

## **RF Exposure Compliance (13.56) MHz**

### **RF Exposure Evaluation of Devices (ISED)**

#### **RSS-102 Clause 2.5.1**

Exemption limit (at 5mm) at 13.56 MHz = 107 mW

The power is less than 107 mW and therefore the device meets ISED SAR Exemption requirements.

### **3.2 RF Exposure Evaluation of Devices (FCC)**

A device requiring an RF exposure evaluation shall be made in accordance with the latest version of IEEE C95.3. If the device is designed such that more than one antenna can functionally transmit at the same time, the RF exposure evaluation shall be conducted while all antennas are transmitting. The individual exposure level ratios shall be totaled and used for compliance purposes.

If the device has more than one antenna but is not designed to have more than one antenna functionally transmit at the same time, the RF exposure evaluation of the device shall be performed for each of the individually transmitting antennas. The maximum RF field strength value shall be recorded and used for compliance purposes.

If the device combines groups of simultaneous and non-simultaneous transmitting antennas, the worst-case of the above scenarios applies.

**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 <sup>2</sup> )	Reference Period (minutes)
0.003-10 <sup>21</sup>	83	90	-	Instantaneous*
0.1-10	-	0.73/ <i>f</i>	-	6**
1.1-10	87/ <i>f</i> <sup>0.5</sup>	-	-	6**
10-20	27.46	0.0728	2	6
20-48	58.07/ <i>f</i> <sup>0.25</sup>	0.1540/ <i>f</i> <sup>0.25</sup>	8.944/ <i>f</i> <sup>0.5</sup>	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 <i>f</i> <sup>0.3417</sup>	0.008335 <i>f</i> <sup>0.3417</sup>	0.02619 <i>f</i> <sup>0.6834</sup>	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/ <i>f</i> <sup>1.2</sup>
150000-300000	0.158 <i>f</i> <sup>0.5</sup>	4.21 x 10 <sup>-4</sup> <i>f</i> <sup>0.5</sup>	6.67 x 10 <sup>-5</sup> <i>f</i>	616000/ <i>f</i> <sup>1.2</sup>
<p><b>Note:</b> <i>f</i> is frequency in MHz.  *Based on nerve stimulation (NS).  ** Based on specific absorption rate (SAR).</p>				

Maximum Measured Average Field Strength = 62.1 dBuV/m

$$\text{EIRP} = \text{FS} - 95.2$$

$$\text{EIRP} = -33.1 \text{ dBm}$$

$$\text{EIRP} = 0.00049 \text{ milliwatts}$$

**Per KDB 447498 D01 - Clause 4.3.1 Standalone SAR test exclusion considerations**

P = power threshold in milliwatts at 100 MHz

D = distance in mm

F = Frequency in GHz

f = Frequency in MHz

**Step 1 - 100 MHz to 6 GHz at test separation distances  $\leq 50$  mm**

Step 1 (solve for 100 MHz at 5 mm)

$$P / D * \sqrt{F} = 3$$

$$P = D * (3 / \sqrt{F})$$

$$P = 5 * (3 / \sqrt{0.1})$$

$$P = 5 * 9.48$$

$$P = 47.4 \text{ mW}$$

**Step 3 – At frequencies below 100 MHz**

**Step 3(a) (solve below 100 MHz  $> 50$  mm and  $< 200$  mm)**

$$P * (1 + \log (100 / f))$$

$$47.4 * (1 + \log (100/13.56))$$

$$47.4 * (1 + \log (7.37))$$

$$47.4 * (1 + 0.868)$$

$$47.4 * 1.868$$

88.5 mW limit at 13.56 MHz at

**Step 3(b) (solve below 100 MHz  $\leq 50$  mm)**

$$88.5 * 0.5$$

44.35 mW = power threshold for 13.56 MHz at a distance less than 50mm

Therefore the device meets ISED SAR Exemption requirements.