

RF Exposure

1. Standard Requirement

According to §15.247 (i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

2. Limits :

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:

$$\left[\frac{(\text{max. power of channel, including tune-up tolerance, mW})}{(\text{min. test separation distance, mm})} \right] \cdot [\sqrt{f_{\text{(GHz)}}}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR,}^{16} \text{ where}$$

- $f_{\text{(GHz)}}$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation¹⁷
- The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum *test separation distance* is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum *test separation distance* is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

3. EUT RF Exposure

The max. power of channel, including tune-up tolerance is -8.31 dBm in high channel(2.480 GHz); -8.31 dBm logarithmic terms convert to numeric result is nearly 0.15mW.

According to the formula. Calculate the EIRP test result:

$$[(\text{max.power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] * [\sqrt{f_{\text{(GHz)}}}]$$

General RF Exposure = $(0.15\text{mW} / 20 \text{ mm}) \times \sqrt{2.480\text{GHz}} = 0.01 \cdots \textcircled{1}$

SAR requirement: $S=3.0 \cdots \textcircled{2}$;

$\textcircled{1} < \textcircled{2}$.

So the SAR report is not required