

FCC ID: WA2ST4280

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	8.0	1.5	9.5	-0.06	7.29	5.358	768	0.007	Pass

Mode	Frequency Range (MHz)	Minimum Separation Distance (cm)	Maximum Average Power (dBm)	Antenna Gain (dBi)	ERP		Threshold ERP (mW)	Ratio	Result
					(dBm)	(mW)			
LTE Band 2	1 850 ~ 1 910	20	21.5	2.21	21.56	143.219	768	0.186	Pass
LTE Band 66/4	1 710 ~ 1 780	20	21.5	0.71	20.06	101.391	768	0.132	Pass
LTE Band 5	824 ~ 849	20	21.5	-2.98	16.37	43.351	421.888	0.103	Pass
LTE Band 12	699 ~ 716	20	21.5	-2.50	16.85	48.417	357.888	0.135	Pass
LTE Band 13	777 ~ 787	20	21.5	-2.04	17.31	53.827	397.824	0.135	Pass
NB-IOT Band 2	1 850 ~ 1 910	20	21.5	2.21	21.56	143.219	768	0.186	Pass
NB-IOT Band 66/4	1 710 ~ 1 780	20	21.5	0.71	20.06	101.391	768	0.132	Pass
NB-IOT Band 85	698 ~ 716	20	21.5	-2.50	16.85	48.417	357.376	0.135	Pass

Note ;

- Bluetooth Low Energy and WWAN can't simultaneous transmission at the same time.
- $ERP\text{ (dBm)} = \text{Maximum average power (dBm)} + \text{Antenna gain (dBi)} - 2.15$
- Maximum average target power is the manufacturer's declared rated power.
- $\text{Maximum average output power} = \text{Maximum average target power (dBm)} + \text{Maximum tune up (dB)}$.

3. Conclusion: No SAR is required.