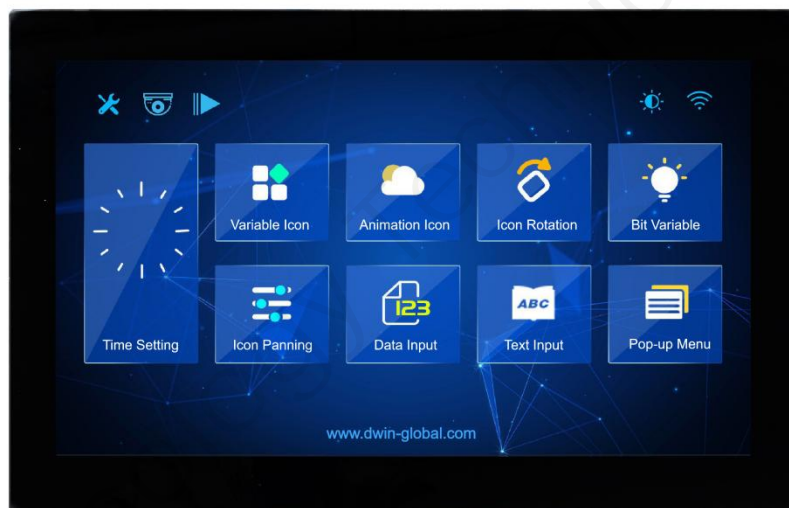


# DMG19108K156\_05WTC

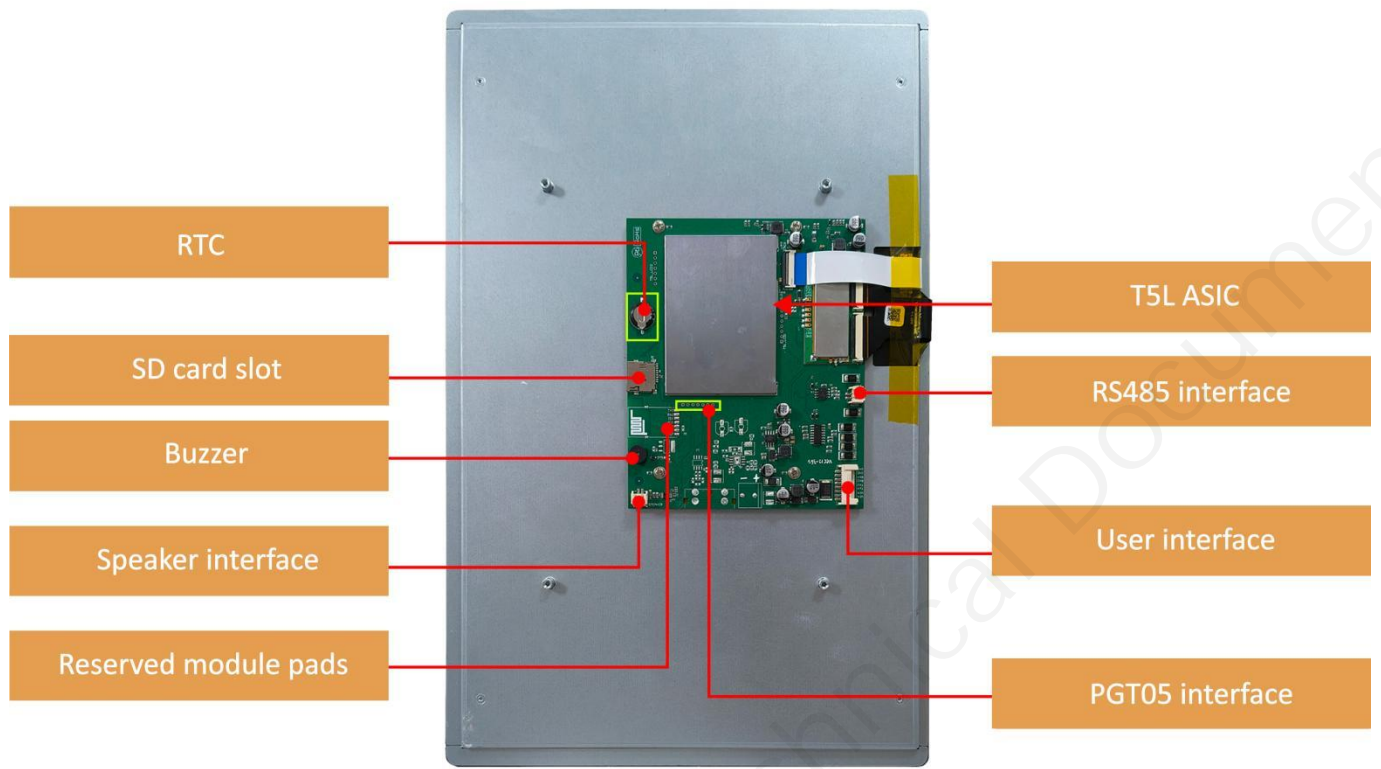
## Features:

- Based on the T5L2 ASIC CPU, running the DGUS II human-machine interaction software platform, smart LCM for medical-grade applications.
- 15.6-inch, 1920\*1080 pixels, 16.7 M colors true-color display, IPS LCD screen.
- High-reliability capacitive touch panel suitable for medical environments.
- With onboard buzzer, RTC and speaker interface.



# 1. Hardware and interface

## 1.1 Hardware interface



Hardware interface

## 1.2 Hardware and interface description

No.	Name	Description
1	T5L2 ASIC*3	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	User interface	8Pin_2.0mm socket for power supply and serial communication. Download rate(typical value): 12KByte/s
3	RS485 interface	2Pin_2.0mm horizontal socket: For RS485 communication
4	Flash	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
5	Expand Flash pads	Two expansion slots are available, supporting expansion of NOR Flash and NAND Flash. The maximum expansion for NOR Flash is up to 64Mbytes. When combining NOR Flash and NAND Flash, the maximum expansion is up to 48Mbytes (using one expansion slots) + 512Mbytes
6	RTC	Super-capacitor for power supply. Accuracy: $\pm 20\text{ppm}$ @25°C. It can work normally for 7 days after power failure
7	Buzzer	3V passive buzzer. Power: <1W
8	Speaker interface	2Pin_2.0mm socket, external speaker
9	SD card slot	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
10	Reserved module interface	Supports soldering of WI-FI module and USB download module. WI-FI module model: WI-FI-10; USB module models: HDL702, HDL703
11	PGT05 interface	Used for reprogramming the underlying DGUS firmware

## 2. Specification parameters

### 2.1 Display parameters

<b>LCD Type</b>	IPS process TFT display screen
<b>Viewing Angle</b>	Wide viewing angle (typical values are 85°/85°/85°/85°), high contrast, and good color reproduction
<b>Resolution</b>	1920×1080 pixels (0°/90°/180°/270°)
<b>Color</b>	16.7M color (24-bit 8R8G8B)
<b>Active Area (A.A.)</b>	343.16mm (W)×192.60mm (H)
<b>View Area (V.A.)</b>	342.16mm (W)×191.59mm (H)
<b>Interface</b>	eDP
<b>Backlight Mode</b>	LED
<b>Backlight Service Life</b>	>20000 hours (Time of the brightness decaying to 50% on the condition of continuous working with the maximum brightness)
<b>Brightness</b>	200nit
<b>Brightness Control</b>	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)
<b>Note:</b> You can use dynamic screen saver wallpapers to avoid afterimages caused by fixed page display for a long time.	

### 2.2 Touch parameters

<b>Type</b>	CTP (Capacitive touch panel)
<b>Structure</b>	G+FF/G+G structure is compatible, and the surface cover is tempered glass
<b>Touch Mode</b>	Single point touch and support continuous sliding touch
<b>Surface Hardness</b>	≥6H
<b>Light Transmittance</b>	>85%
<b>Life</b>	>20,000H

### 2.3 Serial interface parameters

<b>Mode</b>	UART2: RS232 UART4: RS232 (Only available after OS configuration) UART5: RS485 (Only available after OS configuration)				
<b>UART2,4 Voltage Level</b>	Test Condition	Min	Typ	Max	Unit
	Output 1	2.5	5.0	-	V
	Output 0	-	-5.0	-2.5	V
	Input 1	-15.0	-5.0	-	V
	Input 0	-	5.0	15.0	V
<b>UART2,4 Baud Rate</b>	3150~3225600bps, typical value of 115200bps				
<b>UART5 Voltage Level</b>	Test Condition	Min	Typ	Max	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
<b>UART5 Baud Rate</b>	3150~921600bps, typical value of 115200bps				
<b>Data Format</b>	UART2: N81 UART4: N81/E81/O81/N82; 4 modes (OS configuration) UART5: N81/E81/O81/N82; 4 modes (OS configuration)				
<b>Interface Cable</b>	8Pin_2.0mm (RS232) 2Pin_2.0mm (RS485)				

## 2.4 Electrical specifications

<b>Rated Power</b>	<8W	
<b>Operating Voltage</b>	12~36V, typical value of 12V	
<b>Operating Current</b>	620mA	VCC=12V, max backlight
	180mA	VCC=12V, backlight off
<b>Recommended power supply: 12V 1A DC</b>		

## 2.5 Operating environment

<b>Operating Temperature</b>	-10°C~60°C (12V @ 60% RH)
<b>Storage Temperature</b>	-20°C~60°C
<b>Operating Humidity</b>	10%~90%RH, typical value of 60% RH
<b>Conformal Coating</b>	Yes
<b>Aging Test</b>	72 hours high temperature charged aging

### 3. Reliability test

#### 3.1 Electrostatic discharge test

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

Test process: Place the product on the testing fixture of the test bench (fixture height approximately 15cm), and conduct contact discharge and air discharge tests on the smart screen, 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
Screen	A	A	A	A	A	A	A	A
/	/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/	/

Table 2: Electrostatic Discharge Immunity (Direct Contact)

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

### 3.2 EFT test

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

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 17626.2 B level and above.

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

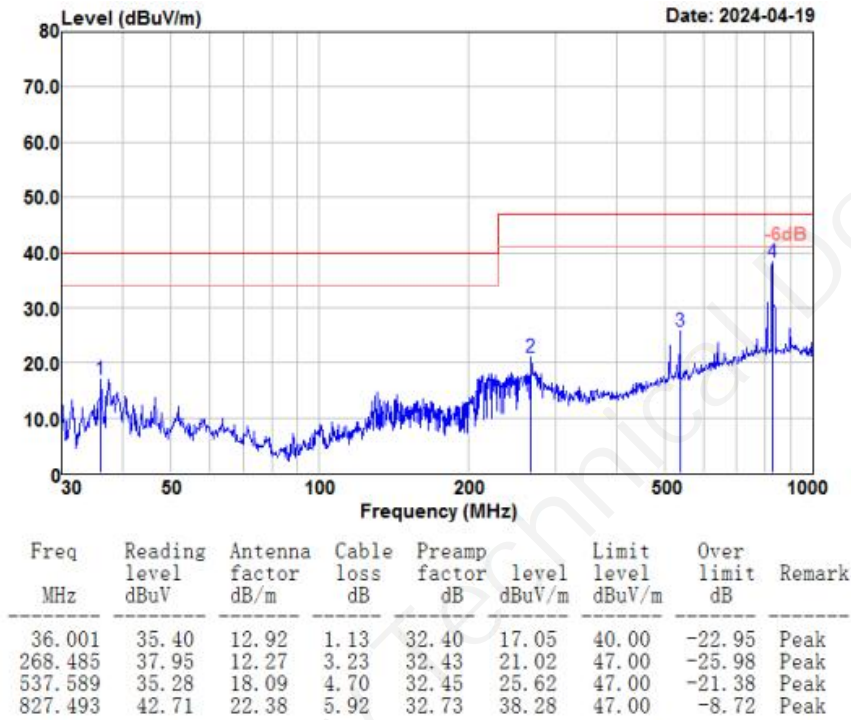
Test Points		Test Levels(kV)							
		-0.5	+0.5	-1.0	+1.0	-2.0	+2.0	-4.0	+4.0
DL Power ports	L					△	△		
	N					△	△		
	Earth	/	/	/	/	/	/	/	/
	L+N					△	△		
	L + Earth	/	/	/	/	/	/	/	/
	N + Earth	/	/	/	/	/	/	/	/
	L+N+Earth	/	/	/	/	/	/	/	/
Signal ports	___/___	/	/	/	/	/	/	/	/



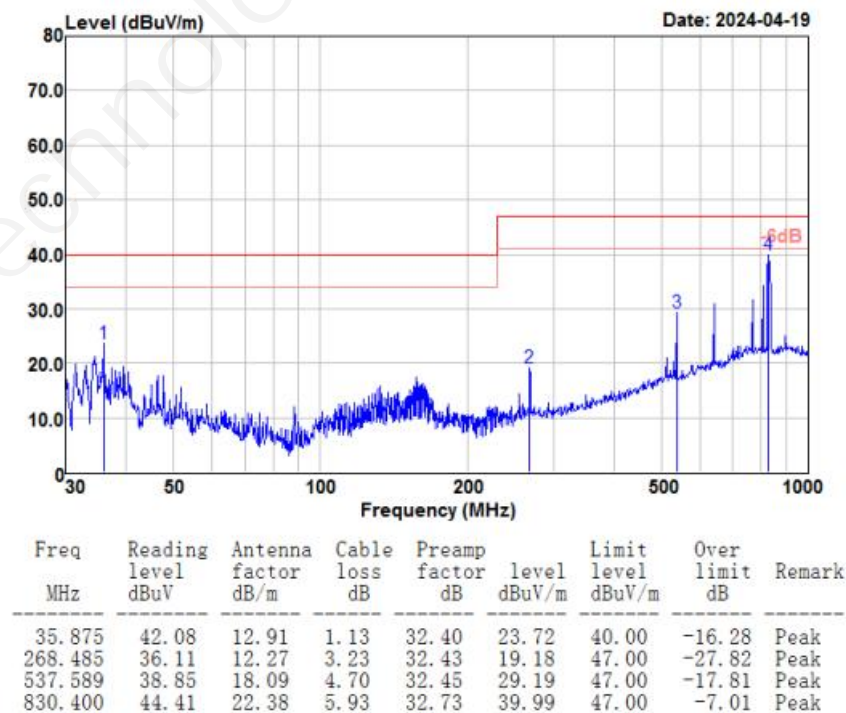
### 3.3 RE test

Test Item	Test Standard	Result
RE	ClassB-6dB	Normal operation

#### HORIZONTAL



#### VERTICAL



### 3.4 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
DC Power Cable	0.15~80	/	/

### 3.5 SURGE test

Test standard :  EN 61000-4-5:2014+A1:2017  IEC 61000-4-5:2014+A1:2017  GB/T 17626.5-2019

Other:

Table 1: DL mains power input port

Level	Voltage	Polarity	Path	Result
1	0.5kV	±		
2	1kV	±	Positive to negative	/
3	2kV	±	/	/
4	4kV	±	/	/

Table 2: \_\_\_\_\_ I/O Circuit and Lines

Level	Voltage	Polarity	Path	Result
1	0.5kV	±	Line-Ground	/
2	1kV	±	Line-Ground	/
3	2kV	±	Line-Ground	/
4	4kV	±	Line-Ground	/

### 3.6 RS test

Test standard :  EN 61000-4-3:2006+A1:2008+A2:2010  IEC 61000-4-3:2006+A1:2007+A2:2010

GB/T 17626.3-2016  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:

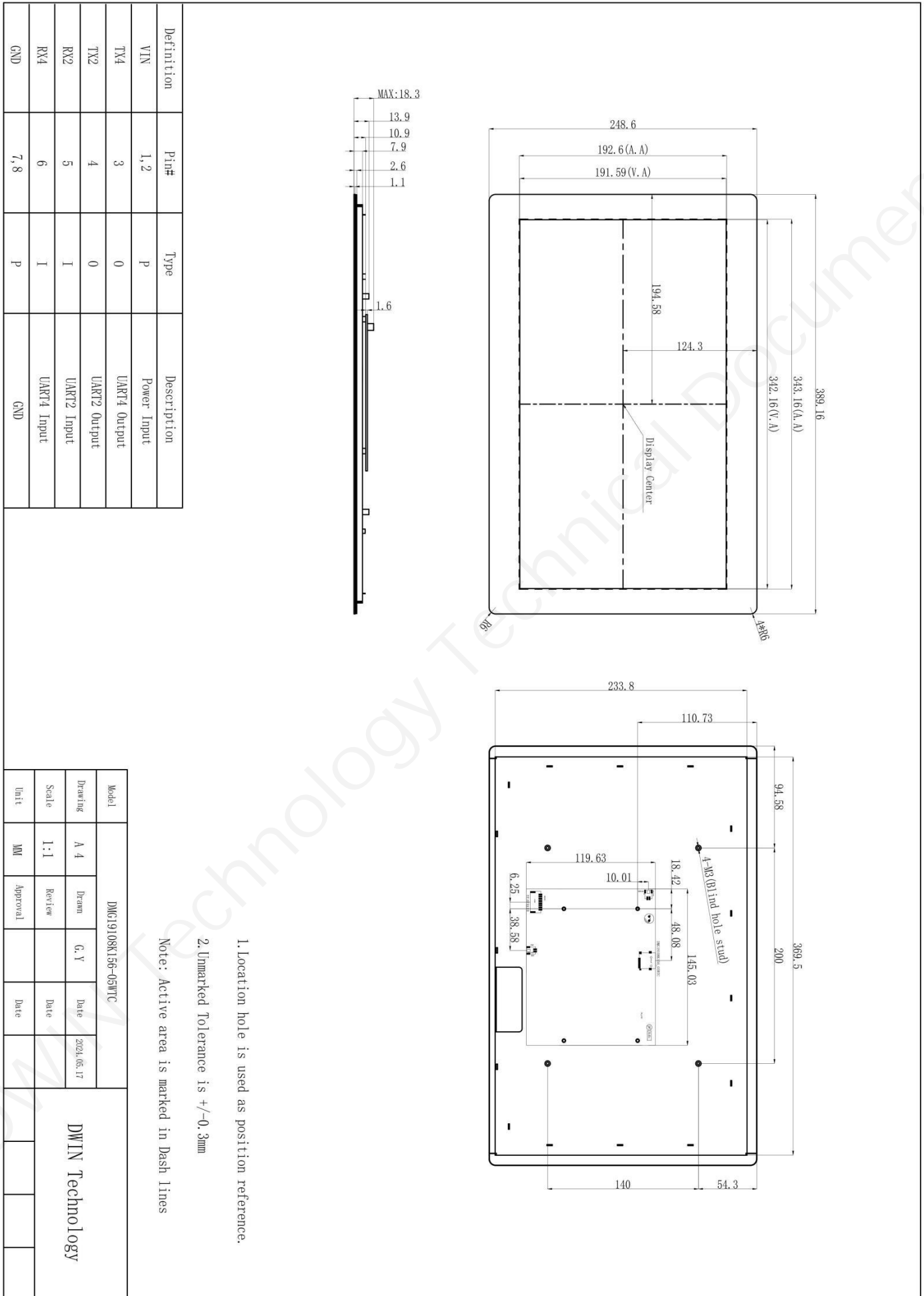
Frequency range (MHz)	Field strength (V/m)	Front side		Rear side		Left side		Right side	
		VER	HOR	VER	HOR	VER	HOR	VER	HOR
80-1000	10	A	A	A	A	A	A	A	A
1400-3000	3	A	A	A	A	A	A	A	A

#### 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.

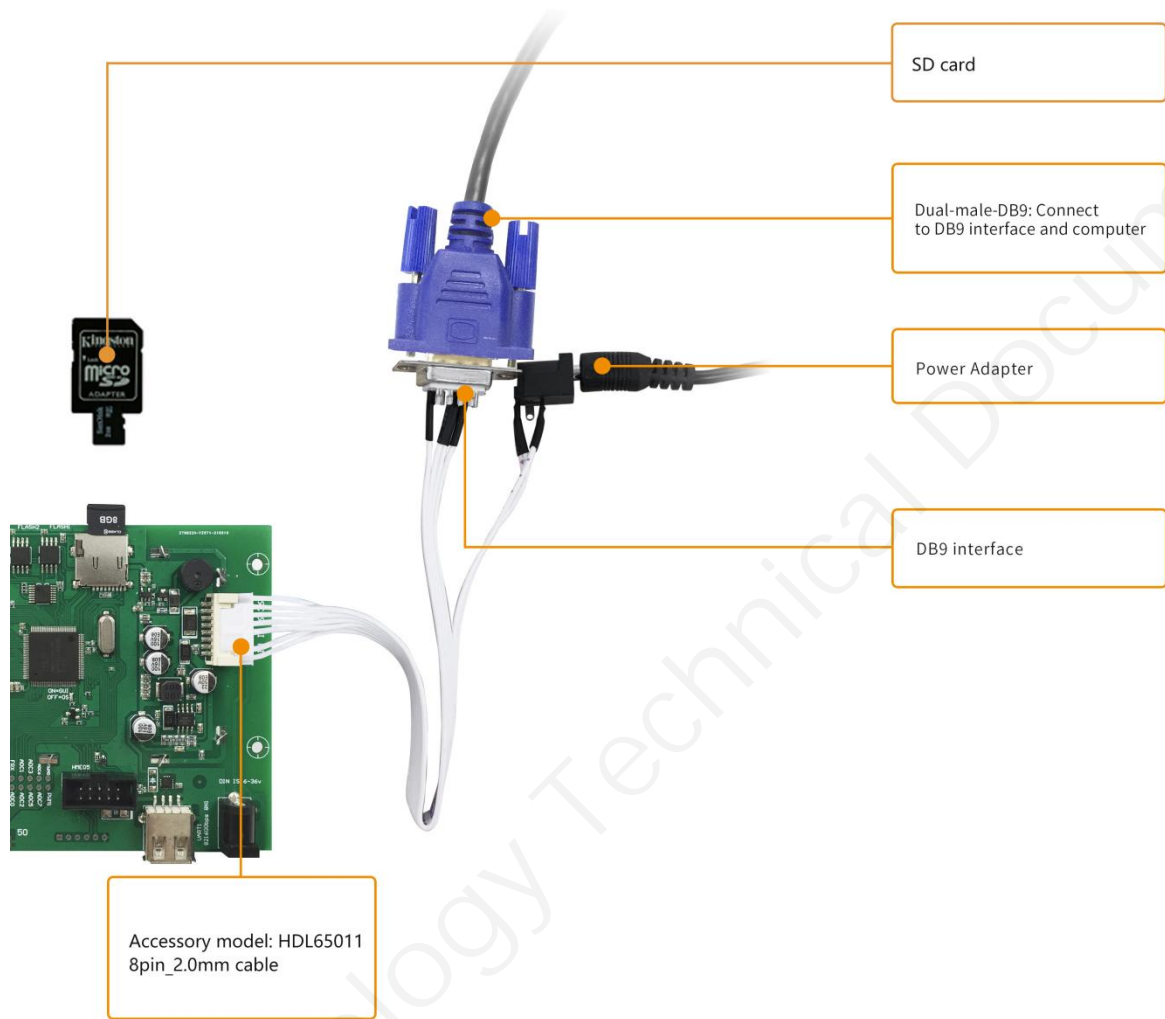
#### 4. Packaging & dimensions

<b>Form Factor</b>	389.16mm (W)×248.60mm (H)×18.30mm (T)			
<b>Net Weight</b>	1780g			
Packaging Standards				
<b>Model</b>	<b>Dimensions</b>	<b>Layer</b>	<b>Quantity/Layer</b>	<b>Quantity(Pcs)</b>
Carton1:	525mm(L)×330mm(W)×80mm (H)	1	1	1
Carton1:	570mm(L)×340mm(W)×385mm (H)	1	5	5



## 5. Debugging tools

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 series IC features

- (1) 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) Separate GUI CPU Core running DGUS II System:
  - High-speed display memory, 2.4GB/S bandwidth.
  - 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.
  - Images and icons stored in JPEG format. Adopt Low-cost 16Mbytes SPI Flash.
  - Support CTP or RTP with adjustable sensitivity and maximum 400 Hz touch frequency.
  - 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 variable storage space for exchanging data with OS CPU Core and memory.
  - Support DGUS development and simulation on PC. Support background remote upgrade.
- (3) Separate CPU (OS CPU) core runs user 8051 code or DWIN OS system and user CPU is omitted in practical application:
  - Standard 8051 architecture and instruction set, 64Kbytes code space, 32Kbytes on-chip RAM.
  - 64 bit integer mathematical operation unit (MDU), including 64 bit MAC and 64 bit divider.
  - 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.
  - Support IAP on-line simulation and debugging with unlimited number of breakpoints.
  - Upgrade code online through DGUS system.
- (4) 1Mbytes on-chip Flash with DWIN patent encryption technology ensure code and data security.
- (5) Operating temperature ranges from -40°C to +85°C(IC operating temperature customizable from -55°C to 105°C).

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

## 7. Revision records

Rev	Revise Date	Content	Editor
00	2024-05-22	First Edition	Xu Ying

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:

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- DWIN Developer Forum: <https://forums.dwin-global.com/>

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



## Important Disclaimer

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.