MM511250-11Wi-F iDatasheet

versions	Date	Content	Author
1.0	2016-09-01	initial release	

目录

1. Introduction

MM511250-11 Wireless WIFI module is a low-power WIFI module for the Internet of Things. It supports IEEE802.11b / g / n protocol. It also embeds IPV4 / IPV6 TCP / IP, HTTP, DNS, FTP and other complete network protocols, making the terminal more reliable, convenient and easy to use.

The MM511250-11 module contains RTL8711AM single-chip solution. the chip in software and hardware are used in low-power technology, the purpose is to lower the power consumption of the entire board, the product more competitive. At present, the module provides a complete serial interface functions and equipment to communicate, so you can through the serial port and mobile client to connect the cloud and equipment.

- IEEE 802.1b/g/n, 2.4Ghz ,1T1R

- internal antennas

- Green TX Low power saving technology

- Low power monitor mode

- Support 150Mbps

- Support PWM

- Full encryption support： WPS, WPA, WPA2, WAPI, WEP, TKIP

- Support IPV4/IPV6, TCP/IP protocol

- Support HTTP, DNS, FTP and other network protocols

1.1 Module System Block Diagram

As shown in Figure 1,the MM511250-11 module contains RTL8711AM single-chip solution. The module uses the internal antenna design in PCB, both for customers to reduce the cost of the antenna, but also eliminates the need to consider the antenna assembly space.
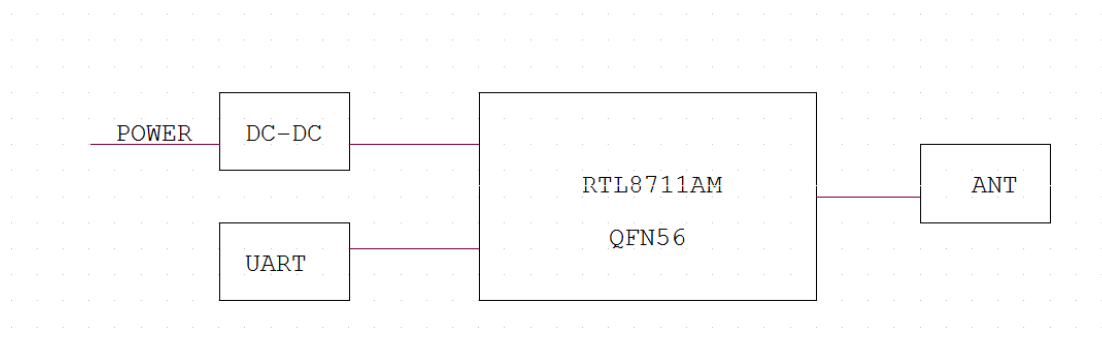
```
POWER   ┌─────────┐                ┌──────────────────┐
────────│  DC-DC  │────────────────│                  │
        └─────────┘                │    RTL8711AM     │        ┌──────────┐
                                    │                  │────────│   ANT    │
                                    │     QFN56        │        └──────────┘
        ┌─────────┐                │                  │
        │  UART   │────────────────│                  │
        └─────────┘                └──────────────────┘
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figure 1. Module System Block Diagram

1.2 Module technical specifications

Main chip	RTL8711AM
Workingfrequency	2.412~2.462GHz
支持的 WIFI 标准	802.11b/g/n(1x1)
Modulation	11b: DBPSK, DQPSK, CCK, DSSS 11g: BPSK, QPSK, 16QAM, OFDM 11n: MCS0~MSC7 OFDM
Supported rates	11b: 1, 2, 5.5 和 11Mbps 11g: 6,9,12,18,24,36,48,54Mbps 11n: MCS0~7, up to 150Mbps
communication interface	UART
PCB layer structure	2 Layers
PCB size	36.0mm(L)x29.0mm(W)x1.0mm(H)
Antenna	internal antennas
Working temperature	-40℃~+85℃

Storage temperature	-40℃~+125℃
Hardware version	RTK-8711AM_36*29_2LVer:1.1

2. Structure specification

2.1 Module structure size
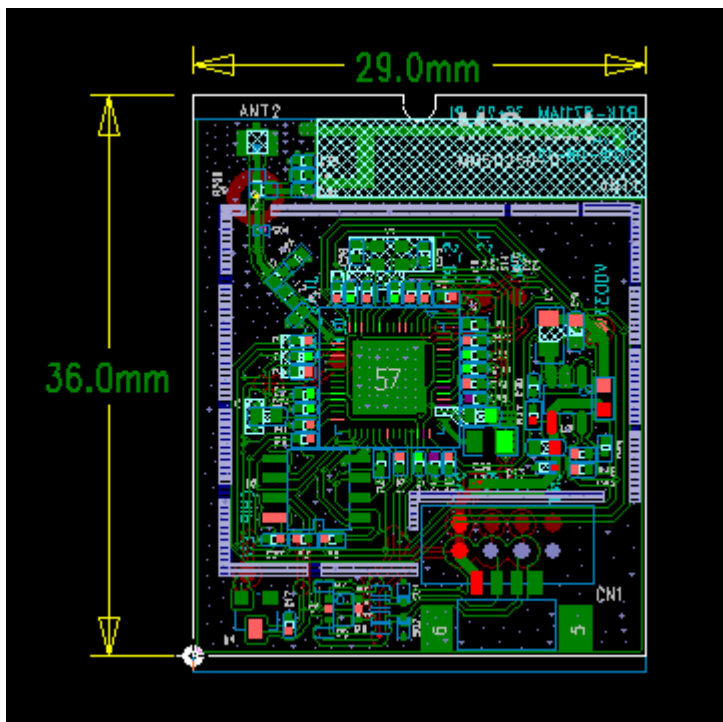
The size of the module as shown above , length:36.0mm,width:29.0mm, thickness 1.0mm (error +/- 0.1mm)

2.2 Hardware interface definition

PIN	Signal Name	Description
1	5VDD	Supply Input Pin
2	MCU_UART_RX	UART receive data
3	MCU_UART_TX	UART transmit data
4	AGND	Ground
5,6	AGND	Ground for SMT

3. Wireless Specification

表 1: 802.11b mode

Item	Spec				
Specification	IEEE802.11b				
Mode	DSSS / CCK				
Channel	CH1 to CH11				
Data rate	1, 2, 5.5, 11Mbps				
TX Characteristics	Min.	Typ.	Max.	Unit	Remark
1. Power Levels(Calibrated)					
1) 16dBm Target	14.5	16	17.5	dBm	
2. Spectrum Mask @ target power					
1) fc +/-11MHz to +/-22MHz	-	-	-30	dBr	
2) fc > +/-22MHz	-	-	-50	dBr	
3. Frequency Error	-15	0	+15	ppm	
RX Characteristics	Min.	Typ.	Max.	Unit	
4 Minimum Input Level Sensitivity					
1) 1Mbps (FER≦8%)	-	-91	-93	dBm	
2) 2Mbps (FER≦8%)	-	-90	-93	dBm	
3) 5.5Mbps (FER≦8%)	-	-88	-90	dBm	
4) 11Mbps (FER≦8%)	-	-84	-86	dBm	
5 Maximum Input Level (FER≦8%)		0	0.5	dBm	

表 2: 802.11g mode

Item	Spec				
Specification	IEEE802.11g				
Mode	OFDM				
Channel	CH1 to CH11				
Data rate	6, 9, 12, 18, 24, 36, 48, 54Mbps				
TX Characteristics	Min.	Typ.	Max.	Unit	
1. Power Levels					
1) 12dBm Target @6Mbps	11.5	12	13.5	dBm	
2) 12dBm Target @54Mbps	11.5	12	13.5	dBm	
2. Spectrum Mask @ target power					
1) at fc +/- 11MHz	-	-	-20	dBr	
2) at fc +/- 20MHz	-	-	-28	dBr	
3) at fc > +/-30MHz	-	-	-40	dBr	
3 Constellation Error(EVM)@ target power					
1) 6Mbps	-	-22	-25	dB	
2) 9Mbps	-	-22	-25	dB	
3) 12Mbps	-	-23	-26	dB	
4) 18Mbps	-	-24	-27	dB	
5) 24Mbps	-	-24	-27	dB	
6) 36Mbps	-	-27	-30	dB	
7) 48Mbps	-	-28	-31	dB	
8) 54Mbps	-	-30	-32	dB	
4 Frequency Error	-15	0	+15	ppm	
RX Characteristics	Min.	Typ.	Max.	Unit	
5 Minimum Input Level Sensitivity					
1) 6Mbps (PER $\leq$ 10%)	-	-88	-90	dBm	
2) 9Mbps (PER $\leq$ 10%)	-	-88	-90	dBm	

3) 12Mbps (PER ≦ 10%)	-	-86	-88	dBm	
4) 18Mbps (PER ≦ 10%)	-	-84	-86	dBm	
5) 24Mbps (PER ≦ 10%)	-	-81	-83	dBm	
6) 36Mbps (PER ≦ 10%)	-	-78	-80	dBm	
7) 48Mbps (PER ≦ 10%)	-	-73	-75	dBm	
8) 54Mbps (PER≦ 10%)	-	-72	-74	dBm	
6 Maximum Input Level (PER ≦ 10%)		0	0.5	dBm	

表 3：802.11n (HT20) mode

Item	Spec				
Specification	IEEE802.11n HT20 @ 2.4GHz				
Mode	OFDM				
Channel	CH1 to CH11				
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7				
TX Characteristics	Min.	Typ.	Max.	Unit	
1. Power Levels					
1) 12dBm Target@MCS0	11.5	12	13.5	dBm	
2) 12dBm Target@MCS7	11.5	12	13.5	dBm	
2. Spectrum Mask @target power					
1) at fc +/- 11MHz	-	-	-20	dBr	
2) at fc +/- 20MHz	-	-	-28	dBr	
3) at fc > +/-30MHz	-	-	-45	dBr	
3. Constellation Error(EVM)@ target					

power					
1) MCS0	-	-22	-24	dB	
2) MCS1	-	-26	-28	dB	
3) MCS2	-	-26	-28	dB	
4) MCS3	-	-26	-28	dB	
5) MCS4	-	-26	-28	dB	
6) MCS5	-	-28	-30	dB	
7) MCS6	-	-28	-30	dB	
8) MCS7	-	-28	-31	dB	
4. Frequency Error	-15	0	+15	ppm	
RX Characteristics	Min.	Typ.	Max.	Unit	
5. Minimum Input Level Sensitivity					
1) MCS0 (PER $\leqq$ 10%)	-	-88	-90	dBm	
2) MCS1 (PER $\leqq$ 10%)	-	-85	-87	dBm	
3) MCS2 (PER $\leqq$ 10%)	-	-83	-85	dBm	
4) MCS3 (PER $\leqq$ 10%)	-	-80	-82	dBm	
5) MCS4 (PER $\leqq$ 10%)	-	-77	-79	dBm	
6) MCS5 (PER $\leqq$ 10%)	-	-77	-79	dBm	
7) MCS6 (PER $\leqq$ 10%)	-	-71	-73	dBm	
8) MCS7 (PER $\leqq$ 10%)	-	-69	-71	dBm	
6. Maximum Input Level (PER $\leqq$ 10%)	-	0	0.5	dBm	

表 4：802.11n (HT40) mode

Item	Spec				
Specification	IEEE802.11n HT40 @ 2.4GHz				
Mode	OFDM				
Channel	CH3 to CH11				
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7				
TX Characteristics	Min.	Typ.	Max.	Unit	
1. Power Levels (Calibrated)					
1) 12dBm Target@MCS0	11.5	12	13.5	dBm	
2) 12dBm Target@MCS7	11.5	12	13.5	dBm	
2. Spectrum Mask @14dBm					
1) at fc +/- 22MHz	-	-	-20	dBr	
2) at fc +/- 40MHz	-	-	-28	dBr	
3) at fc > +/-60MHz	-	-	-45	dBr	
3. Constellation Error(EVM)@target power					
1) MCS0	-	-26	-28	dB	
2) MCS1	-	-22	-24	dB	
3) MCS2	-	-22	-24	dB	
4) MCS3	-	-26	-28	dB	
5) MCS4	-	-26	-28	dB	
6) MCS5	-	-26	-28	dB	

	Min.	Typ.	Max.	Unit	
7) MCS6	-	-27	-29	dB	
8) MCS7	-	-29	-31	dB	
4. Frequency Error	-15	0	+15	ppm	
RX Characteristics	**Min.**	**Typ.**	**Max.**	**Unit**	
5. Minimum Input Level Sensitivity					
1) MCS0 (PER ≦ 10%)	-	-86	-88	dBm	
2) MCS1 (PER ≦ 10%)	-	-83	-85	dBm	
3) MCS2 (PER ≦ 10%)	-	-81	-83	dBm	
4) MCS3 (PER ≦ 10%)	-	-77	-79	dBm	
5) MCS4 (PER ≦ 10%)	-	-74	-76	dBm	
6) MCS5 (PER ≦ 10%)	-	-69	-71	dBm	
7) MCS6 (PER ≦ 10%)	-	-69	-71	dBm	
8) MCS7 (PER ≦ 10%)	-	-67	-69	dBm	
6. Maximum Input Level (PER ≦ 10%)	-	0	0.5	dBm	

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.

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 of relocate the receiving antenna.

● Increase the separation between the equipment and receiver.

● Connect the equipment into an outlet on a circuit difference from that to which the receiver is connected.

● Consult the dealer or an experienced radio/TV technician for help.

Important Note:

Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Country Code selection feature to be disabled for products marketed to the US/Canada.

1. The antenna must be installed such that 20 cm is maintained between the antenna and users, and
2. The transmitter module may not be co-located with any other transmitter or antenna.

As long as the three conditions above are met, further transmitter testing will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

Important Note:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling:

The final end product must be labeled in a visible area with the following "Contains FCC ID: 2ADQOMDWF01"

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: 2ADQOMDWF01.

Manual Information to the End User:

The OEM integrator has to be aware not provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

When the module is installed inside another device, the user manual of this device 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.

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.