DT322X220034Z240201E

产品特点：

- **基于 T5L2 芯片，运行 DGUS II 人机交互软件平台。**
- **7.0 英寸，1024*600 分辨率，IPS 液晶显示屏。**
- **电容触摸屏。**
- **支持单路 1080P 高清显示或两路 720P 同屏显示。**
- **支持摄像头缩放、画面截图功能。支持定制画面录像功能。**

Features:

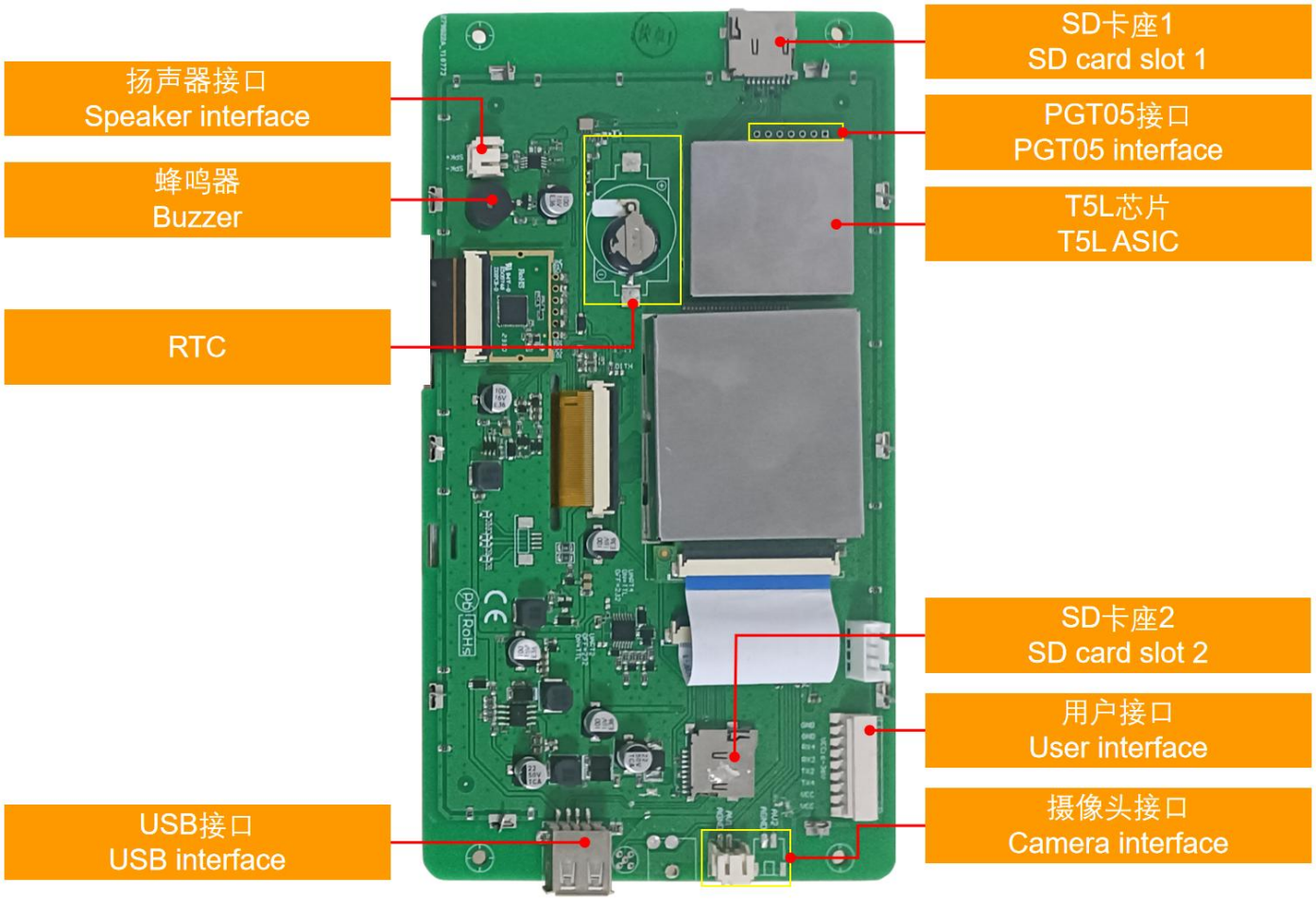
- **Powered by T5L2 ASIC, running DGUS II HMI platform.**
- **7.0-inch, 1024*600 pixels resolution, IPS-TFT LCD.**
- **Capacitive touch screen.**
- **Supports one 1080P single screen display or two 720P same screen displays.**
- **Supports camera zooming, screenshot saving functions. Supports customized video recording function.**



迪文科技 DWIN Technology Technical Document

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

迪文科技 技术文档 DWIN

1.2 硬件及接口说明 Hardware and interface description

序号 No.	名称 Name	说明 Description
1	T5L2 芯片 T5L2 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，8Pin_2.54mm 座子。 8Pin_2.54mm socket for power supply and serial communication.
3	Flash	16Mbytes NOR Flash，存放字库、图片、音乐文件，擦写次数>100,000 次。 16Mbytes NOR Flash, for fonts, pictures and audio files, Rewrite cycle: over 100,000 times.
4	蜂鸣器 Buzzer	3V 无源蜂鸣器。 3V passive buzzer.
5	扬声器接口	2pin_2.0mm 卧式接口。 2pin_ 2.0mm horizontal interface.
6	RTC	法拉电容供电，精度：±20ppm @25℃。掉电后可维持 7 天正常工作。预留电池供电兼容电路。 Super-capacitor powered, accuracy: ±20ppm @25℃, maintains operation for 7 days after power-off. Reserved button cell power supply compatible circuit.
7	SD 卡座 1 SD card slot 1	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.
8	SD 卡座 2 SD card slot 2	支持保存摄像头图像数据。 Support saving camera image data.
9	USB 接口 USB interface	卧式 USB 接口，用于固件烧录。 Horizontal USB interface, Used for firmware burning.
10	摄像头接口 Camera interface	2pin_2.0mm 卧式接口(支持接入单路 1080P 或两路 720P 摄像头，接入 2 路时需保持摄像头为同一类型。总传输帧率：24 帧/秒)。 2pin_ 2.0mm horizontal interface(supports connecting single 1080P or two 720P cameras, and when connecting two channels, the cameras must be of the same type. Total transmission frame rate: 24 frames per second).
11	PGT05 接口 PGT05 interface	用于烧录 DGUS 底层程序。 For programming DGUS firmware.

迪文科技技术资料 DWIN Technology Technical Document

2、规格参数 Specification parameters

2.1 显示参数 Display parameters

显示屏类型 **LCD Type**	IPS TFT 液晶屏。 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**	1024×600（支持 0°/90°/180°/270°显示模式） 1024×600 (support 0°/90°/180°/270°)
有效显示区域 **Active Area (AA)**	154.21mm (W) ×85.92mm (H)
可视区域 **Viewing Area (VA)**	154.21mm (W) ×85.92mm (H)
背光模式 **Backlight Mode**	LED
背光寿命 **Backlight Service Life**	>20,000H
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。 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 **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%

迪文科技 DWIN Technology Technical Document

2.3 串口参数 Serial interface parameters

串口模式 Mode	UART2: ON=TTL/CMOS; OFF=RS232 (出厂默认为 RS232 Defaulted RS232) UART4: ON=TTL/CMOS; OFF=RS232 (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 =-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 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	8Pin_2.54mm				

2.4 电气规格 Electrical specifications

额定功率 Rated Power	<5W	
工作电压 Operating Voltage	9~36V，典型值 12V。 9~36V, typical value of 12V.	
工作电流 Operating Current	380mA	VCC=12V，背光亮度最大。 VCC=12V, max backlight.
	140mA	VCC=12V，背光关闭。 VCC=12V, backlight off.
推荐工作电源：12V 1A 的直流稳压电源。 Recommended power supply: 12V 1A DC.		

2.5 工作环境 Operating environment

工作温度 Operating Temperature	-20℃~70℃（12V @ 60% RH)
存储温度 Storage Temperature	-30℃~80℃
三防漆 Conformal coating	有 Y
工作湿度 Operating Humidity	10%~90%RH，典型值 60%RH。 10%~90%RH, typical value of 60% RH.

迪文科技 DWIN Technology Technical Document

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					A	A		
/	/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/	/

Table 2： Electrostatic Discharge Immunity (Direct Contact)

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

迪文科技 技术文档

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；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. 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:

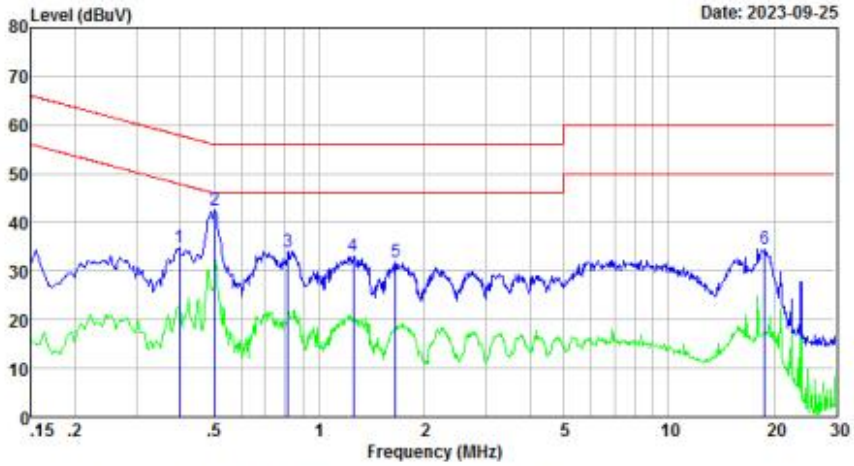
Test Points		Test Levels(kV)							
		-0.5	+0.5	-1.0	+1.0	-2.0	+2.0	-4.0	+4.0
AC Power ports	L					A	A		
	N					A	A		
	Earth	/	/	/	/	/	/	/	/
	L+N					A	A		
	L + Earth	/	/	/	/	/	/	/	/
	N + Earth	/	/	/	/	/	/	/	/
	L+N+Earth	/	/	/	/	/	/	/	/
Signal ports	____/__	/	/	/	/	/	/	/	/

迪文科技 技术文档 DWIN Document

3.3 传导干扰测试 CE test

测试项目 Test Item	测试标准 Test Standard	结果 Result
传导干扰 CE	Class B	正常工作 Normal operation

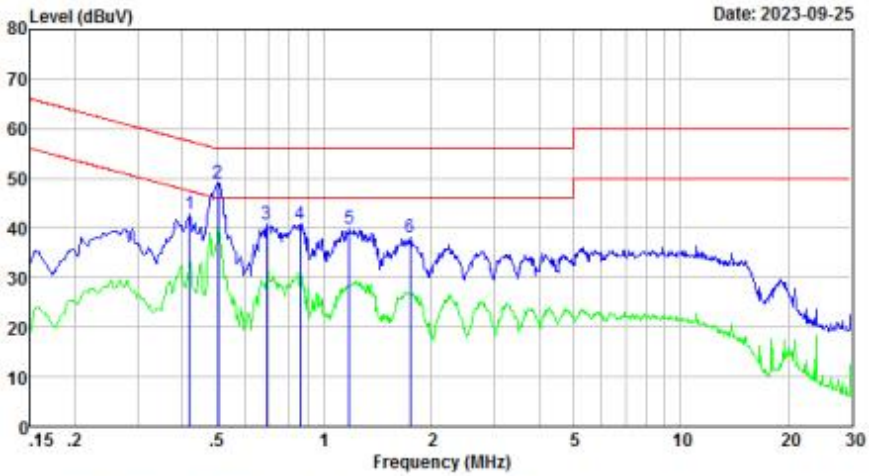
LINE



Freq MHz	Reading level dBuV	LISN/ISN factor dB	Cable loss dB	Result level dBuV	Limit level dBuV	Over limit dB	Remark
0.398	25.08	9.59	0.02	34.69	57.90	-23.21	Peak
0.502	32.74	9.60	0.02	42.36	56.00	-13.64	Peak
0.813	24.44	9.61	0.02	34.07	56.00	-21.93	Peak
1.249	23.58	9.60	0.02	33.20	56.00	-22.80	Peak
1.654	22.11	9.60	0.03	31.74	56.00	-24.26	Peak
18.820	24.50	9.92	0.11	34.53	60.00	-25.47	Peak

Remarks: Result Level = Reading level + LISN/ISN factor + Cable loss

NEUTRAL



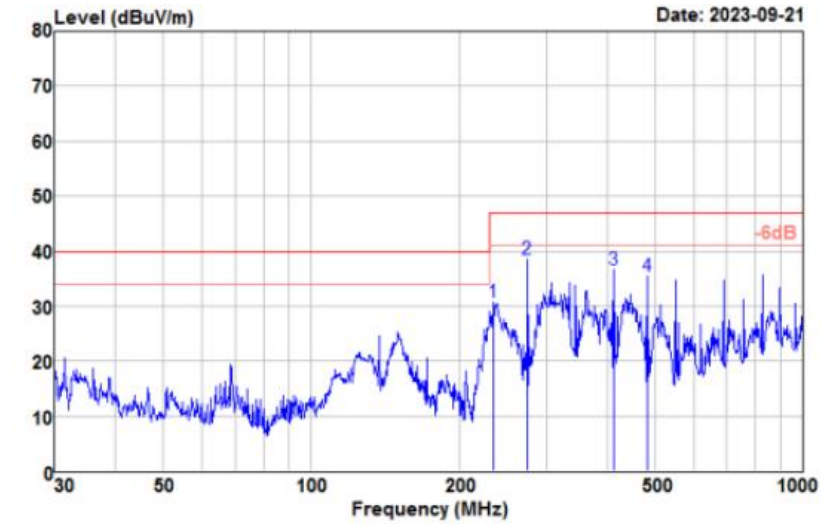
Freq MHz	Reading level dBuV	LISN/ISN factor dB	Cable loss dB	Result level dBuV	Limit level dBuV	Over limit dB	Remark
0.419	33.04	9.60	0.02	42.66	57.46	-14.80	Peak
0.505	39.47	9.60	0.02	49.09	56.00	-6.91	Peak
0.690	31.09	9.61	0.02	40.72	56.00	-15.28	Peak
0.857	31.05	9.61	0.02	40.68	56.00	-15.32	Peak
1.178	30.33	9.61	0.02	39.96	56.00	-16.04	Peak
1.744	28.48	9.61	0.03	38.12	56.00	-17.88	Peak

Remarks: Result Level = Reading level + LISN/ISN factor + Cable loss

3.4 辐射干扰测试 RE test

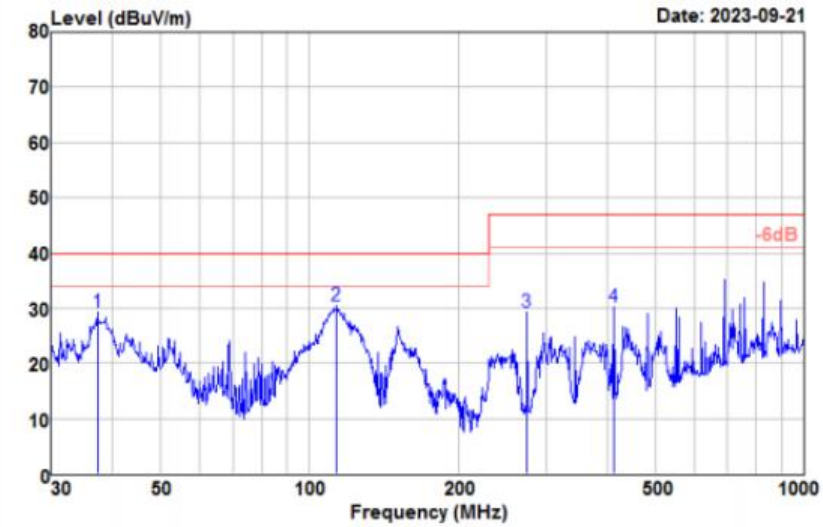
测试项目 Test Item	测试标准 Test Standard	结果 Result
辐射干扰 RE	ClassB-6dB	正常工作 Normal operation

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
234.991	48.63	11.65	2.97	32.66	30.59	47.00	-16.41	Peak
275.157	55.31	12.59	3.28	32.65	38.53	47.00	-8.47	Peak
413.271	50.08	15.40	3.96	32.75	36.69	47.00	-10.31	Peak
482.216	47.28	16.63	4.38	32.82	35.47	47.00	-11.53	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
37.285	46.78	14.00	1.21	32.65	29.34	40.00	-10.66	Peak
113.316	50.12	10.88	2.00	32.66	30.34	40.00	-9.66	Peak
275.157	46.13	12.59	3.28	32.65	29.35	47.00	-17.65	Peak
413.271	43.66	15.40	3.96	32.75	30.27	47.00	-16.73	Peak

迪文科技 DWIN Document

3.5 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 (MHz)	Voltage Level(e.m.f.) (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.

迪文科技 技术文档 DWIN Technology Technical Docum

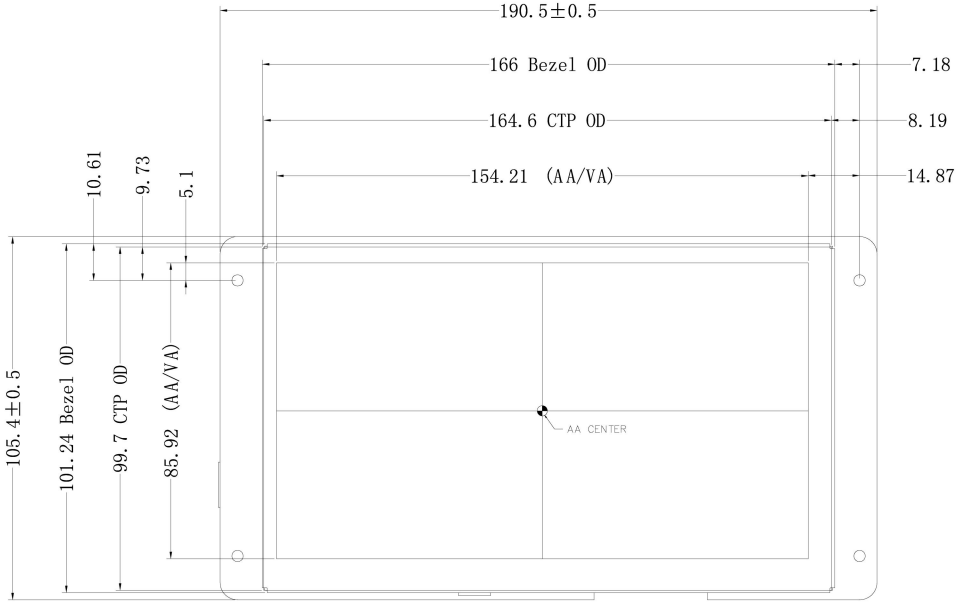
4、包装和物理尺寸 Packaging & dimensions

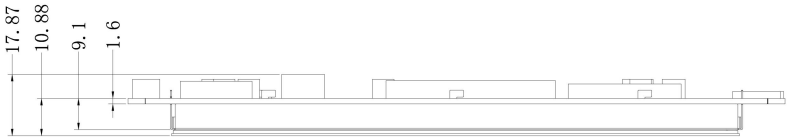
外形尺寸 **Form Factor**	190.50(W) × 105.40(H) ×17.87(T) mm
安装尺寸 **Installation Dimensions**	开孔尺寸：166.00(+0.3mm)×101.24(+0.3mm) Positioning hole: 166.00(+0.3mm)×101.24(+0.3mm)
净重量 **Net Weight**	270g

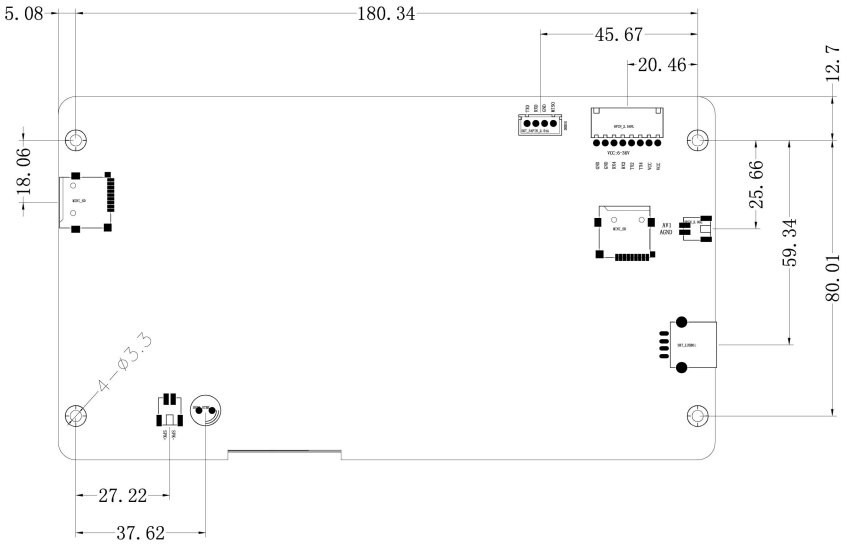
包装标准
Packaging Standards

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：	220(L)×160(W)×47(H)mm	1	1	1
2 号箱 Carton2：	250(L)×200(W)×80 (H)mm	2	1	2
3 号箱 Carton3：	320(L)×270(W)×80 (H)mm	2	2	4
4 号箱 Carton4：	435(L)×335(W)×290(H)mm	-	-	-
5 号箱 Carton5：	600(L)×430(W)×290(H)mm	1	40	40

迪文科技 技术文档 DWIN Technology Technical Document







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

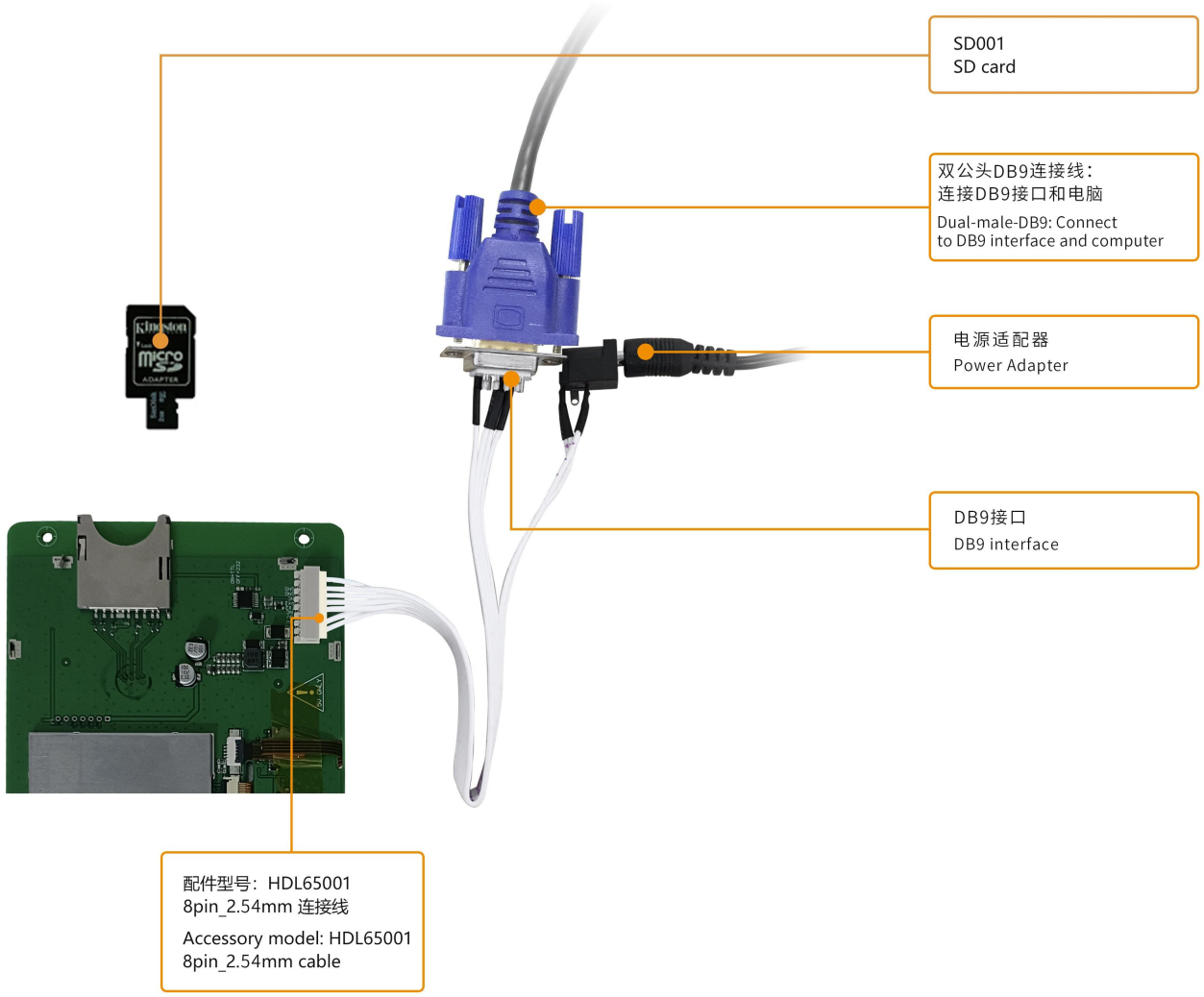
定义 Definition	序号 Pin#	类型 Type	说明 Description
VCC	1,2	P	电源输入 Power Input
TX4	3	O	串口4输出 Output
TX2	4	O	串口2输出 Output
RX2	5	I	串口2输入 Input
RX4	6	I	串口4输入 Input
GND	7,8	P	公共接地 GND

型号 Model	DT322X220034Z240201E					迪文科技 DWIN Technologies
图纸 Drawing	A 4	绘制 Drawn	DWIN	日期 Date	2023.12.19	
比例 Scale	1:1	审核 Review		日期 Date		
单位 Unit	MM	批准 Approval		日期 Date		

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.



迪文科技 技术

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.

.

迪文科技 技术文档 DWIN Technology Technical Document

- 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.

迪文科技 技术文档 DWIN Technology Technical Document

7、修订记录 Revision records

版本 Rev	日期 Revise Date	描述 Content	编辑人 Editor
00	2023-12-25	首次发布 First Edition	郑运佳
01	2024-02-18	变更型号为 DT322X220034Z240201E Change the model to DT322X220034Z240201E	郑运佳
02	2024-04-12	增加页码，增加重要声明 Add page numbers and important disclaimer	孟可
03	2024-05-28	修改功能说明 Modify function description	孟可
04	2024-09-23	修改工作电压 Modify operating voltage	孟可
05	2025-09-17	更新了 CAD 图纸 Updated CAD drawing	孟可

使用本文档或迪文产品过程中如存在任何疑问，或欲了解更多迪文产品最新信息，请及时与我们联络：

Please contact us if you have any questions about the use of this document or our products, or if you would like to know the latest information about our products:

客服电话 Customer service Tel: 400 018 9008

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!

迪文科技 DWIN Technology Technical Document

重要声明

Important Disclaimer

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.

迪文科技 技术文档 DWIN Technology Technical Document