

RF EXPOSURE EVALUATION

MPE-Based Exemption

Applicable Standard

According to the subpart 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

According to KDB 447498 D04 v01 Interim General RF Exposure Guidance

MPE-Based Exemption:

General frequency and separation-distance dependent MPE-based effective radiated power(ERP) thresholds are in Table B.1 [Table 1 of § 1.1307(b)(3)(i)(C)] to support an exemption from further evaluation from 300 kHz through 100 GHz.

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	$0.0128 R^2 f$.
1,500-100,000	$19.2 R^2$.

R is the minimum separation distance in meters

f = frequency in MHz

For multiple RF sources: Multiple RF sources are exempt if:

in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation:

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

Result

Mode	Frequency (MHz)	Tune up conducted power [#] (dBm)	Antenna Gain#		ERP		Evaluation Distance (m)	ERP Limit (mW)
			(dBi)	(dBd)	(dBm)	(mW)		
BT	2402-2480	4.50	1.76	-0.39	4.11	2.58	0.2	768
BLE	2402-2480	3.50	1.76	-0.39	3.11	2.05	0.2	768
2.4G Wi-Fi	2412~2462	22.0	1.76	-0.39	21.61	144.88	0.2	768
5G Wi-Fi	5150-5250	13.0	1.47	-0.68	12.32	17.06	0.2	768
	5725-5850	14.5	1.64	-0.51	13.99	25.06	0.2	768

Note 1: The tune up conducted power and antenna gain was declared by the applicant.

Note 2: The Bluetooth or BLE can transmit at same time with 5G Wi-Fi.

Simultaneous transmitting consideration:

The ratio= (ERP_{BT}/limit) + (ERP_{5G Wi-Fi}/limit) = 2.58/768 + 25.06/768 = 0.04 < 1.0

To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.

Result: Compliant