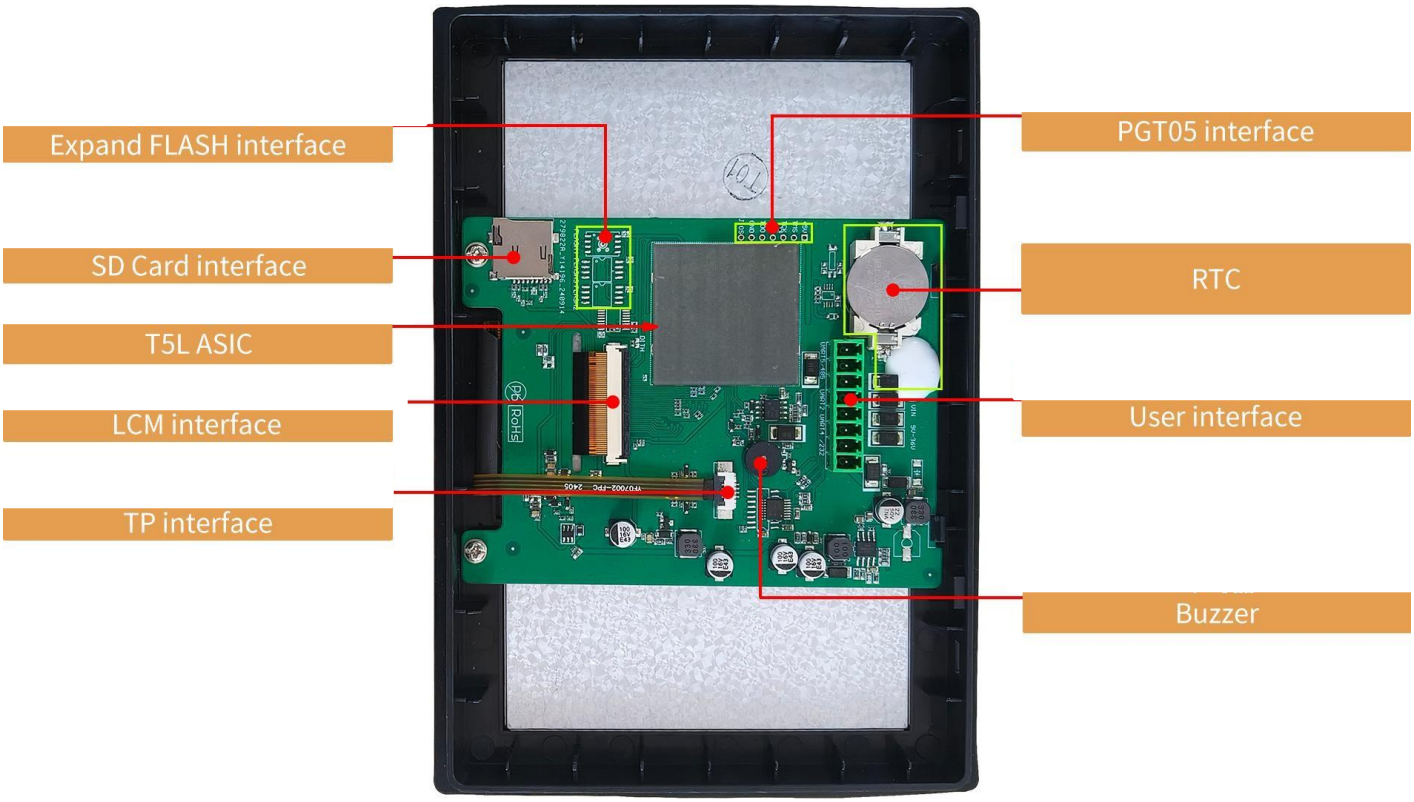
AGM-070A1-I2-R

Features:

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

1、Hardware and interface



Hardware interface

1.1 Hardware and interface description

No.	Name	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_3.81mm socket for power supply and serial communication.
3	Flash	8MBytes NOR Flash, for fonts, pictures and audio files. Rewrite cycle: over 100,000 times.
4	Expand Flash pads	Three expansion slots support NOR or NAND Flash, up to 64MB (4x16MB NOR Flash) or 48MB+512MB (3x16MB NOR Flash + 512MB NAND Flash). The expansion of FLASH in this product requires removing the original FLASH and soldering components such as decoders and capacitors. For related customization, please consult the corresponding salesperson.
5	Buzzer	3V passive buzzer.
6	RTC	Button cell for power supply. Accuracy: ±20ppm @25℃.
7	SD card slot	For DGUS project file downloads (UI, CFG files, kernel, etc.), 4 Mb/s rate.
8	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)	154.1mm (W)×85.9mm (H)
Backlight	LED
Backlight Service Life	>20,000H
Brightness	200nit
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	RTP (Resistive touch panel).
Structure	ITO film + ITO glass.
Light Transmittance	78%±3%

2.3 Serial interface parameters

Mode	UART2: RS232 UART4: RS232 (OS Only available after OS configuration) UART5: RS485 (OS Only available after OS configuration)				
2, 4 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
Baud Rate	3150~3225600bps, typical value of 115200bps.				
5 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
5 Baud Rate	3150~921600bps, typical value of 115200bps.				
Data Format	UART2: N81 UART4: N81/E81/O81/N82）4 modes (OS configuration) UART5: N81/E81/O81/N82（OS）4 modes (OS configuration)				
Interface Cable	8Pin_3.81mm Socket.				

2.4 Electrical specifications

Rated Power	<5W	
Operating Voltage	9~36V， 12V。 9~36V, typical value of 12V.	
Operating Current	240mA	VCC=12V, max backlight.
	140mA	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	N
工**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.

ESD GB/T 17626.2 B

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

■ 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
屏幕	/	/	/	/	A	A	/	/
/	/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/	/

Table 2: Electrostatic Discharge Immunity (Direct Contact)

Test Points Locations	Test Levels							
	-2kV	+2kV	-4kV	+4kV	-6kV	+6kV	-8kV	+8kV
边框 VAF	/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/	/

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;

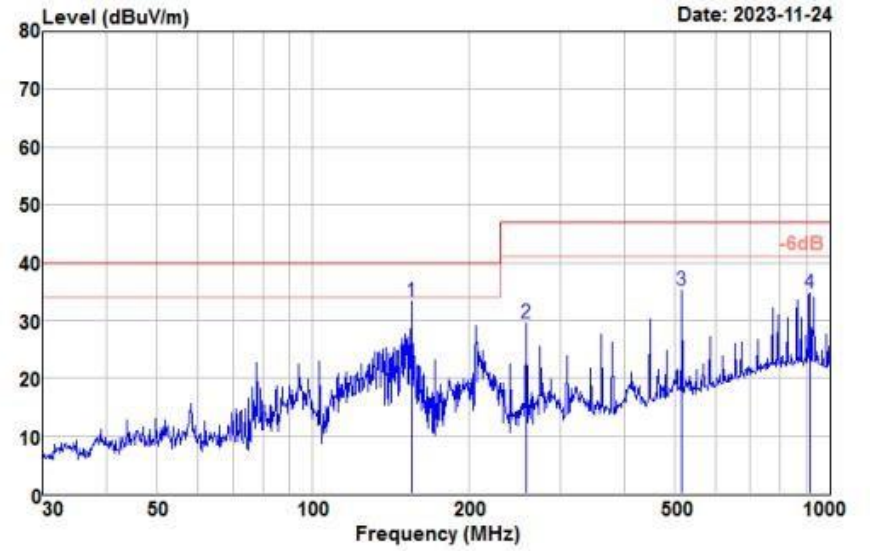
C. Temporary loss of function or degradation of performance, the correction of which requires operator intervention;

D. Loss of function or degradation of performance which is not recoverable, due to damage to hardware or software, or loss of data.

3.2 RE test

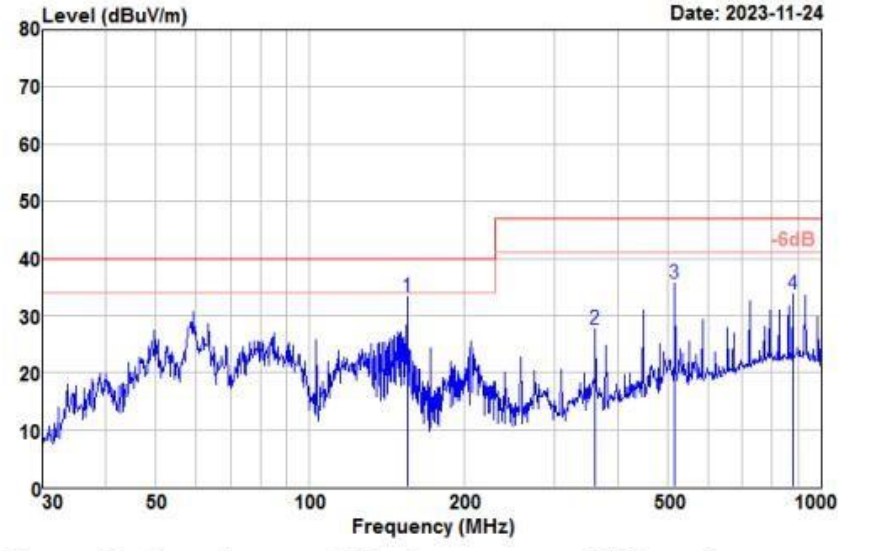
Test Item	Test Standard	Result
RE	Class B	Normal operation

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
154.821	49.83	13.45	2.39	32.50	33.17	40.00	-6.83	Peak
258.326	46.92	11.88	3.17	32.44	29.53	47.00	-17.47	Peak
517.248	44.85	17.94	4.66	32.37	35.08	47.00	-11.92	Peak
912.862	37.61	23.72	6.27	32.99	34.61	47.00	-12.39	Peak

VERTICAL



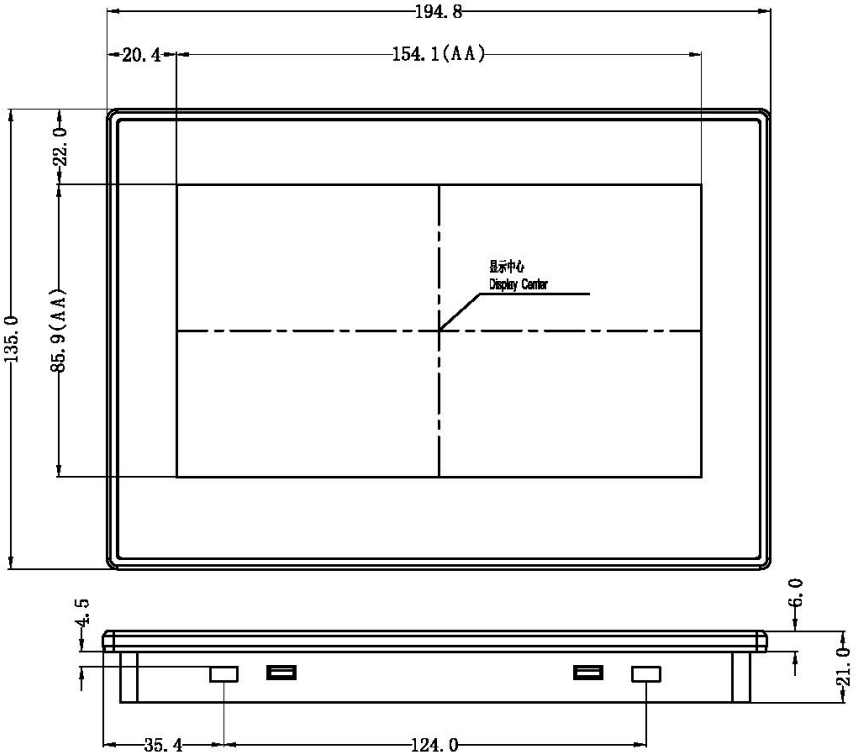
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
154.821	49.91	13.45	2.39	32.50	33.25	40.00	-6.75	Peak
361.714	41.90	14.65	3.68	32.59	27.64	47.00	-19.36	Peak
517.248	45.35	17.94	4.66	32.37	35.58	47.00	-11.42	Peak
878.322	37.69	22.67	6.15	32.78	33.73	47.00	-13.27	Peak

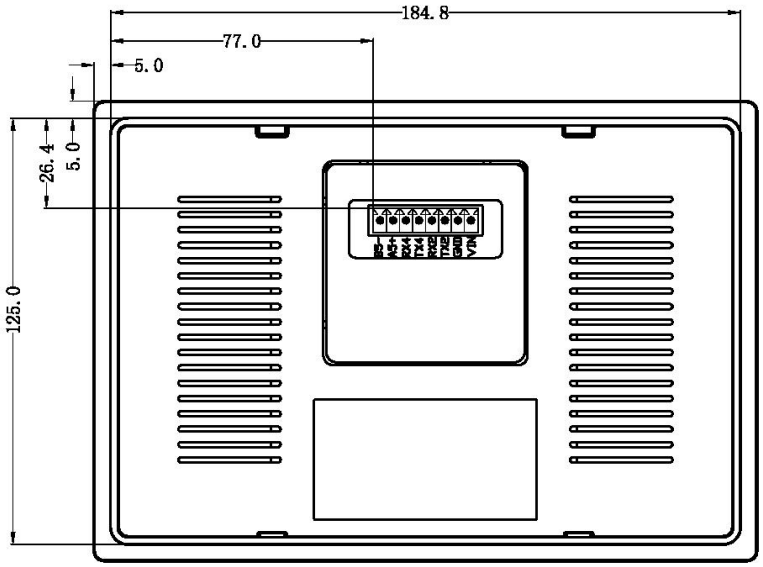
4、Packaging & dimensions

Form Factor	194.8mm (W)×135.0mm (H) ×21.0mm (T)
Net Weight	320g

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)	-	-	-
5 Carton5：	600mm(L)×430mm(W)×290mm(H)	1	20	20





Definition	Pin#	Type	Description
VIN	1	P	Power Input
GND	2	P	GND
TX2	3	O	Output
RX2	4	I	Input
TX4	5	I	Output
RX4	6	P	Input
A5+	7	–	485+
B5–	8	–	485–

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	J.G	日期 Date	20210924
Scale	1:1	Review		日期 Date	
Unit	MM	Approval		日期 Date	

Installation Schematic

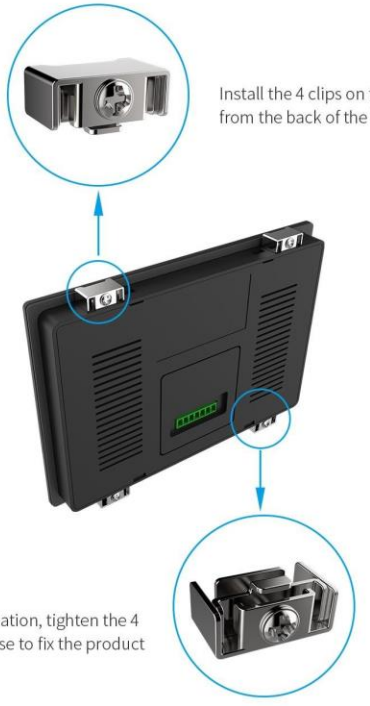
Waterproof rubber gasket (blue part in the schematic, actually in black): located between screen and shell to prevent water ingress. Additional glass glue is available for outdoor use to strengthen the waterproof performance

1

The opening requirements are shown in the figure.
Depth >16.0mm
Device front housing thickness <2.0mm

Install the screen from the front into the housing openings.

2



Install the 4 clips on the screen from the back of the housing

After the installation, tighten the 4 screws clockwise to fix the product to the housing

3

Clip the back cover of the housing

Installation completed

The final effect

Schematic diagram of SD card update steps

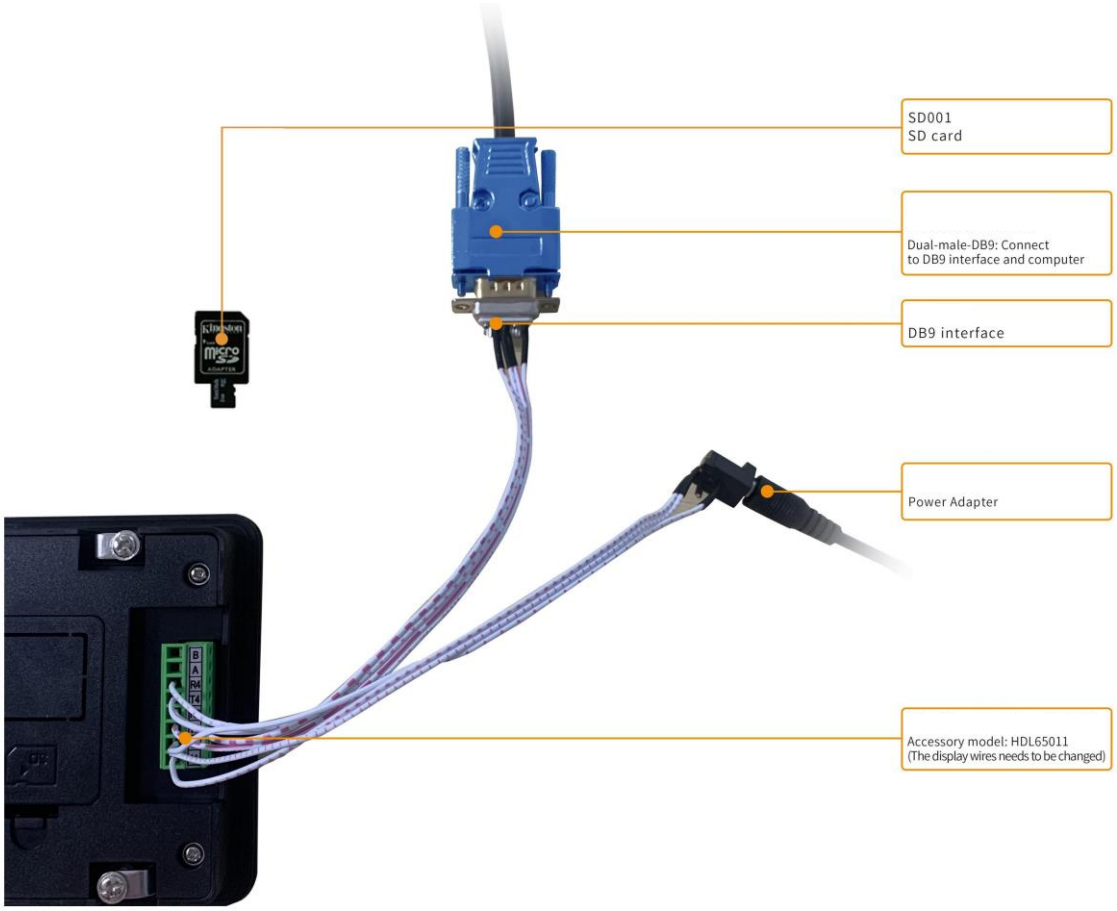
Find the position of the buckle

Press the buckle with a slotted screwdriver or similar tool
and disassemble it outward

Update using an SD card

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 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 个 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 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	2021-12-17	Modify flash to 8MBytes	
02	2022-01-05	Update RTC accuracy description	
03	2022-03-29	Add installation diagram	
04	2022-09-07	Natural switching to TN LCD	
05	2022-11-14	Modify dimension description	
06	2023-06-16	Update physical image	
07	2023-12-04	EMC hardware upgrade, natural consumption of old inventory boards	
08	2024-10-10	Hardware upgrade, optimize RTC and bias circuit	