



U-NII

DFS Bin 5 Test Frequencies

and

Memorandum Opinion & Order

(FCC 16-24) U-NII-3 Band

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Office of Engineering and Technology
Laboratory Division



Reminders

- Old Rules (for operation in the U-NII bands)(*)
 - No more permissive changes under the Old Rules after June 2, 2016
 - Products approved under the Old Rules cannot be sold, marketed or imported after June 2, 2016
 - Products in the field are covered under the existing Grant(s)
- Extension on U-NII-3 band DTS rules expired March 2, 2016

(*) Old Rules == §15.407 rules prior to June 2, 2014 and §15.247 rules for operation in 5725 – 5850 MHz Band since March 2, 2016



DFS Bin 5 Test Frequencies

- Bin 5 (long pulse) radar frequency criteria
 - Radar signal is Tuned to the UUT Channel **Center Frequency** (10 Trials)
 - Radar signal is Tuned so that 90% of the Radar Signal Overlaps with the **Low Edge** of the UUT Occupied Bandwidth (10 Trials)
 - $FL + (0.4 * \text{Chirp Width (MHz)})$
 - Radar signal is Tuned so that 90% of the Radar Signal Overlaps with the **High Edge** of the UUT Occupied Bandwidth (10 Trials)
 - $FH - (0.4 * \text{Chirp Width (MHz)})$
 - Chirp is randomized for all 30 trials but remains fixed for entire trial

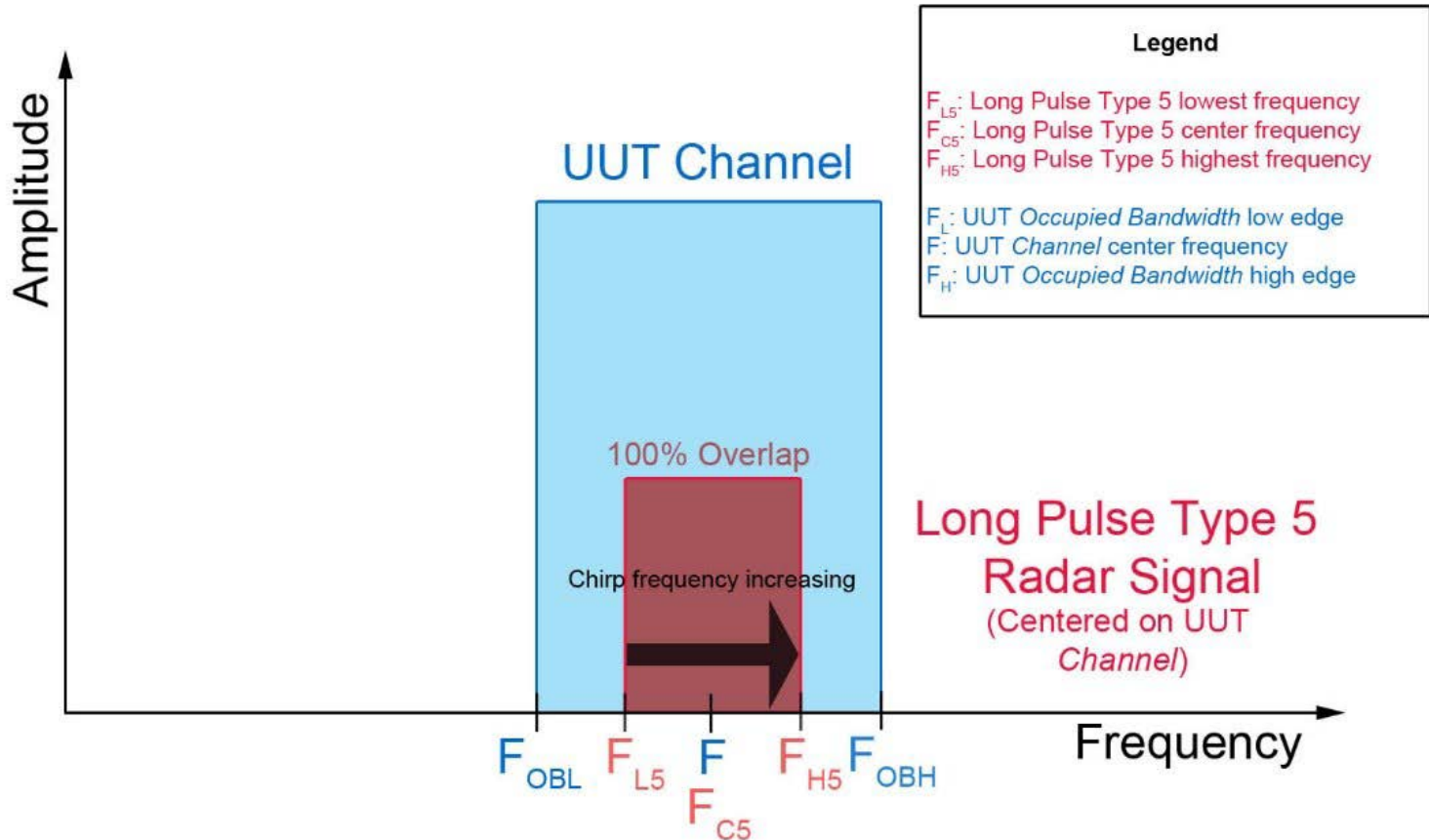


DFS Bin 5 Test Frequencies

- Randomizes 30 trial frequencies across OBW (Radar Detection BW)
 - Expires August 1, 2016
- Three test cases – 10 trials each
 - Radar Signal is Tuned to the UUT Channel Center Frequency
 - Radar Signal is Tuned so that 90% of the Radar Signal Overlaps with the Low Edge of the UUT OBW
 - Radar Signal is Tuned so that 90% of the Radar Signal Overlaps with the High Edge of the UUT OBW

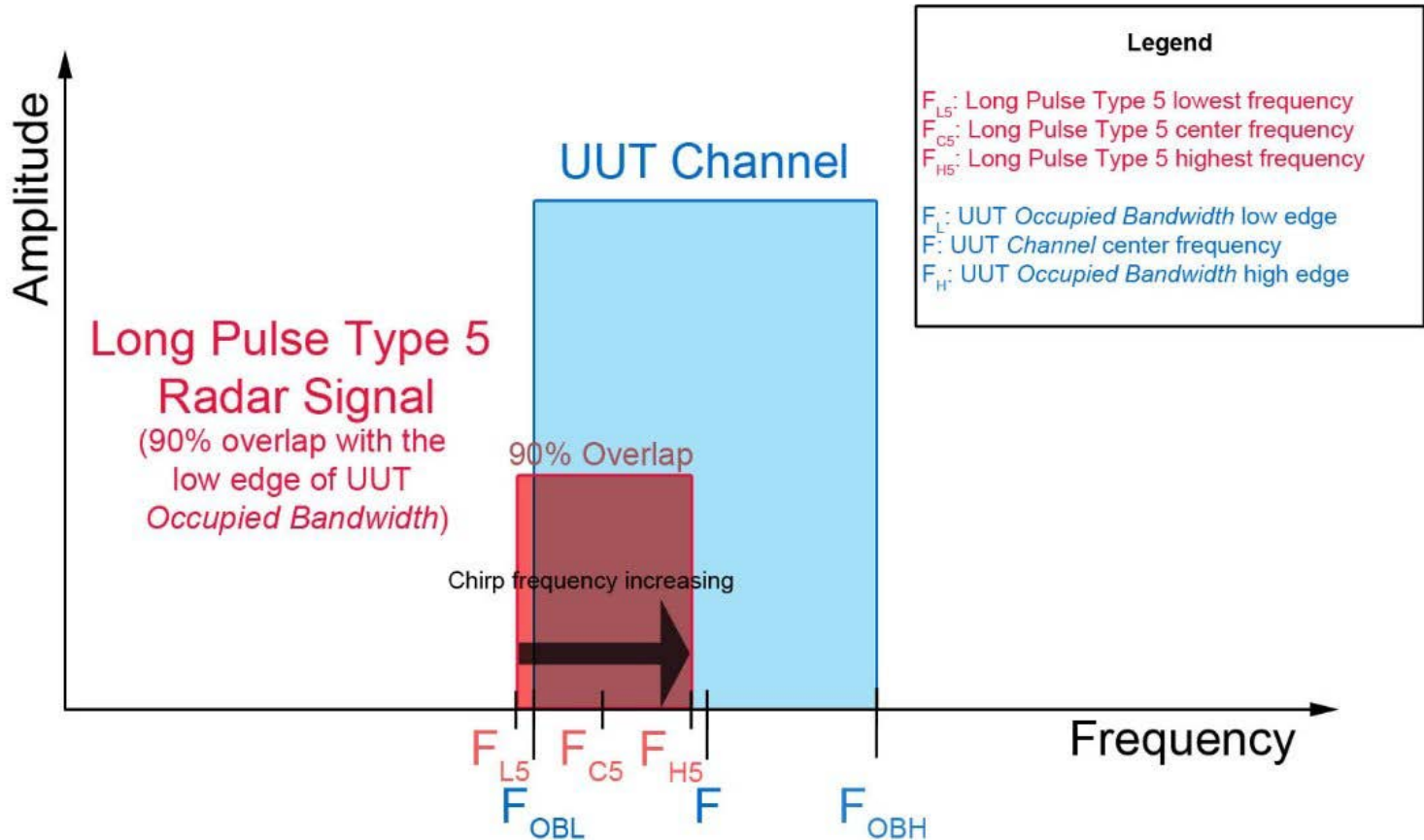


Bin 5 - Center Frequency (10 Trials)



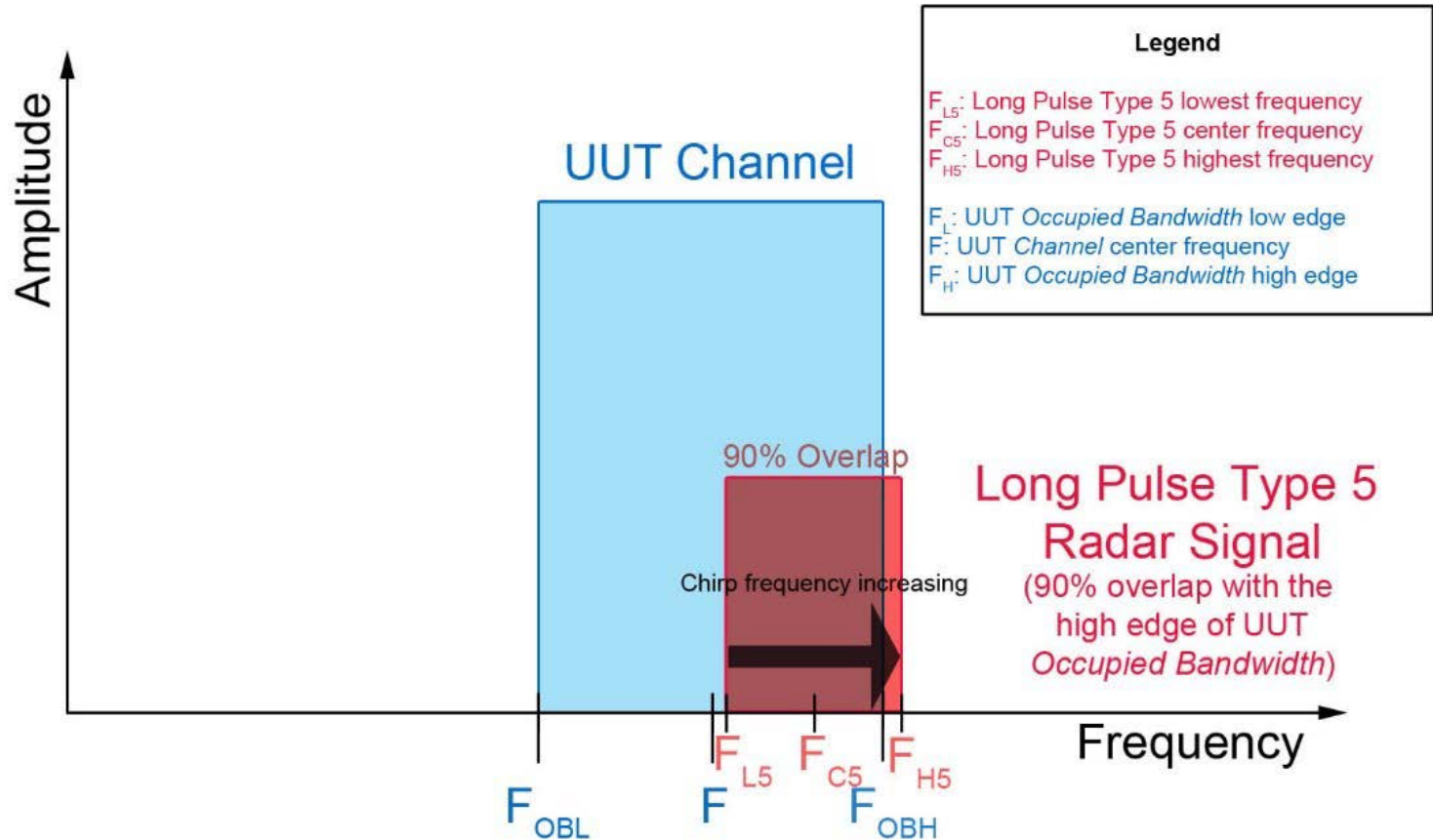


Bin 5 - Lower Edge (10 Trials)





Bin 5 - Upper Edge (10 Trials)





U-NII-1 Band (5150-5250 MHz) Clients

- § 15.407(a)(1)(iv) applies only to U-NII-1 band clients
- Maximum conducted power 250 mW for antenna gain < 6 dBi
 - Power spectral density < 11 dBm/MHz
- Antenna gain > 6 dBi power reduction
 - Reduce by number of dB exceeding 6 dBi antenna gain
 - Equal reduction for power and power spectral density requirements



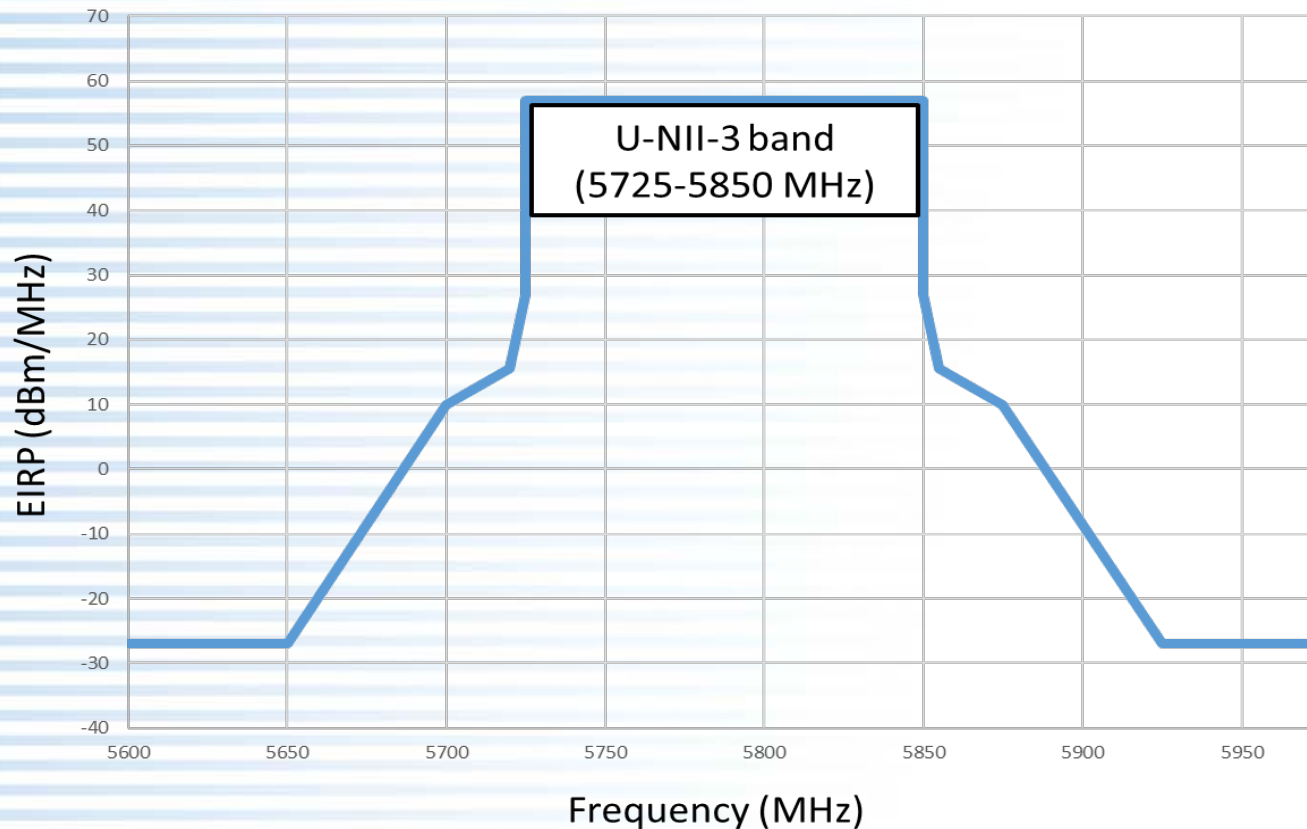
U-NII-3 Emission Mask

- Mask §15.407(b)(4)(i)
 - >75 MHz from the band edge:
 - -27 dBm/MHz
 - 75 to 25 MHz from the band edge:
 - Increase linearly from -27 dBm/MHz to 10 dBm/MHz
 - 25 to 5 MHz from the band edge:
 - Increase linearly from 10 dBm/MHz to 15.6 dBm/MHz
 - 5 MHz to the band edge
 - Increase linearly from 15.6 dBm/MHz to the band edge



U-NII-3 Band (5725-5850 MHz) Emissions Mask

● Mask §15.407(b)(4)(i)





Alternative Band Edge Requirement

- Antenna gain > 10 dBi
 - Emissions Limit: § 15.247(d)
 - KDB [558074 D01 DTS Meas Guidance v03r04](#)
 - Peak detector -20 dBm
 - RMS Average detector -30 dBm
 - Restrictions:
 - Device must be certified before March 2, 2017
 - Manufacturing, marketing, and importation to cease before March 2, 2018
 - Note Code 48



Alternative Band Edge Requirement

- Antenna gain ≤ 10 dBi
 - Emissions Limit: § 15.247(d)
 - KDB [558074 D01 DTS Meas Guidance v03r04](#)
 - Peak detector -20 dBm
 - RMS Average detector -30 dBm
 - Restrictions:
 - Device must be certified before March 2, 2018
 - Manufacturing, marketing, and importation to cease before March 2, 2020
 - Note code 49 if all antennas listed have a gain < 10 dBi (If any antennas listed have a gain greater than 10 dBi Note Code 48 must be used)



U-NII-3 Band Note Codes

- For UNII-3 Band devices complying with § 15.407(b)(4)(ii) emissions mask
 - Note Code 48: The device has been approved under 15.407(b)(4)(ii) for antenna gains greater than 10 dBi and cannot be manufactured, marketed, sold or imported after March 2, 2018.
 - Note Code 49: The device has been approved under 15.407(b)(4)(ii) for antenna gains of 10 dBi or less and cannot be manufactured, marketed, sold or imported after March 2, 2020.



U-NII-3 Band Filing Requirements for Section 15.407(b)(4)(ii)

- Test report showing compliance with Section 15.247(d) emission limits
- For previously approved devices and if there are no hardware or antenna changes, an attestation that the device is applying under 15.407(b)(4)(ii) and that the emission limits comply with Section 15.247(d) for all antenna configurations.
 - Previous 15.247(d) test report can be used with proper additional attestation letter.
- Provide a list of all approved antennas with gain of 10 dBi or less, or list of antennas with gain 10 dBi or greater, as appropriate.



U-NII-3 Band Filing Requirements

- Acknowledgement of the appropriate restrictions for the appropriate antennas
- Devices approved under §15.407(b)(4)(i) emissions mask has no marketing restrictions and applies to all antennas
- Modules applying for §15.407(b)(4)(ii) approval:
 - User's manual instructions to ensure the specific marketing restrictions, including transition dates, for each antenna/device



U-NII-3 Band Permissive Changes

- Power increase to comply with new limits permitted if done by software only
- Test report showing compliance with Section 15.247(d) emission limits.
 - For Permissive changes DTS to NII
 - Cover letter explaining that DTS data is applicable and list the data that is being addressed (band edge, power, etc.)
 - Software security documentation if not on file
 - Updated U-NII-3 band Test Report if power increase.
- Permissive changes for component replacement permitted for one year after marketing expiration



Note Code Summary

- Note Code 39 – Continue to apply for devices meeting new § 15.407 requirements only on some sub-bands and Old Rules in other sub-bands.
- Note Code 38 – Apply for devices meeting § 15.407(b)(4)(i) and all the other U-NII rules in all the U-NII bands.
- Note Code 48 – Apply for devices with antenna gain greater than 10 dBi meeting § 15.407(b)(4)(ii) and all the other rules in all the U-NII bands.
- Note Code 49 – Apply for devices meeting with antenna gain 10 dBi and less than § 15.407(b)(4)(ii) and all the other U-NII rules in all the U-NII bands.



Updating EAS Files for devices under new UNII rules

Original DTS Grant non-Composite

No Class II, SDR	TCB grant Class III PC
With Class II, SDR	TCB request FCC put original grant in audit TCB modify original grant to composite TCB grant new original NII grant non SDR
With class II, Non SDR	TCB request FCC put original grant in audit TCB modify original grant to composite TCB grant new original NII grant
Original TCB Grant less than 30 days prior, No Class II, Non SDR	TCB modify original grant to composite TCB grant new original grant NII
Original TCB Grant greater than 30 days prior, No Class II, Non SDR	TCB request FCC put original grant in audit TCB modify original grant to composite TCB grant new original grant NII
Original grant by FCC, No Class II, Non SDR	TCB/Grantee request FCC set aside original grant and change to composite When FCC grants composite, TCB issues new NII original grant



Updating EAS Files for devices under new UNII rules Original DTS Grant Composite

With no Class II, SDR	TCB grants NII Class III PC
With Class II without NII, SDR	TCB Grants new original grant NII non SDR
With Class II with NII, SDR	TCB grants class II NII PC
Original TCB Grant without NII, no Class II, Non SDR	TCB grants new original NII grant
Original TCB Grant with NII, no Class II, Non SDR	TCB grants NII Class II PC
Original grant by FCC without NII, no Class II, Non SDR	TCB grants new original NII grant
Original grant by FCC with NII, no Class II, Non SDR	TCB grants NII Class II PC
With Class II without NII, Non SDR	TCB grants new original NII Grant, Non SDR
With Class II with NII, Non SDR	TCB grants NII Class II PC



Questions and Answers

Thanks!