WAVESHARE ELECTRONICS

SPECIFICATION
产品规格书

This module uses ROHS material
模块用环保材料

Customer Nam 客户名称	
Project Name 成品机型	
Date 日期	

模组型号
HD276001C40

REVISION RECORD

REV NO. 版本号	DATE 日期	CONTENTS 内容	REMARKS 备注
0.1		初次发行	

SE Checked by/Date：
SPEC 审核/日期：
SAMPLE 审核/日期：

Signature by customer：
SPEC 客户确认/日期
SAMPLE 客户确认/日期：

地址：
联系方式：

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主要特征描述和光电参数

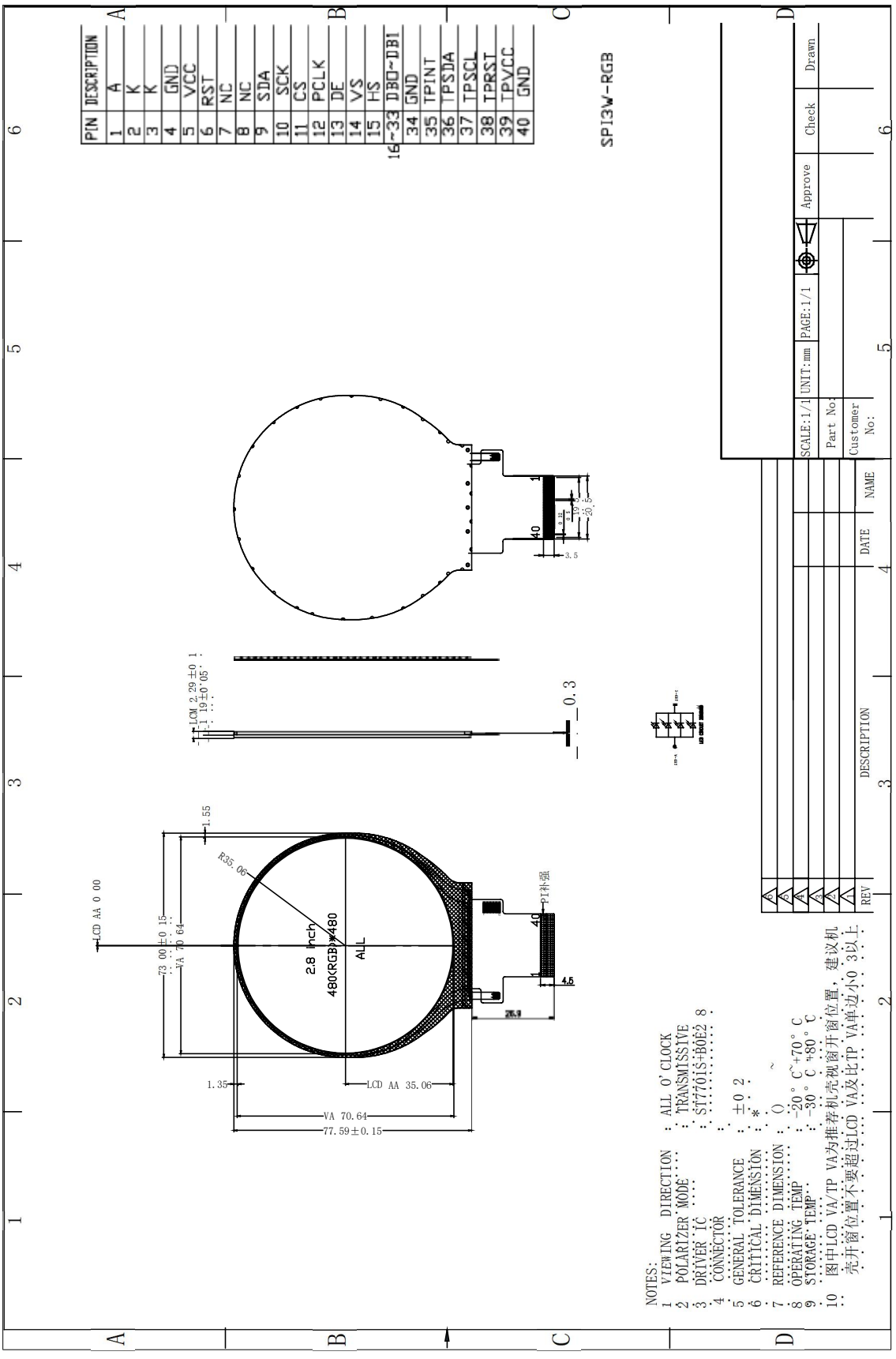
1.1 GENERAL INFORMATION主要特征描述

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）	73(W) ×77.59(H)×2.3(T)	mm
Active area 有效区域 (宽 × 高)	70.13(W) x70.13(H)	mm
Number of Dots 点阵	480RGB x 480Dots	---
Pixel pitch (W × H) 像素点尺寸	0.1461*0.1462	mm
Driver IC 驱动 IC	ST7701S	---
Interface Type 接口类型	SPI-3W-RGB18	---
Input voltage 输入电压	2.8V	–
Backlight Type 背光类型	LED	---

1.2 Electro Optical Characteristics光电参数

Item of electro-optical characteristics 项目	Symbol 符号	Condition 条件	Min 最小值	Typ 典型值	Max 最大值	Unit 单位	Remark 注释
Contrast ratio 对比度	CR	$\theta=0^0$ $\psi=0^0$ I_f=20mA /LED	-	1200	-	-	
SurfaceLuminance 表面亮度	Lv		420	450	-	Cd/m^2	
Luminance uniformity 均匀度	δ WHITE		80	-	-	%	

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		95%(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	2.9	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	2.8	3.3	3.3	V	If=3*20mA
Number of LED LED数量			5		Piece	
Connection mode 连接类型	P		3并			

Using condition: constant current driving method If=60mA(+/-10%).

5. INTERFACE DESCRIPTION 接口定义描述

Pin No.	Symbol	I/O	Function
1	LEDA		LED Positive
2	LEDK		LED Negative
3	LEDK		LED Negative
4	GND		GROUND
5	VCC		POWER SUPPLY FOR LCD 2.8~3.3V
6	RST		TFT Reset Pin
7	NC		NC
8	NC		NC
9	SDA		Serial data input/output bidirectional pin
10	SCL		Serial clock input
11	CS		A chip select signal
12	PCLK		Pixel clock input pin
13	DEN		Data input enable. Low: access enabled;High: access inhibited
14	VS		Vertical sync signal
15	HS		Horizontal sync signal
16~33	DB0~DB17		A 18-bit parallel data bus for RGB Interface.
34	GND		GROUND
35	TPINT		POWER SUPPLY FOR LCD 1.8~3.3V
36	TPSDA		GROUND
37	TPSCL		TP
38	TPRST		TP
39	TPVCC		TP
40	GND		GROUND

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

6. TIMING

RGBInterfaceCharacteristics：

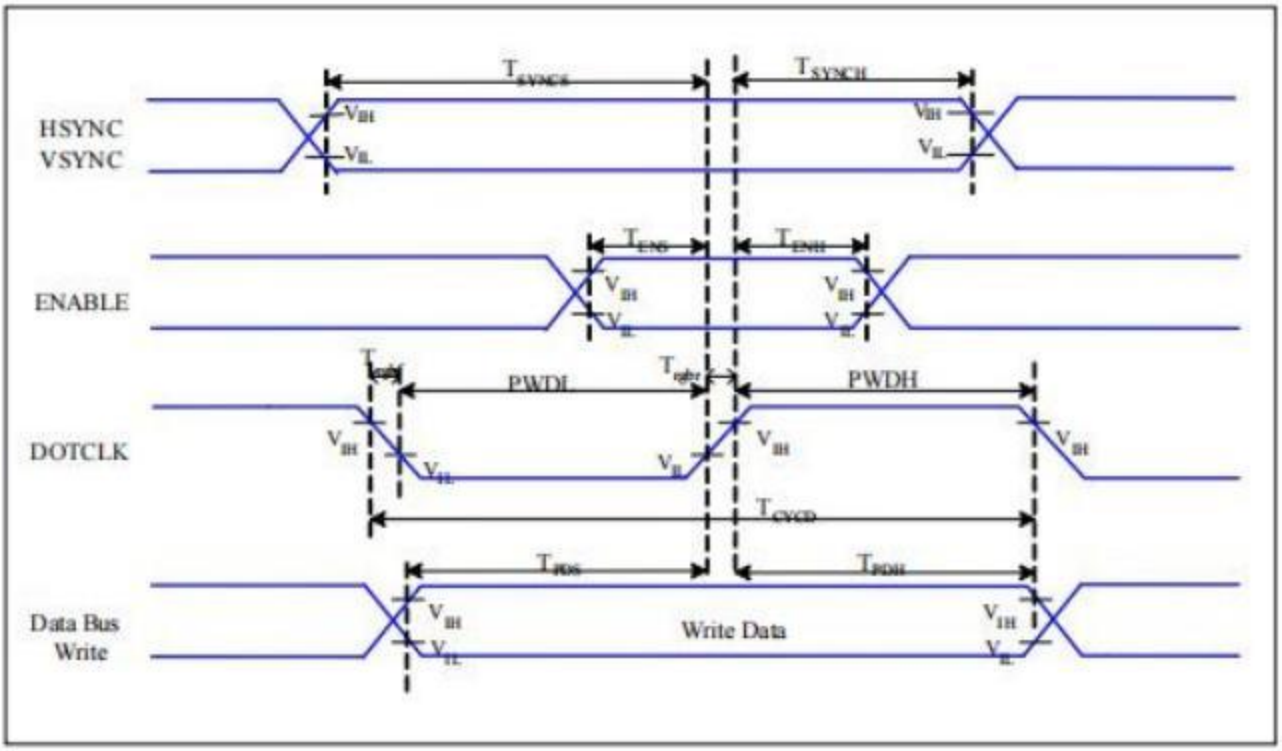


Figure 3 RGB Interface Timing Characteristics

VDDI=1.8,VDD=2.8, AGND=DGND=0V, Ta=25 ℃

Signal	Symbol	Parameter	MIN	MAX	Unit	Description
HSYNC, VSYNC	T_{SYNCS}	VSYNC, HSYNC Setup Time	5	-	ns	
ENABLE	T_{ENS}	Enable Setup Time	5	-	ns	
	T_{ENH}	Enable Hold Time	5	-	ns	
DOTCLK	PWDH	DOTCLK High-level Pulse Width	15	-	ns	
	PWDL	DOTCLK Low-level Pulse Width	15	-	ns	
	T_{CYCD}	DOTCLK Cycle Time	33	-	ns	
	Trghr, Trghf	DOTCLK Rise/Fall time	-	15	ns	
DB	T_{PDS}	PD Data Setup Time	5	-	ns	
	T_{PDH}	PD Data Hold Time	5	-	ns	

7.Reliability TEST CONDITIONS

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℃ 96H	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℃ 96H	
3	High Temperature Operation 高温操作	70℃±2℃ 48H	
4	Low Temperature Operation 低温操作	-20℃±2℃ 48H	
5	High Temperature /Humidity Storage 高温高湿	40℃±2℃ 90%RH 48H	
6	Temperature Cycle 冷热循环	-30℃←→25℃←→80℃ 5min 30min ←→25℃ ,5min after 10cycle, Restore4H at 25℃	
7	Vibration Test (package state) 振荡试验	10Hz~150Hz, 100m/s2, 120min	Not allowed cosmetic and electrical defects.
8	Dropping test 跌落试验	Drop to the ground from 0.5m height, one time, every side of carton. (Packing condition)	
9	ESD test 静电试验	Voltage:±4KV R: 330Ω C: 150pF Air discharge, 10time	

8. PRECAUTIONS FOR USE OF LCD MODULES

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

6.2 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 washit offusing soap and water.

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

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

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

6.6 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%

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

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