



12. Radio Frequency Exposure

12.1.Applicable Standards

<input type="checkbox"/> §1.1307(b)(3)(i)(A)	The available maximum time-averaged power is no more than 1 mW, regardless of separation distance.																																										
<input checked="" type="checkbox"/> §1.1307(b)(3)(i)(c)	ERP is below a threshold calculated based on the distance , R between the person and t antenna / radiating structure, where $R > \lambda / 2 \pi$. <div style="text-align: center;"> TABLE B.1—THRESHOLDS FOR SINGLE RF SOURCES SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION </div> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="2">RF Source Frequency</th> <th colspan="3">Minimum Distance</th> <th>Threshold ERP</th> </tr> <tr> <th>f_L MHz</th> <th>f_H MHz</th> <th>$\lambda_L / 2\pi$</th> <th></th> <th>$\lambda_H / 2\pi$</th> <th>W</th> </tr> </thead> <tbody> <tr> <td>0.3</td> <td>– 1.34</td> <td>159 m</td> <td>–</td> <td>35.6 m</td> <td>1,920 R²</td> </tr> <tr> <td>1.34</td> <td>– 30</td> <td>35.6 m</td> <td>–</td> <td>1.6 m</td> <td>3,450 R²/f²</td> </tr> <tr> <td>30</td> <td>– 300</td> <td>1.6 m</td> <td>–</td> <td>159 mm</td> <td>3.83 R²</td> </tr> <tr> <td>300</td> <td>– 1,500</td> <td>159 mm</td> <td>–</td> <td>31.8 mm</td> <td>0.0128 R²f</td> </tr> <tr> <td>1,500</td> <td>– 100,000</td> <td>31.8 mm</td> <td>–</td> <td>0.5 mm</td> <td>19.2R²</td> </tr> </tbody> </table> <p style="font-size: small; margin-top: 5px;">Subscripts L and H are low and high; λ is wavelength. From § 1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.</p>	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 ² f	1,500	– 100,000	31.8 mm	–	0.5 mm	19.2R ²
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<input type="checkbox"/> § 1.1307(b)(3)(i)(B).	Device operates between 300 MHz and 6 GHz and the maximum time-averaged power or effective radiated power (ERP), whichever is greater, $\leq P_{th}$ $P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$ <p style="text-align: center;">Where</p> $x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$ <p style="text-align: center;">and</p> $ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$ <p style="text-align: center;">$d =$ the separation distance (cm);</p>																																										

**12.2.EUT Specification**

Frequency band (Operating)	<input type="checkbox"/> WLAN: 2412MHz ~ 2462MHz <input checked="" type="checkbox"/> WLAN: 5150MHz ~ 5250MHz <input checked="" type="checkbox"/> WLAN: 5250MHz ~ 5350MHz <input checked="" type="checkbox"/> WLAN: 5470MHz ~ 5725MHz <input checked="" type="checkbox"/> WLAN: 5725MHz ~ 5850MHz <input type="checkbox"/> Bluetooth: 2402MHz ~ 2480MHz
Device category	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation)
Antenna diversity	<input type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input checked="" type="checkbox"/> Tx/Rx diversity
Evaluation applied	<input type="checkbox"/> Blanket 1 mW Blanket Exemption <input checked="" type="checkbox"/> MPE-based Exemption <input type="checkbox"/> SAR-based Exemption
Remark: 1. <u>The maximum conducted output power is 29.64dBm (921.008mW) at 5755MHz (with 6.34 dBi antenna gain.) From Non-Beamforming</u> 2. <u>The maximum conducted output power is 29.54dBm (899.180mW) at 5230MHz (with 4.39 dBi antenna gain.) From Beamforming</u>	



12.3. Test Results

Non-Beamforming

Channel Frequency (MHz)	Max. Conducted output power(dBm)	Max. Tune up power (dBm)	Antenna Gain(dBi)	Max.Tune up e.r.p. Power (dBm)	Max. Tune up e.r.p power (mW)	Limit (mW)
5230	29.11	29.61	3.45	30.91	1233.63	4609.92
5290	23.80	24.30	4.59	26.74	472.35	4609.92
5610	23.47	23.97	6.46	28.28	672.21	4609.92
5775	29.64	30.14	6.34	34.33	2711.84	4609.92

Beamforming

Channel Frequency (MHz)	Max. Conducted output power(dBm)	Max. Tune up power (dBm)	Antenna Gain(dBi)	Max.Tune up e.r.p. Power (dBm)	Max. Tune up e.r.p power (mW)	Limit (mW)
5230	29.54	30.04	4.39	32.28	1689.84	4609.92
5290	23.98	24.48	4.59	26.92	492.18	4609.92
5690	23.53	24.03	6.46	28.34	682.84	4609.92
5795	29.26	29.76	6.34	33.95	2481.84	4609.92



Maximum Permissible Exposure (Co-location)

Non-Beamforming

Modulation Type	Channel Frequency (MHz)	Max. Conducted output power (dBm)	Max. Tune up power (dBm)	Antenna Gain(dBi)	Distance (cm)	Max. Tune up e.r.p power (mW)	Limit (mW)	MPE Ratio
11g	2437	29.96	30.46	3.74	49	1603.48	4609.92	0.35
11ax HE40	5755	29.64	30.14	6.34	49	2711.84	4609.92	0.59
Co-location Total								0.94
Σ MPE ratios Limit								1

Beamforming

Modulation Type	Channel Frequency (MHz)	Max. Conducted output power (dBm)	Max. Tune up power (dBm)	Antenna Gain(dBi)	Distance (cm)	Max. Tune up e.r.p power (mW)	Limit (mW)	MPE Ratio
11ax HE20	2437	29.75	30.25	5.13	49	2103.80	4609.92	0.46
11ax HE40	5795	29.26	29.76	6.34	49	2481.84	4609.92	0.54
Co-location Total								0.99
Σ MPE ratios Limit								1

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