FCC Rules and Millimeter Wave Emissions Measurements

Radio frequency devices may not be legally sold in the United States until the manufacturer, distributor or importer demonstrates that products being offered for sale have met the FCC’s equipment authorization requirements. Equipment authorization is a procedure involving the testing, labeling, and (where the Rules require) the certification of a radio frequency device. The equipment authorization procedures are found in the FCC Rules, CFR47, beginning at paragraph 2.901.

Millimeter wave transmitters must meet the Certification requirements of the equipment authorization program. Certification involves testing to the applicable product requirement, and submission to the FCC of test data, processing fees, schematics, user manuals, product ID labeling and other product information. Upon completion of a satisfactory review, the FCC issues a Grant of Certification for the equipment. Application for certification is done over the internet via FCC’s website.

Prior to 1998, the term “type acceptance” was the name of the equipment authorization for licensed transmitters, and “certification” the term used for unlicensed transmitters operating under Part 15 of the Rules. As of October 1998, “certification” is the term which applies to both licensed and unlicensed transmitters.

Certification applies to unlicensed transmitters, as well as to transmitters requiring an operator’s license. Some of the microwave devices regulated under the certification program:

The Rules specify the frequency range of measurements for transmitters, depending on their operating frequency. Paragraph 2.997 covers requirements for licensed transmitters and paragraph 15.33(a) covers requirements for unlicensed transmitters. The requirements for both are identical:
<table>
<thead>
<tr>
<th>Device or Service</th>
<th>Authorized Frequency Range</th>
<th>Rule Section/Paragraph</th>
<th>License Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field Disturbance Sensor</td>
<td>5785-5815 MHz</td>
<td>15.245</td>
<td>Unlicensed</td>
</tr>
<tr>
<td></td>
<td>10.500 - 10.550 GHz</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>24.075 - 24.175 GHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spread Spectrum radios</td>
<td>5725 - 5850 MHz</td>
<td>15.247</td>
<td>Unlicensed</td>
</tr>
<tr>
<td>General Purpose RF</td>
<td>5725-5875 MHz</td>
<td>15.249</td>
<td>Unlicensed</td>
</tr>
<tr>
<td></td>
<td>24.0 - 24.25 GHz</td>
<td></td>
<td></td>
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<tr>
<td>U-NII</td>
<td>5.15 - 5.35 GHz</td>
<td>15.401</td>
<td>Unlicensed</td>
</tr>
<tr>
<td></td>
<td>5.725 - 5.825 GHz</td>
<td></td>
<td></td>
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<tr>
<td>Vehicle radar system</td>
<td>46.7 - 46.9 GHz</td>
<td>15.253</td>
<td>Unlicensed</td>
</tr>
<tr>
<td></td>
<td>76.0 - 77.0 GHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed operation</td>
<td>59.0 - 64.0 GHz</td>
<td>15.255</td>
<td>Unlicensed</td>
</tr>
<tr>
<td>Maritime Services</td>
<td>9.2 - 9.5 GHz</td>
<td>80.1075</td>
<td>Licensed</td>
</tr>
<tr>
<td>Aeronautical radars and Radionavigation</td>
<td>Various bands between 5.0 - 33.4 GHz</td>
<td>87.169</td>
<td>Licensed</td>
</tr>
<tr>
<td>Private Land Mobile Radio Services</td>
<td>8.40- 8.5 GHz</td>
<td>90.63</td>
<td>Licensed</td>
</tr>
<tr>
<td></td>
<td>10.550 - 10.68 GHz</td>
<td>90 Subpart B Note</td>
<td></td>
</tr>
<tr>
<td>Fixed Microwave Services</td>
<td>Various bands between 5.925 - 40.0 GHz</td>
<td>101.101</td>
<td>Licensed</td>
</tr>
<tr>
<td></td>
<td>27.5 - 31.3 GHz (LMDS)</td>
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</tr>
</tbody>
</table>

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- **Operating frequency, Equipment Under Test**
  - below 10 GHz
  - 10 - 30 GHz
  - above 30 GHz

- **Frequency Range to be Investigated**
  - to lower of 10th harmonic or 40 GHz
  - to lower of 5th harmonic or 100 GHz
  - to lower of 5th harmonic or 200 GHz

**NOTE:** Several sections of the FCC Rules were revised in 1998 in order to streamline equipment authorization procedures and paragraph numbers were changed for a number of rules pertaining to certification. The paragraph numbers listed above are in the 1997 published version of the Rules; the 1998 version will be available starting March 1999.
Part 2  Paragraph Changes
Deleted paragraphs  2.971, 2.973, 2.975, 2.977, 2.981, 2.983, 2.999, 2.1001, 2.1005

Renumbered paragraphs: 2.985 to 2.1046
2.987 to 2.1047
2.989 to 2.1049
2.991 to 2.1051
2.993 to 2.1053
2.995 to 2.1055
2.997 to 2.1057

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