

FCC §1.1307 (B) & §2.1091- 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)(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	19.2R 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)		
Lora	903-927	16.0	4.44	2.29	18.29	67.45	0.25	722
WCDMA B2	1850-1910	25.00	1.59	-0.56	24.44	277.97	0.25	1200
WCDMA B4	1710-1755	25.00	2.00	-0.15	24.85	305.49	0.25	1200
WCDMA B5	824-849	25.00	2.29	0.14	25.14	326.59	0.25	659
LTE B2	1850-1910	25.00	1.59	-0.56	24.44	277.97	0.25	1200
LTE B4	1710-1755	25.00	2.00	-0.15	24.85	305.49	0.25	1200
LTE B5	824-849	25.00	2.29	0.14	25.14	326.59	0.25	659
LTE B7	2500-2570	25.00	3.00	0.85	25.85	384.59	0.25	1200
LTE B12	699-716	25.00	3.26	1.11	26.11	408.32	0.25	559
LTE B13	777-787	25.00	4.45	2.30	27.30	537.03	0.25	622
LTE B25	1850-1915	25.00	1.59	-0.56	24.44	277.97	0.25	1200
LTE B26	814-849	25.00	2.53	0.38	25.38	345.14	0.25	651
LTE B38	2570-2620	25.00	2.06	-0.09	24.91	309.74	0.25	1200
LTE B41	2496-2620	25.00	3.00	0.85	25.85	384.59	0.25	1200

Note: 1. The tune up conducted power and antenna gain was declared by the applicant.
 2. 0dBd=2.15dBi
 3. The device contains a certified WWAN model (model: EG25-G, FCC ID: XMR201903EG25G)

Simultaneous transmitting consideration (worst case):

The ratio= $ERP_{Lora}/limit + ERP_{LTE\ B13}/limit = 67.45/722 + 537.03/622 = 0.957 < 1.0$

To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 25cm from nearby persons.

Result: Compliant