深圳秦唐盛世科技有限公司

PRODUCT LCD MODULE
产品名称 ： 液晶显示模块
MODELNO
模块型号 ： QT169-TSC12PG01
SUPPLIER
供应商 ： QTSS
DATE
日期 ： 2021-7-2
Customer number
客户编号：

SPECIFICATION
产品规格书

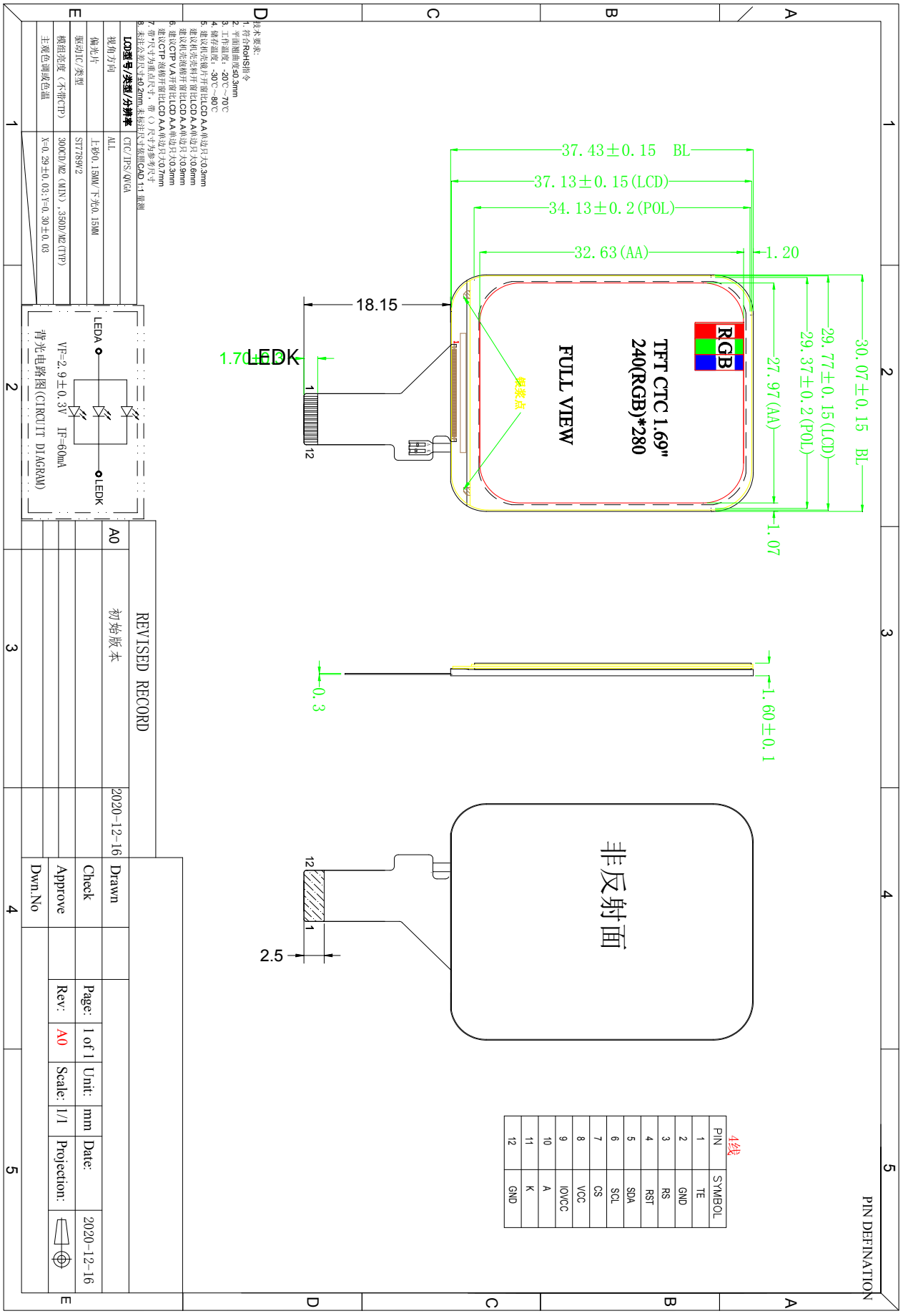
Version：V0
版本： V0
This module uses ROHS material
模块用环保材料

Hua di（华迪）		Customer（客户）
PREPARED BY 制定		Approved By _____
CHECKED BY 审核		
Quality Department 品质		
Approved by 批准		

1. GENERAL INFORMATION 主要特征描述

Item 项目	Contents 内容	Unit 单位
LCD Type 液晶显示类型	TFT/TRANSMISSIVE	---
Viewing Direction 视角方向	ALL	O'Clock
Outline Dimensions (W × H×T) 外形尺寸 （宽 x 高 x 厚）	30.07(W) ×37.43(H)×1.56(T)	mm
Viewing area 可视区域	28.63 x35.64	mm
Active area 有效区域 (宽 × 高)	27.97(W)x 32.63(H)	mm
Number of Dots 点阵	240RGB x 280 Dots	---
Pixel pitch (W × H) 像素点尺寸	0.073*0.219	mm
Driver IC 驱动 IC	ST7789+CTC	---
Interface Type 接口类型	SPI4W1L	---
Input voltage 输入电压	2.8V	—
Module Power consumption 模块功耗	TBD	MW
Colors 色彩	262K	---
Backlight Type 背光类型	LED	---

2. OUTLINE DRAWING 外形尺寸



3. ABSOLUTE MAXIMUM RATINGS 极限参数

Item 项目	Symbol 符号	Min 最小值	Max 最大值	Unit 单位
Supply voltage for logic 逻辑电压	VDD	-0.3	4.6	V
Input voltage 输入电平	VIN	-0.3	VDD+ 0.3	V
Operating temperature 使用温度	TOP	-20	70	℃
Storage temperature 存储温度	TST	-30	80	℃
Humidity 湿度	RH		90%(Max60 °C)	RH

4. ELECTRICAL CHARACTERISTICS 模块电气特性

4.1DC CHARACTERISTICS 直流特性

Item 项目	Symbol 符号	Min 最小值	Typ 典型值	Max 最大值	Unit 单位
Supply voltage for logic 逻辑电压	VDD	2.7	2.8	3.3	V
Input Current 输入电流	Idd		TBD	TBD	mA
Input voltage 'H' level 输入高电平	VIH	0.7VDD	-	VDD	V
Input voltage 'L' level 输入低电平	VIL	VSS		0.3VDD	V
Output voltage 'H' level 输出高电平	VOH	0.8VDD		VDD	V
Output voltage 'L' level 输出低电平	VOL	VSS		0.2VDD	V

4.2 BACKLIGHT CHARACTERISTICS 背光电气特性

Item 项目	Symbol 符号	Min 最小值	Typ 典型值	Max 最大值	Unit 单位	Condition 条件
Forward voltage 正向电压	Vf	3.0	3.2	3.4	V	If=2*20mA
Number of LED LED数量			2		Piece	
Connection mode 连接类型	P		Parallel			

Using condition: constant current driving method If=40mA(+/-10%).
使用条件：恒流的驱动方式是 If=40mA(+/-10%).

5.ELECTRO-OPTICAL CHARACTERISTICS 光电参数

Parameter	Symbol	Values			Unit	Notes
		Min	Typ	Max		
Transmittance(LCM)	T(%)	-	5	-	%	
Contrast Ratio (LCM)	C/R	-	150	-		
Response Time (TFT)	Tr+Tf	-	50	-	msec	
Surface Luminance (LCM)	lv	100			cd/m^2	
CIE Color Coordinate (LCM)	Rx	0.5156	0.5656	0.6156	-	
	Ry	0.2620	0.3120	0.3620	-	
	Gx	0.2714	0.3214	0.3714	-	
	Gy	0.5400	0.5900	0.6400	-	
	Bx	0.0946	0.1446	0.1946	-	
	By	0.0415	0.0915	0.1415	-	
	Wx	0.2054	0.2754	0.3454	-	
	Wy	0.2441	0.3141	0.3841	-	
Viewing Angle (TFT)	θ l	-	45	-	Degree	
	θ r	-	45	-		
	θ u	-	35	-		
	θ d	-	15	-		

6. INTEFACE DESCRIPTION 接口定义

NO.	SYMBOL	Pin Assignment
1	TE	
2	GND	
3	RS	
4	RST	
5	SDA	
6	SCL	
7	CS	
8	VCC	
9	IOVCC	
10	A	
11	K	
12	GND	

4SPI接口

Note: The voltage power of the interface logic pin depend on IOVCC and GND, Such as DBn, IMn and function pins

7. REFERENCE APPLICATION CIRCUIT

参考应用电路

Please consult our technical department for detail information.

详细信息请联系我们的技术部门

8. RELIABILITY TEST CONDITIONS 可靠性试验条件

No. 序号	Test Item 试验项目	Test condition 试验条件	Inspection after test 判断标准
1	High Temperature Storage 高温存放	80℃±2℃120H	Inspection after 2~4hours storage at room temperature, the sample shall be free from defects: 试验结束后,已测试的 LCD 样品必须在室内正常温湿度环境下放置 2~4 个小时以上才能进行功能和外观检查，样品不允许有以下缺陷： 1.Air bubble in the LCD; 模块中有气泡； 2.Sealleak; 封口松脱； 3.Non-display; 不显示； 4.missing segments; 漏笔 5.Glass crack; 玻璃破碎； 6.Current Idd is twice higher than initial value.电流 Idd 大于初时值的 2 倍 .
2	Low Temperature Storage 低温存放	-30℃±2℃ 120H	
3	High Temperature Operation 高温操作	70℃±2℃ 120H	
4	Low Temperature Operation 低温操作	-20℃±2℃ 120H	
5	High Temperature /Humidity Storage 高温高湿	60℃±2℃ 90%RH 120H	
6	Temperature Cycle 冷热循环	低温：-30℃； 时间：30min 高温：70℃； 时间：30min 循环次数：24 个循环（从低 始做循环） 温度转换时间：小于5min	
7	Vibration Test (package state) 振荡试验	10Hz~55Hz~10Hz, X/Y/Z下各10min,扫频周期1min	Not allowed cosmetic and electrical defects.
8	Dropping test 跌落试验	08m LCD≥3.0inch	

9.INSPECTION CRITERION 检查标准

Please consult our Quality Department for detail information.
详细信息请联系我们的品质部门

10. PRECAUTIONS FOR USE OF LCD MODULES

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.

10.1.2 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.

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

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

10.1.5 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
Solvents other than those mentioned above may damage the polarizer.

Especially, do not use the following:

10.1.6 Do not attempt to disassemble the LCD Module.

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

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

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

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

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

d. 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

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

10.2.2 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%

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

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