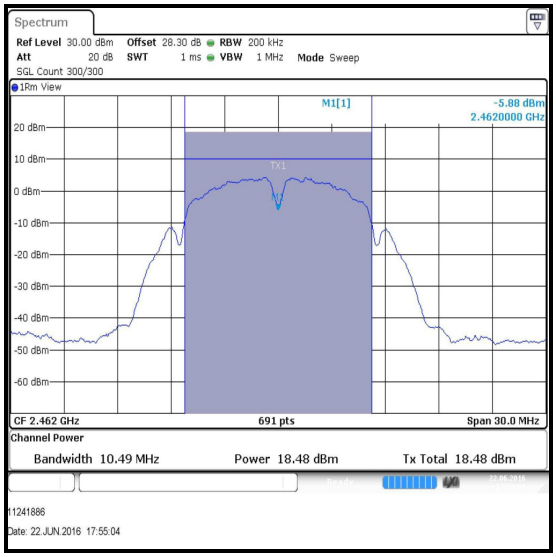
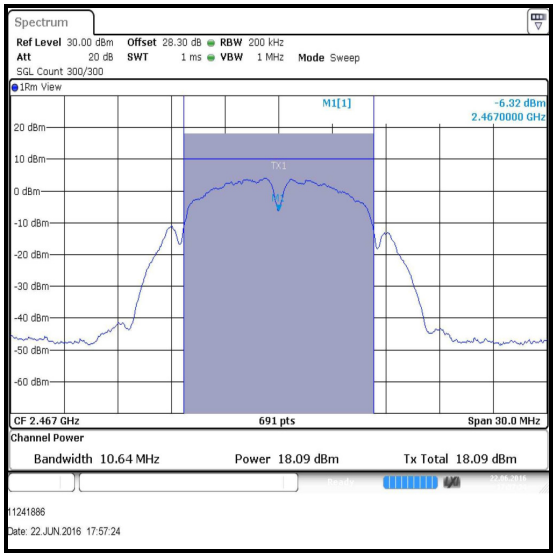
Transmitter Maximum (Average) Output Power (continued)

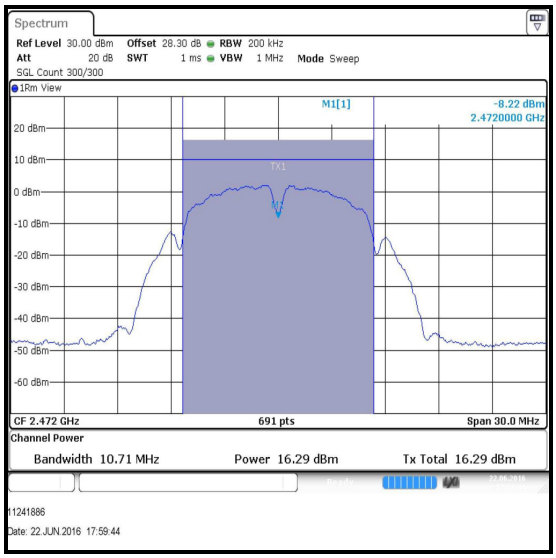
Results: 802.11b / 20 MHz / DBPSK / 1 Mbps



Channel 11



Channel 12



Channel 13

Transmitter Maximum (Average) Output Power (continued)

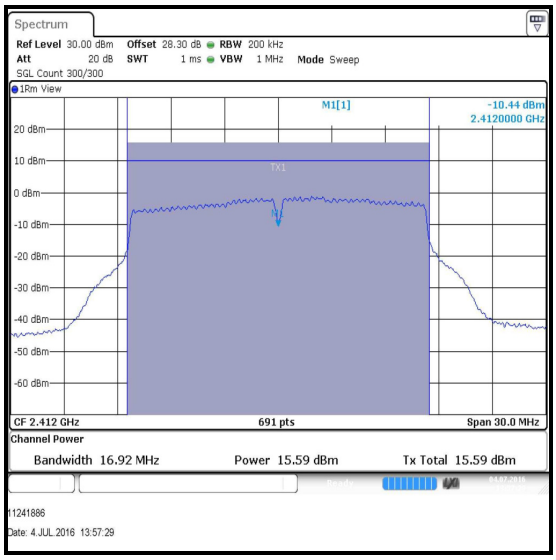
Results: 802.11g / 20 MHz / BPSK / 6 Mbps

Conducted Peak Limit Comparison

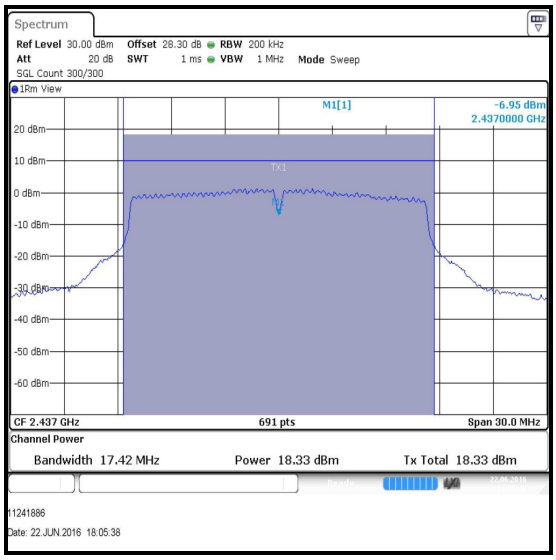
Channel	Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
1	15.6	30.0	14.4	Complied
6	18.3	30.0	11.7	Complied
11	14.5	30.0	15.5	Complied
12	13.6	30.0	16.4	Complied
13	4.4	30.0	25.6	Complied

De Facto EIRP Limit Comparison

Channel	Conducted Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
1	15.6	-1.8	13.8	36.0	22.2	Complied
6	18.3	-1.8	16.5	36.0	19.5	Complied
11	14.5	-1.8	12.7	36.0	23.3	Complied
12	13.6	-1.8	11.8	36.0	24.2	Complied
13	4.4	-1.8	2.6	36.0	33.4	Complied



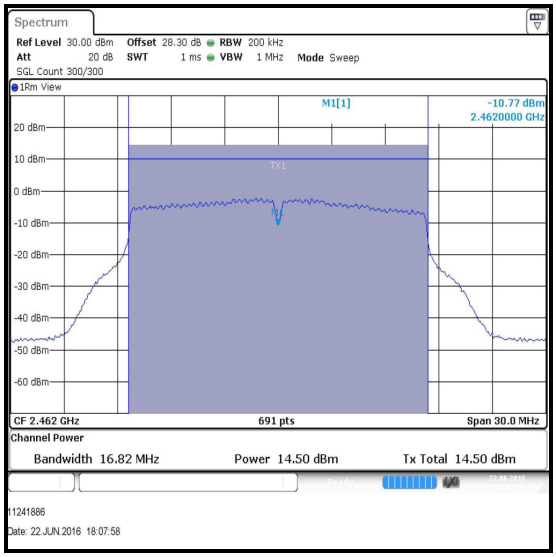
Channel 1



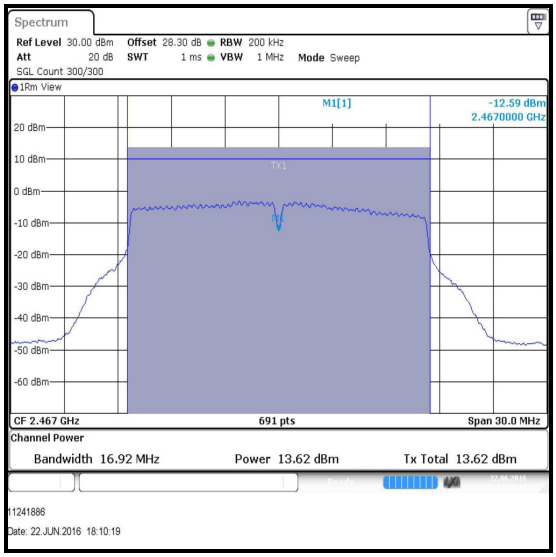
Channel 6

Transmitter Maximum (Average) Output Power (continued)

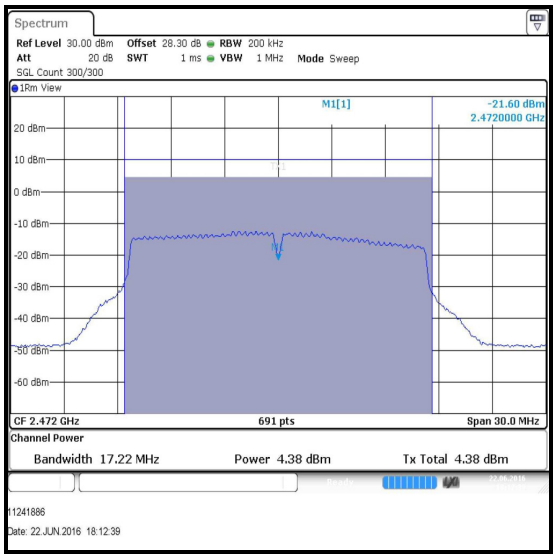
Results: 802.11g / 20 MHz / BPSK / 6 Mbps



Channel 11



Channel 12



Channel 13

Transmitter Maximum (Average) Output Power (continued)

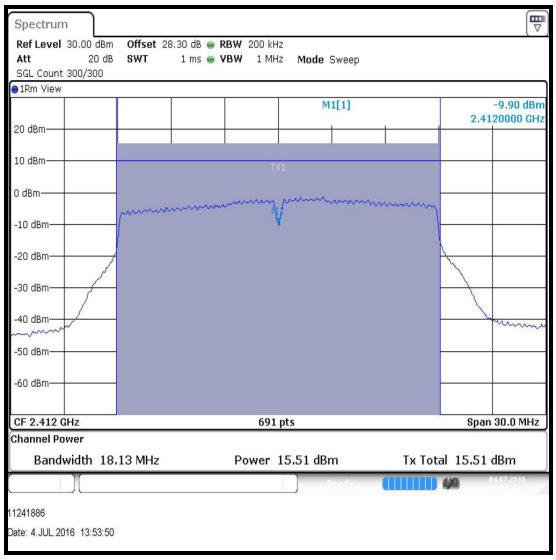
Results: 802.11n / HT20 / BPSK / MCS0 / SISO

Conducted Peak Limit Comparison

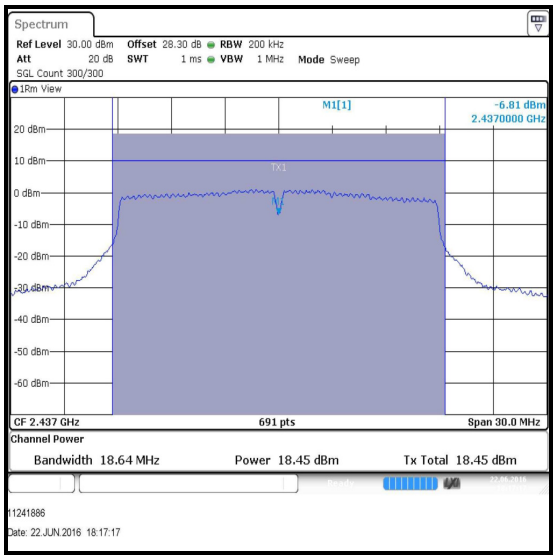
Channel	Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
1	15.5	30.0	14.5	Complied
6	18.5	30.0	11.5	Complied
11	14.4	30.0	15.6	Complied
12	13.6	30.0	16.4	Complied
13	4.2	30.0	25.8	Complied

De Facto EIRP Limit Comparison

Channel	Conducted Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
1	15.5	-1.8	13.7	36.0	22.3	Complied
6	18.5	-1.8	16.7	36.0	19.3	Complied
11	14.4	-1.8	12.6	36.0	23.4	Complied
12	13.6	-1.8	11.8	36.0	24.2	Complied
13	4.2	-1.8	2.4	36.0	33.6	Complied



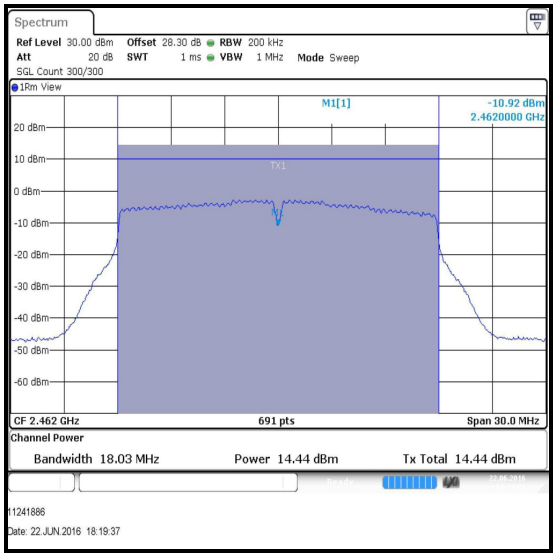
Channel 1



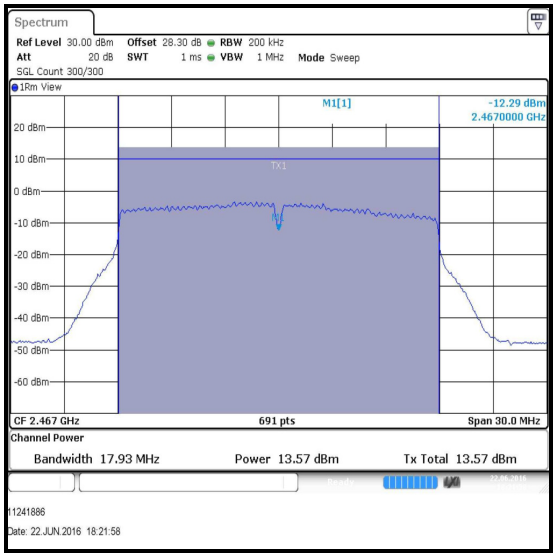
Channel 6

Transmitter Maximum (Average) Output Power (continued)

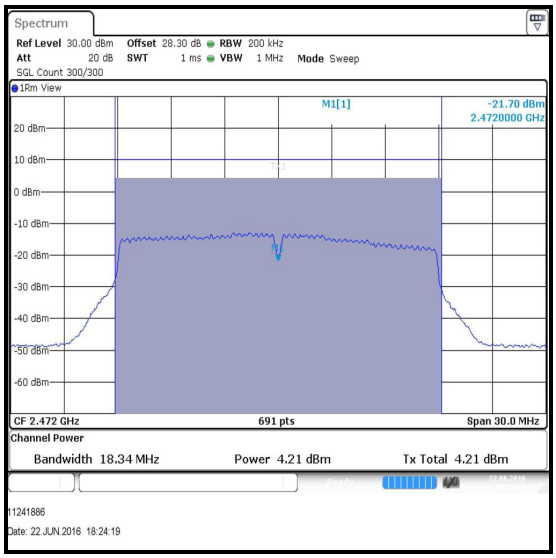
Results: 802.11n / HT20 / BPSK / MCS0 / SISO



Channel 11



Channel 12



Channel 13

Transmitter Maximum (Average) Output Power (continued)

Results: 802.11n / HT20 / BPSK / MCS0 / MIMO

Conducted Peak Limit Comparison

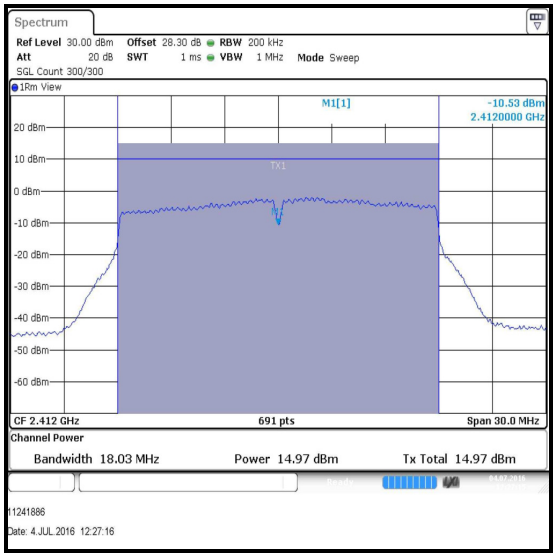
Channel	Conducted Power Port 1 (dBm)	Conducted Power Port 2 (dBm)	Combined Conducted Power (dBm)	Conducted Power Limit (dBm)	Margin (dB)	Result
1	15.0	14.8	17.9	30.0	12.1	Complied
6	18.6	19.1	21.9	30.0	8.1	Complied
11	14.0	13.8	16.9	30.0	13.1	Complied
12	12.7	12.2	15.5	30.0	14.5	Complied
13	4.3	3.3	6.8	30.0	23.2	Complied

De Facto EIRP Limit Comparison

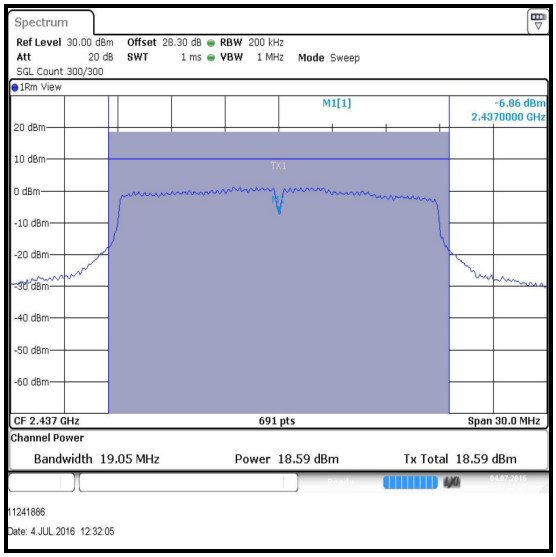
Channel	Combined Conducted Power (dBm)	Directional Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
1	17.9	1.5	19.4	36.0	16.6	Complied
6	21.9	1.5	23.4	36.0	12.6	Complied
11	16.9	1.5	18.4	36.0	17.6	Complied
12	15.5	1.5	17.0	36.0	19.0	Complied
13	6.8	1.5	8.3	36.0	27.7	Complied

Transmitter Maximum (Average) Output Power (continued)

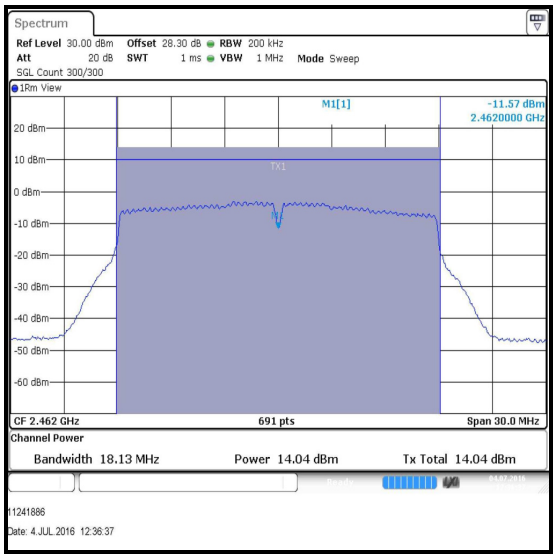
Results: 802.11n / HT20 / BPSK / MCS0 / MIMO / Port 1



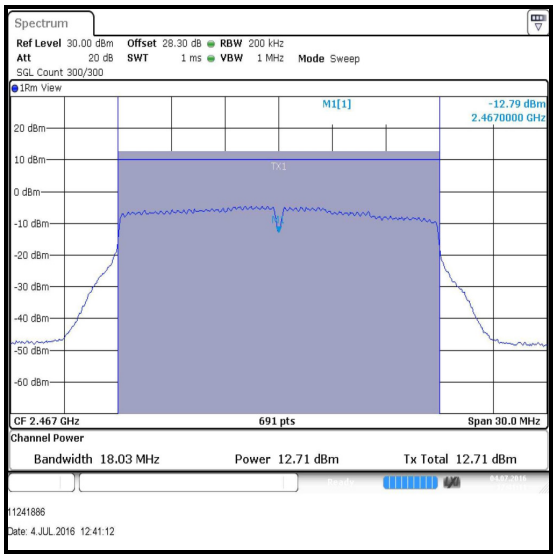
Channel 1



Channel 6



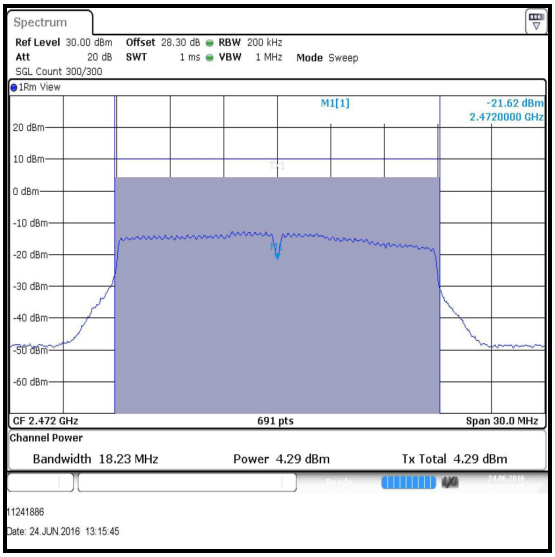
Channel 11



Channel 12

Transmitter Maximum (Average) Output Power (continued)

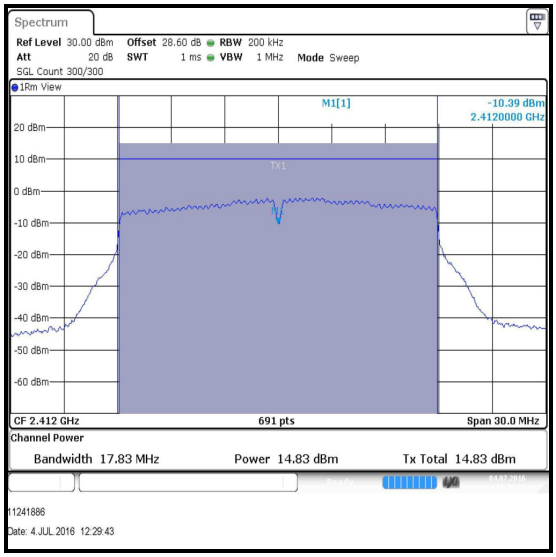
Results: 802.11n / HT20 / BPSK / MCS0 / MIMO / Port 1



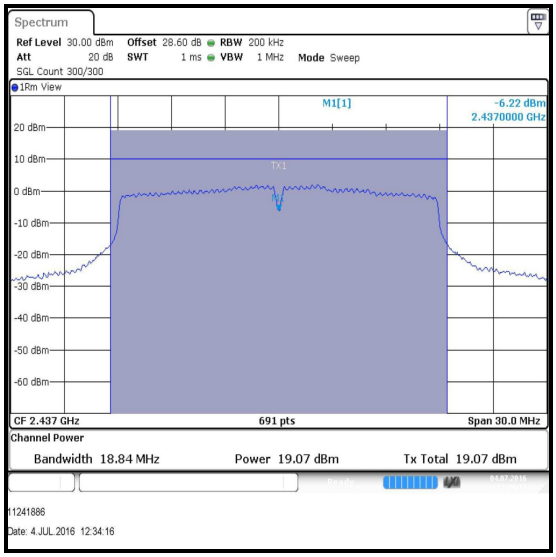
Channel 13

Transmitter Maximum (Average) Output Power (continued)

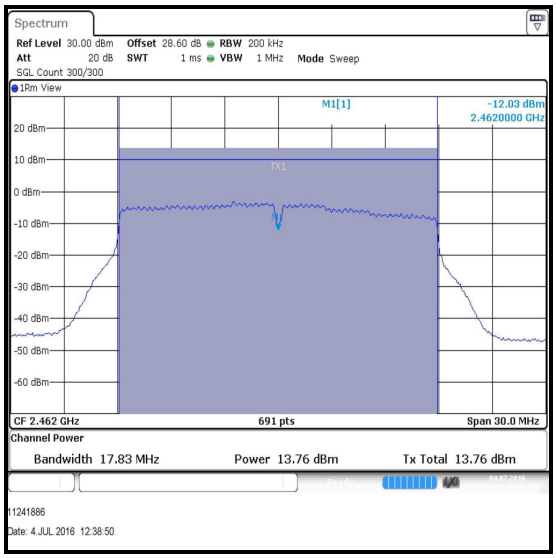
Results: 802.11n / HT20 / BPSK / MCS0 / MIMO / Port 2



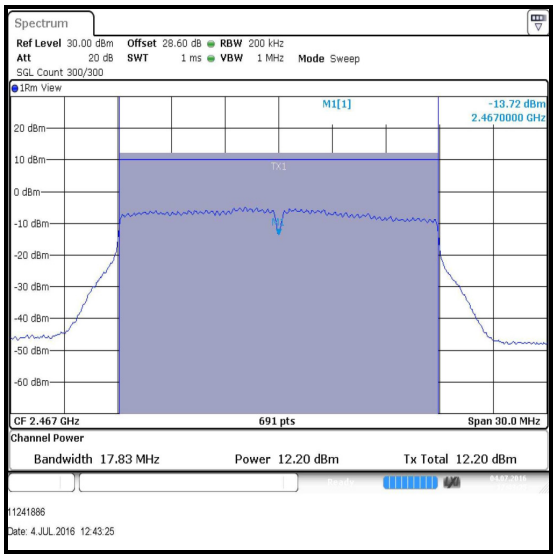
Channel 1



Channel 6



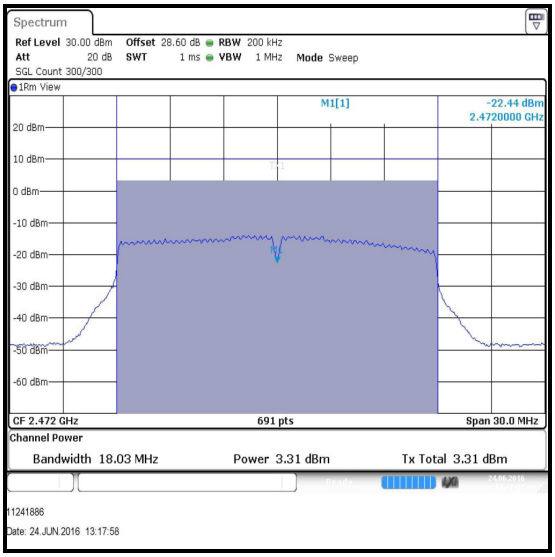
Channel 11



Channel 12

Transmitter Maximum (Average) Output Power (continued)

Results: 802.11n / HT20 / BPSK / MCS0 / MIMO / Port 2



Channel 13

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1659	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	02 Apr 2017	12
M1835	Signal Analyser	Rohde & Schwarz	FSV30	103050	27 Feb 2017	12
M1867	Attenuator	Huber + Suhner AG	6820.17.B	07101	Calibrated before use	-
A2847	Attenuator	Radiall	R411.820.121	24671450	Calibrated before use	-
A2345	Attenuator	Macom	2082-6043-20	None stated	Calibrated before use	-
A2952	RF Switch	Pickering Interfaces	64-102-002 & 40-881-001	XZ361012 & X361507	Calibrated before use	-
S0538	DC Power Supply	TTi	PL154	250135	Calibrated before use	-
M1818	Multimeter	Fluke	79III	71811580	27 Apr 2017	12
M1252	Signal Generator	Hewlett Packard	83640A	3119A00489	26 Oct 2017	24

5.2.4. Transmitter Radiated Emissions

Test Summary:

Test Engineer:	Nick Steele	**Test Date:**	16 June 2016
Test Sample Serial Number:	C7CRR00GHCPX		

FCC Reference:	Parts 15.247(d) & 15.209(a)
Test Method Used:	ANSI C63.10 Sections 6.3 and 6.5
Frequency Range	30 MHz to 1000 MHz

Environmental Conditions:

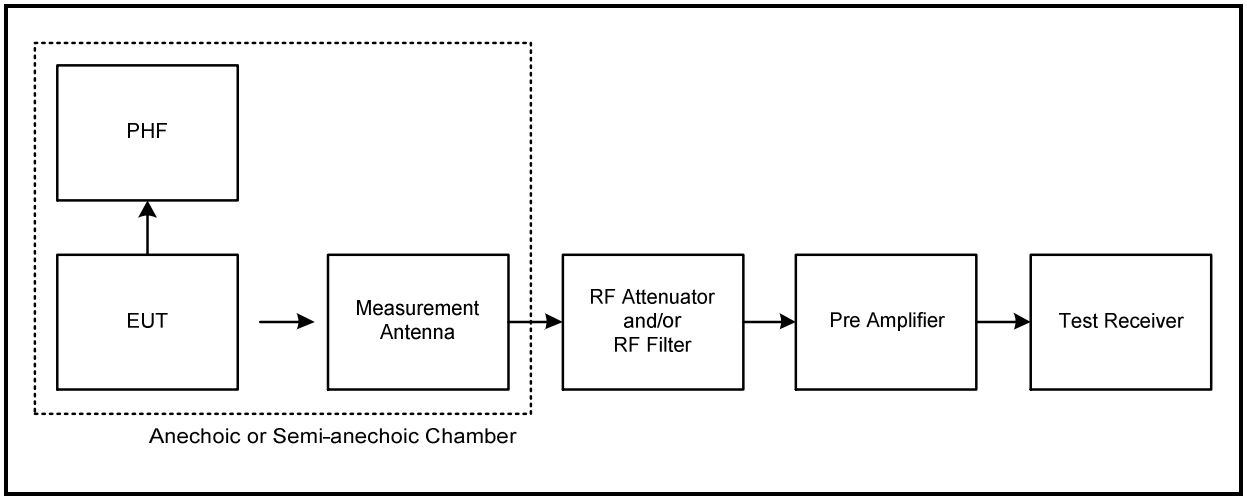
Temperature (℃):	27
Relative Humidity (%):	42

Note(s):

1. The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.
2. 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.
3. All emissions shown on the pre-scan plots were investigated and found to be ambient, or >20 dB below the applicable limit or below the measurement system noise floor. Therefore the highest peak noise floor reading of the measuring receiver was recorded in the table below.
4. Measurements below 1 GHz were performed in a semi-anechoic chamber (Asset Number K0017) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
5. Pre-scans were performed and markers placed on the highest measured levels. The test receiver resolution bandwidth was set to 100 kHz and video bandwidth 300 kHz. A peak detector was used, sweep time was set to auto and trace mode was Max Hold.
6. 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 big enough to see the whole emission.

Transmitter Radiated Emissions (continued)

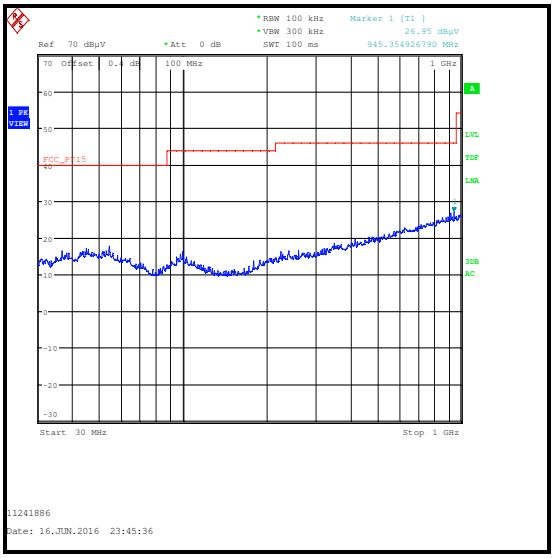
Test setup for radiated measurements:



Transmitter Radiated Emissions (continued)

Results: Middle Channel / 802.11n / HT20 / BPSK / MCS0 / MIMO

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
945.355	Vertical	27.0	46.0	19.0	Complied



Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M2003	Thermohygrometer	JM Handelspunkt	608-H1	45046641	22 Apr 2017	12
K0017	3m RSE Chamber	Rainford EMC	N/A	N/A	19 May 2017	12
M1995	Test Receiver	Rohde & Schwarz	ESU40	100428	21 Mar 2017	12
A2888	Antenna	Schwarzbeck	VULB 9163	9163-941	07 Apr 2017	12
A2175	Low Pass Filter	AtlanTecRF	AFL-01000	800976	30 Apr 2017	12

Transmitter Radiated Emissions (continued)

Test Summary:

Test Engineer:	Nick Steele	**Test Date:**	16 June 2016
Test Sample Serial Number:	C7CRR00GHCPX		

FCC Reference:	Parts 15.247(d) & 15.209(a)
Test Method Used:	ANSI C63.10 Sections 6.3 and 6.6
Frequency Range	1 GHz to 25 GHz

Environmental Conditions:

Temperature (℃):	27
Relative Humidity (%):	42

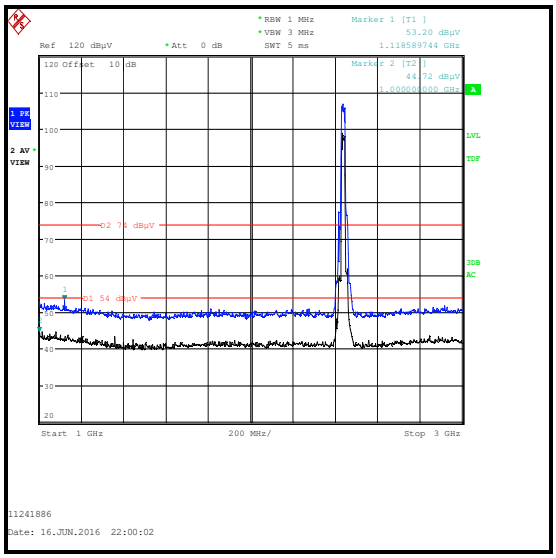
Note(s):

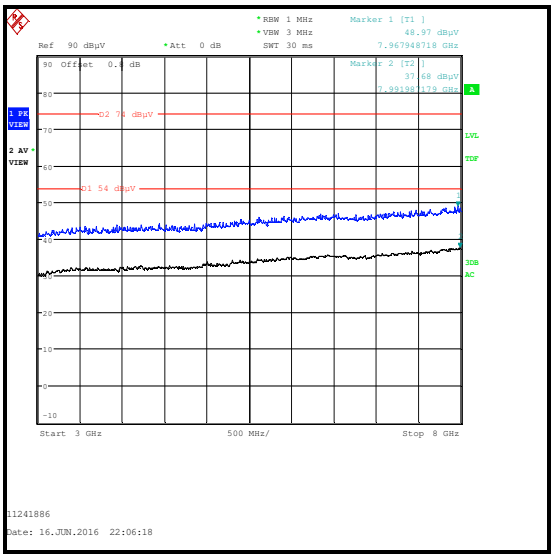
1. Transmitter radiated spurious emissions tests were performed with the EUT transmitting in 802.11n / MCS0 / MIMO, as this was found to transmit the highest power and therefore deemed worst case.
2. The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.
3. No spurious emissions were detected above the noise floor of the measuring receiver therefore the highest noise floor reading of the measuring receiver was recorded as shown in the table below.
4. The emission shown approximately at 2437 MHz on the 1 GHz to 4 GHz plot is the EUT fundamental.
5. Middle channel results are recorded in this report and are representative of bottom and top channel results which are held on the UL IT server and available for inspection on request.
6. Pre-scans above 1 GHz were performed in a fully anechoic chamber (Asset Number K0017) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT.
7. Pre-scans were performed and a marker placed on the highest measured level of the appropriate plot. The test receiver resolution bandwidth was set to 1 MHz and video bandwidth 3 MHz. The sweep time was set to auto.
8. In accordance with ANSI C63.10 Section 6.6.4.3 (Note 1), if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.

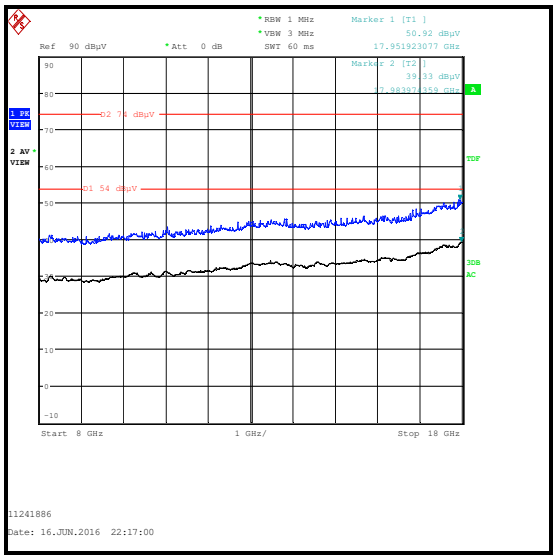
Results: Peak

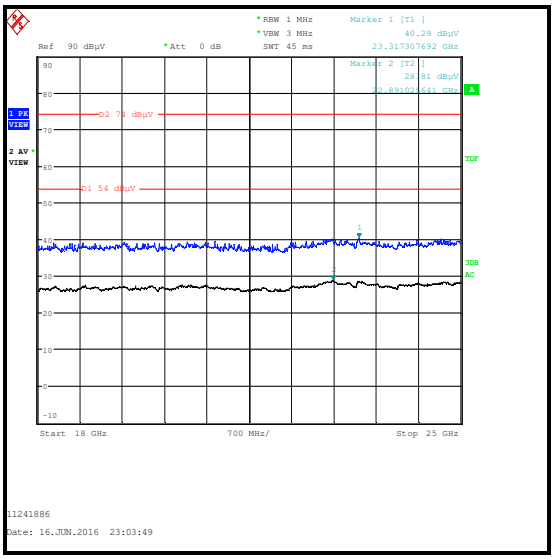
Frequency (MHz)	Antenna Polarity	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
1118.590	Vertical	53.2	54.0	0.8	Complied

Transmitter Radiated Emissions (continued)









Transmitter Radiated Emissions (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M2003	Thermohygrometer	JM Handelspunkt	608-H1	45046641	22 Apr 2017	12
K0017	3m RSE Chamber	Rainford EMC	N/A	N/A	19 May 2017	12
M1995	Test Receiver	Rohde & Schwarz	ESU40	100428	21 Mar 2017	12
A2889	Antenna	Schwarzbeck	BBHA 9120 B	BBHA 9120 B 653	07 Apr 2017	12
A2863	Pre Amplifier	Agilent	8449B	3008A02100	07 Jan 2017	12
A2890	Antenna	Schwarzbeck	HWRD 750	014	06 May 2017	12
A2891	Pre Amplifier	Schwarzbeck	BBV 9718	9718-306	07 Apr 2017	12
A2892	Antenna	Schwarzbeck	BBHA 9170	9170-727	07 Apr 2017	12
A2893	Pre Amplifier	Schwarzbeck	BBV 9721	9721-021	07 Apr 2017	12
S0582	Power Supply	Schwarzbeck	PS9721	00005	Calibrated before use	-
A2914	High Pass Filter	AtlanTecRF	AFH-03000	2155	19 May 2017	12
A2916	Attenuator	AtlanTecRF	AN18W5-10	832827#1	19 May 2017	12
M1818	Multimeter	Fluke	79 Series II	71811580	27 Apr 2017	12

5.2.5. Transmitter Band Edge Radiated Emissions

Test Summary:

Test Engineers:	Nick Steele, Andrew Edwards & David Doyle	**Test Dates:**	14 June 2016 to 30 July 2016
Test Sample Serial Number:	C7CRR00GHCPX		

FCC Reference:	Parts 15.247(d) & 15.209(a)
Test Method Used:	ANSI C63.10 Section 6.10 & FCC KDB 558074 Sections 11 & 12

Environmental Conditions:

Temperature (℃):	24 to 25
Relative Humidity (%):	42 to 47

Transmitter Band Edge Radiated Emissions (continued)

Note(s):

1. The customer declared the following data rates to be used for all measurements as:
   - 802.11b – DBPSK / 1 Mbps / Port 1
   - 802.11g – BPSK / 6 Mbps / Port 1
   - 802.11n HT20 / SISO – BPSK / 6.5 Mbps / MCS0 / Port 1
   - 802.11n HT20 / MIMO – BPSK / 6.5 Mbps / MCS0

   Final measurements were performed with the above configurations.
2. For 802.11n HT20 SISO, the EUT was transmitting from Port 1 only as this Port emits the highest output power level and was therefore deemed to be worst case. For 802.11n MIMO, the EUT was transmitting from both ports.
3. The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.
4. The maximum conducted (average) output power was previously measured. In accordance with FCC KDB 558074 Section 11.1(b), the lower band edge measurement should be performed with a peak detector and the -30 dBc limit applied.
5. As the lower band edge falls within a non-restricted band, only peak measurements are required. In accordance with FCC KDB 558074 Section 11.1, the test method in Section 11.3 was followed: the test receiver resolution bandwidth was set to 100 kHz and video bandwidth 300 kHz. A peak detector was used, sweep time was set to auto and trace mode was Max Hold. The test receiver was left to sweep for a sufficient length of time in order to maximise the carrier level and out-of-band emissions. A marker and corresponding reference level line were placed on the peak of the carrier. As the maximum conducted (average) output power was measured using an RMS detector in accordance with FCC KDB 558074 Section 9.2.2.4 an out-of-band limit line was placed 30 dB (FCC KDB 558074 Section 11.1(b)) below the peak level. A marker was placed on the band edge spot frequencies 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.
6. As the upper band edge falls within a restricted band both peak and average measurements were recorded by placing a marker at the edge of the band. For peak measurements the test receiver resolution bandwidth was set to 1 MHz and the video bandwidth 3 MHz. A peak detector was used, sweep time was set to auto and trace mode was Max Hold. For average measurements the test receiver resolution bandwidth was set to 1 MHz and the video bandwidth 3 MHz. An average detector was used, sweep time was set to auto and trace mode was Max Hold. The test receiver was left to sweep for a sufficient length of time in order to maximise the carrier level and out-of-band emissions. A marker was placed on the band edge spot frequencies and a second marker placed on the highest emission level in the adjacent restricted band of operation (where a higher level emission was present). Marker frequencies and levels were recorded.
7. There is a restricted band 10 MHz below the lower band edge. The test receiver was set up as follows: the RBW set to 1 MHz, the VBW set to 3 MHz, with the sweep time set to auto couple. Peak and average measurements were performed with their respective detectors. Markers were placed on the highest point on each trace.
8. * -30 dBc limit.
9. Radiated measurements on channels 2 and 10 were performed under a different job number as shown on the plots below.

Transmitter Band Edge Radiated Emissions (continued)

Results: 802.11b / 20 MHz / DBPSK / 1 Mbps / Port 1

Results: Lower Band Edge / Channel 1

Frequency (MHz)	Level (dBµV/m)	-30 dBc Limit (dBµV/m)	Margin (dB)	Result
2399.009	47.0	69.2	22.2	Complied
2400	45.1	69.2	24.1	Complied

Results: Restricted Band / Upper Band Edge / Peak / Channel 11

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2388.629	50.8	74.0	23.2	Complied
2483.5	55.1	74.0	18.9	Complied
2483.701	55.9	74.0	18.1	Complied

Results: Restricted Band / Upper Band Edge / Average / Channel 11

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2365.314	43.0	54.0	11.0	Complied
2483.5	46.1	54.0	7.9	Complied

Results: Upper Band Edge / Peak / Channel 12

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	57.1	74.0	16.9	Complied

Results: Upper Band Edge / Average / Channel 12

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	46.7	54.0	7.3	Complied
2483.714	47.0	54.0	7.0	Complied

Transmitter Band Edge Radiated Emissions (continued)

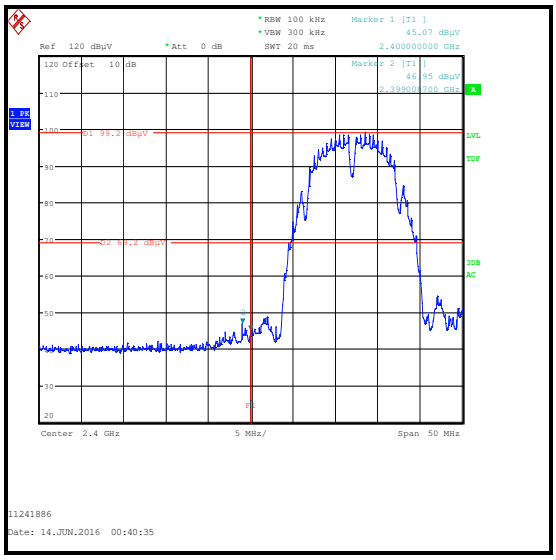
Results: 802.11b / 20 MHz / DBPSK / 1 Mbps / Port 1

Results: Upper Band Edge / Peak / Channel 13

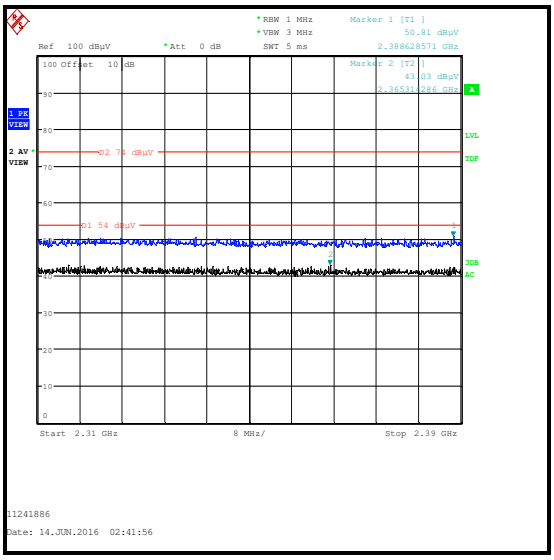
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	55.1	74.0	18.9	Complied
2485.429	56.8	74.0	17.2	Complied

Results: Upper Band Edge / Average / Channel 13

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	49.0	54.0	5.0	Complied
2485.000	52.0	54.0	2.0	Complied



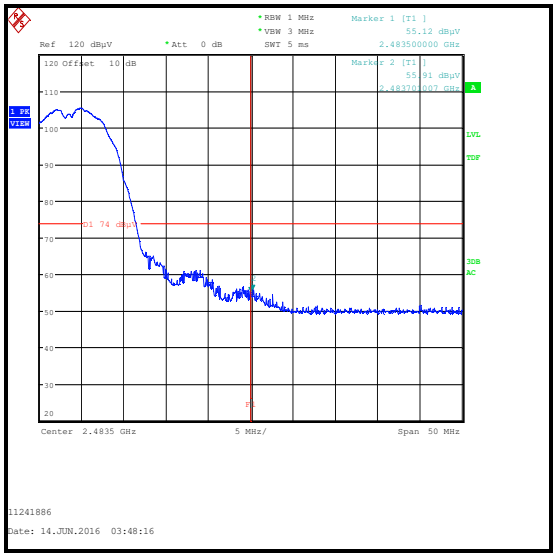
Lower Band Edge Peak Measurement Channel 1



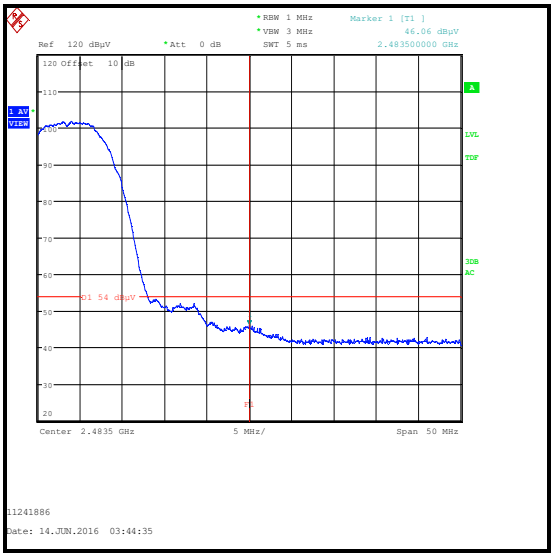
2310 MHz to 2390 MHz Restricted Band Plot

Transmitter Band Edge Radiated Emissions (continued)

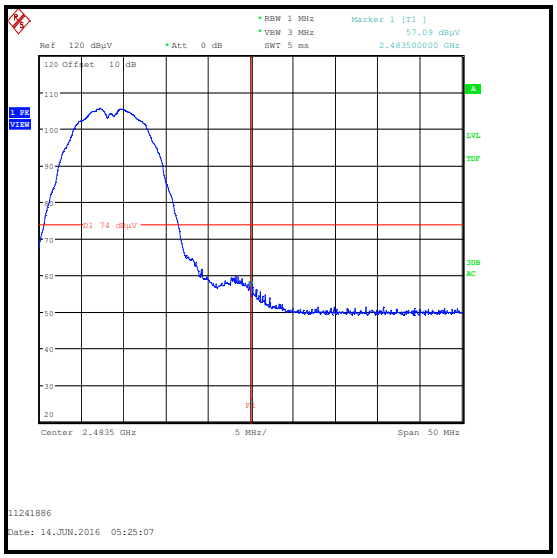
Results: 802.11b / 20 MHz / DBPSK / 1 Mbps / Port 1



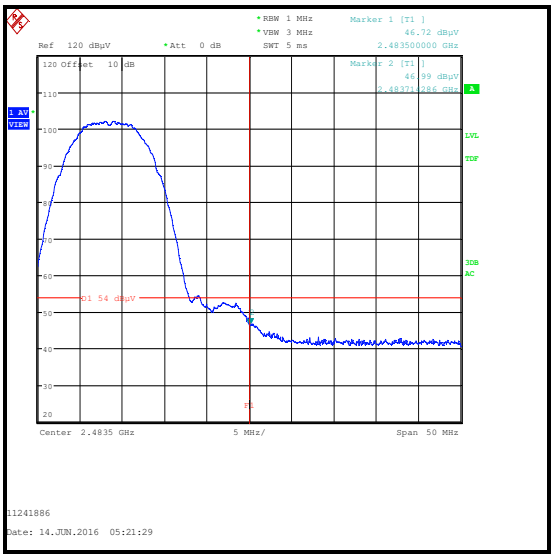
Upper Band Edge Peak Measurement Channel 11



Upper Band Edge Average Measurement Channel 11



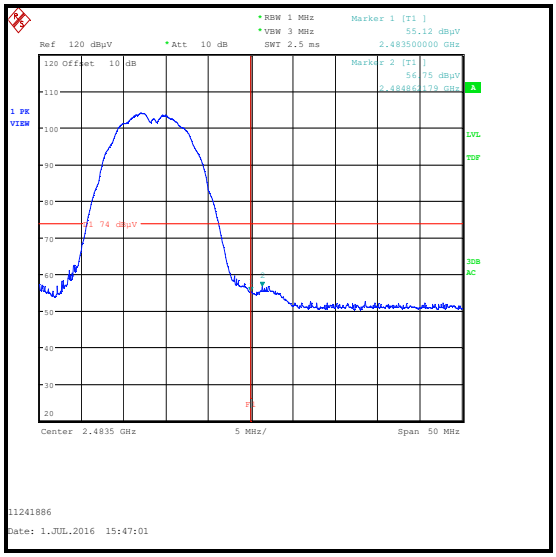
Upper Band Edge Peak Measurement Channel 12



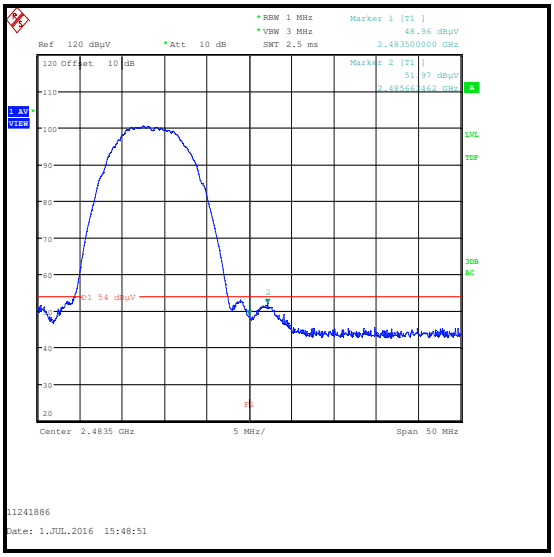
Upper Band Edge Average Measurement Channel 12

Transmitter Band Edge Radiated Emissions (continued)

Results: 802.11b / 20 MHz / DBPSK / 1 Mbps / Port 1



Upper Band Edge Peak Measurement
Channel 13



Upper Band Edge Average Measurement
Channel 13

Transmitter Band Edge Radiated Emissions (continued)

Results: 802.11g / 20 MHz / BPSK / 6 Mbps / Port 1

Results: Lower Band Edge / Channel 1

Frequency (MHz)	Level (dBµV/m)	-30 dBc Limit (dBµV/m)	Margin (dB)	Result
2400	48.4	63.7	15.3	Complied

Results: Lower Band Edge / Channel 2

Frequency (MHz)	Level (dBµV/m)	-30 dBc Limit (dBµV/m)	Margin (dB)	Result
2399.519	50.0	65.5	15.5	Complied
2400	48.8	65.5	16.7	Complied

Results: Upper Band Edge / Peak / Channel 10

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	58.8	74.0	15.2	Complied

Results: Upper Band Edge / Average / Channel 10

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	51.0	54.0	3.0	Complied
2484.381	51.7	54.0	2.3	Complied

Results: Restricted Band / Upper Band Edge / Peak / Channel 11

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2329.543	51.7	74.0	22.3	Complied
2483.5	60.5	74.0	13.5	Complied

Results: Restricted Band / Upper Band Edge / Average / Channel 11

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2331.029	43.9	54.0	11.1	Complied
2483.5	49.6	54.0	4.4	Complied

Transmitter Band Edge Radiated Emissions (continued)

Results: 802.11g / 20 MHz / BPSK / 6 Mbps / Port 1

Results: Upper Band Edge / Peak / Channel 12

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	59.2	74.0	14.8	Complied
2485.000	59.6	74.0	14.4	Complied

Results: Upper Band Edge / Average / Channel 12

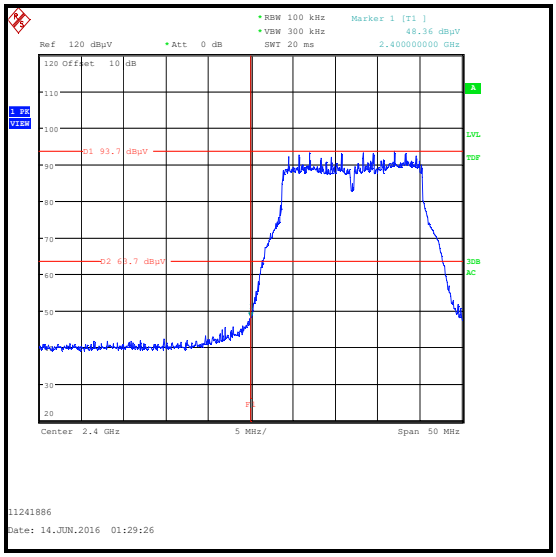
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	50.8	54.0	3.2	Complied

Results: Upper Band Edge / Peak / Channel 13

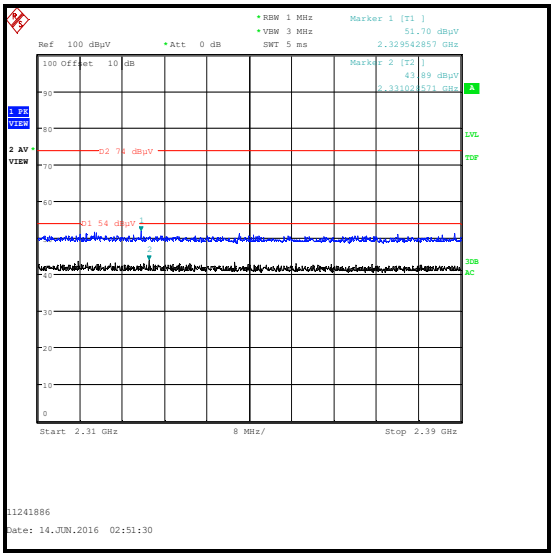
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	65.3	74.0	8.7	Complied

Results: Upper Band Edge / Average / Channel 13

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	52.1	54.0	1.9	Complied



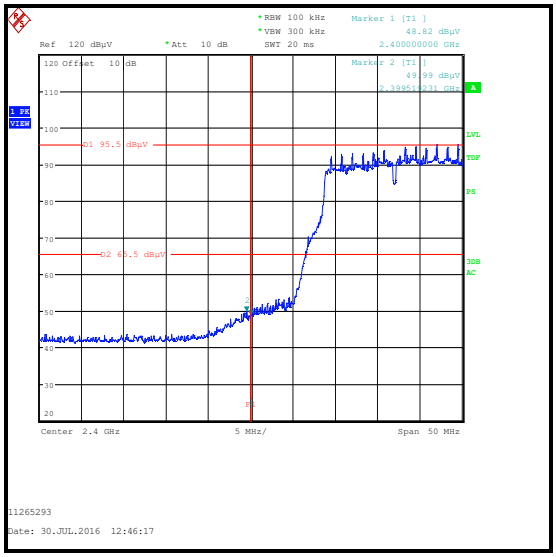
Lower Band Edge Peak Measurement Channel 1



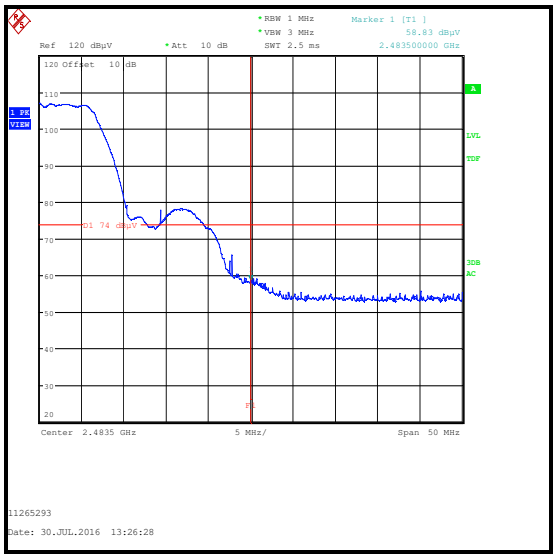
2310 MHz to 2390 MHz Restricted Band Plot

Transmitter Band Edge Radiated Emissions (continued)

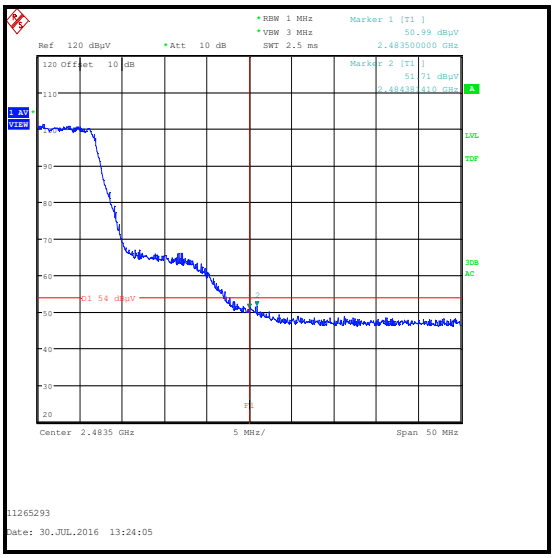
Results: 802.11g / 20 MHz / BPSK / 6 Mbps / Port 1



Lower Band Edge Peak Measurement
Channel 2



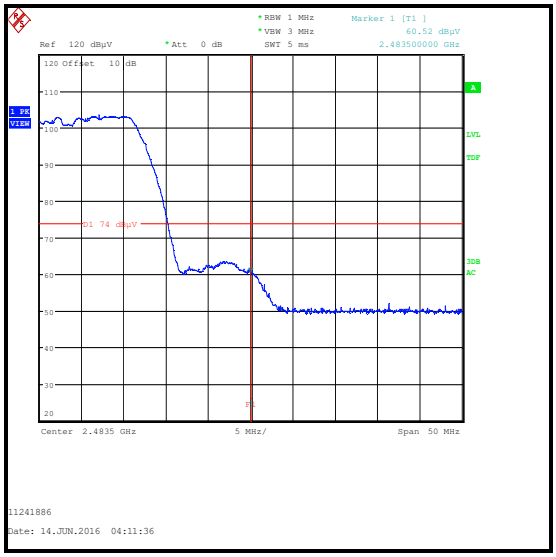
Upper Band Edge Peak Measurement
Channel 10



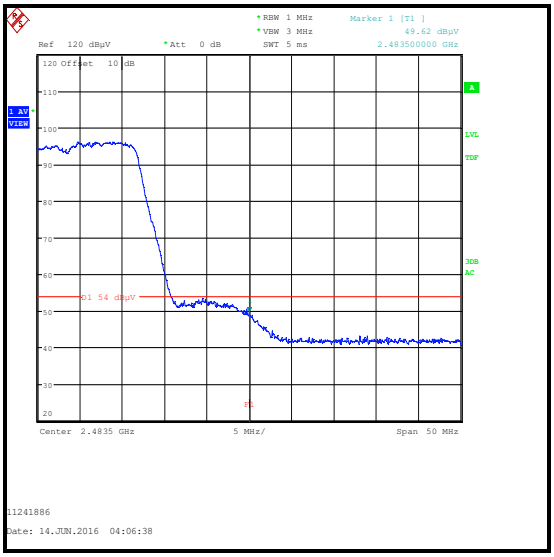
Upper Band Edge Average Measurement
Channel 10

Transmitter Band Edge Radiated Emissions (continued)

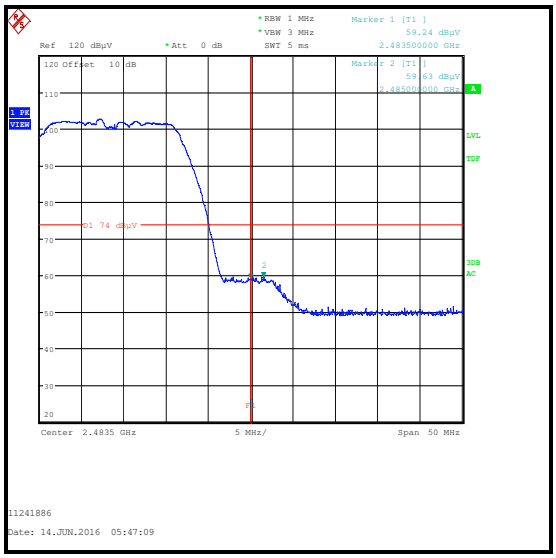
Results: 802.11g / 20 MHz / BPSK / 6 Mbps / Port 1



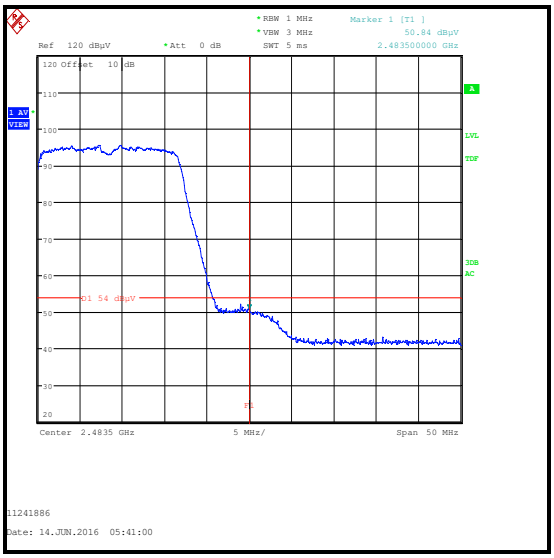
Upper Band Edge Peak Measurement Channel 11



Upper Band Edge Average Measurement Channel 11



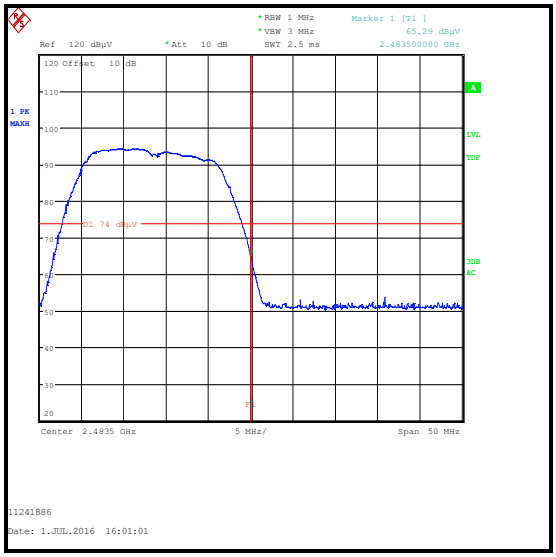
Upper Band Edge Peak Measurement Channel 12



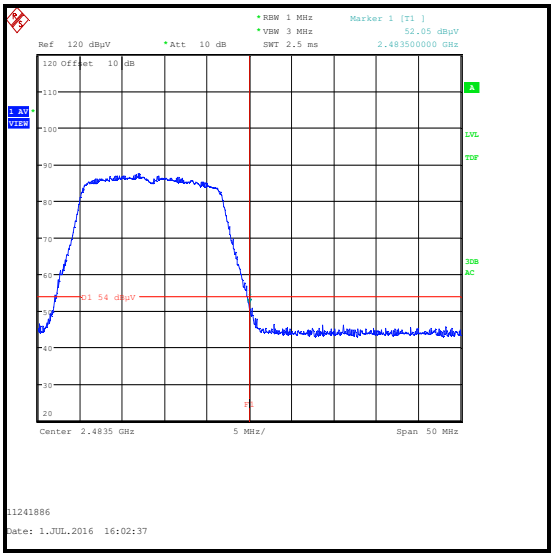
Upper Band Edge Average Measurement Channel 12

Transmitter Band Edge Radiated Emissions (continued)

Results: 802.11g / 20 MHz / BPSK / 6 Mbps / Port 1



Upper Band Edge Peak Measurement
Channel 13



Upper Band Edge Average Measurement
Channel 13

Transmitter Band Edge Radiated Emissions (continued)

Results: 802.11n HT20 / SISO / BPSK / 6.5 Mbps / Port 1

Results: Lower Band Edge / Channel 1

Frequency (MHz)	Level (dBµV/m)	-30 dBc Limit (dBµV/m)	Margin (dB)	Result
2399.857	50.6	64.2	13.6	Complied
2400	48.3	64.2	15.9	Complied

Results: Lower Band Edge / Channel 2

Frequency (MHz)	Level (dBµV/m)	-30 dBc Limit (dBµV/m)	Margin (dB)	Result
2398.558	53.3	65.3	12.0	Complied
2400	52.7	65.3	12.6	Complied

Results: Upper Band Edge / Peak / Channel 10

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	61.7	74.0	12.3	Complied

Results: Upper Band Edge / Average / Channel 10

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	51.4	54.0	2.6	Complied
2484.782	51.8	54.0	2.2	Complied

Results: Restricted Band / Upper Band Edge / Peak / Channel 11

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2319.029	51.6	74.0	22.4	Complied
2483.5	66.6	74.0	7.4	Complied

Results: Restricted Band / Upper Band Edge / Average / Channel 11

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2332.171	43.9	54.0	10.1	Complied
2483.5	49.8	54.0	4.2	Complied
2483.786	50.2	54.0	3.8	Complied

Transmitter Band Edge Radiated Emissions (continued)

Results: 802.11n HT20 / SISO / BPSK / 6.5 Mbps / Port 1

Results: Upper Band Edge / Peak / Channel 12

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	59.9	74.0	14.1	Complied
2484.143	61.8	74.0	12.2	Complied

Results: Upper Band Edge / Average / Channel 12

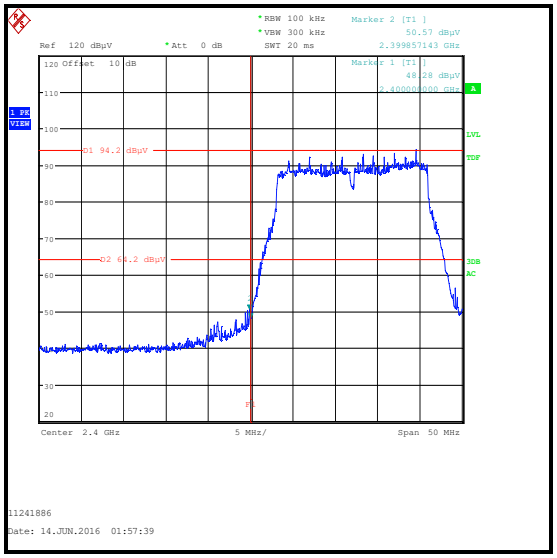
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	49.8	54.0	4.2	Complied
2483.857	49.9	54.0	4.1	Complied

Results: Upper Band Edge / Peak / Channel 13

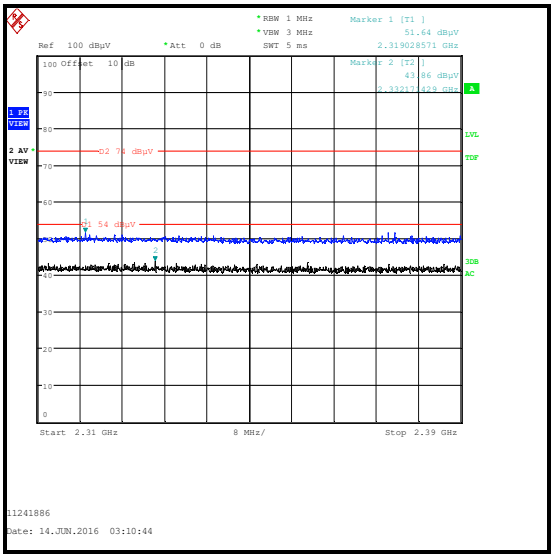
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	68.3	74.0	5.7	Complied

Results: Upper Band Edge / Average / Channel 13

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	51.1	54.0	2.9	Complied



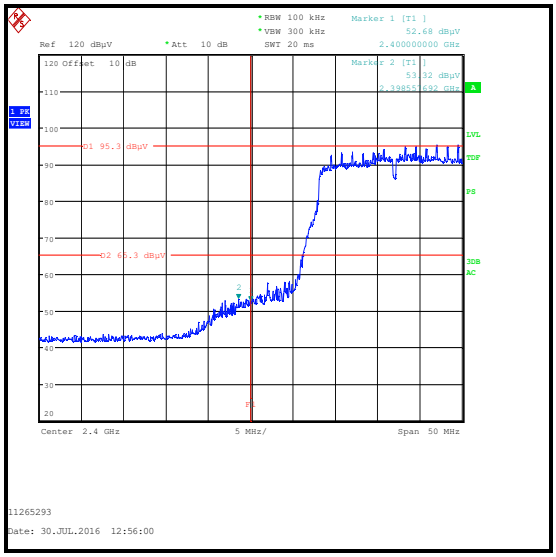
Lower Band Edge Peak Measurement Channel 1



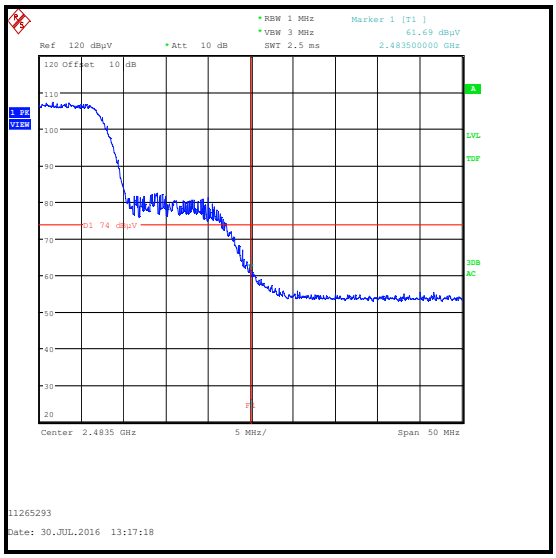
2310 MHz to 2390 MHz Restricted Band Plot

Transmitter Band Edge Radiated Emissions (continued)

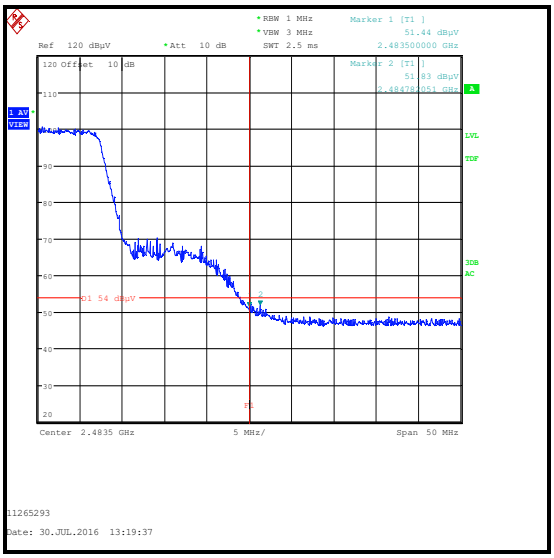
Results: 802.11n HT20 / SISO / BPSK / 6.5 Mbps / Port 1



Lower Band Edge Peak Measurement
Channel 2



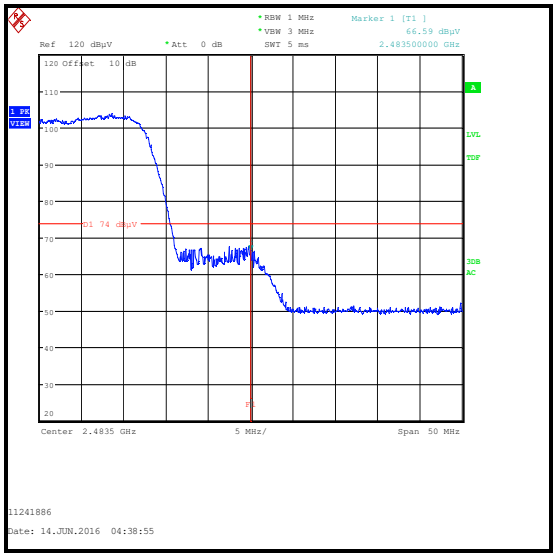
Upper Band Edge Peak Measurement
Channel 10



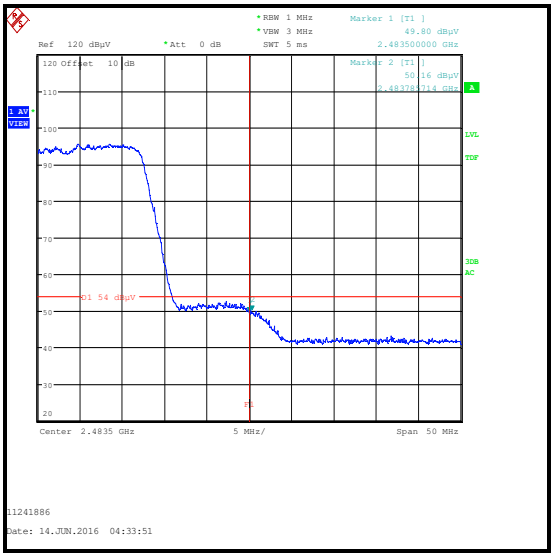
Upper Band Edge Average Measurement
Channel 10

Transmitter Band Edge Radiated Emissions (continued)

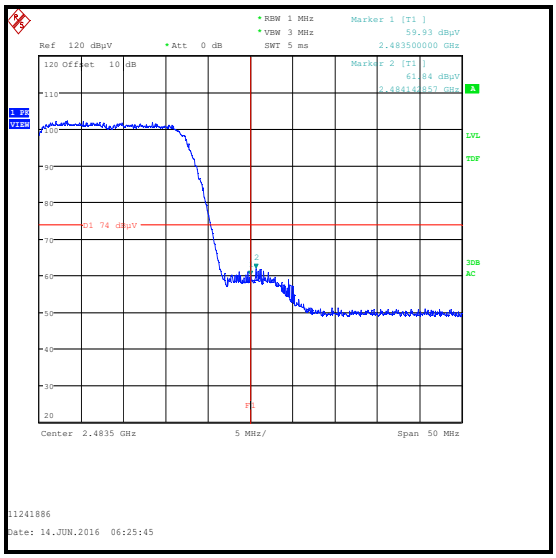
Results: 802.11n HT20 / SISO / BPSK / 6.5 Mbps / Port 1



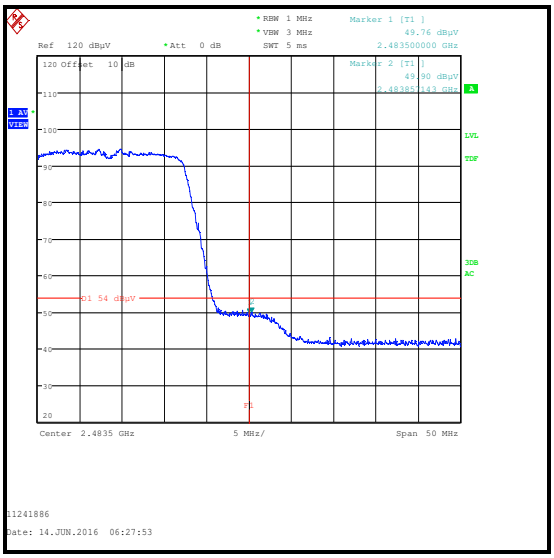
Upper Band Edge Peak Measurement Channel 11



Upper Band Edge Average Measurement Channel 11



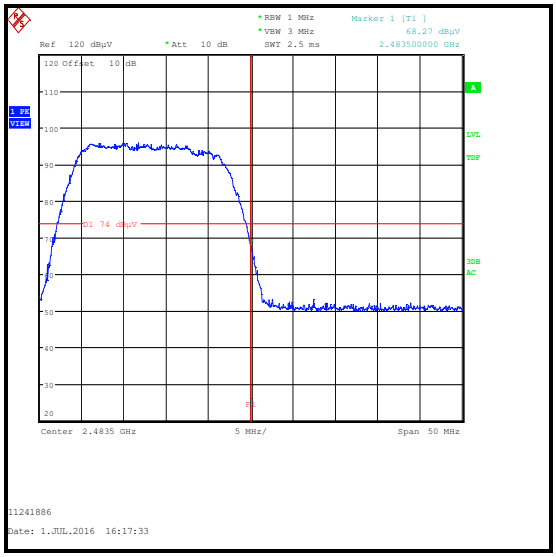
Upper Band Edge Peak Measurement Channel 12



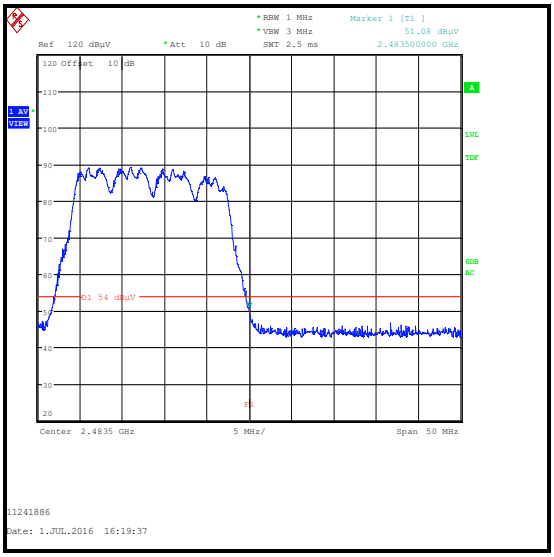
Upper Band Edge Average Measurement Channel 12

Transmitter Band Edge Radiated Emissions (continued)

Results: 802.11n HT20 / SISO / BPSK / 6.5 Mbps / Port 1



Upper Band Edge Peak Measurement
Channel 13



Upper Band Edge Average Measurement
Channel 13

Transmitter Band Edge Radiated Emissions (continued)

Results: 802.11n HT20 / MIMO / BPSK / MCS0

Results: Lower Band Edge / Channel 1

Frequency (MHz)	Level (dBµV/m)	-30 dBc Limit (dBµV/m)	Margin (dB)	Result
2399.772	49.7	64.8	15.1	Complied
2400	48.2	64.8	16.6	Complied

Results: Lower Band Edge / Channel 2

Frequency (MHz)	Level (dBµV/m)	-30 dBc Limit (dBµV/m)	Margin (dB)	Result
2399.199	55.5	68.6	13.1	Complied
2400	50.2	68.6	18.4	Complied

Results: Upper Band Edge / Peak / Channel 10

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	55.7	74.0	18.3	Complied
2484.061	57.0	74.0	17.0	Complied

Results: Upper Band Edge / Average / Channel 10

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	49.9	54.0	4.1	Complied
2484.381	50.7	54.0	3.3	Complied

Results: Restricted Band / Upper Band Edge / Peak / Channel 11

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2312.400	51.4	74.0	22.6	Complied
2483.5	58.7	74.0	15.3	Complied
2484.429	61.6	74.0	12.4	Complied

Results: Restricted Band / Upper Band Edge / Average / Channel 11

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2323.029	43.6	54.0	10.4	Complied
2483.5	47.1	54.0	6.9	Complied
2484.429	48.0	54.0	6.0	Complied

Transmitter Band Edge Radiated Emissions (continued)

Results: 802.11n HT20 / MIMO / BPSK / MCS0

Results: Upper Band Edge / Peak / Channel 12

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	57.5	74.0	16.5	Complied
2484.357	58.9	74.0	15.1	Complied

Results: Upper Band Edge / Average / Channel 12

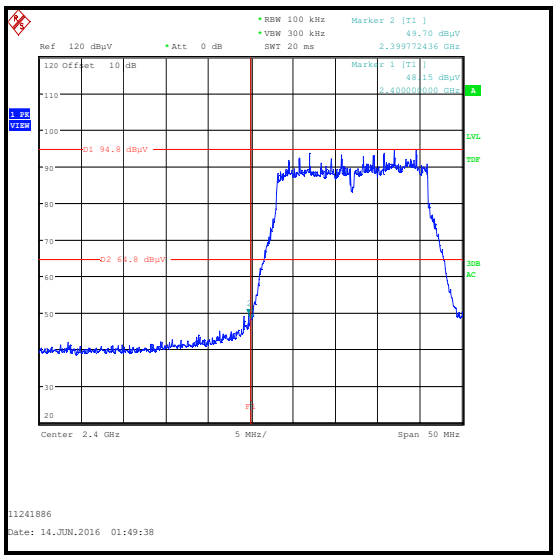
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	49.6	54.0	4.4	Complied

Results: Upper Band Edge / Peak / Channel 13

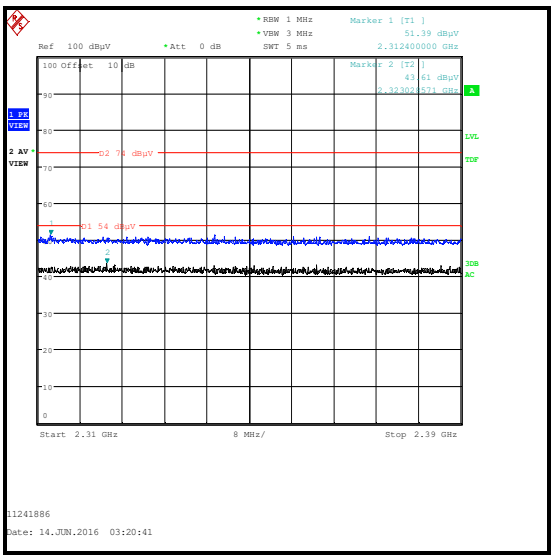
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	67.3	74.0	6.7	Complied

Results: Upper Band Edge / Average / Channel 13

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	50.5	54.0	3.5	Complied



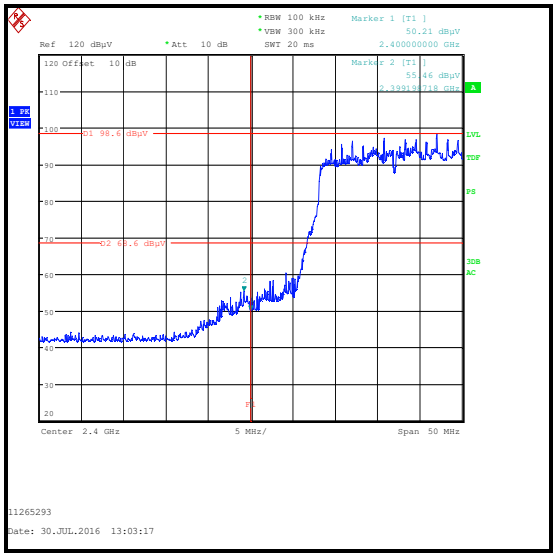
Lower Band Edge Peak Measurement Channel 1



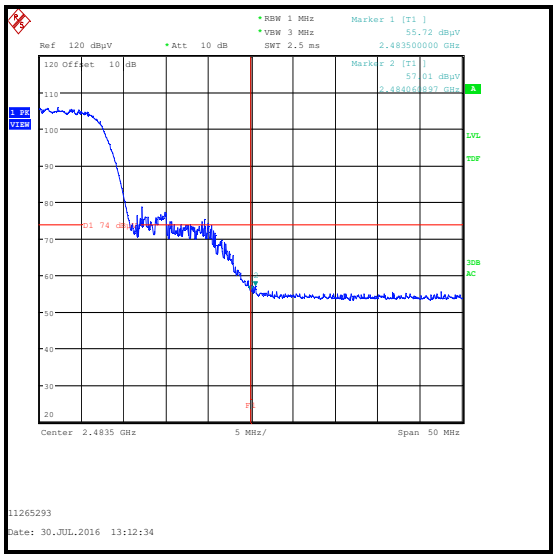
2310 MHz to 2390 MHz Restricted Band Plot

Transmitter Band Edge Radiated Emissions (continued)

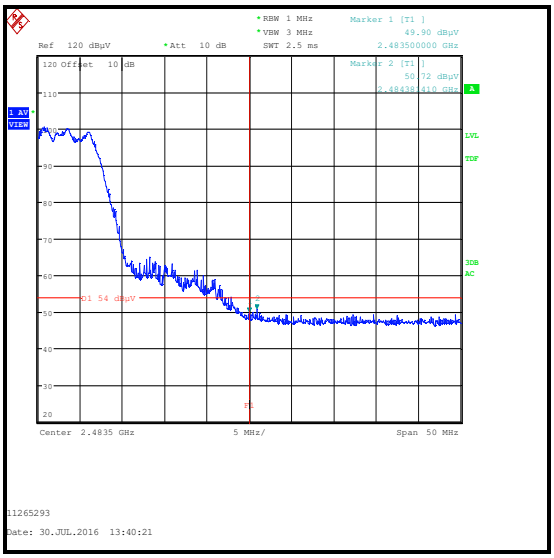
Results: 802.11n HT20 / MIMO / BPSK / MCS0



Lower Band Edge Peak Measurement
Channel 2



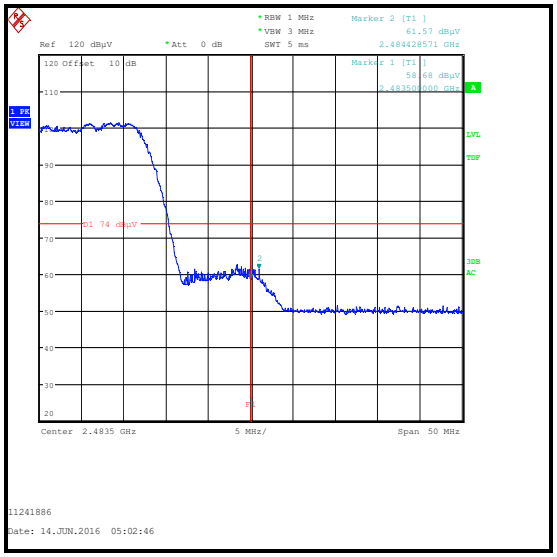
Upper Band Edge Peak Measurement
Channel 10



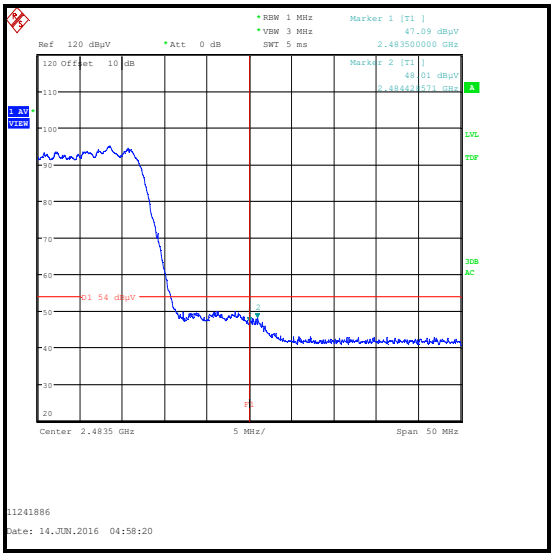
Upper Band Edge Average Measurement
Channel 10

Transmitter Band Edge Radiated Emissions (continued)

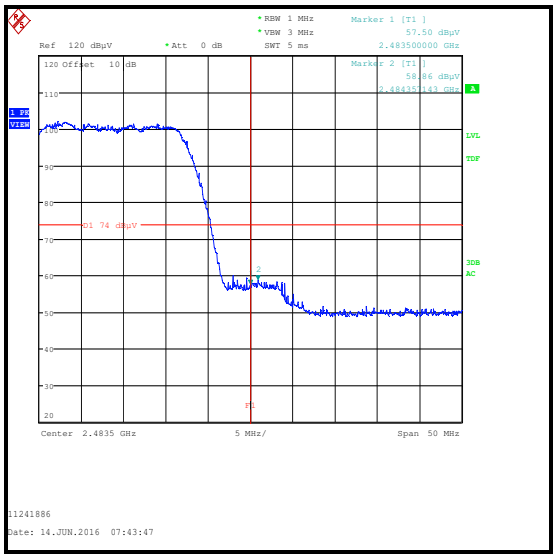
Results: 802.11n HT20 / MIMO / BPSK / MCS0



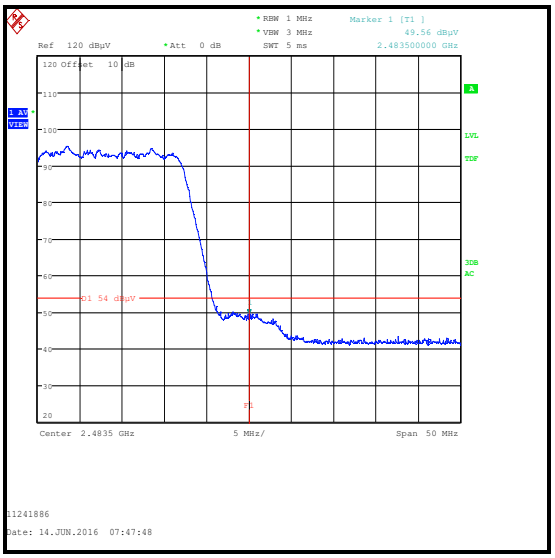
Upper Band Edge Peak Measurement Channel 11



Upper Band Edge Average Measurement Channel 11



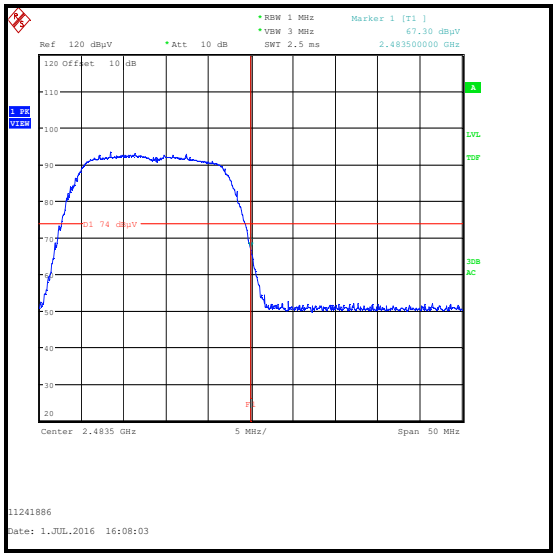
Upper Band Edge Peak Measurement Channel 12



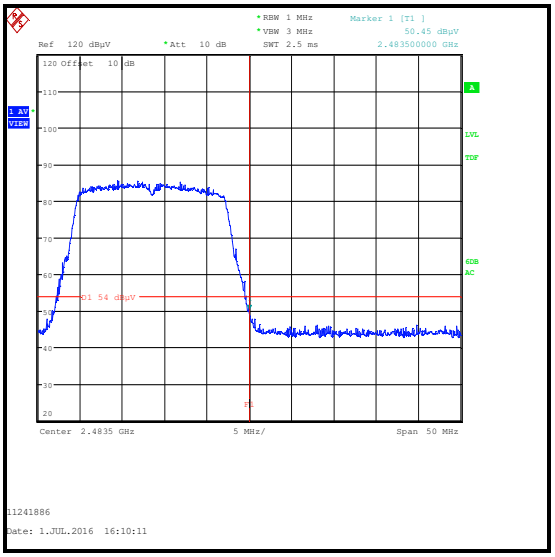
Upper Band Edge Average Measurement Channel 12

Transmitter Band Edge Radiated Emissions (continued)

Results: 802.11n HT20 / MIMO / BPSK / MCS0



Upper Band Edge Peak Measurement Channel 13



Upper Band Edge Average Measurement Channel 13

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M2003	Thermohygrometer	Testo	608-H1	45046641	22 Apr 2017	12
K0017	3m RSE Chamber	Rainford EMC	N/A	N/A	19 May 2017	12
M1995	Test Receiver	Rohde & Schwarz	ESU40	100428	21 Mar 2017	12
A2863	Pre Amplifier	Agilent	8449B	3008A02100	07 Jan 2017	12
A2889	Antenna	Scharzbeck	BBHA 9120 B	BBHA 9120 B 653	07 Apr 2017	12
A2916	Attenuator	AtlanTecRF	AN18W5-10	832827#1	19 May 2017	12

6. Measurement Uncertainty

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

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

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

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

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
Minimum 6 dB Bandwidth	2.4 GHz to 2.4835 GHz	95%	±4.59 %
Duty Cycle	2.4 GHz to 2.4835 GHz	95%	±1.14 %
Spectral Power Density	2.4 GHz to 2.4835 GHz	95%	±1.13 dB
Conducted Maximum Output Power	2.4 GHz to 2.4835 GHz	95%	±1.13 dB
Radiated Spurious Emissions	30 MHz to 1 GHz	95%	±5.65 dB
Radiated Spurious Emissions	1 GHz to 25 GHz	95%	±2.94 dB

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

7. Report Revision History

Version Number	Revision Details		
	Page No(s)	**Clause**	**Details**
1.0	-	-	Initial Version
2.0	-	-	Updates as requested by the TCB
3.0	-	-	Updates as requested by the TCB
4.0	-	-	Updates as requested by the TCB