ALL SHORE INDUSTRIES

ASI-T-5007A3MN/D

Item	Contents	Unit
Size	5.0	inch
Resolution	720(RGB) x 1280	/
Technology type	IPS	/
Viewing Direction	All	/
Interface	MIPI	
Pixel pitch (W x H)	/	mm
Pixel Configuration	R.G.B. Vertical Stripe	
Outline Dimension (W x H x D)	65.30 x 118.80 x 1.60	mm
Active Area(W x H)	62.10 x 110.40	mm
DRIVER IC	ILI9881C	/
Display Mode	Transmissive	/
Backlight Type	LED	/
Weight	TBD	g

Record of Revision

Date	Revision No.	Summary
2016-05-17	1.0	Rev 1.0 was issued
2016-12-19	1.1	Update the controller IC

1. Scope

   This data sheet is to introduce the specification of ASI-T-5007A3MN/D active matrix TFT module. It is composed of a color TFT-LCD panel, driver ICs, FPC and a backlight unit. The 5.0'' display area contains 720(RGB) x1280 pixels.
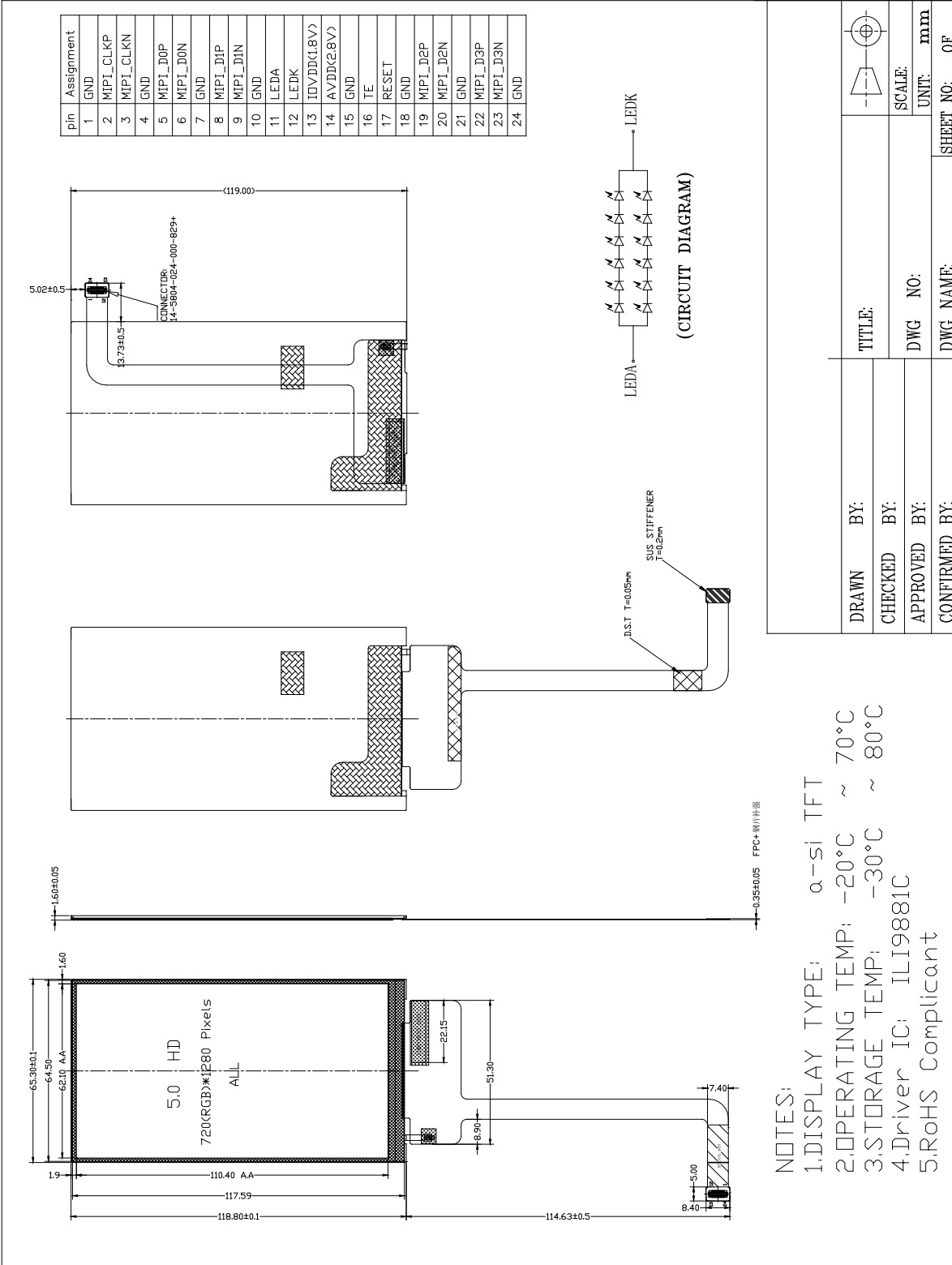
2. Application

   Digital equipments which need color display, mobile navigator/video systems.

3. General Information

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4. Outline Drawing

pin	Assignment
1	GND
2	MIPI_CLKP
3	MIPI_CLKN
4	GND
5	MIPI_D0P
6	MIPI_D0N
7	GND
8	MIPI_D1P
9	MIPI_D1N
10	GND
11	LEDA
12	LEDK
13	IOVDD(1.8V)
14	AVDD(2.8V)
15	GND
16	TE
17	RESET
18	GND
19	MIPI_D2P
20	MIPI_D2N
21	GND
22	MIPI_D3P
23	MIPI_D3N
24	GND

(CIRCUIT DIAGRAM)

LEDA · · LEDK

CONNECTOR: 14-5804-024-000-829+

SUS STIFFENER T=0.2mm

D.S.T T=0.05mm

5.0 HD
720(RGB)*1280 Pixels
ALL

NOTES:
1.DISPLAY TYPE: a-si TFT
2.OPERATING TEMP: -20°C ~ 70°C
3.STORAGE TEMP: -30°C ~ 80°C
4.Driver IC: ILI9881C
5.RoHS Compliant

FPC+单片补强

TITLE:

DRAWN BY:
CHECKED BY:
APPROVED BY:
CONFIRMED BY:

DWG NO:
DWG NAME:

SCALE:
UNIT: mm
SHEET NO: OF

5. Interface signals

Pin No.	Symbol	Function	Remark
1	GND	Ground	
2	MIPI_CLKP	DSI-CLK+ clock signals	
3	MIPI_CLKN	DSI-CLK- clock signals	
4	GND	Ground	
5	MIPI_D0P	DSI-D0+ clock signals	
6	MIPI_D0N	DSI-D0- clock signals	
7	GND	Ground	
8	MIPI_D1P	DSI-D1+ clock signals	
9	MIPI_D1N	DSI-D1- clock signals	
10	GND	Ground	
11	LEDA	LED Anode	
12	LEDK	LED Cathode	
13	IOVDD(1.8V)	Power Supply 1.8V-2.8V	
14	AVDD(2.8V)	Power Supply 2.8V	
15	GND	Ground	
16	TE	Tearing effect output	
17	RESET	LCM Reset input signal	
18	GND	Ground	
19	MIPI_D2P	DSI-D2+ clock signals	
20	MIPI_D2N	DSI-D2- clock signals	
21	GND	Ground	
22	MIPI_D3P	DSI-D3+ clock signals	
23	MIPI_D3N	DSI-D3- clock signals	
24	GND	Ground	

Connector number:14-5804-030-000-829+

6. Absolute maximum Ratings

6.1. Electrical Absolute max. ratings

Parameter	Symbol	MIN	MAX	Unit	Remark
Power supply voltage for logic	VDD	0.3	4.6	V	
Input voltage	VIN	/	VDD+0.3	V	

Notes:

1. If the module is above these absolute maximum ratings. It may become permanently damaged. Using the module within the following electrical characteristic conditions are also exceeded, the module will malfunction and cause poor reliability.

2. VDD >V_{SS} must be maintained.

6.2. Environment Conditions

Item	Symbol	MIN	MAX	Unit	Remark
Operating Temperature	TOPR	-20	70	℃	
Storage Temperature	TSTG	-30	80	℃	

Notes:
Background color changes slightly depending on ambient temperature. This Phenomenon is reversible.

Ta≦70℃: 75%RH max

Ta>70℃: absolute humidity must be lower than the humidity of 75%RH at 70℃

Ta at -30℃ will be <48hrs, at 80 ℃ will be <120hrs

7. Electrical Specifications

7.1 Electrical characteristics

GND=0V, Ta=25℃

| Item	Symbol	MIN	TYP	MAX	Unit	Remark
Operating voltage	VDD	2.6	2.8	3.3	V	
Supply current	IDD	-	-	5	mA	VDD=2.8V,Ta=25°C
Input voltage	VIL	0	--	0.2*VDD	V	
	VIH	0.8*VDD	--	VDD	V	
Input leakage current	I_{IL}	-1.0	-	1.0	uA	VIN=VDD or VSS

Note: Voltage greater than above may damage the module.

All voltages are specified relative to VSS=0V.

7.2 LED Backlight

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Forward Current	IF	--	40	--	mA	
Forward Voltage	VF	--	19.2	--	V	
Life time	--	--	25,000	--	Hr	

7.3 BLOCK DIAGRAM
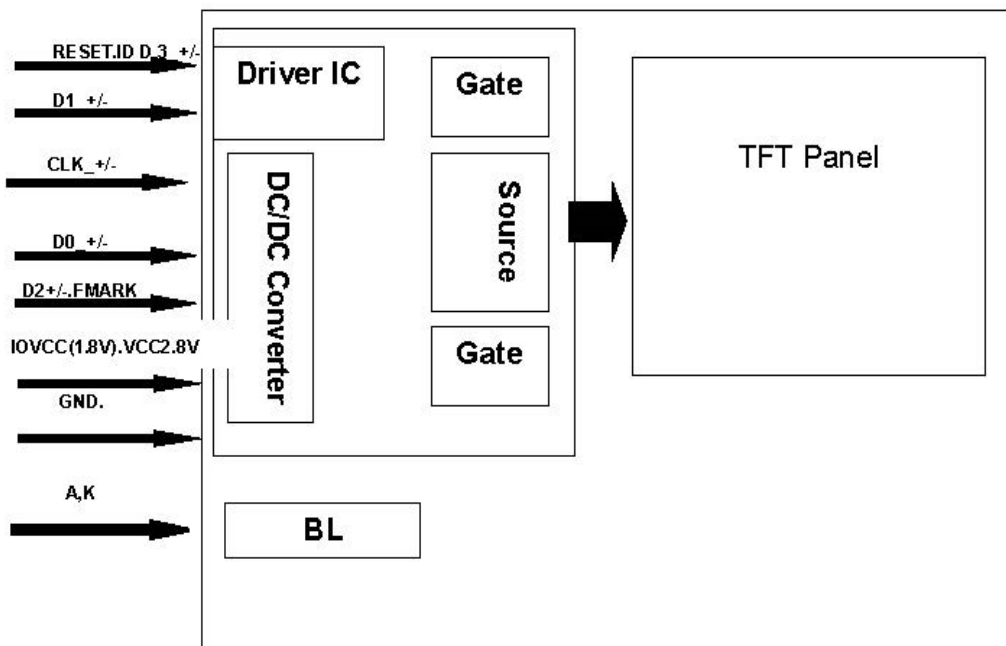
8. AC CHARACTERISTICS

Interface: System Bus Read/Write Characteristics

(VSS=VSSI=DVSS=0V, VDDI=1.65V to 3.3V, VDD=2.3V to 4.8V,Ta = -30 to 70 °C)

| Signal	Symbol	Parameter	MIN	TYP	MAX	Unit	Description
		Low Power Mode to High Speed Mode Timing					
DSI-Dn+/-	T_{LPX}	Length of any low power state period	50	-	-	ns	Input
DSI-Dn+/-	$T_{HS-PREPARE}$	Time to drive LP-00 to prepare for HS transmission	40+4xUI	-	85+6xUI	ns	Input
DSI-Dn+/-	$T_{HS-TERMEN}$	Time to enable data receiver line termination measured from when Dn crosses V_{ILMAX}	-	-	35+4xUI	ns	Input
		High Speed Mode to Low Power Mode Timing					
DSI-Dn+/-	$T_{HS-SKIP}$	Time-out at display module to ignore transition period of EoT	40	-	55+4xUI	ns	Input
DSI-Dn+/-	$T_{HS-EXIT}$	Time to drive LP-11 after HS burst	100	-	-	ns	Input
DSI-Dn+/-	$T_{HS-TRAIL}$	Time to drive flipped differential state after last payload data bit of a HS transmission burst	60+4xUI	-	-	ns	Input
		High Speed Mode to/from Low Power Mode Timing					
DSI-CLK+/-	$T_{CLK-POST}$	Time that the MPU shall continue sending HS clock after the last associated data lane has transition to LP mode	60+128x UI	-	-	ns	Input
DSI-CLK+/-	$T_{CLK-TRAIL}$	Time to drive HS differential state after last payload clock bit of a HS transmission burst	60	-	-	ns	Input
DSI-CLK+/-	$T_{HS-EXIT}$	Time to drive LP-11 after HS burst	100	-	-	ns	Input
DSI-CLK+/-	$T_{CLK-PREPARE}$	Time to drive LP-00 to prepare for HS transmission	38	-	95	ns	Input
DSI-CLK+/-	$T_{CLK-TERMEN}$	Time-out at clock lane display module to enable HS transmission	-	-	38	ns	Input
DSI-CLK+/-	$T_{CLK-PREPARE}$ + $T_{CLK-ZERO}$	Minimum lead HS-0 drive period before starting clock	300	-	-	ns	Input
DSI-CLK+/-	$T_{CLK-PRE}$	Time that the HS clock shall be driven prior to any associated data lane beginning the transition from LP to HS mode	8xUI	-	-	ns	Input

Note) Dn = D0 and D1.

9. Optical Specification

Ta=25℃

Item		Symbol	Condition	Min	Typ.	Max.	Unit	Remark
Contrast Ratio		CR	θ=0°	500	700	-		Note1 Note2
Response Time		Tr+Tf	25℃	-	25	-	ms	Note1 Note3
View Angles		ΘT	CR≧10	80	-	-	Degree	Note 4
		ΘB		80	-	-		
		ΘL		80	-	-		
		ΘR		80	-	-		
Chromaticity	White	x	Brightness is on	Typ-0.05	TBD	Typ+0.05		Note5, Note1
		y			TBD			
	Red	x			TBD			
		y			TBD			
	Green	x			TBD			
		y			TBD			
	Blue	x			TBD			
		y			TBD			
Luminance		L		250	350	-	cd/m^2	Note1 Note6
Uniformity		U		75	80	-	%	Note1 Note7

Note 1: Definition of optical measurement system.

Temperature = 25℃($\pm$3℃)

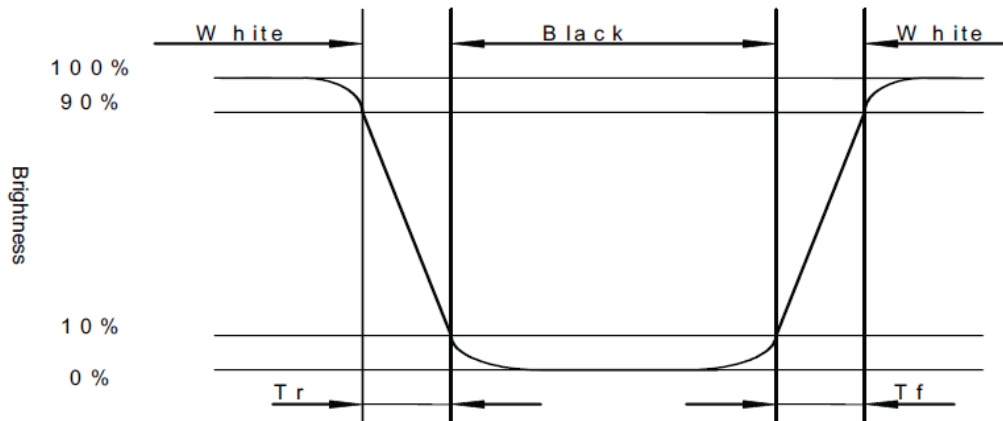LED back-light: ON, Environment brightness < 150 lx
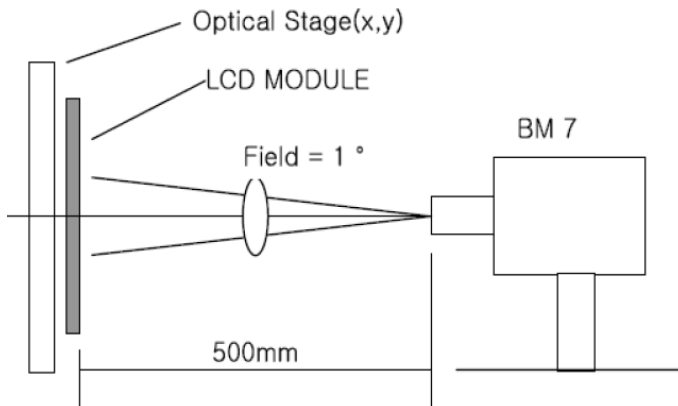
Note 2: Contrast ratio is defined as follow:

$$\text{Contrast Ratio} = \frac{\text{Surface Luminance with all white pixels}}{\text{Surface Luminance with all black pixels}}$$
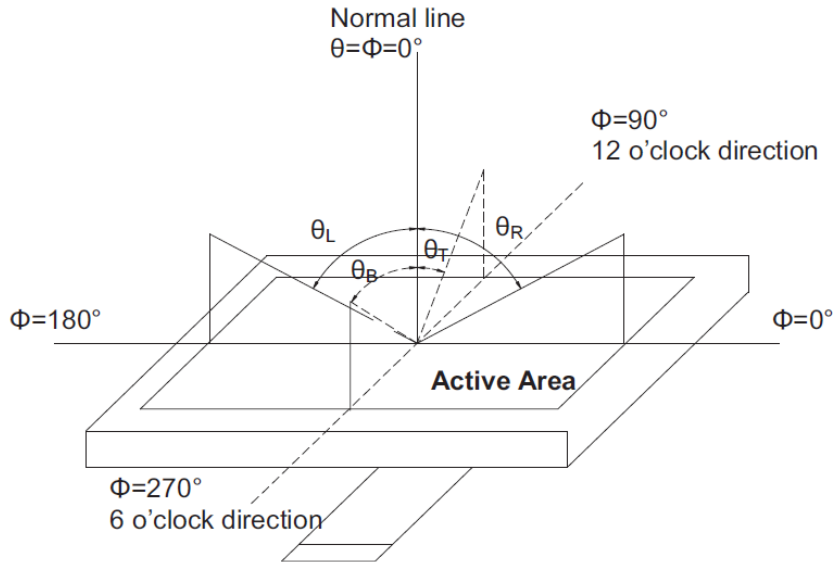
Note 3: Response time is defined as follow:

Response time is the time required for the display to transition from black to white (Rise Time, Tr) and from white to black (Decay Time, Tf).
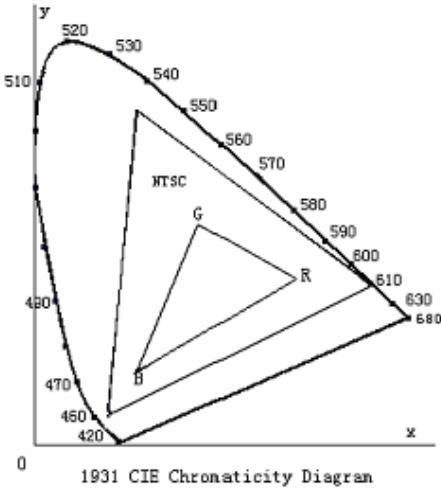

Note 4: Viewing angle range is defined as follow:

Viewing angle is measured at the center point of the LCD.

Note 5: Color chromaticity is defined as follow: (CIE1931)

Color coordinates measured at center point of LCD.

1931 CIE Chromaticity Diagram

$$S = \frac{area \ of \ RGB \ triangle}{area \ of \ NTSC \ triangle} \times 100\%$$

Note 6: Luminance is defined as follow:

Luminance is defined as the brightness of all pixels "White" at the center of display area on optimum contrast.

Note 7: Luminance Uniformity is defined as follow:

Active area is divided into 9 measuring areas (Refer Fig. 2). Every measuring point is placed at the center of each measuring area.

$$\text{Uniformity(U)} = \frac{\text{Minimum Luminance(brightness) in 9 points}}{\text{Maximum Luminance(brightness) in 9 points}}$$
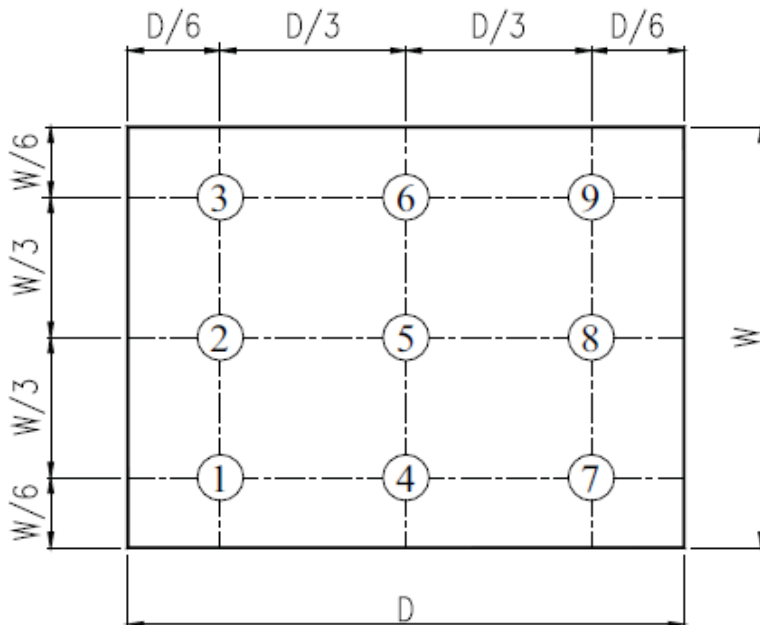

Fig. 2 Definition of uniformity

10. Environmental / Reliability Tests

No	Test Item	Condition	Judgment criteria
1	High Temp Operation	Ts=+70℃, 120 hrs	Per table in below
2	Low Temp Operation	Ta=-20℃, 120 hrs	Per table in below
3	High Temp Storage	Ta=+80℃, 120 hrs	Per table in below
4	Low Temp Storage	Ta=-30℃, 120 hrs	Per table in below
5	High Temp & High Humidity Storage	Ta=+40℃, 90% RH 120 hours	Per table in below (polarizer discoloration is excluded)
6	Thermal Shock (Non-operation)	-20℃ 30 min~+70℃ 30 min, Change time:5min, 10 Cycles	Per table in below
7	ESD (Operation)	C=150pF, R=330Ω□5points/panel Air:±8KV, 5times; Contact:±4KV, 5 times;	Per table in below
8	Vibration (Non-operation)	10Hz~150Hz, 100m/s2, 120min	Per table in below
9	Shock (Non-operation)	Half- sine wave,300m/s2,11ms	Per table in below
10	Package Drop Test	Height:80 cm, 1 corner, 3 edges, 6 surfaces	Per table in below

INSPECTION	CRITERION(after test)
Appearance	No Crack on the FPC, on the LCD Panel
Alignment of LCD Panel	No Bubbles in the LCD Panel No other Defects of Alignment in Active area
Electrical current	Within device specifications
Function / Display	No Broken Circuit, No Short Circuit or No Black line No Other Defects of Display

11. Precautions for Use of LCD Modules

11.1 Safety

The liquid crystal in the LCD is poisonous. Do not put it in your mouth. If the liquid crystal touches your skin or clothes, wash it off immediately using soap and water.

11.2 Handling

A. The LCD and touch panel is made of plate glass. Do not subject the panel to mechanical shock or to excessive force on its surface.

B. Do not handle the product by holding the flexible pattern portion in order to assure the reliability

C. Transparency is an important factor for the touch panel. Please wear clear finger sacks, gloves and mask to protect the touch panel from finger print or stain and also hold the portion outside the view area when handling the touch panel.

D. Provide a space so that the panel does not come into contact with other components.

E. To protect the product from external force, put a covering lens (acrylic board or similar board) and keep an appropriate gap between them.

F. Transparent electrodes may be disconnected if the panel is used under environmental conditions where dew condensation occurs.

G. Property of semiconductor devices may be affected when they are exposed to light, possibly resulting in IC malfunctions.

H. To prevent such IC malfunctions, your design and mounting layout shall be done in the way that the IC is not exposed to light in actual use.

11.3 Static Electricity

A. Ground soldering iron tips, tools and testers when they are in operation.

B. Ground your body when handling the products.

C. Power on the LCD module before applying the voltage to the input terminals.

D. Do not apply voltage which exceeds the absolute maximum rating.

E. Store the products in an anti-electrostatic bag or container.

11.4 Storage

A. Store the products in a dark place at $+25℃\pm10℃$ with low humidity (40% RH to 60% RH). Don't expose to sunlight or fluorescent light.

B. Storage in a clean environment, free from dust, active gas, and solvent.

11.5 Cleaning

A. Do not wipe the touch panel with dry cloth, as it may cause scratch.

B. Wipe off the stain on the product by using soft cloth moistened with ethanol. Do not allow ethanol to get in between the upper film and the bottom glass. It may cause peeling issue or defective operation. Do not use any organic solvent or detergent other than ethanol.

11.6 Cautions for installing and assembling

Bezel edge must be positioned in the area between the Active area and View area. The bezel may press the touch screen and cause activation if the edge touches the active area. A gap of approximately 0.5mm is needed between the bezel and the top electrode. It may cause unexpected activation if the gap is too narrow. There is a tolerance of 0.2 to 0.3mm for the outside dimensions of the touch panel and tail. A gap must be made to absorb the tolerance in the case and connector.