HTM070A01

LCD Module User Manual

HOT DISPLAY

Shenzhen HOT Display Technology Co., Ltd.

Rev.	Descriptions	Date
01	Prelimiay Release	2013-08-01

Table of Content

1. Basic Specifications……3

1.1 Display Specifications……..……..3
1.2 Mechanical Specifications……..……..3
1.3 Absolute Maximum Ratings……..3
1.4 DC Electrical Characteristics……..……..3
1.5 Optical Characteristics……..……..……..3
1.6 Backlight & LED Characteristics……..……..……..……...5

2. Module Structure..……6

2.1 Counter Drawin……..……..6
2.2 Interface Description……..……..7
2.3 Timing Characteristics……..……..7
2.4 Display Command……..……..7

3. Inspection Standards……..……8

4. Handling Precautions……..……..……9

1. Basic Specifications

1.1 Display Specifications

1>LCD Display Mode	a-TFT,7',Transmissive
2>Viewing Angle	6H
3>Driving Method	Graphic 800（R+G+B）x480 Dots-matrix
4>Interface	8080 MPU interface(8/16 Bit Bus)
5>Backlight:	3X7 Pcs White LED
6>Controller/Driver	SSD1963

1.2 Mechanical Specifications

1>Outline Dimension	185.52(L)x112.12(W)x12.0(H)mm(DetailedInformation refer to LCM Drawing)
2>Active Area	156.4(L)x89.0(W)
3>Pixel Pitch	0.063 (L)x0.179(W)

1.3 Absolute Maximum Ratings

Items	Symbol	MIN.	MAX.	Unit	Condition
Power Supply	VCC	-0.3	3.6	V	-
Input Voltage	VIN	-0.3	IOVCC	V	-
LCD Driver Supp	VGH-VSS	-0.3	18.5	V	-
Operating	TOP	-10	+60	℃	No Condensation
Storage	Tst	-20	+70	℃	No Condensation
Storage	Hd	-	Ta<40	℃	

1.4 DC Electrical Characteristics

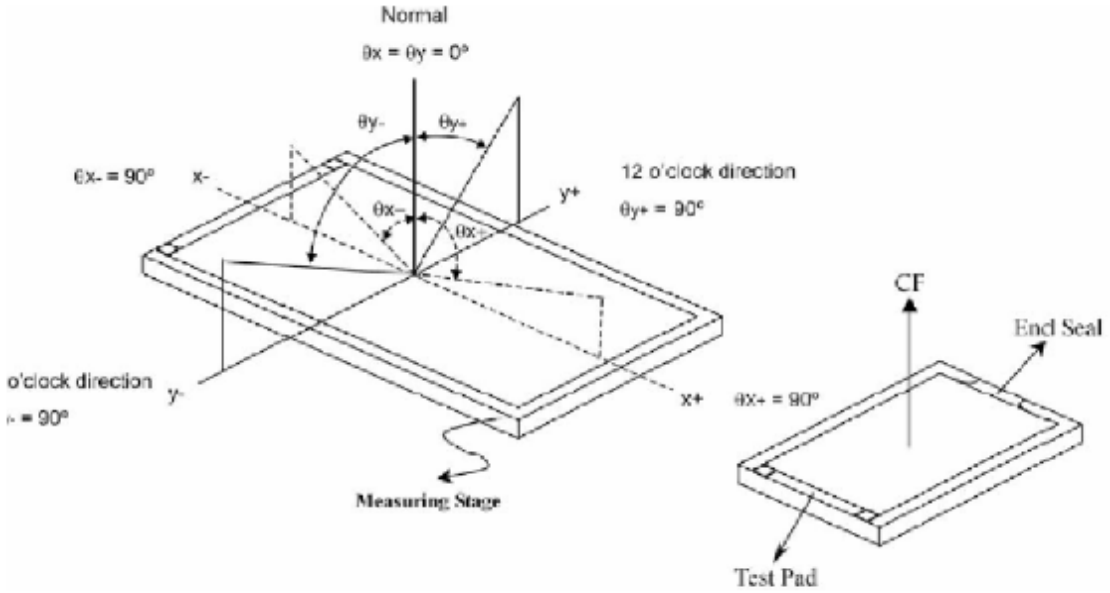
Items	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Logic Supplay Voltage	IOVCC	2.7	3.3	3.6	V	-
Input High Voltage	VIH	0.8 IOVCC	--	IOVCC	V	-
Input Low Voltage	VIL	-0.3	-	0.2 IOVCC	V	-
Output H Voltage	VOH	0.8 IOVCC		IOVCC	V	-
Output L Voltage	VOL	-0.3	-	0.2 IOVCC	V	-
Supply Current	I	34	-	500	mA	VCC=3.3V

1.5 Optical Characteristics

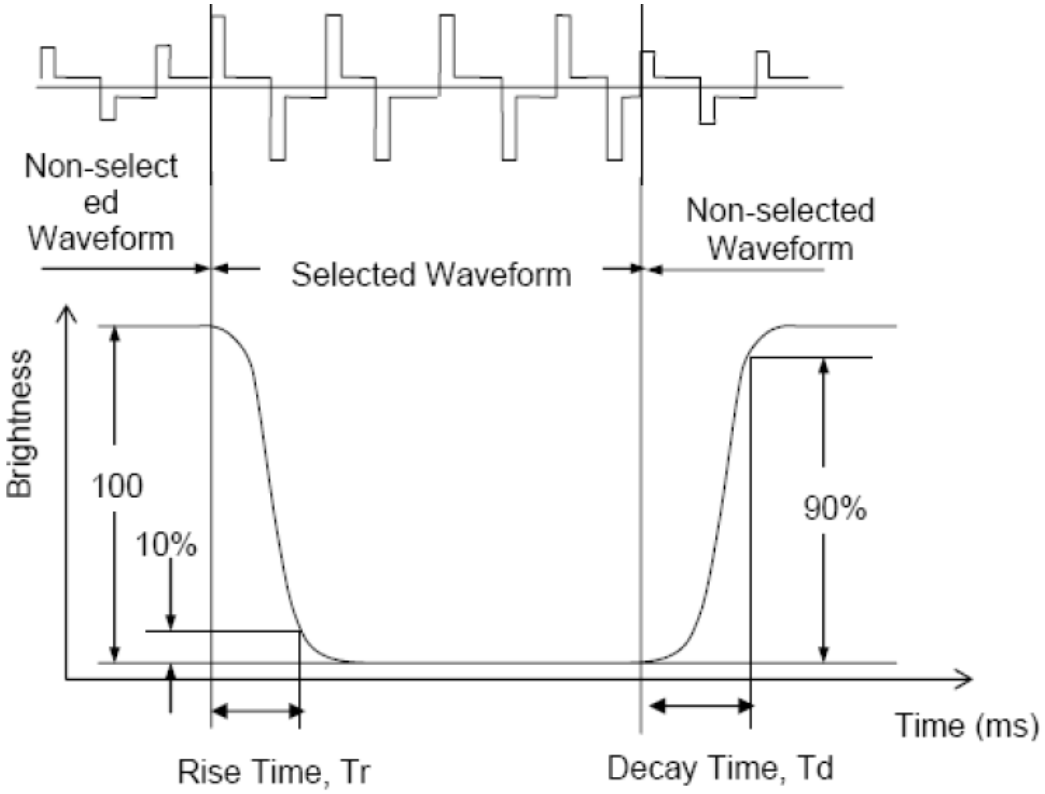
Items	Symbol		MIN.	TYP.	MAX.	Reference	Condition
View Angle	Hor	θL	-	70	-	Note5-1	CRε 10 B / L on
		θR	-	70	-	Note5-1	
	Ver	ΦH	-	50	-	Note5-1	
		ΦL	-	60	-	Note5-1	
Contrast Ratio	C		-	300	-	-	θ=0°，Φ=0
Response	tr		-	TBD	-	Note5-2	θ=0°，Φ=0
Response Time(fall)	tf		-	TBD	-	Note5-2	θ=0°，Φ=0
Luminance	B		200	250		Cd/m^2	θ=0°，∮ =0

Note 5-1 The definitions of viewing angles:

1. Note 5-2 The definitions of Viewing Angle



(-) Response time is defined as follow



1.6 Backlight & LED Characteristics

Maximum Ratings

Items	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Forword Voltage	V_F	2.4	3.3	3.6	V	VCC=3.3V
Forword Current	IF		450	-	mA	Ta=25℃
Power Dissipation	P_{WF}		1485	-	mW	-
Operating Temperature	Top	-10	-	60	℃	-
Storage Temperature	Tst	-20	-	70	℃	-
Solder Temp. For 3 Seconds	-	-	-	260	℃	-

Electrical/Optical Characteristics

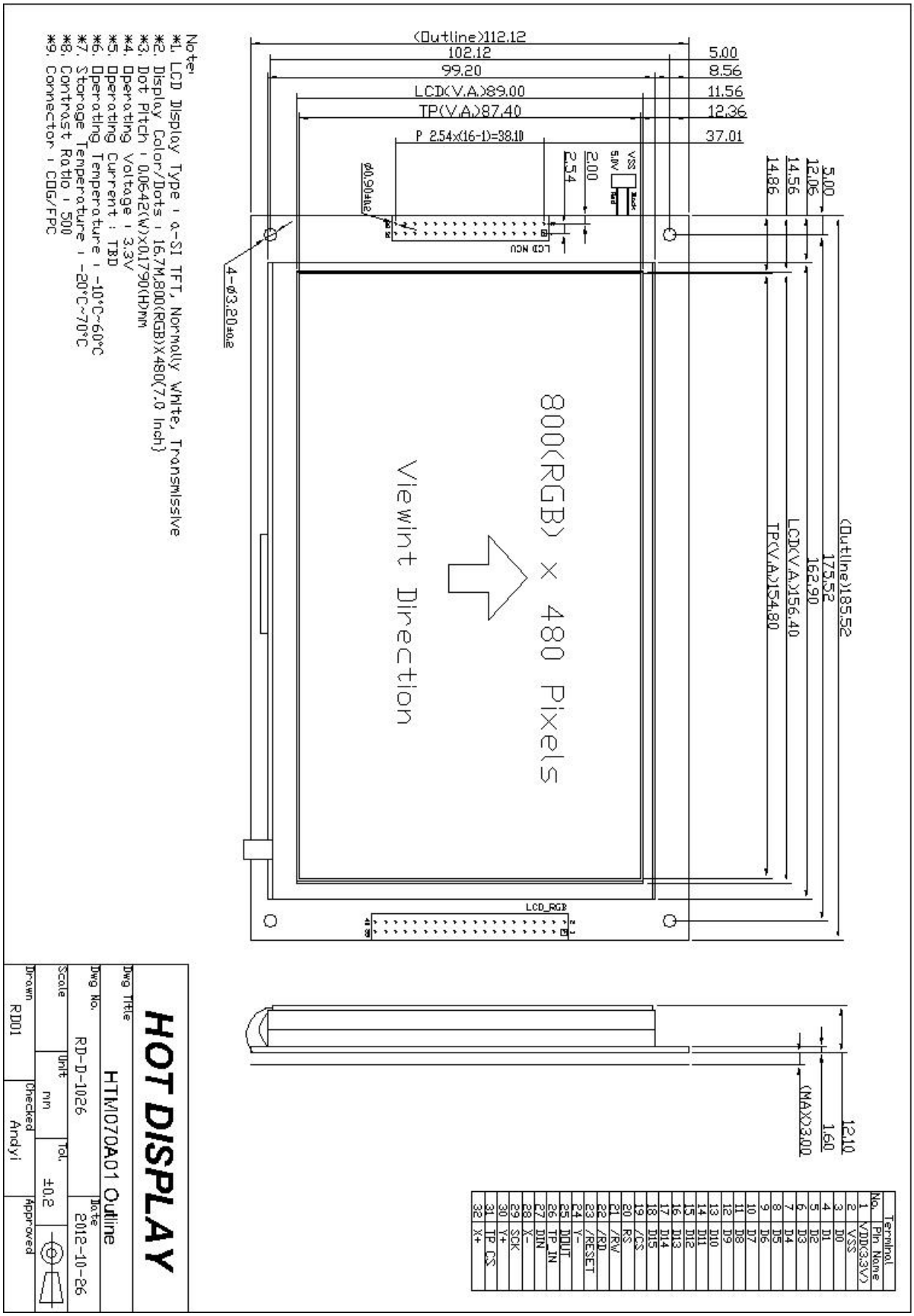
VSS=0V,Ta=25℃

Items	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Forword Voltage	VF	3.0	3.2	3.4	V	IF=15Ma*7
Reverse Current	IR	-	-	10	uA	VR=10V
Average Brightness (without LCD)	IV	2800	5000	-	cd/m^2	IF=15mA*7
CIE Color Coordinate (without LCD)	X	0.26	-	0.300	-	IF=15mA*7
	Y	0.26	-	0.300		
Color	WHITE					

***1 Thie value will be change while mass production.**

2. Module Structure

2.1 Counter Drawing



2.2 Interface Description

Pin No.	Pin Name	Function
1	VDD	Power Supply (3.3V)
2	VSS	Power Supply (0V)
3-18	DB0~DB15	16-Bit Data Bus
19	/CS	Chip Select Signal /CS = L, enable Access To The LCD module
20	RS	Data Type Select RS=L, Command Write,RS=H, Data Write
21	/WR	Write Enable Input
22	/RD	Read Enable Input
23	/RESET	/RESET = H, Normal Running /RESET = L, Initialization is executed
24	NC	
25	NC	
26	NC	
27	NC	
28	NC	
29	NC	
30	NC	
31	NC	
32	NC	

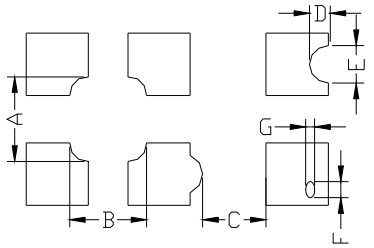
2.3 Timing Characteristics

Please refer to SSD1963 Datasheet

2.4 Display Command

Please refer toSSD1963 Datasheet

3.Inspection Standards

Item	Criterion for defects	Defect type
1) Display on inspection	(1) Non display (2) Vertical line is deficient (3) Horizontal line is deficient (4) Cross line is deficient	Major
2) Black / White spot	Size Φ(mm) Acceptable number Φ≤0.3 Ignore (note) 0.3<Φ≤0.45 3 0.45<Φ≤0.6 1 0.6<Φ 0	Minor
3) Black / White line	Length (mm) Width (mm) Acceptable number L≤10 W≤0.03 Ignore 5.0≤L≤10 0.03<W≤0.04 3 5.0≤L≤10 0.04<W≤0.05 2 1.0≤L≤10 0.05<W≤0.06 2 1.0≤L≤10 0.06<W≤0.08 1 L≤10 0.08<W follows 2) point defect Defects separate with each other at an interval of more than 20mm	Minor
4) Display pattern	 $\frac{A+B}{2}\leq 0.28$ | 0<C | $\frac{D+E}{2}\leq 0.25$ | $\frac{F+G}{2}\leq 0.25$ Note: 1) Up to 3 damages acceptable 2) Not allowed if there are two or more pinholes every three-fourth inch.	Minor
5) Spot-like contrast irregularity	Size Φ(mm) Acceptable Number Φ≤0.7 Ignore (note) 0.7<Φ≤1.0 3 1.0<Φ≤1.5 1 1.5<Φ 0 Note: 1) Conformed to limit samples. 2) Intervals of defects are more than 30mm.	Minor
6) Bubbles in polarizer	Size Φ(mm) Acceptable Number Φ≤0.4 Ignore (note) 0.4<Φ≤0.65 2 0.65<Φ≤1.2 1 1.2<Φ 0	Minor
7) Scratches and dent on the polarizer	Scratches and dent on the polarizer shall be in the accordance with "2) Black/white spot", and "3) Black/White line".	Minor
8) Stains on the surface of LCD panel	Stains which cannot be removed even when wiped lightly with a soft cloth or similar cleaning.	Minor
9) Rainbow color	No rainbow color is allowed in the optimum contrast on state within the active area.	Minor
10) Viewing area encroachment	Polarizer edge or line is visible in the opening viewing area due to polarizer shortness or sealing line.	Minor
11) Bezel appearance	Rust and deep damages that are visible in the bezel are rejected.	Minor
12) Defect of land surface contact	Evident crevices that are visible are rejected.	Minor
13) Parts mounting	(1) Failure to mount parts (2) Parts not in the specifications are mounted (3) For example: Polarity is reversed, HSC or TCP falls off.	Minor
14) Part alignment	(1) LSI, IC lead width is more than 50% beyond pad outline. (2) More than 50% of LSI, IC leads is off the pad outline.	Minor
15) Conductive foreign matter (solder ball, solder hips)	(1) 0.45<Φ, N≥1 (2) 0.3<Φ≤0.45, N≥1, Φ: Average diameter of solder ball (unit: mm) (3) 0.5<L, N≥1, L: Average length of solder chip (unit: mm)	Minor
16) Bezel flaw	Bezel claw missing or not bent	Minor
17) Indication on name plate (sampling indication label)	(1) Failure to stamp or label error, or not legible.(all acceptable if legible) (2) The separation is more than 1/3 for indication discoloration, in which the characters can be checked.	Minor

4. Handling Precautions

4.1 Mounting method

A panel of LCD module made by our company consists of two thin glass plates with polarizers that easily get damaged.

And since the module in so constructed as to be fixed by utilizing fitting holes in the printed circuit board (PCB), extreme care should be used when handling the LCD modules.

4.2 Cautions of LCD handling and cleaning

When cleaning the display surface, use soft cloth with solvent (recommended below) and wipe lightly.

-Isopropyl alcohol

-Ethyl alcohol

-Trichlorotriflorothane

Do not wipe the display surface with dry or hard materials that will damage the polarizer surface.

Do not use the following solvent:

-Water

-Ketene

-Aromatics

4.3 Caution against static charge

The LCD module use C-MOS LSI drivers. So we recommend you:

Connect any unused input terminal to V_{dd} or V_{ss}. Do not input any signals before power is turned on, and ground your body, work/assembly areas, assembly equipment to protect against static electricity.

4.4 Packaging

-Module employs LCD elements, and must be treated as such. Avoid intense shock and falls from a height.

-To prevent modules from degradation, do not operate or store them exposed direct to sunshine or high temperature/humidity.

4.5 Caution for operation

-It is an indispensable condition to drive LCD module within the limits of the specified voltage since the higher voltage over the limits may cause the shorter life of LCD module.

-An electrochemical reaction due to DC (direct current) causes LCD undesirable deterioration so that the uses of DC (direct current) drive should be avoided.

-Response time will be extremely delayed at lower temperature than the operating temperature range and on the other hand at higher temperature LCD module may show dark color in them. However those phenomena do not mean malfunction or out of order of LCD module, which will come back in the specified operating temperature.

4.6 Storage

In the case of storing for a long period of time, the following ways are recommended:

-Storage in polyethylene bag with the opening sealed so as not to enter fresh air outside in it. And with not desiccant.

-Placing in a dark place where neither exposure to direct sunlight nor light is. Keeping the storage temperature range.

-Storing with no touch on polarizer surface by any thing else.

4.7 Safety

-It is recommendable to crash damaged or unnecessary LCD into pieces and to wash off liquid crystal by either of solvents such as acetone and ethanol, which should be burned up later.

-When any liquid leaked out of a damaged glass cell comes in contact with your hands, please wash it off well at once with soap and water.

HOT DISPLAY