ER-TFTM070-5

TFT Display Datasheet

EastRising Technology Co., Limited

Attention:

A. Some specifications of IC are not listed in this datasheet. Please refer to the IC datasheet for more details.

B. The related documents for interfacing, demo code, ic datasheet are all available, please download from our web.

C. Please pay more attention to “INSPECTION CRITERIA” in this datasheet. We assume you already agree with these criterions when you place an order with us. No more recommendations.

REV	DESCRIPTION	RELEASE DATE
1.0	Preliminary Release	Dec-04-2013

CONTENTS

1. ORDERING INFORMATION

1.1 Order Number

Part Number(Order Number)	Description
ER-TFTM070-4	TFT LCD display module with SSD1963 controller
ER-DB-TM070-4	Demo Board for ER-TFTM070-4

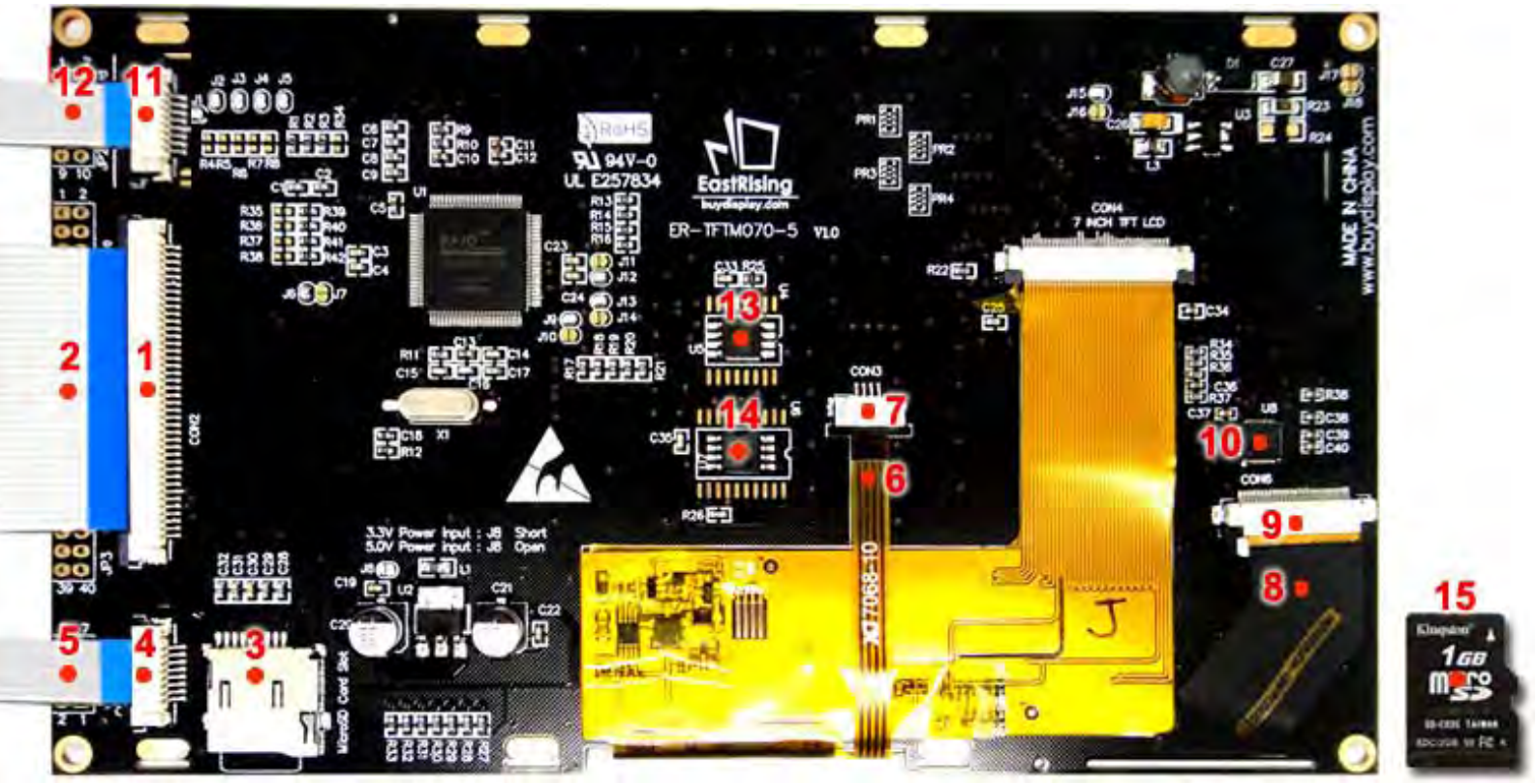
1.2 Optional Accessory List **(We give customer's more freedom to build your own display)**

Attention: The accessory you select would be mounted on board by default except flash memory chip.

No	Accessory for Parallel Interface	Qty	Position on Board
1	ZIF connector in 40 pins(1 piece is soldered on board, the another is used on customer's board)	2	CON2
2	FFC in 40 pins, 100mm length,1.00mm pitch used to connect display with customer's board	1	CON2
No	**Accessory for MicroSD Card Interface**	**Qty**	**Position on Board**
3	Micro SD Card Slot(Mounting on board by default)	1	MicroSD Card Slot
4	ZIF connector in 8 pins (1 piece is soldered on board, the another is used on customer's board)	2	CON5
5	FFC in 8 pins,100mm length,1.00mm pitch used to connect display with customer's board	1	CON5
No	**Accessory for 4-wire Resistive Touch Panel**	**Qty**	**Position on Board**
6	7 inch 4-wire Resistive Touch Panel (Mounting on board by default)	1	CON3
7	ZIF connector in 4 pins (Mounting on board by default)	1	CON3
No	**Accessory for Capacitive Touch Panel**	**Qty**	**Position on Board**
8	7 inch Capacitive Touch Panel (Mounting on board by default)	1	CON6
9	ZIF connector in 30 pins (Mounting on board by default)	1	CON6
10	Capacitive Touch Panel Controller	1	CON6
No	**Accessory for Keyboard Interface**	**Qty**	**Position on Board**
11	ZIF connector in 10 pins (1 piece is soldered on board, the another is used on customer's board)	2	CON1
12	FFC in 10 pins,100mm length,1.00mm pitch used to connect display with customer's board	1	CON1
No	**Other Accessory**	**Qty**	**Position on Board**
13	Flash Memory Chip (Not mounting on board by default)	1	U5

14	Font Chip (Mounting on board by default)	1	U7
15	MicroSD Card (Not mounting on board by default)	1	N/A

1.3 Image



with Capacitive Touch Panel

with 4-wire Resistive Touch Panel

2. ATTRIBUTES

2.1 Display Attributes

ITEM	STANDARD VALUE	UNIT
Display Format	800（RGB）x 480 Dots	--
Display Connector	FFC or Pin Header	--
FPC Connector	40 Pins,1.0mm Pitch, SMD Horizontal Type Top contact	--
Operating Temperature	-20 ~ +70	℃
Storage Temperature	-30 ~ +80	℃
Touch Panel Optional	Yes	--
Sunlight Readable	No	--

2.2 Mechanical Attributes

ITEM	STANDARD VALUE	UNIT
Diagonal Size	7.0	inch
Outline Dimension(PCB)	180.0 x 104.0	mm
Active Area	154.08 x 85.92	mm
Dot Pitch	0.0642(W) x 0.1790(H) mm	mm
Gross Weight	341	g

2.3 Electrical Attributes

ITEM	STANDARD VALUE	UNIT
IC Package	SMT	--
Controller	RA8875	--
Interface	8080/6800 8-bit/16-bit Parallel, 3-wire,4-wire SPI ,I2C	--
Response Time (Typ)	20	ms

2.4 Optical Attributes

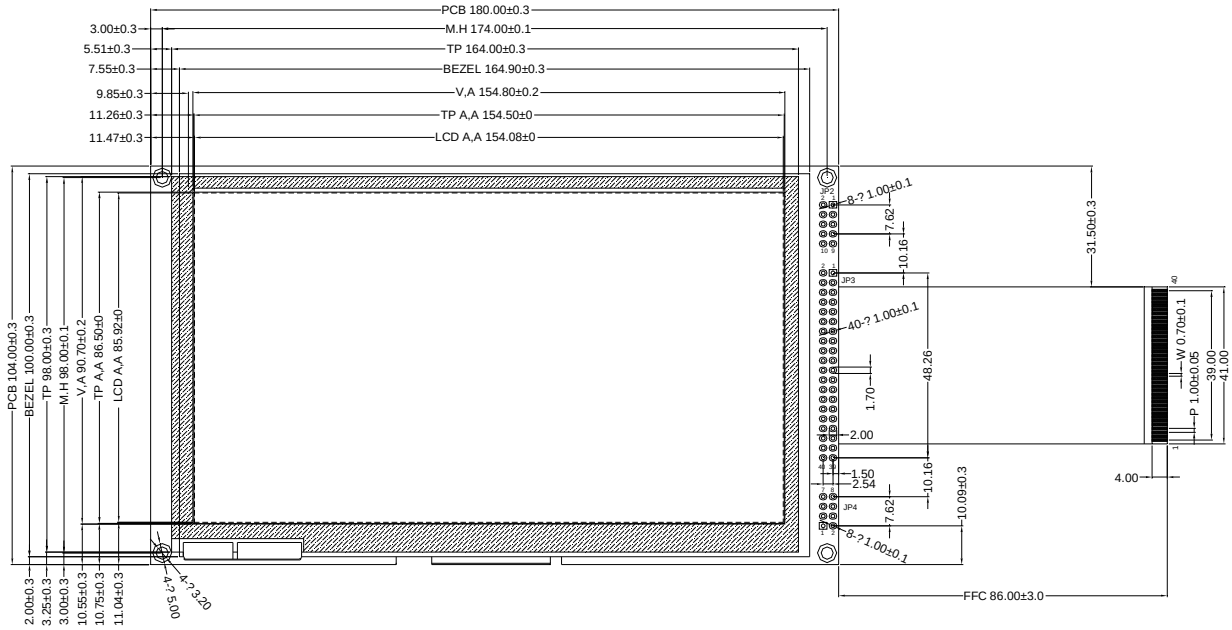
ITEM	STANDARD VALUE	UNIT
LCD Type	TFT-LCD / Transmissive / Negative	--
Viewing Angle Range	Left:60, Right:60, Up:60, Down:60	deg
Colors	256/65K	--
Contrast Ratio (Typ)	500:1	--
Brightness (Typ)	200	cd/m2

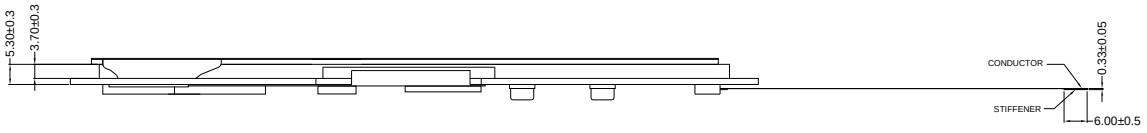
3. OUTLINE DRAWING

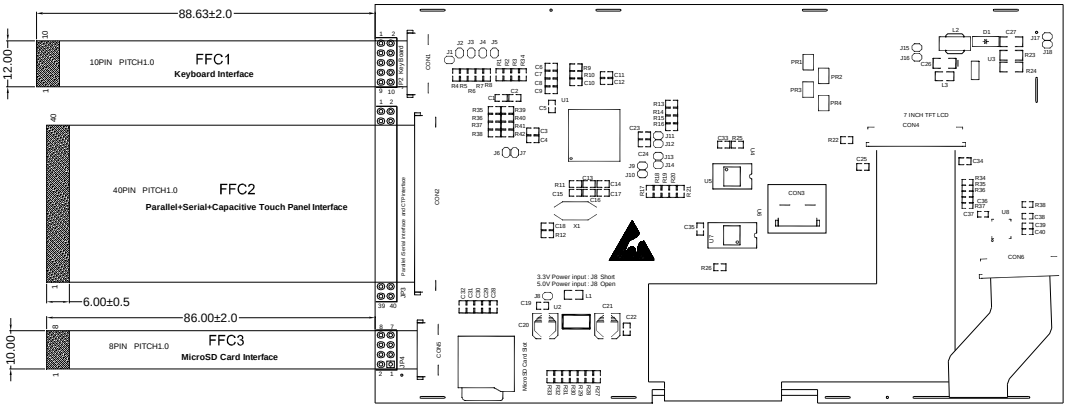
3.1 Outline Drawing with 4-wire Resistive Touch Panel

REV.	DESCRIPTION OF MODIFY	MODIFY BY	DATE
A0	1'ST,DESIGN	JIM	Nov-27-2013
A1			
A2			

with 4-wire Resistive Touch Panel





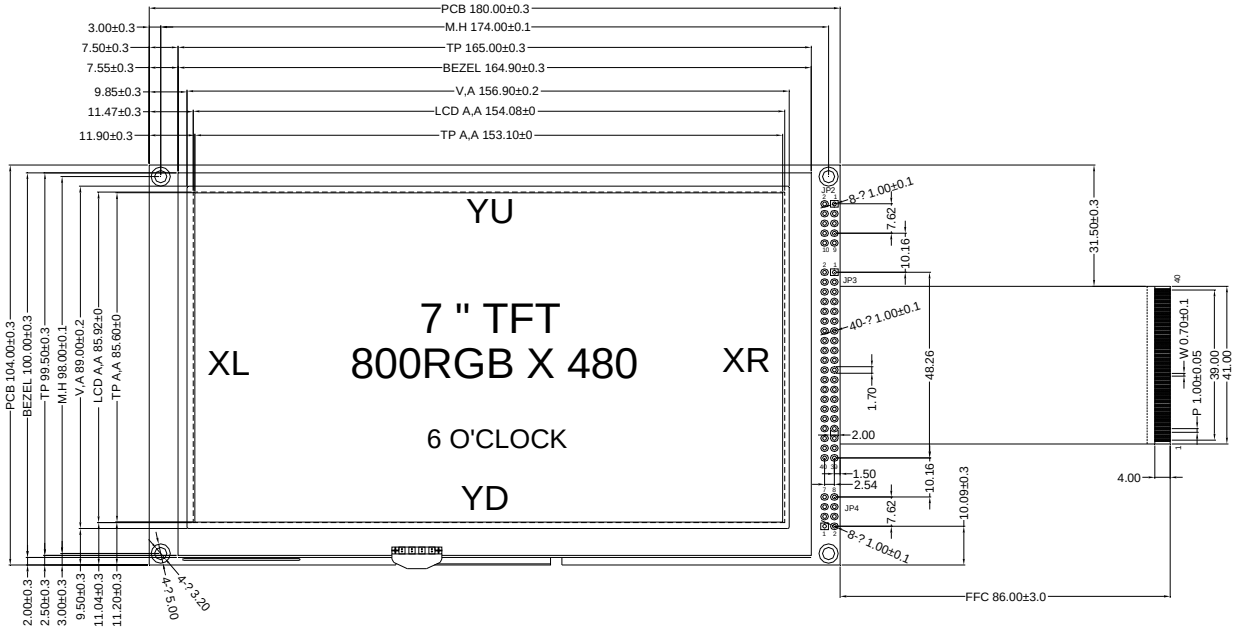


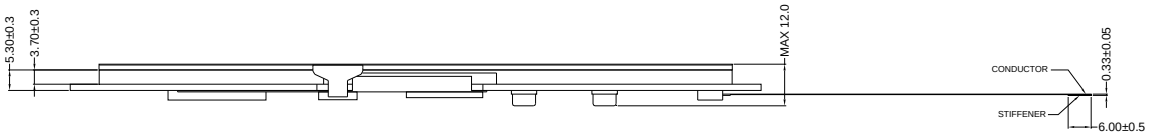
EastRising Technology Co.,Ltd 旭日东方科技有限公司		CD
	UNIT: MM	SIZE: A4
	SHEET: 1 OF 1	
LCM PART NUMBER: ER-TFTM070-5		REV: A0
DRAWN BY :JIM	CHECKED BY :	APPROVED BY :

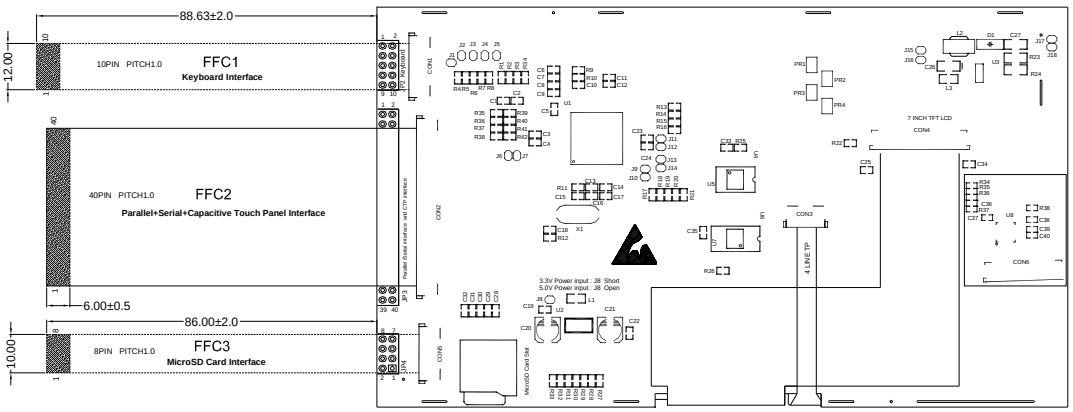
3.2 Outline Drawing with Capacitive Touch Panel

REV.	DESCRIPTION OF MODIFY	MODIFY BY	DATE
A0	1'ST.DESIGN	JIM	Nov-27-2013
A1			
A2			

with Capacitive Touch Panel







BACK

EastRising Technology Co.,Ltd 旭日东方科技有限公司			CD
		UNIT: MM	SIZE: A4
		SHEET: 1 OF 1	
LCM PART NUMBER: ER-TFTM070-5			REV: A0
DRAWN BY :JIM	CHECKED BY :	APPROVED BY :	

4. ELECTRICAL SPEC

4.1 Pin Configuration-JP3/CON2 (Parallel+Serial+ Capacitive Touch Panel Interface)

Pin No	Symbol	Descriptions
1	VSS	Ground
2	VSS	Ground
3	VDD	Power Supply
4	VDD	Power Supply
5	Parallel Mode E_/RD	Enable/Read Enable When MCU interface (I/F) is 8080 series, this pin is used as RD# signal (Data Read) , active low. When MCU I/F is 6800 series, this pin is used as EN signal (Enable), active high.
	Serial Mode /SCS	Serial Mode Chip Select, Low active chip select pin. Chip select pin for 3-wire , 4-wire serial or I2C I/F.
6	Parallel Mode R/W_/WR	Write/Read-Write When MCU I/F is 8080 series, this pin is used as WR# signal (data write) , active low. When MCU I/F is 6800 series, this pin is used as RW# signal (data read/write control) . Active high for read and active low for write.
	Serial Mode SDO	3-wire SPI Data /4-wire SPI Data Output 4-wire SPI I/F: Data output for serial I/F. 3-wire SPI I/F: Bi-direction data for serial I/F IIC I/F: NC, if no use, please keep floating. If no use, please keep floating.
7	Parallel Mode /CS	Parallel Mode Chip Select Input Low active chip select pin.
	Serial Mode SDI	IIC data /4-wire SPI Data Input 4-wire SPI I/F: Data input for serial I/F. 3-wire SPI I/F: NC IIC I/F: Bi-direction data for serial I/F
8	Parallel Mode RS	Command / Data Select Input The pin is used to select command/data cycle. RS = 0, data Read/Write cycle is selected. RS = 1, status read/command write cycle is selected. In 8080 interface, usually it connects to “A0” address pin.
	SCLK	SPI Clock 3-wire, 4-wire Serial or IIC I/F clock

9	WAIT	Wait Signal Output This is a WAIT# output to indicate the RA8875 is in busy state. The RA8875 can't access MCU cycle when WAIT# pin is active. It is active low and could be used for MCU to poll busy status by connecting it to I/O port.
10	INT	Interrupt Signal Output The interrupt output for MCU to indicate the status of RA8875.
11	/RESET(NC)	Master synchronizes reset, Active Low. RC Reset circuit on board.
12	C86(NC)	MCU Interface Select 0: 8080 interface is selected 1: 6800 interface is selected Internally connected to the low level.
13	VSS	Ground
14	BL_CONTROL	BackLight control signal input.When using the internal PWM signal this pin floating.
15~30	DB0~DB15	Data Bus These are data bus for data transfer between MCU and RA8875. When setting register number and register data, DB[7:0] is used. When writing data to display RAM, DB[15:0] is used according to data bus mode setting. DB[15:8] will be input and should be pull-low or pullhigh when 8-bit data bus mode is used.
31	VSS	Ground
32	CTP_WAKE	An interrupt signal for the host to change F5206 from hibernates to active mode.
33	CTP_INT	An interrupt signal to inform the host processor that touch data is ready for read
34	CTP_SDA	Serial data input/output
35	CTP_SCL	Serial clock input
36	CTP_/RST	External low signal reset the chip. RC reset circuit on board, this pin can be left unconnected.
37	VDD	Power Supply
38	VDD	Power Supply
39	VSS	Ground
40	VSS	Ground

Note: CTP means Capacitive Touch Panel.

4.2 Pin Configuration-JP2/CON1 (4x5 Keyboard interface)

No	Symbol	Descriptions
1-5	KIN0-KIN4 GPI0-GPI4	**Keypad Data Line or GPIs (General Purpose Input)** Keypad data inputs (Default). They could be programmed as GPIs by register setting.
6-9	KOUT0-KOUT3 GPO0-GPO3	**Keypad Strobe Line or GPOs (General Purpose Output)** Keypad matrix strobe lines outputs with open-drain. (Default). They could be programmed as GPOs by register setting, if don't use, please keep floating.
10	PWM2	PWM signal output

Note:The keyboard is disable by default.Please leave J1 to J5 open and R4 to R8 is with 100k ohm if you want to enable.

4.3 Pin Configuration-JP4/CON5 (Micro SD Card Interface)

SD Mode		SPI Mode	
Pin No	**Symbol**	**Pin No**	**Symbol**
1	DATA2	1	NC
2	DATA3	2	/CS
3	CMD	3	DIN
4	CLK	4	SCLK
5	GND	5	GND
6	DATA0	6	DOUT
7	DATA1	7	NC
8	CARD DETECTION	8	CARD DETECTION

4.4 Jump Point Description

Function Description	Jump Method
Enable/Disable Keyboard	J1~J5 Short: No use Keyboard,R4~R8 NC / J1~J5 Open: Use Keyboard,R4~ R8=100K
Power Supply Switch	J8 Short: Vdd=3.3V Power Supply / J8 Open: Vdd=5V Power Supply
8080 Parallel Interface	J6，J9，J12，J13,J15 Short and J7,J10,J11,14,J16 Open: 8080 Interface R1~R3=0R,R39~R42=0R
6800 Parallel Interface	J7，J9，J12，J13,J15 Short and J6,J10,J11,14,J16 Open: 6800 Interface R1~R3=0R,R39~R42=0R ,R35~R38 NC
I2C Interface	J9,J12,J13,J15 Open and J10,J11,J14,J16 Short, R1=0R, R35~R38=0R,R2=10K, R3=10K,R39~R42 NC

3-wire Serial Interface	J9,J12,J14,J15 Open and J10,J11,J13,J16 Short, R2=0R, R35~R38=0R, R1=10K, R3=10K,R39~R42 NC
4-wire Serial Interface	J9,J11,J13,J15 Open and J10,J12,J14,J16 Short, R1~R3=10K, R35~R38=0R,R39~R42 NC
Backlight Control	J15 Short,J16 Open: Select Backlight Control Signal with External Input J15 Open,J16 Short: Select Backlight Control Signal with RA8875 'PWM'
Connect fix hole to ground	J17 Shot: Connect fix hole to the ground

Note: We leave J1 to,J5,J6,J9,J12,J13,J15 short ,R39~R42=0R and J7,J8,J10,J11,J14,J16,J17 open ,R35~R38 NC by default.

4.5 Absolute Maximum Ratings

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
Power Supply Voltage	VDD	-0.5	-	+5.5	V
Logic signal voltage	VDDIO	-0.5	-	+3.3	V
operating temperature	Top	-20	-	+70	° C
storage temperature	TST	-30	-	+80	° C
Humidity	RH	-		90%(Max60° C)	RH

4.6 Electrical Characteristics

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
Power supply voltage(*1)	VDD	3.0	3.3	3.6	V
		4.8	5.0	5.2	V
Logic signal I/O voltage	VDDIO	3.0	3.3	3.6	V
Input voltage 'H' level	VIH	0.8VDDIO	-	VDDIO	V
Input voltage 'L' level	VIL	GND	-	0.2VDDIO	V
Output voltage 'H' level	VOH	VDDIO-0.4	-	VDDIO	V
Output voltage 'L' level	VCL	GND	-	GND+0.4	V
Schmitt-Trigger Input (*2)					
Input voltage 'H' level	VIH	0.7VDDIO	-	VDDIO	V
Input voltage 'L' level	VIL	GND	-	0.3VDDIO	V
Input Leakage Current 1（*3）	VIH	--	+	+2	uA
Input Leakage Current 2（*3）	VIL	--		-2	uA
Model Current	IDD(3.3V)	--	--	480	mA

	IDD(5.0V)	--	--	300	mA
Sleep Mode（*3）	ISLP	--	320	--	uA

Note1: Short J8 if VDD=3.3V

Note2: Signals RD#, WR#, CS#, RS, RST# are inputs of Schmitt-trigger.

Note3: Oscillator Clock = 20MHz, System Clock = 20~60MHz,VSYNC = 45~65Hz, T_A=25 ℃

5. INSPECTION CRITERIA

5.1 Acceptable Quality Level

Each lot should satisfy the quality level defined as follows

PARTITION	AQL	DEFINITION
A. Major	0.4%	Functional defective as product
B. Minor	1.5%	Satisfy all functions as product but not satisfy cosmetic stanard

5.2 Definition of Lot

One lot means the delivery quantity to customer at one time.

5.3 Condition of Cosmetic Inspection

◆ INSPECTION AND TEST

-FUNCTION TEST

-APPEARANCE INSPECTION

-PACKING SPECIFICTION

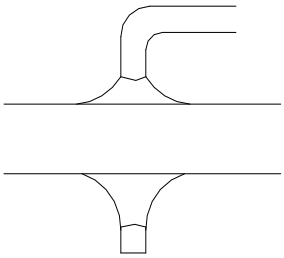
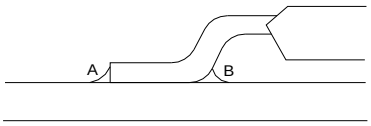
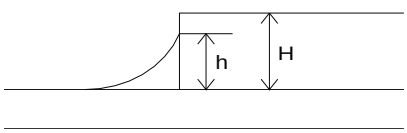
◆ INSPECTION CONDITION

- Put under the lamp (20w¡Á2) at a distance 100mm from
- Tilt upright 45 degree by the front (back) to inspect LCD appearance.

◆ AQL INSPECTION LEVEL

- SAMPLING METHOD: MIL-STD-105D
- SAMPLING PLAN: SINGLE
- MAJOR DEFECT: 0.65% (MAJOR)
- MINOR DEFECT: 2.5% (MINOR)
- GENERAL LEVEL: II/NORMAL

5.4 Module Cosmetic Criteria

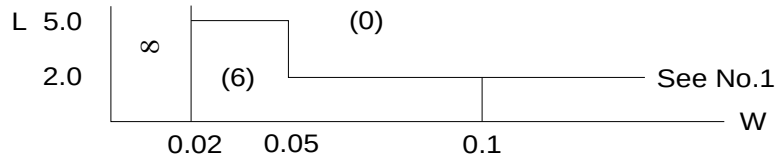
NO.	Item	Judgment Criterion	Partition
1	Difference in Spec.	None allowed	Major
2	Pattern Peeling	No substrate pattern peeling and floating	Major
3	Soldering defects	No soldering missing	Major
		No soldering bridge	Major
		No cold soldering	Minor
4	Resist flaw on substrate	Invisible copper foil(¢0.5mm or more)on substrate pattern	Minor
5	Accretion of metallic	No soldering dust	Minor
	Foreign matter	No accretion of metallic foreign matters(Not exceed¢0.2mm)	
6	Stain	No stain to spoil cosmetic badly	Minor
7	Plate discoloring	No plate fading,rusting and discoloring	Minor
8	Solder amount 1.Lead parts	a. Soldering side of PCB Solder to form a'Filet' all around the lead. Solder should not hide the lead form perfectly.(too much) b.Components side (In case of 'Through Hole PCB') Solder to reach the Components side of PCB 	Minor
	2.Flat packages	Either 'toe'(A) or 'heal' (B) of the lead to be covered by 'Filet' Lead form to be assume over Solder. 	Minor
	3.Chips	(3/2) H≧h≧(1/2)H 	Minor

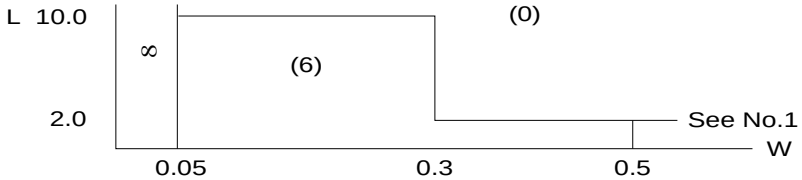
9	Backlight defects	1.Light fails or flickers.(Major) 2. Color and luminance do not correspond to specifications. (Major) 3.Exceeds standards for display's blemishes, foreign matter, dark lines or scratches.(Minor)	See list ←
10	PCB defects	Oxidation or contamination on connectors.* 2. Wrong parts, missing parts, or parts not in specification.* 3.Jumpers set incorrectly.(Minor) 4.Solder(if any)on bezel,LED pad,zebra pad,or screw hole pad is not smooth.(Minor) *Minor if display functions correctly.Major if the display fails.	See list ←
11	Soldering defects	1. Unmelted solder paste. 2. Cold solder joints,missing solder connections,or oxidation.* 3. Solder bridges causing short circuits.* 4. Residue or solder balls. 5. Solder flux is black or brown. *Minor if display functions correctly.Major if the display fails.	Minor

5.5 Screen Cosmetic Criteria (Non-Operating)

No.	Defect	Judgment Criterion		Partition
1	Spots	In accordance with Screen Cosmetic Criteria (Operating) No.1.		Minor
2	Lines	In accordance with Screen Cosmetic Criteria (Operation) No.2.		Minor
3	Bubbles in Polarizer			Minor
		Size: d mm	Acceptable Qty in active area	
		d≦0.3 0.3<d≦1.0 1.0<d≦1.5 1.5<d	Disregard 3 1 0	
4	Scratch	In accordance with spots and lines operating cosmetic criteria, When the light reflects on the panel surface, the scratches are not to be remarkable.		Minor
5	Allowable density	Above defects should be separated more than 30mm each other.		Minor
6	Coloration	Not to be noticeable coloration in the viewing area of the LCD panels. Back-lit type should be judged with back-lit on state only.		Minor
7	Contamination	Not to be noticeable.		Minor

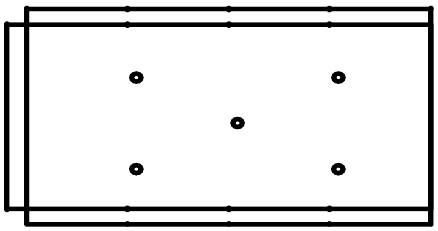
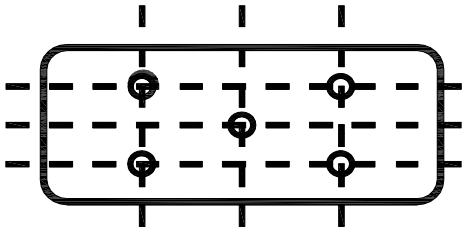
5.6 Screen Cosmetic Criteria (Operating)

<table>
<tr><th>No.</th><th>Defect</th><th>Judgment Criterion</th><th>Partition</th></tr>
<tr><td>1</td><td>Spots</td><td>A) Clear
<table>
<tr><td>Size:d mm</td><td>Acceptable Qty in active area</td></tr>
<tr><td>d≦0.1
0.1<d≦0.2
0.2<d≦0.3
0.3<d</td><td>Disregard
6
2
0</td></tr>
</table>
Note: Including pin holes and defective dots which must be within one pixel Size.
B) Unclear
<table>
<tr><td>Size:d mm</td><td>Acceptable Qty in active area</td></tr>
<tr><td>d≦0.2
0.2<d≦0.5
0.5<d≦0.7
0.7<d</td><td>Disregard
6
2
0</td></tr>
</table></td><td>Minor</td></tr>
<tr><td>2</td><td>Lines</td><td>A) Clear
 

Note: () – Acceptable Qty in active area
L - Length (mm)
W -Width(mm)
∞-Disregard
B) Unclear
 
</td><td>Minor</td></tr>
</table>

‘Clear’ = The shade and size are not changed by Vo.

‘Unclear’ = The shade and size are changed by Vo.

No.	Defect	Judgment Criterion	Partition
3	Rubbing line	Not to be noticeable.	
4	Allowable density	Above defects should be separated more than 10mm each other.	Minor
5	Rainbow	Not to be noticeable.	Minor
6	Dot size	To be 95%~105%of the dot size (Typ.) in drawing. Partial defects of each dot (ex.pin-hole) should be treated as'spot'. (see Screen Cosmetic Criteria (Operating) No.1)	Minor
7	Brightness (only back-lit Module)	Brightness Uniformity must be BMAX/BMIN≦2 - BMAX :Max.value by measure in 5 points - BMIN : Min.value by measure in 5 points Divide active area into 4 vertically and horizontally. Measure 5 points shown in the following figure. 	Minor
8	Contrast Uniformity	Contrast Uniformity must be BmAX/BMIN≦2 Measure 5 points shown in the following figure. Dashed lines divide active area into 4 vertically and horizontally. Measuring points are located at the inter-sections of dashed line.  Note: BMAX – Max.value by measure in 5 points. BMIN – Min.value by measure in 5 points. O – Measuring points in ∅10mm.	Minor

Note:

(1) Size : d=(long length + short length)/2

(2) The limit samples for each item have priority.

(3) Complexed defects are defined item by item, but if the number of defects is defined in above table, the total number should not exceed 10.

(4) In case of 'concentration', even the spots or the lines of 'disregarded' size should not be allowed. Following three situations

Should be treated as 'concentration'.

-7 or over defects in circle of ¢5mm.

-10 or over defects in circle of ¢10mm

-20 or over defects in circle of ¢20mm

6. PRECAUTIONS FOR USING

6.1 Handling Precautions

- This device is susceptible to Electro-Static Discharge (ESD) damage. Observe Anti-Static precautions.
- EastRising display panel is made of glass. Do not subject it to a mechanical shock by dropping it or impact.
- If EastRising display panel is damaged and the liquid crystal substance leaks out, be sure not to get any in your mouth. If the substance contacts your skin or clothes, wash it off using soap and water.
- Do not apply excessive force to the EastRising display surface or the adjoining areas since this may cause the color tone to vary.
- The polarizer covering the EastRising display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.
- If EastRising display surface becomes contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If it is heavily contaminated, moisten cloth with one of the following Isopropyl or alcohol.
- Solvents other than those above-mentioned may damage the polarizer. Especially, do not use the Water.
- Exercise care to minimize corrosion of the electrode. Corrosion of the electrodes is accelerated by water droplets, moisture condensation or a current flow in a high-humidity environment.
- Install the EastRising LCD Module by using the mounting holes. When mounting the LCD module make sure it is free of twisting, warping and distortion. In particular, do not forcibly pull or bend the cable or the backlight cable.
- Do not attempt to disassemble or process EastRising LCD module.
- NC terminal should be open. Do not connect anything.
- If the logic circuit power is off, do not apply the input signals.
- To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.
  -Be sure to ground the body when handling EastRising LCD modules.
  -Tools required for assembling, such as soldering irons, must be properly grounded.
  -To reduce the amount of static electricity generated, do not conduct assembling and other work under dry conditions.
  -The LCD module is coated with a film to protect the display surface. Exercise care when peeling off this protective film since static electricity may be generated.

6.2 Power Supply Precautions

◆ Identify and, at all times, observe absolute maximum ratings for both logic and LC drivers. Note that there is some variance between models.
◆ Prevent the application of reverse polarity to VDD and VSS, however briefly.
◆ Use a clean power source free from transients. Power-up conditions are occasionally jolting and may exceed the maximum ratings of EastRising modules.
◆ The VDD power of EastRising module should also supply the power to all devices that may access the display. Don't allow the data bus to be driven when the logic supply to the module is turned off.

6.3 Operating Precautions

◆ DO NOT plug or unplug EastRising module when the system is powered up.
◆ Minimize the cable length between EastRising module and host MPU.
◆ For models with backlights, do not disable the backlight by interrupting the HV line. Unload inverters produce voltage extremes that may arc within a cable or at the display.
◆ Operate EastRising module within the limits of the modules temperature specifications.

6.4 Mechanical/Environmental Precautions

◆ Improper soldering is the major cause of module difficulty. Use of flux cleaner is not recommended as they may seep under the electrometric connection and cause display failure.
◆ Mount EastRising module so that it is free from torque and mechanical stress.
◆ Surface of the LCD panel should not be touched or scratched. The display front surface is an easily scratched, plastic polarizer. Avoid contact and clean only when necessary with soft, absorbent cotton dampened with petroleum benzene.
◆ Always employ anti-static procedure while handling EastRising module.
◆ Prevent moisture build-up upon the module and observe the environmental constraints for storage tem
◆ Do not store in direct sunlight
◆ If leakage of the liquid crystal material should occur, avoid contact with this material, particularly ingestion. If the body or clothing becomes contaminated by the liquid crystal material, wash thoroughly with water and soap

6.5 Storage Precautions

When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps. Keep EastRising modules in bags (avoid high temperature / high humidity and low temperatures below 0C Whenever possible, EastRising LCD modules should be stored in the same conditions in which they were shipped from our company.

6.6 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 EastRising 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.

7. USING LCD MODULES

7.1 Liquid Crystal Display Modules

EastRising LCD is composed of glass and polarizer. Pay attention to the following items when handling.

- 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.
- Do not touch, push or rub the exposed polarizers with anything harder than an HB pencil lead (glass, tweezers, etc.).
- N-hexane is recommended for cleaning the adhesives used to attach front/rear polarizers and reflectors made of organic substances which will be damaged by chemicals such as acetone, toluene, ethanol and isopropylalcohol.
- When EastRising display surface becomes dusty, wipe gently with absorbent cotton or other soft material like chamois soaked in petroleum benzin. Do not scrub hard to avoid damaging the display surface.
- Wipe off saliva or water drops immediately, contact with water over a long period of time may cause deformation or color fading.
- Avoid contacting oil and fats.
- Condensation on the surface and contact with terminals due to cold will damage, stain or dirty the polarizers. After products are tested at low temperature they must be warmed up in a container before coming is contacting with room temperature air.
- Do not put or attach anything on EastRising display area to avoid leaving marks on.
- Do not touch the display with bare hands. This will stain the display area and degradate insulation between terminals (some cosmetics are determinated to the polarizers).
- As glass is fragile. It tends to become or chipped during handling especially on the edges. Please avoid dropping or jarring.

7.2 Installing LCD Modules

- Cover the surface with a transparent protective plate to protect the polarizer and LC cell.
- 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±0.1mm.

7.3 Precaution for Handling LCD Modules

Since EastRising LCM has been assembled and adjusted with a high degree of precision; avoid applying excessive shocks to the module or making any alterations or modifications to it.

- Do not alter, modify or change the shape of the tab on the metal frame.
- Do not make extra holes on the printed circuit board, modify its shape or change the positions of components to be attached.
- Do not damage or modify the pattern writing on the printed circuit board.
- Absolutely do not modify the zebra rubber strip (conductive rubber) or heat seal connector.
- Except for soldering the interface, do not make any alterations or modifications with a soldering iron.
- Do not drop, bend or twist EastRising LCM.

7.4 Electro-Static Discharge Control

Since this module uses a CMOS LSI, the same careful attention should be paid to electrostatic discharge as for an ordinary CMOS IC.

- Make certain that you are grounded when handing LCM.
- Before remove LCM from its packing case or incorporating it into a set, be sure the module and your body have the same electric potential.
- When soldering the terminal of LCM, make certain the AC power source for the soldering iron does not leak.
- When using an electric screwdriver to attach LCM, the screwdriver should be of ground potentiality to minimize as much as possible any transmission of electromagnetic waves produced sparks coming from the commutator of the motor.
- As far as possible make the electric potential of your work clothes and that of the work bench the ground potential.
- To reduce the generation of static electricity be careful that the air in the work is not too dried. A relative humidity of 50%-60% is recommended.

7.5 Precaution for Soldering to EastRising LCM

- Observe the following when soldering lead wire, connector cable and etc. to the LCM.
  -Soldering iron temperature : 280℃±10℃
  -Soldering time: 3-4 sec.
  -Solder: eutectic solder.
  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.
- 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.
- 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.

7.6 Precaution for Operation

- Viewing angle varies with the change of liquid crystal driving voltage (VO). Adjust VO to show the best contrast.
- Driving the EastRising LCD in the voltage above the limit shortens its life.
- Response time is greatly delayed at temperature below the operating temperature range. However, this does not mean the LCD will be out of the order. It will recover when it returns to the specified temperature range.
- If EastRising 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.
- Condensation on terminals can cause an electrochemical reaction disrupting the terminal circuit. Therefore, it must be used under the relative condition of 40℃, 50% RH.
- When turning the power on, input each signal after the positive/negative voltage becomes stable.

7.7 Limited Warranty

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

7.7 Return Policy

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

-Broken LCD glass.
-PCB eyelet 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's, conductors and terminals

That's the end of the Datasheet