

# DMG48270C043\_04WTC

## 产品特点:

- 基于 T5L0 ASIC，运行 DGUS II 人机交互软件平台，商业级智能屏。
- 4.3 英寸，480\*272 分辨率，TV-TN 液晶显示屏。
- 高可靠性电容触摸屏。

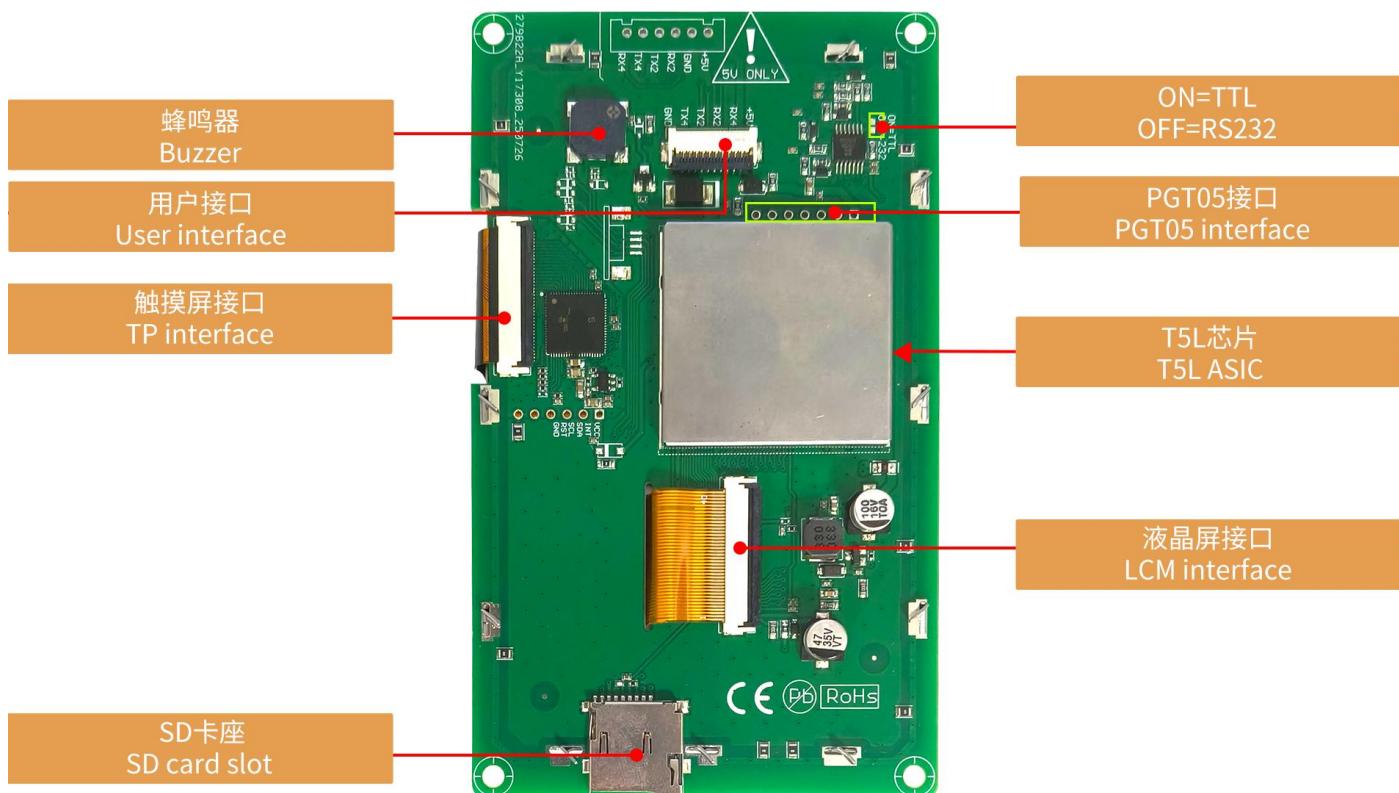
## Features:

- Powered by T5L0 ASIC, running DGUS II HMI platform, commercial-grade smart LCM.
- 4.3 inch, 480\*272 resolution, TV-TN-TFT LCD.
- Reliable capacitive touch panel.



## 1、硬件及接口 Hardware and interface

### 1.1 硬件接口图 Hardware interface diagram



## 1.2 硬件及接口说明 Hardware and interface description

| 序号<br>No. | 名称<br>Name                  | 说明<br>Description   |
|-----------|-----------------------------|---|
| 1         | T5L0 芯片<br>T5L0 ASIC        | 迪文自主研发，2020 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。<br>DWIN independently developed, mass production in 2020. Dual 8051 cores, GUI and application run on separate 8051 cores. |
| 2         | 用户接口<br>User interface      | 用于供电和串口通讯，10Pin_1.0mm 座子。<br>10Pin_1.0mm socket for power supply and serial communication.  |
| 3         | Flash                       | 16MB 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。<br>16MB NOR Flash for storing UI files like fonts, images, music, with over 100,000 erase/write cycles.                     |
| 4         | 蜂鸣器<br>Buzzer               | 3V 无源蜂鸣器。<br>3V passive buzzer.   |
| 5         | SD 卡座<br>SD card slot       | 用于 DGUS 工程文件下载 (UI 文件、CFG 文件、内核等)，下载速率：4Mb/s。<br>For DGUS project file downloads (UI, CFG files, kernel, etc.), 4 Mb/s rate.  |
| 6         | PGT05 接口<br>PGT05 interface | 用于烧录 DGUS 底层程序。<br>For programming DGUS firmware.   |

## 2、规格参数 Specification parameters

### 2.1 显示参数 Display parameters

|   |  |
|---|--|
| 显示屏类型<br><b>LCD Type</b>  | TV-TN TFT 液晶屏。<br>TV-TN, TFT LCD.  |
| 视角<br><b>Viewing Angle</b>  | TV 视角, 典型值 70°/70°/40°/30° (L/R/U/D)<br>TV viewing angle, 70°/70°/40°/30° (L/R/U/D)  |
| 分辨率<br><b>Resolution</b>  | 480×272 (支持 0°/90°/180°/270°显示模式)<br>480×272 (0°/90°/180°/270°)  |
| 有效显示区域<br><b>Active Area (AA)</b>   | 95.04mm (W)×53.86mm (H)  |
| 可视区域<br><b>Viewing Area (VA)</b>  | 96.54mm (W)×55.36mm (H)  |
| 背光<br><b>Backlight</b>  | LED  |
| 背光寿命<br><b>Backlight Service Life</b>   | >10000 小时<br>>10000 hours  |
| 亮度<br><b>Brightness</b>   | 250nit   |
| 亮度调节<br><b>Brightness Control</b>   | 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)<br>100-level brightness adjustment (Flickering may occur at 1%-30% of max brightness; not recommended for use in this range) |
| 注: 长时间显示固定画面可能导致残影现象, 建议设置动态屏保进行规避。<br>Note: Use dynamic screen saver to prevent afterimages from prolonged fixed page display. |  |

### 2.2 触摸参数 Touch parameters

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

## 2.3 串口参数 Serial interface parameters

|                                |   |         |         |         |         |
|--------------------------------|---|---------|---------|---------|---------|
| 串口模式<br><b>Mode</b>            | UART2: ON=TTL/CMOS; OFF=RS232<br>UART4: ON=TTL/CMOS; OFF=RS232 (OS 配置后才能使用 Only available after OS configuration) |         |         |         |         |
| 串口电平<br><b>Voltage Level</b>   | 测试条件 Test Condition   | 最小值 Min | 典型值 Typ | 最大值 Max | 单位 Unit |
|                                | Output 1, Iout = -4mA   | 2.7     | 3.2     | -       | V       |
|                                | Output 0, Iout = 4mA  | -       | 0.1     | 0.4     | V       |
|                                | Input 1   | 2.4     | 3.3     | 5.5     | V       |
|                                | Input 0   | 0       | -       | 1.0     | V       |
| 串口波特率<br><b>Baud Rate</b>      | 3150~3225600bps, 典型值: 115200bps.<br>3150~3225600bps, typical value of 115200bps.                                  |         |         |         |         |
| 数据格式<br><b>Data Format</b>     | UART2: N81<br>UART4: N81/E81/O81/N82 四种模式可选 (OS 配置) 4 modes (OS configuration)                                    |         |         |         |         |
| 接口端子<br><b>Interface Cable</b> | 10Pin_1.0mm   |         |         |         |         |

## 2.4 电气规格 Electrical specifications

|   |   |   |
|---|---|---|
| 额定功率<br><b>Rated Power</b>                                    | <5W   |   |
| 工作电压<br><b>Operating Voltage</b>                              | 4.5~5.5V, 典型值 5V.<br>4.5~5.5V, typical value of 5V. |   |
| 工作电流<br><b>Operating Current</b>                              | 200mA   | VCC=5V, 背光亮度最大。<br>VCC=5V, max backlight. |
|   | 70mA  | VCC=5V, 背光关闭。<br>VCC=5V, backlight off.   |
| 推荐工作电源: 5V 1A 的直流稳压电源。<br>Recommended power supply: 5V 1A DC. |   |   |

## 2.5 工作环境 Operating environment

|                                      |  |  |
|--------------------------------------|--|--|
| 工作温度<br><b>Operating Temperature</b> | -10°C~60°C (5V @ 60% RH)                                     |  |
| 存储温度<br><b>Storage Temperature</b>   | -20°C~70°C   |  |
| 防紫外线<br><b>Anti-UV</b>               | 无<br>N   |  |
| 三防漆<br><b>Conformal coating</b>      | 无<br>N   |  |
| 工作湿度<br><b>Operating Humidity</b>    | 10%~90%RH, 典型值 60%RH.<br>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 standards.

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    |       |       |
| /                     | /           | /    | /    | /    | /    | /    | /     | /     |
| /                     | /           | /    | /    | /    | /    | /    | /     | /     |

Table 2: Electrostatic Discharge Immunity (Direct Contact)

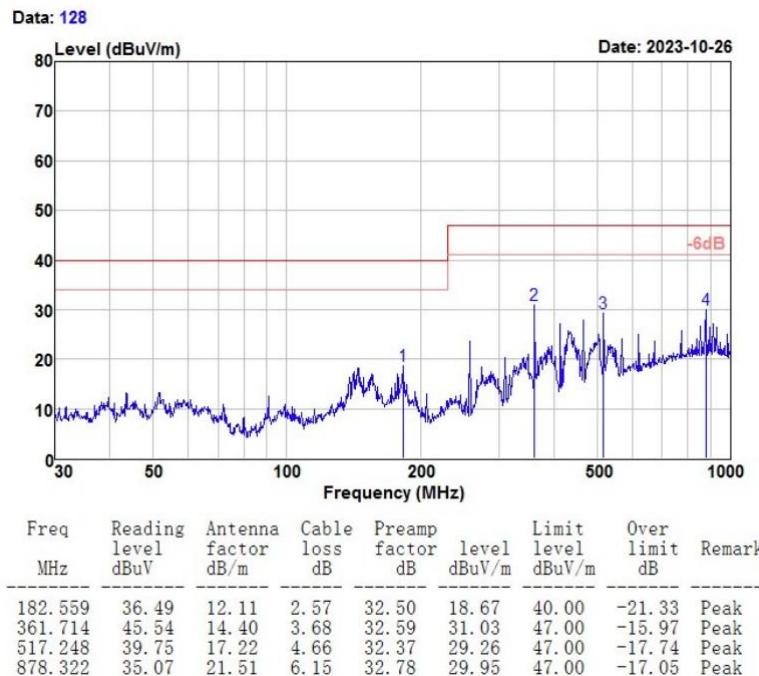
| Test Points Locations | Test Levels |      |      |      |      |      |      |      |
|-----------------------|-------------|------|------|------|------|------|------|------|
|                       | -2kV        | +2kV | -4kV | +4kV | -6kV | +6kV | -8kV | +8kV |
| 边框                    |             |      |      |      | B    | B    |      |      |
| /                     | /           | /    | /    | /    | /    | /    | /    | /    |
| /                     | /           | /    | /    | /    | /    | /    | /    | /    |



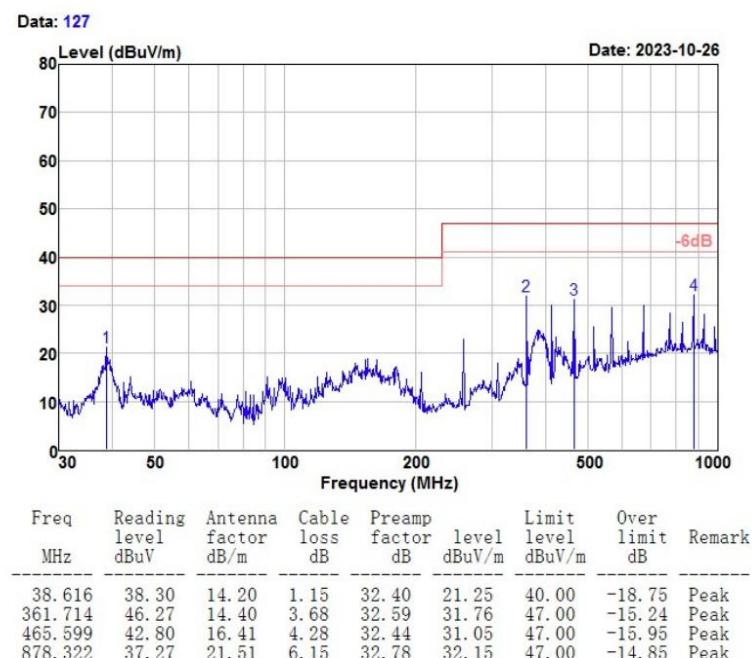
### 3.2 辐射干扰测试 RE test

| 测试项目<br>Test Item | 测试标准<br>Test Standard | 结果<br>Result             |
|-------------------|-----------------------|--------------------------|
| 辐射干扰<br>RE        | ClassB-6dB            | 正常工作<br>Normal operation |

#### HORIZONTAL

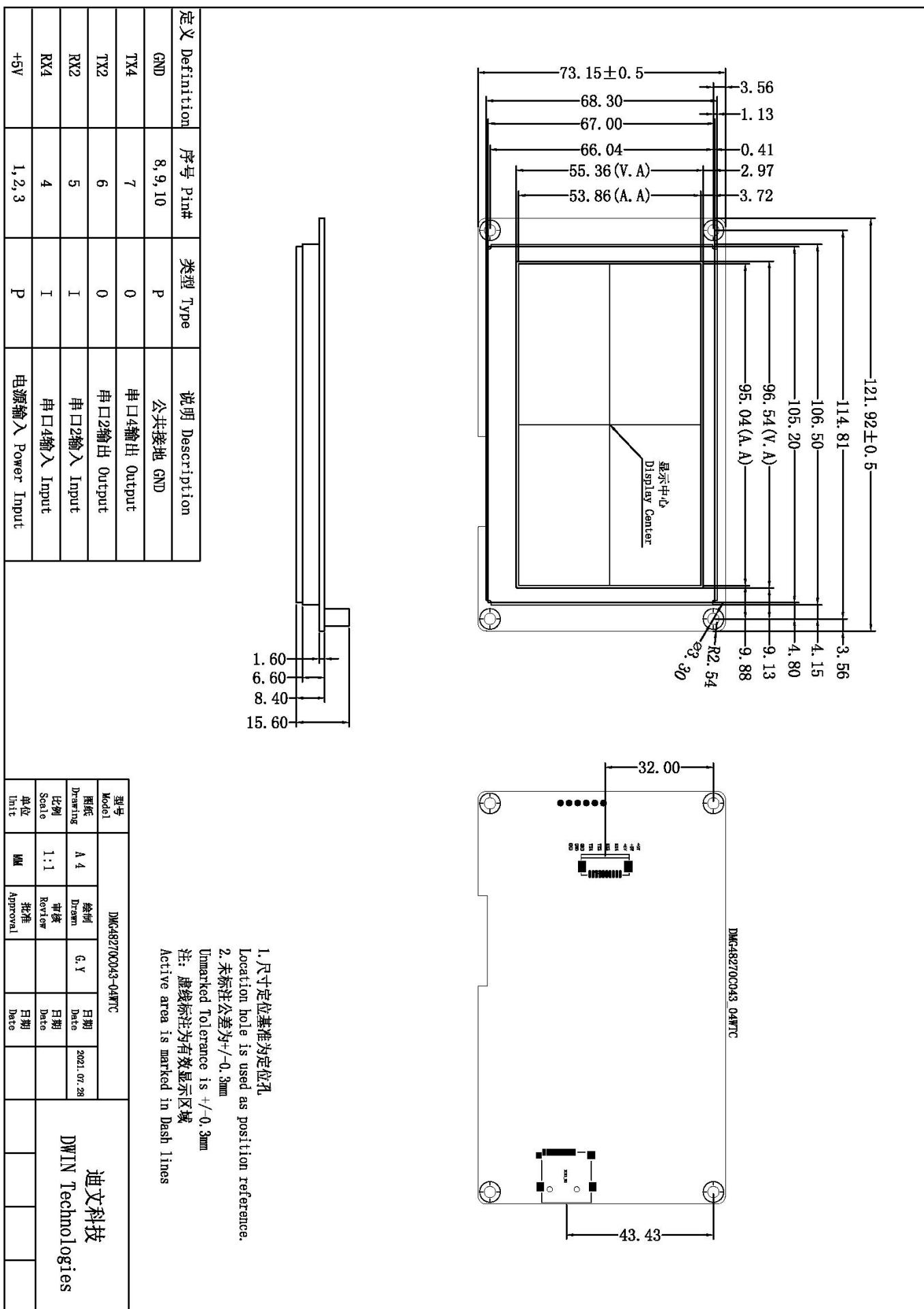


#### VERTICAL



**4、包装和物理尺寸 Packaging & dimensions**

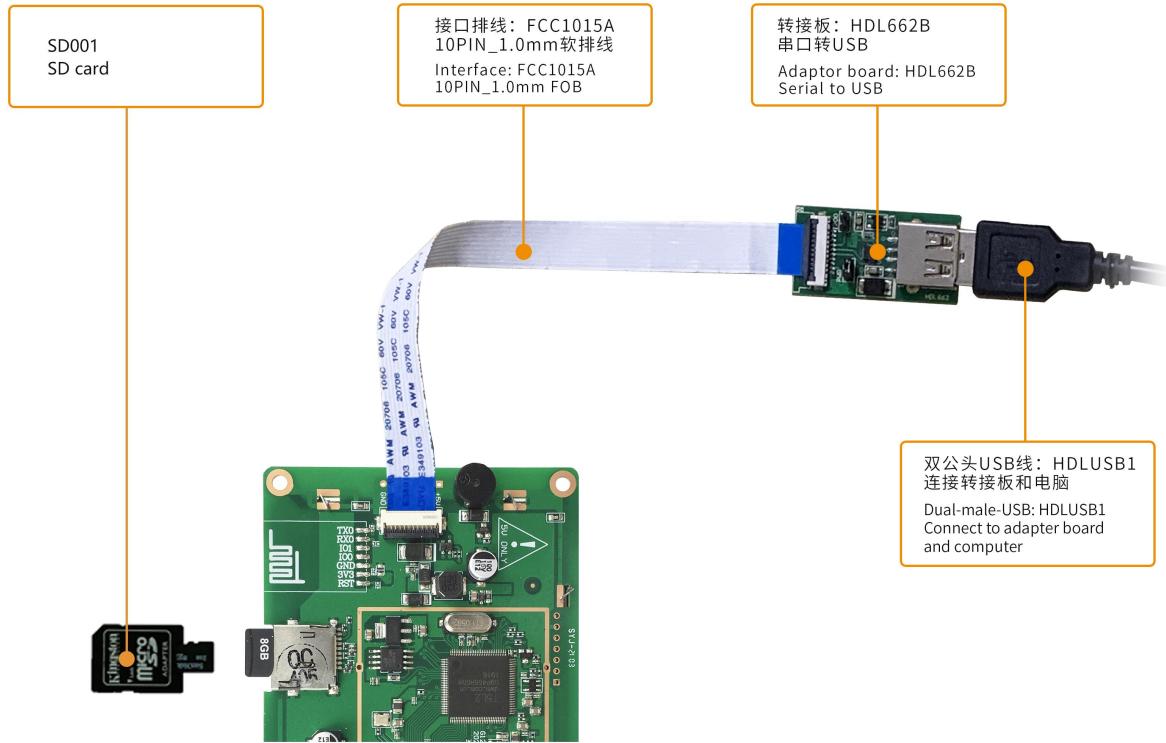
| 外形尺寸<br><b>Form Factor</b>             | 121.92mm (W)×73.15mm (H)×15.60mm (T)  |                       |                                  |                                |
|--|---|-----------------------|----------------------------------|--------------------------------|
| 安装尺寸<br><b>Installation Dimensions</b> | 开孔尺寸: 106.50 (+0.3mm) ×68.30 (+0.3mm)<br>Positioning hole: 106.50(+0.3mm)×68.30(+0.3mm) |                       |                                  |                                |
| 净重量<br><b>Net Weight</b>               | 115g  |                       |                                  |                                |
| 包装标准<br><b>Packaging Standards</b>     |   |                       |                                  |                                |
| 包装箱型号<br><b>Model</b>                  | 包装箱尺寸<br><b>Dimensions</b>  | 层数(层)<br><b>Layer</b> | 数量/层(片)<br><b>Quantity/Layer</b> | 总数量(片)<br><b>Quantity(Pcs)</b> |
| 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)  | 2                     | 25                               | 50                             |
| 5号箱 Carton5:                           | 600mm(L)×430mm(W)×290mm(H)  | 2                     | 60                               | 120                            |



## 5、调试工具 Debug 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.



## 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-channel 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.

- 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°C~+85°C 工作温度范围 (可定制 -55°C~105°C 工作温度范围 IC)。

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

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     | 2021-09-13     | 编制数据手册<br>First edition  | 郑运佳        |
| 01     | 2021-10-14     | 更正温度参数<br>Correct temperature parameters                       | 郑运佳        |
| 02     | 2021-11-04     | 升级版本<br>Upgrade version  | 郑运佳        |
| 03     | 2022-11-14     | 修改尺寸说明<br>Modify dimension description                         | 郑运佳        |
| 04     | 2023-11-15     | EMC 升级<br>EMC updated  | 陈律志        |
| 05     | 2025-04-15     | 触摸 IC 替换为 TPS04<br>Replace touch IC with TPS04                 | 赵方维        |
| 06     | 2025-08-06     | 更新触摸封装, 更新实物图<br>Update touch packaging, update physical image | 郑运佳        |

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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

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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.

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