

RF EXPOSURE REPORT

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 or Supplier:	Quectel Wireless Solutions Co., Ltd.
Address:	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233
Product:	LTE Module
Brand Name:	Quectel
Model Name:	SC66-A
FCC ID:	XMR201908SC66A
Date of tests:	Jul. 13, 2019 ~ Sept. 06, 2019

The submitted sample of the above equipment has been tested for according to the requirements of the following standards:

- ☒ IEEE C95.1
- ☒ FCC Part 2.1091
- ☒ KDB 447498 D01 General RF Exposure Guidance v06

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Prepared by Alex Chen Engineer / Mobile Department	Approved by Luke Lu Manager / Mobile Department
	
Date: Sept. 29, 2019	Date: Sept. 29, 2019

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Test Report No.: SA190522W005-1

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA190522W005-1	Original release	Sept. 29, 2019

1 GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF EUT

PRODUCT	LTE Module	
MODEL NAME	Quectel	
NOMINAL VOLTAGE	SC66-A	
OPERATING TEMPERATURE RANGE	-35 ~ 65°C	
MODULATION TYPE	WLAN	CCK, DQPSK, DBPSK for DSSS 16QAM, QPSK, BPSK for OFDM
	WCDMA	BPSK/QPSK
	LTE	QPSK, 16QAM
OPERATING FREQUENCY	WIFI 2.4G	2412~ 2462MHz for 11b/g/n(HT20) 2422~ 2452MHz for 11b/g/n(HT40)
	WIFI 5G	5180 ~ 5240MHz, 5260 ~5320MHz, 5500 ~ 5700MHz, 5745 ~ 5805MHz for 11a/n(HT20)/n(HT40)/n(VHT80)
	WCDMA	1852.4-1907.6MHz (FOR WCDMA II) 1712.4-1752.6MHz (FOR WCDMA IV) 826.4-846.6MHz (FOR WCDMA V)
	LTE	1850.7MHz ~ 1909.3MHz (FOR LTE Band2) 1710.7MHz ~ 1754.3MHz (FOR LTE Band4) 824.7MHz ~ 848.3MHz (FOR LTE Band5) 2502.5MHz-2567.5MHz (FOR LTE Band7) 699.7MHz ~ 715.3MHz (FOR LTE Band12) 779.5MHz-784.5MHz (FOR LTE Band13) 790.5MHz-795.5MHz (FOR LTE Band14) 706.5MHz-713.5MHz (FOR LTE Band17) 1850.7MHz-1914.3MHz (FOR LTE Band25) 814.7MHz-848.3MHz (FOR LTE Band26) 2498.5MHz-2687.5MHz (FOR LTE Band41) 1710.7MHz ~ 1779.3MHz (FOR LTE Band66) 665.5MHz-695.5MHz (FOR LTE Band71)

ANTENNA GAIN	BLUETOOTH/LE	PCB Antenna with 5.16dBi gain
	WLAN 2.4G	PCB Antenna with 5.16dBi gain
	WLAN 5G	PCB Antenna with 4.48dBi gain for 5.15~5.25GHz PCB Antenna with 4.88dBi gain for 5.25~5.35GHz PCB Antenna with 5.05dBi gain for 5.47~5.725GHz PCB Antenna with 4.54dBi gain for 5.725~5.85GHz
	WCDMA II	Fixed External Antenna with 1.38dBi gain
	WCDMA IV	Fixed External Antenna with 1.94dBi gain
	WCDMA V	Fixed External Antenna with 2.13dBi gain
	LTE Band 2	Fixed External Antenna with 1.38dBi gain
	LTE Band 4	Fixed External Antenna with 1.94dBi gain
	LTE Band 5	Fixed External Antenna with 2.13dBi gain
	LTE Band 7	Fixed External Antenna with 2.68dBi gain
	LTE Band 12	Fixed External Antenna with 3.26dBi gain
	LTE Band 13	Fixed External Antenna with 4.45dBi gain
	LTE Band 14	Fixed External Antenna with 3.63dBi gain
	LTE Band 17	Fixed External Antenna with 3.26dBi gain
	LTE Band 25	Fixed External Antenna with 1.38dBi gain
	LTE Band 26	Fixed External Antenna with 2.13dBi gain
	LTE Band 41	Fixed External Antenna with 2.44dBi gain
	LTE Band 66	Fixed External Antenna with 1.94dBi gain
	LTE Band 71	Fixed External Antenna with 1.66dBi gain
HW VERSION	R1.0	
SW VERSION	SC66ANAR01A06	
I/O PORTS	Refer to user's manual	

NOTE:

- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2 RF EXPOSURE

2.1 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)
(A) 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
(B) 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

2.2 MPE CALCULATION FORMULA

$$P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$$

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm



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2.3 CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

**2.4 CALCULATION RESULT OF MAXIMUM CONDUCTED POWER****WIFI**

Mode	Frequency (MHz)	Operating Mode	Antenna Gain (dBi)	Tune-up Power (dBm)	Tune-up Power (mW)	Power Density (mW/cm ²)	limit (mW/cm ²)	PASS / FAIL
WIFI 2.4G	2412-2462	11b	5.16	19.5	89.13	0.0582	1.00	PASS
WIFI 5G	5180-5240	11a	4.48	14.0	25.12	0.014	1.00	PASS
WIFI 5G	5260-5320	11a	4.88	13.5	22.39	0.0137	1.00	PASS
WIFI 5G	5500-5700	11a	5.05	14.0	25.12	0.016	1.00	PASS
WIFI 5G	5745-5805	11a	4.54	14.0	25.12	0.0142	1.00	PASS

BLUETOOTH/LE

Mode	Frequency (MHz)	Operating Mode	Antenna Gain (dBi)	Tune-up Power (dBm)	Tune-up Power (mW)	Power Density (mW/cm ²)	limit (mW/cm ²)	PASS / FAIL
BT 2.0	2402-2480	GFSK	5.16	12.0	15.85	0.0103	1.00	PASS
BT LE (1M)	2402-2480	1M	5.16	2.0	1.58	0.001	1.00	PASS
BT LE (2M)	2402-2480	2M	5.16	2.0	1.58	0.001	1.00	PASS

WCDMA

Mode	Frequency (MHz)	Operating Mode	Antenna Gain (dBi)	Tune-up Power (dBm)	Tune-up Power (mW)	Power Density (mW/cm ²)	limit (mW/cm ²)	PASS / FAIL
WCDMA II	1850-1910	RMC12.2K	1.38	23.0	199.53	0.0545	1.00	PASS
WCDMA IV	1710-1755	RMC12.2K	1.94	22.5	177.83	0.0553	1.00	PASS
WCDMA V	824-849	RMC12.2K	2.13	23.0	199.53	0.0648	0.55	PASS

LTE

Mode	Frequency (MHz)	Operating Mode	Antenna Gain (dBi)	Tune-up Power (dBm)	Tune-up Power (mW)	Power Density (mW/cm ²)	limit (mW/cm ²)	PASS / FAIL
Band2	1850-1910	QPSK	1.38	23.5	223.87	0.0612	1.00	PASS
Band4	1710-1755	QPSK	1.94	23.5	223.87	0.0696	1.00	PASS
Band5	824-849	QPSK	2.13	23.0	199.53	0.0648	0.55	PASS
Band7	2500-2570	QPSK	2.68	24.0	251.19	0.0926	1.00	PASS
Band12	699-716	QPSK	3.26	23.0	199.53	0.0841	0.47	PASS
Band13	777-787	QPSK	4.45	23.0	199.53	0.1106	0.52	PASS
Band14	788-798	QPSK	3.63	23.0	199.53	0.0916	0.53	PASS
Band17	704-716	QPSK	3.26	23.0	199.53	0.0841	0.47	PASS
Band25	1850-1915	QPSK	1.38	23.5	223.87	0.0612	1.00	PASS
Band26	814-849	QPSK	2.13	23.0	199.53	0.0648	0.54	PASS
Band41	2496-2690	QPSK	2.44	23.5	223.87	0.0781	1.00	PASS
Band66	1710-1780	QPSK	1.94	23.5	223.87	0.0696	1.00	PASS
Band71	663-698	QPSK	1.66	23.5	223.87	0.0653	0.44	PASS

2.5 CONCLUSION OF SIMULTANEOUS TRANSMITTER

Both of the WLAN and plug-in device can transmit simultaneously, the formula of calculated the MPE is:

$$CPD1/LPD1+CPD2/LPD2+.....etc. < 1$$

CPD = Calculation power density

LPD = Limit of power density

Therefore the worst-case situation is $0.016/1.00+0.111/1.00=0.127$, which is less than "1", This confirmed that the device comply with FCC 1.1310 MPE limit.

Band	Frequency (MHz)	Power Density (mW/cm ²)	limit (mW/cm ²)	Power Density / Limit	Total Power Density / Limit	MPE Limit	PASS / FAIL
WIFI 5G-11a	5500~5700	0.016	1	0.016	0.127	1.000	PASS
LTE Band 13	777-787	0.111	1	0.111			

--END--