

RF exposure evaluation

§ 2.1093 Radiofrequency radiation exposure evaluation: Portable Devices.

According to § 15.247(i) and § 1.1307b(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 guidance.

The 1-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, where

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- When the minimum test separation distance is < 5 mm, a distance of 5 mm according is applied to determine SAR test exclusion.
- The result is rounded to one decimal place for comparison

For BDR+EDR:

| Modulation | Tune up Power (dBm) | Max. Tune up Power (dBm) | Max. Tune up Power (mW) |
|------------|---------------------|--------------------------|-------------------------|
| GFSK | 3.8±1 | 4.8 | 3.02 |
| π/4-DQPSK | 7±1 | 8 | 6.31 |
| 8DPSK | 7.43±1 | 8.43 | 6.97 |

| Channel | Frequency (GHz) | Max. Tune up Power (dBm) | Max. Tune up Power (mW) | Test distance (mm) | Result | exclusion thresholds for 1-g SAR |
|---------|-----------------|--------------------------|-------------------------|--------------------|--------|----------------------------------|
| CH 78 | 2.480 | 8.43 | 6.97 | 5 | 2.20 | 3.0 |

For BLE:

| Modulation | Tune up Power (dBm) | Max. Tune up Power (dBm) | Max. Tune up Power (mW) |
|------------|---------------------|--------------------------|-------------------------|
| GFSK | 4.5±1 | 5.5 | 3.55 |

| Channel | Frequency (GHz) | Max. Tune up Power (dBm) | Max. Tune up Power (mW) | Test distance (mm) | Result | exclusion thresholds for 1-g SAR |
|---------|-----------------|--------------------------|-------------------------|--------------------|--------|----------------------------------|
| CH 39 | 2.480 | 5.5 | 3.55 | 5 | 1.12 | 3.0 |