TEST REPORT

Test Report No. : UL-RPT-RP10874323JD07A

Manufacturer	:	ModCam AB
Model No.	:	MOD.01
FCC ID	:	2AEV4-01
Technology	:	WLAN
Test Standard(s)	:	FCC Parts 15.207, 15.209(a) & 15.407

1. This test report shall not be reproduced in full or partial, without the written approval of UL VS LTD.
2. The results in this report apply only to the sample(s) tested.
3. The sample tested is in compliance with the above standard(s).
4. The test results in this report are traceable to the national or international standards.
5. Version 1.0

Date of Issue: 08 March 2016

Checked by:

Sarah Williams
Engineer, Radio Laboratory

Company Signatory:

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UL VS LTD

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This laboratory is accredited by UKAS. The tests reported herein have been performed in accordance with its terms of accreditation.

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1. Customer Information

Company Name:	ModCam AB
Address:	Bredgatan 4 211 30 Malmő Sweden

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR15.407 and 47CFR15.403
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications): Part 15 Subpart E (Unlicensed National Information Infrastructure Devices) – Sections 15.403 and 15.407
Specification Reference:	47CFR15.207 and 47CFR15.209
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications): Part 15 Subpart C (Intentional Radiators) - Sections 15.207 and 15.209
Site Registration:	209735
Location of Testing:	UL VS LTD, Unit 3 Horizon, Wade Road, Kingsland Business Park, Basingstoke, Hampshire, RG24 8AH, United Kingdom
Test Dates:	30 August 2015 to 04 March 2016

2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
Part 15.207	Transmitter AC Conducted Emissions	✓
Part 15.403(i)	Transmitter 26 dB Emission Bandwidth	✓
Part 15.35(c)	Transmitter Duty Cycle	Note 1
Part 15.407(a)(1)(iv)	Transmitter Maximum Conducted Output Power (5.15-5.25 GHz band)	✓
Part 15.407(a)(2)	Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands)	✓
Part 15.407(a)(1)(iv)	Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band)	✓
Part 15.407(a)(2)	Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands)	✓
Part 15.407(b)/15.209(a)	Transmitter Out of Band Radiated Emissions	✓
Part 15.407(b)/15.209(a)	Transmitter Band Edge Radiated Emissions	✓
Part 15.407(g)	Transmitter Frequency Stability (Temperature & Voltage Variation)	Note 2
Part 15.407(h)(1)	Transmitter Power Control	Note 3
Key to Results		
✓ = Complied ✗ = Did not comply		

Note(s):

1. The measurement was performed to assist in the calculation of the level of average output power, power spectral density and emissions as the EUT employs pulsed operation.
2. Frequency stability is better than 20 ppm which ensures that the signal remains in the allocated bands under all operational conditions stated in the user manual.
3. Transmit Power Control was not tested as the maximum EIRP is less than 500 mW (27 dBm).

2.3. Methods and Procedures

Reference:	ANSI C63.10-2013
Title:	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
Reference:	KDB 789033 D02 General U-NII Test Procedures New Rules v01r01 January 8, 2016
Title:	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E

2.4. Deviations from the Test Specification

For the measurements contained within this test report, there were no deviations from, additions to, or exclusions from the test specifications identified above.

3. Equipment Under Test (EUT)

3.1. Identification of Equipment Under Test (EUT)

Brand Name:	ModCam
Model Name or Number:	MOD.01
Test Sample Serial Number:	MC000170 *(Radiated sample #1)*
Hardware Version:	2.0
Software Version:	114
FCC ID:	2AEV4-01

Brand Name:	ModCam
Model Name or Number:	MOD.01
Test Sample Serial Number:	01001716 *(Radiated sample #2)*
Hardware Version:	2.0
Software Version:	114
FCC ID:	2AEV4-01

Brand Name:	ModCam
Model Name or Number:	MOD.01
Test Sample Serial Number:	MC000058 *(Conducted sample with RF port #1)*
Hardware Version:	2.0
Software Version:	114
FCC ID:	2AEV4-01

Brand Name:	ModCam
Model Name or Number:	MOD.01
Test Sample Serial Number:	0100174A *(Conducted sample with RF port #2)*
Hardware Version:	2.0
Software Version:	114
FCC ID:	2AEV4-01

3.2. Description of EUT

The equipment under test was an IP camera which incorporated the following wireless technologies; *Bluetooth*, *Bluetooth LE*, GPS, WLAN 2.4 GHz and 5 GHz bands.

3.3. Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing.

3.4. Additional Information Related to Testing

Technology Tested:	WLAN (IEEE 802.11a,n) / U-NII		
Type of Unit:	Transceiver		
Modulation:	BPSK, QPSK, 16QAM & 64QAM		
Data rates:	802.11a	6, 9, 12, 18, 24, 36 ,48 & 54 Mbps	
	802.11n HT20	MCS0 to MCS7 (1 spatial stream)	
	802.11n HT40	MCS0 to MCS7 (1 spatial stream)	
Power Supply Requirement(s):	Nominal	3.8 VDC via 120 VAC 60 Hz adaptor	
Antenna Gains:	5.15 to 5.35 GHz	-3.3 dBi	
	5.47 to 5.725 GHz	1.3 dBi	
Maximum Conducted Output Power:	20 MHz	13.6 dBm	
	40 MHz	14.1 dBm	
Channel Spacing:	20 MHz		
Transmit Frequency Band:	5150 MHz to 5250 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	36	5180
	Middle	40	5200
	Top	48	5240
Transmit Frequency Band:	5250 MHz to 5350 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	52	5260
	Middle	56	5280
	Top	64	5320
Transmit Frequency Band:	5470 MHz to 5725 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	100	5500
	Middle	116	5580
	Top	140	5700

Additional Information Related to Testing (continued)

Channel Spacing:	40 MHz		
Transmit Frequency Band:	5150 MHz to 5250 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	38	5190
	Top	46	5230
Transmit Frequency Band:	5250 MHz to 5350 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	54	5270
	Top	62	5310
Transmit Frequency Band:	5470 MHz to 5725 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	102	5510
	Middle	110	5550
	Top	134	5670

3.5. Support Equipment

The following support equipment was used to exercise the EUT during testing:

Description:	Test laptop
Brand Name:	Hewlett Packard
Model Name or Number:	Compaq 6910p
Serial Number:	HUB7451SGN

Description:	USB Cable
Brand Name:	SONY
Model Name or Number:	EC450
Serial Number:	132112D80289990

Description:	AC Charger
Brand Name:	SONY
Model Name or Number:	EP880
Serial Number:	8512W32 101946 SEM0600

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

The EUT was tested in the following operating mode(s):

- Continuously transmitting with a modulated carrier at maximum power on the bottom, middle and top channels as required using the supported data rates/modulation types.

4.2. Configuration and Peripherals

The EUT was tested in the following configuration(s):

- Controlled using a terminal application on the laptop PC along with instructions provided by the customer. The instructions were called *"How to set to WLAN continuous signal 01 Oct 2015.docx"* dated *13 January 2016.*
- The terminal application was used to enable a continuous transmission mode and to select the test channels, data rates and modulation schemes as required.
- In order for all test cases to meet their respective limits, the power settings have been specified in section 4.3 of this report. When the EUTwas placed in closed loop it was set to the maximum possible power that it would support.
- All supported modes and channel widths were initially investigated on one channel. The modes that produced the highest power and widest bandwidth for all bands were:
    - Highest output power and power spectral density
        - 802.11a – QPSK / 12 Mbps
        - 802.11n HT20 – 16QAM / MCS4
        - 802.11n HT40 – BPSK / MCS0
    - Widest bandwidth
        - 802.11a – BPSK / 9 Mbps
        - 802.11n HT20 – BPSK / MCS0
        - 802.11n HT40 – BPSK / MCS0

  Pre-scan results for all modes are archived on the Company server and available for inspection if required.
- RF cables and attenuators connecting the test equipment to the EUT were calibrated before use and the calibration data incorporated into the conducted measurement results.
- Transmitter spurious emissions were performed with the EUT transmitting with a data rate of MCS4 (802.11n HT20). This was found to be the worst case modulation scheme with regards to emissions after preliminary investigations and, as this mode emits the highest power spectral density, it was deemed to be the worst case.
- Transmitter radiated emissions were performed with the EUT connected to its AC charger and USB cable. The AC charger was powered by 120 VAC 60 Hz.
- The conducted sample with serial number MC000058 was used for 26 dB bandwidth and duty cycle tests.
- The conducted sample with serial number 0100174A was used for maximum conducted output power and peak power spectral density tests.

Configuration and Peripherals (continued)

- The radiated sample with serial number MC000170 was used for ac conducted spurious emissions and radiated emissions < 1 GHz tests.
- The radiated sample with serial number 01001716 was used for all other tests.

4.3. Power Settings

The power settings below have been used for testing:

U-NII Band 1 (5150 to 5250 MHz)

Mode	Bottom channel 5180 MHz	Middle channel 5200 MHz	Top Channel 5240 MHz
802.11a	11 dBm	11 dBm	11 dBm
802.11n HT20	11 dBm	11 dBm	11 dBm
	Bottom channel 5190 MHz		**Top Channel 5230 MHz**
802.11n HT40	11 dBm		11 dBm

U-NII Band 2A (5250 to 5350 MHz)

Mode	Bottom channel 5260 MHz	Middle channel 5280 MHz	Top Channel 5320 MHz
802.11a	11 dBm	11 dBm	11 dBm
802.11n HT20	11 dBm	11 dBm	11 dBm
	Bottom channel 5270 MHz		**Top Channel 5310 MHz**
802.11n HT40	11 dBm		11 dBm

U-NII Band 2C (5470 to 5725 MHz)

Mode	Bottom channel 5500 MHz	Middle channel 5580 MHz	Top Channel 5700 MHz
802.11a	Closed loop	Closed loop	Closed loop
802.11n HT20	Closed loop	Closed loop	Closed loop
	Bottom channel 5510 MHz	**Middle channel 5550 MHz**	**Top Channel 5670 MHz**
802.11n HT40	Closed loop	Closed loop	Closed loop

5. Measurements, Examinations and Derived Results

5.1. General Comments

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%. Please refer to *Section* 6 *Measurement Uncertainty* for details.

In accordance with UKAS requirements all the measurement equipment is on a calibration schedule. All equipment was within the calibration period on the date of testing.

5.2. Test Results

5.2.1. Transmitter AC Conducted Spurious Emissions

Test Summary:

Test Engineers:	Andrew Edwards & Kiren Mistry	**Test Date:**	22 September 2015
Test Sample Serial Number:	MC000170		

FCC Reference:	Part 15.207
Test Method Used:	ANSI C63.10 Section 6.2

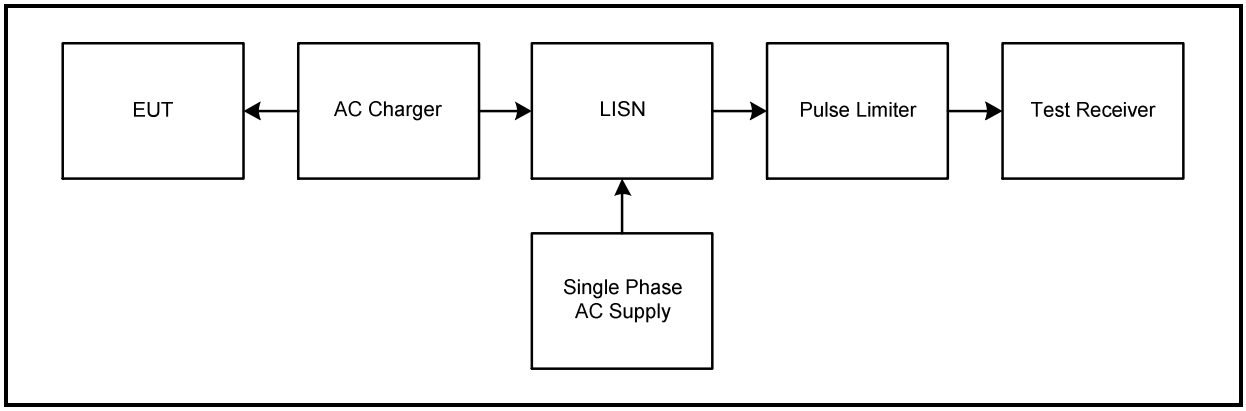
Environmental Conditions:

Temperature (°C):	21
Relative Humidity (%):	52

Note(s):

1. The EUT was plugged into a USB cable which is connected to an AC charger. The AC charger was connected to 120 VAC 60 Hz single phase supply via a LISN.
2. Pre-scans were performed and markers placed on the highest live and neutral measured levels. Final measurements were performed on the marker frequencies and the results entered into the tables below.
3. A pulse limiter was fitted between the LISN and the test receiver.

Test setup:



Transmitter AC Conducted Spurious Emissions (continued)

Results: Live / Quasi Peak

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.150	Live	56.0	66.0	10.0	Complied
0.155	Live	55.5	65.8	10.3	Complied
0.258	Live	45.2	61.5	16.3	Complied
0.438	Live	18.5	57.1	38.6	Complied
0.582	Live	13.7	56.0	42.3	Complied

Results: Live / Average

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.155	Live	28.5	55.8	27.3	Complied
0.209	Live	22.9	53.3	30.4	Complied
0.290	Live	18.7	50.5	31.8	Complied
0.461	Live	8.5	46.7	38.2	Complied
1.176	Live	6.0	46.0	40.0	Complied

Transmitter AC Conducted Spurious Emissions (continued)

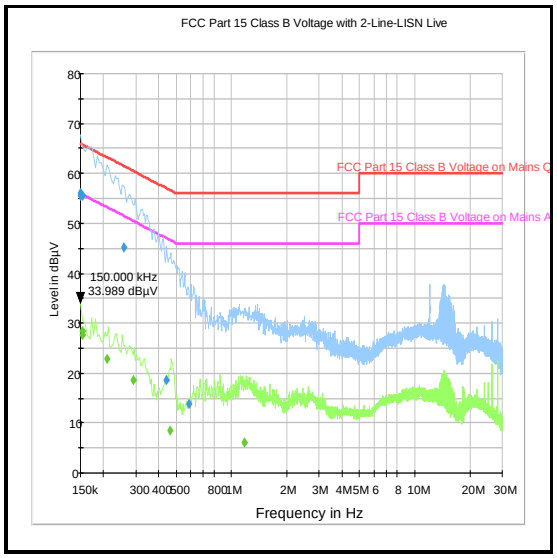
Results: Neutral / Quasi Peak

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.155	Neutral	55.2	65.8	10.6	Complied
0.177	Neutral	53.4	64.6	11.2	Complied
0.330	Neutral	12.9	59.5	46.6	Complied
0.452	Neutral	14.2	56.8	42.6	Complied
0.965	Neutral	8.5	56.0	47.5	Complied
1.298	Neutral	8.5	56.0	47.5	Complied

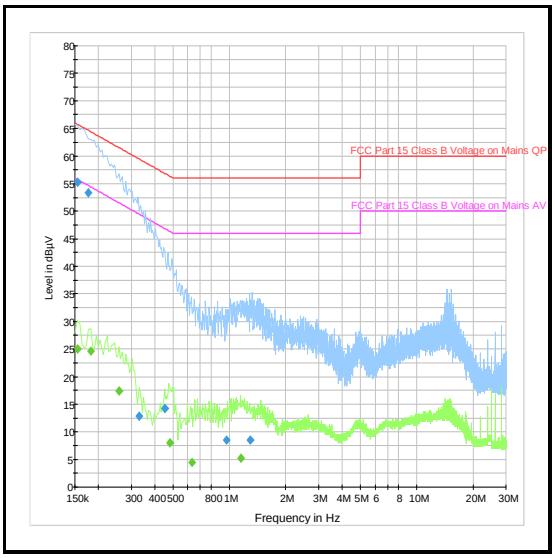
Results: Neutral / Average

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.155	Neutral	25.1	55.8	30.7	Complied
0.182	Neutral	24.7	54.4	29.7	Complied
0.258	Neutral	17.4	51.5	34.1	Complied
0.483	Neutral	8.0	46.3	38.3	Complied
0.632	Neutral	4.5	46.0	41.5	Complied
1.149	Neutral	5.2	46.0	40.8	Complied

Transmitter AC Conducted Spurious Emissions (continued)



Live



Neutral

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

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1625	Thermohygrometer	JM Handelspunkt	30.5015.06	None stated	07 Jan 2016	12
A649	LISN	Rohde & Schwarz	ESH3-Z5	825562/008	14 Jul 2016	12
A1830	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100668	02 Mar 2016	12
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	14 Oct 2015	12

5.2.2. Transmitter 26 dB Emission Bandwidth

Test Summary:

Test Engineer:	Andrew Edwards	**Test Dates:**	14 September 2015 & 21 September 2015
Test Sample Serial Number:	MC000058		

FCC Reference:	Part 15.403(i)
Test Method Used:	KDB 789033 D02 Section II.C.1.

Environmental Conditions:

Temperatures (°C):	23 to 27
Relative Humidity (%):	34 to 52

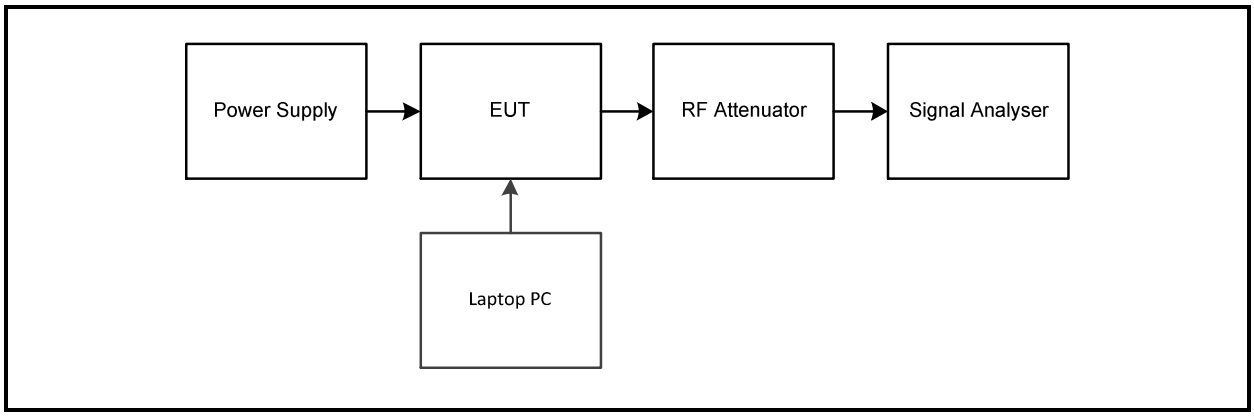
Note(s):

1. All configurations supported by the EUT were investigated on the one channel in accordance with KDB 789033 Section II.C.1. Emission Bandwidth (EBW) test procedure. The data rates that produced the widest bandwidth and therefore deemed worst case were:
    - 802.11a – BPSK / 9 Mbps
    - 802.11n HT20 – BPSK / MCS0
    - 802.11n HT40 – BPSK / MCS0
2. Final measurements were performed in each supported operating band using the above configurations on the bottom, middle and top channels.
3. For 20 MHz measurements the signal analyser resolution bandwidth was set to 200 kHz (approximately 1% of the emission bandwidth) and video bandwidth 1 MHz. A peak detector was used, sweep time set to auto and trace mode was Max Hold. The span was set to 35 MHz. The emission bandwidth was measured at 26 dB down from the peak of the signal.
4. For 40 MHz measurements the signal analyser resolution bandwidth was set to 500 kHz (approximately 1% of the emission bandwidth) and video bandwidth 2 MHz. A peak detector was used, sweep time set to auto and trace mode was Max Hold. The span was set to 75 MHz. The emission bandwidth was measured at 26 dB down from the peak of the signal.
5. The signal analyser was connected to the RF port on the EUT using suitable attenuation and RF cable.
6. Plots for all data rates are archived on the Company server and available for inspection upon request.
7. For the power measurements in this report, the highest power output level was recorded when the EUT was configured as:
    - 802.11a – QPSK / 12 Mbps
    - 802.11n HT20 – 16QAM / MCS4

    Emission bandwidth plots for these configurations have been included as ‘Reference plots’ at the end of this section and the results used for calculations on Section 5.2.4.

Transmitter 26 dB Emission Bandwidth (continued)

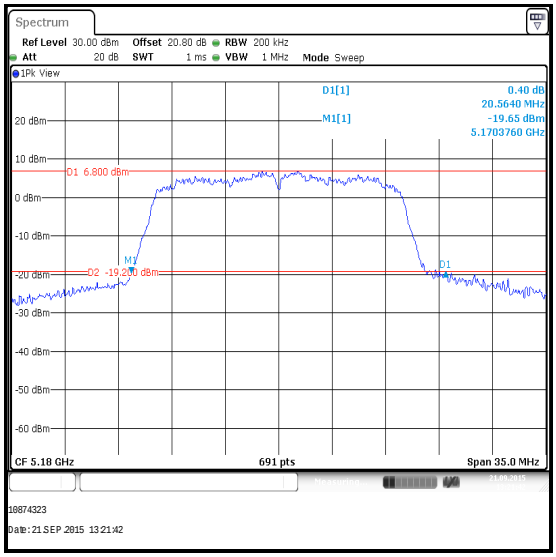
Test setup:



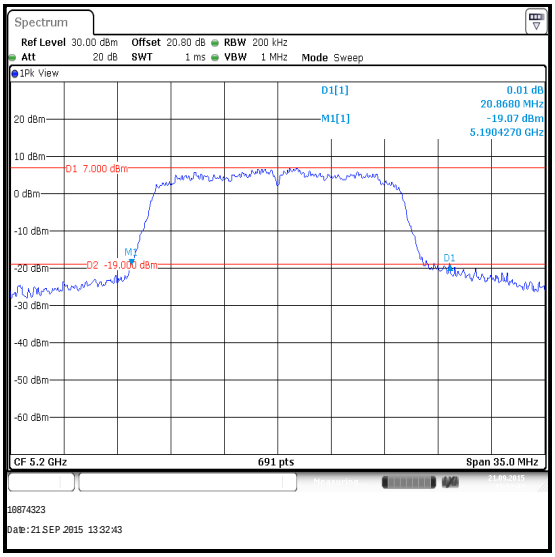
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11a / 20 MHz / 5.15-5.25 GHz band

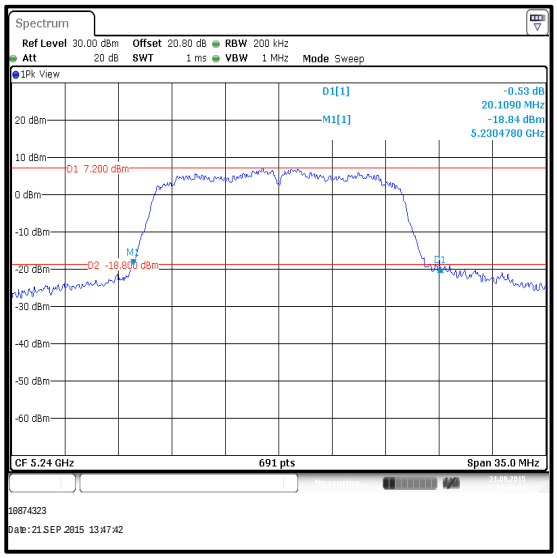
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps	26 dB Emission Bandwidth (MHz)
Bottom	5180	BPSK	9	20.564
Middle	5200	BPSK	9	20.868
Top	5240	BPSK	9	20.109



Bottom Channel



Middle Channel

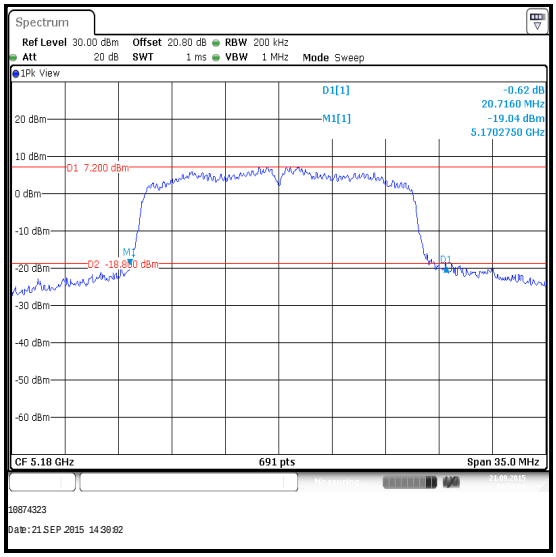


Top Channel

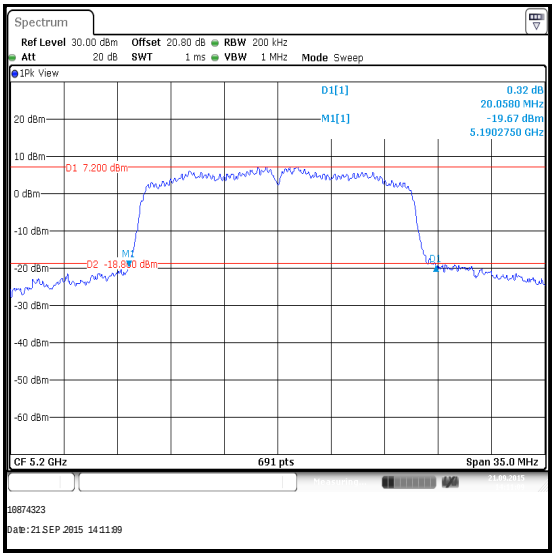
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11n / 20 MHz / 5.15-5.25 GHz band

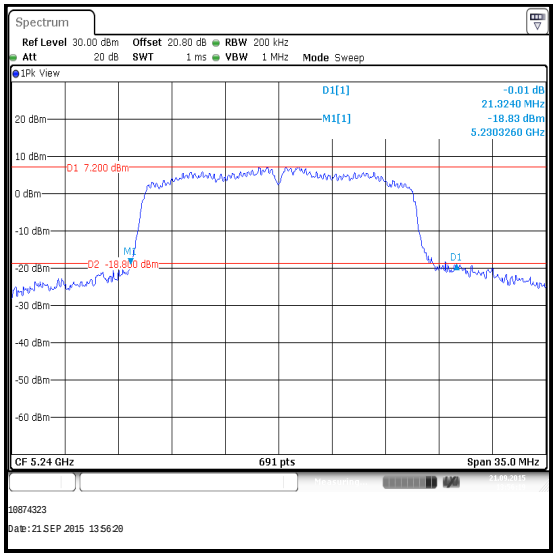
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5180	BPSK	7.2 / 0	20.716
Middle	5200	BPSK	7.2 / 0	20.058
Top	5240	BPSK	7.2 / 0	21.324



Bottom Channel



Middle Channel

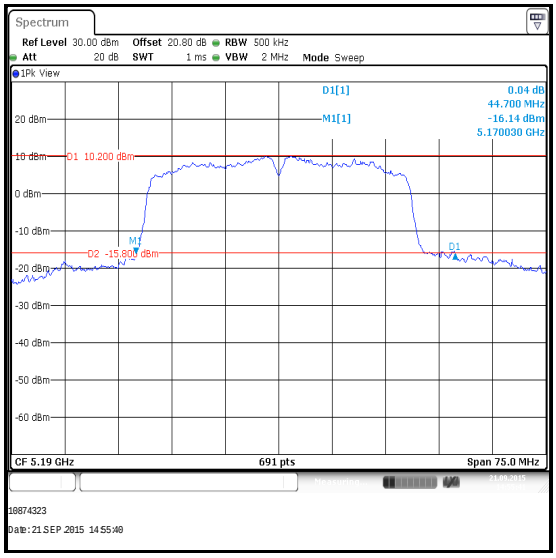


Top Channel

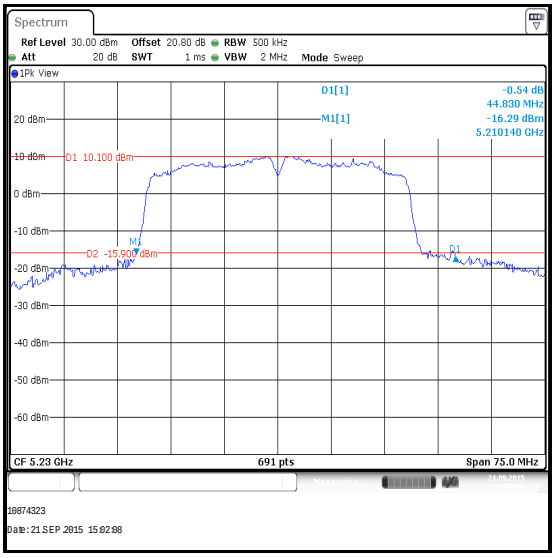
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11n / 40 MHz / 5.15-5.25 GHz band

Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5190	BPSK	15.0 / 0	44.700
Top	5230	BPSK	15.0 / 0	44.830



Bottom Channel

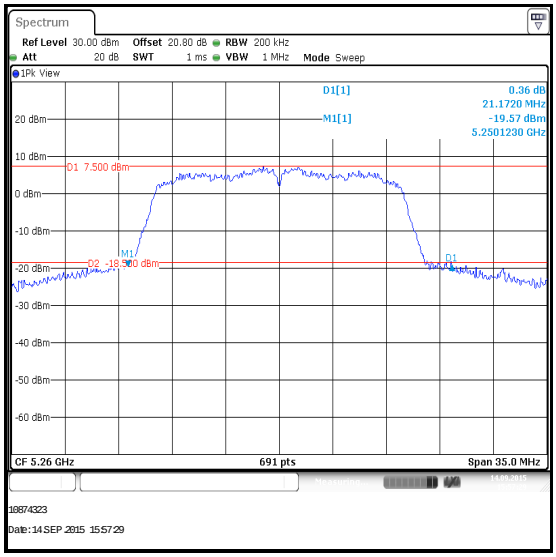


Top Channel

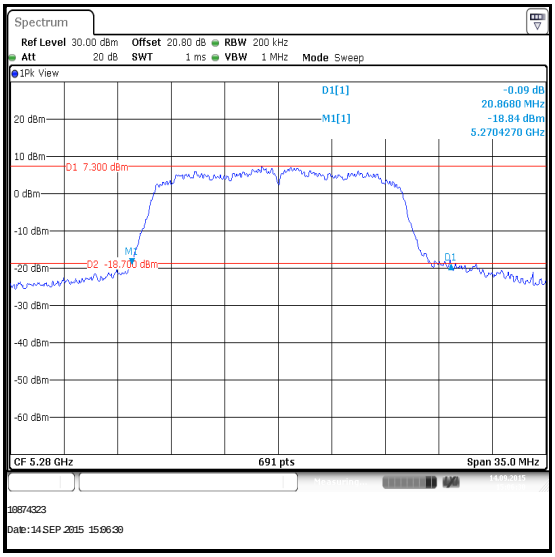
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11a / 20 MHz / 5.25-5.35 GHz band

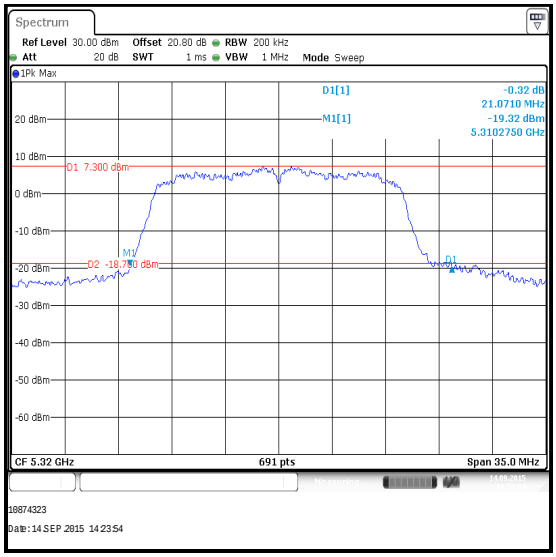
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps	26 dB Emission Bandwidth (MHz)
Bottom	5260	BPSK	9	21.172
Middle	5280	BPSK	9	20.868
Top	5320	BPSK	9	21.071



Bottom Channel



Middle Channel

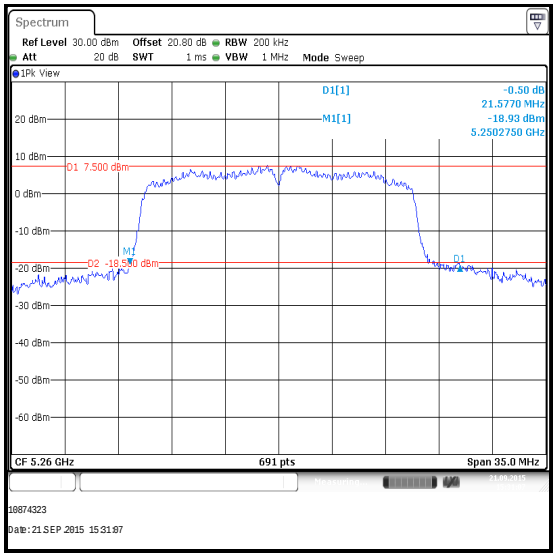


Top Channel

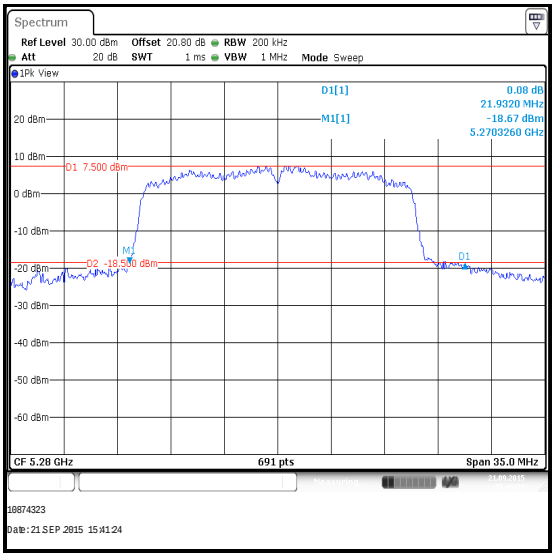
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11n / 20 MHz / 5.25-5.35 GHz band

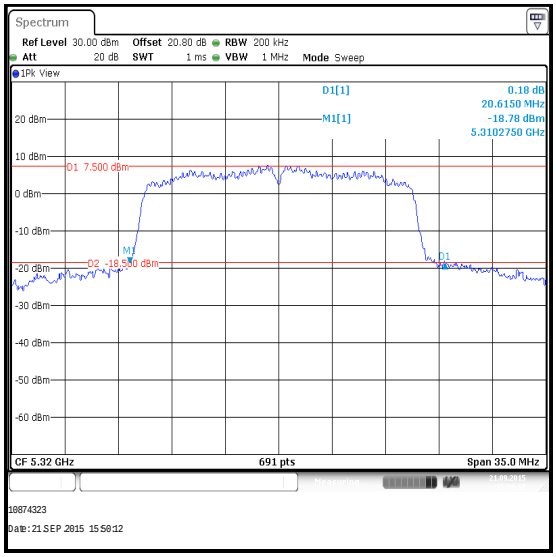
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5260	BPSK	7.2 / 0	21.577
Middle	5280	BPSK	7.2 / 0	21.932
Top	5320	BPSK	7.2 / 0	20.615



Bottom Channel



Middle Channel

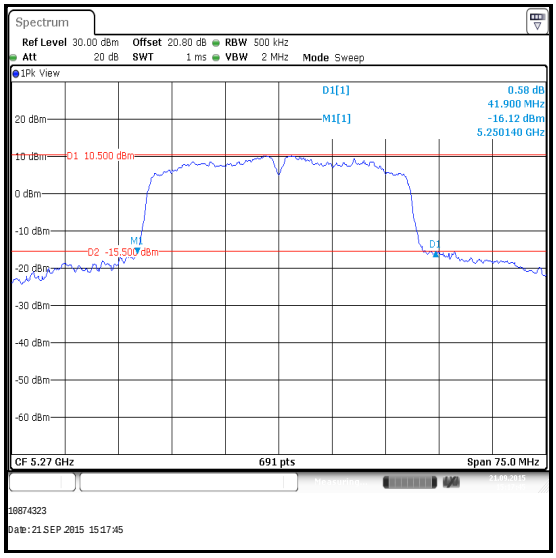


Top Channel

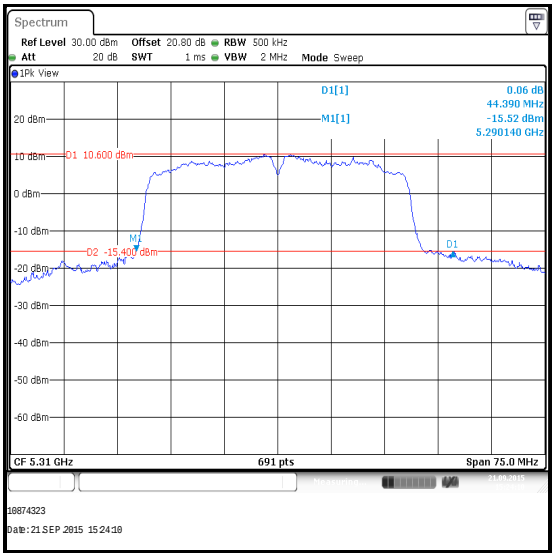
Transmitter 26 dB Emission Bandwidth (continued)

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

Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5270	BPSK	15.0 / 0	41.900
Top	5310	BPSK	15.0 / 0	44.390



Bottom Channel

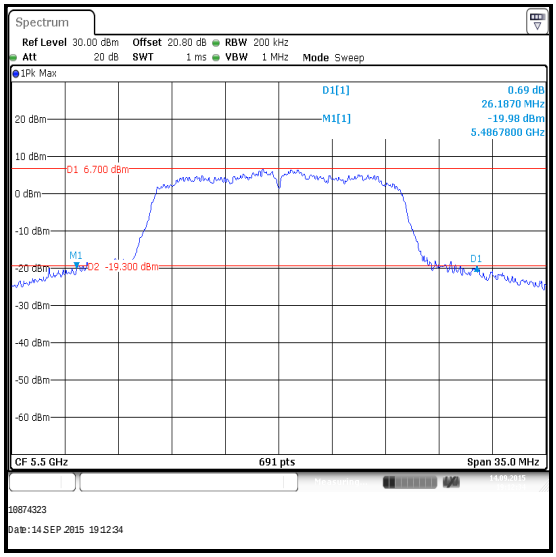


Top Channel

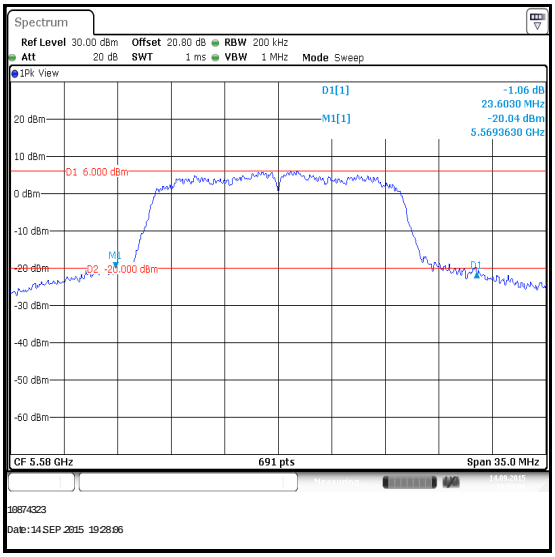
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11a / 20 MHz / 5.47-5.725 GHz band

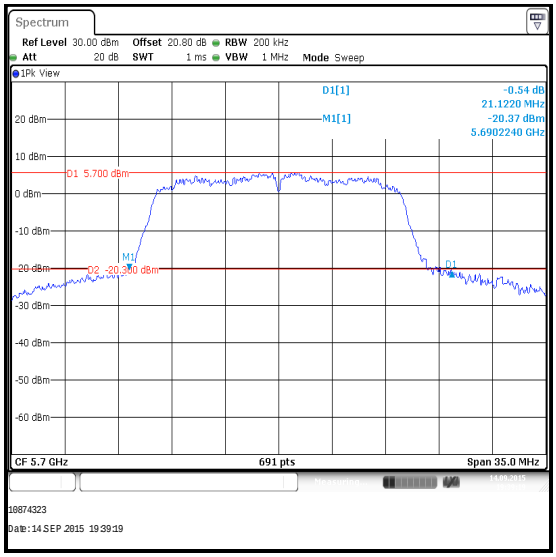
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps	26 dB Emission Bandwidth (MHz)
Bottom	5500	BPSK	9	26.187
Middle	5580	BPSK	9	23.603
Top	5700	BPSK	9	21.122



Bottom Channel



Middle Channel

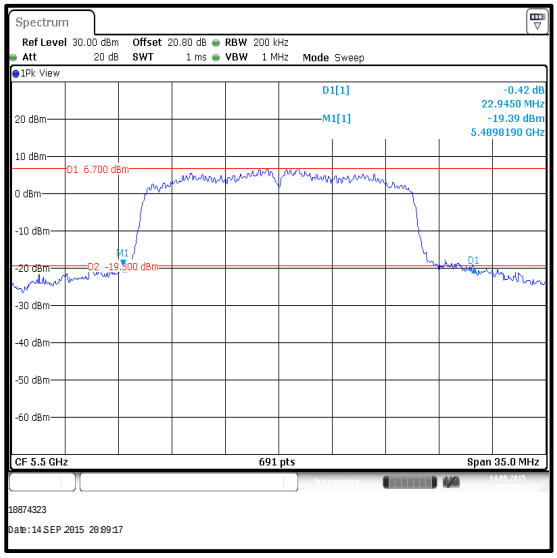


Top Channel

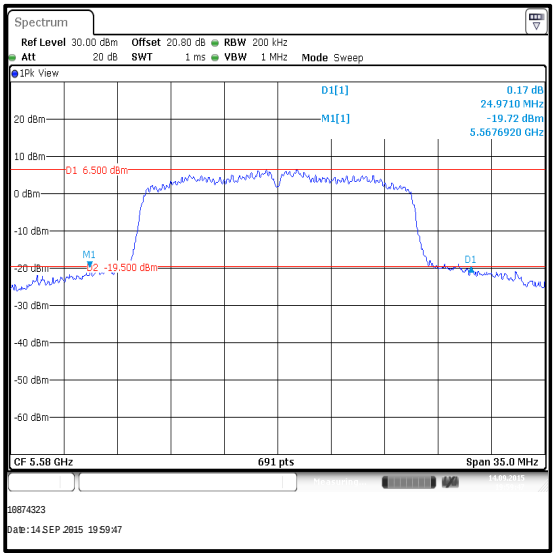
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11n / 20 MHz / 5.47-5.725 GHz band

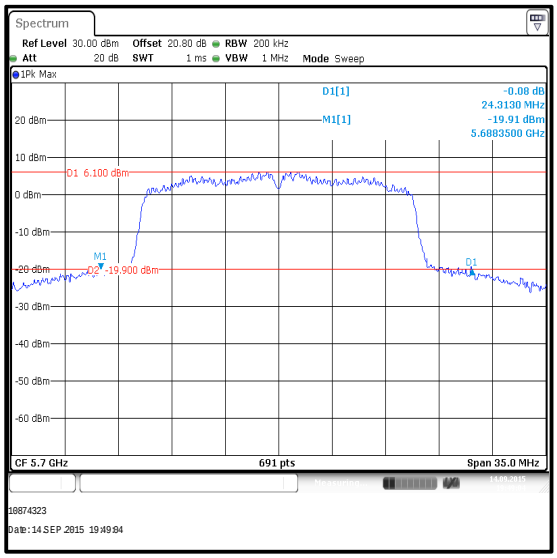
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5500	BPSK	7.2 / 0	22.945
Middle	5580	BPSK	7.2 / 0	24.971
Top	5700	BPSK	7.2 / 0	24.313



Bottom Channel



Middle Channel

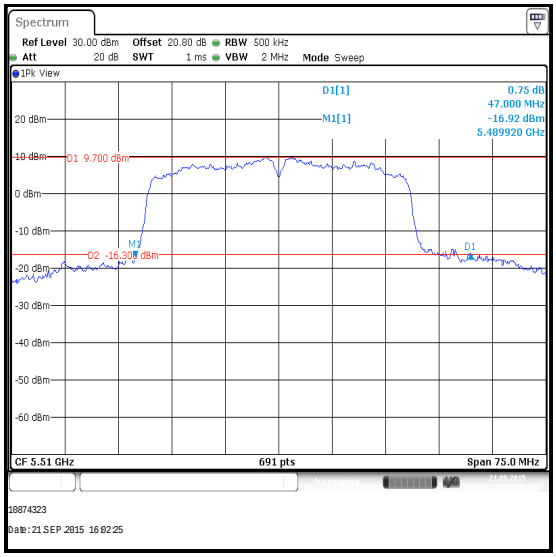


Top Channel

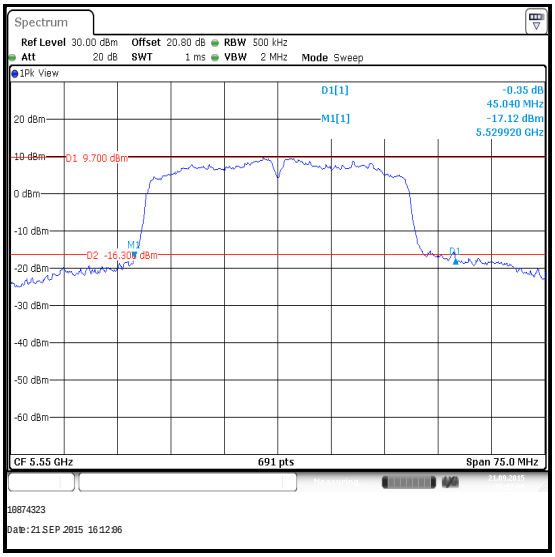
Transmitter 26 dB Emission Bandwidth (continued)

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

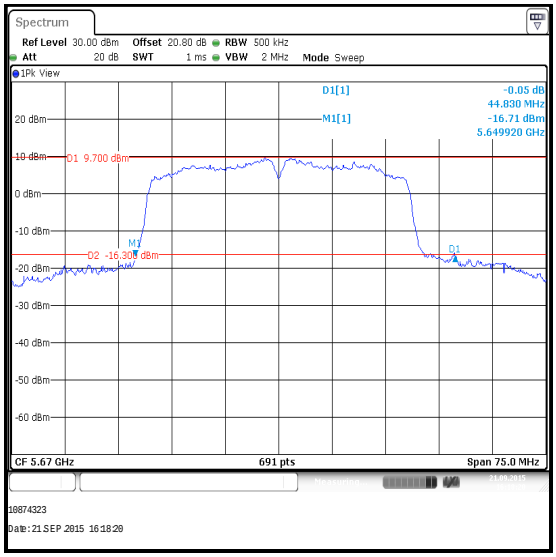
Channel	Frequency (MHz)	Modulation scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5510	BPSK	15.0 / 0	47.000
Middle	5550	BPSK	15.0 / 0	45.040
Top	5670	BPSK	15.0 / 0	44.830



Bottom Channel



Middle Channel

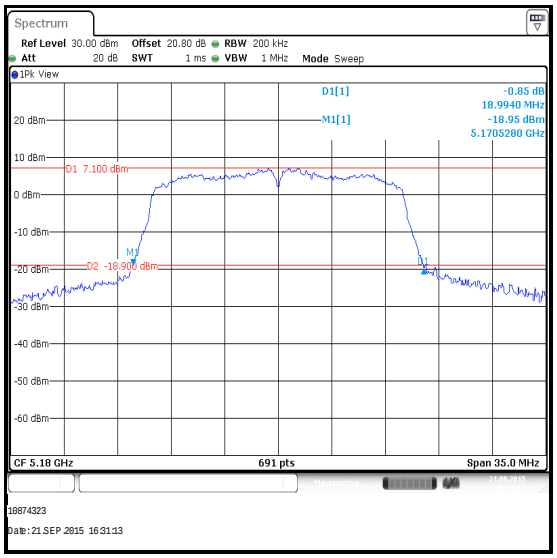


Top Channel

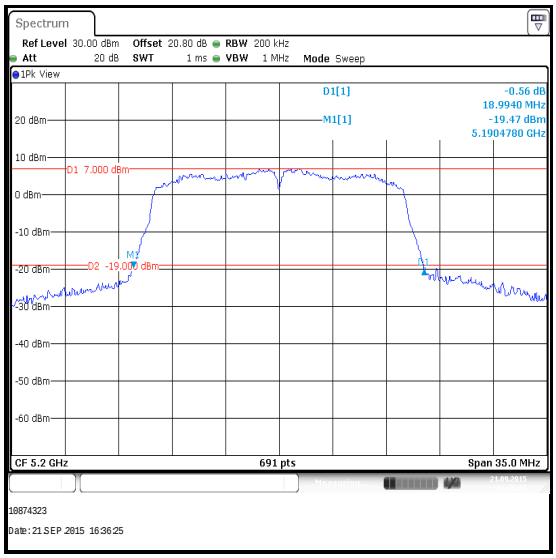
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11a / 20 MHz / 5.15-5.25 GHz band (Reference Plots)

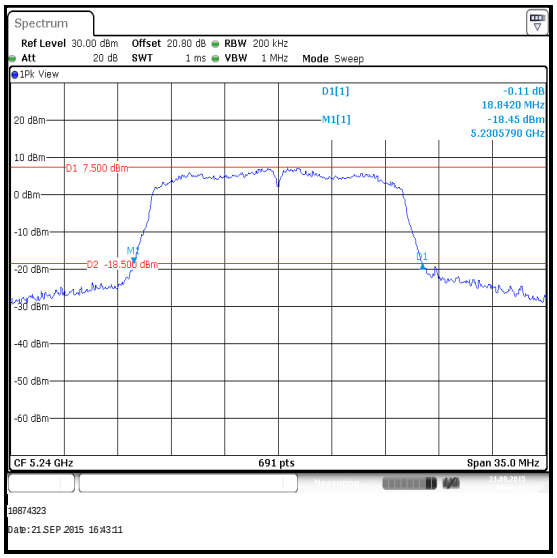
Channel	Frequency (MHz)	Modulation Scheme	Data Rate Mbps	26 dB Emission Bandwidth (MHz)
Bottom	5180	QPSK	12	18.994
Middle	5200	QPSK	12	18.994
Top	5240	QPSK	12	18.842



Bottom Channel



Middle Channel

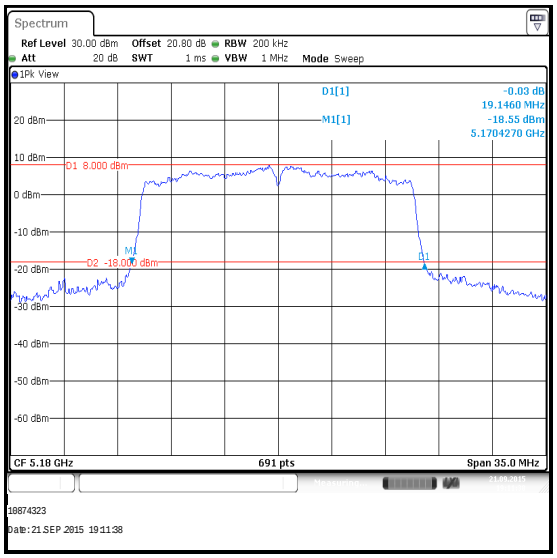


Top Channel

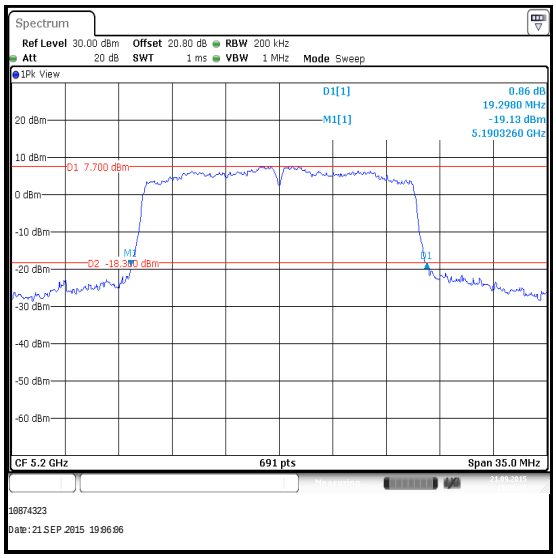
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11n / 20 MHz/ 5.15-5.25 GHz band (Reference Plots)

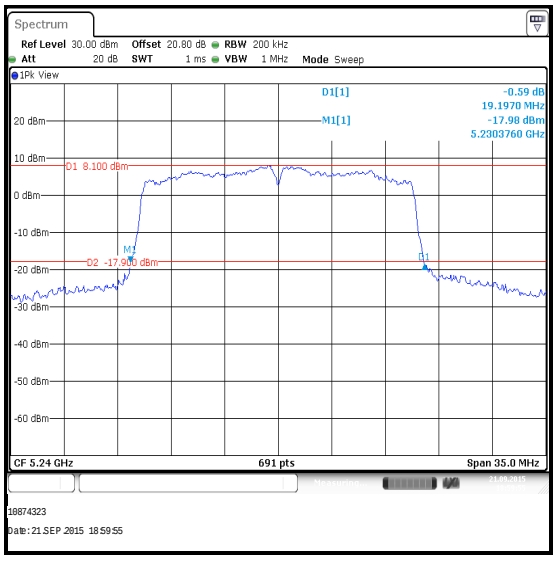
Channel	Frequency (MHz)	Modulation Scheme	Data Rate Mbps / MCS	26 dB Emission Bandwidth (MHz)
Bottom	5180	16QAM	43.3 / 4	19.146
Middle	5200	16QAM	43.3 / 4	19.298
Top	5240	16QAM	43.3 / 4	19.197



Bottom Channel



Middle Channel

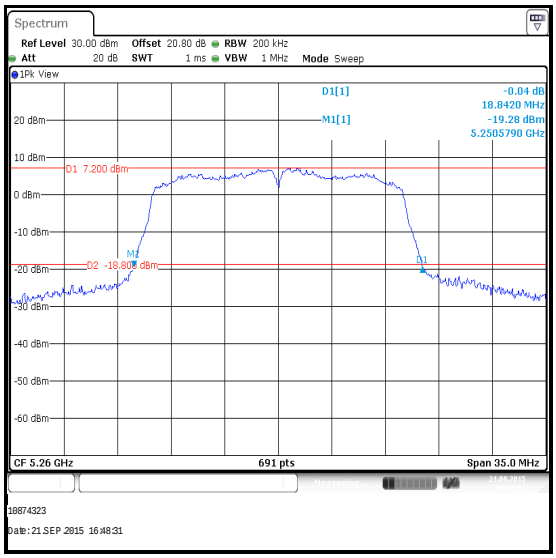


Top Channel

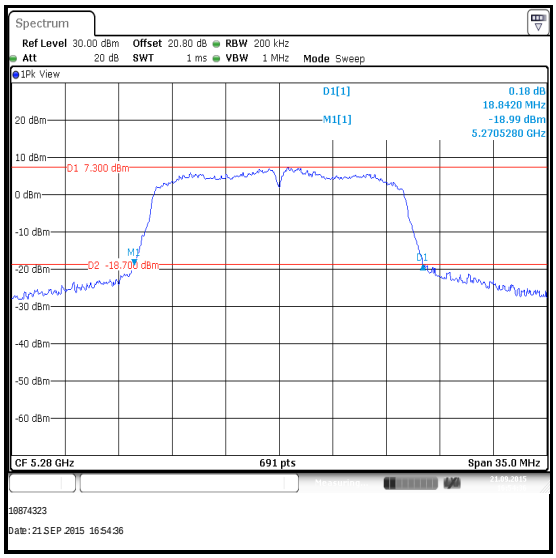
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11a / 20 MHz / 5.25-5.35 GHz band (Reference Plots)

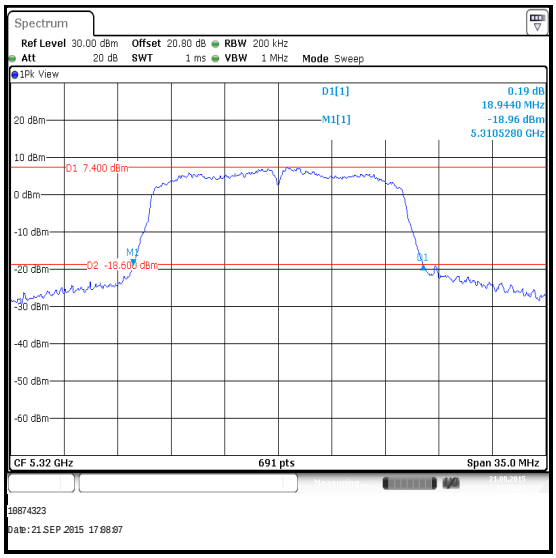
Channel	Frequency (MHz)	Modulation Scheme	Data Rate Mbps	26 dB Emission Bandwidth (MHz)
Bottom	5260	QPSK	12	18.842
Middle	5280	QPSK	12	18.842
Top	5320	QPSK	12	18.944



Bottom Channel



Middle Channel

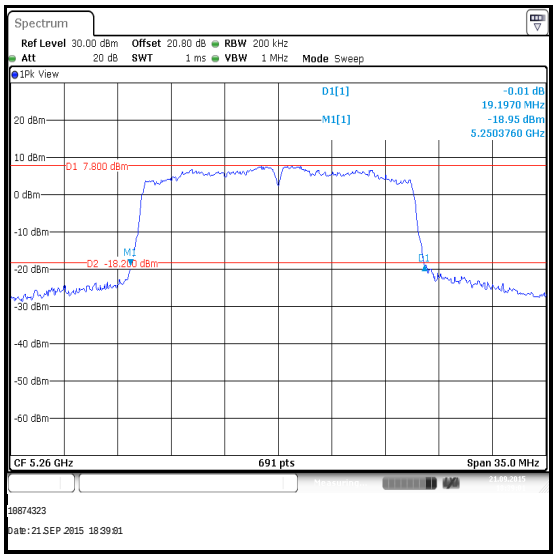


Top Channel

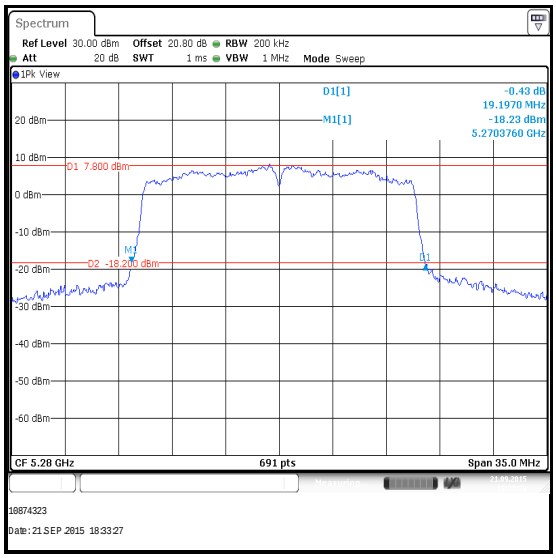
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11n / 20 MHz / 5.25-5.35 GHz band (Reference Plots)

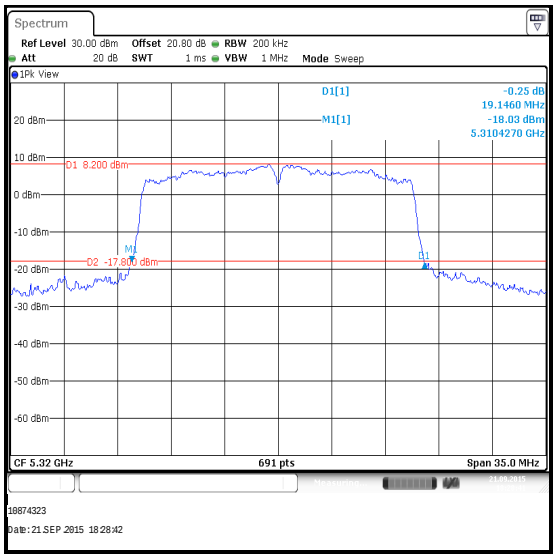
Channel	Frequency (MHz)	Modulation Scheme	Data Rate Mbps	26 dB Emission Bandwidth (MHz)
Bottom	5260	16QAM	43.3 / 4	19.197
Middle	5280	16QAM	43.3 / 4	19.197
Top	5320	16QAM	43.3 / 4	19.146



Bottom Channel



Middle Channel

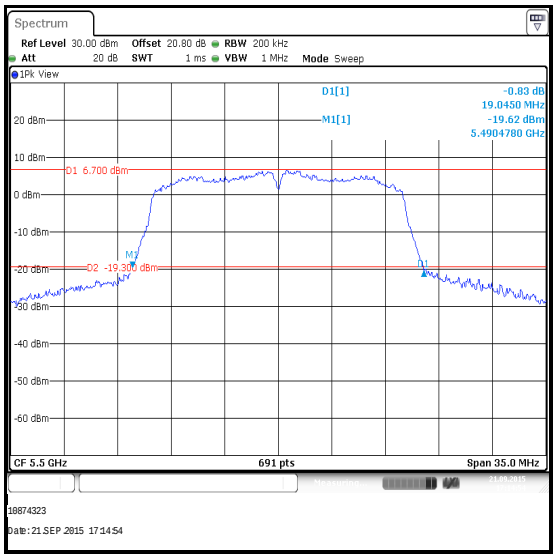


Top Channel

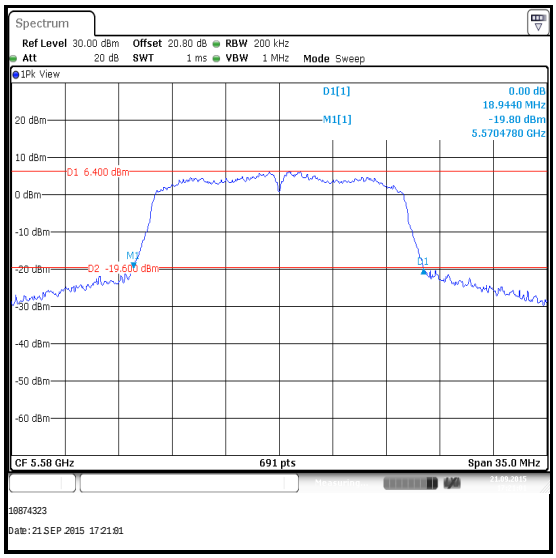
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11a / 20 MHz / 5.47-5.725 GHz band (Reference Plots)

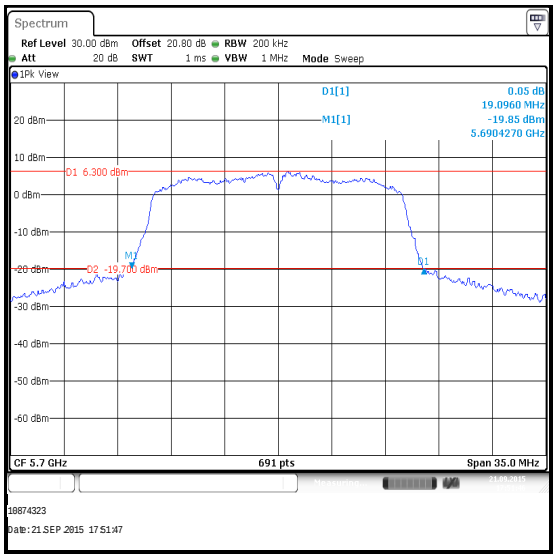
Channel	Frequency (MHz)	Modulation Scheme	Data Rate Mbps	26 dB Emission Bandwidth (MHz)
Bottom	5500	QPSK	12	19.045
Middle	5580	QPSK	12	18.944
Top	5700	QPSK	12	19.096



Bottom Channel



Middle Channel

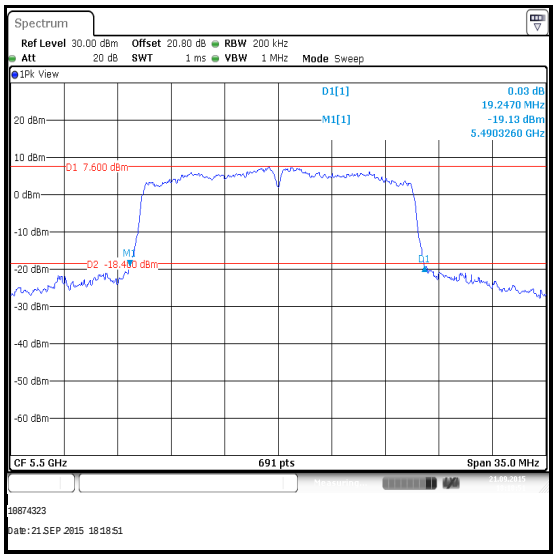


Top Channel

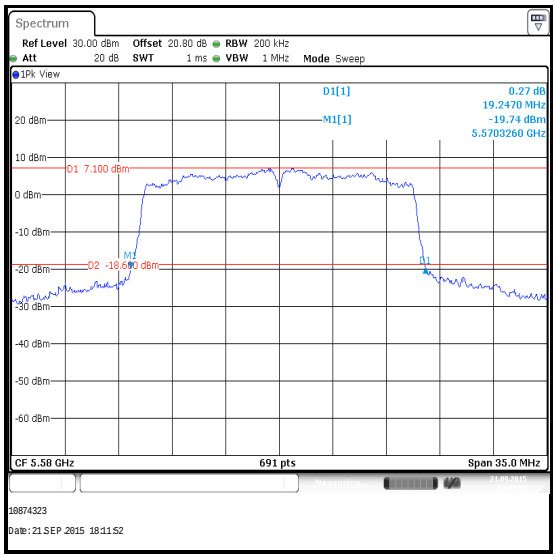
Transmitter 26 dB Emission Bandwidth (continued)

Results: 802.11n / 20 MHz / 5.47-5.725 GHz band (Reference Plots)

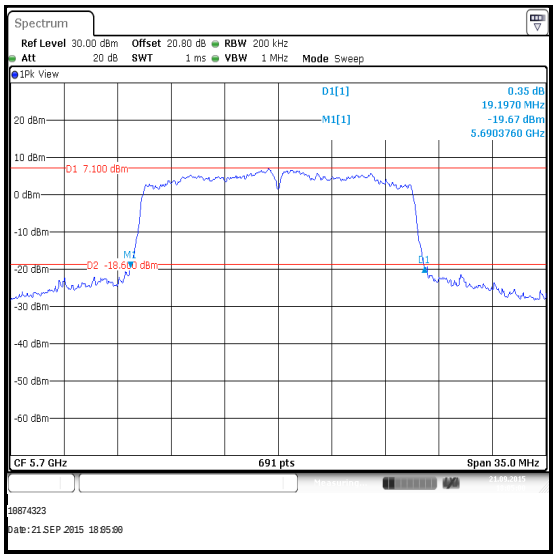
Channel	Frequency (MHz)	Modulation Scheme	Data Rate Mbps	26 dB Emission Bandwidth (MHz)
Bottom	5500	16QAM	43.3 / 4	19.247
Middle	5580	16QAM	43.3 / 4	19.247
Top	5700	16QAM	43.3 / 4	19.197



Bottom Channel



Middle Channel



Top Channel

Transmitter 26 dB Emission Bandwidth (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1783	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	23 Apr 2016	12
M1835	Signal Anaylser	Rohde & Schwarz	FSV30	103050	18 Feb 2016	12
A2522	Attenuator	AtlanTecRF	AN18-20	832797#3	Calibrated before use	-
S0537	DC Power Supply	TTI	EL302D	249928	Calibrated before use	-
M1269	Multimeter	Fluke	179	90250210	26 May 2016	12

5.2.3. Transmitter Duty Cycle

Test Summary:

Test Engineer:	Andrew Edwards	**Test Date:**	03 September 2015
Test Sample Serial Number:	MC000058		

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

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	34

Note(s):

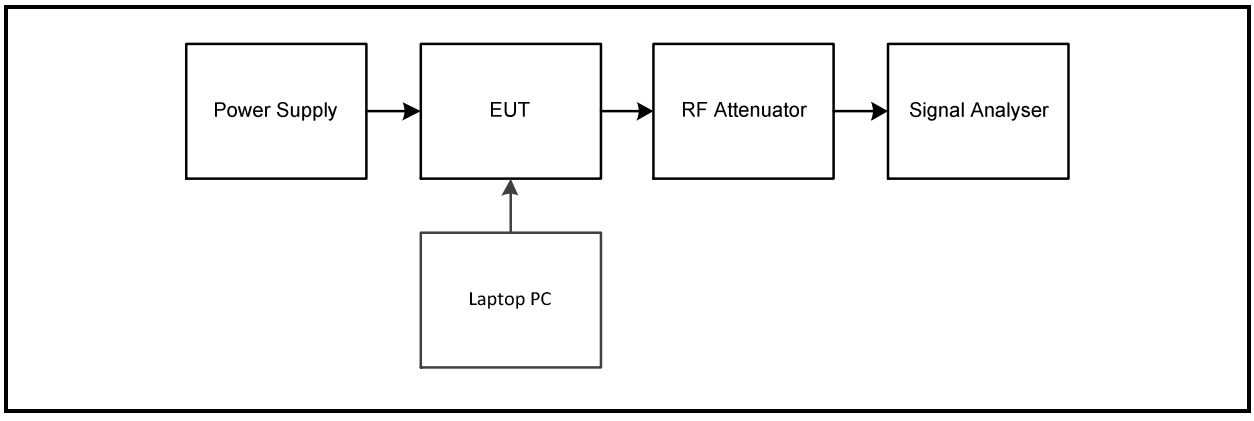
1. In order to assist with the determination of the average level of fundamental and spurious emissions field strength, measurements were made of duty cycle to determine the transmission duration and the silent period time of the transmitter. The transmitter duty cycle was measured using a spectrum analyser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

10 log 1 / (On Time / [Period or 100 ms whichever is the lesser]).

802.11a / 9 Mbps duty cycle: 10 log (1 / (941.010 µs / 1040.430 µs*)) = 0.4*
802.11a / 12 Mbps duty cycle: 10 log (1 / (707.100 µs / 805.940 µs)) = 0.6
802.11n HT20 / MCS0 duty cycle: 10 log (1 / (1181.300 µs / 1280.430 µs)) = 0.3
802.11n HT20 / MCS4 duty cycle: 10 log (1 / (226.891 µs / 326.022 µs)) = 1.6
802.11n HT40 / MCS0 duty cycle: 10 log (1 / (586.880 µs / 685.430 µs)) = 0.7

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

Test setup:

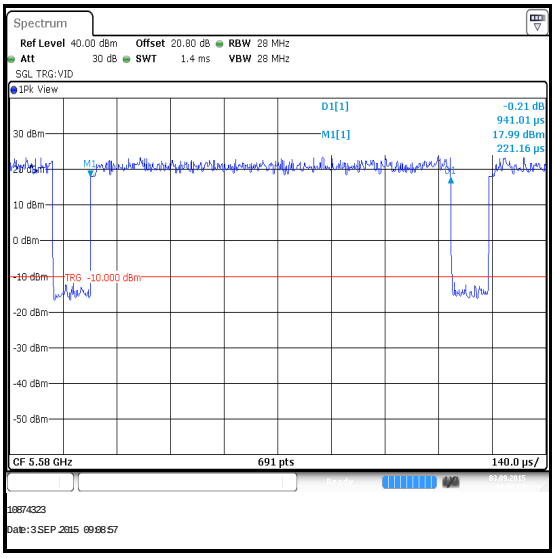


Transmitter Duty Cycle (continued)

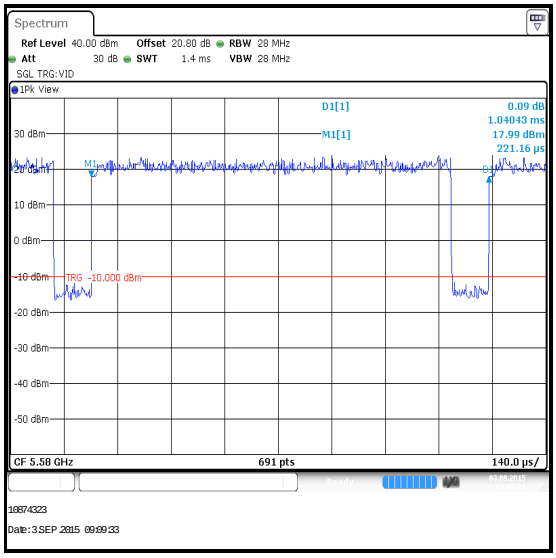
Results: 802.11a / 20 MHz / 9 Mbps

Pulse Duration (µs)	Duty Cycle (dB)
941.010	0.4

Period (µs)
1040.430



TX on time



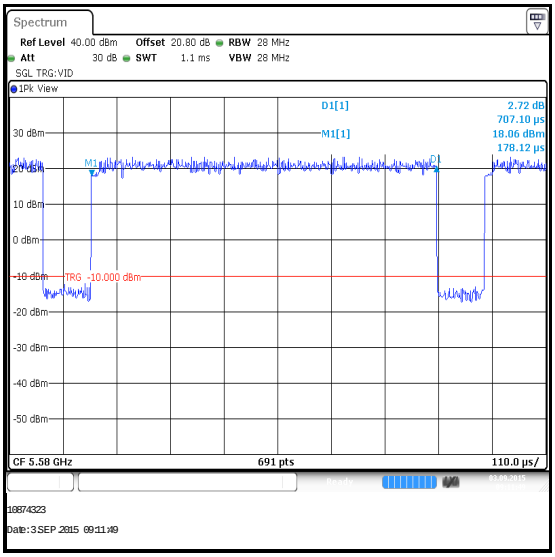
TX on + off time

Transmitter Duty Cycle (continued)

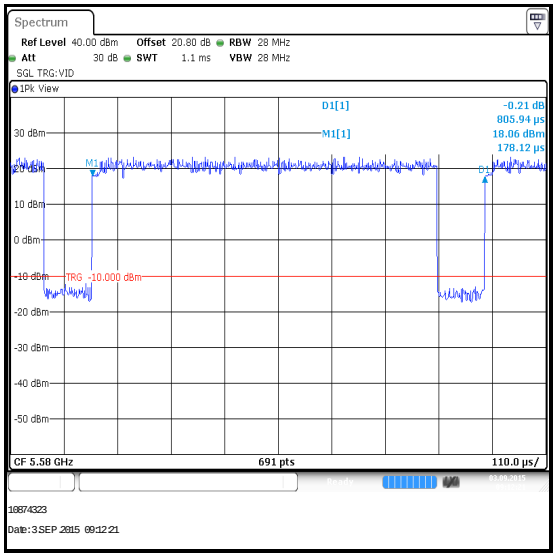
Results: 802.11a / 20 MHz / 12 Mbps

Pulse Duration (µs)	Duty Cycle (dB)
707.100	0.6

Period (µs)
805.940



TX on time



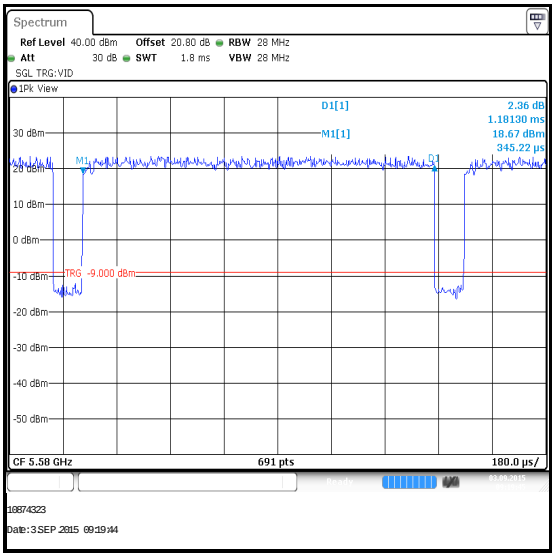
TX on + off time

Transmitter Duty Cycle (continued)

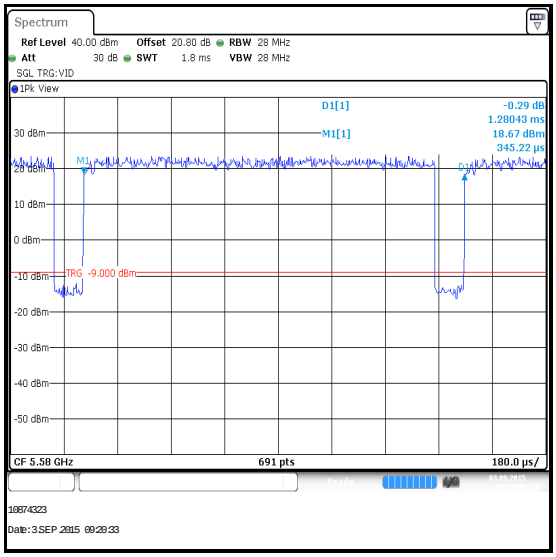
Results: 802.11n / 20 MHz / MCS0

Pulse Duration (µs)	Duty Cycle (dB)
1181.300	0.3

Period (µs)
1280.430



TX on time



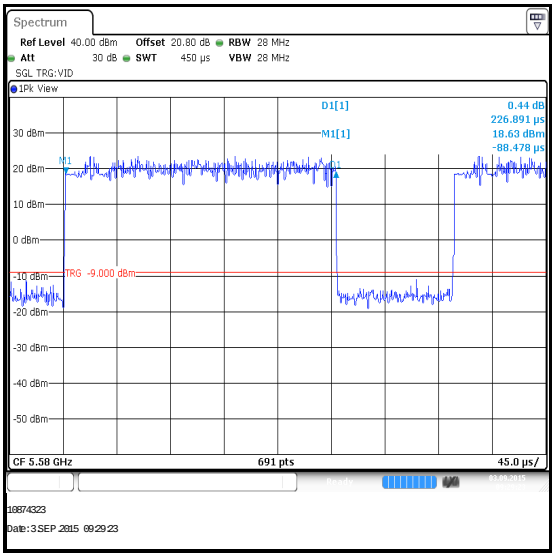
TX on + off time

Transmitter Duty Cycle (continued)

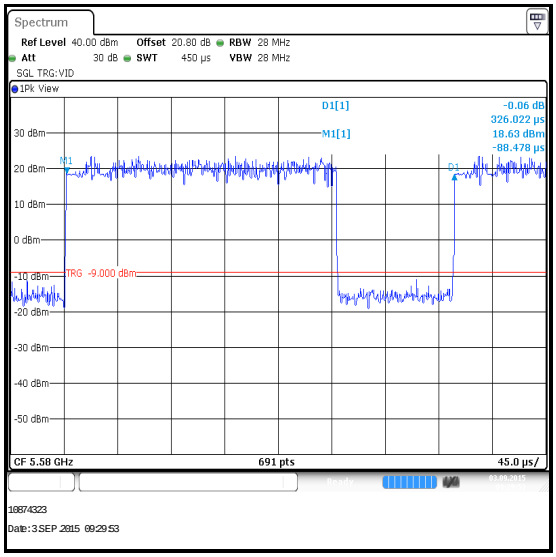
Results: 802.11n / 20 MHz / MCS4

Pulse Duration (µs)	Duty Cycle (dB)
226.891	1.6

Period (µs)
326.022



TX on time



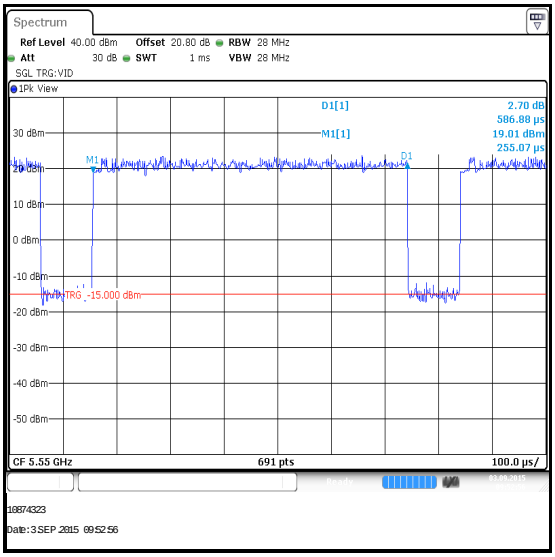
TX on + off time

Transmitter Duty Cycle (continued)

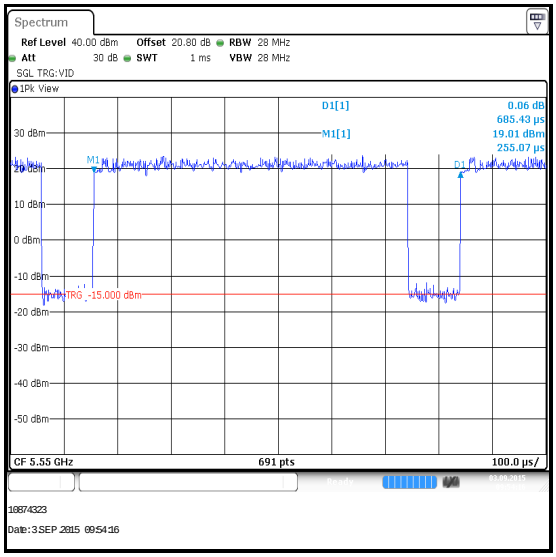
Results: 802.11n / 40 MHz / MCS0

Pulse Duration (µs)	Duty Cycle (dB)
586.880	0.7

Period (µs)
685.430



TX on time



TX on + off time

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1783	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	23 Apr 2016	12
M1835	Signal Anaylser	Rohde & Schwarz	FSV30	103050	18 Feb 2016	12
A2522	Attenuator	AtlanTecRF	AN18-20	832797#3	Calibrated before use	-
S0537	DC Power Supply	TTI	EL302D	249928	Calibrated before use	-
M1269	Multimeter	Fluke	179	90250210	26 May 2016	12

5.2.4. Transmitter Maximum Conducted Output Power

Test Summary:

Test Engineer:	Keith Tucker	**Test Date:**	04 February 2016
Test Sample Serial Number:	0100174A		

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

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	35

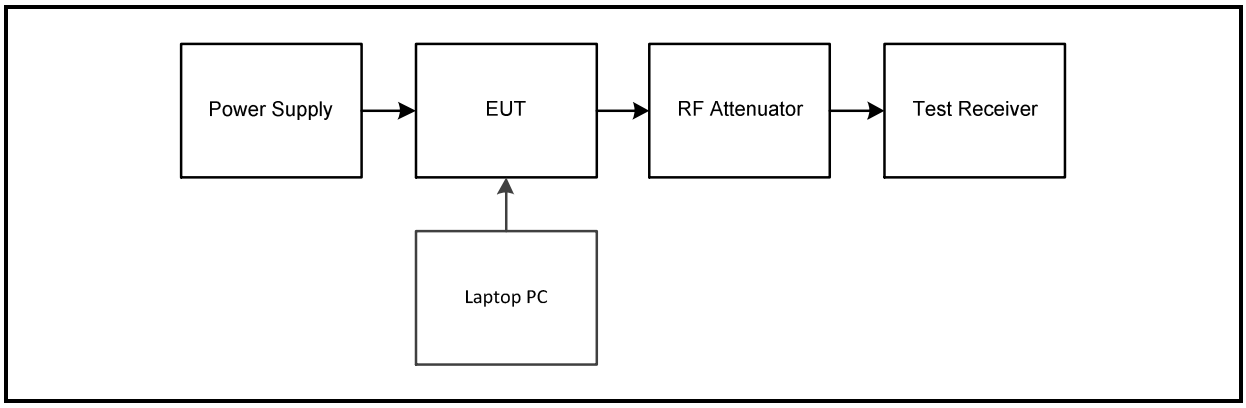
Note(s):

1. All supported modes and channel widths were initially investigated on one channel. The modes that produced the highest power and therefore deemed worst case were:
    - 802.11a – QPSK / 12 Mbps
    - 802.11n HT20 – 16QAM / MCS4
    - 802.11n HT40 – BPSK / MCS0

   Measurements were then performed in these modes on bottom, middle and top channels in all operating bands.
2. As the duty cyle is < 98%, conducted output power measurements were performed in accordance with FCC KDB 789033 II.E.2.d) Method SA-2. The test receiver's integration function was used to integrate across the 26 dB emission bandwidth. The resolution bandwidth was set to 1 MHz and video bandwidth 3 MHz. An RMS detector was used and sweep time was set to auto and 300 traces performed. The span was set to encompass the 26 dB emission bandwidth. The channel power results are recorded in the tables below.
3. The calculated duty cycle in section 5.2.3 was added to the measured power in order to compute the average power during the actual transmission time.
4. The EUT antenna has a gain of <6 dBi.
5. The test receiver was connected to the RF port on the EUT using suitable attenuation and RF cable. An RF level offset was entered on the test receiver to compensate for the loss of the attenuator and RF cable.
6. The Part 15.407(a)(1)(iv) limit shall not exceed 250 mW (24.0 dBm).

Transmitter Maximum Conducted Output Power (continued)

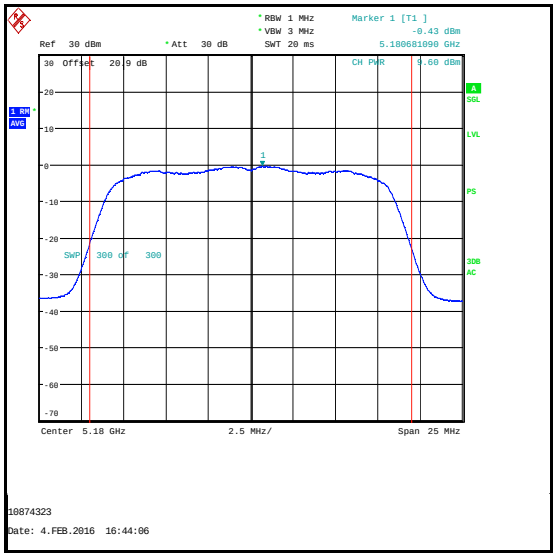
Test setup:



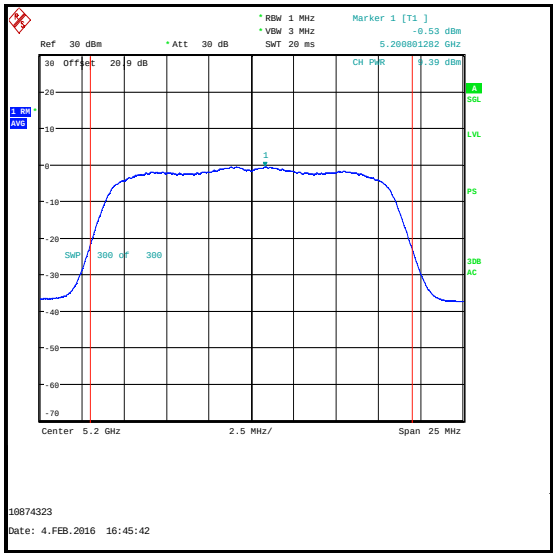
Transmitter Maximum Conducted Output Power (5.15-5.25 GHz band) (continued)

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

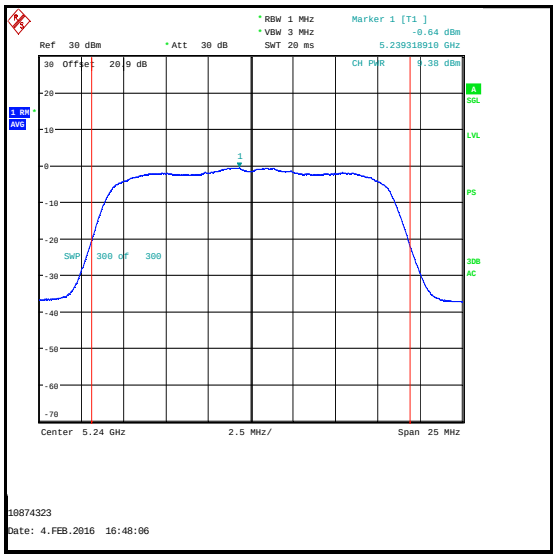
Channel	Frequency (MHz)	Conducted Power (dBm)	Duty cycle correction factor (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5180	9.6	0.6	10.2	24.0	13.8	Complied
Middle	5200	9.4	0.6	10.0	24.0	14.0	Complied
Top	5240	9.4	0.6	10.0	24.0	14.0	Complied



Bottom Channel



Middle Channel

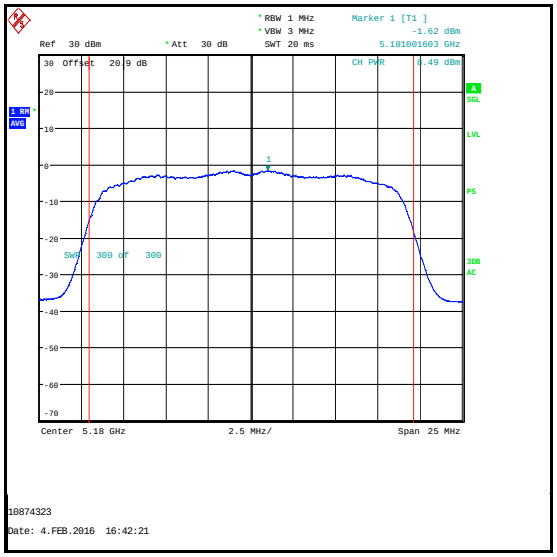


Top Channel

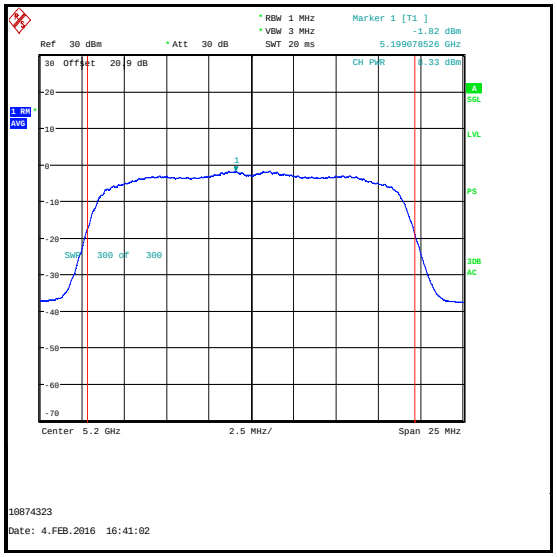
Transmitter Maximum Conducted Output Power (5.15-5.25 GHz band) (continued)

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

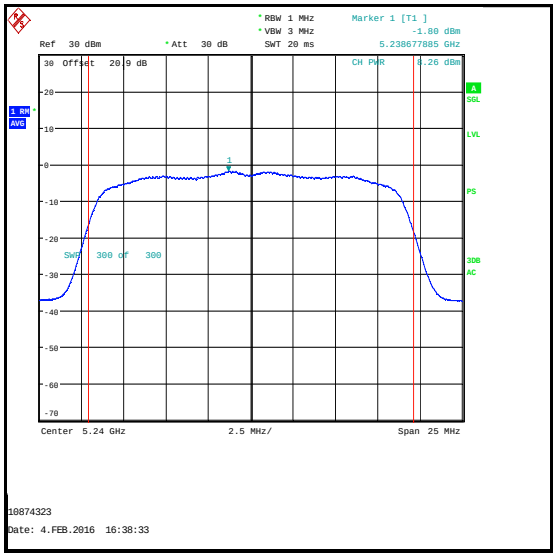
Channel	Frequency (MHz)	Conducted Power (dBm)	Duty cycle correction factor (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5180	8.5	1.6	10.1	24.0	13.9	Complied
Middle	5200	8.3	1.6	9.9	24.0	14.1	Complied
Top	5240	8.3	1.6	9.9	24.0	14.1	Complied



Bottom Channel



Middle Channel

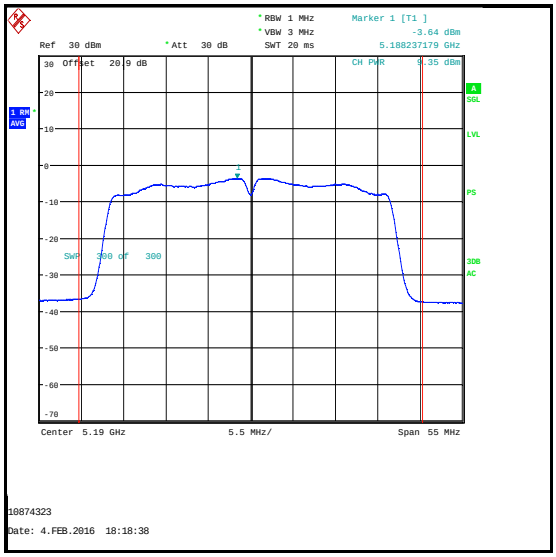


Top Channel

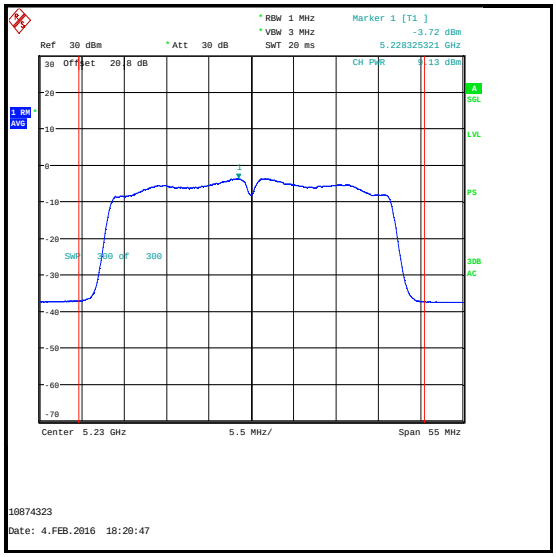
Transmitter Maximum Conducted Output Power (5.15-5.25 GHz band) (continued)

Results: 802.11n / 40 MHz / BPSK / MCS0

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



Bottom Channel



Top Channel

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

Test Summary:

Test Engineer:	Keith Tucker	**Test Date:**	04 February 2016
Test Sample Serial Number:	0100174A		

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

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	35

Note(s):

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

5.25-5.35 GHz band

802.11a 20 MHz channel width / Bottom channel = *11 dBm + 10 $\log_{10}$ 18.842 = 23.75 dBm*
802.11a 20 MHz channel width / Middle channel = *11 dBm + 10 $\log_{10}$ 18.842 = 23.75 dBm*
802.11a 20 MHz channel width / Top channel = *11 dBm + 10 $\log_{10}$ 18.944 = 23.77 dBm*
802.11n 20 MHz channel width / Bottom channel = *11 dBm + 10 $\log_{10}$ 19.197 = 23.83 dBm*
802.11n 20 MHz channel width / Middle channel = *11 dBm + 10 $\log_{10}$ 19.197 = 23.83 dBm*
802.11n 20 MHz channel width / Top channel = *11 dBm + 10 $\log_{10}$ 19.146 = 23.82 dBm*
802.11n 40 MHz channel width / Bottom channel = *11 dBm + 10 $\log_{10}$ 41.900 = 27.22 dBm*
802.11n 40 MHz channel width / Top channel = *11 dBm + 10 $\log_{10}$ 44.390 = 27.47 dBm*

5.47-5.725 GHz band

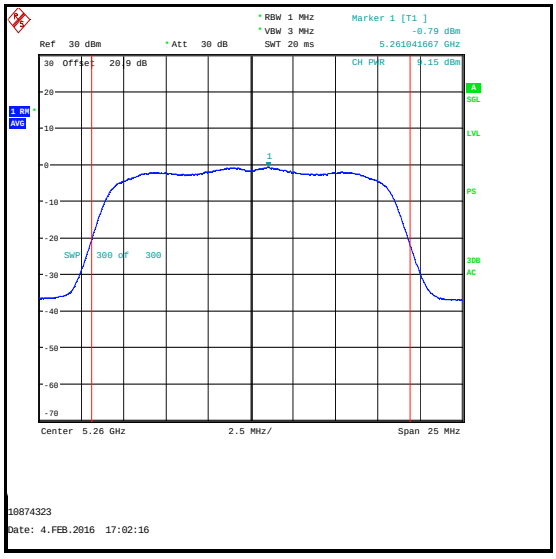
802.11a 20 MHz channel width / Bottom channel = *11 dBm + 10 $\log_{10}$ 19.045 = 23.80 dBm*
802.11a 20 MHz channel width / Middle channel = *11 dBm + 10 $\log_{10}$ 18.944 = 23.77 dBm*
802.11a 20 MHz channel width / Top channel = *11 dBm + 10 $\log_{10}$ 19.096 = 23.81 dBm*
802.11n 20 MHz channel width / Bottom channel = *11 dBm + 10 $\log_{10}$ 19.247 = 23.84 dBm*
802.11n 20 MHz channel width / Middle channel = *11 dBm + 10 $\log_{10}$ 19.247 = 23.84 dBm*
802.11n 20 MHz channel width / Top channel = *11 dBm + 10 $\log_{10}$ 19.197 = 23.83 dBm*
802.11n 40 MHz channel width / Bottom channel = *11 dBm + 10 $\log_{10}$ 47.000 = 27.72 dBm*
802.11n 40 MHz channel width / Middle channel = *11 dBm + 10 $\log_{10}$ 45.040 = 27.54 dBm*
802.11n 40 MHz channel width / Top channel = *11 dBm + 10 $\log_{10}$ 44.830 = 27.52 dBm*

For 20 MHz channels the calculated limit was applied to the results as they were below the fixed limit.
For 40 MHz channels the fixed limit of 250 mW (24.0 dBm) was applied to the results.

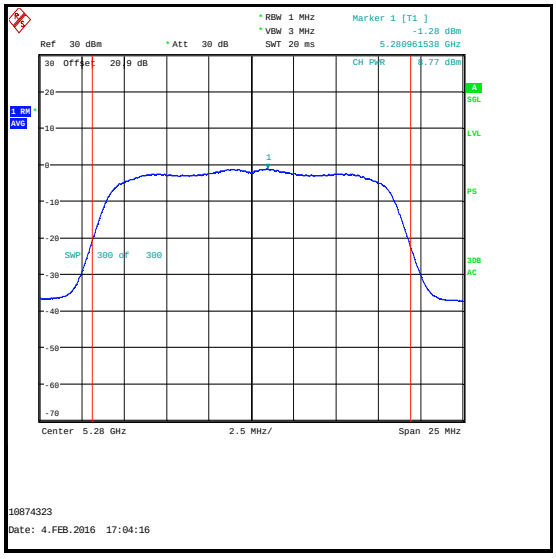
Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

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

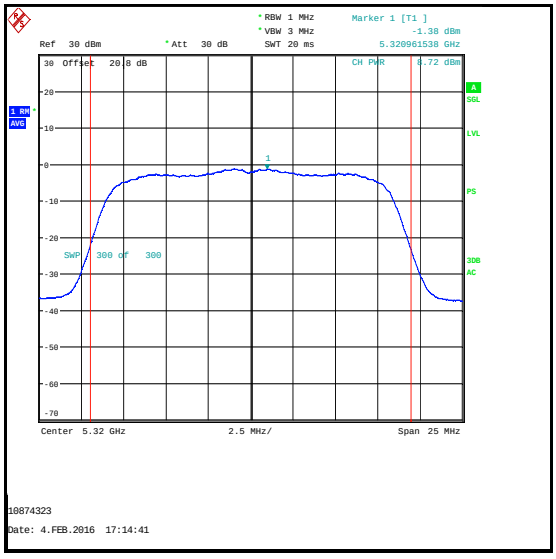
Channel	Frequency (MHz)	Conducted Power (dBm)	Duty cycle correction factor (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5260	9.2	0.6	9.8	23.8	14.0	Complied
Middle	5280	8.8	0.6	9.4	23.8	14.4	Complied
Top	5320	8.7	0.6	9.3	23.8	14.5	Complied



Bottom Channel



Middle Channel

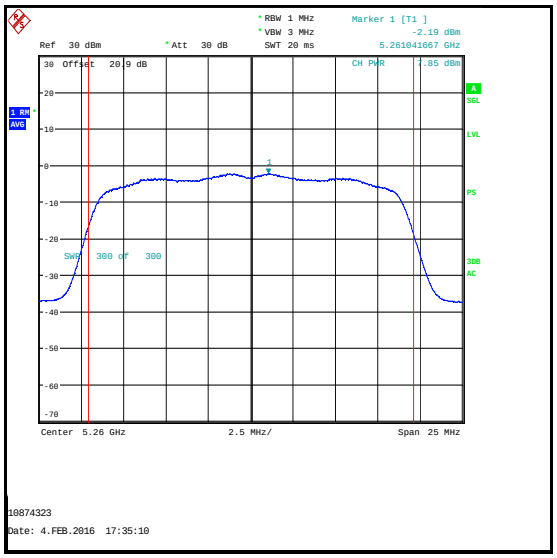


Top Channel

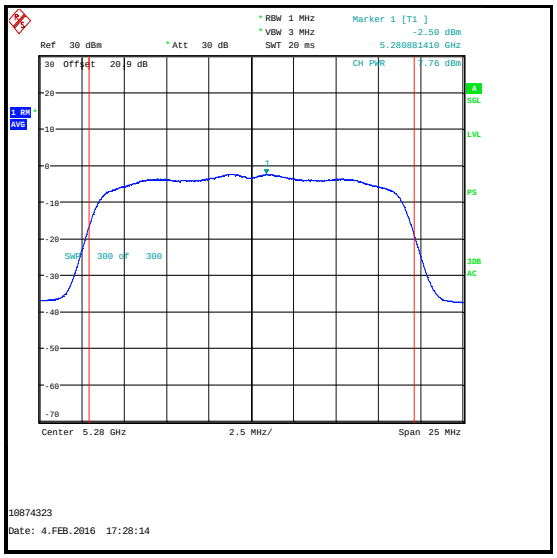
Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

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

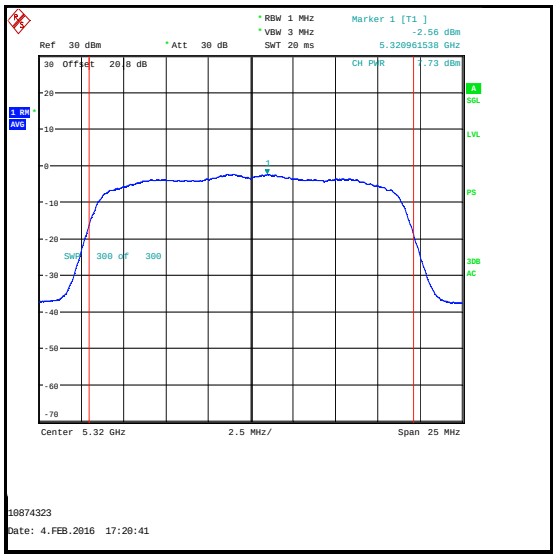
Channel	Frequency (MHz)	Conducted Power (dBm)	Duty cycle correction factor (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5260	7.9	1.6	9.5	23.8	14.3	Complied
Middle	5280	7.8	1.6	9.4	23.8	14.4	Complied
Top	5320	7.7	1.6	9.3	23.8	14.5	Complied



Bottom Channel



Middle Channel

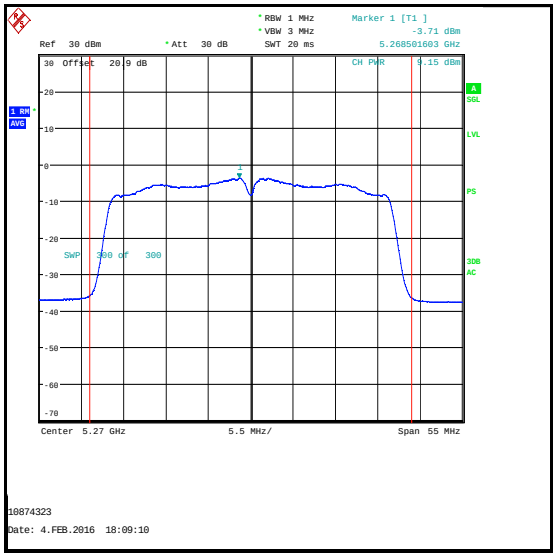


Top Channel

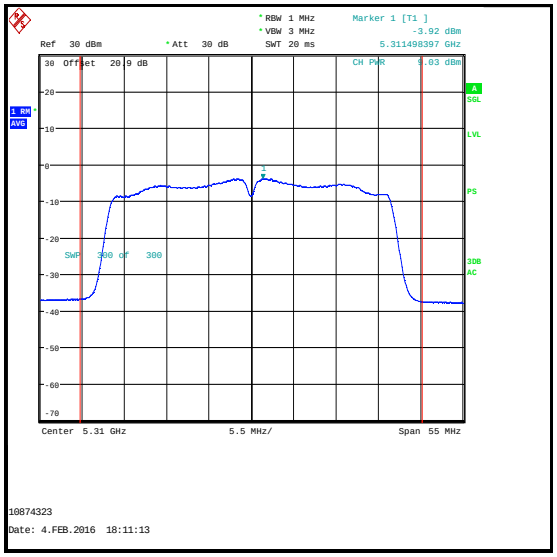
Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

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

Channel	Frequency (MHz)	Conducted Power (dBm)	Duty cycle correction factor (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5270	9.2	0.7	9.9	24.0	14.1	Complied
Top	5310	9.0	0.7	9.7	24.0	14.3	Complied



Bottom Channel

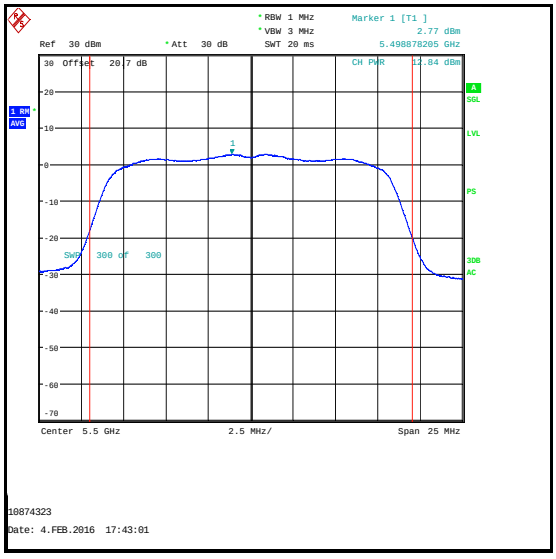


Top Channel

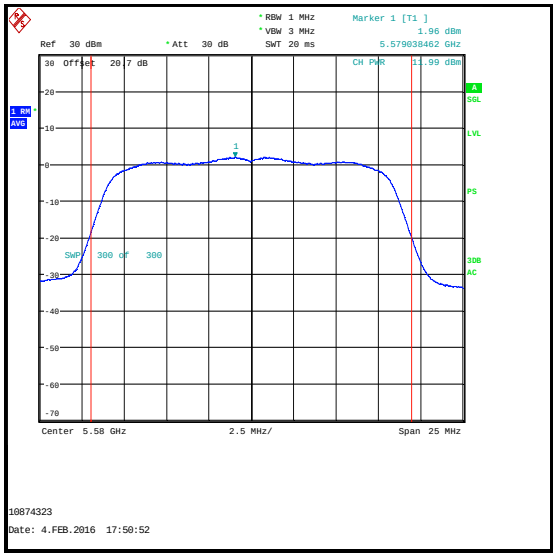
Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

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

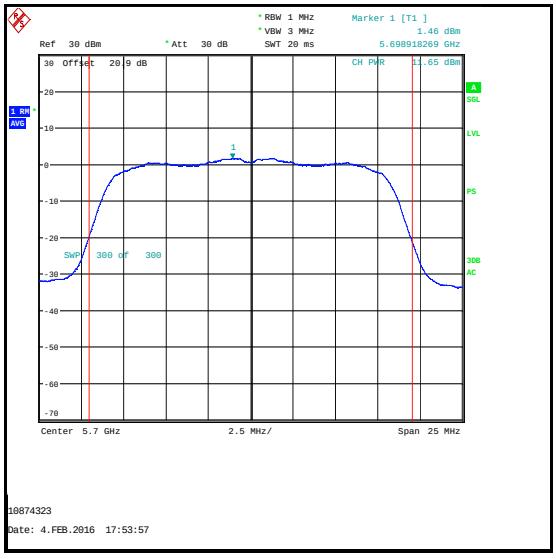
Channel	Frequency (MHz)	Conducted Power (dBm)	Duty cycle correction factor (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5500	12.8	0.6	13.4	23.8	10.4	Complied
Middle	5580	12.0	0.6	12.6	23.8	11.2	Complied
Top	5700	11.7	0.6	12.3	23.8	11.5	Complied



Bottom Channel



Middle Channel

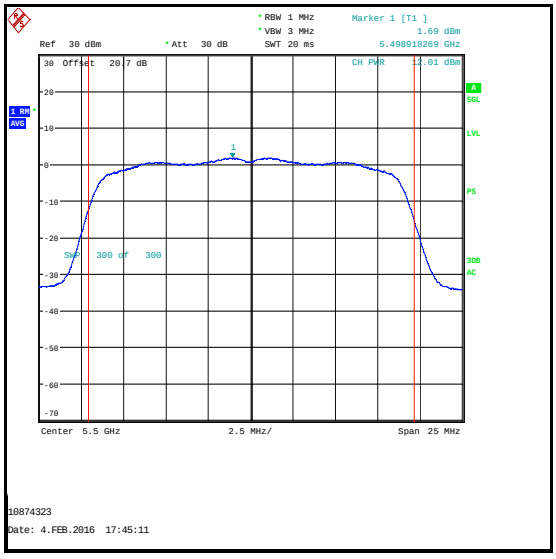


Top Channel

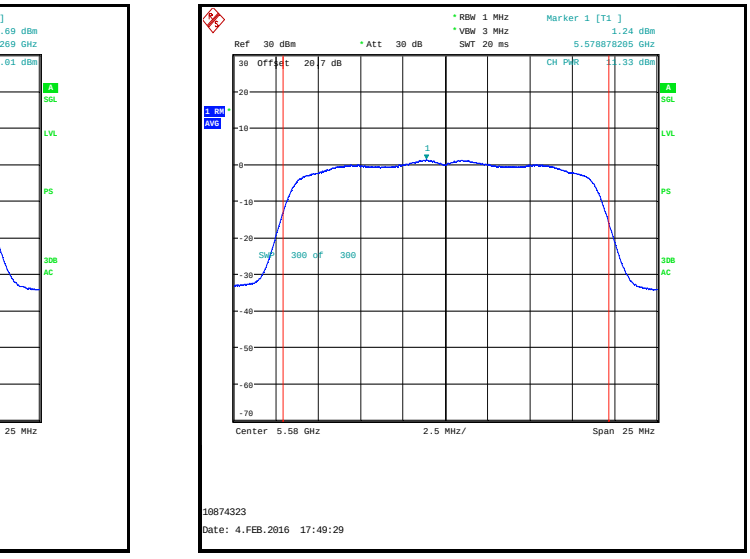
Transmitter Maximum Conducted Output Power (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

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

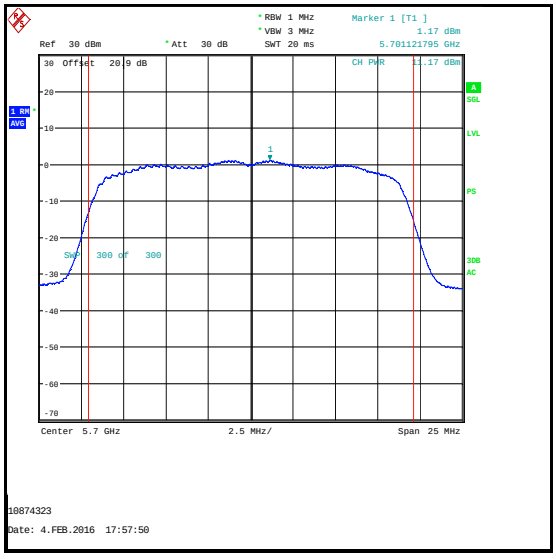
Channel	Frequency (MHz)	Conducted Power (dBm)	Duty cycle correction factor (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5500	12.0	1.6	13.6	23.8	10.2	Complied
Middle	5580	11.3	1.6	12.9	23.8	10.9	Complied
Top	5700	11.2	1.6	12.8	23.8	11.0	Complied



Bottom Channel



Middle Channel



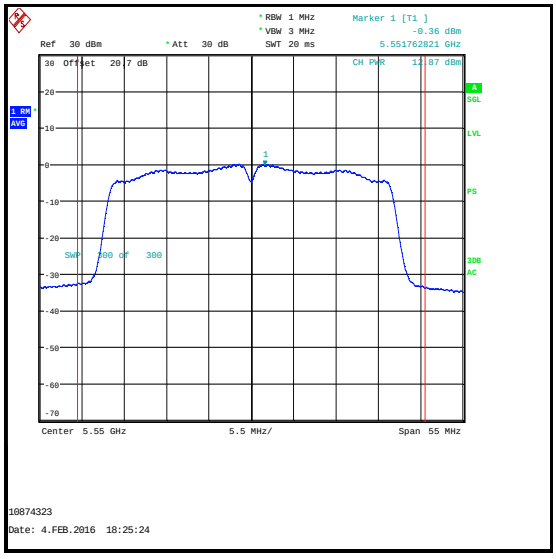
Top Channel

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

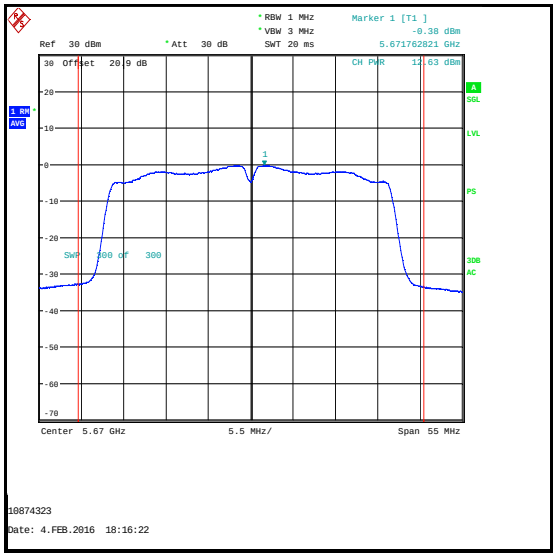
Results: 802.11n / 40 MHz / BPSK / MCS0 / 5.47-5.725 GHz band

Channel	Frequency (MHz)	Conducted Power (dBm)	Duty cycle correction factor (dB)	Corrected Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5510	13.4	0.7	14.1	24.0	9.9	Complied
Middle	5550	12.9	0.7	13.6	24.0	10.4	Complied
Top	5670	12.6	0.7	13.3	24.0	10.7	Complied

Bottom Channel



Middle Channel



Top Channel

Transmitter Maximum Conducted Output Power (continued)

Test Equipment Used:

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

5.2.5. Transmitter Maximum Power Spectral Density

Test Summary:

Test Engineer:	Keith Tucker	**Test Date:**	04 February 2016
Test Sample Serial Number:	0100174A		

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

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	35

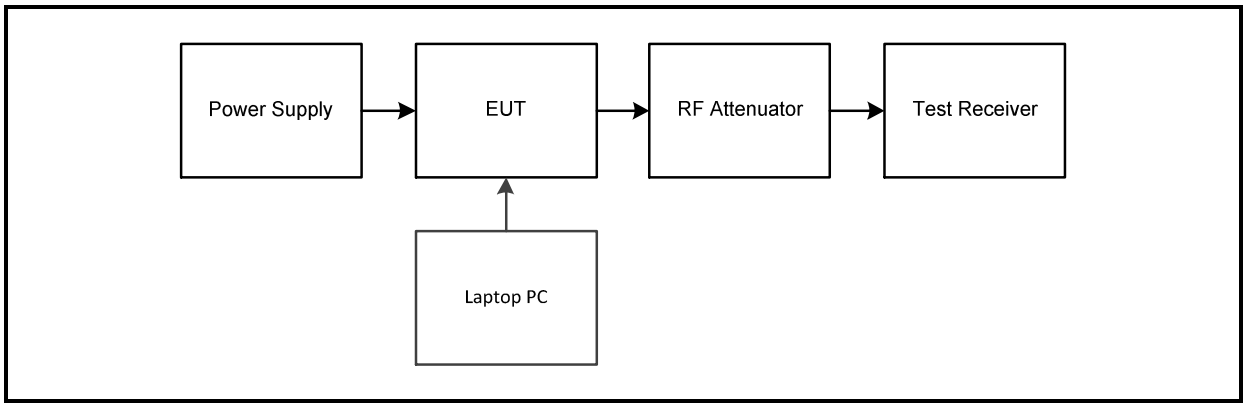
Note(s):

1. Transmitter Maximum Power Spectral Density tests in all bands were performed using a test receiver in accordance with KDB 789033 II. F referencing II.E.2.d) Method SA-2.
2. All supported modes and channel widths were initially investigated on one channel. The modes that produced the highest power and therefore deemed worst case were:
    - 802.11a – QPSK / 12 Mbps
    - 802.11n HT20 – 16QAM / MCS4
    - 802.11n HT40 – BPSK / MCS0

    Measurements were then performed in these modes on bottom, middle and top channels in all operating bands.
3. The EUT was transmitting at <98% duty cycle, the calculated duty cycle in section 5.2.3 was added to the measured maximum power spectral density in order to compute the average maximum power spectral density during the actual transmission time.
4. The EUT antenna has a gain of <6 dBi.
5. The signal analyser was connected to the RF port on the EUT using suitable attenuation and RF cable. An RF level offset was entered on the signal analyser to compensate for the loss of the attenuator and RF cable.
6. As the power spectral density test uses the same test method as the output power test, before the power is integrated across the emission bandwidth, the conducted power spectral density plots are located in the conducted output power section 5.2.4 of this test report. The peak spectral density was measured by placing a marker on the peak of the signal and the results entered in the tables below.

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)

Test setup:



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

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

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

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

Results: 802.11n / 40 MHz / BPSK / MCS0

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

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

Test Summary:

Test Engineer:	Keith Tucker	**Test Date:**	04 February 2016
Test Sample Serial Number:	0100174A		

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

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	35

Note(s):

1. FCC Part 15.407(a)(2) limit for PPSD in the 5.25-5.35 GHz and 5.47-5.725 GHz operating bands is <11 dBm/MHz.
2. As the power spectral density test uses the same test method as the output power test, before the power is integrated across the emission bandwidth, the conducted power spectral density plots are located in the conducted output power section 5.2.4 of this test report. The peak spectral density was measured by placing a marker on the peak of the signal and the results entered in the tables below.

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

Channel	Frequency (MHz)	PSD (dBm /MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5260	-0.8	0.6	-0.2	11.0	11.2	Complied
Middle	5280	-1.3	0.6	-0.7	11.0	11.7	Complied
Top	5320	-1.4	0.6	-0.8	11.0	11.8	Complied

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

Channel	Frequency (MHz)	PSD (dBm /MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5260	-2.2	1.6	-0.6	11.0	11.6	Complied
Middle	5280	-2.5	1.6	-0.9	11.0	11.9	Complied
Top	5320	-2.6	1.6	-1.0	11.0	12.0	Complied

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

Channel	Frequency (MHz)	PSD (dBm /MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5270	-3.7	0.7	-3.0	11.0	14.0	Complied
Top	5310	-3.9	0.7	-3.2	11.0	14.2	Complied

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

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

Channel	Frequency (MHz)	PSD (dBm /MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5500	2.8	0.6	3.4	11.0	7.6	Complied
Middle	5580	2.0	0.6	2.6	11.0	8.4	Complied
Top	5700	1.5	0.6	2.1	11.0	8.9	Complied

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

Channel	Frequency (MHz)	PSD (dBm /MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5500	1.7	1.6	3.3	11.0	7.7	Complied
Middle	5580	1.2	1.6	2.8	11.0	8.2	Complied
Top	5700	1.2	1.6	2.8	11.0	8.2	Complied

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

Channel	Frequency (MHz)	PSD (dBm /MHz)	Duty cycle correction factor (dB)	Corrected PSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5510	0.5	0.7	1.2	11.0	9.8	Complied
Middle	5550	-0.4	0.7	0.3	11.0	10.7	Complied
Top	5670	-0.4	0.7	0.3	11.0	10.7	Complied

Test Equipment Used:

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

5.2.6. Transmitter Out of Band Radiated Emissions

Test Summary:

Test Engineer:	Andrew Edwards	**Test Date:**	30 August 2015
Test Sample Serial Number:	MC000170		

FCC Reference:	Parts 15.407(b)(3),(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:

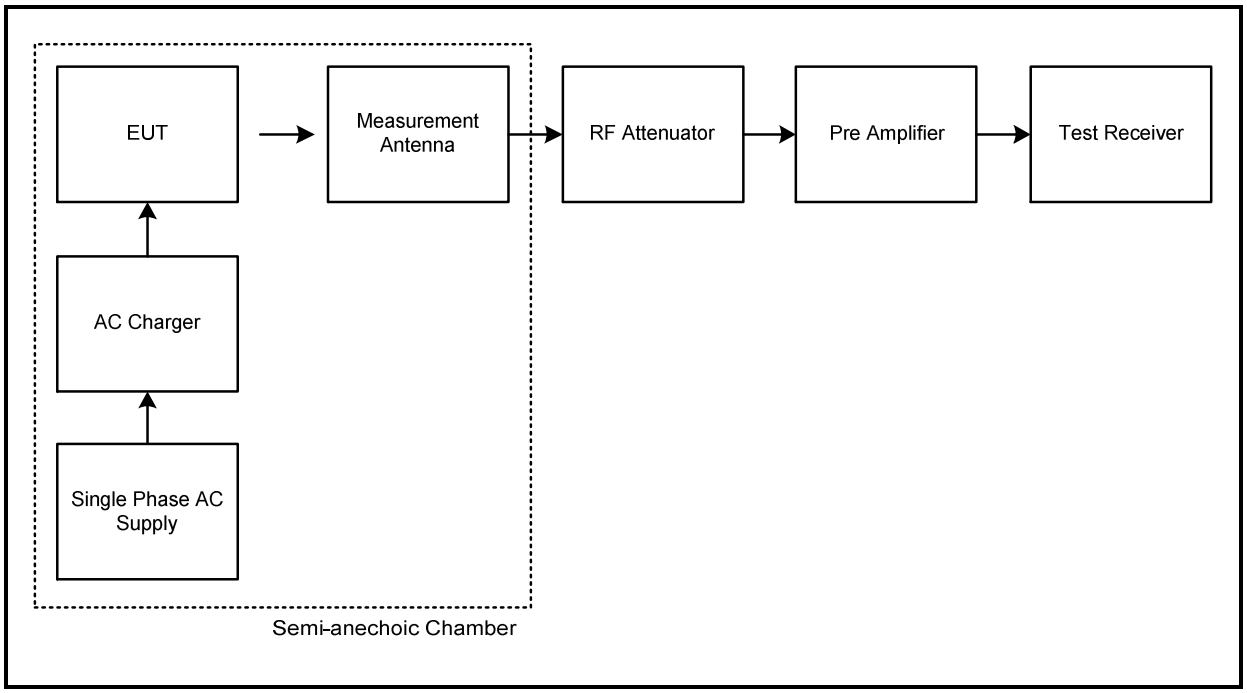
Temperature (°C):	23
Relative Humidity (%):	42

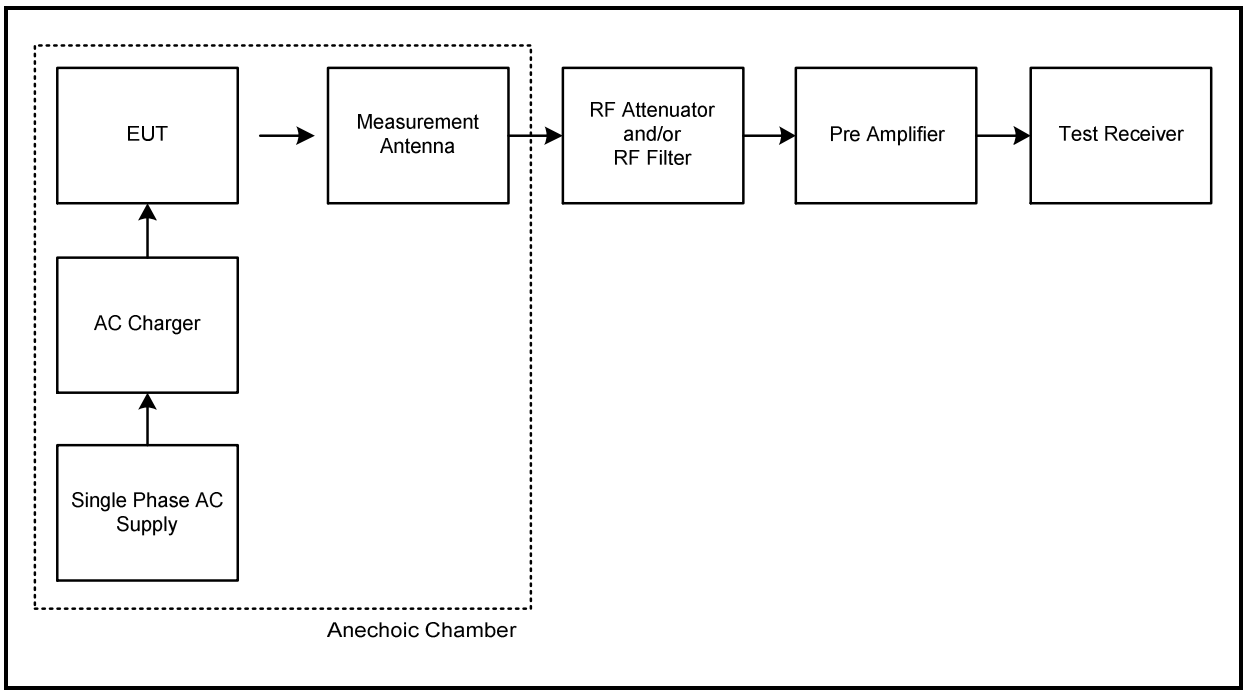
Note(s):

1. Measurements below 1 GHz were limited to the 5.47-5.725 GHz band, the EUT was transmitting with a data rate of MCS4 (802.11n HT20) as it produced the highest conducted power spectral density and was therefore deemed worst case.
2. Pre-scans with the EUT transmitting on the middle channel were measured according to FCC Part 15.407(b)(3) which states for transmitters operating in the band 5.47 to 5.725 GHz: all emissions outside of the band 5.47 to 5.725 GHz band shall not exceed -27 dBm/MHz. Part (b)(6) states unwanted emissions below 1 GHz must comply with the general field strength limits set forth in 15.209. Part (b)(7) states the provisions of 15.205 apply, e.g. restricted bands of operation.
3. The final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
4. The 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.
5. All other emissions shown on the pre-scan plots were found to be below the measurement system noise floor or ambient.
6. 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.
7. 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. The sweep time was set to auto. A peak detector was used, sweep time was set to auto and trace mode was Max Hold.
8. 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 Out of Band Radiated Emissions (continued)

Test setup for radiated measurements

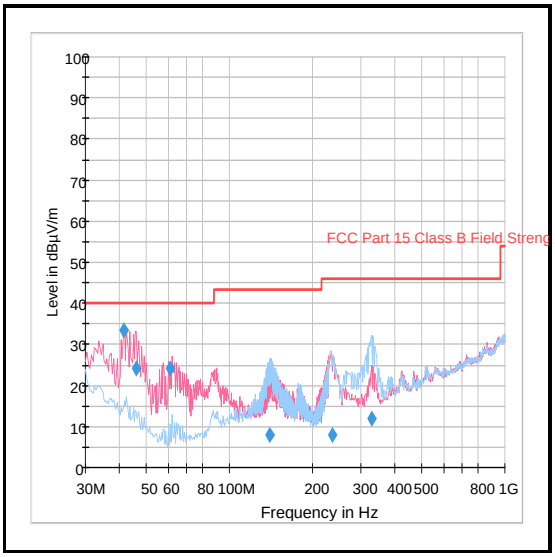




Transmitter Out of Band Radiated Emissions (5.47-5.725 GHz band operation) (continued)

Results: Middle Channel / Field Strength

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
327.657	Horizontal	29.5	46.0	16.5	Complied



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

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1945	Thermohygrometer	JM Handelspunkt	30.5015.01	0112	23 Apr 2016	12
K0001	5 m RSE Chamber	Rainford EMC	N/A	N/A	19 Mar 2016	12
M1273	Test Receiver	Rohde & Schwarz	ESIB26	100275	06 Oct 2015	12
A490	Antenna	Chase	CBL6111A	1590	30 Apr 2016	12
G0543	Amplifier	Sonoma	310N	230801	06 Nov 2015	3
A1834	Attenuator	Hewlett Packard	8491B	10444	05 Mar 2016	12

Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band operation) (continued)

Test Summary:

Test Engineer:	Kiren Mistry	**Test Dates:**	09 February 2016 & 22 February 2016
Test Sample Serial Number:	01001716		

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

Environmental Conditions:

Temperature (°C):	23 to 24
Relative Humidity (%):	32 to 35

Note(s):

1. FCC Part 15.407(b)(1) states for transmitters operating in the band 5.15 to 5.25 GHz: all emissions outside of the band 5.15 to 5.35 GHz will not exceed -27 dBm/MHz. Part(b)(7) states the provisions of 15.205 apply e.g. restricted bands of operation.
2. Pre-scans were performed with the EUT transmitting on middle channel in the 5.47 to 5.725 GHz band. An inquiry was made to the FCC and the response was pre-scans could be performed in the band with the high power spectral density and all final measurements should be performed on any emissions seen in each band.
3. 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.
4. Tests were performed as field strength measurements and any emissions in non-restricted bands converted to an E.I.R.P. value in dBm in accordance with KDB 789033 Section II.G.2 using a conversion factor of 95.2. The measured values incorporate the calibrated antenna factor and cable loss.
5. The final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
6. Where the highest levels of emissions or noise floor occurred in a restricted band, the maximum peak field strength level was compared to peak (74 dBµV/m) or average (54 dBµV/m) limits (see note 7). Where the highest levels of emission or noise floor occurred in a non-restricted band, the maximum field strength measured was converted to E.I.R.P. and compared to the -27 dBm/MHz E.I.R.P. limit. The -27 dBm/MHz E.I.R.P. limit was converted to a field strength limit of 68.2 dBµV/m at a measurement distance of 3 metres.
7. In accordance with KDB 789033 Section II.G.1.c) if the peak measurement satisfies the average limit, it is not necessary to perform a separate average measurement.
8. All other emissions shown on the pre-scan plots were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
9. Final measurements above 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 1.5 metresabove the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band operation) (continued)

Results: Bottom Channel / EIRP

Frequency (MHz)	Antenna Polarity	Peak Level (dBm/MHz)	Peak Limit (dBm/MHz EIRP)	Margin (dB)	Result
10363.397	Horizontal	-46.7	-27.0	19.7	Complied

Results: Bottom Channel / Field Strength

Frequency (MHz)	Antenna Polarity	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
15540.160	Horizontal	46.3	54.0	7.7	Complied

Results: Middle Channel / EIRP

Frequency (MHz)	Antenna Polarity	Peak Level (dBm/MHz)	Peak Limit (dBm/MHz EIRP)	Margin (dB)	Result
10403.349	Horizontal	-47.9	-27.0	20.9	Complied

Results: Middle Channel / Field Strength

Frequency (MHz)	Antenna Polarity	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
15600.321	Horizontal	47.5	54.0	6.5	Complied

Results: Top Channel / EIRP

Frequency (MHz)	Antenna Polarity	Peak Level (dBm/MHz)	Peak Limit (dBm/MHz EIRP)	Margin (dB)	Result
6986.669	Horizontal	-48.2	-27.0	21.2	Complied

Results: Top Channel / Field Strength

Frequency (MHz)	Antenna Polarity	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
15720.000	Horizontal	49.9	54.0	4.1	Complied

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

Test Summary:

Test Engineers:	Andrew Edwards & Kiren Mistry	**Test Dates:**	09 February 2016 & 22 February 2016
Test Sample Serial Number:	01001716		

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

Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	35 to 37

Note(s):

1. FCC Part 15.407(b)(2) states for transmitters operating in the band 5.25 to 5.35 GHz: all emissions outside of the 5.15-5.35 GHz band will not exceed -27 dBm/MHz. Part(b)(7) states the provisions of 15.205 apply e.g. restricted bands of operation.
2. Pre-scans were performed with the EUT transmitting on middle channel in the 5.47 to 5.725 GHz band. An inquiry was made to the FCC and the response was pre-scans could be performed in the band with the highest power spectral densirty and all final measurements should be performed on any emissions seen in each band.
3. 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.
4. Tests were performed as field strength measurements and any emissions in non-restricted bands converted to an E.I.R.P. value in dBm in accordance with KDB 789033 Section II.G.2 using a conversion factor of 95.2. The measured values incorporate the calibrated antenna factor and cable loss.
5. The final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
6. Where the highest levels of emissions or noise floor occurred in a restricted band, the maximum peak field strength level was compared to peak (74 dBµV/m) or average (54 dBµV/m) limits (see note 7). Where the highest levels of emission or noise floor occurred in a non-restricted band, the maximum field strength measured was converted to E.I.R.P. and compared to the -27 dBm/MHz E.I.R.P. limit. The -27 dBm/MHz E.I.R.P. limit was converted to a field strength limit of 68.2 dBµV/m at a measurement distance of 3 metres.
7. In accordance with KDB 789033 Section II.G.1.c) if the peak measurement is below the average limit, it is not necessary to perform a separate average measurement.
8. All other emissions shown on the pre-scan plot were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
9. Final measurements above 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

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

Results: Bottom Channel / EIRP

Frequency (MHz)	Antenna Polarity	Peak Level (dBm/MHz)	Peak Limit (dBm/MHz EIRP)	Margin (dB)	Result
7013.288	Horizontal	-47.8	-27.0	20.8	Complied

Results: Bottom Channel / Field Strength

Frequency (MHz)	Antenna Polarity	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
15780.321	Horizontal	51.2	54.0	2.8	Complied

Results: Middle Channel / EIRP

Frequency (MHz)	Antenna Polarity	Peak Level (dBm/MHz)	Peak Limit (dBm/MHz EIRP)	Margin (dB)	Result
7039.745	Horizontal	-47.9	-27.0	20.9	Complied

Results: Middle Channel / Field Strength

Frequency (MHz)	Antenna Polarity	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
15840.160	Horizontal	52.9	54.0	1.1	Complied

Results: Top Channel / EIRP

Frequency (MHz)	Antenna Polarity	Peak Level (dBm/MHz)	Peak Limit (dBm/MHz EIRP)	Margin (dB)	Result
7093.234	Horizontal	-47.4	-27.0	20.4	Complied

Results: Top Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
15960.481	Horizontal	55.0	74.0	19.0	Complied

Results: Top Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
15603.205	Horizontal	42.2	54.0	11.8	Complied

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

Test Summary:

Test Engineers:	Andrew Edwards & Kiren Mistry	**Test Dates:**	08 February 2016, 09 February 2016, 10 February 2016, 22 February 2016 & 04 March 2016
Test Sample Serial Number:	01001716		

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):	22 to 24
Relative Humidity (%):	31 to 35

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

Note(s):

1. FCC Part 15.407(b)(3) states for transmitters operating in the band 5.47 to 5.725 GHz: all emissions outside of the band will not exceed -27 dBm/MHz. Part(b)(7) states the provisions of 15.205 apply e.g. restricted bands of operation.
2. Pre-scans were performed with the EUT transmitting on the middle channel in this band. An inquiry was made to the FCC and the response was pre-scans could be performed in the band with the highest power spectral density (802.11n / MCS4) and all final measurements should be performed on any emission seen for each band.
3. 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.
4. Tests were performed as field strength measurements and any emissions in non-restricted bands converted to an E.I.R.P. value in dBm in accordance with KDB 789033 Section II.G.2 using a conversion factor of 95.2. The measured values incorporate the calibrated antenna factor and cable loss.
5. The final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
6. Where the highest levels of emissions or noise floor occurred in a restricted band, the maximum peak field strength level was compared to peak (74 dBµV/m) or average (54 dBµV/m) limits (see note 8). Where the highest levels of emission or noise floor occurred in a non-restricted band, the maximum field strength measured was converted to E.I.R.P. and compared to the -27 dBm/MHz E.I.R.P. limit. The -27 dBm/MHz E.I.R.P. limit was converted to a field strength limit of 68.2 dBµV/m at a measurement distance of 3 metres.
7. The emission shown on the 4 GHz to 6 GHz plot is the EUT fundamental.
8. In accordance with KDB 789033 Section II.G.1.c) if the peak measurement is below the average limit, it is not necessary to perform a separate average measurement.
9. All other emissions shown on the pre-scan plot were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
10. Pre-scan plots 4 to 6 GHz and the two restricted band plots (4.5 to 5.15 and 5.35 to 5.46 GHz) were performed with 4001 Sweep points and 144 sweep points in accordance with KDB 789033 II.G.6.c)(iii). All other measurements were performed with the instruments default setting of 625 sweep points.
11. Measurements were performed across the two restricted bands closest to the bands of operation with the EUT transmitting on the top channel in the 5.25 to 5.35 GHz band. Plots are included in this section of the test report. Peak and average measurements were made.
12. Pre-scans above 1 GHz were performed in a fully anechoic chamber (Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

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

Results: Bottom Channel / EIRP

Frequency (MHz)	Antenna Polarity	Peak Level (dBm/MHz)	Peak Limit (dBm/MHz EIRP)	Margin (dB)	Result
16500.641	Horizontal	-30.0	-27.0	3.0	Complied

Results: Bottom Channel / Field Strength

Frequency (MHz)	Antenna Polarity	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
7333.342	Horizontal	48.5	54.0	5.5	Complied
9164.920	Horizontal	49.5	54.0	4.5	Complied

Results: Middle Channel / EIRP

Frequency (MHz)	Antenna Polarity	Peak Level (dBm/MHz)	Peak Limit (dBm/MHz EIRP)	Margin (dB)	Result
16740.813	Horizontal	-34.4	-27.0	7.4	Complied

Results: Middle Channel / Field Strength

Frequency (MHz)	Antenna Polarity	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
7440.088	Horizontal	48.9	54.0	5.1	Complied
9303.125	Horizontal	49.6	54.0	4.4	Complied

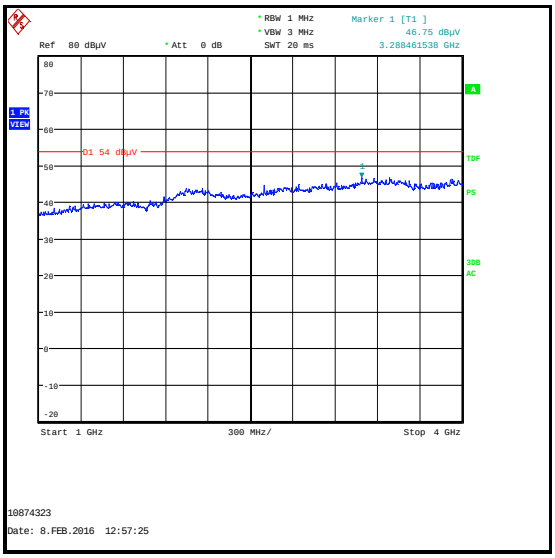
Results: Top Channel / EIRP

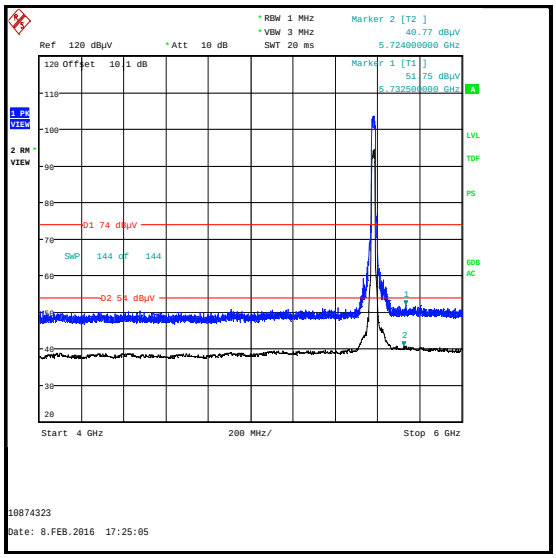
Frequency (MHz)	Antenna Polarity	Peak Level (dBm/MHz)	Peak Limit (dBm/MHz EIRP)	Margin (dB)	Result
17095.833	Horizontal	-39.2	-27.0	12.2	Complied

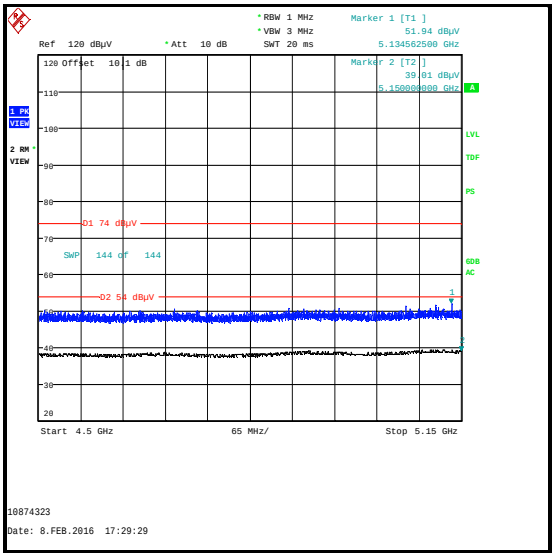
Results: Top Channel / Field Strength

Frequency (MHz)	Antenna Polarity	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
7600.068	Horizontal	48.8	54.0	5.2	Complied
9499.529	Horizontal	47.8	54.0	6.2	Complied

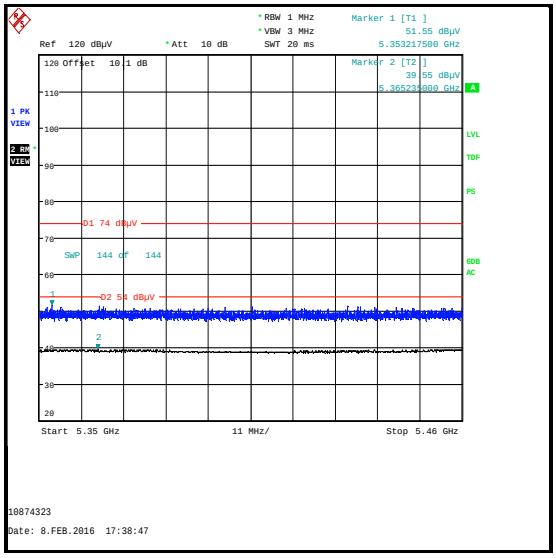
Transmitter Out of Band Radiated Emissions (5.47-5.725 GHz band operation) (continued)





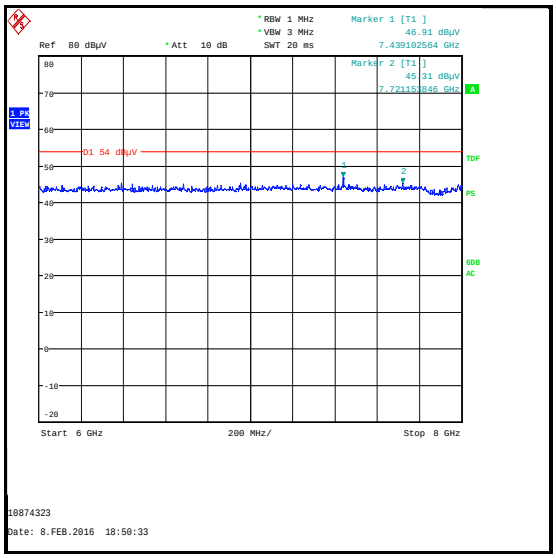


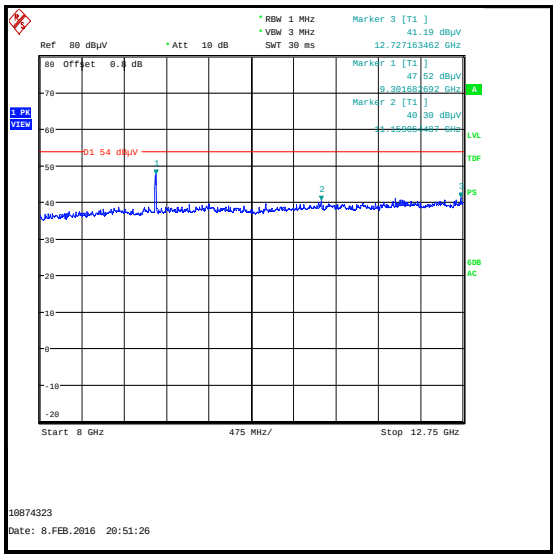
Restricted Band 4.5 GHz to 5.15 GHz

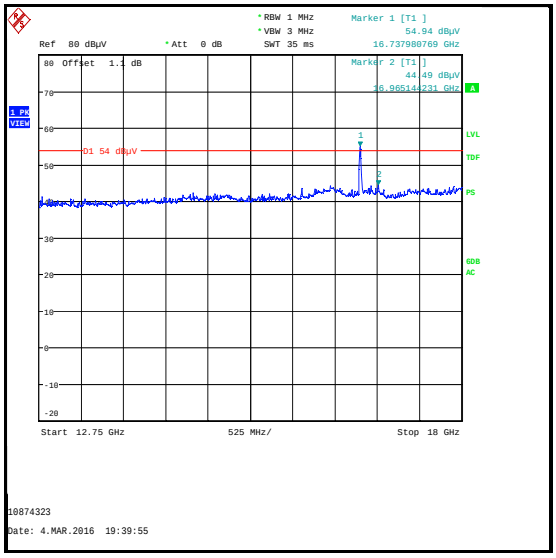


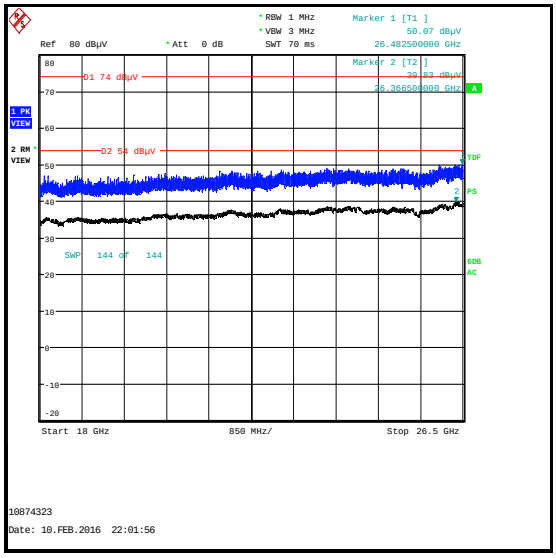
Restricted Band 5.35 GHz to 5.46 GHz

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

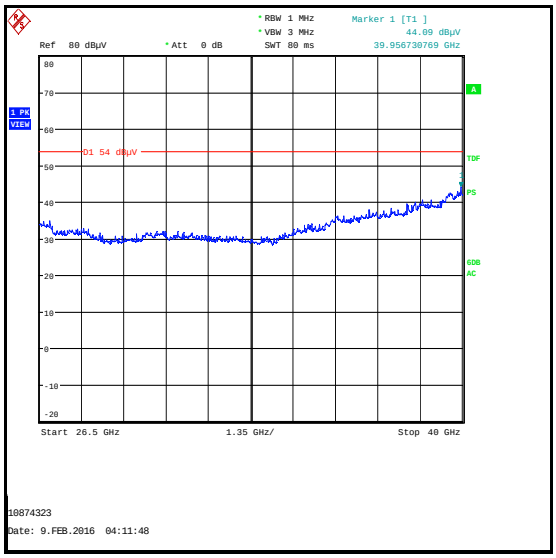








Transmitter Out of Band Radiated Emissions (5.47-5.725 GHz band operation) (continued)



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

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1656	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	23 Apr 2016	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	21 Dec 2016	12
M1886	Test Receiver	Rohde & Schwarz	ESU26	100554	21 May 2016	12
M1630	Test Receiver	Rohde & Schwarz	ESU40	100233	20 Feb 2016	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	19 Dec 2016	12
A1785	Low Noise Amplifier	Farran Technology	FLNA-28-30	FTL 6483	12 Jan 2017	12
A1818	Antenna	EMCO	3115	00075692	17 Dec 2016	12
A253	Antenna	Flann Microwave	12240-20	128	17 Dec 2016	12
A254	Antenna	Flann Microwave	14240-20	139	17 Dec 2016	12
A255	Antenna	Flann Microwave	16240-20	519	17 Dec 2016	12
A256	Antenna	Flann Microwave	18240-20	400	17 Dec 2016	12
A436	Antenna	Flann Microwave	20240-20	330	19 Dec 2016	12
A203	Antenna	Flann Microwave	22240-20	343	19 May 2016	36
A1396	Attenuator	Huber & Suhner	6810.17.B	757987	05 May 2016	12
A2176	High Pass Filter	AtlanTecRF	AFH-07000	800980	17 Apr 2016	12

5.2.7. Transmitter Band Edge Radiated Emissions

Test Summary:

Test Engineer:	Andrew Edwards	**Test Date:**	06 February 2016
Test Sample Serial Number:	01001716		

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
Relative Humidity (%):	38

Note(s):

1. An Inquiry was made to the FCC and the response confirmed band edge measurements need only be performed in the EUT modes that produce the highest power and the widest bandwidths. The modes that produced the highest power and widest bandwidth were:
    - 802.11a - BPSK / 9 Mbps & QPSK / 12 Mbps
    - 802.11n HT20 – BPSK / MCS0 & 16QAM / MCS4
    - 802.11n HT40 – BPSK / MCS0
2. Lower band edge measurements were performed with the EUT transmitting on the bottom channel. Upper band edge measurements were performed with the EUT transmitting on the top channel.
3. For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. However, there are restricted bands of operation below the lower band edge at 4.5-5.15 GHz and also above the upper band edge at 5.35-5.46 GHz therefore the provisions of FCC Part 15.205 apply.
4. Field strength measurements using peak and average detectors were performed in the restricted bands below 5.15 GHz and above 5.35 GHz. Field strength and EIRP results were found to be compliant with the restricted band limits and Part 15.407 out-of-band limits.
5. In accordance with KDB 789033 Section II.G.1.c) if the peak measurement is below the average limit, it is not necessary to perform a separate average measurement.
6. In accordance with KDB 789033 Section II.G.6.c) Method AD (vi), the average measurements were performed using an increased number of sweeps as calculated below:
    - 802.11a / BPSK / 9 Mbps – 107 sweeps
    - 802.11a / QPSK / 12 Mbps – 114 sweeps
    - 802.11n HT20 / BPSK / MCS0 – 109 sweeps
    - 802.11n HT20 / 16QAM / MCS4 – 144 sweeps
    - 802.11n HT40 / BPSK / MCS0 – 117 sweeps
7. In accordance with KDB 789033 Section II.G.6.c) Method AD (vii), for average measurements, data rates where the EUT was transmitting <98% duty cycle, the duty cycle correction factor calculated in section 5.2.3 was added to the measured result.

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

Results: 802.11a / 20 MHz / BPSK / 9 Mbps / Peak

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5150	61.5	74.0	12.5	Complied

Frequency (MHz)	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
5350	51.3	54.0	2.7	Complied
5370.272	52.9	54.0	1.1	Complied

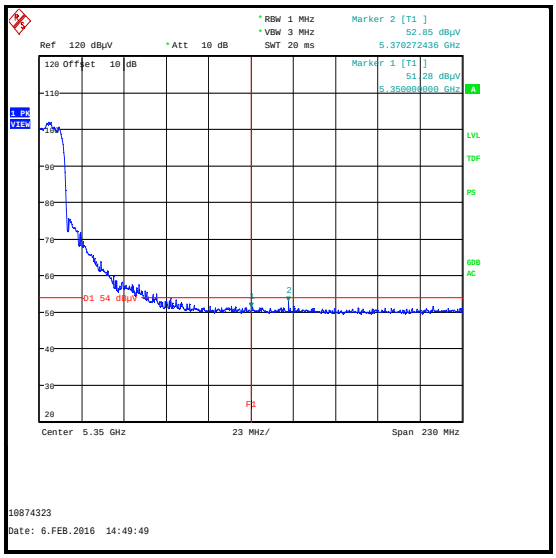
Results: 802.11a / 20 MHz / BPSK / 9 Mbps / Average

Frequency (MHz)	Level (dBµV/m)	Duty Cycle correction (dB)	Corrected Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5150	41.2	0.4	41.6	54.0	12.4	Complied

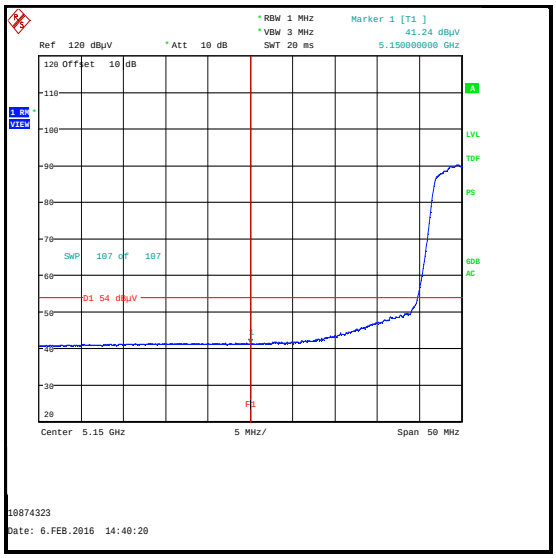
Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)

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

Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Lower Band Edge Average Measurement

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

Results: 802.11a / 20 MHz / QPSK / 12 Mbps / Peak

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5150	60.9	74.0	13.1	Complied

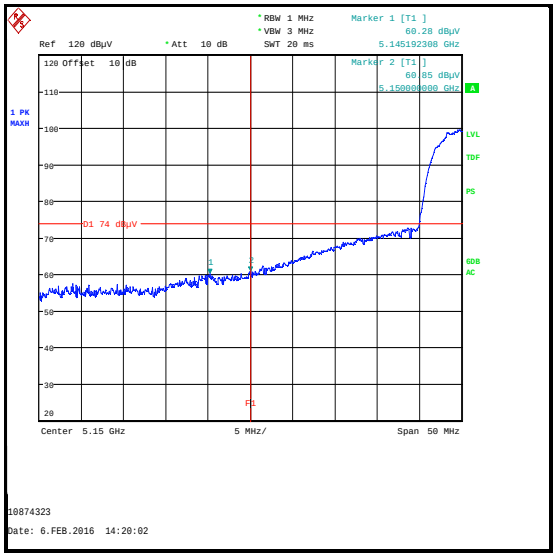
Frequency (MHz)	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
5350	50.5	54.0	3.5	Complied
5365.112	51.2	54.0	2.8	Complied

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

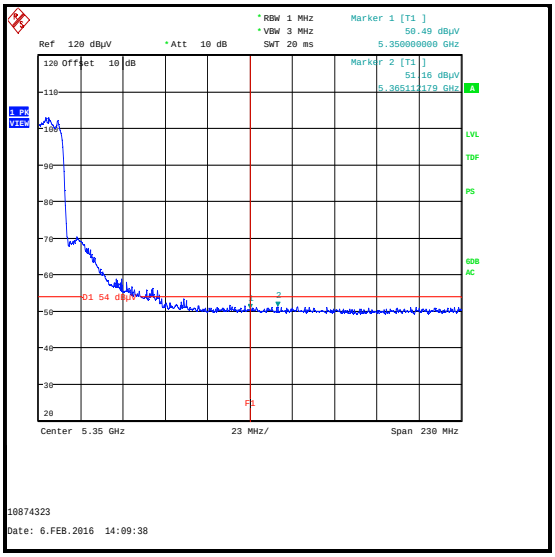
Frequency (MHz)	Level (dBµV/m)	Duty Cycle correction (dB)	Corrected Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5150	41.2	0.6	41.8	54.0	12.2	Complied

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

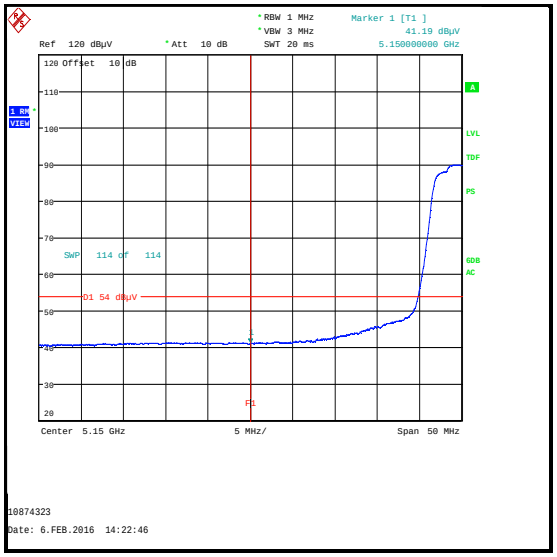
Results: 802.11a / 20 MHz / QPSK / 12 Mbps



Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Lower Band Edge Average Measurement

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

Results: 802.11n / 20 MHz / BPSK / MCS0 / Peak

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5150	60.6	74.0	13.4	Complied

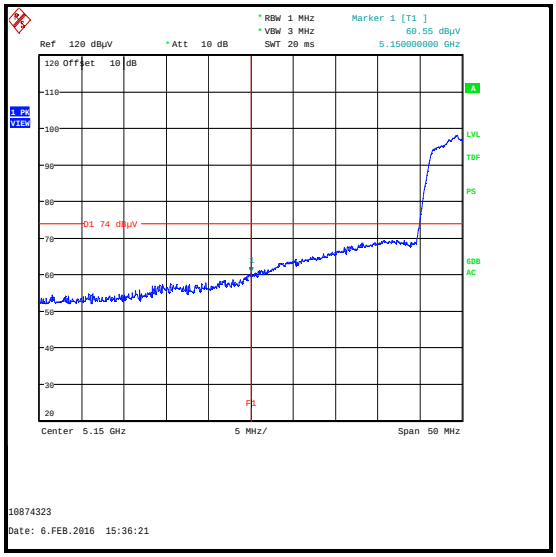
Frequency (MHz)	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
5350	50.0	54.0	4.0	Complied
5434.407	51.6	54.0	2.4	Complied

Results: 802.11n / 20 MHz / BPSK / MCS0 / Average

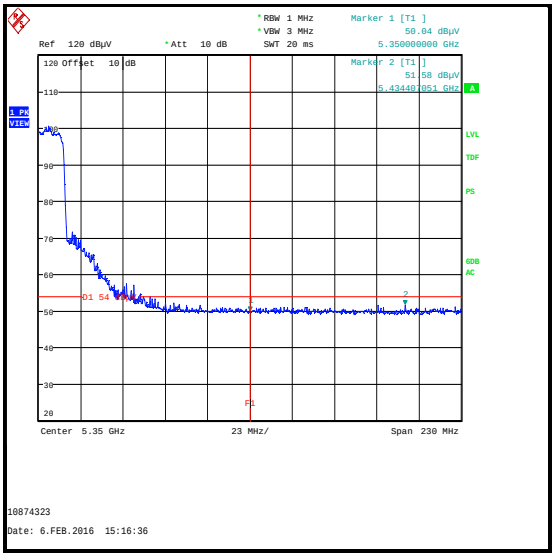
Frequency (MHz)	Level (dBµV/m)	Duty Cycle correction (dB)	Corrected Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5150	40.4	0.3	40.7	54.0	13.3	Complied

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

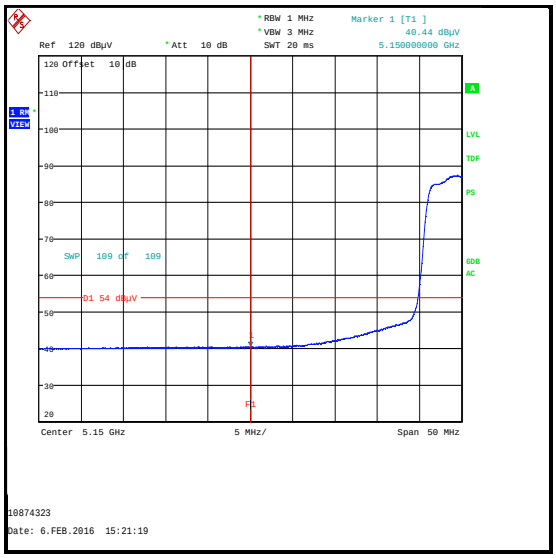
Results: 802.11n / 20 MHz / BPSK / MCS0



Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Lower Band Edge Average Measurement

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

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

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5149.599	57.6	74.0	16.4	Complied
5150	56.2	74.0	17.8	Complied

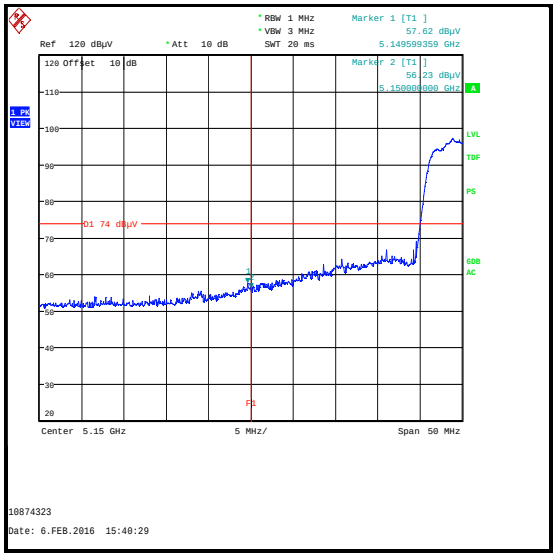
Frequency (MHz)	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
5350	50.8	54.0	3.2	Complied
5351.474	52.0	54.0	2.0	Complied

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

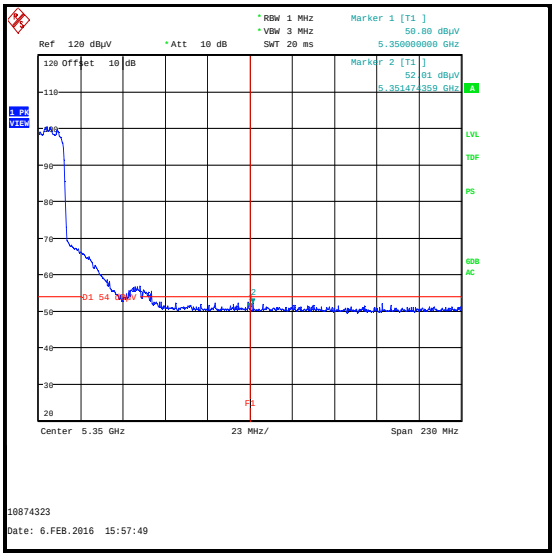
Frequency (MHz)	Level (dBµV/m)	Duty Cycle correction (dB)	Corrected Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5150	40.2	1.6	41.8	54.0	12.2	Complied

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

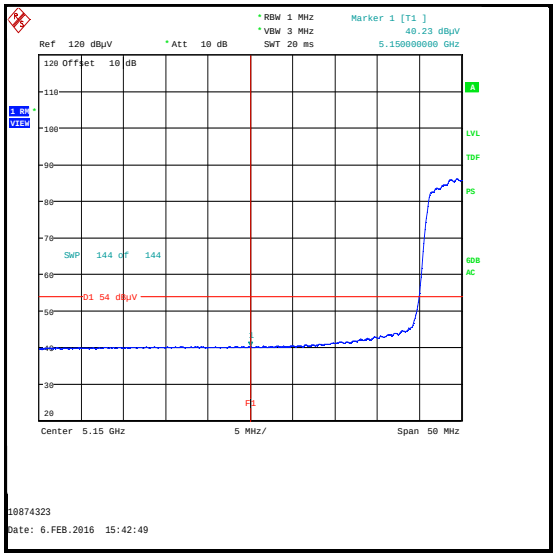
Results: 802.11n / 20 MHz / 16QAM / MCS4



Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Lower Band Edge Average Measurement

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

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

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5148.558	58.9	74.0	15.1	Complied
5150	57.1	74.0	16.9	Complied

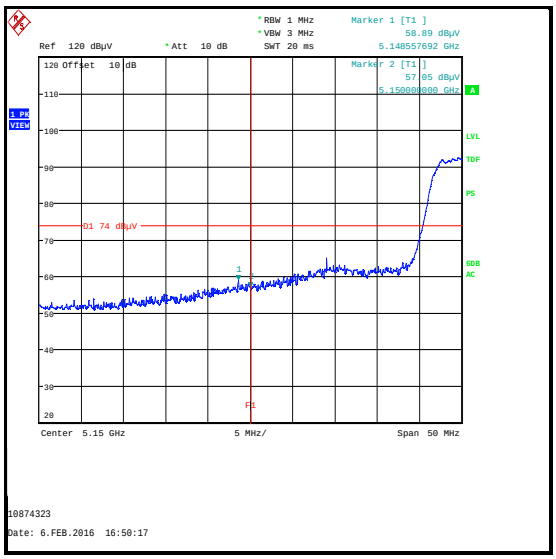
Frequency (MHz)	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
5350	50.6	54.0	3.4	Complied
5352.580	51.4	54.0	2.6	Complied

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

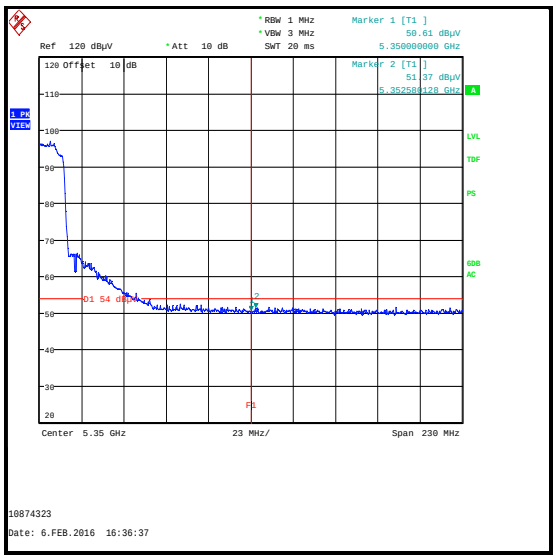
Frequency (MHz)	Level (dBµV/m)	Duty Cycle correction (dB)	Corrected Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5150	40.9	0.7	41.6	54.0	12.4	Complied

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

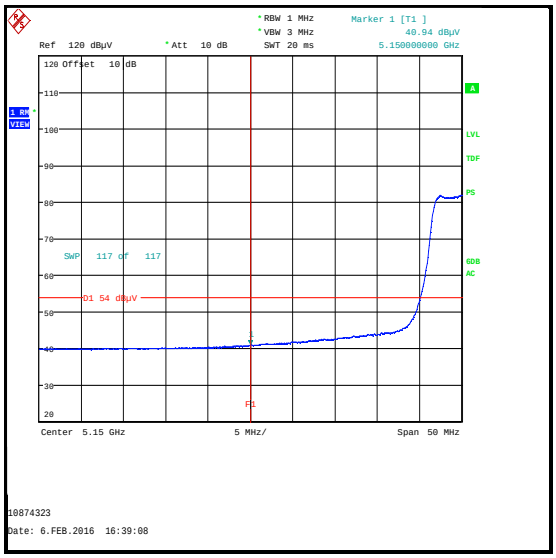
Results: 802.11n / 40 MHz / BPSK / MCS0



Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Lower Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band)

Test Summary:

Test Engineer:	Andrew Edwards	**Test Date:**	07 February 2016
Test Sample Serial Number:	01001716		

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):	22
Relative Humidity (%):	37

Note(s):

1. An Inquiry was made to the FCC and the response confirmed band edge measurements need only be performed in the EUT modes that produce the highest power and the widest bandwidths. The modes that produced the highest power and widest bandwidth were:
    - 802.11a - BPSK / 9 Mbps & QPSK / 12 Mbps
    - 802.11n HT20 – BPSK / MCS0 & 16QAM / MCS4
    - 802.11n HT40 – BPSK / MCS0
2. Lower band edge measurements were performed with the EUT transmitting on the bottom channel. Upper band edge measurements were performed with the EUT transmitting on the top channel.
3. For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. However, there are restricted bands of operation below the lower band edge at 4.5-5.15 GHz and also above the upper band edge at 5.35-5.46 GHz therefore the provisions of FCC Part 15.205 apply.
4. Field strength measurements using peak and average detectors were performed in the restricted bands below 5.15 GHz and above 5.35 GHz. Field strength and EIRP results were found to be compliant with the restricted band limits and Part 15.407 out-of-band limits.
5. In accordance with KDB 789033 Section II.G.1.c) if the peak measurement is below the average limit, it is not necessary to perform a separate average measurement.
6. In accordance with KDB 789033 Section II.G.6.c) Method AD (vi), the average measurements were performed using an increased number of sweeps as calculated below:
    - 802.11a / BPSK / 9 Mbps – 107 sweeps
    - 802.11a / QPSK / 12 Mbps – 114 sweeps
    - 802.11n HT20 / BPSK / MCS0 – 109 sweeps
    - 802.11n HT20 / 16QAM / MCS4 – 144 sweeps
    - 802.11n HT40 / BPSK / MCS0 – 117 sweeps
7. In accordance with KDB 789033 Section II.G.6.c) Method AD (vii), for average measurements, data rates where the EUT was transmitting <98% duty cycle, the duty cycle correction factor calculated in section 5.2.3 was added to the measured result.

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)

Results: 802.11a / 20 MHz / BPSK / 9 Mbps / Peak

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	64.5	74.0	9.5	Complied
5350.561	65.0	74.0	9.0	Complied

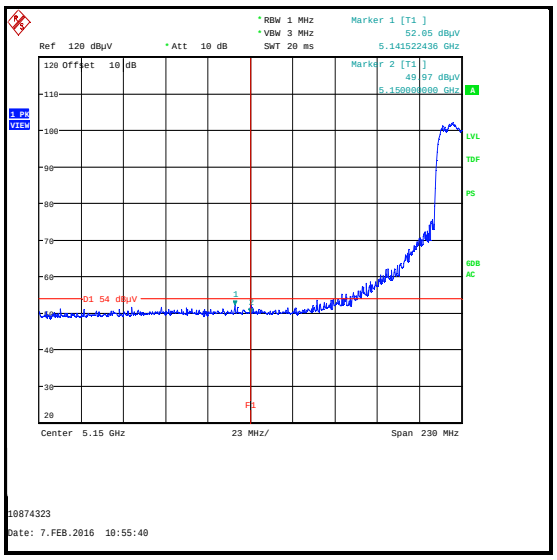
Frequency (MHz)	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
5141.522	52.1	54.0	1.9	Complied
5150	50.0	54.0	4.0	Complied

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

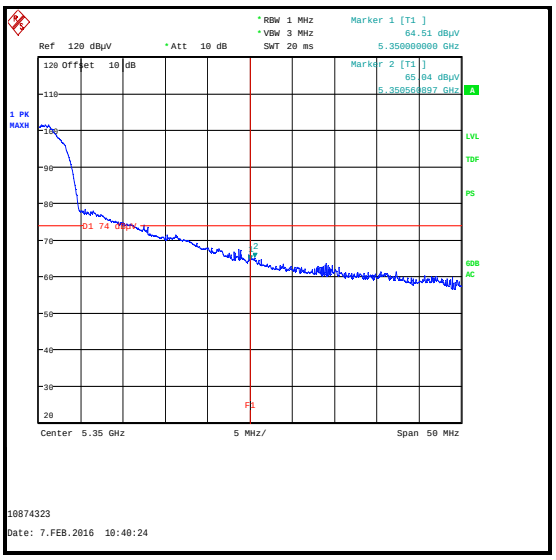
Frequency (MHz)	Level (dBµV/m)	Duty Cycle correction (dB)	Corrected Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	43.2	0.4	43.6	54.0	10.4	Complied
5350.641	43.4	0.4	43.8	54.0	10.2	Complied

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)

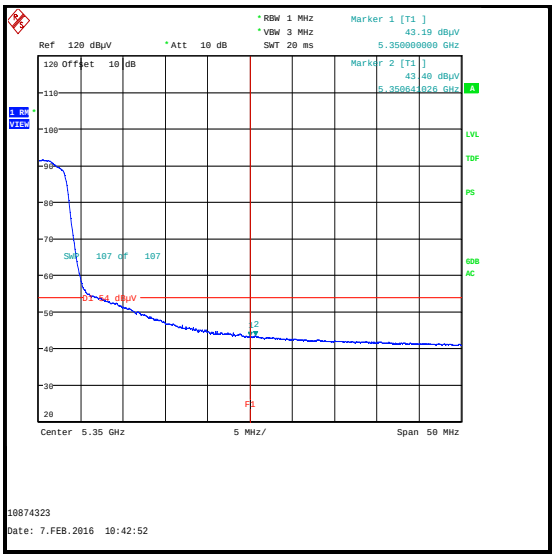
Results: 802.11a / 20 MHz / BPSK / 9 Mbps



Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)

Results: 802.11a / 20 MHz / QPSK / 12 Mbps / Peak

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	62.4	74.0	11.6	Complied

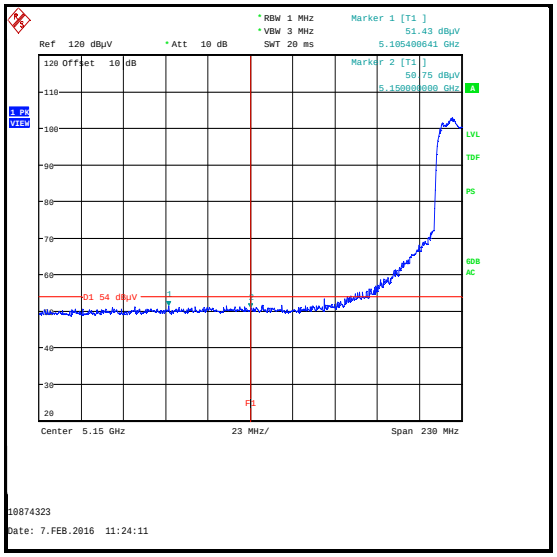
Frequency (MHz)	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
5105.401	51.4	54.0	2.6	Complied
5150	50.8	54.0	3.2	Complied

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

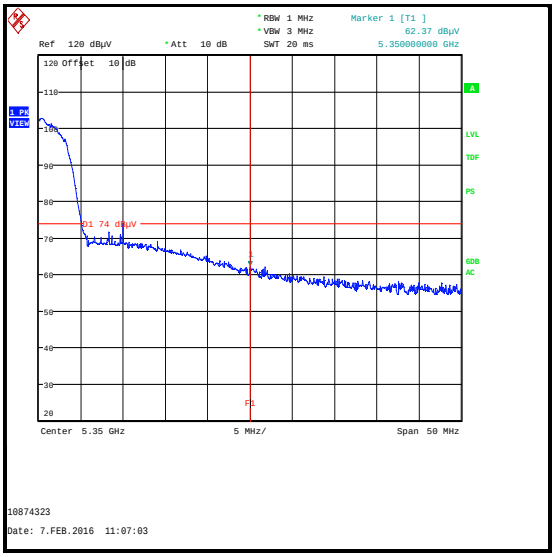
Frequency (MHz)	Level (dBµV/m)	Duty Cycle correction (dB)	Corrected Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	41.9	0.6	42.5	54.0	11.5	Complied

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)

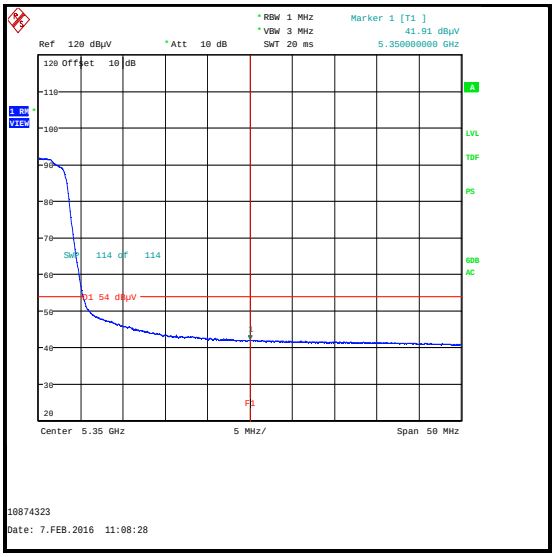
Results: 802.11a / 20 MHz / QPSK / 12 Mbps



Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)

Results: 802.11n / 20 MHz / BPSK / MCS0/ Peak

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	62.7	74.0	11.3	Complied
5354.087	64.2	74.0	9.8	Complied

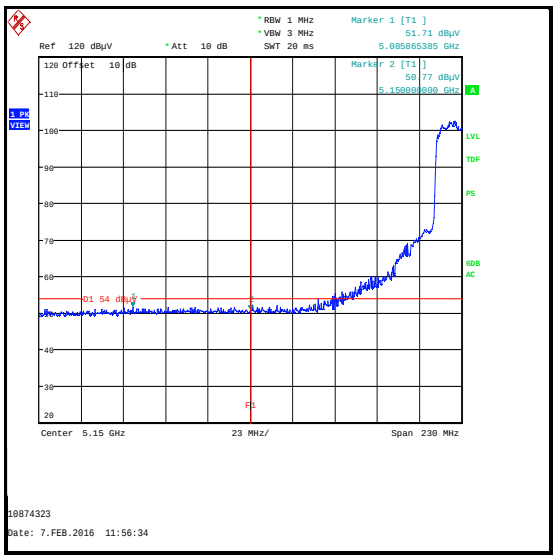
Frequency (MHz)	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
5085.865	51.7	54.0	2.3	Complied
5150	50.8	54.0	3.2	Complied

Results: 802.11n / 20 MHz / BPSK / MCS0/ Average

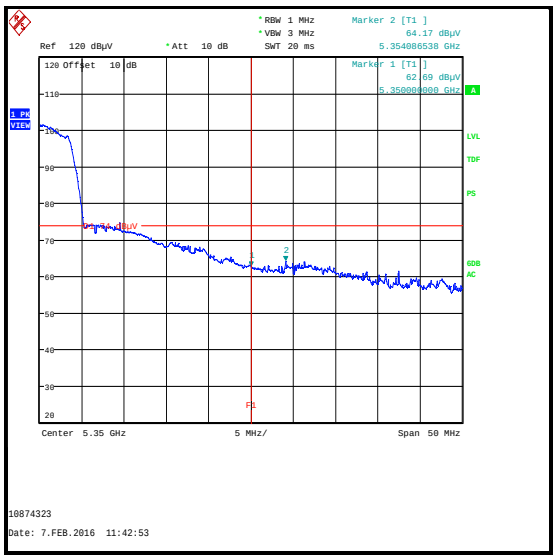
Frequency (MHz)	Level (dBµV/m)	Duty Cycle correction (dB)	Corrected Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	41.7	0.3	42.0	54.0	12.0	Complied

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)

Results: 802.11n / 20 MHz / BPSK / MCS0



Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement

Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)

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

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	59.9	74.0	14.1	Complied
5350.160	60.1	74.0	13.9	Complied

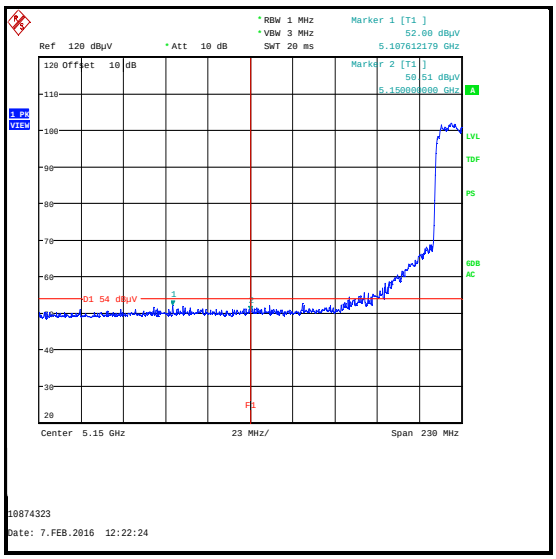
Frequency (MHz)	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
5107.612	52.0	54.0	2.0	Complied
5150	50.5	54.0	3.5	Complied

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

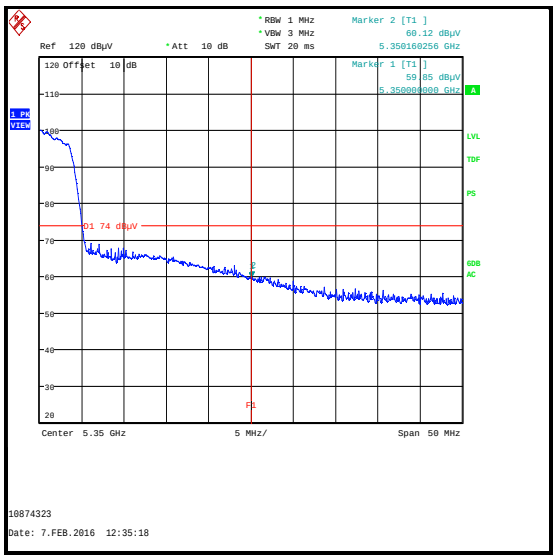
Frequency (MHz)	Level (dBµV/m)	Duty Cycle correction (dB)	Corrected Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	40.3	1.6	41.9	54.0	12.1	Complied

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)

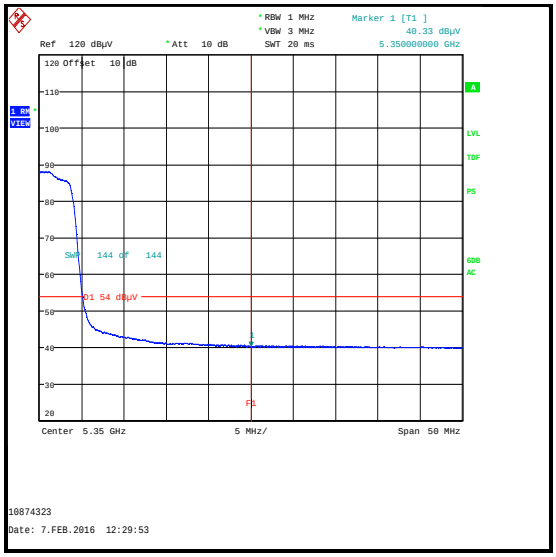
Results: 802.11n / 20 MHz / 16QAM / MCS4



Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)

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

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	61.6	74.0	12.4	Complied
5350.561	62.9	74.0	11.1	Complied

Frequency (MHz)	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
5136.731	52.3	54.0	1.7	Complied
5150	51.8	54.0	2.2	Complied

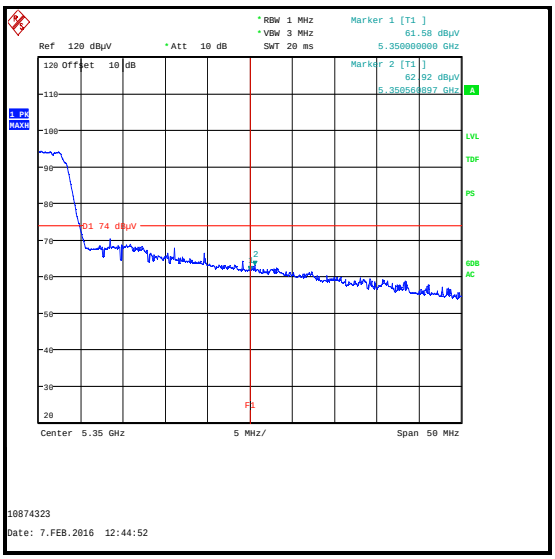
Results: 802.11n / 40 MHz / BPSK / MCS0 / Average

Frequency (MHz)	Level (dBµV/m)	Duty Cycle correction (dB)	Corrected Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5350	41.6	0.7	42.3	54.0	11.7	Complied

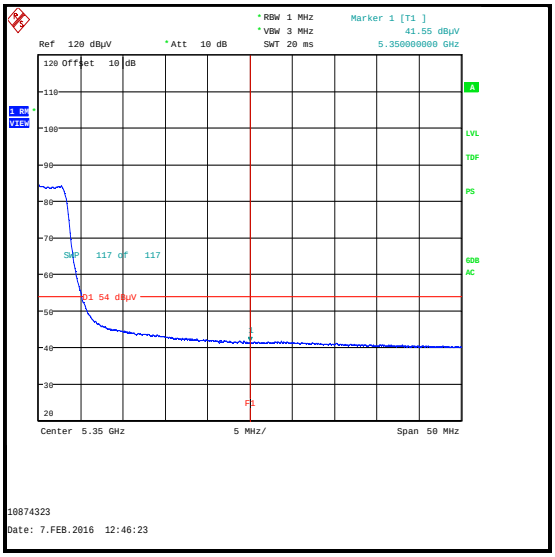
Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)

Results: 802.11n / 40 MHz / BPSK / MCS0

Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Upper Band Edge Average Measurement

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

Test Summary:

Test Engineer:	Andrew Edwards	**Test Dates:**	07 February 2016, 08 February 2016 & 04 March 2016
Test Sample Serial Number:	01001716		

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

Environmental Conditions:

Temperature (°C):	22 to 23
Relative Humidity (%):	31 to 36

Note(s):

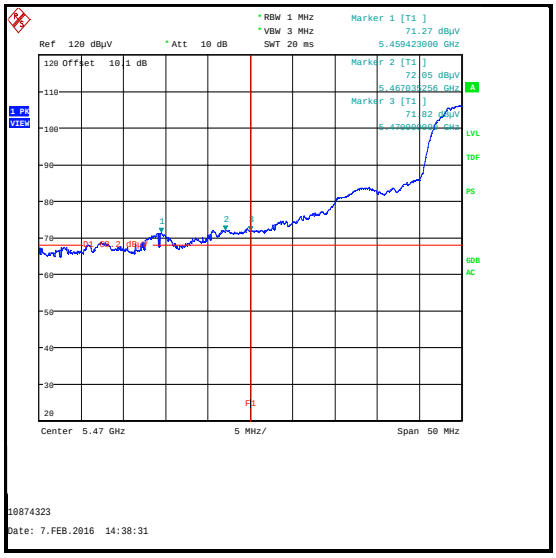
1. An Inquiry was made to the FCC and the response confirmed band edge measurements need only be performed in the EUT modes that produce the highest power and the widest bandwidths. The modes that produced the highest power and widest bandwidth were:
    - 802.11a - BPSK / 9 Mbps & QPSK / 12 Mbps
    - 802.11n HT20 – BPSK / MCS0 & 16QAM / MCS4
    - 802.11n HT40 – BPSK / MCS0
2. Lower band edge measurements were performed with the EUT transmitting on the bottom channel. Upper band edge measurements were performed with the EUT transmitting on the top channel.
3. For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz. However, there are restricted bands of operation below the lower band edge at 4.5-5.15 GHz and also at 5.35-5.46 GHz therefore the provisions of FCC Part 15.205 apply. 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 5.47-5.725 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.d.(iii) using a conversion factor of 95.2.
5. *In accordance with FCC KDB 789033 Section II.G.3(d)(ii), the integration method was used to show compliance. The channel power function of a test receiver was used to perform the measurements in a 1 MHz bandwidth. The measurement was centred 500 kHz below the lower band edge (5469.5 MHz) and 500 kHz above the upper band edge (5725.5 MHz). Emissions that were found to be a higher level than the band edge emission were measured on the centre frequency of the measured emission. The test receiver was left to sweep for a sufficient period of time on Max Hold until the emission levels were maximised.

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

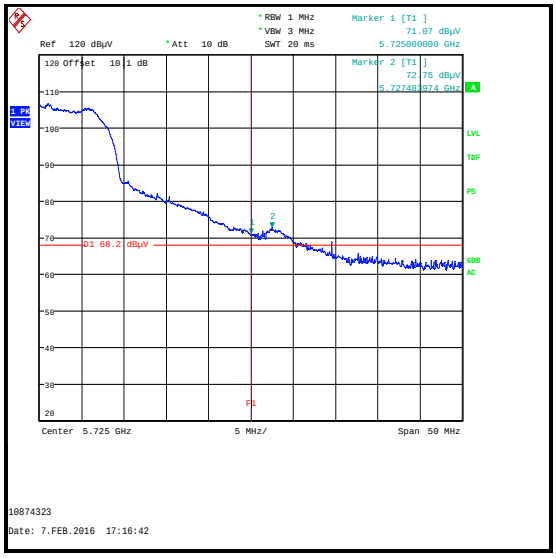
Results: 802.11a / 20 MHz / BPSK / 9 Mbps / Peak

Frequency (MHz)	Level (dBm/MHz)	EIRP Limit (dBm/MHz)	Margin (dB)	Result
5459.423	-32.4*	-27.0	5.4	Complied
5467.035	-30.0*	-27.0	3.0	Complied
5470	-29.9*	-27.0	2.9	Complied
5725	-30.1*	-27.0	3.1	Complied
5727.484	-35.8*	-27.0	8.8	Complied

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5459.423	62.8*	68.2	5.4	Complied
5467.035	65.2*	68.2	3.0	Complied
5470	65.3*	68.2	2.9	Complied
5725	65.1*	68.2	3.1	Complied
5727.484	59.4*	68.2	8.8	Complied



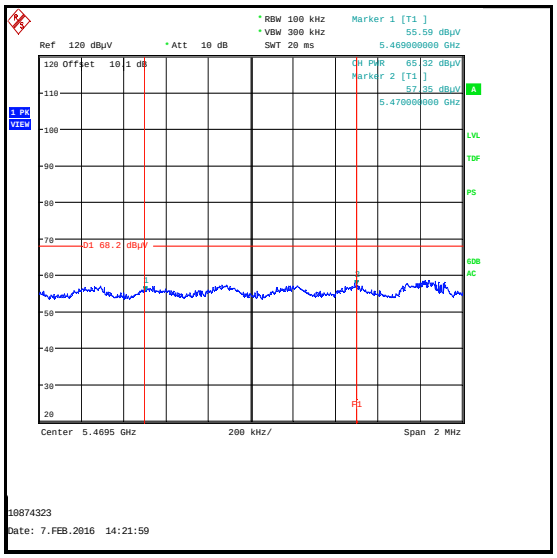
Lower Band Edge Measurement



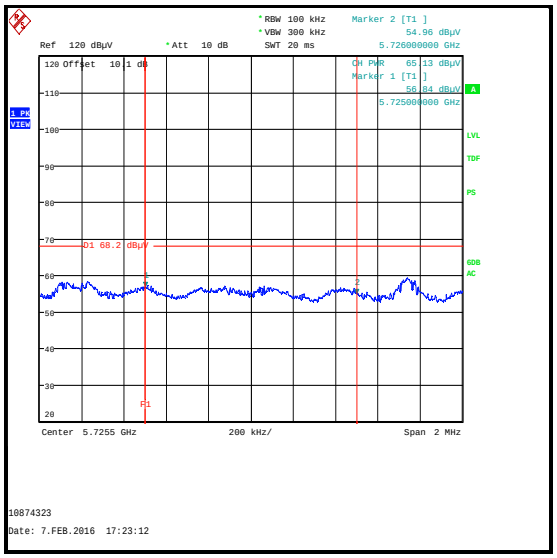
Upper Band Edge Measurement

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

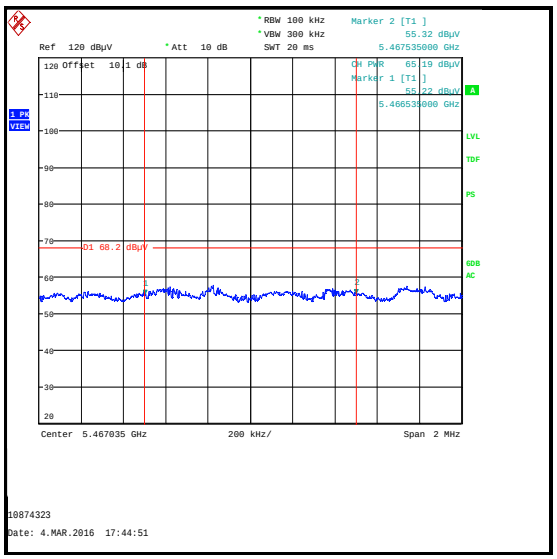
Results: 802.11a / 20 MHz / BPSK / 9 Mbps



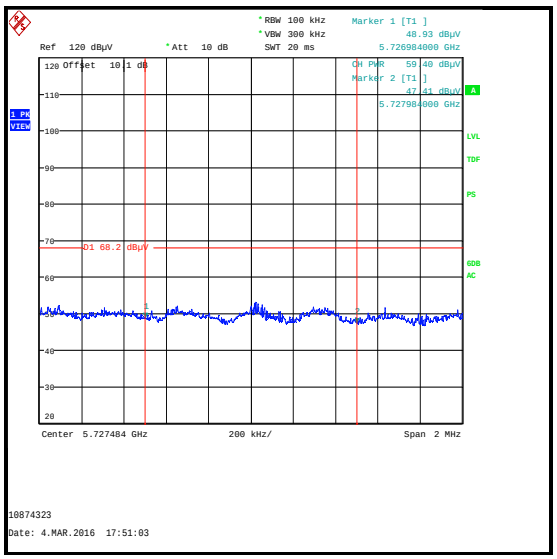
Lower Band Edge Measurement
Integration method



Upper Band Edge Measurement
Integration method



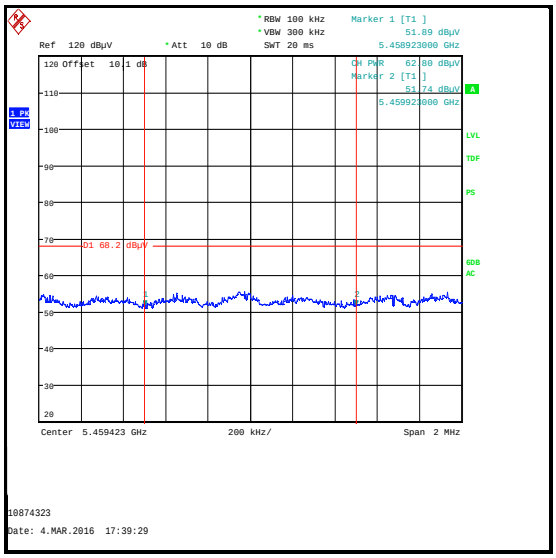
Lower Band Edge Measurement
Integration method (emission at 5467.035MHz)



Upper Band Edge Measurement
Integration method (emission at 5727.484 MHz)

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

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



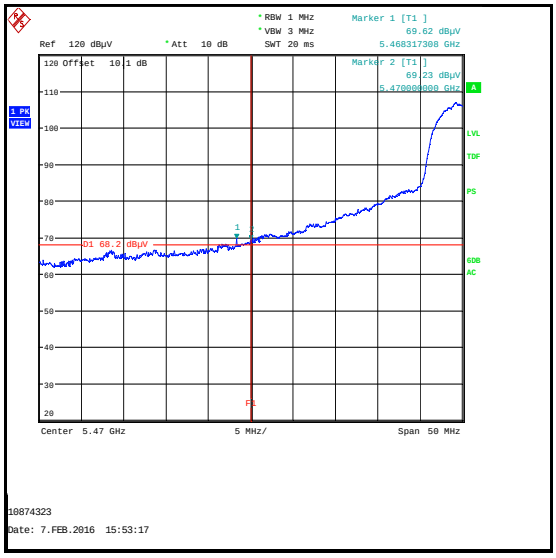
Lower Band Edge Measurement
Integration method (emission at 5459.423 MHz)

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

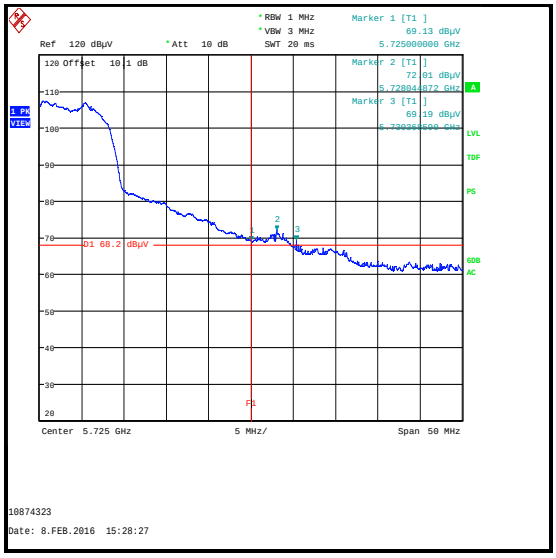
Results: 802.11a / 20 MHz / QPSK / 12 Mbps / Peak

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5468.317	-35.1*	-27.0	8.1	Complied
5470	-33.8*	-27.0	6.8	Complied
5725	-31.3*	-27.0	4.3	Complied
5728.045	-33.3*	-27.0	6.3	Complied
5730.369	-34.7*	-27.0	7.7	Complied

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5468.317	60.1*	68.2	8.1	Complied
5470	61.4*	68.2	6.8	Complied
5725	63.9*	68.2	4.3	Complied
5728.045	61.9*	68.2	6.3	Complied
5730.369	60.5*	68.2	7.7	Complied



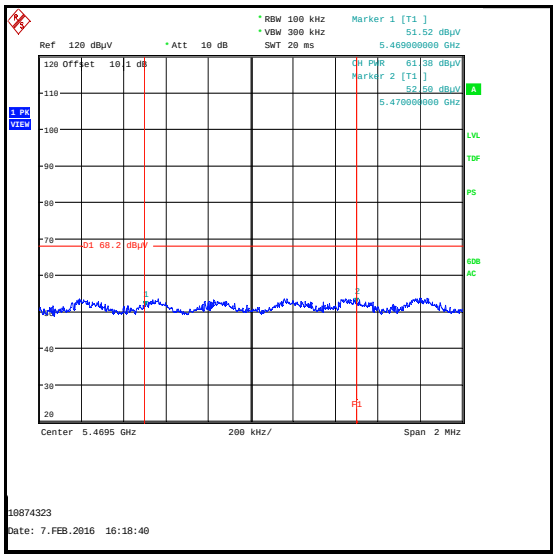
Lower Band Edge Measurement



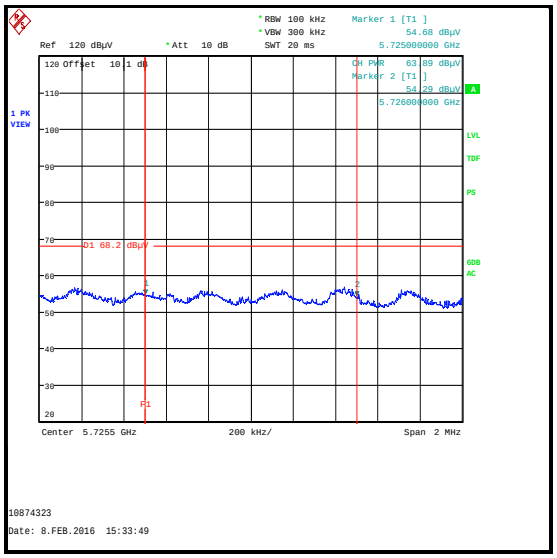
Upper Band Edge Measurement

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

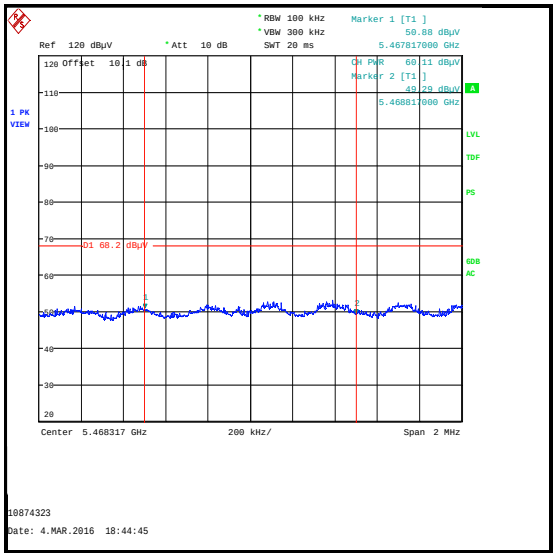
Results: 802.11a / 20 MHz / QPSK / 12 Mbps / Peak



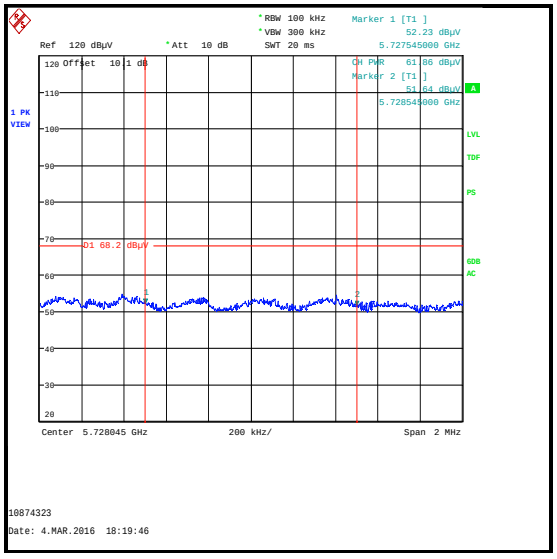
Lower Band Edge Measurement
Integration method



Upper Band Edge Measurement
Integration method



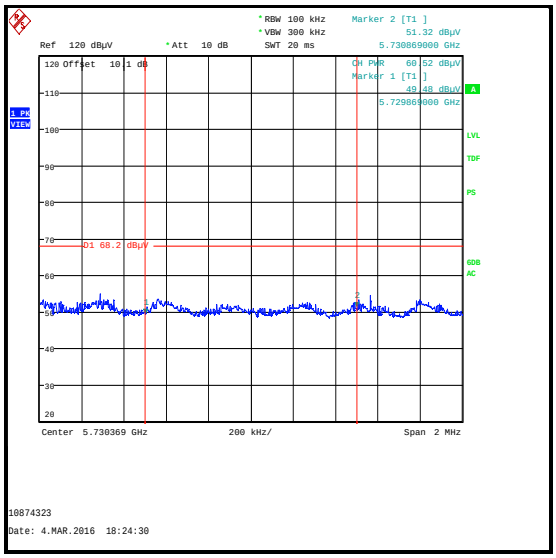
Lower Band Edge Measurement
Integration method (emission at 5468.317 MHz)



Upper Band Edge Measurement
Integration method (emission at 5728.045 MHz)

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

Results: 802.11a / 20 MHz / QPSK / 12 Mbps / Peak



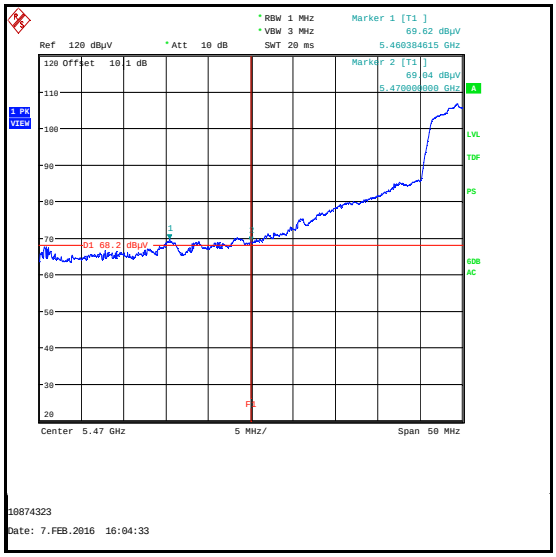
Upper Band Edge Measurement
Integration method (emission at 5730.369 MHz)

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

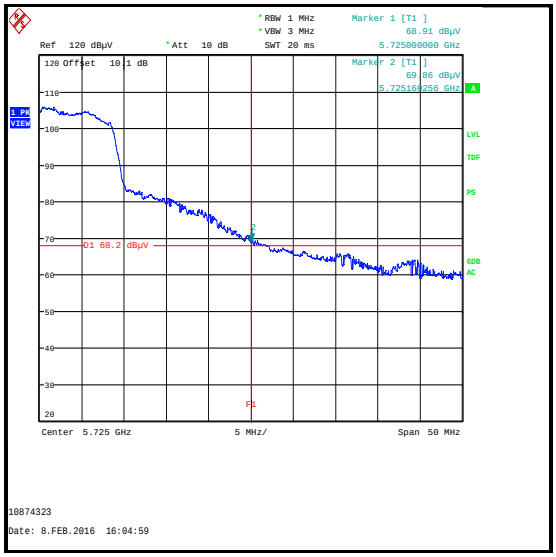
Results: 802.11n / 20 MHz / BPSK / MCS0 / Peak

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5460.385	-34.8*	-27.0	7.8	Complied
5470	-31.9*	-27.0	4.9	Complied
5725	-32.3*	-27.0	5.3	Complied
5725.160	-33.5*	-27.0	6.5	Complied

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5460.385	60.4*	68.2	7.8	Complied
5470	63.3*	68.2	4.9	Complied
5725	62.9*	68.2	5.3	Complied
5725.160	61.7*	68.2	6.5	Complied



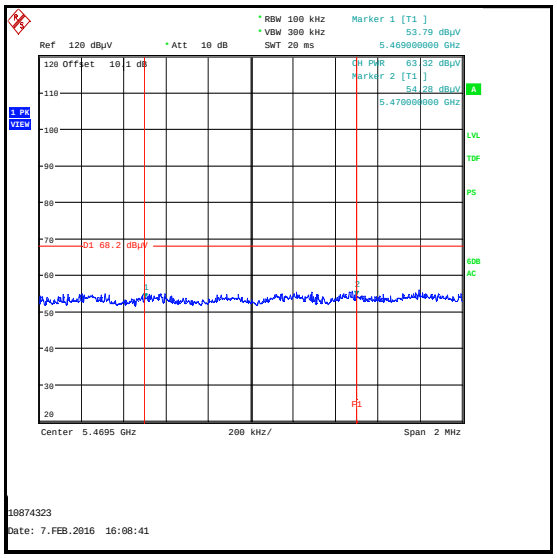
Lower Band Edge Measurement



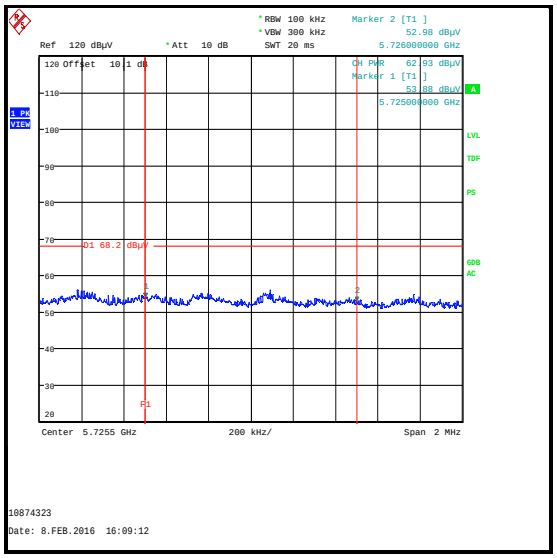
Upper Band Edge Measurement

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

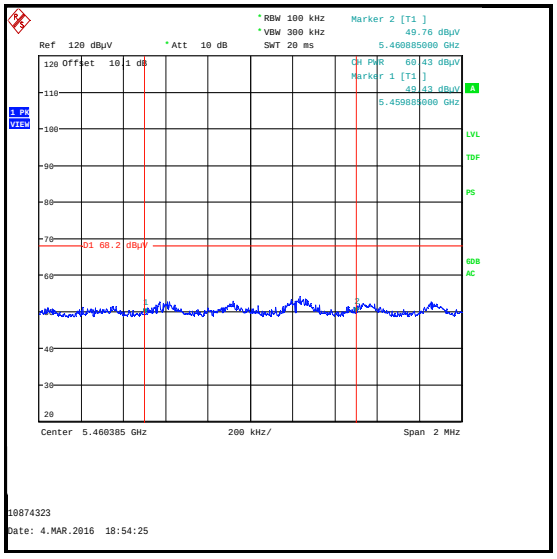
Results: 802.11n / 20 MHz / BPSK / MCS0



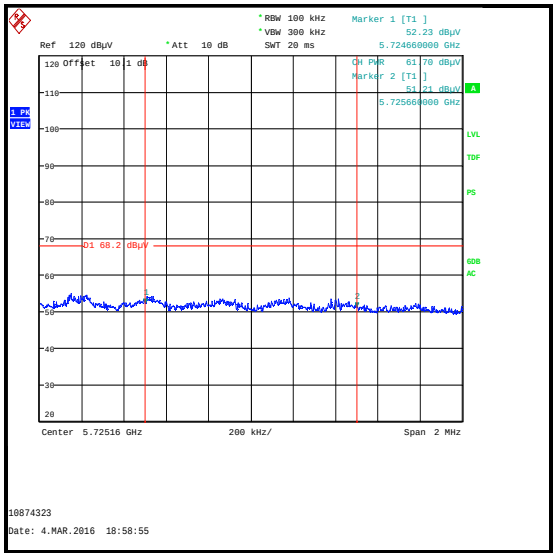
Lower Band Edge Measurement
Integration method



Upper Band Edge Measurement
Integration method



Lower Band Edge Measurement
Integration method (emission at 5460.385 MHz)



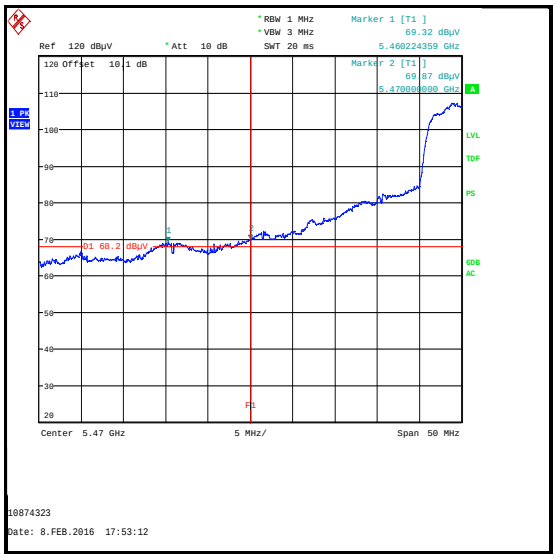
Upper Band Edge Measurement
Integration method (emission at 5725.160 MHz)

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

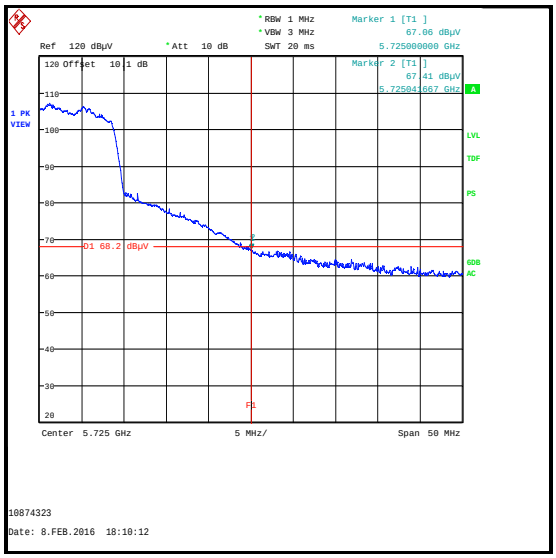
Results: 802.11n / 20 MHz / 16QAM / MCS4 / Peak

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5460.224	-34.1*	-27.0	7.1	Complied
5470	-30.8*	-27.0	3.8	Complied
5725	-28.1	-27.0	1.1	Complied
5725.042	-27.8	-27.0	0.8	Complied

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5460.224	61.1*	68.2	7.1	Complied
5470	64.4*	68.2	3.8	Complied
5725	67.1	68.2	1.1	Complied
5725.042	67.4	68.2	0.8	Complied



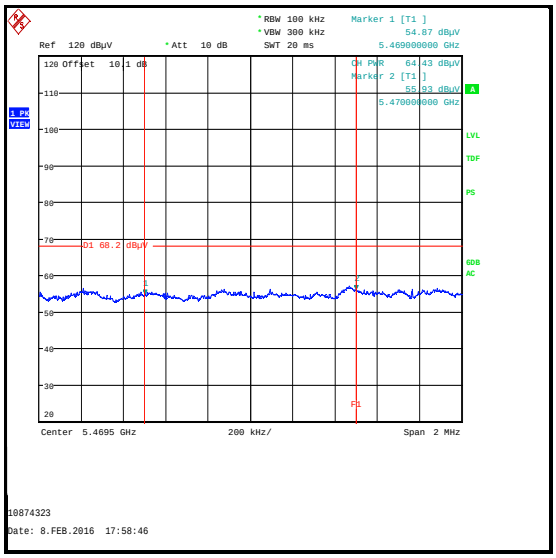
Lower Band Edge Measurement



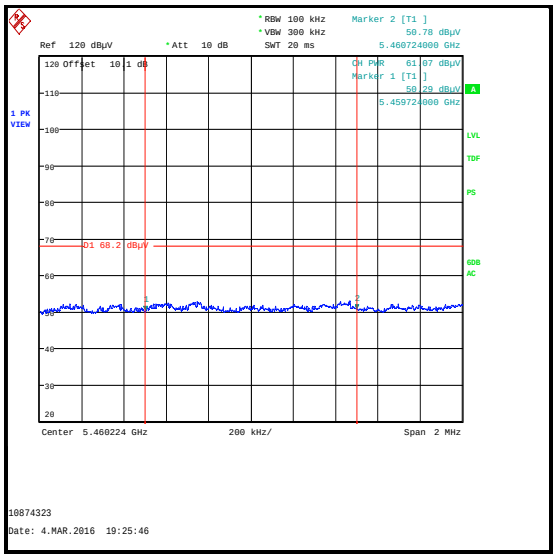
Upper Band Edge Measurement

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

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



Lower Band Edge Measurement
Integration method



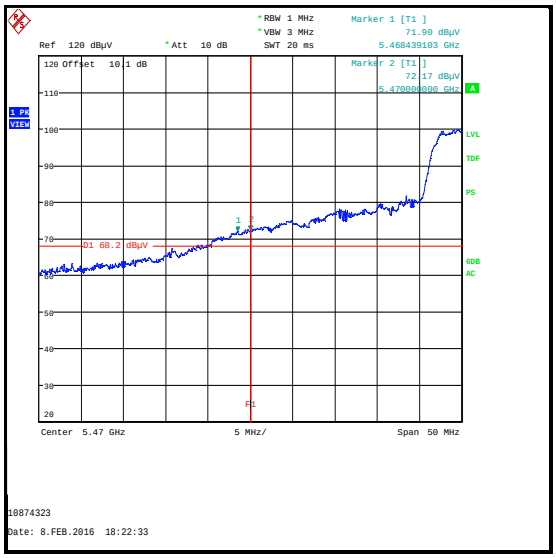
Lower Band Edge Measurement
Integration method (emission at 5460.224 MHz)

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

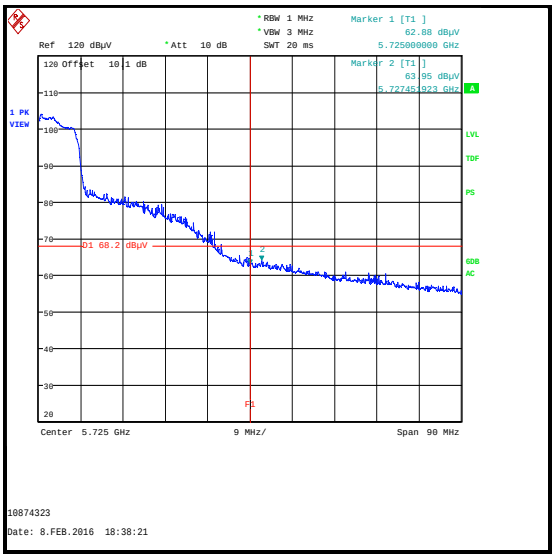
Results: 802.11n / 40 MHz / BPSK / MCS0 / Peak

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5470	-28.6*	-27.0	1.6	Complied
5725	-32.3	-27.0	5.3	Complied
5727.452	-31.2	-27.0	4.2	Complied

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
5470	66.6*	68.2	1.6	Complied
5725	62.9	68.2	5.3	Complied
5727.452	64.0	68.2	4.2	Complied



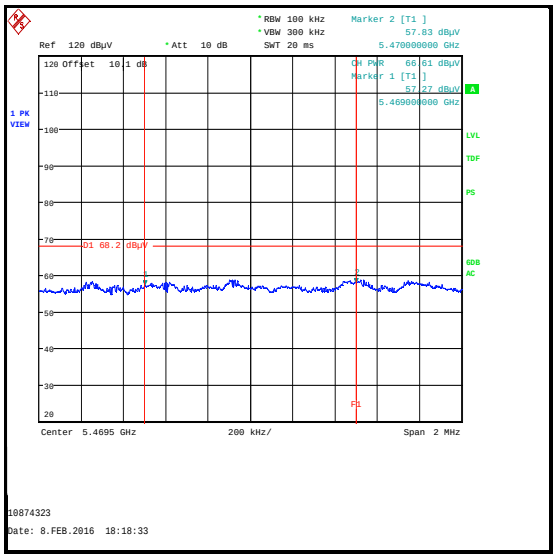
Lower Band Edge Measurement



Upper Band Edge Measurement

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

Results: 802.11n / 40 MHz / BPSK / MCS0



Lower Band Edge Measurement
Integration method

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1656	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	23 Apr 2016	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	21 Dec 2016	12
M1886	Test Receiver	Rohde & Schwarz	ESU26	100554	21 May 2016	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	19 Dec 2016	12
A253	Antenna	Flann Microwave	12240-20	128	17 Dec 2016	12
A1396	Attenuator	Huber & Suhner	6810.17.B	757987	05 May 2016	12

6. Measurement Uncertainty

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

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

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

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

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	±4.69 dB
Maximum Conducted Output Power	5.15 GHz to 5.850 GHz	95%	±1.13 dB
Maximum Power Spectral Density	5.15 GHz to 5.850 GHz	95%	±1.13 dB
26 dB Emission Bandwidth	5.15 GHz to 5.850 GHz	95%	±3.92 %
Radiated Spurious Emissions	30 MHz to 1 GHz	95%	±5.65 dB
Radiated Spurious Emissions	1 GHz to 40 GHz	95%	±2.94 dB

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

7. Report Revision History

Version Number	Revision Details		
	Page No(s)	Clause	Details
1.0	-	-	Initial Version

--- END OF REPORT ---