6 GHz U-NII Bands

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Federal Communications Commission
Office of Engineering and Technology
Laboratory Division
6 GHZ 15E Rule

A draft publication was posted for comment Aug 14 2020 for U-NII 6 GHz devices operating in the 5.925-7.125 GHz band and expired on Sept 25 2020. There were 24 comments.

Comments are currently being reviewed.

U-NII 6 GHz devices will be under rule part 15E in U-NII Bands 5,6,7,8 in two Basic categories:

1. Indoor devices - Phase 1
- Access Points (AP)
- Associated Clients

2. Standard devices - Phase 2 - Database Managed - Automated Frequency Coordination (AFC)
- Access Points (AP)
- Associated Clients

Notification of a final Publication will be provided on https://apps.fcc.gov/oetcf/kdb/index.cfm under Recent Guidelines and Interpretations.
- Phase 1 – First Publication.
- Phase 2 – After AFC established.
### 6 GHz 15E Rule

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<th>Band</th>
<th>Band GHz</th>
<th>Rules</th>
<th>Notes</th>
<th>KDB Pub</th>
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<tr>
<td>U-NII 1</td>
<td>5.15-5.25</td>
<td>15.407(a)(1)</td>
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<td>U-NII 3</td>
<td>5.725-5.85</td>
<td>14.407(a)(3)</td>
<td>Indoor/Outdoor</td>
<td>789033 (U-NII)</td>
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<td>926956 (*)</td>
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<tr>
<td>DSRC</td>
<td>5.85-5.925</td>
<td>95 Subpart L and 90 Subpart M</td>
<td>On-Board Units (OBU) must transmit signals to other OBUs and Roadside Units (RSU).</td>
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<td>U-NII 5</td>
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<tr>
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<td>15.407(a)(4) – (8)</td>
<td>Low Power Indoor AP, Subordinates, Indoor Clients</td>
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<td>Standard Power AP, Fixed &amp; Standard Clients</td>
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<td>U-NII 8</td>
<td>6.875-7.125</td>
<td>15.407(a)(5), (6), (8)</td>
<td>Low Power Indoor AP, Subordinates, Indoor Clients</td>
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</tbody>
</table>

* Transition period ended March 2, 2020 for marketing DTS in the 5 GHz Band, as stated in 15.407(b)(4)(ii)
6 GHZ 15E Rule
New Equipment Classes

Indoor Only Devices
Contention Based (LBT)

- Indoor AP 6ID
- Subordinate 6PP
- Indoor Only Client 6XD

Standard Device
Indoor/Outdoor & AFC (Data Base) Manager

- Standard AP 6SP
- Standard Client 6FX
- Dual Client 6CD
- Fixed Client 6FC

Phase 1

Phase 2
6 GHz Rules & Test procedures
KDB Publication 987594

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# Summary

<table>
<thead>
<tr>
<th>Device Class</th>
<th>Operating Bands</th>
<th>Maximum EIRP</th>
<th>Maximum EIRP Power Spectral Density</th>
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<tr>
<td>Standard-Power Access Point (AFC Controlled)</td>
<td>U-NII-5 (5.925-6.425 GHz)</td>
<td>36 dBm</td>
<td>23 dBm/MHz</td>
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<tr>
<td></td>
<td>U-NII-7 (6.525-6.875 GHz)</td>
<td>30 dBm</td>
<td>17 dBm/MHz</td>
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<tr>
<td>Client Connected to Standard-Power Access Point</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Low-Power Access Point (indoor only)</td>
<td>U-NII-5 (5.925-6.425 GHz)</td>
<td>30 dBm</td>
<td>5 dBm/MHz</td>
</tr>
<tr>
<td></td>
<td>U-NII-6 (6.425-6.525 GHz)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>U-NII-7 (6.525-6.875 GHz)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Client Connected to Low-Power Access Point</td>
<td>U-NII-8 (6.875-7.125 GHz)</td>
<td>24 dBm</td>
<td>-1 dBm/MHz</td>
</tr>
</tbody>
</table>
Low Power Indoor Devices

❖ Access Points
❖ Subordinate devices
❖ Clients
1. All low power devices require integrated antennas
2. Contention-based protocol
3. Operate indoors
4. Access points and subordinate devices require an “Indoor Only” label.
5. Client devices when connected to low power indoor APs and subordinate devices can only operate indoors
6. APs and Subordinate devices require direct connection to AC power and cannot have a weatherized enclosure
7. APs and Subordinate devices cannot be used in vehicles (exception: APs in U-NII 5 maybe used on large aircraft when operating above 10,000 feet)
8. Prohibited for control of or communications with unmanned aircraft systems.

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Standard Power Devices

- Standard power AP
- Fixed client
- Standard client

1. Require AFC coordination
2. May operate indoors or outdoors
3. Std. power APs and Fixed clients installed outdoors required to reduce EIRP to less than 125 mW for elevation angles greater than 30 degrees
4. Standard clients are required to maintain power levels 6 dB below the AFC authorized power levels of associated standard power APs
5. APs and Fixed clients cannot be installed on vehicles
6. Prohibited for control of or communications with unmanned aircraft systems.
Sub-band band edges

99% occupied BW should be contained in each sub-band. Exception for straddle channels.
 Refer to 987594 D02 section J
 i. Crest of channel touches top of mask
 ii. Linear interpolation for mask (see Q&A #5 in KDB)
Contestation-Based Protocol

- Required for all low power indoor devices
- Needed to protect incumbents
- Test procedures in KDB 987594 Section I
- -62 dBm detection threshold
-27 dBm in non-restricted bands. RMS detector
15.35(b) applies
15.209 applies in restricted bands
Declarations

- An indoor client will only associate with a low power indoor AP.

- Client devices, except fixed client devices, must operate under the control of a standard power access point, indoor access point or subordinate devices; Subordinate devices must operate under the control of an indoor access point. In all cases, an exception exists for transmitting brief messages to an access point when attempting to join its network after detecting a signal that confirms that an access point is operating on a particular channel.

- Client devices are prohibited from connecting directly to another client device.
Questions?

THANK YOU