

1 EXPOSURE EVALUATION OF PORTABLE OR MOBILE DEVICES

Human exposure to RF emissions from portable devices (47 CFR §2.1093), as defined by the FCC, must be evaluated with respect to the FCC-adopted limits for SAR. Evaluation of mobile devices, as defined by the FCC, may also be performed with respect to SAR limits, but in such cases it is usually simpler and more cost-effective to evaluate compliance with respect to field strength or power density limits. For certain devices that are designed to be used in both mobile and portable configurations similar to those described in 47 CFR §2.1091(d)(4), such as certain desktop phones and wireless modem modules, compliance for mobile configurations is also satisfied when the same device is evaluated for SAR compliance in portable configurations.

1.1 SAR TEST EXCLUSION THRESHOLD FOR 100MHz to 6GHz and ≤ 50mm

| Frequency (MHz) | 5 | 10 | 15 | 20 | 25 | Separation distance (mm) |
|-----------------|----|----|-----|-----|-----|-----------------------------------|
| 150 | 39 | 77 | 116 | 155 | 194 | SAR Test Exclusion Threshold (mW) |
| 300 | 27 | 55 | 82 | 110 | 137 | |
| 450 | 22 | 45 | 67 | 89 | 112 | |
| 835 | 16 | 33 | 49 | 66 | 82 | |
| 900 | 16 | 32 | 47 | 63 | 79 | |
| 1500 | 12 | 24 | 37 | 49 | 61 | |
| 1900 | 11 | 22 | 33 | 44 | 54 | |
| 2450 | 10 | 19 | 29 | 38 | 48 | |
| 3600 | 8 | 16 | 24 | 32 | 40 | |
| 5200 | 7 | 13 | 20 | 26 | 33 | |
| 5400 | 6 | 13 | 19 | 26 | 32 | |
| 5800 | 6 | 12 | 19 | 25 | 31 | |

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

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

- $f(\text{GHz})$ 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

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

1.2 EVALUATION RESULTS

| Maximum Conducted Output Power Result | | | | | |
|---------------------------------------|-------------|-----------------------|---------------------|--------------------|--------------------|
| Condition | | RF Output Power (dBm) | | | |
| Modulation Mode | Freq. (MHz) | Peak Power (dBm) | Average Power (dBm) | Average Power (mW) | Antenna Gain (dBi) |
| BR-1Mbps | 2402 | -2.58 | -3.92 | 0.406 | -1.07 |
| BR-1Mbps | 2441 | -2.38 | -3.74 | 0.423 | -1.07 |
| BR-1Mbps | 2480 | -2.68 | -4.04 | 0.394 | -1.07 |
| EDR-2Mbps | 2402 | -4.02 | -7.48 | 0.179 | -1.07 |
| EDR-2Mbps | 2441 | -3.83 | -7.36 | 0.184 | -1.07 |
| EDR-2Mbps | 2480 | -4.19 | -7.76 | 0.167 | -1.07 |
| EDR-3Mbps | 2402 | -3.45 | -7.38 | 0.183 | -1.07 |
| EDR-3Mbps | 2441 | -3.52 | -7.28 | 0.187 | -1.07 |
| EDR-3Mbps | 2480 | -3.84 | -7.71 | 0.169 | -1.07 |

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

$$= 0.423 / 5 * \sqrt{2.441} = 0.132 < 3.0$$

SAR Test Exclusion Thresholds is < 10mW and 3.0 for separation distance 5mm. Therefore, SAR test is not required.