

FCC§15.247 (I), §1.1307 (B) (3) &§2.1093 – RF EXPOSURE

Applicable Standard

According to FCC §2.1093 and §1.1307(b) (3), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB 447498 D04 Interim General RF Exposure Guidance

SAR-Based Exemption:

SAR-based thresholds are derived based on frequency, power, and separation distance of the RF source. The formula defines the thresholds in general for either available maximum timeaveraged power or maximum time-averaged ERP, whichever is greater.

Per § 1.1307(b)(3)(i)(B), for single RF sources (i.e., any single fixed RF source, mobile device, or portable device, as defined in paragraph (b)(2) of this section): A single RF source is exempt if:

the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P_{th} (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by:

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

d = the separation distance (cm);

Finally, when 10-g extremity SAR applies, SAR test exemption may be considered by applying a factor of 2.5 to the SAR-based exemption thresholds.

For worst case:

Band	Frequency (MHz)	Tune up conducted power		Antenna Gain		ERP		Evaluation Distance (m)	Pth (mW)
		(dBm)	(W)	(dBi)	(dBd)	(dBm)	(mW)		
CDMA BC0	824-849	23.0	199.53	4.88	2.73	25.73	374.11	0.2	1681
CDMA BC1	1850-1910	23.0	199.53	4.89	2.74	25.74	374.97	0.2	3060
LTE B2	1850-1910	24.0	251.19	4.89	2.74	26.74	472.06	0.2	3060
LTE B4	1710-1755	24.0	251.19	4.25	2.1	26.1	407.38	0.2	3060
LTE B5	824-849	24.0	251.19	4.88	2.73	26.73	470.98	0.2	1681
LTE B12	699-716	24.0	251.19	3.77	1.62	25.62	364.75	0.2	1426
LTE B13	777-787	24.0	251.19	5.63	3.48	27.48	559.76	0.2	1585
LTE B25	1850-1915	22.5	177.83	4.89	2.74	25.24	334.20	0.2	3060
LTE B41	2496-2690	22.0	158.49	5.19	3.04	25.04	319.15	0.2	3060
LTE B66	1710-1780	22.5	177.83	4.25	2.1	24.6	288.40	0.2	3060

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

Result: Compliant.