

RF Exposure evaluation

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 ≤ 50 mm are determined by:

$$\left[\frac{\text{max. power of channel, including tune-up tolerance, mW}}{\text{min. test separation distance, mm}} \right] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where } f(\text{GHz}) \text{ is the RF channel transmit frequency in GHz}$$

Power and distance are rounded to the nearest mW and mm before calculation
The result is rounded to one decimal place for comparison

$$\text{eirp} = \text{pt} \times \text{gt} = (\text{EXd})^2/30$$

where:

pt = transmitter output power in watts,

gt = numeric gain of the transmitting antenna (unitless),

E = electric field strength in V/m, --- $10^{((\text{dBuV/m})/20)}/10^6$

d = measurement distance in meters (m)---3m

$$\text{So pt} = (\text{EXd})^2/30 \times \text{gt}$$

For Worst case Mode: 433.99MHz

Field strength =74.6 dBuV/m @3m

Ant gain 0 dBi; so Ant numeric gain=1

$$\text{So pt} = \left\{ \left[\frac{10^{(74.6/20)}}{10^6} \times 3 \right]^2 / 30 \times 1 \right\} \times 1000 \text{ mW} = 0.00865 \text{ mW}$$

$$\text{So } (0.00865 \text{ mW} / 5 \text{ mm}) \times \sqrt{0.43399 \text{ GHz}} = 0.00075 < 3$$

Then SAR evaluation is not required