

AGM-097A0-I1-R

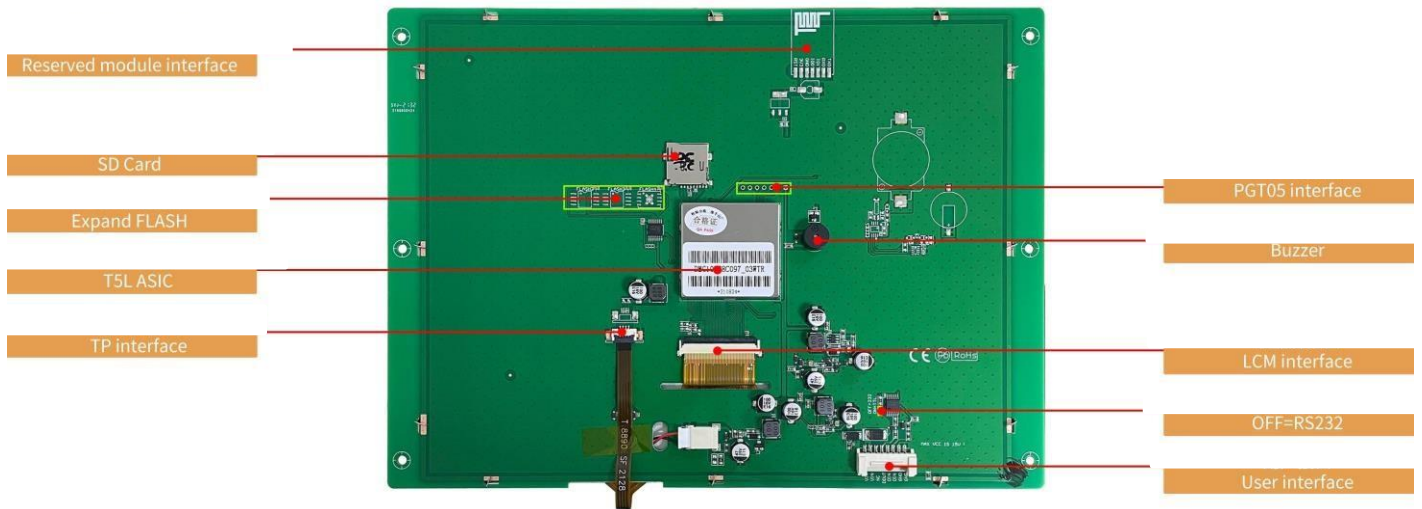
Features:

- Based on T5L2, running DGUS II system, commercial grade.
- 9.7-inch, 1024*768 Pixels resolution, 16.7M Colors, TN-TFT-LCD, normal viewing angle.
- Resistive touch screen.
- 16MB memory, cost-effective.



1、 Hardware and interface

1.1 Hardware interface



Hardware interface

1.2 Interface description

No.	Name	Description
1	T5L2 ASIC	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	FPC4_1.0mm
4	User interface	8Pin_2.0mm socket for power supply and serial communication. Download rate(typical value): 12KByte/s
5	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
6	Expand Flash	Expandable to 64Mbytes NOR Flash or 48Mbytes NOR Flash+512Mbytes NAND Flash
7	Buzzer	3V passive buzzer. Power: <1W
8	SD interface	FAT32. Download files by SD interface can be displayed in statistics. Download rate: 4Mb/s
9	Reserved module interface	Wi-Fi module: connect to the cloud platform to update remotely USB module: download files by USB flash disk
10	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 (0°/90°/180°/270°)
Color	24-bit 8R8G8B
Active Area (A.A.)	196.6mm (W) × 147.5mm (H)
View Area (V.A.)	-
Backlight Mode	LED
Backlight Service Life	>20000 hours (Time of the brightness decaying to 50% on the condition of continuous working with the maximum brightness)
Brightness	250nit
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)
<p>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.</p>	

2.2 Touch parameters

Type	RTP (Resistive touch panel)
Structure	ITO film + ITO glass
Touch Mode	Support point touch and drag
Surface Hardness	3H
Light Transmittance	Over 80%
Life	Over 1,000,000 times touch

2.3 Serial interface parameters

Mode	UART2: ON=TTL/CMOS; OFF=RS232				
Voltage Level	Test Condition	Min	Typ	Max	Unit
	Output 1, Iout = -4mA	2.7	3.2	-	V
	Output 0, Iout = 4mA	-	0.1	0.4	V
	Input 1	2.4	3.3	5.5	V
	Input 0	0	-	1.0	V
Baud Rate	3150~3225600bps, typical value of 115200bps				
Data Format	UART2: N81				
Interface Cable	8Pin_2.0mm				

2.4 Electrical specifications

Rated Power	<5W	
Operating Voltage	6~15V, typical value of 12V	
Operating Current	330mA	VCC=12V, max backlight
	110mA	VCC=12V, backlight off
Recommended power supply: 12V 1A DC		

2.5 Operating environment

Operating Temperature	-20°C~70°C (12V @ 60% RH)
Storage Temperature	-30°C~80°C
Conformal coating	None
Operating Humidity	10%~90%RH, typical value of 60% RH

3、 Reliability test

3.1 Electrostatic discharge test

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

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 as shown in Fig.3.1 below. 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.



Electrostatic discharge test

Discharge Type	Discharge Value	Result
Contact discharge	±4KV	Normal operation
Air discharge	±4KV	Normal operation

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 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 17626.2 B level and above.



EFT test

Test Item	Test Standard	Result
Power supply	±1KV;100KHz	Normal operation

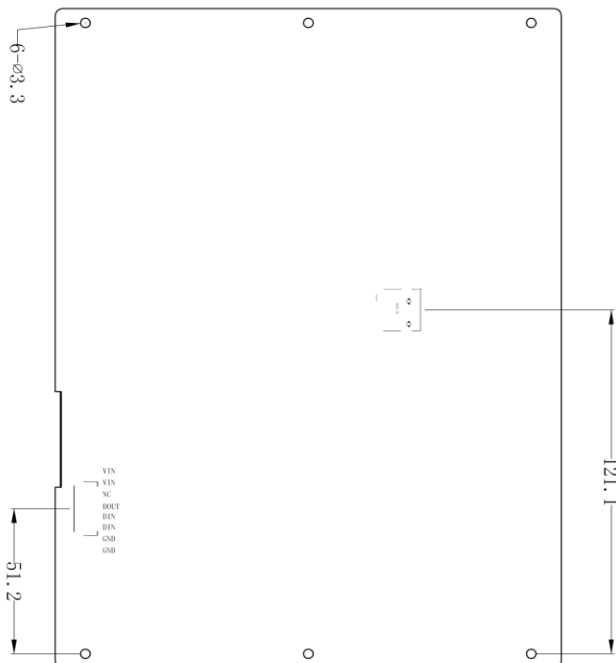
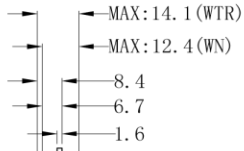
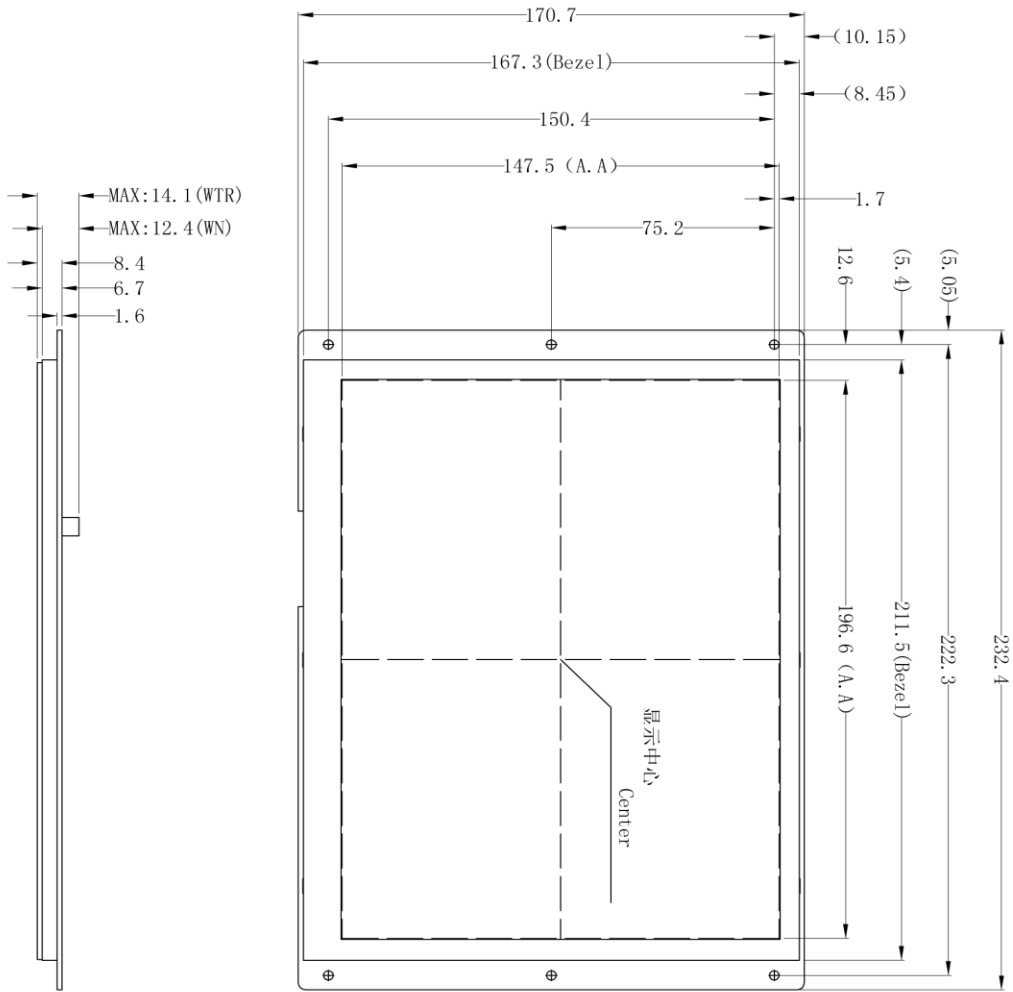
4、Packaging & dimensions

Form Factor	232.4(W) ×170.7(H) × 14.1(T) mm
Installation Dimensions	Positioning hole: 211.5(+0.3mm)×167.3(+0.3mm)
Net Weight	410g

Packaging Standards

Model	Dimensions	Layer	Quantity/Layer	Quantity(Pcs)
1 Carton1:	220mm(L)×160mm(W)×47mm (H)	-	-	-
2 Carton2:	250mm(L)×200mm(W)×80mm (H)	2	1	2
3 Carton3:	320mm(L)×270mm(W)×80mm (H)	-	-	-
4 Carton4:	435mm(L)×335mm(W)×290mm(H)	1	10	10
5 Carton5:	600mm(L)×430mm(W)×290mm(H)	1	20	20

Disclaimer: the data is for reference only and the information of product design that do not affect performance parameters and utilization is subject to alternation without prior notice.



GND	7, 8	P	/GND
DIN	5, 6	I	.DIN
DOU1	4	0	.DOU1
NC	3	-	ot Defind
VCC	1, 2	P	/Power Input

Location hole is used as position reference.

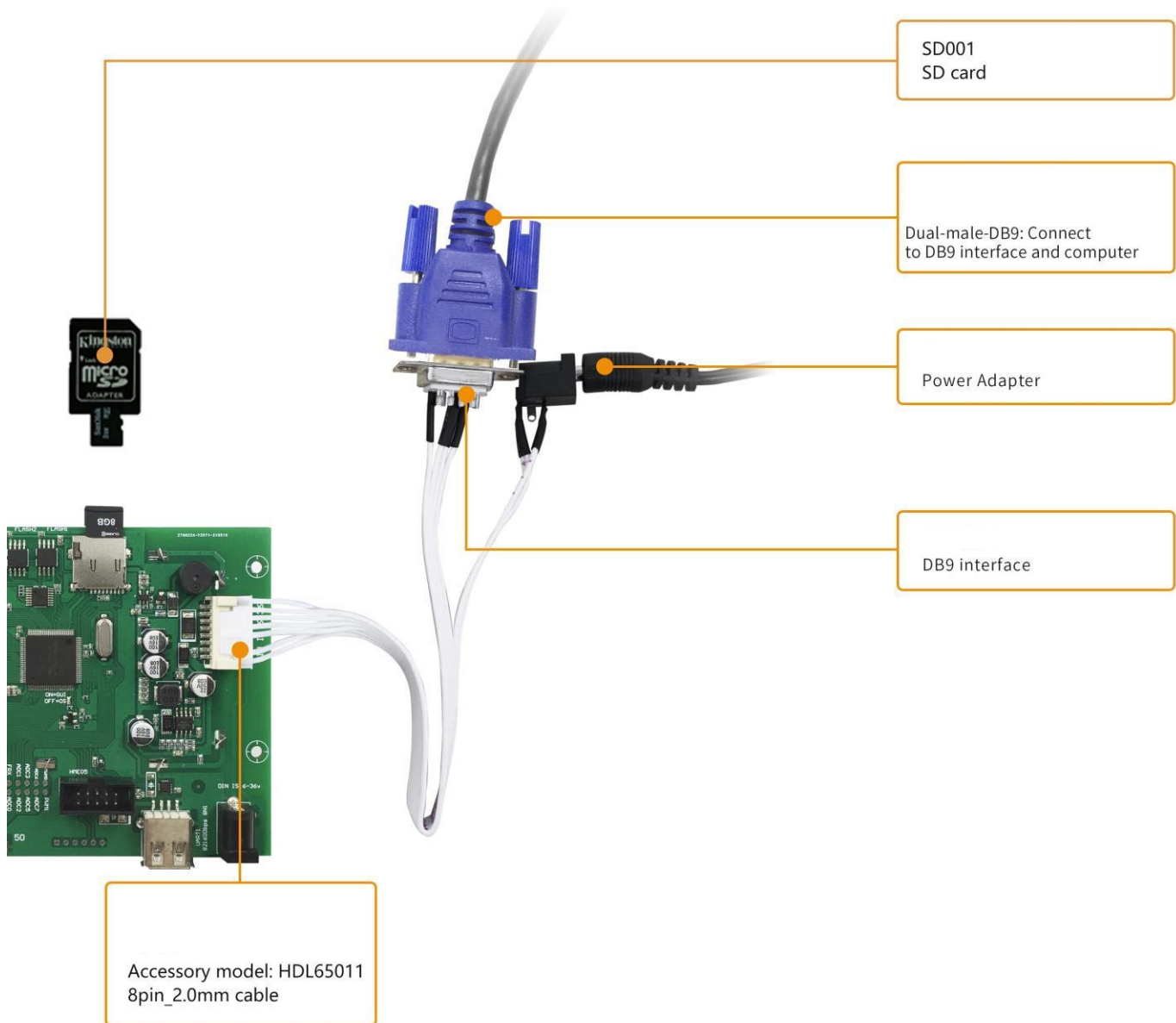
Unmarked Tolerance is +/-0.3mm

Active area is marked in Dash lines

A 4									
MM									

5、 Debugging tools

It is recommended for new users smart LCMs to purchase official accessories. For more details, please refer to customer service center.



6、T5L series IC features

(1) 8051 1T 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) CPU GUI CPU) DGUS II

Separate GUI CPU Core running DGUS II System:

- , 2.4GB/S。

High-speed display memory, 2.4GB/S bandwidth.

- 2D JPEG 200fps@1280*800, UI

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 16Mbytes SPI Flash。

Images and icons stored in JPEG format. Adopt Low-cost 16Mbytes SPI Flash.

- 400Hz

Support CTP or RTP with adjustable sensitivity and maximum 400 Hz touch frequency.

- 1路 15bit 32Ksps PWM

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 OS CPU

128Kbytes variable storage space for exchanging data with OS CPU Core and memory.

- PC

Support DGUS development and simulation on PC. Support background remote upgrade.

(3) CPU (OS CPU) 8051 CPU:

Separate CPU (OS CPU) core runs user 8051 code OS system and user CPU is omitted in practical application:

- 8051, 64Kbytes 32Kbytes 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) , 64bit MAC 64bit

64 bit integer mathematical operation unit (MDU), including 64 bit MAC and 64 bit divider.

- 28 IO, 4 UARTs, 1 CAN 8 12bit A/D, 2 16bit 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.

- IAP Support IAP on-line simulation and debugging with unlimited number of breakpoints.

- DGUS

Upgrade code online through DGUS system.

- (4) 1Mbytes Flash,

1Mbytes on-chip Flash with encryption technology ensure code and data security.

- (5)

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

7、 Revision records

Rev	Revise Date	Content	Editor
00	2021-11-02	First Edition	