DMG48320C035_03WTC

迪文科技

产品特点：

- 基于 **T5L1** 芯片，运行 **DGUS Ⅱ** 系统，商业级产品。

- **3.5** 英寸，**320*480** 分辨率，**16.7M** 色，**IPS** 屏，宽视角。
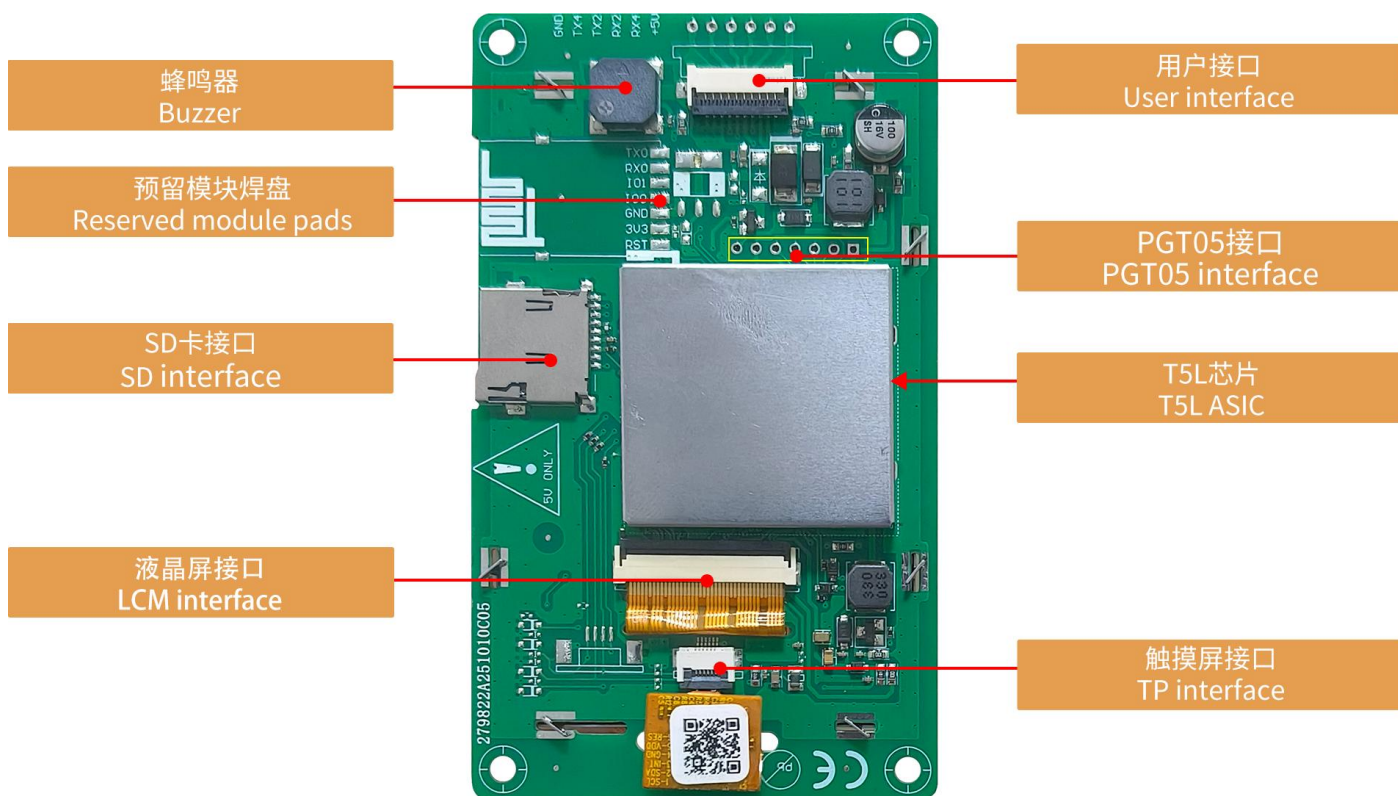
- 电容触摸屏。

Features:

- **Based on T5L1, running DGUS Ⅱ system, commercial grade.**

- **3.5-inch, 320*480 pixels resolution, 16.7M colors, IPS-TFT-LCD, wide viewing angle.**

- **Capacitive touch screen.**

1、硬件及接口 Hardware and interface

1.1 硬件接口图 Hardware interface

蜂鸣器
Buzzer

预留模块焊盘
Reserved module pads

SD卡接口
SD interface

液晶屏接口
LCM interface

用户接口
User interface

PGT05接口
PGT05 interface

T5L芯片
T5L ASIC

触摸屏接口
TP interface

硬件接口图
Hardware interface

1.2 硬件及接口说明 Hardware and interface description

序号 No.	名称 Name	说明 Description
1	T5L1 芯片 T5L1 ASIC	迪文自主研发，2019 年量产。芯片采用双 8051 核架构，GUI 和应用分别在一颗 8051 核中运行。 DWIN independently developed, mass production in 2019. Dual 8051 cores, GUI and application run on separate 8051 cores.
2	用户接口 User interface	用于供电和串口通讯，10Pin_1.0mm 座子。 10Pin_1.0mm socket for power supply and serial communication.
3	Flash	16MBytes (1*16MBytes NOR Flash)，可用于存放字库、图片、音乐等用户 UI 文件，擦写次数>100,000 次。 16MBytes (1*16MBytes NOR Flash) for storing UI files like fonts, images, music, with over 100,000 erase/write cycles.
4	蜂鸣器 Buzzer	3V 无源蜂鸣器。 3V passive buzzer.
5	SD 卡接口 SD interface	用于 DGUS 工程文件下载（UI 文件、CFG 文件、内核等），下载速率：4Mb/s。 For DGUS project file downloads (UI, CFG files, kernel, etc.), 4 Mb/s rate.
6	预留模块接口 Reserved module interface	支持拓展迪文 WIFI 模组（WIFI-20 等）、USB 下载模组（HDL702 等）。 Supports DWIN WiFi modules (e.g., WIFI-20) and USB download modules (e.g., HDL702).
7	PGT05 接口 PGT05 interface	用于烧录 DGUS 底层程序。 For programming DGUS firmware.

2、规格参数 Specification parameters

2.1 显示参数 Display parameters

显示屏类型 **LCD Type**	IPS, TFT LCD
视角 **Viewing Angle**	宽视角，典型值 85°/85°/85°/85°（L/R/U/D） Wide viewing angle, 85°/85°/85°/85° (L/R/U/D)
分辨率 **Resolution**	320×480（支持 0°/90°/180°/270°显示模式） 320×480 pixels (0°/90°/180°/270°)
有效显示区域 **Active Area (AA)**	49.0mm (W)×73.4mm (H)
可视区域 **Viewing Area (VA)**	-
背光 **Backlight**	LED
背光寿命 **Backlight Service Life**	>20000 小时（以最高亮度连续工作，亮度减半时间） >20000 hours (Time of the brightness decaying to 50% on the condition of continuous working with the maximum brightness)
亮度 **Brightness**	250nit
亮度调节 **Brightness Control**	100 级亮度调节（当亮度调节至最高亮度的 1%~30%时，可能出现闪烁现象，不建议在此范围使用） 0~100 grade (When the brightness is adjusted to 1%~30% of the maximum brightness, flickering may occur and is not recommended to use in this range)
注：长时间固定画面显示可能导致屏幕残影，可以用动态图片切换做屏保解决。 Note: You can use dynamic screen saver wallpapers to avoid afterimages caused by fixed page display for a long time.	

2.2 触摸参数 Touch parameters

触摸屏类型 **Type**	电容式触摸面板。 Capacitive touch panel.
触摸屏结构 **Structure**	G+G 结构，表层为钢化玻璃，玻璃硬度≥6H。 G+G structure with tempered glass surface and hardness ≥ 6H.
透光率 **Light Transmittance**	>85%

2.3 串口参数 Serial interface parameters

串口模式 Mode	UART2: TTL/CMOS UART4: TTL/CMOS (OS 配置后才能使用 Only available after OS configuration)				
串口电平 **Voltage Level**	测试条件 Test Condition	最小值 Min	典型值 Typ	最大值 Max	单位 Unit
	Output 1, Iout = 1mA	3.0	3.3	-	V
	Output 0, Iout = -1mA	-	0	0.3	V
	Input 1, Iin = 1mA	2.4	3.3	5.0	V
	Input 0, Iin = -1mA	0	-	0.5	V
串口波特率 **Baud Rate**	3150~3225600bps，典型值：115200bps。 3150~3225600bps, typical value of 115200bps.				
数据格式 **Data Format**	UART2: N81 UART4: N81/E81/O81/N82 四种模式可选（OS 配置）4 modes (OS configuration)				
接口端子 **Interface Cable**	10Pin_1.0mm				

2.4 电气规格 Electrical specifications

额定功率 **Rated Power**	<5W	
工作电压 **Operating Voltage**	4.5~5.5V，典型值 5V。 4.5~5.5V, typical value of 5V.	
工作电流 **Operating Current**	180mA	VCC=5V，背光亮度最大。 VCC=5V, max backlight.
	80mA	VCC=5V，背光关闭。 VCC=5V, backlight off.
推荐工作电源：**5V 1A** 的直流稳压电源。 **Recommended power supply: 5V 1A DC.**		

2.5 工作环境 Operating environment

工作温度 **Operating Temperature**	-20℃~70℃ (5V @ 60% RH)
存储温度 **Storage Temperature**	-30℃~80℃
三防漆 **Conformal coating**	无 N
工作湿度 **Operating Humidity**	10%~90%RH，典型值 60%RH。 10%~90%RH, typical value of 60% RH.

3、可靠性测试 Reliability test

3.1 静电放电测试 Electrostatic discharge test

测试环境温度：25°C，测试环境湿度：50%RH。

Test temperature: 25°C. Test humidity: 50%RH.

测试过程：将产品放置在测试台面的测试工装上（测试工装高度约 15cm），针对智能屏进行接触放电和空气放电测试，实验过程观察屏幕有无死机、黑屏、白屏、花屏、重启等异常现象。

Test process: Place the product on the test bench fixture (approximately 15cm in height), and perform contact and air discharge tests on the smart LCM. Observe if any freezing, black or white screen, flickering, or rebooting occurs during the test.

测试结论：产品 ESD 性能达到 GB/T 17626.2 B 级。

Test conclusion: The product's ESD performance meets GB/T 17626.2 Class B

■ Test standard : ☐EN 61000-4-2:2009　☑IEC 61000-4-2:2008　☐GB/T 17626.2-2018
☐Other:

Table 1：Electrostatic Discharge Immunity (Air Discharge)

Test Points Locations	Test Levels							
	-2kV	+2kV	-4kV	+4kV	-8kV	+8kV	-15kV	+15kV
屏幕	\	\	\	\	A	A	\	\	NAF
/	/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/	/

Table 2：Electrostatic Discharge Immunity (Direct Contact)

Test Points Locations	Test Levels							
	-2kV	+2kV	-4kV	+4kV	-6kV	+6kV	-8kV	+8kV
边框	\	\	\	\	A	A	\	\	NAF
/	/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/	/

standards.

性能标准：

A.在制造商、委托方或购买方规定的限值内性能正常；

B.功能或性能暂时丧失或降低，但在骚扰停止后能自行恢复，不需要操作者干预；

C.功能或性能暂时丧失或降低，但需操作者干预才能恢复；

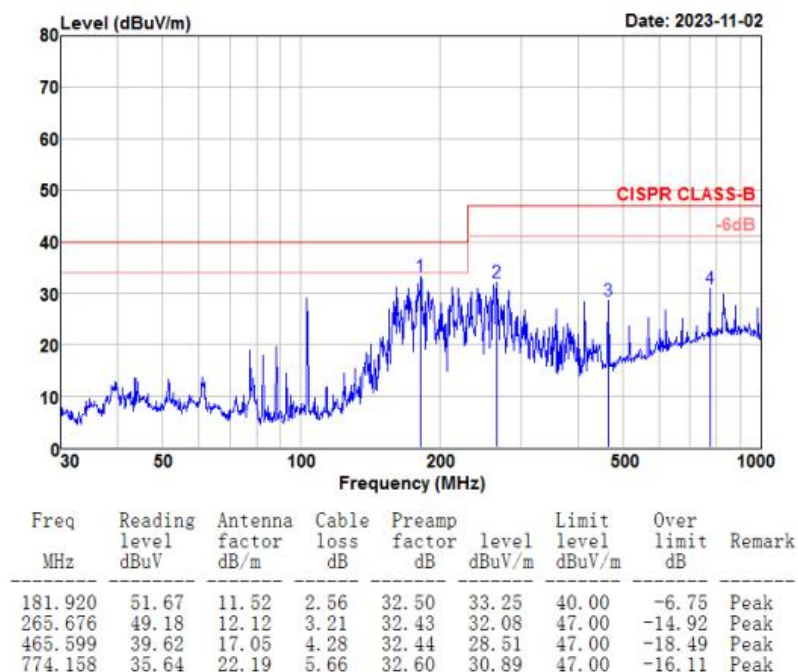D.因设备硬件或软件损坏，或数据丢失而造成不能恢复的功能丧失或性能降低。

Performance Criterion:

A. Normal performance within limits specified by the manufacturer, requestor or purchaser;

B. Temporary loss of function or degradation of performance which ceases after the disturbance ceases, and from which the equipment under test recovers its normal performance, without operator intervention;

C. Temporary loss of function or degradation of performance, the correction of which requires operator intervention;

D. Loss of function or degradation of performance which is not recoverable, due to damage to hardware or software, or loss of data.
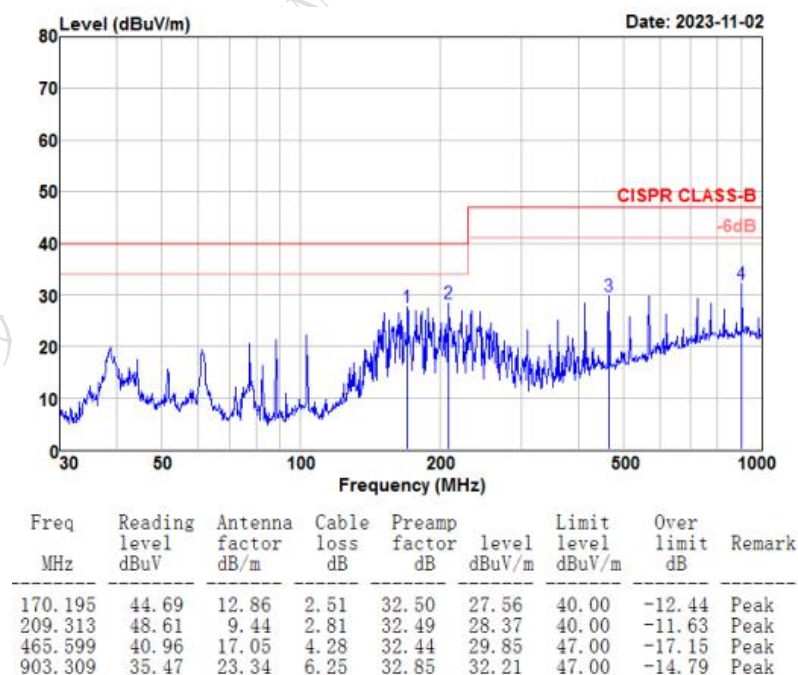
3.2 辐射干扰测试 RE test

测试项目 Test Item	测试标准 Test Standard	结果 Result
辐射干扰 RE	Class B	正常工作 Normal operation

HORIZONTAL

Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
181.920	51.67	11.52	2.56	32.50	33.25	40.00	-6.75	Peak
265.676	49.18	12.12	3.21	32.43	32.08	47.00	-14.92	Peak
465.599	39.62	17.05	4.28	32.44	28.51	47.00	-18.49	Peak
774.158	35.64	22.19	5.66	32.60	30.89	47.00	-16.11	Peak

VERTICAL

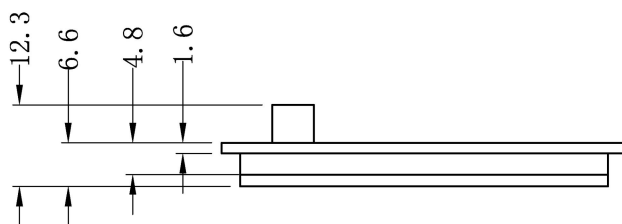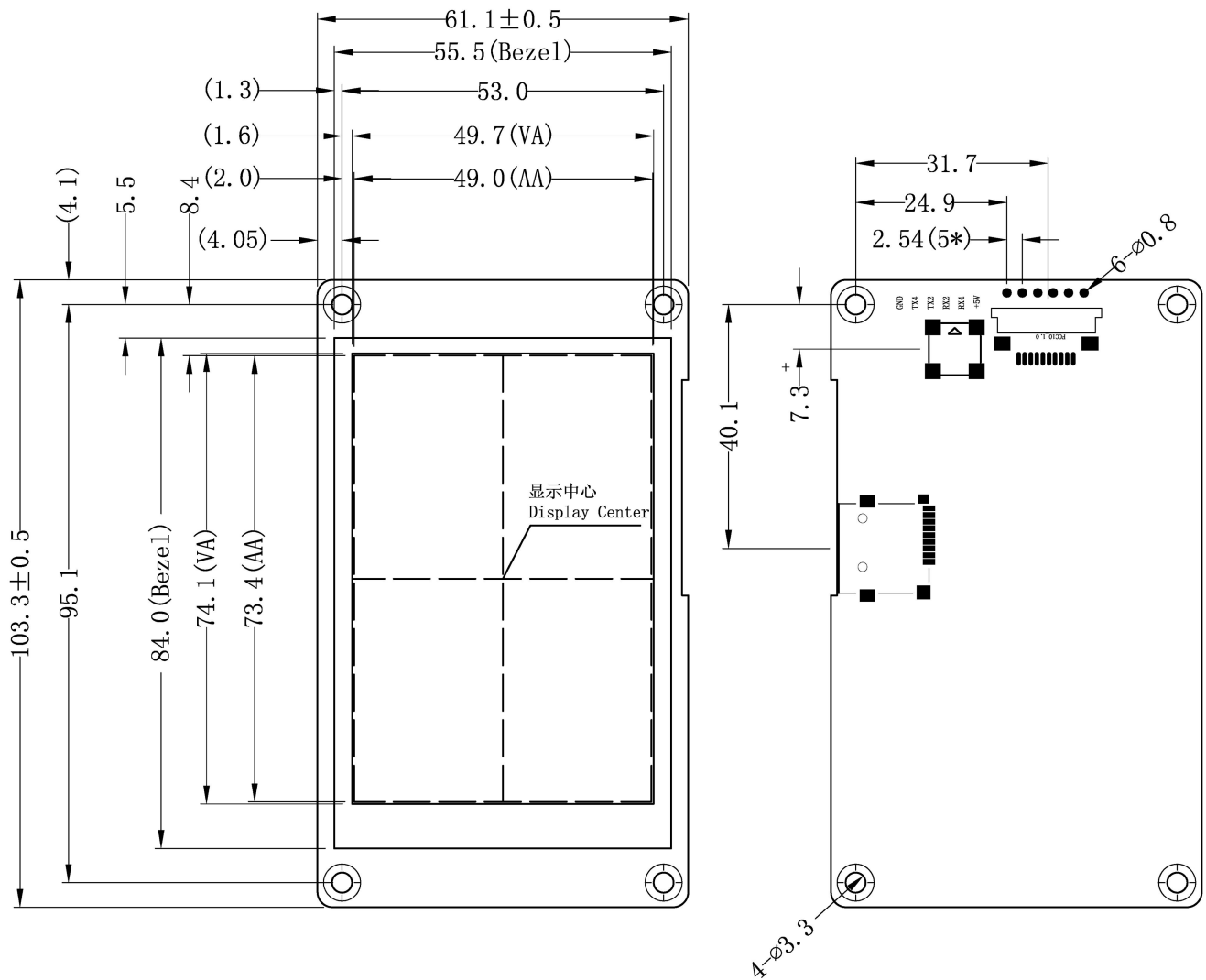| Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
170.195	44.69	12.86	2.51	32.50	27.56	40.00	-12.44	Peak
209.313	48.61	9.44	2.81	32.49	28.37	40.00	-11.63	Peak
465.599	40.96	17.05	4.28	32.44	29.85	47.00	-17.15	Peak
903.309	35.47	23.34	6.25	32.85	32.21	47.00	-14.79	Peak

4、包装和物理尺寸 Packaging & dimensions

外形尺寸 Form Factor	61.1mm (W)×103.3mm (H)×12.3mm (T)
安装尺寸 Installation Dimensions	开孔尺寸：55.5（+0.3mm）×84.0（+0.3mm） Positioning hole:55.5(+0.3mm)×84.0(+0.3mm)
净重量 Net Weight	65g

包装标准 Packaging Standards

包装箱型号 Model	包装箱尺寸 Dimensions	层数（层） Layer	数量/层（片） Quantity/Layer	总数量（片） Quantity(Pcs)
1 号箱 Carton1：	220mm(L)×160mm(W)×47mm (H)	1	2	2
2 号箱 Carton2：	250mm(L)×200mm(W)×80mm (H)	2	2	4
3 号箱 Carton3：	320mm(L)×270mm(W)×80mm (H)	2	4	8
4 号箱 Carton4：	435mm(L)×335mm(W)×290mm(H)	-	-	-
5 号箱 Carton5：	600mm(L)×430mm(W)×290mm(H)	2	60	120

1.尺寸定位基准为定位孔
Location hole is used as position reference.
2.未标注公差为+/-0.3mm
Unmarked Tolerance is +/-0.3mm
注：虚线标注为有效显示区域
Active area is marked in Dash lines

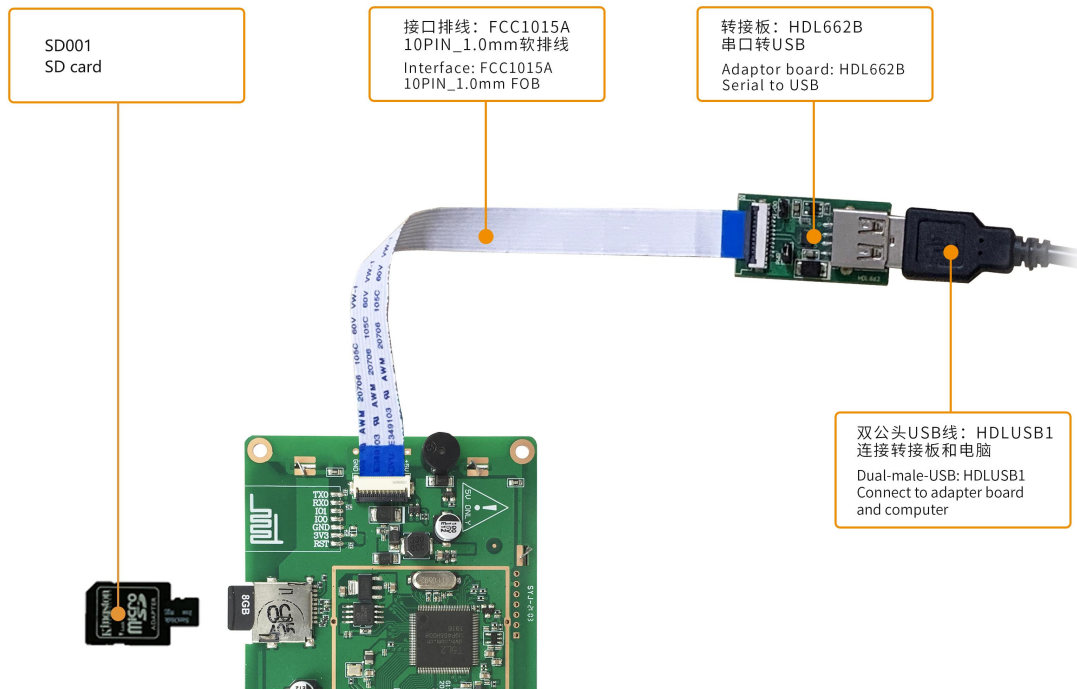| 引脚名称	引脚定义	引脚类型	说　明
GND	8,9,10	P	公共接地/GND
TX4	7	O	迪文屏串口输出DOUT
TX2	6	O	迪文屏串口输出DOUT
RX2	5	I	迪文屏串口输入DIN
RX4	4	I	迪文屏串口输入DIN
+5V	1,2,3	P	电源输入 /Power Input

型　号	DMG48320C035_03WTC				迪文科技
图　纸	A 4	图 纸	DWIN	日期	DWIN Technologies
比　例		审　核		日期	
单　位	MM	批　准		日期	

5、调试工具 Debugging tools

建议首次使用迪文智能屏的用户购买标准配件。详细信息可联系客服人员。

It is recommended for new users of DWIN smart LCMs to purchase official accessories. For more details, please refer to customer service center.

SD001
SD card

接口排线：FCC1015A
10PIN_1.0mm软排线
Interface: FCC1015A
10PIN_1.0mm FOB

转接板：HDL662B
串口转USB
Adaptor board: HDL662B
Serial to USB

双公头USB线：HDLUSB1
连接转接板和电脑
Dual-male-USB: HDLUSB1
Connect to adapter board
and computer

6、T5L 系列芯片特点 T5L series IC features

（1）采用应用最广泛、成熟和稳定的 8051 核，1T（单指令周期）高速工作，最高主频 250MHz。

Mature and stable 8051 core which is the most widely used with the maximum operating frequency of T5L is up to 250MHz, 1T(single instruction cycle)high speed operation.

（2）单独 CPU 核（GUI CPU）运行 DGUS II 系统：

Separate GUI CPU Core running DGUS II System:

● 内置高速显存，2.4GB/S 带宽。

High-speed display memory, 2.4GB/S bandwidth.

● 2D 硬件加速，JPEG 解压缩速度高达 200fps@1280*800，UI 极其流畅。

2D hardware acceleration, the decompression speed of JPEG is up to 200fps@1280*800 and the UI with animation and icons as its main feature is extremely cool and smooth.

● JPEG 压缩模式存储图片、图标，大幅度缩小外置存储器到低成本的 16Mbytes SPI Flash。

Images and icons stored in JPEG format. Adopt Low-cost 16Mbytes SPI Flash.

● 支持电阻或电容触摸屏，灵敏度可以调节，最快 400Hz 触控打点速度。

Support CTP or RTP with adjustable sensitivity and maximum 400 Hz touch frequency.

● 1 路 15bit 32Ksps PWM 数字功放驱动扬声器，实现高品质语音压缩存储和播放。

1-way 15bit 32Ksps PWM digital power amplifier driver loudspeaker, save power amplifier cost and achieve high signal-to-noise ratio and sound quality restoration.

● 128Kbytes 变量存储器空间，存储器接口和 OS CPU 核交换数据，应用及其简单。

128Kbytes variable storage space for exchanging data with OS CPU Core and memory.

● 支持 PC 端组态开发和仿真，支持后台远程升级。

Support DGUS development and simulation on PC. Support background remote upgrade.

（3）单独 CPU 核（OS CPU）运行用户 8051 代码，应用中省掉用户 CPU：

Separate CPU (OS CPU) core runs user 8051 code or DWIN OS system and user CPU is omitted in practical application:

● 标准 8051 架构和指令集，64Kbytes 代码空间，32Kbytes 片内 RAM。

Standard 8051 architecture and instruction set, 64Kbytes code space, 32Kbytes on-chip RAM.

● 64bit 整数型数学运算单元（MDU），包括 64bit MAC 和 64bit 除法器。

64 bit integer mathematical operation unit (MDU), including 64 bit MAC and 64 bit divider.

● 28 个 IO，4 路 UARTs，1 路 CAN 接口，最多 8 路 12bit A/D，2 路 16bit 分辨率可调的 PWM。

28 IOs, 4-channel UARTs, 1-channel CAN, up to 8-channel 12-bit A/Ds and 2-channle 16-bit PWM of adjustable resolution.

● 支持 IAP 在线仿真和调试，断点数量无限制。

Support IAP on-line simulation and debugging with unlimited number of breakpoints.

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● 可以透过 DGUS 系统在线升级代码。

Upgrade code online through DGUS system.

（4）1Mbytes 片内 Flash，迪文专利加密技术，确保代码和数据安全，杜绝山寨和克隆。

1Mbytes on-chip Flash with DWIN patent encryption technology ensure code and data security.

（5）-40℃~+85℃工作温度范围（可定制 -55℃~105℃工作温度范围 IC）。

Operating temperature ranges from -40℃ to +85℃(IC operating temperature customizable from -55℃ to 105℃).

迪文欢迎广大用户基于 **T5L** 自主设计客制化产品。

DWIN encourages users to design your own customized product based on T5L.

7、修订记录 Revision records

版本 Rev	日期 Revise Date	描述 Content	编辑人 Editor
00	2019-03-27	首次发布 First Edition	ZK
01	2020-05-25	更新存储器特性 Update Memory	ZK
02	2020-06-10	重新修订，液晶屏物料由 TN 换为 IPS Revise, LCD type is replace from TN to IPS	ZK
03	2020-09-18	更新实物图 Update physical drawing	ZK
04	2020-10-26	更新液晶类型 Update panel type	ZK
05	2021-11-05	升级版本 Upgrade version	李精精
06	2021-12-17	更正电流参数 Modify current parameters	郑运佳
07	2022-11-14	修改尺寸说明 Modify dimension description	郑运佳
08	2023-11-27	EMC 硬件升级，库存旧板自然消耗 EMC hardware upgrade, natural consumption of old inventory boards	郑运佳
09	2025-10-15	蜂鸣器变更为贴片式，更新实物图 Change to patch type buzzer,Update physical image	郑运佳

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客服 QQ Customer service QQ: 400 018 9008

企业微信 WeCom：

客服邮箱 Customer service email: dwinhmi@dwin.com.cn

迪文开发者论坛 DWIN Developer Forum: http://inforum.dwin.com.cn:20080/forum.php

感谢大家一直以来对迪文的支持，您的支持是我们进步的动力！

Thank you all for continuous support of DWIN, and your approval is the driving force of our progress!

重要声明
Important Disclaimer

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客户应自行确保在产品应用过程中严格遵循所有相关标准及其他要求，包括但不限于功能安全、信息安全及监管等方面的规定。

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DWIN reserves the right to make any changes to product designs without prior notice.

Customers should ensure strictly adhering to all the relevant standards and requirements during the product application process, including but not limited to functional safety, information security, and regulatory provisions.

DWIN shall not bear any joint and several liability for any consequences that may arise from customers' adoption of DWIN products. In particular, for risks that may lead to significant property losses, environmental hazards, personal injury, or even death, especially in high-risk application areas such as military applications, flammable and explosive places, and life-saving medical equipment, customers should independently assess the risks and take corresponding preventive and protective measures. DWIN shall not bear any relevant responsibility.