



## RF exposure

According to 447498 D01 General RF Exposure Guidance v06

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances  $\leq 50$  mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$  for 1-g SAR and  $\leq 7.5$  for 10-g extremity SAR,

Where;

$f(\text{GHz})$  is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation

The result is rounded to one decimal place for comparison

### Results – Bluetooth EDR (3Mbps)

Frequency (GHz)	Distance (mm)	Max Average tune-up power (dBm)		Calculation value	Exclusion Threshold
		(dBm)	(mW)		
2.402	5	4.00	2.51	0.78	$\leq 3.0$
2.442	5	4.00	2.51	0.79	$\leq 3.0$
2.480	5	4.00	2.51	0.79	$\leq 3.0$



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According to FCC part 1.1310 : The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in § 1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength(V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Average time
(A) Limits for Occupational / Control Exposures				
300 – 1 500	--	--	f/300	6
1 500 - 100000	--	--	5	6
(B) Limits for General Population / Uncontrol Exposures				
300 – 1 500	--	--	f/1500	6
1 500 – 100 000	--	--	1	30

f= frequency in MHz

Friis transmission formula:  $P_d = (P_{out} \times G) / (4 \times \pi \times R^2)$

Where,

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

R = distance between observation point and center of the radiator in cm

$P_d$  the limit of MPE, 1 mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

## Results – Telecommand

Frequency (GHz)	Max tune-up power (dBm)	Antenna gain (dBi)	Power density at 20 cm(mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
903	12.50	1.20	0.004 66	0.60
915	12.50	1.20	0.004 66	0.61
927	12.50	1.20	0.004 66	0.62