

FCCID: 2AMS7WA-640

RF Exposure evaluation

According to 447498 D01 General RF Exposure Guidance v06

4.3. General SAR test exclusion guidance

4.3.1. Standalone SAR test exclusion considerations

- a) For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following: $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR, and ≤ 7.5 for 10-g extremity SAR,³⁰ where

- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation³¹
- The result is rounded to one decimal place for comparison
- The values 3.0 and 7.5 are referred to as numeric thresholds in step b) below

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 according to 4.1 f) is applied to determine SAR test exclusion.

³⁰ This is equivalent to the formula written as: $[(\text{max. power of channel, including tune-up tolerance, mW}) / (60 / \sqrt{f(\text{GHz})} \text{ mW})] \cdot [20 \text{ mm} / (\text{min. test separation distance, mm})] \leq 1.0$ for 1-g SAR; also see Appendix A for approximate exclusion threshold numerical values at selected frequencies and distances.

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

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

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

RF Exposure evaluation

Copied from the FCC test report:

615.000 MHz, Horizontal					
Spurious Emission Frequency (MHz)	P_{Meas} (dBm)	AUX factor (dB)	EIRP (dBm)	Limit/ dBm	Margin(dB)
Fundamental: 615.0	-28.8	38.8	10.0	24	-14.0
608.1	-76.0	38.3	-37.7	-13	-24.7
731.3	-55.5	38.6	-16.9	-13	-3.9
780.8	-57.8	40.1	-17.7	-13	-4.7
1845.0	-30.2	-5.7	-35.9	-13	-22.9
615.000 MHz, Vertical					
Fundamental: 615.0	-27.2	37.3	10.1	24	-13.9
608.1	-74.6	37.1	-37.5	-13	-24.5
731.3	-57.0	39.8	-17.2	-13	-4.2
1845.0	-22.1	-5.5	-27.6	-13	-14.6
2460.0	-30.6	-3.5	-34.1	-13	-21.1
643.000 MHz, Horizontal					
Fundamental: 643.0	-30.4	40.9	10.5	24	-13.5
608.1	-74.5	38.3	-36.2	-13	-23.2
731.3	-54.6	38.6	-16.0	-13	-3.0
780.8	-57.3	40.1	-17.2	-13	-4.2
1929.0	-31.7	-5.0	-36.7	-13	-23.7
643.000 MHz, Vertical					
Fundamental: 643.0	-27.6	37.9	10.3	24	-13.7
608.1	-74.7	37.1	-37.6	-13	-24.6
731.3	-57.1	39.8	-17.3	-13	-4.3
1929.0	-21.3	-4.9	-26.2	-13	-13.2
2572.0	-30.9	-2.6	-33.5	-13	-20.5
664.750 MHz, Horizontal					
Fundamental: 664.8	-30.5	40.8	10.3	24	-13.7
608.1	-74.5	38.3	-36.2	-13	-23.2
731.3	-54.6	38.6	-16.0	-13	-3.0

780.8	-57.6	40.1	-17.5	-13	-4.5
1994.3	-31.9	-4.6	-36.5	-13	-23.5
664.750 MHz, Vertical					
Fundamental: 664.8	-28.2	38.1	9.9	24	-14.1
608.1	-74.7	37.1	-37.6	-13	-24.6
731.3	-57.1	39.8	-17.3	-13	-4.3
1994.3	-21.3	-4.5	-25.8	-13	-12.8
2659.0	-31.9	-2.2	-34.1	-13	-21.1

tune-up tolerance= ± 1 dB,

min. test separation distance = 5 mm, since the min distance from the antenna to the outer = 4 mm

The max Field strength = 10.5 dBm in 643.000 MHz

Max. power of channel after included tune-up tolerance

Field strength = 11.5 dBm= 14.13 mW in 643.000 MHz

So $(14.13 \text{ mW}) / (5.0 \text{ mm}) \times \sqrt{0.643000 \text{ GHz}} = 2.27 < 3$

Then SAR evaluation is not required