



US Micro Products
Electronic Products for the OEM

TFT-LCD PRODUCT SPECIFICATION

PART NUMBER:	USMP-TT057Q-01D
DESCRIPTION:	5.7" TFT LCD with 320 x 240 resolution, Digital 24-bits RGB Interface and 6 O'Clock Viewing Direction

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
05/07/2007	-	0	MASS PRODUCTION	—	Peter
06/22/2007	-	A	Modify B/L Connector number	—	Peter
08/18/2008	01	001	1.Modify Average Brightness. 2.Modify Power Dissipation of B/L 3. Modify Backlight Tolerance.	6 9 Appendix	Jared

Total: 27 Page

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Appendix : LCM Drawing

Note : For detailed information please refer to IC data sheet :

Primacy(TFT LCD): Himax: HX8218-A + HX8615A
(Or compatible IC)

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1. SPECIFICATIONS

1.1 Features

Main LCD panel

Item	Standard Value
Display Type	320(R、G、B) * 240 Dots
LCD Type	Normally white, Transmissive type
Screen size(inch)	5.7 inch
Viewing Direction	6 O'clock
Color configuration	RGB-Strip
Backlight	LED
Interface	Digital 24-bits RGB
Other(controller/driver IC)	320(R、G、B) * 240 Dots

1.2 Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension	159.4 (W) * 111.0 (L) * 9.0 (H)	mm

LCD panel

Item	Standard Value	Unit
Viewing Area	116.2 (W) * 87.4 (L)	mm
Active Area	115.2 (W) * 86.4 (L)	mm

Note : For detailed information please refer to LCM drawing

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1.3 Absolute Maximum Ratings

Module

Item	Symbol	Condition	Min.	Max.	Unit
System Power Supply Voltage	VDD	AVSS=0	-0.3	7.0	V
Input Voltage	V _i	-	-0.3	VDD+0.3	V
Operating Temperature	T _{OP}	-	-20	70	°C
Storage Temperature	T _{ST}	-	-30	80	°C

1.4 DC Electrical Characteristics

Module

GND = 0V, Ta = 25 °C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply Voltage1	VDD	-	3.0	3.3	3.6	V
Supply Current	IDD	VDD = 3.3 V Pattern=full display	-	90.0	-	mA
		VDD = 3.3 V Pattern= black *1	-	95.0	140.0	mA

Note1:Maximum current display

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1.5 Optical Characteristics

TFT LCD Module

VDD= 3.3V, Ta=25°C

Item	Symbol	Condition	Min.	Typ.	Max.	unit		
Response time	Rise	Tr	Ta = 25°C θX, θY = 0°	-	15	30	ms	Note 2
	Fall	Tf		-	35	50		
Viewing angle	Top	θY+	CR ≥ 10	-	50	-	Deg.	Note 4
	Bottom	θY-		-	45	-		
	Left	θX-		-	50	-		
	Right	θX+		-	50	-		
Contrast ratio	CR	Ta = 25°C θX, θY = 0°	-	150	250	-	Note 3	
Color of CIE Coordinate (With B/L)	White	X	Ta = 25°C θX, θY = 0°	0.277	0.327	0.377	-	Note1
		Y		0.289	0.339	0.389		
	Red	X		0.579	0.629	0.679		
		Y		0.311	0.361	0.411		
	Green	X		0.299	0.349	0.399		
		Y		0.524	0.574	0.624		
	Blue	X		0.093	0.143	0.193		
		Y		0.040	0.090	0.140		
Average Brightness Pattern=white display (With B/L)	IV	IF=200mA	250	300	-	cd/m ²	Note1	
Uniformity (With B/L)	△B	IF=200mA	70	-	-	%	Note1	

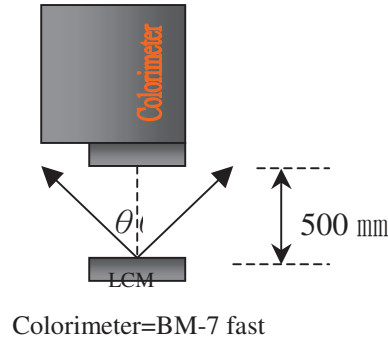
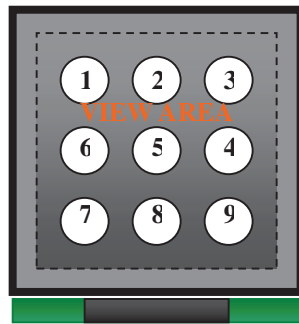
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Note 1:

*1 : $\Delta B = B(\text{min}) / B(\text{max}) * 100\%$

*2 : Measurement Condition for Optical Characteristics:

- a : Environment: $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ / $60 \pm 20\% \text{R.H}$, no wind , dark room below 10 Lux at typical lamp current and typical operating frequency.
- b : Measurement Distance: 500 ± 50 mm , ($\theta = 0^{\circ}$)
- 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 $\pm 4\%$



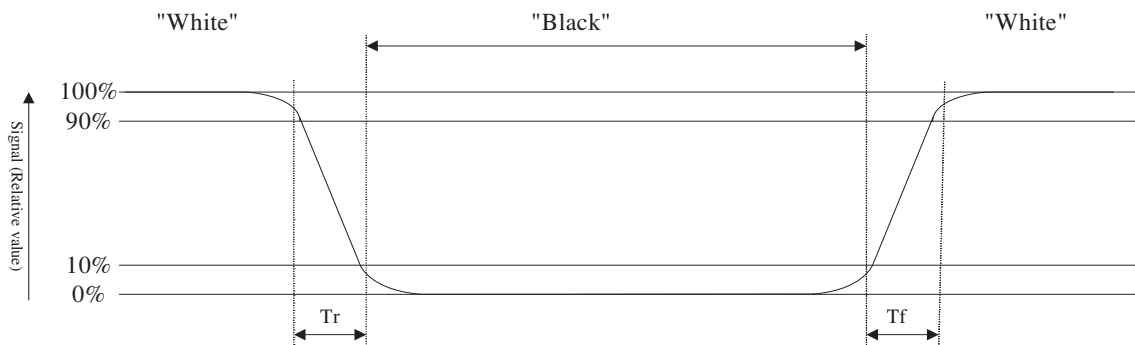
To be measured at the center area of panel with a viewing cone of 1° by Topcon luminance meter BM-7, after 10 minutes operation (module)

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.

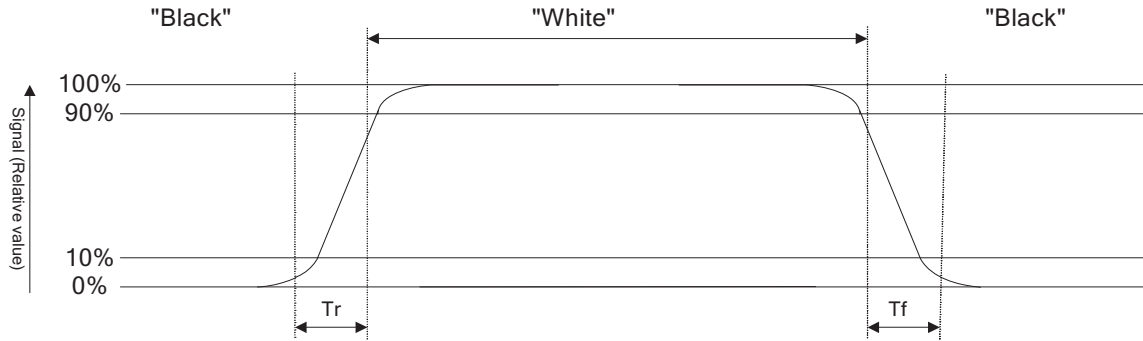
Refer to figure as below:

Normally White



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Normally Black



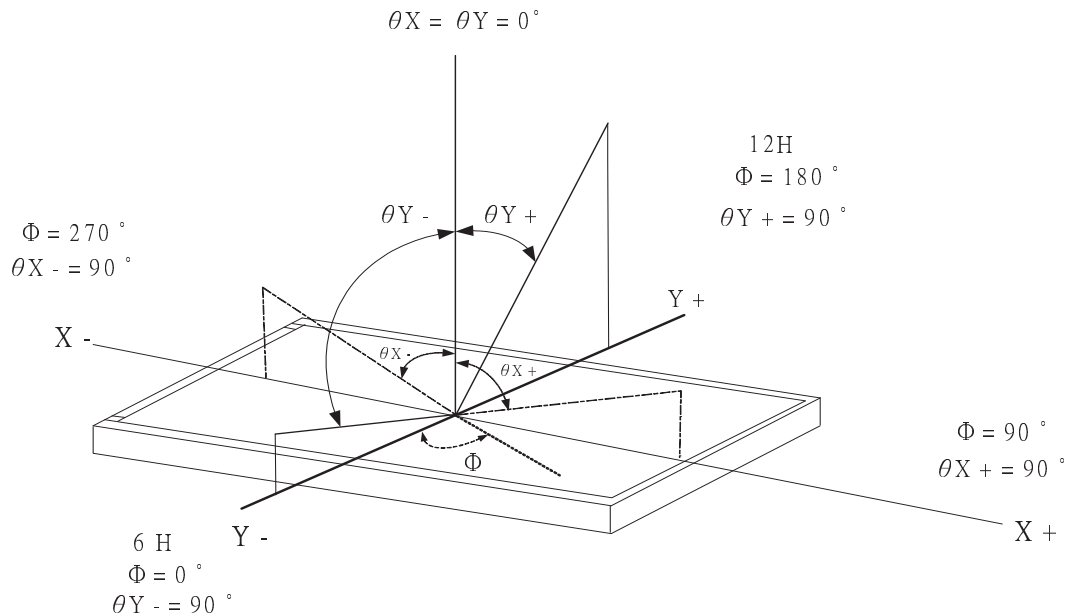
Note3: Definition of contrast ratio:

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:



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1.6 Backlight Characteristics

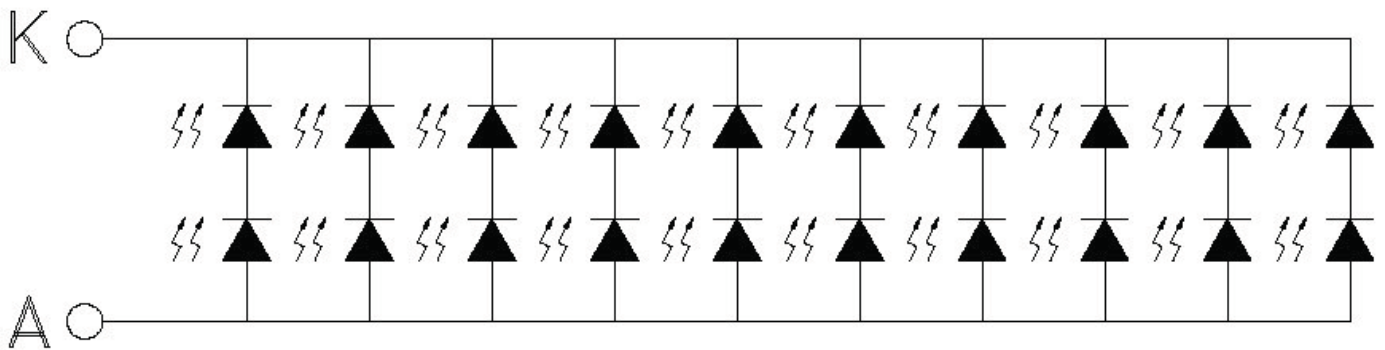
Maximum Ratings

Item	Symbol	Conditions	Min.	Max.	Unit
Forward Current	IF	Ta =25°C	-	200	mA
Reverse Voltage	VR	Ta =25°C	-	10	V
LED Power Dissipation	PD _{LED}	Ta =25°C / 20mA	-	0.12	W
Power Dissipation	PD	Ta =25°C	-	2.4	W

Electrical / Optical Characteristics

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	VF	IF= 200 mA	6.0	6.8	8.5	V
Average Brightness (without LCD)	IV		3800	4500	-	cd/m ²
Color	White					

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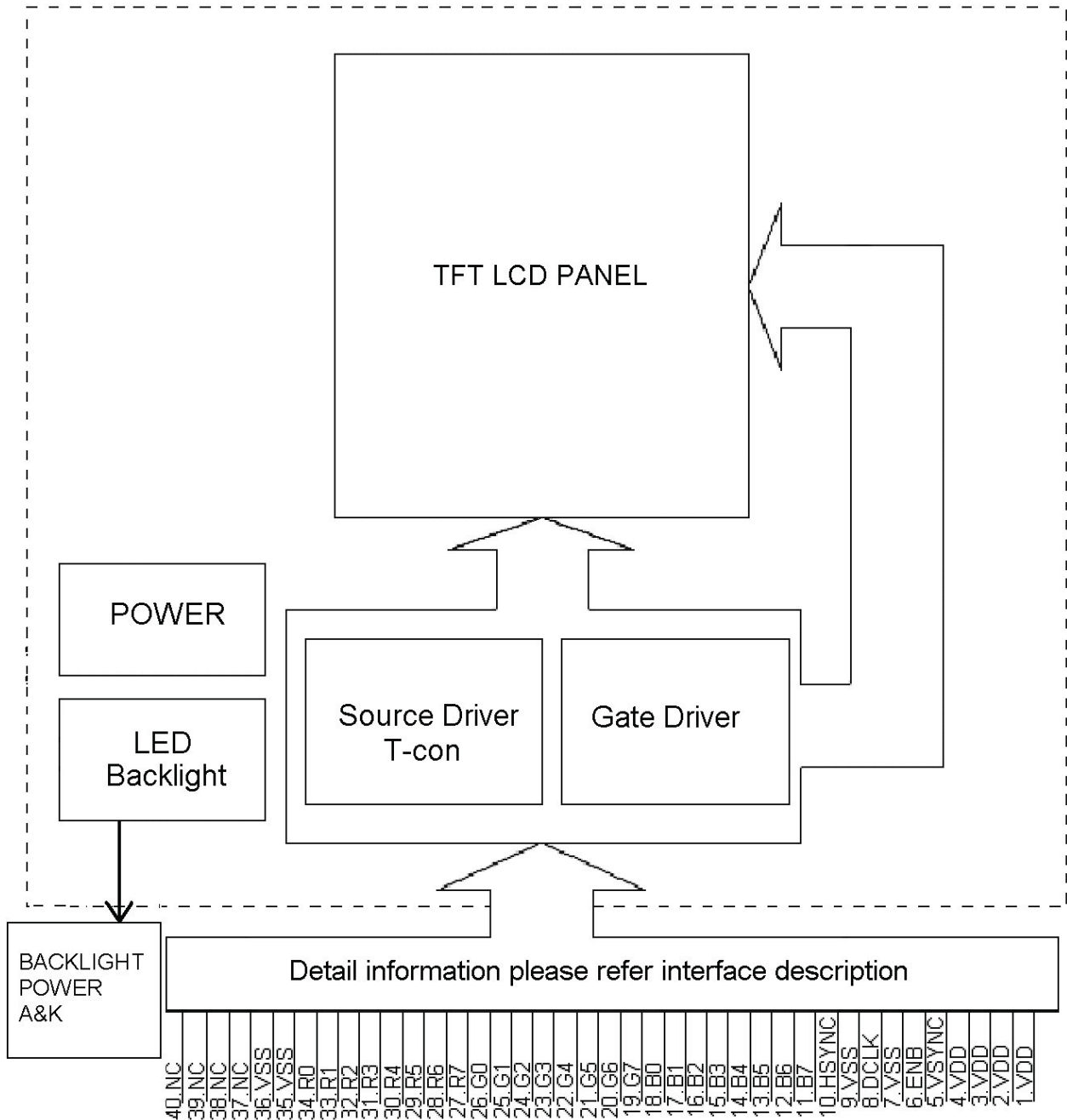
2. MODULE STRUCTURE

2.1 Counter Drawing

2.1.1 LCM Mechanical Diagram

* See Appendix

2.1.2 Block Diagram



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2.2 Interface Pin Description

Pin No.	Symbol	Function
1	VDD	Analog power.
2	VDD	
3	VDD	
4	VDD	
5	VSYNC	Vertical sync input
6	ENB	Data enable control
7	VSS	Ground
8	DCLK	Dot data clock
9	VSS	Ground
10	HSYNC	Horizontal sync input
11	B7	data bit B7
12	B6	data bit B6
13	B5	data bit B5
14	B4	data bit B4
15	B3	data bit B3
16	B2	data bit B2
17	B1	data bit B1
18	B0	data bit B0
19	G7	data bit G7
20	G6	data bit G6
21	G5	data bit G5
22	G4	data bit G4
23	G3	data bit G3
24	G2	data bit G2
25	G1	data bit G1
26	G0	data bit G0

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Interface Pin Description(CONT.)

27	R7	data bit R7
28	R6	data bit R6
29	R5	data bit R5
30	R4	data bit R4
31	R3	data bit R3
32	R2	data bit R2
33	R1	data bit R1
34	R0	data bit R0
35	VSS	Ground
36	VSS	Ground
37	NC	No use.
38	NC	No use.
39	NC	No use.
40	NC	No use.

Backlight Pin Description

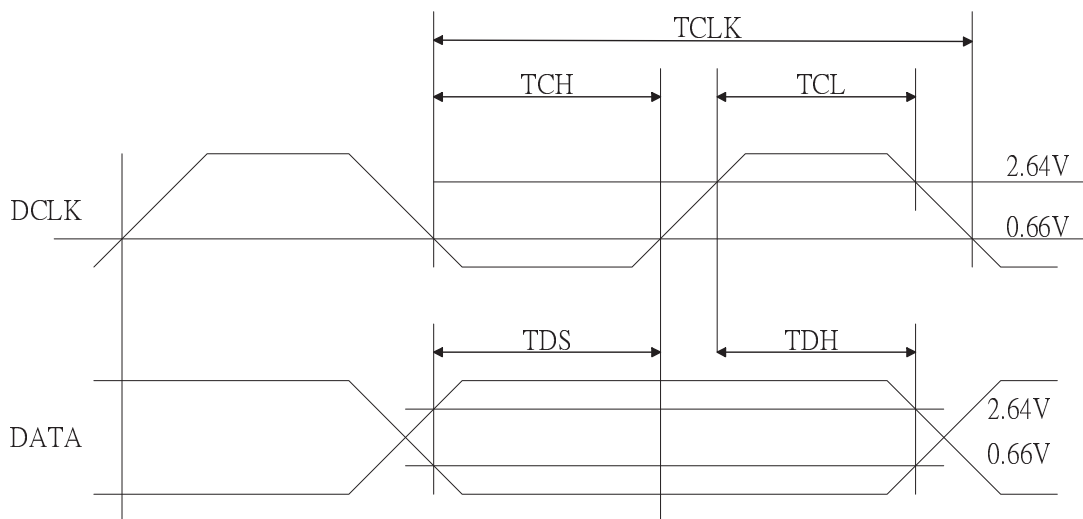
1	A	Power supply for LED Backlight anode input.
2	NC	No use.
3	K	Power supply for LED Backlight cathode input.

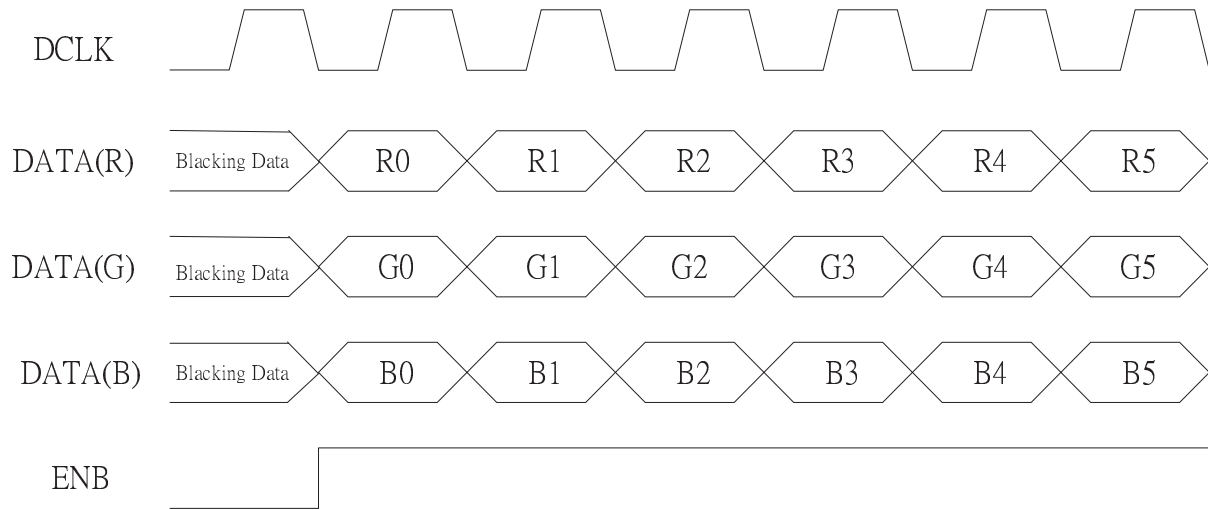
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2.3 Timing Characteristics

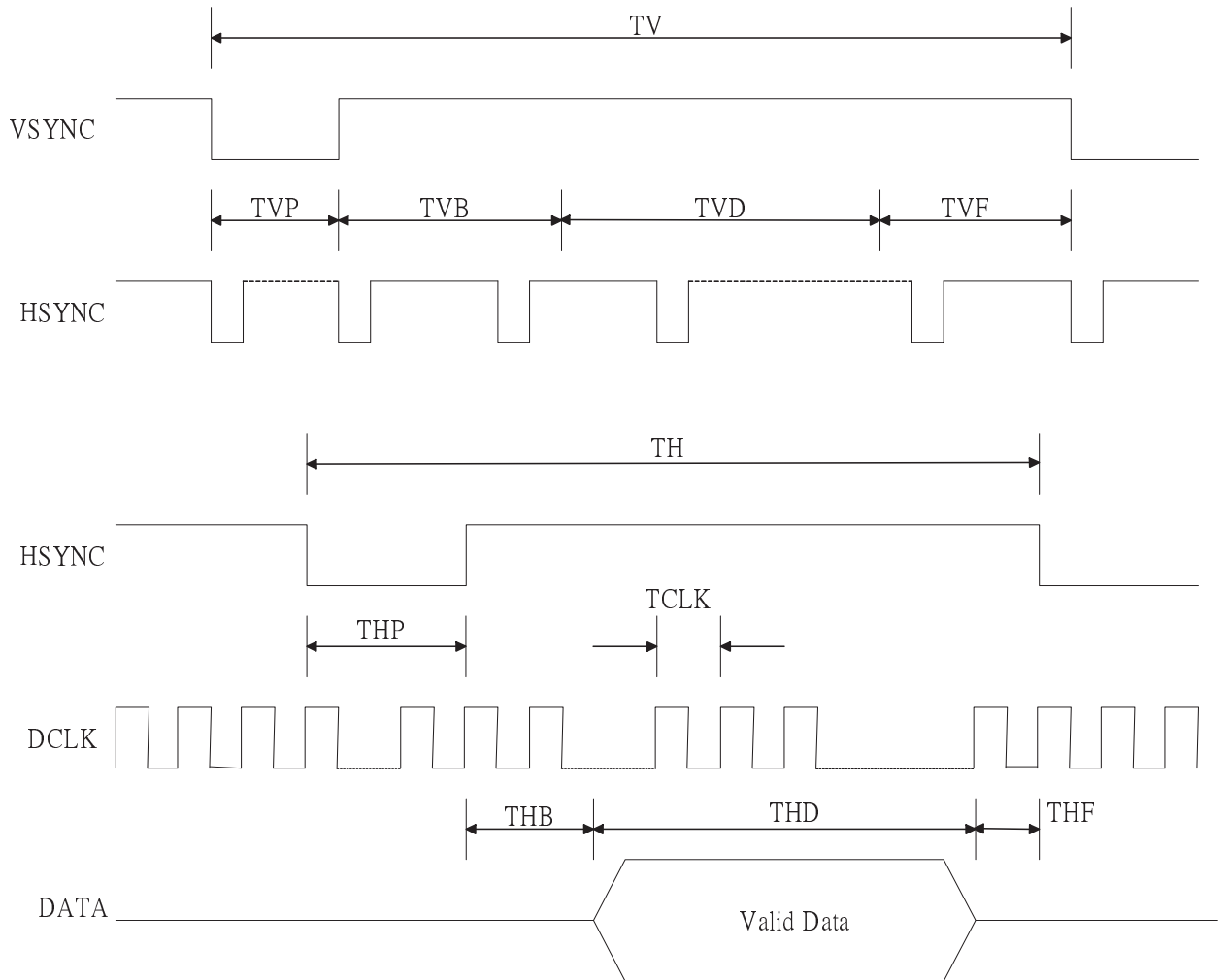
Signal	Item		Symbol	Min.	Typ.	Max.	Unit
Dclk	Frequency		Dclk		6.4		MHz
	High Time		Tch		78		ns
	Low Time		Tcl		78		ns
Data	Setup Time		Tds	12			ns
	Hold Time		Tdh	12			ns
Hsync	Period		TH		408		DCLK
	Pulse Width		Thp		30		DCLK
	Back-Porch		Thb		38		DCLK
	Display Period		Thd		320		DCLK
	Front-Porch		Thf		20		DCLK
Vsync	Period	NTSC	Tv		262.5		TH
		PAL		312.5			
	Pulse Width		Tvp	1	3	5	TH
	Back-Porch	NTSC	Tvb		15		TH
		PAL		23			
	Display Period		Tvd		240		TH
	Front-Porch	NTSC	Tvf		4.5		TH
		PAL		46.5			

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Color Data Assignment

COLOR	INPUT DATA	R DATA								G DATA								B DATA							
		R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
		MSB							LSB	MSB							LSB	MSB							LSB
BASIC COLOR	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(255)	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	GREEN(255)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	
	BLUE(255)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	
	CYAN	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	MAGENTA	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	
	YELLOW	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	
	WHITE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
RED	RED(0)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	RED(1)	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	RED(2)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	RED(254)	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	RED(255)	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
GREEN	GREEN(0)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	GREEN(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
	GREEN(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
	GREEN(254)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	
	GREEN(255)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	
BLUE	BLUE(0)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	BLUE(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
	BLUE(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
	BLUE(254)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	
	BLUE(255)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	

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[Note]

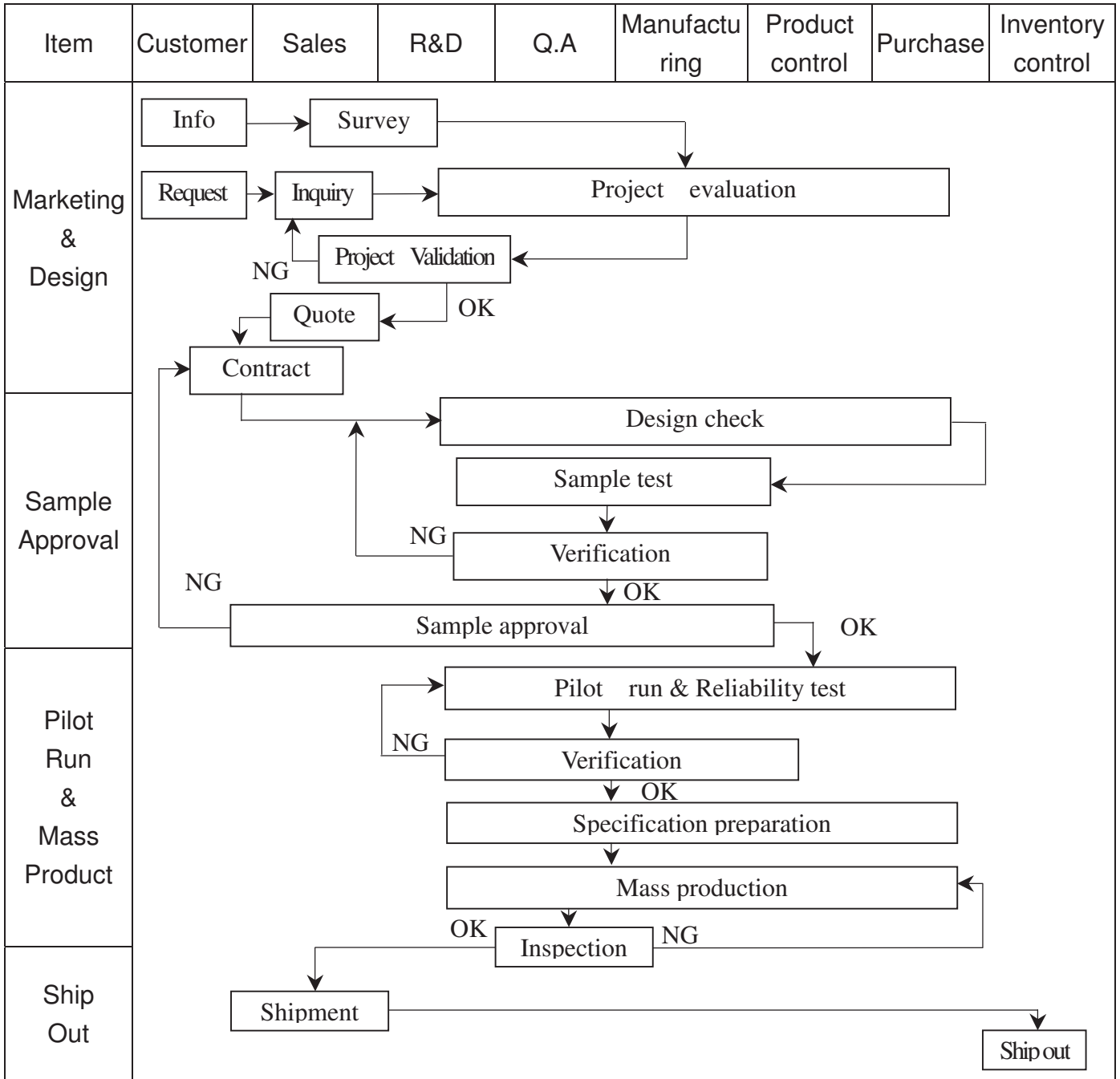
- (1) Definition of gray scale
 Color (n) : n means level of gray scale
 Larger n means brighter level
- (2)Data: 1-High,0-Low

2.4 JUMPER(Setting different use)
(J1-1J2-2,J3-2,J4-1,J5-1,J6-2)

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3. QUALITY ASSURANCE SYSTEM

3.1 Quality Assurance Flow Chart



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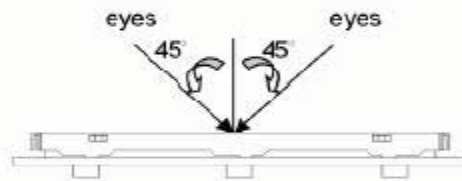
Item	Customer	Sales	R&D	Q.A	Manufacturing	Product control	Purchase	Inventory control
Sales Service	<pre> graph TD Info[Info] --> Claim[Claim] Claim --> FA[Failure analysis] FA --> AR[Analysis report] FA --> CA[Corrective action] CA --> Tracking[Tracking] </pre>							
Q.A Activity	1. ISO 9001 Maintenance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

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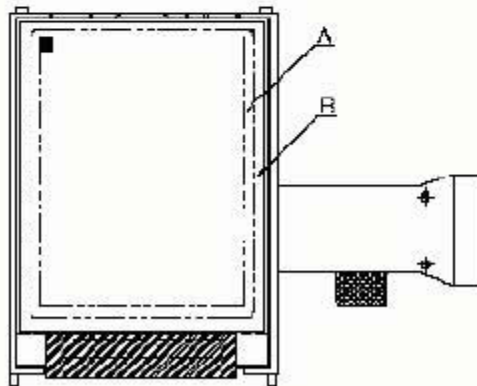
3.2 Inspection Specification

1. Inspection Specification

- ◆ Scope : The document shall be applied to TFT-LCD Module for 3.5" ~10" (Ver. 02).
- ◆ 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 3.5" ~10" :

(Ver. 02)

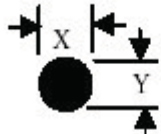
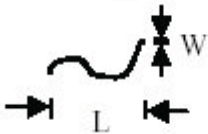
NO	Item	Criterion	Level												
01	Product condition	1. 1 The part number is inconsistent with work order of production.	Major												
		1. 2 Mixed product types.	Major												
		1. 3 Assembled in inverse direction.	Major												
02	Quantity	2. 1 The quantity is inconsistent with work 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	Dot defect (Bright dot , Dark dot) On -display	<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;">≤ 4</td> </tr> <tr> <td style="text-align: center;">Dark Dot</td> <td style="text-align: center;">≤ 5</td> </tr> <tr> <td style="text-align: center;">Joint Dot</td> <td style="text-align: center;">≤ 3</td> </tr> <tr> <td style="text-align: center;">Total</td> <td style="text-align: center;">≤ 7</td> </tr> </tbody> </table>	Item		Acceptance (Q'ty)	Dot Defect	Bright Dot	≤ 4	Dark Dot	≤ 5	Joint Dot	≤ 3	Total	≤ 7	Minor
		Item		Acceptance (Q'ty)											
		Dot Defect	Bright Dot	≤ 4											
			Dark Dot	≤ 5											
			Joint Dot	≤ 3											
Total	≤ 7														
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.															

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◆ Specification For TFT-LCD Module 3.5" ~10" :

(Ver. 02)

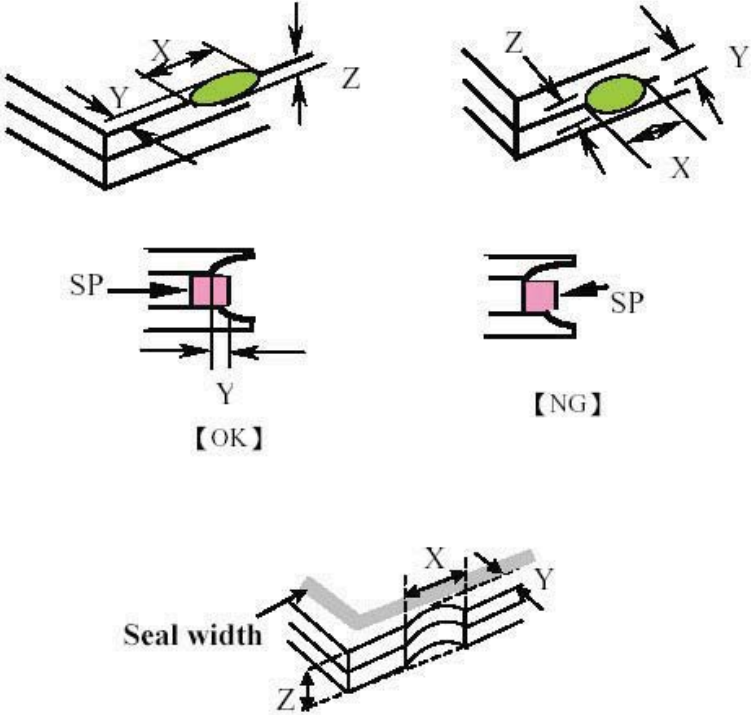
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NO	Item	Criterion	Level																												
06	<p>Black or white dot、scratch、contamination</p> <p>Round type</p>  <p>$\Phi = (x + y) / 2$</p> <p>Line type</p> 	<p>6.1 Round type (Non-display or display) :</p> <table border="1"> <thead> <tr> <th>Dimension (diameter : Φ)</th> <th>Acceptance (Q'ty)</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.25$</td> <td>Ignore</td> </tr> <tr> <td>$0.25 < \Phi \leq 0.50$</td> <td>5</td> </tr> <tr> <td>$\Phi > 0.50$</td> <td>0</td> </tr> <tr> <td>Total</td> <td>5</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>$L \leq 10.0$</td> <td>$0.03 < W \leq 0.05$</td> <td>4</td> </tr> <tr> <td>$L \leq 5.0$</td> <td>$0.05 < W \leq 0.10$</td> <td>2</td> </tr> <tr> <td>---</td> <td>$W > 0.10$</td> <td>As round type</td> </tr> <tr> <td colspan="2">Total</td> <td>5</td> </tr> </tbody> </table>	Dimension (diameter : Φ)	Acceptance (Q'ty)	$\Phi \leq 0.25$	Ignore	$0.25 < \Phi \leq 0.50$	5	$\Phi > 0.50$	0	Total	5	Length (L)	Width (W)	Acceptance (Q'ty)	---	$W \leq 0.03$	Ignore	$L \leq 10.0$	$0.03 < W \leq 0.05$	4	$L \leq 5.0$	$0.05 < W \leq 0.10$	2	---	$W > 0.10$	As round type	Total		5	Minor
Dimension (diameter : Φ)	Acceptance (Q'ty)																														
$\Phi \leq 0.25$	Ignore																														
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Total		5																													
07	Polarizer Bubble	<table border="1"> <thead> <tr> <th>Dimension (diameter : Φ)</th> <th>Acceptance (Q'ty)</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.25$</td> <td>Ignore</td> </tr> <tr> <td>$0.25 < \Phi \leq 0.50$</td> <td>4</td> </tr> <tr> <td>$0.50 < \Phi \leq 0.80$</td> <td>1</td> </tr> <tr> <td>$\Phi > 0.80$</td> <td>0</td> </tr> <tr> <td>Total</td> <td>5</td> </tr> </tbody> </table>	Dimension (diameter : Φ)	Acceptance (Q'ty)	$\Phi \leq 0.25$	Ignore	$0.25 < \Phi \leq 0.50$	4	$0.50 < \Phi \leq 0.80$	1	$\Phi > 0.80$	0	Total	5	Minor																
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$\Phi \leq 0.25$	Ignore																														
$0.25 < \Phi \leq 0.50$	4																														
$0.50 < \Phi \leq 0.80$	1																														
$\Phi > 0.80$	0																														
Total	5																														

◆ Specification For TFT-LCD Module 3.5" ~10" :

(Ver. 02)

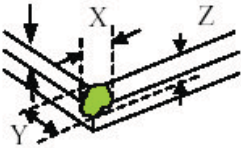
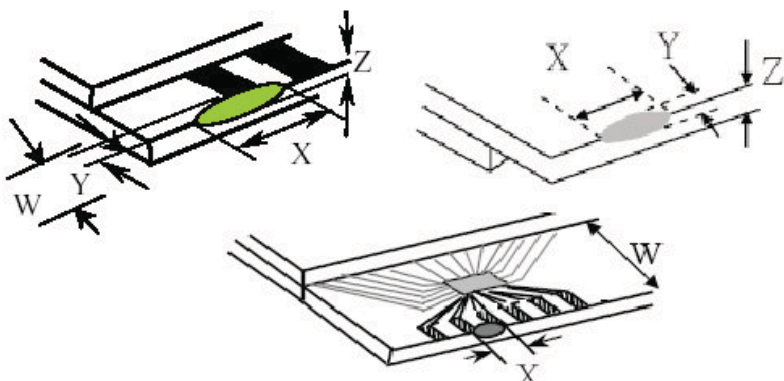
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NO	Item	Criterion	Level						
08	The crack of glass	<p>Symbols :</p> <p>X : The length of crack Z : The thickness of crack t : The thickness of glass</p> <p>Y : The width of crack. W : terminal length a : LCD side length</p>	Minor						
		<p>8.1 General glass chip :</p> <p>8.1.1 Chip on panel surface and crack between panels:</p>  <table border="1" data-bbox="597 1528 1390 1812"> <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	$\leq 1/2 t$
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 3.5" ~10" :

(Ver. 02)

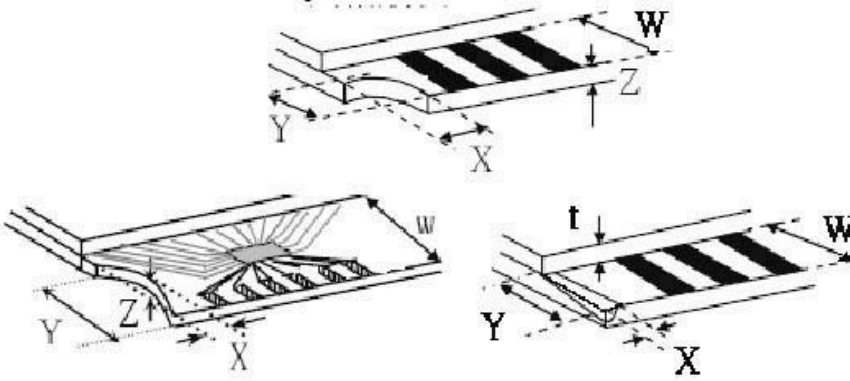
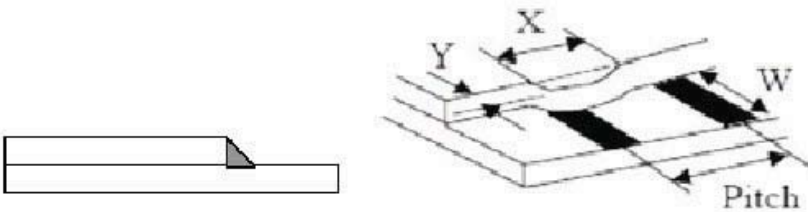
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NO	Item	Criterion	Level										
08	The crack of glass	<p>Symbols :</p> <p>X : The length of crack Z : The thickness of crack t : The thickness of glass</p> <p>Y : The width of crack. W : terminal length a : LCD side length</p> <hr/> <p>8.1.2 Corner crack :</p>  <table border="1" data-bbox="581 751 1369 1039"> <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="617 1612 1377 1780"> <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 3.5" ~10" :

(Ver. 02)

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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>	Minor									
		<p>8.2.2 Non-conductive portion :</p>  <table border="1" data-bbox="678 976 1295 1129"> <thead> <tr> <th>X</th> <th>Y</th> <th>Z</th> </tr> </thead> <tbody> <tr> <td>$\leq 1/3 a$</td> <td>$\leq W$</td> <td>$\leq t$</td> </tr> </tbody> </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="600 1669 1279 1810"> <thead> <tr> <th>X</th> <th>Y</th> <th>Z</th> </tr> </thead> <tbody> <tr> <td>$\leq a$</td> <td>$\leq 1/3 W$</td> <td>$\leq t$</td> </tr> </tbody> </table>		X	Y	Z	$\leq 1/3 a$	$\leq W$	$\leq t$	X	Y	Z
X	Y	Z										
$\leq 1/3 a$	$\leq W$	$\leq t$										
X	Y	Z										
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◆Specification For TFT-LCD Module 3.5" ~10" :

(Ver. 02)

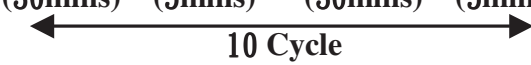
NO	Item	Criterion	Level
09	Backlight elements	9.1 Backlight can't work normally.	Major
		9.2 Backlight doesn't light or color is wrong.	Major
		9.3 Illumination source flickers when lit.	Major
10	General appearance	10.1 Pin type 、 quantity 、 dimension must match type in structure diagram.	Major
		10.2 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

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4. RELIABILITY TEST

4.1 Reliability Test Condition

Ver.02

NO.	TEST ITEM	TEST CONDITION											
1	High Temperature Storage Test	Keep in +80 ±2°C 96 hrs Surrounding temperature, then storage at normal condition 4hrs.											
2	Low Temperature Storage Test	Keep in -30 ±2°C 96 hrs Surrounding temperature, then storage at normal condition 4hrs.											
3	High Temperature / High Humidity Storage Test	Keep in +60°C / 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 ambience : 15°C ~ 35°C 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°C → +25°C → +70°C → +25°C (30mins) (5mins) (30mins) (5mins)  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)	<table border="1"> <thead> <tr> <th>Packing Weight (Kg)</th> <th>Drop Height (cm)</th> </tr> </thead> <tbody> <tr> <td>0 ~ 45.4</td> <td>122</td> </tr> <tr> <td>45.4 ~ 90.8</td> <td>76</td> </tr> <tr> <td>90.8 ~ 454</td> <td>61</td> </tr> <tr> <td>Over 454</td> <td>46</td> </tr> </tbody> </table>		Packing Weight (Kg)	Drop Height (cm)	0 ~ 45.4	122	45.4 ~ 90.8	76	90.8 ~ 454	61	Over 454	46
		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 $320\pm 10^{\circ}\text{C}$ and 3-5 sec.
- 5.2.9 To avoid liquid (include organic solvent) stained on LCM .

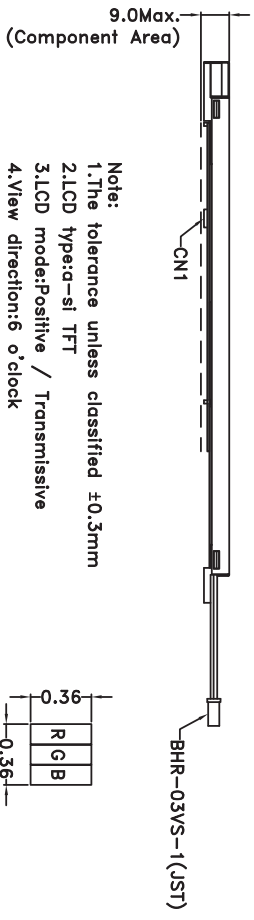
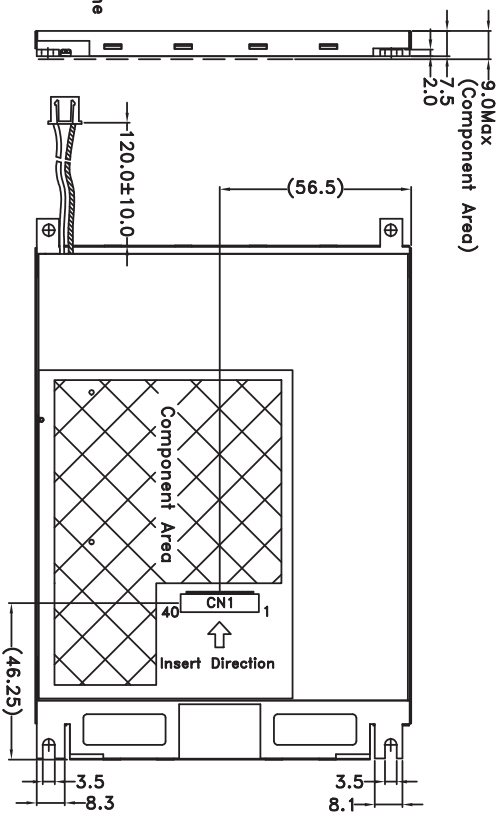
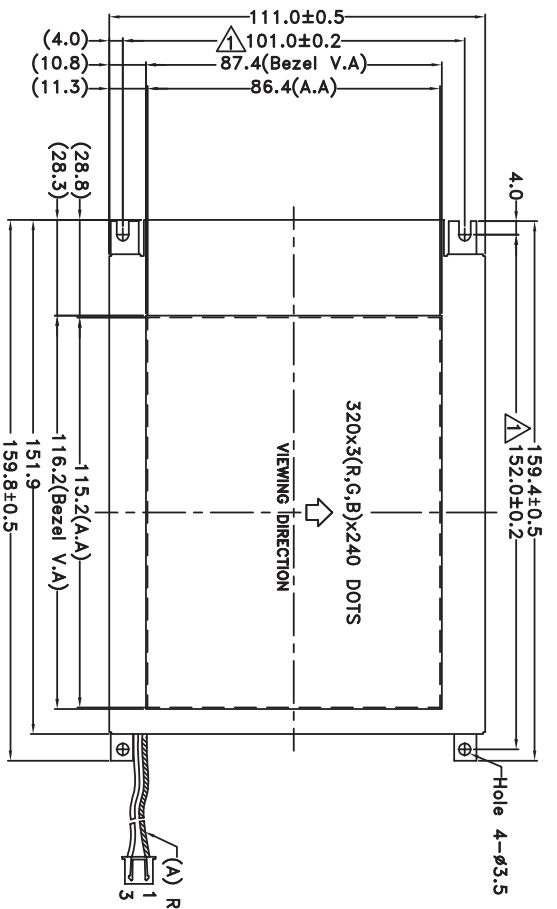
5.3 STORAGE

- 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.

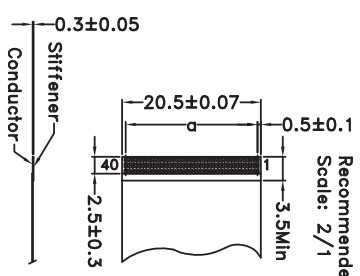
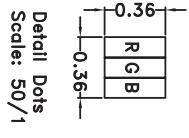
5.4 TERMS OF WARRANTY

- 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.

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- Note:
- 1.The tolerance unless classified ±0.3mm
 - 2.LCD type:a-si TFT
 - 3.LCD mode:Positive / Transmissive
 - 4.View direction:6 °clock
 - 5.T₉₀=-20° C~70° C , T_g=-30° C~80° C
 - 6.d=(P0.5x39=19.5±0.05,W=0.3±0.03)
 - 7.CN1:3681S-40A-GF(RISO)
 8. PCB Component Area



005																			
004																			
003																			
002																			
A	Modify Backlight Tolerance & Average Brightness	Mag	2008/08/21																
0	NEW DRAWING	Mag	2007/06/21																
REV		REVISER	DATE																
PART NO:		USMP-TT057Q-01D		DRAWING NAME:		USMP-TT057Q-01D		DESIGN		Mag		UNIT		MM		SURFACE			
TITLE:		LCD MODULE DRAWING		CHECK		Stone		APPROVE		Oliver		SCALE		1:2.1		THICKNESS			
DATE		2007/05/03		REVISER				PAGE		1/1		QUANTITY							

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Electronic Products for the OEM

6207 Bee Caves Rd., Ste. 330, Austin, TX 78746 USA
Tel:(800) 741-7155,sales@usmicroproducts.com
www.usmicroproducts.com

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公司標準
大小長度
1 ~ 4
4 ~ 16
16 ~ 63
63 ~ 250
250 ~ 1000

精度



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OLEDs



TFT Displays



Open Frame Monitors



Passive LCDs



Multitouch



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Trackballs



Aerospace Trackballs



Joysticks



Printers

