

December 09, 2020

**Federal Communications Commission
Office of Engineering and Technology
Laboratory Division**

**Part 15 Subpart E U-NII 6 GHz
Questions and Answers**

Q1. What are the different types of devices that can be certified for 6 GHz U-NII use?

A1

- i. **Standard Power Access Point** – Devices that can be installed indoors or outdoors and utilize an AFC database to determine available channels and power levels. If installed outside, the access point must limit its EIRP to 21 dBm above 30-degree antenna elevation angles.
- ii. **Client connected to Standard Power Access Point** – these devices can be used indoors or outdoors. They must maintain an EIRP level at least 6 dB below that of the associated AP.
- iii. **Fixed Client Device** – Indoor/Outdoor client device that connects to a Standard Power Access point and is installed in a fixed location. These devices shall have the same certification requirements as a Standard Power Access Points (AFC required, power levels, etc.).
- iv. **Low-Power indoor Access Point** – Limited to indoor use. Must not have weatherized enclosure, power supplied from a wired connection, must not run on batteries, and must have an integrated antenna. A contention-based protocol is required to protect incumbent users.
- v. **Client connected to low-power indoor Access Point** – clients that connect to low-power indoor Access Points and use a contention-based protocol.
- vi. **Subordinate Device** – a device such as an indoor extender that is under the control of a low-power indoor Access Point, is supplied power from a wired connection, has an integral antenna, does not have a weatherized enclosure and is not used to connect devices between separate buildings and structures. Must use a contention-based protocol. Power limits are set the same as a Low Power indoor Access Point.
- vii. **Dual Client** – these client devices can connect to Standard Power APs as well as Low Power indoor APs.

Q2. Can these devices be certified for vehicular use?

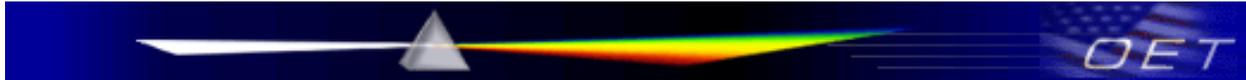
A2. No. At this time these devices cannot be used on cars, trains, boats and aircraft, with the exception that low power indoor devices and associated client devices can operate on large aircrafts above 10,000 feet.

Q3. Is modular approval allowed for these devices?

A3. Yes, except for Subordinate devices.

Q4. How is linear interpolation interpreted when constructing the mask?

987594 D03 U-NII 6GHz Q&A v01



A4. The rules specify PSD suppression values in dB (logarithmic scale). When linearly interpolating, the dB values must first be converted to a linear scale. After interpolating in linear terms, the PSD values should be converted back into dB.

Q5. Is Transmit Power Control (TPC) required for client devices?

A5. TPC is required for all client devices connected to Standard Power Access Points excluding Fixed Client devices. The TPC mechanism shall limit client power to no more than 6 dB below its associated Standard Power APs authorized transmit power level. TPC is not required for client devices connected to Low-Power indoor Access Points and Subordinate devices.

Q6. Can a Client device be certified for outdoor and indoor use?

A6. Yes. A Dual Client device may work with a Standard Power AP and a low power indoor AP. In this case the client shall meet all the requirements for an Outdoor Client as well as an Indoor Client. Additionally, testing must show that the client properly adjusts its power when transitioning from Outdoor to Indoor.

Q7. Can a Client device directly connect to another Client device?

A7. No. Direct Client to Client communication is prohibited.

Q8. Can new 6 GHz bands be added to an existing U-NII grant under the same FCC ID?

A8. Yes. If hardware or enclosure changes have not been made, a new original equipment application can be filed under the same FCC ID. If the granted application is not already a composite, the TCB shall send an inquiry to the FCC to request that the FCC place the application in audit mode thereby allowing TCB to modify the existing grant to identify the device as a composite.

Q9. If a device operates in U-NII bands 5, 6, 7 and 8, does the test lab need to test at least three channels (L, M & H) in each sub-band of operation?

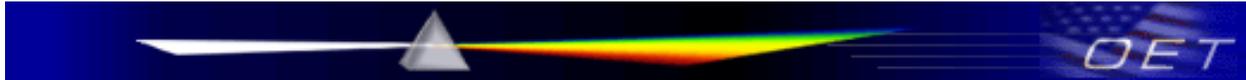
A9. Yes. LMH in band 5, LMH in band 6, and so forth. Exception exists for the contention-based protocol test where only one channel in each supported sub-band needs to be tested. The narrowest and widest bandwidth in each channel shall be measured.

Q10. If a device only operates in one sub-band (example, U-NII-6), does OOB need to be shown in other sub-bands (example, U-NII-5&7)?

A10. No. Compliance with OOB limits only apply outside of the 5.925 – 7.125 GHz band. All in-band emissions need to meet the channel mask.

Q11. How are operating channels listed on an equipment authorization grant?

A11. The frequency range for the Form 731 and listed on the grant shall be the contiguous frequency span of operation as authorized for that equipment class from the channel center frequency of the lowest frequency channel to the channel center frequency of the highest frequency channel. 99% of



the occupied bandwidth must be contained within all the U-NII sub bands authorized for that equipment class.

For example:

A device such as a low-power indoor access point operating in all 6 GHz U-NII bands (5-8) would list the frequency range for all channels of operation as one-line entry across all 6 GHz U-NII bands (5-8). Channels spanning within U-NII sub bands (i.e. 5 & 6, 6 & 7, 7 & 8) are not required to be separately listed on the Form 731. 99% of the occupied bandwidth of any channel must be contained within U-NII bands (5-8).

A device such as a standard power access point operating in U-NII bands (5 & 7) would list separately the frequency range for each contiguous frequency span of operation in U-NII sub band 5 and U-NII sub band 7. In no case are channels permitted spanning across U-NII bands that they are not authorized in (i.e. across 5 & 6, 6 & 7 and 7 & 8). 99% of the occupied bandwidth of any channel must be contained within each of its respective U-NII sub bands (e.g., 5) separately.

Q12. How does one determine if an enclosure is not weatherized?

A12. There are many factors in determining if an indoor device meets the requirement of not having a weatherized enclosure. Clearly if the enclosure has openings to vent heat it is not weatherized. The IP rating of a device could potentially be used. For example, if a device has been certified for IP 65 (Ingress Protection Code, IEC standard 60529) there is a good chance that the device can be used outdoors. However, test labs and TCBs shall review the user manual and other documentation to verify that the device cannot be used outdoors and that the intent of the requirement is met.

Q13. Can the smallest 26 dB bandwidth be used for all channels with the same nominal bandwidth when performing the mask measurement?

A13. Yes. As an example, for a 20 MHz nominal bandwidth the smallest measured 26 dB bandwidth may be used for all 20 MHz channels. As a practical matter, the nominal bandwidth may also be used provided it can be shown that the 26 dB bandwidth is always > nominal bandwidth.

Q14. For a client device connected to a standard power access point, is the 6 dB reduction required on both the PSD as well as the conducted power?

A14. Yes.

Q15. During contention-based protocol testing, once the EUT has detected an AWGN signal and ceased transmission is it allowed to send intermittent control signals?

A15. No. Signals of any kind are not allowed to be sent.

Q16. What data is required to be submitted for contention-based protocol testing?

A16. In addition to showing that the device stops transmitting at the required threshold we would also like to see the AWGN signal levels that the device starts transmitting again. That is, what is the lowest AWGN signal level that the EUT detects and determines the medium is busy.