



TEST REPORT

Test Report No. : UL-RPT-RP10895533JD05A V2.0

Manufacturer : Bang & Olufsen a/s
Model No. : WUS-AC08V
FCC ID : TTUWUSAC08V
Technology : WLAN (802.11a/n/ac)
Test Standard(s) : FCC Parts 15.209(a) & 15.407(b)

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2. The results in this report apply only to the sample(s) tested.
3. The sample tested is in compliance with the above standard(s).
4. The test results in this report are traceable to the national or international standards.
5. Version 2.0 supersedes all previous versions.

Date of Issue: 20 December 2016

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This laboratory is accredited by UKAS.
The tests reported herein have been
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Table of Contents

1. Customer Information..... 4

2. Summary of Testing..... 5

 2.1. General Information 5

 2.2. Summary of Test Results 5

 2.3. Methods and Procedures 5

 2.4. Deviations from the Test Specification 5

3. Equipment Under Test (EUT) 6

 3.1. Identification of Equipment Under Test (EUT) 6

 3.1.1 Host Product Details 6

 3.2. Description of EUT 6

 3.3. Modifications Incorporated in the EUT 6

 3.4. Additional Information Related to Testing 7

 3.5. Support Equipment 8

4. Operation and Monitoring of the EUT during Testing12

 4.1. Operating Modes 12

 4.2. Configuration and Peripherals 12

 4.3. Power Settings Used During Testing 13

5. Measurements, Examinations and Derived Results14

 5.1. General Comments 14

 5.2. Test Results 15

 5.2.1. Transmitter Out of Band Radiated Emissions 15

 5.2.2. Transmitter Band Edge Radiated Emissions 32

6. Measurement Uncertainty75

7. Report Revision History76

Appendix 1. Part 15.407(b)(4) Emission Limits77

1. Customer Information





| | |
|----------------------|--|
| Company Name: | Bang & Olufsen A/S |
| Address: | Peter Bangs Vej 15 7600 Struer Denmark |

2. Summary of Testing

2.1. General Information

| | |
|---------------------------------|---|
| Specification Reference: | 47CFR15.407 |
| Specification Title: | Code of Federal Regulations Volume 47 (Telecommunications): Part 15 Subpart E (Unlicensed National Information Infrastructure Devices) – Section 15.407 |
| Specification Reference: | 47CFR15.209 |
| Specification Title: | Code of Federal Regulations Volume 47 (Telecommunications): Part 15 Subpart C (Intentional Radiators) - Section 15.209 |
| Site Registration: | 209735 |
| Location of Testing: | UL VS LTD, Unit 3 Horizon, Wade Road, Kingsland Business Park, Basingstoke, Hampshire, RG24 8AH, United Kingdom |
| Test Dates: | 15 March 2016 to 13 April 2016 |

2.2. Summary of Test Results

| FCC Reference (47CFR) | Measurement | Result |
|---|--|--|
| Part 15.407(b)/15.209(a) | Transmitter Out of Band Radiated Emissions |  |
| Part 15.407(b)/15.209(a) | Transmitter Band Edge Radiated Emissions |  |
| Key to Results | | |
|  = Complied  = Did not comply | | |

2.3. Methods and Procedures

| | |
|-------------------|---|
| Reference: | ANSI C63.10-2013 |
| Title: | American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices |
| Reference: | KDB 789033 D02 General UNII Test Procedures New Rules v01r03 August 22, 2016 |
| Title: | Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E |

2.4. Deviations from the Test Specification

For the measurements contained within this test report, there were no deviations from, additions to, or exclusions from the test specifications identified above.

3. Equipment Under Test (EUT)

3.1. Identification of Equipment Under Test (EUT)

| | |
|---------------------------------|--|
| Brand Name: | WUS-AC08V |
| Model Name or Number: | WUS-AC08V |
| Test Sample MAC address: | 542AA22F8F19 (<i>Conducted sample</i>) |
| Hardware Version: | A1G |
| Software Version: | 4.2.3.5 |
| FCC ID: | TTUWUSAC08V |

3.1.1 Host Product Details

| | |
|-----------------------------------|----------------------------------|
| Brand Name: | BeoVision 14-55 |
| Model Name or Number: | BeoVision 14-55 |
| Test Sample Serial Number: | 92875 (<i>Radiated sample</i>) |
| Hardware Version: | 8009004 |
| Software Version: | 7.77 |

| | |
|------------------------------|----------------------|
| Description: | AC power cable |
| Brand Name: | Not marked or stated |
| Model Name or Number: | Not marked or stated |
| Serial Number: | Not marked or stated |

3.2. Description of EUT

The equipment under test was a *Bluetooth* Basic Rate + EDR, *Bluetooth* Low Energy, IEEE 802.11a,b,g,n,ac WLAN module operating in the 2.4 GHz and 5 GHz bands, which was incorporated into a 55" Television. The EUT has two external antenna ports with two transmit chains and MIMO is supported. For 802.11a/g/n/ac operation the device uses two by two MIMO transmitters. Depending on the 802.11 data rate, the device transmits 1 or 2 spatial stream. The device uses spatial multiplexing and from an RF point of view the streams are correlated.

3.3. Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing.

3.4. Additional Information Related to Testing

| | | | |
|----------------------------------|-----------------------------------|------------------------------------|--------------------------------|
| Technology Tested: | WLAN (IEEE 802.11a,n,ac) / U-NII | | |
| Type of Unit: | Transceiver | | |
| Modulation: | BPSK, QPSK, 16QAM, 64QAM & 256QAM | | |
| Data rates: | 802.11a | 6, 9, 12, 18, 24, 36, 48 & 54 Mbps | |
| | 802.11n HT20 (SISO) | MCS0 to MCS7 | |
| | 802.11n HT20 (MIMO) | MCS0 to MCS15 (CDD MCS0 to MCS7) | |
| | 802.11n HT40 (SISO) | MCS0 to MCS7 | |
| | 802.11n HT40 (MIMO) | MCS0 to MCS15 (CDD MCS0 to MCS7) | |
| | 802.11ac VHT20 | MCS0 to MCS8 | |
| | 802.11ac VHT40 | MCS0 to MCS9 | |
| | 802.11ac VHT80 | MCS0 to MCS9 | |
| Transmit Frequency Band: | 5150 MHz to 5250 MHz | | |
| Channel Spacing: | 20 MHz | | |
| Transmit Channels Tested: | Channel ID | Channel Number | Channel Frequency (MHz) |
| | Bottom | 36 | 5180 |
| | Middle | 40 | 5200 |
| | Top | 48 | 5240 |
| Channel Spacing: | 40 MHz | | |
| Transmit Channels Tested: | Channel ID | Channel Number | Channel Frequency (MHz) |
| | Bottom | 38 | 5190 |
| | Top | 46 | 5230 |
| Channel Spacing: | 80 MHz | | |
| Transmit Channel Tested: | Channel ID | Channel Number | Channel Frequency (MHz) |
| | Single | 42 | 5210 |

Additional Information Related to Testing (continued)

| | | | |
|----------------------------------|----------------------|-----------------------|--------------------------------|
| Transmit Frequency Band: | 5725 MHz to 5850 MHz | | |
| Channel Spacing: | 20 MHz | | |
| Transmit Channels Tested: | Channel ID | Channel Number | Channel Frequency (MHz) |
| | Bottom | 149 | 5745 |
| | Middle | 157 | 5785 |
| | Top | 165 | 5825 |
| Channel Spacing: | 40 MHz | | |
| Transmit Channels Tested: | Channel ID | Channel Number | Channel Frequency (MHz) |
| | Bottom | 151 | 5755 |
| | Top | 159 | 5795 |
| Channel Spacing: | 80 MHz | | |
| Transmit Channel Tested: | Channel ID | Channel Number | Channel Frequency (MHz) |
| | Single | 155 | 5775 |

3.5. Support Equipment

The following support equipment was used to exercise the EUT during testing:

| | |
|------------------------------|--------------------|
| Description: | Remote control |
| Brand Name: | Bang & Olufsen a/s |
| Model Name or Number: | BeoRemote One T30 |
| Serial Number: | 25143484 |

| | |
|------------------------------|---------------|
| Description: | BTLE box |
| Brand Name: | Alpha Network |
| Model Name or Number: | WUS-AC08V |
| Serial Number: | H11145216 |

| | |
|------------------------------|-----------------------------------|
| Description: | HDMI cable. Quantity 3. Length 2m |
| Brand Name: | Not marked or stated |
| Model Name or Number: | Not marked or stated |
| Serial Number: | Not marked or stated |

Support Equipment (continued)

| | |
|------------------------------|-----------------------------------|
| Description: | HDMI cable. Quantity 2. Length 3m |
| Brand Name: | Not marked or stated |
| Model Name or Number: | Not marked or stated |
| Serial Number: | Not marked or stated |

| | |
|------------------------------|--------------------|
| Description: | Now TV set top box |
| Brand Name: | Sky |
| Model Name or Number: | 2400SK |
| Serial Number: | 1MM4DE006281 |

| | |
|------------------------------|--------------------|
| Description: | Now TV set top box |
| Brand Name: | Sky |
| Model Name or Number: | 2400SK |
| Serial Number: | 1MM552038807 |

| | |
|------------------------------|-------------------------|
| Description: | Freeview HD Set Top Box |
| Brand Name: | Technika |
| Model Name or Number: | STBHDIS2010 |
| Serial Number: | GRTB58073912047 |

| | |
|------------------------------|-------------------|
| Description: | HDMI media player |
| Brand Name: | SUMVISION |
| Model Name or Number: | Cyclone Micro |
| Serial Number: | SUM091104017 |

| | |
|------------------------------|---------------------------------------|
| Description: | Ethernet cable. Quantity 3. Length 2m |
| Brand Name: | Not marked or stated |
| Model Name or Number: | Not marked or stated |
| Serial Number: | Not marked or stated |

| | |
|------------------------------|---------------------------------------|
| Description: | Ethernet cable. Quantity 3. Length 3m |
| Brand Name: | Not marked or stated |
| Model Name or Number: | Not marked or stated |
| Serial Number: | Not marked or stated |

Support Equipment (continued)

| | |
|------------------------------|---------------------------------------|
| Description: | Ethernet cable. Quantity 1. Length 5m |
| Brand Name: | Not marked or stated |
| Model Name or Number: | Not marked or stated |
| Serial Number: | Not marked or stated |

| | |
|------------------------------|--|
| Description: | Ethernet cable. Quantity 1. Length 10m |
| Brand Name: | Not marked or stated |
| Model Name or Number: | Not marked or stated |
| Serial Number: | Not marked or stated |

| | |
|------------------------------|---------------------|
| Description: | ADSL2+ Modem Router |
| Brand Name: | Netgear |
| Model Name or Number: | DG834 v4 |
| Serial Number: | 1PL596BD001A4 |

| | |
|------------------------------|-------------------|
| Description: | ADSL Modem Router |
| Brand Name: | Linksys |
| Model Name or Number: | WAG54G |
| Serial Number: | CF610E100799 |

| | |
|------------------------------|---|
| Description: | USB cable type A male to type A male. Quantity 3. Length 3m |
| Brand Name: | Not marked or stated |
| Model Name or Number: | Not marked or stated |
| Serial Number: | Not marked or stated |

| | |
|------------------------------|---|
| Description: | Audio cable 3.5mm male to 3.5mm male. Quantity 1. Length 3m |
| Brand Name: | Not marked or stated |
| Model Name or Number: | Not marked or stated |
| Serial Number: | Not marked or stated |

| | |
|------------------------------|-------------------------------------|
| Description: | Aerial cable. Quantity 1. Length 2m |
| Brand Name: | Belkin |
| Model Name or Number: | Not marked or stated |
| Serial Number: | Not marked or stated |

Support Equipment (continued)

| | |
|------------------------------|----------------------|
| Description: | Freeview Set Top Box |
| Brand Name: | Sagem |
| Model Name or Number: | 251657024 |
| Serial Number: | 441901036882 |

| | |
|------------------------------|---|
| Description: | USB cable type A male to type B male. Quantity 1. Length 3m with 3 FAIR-RITE V0 ferrites and 1 unmarked or stated ferrite |
| Brand Name: | Not marked or stated |
| Model Name or Number: | Not marked or stated |
| Serial Number: | Not marked or stated |

| | |
|------------------------------|-----------------|
| Description: | Laptop Computer |
| Brand Name: | Lenovo |
| Model Name or Number: | E555 |
| Serial Number: | PF03XEND |

| | |
|------------------------------|----------------------|
| Description: | USB Hub |
| Brand Name: | Belkin |
| Model Name or Number: | Not marked or stated |
| Serial Number: | Not marked or stated |

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

The EUT was tested in the following operating mode(s):

- Continuously transmitting with a modulated carrier at maximum power on the bottom, middle and top channels as required using the supported data rates/modulation types.

4.2. Configuration and Peripherals

The EUT was tested in the following configuration(s):

- Controlled using *MT7662U_QA_tool_V1.0.3.0* test application supplied by the customer on a UL laptop PC. The application was used to enable a continuous transmission mode and to select the test channels, data rates and modulation schemes as required.
- All supported modes and channel widths were initially investigated on one channel. The modes that produced the highest power for all bands were:
 - Highest power
 - 802.11a SISO – BPSK / 6 Mbps
 - 802.11a CDD – BPSK / 6 Mbps
 - 802.11n HT20 SISO – 16QAM / 26 Mbps / MCS3
 - 802.11n HT40 SISO – 16QAM / 54 Mbps / MCS3
 - 802.11n HT20 MIMO – QPSK / 13 Mbps / MCS1
 - 802.11n HT40 MIMO – 16QAM / 54 Mbps / MCS3
 - 802.11ac VHT80 SISO – QPSK / 87.8 Mbps / MCS2
 - 802.11ac VHT80 MIMO – 16QAM / 117 Mbps / MCS3
 - Widest bandwidth
 - 802.11a SISO– BPSK / 6 Mbps
 - 802.11a CDD – BPSK / 6 Mbps
 - 802.11n HT20 SISO – BPSK / 6.5 Mbps / MCS0
 - 802.11n HT40 SISO – BPSK / 13.5 Mbps / MCS0
 - 802.11n HT20 MIMO – BPSK / 6.5 Mbps / MCS0
 - 802.11n HT40 MIMO – BPSK / 13.5 Mbps / MCS0
 - 802.11ac VHT80 SISO – QPSK / 87.8 Mbps / MCS2
 - 802.11ac VHT80 MIMO – BPSK / 29.3 Mbps / MCS0
- For 802.11n HT modes, *HT MixMode* & *HT GreenField* data formats were selectable. Both formats were initially compared on a range of modulation types and bandwidths, and found to give identical results. For all tests requiring HT modes, *HT MixMode* was therefore selected.
- For all radiated measurements the EUT, being the TV, was connected to 120 VAC 60 Hz. The customer had fitted a USB cable to the module that was inside the TV. This was used to place the TV into test mode as required.
- The customer declared the power settings which are stated in section 4.3 of this test report.

Configuration and Peripherals (continued)

- Radiated spurious emissions tests were performed with the EUT transmitting with a data rate of 802.11a / 6 Mbps on Antenna 1 as it produced the worst conducted output power and highest spectral density level and was therefore deemed worst case.
- In order to operate the EUT the TV needed to be enabled. This was done by turning on the TV and pairing it with T30 remote control with the external BTLE box which was connected to the TV. The external BTLE box has a 0.83 metre cable with a USB type A male connector. Once the TV was enabled, the EUT could be controlled using the MT7662U application.
- Once the TV was turned on and the EUT was in transmit mode the T30 remote control and external BTLE box were removed from the chamber.
- For all radiated tests the support equipment was used to terminate all active ports.

4.3. Power Settings Used During Testing

The manufacturer's declared power settings stated in the table below were used for both SISO and MIMO measurements:

| Mode | Power Setting | | | | | |
|------------------------------|------------------------------------|-------------------|----------------|-------------------------------------|-------------------|----------------|
| | Frequency Band 5.15 to 5.25 GHz | | | Frequency Band 5.725 to 5.85 GHz | | |
| | Bottom Channel | Middle Channel | Top Channel | Bottom Channel | Middle Channel | Top Channel |
| 802.11a SISO / 6 Mbps | 16 | 16 | 16 | 16 | 16 | 16 |
| 802.11a CDD / 6 Mbps | 10 | 10 | 10 | 10 | 10 | 10 |
| 802.11n HT20 / SISO / MCS0 | 18 | 18 | 18 | 18 | 18 | 18 |
| 802.11n HT20 / SISO / MCS3 | 18 | 18 | 18 | 18 | 18 | 18 |
| 802.11n HT40 / SISO / MCS0 | 18 | N/A | 18 | 18 | N/A | 18 |
| 802.11n HT40 / SISO / MCS3 | 18 | N/A | 18 | 18 | N/A | 18 |
| 802.11n HT20 / MIMO / MCS0 | 12 | 12 | 12 | 12 | 12 | 12 |
| 802.11n HT20 / MIMO / MCS1 | 12 | 12 | 12 | 12 | 12 | 12 |
| 802.11n HT40 / MIMO / MCS0 | 12 | N/A | 12 | 12 | N/A | 12 |
| 802.11n HT40 / MIMO / MCS3 | 12 | N/A | 12 | 12 | N/A | 12 |
| 802.11ac VHT80 / SISO / MCS2 | N/A | 1A | N/A | N/A | 1A | N/A |
| 802.11ac VHT80 / MIMO / MCS0 | N/A | 14 | N/A | N/A | 14 | N/A |
| 802.11ac VHT80 / MIMO / MCS3 | N/A | 14 | N/A | N/A | 14 | N/A |

5. Measurements, Examinations and Derived Results

5.1. General Comments

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%. Please refer to *Section 6 Measurement Uncertainty* for details.

In accordance with UKAS requirements all the measurement equipment is on a calibration schedule. All equipment was within the calibration period on the date of testing.

5.2. Test Results

5.2.1. Transmitter Out of Band Radiated Emissions

Test Summary:

| | | | |
|-----------------------------------|-------------|-------------------|---------------|
| Test Engineer: | David Doyle | Test Date: | 13 April 2016 |
| Test Sample Serial Number: | 92875 | | |

| | |
|--------------------------|---|
| FCC Reference: | Parts 15.407(b)(1),(6),(7) & 15.209(a) |
| Test Method Used: | KDB 789033 II.G. & ANSI C63.10 Sections 6.3 and 6.5 |
| Frequency Range: | 30 MHz to 1000 MHz |

Environmental Conditions:

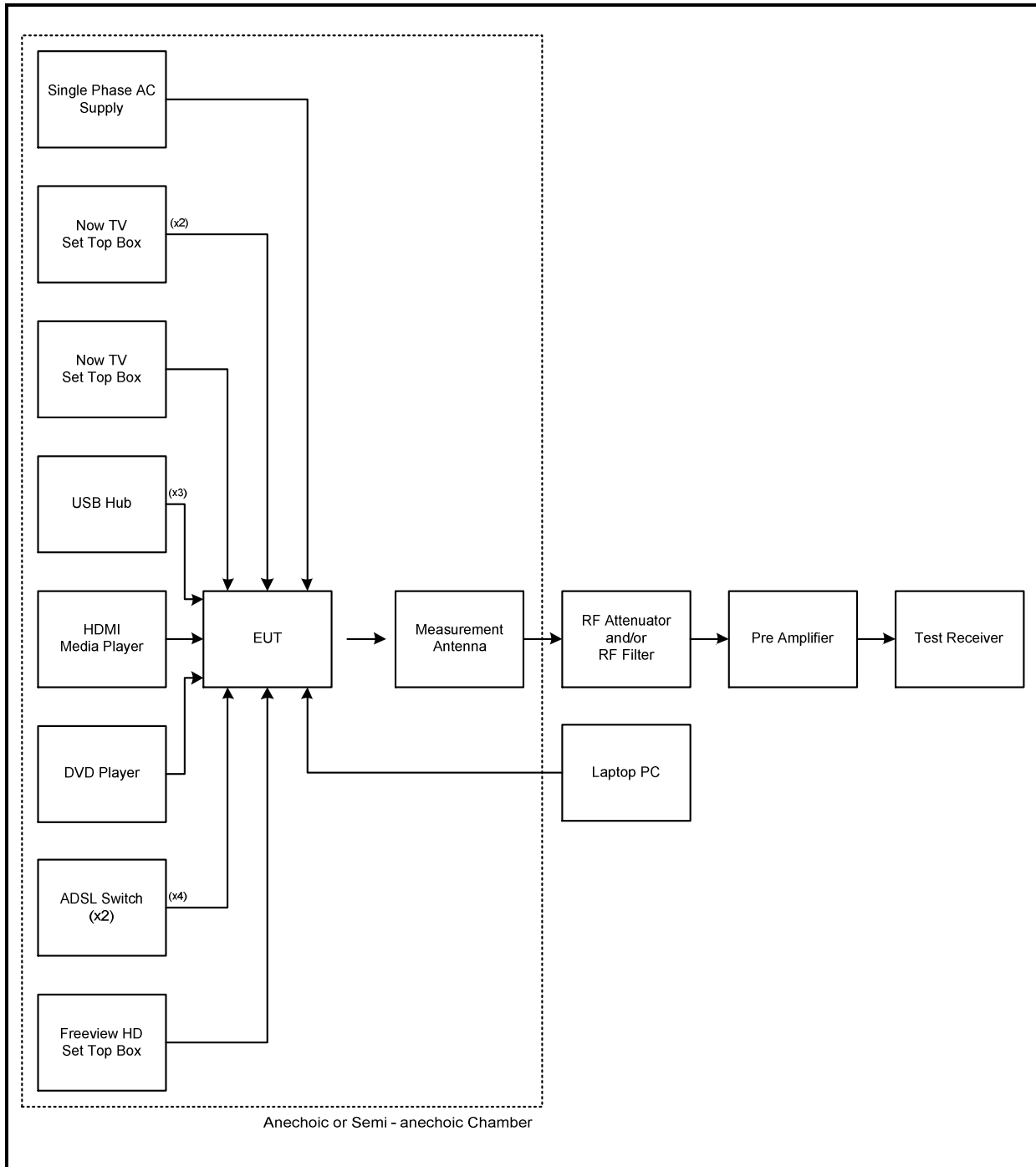
| | |
|-------------------------------|----|
| Temperature (°C): | 21 |
| Relative Humidity (%): | 31 |

Note(s):

1. Measurements below 1 GHz were limited to the 5.15-5.25 GHz band, the EUT was transmitting with a data rate of 6 Mbps (802.11a) as it produced the highest EIRP and was therefore deemed worst case
2. Pre-scans with the EUT transmitting on the middle channel were measured according to FCC Part 15.407(b)(1) which states for transmitters operating in the band 5.15 to 5.25 GHz: all emissions outside of the band 5.15-5.35 GHz shall not exceed -27 dBm/MHz. Part(b)(6) states unwanted emissions below 1 GHz must comply with the general field strength limits set forth in 15.209. Part(b)(7) states the provisions of 15.205 apply, e.g. restricted bands of operation.
3. The final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
4. The preliminary scans showed similar emission levels below 1 GHz, for each channel of operation. Therefore final radiated emissions measurements were performed with the EUT set to the middle channel only.
5. In accordance with ANSI C63.10 Section 6.5.4, the frequency and amplitude of the six highest spurious emissions relative to the limit were recorded in the table below.
6. Measurements below 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

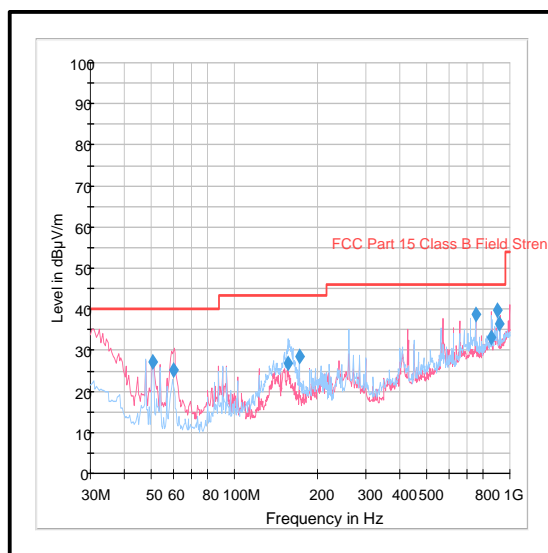
Transmitter Out of Band Radiated Emissions (continued)

Test setup for radiated measurements:



Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: Middle Channel / Field Strength**

| Frequency (MHz) | Antenna Polarity | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|------------------|----------------------|----------------------|-------------|----------|
| 50.687 | Vertical | 27.0 | 40.0 | 13.0 | Complied |
| 60.176 | Vertical | 25.2 | 40.0 | 14.8 | Complied |
| 750.074 | Horizontal | 38.8 | 46.0 | 7.2 | Complied |
| 856.078 | Vertical | 33.0 | 46.0 | 13.0 | Complied |
| 900.092 | Vertical | 39.8 | 46.0 | 6.2 | Complied |
| 917.484 | Vertical | 36.6 | 46.0 | 9.4 | Complied |



Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying table.

Test Equipment Used:

| Asset No. | Instrument | Manufacturer | Type No. | Serial No. | Date Calibration Due | Cal. Interval (Months) |
|-----------|------------------|-------------------|------------|-------------|----------------------|------------------------|
| M1627 | Thermohygrometer | JM Handlungspunkt | 30.5015.10 | None stated | 11 Jan 2017 | 12 |
| K0001 | 5m RSE Chamber | Rainford EMC | N/A | N/A | 12 Jan 2017 | 12 |
| G0543 | Amplifier | Sonoma | 310N | 230801 | 29 May 2016 | 3 |
| M1124 | Test Receiver | Rohde & Schwarz | ESIB26 | 100046 | 18 Nov 2016 | 12 |
| A259 | Antenna | Chase | CBL6111 | 1513 | 19 Jul 2016 | 12 |
| A1834 | Attenuator | Hewlett Packard | 8491B | 10444 | 30 Mar 2017 | 12 |

Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Test Summary:**

| | | | |
|-----------------------------------|---------------------------------|--------------------|-----------------------------------|
| Test Engineers: | David Doyle & Andrew Edwards | Test Dates: | 15 March 2016 to 12 April 2016 |
| Test Sample Serial Number: | 92875 | | |

| | |
|--------------------------|---|
| FCC Reference: | Part 15.407(b)(1),(7) & 15.209(a) |
| Test Method Used: | KDB 789033 II.G. & ANSI C63.10 Sections 6.3 and 6.6 |
| Frequency Range: | 1 GHz to 40 GHz |

Environmental Conditions:

| | |
|-------------------------------|----------|
| Temperature (°C): | 22 to 25 |
| Relative Humidity (%): | 31 to 36 |

Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Note(s):**

1. FCC Part 15.407(b)(1) states for transmitters operating in the band 5.15 to 5.25 GHz: all emissions outside of the 5.15 to 5.35 GHz band will not exceed -27 dBm/MHz. Part(b)(7) states the provisions of 15.205 apply e.g. restricted bands of operation.
2. Pre-scans were performed with the EUT transmitting on middle channel in the 5.15 to 5.25 GHz band. An inquiry was made to the FCC and the response was pre-scans could be performed in the band with the highest EIRP and all final measurements should be performed on any emissions seen in each band.
3. The final measured value, for the given emission in the result tables, incorporates the calibrated antenna factor and cable loss.
4. Appropriate RF filters and attenuators were used during pre-scans and final measurements. Insertion losses were entered on the spectrum analyser as RF levels offsets.
5. *In accordance with KDB 789033 Section II.G.1.c) if the peak measurement is below the average limit, it is not necessary to perform a separate average measurement.
6. In accordance with KDB 789033 Section II.G.6.c) Method AD (vi), the average measurements were performed using an increased number of sweeps. The number of sweeps used was 116.
7. In accordance with KDB 789033 Section II.G.6.c) Method AD (iii), pre-scan plots from 1 to 26.5 GHz were performed using an increased number of sweep points as calculated below:
 - o 1 to 4 GHz – 6001 sweep points
 - o 4 to 6 GHz – 4001 sweep points
 - o 4.5 to 5.15 GHz – 1301 sweep points
 - o 5.35 to 5.46 GHz – 301 sweep points
 - o 6 to 8 GHz – 4001 sweep points
 - o 8 to 12.75 GHz – 9501 sweep points
 - o 12.75 to 18 GHz – 10501 sweep points
 - o 18 to 26.5 GHz – 17001 sweep points

All other measurements were performed with the Test Receiver's default setting of 625 sweep points.

8. In accordance with KDB 789033 Section II.G.6.c) Method AD (vii), for average measurements on data rates where the EUT was transmitting <98% duty cycle, the duty cycle correction factor was added to the measured result. Refer to UL test report UL-RPT-RP10895558JD02G Section 5.2.4 for duty cycle correction factor calculations.
9. All other emissions shown on the pre-scan plots were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
10. Pre-scans above 1 GHz were performed in a fully anechoic chamber (Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 1.5 m above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: Bottom Channel / EIRP**

| Frequency (MHz) | Antenna Polarity | Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|------------------|-------------|-------------|-------------|----------|
| 1630.839 | Horizontal | -45.9 | -27.0 | 18.9 | Complied |
| 1717.500 | Vertical | -40.4 | -27.0 | 13.4 | Complied |
| 1745.682 | Horizontal | -34.7 | -27.0 | 7.7 | Complied |
| 6110.942 | Horizontal | -40.7 | -27.0 | 13.7 | Complied |
| 7202.679 | Horizontal | -42.9 | -27.0 | 15.9 | Complied |
| 7223.759 | Horizontal | -46.7 | -27.0 | 19.7 | Complied |

Results: Bottom Channel / Field Strength / Peak

| Frequency (MHz) | Antenna Polarity | Peak Level (dB μ V/m) | Peak Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|------------------|---------------------------|---------------------------|-------------|----------|
| 1000.171 | Horizontal | 48.8 | 54.0* | 5.2 | Complied |
| 1048.426 | Horizontal | 49.6 | 54.0* | 4.4 | Complied |
| 1142.357 | Horizontal | 53.7 | 54.0* | 0.3 | Complied |
| 2251.086 | Horizontal | 50.1 | 54.0* | 3.9 | Complied |
| 2700.286 | Vertical | 52.4 | 54.0* | 1.6 | Complied |
| 2846.402 | Horizontal | 57.1 | 74.0 | 16.9 | Complied |
| 15535.288 | Vertical | 64.0 | 74.0 | 10.0 | Complied |

Results: Bottom Channel / Field Strength / Average

| Frequency (MHz) | Antenna Polarity | Level (dB μ V/m) | Duty Cycle correction (dB) | Corrected Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|------------------|----------------------|----------------------------|--------------------------------|----------------------|-------------|----------|
| 2700.286 | Vertical | 43.3 | 0.6 | 43.9 | 54.0 | 10.1 | Complied |
| 15537.868 | Vertical | 48.5 | 0.6 | 49.1 | 54.0 | 4.9 | Complied |

Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: Middle Channel / EIRP**

| Frequency (MHz) | Antenna Polarity | Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|------------------|-------------|-------------|-------------|----------|
| 1630.839 | Horizontal | -45.9 | -27.0 | 18.9 | Complied |
| 1717.500 | Vertical | -40.4 | -27.0 | 13.4 | Complied |
| 1745.682 | Horizontal | -34.7 | -27.0 | 7.7 | Complied |
| 6110.942 | Horizontal | -40.7 | -27.0 | 13.7 | Complied |
| 7202.679 | Horizontal | -42.9 | -27.0 | 15.9 | Complied |
| 7223.759 | Horizontal | -46.7 | -27.0 | 19.7 | Complied |

Results: Middle Channel / Field Strength / Peak

| Frequency (MHz) | Antenna Polarity | Peak Level (dB μ V/m) | Peak Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|------------------|---------------------------|---------------------------|-------------|----------|
| 1000.171 | Horizontal | 48.8 | 54.0* | 5.2 | Complied |
| 1048.426 | Horizontal | 49.6 | 54.0* | 4.4 | Complied |
| 1142.357 | Horizontal | 53.7 | 54.0* | 0.3 | Complied |
| 2251.086 | Horizontal | 50.1 | 54.0* | 3.9 | Complied |
| 2700.286 | Vertical | 52.4 | 54.0* | 1.6 | Complied |
| 2846.402 | Horizontal | 57.1 | 74.0 | 16.9 | Complied |
| 15596.840 | Vertical | 62.4 | 74.0 | 11.6 | Complied |

Results: Middle Channel / Field Strength / Average

| Frequency (MHz) | Antenna Polarity | Level (dB μ V/m) | Duty Cycle correction (dB) | Corrected Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|------------------|----------------------|----------------------------|--------------------------------|----------------------|-------------|----------|
| 2700.286 | Vertical | 43.3 | 0.6 | 43.9 | 54.0 | 10.1 | Complied |
| 15598.522 | Vertical | 48.1 | 0.6 | 48.7 | 54.0 | 5.3 | Complied |

Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: Top Channel / EIRP**

| Frequency (MHz) | Antenna Polarity | Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|------------------|-------------|-------------|-------------|----------|
| 1630.839 | Horizontal | -45.9 | -27.0 | 18.9 | Complied |
| 1717.500 | Vertical | -40.4 | -27.0 | 13.4 | Complied |
| 1745.682 | Horizontal | -34.7 | -27.0 | 7.7 | Complied |
| 6110.942 | Horizontal | -40.7 | -27.0 | 13.7 | Complied |
| 7202.679 | Horizontal | -42.9 | -27.0 | 15.9 | Complied |
| 7223.759 | Horizontal | -46.7 | -27.0 | 19.7 | Complied |

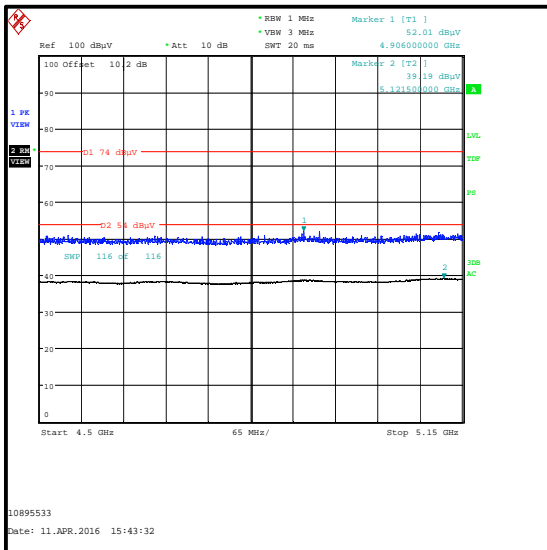
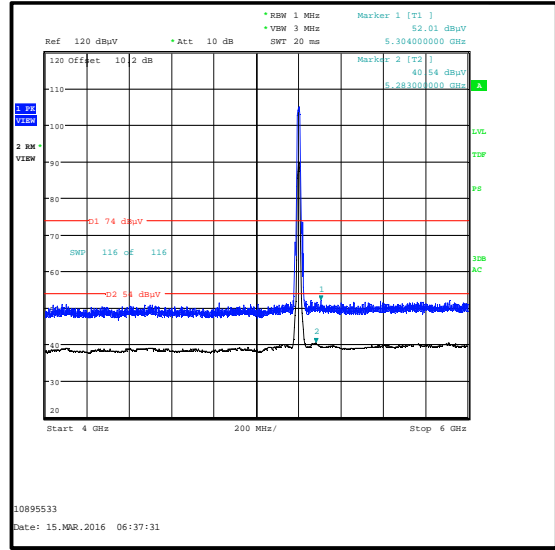
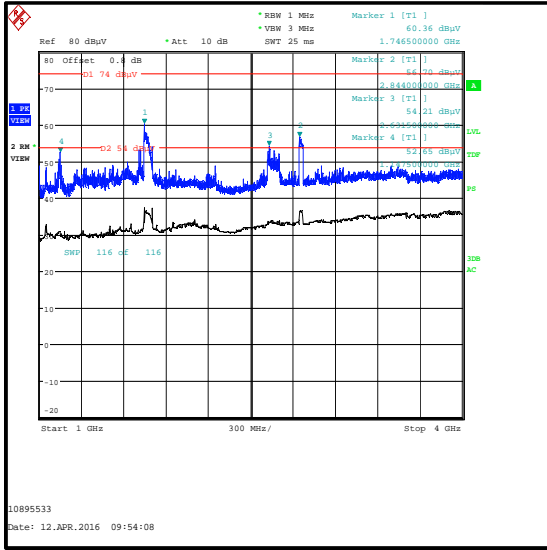
Results: Top Channel / Field Strength / Peak

| Frequency (MHz) | Antenna Polarity | Peak Level (dB μ V/m) | Peak Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|------------------|---------------------------|---------------------------|-------------|----------|
| 1000.171 | Horizontal | 48.8 | 54.0* | 5.2 | Complied |
| 1048.426 | Horizontal | 49.6 | 54.0* | 4.4 | Complied |
| 1142.357 | Horizontal | 53.7 | 54.0* | 0.3 | Complied |
| 2251.086 | Horizontal | 50.1 | 54.0* | 3.9 | Complied |
| 2700.286 | Vertical | 52.4 | 54.0* | 1.6 | Complied |
| 2846.402 | Horizontal | 57.1 | 74.0 | 16.9 | Complied |
| 15721.009 | Vertical | 62.0 | 74.0 | 12.0 | Complied |

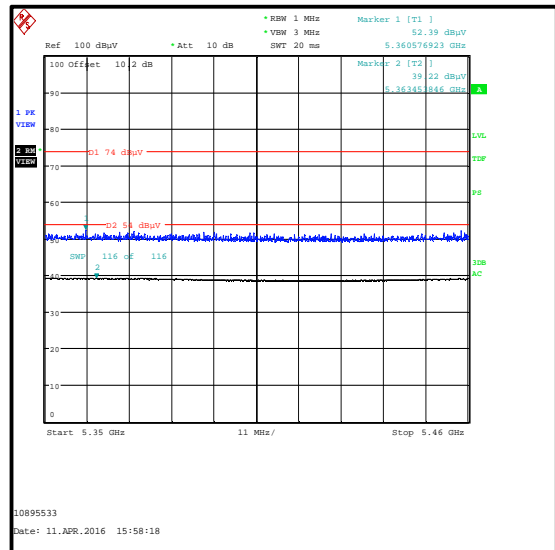
Results: Top Channel / Field Strength / Average

| Frequency (MHz) | Antenna Polarity | Level (dB μ V/m) | Duty Cycle correction (dB) | Corrected Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|------------------|----------------------|----------------------------|--------------------------------|----------------------|-------------|----------|
| 2700.286 | Vertical | 43.3 | 0.6 | 43.9 | 54.0 | 10.1 | Complied |
| 15721.009 | Vertical | 46.6 | 0.6 | 47.2 | 54.0 | 6.8 | Complied |

Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band operation) (continued)

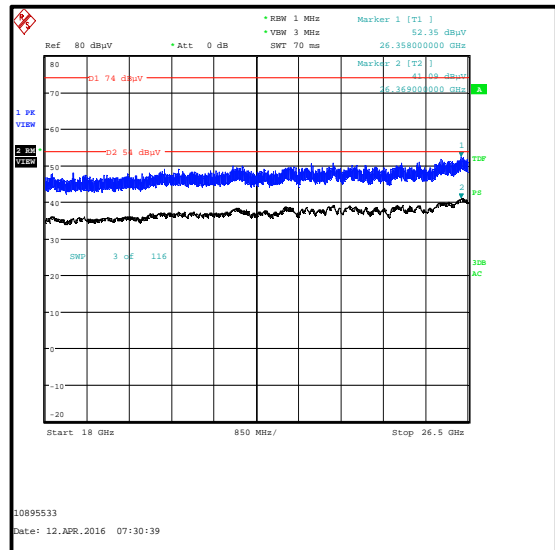
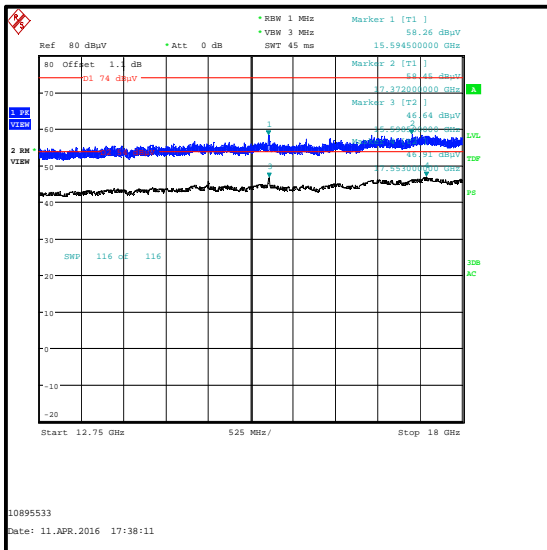
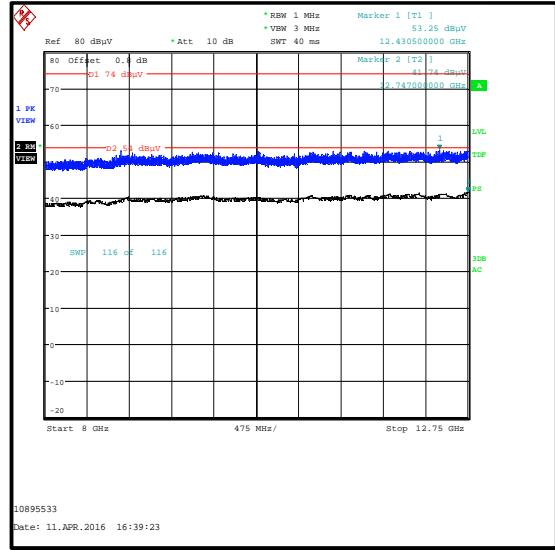
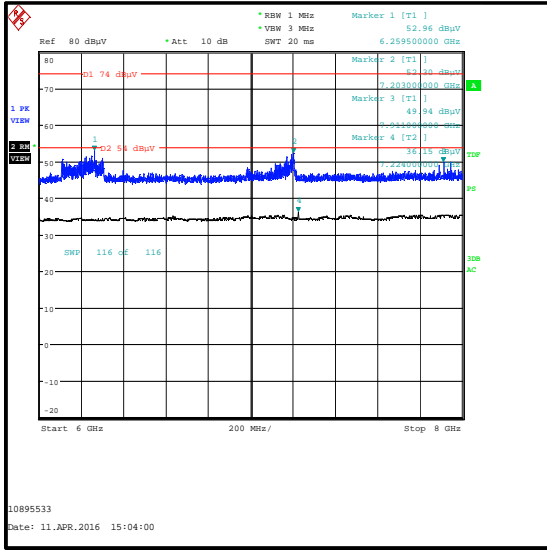


Restricted Band 4.5 GHz to 5.15 GHz

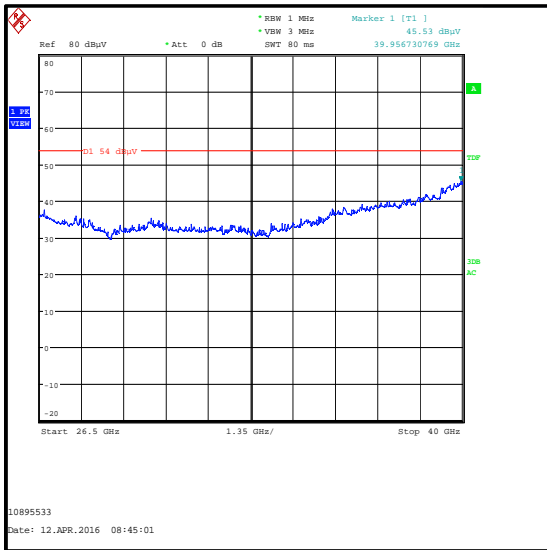


Restricted Band 5.35 GHz to 5.46 GHz

Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band operation) (continued)



Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band operation) (continued)



Transmitter Out of Band Radiated Emissions (5.725-5.85 GHz band operation) (continued)**Test Summary:**

| | | | |
|-----------------------------------|---------------------------------|--------------------|-----------------------------------|
| Test Engineers: | David Doyle & Andrew Edwards | Test Dates: | 15 March 2016 to 12 April 2016 |
| Test Sample Serial Number: | 92875 | | |

| | |
|--------------------------|---|
| FCC Reference: | Part 15.407(b)(4)(i),(7) & 15.209(a) |
| Test Method Used: | KDB 789033 II.G. & ANSI C63.10 Sections 6.3 and 6.6 |
| Frequency Range: | 1 GHz to 40 GHz |

Environmental Conditions:

| | |
|-------------------------------|----------|
| Temperature (°C): | 22 to 25 |
| Relative Humidity (%): | 31 to 36 |

Transmitter Out of Band Radiated Emissions (5.725-5.85 GHz band operation) (continued)**Note(s):**

1. FCC Part 15.407(b)(4)(i) states for transmitters operating in the band 5.725 to 5.85 GHz: all emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge. Part(b)(7) states the provisions of 15.205 apply e.g. restricted bands of operation
2. Pre-scans were performed with the EUT transmitting on middle channel in 5.15 to 5.25 GHz band. An inquiry was made to the FCC and the response was pre-scans could be performed in the band with the highest conducted output power and all final measurements should be performed on any emissions seen in each band.
3. The final measured value, for the given emission in the result tables, incorporates the calibrated antenna factor and cable loss.
4. Appropriate RF filters and attenuators were used during pre-scans and final measurements. Insertion losses were entered on the spectrum analyser as RF levels offsets.
5. *In accordance with KDB 789033 Section II.G.1.c) if the peak measurement is below the average limit, it is not necessary to perform a separate average measurement.
6. In accordance with KDB 789033 Section II.G.6.c) Method AD (vii), for average measurements on data rates where the EUT was transmitting <98% duty cycle, the duty cycle correction factor was added to the measured result. Refer to UL test report UL-RPT-RP10895558JD02G Section 5.2.4 for duty cycle correction factor calculations.
7. All other emissions shown on the pre-scan plot were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
8. The third harmonic emission was observed on the 12.75 to 18 GHz pre-scan plot when the EUT is transmitting on middle channel in the 5.15 to 5.25 GHz band. This harmonic was investigated in the 5.725 to 5.85 GHz band and emission levels were found to be below the measurement system noise floor on bottom and top channels.
9. Pre-scans above 1 GHz were performed in a fully anechoic chamber (Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 1.5 m above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Transmitter Out of Band Radiated Emissions (5.725-5.85 GHz band operation) (continued)**Results: Bottom Channel / EIRP**

| Frequency (MHz) | Antenna Polarity | Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|------------------|-------------|-------------|-------------|----------|
| 1630.839 | Horizontal | -45.9 | -27.0 | 18.9 | Complied |
| 1717.500 | Vertical | -40.4 | -27.0 | 13.4 | Complied |
| 1745.682 | Horizontal | -34.7 | -27.0 | 7.7 | Complied |
| 6110.942 | Horizontal | -40.7 | -27.0 | 13.7 | Complied |
| 7202.679 | Horizontal | -42.9 | -27.0 | 15.9 | Complied |
| 7223.759 | Horizontal | -46.7 | -27.0 | 19.7 | Complied |

Results: Bottom Channel / Field Strength / Peak

| Frequency (MHz) | Antenna Polarity | Peak Level (dB μ V/m) | Peak Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|------------------|---------------------------|---------------------------|-------------|----------|
| 1000.171 | Horizontal | 48.8 | 54.0* | 5.2 | Complied |
| 1048.426 | Horizontal | 49.6 | 54.0* | 4.4 | Complied |
| 1142.357 | Horizontal | 53.7 | 54.0* | 0.3 | Complied |
| 2251.086 | Horizontal | 50.1 | 54.0* | 3.9 | Complied |
| 2700.286 | Vertical | 52.4 | 54.0* | 1.6 | Complied |
| 2846.402 | Horizontal | 57.1 | 74.0 | 16.9 | Complied |

Results: Bottom Channel / Field Strength / Average

| Frequency (MHz) | Antenna Polarity | Level (dB μ V/m) | Duty Cycle correction (dB) | Corrected Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|------------------|----------------------|----------------------------|--------------------------------|----------------------|-------------|----------|
| 2700.286 | Vertical | 43.3 | 0.6 | 43.9 | 54.0 | 10.1 | Complied |

Transmitter Out of Band Radiated Emissions (5.725-5.85 GHz band operation) (continued)**Results: Middle Channel / EIRP**

| Frequency (MHz) | Antenna Polarity | Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|------------------|-------------|-------------|-------------|----------|
| 1630.839 | Horizontal | -45.9 | -27.0 | 18.9 | Complied |
| 1717.500 | Vertical | -40.4 | -27.0 | 13.4 | Complied |
| 1745.682 | Horizontal | -34.7 | -27.0 | 7.7 | Complied |
| 6110.942 | Horizontal | -40.7 | -27.0 | 13.7 | Complied |
| 7202.679 | Horizontal | -42.9 | -27.0 | 15.9 | Complied |
| 7223.759 | Horizontal | -46.7 | -27.0 | 19.7 | Complied |
| 17353.480 | Horizontal | -36.5 | -27.0 | 9.5 | Complied |

Results: Middle Channel / Field Strength / Peak

| Frequency (MHz) | Antenna Polarity | Peak Level (dB μ V/m) | Peak Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|------------------|---------------------------|---------------------------|-------------|----------|
| 1000.171 | Horizontal | 48.8 | 54.0* | 5.2 | Complied |
| 1048.426 | Horizontal | 49.6 | 54.0* | 4.4 | Complied |
| 1142.357 | Horizontal | 53.7 | 54.0* | 0.3 | Complied |
| 2251.086 | Horizontal | 50.1 | 54.0* | 3.9 | Complied |
| 2700.286 | Vertical | 52.4 | 54.0* | 1.6 | Complied |
| 2846.402 | Horizontal | 57.1 | 74.0 | 16.9 | Complied |

Results: Middle Channel / Field Strength / Average

| Frequency (MHz) | Antenna Polarity | Level (dB μ V/m) | Duty Cycle correction (dB) | Corrected Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|------------------|----------------------|----------------------------|--------------------------------|----------------------|-------------|----------|
| 2700.286 | Vertical | 43.3 | 0.6 | 43.9 | 54.0 | 10.1 | Complied |

Transmitter Out of Band Radiated Emissions (5.725-5.85 GHz band operation) (continued)**Results: Top Channel / EIRP**

| Frequency (MHz) | Antenna Polarity | Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|------------------|-------------|-------------|-------------|----------|
| 1630.839 | Horizontal | -45.9 | -27.0 | 18.9 | Complied |
| 1717.500 | Vertical | -40.4 | -27.0 | 13.4 | Complied |
| 1745.682 | Horizontal | -34.7 | -27.0 | 7.7 | Complied |
| 6110.942 | Horizontal | -40.7 | -27.0 | 13.7 | Complied |
| 7202.679 | Horizontal | -42.9 | -27.0 | 15.9 | Complied |
| 7223.759 | Horizontal | -46.7 | -27.0 | 19.7 | Complied |

Results: Top Channel / Field Strength / Peak

| Frequency (MHz) | Antenna Polarity | Peak Level (dB μ V/m) | Peak Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|------------------|---------------------------|---------------------------|-------------|----------|
| 1000.171 | Horizontal | 48.8 | 54.0* | 5.2 | Complied |
| 1048.426 | Horizontal | 49.6 | 54.0* | 4.4 | Complied |
| 1142.357 | Horizontal | 53.7 | 54.0* | 0.3 | Complied |
| 2251.086 | Horizontal | 50.1 | 54.0* | 3.9 | Complied |
| 2700.286 | Vertical | 52.4 | 54.0* | 1.6 | Complied |
| 2846.402 | Horizontal | 57.1 | 74.0 | 16.9 | Complied |

Results: Top Channel / Field Strength / Average

| Frequency (MHz) | Antenna Polarity | Level (dB μ V/m) | Duty Cycle correction (dB) | Corrected Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|------------------|----------------------|----------------------------|--------------------------------|----------------------|-------------|----------|
| 2700.286 | Vertical | 43.3 | 0.6 | 43.9 | 54.0 | 10.1 | Complied |

Transmitter Out of Band Radiated Emissions (continued)**Test Equipment Used:**

| Asset No. | Instrument | Manufacturer | Type No. | Serial No. | Date Calibration Due | Cal. Interval (Months) |
|-----------|------------------|-------------------|------------|-------------|-----------------------|------------------------|
| M1656 | Thermohygrometer | JM Handelpunkt | 30.5015.13 | Not stated | 23 Apr 2016 | 12 |
| K0002 | 3m RSE Chamber | Rainford EMC | N/A | N/A | 21 Dec 2016 | 12 |
| M1874 | Test Receiver | Rohde & Schwarz | ESU26 | 100553 | 12 Jun 2016 | 12 |
| M1630 | Test Receiver | Rohde & Schwarz | ESU40 | 100233 | 17 Feb 2017 | 12 |
| A1534 | Pre Amplifier | Hewlett Packard | 8449B | 3008A00405 | 19 Dec 2016 | 12 |
| A1785 | Pre Amplifier | Farran Technology | FLNA-28-30 | FTL 6483 | 12 Jan 2017 | 12 |
| A1818 | Antenna | EMCO | 3115 | 00075692 | 17 Dec 2016 | 12 |
| A253 | Antenna | Flann Microwave | 12240-20 | 128 | 17 Dec 2016 | 12 |
| A254 | Antenna | Flann Microwave | 14240-20 | 139 | 17 Dec 2016 | 12 |
| A255 | Antenna | Flann Microwave | 16240-20 | 519 | 17 Dec 2016 | 12 |
| A256 | Antenna | Flann Microwave | 18240-20 | 400 | 17 Dec 2016 | 12 |
| A436 | Antenna | Flann Microwave | 20240-20 | 330 | 19 Dec 2016 | 12 |
| A201 | Antenna | Flann Microwave | 22240-20 | 343 | 19 May 2016 | 36 |
| A1396 | Attenuator | Huber & Suhner | 6810.17.B | 757987 | 30 May 2016 | 12 |
| A2176 | High Pass Filter | AtlanTecRF | AFH-07000 | 800980 | 17 Apr 2016 | 12 |
| A2133 | Low Pass Filter | AtlanTecRF | AFL-04000 | JFB1006-002 | 26 Apr 2016 | 12 |
| S0537 | DC Power Supply | TTi | EL302D | 249928 | Calibrated before use | - |
| M1269 | Multimeter | Fluke | 179 | 90250210 | 26 May 2016 | 12 |

5.2.2. Transmitter Band Edge Radiated Emissions**Test Summary:**

| | | | |
|-----------------------------------|-------------|--------------------|----------------------------------|
| Test Engineer: | David Doyle | Test Dates: | 15 March 2016 & 31 March 2016 |
| Test Sample Serial Number: | 92875 | | |

| | |
|--------------------------|---|
| FCC Reference: | Parts 15.407(b)(1),(7), 15.205 & 15.209(a) |
| Test Method Used: | ANSI C63.10 Section 6.10 & KDB 789033 II.G. |

Environmental Conditions:

| | |
|-------------------------------|----------|
| Temperature (°C): | 22 to 25 |
| Relative Humidity (%): | 31 to 35 |

Note(s):

1. Band edge measurements were performed in the EUT modes that produce the highest power and the widest bandwidths. The modes were:
 - 802.11a - BPSK / 6 Mbps
 - 802.11a CDD - BPSK / 6 Mbps
 - 802.11n HT20 SISO - BPSK / MCS0 & 16QAM / MCS3
 - 802.11n HT40 SISO - BPSK / MCS0 & 16QAM / MCS3
 - 802.11n HT20 MIMO - BPSK / MCS0 & QPSK / MCS1
 - 802.11n HT40 MIMO - BPSK / MCS0 & 16QAM / MCS3
 - 802.11ac VHT80 SISO - QPSK / MCS2
 - 802.11ac VHT80 MIMO - BPSK / MCS0 & 16QAM / MCS3
2. Lower band edge measurements were performed with the EUT transmitting on the bottom or single channel. Upper band edge measurements were performed with the EUT transmitting on the top or single channel.
3. For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. However, there are restricted bands of operation below the lower band edge at 4.5-5.15 GHz and also above the upper band edge at 5.35-5.46 GHz therefore the provisions of FCC Part 15.205 apply.
4. Field strength measurements using peak and average detectors were performed in the restricted bands below 5.15 GHz and above 5.35 GHz. Field strength and EIRP results were found to be compliant with the restricted band limits and Part 15.407 out-of-band limits.

Transmitter Band Edge Radiated Emissions (continued)**Note(s):**

5. In accordance with KDB 789033 Section II.G.6.c) Method AD (vi), the average measurements were performed using a number of sweeps greater than or equal to the number of sweeps calculated below:
 - 802.11a - BPSK / 6 Mbps – 116 sweeps
 - 802.11a CDD - BPSK / 6 Mbps – 115 sweeps
 - 802.11n HT20 SISO - BPSK / MCS0 – 117 sweeps
 - 802.11n HT20 SISO – 16QAM / MCS3 – 165 sweeps
 - 802.11n HT40 SISO - BPSK / MCS0 – 134 sweeps
 - 802.11n HT40 SISO – 16QAM / MCS3 – 206 sweeps
 - 802.11n HT20 MIMO - BPSK / MCS0 – 133 sweeps
 - 802.11n HT20 MIMO - QPSK / MCS1 – 164 sweeps
 - 802.11n HT40 MIMO - BPSK / MCS0 – 158 sweeps
 - 802.11n HT40 MIMO – 16QAM / MCS3 – 272 sweeps
 - 802.11ac VHT80 SISO - QPSK / MCS2 – 247 sweeps
 - 802.11ac VHT80 MIMO - BPSK / MCS0 – 161 sweeps
 - 802.11ac VHT80 MIMO – 16QAM / MCS3 – 323 sweeps
6. In accordance with KDB 789033 Section II.G.6.c) Method AD (vii), for average measurements on data rates where the EUT was transmitting <98% duty cycle, the duty cycle correction factor was added to the measured result. Refer to UL test report UL-RPT-RP10895558JD02G Section 5.2.4 for duty cycle correction factor calculations.
7. * Plot illustrates a limit line at 74.0 dB μ V/m instead of 54.0 dB μ V/m. The correct limit has been applied on the results table.

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11a / 20 MHz / BPSK / 6 Mbps / Peak**

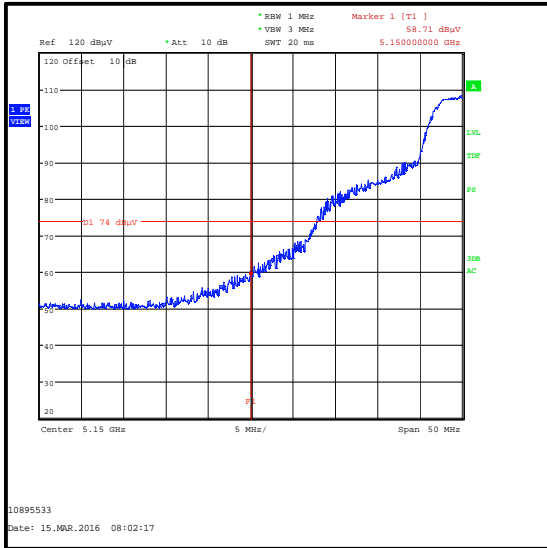
| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------|-------------|----------|
| 5150 | 58.7 | 74.0 | 15.3 | Complied |
| 5350 | 50.8 | 74.0 | 23.2 | Complied |

Results: 802.11a / 20 MHz / BPSK / 6 Mbps / Average

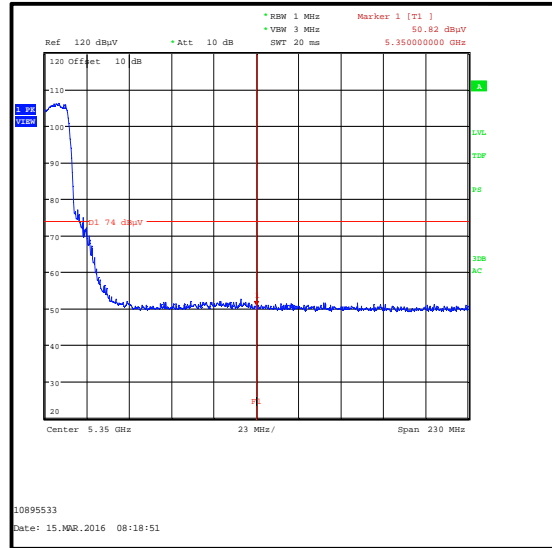
| Frequency (MHz) | Level (dB μ V/m) | Duty Cycle correction (dB) | Corrected Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------------|--------------------------------|----------------------|-------------|----------|
| 5150 | 40.6 | 0.6 | 41.2 | 54.0 | 12.8 | Complied |
| 5350 | 39.8 | 0.6 | 40.4 | 54.0 | 13.6 | Complied |

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)

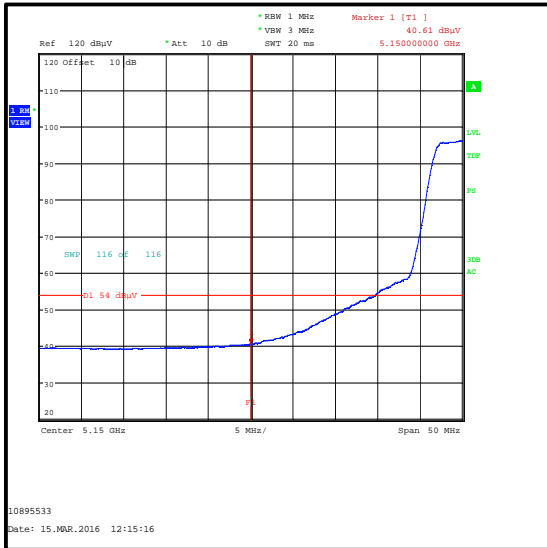
Results: 802.11a / 20 MHz / BPSK / 6 Mbps



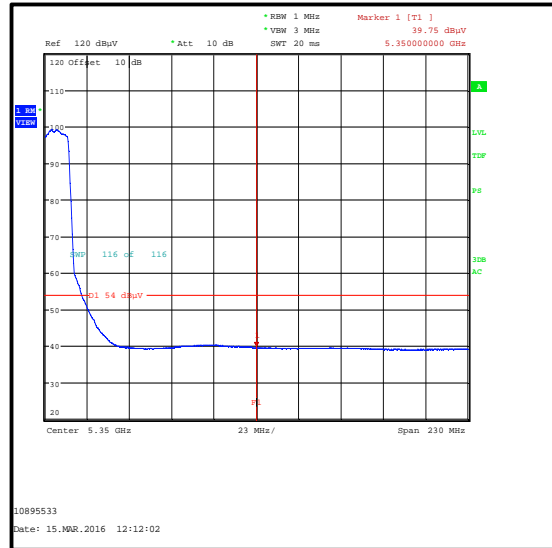
Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Lower Band Edge Average Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11a / 20 MHz / CDD / BPSK / 6 Mbps / Peak**

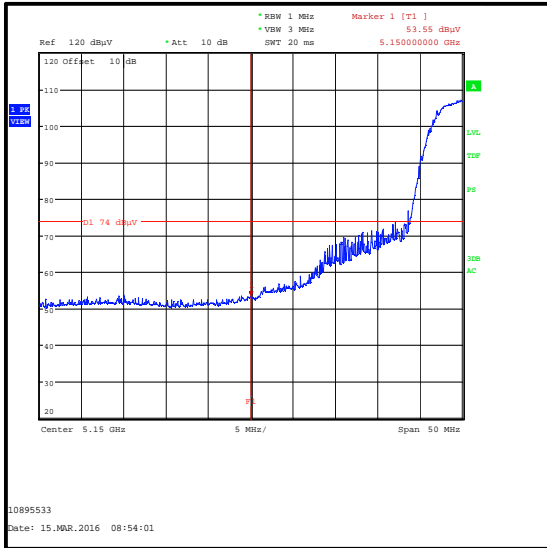
| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------|-------------|----------|
| 5150 | 53.6 | 74.0 | 20.4 | Complied |
| 5350 | 49.9 | 74.0 | 24.1 | Complied |

Results: 802.11a / 20 MHz / CDD / BPSK / 6 Mbps / Average

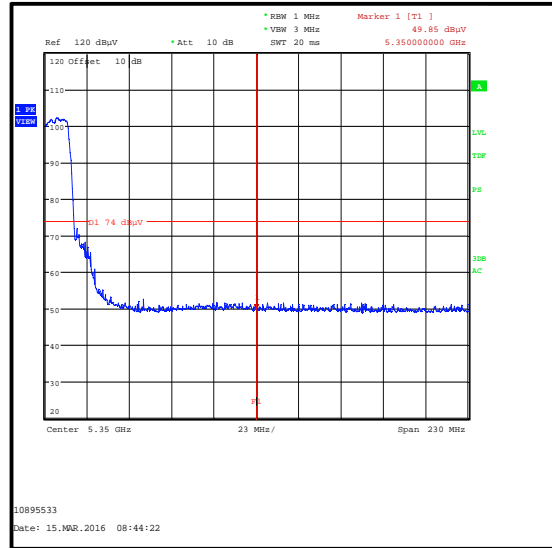
| Frequency (MHz) | Level (dB μ V/m) | Duty Cycle correction (dB) | Corrected Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------------|--------------------------------|----------------------|-------------|----------|
| 5150 | 41.3 | 0.6 | 41.9 | 54.0 | 12.1 | Complied |
| 5350 | 39.6 | 0.6 | 40.2 | 54.0 | 13.8 | Complied |

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)

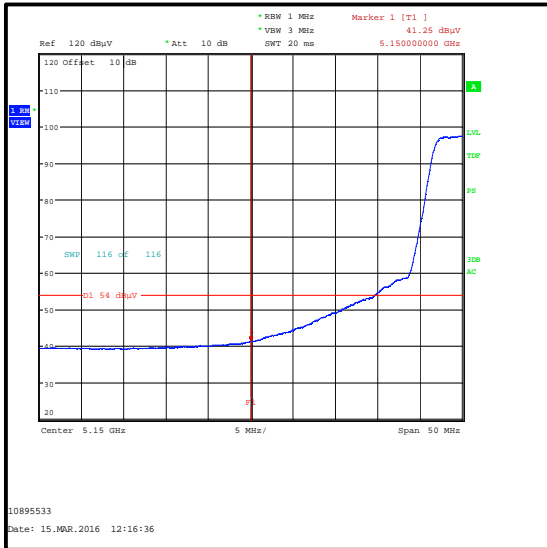
Results: 802.11a / 20 MHz / CDD / BPSK / 6 Mbps



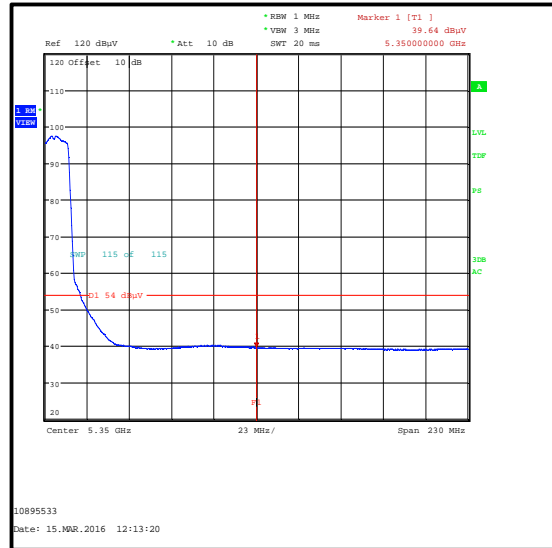
Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Lower Band Edge Average Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11n / 20 MHz / SISO / BPSK / MCS0 / Peak**

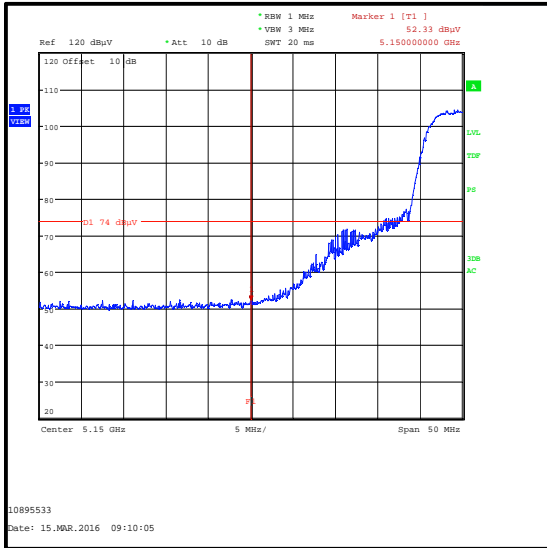
| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------|-------------|----------|
| 5150 | 52.3 | 74.0 | 21.7 | Complied |
| 5350 | 50.9 | 74.0 | 23.1 | Complied |

Results: 802.11n / 20 MHz / SISO / BPSK / 6.5 Mbps / MCS0 / Average

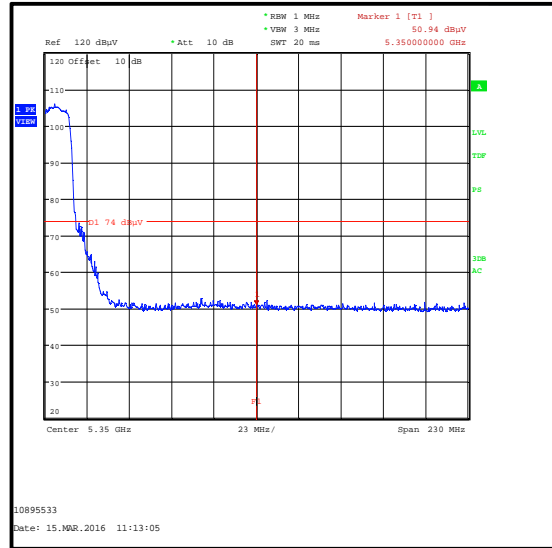
| Frequency (MHz) | Level (dB μ V/m) | Duty Cycle correction (dB) | Corrected Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------------|--------------------------------|----------------------|-------------|----------|
| 5150 | 40.2 | 0.6 | 40.8 | 54.0 | 13.2 | Complied |
| 5350 | 39.7 | 0.6 | 40.3 | 54.0 | 13.7 | Complied |

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)

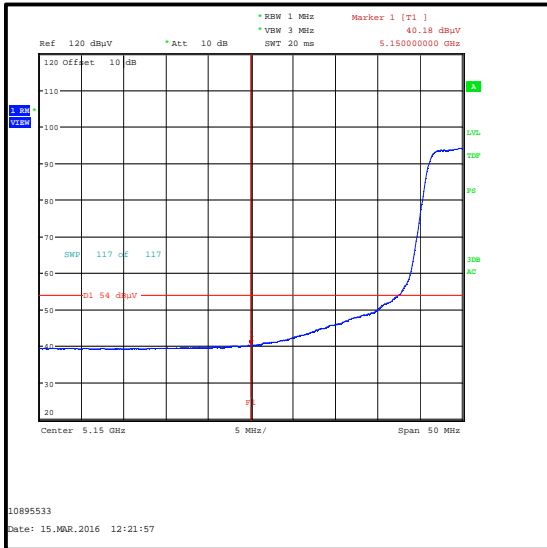
Results: 802.11n / 20 MHz / SISO / BPSK / MCS0



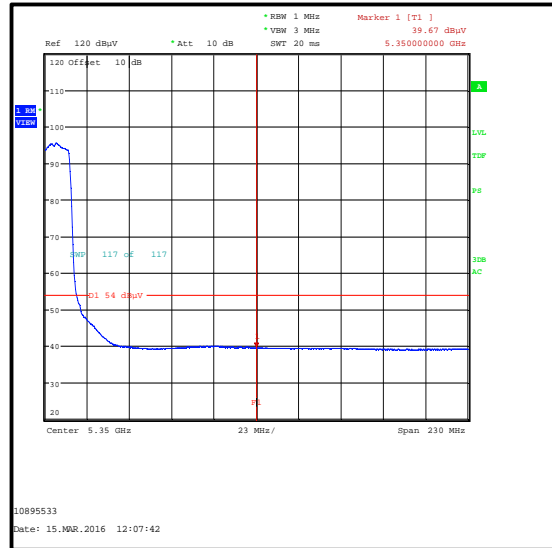
Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Lower Band Edge Average Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11n / 20 MHz / SISO / 16QAM / MCS3 / Peak**

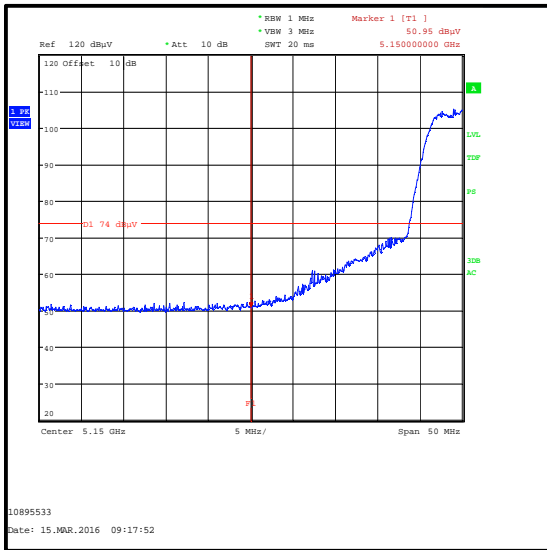
| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------|-------------|----------|
| 5150 | 51.0 | 74.0 | 23.0 | Complied |
| 5350 | 50.4 | 74.0 | 23.6 | Complied |

Results: 802.11n / 20 MHz / SISO / 16QAM / MCS3 / Average

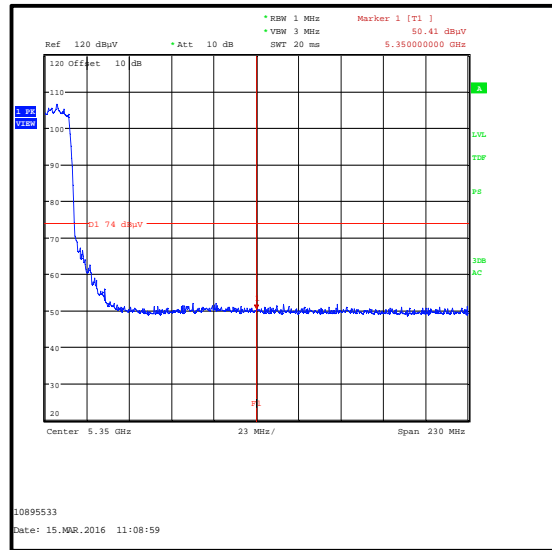
| Frequency (MHz) | Level (dB μ V/m) | Duty Cycle correction (dB) | Corrected Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------------|--------------------------------|----------------------|-------------|----------|
| 5150 | 40.0 | 2.0 | 42.0 | 54.0 | 12.0 | Complied |
| 5350 | 39.6 | 2.0 | 41.6 | 54.0 | 12.4 | Complied |

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)

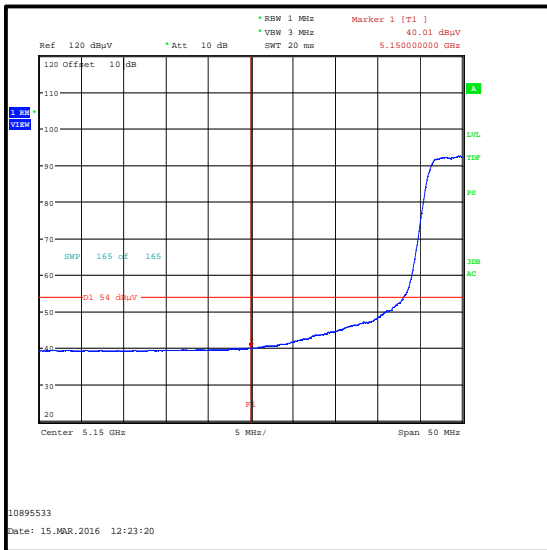
Results: 802.11n / 20 MHz / SISO / 16QAM / MCS3



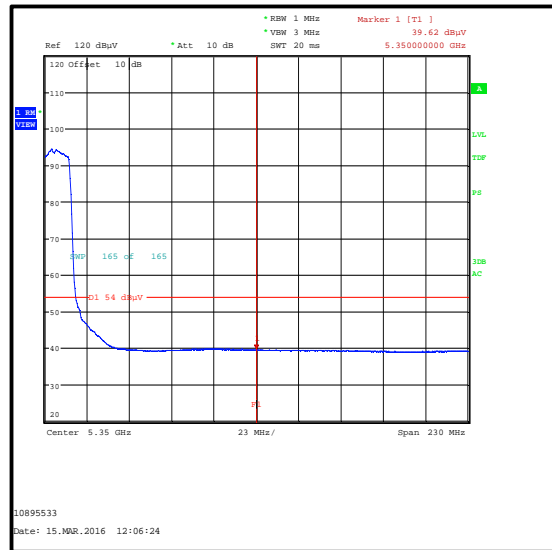
Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Lower Band Edge Average Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11n / 40 MHz / SISO / BPSK / MCS0 / Peak**

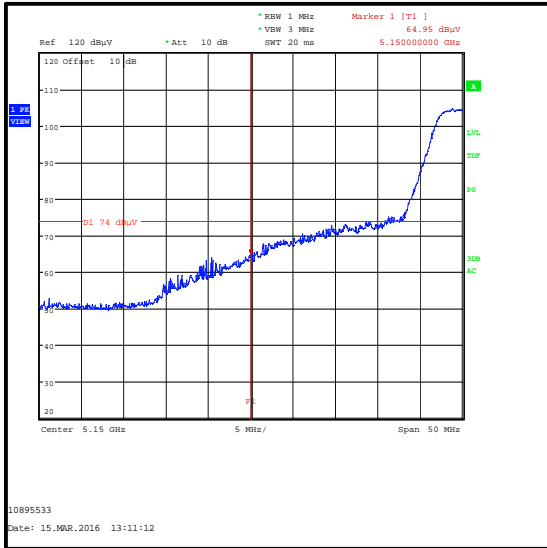
| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------|-------------|----------|
| 5150 | 65.0 | 74.0 | 9.0 | Complied |
| 5350 | 50.2 | 74.0 | 23.8 | Complied |

Results: 802.11n / 40 MHz / SISO / BPSK / MCS0 / Average

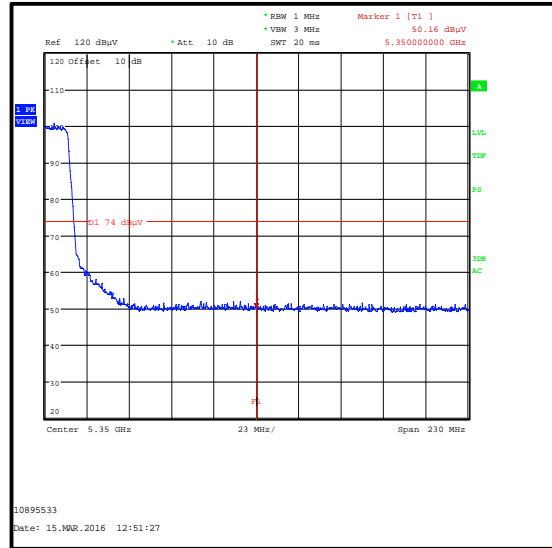
| Frequency (MHz) | Level (dB μ V/m) | Duty Cycle correction (dB) | Corrected Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------------|--------------------------------|----------------------|-------------|----------|
| 5150 | 45.4 | 1.2 | 46.6 | 54.0 | 7.4 | Complied |
| 5350 | 39.5 | 1.2 | 40.7 | 54.0 | 13.3 | Complied |

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)

Results: 802.11n / 40 MHz / SISO / BPSK / MCS0



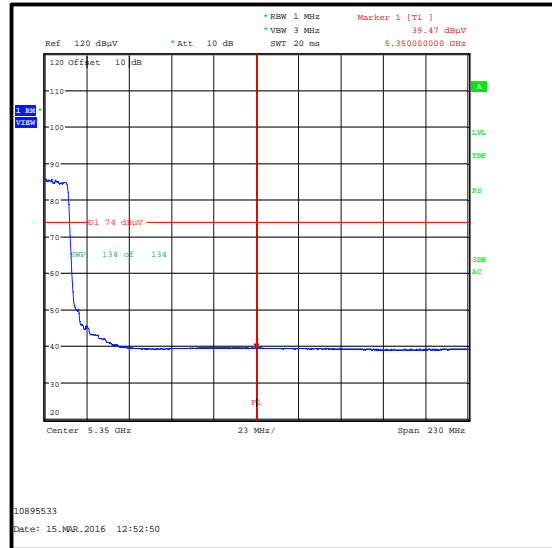
Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Lower Band Edge Average Measurement



Upper Band Edge Average Measurement

** See Note 7*

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11n / 40 MHz / SISO / 16QAM / MCS3 / Peak**

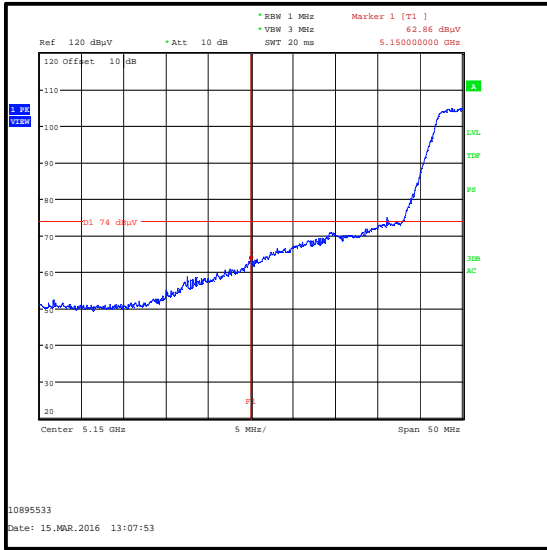
| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------|-------------|----------|
| 5150 | 62.9 | 74.0 | 11.1 | Complied |
| 5350 | 50.8 | 74.0 | 23.2 | Complied |

Results: 802.11n / 40 MHz / SISO / 16QAM / MCS3 / Average

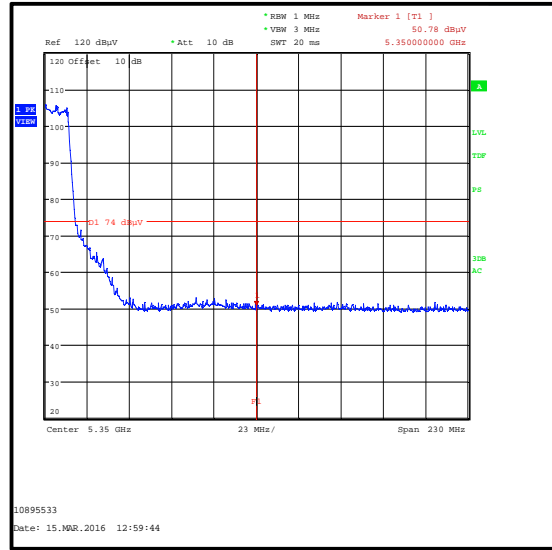
| Frequency (MHz) | Level (dB μ V/m) | Duty Cycle correction (dB) | Corrected Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------------|--------------------------------|----------------------|-------------|----------|
| 5150 | 45.2 | 3.1 | 48.3 | 54.0 | 5.7 | Complied |
| 5350 | 39.6 | 3.1 | 42.7 | 54.0 | 11.3 | Complied |

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)

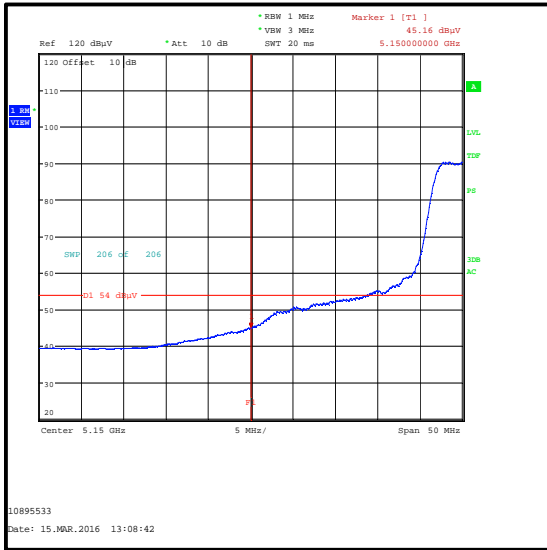
Results: 802.11n / 40 MHz / SISO / 16QAM / MCS3



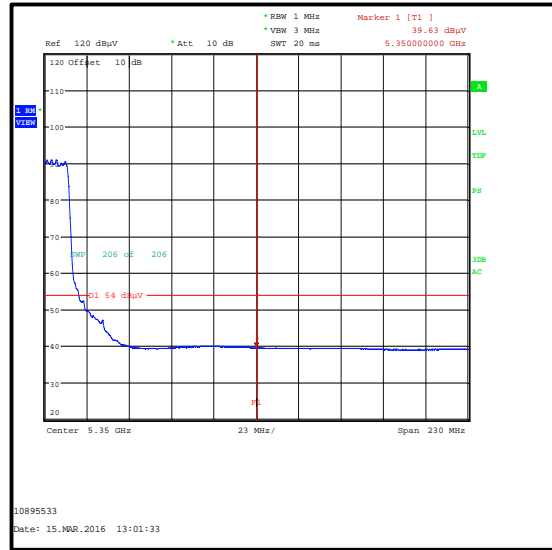
Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Lower Band Edge Average Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11n / 20 MHz / MIMO / BPSK / MCS0 / Peak**

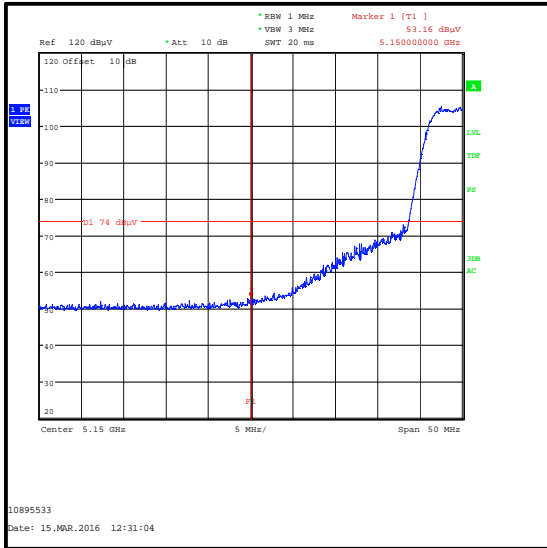
| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------|-------------|----------|
| 5150 | 53.2 | 74.0 | 20.8 | Complied |
| 5350 | 50.9 | 74.0 | 23.1 | Complied |

Results: 802.11n / 20 MHz / MIMO / BPSK / MCS0 / Average

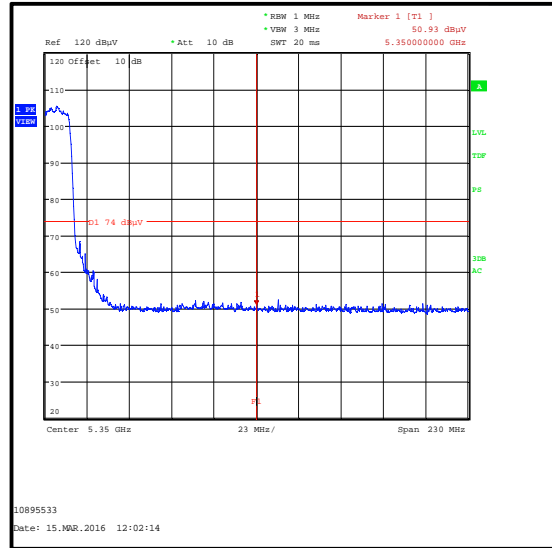
| Frequency (MHz) | Level (dB μ V/m) | Duty Cycle correction (dB) | Corrected Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------------|--------------------------------|----------------------|-------------|----------|
| 5150 | 40.3 | 0.6 | 40.9 | 54.0 | 13.1 | Complied |
| 5350 | 39.7 | 0.6 | 40.3 | 54.0 | 13.7 | Complied |

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)

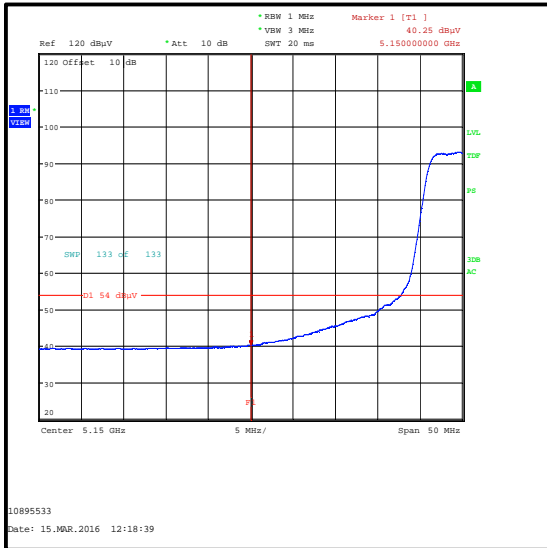
Results: 802.11n / 20 MHz / MIMO / BPSK / MCS0



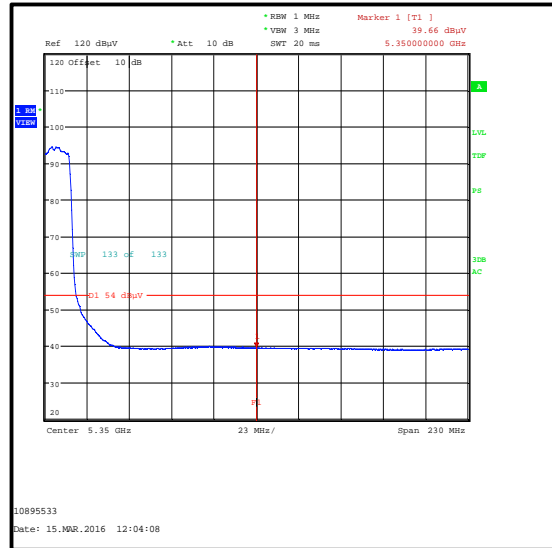
Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Lower Band Edge Average Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11n / 20 MHz / MIMO / QPSK / MCS1 / Peak**

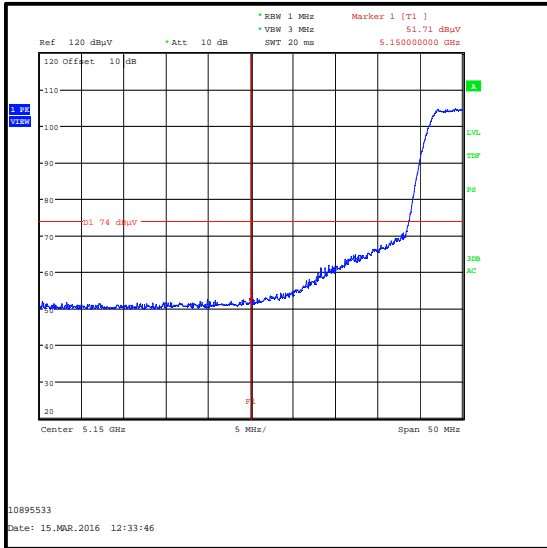
| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------|-------------|----------|
| 5150 | 51.7 | 74.0 | 22.3 | Complied |
| 5350 | 51.5 | 74.0 | 22.5 | Complied |

Results: 802.11n / 20 MHz / MIMO / QPSK / MCS1 / Average

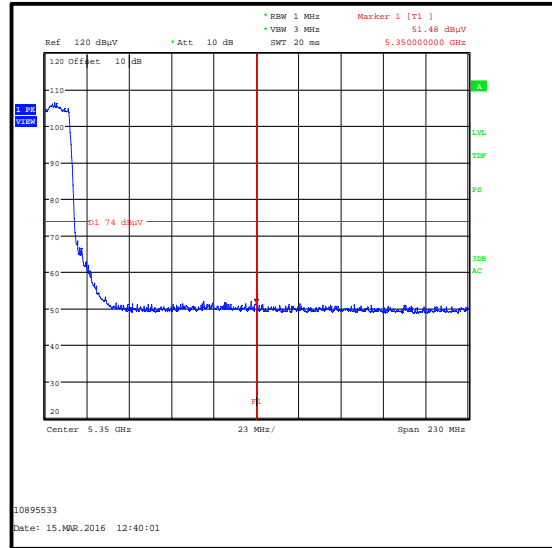
| Frequency (MHz) | Level (dB μ V/m) | Duty Cycle correction (dB) | Corrected Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------------|--------------------------------|----------------------|-------------|----------|
| 5150 | 40.2 | 1.1 | 41.3 | 54.0 | 12.7 | Complied |
| 5350 | 39.6 | 1.1 | 40.7 | 54.0 | 13.3 | Complied |

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)

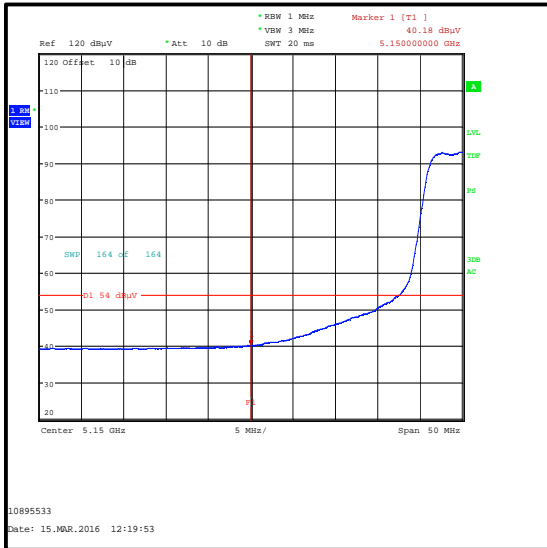
Results: 802.11n / 20 MHz / MIMO / QPSK / MCS1



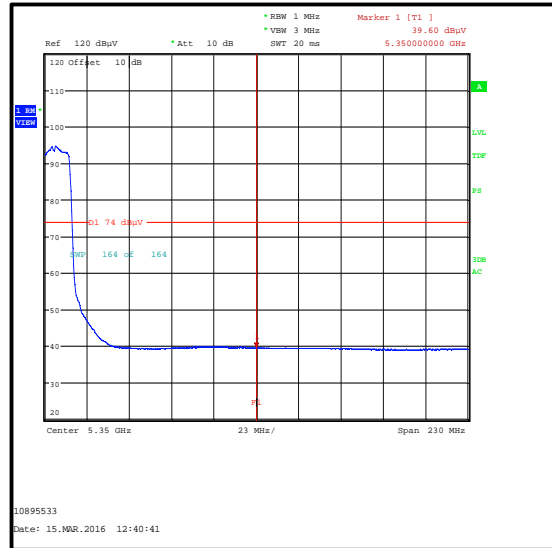
Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Lower Band Edge Average Measurement



Upper Band Edge Average Measurement

** See Note 7*

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11n / 40 MHz / MIMO / BPSK / MCS0 / Peak**

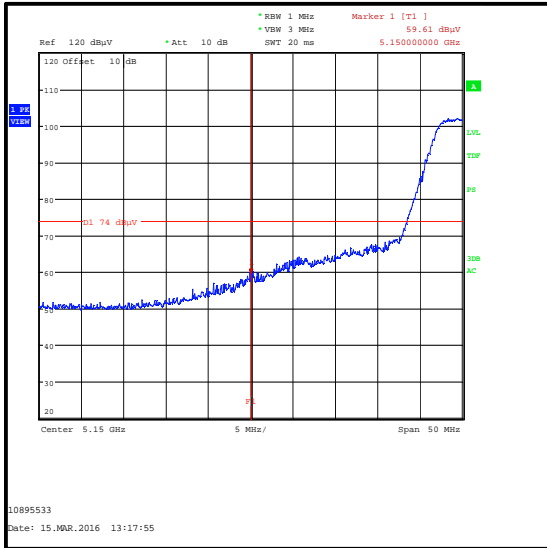
| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------|-------------|----------|
| 5150 | 59.6 | 74.0 | 14.4 | Complied |
| 5350 | 49.8 | 74.0 | 24.2 | Complied |

Results: 802.11n / 40 MHz / MIMO / BPSK / MCS0 / Average

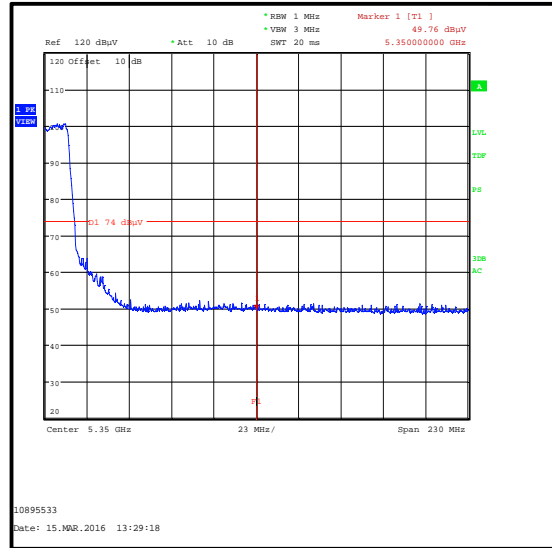
| Frequency (MHz) | Level (dB μ V/m) | Duty Cycle correction (dB) | Corrected Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------------|--------------------------------|----------------------|-------------|----------|
| 5150 | 43.1 | 1.2 | 44.3 | 54.0 | 9.7 | Complied |
| 5350 | 39.6 | 1.2 | 40.8 | 54.0 | 13.2 | Complied |

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)

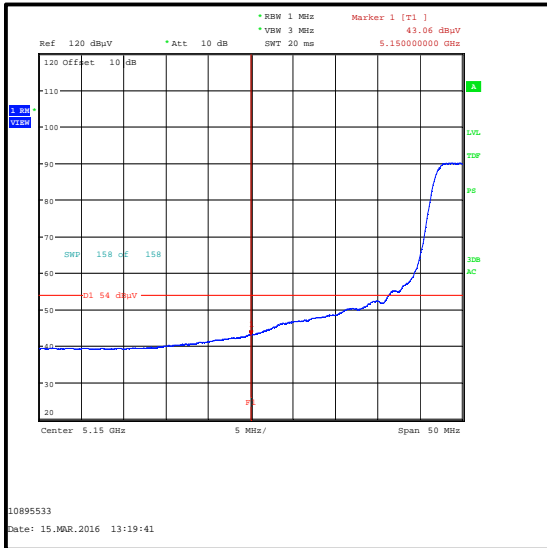
Results: 802.11n / 40 MHz / MIMO / BPSK / MCS0



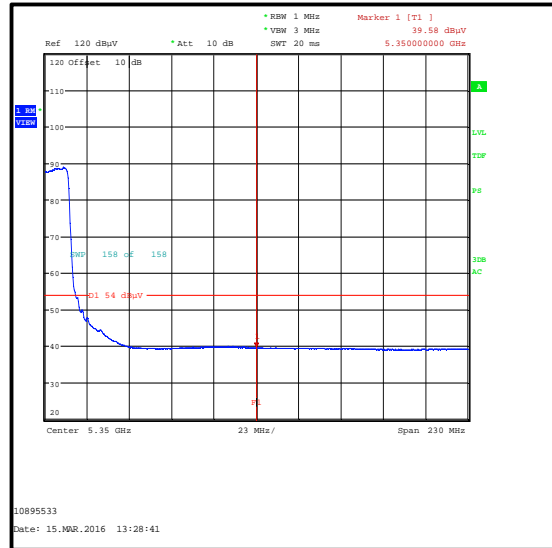
Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Lower Band Edge Average Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11n / 40 MHz / MIMO / 16QAM / MCS3 / Peak**

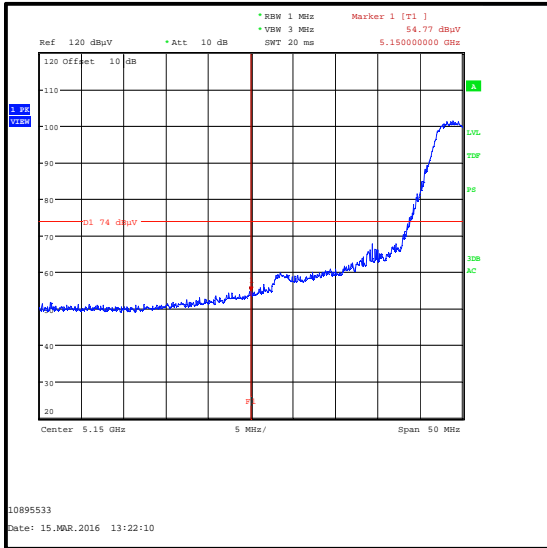
| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------|-------------|----------|
| 5150 | 54.8 | 74.0 | 19.2 | Complied |
| 5350 | 50.0 | 74.0 | 24.0 | Complied |

Results: 802.11n / 40 MHz / MIMO / 16QAM / MCS3 / Average

| Frequency (MHz) | Level (dB μ V/m) | Duty Cycle correction (dB) | Corrected Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------------|--------------------------------|----------------------|-------------|----------|
| 5150 | 41.2 | 3.1 | 44.3 | 54.0 | 9.7 | Complied |
| 5350 | 39.6 | 3.1 | 42.7 | 54.0 | 11.3 | Complied |

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)

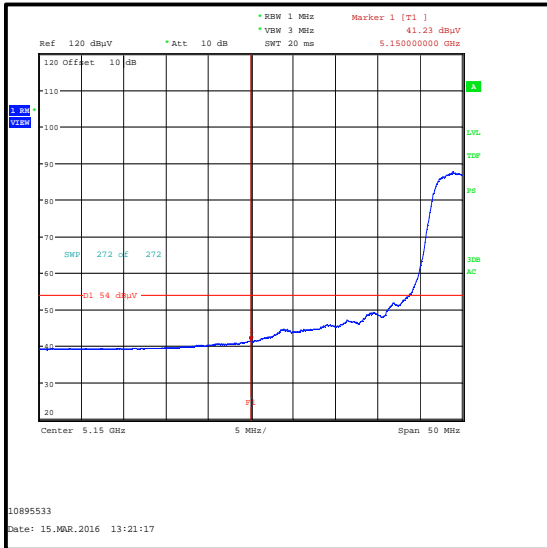
Results: 802.11n / 40 MHz / MIMO / 16QAM / MCS3



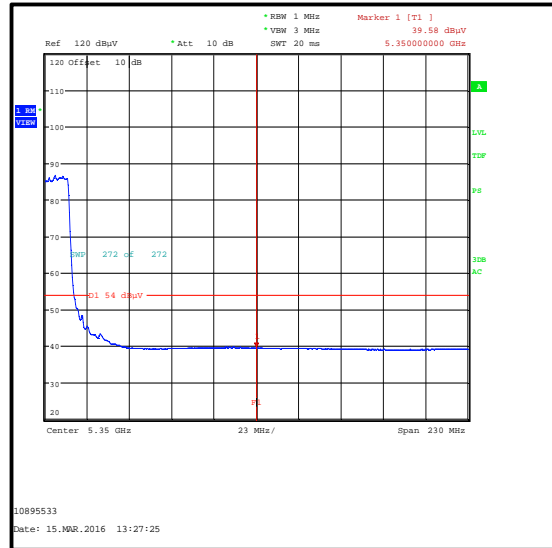
Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Lower Band Edge Average Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11ac / 80 MHz / SISO / QPSK / MCS2 / Peak**

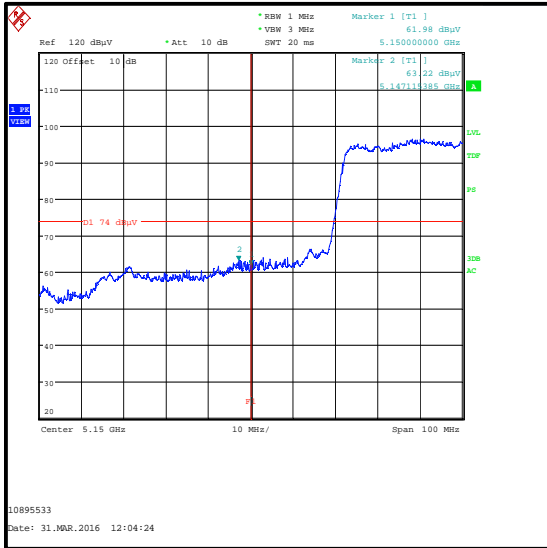
| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------|-------------|----------|
| 5147.115 | 63.2 | 74.0 | 10.8 | Complied |
| 5150 | 62.0 | 74.0 | 12.0 | Complied |
| 5350 | 50.3 | 74.0 | 23.7 | Complied |
| 5392.019 | 52.4 | 74.0 | 21.6 | Complied |

Results: 802.11ac / 80 MHz / SISO / QPSK / MCS2 / Average

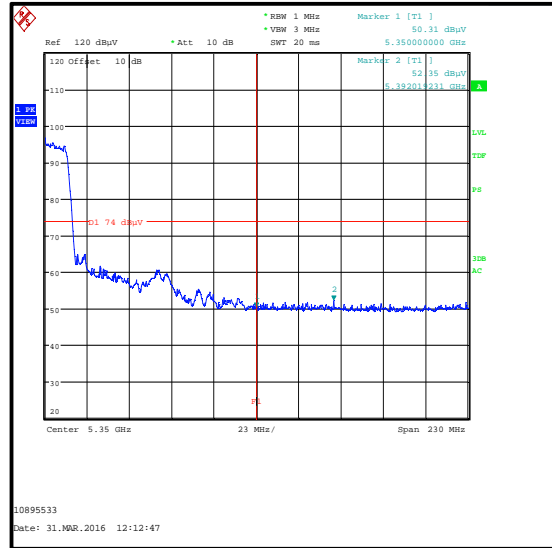
| Frequency (MHz) | Level (dB μ V/m) | Duty Cycle correction (dB) | Corrected Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------------|--------------------------------|----------------------|-------------|----------|
| 5150 | 45.6 | 3.9 | 49.5 | 54.0 | 4.5 | Complied |
| 5350 | 39.5 | 3.9 | 43.4 | 54.0 | 10.6 | Complied |

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)

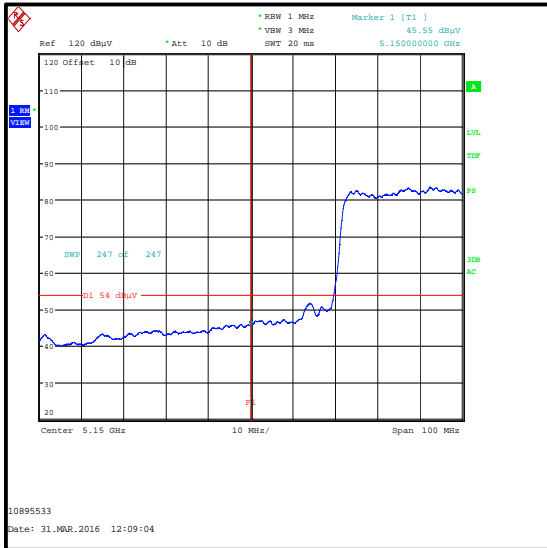
Results: 802.11ac / 80 MHz / SISO / QPSK / MCS2



Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Lower Band Edge Average Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11ac / 80 MHz / MIMO / BPSK / MCS0 / Peak**

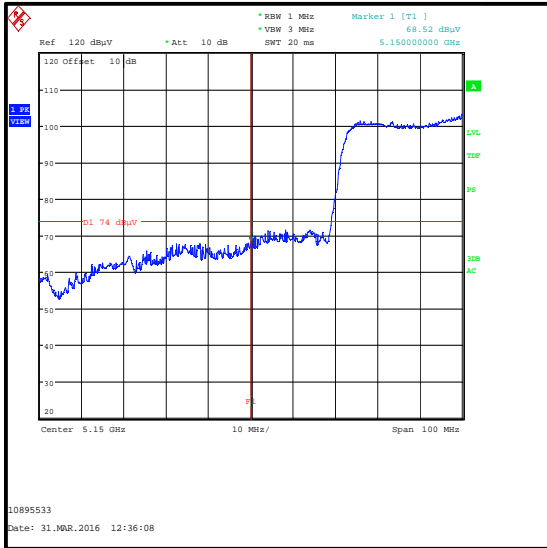
| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------|-------------|----------|
| 5150 | 68.5 | 74.0 | 5.5 | Complied |
| 5350 | 53.1 | 74.0 | 20.9 | Complied |

Results: 802.11ac / 80 MHz / MIMO / BPSK / MCS0 / Average

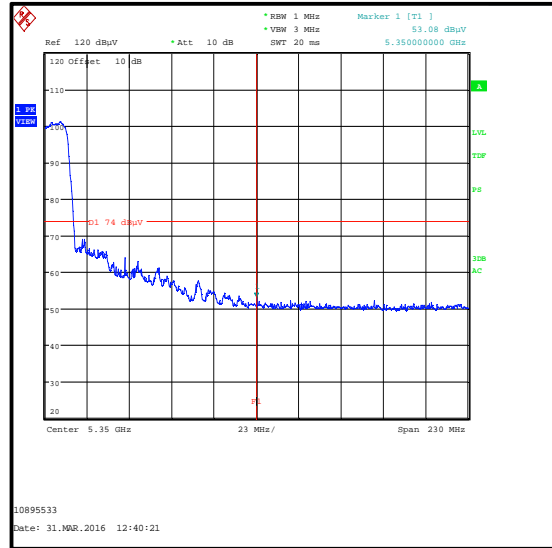
| Frequency (MHz) | Level (dB μ V/m) | Duty Cycle correction (dB) | Corrected Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------------|--------------------------------|----------------------|-------------|----------|
| 5150 | 50.9 | 2.1 | 53.0 | 54.0 | 1.0 | Complied |
| 5350 | 40.0 | 2.1 | 42.1 | 54.0 | 11.9 | Complied |

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)

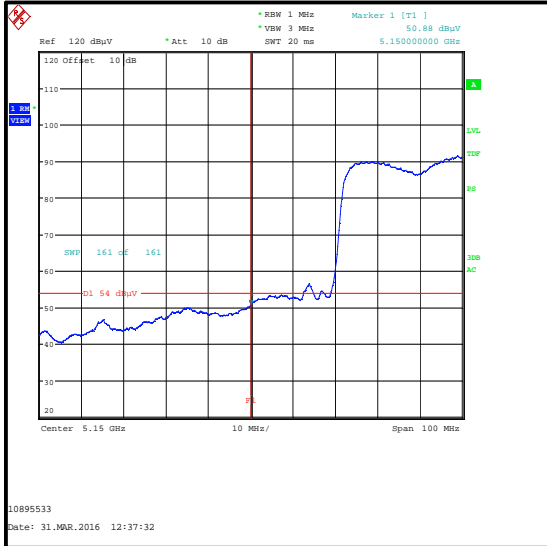
Results: 802.11ac / 80 MHz / MIMO / BPSK / MCS0



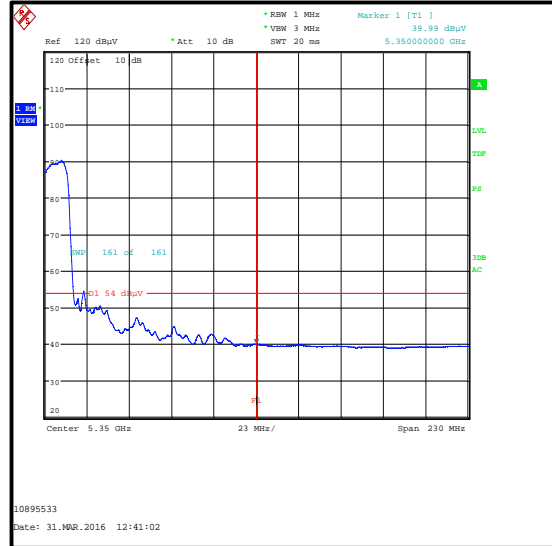
Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Lower Band Edge Average Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11ac / 80 MHz / MIMO / 16QAM / MCS3 / Peak**

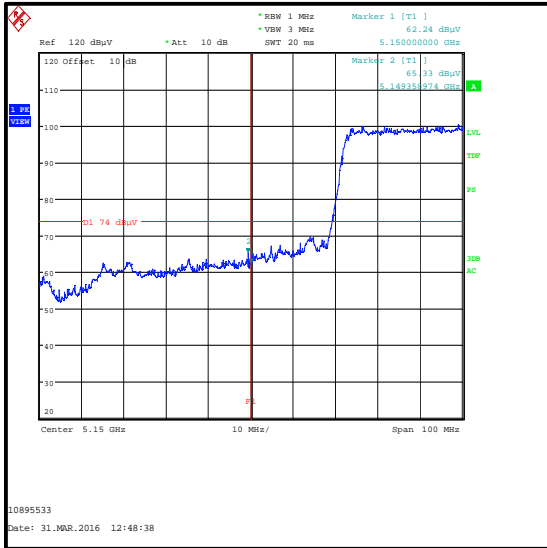
| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------|-------------|----------|
| 5149.359 | 65.3 | 74.0 | 8.7 | Complied |
| 5150 | 62.2 | 74.0 | 11.8 | Complied |
| 5350 | 51.9 | 74.0 | 22.1 | Complied |

Results: 802.11ac / 80 MHz / MIMO / 16QAM / MCS3 / Average

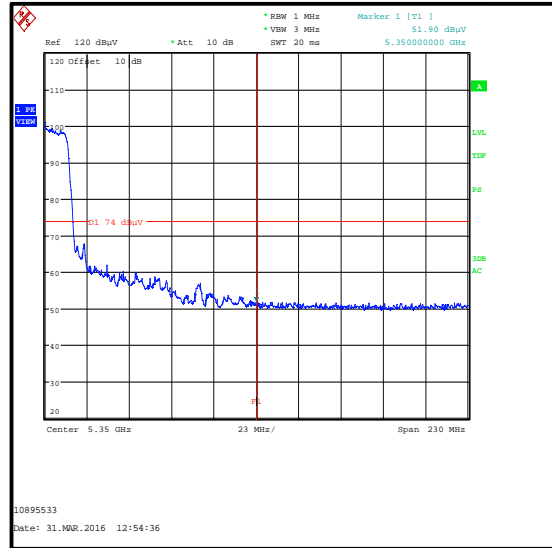
| Frequency (MHz) | Level (dB μ V/m) | Duty Cycle correction (dB) | Corrected Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------------|--------------------------------|----------------------|-------------|----------|
| 5150 | 45.6 | 4.5 | 50.1 | 54.0 | 3.9 | Complied |
| 5350 | 39.6 | 4.5 | 44.1 | 54.0 | 9.9 | Complied |

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)

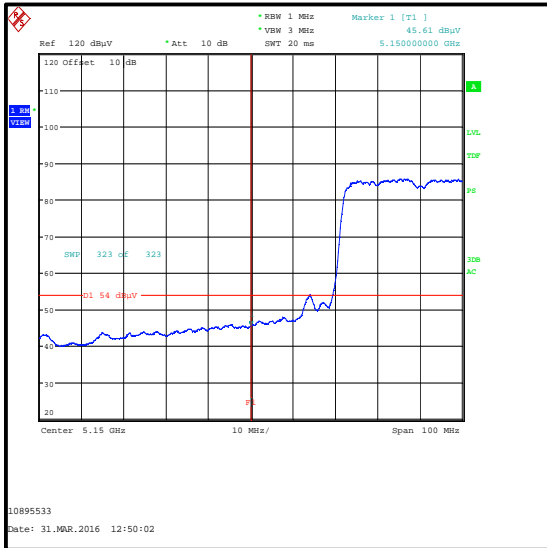
Results: 802.11ac / 80 MHz / MIMO / 16QAM / MCS3



Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Lower Band Edge Average Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band)**Test Summary:**

| | | | |
|-----------------------------------|---------------------------------|--------------------|----------------------------------|
| Test Engineers: | David Doyle & Andrew Edwards | Test Dates: | 31 March 2016 & 05 April 2016 |
| Test Sample Serial Number: | 92875 | | |

| | |
|--------------------------|---|
| FCC Reference: | Parts 15.407(b)(4),(7), 15.205 & 15.209(a) |
| Test Method Used: | ANSI C63.10 Section 6.10.4 & KDB 789033 II.G. |

Environmental Conditions:

| | |
|-------------------------------|----------|
| Temperature (°C): | 22 to 23 |
| Relative Humidity (%): | 31 to 36 |

Note(s):

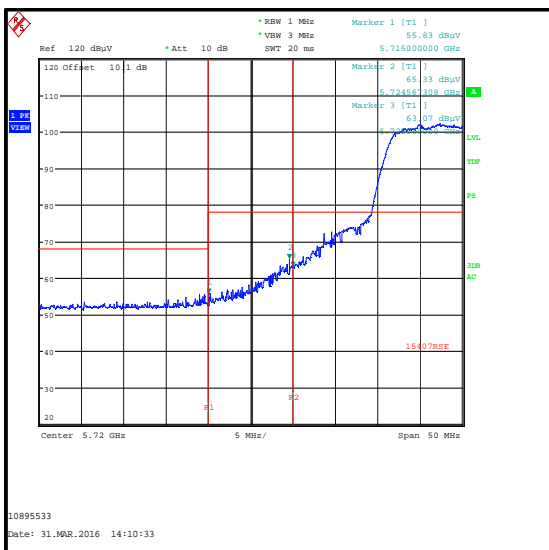
- Band edge measurements were performed in the EUT modes that produce the highest power and the widest bandwidths. The modes were:
 - 802.11a - BPSK / 6 Mbps
 - 802.11a CDD - BPSK / 6 Mbps
 - 802.11n HT20 SISO - BPSK / 6.5 Mbps / MCS0 & 16QAM / MCS3
 - 802.11n HT40 SISO - BPSK / MCS0 & 16QAM / MCS3
 - 802.11n HT20 MIMO - BPSK / MCS0 & QPSK / MCS1
 - 802.11n HT40 MIMO - BPSK / MCS0 & 16QAM / MCS3
 - 802.11ac VHT80 SISO - QPSK / MCS2
 - 802.11ac VHT80 MIMO - BPSK / MCS0 & 16QAM / MCS3
- Lower band edge measurements were performed with the EUT transmitting on the bottom or single channel. Upper band edge measurements were performed with the EUT transmitting on the top or single channel.
- For completeness, results are also shown as EIRP in dBm and also as field strength in dB μ V/m. Measured field strength was converted to EIRP in accordance with KDB 789033 G.2.d(iii) using a conversion factor of 95.2.
- An amendment of Part 15.407(b)(4) was published on 6th April 2016 with effective date 6th May 2016. As testing was performed before that date, the former and stricter emission limits were applied to show compliance at band edges. Compliance with those limits is deemed worst case. Therefore the EUT will also comply with the new emission limits. Please refer to Appendix 1 for a comparison graph between the new and former emission limits.

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band operation) (continued)

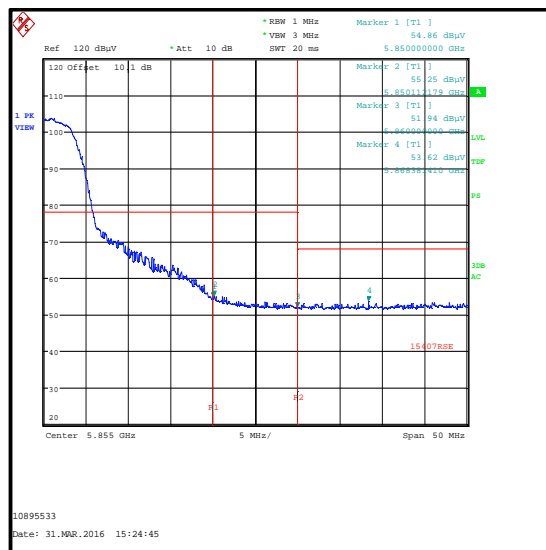
Results: 802.11a / 20 MHz / BPSK / 6 Mbps / Peak

| Frequency (MHz) | Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|-------------|-------------|-------------|----------|
| 5715 | -39.4 | -27.0 | 12.4 | Complied |
| 5724.567 | -29.9 | -17.0 | 12.9 | Complied |
| 5725 | -32.1 | -17.0 | 15.1 | Complied |
| 5850 | -40.3 | -17.0 | 23.3 | Complied |
| 5850.112 | -39.9 | -17.0 | 22.9 | Complied |
| 5860 | -43.3 | -27.0 | 16.3 | Complied |
| 5868.381 | -41.6 | -27.0 | 14.6 | Complied |

| Frequency (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Result |
|-----------------|----------------|----------------|-------------|----------|
| 5715 | 55.8 | 68.2 | 12.4 | Complied |
| 5724.567 | 65.3 | 78.2 | 12.9 | Complied |
| 5725 | 63.1 | 78.2 | 15.1 | Complied |
| 5850 | 54.9 | 78.2 | 23.3 | Complied |
| 5850.112 | 55.3 | 78.2 | 22.9 | Complied |
| 5860 | 51.9 | 68.2 | 16.3 | Complied |
| 5868.381 | 53.6 | 68.2 | 14.6 | Complied |



Lower Band Edge Measurement



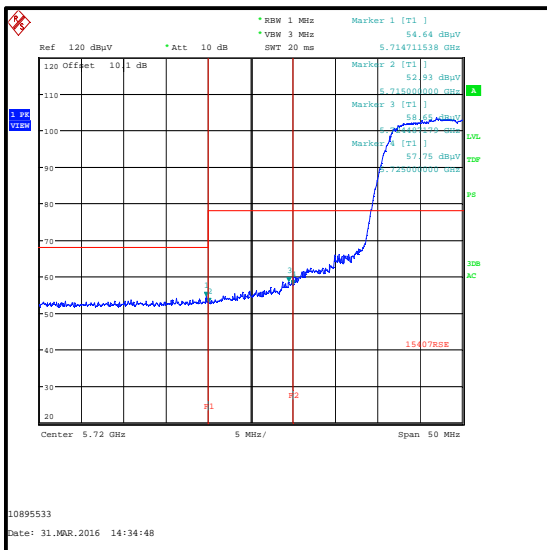
Upper Band Edge Measurement

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band operation) (continued)

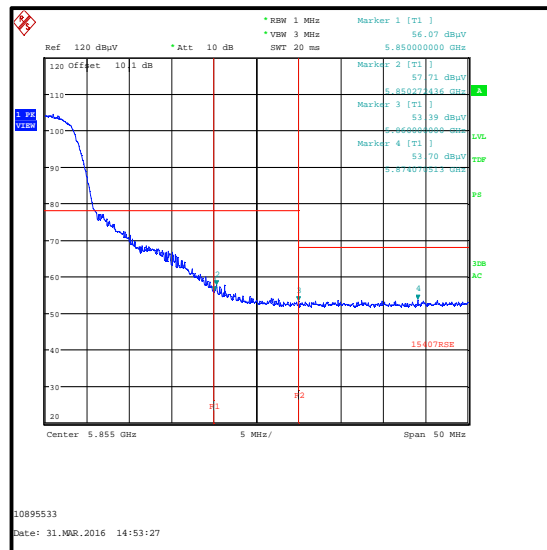
Results: 802.11a / 20 MHz / CDD / BPSK / 6 Mbps / Peak

| Frequency (MHz) | Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|-------------|-------------|-------------|----------|
| 5714.712 | -40.6 | -27.0 | 13.6 | Complied |
| 5715 | -42.3 | -27.0 | 15.3 | Complied |
| 5724.487 | -36.5 | -17.0 | 19.5 | Complied |
| 5725 | -37.4 | -17.0 | 20.4 | Complied |
| 5850 | -39.1 | -17.0 | 22.1 | Complied |
| 5850.272 | -37.5 | -17.0 | 20.5 | Complied |
| 5860 | -41.8 | -27.0 | 14.8 | Complied |
| 5874.071 | -41.5 | -27.0 | 14.5 | Complied |

| Frequency (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Result |
|-----------------|----------------|----------------|-------------|----------|
| 5714.712 | 54.6 | 68.2 | 13.6 | Complied |
| 5715 | 52.9 | 68.2 | 15.3 | Complied |
| 5724.487 | 58.7 | 78.2 | 19.5 | Complied |
| 5725 | 57.8 | 78.2 | 20.4 | Complied |
| 5850 | 56.1 | 78.2 | 22.1 | Complied |
| 5850.272 | 57.7 | 78.2 | 20.5 | Complied |
| 5860 | 53.4 | 68.2 | 14.8 | Complied |
| 5874.071 | 53.7 | 68.2 | 14.5 | Complied |



Lower Band Edge Measurement



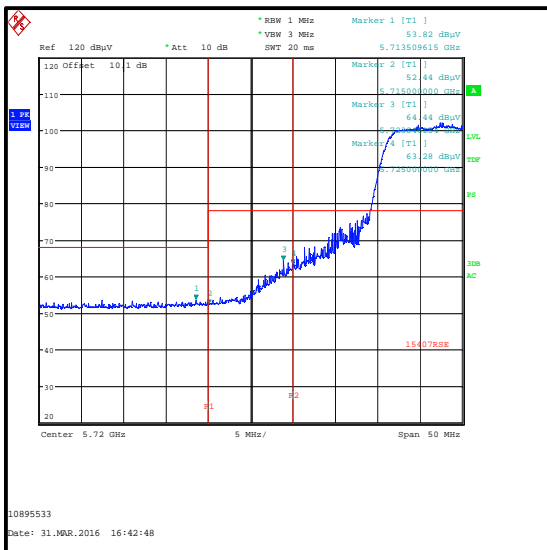
Upper Band Edge Measurement

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band operation) (continued)

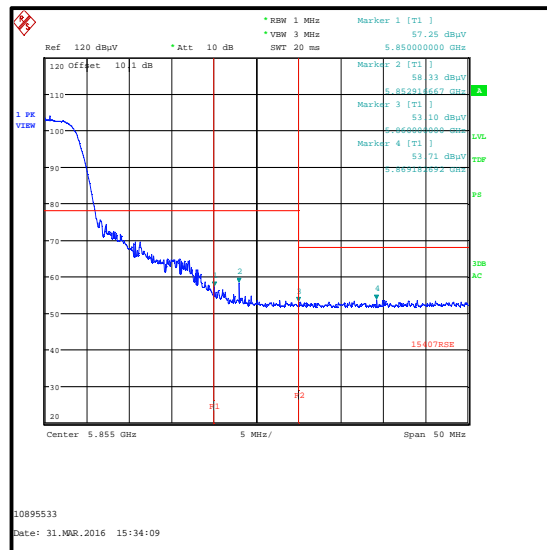
Results: 802.11n / 20 MHz / SISO / BPSK / MCS0 / Peak

| Frequency (MHz) | Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|-------------|-------------|-------------|----------|
| 5713.510 | -41.4 | -27.0 | 14.4 | Complied |
| 5715 | -42.8 | -27.0 | 15.8 | Complied |
| 5723.846 | -30.8 | -17.0 | 13.8 | Complied |
| 5725 | -31.9 | -17.0 | 14.9 | Complied |
| 5850 | -37.9 | -17.0 | 20.9 | Complied |
| 5852.917 | -36.9 | -17.0 | 19.9 | Complied |
| 5860 | -42.1 | -27.0 | 15.1 | Complied |
| 5869.183 | -41.5 | -27.0 | 14.5 | Complied |

| Frequency (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Result |
|-----------------|----------------|----------------|-------------|----------|
| 5713.510 | 53.8 | 68.2 | 14.4 | Complied |
| 5715 | 52.4 | 68.2 | 15.8 | Complied |
| 5723.846 | 64.4 | 78.2 | 13.8 | Complied |
| 5725 | 63.3 | 78.2 | 14.9 | Complied |
| 5850 | 57.3 | 78.2 | 20.9 | Complied |
| 5852.917 | 58.3 | 78.2 | 19.9 | Complied |
| 5860 | 53.1 | 68.2 | 15.1 | Complied |
| 5869.183 | 53.7 | 68.2 | 14.5 | Complied |



Lower Band Edge Measurement



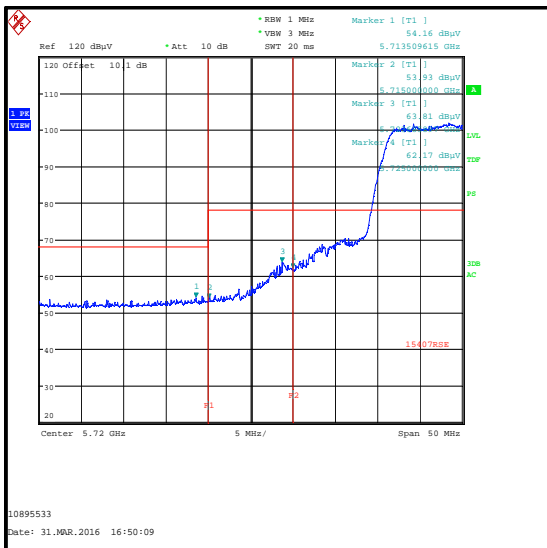
Upper Band Edge Measurement

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band operation) (continued)

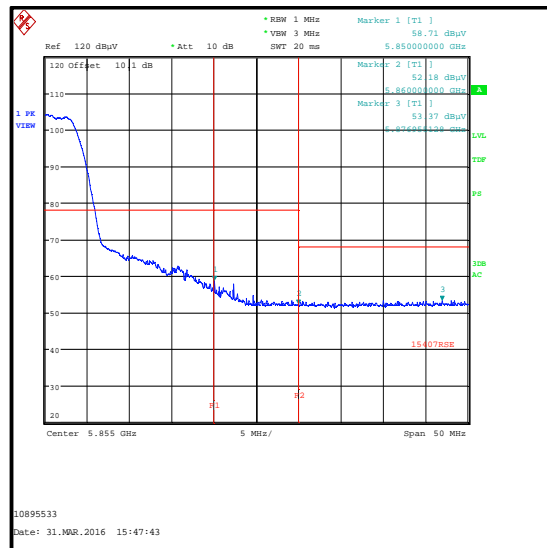
Results: 802.11n / 20 MHz / SISO / 16QAM / MCS3 / Peak

| Frequency (MHz) | Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|-------------|-------------|-------------|----------|
| 5713.510 | -41.0 | -27.0 | 14.0 | Complied |
| 5715 | -41.3 | -27.0 | 14.3 | Complied |
| 5723.686 | -31.4 | -17.0 | 14.4 | Complied |
| 5725 | -33.0 | -17.0 | 16.0 | Complied |
| 5850 | -36.5 | -17.0 | 19.5 | Complied |
| 5860 | -43.0 | -27.0 | 16.0 | Complied |
| 5876.955 | -41.8 | -27.0 | 14.8 | Complied |

| Frequency (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Result |
|-----------------|----------------|----------------|-------------|----------|
| 5713.510 | 54.2 | 68.2 | 14.0 | Complied |
| 5715 | 53.9 | 68.2 | 14.3 | Complied |
| 5723.686 | 63.8 | 78.2 | 14.4 | Complied |
| 5725 | 62.2 | 78.2 | 16.0 | Complied |
| 5850 | 58.7 | 78.2 | 19.5 | Complied |
| 5860 | 52.2 | 68.2 | 16.0 | Complied |
| 5876.955 | 53.4 | 68.2 | 14.8 | Complied |



Lower Band Edge Measurement



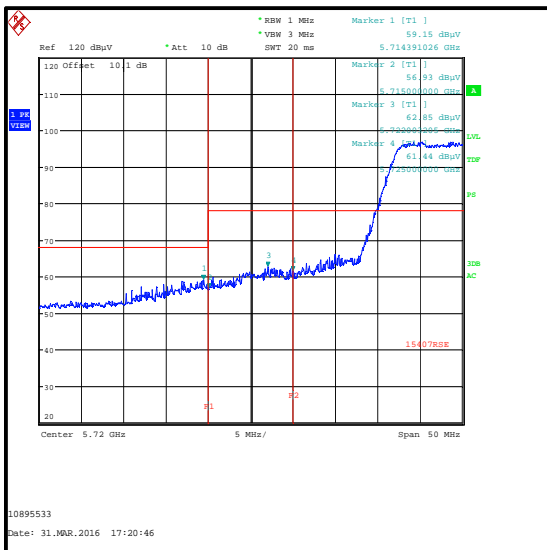
Upper Band Edge Measurement

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band operation) (continued)

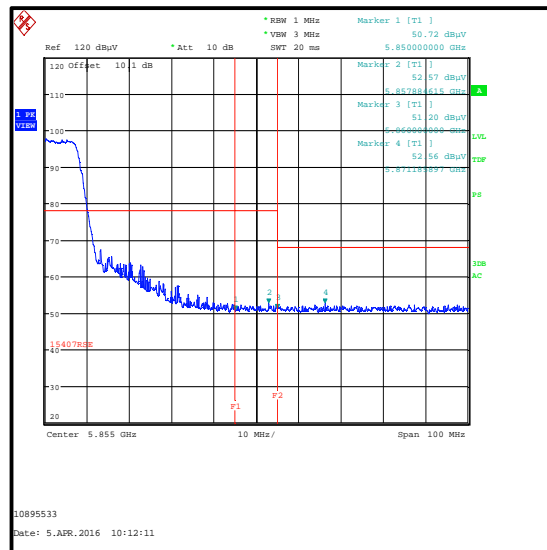
Results: 802.11n / 40 MHz / SISO / BPSK / MCS0 / Peak

| Frequency (MHz) | Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|-------------|-------------|-------------|----------|
| 5714.391 | -36.0 | -27.0 | 9.0 | Complied |
| 5715 | -38.3 | -27.0 | 11.3 | Complied |
| 5722.003 | -32.3 | -17.0 | 15.3 | Complied |
| 5725 | -33.8 | -17.0 | 16.8 | Complied |
| 5850 | -44.5 | -17.0 | 27.5 | Complied |
| 5857.885 | -42.6 | -17.0 | 25.6 | Complied |
| 5860 | -44.0 | -27.0 | 17.0 | Complied |
| 5871.186 | -42.6 | -27.0 | 15.6 | Complied |

| Frequency (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Result |
|-----------------|----------------|----------------|-------------|----------|
| 5714.391 | 59.2 | 68.2 | 9.0 | Complied |
| 5715 | 56.9 | 68.2 | 11.3 | Complied |
| 5722.003 | 62.9 | 78.2 | 15.3 | Complied |
| 5725 | 61.4 | 78.2 | 16.8 | Complied |
| 5850 | 50.7 | 78.2 | 27.5 | Complied |
| 5857.885 | 52.6 | 78.2 | 25.6 | Complied |
| 5860 | 51.2 | 68.2 | 17.0 | Complied |
| 5871.186 | 52.6 | 68.2 | 15.6 | Complied |



Lower Band Edge Measurement



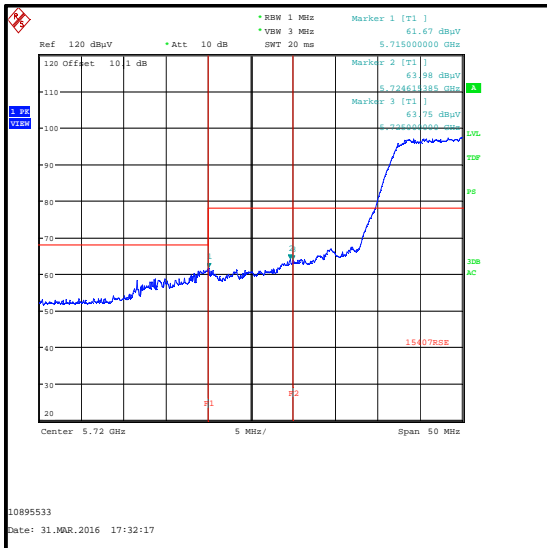
Upper Band Edge Measurement

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band operation) (continued)

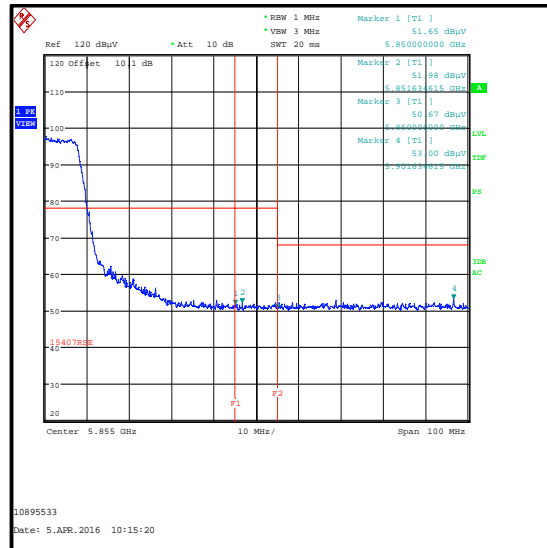
Results: 802.11n / 40 MHz / SISO / 16QAM / MCS3 / Peak

| Frequency (MHz) | Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|-------------|-------------|-------------|----------|
| 5715 | -33.5 | -27.0 | 6.5 | Complied |
| 5724.615 | -31.2 | -17.0 | 14.2 | Complied |
| 5725 | -31.4 | -17.0 | 14.4 | Complied |
| 5850 | -43.5 | -17.0 | 26.5 | Complied |
| 5851.635 | -43.2 | -17.0 | 26.2 | Complied |
| 5860 | -44.5 | -27.0 | 17.5 | Complied |
| 5901.635 | -42.2 | -27.0 | 15.2 | Complied |

| Frequency (MHz) | Level (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Result |
|-----------------|----------------------|----------------------|-------------|----------|
| 5715 | 61.7 | 68.2 | 6.5 | Complied |
| 5724.615 | 64.0 | 78.2 | 14.2 | Complied |
| 5725 | 63.8 | 78.2 | 14.4 | Complied |
| 5850 | 51.7 | 78.2 | 26.5 | Complied |
| 5851.635 | 52.0 | 78.2 | 26.2 | Complied |
| 5860 | 50.7 | 68.2 | 17.5 | Complied |
| 5901.635 | 53.0 | 68.2 | 15.2 | Complied |



Lower Band Edge Measurement



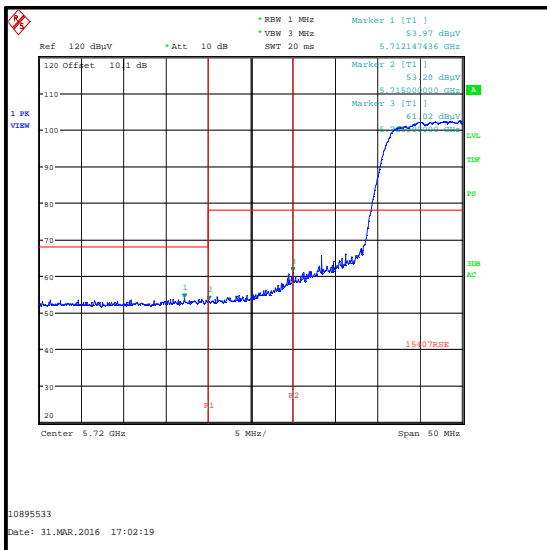
Upper Band Edge Measurement

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band operation) (continued)

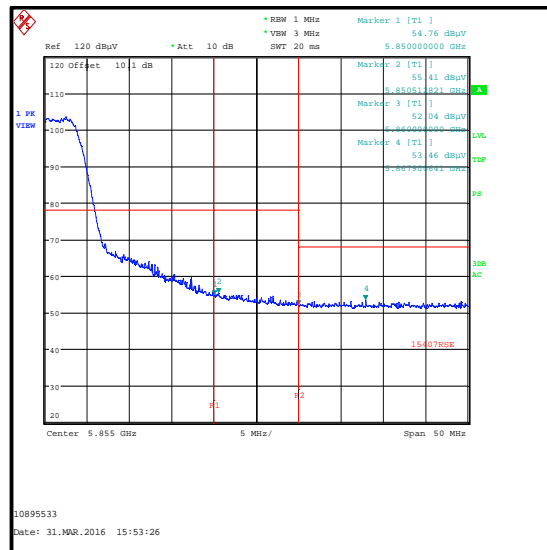
Results: 802.11n / 20 MHz / MIMO / BPSK / MCS0 / Peak

| Frequency (MHz) | Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|-------------|-------------|-------------|----------|
| 5712.147 | -41.2 | -27.0 | 14.2 | Complied |
| 5715 | -42.0 | -27.0 | 15.0 | Complied |
| 5725 | -34.2 | -17.0 | 17.2 | Complied |
| 5850 | -40.4 | -17.0 | 23.4 | Complied |
| 5850.513 | -39.8 | -17.0 | 22.8 | Complied |
| 5860 | -43.2 | -27.0 | 16.2 | Complied |
| 5867.901 | -41.7 | -27.0 | 14.7 | Complied |

| Frequency (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Result |
|-----------------|----------------|----------------|-------------|----------|
| 5712.147 | 54.0 | 68.2 | 14.2 | Complied |
| 5715 | 53.2 | 68.2 | 15.0 | Complied |
| 5725 | 61.0 | 78.2 | 17.2 | Complied |
| 5850 | 54.8 | 78.2 | 23.4 | Complied |
| 5850.513 | 55.4 | 78.2 | 22.8 | Complied |
| 5860 | 52.0 | 68.2 | 16.2 | Complied |
| 5867.901 | 53.5 | 68.2 | 14.7 | Complied |



Lower Band Edge Measurement



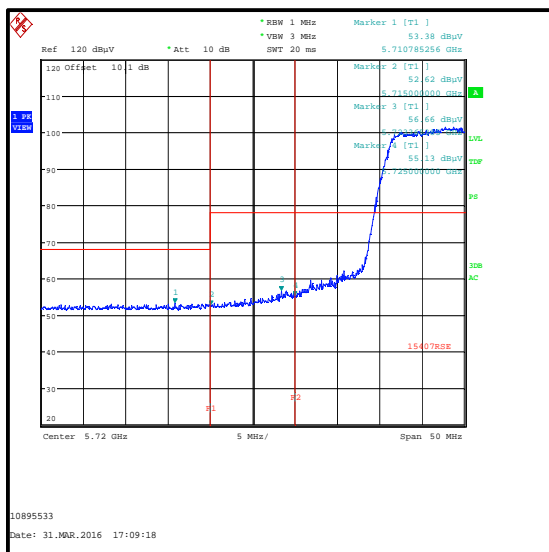
Upper Band Edge Measurement

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band operation) (continued)

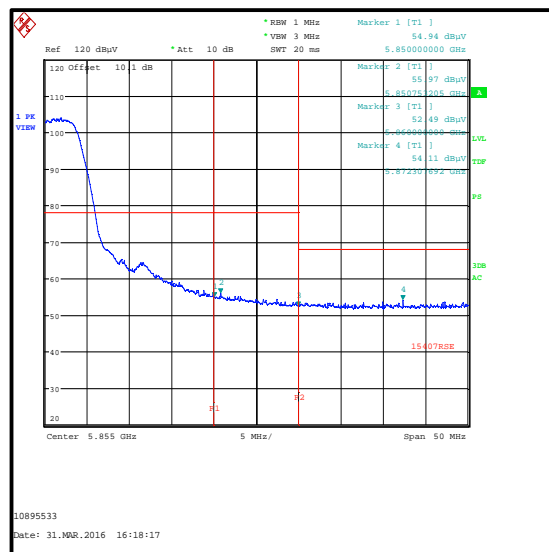
Results: 802.11n / 20 MHz / MIMO / QPSK / MCS1 / Peak

| Frequency (MHz) | Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|-------------|-------------|-------------|----------|
| 5710.785 | -41.8 | -27.0 | 14.8 | Complied |
| 5715 | -42.6 | -27.0 | 15.6 | Complied |
| 5723.365 | -38.5 | -17.0 | 21.5 | Complied |
| 5725 | -40.1 | -17.0 | 23.1 | Complied |
| 5850 | -40.3 | -17.0 | 23.3 | Complied |
| 5850.753 | -39.2 | -17.0 | 22.2 | Complied |
| 5860 | -42.7 | -27.0 | 15.7 | Complied |
| 5872.308 | -41.1 | -27.0 | 14.1 | Complied |

| Frequency (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Result |
|-----------------|----------------|----------------|-------------|----------|
| 5710.785 | 53.4 | 68.2 | 14.8 | Complied |
| 5715 | 52.6 | 68.2 | 15.6 | Complied |
| 5723.365 | 56.7 | 78.2 | 21.5 | Complied |
| 5725 | 55.1 | 78.2 | 23.1 | Complied |
| 5850 | 54.9 | 78.2 | 23.3 | Complied |
| 5850.753 | 56.0 | 78.2 | 22.2 | Complied |
| 5860 | 52.5 | 68.2 | 15.7 | Complied |
| 5872.308 | 54.1 | 68.2 | 14.1 | Complied |



Lower Band Edge Measurement



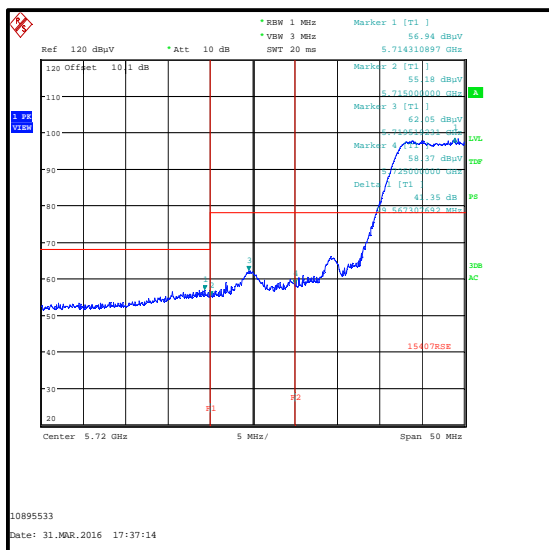
Upper Band Edge Measurement

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band operation) (continued)

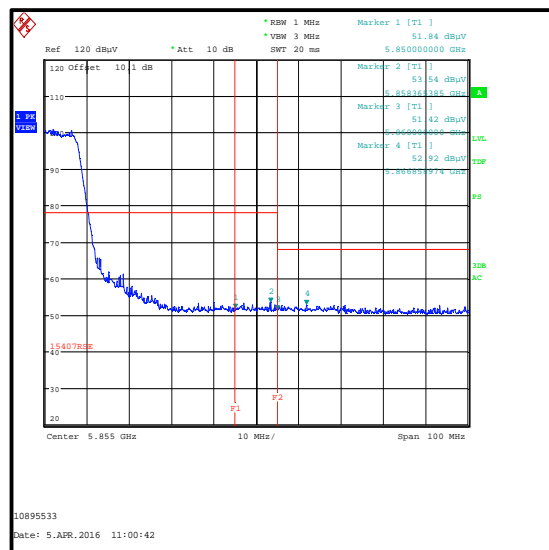
Results: 802.11n / 40 MHz / MIMO / BPSK / MCS0 / Peak

| Frequency (MHz) | Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|-------------|-------------|-------------|----------|
| 5714.311 | -38.3 | -27.0 | 11.3 | Complied |
| 5715 | -40.0 | -27.0 | 13.0 | Complied |
| 5719.519 | -33.1 | -17.0 | 16.1 | Complied |
| 5725 | -36.8 | -17.0 | 19.8 | Complied |
| 5850 | -43.4 | -17.0 | 26.4 | Complied |
| 5858.365 | -41.7 | -17.0 | 24.7 | Complied |
| 5860 | -43.8 | -27.0 | 16.8 | Complied |
| 5866.859 | -42.3 | -27.0 | 15.3 | Complied |

| Frequency (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Result |
|-----------------|----------------|----------------|-------------|----------|
| 5714.311 | 56.9 | 68.2 | 11.3 | Complied |
| 5715 | 55.2 | 68.2 | 13.0 | Complied |
| 5719.519 | 62.1 | 78.2 | 16.1 | Complied |
| 5725 | 58.4 | 78.2 | 19.8 | Complied |
| 5850 | 51.8 | 78.2 | 26.4 | Complied |
| 5858.365 | 53.5 | 78.2 | 24.7 | Complied |
| 5860 | 51.4 | 68.2 | 16.8 | Complied |
| 5866.859 | 52.9 | 68.2 | 15.3 | Complied |



Lower Band Edge Measurement



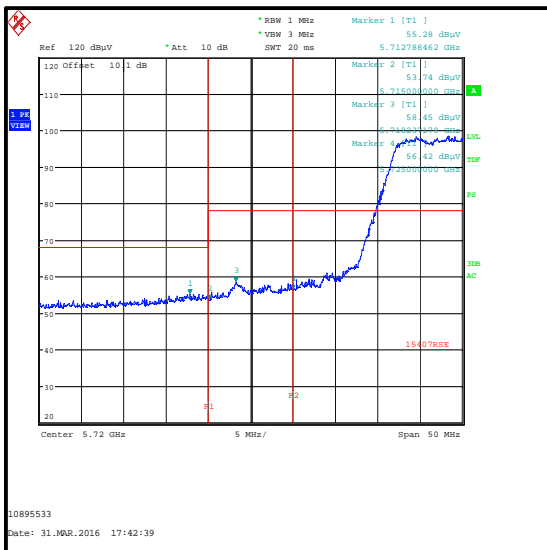
Upper Band Edge Measurement

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band operation) (continued)

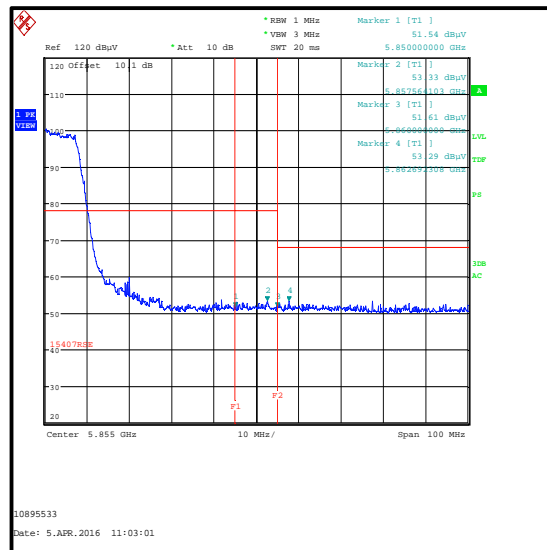
Results: 802.11n / 40 MHz / MIMO / 16QAM / MCS3 / Peak

| Frequency (MHz) | Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|-------------|-------------|-------------|----------|
| 5712.788 | -39.9 | -27.0 | 12.9 | Complied |
| 5715 | -41.5 | -27.0 | 14.5 | Complied |
| 5718.237 | -36.7 | -17.0 | 19.7 | Complied |
| 5725 | -38.8 | -17.0 | 21.8 | Complied |
| 5850 | -43.7 | -17.0 | 26.7 | Complied |
| 5857.564 | -41.9 | -17.0 | 24.9 | Complied |
| 5860 | -43.6 | -27.0 | 16.6 | Complied |
| 5862.692 | -41.9 | -27.0 | 14.9 | Complied |

| Frequency (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Result |
|-----------------|----------------|----------------|-------------|----------|
| 5712.788 | 55.3 | 68.2 | 12.9 | Complied |
| 5715 | 53.7 | 68.2 | 14.5 | Complied |
| 5718.237 | 58.5 | 78.2 | 19.7 | Complied |
| 5725 | 56.4 | 78.2 | 21.8 | Complied |
| 5850 | 51.5 | 78.2 | 26.7 | Complied |
| 5857.564 | 53.3 | 78.2 | 24.9 | Complied |
| 5860 | 51.6 | 68.2 | 16.6 | Complied |
| 5862.692 | 53.3 | 68.2 | 14.9 | Complied |



Lower Band Edge Measurement



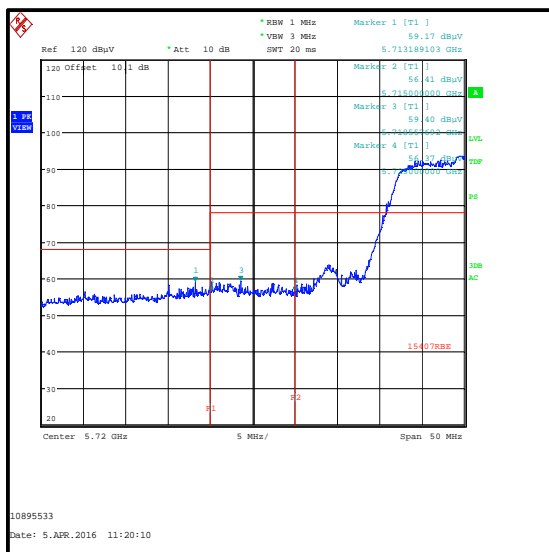
Upper Band Edge Measurement

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band operation) (continued)

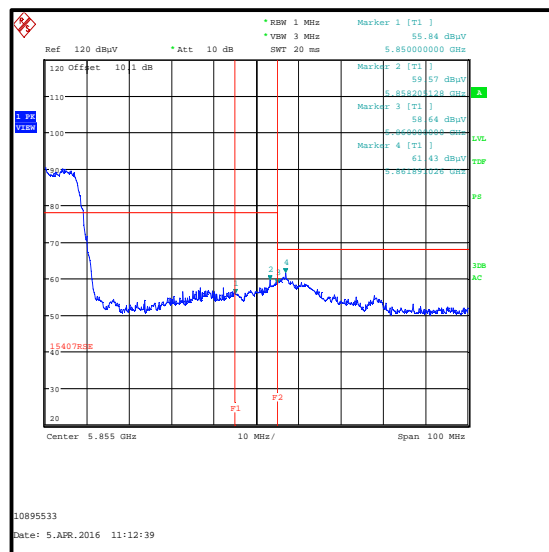
Results: 802.11ac / 80 MHz / SISO / QPSK / MCS2 / Peak

| Frequency (MHz) | Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|-------------|-------------|-------------|----------|
| 5713.189 | -36.0 | -27.0 | 9.0 | Complied |
| 5715 | -38.8 | -27.0 | 11.8 | Complied |
| 5718.558 | -35.8 | -17.0 | 18.8 | Complied |
| 5725 | -38.8 | -17.0 | 21.8 | Complied |
| 5850 | -39.4 | -17.0 | 22.4 | Complied |
| 5858.205 | -35.6 | -17.0 | 18.6 | Complied |
| 5860 | -36.6 | -27.0 | 9.6 | Complied |
| 5861.891 | -33.8 | -27.0 | 6.8 | Complied |

| Frequency (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Result |
|-----------------|----------------|----------------|-------------|----------|
| 5713.189 | 59.2 | 68.2 | 9.0 | Complied |
| 5715 | 56.4 | 68.2 | 11.8 | Complied |
| 5718.558 | 59.4 | 78.2 | 18.8 | Complied |
| 5725 | 56.4 | 78.2 | 21.8 | Complied |
| 5850 | 55.8 | 78.2 | 22.4 | Complied |
| 5858.205 | 59.6 | 78.2 | 18.6 | Complied |
| 5860 | 58.6 | 68.2 | 9.6 | Complied |
| 5861.891 | 61.4 | 68.2 | 6.8 | Complied |



Lower Band Edge Measurement



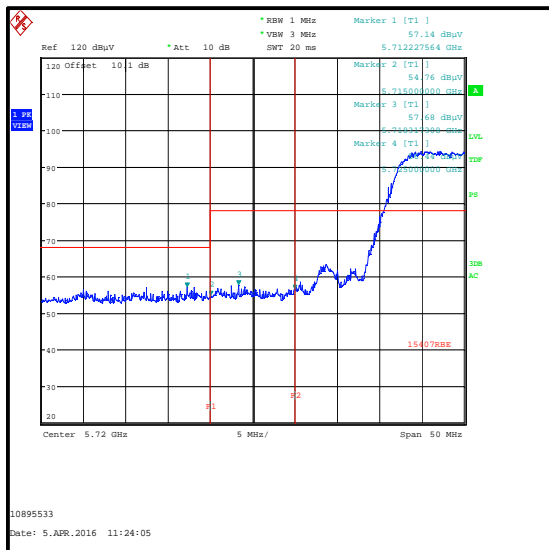
Upper Band Edge Measurement

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band operation) (continued)

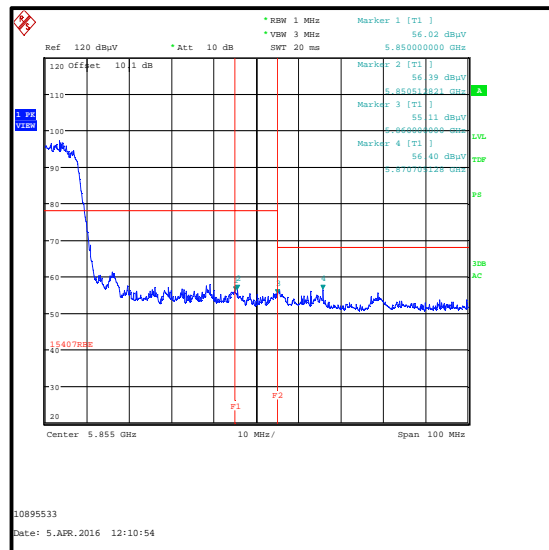
Results: 802.11ac / 80 MHz / MIMO / BPSK / MCS0 / Peak

| Frequency (MHz) | Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|-------------|-------------|-------------|----------|
| 5712.228 | -38.1 | -27.0 | 11.1 | Complied |
| 5715 | -40.4 | -27.0 | 13.4 | Complied |
| 5718.317 | -37.5 | -17.0 | 20.5 | Complied |
| 5725 | -38.8 | -17.0 | 21.8 | Complied |
| 5850 | -39.2 | -17.0 | 22.2 | Complied |
| 5850.513 | -38.8 | -17.0 | 21.8 | Complied |
| 5860 | -40.1 | -27.0 | 13.1 | Complied |
| 5870.705 | -38.8 | -27.0 | 11.8 | Complied |

| Frequency (MHz) | Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Result |
|-----------------|----------------|----------------|-------------|----------|
| 5712.228 | 57.1 | 68.2 | 11.1 | Complied |
| 5715 | 54.8 | 68.2 | 13.4 | Complied |
| 5718.317 | 57.7 | 78.2 | 20.5 | Complied |
| 5725 | 56.4 | 78.2 | 21.8 | Complied |
| 5850 | 56.0 | 78.2 | 22.2 | Complied |
| 5850.513 | 56.4 | 78.2 | 21.8 | Complied |
| 5860 | 55.1 | 68.2 | 13.1 | Complied |
| 5870.705 | 56.4 | 68.2 | 11.8 | Complied |



Lower Band Edge Measurement



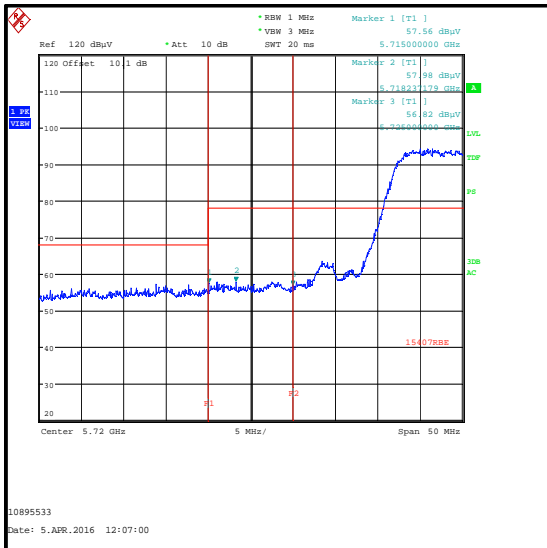
Upper Band Edge Measurement

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band operation) (continued)

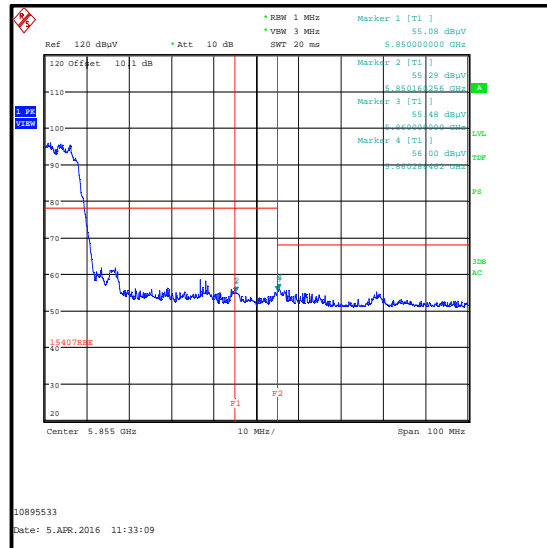
Results: 802.11ac / 80 MHz / MIMO / 16QAM / MCS3 / Peak

| Frequency (MHz) | Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|-------------|-------------|-------------|----------|
| 5715 | -37.6 | -27.0 | 10.6 | Complied |
| 5718.237 | -37.2 | -17.0 | 20.2 | Complied |
| 5725 | -38.4 | -17.0 | 21.4 | Complied |
| 5850 | -40.1 | -17.0 | 23.1 | Complied |
| 5850.160 | -39.9 | -17.0 | 22.9 | Complied |
| 5860 | -39.7 | -27.0 | 12.7 | Complied |
| 5860.288 | -39.2 | -27.0 | 12.2 | Complied |

| Frequency (MHz) | Level (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Result |
|-----------------|----------------|----------------|-------------|----------|
| 5715 | 57.6 | 68.2 | 10.6 | Complied |
| 5718.237 | 58.0 | 78.2 | 20.2 | Complied |
| 5725 | 56.8 | 78.2 | 21.4 | Complied |
| 5850 | 55.1 | 78.2 | 23.1 | Complied |
| 5850.160 | 55.3 | 78.2 | 22.9 | Complied |
| 5860 | 55.5 | 68.2 | 12.7 | Complied |
| 5860.288 | 56.0 | 68.2 | 12.2 | Complied |



Lower Band Edge Measurement



Upper Band Edge Measurement

Transmitter Band Edge Radiated Emissions (continued)**Test Equipment Used:**

| Asset No. | Instrument | Manufacturer | Type No. | Serial No. | Date Calibration Due | Cal. Interval (Months) |
|-----------|------------------|-----------------|------------|-------------|----------------------|------------------------|
| M1656 | Thermohygrometer | JM Handelpunkt | 30.5015.13 | None stated | 23 Apr 2016 | 12 |
| K0002 | 3m RSE Chamber | Rainford EMC | N/A | N/A | 21 Dec 2016 | 12 |
| M1874 | Test Receiver | Rohde & Schwarz | ESU26 | 100553 | 12 Jun 2016 | 12 |
| A1534 | Pre Amplifier | Hewlett Packard | 8449B | 3008A00405 | 19 Dec 2016 | 12 |
| A253 | Antenna | Flann Microwave | 12240-20 | 128 | 17 Dec 2016 | 12 |
| A1396 | Attenuator | Huber & Suhner | 6810.17.B | 757987 | 30 May 2016 | 12 |

6. Measurement Uncertainty

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor such that a confidence level of approximately 95% is maintained. For the purposes of this document "approximately" is interpreted as meaning "effectively" or "for most practical purposes".

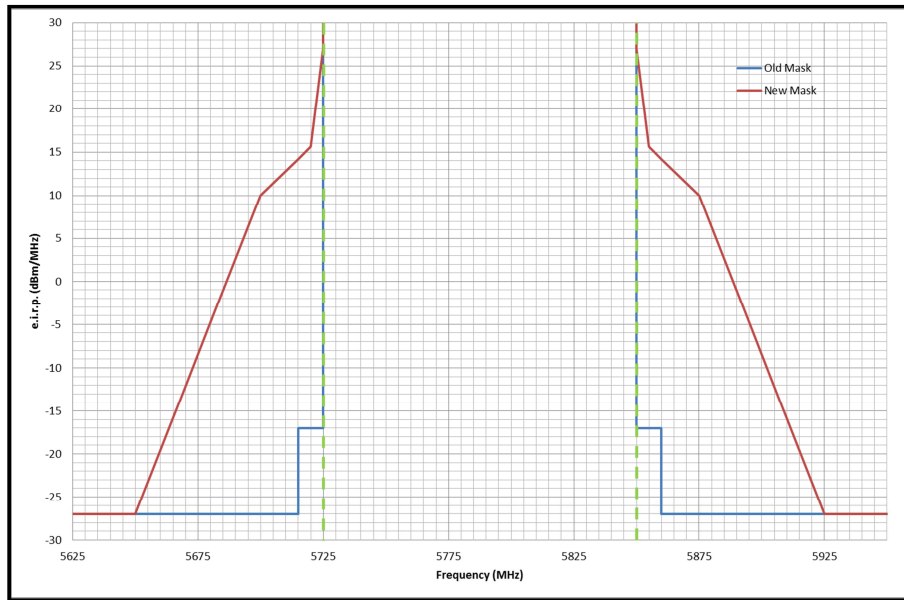
| Measurement Type | Range | Confidence Level (%) | Calculated Uncertainty |
|-----------------------------|-----------------|-----------------------------|-------------------------------|
| Radiated Spurious Emissions | 30 MHz to 1 GHz | 95% | ±5.65 dB |
| Radiated Spurious Emissions | 1 GHz to 40 GHz | 95% | ±2.94 dB |

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty the published guidance of the appropriate accreditation body is followed.

7. Report Revision History

| Version Number | Revision Details | | |
|----------------|------------------|--------|---|
| | Page No(s) | Clause | Details |
| 1.0 | - | - | Initial Version |
| 2.0 | - | - | Model Number updated, Sections 3.1 and 3.2 updated |

Appendix 1. Part 15.407(b)(4) Emission Limits



Comparison graph of Part 15.407(b)(4) emission limits

Note(s):

1. Red line corresponds to the Part 15.407(b)(4)(i) emission limits with effective date 6th May 2016.
2. Blue line corresponds to the former Part 15.407(b)(4) emission limits.
3. Green dotted frequency lines are placed at the band edge frequencies.

--- END OF REPORT ---