

1. SAR-based Exemption

A more comprehensive exemption, considering a variable power threshold that depends on both the separation distance and power, is provided in § 1.1307(b)(3)(i)(B). This exemption is applicable to the frequency range between 300 MHz and 6 GHz, with test separation distances between 0.5 cm and 40 cm, and for all RF sources in fixed, mobile, and portable device exposure conditions.

Accordingly, a RF source is considered an RF exempt device if its available maximum time-averaged (matched conducted) power or its effective radiated power (ERP), whichever is greater, are below a specified threshold. This exemption threshold was derived based on general population 1-g SAR requirements and is detailed in Appendix C.

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

2. RF Exposure Test Exemptions for Single Source

Mode	Frequency Range (MHz)	Minimum Separation Distance (cm)	Maximum Average Target Power (dBm)	Maximum Tune up (dB)	Maximum Average Output Power		Antenna Gain (dBi)	ERP		P _{th} (mW)	Ratio ¹⁾	Result
					(dBm)	(mW)		(dBm)	(mW)			
Bluetooth Low Energy	2 402 ~ 2 480	0.5	2	1	3	2	-2.26	-1.41	0.72	6.79	0.29	Pass

Note ;

- Maximum average target power is the manufacturer's declared rated power.
- Maximum average output power(dBm) = Maximum average target power(dBm) + Maximum tune up(dB).
- ERP(dBm) = Maximum average output power(dBm) + Antenna gain(dBi) - 2.15
- Threshold level calculation;
Bluetooth Low Energy (2 402 MHz ~ 2 480 MHz)
1-g SAR threshold level is 2.717 mW, applying factor of 2.5 for 10-g extremity SAR, final threshold level is 6.79mW.

1) A greater value between the ERP(dBm) and the Maximum Average Output Power(dBm) is applied.

3. Conclusion: No SAR is required.