



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 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="2">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>$\lambda_H / 2\pi$</th> <th>W</th> </tr> </thead> <tbody> <tr> <td>0.3</td> <td>–</td> <td>159 m</td> <td>–</td> <td>35.6 m</td> <td>1,920 R²</td> </tr> <tr> <td>1.34</td> <td>–</td> <td>30</td> <td>–</td> <td>1.6 m</td> <td>3,450 R²/f²</td> </tr> <tr> <td>30</td> <td>–</td> <td>300</td> <td>–</td> <td>159 mm</td> <td>3.83 R²</td> </tr> <tr> <td>300</td> <td>–</td> <td>1,500</td> <td>–</td> <td>31.8 mm</td> <td>0.0128 R²f</td> </tr> <tr> <td>1,500</td> <td>–</td> <td>100,000</td> <td>–</td> <td>0.5 mm</td> <td>19.2R²</td> </tr> </tbody> </table> <p>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	–	159 m	–	35.6 m	1,920 R ²	1.34	–	30	–	1.6 m	3,450 R ² /f ²	30	–	300	–	159 mm	3.83 R ²	300	–	1,500	–	31.8 mm	0.0128 R ² f	1,500	–	100,000	–	0.5 mm	19.2R ²
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<input checked="" 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>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>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 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 type="checkbox"/> Blanket 1 mW Blanket Exemption <input checked="" type="checkbox"/> MPE-based Exemption <input type="checkbox"/> SAR-based Exemption
Remark:	
The maximum conducted output power is <u>23.55dBm (226.464mW) at 5745MHz (with 6.24dBi antenna gain.)</u>	

12.3.Result

Maximum Permissible Exposure

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)
5200	23.48	23.98	6.20	28.03	635.18	3060
5260	23.47	23.97	6.33	28.15	652.53	3060
5720	22.15	22.65	6.05	26.55	451.86	3060
5745	23.55	24.05	6.24	28.14	652.08	3060

Maximum Permissible Exposure (Co-location)

BLE+5G

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
GFSK(1Mbps)	2402	18.29	18.79	2.935	20	90.678	3060.000	0.030
11ax HE20	5260	23.47	23.97	6.33	20	652.529	3060.000	0.213
Co-location Total								0.393
Σ MPE ratios Limit								1

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