



## 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)	<p>ERP is below a threshold calculated based on the distance , R between the person and t antenna / radiating structure, where <math>R &gt; \lambda / 2 \pi</math>.</p> <p style="text-align: center;">TABLE B.1—THRESHOLDS FOR SINGLE RF SOURCES SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="2">RF Source Frequency</th> <th colspan="2">Minimum Distance</th> <th>Threshold ERP</th> </tr> <tr> <th><math>f_L</math> MHz</th> <th><math>f_H</math> MHz</th> <th><math>\lambda_L / 2\pi</math></th> <th><math>\lambda_H / 2\pi</math></th> <th>W</th> </tr> </thead> <tbody> <tr> <td>0.3</td> <td>– 1.34</td> <td>159 m</td> <td>– 35.6 m</td> <td><math>1,920 R^2</math></td> </tr> <tr> <td>1.34</td> <td>– 30</td> <td>35.6 m</td> <td>– 1.6 m</td> <td><math>3,450 R^2/f^2</math></td> </tr> <tr> <td>30</td> <td>– 300</td> <td>1.6 m</td> <td>– 159 mm</td> <td><math>3.83 R^2</math></td> </tr> <tr> <td>300</td> <td>– 1,500</td> <td>159 mm</td> <td>– 31.8 mm</td> <td><math>0.0128 R^2f</math></td> </tr> <tr> <td>1,500</td> <td>– 100,000</td> <td>31.8 mm</td> <td>– 0.5 mm</td> <td><math>19.2R^2</math></td> </tr> </tbody> </table> <p>Subscripts L and H are low and high; <math>\lambda</math> 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	$0.0128 R^2f$	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).	<p>Device operates between 300 MHz and 6 GHz and the maximum time-averaged power or effective radiated power (ERP), whichever is greater, <math>\leq P_{th}</math></p> $P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$ <p>Where</p> $x = -\log_{10} \left( \frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$ <p>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><math>d = \text{the separation distance (cm);}</math></p>																																			



**12.2.EUT Specification**

<b>Frequency band (Operating)</b>	<input checked="" type="checkbox"/> WLAN: 5925MHz~6425MHz <input checked="" type="checkbox"/> WLAN: 6425MHz~6525MHz <input checked="" type="checkbox"/> WLAN: 6525MHz~6875MHz <input checked="" type="checkbox"/> WLAN: 6875MHz~7125MHz
<b>Device category</b>	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation)
<b>Antenna diversity</b>	<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
<b>Evaluation applied</b>	<input type="checkbox"/> Blanket 1 mW Blanket Exemption <input checked="" type="checkbox"/> MPE-based Exemption <input type="checkbox"/> SAR-based Exemption
<b>Remark:</b>	
<ol style="list-style-type: none"> <li>The maximum conducted output power is <u>17.87 dBm (61.174mW) at 6415MHz (with 5.30dBi antenna gain.) From Non BeamForming</u></li> <li>The maximum conducted output power is <u>14.74 dBm (29.762 mW) at 6415MHz (with 8.06dBi antenna gain.) From BeamForming</u></li> </ol>	

**12.3.Result**

**Non BeamForming**

Channel Frequency (MHz)	Max. Conducted output power(dBm)	Max. Tune up power (dBm)	Antenna Gain(dBi)	Max. Tune up EIRP (dBm)	Max. Tune up ERP (dBm)	Distance (cm)	$\lambda/2\pi$ (cm)	Max. Tune up ERP (W)	ERP Threshold (W)
6025	17.87	18.37	5.30	23.67	21.52	20	0.793	0.142	0.768
6465	15.01	15.51	5.10	20.61	18.46	20	0.739	0.070	0.768
6665	17.24	17.74	5.10	22.84	20.69	20	0.717	0.117	0.768
6985	17.62	18.12	5.30	23.42	21.27	20	0.684	0.134	0.768

No non-compliance noted.

**BeamForming**

Channel Frequency (MHz)	Max. Conducted output power(dBm)	Max. Tune up power (dBm)	Antenna Gain(dBi)	Max. Tune up EIRP (dBm)	Max. Tune up ERP (dBm)	Distance (cm)	$\lambda/2\pi$ (cm)	Max. Tune up ERP (W)	ERP Threshold (W)
6185	14.74	15.24	8.06	23.30	21.15	20	0.7724	0.130	0.768
6465	11.88	12.38	7.77	20.15	18.00	20	0.73891	0.063	0.768
6665	14.29	14.79	8.01	22.80	20.65	20	0.71674	0.116	0.768
6985	14.48	14.98	8.26	23.24	21.09	20	0.6839	0.129	0.768

No non-compliance noted.



**Co-located**

**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	2412-2462	24.32	24.82	3.2	20	386.42	3060.00	0.13
11ax HE40	5745-5825	27.95	28.45	5.3	20	1445.44	3060.00	0.47
11ax HE160	5955~6415	17.87	18.37	5.3	20	141.91	3060.00	0.05
Co-location Total								0.65
Σ MPE ratios Limit								1.00

**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	2412-2462	19.89	20.39	6.06	20	269.18	3060.00	0.09
11ax HE40	5745-5825	24.92	25.42	8.26	20	1422.33	3060.00	0.46
11ax HE160	5725-5850	14.74	15.24	8.06	20	130.32	3060.00	0.04
Co-location Total								0.59
Σ MPE ratios Limit								1.00

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