



US Micro Products
Electronic Products for the OEM

TFT-LCD PRODUCT SPECIFICATION

PART NUMBER:	USMP-TT032WJ-01C-TP
DESCRIPTION:	3.2" TFT LCD with 320 x 480 resolution, White LED B/L 16-bit interface for DBI Type B, and Touch Panel.

ISSUE DATE	APPROVED BY (Customer Use Only)	CHECKED BY	PREPARED BY
PROPRIETARY NOTE:	THIS SPECIFICATION IS THE PROPERTY OF US MICRO PRODUCTS AND SHALL NOT BE REPRODUCED OR COPIED WITHOUT THE WRITTEN PERMISSION OF US MICRO PRODUCTS AND MUST BE RETURNED TO US MICRO PRODUCTS UPON ITS REQUEST.		

Contents

1. SPECIFICATIONS

- 1.1 Features
- 1.2 Mechanical Specifications
- 1.3 Absolute Maximum Ratings
- 1.4 DC Electrical Characteristics
- 1.5 Optical Characteristics
- 1.6 Backlight Characteristics

2. MODULE STRUCTURE

- 2.1 Counter Drawing
- 2.2 Interface Pin Description
- 2.3 Timing Characteristics

3. QUALITY ASSURANCE SYSTEM

- 3.1 Quality Assurance Flow Chart
- 3.2 Inspection Specification

4. RELIABILITY TEST

- 4.1 Reliability Test Condition

5. PRECAUTION RELATING PRODUCT HANDLING

- 5.1 Safety
- 5.2 Handling
- 5.3 Storage
- 5.4 Terms of Warranty

Appendix : 1. LCM Drawing

CONFIDENTIAL

1. SPECIFICATIONS

1.1 Features

Main LCD Panel

Item	Standard Value
Display Type	320* (R · G · B) * 480 Dots
LCD Type	a-Si TFT , Normally white TN mode , Transmissive
Screen size(inch)	3.2(Diagonal)
Viewing Direction	12 O'clock
Color configuration	R.G.B. vertical stripe
Backlight	White LED
Interface	16-bit interface for DBI Type B
Other(controller / driver IC)	ILI9481

1.2 Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension	51.5(W) * 78.5 (L) * 2.8(H)	mm

LCD Panel

Item	Standard Value	Unit
Viewing Area	46.64(W) * 68.96 (L)	mm
Active Area	44.64 (W) * 66.96(L)	mm

Note : For detailed information please refer to LCM drawing

CONFIDENTIAL

1.3 Absolute Maximum Ratings

Module					
Item	Symbol	Condition	Min.	Max.	Unit
System Power Supply Voltage	V _{CI}	-	-0.3	+4.6	V
	IOVCC		-0.3	+4.6	
	V _{GH}	-	-0.3	+18.5	V
	V _{GL}	-	-0.3	+18.5	V
Input Voltage	V _{IN}	-	-0.3	IOVCC+0.3	V
Operating Temperature	T _{OP}	-	-20	+70	°C
Storage Temperature	T _{ST}	-	-30	+80	°C
Storage Humidity	H _D	T _a ≅ 40 °C	20	90	%RH

1.4 DC Electrical Characteristics

Module						GND = 0V, T _a = 25°C	
Item	Symbol	Condition	Min.	Typ.	Max.	Unit	
Power Supply Voltage1	V _{CI}	-	-	2.8	-	V	
Power Supply Voltage2	IOVCC	-	-	2.8	-	V	
Input High Voltage	V _{IH}	-	0.7 *IOVCC	-	IOVCC	V	
Input Low Voltage	V _{IL}	-	0	-	0.3*IOVCC	V	
Output High Voltage	V _{OH}	IOH=-0.1mA	0.8*IOVCC	-	IOVCC	V	
Output Low Voltage	V _{OL}	IOL=0.1mA	0	-	0.2*IOVCC	V	
Supply Current	I _{DD}	VDD= 2.8V, Pattern=BLACK*1	-	12	18	mA	

Note1 : Maximum current display

CONFIDENTIAL

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 θX, θY = 0°	-	30	45	ms	Note2	
Viewing angle	Top	θY+	CR ≥ 10	-	50	-	Deg.	Note4
	Bottom	θY-		-	45	-		
	Left	θX-		-	50	-		
	Right	θX+		-	50	-		
Contrast ratio	CR		200	250	-	-	Note3	
Color of CIE Coordinate (With B/L)	White	X	Ta = 25°C θX, θY = 0°	0.23	0.28	0.33	-	Note1
		Y		0.25	0.30	0.35		
	Red	X		0.58	0.63	0.68		
		Y		0.29	0.34	0.39		
	Green	X		0.29	0.34	0.39		
		Y		0.56	0.61	0.66		
	Blue	X		0.1	0.15	0.2		
		Y		0.03	0.08	0.13		
Average Brightness Pattern=white display (With B/L)	IV	IF= 100mA	200	230	-	cd/m ²	Note1	
Uniformity (With B/L)	△B	IF= 100mA	80	-	-	%	Note1	

Note1:

1 : $\Delta B = B(\min) / B(\max) \times 100\%$

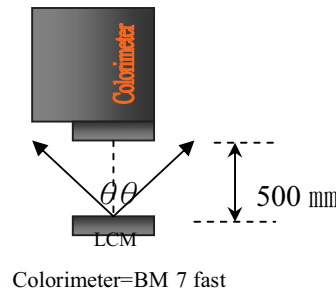
2 : Measurement Condition for Optical Characteristics:

a : Environment: 25°C±5°C / 60±20%R.H , no wind , dark room below 10 Lux at typical lamp current and typical operating frequency.

b : Measurement Distance: 500 ± 50 mm , (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%

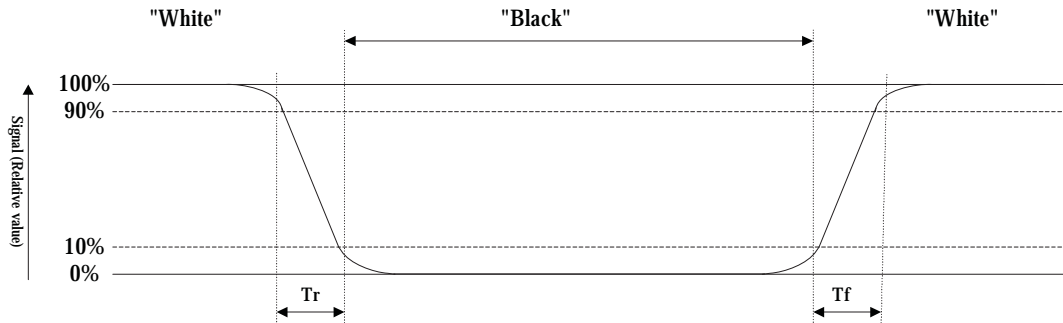


CONFIDENTIAL

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:



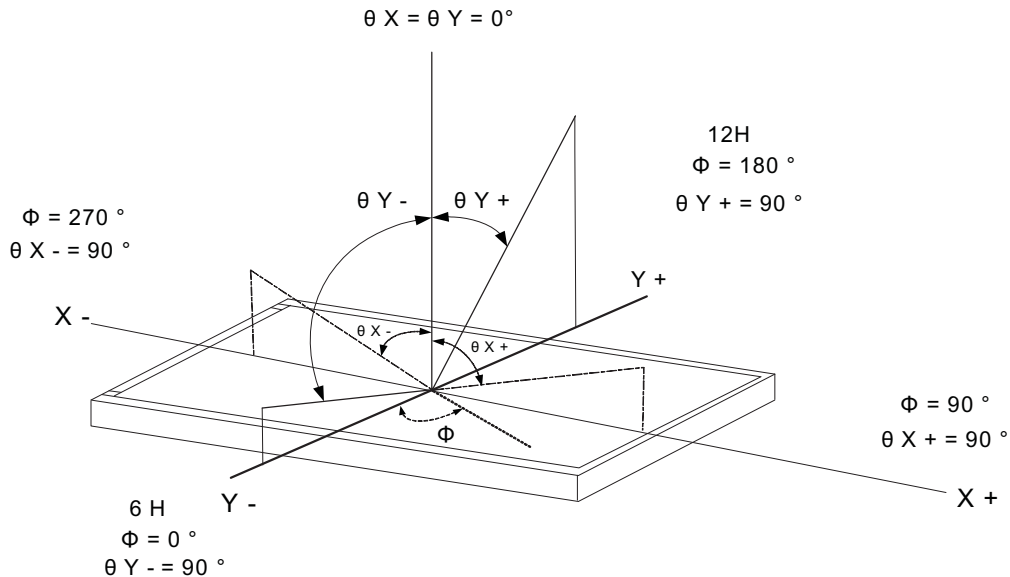
Note3: Definition of contrast ratio:

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:



CONFIDENTIAL

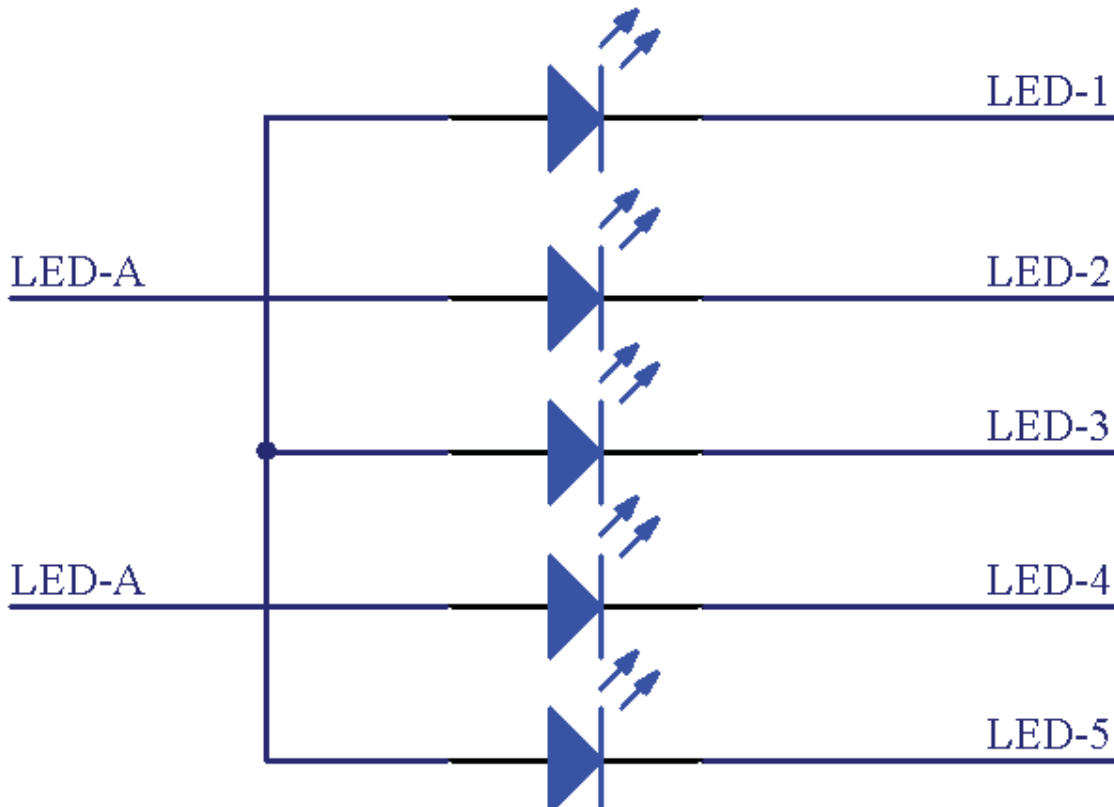
1.6 Backlight Characteristics

Maximum Ratings

Item	Symbol	Conditions	Min.	Max.	Unit
Forward Current	IF	Ta =25°C	-	150	mA
Forward Voltage	VF	Ta =25°C	-	4	V
Reverse Voltage	VR	Ta =25°C	-	5	V
Power Dissipation	PD	Ta =25°C	-	360	mW

Electrical / Optical Characteristics

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	VF	IF= 100mA	-	3.5	3.6	V
Average Brightness (without LCD)	IV	IF= 100mA	4500	4800	-	cd/m ²
Color of CIE Coordinate (without LCD)	X		0.24	0.27	0.30	-
	Y		0.24	0.27	0.30	
Color	White					



CONFIDENTIAL

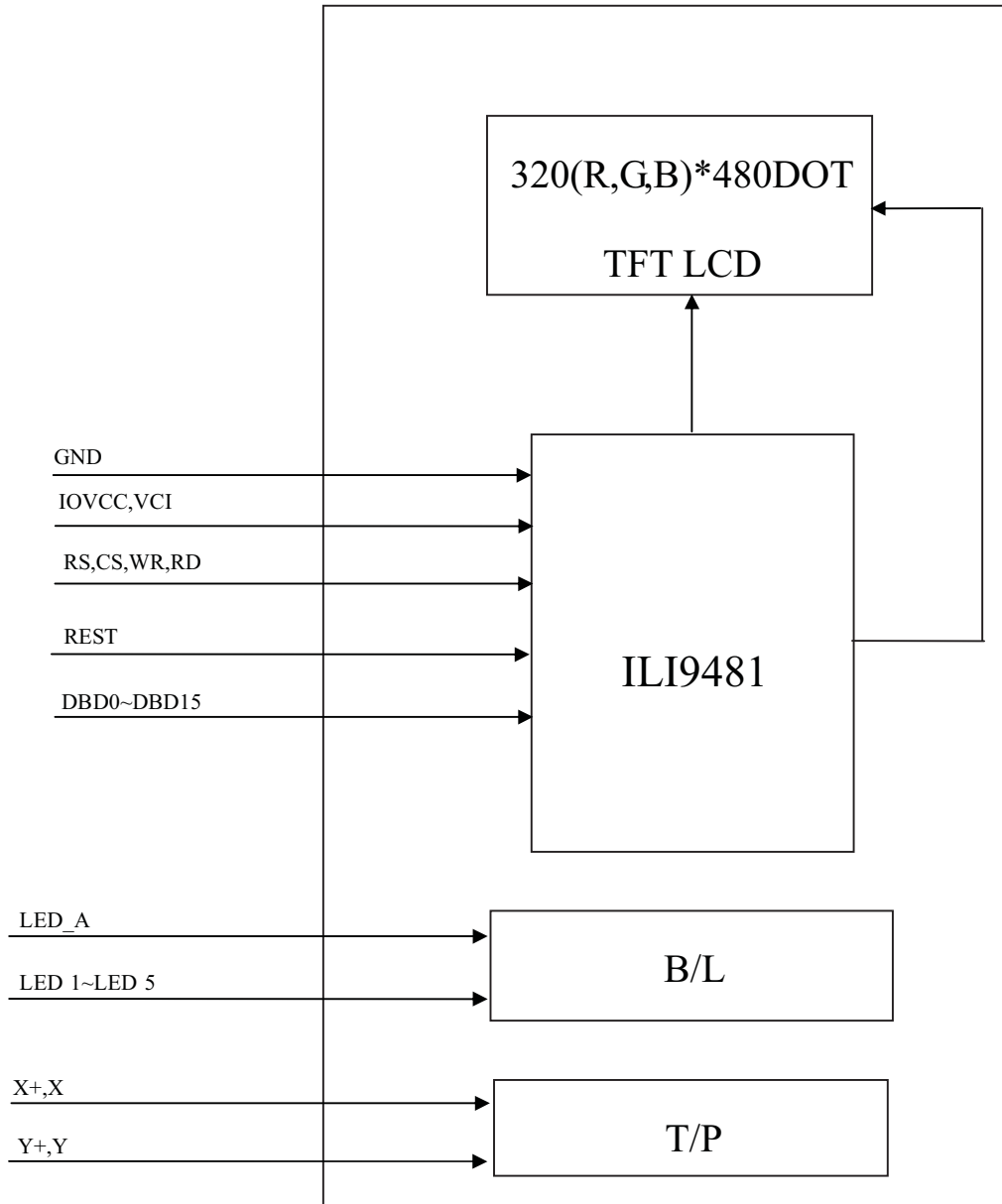
2. MODULE STRUCTURE

2.1 Counter Drawing

2.1.1 LCM Mechanical Diagram

* See Appendix

2.1.2 Block Diagram



CONFIDENTIAL

2.2 Interface Pin Description

Pin No.	Symbol	Function
1	GND	System ground.(0V)
2	IOVCC	Power supply.(2.8V)
3	VCI	Power supply.(2.8V)
4	CS	Chip select signal, active "L".
5	RS	Command/Display data selection. 0:Command 1:Display data
6	WR	Write signal input, active "L".
7	RD	Read signal input, active "L".
8	REST	Reset input pin. When RESET is "L", initialization is executed.
9	DBD0	Bi-directional data bus.
10	DBD1	Bi-directional data bus.
11	DBD2	Bi-directional data bus.
12	DBD3	Bi-directional data bus.
13	DBD4	Bi-directional data bus.
14	DBD5	Bi-directional data bus.
15	DBD6	Bi-directional data bus.
16	DBD7	Bi-directional data bus.
17	DBD8	Bi-directional data bus.
18	DBD9	Bi-directional data bus.
19	DBD10	Bi-directional data bus.
20	DBD11	Bi-directional data bus.
21	DBD12	Bi-directional data bus.
22	DBD13	Bi-directional data bus.
23	DBD14	Bi-directional data bus.
24	DBD15	Bi-directional data bus.
25	GND	System ground.(0V)

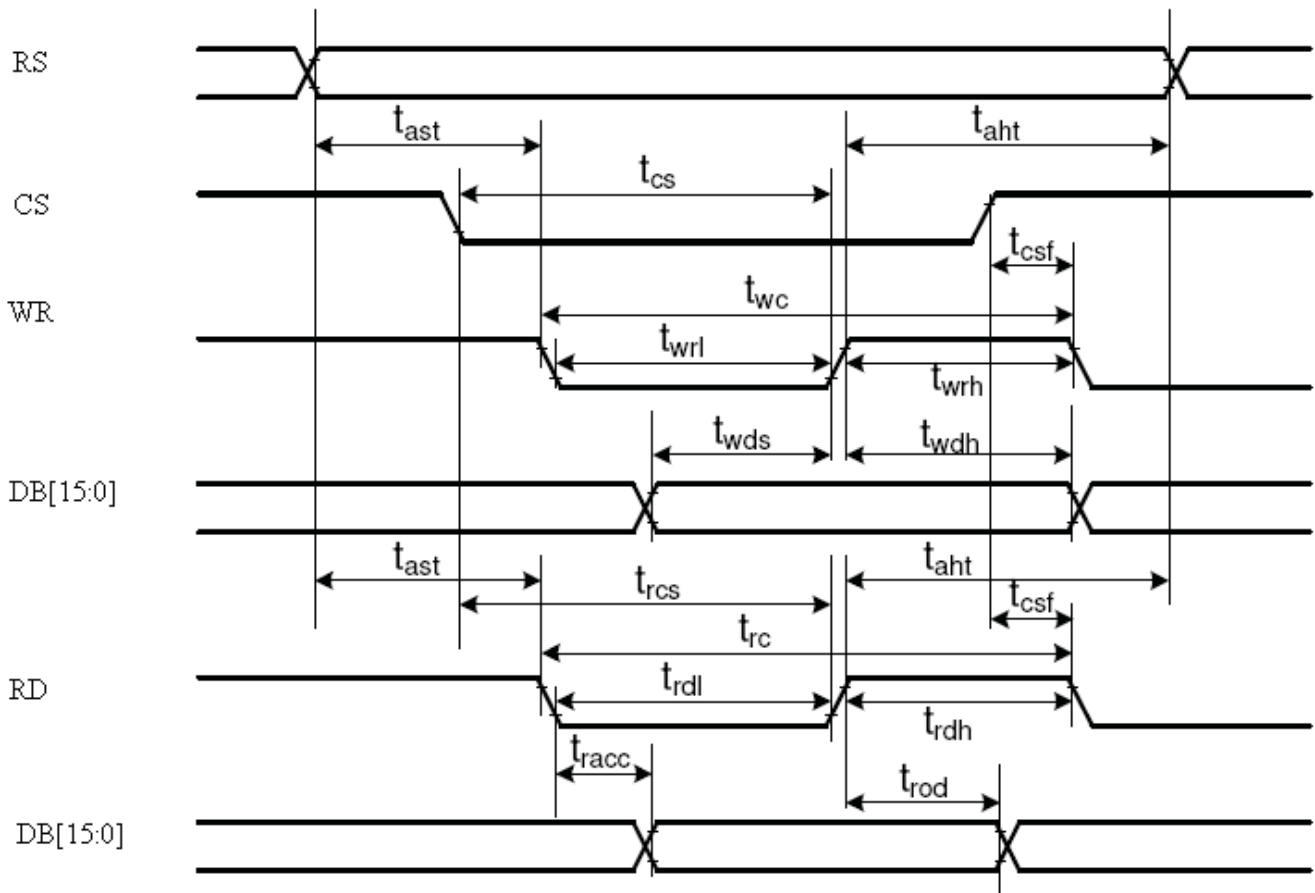
CONFIDENTIAL

Pin No.	Symbol	Function
26	Y-	Touch Panel control pin.
27	X-	Touch Panel control pin.
28	Y+	Touch Panel control pin.
29	X+	Touch Panel control pin.
30	LED-1	Power supply for LED Backlight Cathode input.
31	LED-2	Power supply for LED Backlight Cathode input.
32	LED-3	Power supply for LED Backlight Cathode input.
33	LED-4	Power supply for LED Backlight Cathode input.
34	LED-5	Power supply for LED Backlight Cathode input.
35	LED-A	Power supply for LED Backlight Anode input.
36	LED-A	Power supply for LED Backlight Anode input.
37	GND	System ground.(0V)

CONFIDENTIAL

2.3 Timing Characteristics

DBI Type B Interface



Signal	Symbol	Parameter	min	max	Unit	Description
RS	t _{ast}	Address setup time	10	-	ns	
	t _{aht}	Address hold time (Write/Read)	10	-	ns	
CS	t _{cs}	Chip Select setup time (Write)	20	-	ns	
	t _{trcs}	Chip Select setup time (Read)	20	-	ns	
	t _{csf}	Chip Select Wait time (Write/Read)	20	-	ns	
WR	t _{wc}	Write cycle	100	-	ns	
	t _{wrh}	Write Control pulse H duration	30	-	ns	
	t _{wrl}	Write Control pulse L duration	25	-	ns	
RD	t _{rc}	Read cycle	450	-	ns	
	t _{rdh}	Read Control pulse H duration	250	-	ns	
	t _{rcl}	Read Control pulse L duration	170	-	ns	
DB[17:0], DB[15:0], DB[8:0], DB[7:0]	t _{wds}	Write data setup time	15	-	ns	For maximum CL=30pF For minimum CL=8pF
	t _{wdh}	Write data hold time	25	-	ns	
	t _{racc}	Read access time	10	340	ns	
	t _{rod}	Read output disable time	10	-	ns	

Note: Logic high and low levels are specified as 30% and 70% of IOVCC for Input signals.

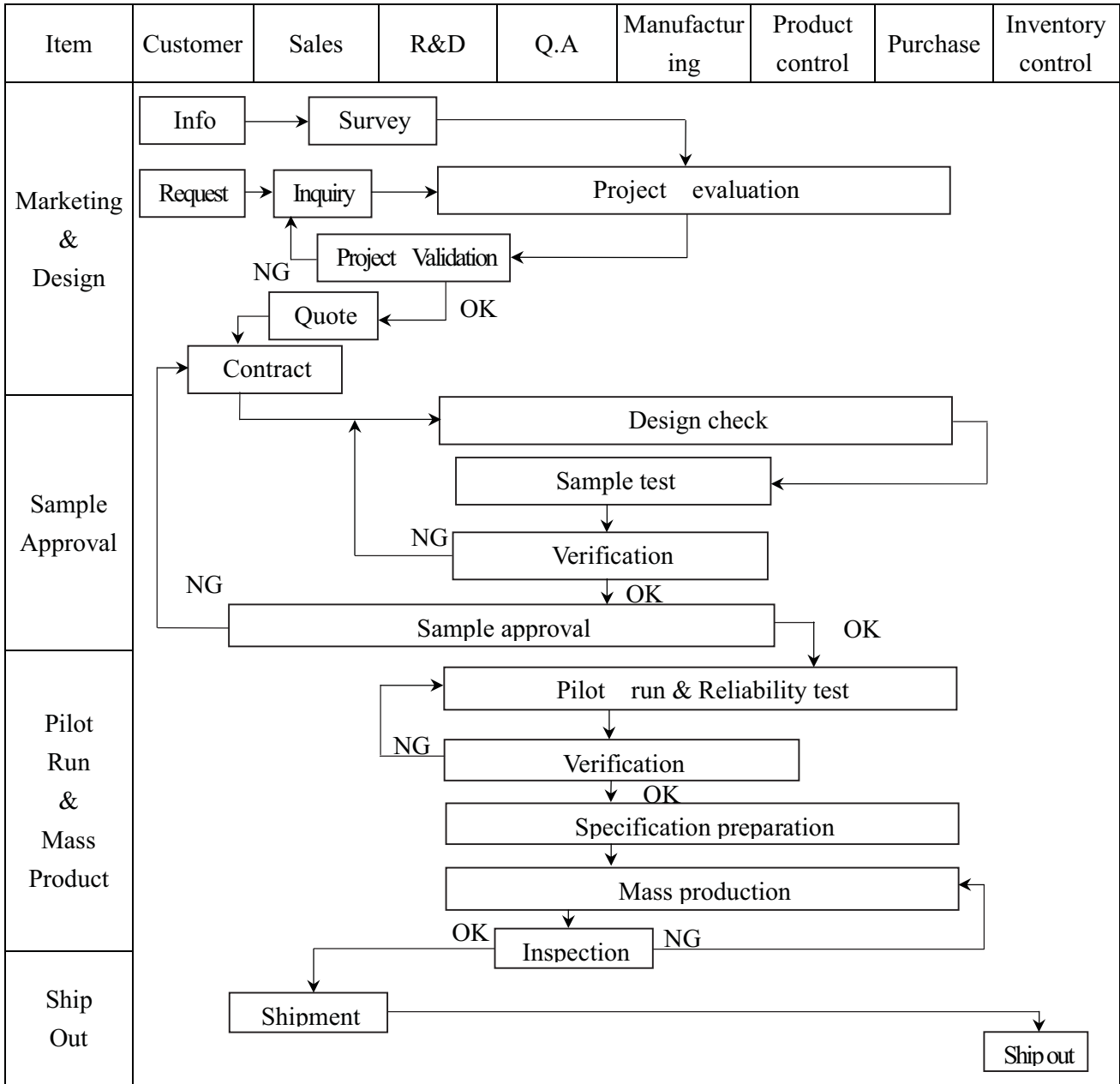
Note: T_a = -30 to 70 °C, IOVCC=1.65V to 3.3V, VCI=2.5V to 3.3V, GND=0V

CONFIDENTIAL

3. QUALITY ASSURANCE SYSTEM

3.1 Quality Assurance Flow Chart

CONFIDENTIAL



Item	Customer	Sales	R&D	Q.A	Manufacturing	Product control	Purchase	Inventory control
Sales Service	<pre> graph TD Info[Info] --> Claim[Claim] Claim --> Failure[Failure analysis] Failure --> Report[Analysis report] Failure --> Action[Corrective action] Action --> Tracking[Tracking] </pre>							
Q.A Activity	1. ISO 9001 Maintenance Activities 3. Equipment calibration 5. Standardization Management				2. Process improvement proposal 4. Education And Training Activities			

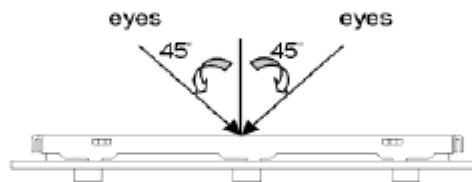
CONFIDENTIAL

3.2 Inspection Specification

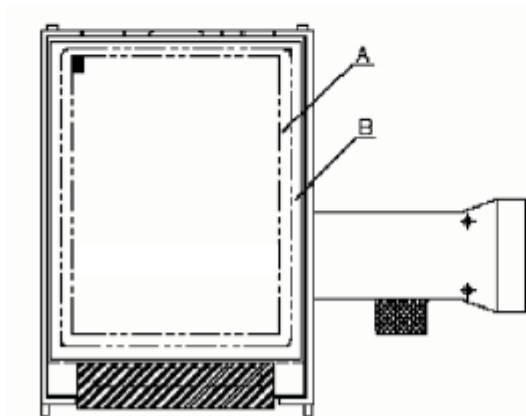
- ◆ Scope : The document shall be applied to TFT-LCD Module for less than 3.5" (Ver.B01).
- ◆ Inspection Standard : MIL-STD-105E Table Normal Inspection Single Sampling Level II.
- ◆ Equipment : Gauge 、 MIL-STD 、 Sample
- ◆ Defect Level : Major Defect AQL : 0.4 ; Minor Defect AQL : 1.5
- ◆ OUT Going 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)

CONFIDENTIAL

◆Specification For TFT-LCD Module Less Than 3.5" :

(Ver. 02)

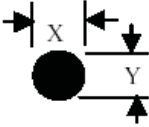

NO	Item	Criterion	Level												
01	Product condition	1. 1 The part number is inconsistent with work order of production.	Major												
		1. 2 Mixed product types.	Major												
		1. 3 Assembled in inverse direction.	Major												
02	Quantity	2. 1 The quantity is inconsistent with work 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 Display malfunction.	Major												
		4. 4 LCD viewing angle defect.	Major												
		4. 5 Current consumption exceeds product specifications.	Major												
05	<p>Dot defect (Bright dot 、 Dark dot)</p> <p>On -display</p>	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="2">Item</th> <th>Acceptance (Q'ty)</th> </tr> </thead> <tbody> <tr> <td rowspan="4" style="text-align: center; vertical-align: middle;">Dot Defect</td> <td style="text-align: center;">Bright Dot</td> <td style="text-align: center;">≤ 2</td> </tr> <tr> <td style="text-align: center;">Dark Dot</td> <td style="text-align: center;">≤ 3</td> </tr> <tr> <td style="text-align: center;">Joint Dot</td> <td style="text-align: center;">≤ 2</td> </tr> <tr> <td style="text-align: center;">Total</td> <td style="text-align: center;">≤ 3</td> </tr> </tbody> </table> <p>5. 1 Inspection pattern : full white , full black , Red , Green and blue screens.</p> <p>5. 2 It is defined as dot defect if defect area $> 1/2$ dot.</p> <p>5. 3 The distance between two dot defect ≥ 5 mm.</p>	Item		Acceptance (Q'ty)	Dot Defect	Bright Dot	≤ 2	Dark Dot	≤ 3	Joint Dot	≤ 2	Total	≤ 3	Minor
Item		Acceptance (Q'ty)													
Dot Defect	Bright Dot	≤ 2													
	Dark Dot	≤ 3													
	Joint Dot	≤ 2													
	Total	≤ 3													

CONFIDENTIAL

◆Specification For TFT-LCD Module Less Than 3.5" :

(Ver. 02)

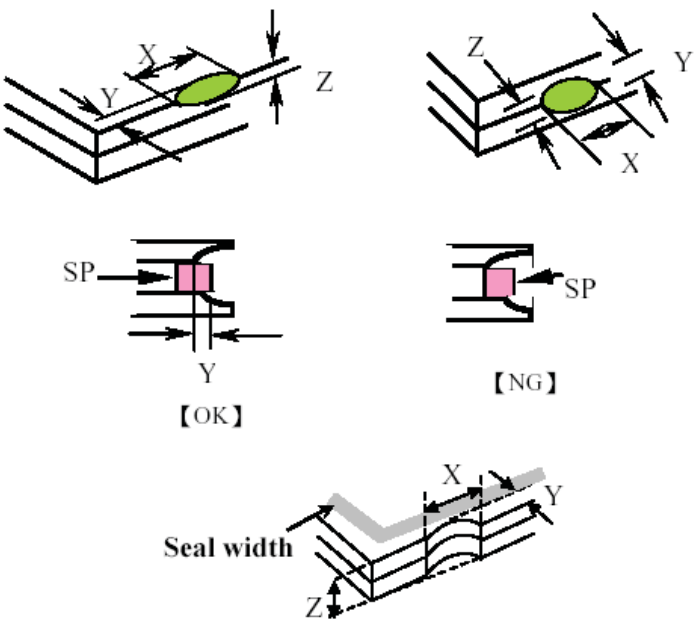
CONFIDENTIAL

NO	Item	Criterion	Level																											
06	<p>Black or white dot、scratch、contamination</p> <p>Round type</p>  <p>$\Phi = (x + y) / 2$</p> <p>Line type</p> 	<p>6.1 Round type (Non-display or display) :</p> <table border="1"> <thead> <tr> <th>Dimension (diameter : Φ)</th> <th>Acceptance (Q'ty)</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.15$</td> <td>Ignore</td> </tr> <tr> <td>$0.15 < \Phi \leq 0.20$</td> <td>2</td> </tr> <tr> <td>$0.20 < \Phi \leq 0.30$</td> <td>2</td> </tr> <tr> <td>$\Phi > 0.30$</td> <td>0</td> </tr> <tr> <td>Total</td> <td>3</td> </tr> </tbody> </table> <p>6.2 Line type(Non-display or display) :</p> <table border="1"> <thead> <tr> <th>Length (L)</th> <th>Width (W)</th> <th>Acceptance (Q'ty)</th> </tr> </thead> <tbody> <tr> <td>---</td> <td>$W \leq 0.03$</td> <td>Ignore</td> </tr> <tr> <td>$L \leq 5.0$</td> <td>$0.03 < W \leq 0.05$</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> </tbody> </table>	Dimension (diameter : Φ)	Acceptance (Q'ty)	$\Phi \leq 0.15$	Ignore	$0.15 < \Phi \leq 0.20$	2	$0.20 < \Phi \leq 0.30$	2	$\Phi > 0.30$	0	Total	3	Length (L)	Width (W)	Acceptance (Q'ty)	---	$W \leq 0.03$	Ignore	$L \leq 5.0$	$0.03 < W \leq 0.05$	3	---	$W > 0.05$	As round type	Total		3	Minor
Dimension (diameter : Φ)	Acceptance (Q'ty)																													
$\Phi \leq 0.15$	Ignore																													
$0.15 < \Phi \leq 0.20$	2																													
$0.20 < \Phi \leq 0.30$	2																													
$\Phi > 0.30$	0																													
Total	3																													
Length (L)	Width (W)	Acceptance (Q'ty)																												
---	$W \leq 0.03$	Ignore																												
$L \leq 5.0$	$0.03 < W \leq 0.05$	3																												
---	$W > 0.05$	As round type																												
Total		3																												
07	Polarizer Bubble	<table border="1"> <thead> <tr> <th>Dimension (diameter : Φ)</th> <th>Acceptance (Q'ty)</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.20$</td> <td>Ignore</td> </tr> <tr> <td>$0.20 < \Phi \leq 0.50$</td> <td>3</td> </tr> <tr> <td>$\Phi > 0.50$</td> <td>0</td> </tr> <tr> <td>Total</td> <td>3</td> </tr> </tbody> </table>	Dimension (diameter : Φ)	Acceptance (Q'ty)	$\Phi \leq 0.20$	Ignore	$0.20 < \Phi \leq 0.50$	3	$\Phi > 0.50$	0	Total	3	Minor																	
Dimension (diameter : Φ)	Acceptance (Q'ty)																													
$\Phi \leq 0.20$	Ignore																													
$0.20 < \Phi \leq 0.50$	3																													
$\Phi > 0.50$	0																													
Total	3																													

◆Specification For TFT-LCD Module Less Than 3.5" :

(Ver. 02)

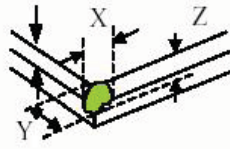
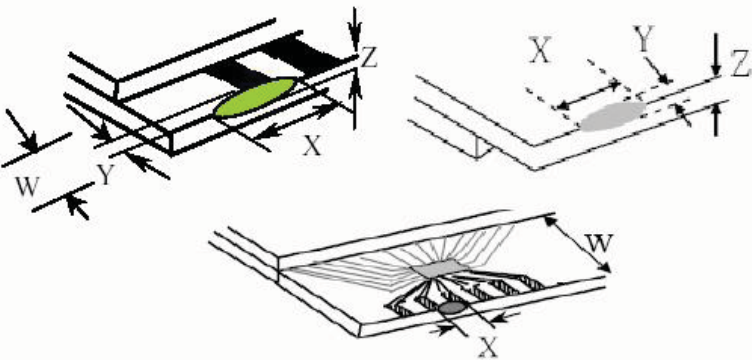
CONFIDENTIAL

NO	Item	Criterion	Level									
08	The crack of glass	<p>Symbols :</p> <p>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</p> <hr/> <p>8.1 General glass chip :</p> <p>8.1.1 Chip on panel surface and crack between panels:</p>  <table border="1" data-bbox="581 1444 1315 1711"> <thead> <tr> <th>X</th> <th>Y</th> <th>Z</th> </tr> </thead> <tbody> <tr> <td>$\leq a$</td> <td>Crack can't enter viewing area</td> <td>$\leq 1/2 t$</td> </tr> <tr> <td>$\leq a$</td> <td>Crack can't exceed the half of SP width.</td> <td>$1/2 t < Z \leq 2 t$</td> </tr> </tbody> </table>	X	Y	Z	$\leq a$	Crack can't enter viewing area	$\leq 1/2 t$	$\leq a$	Crack can't exceed the half of SP width.	$1/2 t < Z \leq 2 t$	Minor
X	Y	Z										
$\leq a$	Crack can't enter viewing area	$\leq 1/2 t$										
$\leq a$	Crack can't exceed the half of SP width.	$1/2 t < Z \leq 2 t$										

◆Specification For TFT-LCD Module Less Than 3.5" :

(Ver. 02)

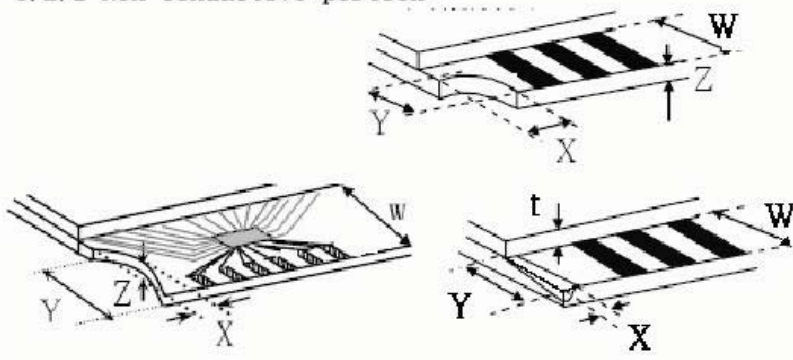
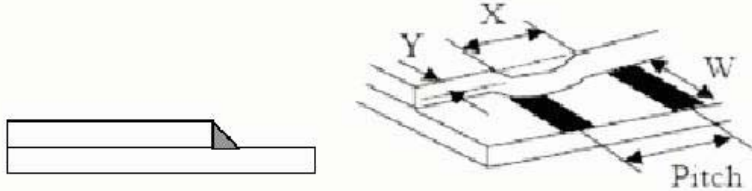
CONFIDENTIAL

NO	Item	Criterion	Level									
08	The crack of glass	<p>Symbols :</p> <p>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</p> <hr/> <p>8.1.2 Corner crack :</p>  <table border="1" data-bbox="568 787 1307 1060"> <thead> <tr> <th>X</th> <th>Y</th> <th>Z</th> </tr> </thead> <tbody> <tr> <td>$\leq 1/5 a$</td> <td>Crack can't enter viewing area</td> <td>$Z \leq 1/2 t$</td> </tr> <tr> <td>$\leq 1/5 a$</td> <td>Crack can't exceed the half of SP width.</td> <td>$1/2 t < Z \leq 2 t$</td> </tr> </tbody> </table>	X	Y	Z	$\leq 1/5 a$	Crack can't enter viewing area	$Z \leq 1/2 t$	$\leq 1/5 a$	Crack can't exceed the half of SP width.	$1/2 t < Z \leq 2 t$	Minor
		X	Y	Z								
$\leq 1/5 a$	Crack can't enter viewing area	$Z \leq 1/2 t$										
$\leq 1/5 a$	Crack can't exceed the half of SP width.	$1/2 t < Z \leq 2 t$										
<p>8.2 Protrusion over terminal :</p> <p>8.2.1 Chip on electrode pad :</p>  <table border="1" data-bbox="600 1606 1315 1774"> <thead> <tr> <th></th> <th>X</th> <th>Y</th> <th>Z</th> </tr> </thead> <tbody> <tr> <td>Front</td> <td>$\leq a$</td> <td>$\leq 1/2 W$</td> <td>$\leq t$</td> </tr> <tr> <td>Back</td> <td>$\leq a$</td> <td>$\leq W$</td> <td>$\leq 1/2 t$</td> </tr> </tbody> </table>		X	Y	Z	Front	$\leq a$	$\leq 1/2 W$	$\leq t$	Back	$\leq a$	$\leq W$	$\leq 1/2 t$
	X	Y	Z									
Front	$\leq a$	$\leq 1/2 W$	$\leq t$									
Back	$\leq a$	$\leq W$	$\leq 1/2 t$									

◆ Specification For TFT-LCD Module Less Than 3.5" :

(Ver. 02)

CONFIDENTIAL

NO	Item	Criterion	Level												
08	The crack of glass	<p>Symbols :</p> <p>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</p> <hr/> <p>8.2.2 Non-conductive portion :</p>  <table border="1" data-bbox="652 1003 1227 1142"> <tr> <td>X</td> <td>Y</td> <td>Z</td> </tr> <tr> <td>$\leq 1/3 a$</td> <td>$\leq W$</td> <td>$\leq t$</td> </tr> </table> <p>⊙ If the chipped area touches the ITO terminal, over 2/3 of the ITO must remain and be inspected according to electrode terminal specifications.</p> <p>8.2.3 Glass remain :</p>  <table border="1" data-bbox="581 1669 1211 1797"> <tr> <td>X</td> <td>Y</td> <td>Z</td> </tr> <tr> <td>$\leq a$</td> <td>$\leq 1/3 W$</td> <td>$\leq t$</td> </tr> </table>	X	Y	Z	$\leq 1/3 a$	$\leq W$	$\leq t$	X	Y	Z	$\leq a$	$\leq 1/3 W$	$\leq t$	Minor
		X	Y	Z											
$\leq 1/3 a$	$\leq W$	$\leq t$													
X	Y	Z													
$\leq a$	$\leq 1/3 W$	$\leq t$													

◆Specification For TFT-LCD Module Less Than 3.5" :

(Ver. 02)

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

CONFIDENTIAL

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 $320 \pm 10^{\circ}\text{C}$ and 3-5 sec.
- 5.2.9 To avoid liquid (include organic solvent) stained on LCM

5.3 STORAGE

- 5.3.1 Store the panel or module in a dark place where the temperature is $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 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.

CONFIDENTIAL



US Micro Products

Electronic Products for the OEM

Los Angeles • Austin • New York • Orlando • Shenzhen

(800) 741-7755

www.usmicroproducts.com

Displays

US Micro Products is an industrial distributor specializing in engineered display solutions. We dedicate ourselves to providing the best in displays for the medical, industrial, gaming, automotive, aerospace, military, and consumer markets.

OLEDs



TFT Displays



Open Frame Monitors



Passive LCDs



Multitouch



As a customer, you benefit from our expert knowledge, support and service which allow quick selection and design-in of the best display for your application. On hand stock and demo boards facilitate quick access and evaluation to get you going fast. Our technical sales staff and experienced design engineers provide answers to your questions as well as engineered solutions to solve your display needs.

Peripheral Devices

Our full line of peripheral devices includes keyboards, trackballs, and printers. These rugged industrial products are designed to meet your demanding requirements and are available as both standard and custom solutions.

Keyboards



Trackballs



Aerospace Trackballs



Joysticks



Printers

