

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:

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

- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- 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:

Channel	Frequency (GHz)	Tune up Power (dBm)	Max. Tune up Power (dBm)	Max. Tune up Power (mW)
CH 00	2.402	-2 $\pm$ 1	-1	0.79
CH 39	2.441	-2.5 $\pm$ 1	-1.5	0.71
CH 78	2.480	-3 $\pm$ 1	-2	0.63

Channel	Frequency (GHz)	Max. Tune up Power (dBm)	Max. Tune up Power (mW)	Test distance (mm)	Result	Exclusion thresholds for 1-g SAR
CH 00	2.402	-1	0.79	5	0.24	3.0

For BLE:

Channel	Frequency (GHz)	Tune up Power (dBm)	Max. Tune up Power (dBm)	Max. Tune up Power (mW)
CH 00	2.402	-9.5 $\pm$ 1	-8.5	0.14
CH 19	2.440	-9.5 $\pm$ 1	-8.5	0.14
CH 39	2.480	-9.5 $\pm$ 1	-8.5	0.14

Channel	Frequency (GHz)	Max. Tune up Power (dBm)	Max. Tune up Power (mW)	Test distance (mm)	Result	Exclusion thresholds for 1-g SAR
CH 00	2.402	-8.5	0.14	5	0.04	3.0

For 2.4G WIFI:

Channel	Frequency (GHz)	Tune up Power (dBm)	Max. Tune up Power (dBm)	Max. Tune up Power (mW)
CH 01	2.412	8±1	9	7.94
CH 06	2.437	8±1	9	7.94
CH 11	2.462	8±1	9	7.94
CH 03	2.422	8±1	9	7.94
CH 06	2.437	8±1	9	7.94
CH 09	2.452	8±1	9	7.94

Channel	Frequency (GHz)	Power (dBm)	Max. Power (mW)	Test distance (mm)	Result	exclusion thresholds for 1-g SAR
CH 11	2.462	9	7.94	5	2.49	3.0

For 5G WIFI:

Band	Frequency (GHz)	Tune up Power (dBm)	Max. Tune up Power (dBm)	Max. Tune up Power (mW)
1	5.24	6±1	7	5.01
2A	5.32	6±1	7	5.01
2C	5.72	6±1	7	5.01
3	5.825	6±1	7	5.01

Band	Frequency (GHz)	Power (dBm)	Max. Power (mW)	Test distance (mm)	Result	exclusion thresholds for 1-g SAR
1	5.24	7	5.01	5	2.29	3.0
2A	5.32	7	5.01	5	2.31	3.0
2C	5.72	7	5.01	5	2.40	3.0
3	5.825	7	5.01	5	2.42	3.0