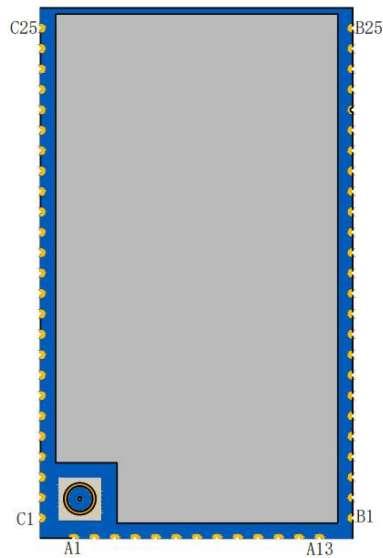


WH-MT7688/7628AN-V2.4

Design Manual

Ver: V1.0.0



FCC ID:2ACZO-WH-MT7628AN

Model Name: WH-MT7628AN

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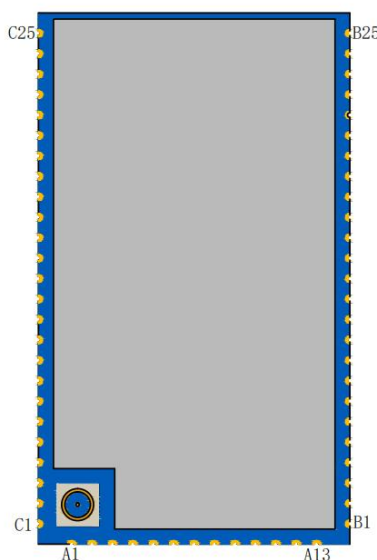
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1 About documentation

1.1 Purpose of the Documentation

This paper elaborates the basic functions and main features, hardware interface and usage methods, structural characteristics and other electrical indicators of the 628AN-V2.4 wireless module. By reading this document, users can have an overall understanding of the product, have a clear understanding of the product specifications, and smoothly embed the module into various terminal designs.

1.2 Product Appearance



Pic 1 3D 渲染图

2 Product Introduction

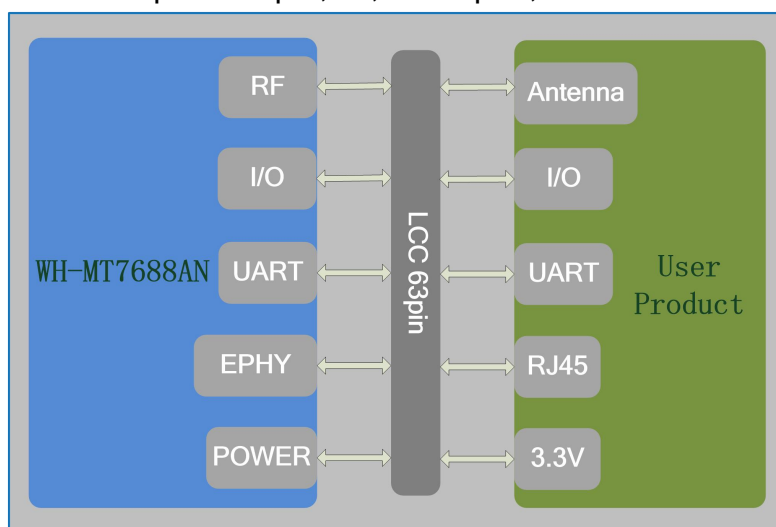
2.1 . Basic parameters

Table 1 List of parameters

classify	parameter	Valid values
Wireless parameters	Wireless standards	802.11 b/g/n
	Transmit power	802.11b: +20dBm(Max.@11Mbps, CCK) 802.11g: +17dBm(Max.@54Mbps, OFDM) 802.11n: +17dBm(Max.@HT20, MCS7) 802.11n: +16dBm(Max.@HT40, MCS7)
	Receive sensitivity	802.11b: -88 dBm(typ.@11Mbps, CCK) 802.11g: -75 dBm(typ.@54Mbps, OFDM) 802.11n: -73 dBm(typ.@HT20, MCS7) 802.11n: -70 dBm(typ.@HT40, MCS7)
	Antenna options	Choose between an IPEX socket and an external pad
Hardware parameters	Interface standards	Ethernet: 1~5 个 10M/100M Adaptive USB2.0: 1 way SDIO: 1way SPI: 1 way I2C: 1 way I2S: 1 way UART: 3way PWM: 4way GPIO: 8 channels and above
	Operating voltage	3.3V+/-0.2V
	Operating current	No-load operating current: average 170 ± 50mA
	Electrical requirements	800mA above
	flash	128Mb
	Running memory	DDR2: 1Gb
	Operating temperature	-20℃ ~ +55℃
	Storage temperature	-20℃ ~ +80℃
	Operating humidity	10~90%RH(No condensation)
	Store humidity	10~90%RH(No condensation)
	size	size: 33.02mm x 17.78mm x 3.5mm
	encapsulation	SMT

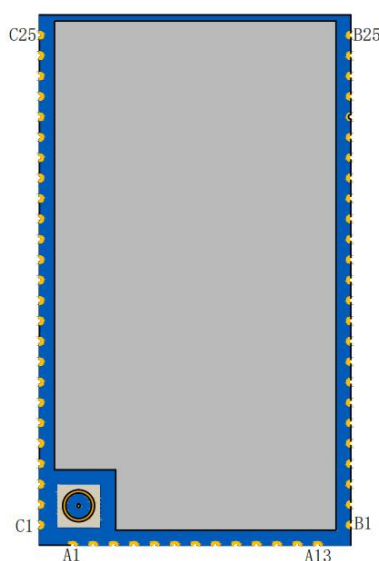
2.2 . Module application block diagram

Module interfaces include: power input, IO, serial port, RF interface



Pic 2 Block diagram of the module application

2.3 . Pin definition



Pic 3 Pin definition

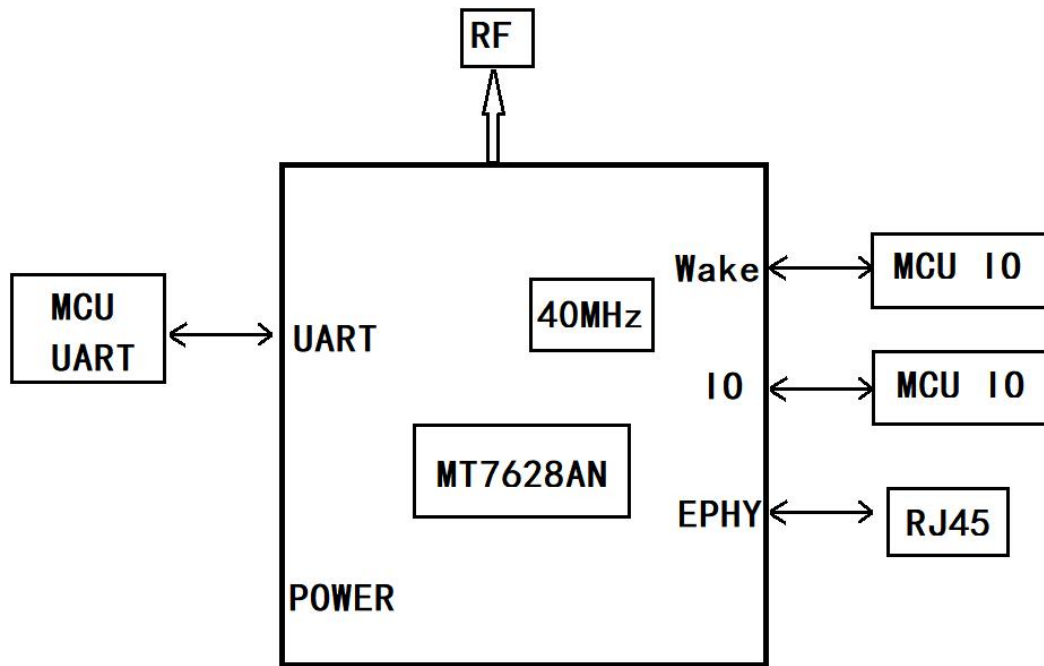
Table 2 LCC Package pin definition

pins	name	Signal type	illustrate
A1	I2S_SDI	I	I2S Data Entry; GPIO0
A2	I2S_SDO	O	I2S Data output , Related to chip start-up, the external cannot be pulled up and down, and the

			drive source cannot be connected; GPIO1
A7	VDD_FLASH	P	FLASH Independent power supply, 3.3V
B23	GND	P	GND
B24	UD_P	IO	USB D+
B25	UD_N	IO	USB D-
C1	GND	P	GND
C2	RF	IO	RF input and output
C3	GND	P	GND
C4	GND	P	GND
C17	3.3VD	P	POWER
C18	GND	P	GND
C19	GPIO40/LINK3	IO	GPIO40/PORT3 LED
C20	GPIO39/LINK4	IO	GPIO39/PORT4 LED
C21	CPURST_N	I	CPU reset input
C22	WPS_RST_PBC	I	GPIO38
C25	GND	P	GND

3 Hardware reference designs

3.1. Peripheral circuit frame reference



Pic 4 Module peripheral circuit reference

3.2. Power interface

The input voltage of the power supply is 3.1~3.5V, the standard value is 3.3V, and the no-load operating current: the average is $170 \pm 50\text{mA}$, and the power supply current must be greater than 800mA. The pin interface reserves a high-frequency filter capacitor, and $10\mu\text{F} + 0.1\mu\text{F} + 1\text{nF} + 100\text{pf}$ is recommended. If the application environment is harsh, often subject to ESD interference or high EMC requirements, it is recommended to connect magnetic beads in series or TVS transistors in parallel to increase the stability of the module.

When designing products, users should first ensure that the peripheral circuit can provide sufficient power supply capacity, and the power supply range should be strictly controlled within $3.3\text{V} \pm 0.2\text{V}$, and the peak value of power supply voltage should be within 300mV. In addition, a large capacitor is placed after DC/DC or LDO to prevent voltage dips in the external power supply during the pulse current period.

Table 3 Module power consumption

Node name	Pin description	MIN	Average	MAX	unit
VCC	Module supply voltage	3.1	3.3	3.5	V
I	The module runs at no load	-	-	220	mA

3.3. UART interface

The TX port of serial port 0 (module pin B1) and the TX port of serial port 1 (module pin C6) are related to chip startup, and cannot be pulled up or down externally, and cannot be connected to the drive source.

If the serial port of the module communicates directly with the MCU (3.3V level), you only need to add the TXD of the module to the RXD of the MCU, and connect the RXD of the module to the TXD of the MCU. When the level of the module does not match the level of the MCU, a special level translation chip needs to be added in the middle.

4 Electrical characteristics

4.1. Operating storage temperature

The operating storage temperature is shown in the figure below

Table 4 Temperature parameters

Parameter	Min	Max
Operating temperature	-20℃	+55℃
Storage temperature	-20℃	+80℃

4.2. Input power

Table 5 Power supply range

Parameter	Min.	Typ.	Max.
Input Voltage (V)	3.1	3.3	3.5

4.3. Module IO port level

Table 6 I/O pin voltage parameters

Symbol	Parameter	Min	Typ	Max	Unit
V _{IH}	High-level input voltage	2.0	-	VCC+0.3V	V
V _{IL}	Low-level input voltage	-0.3	-	0.8	V
V _{OH}	High-level output voltage	2.4	-	-	V
V _{OL}	Low-level output voltage	-	-	0.4	V

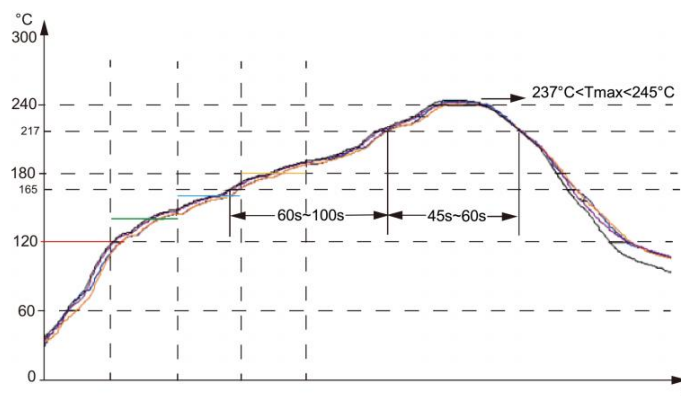
VCC supplies the voltage to the module.

4.4. IO drive current

IO pins	Maximum drive current	Maximum input current
All I/O ports	2mA	2mA

5 Mechanical properties

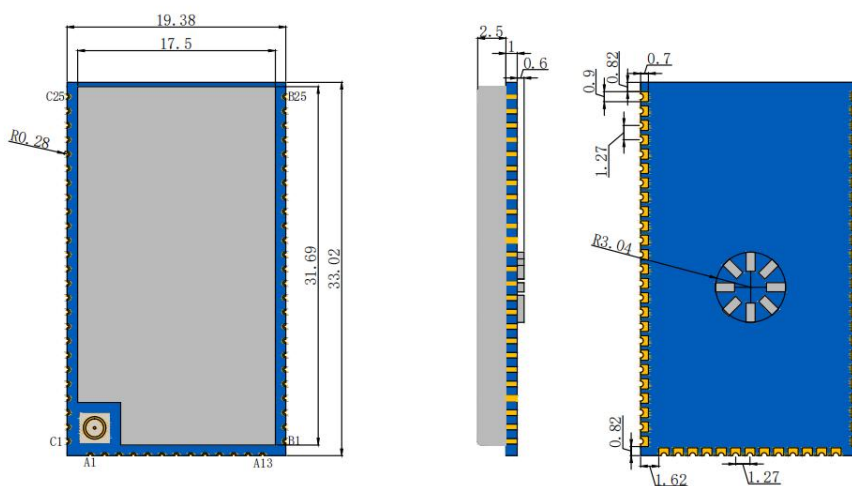
5.1. Reflow soldering is recommended



Pic5 A reflow temperature profile is recommended

5.2. Size description

单位: MM



Pic6 Size description

Federal Communication Commission (FCC) Radiation Exposure Statement

When using the product, maintain a distance of 20cm from the body to ensure compliance with RF exposure requirements.

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications or changes to this equipment. Such modifications or changes could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

ORIGINAL EQUIPMENT MANUFACTURER (OEM) NOTES

The OEM must certify the final end product to comply with unintentional radiators (FCC Sections 15.107 and 15.109) before declaring compliance of the final product to Part 15 of the FCC rules and regulations. Integration into devices that are directly or indirectly connected to AC lines must add with Class II Permissive Change.

The OEM must comply with the FCC labeling requirements. If the module's label is not visible when installed, then an additional permanent label must be applied on the outside of the finished product which states: "Contains transmitter module FCC ID:

WH-MT7628AN. Additionally, the following statement should be included on the label and in the final product's user manual: "This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interferences, and (2) this device must accept any interference received, including interference that may cause undesired operation."

The module is allowed to be installed in mobile and portable applications A module or modules can only be used without additional authorizations if they have been tested and granted under the same intended end - use operational conditions, including simultaneous transmission operations. When they have not been tested and granted in this manner, additional testing and/or FCC application filing may be required. The most straightforward approach to address additional testing conditions is to have the grantee responsible for the certification of at least one of the modules submit a permissive change application.

When having a module grantee file a permissive change is not practical or feasible, the following guidance provides some additional options for host manufacturers. Integrations using modules where additional testing and/or FCC application filing(s) may be required are: (A) a module used in devices requiring additional RF exposure compliance information (e.g., MPE evaluation or SAR testing); (B) limited and/or split modules not meeting all of the module requirements; and (C) simultaneous transmissions for independent collocated transmitters not previously granted together.

This Module is full modular approval, it is limited to OEM installation ONLY. Integration into devices that are directly or indirectly connected to AC lines must add with Class II Permissive Change. (OEM) Integrator has to assure compliance of the entire end product include the integrated Module. Additional measurements (15B) and/or equipment authorizations (e.g. Verification) may need to be addressed depending on co-location or simultaneous transmission issues if applicable. (OEM) Integrator is reminded to assure that these installation instructions will not be made available to the end user.