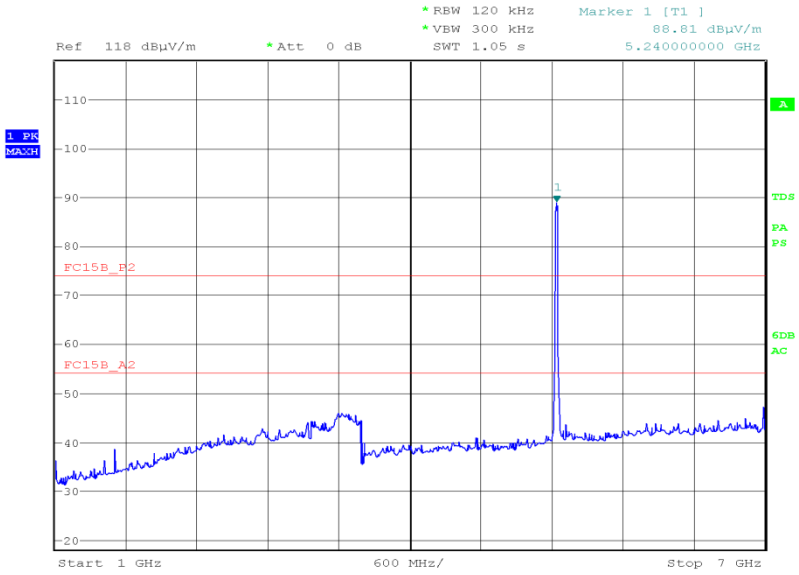
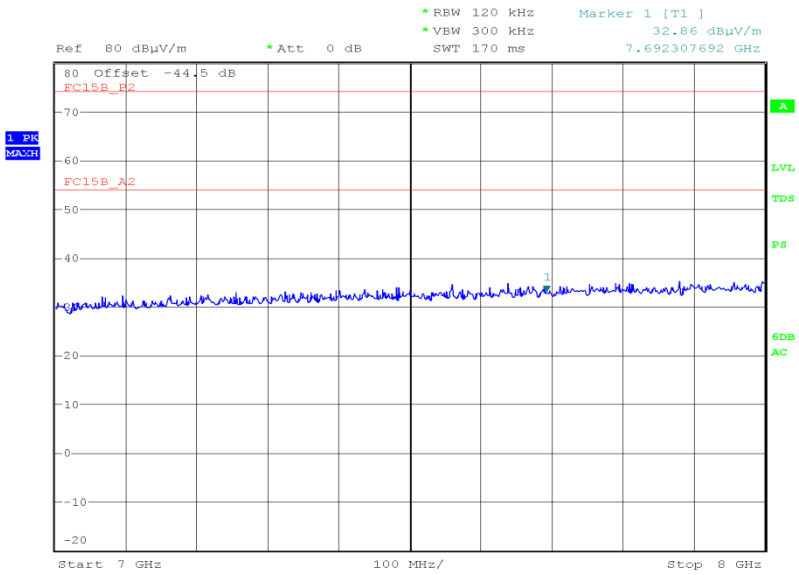
Product Service

1 GHz to 7 GHz



Date: 27.MAR.2012 20:48:32

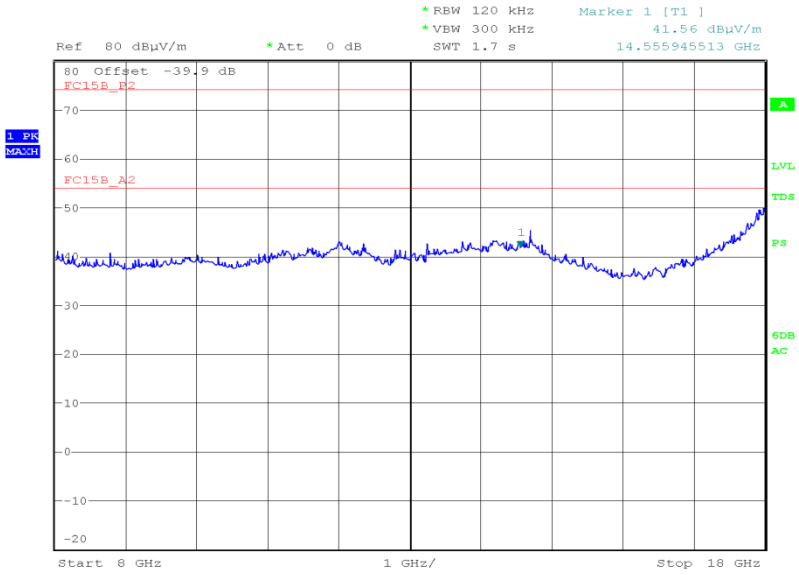
7 GHz to 8 GHz



Date: 2.APR.2012 17:31:12

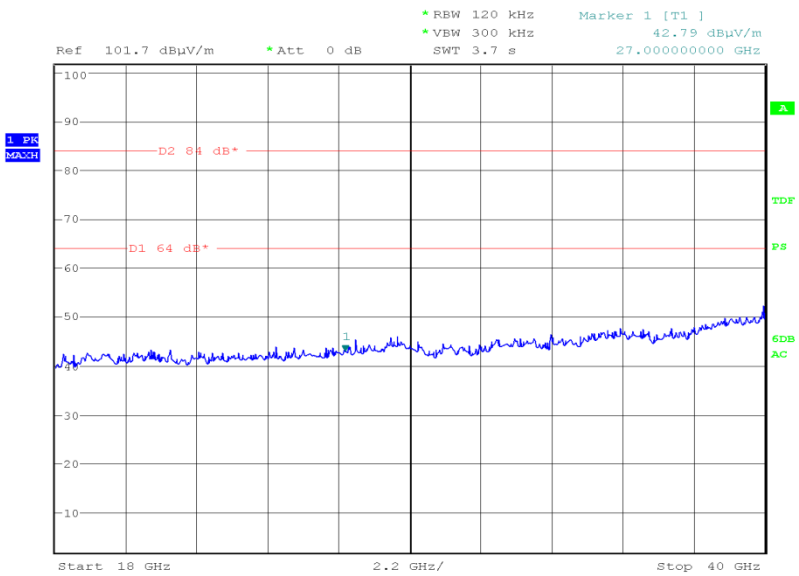
Product Service

8 GHz to 18 GHz



Date: 2.APR.2012 21:11:50

18 GHz to 40 GHz

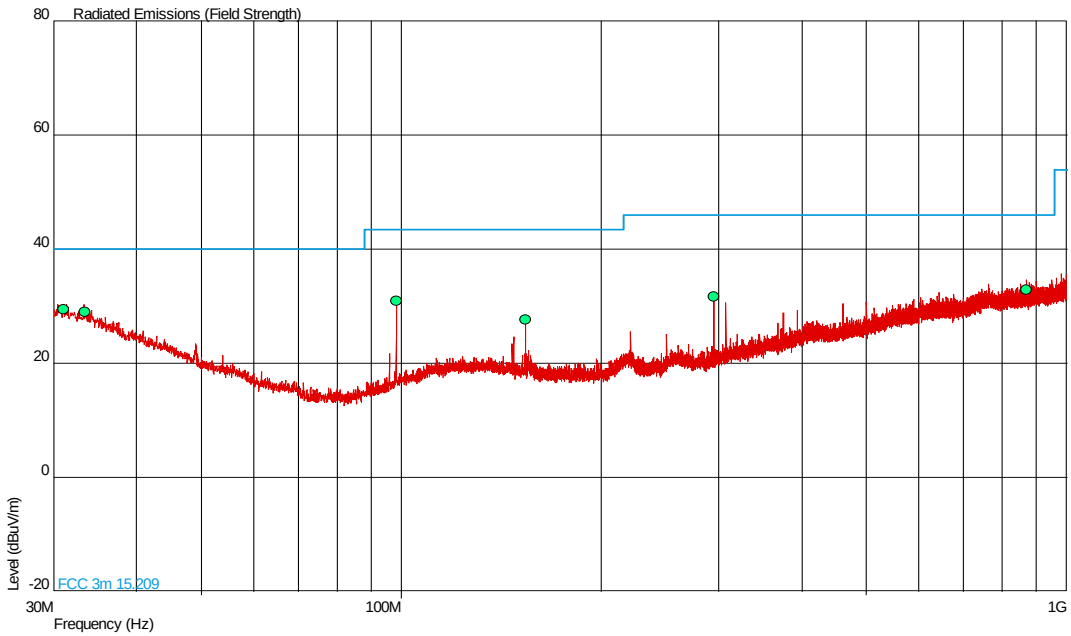


Date: 4.APR.2012 17:00:36

Frequency Band 2

5260 MHz

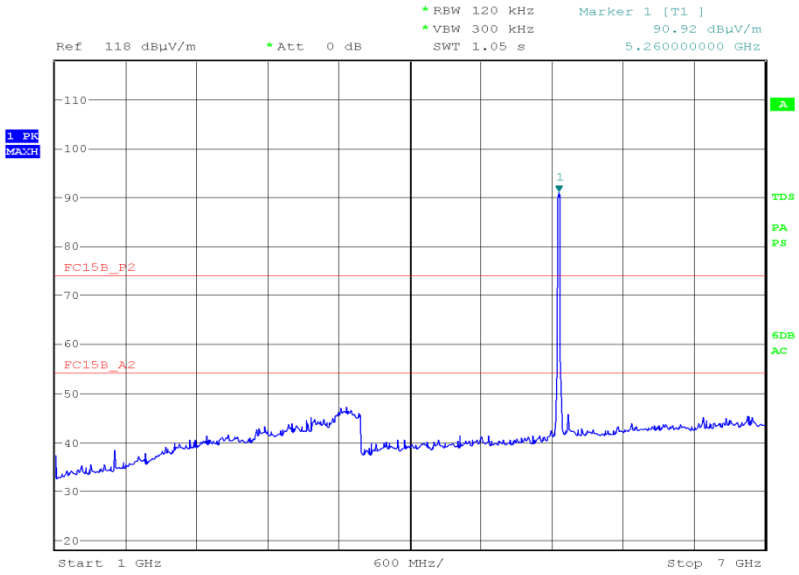
30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height(m)	Polarity
31.115	29.5	29.9	40.0	100	-10.5	70.1	346	1.00	Horizontal
33.456	29.0	28.2	40.0	100	-11.0	71.8	139	1.00	Vertical
98.306	31.0	35.5	43.5	150	-12.5	114.5	360	1.00	Vertical
153.591	27.6	24.0	43.5	150	-15.9	126.0	41	1.39	Vertical
294.908	31.8	38.9	46.0	200	-14.2	161.1	360	1.00	Horizontal
869.622	32.8	43.7	46.0	200	-13.2	156.3	282	1.00	Vertical

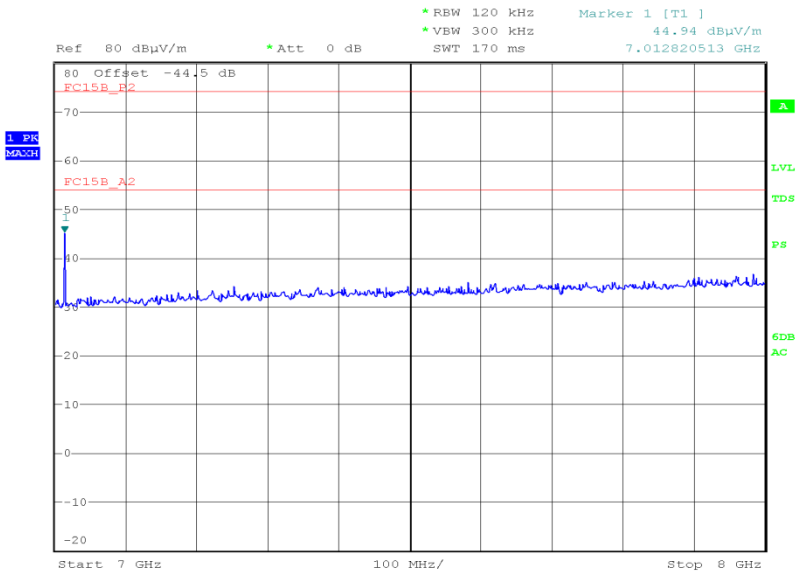
Product Service

1 GHz to 7 GHz



Date: 27.MAR.2012 21:31:09

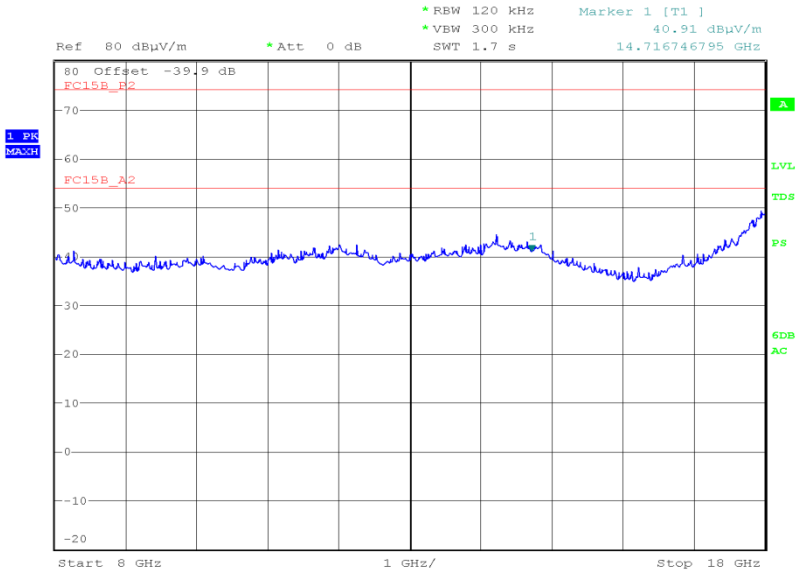
7 GHz to 8 GHz



Date: 2.APR.2012 17:41:38

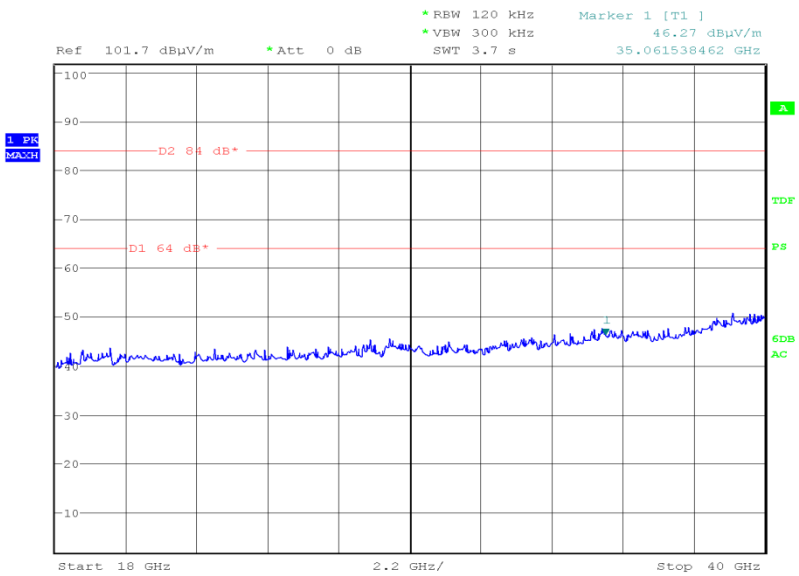
Product Service

8 GHz to 18 GHz



Date: 2.APR.2012 21:27:46

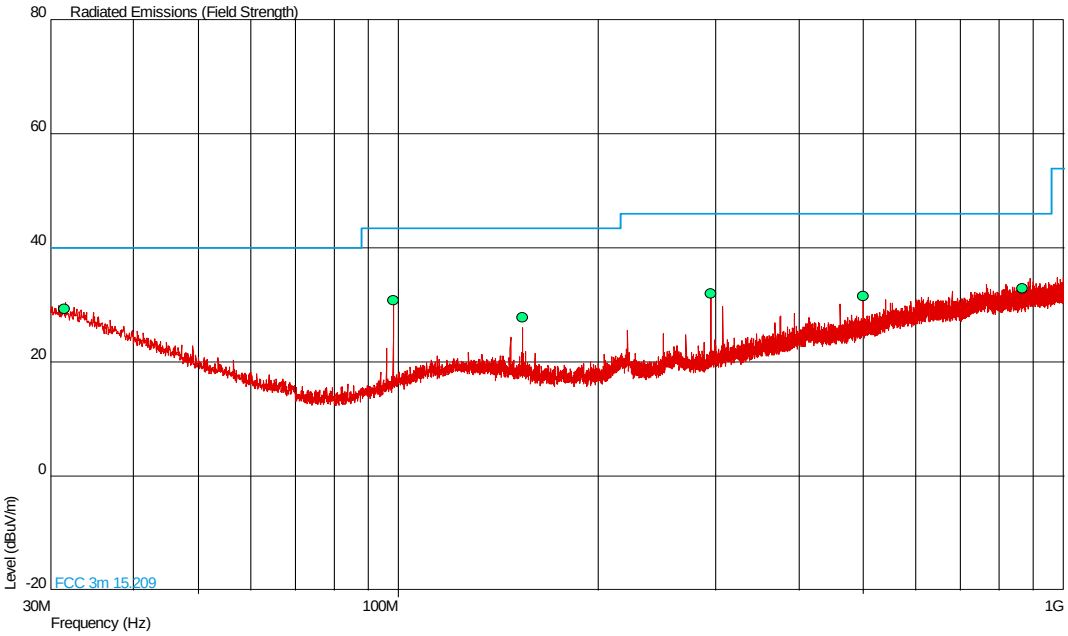
18 GHz to 40 GHz



Date: 4.APR.2012 17:37:34

5300 MHz

30 MHz to 1 GHz

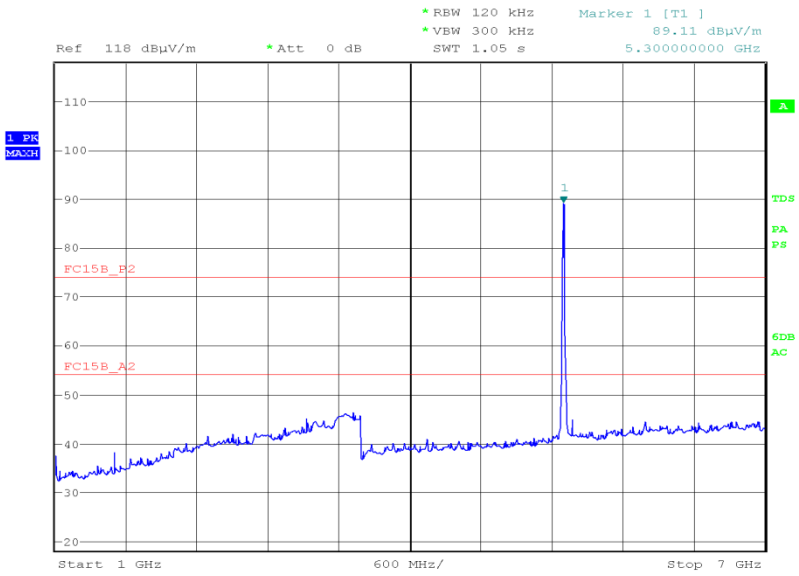


Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height(m)	Polarity
31.527	29.4	29.5	40.0	100	-10.6	70.5	153	1.00	Vertical
98.313	30.8	34.7	43.5	150	-12.7	115.3	360	1.00	Vertical
153.593	27.8	24.5	43.5	150	-15.7	125.5	40	1.08	Vertical
294.912	32.0	39.8	46.0	200	-14.0	160.2	336	1.00	Vertical
500.046	31.5	37.6	46.0	200	-14.5	162.4	0	1.69	Vertical
866.742	32.9	44.2	46.0	200	-13.1	155.8	236	1.00	Horizontal

1GHz to 40GHz

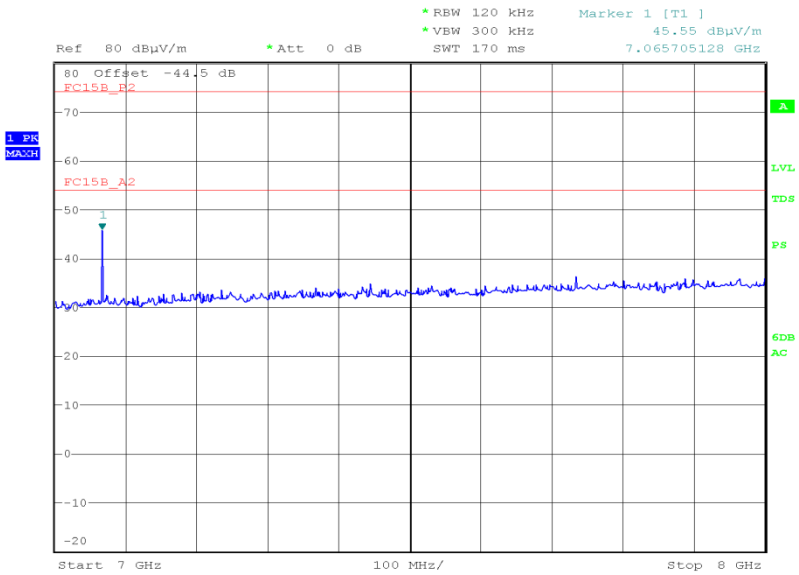
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
5.371	Vertical	100	343	60.39	47.93

1 GHz to 7 GHz



Date: 27.MAR.2012 21:44:06

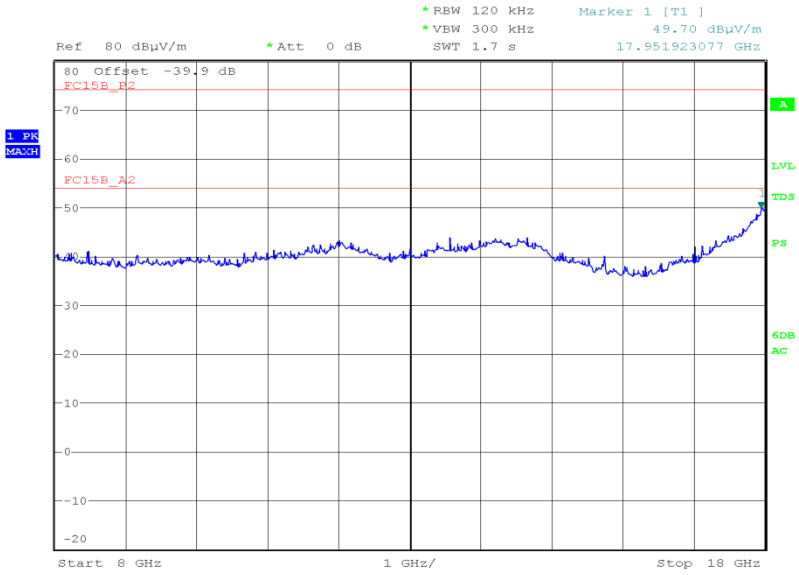
7 GHz to 8 GHz



Date: 2.APR.2012 17:50:54

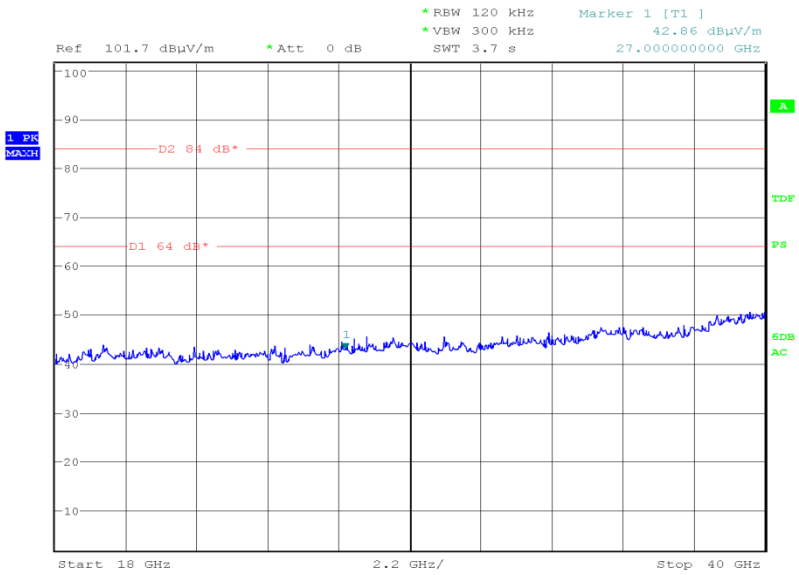
Product Service

8 GHz to 18 GHz



Date: 2.APR.2012 21:45:34

18 GHz to 40 GHz

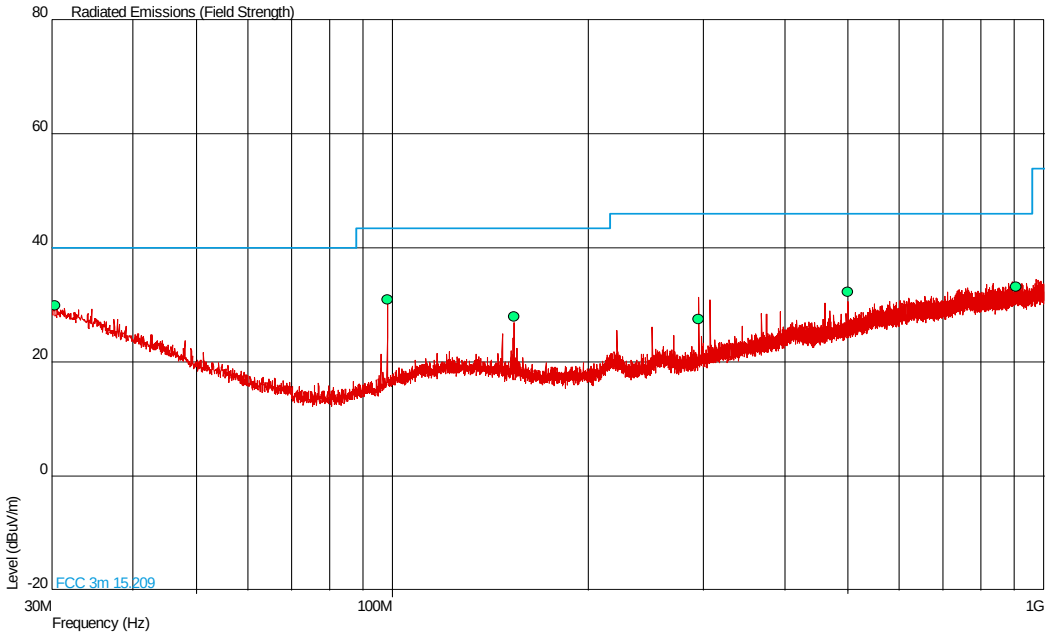


Date: 4.APR.2012 17:56:23

Product Service

5320 MHz

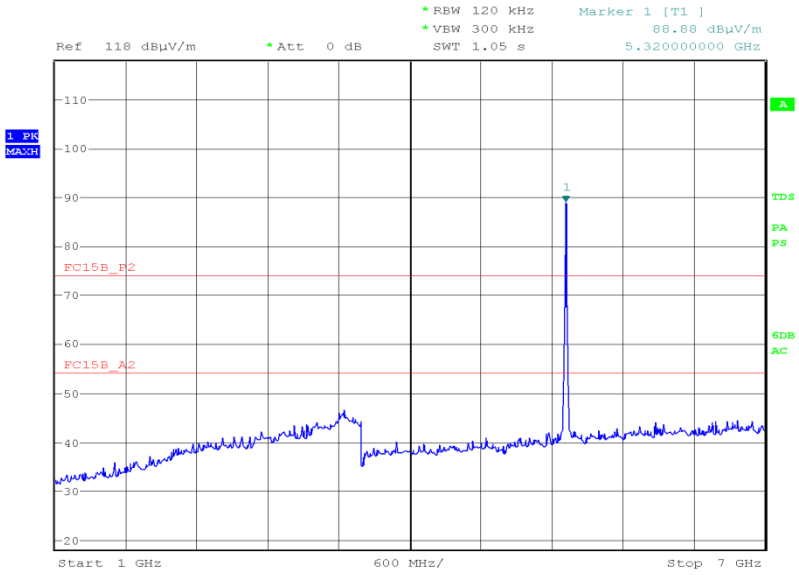
30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height(m)	Polarity
30.316	29.9	31.3	40.0	100	-10.1	68.7	58	1.00	Vertical
98.303	31.0	35.5	43.5	150	-12.5	114.5	360	1.15	Vertical
153.595	28.0	25.1	43.5	150	-15.5	124.9	53	1.51	Vertical
294.921	27.5	23.7	46.0	200	-18.5	176.3	331	1.68	Vertical
500.045	32.3	41.2	46.0	200	-13.7	158.8	0	1.24	Vertical
906.932	33.1	45.2	46.0	200	-12.9	154.8	130	1.00	Horizontal

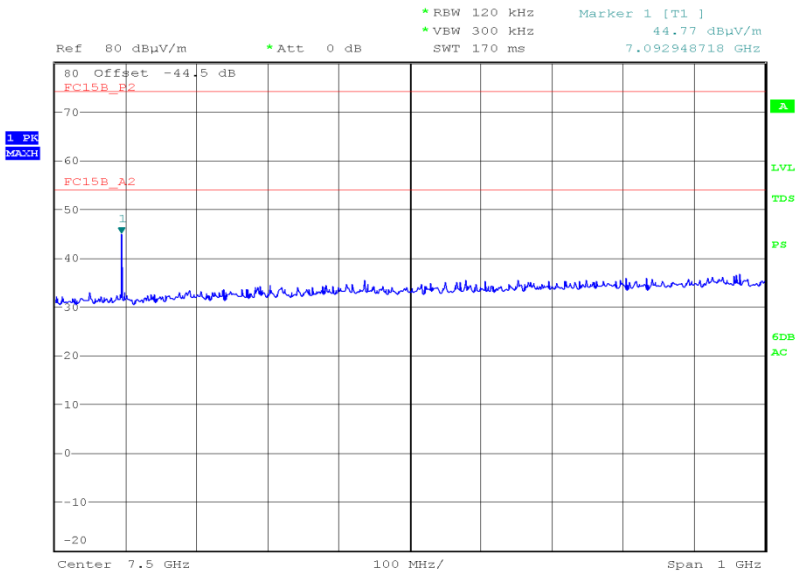
Product Service

1 GHz to 7 GHz



Date: 27.MAR.2012 22:17:15

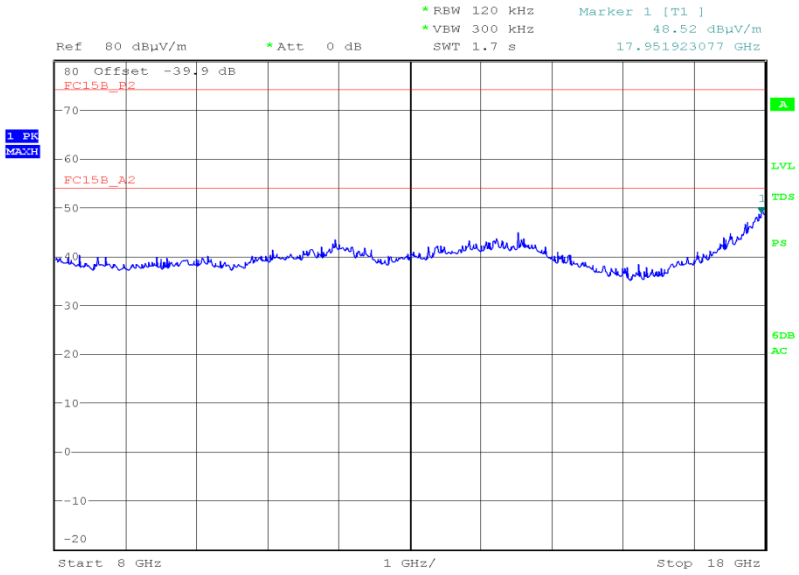
7 GHz to 8 GHz



Date: 2.APR.2012 19:53:52

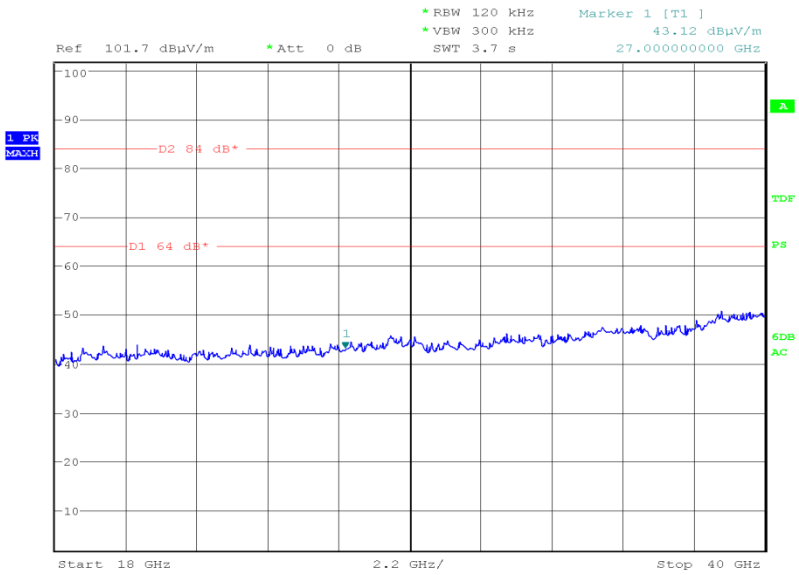
Product Service

8 GHz to 18 GHz



Date: 2.APR.2012 21:59:06

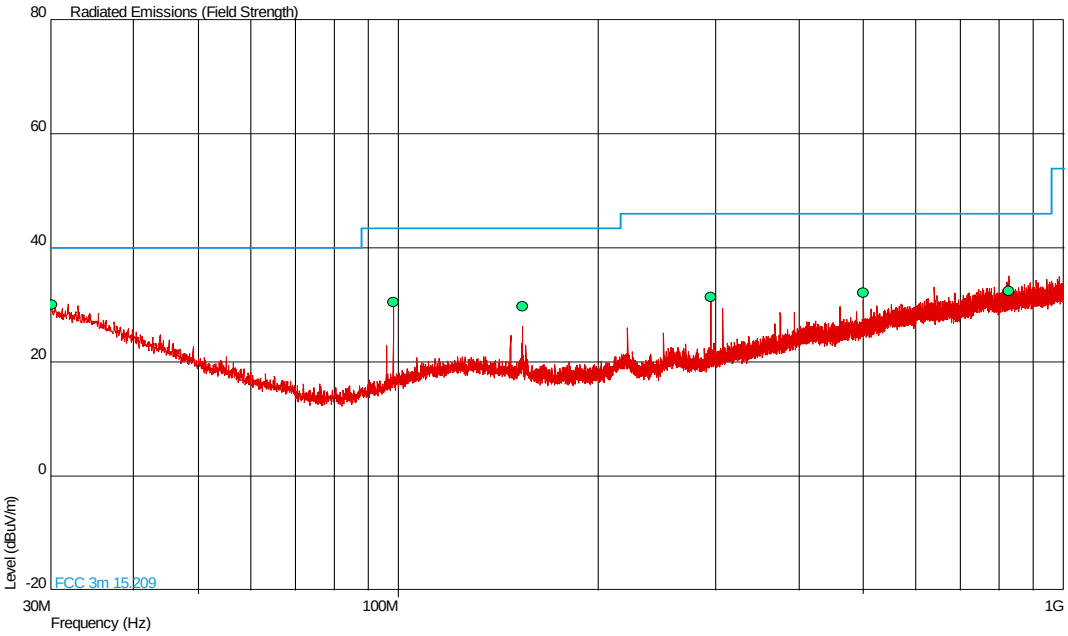
18 GHz to 40 GHz



Date: 4.APR.2012 18:04:05

5500 MHz

30 MHz to 1 GHz



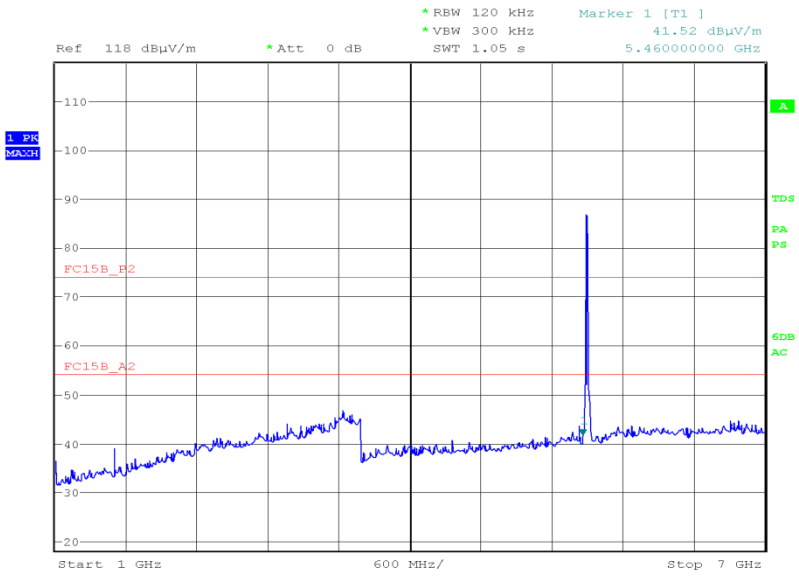
Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height(m)	Polarity
30.135	30.0	31.6	40.0	100	-10.0	68.4	196	1.00	Vertical
98.313	30.6	33.9	43.5	150	-12.9	116.1	0	1.00	Vertical
153.603	29.8	30.9	43.5	150	-13.7	119.1	350	2.35	Horizontal
294.931	31.4	37.2	46.0	200	-14.6	162.8	330	1.00	Horizontal
500.038	32.1	40.3	46.0	200	-13.9	159.7	0	1.00	Vertical
827.544	32.4	41.7	46.0	200	-13.6	158.3	212	1.00	Vertical

Product Service

1GHz to 40GHz

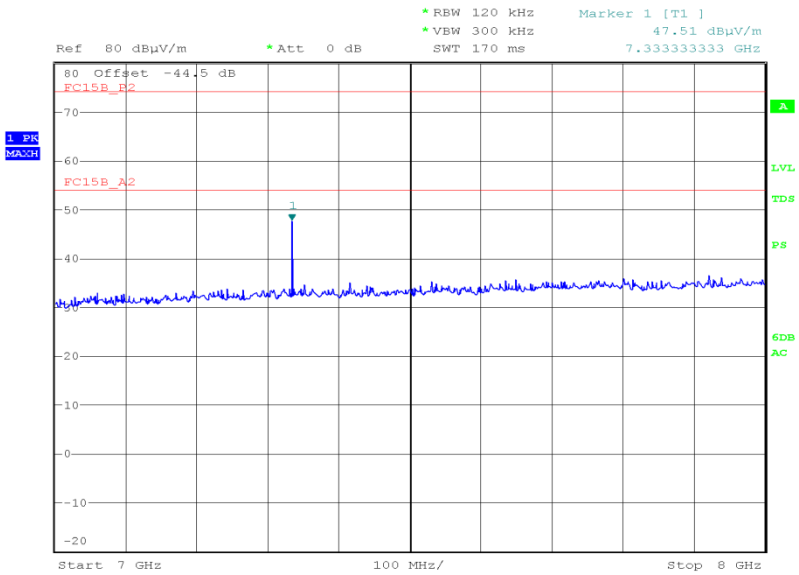
Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
7.333	Vertical	100	053	53.89	48.81

1 GHz to 7 GHz



Date: 27.MAR.2012 22:31:07

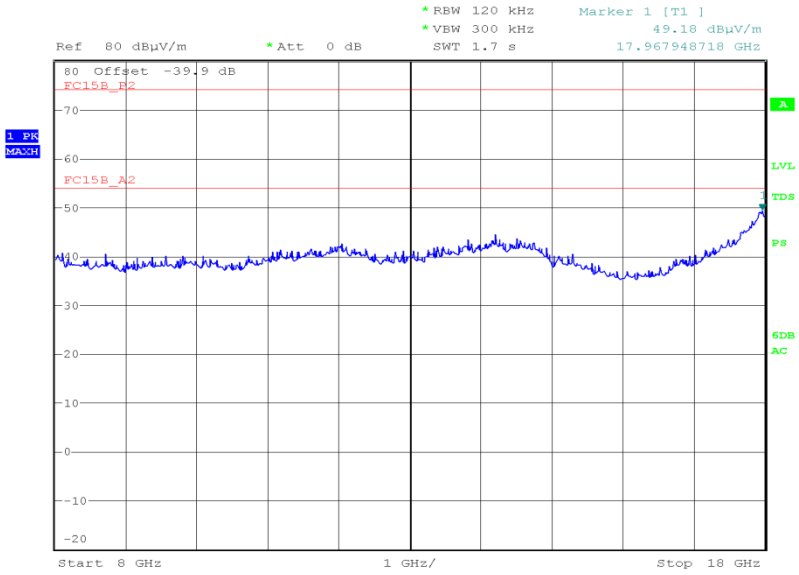
7 GHz to 8 GHz



Date: 2.APR.2012 18:12:24

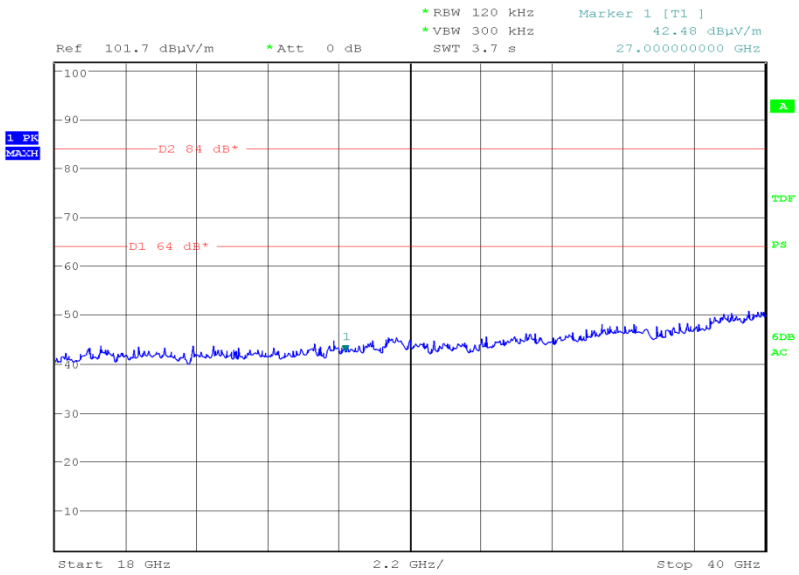
Product Service

8 GHz to 18 GHz



Date: 2.APR.2012 22:09:09

18 GHz to 40 GHz

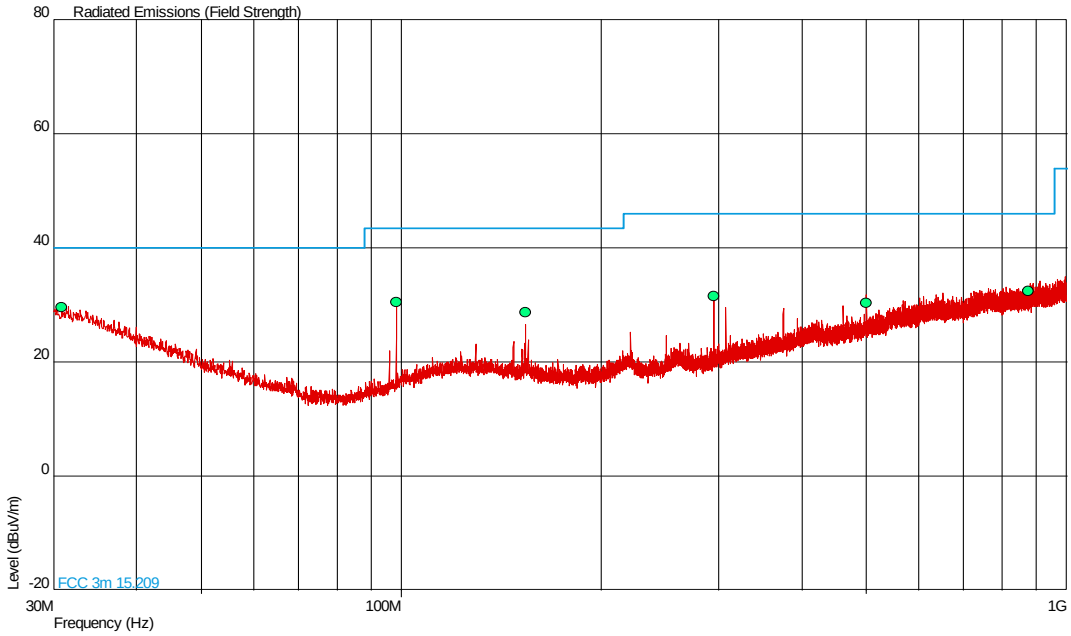


Date: 4.APR.2012 18:23:21

Product Service

5600 MHz

30 MHz to 1 GHz

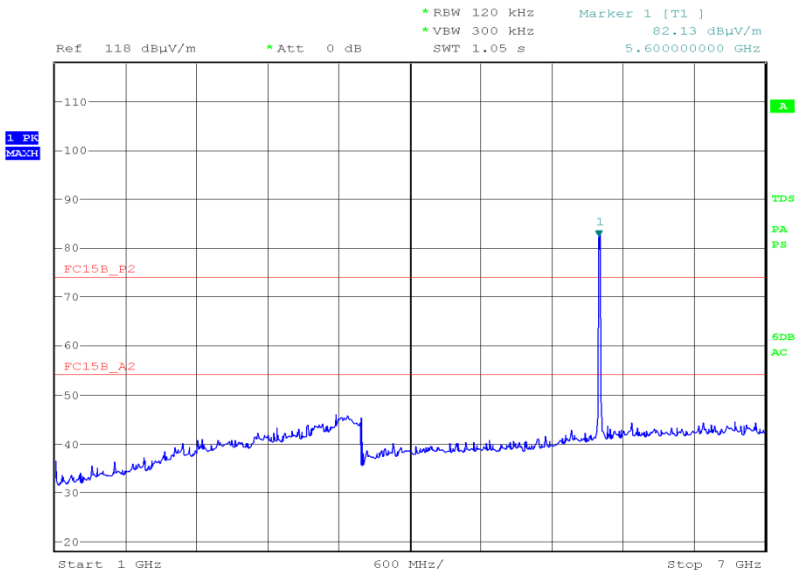


Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height(m)	Polarity
30.881	29.7	30.5	40.0	100	-10.3	69.5	360	1.00	Vertical
98.299	30.5	33.5	43.5	150	-13.0	116.5	8	1.00	Vertical
153.618	28.7	27.2	43.5	150	-14.8	122.8	206	2.38	Horizontal
294.902	31.5	37.6	46.0	200	-14.5	162.4	167	1.00	Horizontal
500.085	30.3	32.7	46.0	200	-15.7	167.3	360	1.00	Vertical
875.873	32.4	41.7	46.0	200	-13.6	158.3	224	1.00	Horizontal

1GHz to 40GHz

Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
7.460	Vertical	100	045	50.69	44.72

1 GHz to 7 GHz



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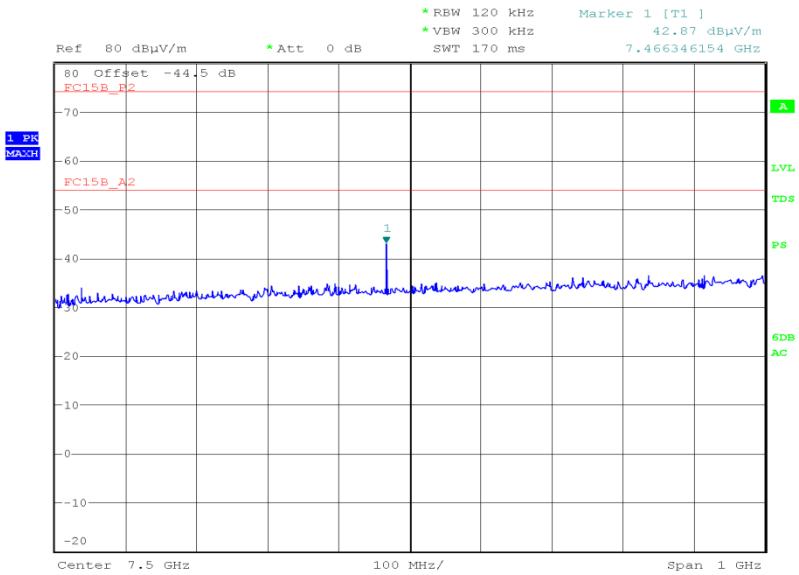
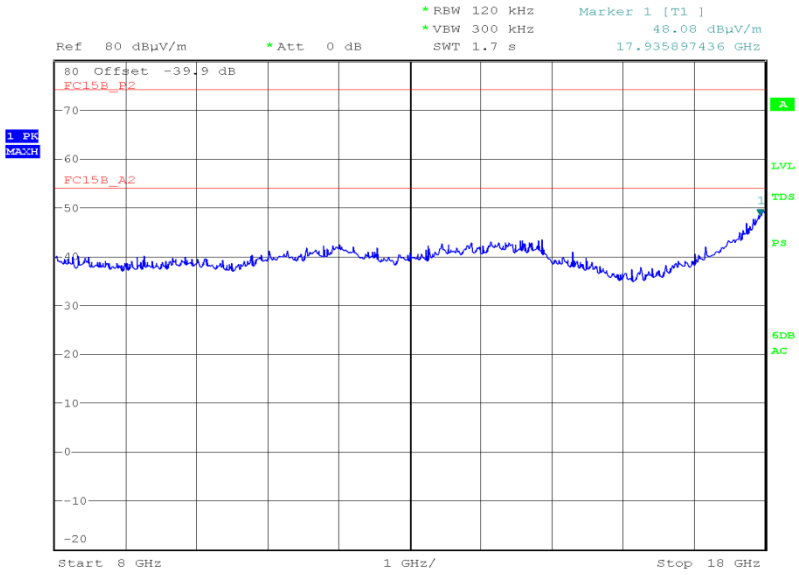
7 GHz to 8 GHz



Date: 2.APR.2012 19:04:56

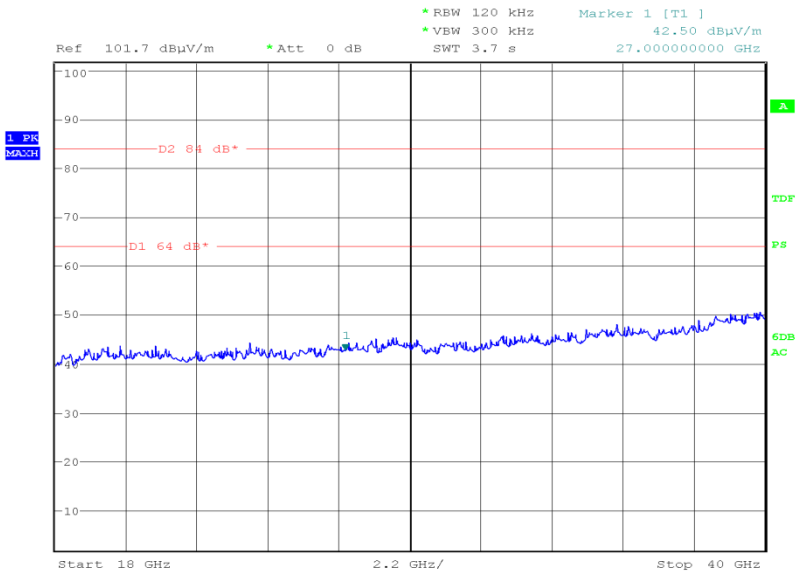
Product Service

8 GHz to 18 GHz



Date: 2.APR.2012 22:21:01

18 GHz to 40 GHz



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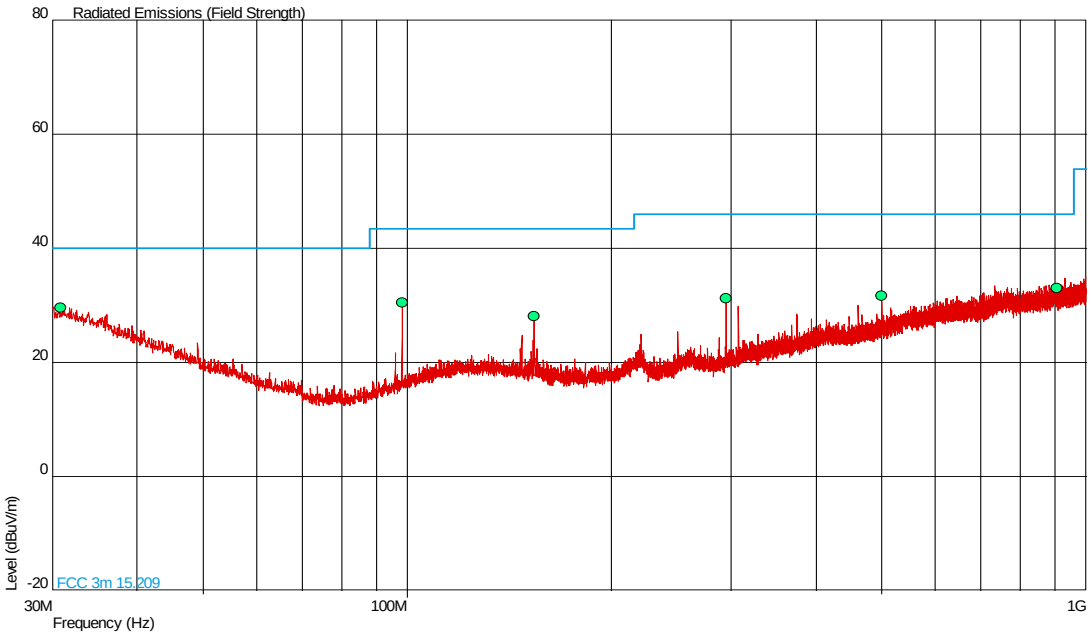
Product Service

5700 MHz

30 MHz to 1 GHz

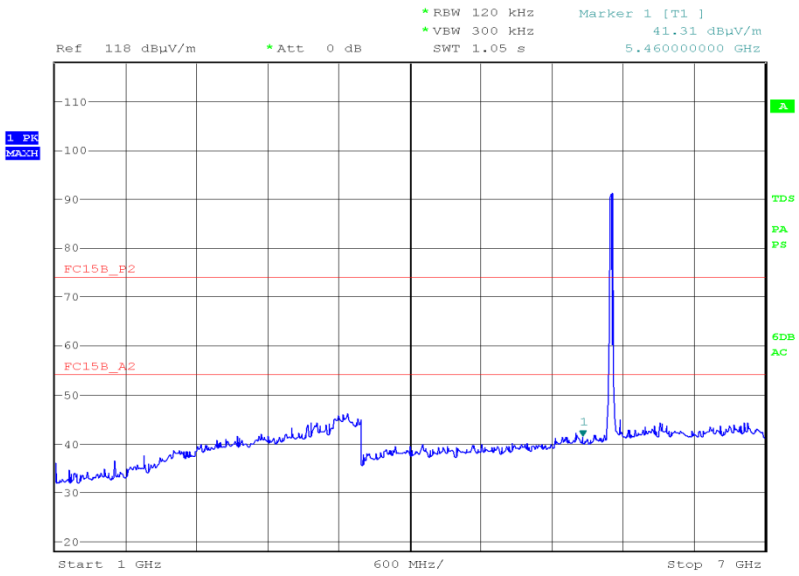


Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height(m)	Polarity
30.901	29.6	30.2	40.0	100	-10.4	69.8	360	1.00	Horizontal
98.314	30.5	33.5	43.5	150	-13.0	116.5	12	1.00	Horizontal
153.598	28.1	25.4	43.5	150	-15.4	124.6	70	1.00	Vertical
294.896	31.2	36.3	46.0	200	-14.8	163.7	360	1.00	Horizontal
500.046	31.7	38.5	46.0	200	-14.3	161.5	154	1.00	Vertical
904.897	33.0	44.7	46.0	200	-13.0	155.3	286	2.84	Vertical

1GHz to 40GHz

Frequency (GHz)	Antenna Polarisation	Antenna Height (cm)	EUT Arc (degrees)	Final Peak (dBµV/m)	Final Average (dBµV/m)
7.600	Vertical	100	046	50.27	42.48

1 GHz to 7 GHz



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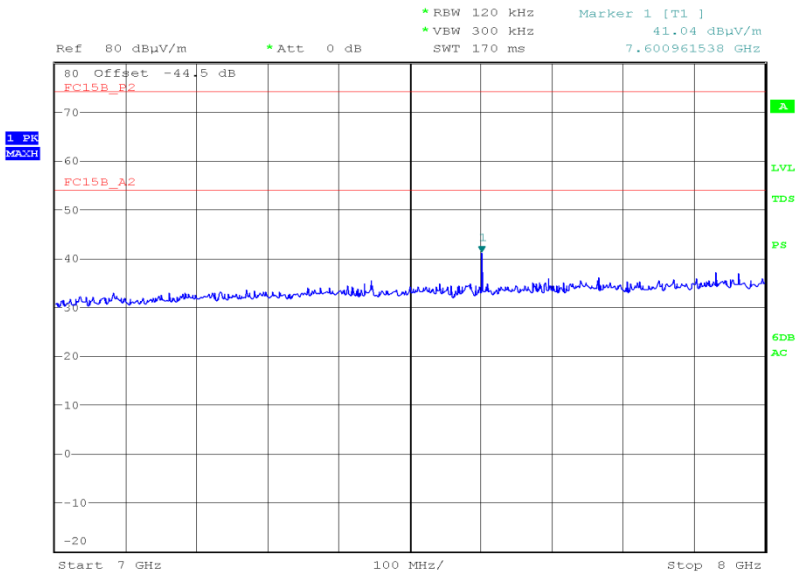
7 GHz to 8 GHz



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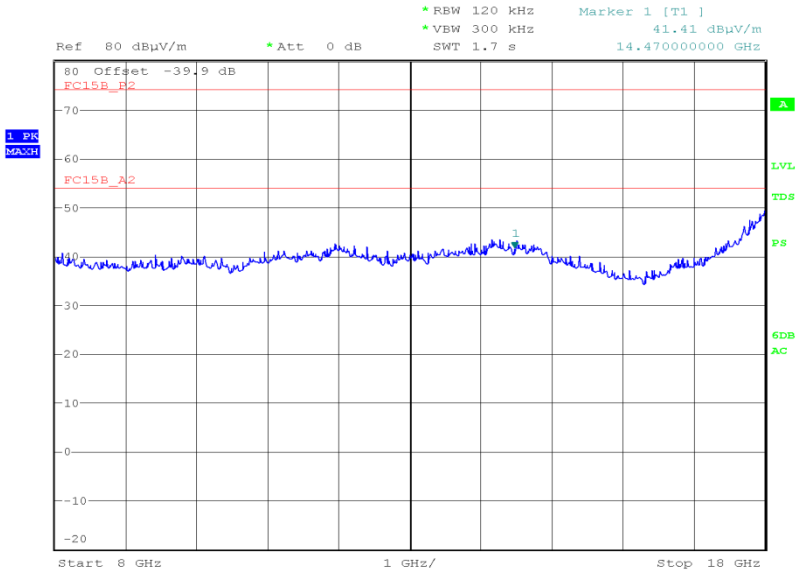
Product Service

8 GHz to 18 GHz



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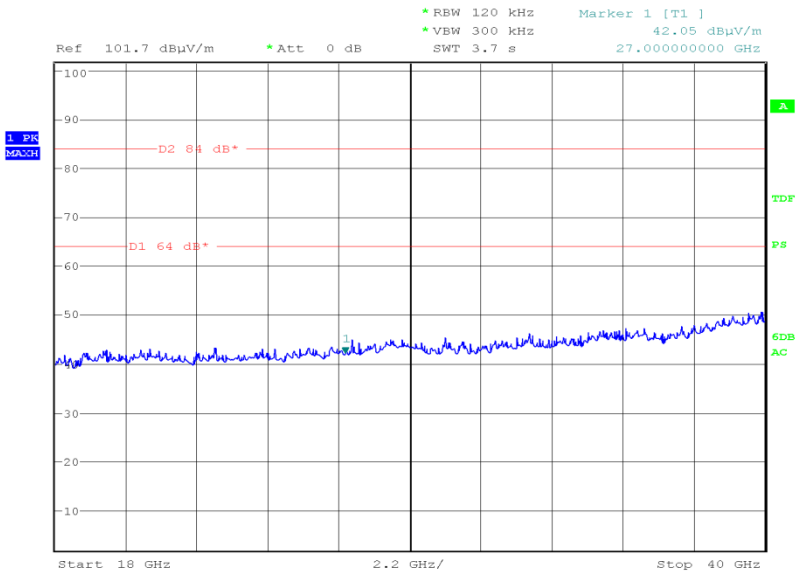
18 GHz to 40 GHz

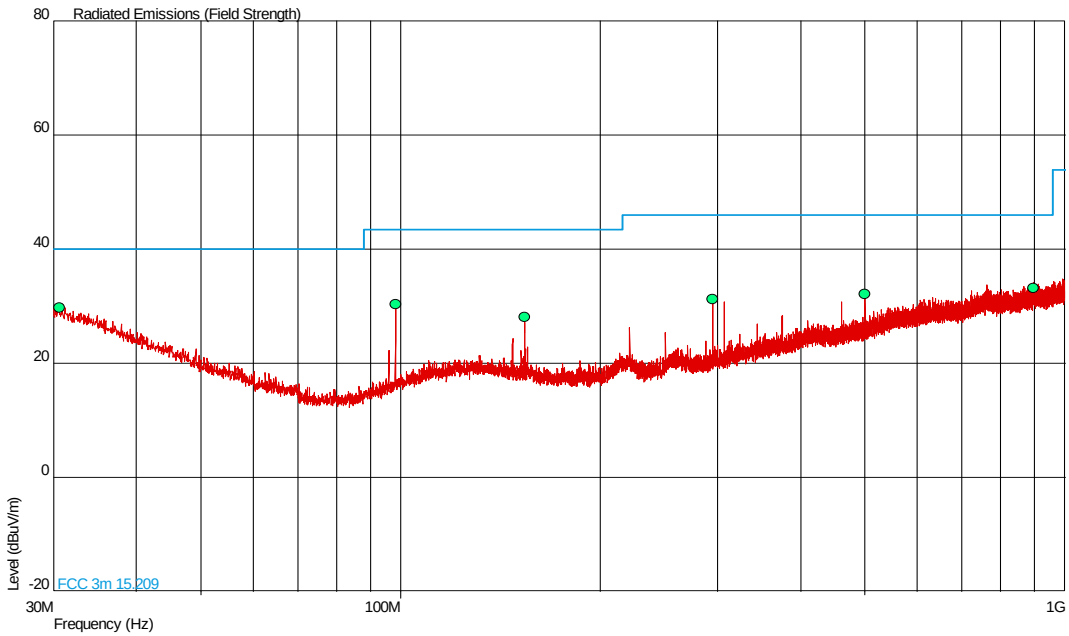


Date: 4.APR.2012 18:53:26

Frequency Band 4

5745 MHz

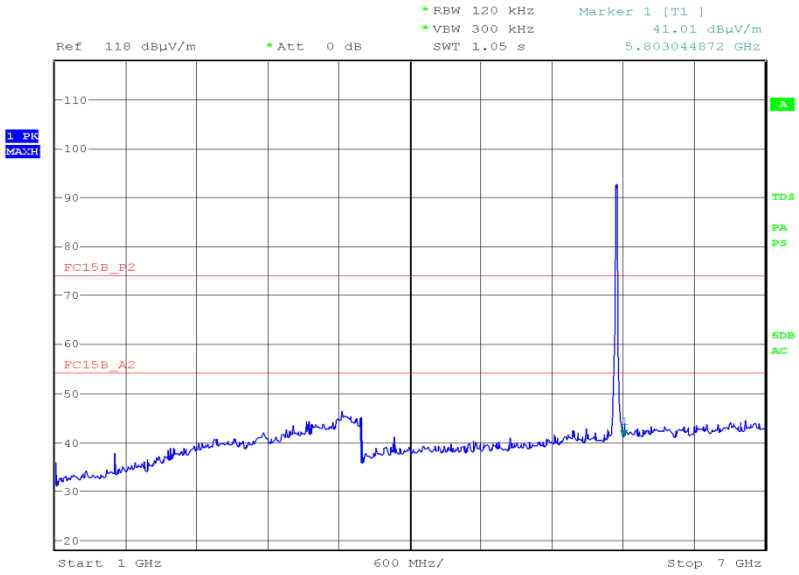
30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height(m)	Polarity
30.612	29.8	30.9	40.0	100	-10.2	69.1	130	1.00	Vertical
98.293	30.4	33.1	43.5	150	-13.1	116.9	360	1.25	Vertical
153.593	28.2	25.7	43.5	150	-15.3	124.3	55	1.08	Vertical
294.906	31.2	36.3	46.0	200	-14.8	163.7	360	1.00	Horizontal
500.046	32.2	40.7	46.0	200	-13.8	159.3	0	1.00	Vertical
897.345	33.3	46.2	46.0	200	-12.7	153.8	216	1.00	Horizontal

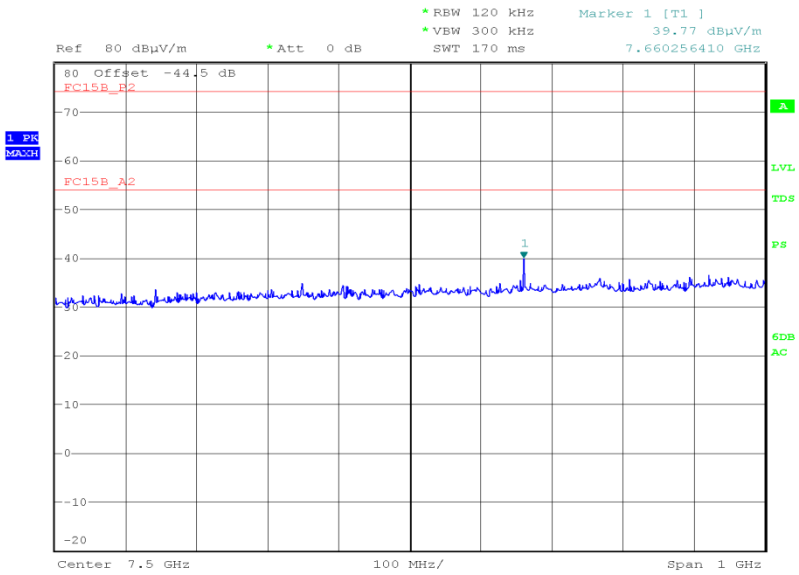
Product Service

1 GHz to 7 GHz



Date: 27.MAR.2012 23:15:20

7 GHz to 8 GHz



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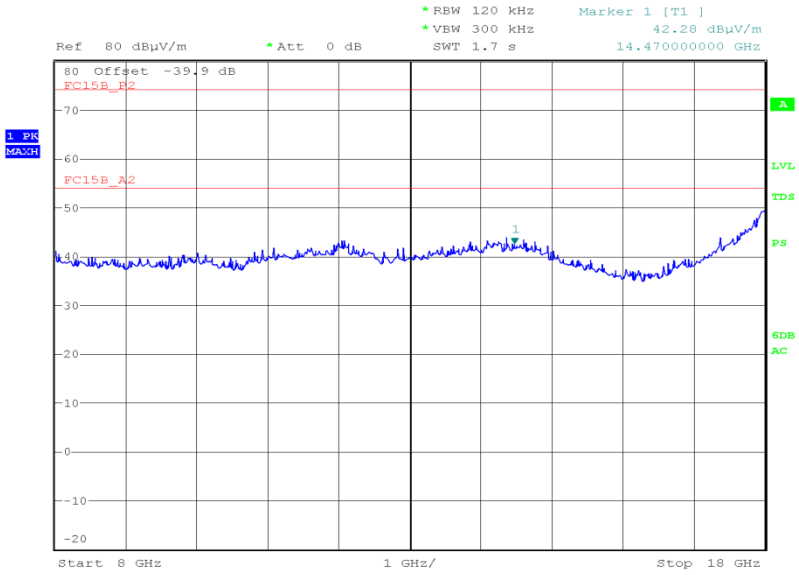
Product Service

8 GHz to 18 GHz



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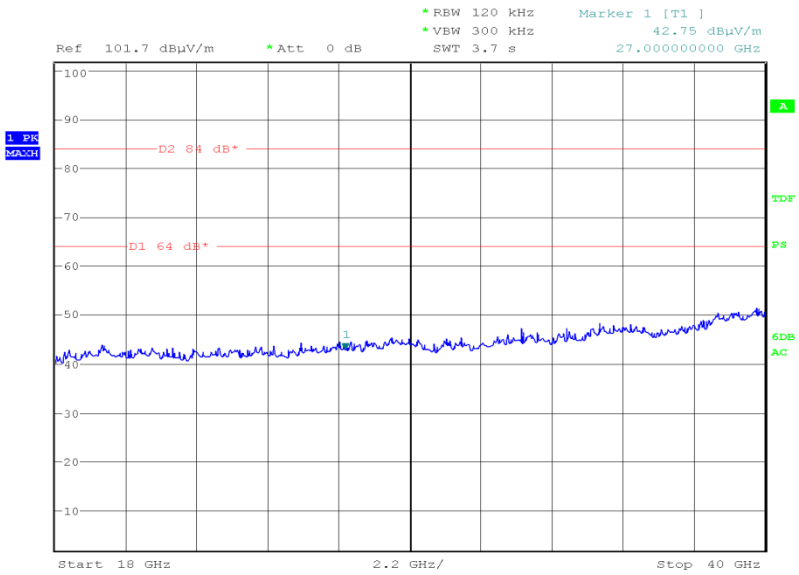
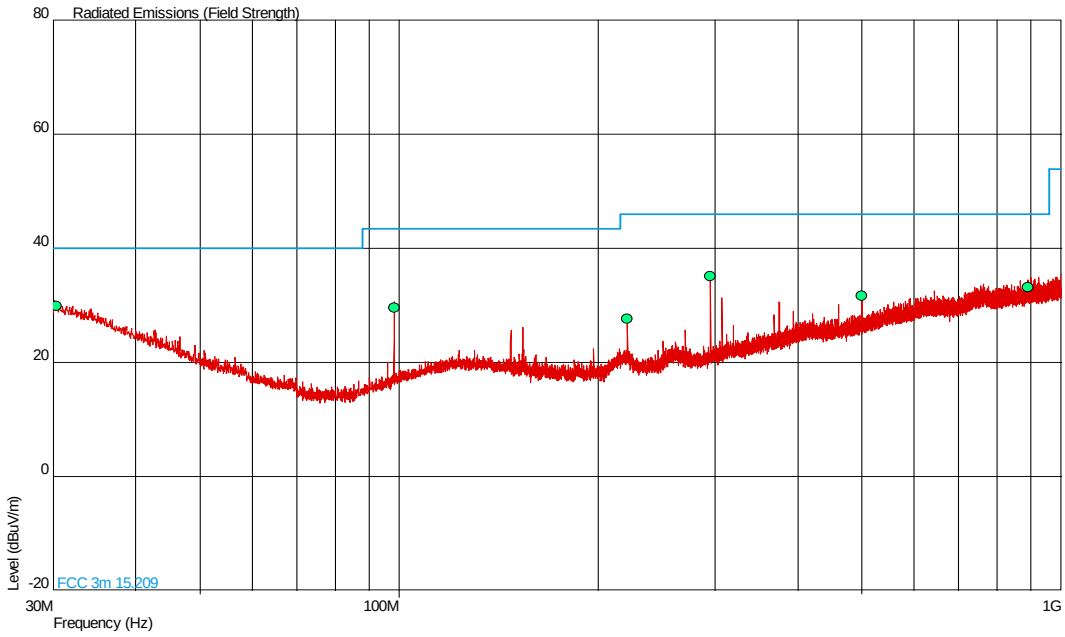
18 GHz to 40 GHz



Date: 4.APR.2012 19:01:01

5745 MHz

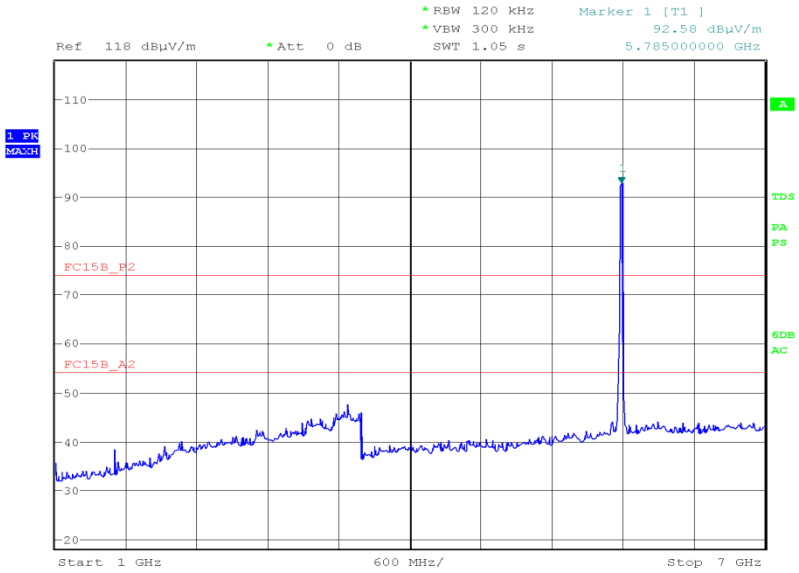
30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height(m)	Polarity
30.384	30.0	31.6	40.0	100	-10.0	68.4	204	2.83	Horizontal
98.284	29.6	30.2	43.5	150	-13.9	119.8	5	1.08	Vertical
221.182	27.6	24.0	46.0	200	-18.4	176.0	91	1.00	Vertical
294.909	35.1	56.9	46.0	200	-10.9	143.1	345	1.00	Horizontal
500.054	31.7	38.5	46.0	200	-14.3	161.5	0	1.03	Vertical
891.190	33.2	45.7	46.0	200	-12.8	154.3	49	1.03	Vertical

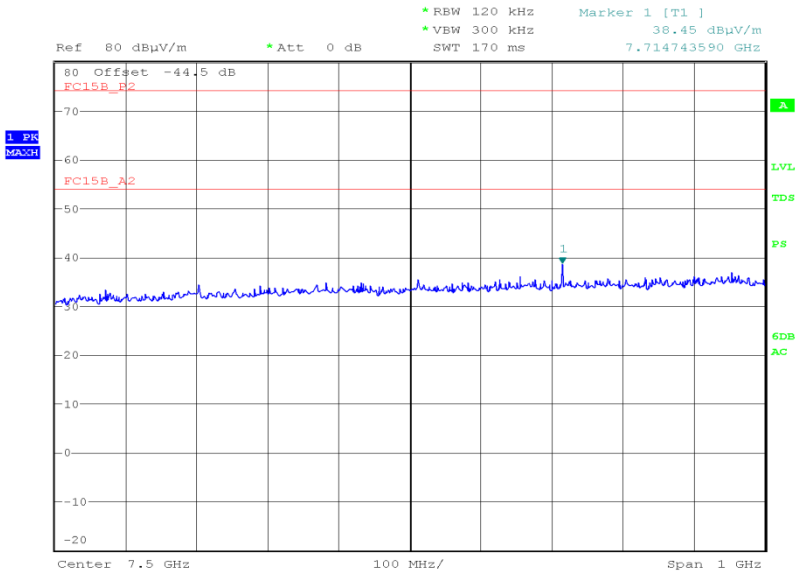
Product Service

1 GHz to 7 GHz



Date: 27.MAR.2012 23:32:44

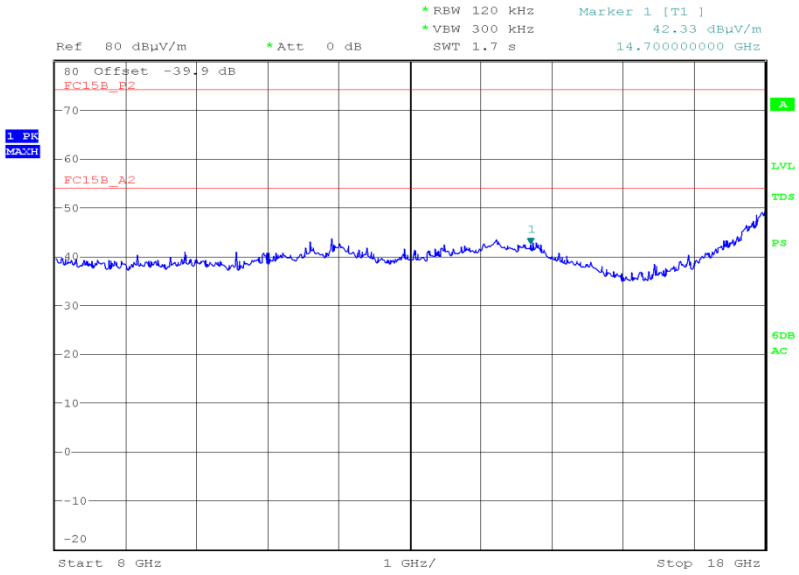
7 GHz to 8 GHz



Date: 2.APR.2012 19:45:17

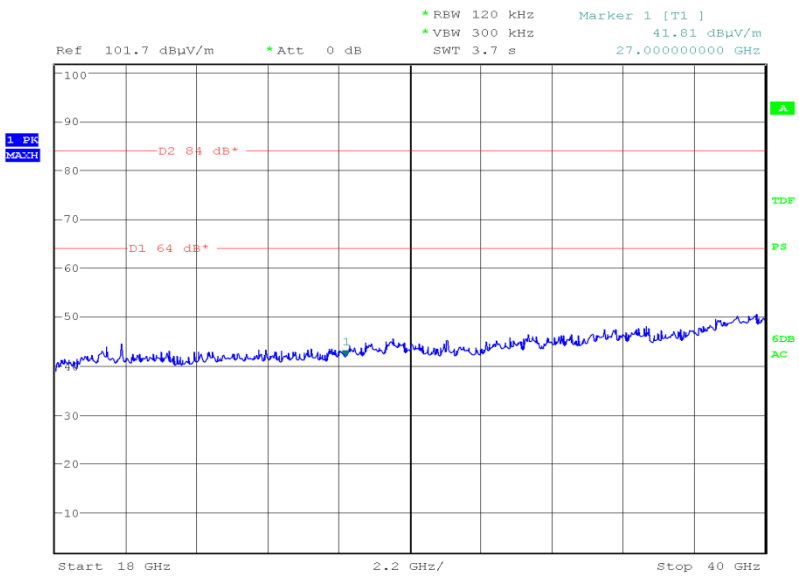
Product Service

8 GHz to 18 GHz



Date: 2.APR.2012 23:02:04

18 GHz to 40 GHz

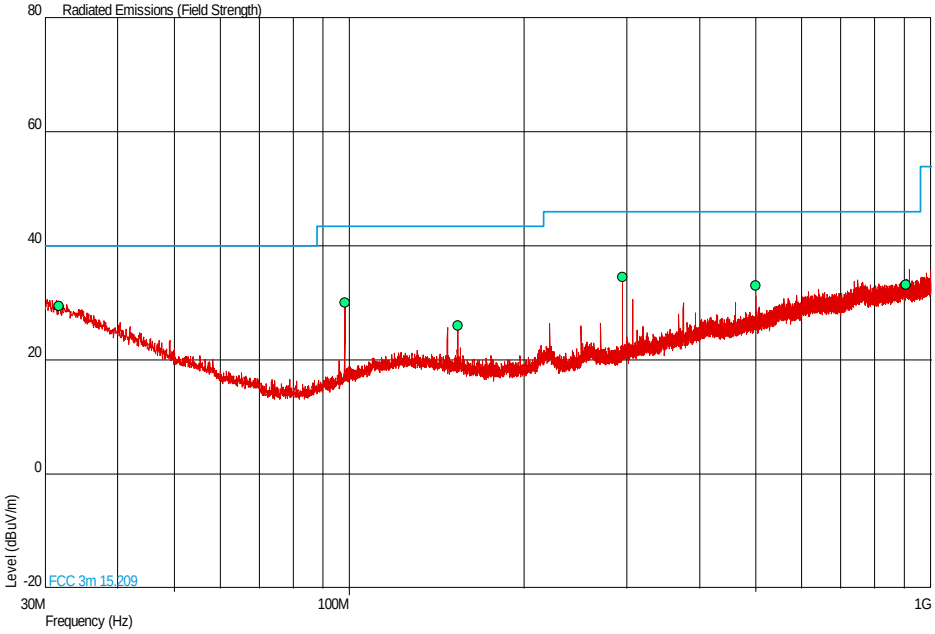


Date: 4.APR.2012 19:11:09

Product Service

5805 MHz

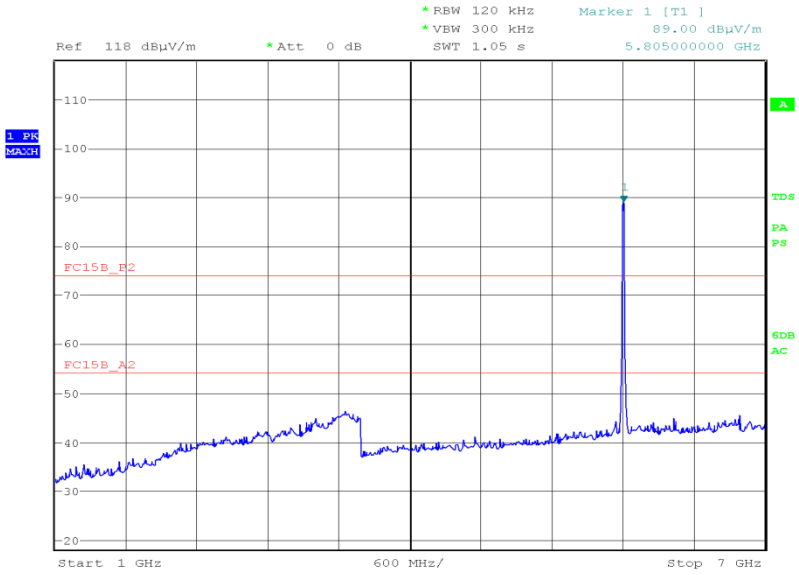
30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height(m)	Polarity
31.676	29.5	29.9	40.0	100	-10.5	70.1	228	1.00	Horizontal
98.298	30.1	32.0	43.5	150	-13.4	118.0	167	1.52	Vertical
153.586	26.0	20.0	43.5	150	-17.5	130.0	360	1.25	Vertical
294.919	34.6	53.7	46.0	200	-11.4	146.3	324	1.00	Horizontal
500.030	33.1	45.2	46.0	200	-12.9	154.8	179	1.52	Vertical
906.591	33.3	46.2	46.0	200	-12.7	153.8	219	1.00	Horizontal

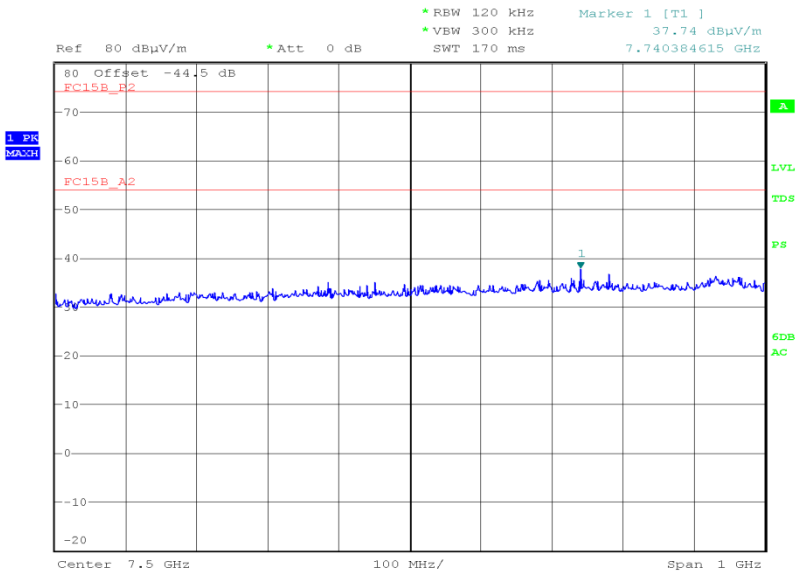
Product Service

1 GHz to 7 GHz



Date: 27.MAR.2012 23:49:21

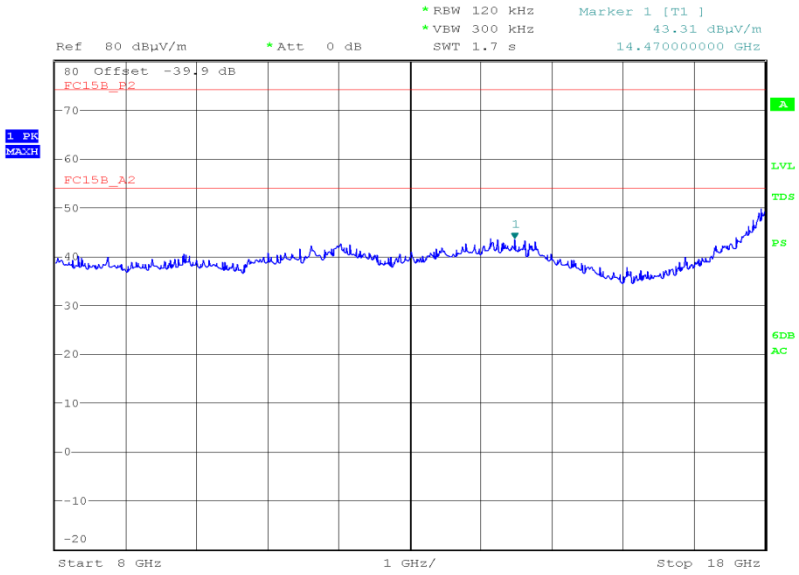
7 GHz to 8 GHz



Date: 2.APR.2012 19:49:57

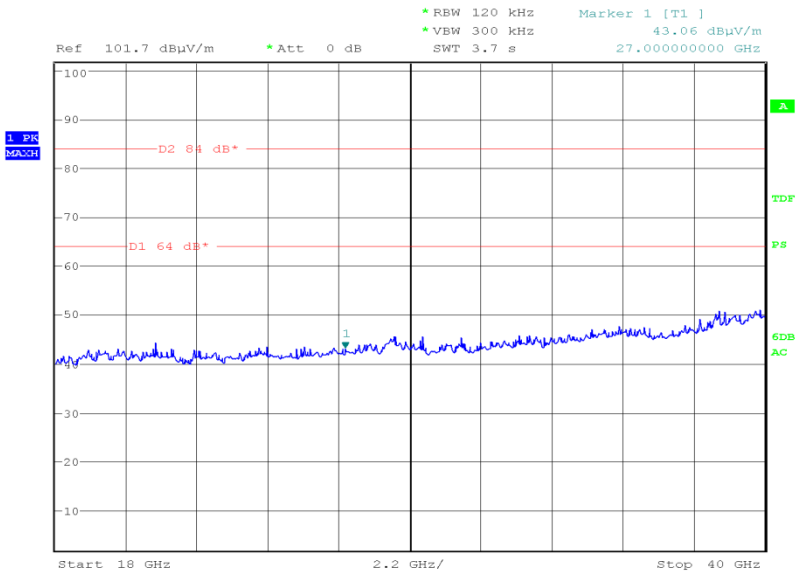
Product Service

8 GHz to 18 GHz



Date: 2.APR.2012 23:16:51

18 GHz to 40 GHz



Date: 4.APR.2012 19:23:10

Limit

Peak (dBµV/m)	Average (dBµV/m)
74.0	54.0

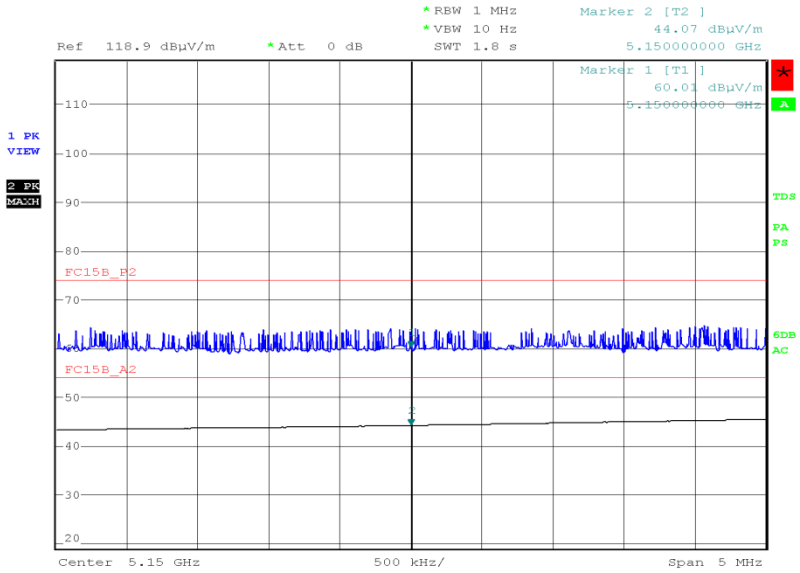
802.11(n) - 5 GHz, 20 MHz BW – Onboard PIFA Antenna

4V, 3.3V, 1.2V DC Supply

Band Edge Emissions

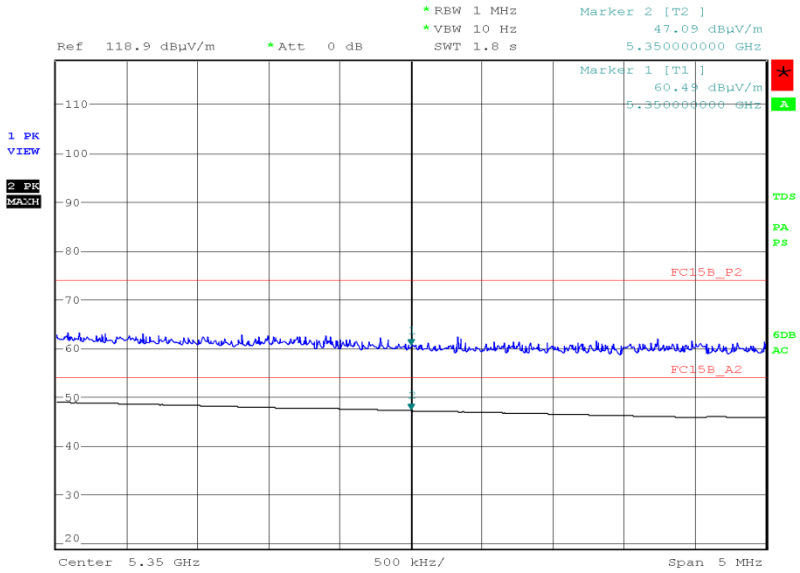
5180 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	60.01	44.07



5320 MHz

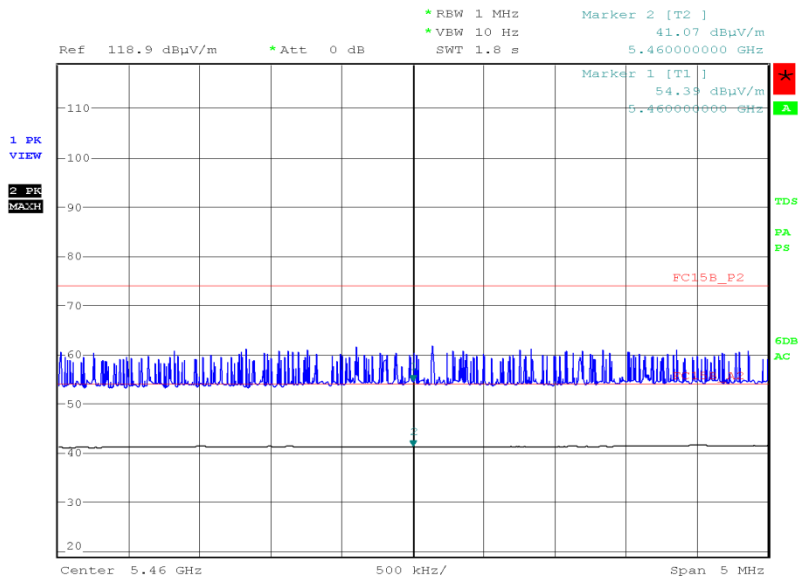
Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	60.49	47.19



Date: 7.MAR.2012 19:23:46

5500 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	51.39	41.07



Date: 7.MAR.2012 19:46:58

Limit

Peak (dBµV/m)	Average (dBµV/m)
74.0	54.0

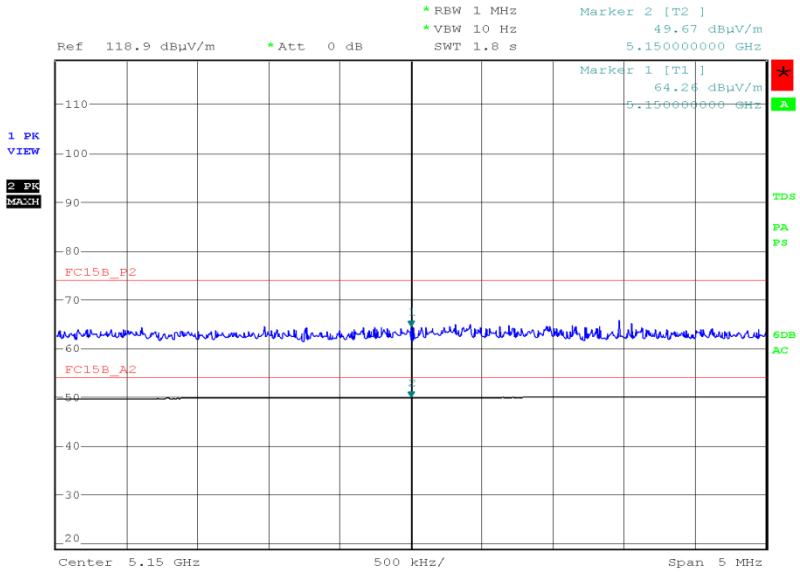
802.11(n) - 5 GHz, 40 MHz BW – Onboard PIFA Antenna

4V, 3.3V, 1.2V DC Supply

Band Edge Emissions

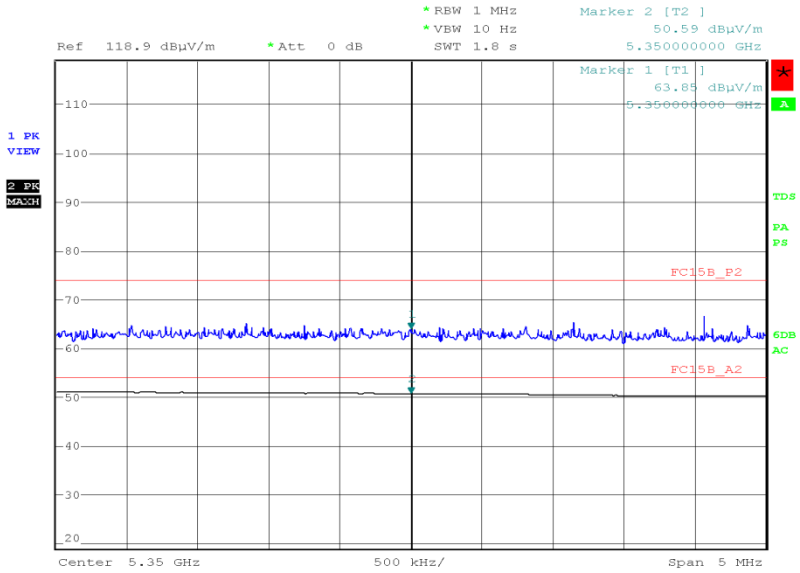
5190 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	64.26	49.67



5310 MHz

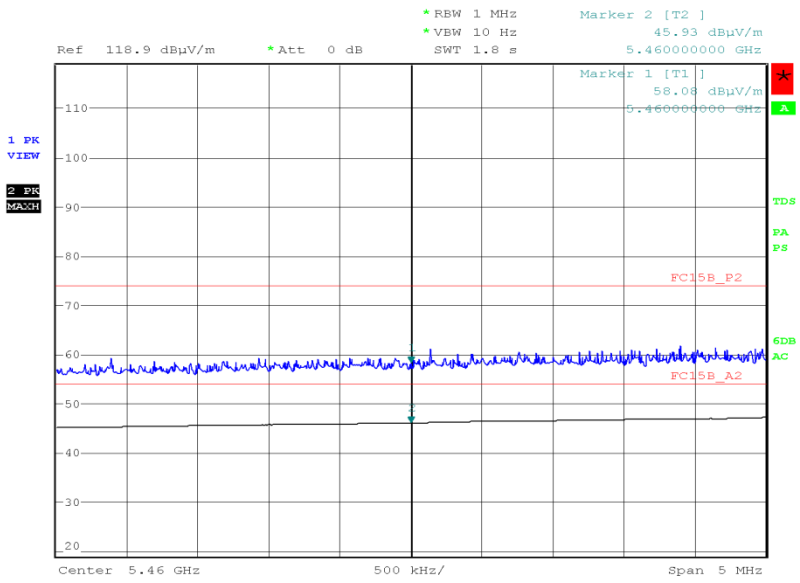
Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	63.85	50.59



Date: 7.MAR.2012 20:18:50

5510 MHz

Polarisation	Final Peak (dBµV/m)	Final Average (dBµV/m)
Horizontal	58.09	45.93



Date: 7.MAR.2012 20:45:35

Limit

Peak (dBµV/m)	Average (dBµV/m)
74.0	54.0

Product Service

2.4 FREQUENCY STABILITY

2.4.1 Specification Reference

FCC CFR 47 Part 15E, Clause 2.1055 and 15.407 (g)

2.4.2 Equipment Under Test and Modification State

Venice 6.5 S/N: RAD 103037 on Test Jig S/N: RAD103234 - Modification State 0

2.4.3 Date of Test

11 April 2012 & 27 April 2012

2.4.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.4.5 Test Procedure

The EUT was set to transmit on maximum power with test model 1. In accordance with 2.1055, the temperature was varied from -30°C to +50° in 10° steps. Testing was performed on the top and middle channels of each band.

2.4.6 Environmental Conditions

Ambient Temperature	23.3 - 24.2°C
Relative Humidity	31.6 - 32.2%

Product Service

2.4.7 Test Results

802.11(a) – Onboard PIFA Antenna

4V, 3.3V, 1.2V DC Supply

Frequency Band 1

Temperature Interval	Supply Voltage	Frequency Error (ppm)	
		5180 MHz	5240 MHz
0°C	4V, 3.3V, 1.2V DC	2.85	2.78
+10°C	4V, 3.3V, 1.2V DC	1.33	1.30
+20°C	4V, 3.3V, 1.2V DC	-1.78	-1.49
	3.4 V, 2.805 V, 1.02 V DC	-1.01	-1.11
	4.6 V, 3.795 V, 1.38 V DC	-1.78	-1.91
-30°C	4V, 3.3V, 1.2V DC	-3.71	-3.75
+40°C	4V, 3.3V, 1.2V DC	-4.97	-4.43
+50°C	4V, 3.3V, 1.2V DC	-4.02	-4.11
+60°C	4V, 3.3V, 1.2V DC	-1.19	-2.05
+70°C	4V, 3.3V, 1.2V DC	4.51	5.28
Maximum Frequency Error (Hz)		-25725	27675

Frequency Band 2

Temperature Interval	Supply Voltage	Frequency Error (ppm)	
		5260 MHz	5320 MHz
0°C	4V, 3.3V, 1.2V DC	2.92	3.27
+10°C	4V, 3.3V, 1.2V DC	1.27	1.18
+20°C	4V, 3.3V, 1.2V DC	-1.48	-1.59
	3.4 V, 2.805 V, 1.02 V DC	-0.91	-1.18
	4.6 V, 3.795 V, 1.38 V DC	-1.97	-1.91
-30°C	4V, 3.3V, 1.2V DC	-3.87	-3.90
+40°C	4V, 3.3V, 1.2V DC	-4.44	-4.41
+50°C	4V, 3.3V, 1.2V DC	-4.10	-4.07
+60°C	4V, 3.3V, 1.2V DC	-2.05	-1.99
+70°C	4V, 3.3V, 1.2V DC	3.90	4.00
Maximum Frequency Error (Hz)		-23350	-23475

Product Service

Frequency Band 3

Temperature Interval	Supply Voltage	Frequency Error (ppm)	
		5500 MHz	5700 MHz
0°C	4V, 3.3V, 1.2V DC	3.22	2.85
+10°C	4V, 3.3V, 1.2V DC	1.30	1.15
+20°C	4V, 3.3V, 1.2V DC	-1.54	-1.50
	3.4 V, 2.805 V, 1.02 V DC	-0.94	-1.12
	4.6 V, 3.795 V, 1.38 V DC	-1.74	-0.21
-30°C	4V, 3.3V, 1.2V DC	-3.74	-3.9
+40°C	4V, 3.3V, 1.2V DC	-4.39	-4.78
+50°C	4V, 3.3V, 1.2V DC	-4.08	-4.07
+60°C	4V, 3.3V, 1.2V DC	-2.08	-1.75
+70°C	4V, 3.3V, 1.2V DC	3.90	4.15
Maximum Frequency Error (Hz)		-24125	-27273

Frequency Band 4

Temperature Interval	Supply Voltage	Frequency Error (ppm)	
		5745 MHz	5805 MHz
0°C	4V, 3.3V, 1.2V DC	3.23	2.88
+10°C	4V, 3.3V, 1.2V DC	1.21	1.10
+20°C	4V, 3.3V, 1.2V DC	-1.49	-1.48
	3.4 V, 2.805 V, 1.02 V DC	-1.25	-1.25
	4.6 V, 3.795 V, 1.38 V DC	-2.00	-2.00
-30°C	4V, 3.3V, 1.2V DC	-3.94	-4.05
+40°C	4V, 3.3V, 1.2V DC	-4.67	-4.67
+50°C	4V, 3.3V, 1.2V DC	-4.02	-4.02
+60°C	4V, 3.3V, 1.2V DC	-1.79	-1.74
+70°C	4V, 3.3V, 1.2V DC	4.17	4.20
Maximum Frequency Error (Hz)		-26850	-27125

Limit

Maintained within the band of operation under all conditions of normal operations as specified in the user's manual.

802.11(n) - 5 GHz, 20 MHz BW – Onboard PIFA Antenna

4V, 3.3V, 1.2V DC Supply

Frequency Band 1

Temperature Interval	Supply Voltage	Frequency Error (ppm)	
		5180 MHz	5240 MHz
0°C	4V, 3.3V, 1.2V DC	2.85	2.78
+10°C	4V, 3.3V, 1.2V DC	1.33	1.3
+20°C	4V, 3.3V, 1.2V DC	-1.38	-1.49
	3.4 V, 2.805 V, 1.02 V DC	-1.01	-1.11
	4.6 V, 3.795 V, 1.38 V DC	-1.78	-1.91
-30°C	4V, 3.3V, 1.2V DC	-3.71	-3.75
+40°C	4V, 3.3V, 1.2V DC	-4.97	-4.43
+50°C	4V, 3.3V, 1.2V DC	-4.02	-4.11
+60°C	4V, 3.3V, 1.2V DC	-1.19	-2.05
+70°C	4V, 3.3V, 1.2V DC	4.51	5.28
Maximum Frequency Error (Hz)		25725	27675

Frequency Band 2

Temperature Interval	Supply Voltage	Frequency Error (ppm)	
		5260 MHz	5320 MHz
0°C	4V, 3.3V, 1.2V DC	2.92	3.27
+10°C	4V, 3.3V, 1.2V DC	1.27	1.18
+20°C	4V, 3.3V, 1.2V DC	-1.48	-1.59
	3.4 V, 2.805 V, 1.02 V DC	-0.91	-1.18
	4.6 V, 3.795 V, 1.38 V DC	-1.97	-1.91
-30°C	4V, 3.3V, 1.2V DC	-3.87	-3.90
+40°C	4V, 3.3V, 1.2V DC	-4.44	-4.41
+50°C	4V, 3.3V, 1.2V DC	-4.10	-4.07
+60°C	4V, 3.3V, 1.2V DC	-2.05	-1.99
+70°C	4V, 3.3V, 1.2V DC	3.90	4.00
Maximum Frequency Error (Hz)		21550	23475

Frequency Band 3

Temperature Interval	Supply Voltage	Frequency Error (ppm)	
		5500 MHz	5700 MHz
0°C	4V, 3.3V, 1.2V DC	3.22	2.85
+10°C	4V, 3.3V, 1.2V DC	1.30	1.15
+20°C	4V, 3.3V, 1.2V DC	-1.54	-1.5
	3.4 V, 2.805 V, 1.02 V DC	-0.94	-1.12
	4.6 V, 3.795 V, 1.38 V DC	-1.74	-0.21
-30°C	4V, 3.3V, 1.2V DC	-3.74	-3.90
+40°C	4V, 3.3V, 1.2V DC	-4.39	-4.78
+50°C	4V, 3.3V, 1.2V DC	-4.08	-4.07
+60°C	4V, 3.3V, 1.2V DC	-2.08	-1.75
+70°C	4V, 3.3V, 1.2V DC	3.90	4.15
Maximum Frequency Error (Hz)		24125	27273

Frequency Band 4

Temperature Interval	Supply Voltage	Frequency Error (ppm)	
		5745 MHz	5805 MHz
0°C	4V, 3.3V, 1.2V DC	3.23	2.88
+10°C	4V, 3.3V, 1.2V DC	1.21	1.10
+20°C	4V, 3.3V, 1.2V DC	-1.49	-1.48
	3.4 V, 2.805 V, 1.02 V DC	-1.25	-1.23
	4.6 V, 3.795 V, 1.38 V DC	-2.00	-2.04
-30°C	4V, 3.3V, 1.2V DC	-3.94	-4.05
+40°C	4V, 3.3V, 1.2V DC	-4.67	-4.67
+50°C	4V, 3.3V, 1.2V DC	-4.02	-4.02
+60°C	4V, 3.3V, 1.2V DC	-1.79	-1.74
+70°C	4V, 3.3V, 1.2V DC	4.17	4.20
Maximum Frequency Error (Hz)		26850	27125

Limit

Maintained within the band of operation under all conditions of normal operations as specified in the user's manual.

802.11(n) - 5 GHz 40 MHz BW – Onboard PIFA Antenna

4V, 3.3V, 1.2V DC Supply

Frequency Band 1

Temperature Interval	Supply Voltage	Frequency Error (ppm)	
		5190 MHz	5230 MHz
0°C	4V, 3.3V, 1.2V DC	2.89	2.50
+10°C	4V, 3.3V, 1.2V DC	1.03	1.01
+20°C	4V, 3.3V, 1.2V DC	-1.34	-1.47
	3.4 V, 2.805 V, 1.02 V DC	-0.86	-1.04
	4.6 V, 3.795 V, 1.38 V DC	-1.69	-1.89
-30°C	4V, 3.3V, 1.2V DC	-3.86	-3.89
+40°C	4V, 3.3V, 1.2V DC	-4.47	-4.52
+50°C	4V, 3.3V, 1.2V DC	-4.38	-4.46
+60°C	4V, 3.3V, 1.2V DC	-0.81	-1.44
+70°C	4V, 3.3V, 1.2V DC	5.28	5.51
Maximum Frequency Error (Hz)		27425	28800

Frequency Band 2

Temperature Interval	Supply Voltage	Frequency Error (ppm)	
		5270 MHz	5310 MHz
0°C	4V, 3.3V, 1.2V DC	2.58	2.7
+10°C	4V, 3.3V, 1.2V DC	0.9	0.97
+20°C	4V, 3.3V, 1.2V DC	-1.36	-1.42
	3.4 V, 2.805 V, 1.02 V DC	-1.01	-1.09
	4.6 V, 3.795 V, 1.38 V DC	-1.76	-2.0
-30°C	4V, 3.3V, 1.2V DC	-4.01	-3.43
+40°C	4V, 3.3V, 1.2V DC	-4.47	-4.52
+50°C	4V, 3.3V, 1.2V DC	-4.44	-4.44
+60°C	4V, 3.3V, 1.2V DC	-1.42	-1.41
+70°C	4V, 3.3V, 1.2V DC	3.99	4.06
Maximum Frequency Error (Hz)		-24000	-24625

Frequency Band 3

Temperature Interval	Supply Voltage	Frequency Error (ppm)	
		5510 MHz	5670 MHz
0°C	4V, 3.3V, 1.2V DC	2.99	3.04
+10°C	4V, 3.3V, 1.2V DC	1.0	1.26
+20°C	4V, 3.3V, 1.2V DC	-1.39	-1.46
	3.4 V, 2.805 V, 1.02 V DC	-0.94	-0.63
	4.6 V, 3.795 V, 1.38 V DC	-1.75	-1.32
-30°C	4V, 3.3V, 1.2V DC	-3.41	3.96
+40°C	4V, 3.3V, 1.2V DC	-4.47	-4.55
+50°C	4V, 3.3V, 1.2V DC	-4.40	-4.37
+60°C	4V, 3.3V, 1.2V DC	-1.45	-1.38
+70°C	4V, 3.3V, 1.2V DC	3.94	4.08
Maximum Frequency Error (Hz)		24625	25775

Frequency Band 4

Temperature Interval	Supply Voltage	Frequency Error (ppm)	
		5755 MHz	5795 MHz
0°C	4V, 3.3V, 1.2V DC	2.86	2.7
+10°C	4V, 3.3V, 1.2V DC	1.17	1.01
+20°C	4V, 3.3V, 1.2V DC	-1.55	-1.52
	3.4 V, 2.805 V, 1.02 V DC	-1.18	-1.15
	4.6 V, 3.795 V, 1.38 V DC	-1.98	-1.95
-30°C	4V, 3.3V, 1.2V DC	-4.01	-4.02
+40°C	4V, 3.3V, 1.2V DC	-4.53	-4.53
+50°C	4V, 3.3V, 1.2V DC	-4.17	-4.09
+60°C	4V, 3.3V, 1.2V DC	-1.34	-1.32
+70°C	4V, 3.3V, 1.2V DC	4.06	4.26
Maximum Frequency Error (Hz)		26075	26275

Limit

Maintained within the band of operation under all conditions of normal operations as specified in the user's manual.

2.5 26 dB BANDWIDTH

2.5.1 Specification Reference

FCC CFR 47 Part 15E, Clause 15.407 (a)

2.5.2 Equipment Under Test and Modification State

Venice 6.5 S/N: RAD 103037 on Test Jig S/N: RAD103234 - Modification State 0

2.5.3 Date of Test

20 April 2012 & 23 April 2012

2.5.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.5.5 Test Procedure

The EUT was transmitted at maximum power via an attenuator and cable connected to the spectrum analyser. The analyser settings were adjusted to display the resultant trace on screen and a resolution bandwidth and video bandwidth were set appropriately to perform the measurement correctly.

2.5.6 Environmental Conditions

Ambient Temperature	23.1 - 23.3°C
Relative Humidity	30.8 - 32.2%

Product Service

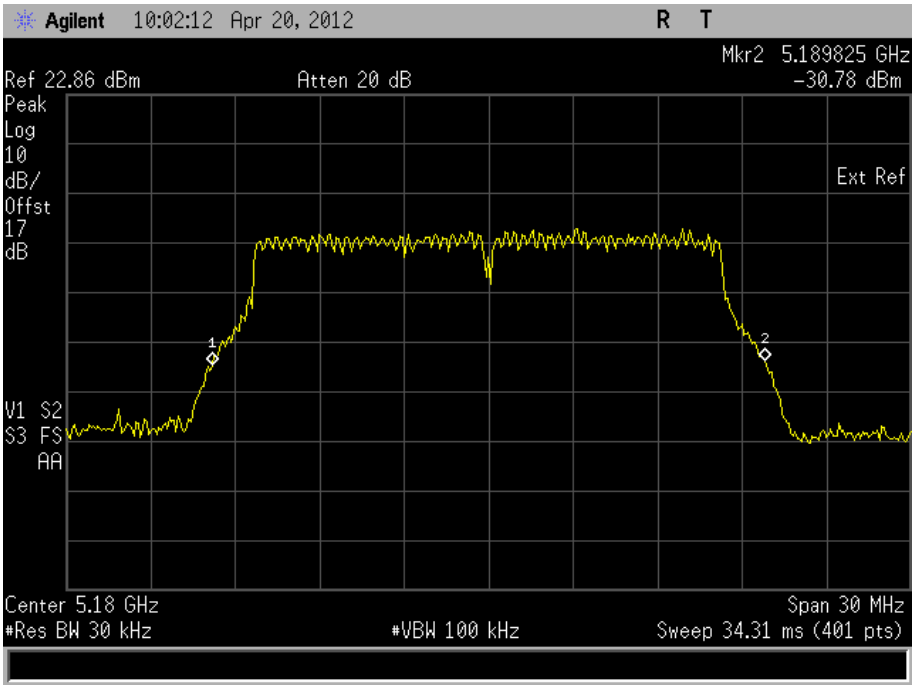
2.5.7 Test Results

802.11(a) – Onboard PIFA Antenna

Frequency Band 1

5180 MHz

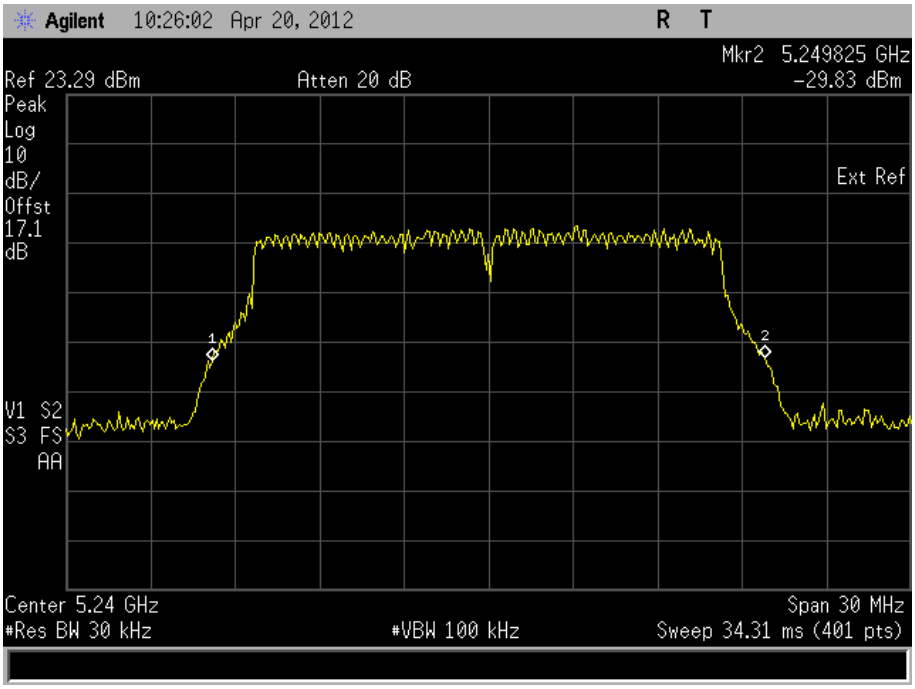
26 dB Bandwidth (MHz)	19.650



Product Service

5240 MHz

26 dB Bandwidth (MHz)	19.650

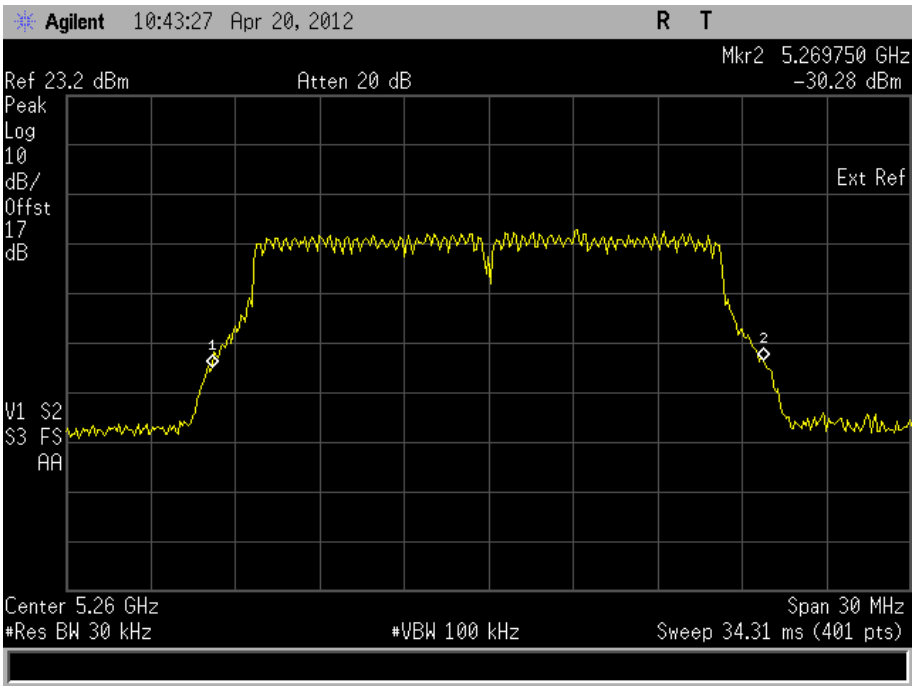


The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 54Mbps.

Frequency Band 2

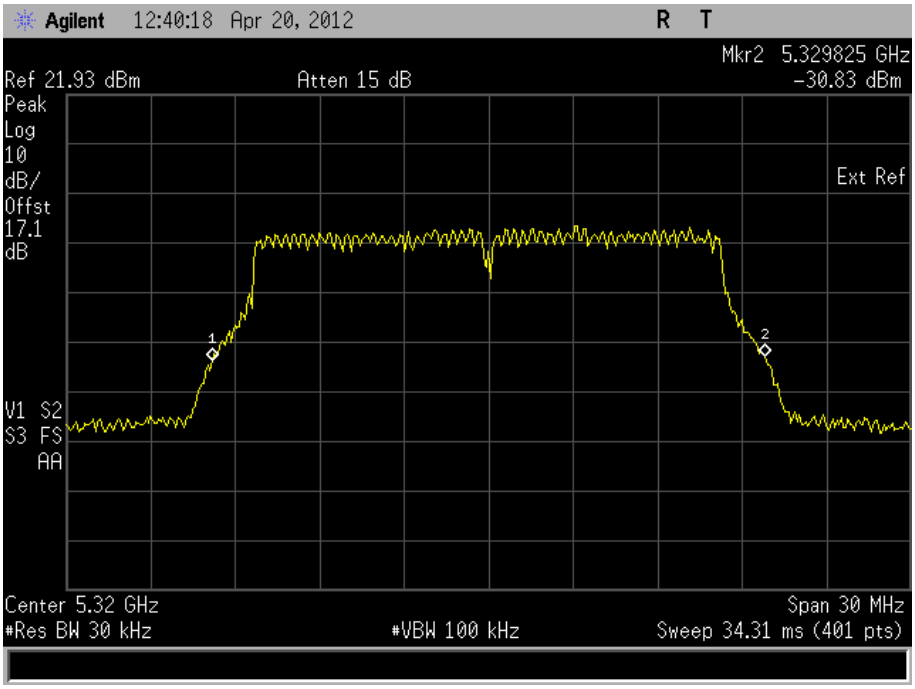
5260 MHz

26 dB Bandwidth (MHz)	19.575



5320 MHz

26 dB Bandwidth (MHz)	19.650

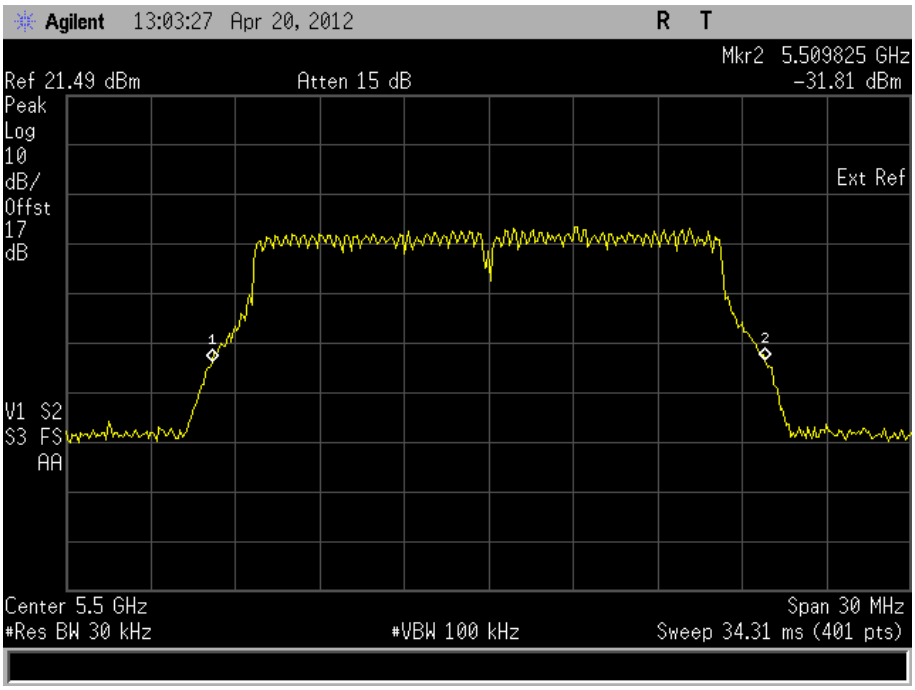


The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 54Mbps.

Frequency Band 3

5500 MHz

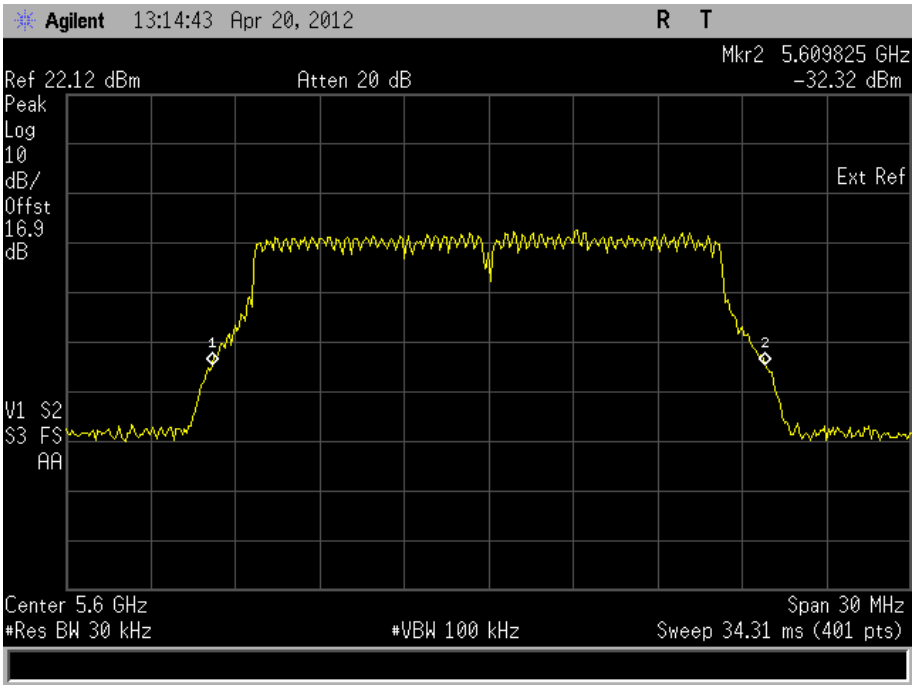
26 dB Bandwidth (MHz)	19.650



Product Service

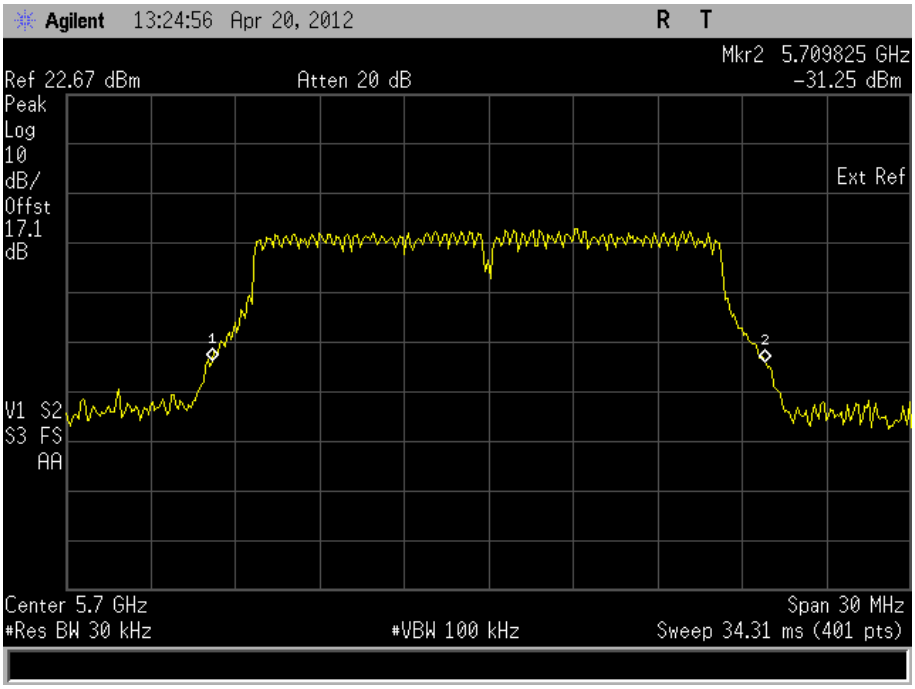
5600 MHz

26 dB Bandwidth (MHz)	19.650



5700 MHz

26 dB Bandwidth (MHz)	19.650

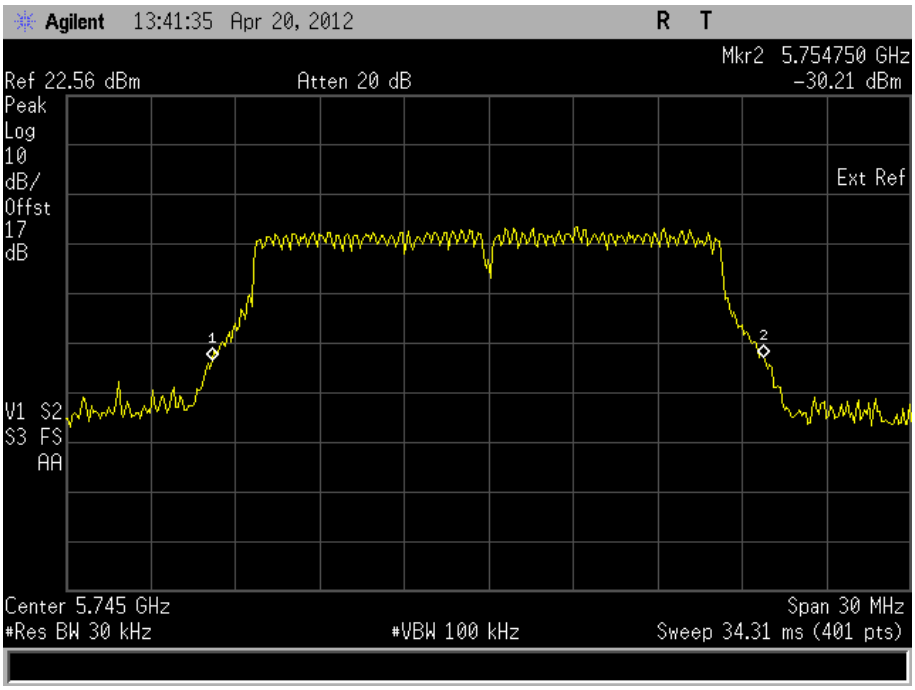


The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 54Mbps.

Frequency Band 4

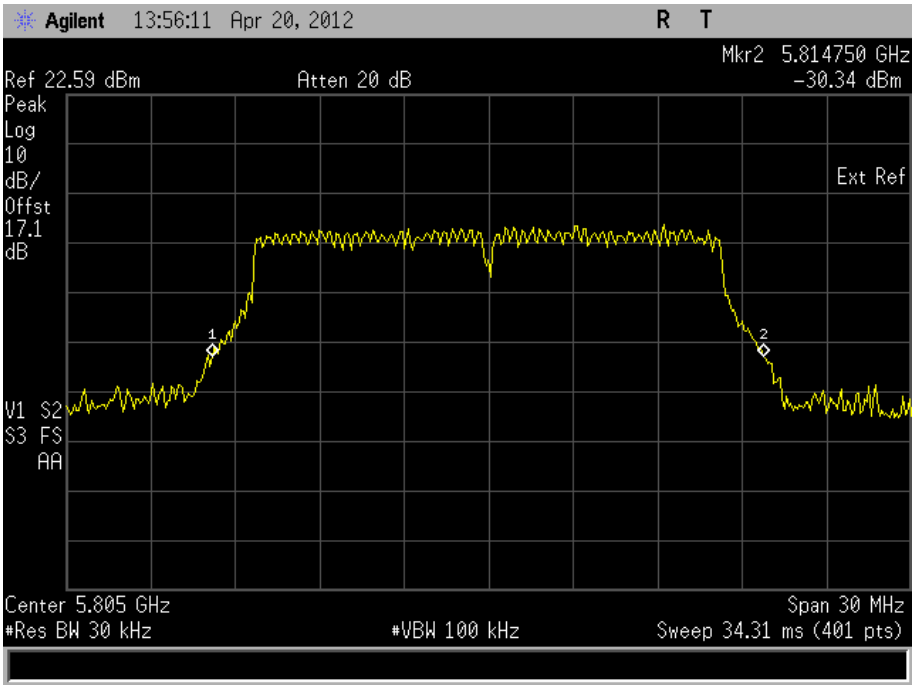
5745 MHz

26 dB Bandwidth (MHz)	19.575



5805 MHz

26 dB Bandwidth (MHz)	19.575



The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 54Mbps.

Limit

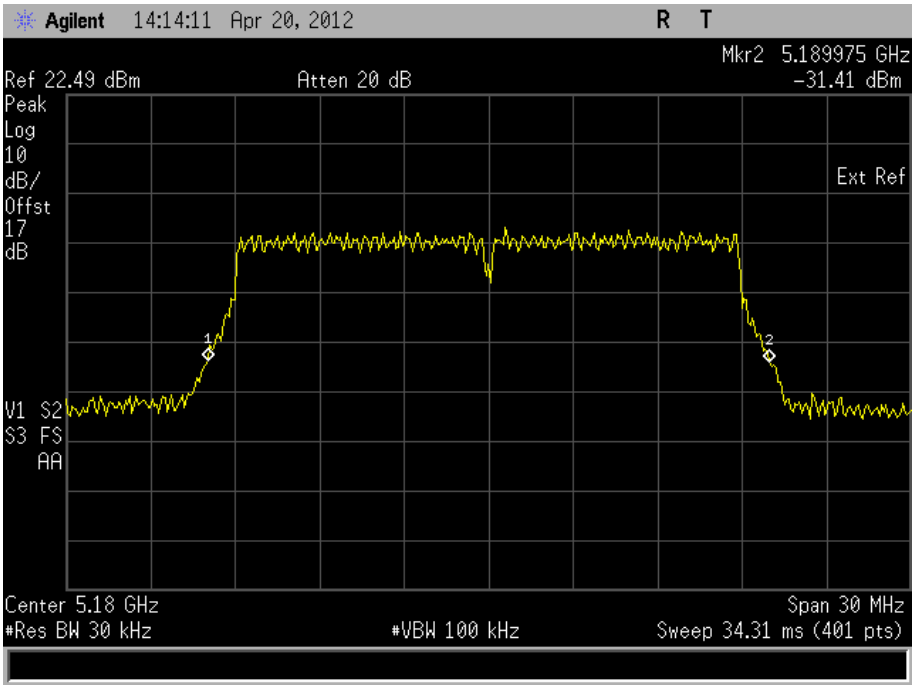
Not specified.

802.11(n) - 5 GHz, 20 MHz BW – Onboard PIFA Antenna

Frequency Band 1

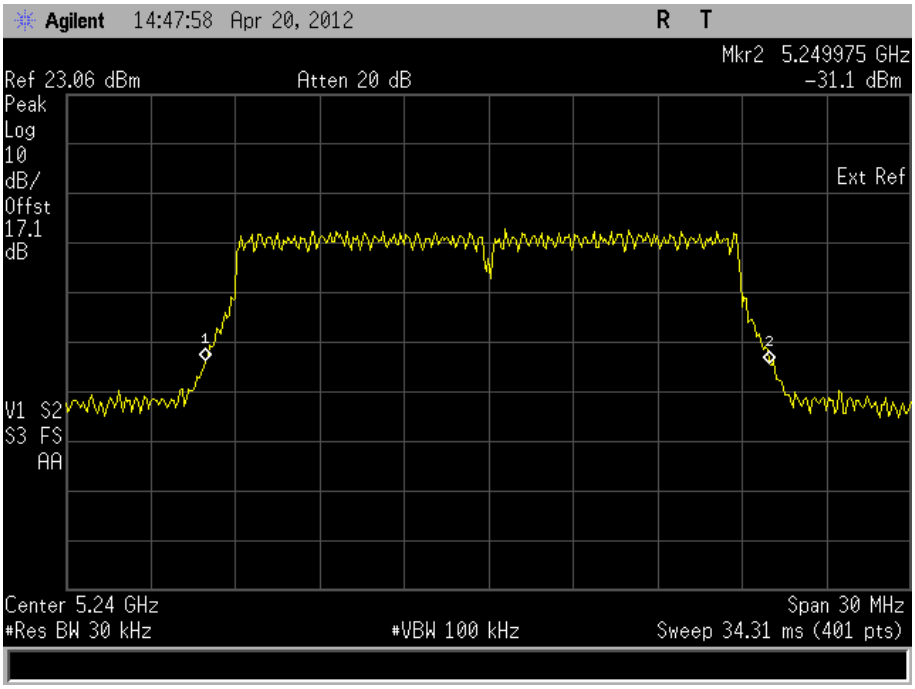
5180 MHz

26 dB Bandwidth (MHz)	19.950



5240 MHz

26 dB Bandwidth (MHz)	20.025

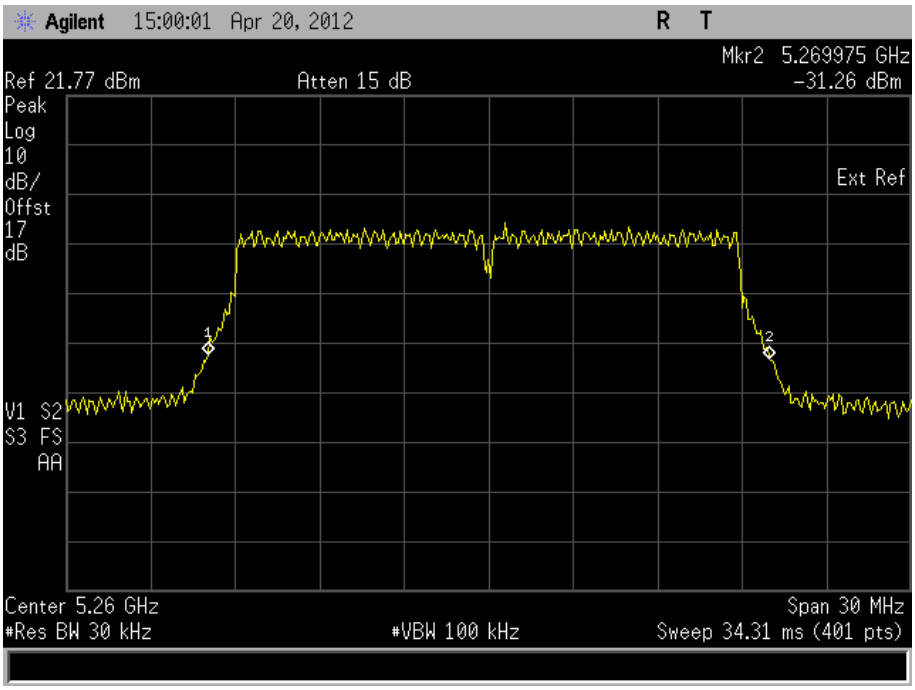


The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 21.70 Mbps.

Frequency Band 2

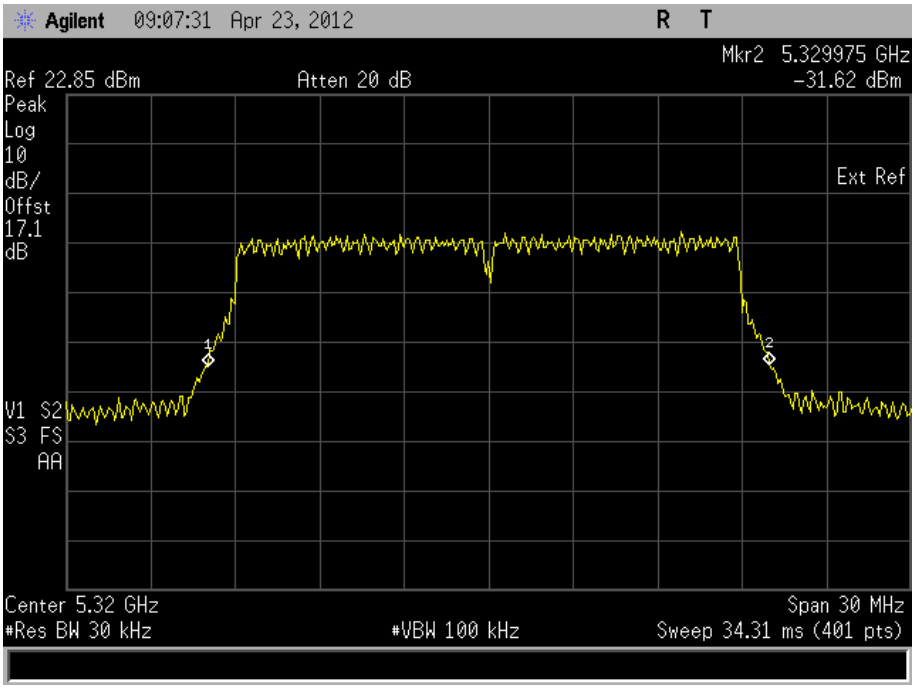
5260 MHz

26 dB Bandwidth (MHz)	19.950



5320 MHz

26 dB Bandwidth (MHz)	19.950

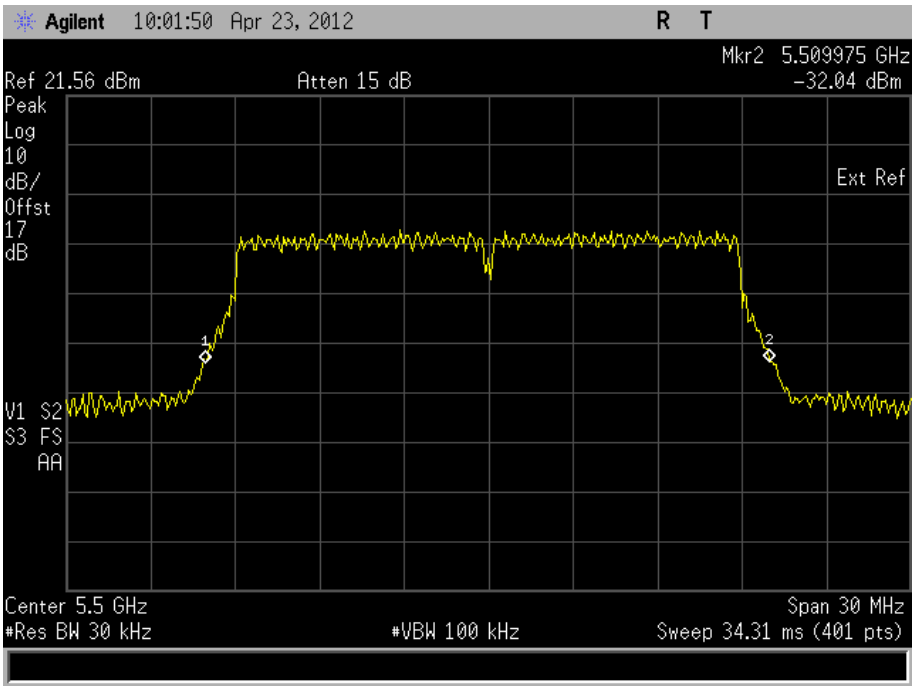


The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 21.70 Mbps.

Frequency Band 3

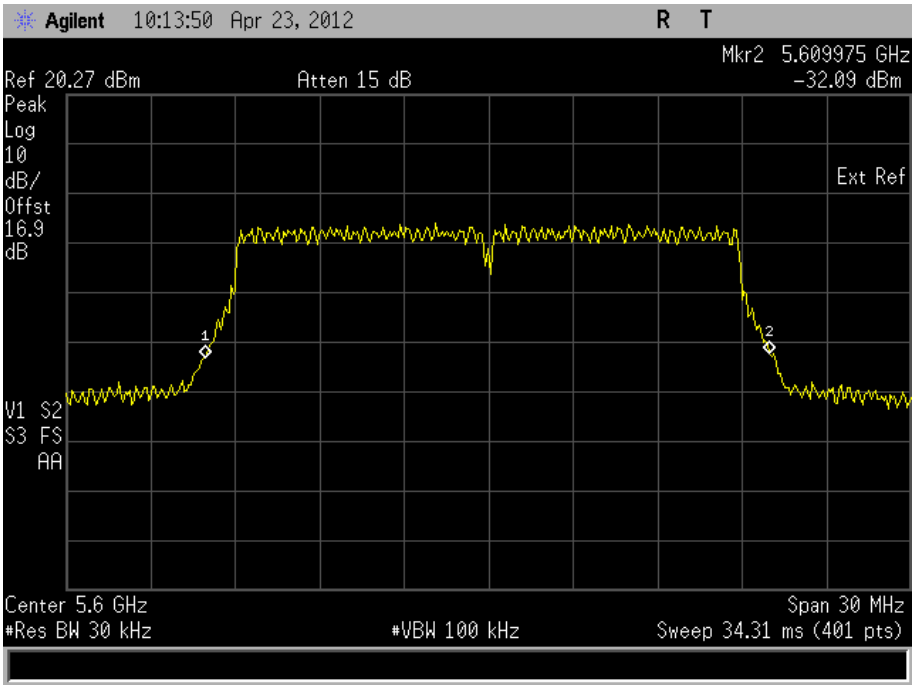
5500 MHz

26 dB Bandwidth (MHz)	20.025



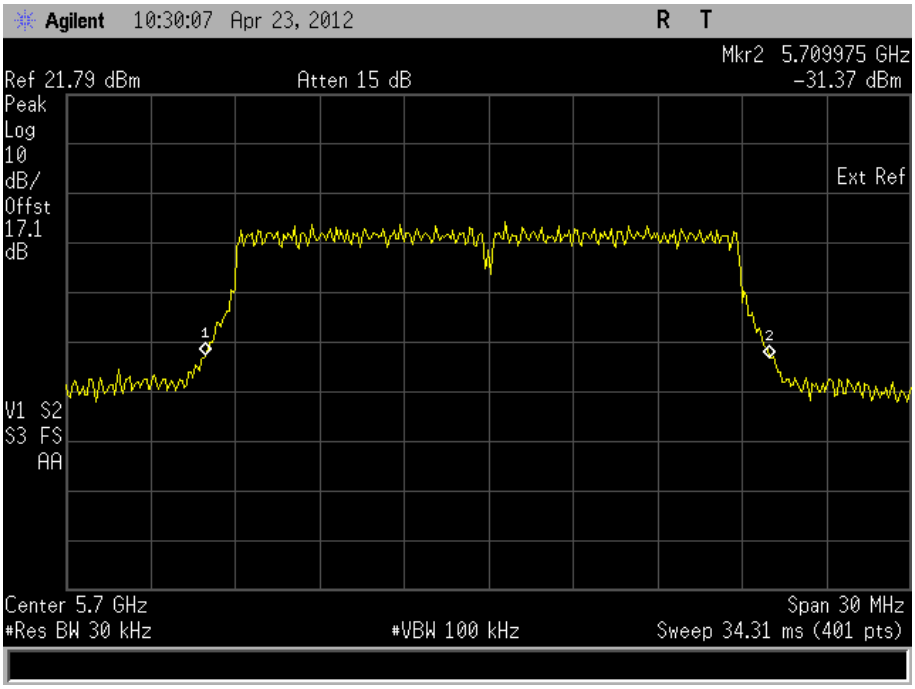
5600 MHz

26 dB Bandwidth (MHz)	20.025



5700 MHz

26 dB Bandwidth (MHz)	20.025

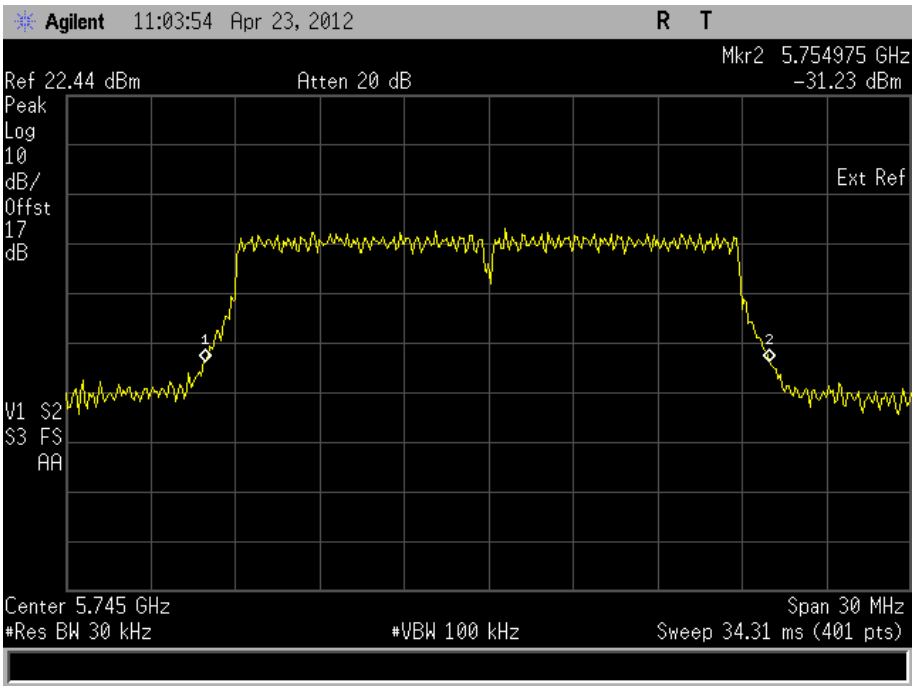


The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 21.70 Mbps.

Frequency Band 4

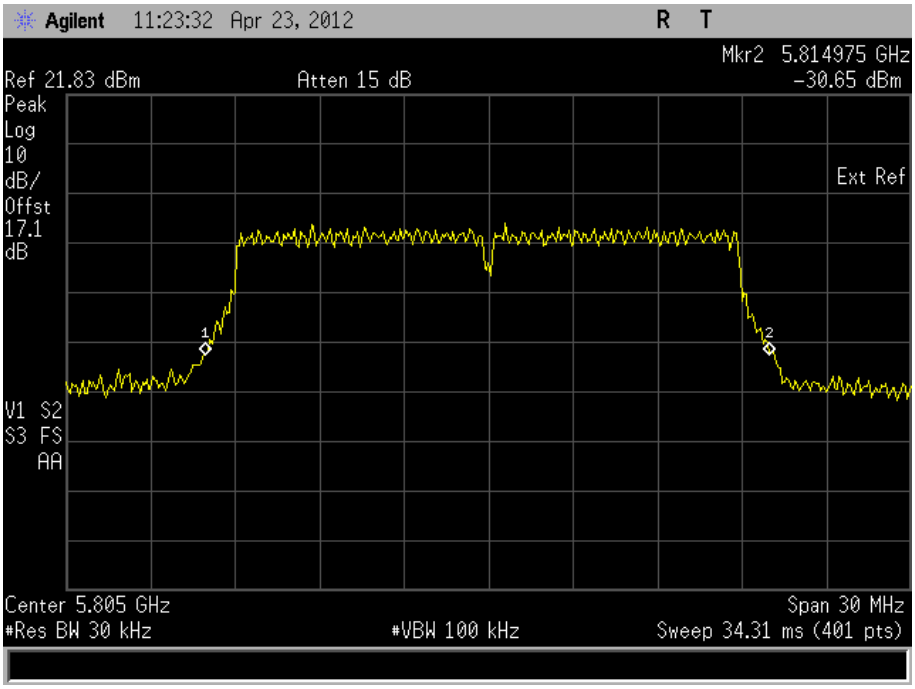
5745 MHz

26 dB Bandwidth (MHz)	20.025



5805 MHz

26 dB Bandwidth (MHz)	20.025



The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 21.70 Mbps.

Limit

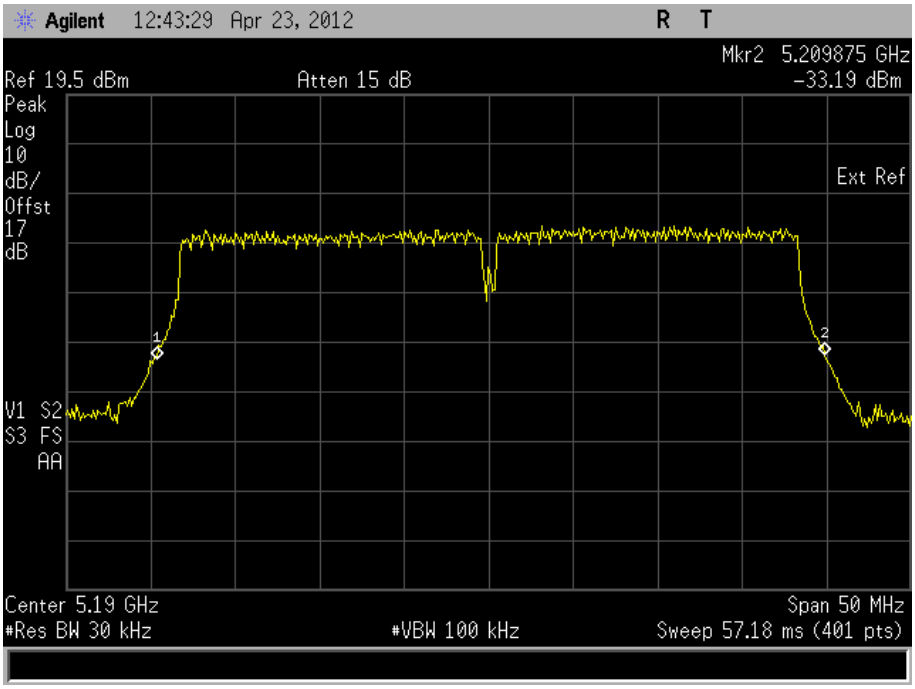
Not specified.

802.11(n) - 5 GHz 40 MHz BW – Onboard PIFA Antenna

Frequency Band 1

5190 MHz

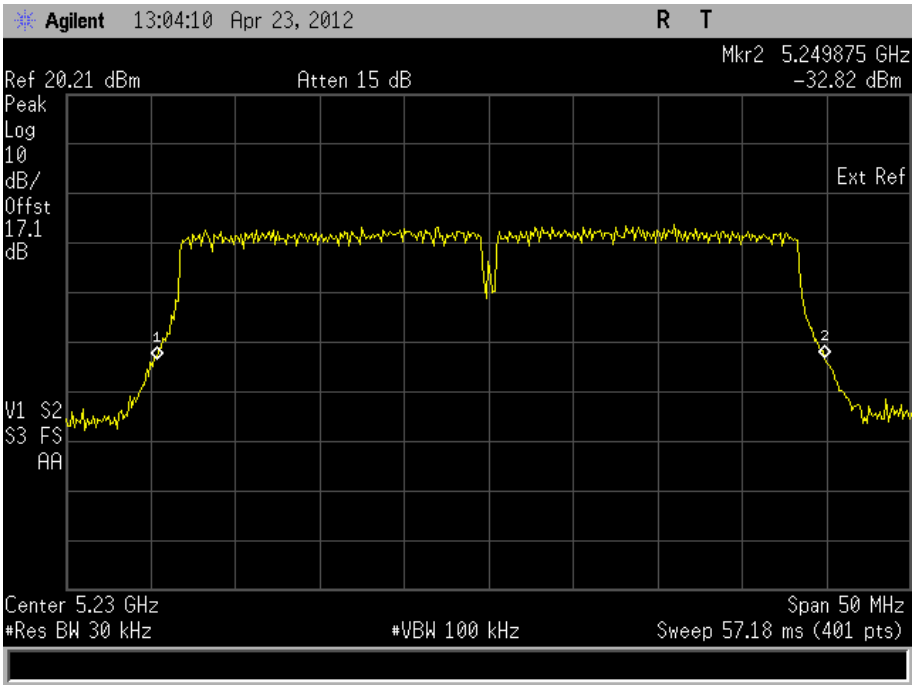
26 dB Bandwidth (MHz)	39.500



Product Service

5230 MHz

26 dB Bandwidth (MHz)	39.500

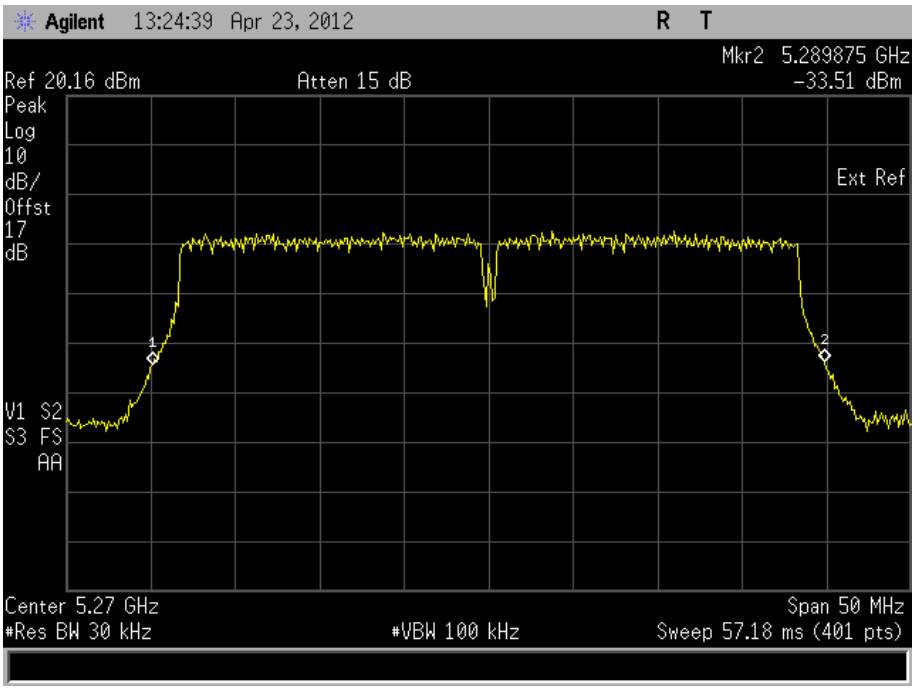


The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 135Mbps.

Frequency Band 2

5270 MHz

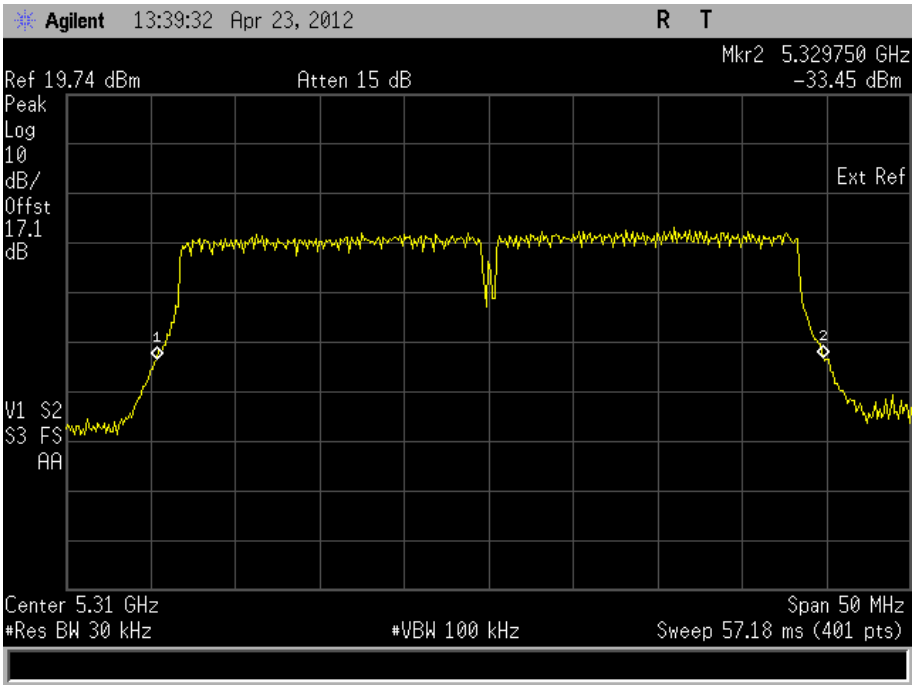
26 dB Bandwidth (MHz)	39.750



Product Service

5310 MHz

26 dB Bandwidth (MHz)	39.375

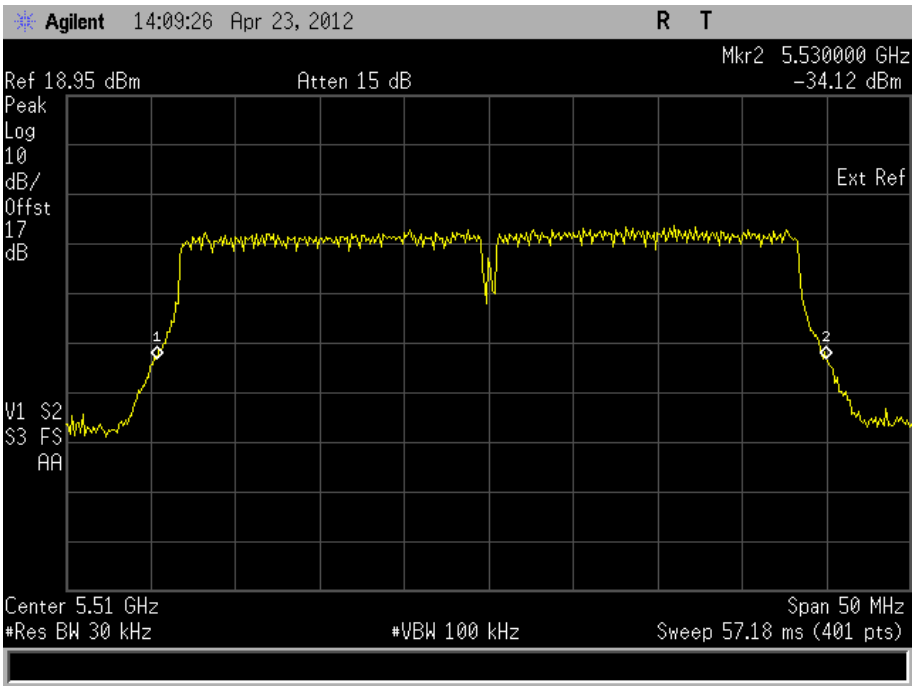


The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 135Mbps.

Frequency Band 3

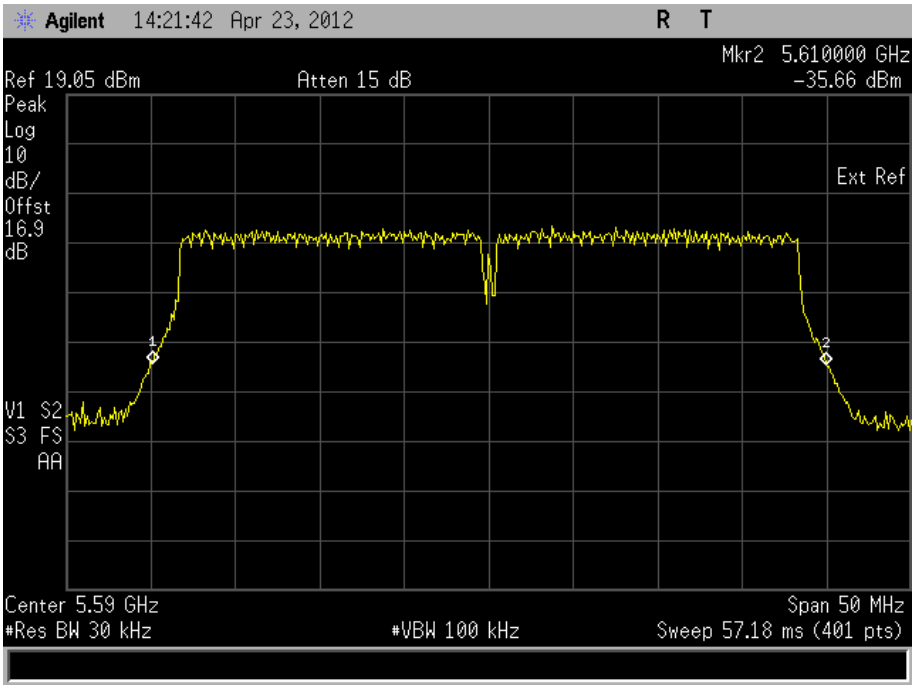
5510 MHz

26 dB Bandwidth (MHz)	39.625



5590 MHz

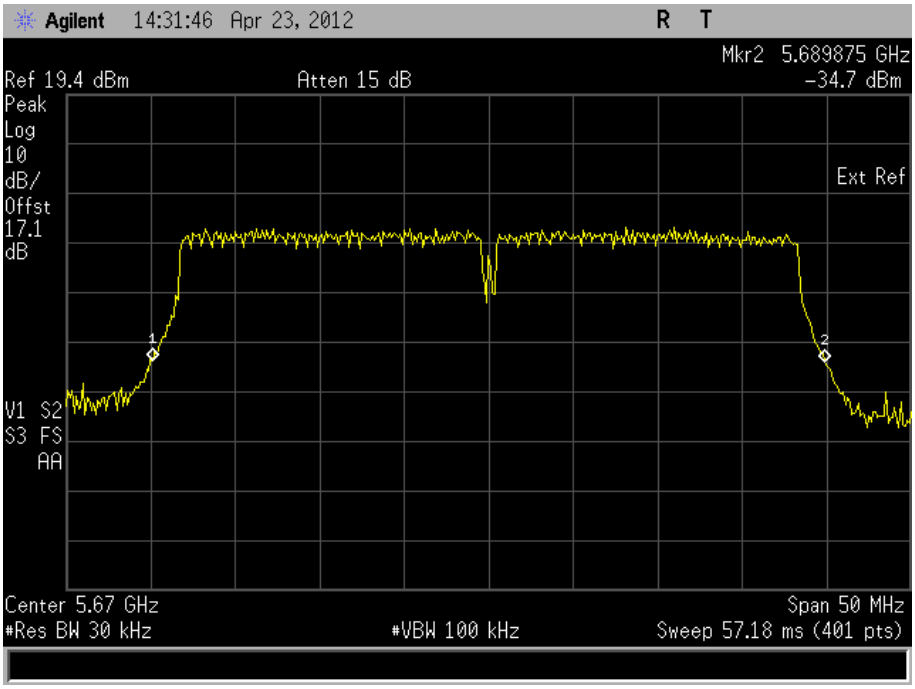
26 dB Bandwidth (MHz)	39.875



Product Service

5670 MHz

26 dB Bandwidth (MHz)	39.750

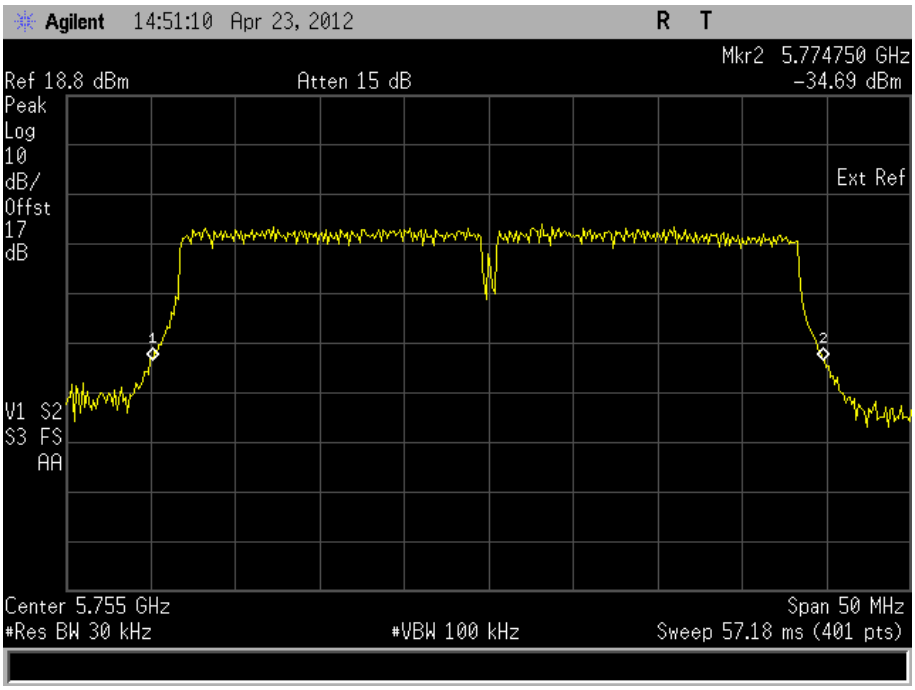


The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 135Mbps.

Frequency Band 4

5755 MHz

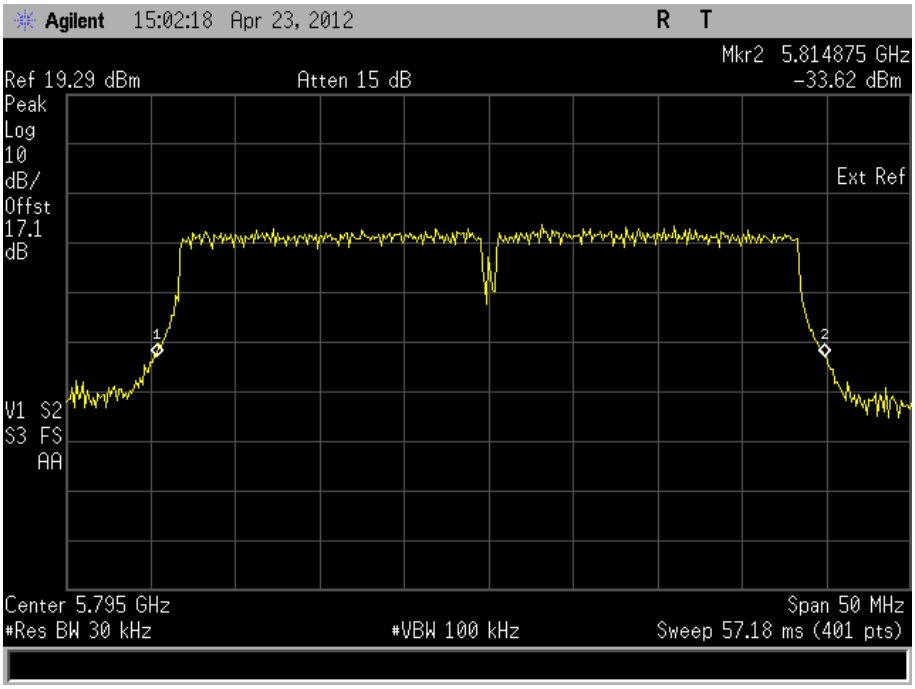
26 dB Bandwidth (MHz)	39.625



Product Service

5795 MHz

26 dB Bandwidth (MHz)	39.500



The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 135Mbps.

Limit

Not specified.

2.6 99 % EMISSION BANDWIDTH

2.6.1 Specification Reference

Industry Canada RSS-210, Clause A9.2

2.6.2 Equipment Under Test and Modification State

Venice 6.5 S/N: RAD 103037 on Test Jig S/N: RAD103234 - Modification State 0

2.6.3 Date of Test

20 April 2012 & 23 April 2012

2.6.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.6.5 Test Procedure

The EUT was transmitted at maximum power via an attenuator and cable connected to the spectrum analyser. The analyser settings were adjusted to display the resultant trace on screen and a resolution bandwidth and video bandwidth were set appropriately to perform the measurement correctly.

2.6.6 Environmental Conditions

Ambient Temperature	23.1 - 23.3°C
Relative Humidity	30.8 - 32.2%

Product Service

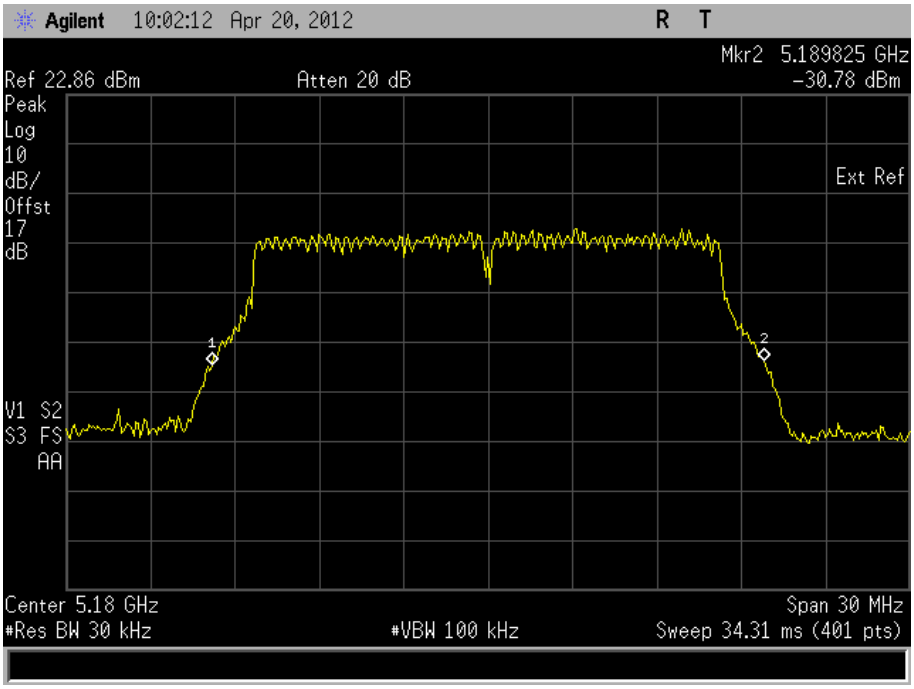
2.6.7 Test Results

802.11(a) – Onboard PIFA Antenna

Frequency Band 1

5180 MHz

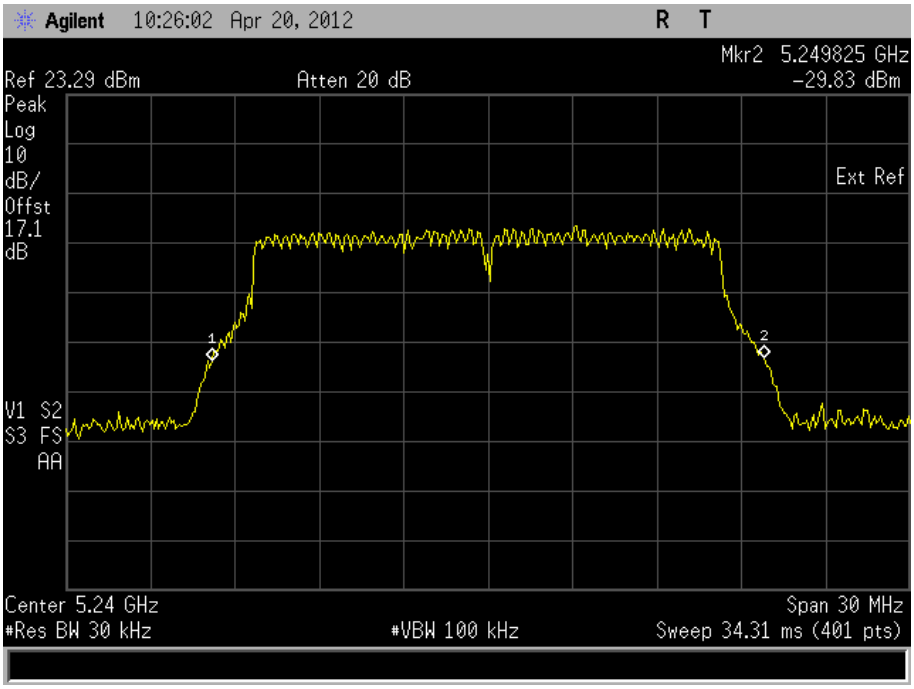
99 % Emission Bandwidth (MHz)	19.650



Product Service

5240 MHz

99 % Emission Bandwidth (MHz)	19.650

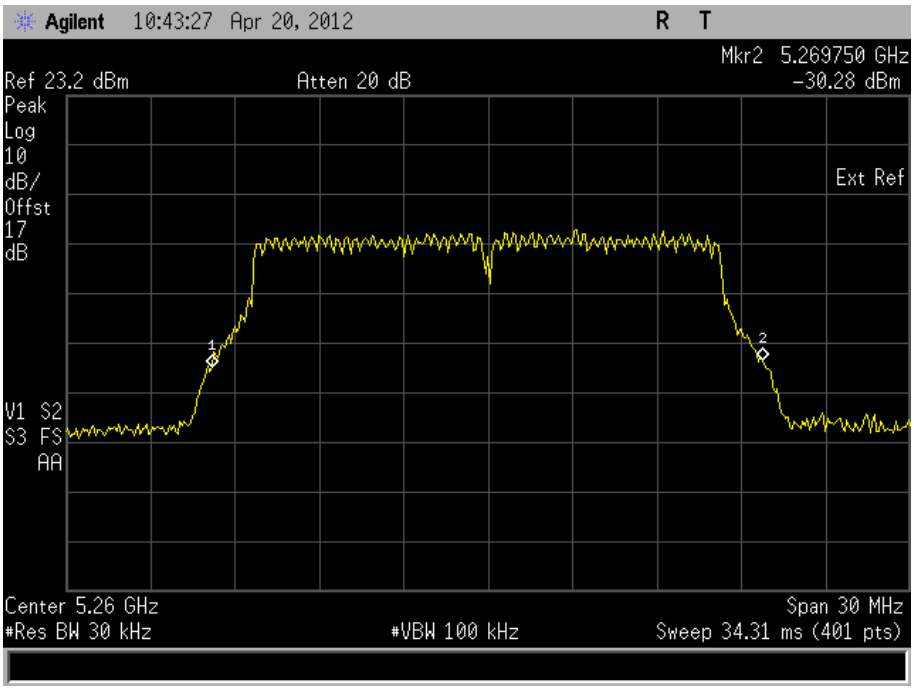


The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 54Mbps.

Frequency Band 2

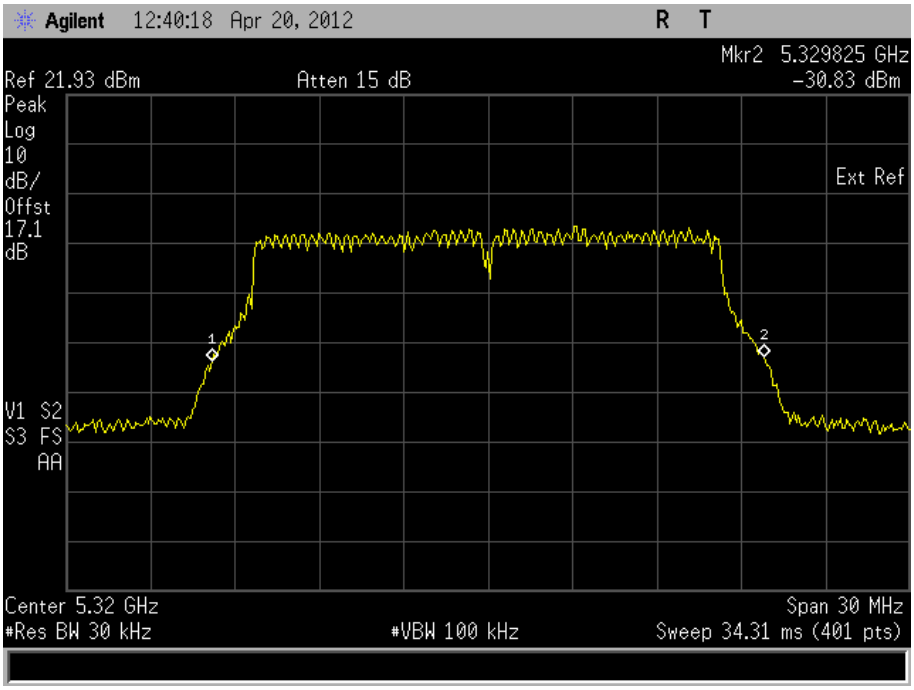
5260 MHz

99 % Emission Bandwidth (MHz)	19.575



5320 MHz

99 % Emission Bandwidth (MHz)	19.650

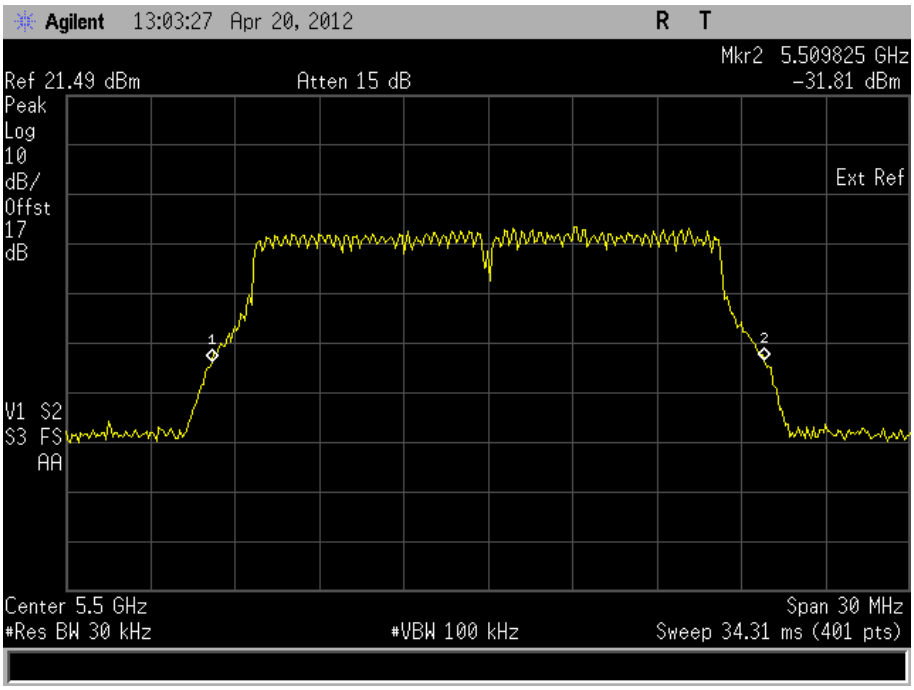


The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 54Mbps.

Frequency Band 3

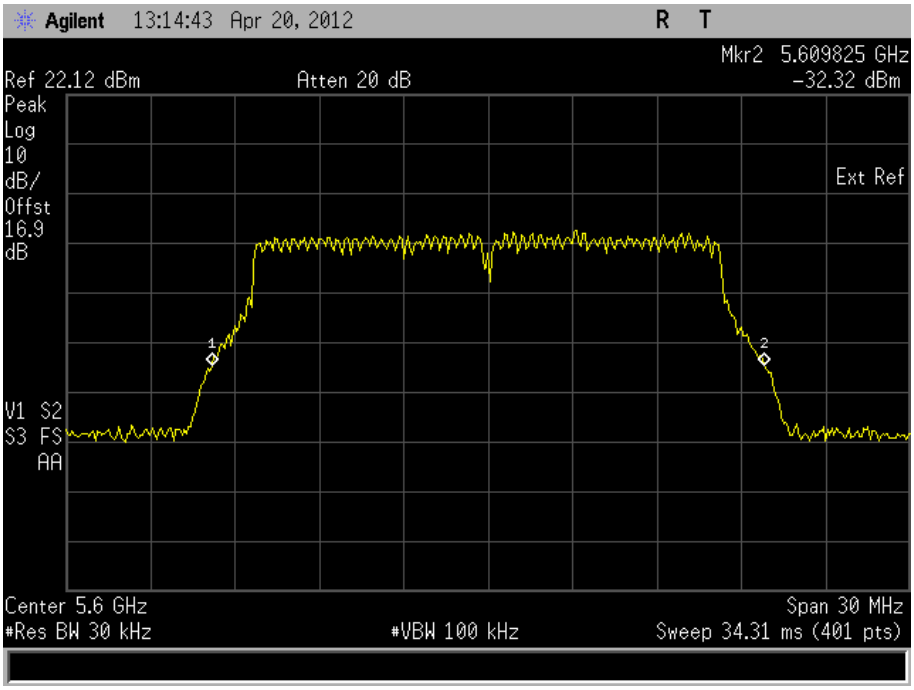
5500 MHz

99 % Emission Bandwidth (MHz)	19.650



5600 MHz

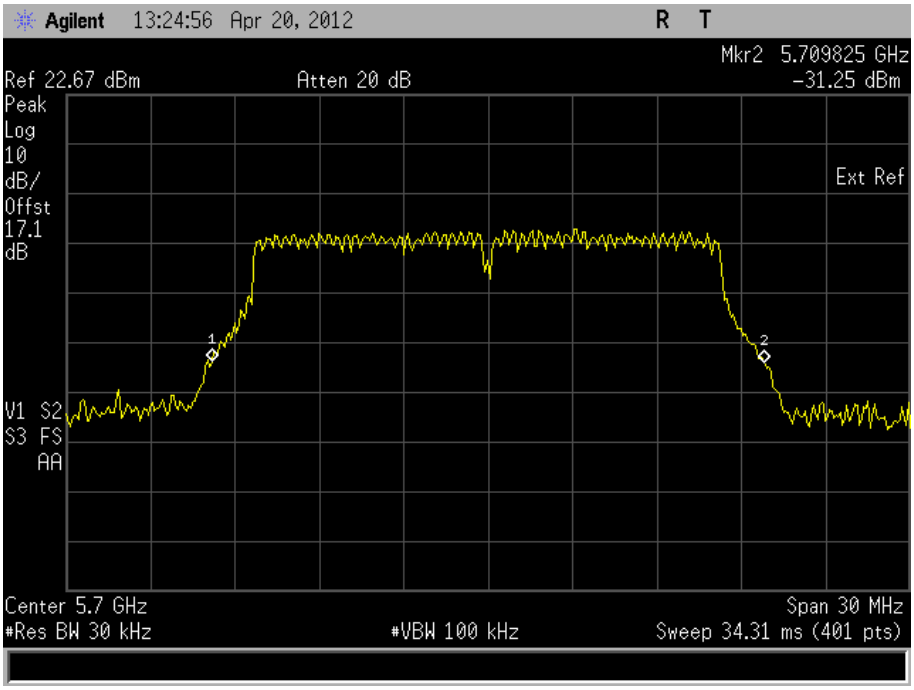
99 % Emission Bandwidth (MHz)	19.650



Product Service

5700 MHz

99 % Emission Bandwidth (MHz)	19.650



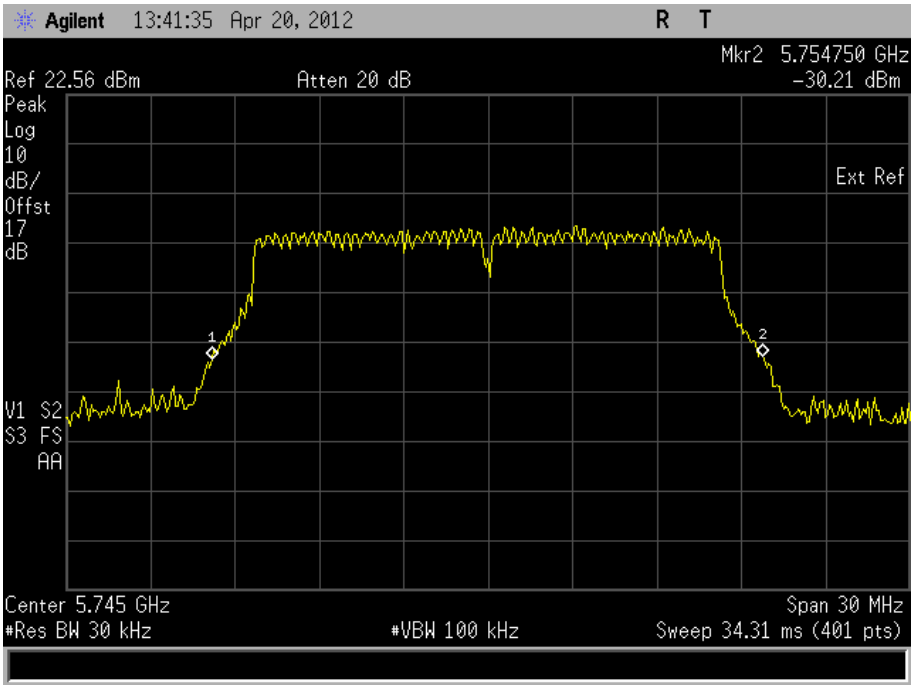
The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 54Mbps.

Product Service

Frequency Band 4

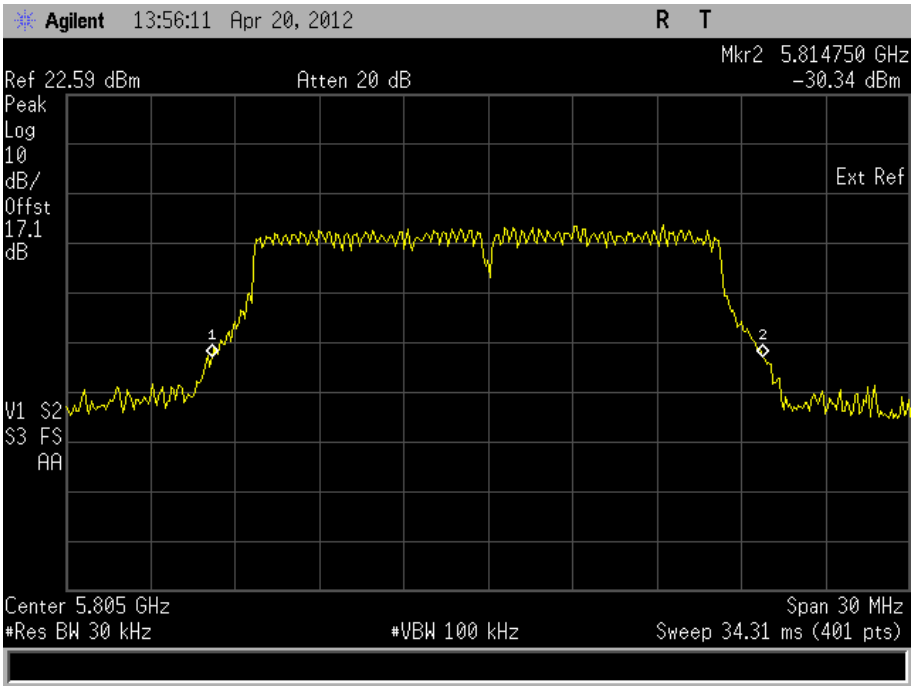
5745 MHz

99 % Emission Bandwidth (MHz)	19.575



5805 MHz

99 % Emission Bandwidth (MHz)	19.575



The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 54Mbps.

Limit

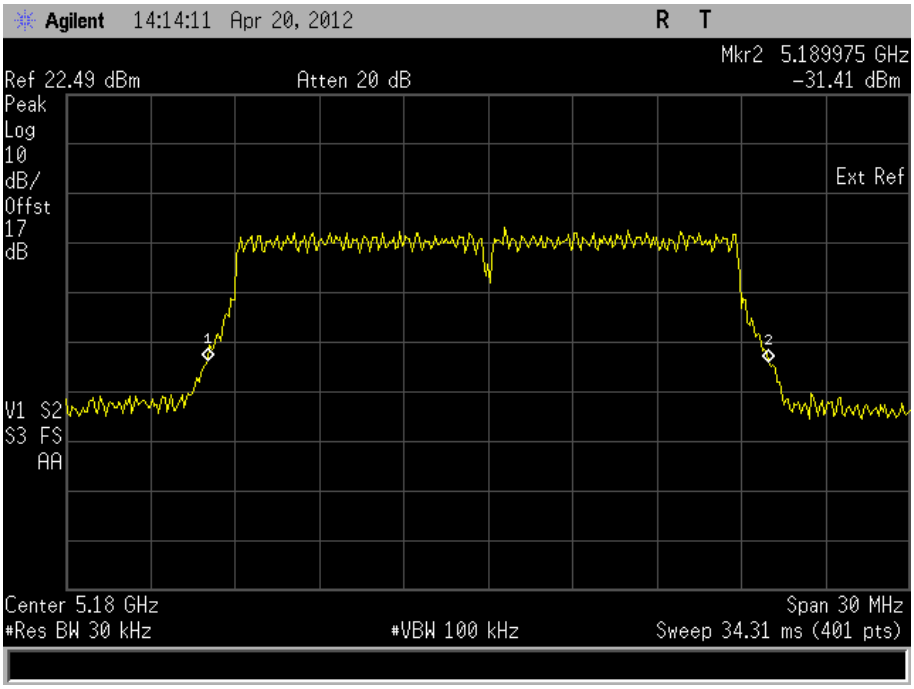
Not specified.

802.11(n) - 5 GHz, 20 MHz BW – Onboard PIFA Antenna

Frequency Band 1

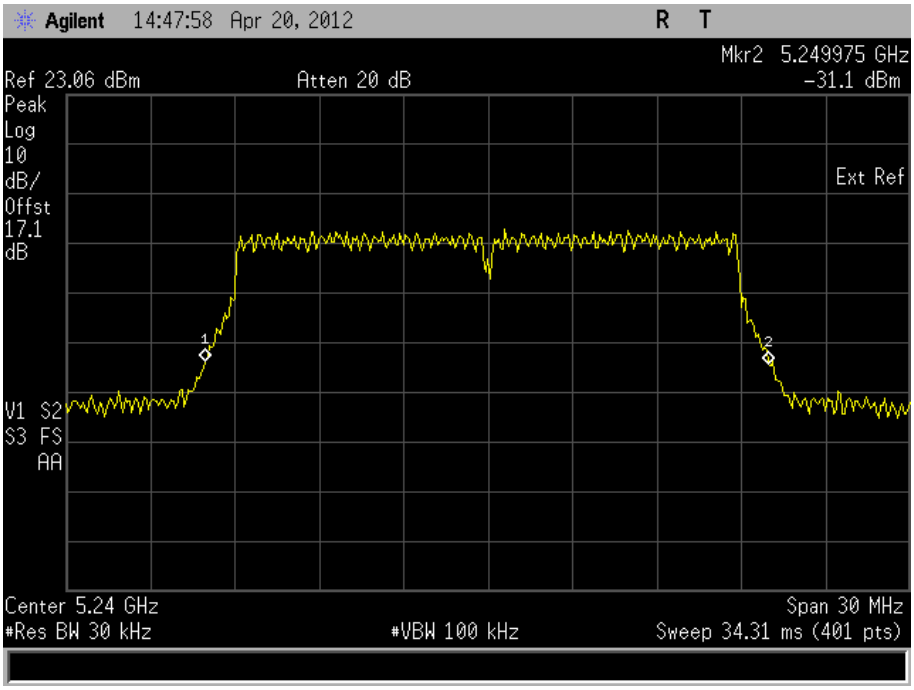
5180 MHz

99 % Emission Bandwidth (MHz)	19.950



5240 MHz

99 % Emission Bandwidth (MHz)	20.025

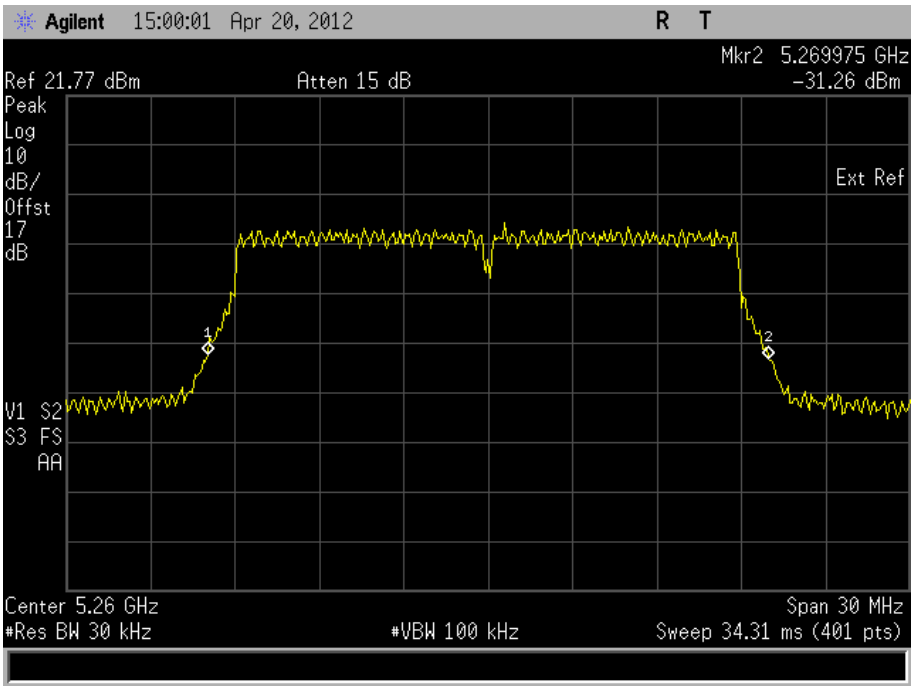


The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 21.70 Mbps.

Frequency Band 2

5260 MHz

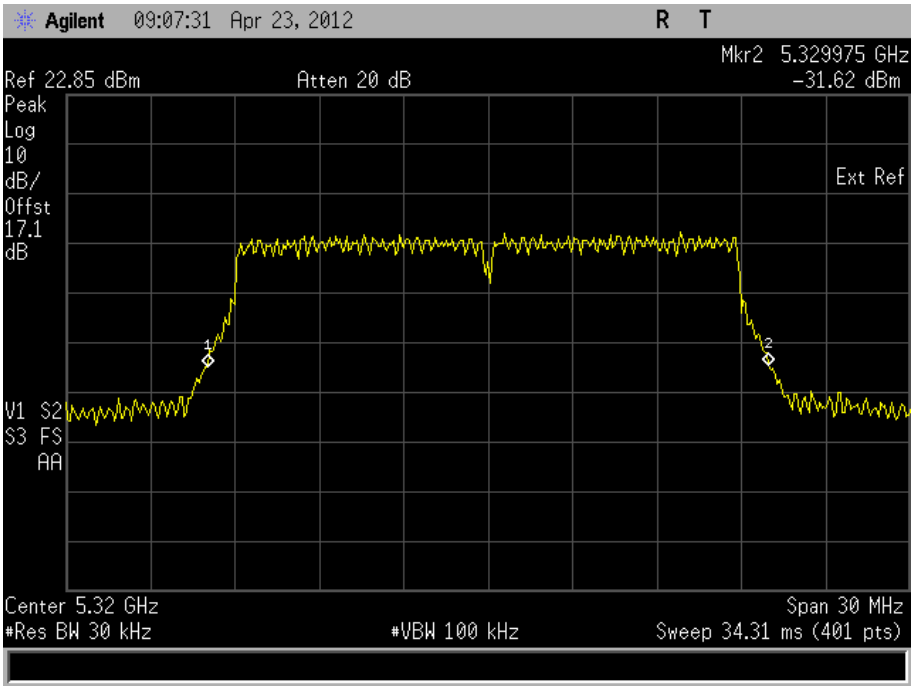
99 % Emission Bandwidth (MHz)	19.950



Product Service

5320 MHz

99 % Emission Bandwidth (MHz)	19.950

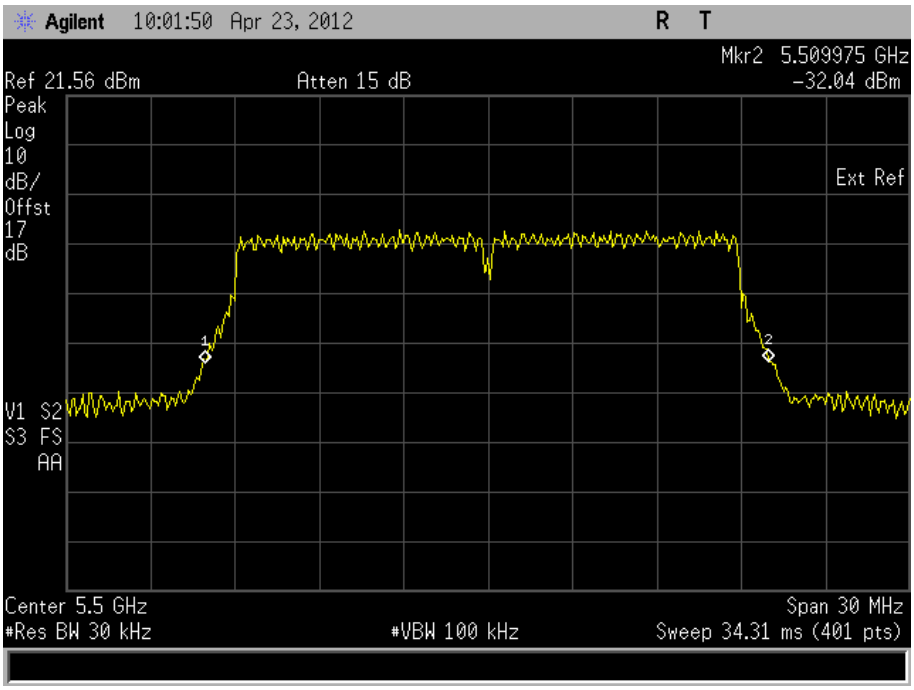


The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 21.70 Mbps.

Frequency Band 3

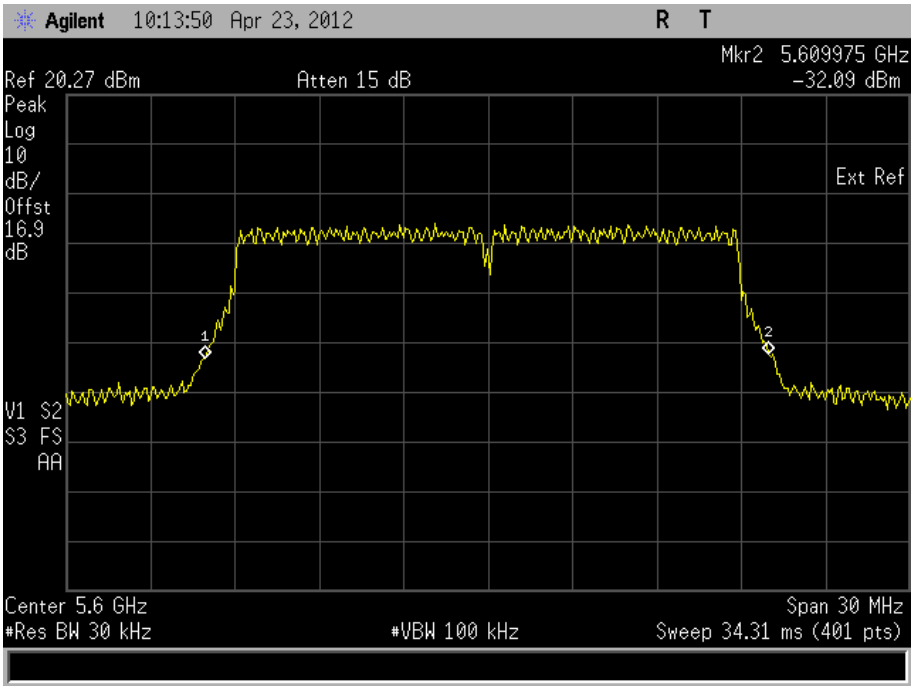
5500 MHz

99 % Emission Bandwidth (MHz)	20.025



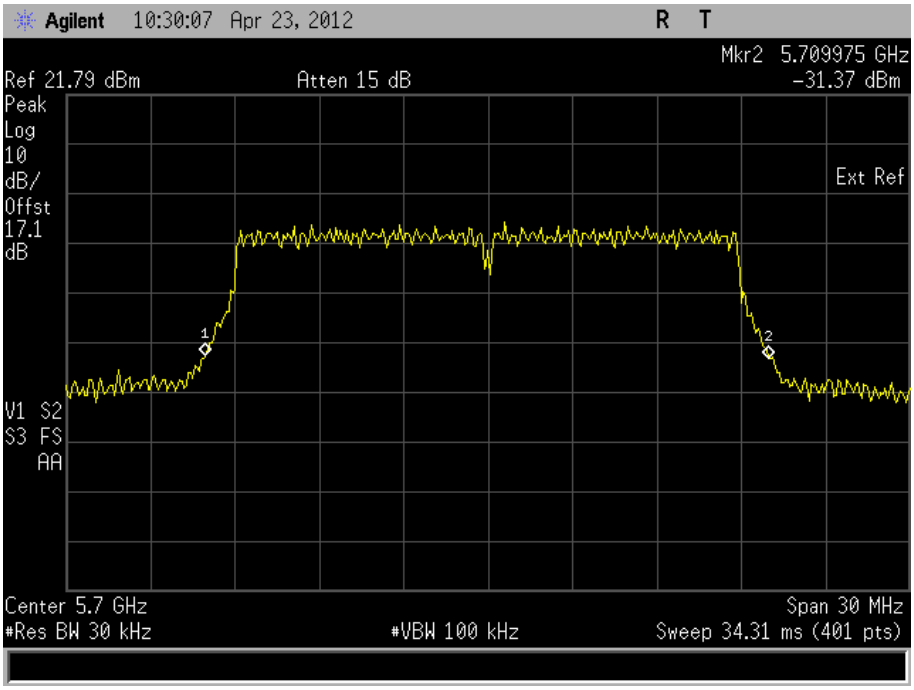
5600 MHz

99 % Emission Bandwidth (MHz)	20.025



5700 MHz

99 % Emission Bandwidth (MHz)	20.025

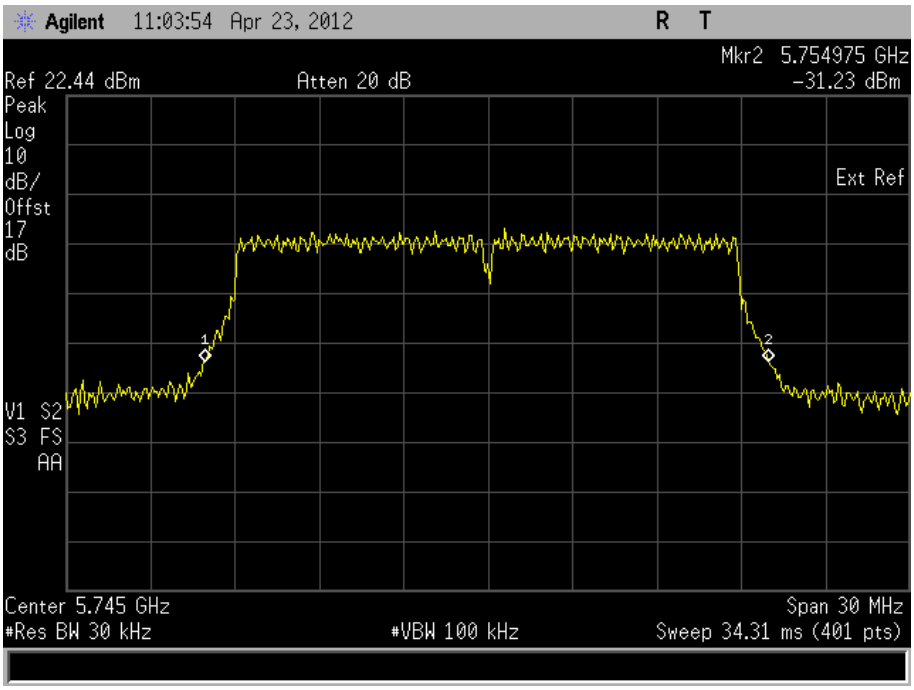


The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 21.70 Mbps.

Frequency Band 4

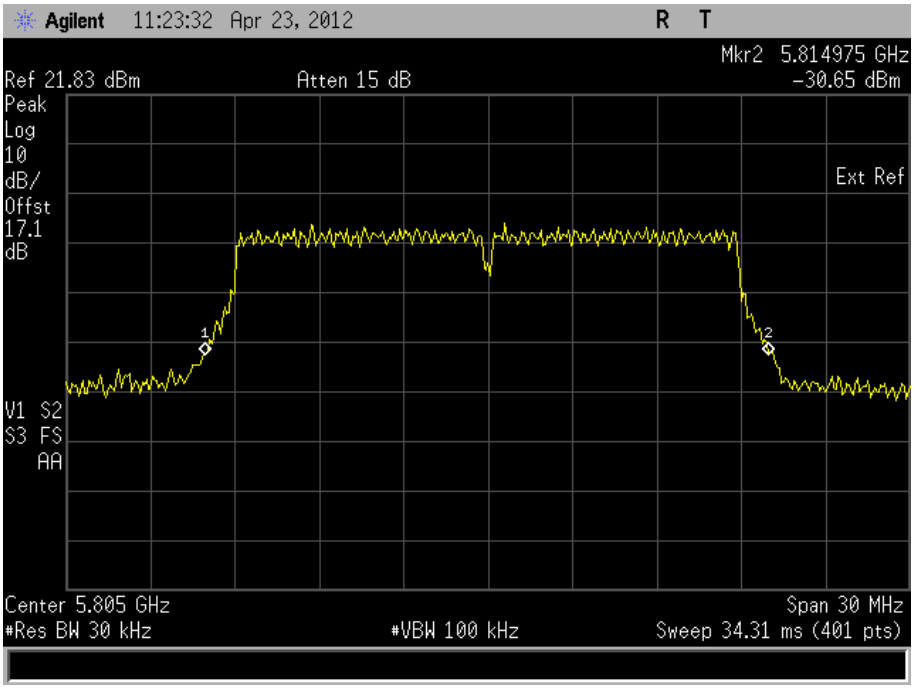
5745 MHz

99 % Emission Bandwidth (MHz)	20.025



5805 MHz

99 % Emission Bandwidth (MHz)	20.025



The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 21.70 Mbps.

Limit

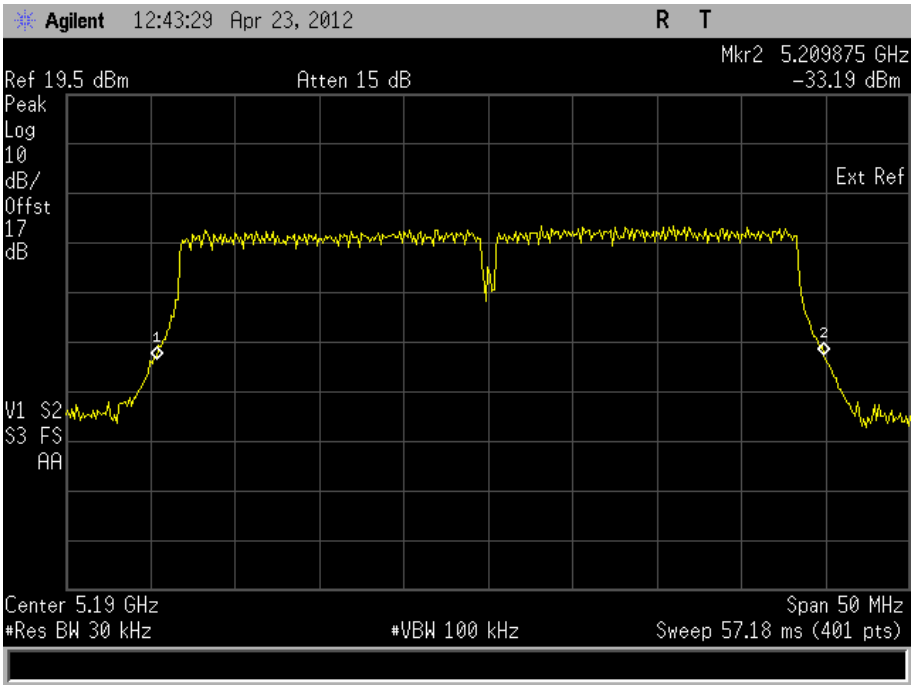
Not specified.

802.11(n) - 5 GHz 40 MHz BW – Onboard PIFA Antenna

Frequency Band 1

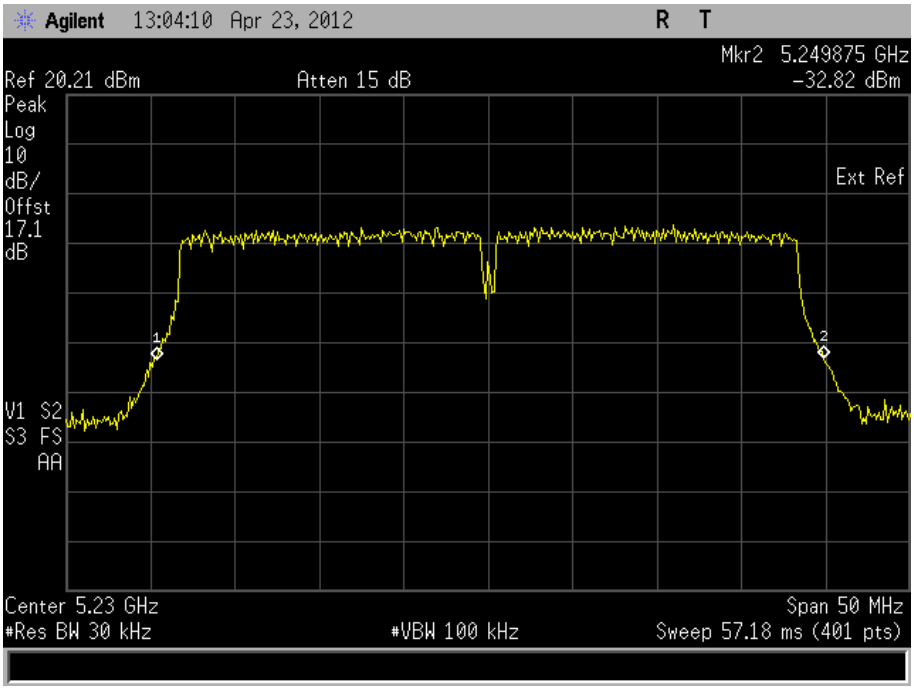
5190 MHz

99 % Emission Bandwidth (MHz)	39.500



5230 MHz

99 % Emission Bandwidth (MHz)	39.500

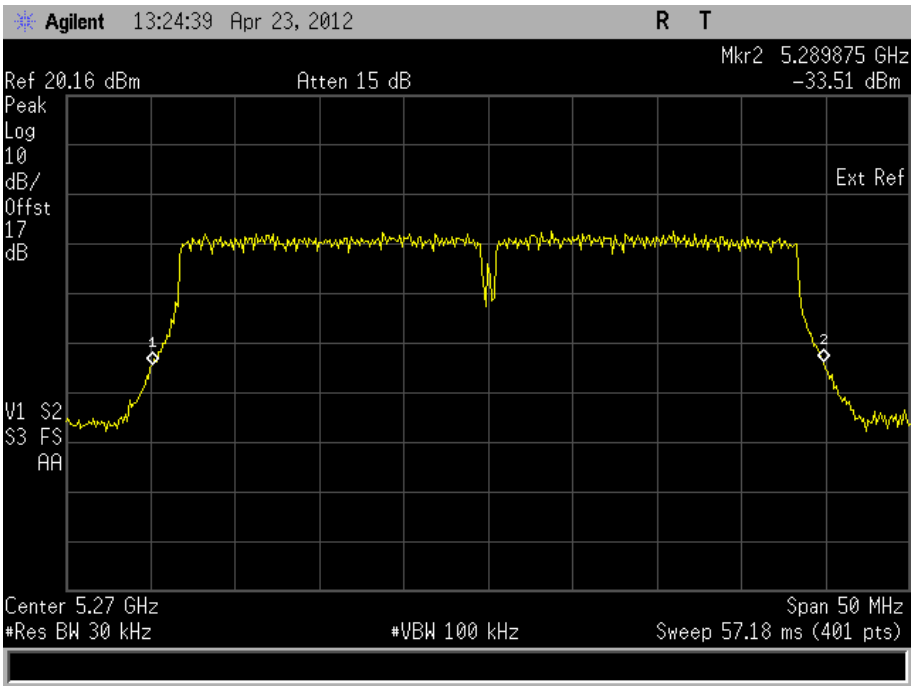


The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 135Mbps.

Frequency Band 2

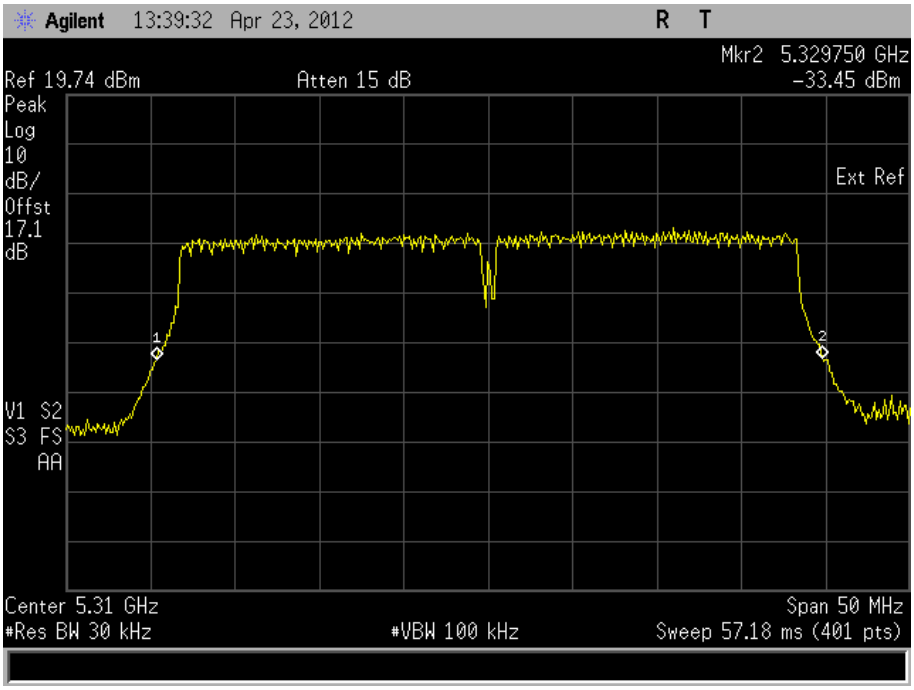
5270 MHz

99 % Emission Bandwidth (MHz)	39.750



5310 MHz

99 % Emission Bandwidth (MHz)	39.375

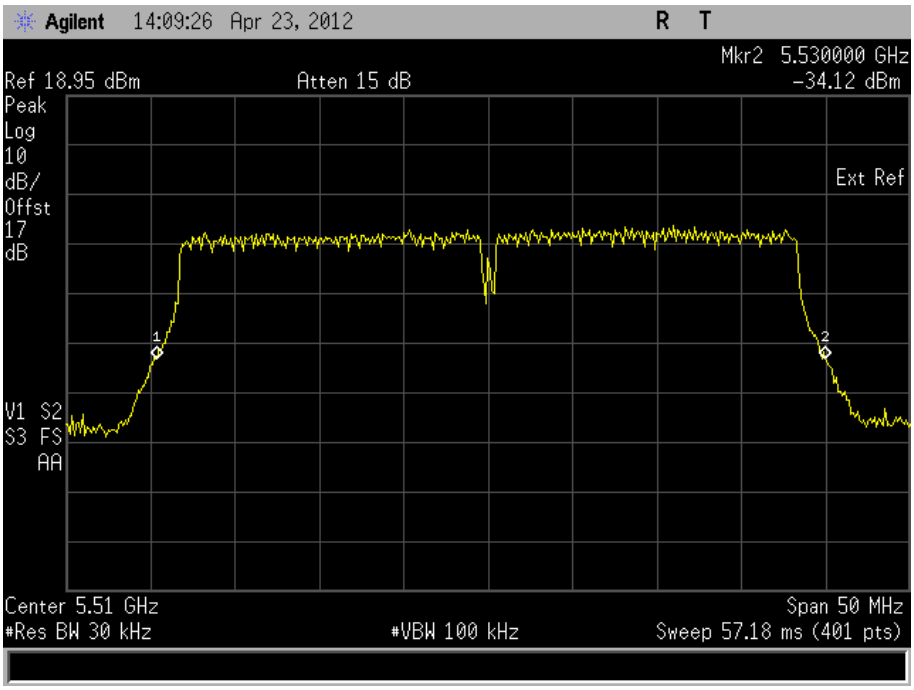


The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 135Mbps.

Frequency Band 3

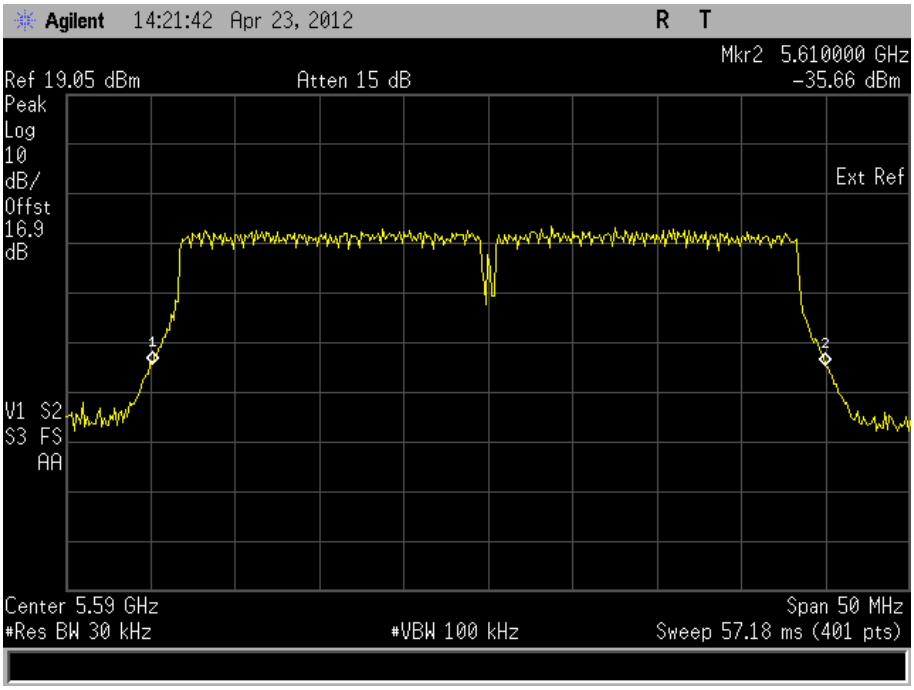
5510 MHz

99 % Emission Bandwidth (MHz)	39.625



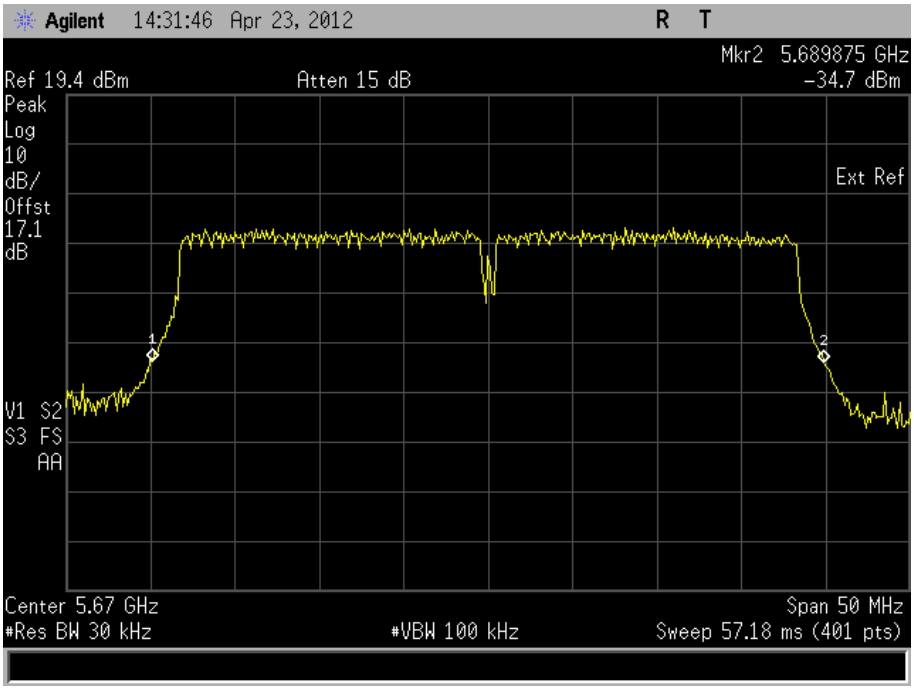
5590 MHz

99 % Emission Bandwidth (MHz)	39.875



5670 MHz

99 % Emission Bandwidth (MHz)	39.750

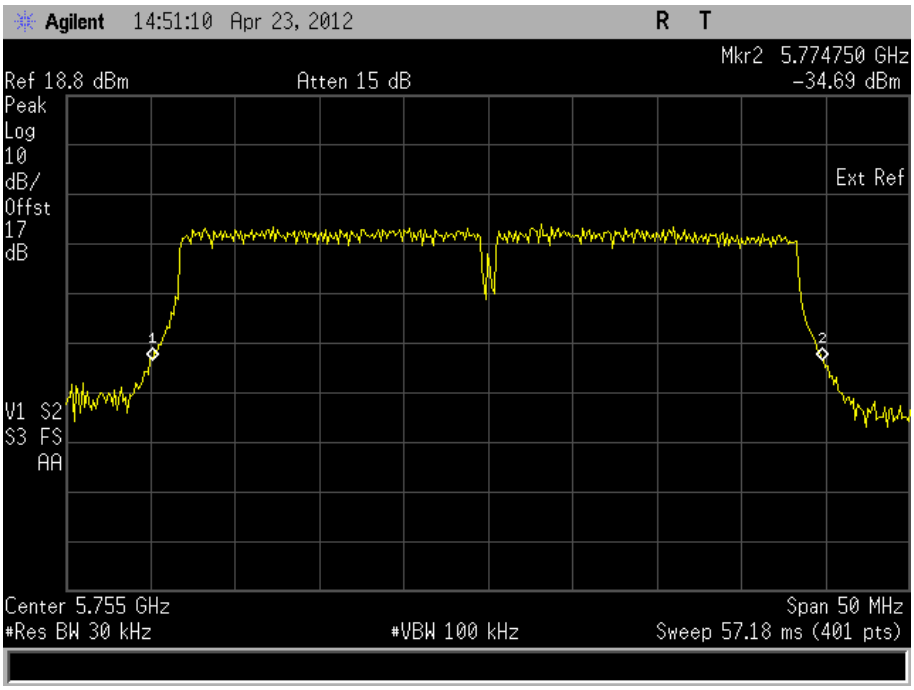


The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 135Mbps.

Frequency Band 4

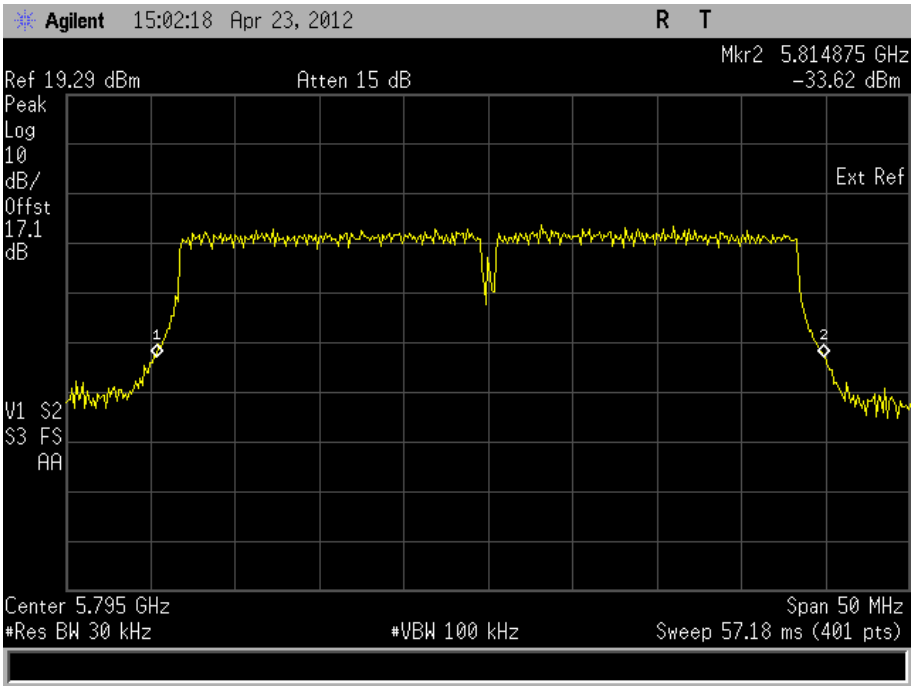
5755 MHz

99 % Emission Bandwidth (MHz)	39.625



5795 MHz

99 % Emission Bandwidth (MHz)	39.500



The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 135Mbps.

Limit

Not specified.

2.7 PEAK POWER SPECTRAL DENSITY

2.7.1 Specification Reference

FCC CFR 47 Part 15E, Clause 15.407 (a)(5)
Industry Canada RSS-210, Clause A9.2

2.7.2 Equipment Under Test and Modification State

Venice 6.5 S/N: RAD 103037 on Test Jig S/N: RAD103234 - Modification State 0

2.7.3 Date of Test

20 April 2012 & 23 April 2012

2.7.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.7.5 Test Procedure

The EUT was transmitted at maximum power via an attenuator and cable connected to the spectrum analyser. The analyser settings were adjusted to display the resultant trace on screen. The resolution bandwidth and video bandwidth were set to 3kHz and 10kHz respectively. The trace was set to Max Hold and the peak of the level was measured.

2.7.6 Environmental Conditions

Ambient Temperature	23.1 - 23.3°C
Relative Humidity	30.8 - 32.2%

Product Service

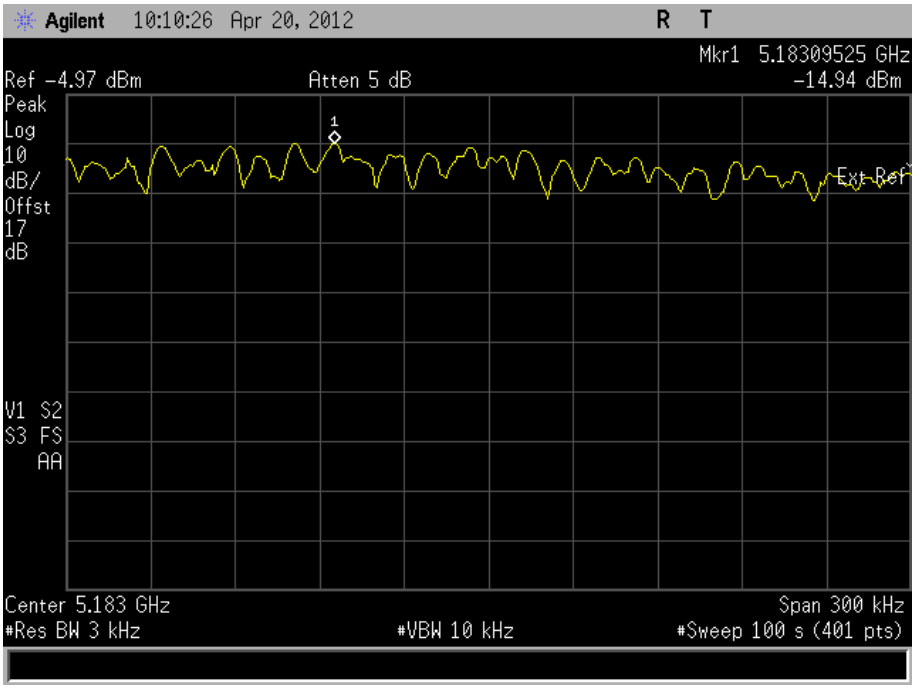
2.7.7 Test Results

802.11(a) – Onboard PIFA Antenna

Frequency Band 1

5180 MHz

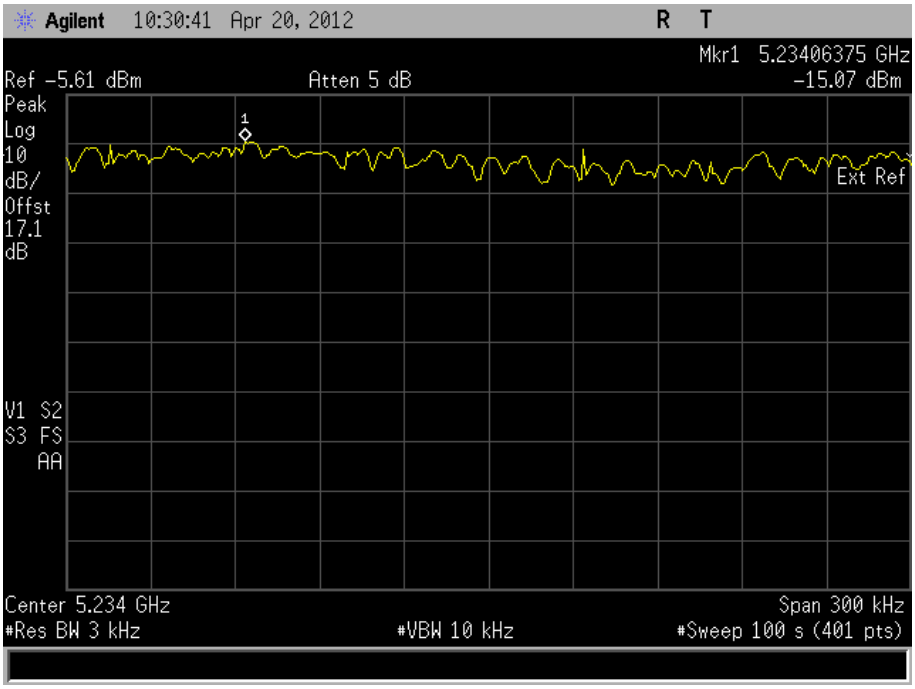
Peak Power Spectral Density (dBm)	-14.94



Product Service

5240 MHz

Peak Power Spectral Density (dBm)	-15.07

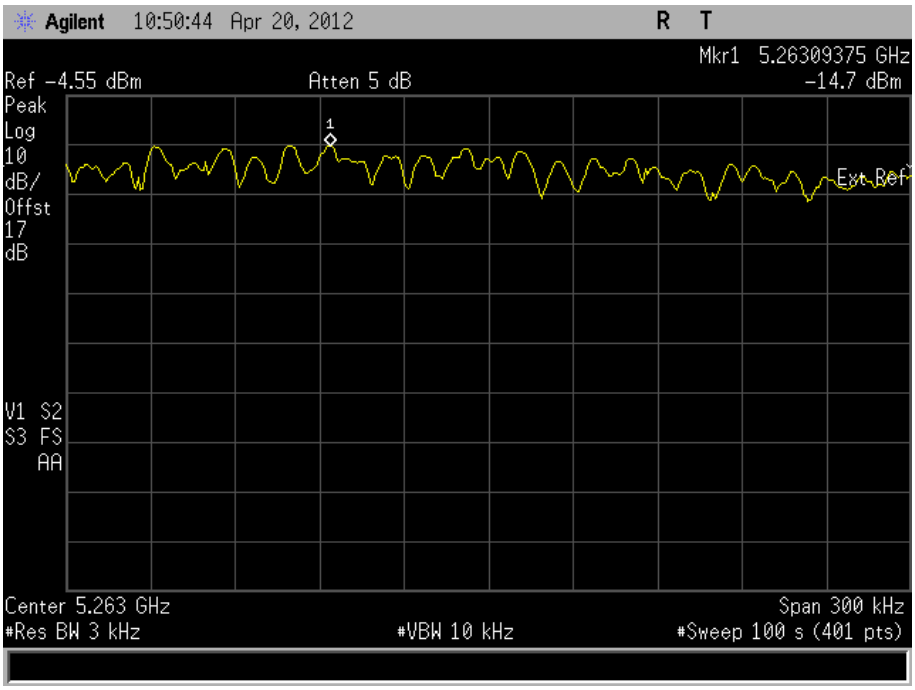


The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 54Mbps.

Frequency Band 2

5260 MHz

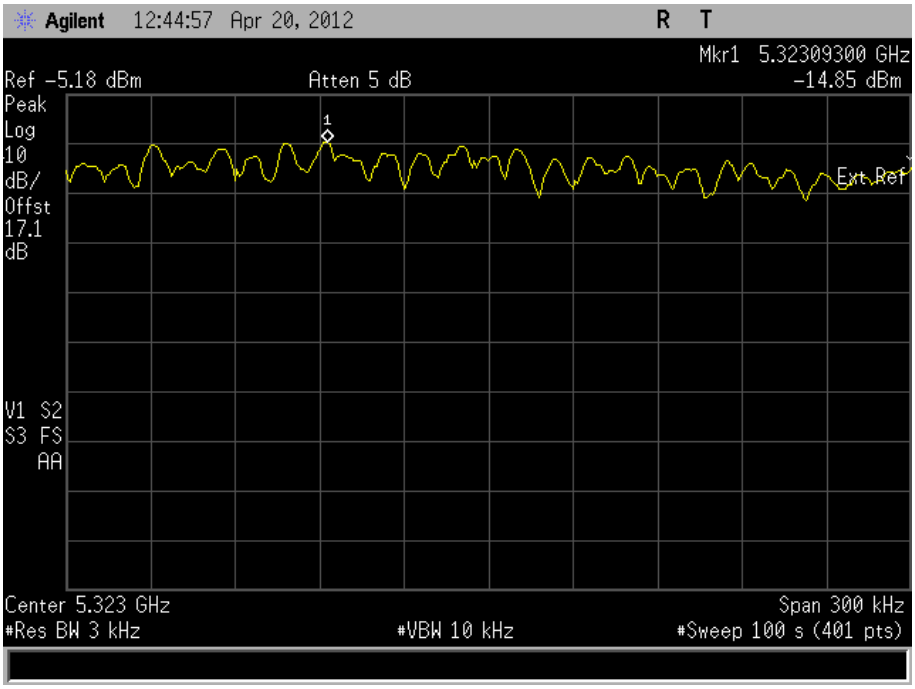
Peak Power Spectral Density (dBm)	-14.7



Product Service

5320 MHz

Peak Power Spectral Density (dBm)	-14.85

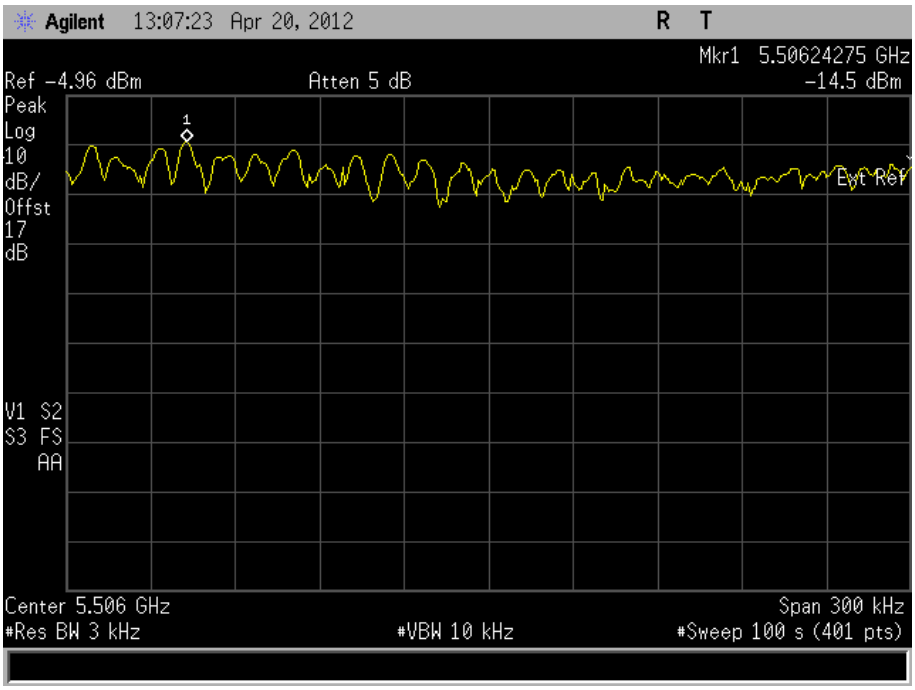


The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 54Mbps.

Frequency Band 3

5500 MHz

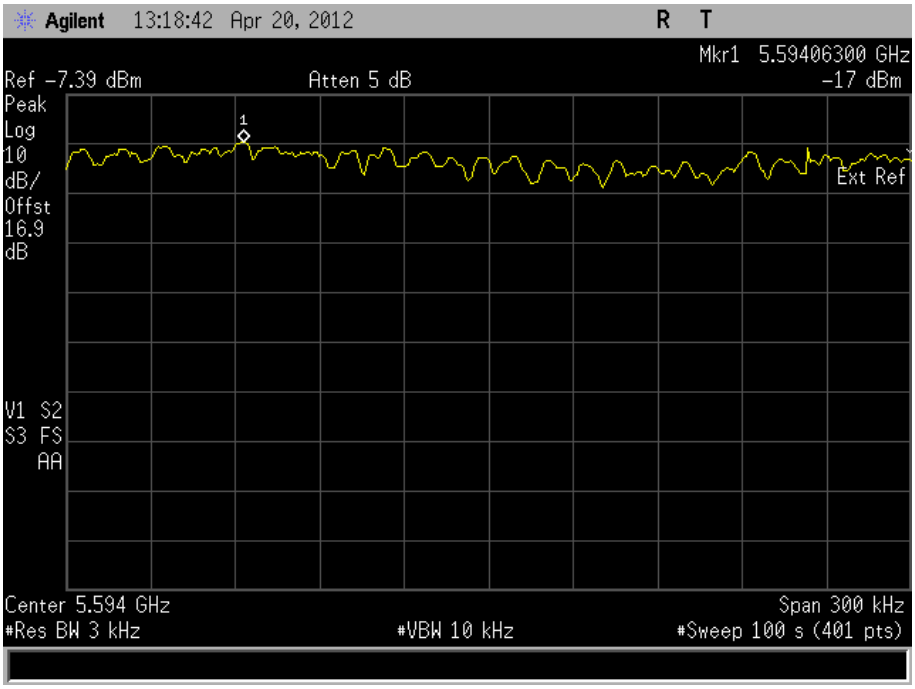
Peak Power Spectral Density (dBm)	-14.5



Product Service

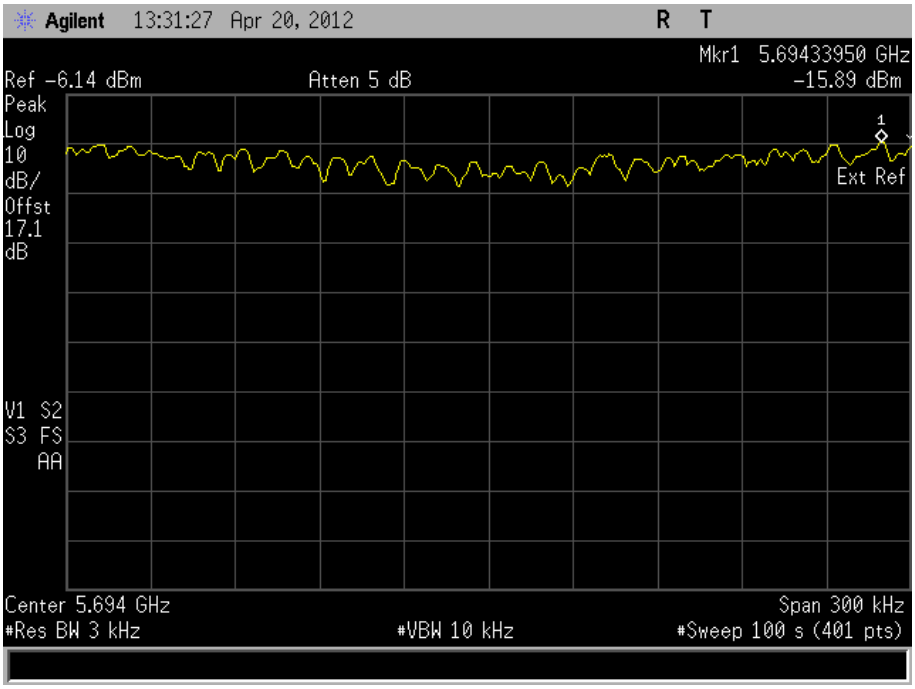
5600 MHz

Peak Power Spectral Density (dBm)	-17.0



5700 MHz

Peak Power Spectral Density (dBm)	-15.89

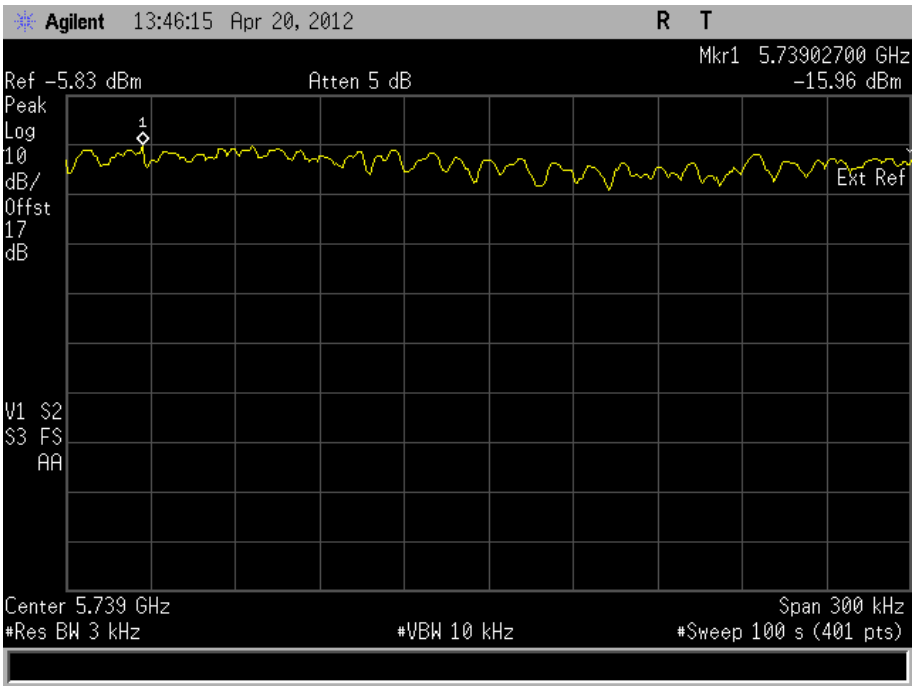


The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 54Mbps.

Frequency Band 4

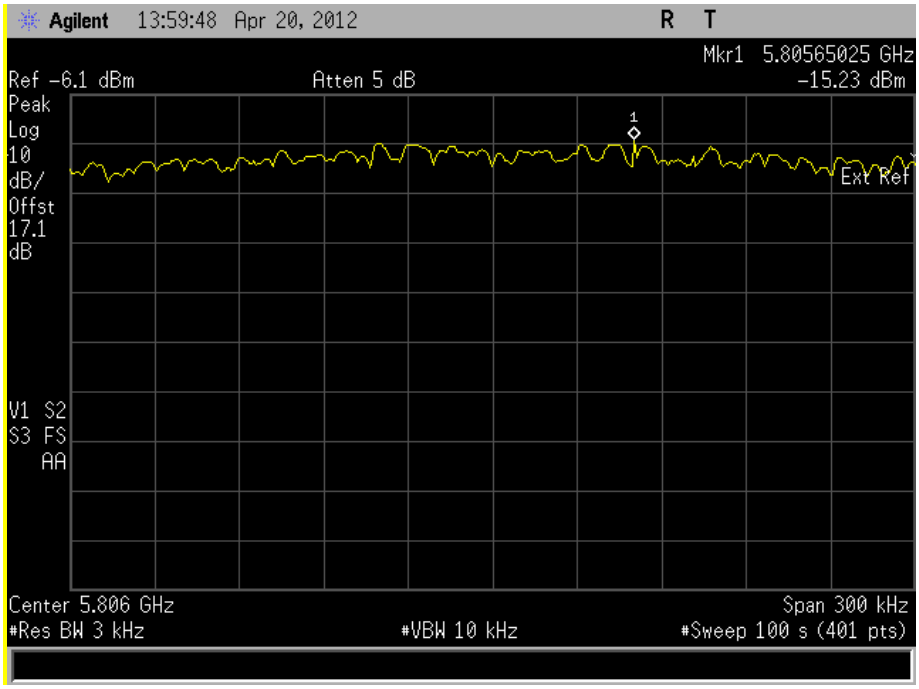
5745 MHz

Peak Power Spectral Density (dBm)	-15.96



5805 MHz

Peak Power Spectral Density (dBm)	-15.23



The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 54Mbps.

Limit

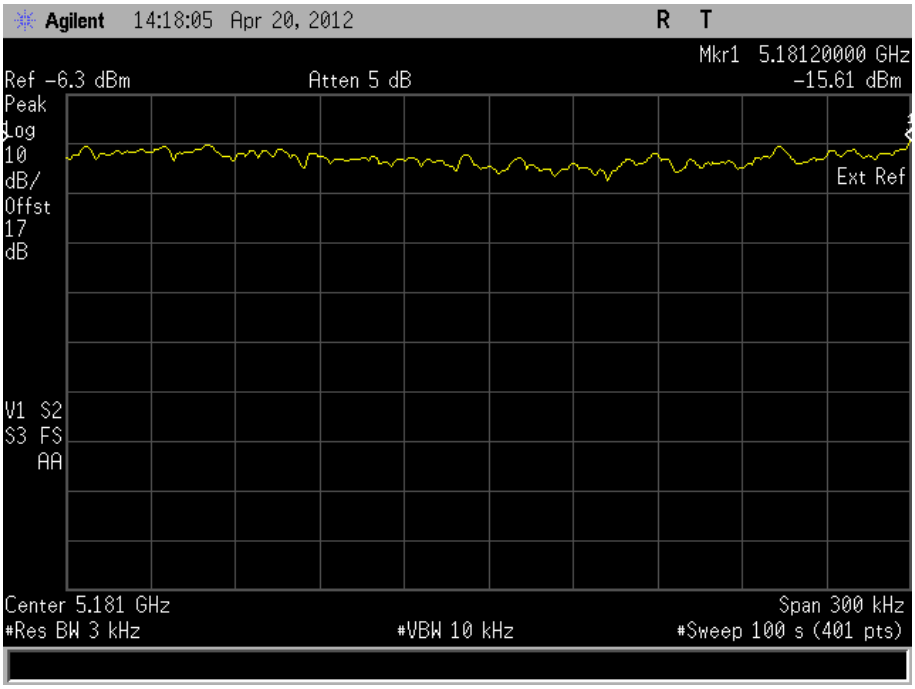
Frequency Band (MHz)	FCC Limit	IC Limit
5150 to 5250	<4 dBm / 1 MHz	<10 dBm / 1 MHz
5250 to 5350	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5470 to 5725	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5725 to 5825	<17 dBm / 1 MHz	<17 dBm / 1 MHz

802.11(n) - 5 GHz, 20 MHz BW – Onboard PIFA Antenna

Frequency Band 1

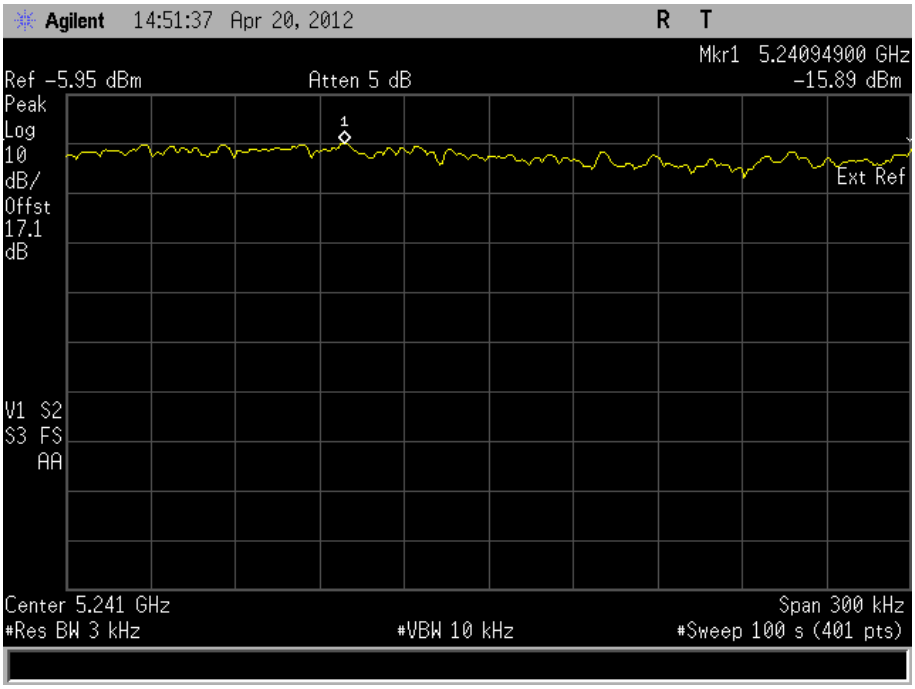
5180 MHz

Peak Power Spectral Density (dBm)	-15.61



5240 MHz

Peak Power Spectral Density (dBm)	-15.89



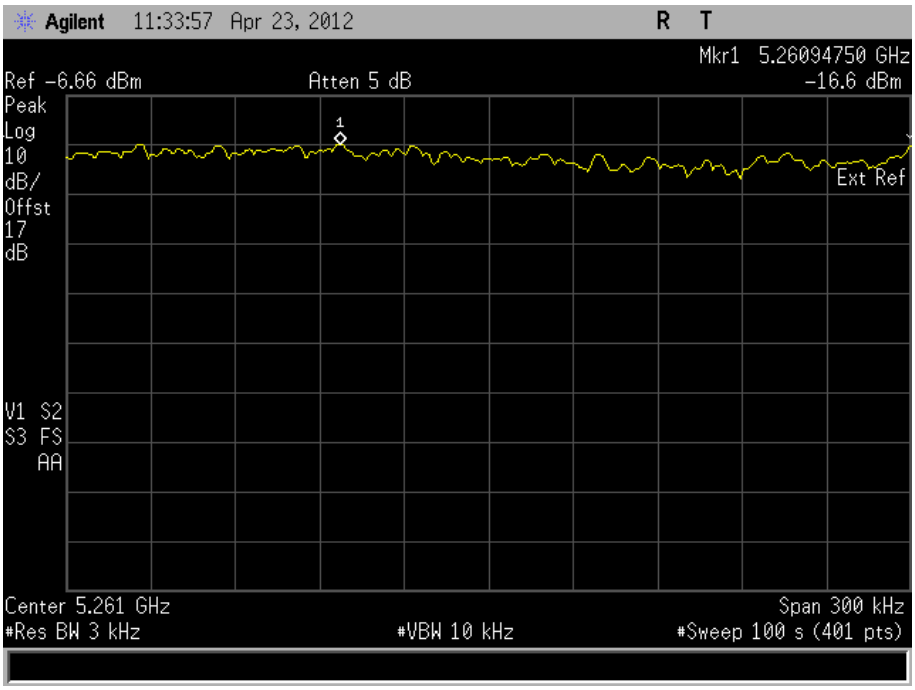
The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 21.70 Mbps.

Product Service

Frequency Band 2

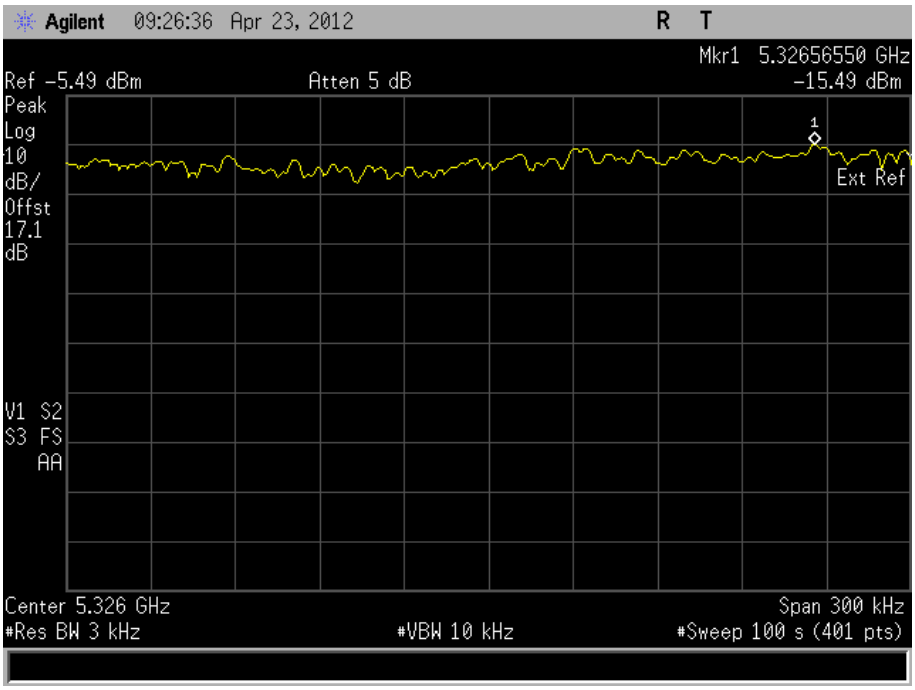
5260 MHz

Peak Power Spectral Density (dBm)	-16.6



5320 MHz

Peak Power Spectral Density (dBm)	-15.49

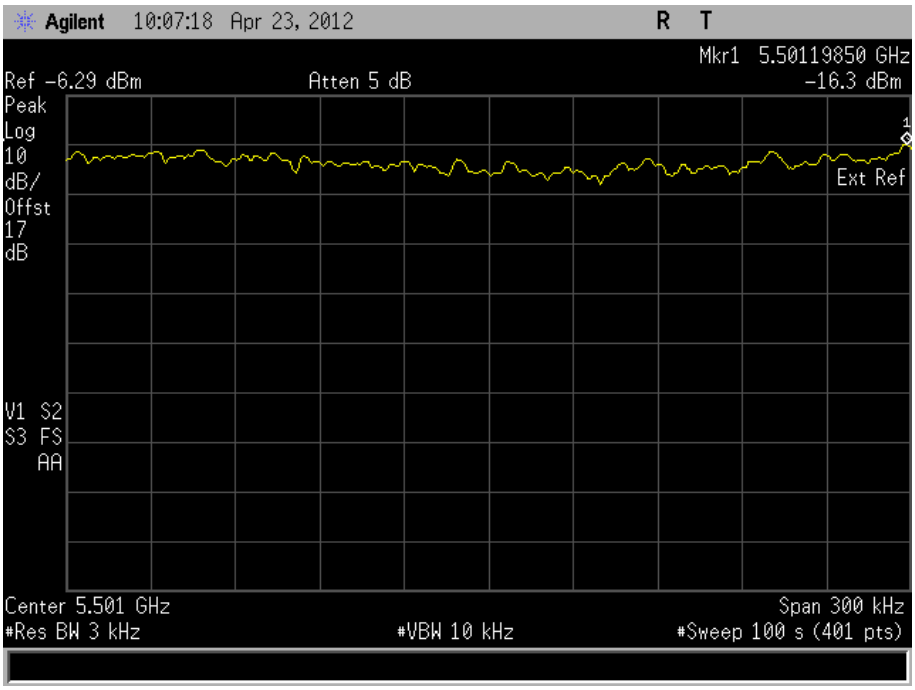


The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 21.70 Mbps.

Frequency Band 3

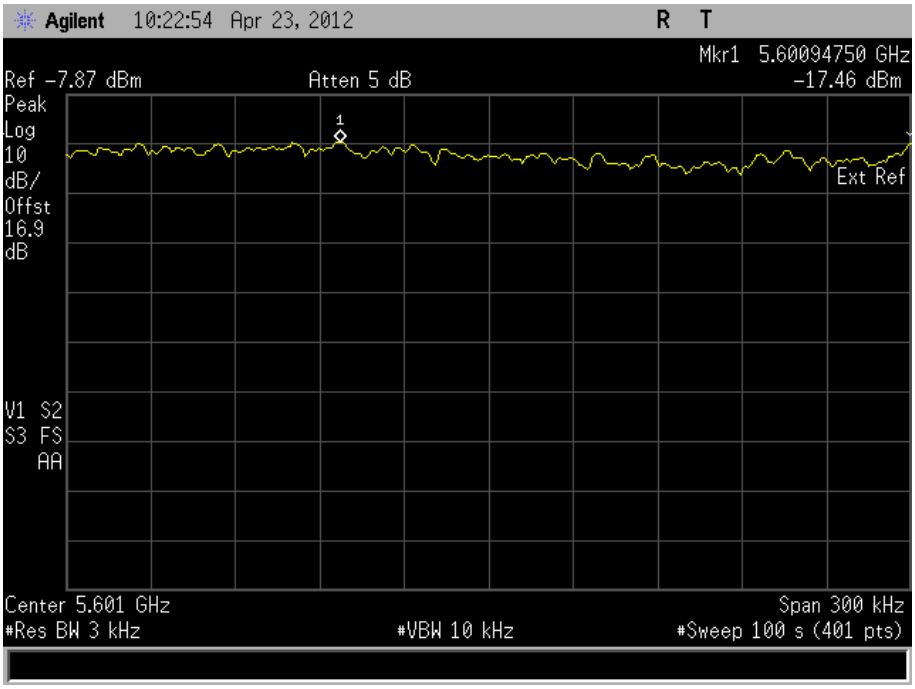
5500 MHz

Peak Power Spectral Density (dBm)	-16.30



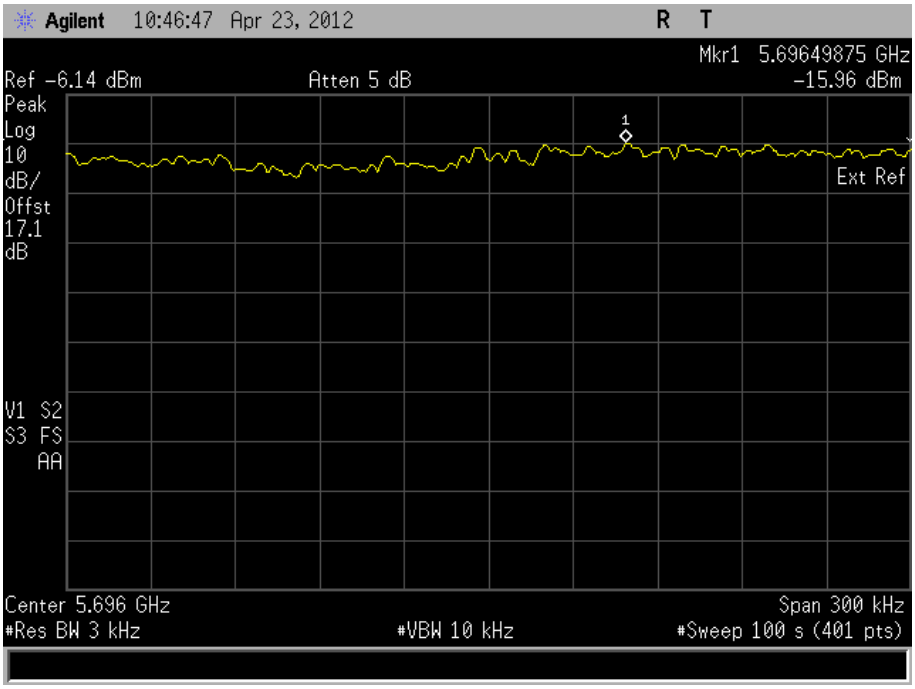
5600 MHz

Peak Power Spectral Density (dBm)	-17.46



5700 MHz

Peak Power Spectral Density (dBm)	-15.96

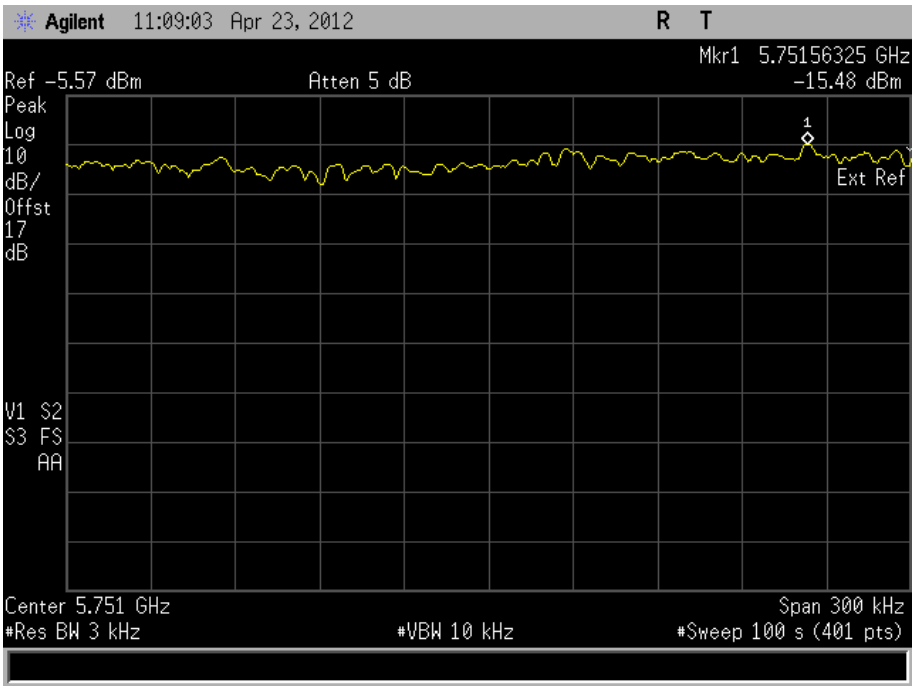


The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 21.70 Mbps.

Frequency Band 4

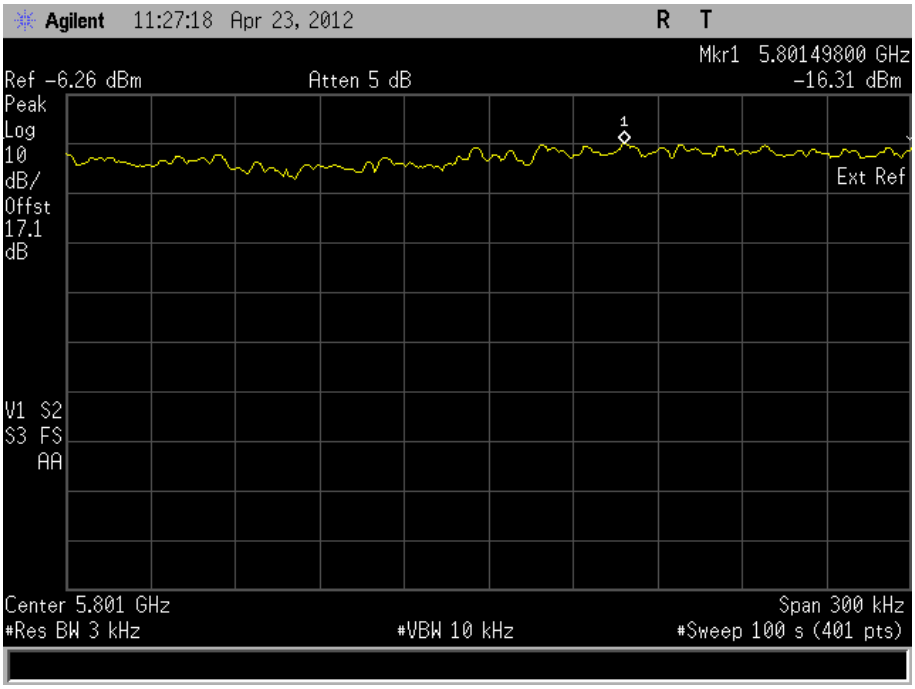
5745 MHz

Peak Power Spectral Density (dBm)	-15.48



5805 MHz

Peak Power Spectral Density (dBm)	-16.31



The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 21.70 Mbps.

Limit

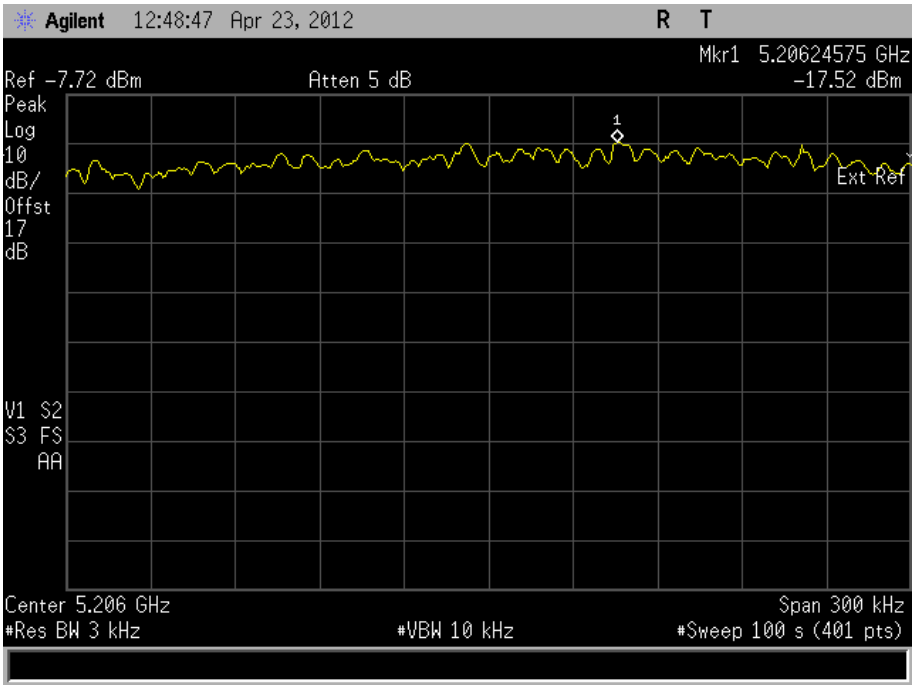
Frequency Band (MHz)	FCC Limit	IC Limit
5150 to 5250	<4 dBm / 1 MHz	<10 dBm / 1 MHz
5250 to 5350	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5470 to 5725	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5725 to 5825	<17 dBm / 1 MHz	<17 dBm / 1 MHz

802.11(n) - 5 GHz 40 MHz BW – Onboard PIFA Antenna

Frequency Band 1

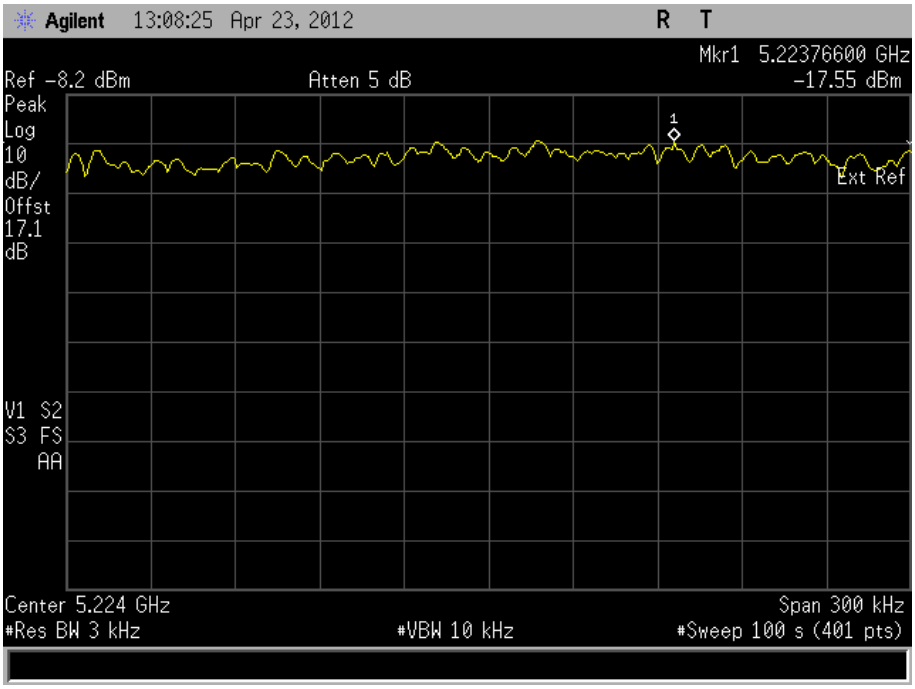
5190 MHz

Peak Power Spectral Density (dBm)	-17.52



5230 MHz

Peak Power Spectral Density (dBm)	-17.55



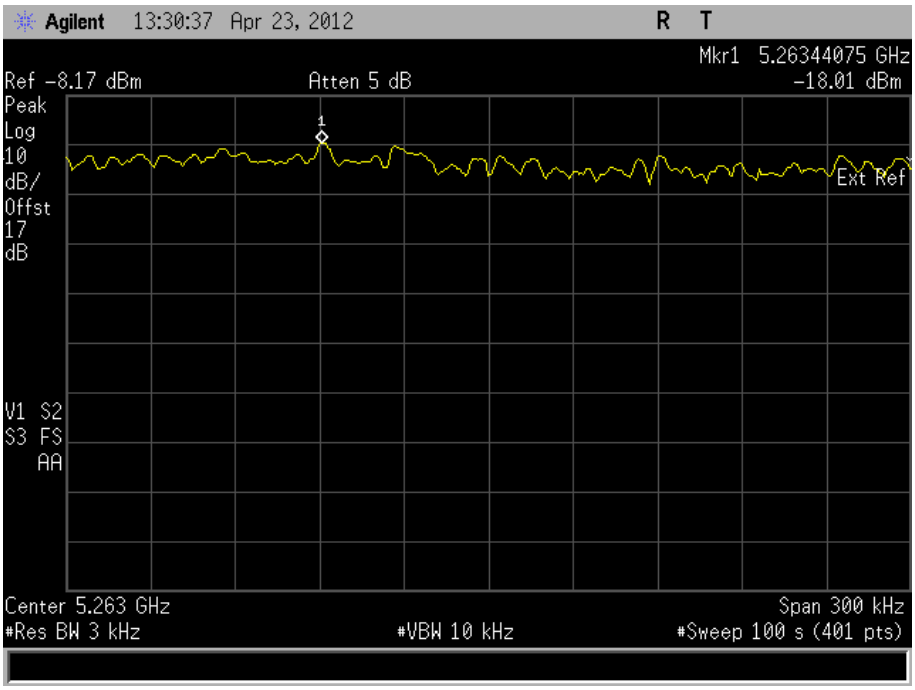
The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 135Mbps.

Product Service

Frequency Band 2

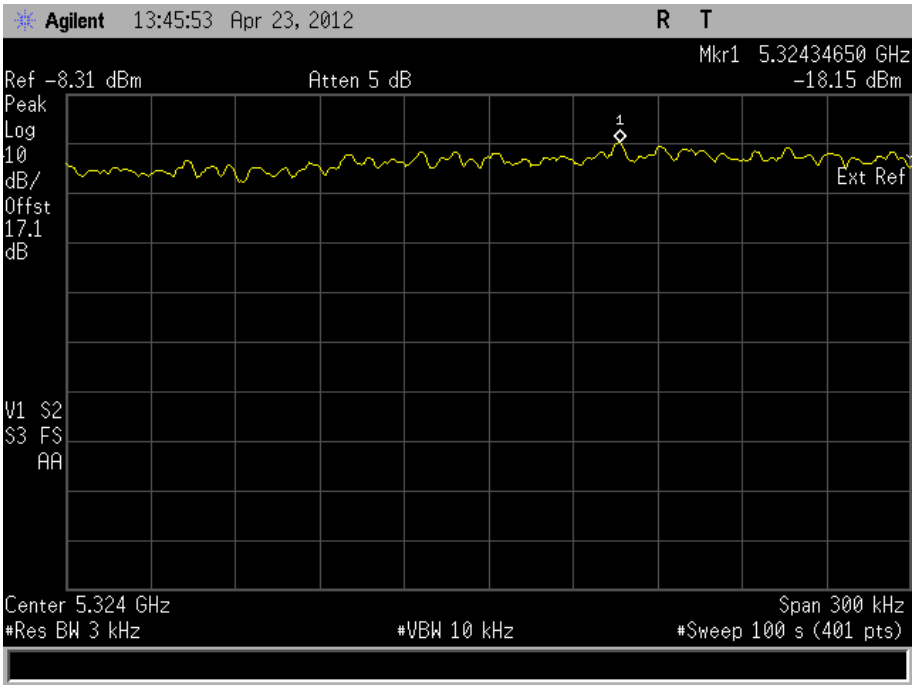
5270 MHz

Peak Power Spectral Density (dBm)	-18.01



5310 MHz

Peak Power Spectral Density (dBm)	-18.15

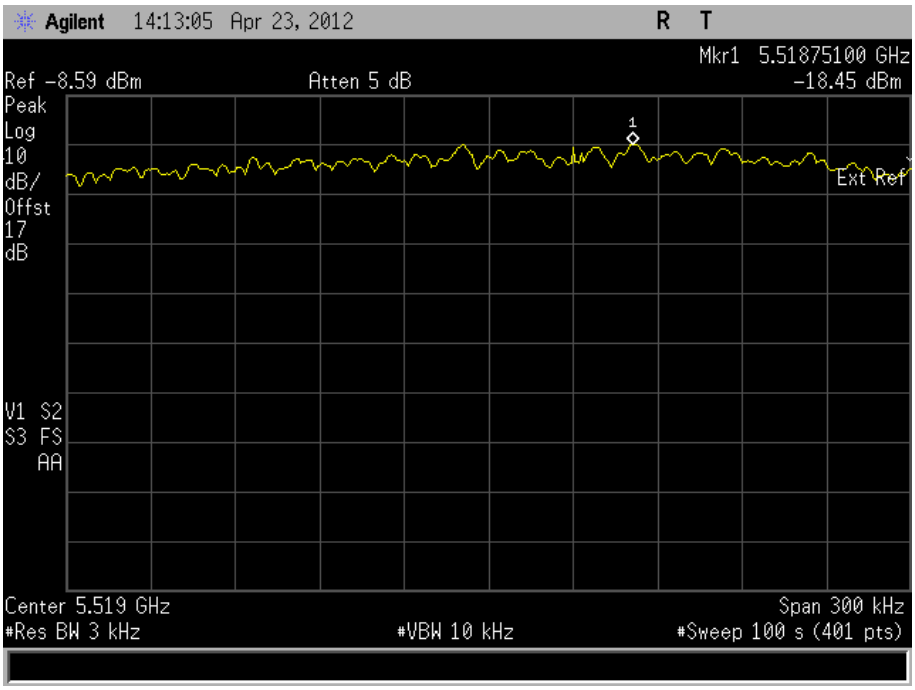


The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 135Mbps.

Frequency Band 3

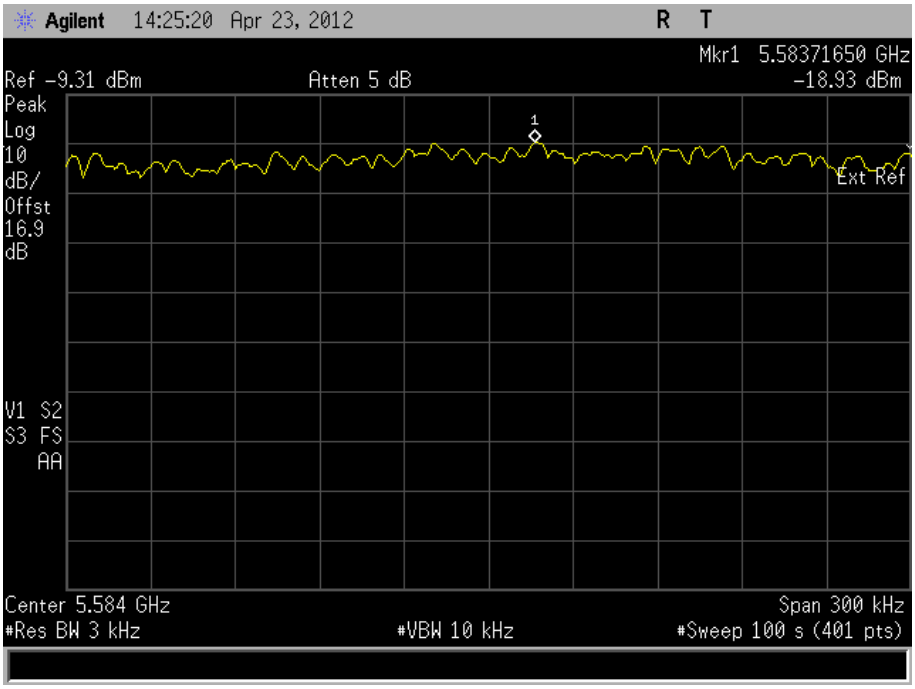
5510 MHz

Peak Power Spectral Density (dBm)	-18.45



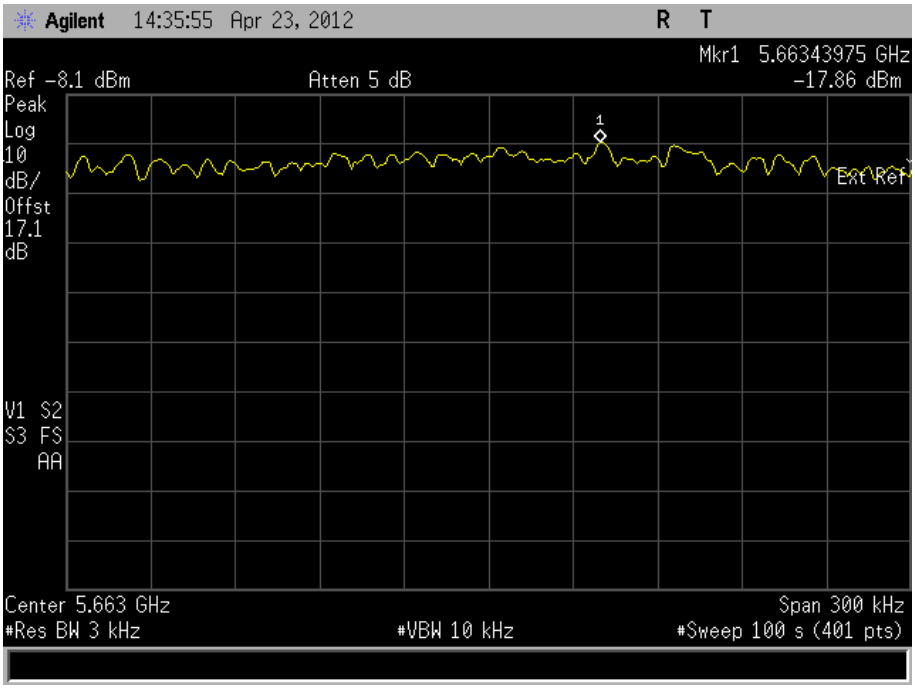
5590 MHz

Peak Power Spectral Density (dBm)	-18.93



5670 MHz

Peak Power Spectral Density (dBm)	-17.86

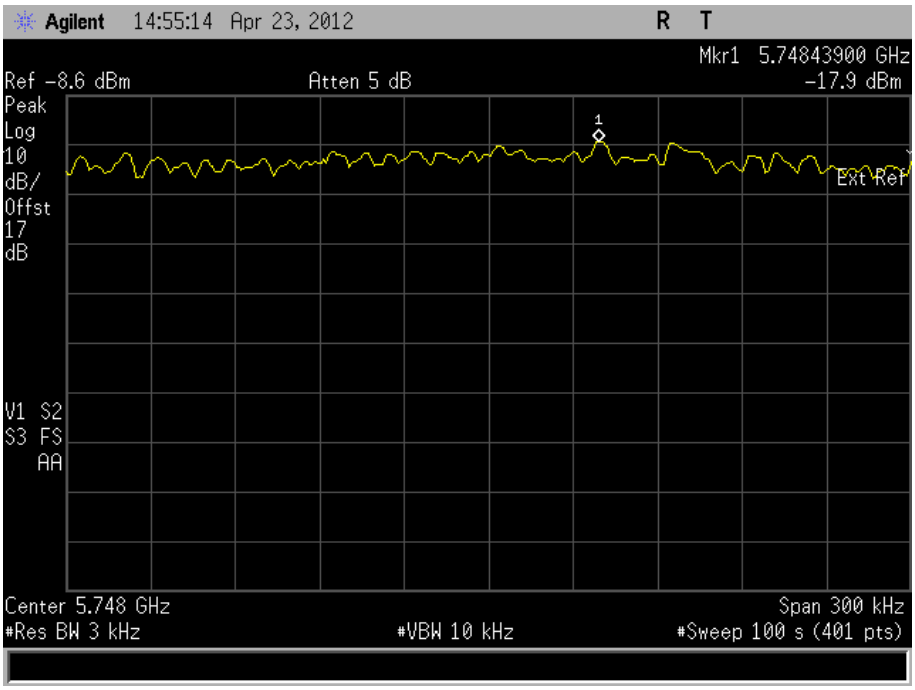


The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 135Mbps.

Frequency Band 4

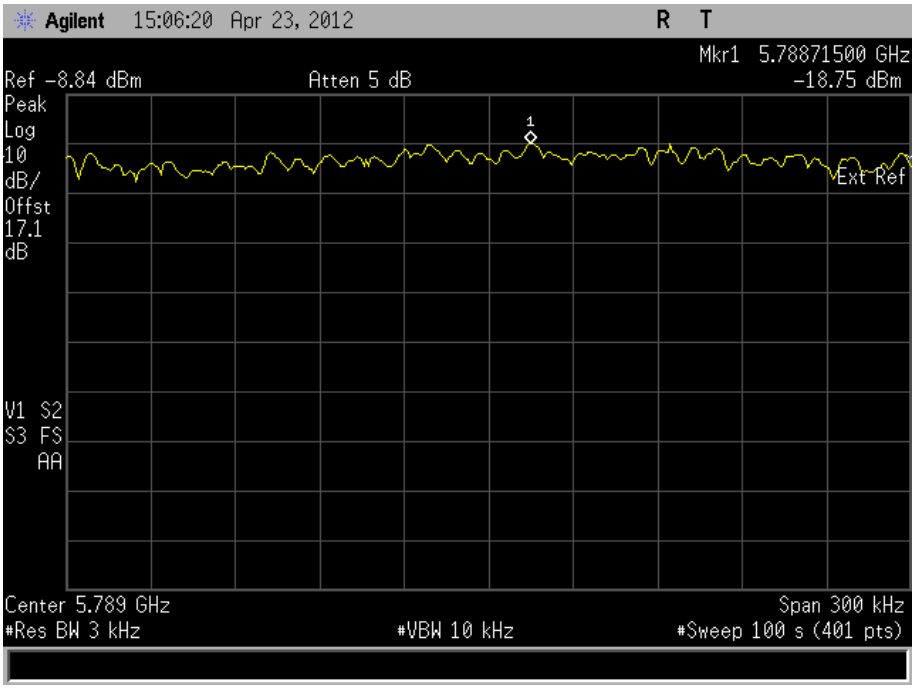
5755 MHz

Peak Power Spectral Density (dBm)	-17.9



5795 MHz

Peak Power Spectral Density (dBm)	-18.75



The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 135Mbps.

Limit

Frequency Band (MHz)	FCC Limit	IC Limit
5150 to 5250	<4 dBm / 1 MHz	<10 dBm / 1 MHz
5250 to 5350	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5470 to 5725	<11 dBm / 1 MHz	<11 dBm / 1 MHz
5725 to 5825	<17 dBm / 1 MHz	<17 dBm / 1 MHz

2.8 RATIO OF THE PEAK EXCURSION OF THE MODULATION ENVELOPE

2.8.1 Specification Reference

FCC CFR 47 Part 15E, Industry Canada RSS-210 and Industry Canada RSS-GEN, Clause 15.407 (a)(6)

2.8.2 Equipment Under Test and Modification State

Venice 6.5 S/N: RAD 103037 on Test Jig S/N: RAD103234 - Modification State 0

2.8.3 Date of Test

20 April 2012, 23 April 2012 & 30 April 2012

2.8.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.8.5 Test Procedure

The EUT was transmitted at maximum power via an attenuator and cable connected to the spectrum analyser. The analyser settings were adjusted to display the resultant trace on screen. The resolution bandwidth and video bandwidth were set to 1MHz and 1MHz respectively. The trace was set to Max Hold and the peak excursion of the modulation envelope was measured. The ratio of this measurement to the maximum conducted output power was measured.

2.8.6 Environmental Conditions

Ambient Temperature	23.1 - 24.2°C
Relative Humidity	30.8 - 32.2%

Product Service

2.8.7 Test Results

802.11(a) – Onboard PIFA Antenna

Frequency Band 1

5180 MHz

Ratio (dB)	10.18

5240 MHz

Ratio (dB)	9.97

The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 54Mbps.

Frequency Band 2

5260 MHz

Ratio (dB)	10.38

5320 MHz

Ratio (dB)	10.65

The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 54Mbps.

Frequency Band 3

5500 MHz

Ratio (dB)	10.46

5600 MHz

Ratio (dB)	10.21

5700 MHz

Ratio (dB)	8.69

The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 54Mbps.

Frequency Band 4

5745 MHz

Ratio (dB)	8.59

5805 MHz

Ratio (dB)	8.02

The test was performed on the worst case data rate for 802.11(a) modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 54Mbps.

Limit

Not specified.

802.11(n) - 5 GHz, 20 MHz BW – Onboard PIFA Antenna

Frequency Band 1

5180 MHz

Ratio (dB)	9.38

5240 MHz

Ratio (dB)	9.25

The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 21.70 Mbps.

Frequency Band 2

5260 MHz

Ratio (dB)	-9.42

5320 MHz

Ratio (dB)	9.48

The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 21.70 Mbps.

Frequency Band 3

5500 MHz

Ratio (dB)	9.4

5600 MHz

Ratio (dB)	9.14

5700 MHz

Ratio (dB)	8.23

The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 21.70 Mbps.

Frequency Band 4

5745 MHz

Ratio (dB)	8.3

5805 MHz

Ratio (dB)	8.03

The test was performed on the worst case data rate for 802.11(n) - 20 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 21.70 Mbps.

Limit

Not specified.

802.11(n) - 5 GHz 40 MHz BW – Onboard PIFA Antenna

Frequency Band 1

5190 MHz

Ratio (dB)	10.04

5230 MHz

Ratio (dB)	9.74

The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 135Mbps.

Frequency Band 2

5270 MHz

Ratio (dB)	10.37

5310 MHz

Ratio (dB)	10.59

The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 135Mbps.

Frequency Band 3

5510 MHz

Ratio (dB)	10.39

5590 MHz

Ratio (dB)	9.92

5670 MHz

Ratio (dB)	8.88

The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 135Mbps.

Frequency Band 4

5755 MHz

Ratio (dB)	8.89

5795 MHz

Ratio (dB)	8.18

The test was performed on the worst case data rate for 802.11(n) - 40 MHz BW modulation. The worst case was deemed as the data rate which produced the highest level of conducted average power. This data rate was 135Mbps.

Limit

Not specified.

Product Service

SECTION 3

TEST EQUIPMENT USED

Product Service

3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.1 – AC Line Conducted Emissions					
LISN (1 Phase)	Chase	MN 2050	336	12	23-Mar-2013
Transient Limiter	Hewlett Packard	11947A	1032	12	22-Jun-2012
Screened Room (5)	Rainford	Rainford	1545	36	3-Feb-2014
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	29-Sep-2012
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	TU
Section 2.2 - Maximum Output Power					
Peak Power Analyser	Hewlett Packard	8990A	107	12	10-Feb-2013
Climatic Chamber	Votsch	VT4002	161	-	O/P Mon
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	8-Dec-2012
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	14-Nov-2012
Dual programable power supply	Thurlby	T-1000	418	-	TU
Power Splitter	Weinschel	1506A	606	12	19-Dec-2012
Power Supply Unit	Farnell	D302T	609	-	O/P Mon
Rubidium Standard	Rohde & Schwarz	XRSM	1316	12	13-Sep-2012
Screened Room (5)	Rainford	Rainford	1545	36	3-Feb-2014
Signal Generator (1GHz to 40GHz)	Rohde & Schwarz	SMR40	1589	12	11-Nov-2012
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Power Sensor	Hewlett Packard	84812A	2743	-	TU
Hygrometer	Rotronic	I-1000	2891	12	3-May-2012
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	22-Aug-2012
Thermocouple Thermometer	Fluke	51	3172	12	23-Jul-2012
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	29-Sep-2012
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	TU
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	27-Jan-2013
'3.5mm' - '3.5mm' RF Cable (2m)	Rhophase	3PS-1803-2000-3PS	3703	-	TU
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	12	26-Aug-2012
Tilt Antenna Mast	maturo Gmbh	TAM 4.0-P	3916	-	TU
Mast Controller	maturo Gmbh	NCD	3917	-	TU
DC - 12.4 GHz 10 dB Attenuator	Suhner	6810.17.A	3965	12	24-Jun-2012
P-Series Power Meter	Agilent	N1911A	3981	12	12-Sep-2012
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3983	12	12-Sep-2012

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.3 – Undesirable Emission Limits					
30V/5A Power Supply	Farnell	L30-5	191	-	O/P Mon
Antenna (Double Ridge Guide)	Link Microtek Ltd	AM180HA-K-TU2	230	24	13-Sep-2013
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	12	14-Nov-2012
Dual Power Supply Unit	Thurlby	PL320	288	-	TU
Dual programable power supply	Thurlby	T-1000	418	-	TU
Filter (High Pass)	Lorch	SHP7-7000-SR	566	12	20-Feb-2013
Power Supply Unit	Farnell	D302T	609	-	O/P Mon
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	28-Jun-2012
Rubidium Standard	Rohde & Schwarz	XRSM	1316	12	13-Sep-2012
Antenna (Double Ridge Guide)	Q-Par Angus Ltd	QSH 180K	1511	24	2-Aug-2012
Pre-Amplifier	Phase One	PS04-0086	1533	12	20-Sep-2012
Pre-Amplifier	Phase One	PSO4-0087	1534	12	26-Sep-2012
Screened Room (5)	Rainford	Rainford	1545	36	3-Feb-2014
Signal Generator (1GHz to 40GHz)	Rohde & Schwarz	SMR40	1589	12	11-Nov-2012
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Test Receiver	Rohde & Schwarz	ESIB40	1934	12	25-Oct-2012
DC Power Supply Unit	Farnell	LT30-2	2116	-	TU
Cable (2m, SMA-SMA)	Reynolds	262-0248-2000	2400	-	TU
High Pass Filter (4GHz)	RLC Electronics	F-100-4000-5-R	2773	12	20-Sep-2012
Hygrometer	Rotronic	I-1000	2891	12	3-May-2012
Antenna (Bilog)	Chase	CBL6143	2904	24	12-May-2013
Attenuator (20dB, 20W)	Weinschel	1	3032	12	TU
Signal Generator (10MHz to 40GHz)	Rohde & Schwarz	SMR40	3171	12	22-Aug-2012
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	29-Sep-2012
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	21-Apr-2012
3 GHz High Pass Filter	K&L Microwave	11SH10-3000/X18000-O/O	3552	12	14-Apr-2012
'2.92mm' - '2.92mm' RF Cable (2m)	Rhophase	KPS-1503-2000-KPS	3694	-	TU
'2.92mm' - '2.92mm' RF Cable (2m)	Rhophase	KPS-1503-2000-KPS	3695	-	TU
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	27-Jan-2013
'3.5mm' - '3.5mm' RF Cable (2m)	Rhophase	3PS-1803-2000-3PS	3703	-	TU
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	12	26-Aug-2012
Tilt Antenna Mast	maturo Gmbh	TAM 4.0-P	3916	-	TU
Mast Controller	maturo Gmbh	NCD	3917	-	TU
DC - 12.4 GHz 10 dB Attenuator	Suhner	6810.17.A	3965	12	24-Jun-2012
Low Noise Amplifier	Wright Technologies	APS04-0085	3969	12	8-Jul-2012

Product Service

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.4 - Frequency Stability					
Climatic Chamber	Votsch	VT4002	161	-	O/P Mon
Dual programable power supply	Thurlby	T-1000	418	-	TU
Power Splitter	Weinschel	1506A	606	12	19-Dec-2012
Power Supply Unit	Farnell	D302T	609	-	O/P Mon
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	28-Jun-2012
Rubidium Standard	Rohde & Schwarz	XRSM	1316	12	13-Sep-2012
Hygrometer	Rotronic	I-1000	2891	12	3-May-2012
Thermocouple Thermometer	Fluke	51	3172	12	23-Jul-2012
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	27-Jan-2013
DC - 12.4 GHz 10 dB Attenuator	Suhner	6810.17.A	3965	12	24-Jun-2012
Section 2.5 – 26 dB Bandwidth					
Dual programable power supply	Thurlby	T-1000	418	-	TU
Power Supply Unit	Farnell	D302T	609	-	O/P Mon
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	28-Jun-2012
Rubidium Standard	Rohde & Schwarz	XRSM	1316	12	13-Sep-2012
Hygrometer	Rotronic	I-1000	2891	12	3-May-2012
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	27-Jan-2013
DC - 12.4 GHz 10 dB Attenuator	Suhner	6810.17.A	3965	12	24-Jun-2012
Section 2.6 – 99% Bandwidth					
Dual programable power supply	Thurlby	T-1000	418	-	TU
Power Supply Unit	Farnell	D302T	609	-	O/P Mon
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	28-Jun-2012
Rubidium Standard	Rohde & Schwarz	XRSM	1316	12	13-Sep-2012
Hygrometer	Rotronic	I-1000	2891	12	3-May-2012
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	27-Jan-2013
DC - 12.4 GHz 10 dB Attenuator	Suhner	6810.17.A	3965	12	24-Jun-2012
Section 2.7- Peak Power Spectral Density					
Dual programable power supply	Thurlby	T-1000	418	-	TU
Power Splitter	Weinschel	1506A	606	12	19-Dec-2012
Power Supply Unit	Farnell	D302T	609	-	O/P Mon
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	28-Jun-2012
Rubidium Standard	Rohde & Schwarz	XRSM	1316	12	13-Sep-2012
Hygrometer	Rotronic	I-1000	2891	12	3-May-2012
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	27-Jan-2013
DC - 12.4 GHz 10 dB Attenuator	Suhner	6810.17.A	3965	12	24-Jun-2012

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Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.8 - Ratio of the Peak Excursion of the Modulation Envelope					
Climatic Chamber	Votsch	VT4002	161	-	O/P Mon
Dual programable power supply	Thurlby	T-1000	418	-	TU
Power Splitter	Weinschel	1506A	606	12	19-Dec-2012
Power Supply Unit	Farnell	D302T	609	-	O/P Mon
Rubidium Standard	Rohde & Schwarz	XRSM	1316	12	13-Sep-2012
Hygrometer	Rotronic	I-1000	2891	12	3-May-2012
Thermocouple Thermometer	Fluke	51	3172	12	23-Jul-2012
'3.5mm' - '3.5mm' RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3697	12	27-Jan-2013
DC - 12.4 GHz 10 dB Attenuator	Suhner	6810.17.A	3965	12	24-Jun-2012
P-Series Power Meter	Agilent	N1911A	3981	12	12-Sep-2012
50 MHz-18 GHz Wideband Power Sensor	Agilent	N1921A	3983	12	12-Sep-2012

TU – Traceability Unscheduled
O/P MON – Output Monitored with Calibrated Equipment

3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	MU
Power Limits	Conducted: ± 0.70 dB Radiated: 30MHz to 1GHz: ± 5.1 dB Radiated: 1GHz to 40GHz: ± 6.3 dB
Undesirable Emission Limits	Conducted: ± 3.454 dB Radiated: ± 3.08 dB
AC Line Conducted Emissions	± 3.2 dB
Frequency Stability	± 90.32 Hz
26 dB Bandwidth	± 5.72 kHz
99 % Emission Bandwidth	± 5.72 kHz
Peak Power Spectral Density	± 3.0 dB
Ratio of the Peak Excursion of the Modulation Envelope	± 0.70 dB

Product Service

SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).