

# TC040C17U00

## 产品特点:

- 基于 T5L0 芯片，运行 DGUS II 系统，超薄线控器。
- 4.0 英寸，480\*480 分辨率，262K 色，IPS 屏，宽视角。
- 全贴合工艺电容触摸屏。
- 带扬声器和 RTC。
- 带三防工艺。
- 支持红外接收、温湿度实时显示、接近传感功能，可拓展离线语音。

## Features:

- Based on T5L0, running DGUS II system, ultra-thin wired controller.
- 4.0-inch, 480\*480 pixels resolution, 262K colors, IPS-TFT-LCD, wide viewing angle.
- OCA bonded capacitive touch screen.
- With speaker and RTC.
- With conformal coating.
- Support infrared reception, temperature and humidity real-time display, proximity sensing function, expandable offline voice.



## 1、硬件及接口说明 Hardware and interface description

序号 No.	名称 Name	说明 Description
1	T5L0 芯片 T5L0 ASIC	迪文自主研发, 2020 年量产, 1MBytes 片内 Nor Flash, 其中 512KBytes 用于存储用户数据库, 擦写次数>100,000 次 Developed by DWIN. Mass production in 2020, 1MBytes Nor Flash on the chip, 512KBytes used to store the user database. Rewrite cycle: over 100,000 times
2	COF 屏接口 COF interface	FPC40_0.5mm FPC40_0.5mm
3	用户接口 User interface	用于供电和串口通讯, 4Pin_2.0mm 座子。串口下载速率(典型值): 12KByte/s 4Pin_2.0mm socket for power supply and serial communication. Download rate(typical value): 12KByte/s
4	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
5	扬声器 Speaker	内置扬声器, 8Ω1W Built-in Speaker, 8Ω1W
6	SD 卡接口 SD interface	FAT32 格式, 下载文件, 文件可在屏幕统计显示, 下载速率: 4Mb/s FAT32. Download files by SD interface can be displayed in statistics. Download rate: 4Mb/s
7	RTC	法拉电容供电, 精度: ±20ppm @25°C。掉电后可维持 7 天正常工作 Super-capacitor for power supply. Accuracy: ±20ppm @25°C. It can work normally for 7 days after power failure

## 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	480×480 (支持 0°/90°/180°/270°显示模式) 480×480 pixels (0°/90°/180°/270°)
色彩 Color	18 位 6R6G6B 18-bit 6R6G6B
AA 区 Active Area (A.A.)	71.9mm (W)×68.0mm (H)
背光模式 Backlight Mode	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)
背光亮度 Brightness	250nit
背光调节 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: 超过 30 分钟长时间显示高对比度静止画面可能导致显示残影, 请增加屏保避免该问题。 Note: Long time display of high contrast still image over 30 minutes may lead to display residual shadow, please use screen saver to avoid this problem.	

### 2.2 触摸参数 Touch parameters

触摸屏类型 Type	电容式触摸面板 CTP (Capacitive touch panel)
触摸屏结构 Structure	G+G 结构, 表面盖板为钢化玻璃 G+G structure with surface cover of tempered glass
触摸方式 Touch Mode	单点触摸, 支持连续滑动触摸 Support point touch and drag
表面硬度 Surface Hardness	6H
透光率 Light Transmittance	90%以上 Over 90%
触控次数 Life	>1,000,000 次 Over 1,000,000 times touch

## 2.3 串口参数 Serial interface parameters

串口模式 Mode	RS485				
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	2.5	5.0	-	V
	Output 0	-	-5.0	-2.5	V
	Input 1	0	2.5	-	V
	Input 0	-	-2.5	-0.2	V
串口波特率 Baud Rate	3150~921600bps, 典型值: 115200bps 3150~921600bps, typical value of 115200bps				
数据格式 Data Format	N81				
接口排线 Interface Cable	4Pin_2.0mm				

## 2.4 电气规格 Electrical specifications

额定功率 Rated Power	<5W	
工作电压 Operating Voltage	6~36V, 典型值 12V 6~36V, typical value of 12V	
工作电流 Operating Current	190mA	VCC=12V, 背光亮度最大 VCC=12V, max backlight
	80mA	VCC=12V, 背光关闭 VCC=12V, backlight off
推荐工作电源: 12V 0.5A 的直流稳压电源 Recommended power supply: 12V 0.5A DC		

## 2.5 工作环境 Operating environment

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

### 3、可靠性测试 Reliability test

测试项目 Test Item	测试级别 Test Level	结果 Result
传导骚扰测试 CE	Class B	正常工作 Normal performance
辐射骚扰测试 RE	Class A	正常工作 Normal performance
传导骚扰抗扰度 CS	10Vrms 0.15MHz-80MHz 80% AM at 1kHz	正常工作 Normal performance
浪涌 Surge	±1kV (AC)	正常工作 Normal performance
静电放电抗扰度 ESD	空气±8kV Air discharge ±8kV	正常工作 Normal performance
电快速瞬变脉冲群抗扰度 EFT	±2kV (AC)	正常工作 Normal performance

## 4、包装和物理尺寸 Packaging & dimensions

### 4.1 物理尺寸 Dimensions

外形尺寸 Form Factor	86.0mm(W)×87.2mm (H)×16.9(T)mm
净重量 Net Weight	105g

### 4.2 包装 Packaging

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)	-	-	-
2 号箱 Carton2:	250mm(L)×200mm(W)×80mm(H)	-	-	-
3 号箱 Carton3:	320mm(L)×270mm(W)×80mm(H)	-	-	-
4 号箱 Carton4:	435mm(L)×335mm(W)×290mm(H)	2	10	20
5 号箱 Carton5:	600mm(L)×430mm(W)×290mm(H)	2	20	40

### 4.3 箱内物品 Included Items

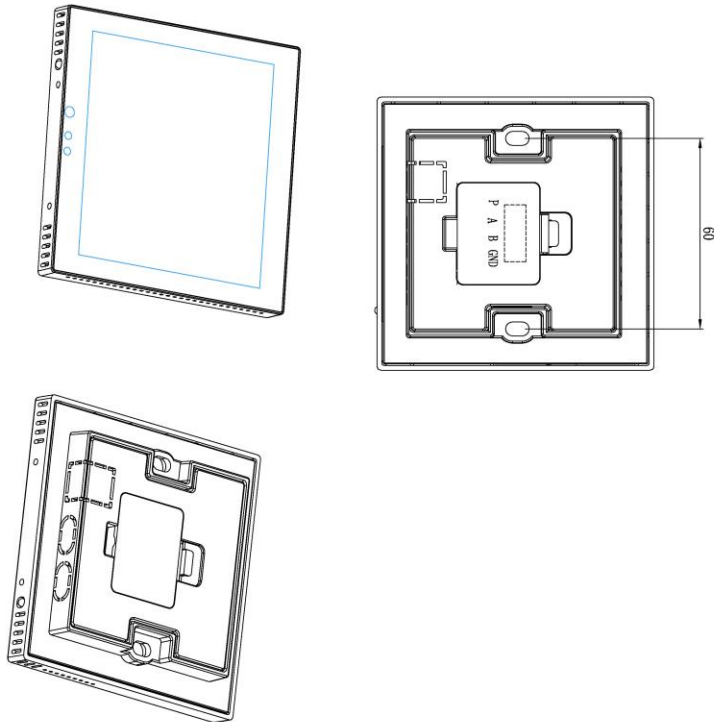
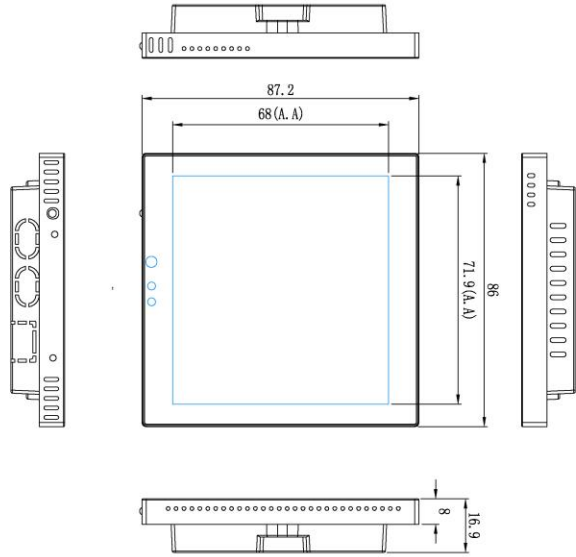
物品 Item	规格 Specification	数量 Quantity
线控器	TC040C17U00	1
连接线	HDL65071 双 4pin 2.0 间距插头, 同侧线, 50CM	1
圆头螺丝	M4*25mm	2

声明: 产品设计改善或变更, 不单独另行通知。

Disclaimer: The product design is subject to alternation and improvement without prior

notice.

名称 Name	定义 Pin#	类型 Type	说明 Description
P	1	P	电源输入 /Power Input
A	2	485+	迪文屏485+
B	3	485-	迪文屏485-
GND	4	P	公共接地/GND

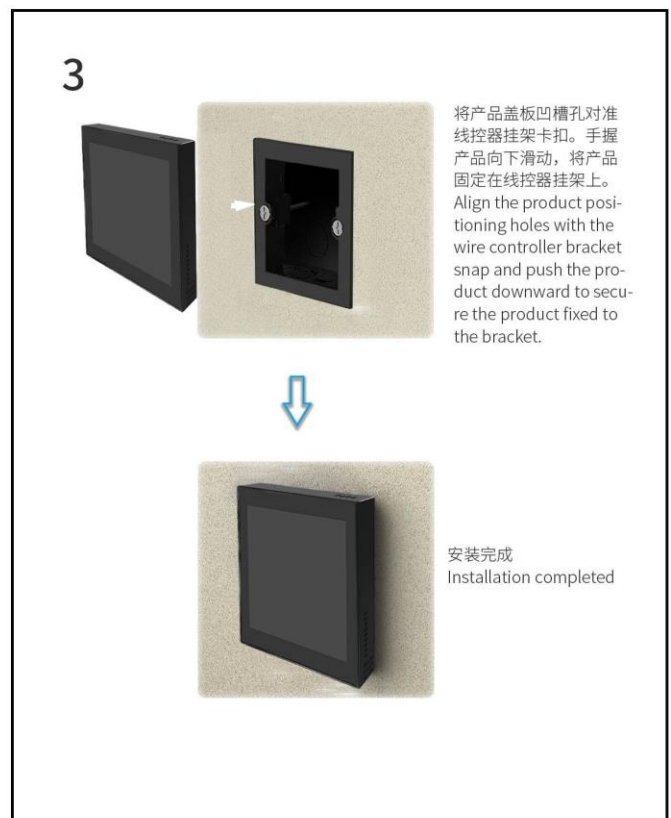
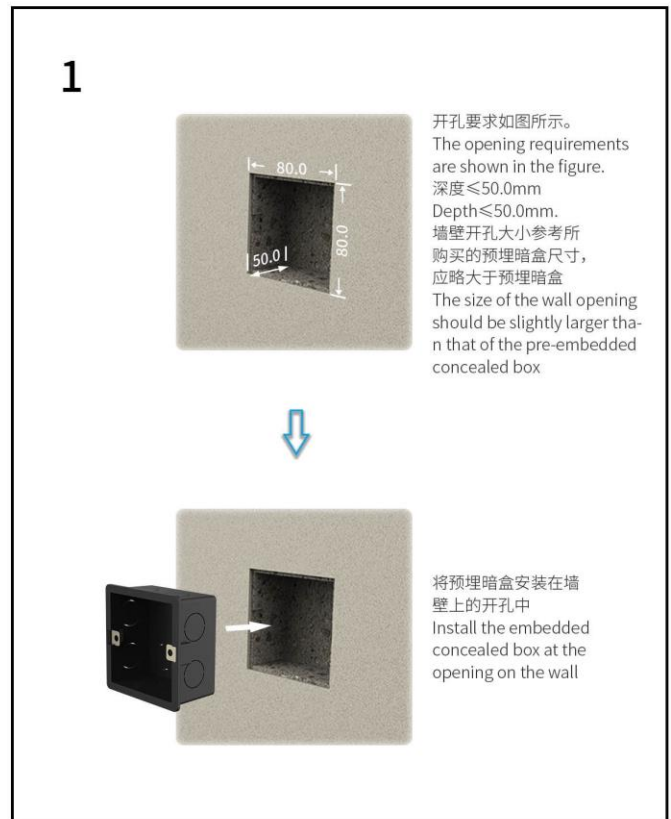
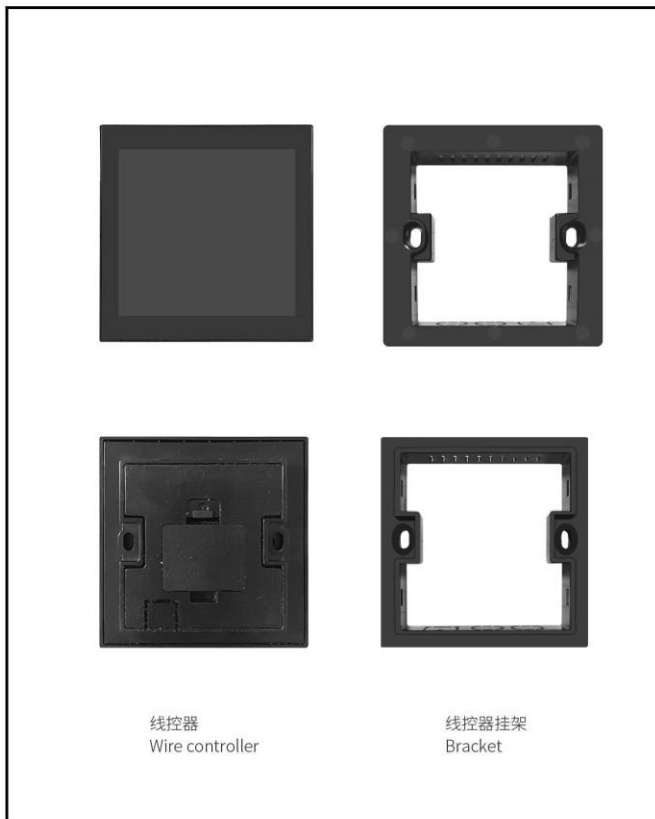


1. 尺寸定位基准为定位孔  
Location hole is used as position reference.
  2. 未标注公差为 $\pm 0.3\text{mm}$   
Unmarked Tolerance is  $\pm 0.3\text{mm}$
- 注：虚线标注为有效显示区域  
Active area is marked in Dash Lines

型号	TC040C17U00		
图纸	A 4	图纸	DWIN
比例		审核	日期
单位	MM	批准	日期

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DWIN Technology Co., Ltd

## 安装示意图 / Installation Schematic





## 5、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)  $-40^{\circ}\text{C}$  ~  $+85^{\circ}\text{C}$  工作温度范围 (可定制  $-55^{\circ}\text{C}$  ~  $105^{\circ}\text{C}$  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.**

## 6、修订记录 Revision records

版本 Rev	日期 Revise Date	描述 Content	编辑人 Editor
00	2023-12-12	首次发布 First Edition	陈律志

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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!