

RF EXPOSURE EVALUATION

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)(1)(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

Frequency (MHz)	Tune up conducted power [#]	Antenna Gain [#]		ERP		Evaluation Distance (m)	ERP Limit (mW)
	(dBm)	(dBi)	(dBd)	(dBm)	(mW)		
2402-2480	4.0	-1.42	-3.57	0.43	1.10	0.2	768
WCDMA B2	25.0	1.87	-0.28	24.72	296.48	0.2	768
WCDMA B5	25.0	0.91	-1.24	23.76	237.68	0.2	422
LTE B2	25.7	1.87	-0.28	25.42	348.34	0.2	768
LTE B4	25.7	3.49	1.34	27.04	505.82	0.2	768
LTE B12	25.7	1.57	-0.58	25.12	325.09	0.2	358
LTE B17	25.7	1.57	-0.58	25.12	325.09	0.2	360

Note: 1. The tune up conducted power and antenna gain was declared by the applicant.
 2. 0dBd=2.15dBi
 3. The EUT built-in LTE module, which have a FCC ID:UDV-201606.

Simultaneous transmitting consideration (worst case):

The ratio= $ERP_{BLE} / \text{limit} + ERP_{LTE\ B4} / \text{limit} = 1.10/768 + 325.09/358 = 0.91 < 1.0$

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

Result: Compliant