



## 9. Radio Frequency Exposure

### 9.1. Applicable Standards

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



## 9.2. EUT Specification

|                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Frequency band (Operating)</b>                                                                                                          | <input type="checkbox"/> WLAN: 2412MHz ~ 2462MHz<br><input checked="" type="checkbox"/> WLAN: 5150MHz ~ 5250MHz<br><input checked="" type="checkbox"/> WLAN: 5250MHz ~ 5350MHz<br><input checked="" type="checkbox"/> WLAN: 5470MHz ~ 5725MHz<br><input checked="" type="checkbox"/> WLAN: 5725MHz ~ 5850MHz<br><input type="checkbox"/> Bluetooth: 2402MHz ~ 2480MHz                                                                                                                       |
| <b>Device category</b>                                                                                                                     | <input type="checkbox"/> Portable (<20cm separation)<br><input checked="" type="checkbox"/> Mobile (>20cm separation)                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Antenna diversity</b>                                                                                                                   | SISO<br><input checked="" type="checkbox"/> Single antenna<br><input type="checkbox"/> Multiple antennas<br><input type="checkbox"/> Tx diversity<br><input type="checkbox"/> Rx diversity<br><input type="checkbox"/> Tx/Rx diversity<br>MIMO<br><input type="checkbox"/> Single antenna<br><input checked="" type="checkbox"/> Multiple antennas<br><input checked="" type="checkbox"/> Tx diversity<br><input type="checkbox"/> Rx diversity<br><input type="checkbox"/> Tx/Rx diversity |
| <b>Evaluation applied</b>                                                                                                                  | <input type="checkbox"/> Blanket 1 mW Blanket Exemption<br><input checked="" type="checkbox"/> MPE-based Exemption<br><input type="checkbox"/> SAR-based Exemption                                                                                                                                                                                                                                                                                                                          |
| <b>Remark:</b><br>The maximum conducted output power is <u>19.51dBm (89.265 mW)</u> at <u>5260MHz</u> (with <u>1.01dBi antenna gain.</u> ) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |



### 9.3. Result

ESY10I1E

ANT A

| Modulation Type | 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) |
|-----------------|-------------------------|----------------------------------|--------------------------|-------------------|---------------------------------|-------------------------------|------------|
| 11a             | 5180-5240               | 18.21                            | 18.71                    | 0.87              | 17.43                           | 55.34                         | 3060       |
| 11a             | 5260-5320               | 15.30                            | 15.80                    | 0.74              | 14.39                           | 27.48                         | 3060       |
| 11a             | 5500-5720               | 16.02                            | 16.52                    | 1.16              | 15.53                           | 35.73                         | 3060       |
| 11a             | 5745-5825               | 15.59                            | 16.09                    | 1.09              | 15.03                           | 31.84                         | 3060       |

ANT B

| Modulation Type | 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) |
|-----------------|-------------------------|----------------------------------|--------------------------|-------------------|---------------------------------|-------------------------------|------------|
| 11a             | 5180-5240               | 19.05                            | 19.55                    | 0.92              | 18.32                           | 67.92                         | 3060       |
| 11a             | 5260-5320               | 17.95                            | 18.45                    | 1.01              | 17.31                           | 53.83                         | 3060       |
| 11a             | 5500-5720               | 17.50                            | 18.00                    | 1.18              | 17.03                           | 50.47                         | 3060       |
| 11a             | 5745-5825               | 17.54                            | 18.04                    | 1.3               | 17.19                           | 52.36                         | 3060       |

ANT A, B

| Modulation Type | 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) |
|-----------------|-------------------------|----------------------------------|--------------------------|-------------------|---------------------------------|-------------------------------|------------|
| 11ax HE20       | 5180-5240               | 18.07                            | 18.57                    | 0.92              | 17.34                           | 54.20                         | 3060       |
| 11ax HE20       | 5260-5320               | 19.51                            | 20.01                    | 1.01              | 18.87                           | 77.09                         | 3060       |
| 11ax HE40       | 5500-5720               | 17.82                            | 18.32                    | 1.18              | 17.35                           | 54.33                         | 3060       |
| 11ax HE20       | 5745-5825               | 16.24                            | 16.74                    | 1.3               | 15.89                           | 38.82                         | 3060       |

No non-compliance noted.



ESY15I1E

**ANT A**

| Modulation Type | 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) |
|-----------------|-------------------------|----------------------------------|--------------------------|-------------------|--------------------------------|-------------------------------|------------|
| 11a             | 5180-5240               | 18.20                            | 18.70                    | 1.65              | 18.20                          | 66.07                         | 3060       |
| 11a             | 5260-5320               | 15.27                            | 15.77                    | 1.17              | 14.79                          | 30.13                         | 3060       |
| 11a             | 5500-5720               | 16.01                            | 16.51                    | 2.08              | 16.44                          | 44.06                         | 3060       |
| 11a             | 5745-5825               | 15.40                            | 15.90                    | 2.01              | 15.76                          | 37.67                         | 3060       |

**ANT B**

| Modulation Type | 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) |
|-----------------|-------------------------|----------------------------------|--------------------------|-------------------|--------------------------------|-------------------------------|------------|
| 11a             | 5180-5240               | 19.09                            | 19.59                    | 2.03              | 19.47                          | 88.51                         | 3060       |
| 11a             | 5260-5320               | 18.06                            | 18.56                    | 2.2               | 18.61                          | 72.61                         | 3060       |
| 11a             | 5500-5720               | 17.53                            | 18.03                    | 2.05              | 17.93                          | 62.09                         | 3060       |
| 11a             | 5745-5825               | 17.57                            | 18.07                    | 2.07              | 17.99                          | 62.95                         | 3060       |

**ANT A, B**

| Modulation Type | 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) |
|-----------------|-------------------------|----------------------------------|--------------------------|-------------------|--------------------------------|-------------------------------|------------|
| 11ax HE20       | 5180-5240               | 18.09                            | 18.59                    | 2.03              | 18.47                          | 70.31                         | 3060       |
| 11ax HE20       | 5260-5320               | 19.28                            | 19.78                    | 2.2               | 19.83                          | 96.16                         | 3060       |
| 11ax HE40       | 5500-5720               | 17.91                            | 18.41                    | 2.08              | 18.34                          | 68.23                         | 3060       |
| 11ax HE20       | 5745-5825               | 16.32                            | 16.82                    | 2.07              | 16.74                          | 47.21                         | 3060       |

No non-compliance noted.



ESY2211E

ANT A

| Modulation Type | 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) |
|-----------------|-------------------------|----------------------------------|--------------------------|-------------------|--------------------------------|-------------------------------|------------|
| 11a             | 5180-5240               | 18.23                            | 18.73                    | 1.49              | 18.07                          | 64.12                         | 3060       |
| 11a             | 5260-5320               | 15.35                            | 15.85                    | 1.18              | 14.88                          | 30.76                         | 3060       |
| 11a             | 5500-5720               | 16.03                            | 16.53                    | 1.02              | 15.40                          | 34.67                         | 3060       |
| 11a             | 5745-5825               | 15.63                            | 16.13                    | 1.24              | 15.22                          | 33.27                         | 3060       |

ANT B

| Modulation Type | 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) |
|-----------------|-------------------------|----------------------------------|--------------------------|-------------------|--------------------------------|-------------------------------|------------|
| 11a             | 5180-5240               | 18.05                            | 18.55                    | 1.12              | 17.52                          | 56.49                         | 3060       |
| 11a             | 5260-5320               | 14.55                            | 15.05                    | 1.12              | 14.02                          | 25.23                         | 3060       |
| 11a             | 5500-5720               | 16.58                            | 17.08                    | 1.08              | 16.01                          | 39.90                         | 3060       |
| 11a             | 5745-5825               | 17.23                            | 17.73                    | 1.66              | 17.24                          | 52.97                         | 3060       |

ANT A, B

| Modulation Type | 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) |
|-----------------|-------------------------|----------------------------------|--------------------------|-------------------|--------------------------------|-------------------------------|------------|
| 11ax HE20       | 5180-5240               | 18.06                            | 18.56                    | 1.49              | 17.90                          | 61.66                         | 3060       |
| 11ax HE20       | 5260-5320               | 19.31                            | 19.81                    | 1.18              | 18.84                          | 76.56                         | 3060       |
| 11ax HE40       | 5500-5720               | 17.77                            | 18.27                    | 1.08              | 17.20                          | 52.48                         | 3060       |
| 11ax HE20       | 5745-5825               | 16.17                            | 16.67                    | 1.66              | 16.18                          | 41.50                         | 3060       |

No non-compliance noted.

**Maximum Permissible Exposure (Co-location)**

For ESY10I1E  
Co-Located (BT+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               | 2402-2480               | 15.37                             | 15.87                    | 0.79              | 20            | 28.25                        | 3060.00    | 0.009     | Pass |
| 11ax HE20          | 5260-5320               | 19.51                             | 20.01                    | 1.01              | 20            | 77.09                        | 3060.00    | 0.025     |      |
| Co-location Total  |                         |                                   |                          |                   |               |                              | ---        | 0.034     |      |
| Σ MPE ratios Limit |                         |                                   |                          |                   |               |                              | ---        | 1.000     |      |

For ESY15I1E  
Co-Located (BT+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               | 2402-2480               | 15.51                             | 16.01                    | 1.45              | 20            | 33.96                        | 3060.00    | 0.011     | Pass |
| 11ax HE20          | 5260-5320               | 19.28                             | 19.78                    | 2.2               | 20            | 96.16                        | 3060.00    | 0.031     |      |
| Co-location Total  |                         |                                   |                          |                   |               |                              | ---        | 0.042     |      |
| Σ MPE ratios Limit |                         |                                   |                          |                   |               |                              | ---        | 1.000     |      |

For ESY22I1E  
Co-Located (BT+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               | 2402-2480               | 15.69                             | 16.19                    | 0.75              | 20            | 30.13                        | 3060.00    | 0.010     | Pass |
| 11ax HE20          | 5260-5320               | 19.31                             | 19.81                    | 1.18              | 20            | 76.56                        | 3060.00    | 0.025     |      |
| Co-location Total  |                         |                                   |                          |                   |               |                              | ---        | 0.035     |      |
| Σ MPE ratios Limit |                         |                                   |                          |                   |               |                              | ---        | 1.000     |      |

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