FCC ID: VA5CLC350-XC2

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 ㎑ to 100 ㎓, applicable for separation distances greater or equal to λ/2π, 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 (㎒)	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	$0.012\,8\ R^2f$
1 500-100 000	$19.2\ R^2$

2. RF Exposure Test Exemptions for Single Source

Mode	Frequency Range (㎒)	Minimum Separation Distance (㎝)	Maximum Average Target Power (㏈m)	Maximum Tune up (㏈)	Maximum Average Output Power (㏈m)	Antenna Gain (㏈i)	ERP (㏈m)	ERP (㎽)	Threshold ERP (㎽)	Ratio	Result
Bluetooth Low energy	2 402 ~ 2 480	20	-1	1	0	1.69	-0.46	0.899	768	0.001	Pass
WLAN 2	2 412 ~ 2 462	20	11	2	13	1.69	12.54	17.947	768	0.023	Pass

Mode	Frequency Range (㎒)	Minimum Separation Distance (㎝)	Maximum Average Power (㏈m)	Antenna Gain (㏈i)	ERP (㏈m)	ERP (㎽)	Threshold ERP (㎽)	Ratio	Result
WCDMA II	1 850 ~ 1 910	20	25	2.31	25.16	328.095	768	0.427	Pass
LTE Band 2	1 850 ~ 1 910	20	25	2.31	25.16	328.095	768	0.427	Pass
LTE Band 4	1 710 ~ 1 780	20	25	0.63	23.48	222.844	768	0.290	Pass
LTE Band 12	699 ~ 716	20	25	-1.29	21.56	143.219	358	0.400	Pass

Note ;

- Bluetooth Low Energy or WLAN 2 can transmit simultaneously with WWAN.
- ERP (㏈m) = Maximum average power (㏈m) + Antenna gain (㏈i) -2.15
- Maximum average target power is the manufacturer's declared rated power.
- Maximum average output power = Maximum average target power (㏈m) + Maximum tune up (㏈).

3. Simultaneous Transmission SAR Test Exemption with Respect to Multiple Exemption Criteria

Either SAR-based or MPE-based exemption may be considered for test exemption for fixed, mobile, or portable device exposure conditions; therefore, the contributions from each exemption in conjunction with the measured SAR (Evaluated$_k$ term) shall be used to determine exemption for simultaneous transmission according to Formula (C.1) [repeated from § 1.1307(b)(3)(ii)(B)].

$$\sum_{i=1}^{a} \frac{P_i}{P_{th,i}} + \sum_{j=1}^{b} \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^{c} \frac{Evaluated_k}{Exposure\ Limit_k} \leq 1$$

Mode	P_i/P_{th} Ratio Mode A	P_i/P_{th} Ratio Mode B	Σ P_i/P_{th} Ratio Mode A+B	Result
Bluetooth Low energy + LTE 2	0.001	0.427	0.428	Pass
WLAN 2 + LTE 2	0.023	0.427	0.450	Pass

Note ;

- Bluetooth Low energy and WLAN 2 can't simultaneous transmission at the same time.
- WCDMA and LTE can't simultaneous transmission at the same time.

4. Conclusion: No SAR is required.