



ASI-T-177BE2IN/D

Revision 1.4

Item	Contents	Unit
Size	1.77	inch
Resolution	128X(RGB) x 160	/
Interface	8-bits	/
Technology type	TN TFT	/
Pixel pitch	0.219x0.219	mm
Pixel Configuration	Stripe	
Outline Dimension (W x H x D)	34.7x46.7x2.6	mm
Active Area	35.04 x 28.03	mm
Display Mode	Transmissive, Normally white	/
Backlight Type	LED	/
Driver IC	ILI9163V	/
Weight	TBD	g

Customer Approval

Name:
Title:
Signature:
Date:



Record of Revision

Date	Revision No.	Summary
2015-10-08	1.0	Rev 1.0 was issued
2015-10-15	1.1	Modify 5.0
2015-10-16	1.2	Modify 5.0
2015-10-21	1.3	Modify LED circuit and the pin of backlight
2016-08-05	1.4	Update Pixel Configuration



ASI-T-177BE2IN/D

1. Scope

This data sheet is to introduce the specification of ASI-T-177BE2IN/D active matrix TFT module. It is composed of a color TFT-LCD panel, driver ICs, FPC and a backlight unit. The 1.77" display area contains 128X(RGB) x 160 pixels.

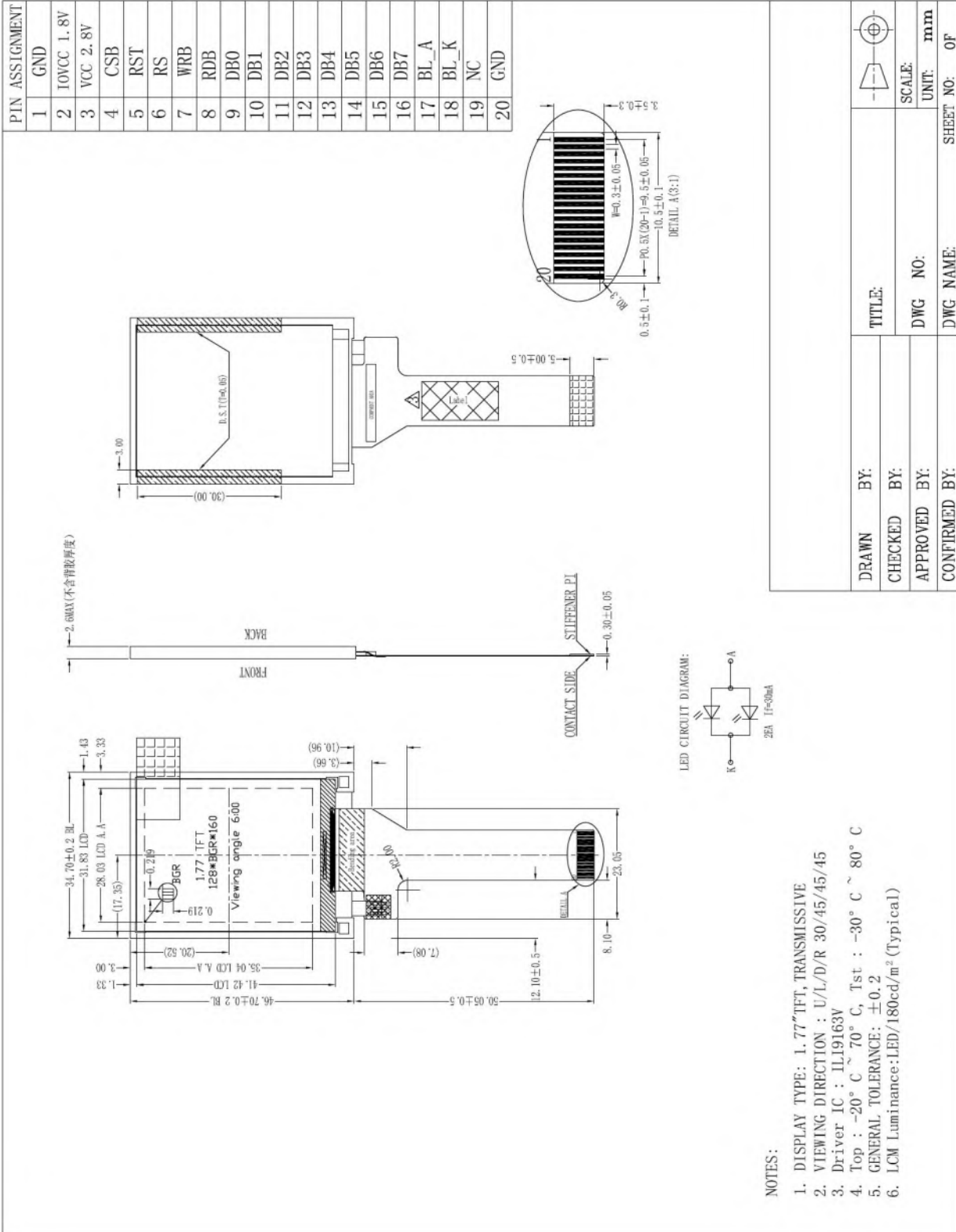
2. Application

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

3. General Information

Item	Contents	Unit
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4. Outline Drawing





5. Interface signals

No.	Symbol	Function	Remark
1	GND	Ground	
2	IOVCC	TYP: 2.8 V/1.8V	
3	VCC	TYP: 2.8 V	
4	CSB	Chip Selection	
5	RST	Reset Signal	
6	RS	Data or Command selection	
7	WRB	Write Enable	
8	RDB	Read Enable	
9	DB0	Data bus	
10	DB1	Data bus	
11	DB2	Data bus	
12	DB3	Data bus	
13	DB4	Data bus	
14	DB5	Data bus	
15	DB6	Data bus	
16	DB7	Data bus	
17	BL_A	Anode pin of backlight	
18	BL_K	Cathode pin of backlight	
19	NC	No connection	
20	GND	Ground	



6. Absolute maximum Ratings

6.1. Electrical Absolute max. ratings

Parameter	Symbol	MIN	MAX	Unit	Remark
Supply voltage for logic	IOVCC	-0.3	+4.6	V	
Power voltage for Analog	VCC	-0.3	+4.6	V	

6.2. Environment Conditions

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

6.3. LED Backlight Absolute max. ratings

Item	Symbol	MIN	MAX	Unit	Remark
LED Forward Current	ILED	--	25	mA	One LED



7. Electrical Specifications

7.1 Electrical characteristics

Ta=25°C

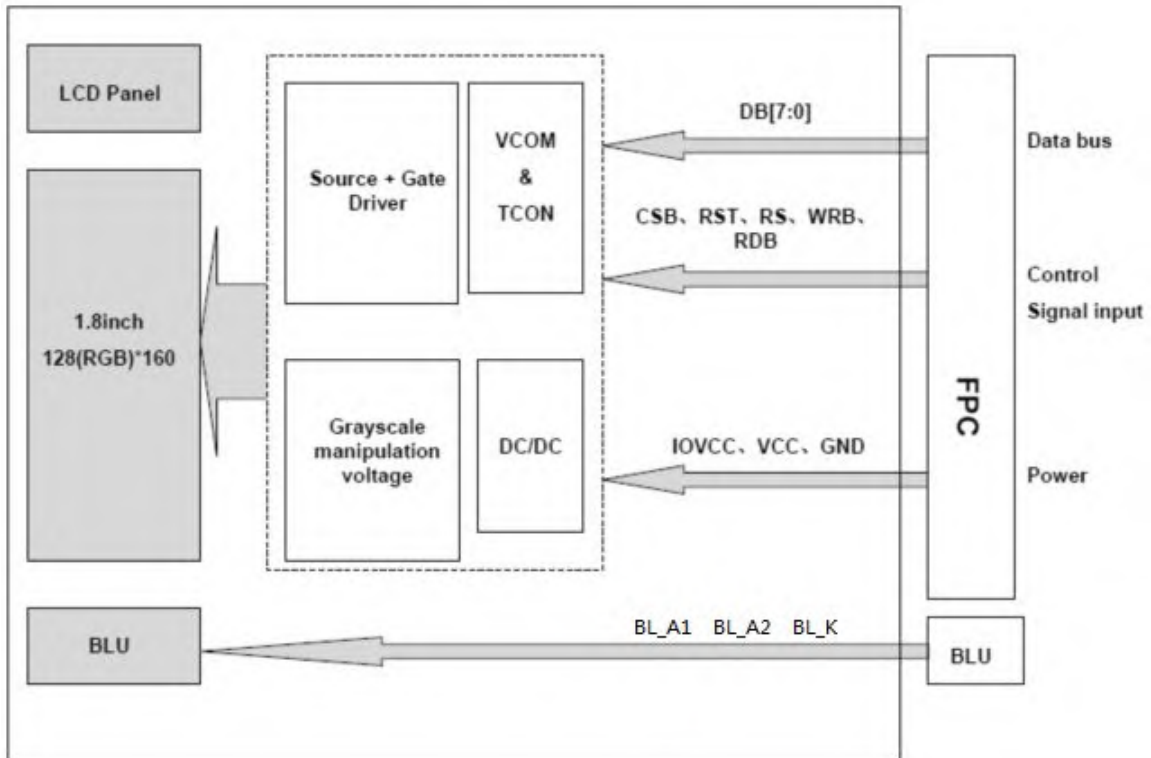
Item	Symbol	MIN	TYP	MAX	Unit	Remark
Supply voltage for logic	IOVCC	1.65	2.8	3.3	V	
Power voltage for Analog	VCC	2.5	2.8	3.3	V	
Logic Low input voltage	VIL	GND	-	0.3*IOVCC	V	
Logic High input voltage	VIH	0.7*IOVCC	-	IOVCC	V	
Logic Low output voltage	VOL	GND	-	0.2*IOVCC	V	
Logic High output voltage	VOH	0.8*IOVCC	-	IOVCC	V	
Current Consumption All Black	Logic	ICC+ IIN	-	1.52	-	mA
	Analog					

7.2 LED Backlight

Ta=25°C

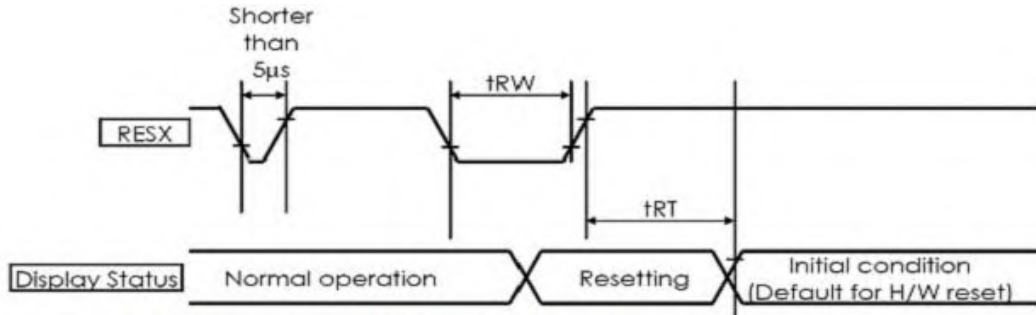
Item	Symbol	MIN	TYP	MAX	Unit	Remark
Forward Current	IF	--	15*2		mA	Ta=25 °C, VF=3.2V/LED
Forward Voltage	VF	3.0	3.2	3.4	V	Ta=25 °C, IF=15mA/LED
Power dissipation	PD	-	96	136	mW	
LED life time	-	-	(25,000)	-	Hrs	

7.3 Schematic of LCD module system



8. Command/AC Timing

8.1 Reset timing



(VSS=0V, VDDI=1.65V to 1.95V, V_{PNL}=2.6V to 2.9V, T_a = -30 to 70°C)

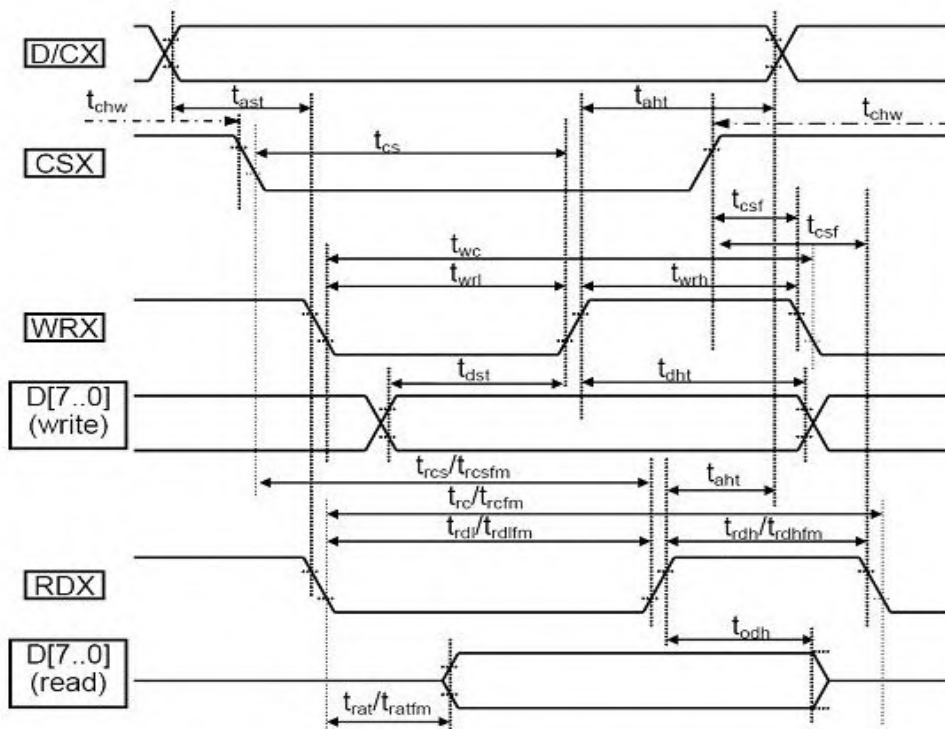
Symbol	Parameter	Related Pins	MIN	TYP	MAX	Note	Unit
t _{RESW}	*1) Reset low pulse width	RESX	10	-	-	-	μs
t _{REST}	*2) Reset complete width	-	-	-	5	When reset applied during Sleep in mode	ms
		-	-	-	120	When reset applied during Sleep out mode	ms

Note

1. Spike due to an electrostatic discharge on RESX line does not cause system reset according to the table below.

8.2 Interface timing

Display Module Parallel 18/16/9/8-bit Bus



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

Signal	Symbol	Parameter	min	max	unit	description
D/CX	tast	Address setup time	0		ns	
	taht	Address hold time(Write/Read)	10		ns	
CSX	tchw	"S""H" Pulse Width	0		ns	
	tcs	Chip Select setup time (Write)	10		ns	
	trcs	Chip Select setup time (Read ID)	45		ns	
	trcsfm	Chip Select setup time (Read FM)	355		ns	
	tcsf	Chip Select Wait time(Write/read)	10		ns	
WRX	twc	Write cycle	66		ns	
	twrh	Control pulse H duration	15		ns	
	twrl	Control pulse L duration	15		ns	
RDX	trc	Read cycle (ID)	160		ns	When read ID data
	trdh	Control pulse H duration(ID)	90		ns	
	trdl	Control pulse L duration(ID)	45		ns	
RDX	trcfm	Read cycle (FM)	450		ns	When read from frame memory
	trdhfm	Control pulse H duration (FM)	90		ns	
	trdlfm	Control pulse L duration (FM)	355		ns	
D[17..0]	tdst	Data setup time	10		ns	For maximum CL = 30pF For minimum CL = 8pF
	tdht	Data hold time	10		ns	
	trat	Read access time (ID)		40	ns	
	tratfm	Read access time (FM)		340	ns	
	todh	Output disable time	20	80	ns	

Note 1: VDDI 1.65 to 3.3V, VDD=2.6 to 3.3V, AGND=GND=0V, Ta=-30 to 70 °C (to +85°C no damage)

Note 2: This input signal rise time and fall time (tr, tf) is specified at 15 ns or less. Logic high and low levels are specified as 30% and 70% of VDDI for input signals



9. Optical Specification

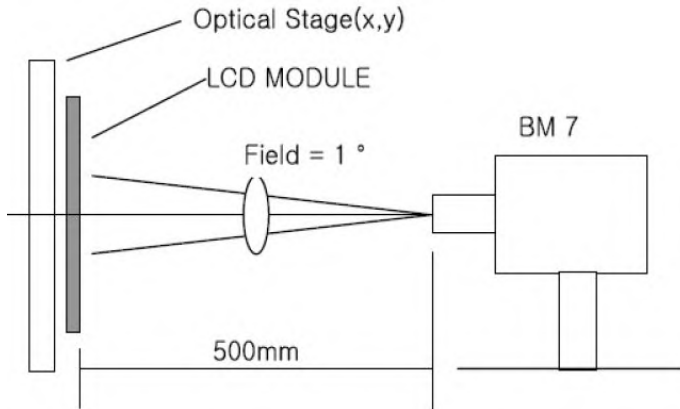
Ta=25°C

Item	Symbol	Condition	Min	Typ.	Max.	Unit	Remark
Contrast Ratio	CR	$\theta=0^\circ$	400	500	--		Note1 Note2
Response Time	Ton/ Toff	25°C	--	20	30	ms	Note1 Note3
View Angles	θT	$CR \geq 10$	35	50	-	Degree	Note 4
	θB		10	20	-		
	θL		35	45	-		
	θR		35	45	-		
Chromaticity	White	Brightness is on	x	0.253	0.303	0.353	Note5, Note1
			y	0.306	0.356	0.406	
	Red		x	0.575	0.625	0.675	
			y	0.272	0.322	0.372	
	Green		x	0.250	0.300	0.350	
			y	0.514	0.564	0.614	
	Blue		x	0.084	0.134	0.184	
			y	0.109	0.159	0.209	
Luminance	L		-	200	-	cd/m ²	Note1 Note6

Note 1: Definition of optical measurement system.

Temperature = 25°C (±3°C)

LED back-light: ON, Environment brightness < 150 lx

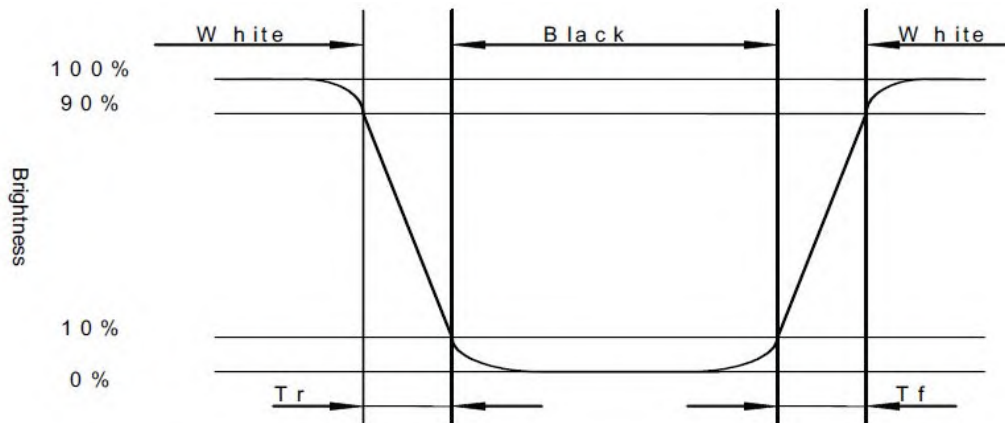


Note 2: Contrast ratio is defined as follow:

$$\text{Contrast Ratio} = \frac{\text{Surface Luminance with all white pixels}}{\text{Surface Luminance with all black pixels}}$$

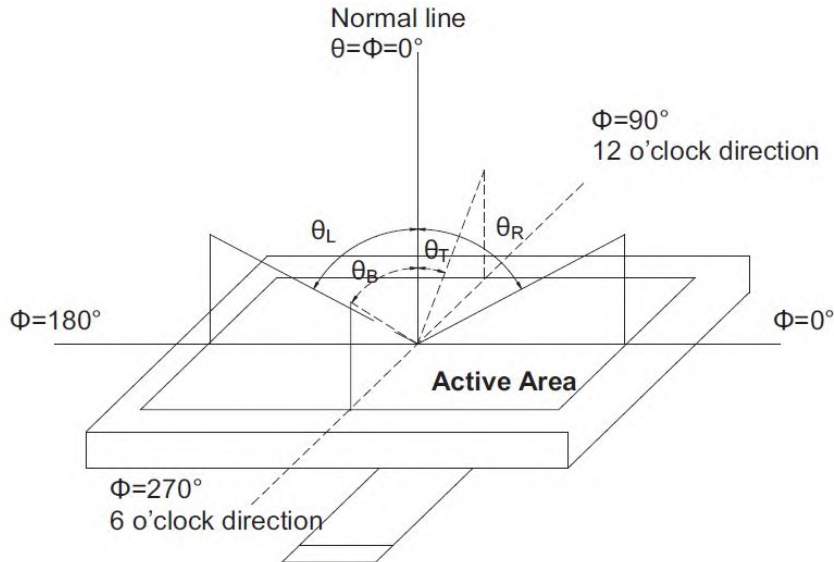
Note 3: Response time is defined as follow:

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



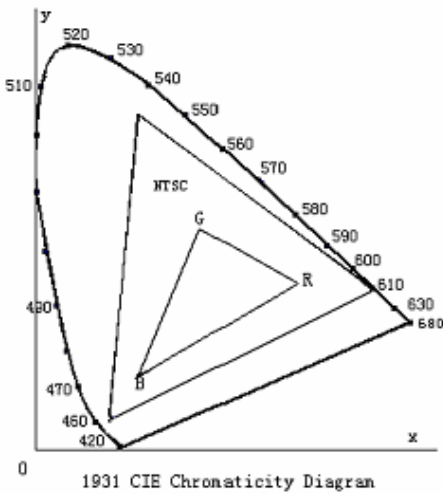
Note 4: Viewing angle range is defined as follow:

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.



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

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.



10. Environmental / Reliability Tests

No	Test Item	Condition	Judgment criteria
1	High Temp Operation	Ts=+70°C, 48hrs	Per table in below
2	Low Temp Operation	Ta=-20°C, 48hrs	Per table in below
3	High Temp Storage	Ta=+80°C, 48hrs	Per table in below
4	Low Temp Storage	Ta=-30°C, 48hrs	Per table in below
5	High Temp & High Humidity Storage	Ta=+50°C, 90% RH 48 hours	Per table in below (polarizer discoloration is excluded)
6	Thermal Shock (Non-operation)	-20°C 30 min~+70°C 30 min, Change time:5min, 10 Cycles	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 $+25^{\circ}\text{C} \pm 10^{\circ}\text{C}$ 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.

