

RSS-102 § 4 –EXPOSURE LIMITS

Applicable Standard

According to RSS-102 §4:

Table 4: RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)				
Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m ²)	Reference Period (minutes)
0.003-10 ²¹	83	90	-	Instantaneous [*]
0.1-10	-	0.73/ <i>f</i>	-	6 ^{**}
1.1-10	87/ <i>f</i> ^{0.5}	-	-	6 ^{**}
10-20	27.46	0.0728	-2	6
20-48	58.07/ <i>f</i> ^{0.25}	0.1540/ <i>f</i> ^{0.25}	8.944/ <i>f</i> ^{0.5}	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 <i>f</i> ^{0.3417}	0.008335 <i>f</i> ^{0.3417}	0.02619 <i>f</i> ^{0.6834}	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/ <i>f</i> ^{1.2}
150000-300000	0.158 <i>f</i> ^{0.5}	4.21 x 10 ⁻⁴ <i>f</i> ^{0.5}	6.67 x 10 ⁻⁵ <i>f</i>	616000/ <i>f</i> ^{1.2}

Note: *f* is frequency in MHz.
^{*} Based on nerve stimulation (NS).
^{**} Based on specific absorption rate (SAR).

Calculated Formulary:

Predication of MPE limit at a given distance

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

S = power density (in appropriate units, e.g. mW/cm²)

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

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)

According to RSS-102 clause 3.1.2

Compliance of devices with multiple transmitters capable of simultaneous transmission shall be assessed in accordance with the latest version of IEEE 1528. However, other recognized methods — such as the proceduresFootnote16published by the FCC proven to provide a conservative estimate of the SAR value — can also be used. Applicants shall include in the RF exposure technical brief all information relevant to the exact test methodology used.

Simultaneous transmitting consideration for PCB & WIFI:

Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (m)	Power Density (W/m ²)	MPE Limit (W/m ²)
	(dBi)	(numeric)	(dBm)	(W)			
2412-2472 WIFI	3.0	2.00	15	0.032	0.2	0.127	5.37
1850-1910 WCDMA	3.5	2.24	23.5	0.224	0.2	0.999	4.48
1710-1755 WCDMA	3.5	2.24	23.5	0.224	0.2	0.999	4.24
824-849 WCDMA	3.5	2.24	23.5	0.224	0.2	0.999	2.58
1850-1910 LTE	3.5	2.24	24	0.251	0.2	1.119	4.48
1710-1755 LTE	3.5	2.24	24	0.251	0.2	1.119	4.24
699-716 LTE	3.5	2.24	24	0.251	0.2	1.119	2.30

Note: PCB Data comes from the PCB report.

Simultaneous transmitting consideration for PCB & WIFI:

$$\sum_i \frac{S_i}{S_{Limit,i}} = 1.119/2.3 + 0.127/5.37 = 0.51 < 1.0$$

To maintain compliance with the RF exposure guidelines, place the equipment at least 20cm from nearby persons.

So the RF Exposure evaluation can be exempted.