

5.2.6. Transmitter Maximum Power Spectral Density**Test Summary:**

Test Engineer:	Nick Steele	Test Date:	20 August 2014
Test Sample IMEI:	352025060506475		

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

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	40

Note(s):

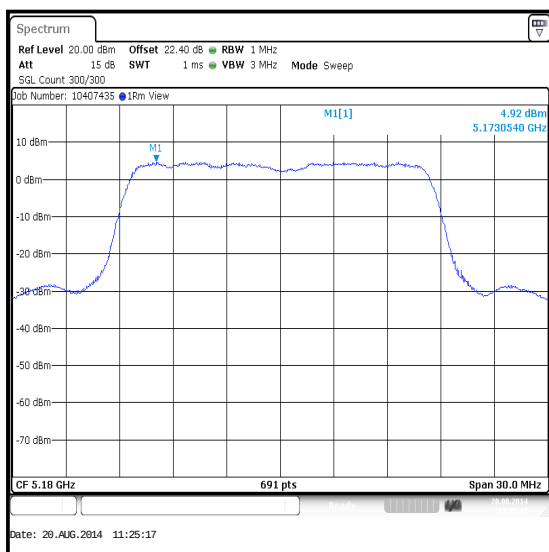
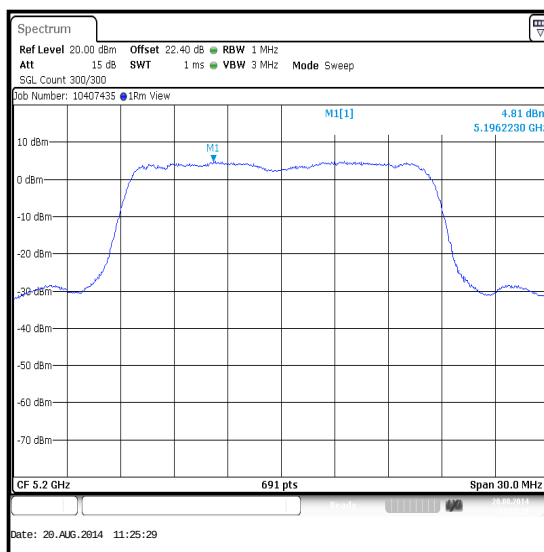
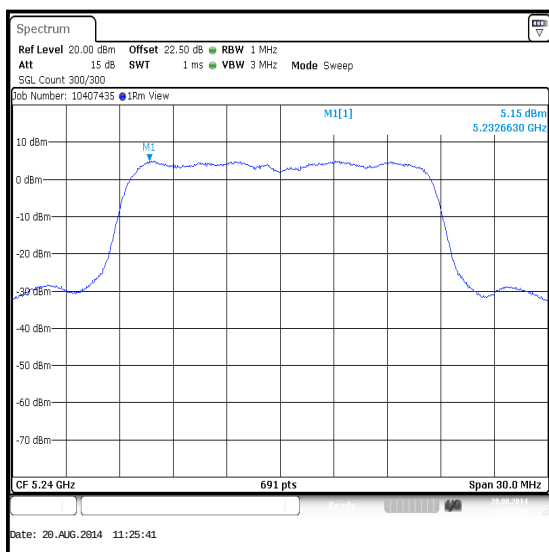
1. Transmitter Maximum Power Spectral Density tests in all bands were performed using a signal analyser in accordance with KDB 789033 II. F referencing II.E.2.b) Method SA-1 and II.E.2.d) Method SA-2.
2. The customer declared the following data rates to be used for all measurements as:
 - o 802.11a – BPSK / 6 Mbps
 - o 802.11n HT20 SISO – BPSK / 6.5 Mbps / MCS0
 - o 802.11n HT40 SISO – BPSK / 13.5 Mbps / MCS0
 - o 802.11n HT20 MIMO – BPSK / 6.5 Mbps / MCS0
 - o 802.11n HT40 MIMO – BPSK / 13.5 Mbps / MCS0

Measurements were then performed in these modes on bottom, middle and top channels in all operating bands.

3. For data rates where the EUT was transmitting at <98% duty cycle, the calculated duty cycle in section 5.2.4 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. For 802.11a and 802.11n SISO modes, power spectral density was measured on both ports, Port 1 produced the highest power and was therefore deemed worst case. Results for Port 1 are recorded in the tables below.
5. For 802.11n MIMO mode, conducted power spectral density was measured on both ports and then combined using the measure-and-sum method stated in FCC KDB 662911.
6. The EUT antenna has a gain of <6 dBi in the 5.15-5.25 GHz band.
7. 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.

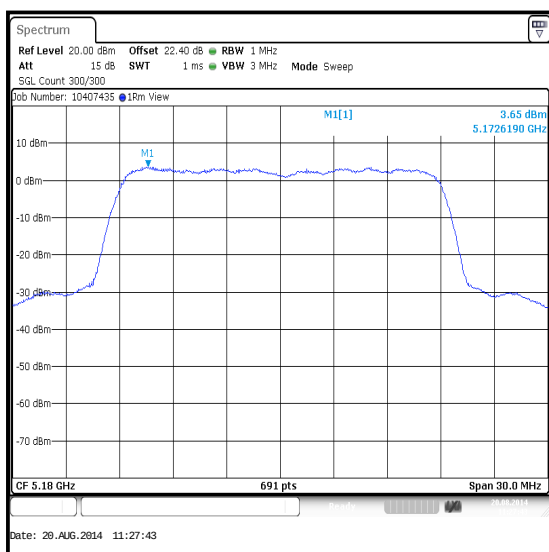
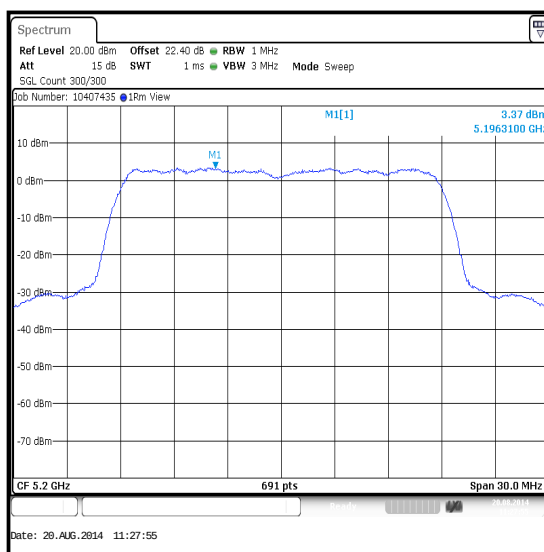
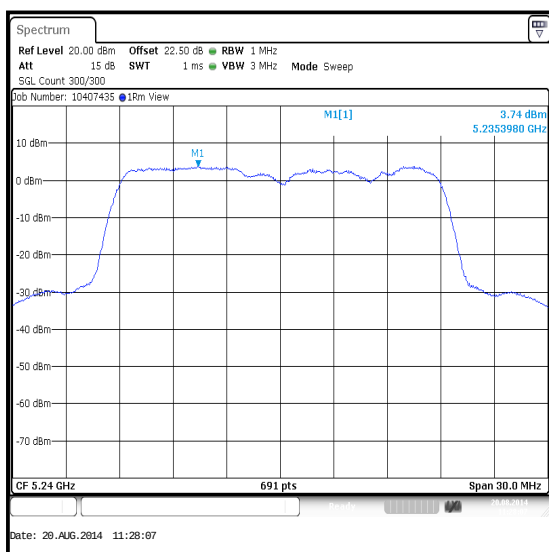
Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)**Results: 802.11a / 20 MHz / BPSK / 6 Mbps / Port 1**

Channel	Frequency (MHz)	PSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5180	4.9	11.0	6.1	Complied
Middle	5200	4.8	11.0	6.2	Complied
Top	5240	5.2	11.0	5.8	Complied

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

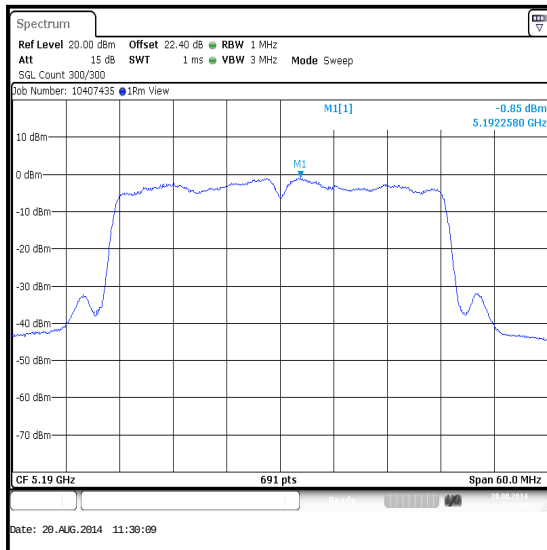
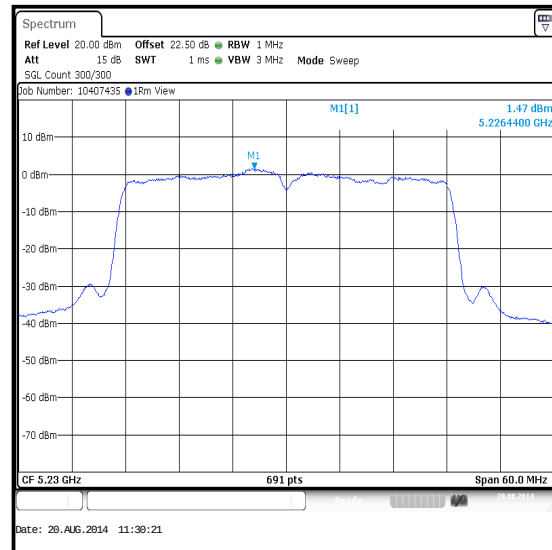
Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)**Results: 802.11n / 20 MHz / BPSK / MCS0 / SISO / Port 1**

Channel	Frequency (MHz)	PSD (dBm/MHz)	Duty Cycle Correction (dB)	Corrected PSD (dBm /MHz)	Limit (dBm)	Margin (dB)	Result
Bottom	5180	3.7	0.1	3.8	11.0	7.2	Complied
Middle	5200	3.4	0.1	3.5	11.0	7.5	Complied
Top	5240	3.7	0.1	3.8	11.0	7.2	Complied

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

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)**Results: 802.11n / 40 MHz / BPSK / MCS0 / SISO / Port 1**

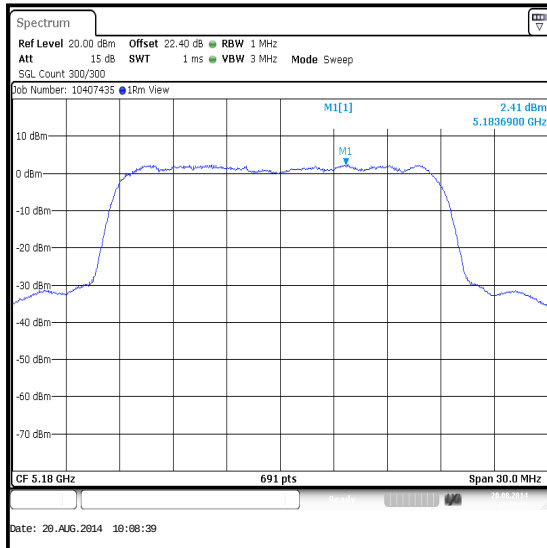
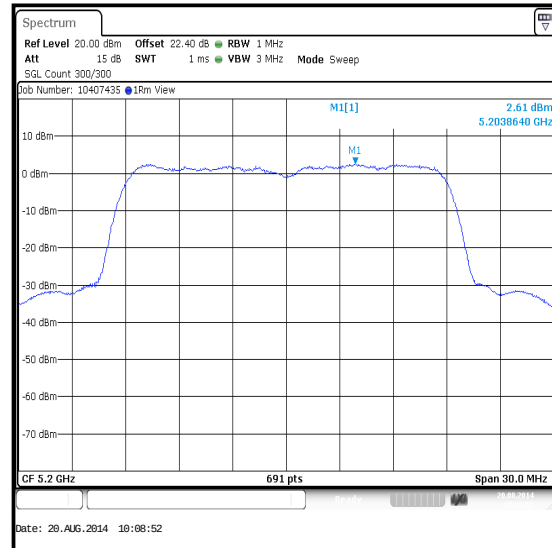
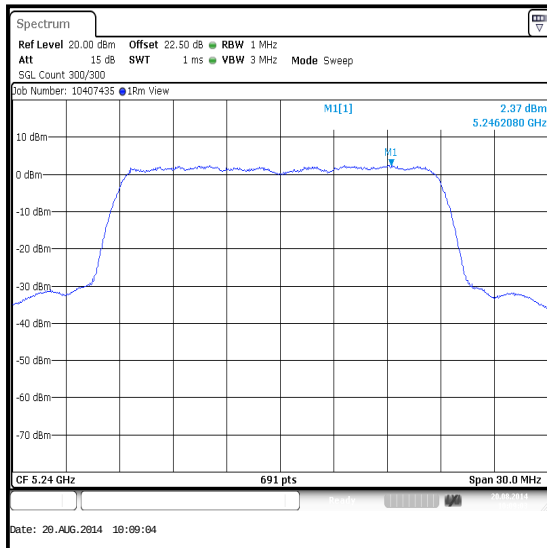
Channel	Frequency (MHz)	PSD (dBm/MHz)	Duty Cycle Correction (dB)	Limit (dBm /MHz)	Limit (dBm)	Margin (dB)	Result
Bottom	5190	-0.8	0.2	-0.6	11.0	11.6	Complied
Top	5230	1.5	0.2	1.7	11.0	9.3	Complied

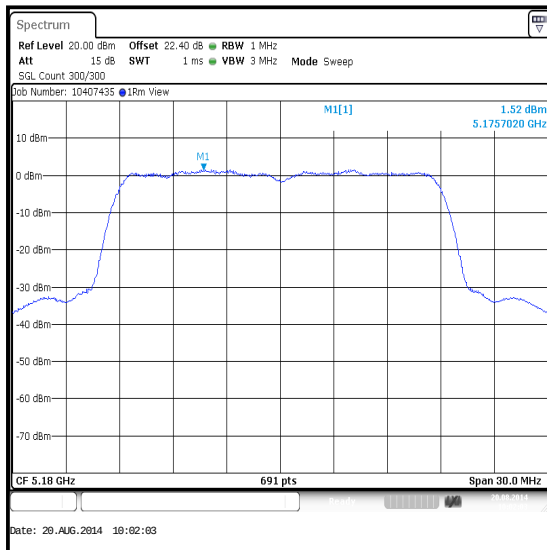
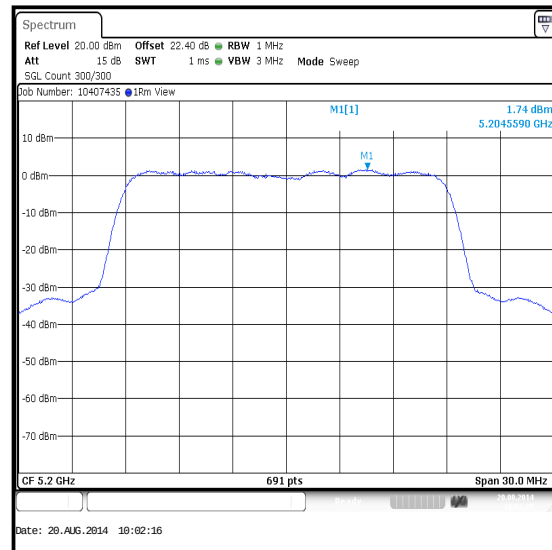
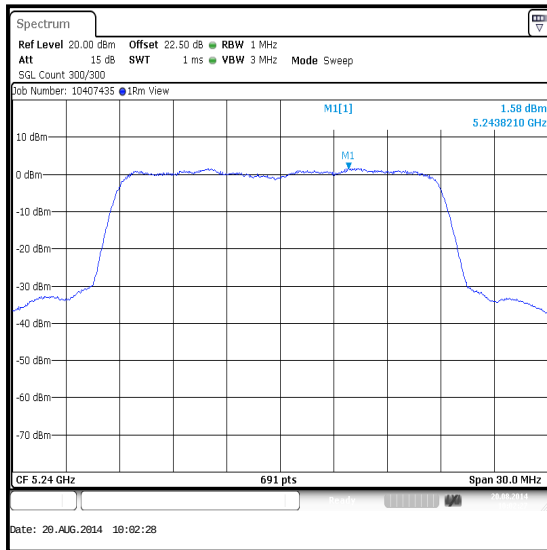
**Bottom Channel****Top Channel**

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)**Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO**

Channel	Port 1			Port 2		
	PSD (dBm /MHz)	Duty Cycle Correction (dB)	Corrected PSD (dBm /MHz)	PSD (dBm /MHz)	Duty Cycle Correction (dB)	Corrected PSD (dBm /MHz)
Bottom	2.4	0.1	2.5	1.5	0.1	1.6
Middle	2.6	0.1	2.7	1.7	0.1	1.8
Top	2.4	0.1	2.5	1.6	0.1	1.7

Channel	Frequency (MHz)	Conducted PSD Port 1 (dBm /MHz)	Conducted PSD Port 2 (dBm /MHz)	Combined Conducted PSD (dBm /MHz)	Limit (dBm)	Margin (dB)	Result
Bottom	5180	2.5	1.6	5.1	11.0	5.9	Complied
Middle	5200	2.7	1.8	5.3	11.0	5.7	Complied
Top	5240	2.5	1.7	5.1	11.0	5.9	Complied

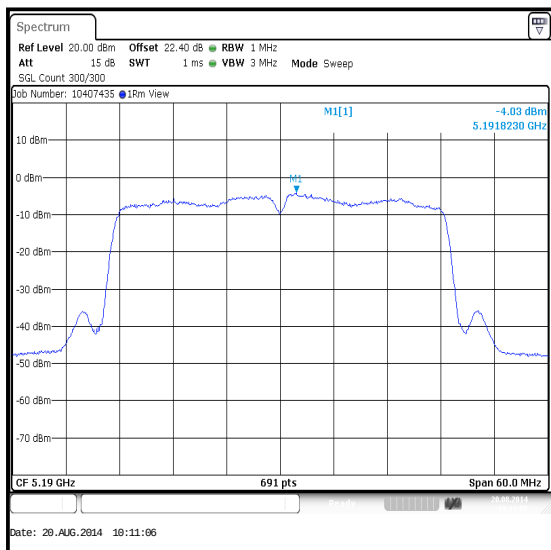
Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)**Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / Port 1****Bottom Channel****Middle Channel****Top Channel**

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)**Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / Port 2****Bottom Channel****Middle Channel****Top Channel**

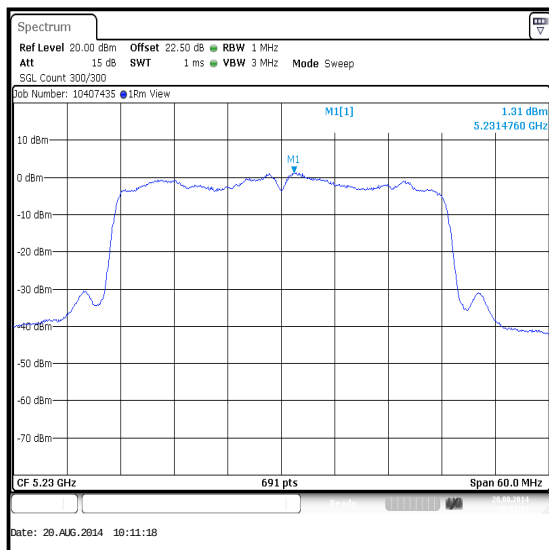
Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)**Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO**

Channel	Port 1			Port 2		
	PSD (dBm /MHz)	Duty Cycle Correction (dB)	Corrected PSD (dBm /MHz)	PSD (dBm /MHz)	Duty Cycle Correction (dB)	Corrected PSD (dBm /MHz)
Bottom	-4.0	0.2	-3.8	-5.1	0.2	-4.9
Top	1.3	0.2	1.5	0.8	0.2	1.0

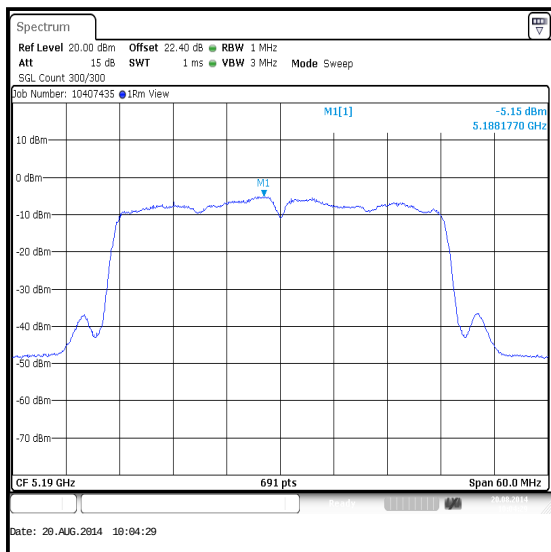
Channel	Frequency (MHz)	Conducted PSD Port 1 (dBm /MHz)	Conducted PSD Port 2 (dBm /MHz)	Combined Conducted PSD (dBm /MHz)	Limit (dBm)	Margin (dB)	Result
Bottom	5190	-3.8	-4.9	-1.3	11.0	12.3	Complied
Top	5230	1.5	1.0	4.3	11.0	6.7	Complied

Transmitter Maximum Power Spectral Density (5.15-5.25 GHz band) (continued)**Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / Port 1**

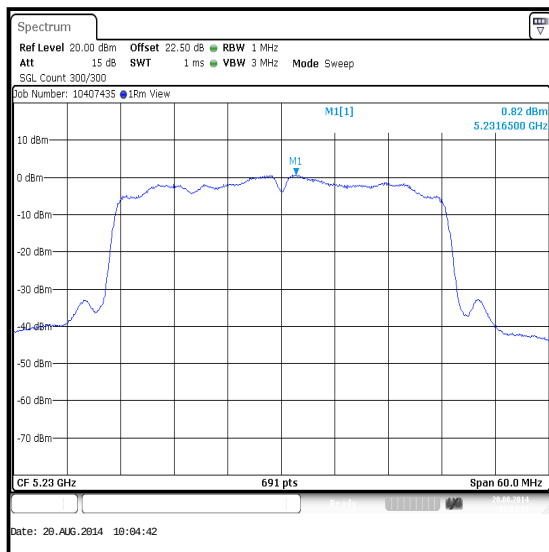
Bottom Channel



Top Channel

Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / Port 2

Bottom Channel



Top Channel

Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands)**Test Summary:**

Test Engineer:	Nick Steele	Test Date:	20 August 2014
Test Sample IMEI:	352025060506475		

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

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	40

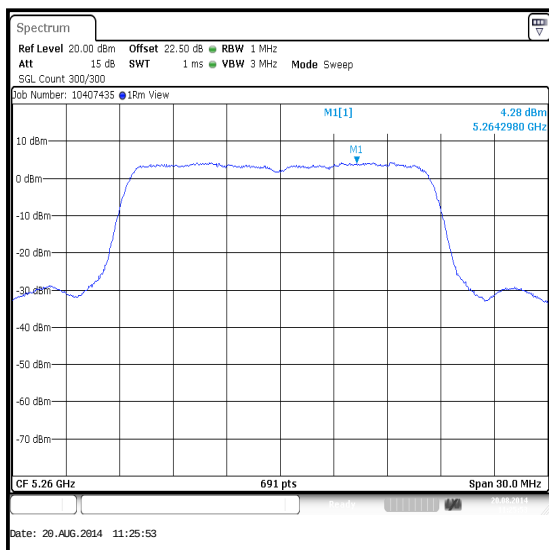
Note(s):

1. FCC Part 15.407(a)(2) limit for PSD in the 5.25-5.35 GHz and 5.47-5.725 GHz operating bands is <11 dBm/MHz.
2. For 802.11a and 802.11n SISO mode, the EUT antenna has a gain of <6 dBi.
3. For 802.11n MIMO mode in the 5.25-5.35 GHz band, the EUT antenna has a directional gain of <6 dBi.
4. For 802.11n MIMO mode in the 5.47-5.725 GHz band, the EUT antenna has a combined gain of 6.4 dBi. In accordance with 15.407(a)(2), the limit was reduced by the amount in dB the antenna gain exceeds 6 dBi. Therefore the limit of 11 dBm/MHz has been reduced by 0.4 dB to 10.6 dBm/MHz.

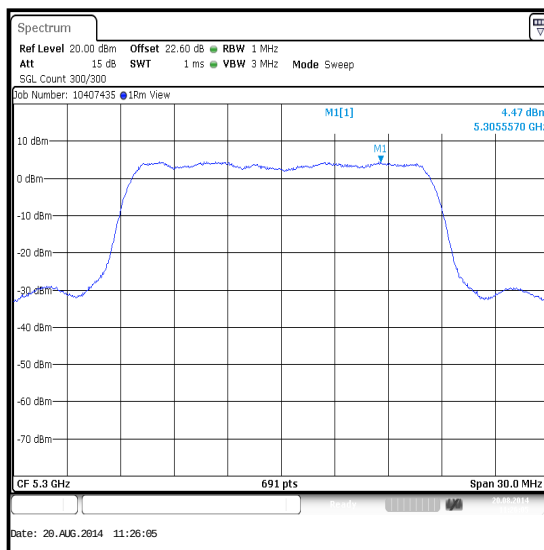
Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11a / 20 MHz / BPSK / 6 Mbps / 5.25-5.35 GHz band/ Port 1

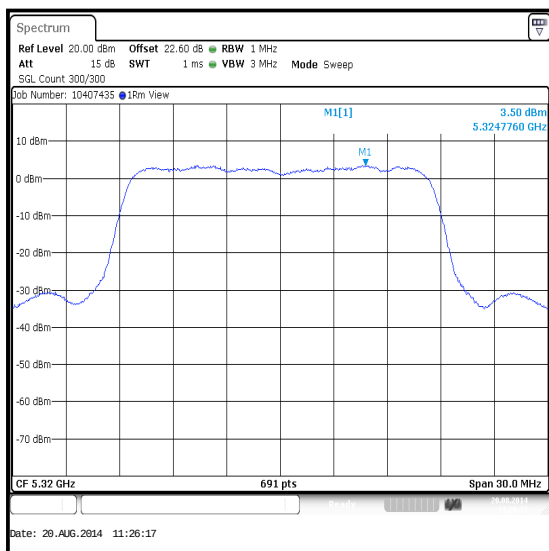
Channel	Frequency (MHz)	PSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5260	4.3	11.0	6.7	Complied
Middle	5300	4.5	11.0	6.5	Complied
Top	5320	3.5	11.0	7.5	Complied



Bottom Channel



Middle Channel

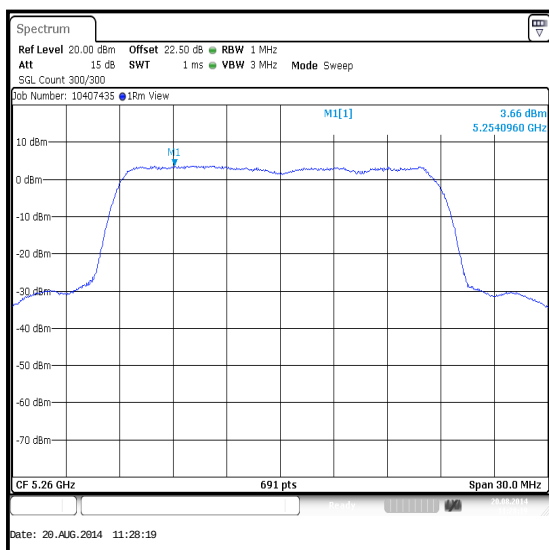


Top Channel

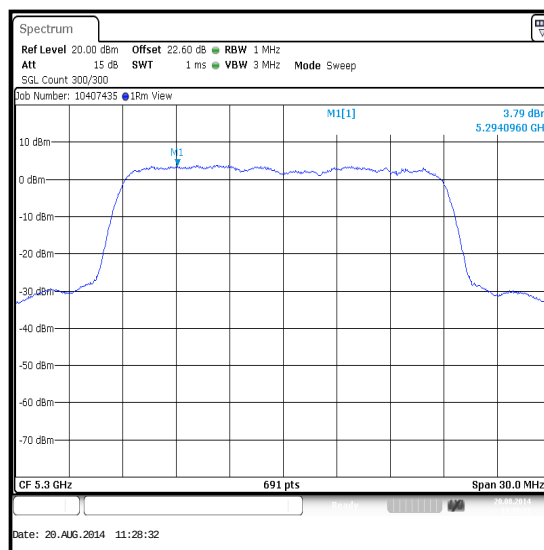
Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11n / 20 MHz / BPSK / MCS0 / SISO / 5.25-5.35 GHz band / Port 1

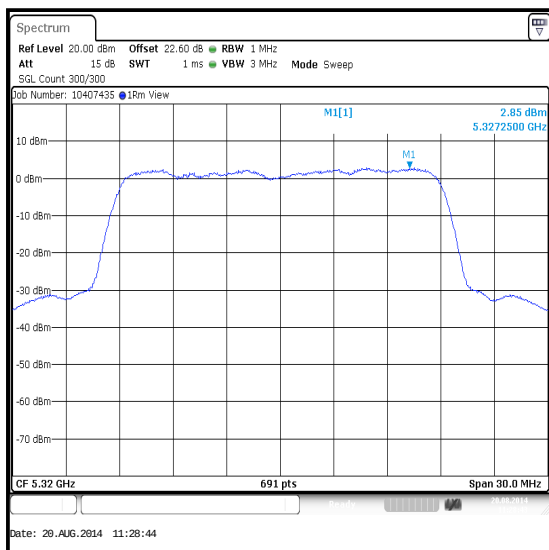
Channel	Frequency (MHz)	PSD (dBm/MHz)	Duty Cycle Correction (dB)	Corrected PSD (dBm /MHz)	Limit (dBm)	Margin (dB)	Result
Bottom	5260	3.7	0.1	3.8	11.0	7.2	Complied
Middle	5300	3.8	0.1	3.9	11.0	7.1	Complied
Top	5320	2.9	0.1	3.0	11.0	8.0	Complied



Bottom Channel



Middle Channel

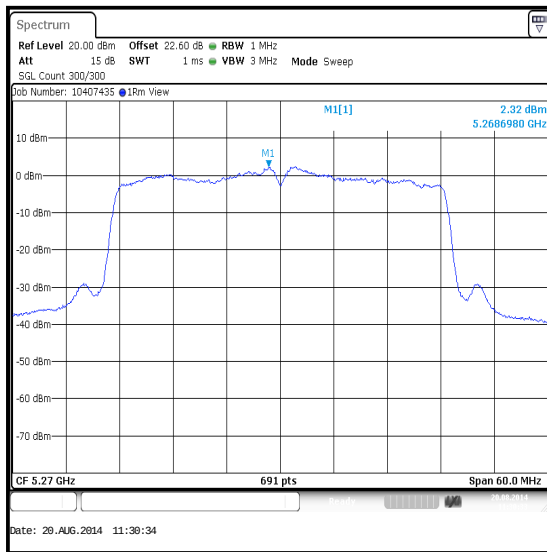


Top Channel

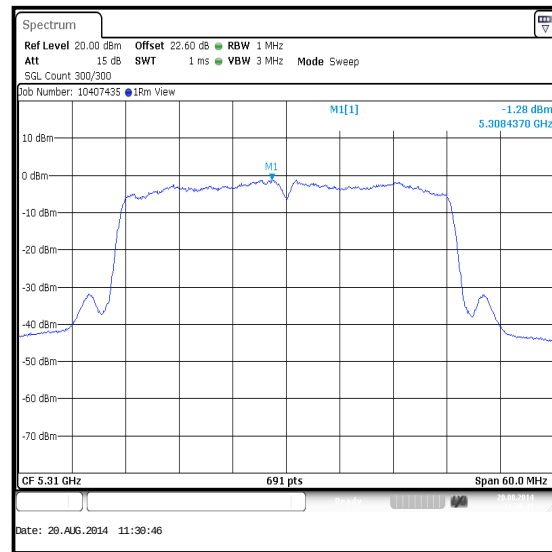
Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11n / 40 MHz / BPSK / MCS0 / SISO / 5.25-5.35 GHz band / Port 1

Channel	Frequency (MHz)	PSD (dBm /MHz)	Duty cycle correction (dB)	Corrected PSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5270	2.3	0.2	2.5	11.0	8.5	Complied
Top	5310	-1.3	0.2	-1.1	11.0	12.1	Complied



Bottom Channel



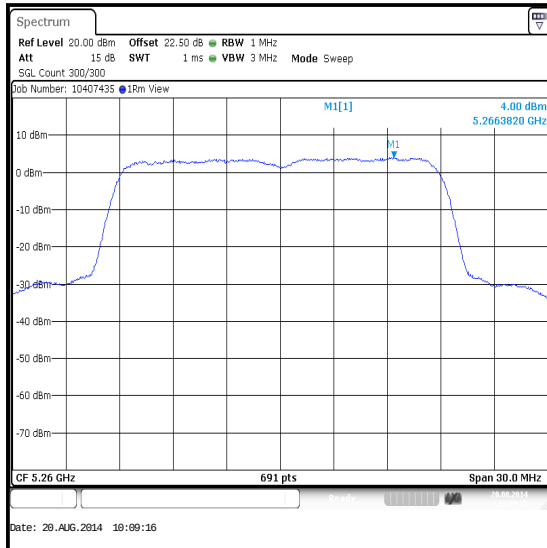
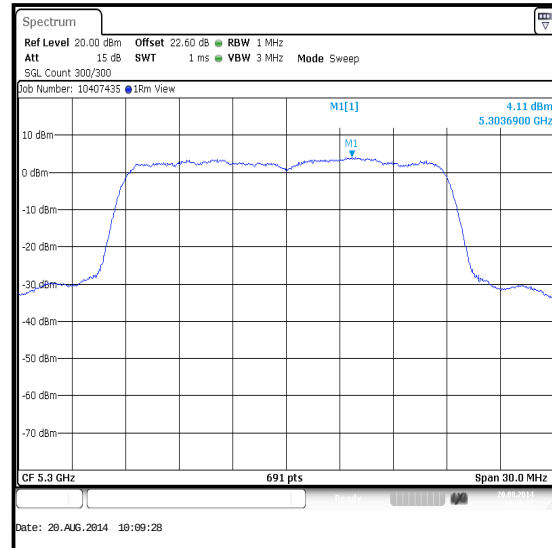
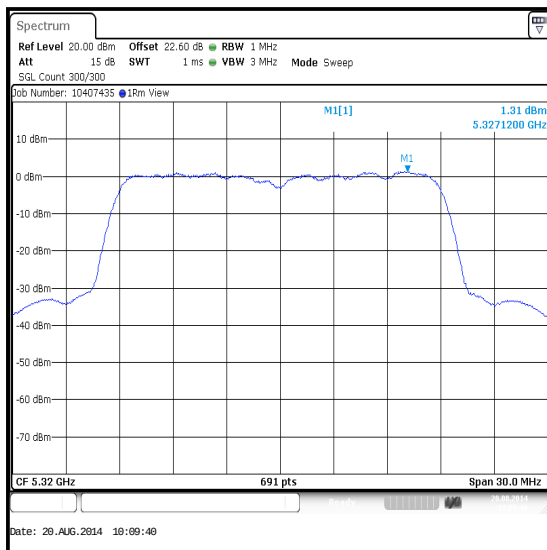
Top Channel

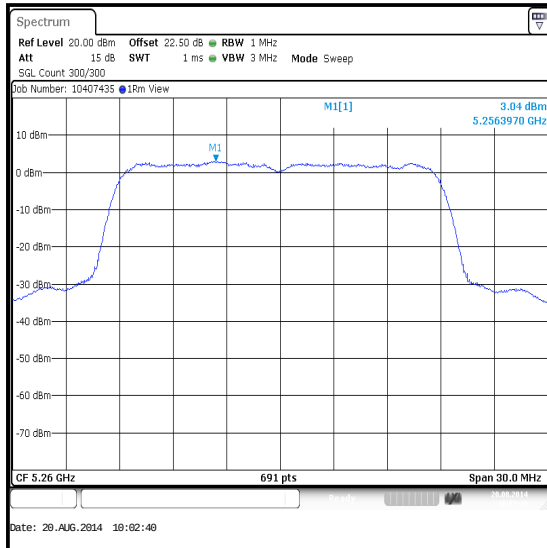
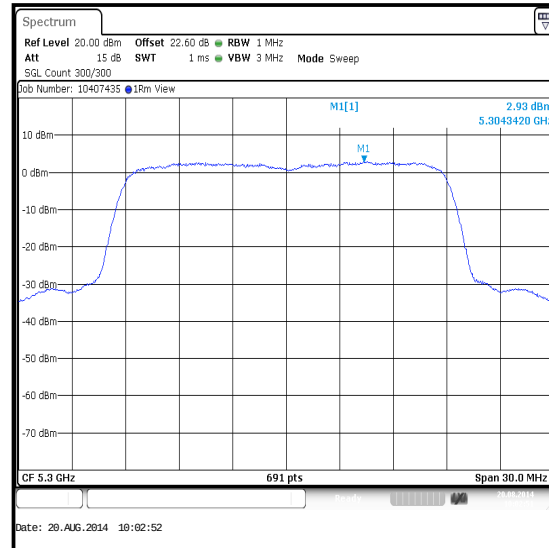
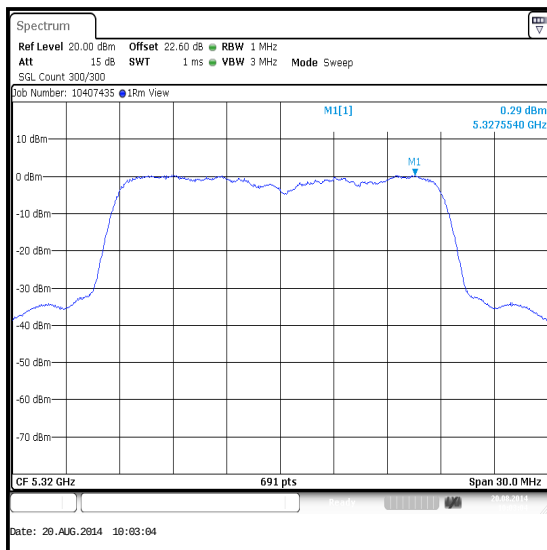
Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands)
(continued)

Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / 5.25-5.35 GHz band

Channel	Port 1			Port 2		
	PSD (dBm /MHz)	Duty Cycle Correction (dB)	Corrected PSD (dBm /MHz)	PSD (dBm /MHz)	Duty Cycle Correction (dB)	Corrected PSD (dBm /MHz)
Bottom	4.0	0.1	4.1	3.0	0.1	3.1
Middle	4.1	0.1	4.2	2.9	0.1	3.0
Top	1.3	0.1	1.4	0.3	0.1	0.4

Channel	Frequency (MHz)	Conducted PSD Port 1 (dBm /MHz)	Conducted PSD Port 2 (dBm /MHz)	Combined Conducted PSD (dBm /MHz)	Limit (dBm)	Margin (dB)	Result
Bottom	5260	4.1	3.1	6.6	11.0	4.4	Complied
Middle	5300	4.2	3.0	6.6	11.0	4.4	Complied
Top	5320	1.4	0.4	3.9	11.0	7.1	Complied

**Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands)
(continued)****Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / 5.25-5.35 GHz band / Port 1****Bottom Channel****Middle Channel****Top Channel**

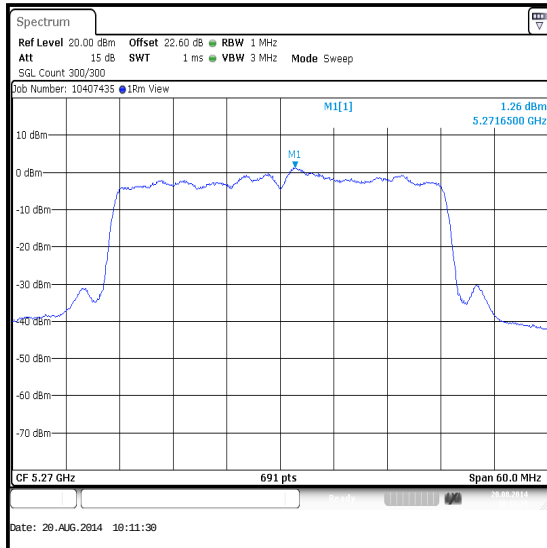
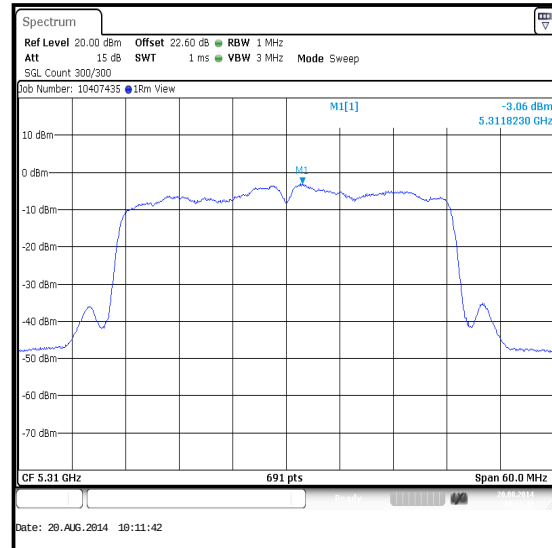
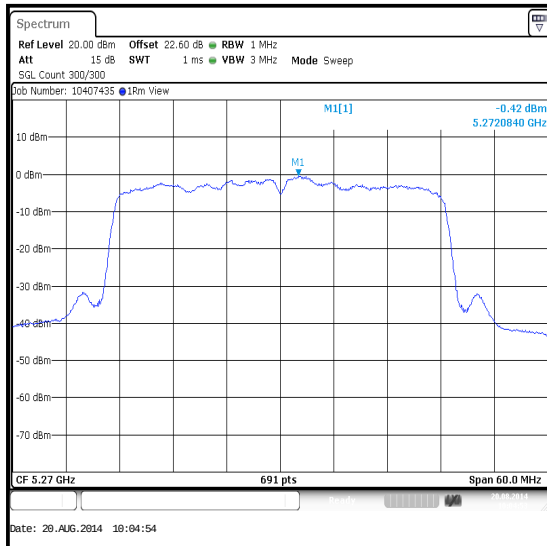
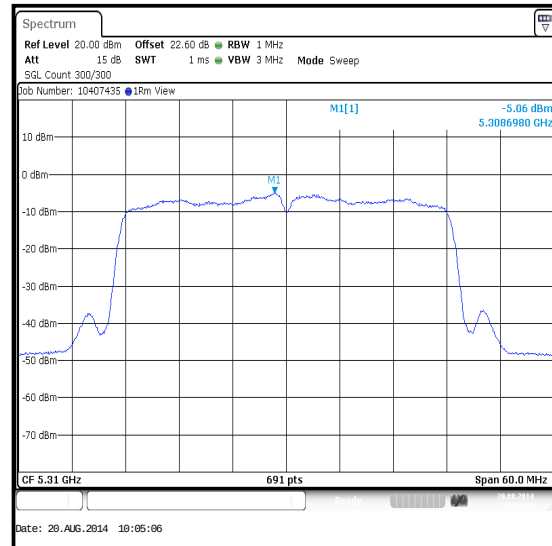
**Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands)
(continued)****Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / 5.25-5.35 GHz band / Port 2****Bottom Channel****Middle Channel****Top Channel**

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

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

Channel	Port 1			Port 2		
	PSD (dBm /MHz)	Duty Cycle Correction (dB)	Corrected PSD (dBm /MHz)	PSD (dBm /MHz)	Duty Cycle Correction (dB)	Corrected PSD (dBm /MHz)
Bottom	1.3	0.2	1.5	-0.4	0.2	-0.2
Top	-3.1	0.2	-2.9	-5.1	0.2	-4.9

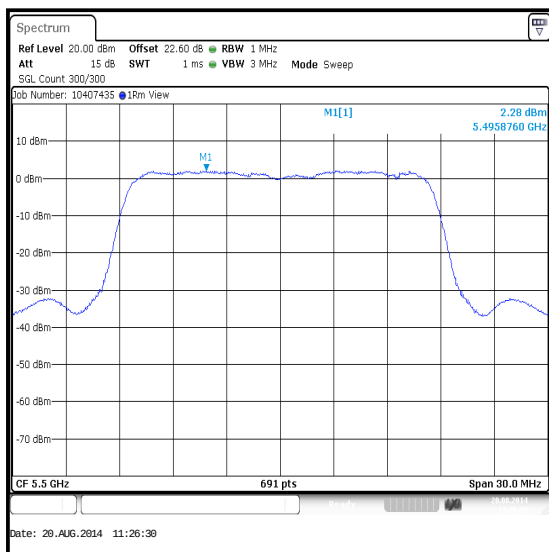
Channel	Frequency (MHz)	Conducted PSD Port 1 (dBm /MHz)	Conducted PSD Port 2 (dBm /MHz)	Combined Conducted PSD (dBm /MHz)	Limit (dBm)	Margin (dB)	Result
Bottom	5270	1.5	-0.2	3.7	11.0	7.3	Complied
Top	5310	-2.9	-4.9	-0.8	11.0	11.8	Complied

**Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands)
(continued)****Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / 5.25-5.35 GHz band / Port 1****Bottom Channel****Top Channel****Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / 5.25-5.35 GHz band / Port 2****Bottom Channel****Top Channel**

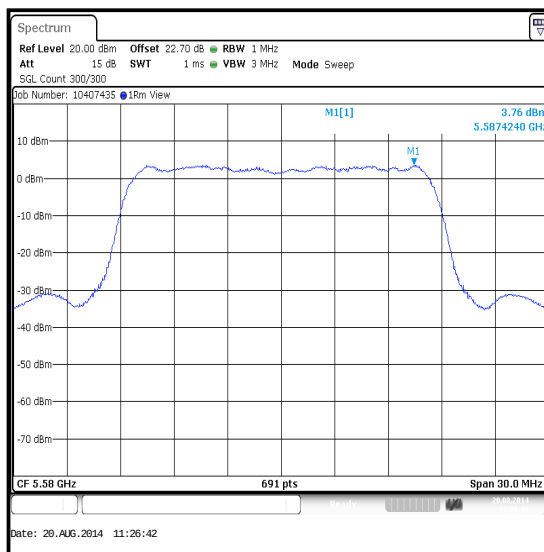
Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11a / 20 MHz / BPSK / 6 Mbps / 5.47-5.725 GHz band / Port 1

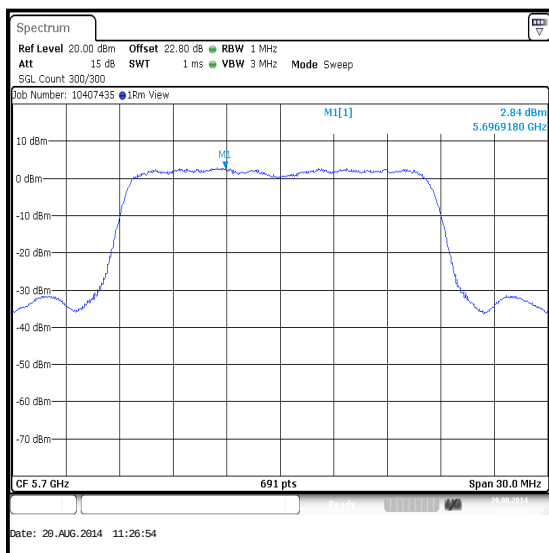
Channel	Frequency (MHz)	PSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5500	2.3	11.0	8.7	Complied
Middle	5580	3.8	11.0	7.2	Complied
Top	5700	2.8	11.0	8.2	Complied



Bottom Channel



Middle Channel

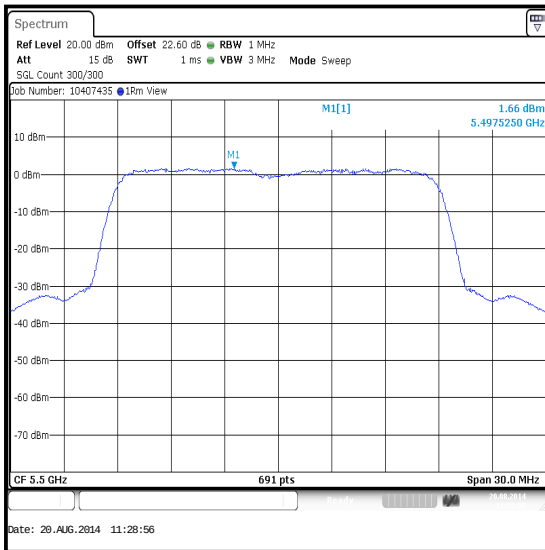


Top Channel

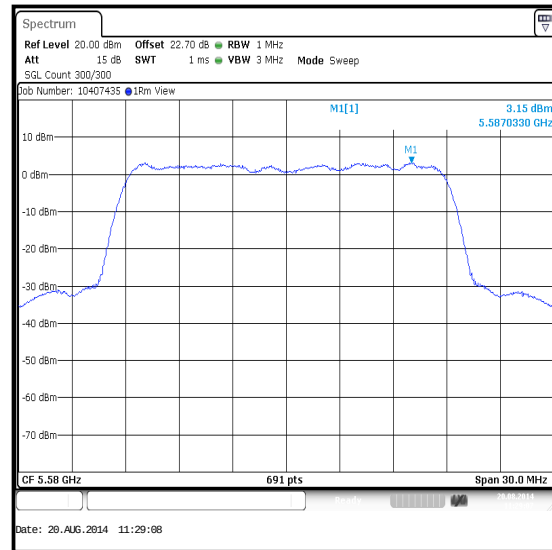
Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11n / 20 MHz / BPSK / MCS0 / SISO / 5.47-5.725 GHz band / Port 1

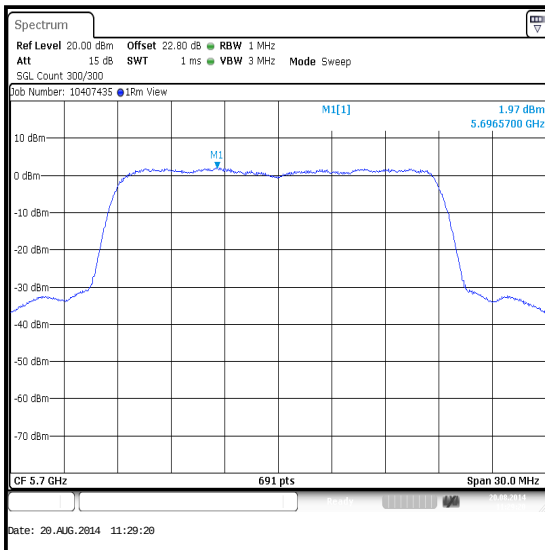
Channel	Frequency (MHz)	PSD (dBm/MHz)	Duty Cycle Correction (dB)	Corrected PSD (dBm /MHz)	Limit (dBm)	Margin (dB)	Result
Bottom	5500	1.7	0.1	1.8	11.0	9.2	Complied
Middle	5580	3.2	0.1	3.3	11.0	7.7	Complied
Top	5700	2.0	0.1	2.1	11.0	8.9	Complied



Bottom Channel



Middle Channel

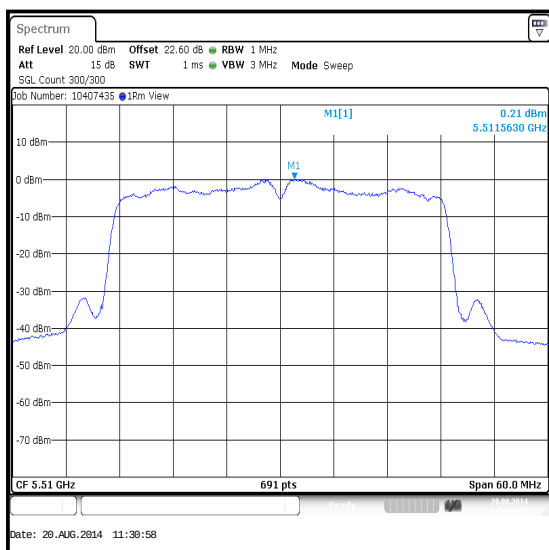


Top Channel

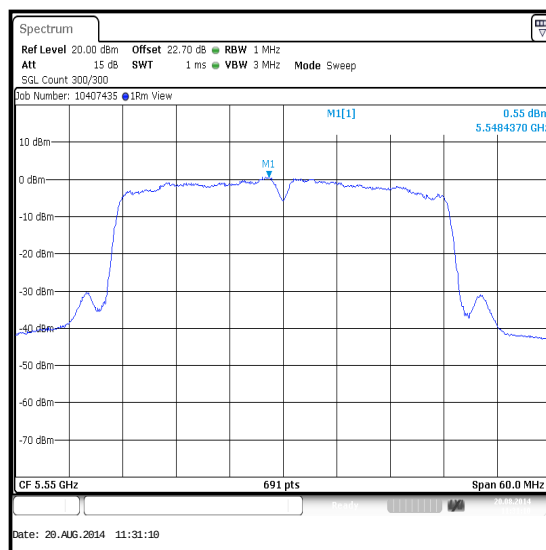
Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands) (continued)

Results: 802.11n / 40 MHz / BPSK / MCS0 / SISO / 5.47-5.725 GHz band / Port 1

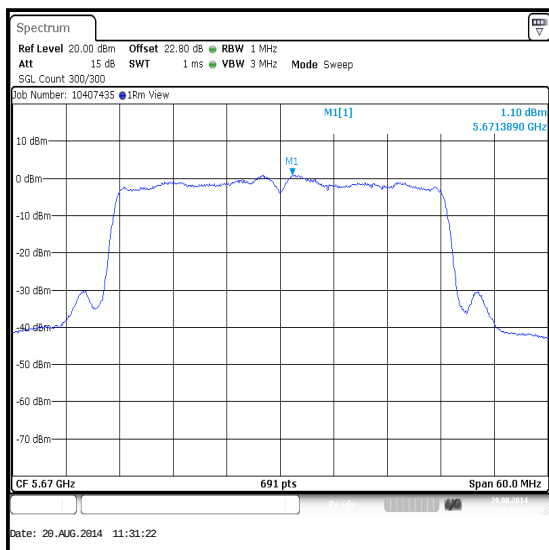
Channel	Frequency (MHz)	PSD (dBm /MHz)	Duty cycle correction (dB)	Corrected PSD (dBm /MHz)	Limit (dBm /MHz)	Margin (dB)	Result
Bottom	5510	0.2	0.2	0.4	11.0	10.6	Complied
Middle	5550	0.6	0.2	0.8	11.0	10.2	Complied
Top	5670	1.1	0.2	1.3	11.0	9.7	Complied



Bottom Channel



Middle Channel



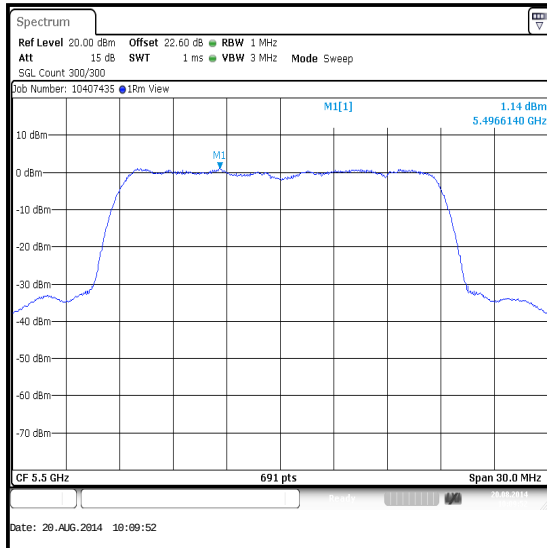
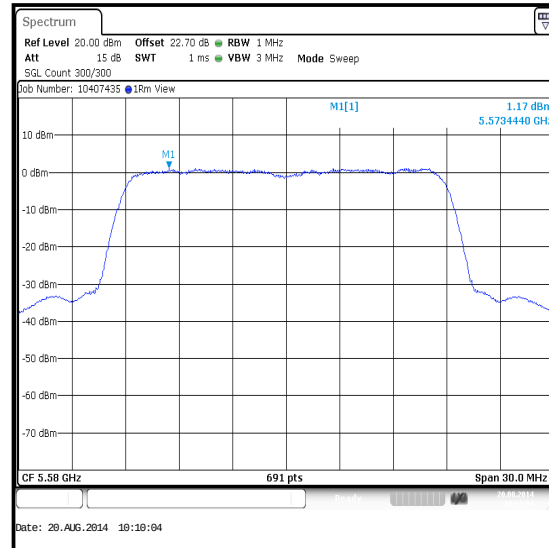
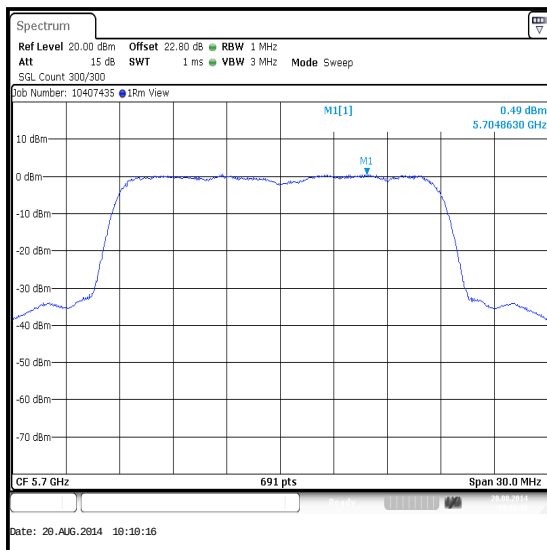
Top Channel

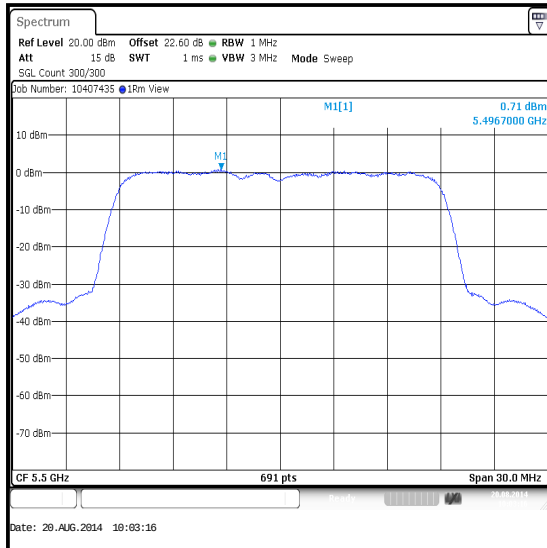
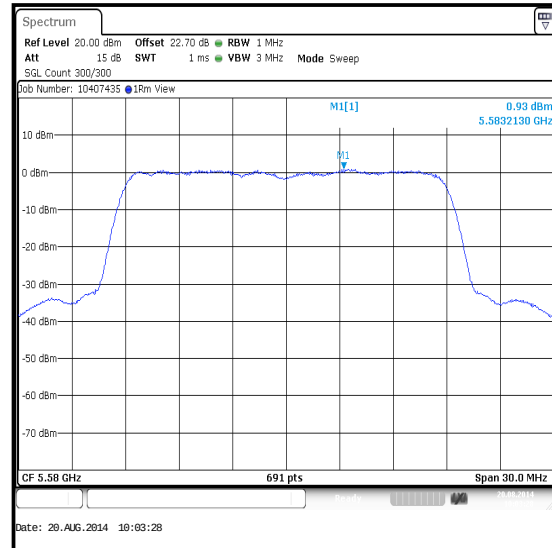
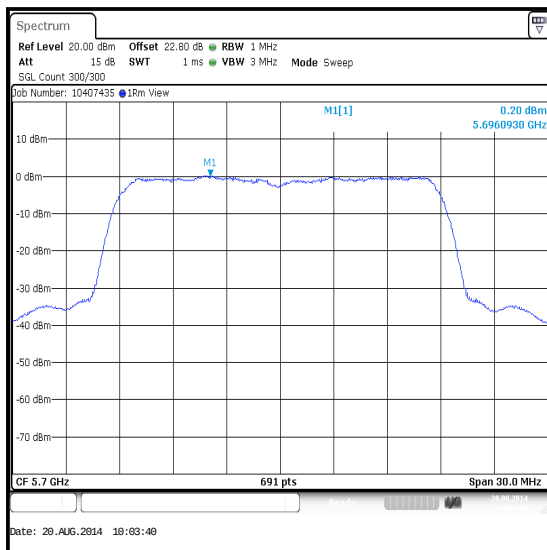
Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands)
(continued)

Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / 5.47-5.725 GHz band

Channel	Port 1			Port 2		
	PSD (dBm /MHz)	Duty Cycle Correction (dB)	Corrected PSD (dBm /MHz)	PSD (dBm /MHz)	Duty Cycle Correction (dB)	Corrected PSD (dBm /MHz)
Bottom	1.1	0.1	1.2	0.7	0.1	0.8
Middle	1.2	0.1	1.3	0.9	0.1	1.0
Top	0.5	0.1	0.6	0.2	0.1	0.3

Channel	Frequency (MHz)	Conducted PSD Port 1 (dBm /MHz)	Conducted PSD Port 2 (dBm /MHz)	Combined Conducted PSD (dBm /MHz)	Limit (dBm)	Margin (dB)	Result
Bottom	5500	1.2	0.8	4.0	10.6	6.6	Complied
Middle	5580	1.3	1.0	4.2	10.6	6.4	Complied
Top	5700	0.6	0.3	3.5	10.6	7.1	Complied

**Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands)
(continued)****Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / 5.47-5.725 GHz band / Port 1****Bottom Channel****Middle Channel****Top Channel**

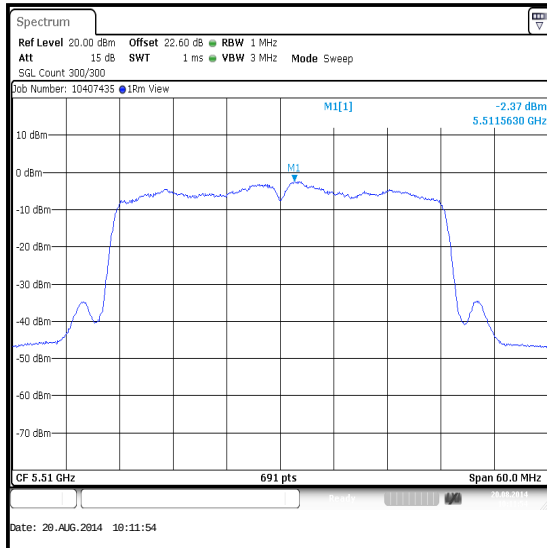
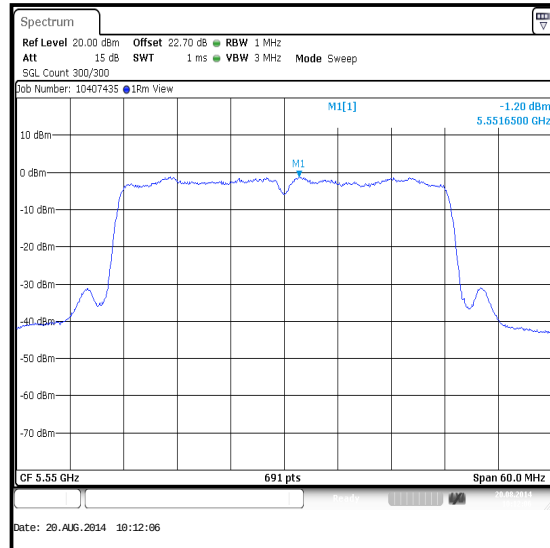
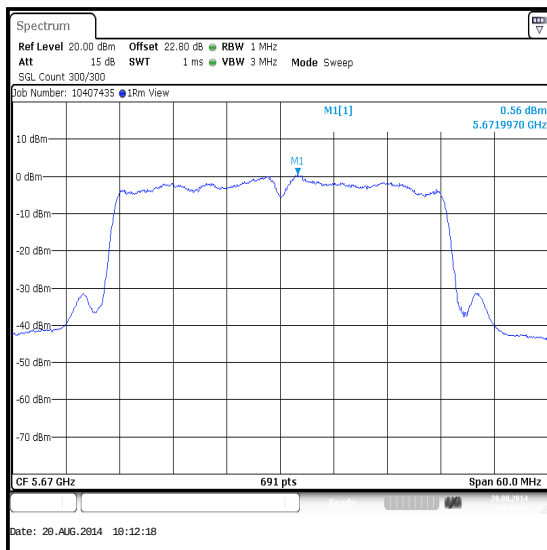
**Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands)
(continued)****Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / 5.47-5.725 GHz band / Port 2****Bottom Channel****Middle Channel****Top Channel**

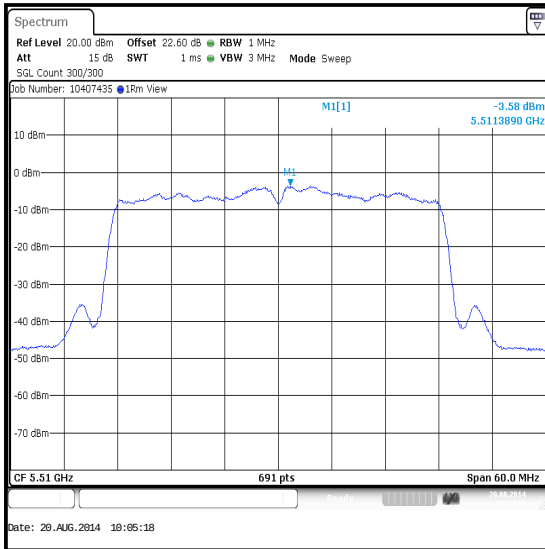
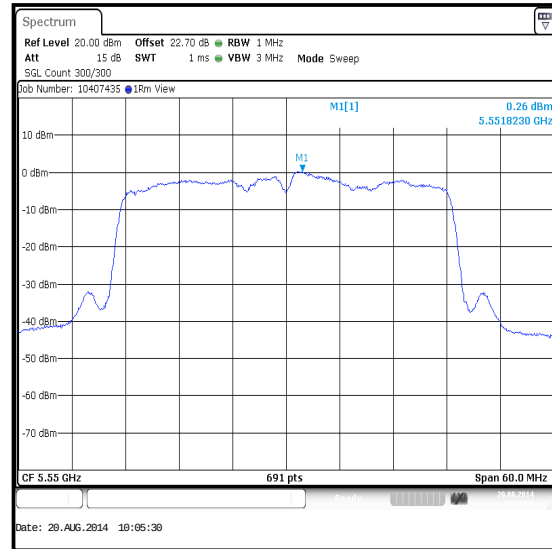
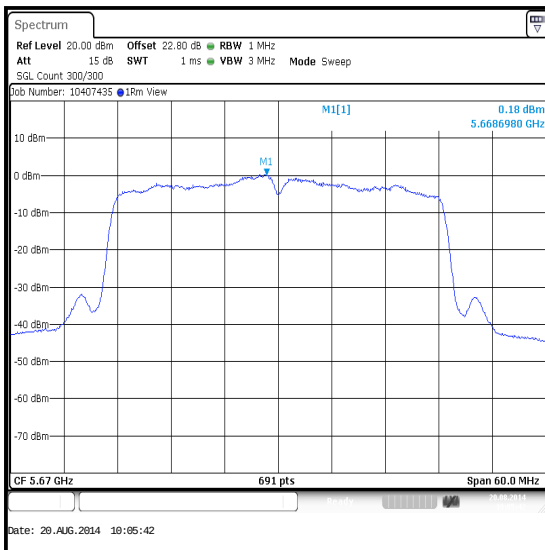
Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands)
(continued)

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

Channel	Port 1			Port 2		
	PSD (dBm /MHz)	Duty Cycle Correction (dB)	Corrected PSD (dBm /MHz)	PSD (dBm /MHz)	Duty Cycle Correction (dB)	Corrected PSD (dBm /MHz)
Bottom	-2.4	0.2	-2.2	-3.6	0.2	-3.4
Middle	-1.2	0.2	-1.0	0.3	0.2	0.5
Top	0.6	0.2	0.8	0.2	0.2	0.4

Channel	Frequency (MHz)	Conducted PSD Port 1 (dBm /MHz)	Conducted PSD Port 2 (dBm /MHz)	Combined Conducted PSD (dBm /MHz)	Limit (dBm)	Margin (dB)	Result
Bottom	5510	-2.2	-3.4	0.2	10.6	10.4	Complied
Middle	5550	-1.0	0.5	2.8	10.6	7.8	Complied
Top	5670	0.8	0.4	3.6	10.6	7.0	Complied

**Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands)
(continued)****Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / 5.47-5.725 GHz band / Port 1****Bottom Channel****Middle Channel****Top Channel**

**Transmitter Maximum Power Spectral Density (5.25-5.35 GHz & 5.47-5.725 GHz bands)
(continued)****Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / 5.47-5.725 GHz band / Port 2****Bottom Channel****Middle Channel****Top Channel**

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

Test Engineer:	Nick Steele	Test Date:	20 August 2014
Test Sample IMEI:	352025060506475		

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

Environmental Conditions:

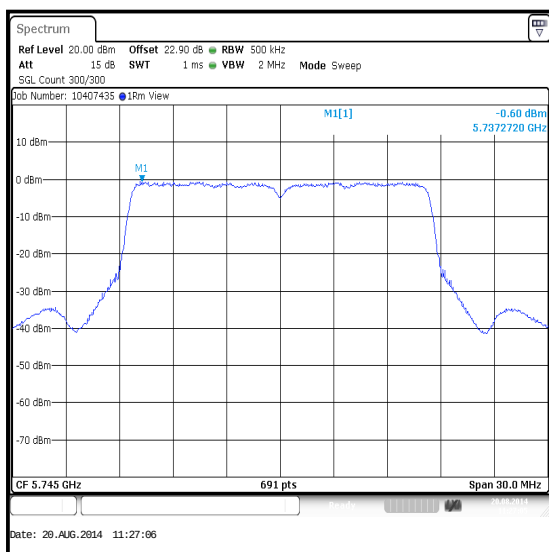
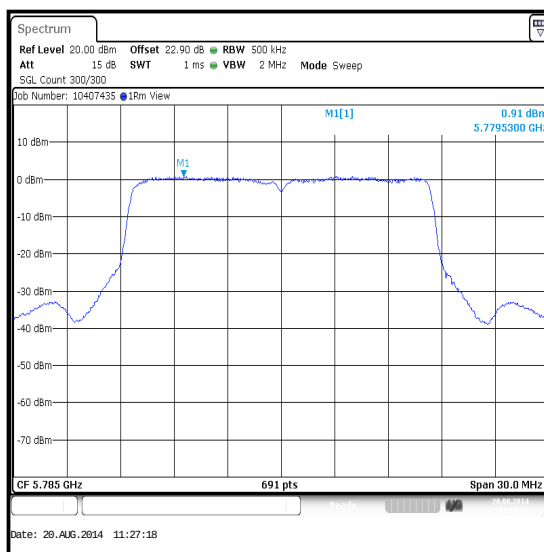
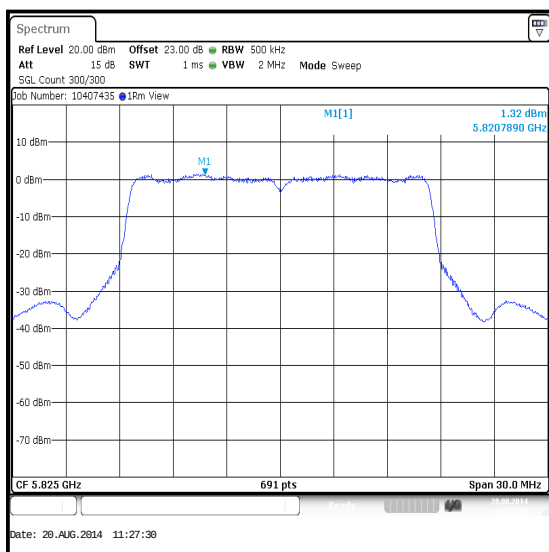
Temperature (°C):	24
Relative Humidity (%):	40

Note(s):

1. FCC Part 15.407(a)(3) limit for PSD in the 5.725-5.85 GHz operating band is <30 dBm/500 kHz.
2. For 802.11a and 802.11n SISO mode, the EUT antenna has a gain of <6 dBi.
3. For 802.11n MIMO mode, the EUT antenna has a combined gain of 6.3 dBi. According to 15.407(a)(3), the limit was reduced by the amount in dB the antenna gain exceeds 6 dBi. Therefore the limit of 30 dBm/500 kHz has been reduced by 0.3 dB to 29.7 dBm/500 kHz.

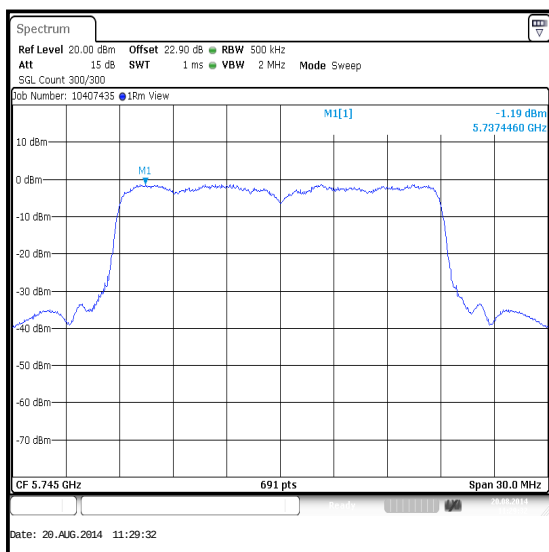
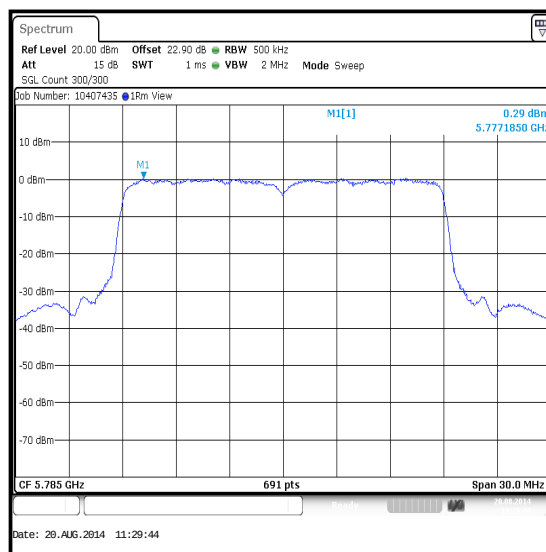
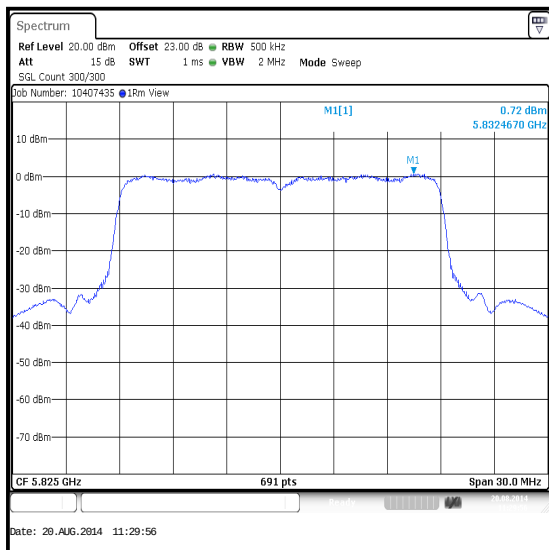
Transmitter Maximum Power Spectral Density (5.725-5.85 GHz band) (continued)**Results: 802.11a / 20 MHz / BPSK / 6 Mbps / Port 1**

Channel	Frequency (MHz)	PSD (dBm /500 kHz)	Limit (dBm /500 kHz)	Margin (dB)	Result
Bottom	5745	-0.6	30.0	30.6	Complied
Middle	5785	0.9	30.0	29.1	Complied
Top	5825	1.3	30.0	28.7	Complied

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

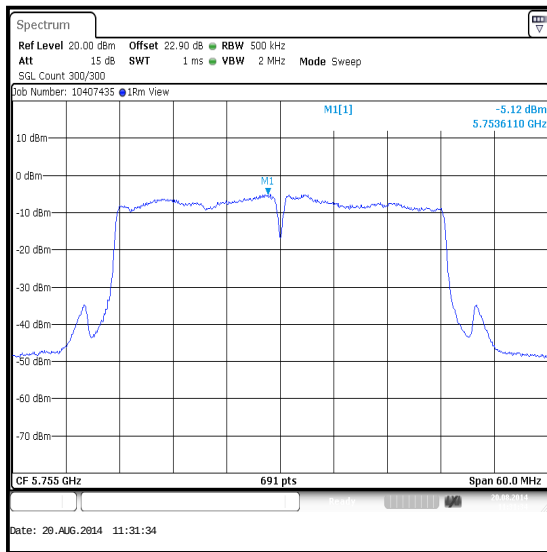
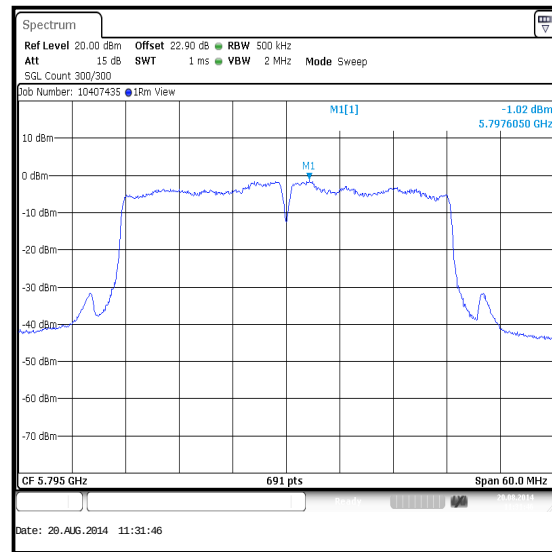
Transmitter Maximum Power Spectral Density (5.725-5.85 GHz band) (continued)**Results: 802.11n / 20 MHz / BPSK / MCS0 / SISO / Port 1**

Channel	Frequency (MHz)	PSD (dBm / 500kHz)	Duty Cycle Correction (dB)	Corrected PSD (dBm / 500kHz)	Limit (dBm / 500kHz)	Margin (dB)	Result
Bottom	5745	-1.2	0.1	-1.1	30.0	31.1	Complied
Middle	5785	0.3	0.1	0.4	30.0	29.6	Complied
Top	5825	0.7	0.1	0.8	30.0	29.2	Complied

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

Transmitter Maximum Power Spectral Density (5.725-5.85 GHz band) (continued)**Results: 802.11n / 40 MHz / BPSK / MCS0 / SISO / Port 1**

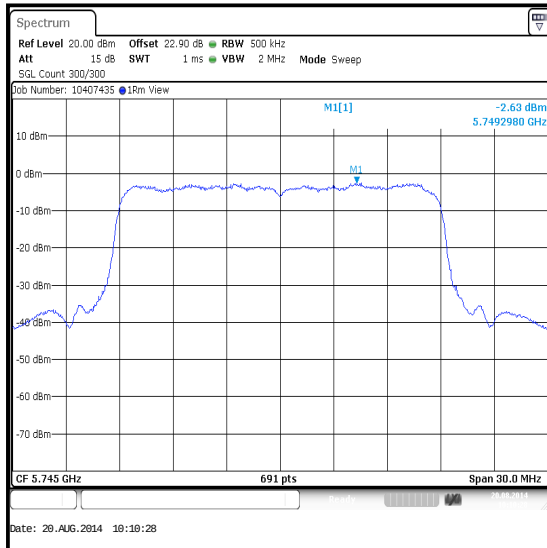
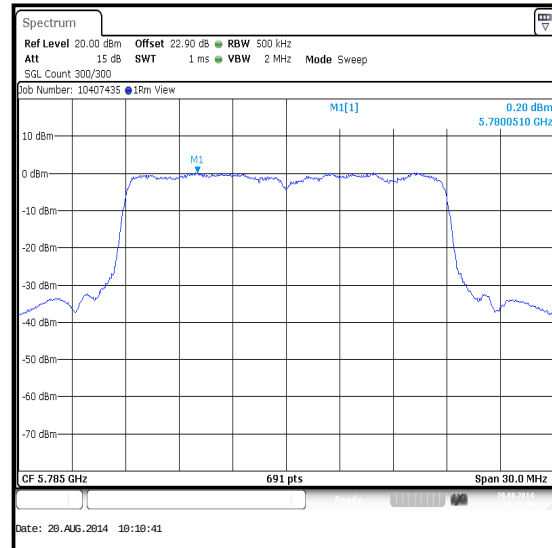
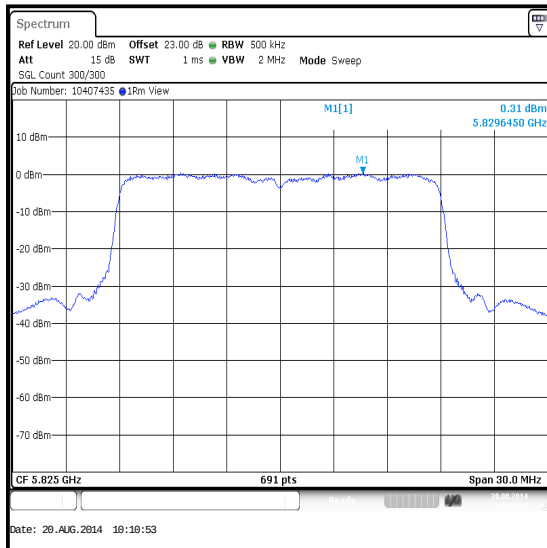
Channel	Frequency (MHz)	PSD (dBm / 500kHz)	Duty cycle correction (dB)	Corrected PSD (dBm / 500kHz)	Limit (dBm / 500kHz)	Margin (dB)	Result
Bottom	5755	-5.1	0.2	-4.9	30.0	34.9	Complied
Top	5795	-1.0	0.2	-0.8	30.0	30.8	Complied

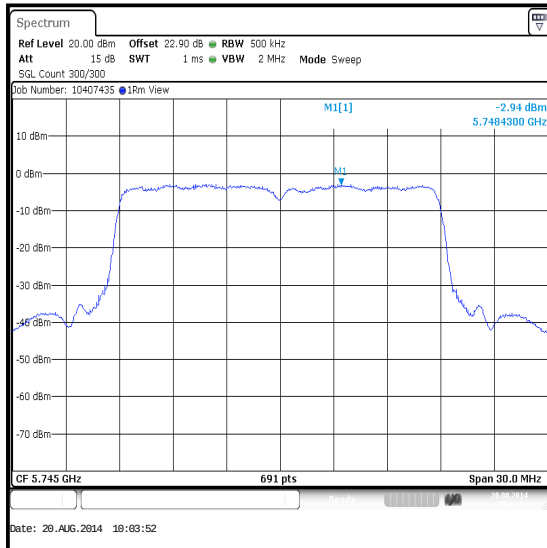
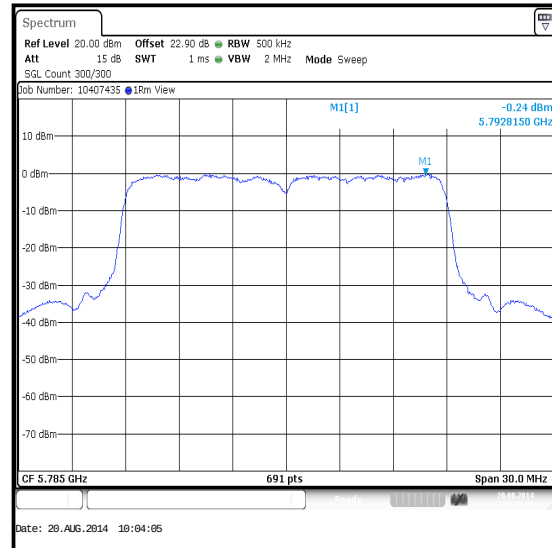
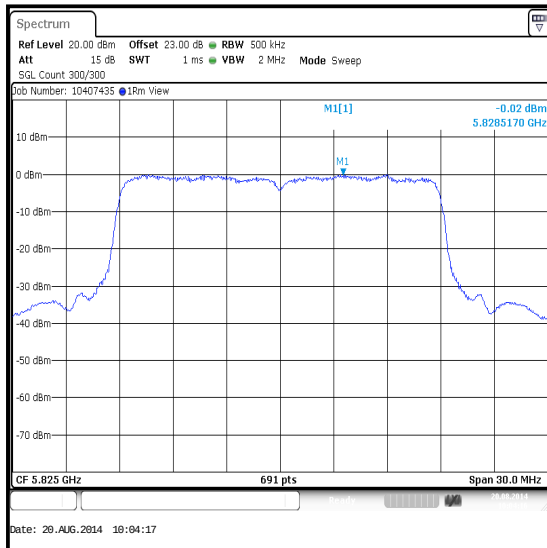
**Bottom Channel****Top Channel**

Transmitter Maximum Power Spectral Density (5.725-5.85 GHz band) (continued)**Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO**

Channel	Port 1			Port 2		
	PSD (dBm / 500kHz)	Duty Cycle Correction (dB)	Corrected PSD (dBm / 500kHz)	PSD (dBm / 500kHz)	Duty Cycle Correction (dB)	Corrected PSD (dBm / 500kHz)
Bottom	-2.6	0.1	-2.5	-2.9	0.1	-2.8
Middle	0.2	0.1	0.3	-0.2	0.1	-0.1
Top	0.3	0.1	0.4	0.0	0.1	0.1

Channel	Frequency (MHz)	Conducted PSD Port 1 (dBm / 500kHz)	Conducted PSD Port 2 (dBm / 500kHz)	Combined Conducted PSD (dBm / 500kHz)	Limit (dBm)	Margin (dB)	Result
Bottom	5745	-2.5	-2.8	0.4	29.7	29.3	Complied
Middle	5785	0.3	-0.1	3.1	29.7	26.6	Complied
Top	5825	0.4	0.1	3.3	29.7	26.4	Complied

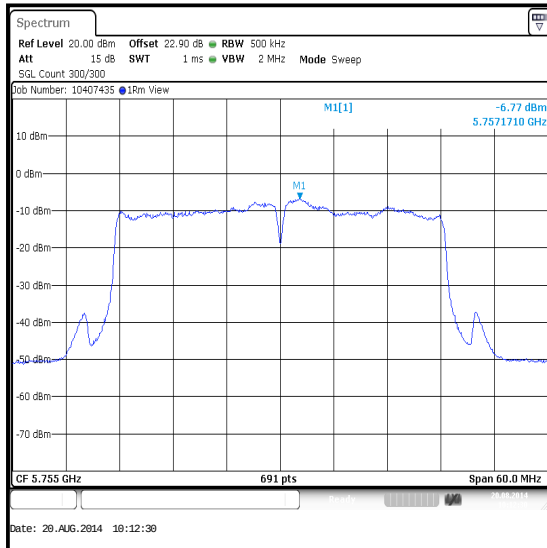
Transmitter Maximum Power Spectral Density (5.725-5.85 GHz band) (continued)**Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / Port 1****Bottom Channel****Middle Channel****Top Channel**

Transmitter Maximum Power Spectral Density (5.725-5.85 GHz band) (continued)**Results: 802.11n / 20 MHz / BPSK / MCS0 / MIMO / Port 2****Bottom Channel****Middle Channel****Top Channel**

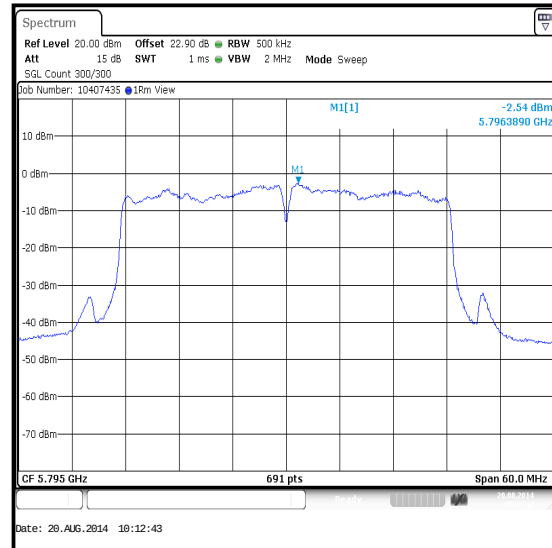
Transmitter Maximum Power Spectral Density (5.725-5.85 GHz band) (continued)**Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO**

Channel	Port 1			Port 2		
	PSD (dBm / 500kHz)	Duty Cycle Correction (dB)	Corrected PSD (dBm / 500kHz)	PSD (dBm / 500kHz)	Duty Cycle Correction (dB)	Corrected PSD (dBm / 500kHz)
Bottom	-6.8	0.2	-6.6	-7.5	0.2	-7.3
Top	-2.5	0.2	-2.3	-2.6	0.2	-2.4

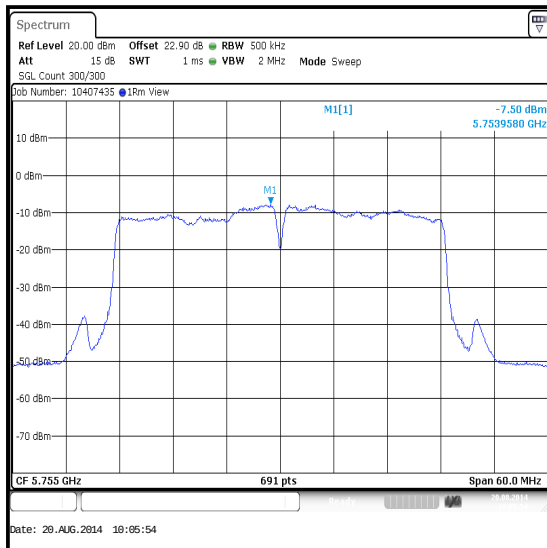
Channel	Frequency (MHz)	Conducted PSD Port 1 (dBm / 500kHz)	Conducted PSD Port 2 (dBm / 500kHz)	Combined Conducted PSD (dBm / 500kHz)	Limit (dBm)	Margin (dB)	Result
Bottom	5755	-6.6	-7.3	-3.9	29.7	33.6	Complied
Top	5795	-2.3	-2.4	0.7	29.7	29.0	Complied

Transmitter Maximum Power Spectral Density (5.725-5.85 GHz band) (continued)**Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / Port 1**

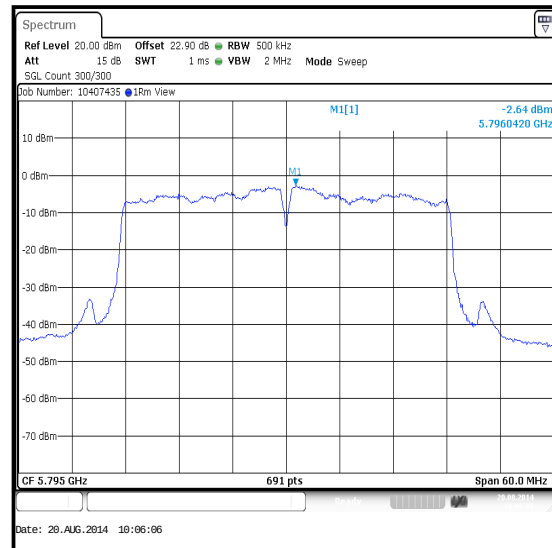
Bottom Channel



Top Channel

Results: 802.11n / 40 MHz / BPSK / MCS0 / MIMO / Port 2

Bottom Channel



Top Channel

Transmitter Maximum Power Spectral Density (continued)**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1658	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	14 Mar 2015	12
L1138	Signal Analyser	Rohde & Schwarz	FSV13.6	101389	17 Apr 2015	12
A1998	Attenuator	Huber & Suhner	6820.17.B	07101	Calibrated before use	-
S0558	DC Power Supply	TTI	EL 303R	395825	Calibrated before use	-
M1251	Multimeter	Fluke	175	89170179	19 May 2015	12
G0608	Signal Generator	Rohde & Schwarz	SMIQ 06B	838341/033	14 Feb 2015	12
M199	Power Meter	Rohde & Schwarz	NRVS	827023/075	08 Apr 2016	24
M1267	Power Sensor	Rohde & Schwarz	NRV-Z52	100155	23 Apr 2016	24

5.2.7. Transmitter Out of Band Radiated Emissions**Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	20 August 2014
Test Sample IMEI:	352025060501666		

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

Environmental Conditions:

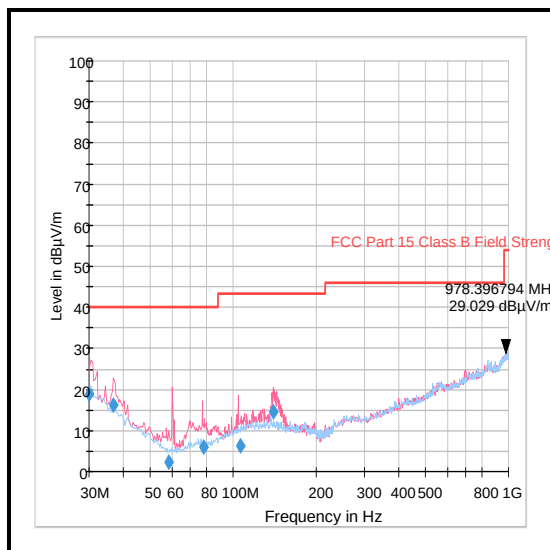
Temperature (°C):	24
Relative Humidity (%):	30

Note(s):

- Measurements below 1 GHz were limited to the 5.725-5.85 GHz band, the EUT was transmitting with a data rate of 6.5 Mbps / MCS0 (802.11n HT20 / MIMO) as it produced the highest conducted output power and was therefore deemed worst case.
- Pre-scans with the EUT transmitting on the top channel were measured according to FCC Part 15.407(b)(4) which states for transmitters operating in the band 5.725 to 5.85 GHz: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge will 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.
- The final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
- 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 top channel only.
- All emissions shown on the pre-scan plots were found to be below the measurement system noise floor or ambient, therefore the highest peak noise floor reading of the measuring receiver was recorded in the table below.
- 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.

Results: Top Channel / Field Strength

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
978.397	Vertical	29.0	54.0	25.0	Complied

Transmitter Out of Band Radiated Emissions (5.725-5.85 GHz band operation) (continued)**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1622	Thermohygrometer	JM Handelspunkt	30.5015.06	Not stated	31 Dec 2014	12
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	26 Nov 2014	12
M1273	Test Receiver	Rohde & Schwarz	ESIB26	100275	15 Feb 2015	12
G0543	Amplifier	Sonoma	310N	230801	19 Nov 2014	3
A490	Antenna	Chase	CBL6111A	1590	29 Apr 2015	12
A1834	Attenuator	Hewlett Packard	8491B	10444	15 Nov 2014	12

Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	18 August 2014
Test Sample IMEI:	352025060501666		

FCC Reference:	Part 15.407(b)(1),(7) & 15.209(a)
Test Method Used:	As detailed in 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
Relative Humidity (%):	51

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 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 top channel in the 5.725 to 5.85 GHz band. An inquiry was made to the FCC and the response was pre-scans could be performed in the band with the highest conducted output power and all final measurements should be performed on any emissions seen in each band.
3. The final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
4. 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.
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. 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.
7. 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 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.

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

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
4754.680	Horizontal	-42.1	-27.0	15.1	Complied
4956.122	Horizontal	-39.8	-27.0	12.8	Complied
5113.526	Horizontal	-31.9	-27.0	4.9	Complied
5402.160	Horizontal	-36.8	-27.0	9.8	Complied
5605.231	Horizontal	-41.1	-27.0	14.1	Complied

Results: Bottom Channel / Field Strength

Frequency (MHz)	Antenna Polarity	Peak Level (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)	Result
4754.680	Horizontal	53.1	54.0	0.9	Complied

Results: Bottom Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4956.122	Horizontal	55.4	74.0	18.6	Complied
5113.526	Horizontal	63.3	74.0	10.7	Complied
5402.160	Horizontal	58.4	74.0	15.6	Complied

Results: Bottom Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4960.499	Horizontal	43.3	54.0	10.7	Complied
5106.603	Horizontal	43.9	54.0	10.1	Complied
5399.279	Horizontal	46.5	54.0	7.5	Complied

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

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
4767.628	Horizontal	-40.5	-27.0	13.5	Complied
4989.859	Horizontal	-39.7	-27.0	12.7	Complied
5056.125	Horizontal	-39.9	-27.0	12.9	Complied
5123.452	Horizontal	-39.2	-27.0	12.2	Complied
5353.519	Horizontal	-38.5	-27.0	11.5	Complied
5416.581	Horizontal	-37.3	-27.0	10.3	Complied
5499.679	Horizontal	-41.7	-27.0	14.7	Complied
5633.718	Horizontal	-40.8	-27.0	13.8	Complied

Results: Middle Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4767.628	Horizontal	54.7	74.0	19.3	Complied
4989.859	Horizontal	55.5	74.0	18.5	Complied
5056.125	Horizontal	55.3	74.0	18.7	Complied
5123.452	Horizontal	56.0	74.0	18.0	Complied
5353.519	Horizontal	56.7	74.0	17.3	Complied
5416.581	Horizontal	57.9	74.0	16.1	Complied

Results: Middle Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4762.901	Horizontal	42.2	54.0	11.8	Complied
4979.362	Horizontal	43.4	54.0	10.6	Complied
5046.429	Horizontal	43.5	54.0	10.5	Complied
5126.096	Horizontal	43.6	54.0	10.4	Complied
5353.119	Horizontal	44.5	54.0	9.5	Complied
5416.742	Horizontal	46.7	54.0	7.3	Complied

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

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
4796.966	Horizontal	-42.1	-27.0	15.1	Complied
5027.788	Horizontal	-39.3	-27.0	12.3	Complied
5087.855	Horizontal	-39.6	-27.0	12.6	Complied
5395.763	Horizontal	-38.9	-27.0	11.9	Complied
5458.942	Horizontal	-38.1	-27.0	11.1	Complied
5535.555	Horizontal	-41.3	-27.0	14.3	Complied
5670.048	Horizontal	-40.8	-27.0	13.8	Complied

Results: Top Channel / Field Strength

Frequency (MHz)	Antenna Polarity	Peak Level (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)	Result
4796.966	Horizontal	53.1	54.0	0.9	Complied

Results: Top Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5027.788	Horizontal	55.9	74.0	18.1	Complied
5087.855	Horizontal	55.6	74.0	18.4	Complied
5395.763	Horizontal	56.3	74.0	17.7	Complied
5458.942	Horizontal	57.1	74.0	16.9	Complied

Results: Top Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5017.532	Horizontal	44.3	54.0	9.7	Complied
5086.442	Horizontal	43.5	54.0	10.5	Complied
5395.763	Horizontal	43.6	54.0	10.4	Complied
5458.381	Horizontal	46.0	54.0	8.0	Complied

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

Test Engineer:	Andrew Edwards	Test Date:	18 August 2014
Test Sample IMEI:	352025060501666		

FCC Reference:	Part 15.407(b)(2),(7) & 15.209(a)
Test Method Used:	As detailed in 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
Relative Humidity (%):	49

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 top channel in the 5.725 to 5.85 GHz band. An inquiry was made to the FCC and the response was pre-scans could be performed in the band with the highest conducted output power and all final measurements should be performed on any emissions seen in each band.
3. The final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
4. 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.
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. 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.
7. 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 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.

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

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
4821.538	Horizontal	-40.8	-27.0	13.8	Complied
5048.996	Horizontal	-39.0	-27.0	12.0	Complied
5109.577	Horizontal	-39.0	-27.0	12.0	Complied
5402.588	Horizontal	-39.9	-27.0	12.9	Complied
5479.447	Horizontal	-37.7	-27.0	10.7	Complied
5563.330	Horizontal	-41.4	-27.0	14.4	Complied
5701.923	Horizontal	-41.9	-27.0	14.9	Complied

Results: Bottom Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4821.538	Horizontal	54.4	74.0	19.6	Complied
5048.996	Horizontal	56.2	74.0	17.8	Complied
5109.577	Horizontal	56.2	74.0	17.8	Complied
5402.588	Horizontal	55.3	74.0	18.7	Complied

Results: Bottom Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4821.667	Horizontal	43.9	54.0	10.1	Complied
5044.336	Horizontal	44.1	54.0	9.9	Complied
5103.709	Horizontal	43.9	54.0	10.1	Complied
5415.633	Horizontal	43.5	54.0	10.5	Complied

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

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
4851.308	Horizontal	-41.3	-27.0	14.3	Complied
5082.488	Horizontal	-38.6	-27.0	11.6	Complied
5149.635	Horizontal	-40.4	-27.0	13.4	Complied
5442.220	Horizontal	-38.7	-27.0	11.7	Complied
5520.746	Horizontal	-36.3	-27.0	9.3	Complied
5598.359	Horizontal	-41.7	-27.0	14.7	Complied
5736.987	Horizontal	-40.1	-27.0	13.1	Complied

Results: Middle Channel / Field Strength

Frequency (MHz)	Antenna Polarity	Peak Level (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)	Result
4851.308	Horizontal	53.9	54.0	0.1	Complied

Results: Middle Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5082.488	Horizontal	56.6	74.0	17.4	Complied
5149.635	Horizontal	54.8	74.0	19.2	Complied
5442.220	Horizontal	56.5	74.0	17.5	Complied

Results: Middle Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5074.955	Horizontal	45.6	54.0	8.4	Complied
5146.429	Horizontal	42.6	54.0	11.4	Complied
5453.117	Horizontal	44.0	54.0	10.0	Complied

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

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
4877.814	Horizontal	-42.3	-27.0	15.3	Complied
5092.469	Horizontal	-38.9	-27.0	11.9	Complied
5394.994	Horizontal	-34.2	-27.0	7.2	Complied
5541.897	Horizontal	-37.3	-27.0	10.3	Complied
5769.038	Horizontal	-39.9	-27.0	12.9	Complied

Results: Top Channel / Field Strength

Frequency (MHz)	Antenna Polarity	Peak Level (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)	Result
4877.814	Horizontal	52.9	54.0	1.1	Complied

Results: Top Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5092.469	Horizontal	56.3	74.0	17.7	Complied
5394.994	Horizontal	61.0	74.0	13.0	Complied

Results: Top Channel / Field Strength Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5094.312	Horizontal	44.0	54.0	10.0	Complied
5395.410	Horizontal	45.0	54.0	9.0	Complied

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

Test Engineer:	Andrew Edwards	Test Date:	18 August 2014
Test Sample IMEI:	352025060501666		

FCC Reference:	Part 15.407(b)(3),(7) & 15.209(a)
Test Method Used:	As detailed in 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
Relative Humidity (%):	49

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 top channel in the 5.725 to 5.85 GHz band. An inquiry was made to the FCC and the response was pre-scans could be performed in the band with the highest conducted output power and all final measurements should be performed on any emissions seen in each band.
3. The final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
4. 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.
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. 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.
7. 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 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.

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

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5092.692	Horizontal	-42.4	-27.0	15.4	Complied
5198.638	Horizontal	-41.9	-27.0	14.9	Complied
5296.538	Horizontal	-37.9	-27.0	10.9	Complied
5337.798	Horizontal	-40.0	-27.0	13.0	Complied
5792.189	Horizontal	-41.5	-27.0	14.5	Complied
5909.519	Horizontal	-42.0	-27.0	15.0	Complied

Results: Bottom Channel / Field Strength

Frequency (MHz)	Antenna Polarity	Peak Level (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)	Result
5092.692	Horizontal	52.8	54.0	1.2	Complied

Results: Bottom Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5337.798	Horizontal	55.2	74.0	18.8	Complied
5421.863	Horizontal	61.1	74.0	12.9	Complied

Results: Bottom Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5343.567	Horizontal	43.0	54.0	11.0	Complied
5423.449	Horizontal	45.3	54.0	8.7	Complied

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

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5174.391	Horizontal	-41.0	-27.0	14.0	Complied
5276.676	Horizontal	-42.0	-27.0	15.0	Complied
5371.015	Horizontal	-37.2	-27.0	10.2	Complied
5419.359	Horizontal	-39.8	-27.0	12.8	Complied
5733.032	Horizontal	-40.4	-27.0	13.4	Complied
5787.000	Horizontal	-36.6	-27.0	9.6	Complied
5874.487	Horizontal	-41.6	-27.0	14.6	Complied
5996.474	Horizontal	-37.9	-27.0	10.9	Complied

Results: Middle Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5371.015	Horizontal	58.0	74.0	16.0	Complied
5419.359	Horizontal	55.4	74.0	18.6	Complied

Results: Middle Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5366.769	Horizontal	46.0	54.0	8.0	Complied
5418.333	Horizontal	42.6	54.0	11.4	Complied

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

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5283.462	Horizontal	-40.3	-27.0	13.3	Complied
5398.692	Horizontal	-41.0	-27.0	14.0	Complied
5774.689	Horizontal	-37.1	-27.0	10.1	Complied
5911.319	Horizontal	-36.3	-27.0	9.3	Complied
5996.955	Horizontal	-38.8	-27.0	11.8	Complied
6122.317	Horizontal	-38.3	-27.0	11.3	Complied

Results: Top Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5398.692	Horizontal	54.2	74.0	19.8	Complied

Results: Top Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5403.885	Horizontal	42.2	54.0	11.8	Complied

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

Test Engineer:	Andrew Edwards	Test Dates:	14 August 2014 to 18 August 2014
Test Sample IMEI:	352025060501666		

FCC Reference:	Part 15.407(b)(4),(7) & 15.209(a)
Test Method Used:	As detailed in 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 23
Relative Humidity (%):	43 to 49

Note(s):

1. FCC Part 15.407(b)(4) states for transmitters operating in the band 5.725 to 5.85 GHz: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge 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 top 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 conducted output power (802.11n HT20 / 6.5 Mbps / MCS0 / MIMO) and all final measurements should be performed on any emission seen for each band.
3. The final measured value, for the given emission in the field strength result tables, incorporates the calibrated antenna factor and cable loss.
4. The emission shown on the 4 GHz to 6 GHz plot is the EUT fundamental.
5. Appropriate RF filters and attenuators were used during pre-scans and final measurements. Insertion losses were entered on the spectrum analyser as RF levels offsets.
6. 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.
7. 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 100 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.
8. Measurements were performed across the two restricted bands closest to the bands of operation with the EUT transmitting on the top channel in the 5.725 to 5.85 GHz band. Plots are included in this section of the test report. Peak and average measurements were made.
9. 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 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.

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

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5312.837	Horizontal	-40.1	-27.0	13.1	Complied
5438.667	Horizontal	-41.0	-27.0	14.0	Complied
5528.005	Horizontal	-37.7	-27.0	10.7	Complied
5578.269	Horizontal	-40.7	-27.0	13.7	Complied
5672.897	Horizontal	-34.4	-27.0	7.4	Complied
5962.705	Horizontal	-40.4	-27.0	13.4	Complied
6036.907	Horizontal	-39.4	-27.0	12.4	Complied
6171.174	Horizontal	-39.1	-27.0	12.1	Complied

Results: Bottom Channel / Field Strength / Peak

Frequency (MHz)	Antenna Polarity	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5438.667	Horizontal	54.2	74.0	19.8	Complied

Results: Bottom Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5453.730	Horizontal	42.6	54.0	11.4	Complied

Results: Middle Channel / EIRP

Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5364.378	Horizontal	-39.7	-27.0	12.7	Complied
5488.564	Horizontal	-38.7	-27.0	11.7	Complied
5564.109	Horizontal	-34.8	-27.0	7.8	Complied
5631.179	Horizontal	-38.7	-27.0	11.7	Complied
5941.564	Horizontal	-39.4	-27.0	12.4	Complied
6006.721	Horizontal	-37.8	-27.0	10.8	Complied
6082.115	Horizontal	-39.3	-27.0	12.3	Complied
6219.212	Horizontal	-38.9	-27.0	11.9	Complied

Transmitter Out of Band Radiated Emissions (5.725-5.85 GHz band operation) (continued)**Results: Middle Channel / Field Strength / Peak**

Frequency (MHz)	Antenna Polarity	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5364.378	Horizontal	55.5	74.0	18.5	Complied

Results: Middle Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5351.429	Horizontal	42.7	54.0	11.3	Complied

Results: Top Channel / EIRP

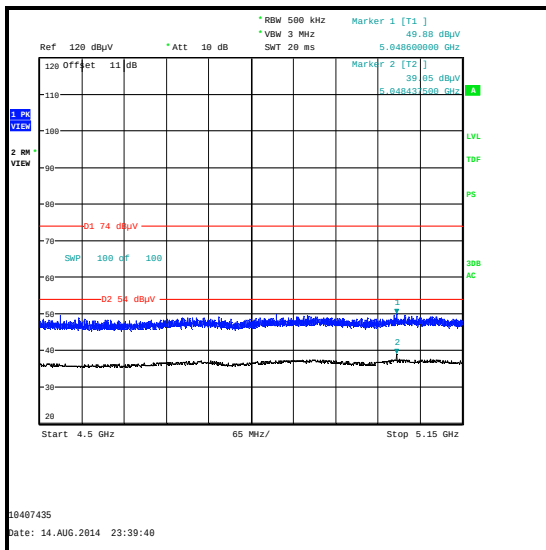
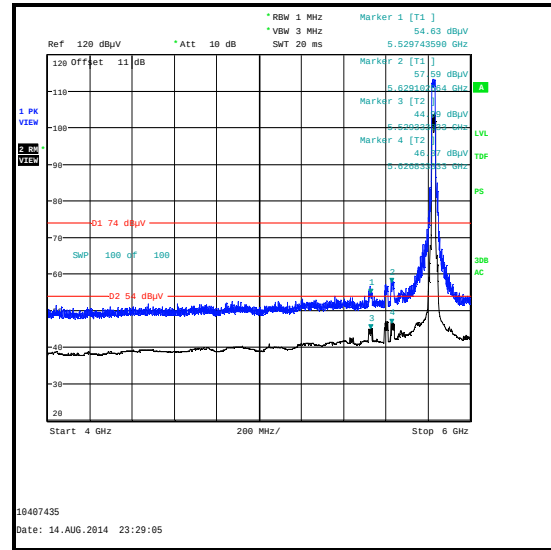
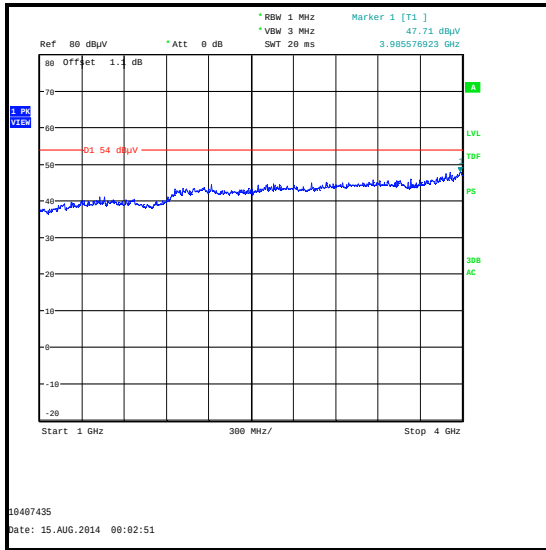
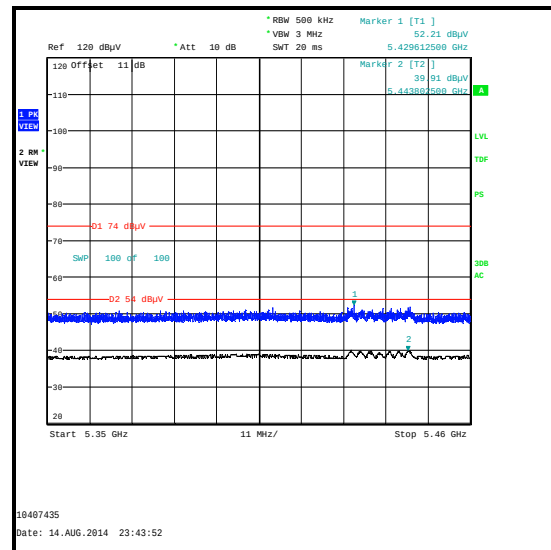
Frequency (MHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5444.808	Horizontal	-37.4	-27.0	10.4	Complied
5530.885	Horizontal	-38.4	-27.0	11.4	Complied
5601.731	Horizontal	-37.1	-27.0	10.1	Complied
5673.897	Horizontal	-38.5	-27.0	11.5	Complied
5965.564	Horizontal	-39.6	-27.0	12.6	Complied
6019.410	Horizontal	-36.5	-27.0	9.5	Complied
6057.712	Horizontal	-39.0	-27.0	12.0	Complied
6125.122	Horizontal	-38.9	-27.0	11.9	Complied
6213.080	Horizontal	-38.1	-27.0	11.1	Complied

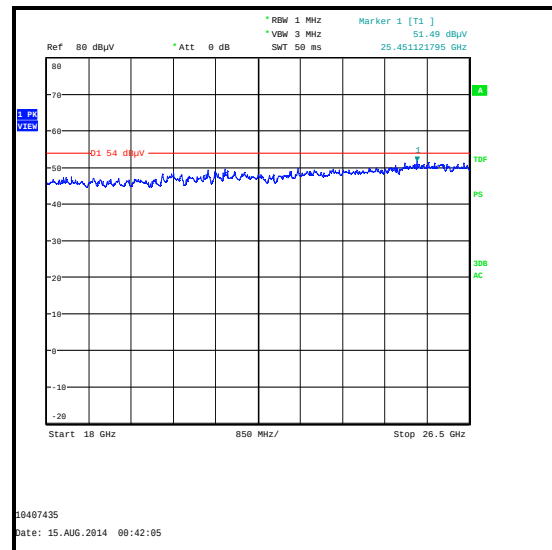
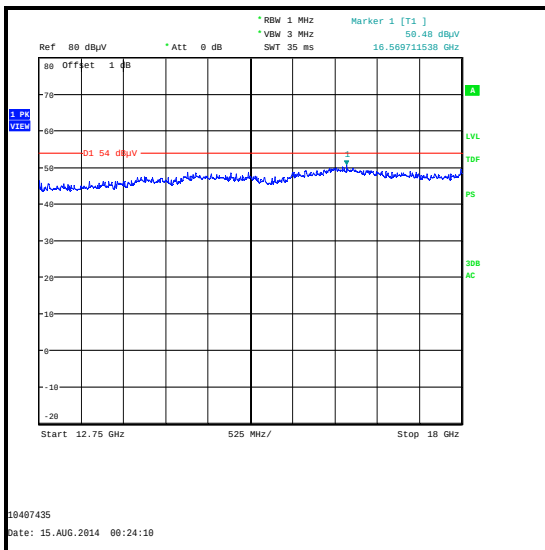
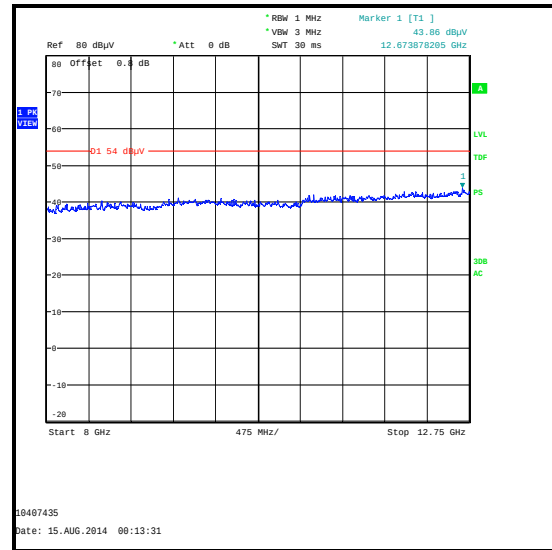
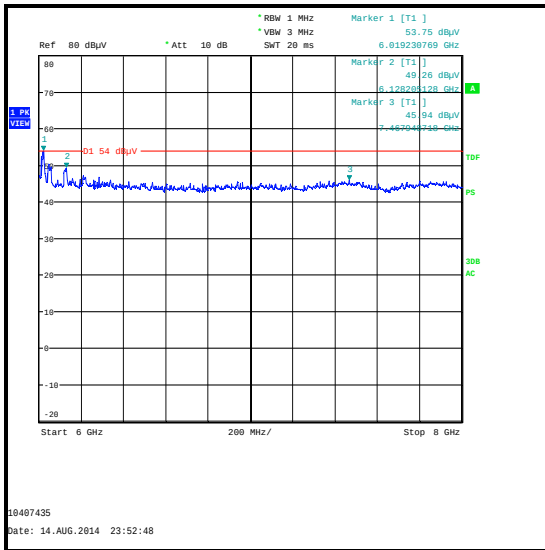
Results: Top Channel / Field Strength / Peak

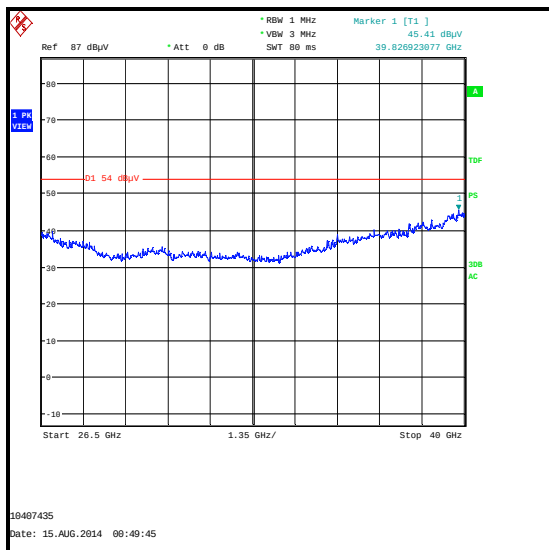
Frequency (MHz)	Antenna Polarity	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5444.808	Horizontal	57.8	74.0	16.2	Complied

Results: Top Channel / Field Strength / Average

Frequency (MHz)	Antenna Polarity	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5439.936	Horizontal	47.1	54.0	6.9	Complied

Transmitter Out of Band Radiated Emissions (5.725-5.85 GHz band operation) (continued)**Restricted Band 4.5 GHz to 5.15 GHz****Restricted Band 5.35 GHz to 5.46 GHz**

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

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

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

Transmitter Out of Band Radiated Emissions (continued)**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1622	Thermohygrometer	JM Handelspunkt	30.5015.06	Not stated	31 Dec 2014	12
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	26 Nov 2014	12
M1273	Test Receiver	Rohde & Schwarz	ESIB26	100275	15 Feb 2015	12
G0543	Amplifier	Sonoma	310N	230801	19 Nov 2014	3
A490	Antenna	Chase	CBL6111A	1590	29 Apr 2015	12
A1834	Attenuator	Hewlett Packard	8491B	10444	15 Nov 2014	12
M1656	Thermohygrometer	JM Handelspunkt	30.5015.13	Not stated	14 Mar 2015	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	14 Nov 2014	12
M1874	Test Receiver	Rohde & Schwarz	ESU26	100553	13 May 2015	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	18 May 2015	12
A1818	Antenna	EMCO	3115	00075692	14 Nov 2014	12
A253	Antenna	Flann Microwave	12240-20	128	14 Nov 2014	12
A254	Antenna	Flann Microwave	14240-20	139	14 Nov 2014	12
A255	Antenna	Flann Microwave	16240-20	519	14 Nov 2014	12
A256	Antenna	Flann Microwave	18240-20	400	14 Nov 2014	12
A436	Antenna	Flann Microwave	20240-20	330	14 Nov 2014	12
A203	Antenna	Flann Microwave	22240-20	343	19 May 2016	36
A1396	Attenuator	Huber & Suhner	6810.17.B	757987	02 May 2015	12
A2133	Low Pass Filter	AtlanTecRF	AFL-04000	JFB1006-002	25 Apr 2015	12
A2176	High Pass Filter	AtlanTecRF	AFH-07000	800980	12 Apr 2015	12
M1630	Test Receiver	Rohde & Schwarz	ESU40	100233	13 Mar 2015	12
A1785	Pre Amplifier	Farran Technology	FLNA-28-30	FTL 6483	13 Jan 2015	12
M1229	Digital Multimeter	Fluke	179	87640015	24 Apr 2015	12
S0557	DC Power Supply	TTI	EL303R	395819	Calibrated before use	-

5.2.8. Transmitter Band Edge Radiated Emissions**Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	14 August 2014
Test Sample IMEI:	352025060501666		

FCC Reference:	Parts 15.407(b)(1),(7), 15.205 & 15.209(a)
Test Method Used:	ANSI C63.10 Section 6.9.2 & KDB 789033 II.G.

Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	52

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:
 - o 802.11a – BPSK / 6 Mbps
 - o 802.11n HT20 SISO – BPSK / 6.5 Mbps / MCS0
 - o 802.11n HT40 SISO – BPSK / 13.5 Mbps / MCS0
 - o 802.11n HT20 MIMO – BPSK / 6.5 Mbps / MCS0
 - o 802.11n HT40 MIMO – BPSK / 13.5 Mbps / 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:
 - o 802.11a – 6 Mbps – 100 sweeps
 - o 802.11n HT20 – MCS0 / SISO – 103 sweeps
 - o 802.11n HT40 – MCS0 / SISO – 105 sweeps
 - o 802.11n HT20 – MCS0 / MIMO – 100 sweeps
 - o 802.11n HT40 – MCS0 / MIMO – 105 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 5.2.4 was added to the measured result.

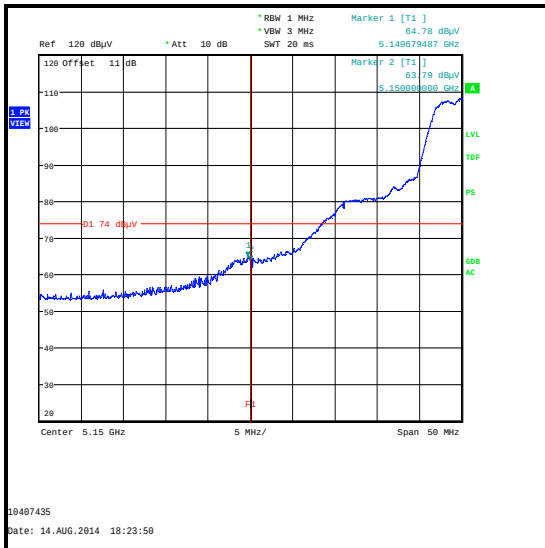
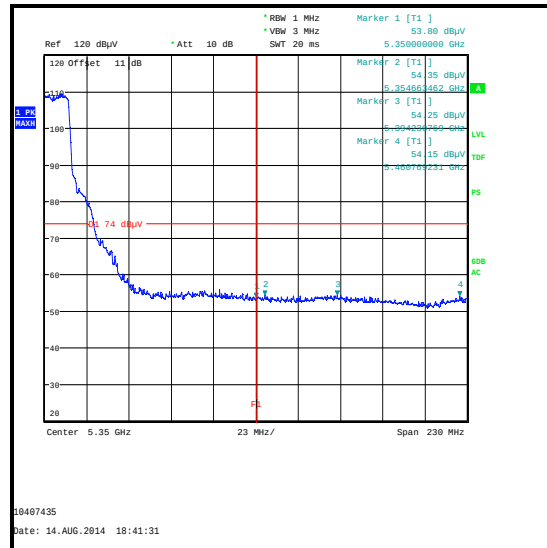
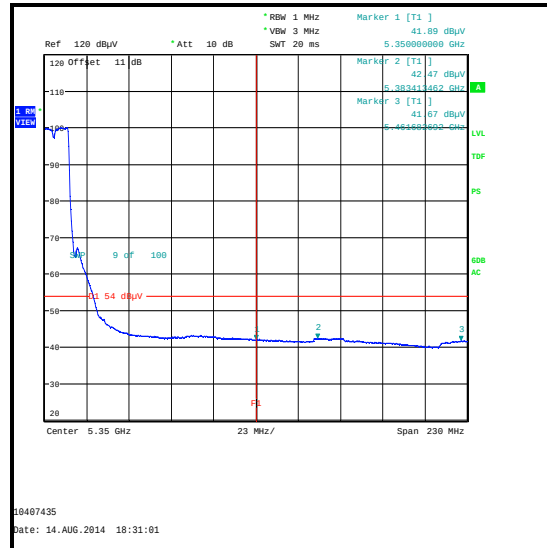
Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11a / 20 MHz / BPSK / 6 Mbps / Peak**

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5149.679	64.8	74.0	9.2	Complied
5150	63.8	74.0	10.2	Complied
5354.663	54.4	74.0	19.6	Complied

Frequency (MHz)	Peak Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
5350	53.8	54.0	0.2	Complied

Results: 802.11a / 20 MHz / BPSK / 6 Mbps / Average

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5149.840	44.7	54.0	9.3	Complied
5150	44.7	54.0	9.3	Complied
5383.413	42.5	54.0	11.5	Complied

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

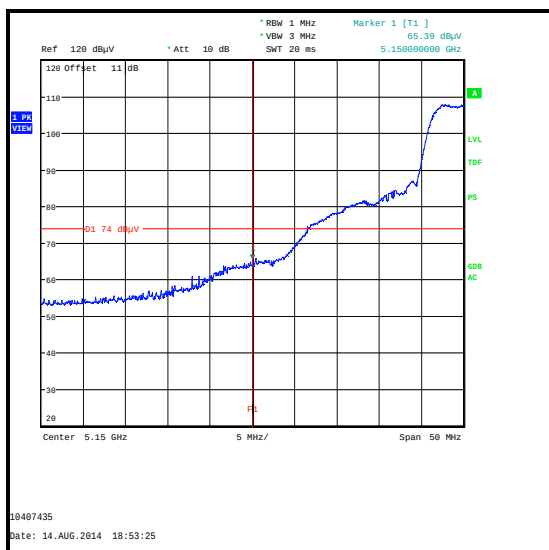
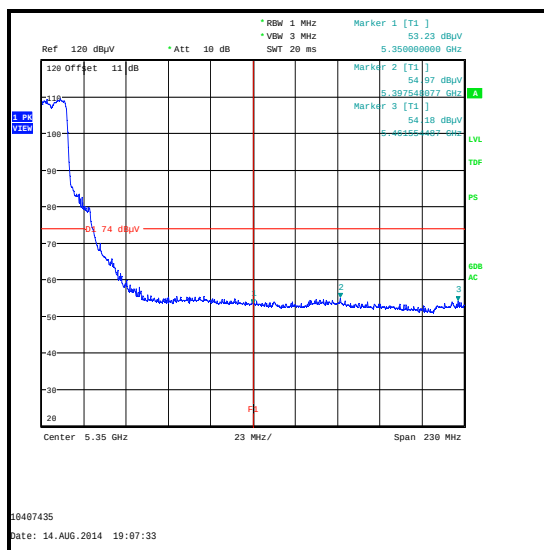
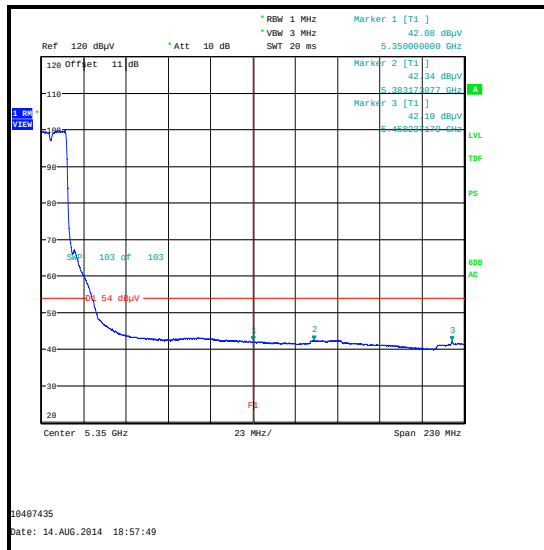
Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11n HT20 / BPSK / MCS0 / SISO / Peak**

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5150	65.4	74.0	8.6	Complied
5397.548	55.0	74.0	19.0	Complied

Frequency (MHz)	Peak Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
5350	53.2	54.0	0.8	Complied

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

Frequency (MHz)	Level (dBμV/m)	Duty Cycle correction (dB)	Corrected Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5149.679	45.4	0.1	45.5	54.0	8.5	Complied
5150	45.2	0.1	45.3	54.0	8.7	Complied
5383.173	42.3	0.1	42.4	54.0	11.6	Complied

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11n HT20 / BPSK / MCS0 / SISO****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Lower Band Edge Average Measurement****Upper Band Edge Average Measurement**

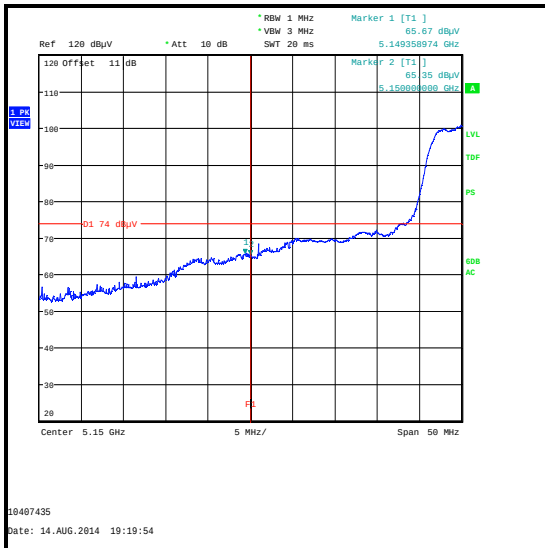
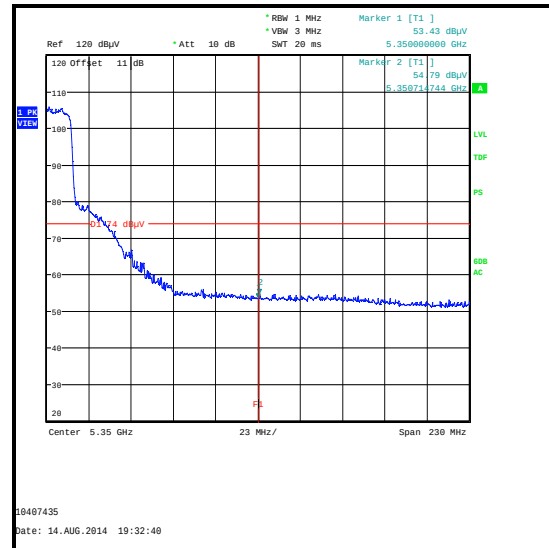
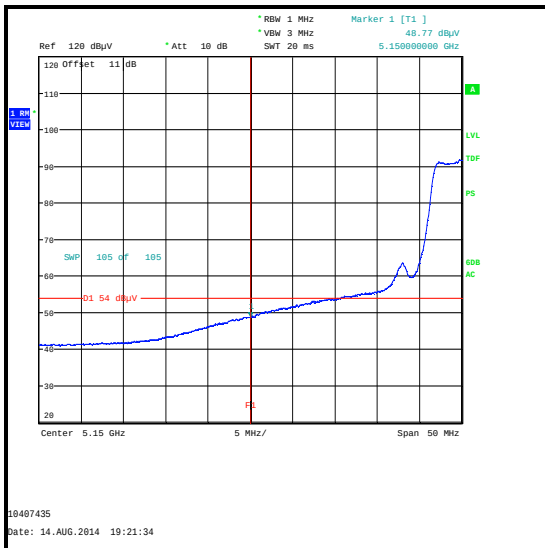
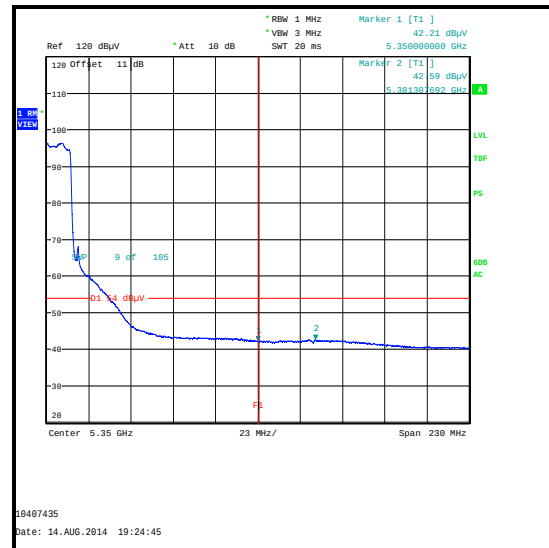
Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11n HT40 / BPSK / MCS0 / SISO / Peak**

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5149.359	65.7	74.0	8.3	Complied
5150	65.4	74.0	8.6	Complied
5350.715	54.8	74.0	19.2	Complied

Frequency (MHz)	Peak Level (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)	Result
5350	53.4	54.0	0.6	Complied

Results: 802.11n HT40 / BPSK / MCS0 / SISO / Average

Frequency (MHz)	Level (dB μ V/m)	Duty Cycle correction (dB)	Corrected Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5150	48.8	0.2	49.0	54.0	5.0	Complied
5381.308	42.6	0.2	42.8	54.0	11.2	Complied

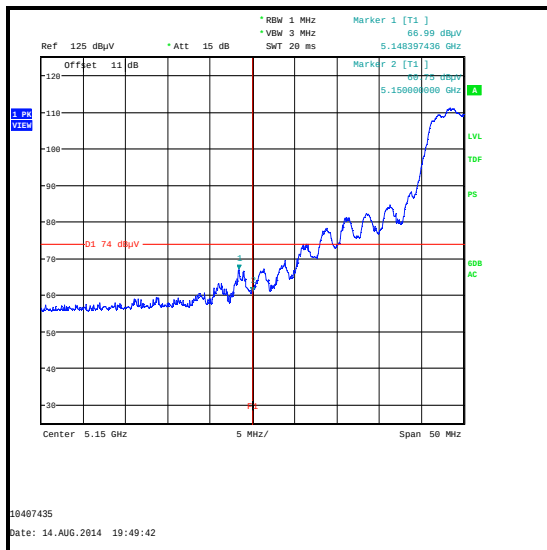
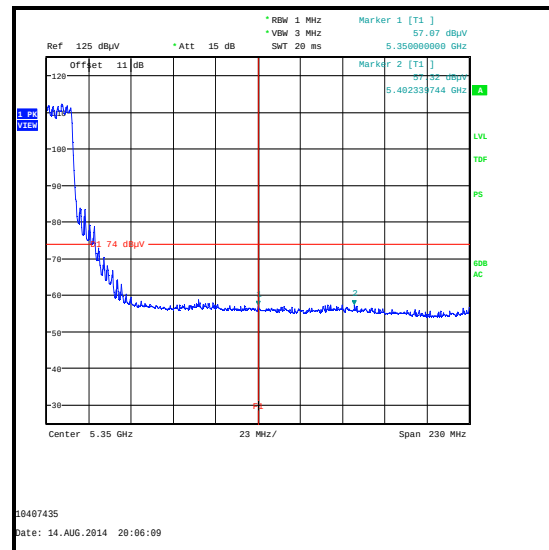
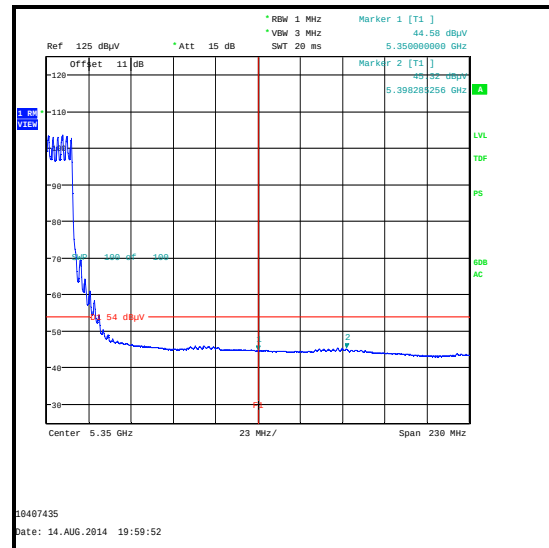
Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11n HT40 / BPSK / MCS0 / SISO****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Lower Band Edge Average Measurement****Upper Band Edge Average Measurement**

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11n HT20 / BPSK / MCS0 / MIMO / Peak**

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5148.397	67.0	74.0	7.0	Complied
5150	60.8	74.0	13.2	Complied
5350	57.1	74.0	16.9	Complied
5402.340	57.3	74.0	16.7	Complied

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

Frequency (MHz)	Level (dBμV/m)	Duty Cycle correction (dB)	Corrected Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5148.718	46.9	0.1	47.0	54.0	7.0	Complied
5150	46.2	0.1	47.3	54.0	7.7	Complied
5350	44.6	0.1	44.7	54.0	9.3	Complied
5398.285	45.3	0.1	45.4	54.0	8.6	Complied

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11n HT20 / BPSK / MCS0 / MIMO****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Lower Band Edge Average Measurement****Upper Band Edge Average Measurement**

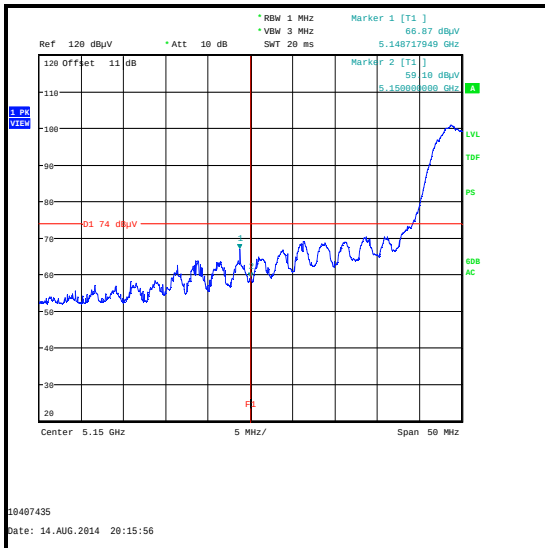
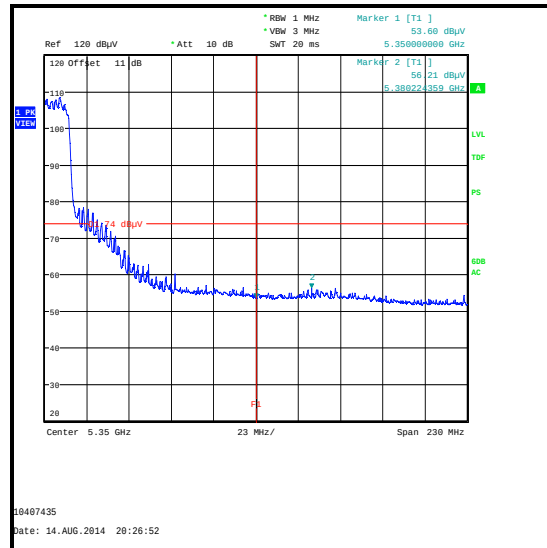
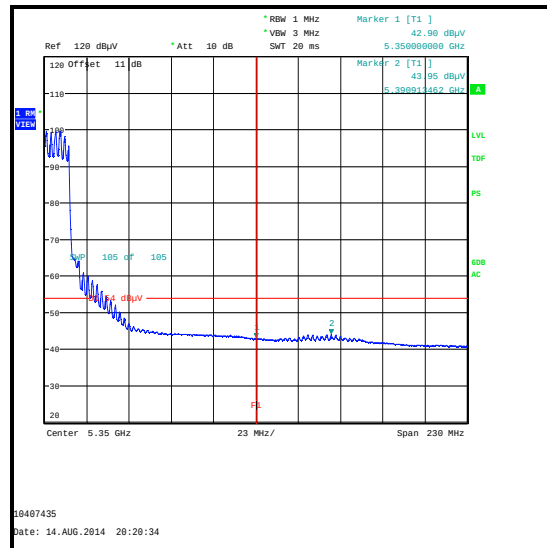
Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11n HT40 / BPSK / MCS0 / MIMO / Peak**

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5148.718	66.9	74.0	7.1	Complied
5150	59.1	74.0	14.9	Complied
5380.224	56.2	74.0	17.8	Complied

Frequency (MHz)	Peak Level (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)	Result
5350	53.6	54.0	0.4	Complied

Results: 802.11n HT40 / BPSK / MCS0 / MIMO / Average

Frequency (MHz)	Level (dB μ V/m)	Duty Cycle correction (dB)	Corrected Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5148.798	45.0	0.2	45.2	54.0	8.8	Complied
5150	43.1	0.2	43.3	54.0	10.7	Complied
5390.913	44.0	0.2	44.2	54.0	9.8	Complied

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band operation) (continued)**Results: 802.11n HT40 / BPSK / MCS0 / MIMO****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Lower Band Edge Average Measurement****Upper Band Edge Average Measurement**

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

Test Engineer:	Andrew Edwards	Test Date:	14 August 2014
Test Sample IMEI:	352025060501666		

FCC Reference:	Parts 15.407(b)(2),(7), 15.205 & 15.209(a)
Test Method Used:	ANSI C63.10 Section 6.9.2 & KDB 789033 II.G.

Environmental Conditions:

Temperature (°C):	22
Relative Humidity (%):	52

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:
 - o 802.11a – BPSK / 6 Mbps
 - o 802.11n HT20 SISO – BPSK / 6.5 Mbps / MCS0
 - o 802.11n HT40 SISO – BPSK / 13.5 Mbps / MCS0
 - o 802.11n HT20 MIMO – BPSK / 6.5 Mbps / MCS0
 - o 802.11n HT40 MIMO – BPSK / 13.5 Mbps / 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. Tests were performed in these restricted bands, the results are included in the transmitter 5.725-5.85 GHz band radiated spurious emissions section of this test report.
4. Field strength measurements using peak and average detectors were performed in the restricted bands below 5.15 GHz and above 5.35 GHz. Field strength and EIRP results were found to be compliant with the restricted band limits and Part 15.407 out-of-band limits.
5. 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:
 - o 802.11a / 6 Mbps – 100 sweeps
 - o 802.11n HT20 – MCS0 / SISO – 103 sweeps
 - o 802.11n HT40 – MCS0 / SISO – 105 sweeps
 - o 802.11n HT20 – MCS0 / MIMO – 100 sweeps
 - o 802.11n HT40 – MCS0 / MIMO – 105 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 5.2.4 was added to the measured result.

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

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5350	62.6	74.0	11.4	Complied
5350.080	63.1	74.0	10.9	Complied

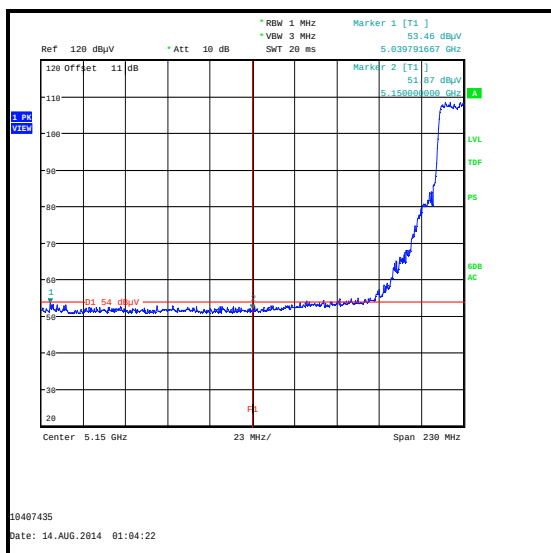
Frequency (MHz)	Peak Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
5039.792	53.5	54.0	0.5	Complied
5150	51.9	54.0	2.1	Complied

Results: 802.11a / 20 MHz / BPSK / 6 Mbps / Average

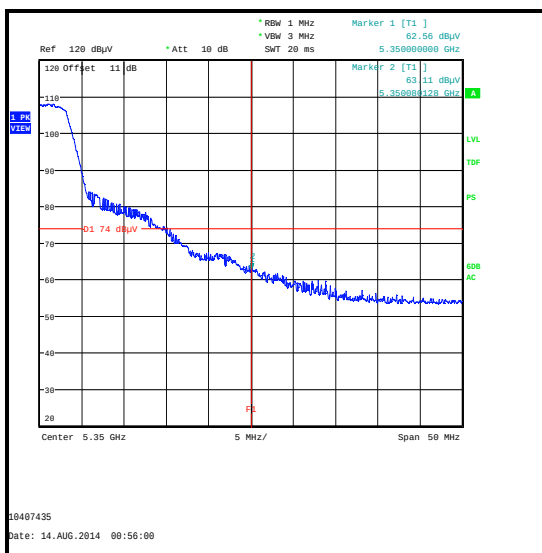
Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5350	43.6	54.0	10.4	Complied
5350.401	44.0	54.0	10.0	Complied

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

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



Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Upper Band Edge Average Measurement

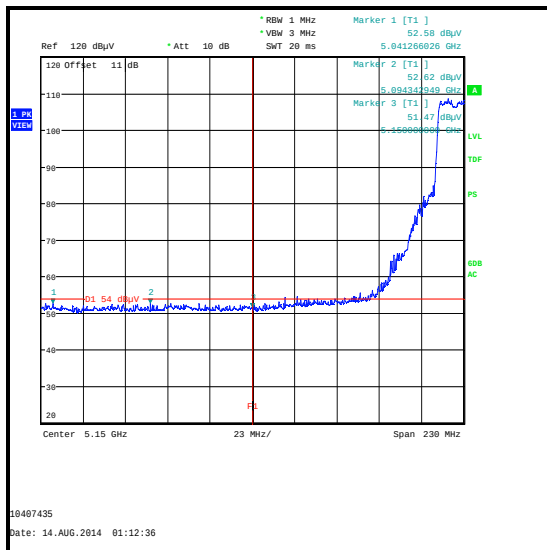
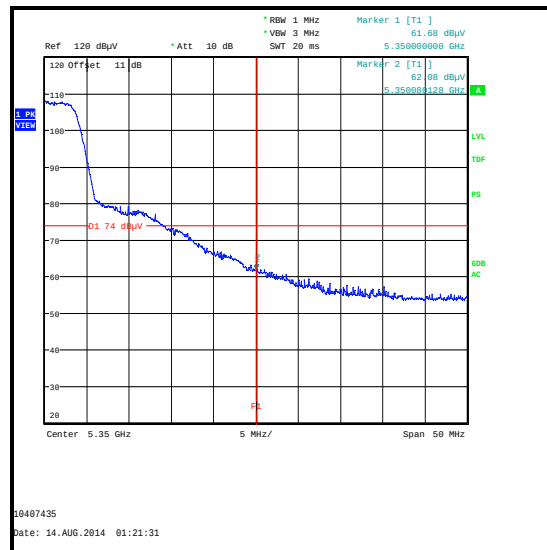
Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)**Results: 802.11n HT20 / BPSK / MCS0 / SISO / Peak**

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5350	61.7	74.0	12.3	Complied
5350.080	62.1	74.0	11.9	Complied

Frequency (MHz)	Peak Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
5094.343	52.6	54.0	1.4	Complied
5150	51.5	54.0	2.5	Complied

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

Frequency (MHz)	Level (dBμV/m)	Duty Cycle correction (dB)	Corrected Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5350	43.9	0.1	44.0	54.0	10.0	Complied
5350.080	43.9	0.1	44.0	54.0	10.0	Complied

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)**Results: 802.11n HT20 / BPSK / MCS0 / SISO****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Upper Band Edge Average Measurement**

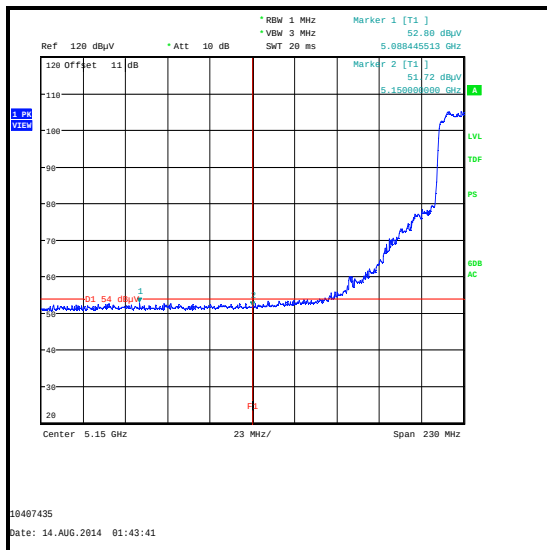
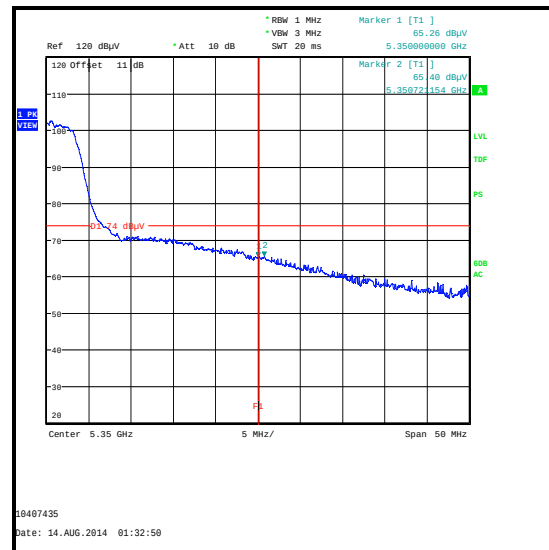
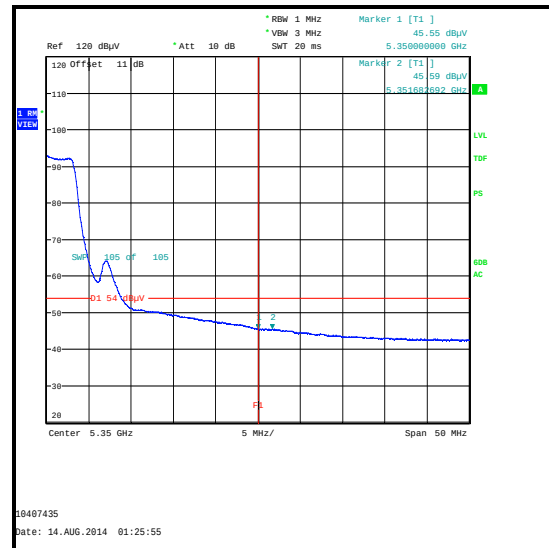
Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)**Results: 802.11n HT40 / BPSK / MCS0 / SISO / Peak**

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5350	65.3	74.0	8.7	Complied
5350.721	65.4	74.0	8.6	Complied

Frequency (MHz)	Peak Level (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)	Result
5088.446	52.8	54.0	1.2	Complied
5150	51.7	54.0	2.3	Complied

Results: 802.11n HT40 / BPSK / MCS0 / SISO / Average

Frequency (MHz)	Level (dB μ V/m)	Duty Cycle correction (dB)	Corrected Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5350	45.6	0.2	45.8	54.0	8.2	Complied
5351.683	45.6	0.2	45.8	54.0	8.2	Complied

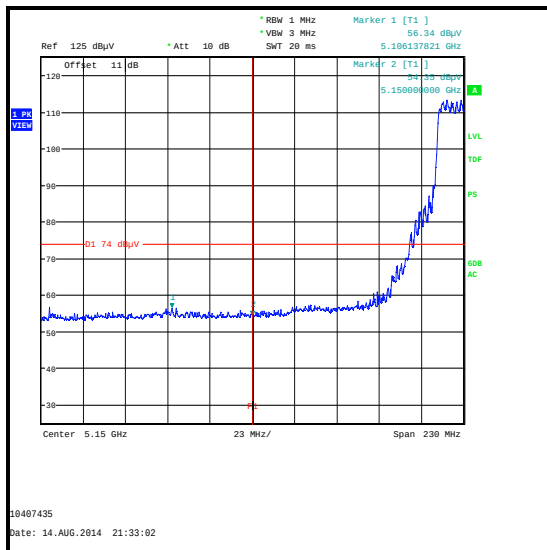
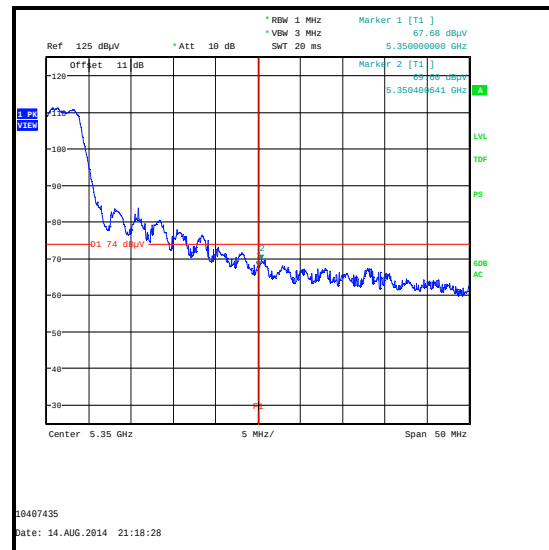
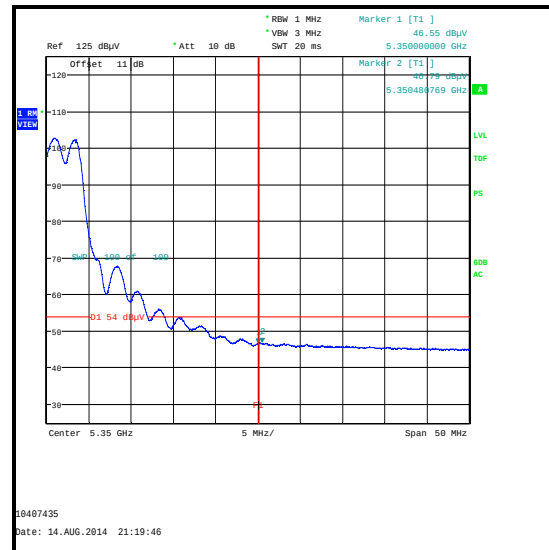
Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)**Results: 802.11n HT40 / BPSK / MCS0 / SISO****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Upper Band Edge Average Measurement**

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)**Results: 802.11n HT20 / BPSK / MCS0 / MIMO / Peak**

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5106.138	56.3	74.0	17.7	Complied
5150	54.4	74.0	19.6	Complied
5350	67.7	74.0	6.3	Complied
5350.401	69.6	74.0	4.4	Complied

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

Frequency (MHz)	Level (dB μ V/m)	Duty Cycle correction (dB)	Corrected Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5106.506	44.5	0.1	44.6	54.0	9.4	Complied
5150	43.1	0.1	43.2	54.0	10.8	Complied
5350	46.6	0.1	46.7	54.0	7.3	Complied
5350.481	46.8	0.1	46.9	54.0	7.1	Complied

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)**Results: 802.11n HT20 / BPSK / MCS0 / MIMO****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Lower Band Edge Average Measurement****Upper Band Edge Average Measurement**

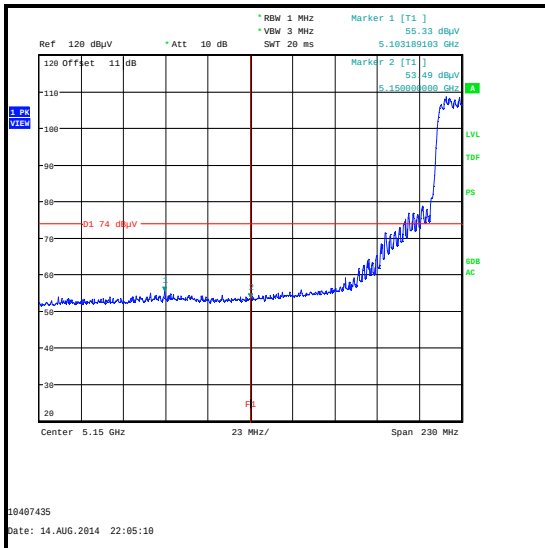
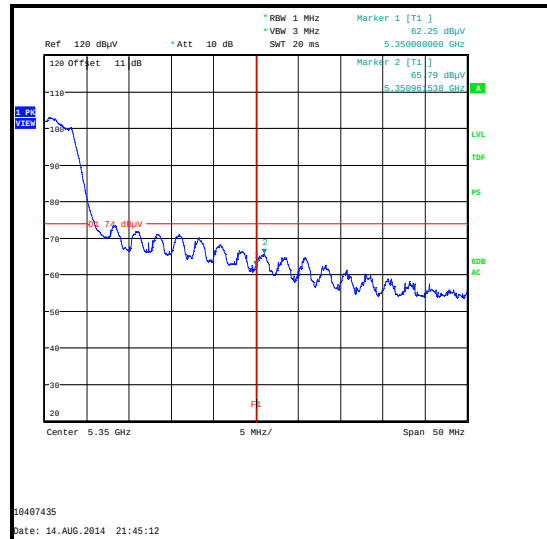
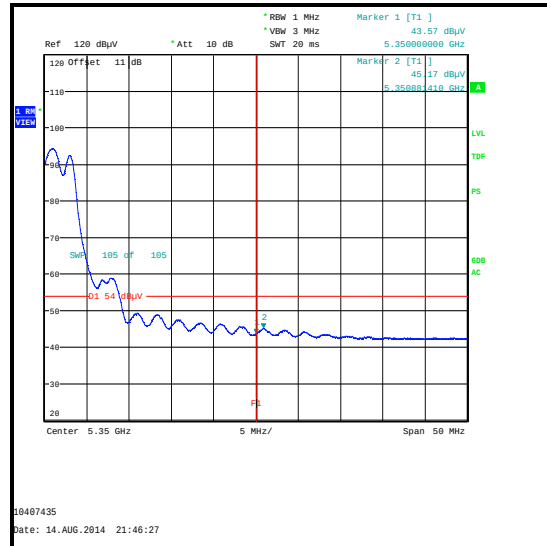
Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)**Results: 802.11n HT40 / BPSK / MCS0 / MIMO / Peak**

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5103.189	55.3	74.0	18.7	Complied
5350	62.3	74.0	11.7	Complied
5350.962	65.8	74.0	8.2	Complied

Frequency (MHz)	Peak Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
5150	53.5	54.0	0.5	Complied

Results: 802.11n HT40 / BPSK / MCS0 / MIMO / Average

Frequency (MHz)	Level (dBμV/m)	Duty Cycle correction (dB)	Corrected Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5102.821	42.5	0.2	42.7	54.0	11.3	Complied
5350	43.6	0.2	43.8	54.0	10.2	Complied
5350.881	45.2	0.2	45.4	54.0	8.6	Complied

Transmitter Band Edge Radiated Emissions (5.25-5.35 GHz band operation) (continued)**Results: 802.11n HT40 / BPSK / MCS0 / MIMO****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Lower Band Edge Average 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:	13 August 2014 & 14 August 2014
Test Sample IMEI:	352025060501666		

FCC Reference:	Parts 15.407(b)(3),(7), 15.205 & 15.209(a)
Test Method Used:	ANSI C63.10 Section 6.9.2 & KDB 789033 II.G.

Environmental Conditions:

Temperature (°C):	22 to 23
Relative Humidity (%):	49 to 53

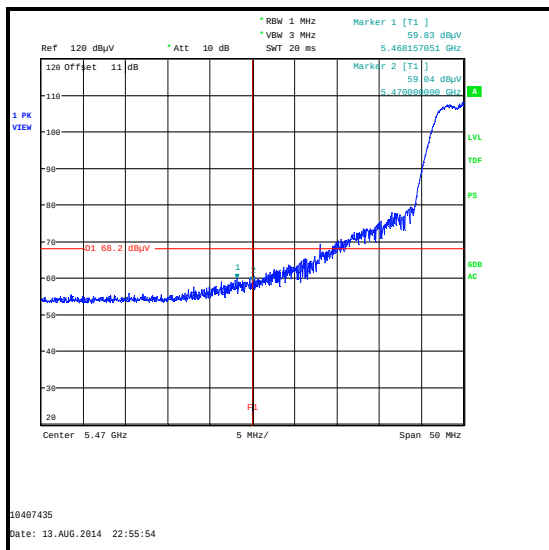
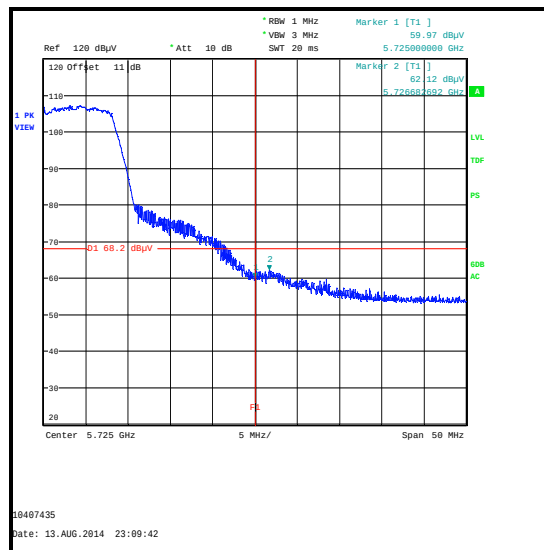
Note(s):

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:
 - o 802.11a – BPSK / 6 Mbps
 - o 802.11n HT20 SISO – BPSK / 6.5 Mbps / MCS0
 - o 802.11n HT40 SISO – BPSK / 13.5 Mbps / MCS0
 - o 802.11n HT20 MIMO – BPSK / 6.5 Mbps / MCS0
 - o 802.11n HT40 MIMO – BPSK / 13.5 Mbps / 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 5.725-5.85 GHz band radiated spurious emissions section of this test report.
4. For completeness, results are also shown as EIRP in dBm and also as field strength in dBμV/m. Measured field strength was converted to EIRP in accordance with KDB 789033 II.G.2.d.(iii) using a conversion factor of 95.2.

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

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5468.157	-35.4	-27.0	8.4	Complied
5470	-36.2	-27.0	9.2	Complied
5725	-35.2	-27.0	8.2	Complied
5726.683	-33.1	-27.0	6.1	Complied

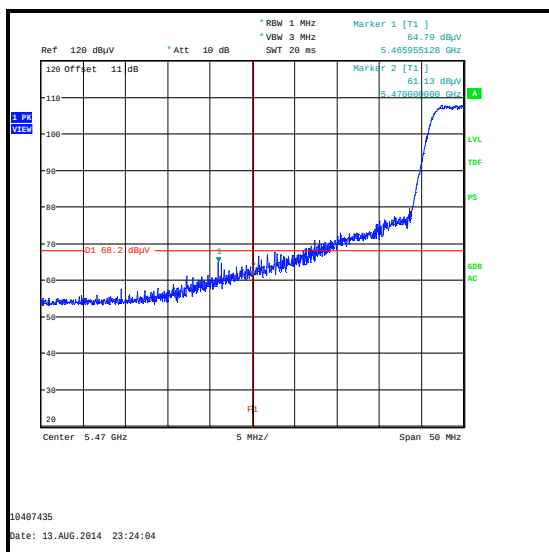
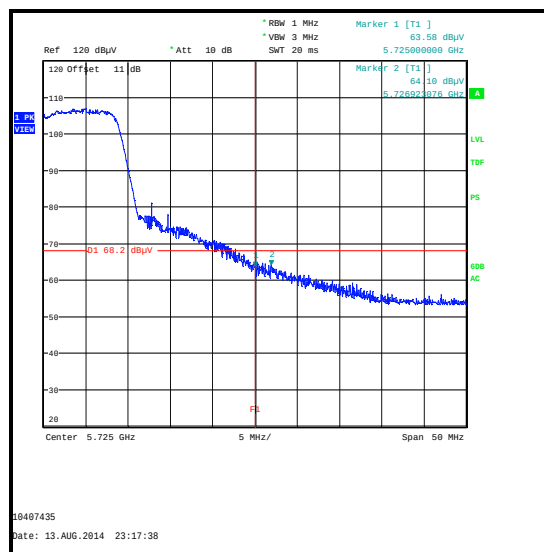
Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5468.157	59.8	68.2	8.4	Complied
5470	59.0	68.2	9.2	Complied
5725	60.0	68.2	8.2	Complied
5726.683	62.1	68.2	6.1	Complied

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

Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)**Results: 802.11n HT20 / BPSK / MCS0 / SISO / Peak**

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5465.955	-30.4	-27.0	3.4	Complied
5470	-34.1	-27.0	7.1	Complied
5725	-31.6	-27.0	4.6	Complied
5726.923	-31.1	-27.0	4.1	Complied

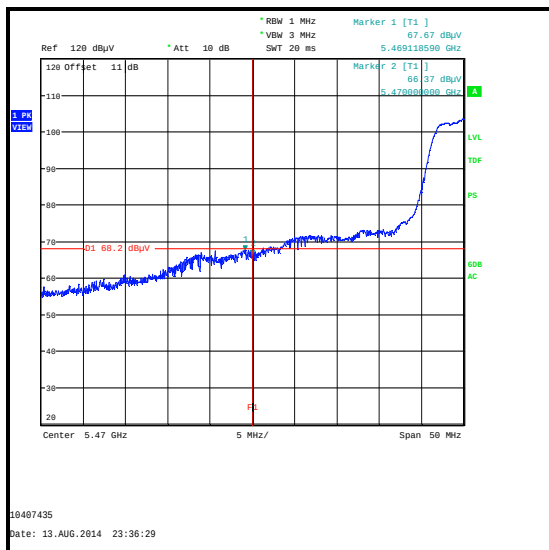
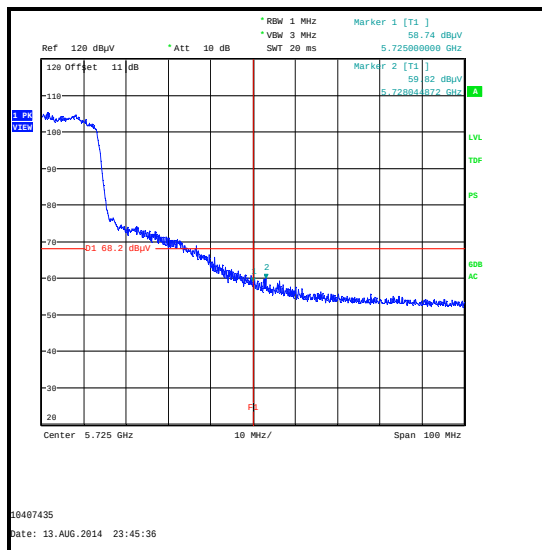
Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5465.955	64.8	68.2	3.4	Complied
5470	61.1	68.2	7.1	Complied
5725	63.6	68.2	4.6	Complied
5726.923	64.1	68.2	4.1	Complied

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

Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)**Results: 802.11n HT40 / BPSK / MCS0 / SISO / Peak**

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5469.119	-27.5	-27.0	0.5	Complied
5470	-28.8	-27.0	1.8	Complied
5725	-36.5	-27.0	9.5	Complied
5728.045	-35.4	-27.0	8.4	Complied

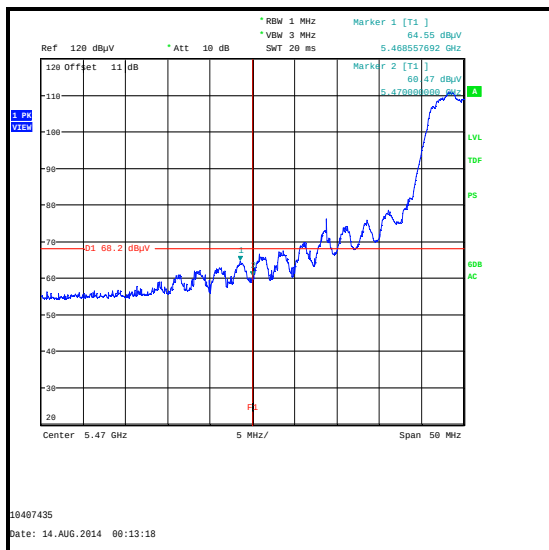
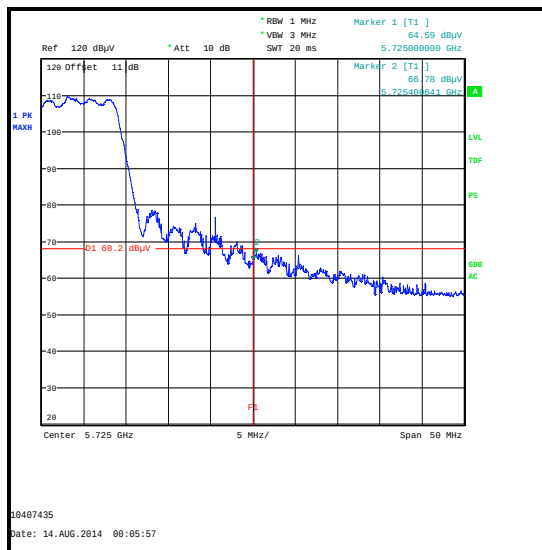
Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5469.119	67.7	68.2	0.5	Complied
5470	66.4	68.2	1.8	Complied
5725	58.7	68.2	9.5	Complied
5728.045	59.8	68.2	8.4	Complied

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

Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)**Results: 802.11n HT20 / BPSK / MCS0 / MIMO / Peak**

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5468.558	-30.6	-27.0	3.6	Complied
5470	-34.7	-27.0	7.7	Complied
5725	-30.6	-27.0	3.6	Complied
5725.401	-28.4	-27.0	1.4	Complied

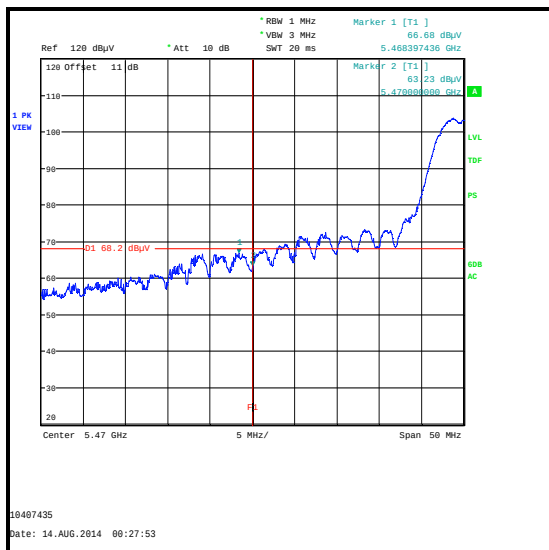
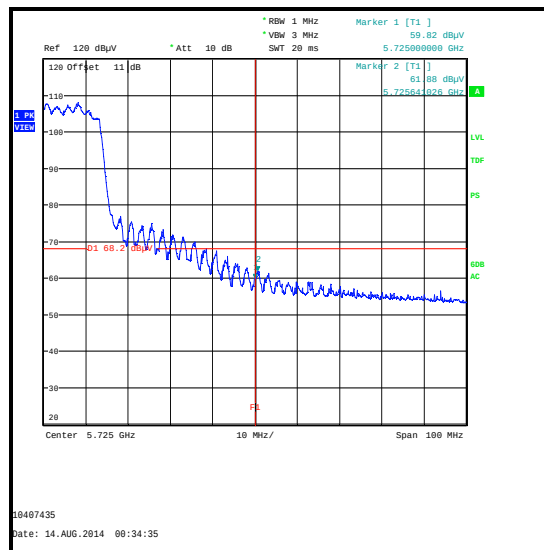
Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5468.558	64.6	68.2	3.6	Complied
5470	60.5	68.2	7.7	Complied
5725	64.6	68.2	3.6	Complied
5725.401	66.8	68.2	1.4	Complied

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

Transmitter Band Edge Radiated Emissions (5.47-5.725 GHz band operation) (continued)**Results: 802.11n HT40 / BPSK / MCS0 / MIMO / Peak**

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5468.397	-28.5	-27.0	1.5	Complied
5470	-32.0	-27.0	5.0	Complied
5725	-35.4	-27.0	8.4	Complied
5725.641	-33.3	-27.0	6.3	Complied

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5468.397	66.7	68.2	1.5	Complied
5470	63.2	68.2	5.0	Complied
5725	59.8	68.2	8.4	Complied
5725.641	61.9	68.2	6.3	Complied

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

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

Test Engineer:	Andrew Edwards	Test Date:	13 August 2014
Test Sample IMEI:	352025060501666		

FCC Reference:	Parts 15.407(b)(4),(7), 15.205 & 15.209(a)
Test Method Used:	ANSI C63.10 Section 6.9.2 & KDB 789033 II.G.

Environmental Conditions:

Temperature (°C):	22 to 23
Relative Humidity (%):	48 to 50

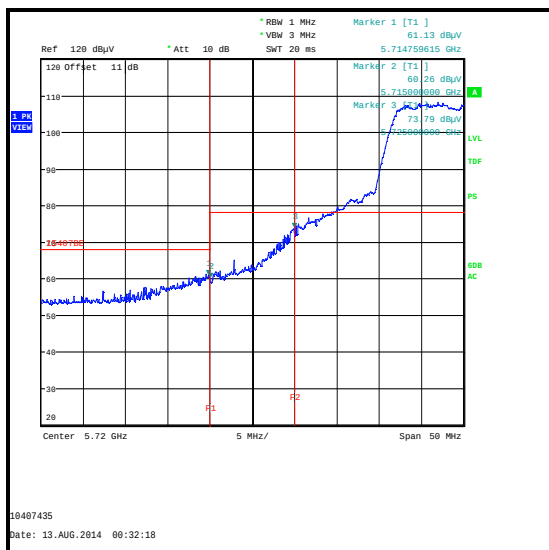
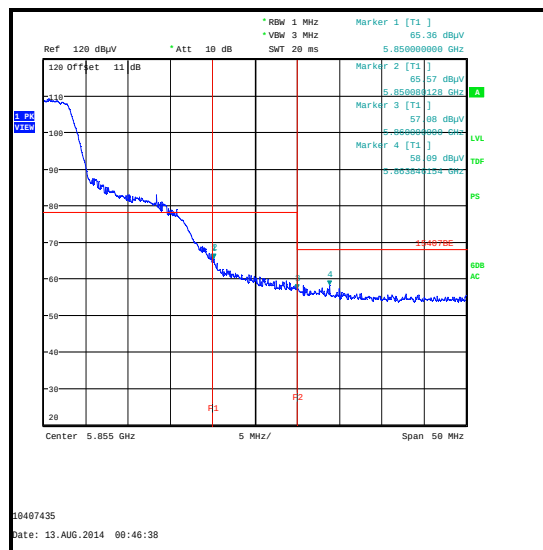
Note(s):

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:
 - o 802.11a – BPSK / 6 Mbps
 - o 802.11n HT20 SISO – BPSK / 6.5 Mbps / MCS0
 - o 802.11n HT40 SISO – BPSK / 13.5 Mbps / MCS0
 - o 802.11n HT20 MIMO – BPSK / 6.5 Mbps / MCS0
 - o 802.11n HT40 MIMO – BPSK / 13.5 Mbps / 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 completeness, results are also shown as EIRP in dBm and also as field strength in dBμV/m. Measured field strength was converted to EIRP in accordance with KDB 789033 G.2.d)(iii) using a conversion factor of 95.2.

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

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5714.760	-34.1	-27.0	7.1	Complied
5715	-34.9	-27.0	7.9	Complied
5725	-21.4	-17.0	4.4	Complied
5850	-29.8	-17.0	12.8	Complied
5850.080	-29.6	-17.0	12.6	Complied
5860	-38.1	-27.0	11.1	Complied
5863.846	-37.1	-27.0	10.1	Complied

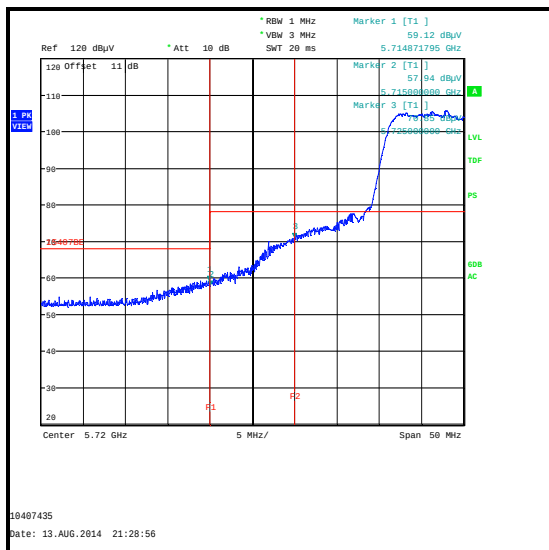
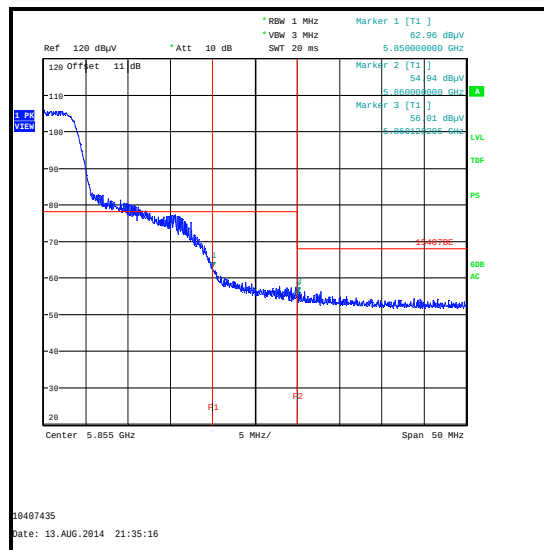
Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5714.760	61.1	68.2	7.1	Complied
5715	60.3	68.2	7.9	Complied
5725	73.8	78.2	4.4	Complied
5850	65.4	78.2	12.8	Complied
5850.080	65.6	78.2	12.6	Complied
5860	57.1	68.2	11.1	Complied
5863.846	58.1	68.2	10.1	Complied

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

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band operation) (continued)**Results: 802.11n HT20 / BPSK / MCS0 / SISO / Peak**

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5714.872	-36.1	-27.0	9.1	Complied
5715	-37.3	-27.0	10.3	Complied
5725	-24.3	-17.0	7.3	Complied
5850	-32.2	-17.0	15.2	Complied
5860	-40.3	-27.0	13.3	Complied
5860.128	-39.2	-27.0	12.2	Complied

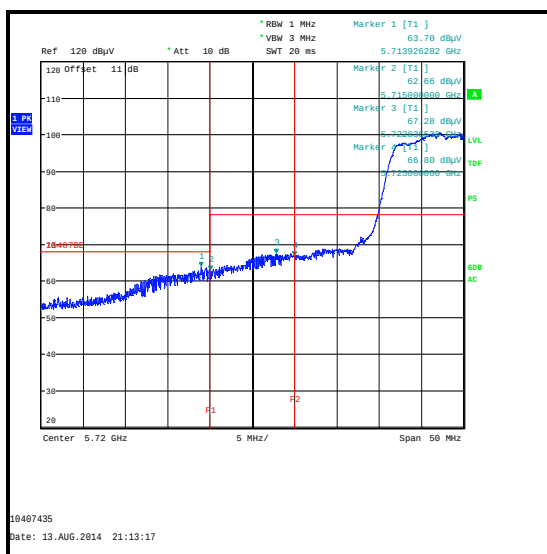
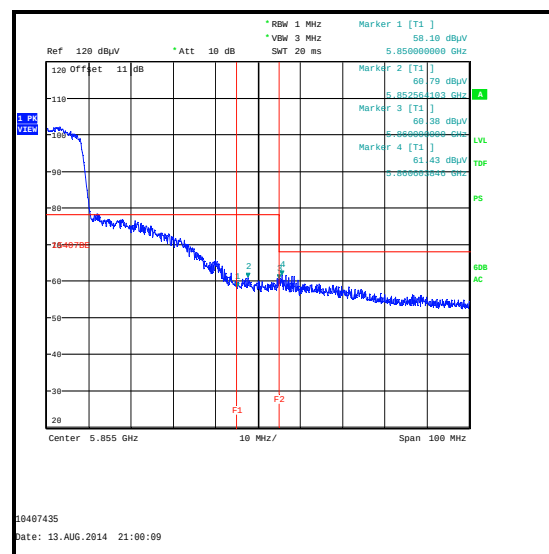
Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
5714.872	59.1	68.2	9.1	Complied
5715	57.9	68.2	10.3	Complied
5725	70.9	78.2	7.3	Complied
5850	63.0	78.2	15.2	Complied
5860	54.9	68.2	13.3	Complied
5860.128	56.0	68.2	12.2	Complied

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

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band operation) (continued)**Results: 802.11n HT40 / BPSK / MCS0 / SISO / Peak**

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5713.926	-31.5	-27.0	4.5	Complied
5715	-32.5	-27.0	5.5	Complied
5722.837	-27.9	-17.0	10.9	Complied
5725	-28.4	-17.0	11.4	Complied
5850	-37.1	-17.0	20.1	Complied
5852.564	-34.4	-17.0	17.4	Complied
5860	-34.8	-27.0	7.8	Complied
5860.604	-33.8	-27.0	6.8	Complied

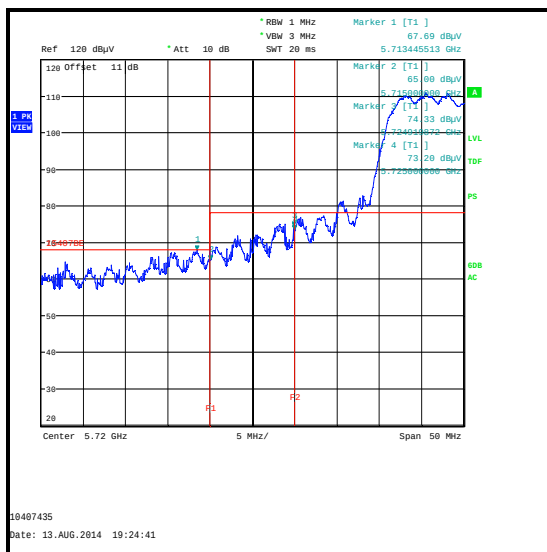
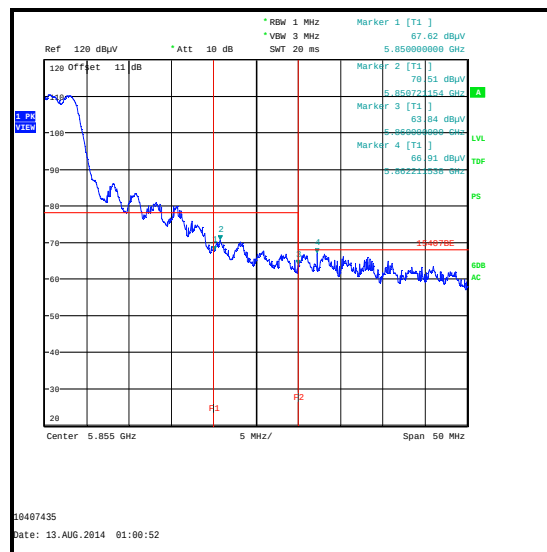
Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5713.926	63.7	68.2	4.5	Complied
5715	62.7	68.2	5.5	Complied
5722.837	67.3	78.2	10.9	Complied
5725	66.8	78.2	11.4	Complied
5850	58.1	78.2	20.1	Complied
5852.564	60.8	78.2	17.4	Complied
5860	60.4	68.2	7.8	Complied
5860.604	61.4	68.2	6.8	Complied

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

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band operation) (continued)**Results: 802.11n HT20 / BPSK / MCS0 / MIMO / Peak**

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5713.446	-27.5	-27.0	0.5	Complied
5715	-30.2	-27.0	3.2	Complied
5724.920	-20.9	-17.0	3.9	Complied
5725	-22.0	-17.0	5.0	Complied
5850	-27.6	-17.0	10.6	Complied
5850.721	-24.7	-17.0	7.7	Complied
5860	-31.4	-27.0	4.4	Complied
5862.212	-28.3	-27.0	1.3	Complied

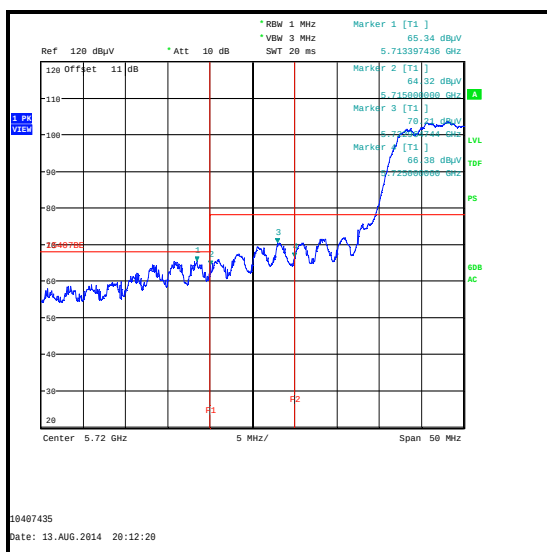
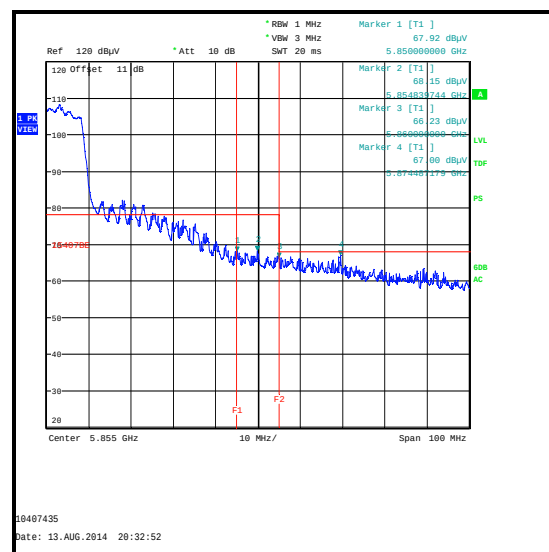
Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5713.446	67.7	68.2	0.5	Complied
5715	65.0	68.2	3.2	Complied
5724.920	74.3	78.2	3.9	Complied
5725	73.2	78.2	5.0	Complied
5850	67.6	78.2	10.6	Complied
5850.721	70.5	78.2	7.7	Complied
5860	63.8	68.2	4.4	Complied
5862.212	66.9	68.2	1.3	Complied

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

Transmitter Band Edge Radiated Emissions (5.725-5.85 GHz band operation) (continued)**Results: 802.11n HT40 / BPSK / MCS0 / MIMO / Peak**

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Result
5713.397	-29.9	-27.0	2.9	Complied
5715	-30.9	-27.0	3.9	Complied
5722.965	-25.0	-17.0	8.0	Complied
5725	-28.8	-17.0	11.8	Complied
5850	-27.3	-17.0	10.3	Complied
5854.840	-27.0	-17.0	10.0	Complied
5860	-29.0	-27.0	2.0	Complied
5874.487	-28.2	-27.0	1.2	Complied

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
5713.397	65.3	68.2	2.9	Complied
5715	64.3	68.2	3.9	Complied
5722.965	70.2	78.2	8.0	Complied
5725	66.4	78.2	11.8	Complied
5850	67.9	78.2	10.3	Complied
5854.840	68.2	78.2	10.0	Complied
5860	66.2	68.2	2.0	Complied
5874.487	67.0	68.2	1.2	Complied

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

Transmitter Band Edge Radiated Emissions (continued)**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1656	Thermohygrometer	JM Handelspunkt	30.5015.13	Not stated	14 Mar 2015	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	14 Nov 2014	12
M1874	Test Receiver	Rohde & Schwarz	ESU26	100553	13 May 2015	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	18 May 2015	12
A253	Antenna	Flann Microwave	12240-20	128	14 Nov 2014	12
A1396	Attenuator	Huber & Suhner	6810.17.B	757987	02 May 2014	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
Minimum 6 dB Emission Bandwidth	5.15 GHz to 5.850 GHz	95%	±3.92 %
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
2.0	-	-	Admin updates

--- END OF REPORT ---