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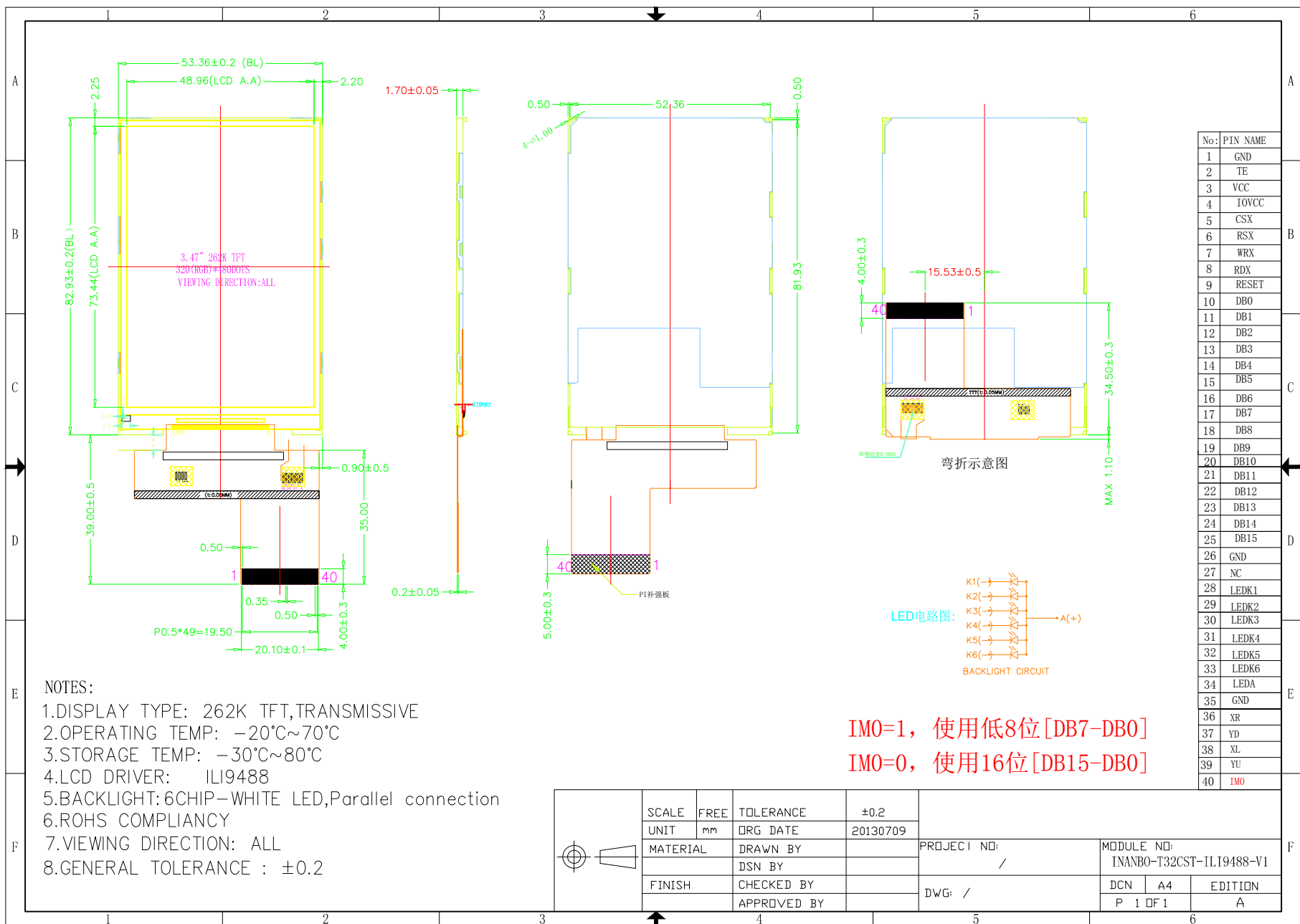
REVISION RECORD

REV NO.	REV DATE	CONTENTS	REMARKS

GENERAL INFORMATION

Item	Contents	Unit
Module Size(W*H*T)	53.36*82.93*1.70	mm
Modules structure	3.5 inch TFT LCD+IC+FPC+BL	
Mcu interface	16/8 BITS 80 parallel interface	
LCD Type	TFT Negative Transmissive	-
Driver element	a-Si TFT Active matrix	
Number of Dots	320*(RGB)*480	Dots
Pixel Arrangement	RGB Stripes Arrangement	
Pixel Pitch (W*H)	0.2025*0.2025	mm
Active Area	48.96*73.44	mm
Glass Area (W*H)	52.96*81.44	mm
Viewing Direction	ALL(IPS)	
Control IC	ILI9488	
Back Light	6-chip white LEDS Parallel	
Touch Panel Type		
Touch Panel Active Area		
Touch Panel View Area		
TP outline		
Operation temperature	-10℃ ~60℃	
Storage temperature	-20℃ ~70℃	
Approx. Weight		g

EXTERNAL DIMENSIONS



INTERFACE DESCRIPTION

Pin No.	Symbol	Level
1	GND	
2	TE	
3	VCC	
4	IOVCC	
5	CSX	
6	RSX	
7	WRX	
8	RDX	
9	REST	
10	DB0	
11	DB1	
12	DB2	
13	DB3	
14	DB4	
15	DB5	
16	DB6	
17	DB7	
18	DB8	
29	DB9	
20	DB10	
21	DB11	
22	DB12	
23	DB13	
24	DB14	
25	DB15	
26	GND	
27	NC	
28	LED-1	LED Cathode
29	LED-2	LED Cathode
30	LED-3	LED Cathode
31	LED-4	LED Cathode
32	LED-5	LED Cathode
33	LED-6	LED Cathode
34	LED-A	LED Anode
35	GND	
36	XR	
37	YD	
38	XL	
39	YU	
40	NC	

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Max	Unit
Supply voltage for logic	V _{DD}	-0.3	4.6	V
Input voltage for logic	V _{IN}	-0.5	VDD +0.3	V
Supply current (One LED)	I _{LED}		20	mA
Operating temperature	T _{OP}	-10	+60	°C
Storage temperature	T _{ST}	-20	+70	°C

ELECTRICAL CHARACTERISTICS

Item	Symbol	Min	Typ	Max	Unit	Applicable
Supply voltage for logic	VDD	2.6	2.8	3.0	V	VDD
	VIL	-0.3	-	0.2 VDD	V	
	VIH	0.8 VDD	-	VDD	V	
Input voltage						
Input leakage current	ILKG				µA	
LED Forward voltage	Vf	3.0	3.2	3.4	V	--
Input backlight current	I _{LED}	-	15	20	mA	Single LED

BACK LIGHT ELECTRIC CHARACTERISTICS

Parameter	Symbol	Conditions	Standard Value			Unit
			Min	Type	Max	
Forward Voltage	Vf		3.0	3.2	3.4	V
Luminance	Lv	If=15ma/LED	2800	3200	3600	cd/m2
Uniformity	Avg		80	85		%
Colour Coordinate	X		0.26		0.31	
	Y		0.26		0.31	

Handling precaution for LCM

LCM is easy to be damaged.

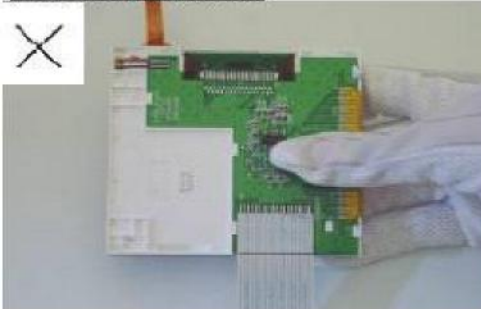
Please note below and be careful for handling!

Correct handling:

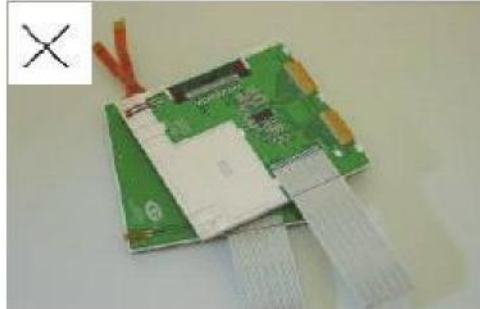


As above picture, please handle with anti-static gloves around LCM edges.

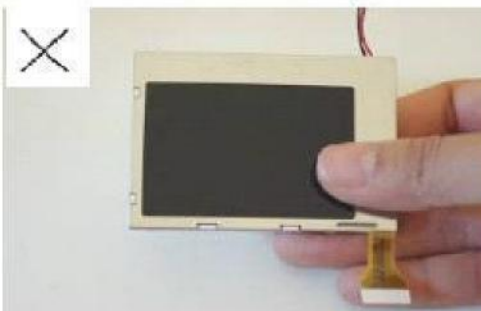
Incorrect handling:



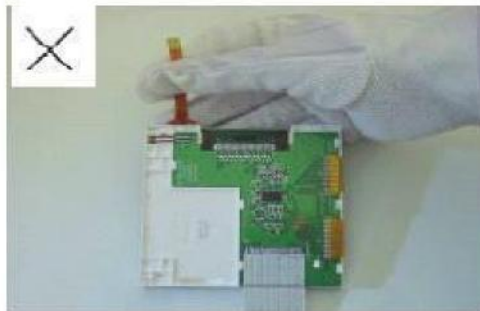
Please don't touch IC directly.



Please don't stack LCM.



Please don't hold the surface of panel.



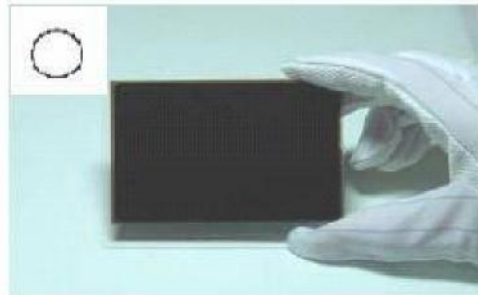
Please don't stretch interface of output, such as FPC cable.

Handling precaution for LCD

LCD is easy to be damaged.

Please note below and be careful for handling!

Correct handling:

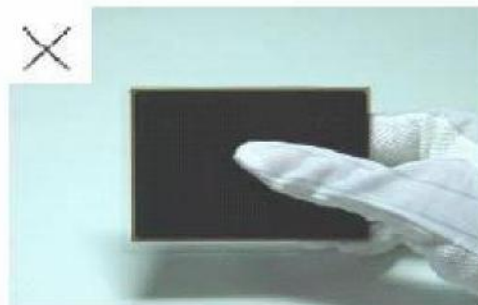


As above photo, please handle with anti-static gloves around LCD edges.

Incorrect handling:



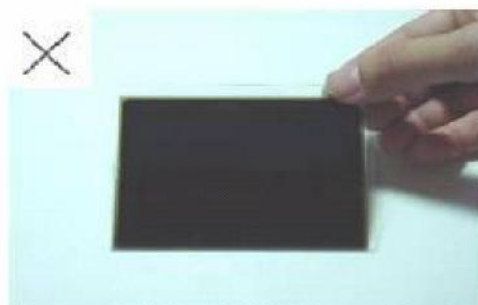
Please don't stack the LCDS.



Please don't hold the surface of LCD.



Please don't operate with sharp stick such as pens.

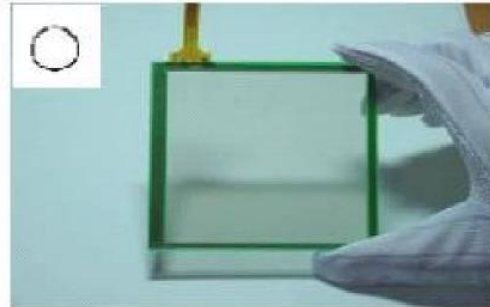
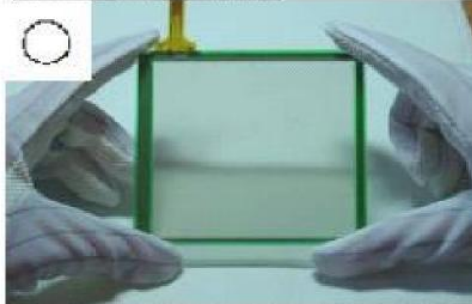


Please don't touch ITO glass without anti-static gloves.

Handling precaution for Touch panel

Touch Panel is easy to be damaged.
Please note below and be careful for handling!

Correct handling:

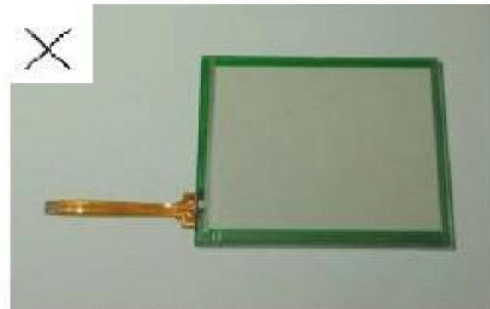


As above picture, please handle with anti-static gloves around touch panel edges.

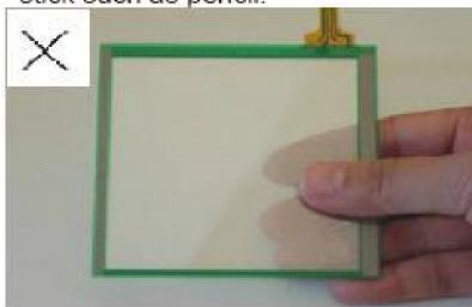
Incorrect handling:



Please don't operate with sharp stick such as pencil.



Please keep film surface on upper side.



Please don't hold the surface of touch panel.



Please don't hold FPC, stretch FPC, or twist FPC.

Storage Precautions

When storing the LCD modules, the following precaution is necessary.

(1) Store them in a sealed polyethylene bag. If properly sealed, there is no need for the dessicant.

(2)Store them in a dark place. Do not expose to sunlight or fluorescent light, keep the temperature between 0°C and 35°C, and keep the relative humidity between 40%RH and 60%RH.

(3)The polarizer surface should not come in contact with any other objects. (We advise you to store them in the anti-static electricity container in which they were shipped.

Others

Liquid crystals solidify under low temperature (below the storage temperature range) leading to defective orientation or the generation of air bubbles (black or white). Air bubbles may also be generated if the module is subject to a low temperature.

If the LCD modules have been operating for a long time showing the same display patterns, the display patterns may remain on the screen as ghost images and a slight contrast irregularity may also appear. A normal operating status can be regained by suspending use for some time. It should be noted that this phenomenon does not adversely affect performance reliability.

To minimize the performance degradation of the LCD modules resulting from destruction caused by static electricity etc., exercise care to avoid holding the following sections when handling the modules.

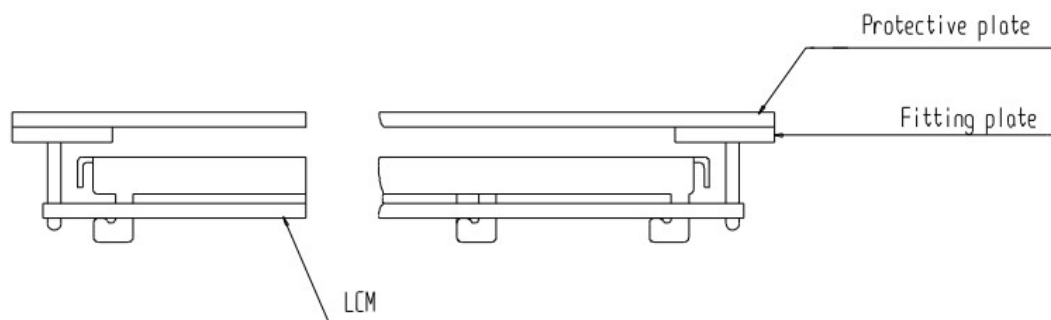
- Exposed area of the printed circuit board.
- Terminal electrode sections.
-

USING LCD MODULES

Installing LCD Modules

The hole in the printed circuit board is used to fix LCM as shown in the picture below. Attend to the following items when installing the LCM.

(1) Cover the surface with a transparent protective plate to protect the polarizer and LC cell.

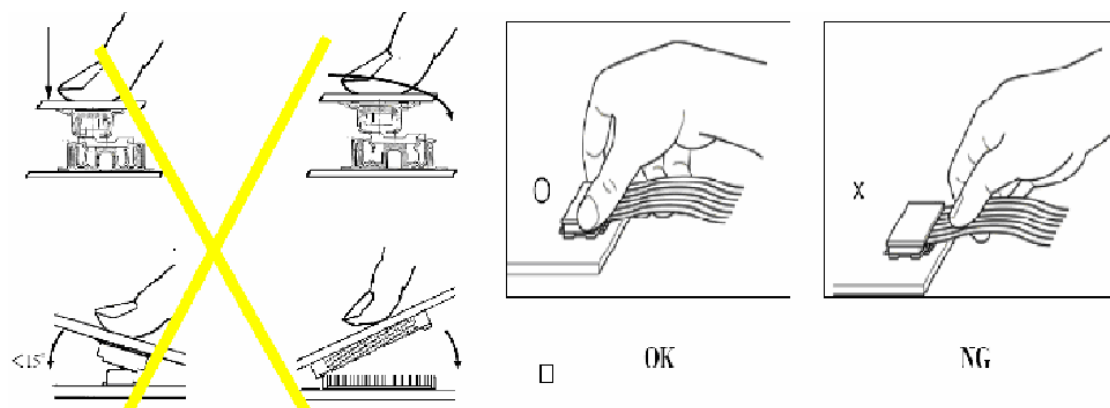


(2) When assembling the LCM into other equipment, the spacer to the bit between the LCM and the fitting plate should have enough height to avoid causing stress to the

module surface, refer to the individual specifications for measurements. The measurement tolerance should be $\pm 0.1\text{mm}$.

Precaution for assemble the module with BTB connector:

Please note the position of the male and female connector position, don't assemble or assemble like the method which the following picture shows



Precaution for soldering the LCM

	Manual soldering	Machine drag soldering	Machine press soldering
No ROHS product	290°C ~350°C. Time : 3-5S.	330°C ~350°C. Speed : 4-8 mm/s.	300°C ~330°C. Time : 3-6S. Press: 0.8~1.2Mpa
ROHS product	340°C ~370°C. Time : 3-5S.	350°C ~370°C. Time : 4- 8 mm/s.	330°C ~360°C. Time : 3-6S. Press: 0.8~1.2Mpa

(1) If soldering flux is used, be sure to remove any remaining flux after finishing to soldering operation. (This does not apply in the case of a non-halogen type of flux.) It is recommended that you protect the LCD surface with a cover during soldering to prevent any damage due to flux spatters.

(2) When soldering the electroluminescent panel and PC board, the panel and board should not be detached more than three times. This maximum number is determined by the temperature and time conditions mentioned above, though there may be some variance depending on the temperature of the soldering iron.

(3) When remove the electroluminescent panel from the PC board, be sure the solder has completely melted, the soldered pad on the PC board could be damaged.

Precautions for Operation

(1) Viewing angle varies with the change of liquid crystal driving voltage (VLCD). Adjust VLCD to show the best contrast.

(2) It is an indispensable condition to drive LCD's within the specified voltage limit since the higher voltage than the limit cause the shorter LCD life. An electrochemical reaction due to direct current causes LCD's undesirable deterioration, so that the use of direct current drive should be avoided.

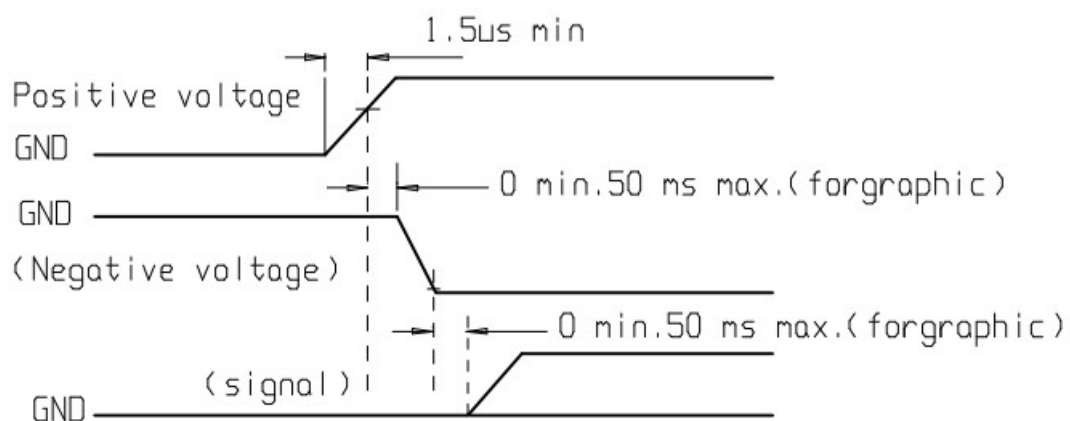
(3) Response time will be extremely delayed at lower temperature than the operating temperature range and on the other hand at higher temperature LCD's show dark color in them. However those phenomena do not mean malfunction or out of order with LCD's, Which will come back in the specified operating temperature.

(4) If the display area is pushed hard during operation, the display will become abnormal. However, it will return to normal if it is turned off and then back on.

(5) A slight dew depositing on terminals is a cause for electro-chemical reaction resulting in terminal open circuit. Usage under the maximum operating temperature, 50%RH or less is required.

(6) Input each signal after the positive/negative voltage becomes stable.

(7) Please keep the temperature within specified range for use and storage. Polarization degradation, bubble generation or polarizer peel-off may occur with high temperature and high humidity.



Safety

- (1) It is recommended to crush damaged or unnecessary LCDs into pieces and wash them off with solvents such as acetone and ethanol, which should later be burned.
- (2) If any liquid leaks out of a damaged glass cell and comes in contact with the hands, wash off thoroughly with soap and water.

Limited Warranty

Unless agreed between INANBO and customer, INANBO will replace or repair any of its LCD modules which are found to be functionally defective when inspected in accordance with INANBO LCD acceptance standards (copies available upon request) for a period of one year from date of shipments. Cosmetic/visual defects must be returned to INANBO within 90 days of shipment. Confirmation of such date shall be based on freight documents. The warranty liability of INANBO limited to repair and/or replacement on the terms set forth above. INANBO will not be responsible for any subsequent or consequential events.

Return LCM under warranty

No warranty can be granted if the precautions stated above have been disregarded. The typical examples of violations are :

- Broken LCD glass.
- PCB eyelet is damaged or modified.
- PCB conductors damaged.
- Circuit modified in any way, including addition of components.
- PCB tampered with by grinding, engraving or painting varnish.
- Soldering to or modifying the bezel in any manner.

Module repairs will be invoiced to the customer upon mutual agreement. Modules must be returned with sufficient description of the failures or defects. Any connectors or cable installed by the customer must be removed completely without damaging the PCB eyelet, conductors and terminals.

PACKING SPECIFICATION

TBD

PRIOR CONSULT MATTER

- 1.For INanbo standard products, we keep the right to change material, process ... for improving the product property without notice on our customer.
- 2.For OEM products, if any change needed which may affect the product property, we will consult with our customer in advance.
- 3.If you have special requirement about reliability condition, please let us know before you start the test on our samples.