

RF Exposure evaluation

According to KDB 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, --- $10^{((\text{dBuV/m})/20)} / 10^6$

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

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

Field strength = 76.96 dBuV/m @ 3m

Ant gain 2 dBi; so Ant numeric gain = 1.58

$$\text{So pt} = \{ [10^{(76.96/20)} / 10^6 \times 3]^2 / 30 \times 1.58 \} \times 1000 \text{ mW} = 0.01 \text{ mW}$$

$$\text{So } (0.01 \text{ mW} / 5 \text{ mm}) \times \sqrt{0.9168 \text{ GHz}} = 0.002 < 3$$

Then SAR evaluation is not required