

6 GHz U-NII Bands

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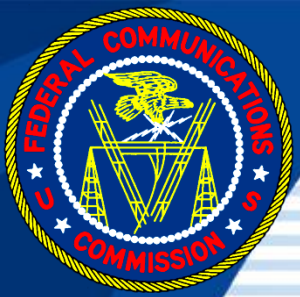
6 GHz 15E Rule

- 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

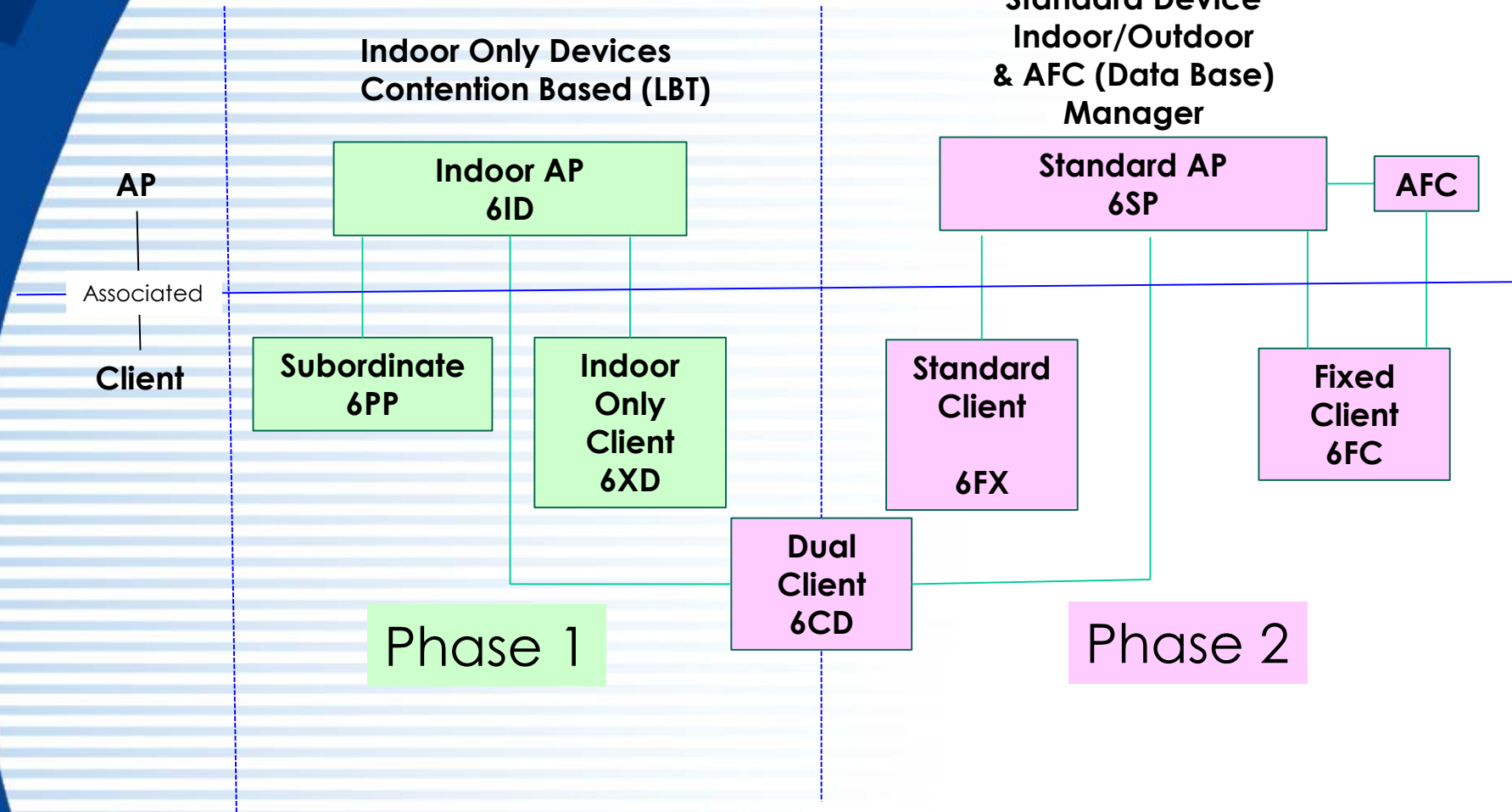
Band	Band GHz	Rules	Notes	KDB Pub
U-NII 1	5.15-5.25	15.407(a)(1)	Indoor Use/Outdoor Restrictions	789033 (U-NII)
U-NII 2A	5.25-5.35	15.407(a)(2)	Indoor/Outdoor/DFS	789033 (U-NII) 905462 (DFS)
U-NII 2B	5.35-5.47	Not Available		
U-NII 2C	5.47-5.725	15.407(a)(2)	Indoor/Outdoor/DFS	789033 (U-NII) 905462 (DFS)
U-NII 3	5.725-5.85	14.407(a)(3)	Indoor/Outdoor	789033 (U-NII) 926956 (*)
DSRC	5.85-5.925	95 Subpart L and 90 Subpart M	On-Board Units (OBU) must transmit signals to other OBUs and Roadside Units (RSU).	
U-NII 5	5.925-6.425	15.407(a)(4) – (8)	Low Power Indoor AP, Subordinates, Indoor Clients Standard Power AP, Fixed & Standard Clients	789033 (U-NII) 987594 (6 GHz Band)
U-NII 6	6.425-6.525	15.407(a)(5), (6), (8)	Low Power Indoor AP, Subordinates, Indoor Clients	
U-NII 7	6.525-6.875	15.407(a)(4) – (8)	Low Power Indoor AP, Subordinates, Indoor Clients Standard Power AP, Fixed & Standard Clients	
U-NII 8	6.875-7.125	15.407(a)(5), (6), (8)	Low Power Indoor AP, Subordinates, Indoor Clients	
* Transition period ended March 2, 2020 for marketing DTS in the 5 GHz Band, as stated in 15.407(b)(4)(ii)				

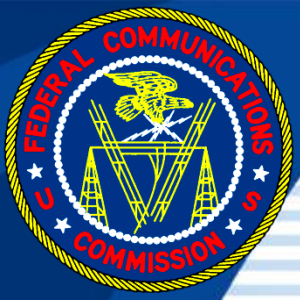


6 GHz 15E Rule New Equipment Classes

Indoor Only Devices
Contention Based (LBT)

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





6 GHz Rules & Test procedures

KDB Publication 987594

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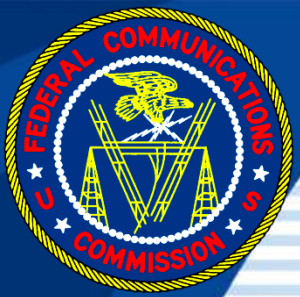
Summary

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



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.



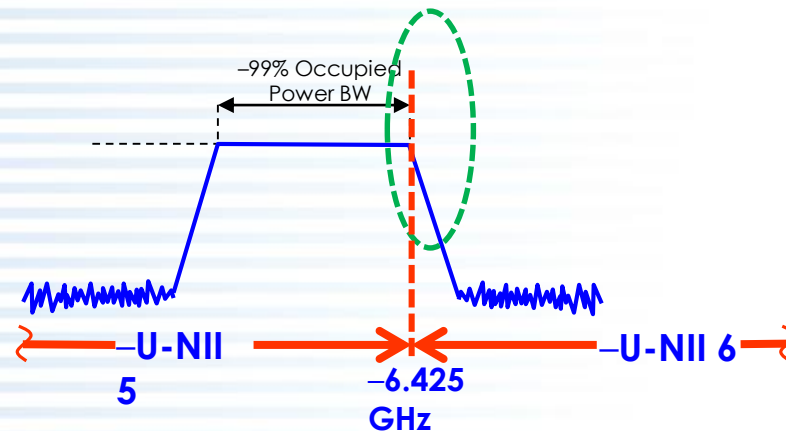
Standard Power Devices

- ❖ 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

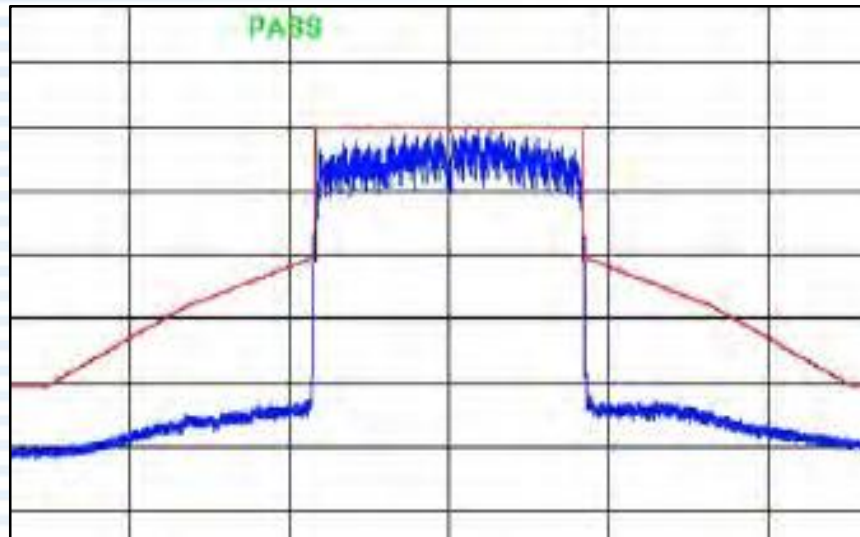
99% occupied BW should be contained in each sub-band.
Exception for straddle channels.

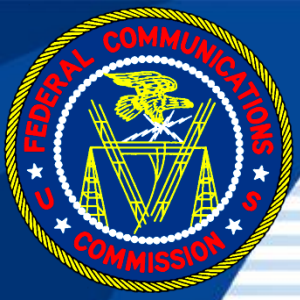




MASK

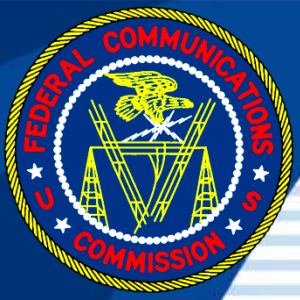
- Refer to 987594 D02 section J
 - i. Crest of channel touches top of mask
 - ii. Linear interpolation for mask (see Q&A #5 in KDB)





Contention-Based Protocol

- Required for all low power indoor devices
- Needed to protect incumbents
- Test procedures in KDB 987594 Section I
- -62 dBm detection threshold



OBE & Spurious

- -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