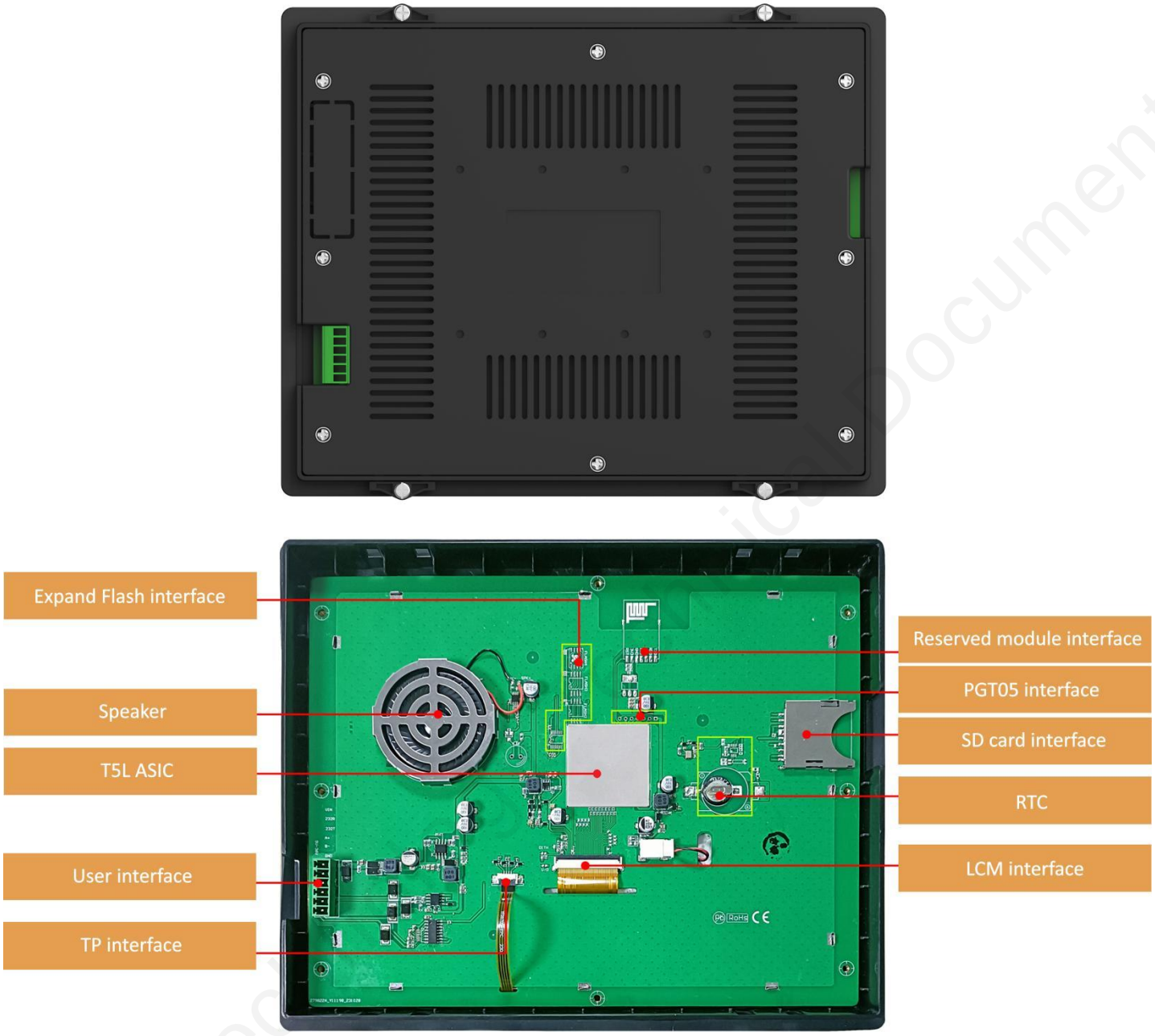
DMG10768T097_15WTR

Features:

- **Based on T5L2, running DGUS II system, industrial grade.**
- **9.7-inch, 1024*768 pixels resolution, 16.7M colors, TN TFT display.**
- **With built-in speaker, built-in RTC.**
- **With conformal coating, with enclosure.**

1.Hardware and interface

1.1 Hardware interface



Hardware interface

1.2 Hardware and interface description

No.	Name	Description
1	T5L2 ASIC	Developed by DWIN. Mass production in 2019,1MBytes Nor Flash on the chip, 512KBytes used to store the user database. Rewrite cycle: over 100,000 times
2	LCM interface	FPC50_0.5mm, RGB interface
3	RTP interface	4Pin_1.0mm interface
4	User interface	6Pin_3.81mm socket for power supply and serial communication. Download rate(typical value): 12KByte/s
5	Flash	16MBytes NOR Flash, for fonts, pictures and audio files. Rewrite cycle: over 100,000 times
6	Expand Flash	Expandable to 64Mbytes NOR Flash or 48Mbytes NOR Flash+512Mbytes NAND Flash.When expanding Flash, components such as decoders and capacitors need to be soldered. Please consult the corresponding salesperson for relevant customization.
7	Speaker	Onboard speaker. Power: 2W
8	RTC	Super-capacitor for power supply. Accuracy: ±20ppm @25℃. It can work normally for 7 days after power failure
9	SD card interface	FAT32. Download files by SD interface can be displayed in statistics. Download rate: 4Mbit/s
10	Reserved module interface	Wi-Fi module: connect to the cloud platform to update remotely USB module: download files by USB flash disk
11	PGT05 interface	When product crashes by accident, you can use PGT05 to update DGUS kernel and make the product return to normal

2.Specification parameters

2.1 Display parameters

LCD Type	TN, TFT LCD
Viewing Angle	Normal viewing angle, 70°/70°/50°/70°（L/R/U/D）
Resolution	1024×768 pixels (support 0°/90°/180°/270°)
Color	24-bit 8R8G8B
Active Area (A.A.)	196.6mm (W) ×147.5mm (H)
Backlight Mode	LED
Backlight Service Life	>30000 hours (Time of the brightness decaying to 50% on the condition of continuous working with the maximum brightness)
Brightness	200nit
Brightness Control	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)
Note:You can use dynamic screen saver wallpapers to avoid afterimages caused by fixed page display for a long time.	

2.2 Touch parameters

Type	Four-wire RTP (Resistive touch panel)
Structure	ITO film + ITO glass
Touch Mode	Single touch, support continuous sliding touch
Surface Hardness	3H
Light Transmittance	Over 80%
Life	Over 1,000,000 times touch

2.3 Serial interface parameters

Mode	UART2: RS232 UART4: RS485 (Only available after OS configuration)				
UART2 Voltage Level	Test Condition	Min	Typ	Max	Unit
	Output 1	-	-5.0	-3.0	V
	Output 0	3.0	5.0	-	V
	Input 1	-15.0	-5.0	-	V
	Input 0	-	5.0	15.0	V
UART2 Baud Rate	3150~3225600bps, typical value of 115200bps				
UATR4 Voltage Level	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
UART4 Baud Rate	3150~921600bps, typical value of 115200bps				
Data Format	UART2: N81 UART4: N81/E81/O81/N82 , 4 modes (OS configuration)				
Interface table	6Pin_3.81mm Socket				

2.4 Electrical specifications

Rated Power	<10W	
Operating Voltage	9~36V, typical value of 12V	
Operating Current	420mA	VCC=12V, max backlight
	150mA	VCC=12V, backlight off
Recommended power supply: 12V 1A DC		

2.5 Operating environment

Operating Temperature	-20℃~70℃ (12V @ 60% RH)
Storage Temperature	-30℃~80℃
Conformal Coating	Yes
Operating Humidity	10%~90%RH, typical value of 60% RH
Protective Level	IP65 (Front)

3.Reliability test

3.1 Electrostatic discharge test

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

■ 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	\	\
/	/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/	/

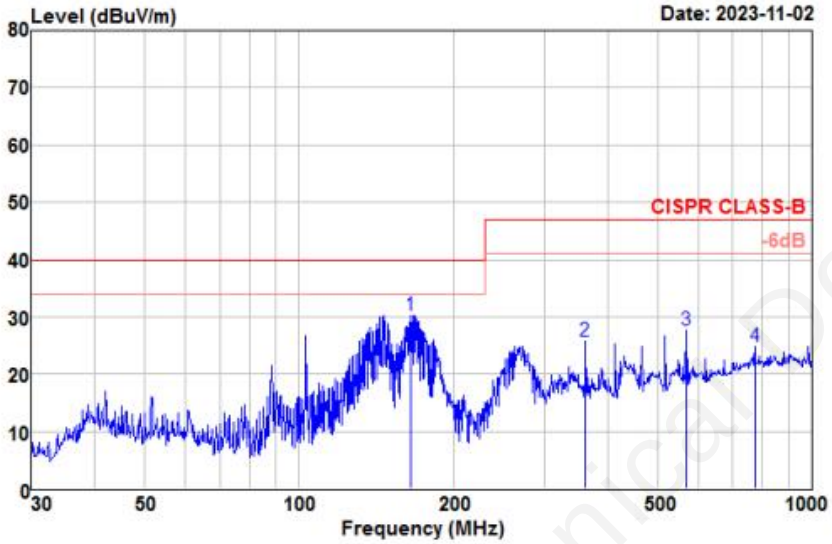
Table 2: Electrostatic Discharge Immunity (Direct Contact)

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

3.2 RE test

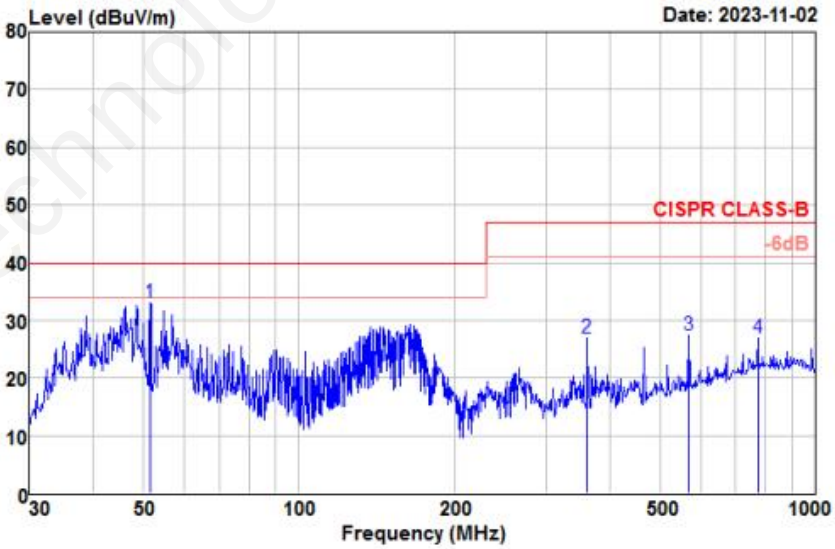
Test Item	Test Standard	Result
RE	Class B	Normal operation

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
164.908	47.13	13.19	2.47	32.50	30.29	40.00	-9.71	Peak
361.714	40.09	14.65	3.68	32.59	25.83	47.00	-21.17	Peak
568.613	36.41	18.97	4.88	32.57	27.69	47.00	-19.31	Peak
774.158	29.62	22.19	5.66	32.60	24.87	47.00	-22.13	Peak

VERTICAL

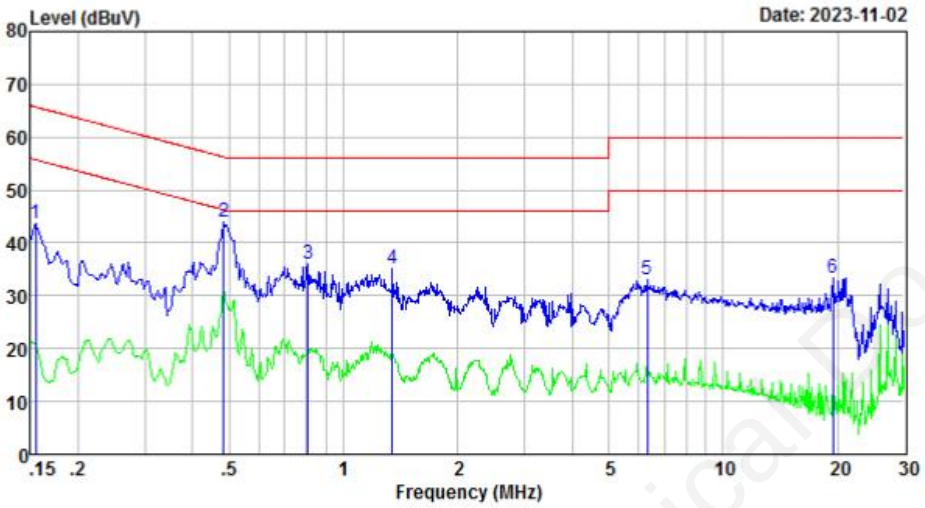


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
51.481	50.29	13.76	1.32	32.40	32.97	40.00	-7.03	Peak
361.714	41.17	14.65	3.68	32.59	26.91	47.00	-20.09	Peak
568.613	36.08	18.97	4.88	32.57	27.36	47.00	-19.64	Peak
774.158	31.60	22.19	5.66	32.60	26.85	47.00	-20.15	Peak

3.3 CE test

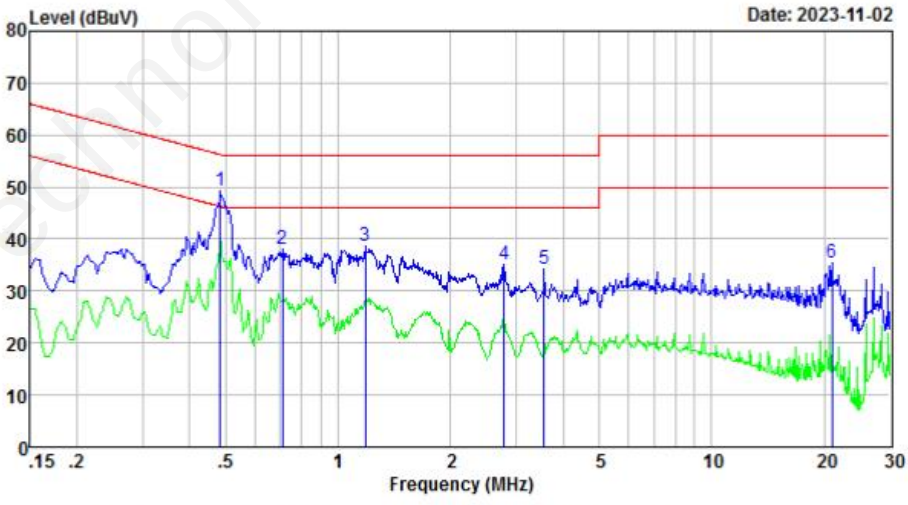
Test Item	Test Standard	Result
CE	Class B	Normal operation

LINE



Freq MHz	Reading level dBuV	LISN/ISN factor dB	Cable loss dB	Result level dBuV	Limit level dBuV	Over limit dB	Remark
0.155	34.15	9.57	0.01	43.73	65.74	-22.01	Peak
0.484	34.36	9.60	0.02	43.98	56.27	-12.29	Peak
0.804	26.40	9.61	0.02	36.03	56.00	-19.97	Peak
1.345	25.44	9.60	0.03	35.07	56.00	-20.93	Peak
6.319	23.27	9.73	0.06	33.06	60.00	-26.94	Peak
19.428	23.45	9.92	0.11	33.48	60.00	-26.52	Peak

NEUTRAL



Freq MHz	Reading level dBuV	LISN/ISN factor dB	Cable loss dB	Result level dBuV	Limit level dBuV	Over limit dB	Remark
0.484	39.75	9.60	0.02	49.37	56.27	-6.90	Peak
0.708	28.51	9.61	0.02	38.14	56.00	-17.86	Peak
1.184	29.13	9.61	0.02	38.76	56.00	-17.24	Peak
2.779	25.39	9.63	0.04	35.06	56.00	-20.94	Peak
3.565	24.40	9.65	0.05	34.10	56.00	-21.90	Peak
21.035	25.18	10.00	0.12	35.30	60.00	-24.70	Peak

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
RC 耦合	0.15~80	10	1

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

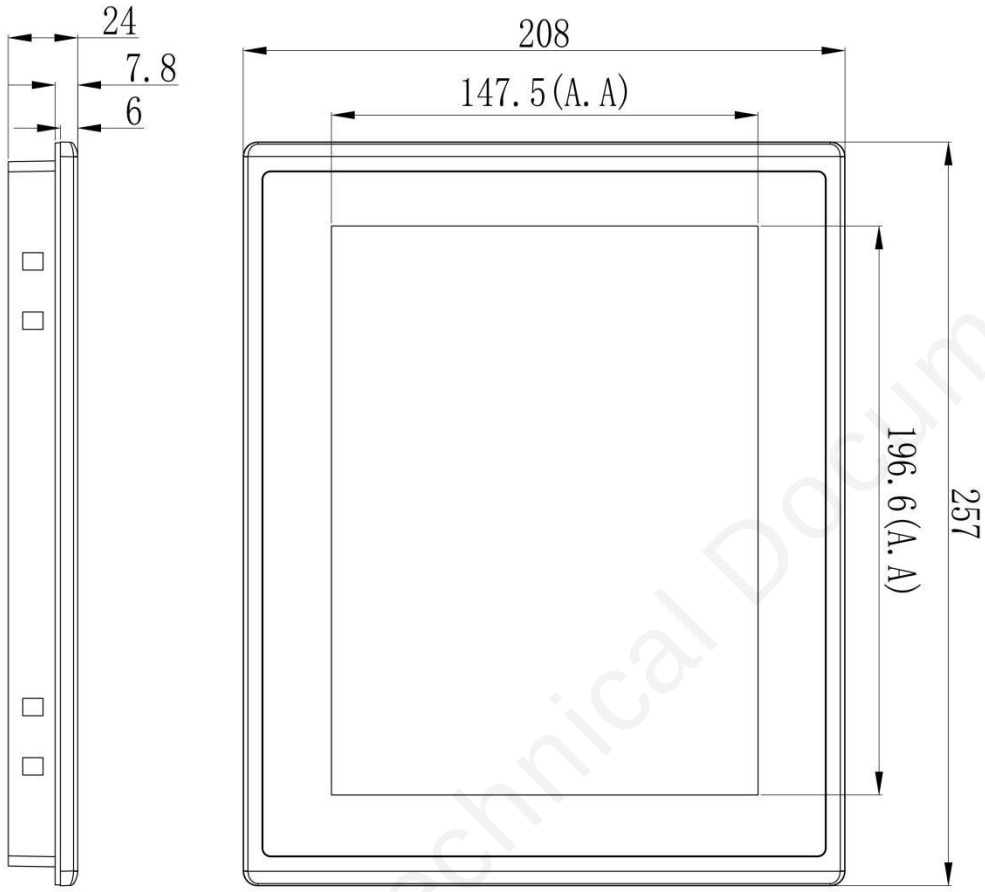
Form Factor	257.0mm (W)×208.0mm (H)×24.0mm (T)
Net Weight	815g

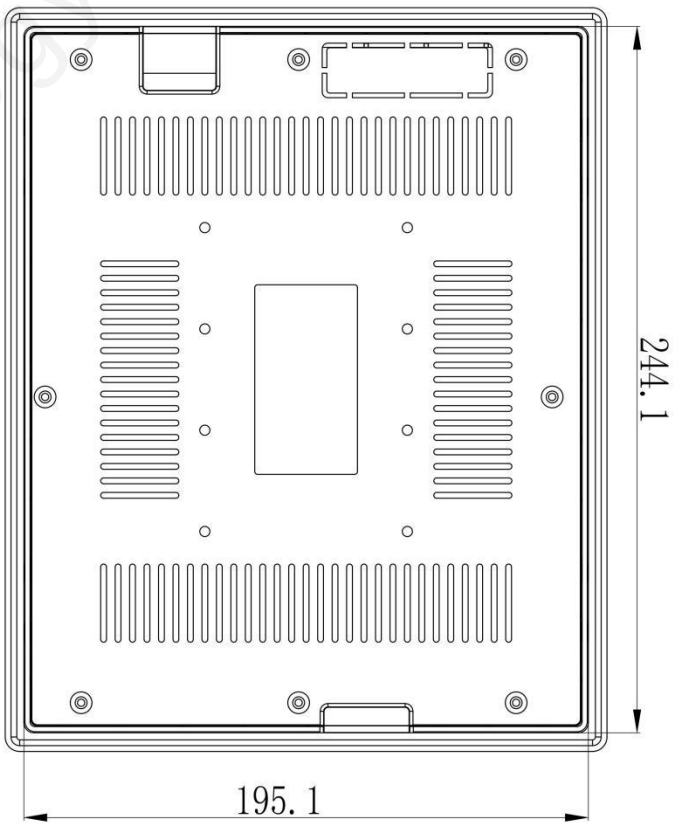
Packaging Standards

Model	Dimensions	Layer	Quantity/Layer	Quantity(Pcs)
Carton1：	220mm(L)×160mm(W)×47mm (H)	-	-	-
Carton2：	250mm(L)×200mm(W)×80mm (H)	-	-	-
Carton3：	320mm(L)×270mm(W)×80mm (H)	1	2	2
Carton4：	450mm(L)×350mm(W)×300mm(H)	2	5	10
Carton5：	600mm(L)×450mm(W)×300mm(H)	2	8	16

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

Definition	Pin#	Type	Description
VIN	1	P	Power Input
RXD	2	O	Input
TXD	3	I	Output
A	4	A+	485+
B	5	B-	485-
GND	6	P	GND





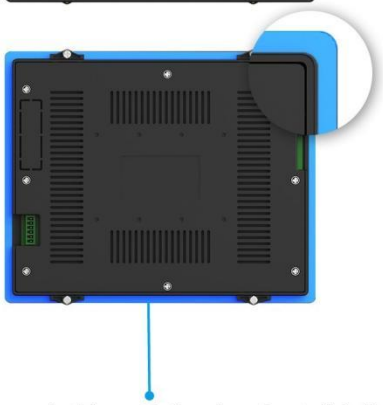
1.Location hole is used as position reference.

2.Unmarked Tolerance is +/-0.3mm

Note: Active area is marked in Dash lines

Model	DMG10768T097-15WTR					DWIN Technology
Drawing	A 4	Drawn	DWIN	Date		
Scale		Review		Date		
Unit	m m	Approval		Date		

Installation Schematic



Waterproof rubber gasket(blue part in the schematic,actually in black); located between screen and shell to prevent water ingress.Additional glass glue is available for outdoor use to strengthen the waterproof performance

1

The opening requirements are shown in the figure.
Depth＞17.0mm
Device front housing thickness＜3.0mm

Install the screen from the front into the housing openings

2

Install the snap into the housing mounting hole and pull back to tighten the snap on the housing

Untightened state

Lock the 4 screws to fix the product on the housing

Tightened state

3

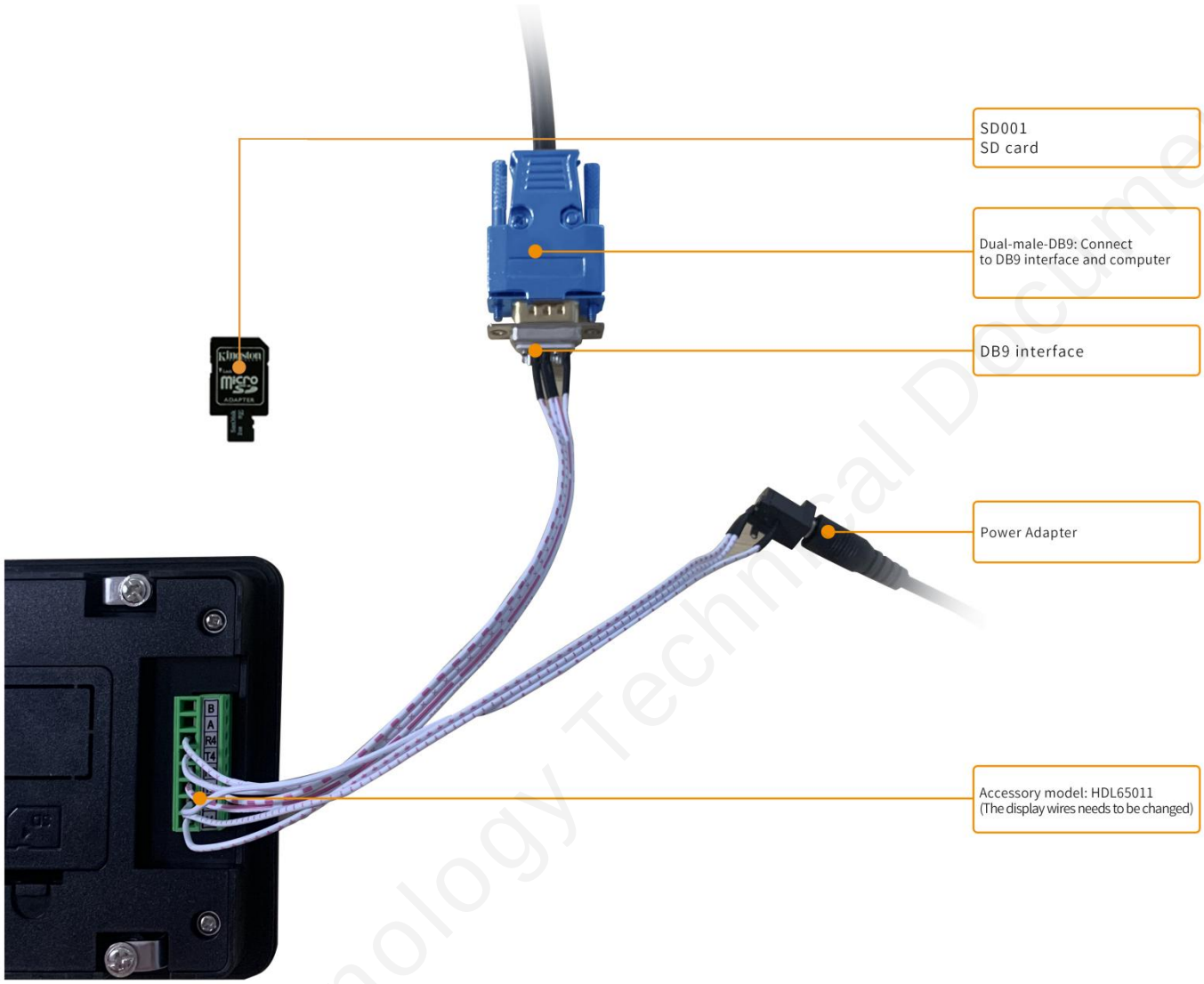
Clip the back cover of the housing

Installation completed

The final effect

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℃ to +85℃(IC operating temperature customizable from -55℃ to 105℃).

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

7.Revision records

Rev	Revise Date	Content	Editor
00	2023-12-18	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:

- Customer service Tel: +86 400 018 9008
- Customer service email: dwinhmi@dwin.com.cn
- 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!