

MPE Evaluation

FCC ID: 2BA2D-I0B0

Applicable Standard

KDB447498 D04 Interim General RF Exposure Guidance v01, clause 2.1.4 MPE-Base Exemption:

An alternative to the SAR-based exemption is provided in clause 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 clause 1. 1310(e)(1).

Table 1-Thresholds For Single Rf Sources Subject To Routine Environmental Evaluation

RF Source Frequency			Minimum Distance			Threshold ERP
f_L MHz		f_H MHz	$\lambda_L / 2\pi$		$\lambda_H / 2\pi$	W
0.3	—	1.34	159 m	—	35.6 m	$1,920 R^2$
1.34	—	30	35.6 m	—	1.6 m	$3,450 R^2/f^2$
30	—	300	1.6 m	—	159 mm	$3.83 R^2$
300	—	1,500	159 mm	—	31.8 mm	$0.0128 R^2 f$
1,500	—	100,000	31.8 mm	—	0.5 mm	$19.2 R^2$
Subscripts L and H are low and high; λ is wavelength. From § 1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.						

Note: The minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates the ERP (watts) is no more than the calculated value prescribed for that frequency

TEST RESULT

☒ Passed

☐ Not Applicable

BT

Test mode	Channel Frequency (MHz)	Max. Measured Power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power		Evaluation distance cm	Exemption Limit (mW)
				dBm	mw		
BDR	2402	-3.11	±1	-2.11	0.62	20	768

BLE

Test mode	Channel Frequency (MHz)	Max. Measured Power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power		Evaluation distance cm	Exemption Limit (mW)
				dBm	mw		
BLE	2402	-2.57	±1	-1.57	0.70	20	768

WIFI

Test mode	Channel Frequency (MHz)	Max. Measured Power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power		Evaluation distance cm	Exemption Limit (mW)
				dBm	mw		
B	2412	18.27	±1	19.27	84.53	20	768

Note:

- The tune-up power was declared by the applicant
- $dBi = dBd + 2.15$
- $limit = 19.2 \times 0.2^2 = 0.768W = 768mW$
- The maximum antenna gain is 2.36dBi.
- To maintain compliance with the RF exposure guidelines, place the equipment at least 20cm from nearby persons
- The WIFI, BT/BLE can be transmit simultaneously transmitting: $84.53/768 + 0.70/768 = 0.11 < 1$.

Result:Compliant

--THE END--