



RF MPE Report

Applicant: Quectel Wireless Solutions Company Limited
Address: Building 5, Shanghai Business Park Phase III(Area B), No.1016
Tianlin Road, Minhang District, Shanghai, 200233 China
Product: Smart LTE Module with Wi-Fi & Bluetooth
Model No.: SC200E-NA, SC206E-NA
Brand Name: QUECTEL
FCC ID: XMR2024SC200ENA
Standards: 47 CFR Part 2.1091
FCC KDB 447498 D01 v06
Report No.: PD20240152-R3G
Issue Date: 2025/02/06
Test Result: PASS *

* Testing performed at Hefei Panwin Technology Co., Ltd. on the above equipment indicates the product meets the requirements of the relevant standards.

Reviewed By: Charlie Wang

Approved By: Alec Yang

Hefei Panwin Technology Co., Ltd.

Floor 1, Zone E, Plant 2#, Mingzhu Industrial Park, No.106 Chuangxin
Avenue, High-tech Zone, Hefei City, Anhui Province, China
TEL: +86-0551-63811775

Revision History

Report No.	Version	Description	Issue Date	Note
PD20240152-R3G	01	Initial Report	2025/02/06	Valid

Remark:

- The samples tested have been evaluated in accordance with 47 CFR Part 2.1091 and FCC KDB 447498 D01 v06, and have been proven to meet the applicable limit requirements.

Note: SC206E-NA shares the same hardware design with SC200E-NA. They support the same bands. The only difference between the two models is the operating system. The different OS is as below:

Module	SC200E-NA	SC206E-NA
System	Android	Linux

Above changes won't impact the protocol and RF performance for original frequency bands.

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1 Test Laboratory

1.1 Notes of the Test Report

This report is invalid without signature of auditor and approver or with any alterations. The report shall not be partially reproduced without written approval of the testing company. Entrusted test results are only responsible for incoming samples. If there is any objection to the testing report, it shall be raised to the testing company within 15 days from the date of receiving the report. In the test results, "NA" means "not applicable", and the test items marked with "Δ" are subcontracted projects.

1.2 Testing Laboratory

Company Name	Hefei Panwin Technology Co., Ltd.
Address	Floor 1, Zone E, Plant 2#, Mingzhu Industrial Park, No.106 Chuangxin Avenue, High-tech Zone, Hefei City, Anhui Province, China
Telephone	+86-0551-63811775
Post Code	230031

2 General Description of Equipment under Test

2.1 Details of Application

Applicant	Quectel Wireless Solutions Company Limited
Applicant Address	Building 5, Shanghai Business Park Phase III(Area B), No.1016 Tianlin Road, Minhang District, Shanghai, 200233 China
Manufacturer	Quectel Wireless Solutions Company Limited
Manufacturer Address	Building 5, Shanghai Business Park Phase III(Area B), No.1016 Tianlin Road, Minhang District, Shanghai, 200233 China

2.2 Details of EUT

Product	Smart LTE Module with Wi-Fi & Bluetooth
Model	SC200E-NA, SC206E-NA
Hardware Version	R2.0
Software Version	SC200ENADAR13A02, SC206ENADAR60A01
Antenna Type	<input checked="" type="checkbox"/> External <input type="checkbox"/> Integrated
Note: The declared of product specification for EUT and/or Antenna presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.	

3 Test Condition

3.1 Laboratory Environment

Temperature	Min.= 20℃, Max.=30℃
Relative Humidity	Min.= 25%, Max.=75%
Ground System Resistance	< 1 Ω
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

4 Maximum Permissible Exposure (MPE)

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Table 1 to § 1.1310(e)(1)—Limits for Maximum Permissible Exposure (MPE)				
Frequency Range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(i) Limits for Occupational/Controlled Exposure				
0.3–3.0	614	1.63	*(100)	≤6
3.0–30	1842/f	4.89/f	*(900/f ²)	<6
30–300	61.4	0.163	1.0	<6
300–1,500	--	--	f/300	<6
1,500–100,000	--	--	5	<6
(ii) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	<30
1.34–30	824/f	2.19/f	*(180/f ²)	<30
30–300	27.5	0.073	0.2	<30
300–1,500	--	--	f/1500	<30
1,500–100,000	--	--	1.0	<30
f = frequency in MHz. * = Plane-wave equivalent power density.				

The transmitter is using external antennas that operate at 20 cm or more from nearby persons. The maximum permitted level is calculated using the general equation:

$$S = PG / 4\pi R^2$$

Where:

S = power density (in appropriate units, e.g. Wm²)

P = power input to the antenna (in appropriate units, e.g., W)

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 (appropriate units, e.g., m)

Solve S, the power density at 20 cm is shown in Appendix A, so the limit is kept.

----- THE END -----

ANNEX A: RF Exposure Evaluation

Maximum Measured Conducted Output Power and Antenna Gain

Band	TX Freq. (MHz)	Maximum conducted output power (dBm)	Maximum Antenna Gain (dBi)
LTE Band 2	1850 to 1910	25.00	1.90
LTE Band 4	1710 to 1755	25.00	1.60
LTE Band 5	824 to 849	25.00	2.10
LTE Band 7	2500 to 2570	25.00	4.50
LTE Band 12	699 to 716	25.00	1.70
LTE Band 13	777 to 787	25.00	1.50
LTE Band 14	788 to 798	25.00	1.60
LTE Band 17	704 to 716	25.00	1.70
LTE Band 25	1850 to 1915	25.00	1.90
LTE Band 26	814 to 849	25.00	2.10
LTE Band 41	2496 to 2690	25.00	4.50
LTE Band 66	1710 to 1780	25.00	2.00
LTE Band 71	663 to 698	25.00	1.50
Bluetooth	2402 to 2480	10.00	0.47
Wi-Fi 2.4G	2412 to 2462	19.50	0.47
Wi-Fi 5G	5150 to 5850	18.50	1.28

Test Results of Maximum Permissible Exposure

Band	Frequency (MHz)	Maximum Power (dBm)	Antenna Gain (dBi)	FCC ERP/EIRP Limit(W)	FCC MPE Result (mW/cm ²)	MPE Limit (mW/cm ²)	FCC MPE Result / FCC MPE Limit Ratio	Ant Gain to Meet FCC MPE limit (dBi)	Ant Gain to Meet FCC ERP/EIRP limit (dBi)	Max Gain Allowed (dBi)
LTE Band 2	1850	25.00	1.90	2.000	0.0974	1.0000	0.0974	12.0	8.0	8.0
LTE Band 4	1710	25.00	1.60	1.000	0.0909	1.0000	0.0909	12.0	5.0	5.0
LTE Band 5	824	25.00	2.10	7.000	0.1020	0.5493	0.1857	9.4	13.5	9.4
LTE Band 7	2500	25.00	4.50	2.000	0.1773	1.0000	0.1773	12.0	8.0	8.0
LTE Band 12	699	25.00	1.70	3.000	0.0931	0.4660	0.1997	8.7	9.8	8.7
LTE Band 13	777	25.00	1.50	3.000	0.0889	0.5180	0.1716	9.2	9.8	9.2
LTE Band 14	788	25.00	1.60	3.000	0.0909	0.5253	0.1731	9.2	9.8	9.2
LTE Band 17	704	25.00	1.70	3.000	0.0931	0.4693	0.1983	8.7	9.8	8.7
LTE Band 25	1850	25.00	1.90	2.000	0.0974	1.0000	0.0974	12.0	8.0	8.0
LTE Band 26	814	25.00	2.10	7.000	0.1020	0.5427	0.1880	9.4	13.5	9.4
LTE Band 41	2496	25.00	4.50	2.000	0.1773	1.0000	0.1773	12.0	8.0	8.0
LTE Band 66	1710	25.00	2.00	1.000	0.0997	1.0000	0.0997	12.0	5.0	5.0
LTE Band 71	663	25.00	1.50	3.000	0.0889	0.4420	0.2011	8.5	9.8	8.5
Bluetooth	2402	10.00	0.47	1.000	0.0022	1.0000	0.0022	--	--	--
Wi-Fi 2.4G	2412	19.50	0.47	1.000	0.0198	1.0000	0.0198	--	--	--
Wi-Fi 5G	5150	18.50	1.28	1.000	0.0189	1.0000	0.0189	--	--	--

Note 1: For mobile or fixed location transmitters, minimum separation distance is 20cm, even if calculations indicate EMF distance is less.

Note 2: For conservativeness, the lowest uplink frequency of each band is used to determine the MPE limit of that band.

Note 3: Chose the maximum RF output tune up power of all antennas among same frequency WWAN bands and the maximum antenna gain to perform MPE calculation conservatively.

Exposure calculations for multiple sources

In order to ensure compliance with the MPE for a controlled environment, the sum of the ratios of the power density to the corresponding MPE should not exceed unity. That is

$$\sum_{i=1}^n \frac{S_i}{MPE_i} \leq 1$$

The product also has multiple transmitters The Simultaneous Transmission Possibilities are as below:

Simultaneous Tx Combination	Configuration
1	WWAN + Wi-Fi 2.4G + Bluetooth
2	WWAN + Wi-Fi 2.4G
3	Bluetooth + Wi-Fi 2.4G

No.	Mode	Result Ratio	Total Ratio	Limit	Result
1	LTE Band 71*	0.2011	0.2231	1.0000	PASS
	Wi-Fi 2.4G	0.0198			
	Bluetooth	0.0022			
2	LTE Band 71*	0.2011	0.2209	1.0000	PASS
	Wi-Fi 2.4G	0.0198			
3	Bluetooth	0.0022	0.0220	1.0000	PASS
	Wi-Fi 2.4G	0.0198			

Remark*: This WWAN Band was recalculated on worst Band.

ANNEX B: The EUT Appearance

The EUT Appearance (internal and external photographs) are submitted separately.