

# DMG80480T070\_41WN

## 产品特点:

- 基于 **T5L2 ASIC CPU**，运行 **DGUSII** 人机交互软件平台，工业级应用的智能屏。
- **7.0 英寸**，**800\*480** 分辨率，**16.7M** 种颜色真彩显示，**TN TFT** 显示屏。
- 数字信号多媒体方案屏。
- 支持图片、音频、视频播放，以及 **USB** 摄像头视频录制和画面截取功能。
- 支持扩展远程更新视频和网络摄像头功能。

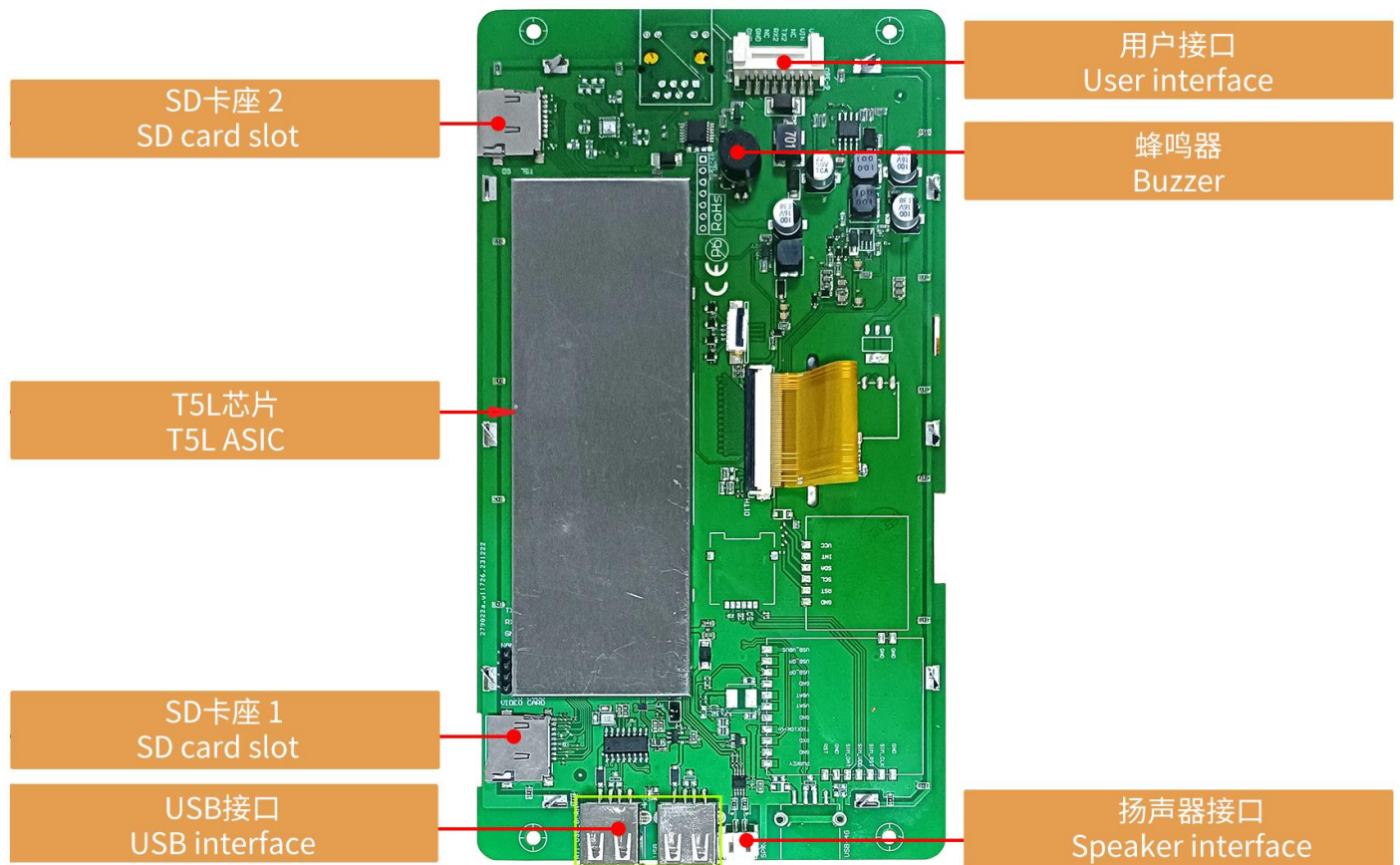
## Features:

- Based on the **T5L2 ASIC CPU**, running the **DGUSII** human-machine interaction software platform, smart LCM for industrial-grade applications.
- **7.0-inch**, **800\*480** pixels resolution, **16.7 M** colors true-color display, **TN TFT** display.
- Digital signal multimedia solution screen.
- Support image, audio, and video playback, as well as **USB** camera video recording and screen capture function.
- Support extended remote video updates and network camera function.



## 1、硬件及接口 Hardware and interface

### 1.1 硬件接口图 Hardware interface



硬件接口图  
Hardware interface

## 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         | T5L2 芯片<br>T5L2 ASIC                  | 迪文自主研发，2019 年量产；专利加密技术，确保代码和数据安全；功耗低，抗干扰能力强，双面 PCB 设计上轻松通过 EMC/EMI 测试。<br>DWIN independently developed, mass production in 2019; patented encryption technology ensures code and data security; low power consumption, strong anti-interference capability, easily passes EMC/EMI tests with dual-sided PCB design.  |
| 2         | 用户接口<br>User interface                | 用于供电和串口通讯，8Pin_2.0mm 座子。串口下载速率（典型值）：12KByte/s。<br>8Pin_2.0mm socket for power supply and serial communication.<br>Download rate(typical value): 12KByte/s.   |
| 3         | NOR Flash                             | 32MBytes (2 颗 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。<br>32MBytes (2*16MBytes NOR Flash), can be used to store user UI files such as fonts, images, music, etc., with erase/write cycles >100,000 times.  |
| 4         | NAND Flash                            | 512Mbytes，用于存储 R11 固件。<br>512Mbytes, used to store R11 firmware.   |
| 5         | 蜂鸣器<br>Buzzer                         | 3V 无源蜂鸣器。<br>3V passive buzzer.  |
| 6         | SD 卡座 1<br>SD card slot 1             | 支持 SD 卡图片、音频、视频播放。还可用于导出摄像头截图文件（JPEG）或录像文件（MP4）。<br>Supports SD card image, audio, and video playback. It can also be used to export camera screenshot files (JPEG) or video files (MP4).  |
| 7         | SD 卡座 2<br>SD card slot 2             | 支持所有文件（用户 UI 文件、CFG 硬件配置文件、底层内核固件）下载，屏幕显示下载统计信息，下载速率：4Mb/s。下载文件时，SD 卡需格式化为 FAT32 格式，推荐块大小为 4096。<br>Supports downloading of all files (user UI files, CFG files, underlying kernel firmware), displays download statistics on the screen, download rate: 4 Mb/s. When downloading files, the SD card needs to be formatted in FAT32 format, with a recommended allocation unit size of 4096. |
| 8         | 扬声器接口<br>Speaker                      | 2Pin_2.0mm 接口，外接扬声器。<br>2Pin_2.0mm interface, external speaker.  |
| 9         | USB 接口<br>USB interface               | R11_USB: 卧式 USB 接口，用于固件烧录。<br>USB 接口：卧式 USB 接口，可外接 USB 摄像头或播放 U 盘文件。<br>R11_USB: Horizontal USB interface, Used for firmware burning.<br>USB interface: Horizontal USB interface, can connect to USB camera or play USB files.   |
| 10        | 预留模块焊盘<br>Reserved module solder pads | 本产品预留了 4G 模块焊盘、以太网接口（RJ45 座子）焊盘、WIFI 模块焊盘。可拓展远程更新视频功能，网络摄像头功能，如有相关需求与对应业务沟通。<br>This product has reserved 4G modules, Ethernet interfaces (RJ45 socket), and WIFI module pads. Expandable remote update video function and network camera function, communicate with corresponding business if there are related needs.  |

## 2、规格参数 Specification parameters

### 2.1 显示参数 Display parameters

|                                |  |
|--------------------------------|--|
| 显示屏类型<br>LCD Type              | TN 工艺 TFT 显示屏。<br>TN process TFT display screen.   |
| 视角<br>Viewing Angle            | 普通视角，典型值 70°/70°/50°/70° (L/R/U/D)<br>Normal viewing angle, 70°/70°/50°/70° (L/R/U/D)  |
| 分辨率<br>Resolution              | 800×480 (支持 0°/90°/180°/270° 显示模式)<br>800×480 pixels (support 0°/90°/180°/270°)  |
| 色彩<br>Color                    | 16.7M 色 (24 位 8R8G8B)<br>16.7M color (24-bit 8R8G8B)   |
| AA 区<br>Active Area (A.A.)     | 154.08mm (W)×85.92mm (H)   |
| 接口<br>Interface                | RGB  |
| 背光模式<br>Backlight Mode         | LED  |
| 背光寿命<br>Backlight Service Life | >30000 小时 (以最高亮度连续工作，亮度减半时间)<br>>30000 hours (Time of the brightness decaying to 50% on the condition of continuous working with the maximum brightness)   |
| 背光亮度<br>Brightness             | 300nit   |
| 背光调节<br>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)<br>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 串口参数 Serial interface parameters

|                         |  |         |         |         |         |
|-------------------------|--|---------|---------|---------|---------|
| 串口模式<br>Mode            | UART2: ON=TTL/CMOS; OFF=RS232  |         |         |         |         |
| 串口电平<br>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 = -4mA  | 4.78    | 5.0     | -       | V       |
|                         | Output 0, Iout = 4mA   | -       | -       | 0.4     | V       |
|                         | Input 1  | 2.5     | 5.0     | -       | V       |
|                         | Input 0  | -       | -       | 1.0     | V       |
| 串口波特率<br>Baud Rate      | 3150~3225600bps, 典型值: 115200bps<br>3150~3225600bps, typical value of 115200bps |         |         |         |         |
| 数据格式<br>Data Format     | UART2: N81   |         |         |         |         |
| 接口排线<br>Interface Cable | 8Pin_2.0mm   |         |         |         |         |

## 2.3 电气规格 Electrical specifications

|   |   |   |
|---|---|---|
| 额定功率<br>Rated Power   | <3W   |   |
| 工作电压<br>Operating Voltage                                     | 7~36V, 典型值 12V<br>7~36V, typical value of 12V |   |
| 工作电流<br>Operating Current                                     | 230mA   | VCC=12V, 背光亮度最大<br>VCC=12V, max backlight |
|   | 90mA  | VCC=12V, 背光关闭<br>VCC=12V, backlight off   |
| 推荐工作电源: 12V 1A 的直流稳压电源<br>Recommended power supply: 12V 1A DC |   |   |

## 2.4 工作环境 Operating environment

|                               |  |
|-------------------------------|--|
| 工作温度<br>Operating Temperature | -20℃~70℃ (12V @ 60% RH)                                    |
| 存储温度<br>Storage Temperature   | -30℃~80℃   |
| 三防漆工艺<br>Conformal coating    | 有 Yes  |
| 工作湿度<br>Operating Humidity    | 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.

试验过程：将产品平置于测试台上，针对串口屏铁框和显示区域依次进行接触和空气放电；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。性能符合判据 GB/T 17626.2 B 级及以上。

Test process: the product was placed on the test bench to perform contact and air discharge in turn of the serial screen iron frame and display area. During the experimental process, it was observed whether the screen is dead, black, white, splash, or reboot. According to the experiment results, the performance is in line with the criteria GB/T 17626.2 B level and above.

■ 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                    |             |      |      |      | △    | △    |       |       |
|                       |             |      |      |      |      |      |       |       |
|                       |             |      |      |      |      |      |       |       |

Table 2: Electrostatic Discharge Immunity (Direct Contact)

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



### 3.2 电快速瞬变脉冲群 EFT 测试 EFT 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.

试验过程：将产品平置于测试台上，通过脉冲群发生仪耦合脉冲群后的电源对智能屏进行供电如下图 3.2 所示；实验过程观察屏幕是否出现复位重启、异常显示、触摸异常等现象，性能符合 GB/T 17626.4 B 级及以上。

Test process: the product was placed on the test bench to perform contact and the smart screen is energized by the power supply coupled with a EFT generator as shown in Fig. 3.2 below. During the experimental process, it was observed whether abnormal reset, display or touch phenomena occurs. According to the experiment results, the performance is in line with the criteria GB/T 17626.4 B level and above.

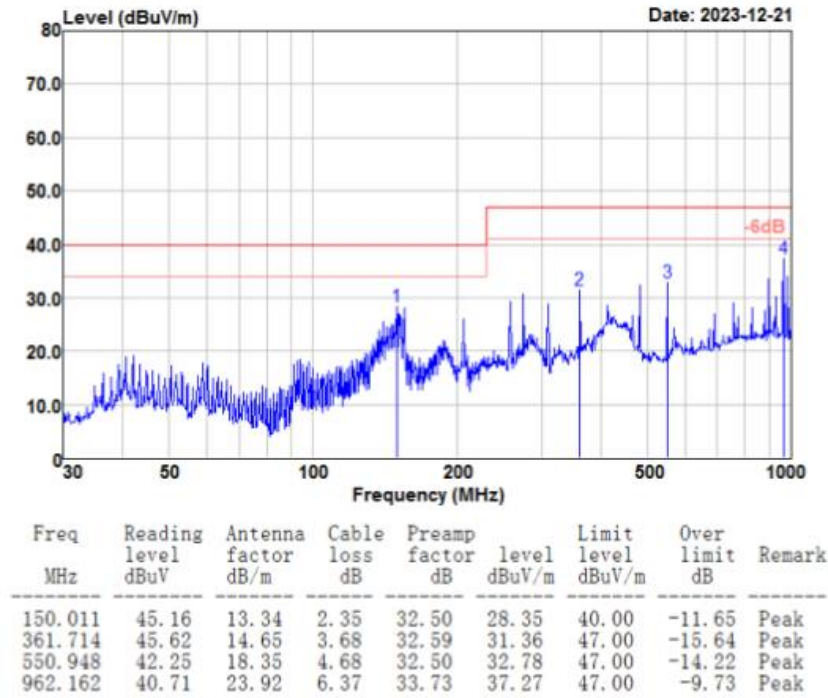
Test standard : ☐ EN 61000-4-4:2012 ☒ IEC 61000-4-4:2012 ☐ GB/T 17626.4-2018  
☐ Other:

| Test Points   |           | Test Levels(kV) |      |      |      |      |      |      |      |
|---|-----------|-----------------|------|------|------|------|------|------|------|
|   |           | -0.5            | +0.5 | -1.0 | +1.0 | -2.0 | +2.0 | -4.0 | +4.0 |
| <div>  <br/>Power ports </div> | L         | A               | A    | A    | A    | A    | A    | /    | /    |
|   | N         | A               | A    | A    | A    | A    | A    | /    | /    |
|   | Earth     | /               | /    | /    | /    | /    | /    | /    | /    |
|   | L+N       | A               | A    | A    | A    | A    | A    | /    | /    |
|   | L + Earth | /               | /    | /    | /    | /    | /    | /    | /    |
|   | N + Earth | /               | /    | /    | /    | /    | /    | /    | /    |
|   | L+N+Earth | /               | /    | /    | /    | /    | /    | /    | /    |
| Signal ports  | —/—       | /               | /    | /    | /    | /    | /    | /    | /    |

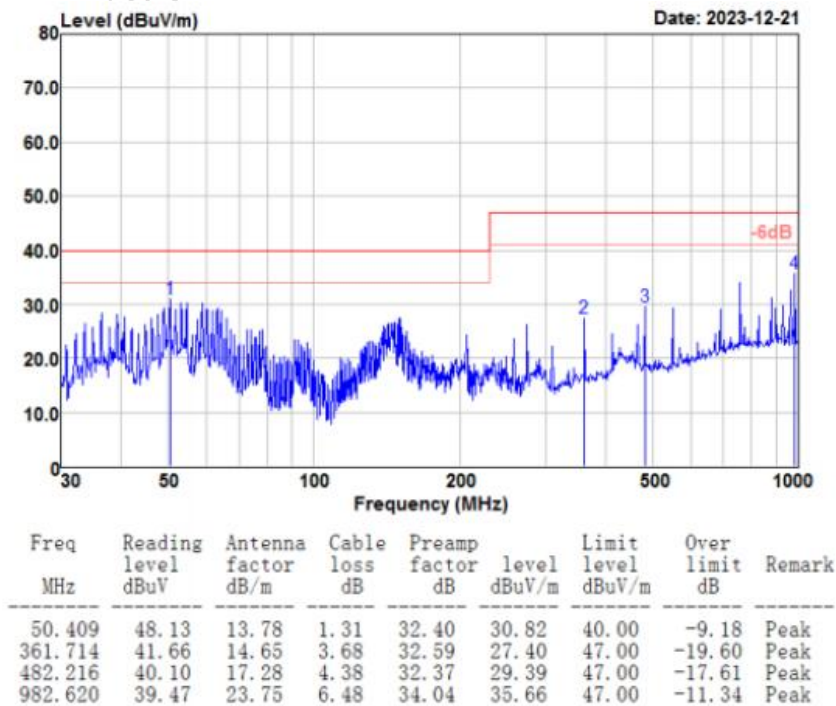
### 3.3 辐射干扰测试 RE test

| 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





### 3.4 传导骚扰抗扰度测试 CS test

- Test standard : ☐ EN 61000-4-6:2014    ■ IEC 61000-4-6:2013    ☐ GB/T 17626.6-2017  
☐ Other:  
 ■ Modulation: ■ Amplitude 80%,1kHz sine wave    ☐ Amplitude 80%,2Hz sine wave    ☐ Other:  
 ■ Dwell time: ■ 1s    ☐ 3s    ☐ other:  
 ■ Frequency Step Size : ■ 1 % of preceding frequency value    ☐ other:

| Coupling Line | Frequency Range<br>(MHz) | Voltage Level(e.m.f.)<br>(V) | Result |
|---------------|--------------------------|------------------------------|--------|
| 电源端           | 0.15-80                  | 10                           | A      |

#### 性能标准:

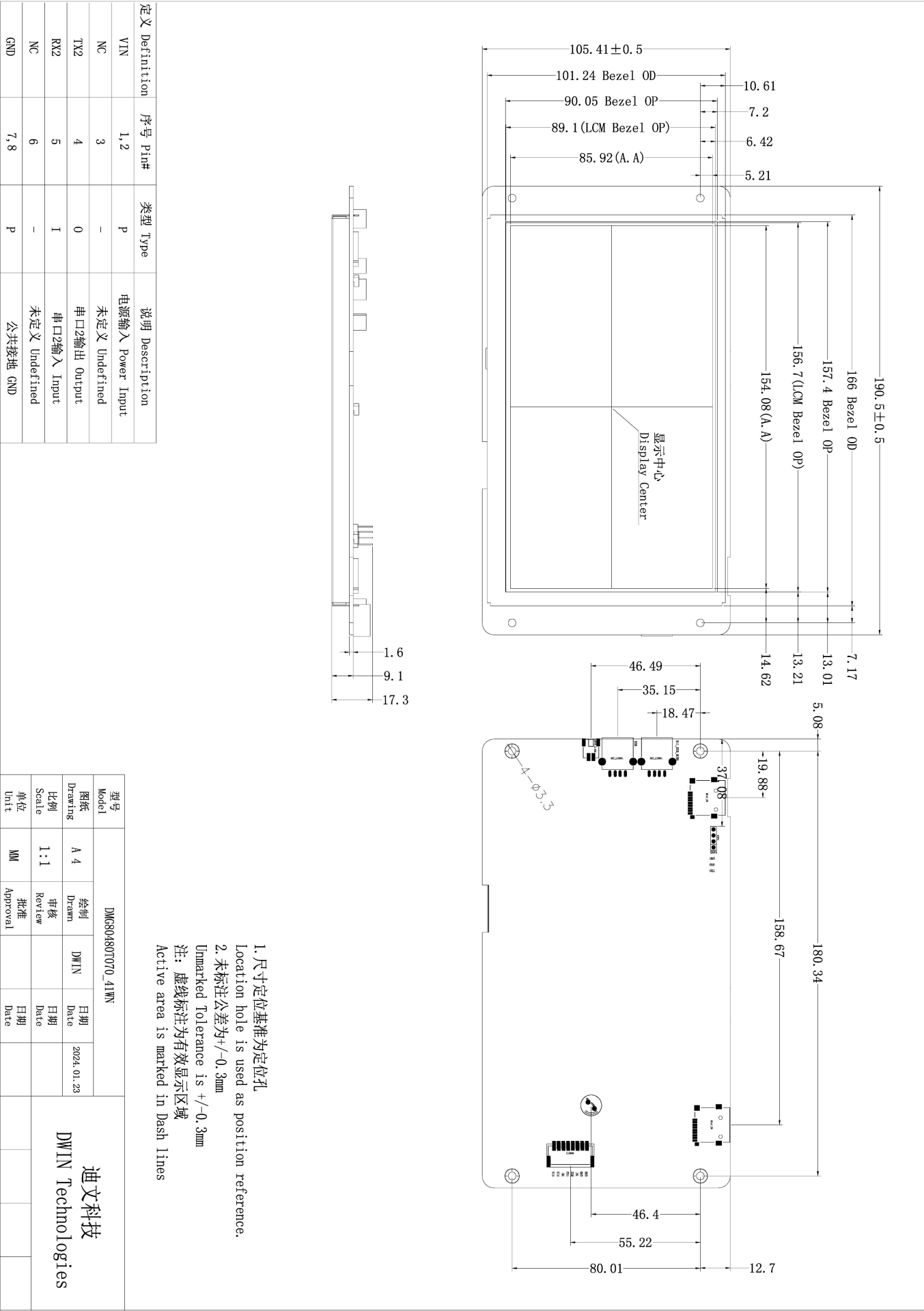
- A.在制造商、委托方或购买方规定的限值内性能正常;  
 B.功能或性能暂时丧失或降低,但在骚扰停止后能自行恢复,不需要操作者干预;  
 C.功能或性能暂时丧失或降低,但需操作者干预才能恢复;  
 D.因设备硬件或软件损坏,或数据丢失而造成不能恢复的功能丧失或性能降低。

#### 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.

#### 4、包装和物理尺寸 Packaging & dimensions

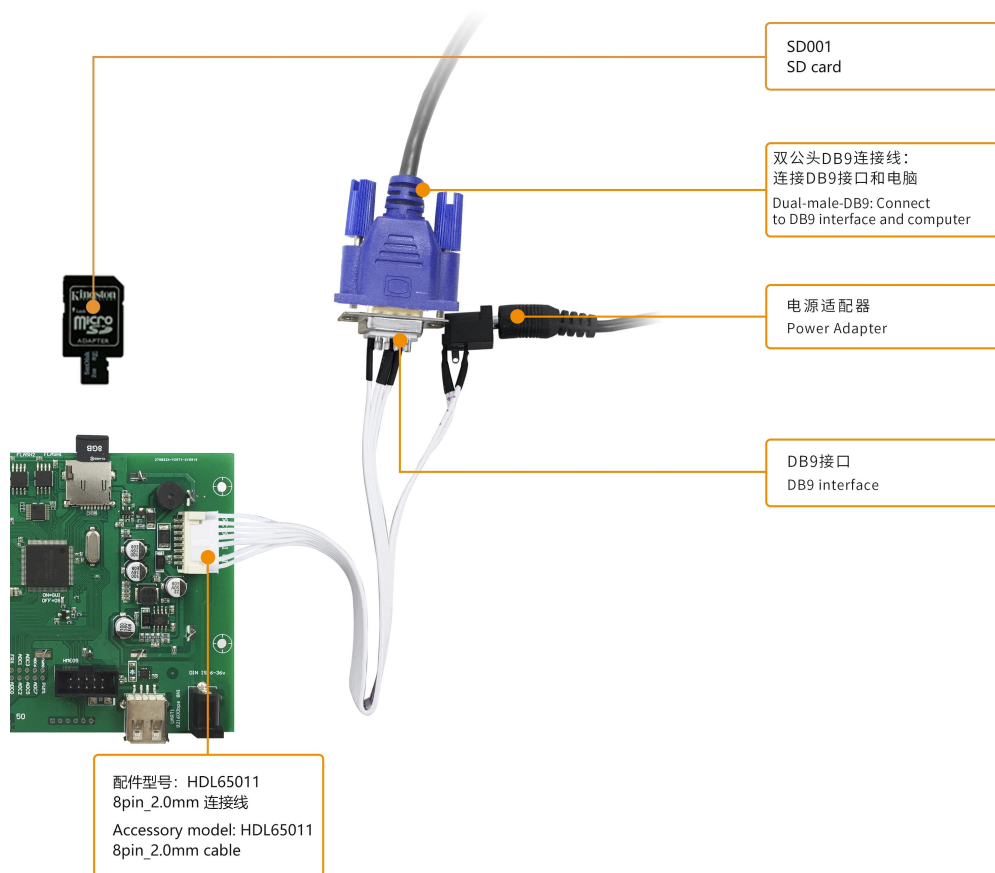
|                                 |   |                 |                            |                          |
|---------------------------------|---|-----------------|----------------------------|--------------------------|
| 外形尺寸<br>Form Factor             | 190.50mm (W)×105.41mm (H)×17.30mm (T)   |                 |                            |                          |
| 安装尺寸<br>Installation Dimensions | 开孔尺寸: 166.00 (+0.3mm) ×101.24 (+0.3mm)<br>Positioning hole: 166.00 (+0.3mm)×101.24 (+0.3mm) |                 |                            |                          |
| 净重量<br>Net Weight               | 280g  |                 |                            |                          |
| 包装标准 Packaging Standards        |   |                 |                            |                          |
| 包装箱型号<br>Model                  | 包装箱尺寸<br>Dimensions   | 层数 (层)<br>Layer | 数量/层 (片)<br>Quantity/Layer | 总数量 (片)<br>Quantity(Pcs) |
| 1 号箱 Carton1:                   | 220mm(L)×160mm(W)×47mm (H)  | 1               | 1                          | 1                        |
| 2 号箱 Carton2:                   | 250mm(L)×200mm(W)×80mm (H)  | 2               | 1                          | 2                        |
| 3 号箱 Carton3:                   | 320mm(L)×270mm(W)×80mm (H)  | 2               | 2                          | 4                        |
| 4 号箱 Carton4:                   | 435mm(L)×335mm(W)×290mm(H)  | -               | -                          | -                        |
| 5 号箱 Carton5:                   | 600mm(L)×430mm(W)×290mm(H)  | 1               | 40                         | 40                       |



## 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.



## 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.

- 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)  $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$  工作温度范围 (可定制  $-55^{\circ}\text{C} \sim 105^{\circ}\text{C}$  工作温度范围 IC)。

Operating temperature ranges from  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  (IC operating temperature customizable from  $-55^{\circ}\text{C}$  to  $105^{\circ}\text{C}$ ).

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     | 2024-01-25     | 首次发布<br>First Edition                  | 郑运佳        |
| 01     | 2024-03-26     | 更新 FLASH 参数<br>Update FLASH parameters | 郑运佳        |

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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!

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迪文有权进行产品设计的任何改善或变更，且不另行单独通知客户。

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。

对于客户在其产品中采用迪文产品可能引发的任何后果，迪文不承担连带责任。特别地，对于可能导致的重大财产损失、环境危害、人身伤害甚至死亡等风险，尤其是在军事、易燃易爆、生命医疗设备等高风险应用领域，客户应自行评估风险，并采取相应的预防和保护措施，迪文不承担相关责任。

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.