

According to KDB 447498 D04 Interim General RF Exposure Guidance v01

1. MPE-Based Exemption

An alternative to the SAR-based exemption is provided in § 1.1307(b)(3)(i)(C), for a much wider frequency range, from 300 kHz to 100 GHz, applicable for separation distances greater or equal to $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. The MPE-based test exemption condition is in terms of ERP, defined as the product of the maximum antenna gain and the delivered maximum time-averaged power. For this case, a RF source is an RF exempt device if its ERP (watts) is no more than a frequency-dependent value, as detailed tabular form in Appendix B. These limits have been derived based on the basic specifications on Maximum Permissible Exposure (MPE) considered for the FCC rules in § 1.1310(e)(1).

Table 1 to 1.1307(b)(3)(i)(c) – Single RF Sources Subject to Routine Environmental Evaluation

RF Source Frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1 920 R ²
1.34-30	3 450 R ² /f ²
30-300	3.83 R ²
300-1 500	0.012 8 R ² f
1 500-100 000	19.2 R ²

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 (dBm)	Antenna Gain (dBi)	ERP		Threshold ERP (mW)	Ratio	Result
							(dBm)	(mW)			
Bluetooth Low energy	2 402 ~ 2 480	20	0	1.5	1.5	2.81	2.16	1.644	768	0.002	Pass

Mode	Frequency Range (MHz)	Minimum Separation Distance (cm)	Radiated Power (dBuV/m)	ERP (dBm)	ERP (mW)	Threshold ERP (mW)	Ratio	Result
NFC	13.56	0.5	60.26	-34.97	0.000 319	0.469	0.000 680	Pass

Note ;

- ERP (dBm) = Maximum average output power (dBm) + Antenna gain (dBi) -2.15
- Maximum average target power is the manufacturer's declared rated power.
- Maximum average output power = Maximum average target power (dBm) + Maximum tune up (dB).
- $ERP(W) = p_t \times g_t = (E_{\text{exd}})^2 / 49.2$ (According to ANSI C63.10 Annex G.2)

Where;

p_t is the transmitter output power in watts

g_t is the numeric gain of the transmitting antenna (dimensionless)

E is the electric field strength in V/m

D is the measurement distance in meters (m)

$V/m = 10^{(dBuV-120)/20}$

3. Conclusion: No SAR is required.