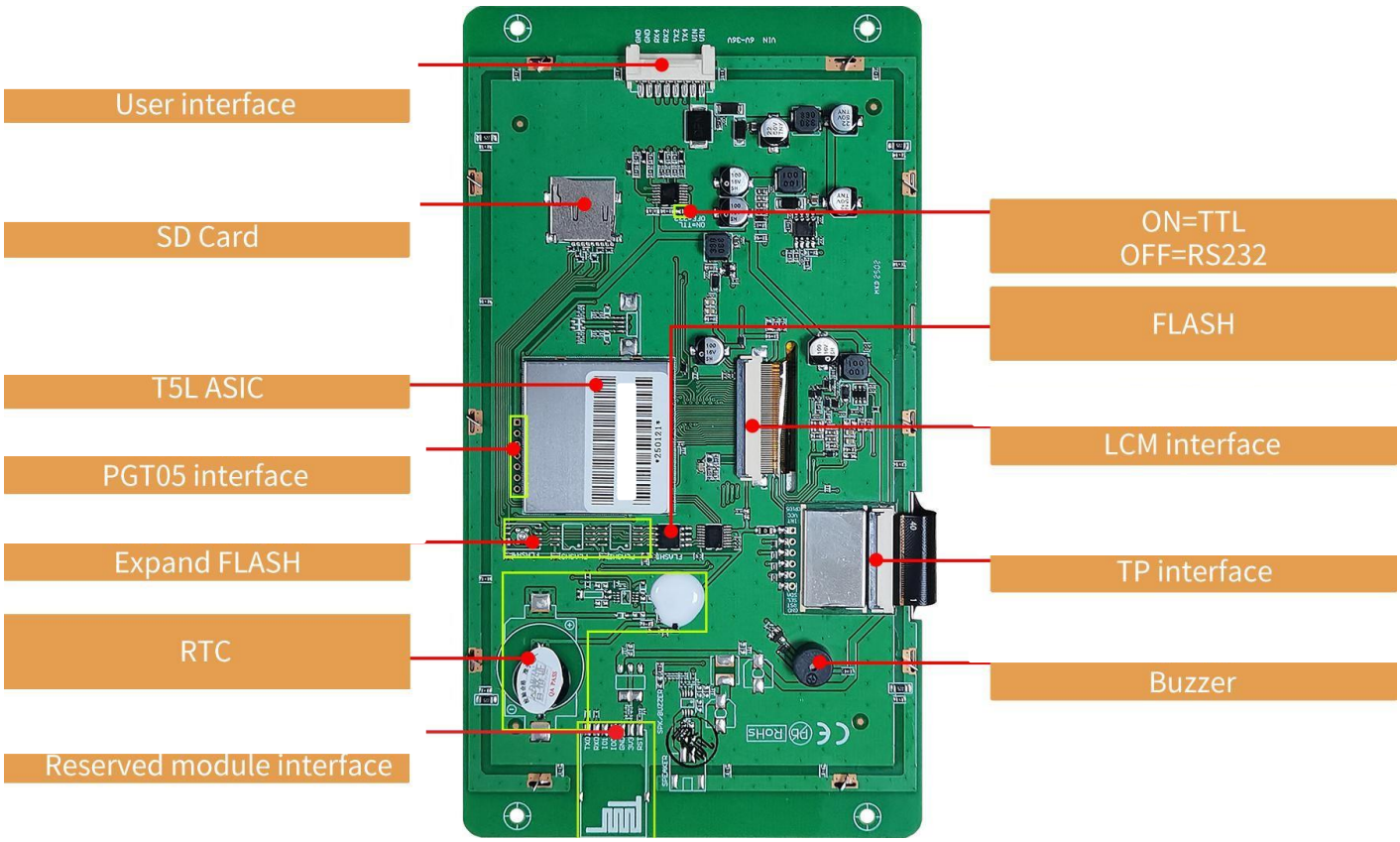
AGM-070A1-I3C

Features:

- **Powered by T5L0 ASIC, running DGUS II HMI platform, industrial-grade smart LCM.**
- **7.0 inch, 800*480 resolution, TN-TFT LCD.**
- **Reliable capacitive touch panel.**
- **With conformal coating.**

1、Hardware and interface

1.1 Hardware interface diagram



Hardware interface

1.2 Hardware and interface description

No.	Item	Description
1	T5L0 ASIC	independently developed, mass production in 2020. Dual 8051 cores, GUI and application run on separate 8051 cores.
2	User interface	◦ 8Pin_2.0mm socket for power supply and serial communication.
3	Flash	16MB (1*16MB NOR Flash) for storing UI files like fonts, images, music, with over 100,000 erase/write cycles.
4	Expand Flash interface	Three expansion slots support NOR or NAND Flash, up to 64MB (4x16MB NOR Flash) or 48MB+512MB (3x16MB NOR Flash + 512MB NAND Flash).
5	Buzzer	3V passive buzzer.
6	RTC	Super-capacitor powered, accuracy: ±20ppm @25℃, maintains operation for 7 days after power-off. Reserved button cell power supply compatible circuit.
7	SD interface	For DGUS project file downloads (UI, CFG files, kernel, etc.), 4 Mb/s rate.
8	Reserved module interface	Supports Wi-Fi modules (e.g., Wi-Fi-20) and USB download modules (e.g., HDL702).
9	PGT05 interface	For programming DGUS firmware.

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	800×480 (support 0°/90°/180°/270°)
Active Area (AA)	154.08mm (W)×85.92mm (H)
Backlight	LED
Backlight Service Life	>30000 hours
Brightness	250nit
Brightness Control	100-level brightness adjustment (Flickering may occur at 1%-30% of max brightness; not recommended for use in this range)
Note: Use dynamic screen saver to prevent afterimages from prolonged fixed page display.	

2.2 Touch parameters

Type	Capacitive touch panel.
Structure	G+G structure with tempered glass surface and hardness ≥ 6H.
Light Transmittance	>85%

2.3 Serial interface parameters

Mode	UART2: ON=TTL/CMOS; OFF=RS232 UART4: ON=TTL/CMOS; OFF=RS232 (OS Only available after OS configuration)				
Voltage Level	Test Condition	Min	Typ	Max	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
Baud Rate	3150~3225600bps, typical value of 115200bps.				
Data Format	UART2: N81 UART4: N81/E81/O81/N82（OS）4 modes (OS configuration)				
Interface Cable	8Pin_2.0mm				

2.4 Electrical specifications

Rated Power	<5W	
Operating Voltage	9~36V, typical value of 12V.	
Operating Current	220mA	VCC=12V, max backlight.
	80mA	。 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℃
Anti-UV	N
Conformal coating	Y
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: Place the product on the test bench fixture (approximately 15cm in height), and perform contact and air discharge tests on the smart LCM. Observe if any freezing, black or white screen, flickering, or rebooting occurs during the test.

Test conclusion: The product's ESD performance meets GB/T 17626.2 Class B standards.

Discharge Type	Discharge Value	Result
Contact discharge	±6KV	Normal operation
Air discharge	±8KV	Normal operation

3.2 EFT EFT test

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

Test process: Place the product flat on the test bench, power the smart LCM through the power supply coupled with an impulse generator. Observe if any reboot, abnormal display, or touch malfunction occurs during the test.

EFT GB/T 17626.4 B。

Test conclusion: The product's EFT performance meets GB/T 17626.4 Class B standards.

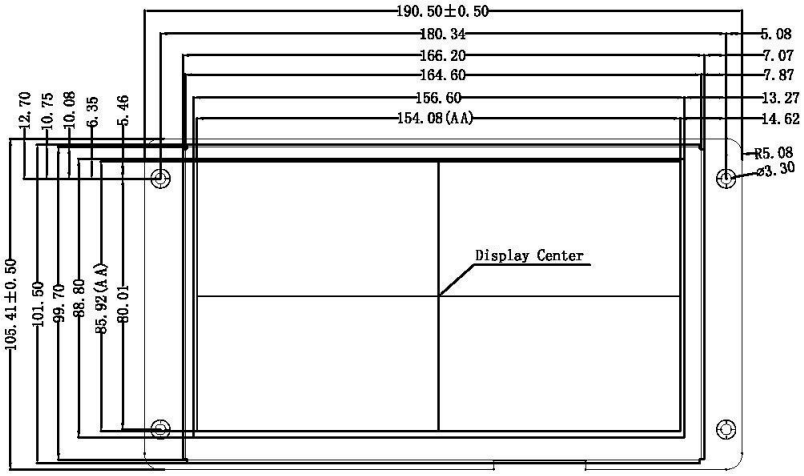
Test Item	Test Standard	Result
Power supply	±2KV;100KHz	Normal operation

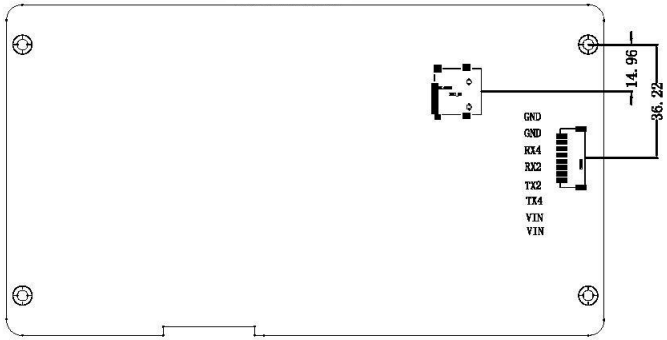
4、Packaging & dimensions

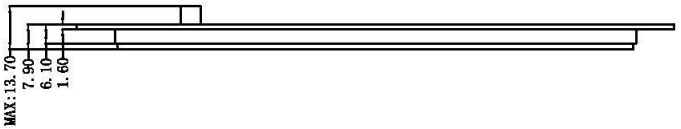
Form Factor	190.50mm (W)×105.41mm (H) ×13.70mm (T)
Installation Dimensions	Positioning hole: 166.20 (+0.3mm)×101.50 (+0.3mm)
Net Weight	268g

Packaging Standards

Model	Dimensions	Layer	Quantity/Layer	Quantity(Pcs)
1 Carton1：	220mm(L)×160mm(W)×47mm (H)	1	1	1
2 Carton2：	250mm(L)×200mm(W)×80mm (H)	2	1	2
3 Carton3：	320mm(L)×270mm(W)×80mm (H)	2	2	4
4 Carton4：	435mm(L)×335mm(W)×290mm(H)	-	-	-
5 Carton5：	600mm(L)×430mm(W)×290mm(H)	1	40	40







Definition	Pin#	Type	Description
VIN	1,2	P	Power Input
TX4	3	O	Output
TX2	4	O	Output
RX2	5	I	Input
RX4	6	I	Input
GND	7,8	P	GND

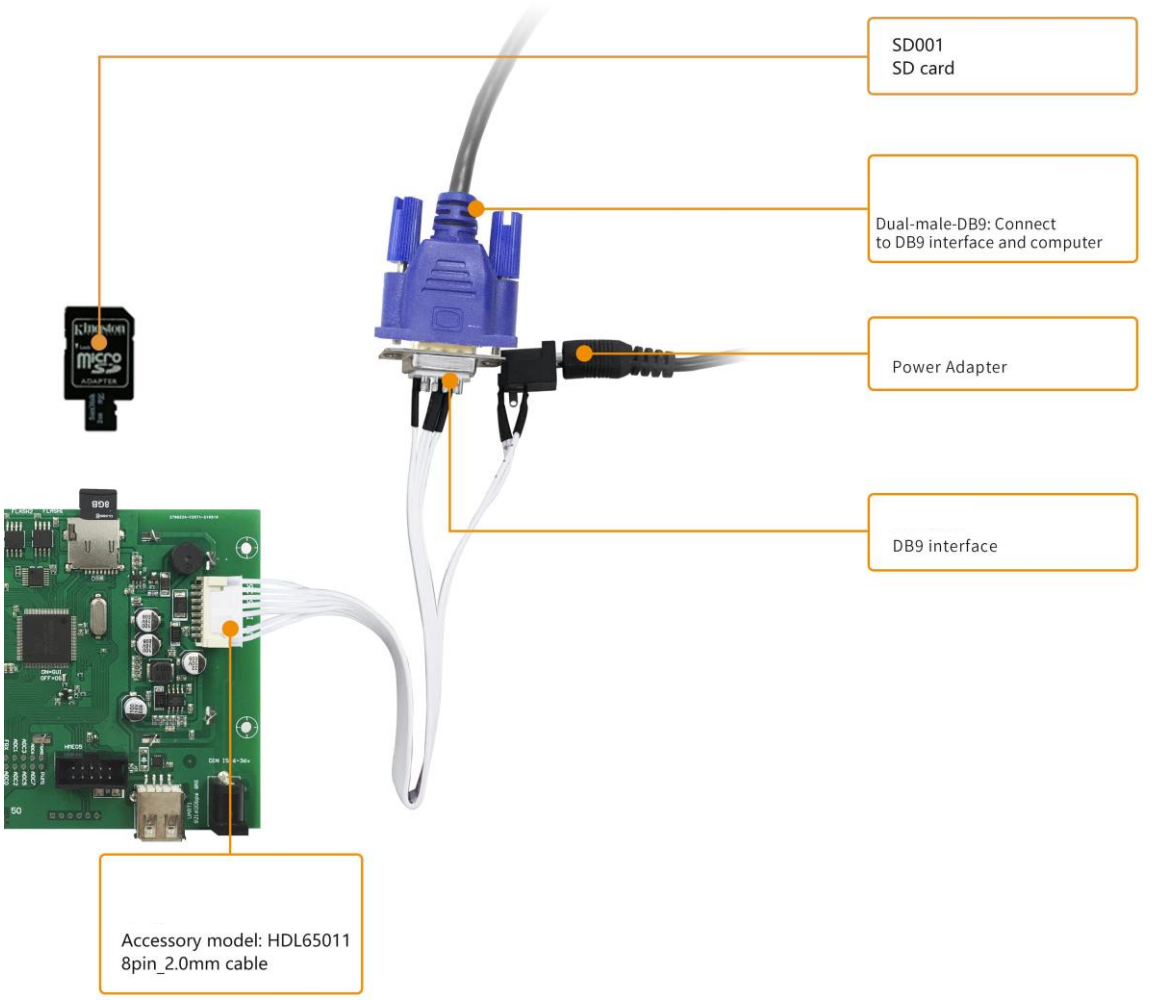
1.
Location hole is used as position reference.
2.
Unmarked Tolerance is +/-0.3mm

Active area is marked in Dash lines

Model					
Drawing	A 4	Drawn	G.Y	Date	2021.09.14
Scale	1:1	Review		Date	
Unit	MM	Approval		Date	

5、Debug 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 系统：

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 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 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 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（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-channle 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 patent encryption technology ensure code and data security.

（5）-40℃~+85℃ -55℃~105℃ IC）。

Operating temperature ranges from -40℃ to +85℃(IC operating temperature customizable from -55℃ to 105℃).

7、Revision records

Rev	Revise Date	Content	Editor
00	2021-09-25	First Edition	
01	2022-01-05	Update RTC accuracy description	
02	2022-11-14	Modify dimension description	
03	2024-01-08	Hardware optimization (RTC design compatible with circuits, adding speaker circuits), natural consumption of inventory	
04	2024-05-27	Add FLASH extension components	
05	2024-08-30	Modify Power Voltage	
06	2025-03-14	Replace touch IC with TPS04	