GD Midea Consumer Electric MFG. Co., Ltd

Device Name: WIFI Module

Model size:QCA4004SIP

Material code:17210900001218

Compiled by: Li Linyuan

Review: Tan Hua

Supplier will sign: Jiang Qiangling

Note:

1、 This specificationBoth sides of the bookAfter the signature is officially in effect, this specification book even covers together21Pages;

2、 This specification book in two copies, the version by the user and the supplier jointly maintain;

AnyChanges to the content must be made by mutual consent and published in writing.

Specification update record:

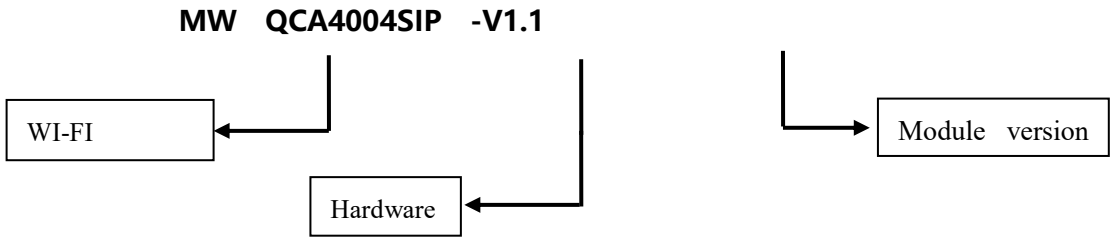
Serial number	Change what's	Why you've changed	Change the time	Responsible
V1.0	Create		**2018-03-06**	Jiang Qiangling

A manufacturer brand in English and Chinese: .

Company's English name:GD Midea Consumer Electric MFG. Co., Ltd

2 Origin (domestic factory address): No.19SanLeRoad,Beijiao,Shunde,Foshan,Guangdong

Three models and model meaning:



Four circuit principles:

- 4.1 Chart of Principles

The module's hardware schematic, shown inFigure2, is based onQCA4004B and is implemented with very few peripheral components Conversion of UART to Wi-Fisignals.

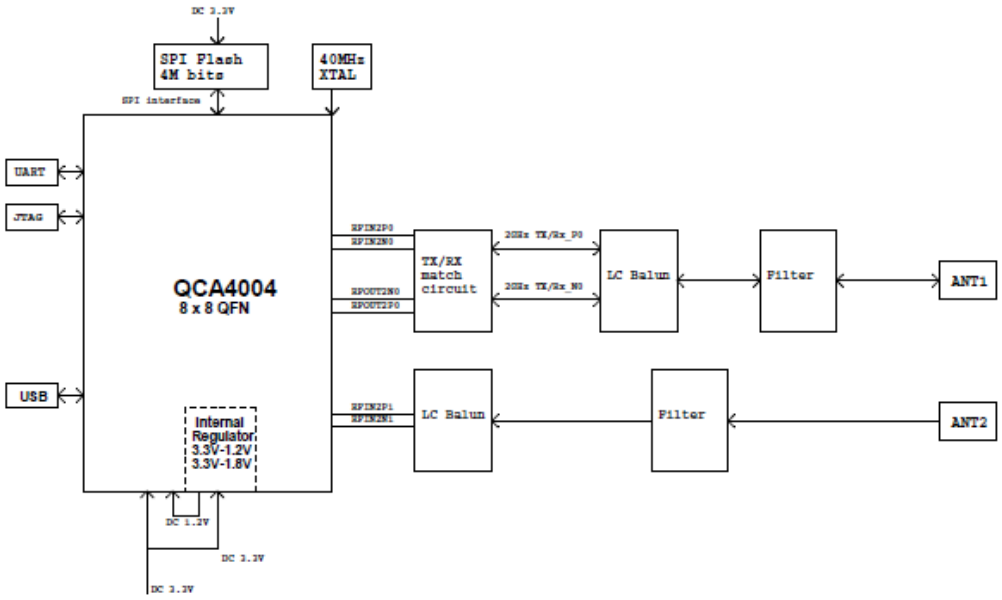


图 2

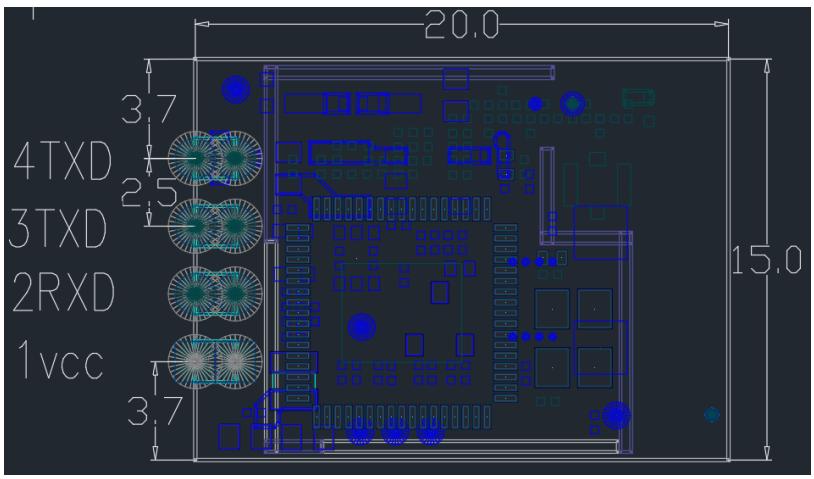
- 4.2 Circuit schematics

rmd_mw_qca400
4sip_aoeoa_v1.p

Five lead-out or pin description:

Port definition:

4Pin, 2. 54mm 间距



Serial number	**WiFi module end** Pin **description**	**Home appliance end pin description**	**Note**
1	VCC	VCC	5V
2	RXD module reception	Send of TXD appliances	5V
3	TXD module send	Reception of RXD appliances	5V
4	GND	GND 地	5V

Six appearance dimensions: (inmm)

- 6.1 Appearance Reality

图 3

Note: Address code: The MAC address for each module **is independent and unique;**

S/N: Production lot numbers vary with the date of production;

Software version: Because the software will be upgraded, so the software version will change with the software upgrade;

Seven key component brands, parameters, specifications:

Bill Of Material:

RMD_MW_QCA4004SIP_AOEOA_\

Eight Key Electrical Performance **Parameters**

- **8.1 Feature description**
  - ✓ **QCA4004SIP**It is a general Wi-Fi module with low cost and low power consumption from UART to serial port, which can intervene UART data into the Internet. This module supports IEEE 802.11b/g/n protocol, TCP/IP,SSL. The module is based on Qualcomm Atheros QCA4004
- **8.2 Basic features**
  - **8.2.1 Basic features:**
    - ✓ AP mode: that is, a working mode of the module as a hot spot;
    - ✓ STATION mode: LAN mode, a working mode for WiFi modules connected to the router;
    - ✓ AP /STATION ;
    - ✓ AP Mode DHCP server function ;
    - ✓ STATION Mode DHCP client function ;
    - ✓ Serial data receive /send;

- ✓ Network data to send and receive;
- ✓ Data is verified according to u.S. protocol, data parsing

8.2.2UART (household electrical appliances MCU)

- ✓ Read device SNcode
- ✓ Save parameters to clear
- ✓ Read MAC address
- ✓ Uart switching mode

8.2.3 Data Transfer

- ✓ According to the Group Agreement of the United States, the transfer of data to the network or home appliance s

8.2.4 Responses to network clients

- ✓ Up to 3clients are supported to connect at the same time
- ✓ No heartbeat auto-disconnect
- ✓ Configure SSID, encryption and password/ and save
- ✓ Work State Save
- ✓ Auto-switch working mode
- ✓ AP Scan: Wi-Fi scans nearby A Psin Station mode and records the front by signal strength SSIDfor20APsand encryption, saving up to20hotspots. Then switch to AP mode and return the scanned AP and its parameters to the connected phone.
- ✓ Restart
- ✓ Working state (mode, signal strength, connection status) is obtained
- ✓ Module software upgrade
- ✓ Resolve the server domain name

- ✓ Automatic connection to the server
- ✓ Get home appliance idand save
- ✓ Sign in to the server
- ✓ Transmission of server data
- ✓ AES128 Data Encryption
- ✓ MD5 Digital Signature
- ✓ Auto-switch connection to Mini Server
- ✓ Upgrade from a cloud server

➢ 8.3 Reference standards

- IEEE Std. 802.11b
- IEEE Std. 802.11g
- IEEE Std. 802.11n

➢ 8.4 System parameters

Main chip	QCA4004X-BL3A(QCA4004B)
Frequency of operation	2.40~2.4835GHz
Standard	802.11b/g/n(1X1)
Modulation	11b: DBPSK, DQPSK and CCK and DSSS 11g: BPSK, QPSK, 16QAM, 64QAM and OFDM 11n: MCS0~7 OFDM
Data transfer rate	11b:1, 2, 5.5 and 11Mbps 11g:6, 9, 12, 18, 24, 36, 48 and 54 Mbps 11n: MCS0~7, up to 150Mbps
Output terminals	4pin side type WTB CONN, 2.54mm pitch, 4PIN WTB，2.54mm

Main interface	UART
PCB 规格	2-layers
PCB 尺寸	15mm (W) -20mm(L) 1.0mm (T)
Antenna	PCB Antenna
Operating temperature	-10℃ to +85℃
Storage temperature	-40℃ to +125℃
Operating voltage	5V +/-5%
CHIP-PWD	11uA
Sleep current	130uA
Operating current	60mA
Maximum current	350ma

➢

➢ 8.5 Electrical specifications

8.5.1 802.11b

Project	Specifications				
Specification	IEEE802.11b				
Mode	DSSS / CCK				
Channel	CH1 to CH11				
Data rate	1, 2, 5.5, 11Mbps				
DC Characteristics	**Min.**	**Type.**	**Max.**	**Unit**	**Note**
1.DC current (Average) @3.3V input					
1) TX only @dBm	-		220	But	
2) TX throughput mode	-		120	But	
3) RX throughput mode	-		100	But	
TX Characteristics	Min.	Type.	Max.	Unit	
3. Spectrum Mask @ target power					
1) fc +/-11MHz to +/-22MHz	-	-	-30	dBr	
2) fc > +/-22MHz	-	-	-50	dBr	
4. Frequency Error	-25	0	+25	ppm	
RX Characteristics	Min.	Type.	Max.	Unit	
5 Minimum Input Level Sensitivity					
1) 1Mbps (FER-8%)	-	-	-83	dBm	
2) 2Mbps (FER-8%)	-	-	-80	dBm	
3) 5.5Mbps (FER-8%)	-	-	-79	dBm	

4) 11Mbps (FER-8%)	-	-88	-76	dBm	
6 Maximum Input Level (FER≦8%)	-20	-10	-	dBm	

8.5.2 802.11g

Project	**Specifications**				
Specification	IEEE802.11g				
Mode	OFDM				
Channel	CH1 to CH11				
Data rate	6, 9, 12, 18, 24, 36, 48, 54Mbps				
DC Characteristics	Min.	Type.	Max.	Unit	Remark
1. DC current (Average) @3.3V input					
1) TX only @dBm	-		220	But	
2) TX throughput mode	-		120	But	
3) RX throughput mode	-		100	But	
TX Characteristics	Min.	Type.	Max.	Unit	
3. Spectrum Mask @ target power					
1) at fc +/- 11MHz	-	-	-20	dBr	
2) at fc +/- 20MHz	-	-	-28	dBr	
3) at fc > +/-30MHz	-	-	-40	dBr	
4 Constellation Error(EVM)@ target power					
1) 6Mbps	-	-	-5	dB	
2) 9Mbps	-	-	-8	dB	
3) 12Mbps	-	-	-10	dB	

4) 18Mbps	-	-	-13	dB	
5) 24Mbps	-	-	-16	dB	
6) 36Mbps	-	-	-19	dB	
7) 48Mbps	-	-	-22	dB	
8) 54Mbps	-	-31	-25	dB	
5 Frequency Error	-25	0	+25	ppm	
RX Characteristics	Min.	Type.	Max.	Unit	
6 Minimum Input Level Sensitivity					
1) 6Mbps (PER ≦ 10%)	-	-	-85	dBm	
2) 9Mbps (PER ≦ 10%)	-	-	-84	dBm	
3) 12Mbps (PER ≦ 10%)	-	-	-82	dBm	
4) 18Mbps (PER ≦ 10%)	-	-	-80	dBm	
5) 24Mbps (PER ≦ 10%)	-	-	-77	dBm	
6) 36Mbps (PER ≦ 10%)	-	-	-73	dBm	
7) 48Mbps (PER ≦ 10%)	-	-	-69	dBm	
8) 54Mbps (PER≦ 10%)	-	-74	-68	dBm	
7 Maximum Input Level (PER ≦ 10%)	-20	-10	-	dBm	

8.5.3 802.11n HT20

Project	Specifications				
Specification	IEEE802.11n HT20 - 2.4GHz				
Mode	OFDM				
Channel	CH1 to CH11				
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7				
DC Characteristics	Min.	Type.	Max.	Unit	Remark
1. DC current (Average) @3.3V input					
1) TX only @ dBm Target(each port),	-		230	But	
2) TX throughput mode	-		120	But	
3) RX throughput mode	-		100	But	
TX Characteristics	Min.	Type.	Max.	Unit	
3. Spectrum Mask @target power					
1) at fc +/- 11MHz	-	-	-20	dBr	
2) at fc +/- 20MHz	-	-	-28	dBr	
3) at fc > +/-30MHz	-	-	-45	dBr	
4. Constellation Error(EVM)@ target power					
1) MCS0	-	-	-5	dB	
2) MCS1	-	-	-10	dB	
3) MCS2	-	-	-13	dB	

4) MCS3	-	-	-16	dB	
5) MCS4	-	-	-19	dB	
6) MCS5	-	-	-22	dB	
7) MCS6	-	-	-25	dB	
8) MCS7	-	-31	-28	dB	
5. Frequency Error	-25	0	+25	ppm	
RX Characteristics	Min.	Type.	Max.	Unit	
6. Minimum Input Level Sensitivity					
1) MCS0 (PER - 10%)	-	-	-85	dBm	
2) MCS1 (PER - 10%)	-	-	-82	dBm	
3) MCS2 (PER - 10%)	-	-	-80	dBm	
4) MCS3 (PER - 10%)	-	-	-77	dBm	
5) MCS4 (PER - 10%)	-	-	-73	dBm	
6) MCS5 (PER - 10%)	-	-	-69	dBm	
7) MCS6 (PER - 10%)	-	-	-68	dBm	
8) MCS7 (PER - 10%)	-	-71	-67	dBm	
7. Maximum Input Level (PER ≦ 10%)	-20	-10	-	dBm	

Project	Specifications				
Specification	IEEE802.11n HT40 - 2.4GHz				
Mode	OFDM				
Channel	CH3 to CH9				
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7				
DC Characteristics	Min.	Type.	Max.	Unit	Remark
1. DC current (Average) @3.3V input					
1) TX only @ dBm Target	-		200	But	
2) TX throughput mode	-		120	But	
3) RX throughput mode	-		100	But	
TX Characteristics	Min.	Type.	Max.	Unit	
3. Spectrum Mask @14dBm					
1) at fc +/- 22MHz	-	-	-20	dBr	
2) at fc +/- 40MHz	-	-	-28	dBr	
3) at fc > +/-60MHz	-	-	-45	dBr	
4. Constellation Error(EVM)@target power					
1) MCS0	-	-	-5	dB	
2) MCS1	-	-	-10	dB	
3) MCS2	-	-	-13	dB	
4) MCS3	-	-	-16	dB	

5) MCS4	-	-	-19	dB	
6) MCS5	-	-	-22	dB	
7) MCS6	-	-	-25	dB	
8) MCS7	-	-30	-28	dB	
5. Frequency Error	-25	0	+25	ppm	
RX Characteristics	Min.	Type.	Max.	Unit	
6. Minimum Input Level Sensitivity					
1) MCS0 (PER - 10%)	-	-	-82	dBm	
2) MCS1 (PER - 10%)	-	-	-79	dBm	
3) MCS2 (PER - 10%)	-	-	-77	dBm	
4) MCS3 (PER - 10%)	-	-	-74	dBm	
5) MCS4 (PER - 10%)	-	-	-70	dBm	
6) MCS5 (PER - 10%)	-	-	-66	dBm	
7) MCS6 (PER - 10%)	-	-	-65	dBm	
8) MCS7 (PER - 10%)	-	-68	-62	dBm	
7. Maximum Input Level (PER ≦ 10%)	-20	-10	-	dBm	

Nine key control points of the manufacturer:

1, the whole process of production needs to have anti-static measures;

2-WIFI

3,functional automation testing;

Ten device usage precautions

1.detection/use is, light, to avoid collision, fall, not stacked, vertical, in order to prevent damage.

2、 Working voltage range: 5V +/-5%。

3,operating temperature range:-10degrees C to 85degreesC,operating humidity: relative humidity less than90% ,if exceeded, it may cause WIFI drop-off, etc., but it will not be damaged.

4、Storage environment: dustproof, moisture-proof, antistatic, its temperature: storage temperature:-40 ℃ to 125 ℃, humidity: 5%-95%RH。

5.WIFI antenna: built-in antenna

6,use precautions: when using the antenna outside there is no frequency mask and other similar devices, no similar frequency band interference source, and close to the wireless router to ensure good signal, preferably no wifi with channel conflict(13any one of the channels.

FCC Certification Requirements.

According to the definition of mobile and fixed device is described in Part 2.1091(b), this device is a mobile device.

And the following conditions must be met:

1. This Modular Approval is limited to OEM installation for mobile and fixed applications only. The antenna installation and operating configurations of this transmitter, including any applicable source-based time- averaging duty factor, antenna gain and cable loss must satisfy MPE categorical Exclusion Requirements of 2.1091.

2. The EUT is a mobile device; maintain at least a 20 cm separation between the EUT and the user' s body and must not transmit simultaneously with any other antenna or transmitter.

3.A label with the following statements must be attached to the host end product: This device contains FCC ID: TAPMC-4004SIP.

4.To comply with FCC regulations limiting both maximum RF output power and human exposure to RF radiation, maximum antenna gain (including cable loss) must not exceed: WIFI: <0dBi

5. This module must not transmit simultaneously with any other antenna or transmitter

6. The host end product must include a user manual that clearly defines operating requirements and conditions that must be observed to ensure compliance with current FCC RF exposure guidelines.

For portable devices, in addition to the conditions 3 through 6 described above, a separate approval is required to satisfy the SAR requirements of FCC Part 2.1093

If the device is used for other equipment that separate approval is required for all other operating configurations, including portable configurations with respect to 2.1093 and different antenna configurations.

For this device, OEM integrators must be provided with labeling instructions of finished products. Please refer to KDB784748 D01 v07, section 8. Page 6/7 last two paragraphs:

A certified modular has the option to use a permanently affixed label, or an electronic label. For a permanently affixed label, the module must be labelled with an FCC ID – Section 2.926 (see 2.2 Certification (labelling requirements) above). The OEM manual must provide clear instructions explaining to the OEM the labelling requirements , options and OEM user manual instructions that are required (see next paragraph).

For a host using a certified modular with a standard fixed label, if (1) the module' s FCC ID is not visible when installed in the host, or (2) if the host is marketed so that end users do not have straight forward commonly used methods for access to remove the module so that the FCC ID of the module is visible; then an additional permanent label referring to the enclosed module: "Contains Transmitter Module FCC ID: TAPMC-4004SIP" or "Contains FCC ID: TAPMC-4004SIP" must be used. The host OEM user manual must also contain clear
instructions on how end users can find and/or access the module and the FCC ID.

The final host / module combination may also need to be evaluated against the FCC Part15B criteria for unintentional radiators in order to be properly authorized for operation as a Part 15 digital device.

The user' s manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party

responsible for compliance could void the user's authority to operate the equipment. In cases where the manual is provided only in a form other than paper, such as on a computer disk or over the Internet, the information required by this section may be included in the manual in that alternative form, provided the user can reasonably be expected to have the capability to access information in that form.

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.

Changes or modifications not expressly approved by the manufacturer could void the user’ s authority to operate the equipment.

To ensure compliance with all non-transmitter functions the host manufacturer is responsible for ensuring compliance with the module(s) installed and fully operational. For example, if a host was previously authorized as an unintentional radiator under the Declaration of Conformity procedure without a transmitter certified module and a module is added, the host manufacturer is responsible for ensuring that the after the module is installed and operational the host continues to be compliant with the Part 15B unintentional radiator requirements.

Eleven factory original specifications inserted

12 Factory packaging

Plastic size	外围:310*290*20/内格:30*17*10MM	Number of modules installed	8*12-1=95pcs
Cartons size	303*323*180MM/K=K/RF-LINK	Number of modules installed	12*95=1140pcs