Operating Instructions of Gaussian MT7628 WiFi Module Product

Conbox

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Hardware Research & Development Department

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Revision History					
Revision date	**Version**	**Revision abstract**	**Revised by**	**Reviewed by**	**Approved by**
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I. Product overview

1.1 Module introduction

The MT7628 WIFI module is a low-cost and low-power router manufactured by Shanghai Gaussian Automation Technology Development Co., Ltd. based on MT7628MN. The modified module, which supports operating system and customized development of Linux and OpenWRT, is an integrated 802.11b/g/n WIFI solution that can be widely applied in intelligent devices, robots, etc.

1.2 Main applications

(1) Hardware AP

(2) Router

(3) Intelligent robot

(4) Monitoring

II. Module features

With small size and stable performance, the module uses the MT7628MN solution. The main features are shown below:

1) Ultra-small size, length and width 55mm*38mm;
2) 2.0mm expansion, easy installation;
3) Optional ceramic antenna and I-PEX interface;
4) Single 3.3V power supply;
5) Wired + wireless router solution;
6) Support 802.11b/g/n protocol, up to 300/150Mbps;
7) Wired support 1WAN and 1LAN, 10M/100M adaptive;
8) Moderate RF power consumption;

9) Onboard 64-256MB DDR2 memory, 8-16MB Flash;

10) 480Mbps high-speed USB interface;

11) 3-way UART (recommended UARTO for system DEBUG);

12) TCP to serial port;

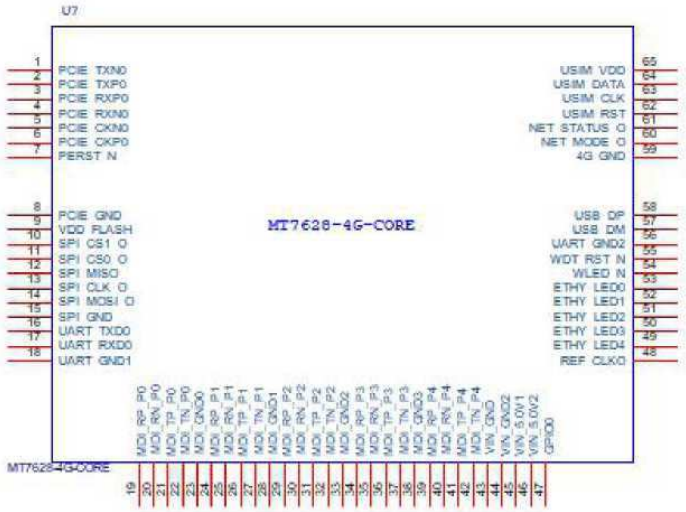
13) SDS-XC, eMMC, PCM, IIS, digital audio interface 192K/24bits), IIC communication interface, PWM, SPImaster/slave;

14) Many GPIOs;

III. Basic parameters of the module

Classification	Parameter	
Wireless parameter	Wireless rate	150Mbps or 300Mbps
	Frequency range	2.4GHz-2.4835GHz
	Wireless standard	IEEE 802.11b/g/n
	Wireless option	I-PEX connector or onboard ceramic antenna
Hardware parameter	Operating voltage	2.97-3.63V
	Operating temperature	0°C — 55°C
	Storage temperature	-20°C — 70°C
	Data interface	UART, IIS, IIC, SPI, PWM, GPIO
	Size	55mm*38mm
Board software	Customized development	Offer SDK for secondary development by customer
	Wireless type	AP/STA/AP+STA
	Encryption type	WEP64/WEP128
	Security mechanism	WEP/WAP-PSK/WAP2-PSK/AES

IV. Hardware introduction



1.1 Pin definition

Pin	Network name	Signal	Remarks
1	PREST_N	PREST	
2	PCIE_GND	Power	Power ground
3	VDD_FLASH	Power	Power supply
4	SPI_CS1_O	I	SPI chip 1
5	SPI_CS0_O	I	SPI chip 0
6	SPI_MISO	I/O	SPI MISO
7	SPI_CLK_O	I/O	SPI clock
8	SPI_MOSI_O	I/O	SPI MOSI
9	SPI_GND	Power	Power ground
10	UART_TXD0	O	UART0 sent

11	UART_RXD0	I	UART0 received
12	UART_GND	Power	Power ground
13	MDI_RP_P0	RP_P0	P0 port
14	MDI_RN_P0	RN_P0	P0 port
15	MDI_TP_P0	TP_P0	P0 port
16	MDI_TN_P0	TN_P0	P0 port
17	MDI_GND0	Power	Power ground
18	MDI_RP_P1	RP_P1	P1 port
19	MDI_RN_P1	RN_P1	P1 port
20	MDI_TP_P1	TP_P1	P1 port
21	MDI_TN_P1	TN_P1	P1 port
22	MDI_GND1	Power	Power ground
23	MDI_RP_P2	RP_P2	P2 port
24	MDI_RN_P2	RN_P2	P2 port
25	MDI_TP_P2	TP_P2	P2 port
26	MDI_TN_P2	TN_P2	P2 port
27	MDI_GND2	Power	Power ground
28	MDI_RP_P3	RP_P3	P3 port
29	MDI_RN_P3	RN_P3	P3 port
30	MDI_TP_P3	TP_P3	P3 port
31	MDI_TN_P3	TN_P3	P3 port

32	MDI_GND3	Power	Power ground
33	MDI_RP_P4	RP_P4	P4 port
34	MDI_RN_P4	RN_P4	P4 port
35	MDI_TP_P4	TP_P4	P4 port
36	MDI_TN_P4	TN_P4	P4 port
37	VIN_GND	Power	Power ground
38	VIN_GND2	Power	Power ground
39	VIN_5.0V1	Power	Power supply
40	VIN_5.0V2	Power	Power supply
41	GPIO0	I/O	Universal input and output ports
42	REF_CLKO	I/O	Clock output
43	ETHY_LED4	I/O	Indicator light 4
44	ETHY_LED3	I/O	Indicator light 3
45	ETHY_LED2	I/O	Indicator light 2
46	ETHY_LED1	I/O	Indicator light 1
47	ETHY_LED0	I/O	Indicator light 0
48	WLED_N	O	WIFI status indication
49	WDT_RST_N	WDT_RST	Reset
50	UART_GND2	Power	Power ground
51	USB_DM	I/O	USB 2.0D-
52	USB_DP	I/O	USB 2.0D+

53	NET_MODE_O	MODE_O	
54	NET_STATUS_0	STATUS_O	
55	USIM_RST	USIM_RST	USIM reset
56	USIM_CLK	O	USIM clock
57	USIM_DATA	O	USIM data
58	USIM_VDD	Power	USIM power supply

1.2 Electric features

Parameter	Condition	Minimum value	Typical value	Maximum value	Unit
Storage temperature range		-45		125	℃
Operating voltage		2.97	3.3	3.62	V
Random I/O voltage		0		3.3	V
Electrostatic discharge capacity (human body model)	TAMB=25°C			2	KV
Electrostatic discharge capacity (charging device model)	TAMB=25°C			2	KV

V. Antenna

The module supports onboard ceramic antennas and external antennas.

To use built-in antenna, the following precautions shall be observed:

1) Keep the antenna away from metal, with at least 10mm distance from

surrounding higher components;

2) Not block the antenna by metal casing, with at least 10mm distance from plastic casing;

To use the external antenna interface, the parameters of external antenna are shown in the table below according to the requirements of IEEE802.11b/g/n standard:

Item	Parameter
Frequency range	2.4-2.5GHz
Impedance	50Q
VSWR	2 (Max)
Return loss	-10DB (Max)
Connection type	-10DB (Max)

FCC Statement

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.

Any Changes or modifications not expressly approved by the party responsible for compliance 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.

The modular can be installed or integrated in mobile or fix devices only. This modular cannot be installed in any portable device, for example, USB dongle like transmitters is forbidden.

FCC Radiation Exposure Statement

This modular complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This modular must be installed and operated with a minimum distance of 20 cm between the radiator and user body.

If the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This

exterior label can use wording such as the following: “Contains Transmitter Module FCC ID: 2ATCV-SR700 Or Contains FCC ID: 2ATCV-SR700”

When the module is installed inside another device, the user manual of the host must contain below warning statements;

1. 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.

(2) This device must accept any interference received, including interference that may cause undesired operation.

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.

2. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

Any company of the host device which install this modular with limit modular approval should perform the test of radiated & conducted emission and spurious emission,etc. according to FCC part 15C : 15.247 and 15.209 & 15.207 ,15B Class B requirement, Only if the test result comply with FCC part 15C : 15.247 and 15.209 & 15.207 ,15B Class B requirement，then the host can be sold legally.

IC STATEMENT

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science

and Economic Development Canada’s licence-exempt RSS(s). Operation is subject

to the following two conditions:

(1) This device may not cause interference.

(2) This device must accept any interference, including interference that may cause

undesired operation of the device

Cet appareil contient des émetteurs / récepteurs exemptés de licence conformes aux RSS (RSS)

d'Innovation, Sciences et Développement économique Canada. Le fonctionnement est soumis aux

deux conditions suivantes :

(1) Cet appareil ne doit pas causer d'interférences.

(2) Cet appareil doit accepter toutes les interférences, y compris celles susceptibles de

provoquer un fonctionnement indésirable de l'appareil.

IC Radiation Exposure Statement

The modular can be installed or integrated in mobile or fix devices only. This modular cannot be installed in any portable device, for example, USB dongle like transmitters is forbidden.

This modular complies with IC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This modular must be installed and operated with a minimum distance of 20 cm between the radiator and user body. Cette modulaire doit être installé et utilisé à une distance minimum de 20 cm entre le radiateur et le corps de l'utilisateur.

If the IC number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following:

“Contains IC: 25038-SR700”

when the module is installed inside another device, the user manual of this device must contain below warning statements;

1. This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada’s licence-exempt RSS(s). Operation is subject

to the following two conditions:

(1) This device may not cause interference.

(2) This device must accept any interference, including interference that may cause

undesired operation of the device.

2. Cet appareil contient des émetteurs / récepteurs exemptés de licence conformes aux RSS (RSS)

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provoquer un fonctionnement indésirable de l'appareil.

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

FCC rules：

FCC part 15C 15.247

Antenna ：

The modular use 2 External antenna with Reversed polarity non standard unique antenna port

Antenna gain of each antenna:3dBi