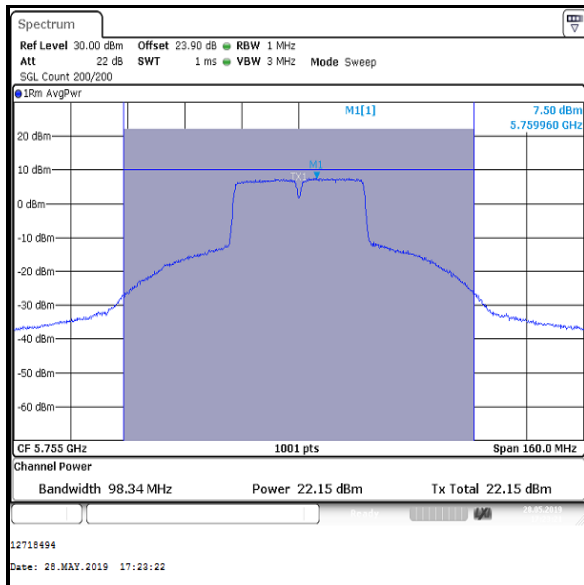
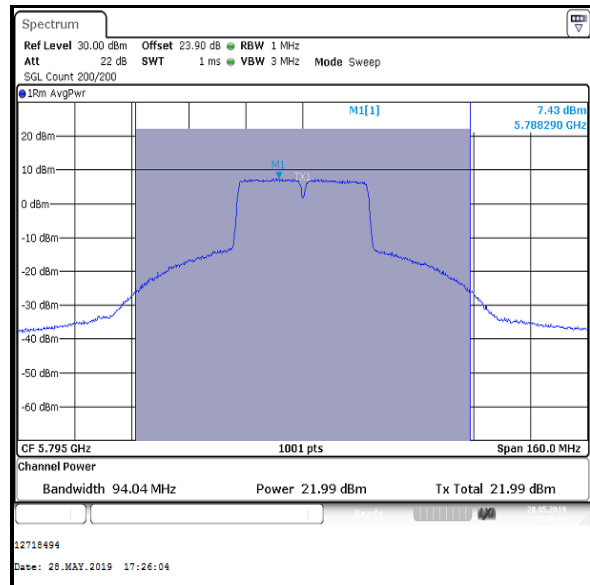


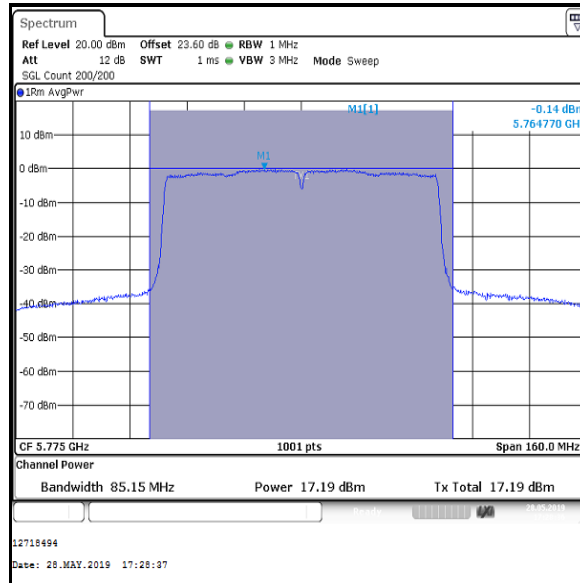
Transmitter Maximum Conducted Output Power (5.725-5.85 GHz band) (continued)**Results: 802.11n / 40 MHz / SISO / BPSK / MCS0 / Core 2**

Channel	Frequency (MHz)	Conducted Power (dBm)	Duty cycle correction factor (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5755	22.2	0.1	22.3	30.0	7.7	Complied
Top	5795	22.0	0.1	22.1	30.0	7.9	Complied

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

Transmitter Maximum Conducted Output Power (5.725-5.85 GHz band) (continued)**Results: 802.11ac / 80 MHz / SISO / BPSK / MCS0 / Core 2**

Channel	Frequency (MHz)	Conducted Power (dBm)	Duty cycle correction factor (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Single	5775	17.2	0.2	17.4	30.0	12.6	Complied

**Single Channel**

4.5. Transmitter Maximum Power Spectral Density

4.5.1. 5.15-5.25 GHz band

Test Summary:

Test Engineer:	Max Passell	Test Dates:	28 May 2019 & 10 June 2019
Test Sample Serial Number:	C02YF007MFLF		

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

Environmental Conditions:

Temperature (°C):	21
Relative Humidity (%):	45 to 50

Note(s):

1. 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.b) Method SA-1 and II.E.2.d) Method SA-2.
2. Measurements were performed using configurations detailed in Section 3.5 of this test report on the relevant channels.
3. For data rates where the EUT was transmitting at <98% duty cycle, 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.
4. FCC Part 15.407(a)(1)(iv) limit for PSD is <11 dBm/MHz.
5. For all modes of operation, the antenna gain is < 6 dBi.
6. For details on antenna gains refer to Section 3.4 of this test report.
7. 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.
8. 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 4.4 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)**Results: 802.11a / 20 MHz / SISO / BPSK / 6 Mbps / Core 2**

Channel	Frequency (MHz)	PSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5180	5.3	11.0	5.7	Complied
Middle	5200	9.5	11.0	1.5	Complied
Top	5240	9.6	11.0	1.4	Complied

Results: 802.11n / 20 MHz / SISO / BPSK / MCS0 / Core 2

Channel	Frequency (MHz)	PSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5180	5.0	11.0	6.0	Complied
Middle	5200	9.1	11.0	1.9	Complied
Top	5240	8.8	11.0	2.2	Complied

Results: 802.11n / 40 MHz / SISO / BPSK / MCS0 / Core 2

Channel	Frequency (MHz)	PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5190	0.5	0.1	0.6	11.0	10.4	Complied
Top	5230	6.4	0.1	6.5	11.0	4.5	Complied

Results: 802.11ac / 80 MHz / SISO / BPSK / MCS0 / Core 2

Channel	Frequency (MHz)	PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Result
Single	5210	-2.1	0.2	-1.9	11.0	12.9	Complied

Transmitter Maximum Power Spectral Density (5.25-5.35 GHz band)**4.5.2. 5.25-5.35 GHz band****Test Summary:**

Test Engineer:	Max Passell	Test Dates:	28 May 2019 & 10 June 2019
Test Sample Serial Number:	C02YF007MFLF		

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

Environmental Conditions:

Temperature (°C):	21
Relative Humidity (%):	45 to 50

Note(s):

1. 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.b) Method SA-1 and II.E.2.d) Method SA-2.
2. Measurements were performed using configurations detailed in Section 3.5 of this test report on the relevant channels.
3. For data rates where the EUT was transmitting at <98% duty cycle, 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.
4. FCC Part 15.407(a)(2) limit for PSD in the 5.25-5.35 GHz band is <11 dBm/MHz.
5. For all modes of operation, the antenna gain is < 6 dBi.
6. For details on antenna gains refer to Section 3.4 of this test report.
7. 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.
8. 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 4.4 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 (5.25-5.35 GHz band) (continued)**Results: 802.11a / 20 MHz / SISO / BPSK / 6 Mbps / Core 2**

Channel	Frequency (MHz)	PSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5260	9.6	11.0	1.4	Complied
Middle	5280	9.4	11.0	1.6	Complied
Top	5320	5.5	11.0	5.5	Complied

Results: 802.11n / 20 MHz / SISO / BPSK / MCS0 / Core 2

Channel	Frequency (MHz)	PSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5260	8.5	11.0	2.5	Complied
Middle	5280	9.1	11.0	1.9	Complied
Top	5320	5.2	11.0	5.8	Complied

Results: 802.11n / 40 MHz / SISO / BPSK / MCS0 / Core 2

Channel	Frequency (MHz)	PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Result
Bottom	5270	5.8	0.1	5.9	11.0	5.1	Complied
Top	5310	1.0	0.1	1.1	11.0	9.9	Complied

Results: 802.11ac / 80 MHz / SISO / BPSK / MCS0 / Core 2

Channel	Frequency (MHz)	PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Result
Single	5290	-2.7	0.2	-2.5	11.0	13.5	Complied

Transmitter Maximum Power Spectral Density (5.47-5.725 GHz band)**4.5.3. 5.47-5.725 GHz band****Test Summary:**

Test Engineer:	Max Passell	Test Dates:	28 May 2019 to 10 June 2019
Test Sample Serial Number:	C02YF007MFLF		

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

Environmental Conditions:

Temperature (°C):	21 to 23
Relative Humidity (%):	36 to 50

Note(s):

1. 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.b) Method SA-1 and II.E.2.d) Method SA-2.
2. Measurements were performed using configurations detailed in Section 3.5 of this test report on the relevant channels.
3. For data rates where the EUT was transmitting at <98% duty cycle, 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.
4. FCC Part 15.407(a)(2) limit for PSD in the 5.47-5.725 GHz band is <11 dBm/MHz.
5. For all modes of operation, the antenna gain is < 6 dBi.
6. For details on antenna gains refer to Section 3.4 of this test report.
7. 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.
8. 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 4.4 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 (5.47-5.725 GHz band) (continued)**Results: 802.11a / 20 MHz / SISO / BPSK / 6 Mbps / Core 2**

Channel	Frequency (MHz)	PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Result
Bottom	5500	3.5	11.0	7.5	Complied
Middle	5580	9.0	11.0	2.0	Complied
Top	5700	3.2	11.0	7.8	Complied

Results: 802.11n / 20 MHz / SISO / BPSK / MCS0 / Core 2

Channel	Frequency (MHz)	PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Result
Bottom	5500	3.1	11.0	7.9	Complied
Middle	5580	8.8	11.0	2.2	Complied
Top	5700	2.7	11.0	8.3	Complied

Results: 802.11n / 40 MHz / SISO / BPSK / MCS0 / Core 2

Channel	Frequency (MHz)	PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Result
Bottom	5510	0.1	0.1	0.2	11.0	10.8	Complied
Middle	5590	7.2	0.1	7.3	11.0	3.7	Complied
Top	5670	1.7	0.1	1.8	11.0	9.2	Complied

Results: 802.11ac / 80 MHz / SISO / BPSK / MCS0 / Core 2

Channel	Frequency (MHz)	PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Result
Bottom	5530	-2.6	0.2	-2.4	11.0	13.4	Complied
Top	5610	0.6	0.2	0.8	11.0	10.2	Complied

Transmitter Maximum Power Spectral Density (Straddle channels)**4.5.4. Channels that straddle the U-NII-2C and U-NII-3 bands****Test Summary:**

Test Engineer:	Max Passell	Test Dates:	28 May 2019 & 10 June 2019
Test Sample Serial Number:	C02YF007MFLF		

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

Environmental Conditions:

Temperature (°C):	21
Relative Humidity (%):	45 to 50

Note(s):

1. Channels that straddle the U-NII-2C and U-NII-3 bands at 5725 MHz, need to meet requirements of both U-NII bands. Due to maximum power spectral density limit being more stringent on U-NII-2C, compliance is shown against the limits of U-NII-2C. By default the EUT also complied on U-NII-3.
2. 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.b) Method SA-1 and II.E.2.d) Method SA-2.
3. Measurements were performed using configurations detailed in Section 3.5 of this test report on the relevant channels.
4. For data rates where the EUT was transmitting at <98% duty cycle, 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.
5. FCC Part 15.407(a)(2) limit for PPSD in the 5.47-5.725 GHz band is <11 dBm/MHz.
6. For all modes of operation, the antenna gain is < 6 dBi.
7. For details on antenna gains refer to Section 3.4 of this test report.
8. 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.
9. 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 4.4 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 (Straddle channels) (continued)**Results: 802.11a / 20 MHz / SISO / BPSK / 6 Mbps / Core 2**

Channel	Frequency (MHz)	PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Result
Single	5720	9.5	11.0	1.5	Complied

Results: 802.11n / 20 MHz / SISO / BPSK / MCS0 / Core 2

Channel	Frequency (MHz)	PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Result
Single	5720	8.6	11.0	2.4	Complied

Results: 802.11n / 40 MHz / SISO / BPSK / MCS0 / Core 2

Channel	Frequency (MHz)	PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Result
Single	5710	7.0	0.1	7.1	11.0	3.9	Complied

Results: 802.11ac / 80 MHz / SISO / BPSK / MCS0 / Core 2

Channel	Frequency (MHz)	PSD (dBm/MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)	Result
Single	5690	4.4	0.2	4.6	11.0	6.4	Complied

Transmitter Maximum Power Spectral Density (5.725-5.85 GHz band)**4.5.5. 5.725-5.85 GHz band****Test Summary:**

Test Engineer:	Max Passell	Test Date:	28 May 2019
Test Sample Serial Number:	C02YF007MFLF		

FCC Reference:	Part 15.407(a)(3)
Test Method Used:	KDB 789033 D02 Section II.F. referencing II.E.2.b) and II.E.2.d)

Environmental Conditions:

Temperature (°C):	21
Relative Humidity (%):	45

Note(s):

1. 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.b) Method SA-1 and II.E.2.d) Method SA-2.
2. Measurements were performed using configurations detailed in Section 3.5 of this test report on the relevant channels.
3. For data rates where the EUT was transmitting at <98% duty cycle, 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.
4. FCC Part 15.407(a)(3) limit for PPSD in the 5.725-5.85 GHz operating band is <30 dBm/500 kHz.
5. In accordance with ANSI C63.10 Section 4.1.4.1, use of bandwidths greater than those specified can produce higher readings. Compliance against the applicable limits is shown using a 1 MHz resolution bandwidth. This was deemed worst case.
6. For all modes of operation, the antenna gain is < 6 dBi.
7. For details on antenna gains refer to Section 3.4 of this test report.
8. 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.
9. 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 4.4 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 (5.725-5.85 GHz band) (continued)**Results: 802.11a / 20 MHz / SISO / BPSK / 6 Mbps / Core 2**

Channel	Frequency (MHz)	PSD (dBm / 1 MHz)	Limit (dBm / 500 kHz)	Margin (dB)	Result
Bottom	5745	10.7	30.0	19.3	Complied
Middle	5785	10.5	30.0	19.5	Complied
Top	5825	10.8	30.0	19.2	Complied

Results: 802.11n / 20 MHz / SISO / BPSK / MCS0 / Core 2

Channel	Frequency (MHz)	PSD (dBm / 1 MHz)	Limit (dBm / 500 kHz)	Margin (dB)	Result
Bottom	5745	10.3	30.0	19.7	Complied
Middle	5785	10.4	30.0	19.6	Complied
Top	5825	10.4	30.0	19.6	Complied

Results: 802.11n / 40 MHz / SISO / BPSK / MCS0 / Core 2

Channel	Frequency (MHz)	PSD (dBm/1 MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/ 1 MHz)	Limit (dBm / 500 kHz)	Margin (dB)	Result
Bottom	5755	7.5	0.1	7.6	30.0	22.4	Complied
Top	5795	7.4	0.1	7.5	30.0	22.5	Complied

Results: 802.11ac / 80 MHz / SISO / BPSK / MCS0 / Core 2

Channel	Frequency (MHz)	PSD (dBm/1 MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm/ 1 MHz)	Limit (dBm / 500 kHz)	Margin (dB)	Result
Single	5775	-0.1	0.2	0.1	30.0	29.9	Complied

5. Radiated Test Results

5.1. Transmitter Out of Band Radiated Emissions <1 GHz

Test Summary:

Test Engineer:	Marco Zunarelli	Test Date:	04 July 2019
Test Sample Serial Number:	C02YD006MFLQ		

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

Environmental Conditions:

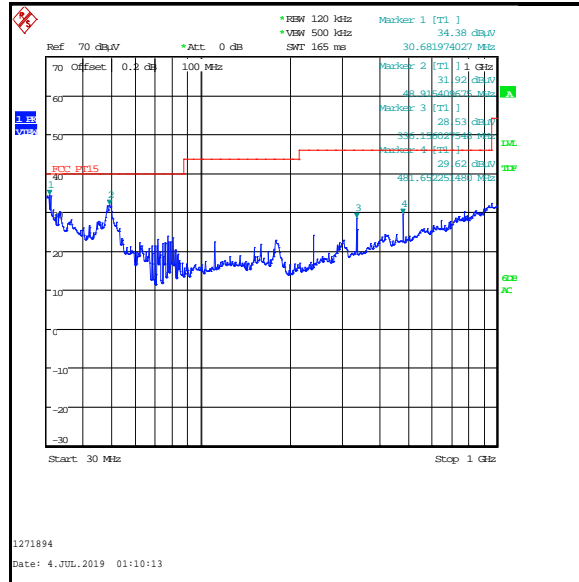
Temperature (°C):	25
Relative Humidity (%):	41

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 5.725 to 5.85 GHz band with a configuration of 802.11n / HT20 / MCS0 on middle channel in this band as it produced the highest power spectral density and was therefore deemed worst case. 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 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.
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 Radiated Emissions <1 GHz (continued)**Results: Quasi-Peak / Middle Channel / 802.11n / 20 MHz / MCS0**

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
240.032	Vertical	18.4	46.0	27.6	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 Radiated Emissions >1 GHz**5.2.1. 5.15-5.25 GHz band****Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band operation)****Test Summary:**

Test Engineers:	James O'Reilly, Mohamed Toubella, Andrew Harding & Mark Perry	Test Dates:	12 May 2019 to 07 June 2019
Test Sample Serial Number:	C02YD006MFLQ		

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

Environmental Conditions:

Temperature (°C):	23 to 24
Relative Humidity (%):	36 to 41

Note(s):

1. FCC Part 15.407(b)(1) states for transmitters operating in the band 5.15 to 5.25 GHz: all emissions outside of the 5.15 to 5.35 GHz band will not exceed -27 dBm/MHz. Part(b)(7) states the provisions of 15.205 apply e.g. restricted bands of operation.
2. Pre-scans were performed with the EUT transmitting in the band 5.725 to 5.85 GHz band with a data rate of 802.11n / HT20 / MCS0 on middle channel in this band as it produced the highest power spectral density and was therefore deemed worst case. 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 final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
4. 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.
5. 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.
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. Measurements above 1 GHz were performed in a fully 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)**Results: Bottom Channel / EIRP**

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
15923.462	Vertical	-38.0	-27.0	11.0	Complied
23819.000	Vertical	-43.7	-27.0	16.7	Complied

Results: Bottom Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15923.462	Vertical	57.2	74.0	16.8	Complied
23819.000	Vertical	51.5*	54.0	2.5	Complied

Results: Bottom Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15997.500	Vertical	38.6	54.0	15.4	Complied

Results: Middle Channel / EIRP

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
15923.462	Vertical	-38.0	-27.0	11.0	Complied
23819.000	Vertical	-43.7	-27.0	16.7	Complied

Results: Middle Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15923.462	Vertical	57.2	74.0	16.8	Complied
23819.000	Vertical	51.5*	54.0	2.5	Complied

Results: Middle Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15997.500	Vertical	38.6	54.0	15.4	Complied

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

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
15923.462	Vertical	-38.0	-27.0	11.0	Complied
23819.000	Vertical	-43.7	-27.0	16.7	Complied

Results: Top Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15923.462	Vertical	57.2	74.0	16.8	Complied
23819.000	Vertical	51.5*	54.0	2.5	Complied

Results: Top Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15997.500	Vertical	38.6	54.0	15.4	Complied

5.2.2. 5.25-5.35 GHz band**Transmitter Out of Band Radiated Emissions (5.25-5.35 GHz band operation)****Test Summary:**

Test Engineers:	James O'Reilly, Mohamed Toubella, Andrew Harding & Mark Perry	Test Dates:	12 May 2019 to 07 June 2019
Test Sample Serial Number:	C02YD006MFLQ		

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

Environmental Conditions:

Temperature (°C):	23 to 24
Relative Humidity (%):	36 to 41

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 5.725 to 5.85 GHz band with a data rate of 802.11n / HT20 / MCS0 on middle channel in this band as it produced the highest power spectral density and was therefore deemed worst case. 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 final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
4. 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.
5. 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.
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. Measurements above 1 GHz were performed in a fully anechoic chamber (Asset Number K0017 or 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 / EIRP**

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
15923.462	Vertical	-38.0	-27.0	11.0	Complied
23819.000	Vertical	-43.7	-27.0	16.7	Complied

Results: Bottom Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15923.462	Vertical	57.2	74.0	16.8	Complied
23819.000	Vertical	51.5*	54.0	2.5	Complied

Results: Bottom Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15997.500	Vertical	38.6	54.0	15.4	Complied

Results: Middle Channel / EIRP

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
15923.462	Vertical	-38.0	-27.0	11.0	Complied
23819.000	Vertical	-43.7	-27.0	16.7	Complied

Results: Middle Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15923.462	Vertical	57.2	74.0	16.8	Complied
23819.000	Vertical	51.5*	54.0	2.5	Complied

Results: Middle Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15997.500	Vertical	38.6	54.0	15.4	Complied

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

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
15923.462	Vertical	-38.0	-27.0	11.0	Complied
23819.000	Vertical	-43.7	-27.0	16.7	Complied

Results: Top Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15923.462	Vertical	57.2	74.0	16.8	Complied
23819.000	Vertical	51.5*	54.0	2.5	Complied

Results: Top Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15997.500	Vertical	38.6	54.0	15.4	Complied

5.2.3. 5.47-5.725 GHz band**Transmitter Out of Band Radiated Emissions (5.47-5.725 GHz band operation)****Test Summary:**

Test Engineers:	James O'Reilly, Mohamed Toubella, Andrew Harding & Mark Perry	Test Dates:	12 May 2019 to 07 June 2019
Test Sample Serial Number:	C02YD006MFLQ		

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

Environmental Conditions:

Temperature (°C):	23 to 24
Relative Humidity (%):	36 to 41

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 in the band 5.725 to 5.85 GHz band with a data rate of 802.11n / HT20 / MCS0 on middle channel in this band as it produced the highest power spectral density and was therefore deemed worst case. 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 final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
4. 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.
5. 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.
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. Measurements above 1 GHz were performed in a fully anechoic chamber (Asset Number K0017 or 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 (5.47-5.725 GHz band operation) (continued)**Results: Bottom Channel / EIRP**

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
15923.462	Vertical	-38.0	-27.0	11.0	Complied
23819.000	Vertical	-43.7	-27.0	16.7	Complied

Results: Bottom Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15923.462	Vertical	57.2	74.0	16.8	Complied
23819.000	Vertical	51.5*	54.0	2.5	Complied

Results: Bottom Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15997.500	Vertical	38.6	54.0	15.4	Complied

Results: Middle Channel / EIRP

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
15923.462	Vertical	-38.0	-27.0	11.0	Complied
23819.000	Vertical	-43.7	-27.0	16.7	Complied

Results: Middle Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15923.462	Vertical	57.2	74.0	16.8	Complied
23819.000	Vertical	51.5*	54.0	2.5	Complied

Results: Middle Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15997.500	Vertical	38.6	54.0	15.4	Complied

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

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
15923.462	Vertical	-38.0	-27.0	11.0	Complied
23819.000	Vertical	-43.7	-27.0	16.7	Complied

Results: Top Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15923.462	Vertical	57.2	74.0	16.8	Complied
23819.000	Vertical	51.5*	54.0	2.5	Complied

Results: Top Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15997.500	Vertical	38.6	54.0	15.4	Complied

5.2.4. Channels that straddle the U-NII-2C and U-NII-3 bands at 5725 MHz**Transmitter Out of Band Radiated Emissions (Channels that straddle the U-NII-2C and U-NII-3 bands at 5725 MHz)****Test Summary:**

Test Engineers:	James O'Reilly, Mohamed Toubella, Andrew Harding & Mark Perry	Test Dates:	12 May 2019 & 07 June 2019
Test Sample Serial Number:	C02YD006MFLQ		

FCC Reference:	Part 15.407(b)(3),(4)(i),(7) & 15.209(a)
Test Method Used:	KDB 789033 II.G. & ANSI C63.10 Sections 6.3 and 6.6
Frequency Range:	1 GHz to 40 GHz

Environmental Conditions:

Temperature (°C):	23 to 24
Relative Humidity (%):	36 to 41

Note(s):

1. KDB 789033 Section III.B.2.b)(iii) states "Straddle channels are considered to be operating in both U-NII-2C and U-NII-3. The worst case out of band emission i.e. -27 dBm/MHz peak EIRP, applies at the band edges. The band edges are considered to be 5.47 GHz and 5.85 GHz."
2. Pre-scans were performed with the EUT transmitting in the band 5.725 to 5.85 GHz band with a data rate of 802.11n / HT20 / MCS0 on middle channel in this band as it produced the highest power spectral density and was therefore deemed worst case. 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 final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
4. 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.
5. 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.
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. Measurements above 1 GHz were performed in a fully anechoic chamber (Asset Number K0017 or 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 (Channels that straddle the U-NII-2C and U-NII-3 bands at 5725 MHz) (continued)**Results: Straddle Channel / EIRP**

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
15923.462	Vertical	-38.0	-27.0	11.0	Complied
23819.000	Vertical	-43.7	-27.0	16.7	Complied

Results: Straddle Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15923.462	Vertical	57.2	74.0	16.8	Complied
23819.000	Vertical	51.5*	54.0	2.5	Complied

Results: Straddle Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15997.500	Vertical	38.6	54.0	15.4	Complied

5.2.5. 5.725-5.85 GHz band**Transmitter Out of Band Radiated Emissions (5.725-5.85 GHz band operation)****Test Summary:**

Test Engineers:	James O'Reilly, Mohamed Toubella, Andrew Harding & Mark Perry	Test Dates:	12 May 2019 to 07 June 2019
Test Sample Serial Number:	C02YD006MFLQ		

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

Environmental Conditions:

Temperature (°C):	23 to 24
Relative Humidity (%):	36 to 46

Note(s):

1. FCC Part 15.407(b)(4)(i) states for transmitters operating in the band 5.725 to 5.85 GHz: all emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge. Part(b)(7) states the provisions of 15.205 apply e.g. restricted bands of operation.
2. Pre-scans were performed with the EUT transmitting in this band with a data rate of 802.11n / HT20 / MCS0 on middle channel as it produced the highest power spectral density and was therefore deemed worst case. An inquiry was made to the FCC and the response was pre-scans could be performed in the band with the highest conduct power and all final measurements should be performed on any emissions seen in each band.
3. The final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
4. The emission shown on the 1 GHz to 6 GHz plot is the EUT fundamental.
5. 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.
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. Measurements were performed across the two restricted bands closest to the bands of operation with the EUT transmitting on the bottom channel in the 5.15 to 5.25 GHz band and top channel in the 5.25 to 5.35 GHz range. Plots are included in this section of the test report. Peak and average measurements were made.
9. Measurements above 1 GHz were performed in a fully anechoic chamber (Asset Number K0017 or 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 (5.725-5.85 GHz band operation) (continued)**Results: Bottom Channel / EIRP**

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
15923.462	Vertical	-38.0	-27.0	11.0	Complied
23819.000	Vertical	-43.7	-27.0	16.7	Complied

Results: Bottom Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15923.462	Vertical	57.2	74.0	16.8	Complied
23819.000	Vertical	51.5*	54.0	2.5	Complied

Results: Bottom Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15997.500	Vertical	38.6	54.0	15.4	Complied

Results: Middle Channel / EIRP

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
15923.462	Vertical	-38.0	-27.0	11.0	Complied
23819.000	Vertical	-43.7	-27.0	16.7	Complied

Results: Middle Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15923.462	Vertical	57.2	74.0	16.8	Complied
23819.000	Vertical	51.5*	54.0	2.5	Complied

Results: Middle Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15997.500	Vertical	38.6	54.0	15.4	Complied

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

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
15923.462	Vertical	-38.0	-27.0	11.0	Complied
23819.000	Vertical	-43.7	-27.0	16.7	Complied

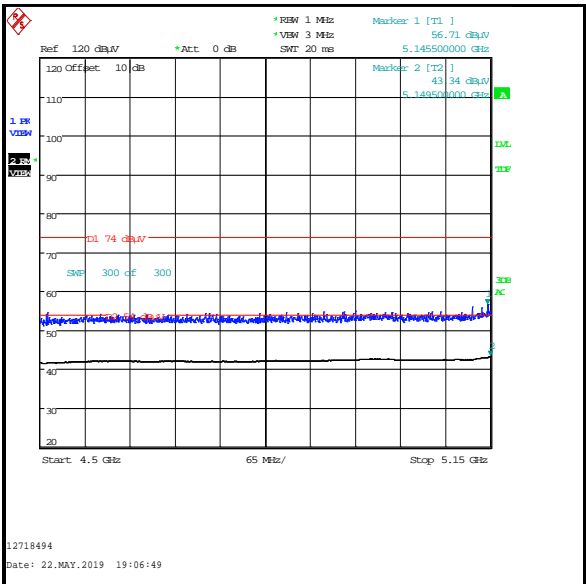
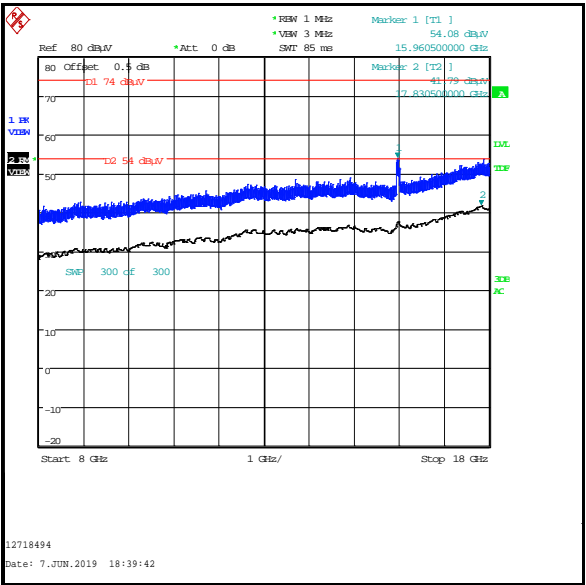
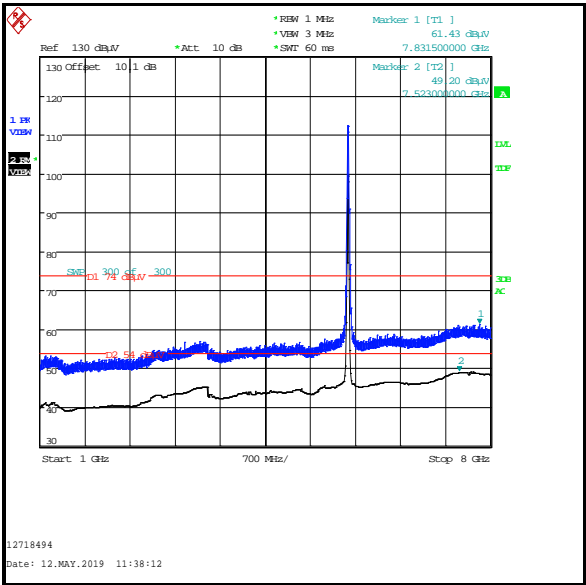
Results: Top Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15923.462	Vertical	57.2	74.0	16.8	Complied
23819.000	Vertical	51.5*	54.0	2.5	Complied

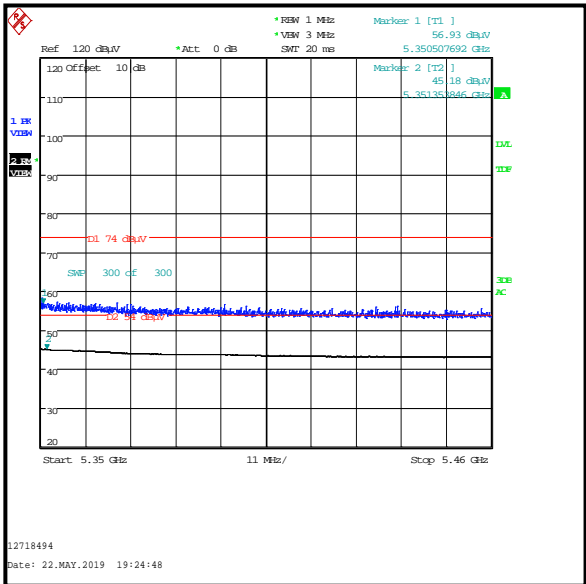
Results: Top Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
15997.500	Vertical	38.6	54.0	15.4	Complied

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

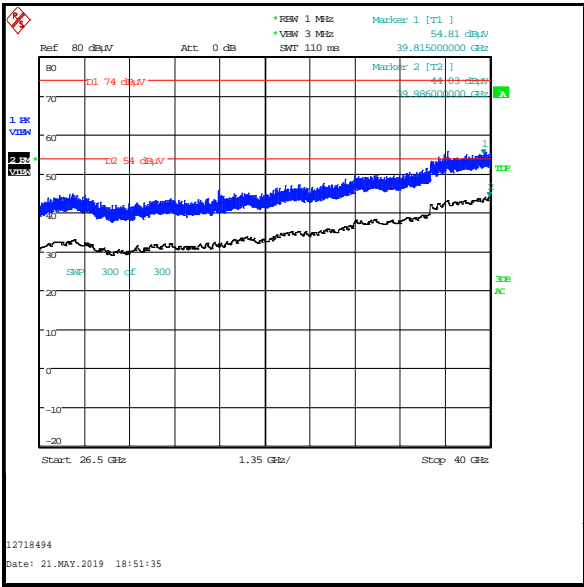
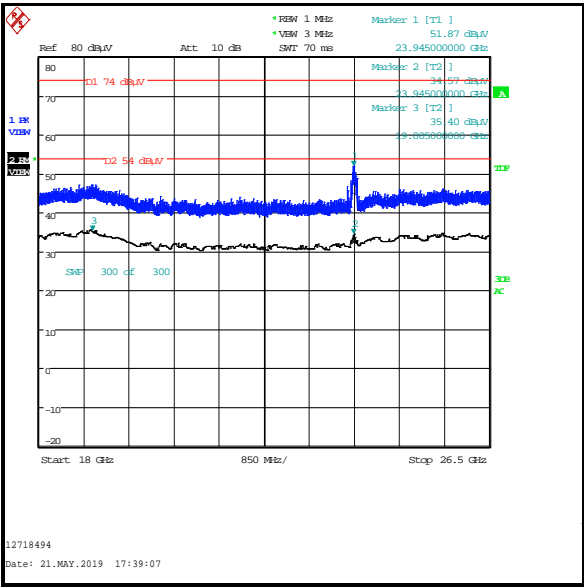


Restricted Band 4.5 GHz to 5.15 GHz



Restricted Band 5.35 GHz to 5.46 GHz

Transmitter Out of Band Radiated Emissions (5.725-5.85 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. 5.15-5.25 GHz band

Test Summary:

Test Engineers:	Mark Perry & James O'Reilly	Test Dates:	21 April 2019 to 08 May 2019
Test Sample Serial Numbers:	C02YF00CMFLF & C02YD006MFLQ		

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

Environmental Conditions:

Temperature (°C):	23 to 25
Relative Humidity (%):	33 to 37

Note(s):

1. The following modes were tested:
 - 802.11a - BPSK / 6 Mbps / Core 2
 - 802.11n HT20 / SISO - BPSK / MCS0 / Core 2
 - 802.11n HT40 / SISO - BPSK / MCS0 / Core 2
 - 802.11ac VHT80 / SISO – BPSK / MCS0 / Core 2
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. Tests were performed in these restricted bands of operation, the results are included in the transmitter 5.725-5.85 GHz band radiated spurious emission section of this test report.
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. 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.

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11a / 20 MHz / SISO / BPSK / 6 Mbps / Core 2****Results: Lower Band Edge / Peak**

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5150	68.4	74.0	5.6	Complied

Results: Upper Band Edge / Peak

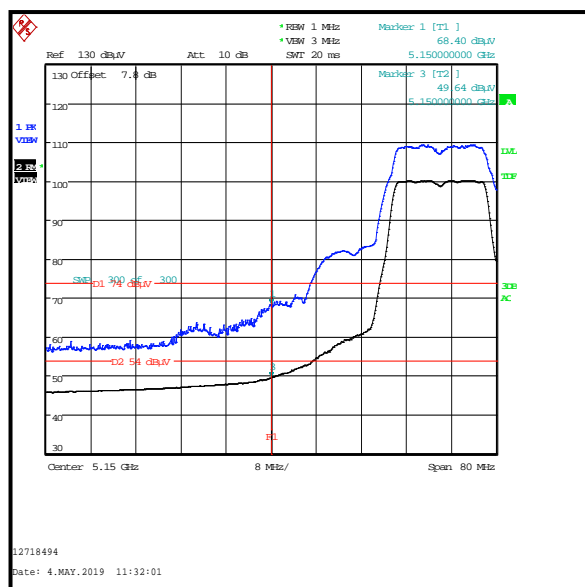
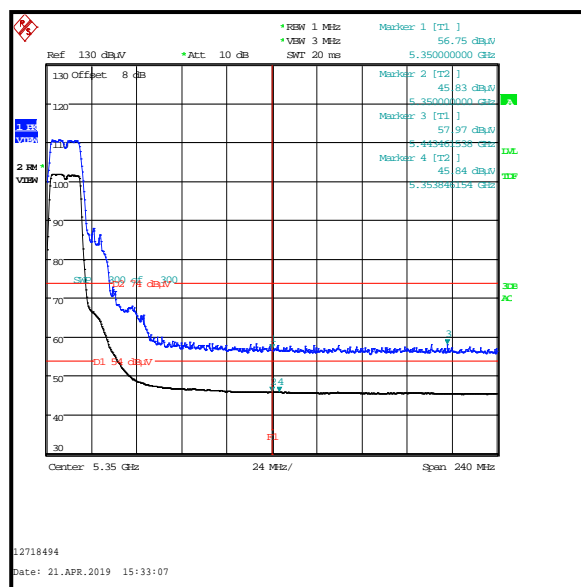
Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5350	56.8	74.0	17.2	Complied
5442.462	58.0	74.0	16.0	Complied

Results: Lower Band Edge / Average

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5150	49.6	54.0	4.4	Complied

Results: Upper Band Edge / Average

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5350	45.8	54.0	8.2	Complied

**Lower Band Edge****Upper Band Edge**

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11n / 20 MHz / SISO / BPSK / MCS0 / Core 2****Results: Lower Band Edge / Peak**

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5146.410	67.5	74.0	6.5	Complied
5150	65.1	74.0	8.9	Complied

Results: Upper Band Edge / Peak

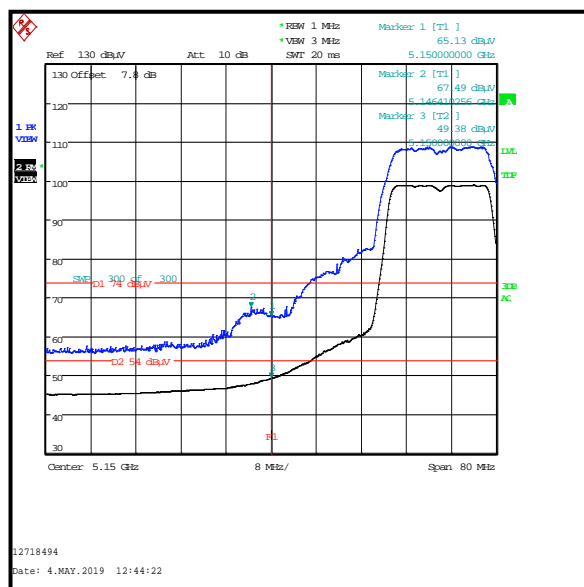
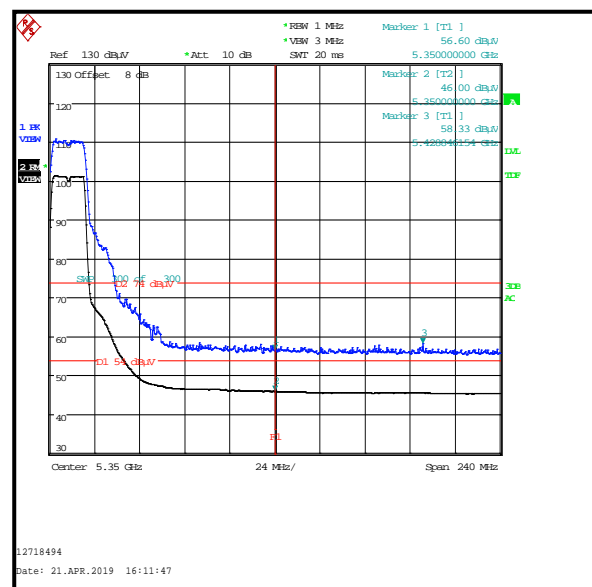
Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5350	56.6	74.0	17.4	Complied
5428.846	58.3	74.0	15.7	Complied

Results: Lower Band Edge / Average

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5150	49.4	54.0	4.6	Complied

Results: Upper Band Edge / Average

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5350	46.0	54.0	8.0	Complied

**Lower Band Edge****Upper Band Edge**

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11n / 40 MHz / SISO / BPSK / MCS0 / Core 2****Results: Lower Band Edge / Peak**

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5149.615	67.9	74.0	6.1	Complied
5150	67.2	74.0	6.8	Complied

Results: Upper Band Edge / Peak

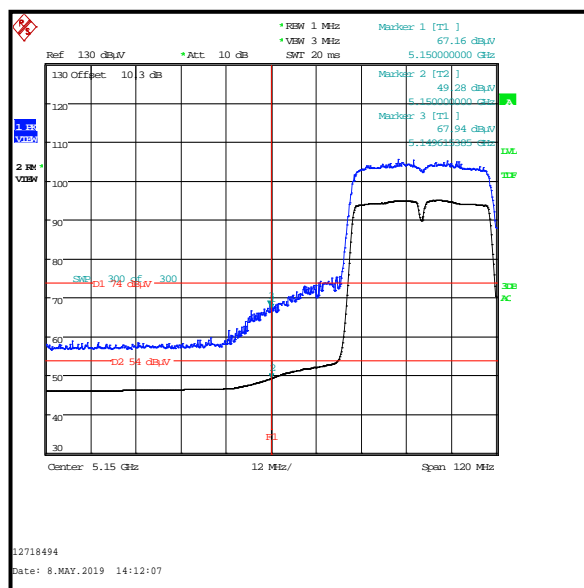
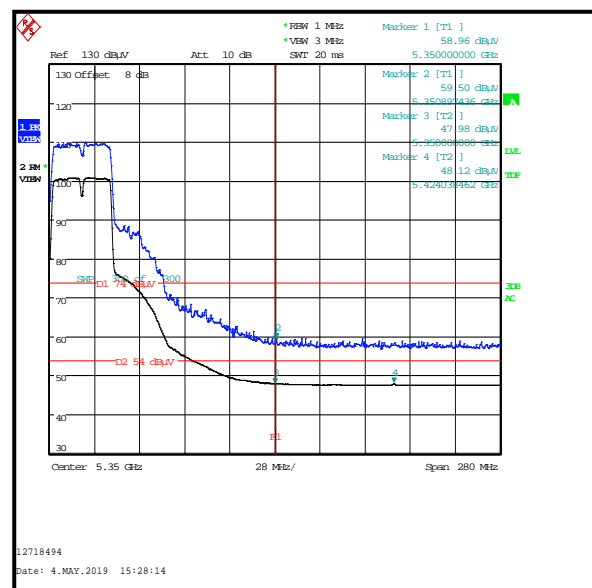
Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5350	59.0	74.0	15.0	Complied
5350.897	59.5	74.0	14.5	Complied

Results: Lower Band Edge / Average

Frequency (MHz)	Level (dB μ V/m)	Duty Cycle correction factor (dB)	Corrected Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5150	49.3	0.1	49.4	54.0	4.6	Complied

Results: Upper Band Edge / Average

Frequency (MHz)	Level (dB μ V/m)	Duty Cycle correction factor (dB)	Corrected Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5350	48.0	0.1	48.1	54.0	5.9	Complied
5424.038	48.1	0.1	48.2	54.0	5.8	Complied

**Lower Band Edge****Upper Band Edge**

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11ac / 80 MHz / SISO / BPSK / MCS0 / Core 2****Results: Lower Band Edge / Peak**

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5150	67.0	74.0	7.0	Complied

Results: Upper Band Edge / Peak

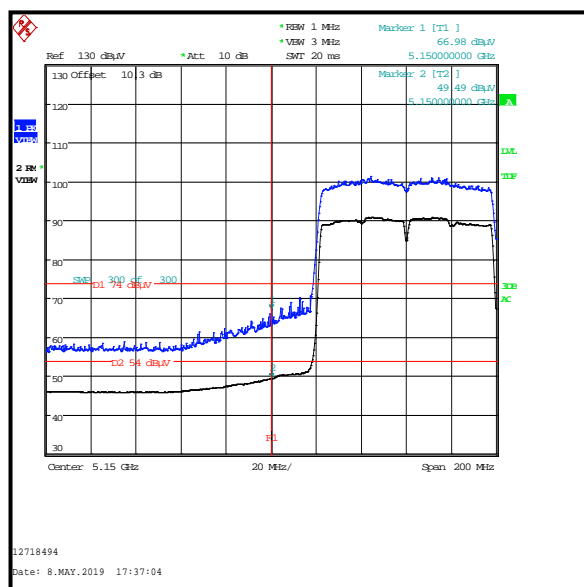
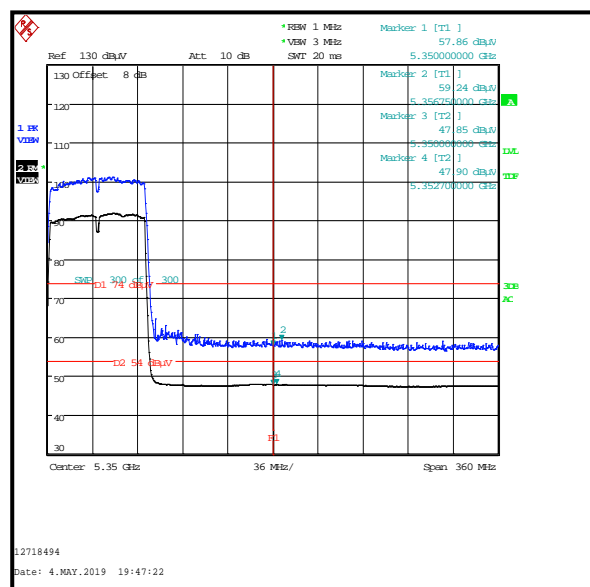
Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5350	57.9	74.0	16.1	Complied
5356.750	59.2	74.0	14.8	Complied

Results: Lower Band Edge / Average

Frequency (MHz)	Level (dB μ V/m)	Duty Cycle correction factor (dB)	Corrected Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5150	49.5	0.2	49.7	54.0	4.3	Complied

Results: Upper Band Edge / Average

Frequency (MHz)	Level (dB μ V/m)	Duty Cycle correction factor (dB)	Corrected Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5350	47.9	0.2	48.1	54.0	5.9	Complied

**Lower Band Edge****Upper Band Edge**

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band)**5.3.2. 5.25-5.35 GHz band****Test Summary:**

Test Engineers:	Mark Perry & James O'Reilly	Test Dates:	21 April 2019 to 08 May 2019
Test Sample Serial Numbers:	C02YF00CMFLF & C02YD006MFLQ		

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):	23 to 25
Relative Humidity (%):	33 to 37

Note(s):

- The following modes were tested:
 - 802.11a - BPSK / 6 Mbps / Core 2
 - 802.11n HT20 / SISO - BPSK / MCS0 / Core 2
 - 802.11n HT40 / SISO - BPSK / MCS0 / Core 2
 - 802.11ac VHT80 / SISO – BPSK / MCS0x1 / Core 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.
- 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, the results are included in the transmitter 5.725-5.85 GHz band radiated spurious emissions section of this test report.
- 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.
- 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).
- 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.

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)**Results: 802.11a / 20 MHz / BPSK / 6 Mbps / Core 2****Results: Lower Band Edge / Peak**

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5035.000	58.3	74.0	15.7	Complied
5150	55.7	74.0	18.3	Complied

Results: Upper Band Edge / Peak

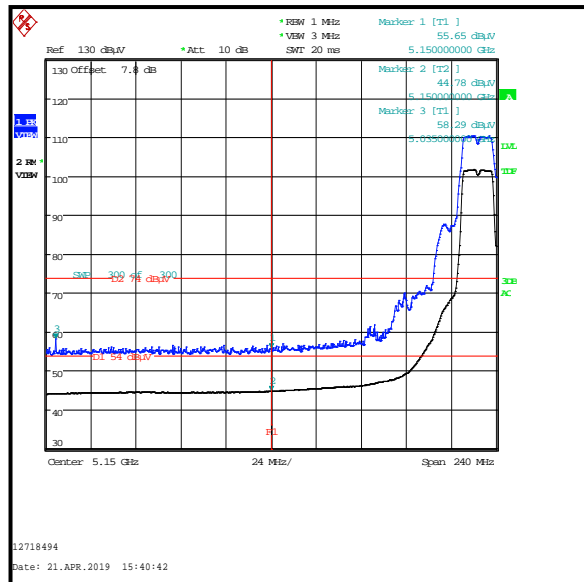
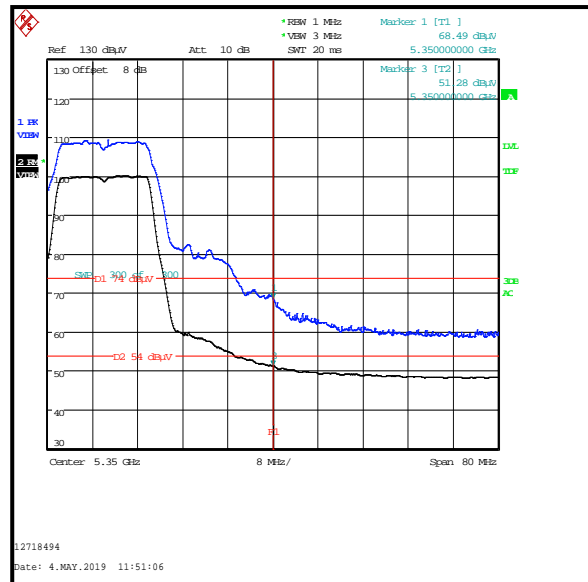
Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5350	68.5	74.0	5.5	Complied

Results: Lower Band Edge / Average

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5150	44.8	54.0	9.2	Complied

Results: Upper Band Edge / Average

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5350	51.3	54.0	2.7	Complied

**Lower Band Edge****Upper Band Edge**

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)**Results: 802.11n / 20 MHz / SISO / BPSK / MCS0 / Core 2****Results: Lower Band Edge / Peak**

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5143.077	56.7	74.0	17.3	Complied
5150	55.1	74.0	18.9	Complied

Results: Upper Band Edge / Peak

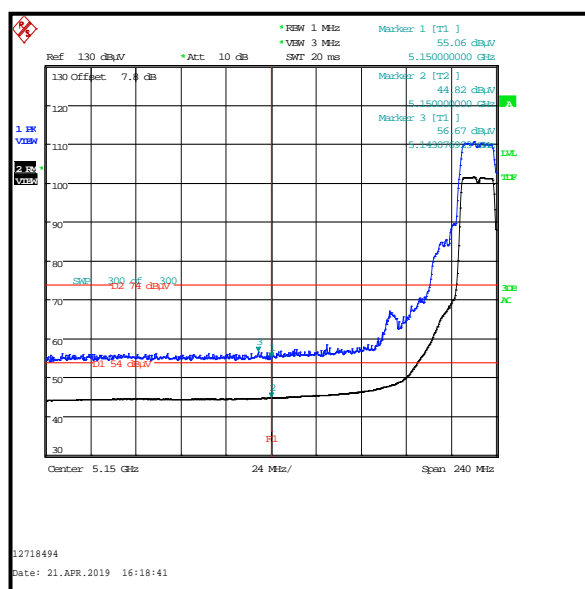
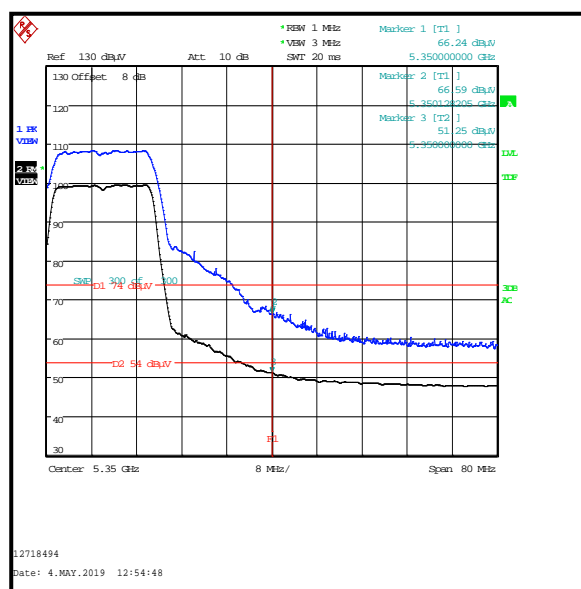
Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5350	66.2	74.0	7.8	Complied
5350.128	66.6	74.0	7.4	Complied

Results: Lower Band Edge / Average

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5150	44.8	54.0	9.2	Complied

Results: Upper Band Edge / Average

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5350	51.3	54.0	2.7	Complied

**Lower Band Edge****Upper Band Edge**

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)**Results: 802.11n / 40 MHz / SISO / BPSK / MCS0 / Core 2****Results: Lower Band Edge / Peak**

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5036.026	58.3	74.0	15.7	Complied
5150	57.4	74.0	16.6	Complied

Results: Upper Band Edge / Peak

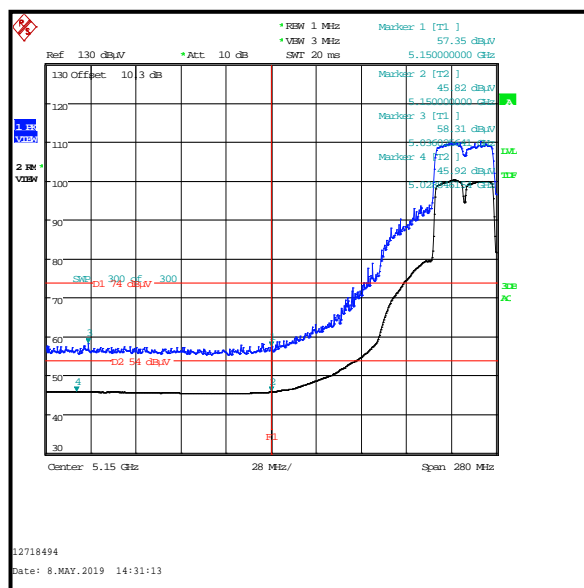
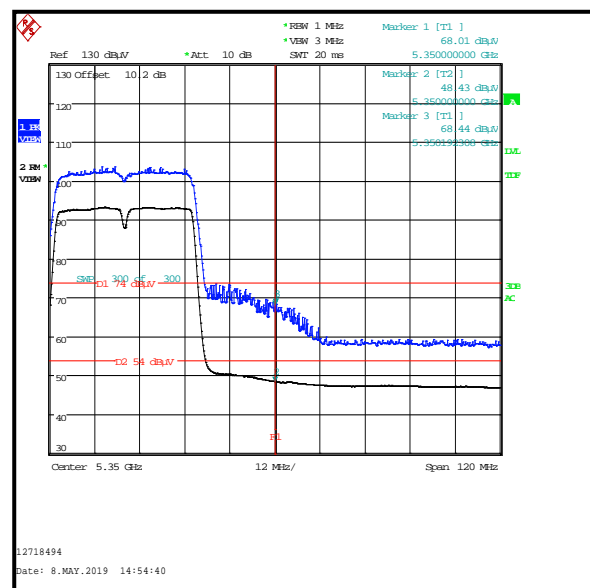
Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5350	68.0	74.0	6.0	Complied
5350.192	68.4	74.0	5.6	Complied

Results: Lower Band Edge / Average

Frequency (MHz)	Level (dB μ V/m)	Duty Cycle correction factor (dB)	Corrected Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5028.846	45.9	0.1	46.0	54.0	8.0	Complied
5150	45.8	0.1	45.9	54.0	8.1	Complied

Results: Upper Band Edge / Average

Frequency (MHz)	Level (dB μ V/m)	Duty Cycle correction factor (dB)	Corrected Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5350	48.4	0.1	48.5	54.0	5.5	Complied

**Lower Band Edge****Upper Band Edge**

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)**Results: 802.11ac / 80 MHz / SISO / BPSK / MCS0 / Core 2****Results: Lower Band Edge / Peak**

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5080.192	58.6	74.0	15.4	Complied
5150	56.6	74.0	17.4	Complied

Results: Upper Band Edge / Peak

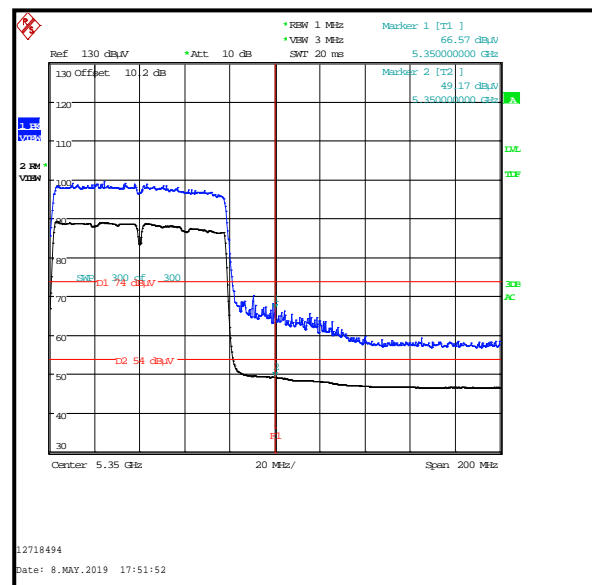
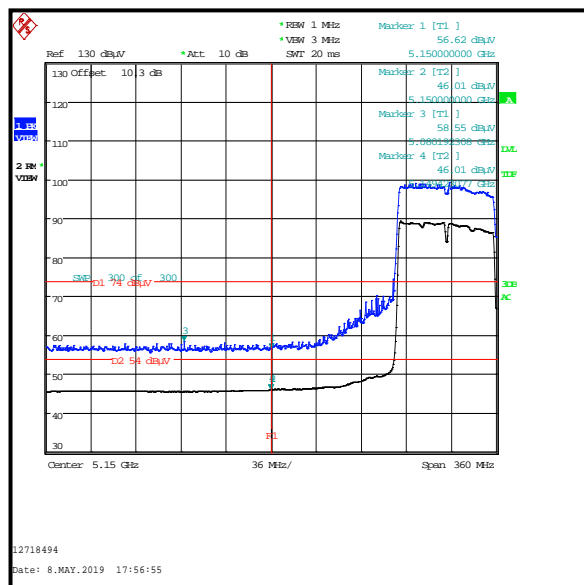
Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5350	66.6	74.0	7.4	Complied

Results: Lower Band Edge / Average

Frequency (MHz)	Level (dB μ V/m)	Duty Cycle correction factor (dB)	Corrected Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5150	46.0	0.2	46.2	54.0	7.8	Complied

Results: Upper Band Edge / Average

Frequency (MHz)	Level (dB μ V/m)	Duty Cycle correction factor (dB)	Corrected Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5350	49.2	0.2	49.4	54.0	4.6	Complied



Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band)**5.3.3. 5.47-5.725 GHz band****Test Summary:**

Test Engineers:	Mark Perry & James O'Reilly	Test Dates:	20 April 2019 to 08 May 2019
Test Sample Serial Numbers:	C02YF00CMFLF & C02YD006MFLQ		

FCC Reference:	Parts 15.407(b)(3),(7), 15.205 & 15.209(a)
Test Method Used:	ANSI C63.10 Section 6.10 & KDB 789033 II.G.

Environmental Conditions:

Temperature (°C):	23 to 25
Relative Humidity (%):	33 to 37

Note(s):

1. The following modes were tested:
 - 802.11a - BPSK / 6 Mbps / Core 2
 - 802.11n HT20 / SISO - BPSK / MCS0 / Core 2
 - 802.11n HT40 / SISO - BPSK / MCS0 / Core 2
 - 802.11ac VHT80 / SISO – BPSK / MCS0x1 / Core 2
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. Tests were performed in these restricted bands of operation with the EUT transmitting on the bottom and top channels within 5.47-5.725 GHz band, the results are included in the transmitter 5.725-5.85 GHz band radiated spurious emissions section of this test report.
4. For completeness, results are also shown as EIRP in dBm and also as field strength in dBμV/m. Measured field strength was converted to EIRP in accordance with KDB 789033 II.G.2.c)(iii) using a conversion factor of 95.2.

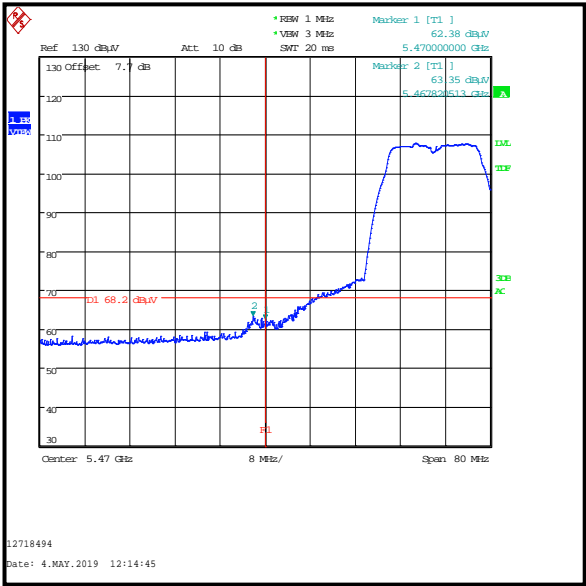
Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)**Results: 802.11a / 20 MHz / SISO / BPSK / 6 Mbps / Core 2 / Peak**

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5467.821	-31.8	-27.0	4.8	Complied
5470	-32.8	-27.0	5.8	Complied
5725	-34.4	-27.0	7.4	Complied
5726.234	-32.1	-27.0	5.1	Complied
5850	-37.2	-27.0	10.2	Complied
5859.423	-35.1	-27.0	8.1	Complied

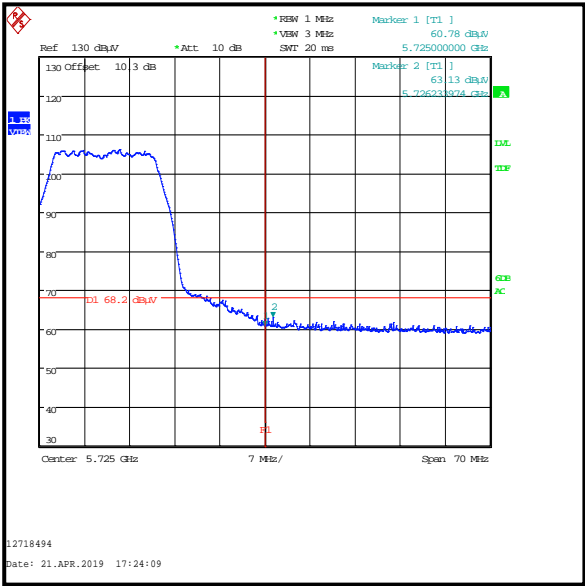
Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5467.821	63.4	68.2	4.8	Complied
5470	62.4	68.2	5.8	Complied
5725	60.8	68.2	7.4	Complied
5726.234	63.1	68.2	5.1	Complied
5850	58.0	68.2	10.2	Complied
5859.423	60.1	68.2	8.1	Complied

Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)

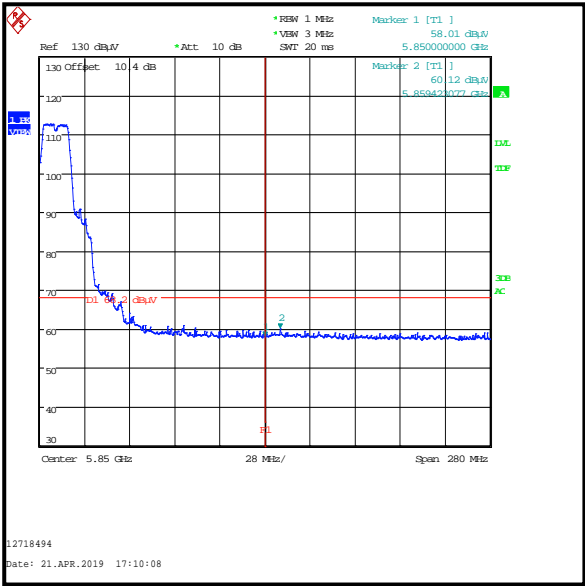
Results: 802.11a / 20 MHz / SISO / BPSK / 6 Mbps / Core 2 / Peak



Lower Band Edge



Upper Band Edge



Straddle Channel emission level at 5850 MHz

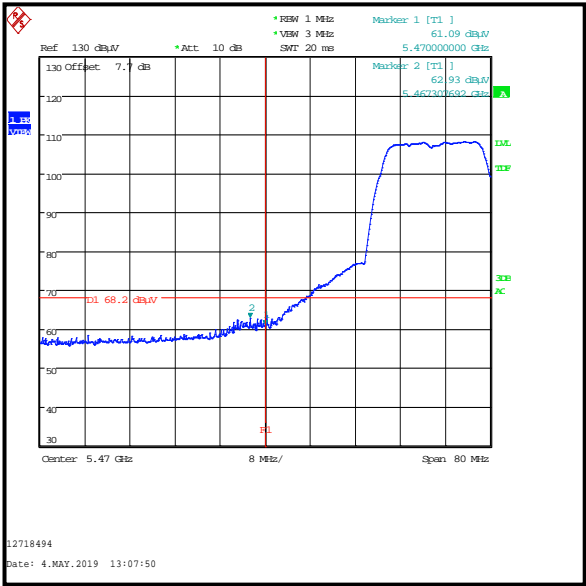
Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)**Results: 802.11n / 20 MHz / SISO / BPSK / MCS0 / Core 2 / Peak**

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5467.308	-32.3	-27.0	5.3	Complied
5470	-34.1	-27.0	7.1	Complied
5725	-33.3	-27.0	6.3	Complied
5726.571	-33.2	-27.0	6.2	Complied
5850	-36.4	-27.0	9.4	Complied
5863.910	-35.8	-27.0	8.8	Complied

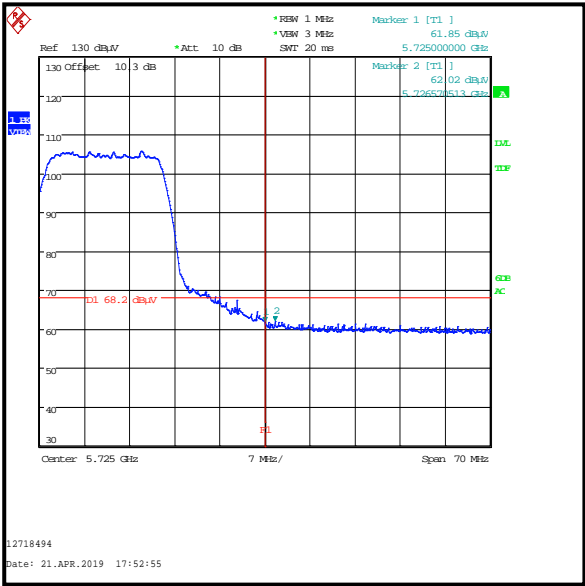
Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5467.308	62.9	68.2	5.3	Complied
5470	61.1	68.2	7.1	Complied
5725	61.9	68.2	6.3	Complied
5726.571	62.0	68.2	6.2	Complied
5850	58.8	68.2	9.4	Complied
5863.910	59.4	68.2	8.8	Complied

Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)

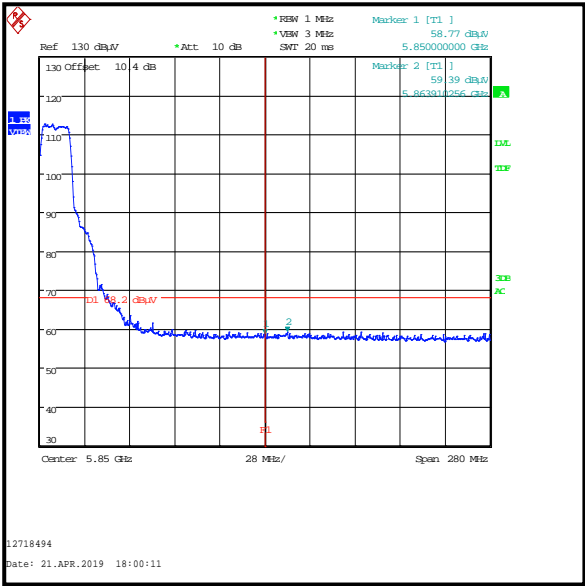
Results: 802.11n / 20 MHz / SISO / BPSK / MCS0 / Core 2 / Peak



Lower Band Edge



Upper Band Edge



Straddle Channel emission level at 5850 MHz

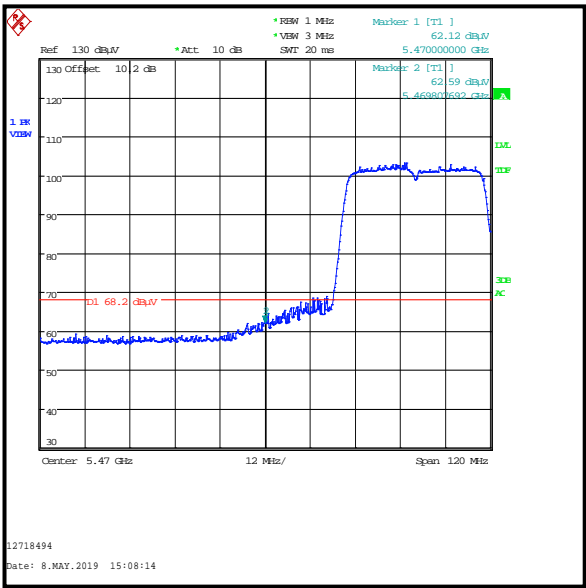
Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)**Results: 802.11n / 40 MHz / SISO / BPSK / MCS0 / Core 2 / Peak**

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5469.808	-32.6	-27.0	5.6	Complied
5470	-33.1	-27.0	6.1	Complied
5725	-32.9	-27.0	5.9	Complied
5725.964	-31.8	-27.0	4.8	Complied
5850	-37.1	-27.0	10.1	Complied
5888.463	-36.1	-27.0	9.1	Complied

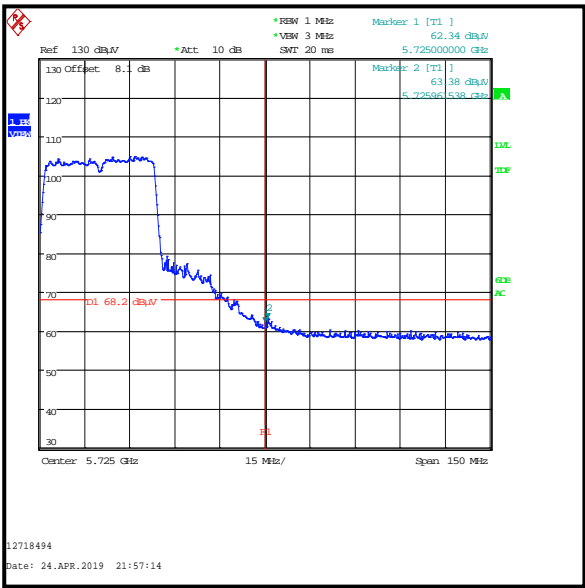
Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5469.808	62.6	68.2	5.6	Complied
5470	62.1	68.2	6.1	Complied
5725	62.3	68.2	5.9	Complied
5725.962	63.4	68.2	4.8	Complied
5850	58.1	68.2	10.1	Complied
5888.462	59.1	68.2	9.1	Complied

Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)

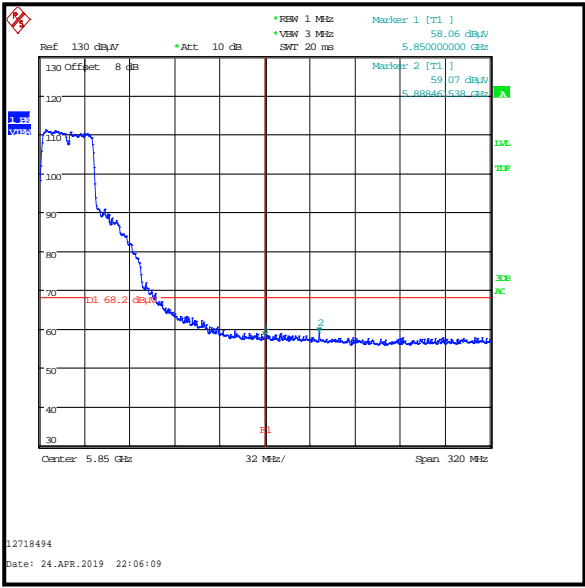
Results: 802.11n / 40 MHz / SISO / BPSK / MCS0 / Core 2 / Peak



Lower Band Edge



Upper Band Edge



Straddle Channel emission level at 5850 MHz

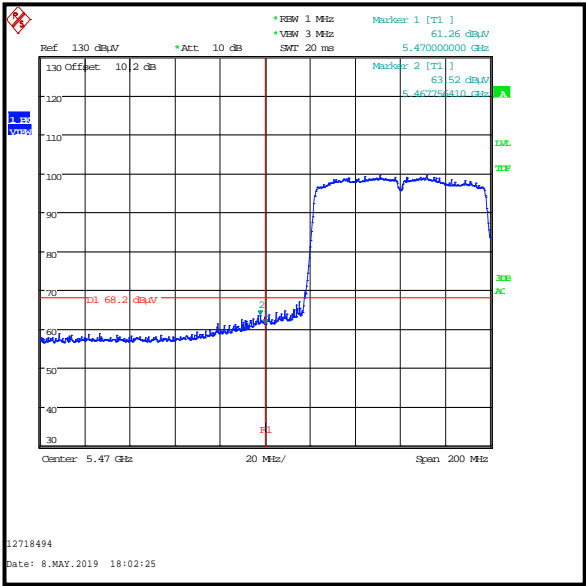
Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)**Results: 802.11ac / 80 MHz / SISO / BPSK / MCS0 / Core 2 / Peak**

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5467.754	-31.7	-27.0	4.7	Complied
5470	-33.9	-27.0	6.9	Complied
5725	-28.6	-27.0	1.6	Complied
5850	-34.5	-27.0	7.5	Complied
5858.333	-33.4	-27.0	6.4	Complied

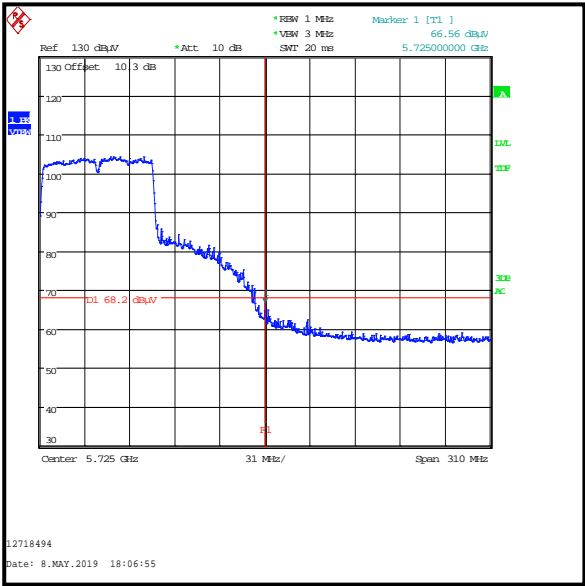
Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5467.756	63.5	68.2	4.7	Complied
5470	61.3	68.2	6.9	Complied
5725	66.6	68.2	1.6	Complied
5850	60.7	68.2	7.5	Complied
5858.333	61.8	68.2	6.4	Complied

Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)

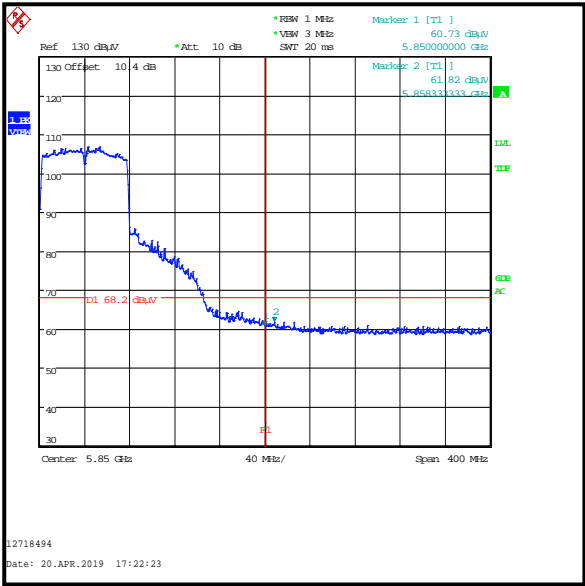
Results: 802.11ac / 80 MHz / SISO / BPSK / MCS0 / Core 2 / Peak



Lower Band Edge



Upper Band Edge



Straddle Channel emission level at 5850 MHz

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band)**5.3.4. 5.725-5.85 GHz band****Test Summary:**

Test Engineers:	Mark Perry & James O'Reilly	Test Dates:	04 May 2019 to 08 May 2019
Test Sample Serial Numbers:	C02YF00CMFLF & C02YD006MFLQ		

FCC Reference:	Parts 15.407(b)(4)(i),(7), 15.205 & 15.209(a)
Test Method Used:	ANSI C63.10 Section 6.10 & KDB 789033 II.G.

Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	33 to 36

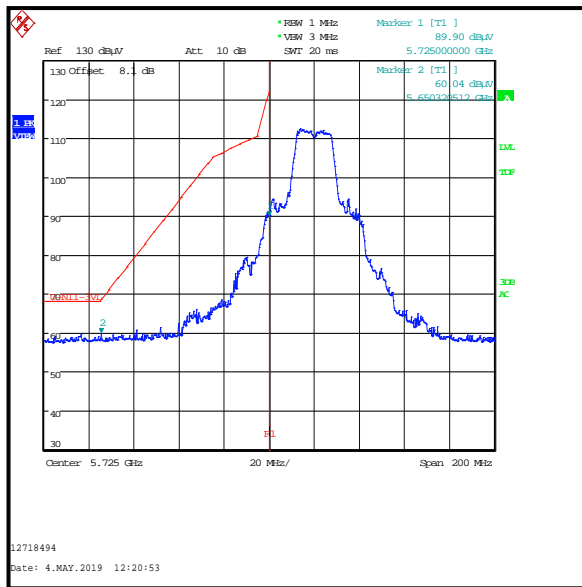
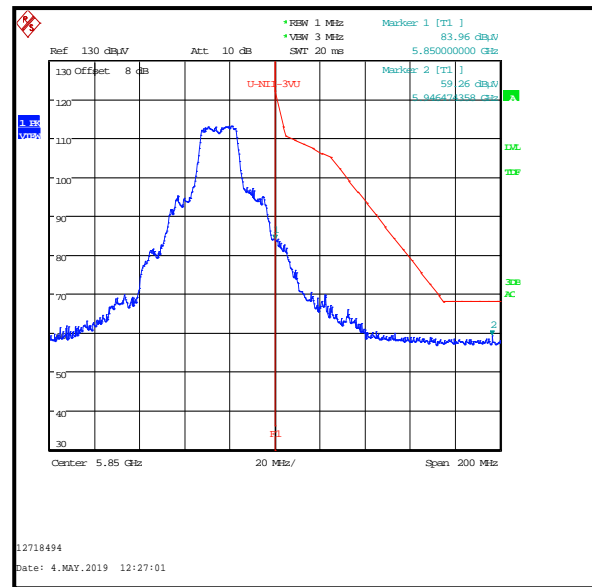
Note(s):

1. The following modes were tested:
 - 802.11a - BPSK / 6 Mbps / Core 2
 - 802.11n HT20 / SISO - BPSK / MCS0 / Core 2
 - 802.11n HT40 / SISO - BPSK / MCS0 / Core 2
 - 802.11ac VHT80 / SISO – BPSK / MCS0x1 / Core 2
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 completeness, results are also shown as EIRP in dBm and also as field strength in dBμV/m. Measured field strength was converted to EIRP in accordance with KDB 789033 G.2.c)(iii) using a conversion factor of 95.2.

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band operation) (continued)**Results: 802.11a / 20 MHz / SISO / BPSK / 6 Mbps / Core 2 / Peak**

Frequency (MHz)	Level (dBm)	Limit (dBm/MHz)	Margin (dB)	Result
5650.321	-35.2	-27.0	8.2	Complied
5725	-5.3	27.0	32.3	Complied
5850	-11.2	27.0	38.2	Complied
5946.474	-35.9	-27.0	8.9	Complied

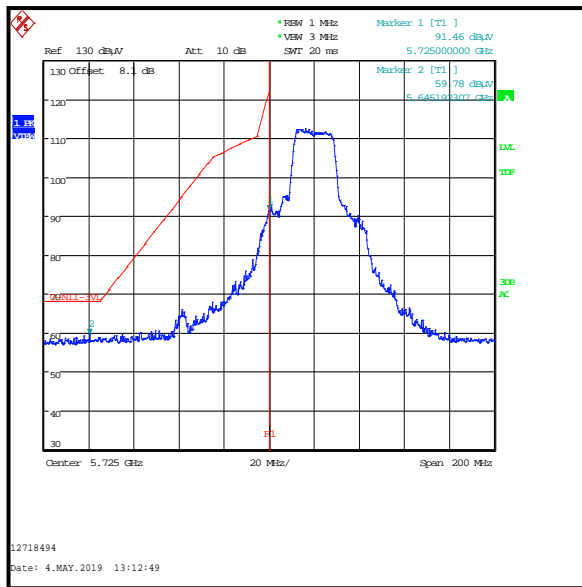
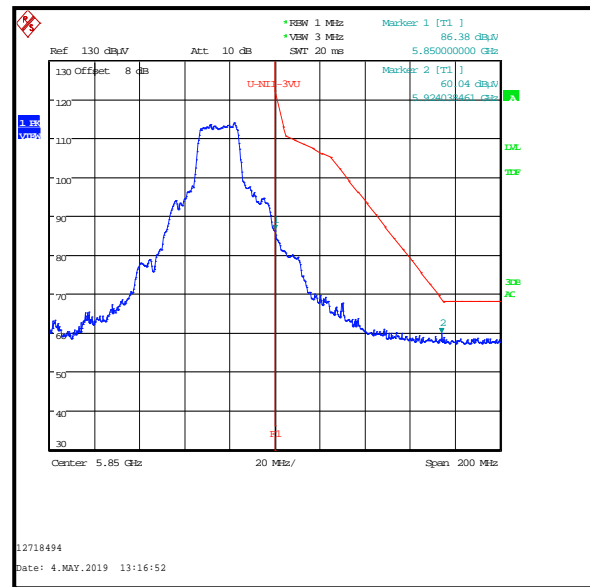
Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5650.321	60.0	68.2	8.2	Complied
5725	89.9	122.2	32.3	Complied
5850	84.0	122.2	38.2	Complied
5946.474	59.3	68.2	8.9	Complied

**Lower Band Edge****Upper Band Edge**

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band operation) (continued)**Results: 802.11n / 20 MHz / SISO / BPSK / MCS0 / Core 2 / Peak**

Frequency (MHz)	Level (dBm)	Limit (dBm/MHz)	Margin (dB)	Result
5645.192	-35.4	-27.0	8.4	Complied
5725	-3.7	27.0	30.7	Complied
5850	-8.8	27.0	35.8	Complied
5924.038	-35.2	-27.0	8.2	Complied

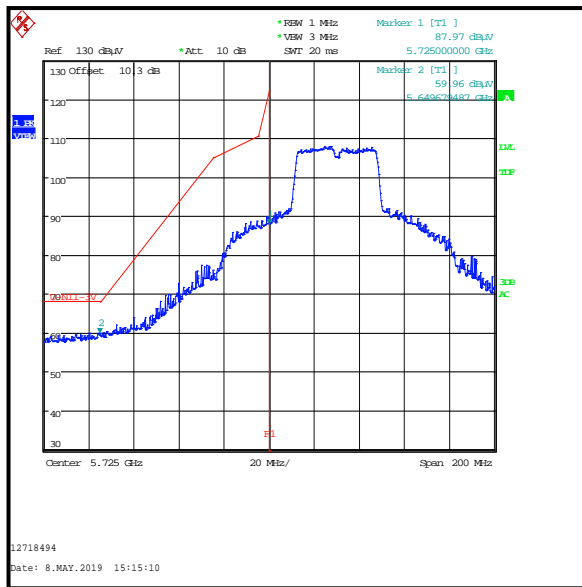
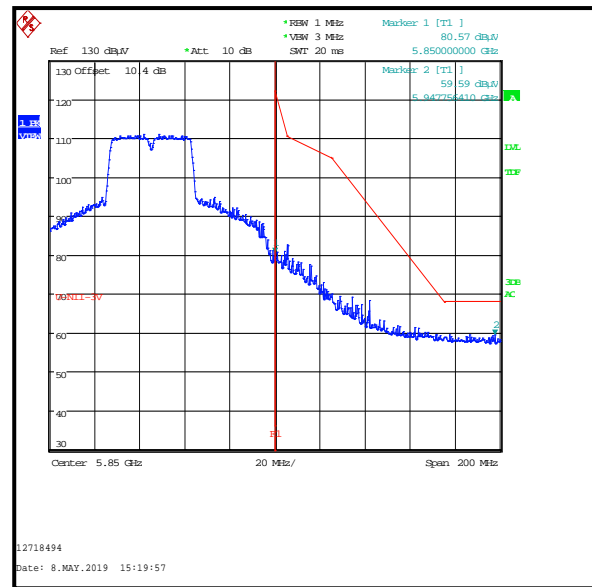
Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5645.192	59.8	68.2	8.4	Complied
5725	91.5	122.2	30.7	Complied
5850	86.4	122.2	35.8	Complied
5924.038	60.0	68.2	8.2	Complied

**Lower Band Edge****Upper Band Edge**

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band operation) (continued)**Results: 802.11n / 40 MHz / SISO / BPSK / MCS0 / Core 2 / Peak**

Frequency (MHz)	Level (dBm)	Limit (dBm/MHz)	Margin (dB)	Result
5649.679	-35.2	-27.0	8.2	Complied
5725	-7.2	27.0	34.2	Complied
5850	-14.6	27.0	41.6	Complied
5947.756	-35.6	-27.0	8.6	Complied

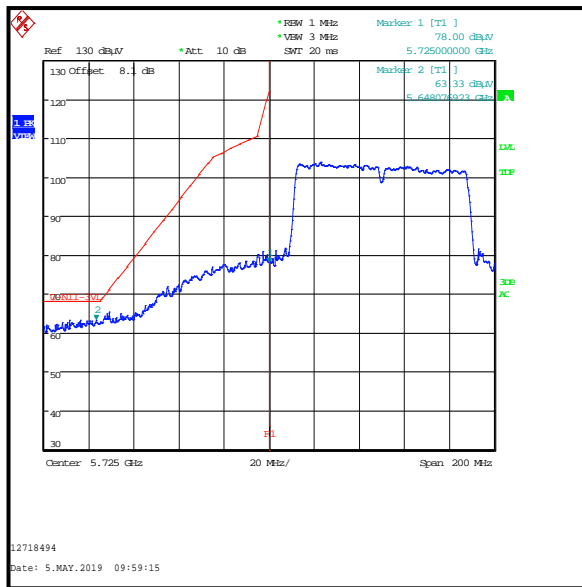
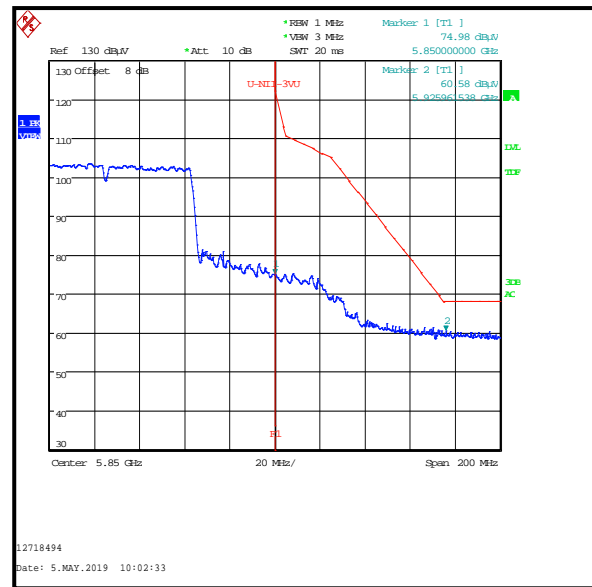
Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5649.679	60.0	68.2	8.2	Complied
5725	88.0	122.2	34.2	Complied
5850	80.6	122.2	41.6	Complied
5947.756	59.6	68.2	8.6	Complied

**Lower Band Edge****Upper Band Edge**

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band operation) (continued)**Results: 802.11ac / 80 MHz / SISO / BPSK / MCS0 / Core 2 / Peak**

Frequency (MHz)	Level (dBm)	Limit (dBm/MHz)	Margin (dB)	Result
5648.077	-31.9	-27.0	4.9	Complied
5725	-17.2	27.0	44.2	Complied
5850	-20.2	27.0	47.2	Complied
5925.962	-34.6	-27.0	7.6	Complied

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5648.077	63.3	68.2	4.9	Complied
5725	78.0	122.2	44.2	Complied
5850	75.0	122.2	47.2	Complied
5925.962	60.6	68.2	7.6	Complied

**Lower Band Edge****Upper Band Edge****--- END OF REPORT ---**