

FCC §1.1307(b)-RF EXPOSURE

Applicable Standard

According to KDB 447498 D04 Interim General RF Exposure Guidance v01, clause 2.1.4 –MPE-Based Exemption:

An alternative to the SAR-based exemption is provided in § 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 § 1.1310(e)(1).

Table 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	$19.2 R^2$.

f = frequency in MHz;

R = minimum separation distance from the body of a nearby person (appropriate units, e.g., m);

Test Result:

For worst case:

Mode	Frequency Range (MHz)	Tune-Up Conducted Average Output Power (dBm)	Antenna Gain		ERP		Evaluation Distance (cm)	MPE-Based Exemption (mW)
			(dBi)	(dBd)	(dBm)	(mW)		
WCDMA B2	1850-1910	24.0	2.28	0.13	24.13	258.82	20	768.0
WCDMA B4	1710-1755	24.0	1.8	-0.35	23.65	231.74	20	768.0
WCDMA B5	824-849	24.0	-0.29	-2.44	21.56	143.22	20	421.9
LTE B2	1850-1910	23.5	2.28	0.13	23.63	230.67	20	768.0
LTE B4	1710-1755	24.0	1.80	-0.35	23.65	231.74	20	768.0
LTE B5	824-849	24.5	-0.29	-2.44	22.06	160.69	20	421.9
LTE B12	699-716	24.5	-1.10	-3.25	21.25	133.35	20	357.9
LTE B13	777-787	24.0	-0.27	-2.42	21.58	143.88	20	397.8
LTE B14	788-798	24.0	-0.12	-2.27	21.73	148.94	20	403.5
LTE B66	1710-1780	24.0	1.80	-0.35	23.65	231.74	20	768.0
LTE B71	663-698	24.0	-1.91	-4.06	19.94	98.63	20	339.5

Note 1: The tune-up power was declared by the applicant.

Note 2: 0dBd=2.15dBi.

Simultaneous transmission consideration:

For the 433.92MHz SRD is a very lower power device, it's almost have no influence on the results of simultaneous transmission, so the device compliance with RF exposure in simultaneous transmission condition.

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

Result: Compliant.