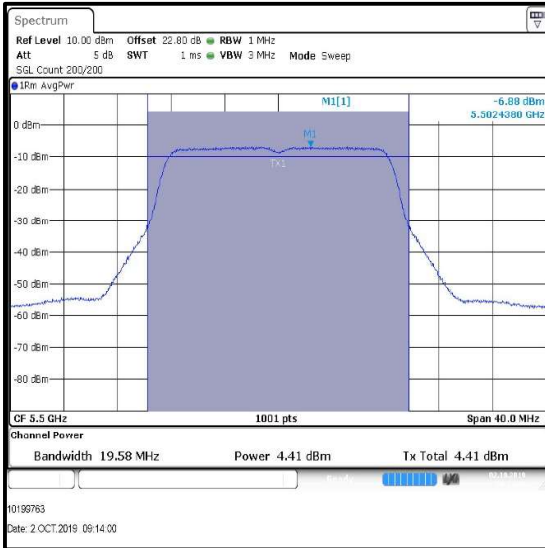
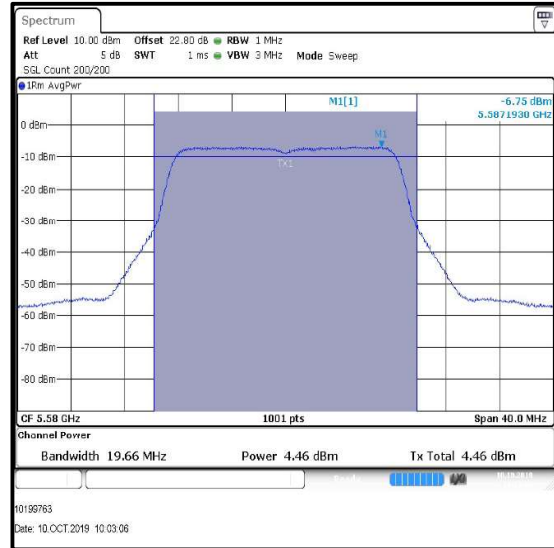


**Transmitter Maximum Conducted Output Power (5.47-5.725 GHz band) (continued)**

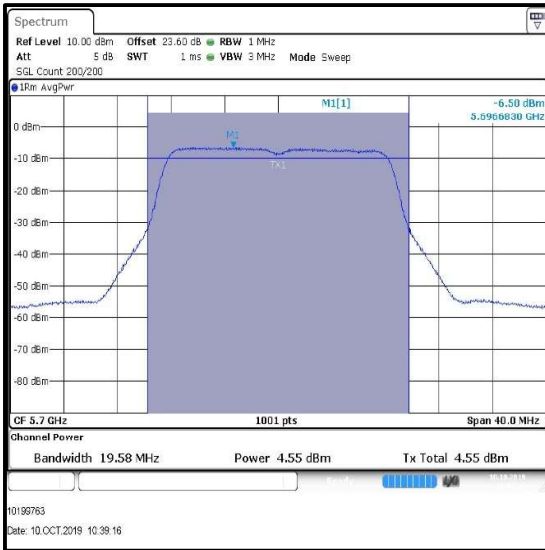
**Results: 802.11a / 20 MHz / MIMO / 4Tx CDD / QPSK / 12 Mbps / Port 1**



Bottom Channel



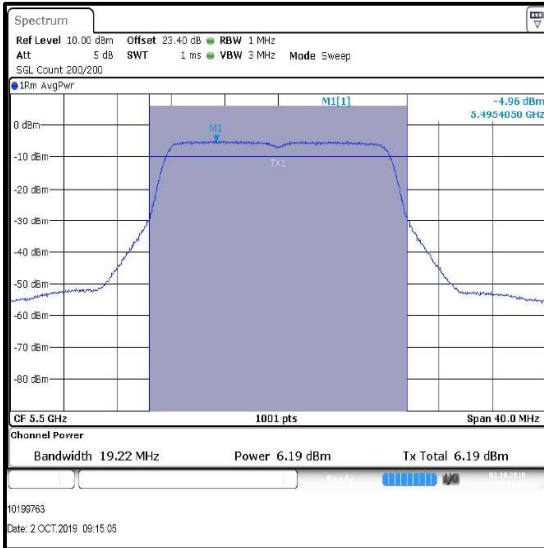
Middle Channel



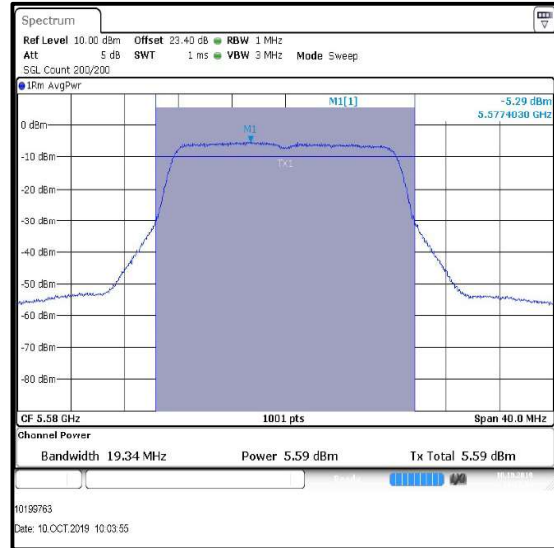
Top Channel

**Transmitter Maximum Conducted Output Power (5.47-5.725 GHz band) (continued)**

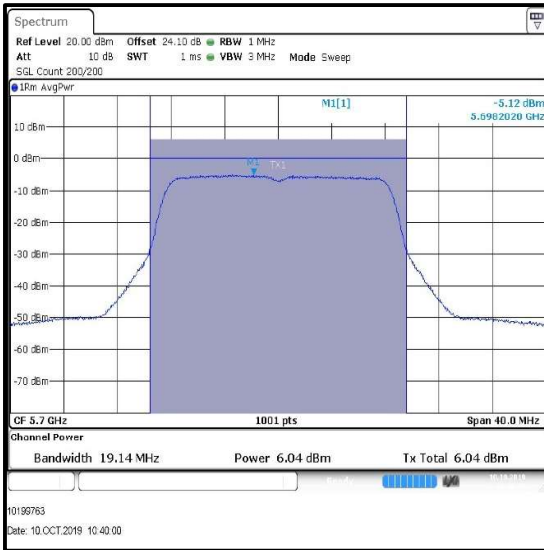
**Results: 802.11a / 20 MHz / MIMO / 4Tx CDD / QPSK / 12 Mbps / Port 2**



**Bottom Channel**



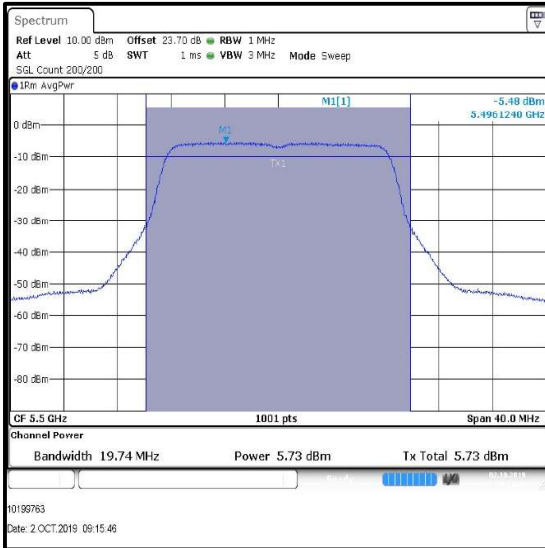
**Middle Channel**



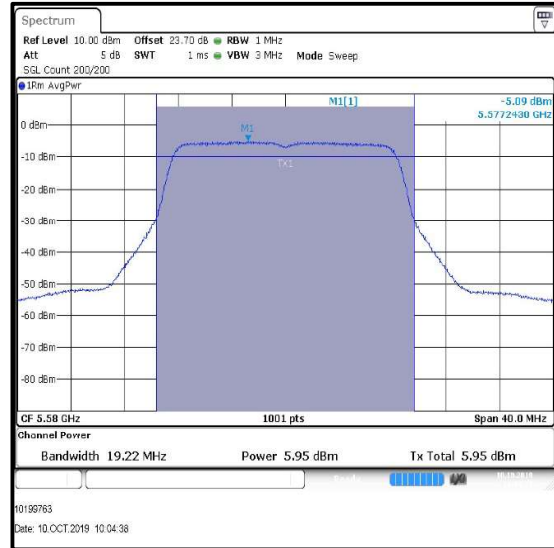
**Top Channel**

**Transmitter Maximum Conducted Output Power (5.47-5.725 GHz band) (continued)**

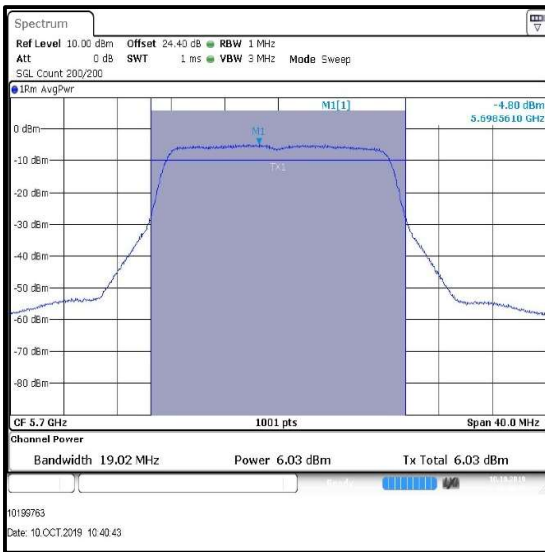
**Results: 802.11a / 20 MHz / MIMO / 4Tx CDD / QPSK / 12 Mbps / Port 3**



**Bottom Channel**



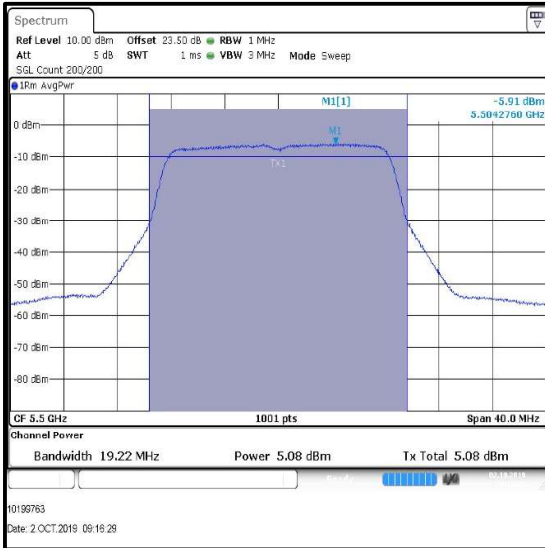
**Middle Channel**



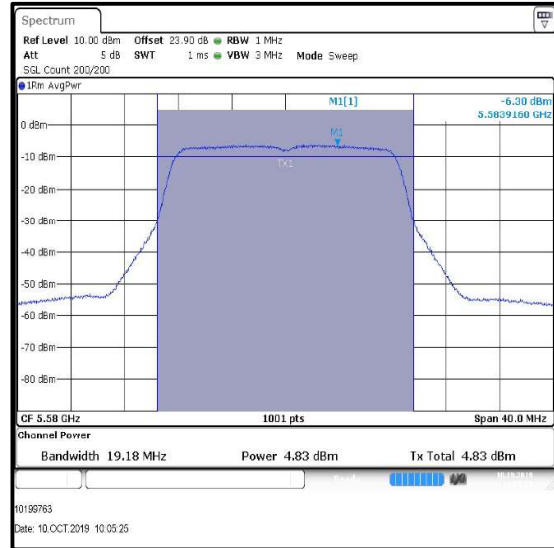
**Top Channel**

**Transmitter Maximum Conducted Output Power (5.47-5.725 GHz band) (continued)**

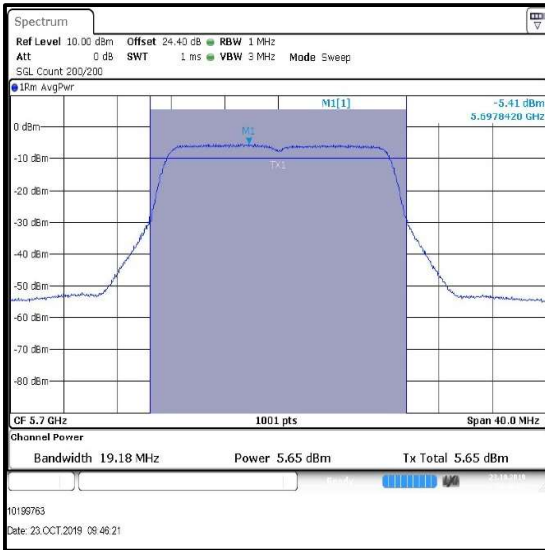
**Results: 802.11a / 20 MHz / MIMO / 4Tx CDD / QPSK / 12 Mbps / Port 4**



**Bottom Channel**



**Middle Channel**



**Top Channel**

**Transmitter Maximum Conducted Output Power (5.47-5.725 GHz band) (continued)****Results: 802.11n / 20 MHz / MIMO / 4Tx CDD / QPSK / MCS1**

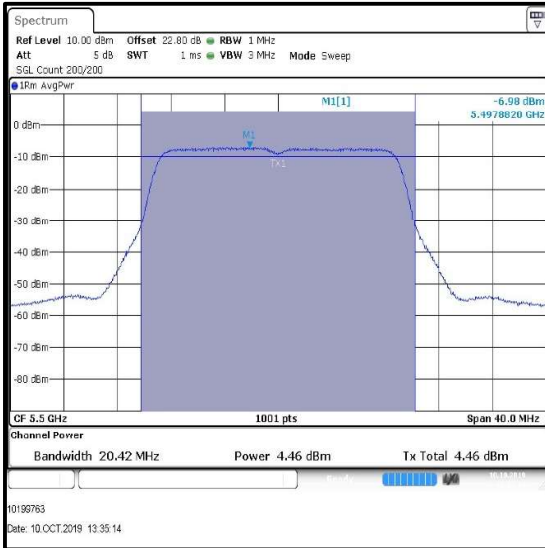
Channel	Frequency (MHz)	Port 1			Port 2		
		Conducted Power (dBm)	Duty Cycle correction factor (dB)	Corrected Conducted Power (dBm)	Conducted Power (dBm)	Duty Cycle correction factor (dB)	Corrected Conducted Power (dBm)
Bottom	5500	4.5	0.6	5.1	6.0	0.6	6.6
Middle	5580	5.0	0.5	5.5	5.7	0.5	6.2
Top	5700	4.7	0.5	5.2	6.4	0.5	6.9

Channel	Frequency (MHz)	Port 3			Port 4		
		Conducted Power (dBm)	Duty Cycle correction factor (dB)	Corrected Conducted Power (dBm)	Conducted Power (dBm)	Duty Cycle correction factor (dB)	Corrected Conducted Power (dBm)
Bottom	5500	5.6	0.6	6.2	5.2	0.6	5.8
Middle	5580	6.6	0.5	7.1	4.8	0.5	5.3
Top	5700	6.1	0.5	6.6	5.1	0.5	5.6

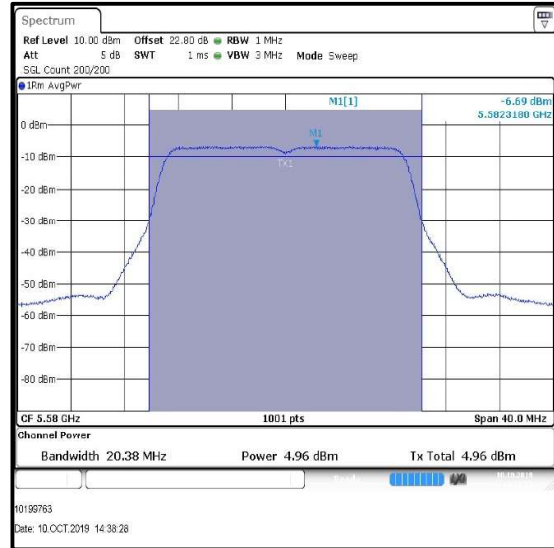
Channel	Frequency (MHz)	Combined Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5500	12.0	21.0	9.0	Complied
Middle	5580	12.1	21.0	8.9	Complied
Top	5700	12.2	21.0	8.8	Complied

**Transmitter Maximum Conducted Output Power (5.47-5.725 GHz band) (continued)**

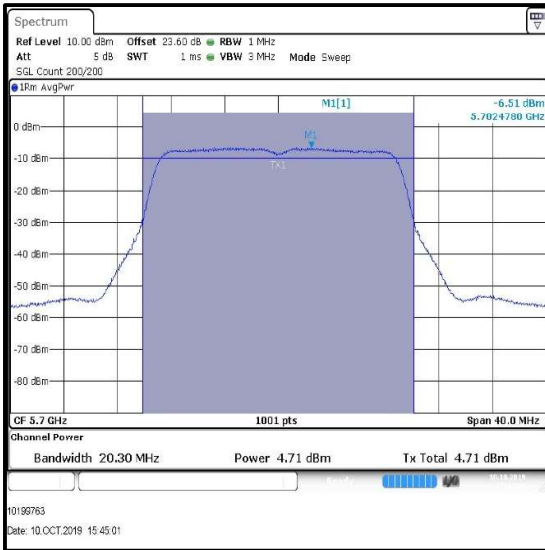
**Results: 802.11n / 20 MHz / MIMO / 4Tx CDD / QPSK / MCS1 / Port 1**



**Bottom Channel**



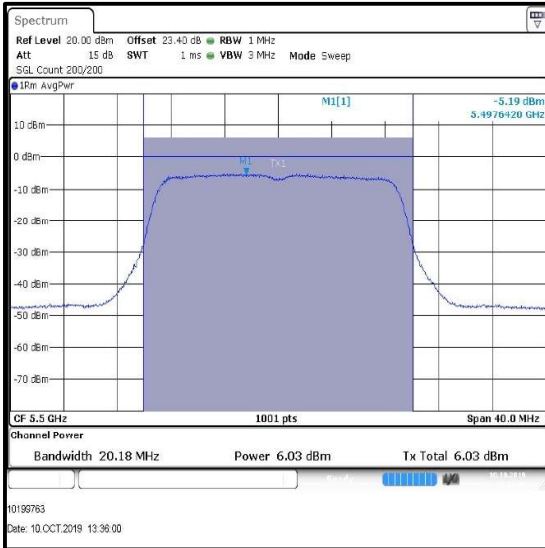
**Middle Channel**



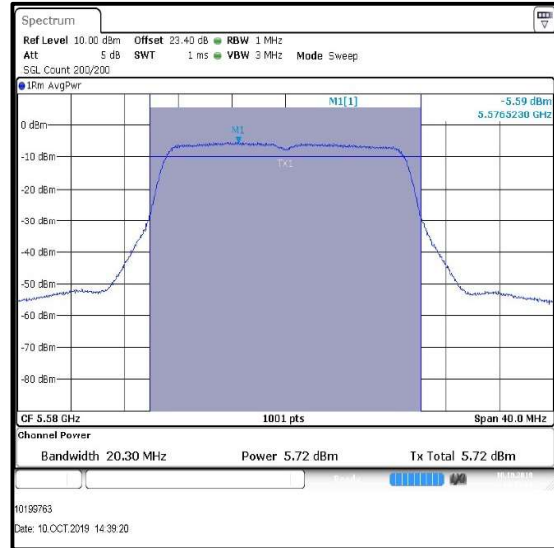
**Top Channel**

**Transmitter Maximum Conducted Output Power (5.47-5.725 GHz band) (continued)**

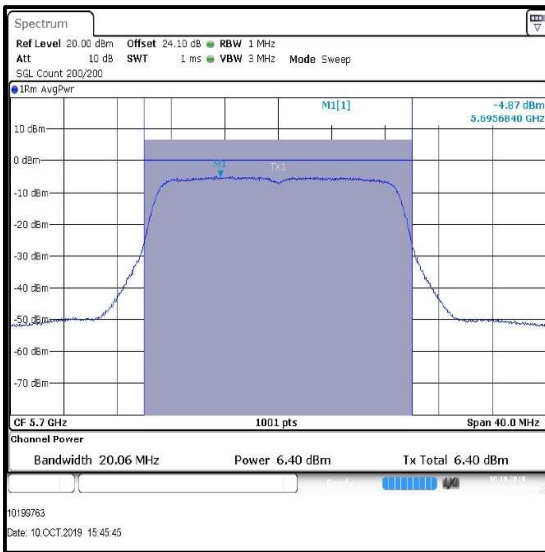
**Results: 802.11n / 20 MHz / MIMO / 4Tx CDD / QPSK / MCS1 / Port 2**



**Bottom Channel**



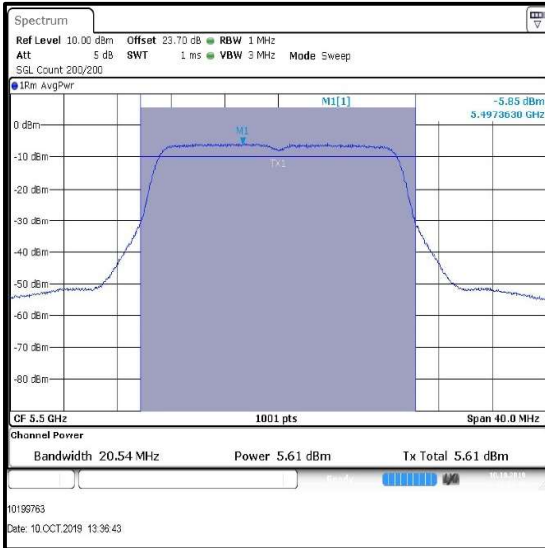
**Middle Channel**



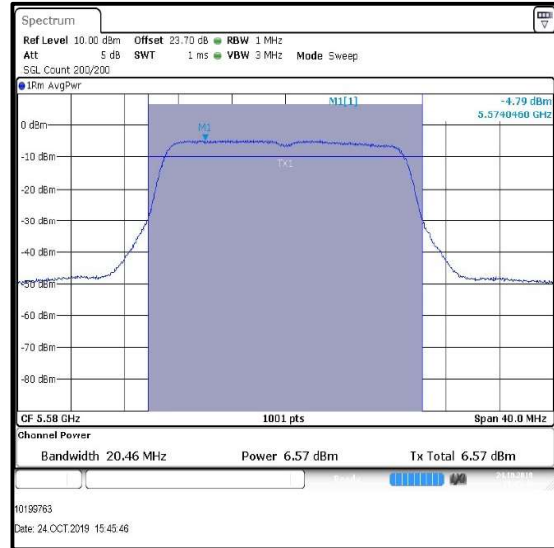
**Top Channel**

**Transmitter Maximum Conducted Output Power (5.47-5.725 GHz band) (continued)**

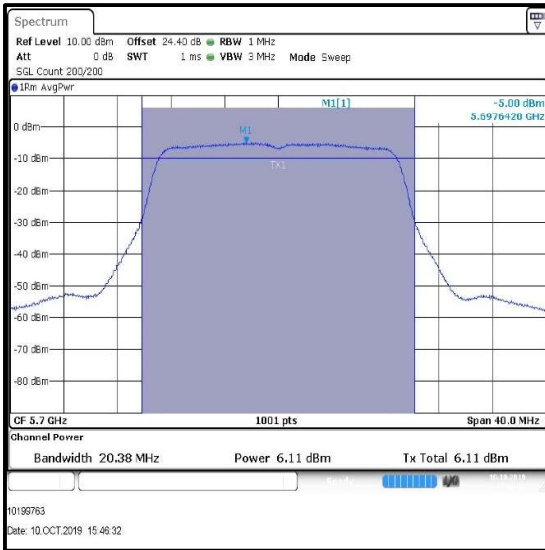
**Results: 802.11n / 20 MHz / MIMO / 4Tx CDD / QPSK / MCS1 / Port 3**



Bottom Channel



Middle Channel

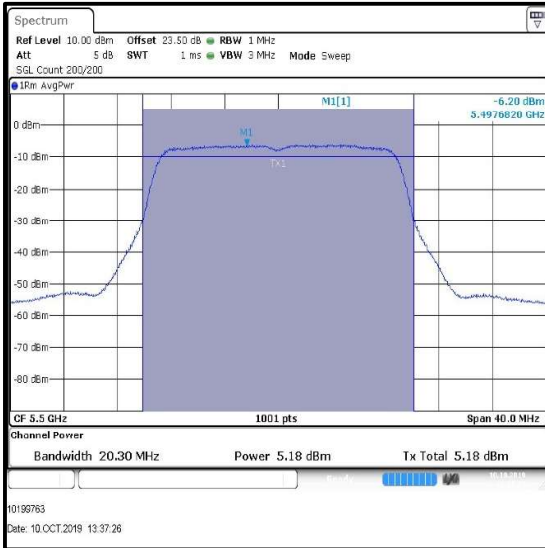


Top Channel

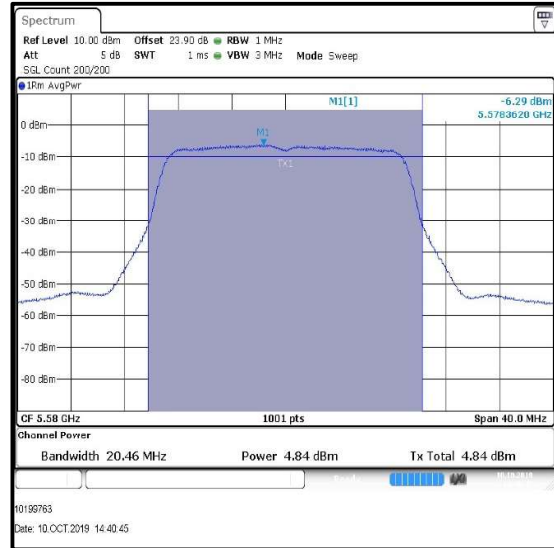


**Transmitter Maximum Conducted Output Power (5.47-5.725 GHz band) (continued)**

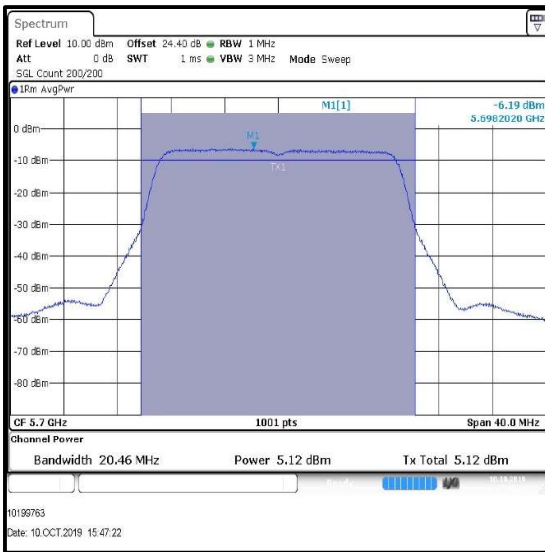
**Results: 802.11n / 20 MHz / MIMO / 4Tx CDD / QPSK / MCS1 / Port 4**



Bottom Channel



Middle Channel



Top Channel

**Transmitter Maximum Conducted Output Power (5.47-5.725 GHz band) (continued)****Results: 802.11n / 40 MHz / MIMO / 4Tx CDD / 16QAM / MCS3**

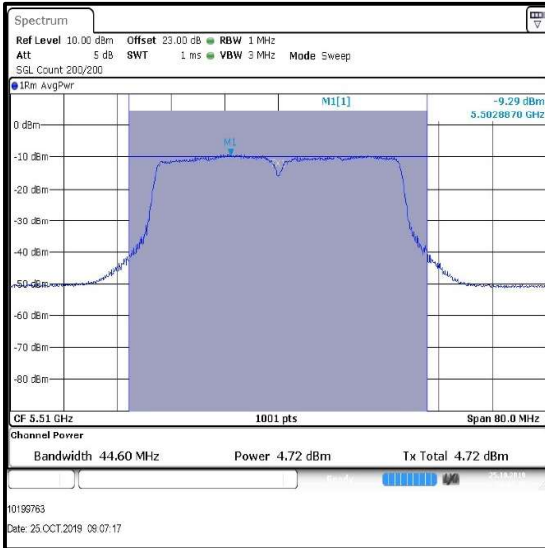
Channel	Frequency (MHz)	Port 1			Port 2		
		Conducted Power (dBm)	Duty Cycle correction factor (dB)	Corrected Conducted Power (dBm)	Conducted Power (dBm)	Duty Cycle correction factor (dB)	Corrected Conducted Power (dBm)
Bottom	5510	4.7	1.5	6.2	6.7	1.5	8.2
Middle	5550	4.7	1.4	6.1	5.9	1.4	7.3
Top	5670	4.4	1.4	5.8	5.9	1.4	7.3

Channel	Frequency (MHz)	Port 3			Port 4		
		Conducted Power (dBm)	Duty Cycle correction factor (dB)	Corrected Conducted Power (dBm)	Conducted Power (dBm)	Duty Cycle correction factor (dB)	Corrected Conducted Power (dBm)
Bottom	5510	6.3	1.5	7.8	5.5	1.5	7.0
Middle	5550	5.8	1.4	7.2	5.1	1.4	6.5
Top	5670	6.0	1.4	7.4	5.2	1.4	6.6

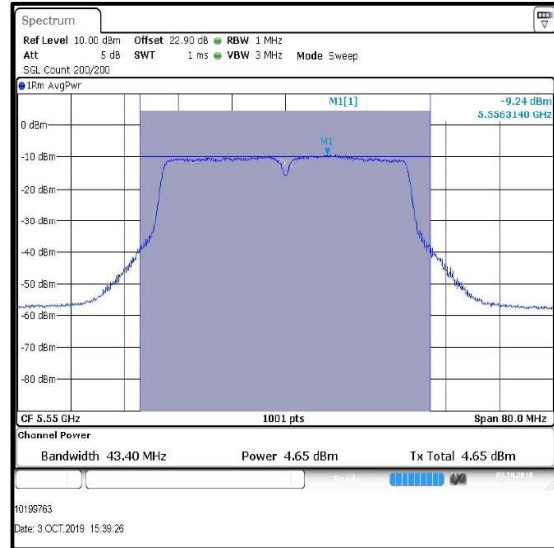
Channel	Frequency (MHz)	Combined Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5510	13.4	21.0	7.6	Complied
Middle	5550	12.8	21.0	8.2	Complied
Top	5670	12.8	21.0	8.2	Complied

**Transmitter Maximum Conducted Output Power (5.47-5.725 GHz band) (continued)**

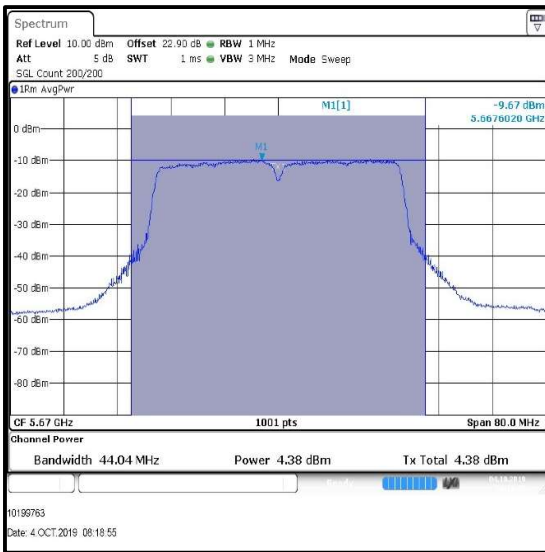
**Results: 802.11n / 40 MHz / MIMO / 4Tx CDD / 16QAM / MCS3 / Port 1**



**Bottom Channel**



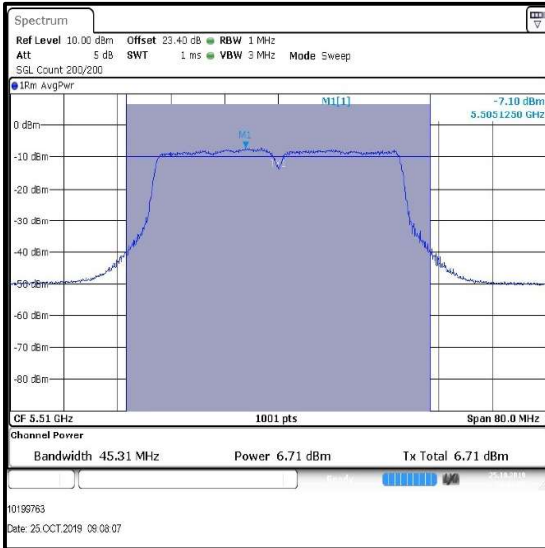
**Middle Channel**



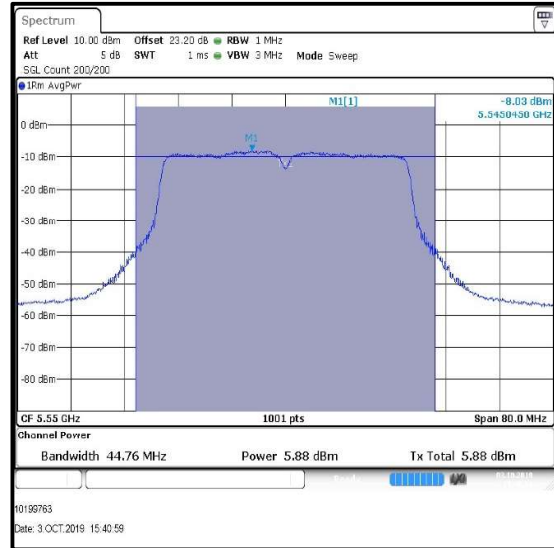
**Top Channel**

**Transmitter Maximum Conducted Output Power (5.47-5.725 GHz band) (continued)**

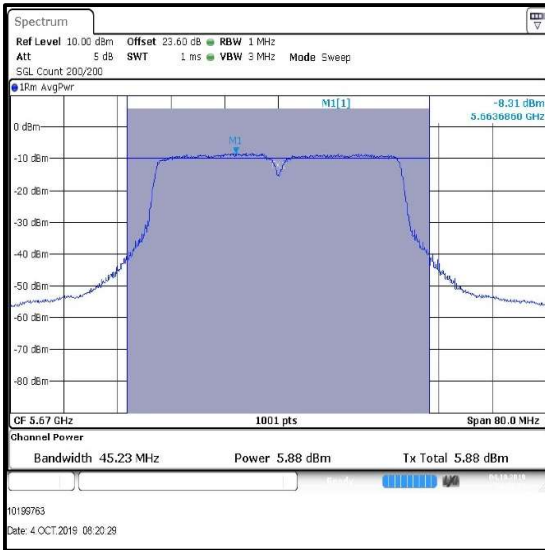
**Results: 802.11n / 40 MHz / MIMO / 4Tx CDD / 16QAM / MCS3 / Port 2**



**Bottom Channel**



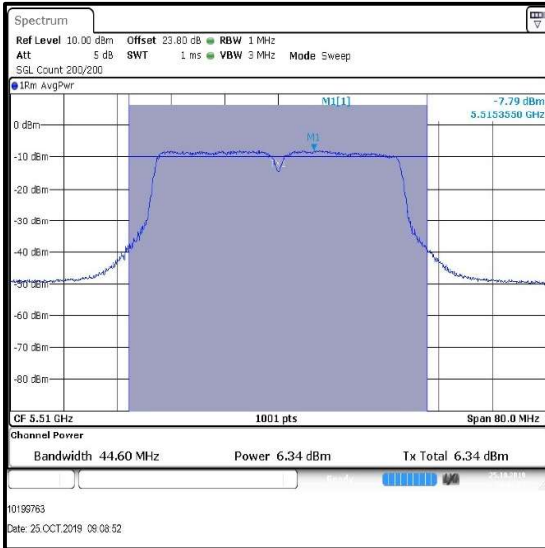
**Middle Channel**



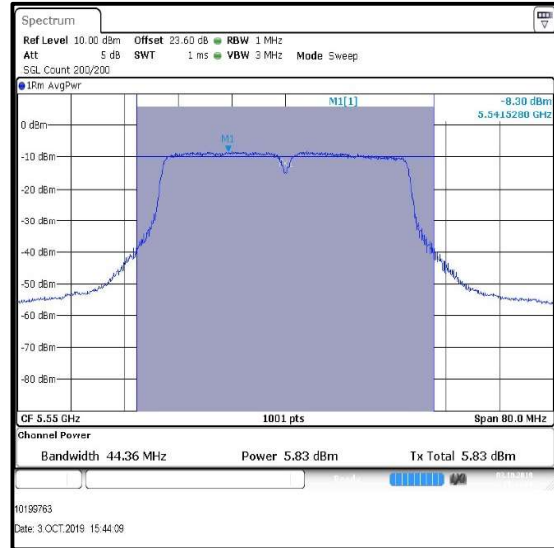
**Top Channel**

**Transmitter Maximum Conducted Output Power (5.47-5.725 GHz band) (continued)**

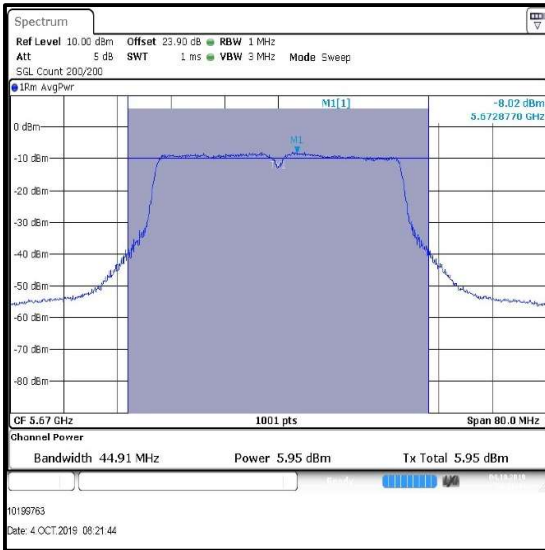
**Results: 802.11n / 40 MHz / MIMO / 4Tx CDD / 16QAM / MCS3 / Port 3**



**Bottom Channel**



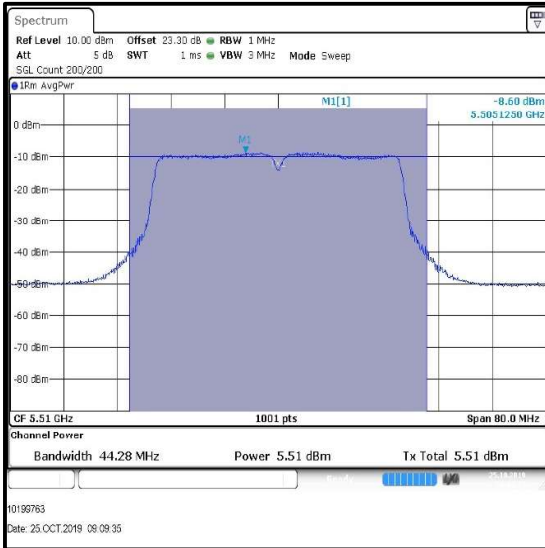
**Middle Channel**



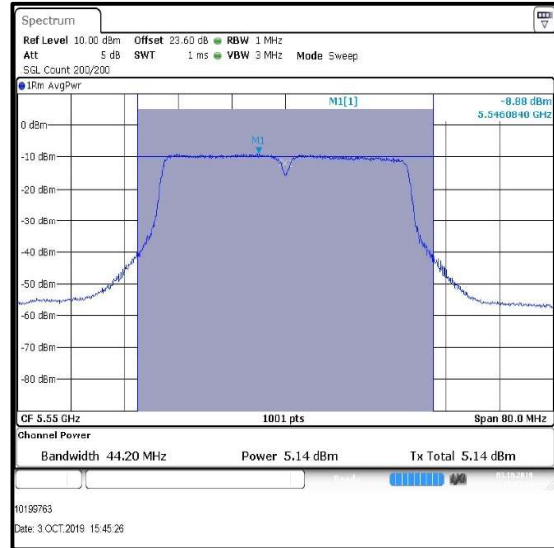
**Top Channel**

**Transmitter Maximum Conducted Output Power (5.47-5.725 GHz band) (continued)**

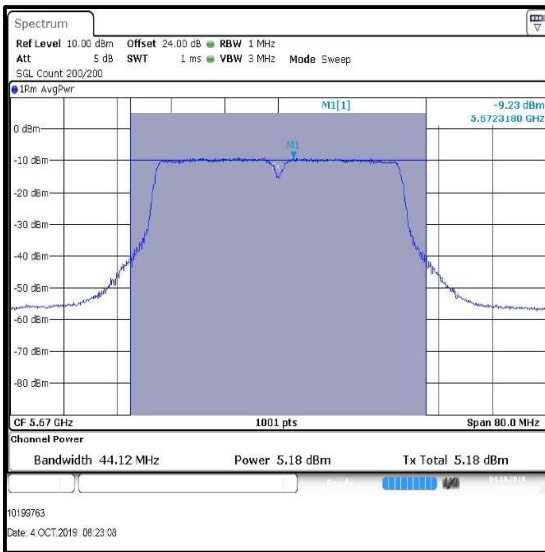
**Results: 802.11n / 40 MHz / MIMO / 4Tx CDD / 16QAM / MCS3 / Port 4**



**Bottom Channel**



**Middle Channel**



**Top Channel**

**Transmitter Maximum Conducted Output Power (5.47-5.725 GHz band) (continued)****Results: 802.11ac / 80 MHz / MIMO / 4Tx CDD / 16QAM / MCS3x1**

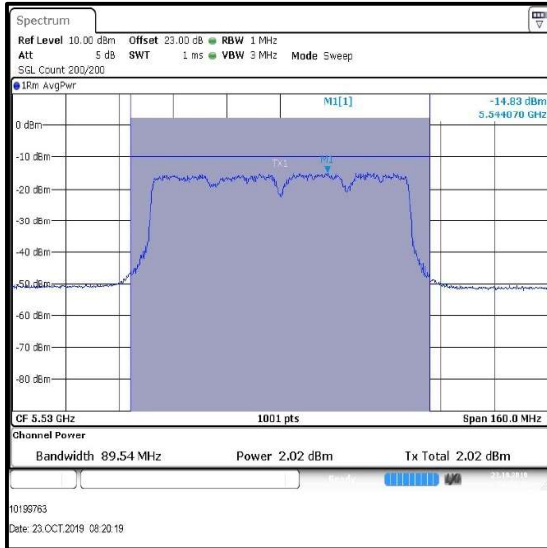
Channel	Frequency (MHz)	Port 1			Port 2		
		Conducted Power (dBm)	Duty Cycle correction factor (dB)	Corrected Conducted Power (dBm)	Conducted Power (dBm)	Duty Cycle correction factor (dB)	Corrected Conducted Power (dBm)
Bottom	5530	2.0	3.1	5.1	3.8	3.1	6.9
Top	5610	3.1	3.2	6.3	3.8	3.2	7.0

Channel	Frequency (MHz)	Port 3			Port 4		
		Conducted Power (dBm)	Duty Cycle correction factor (dB)	Corrected Conducted Power (dBm)	Conducted Power (dBm)	Duty Cycle correction factor (dB)	Corrected Conducted Power (dBm)
Bottom	5530	3.6	3.1	6.7	3.0	3.1	6.1
Top	5610	3.8	3.2	7.0	3.2	3.2	6.4

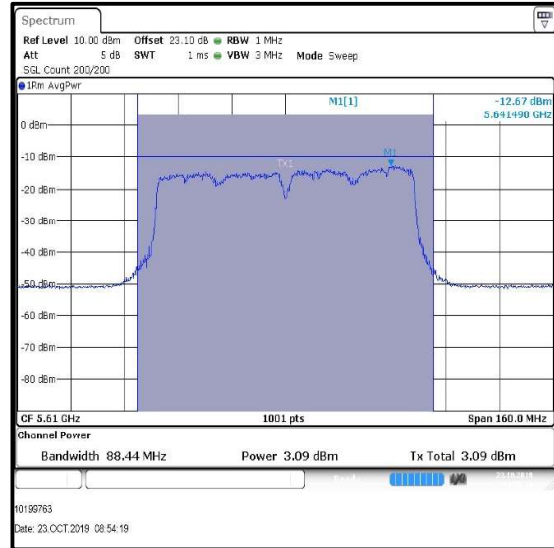
Channel	Frequency (MHz)	Combined Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5530	12.3	21.0	8.7	Complied
Top	5610	12.7	21.0	8.3	Complied

**Transmitter Maximum Conducted Output Power (5.47-5.725 GHz band) (continued)**

**Results: 802.11ac / 80 MHz / MIMO / 4Tx CDD / 16QAM / MCS3x1 / Port 1**

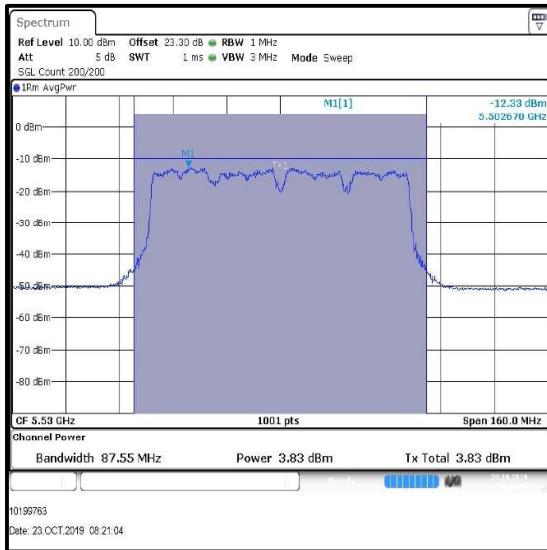


Bottom Channel

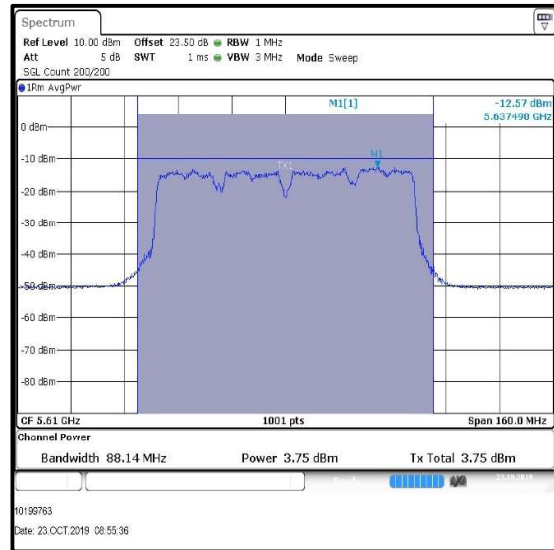


Top Channel

**Results: 802.11ac / 80 MHz / MIMO / 4Tx CDD / 16QAM / MCS3x1 / Port 2**



Bottom Channel

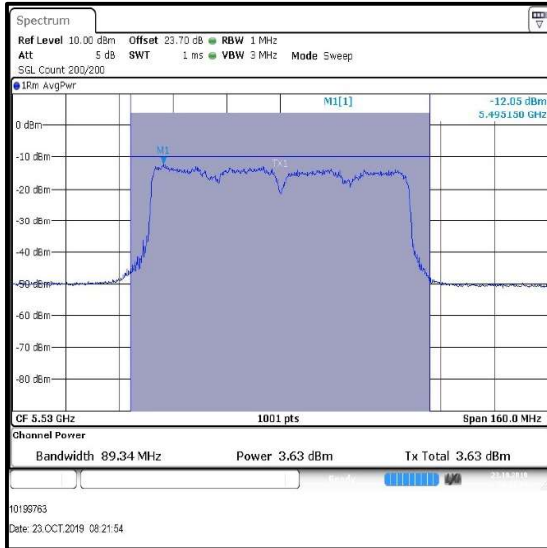


Top Channel

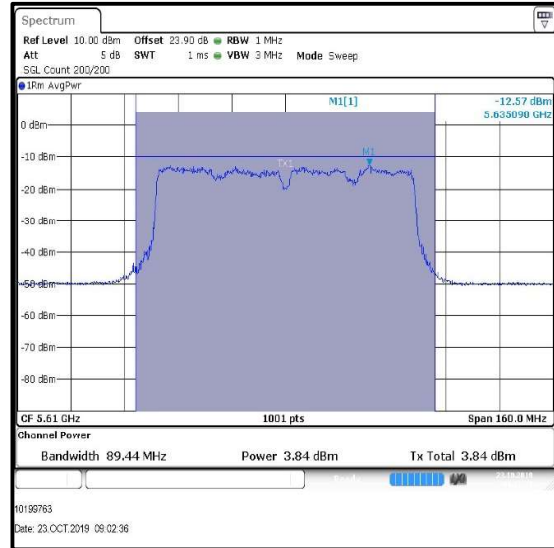


**Transmitter Maximum Conducted Output Power (5.47-5.725 GHz band) (continued)**

**Results: 802.11ac / 80 MHz / MIMO / 4Tx CDD / 16QAM / MCS3x1 / Port 3**

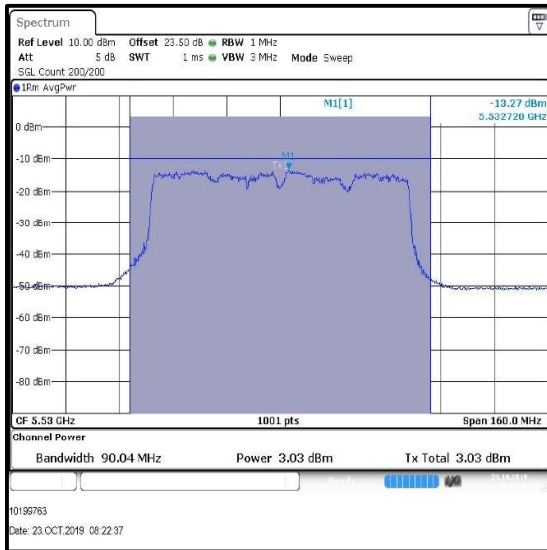


Bottom Channel

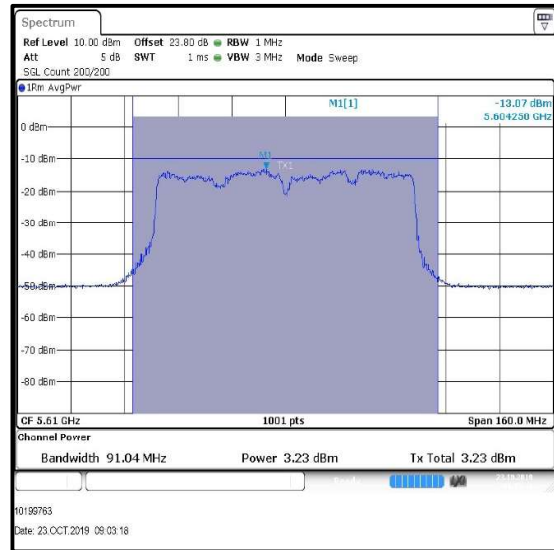


Top Channel

**Results: 802.11ac / 80 MHz / MIMO / 4Tx CDD / 16QAM / MCS3x1 / Port 4**



Bottom Channel



Top Channel

## **4.4. Transmitter Maximum Power Spectral Density**

### **4.4.1. 5.25-5.35 GHz band**

#### **Test Summary:**

<b>Test Engineer:</b>	Max Passell	<b>Test Dates:</b>	01 October 2019 to 22 October 2019
<b>Test Sample Serial Number:</b>	2405067		

<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>Temperatures (°C):</b>	21 to 24
<b>Relative Humidity (%):</b>	35 to 44

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

1. This section contains results for 4Tx modes only.
2. All configurations supported by the EUT were investigated on one channel. The data rates that produced the highest output power and therefore deemed worst case were:
  - 802.11a MIMO – QPSK / 12 Mbps / 4Tx CDD / Ports 1, 2, 3 & 4
  - 802.11n HT20 MIMO – QPSK / MCS1 / 4Tx CDD / Ports 1, 2, 3 & 4
  - 802.11n HT40 MIMO – 16-QAM / MCS3 / 4Tx CDD / Ports 1, 2, 3 & 4
  - 802.11ac VHT80 MIMO – 16-QAM / MCS3x1 / 4Tx CDD / Ports 1, 2, 3 & 4
3. Transmitter Maximum Power Spectral Density tests in all bands were performed using a signal analyser in accordance with KDB 789033 II. F referencing II.E.2.d) Method SA-2.
4. As the power spectral density test uses the same test method as the output power test, before the power is integrated across the 26 dB bandwidth, the conducted power spectral density plots are located in the conducted output power section 4.3 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.
5. The calculated duty cycle in Section 4.1 was added to the measured maximum power spectral density in order to compute the average maximum power spectral density during the actual transmission time.
6. PSD was measured on each port and then combined using the *measure and sum spectral maxima across the outputs* technique, stated in FCC KDB 662911 D01 Section E)2)b).
7. The EUT has a directional antenna gain of 15.0 dBi. In accordance with Part 15.407(a)(2), the limit was reduced by the amount in dB the antenna gain exceeds 6 dBi. Therefore the limit of 11.0 dBm has been reduced by 9.0 dB to 2.0 dBm.
8. For details on antenna gains refer to Section 3.4 of this test report.
9. The signal analyser was connected to the RF port on the EUT using an RF switch, 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.

**Transmitter Maximum Power Spectral Density (5.25-5.35 GHz band) (continued)****Results: 802.11a / 20 MHz / MIMO / 4Tx CDD / QPSK / 12 Mbps**

Channel	Frequency (MHz)	Port 1			Port 2		
		PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)	PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)
Bottom	5260	-6.7	0.4	-6.3	-5.1	0.4	-4.7
Middle	5280	-6.0	0.4	-5.6	-4.8	0.4	-4.4
Top	5320	-6.8	0.8	-6.0	-5.0	0.8	-4.2

Channel	Frequency (MHz)	Port 3			Port 4		
		PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)	PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)
Bottom	5260	-5.8	0.4	-5.4	-6.6	0.4	-6.2
Middle	5280	-5.1	0.4	-4.7	-5.7	0.4	-5.3
Top	5320	-5.6	0.8	-4.8	-5.3	0.8	-4.5

Channel	Frequency (MHz)	Combined PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Result
Bottom	5260	0.4	2.0	1.6	Complied
Middle	5280	1.0	2.0	1.0	Complied
Top	5320	1.2	2.0	0.8	Complied

**Transmitter Maximum Power Spectral Density (5.25-5.35 GHz band) (continued)****Results: 802.11n / 20 MHz / MIMO / 4Tx CDD / QPSK / MCS1**

Channel	Frequency (MHz)	Port 1			Port 2		
		PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)	PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)
Bottom	5260	-6.8	0.6	-6.2	-4.9	0.6	-4.3
Middle	5280	-5.9	0.5	-5.4	-4.3	0.5	-3.8
Top	5320	-6.5	0.6	-5.9	-4.3	0.6	-3.7

Channel	Frequency (MHz)	Port 3			Port 4		
		PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)	PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)
Bottom	5260	-5.2	0.6	-4.6	-5.8	0.6	-5.2
Middle	5280	-4.9	0.5	-4.4	-5.5	0.5	-5.0
Top	5320	-5.4	0.6	-4.8	-5.1	0.6	-4.5

Channel	Frequency (MHz)	Combined PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Result
Bottom	5260	1.0	2.0	1.0	Complied
Middle	5280	1.4	2.0	0.6	Complied
Top	5320	1.4	2.0	0.6	Complied

**Transmitter Maximum Power Spectral Density (5.25-5.35 GHz band) (continued)****Results: 802.11n / 40 MHz / MIMO / 4Tx CDD / 16QAM / MCS3**

Channel	Frequency (MHz)	Port 1			Port 2		
		PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)	PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)
Bottom	5270	-9.7	1.4	-8.3	-8.5	1.4	-7.1
Top	5310	-10.3	1.4	-8.9	-8.1	1.4	-6.7

Channel	Frequency (MHz)	Port 3			Port 4		
		PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)	PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)
Bottom	5270	-8.6	1.4	-7.2	-9.4	1.4	-8.0
Top	5310	-9.0	1.4	-7.6	-9.8	1.4	-8.4

Channel	Frequency (MHz)	Combined PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Result
Bottom	5270	-1.6	2.0	3.6	Complied
Top	5310	-1.8	2.0	3.8	Complied

**Transmitter Maximum Power Spectral Density (5.25-5.35 GHz band) (continued)****Results: 802.11ac / 80 MHz / MIMO / 4Tx CDD / 16QAM / MCS3x1**

Channel	Frequency (MHz)	Port 1			Port 2		
		PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)	PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)
Single	5290	-14.7	3.0	-11.7	-12.7	3.0	-9.7

Channel	Frequency (MHz)	Port 3			Port 4		
		PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)	PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)
Single	5290	-13.5	3.0	-10.5	-14.5	3.0	-11.5

Channel	Frequency (MHz)	Combined PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Result
Single	5290	-4.8	2.0	6.8	Complied

**Transmitter Maximum Power Spectral Density (5.47-5.725 GHz band)****4.4.2. 5.47-5.725 GHz band****Test Summary:**

<b>Test Engineer:</b>	Max Passell	<b>Test Dates:</b>	02 October 2019 25 October 2019
<b>Test Sample Serial Number:</b>	2405067		

<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>Temperatures (°C):</b>	21 to 24
<b>Relative Humidity (%):</b>	35 to 44

**Note(s):**

- This section contains results for 4Tx modes only.
- All configurations supported by the EUT were investigated on one channel. The data rates that produced the highest output power and therefore deemed worst case were:
  - 802.11a MIMO – QPSK / 12 Mbps / 4Tx CDD / Ports 1, 2, 3 & 4
  - 802.11n HT20 MIMO – QPSK / MCS1 / 4Tx CDD / Ports 1, 2, 3 & 4
  - 802.11n HT40 MIMO – 16-QAM / MCS3 / 4Tx CDD / Ports 1, 2, 3 & 4
  - 802.11ac VHT80 MIMO – 16-QAM / MCS3x1 / 4Tx CDD / Ports 1, 2, 3 & 4
- Transmitter Maximum Power Spectral Density tests in all bands were performed using a signal analyser in accordance with KDB 789033 II. F referencing II.E.2.d) Method SA-2.
- As the power spectral density test uses the same test method as the output power test, before the power is integrated across the 26 dB bandwidth, the conducted power spectral density plots are located in the conducted output power section 4.3 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.
- The calculated duty cycle in Section 4.1 was added to the measured maximum power spectral density in order to compute the average maximum power spectral density during the actual transmission time.
- PSD was measured on each port and then combined using the *measure and sum spectral maxima across the outputs* technique, stated in FCC KDB 662911 D01 Section E)2)b).
- the EUT has a directional antenna gain of 15.0 dBi. In accordance with Part 15.407(a)(2), the limit was reduced by the amount in dB the antenna gain exceeds 6 dBi. Therefore the limit of 11.0 dBm has been reduced by 9.0 dB to 2.0 dBm.
- For details on antenna gains refer to Section 3.4 of this test report.
- The signal analyser was connected to the RF port on the EUT using an RF switch, 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.

**Transmitter Maximum Power Spectral Density (5.47-5.725 GHz band) (continued)****Results: 802.11a / 20 MHz / MIMO / 4Tx CDD / QPSK / 12 Mbps**

Channel	Frequency (MHz)	Port 1			Port 2		
		PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)	PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)
Bottom	5500	-6.9	0.6	-6.3	-5.0	0.6	-4.4
Middle	5580	-6.7	0.5	-6.2	-5.3	0.5	-4.8
Top	5700	-6.5	0.6	-5.9	-5.1	0.6	-4.5

Channel	Frequency (MHz)	Port 3			Port 4		
		PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)	PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)
Bottom	5500	-5.5	0.6	-4.9	-5.9	0.6	-5.3
Middle	5580	-5.1	0.5	-4.6	-6.3	0.5	-5.8
Top	5700	-4.8	0.6	-4.2	-5.4	0.6	-4.8

Channel	Frequency (MHz)	Combined PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Result
Bottom	5500	0.9	2.0	1.1	Complied
Middle	5580	0.7	2.0	1.3	Complied
Top	5700	1.2	2.0	0.8	Complied



**Transmitter Maximum Power Spectral Density (5.47-5.725 GHz band) (continued)****Results: 802.11n / 20 MHz / MIMO / 4Tx CDD / QPSK / MCS1**

Channel	Frequency (MHz)	Port 1			Port 2		
		PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)	PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)
Bottom	5500	-7.0	0.6	-6.4	-5.2	0.6	-4.6
Middle	5580	-6.7	0.5	-6.2	-5.6	0.5	-5.1
Top	5700	-6.5	0.5	-6.0	-4.9	0.5	-4.4

Channel	Frequency (MHz)	Port 3			Port 4		
		PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)	PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)
Bottom	5500	-5.8	0.6	-5.2	-6.2	0.6	-5.6
Middle	5580	-4.8	0.5	-4.3	-6.3	0.5	-5.8
Top	5700	-5.0	0.5	-4.5	-6.2	0.5	-5.7

Channel	Frequency (MHz)	Combined PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Result
Bottom	5500	0.6	2.0	1.4	Complied
Middle	5580	0.7	2.0	1.3	Complied
Top	5700	0.9	2.0	1.1	Complied

**Transmitter Maximum Power Spectral Density (5.47-5.725 GHz band) (continued)****Results: 802.11n / 40 MHz / MIMO / 4Tx CDD / 16-QAM / MCS3**

Channel	Frequency (MHz)	Port 1			Port 2		
		PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)	PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)
Bottom	5510	-9.3	1.5	-7.8	-7.1	1.5	-5.6
Middle	5550	-9.2	1.4	-7.8	-8.0	1.4	-6.6
Top	5670	-9.7	1.4	-8.3	-8.3	1.4	-6.9

Channel	Frequency (MHz)	Port 3			Port 4		
		PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)	PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)
Bottom	5510	-7.8	1.5	-6.3	-8.6	1.5	-7.1
Middle	5550	-8.3	1.4	-6.9	-8.9	1.4	-7.5
Top	5670	-8.0	1.4	-6.6	-9.2	1.4	-7.8

Channel	Frequency (MHz)	Combined PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Result
Bottom	5510	-0.6	2.0	2.6	Complied
Middle	5550	-1.2	2.0	3.2	Complied
Top	5670	-1.3	2.0	3.3	Complied

**Transmitter Maximum Power Spectral Density (5.47-5.725 GHz band) (continued)****Results: 802.11ac / 80 MHz / MIMO / 4Tx CDD / 16-QAM / MCS3x1**

Channel	Frequency (MHz)	Port 1			Port 2		
		PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)	PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)
Bottom	5530	-14.8	3.1	-11.7	-12.3	3.1	-9.2
Top	5610	-12.7	3.2	-9.5	-12.6	3.2	-9.4

Channel	Frequency (MHz)	Port 3			Port 4		
		PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)	PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)
Bottom	5530	-12.0	3.1	-8.9	-13.3	3.1	-10.2
Top	5610	-12.6	3.2	-9.4	-13.1	3.2	-9.9

Channel	Frequency (MHz)	Combined PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Result
Bottom	5530	-3.8	2.0	5.8	Complied
Top	5610	-3.5	2.0	5.5	Complied

**4.5. Transmitter Out of Band Conducted Emissions <1 GHz****Test Summary:**

<b>Test Engineers:</b>	Matthew Botfield & Chanthu Thevarajah	<b>Test Dates:</b>	01 October 2019 to 03 October 2019
<b>Test Sample Serial Number:</b>	2428534		

<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, 6.4 and 6.5
<b>Frequency Range:</b>	9 kHz to 1000 MHz

**Environmental Conditions:**

<b>Temperature (°C):</b>	22 to 23
<b>Relative Humidity (%):</b>	40 to 62

**Note(s):**

1. The final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
2. Pre-scans were performed with the EUT transmitting in the band 5.47 to 5.725 GHz band with a data rate of 802.11n / 20 MHz / MIMO / 2Tx CDD / MCS0 on middle channel as it produced the worst case with respect to emissions. An inquiry was made to the FCC and the response was pre-scans could be performed in the band with the highest power spectral density and all final measurements should be performed on any emissions seen in each band.
3. All 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. Therefore the highest peak noise floor reading of the measuring receiver was recorded in the table below.
4. \*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.
5. The signal analyser reference level offset includes the 9.0 dBi antenna gain.

**Transmitter Out of Band Conducted Emissions (continued)****Results: 802.11n / 20 MHz / MIMO / 2Tx CDD / BPSK / MCS0****Results: Peak Detector / Middle Channel / Port 1**

Frequency (MHz)	Analyzer Peak Level (dBm)	Ground Reflection Factor (dB)	MIMO Correction Factor (dB)	Directional Gain (dB)	Corrected Peak Level (dBm)
791.450	-57.4	4.7	3.0	3.0	-46.7

Frequency (MHz)	Corrected Peak Level (dBm)	EIRP(dBm) to EIRP (dB $\mu$ V/m) Factor	Converted Peak Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
791.450	-46.7	95.2	48.5	54.0*	5.5	Complied

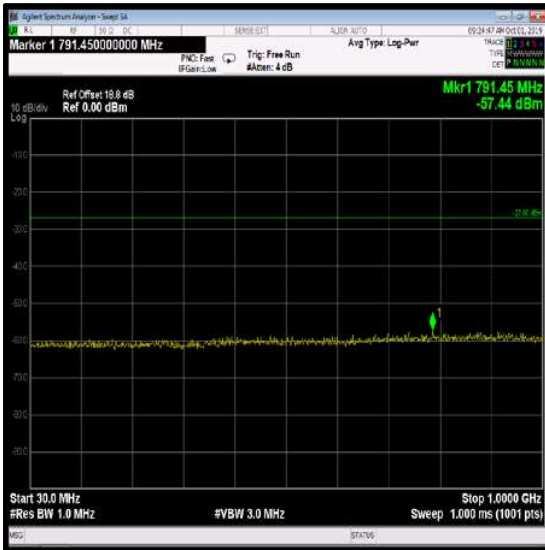
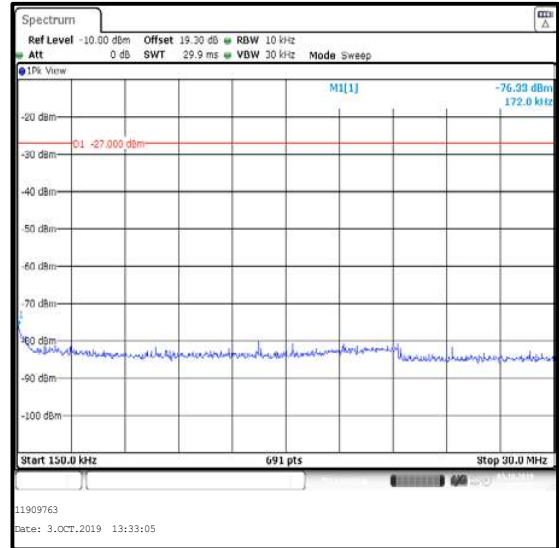
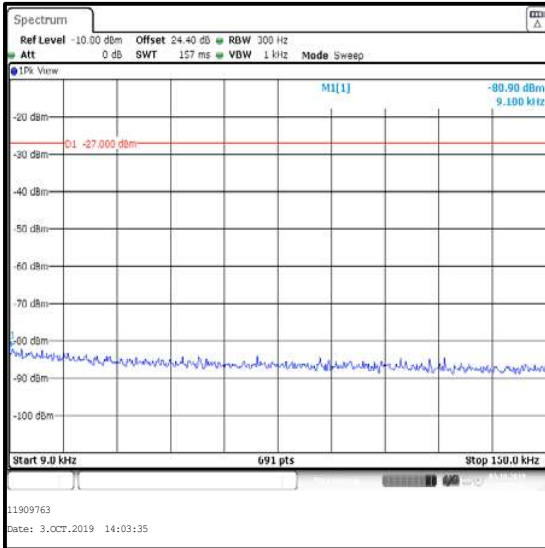
**Results: Peak Detector / Middle Channel / Port 2**

Frequency (MHz)	Analyzer Peak Level (dBm)	Ground Reflection Factor (dB)	MIMO Correction Factor (dB)	Directional Gain (dB)	Corrected Peak Level (dBm)
854.500	-57.8	4.7	3.0	3.0	-47.1

Frequency (MHz)	Corrected Peak Level (dBm)	EIRP(dBm) to EIRP (dB $\mu$ V/m) Factor	Converted Peak Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
854.500	-47.1	95.2	48.1	54.0*	5.9	Complied

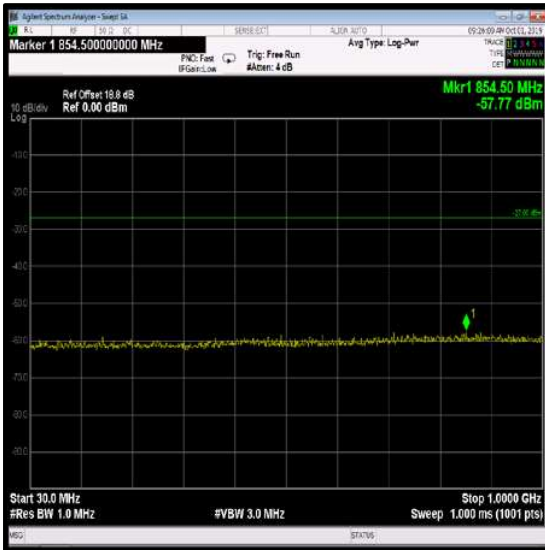
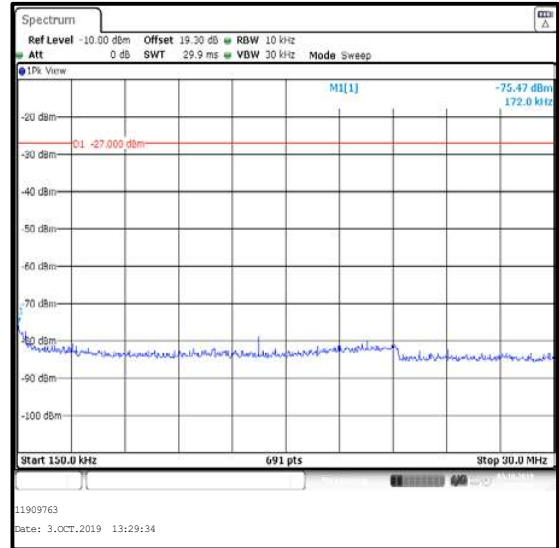
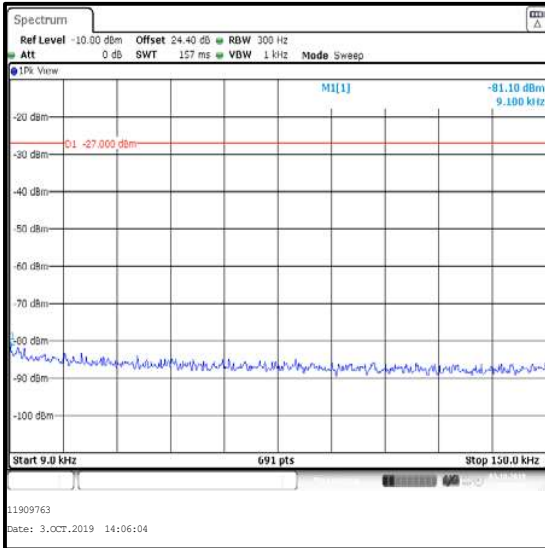
**Transmitter Out of Band Conducted Emissions (continued)**

**Results: 802.11n / 20 MHz / MIMO / 2Tx CDD / BPSK / MCS0 / Port 1**



**Transmitter Out of Band Conducted Emissions (continued)**

**Results: 802.11n / 20 MHz / MIMO / 2Tx CDD / BPSK / MCS0 / Port 2**



**4.6. Transmitter Out of Band Conducted Emissions >1 GHz****4.6.1. 5.25-5.35 GHz band****Test Summary:**

<b>Test Engineers:</b>	Matthew Botfield & Chanthu Thevarajah	<b>Test Dates:</b>	01 October 2019 to 03 October 2019
<b>Test Sample Serial Number:</b>	2428534		

<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>	40 to 62

**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 in the band 5.47 to 5.725 GHz band with a data rate of 802.11n / 20 MHz / MIMO / 2Tx CDD / MCS0 on middle channel as it produced the worst case with respect to emissions. An inquiry was made to the FCC and the response was pre-scans could be performed in the band with the highest power spectral density and all final measurements should be performed on any emissions seen in each band.
3. 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.
4. The final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
5. The emission shown on the 1 GHz to 6 GHz plot is the EUT fundamental.
6. 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.
7. \*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.
8. The signal analyser reference level offset includes the 9.0 dBi antenna gain.



**Transmitter Out of Band Conducted Emissions (5.25-5.35 GHz band operation) (continued)****Results: 802.11n / 20 MHz / MIMO / 2Tx CDD / BPSK / MCS0****Results: Bottom Channel / EIRP / Peak**

Frequency (MHz)	Port 1 Level (dBm)	Port 2 Level (dBm)	Combined Level (dB)	Directional Gain (dB)	Corrected Level (dBm)	Limit (dBm)	Margin (dB)	Result
7013.000	-44.1	-36.0	-35.4	3.0	-32.4	-27.0	5.4	Complied

**Results: Middle Channel / EIRP / Peak**

Frequency (MHz)	Port 1 Level (dBm)	Port 2 Level (dBm)	Combined Level (dB)	Directional Gain (dB)	Corrected Level (dBm)	Limit (dBm)	Margin (dB)	Result
7040.000	-45.1	-37.5	-36.8	3.0	-33.8	-27.0	6.8	Complied

**Results: Top Channel / EIRP / Peak**

Frequency (MHz)	Port 1 Level (dBm)	Port 2 Level (dBm)	Combined Level (dB)	Directional Gain (dB)	Corrected Level (dBm)	Limit (dBm)	Margin (dB)	Result
7093.000	-46.7	-44.4	-42.4	3.0	-39.4	-27.0	12.4	Complied

**4.6.2. 5.47-5.725 GHz band****Transmitter Out of Band Conducted Emissions (5.47-5.725 GHz band operation)****Test Summary:**

<b>Test Engineers:</b>	Matthew Botfield & Chanthu Thevarajah	<b>Test Dates:</b>	01 October 2019 to 03 October 2019
<b>Test Sample Serial Number:</b>	2428534		

<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>	40 to 62

**Note(s):**

1. FCC Part 15.407(b)(3) states for transmitters operating in the band 5.25 to 5.35 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 in the band 5.47 to 5.725 GHz band with a data rate of 802.11n / 20 MHz / MIMO / 2Tx CDD / MCS0 on middle channel as it produced the worst case with respect to emissions. An inquiry was made to the FCC and the response was pre-scans could be performed in the band with the highest power spectral density and all final measurements should be performed on any emissions seen in each band.
3. 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.
4. The final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
5. The emission shown on the 1 GHz to 6 GHz plot is the EUT fundamental.
6. 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.
7. \*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.
8. The signal analyser reference level offset includes the 9.0 dBi antenna gain.

**Transmitter Out of Band Conducted Emissions (5.47-5.725 GHz band operation) (continued)****Results: 802.11n / 20 MHz / MIMO / 2Tx CDD / BPSK / MCS0****Results: Peak Detector / Bottom Channel / Peak**

Frequency (MHz)	Port 1 Level (dBm)	Port 2 Level (dBm)	Combined Level (dB)	Directional Gain (dB)	Corrected Peak Level (dBm)
7330.000	-50.3	-49.6	-46.9	3.0	-43.9

Frequency (MHz)	Corrected Peak Level (dBm)	EIRP(dBm) to EIRP (dB $\mu$ V/m) Factor	Converted Level (dB $\mu$ V/m)	Average Limit (dB $\mu$ V/m)	Margin (dB)	Result
7330.000	-43.9	95.2	51.3	54.0*	2.7	Complied

**Results: Peak Detector / Middle Channel / Peak**

Frequency (MHz)	Port 1 Level (dBm)	Port 2 Level (dBm)	Combined Level (dB)	Directional Gain (dB)	Corrected Peak Level (dBm)
7440.000	-50.5	-51.3	-47.9	3.0	-44.9

Frequency (MHz)	Corrected Peak Level (dBm)	EIRP(dBm) to EIRP (dB $\mu$ V/m) Factor	Converted Level (dB $\mu$ V/m)	Average Limit (dB $\mu$ V/m)	Margin (dB)	Result
7440.000	-44.9	95.2	50.3	54.0*	3.7	Complied

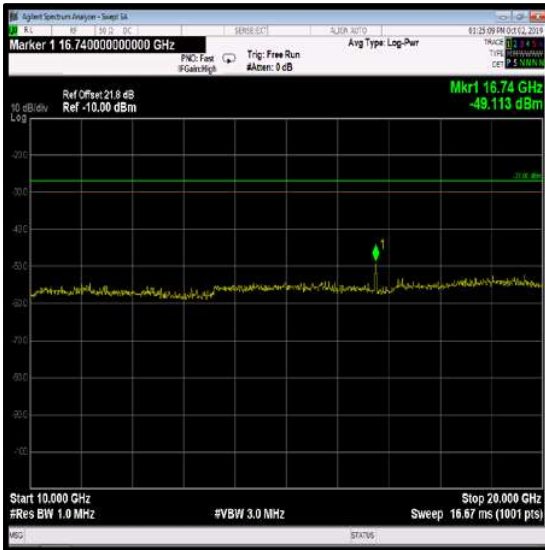
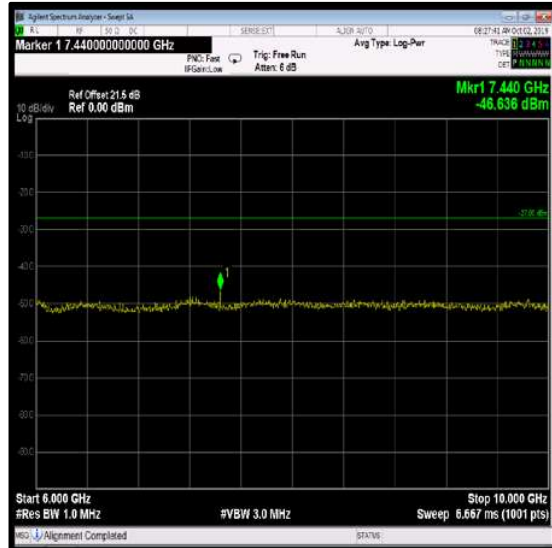
**Results: Peak Detector / Top Channel / Peak**

Frequency (MHz)	Port 1 Level (dBm)	Port 2 Level (dBm)	Combined Level (dB)	Directional Gain (dB)	Corrected Peak Level (dBm)
7660.000	-51.8	-54.1	-49.8	3.0	-46.8

Frequency (MHz)	Corrected Peak Level (dBm)	EIRP(dBm) to EIRP (dB $\mu$ V/m) Factor	Converted Field Strength Peak Level (dB $\mu$ V/m)	Average Limit (dB $\mu$ V/m)	Margin (dB)	Result
7660.000	-46.8	95.2	48.4	54.0*	5.6	Complied

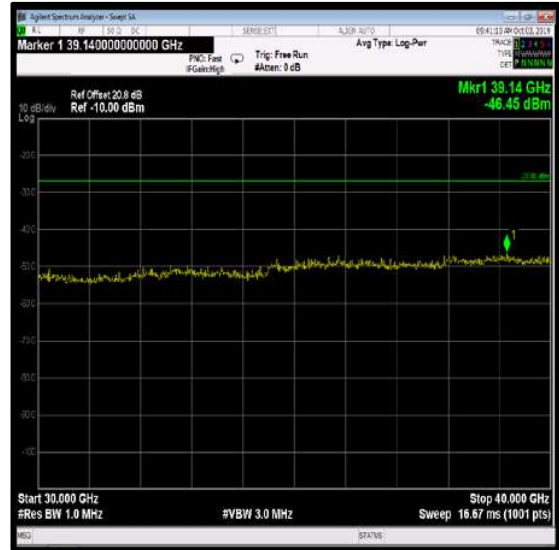
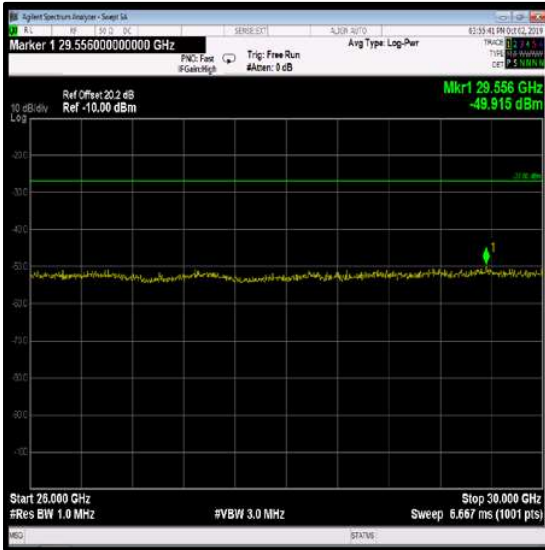
**Transmitter Out of Band Conducted Emissions (continued)**

**Results: 802.11n / 20 MHz / MIMO / 2Tx CDD / BPSK / MCS0 / Port 1**



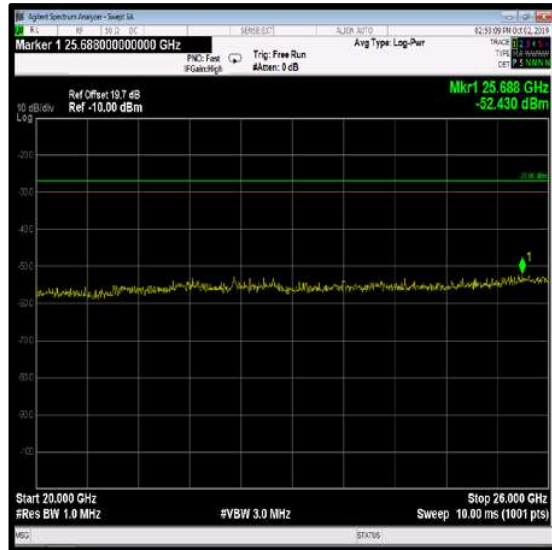
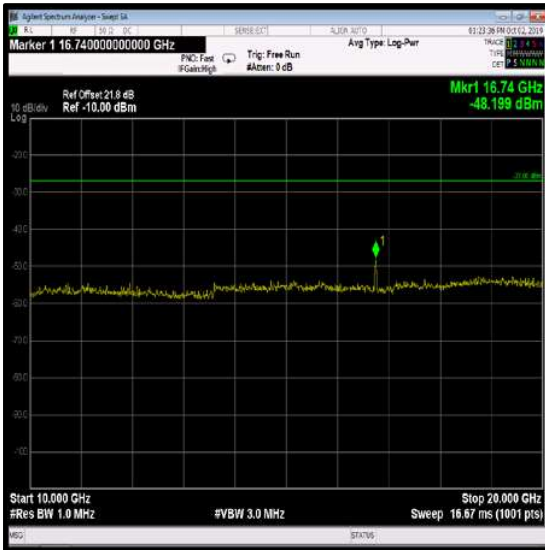
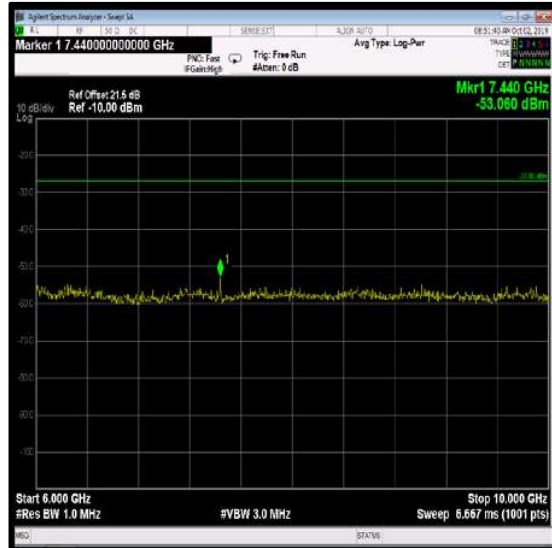
**Transmitter Out of Band Conducted Emissions (continued)**

**Results: 802.11n / 20 MHz / MIMO / 2Tx CDD / BPSK / MCS0 / Port 1**



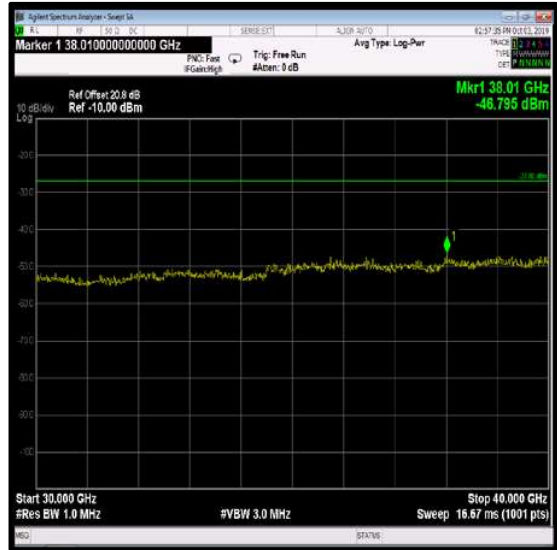
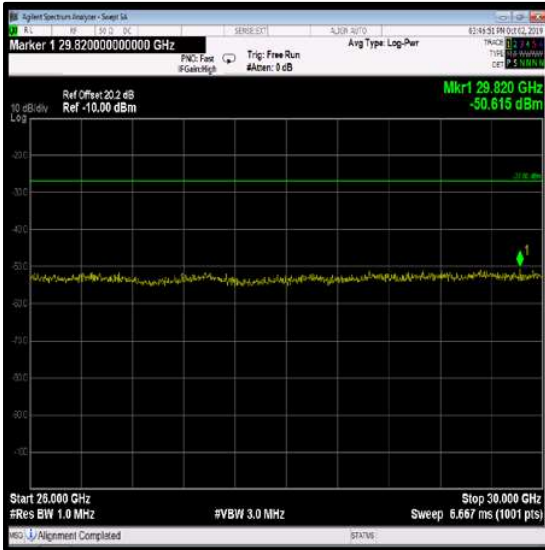
**Transmitter Out of Band Conducted Emissions (continued)**

**Results: 802.11n / 20 MHz / MIMO / 2Tx CDD / BPSK / MCS0 / Port 2**



**Transmitter Out of Band Conducted Emissions (continued)**

**Results: 802.11n / 20 MHz / MIMO / 2Tx CDD / BPSK / MCS0 / Port 2**



## **5. Radiated Test Results**

### **5.1. Transmitter Out of Band Cabinet Radiated Emissions <1 GHz**

#### **Test Summary:**

<b>Test Engineer:</b>	Mark Perry	<b>Test Date:</b>	05 October 2019
<b>Test Sample Serial Number:</b>	2428534		

<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, 6.5 & 12.7
<b>Frequency Range:</b>	30 MHz to 1000 MHz

#### **Environmental Conditions:**

<b>Temperature (°C):</b>	23
<b>Relative Humidity (%):</b>	51

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

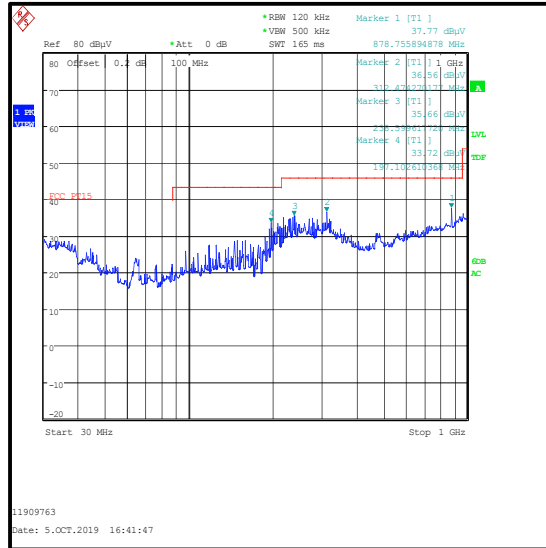
1. The final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
2. Pre-scans were performed with the EUT transmitting with a data rate of 802.11n / 20 MHz / MIMO / 2Tx CDD / MCS0 on middle channel as it produced the worst case with respect to emissions. An inquiry was made to the FCC and the response was pre-scans could be performed in the band with the highest power spectral density and all final measurements should be performed on any emissions seen in each band.
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 were investigated and found to be ambient, or >20 dB below the applicable limit or below the measurement system noise floor.
5. Measurements below 1 GHz were performed in a semi-anechoic chamber (Asset Number K0017) 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.
6. Pre-scans were performed and markers placed on the highest measured levels. The test receiver resolution bandwidth was set to 120 kHz and video bandwidth 500 kHz. The sweep time was set to auto. A peak detector was used, sweep time was set to auto and trace mode was Max Hold.
7. Final measurements were performed on the marker frequencies and the results entered into the table below. The test receiver resolution bandwidth was set to 120 kHz, using a CISPR quasi-peak detector and span wide enough to see the whole emission.



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

**Results: Quasi-Peak / Middle Channel / 802.11n / 20 MHz / MIMO / 2Tx CDD / MCS0**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
270.184	Horizontal	33.0	46.0	13.0	Complied
242.665	Horizontal	33.1	46.0	12.9	Complied

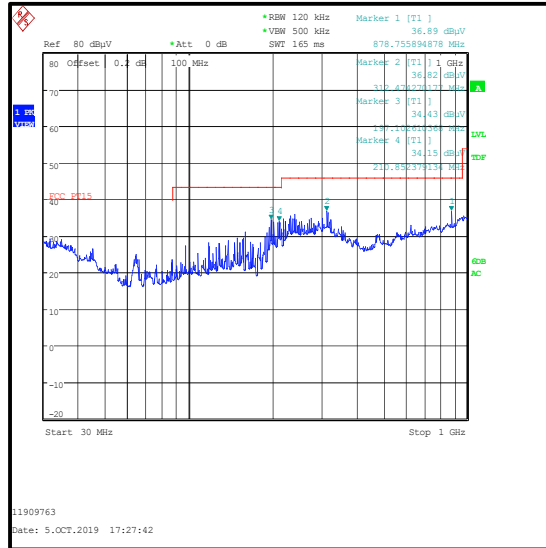


Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying table.

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

**Results: Quasi-Peak / Middle Channel / 802.11n / 20 MHz / MIMO / 2Tx CDD / MCS0**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
270.182	Horizontal	32.4	46.0	13.6	Complied
241.200	Horizontal	28.5	46.0	17.5	Complied



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

## **5.2. Transmitter Out of Band Cabinet Radiated Emissions >1 GHz**

### **5.2.1. 5.25-5.35 GHz band**

#### **Test Summary:**

<b>Test Engineer:</b>	Mark Perry	<b>Test Dates:</b>	04 October 2019 & 05 October 2019
<b>Test Sample Serial Number:</b>	2428534		

<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, 6.6 & 12.7
<b>Frequency Range:</b>	1 GHz to 40 GHz

#### **Environmental Conditions:**

<b>Temperature (°C):</b>	22 to 23
<b>Relative Humidity (%):</b>	48 to 51

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

1. The final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
2. Pre-scans were performed with the EUT transmitting with a data rate of 802.11n / 20 MHz / MIMO / 2Tx CDD / MCS0 on middle channel as it produced the highest EIRP power spectral density and was therefore deemed worst case.
3. 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.
4. The emission shown on the 1 GHz to 6 GHz plot is the EUT fundamental.
5. Measurements were performed across the two restricted bands closest to the bands of operation with the EUT transmitting on the middle channel in the 5.25 to 5.35 GHz band. Plots are included in this section of the test report. Peak and average measurements were made.
6. Pre-scans above 1 GHz were performed in a fully anechoic chamber (Asset Number K0017) 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.
7. Measurements above 1 GHz were performed in a fully anechoic chamber (Asset Number K0017) 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
15784.814	Vertical	65.4	74.0	8.6	Complied

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

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
15784.135	Vertical	48.1	54.0	5.9	Complied

**Results: Middle Channel / EIRP / Peak**

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
7040.064	Horizontal	-42.6	-27.0	15.6	Complied

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

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
15843.824	Vertical	65.0	74.0	9.0	Complied

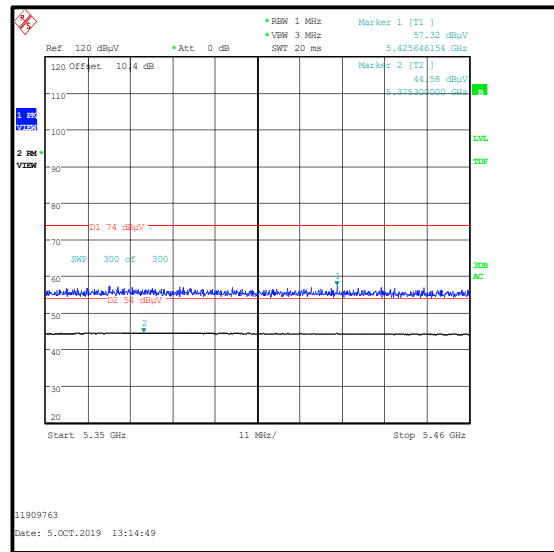
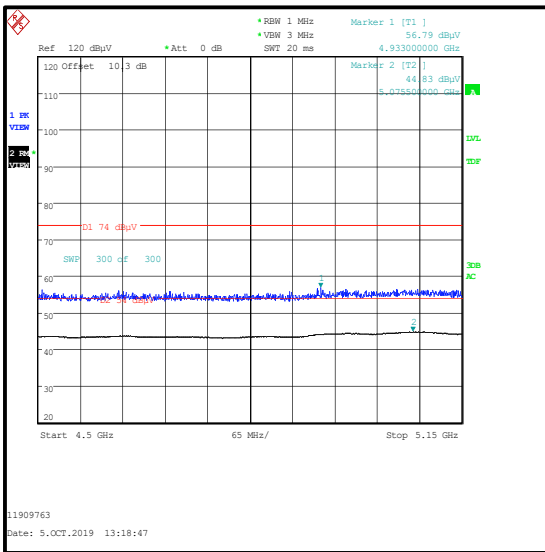
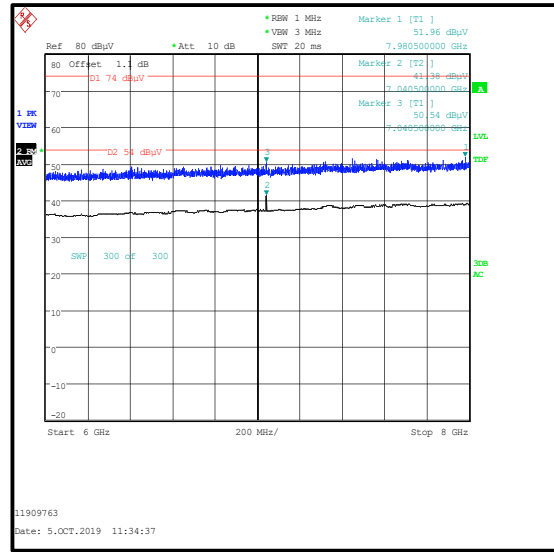
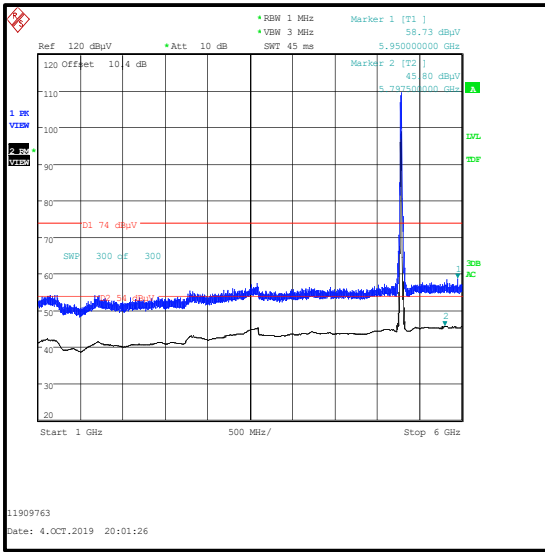
**Results: Middle Channel / Field Strength / Average**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
15843.984	Vertical	47.5	54.0	6.5	Complied

**Results: Top Channel / EIRP**

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
7093.500	Horizontal	-43.3	-27.0	16.3	Complied

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

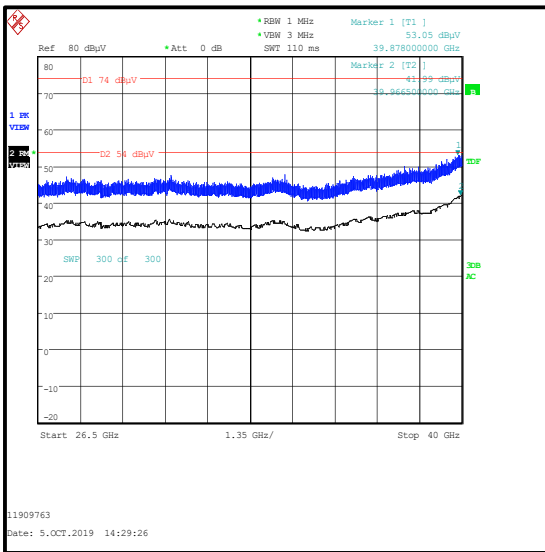
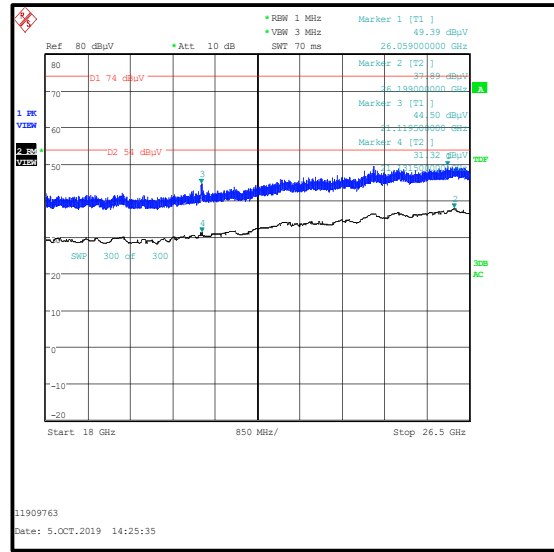
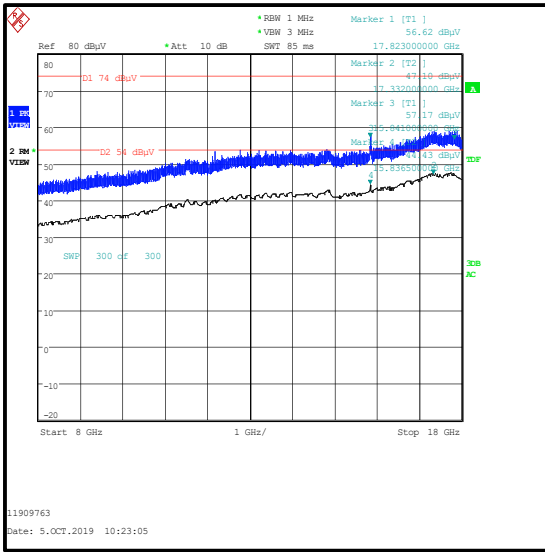


**Restricted Band 4.5 GHz to 5.15 GHz**

**Restricted Band 5.35 GHz to 5.46 GHz**

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

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



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

**5.2.2. 5.47-5.725 GHz band****Transmitter Out of Band Radiated Emissions (5.47-5.725 GHz band operation)****Test Summary:**

<b>Test Engineer:</b>	Mark Perry	<b>Test Dates:</b>	05 October 2019
<b>Test Sample Serial Number:</b>	2428534		

<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, 6.6 & 12.7
<b>Frequency Range:</b>	1 GHz to 40 GHz

**Environmental Conditions:**

<b>Temperature (°C):</b>	23
<b>Relative Humidity (%):</b>	51

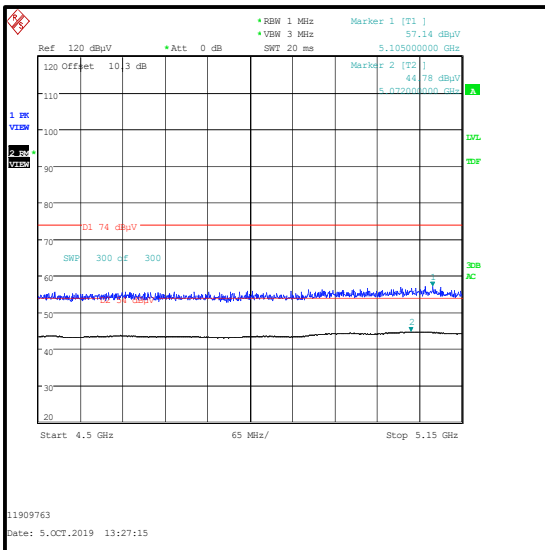
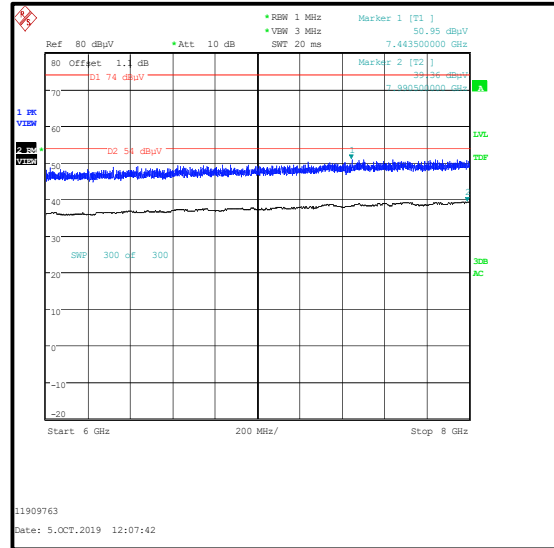
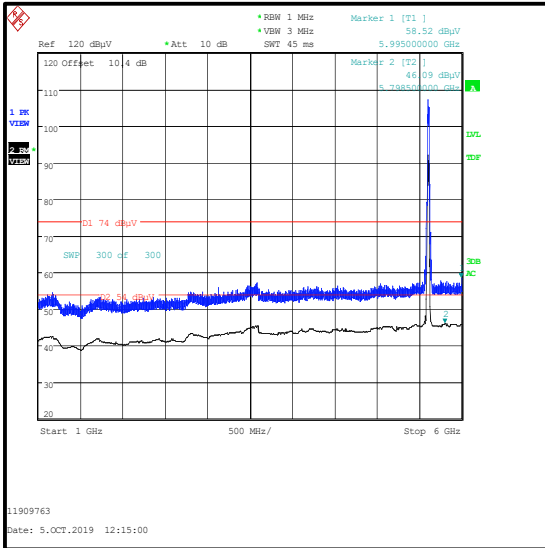
**Note(s):**

1. The final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
2. Pre-scans were performed with the EUT transmitting with a data rate of 802.11n / 20 MHz / MIMO / 2Tx CDD / MCS0 on middle channel as it produced the highest EIRP power spectral density and was therefore deemed worst case.
3. All 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. The highest noise floor reading has been recorded in the table below.
4. The emission shown on the 1 GHz to 6 GHz plot is the EUT fundamental.
5. Measurements were performed across the two restricted bands closest to the bands of operation with the EUT transmitting on the middle channel in the 5.25 to 5.35 GHz band. Plots are included in this section of the test report. Peak and average measurements were made.
6. Pre-scans above 1 GHz were performed in a fully anechoic chamber (Asset Number K0017) 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.

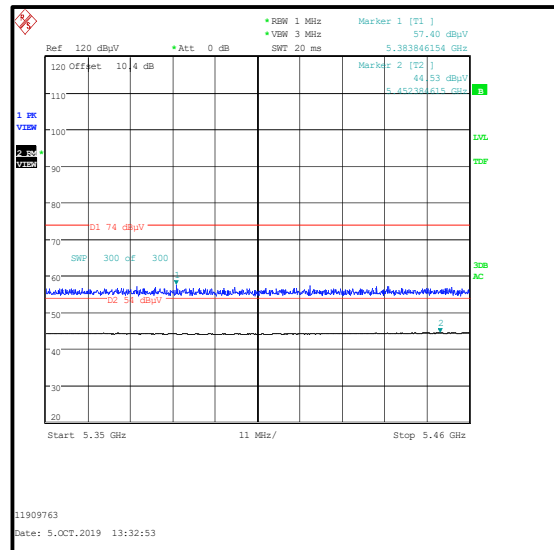
**Results: Middle Channel / EIRP**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
17609.000	Horizontal	60.1	-35.1	-27.0	8.1	Complied

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



**Restricted Band 4.5 GHz to 5.15 GHz**

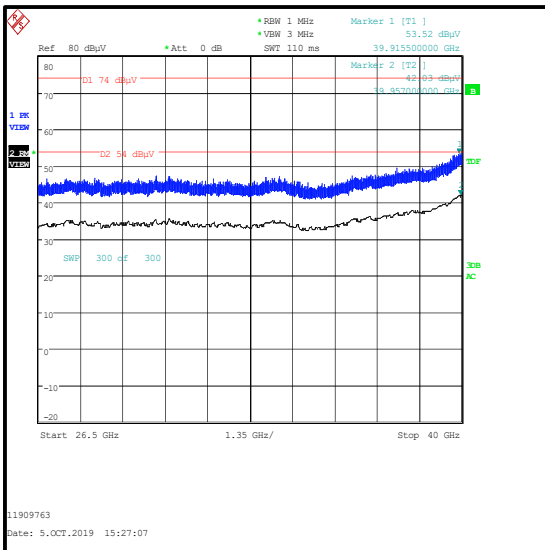
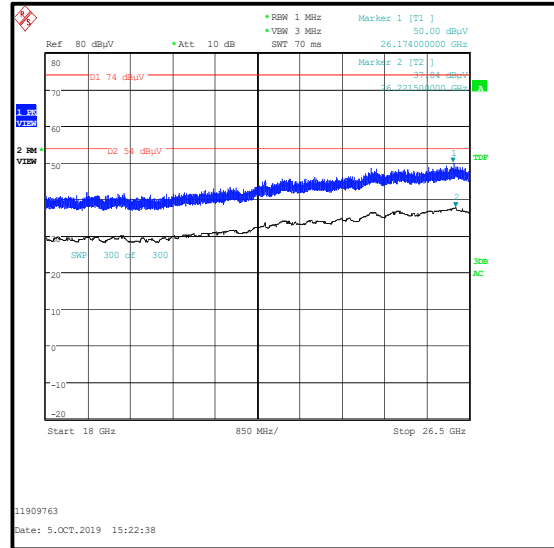
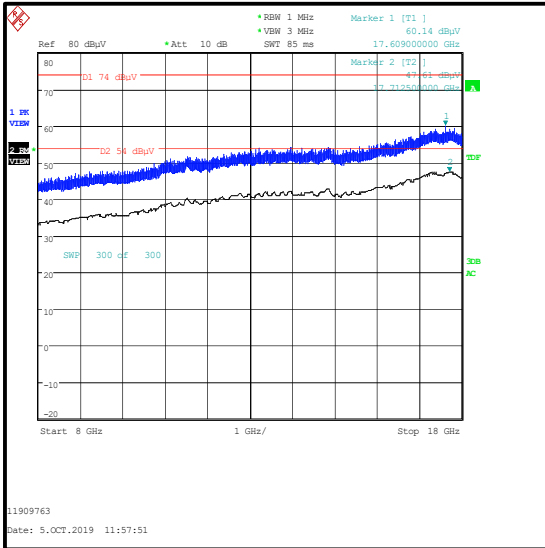


**Restricted Band 5.35 GHz to 5.46 GHz**

*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 GHz band operation)  
(continued)**



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

**5.3. Transmitter Band Edge Radiated Emissions****5.3.1. 5.25-5.35 GHz band****Test Summary:**

<b>Test Engineers:</b>	John Ferdinand, Andrew Harding, Mark Perry & Mohamed Toubella	<b>Test Dates:</b>	10 September 2019 to 27 September 2019
<b>Test Sample Serial Numbers:</b>	2405066 & 2428534		

<b>FCC Reference:</b>	Parts 15.407(b)(2),(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>	21 to 24
<b>Relative Humidity (%):</b>	41 to 52

**Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)****Note(s):**

1. Measurements were performed in the EUT modes that produced the highest power and the widest bandwidths as these were deemed to be the worst case modes. The modes that produced the highest power and widest bandwidth were:
  - 802.11a SISO – 64-QAM / 48 Mbps / Port 1
  - 802.11a SISO – 64-QAM / 54 Mbps / Port 1
  - 802.11n HT20 SISO – QPSK / MCS2 / Port 1
  - 802.11n HT20 SISO – 64-QAM / MCS6 / Port 1
  - 802.11n HT40 SISO – 16-QAM / MCS3 / Port 1
  - 802.11n HT40 SISO – 16-QAM / MCS4 / Port 1
  - 802.11ac VHT80 SISO – QPSK / MCS1x1 / Port 1
  - 802.11ac VHT80 SISO – 256-QAM / MCS8x1 / Port 1
  - 802.11a MIMO – 64-QAM / 48 Mbps / 2Tx CDD / Ports 1 & 2
  - 802.11a MIMO – 64-QAM / 54 Mbps / 2Tx CDD / Ports 1 & 2
  - 802.11n HT20 MIMO – BPSK / MCS0 / 2Tx CDD / Ports 1 & 2
  - 802.11n HT20 MIMO – 16-QAM / MCS4 / 2Tx CDD / Ports 1 & 2
  - 802.11n HT40 MIMO – 64-QAM / MCS7 / 2Tx CDD / Ports 1 & 2
  - 802.11ac VHT80 MIMO – 64-QAM / MCS5x1 / 2Tx CDD / Ports 1 & 2
  - 802.11ac VHT80 MIMO – 256-QAM / MCS9x1 / 2Tx CDD / Ports 1 & 2
  - 802.11a MIMO – BPSK / 9 Mbps / 3Tx CDD / Ports 1, 2 & 3
  - 802.11a MIMO – QPSK / 12 Mbps / 3Tx CDD / Ports 1, 2 & 3
  - 802.11n HT20 MIMO – 16-QAM / MCS3 / 3Tx CDD / Ports 1, 2 & 3
  - 802.11n HT20 MIMO – 64-QAM / MCS7 / 3Tx CDD / Ports 1, 2 & 3
  - 802.11n HT40 MIMO – 16-QAM / MCS3 / 3Tx CDD / Ports 1, 2 & 3
  - 802.11n HT40 MIMO – 64-QAM / MCS5 / 3Tx CDD / Ports 1, 2 & 3
  - 802.11ac VHT80 MIMO – QPSK / MCS1x1 / 3Tx CDD / Ports 1, 2 & 3
  - 802.11ac VHT80 MIMO – QPSK / MCS2x1 / 3Tx CDD / Ports 1, 2 & 3
  - 802.11a MIMO – QPSK / 12 Mbps / 4Tx CDD / Ports 1, 2, 3 & 4
  - 802.11n HT20 MIMO – QPSK / MCS1 / 4Tx CDD / Ports 1, 2, 3 & 4
  - 802.11n HT40 MIMO – 16-QAM / MCS3 / 4Tx CDD / Ports 1, 2, 3 & 4
  - 802.11ac VHT80 MIMO – 16-QAM / MCS3x1 / 4Tx CDD / Ports 1, 2, 3 & 4
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. Tests were performed in these restricted bands of operation with the EUT transmitting on the bottom and top channels within 5.25-5.35 GHz band.
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 (5.25-5.35 GHz band operation) (continued)****Note(s) (continued):**

5. For all average measurements in this section, 300 sweeps were used. This satisfies the requirement for the minimum number of sweep points, as stated in KDB 789033 Section II.G.6.c) Method AD (vi).
6. 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 4.1 was added to the measured result.