

# ATTACHMENT

## RF EXPOSURE EVULATION

### 1.1 Limit

According to §1.1310 and §2.1091 RF exposure is calculated.

(B) Limits for General Population/Uncontrolled Exposures

Frequency range (MHz)	Electric field Strength	Magnetic field Strength	Power density	Averaging time
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.....	.....	.....	<b>1.0</b>	30

F = frequency in MHz

\* = Plane-wave equivalent power density

### 1.2 MAXIMUM PERMISSIBLE EXPOSURE Prediction

Prediction of MPE limit at a given distance

#### Power density at the specific separation:

$S = PG/(4R^2 \pi)$ $S = (2.20 * 0.30) / (4 * 20^2 * \pi)$ $S = 0.0006 \text{ mW/cm}^2$	<p>Where,</p> <ul style="list-style-type: none"> <li>S = Maximum power density (mW/cm<sup>2</sup>)</li> <li>P = Power input to the antenna (mW)</li> <li>G = Numeric power gain of the antenna</li> <li>R = Distance to the center of the radiation of the antenna (20 cm = limit for MPE)</li> </ul>
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**ATTACHMENT****1.3 MAXIMUM PERMISSIBLE EXPOSURE Prediction****- Calculated under the worst-case conditions of each mode.****(Measured power 3.42 dBm ± 0.5dB)**Zigbee Mode

Max Peak output Power at antenna input terminal	3.42	dBm
Max Peak output Power at antenna input terminal	2.20	mW
Prediction distance	5	cm
Prediction frequency	2440	MHz
Antenna Gain(typical)	-5.27	dBi
Antenna Gain(numeric)	0.30	-

For 100 MHz to 6 GHz and test separation distances  $\leq 50$  mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})]$

$\cdot [\sqrt{f(\text{GHz})}] \leq 3.0$  for 1-g SAR, and  $\leq 7.5$  for 10-g extremity SAR

$[(2.20)/(5)] \cdot [\sqrt{2.440}] = 0.68 \leq 3.0$

**Thus, SAR for this device is not required.**