

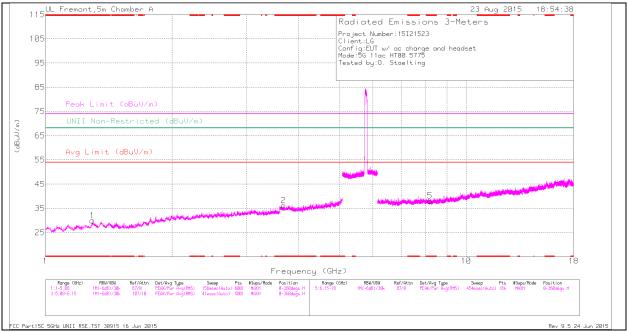
HIGHER EDGE, VERTICAL PEAK AND AVERAGE PLOT

VERTICAL DATA

| | | | | | - | | | | | | | |
|--------|--------------------|---------------------------|-----|-------------------|------------------------------|---------------------------|------------------------------|---------------------|-------------------|-------------------|----------------|----------|
| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | AF T119 (dB/m) | Amp/Cbl/F ltr/Pad (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
| 1 | 5.85 | -67.49 | РК | 34.9 | -20.6 | 11.8 | -41.39 | -17 | -24.39 | 199 | 294 | V |
| 2 | 5.884 | -64.41 | РК | 35 | -20.4 | 11.8 | -38.01 | -27 | -11.01 | 199 | 294 | V |

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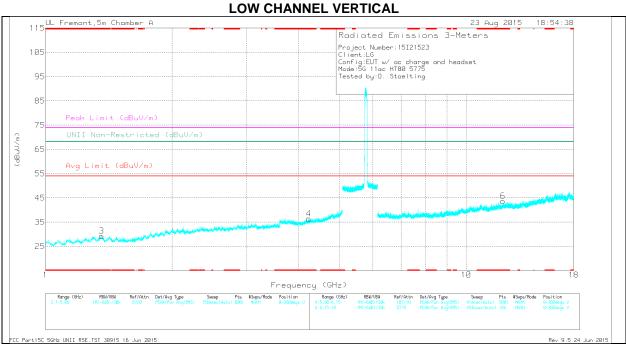
HARMONICS AND SPURIOUS EMISSIONS



LOW CHANNEL HORIZONTAL

Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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Note: Emission was scanned up to 40GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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LOW CHANNEL DATA

TRACE MARKERS

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T136 (dB/m) | Amp/Cbi/ Fitr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | UNII Non- Restricted (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|--------------------|----------------------------|-----|-------------------|------------------------------|-----------------|----------------------------------|-----------------------|----------------|------------------------|-------------------|-------------------------------------|-------------------|-------------------|----------------|----------|
| 1 | * 1.292 | 36.92 | Pk | 28.8 | -35.7 | 0 | 30.02 | - | - | 74 | -43.98 | - | - | 0-360 | 201 | н |
| 2 | * 3.68 | 35.62 | Pk | 33.2 | -32.6 | 0 | 36.22 | - | - | 74 | -37.78 | - | - | 0-360 | 201 | н |
| 3 | * 1.359 | 35.78 | Pk | 28.7 | -35.2 | 0 | 29.28 | - | - | 74 | -44.72 | - | - | 0-360 | 200 | V |
| 4 | * 4.225 | 33.82 | Pk | 33.4 | -30.8 | 0 | 36.42 | - | - | 74 | -37.58 | - | - | 0-360 | 200 | V |
| 5 | * 8.201 | 27.91 | Pk | 35.6 | -25.4 | 0 | 38.11 | - | - | 74 | -35.89 | - | - | 0-360 | 100 | н |
| 6 | * 12.226 | 27.29 | Pk | 38.9 | -22.4 | 0 | 43.79 | - | - | 74 | -30.21 | - | - | 0-360 | 200 | V |

PK - Peak detector

RADIATED EMISSIONS

| Frequency (GHz) | Meter Reading | Det | AF T136 (dB/m) | Amp/Cbl/Fl tr/Pad (dB) | DC Corr (dB) | Corrected Reading | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | UNII Non- Restricted | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------------------|------------------|------|-------------------|---------------------------|--------------|----------------------|-----------------------|----------------|------------------------|-------------------|-------------------------|-------------------|-------------------|----------------|----------|
| | (dBuV) | | | | | (dBuV/m) | | | | | (dBuV/m) | | | | |
| * 1.294 | 44.14 | PK-U | 28.8 | -35.7 | 0 | 37.24 | - | - | 74 | -36.76 | - | - | 360 | 202 | н |
| * 1.294 | 32.6 | ADR | 28.8 | -35.7 | .09 | 25.79 | 54 | -28.21 | - | - | - | - | 360 | 202 | н |
| * 3.682 | 42.21 | PK-U | 33.2 | -32.6 | 0 | 42.81 | - | - | 74 | -31.19 | - | - | 360 | 202 | н |
| * 3.681 | 31.14 | ADR | 33.2 | -32.6 | .09 | 31.83 | 54 | -22.17 | - | - | - | - | 360 | 202 | н |
| * 1.36 | 44.08 | PK-U | 28.7 | -35.2 | 0 | 37.58 | - | - | 74 | -36.42 | - | - | 360 | 202 | V |
| * 1.358 | 32.66 | ADR | 28.7 | -35.2 | .09 | 26.25 | 54 | -27.75 | - | - | - | - | 360 | 202 | V |
| * 4.225 | 41.41 | PK-U | 33.4 | -30.8 | 0 | 44.01 | - | - | 74 | -29.99 | - | - | 360 | 202 | V |
| * 4.223 | 29.91 | ADR | 33.4 | -30.8 | .09 | 32.6 | 54 | -21.4 | - | - | - | - | 360 | 202 | V |
| * 8.201 | 36.18 | PK-U | 35.6 | -25.4 | 0 | 46.38 | - | - | 74 | -27.62 | - | - | 360 | 100 | н |
| * 8.201 | 24.87 | ADR | 35.6 | -25.4 | .09 | 35.16 | 54 | -18.84 | - | - | - | - | 360 | 100 | н |
| * 12.226 | 34.1 | PK-U | 38.9 | -22.4 | 0 | 50.6 | - | - | 74 | -23.4 | - | - | 304 | 267 | V |
| * 12.224 | 22.13 | ADR | 38.9 | -22.4 | .09 | 38.72 | 54 | -15.28 | - | - | - | - | 304 | 267 | V |

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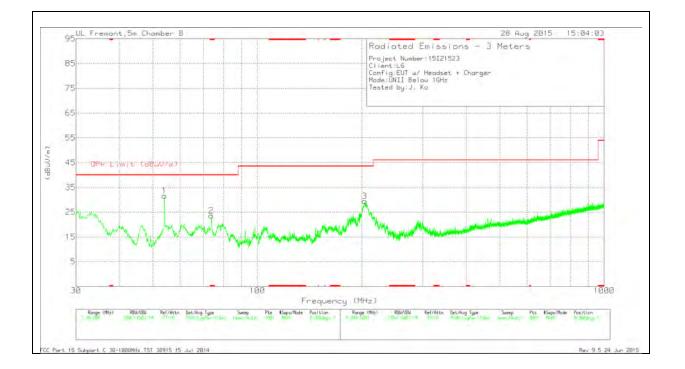
12. WORST-CASE BELOW 1 GHz (in the 5.3 GHz Band)



SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

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SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)



Below 1G Data

| Marker | Frequency (MHz) | Meter Reading | Det | AF T243 (dB/m) | Amp/Cbl (dB) | Corrected Reading | QPk Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|--------------------|------------------|-----|-------------------|--------------|----------------------|-----------------------|----------------|-------------------|----------------|----------|
| | | (dBuV) | | | | (dBuV/m) | | | | | |
| 2 | * 73.7325 | 43.91 | Pk | 8 | -28.3 | 23.61 | 40 | -16.39 | 0-360 | 101 | V |
| 6 | * 330.3 | 38.58 | Pk | 14.1 | -26 | 26.68 | 46.02 | -19.34 | 0-360 | 101 | Н |
| 1 | 54.0125 | 52.69 | Pk | 7.4 | -28.5 | 31.59 | 40 | -8.41 | 0-360 | 101 | V |
| 4 | 154.5675 | 39.75 | Pk | 12.4 | -27.5 | 24.65 | 43.52 | -18.87 | 0-360 | 199 | Н |
| 3 | 203.8 | 45.1 | Pk | 11.3 | -27 | 29.4 | 43.52 | -14.12 | 0-360 | 101 | V |
| 5 | 208 | 50.53 | Pk | 10.6 | -27 | 34.13 | 43.52 | -9.39 | 0-360 | 101 | н |

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13. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

| Frequency of Emission (MHz) | Conducted Limit (dBuV) | | | | |
|-----------------------------|------------------------|------------|--|--|--|
| | Quasi-peak | Average | | | |
| 0.15-0.5 | 66 to 56 " | 56 to 46 * | | | |
| 0.5-5 | 56 | 46 | | | |
| 5-30 | 60 | 50 | | | |

Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

<u>RESULTS</u>

Refer to original report 15I21235-E5.

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14. DYNAMIC FREQUENCY SELECTION

14.1. OVERVIEW

14.1.1. LIMITS

INDUSTRY CANADA

IC RSS-247 is closely harmonized with FCC Part 15 DFS rules. The deviations are as follows:

RSS-247 Issue 1

Note: For the band 5600–5650 MHz, no operation is permitted.

Until further notice, devices subject to this annex shall not be capable of transmitting in the band 5600– 5650 MHz. This restriction is for the protection of Environment Canada weather radars operating in this band.

<u>FCC</u>

§15.407 (h), FCC KDB 905462 D02 "COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVICES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION" and KDB 905462 D03 "U-NII CLIENT DEVICES WITHOUT RADAR DETECTION CAPABILITY".

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Table 1: Applicability of DFS requirements prior to use of a channel

| Requirement | Operational Mode | | | | | |
|---------------------------------|------------------|-----------------------|--------------------|--|--|--|
| | Mastar | Client (without radar | Client (with radar | | | |
| | Master | detection) | detection) | | | |
| Non-Occupancy Period | Yes | Not required | Yes | | | |
| DFS Detection Threshold | Yes | Not required | Yes | | | |
| Channel Availability Check Time | Yes | Not required | Not required | | | |
| U-NII Detection Bandwidth | Yes | Not required | Yes | | | |

Table 2: Applicability of DFS requirements during normal operation

| Requirement | Operational | Operational Mode | | | | | | |
|-----------------------------------|-------------|-------------------------|----------------------|--|--|--|--|--|
| | Master | Client (without DFS) | Client (with DFS) | | | | | |
| DFS Detection Threshold | Yes | Not required | Yes | | | | | |
| Channel Closing Transmission Time | Yes | Yes | Yes | | | | | |
| Channel Move Time | Yes | Yes | Yes | | | | | |
| U-NII Detection Bandwidth | Yes | Not required | Yes | | | | | |

| | Master Davias an Client with | Client | | | | | |
|---|--------------------------------------|-----------------------|--|--|--|--|--|
| Additional requirements for devices | Master Device or Client with | Client | | | | | |
| with multiple bandwidth modes | Radar DFS | (without DFS) | | | | | |
| U-NII Detection Bandwidth and | All BW modes must be tested | Not required | | | | | |
| Statistical Performance Check | | | | | | | |
| Channel Move Time and Channel | Test using widest BW mode | Test using the widest | | | | | |
| Closing Transmission Time | available | BW mode available | | | | | |
| | | for the link | | | | | |
| All other tests | Any single BW mode | Not required | | | | | |
| Note: Frequencies selected for statistical | performance check (Section 7.8.4) sh | nould include several | | | | | |
| frequencies within the radar detection ba | andwidth and frequencies near the eq | dge of the radar | | | | | |
| detection bandwidth. For 802.11 devices it is suggested to select frequencies in all 20 MHz channel | | | | | | | |
| blocks and a null frequency between the | bonded 20 MHz channel blocks. | | | | | | |

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Table 3: Interference Threshold values, Master or Client incorporating In-Service Monitoring

| · · · · · | | | | | | | |
|---|----------------------------------|--|--|--|--|--|--|
| Maximum Transmit Power | Value | | | | | | |
| | (see notes) | | | | | | |
| E.I.R.P. ≥ 200 mill watt | -64 dBm | | | | | | |
| E.I.R.P. < 200 mill watt and | -62 dBm | | | | | | |
| power spectral density < 10 dBm/MHz | | | | | | | |
| E.I.R.P. < 200 mill watt that do not meet power spectral density | -64 dBm | | | | | | |
| requirement | | | | | | | |
| Note 1: This is the level at the input of the receiver assuming a 0 dB | receive antenna | | | | | | |
| Note 2: Throughout these test procedures an additional 1 dB has be | en added to the amplitude of the | | | | | | |
| test transmission waveforms to account for variations in measurement equipment. This will ensure that | | | | | | | |
| the test signal is at or above the detection threshold level to trigger a DFS response. | | | | | | | |
| Note 2: ELP D is based on the highest antenna gain. For MIMO devices refer to KDP publication | | | | | | | |

Note 3: E.I.R.P. is based on the highest antenna gain. For MIMO devices refer to KDB publication 662911 D01.

Table 4: DFS Response requirement values

| Parameter | Value |
|-----------------------------------|-----------------------------|
| Non-occupancy period | 30 minutes |
| Channel Availability Check Time | 60 seconds |
| Channel Move Time | 10 seconds (See Note 1) |
| Channel Closing Transmission Time | 200 milliseconds + approx. |
| | 60 milliseconds over |
| | remaining 10 second period. |
| | (See Notes 1 and 2) |
| U-NII Detection Bandwidth | Minimum 100% of the U-NII |
| | 99% transmission power |
| | bandwidth. |
| | (See Note 3) |

Note 1: *Channel Move Time* and the *Channel Closing Transmission Time* should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.

Note 2: The *Channel Closing Transmission Time* is comprised of 200 milliseconds starting at the beginning of the *Channel Move Time* plus any additional intermittent control signals required to facilitate a *Channel* move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Note 3: During the *U-NII Detection Bandwidth* detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

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| Table 5 | | | | | |
|---------|-------------|---------------------------|---|------------------|----------|
| Radar | Pulse | PRI | Pulses | Minimum | Minimum |
| Туре | Width | (usec) | | Percentage of | Trials |
| | (usec) | | | Successful | |
| | | | | Detection | |
| 0 | 1 | 1428 | 18 | See Note 1 | See Note |
| | | | | | 1 |
| 1 | 1 | Test A: 15 unique PRI | | 60% | 30 |
| | | values randomly | | | |
| | | selected from the list | Roundup: | | |
| | | of 23 PRI values in | {(1/360) x (19 x 10 ⁶ PRI _{usec})} | | |
| | | table 5a | | | |
| | | Test B: 15 unique PRI | | | |
| | | values randomly | | | |
| | | selected within the | | | |
| | | range of 518-3066 | | | |
| | | usec. With a minimum | | | |
| | | increment of 1 usec, | | | |
| | | excluding PRI values | | | |
| | | selected in Test A | | | |
| 2 | 1-5 | 150-230 | 23-29 | 60% | 30 |
| 3 | 6-10 | 200-500 | 16-18 | 60% | 30 |
| 4 | 11-20 | 200-500 | 12-16 | 60% | 30 |
| | | Aggregate (Radar Ty | vpes 1-4) | 80% | 120 |
| Note 1: | Short Puls | se Radar Type 0 should be | used for the Detection Bandwidth | test, Channel Mo | ve Time, |
| and Cha | nnel Closii | ng Time tests. | | | |
| r | | | | | |

Table 5 – Short Pulse Radar Test Waveforms

Table 6 – Long Pulse Radar Test Signal

| Radar | Pulse | Chirp | PRI | Pulses | Number | Minimum | Minimum |
|----------|--------|-------|--------|--------|--------|---------------|---------|
| Waveform | Width | Width | (µsec) | per | of | Percentage of | Trials |
| Туре | (µsec) | (MHz) | | Burst | Bursts | Successful | |
| | | | | | | Detection | |
| 5 | 50-100 | 5-20 | 1000- | 1-3 | 8-20 | 80% | 30 |
| | | | 2000 | | | | |
| | | | | | | | |

Table 7 – Frequency Hopping Radar Test Signal

| Radar | Pulse | PRI | Pulses | Hopping | Hopping | Minimum | Minimum |
|----------|--------|--------|--------|---------|---------------|----------------------|---------|
| Waveform | Width | (µsec) | per | Rate | Sequence | Percentage of | Trials |
| Туре | (µsec) | | Нор | (kHz) | Length (msec) | Successful Detection | |
| 6 | 1 | 333 | 9 | 0.333 | 300 | 70% | 30 |

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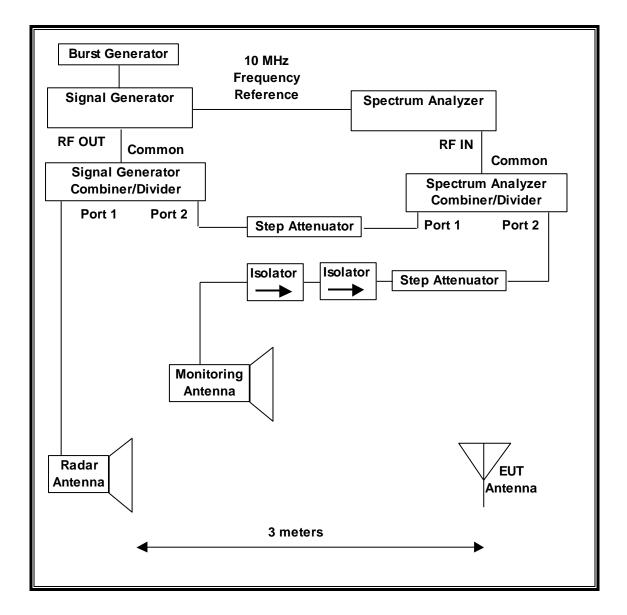
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14.1.2. TEST AND MEASUREMENT SYSTEM

RADIATED METHOD SYSTEM BLOCK DIAGRAM



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SYSTEM OVERVIEW

The short pulse and long pulse signal generating system utilizes the NTIA software. The Vector Signal Generator has been validated by the NTIA. The hopping signal generating system utilizes the CCS simulated hopping method and system, which has been validated by the DoD, FCC and NTIA. The software selects waveform parameters from within the bounds of the signal type on a random basis using uniform distribution.

The short pulse types 1, 2, 3 and 4, and the long pulse type 5 parameters are randomized at run-time.

The hopping type 6 pulse parameters are fixed while the hopping sequence is based on the August 2005 NTIA Hopping Frequency List. The initial starting point randomized at run-time and each subsequent starting point is incremented by 475. Each frequency in the 100-length segment is compared to the boundaries of the EUT Detection Bandwidth and the software creates a hopping burst pattern in accordance with Section 7.4.1.3 Method #2 Simulated Frequency Hopping Radar Waveform Generating Subsystem of KDB 905462 D02. The frequency of the signal generator is incremented in 1 MHz steps from F_L to F_H for each successive trial. This incremental sequence is repeated as required to generate a minimum of 30 total trials and to maintain a uniform frequency distribution over the entire Detection Bandwidth.

The signal monitoring equipment consists of a spectrum analyzer. The aggregate ON time is calculated by multiplying the number of bins above a threshold during a particular observation period by the dwell time per bin, with the analyzer set to peak detection and max hold.

SYSTEM CALIBRATION

A 50-ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to a horn antenna via a coaxial cable, with the reference level offset set to (horn antenna gain – coaxial cable loss). The signal generator is set to CW mode. The amplitude of the signal generator is adjusted to yield a level of –64 dBm as measured on the spectrum analyzer.

Without changing any of the instrument settings, the spectrum analyzer is reconnected to the Common port of the Spectrum Analyzer Combiner/Divider. The Reference Level Offset of the spectrum analyzer is adjusted so that the displayed amplitude of the signal is –64 dBm.

The spectrum analyzer displays the level of the signal generator as received at the antenna ports of the Master Device. The interference detection threshold may be varied from the calibrated value of –64 dBm and the spectrum analyzer will still indicate the level as received by the Master Device.

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ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL

A link is established between the Master and Slave and the distance between the units is adjusted as needed to provide a suitable received level at the Master and Slave devices. The video test file is streamed to generate WLAN traffic. The monitoring antenna is adjusted so that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold.

TEST AND MEASUREMENT EQUIPMENT

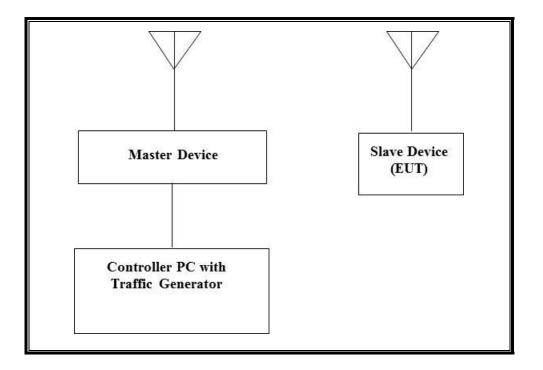
The following test and measurement equipment was utilized for the DFS tests documented in this report:

| TEST EQUIPMENT LIST | | | | | | | | |
|--|--------------|--------|--------------|----------|--|--|--|--|
| Description | Manufacturer | Model | Asset Number | Cal Due | | | | |
| Spectrum Analyzer, PXA, 3Hz to 44GHz | Agilent | N9030A | US51350187 | 06/01/16 | | | | |
| Signal Generator, MXG X-Series RF Vector | Agilent | N5172B | MY51350337 | 02/17/18 | | | | |

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14.1.3. SETUP OF EUT

RADIATED METHOD EUT TEST SETUP



SUPPORT EQUIPMENT

The following support equipment was utilized for the DFS tests documented in this report:

| | PERIPHERAL SUPPORT EQUIPMENT LIST | | | | | | | | |
|------------------------|-----------------------------------|-----------------|--------------------|-----------|--|--|--|--|--|
| Description | Manufacturer | Model | Serial Number | FCC ID | | | | | |
| 802.11ac Dual Band | Cisco | AIR-CAP3702E-A- | FTX181570A6 | LDK102087 | | | | | |
| Wireless Access Point | | K9 | | | | | | | |
| P.O.E. Injector | Phihong | POE30U-560(G) | PHI170102N2 | DoC | | | | | |
| Notebook PC | Lenovo | Type 4236-B92 | PB-HEX04 12/05 | DoC | | | | | |
| (Controller/Server) | | | | | | | | | |
| AC Adapter | Lenovo | 42T4418 | 11S42T4418Z1ZGWG08 | DoC | | | | | |
| (Controller/Server PC) | | | R90M | | | | | | |

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14.1.4. DESCRIPTION OF EUT

For FCC the EUT operates over the 5250-5350 MHz and 5470-5725 MHz ranges.

For IC the EUT operates over the 5250-5350 MHz and 5470-5725 MHz ranges, excluding the 5600-5650 MHz range.

The EUT is a Slave Device without Radar Detection.

The highest power level within these bands is 18.32dBm EIRP in the 5250-5350 MHz band and 18.38dBm EIRP in the 5470-5725 MHz band.

The two antenna assembly utilized with the EUT has a gain of 0.18dBi and 0.03dBi.

Two identical antennas are utilized to meet the diversity and MIMO operational requirements.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is -64 dBm. After correction for procedural adjustments, the required radiated threshold at the antenna port is -64 + 1 = -63 dBm.

The calibrated radiated DFS Detection Threshold level is set to -64 dBm. The tested level is lower than the required level hence it provides a margin to the limit.

The EUT uses two transmitter/receiver chains, each connected to an antenna to perform radiated tests.

WLAN traffic that meets or exceeds the minimum required loading was generated by transferring a data stream from the controller/server PC to the EUT using iPerf version 2.0.5 software package.

The effective Channel Loading for 20MHz Bandwidth is 16.808%.

TPC is not required since the maximum EIRP is less than 500 mW (27 dBm).

The EUT utilizes the 802.11ac architecture. Three nominal channel bandwidths are implemented: 20 MHz, 40 MHz and 80 MHz.

The software installed in the EUT is Android Version M, Build number PP1_150623.

UNIFORM CHANNEL SPREADING

This function is not required per KDB 905462.

This requirement is not applicable to Slave Devices.

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OVERVIEW OF MASTER DEVICE WITH RESPECT TO §15.407 (h) REQUIREMENTS

The Master Device is a Cisco Access Point, FCC ID: LDK102087. The minimum antenna gain for the Master Device is 6 dBi.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is -64 dBm. After correction for procedural adjustments, the required radiated threshold at the antenna port is -64 + 1 = -63 dBm.

The calibrated radiated DFS Detection Threshold level is set to –64 dBm. The tested level is lower than the required level hence it provides a margin to the limit.

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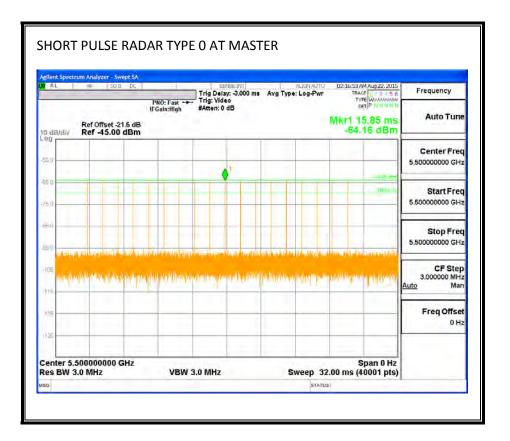
14.2. RESULTS FOR 20 MHz BANDWIDTH

14.2.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5500 MHz.

14.2.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



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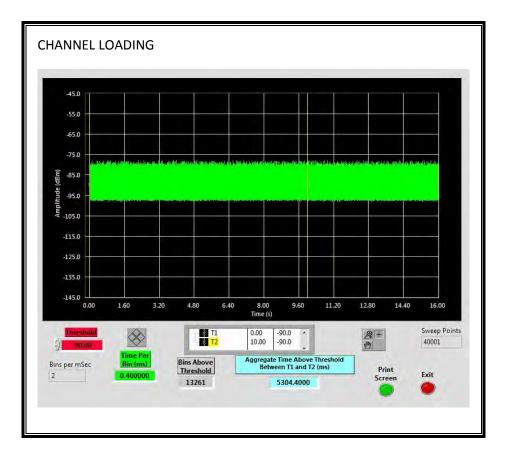
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TRAFFIC

| | trum Analyzer - Swep | | | | | | |
|--------------------|---------------------------------|-----------------------|------------|--------------------------------|----------------------------|---|-------------------------------------|
| N RL | HF- 50 D | DC 1 | - | 1 sever mi | Avg Type: Log-Pwr | D1:45:04 //M Aug 22, 2015 TRACE 10:3 + 5 6 TVPE WALLAND OFT P WALLAND OFT P WALLAND OFT P WALLAND OFT P WALLAND | Frequency |
| 10 dEl/div | Ref Offset -21. Ref -45.00 d | IFG 5 dB | IO: Fast 🔸 | ≓ Trig:Free Run #Atten:0 dB | | | Auto Tune |
| -65.0 | | | | | | | Center Fred 5,50000000 GHz |
| -85 0 | Number | ● ¹ | | | ale other and a second and | | Start Free 5.50000000 GH: |
| -995-01 -315-02 | | | | | | | Stop Free 5.50000000 GH: |
| -105 | | | | | | | CF Step 3.000000 MH: Auto Mar |
| 195 | | | | | | | Freq Offse 0 Hi |
| | | | | | | | |
| 135 | | | | | | | |

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CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 53.044%

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14.2.3. OVERLAPPING CHANNEL TESTS

<u>RESULTS</u>

These tests are not applicable.

14.2.4. MOVE AND CLOSING TIME

REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time = (Number of analyzer bins showing transmission) * (dwell time per bin)

The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

| Channel Move Time | Limit |
|-------------------|-------|
| (sec) | (sec) |
| 0.067 | 10 |

| Aggregate Channel Closing Transmission Time | Limit |
|---|--------|
| (msec) | (msec) |
| 0.0 | 60 |

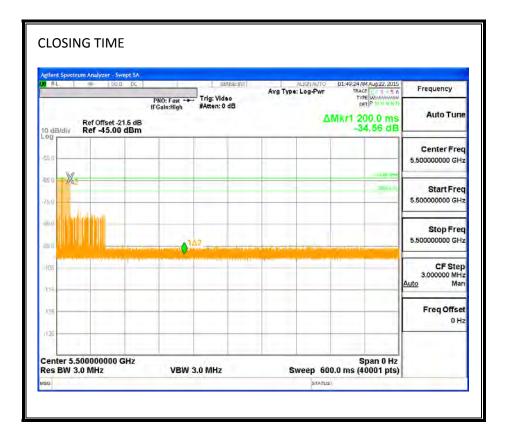
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MOVE TIME

| RL | RF 1.50 B. DC | | SEASE WIT | Avg Type: Log-Pwr | 01:44:53 AM Aug 22, 2015 TRACE 1 3 5 6 | Frequency |
|--|---------------|-------------------------|--------------|--------------------|---|-------------------------------------|
| | | PNO: Fast | #Atten: 0 dB | Contraction of the | DET P MMNN1 | in a la la |
| 10 dB/dlv | Auto Tune | | | | | |
| -# 0 -850 | 102 | | | | -105 dim | Center Fred 5,50000000 GH |
| -05-0 -95-0 | | | | | _ | Start Free 5.50000000 GH: |
| -115 | | | | | | Stop Free 5.50000000 GH: |
| Center 5. Res BW 3 | | VBW | 3.0 MHz | Sweep 1 | Span 0 Hz 6.00 s (40001 pts) | CF Step 3.000000 MH: Auto Mar |
| 1 Δ2 2 F 3 4 5 6 7 8 9 10 11 | t (Δ) t | 67.20 ms (Δ) 1.586 s | | | | Freq Offse 0 Hi |

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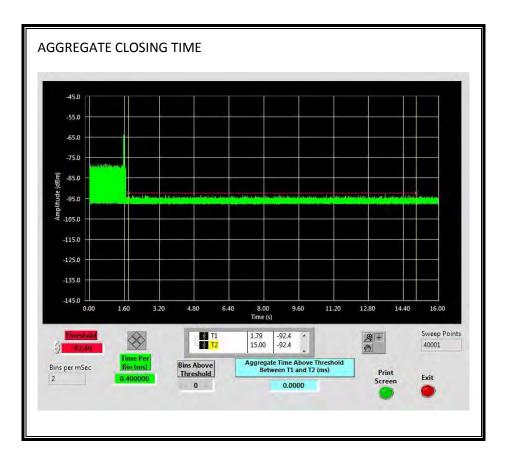
CHANNEL CLOSING TIME



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AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



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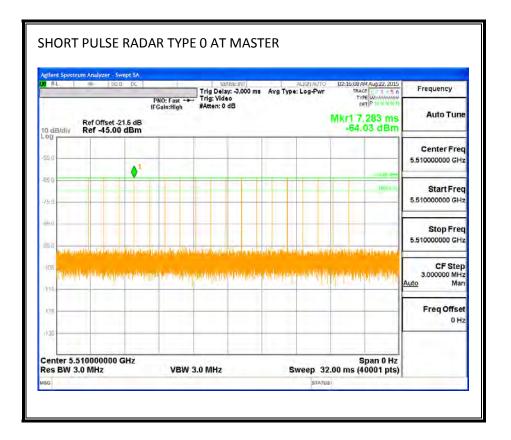
14.3. RESULTS FOR 40 MHz BANDWIDTH

14.3.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5510 MHz.

14.3.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



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 UL VERIFICATION SERVICES INC.
 FORM NO: CCSUP4701H

 47173 BENICIA STREET, FREMONT, CA 94538, USA
 TEL: (510) 771-1000
 FAX: (510) 661-0888

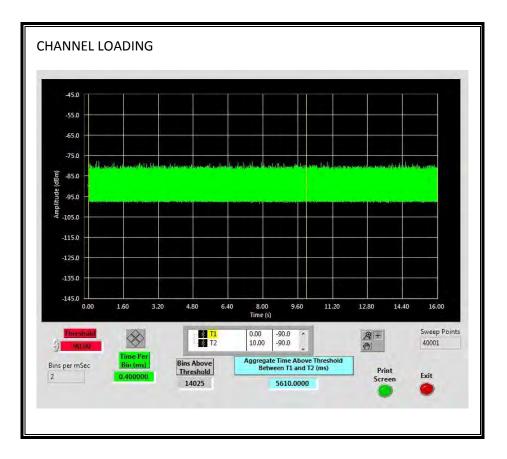
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 FORM NO: CCSUP4701H

TRAFFIC

| | trum Analyzer – Swept 5A | | | | | |
|------------------------|---------------------------------------|--|--|-------------------|-----------------------------------|---|
| RL | RF 50.0. DC | | Trig: Free Run | Avg Type: Log-Pwr | 01:55:35 AM Aug 22, 2015 TRACE | Frequency |
| 10 del/div | Ref Offset -21.5 dB Ref -45.00 dBm | PNO: Fast +++ IFGain:High | #Atten:0 dB | | MKr1 374.8 ms -77.75 dBm | Auto Tum |
| -55,0 | | | | | | Center Fred 5,51000000 GHz |
| -75.0 | | | | | | Start Free 5.510000000 GH: |
| the second | واوار ووارقا الطبو ويتركون والمت | A start of the second star | and the second | | | |
| -99-41 -95-0 | | | | | | Stop Fred 5.510000000 GH2 |
| opean | | | | | | 5.510000000 GH2 CF Step 3.000000 MH2 |
| -55 U -55 U -105 | | | | | | 5.510000000 GH2 CF Step 3.000000 MH2 |
| -105 -115 | | | | | | 5.51000000 GH2 CF Step 3.000000 MH2 <u>Auto</u> Mar Freq Offset |

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CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 56.1%

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14.3.3. OVERLAPPING CHANNEL TESTS

<u>RESULTS</u>

These tests are not applicable.

14.3.4. MOVE AND CLOSING TIME

REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time = (Number of analyzer bins showing transmission) * (dwell time per bin)

The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

| Channel Move Time | Limit |
|-------------------|-------|
| (sec) | (sec) |
| 0.031 | 10 |

| Aggregate Channel Closing Transmission Time | Limit |
|---|--------|
| (msec) | (msec) |
| 0.0 | 60 |

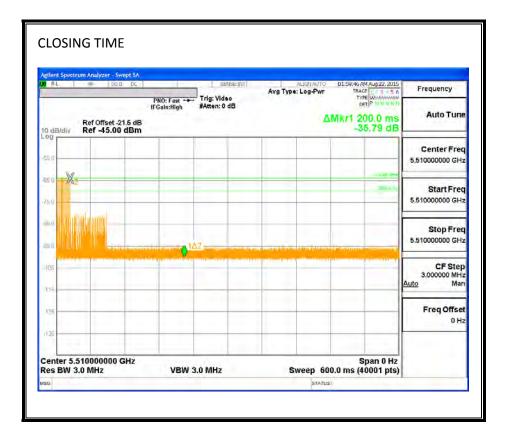
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MOVE TIME

| RL | nalyzer - Swept 5A | | SEASEINT | ALIGN AUTO | 01:57:14 AM Aug 22, 2015 | | |
|----------------------------|--------------------|-------------------------|-------------------------|-------------------|---------------------------------|-------------------------------------|--|
| | | PNO: Fast | | Avg Type: Log-Pwr | TYPE WULLING | Frequency Auto Tune | |
| 10 dB/dlv R | | | | | | | |
| -#0 -650 | 162 | | | | ÷1.05 dim | Center Fred 5,510000000 GHz | |
| -05 0 -05 0 -05 | | | | | | Start Free 5.510000000 GH: | |
| 110 | | | | | | Stop Fred 5.510000000 GH2 | |
| Center 5.510 Res BW 3.0 | ИНz | VBW : | 3.0 MHz | Sweep 1 | Span 0 Hz 6.00 s (40001 pts) | CF Step 3.000000 MHz Auto Mar | |
| | (A) | 30.80 ms (Δ) 1.612 s | -16,53 dB -54.15 dBm | | TOTICE FOR VALUE | Freq Offse 0 Ha | |

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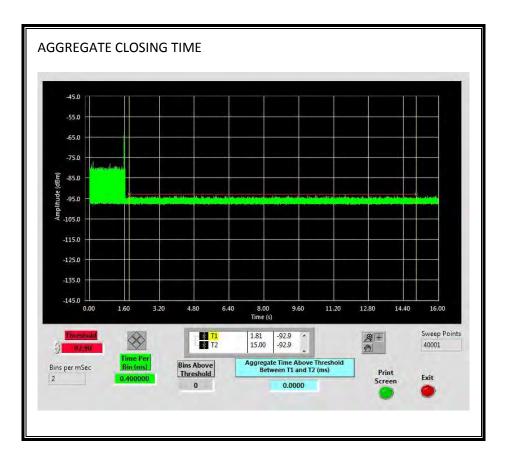
CHANNEL CLOSING TIME



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AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



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14.3.5. 10-MINUTE BEACON MONITORING PERIOD

<u>RESULTS</u>

No EUT transmissions were observed on the test channel during the 10-minute observation time.

| glient Spectrum Analyzer RL RF | Swept 5A | | 1 sever NU | Augnauto Avg Type: Log-Pwr | 02;15:08 AM Aug 22, 2015 TRACE | Frequency |
|-----------------------------------|-------------------------------------|------------|------------------------------|-------------------------------|-----------------------------------|------------------------------------|
| 0 del/div Ref -45 | Pt IFG et -21.5 dB .00 dBm | IO: Fast 🔸 | Trig:Free Run ≇Atten:0 dB | | ΔMkr1 600.0 s -30.79 dB | Auto Tune |
| 5.0 | | | | | | Center Fred 5,51000000 GH |
| 58 0 X2 75 0 | | | | | | Start Free 5.510000000 GH: |
| 80 60 | | | | | 142 | Stop Free 5.510000000 GH: |
| 105 | | | | | | CF Step 3.000000 MH Auto Mar |
| 135 | | | | | | Freq Offse 0 H: |
| enter 5.5100000 es BW 3.0 MHz | 00 GHz | VBW 3 | 3.0 MHz | Sweep | Span 0 Hz 720.0 s (40001 pts) | |

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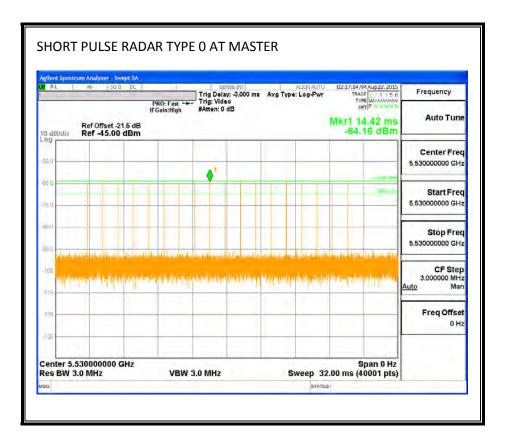
14.4. RESULTS FOR 80 MHz BANDWIDTH

14.4.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5530 MHz.

14.4.2. RADAR WAVEFORM AND TRAFFIC

RADAR WAVEFORM



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 UL VERIFICATION SERVICES INC.
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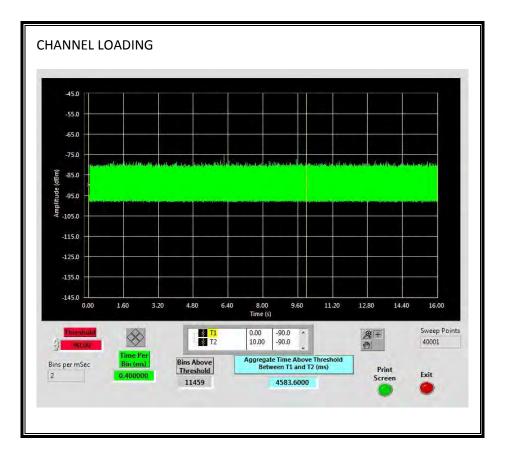
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 FORM NO: CCSUP4701H

TRAFFIC

| UN RL | | | | | Aug Type: Log-Pwr | 02:20:33 AM Aug 22, 2015 TRACE 11 7 3 1 5 6 | Frequency | | |
|------------|------------------------------|-----|------------------------|------------------------------|-------------------|--|----------------------------|--|-------------------------------------|
| 10 del/div | Ref Offset -21 Ref -45.00 | IFG | iO: Fast 🔸 ain:High | Trig: Free F #Atten: 0 di | Run B | | Mkr1 6.222 s -75.17 dBm | | Auto Tune |
| -65.0 | | | | | | | | | Center Fred 5.530000000 GHz |
| -75.0 | | | - | 1 | | | | | Start Freq 5.53000000 GHz |
| -15.0 | adorning:ma | | | | - Annoration | | | | Stop Fred 5.530000000 GHz |
| -105 | | | | | | | | | CF Step 3.000000 MHz Auto Man |
| | - | | | | | | | | Freq Offset 0 Hi |
| 1)35 | | | | | | | | | |

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CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 45.836%

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14.4.3. OVERLAPPING CHANNEL TESTS

<u>RESULTS</u>

These tests are not applicable.

14.4.4. MOVE AND CLOSING TIME

REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time = (Number of analyzer bins showing transmission) * (dwell time per bin)

The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

| Channel Move Time | Limit |
|-------------------|-------|
| (sec) | (sec) |
| 0.069 | 10 |

| Aggregate Channel Closing Transmission Time | Limit |
|---|--------|
| (msec) | (msec) |
| 0.0 | 60 |

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MOVE TIME

| | rum Analyzer - Swept | | EPASEINT | OLD NOT ALLON AUTO | 02:22:33 AM Aug 22, 2015 | | |
|---|----------------------|-----------------------------|------------|--------------------|--------------------------|--------------------------------|--|
| RL. | an Lynn r | PNO: Fast -+ IFGain:High | | Avg Type: Log-Pwr | TRACE | Frequency Auto Turne | |
| Ref Offset -21.5 dB ΔMkr1 68.80 ms 10 dB/div Ref -45.00 dBm -17.77 dB | | | | | | | |
| -50 -550 -550 | - AAA | | | | 54.00 cms | Center Freq 5,530000000 GHz | |
| -05 0 -95 0 105 | | | | | | Start Freq 5.530000000 GHz | |
| -119 -125 116 | | | | | | Stop Freq 5.53000000 GHz | |
| Center 5.530000000 GHz Span 0 Hz Res BW 3.0 MHz VBW 3.0 MHz Sweep 16.00 s (40001 pts) MM2 M000 170 Set X FUNCTION MUST 1 Δ2 t (Δ) 68.80 ms (Δ) 17.77 dB | | | | | | | |
| 2 F 3 4 6 6 7 8 9 10 11 | t | 1.696 s | -64.57 dBm | | | Freq Offset 0 Hz | |

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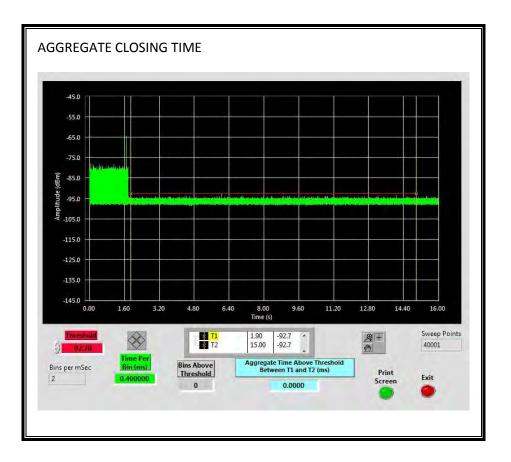
CHANNEL CLOSING TIME

| Frequency | 02:27:33 AM Aug 22, 2015 TRACE 3 5 6 TYPE Westmann DET P | Avg Type: Log-Pwr | Trig: Video | PNO: Fas | glient Spectrum Analyzer - S RL RH- 50 |
|----------------------------------|---|----------------------------|----------------|----------|---|
| Auto Tun | Mkr1 200.0 ms -35.36 dB | ۵ | h SAtten: 0 dB | | Ref Offset - 0. dEl/div Ref -45.00 |
| Center Fre 5.53000000 GH | | | | | 99 8.0 |
| Start Fre 5.53000000 GH | initia din | | | | 95 0 1 X 2 75 0 |
| Stop Fre 5.53000000 GH | eren dir uni | and with the second second | 103 | | mo () ())))))))) |
| CF Ste 3.000000 MH Auto Ma | | | | | 105 |
| Freq Offse | | | | | 05 |
| | Span 0 Hz | Sweep 60 | | GHz | enter 5.530000000 |

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AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



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14.4.5. 10-MINUTE BEACON MONITORING PERIOD

<u>RESULTS</u>

No EUT transmissions were observed on the test channel during the 10-minute observation time.

| | PNO: Fas IFGain:Hig Ref Offset -21.5 dB E/div Ref -45.00 dBm | | ALIONA Avg Type: Log-P | | | Frequency |
|---------------------------------|---|-------|--------------------------------|--------------|----------------------------------|------------------------------------|
| 0 dEl/div Ref -4 | | | Trig: Free Run #Atten: 0 dB | AND THE EVEN | ΔMkr1 600.0 s -31.39 dB | Auto Tune |
| og s.0 | | | | | | Center Fred 5,53000000 GH |
| 55 0 - <mark>Ж2</mark> 75 0 | | | | | | Start Free 5.530000000 GH: |
| 60 60 | | | | | 1∆2 | Stop Free 5.530000000 GH: |
| 105 | | | | | _ | CF Step 3.000000 MH Auto Mar |
| 135 | | | | | | Freq Offse 0 H: |
| enter 5.530000 es BW 3.0 MHz | | VBW : | 3.0 MHz | Sweep | Span 0 Hz 720.0 s (40001 pts) | |

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