

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 ²)	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:

$S = PG/(4R^2 \pi)$ $S = (6.84 * 3.16) / (4 * 20^2 * \pi)$ $S = 0.21 \text{mW/cm}^2$	Where, S = Maximum power density (mW/cm²) 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)
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1.3 MAXIMUM PERMISSIBLE EXPOSURE Prediction**(Measured power 7 dBm ± 0.5dB)****3-1. 2.4 GHz**

Max Peak output Power at antenna input terminal	8.35	dBm
Max Peak output Power at antenna input terminal	6.84	mW
Prediction distance	5	mm
Prediction frequency	2412	MHz
Antenna Gain(typical)	5	dBi
Antenna Gain(numeric)	3.16	-
Power density at prediction frequency(S)	0.21	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.072	mW/cm ²

3-1. 5 GHz

Max Peak output Power at antenna input terminal	6.16	dBm
Max Peak output Power at antenna input terminal	4.13	mW
Prediction distance	5	mm
Prediction frequency	5180	MHz
Antenna Gain(typical)	5	dBi
Antenna Gain(numeric)	3.16	-
Power density at prediction frequency(S)	0.16	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	0.056	mW/cm ²

Simultaneous transmission operations

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

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

$$= [6.84 / 5] * [\sqrt{2.412}] = 2.12 \leq 3, \text{ for 1g SAR}$$

Thus, SAR for this device is not required.SAR Test exclusion thresholds for 100MHz to 6GHz at test separation distance ≤ 50 mm = **Used**

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

$$= [4.13 / 5] * [\sqrt{5.180}] = 1.88 \leq 3, \text{ for 1g SAR}$$

Thus, SAR for this device is not required.