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Product Specification

Customer: _____

Model Name: ET042RF01-Y

Date: _____

Version: _____

■ **Preliminary Specification**

☐ **Final Specification**

For Customer's Acceptance

Approved by	Comment

Approved by	Reviewed by	Prepared by

Contents

1. Record of Revision

Version	Revise Date	Content	Editor
1.0	2023/02/26	First Release.	Luo

2 General Specifications

Feature		Spec
Characteristics	Size	4.2 inch
	Resolution	300(horizontal)*400(Vertical)
	Interface	4 Line SPI
	Connect type	FPC Connector
	Display Mode	Mono TFT/Reflective TFT
	LCD Driver IC	ST7306S
	Viewing Direction	-
	Gray Scale Inversion Direction	-
Mechanical	LCM (Hx Vx D) (mm)	67.6*91.0*1.1
	Active Area(mm)	63.6*84.8
	With /Without TSP	Without TSP
	Weight (g)	TBD
	LED Numbers	-

Note 1: Viewing direction is following the data which measured by optics equipment.
Note 2: Requirements on Environmental Protection: RoHS
Note 3: LCM weight tolerance: +/- 5%

3 Input/Output Terminals

Pin.No	Symbol	Function
1	GND	Power ground
2	NC	NC
3	NC	NC
4	VCI	Power Supply
5	GND	Power ground
6	TE	LCD TE Pin
7	DC	Select Command or Data
8	CS	Chip select input pin
9	SCL	Serial clock input
10	SDA	Serial data input
11	RESET	Reset input pin
12	GND	Power ground

4 Absolute Maximum Ratings

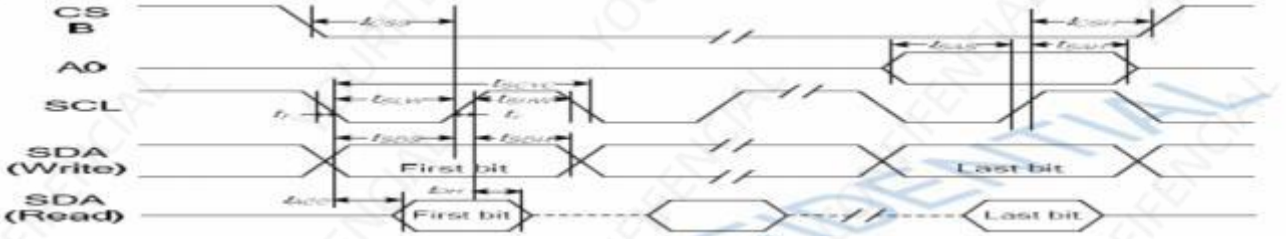
Item	Symbol	MIN	MAX	Unit	Remark
Supply Voltage	VDD	0.3	4.0	V	
Analog Supply Voltage	IOVCC	-0.3	4.0	V	
Logic Input Voltage	V_{in}	-0.3	VDD+0.5	V	
Operating Temperature	T_{OPR}	-20	70	℃	
Storage Temperature	T_{STG}	-30	80	℃	

5 Electrical Characteristics

5.1 Operating conditions:

Parameter	Symbol	MIN	TYP	MAX	Unit	Remark
System Voltage	V_{DD}	2.55	2.8	3.3	V	
Interface Operation Voltage	IOVCC	1.65	1.8	3.3		
Supply Current	Idd		30		mA	
Input Voltage	VIL	0	-	0.2VDD	V	
Input leakage current	IIL	-1.0	-	1.0	uA	

6. Interface Timing



VDDI = 1.8~3.3V, Ta = 25°C

Item	Signal	Symbol	Condition	Min.	Max.	Unit
Serial clock period (Write)	SCL	tSCYC		30	—	ns
Serial clock period (Read)				150		
SCLK "H" pulse width (Write)		tSHW		15	—	
SCLK "H" pulse width (Read)				60		
SCLK "L" pulse width (Write)		tSLW		15	—	
SCLK "L" pulse width (Read)				60		
Address setup time	A0	tSAS		10	—	
Address hold time		tSAH		10	—	
Data setup time	SDA (Write)	tSDS		10	—	
Data hold time		tSDH		10	—	
Read data access time	SDA (Read)	tACC	For maximum CL=30p	10	50	
Read data output disable time		tOH	For minimum CL=8p	15	50	
CSB-SCLK time	CSB	tCSS		10	—	
CSB-SCLK time		tCSH		10	—	

7. Optical Characteristics

Items		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing angles		θ_T	Center CR≥10	-	60	-	Degree.	Note1
		θ_B		-	60	-		
		θ_L		-	60	-		
		θ_R		-	60	-		
Contrast Ratio		CR	Θ =0	-	15	-	-	Note2
Response Time		T_{ON}	25°C	-	10	-	ms	Note3
		T_{OFF}		-	-	-		
Chromaticity	White	X_W	Backlight is on	-	0.300	-	-	BM-7A
		Y_W		-	0.330	-	-	
	Red	X_R		-	-	-	-	
		Y_R		-	-	-	-	
	Green	X_G		-	-	-	-	
		Y_G		-	-	-	-	
	Blue	X_B		-	-	-	-	
		Y_B		-	-	-	-	
Reflectance		T		-	40	-	%	

Note 1 Definition of Viewing Angle:

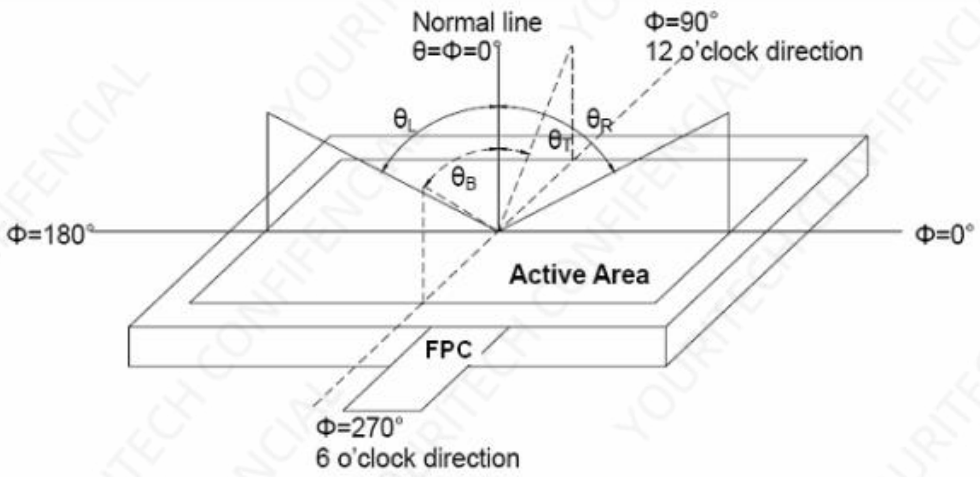
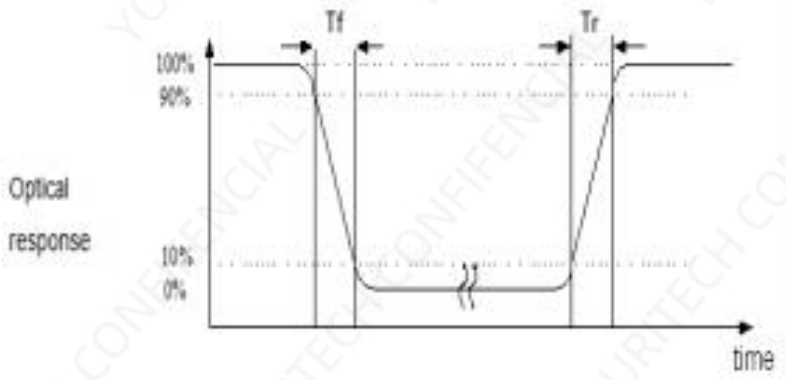


Fig. 1 Definition of viewing angle

Note 2: Definition of contrast ratio

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

Note 3 Definition of Response Time : Sum of Tr and Tf :

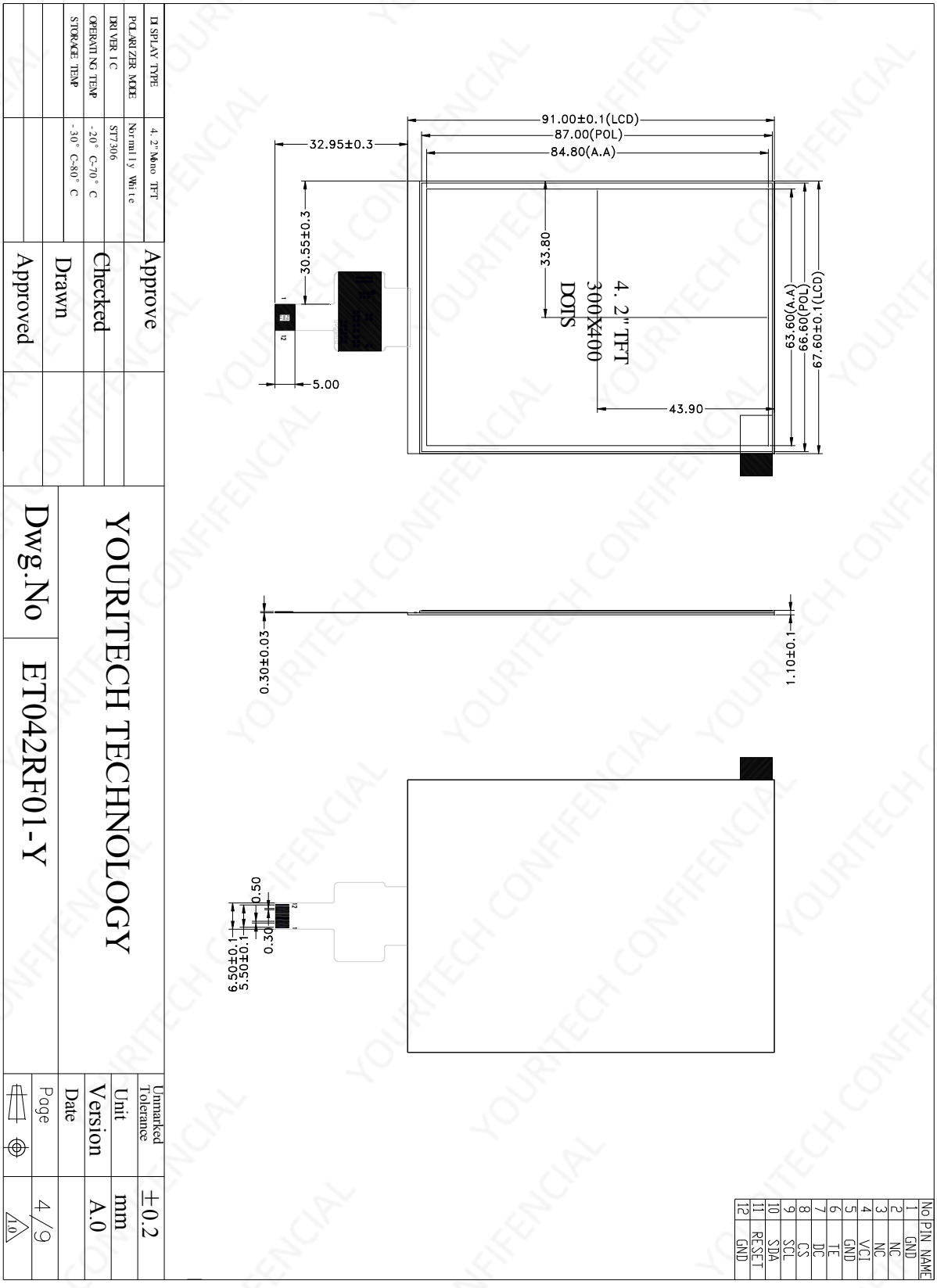


8. Environmental / Reliability Tests

No	Test Item	Condition	Remarks
1	High Temperature Operation	Ts= +70℃, 240hrs	Note 1 IEC60068-2-2, GB2423. 2-89
2	Low Temperature Operation	Ta= -20℃, 240hrs	Note 2 IEC60068-2-1 GB2423.1-89
3	High Temperature Storage	Ta= +80℃, 240hrs	IEC60068-2-2 GB2423. 2-89
4	Low Temperature Storage	Ta= -30℃, 240hrs	IEC60068-2-1 GB/T2423.1-89
5	High Temperature & Humidity Storage	Ta= +60℃, 90% RH max, 160 hours	IEC60068-2-3 GB/T2423.3-2006
6	Thermal Shock (Non-operation)	-30℃ 30 min ~ +80℃ 30 min Change time: 5min, 30 Cycle	Start with cold temperature, end with high temperature IEC60068-2-14, GB2423.22-87
7	Electro Static Discharge (Operation)	C=150pF, R=330 Ω, 5 points/panel Air:±8KV, 5 times; Contact: ±4KV, 5 times; (Environment: 15℃ ~ 35℃, 30% ~ 60%, 86Kpa ~ 106Kpa)	IEC61000-4-2 GB/T17626.2-1998
8	Vibration (Non-operation)	Frequency range: 10~55Hz, Stroke: 1.mm Sweep: 10Hz~55Hz~10Hz 2 hours for each direction of X .Y. Z. (package condition)	IEC60068-2-6 GB/T2423.5-1995
9	Shock (Non-operation)	60G 6ms, ± X, ±Y , ± Z 3 times for each direction	IEC60068-2-27 GB/T2423.5-1995
10	Package Drop Test	Height: 80 cm, 1 corner, 3 edges, 6 surfaces	IEC60068-2-32 GB/T2423.8-1995

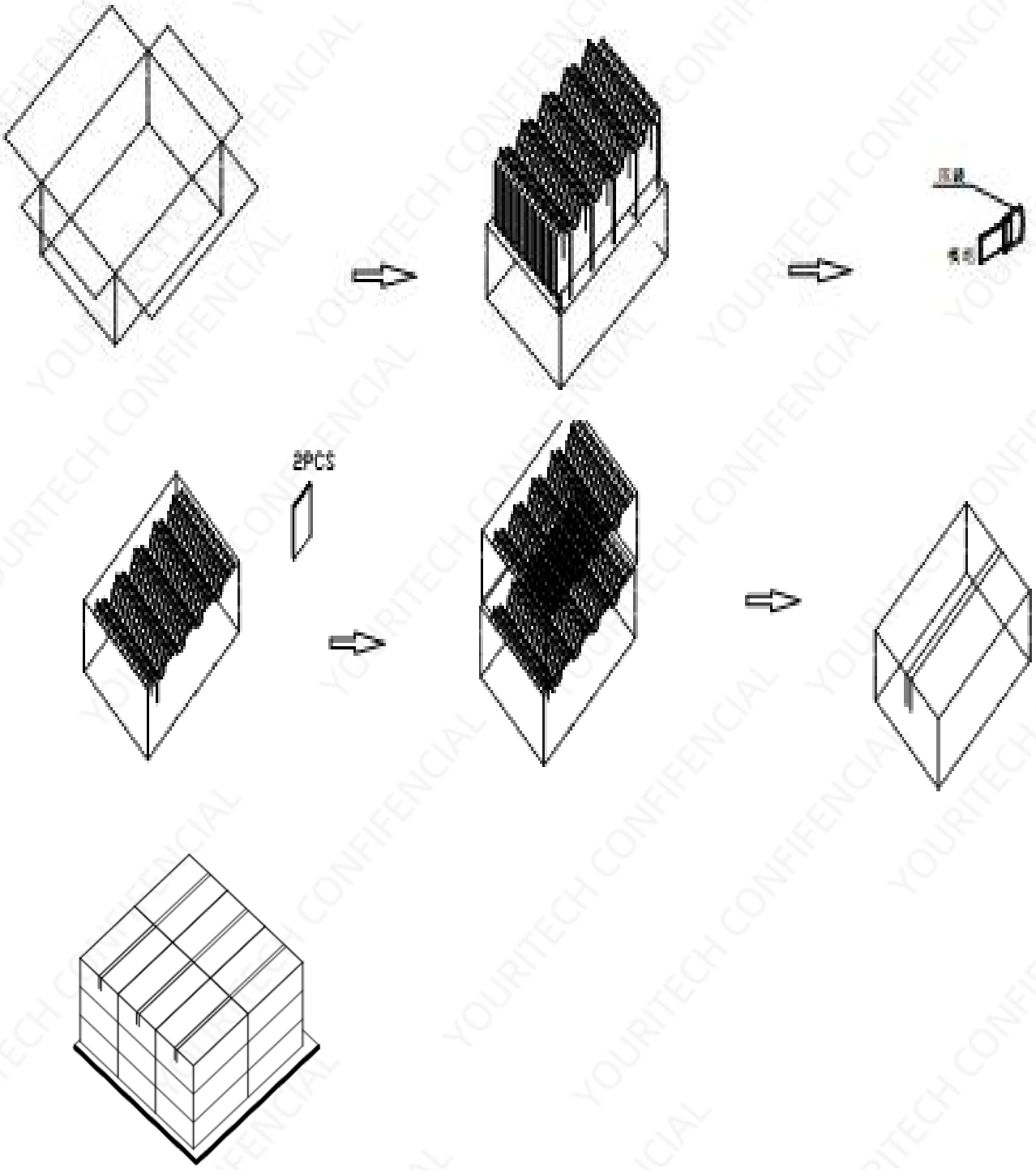
Note: 1. T_S is the temperature of panel's surface.
2. Ta is the ambient temperature of sample.

9. Mechanical Drawing



10. Packing

Packing Method



11. Precautions for Use of LCD modules

11.1 Handling Precautions

11.1.1. The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.

11.1.2. 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.

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

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

11.1.5. 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
- Ketene
- Aromatic solvents

11.1.6. Do not attempt to disassemble the LCD Module.

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

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

11.1.8.1. Be sure to ground the body when handling the LCD Modules.

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

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

11.1.8.4. 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.

11.2 Storage Precautions

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

11.2.2. 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℃ ～ 40℃ Relatively humidity: ≤80%

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

11.3 Transportation Precautions

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