Tailorpixels

A Professional Manufacturer of Display

Manufacturer Certificated

9001 CERT. No.: 282Q19070712006

14001 CERT. No.: 282E19070712007

Product Specification

Model: TTS024BVS-01

2.4″TFT Display Module (240*320)

This module uses RoHS material

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Contents

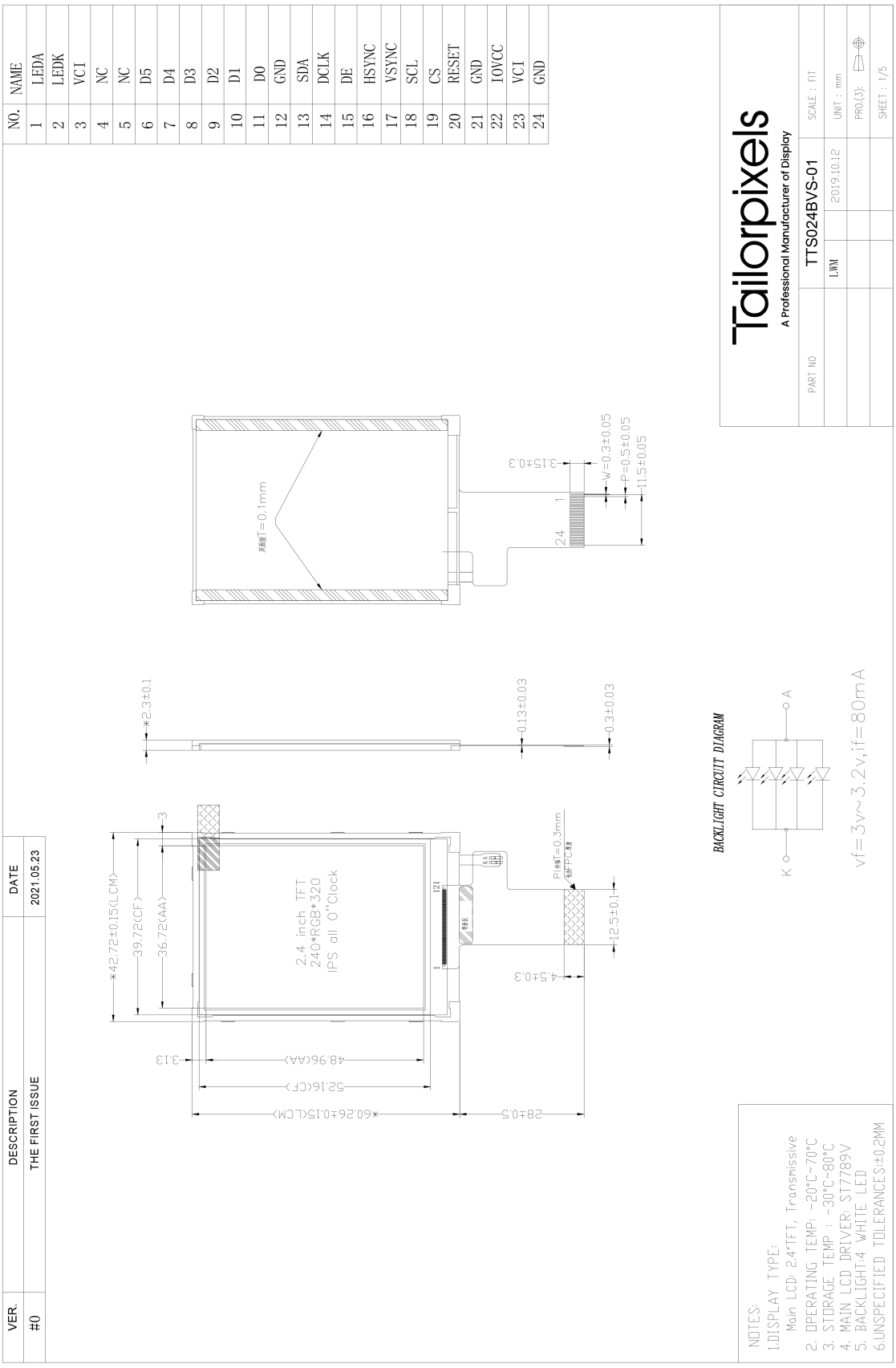
1 Record of Revision

Version	Revise Date	Content	Remark

2 General Specifications

ITEM	Standard value	UNIT
LCD Type	TFT Transmissive	/
Driver Element	TFT Active matrix	
Number of Dots	240* (RGB)*320	Dots
Pixel Arrangement	RGB Stripe	
Dot Size (W*H)	/	mm
Dot Pitch (W*H)	/	mm
Active Area	36.72(W) x48.96(H)	mm
Viewing Area (W*H)	39.72(W) x52.16(H)	mm
Glass Area (W*H)	/	mm
LCD Duty	/	
LCD Bias	/	
Viewing Direction	ALL O'CLOCK	
Control IC	ST7789V	
Module Size(W*H*T)	42.72*60.26*2.30±0.1	mm
Approx. Weight	TBD	g
Back Light	4 White LED	

3 Mechanical Drawing



4 Interface

NO.	SYMBOL	Description
1	LEDA	BACK LIGHT(+)
2	LEDK	BACK LIGHT(-)
3	VCI	Power voltage (2.8v-3.3v)
4-5	NC	DUMMY
6-11	D5-D0	Date bus
12	GND	Ground
13	SDA	Serial data input
14	DCLK	RGB clock signal
15	DE	Date enable
16	HSYNC	Horizontal(line) synchronizing
17	VSYNC	Vertical(frame) synchronizing
18	SCL	Serial clock input
19	CS	Chip selection pin
20	RESET	RESET pin
21	GND	Ground
22	IOVCC	Power voltage (1.8v-3.3v)
23	VCI	Power voltage (2.8v-3.3v)
24	GND	Ground

5 Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply voltage	VCI	-0.3	4.6	V
Supply voltage（I/O）	IOVCC	-0.3	4.6	V
Supply current (one LED)	I_{LED}		20	mA
Operating temperature	T_{OP}	-20	+70	°C
Storage temperature	T_{ST}	-30	+80	°C

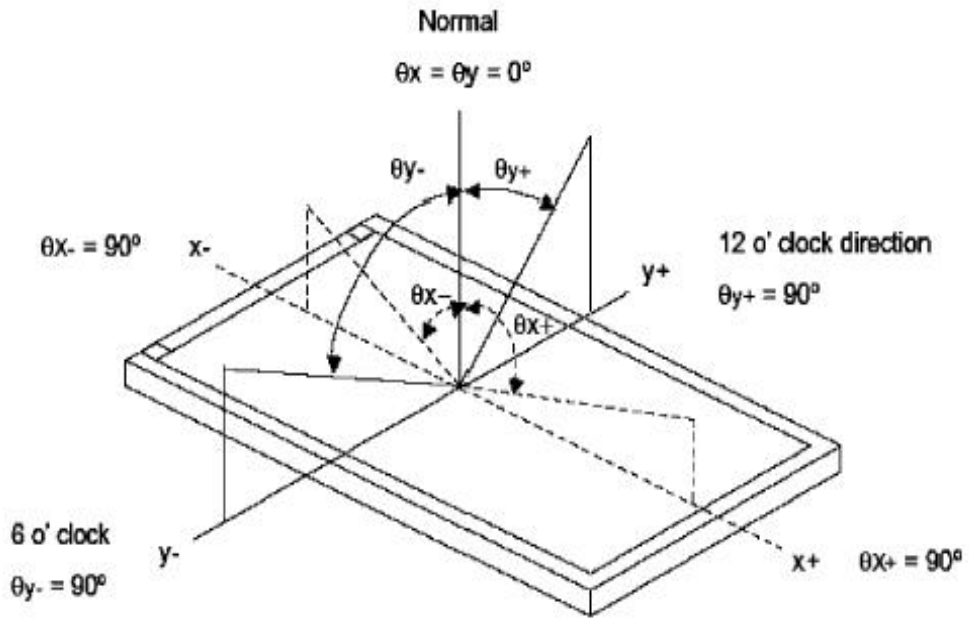
6 Electrical Characteristics

Item	Symbol	Min	Typ	Max	Unit
Supply voltage（I/O）	IOVCC	-	1.8	3.3	V
Supply voltage	VCI	-	2.8	3.3	V
Input voltage	V_{IL}	VSS	-	0.3IOVCC	V
	V_{IH}	0.7IOVCC	-	IOVCC	V
LED Forward voltage	V_f	2.7	3.0	3.3	V
Input backlight current	I_{LED} (One LED)	-	20		mA

7 Optical Characteristics

ITEM		SYMBOL	CONDITIONS	SPECIFICATIONS			UNIT	NOTE
				MIN.	TYP.	MAX		
Brightness		B	Viewing normal angle	TBD	300	TBD	Cd/m^2	All left side data are based on SHENG JING's product reference only
Contrast Ratio		CR		1000	1500	--	--	
Response Time		Tr+Tf		--	35	45	ms	
CIE Color coordinate	Red	XR		0.614	0.644	0.674		
		YR		0.290	0.320	0.350		
	Green	XG		0.270	0.300	0.330		
		YG		0.540	0.570	0.600		
	Blue	XB		0.104	0.134	0.164		
		YB		0.097	0.127	0.157		
	White	XW		0.267	0.297	0.327		
		YW		0.302	0.332	0.362		
Viewing Angle	Hor.	θ_{X+}	Center CR>=10	--	80	--	Deg.	
		θ_{X-}		--	80	--		
	Ver.	θ_{Y+}		--	80	--		
		θ_{Y-}		--	80	--		
Uniformity	Un			--	80	--	%	

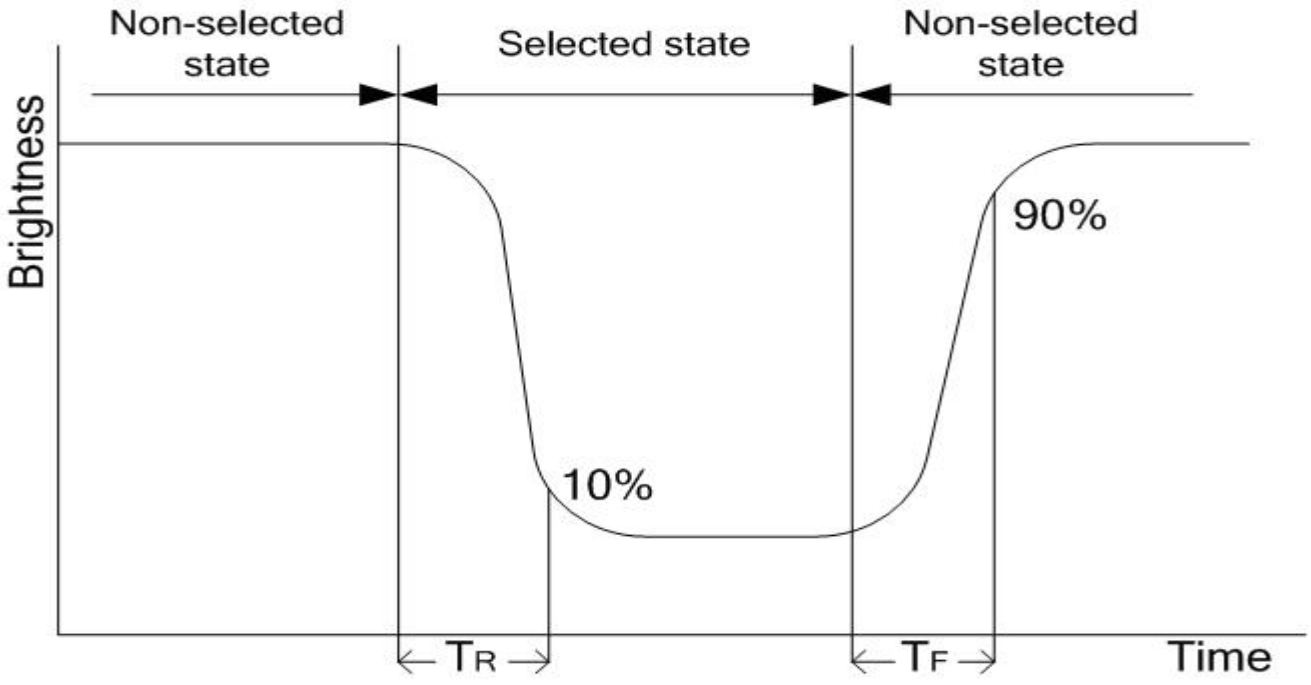
Note 1 : Definition of Viewing Angle θ_x and θ_y :



Note 2: Definition of contrast ratio CR:

$$CR = \frac{\text{Brightness of non-selected dots (white)}}{\text{Brightness of selected dots (black)}}$$

Note 3: Definition of response time (TR, 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:±6KV, 5 times; Contact: ±2KV, 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: 60 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 Precautions For Use of LCD modules

9.1 Handling Precautions

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

9.1.2 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.

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

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

9.1.5 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 the 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

9.1.6 Do not attempt to disassemble the LCD Module.

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

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

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

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

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

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

9.2 Storage Precautions

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

9.2.2 The LCD modules should be stored under the storage temperature range If the LCD modules will be stored for a long time, the recommended condition is:
Temperature: 0℃ ～ 40℃, Relatively humidity: ≤80%

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

9.3 Transportation Precautions

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