

MDT043001R	800x480	24-BIT RGB Interface	TFT Module
Specification			
Version: 1		Date: 08/11/2023	
Revision			
1	08/11/2023	First issue	

Display Features			
Display Size	4.30"		
Resolution	800x480		
Orientation	Landscape		
Appearance	RGB		
Logic Voltage	3.3V		
Interface	24-BIT RGB		
Brightness	500 cd/m ²		
Touchscreen	RTP		
Module Size	104.45 x 65.50 x 3.85 mm		
Operating Temperature	-30°C ~ +85°C	Created By	Checked By
Pinout	40 way FFC	CL	TSB
Pitch	0.50 mm	Box Quantity	Weight / Display
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* - For full design functionality, please use this specification in conjunction with the HX8264D + HX8664B display driver specification.(Provided Separately)

Display Accessories	
Part Number	Description
MBID-40FP	40 Way FFC to cable and wires. Driven by any driver board that can be wired to a 1mm pitch SHDR-40V-S-B receptacle.
MDIB-CC1	Interconnect board for standard pitch pinouts to fine pitch wires. Providing pinouts for 2.54 pinout. 1.27, 1, 0.845, 0.8, 0.7, 0.65, 0.62, 0.6, 0.5 & 0.3 pads.

Optional Variants	
Appearances	Voltage



1. GENERAL SPECIFICATIONS

ITEM	STANDARD VALUE	UNIT
LCD SIZE	4.3	INCH
LCD TYPE	TFT/TRANSMISSIVE	
MODULE SIZE	104.45(H)*65.50(V)*3.85(D)	MM
ACTIVE AREA	95.04(H) *53.86(V)	MM
PIXEL PITCH	0.1188*0.1122	MM
NUMBER OF PIXELS	800(W)* (RGB)*480(H)	
DRIVER IC	HX8264D+HX8664B	
VIEWING DIRECTION	ALL	O’CLOCK
BACKLIGHT TYPE	12-DIES WHITE LED, LED BIN:C/E	
INTERFACE TYPE	24-BIT RGB	
TOUCH PANEL	RTP	

MIDAS
DISPLAYS

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Touch Panel Features:

Type:	4-Wire Analogy Resistive Touch Panel
Input Mode:	Stylus or Finger
ITO Film:	0.2 mm (T)
ITO Glass:	0.7 mm (T)
Connector:	FPC

Touch Panel Mechanical Characteristics

Surface Hardness: 3H or more (according to JIS-K5400).

Touch Panel Optical Characteristics

Transmittance: 80% Typical.

Touch Panel Rating

1. Maximum Voltage

Less than DC 7 volts.

2. Operating Temperature Range

- 30°C to +85°C (Humidity: 20% RH to 70% RH, No condensation of dew).

3. Storage Temperature Range

- 30°C to +85°C (Humidity: 20% RH to 80% RH, No condensation of dew).

Electrical Characteristics

1. Resistance between Terminals

Direction "X": 430~950Ω

Direction "Y": 145~320Ω

2. Linearity

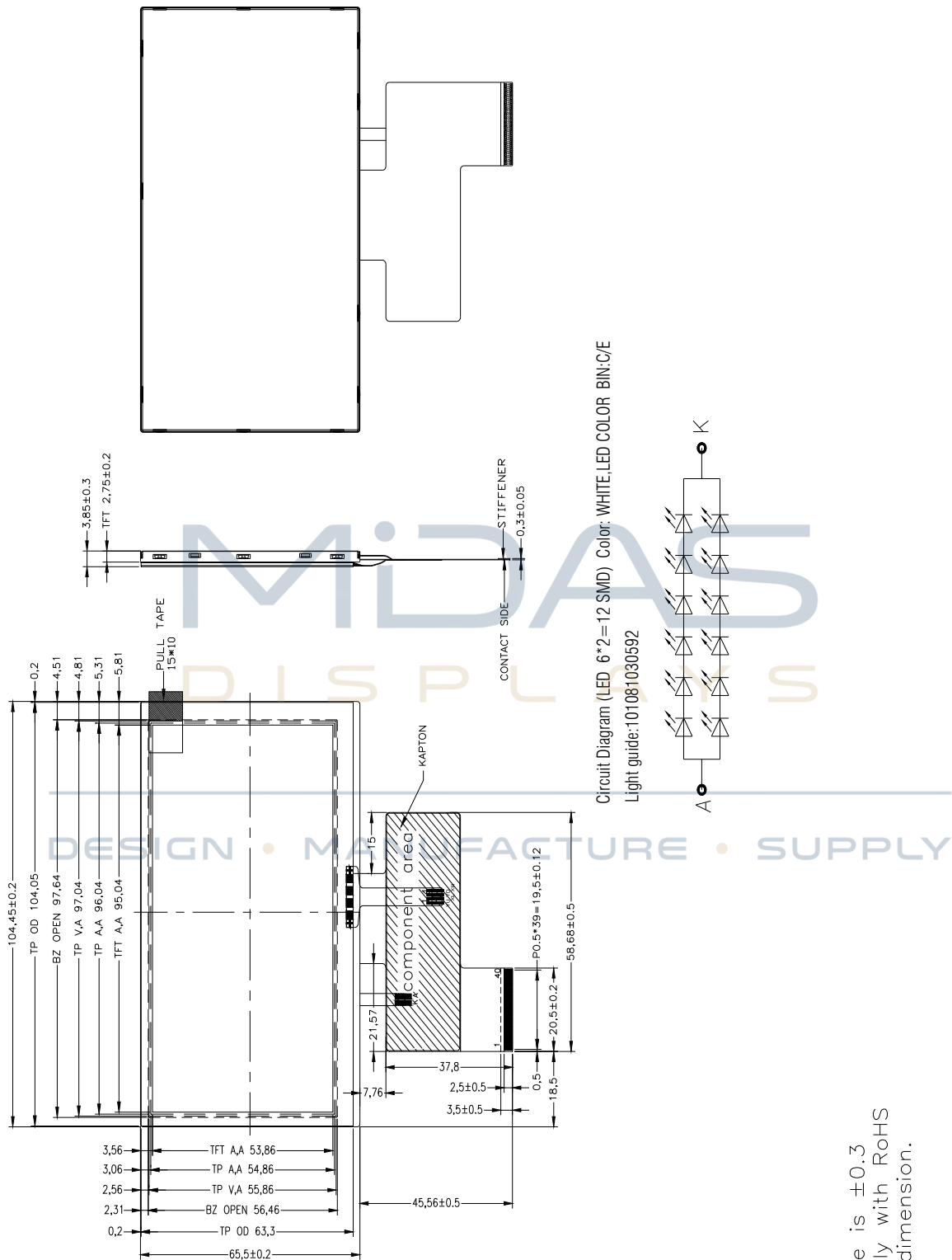
X axis: $\leq \pm 1.5\%$

Y axis: $\leq \pm 1.5\%$

3. Insulation Resistance: 20MΩ or more at DC 25 V.

4. Chattering Time: 10 msec or less at 100kΩ Pull-up.

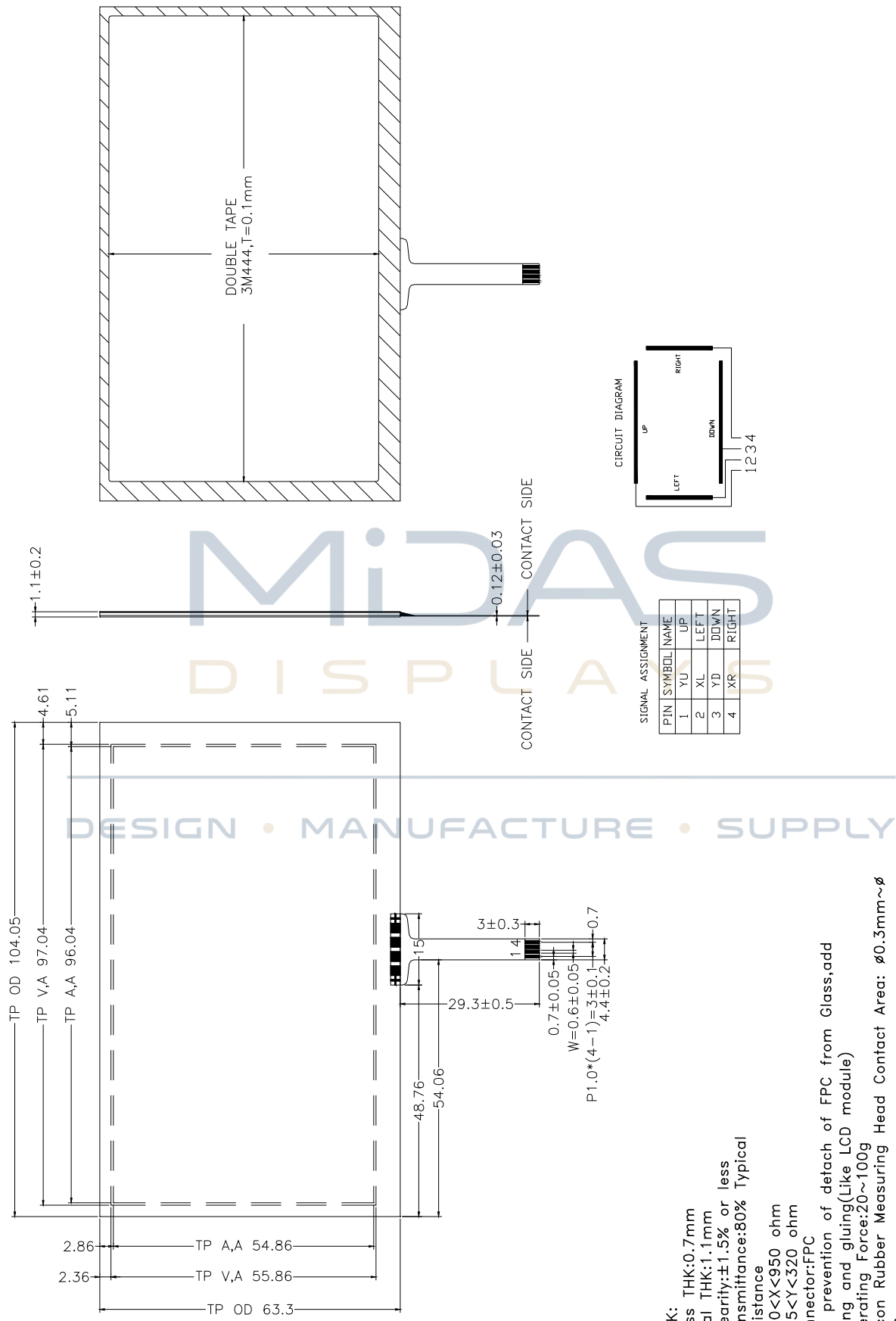
2. EXTERNAL DIMENSIONS



Remark:

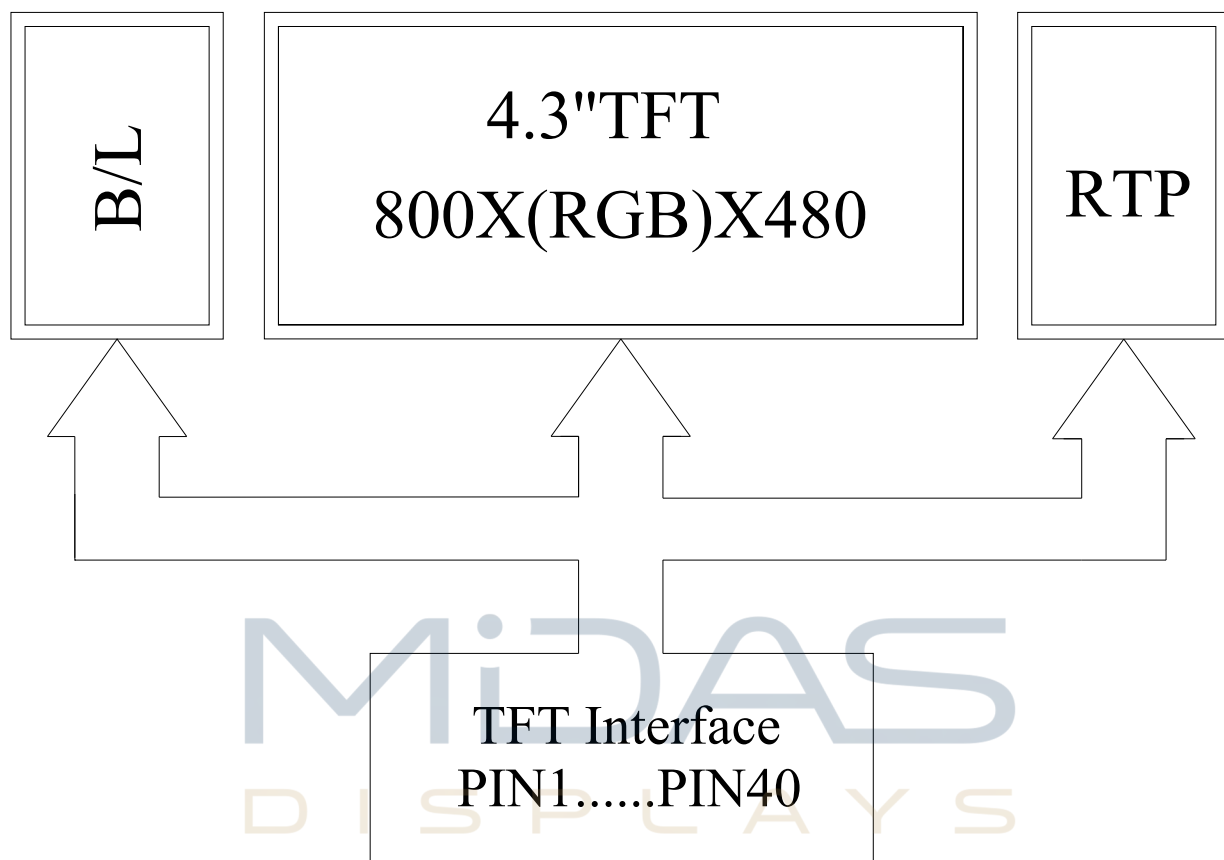
- 1.Unmarked tolerance is ±0.3
- 2.All materials comply with RoHS
3. ...critical dimension.

TOUCH PANEL DRAWING:



- REMARK:
1. Glass THK:0.7mm
 2. Total THK:1.1mm
 3. Linearity:±1.5% or less
 4. Transmittance:80% Typical
 5. Resistance
430<X<950 ohm
145<Y<320 ohm
 6. Connector:FPC
 7. For prevention of detach of FPC from Glass,add taping and gluing(Like LCD module)
 8. Operating Force:20~100g
 9. Silicon Rubber Measuring Head Contact Area: $\phi 0.3\text{mm} \sim \phi 0.8\text{mm}$
 10. General Tolerance:±0.3mm.
 11. All materials comply with RoHS
 12.critical dimension.

3. BLOCK DIAGRAM



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4. PIN ASSIGNMENT

Pin No.	Symbol	Description
1	LEDK	Cathode of LED backlight
2	LEDA	Anode of LED backlight
3	GND	Power ground
4	VDD	Power voltage
5	R0	Red data
6	R1	Red data
7	R2	Red data
8	R3	Red data
9	R4	Red data
10	R5	Red data
11	R6	Red data
12	R7	Red data
13	G0	Green data
14	G1	Green data
15	G2	Green data
16	G3	Green data
17	G4	Green data
18	G5	Green data
19	G6	Green data
20	G7	Green data
21	B0	Blue data
22	B1	Blue data
23	B2	Blue data
24	B3	Blue data
25	B4	Blue data
26	B5	Blue data
27	B6	Blue data
28	B7	Blue data
29	GND	Power ground
30	CLKIN	Pixel clock
31	STBYB	Standby mode. Normally pulled high.
32	HSD	Horizontal sync signal
33	VSD	Vertical sync signal
34	DEN	Data enable
35	NC	NO connect
36	GND	Power ground
37	XR	Touch panel control
38	YD	Touch panel control
39	XL	Touch panel control
40	YU	Touch panel control

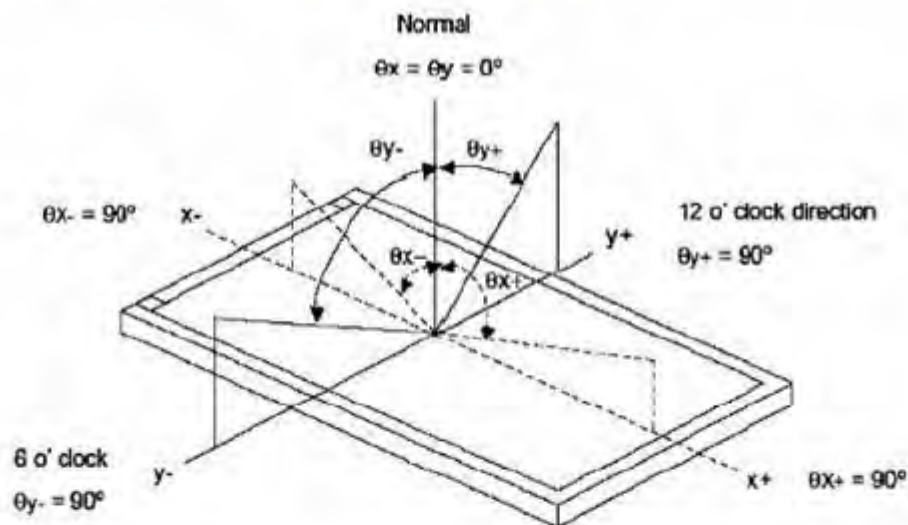


5. OPTICAL CHARACTERISTICS

ITEM		SYMBOL	CONDITIONS	SPECIFICATIONS			UNIT	NOTE
				MIN	TYP.	MAX		
Luminance		L	IL=40mA		500	-	Cd/m ²	
Contrast ratio		CR	$\theta = 0^\circ$	640	800			
Response time		$T_R + T_F$	Normal viewing angle		30	40	ms	
CIE COLOUR COORDINATE	RED	XR	VIEWING NORMAL ANGLE	+/-0.02	0.631	+/-0.02		
		YR			0.329			
	GREEN	XG			0.328			
		YG			0.548			
	BLUE	XB			0.136			
		YB			0.141			
	WHITE	XW			0.313			
		YW			0.339			
VIEWING ANGLE	Hor.	θ_{x+}	CR $\geq$ 10	70	80		Degree	
		θ_{x-}		70	80			
	Ver.	θ_{y+}		70	80			
		θ_{y-}		70	80			



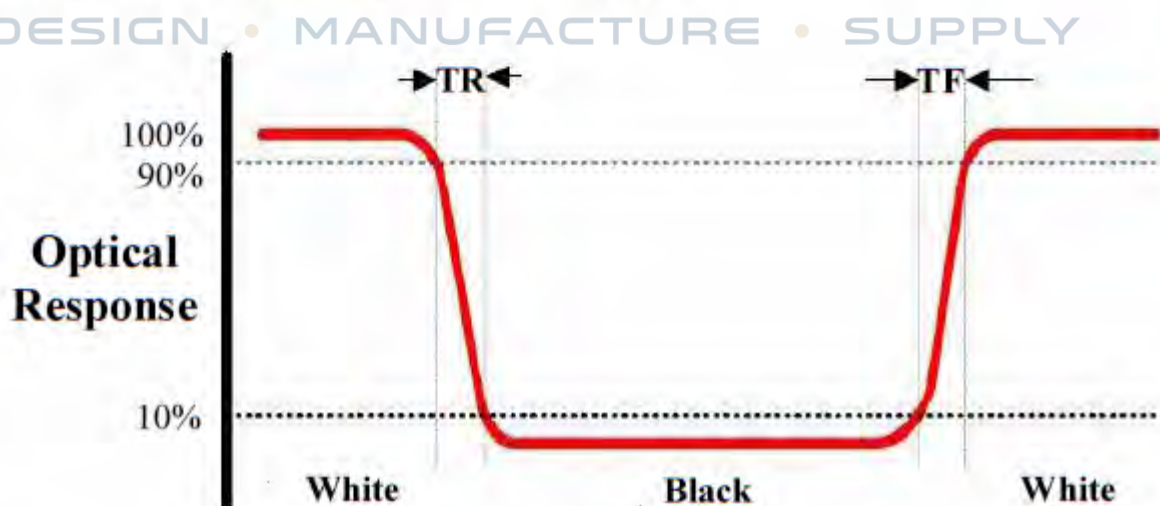
Note 1: Definition of Viewing Angle θ_x and θ_y :



Note 2: Definition of contrast ratio CR:

$$CR = \frac{\text{Luminance of white state}}{\text{Luminance of black state}}$$

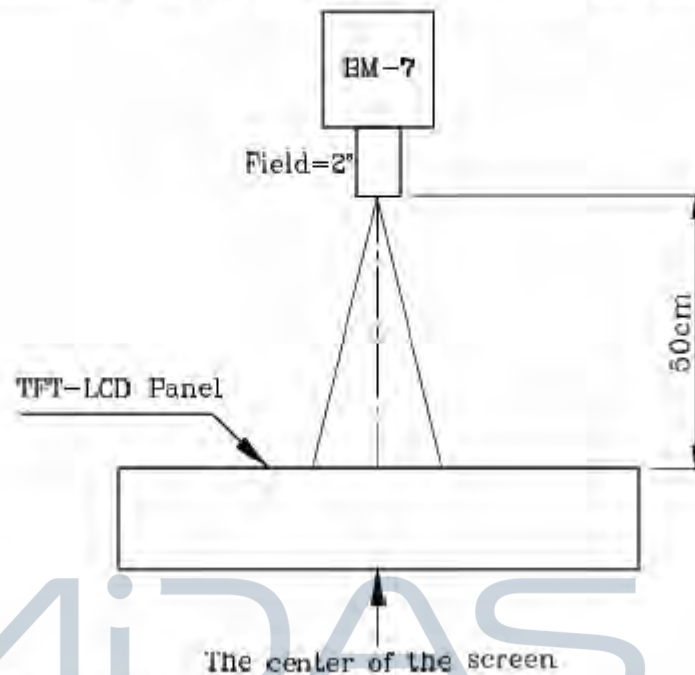
Note 3: Definition of Response Time (T_r , T_f)



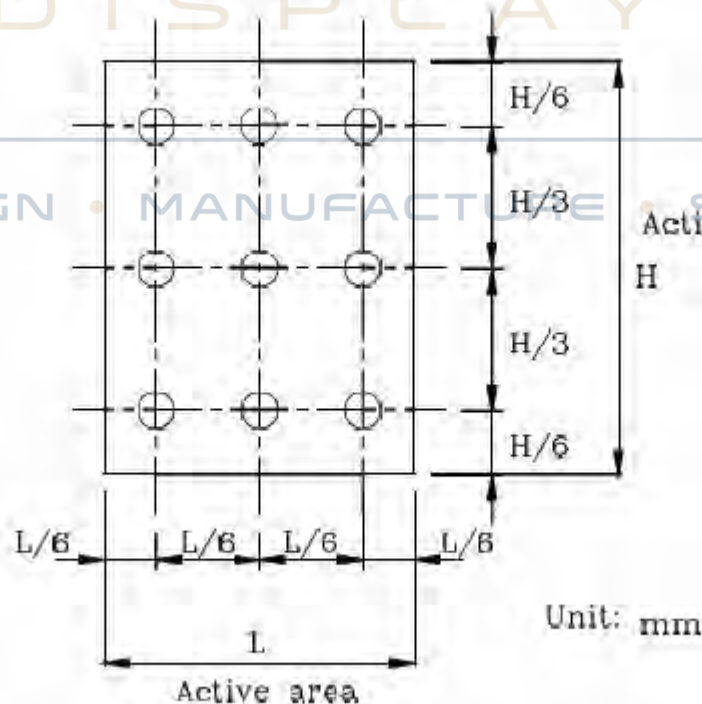
Note 4: Definition of Luminance

① The Brightness Test Equipment Setup

Field=2° (As measuring “black” image, field=2° is the best testing condition)



② The Brightness Test Point Setup



6. ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN	MAX	UNIT
Supply Voltage for analog	VDD	-0.5	5	V
Supply Voltage for logic	VDD	-0.5	5	V
Supply current(One LED)	I _{LED}		30	mA
Operating temperature	T _{op}	-30	+85	°C
Storage temperature	T _{st}	-30	+85	°C

Note: The absolute maximum rating values of this product are not allowed to be exceeded at any times.

Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

7. ELECTRICAL CHARACTERISTICS

7.1 INPUT POWER

ITEM	SYMBOL	MIN	TYP.	MAX	UNIT
Supply Voltage for analog	VDD	2.7	3.3	3.6	V
Supply Voltage for logic	VDD	2.7	3.3	3.6	V
TFT gate on voltage	V _{GH}	-	15	-	V
TFT gate off voltage	V _{GL}	-	-10	-	V
TFT common voltage	V _{com}	3.1	-	5.1	V
Input voltage	V _{IL}	GND	-	0.3VDD	V
	V _{IH}	0.7VDD	-	VDD	V

7.2 BLACKLIGHT DRIVING CONDITIONS

ITEM	SYMBOL	SPECIFICATIONS			UNIT	REMARK
		MIN	TYP.	MAX		
Supply Voltage	V _f	16.8	18	20.4	V	
Supply Current	I _I		40		mA	
Power consumption	P		0.72		W	
LED Life Time		30000	--		Hr	Note

Note: Brightness to be decreased to 50% of the initial value at ambient temperature T_A=25°C



8. TIMING CHARACTERISTICS

8.1 PARALLEL RGB MODE TIMING DIAGRAM

● Horizontal timing

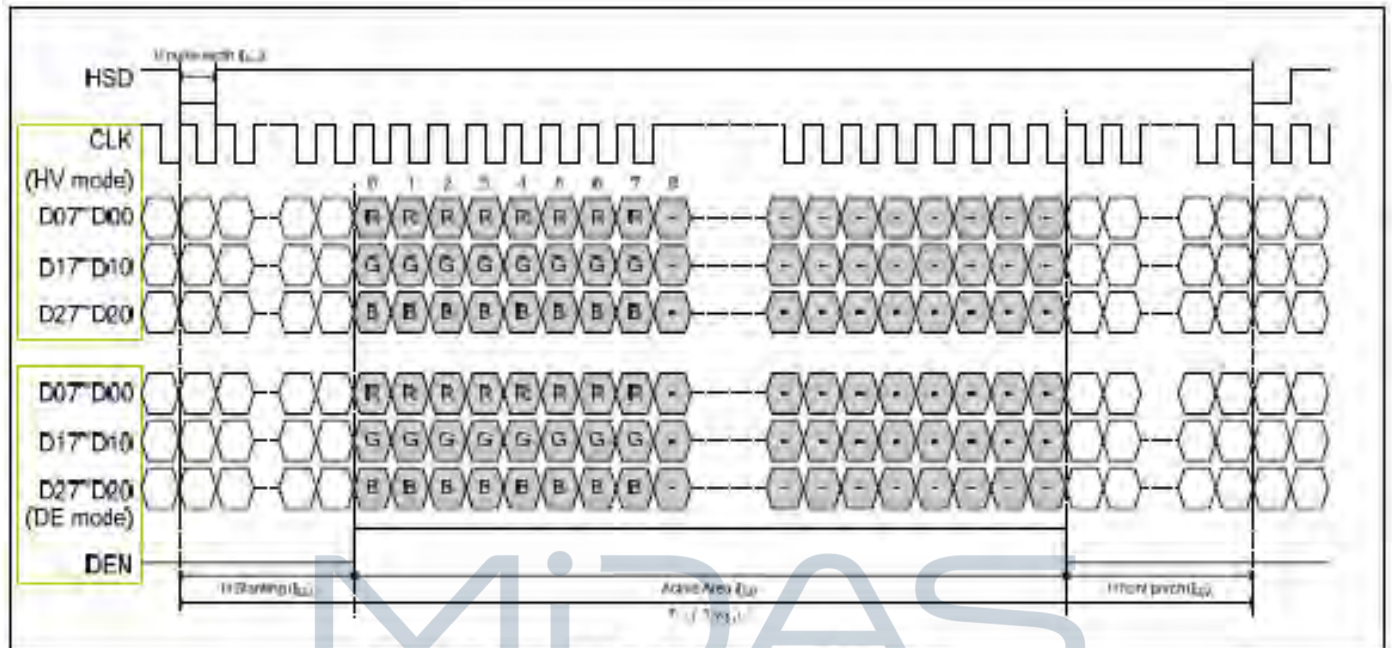


Figure 9. 1 Horizontal Input Timing Diagram

● Vertical timing

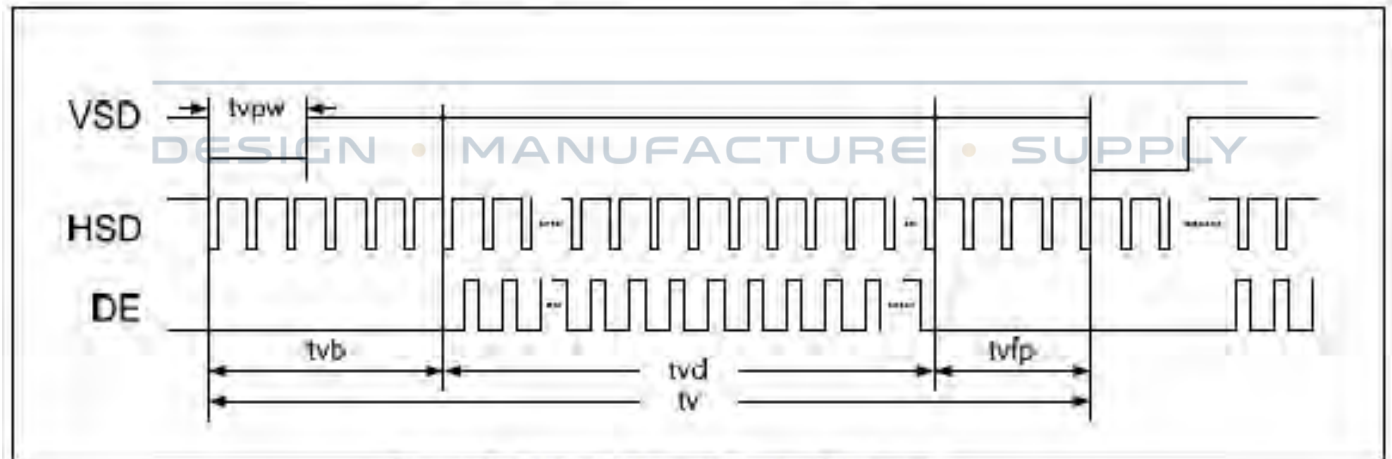


Figure 9. 2 Vertical Input Timing Diagram

8.2 PARALLEL RGB TIMING TABLE

● Horizontal timing

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
Horizontal Display Area	thd		800		DCLK
DCLK frequency	fclk	-	30	50	MHz
One Horizontal Line	th	889	928	1143	DCLK
HS pulse width	thpw	1	48	255	DCLK
HS Back Porch (Blanking)	thb		88		DCLK
HS Front Porch	thfp	1	40	255	DCLK
DE mode Blanking	th-thd	85	128	512	DCLK

● Vertical timing

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
Vertical Display Area	tvd		480		T _H
VS period time	tv	513	525	767	T _H
VS pulse width	typw	3	3	255	T _H
VS Back Porch (Blanking)	tvb		32		T _H
VS Front Porch	tvfp	1	13	255	T _H
DE mode Blanking	tv-tvd	4	45	255	T _H

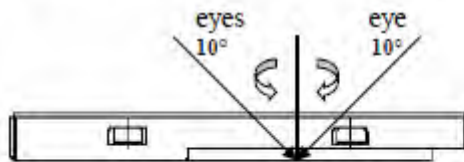
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9. INSPECTION SPECIFICATION

Manner of appearance test

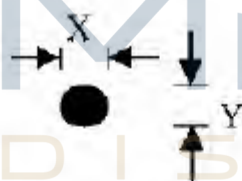
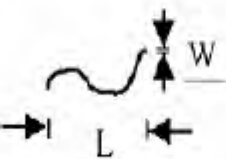
- The test must be under $20W \times 2$ or $40W$ fluorescent light, and the distance of view must be at $30 \pm 5cm$.
- When test the model of transmissive product must add the reflective plate.
- The test direction is base on around 10° of vertical line.
- Temperature: $25 \pm 5^\circ C$ Humidity: $60 \pm 10\%RH$

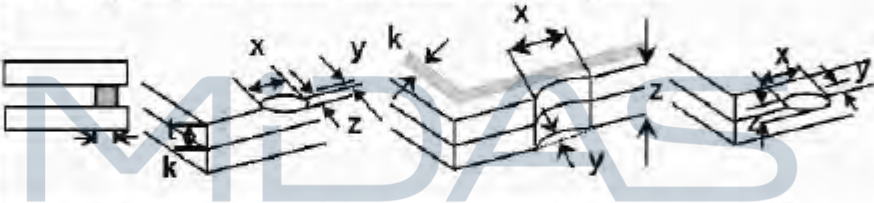
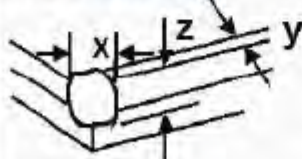


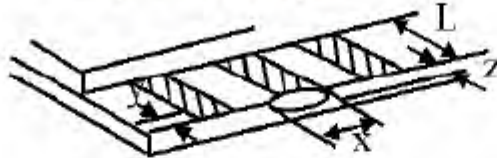
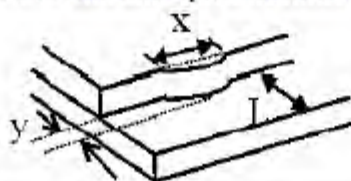
- Definition of area:



A: Viewing area B: Outside viewing area

NO.	Item	Criterion	AQL																										
01	Electrical Testing	1.1 Missing vertical, horizontal segment, segment contrast defect. 1.2 Missing character, dot or icon. 1.3 Display malfunction. 1.4 No function or no display. 1.5 Current consumption exceeds product specifications. 1.6 LCD viewing angle defect. 1.7 Mixed product types. 1.8 Flicker	0.65																										
02	Black or White spots or Bright spots or Color spots on LCD (Display only)	2.1 White and black or color spots on display $\leq 0.25\text{mm}$, no more than Five spots. 2.2 Densely spaced: No more than three spots within 3mm.	2.5																										
03	LCD Panel black spots, white spots, contamination (non – display)	3.1 Round type: As following drawing $\Phi = (X+Y) / 2$  <table><thead><tr><th>Size(mm)</th><th>Acceptable Q'ty</th></tr></thead><tbody><tr><td>$\Phi \leq 0.10$</td><td>Accept no dense</td></tr><tr><td>$0.10 < \Phi \leq 0.20$</td><td>2</td></tr><tr><td>$0.20 < \Phi \leq 0.25$</td><td>2</td></tr><tr><td>$0.25 < \Phi \leq 0.30$</td><td>1</td></tr><tr><td>$0.30 < \Phi$</td><td>0</td></tr></tbody></table> * Densely spaced: No more than two spots within 3mm. 3.2 Line type: (As following drawing)  <table><thead><tr><th>Length(mm)</th><th>Width(mm)</th><th>Acceptable Q'ty</th></tr></thead><tbody><tr><td>---</td><td>$W \leq 0.02$</td><td>Accept no dense</td></tr><tr><td>$L \leq 3.0$</td><td>$0.02 < W \leq 0.05$</td><td rowspan="2">2</td></tr><tr><td>$L \leq 2.5$</td><td>$0.03 < W \leq 0.08$</td></tr><tr><td>---</td><td>$0.08 < W$</td><td>Rejection</td></tr></tbody></table> * Densely spaced: No more than two lines within 3mm.	Size(mm)	Acceptable Q'ty	$\Phi \leq 0.10$	Accept no dense	$0.10 < \Phi \leq 0.20$	2	$0.20 < \Phi \leq 0.25$	2	$0.25 < \Phi \leq 0.30$	1	$0.30 < \Phi$	0	Length(mm)	Width(mm)	Acceptable Q'ty	---	$W \leq 0.02$	Accept no dense	$L \leq 3.0$	$0.02 < W \leq 0.05$	2	$L \leq 2.5$	$0.03 < W \leq 0.08$	---	$0.08 < W$	Rejection	2.5
Size(mm)	Acceptable Q'ty																												
$\Phi \leq 0.10$	Accept no dense																												
$0.10 < \Phi \leq 0.20$	2																												
$0.20 < \Phi \leq 0.25$	2																												
$0.25 < \Phi \leq 0.30$	1																												
$0.30 < \Phi$	0																												
Length(mm)	Width(mm)	Acceptable Q'ty																											
---	$W \leq 0.02$	Accept no dense																											
$L \leq 3.0$	$0.02 < W \leq 0.05$	2																											
$L \leq 2.5$	$0.03 < W \leq 0.08$																												
---	$0.08 < W$	Rejection																											

NO.	Item	Criterion			AQL													
04	Polarizer bubbles	If bubbles are visible, judge using black spot specifications, not easy to find, must check in specify direction	Size Φ (mm)	Acceptable Q'ty	2.5													
			$\Phi \leq 0.20$	Accept no dense														
			$0.20 < \Phi \leq 0.50$	3														
			$0.50 < \Phi \leq 1.00$	2														
			$1.00 < \Phi$	0														
			Total Q'ty	3														
05	Scratches	Follow NO.3 -2 Line Type.																
06	Chipped glass	Symbols: x: Chip length y: Chip width z: Chip thickness k: Seal width t: Glass thickness a: LCD side length L: Electrode pad length 6.1 General glass chip: 6.1.1 Chip on panel surface and crack between panels: 			2.5													
		<table><tr><td>z: Chip thickness</td><td>y: Chip width</td><td>x: Chip length</td></tr><tr><td>$Z \leq 1/2t$</td><td>Not over viewing area</td><td>$x \leq 1/8a$</td></tr><tr><td>$1/2t < z \leq 2t$</td><td>Not exceed 1/3k</td><td>$x \leq 1/8a$</td></tr></table> ⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip 6.1.2 Corner crack:  <table><tr><td>z: Chip thickness</td><td>y: Chip width</td><td>x: Chip length</td></tr><tr><td>$Z \leq 1/2t$</td><td>Not over viewing area</td><td>$x \leq 1/8a$</td></tr><tr><td>$1/2t < z \leq 2t$</td><td>Not exceed 1/3k</td><td>$x \leq 1/8a$</td></tr></table> ⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip	z: Chip thickness	y: Chip width		x: Chip length	$Z \leq 1/2t$	Not over viewing area	$x \leq 1/8a$	$1/2t < z \leq 2t$	Not exceed 1/3k	$x \leq 1/8a$	z: Chip thickness	y: Chip width	x: Chip length	$Z \leq 1/2t$	Not over viewing area	$x \leq 1/8a$
z: Chip thickness	y: Chip width	x: Chip length																
$Z \leq 1/2t$	Not over viewing area	$x \leq 1/8a$																
$1/2t < z \leq 2t$	Not exceed 1/3k	$x \leq 1/8a$																
z: Chip thickness	y: Chip width	x: Chip length																
$Z \leq 1/2t$	Not over viewing area	$x \leq 1/8a$																
$1/2t < z \leq 2t$	Not exceed 1/3k	$x \leq 1/8a$																

NO.	Item	Criterion	AQL																
07	Glass crack	Symbols: x: Chip length y: Chip width z: Chip thickness k: Seal width t: Glass thickness a: LCD side length L: Electrode pad length 7.2 Protrusion over terminal: 7.2.1 Chip on electrode pad:  <table><tr><td>y: Chip width</td><td>x: Chip length</td><td>z: Chip thickness</td></tr><tr><td>$y \leq 0.5\text{mm}$</td><td>$x \leq 1/8a$</td><td>$0 < z \leq t$</td></tr></table> 7.2.2 Non-conductive portion:  <table><tr><td>y: Chip width</td><td>x: Chip length</td><td>z: Chip thickness</td></tr><tr><td>$y \leq L$</td><td>$x \leq 1/8a$</td><td>$0 < z \leq t$</td></tr></table> ⊙ If there chipped area touches the ITO terminal, over 2/3 of the ITO must remain and be inspected according to electrode terminal specifications. ⊙ If the product will be heat sealed by the customer, the alignment mark must not be damaged. 7.2.3 Substrate protuberance and internal crack  <table><tr><td>y: width</td><td>x: length</td></tr><tr><td>$y \leq 1/3L$</td><td>$X \leq a$</td></tr></table>	y: Chip width	x: Chip length	z: Chip thickness	$y \leq 0.5\text{mm}$	$x \leq 1/8a$	$0 < z \leq t$	y: Chip width	x: Chip length	z: Chip thickness	$y \leq L$	$x \leq 1/8a$	$0 < z \leq t$	y: width	x: length	$y \leq 1/3L$	$X \leq a$	2.5
y: Chip width	x: Chip length	z: Chip thickness																	
$y \leq 0.5\text{mm}$	$x \leq 1/8a$	$0 < z \leq t$																	
y: Chip width	x: Chip length	z: Chip thickness																	
$y \leq L$	$x \leq 1/8a$	$0 < z \leq t$																	
y: width	x: length																		
$y \leq 1/3L$	$X \leq a$																		

NO.	Item	Criterion	AQL
08	Cracked glass	The LCD with extensive crack is not acceptable.	2.5
09	Backlight elements	9.1 Illumination source flickers when lit. 9.2 Spots or scratches that appear when lit must be judged. Using LCD spot, lines and contamination standards. 9.3 Backlight doesn't light or color is wrong.	2.5 2.5 0.65
10	Bezel	Bezel must comply with product specifications.	2.5
11	PCB、COB	11.1 COB seal may not have pinholes larger than 0.2mm or contamination. 11.2 COB seal surface may not have pinholes through to the IC. 11.3 The height of the COB should not exceed the height indicated in the assembly diagram. 11.4 There may not be more than 2mm of sealant outside the seal area on PCB. And there should be no more than three places. 11.5 Parts on PCB must be the same as on the production characteristic chart, There should be no wrong parts, missing parts or excess parts. 11.6 The jumper on the PCB should conform to the product characteristic chart.	2.5 2.5 2.5 2.5 0.65 0.65
12	FPC	12.1 FPC terminal damage $\leq 1/2$ FPC terminal width and can not affect the function, we judge accept. 12.2 FPC alignment hole damage $\leq 1/2$ alignment area and can not affect the function, we judge accept.	2.5 2.5
13	Soldering	13.1 No cold solder joints, missing solder connections, oxidation or icicle. 13.2 No short circuits in components on PCB or FPC.	2.5 0.65
14	LCD Ripple	Touch the touch panel, can not see the LCD ripple. Pen: R 1.0mm silicon rubber. Operation Force: 80g	2.5
15	General appearance	15.1 Pin type must match type in specification sheet. 15.2 LCD pin loose or missing pins. 15.3 Product packaging must the same as specified on packaging specification sheet. 15.4 Product dimension and structure must conform to product specification sheet.	0.65 0.65 0.65 0.65

10. RELIABILITY TEST

NO.	TEST ITEM	CONDITIONS	
1	HIGH TEMPERATURE STORAGE	TA=+85℃	240
2	LOW TEMPERATURE STORAGE	TA=-30℃	240
3	HIGH TEMPERATURE OPERATION	TA=+85℃	240
4	LOW TEMPERATURE OPERATION	TA=-30℃	240
5	HIGH TEMPERATURE AND HIGH HUMIDITY OPERATION	+60℃,90%RH	240
6	THERMAL SHOCK	-30℃→+85℃,	0.5H:10CYCLES



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11. LCD MODULES HANDLING PRECAUTIONS

- The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.
- If the display panel is damaged and the liquid crystal substance inside it leaks out, do not get any in your mouth. If the substance come into contact with your skin or clothes promptly wash it off using soap and water.
- Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.
- The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarize carefully.
- To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.
 - Be sure to ground the body when handling the LCD module.
 - Tools required for assembly, such as soldering irons, must be properly grounded.
 - To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.
 - The LCD module is coated with a film to protect the display surface. Exercise care when peeling off this protective film since static electricity may be generated.
- Storage precautions
When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps. Keep the modules in bags designed to prevent static electricity charging under low temperature / normal humidity conditions (avoid high temperature / high humidity and low temperatures below 0°C). Whenever possible, the LCD modules should be stored in the same conditions in which they were shipped from our company.

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12. OTHERS

- Liquid crystals solidify at low temperature (below the storage temperature range) leading to defective orientation of liquid crystal or the generation of air bubbles (black or white). Air bubbles may also be generated if the module is subjected to a strong shock at a low temperature.
- If the LCD modules have been operating for a long time showing the same display patterns may remain on the screen as ghost images and a slight contrast irregularity may also appear. Abnormal operating status can be resumed to be normal condition by suspending use for some time. It should be noted that this phenomena does not adversely affect performance reliability.
- To minimize the performance degradation of the LCD modules resulting from caused by static electricity, etc. exercise care to avoid holding the following sections when handling the modules:
 - Exposed area of the printed circuit board
 - Terminal electrode sections.

