

RF Exposure evaluation

According to 447498 D01 General RF Exposure Guidance v05

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:

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

- $f(\text{GHz})$ 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

Worse case is as below: [902.75 MHz 7.1dBm (5.13mW) output power]

$$\left(\frac{5.13\text{mW}}{5\text{mm}} \right) \cdot \left[\sqrt{0.90275(\text{GHz})} \right] = 0.975 < 3.0 \text{ for 1-g SAR}$$

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

where:

pt = transmitter output power in watts,

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

E = electric field strength in V/m, --- $10((\text{dBuV/m})/20)/106$

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

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

Ant gain 0dBi ;so Ant numeric gain=1

Field strength = 95.92 dBuV/m @3m

So $\text{Pt} = \left\{ \left[\frac{10^{(95.92/20)}}{10^6} \times 3 \right]^2 / 30 \times 1 \right\} \times 1000 \text{ mW} = 1.17 \text{ mW}$

So $\left(\frac{1.17 \text{ mW}}{5\text{mm}} \right) \times \sqrt{2.441 \text{ GHz}} = 0.37 < 3$

$0.975 + 0.37 = 1.345 < 3$

Then SAR evaluation is not required