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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/ f²)	30
30 - 300.....................................	27.5	0.073	0.2	30
300 - 1500...................................	....	....	f/1500	30
1500 - 100.000..............................	....	....	**1.0**	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(Zigbee):

	Where,
$S = PG/(4R^2 \pi)$	S = Maximum power density (mW/cm^2)
$S = (0.81 * 0.31) / (4 * 20^2 * \pi)$	P = Power input to the antenna (mW)
	G = Numeric power gain of the antenna
$S = 0.0001$ mW/cm^2	R = Distance to the center of the radiation of the antenna
	(20 cm = limit for MPE)

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1.3 MAXIMUM PERMISSIBLE EXPOSURE Prediction

- Calculated under the worst-case conditions of each mode.

(Measured power 16.78 dBm ± 0.5dB)

BLE Mode

Max Peak output Power at antenna input terminal	-0.93	dBm
Max Peak output Power at antenna input terminal	0.81	mW
Prediction distance	5	cm
Prediction frequency	2402	MHz
Antenna Gain(typical)	-5.07	dBi
Antenna Gain(numeric)	0.31	-

For 100 MHz to 6 GHz and *test separation distances* ≤ 50 mm, the 1-g and 10-g *SAR test exclusion thresholds* are determined by the following : (also illustrated in Appendix A)

[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] ·

$[\sqrt{f_{(GHz)}}] = [0.81 / 50] * [\sqrt{2402}] = 0.793 < 96$

Thus, SAR for this device is not required.