

# RF Exposure

FCC ID: PJ7-N2610-US

**Applicant:** Shenzhen Neoway Technology Co., Ltd.

Exposure category: General population/uncontrolled environment

EUT Type: Production Unit

Device Type: LTE OBD dongle

Refer Standard: FCC Part 2.1091: Radio Frequency (RF) Exposure Compliance of Radio communication Apparatus (All Frequency Bands)

## FCC MPE Limited:

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minutes)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

Test Data

Predication of MPE limit at a given distance

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

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, the power gain factor, is normally numeric gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

SRD Antenna Gain information

BLE :2dBi

2.4G WLAN: 2dBi

### Worst-Case mode Conducted Output Power Results for 2.4G WIFI

802.11b mode

Channel	Frequency (MHz)	Output Power(dBm)	Tune Up tolerance(dBm)
1	2412	16.65	16 ± 1
6	2437	16.41	16 ± 1
11	2462	16.38	16 ± 1

### Worst-Case mode Conducted Output Power Results for BT /BLE

Bluetooth				
Band	Mode	Test Frequency	Power(dBm)	Tune-up tolerance(dBm)
BLE	GFSK	2402	-2.693	-2 ± 1
	GFSK	2440	-0.226	0 ± 1
	GFSK	2480	0.075	0 ± 1

### Calculation results (for 2.4G WIFI): Worst-case mode

Frequency (MHz)	Maximum tune up power(dBm)	RF distance(cm)	Result (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2412	17	20	0.016	1.0
2437	17	20	0.016	
2462	17	20	0.016	

### Calculation results (for BT/BLE): Worst-case mode

Bluetooth					
Band	Mode	Test Frequency	Power(dBm)	Result (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
BLE	GFSK	2402	-1	0.00025	1.0
	GFSK	2440	1	0.00039	
	GFSK	2480	1	0.00039	

**Calculation results (for WWAN): Worst-Case mode**

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Average EIRP (mW)	Power Density at 20cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Power Density / Limit
GPRS 850 (1 Tx slot)	824.2	4.50	33.00	37.5	707.95	0.141	0.549	0.256
GPRS 850 (2 Tx slots)	824.2	4.50	31.00	35.5	887.03	0.177	0.549	0.321
GPRS 850 (3 Tx slots)	824.2	4.50	28.00	32.5	666.81	0.133	0.549	0.242
GPRS 850 (4 Tx slots)	824.2	4.50	26.00	30.5	562.34	0.112	0.549	0.204
EGPRS 850 (1 Tx slot)	824.2	4.50	26.00	30.5	141.25	0.028	0.549	0.051
EGPRS 850 (2 Tx slots)	824.2	4.50	26.00	30.5	280.50	0.056	0.549	0.102
EGPRS 850 (3 Tx slots)	824.2	4.50	25.00	29.5	334.22	0.067	0.549	0.121
EGPRS 850 (4 Tx slots)	824.2	4.50	25.00	29.5	445.63	0.089	0.549	0.161
GPRS 1900 (1 Tx slot)	1850.2	3.00	30.00	33.0	251.19	0.050	1.000	0.050
GPRS 1900 (2 Tx slots)	1850.2	3.00	28.00	31.0	314.73	0.063	1.000	0.063
GPRS 1900 (3 Tx slots)	1850.2	3.00	26.00	29.0	297.85	0.059	1.000	0.059
GPRS 1900 (4 Tx slots)	1850.2	3.00	23.50	26.5	223.87	0.045	1.000	0.045
EGPRS 1900 (1 Tx slot)	1850.2	3.00	26.00	29.0	100.00	0.020	1.000	0.020
EGPRS 1900 (2 Tx slots)	1850.2	3.00	25.00	28.0	157.74	0.031	1.000	0.031
EGPRS 1900 (3 Tx slots)	1850.2	3.00	24.50	27.5	210.88	0.042	1.000	0.042
EGPRS 1900 (4 Tx slots)	1850.2	3.00	24.00	27.0	250.59	0.050	1.000	0.050
WCDMA Band II	1852.4	3.00	24.00	27.0	501.19	0.100	1.000	0.100
WCDMA Band IV	1712.4	5.00	24.00	29.0	794.33	0.158	1.000	0.158
WCDMA Band V	826.4	4.50	24.00	28.5	707.95	0.141	0.551	0.256
LTE Band 2	1850.7	3.00	23.50	26.5	446.68	0.089	1.000	0.089
LTE Band 4	1710.7	5.00	23.50	28.5	707.95	0.141	1.000	0.141
LTE Band 5	824.7	4.50	23.50	28.0	630.96	0.126	0.550	0.228
LTE Band 7	2502.5	7.00	23.50	30.5	1122.02	0.223	1.000	0.223
LTE Band 12	699.7	8.00	23.50	31.5	1412.54	0.281	0.466	0.603
LTE Band 13	779.5	8.00	23.50	31.5	1412.54	0.281	0.520	0.541
LTE Band 14	790.5	8.00	23.50	31.5	1412.54	0.281	0.527	0.534
LTE Band 25	1850.7	3.00	23.50	26.5	446.68	0.089	1.000	0.089
LTE Band 26	814.7	4.50	23.50	28.0	630.96	0.126	0.543	0.231
LTE Band 66	1710.7	5.00	23.00	28.0	630.96	0.126	1.000	0.126
LTE Band 71	665.5	8.00	23.50	31.5	1412.54	0.281	0.444	<b>0.634</b>

Note: The wwan Calculation results refers to FCCID: PJ7-N75-NA

**Simultaneous Transmission Calculation (Worst-case mode)**

No.	Transmitter Combinations	Scenario Supported or not
1	WWAN+2.4G WLAN+BT	Yes

**Max Simultaneous Transmission Calculation (Worst-case mode)**

No.	Worst Mode	MPE Ratio	Results
1	LTE Band 71 +2.4G WIFI+BLE	0.634+0.016+0.00039	0.65039<1.0(pass)