

Product Name: Wi-Fi&Bluetooth Module	Report No: FCC022022-06260RF14
Product Model: FC64E	Security Classification: Open
Version: V1.0	Total Page: 7

TIRT Testing Report



Prepared By:	Checked By:	Approved By:	A circular blue stamp with the text "TIRT Technology Service Co., Ltd." around the perimeter and "TIRT Shenzhen" in the center.
Stone Tang	Randy Lv	Daniel Chen	
<i>Stone Tang</i>	<i>Randy Lv</i>	<i>Daniel chen</i>	

FCC RF EXPOSURE REPORT

FCC ID: XMR202208FC64E

Project No. : 2022-06260
Equipment : Wi-Fi&Bluetooth Module
Brand Name : Quectel
Test Model : FC64E
Series Model : N/A
Applicant : Quectel Wireless Solutions Co., Ltd
Address : Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233
Manufacturer : Quectel Wireless Solutions Co., Ltd
Address : Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233
Issued Date : Dec. 08, 2022
Report Version : V1.0
Test Sample : Engineering Sample No.: 20221207021267
Standard(s) : FCC Guidelines for Human Exposure IEEE C95.1 & FCC Part 2.1091
FCC Title 47 Part 2.1091
KDB 447498 D01 General RF Exposure Guidance v06

- The test result referred exclusively to the presented test model /sample.
- Without written approval of TIRT Inc. the test report shall not reproduced except in full.

Lab: Beijing TIRT Technology Service Co.,Ltd Shenzhen
Add: 101, 3 # Factory Building, Gongjin Electronics Shatin Community, Kengzi Street, Pingshan District, Shenzhen, China
TEL: +86-0755-27087573

REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
FCC022022-06260RF14	V1.0	Original Report	2022.12.08	Valid

1. TEST FACILITY

Company:	Beijing TIRT Technology Service Co.,Ltd Shenzhen
Address:	101, 3 # Factory Building, Gongjin Electronics Shatin Community, Kengzi Street, Pingshan District, Shenzhen, China
CNAS Registration Number:	CNAS L14158
A2LA Registration Number:	6049.01
FCC Accredited Lab. Designation Number:	CN1309
FCC Test Firm Registration Number:	825524
Telephone:	+86-0755-27087573

2. MPE CALCULATION METHOD

Calculation Method of RF Safety Distance:

$$S = \frac{PG}{4\pi R^2} = \frac{EIRP}{4\pi R^2}$$

where:

S = power density

P = power input to the antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

For BT:

Antenna Specification:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Dipole	N/A	0.73

Note:

- 1) The antenna gain is provided by the manufacturer.
- 2) The antenna is for testing purposes only.

For 2.4GHz:

Antenna Specification:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Dipole	N/A	0.73
2	N/A	N/A	Dipole	N/A	0.73

Note:

- 1) This EUT supports CDD, and all antenna gains are not equal, Directional gain = $G_{ANT} + \text{Array Gain}$.
For power measurements, Array Gain=0dB ($N_{ANT} \leq 4$), so the Directional gain=0.73dBi.
For power spectral density measurements, $N_{ANT}=2$, $N_{SS} = 1$.
So the Directional gain= $G_{ANT} + \text{Array Gain} = G_{ANT} + 10\log(N_{ANT}/N_{SS})\text{dBi} = 0.73 + 10\log(2/1)\text{dBi} = 3.74\text{dBi}$.
- 2) The antenna gain is provided by the manufacturer.
- 3) The antenna is for testing purposes only.

Table for Antenna Configuration:

Operating Mode	1TX	1TX	2TX
TX Mode			
IEEE 802.11b	V (Ant. 1)	V(Ant. 2)	V(Ant. 1 + Ant. 2)
IEEE 802.11g	V (Ant. 1)	V(Ant. 2)	V(Ant. 1 + Ant. 2)
IEEE 802.11n(HT20)	V (Ant. 1)	V(Ant. 2)	V(Ant. 1 + Ant. 2)
IEEE 802.11n(HT40)	V (Ant. 1)	V(Ant. 2)	V(Ant. 1 + Ant. 2)
IEEE 802.11ax(HE20)	V (Ant. 1)	V(Ant. 2)	V(Ant. 1 + Ant. 2)
IEEE 802.11ax(HE40)	V (Ant. 1)	V(Ant. 2)	V(Ant. 1 + Ant. 2)

For 5GHz:

Antenna Specification:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Dipole	N/A	1.14
2	N/A	N/A	Dipole	N/A	1.14

Note:

- 1) This EUT supports CDD, and all antenna gains are not equal, Directional gain = $G_{ANT} + \text{Array Gain}$.
For power measurements, Array Gain=0dB ($N_{ANT} \leq 4$), so the Directional gain=1.14dBi.
For power spectral density measurements, $N_{ANT}=2$, $N_{SS} = 1$.
Then the Directional gain= $G_{ANT} + \text{Array Gain} = G_{ANT} + 10\log(N_{ANT}/N_{SS})\text{dBi} = 1.14 + 10\log(2/1)\text{dBi} = 4.15\text{dBi}$.
- 2) The antenna gain is provided by the manufacturer.
- 3) The antenna is for testing purposes only.

Table for Antenna Configuration:

Operating Mode TX Mode	1TX	1TX	2TX
IEEE 802.11a	V (Ant. 1)	V(Ant. 2)	V(Ant. 1 + Ant. 2)
IEEE 802.11n(HT20)	V (Ant. 1)	V(Ant. 2)	V(Ant. 1 + Ant. 2)
IEEE 802.11n(HT40)	V(Ant. 1)	V(Ant. 2)	V(Ant. 1 + Ant. 2)
IEEE 802.11ac(VHT20)	V(Ant. 1)	V(Ant. 2)	V(Ant. 1 + Ant. 2)
IEEE 802.11ac(VHT40)	V(Ant. 1)	V(Ant. 2)	V(Ant. 1 + Ant. 2)
IEEE 802.11ac(VHT80)	V(Ant. 1)	V(Ant. 2)	V(Ant. 1 + Ant. 2)
IEEE 802.11ax(HE20)	V (Ant. 1)	V(Ant. 2)	V(Ant. 1 + Ant. 2)
IEEE 802.11ax(HE40)	V (Ant. 1)	V(Ant. 2)	V(Ant. 1 + Ant. 2)
IEEE 802.11ax(HE80)	V(Ant. 1)	V(Ant. 2)	V(Ant. 1 + Ant. 2)

3. TEST RESULTS

For BT:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
0.73	1.1830	5.86	3.8548	0.00091	1	Complies

For 2.4GHz:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
0.73	1.1830	26.88	487.5285	0.11474	1	Complies

For 5GHz:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
1.14	1.3002	19.07	80.7235	0.02088	1	Complies

Note: The calculated distance is 20 cm.

End of Test Report