WiFi Module specification

MT7668U

1. GeneralDescription

This Wi-Fi module is a highly integrated MCU module with built-in 2X2 dual-frequency wireless

LAN, supports ieee802.11a /b/g/n 11ac standard, provides the highest speed of 867Mbps,

provides rich wireless connections and reliable throughput.

*Embedded high-performance 32bit RISC microprocessor

*Highly integrated rf and 55nmCMOS technologies

*The 40MHz crystal clock supports low-power running and sleeping modes.

2. Features

nHighlyintegrated28nmRFCMOS technology
n9x9QFN76pinspackage
nIntegratehighefficiencypower managementunitwith single3.3Vpower supplyinput
n26,40,52MHzcrystalclocksupportwithlowpoweroperationinidlemode
nBufferedclockoutputfor co-clockwithotherSOC chipset
n32-bit RISCMCUfor Wi-Fi/Bluetoothprotocols

nARMCortex-R4MCUforWi-Fioffload

nEmbeddedSRAM/ROM

n SDIOdevicefullycomplianttoSDIO3.0specification

nUARTinterfacewith hardwareflowcontrol

nProgrammableand multiplexedGPIO pins
nIEEE802.11a/b/g/n/accompliant

nSupport20MHz,40MHz,80Mhz bandwidthin2.4GHzband 5GHzband

nDual-band 2T2Rmode,datarateup to450MbpswithSDIO3.0.

nSupportMU-MIMO RXand DBDC(dualbanddualconcurrent)

nSupport STBC,LDPC,TXBeamformer and RXB eamformee

nGreenfield, mixedmode,legacymodes support

nIEEE802.11d/e/h/i/j/k/mc/r/v/wsupport

nSecuritysupportforWFAWPA/WPA2personal,WPS2.0,WAPI

nQoSsupportofWFAWMM,WMMPS

nIntegratedLNA,PA, andT/Rswitch

3. Statement

Federal Communication Commission Interference 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.

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 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.

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

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

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 20cm between the radiator & your body.

This device is intended only for OEM integrators under the following conditions:

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 2 conditions above are met, further transmitter test 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 can not 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 can not 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
This transmitter module is authorized only for use in device where the antenna may be installed
such that 20 cm may be maintained between the antenna and users. The final end product must be
labeled in a visible area with the following: “Contains FCC ID:2ACYT-MT7668U”. The grantee's
FCC ID can be used only when all FCC compliance requirements are met.

Manual Information To the End User

The device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;

The OEM integrator has to be aware not to provide information to the end user regarding how to

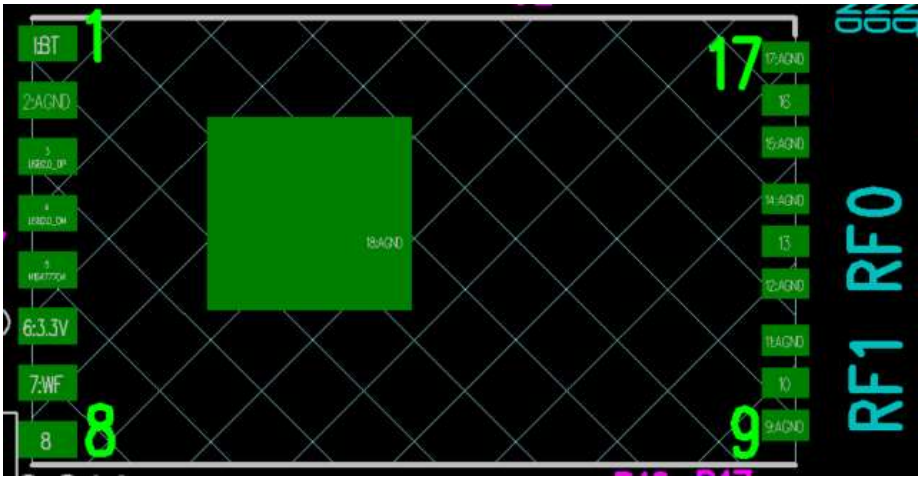
install or remove this RF module in the user’s manual of the end product which integrates this module.

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

4. Essential information

Module:	**CDW-627668U**
Module Description	**IEEE 802.11a/b/g/n/ac (2T2R) WiFi**
Standard	**WIFI: 802.11a/b/g/n/ac**
Frequency Band	**2.4GHz:** **2400-2483.5MHz** **5 GHz:** **5150-5250MHz,** **5250-5350MHz,** **5470-5725MHz,** **5725-5850MHz**
RF Max power	**2.4GHz:22.27dBm/MHz** **5 GHz:** **5150-5250MHz:15.71dBm/MHz** **5250-5350MHz: 16.72dBm/MHz** **5470-5725MHz: 17.44dBm/MHz** **5725-5850MHz: 20.95dBm/MHz**
FCC rules	**FCC Part 15, Subpart C (Section 15.247)** **FCC Part 15, Subpart E, (Section 15.407)** **FCC Part 2 (Section 2.1091)** **FCC Part , Subpart B**
Data Transfer Rate	**1,2,5.5,6,11,12,18,22,24,30,36,48,54,60,90,120 and maximum of 867Mbps**
Modulation Method	**DQPSK, CCK and OFDM (BPSK/QPSK)**
Security	**64-bit WEP (WEP-40) and 128-bit WEP (WEP-104) encryption with**
Product name:	**WiFi11**
Chipset:	**MT7668AUN**
I/O port:	**USB2.0**
Power supply:	**DC3.3V Max. :882mA**
Operation Temperature Range:	**-20~60℃**

5. The module definition

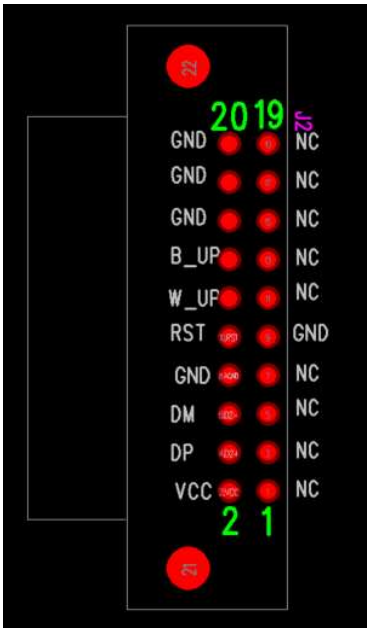


Item	Definition	Description	Item	Definition	Description
1	**NC**	**No connect**	**10**	**WF-RF0**	**WiFi Antenna**
2	**GND**	**Ground**	**11**	**GND**	**Ground**
3	**USB2.0-DP**	**Data+**	**12**	**GND**	**Ground**
4	**USB2.0-DM**	**Data-**	**13**	**WF-RF1**	**WiFi Antenna**
5	**RST**	**Reset**	**14**	**GND**	**Ground**
6	**3.3V**	**3.3V in**	**15**	**GND**	**Ground**
7	**WIFI_WAKE**	**WiFi rouse**	**16**	**BT-RF**	

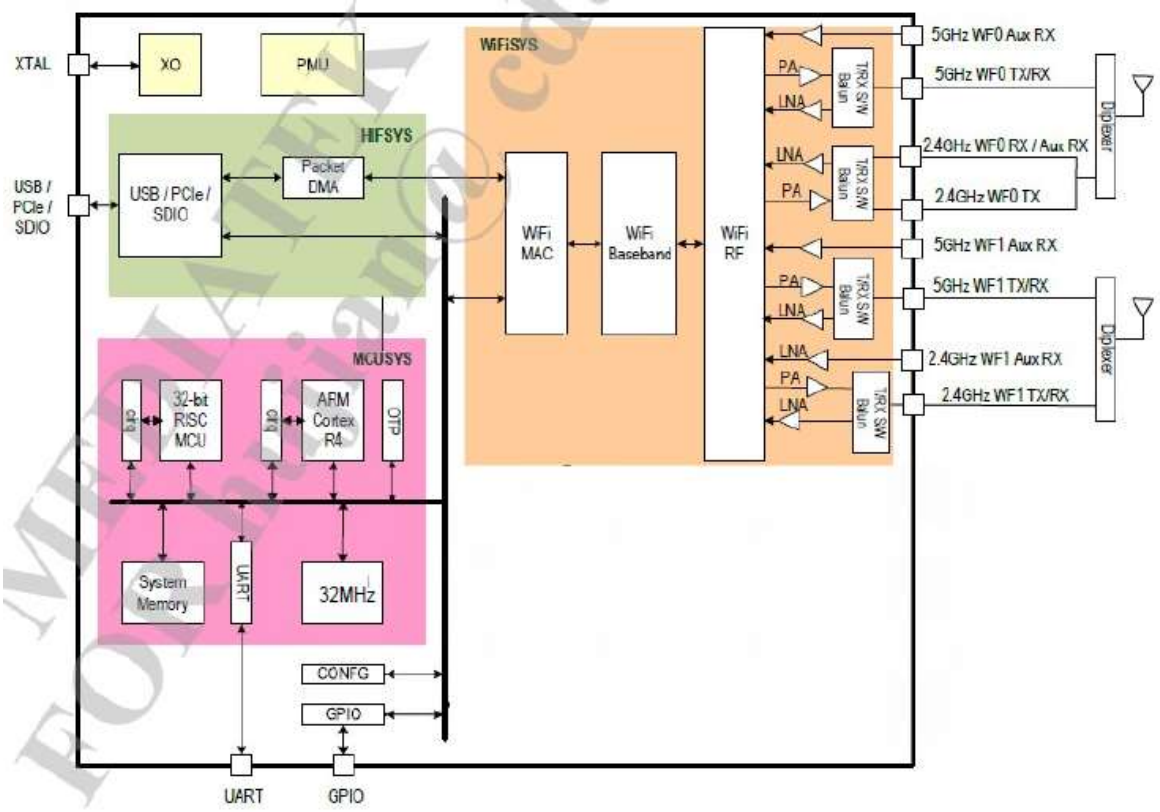
8	**NC**	**NC**	**17**	**GND**	**Ground**
9	**GND**	**Ground**			

6. Pin Assignments

Item	Definition	Description	Item	Definition	Description
1	NC	No connect	11	NC	No connect
2	Vcc	3.3V	12	W_UP	WIFI rouse
3	NC	No connect	13	NC	No connect
4	DP	data+	14	B_UP	
5	NC	No connect	15	NC	No connect
6	DM	data-	16	GND	Ground
7	NC	No connect	17	NC	No connect
8	GND	Ground	18	GND	Ground
9	GND	Ground	19	NC	No connect
10	RST	Reset	20	GND	Ground



7. Block Diagram



8. ElectricalSpecifications

1) RF Characteristics for IEEE802.11b (11Mbps mode unless otherwise specified)

Items	Contents			
Specification	IEEE802.11b			
Channel frequency	2412 ~ 2484 MHz			
RX (per≤85 dBm@8%)	-85 dBm			
Freq Err Limit	±10ppm			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (±2 dBm)		17		dBm
EVM (≤-18)		-18		dB

2) RF Characteristics for IEEE802.11g (54Mbps mode unless otherwise specified)

Items	Contents			
Specification	IEEE802.11g			
Channel frequency	2412 ~ 2484 MHz			
RX (per≤70 dBm@10%)	-70 dBm			
Freq Err Limit	±10ppm			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (±2dBm)		15		dBm
EVM (≤-25)		-27		dB

3) RF Characteristics for IEEE802.11n (BW20_MCS7)

Items	Contents			
Specification	IEEE802.11n (BW20_MCS7)			
Channel frequency	2412 ~ 2484 MHz			
RX (per≤65 dBm@10%)	-65 dBm			
Freq Err Limit	±10ppm			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (±2 dBm)		14		dBm
EVM (≤-28)		-28		dB

4) RF Characteristics for IEEE802.11n (BW40_MCS7)

Items	Contents			
Specification	IEEE802.11n (BW40_MCS7)			
Channel frequency	2412 ~ 2484 MHz			
RX (per≤65 dBm@10%)	-65 dBm			
Freq Err Limit	±10ppm			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (±2 dBm)		14		dBm
EVM (≤-28)		-28		dB

5) RF Characteristics for IEEE802.11A (Data Rate 54M OFDM)

Items	Contents			
Specification	IEEE802.11A (Data Rate 54M OFDM)			
Channel frequency	4.9GHz~ 6.0GHz			
RX (per≤63 dBm@10%)	-65 dBm			
Freq err Limit	±10PPM			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (±2 dBm)		14		dBm
EVM (≤-25)		-27		dB

6) RF Characteristics for IEEE802.11N (BW20_MCS7)

Items	Contents			
Specification	IEEE802.11N (BW20_MCS7)			
Channel frequency	4.9GHz~ 6.0GHz			
RX (per≤63 dBm@10%)	-63 dBm			
Freq err Limit	±10PPM			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (±2 dBm)		14		dBm
EVM (≤-28)		-30		dB

7) RF Characteristics for IEEE802.11AC (BW40_MCS7)

Items	Contents			
Specification	IEEE802.11AC (BW40_MCS7)			
Channel frequency	4.9GHz~ 6.0GHz			
RX (per≤63 dBm@10%)	-63 dBm			
Freq err Limit	±10PPM			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (±2 dBm)		14		dBm
EVM (≤-30)		-30		dB

8) RF Characteristics for IEEE802.11AC (BW80_MCS9)

Items	Contents			
Specification	IEEE802.11AC (BW80_MCS9)			
Channel frequency	4.9GHz~ 6.0GHz			
RX (per≤58 dBm@10%)	-60 dBm			
Freq err Limit	±10PPM			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (±2 dBm)		14		dBm
EVM (≤-32)		-32		dB

8 Bluetooth Specification

9. Environmental Requirements and Specifications TP Content

9.1 Temperature

9.1.1 Operating Temperature Conditions

The product shall be capable of continuous reliable operation when operating in
ambient temperature of -20℃ to +60℃.

9.1.3 Non-Operating Temperature Conditions

Neither subassemblies shall be damaged nor shall the operational performance be
degraded when restored to the operating temperature when exposed to storage
temperature in the range of -45℃ to +135℃.

10. PCB Bending

The PCB bending spec shall be keep planeness under 0.1mm for both NATER and
end assembly customer.

11. Handling environment

11.1 ESD

Symbol	Ratings	Max	Unit
V_{ESD} (HBM)	Electrostatic discharge voltage (human body model)	2000	V
V_{ESD} (CDM)	Electrostatic discharge voltage (charge device model)	500	

Please handle it under ESD protection environment.

11.2 Terminals

The product is mounted with motherboard through half hole. In order to prevent
poor soldering, please do not touch the pad by hand.

11.3 Falling

It will cause damage on the mounted components when the product is falling or
receiving drop shock. It may cause the product mal-function.

12. Storage Condition

12.1 Moisture barrier bag before opened

Moisture barrier bag must be stored under 30 degree C, humidity under 85% RH.
The calculated shelf life for the dry packed product shall be a 12 months from the bag
seal date.

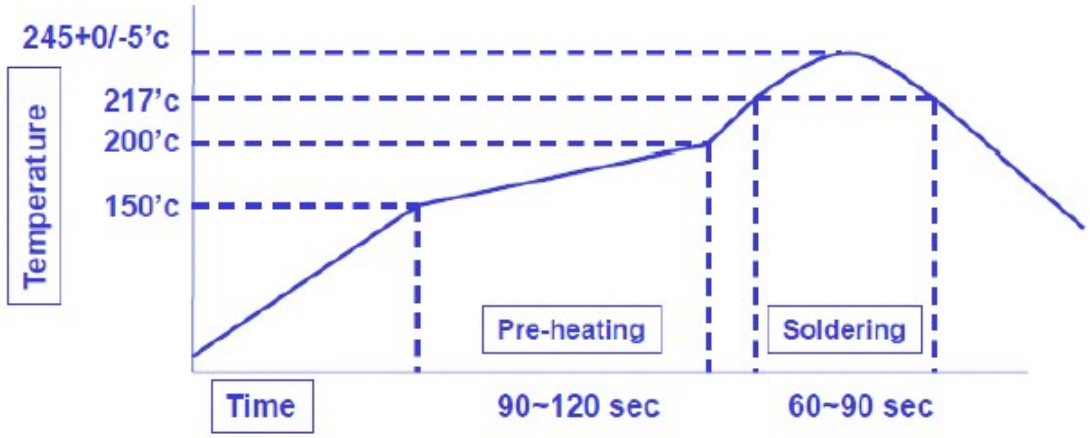
12.2 Moisture barrier bag open

Humidity indicator cards must be blue, <30%.

12.3 Baking Condition

Products require baking before mounting if
a) humidity indicator cards reads>30%
b) temp <30 degree C, humidity < 70% RH, over 96 hours
Baking condition: 90 degree C, 12-24 hours
Baking times: 1 time

12.4 Soldering and reflow condition



- Follow the solder paste composition to set the reflow profile
- Lead free solder paste(SAC305, SAC387 or SAC405) reflow profile setting as above :
  - Ramp up rate (to Peak temp) : < 1.2'c/sec, typically
  - Time above Liquidus(217'C) : 60~90Sec
  - Peak Temp : 245+0/-5'C
  - Ramp-down rate (Peak to RT) : 1~3'C/sec, typically