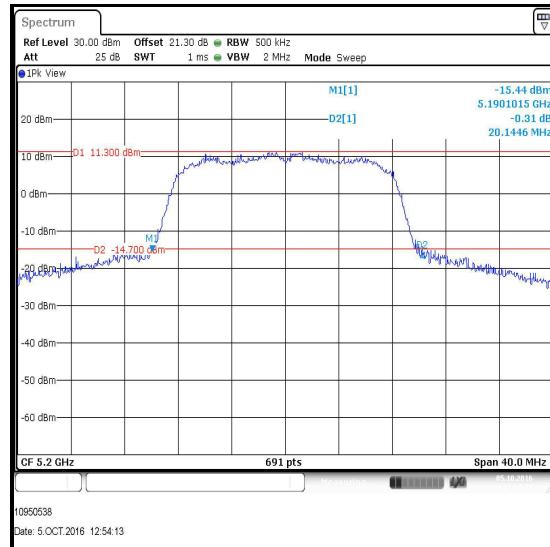
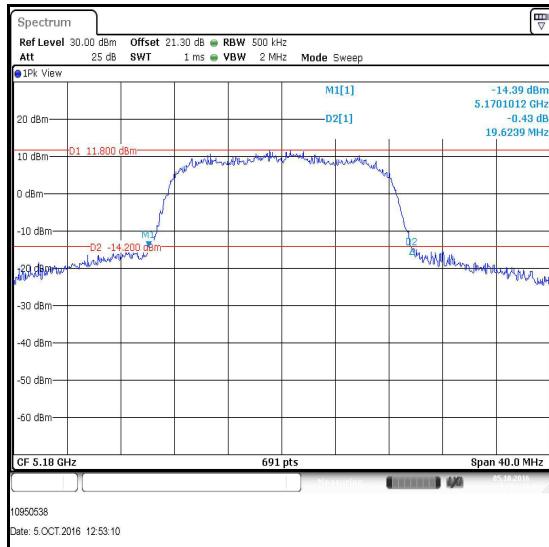


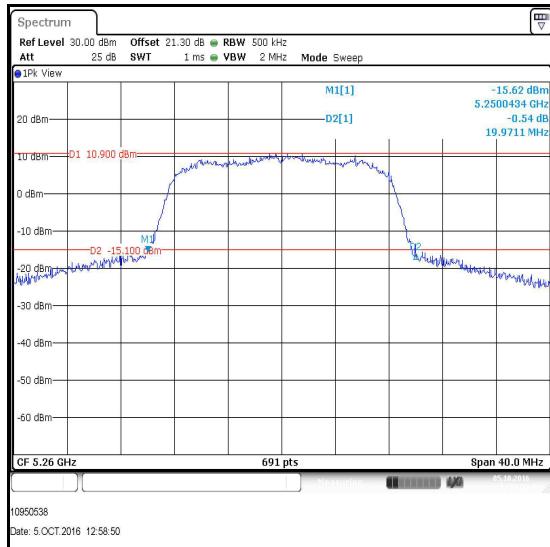
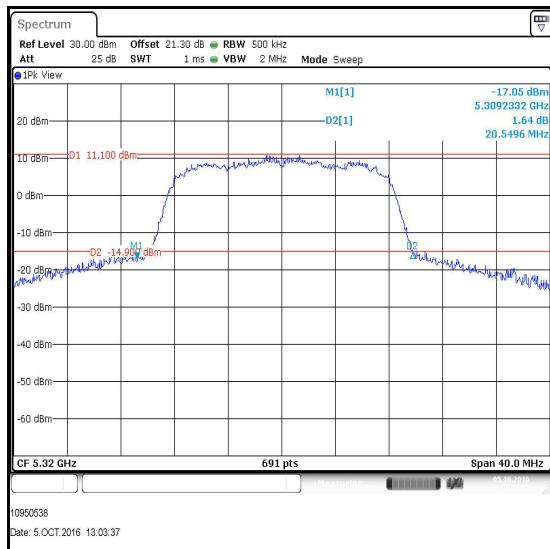
**Transmitter 26 dB Emission Bandwidth (Reference Plots)****Results: 802.11a / 20 MHz / QPSK / 12 Mbps / 5.15-5.25 GHz band**

Channel	Frequency (MHz)	26dB Emission Bandwidth (MHz)
36	5180	19.624
40	5200	20.145
48	5240	19.855

**Channel 36****Channel 40****Channel 48**

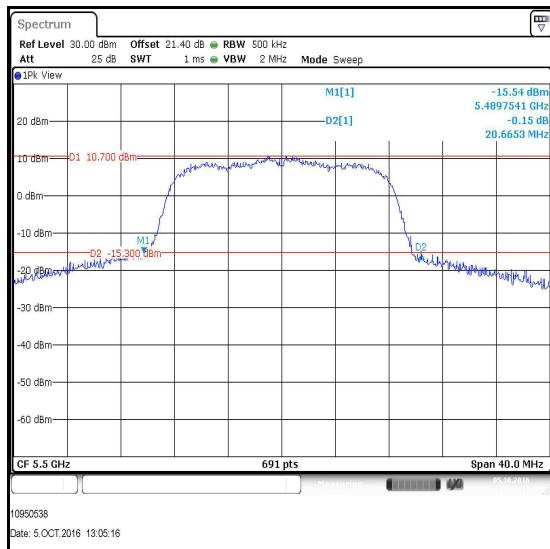
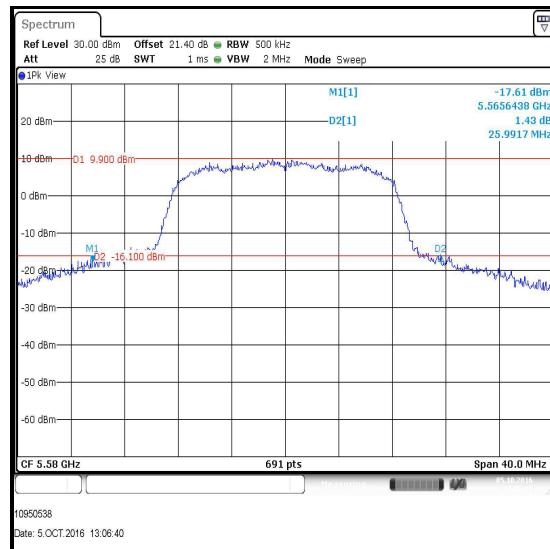
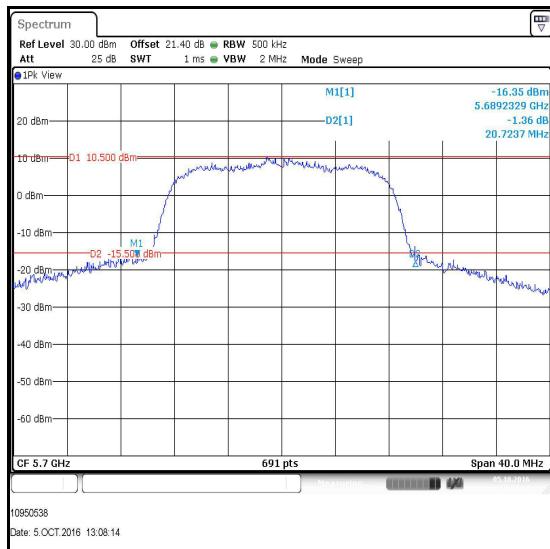
**Transmitter 26 dB Emission Bandwidth (Reference Plots) (continued)****Results: 802.11a / 20 MHz / QPSK / 12 Mbps / 5.25-5.35 GHz band**

Channel	Frequency (MHz)	26dB Emission Bandwidth (MHz)
52	5260	19.971
56	5280	19.797
64	5320	20.550

**Channel 52****Channel 56****Channel 64**

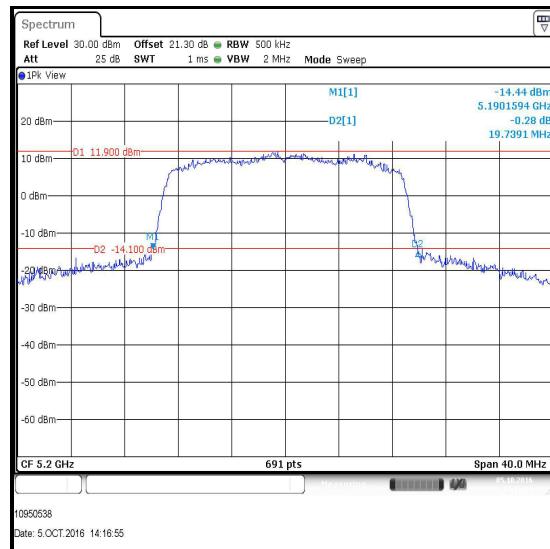
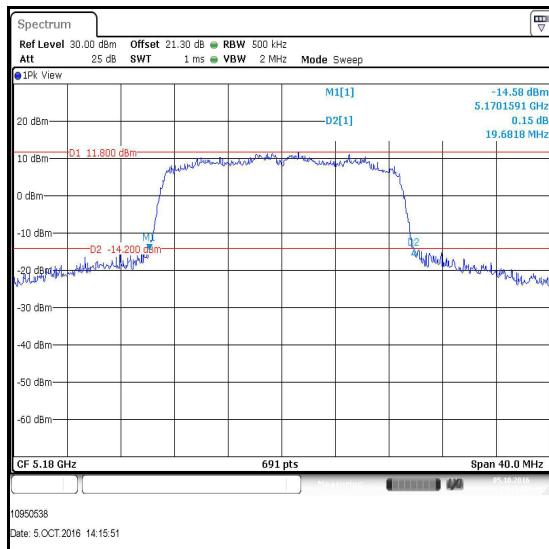
**Transmitter 26 dB Emission Bandwidth (Reference Plots) (continued)****Results: 802.11a / 20 MHz / QPSK / 12 Mbps / 5.47-5.725 GHz band**

Channel	Frequency (MHz)	26dB Emission Bandwidth (MHz)
100	5500	20.665
116	5580	25.992
140	5700	20.724

**Channel 100****Channel 116****Channel 140**

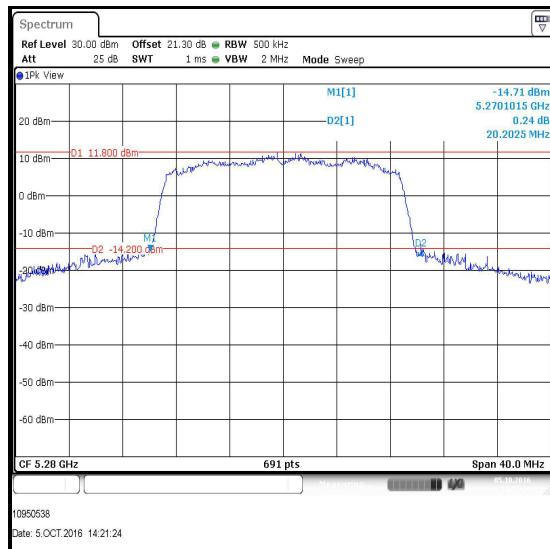
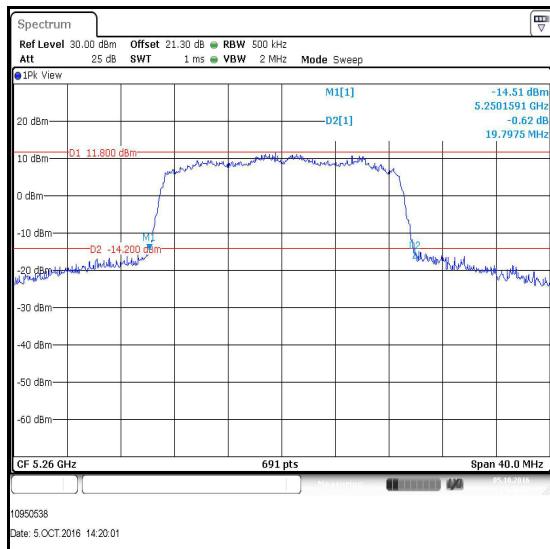
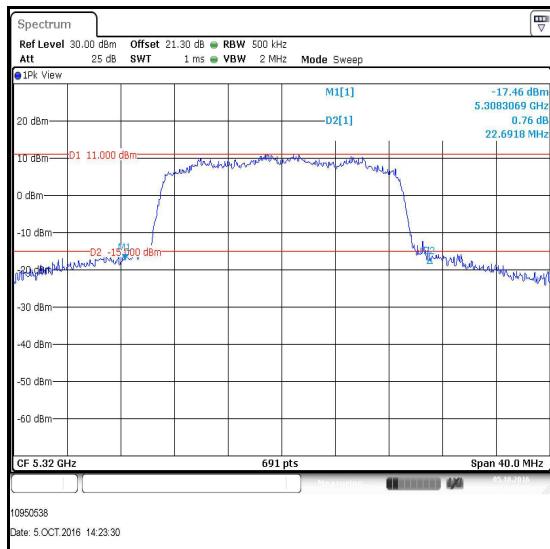
**Transmitter 26 dB Emission Bandwidth (Reference Plots) (continued)****Results: 802.11n / 20 MHz / 16-QAM / MCS4 / 5.15-5.25 GHz band**

Channel	Frequency (MHz)	26dB Emission Bandwidth (MHz)
36	5180	19.682
40	5200	19.739
48	5240	21.360

**Channel 36****Channel 40****Channel 48**

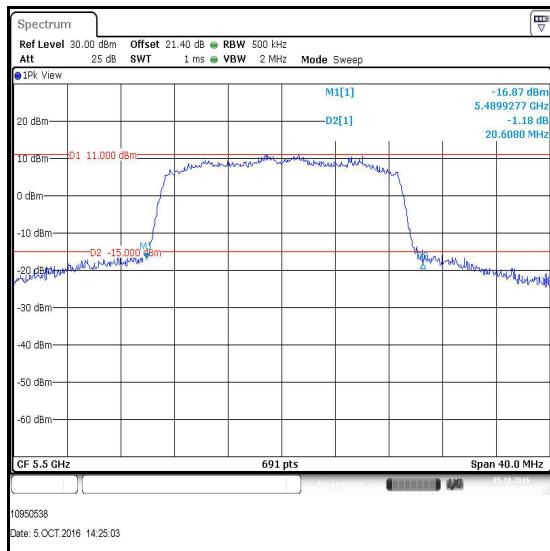
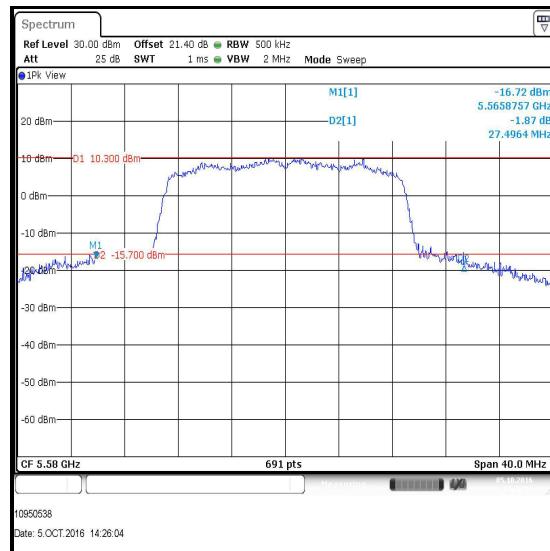
**Transmitter 26 dB Emission Bandwidth (Reference Plots) (continued)****Results: 802.11n / 20 MHz / 16-QAM / MCS4 / 5.25-5.35 GHz band**

Channel	Frequency (MHz)	26dB Emission Bandwidth (MHz)
52	5260	19.798
56	5280	20.202
64	5320	22.692

**Channel 52****Channel 56****Channel 64**

**Transmitter 26 dB Emission Bandwidth (Reference Plots) (continued)****Results: 802.11n / 20 MHz / 16-QAM / MCS4 / 5.47-5.725 GHz band**

Channel	Frequency (MHz)	26dB Emission Bandwidth (MHz)
100	5500	20.608
116	5580	27.496
140	5700	20.666

**Channel 100****Channel 116****Channel 140**

**Transmitter 26 dB Emission Bandwidth (continued)****Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M2002	Thermohygrometer	Testo	608-H1	45041825	02 Apr 2017	12
A2526	Attenuator	AtlanTecRF	AN18W5-20	832828#1	Calibrated before use	-
M1996	Signal Analyser	Rohde & Schwarz	FSV13	100975	02 Mar 2017	12
G0607	Signal Generator	Rohde & Schwarz	SMU200A	100943	10 May 2019	36
S0537	DC Power Supply	TTI	EL302D	249928	Calibrated before use	-
M1269	Multimeter	Fluke	179	90250210	13 May 2017	12

### **5.2.3. Transmitter Duty Cycle**

#### **Test Summary:**

<b>Test Engineer:</b>	Sandeep Bharat	<b>Test Date:</b>	05 October 2016
<b>Test Sample Serial Number:</b>	01001B8D		

<b>FCC Reference:</b>	Part 15.35(c)
<b>Test Method Used:</b>	KDB 789033 D02 Section II.B.2.b)

#### **Environmental Conditions:**

<b>Temperature (°C):</b>	25
<b>Relative Humidity (%):</b>	31

#### **Note(s):**

1. In order to assist with the determination of the average level of fundamental and spurious emissions field strength, measurements were made of duty cycle to determine the transmission duration and the silent period time of the transmitter. The transmitter duty cycle was measured using a spectrum analyser in the time domain and calculated by as shown below:

$$10 \log 1 / (\text{On Time} / [\text{Period or } 100 \text{ ms whichever is the lesser}]).$$

$$802.11a / 9 \text{ Mbps duty cycle: } 10 \log (1 / (939.1 \mu\text{s} / 1040.6 \mu\text{s})) = 0.4$$

$$802.11a / 12 \text{ Mbps duty cycle: } 10 \log (1 / (708.7 \mu\text{s} / 807.3 \mu\text{s})) = 0.6$$

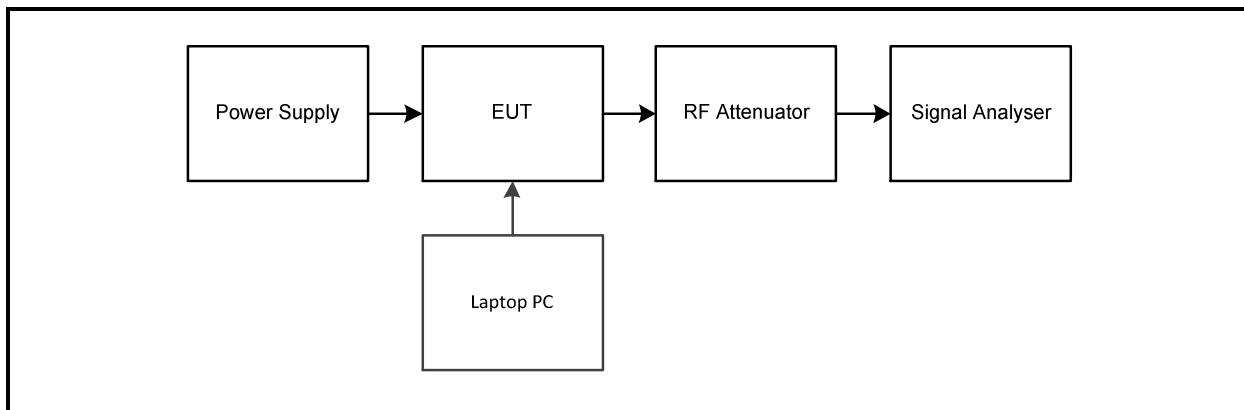
$$802.11n \text{ HT20 / MCS0 duty cycle: } 10 \log (1 / (1181.2 \mu\text{s} / 1279.7 \mu\text{s})) = 0.3$$

$$802.11n \text{ HT20 / MCS4 duty cycle: } 10 \log (1 / (226.8 \mu\text{s} / 326.1 \mu\text{s})) = 1.6$$

$$802.11n \text{ HT40 / MCS0 duty cycle: } 10 \log (1 / (586.2 \mu\text{s} / 684.1 \mu\text{s})) = 0.7$$

2. Plots below are for data rates with a duty cycle less than 98%. Results for all other modes are archived on the UL VS LTD IT server and available for inspection if required.

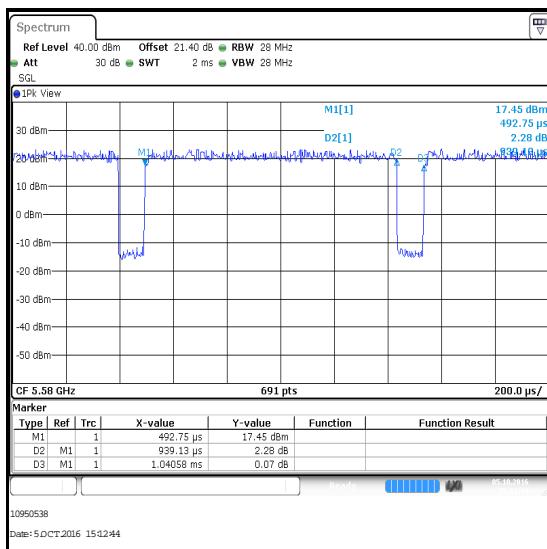
#### **Test setup:**



**Transmitter Duty Cycle (continued)****Results: 802.11a / 20 MHz / 9 Mbps**

Pulse Duration ( $\mu$ s)	Duty Cycle (dB)
939.1	0.4

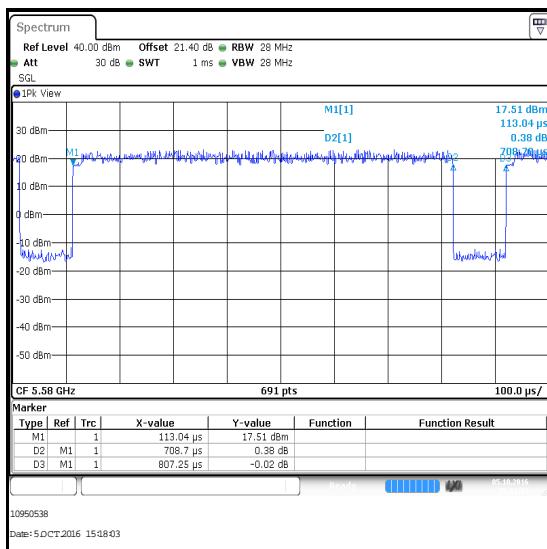
Period ( $\mu$ s)
1040.6

**Pulse Duration & Period**

**Transmitter Duty Cycle (continued)****Results: 802.11a / 20 MHz / 12 Mbps**

Pulse Duration ( $\mu$ s)	Duty Cycle (dB)
708.7	0.6

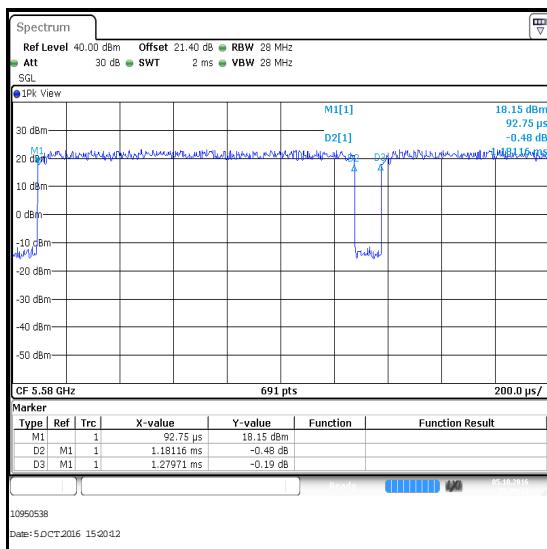
Period ( $\mu$ s)
807.3

**Pulse Duration & Period**

**Transmitter Duty Cycle (continued)****Results: 802.11n / 20 MHz / MCS0**

Pulse Duration ( $\mu$ s)	Duty Cycle (dB)
1181.2	0.3

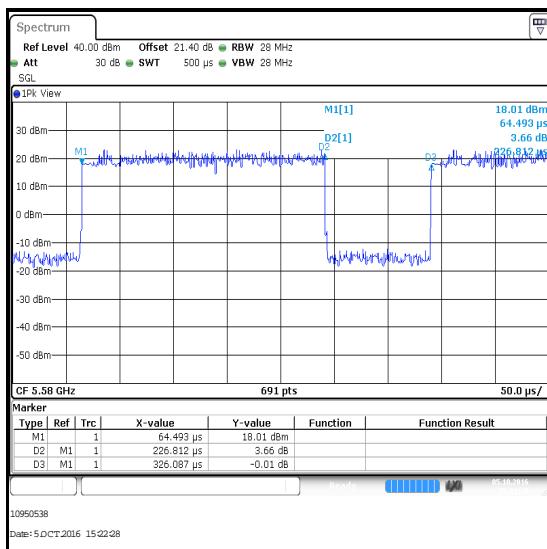
Period ( $\mu$ s)
1279.7

**Pulse Duration & Period**

**Transmitter Duty Cycle (continued)****Results: 802.11n / 20 MHz / MCS4**

Pulse Duration ( $\mu$ s)	Duty Cycle (dB)
226.8	1.6

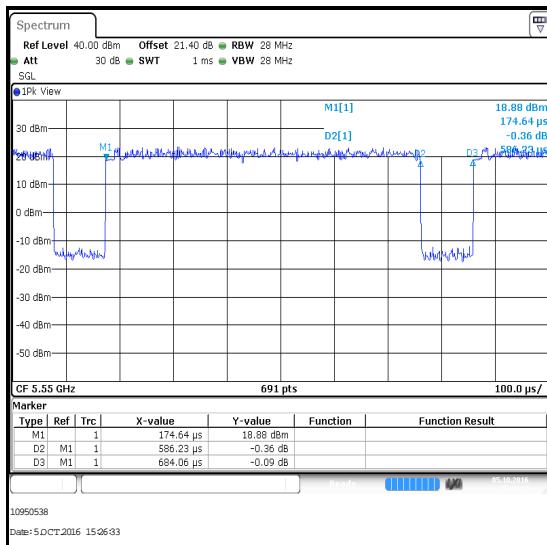
Period ( $\mu$ s)
326.1

**Pulse Duration & Period**

**Transmitter Duty Cycle (continued)****Results: 802.11n / 40 MHz / MCS0**

Pulse Duration ( $\mu$ s)	Duty Cycle (dB)
586.2	0.7

Period ( $\mu$ s)
684.1

**Pulse Duration & Period****Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M2002	Thermohygrometer	Testo	608-H1	45041825	02 Apr 2017	12
A2526	Attenuator	AtlanTecRF	AN18W5-20	832828#1	Calibrated before use	-
M1996	Signal Analyser	Rohde & Schwarz	FSV13	100975	02 Mar 2017	12
G0607	Signal Generator	Rohde & Schwarz	SMU200A	100943	10 May 2019	36
S0537	DC Power Supply	TTI	EL302D	249928	Calibrated before use	-
M1269	Multimeter	Fluke	179	90250210	13 May 2017	12

**5.2.4. Transmitter Maximum Conducted Output Power****Test Summary:**

<b>Test Engineer:</b>	Keith Tucker	<b>Test Date:</b>	04 February 2016
<b>Test Sample Serial Number:</b>	0100174A		

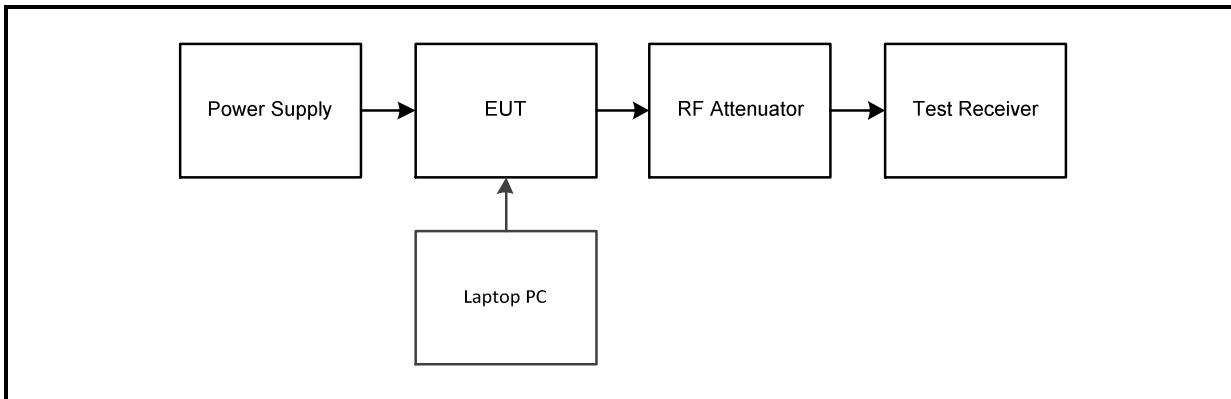
<b>FCC Reference:</b>	Part 15.407(a)(1)(iv)
<b>Test Method Used:</b>	KDB 789033 D02 Section II.E.2.d)

**Environmental Conditions:**

<b>Temperature (°C):</b>	24 to 25
<b>Relative Humidity (%):</b>	35 to 42

**Note(s):**

1. All supported modes and channel widths were initially investigated on one channel. The modes that produced the highest power and therefore deemed worst case were:
  - o 802.11a – QPSK / 12 Mbps
  - o 802.11n HT20 – 16QAM / MCS4
  - o 802.11n HT40 – BPSK / MCS0Measurements were then performed in these modes on bottom, middle and top channels in all operating bands.
2. As the duty cycle is < 98%, conducted output power measurements were performed in accordance with FCC KDB 789033 II.E.2.d) Method SA-2. The test receiver's integration function was used to integrate across the 26 dB emission bandwidth. The resolution bandwidth was set to 1 MHz and video bandwidth 3 MHz. An RMS detector was used and sweep time was set to auto and 300 traces performed. The span was set to encompass the 26 dB emission bandwidth. The channel power results are recorded in the tables below.
3. The calculated duty cycle in Section 5.2.3 of this test report was added to the measured power in order to compute the average power during the actual transmission time.
4. The EUT antenna has a gain of <6 dBi.
5. The test receiver was connected to the RF port on the EUT using suitable attenuation and RF cable. An RF level offset was entered on the test receiver to compensate for the loss of the attenuator and RF cable.
6. The Part 15.407(a)(1)(iv) limit shall not exceed 250 mW (24.0 dBm).

**Transmitter Maximum Conducted Output Power (continued)****Test setup:**

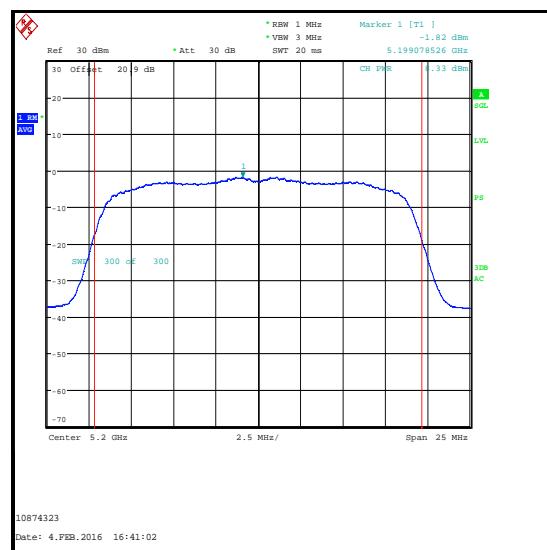
**Transmitter Maximum Conducted Output Power (5.15-5.25 GHz band) (continued)****Results: 802.11a / 20 MHz / QPSK / 12 Mbps**

Channel	Frequency (MHz)	Conducted Power (dBm)	Duty Cycle Correction Factor (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5180	9.6	0.6	10.2	24.0	13.8	Complied
Middle	5200	9.4	0.6	10.0	24.0	14.0	Complied
Top	5240	9.4	0.6	10.0	24.0	14.0	Complied

**Bottom Channel****Middle Channel****Top Channel**

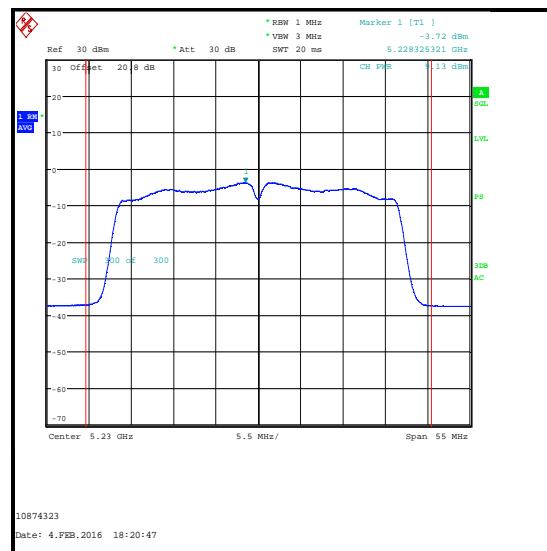
**Transmitter Maximum Conducted Output Power (5.15-5.25 GHz band) (continued)****Results: 802.11n / 20 MHz / 16QAM / MCS4**

Channel	Frequency (MHz)	Conducted Power (dBm)	Duty Cycle Correction Factor (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5180	8.5	1.6	10.1	24.0	13.9	Complied
Middle	5200	8.3	1.6	9.9	24.0	14.1	Complied
Top	5240	8.3	1.6	9.9	24.0	14.1	Complied

**Bottom Channel****Middle Channel****Top Channel**

**Transmitter Maximum Conducted Output Power (5.15-5.25 GHz band) (continued)****Results: 802.11n / 40 MHz / BPSK / MCS0**

Channel	Frequency (MHz)	Conducted Power (dBm)	Duty Cycle Correction Factor (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5190	9.4	0.7	10.1	24.0	13.9	Complied
Top	5230	9.1	0.7	9.8	24.0	14.2	Complied

**Bottom Channel****Top Channel**

**Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands)****Test Summary:**

<b>Test Engineers:</b>	Keith Tucker & Sandeep Bharat	<b>Test Dates:</b>	04 February 2016 to 21 March 2016
<b>Test Sample Serial Number:</b>	0100174A		

<b>FCC Reference:</b>	Part 15.407(a)(2)
<b>Test Method Used:</b>	KDB 789033 D02 Section II.E.2.d)

**Environmental Conditions:**

<b>Temperature (°C):</b>	24 to 25
<b>Relative Humidity (%):</b>	35 to 42

**Note(s):**

1. The FCC Part 15.407(a)(2) limit is the lesser of 250 mW (24.0 dBm) or  $11 \text{ dBm} + 10 \log_{10} B$ , where B is the previously measured 26 dB emission bandwidth in MHz. The limit for each channel was calculated as below:

**5.25-5.35 GHz band**

802.11a 20 MHz channel width / Bottom channel =  $11 \text{ dBm} + 10 \log_{10} 19.971 = 24.0 \text{ dBm}$   
 802.11a 20 MHz channel width / Middle channel =  $11 \text{ dBm} + 10 \log_{10} 19.797 = 24.0 \text{ dBm}$   
 802.11a 20 MHz channel width / Top channel =  $11 \text{ dBm} + 10 \log_{10} 20.550 = 24.1 \text{ dBm}$   
 802.11n 20 MHz channel width / Bottom channel =  $11 \text{ dBm} + 10 \log_{10} 19.798 = 24.0 \text{ dBm}$   
 802.11n 20 MHz channel width / Middle channel =  $11 \text{ dBm} + 10 \log_{10} 20.202 = 24.1 \text{ dBm}$   
 802.11n 20 MHz channel width / Top channel =  $11 \text{ dBm} + 10 \log_{10} 22.692 = 24.6 \text{ dBm}$   
 802.11n 40 MHz channel width / Bottom channel =  $11 \text{ dBm} + 10 \log_{10} 50.940 = 28.1 \text{ dBm}$   
 802.11n 40 MHz channel width / Top channel =  $11 \text{ dBm} + 10 \log_{10} 57.887 = 28.6 \text{ dBm}$

**5.47-5.725 GHz band**

802.11a 20 MHz channel width / Bottom channel =  $11 \text{ dBm} + 10 \log_{10} 20.665 = 24.2 \text{ dBm}$   
 802.11a 20 MHz channel width / Middle channel =  $11 \text{ dBm} + 10 \log_{10} 25.992 = 25.1 \text{ dBm}$   
 802.11a 20 MHz channel width / Top channel =  $11 \text{ dBm} + 10 \log_{10} 20.724 = 24.2 \text{ dBm}$   
 802.11n 20 MHz channel width / Bottom channel =  $11 \text{ dBm} + 10 \log_{10} 20.608 = 24.1 \text{ dBm}$   
 802.11n 20 MHz channel width / Middle channel =  $11 \text{ dBm} + 10 \log_{10} 27.496 = 25.4 \text{ dBm}$   
 802.11n 20 MHz channel width / Top channel =  $11 \text{ dBm} + 10 \log_{10} 20.666 = 24.2 \text{ dBm}$   
 802.11n 40 MHz channel width / Bottom channel =  $11 \text{ dBm} + 10 \log_{10} 59.740 = 28.8 \text{ dBm}$   
 802.11n 40 MHz channel width / Middle channel =  $11 \text{ dBm} + 10 \log_{10} 45.037 = 27.5 \text{ dBm}$   
 802.11n 40 MHz channel width / Top channel =  $11 \text{ dBm} + 10 \log_{10} 58.582 = 28.7 \text{ dBm}$

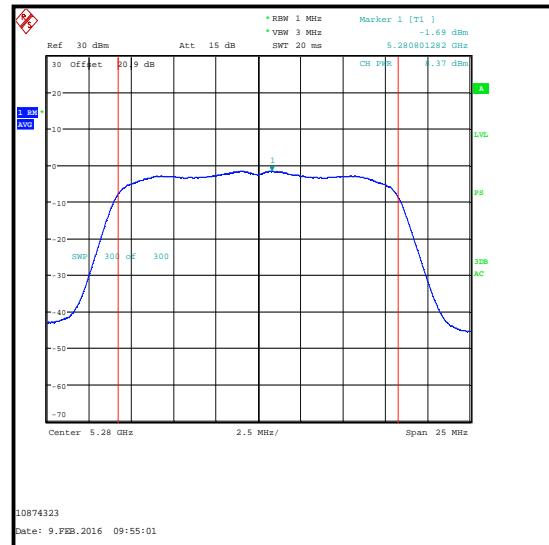
The lesser of the two limits was applied to the results.

2. Measurements on 09 February 2016 were made using Test Receiver with UL Asset No. M1630. Measurements made after 09 February 2016 were made using Signal Analyser with UL Asset No. M1835.

**Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands)  
(continued)**

**Results: 802.11a / 20 MHz / QPSK / 12 Mbps / 5.25-5.35 GHz band**

Channel	Frequency (MHz)	Conducted Power (dBm)	Duty Cycle Correction Factor (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5260	8.6	0.6	9.2	24.0	14.8	Complied
Middle	5280	8.4	0.6	9.0	24.0	15.0	Complied
Top	5320	8.4	0.6	9.0	24.0	15.0	Complied



**Bottom Channel**

**Middle Channel**



**Top Channel**

**Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands)  
(continued)**

**Results: 802.11n / 20 MHz / 16QAM / MCS4 / 5.25-5.35 GHz band**

Channel	Frequency (MHz)	Conducted Power (dBm)	Duty Cycle Correction Factor (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5260	7.5	1.6	9.1	24.0	14.9	Complied
Middle	5280	7.3	1.6	8.9	24.0	15.1	Complied
Top	5320	7.3	1.6	8.9	24.0	15.1	Complied



**Bottom Channel**

**Middle Channel**



**Top Channel**

**Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands)  
(continued)**

**Results: 802.11n / 40 MHz / BPSK / MCS0 / 5.25-5.35 GHz band**

Channel	Frequency (MHz)	Conducted Power (dBm)	Duty Cycle Correction Factor (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5270	8.7	0.7	9.4	24.0	14.6	Complied
Top	5310	8.6	0.7	9.3	24.0	14.7	Complied



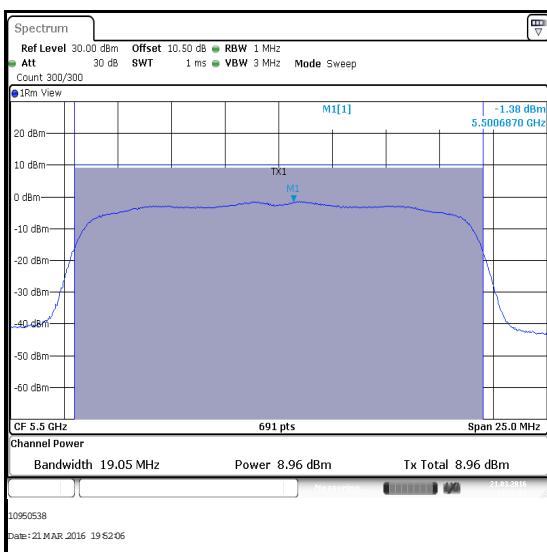
**Bottom Channel**

**Top Channel**

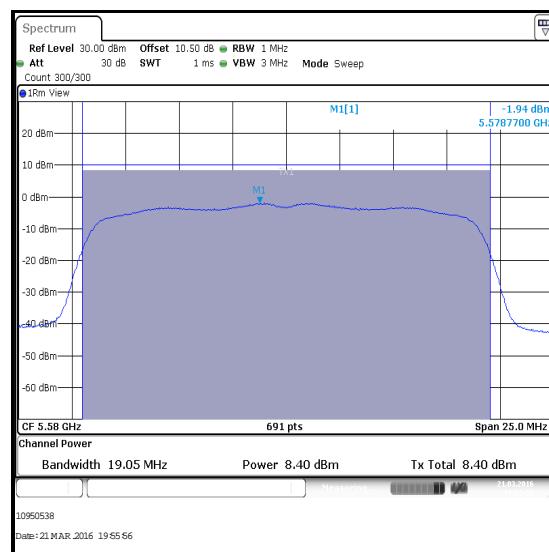
**Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands)  
(continued)**

**Results: 802.11a / 20 MHz / QPSK / 12 Mbps / 5.47-5.725 GHz band**

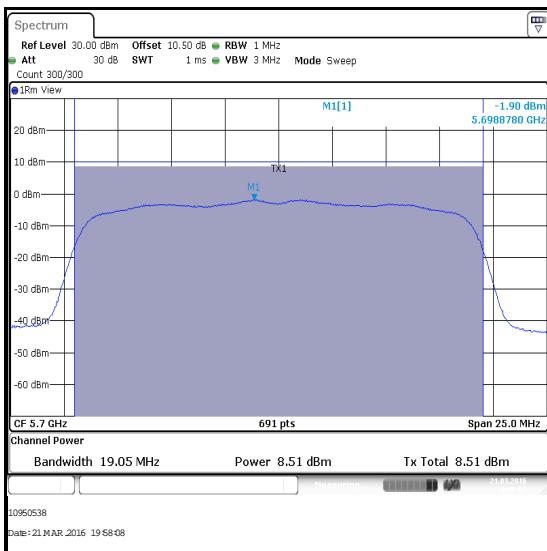
Channel	Frequency (MHz)	Conducted Power (dBm)	Duty Cycle Correction Factor (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5500	9.0	0.6	9.6	24.0	14.4	Complied
Middle	5580	8.4	0.6	9.0	24.0	15.0	Complied
Top	5700	8.5	0.6	9.1	24.0	14.9	Complied



**Bottom Channel**



**Middle Channel**

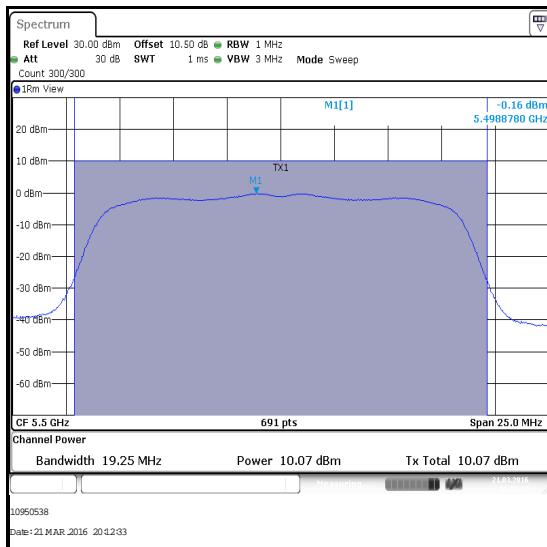


**Top Channel**

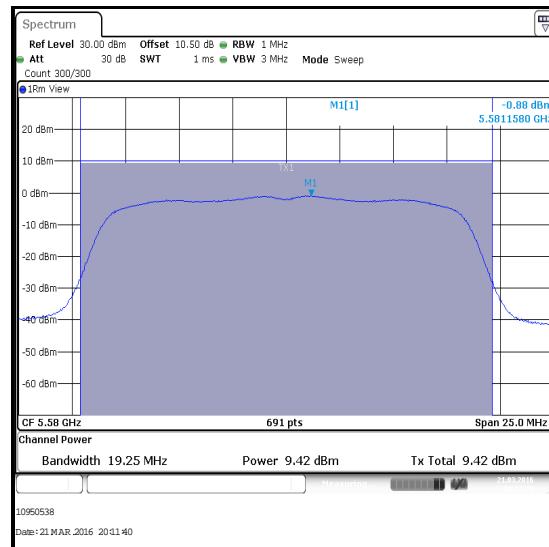
**Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands)  
(continued)**

**Results: 802.11n / 20 MHz / 16QAM / MCS4 / 5.47-5.725 GHz band**

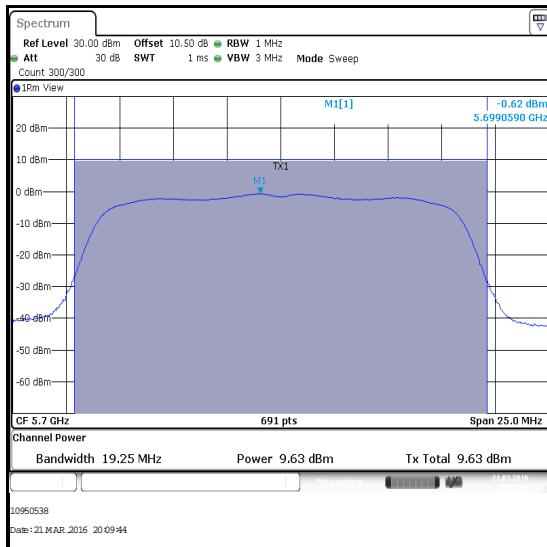
Channel	Frequency (MHz)	Conducted Power (dBm)	Duty Cycle Correction Factor (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5500	10.1	1.6	11.7	24.0	12.3	Complied
Middle	5580	9.4	1.6	11.0	24.0	13.0	Complied
Top	5700	9.6	1.6	11.2	24.0	12.8	Complied



**Bottom Channel**



**Middle Channel**

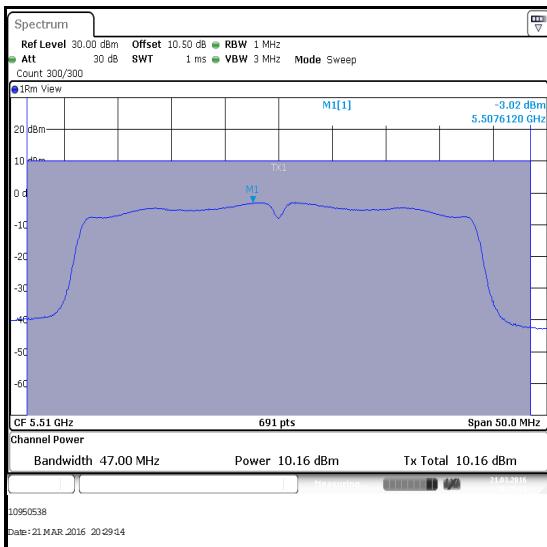


**Top Channel**

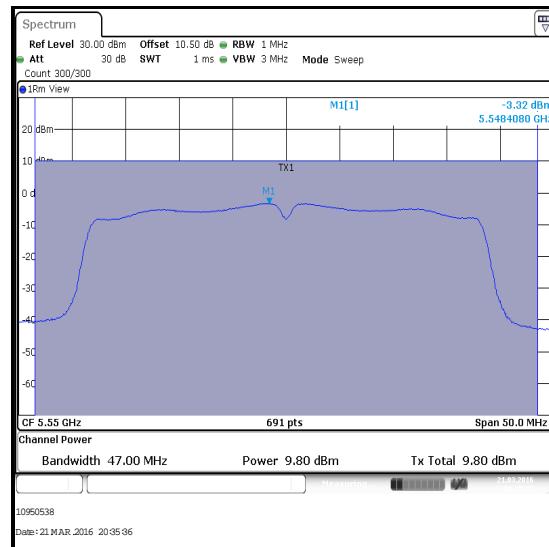
**Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands)  
(continued)**

**Results: 802.11n / 40 MHz / BPSK / MCS0 / 5.47-5.725 GHz band**

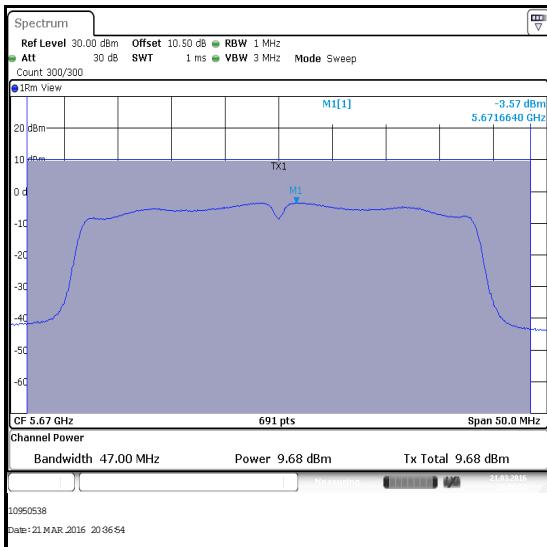
Channel	Frequency (MHz)	Conducted Power (dBm)	Duty Cycle Correction Factor (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5510	10.2	0.7	10.9	24.0	13.1	Complied
Middle	5550	9.8	0.7	10.5	24.0	13.5	Complied
Top	5670	9.7	0.7	10.4	24.0	13.6	Complied



**Bottom Channel**



**Middle Channel**



**Top Channel**

**Transmitter Maximum Conducted Output Power (continued)****Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1785	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	23 Apr 2016	12
M1630	Test Receiver	Rohde & Schwarz	ESU40	100233	20 Feb 2016	12
M1835	Signal Analyser	Rohde & Schwarz	FSV30	103050	26 Feb 2017	12
A2142	Attenuator	AtlanTecRF	AN18-20	081120-23	14 May 2016	12
S0558	DC Power Supply	TTI	EL303R	395825	Calibrated before use	-
M1229	Multimeter	Fluke	179	87640015	23 Apr 2016	12
G0607	Signal Generator	Rohde & Schwarz	SMU200A	100943	18 Jul 2016	36
M199	Power Meter	Rohde & Schwarz	NRVS	827023/075	08 Apr 2016	24
M1267	Power Sensor	Rohde & Schwarz	NRV-Z52	100155	23 Apr 2016	24

**5.2.5. Transmitter Maximum Power Spectral Density****Test Summary:**

<b>Test Engineer:</b>	Keith Tucker	<b>Test Date:</b>	04 February 2016
<b>Test Sample Serial Number:</b>	0100174A		

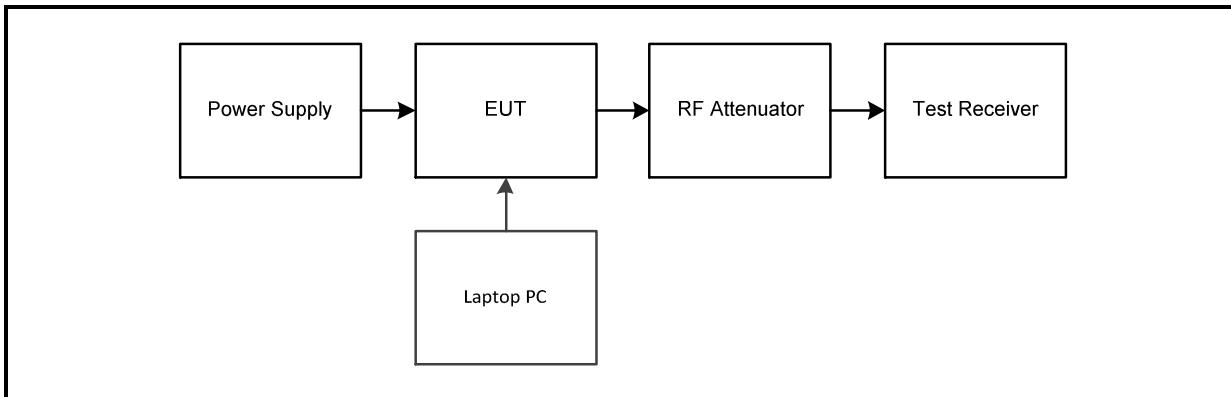
<b>FCC Reference:</b>	Part 15.407(a)(1)(iv)
<b>Test Method Used:</b>	KDB 789033 D02 Section II.F referencing II.E.2.d

**Environmental Conditions:**

<b>Temperature (°C):</b>	24 to 25
<b>Relative Humidity (%):</b>	35 to 42

**Note(s):**

1. Transmitter Maximum Power Spectral Density tests in all bands were performed using a test receiver in accordance with KDB 789033 II. F referencing II.E.2.d) Method SA-2.
2. All supported modes and channel widths were initially investigated on one channel. The modes that produced the highest power and therefore deemed worst case were:
  - o 802.11a – QPSK / 12 Mbps
  - o 802.11n HT20 – 16QAM / MCS4
  - o 802.11n HT40 – BPSK / MCS0Measurements were then performed in these modes on bottom, middle and top channels in all operating bands.
3. The EUT was transmitting at <98% duty cycle, the calculated duty cycle in Section 5.2.3 of this test report was added to the measured maximum power spectral density in order to compute the average maximum power spectral density during the actual transmission time.
4. The EUT antenna has a gain of <6 dBi.
5. The signal analyser was connected to the RF port on the EUT using suitable attenuation and RF cable. An RF level offset was entered on the signal analyser to compensate for the loss of the attenuator and RF cable.
6. As the power spectral density test uses the same test method as the output power test, before the power is integrated across the emission bandwidth, the conducted power spectral density plots are located in the conducted output power Section 5.2.4 of this test report. The peak spectral density was measured by placing a marker on the peak of the signal and the results entered in the tables below.

**Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)****Test setup:****Results: 802.11a / 20 MHz / QPSK / 12 Mbps**

Channel	Frequency (MHz)	PSD (dBm /MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5180	-0.4	0.6	0.2	11.0	10.8	Complied
Middle	5200	-0.5	0.6	0.1	11.0	10.9	Complied
Top	5240	-0.6	0.6	0.0	11.0	11.0	Complied

**Results: 802.11n / 20 MHz / 16QAM / MCS4**

Channel	Frequency (MHz)	PSD (dBm /MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5180	-1.6	1.6	0.0	11.0	11.0	Complied
Middle	5200	-1.8	1.6	-0.2	11.0	11.2	Complied
Top	5240	-1.8	1.6	-0.2	11.0	11.2	Complied

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

Channel	Frequency (MHz)	PSD (dBm /MHz)	Duty cycle correction	Corrected PSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5190	-3.6	0.7	-2.9	11.0	13.9	Complied
Top	5230	-3.7	0.7	-3.0	11.0	14.0	Complied

**Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands)****Test Summary:**

<b>Test Engineers:</b>	Keith Tucker & Sandeep Bharat	<b>Test Dates:</b>	04 February 2016 to 21 March 2016
<b>Test Sample Serial Number:</b>	0100174A		

<b>FCC Reference:</b>	Part 15.407(a)(2)
<b>Test Method Used:</b>	KDB 789033 D02 Section II.F. referencing II.E.2.d)

**Environmental Conditions:**

<b>Temperature (°C):</b>	24 to 25
<b>Relative Humidity (%):</b>	35 to 42

**Note(s):**

1. FCC Part 15.407(a)(2) limit for PPSD in the 5.25-5.35 GHz and 5.47-5.725 GHz operating bands is <11 dBm/MHz.
2. As the power spectral density test uses the same test method as the output power test, before the power is integrated across the emission bandwidth, the conducted power spectral density plots are located in the conducted output power section 5.2.4 of this test report. The peak spectral density was measured by placing a marker on the peak of the signal and the results entered in the tables below.
3. Measurements on 04 February 2016 were made using Test Receiver with Asset No. M1630. Measurements on 21 March 2016 were made using Signal Analyser with Asset No. M1835.

**Results: 802.11a / 20 MHz / QPSK / 12 Mbps / 5.25-5.35 GHz band**

Channel	Frequency (MHz)	PSD (dBm /MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5260	-1.4	0.6	-0.8	11.0	11.8	Complied
Middle	5280	-1.7	0.6	-1.1	11.0	12.1	Complied
Top	5320	-1.6	0.6	-1.0	11.0	12.0	Complied

**Results: 802.11n / 20 MHz / 16QAM / MCS4 / 5.25-5.35 GHz band**

Channel	Frequency (MHz)	PSD (dBm /MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5260	-2.5	1.6	-0.9	11.0	11.9	Complied
Middle	5280	-3.0	1.6	-1.4	11.0	12.4	Complied
Top	5320	-2.8	1.6	-1.2	11.0	12.2	Complied

**Results: 802.11n / 40 MHz / BPSK / MCS0 / 5.25-5.35 GHz band**

Channel	Frequency (MHz)	PSD (dBm /MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5270	-4.2	0.7	-3.5	11.0	14.5	Complied
Top	5310	-4.4	0.7	-3.7	11.0	14.7	Complied

**Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands)  
(continued)**

**Results: 802.11a / 20 MHz / QPSK / 12 Mbps / 5.47-5.725 GHz band**

Channel	Frequency (MHz)	PSD (dBm /MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5500	-1.4	0.6	-0.8	11.0	11.8	Complied
Middle	5580	-1.9	0.6	-1.3	11.0	12.3	Complied
Top	5700	-1.9	0.6	-1.3	11.0	12.3	Complied

**Results: 802.11n / 20 MHz / 16QAM / MCS4 / 5.47-5.725 GHz band**

Channel	Frequency (MHz)	PSD (dBm /MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5500	-0.2	1.6	1.4	11.0	9.6	Complied
Middle	5580	-0.9	1.6	0.7	11.0	10.3	Complied
Top	5700	-0.6	1.6	1.0	11.0	10.0	Complied

**Results: 802.11n / 40 MHz / BPSK / MCS0 / 5.47-5.725 GHz band**

Channel	Frequency (MHz)	PSD (dBm /MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5510	-3.0	0.7	-2.3	11.0	13.3	Complied
Middle	5550	-3.3	0.7	-2.6	11.0	13.6	Complied
Top	5670	-3.6	0.7	-2.9	11.0	13.9	Complied

**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1785	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	23 Apr 2016	12
M1630	Test Receiver	Rohde & Schwarz	ESU40	100233	20 Feb 2016	12
M1835	Signal Analyser	Rohde & Schwarz	FSV30	103050	26 Feb 2017	12
A2142	Attenuator	AtlanTecRF	AN18-20	081120-23	14 May 2016	12
S0558	DC Power Supply	TTI	EL303R	395825	Calibrated before use	-
M1229	Multimeter	Fluke	179	87640015	23 Apr 2016	12
G0607	Signal Generator	Rohde & Schwarz	SMU200A	100943	18 Jul 2016	36
M199	Power Meter	Rohde & Schwarz	NRVS	827023/075	08 Apr 2016	24
M1267	Power Sensor	Rohde & Schwarz	NRV-Z52	100155	23 Apr 2016	24

**5.2.6. Transmitter Out of Band Radiated Emissions****Test Summary:**

<b>Test Engineer:</b>	Sandeep Bharat	<b>Test Date:</b>	29 March 2016
<b>Test Sample Serial Number:</b>	02001-0354		

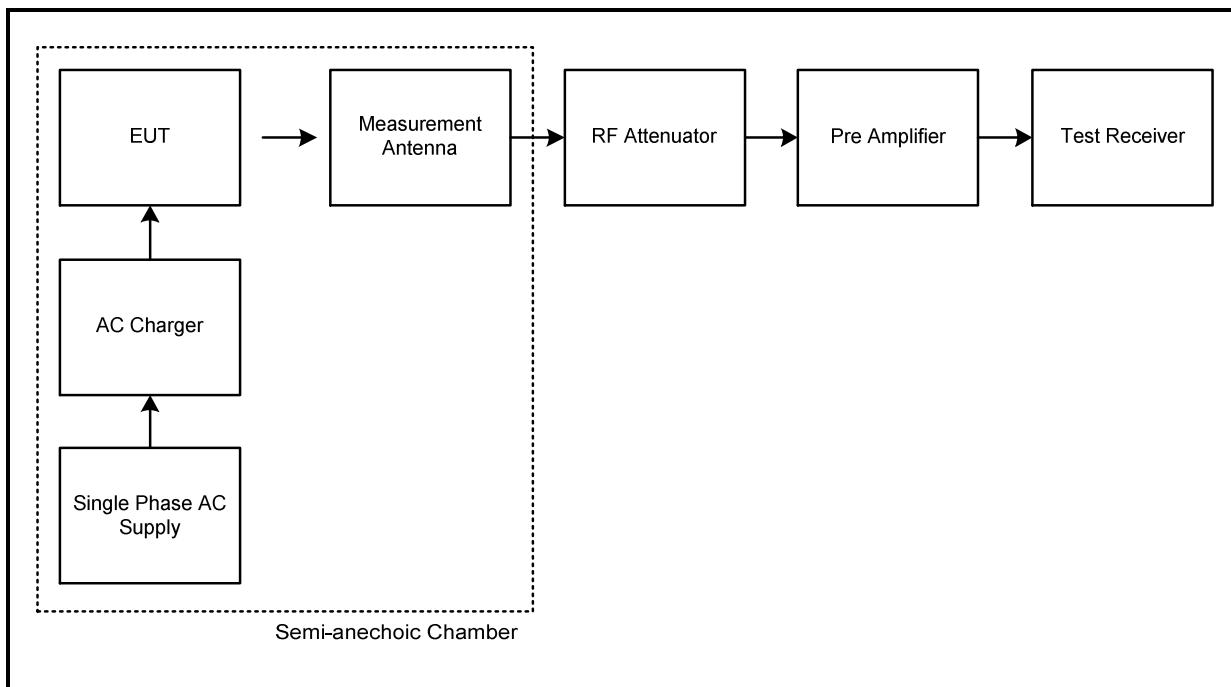
<b>FCC Reference:</b>	Parts 15.407(b)(2),(6),(7) & 15.209(a)
<b>Test Method Used:</b>	KDB 789033 II.G. & ANSI C63.10 Sections 6.3 and 6.5
<b>Frequency Range:</b>	30 MHz to 1000 MHz

**Environmental Conditions:**

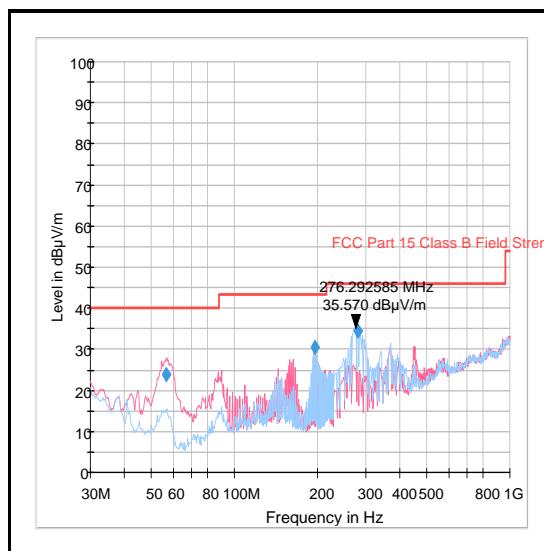
<b>Temperature (°C):</b>	24
<b>Relative Humidity (%):</b>	32

**Note(s):**

1. Measurements below 1 GHz were limited to the 5.47-5.725 GHz band, the EUT was transmitting with a data rate of 43 Mbps (802.11n HT20 / MCS4) as it produced the highest conducted output power and was therefore deemed worst case.
2. The final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
3. 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.
4. All other emissions shown on the pre-scan plots were found to be below the measurement system noise floor or ambient, therefore the highest peak noise floor reading of the measuring receiver was recorded in the table below.
5. 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: Semi-anechoic chamber****Results: Middle Channel / Field Strength**

Frequency (MHz)	Antenna Polarity	Peak Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
276.293	Horizontal	35.6	46.0	10.4	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)
M1945	Thermohygrometer	JM Handelpunkt	30.5015.01	0112	23 Apr 2016	12
K0001	5 m RSE Chamber	Rainford EMC	N/A	N/A	12 Jan 2017	12
M1124	Test Receiver	Rohde & Schwarz	ESIB26	100046	18 Nov 2016	12
A490	Antenna	Chase	CBL6111A	1590	30 Apr 2016	12
G0543	Amplifier	Sonoma	310N	230801	29 May 2016	3
A1834	Attenuator	Hewlett Packard	8491B	10444	05 May 2016	12

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

<b>Test Engineer:</b>	Sandeep Bharat	<b>Test Dates:</b>	17 February 2016 to 21 March 2016
<b>Test Sample Serial Number:</b>	02001-0354		

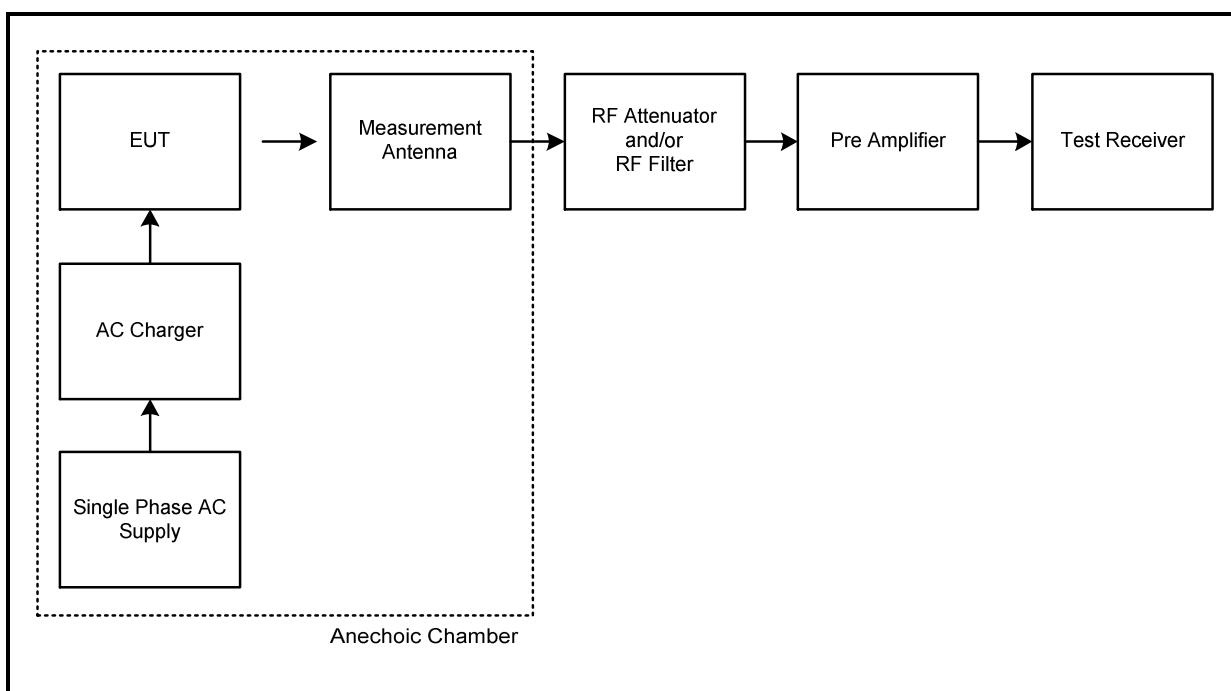
<b>FCC Reference:</b>	Part 15.407(b)(1),(7) & 15.209(a)
<b>Test Method Used:</b>	KDB 789033 II.G. & ANSI C63.10 Sections 6.3 and 6.6
<b>Frequency Range:</b>	1 GHz to 40 GHz

**Environmental Conditions:**

<b>Temperature (°C):</b>	22 to 23
<b>Relative Humidity (%):</b>	31 to 33

**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 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 the middle channel in the 5.47 to 5.725 GHz band. An inquiry made to the FCC confirmed that 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 field strength 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. 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.
7. 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 metres 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)****Test setup: Anechoic chamber**

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

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
15533.269	Horizontal	52.0	74.0	22.0	Complied

**Results: Bottom Channel / Field Strength / Average**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
15539.359	Horizontal	34.5	54.0	19.5	Complied

**Results: Bottom Channel / EIRP**

Frequency (MHz)	Antenna Polarity	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
6906.715	Horizontal	-47.3	-27.0	20.3	Complied

**Results: Middle Channel / Field Strength / Peak**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
15596.795	Horizontal	54.2	74.0	19.8	Complied

**Results: Middle Channel / Field Strength / Average**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
15603.365	Horizontal	41.4	54.0	12.6	Complied

**Results: Middle Channel / EIRP**

Frequency (MHz)	Antenna Polarity	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
6933.044	Horizontal	-46.3	-27.0	19.3	Complied

**Results: Top Channel / Field Strength / Peak**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
15720.801	Horizontal	54.9	74.0	19.1	Complied

**Results: Top Channel / Field Strength / Average**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
15718.397	Horizontal	43.3	54.0	10.7	Complied

**Results: Top Channel / EIRP**

Frequency (MHz)	Antenna Polarity	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
6987.052	Horizontal	-46.3	-27.0	19.3	Complied

**Transmitter Out of Band Radiated Emissions (5.25-5.35 GHz band operation) (continued)****Test Summary:**

<b>Test Engineer:</b>	Sandeep Bharat	<b>Test Dates:</b>	17 February 2016 to 19 February 2016
<b>Test Sample Serial Number:</b>	02001-0354		

<b>FCC Reference:</b>	Part 15.407(b)(2),(7) & 15.209(a)
<b>Test Method Used:</b>	KDB 789033 II.G. & ANSI C63.10 Sections 6.3 and 6.6
<b>Frequency Range:</b>	1 GHz to 40 GHz

**Environmental Conditions:**

<b>Temperature (°C):</b>	22 to 23
<b>Relative Humidity (%):</b>	31 to 33

**Note(s):**

1. FCC Part 15.407(b)(2) states for transmitters operating in the band 5.25 to 5.35 GHz: all emissions outside of the 5.15-5.35 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 the middle channel in the 5.47 to 5.725 GHz band. An inquiry made to the FCC confirmed that 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 field strength 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. The emission shown on the 4 GHz to 6 GHz plot is the EUT fundamental.
6. 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.
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. 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 metres 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 (5.25-5.35 GHz band operation) (continued)****Results: Bottom Channel / Field Strength / Peak**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
15781.763	Horizontal	57.7	74.0	16.3	Complied

**Results: Bottom Channel / Field Strength / Average**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
15781.122	Horizontal	44.8	54.0	9.2	Complied

**Results: Bottom Channel / EIRP**

Frequency (MHz)	Antenna Polarity	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
7013.301	Horizontal	-46.1	-27.0	19.1	Complied

**Results: Middle Channel / Field Strength / Peak**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
15841.442	Horizontal	57.9	74.0	16.1	Complied

**Results: Middle Channel / Field Strength / Average**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
15838.558	Horizontal	45.7	54.0	8.3	Complied

**Results: Middle Channel / EIRP**

Frequency (MHz)	Antenna Polarity	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
7039.872	Horizontal	-46.3	-27.0	19.3	Complied

**Transmitter Out of Band Radiated Emissions (5.25-5.35 GHz band operation) (continued)****Results: Top Channel / Field Strength / Peak**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
15955.994	Horizontal	59.5	74.0	14.5	Complied

**Results: Top Channel / Field Strength / Average**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
15956.955	Horizontal	46.9	54.0	7.1	Complied

**Results: Top Channel / EIRP**

Frequency (MHz)	Antenna Polarity	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
7093.461	Horizontal	-46.2	-27.0	19.2	Complied

**Transmitter Out of Band Radiated Emissions (5.47-5.725 GHz band operation) (continued)****Test Summary:**

<b>Test Engineer:</b>	Sandeep Bharat	<b>Test Dates:</b>	17 February 2016 to 19 February 2016
<b>Test Sample Serial Number:</b>	02001-0354		

<b>FCC Reference:</b>	Part 15.407(b)(3),(7) & 15.209(a)
<b>Test Method Used:</b>	KDB 789033 II.G. & ANSI C63.10 Sections 6.3 and 6.6
<b>Frequency Range:</b>	1 GHz to 40 GHz

**Environmental Conditions:**

<b>Temperature (°C):</b>	22 to 23
<b>Relative Humidity (%):</b>	31 to 33

**Note(s):**

1. FCC Part 15.407(b)(3) states for transmitters operating in the band 5.47 to 5.725 GHz: all emissions outside of the 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 the middle channel in this band. An inquiry made to the FCC confirmed that pre-scans could be performed in the band with the highest EIRP (802.11n HT20 / 43 Mbps / MCS4) and all final measurements should be performed on any emission seen for each band.
3. The final measured value, for the given emission in the field strength 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. 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.
7. The emission shown on the 4 GHz to 6 GHz plot is the EUT fundamental.
8. The third harmonic can be seen on the pre-scan plot 12.75 to 18 GHz with the EUT transmitting on the middle channel in the 5.47 to 5.725 GHz band. This harmonic was investigated for this band and found to be below the applicable limit. Additional measurements of this harmonic on other channels can be found in the table of results below.
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 metres 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.
10. Where the peak level meets the average limit, the average levels have not been reported.

**Transmitter Out of Band Radiated Emissions (5.47-5.725 GHz band operation) (continued)****Results: Bottom Channel / Field Strength**

Frequency (MHz)	Antenna Polarity	Peak Level (dB $\mu$ V/m)	Average Limit (dB $\mu$ V/m)	Margin (dB)	Result
7333.317	Horizontal	52.1	54.0	1.9	Complied

**Results: Bottom Channel / EIRP**

Frequency (MHz)	Antenna Polarity	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
16499.521	Horizontal	-27.5	-27.0	0.5	Complied

**Results: Middle Channel / Field Strength / Peak**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
7439.840	Horizontal	54.4	74.0	19.6	Complied

**Results: Middle Channel / Field Strength / Average**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
7440.064	Horizontal	48.2	54.0	5.8	Complied

**Results: Middle Channel / EIRP**

Frequency (MHz)	Antenna Polarity	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
16736.314	Horizontal	-28.2	-27.0	1.2	Complied

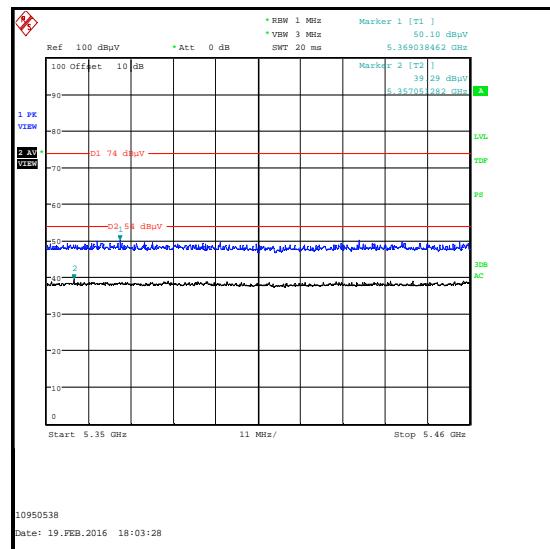
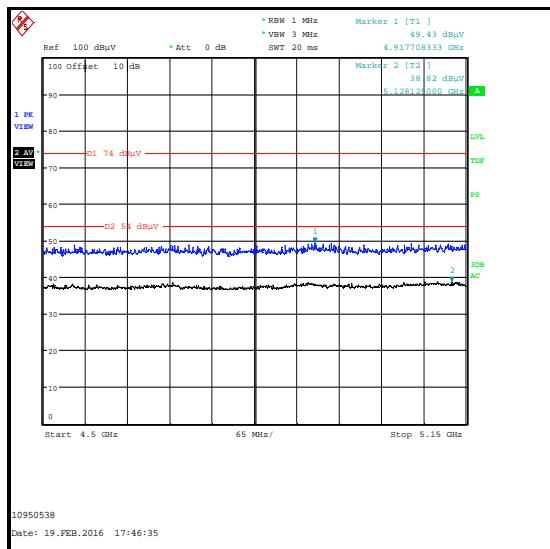
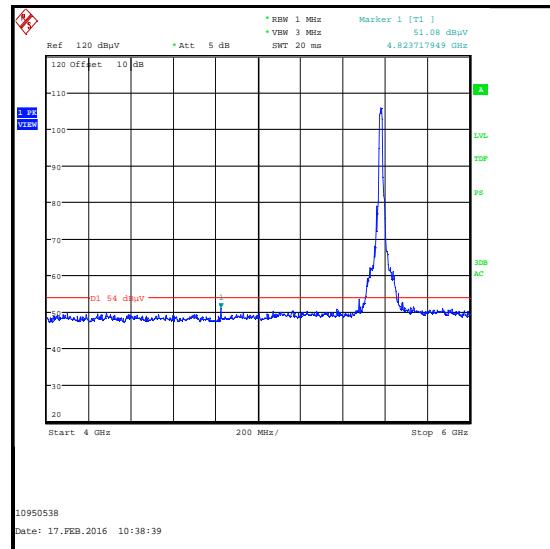
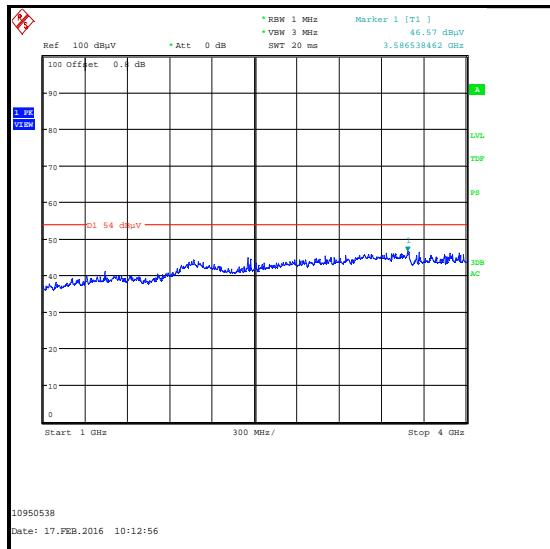
**Results: Top Channel / Field Strength**

Frequency (MHz)	Antenna Polarity	Peak Level (dB $\mu$ V/m)	Average Limit (dB $\mu$ V/m)	Margin (dB)	Result
7599.760	Horizontal	52.4	54.0	1.6	Complied

**Results: Top Channel / EIRP**

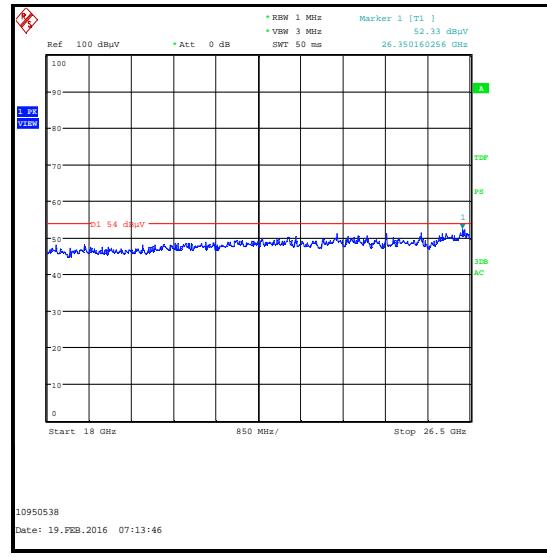
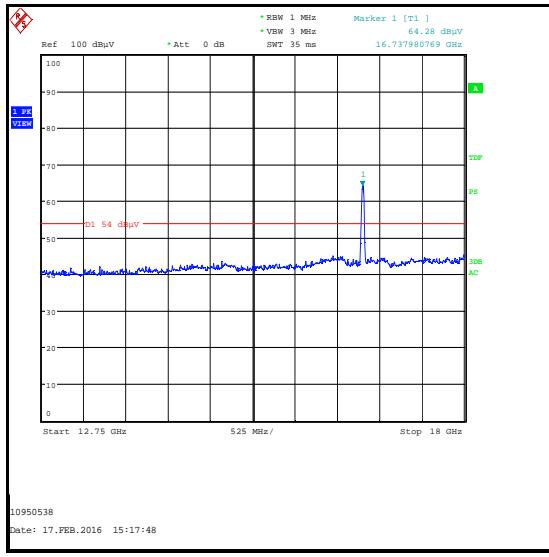
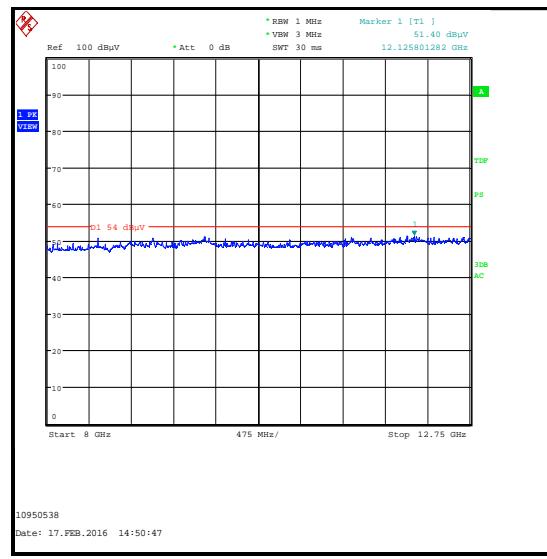
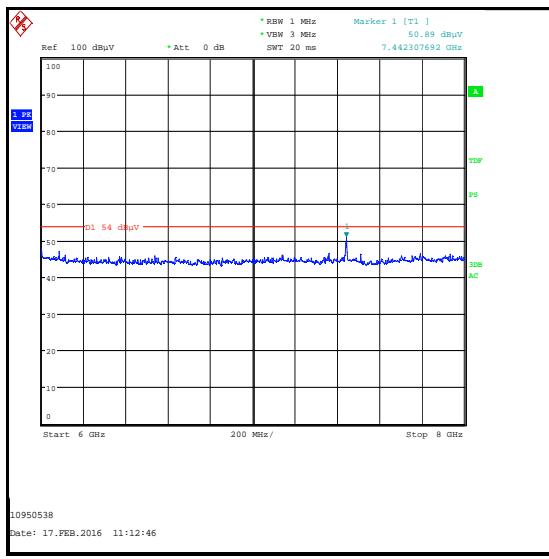
Frequency (MHz)	Antenna Polarity	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
17103.846	Horizontal	-33.3	-27.0	6.3	Complied

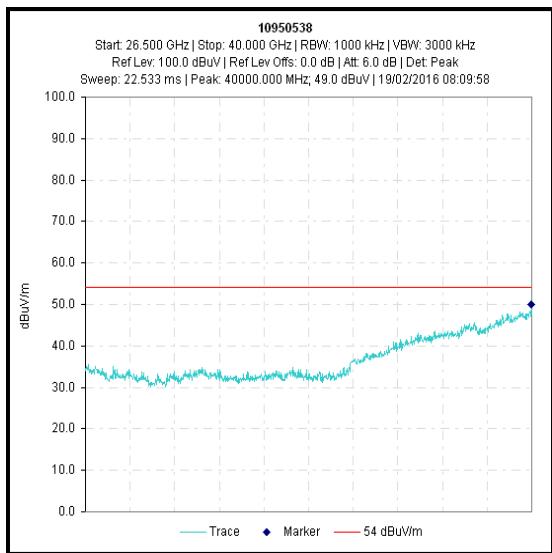
### Transmitter Out of Band Radiated Emissions (5.47-5.725 GHz band operation) (continued)



**Restricted Band 4.5 GHz to 5.15 GHz**

**Restricted Band 5.35 GHz to 5.46 GHz**

**Transmitter Out of Band Radiated Emissions (5.47-5.725 GHz band operation) (continued)**

**Transmitter Out of Band Radiated Emissions (5.47-5.725 GHz band operation) (continued)**

*Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.*

**Transmitter Out of Band Radiated Emissions (5.47-5.725 GHz band operation) (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
M1886	Test Receiver	Rohde & Schwarz	ESU26	100554	21 May 2016	12
M1630	Test Receiver	Rohde & Schwarz	ESU40	100233	20 Feb 2016	12
M1832	Signal Analyser	Agilent	N9010A	MY53470303	30 Mar 2016	24
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	19 Dec 2016	12
A1785	Low Noise 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
A203	Antenna	Flann Microwave	22240-20	343	19 May 2016	36
A1396	Attenuator	Huber & Suhner	6810.17.B	757987	05 May 2016	12
A2176	High Pass Filter	AtlanTecRF	AFH-07000	800980	17 Apr 2016	12
A2130	High Pass Filter	AtlanTecRF	AFH-09000	80rJFBD06-002	17 Apr 2016	12

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

<b>Test Engineer:</b>	Sandeep Bharat	<b>Test Date:</b>	15 February 2016
<b>Test Sample Serial Number:</b>	02001-0354		

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

**Environmental Conditions:**

<b>Temperature (°C):</b>	24
<b>Relative Humidity (%):</b>	40

**Note(s):**

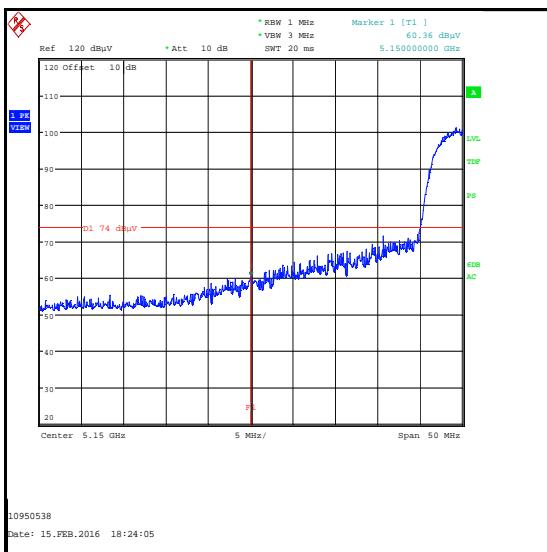
1. An Inquiry was made to the FCC and the response confirmed band edge measurements need only be performed in the EUT modes that produce the highest power and the widest bandwidths. The modes that produced the highest power and widest bandwidth were:
  - o 802.11a - BPSK / 9 Mbps
  - o 802.11a - QPSK / 12 Mbps
  - o 802.11n HT20 – BPSK / 7.2 Mbps / MCS0
  - o 802.11n HT20 – 16QAM / 43.3 Mbps / MCS4
  - o 802.11n HT40 – BPSK / 15.0 Mbps / MCS0
2. Lower band edge measurements were performed with the EUT transmitting on the bottom channel. Upper band edge measurements were performed with the EUT transmitting on the top 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.
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 as calculated below:
  - o 802.11a / BPSK / 9 Mbps – 107 sweeps
  - o 802.11a / QPSK / 12 Mbps – 114 sweeps
  - o 802.11n HT20 / BPSK / 7.2 Mbps / MCS0 – 109 sweeps
  - o 802.11n HT20 / 16QAM / 43.3 Mbps / MCS4 – 144 sweeps
  - o 802.11n HT40 / BPSK / 15 Mbps / MCS0 – 117 sweeps
7. In accordance with KDB 789033 Section II.G.6.c) Method AD (vii), for average measurements, data rates where the EUT was transmitting <98% duty cycle, the duty cycle correction factor calculated in Section 5.2.3 of this test report was added to the measured result.

**Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)****Results: 802.11a / 20 MHz / BPSK / 9 Mbps / Peak**

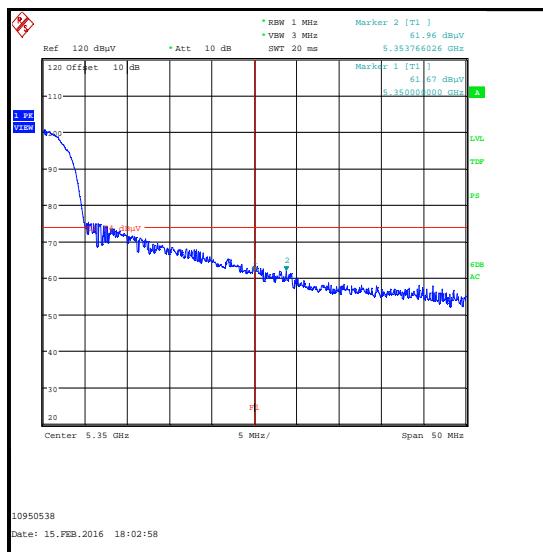
Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
5150	60.4	74.0	13.6	Complied
5350	61.7	74.0	12.3	Complied

**Results: 802.11a / 20 MHz / BPSK / 9 Mbps / Average**

Frequency (MHz)	Level (dB $\mu$ V/m)	Duty Cycle correction (dB)	Corrected Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
5150	41.2	0.4	41.6	54.0	12.4	Complied
5350	41.4	0.4	41.8	54.0	12.2	Complied

**Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)****Results: 802.11a / 20 MHz / BPSK / 9 Mbps**

10950538  
Date: 15.FEB.2016 18:24:05



10950538  
Date: 15.FEB.2016 18:02:58

**Lower Band Edge Peak Measurement**

10950538  
Date: 15.FEB.2016 15:38:19

**Upper Band Edge Peak Measurement**

10950538  
Date: 15.FEB.2016 16:31:33

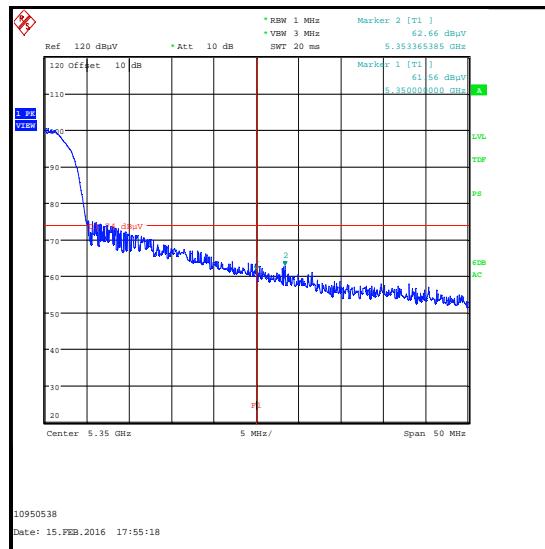
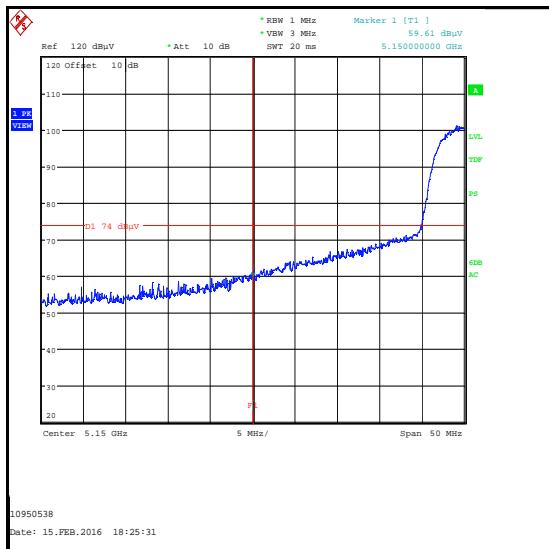
**Lower Band Edge Average Measurement****Upper Band Edge Average Measurement**

**Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)****Results: 802.11a / 20 MHz / QPSK / 12 Mbps / Peak**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
5150	59.6	74.0	14.4	Complied
5350	61.6	74.0	12.4	Complied

**Results: 802.11a / 20 MHz / QPSK / 12 Mbps / Average**

Frequency (MHz)	Level (dB $\mu$ V/m)	Duty Cycle correction (dB)	Corrected Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
5150	41.6	0.6	42.2	54.0	11.8	Complied
5350	41.5	0.6	42.1	54.0	11.9	Complied

**Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)****Results: 802.11a / 20 MHz / QPSK / 12 Mbps****Lower 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 / BPSK / 7.2 Mbps / MCS0 / Peak**

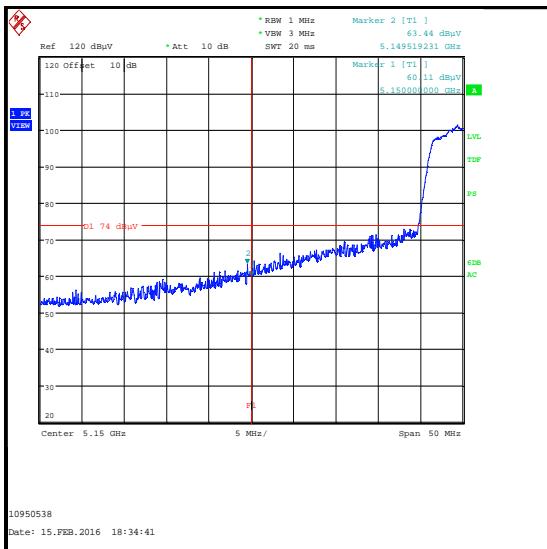
Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
5150	60.1	74.0	13.9	Complied
5350	62.8	74.0	11.2	Complied

**Results: 802.11n / 20 MHz / BPSK / 7.2 Mbps / MCS0 / Average**

Frequency (MHz)	Level (dB $\mu$ V/m)	Duty Cycle correction (dB)	Corrected Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
5150	41.4	0.3	41.7	54.0	12.3	Complied
5350	41.2	0.3	41.5	54.0	12.5	Complied

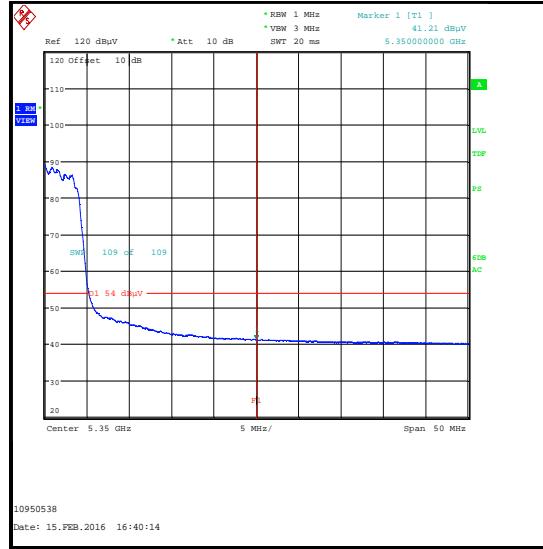
**Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**

**Results: 802.11n / 20 MHz / BPSK / 7.2 Mbps / MCS0**



## Lower Band Edge Peak Measurement

## Upper Band Edge Peak Measurement



## Lower Band Edge Average Measurement

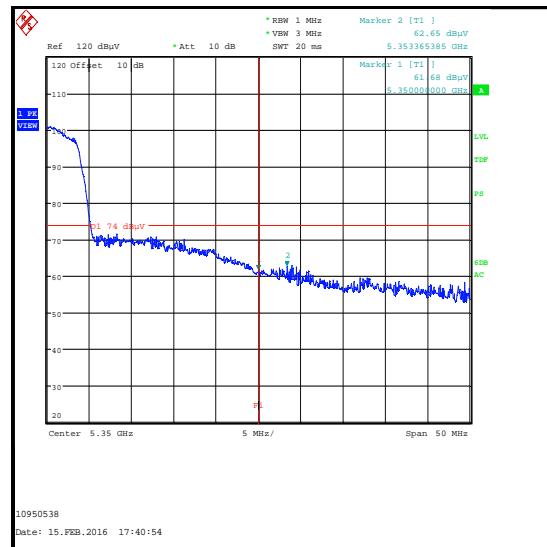
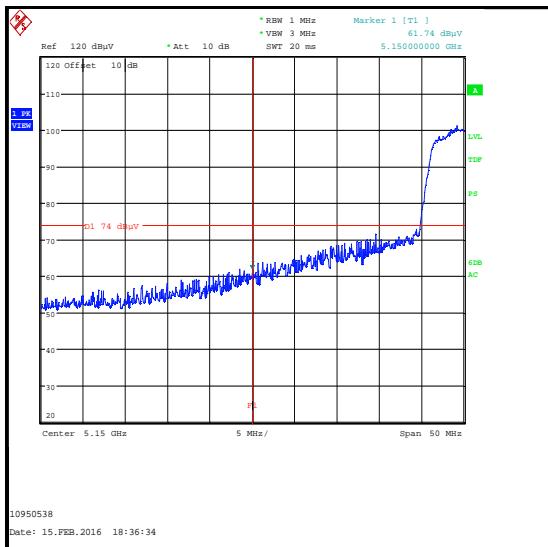
## Upper Band Edge Average Measurement

**Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)****Results: 802.11n / 20 MHz / 16QAM / 43.3 Mbps / MCS4 / Peak**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
5150	61.7	74.0	12.3	Complied
5350	61.7	74.0	12.3	Complied

**Results: 802.11n / 20 MHz / 16QAM / 43.3 Mbps / MCS4 / Average**

Frequency (MHz)	Level (dB $\mu$ V/m)	Duty Cycle correction (dB)	Corrected Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
5150	41.3	1.6	42.9	54.0	11.1	Complied
5350	41.4	1.6	43.0	54.0	11.0	Complied

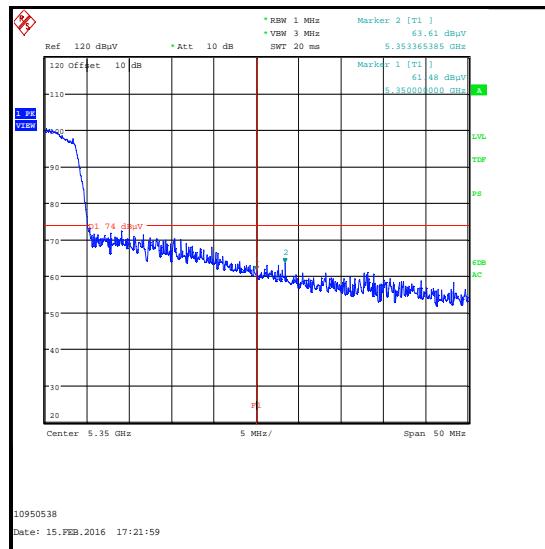
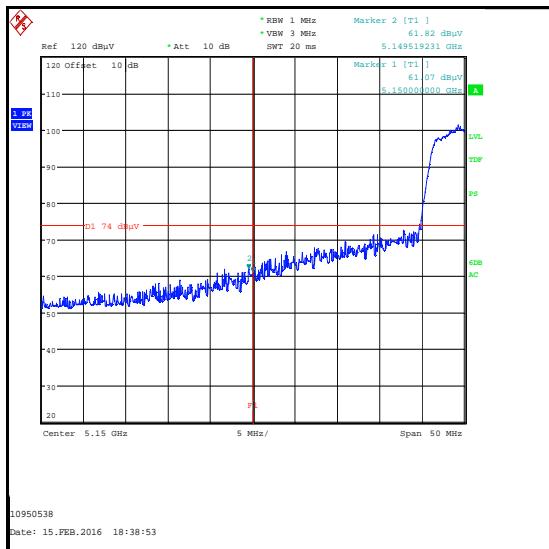
**Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)****Results: 802.11n / 20 MHz / 16QAM / 43.3 Mbps / MCS4****Lower Band Edge Peak Measurement****Lower Band Edge Average Measurement****Upper Band Edge Average Measurement**

**Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)****Results: 802.11n / 40 MHz / BPSK / 15 Mbps / MCS0 / Peak**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
5150	61.1	74.0	12.9	Complied
5350	61.5	74.0	12.5	Complied

**Results: 802.11n / 40 MHz / BPSK / 15 Mbps / MCS0 / Average**

Frequency (MHz)	Level (dB $\mu$ V/m)	Duty Cycle correction (dB)	Corrected Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
5150	41.7	0.7	42.4	54.0	11.6	Complied
5350	41.5	0.7	42.2	54.0	11.8	Complied

**Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)****Results: 802.11n / 40 MHz / BPSK / 15 Mbps / MCS0****Lower Band Edge Peak Measurement****Lower Band Edge Average Measurement****Upper Band Edge Average Measurement**

**Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band)****Test Summary:**

Test Engineer:	Sandeep Bharat	Test Date:	15 February 2016
Test Sample Serial Number:	02001-0354		

FCC Reference:	Parts 15.407(b)(2),(7), 15.205 & 15.209(a)
Test Method Used:	ANSI C63.10 Section 6.10 & KDB 789033 II.G.

**Environmental Conditions:**

Temperature (°C):	24
Relative Humidity (%):	40

**Note(s):**

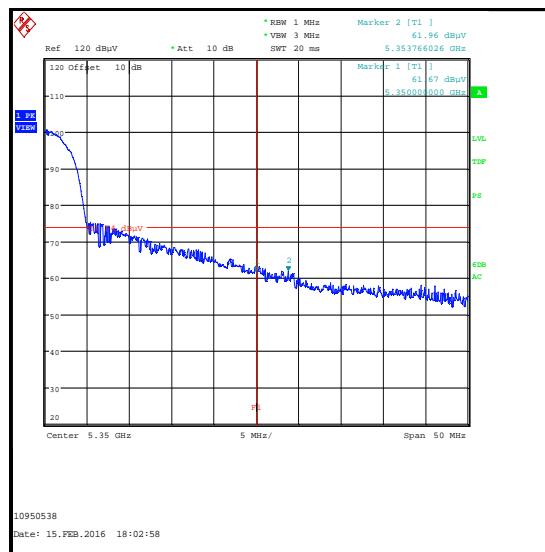
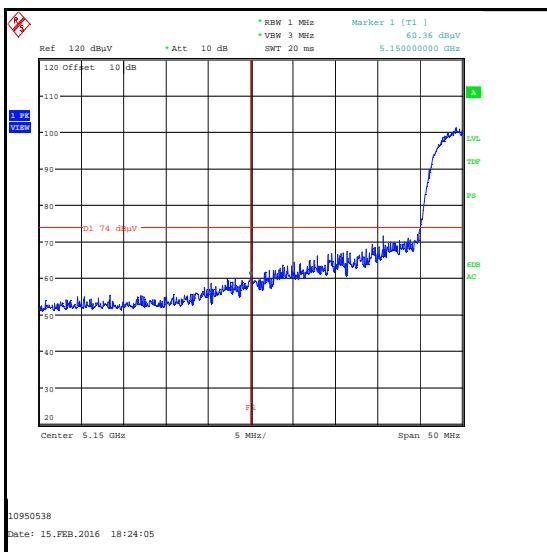
1. An Inquiry was made to the FCC and the response confirmed band edge measurements need only be performed in the EUT modes that produce the highest power and the widest bandwidths. The modes that produced the highest power and widest bandwidth were:
  - o 802.11a - BPSK / 9 Mbps
  - o 802.11a - QPSK / 12 Mbps
  - o 802.11n HT20 – BPSK / 7.2 Mbps / MCS0
  - o 802.11n HT20 – 16QAM / 43.3 Mbps / MCS4
  - o 802.11n HT40 – BPSK / 15.0 Mbps / MCS0
2. Lower band edge measurements were performed with the EUT transmitting on the bottom channel. Upper band edge measurements were performed with the EUT transmitting on the top channel.
3. For transmitters operating in the 5.25-5.35 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.
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 as calculated below:
  - o 802.11a / BPSK / 9 Mbps – 107 sweeps
  - o 802.11a / QPSK / 12 Mbps – 114 sweeps
  - o 802.11n HT20 / BPSK / 7.2 Mbps / MCS0 – 109 sweeps
  - o 802.11n HT20 / 16QAM / 43.3 Mbps / MCS4 – 144 sweeps
  - o 802.11n HT40 / BPSK / 15 Mbps / MCS0 – 117 sweeps
7. In accordance with KDB 789033 Section II.G.6.c) Method AD (vii), for average measurements, data rates where the EUT was transmitting <98% duty cycle, the duty cycle correction factor calculated in Section 5.2.4 of this test report was added to the measured result.

**Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)****Results: 802.11a / 20 MHz / BPSK / 9 Mbps / Peak**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
5150	60.4	74.0	13.6	Complied
5350	61.7	74.0	12.3	Complied

**Results: 802.11a / 20 MHz / BPSK / 9 Mbps / Average**

Frequency (MHz)	Level (dB $\mu$ V/m)	Duty Cycle correction (dB)	Corrected Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
5150	41.2	0.4	41.6	54.0	12.4	Complied
5350	41.4	0.4	41.8	54.0	12.2	Complied

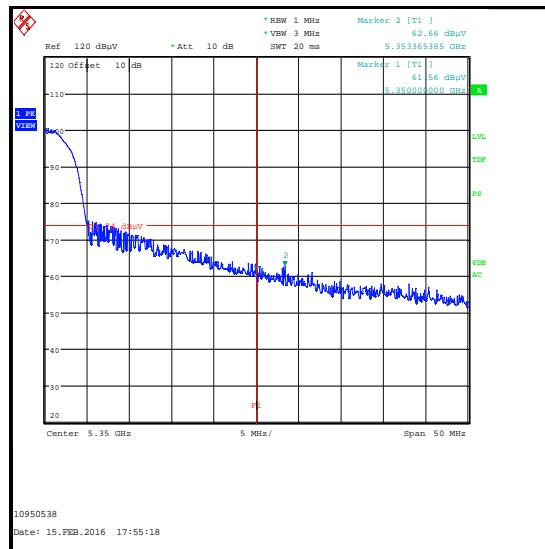
**Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)****Results: 802.11a / 20 MHz / BPSK / 9 Mbps****Lower Band Edge Peak Measurement****Lower Band Edge Average Measurement****Upper Band Edge Average Measurement**

**Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)****Results: 802.11a / 20 MHz / QPSK / 12 Mbps / Peak**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
5150	59.6	74.0	14.4	Complied
5350	61.6	74.0	12.4	Complied

**Results: 802.11a / 20 MHz / QPSK / 12 Mbps / Average**

Frequency (MHz)	Level (dB $\mu$ V/m)	Duty Cycle correction (dB)	Corrected Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
5150	41.6	0.6	42.2	54.0	11.8	Complied
5350	41.5	0.6	42.1	54.0	11.9	Complied

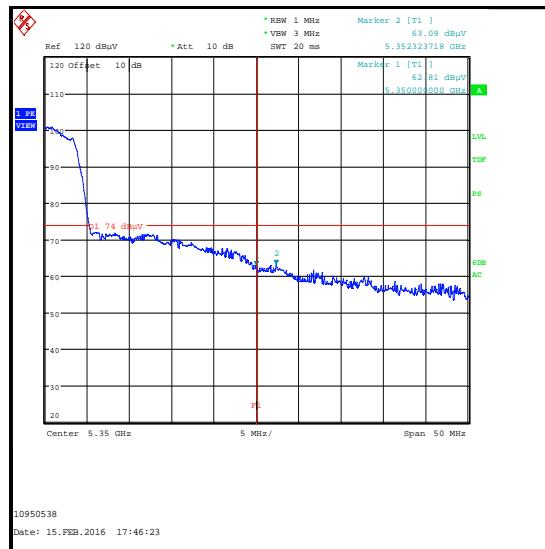
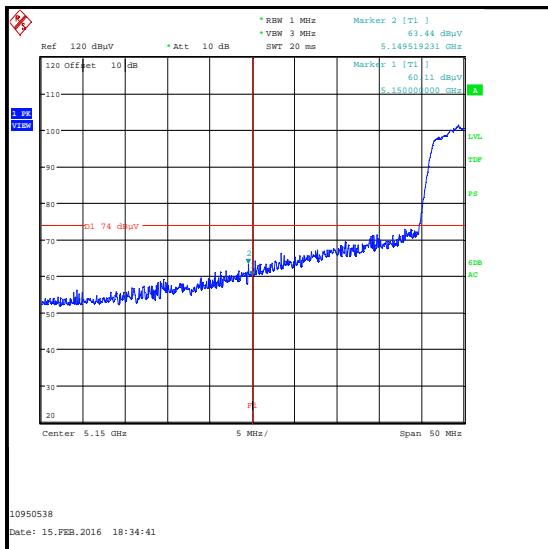
**Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)****Results: 802.11a / 20 MHz / QPSK / 12 Mbps****Lower Band Edge Peak Measurement****Lower Band Edge Average Measurement****Upper Band Edge Average Measurement**

**Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)****Results: 802.11n / 20 MHz / BPSK / 7.2 Mbps / MCS0 / Peak**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
5150	60.1	74.0	13.9	Complied
5350	62.8	74.0	11.2	Complied

**Results: 802.11n / 20 MHz / BPSK / 7.2 Mbps / MCS0 / Average**

Frequency (MHz)	Level (dB $\mu$ V/m)	Duty Cycle correction (dB)	Corrected Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
5150	41.4	0.3	41.7	54.0	12.3	Complied
5350	41.2	0.3	41.5	54.0	12.5	Complied

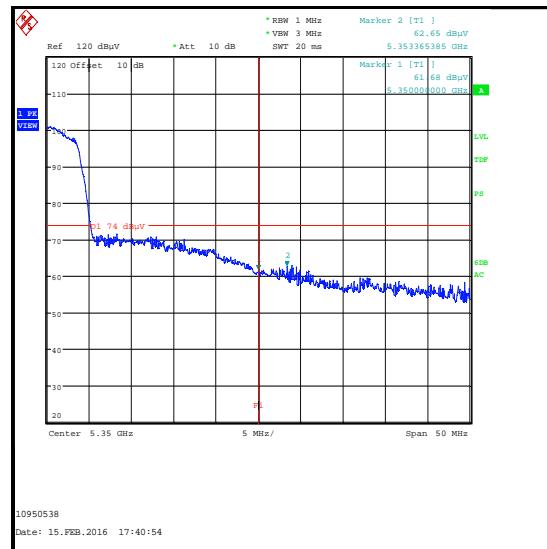
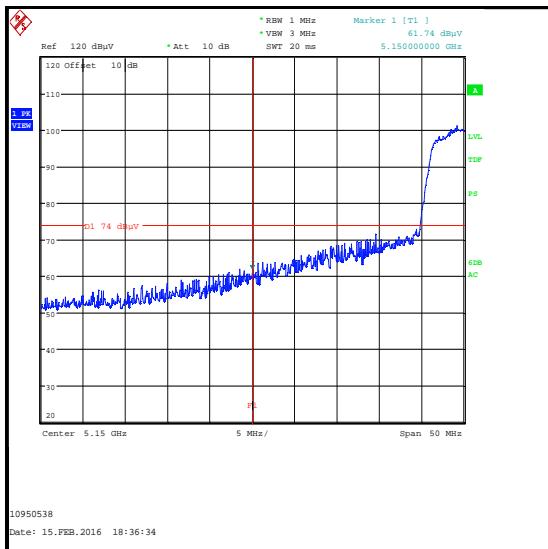
**Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)****Results: 802.11n / 20 MHz / BPSK / 7.2 Mbps / MCS0****Lower Band Edge Peak Measurement****Lower Band Edge Average Measurement****Upper Band Edge Average Measurement**

**Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)****Results: 802.11n / 20 MHz / 16QAM / 43.3 Mbps / MCS4 / Peak**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
5150	61.7	74.0	12.3	Complied
5350	61.7	74.0	12.3	Complied

**Results: 802.11n / 20 MHz / 16QAM / 43.3 Mbps / MCS4 / Average**

Frequency (MHz)	Level (dB $\mu$ V/m)	Duty Cycle correction (dB)	Corrected Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
5150	41.3	1.6	42.9	54.0	11.1	Complied
5350	41.4	1.6	43.0	54.0	11.0	Complied

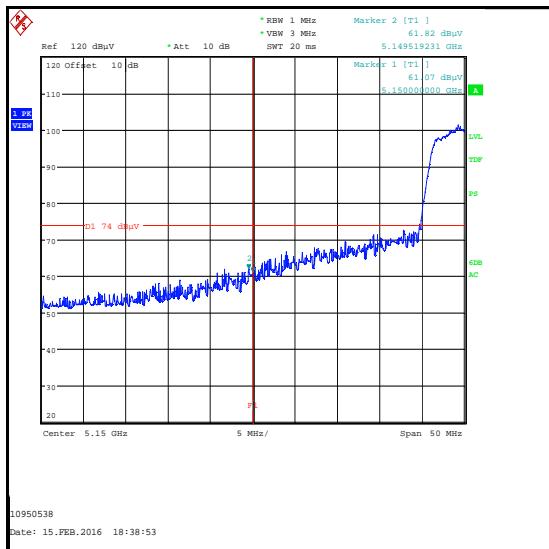
**Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)****Results: 802.11n / 20 MHz / 16QAM / 43.3 Mbps / MCS4****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Lower Band Edge Average Measurement****Upper Band Edge Average Measurement**

**Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)****Results: 802.11n / 40 MHz / BPSK / 15 Mbps / MCS0 / Peak**

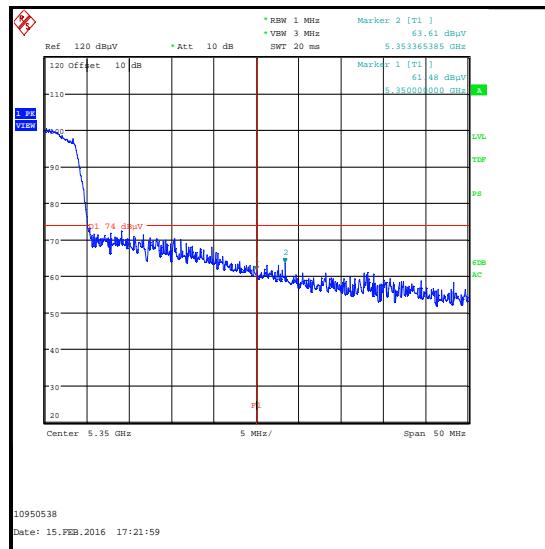
Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
5150	61.1	74.0	12.9	Complied
5350	61.5	74.0	12.5	Complied

**Results: 802.11n / 40 MHz / BPSK / 15 Mbps / MCS0 / Average**

Frequency (MHz)	Level (dB $\mu$ V/m)	Duty Cycle correction (dB)	Corrected Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
5150	41.7	0.7	42.4	54.0	11.6	Complied
5350	41.5	0.7	42.2	54.0	11.8	Complied

**Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)****Results: 802.11n / 40 MHz / BPSK / 15 Mbps / MCS0**

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**Lower Band Edge Peak Measurement**

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Date: 15.FEB.2016 15:49:21

**Lower Band Edge Average Measurement****Upper Band Edge Average Measurement**

**Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band)****Test Summary:**

Test Engineer:	Sandeep Bharat	Test Date:	15 February 2016
Test Sample Serial Number:	02001-0354		

FCC Reference:	Parts 15.407(b)(3),(7), 15.205 & 15.209(a)
Test Method Used:	ANSI C63.10 Section 6.10.4 & KDB 789033 II.G.

**Environmental Conditions:**

Temperature (°C):	24
Relative Humidity (%):	40

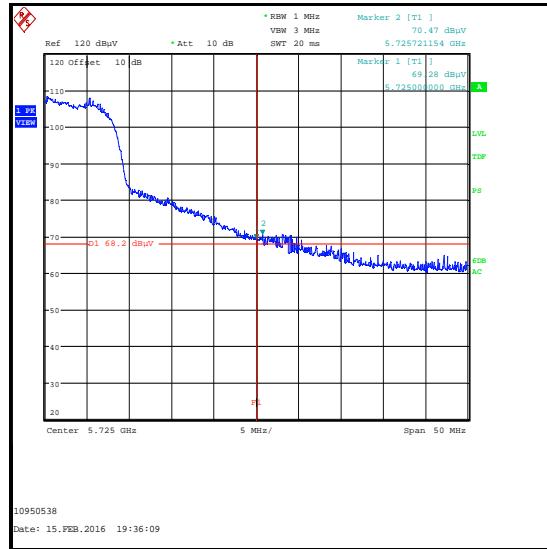
**Note(s):**

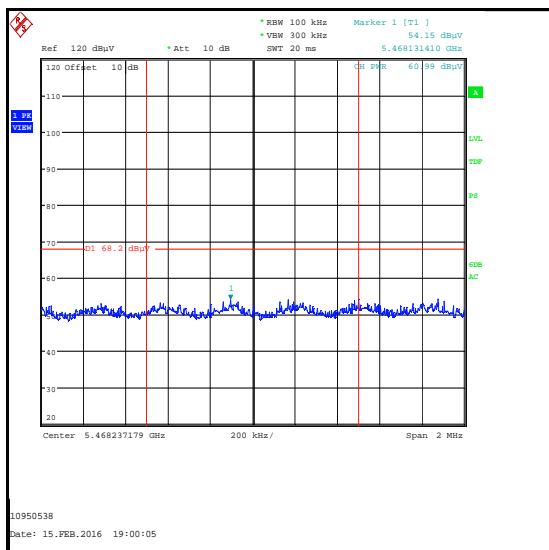
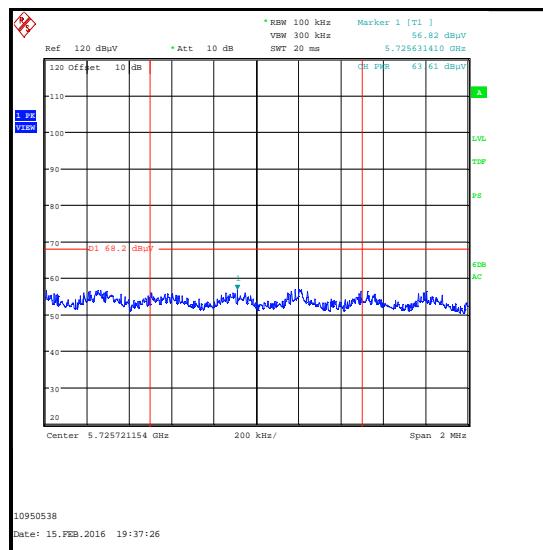
1. An inquiry was made to the FCC confirmed that band edge measurements need only be performed in the EUT modes that produce the highest power and the widest bandwidths. The modes that produced the highest power and widest bandwidth were:
  - o 802.11a - BPSK / 9 Mbps
  - o 802.11a - QPSK / 12 Mbps
  - o 802.11n HT20 – BPSK / 7.2 Mbps / MCS0
  - o 802.11n HT20 – 16QAM / 43.3 Mbps / MCS4
  - o 802.11n HT40 – BPSK / 15.0 Mbps / MCS0
2. Lower band edge measurements were performed with the EUT transmitting on the bottom channel. Upper band edge measurements were performed with the EUT transmitting on the top channel.
3. For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 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 at 5.35-5.46 GHz therefore the provisions of FCC Part 15.205 apply.
4. For completeness, results are also shown as EIRP in dBm and also as field strength in dB $\mu$ V/m. Measured field strength was converted to EIRP in accordance with KDB 789033 II.G.2.d.(iii) using a conversion factor of 95.2.
5. In accordance with KDB 789033 II.G.2.c), if the EUT complies with both peak and average limits of part 15.209, it is not required to satisfy the maximum emission limit of -27 dBm/ MHz.

**Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)****Results: 802.11a / 20 MHz / BPSK / 9 Mbps / Peak**

	EIRP (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Result
5470	-34.2	-27.0	7.2	Complied
5725	-31.6	-27.0	4.6	Complied

Frequency (MHz)	Field Strength at 3m (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
5470	61.0	68.2	7.2	Complied
5725	63.6	68.2	4.6	Complied

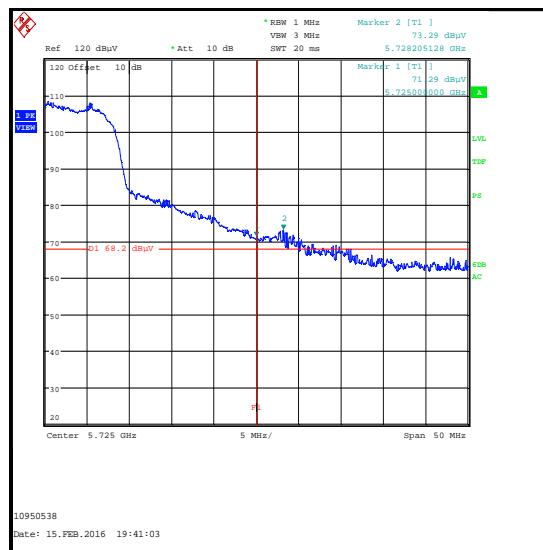
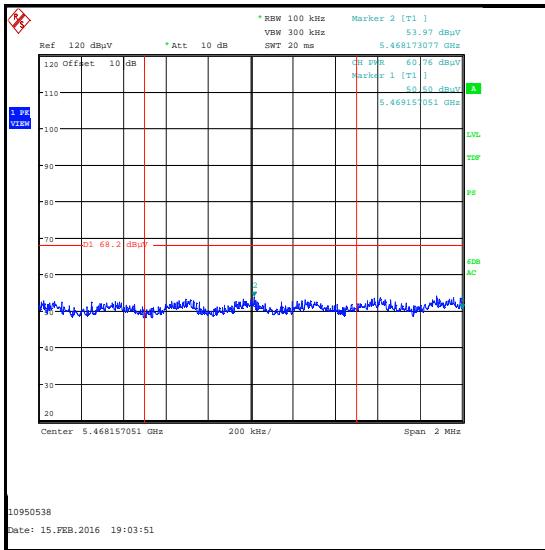
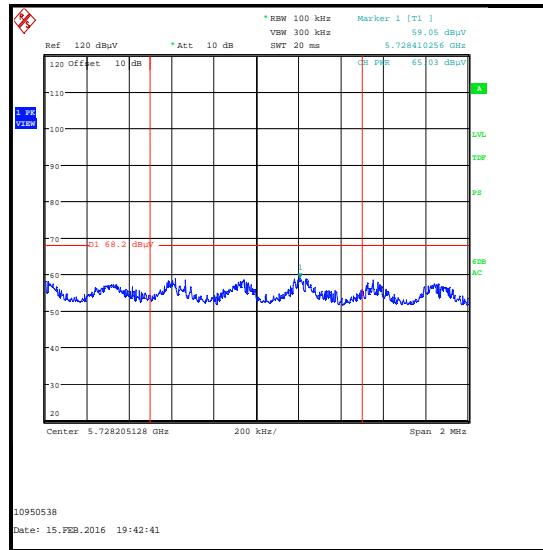


**Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)****Results: 802.11a / 20 MHz / BPSK / 9 Mbps****Lower Band Edge Measurement  
Integration Method****Upper Band Edge Measurement  
Integration Method**

**Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)****Results: 802.11a / 20 MHz / QPSK / 12 Mbps / Peak**

Frequency (MHz)	EIRP (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Result
5470	-34.4	-27.0	7.4	Complied
5725	-30.2	-27.0	3.2	Complied

Frequency (MHz)	Field Strength at 3m (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
5470	60.8	68.2	7.4	Complied
5725	65.0	68.2	3.2	Complied

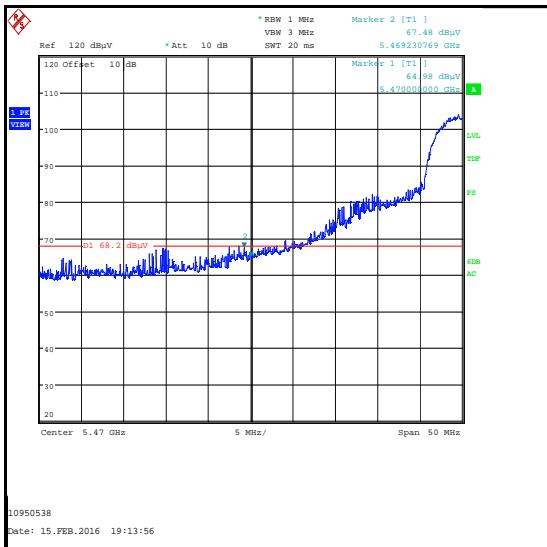
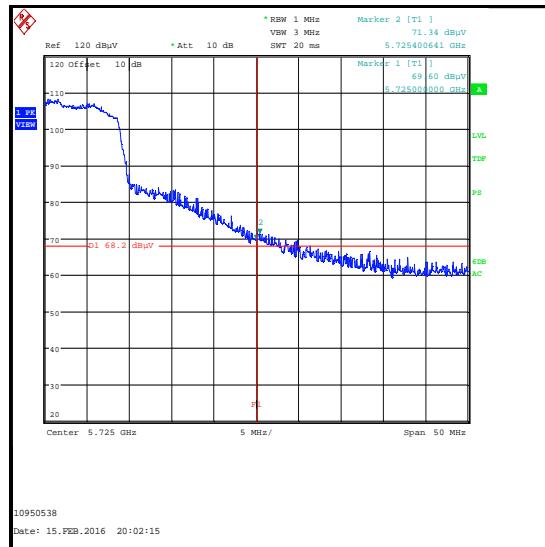
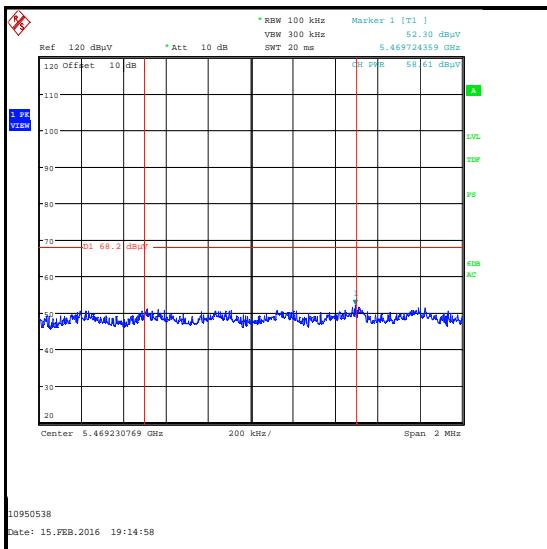
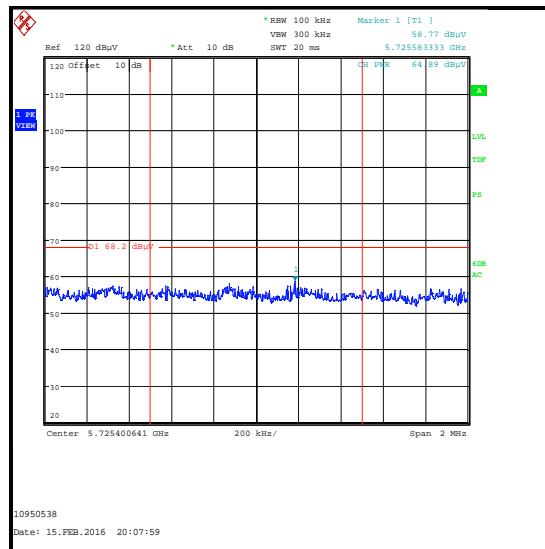
**Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)****Results: 802.11a / 20 MHz / QPSK / 12 Mbps****Lower Band Edge Peak Measurement****Measured using Integration Method****Measured using Integration Method**

**Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)****Results: 802.11n / 20 MHz / BPSK / 7.2 Mbps / MCS0 / Peak**

Frequency (MHz)	Field Strength at 3m (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
5470	58.6	68.2	9.6	Complied
5725	64.9	68.2	3.3	Complied

**Results: 802.11n / 20 MHz / BPSK / 7.2 Mbps / MCS0 / Peak**

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
5470	-36.6	-27.0	9.6	Complied
5725	-30.3	-27.0	3.3	Complied

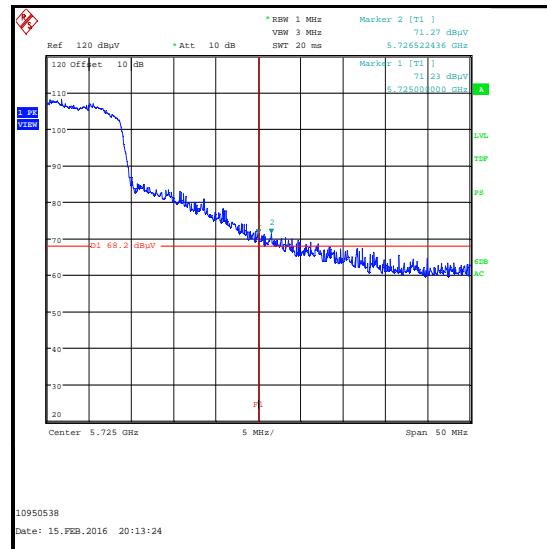
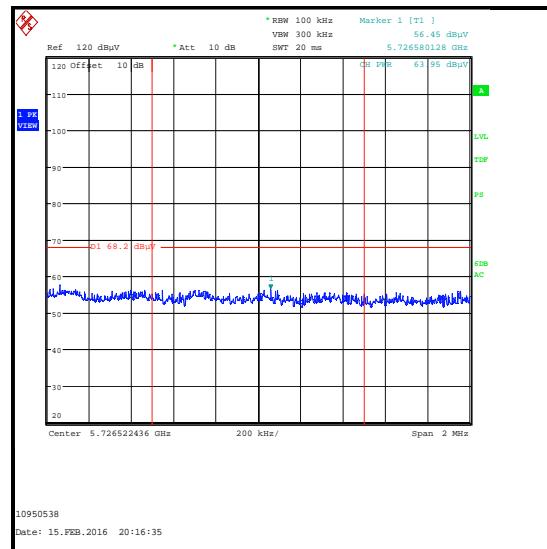
**Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)****Results: 802.11n / 20 MHz / BPSK / 7.2 Mbps / MCS0****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Measured using Integration Method****Measured using Integration Method**

**Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)****Results: 802.11n / 20 MHz / 16QAM / 43.3 Mbps / MCS4 / Peak**

Frequency (MHz)	Field Strength at 3m (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
5470	67.4	68.2	0.8	Complied
5725	64.0	68.2	4.2	Complied

**Results: 802.11n / 20 MHz / 16QAM / 43.3 Mbps / MCS4 / Peak**

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
5470	-27.8	-27.0	0.8	Complied
5725	-31.2	-27.0	4.2	Complied

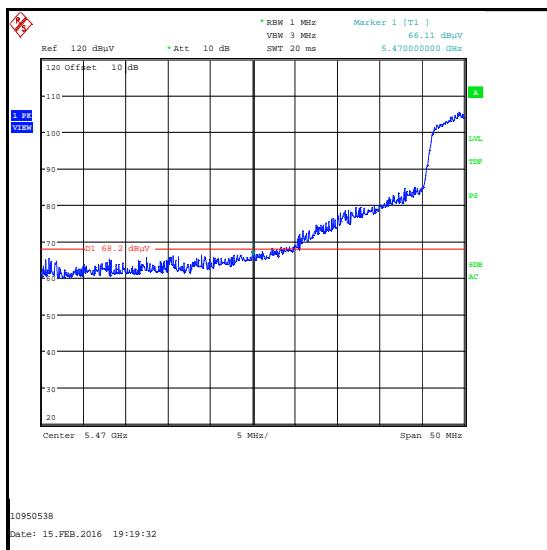
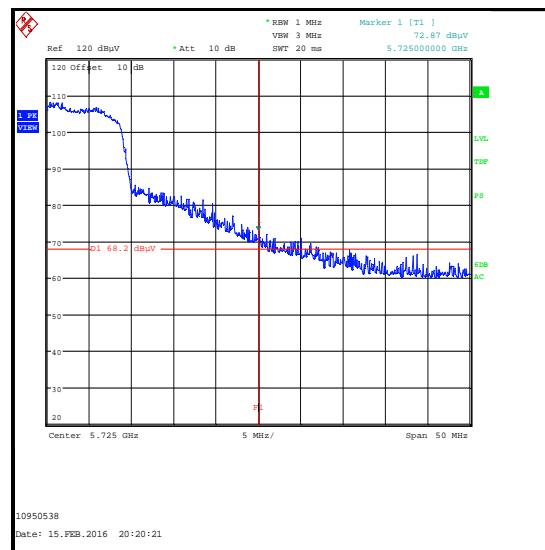
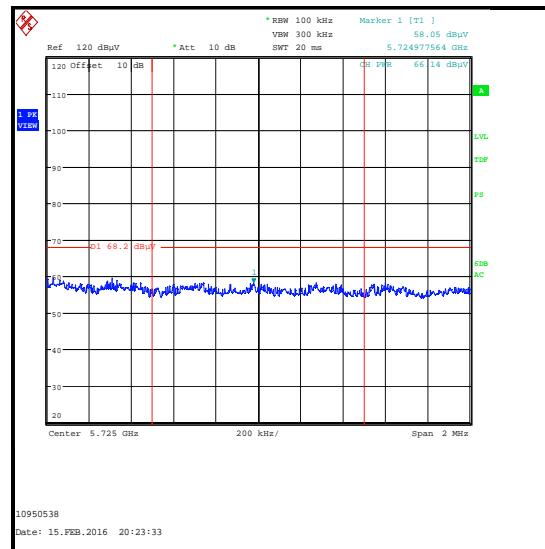
**Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)****Results: 802.11n / 20 MHz / 16QAM / 43.3 Mbps / MCS4****Lower Band Edge Measurement****Upper Band Edge Measurement****Measured using Integration Method**

**Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)****Results: 802.11n / 40 MHz / BPSK / 15.0 Mbps / MCS0 / Peak**

Frequency (MHz)	Field Strength at 3m (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
5470	66.1	68.2	2.1	Complied
5725	66.1	68.2	2.1	Complied

**Results: 802.11n / 40 MHz / BPSK / 15.0 Mbps / MCS0 / Peak**

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
5470	-29.1	-27.0	2.1	Complied
5725	-29.1	-27.0	2.1	Complied

**Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)****Results: 802.11n / 40 MHz / BPSK / 15.0 Mbps / MCS0****Lower Band Edge Measurement****Upper Band Edge Measurement****Measured using Integration Method**

**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
M1886	Test Receiver	Rohde & Schwarz	ESU26	100554	21 May 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	05 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
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	±4.69 dB
Maximum Conducted Output Power	5.15 GHz to 5.850 GHz	95%	±1.13 dB
Maximum Power Spectral Density	5.15 GHz to 5.850 GHz	95%	±1.13 dB
26 dB Emission Bandwidth	5.15 GHz to 5.850 GHz	95%	±3.92 %
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

**--- END OF REPORT ---**