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:

$S = PG/(4R^2 \pi)$ $S = (0.78 * 0.23)/(4 * 20^2 * \pi)$ $S = 0.02 \text{mW/cm}^2$	Where, S = Maximum power density (mW/cm^2) P = Power input to the antenna (mW) G = Numeric power gain of the antenna R = Distance to the center of the radiation of the antenna (20 cm = limit for MPE)

1.3 MAXIMUM PERMISSIBLE EXPOSURE Prediction
 (Measured power 1 dBm ± 0.5dB)

3-1. Zigbee

Max Peak output Power at antenna input terminal	-1.09	dBm
Max Peak output Power at antenna input terminal	0.78	mW
Prediction distance	5	cm
Prediction frequency	2480	MHz
Antenna Gain(typical)	-6.33	dBi
Antenna Gain(numeric)	0.23	-
Power density at prediction frequency(S)	0.02	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	0.007	mW/cm^2

Simultaneous transmission operations

SAR Test exclusion thresholds for 100MHz to 6GHz at test separation distance ≤ 50 mm = **Used**

[(max.power of channel, including tune-up torelance, mW)/(min. test separation distance, mm)] * [√f(GHz)]

= [0.78 / 50] * [√2.480] = 0.02 ≤ 3, for 1g SAR

Thus, SAR for this device is not required.