(Support 65K,262K colors)

1.2 Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension	40.9(W)*55.1(L)*3.8(H)(max)(Exclude Double Tape)	mm

LCD panel

Item	Standard Value	Unit
Active Area	34.848(W)*43.56(L)	mm

Touch panel

Item	Standard Value	Unit
Viewing Area	36.45(W)*49.25(L)	mm
Active Area	35.85(W)*48.65(L)	mm

Note : For detailed information please refer to LCM drawing

1.3 Absolute Maximum Ratings

Module

Item	Symbol	Condition	Min.	Max.	Unit
System Power Supply Voltage	VDD	-	-0.3	+3.6	V
	VGH-GND	-	+10	+15.3	V
	GND-VGL	-	+7.5	+13.5	V
Input Voltage	Vt	-	-0.3	VDD+0.5	V
Operating Temperature	T_{OP}	-	-20	+70	°C
Storage Temperature	T_{ST}	-	-30	+80	°C
Storage Humidity	HD	Ta < 60 °C	-	90	%RH

1.4 DC Electrical Characteristics

Module GND = 0V, Ta = 25°C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply Voltage	VDD	-	2.6	2.8	3.0	V
Input High Voltage	V_{IH}	-	0.7* VDD	-	VDD	V
Input Low Voltage	V_{IL}	-	GND	-	0.3* VDD	V
Output High Voltage	V_{OH}	-	0.8* VDD	-	VDD	V
Output Low Voltage	V_{OL}	-	GND	-	0.2* VDD	V
Supply Current	IDD	VCI connect to VDD= 2.8V, Pattern=black display *1	-	2.5	6.0	mA
	IDD	VCI connect to VDD= 2.8V Pattern=white display	-	2.2	-	mA

Note:

1,Maximum current display.

1.5 Optical Characteristics

TFT LCD Panel VDD=2.8V, Ta=25°C

Item		Symbol	Condition	Min.	Typ.	Max.	unit	
Response time		Tr + Tf	Ta = 25°C	-	35	55	ms	Note2
Viewing angle (CR≧10)	Top	θY+	Contrast Maximum direction	-	50	-	Deg.	Note4
	Bottom	θY-		-	45	-		
	Left	θX-		-	50	-		
	Right	θX+		-	50	-		
Contrast ratio		CR	Ta = 25°C	200	250	-	-	Note3
Color of CIE Coordinate (With LCD&T/P)	White	X		0.24	0.29	0.34	-	Note1
		Y		0.28	0.33	0.38		
	Red	X		0.56	0.61	0.66		
		Y		0.29	0.34	0.39		
	Green	X		0.27	0.32	0.37		
		Y		0.55	0.60	0.65		
	Blue	X		0.09	0.14	0.19		
		Y		0.04	0.09	0.14		
Average Brightness Pattern=white display (With LCD&T/P)		IV	IF=60mA	160	190	-	cd/m^2	Note1
Uniformity (With LCD&T/P)		△B	IF= 60mA	80	-	-	%	Note1
NTSC			63.8				%	-

Note1:

*1：△B=B(min) / B(max) * 100%

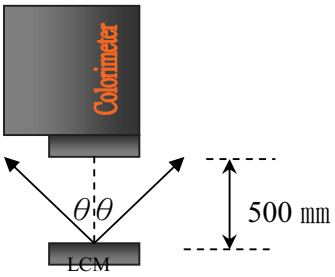
*2：Measurement Condition for Optical Characteristics:

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

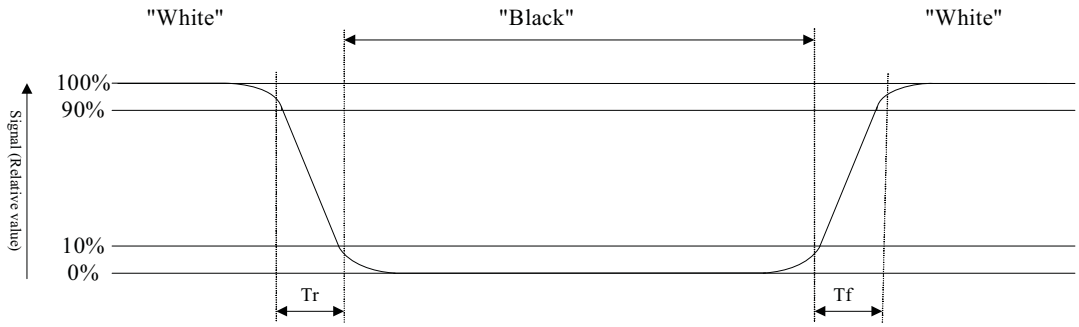
To be measured at the center area of panel with a viewing cone of 1° by Topcon luminance meter BM-7, after 10 minutes operation (module)

Note2: Definition of response time:

The output signals of photo detector are measured when the input signals are changed from “black” to “white”(falling time) and from “white” to “black”(rising time), respectively. The response time is defined as the time interval between the 10% and 90% of Amplitudes.

Refer to figure as below:

Normally White



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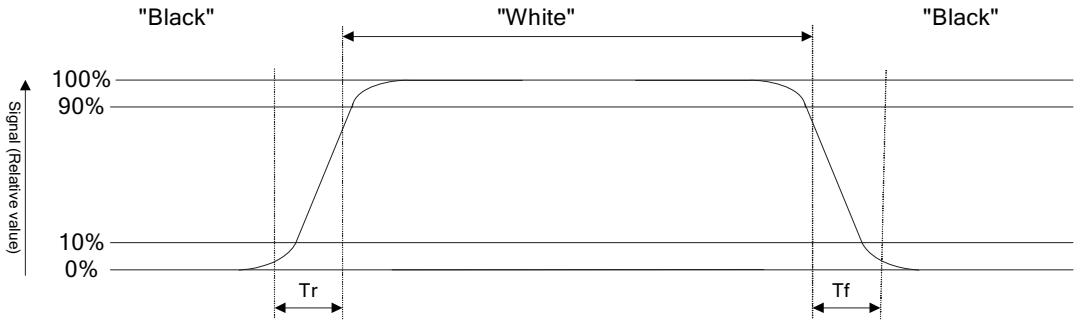
Normally Black



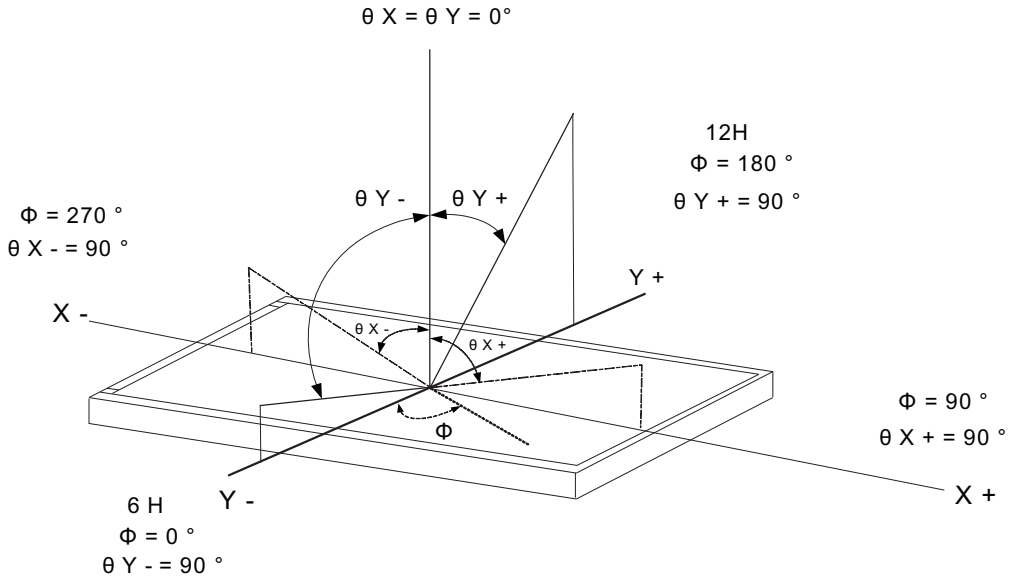
Note3: Definition of contrast ratio:

Contrast ratio is calculated with the following formula

$$\text{Contrast ratio (CR)} = \frac{\text{Photo detector output when LCD is at “White” state}}{\text{Photo detector output when LCD is at “Black” state}}$$

Note4: Definition of viewing angle:

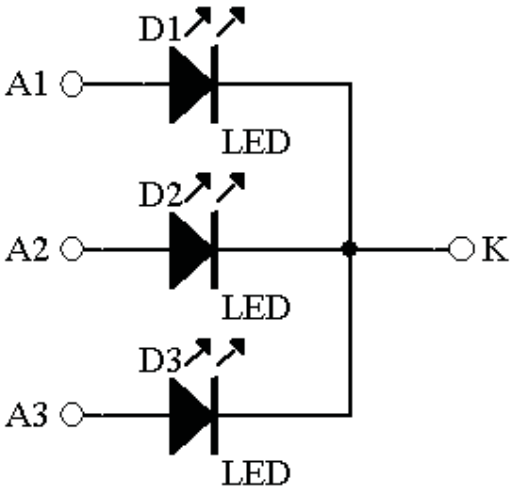
Refer to figure as below:



1.6 Backlight & LED Characteristics

Electrical / Optical Characteristics

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Current	IF	Ta =25°C	-	60	-	mA
Forward Voltage	VF	IF= 60mA	-	3.3	3.6	V



1.7 Touch Panel Characteristics

1	Transparency	80%
2	Hardness	≧3H
3	Electrical Specifications	1. Operating Voltage 5.0V (DC) 2. Circuit close resistance X : 250~510Ω Y : 220~530Ω 3. Circuit open resistance > 20 MΩ at 25V DC
4	Linearity Tolerance :	Less than 1.5%
5	Environment Conditions	Operating Temperature -20°C ~ +70°C Storage Temperature -30°C ~ +80°C (20~ 90% RH)

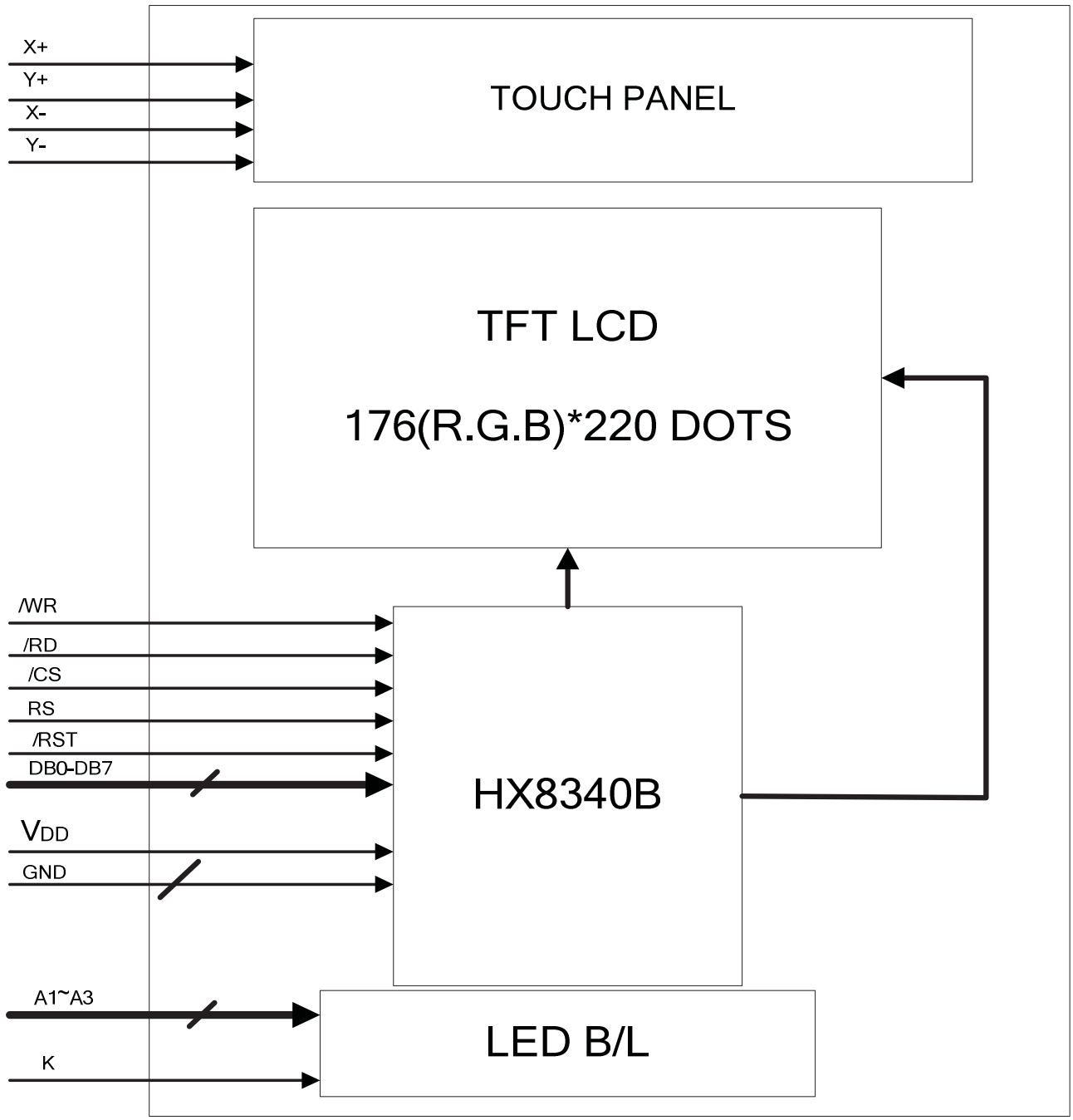
2. MODULE STRUCTURE

2.1 Counter Drawing

2.1.1 LCM Mechanical Diagram

* See Appendix

2.1.2 Block Diagram

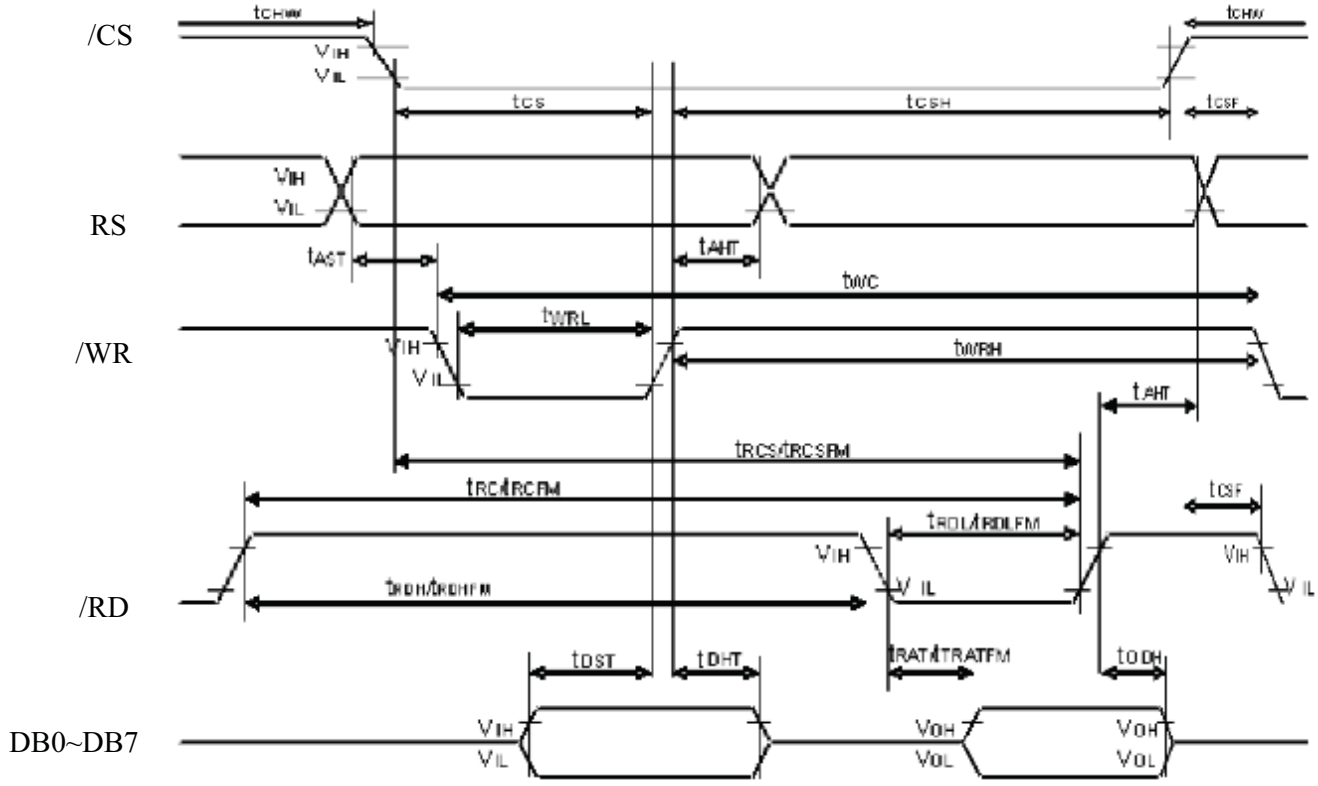


2.2 Interface Pin Description

Pin No.	Symbol	Function
1	GND	System ground. (0V)
2	X+	Touch Panel Data Bus.
3	Y+	Touch Panel Data Bus.
4	X-	Touch Panel Data Bus.
5	Y-	Touch Panel Data Bus.
6	GND	System ground. (0V)
7	VDD	Power supply. (+2.8V)
8	/CS	Chip select signal. Active at 'L'.
9	RS	Register select signal. When RS='L': Select a index or a status register; When RS='H': select a control register.
10	/WR	Write strobe signal. Active at 'L'.
11	/RD	Read strobe signal. Active at 'L'.
12	DB0	8-bit parallel data bus for MPU system interface mode.
13	DB1	
14	DB2	
15	DB3	
16	DB4	
17	DB5	
18	DB6	
19	DB7	
20	/RST	Reset signal. Active at 'L'. Be sure to execute a power-on reset after supplying power.
21	GND	System ground. (0V)
22	A1	Power supply for LED Backlight anode input.
23	A2	Power supply for LED Backlight anode input.
24	A3	Power supply for LED Backlight anode input.
25	K	Power supply for LED Backlight cathode input.
26	NC	Not connect.

2.3 Timing Characteristics

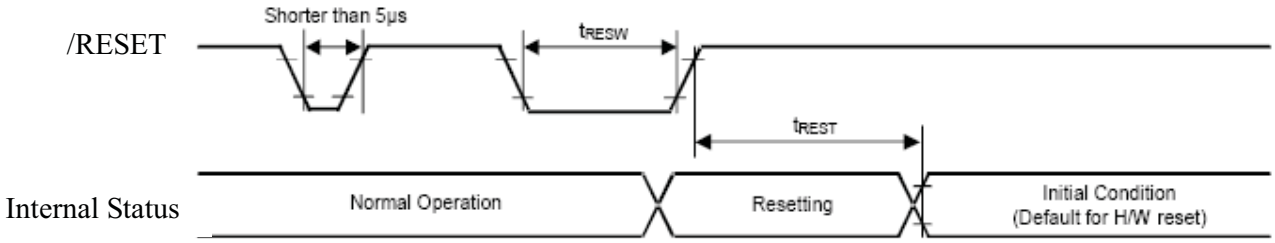
8080-System Bus Interface



VDD=2.8V

Signal	Symbol	Parameter	Min.	Max.	Unit	Description
RS	t_{AST}	Address setup time	0	-	ns	-
	t_{AHT}	Address hold time (Write/Read)	10	-		
/CS	t_{CHW}	Chip select "H" pulse width	0	-	ns	-
	t_{CS}	Chip select setup time (Write)	15	-		
	t_{RCS}	Chip select setup time (Read ID)	45	-		
	t_{RCSFM}	Chip select setup time (Read FM)	355	-		
	t_{CSF}	Chip select wait time (Write/Read)	10	-		
	t_{CSH}	Chip select hold time	10	-		
/WR	t_{WC}	Write cycle	66	-	ns	-
	t_{WRH}	Control pulse "H" duration	15	-		
	t_{WRL}	Control pulse "L" duration	15	-		
/RD(ID)	t_{RC}	Read cycle (ID)	160	-	ns	When read ID data
	t_{RDH}	Control pulse "H" duration (ID)	90	-		
	t_{RDL}	Control pulse "L" duration (ID)	45	-		
/RD(FM)	t_{RCFM}	Read cycle (FM)	450	-	ns	When read from frame memory
	t_{RDHFM}	Control pulse "H" duration (FM)	90	-		
	t_{RDLFM}	Control pulse "L" duration (FM)	355	-		
DB0~DB7	t_{DST}	Data setup time	10	-	ns	For maximum C_L=30pF For minimum C_L=8pF
	t_{DHT}	Data hold time	10	-		
	t_{RAT}	Read access time (ID)	-	40		
	t_{RATFM}	Read access time (FM)	-	340		
	t_{ODH}	Output disable time	20	80		

Reset Timing



VDD=2.8V

Symbol	Parameter	Related Pins	Min.	Typ.	Max.	Note	Unit
tRESW	Reset low pulse width	NRESET	10	-	-	-	µs
tREST	Reset complete time	-	-	-	5	When reset applied during Sleep In mode	ms
		-		-	120	When reset applied during Sleep Out mode	ms

2.4 Initial Code

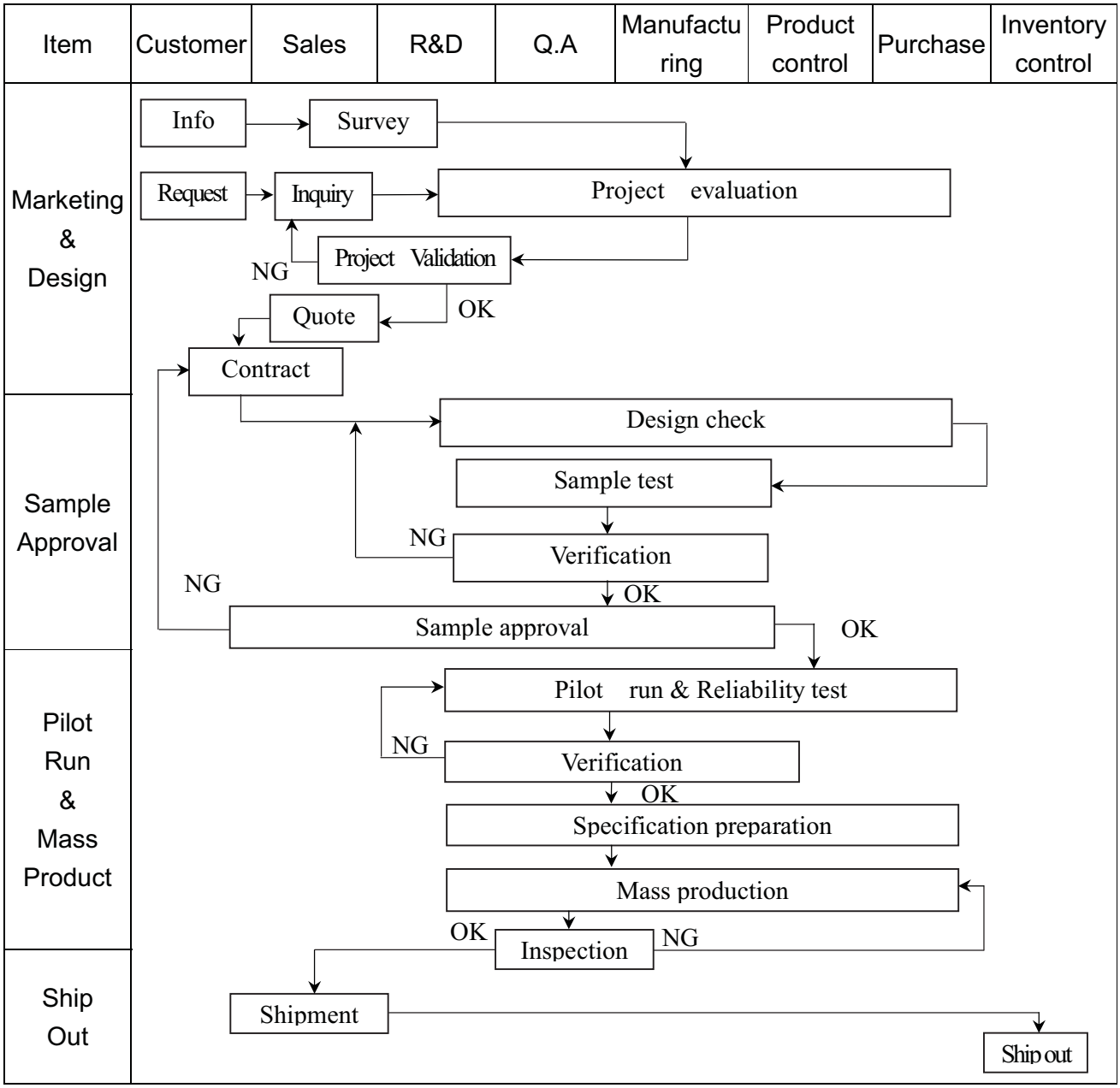
```
/*176(RGB)*220 2.2”TFT,IC:HX8340B,8080:8bits data bus*/
        //Driving ability Setting
      write  comm(0x60); //PTBA[15:8]
      write  data(0x00);
      write  comm(0x61); //PTBA[7:0]
      write  data(0x06);
      write  comm(0x62); //STBA[15:8]
      write  data(0x00);
      write  comm(0x63); //STBA[7:0]
      write  data(0xC8);
      write  comm(0x73); //OPON[7:0],SET OPON=70h, default 38h
      write  data(0x70);
      //Gamma 2.2 Setting
      write  comm(0x40);
      write  data(0x00);
      write  comm(0x41);
      write  data(0x40);
      write  comm(0x42);
      write  data(0x45);
      write  comm(0x43);
      write  data(0x01);
      write  comm(0x44);
      write  data(0x60);
      write  comm(0x45);
```

```
write  data(0x05);
write  comm(0x46);
write  data(0x0C);
write  comm(0x47);
write  data(0xD1);
write  comm(0x48);
write  data(0x05);
write  comm(0x50);
write  data(0x75);
write  comm(0x51);
write  data(0x01);
write  comm(0x52);
write  data(0x67);
write  comm(0x53);
write  data(0x14);
write  comm(0x54);
write  data(0xF2);
write  comm(0x55);
write  data(0x07);
write  comm(0x56);
write  data(0x03);
write  comm(0x57);
write  data(0x49);
//Power Voltage Setting
write  comm(0x1F); //VRH=4.65V
write  data(0x03);
write  comm(0x20); //BT (VGH~15V,VGL~-12V,DDVDH~5V)
write  data(0x00);
write  comm(0x24); //VMH(VCOM High voltage3.2V)
write  data(0x1C);
write  comm(0x25); //VML(VCOM Low voltage -1.2V)
write  data(0x34);
//****VCOM offset**///
write  comm(0x23); //for Flicker adjust //can reload from OTP
write  data(0x2F);
//Power on Setting
write  comm(0x18); //I/P  RADJ,N/P  RADJ, Normal mode 60Hz
write  data(0x44);
write  comm(0x21); //OSC  EN='1', start Osc
```

```
write  data(0x01);
write  comm(0x01); //SLP='0', out sleep
write  data(0x00);
write  comm(0x1C); //AP=011
write  data(0x03);
write  comm(0x19); // VOMG=1,PON=1, DK=0,
write  data(0x06);
delayms(5);
//Display ON Setting
write  comm(0x26); //PT=10,GON=0, DTE=0, D=0100
write  data(0x84);
delayms(40);
write  comm(0x26); //PT=10,GON=1, DTE=1, D=1000
write  data(0xB8);
delayms(40);
write  comm(0x26); //PT=10,GON=1, DTE=1, D=1100
write  data(0xBC);
//Set GRAM Area
write  comm(0x02);
write  data(0x00);
write  comm(0x03); //Column Start
write  data(0x00);
write  comm(0x04);
write  data(0x00);
write  comm(0x05); //Column End
write  data(0xAF);
write  comm(0x06);
write  data(0x00);
write  comm(0x07); //Row Start
write  data(0x00);
write  comm(0x08);
write  data(0x00);
write  comm(0x09); //Row End
write  data(0xDB);
write  comm(0x16);    //set the display memory mode
write  data(0x08);
write  comm(0x17);
write  data(0x55);
write  comm(0x22); //Start GRAM write
```

3. QUALITY ASSURANCE SYSTEM

3.1 Quality Assurance Flow Chart



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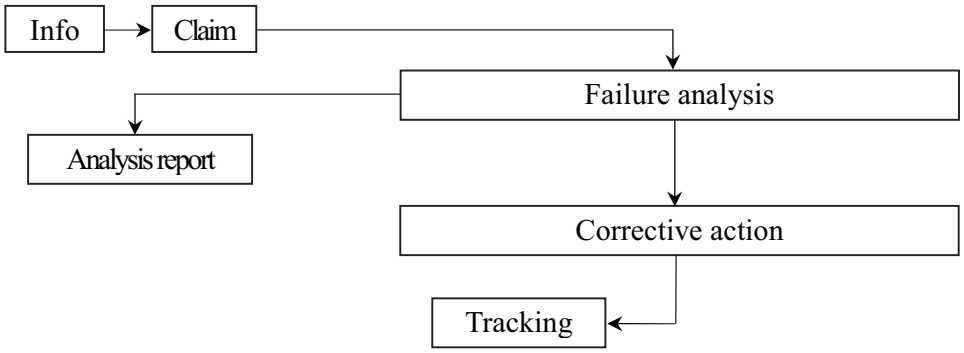
Item	Customer	Sales	R&D	Q.A	Manufacturing	Product control	Purchase	Inventory control
Sales Service								
Q.A Activity	1. ISO 9001 Maintenance Activities 2. Process improvement proposal 3. Equipment calibration 4. Education And Training Activities 5. Standardization Management							

3.2 Inspection Specification

◆Scope ：The document shall be applied to TFT-LCD Module for less than 3.5″ (Ver:B01).

◆Inspection Standard：MIL-STD-105E Table Normal Inspection Single Sampling Level Ⅱ.

◆Equipment：Gauge、MIL-STD、Sample

◆Defect Level：Major Defect AQL： 0.4 ； Minor Defect AQL： 1.5

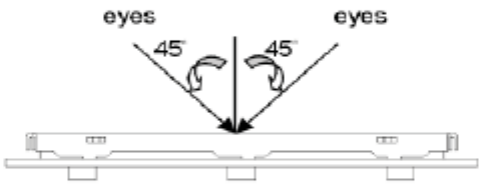
◆OUT Going Defect Level：Sampling.

◆Standard of the product appearance test：

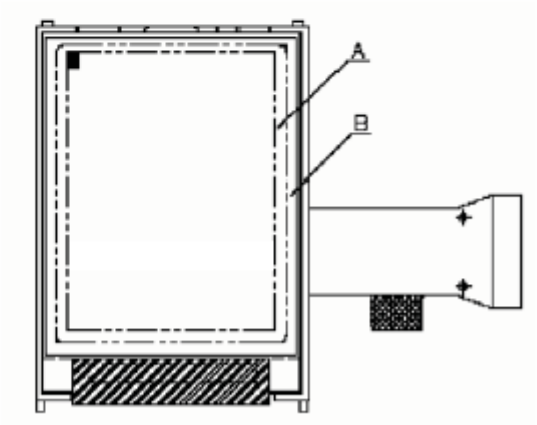
a. Manner of appearance test：

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

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



(3). Definition of area.



A area：viewing area

B area：Outside of viewing area

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

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◆Specification For TFT-LCD Module Less Than 3.5" : (Ver. 03)

<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td rowspan="3">01</td><td rowspan="3">Product condition</td><td>1. 1The part number is inconsistent with work order of production.</td><td>Major</td></tr>
<tr><td>1. 2 Mixed product types.</td><td>Major</td></tr>
<tr><td>1. 3 Assembled in inverse direction.</td><td>Major</td></tr>
<tr><td>02</td><td>Quantity</td><td>2. 1The quantity is inconsistent with work order of production.</td><td>Major</td></tr>
<tr><td>03</td><td>Outline dimension</td><td>3. 1 Product dimension and structure must conform to structure diagram.</td><td>Major</td></tr>
<tr><td rowspan="5">04</td><td rowspan="5">Electrical Testing</td><td>4. 1 Missing line character and icon.</td><td>Major</td></tr>
<tr><td>4. 2 No function or no display.</td><td>Major</td></tr>
<tr><td>4. 3 Display malfunction.</td><td>Major</td></tr>
<tr><td>4. 4 LCD viewing angle defect.</td><td>Major</td></tr>
<tr><td>4. 5 Current consumption exceeds product specifications.</td><td>Major</td></tr>
<tr><td>05</td><td>Dot defect
(Bright dot、Dark dot)
On -display</td><td>
<table>
<tr><th colspan="2">Item</th><th>Acceptance (Q'ty)</th></tr>
<tr><td rowspan="4">Dot Defect</td><td>Bright Dot</td><td>≦ 2</td></tr>
<tr><td>Dark Dot</td><td>≦ 3</td></tr>
<tr><td>Joint Dot</td><td>≦ 2</td></tr>
<tr><td>Total</td><td>≦ 3</td></tr>
</table>
5. 1 Inspection pattern：full white , full black , Red , Green and blue screens.
5. 2 It is defined as dot defect if defect area ＞1/2 dot.
5. 3 The distance between two dot defect ≧5 mm.
</td><td>Minor</td></tr>
</table>

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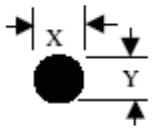
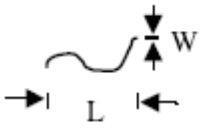
◆Specification For TFT-LCD Module Less Than 3.5" : (Ver. 03)

<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td>06</td><td>Black or white dot、scratch、contamination

Round type
 

Φ=(x+y) / 2

Line type
 
</td><td>6.1 Round type (Non-display or 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 ≦ 0.15</td><td>Ignore</td><td rowspan="5">Ignore</td></tr><tr><td>0.15 < Φ ≦ 0.20</td><td>2</td></tr><tr><td>0.20 < Φ ≦ 0.30</td><td>2</td></tr><tr><td>Φ > 0.30</td><td>0</td></tr><tr><td>Total</td><td>3</td></tr></table>
6.2 Line type(Non-display or display) :
<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>Ignore</td><td rowspan="4">Ignore</td></tr><tr><td>L ≦5.0</td><td>0.03 <W ≦ 0.05</td><td>3</td></tr><tr><td>---</td><td>W >0.05</td><td>As round type</td></tr><tr><td colspan="2">Total</td><td>3</td></tr></table></td><td>Minor</td></tr>
<tr><td>07</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>Ignore</td><td rowspan="4">Ignore</td></tr><tr><td>0.20 < Φ ≦ 0.50</td><td>3</td></tr><tr><td>Φ > 0.50</td><td>0</td></tr><tr><td>Total</td><td>3</td></tr></table></td><td>Minor</td></tr>
</table>

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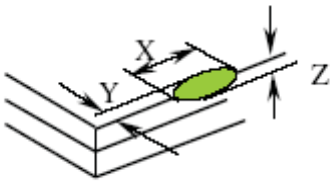
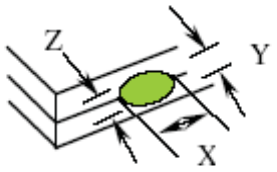
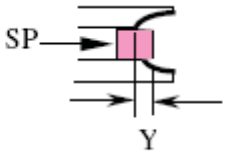
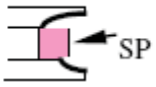
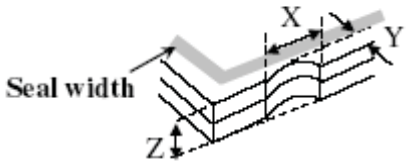
◆Specification For TFT-LCD Module Less Than 3.5" : (Ver. 03)

NO	Item	Criterion	Level
08	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 8.1 General glass chip : 8.1.1 Chip on panel surface and crack between panels:    【OK】  【NG】  	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

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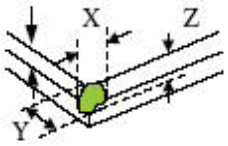
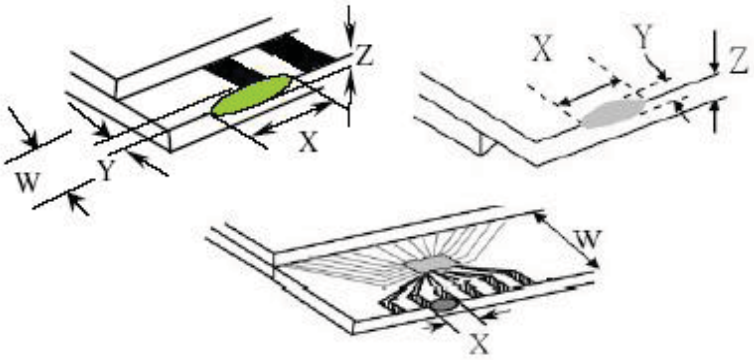
◆Specification For TFT-LCD Module Less Than 3.5" : (Ver. 03)

<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td>08</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

8.1.2 Corner crack :


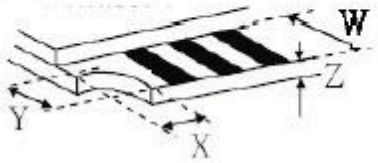
<table>
<tr><th>X</th><th>Y</th><th>Z</th></tr>
<tr><td>≦1/5 a</td><td>Crack can't enter viewing area</td><td>Z ≦ 1/2 t</td></tr>
<tr><td>≦1/5 a</td><td>Crack can't exceed the half of SP width.</td><td>1/2 t < Z ≦ 2 t</td></tr>
</table>
8.2 Protrusion over terminal :
8.2.1 Chip on electrode pad :


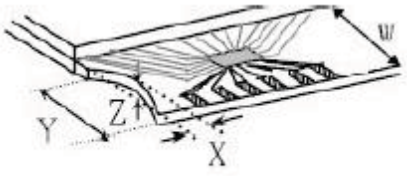
<table>
<tr><th></th><th>X</th><th>Y</th><th>Z</th></tr>
<tr><td>Front</td><td>≦ a</td><td>≦ 1/2 W</td><td>≦ t</td></tr>
<tr><td>Back</td><td>≦ a</td><td>≦ W</td><td>≦ 1/2 t</td></tr>
</table>
</td><td>Minor</td></tr>
</table>

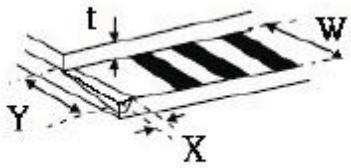
◆Specification For TFT-LCD Module Less Than 3.5" : (Ver. 03)

<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td>08</td><td>The crack of glass</td><td>
Symbols :

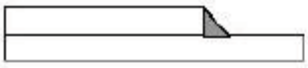
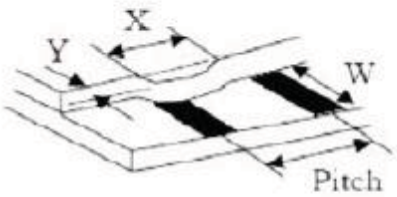
X : The length of crack　　Y : The width of crack.
Z : The thickness of crack　　W : terminal length
t : The thickness of glass　　a : LCD side length

8.2.2 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.

8.2.3 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>

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◆Specification For TFT-LCD Module Less Than 3.5" : (Ver. 03)

NO	Item	Criterion	Level
09	Backlight elements	9.1 Backlight can't work normally.	Major
		9.2 Backlight doesn't light or color is wrong.	Major
		9.3 Illumination source flickers when lit.	Major
10	General appearance	10.1 Pin type、quantity、dimension must match type in structure diagram.	Major
		10.2 No short circuits in components on PCB or FPC .	Major
		10.3 Parts on PCB or FPC must be the same as on the production characteristic chart .There should be no wrong parts , missing parts or excess parts.	Major
		10.4 Product packaging must the same as specified on packaging specification sheet.	Minor
		10.5 The folding and peeled off in polarizer are not acceptable.	Minor
		10.6 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.03

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	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%)
5	Temperature Cycling Storage Test	-20℃ → +25℃ → +70℃ → +25℃ (30mins) (5mins) (30mins) (5mins) 10 Cycle Surrounding temperature, then storage at normal condition 4hrs.
6	Vibration Test (Packaged)	1. Sine wave 10～55 Hz frequency (1 min) 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 1times

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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.

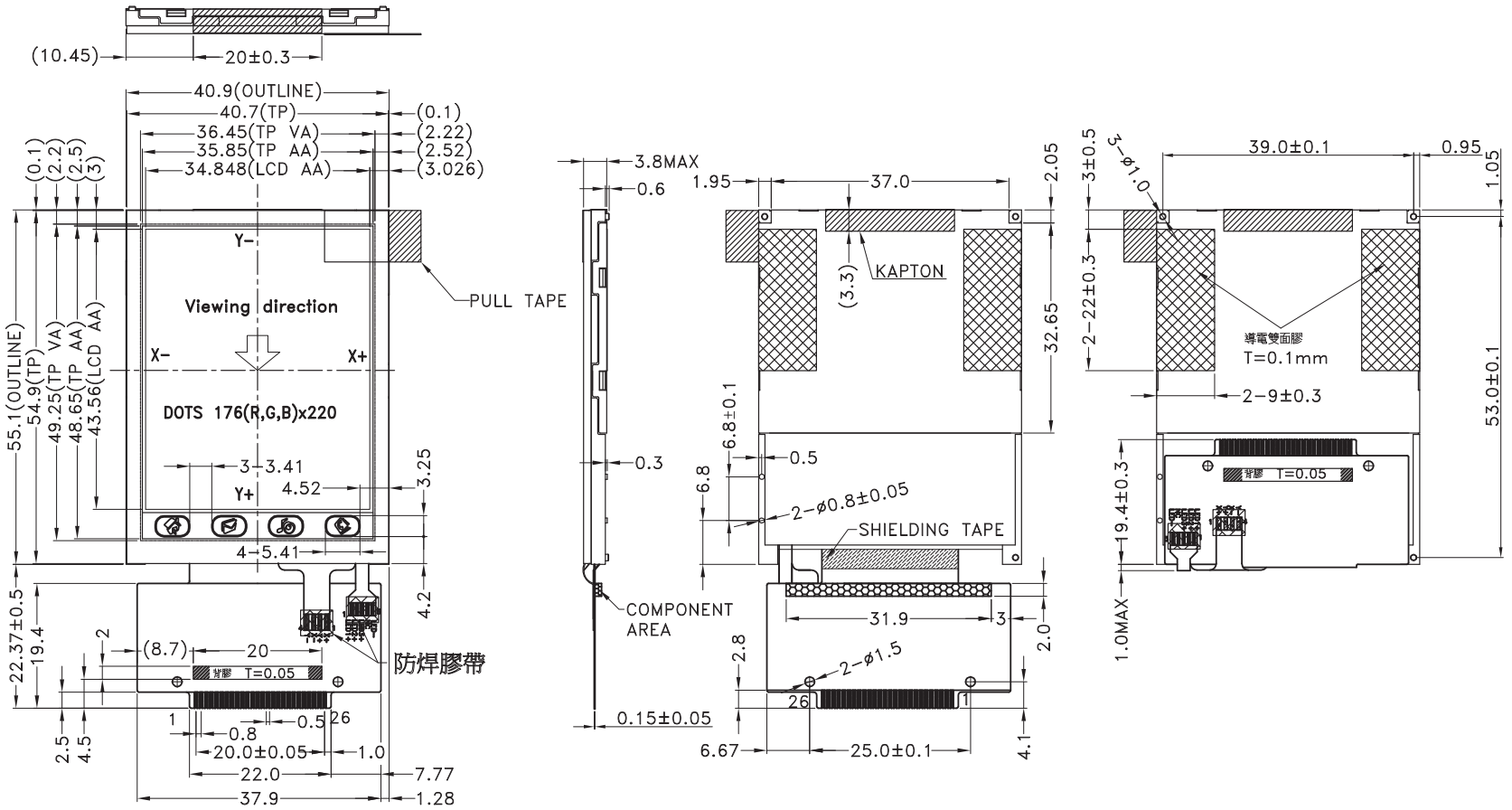
5.4 TERMS OF WARRANTY

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 and where extremely high levels of reliability are required.



NOTES:
1. THE TOLERANCE UNLESS CLASSIFIED±0.2mm
2. R=0.5±0.1mm FOR NOT ASSIGNED
3. DRIVER IC: HX8340B
4.THIS PRODUCT CONFORMS ROHS

REV	DESCRIPTION	DATE
001	NEW DRAWING	08'10.20

US Micro Products
Electronic Products for the OEM
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Tel:(800) 741-7755, sales@usmicroproducts.com
www.usmicroproducts.com

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圖面編號	DMD−08320	EDI 001			

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