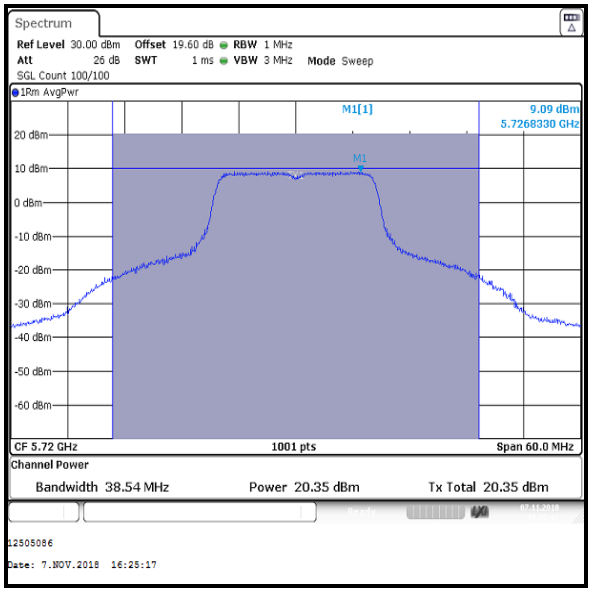
Transmitter Maximum Conducted Output Power (Straddle Channels) (continued)

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

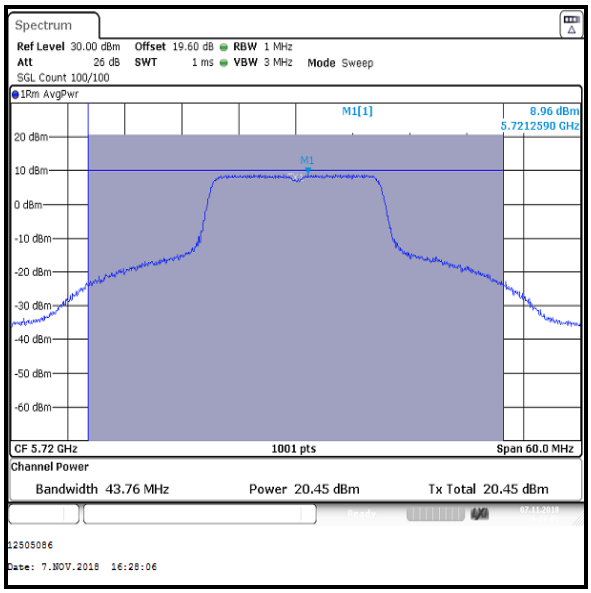
Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Single	5720	20.4	24.0	3.6	Complied



Single Channel

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

Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Single	5720	20.5	24.0	3.5	Complied

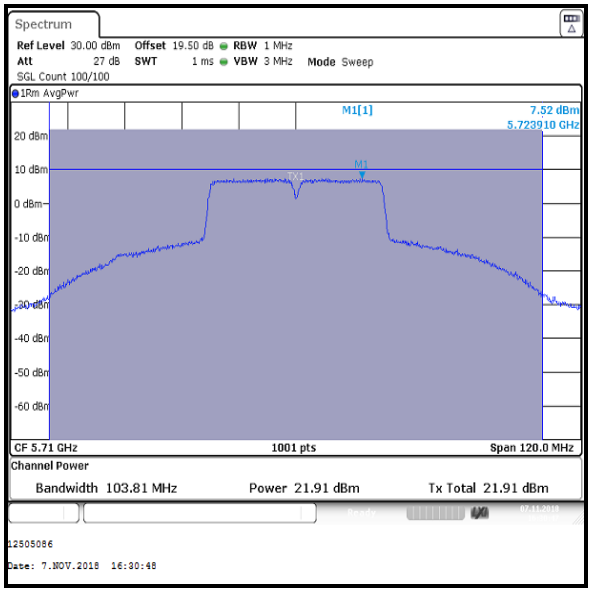


Single Channel

Transmitter Maximum Conducted Output Power (Straddle Channels) (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
Single	5710	21.9	0.1	22.0	24.0	2.0	Complied

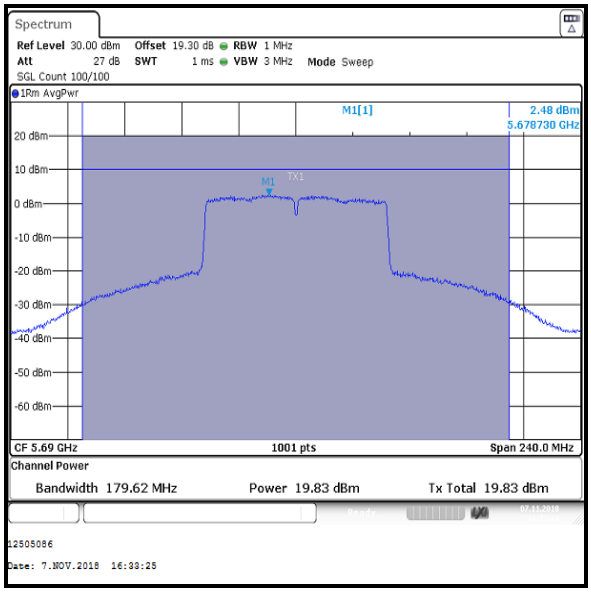


Single Channel

Transmitter Maximum Conducted Output Power (Straddle Channels) (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	5690	19.8	0.2	20.0	24.0	4.0	Complied



Single Channel

Transmitter Maximum Conducted Output Power (5.725-5.85 GHz band)

4.4.5. 5.725-5.85 GHz band

Test Summary:

Test Engineer:	Max Passell	**Test Date:**	07 November 2018
Test Sample Serial Number:	C02X2007KFLX		

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

Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	50

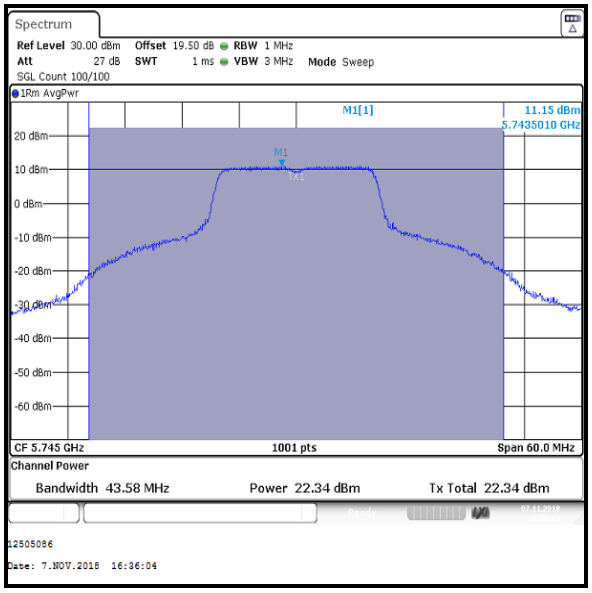
Note(s):

1. For conducted power tests where the duty cycle is >98%, the measurements were performed using a signal analyser in accordance with FCC KDB 789033 II.E.2.b) Method SA-1. Where the duty cycle is <98%, the measurements were performed in accordance with FCC KDB 789033 II.E.2.d) Method SA-2. The signal analyser's integration function was used to integrate across the 26 dB emission bandwidth. The resolution bandwidth was set to 1 MHz and video bandwidth 3 MHz. An RMS detector was used and sweep time was set to auto and 100 traces performed. The span was set to encompass the entire 26 dB emission bandwidth. The channel power results are recorded in the tables below.
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 power in order to compute the average power during the actual transmission time.
4. For all modes of operation, the antenna gain is < 6 dBi
5. For details on antenna gains refer to Section 3.4 of this test report.
6. The FCC Part 15.407(a)(3) limit shall not exceed 1 W (30.0 dBm).
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.

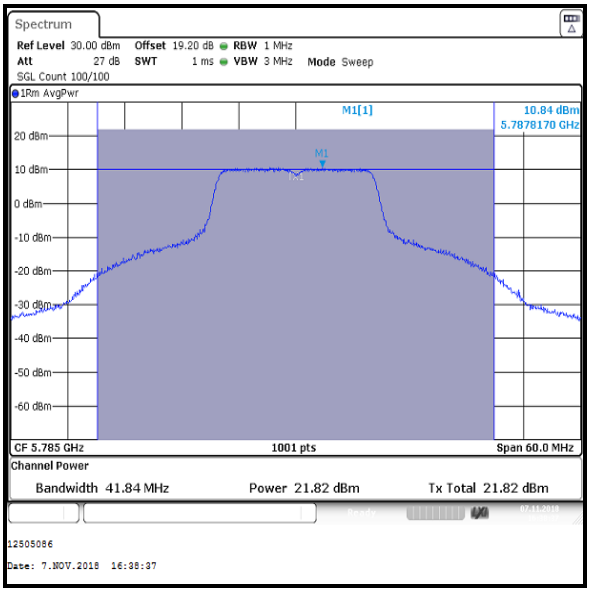
Transmitter Maximum Conducted Output Power (5.725-5.85 GHz band) (continued)

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

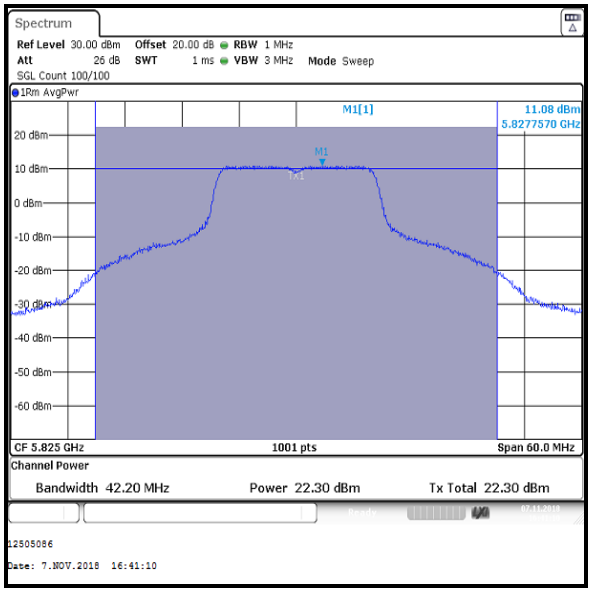
Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5745	22.3	30.0	7.7	Complied
Middle	5785	21.8	30.0	8.2	Complied
Top	5825	22.3	30.0	7.7	Complied



Bottom Channel



Middle Channel

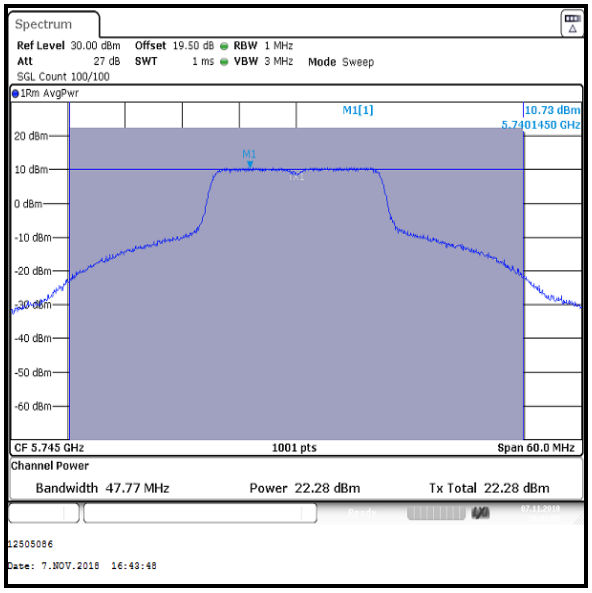


Top Channel

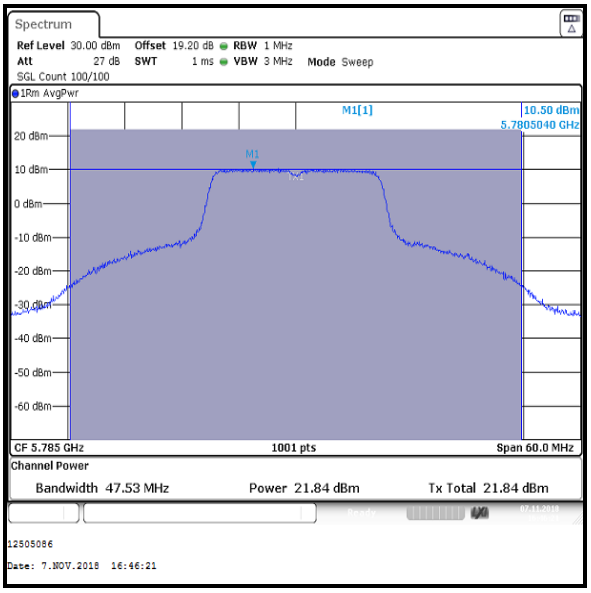
Transmitter Maximum Conducted Output Power (5.725-5.85 GHz band) (continued)

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

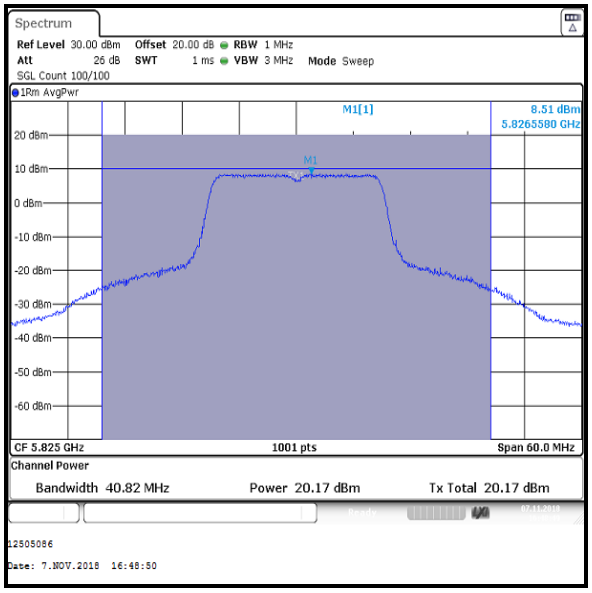
Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5745	22.3	30.0	7.7	Complied
Middle	5785	21.8	30.0	8.2	Complied
Top	5825	20.2	30.0	9.8	Complied



Bottom Channel



Middle Channel

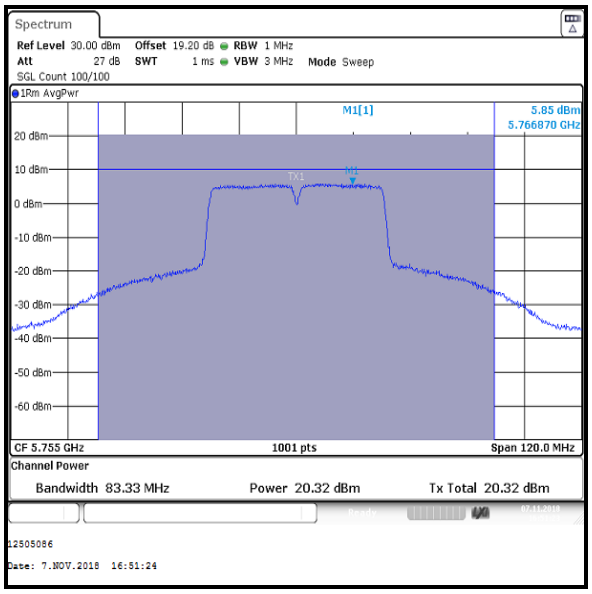


Top Channel

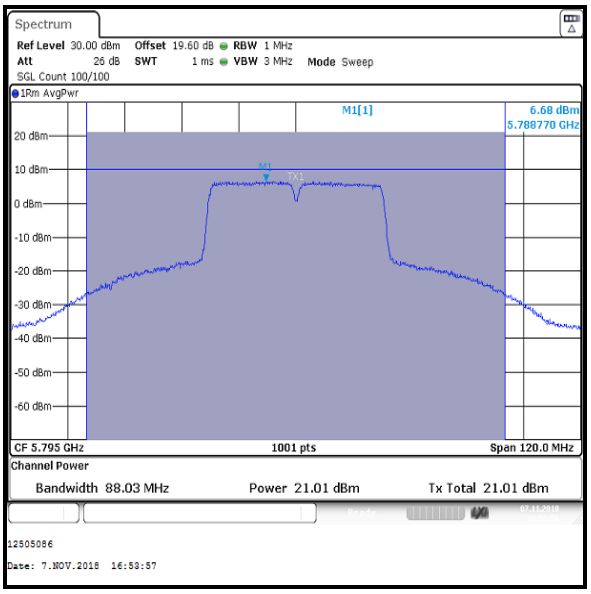
Transmitter Maximum Conducted Output Power (5.725-5.85 GHz band) (continued)

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	20.3	0.1	20.4	30.0	9.6	Complied
Top	5795	21.0	0.1	21.1	30.0	8.9	Complied



Bottom Channel

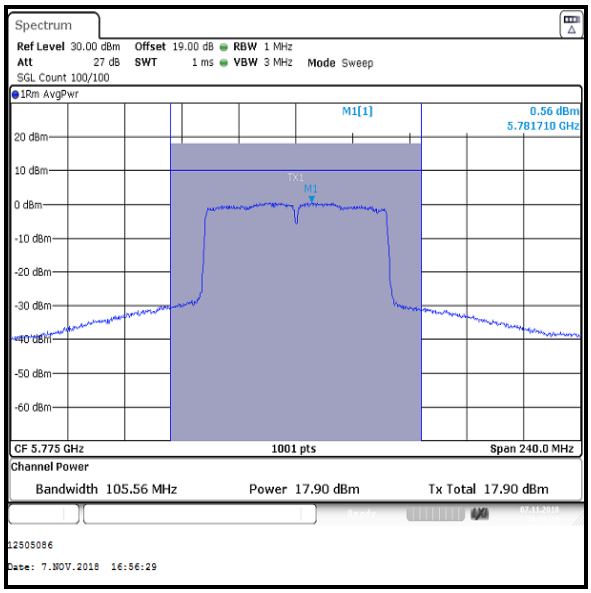


Top Channel

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	17.9	0.2	18.1	30.0	11.9	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 Date:**	07 November 2018
Test Sample Serial Number:	C02X2007KFLX		

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):	23
Relative Humidity (%):	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	1.7	11.0	9.3	Complied
Middle	5200	9.7	11.0	1.3	Complied
Top	5240	9.8	11.0	1.2	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	1.4	11.0	9.6	Complied
Middle	5200	9.7	11.0	1.3	Complied
Top	5240	9.5	11.0	1.5	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	-3.7	0.1	-3.6	11.0	14.6	Complied
Top	5230	5.3	0.1	5.4	11.0	5.6	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	-6.3	0.2	-6.1	11.0	17.1	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 Date:**	07 November 2018
Test Sample Serial Number:	C02X2007KFLX		

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):	23
Relative Humidity (%):	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	9.9	11.0	1.1	Complied
Middle	5280	9.8	11.0	1.2	Complied
Top	5320	2.9	11.0	8.1	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	9.3	11.0	1.7	Complied
Middle	5280	9.5	11.0	1.5	Complied
Top	5320	2.5	11.0	8.5	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	4.9	0.1	5.0	11.0	6.0	Complied
Top	5310	-1.7	0.1	-1.6	11.0	12.6	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	-5.7	0.2	-5.5	11.0	16.5	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 Date:**	07 November 2018
Test Sample Serial Number:	C02X2007KFLX		

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):	23
Relative Humidity (%):	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	3.1	11.0	7.9	Complied
Middle	5580	9.4	11.0	1.6	Complied
Top	5700	2.8	11.0	8.2	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	2.6	11.0	8.4	Complied
Middle	5580	9.0	11.0	2.0	Complied
Top	5700	2.3	11.0	8.7	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	-2.9	0.1	-2.8	11.0	13.8	Complied
Middle	5590	7.6	0.1	7.7	11.0	3.9	Complied
Top	5670	2.1	0.1	2.2	11.0	3.3	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	-5.8	0.2	-5.6	11.0	16.6	Complied
Top	5610	0.5	0.2	0.7	11.0	10.3	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 Date:**	07 November 2018
Test Sample Serial Number:	C02X2007KFLX		

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):	23
Relative Humidity (%):	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	9.1	11.0	1.9	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	9.0	11.0	2.0	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	7.5	0.1	7.6	11.0	3.4	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	2.5	0.2	2.7	11.0	8.3	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:**	07 November 2018
Test Sample Serial Number:	C02X2007KFLX		

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):	23
Relative Humidity (%):	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)(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	11.2	30.0	18.8	Complied
Middle	5785	10.8	30.0	19.2	Complied
Top	5825	11.1	30.0	18.9	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	10.7	30.0	19.3	Complied
Middle	5785	10.5	30.0	19.5	Complied
Top	5825	8.5	30.0	21.5	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	5.9	0.1	6.0	30.0	24.0	Complied
Top	5795	6.7	0.1	6.8	30.0	23.2	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	0.6	0.2	0.8	30.0	29.2	Complied

5. Radiated Test Results

5.1. Transmitter Out of Band Radiated Emissions <1 GHz

Test Summary:

Test Engineer:	James OReilly	**Test Date:**	17 November 2018
Test Sample Serial Number:	C02WW00PKFMM		

FCC Reference:	Parts 15.407(b)(4),(6),(7) & 15.209(a)
Test Method Used:	KDB 789033 II.G. & ANSI C63.10 Sections 6.3 and 6.5
Frequency Range:	30 MHz to 1000 MHz

Environmental Conditions:

Temperature (°C):	21
Relative Humidity (%):	41

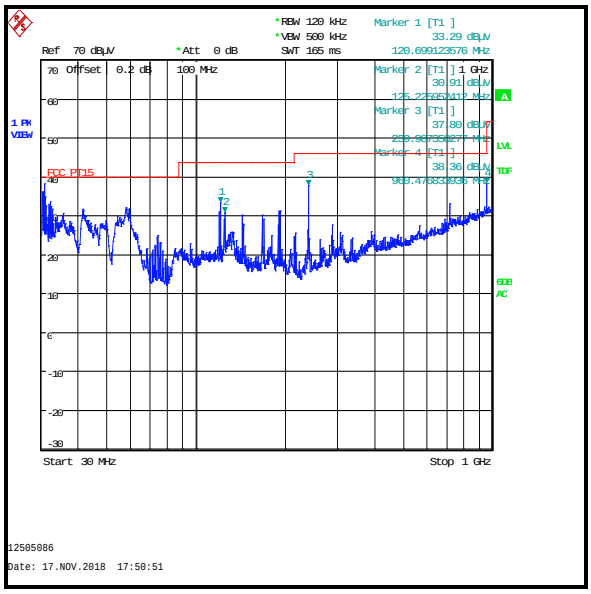
Note(s):

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 802.11a / 6 Mbps 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 (5.725-5.85 GHz band operation) (continued)

Results: Quasi-Peak / Middle Channel / 802.11a / 6 Mbps

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
125.226	Vertical	22.2	43.5	21.3	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 Engineer:	James OReilly	**Test Dates:**	17 November 2018 & 18 November 2018
Test Sample Serial Number:	C02WW00PKFMM		

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):	21 to 24
Relative Humidity (%):	41 to 42

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. In accordance with ANSI C63.10-2013 Section 6.5.4, emissions more than 20 dB below the limit do not need to be reported.
3. Pre-scans were performed with the EUT transmitting in the band 5.725 to 5.85 GHz band with a data rate of 802.11a / 6 Mbps 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.
4. 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 and average noise floor readings of the measuring receiver were recorded in the 5.725-5.85 GHz results section of this report.
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. 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 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. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

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 Engineer:	James OReilly	**Test Dates:**	17 November 2018 & 18 November 2018
Test Sample Serial Number:	C02WW00PKFMM		

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):	21 to 24
Relative Humidity (%):	41 to 42

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. In accordance with ANSI C63.10-2013 Section 6.5.4, emissions more than 20 dB below the limit do not need to be reported.
3. Pre-scans were performed with the EUT transmitting in the band 5.725 to 5.85 GHz band with a data rate of 802.11a / 6 Mbps 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.
4. 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 and average noise floor readings of the measuring receiver were recorded in the 5.725-5.85 GHz results section of this report.
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. 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 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. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

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 Engineer:	James OReilly	**Test Dates:**	17 November 2018 & 18 November 2018
Test Sample Serial Number:	C02WW00PKFMM		

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):	21 to 24
Relative Humidity (%):	41 to 42

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. In accordance with ANSI C63.10-2013 Section 6.5.4, emissions more than 20 dB below the limit do not need to be reported.
3. Pre-scans were performed with the EUT transmitting in the band 5.725 to 5.85 GHz band with a data rate of 802.11a / 6 Mbps 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.
4. 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 and average noise floor readings of the measuring receiver were recorded in the 5.725-5.85 GHz results section of this report.
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. 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 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. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

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 Engineer:	James OReilly	**Test Dates:**	17 November 2018 & 18 November 2018
Test Sample Serial Number:	C02WW00PKFMM		

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):	21 to 24
Relative Humidity (%):	41 to 42

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. In accordance with ANSI C63.10-2013 Section 6.5.4, emissions more than 20 dB below the limit do not need to be reported.
3. Pre-scans were performed with the EUT transmitting in the band 5.725 to 5.85 GHz band with a data rate of 802.11a / 6 Mbps 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
4. 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 and average noise floor readings of the measuring receiver were recorded in the 5.725-5.85 GHz results section of this report.
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. 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 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. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

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 Engineer:	James OReilly	**Test Dates:**	17 November 2018 & 18 November 2018
Test Sample Serial Number:	C02WW00PKFMM		

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):	21 to 24
Relative Humidity (%):	41 to 42

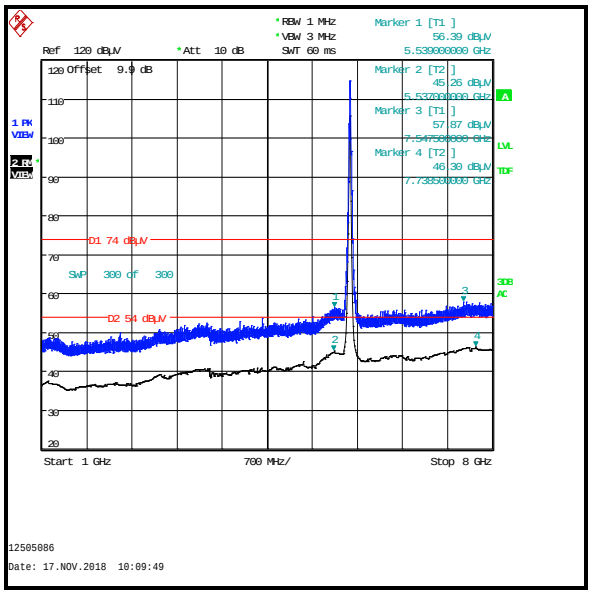
Note(s):

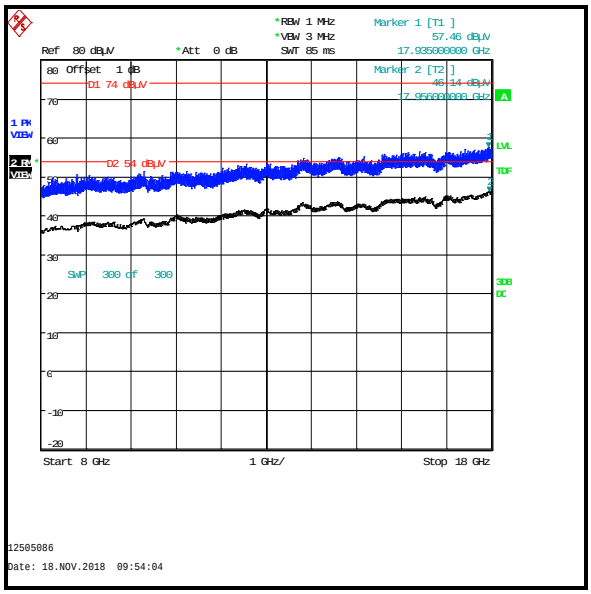
1. FCC Part 15.407(b)(4)(i) states for transmitters operating in the band 5.725 to 5.85 GHz: all emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below 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. In accordance with ANSI C63.10-2013 Section 6.5.4, emissions more than 20 dB below the limit do not need to be reported.
3. Pre-scans were performed with the EUT transmitting in the band 5.725 to 5.85 GHz band with a data rate of 802.11a / 6 Mbps 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.
4. The final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
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. The emission shown on the 1 GHz to 8 GHz plot is the EUT fundamental.
7. All 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. Therefore the highest peak and average noise floor readings of the measuring receiver were recorded.
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 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 K0001) 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. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

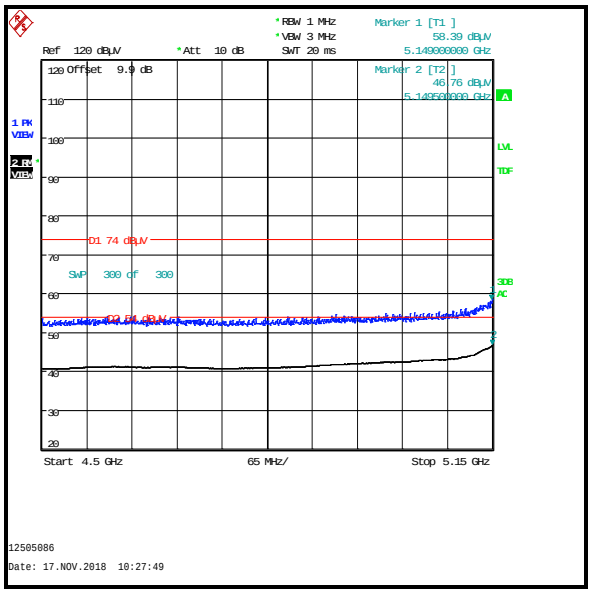
Transmitter Out of Band Radiated Emissions (5.725-5.85 GHz band operation) (continued)

Results: Middle Channel / EIRP

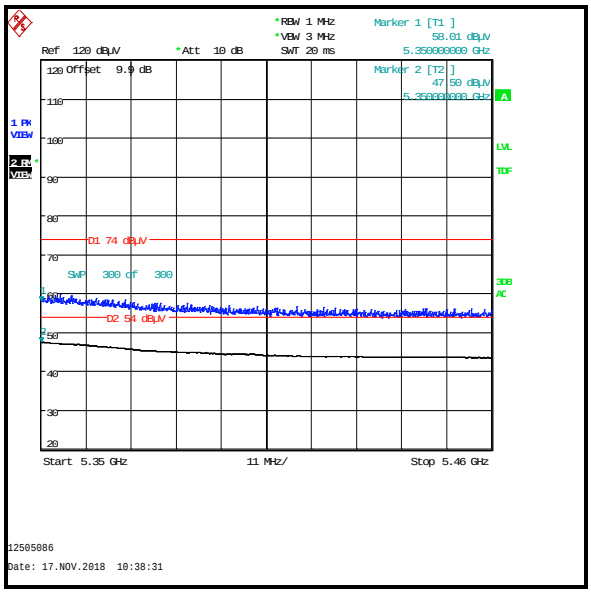
Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
39997.750	Vertical	-35.3	-27.0	8.3	Complied





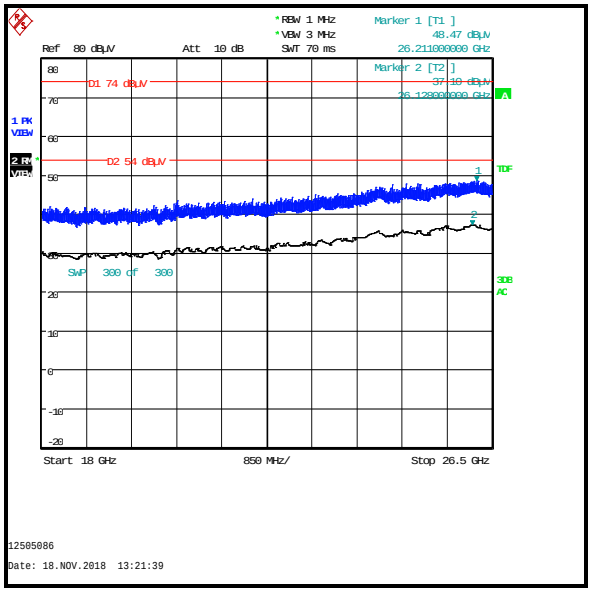


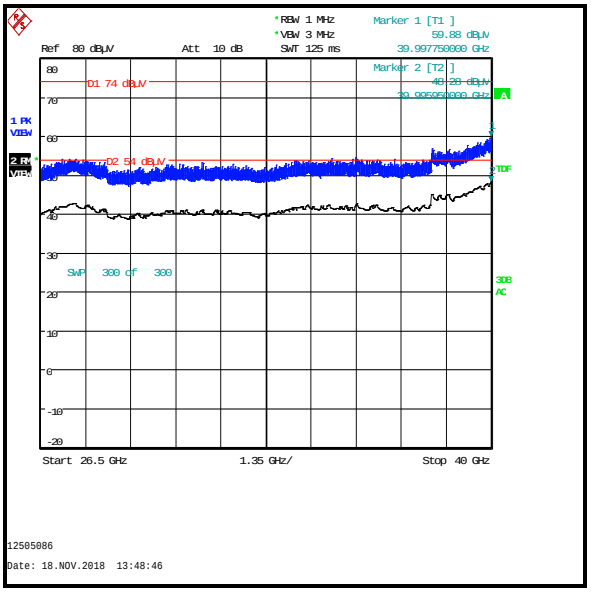
Restricted Band 4.5 GHz to 5.15 GHz



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:	Marco Zunarelli & Mohamed Toubella	**Test Dates:**	25 October 2018 to 04 November 2018
Test Sample Serial Number:	C02WW00PKFMM		

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 26
Relative Humidity (%):	38 to 49

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 measurments if 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 (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5149.359	60.7	74.0	13.3	Complied
5150	59.2	74.0	14.8	Complied

Results: Upper Band Edge / Peak

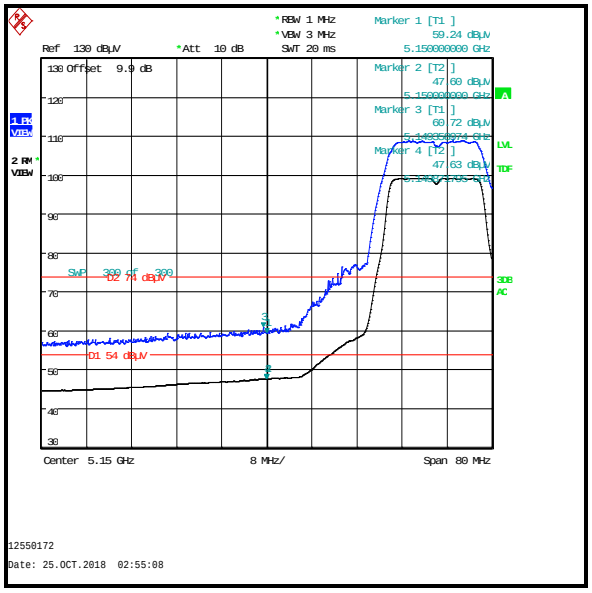
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	55.4	74.0	18.6	Complied
5405.570	57.2	74.0	16.8	Complied

Results: Lower Band Edge / Average

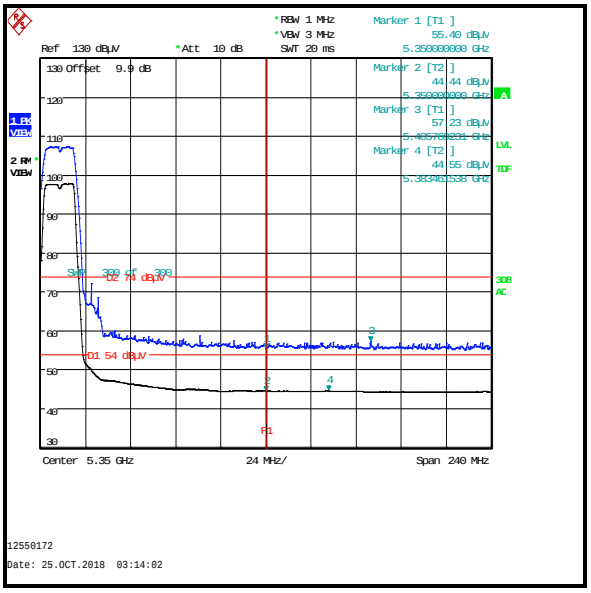
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5150	47.6	54.0	6.4	Complied

Results: Upper Band Edge / Average

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	44.4	54.0	9.6	Complied
5383.462	44.6	54.0	9.4	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 (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5150	60.2	74.0	13.8	Complied

Results: Upper Band Edge / Peak

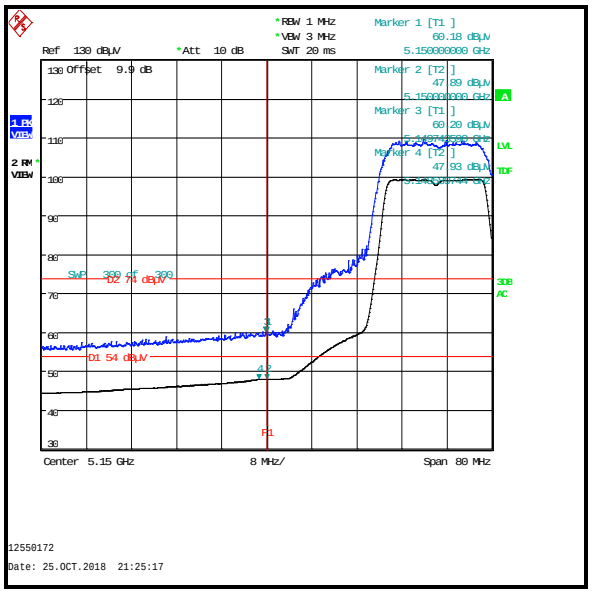
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	55.8	74.0	18.2	Complied

Results: Lower Band Edge / Average

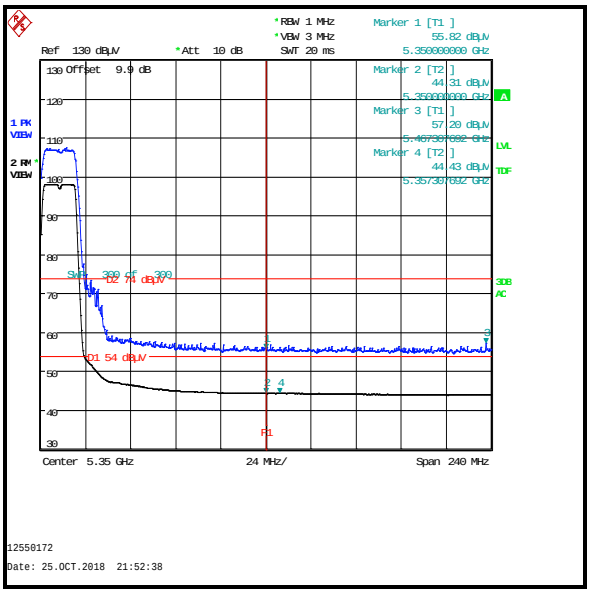
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5150	47.9	54.0	6.1	Complied

Results: Upper Band Edge / Average

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	44.3	54.0	9.7	Complied
5357.308	44.4	54.0	9.6	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 (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5150	63.8	74.0	10.2	Complied

Results: Upper Band Edge / Peak

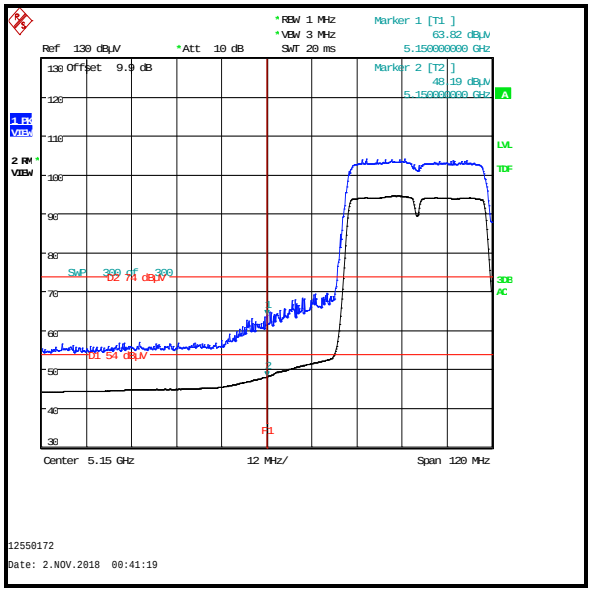
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	57.2	74.0	16.8	Complied
5367.949	57.7	74.0	16.3	Complied

Results: Lower Band Edge / Average

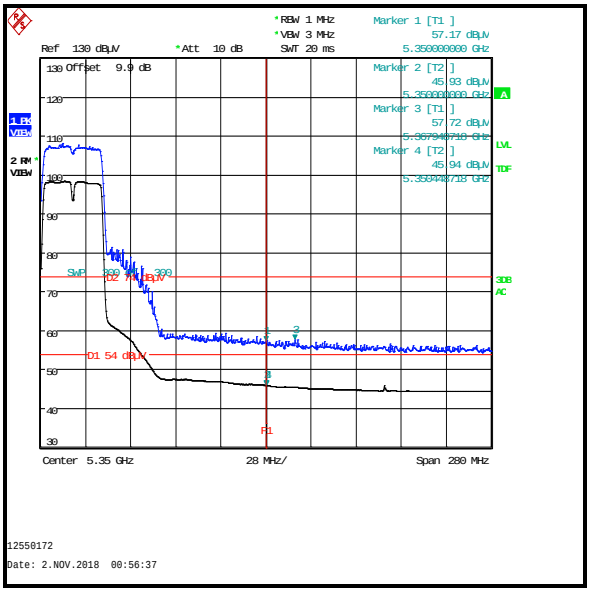
Frequency (MHz)	Level (dBµV/m)	Duty Cycle correction (dB)	Corrected Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5150	48.2	0.1	48.3	54.0	5.7	Complied

Results: Upper Band Edge / Average

Frequency (MHz)	Level (dBµV/m)	Duty Cycle correction (dB)	Corrected Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	45.9	0.1	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: 802.11ac / 80 MHz / SISO / BPSK / MCS0 / Core 2

Results: Lower Band Edge / Peak

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5145.143	59.6	74.0	14.4	Complied
5150	57.4	74.0	16.6	Complied

Results: Upper Band Edge / Peak

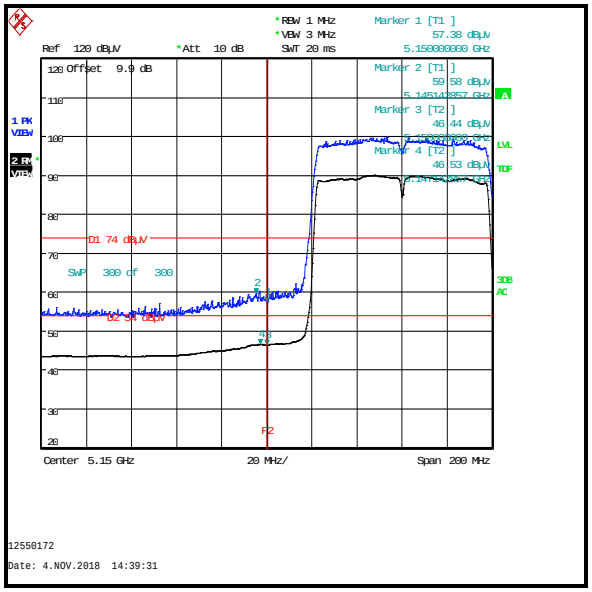
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	56.6	74.0	17.4	Complied
5391.850	57.4	74.0	16.6	Complied

Results: Lower Band Edge / Average

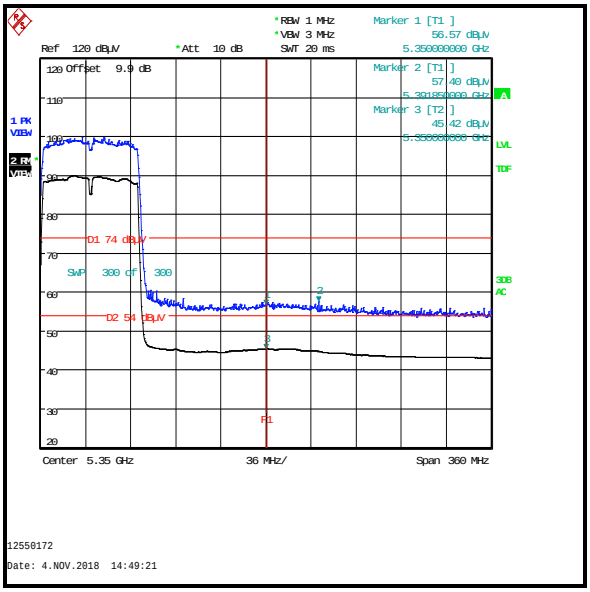
Frequency (MHz)	Level (dBµV/m)	Duty Cycle correction (dB)	Corrected Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5147.143	46.5	0.2	46.7	54.0	7.3	Complied
5150	46.4	0.2	46.6	54.0	7.4	Complied

Results: Upper Band Edge / Average

Frequency (MHz)	Level (dBµV/m)	Duty Cycle correction (dB)	Corrected Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	45.4	0.2	45.6	54.0	8.4	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:	Marco Zunarelli & Mohamed Toubella	**Test Dates:**	25 October 2018 to 04 November 2018
Test Sample Serial Number:	C02WW00PKFMM		

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 26
Relative Humidity (%):	38 to 49

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 5.25-5.35 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.
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 measurments if 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 (5.25-5.35 GHz band operation) (continued)

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

Results: Lower Band Edge / Peak

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5139.615	57.2	74.0	16.8	Complied
5150	55.8	74.0	18.2	Complied

Results: Upper Band Edge / Peak

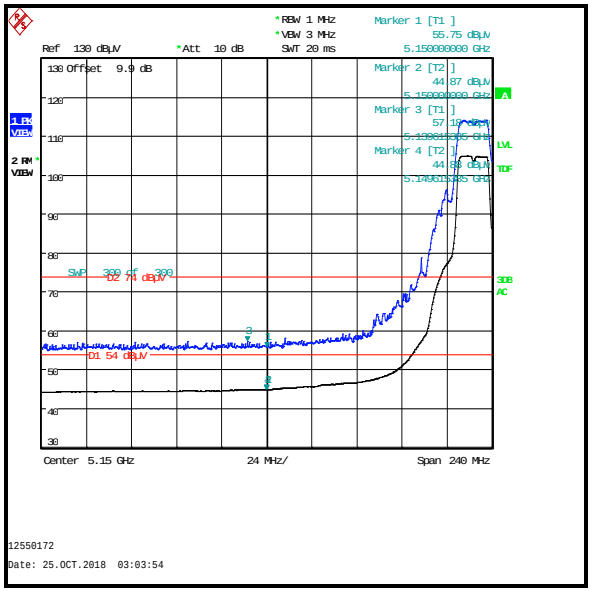
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	60.2	74.0	13.8	Complied
5351.538	61.7	74.0	12.3	Complied

Results: Lower Band Edge / Average

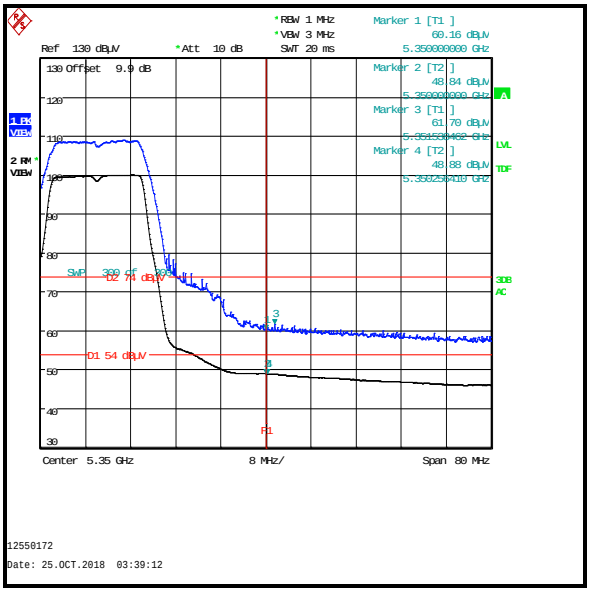
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5150	44.9	54.0	9.1	Complied

Results: Upper Band Edge / Average

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	48.8	54.0	5.2	Complied
5350.256	48.9	54.0	5.1	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 (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5128.077	57.5	74.0	16.5	Complied
5150	55.7	74.0	18.3	Complied

Results: Upper Band Edge / Peak

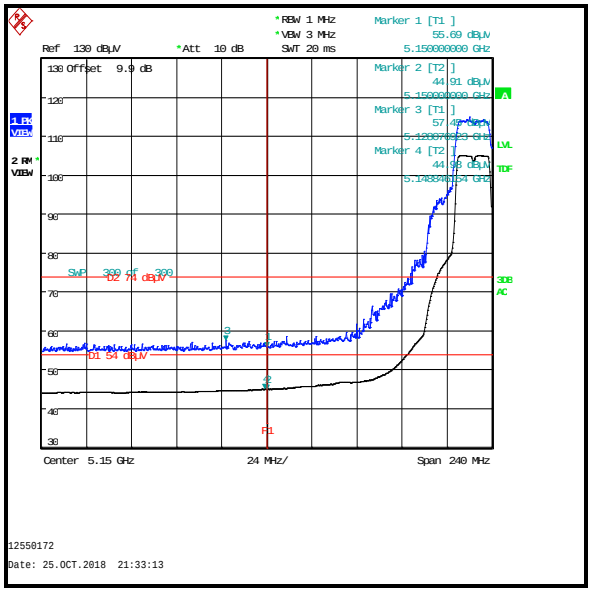
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	60.7	74.0	13.3	Complied
5350.641	61.6	74.0	12.4	Complied

Results: Lower Band Edge / Average

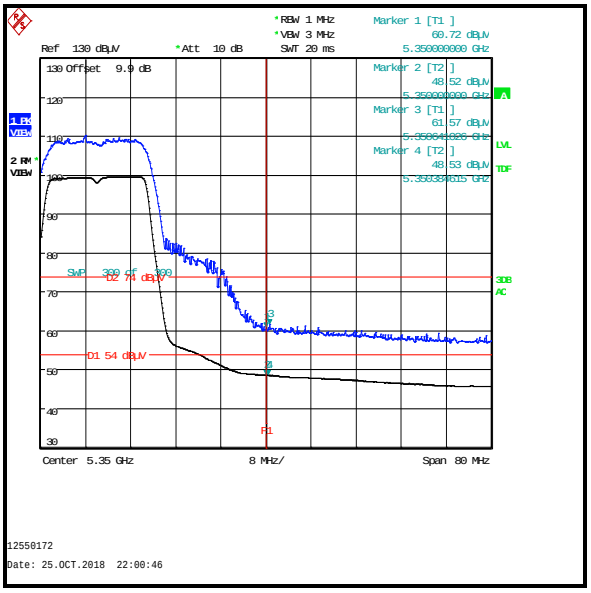
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5148.846	45.0	54.0	9.0	Complied
5150	44.9	54.0	9.1	Complied

Results: Upper Band Edge / Average

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	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: 802.11n / 40 MHz / SISO / BPSK / MCS0 / Core 2

Results: Lower Band Edge / Peak

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5139.679	57.7	74.0	16.3	Complied
5150	56.0	74.0	18.0	Complied

Results: Upper Band Edge / Peak

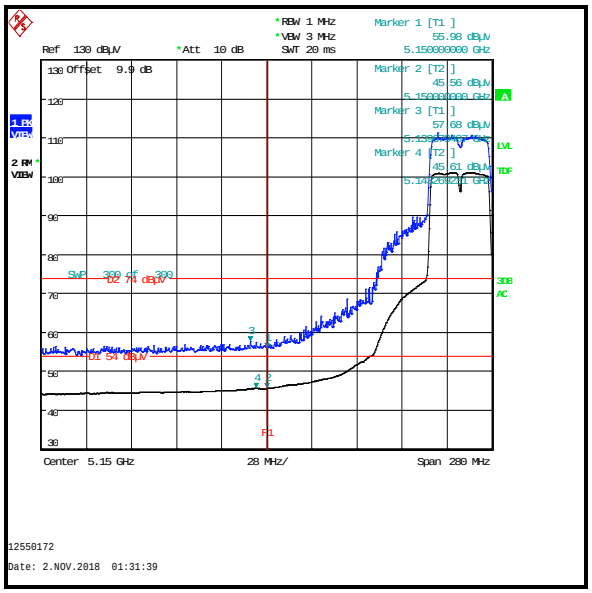
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	65.0	74.0	9.0	Complied
5354.423	67.4	74.0	6.6	Complied

Results: Lower Band Edge / Average

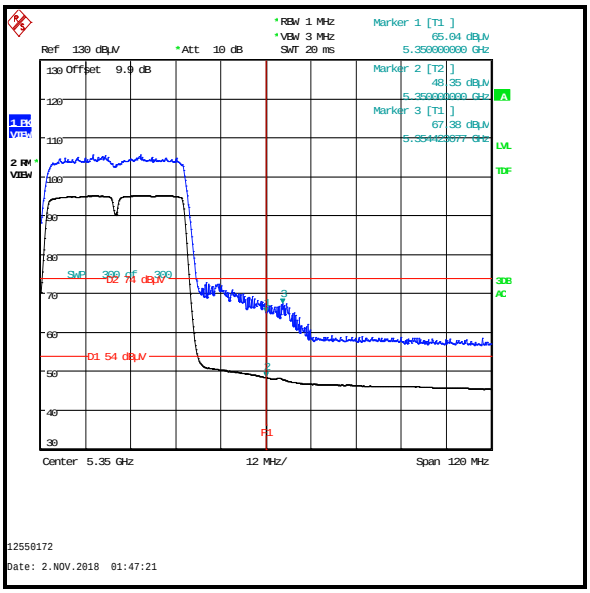
Frequency (MHz)	Level (dBµV/m)	Duty Cycle correction (dB)	Corrected Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5150	45.6	0.1	45.7	54.0	8.3	Complied

Results: Upper Band Edge / Average

Frequency (MHz)	Level (dBµV/m)	Duty Cycle correction (dB)	Corrected Level (dBµV/m)	Limit (dBµV/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 (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5148.650	57.3	74.0	16.7	Complied
5150	55.5	74.0	18.5	Complied

Results: Upper Band Edge / Peak

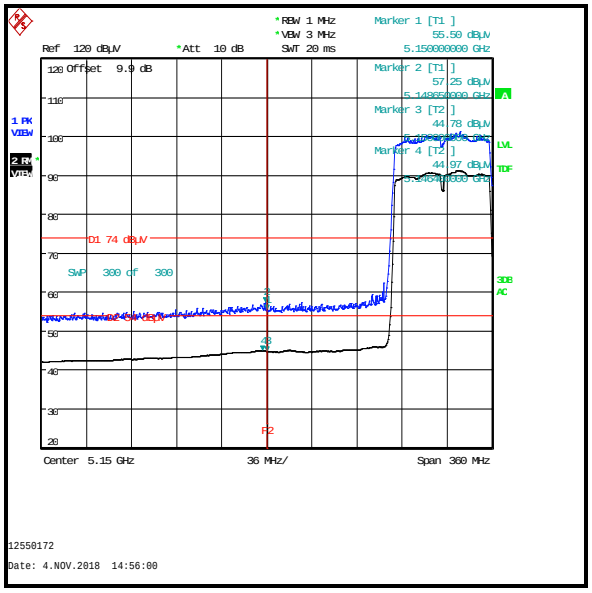
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	58.7	74.0	15.3	Complied
5351.429	60.7	74.0	13.3	Complied

Results: Lower Band Edge / Average

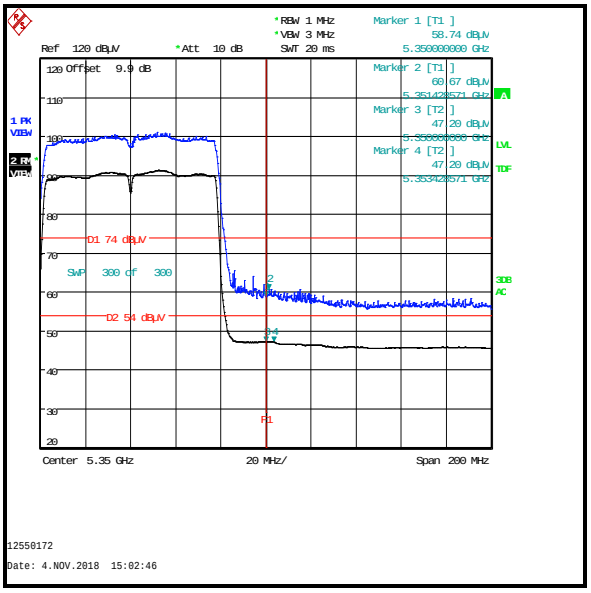
Frequency (MHz)	Level (dBµV/m)	Duty Cycle correction (dB)	Corrected Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5146.400	45.0	0.2	45.2	54.0	8.8	Complied
5150	44.8	0.2	45.0	54.0	9.0	Complied

Results: Upper Band Edge / Average

Frequency (MHz)	Level (dBµV/m)	Duty Cycle correction (dB)	Corrected Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	47.2	0.2	47.4	54.0	6.6	Complied



Lower Band Edge



Upper Band Edge

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

5.3.3. 5.47-5.725 GHz band

Test Summary:

Test Engineers:	Marco Zunarelli & Mohamed Toubella	**Test Dates:**	25 October 2018 to 14 November 2018
Test Sample Serial Number:	C02WW00PKFMM		

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 26
Relative Humidity (%):	39 to 49

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.
5. As straddle channels overlap the upper band edge at 5725 MHz, additional testing was performed in accordance with KDB 778093 III.B.2.b)(iii) which requires compliance of overlapping channels to an unwanted emission level of -27 dBm/MHz at 5850 MHz instead of 5725 MHz. The EUT was configured to transmit on the straddle channels and the emission levels at 5850 MHz were recorded. A marker was placed on the band edge spot frequency and a second marker placed on the highest emission level in the adjacent non-restricted band of operation (where a higher level emission was present). Marker frequencies and levels were recorded.

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

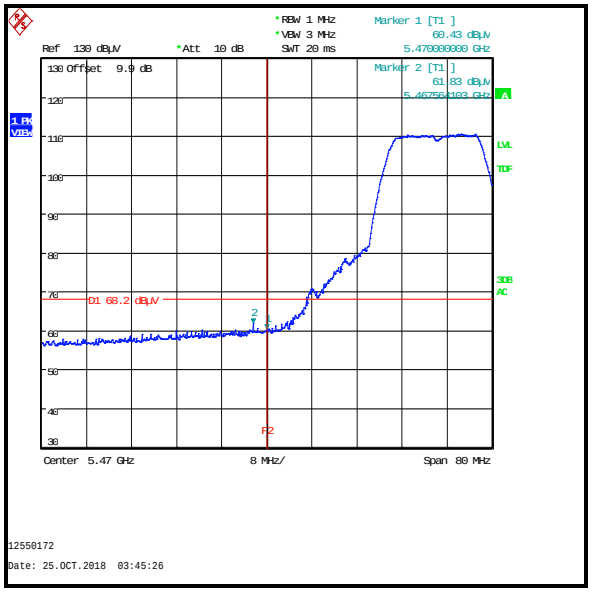
Results: 802.11a / 20 MHz / SISO / BPSK / 6 Mbps / Core 2 / Peak

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5467.564	-33.4	-27.0	6.4	Complied
5470	-34.8	-27.0	7.8	Complied
5725	-32.3	-27.0	5.3	Complied
5725.112	-31.9	-27.0	4.9	Complied
5850	-38.3	-27.0	11.3	Complied
5855.385	-36.3	-27.0	9.3	Complied

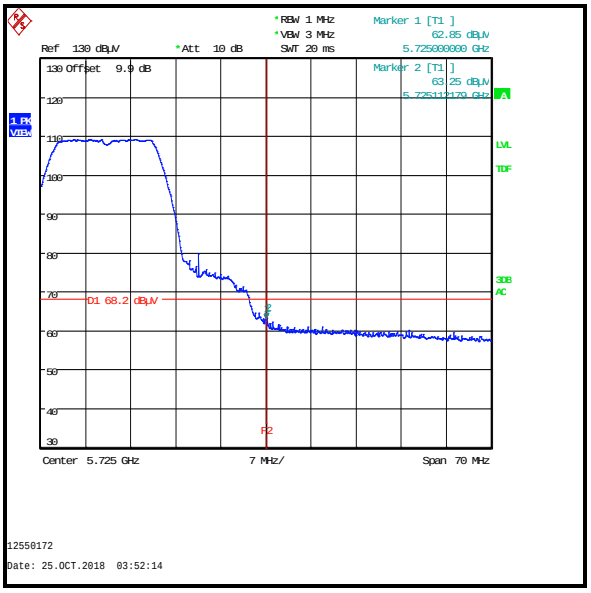
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5467.564	61.8	68.2	6.4	Complied
5470	60.4	68.2	7.8	Complied
5725	62.9	68.2	5.3	Complied
5725.112	63.3	68.2	4.9	Complied
5850	56.9	68.2	11.3	Complied
5855.385	58.9	68.2	9.3	Complied

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

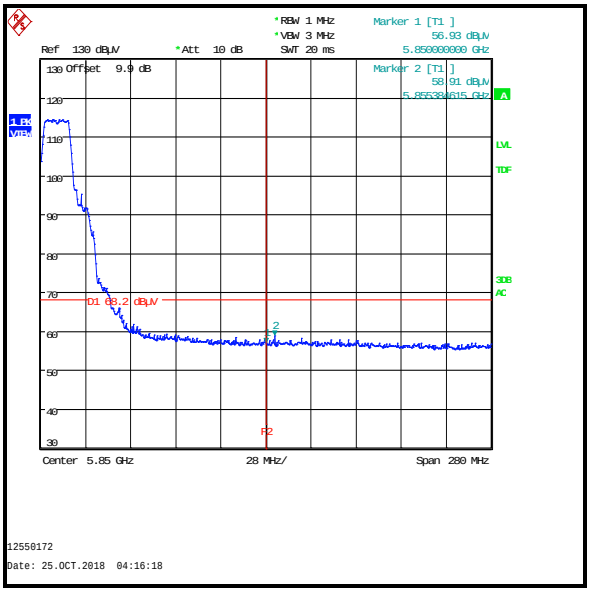
Results: 802.11a / 20 MHz / SISO / BPSK / 6 Mbps / Core 2 / Peak



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)

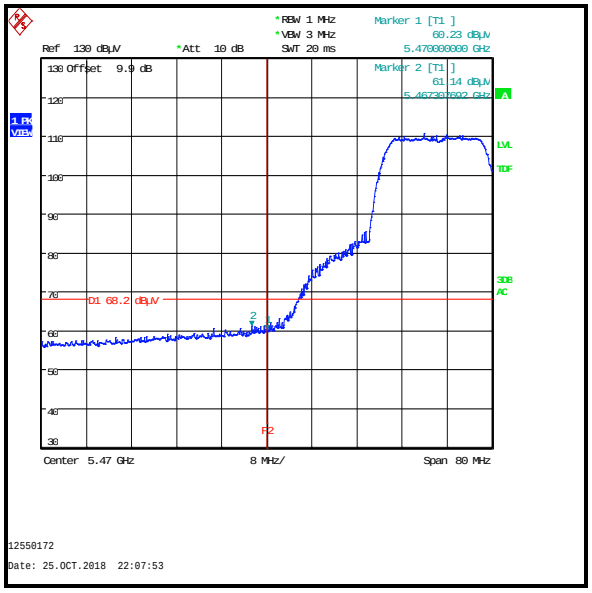
Results: 802.11n / 20 MHz / SISO / BPSK / MCS0 / Core 2 / Peak

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5467.308	-34.1	-27.0	7.1	Complied
5470	-35.0	-27.0	8.0	Complied
5725	-28.8	-27.0	1.8	Complied
5725.449	-28.1	-27.0	1.1	Complied
5850	-37.6	-27.0	10.6	Complied
5890.385	-37.5	-27.0	10.5	Complied

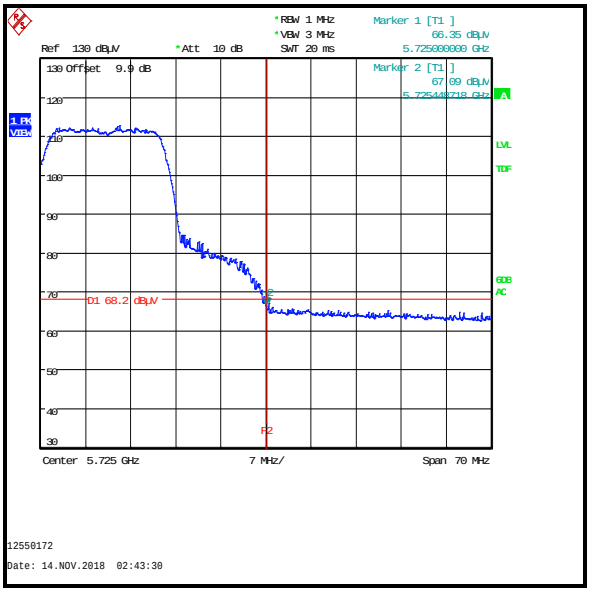
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5467.308	61.1	68.2	7.1	Complied
5470	60.2	68.2	8.0	Complied
5725	66.4	68.2	1.8	Complied
5725.449	67.1	68.2	1.1	Complied
5850	57.6	68.2	10.6	Complied
5890.385	57.7	68.2	10.5	Complied

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

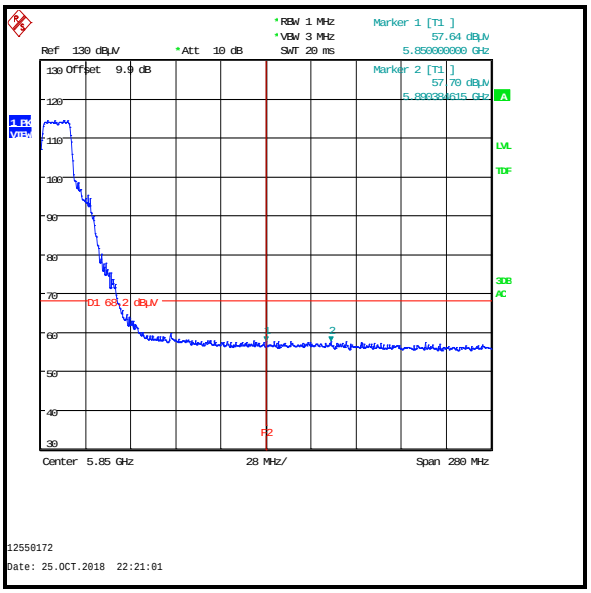
Results: 802.11n / 20 MHz / SISO / BPSK / MCS0 / Core 2 / Peak



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)

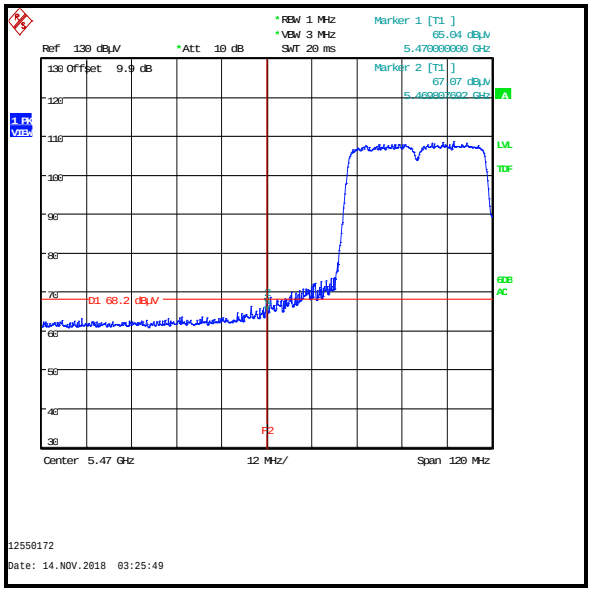
Results: 802.11n / 40 MHz / SISO / BPSK / MCS0 / Core 2 / Peak

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5469.807	-28.1	-27.0	1.1	Complied
5470	-30.2	-27.0	3.2	Complied
5725	-29.8	-27.0	2.8	Complied
5726.202	-29.4	-27.0	2.4	Complied
5850	-38.1	-27.0	11.1	Complied
5862.308	-37.1	-27.0	10.1	Complied

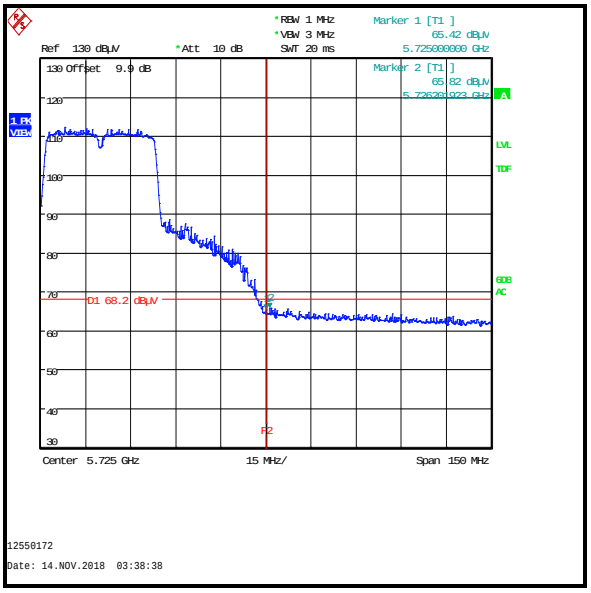
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5469.808	67.1	68.2	1.1	Complied
5470	65.0	68.2	3.2	Complied
5725	65.4	68.2	2.8	Complied
5726.202	65.8	68.2	2.4	Complied
5850	57.1	68.2	11.1	Complied
5862.308	58.1	68.2	10.1	Complied

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

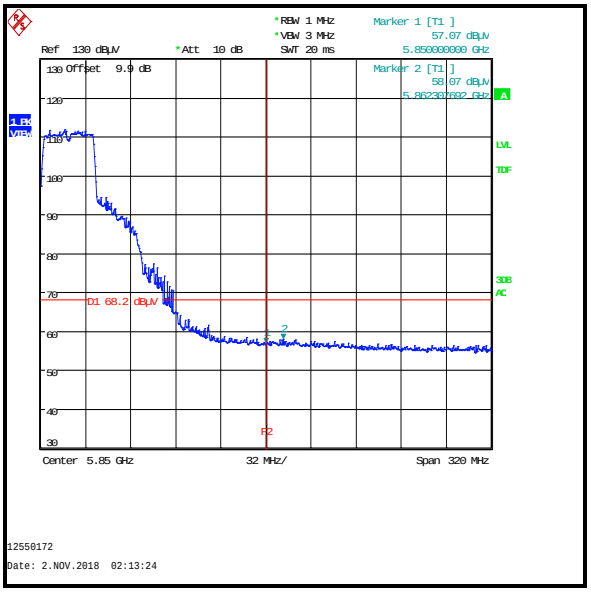
Results: 802.11n / 40 MHz / SISO / BPSK / MCS0 / Core 2 / Peak



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)

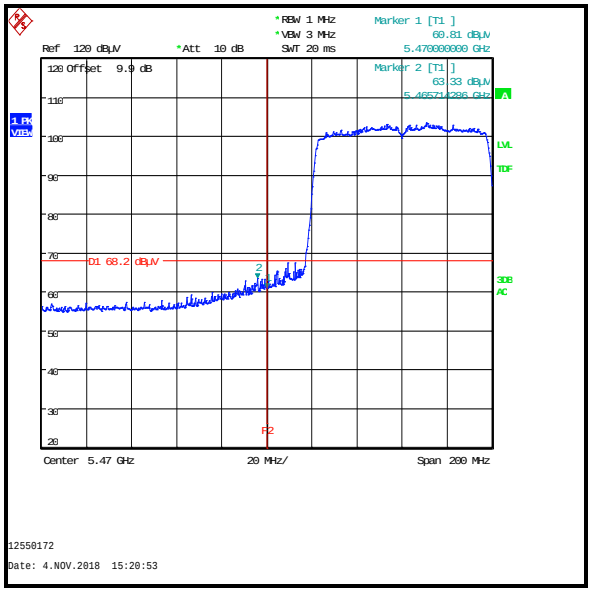
Results: 802.11ac / 80 MHz / SISO / BPSK / MCS0 / Core 2 / Peak

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5465.714	-31.9	-27.0	4.9	Complied
5470	-34.4	-27.0	7.4	Complied
5725	-30.9	-27.0	3.9	Complied
5729.968	-29.5	-27.0	2.5	Complied
5850	-33.8	-27.0	6.8	Complied
5853.500	-32.8	-27.0	5.8	Complied

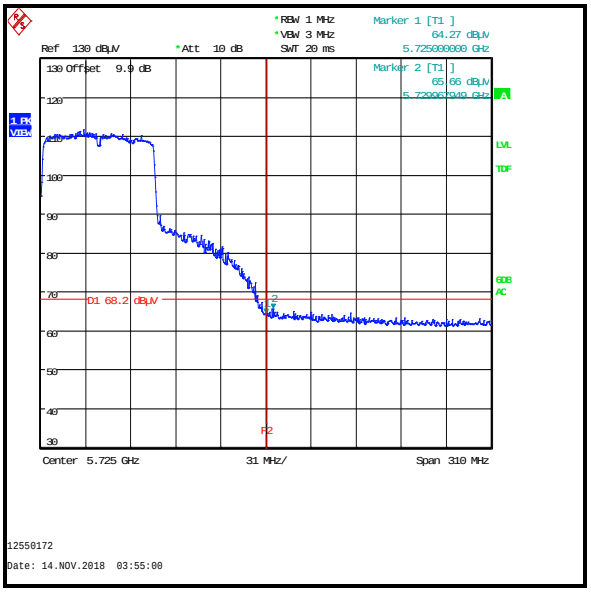
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5465.714	63.3	68.2	4.9	Complied
5470	60.8	68.2	7.4	Complied
5725	64.3	68.2	3.9	Complied
5729.968	65.7	68.2	2.5	Complied
5850	61.4	68.2	6.8	Complied
5853.500	62.4	68.2	5.8	Complied

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

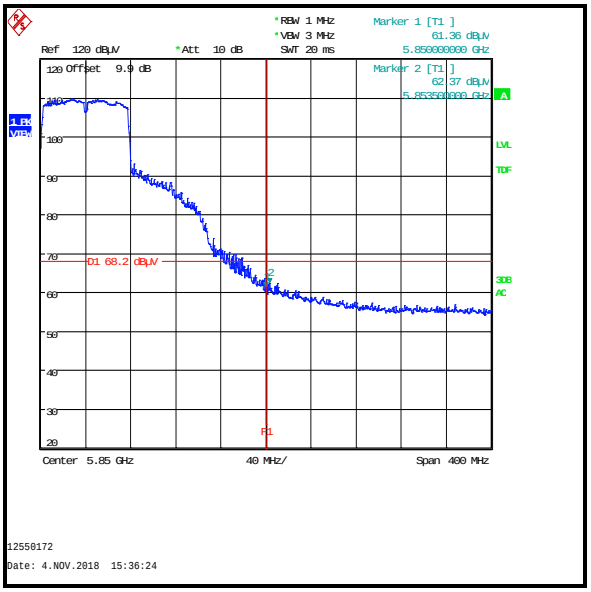
Results: 802.11ac / 80 MHz / SISO / BPSK / MCS0 / Core 2 / Peak



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:	Marco Zunarelli & Mohamed Toubella	**Test Dates:**	25 October 2018 to 14 November 2018
Test Sample Serial Number:	C02WW00PKFMM		

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 to 26
Relative Humidity (%):	39 to 49

Note(s):

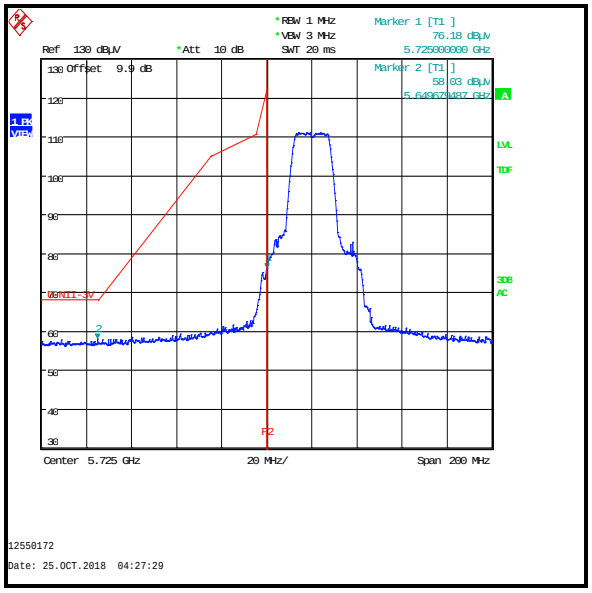
1. The following modes were tested:
    - 802.11a - BPSK / 6 Mbps / Core 2
    - 802.11n HT20 / SISO - BPSK / MCS0 / Core 2
    - 802.11n HT40 / SISO - BPSK / MCS0 / Core 2
    - 802.11ac VHT80 / SISO – BPSK / MCS0x1 / Core 2
2. Lower band edge measurements were performed with the EUT transmitting on 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)

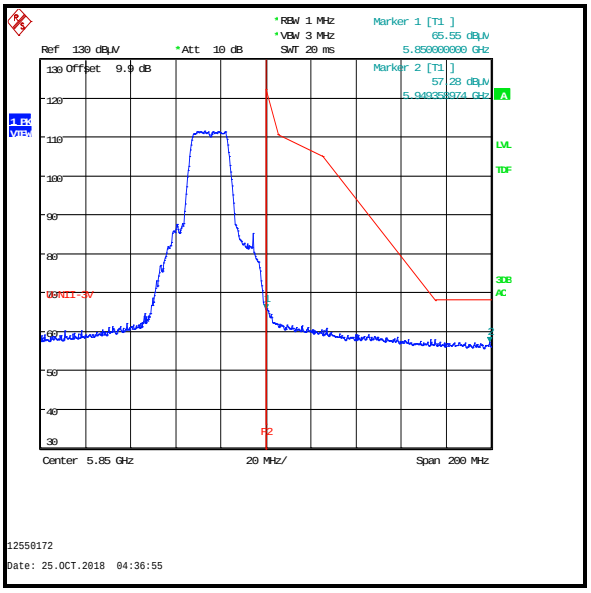
Results: 802.11a / 20 MHz / BPSK / 6 Mbps / Core 2 / Peak

Frequency (MHz)	Level (dBm)	Limit (dBm/MHz)	Margin (dB)	Result
5649.679	-37.2	-27.0	10.2	Complied
5725	-19.0	27.0	46.0	Complied
5850	-29.6	27.0	56.6	Complied
5949.359	-37.9	-27.0	10.9	Complied

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5649.679	58.0	68.2	10.2	Complied
5725	76.2	122.2	46.0	Complied
5850	65.6	122.2	56.6	Complied
5949.359	57.3	68.2	10.9	Complied



Lower Band Edge



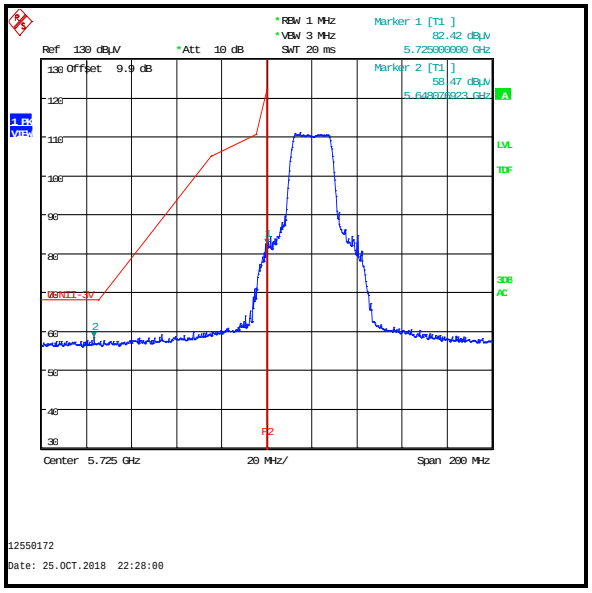
Upper Band Edge

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

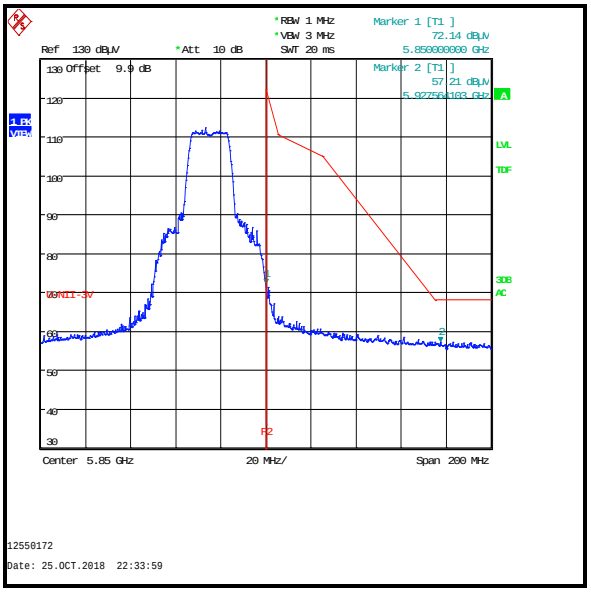
Results: 802.11n / 20 MHz / SISO / BPSK / MCS0 / Core 2 / Peak

Frequency (MHz)	Level (dBm)	Limit (dBm/MHz)	Margin (dB)	Result
5648.077	-36.7	-27.0	9.7	Complied
5725	-12.8	27.0	39.8	Complied
5850	-23.1	27.0	50.1	Complied
5927.564	-38.0	-27.0	11.0	Complied

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5648.077	58.5	68.2	9.7	Complied
5725	82.4	122.2	39.8	Complied
5850	72.1	122.2	50.1	Complied
5927.564	57.2	68.2	11.0	Complied



Lower Band Edge



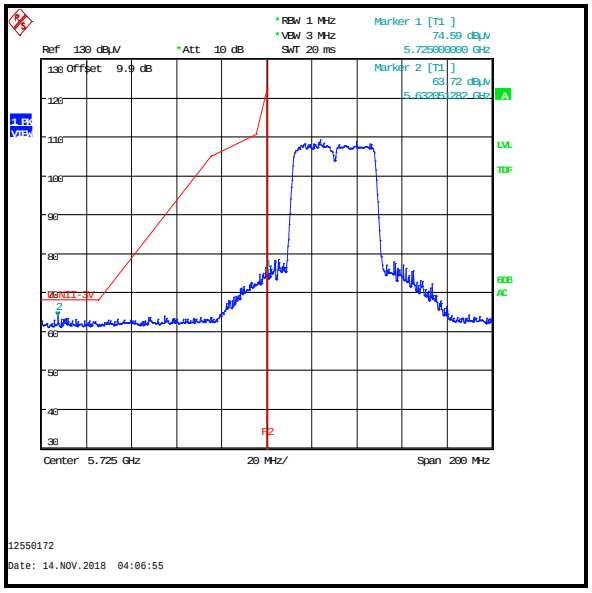
Upper Band Edge

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

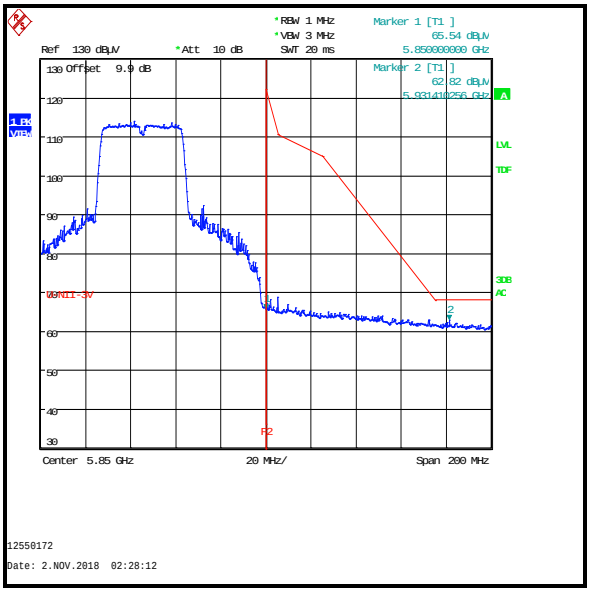
Results: 802.11n / 40 MHz / SISO / BPSK / MCS0 / Core 2 / Peak

Frequency (MHz)	Level (dBm)	Limit (dBm/MHz)	Margin (dB)	Result
5632.051	-31.5	-27.0	4.5	Complied
5725	-20.6	27.0	47.6	Complied
5850	-29.7	27.0	56.7	Complied
5931.410	-32.4	-27.0	5.4	Complied

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5632.051	63.7	68.2	4.5	Complied
5725	74.6	122.2	47.6	Complied
5850	65.5	122.2	56.7	Complied
5931.410	62.8	68.2	5.4	Complied



Lower Band Edge



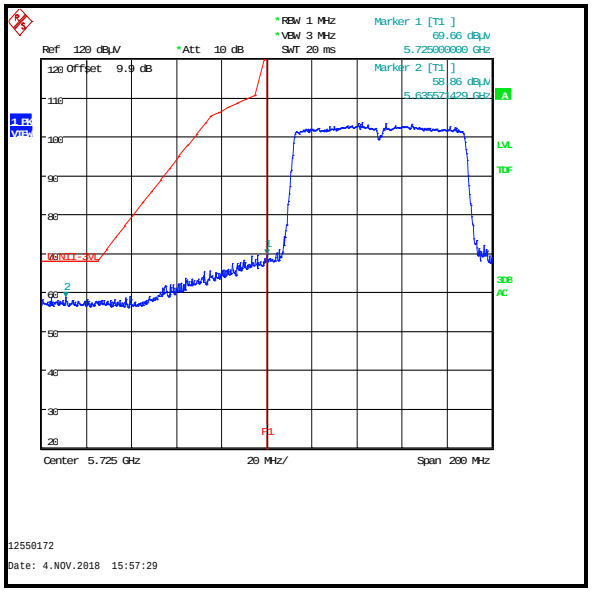
Upper Band Edge

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

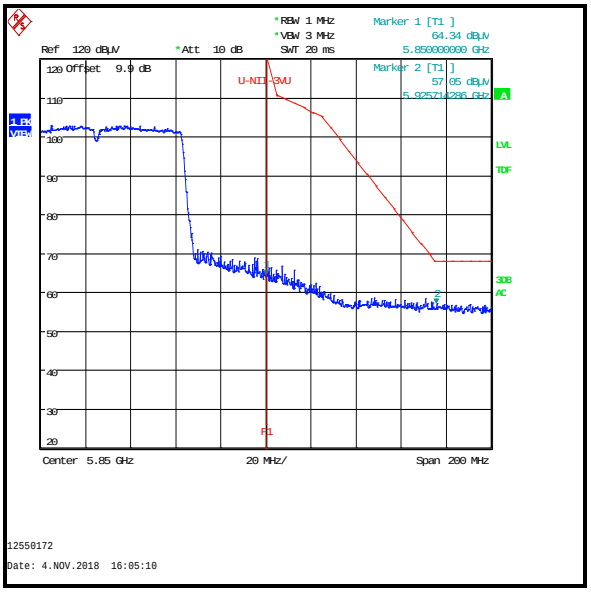
Results: 802.11ac / 80 MHz / SISO / BPSK / MCS0 / Core 2 / Peak

Frequency (MHz)	Level (dBm)	Limit (dBm/MHz)	Margin (dB)	Result
5635.571	-36.3	-27.0	9.3	Complied
5725	-25.5	27.0	52.5	Complied
5850	-30.9	27.0	57.9	Complied
5925.714	-38.1	-27.0	11.1	Complied

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5635.571	58.9	68.2	9.3	Complied
5725	69.7	122.2	52.5	Complied
5850	64.3	122.2	57.9	Complied
5925.714	57.1	68.2	11.1	Complied



Lower Band Edge



Upper Band Edge

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