

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:

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

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

where:

pt = transmitter output power in watts,

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

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

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

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

Ant gain= 1 dBi ; so Ant numeric gain= 1.26

Field strength =93.61 dB μ V/m @2402MHz @3m

$$\text{So Pt} = \{ [10^{(93.61/20)} / 10^6 \times 3]^2 / 30 \times 1.26 \} \times 1000 \text{ mW} = 0.55 \text{ mW}$$

$$\text{So } (0.55 \text{ mW} / 5\text{mm}) \times \sqrt{2.402 \text{ GHz}} = 0.17 < 3$$

Field strength =102.06 dB μ V/m @2405.5MHz @3m

$$\text{So Pt} = \{ [10^{(102.06/20)} / 10^6 \times 3]^2 / 30 \times 1.26 \} \times 1000 \text{ mW} = 3.83 \text{ mW}$$

$$\text{So } (3.83 \text{ mW} / 5\text{mm}) \times \sqrt{2.4055 \text{ GHz}} = 1.2 < 3$$

Then SAR evaluation is not required