

LCD MODULE SPECIFICATION

- Preliminary Specification
- Final Product Specification

MODEL NO. : IE-A-1816BH06R24L-C0-2

CUSTOMER P/N:

ISSUED DATE : 2025.4.17

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1. General Specification

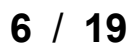
1.1. General Specification for LCM

Feature		Spec
Characteristics	Size	7.0 inch
	Resolution	800(RGB) x 480
	Interface	RGB
	Color Depth	16.7M
	Viewing Direction	12 O'Clock
	Gray scale inversion direction	6 O'Clock
	Display Mode	Normally White
Mechanical Characteristics	Overall dimensions (W x H x D) (mm)	164.9X100X6.65
	Active Area(mm)	154.08X85.92
	With /Without TP	With CTP
	Weight (g)	TBD
	LED Numbers	3S7P-LEDs (white)
Electronic	LCD Driver IC	HX8664B+HX8264E

1.2. General Specification for CTP

Feature		Spec
Mechanical Characteristics	CTP Size	7.0 inch
	Resolution	800 x 480
	Interface	IIC
	CTP report rate	100Hz
	Support Points	5
	Surface hardness	>6H
	Transparency	>85%
	CTP (W x H x D) (mm)	183.5x131.5x2.7
	COVER V.A (mm)	1154.68x86.52
Electronic	CTP Driver IC	GT911
	Power supply	3.3V

2.Mechanical Drawing



2. PIN Description

TFT pin out

Pin No.	Symbol	I/O	Function
1-2	LEDA	P	LED back light(Anode)
3-4	LEDK	P	LED back light(Cathode)
5	GND	P	Ground.
6	VCOM	P	Commom voltage
7	DVDD	P	Power supply
8	MODE	I	DE/YSNC mode select,"H":DE MODE "L":HSD/VSD MDOE
9	DE	I	Data enable pin
10	VS	I	Frame sync signal
11	HS	I	Line sync signal
12-19	B7~B0	I	Blue data bus
20-27	G7~G0	I	Green data bus
28-35	R7~R0	I	Red data bus
36	GND	P	Ground.
37	DCLK	I	Data clock
38	GND	P	Ground.
39	L/R	I	Right/Left sequence control of source driver
40	U/D	I	Gate driver Up/Down scan control of gate driver
41	VGH	P	Gate on voltage
42	VGL	P	Gate off voltage
43	AVDD	P	power for analog circuit
44	RESET	I	Reset the display
45	NC	-	No connection.

46	VCOM	P	Commom voltage
47	DITHB	I	Dithering function enable control.Normally pull high. DITHB=1, enable disable internal dithering function. DITHB =0,disable internal dithering function.
48	GND	P	Ground
49-50	NC	-	No connection.

CTP PIN

Pin No	Symbol	I/O	Function
1	RST	I	CTP reset pin ,active “L”
2	VDD	P	CTP Power supply
3	GND	P	Ground
4	INT	I	External Interrupt to the IC of CTP
5	SDA(3.3V)	I	I2C DATA
6	SCL(3.3V)	I	I2C Clock

4. Absolute Maximum Rating

Ta = 25°C

Item	Symbol	Min.	Max.	Unit	Note
Power Supply Voltage	DVDD	-0.3	5.0	V	1 , 2
	AVDD	6.5	13.5		
	VGH	-0.3	40		
	VGL	-20	0.3		
CPT Power Supply Voltage	VDD-CTP	2.7	3.6	V	1 , 2

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. $V_{DVDD} > GND$ must be maintained.
3. Please be sure users are grounded when handing LCD Module.

5. Electrical Specifications

5.1. Electrical characteristics(Vss=0V ,Ta=25°C)

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Note
Power supply	DVDD	Ta=25°C	3.0	3.3	3.6	V	
	AVDD	Ta=25°C	10.2	10.4	10.6	V	
	VGH	Ta=25°C	15.3	16	16.7	V	
	VGL	Ta=25°C	-7.7	-7	-6.3	V	
	VCOM	Ta=25°C	3.68	3.8	4.08	V	

		VDD-CTP	Ta=25°C	-	3.3	3.6	V	
Input voltage	'H'	V _{IH}	DVDD=3.3V	0.7*DVDD	-	DVDD	V	
	'L'	V _{IL}	DVDD=3.3V	0	-	0.3*DVDD	V	

5.2. Driving Condition for Backlight

Ta=25°C

Item	Symbol	Condition	Min	Typ	Max	Unit	Note
Supply voltage	Vf	If=140mA	8.1	9.0	9.9	V	
Uniformity	ΔBp	If=140mA	75	80	-	%	
Life Time	time	If=140mA	30K	-	-	hours	1

Note 1: Brightness to be decreased to 50% of the initial value at ambient temperature TA=25°C

6. Timing Chart for LCM

6.1 Input timing

Horizontal input timing

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Horizontal Display Area	thd		800		DCLK	
DCLK Frequency	fclk	26.3	33.3	46.8	MHz	
One Horizontal Line	th	862	1056	1200	DCLK	
HS pulse width	thpw	1	-	40	DCLK	
HS Blanking	thb	46	46	46	DCLK	
HS Front Porch	thfp	16	210	354	DCLK	

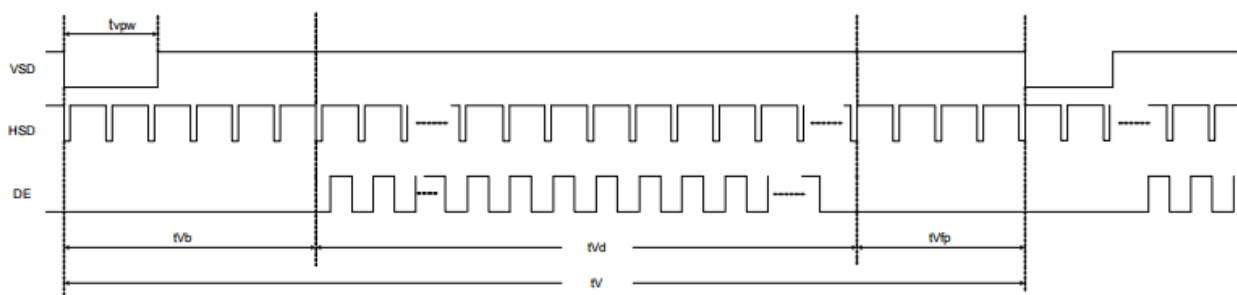
Vertical input timing

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Vertical Display Area	tv _d		480		TH	
VS period time	tv	510	525	650	TH	
VS pulse width	tv _{pw}	1		20	TH	
VS Blanking	tv _b	23	23	23	TH	
VS Front Porch	tv _{fp}	7	22	147	TH	

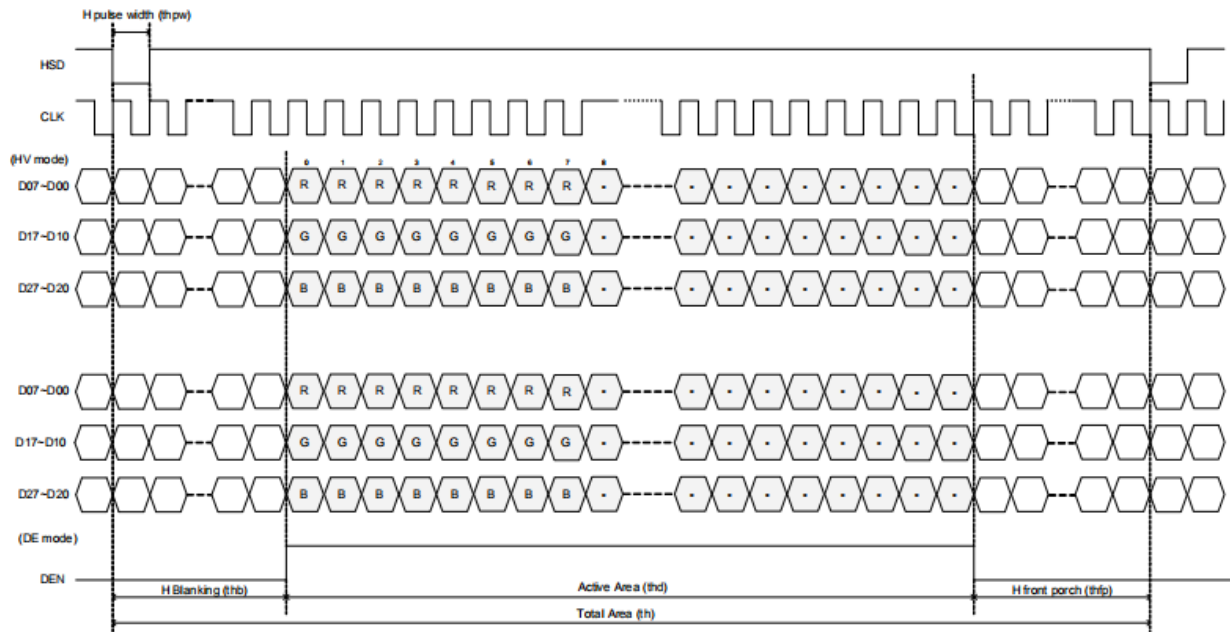
6.2 AC Characteristics

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
VDD Power On Slew rate	TPOR	From 0V to 90% VDD	-	-	20	ms
RSTB pulse width	TRST	CLKIN = 40MHz	1	-	-	ms
CLKIN cycle time	Tcph	-	20	-	-	ns
CLKIN pulse duty	Tcwh	-	40	50	60	%
VSD setup time	Tvst	-	8	-	-	ns
VSD hold time	Tvhd	-	8	-	-	ns
HSD setup time	Thst	-	8	-	-	ns
HSD hold time	Thhd	-	8	-	-	ns
Data set-up time	Tdsu	D0[7:0], D1[7:0], D2[7:0] to CLKIN	8	-	-	ns
Data hold time	Tdhd	D0[7:0], D1[7:0], D2[7:0] to CLKIN	8	-	-	ns
DEN setup time	Tesu	-	8	-	-	ns
DEN hold time	Tehd	-	8	-	-	ns
Output stable time	Tsst	10% to 90% target voltage. CL=120pF, R=10K ohm	-	-	6	us

6.3 Data Input format

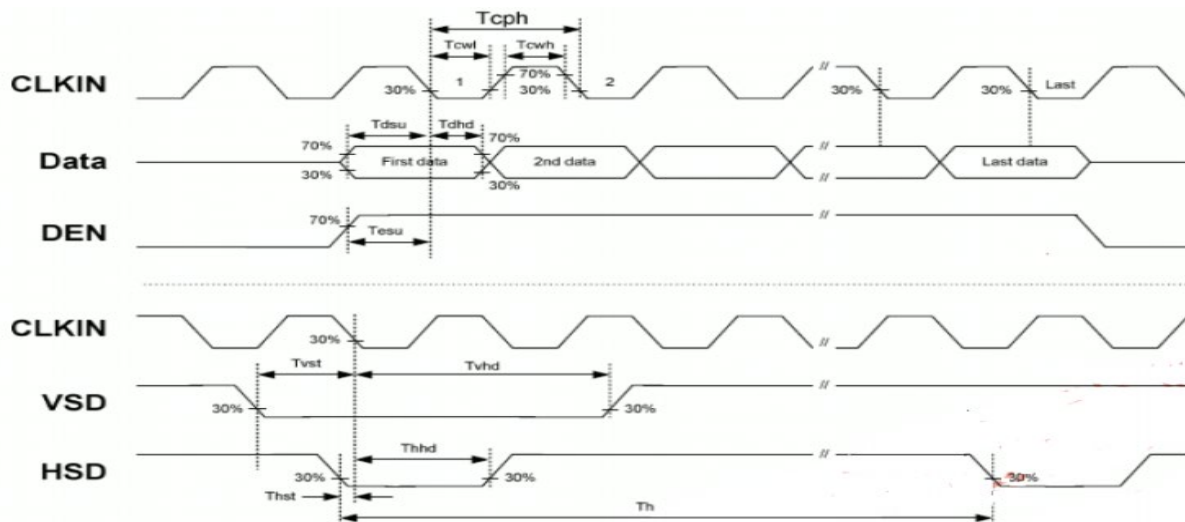


Vertical input timing



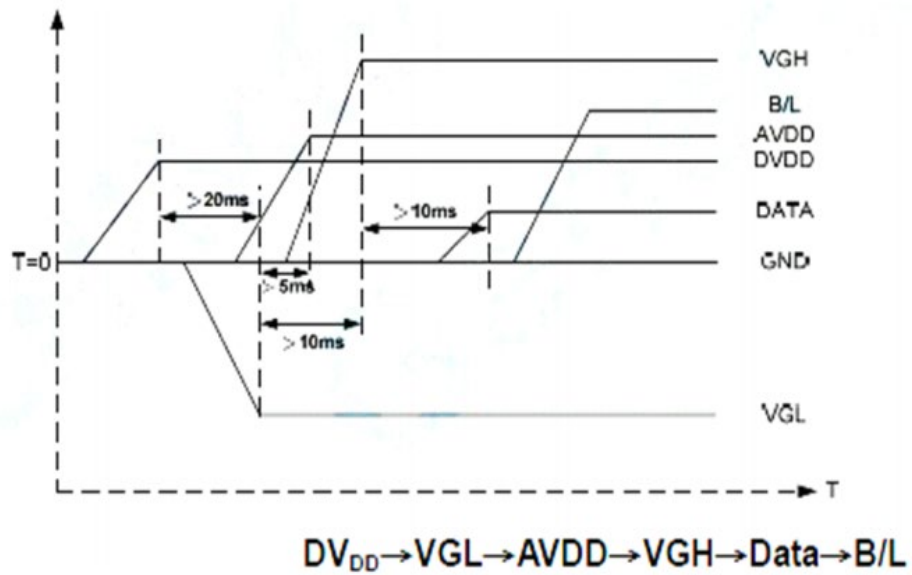
Horizontal input timing

6.4 Input Clock and Data Timing Diagram Data Input Format

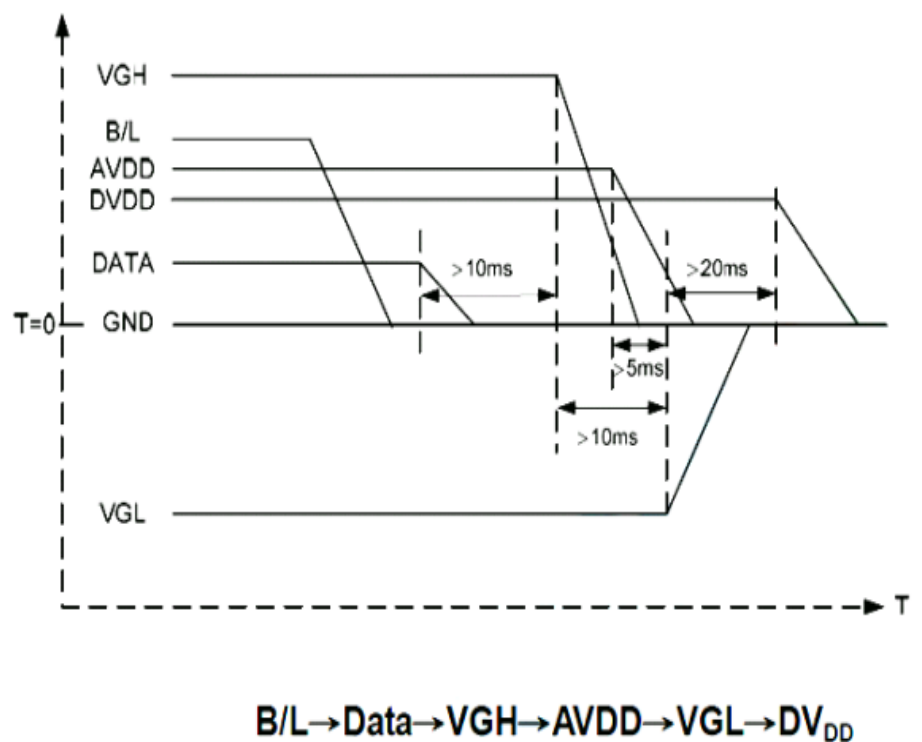


6.5 Power on/off sequence

a. Power on:



b. Power off:



7. Optical Characteristics

Item		Symbol	Condition	Min	Typ	Max	Unit	Remark
View Angle		3:00	CR≧10	-	65	-	Degree	Note 2
		6:00		-	55	-		
		9:00		-	65	-		
		12:00		-	65	-		
Contrast Ratio		CR	θ=0°	500	800	--		Note1 Note3
Response Time		Tr	25℃	--	25	50	ms	Note1 Note4
		Tf						
Chromaticity (CIE1931)	White	x		-0.05	TBD	Typ +0.05	-	Note1 Note5
		y			TBD			
Uniformity		U	-	75	80	--	%	Note1 Note6
Luminance		L	-	--	350	--	cd/m2	Note1 Note7

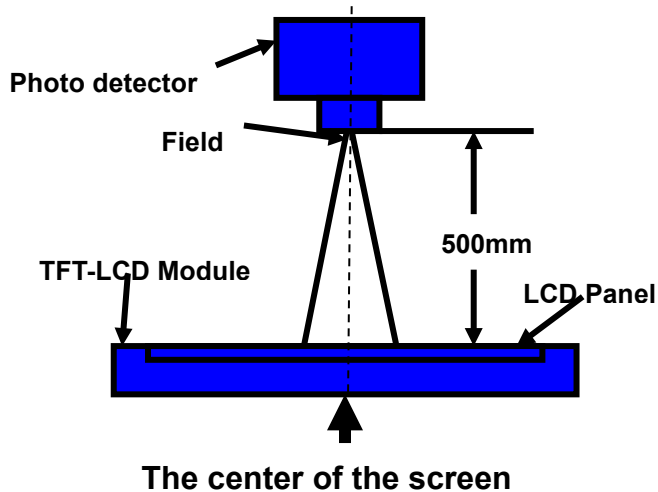
Test Conditions:

1. IF= 140 mA, and the ambient temperature is 25°C.
2. The test systems refer to Note 1 and Note 2.

Note 1: Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 5 Minutes operation, the optical properties are measured at the center point of the LCD screen.

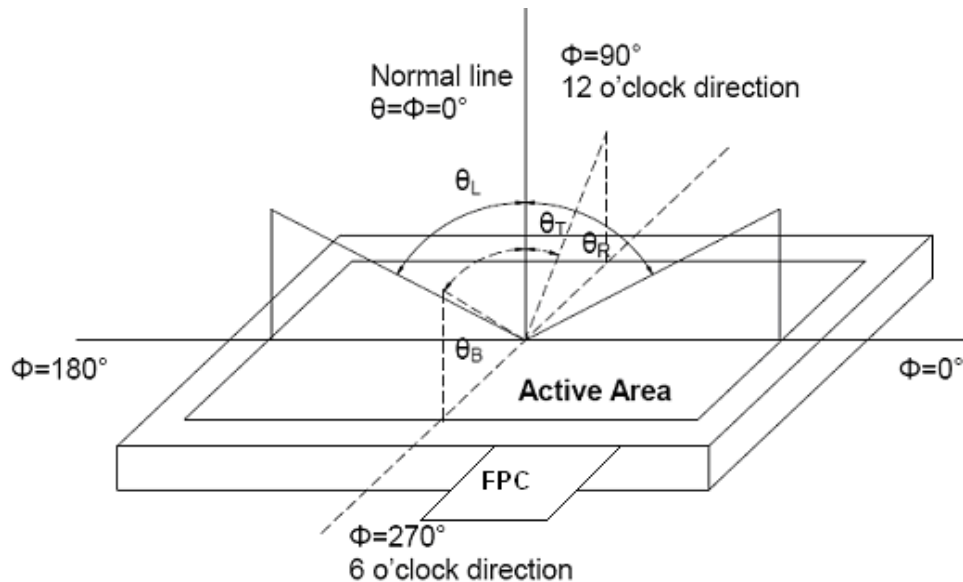
Item	Photo detector	Field
Contrast Ratio	BM-7A	1°
Luminance		
Chromaticity		



Lum Uniformity		
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Note 2: Definition of viewing angle range and measurement system.

viewing angle is measured at the center point of the LCD by CONOSCOPE(ergo-80).



Note 3: Definition of contrast ratio

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD is on the "White" state}}{\text{Luminance measured when LCD is on the "Black" state}}$$

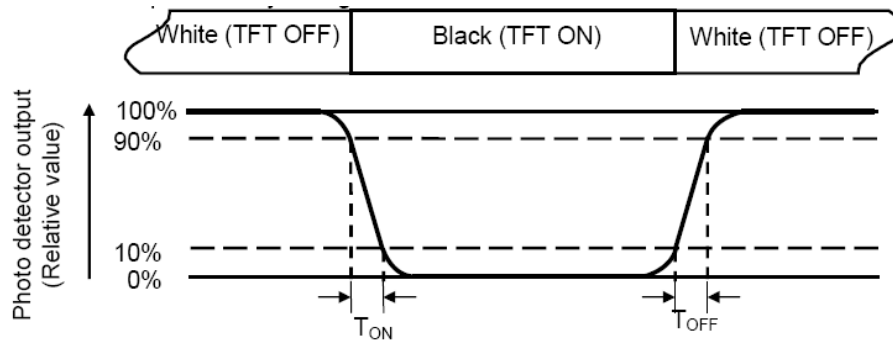
“White” state: The state is that the LCD should drive by V_{white} .

“Black” state: The state is that the LCD should drive by V_{black} .

V_{white} : To be determined V_{black} : To be determined.

Note 4: Definition of Response time

The response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time (T_r) is the time between photo detector output intensity changed from 90% to 10%. And fall time (T_f) is the time between photo detector output intensity changed from 10% to 90%.



Note 5: Definition of color chromaticity (CIE1931)

Color coordinates measured at center point of LCD.

Note 6: Definition of Luminance Uniformity

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

Luminance Uniformity (U) = $L_{min} / L_{max} \times 100\%$

L-----Active area length W----- Active area width

Note 7: Definition of Luminance:

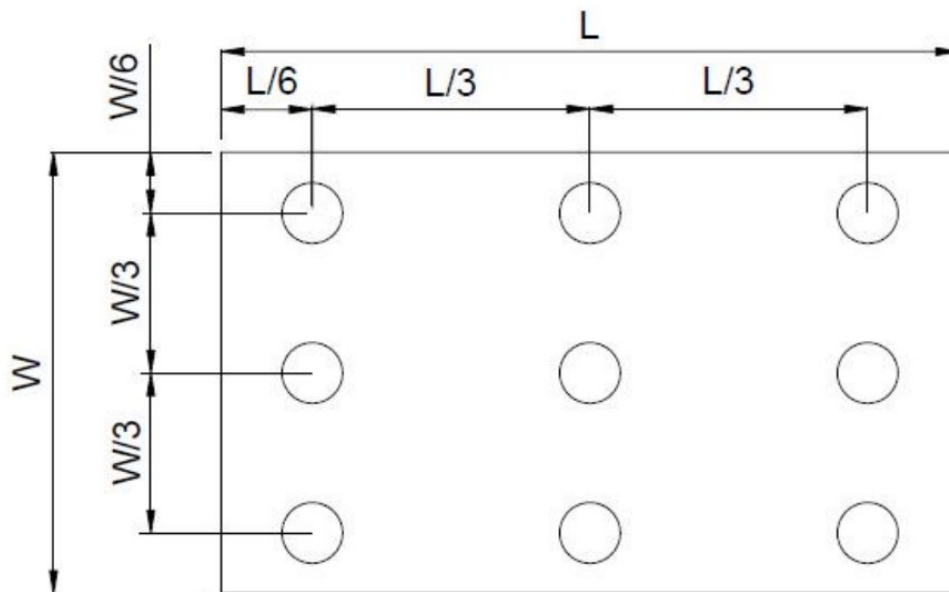
Measure the luminance of white state at center point.

L_{max} : The measured Maximum luminance of all measurement position.

L_{min} : The measured Minimum luminance of all measurement position.

$$\text{Luminance Uniformity (Yu)} = \frac{B_{min}}{B_{max}}$$

L-----Active area length W----- Active area width



8. Reliability Test

Item	Test Conditions	Criterion
High Temperature Storage	Ta = 80℃ 96hrs	A,B,C,D,E
Low Temperature Storage	Ta = -30℃ 96hrs	A,B,C,D,E
High Temperature Operation	Ts = 70℃ 96hrs	A,B,C,D,E
Low Temperature Operation	Ta = -20℃ 96hrs	A,B,C,D,E
Operate at High Temperature and Humidity	+60℃, 90%RH 96hrs	A,B,C,D,E
Thermal Shock(non operation)	-20℃/30 min ~ +70℃/30 min for a total 5 cycles, Start with cold temperature and end with high temperature.	A,B,C,D,E
Vibration Test	Sweep:10Hz~55Hz~10Hz 2G 2 hours for each direction of X. Y. Z. (6 hours for total)	A,B,C,D,E
Package Vibration Test	Random Vibration : 0.015G*G/Hz from 5-200HZ, -6dB/Octave from 200-500HZ 2 hours for each direction of X. Y. Z. (6 hours for total)	A,B,C,D,E
Package Drop Test	Height:60 cm 1 corner, 3 edges, 6 surfaces	A,B,C,D,E
Electro Static Discharge	Contact=+/-2KV, Air=+/-4KV,(R=330R,C=150pF), 1 sec,9point,10times/point;	TBD

※Criterion:

A.LCM each function is OK.

B.LCM appearance inspection without abnormalities (Including scratch, damage, corrosion and serious deformation)

C.LCM brightness above the Min. value of Spec.

D. Luminance uniformity above the Min. value of Spec.

E. Color chromaticity within tolerance range

9. Packing Specification

TBD

10. Precautions

10.1. Handling Precautions

- 10.1.1. 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, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.

- 10.1.2. Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.

- 10.1.3. The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.

- 10.1.4. If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:

- Isopropyl alcohol
- Ethyl alcohol

Solvents other than those mentioned above may damage the polarizer. Especially, do not use the following:

- Water
- Ketone
- Aromatic solvents

- 10.1.5. Do not attempt to disassemble the LCD Module.

- 10.1.6. If the logic circuit power is off, do not apply the input signals.

- 10.1.7. To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

- 10.1.8. Be sure to ground the body when handling the LCD Modules.

- 10.1.9. Tools required for assembly, such as soldering irons, must be properly ground.

- 10.1.10. To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.

- 10.1.11. The LCD Module is coated with a film to protect the display surface. Be care when peeling off this protective film since static electricity may be generated.

10.2. Storage Precautions

When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.

The LCD modules should be stored under the storage temperature range. If the LCD modules will be stored for a long time, the recommend condition is:

Temperature : 0°C ~ 40°C Relatively humidity: ≤80%

The LCD modules should be stored in the room without acid, alkali and harmful gas.

10.3. Transportation Precautions

The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.