



8. Radio Frequency Exposure

8.1. Applicable Standards

<div><input checked="" type="checkbox"/></div> <div>§1.1307(b)(3)(i)(A)</div>	The available maximum time-averaged power is no more than 1 mW, regardless of separation distance.																																																	
<div><input type="checkbox"/></div> <div>§1.1307(b)(3)(i)(c)</div>	<div>ERP is below a threshold calculated based on the distance , R between the person and t</div> <div>antenna / radiating structure, where $R > \lambda / 2 \pi$.</div> <div>TABLE B.1—THRESHOLDS FOR SINGLE RF SOURCES SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION</div> <table><tr><th colspan="3">RF Source Frequency</th><th colspan="3">Minimum Distance</th><th>Threshold ERP</th></tr><tr><td>f_L MHz</td><td></td><td>f_H MHz</td><td>$\lambda_L / 2\pi$</td><td></td><td>$\lambda_H / 2\pi$</td><td>W</td></tr><tr><td>0.3</td><td>–</td><td>1.34</td><td>159 m</td><td>–</td><td>35.6 m</td><td>$1,920 R^2$</td></tr><tr><td>1.34</td><td>–</td><td>30</td><td>35.6 m</td><td>–</td><td>1.6 m</td><td>$3,450 R^2/f^2$</td></tr><tr><td>30</td><td>–</td><td>300</td><td>1.6 m</td><td>–</td><td>159 mm</td><td>$3.83 R^2$</td></tr><tr><td>300</td><td>–</td><td>1,500</td><td>159 mm</td><td>–</td><td>31.8 mm</td><td>$0.0128 R^2f$</td></tr><tr><td>1,500</td><td>–</td><td>100,000</td><td>31.8 mm</td><td>–</td><td>0.5 mm</td><td>$19.2R^2$</td></tr></table> <div>Subscripts L and H are low and high; λ is wavelength. From § 1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.</div>	RF Source Frequency			Minimum Distance			Threshold ERP	f_L MHz		f_H MHz	$\lambda_L / 2\pi$		$\lambda_H / 2\pi$	W	0.3	–	1.34	159 m	–	35.6 m	$1,920 R^2$	1.34	–	30	35.6 m	–	1.6 m	$3,450 R^2/f^2$	30	–	300	1.6 m	–	159 mm	$3.83 R^2$	300	–	1,500	159 mm	–	31.8 mm	$0.0128 R^2f$	1,500	–	100,000	31.8 mm	–	0.5 mm	$19.2R^2$
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<div><input type="checkbox"/></div> <div>§ 1.1307(b)(3)(i)(B).</div>	<div>Device operates between 300 MHz and 6 GHz and the maximum time-averaged power or effective radiated power (ERP), whichever is greater, $\leq P_{th}$</div> <div>$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$</div> <div>Where</div> <div>$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$</div> <div>and</div> <div>$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$</div> <div>$d$ = the separation distance (cm);</div>																																																	



8.2. EUT Specification

Frequency band (Operating)	<input checked="" type="checkbox"/> 13.553MHz ~ 13.567MHz
Device category	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation)
Antenna diversity	<input checked="" type="checkbox"/> Single antenna <input type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
Evaluation applied	<input checked="" type="checkbox"/> Blanket 1 mW Blanket Exemption <input type="checkbox"/> MPE-based Exemption <input type="checkbox"/> SAR-based Exemption
Remark: The maximum Fundamental Emission is <u>55.948dBuV/m</u> at <u>13.56MHz</u> (with <u>0dBi</u> antenna gain.)	

8.3. Result

Channel Frequency (MHz)	Fundamental Emission (dBm)	Antenna Gain (dBi)	Conducted Power (dBm)	Max. Tune up power (dBm)	Fundamental Emission (mW)	Limit (mW)
13.56	-39.28	0.00	-39.28	-38.78	0.000132	1

Antenna Gain (dBi)	Antenna Gain (linear)	Distance (m)	Fundamental Emission (dBuV/m)	Fundamental Emission (V/m)	Fundamental Emission (W)	Fundamental Emission (dBm)
0	1	3	55.948	0.000627	0.000000118	-39.28

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