

RF EXPOSURE EVALUATION

MPE-Based Exemption

Applicable Standard

According to 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

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	8	2.9	0.75	8.75	7.5	0.2	768
BLE	2402-2480	10	2.9	0.75	10.75	11.89	0.2	768
2.4G Wi-Fi	2412-2462	25	5.1	2.95	27.95	623.73	0.2	768
5.2G Wi-Fi	5180-5240	17	2.6	0.45	17.45	55.59	0.2	768
5.8G Wi-Fi	5745-5825	16	3	0.85	16.85	48.42	0.2	768

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

2. The BT, BLE and 2G Wi-Fi cannot transmit at same time, 2.4G Wi-Fi and 5G Wi-Fi cannot transmit at same time, BT, BLE and 5G Wi-Fi can transmit at same time

Simultaneous transmitting consideration (worst case):

The ratio= $EIRP_{BLE} / \text{limit} + EIRP_{5.2G Wi-Fi} / \text{limit} = 11.89/768 + 55.59/768 = 0.088 < 1.0$

So simultaneous exposure is compliant.

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

Result: Compliant