

Radio Test Report No: **EDCS-1393370**

FCC ID: LDK88611057

IC: 2461B-88611057



Radio Intentional EMC Test Report: EDCS - 1393370

For

CP-8861

5250MHz -5350MHz WLAN Radio 802.11 a/n/ac

5470MHz – 5725Mhz WLAN Radio 802.11a/n/ac

FCC ID: LDK88611057

IC: 2461B-88611057

Against the following Specifications :

47 CFR 15.247

RSS-210

RSS-102

RSS GEN

Cisco Systems

170 West Tasman Drive

San Jose, CA 95134

Author: Jose Aguirre

Approved By: Dilip Patel

Title: Manager

This report replaces any previously entered test report under **EDCS-1393370**



This test report has been electronically authorized and archived using the CISCO Engineering Document Control system.

SECTION 1: OVERVIEW	3
1.1 TEST SUMMARY	3
SECTION 2: ASSESSMENT INFORMATION	4
2.1 GENERAL	4
2.4 TESTING FACILITIES	5
2.6 EUT DESCRIPTION	5
SECTION 3: RESULT SUMMARY	7
3.1 RESULTS SUMMARY TABLE	7
SECTION 4: SAMPLE DETAILS	8
4.1 SAMPLE DETAILS (PHOTOGRAPHS OF THE TEST SAMPLES, WHERE APPROPRIATE CAN BE FOUND IN APPENDIX H)	8
4.2 SYSTEM DETAILS	9
4.3 MODE OF OPERATION DETAILS	9
APPENDIX A: TEST RESULTS.....	10
DUTY CYCLE.....	10
99% AND 26dB BANDWIDTH	12
PEAK OUTPUT POWER.....	18
POWER SPECTRAL DENSITY	18
PEAK EXCURSION.....	25
CONDUCTED SPURIOUS EMISSIONS	31
CONDUCTED BANDEDGE.....	43
RADIATED TX SPURIOUS EMISSIONS.....	48
RECIEVER SPURIOUS EMISSIONS	74
CO-LOCATION SPURIOUS EMISSIONS	81
AC MAINS CONDUCTED EMISSIONS	88
APPENDIX B: ABBREVIATION KEY AND DEFINITIONS	91
APPENDIX C: TEST EQUIPMENT/SOFTWARE USED TO PERFORM THE TEST	92
APPENDIX D: TEST PROCEDURES	94



Section 1: Overview

1.1 Test Summary

samples were assessed against the tests detailed in section 3 under the requirements of the following specifications:

CFR47 Part 15.407

RSS-210

RSS-GEN



Section 2: Assessment Information

2.1 General

This report contains an assessment of an apparatus against Electromagnetic Compatibility Standards based upon tests carried out on the samples submitted. The testing was performed by and for the use of Cisco systems Inc:

With regard to this assessment, the following points should be noted:

- a) The results contained in this report relate only to the items tested and were obtained in the period between the date of the initial assessment and the date of issue of the report. Manufactured products will not necessarily give identical results due to production and measurement tolerances.
- b) The apparatus was set up and exercised using the configuration and modes of operation defined in this report only.
- c) Where relevant, the apparatus was only assessed using the susceptibility criteria defined in this report and the Test Assessment Plan (TAP).
- d) All testing was performed under the following environmental conditions:

Temperature	15°C to 35°C (54°F to 95°F)
Atmospheric Pressure	860mbar to 1060mbar (25.4" to 31.3")
Humidity	10% to 75*%

*[Where applicable] For ESD testing the humidity limits used were 30% to 60% and for EFT/B tests the humidity limits used were 25% to 75%.
- e) All AC testing was performed at one or more of the following supply voltages:

110V 60 Hz (+/-20%)

This report must not be reproduced except in full, without written approval of Cisco Systems.



2.2 Date of start of testing

22-Jan-2014

2.3 Report Issue Date

Cisco uses an electronic system to issue, store and control the revision of test reports. This system is called the Engineering Document Control System (EDCS). The actual report issue date is embedded into the original file on EDCS. Any copies of this report, either electronic or paper, that are not on EDCS must be considered uncontrolled

2.4 Testing facilities

This assessment was performed by:

Testing Laboratory

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134
USA

Test Engineers

Jose Aguirre

2.5 Equipment Assessed (EUT)

CP-8861 802.11AC IP Phone

2.6 EUT Description

The CP-8861 802.11AC IP Phone supports the following modes of operation. The modes are further defined in the radio Theory of Operation. The modes included in this report represent the worst case data for all modes.

This specification is applied to the IEEE802.11a/b/g/n/ac W-LAN + Bluetooth 3.0/HS.

- Broadcom BCM4339 inside
- Compliant with IEEE802.11a/b/g/n/ac
- Compliant with Bluetooth specification v3.0+HS
- The FM supports HCI for communication
- Supports standard SDIO v3.0 host interface
- Interface support for Bluetooth is Host Controller Interface (HCI)
- Surface mount type 7.8 x 7.4mm, t=1.0mm Max
- Weight : 0.14g- MSL : Level 3
- RoHS compliant

802.11A , Legacy OFDM, Non HT-20, 6 to 54 Mbps (6Mbps worst case)



802.11N, HT-20, Single Antenna, M0 to M7 (M0 worst Case)

802.11N, HT-40, Single Antenna, M0 to M7 (M0 worst Case)

802.11AC, HT-80, Single Antennas, M0 to M9 (M0 worst Case)

The following Antenna(s) are supported by this product

Frequency	Part number	Antenna Type	Antenna Gain (dBi)
2400-2483.5MHz	Internal	Omni-directional	3.11
5150-5250MHz	Internal	Omni-directional	3.62
5250-5350MHz	Internal	Omni-directional	3.66
5470-5725MHz	Internal	Omni-directional	3.10
5725-5850MHz	Internal	Omni-directional	3.79



Section 3: Result Summary

3.1 Results Summary Table

Conducted emissions

Basic Standard	Test Procedure	Test Details / Comments	Result
Power Spectral Density	KDB 789033	15.407 (A2): the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi	Pass
Peak Output Power	KDB 789033	15.407: (A2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.	Pass
Peak Excursion	KDB 789033	15.407: The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less	Pass
Conducted Spurious Emissions	KDB 789033	15.407: (2) For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band. (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.	Pass
Band Edge Measurements	KDB 789033	Emissions which fall in the restricted bands, as defined in Sec. 15.205(a), must also comply with the radiated emission limits specified in Sec. 15.209(a). (RSS-210 Sec2.7)	Pass



AC conducted Emissions:	ANSI C63.10	AC conducted Emissions: Except when the requirements applicable to a given device state otherwise, for any radio apparatus equipped to operate from the public utility AC power supply, either directly or indirectly (such as with a battery charger), the radio frequency voltage of emissions conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in the table in these sections. The more stringent limit applies at the frequency range boundaries. FCC 15.207 /RSS-Gen 7.2.4	Pass
--------------------------------	----------------	---	------

Radiated emissions

Basic Standard	Test Procedure	Test Details / Comments	Result
Radiated Spurious and Harmonic Emissions	ANSI C63.10 KDB 789033	Radiated emissions which fall in the restricted bands, as defined in Sec. 15.205(a), must also comply with the radiated emission limits specified in Sec. 15.209(a). (RSS-210 Sec2.7)	Pass
RX Spurious Emissions	ANSI C63.10	RX Spurious Emissions: Spurious emissions from the receivers shall not exceed the radiated limits of receiver spurious emissions shown in table 2 in section 6.1. RSS-Gen 4.10	Pass

* MPE measurements reported in separate report.

Section 4: Sample Details

Note: Each sample was evaluated to ensure that its condition was suitable to be used as a test sample prior to the commencement of testing. Please also refer to the "Justification for worst Case test Configuration" section of this report for further details on the selection of EUT samples.

4.1 Sample Details (Photographs of the test samples, where appropriate can be found in appendix H)

Sample No.	Equipment Details	Part Number	Manufacturer	Hardware Rev.	Serial Number
S01	CP-8861	68-5283-01	Cisco Systems	P2	FCH18018UG2
S02	PWR-SPLY	BT-AG4404GE	Bestec	NA	12E000156



4.2 System Details

System #	Description	Samples
1	EUT	S01, S02

4.3 Mode of Operation Details

Mode#	Description	Comments
1	Continuous Transmitting	Continuous Transmitting



Appendix A: Test Results

**Duty Cycle
KDB 789033 B(2b)**

The zero-span mode on a spectrum analyzer or EMI receiver, if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set RBW ≥ EBW if possible; otherwise, set RBW to the largest available value. Set VBW ≥ RBW. Set detector = peak or average.

Description	Plot																									
<p>802.11A Non HT-20</p> <p>Duty Cycle (x) = Tx on/ Tx period Tx on = 3.062mS Tx period = 3.16mS</p> <p>$x = 3.062/3.160 = 0.97$</p> <p>Duty Cycle Correction Factor (DCCF) $= 10\text{Log}(1/x)$ = 0.14 dB</p>	<table border="1"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>1R</td> <td>(1)</td> <td>Time</td> <td>618.8 µs</td> <td>-20.44 dB</td> </tr> <tr> <td>1Δ</td> <td>(1)</td> <td>Time</td> <td>3.062 ms</td> <td>-24.64 dB</td> </tr> <tr> <td>2R</td> <td>(1)</td> <td>Time</td> <td>617.1 µs</td> <td>-8.40 dB</td> </tr> <tr> <td>2Δ</td> <td>(1)</td> <td>Time</td> <td>3.16 ms</td> <td>-22.12 dB</td> </tr> </tbody> </table> <p>Copyright 2000-2004 Agilent Technologies</p>	Marker	Trace	Type	X Axis	Amplitude	1R	(1)	Time	618.8 µs	-20.44 dB	1Δ	(1)	Time	3.062 ms	-24.64 dB	2R	(1)	Time	617.1 µs	-8.40 dB	2Δ	(1)	Time	3.16 ms	-22.12 dB
Marker	Trace	Type	X Axis	Amplitude																						
1R	(1)	Time	618.8 µs	-20.44 dB																						
1Δ	(1)	Time	3.062 ms	-24.64 dB																						
2R	(1)	Time	617.1 µs	-8.40 dB																						
2Δ	(1)	Time	3.16 ms	-22.12 dB																						
<p>802.11 N HT-20</p> <p>Duty Cycle (x) = Tx on/ Tx period Tx on = 1.39mS Tx period = 1.489mS</p> <p>$x = 1.39/1.489 = 0.94$</p> <p>Duty Cycle Correction Factor (DCCF) $= 10\text{Log}(1/x)$ = 0.3dB</p>	<table border="1"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>1R</td> <td>(1)</td> <td>Time</td> <td>368 µs</td> <td>-28.42 dB</td> </tr> <tr> <td>1Δ</td> <td>(1)</td> <td>Time</td> <td>1.39 ms</td> <td>3.16 dB</td> </tr> <tr> <td>2R</td> <td>(1)</td> <td>Time</td> <td>368 µs</td> <td>-28.42 dB</td> </tr> <tr> <td>2Δ</td> <td>(1)</td> <td>Time</td> <td>1.489 ms</td> <td>2.31 dB</td> </tr> </tbody> </table> <p>Copyright 2000-2004 Agilent Technologies</p>	Marker	Trace	Type	X Axis	Amplitude	1R	(1)	Time	368 µs	-28.42 dB	1Δ	(1)	Time	1.39 ms	3.16 dB	2R	(1)	Time	368 µs	-28.42 dB	2Δ	(1)	Time	1.489 ms	2.31 dB
Marker	Trace	Type	X Axis	Amplitude																						
1R	(1)	Time	368 µs	-28.42 dB																						
1Δ	(1)	Time	1.39 ms	3.16 dB																						
2R	(1)	Time	368 µs	-28.42 dB																						
2Δ	(1)	Time	1.489 ms	2.31 dB																						



<p>802.11N HT-40</p> <p>Duty Cycle (x) = Tx on/ Tx period Tx on = 1.39mS Tx period = 1.489mS</p> <p>$x = 1.39/1.489 = 0.94$</p> <p>Duty Cycle Correction Factor (DCCF) $= 10\text{Log}(1/x)$ = 0.3dB</p>	<table border="1"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>1R</td> <td>(1)</td> <td>Time</td> <td>368 μs</td> <td>-28.42 dBm</td> </tr> <tr> <td>1Δ</td> <td>(1)</td> <td>Time</td> <td>1.39 ms</td> <td>3.16 dB</td> </tr> <tr> <td>2R</td> <td>(1)</td> <td>Time</td> <td>368 μs</td> <td>-28.42 dBm</td> </tr> <tr> <td>2Δ</td> <td>(1)</td> <td>Time</td> <td>1.489 ms</td> <td>2.31 dB</td> </tr> </tbody> </table> <p>Copyright 2000-2004 Agilent Technologies</p>	Marker	Trace	Type	X Axis	Amplitude	1R	(1)	Time	368 μs	-28.42 dBm	1Δ	(1)	Time	1.39 ms	3.16 dB	2R	(1)	Time	368 μs	-28.42 dBm	2Δ	(1)	Time	1.489 ms	2.31 dB
Marker	Trace	Type	X Axis	Amplitude																						
1R	(1)	Time	368 μs	-28.42 dBm																						
1Δ	(1)	Time	1.39 ms	3.16 dB																						
2R	(1)	Time	368 μs	-28.42 dBm																						
2Δ	(1)	Time	1.489 ms	2.31 dB																						
<p>802.11AC HT80</p> <p>Duty Cycle (x) = Tx on/ Tx period Tx on = 682uS Tx period = 781uS</p> <p>$x = 682/781 = 0.87$</p> <p>Duty Cycle Correction Factor (DCCF) $= 10\text{Log}(1/x)$ = 0.59dB</p>	<table border="1"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td>1R</td> <td>(1)</td> <td>Time</td> <td>794 μs</td> <td>-24.45 dBm</td> </tr> <tr> <td>1Δ</td> <td>(1)</td> <td>Time</td> <td>682 μs</td> <td>3.46 dB</td> </tr> <tr> <td>2R</td> <td>(1)</td> <td>Time</td> <td>794 μs</td> <td>-24.45 dBm</td> </tr> <tr> <td>2Δ</td> <td>(1)</td> <td>Time</td> <td>781 μs</td> <td>1.61 dB</td> </tr> </tbody> </table> <p>Copyright 2000-2004 Agilent Technologies</p>	Marker	Trace	Type	X Axis	Amplitude	1R	(1)	Time	794 μs	-24.45 dBm	1Δ	(1)	Time	682 μs	3.46 dB	2R	(1)	Time	794 μs	-24.45 dBm	2Δ	(1)	Time	781 μs	1.61 dB
Marker	Trace	Type	X Axis	Amplitude																						
1R	(1)	Time	794 μs	-24.45 dBm																						
1Δ	(1)	Time	682 μs	3.46 dB																						
2R	(1)	Time	794 μs	-24.45 dBm																						
2Δ	(1)	Time	781 μs	1.61 dB																						

- Worst case data rate



99% and 26dB Bandwidth

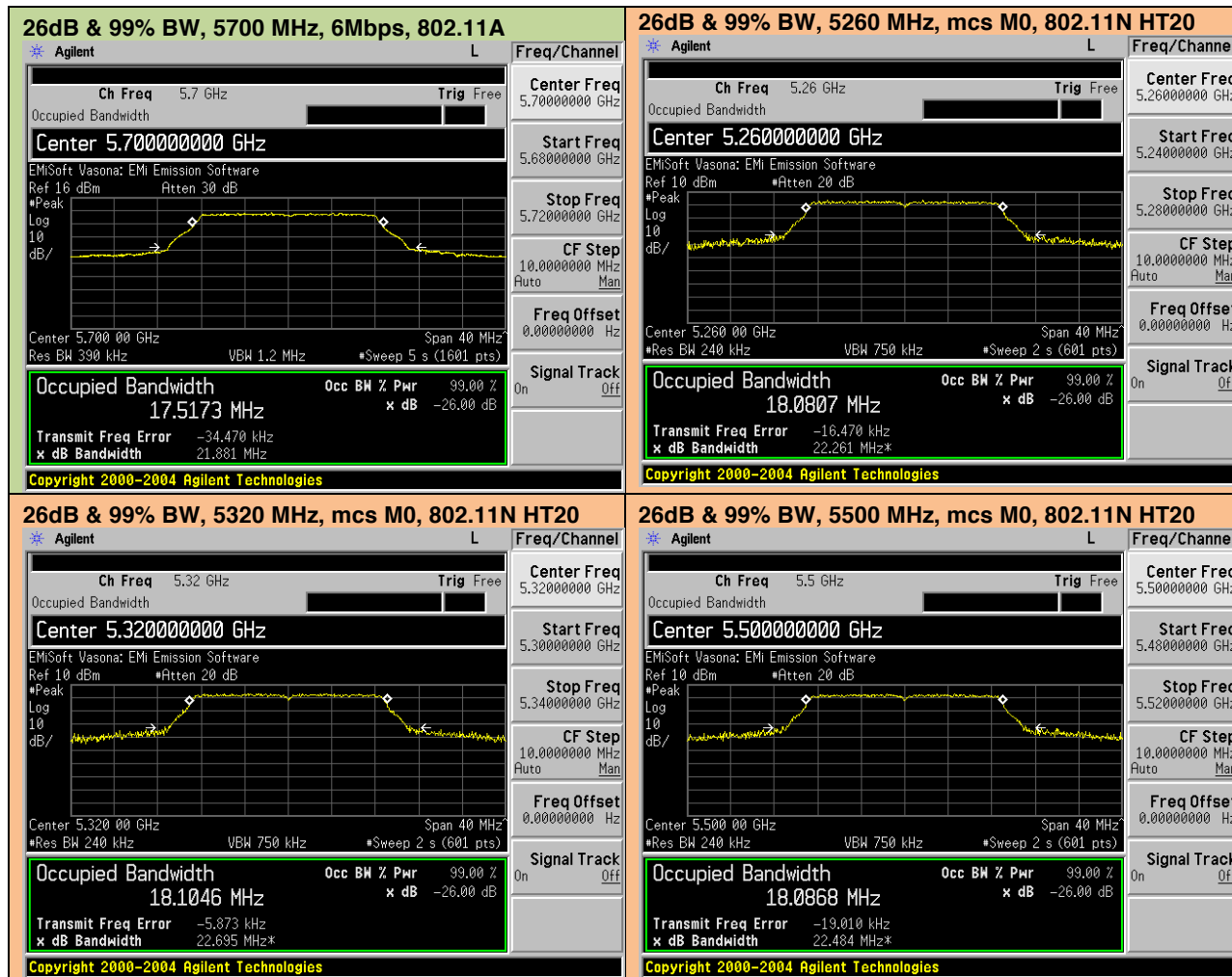
Connect the antenna port(s) to the spectrum analyzer input. Using the spectrum analyzer Channel Bandwidth mode, configure the spectrum analyzer as shown below (enter all losses between the transmitter output and the spectrum analyzer).

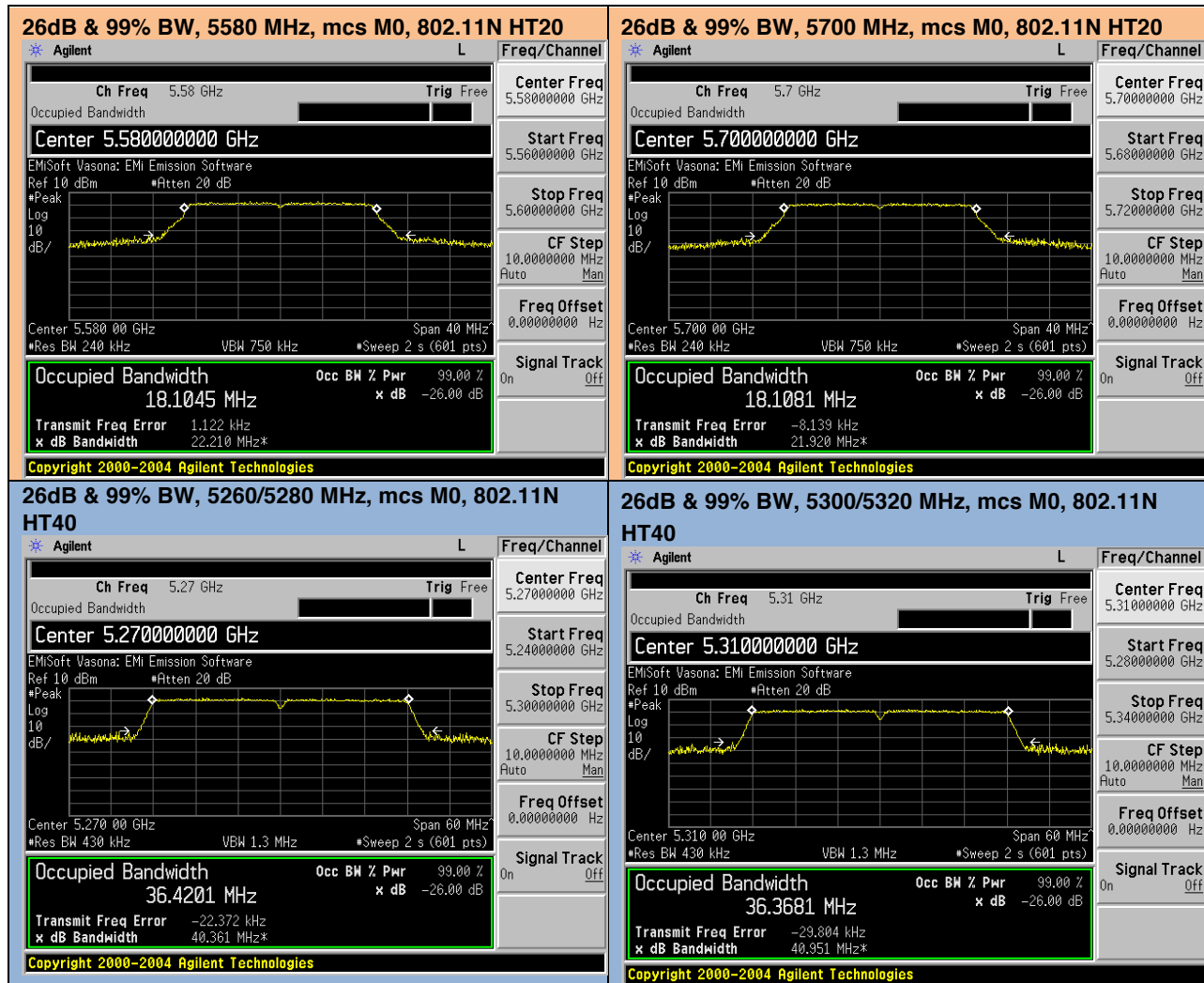
Center Frequency:	Frequency from table below
Span:	2 x Nominal Bandwidth (e.g. 40MHz for a 20MHz channel)
Reference Level:	20 dBm
Attenuation:	10 dB
Sweep Time:	5 s
Resolution Bandwidth:	1%-3% of 26 dB Bandwidth
Video Bandwidth:	≥Resolution Bandwidth
X dB Bandwidth:	26 dB
Detector:	Peak
Trace:	Single

Place the radio in continuous transmit mode. View the transmitter waveform on the spectrum analyzer, and record the pertinent measurements

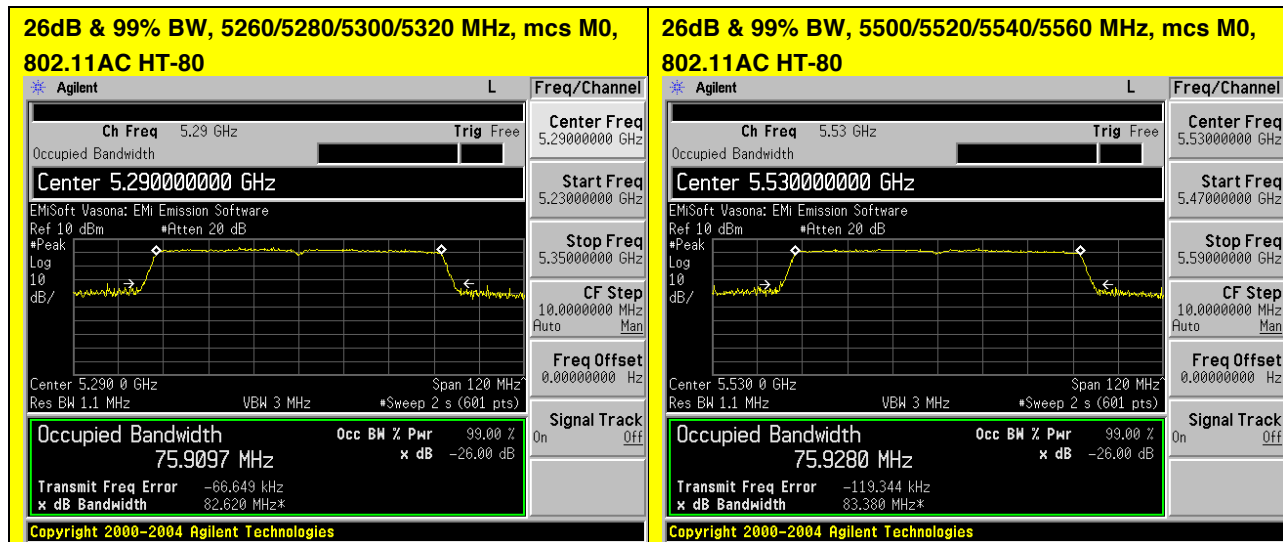
Frequency	Mode	Data Rate	26dB BW MHz	99% BW (MHz)
5260	802.11A Non HT-20	6*	21.261	16.944
5320	802.11A Non HT-20	6*	21.989	17.546
5500	802.11A Non HT-20	6*	21.935	17.550
5580	802.11A Non HT-20	6*	22.075	17.503
5700	802.11A Non HT-20	6*	21.881	17.517
5260	802.11 N HT-20	M0*	22.261	18.081
5320	802.11 N HT-20	M0*	22.695	18.105
5500	802.11 N HT-20	M0*	22.484	18.087
5580	802.11 N HT-20	M0*	22.210	18.105
5700	802.11 N HT-20	M0*	21.920	18.108
5260/5280	802.11N HT-40	M0*	40.361	36.420
5300/5320	802.11N HT-40	M0*	40.951	36.368
5500/5520	802.11N HT-40	M0*	41.678	36.359
5540/5560	802.11N HT-40	M0*	43.064	36.385
5660/5680	802.11N HT-40	M0*	40.811	36.352
5260/5280/5300/5320	802.11AC HT80	M0*	82.620	75.910
5500/5520/5540/5560	802.11AC HT80	M0*	83.380	75.928













Peak Output Power

15.407: (A2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The maximum supported antenna gain for all bands is 3.8dBi.

Limit 802.11A & 802.11N HT20 : $11 \text{ dBm} + 10 \log(21.592) = 24.3 \text{ dBm}$, therefore the **limit is 24dBm (250mW)**
Limit 802.11N HT40 : $11 \text{ dBm} + 10 \log(40.361) = 27.0 \text{ dBm}$, therefore the **limit is 24dBm (250mW)**
Limit 802.11AC HT80 : $11 \text{ dBm} + 10 \log(82.620) = 30.2 \text{ dBm}$, therefore the **limit is 24dBm (250mW)**

Power Spectral Density

15.407: (A2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands. The peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Connect the antenna port(s) to the spectrum analyzer input. Place the radio in continuous transmit mode. Configure the spectrum analyzer as shown below.

Enable "Channel Power" function of analyzer	
Center Frequency:	Frequency from table below
Span:	20 MHz (must be greater than 26dB bandwidth, adjust as necessary)
Ref Level Offset:	Correct for attenuator and cable loss.
Reference Level:	20 dBm
Attenuation:	20 dB
Sweep Time:	100ms, Single sweep
Resolution Bandwidth:	1 MHz
Video Bandwidth:	3 MHz
Detector:	Sample
Trace:	Trace Average 100 traces in Power Averaging Mode
Integration BW:	=26 dB BW from 26 dB Bandwidth Data

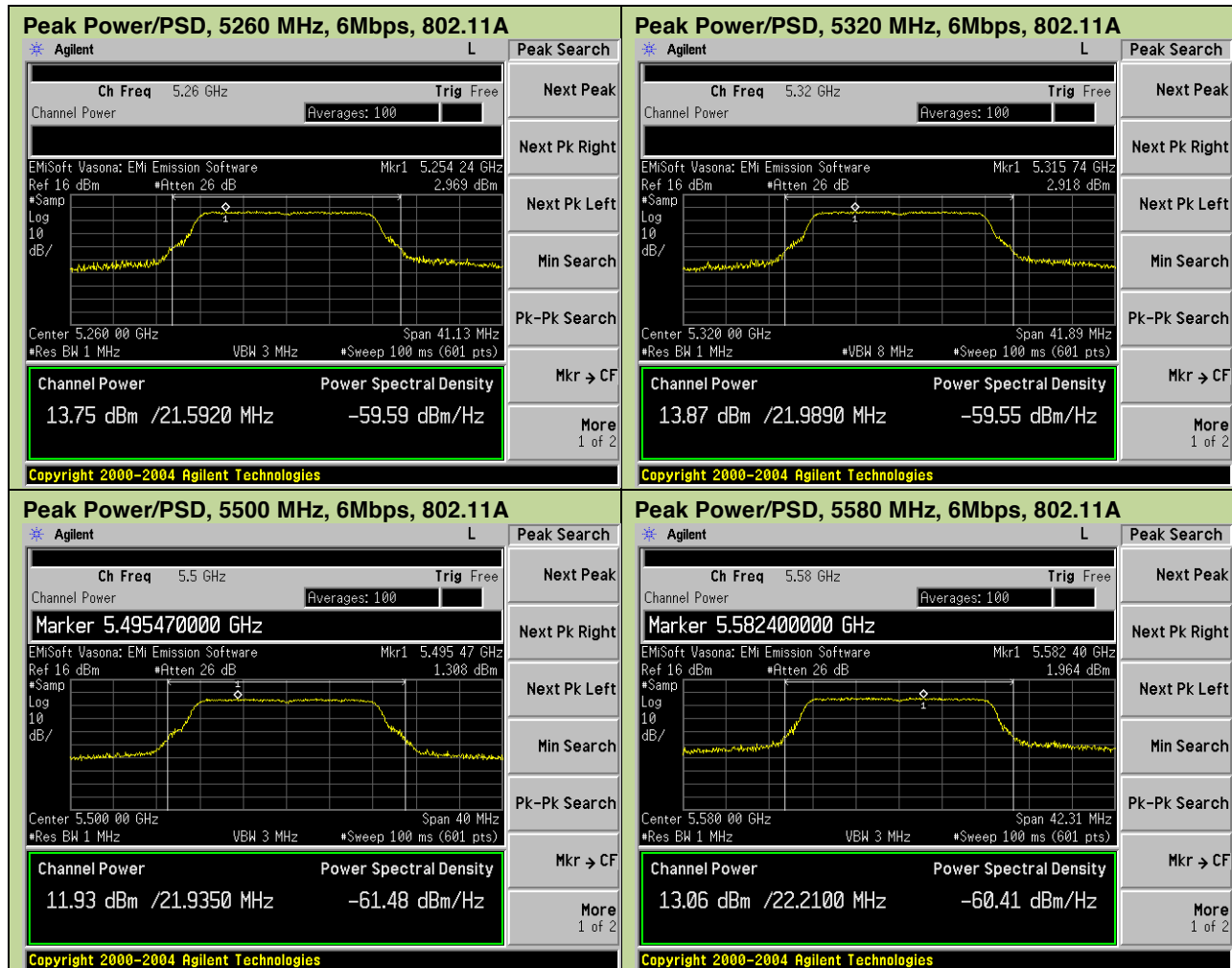
After averaging 100 traces of the transmitter waveform on the spectrum analyzer, record the spectrum analyzer Channel Power. Perform a Marker Peak Search function, and record this value as the Power Spectral Density.

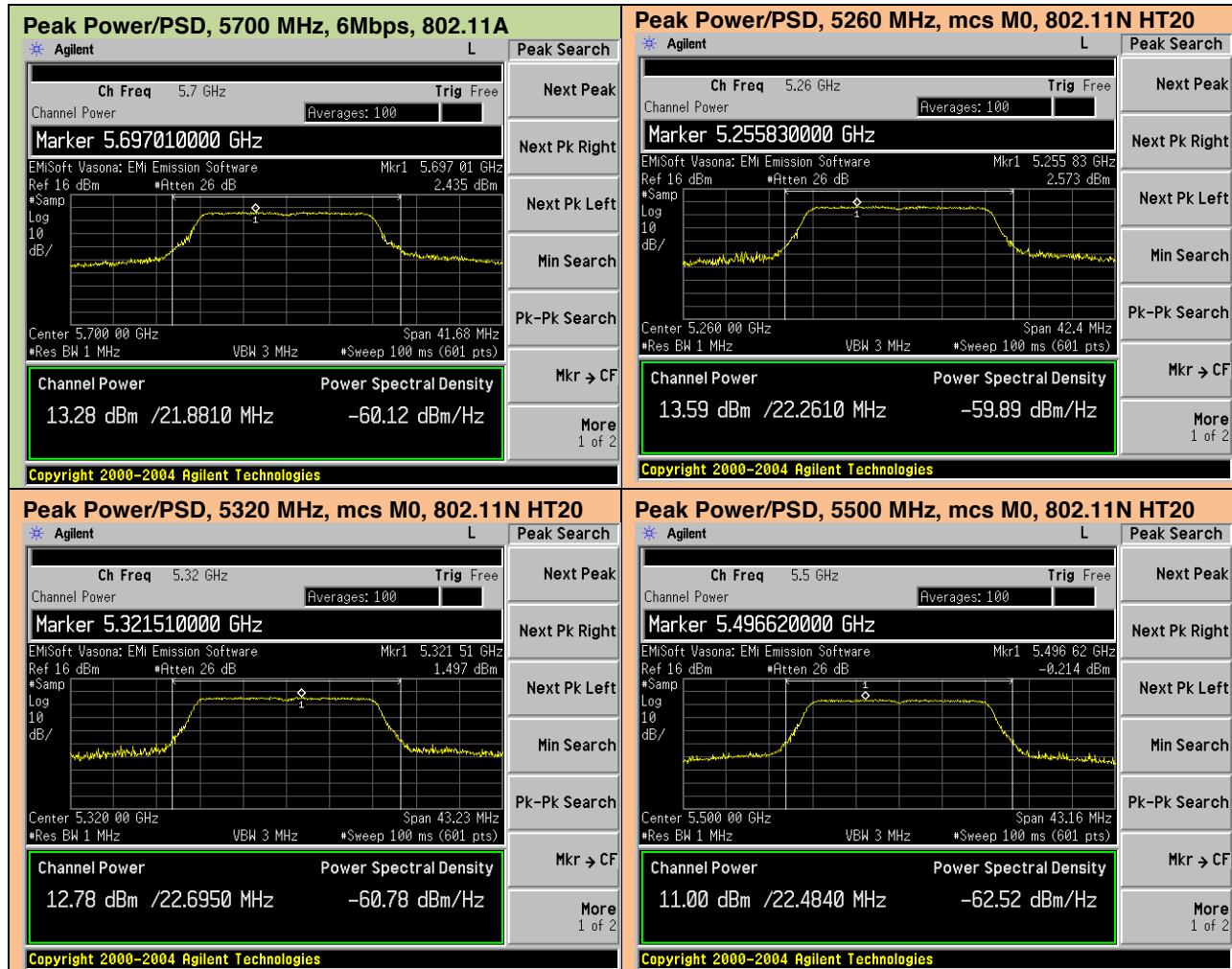
**Peak Output Power**

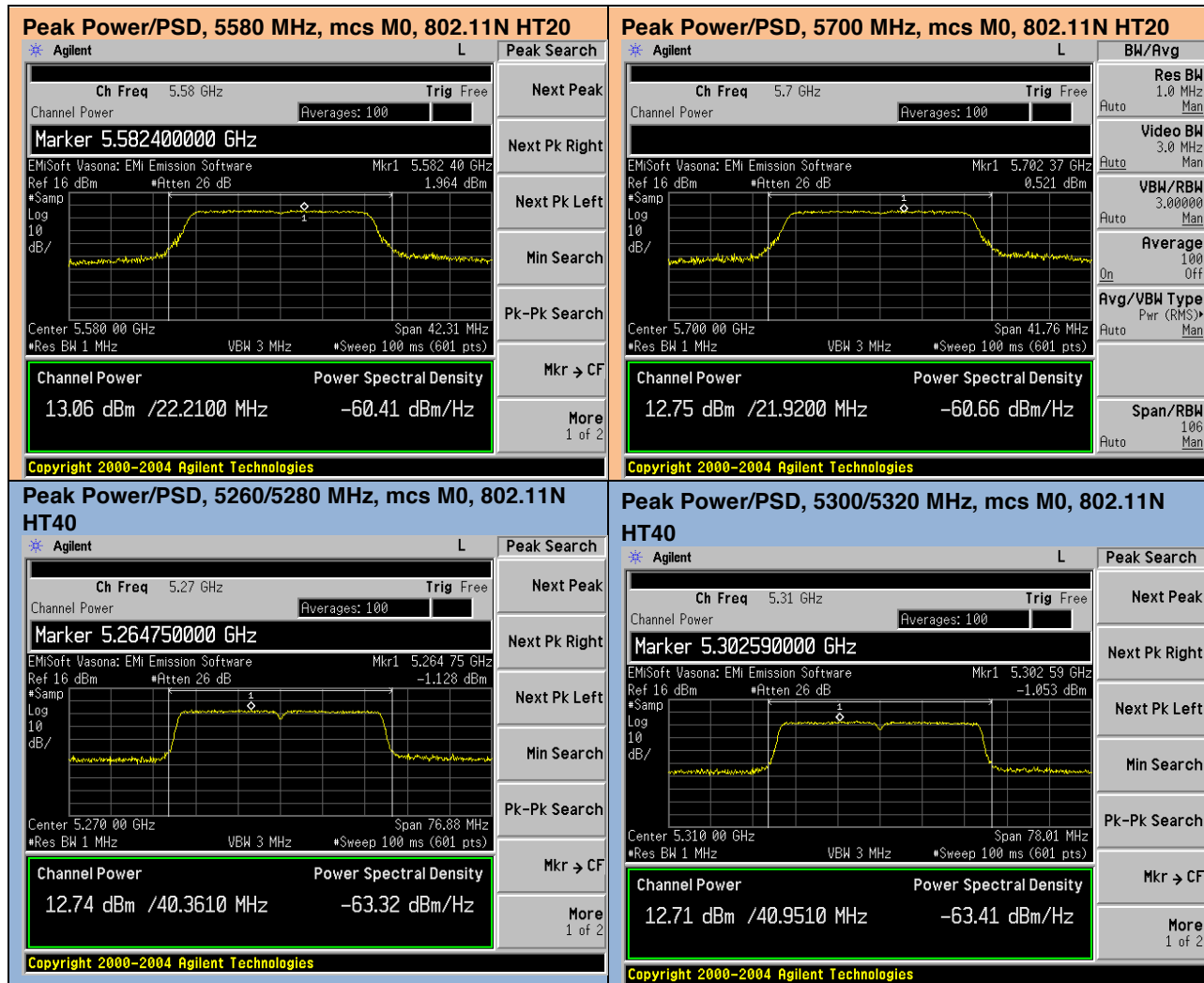
Frequency	Mode	Data Rate	Measured Output power (dBm)	DCCF (dB)	Corr Output Power (dBm)	Limit (dBm)	Margin (dB)
5260	802.11A Non HT-20	6*	13.75	0.14	13.89	24	-10.11
5320	802.11A Non HT-20	6*	13.87	0.14	14.01	24	-9.99
5500	802.11A Non HT-20	6*	11.93	0.14	12.07	24	-11.93
5580	802.11A Non HT-20	6*	13.06	0.14	13.2	24	-10.8
5700	802.11A Non HT-20	6*	13.28	0.14	13.42	24	-10.58
5260	802.11 N HT-20	M0*	13.59	0.3	13.89	24	-10.11
5320	802.11 N HT-20	M0*	12.78	0.3	13.08	24	-10.92
5500	802.11 N HT-20	M0*	11	0.3	11.3	24	-12.7
5580	802.11 N HT-20	M0*	13.06	0.3	13.36	24	-10.64
5700	802.11 N HT-20	M0*	12.75	0.3	13.05	24	-10.95
5260/5280	802.11N HT-40	M0*	12.74	0.3	13.04	24	-10.96
5300/5320	802.11N HT-40	M0*	12.71	0.3	13.01	24	-10.99
5500/5520	802.11N HT-40	M0*	10.97	0.3	11.27	24	-12.73
5540/5560	802.11N HT-40	M0*	12.67	0.3	12.97	24	-11.03
5660/5680	802.11N HT-40	M0*	12.65	0.3	12.95	24	-11.05
5500/5520/5540/5560	802.11AC HT80	M0*	11.72	0.59	12.31	24	-11.69
5260/5280/5300/5320	802.11AC HT80	M0*	9.99	0.59	10.58	24	-13.42

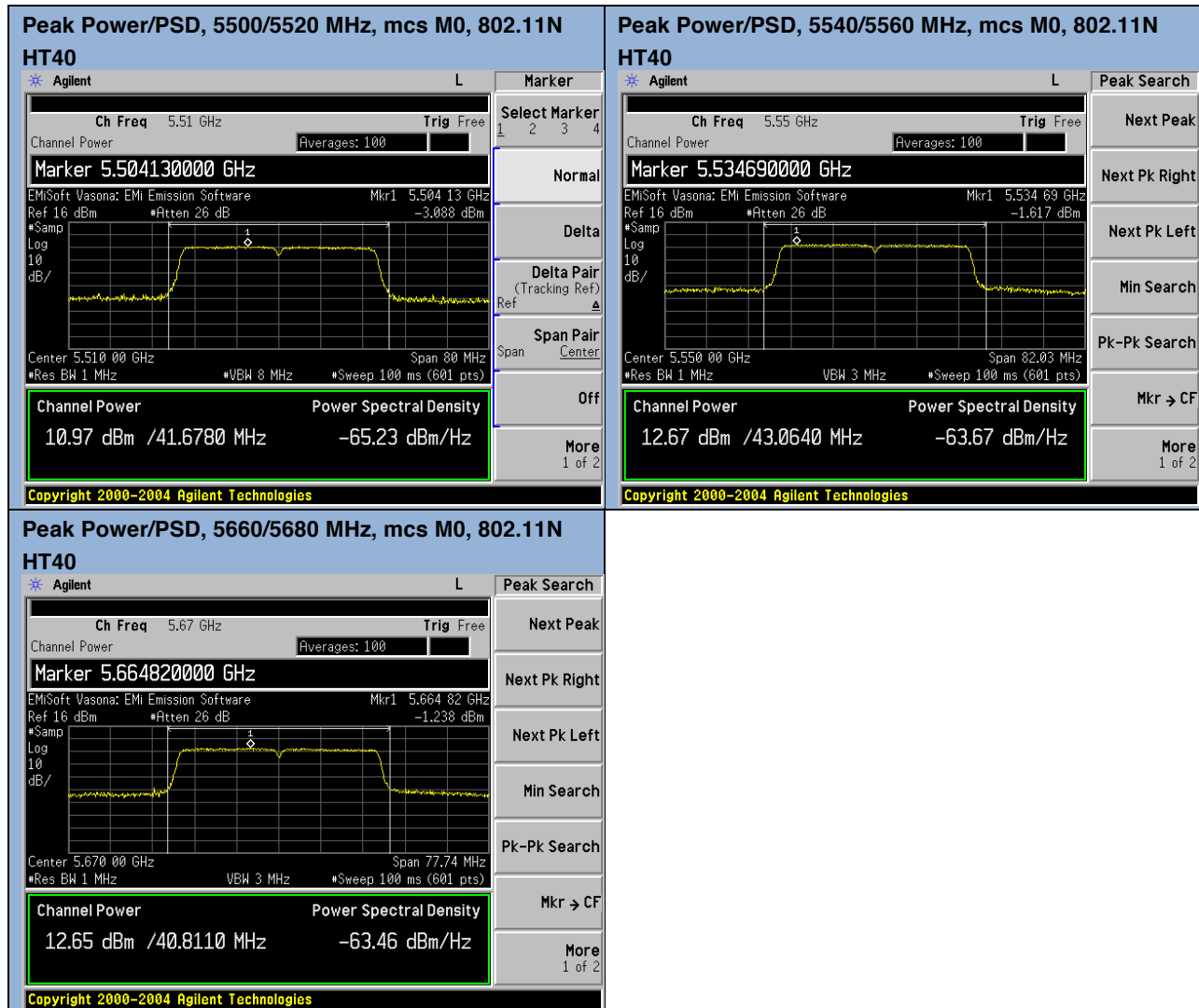
Power Spectral Density

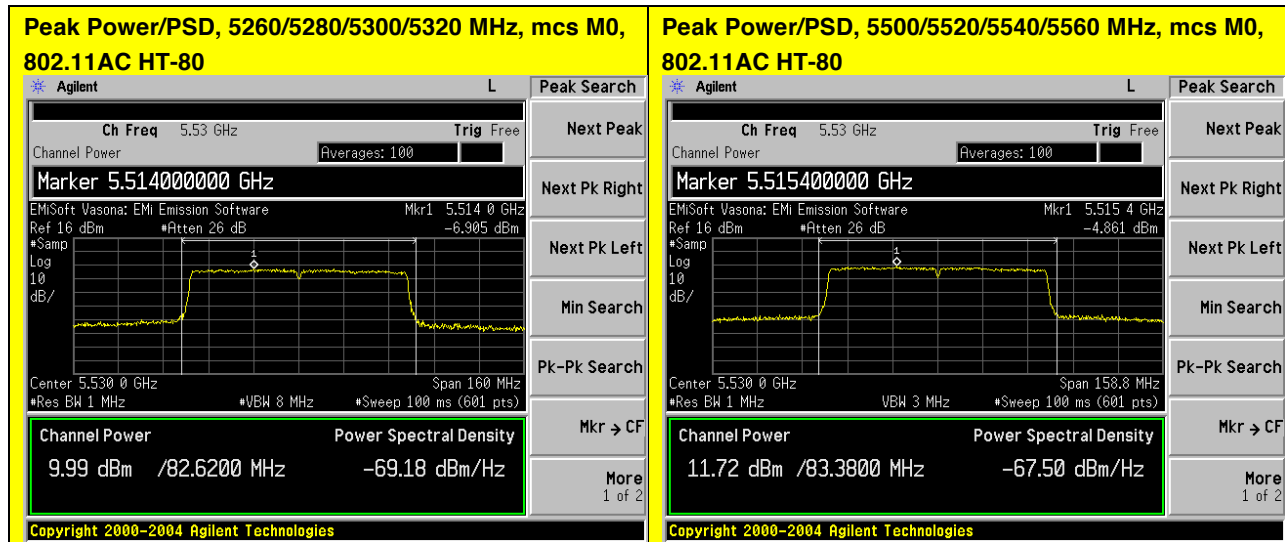
Frequency	Mode	Data Rate	Measured Output power (dBm)	DCCF (dB)	Corr Output Power (dBm)	Limit (dBm)	Margin (dB)
5260	802.11A Non HT-20	6*	2.969	0.14	3.109	11	-7.891
5320	802.11A Non HT-20	6*	2.918	0.14	3.058	11	-7.942
5500	802.11A Non HT-20	6*	1.308	0.14	1.448	11	-9.552
5580	802.11A Non HT-20	6*	1.964	0.14	2.104	11	-8.896
5700	802.11A Non HT-20	6*	2.435	0.14	2.575	11	-8.425
5260	802.11 N HT-20	M0*	2.573	0.3	2.873	11	-8.127
5320	802.11 N HT-20	M0*	1.497	0.3	1.797	11	-9.203
5500	802.11 N HT-20	M0*	-0.214	0.3	0.086	11	-10.914
5580	802.11 N HT-20	M0*	1.964	0.3	2.264	11	-8.736
5700	802.11 N HT-20	M0*	0.521	0.3	0.821	11	-10.179
5260/5280	802.11N HT-40	M0*	-1.128	0.3	-0.828	11	-11.828
5300/5320	802.11N HT-40	M0*	-1.053	0.3	-0.753	11	-11.753
5500/5520	802.11N HT-40	M0*	-3.088	0.3	-2.788	11	-13.788
5540/5560	802.11N HT-40	M0*	-1.617	0.3	-1.317	11	-12.317
5660/5680	802.11N HT-40	M0*	-1.238	0.3	-0.938	11	-11.938
5500/5520/5540/5560	802.11AC HT80	M0*	-4.861	0.59	-4.271	11	-15.271
5260/5280/5300/5320	802.11AC HT80	M0*	-6.905	0.59	-6.315	11	-17.315













Peak Excursion

15.407: The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

Set the spectrum analyzer span to view the entire emission bandwidth. The largest difference between the following two traces must be ≤ 13 dB for all frequencies across the emission bandwidth.

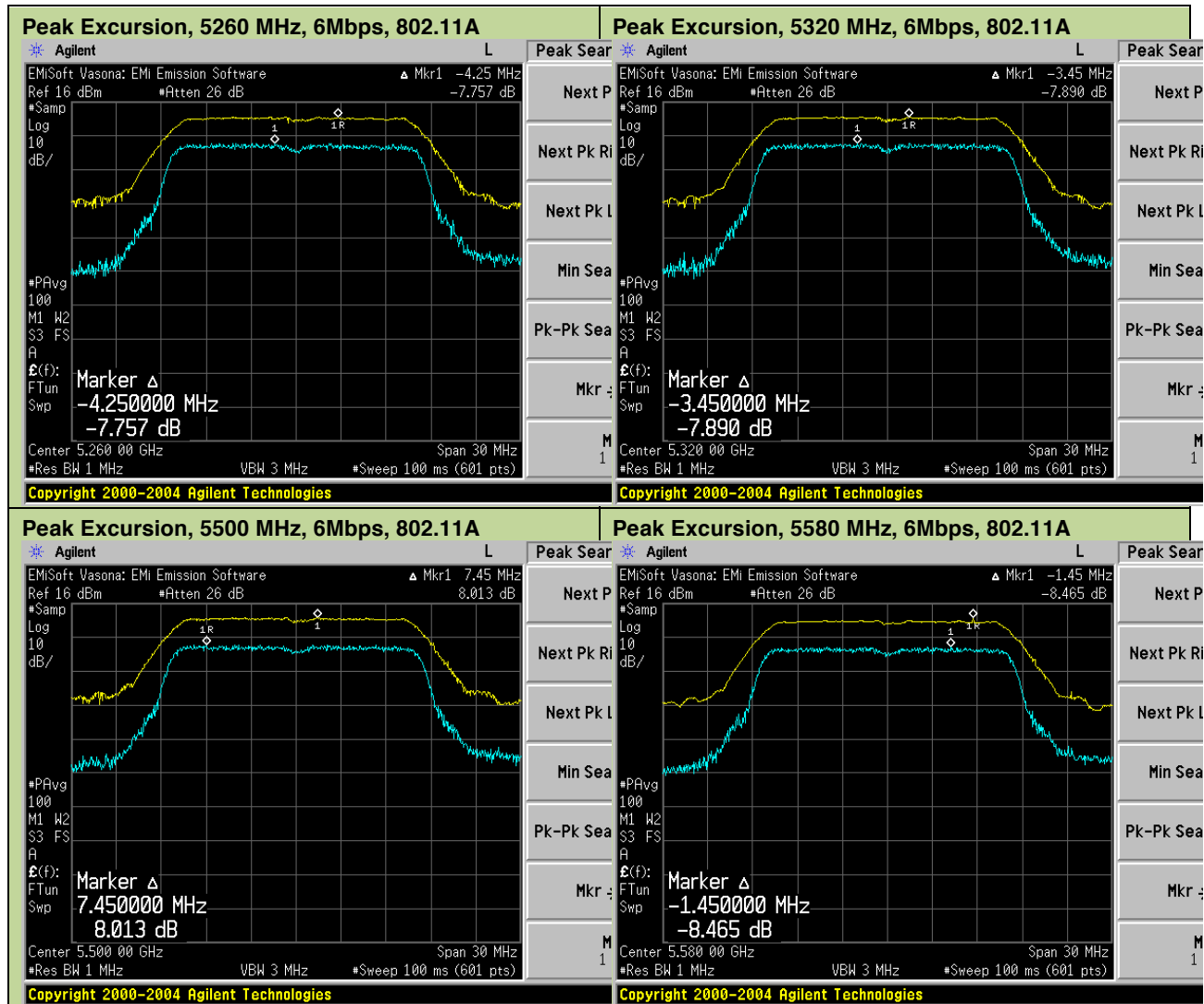
Set the spectrum analyzer span to view the entire emission bandwidth. The largest difference between the following two traces must be ≤ 13 dB for all frequencies across the emission bandwidth.

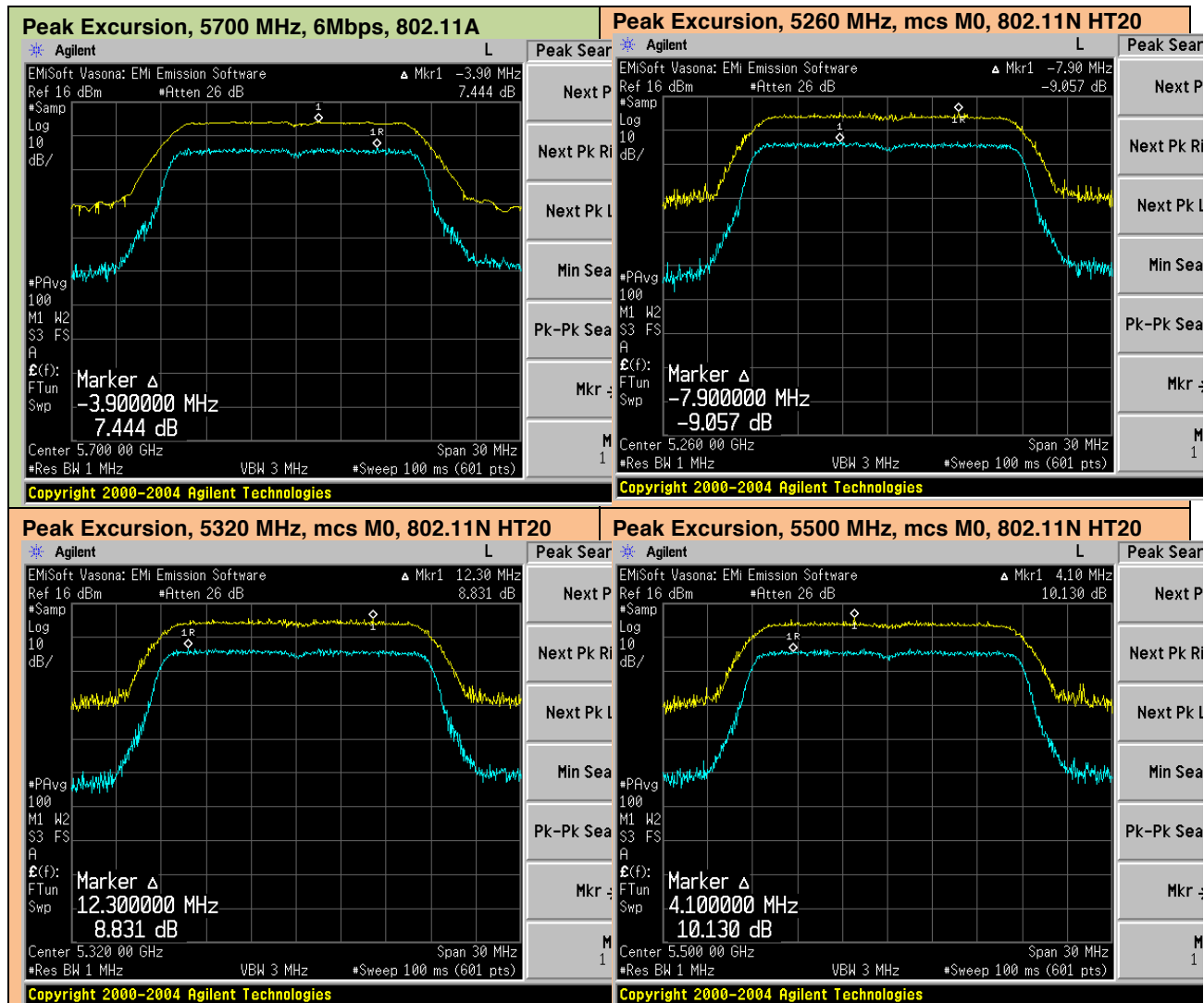
1st Trace: (Peak) Set Span to encompass the entire emission bandwidth of the signal. RBW = 1 MHz, VBW = 3 MHz Detector = Peak Sweep = 10 s Trace 1 = Max-hold Ref Level Offset = correct for attenuator and cable loss Ref Level = 20dBm Atten = 10dBm	2nd Trace: (Average) Trace 2 = clear right Detector = Sample Avg/VBW type = Pwr(RMS) Average = 100 Sweep = single Set marker Deltas Trace 1 & Peak search Marker Delta Trace 2 & Peak search
--	---

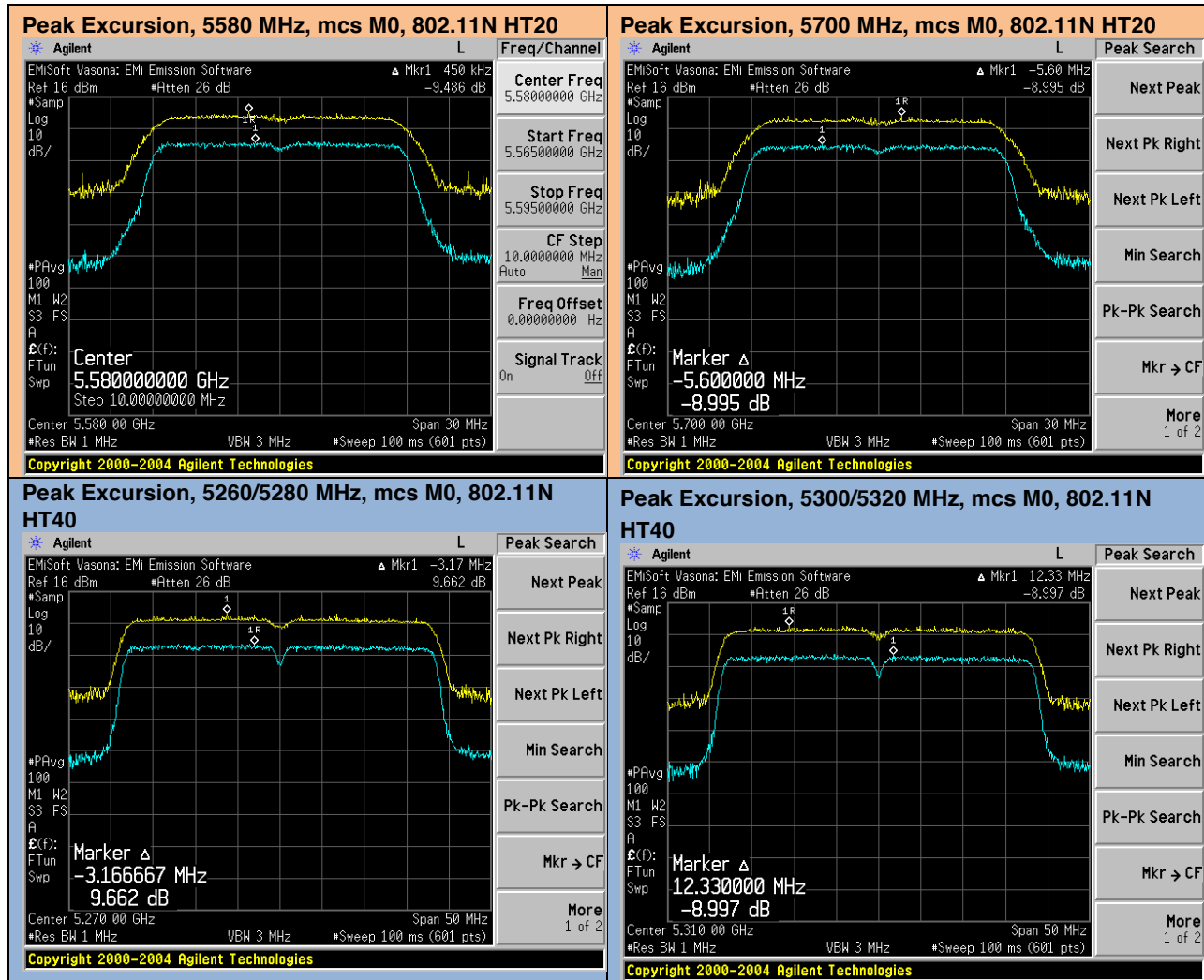
Record the difference between the Peak and Average Markers

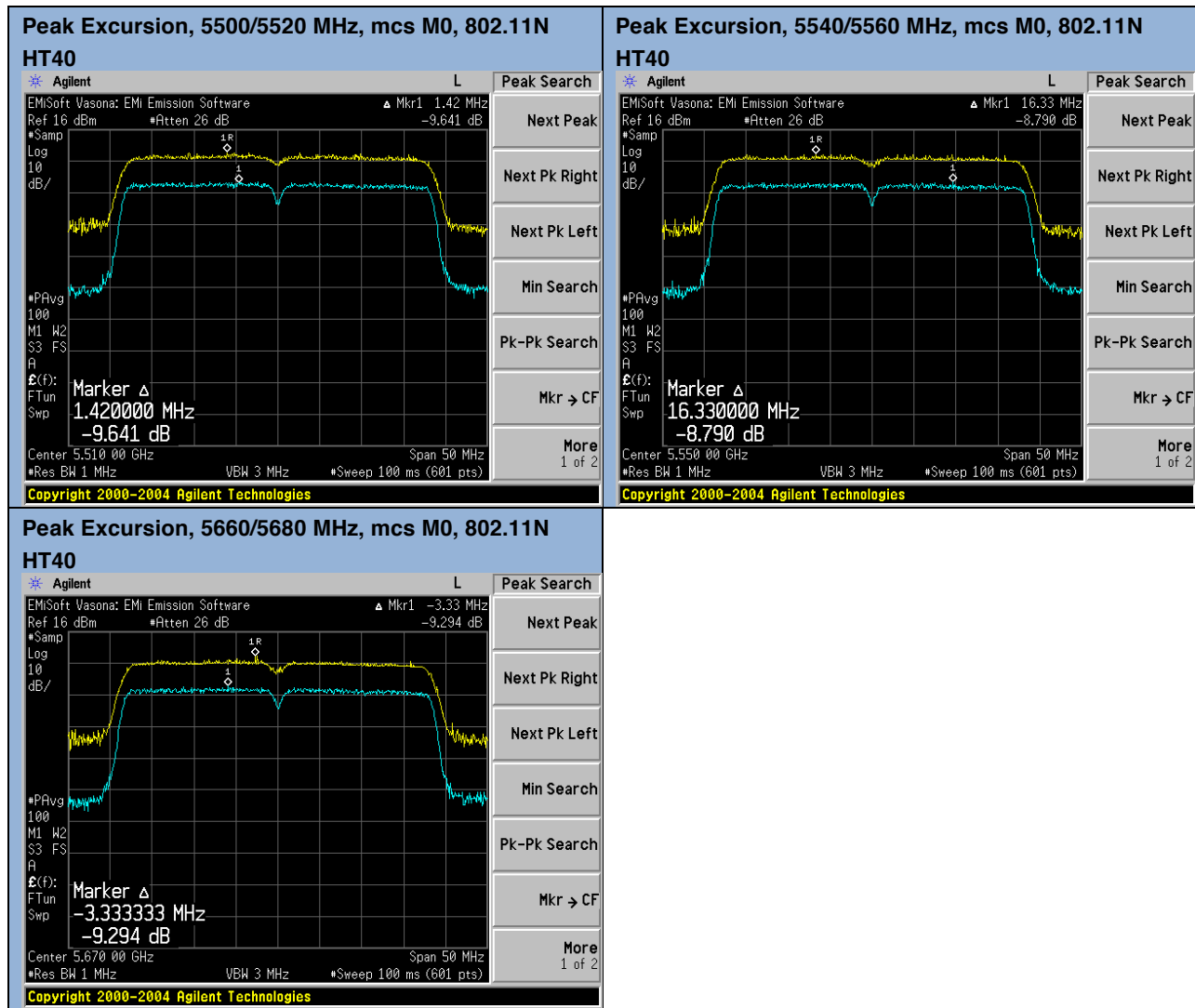
Peak Excursion results

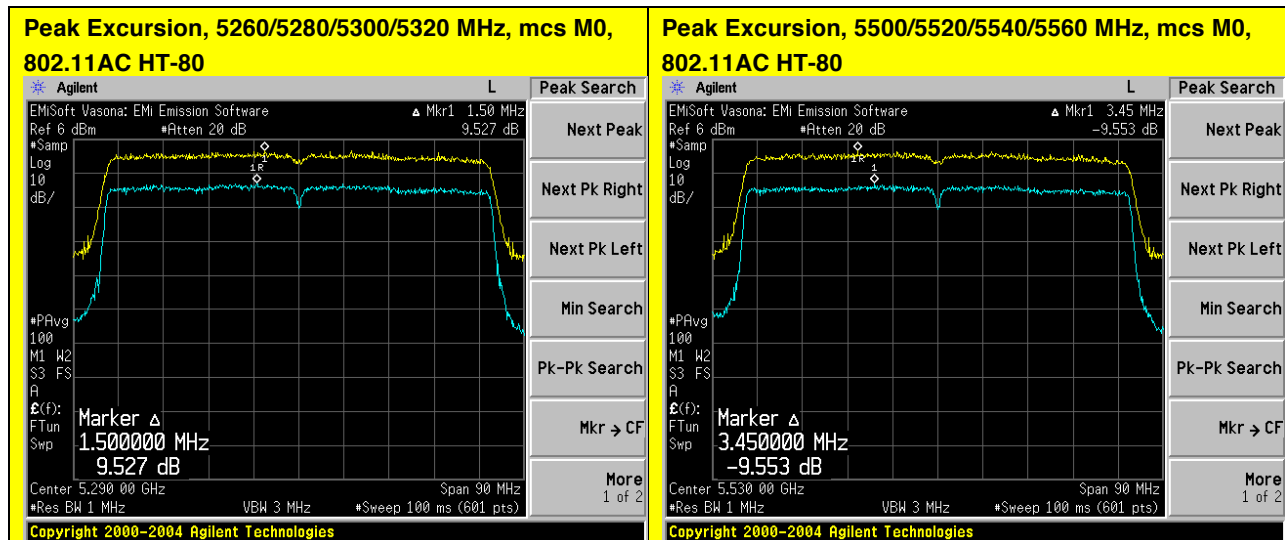
Frequency	Mode	Data Rate	Ratio Pk/Avg (dB)	Limit (dB)	Margin (dB)
5260	802.11A Non HT-20	6*	7.757	≤ 13	-5.243
5320	802.11A Non HT-20	6*	7.89	≤ 13	-5.11
5500	802.11A Non HT-20	6*	7.45	≤ 13	-5.55
5580	802.11A Non HT-20	6*	8.465	≤ 13	-4.535
5700	802.11A Non HT-20	6*	7.44	≤ 13	-5.56
5260	802.11 N HT-20	M0*	9.057	≤ 13	-3.943
5320	802.11 N HT-20	M0*	8.831	≤ 13	-4.169
5500	802.11 N HT-20	M0*	10.13	≤ 13	-2.87
5580	802.11 N HT-20	M0*	9.486	≤ 13	-3.514
5700	802.11 N HT-20	M0*	8.995	≤ 13	-4.005
5260/5280	802.11N HT-40	M0*	9.662	≤ 13	-3.338
5300/5320	802.11N HT-40	M0*	8.997	≤ 13	-4.003
5500/5520	802.11N HT-40	M0*	9.641	≤ 13	-3.359
5540/5560	802.11N HT-40	M0*	8.79	≤ 13	-4.21
5660/5680	802.11N HT-40	M0*	9.294	≤ 13	-3.706
5500/5520/5540/5560	802.11AC HT80	M0*	9.527	≤ 13	-3.473
5260/5280/5300/5320	802.11AC HT80	M0*	9.553	≤ 13	-3.447













Conducted Spurious Emissions

15.407 B (2) For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.

(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.

Connect the antenna port(s) to the spectrum analyzer input. Place the radio in continuous transmit mode. Configure the spectrum analyzer as shown below (be sure to enter all losses between the transmitter output and the spectrum analyzer).

Span:	30 MHz-40 GHz
Reference Level:	20 dBm
Attenuation:	10 dB
Sweep Time:	10 s
Resolution Bandwidth:	1 MHz
Video Bandwidth:	3 MHz
Detector:	Peak
Trace:	Single
Marker:	Peak

**Test Results Table 5260MHz 802.11A 6Mbps**

Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
10519.481	-55.5	1	0	-54.5	Pk	RF	-27	-27.5	Pass	
15780.259	-50	1	0	-48.9	Pk	RF	-27	-21.9	Pass	
21039.615	-53.6	1.1	0	-52.5	Pk	RF	-27	-25.5	Pass	
26300.043	-49.1	1.2	0	-47.9	Pk	RF	-27	-20.9	Pass	

Test Results Table 5320MHz 802.11A 6Mbps

Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
10638.862	-54.9	1	0	-53.9	Pk	RF	-27	-26.9	Pass	
15959.106	-50.8	1	0	-49.7	Pk	RF	-27	-22.7	Pass	
21279.119	-54	1.1	0	-52.8	Pk	RF	-27	-25.8	Pass	
26600.126	-49.2	1.2	0	-48	Pk	RF	-27	-21	Pass	

Test Results Table 5500Mhz 802.11A 6Mbps

Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
11000	-56.3	1	0	-55.2	Pk	RF	-27	-28.2	Pass	
16499.137	-53.8	1	0	-52.7	Pk	RF	-27	-25.7	Pass	
22000.079	-52.3	1.1	0	-51.1	Pk	RF	-27	-24.1	Pass	
27500.391	-54.2	1.2	0	-53	Pk	RF	-27	-26	Pass	

Test Results Table 55800Mhz 802.11A 6Mbps

Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
11159.1	-53.5	1.1	0	-52.5	Pk	RF	-27	-25.5	Pass	
16739.622	-54	1	0	-53	Pk	RF	-27	-26	Pass	
22319.143	-52.8	1.1	0	-51.7	Pk	RF	-27	-24.7	Pass	
27899.469	-54.4	1.2	0	-53.2	Pk	RF	-27	-26.2	Pass	

Test Results Table 5700Mhz 802.11A 6Mbps

Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
11399.316	-53.1	1.1	0	-52	Pk	RF	-27	-25	Pass	
17100.702	-51.6	1	0	-50.6	Pk	RF	-27	-23.6	Pass	
22799.379	-53.2	1.1	0	-52	Pk	RF	-27	-25	Pass	
28500.006	-53.1	1.2	0	-51.9	Pk	RF	-27	-24.9	Pass	

Test Results Table 5260MHz 802.11N HT20 Mcs0

Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
10520.015	-56.4	1	0	-55.4	Pk	RF	-27	-28.4	Pass	
15778.982	-50.5	1	0	-49.5	Pk	RF	-27	-22.5	Pass	
21039.57	-53.1	1.1	0	-52	Pk	RF	-27	-25	Pass	
26300.544	-48.4	1.2	0	-47.2	Pk	RF	-27	-20.2	Pass	

Test Results Table 5320MHz 802.11N HT20 mcs M0

Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
10639.917	-55.7	1	0	-54.7	Pk	RF	-27	-27.7	Pass	
15959.175	-51.1	1	0	-50	Pk	RF	-27	-23	Pass	
21279.855	-53.2	1.1	0	-52.1	Pk	RF	-27	-25.1	Pass	
26599.454	-48.6	1.2	0	-47.4	Pk	RF	-27	-20.4	Pass	

Test Results Table 5500Mhz 802.11N HT20 Mcs M0

Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
11000	-55.2	1	0	-54.1	Pk	RF	-27	-27.1	Pass	
16499.988	-52.8	1	0	-51.8	Pk	RF	-27	-24.8	Pass	
21999.974	-51.5	1.1	0	-50.4	Pk	RF	-27	-23.4	Pass	
27500.385	-53.3	1.2	0	-52	Pk	RF	-27	-25	Pass	

**Test Results Table 5580Mhz 802.11N HT20 Mcs M0**

Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
11160.762	-53.6	1.1	0	-52.5		Pk RF	-27	-25.5	Pass	
16739.822	-54.4	1	0	-53.3		Pk RF	-27	-26.3	Pass	
22320.063	-53.2	1.1	0	-52.1		Pk RF	-27	-25.1	Pass	
27900.051	-53.7	1.2	0	-52.4		Pk RF	-27	-25.4	Pass	

Test Results Table 5700Mhz 802.11N Mcs M0

Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
11401.43	-52.6	1.1	0	-51.6		Pk RF	-27	-24.6	Pass	
17100.045	-51.6	1	0	-50.6		Pk RF	-27	-23.6	Pass	
22798.525	-53.4	1.1	0	-52.3		Pk RF	-27	-25.3	Pass	
28499.352	-53.4	1.2	0	-52.2		Pk RF	-27	-25.2	Pass	

Test Results Table 5270MHz 802.11N 40MHzBW Mcs0

Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
10540.579	-56.7	1	0	-55.7		Pk RF	-27	-28.7	Pass	
15809.249	-52.6	1	0	-51.6		Pk RF	-27	-24.6	Pass	
21080.468	-54	1.1	0	-52.8		Pk RF	-27	-25.8	Pass	
26349.233	-48.8	1.2	0	-47.6		Pk RF	-27	-20.6	Pass	

Test Results Table 5310MHz 802.11N 40MHzBW Mcs0

Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
10619.221	-56.5	1	0	-55.5		Pk RF	-27	-28.5	Pass	
15929.678	-53	1	0	-52		Pk RF	-27	-25	Pass	
21240.035	-53.7	1.1	0	-52.6		Pk RF	-27	-25.6	Pass	
26549.059	-49.6	1.2	0	-48.4		Pk RF	-27	-21.4	Pass	

Test Results Table 5510MHz 802.11N 40MHz BW mcs M0

Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
11021.162	-54.9	1	0	-53.8		Pk RF	-27	-26.8	Pass	
16530.345	-53	1	0	-52		Pk RF	-27	-25	Pass	
22039.849	-51.9	1.1	0	-50.8		Pk RF	-27	-23.8	Pass	
27549.303	-54.3	1.2	0	-53		Pk RF	-27	-26	Pass	

Test Results Table 5550MHz 802.11N 40MHz BW mcs M0

Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
11092.3	-55.9	1.1	0	-54.8		Pk RF	-27	-27.8	Pass	
16549.5	-53.1	1	0	-52.1		Pk RF	-27	-25.1	Pass	
22199.779	-52.3	1.1	0	-51.2		Pk RF	-27	-24.2	Pass	
27750.233	-54.2	1.2	0	-52.9		Pk RF	-27	-25.9	Pass	

Test Results Table 5670MHz 802.11N 40MHzBW mcs M0

Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
11340.437	-54.5	1.1	0	-53.4		Pk RF	-27	-26.4	Pass	
17009.507	-53	1	0	-51.9		Pk RF	-27	-24.9	Pass	
22678.681	-52.8	1.1	0	-51.6		Pk RF	-27	-24.6	Pass	
28349.264	-53.7	1.2	0	-52.4		Pk RF	-27	-25.4	Pass	

Test Results Table 5290MHz 802.11AC 80MHzBW Mcs0

Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
10579.96	-57.2	1	0	-56.2		Pk RF	-27	-29.2	Pass	
15869.545	-53.5	1	0	-52.4		Pk RF	-27	-25.4	Pass	
21159.945	-53.9	1.1	0	-52.8		Pk RF	-27	-25.8	Pass	
26449.869	-49.6	1.2	0	-48.4		Pk RF	-27	-21.4	Pass	

Test Results Table 5530MHz 802.11AC 80MHz BW mcs M0

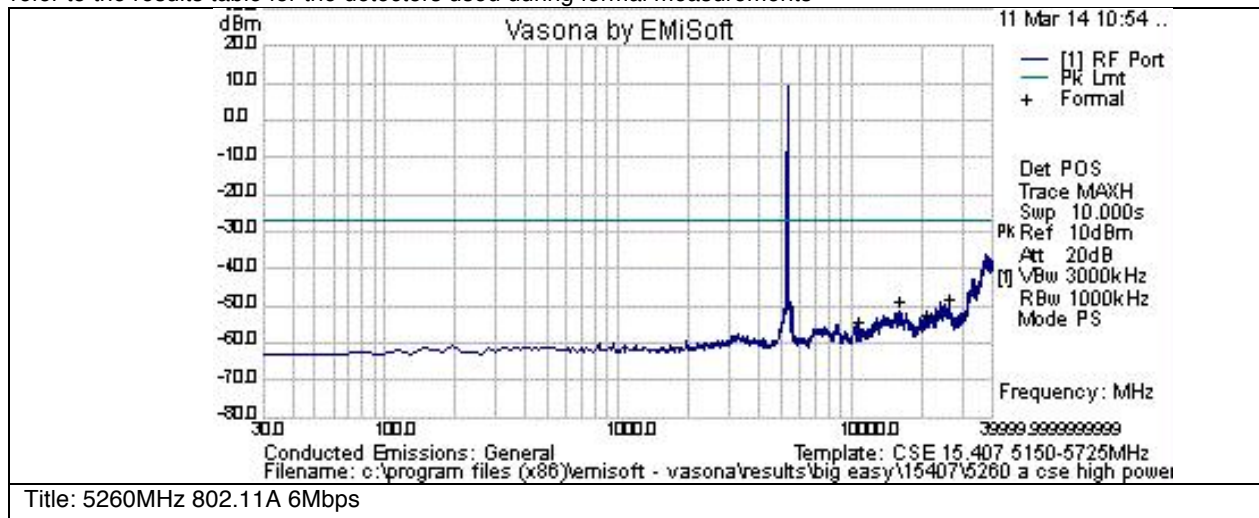
Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
11060.564	-56.2	1	0	-55.1		Pk RF	-27	-28.1	Pass	



Frequency MHz	Raw dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
16590.209	-53.8		1	0	-52.7	Pk RF	-27	-25.7	Pass	
22120.338	-52	1.1	0	0	-50.9	Pk RF	-27	-23.9	Pass	
27650.66	-54	1.2	0	0	-52.8	Pk RF	-27	-25.8	Pass	

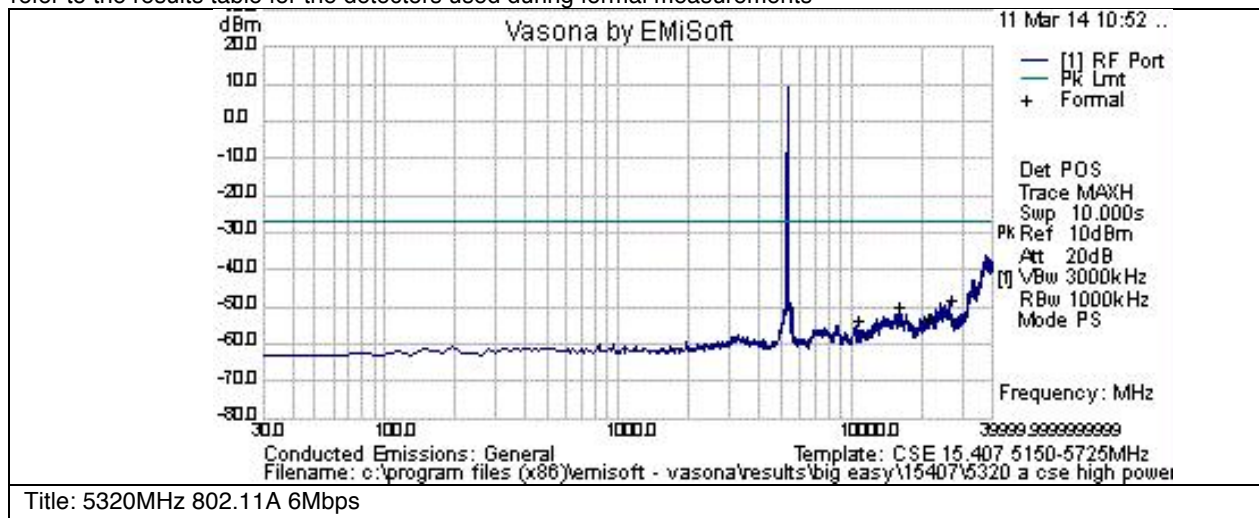
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Graphical Test Results

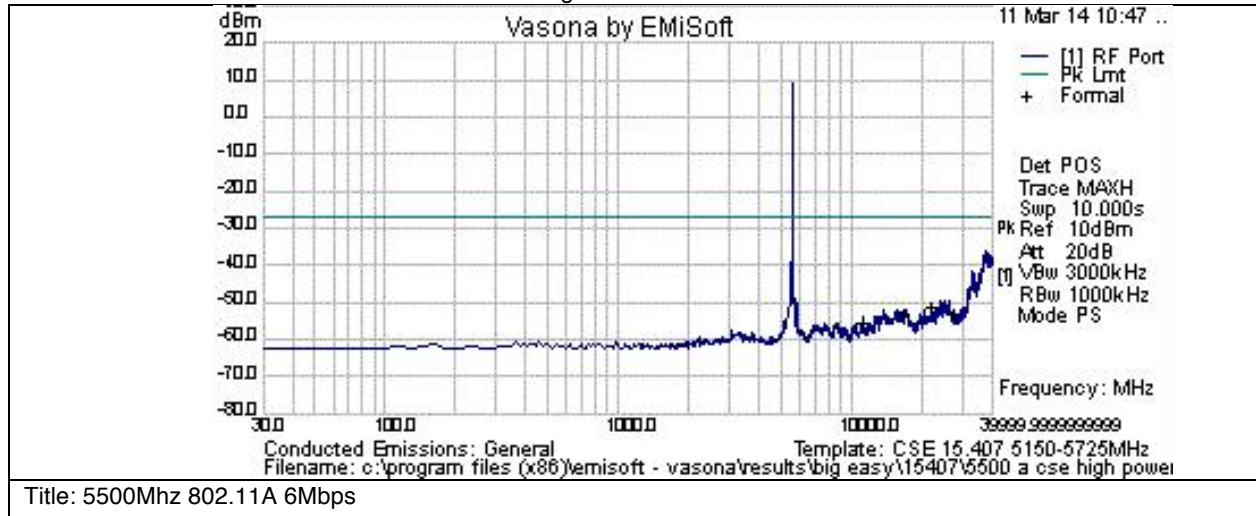
Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





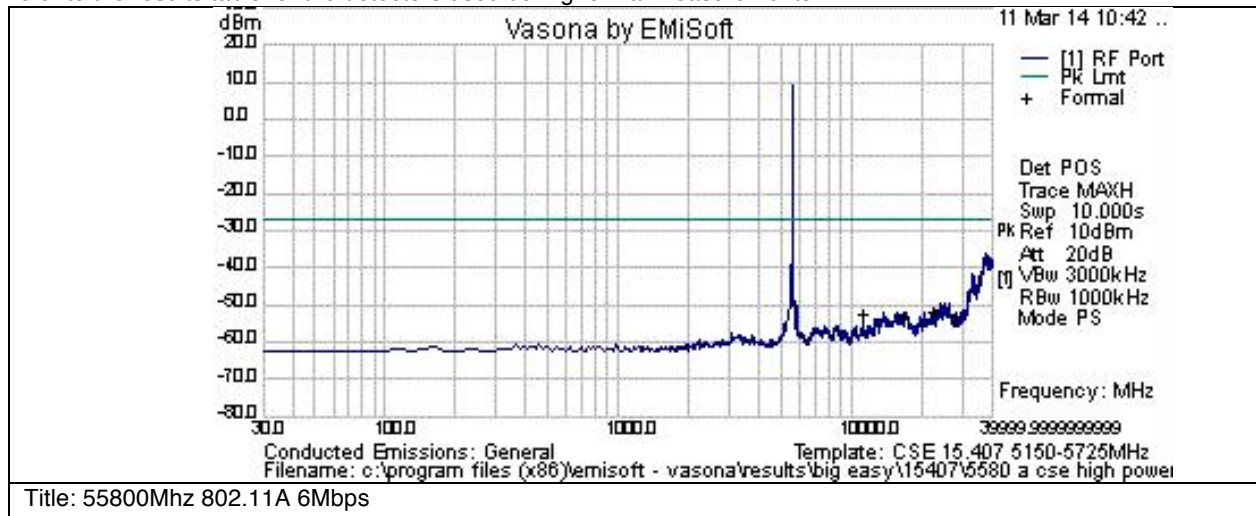
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



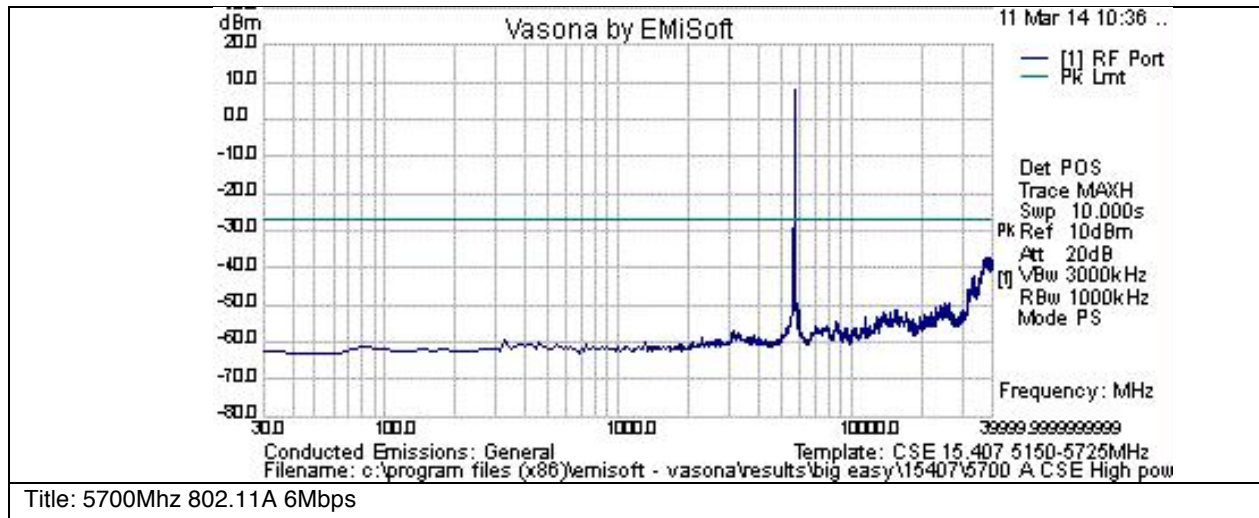
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



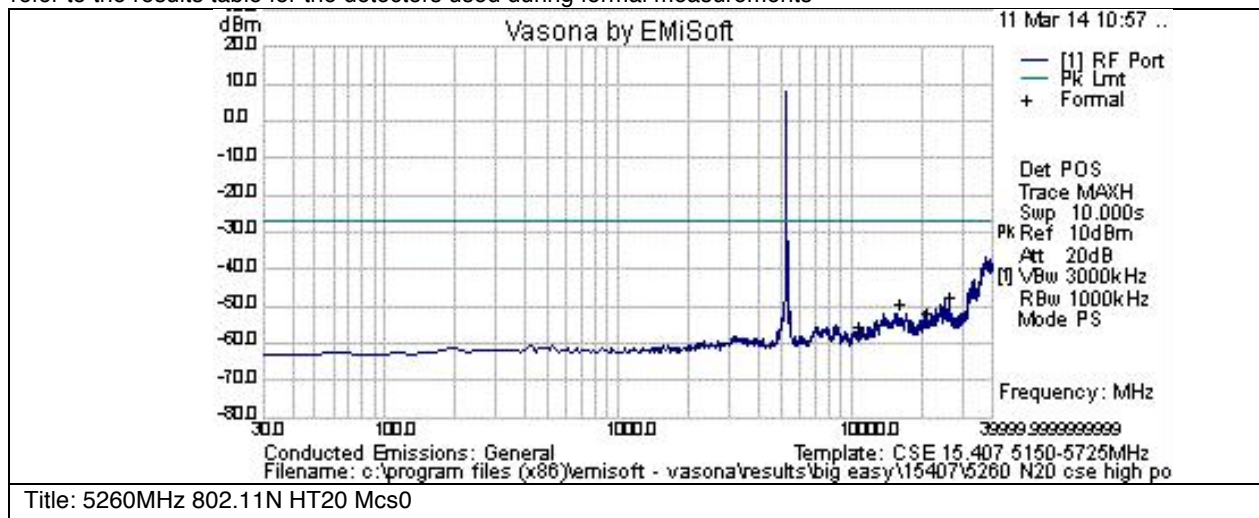
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



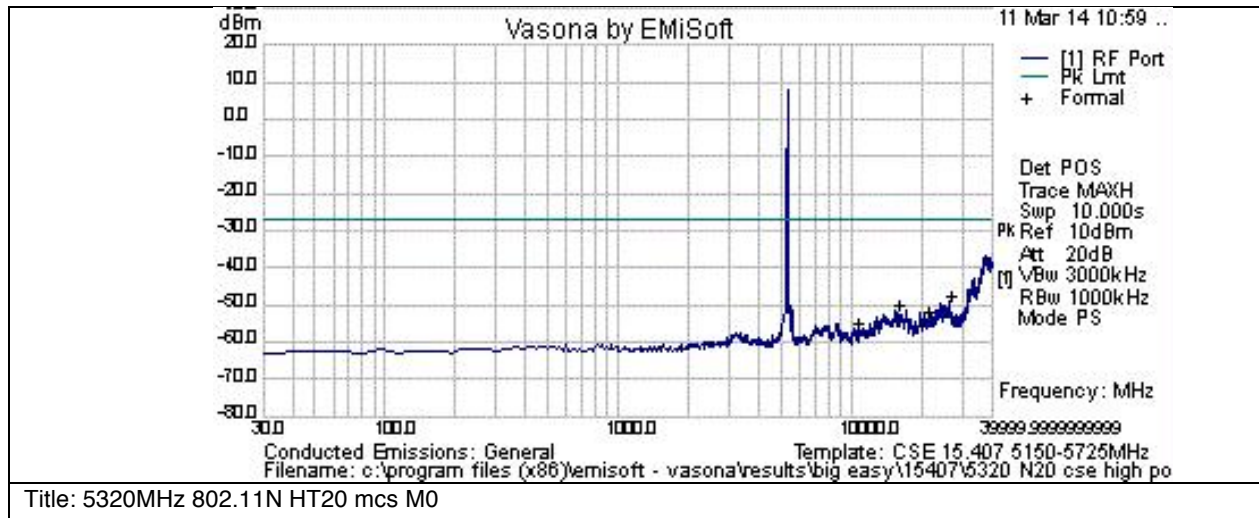
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



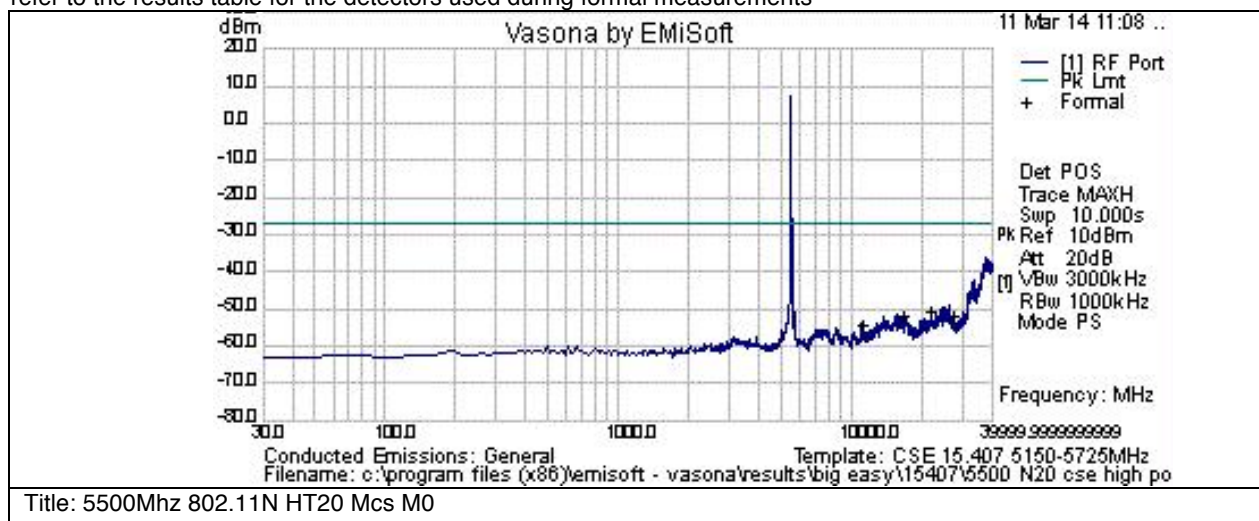
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Graphical Test Results

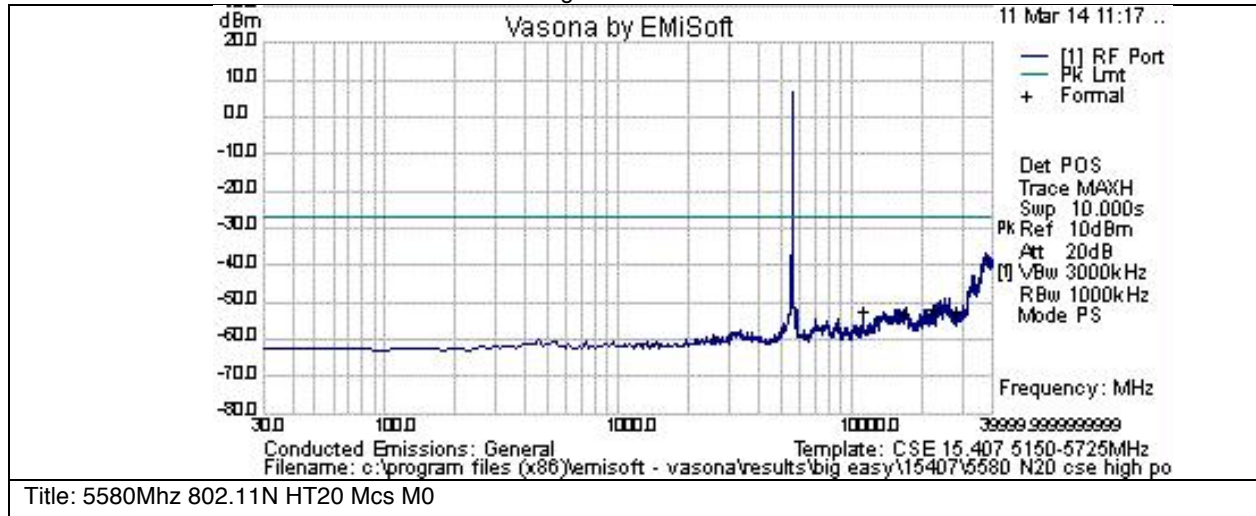
Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





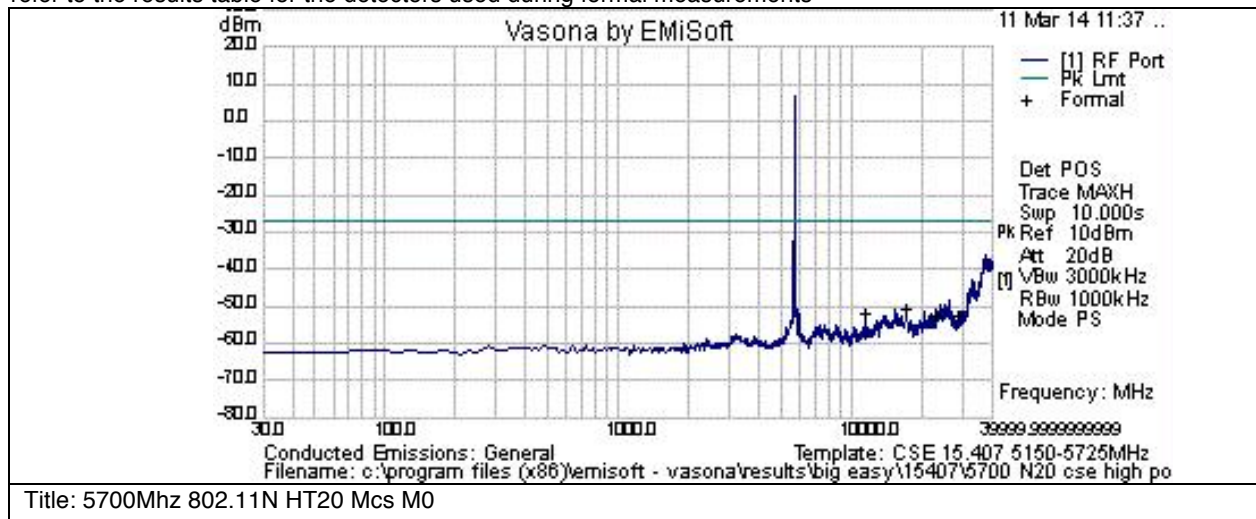
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Graphical Test Results

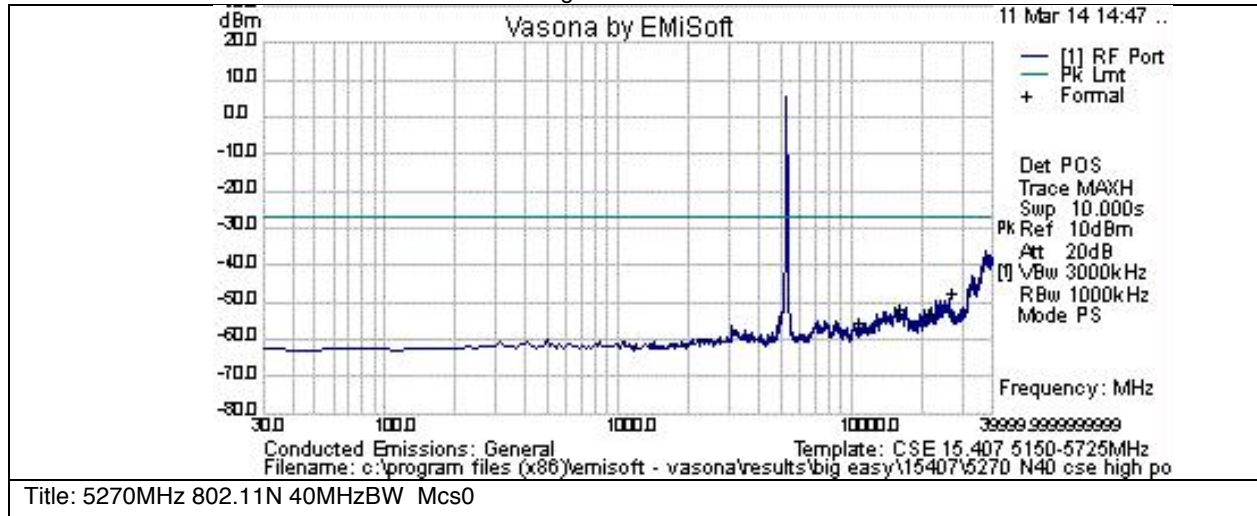
Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





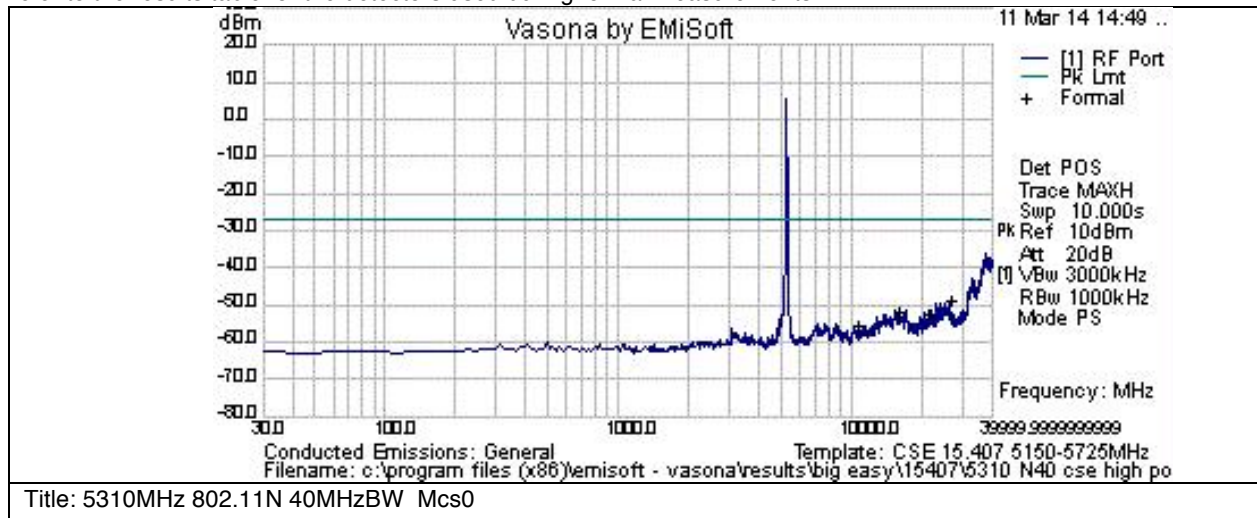
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



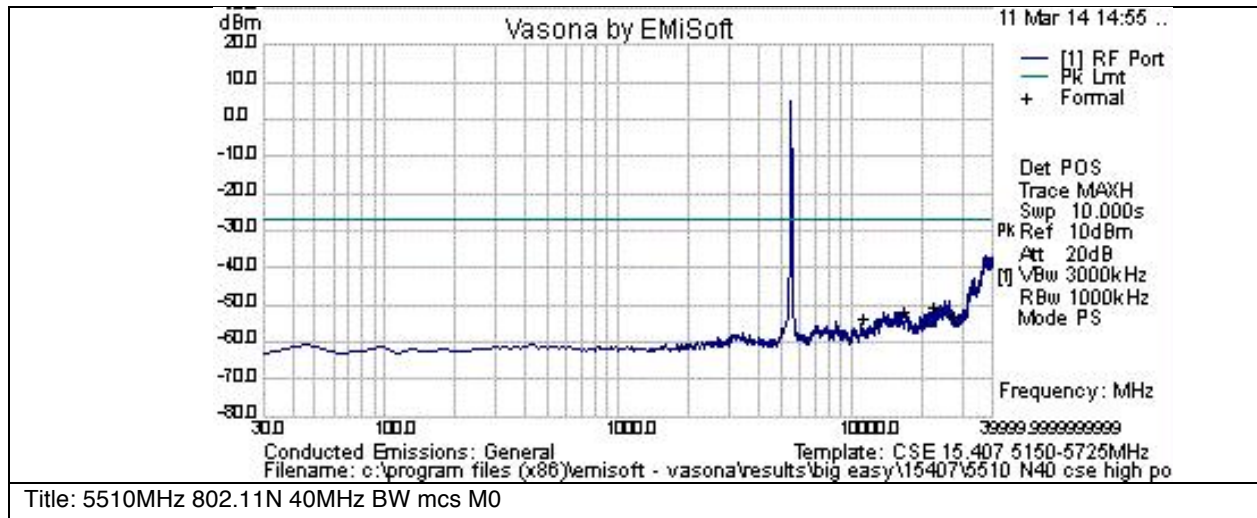
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



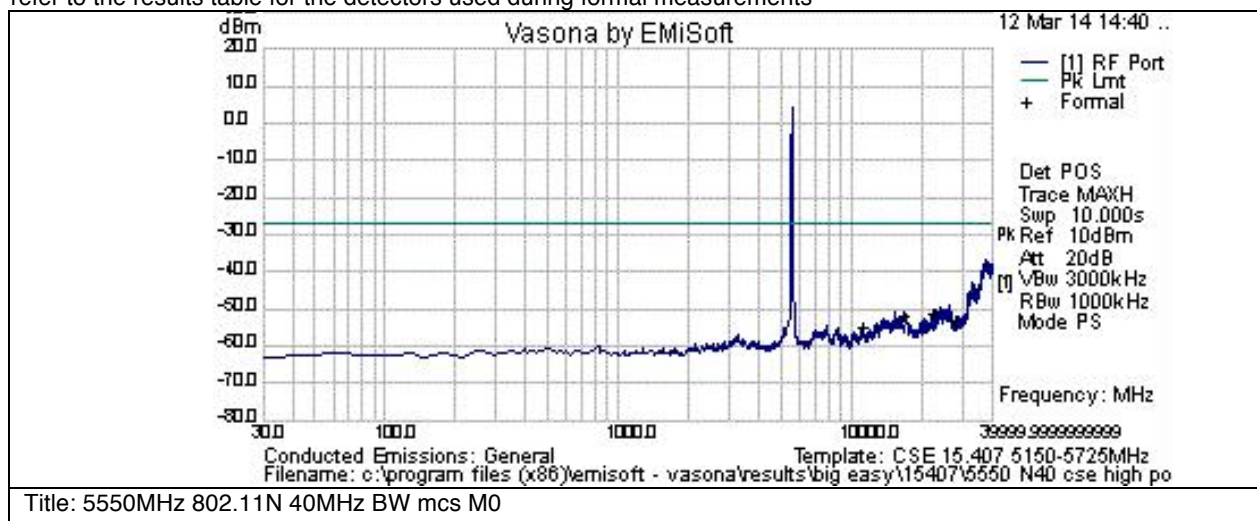
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



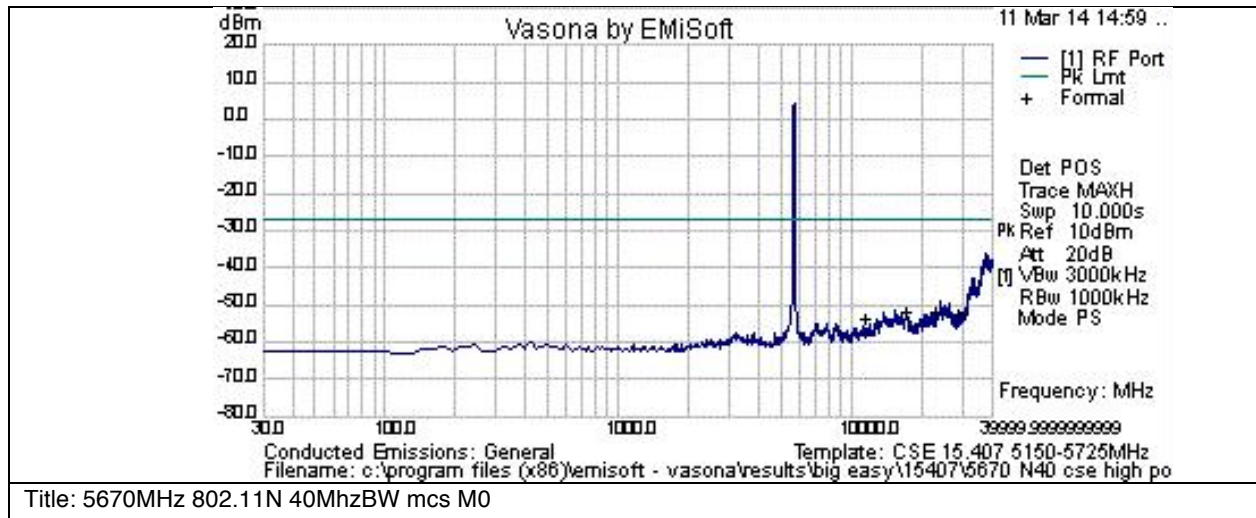
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



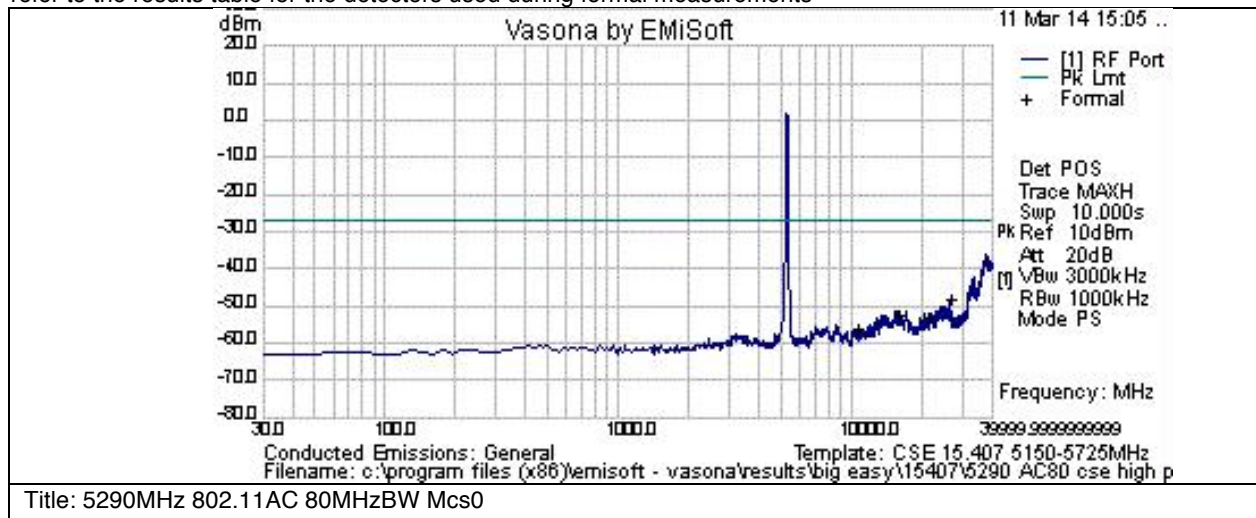
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Graphical Test Results

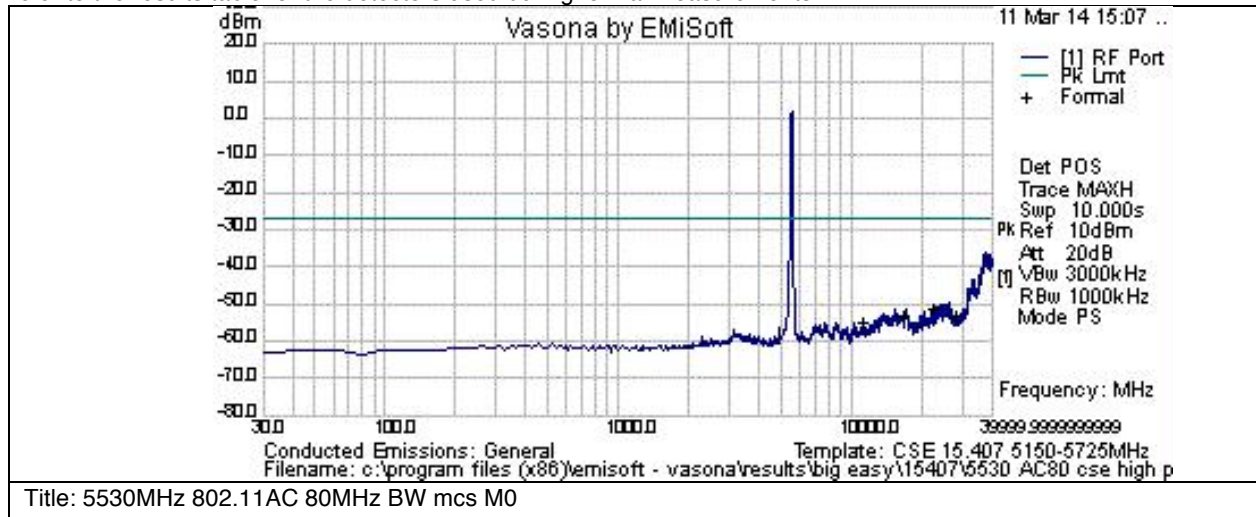
Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





Conducted Bandedge

15.247d Conducted emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

Using Vasona, configure the spectrum analyzer as shown below (be sure to enter all losses between the transmitter output and the spectrum analyzer). Place the radio in continuous transmit mode.

Reference Level:	110 dBuV
Attenuation:	20 dB
Sweep Time:	Coupled
Resolution Bandwidth:	1MHz
Video Bandwidth:	1 MHz for peak, 10 Hz for average
Detector:	Peak

Save 2 plots: 1) Average Plot , Limit= 54dBuV @3m = -41.2dBm eirp
 2) Peak plot, Limit = 74dBuV @3m = -21.2dBm eirp

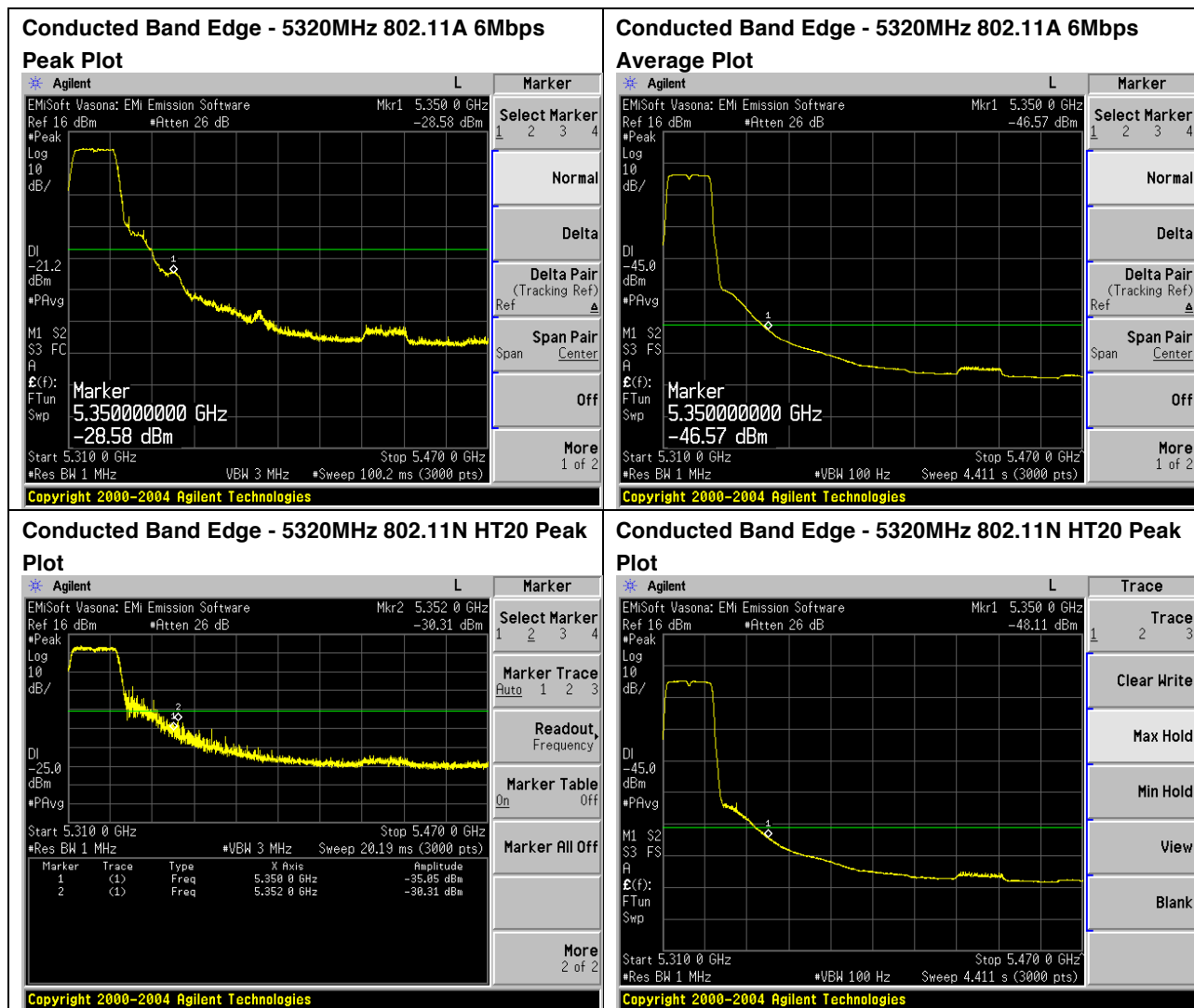
Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands.

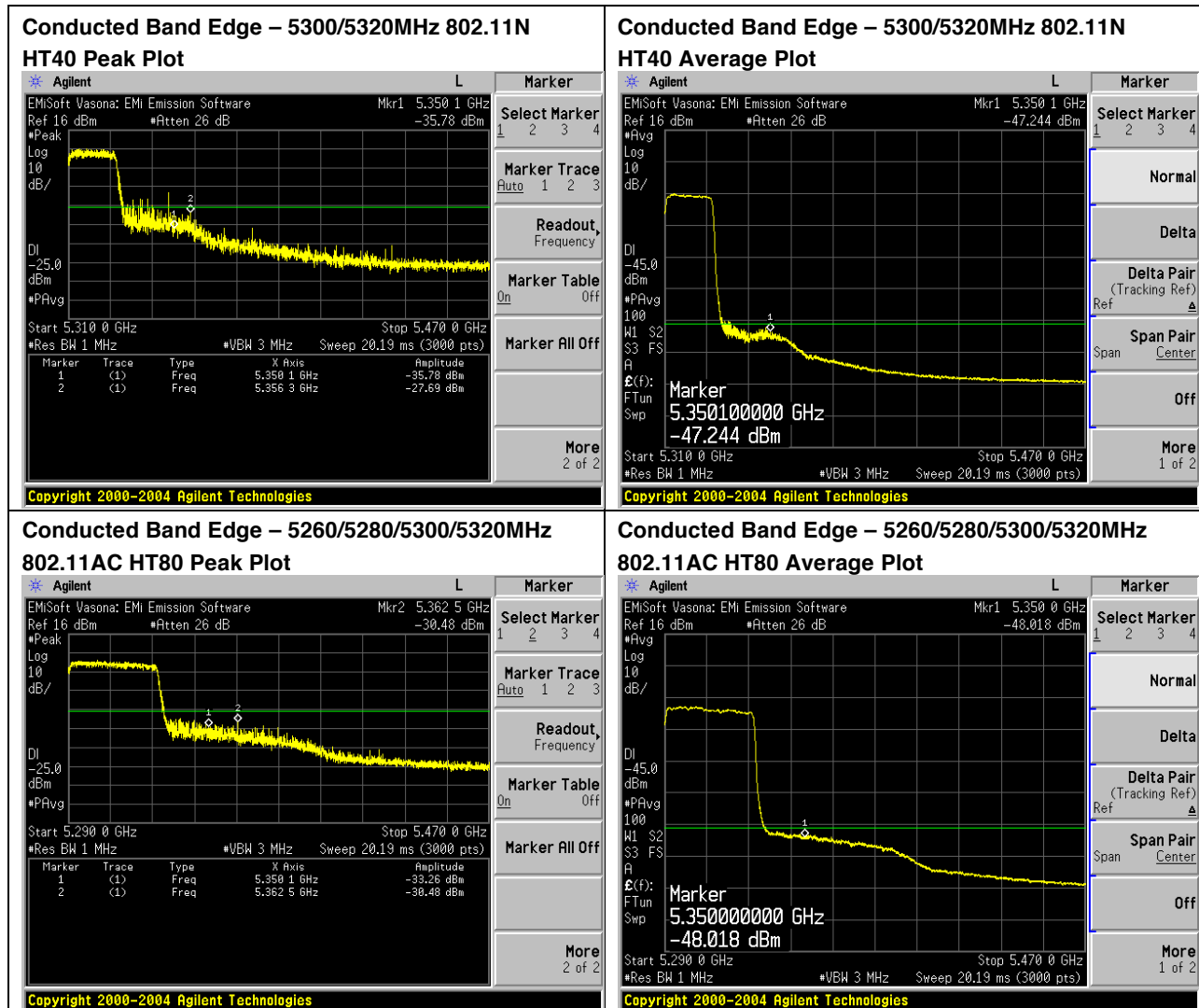
15.407 B (3) For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.

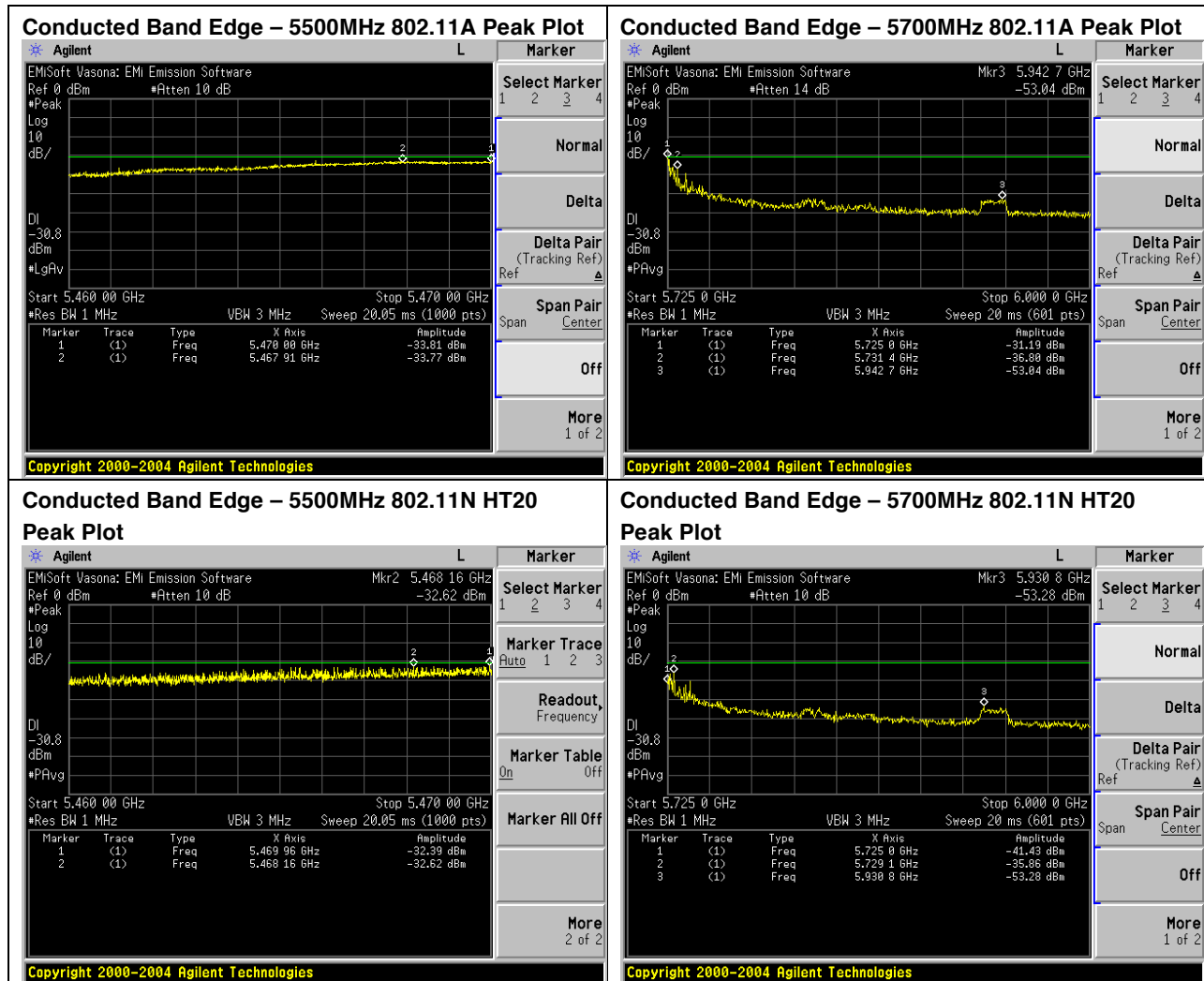
Connect the antenna port(s) to the spectrum analyzer input. Place the radio in continuous transmit mode. Configure the spectrum analyzer as shown below (be sure to enter all losses between the transmitter output and the spectrum analyzer).

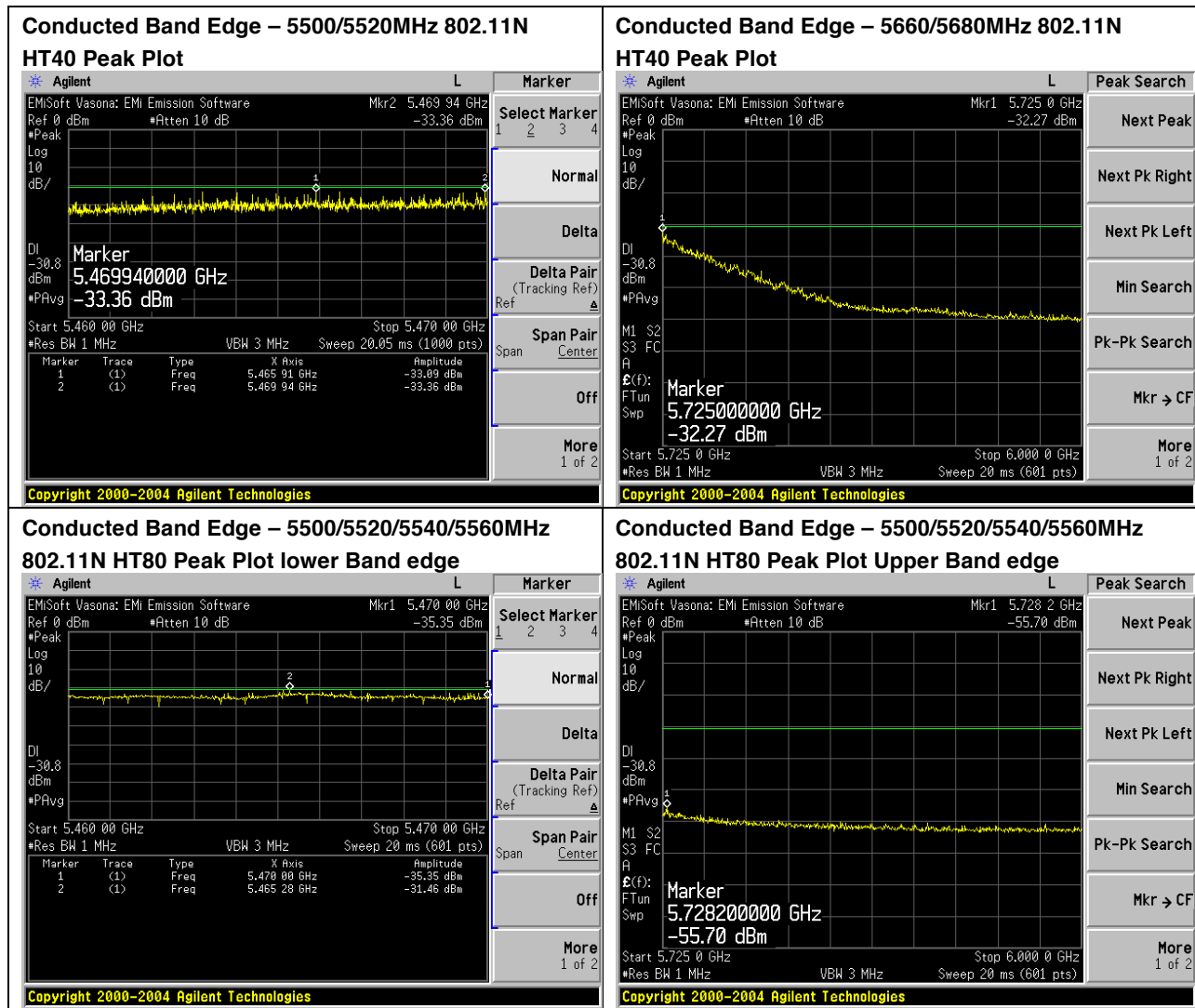
Span:	Wide enough to capture the Band edge
Reference Level:	20 dBm
Attenuation:	10 dB
Sweep Time:	10 s
Resolution Bandwidth:	1 MHz
Video Bandwidth:	3 MHz
Detector:	Peak
Trace:	Max hold
Marker:	Place a marker at the end of the Authorized band

Also measure any emissions in the restricted bands.











Radiated Tx Spurious Emissions

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

Using Vasona, configure the spectrum analyzer as shown below (be sure to enter all losses between the transmitter output and the spectrum analyzer). Place the radio in continuous transmit mode.

Span:	1GHz – 18 GHz
Reference Level:	80 dBuV
Attenuation:	10 dB
Sweep Time:	Coupled
Resolution Bandwidth:	1MHz
Video Bandwidth:	1 MHz for peak, 10 Hz for average
Detector:	Peak

Terminate the access Point RF ports with 50 ohm loads.

Maximize Turntable (find worst case table angle),
Maximize Antenna (find worst case height)

Save 2 plots: 1) Average Plot (Vertical and Horizontal), Limit= 54dBuV @3m
 2) Peak plot (Vertical and Horizontal), Limit = 74dBuV @3m

Place a marker at the end of the restricted band closest to the transmit frequency to show compliance.
Also measure any emissions in the restricted bands.

No emissions seen above 18GHz

**Test Results Table 5260MHz 802.11A 1-18GHz Peak plot**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
10520	39.6	11.5	5.5	56.5	Pk	V	100	181	74	-17.5	Pass	
15780	49.2	12.9	2.1	64.2	Pk	V	100	181	74	-9.8	Pass	
10520	37.5	11.5	5.5	54.4	Pk	H	122	218	74	-19.6	Pass	
15780	42.8	12.9	2.1	57.8	Pk	H	122	218	74	-16.2	Pass	

Test Results Table 5320MHz 802.11A 1-18GHz Peak plot

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
10640	39	11.5	5	55.5	Pk	V	100	181	74	-18.5	Pass	
15960	44.5	12.9	2.9	60.3	Pk	V	100	181	74	-13.7	Pass	
10640	38.2	11.5	5	54.7	Pk	H	125	220	74	-19.3	Pass	
15960	44.1	12.9	2.9	59.9	Pk	H	125	220	74	-14.1	Pass	

Test Results Table 5500MHz 802.11A 1-18GHz Peak plot

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
10998.872	39.6	11.6	5	56.2	Pk	V	100	181	74	-17.8	Pass	
16499.347	41.9	12.9	3.6	58.4	Pk	V	100	181	74	-15.6	Pass	
11000.578	39.3	11.6	5	55.9	Pk	H	125	218	74	-18.1	Pass	
16500.864	42.6	12.9	3.6	59.1	Pk	H	125	218	74	-14.9	Pass	

Test Results Table 5580MHz 802.11A 1-18GHz Peak plot

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11160	33.9	11.6	5.3	50.8	Pk	V	110	177	74	-23.2	Pass	
16740	35.8	12.9	5.1	53.8	Pk	V	110	177	74	-20.2	Pass	
11160	32.2	11.6	5.3	49.1	Pk	H	122	225	74	-24.9	Pass	
16740	36.2	12.9	5.1	54.2	Pk	H	122	225	74	-19.8	Pass	

Test Results Table 5700MHz 802.11A 1-18GHz Peak plot

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11401.043	31.6	11.8	5.9	49.3	Pk	V	110	181	74	-24.7	Pass	
17099.395	33	13.2	5.7	52	Pk	V	110	181	74	-22	Pass	
11400.682	32.5	11.8	5.9	50.2	Pk	H	118	223	74	-23.8	Pass	
17099.337	33.5	13.2	5.7	52.5	Pk	H	118	223	74	-21.5	Pass	

No emissions seen above 18GHz

**Test Results Table 5260MHz 802.11N HT20 1-18GHz Peak plot**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
10519.681	39.8	11.5	5.5	56.7	PK	V	100	181	74	-17.3	Pass	
15779.037	43.8	12.9	2.1	58.8	PK	V	100	181	74	-15.2	Pass	
10520.235	37.4	11.5	5.5	54.3	PK	H	122	218	74	-19.7	Pass	
15779.679	42.9	12.9	2.1	57.9	PK	H	122	218	74	-16.1	Pass	

Test Results Table 5320MHz 802.11N HT20 1-18GHz Peak plot

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
10640.627	39.4	11.5	5	55.8	Pk	V	100	181	74	-18.2	Pass	
15959.204	44.1	12.9	2.9	59.9	Pk	V	100	181	74	-14.1	Pass	
10639.09	38.4	11.5	5	54.9	Pk	H	125	220	74	-19.1	Pass	
15960.58	43.7	12.9	2.9	59.5	Pk	H	125	220	74	-14.5	Pass	

Test Results Table 5500MHz 802.11N HT20 1-18GHz Peak plot

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11001.063	39.5	11.6	5	56.1	Pk	V	100	181	74	-17.9	Pass	
16499.641	42.2	12.9	3.6	58.7	Pk	V	100	181	74	-15.3	Pass	
11001.465	39.2	11.6	5	55.8	Pk	H	125	218	74	-18.2	Pass	
16498.881	42.6	12.9	3.6	59.1	Pk	H	125	218	74	-14.9	Pass	

Test Results Table 5580MHz 802.11N HT20 1-18GHz Peak plot

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11161.205	34.8	11.7	5.3	51.8	Pk	V	110	177	74	-22.2	Pass	
16741.029	36.6	12.9	5.1	54.6	Pk	V	110	177	74	-19.4	Pass	
11161.149	32.8	11.7	5.3	49.8	Pk	H	122	225	74	-24.2	Pass	
16740.52	36.5	12.9	5.1	54.5	Pk	H	122	225	74	-19.5	Pass	

Test Results Table 5700MHz 802.11N HT20 1-18GHz Peak plot

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11398.862	31.4	11.8	5.9	49.1	Pk	V	110	181	74	-24.9	Pass	
17100.108	33.5	13.2	5.7	52.5	Pk	V	110	181	74	-21.5	Pass	
11400.924	33.2	11.8	5.9	50.9	Pk	H	118	223	74	-23.1	Pass	
17098.396	33.6	13.2	5.7	52.5	Pk	H	118	223	74	-21.5	Pass	

No emissions seen above 18GHz

**Test Results Table 5270MHz 802.11N HT40 1-18GHz Peak plot**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
10540.209	32	11.4	5.5	48.9	Pk	V	102	182	74	-25.1	Pass	
15808.926	35.6	12.9	2.3	50.8	Pk	V	102	182	74	-23.2	Pass	
10538.852	31.9	11.4	5.5	48.8	Pk	H	122	232	74	-25.2	Pass	
15810.806	34.1	12.9	2.3	49.3	Pk	H	122	232	74	-24.7	Pass	

Test Results Table 5310MHz 802.11N HT40 1-18GHz Peak plot

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
10618.825	32	11.5	5	48.5	Pk	V	102	182	74	-25.5	Pass	
15929.835	34.9	13	3	50.9	Pk	V	102	182	74	-23.1	Pass	
10621.033	33	11.5	5	49.5	Pk	H	122	232	74	-24.5	Pass	
15929.375	34.3	13	3	50.2	Pk	H	122	232	74	-23.8	Pass	

Test Results Table 5510MHz 802.11N HT40 1-18GHz Peak plot

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11020	32.9	11.6	5	49.5	Pk	V	100	180	74	-24.5	Pass	
16530	36.3	12.8	3	52.1	Pk	V	100	180	74	-21.9	Pass	
11020	33.3	11.6	5	49.9	Pk	H	125	230	74	-24.1	Pass	
16530	35.4	12.8	3	51.2	Pk	H	125	230	74	-22.8	Pass	

Test Results Table 5550MHz 802.11N HT40 1-18GHz Peak plot

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11020.907	32.2	11.6	5	48.8	Pk	V	100	179	74	-25.2	Pass	
16530.269	34.4	12.8	3	50.2	Pk	V	100	179	74	-23.8	Pass	
11020.996	32.6	11.6	5	49.2	Pk	H	120	230	74	-24.8	Pass	
16529.634	35.5	12.8	3	51.3	Pk	H	120	230	74	-22.7	Pass	

Test Results Table 5670MHz 802.11N HT40 1-18GHz Peak plot

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11340.78	33	11.7	6.4	51.1	Pk	V	100	185	74	-22.9	Pass	
17010.18	34.2	13.1	5	52.3	Pk	V	105	185	74	-21.7	Pass	
11340.78	33	11.7	6.4	51.1	Pk	H	127	245	74	-22.9	Pass	
17010.18	34.5	13.1	5	52.6	Pk	H	127	245	74	-21.4	Pass	

No emissions seen above 18GHz

Test Results Table 5290MHz 802.11AC 80MHzBW 1-18GHz Peak plot

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
10580	40.2	11.5	5.3	56.9	Pk	V	110	185	74	-17.1	Pass	
15870	41.8	12.9	2.7	57.4	Pk	V	110	185	74	-16.6	Pass	
10580	38.6	11.5	5.3	55.3	Pk	H	120	223	74	-18.7	Pass	
15870	41.3	12.9	2.7	56.9	Pk	H	120	223	74	-17.1	Pass	

Test Results Table 5530MHz 802.11AC HT80 1-18GHz Peak plot

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11060	33.2	11.7	5	49.8	Pk	V	103	183	74	-24.2	Pass	
16590	34.2	12.9	3.6	50.7	Pk	V	103	183	74	-23.3	Pass	
11060	33.3	11.7	5	49.9	Pk	H	118	236	74	-24.1	Pass	
16590	34.7	12.9	3.6	51.2	Pk	H	118	236	74	-22.8	Pass	

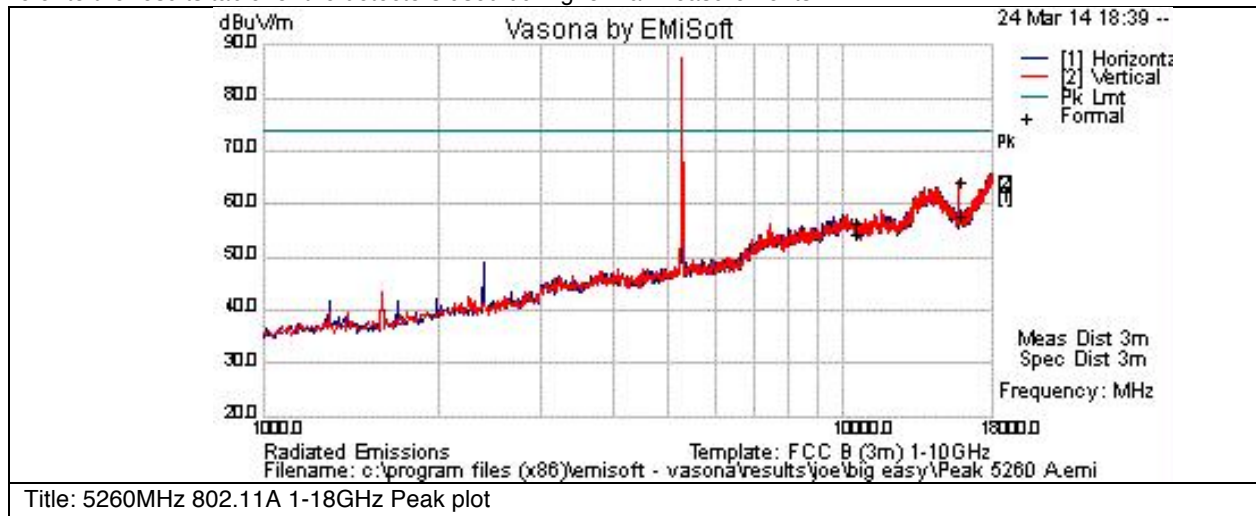
No emissions seen above 18GHz



Radiated TX Spurious, Peak Plots

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Graphical Test Results

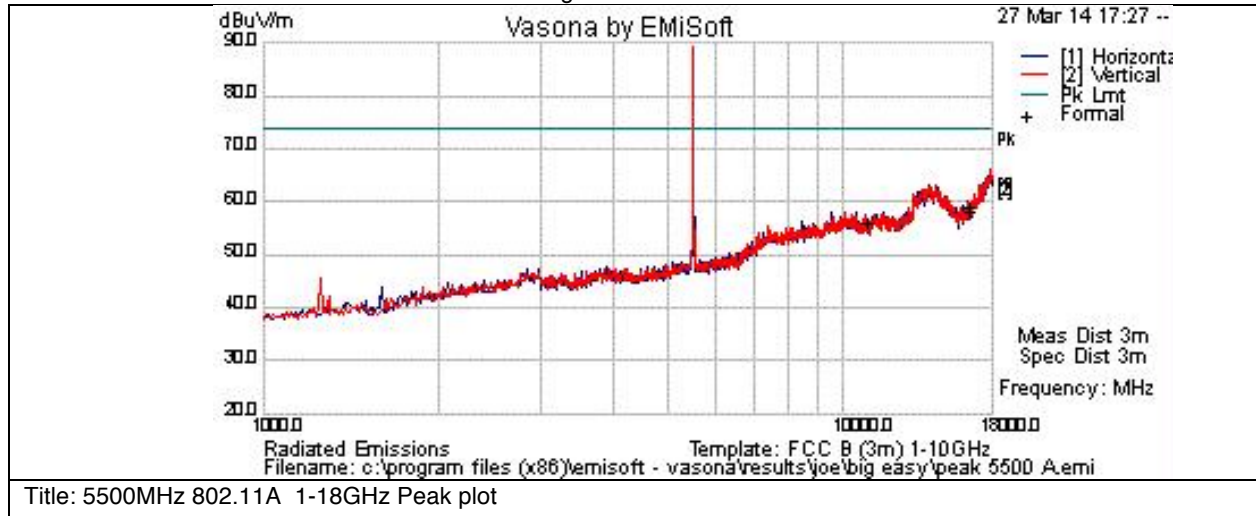
Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



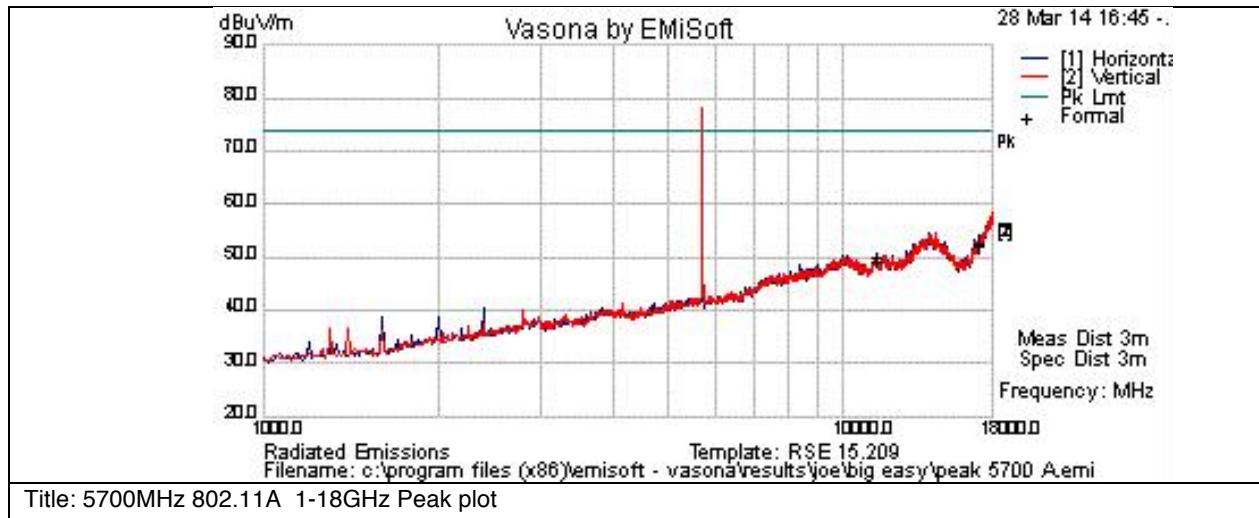
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Graphical Test Results

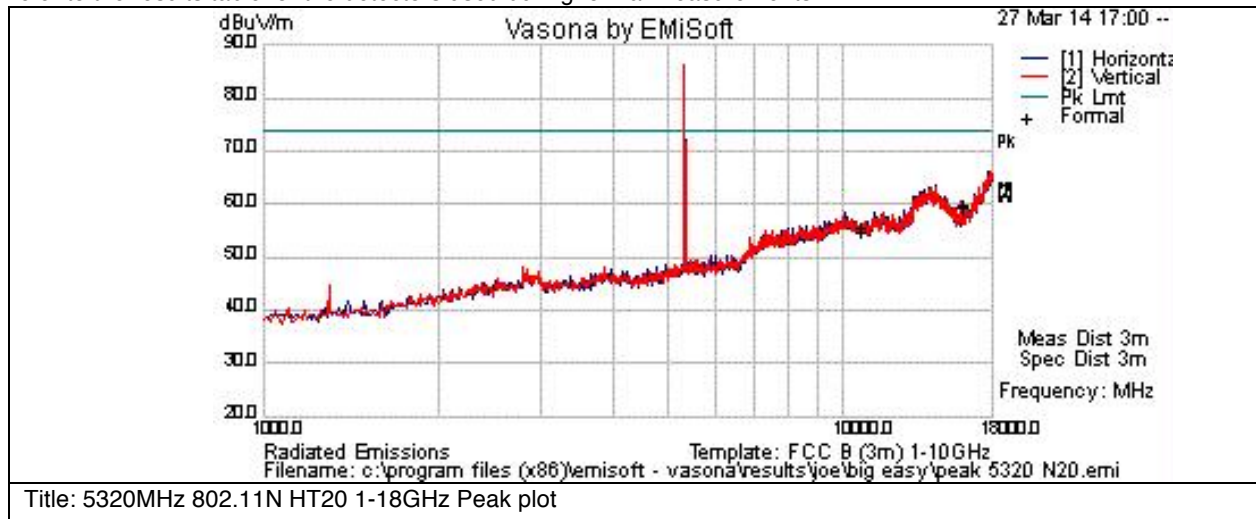
Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





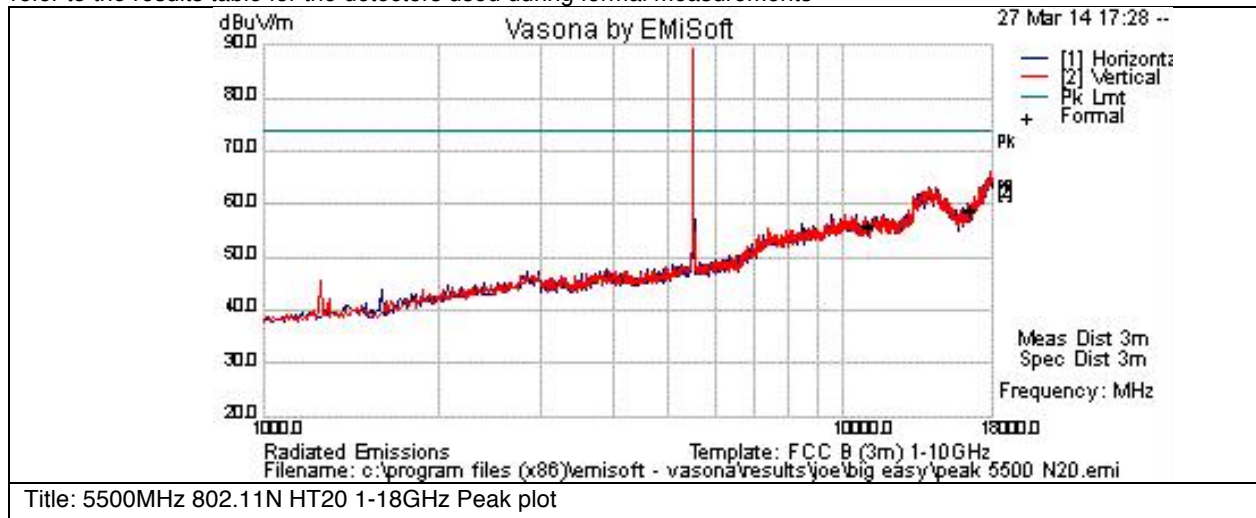
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Graphical Test Results

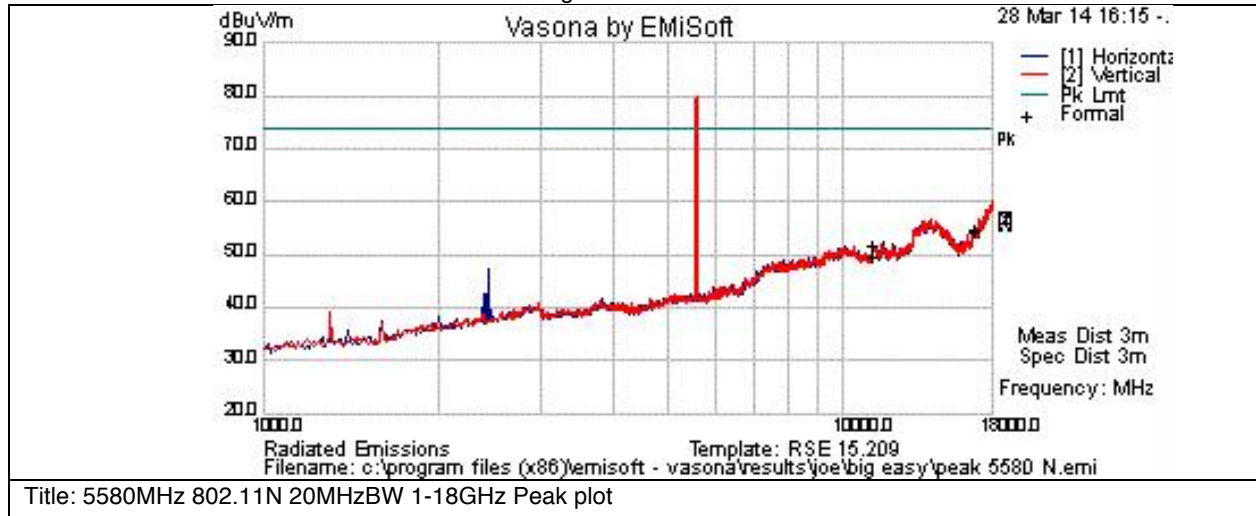
Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Graphical Test Results

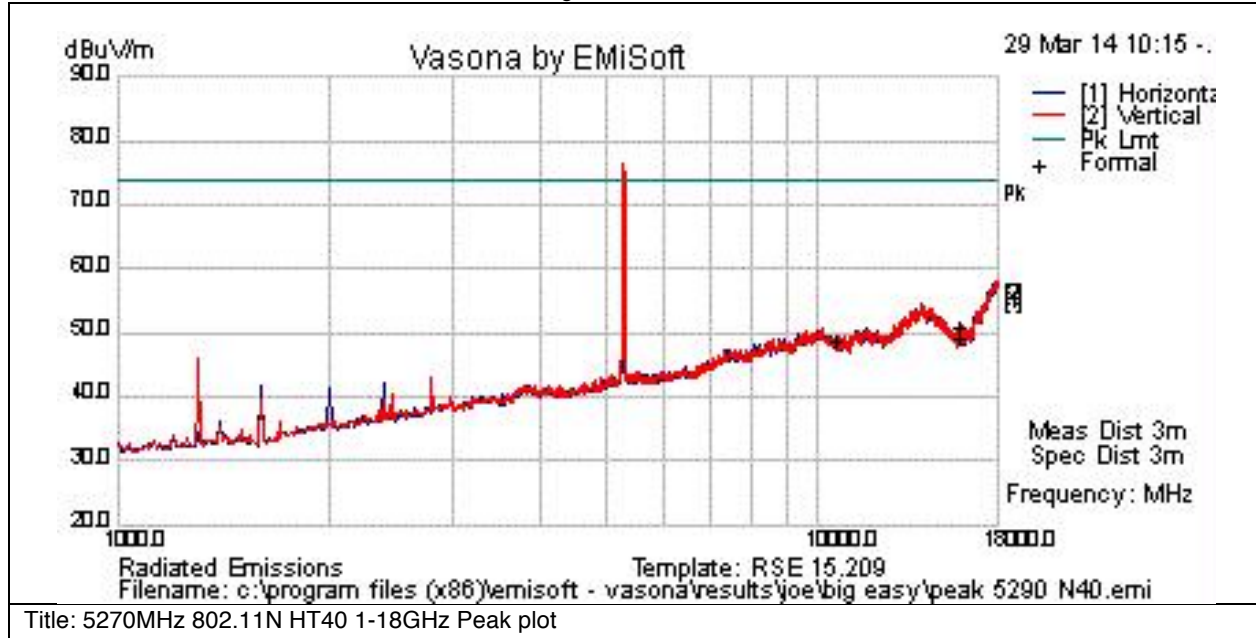
Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





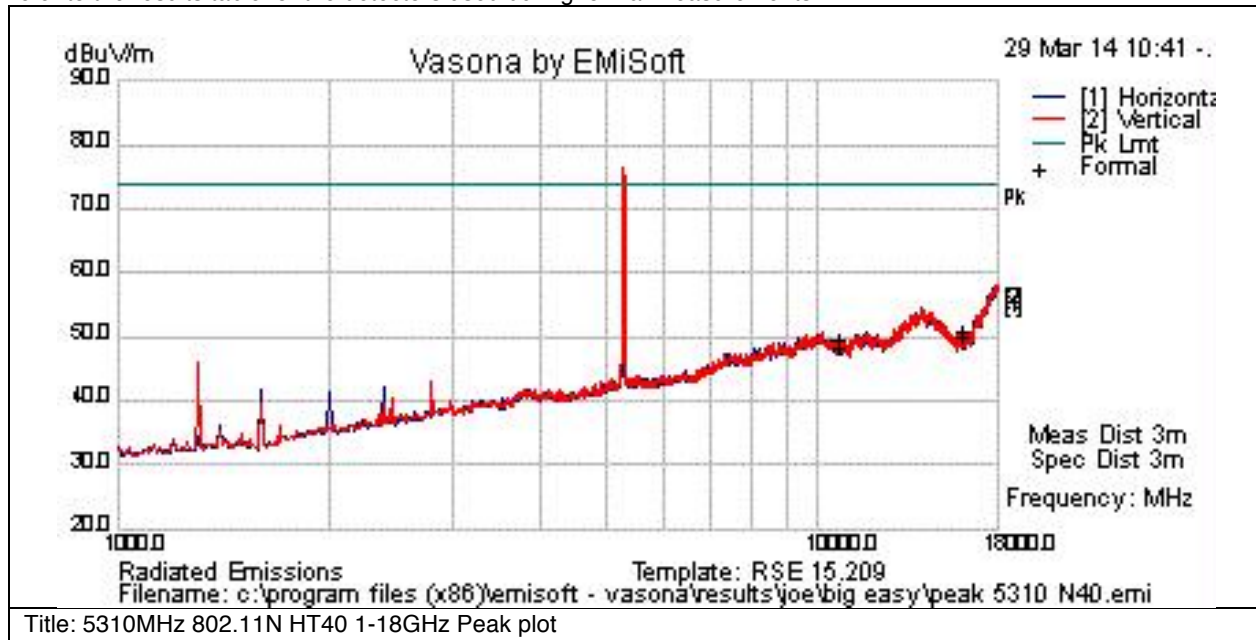
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Graphical Test Results

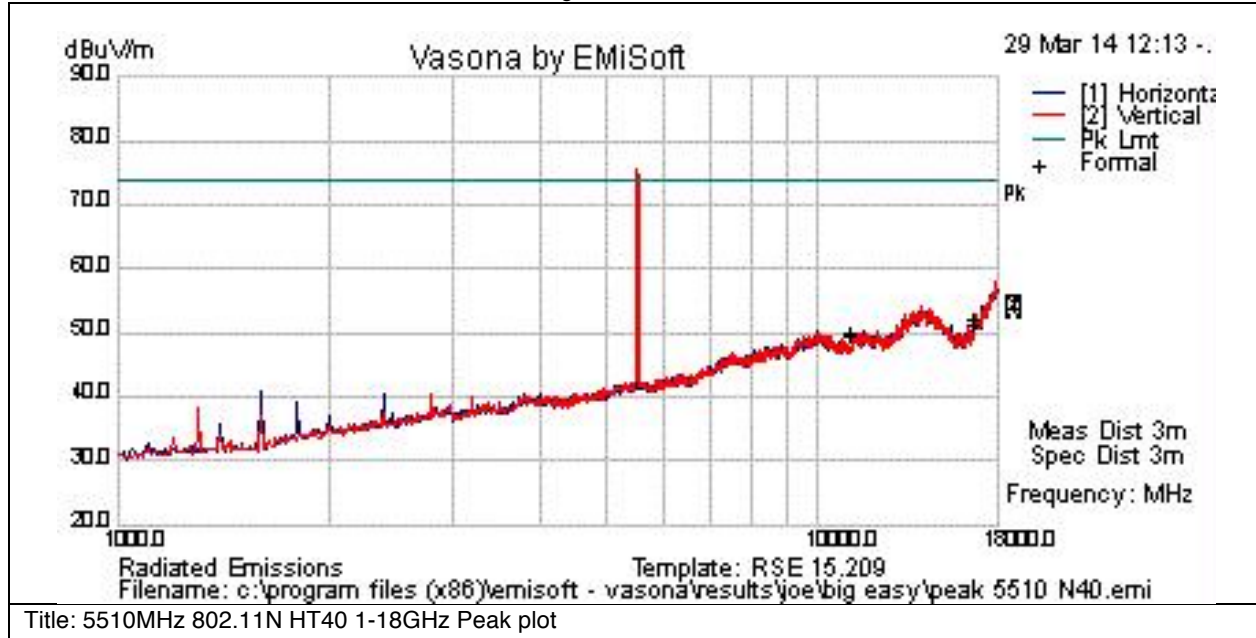
Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





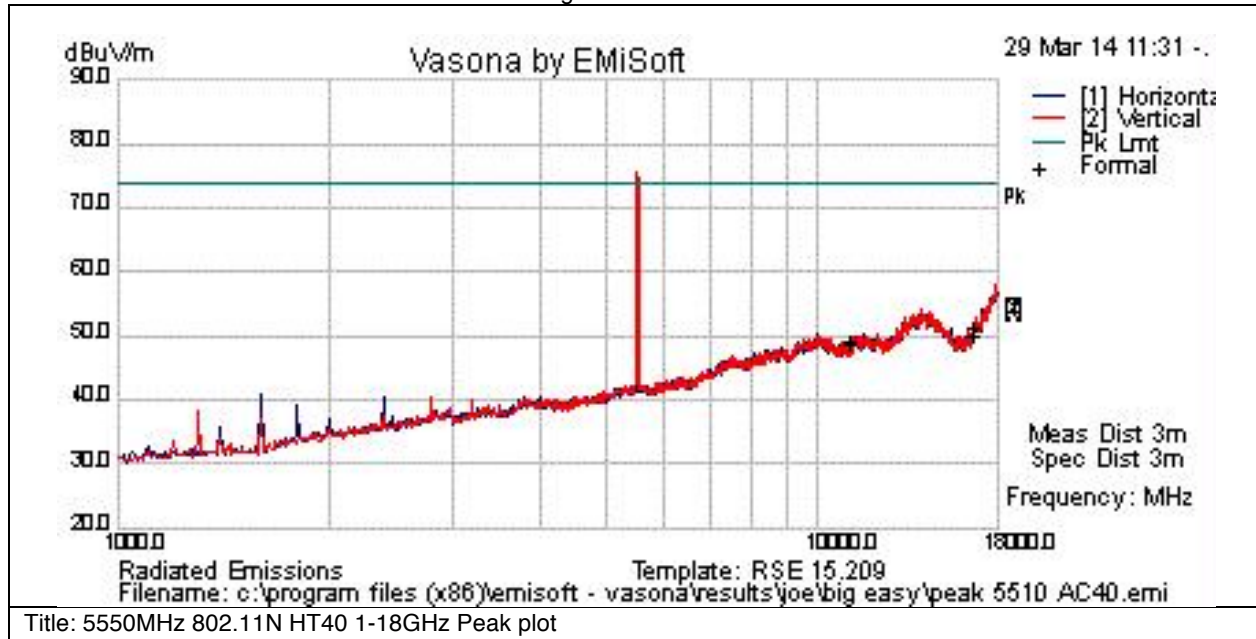
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Graphical Test Results

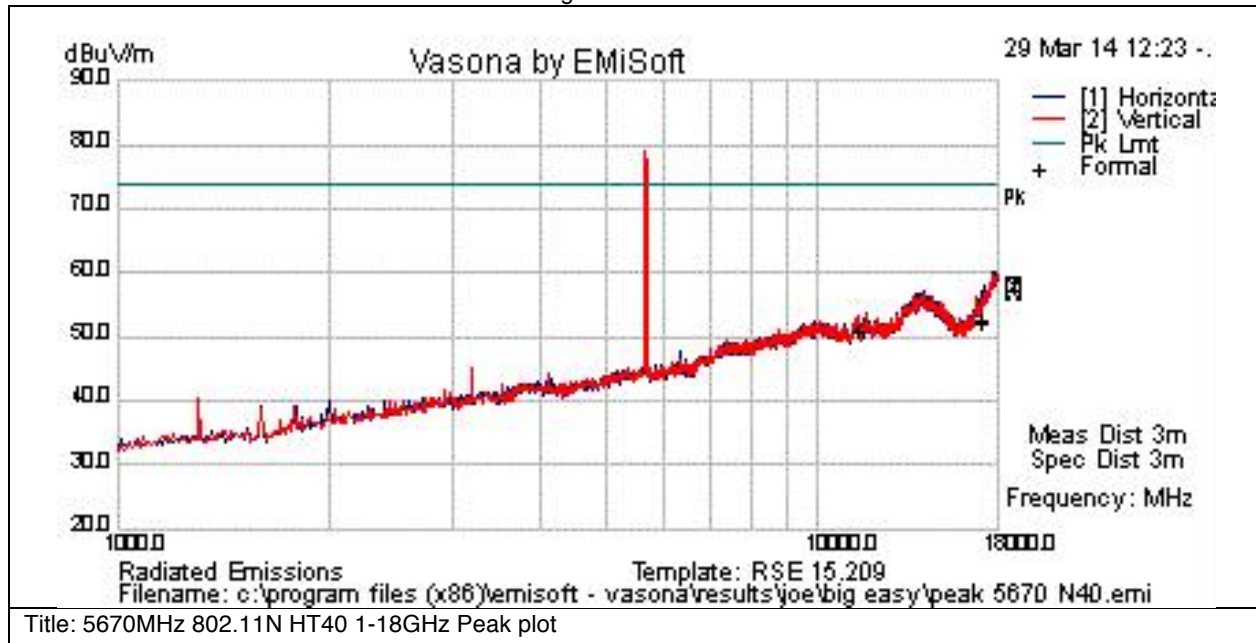
Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





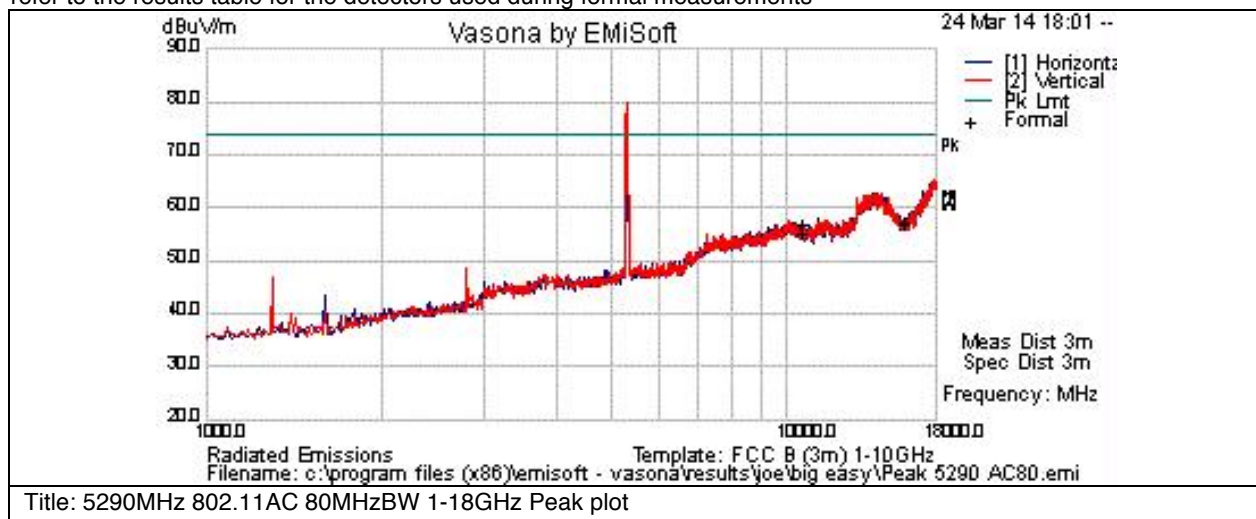
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Graphical Test Results

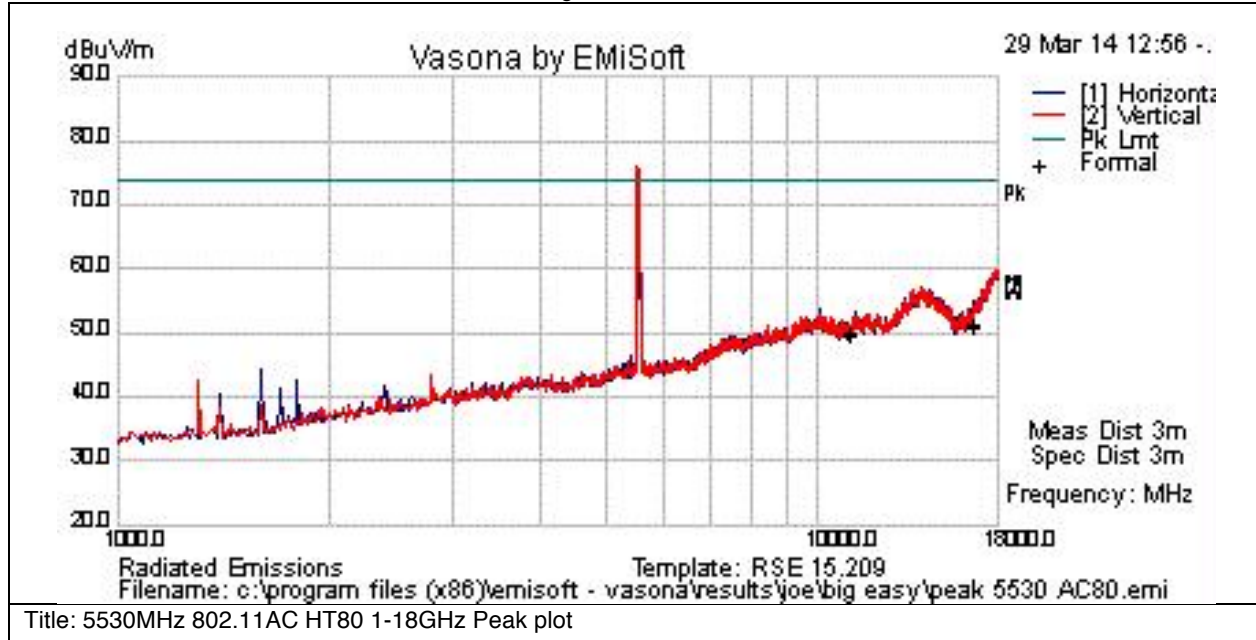
Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





Radiated TX Spurious, Average Plots

Test Results Table 5260MHz 802.11A 1-18GHz Average

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
10520.056	21.9	18	5.1	45	Av	V	113	181	54	-9	Pass	
15779.935	25.6	20.9	1.3	47.7	Av	V	113	181	54	-6.3	Pass	
10520.051	22	18	5.1	45.1	Av	H	121	222	54	-8.9	Pass	
15779.784	21.2	20.9	1.3	43.4	Av	H	121	222	54	-10.6	Pass	

Test Results Table 5320MHz 802.11A 1-18GHz Average

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
10638.544	21.3	18.1	4.7	44.1	Av	V	111	181	54	-9.9	Pass	
15959.887	25.4	21	2.1	48.4	Av	V	111	181	54	-5.6	Pass	
10639.884	20.8	18.1	4.7	43.6	Av	H	121	222	54	-10.4	Pass	
15960.101	24.3	21	2.1	47.3	Av	H	121	222	54	-6.7	Pass	

Test Results Table 5500MHz 802.11A 1-18GHz Average

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11000.007	20.8	18.4	4.5	43.7	Av	V	110	180	54	-10.3	Pass	
16499.817	21	21.3	2.5	44.8	Av	V	110	180	54	-9.2	Pass	
11000.744	20.9	18.4	4.5	43.8	Av	H	120	225	54	-10.2	Pass	
16500.229	21.2	21.3	2.5	45.1	Av	H	120	225	54	-8.9	Pass	

Test Results Table 5580MHz 802.11A 1-18GHz Average

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11160	23.4	18.5	4.7	46.6	Av	V	110	180	54	-7.4	Pass	
16740	21.1	21.5	4.8	47.4	Av	V	110	180	54	-6.6	Pass	
11160	20.8	18.5	4.7	44	Av	H	120	225	54	-10	Pass	
16740	20.8	21.5	4.8	47.1	Av	H	120	225	54	-6.9	Pass	

Test Results Table 5700MHz 802.11A 1-18GHz Average

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11400	21.7	18.7	4.9	45.3	Av	V	110	180	54	-8.7	Pass	
17100	21.2	21.8	6.5	49.5	Av	V	110	180	54	-4.5	Pass	
11400	21.3	18.7	4.9	44.9	Av	H	120	225	54	-9.1	Pass	
17100	20.6	21.8	6.5	48.9	Av	H	120	225	54	-5.1	Pass	

No emissions seen above 18GHz

**Test Results Table 5260MHz 802.11N HT20 1-18GHz Average**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
10519.569	21.9	18	5.1	45	Av	V	113	181	54	-9	Pass	
15779.946	24.9	20.9	1.3	47.1	Av	V	113	181	54	-6.9	Pass	
10519.205	22	18	5.1	45.1	Av	H	121	222	54	-8.9	Pass	
15778.938	24.2	20.9	1.3	46.4	Av	H	121	222	54	-7.6	Pass	

Test Results Table 5320MHz 802.11n HT20 1-18GHz Average

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
10639.445	20.5	18.1	4.7	43.3	Av	V	111	181	54	-10.7	Pass	
15960	27.1	20.9	2.1	50.1	Av	V	111	181	54	-3.9	Pass	
10639.8	20.7	18.1	4.7	43.6	Av	H	121	222	54	-10.4	Pass	
15960	23.8	20.9	2.1	46.8	Av	H	121	222	54	-7.2	Pass	

Test Results Table 5500MHz 802.11N HT20 1-18GHz Average

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
10999.408	22.8	18.4	4.5	45.7	Av	V	110	180	54	-8.3	Pass	
16500.542	22	21.3	2.5	45.8	Av	V	110	180	54	-8.2	Pass	
10999.63	21.9	18.4	4.5	44.8	Av	H	120	225	54	-9.2	Pass	
16499.963	20.8	21.3	2.5	44.6	Av	H	120	225	54	-9.4	Pass	

Test Results Table 5580MHz 802.11n HT20 1-18GHz Average

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11159.298	23.4	18.5	4.7	46.6	Av	V	110	180	54	-7.4	Pass	
16739.263	21.2	21.5	4.8	47.5	Av	V	110	180	54	-6.5	Pass	
11160.31	21.2	18.5	4.7	44.4	Av	H	120	225	54	-9.6	Pass	
16739.055	21	21.5	4.8	47.2	Av	H	120	225	54	-6.8	Pass	

Test Results Table 5700MHz 802.11N HT20 1-18GHz Average

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11401.049	22.3	18.7	4.9	45.9	Av	V	110	180	54	-8.1	Pass	
17100.091	20.3	21.8	6.5	48.6	Av	V	110	180	54	-5.4	Pass	
11400.361	20.7	18.7	4.9	44.3	Av	H	120	225	54	-9.7	Pass	
17100.22	19.4	21.8	6.5	47.7	Av	H	120	225	54	-6.3	Pass	

No emissions seen above 18GHz

**Test Results Table 5270MHz 802.11N HT40 1-18GHz Average**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
10539.483	28.7	11.4	5.5	45.6	Av	V	100	180	54	-8.4	Pass	
15809.017	30.2	12.9	2.3	45.4	Av	V	100	180	54	-8.6	Pass	
10539.116	28.4	11.4	5.5	45.3	Av	H	125	220	54	-8.7	Pass	
15809.308	30.8	12.9	2.3	46	Av	H	125	220	54	-8	Pass	

Test Results Table 5310MHz 802.11N HT40 1-18GHz Average

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
10620	28.7	11.5	5	45.2	Av	V	100	180	54	-8.8	Pass	
15930	30.7	13	3	46.7	Av	V	100	180	54	-7.3	Pass	
10620	28.4	11.5	5	44.9	Av	H	125	228	54	-9.1	Pass	
15930	29.1	13	3	45.1	Av	H	125	225	54	-8.9	Pass	

Test Results Table 5510MHz 802.11N HT40 1-18GHz Average

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11019.072	26.9	11.6	5	43.5	Av	V	100	180	54	-10.5	Pass	
16530.26	30.3	12.8	3	46.1	Av	V	100	180	54	-7.9	Pass	
11020.158	27.9	11.6	5	44.6	Av	H	120	223	54	-9.4	Pass	
16530.75	30.9	12.8	3	46.7	Av	H	120	223	54	-7.3	Pass	

Test Results Table 5550MHz 802.11N HT40 1-18GHz Average

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11101.662	27.6	11.7	4.7	44	Av	V	100	180	54	-10.1	Pass	
16651.177	30.5	12.9	4.2	47.6	Av	V	100	180	54	-6.4	Pass	
11102.003	28.1	11.7	4.7	44.5	Av	H	120	223	54	-9.5	Pass	
16649.401	30.3	12.9	4.2	47.4	Av	H	120	223	54	-6.6	Pass	

Test Results Table 5670MHz 802.11N HT40 1-18GHz Average

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11340	28.8	11.7	6.4	46.9	Av	V	100	180	54	-7.1	Pass	
17010	30.2	13.1	5	48.3	Av	V	100	180	54	-5.7	Pass	
11340	28.6	11.7	6.4	46.7	Av	H	120	223	54	-7.3	Pass	
17010	30.3	13.1	5	48.4	Av	H	120	223	54	-5.6	Pass	

No emissions seen above 18GHz

Test Results Table 5290MHz 802.11AC HT80 1-18GHz Average

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
10580	30.1	11.5	5.3	46.8	Av	V	110	185	54	-7.2	Pass	
15870	30.6	12.9	2.7	46.2	Av	V	110	185	54	-7.8	Pass	
10580	28.7	11.5	5.3	45.4	Av	H	120	223	54	-8.6	Pass	
15870	30.4	12.9	2.7	46	Av	H	120	223	54	-8	Pass	

Test Results Table 5530MHz 802.11AC HT80 1-18GHz Average

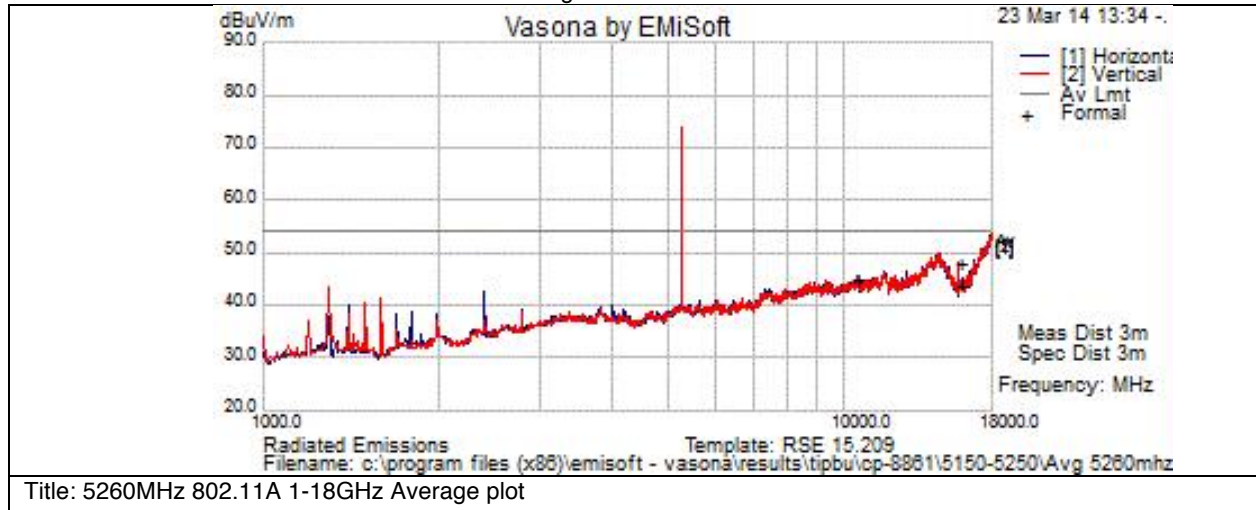
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
11060	28.6	11.7	5	45.2	Av	V	100	174	54	-8.8	Pass	
16590	30.3	12.9	3.6	46.8	Av	V	100	174	54	-7.2	Pass	
11060	27.9	11.7	5	44.5	Av	H	120	223	54	-9.5	Pass	
16590	31	12.9	3.6	47.5	Av	H	120	223	54	-6.5	Pass	

No emissions seen above 18GHz



Graphical Test Results

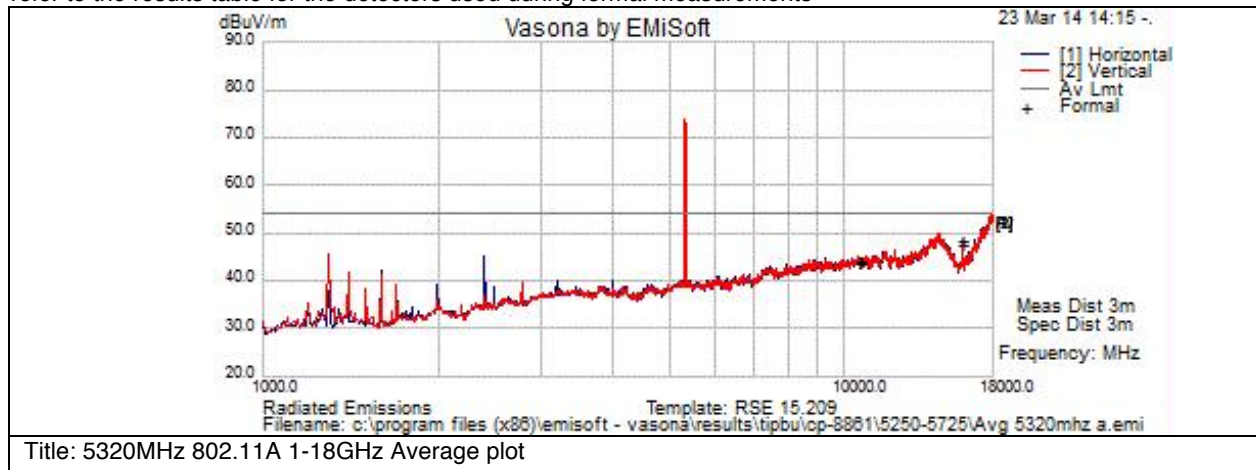
Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Title: 5260MHz 802.11A 1-18GHz Average plot

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements

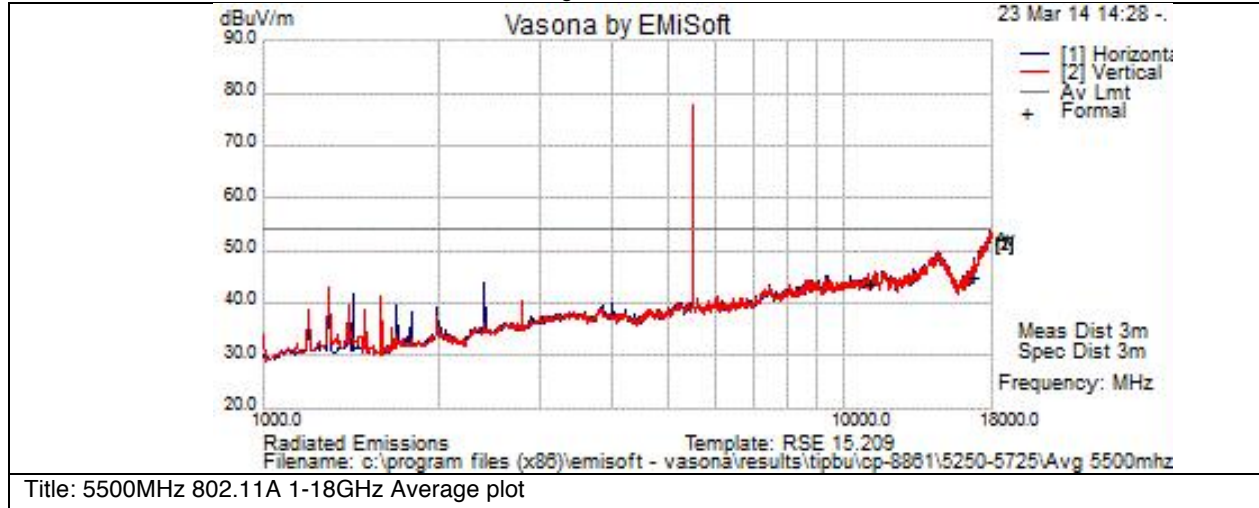


Title: 5320MHz 802.11A 1-18GHz Average plot



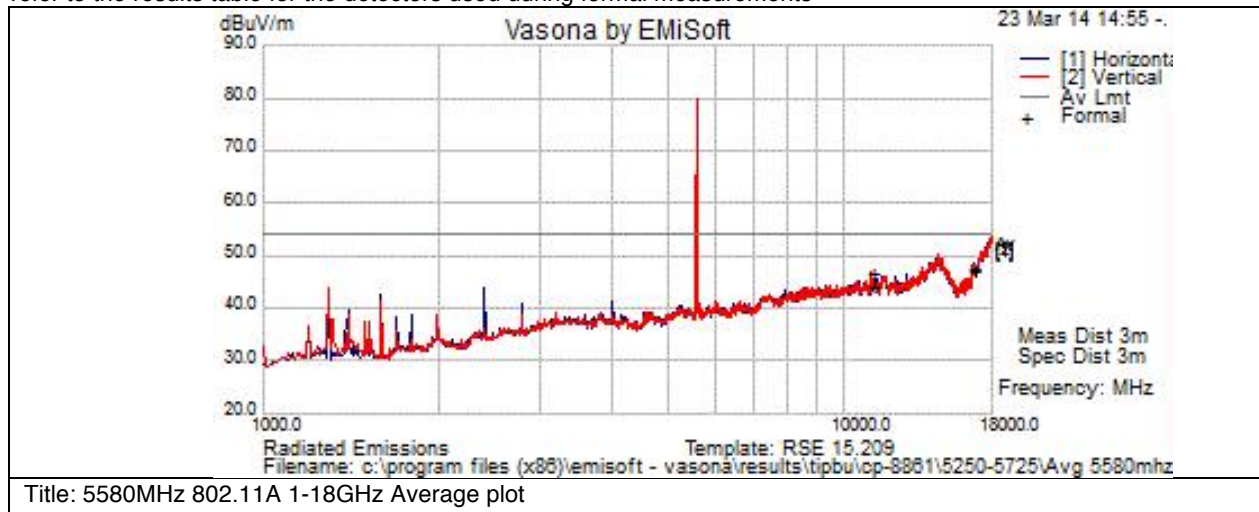
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Graphical Test Results

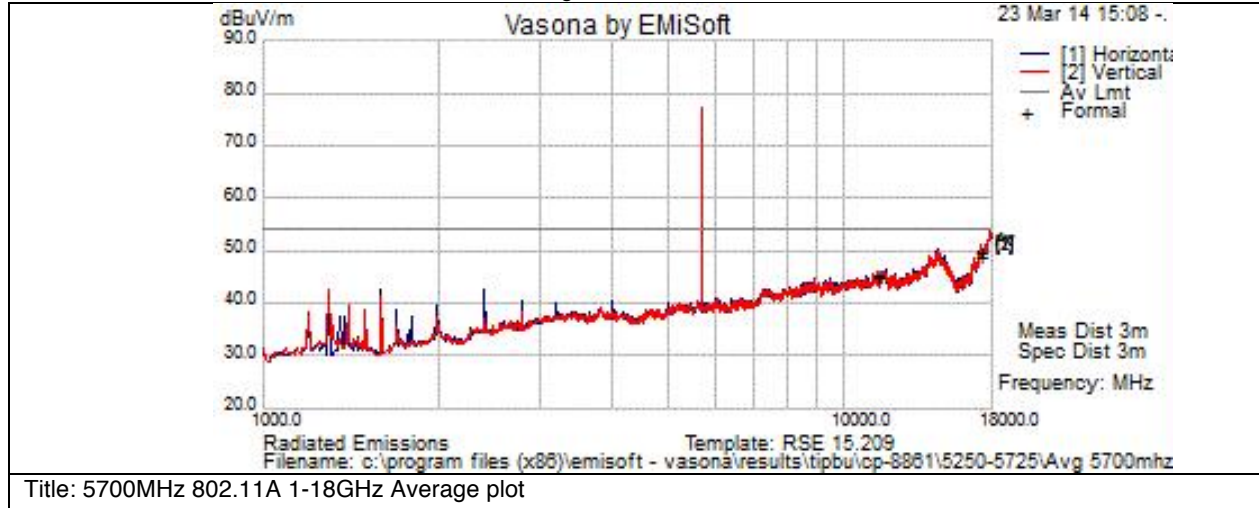
Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





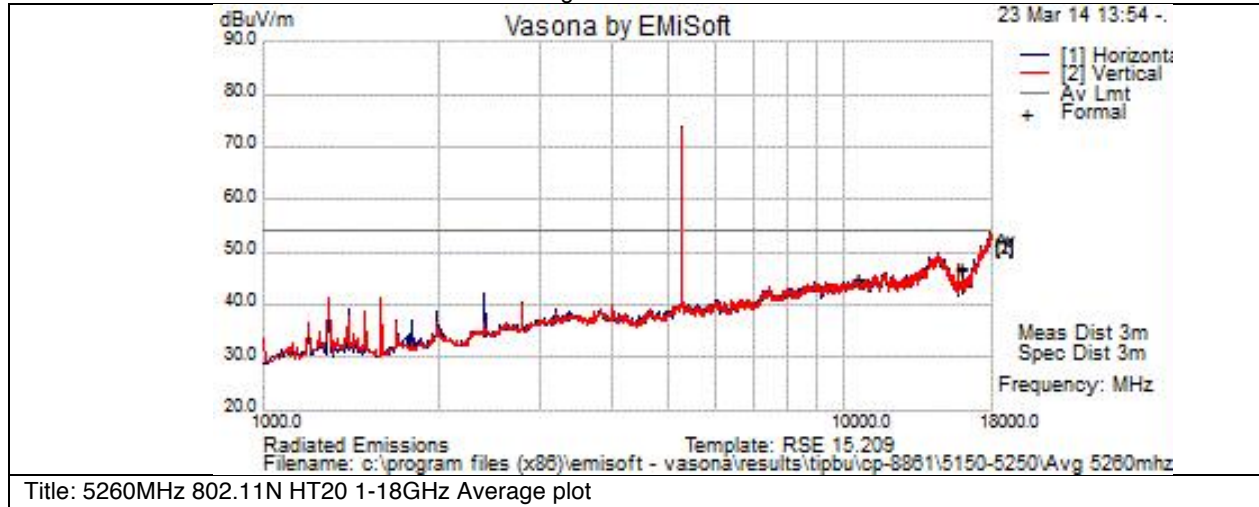
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Graphical Test Results

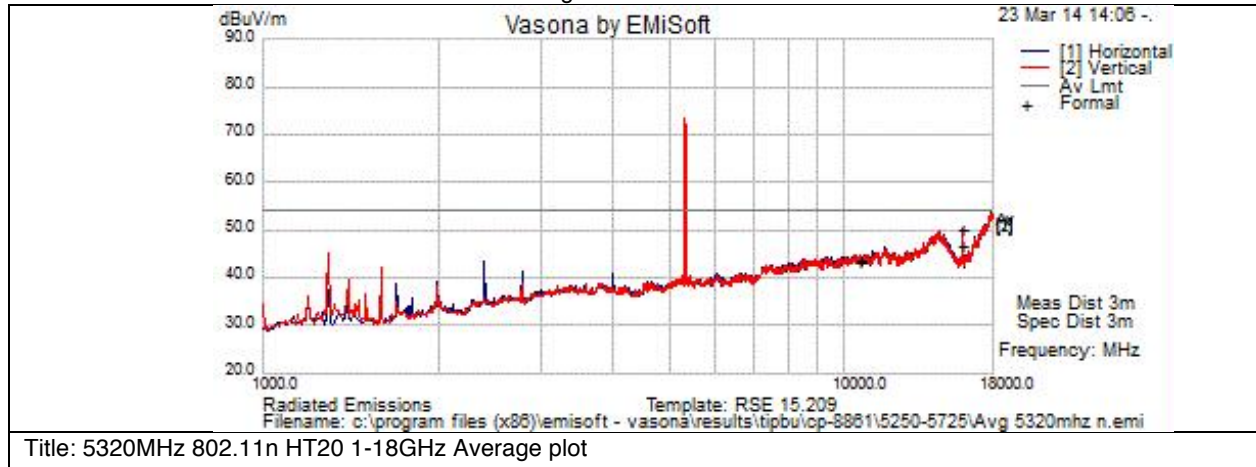
Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





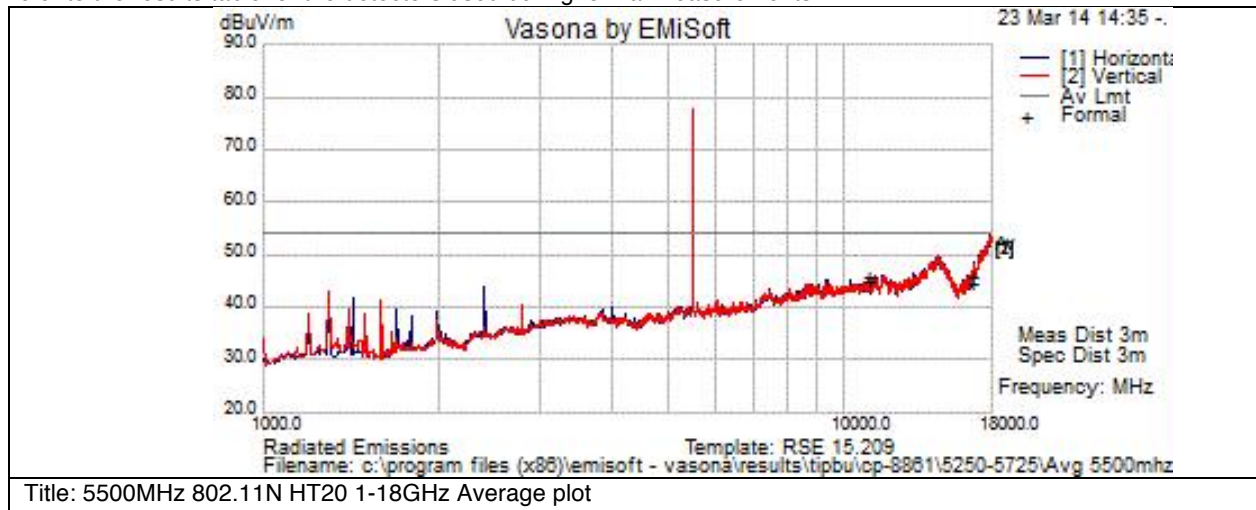
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Graphical Test Results

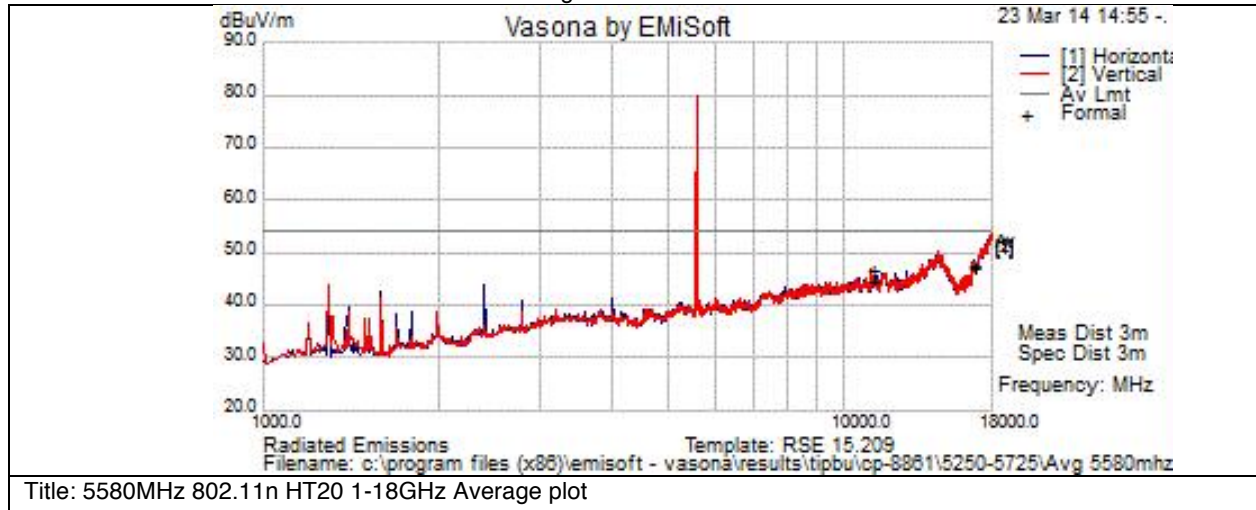
Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Graphical Test Results

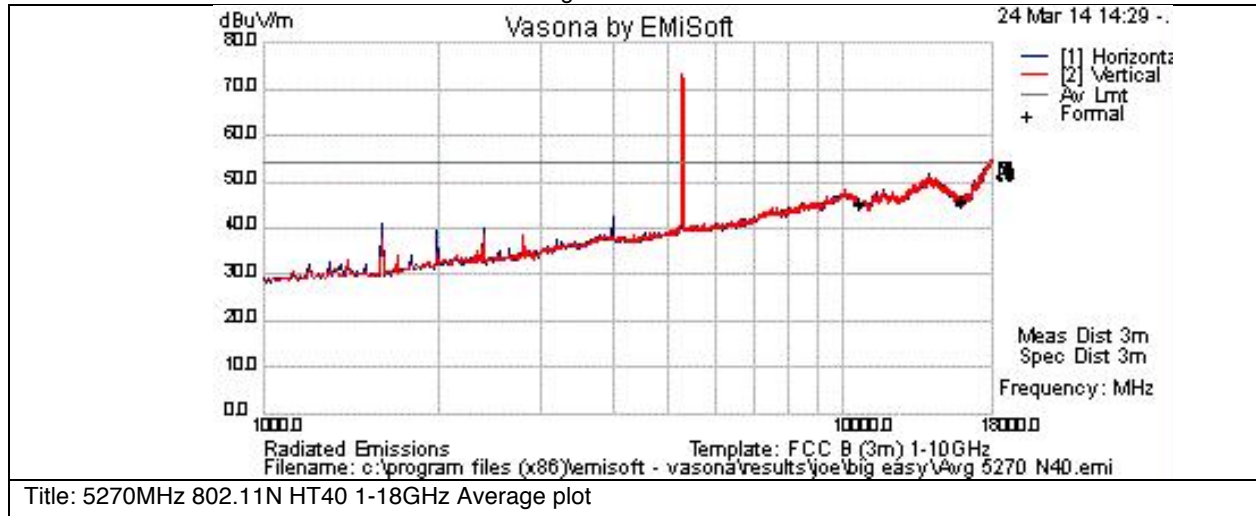
Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





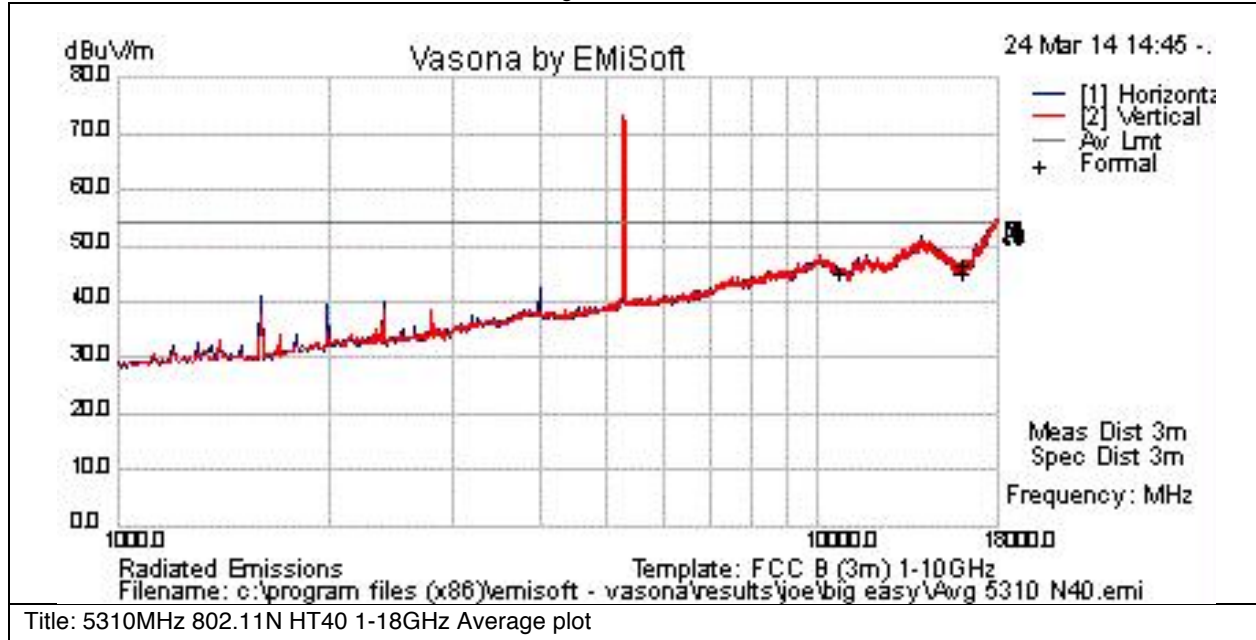
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Graphical Test Results

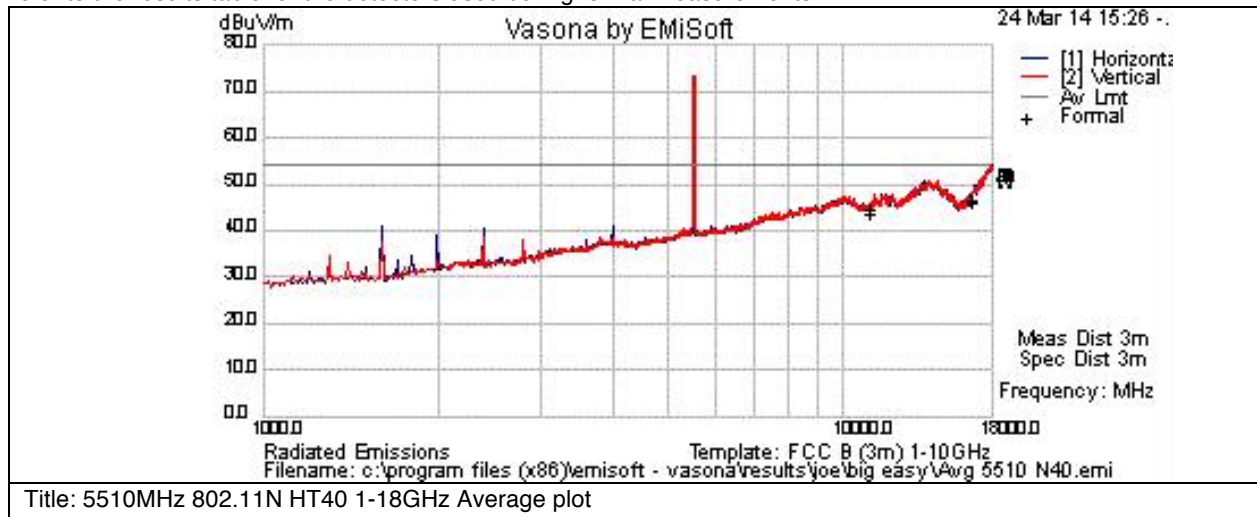
Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Graphical Test Results

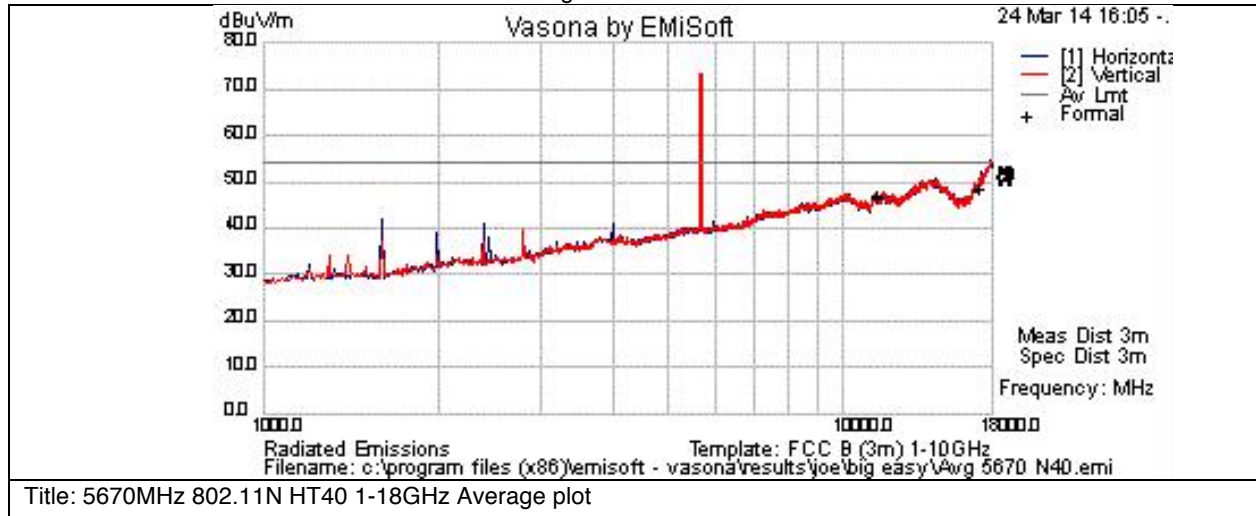
Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





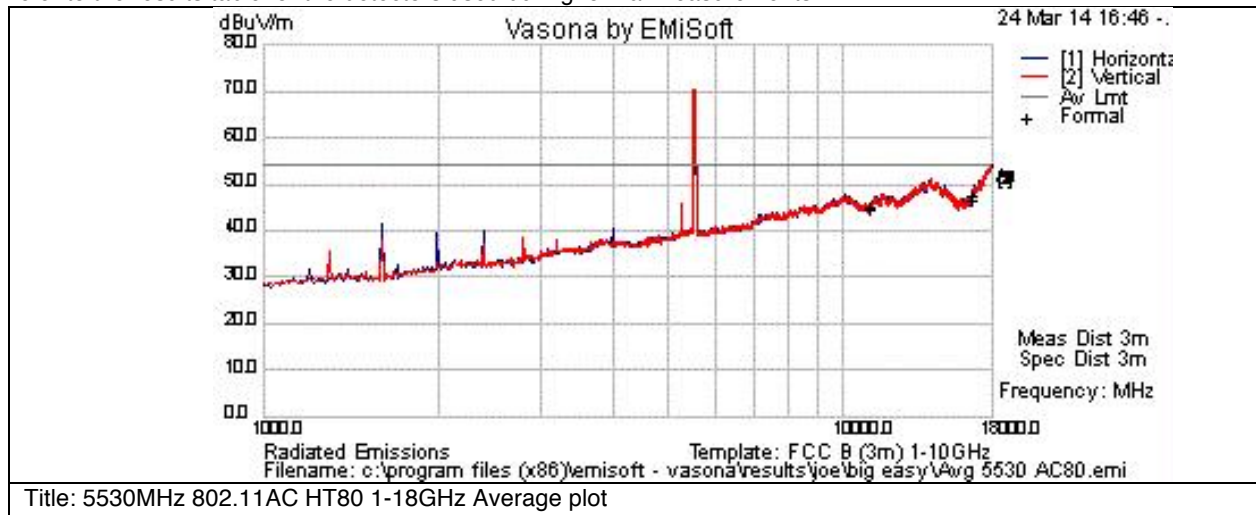
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Graphical Test Results

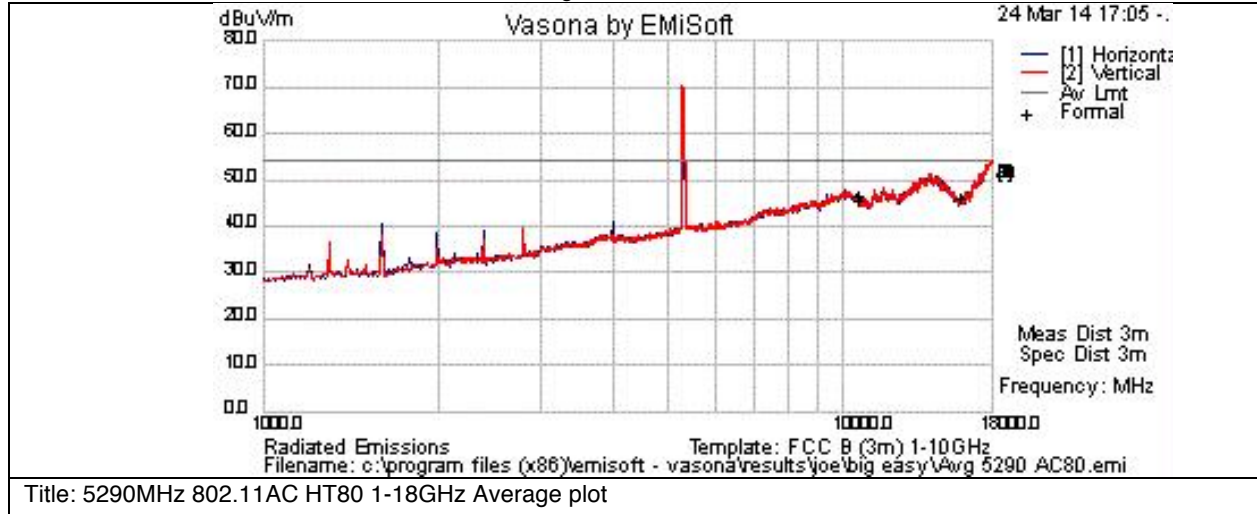
Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements





Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



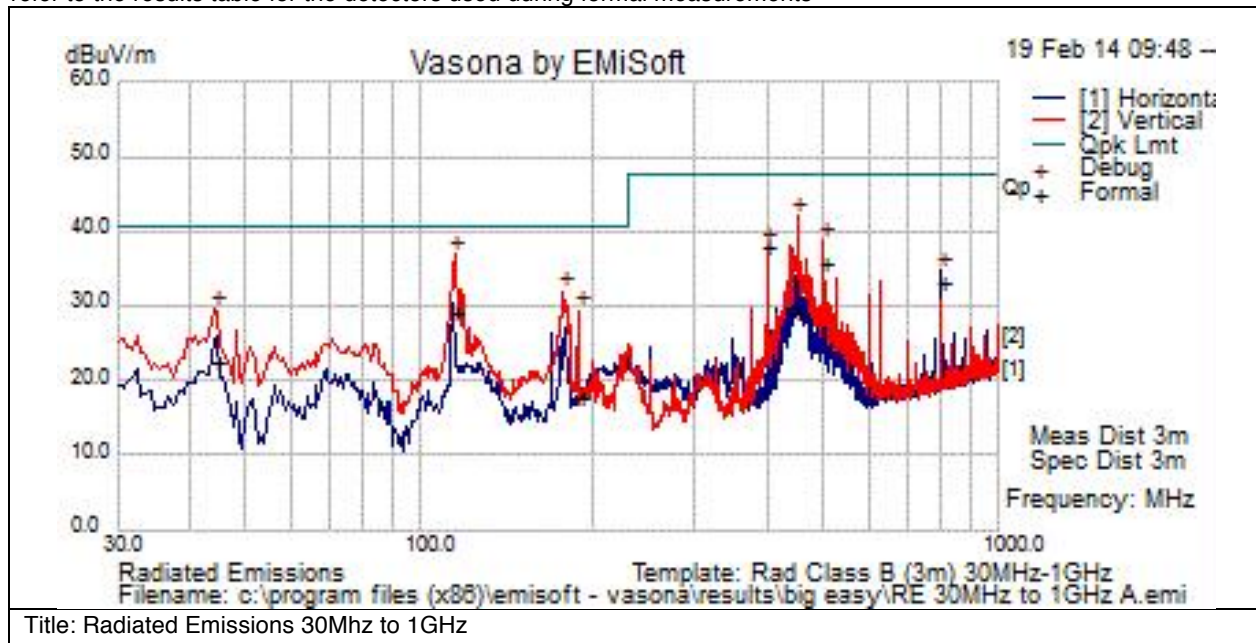


Transmitter Spurious Emissions 30MHz to 1GHz Worst case mode

Subtest Number: 157293 - 4		Subtest Date: 19-Feb-2014	
Engineer	Jose Aguirre		
Lab Information	Building P, 10m Anechoic		
Subtest Results			
Subtest Title	Radiated Emissions 30Mhz to 1GHz		
Subtest Result	Pass		
Highest Frequency	1000.0		
Lowest Frequency	30.0		
Comments on the above Test Results	Radiated Emissions 30Mhz to 1GHz		

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
400.024	49	0.8	-12	37.8	Qp	V	147	350	47.5	-9.8	Pass	
500.016	45.7	0.9	-10.8	35.8	Qp	V	113	297	47.5	-11.6	Pass	
44.255	39.1	0.3	-16.9	22.5	Qp	V	197	201	40.5	-18	Pass	
115.011	42.5	0.4	-14	28.9	Qp	V	133	104	40.5	-11.6	Pass	
800.038	39.3	1.1	-7.2	33.2	Qp	H	106	176	47.5	-14.3	Pass	
449.919	39.4	0.9	-11.3	29	Qp	V	300	95	47.5	-18.5	Pass	
190.336	33	0.6	-15.9	17.6	Qp	V	211	7	40.5	-22.9	Pass	



Receiver Spurious Emissions

RSS-Gen section 4.10 & 6.1

The receiver shall be operated in the normal receive mode near the mid-point of the band in which the receiver is designed to operate.

For either method, the search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (e.g. local oscillator frequency, intermediate or carrier frequency), Or 30 MHz, whichever is higher, to at least 3 times the highest tuneable or local oscillator frequency whichever is higher, without exceeding 40 GHz.

For emissions below 1000 MHz, measurements shall be performed using a CISPR quasi-peak detector and the related measurement bandwidth. As an alternative to CISPR quasi-peak measurement, compliance with the emission limit can be demonstrated using measuring equipment employing a peak detector function properly adjusted for factors such as pulse desensitization as required, with an equal or greater measurement bandwidth relative to the applicable CISPR quasi-peak bandwidth.

Spurious emissions from receivers shall not exceed the radiated limits shown in the table 2 in section 6.1 of RSS-Gen.

Using Vasona, configure the spectrum analyzer as shown below (be sure to enter all losses between the transmitter output and the spectrum analyzer). Place the radio in Receive mode.

Span:	1GHz – 18 GHz
Reference Level:	80 dBuV
Attenuation:	10 dB
Sweep Time:	Coupled
Resolution Bandwidth:	1MHz
Video Bandwidth:	1 MHz for peak, 10 Hz for average
Detector:	Peak

Maximize Turntable (find worst case table angle),
Maximize Antenna (find worst case height)

Save 2 plots: 1) Average Plot (Vertical and Horizontal), Limit= 54dBuV @3m
 2) Peak plot (Vertical and Horizontal), Limit = 74dBuV @3m

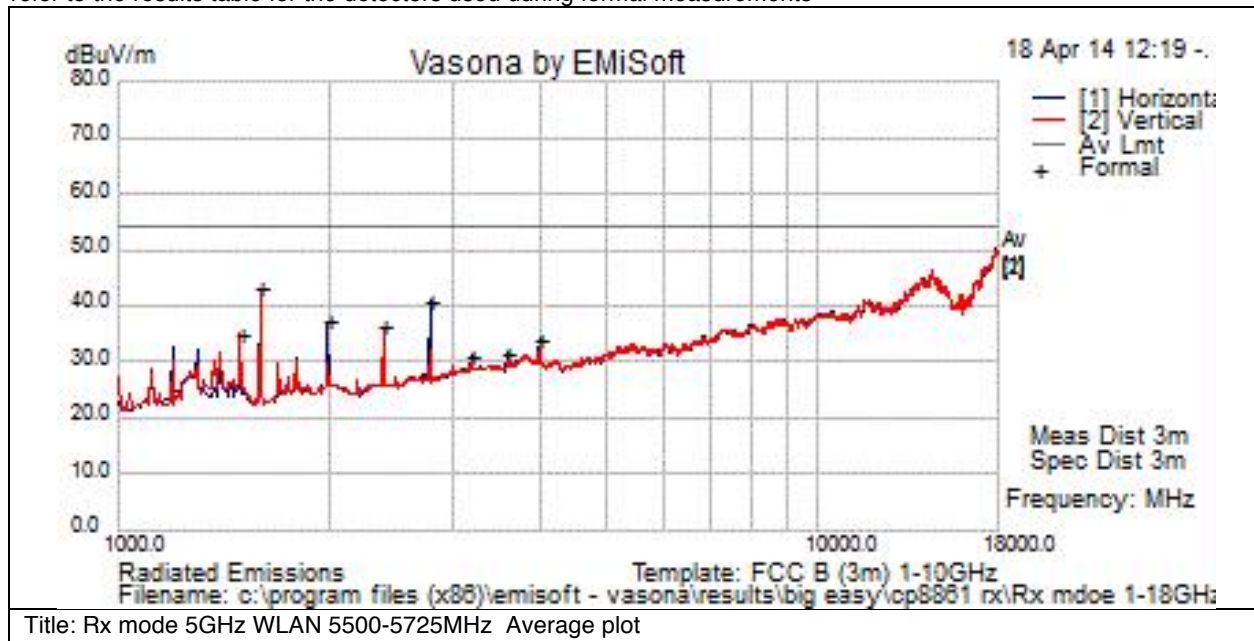
This report represents the worst case data for all supported operating modes and antennas. There were no measurable emissions above 15 GHz.

**Receiver Spurious Emissions 1GHz to 18GHz Average Plot**

Subtest Number: 164252 - 4		Subtest Date: 18-Apr-2014	
Engineer	Jose Aguirre		
Lab Information	Building P, 5m Anechoic		
Subtest Results			
Subtest Title	Rx mode 5GHz WLAN 5500-5725MHz Average plot		
Subtest Result	Pass		
Highest Frequency	18000.0		
Lowest Frequency	1000.0		
Comments on the above Test Results	Rx mode 5GHz WLAN 5500-5725MHz Average plot		

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements

**Test Results Table**

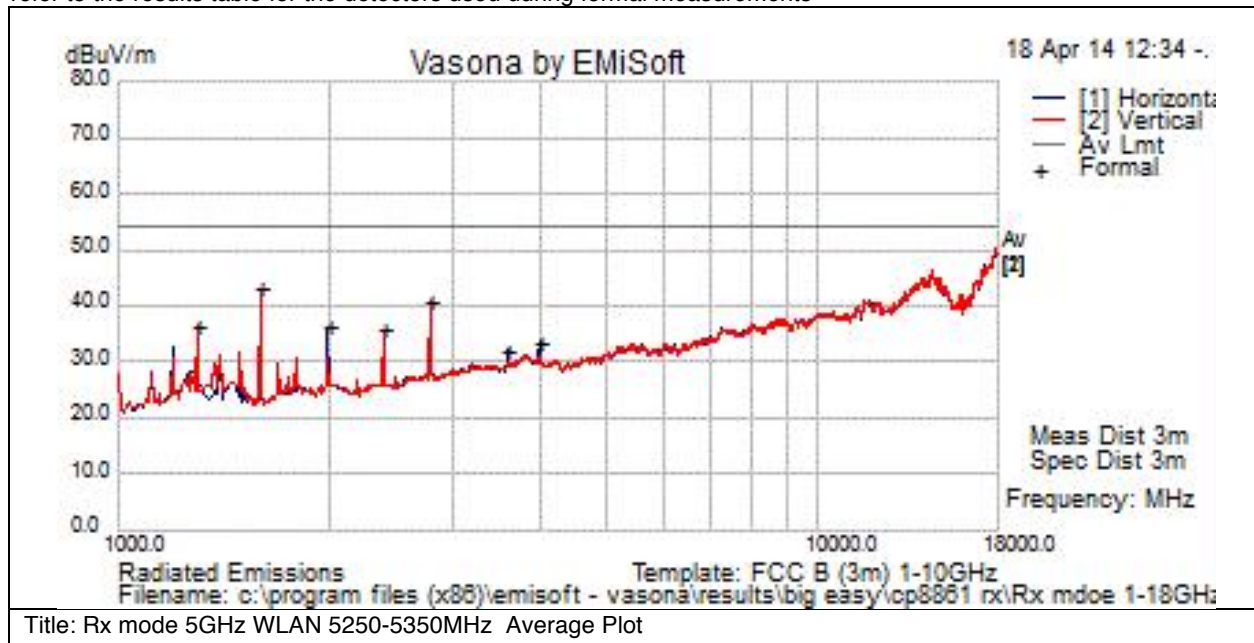
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1493	38.5	4.2	-7.7	35	Av	V	105	90	54	-19	Pass	
1595	46.7	4.4	-8	43	Av	V	105	90	54	-11	Pass	
1994.5	37.6	4.9	-5.3	37.2	Av	H	105	270	54	-16.8	Pass	
2394	36.8	5.4	-6.1	36	Av	V	105	0	54	-18	Pass	
2793.5	41	5.8	-5.8	40.9	Av	H	105	360	54	-13.1	Pass	
4001.013	30.3	7.1	-3.7	33.7	Av	V	100	360	54	-20.3	Pass	
3599.776	29.7	6.7	-4.8	31.6	Av	H	100	360	54	-22.4	Pass	
3193.379	29	6.2	-4.4	30.9	Av	H	100	360	54	-23.1	Pass	



Subtest Number: 164252 - 5		Subtest Date: 18-Apr-2014	
Engineer	Jose Aguirre		
Lab Information	Building P, 5m Anechoic		
Subtest Results			
Subtest Title	Rx mode 5GHz WLAN 5250-5350MHz Average plot		
Subtest Result	Pass		
Highest Frequency	18000.0		
Lowest Frequency	1000.0		
Comments on the above Test Results	Rx mode 5GHz WLAN 5250-5350MHz Average Plot		

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1297.5	41.2	3.9	-8.8	36.3	Av	V	105	270	54	-17.7	Pass	
1595	46.8	4.4	-8	43.1	Av	H	105	0	54	-10.9	Pass	
1994.5	36.6	4.9	-5.3	36.2	Av	H	105	270	54	-17.8	Pass	
2394	36.5	5.4	-6.1	35.7	Av	V	105	0	54	-18.3	Pass	
2793.5	41	5.8	-5.8	40.9	Av	V	105	0	54	-13.1	Pass	
3999.339	30	7.1	-3.8	33.3	Av	H	103	360	54	-20.7	Pass	
3601.558	30.1	6.7	-4.8	32	Av	H	103	360	54	-22	Pass	

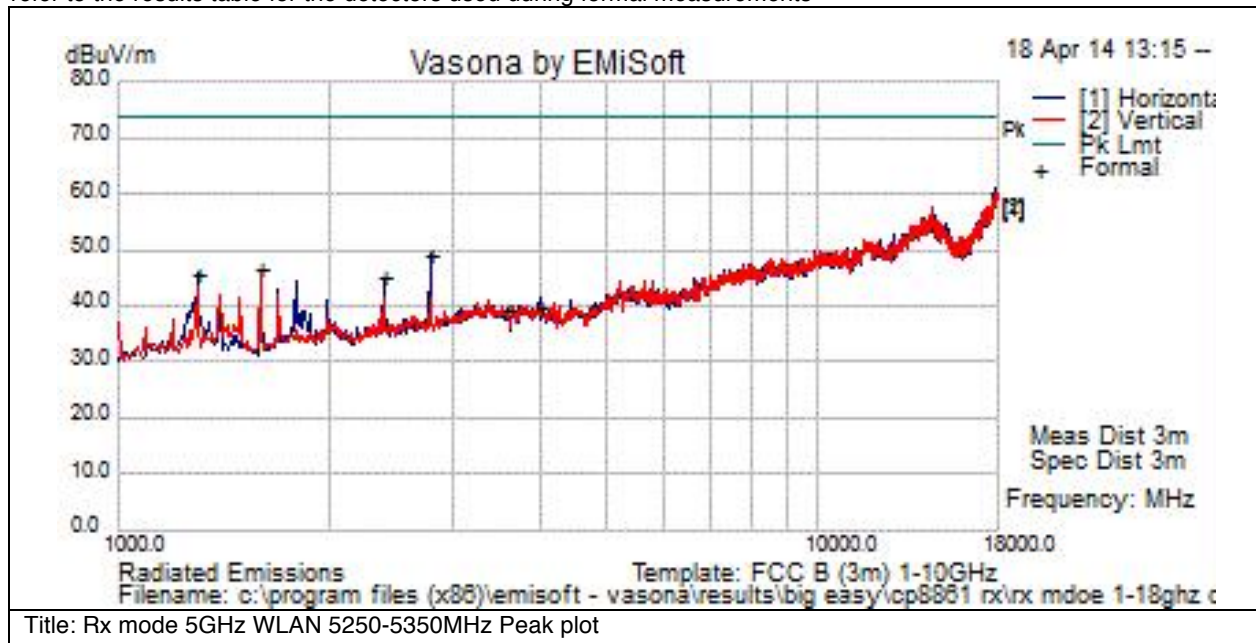


Receiver Spurious Emissions 1GHz to 18GHz Peak Plot

Subtest Number: 164252 - 8		Subtest Date: 18-Apr-2014	
Engineer	Jose Aguirre		
Lab Information	Building P, 5m Anechoic		
Subtest Results			
Subtest Title	Rx mode 5GHz WLAN 5250-5350MHz Peak plot		
Subtest Result	Pass		
Highest Frequency	18000.0		
Lowest Frequency	1000.0		
Comments on the above Test Results	Rx mode 5GHz WLAN 5250-5350MHz Peak plot		

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

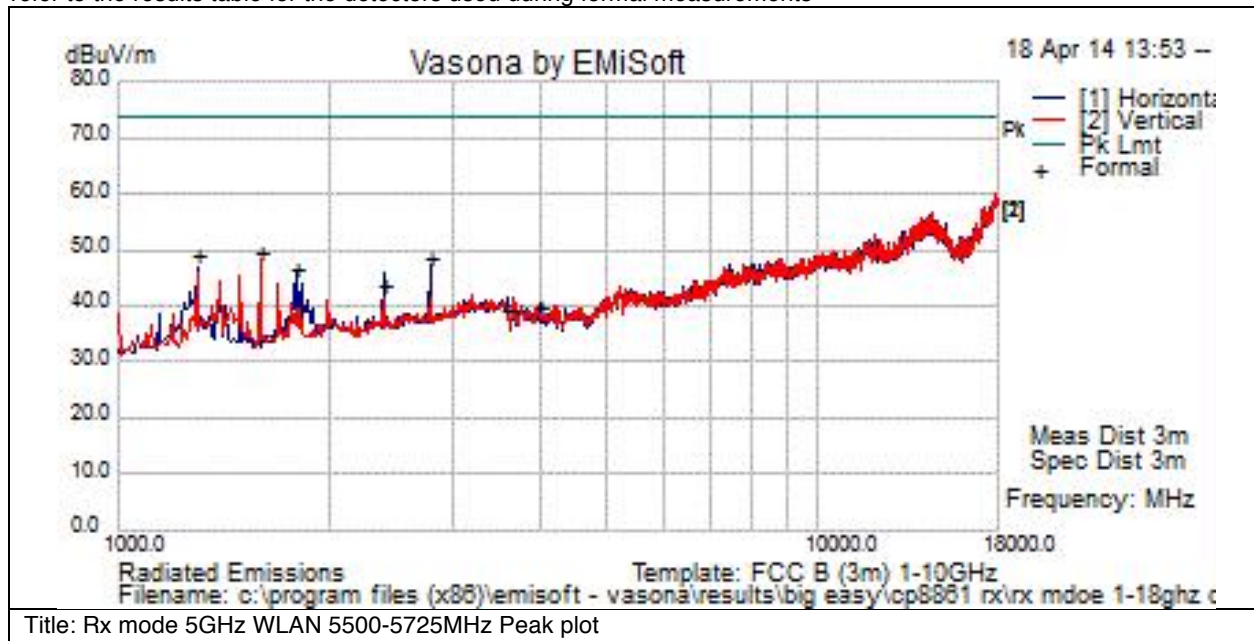
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1297.5	50.6	3.9	-8.8	45.7	Pk	H	100	115	74	-28.3	Pass	
1595	50.1	4.3	-8	46.4	Pk	V	100	123	74	-27.6	Pass	
2394	45.8	5.3	-6.1	45	Pk	H	112	188	74	-29	Pass	
2793.5	49.3	5.8	-5.8	49.2	Pk	H	108	145	74	-24.8	Pass	
3600.067	37.3	6.7	-4.8	39.2	Pk	H	103	180	74	-34.8	Pass	
4000.5	36.6	7.1	-3.7	39.9	Pk	H	105	195	74	-34.1	Pass	



Subtest Number: 164252 - 9		Subtest Date: 18-Apr-2014	
Engineer	Jose Aguirre		
Lab Information	Building P, 5m Anechoic		
Subtest Results			
Subtest Title	Rx mode 5GHz WLAN 5500-5725MHz Peak plot		
Subtest Result	Pass		
Highest Frequency	18000.0		
Lowest Frequency	1000.0		
Comments on the above Test Results	Rx mode 5GHz WLAN 5500-5725MHz Peak plot		

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1300.044	53.9	3.9	-8.8	49	Pk	H	163	320	74	-25	Pass	
1600.075	53.3	4.4	-8.1	49.5	Pk	V	128	54	74	-24.5	Pass	
1800.294	49.2	4.6	-7.2	46.6	Pk	H	142	32	74	-27.4	Pass	
2400.225	44.4	5.4	-6.2	43.6	Pk	H	156	19	74	-30.4	Pass	
2800.175	48.5	5.8	-5.9	48.5	Pk	H	122	66	74	-25.5	Pass	
3600.067	37.3	6.7	-4.8	39.2	Pk	H	103	180	74	-34.8	Pass	
4000.5	36.6	7.1	-3.7	39.9	Pk	H	105	195	74	-34.1	Pass	

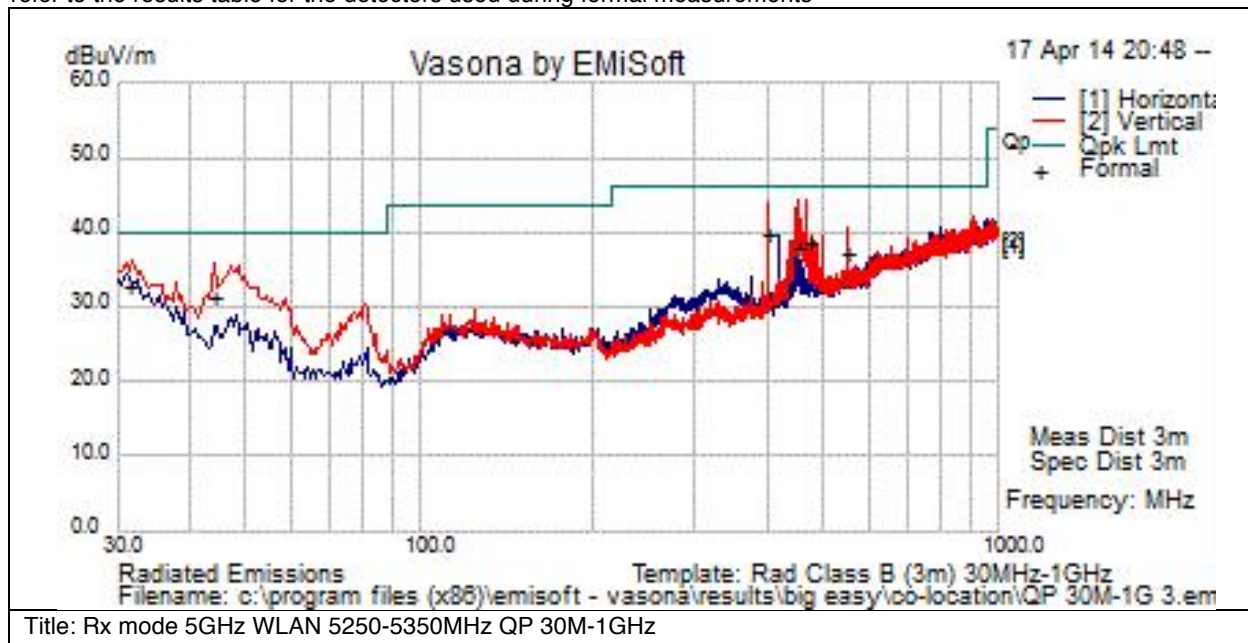


Receiver Spurious Emissions 30MHz to 1GHz

Subtest Number: 164061 - 13		Subtest Date: 17-Apr-2014	
Engineer	Jose Aguirre		
Lab Information	Building P, 5m Anechoic		
Subtest Results			
Subtest Title	Rx mode 5GHz WLAN 5250-5350MHz QP 30M-1GHz		
Subtest Result	Pass		
Highest Frequency	1000.0		
Lowest Frequency	30.0		
Comments on the above Test Results	Rx mode 5GHz WLAN 5250-5350MHz QP 30M-1GHz		

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

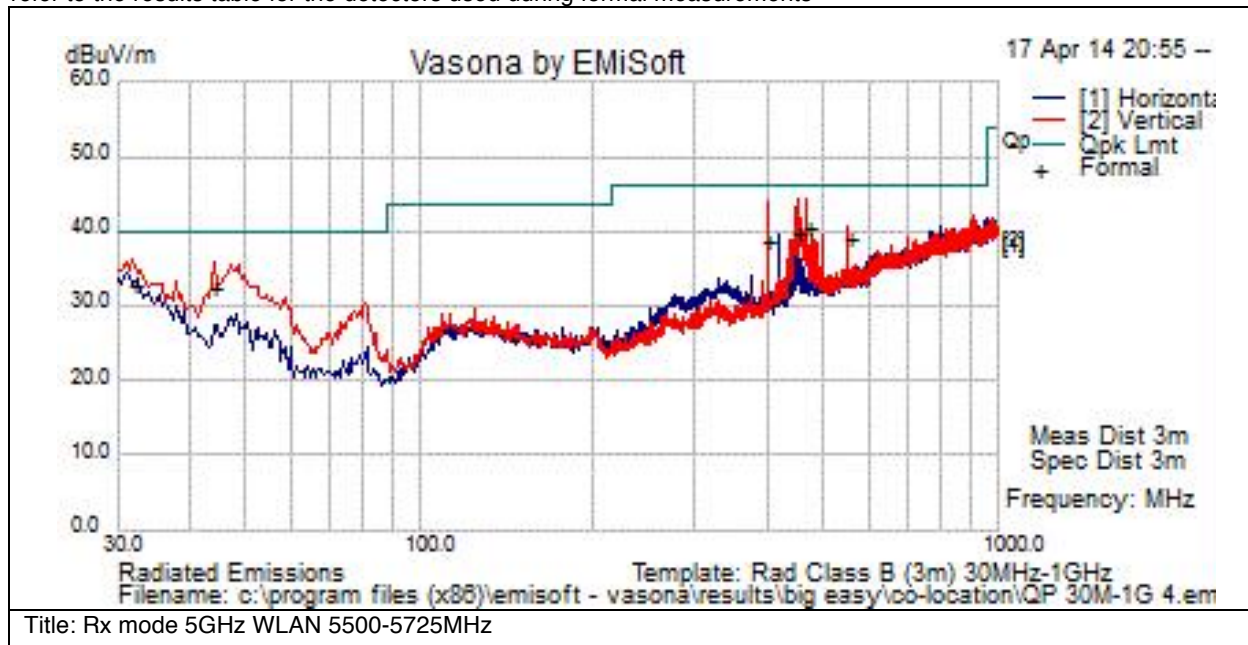
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
31.411	12.9	0.6	19.3	32.8	Qp	V	140	33	40	-7.2	Pass	
44.01	19.7	0.7	10.9	31.3	Qp	V	134	175	40	-8.7	Pass	
400.016	21.8	2.1	15.7	39.6	Qp	V	110	122	46	-6.4	Pass	
450.018	18.7	2.3	16.8	37.8	Qp	V	135	136	46	-8.2	Pass	
468.798	18.9	2.3	17.4	38.6	Qp	V	171	166	46	-7.4	Pass	
550.562	16.4	2.5	18.4	37.3	Qp	V	174	80	46	-8.7	Pass	



Subtest Number: 164061 - 14		Subtest Date: 17-Apr-2014	
Engineer	Jose Aguirre		
Lab Information	Building P, 5m Anechoic		
Subtest Results			
Subtest Title	Rx mode 5GHz WLAN 5500-5725MHz QP 30M-1GHz		
Subtest Result	Pass		
Highest Frequency	1000.0		
Lowest Frequency	30.0		
Comments on the above Test Results	Rx mode 5GHz WLAN 5500-5725MHz QP 30M-1GHz		

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
468.906	20.6	2.3	17.4	40.3	Qp	V	166	15	46	-5.7	Pass	
450.015	20.5	2.3	16.8	39.6	Qp	V	142	140	46	-6.4	Pass	
550.901	18.2	2.5	18.4	39.1	Qp	V	150	171	46	-6.9	Pass	
31.944	13.2	0.6	19	32.7	Qp	V	156	201	40	-7.3	Pass	
44.123	20.9	0.7	10.9	32.5	Qp	V	127	18	40	-7.5	Pass	
400.056	20.7	2.1	15.7	38.5	Qp	V	113	155	46	-7.5	Pass	



Co-Location Spurious Emissions

Using Vasona, configure the spectrum analyzer as shown below (be sure to enter all losses between the transmitter output and the spectrum analyzer). Place the radio in Continuous Tx mode for Co-located radios.

Span:	1GHz – 18 GHz
Reference Level:	80 dBuV
Attenuation:	10 dB
Sweep Time:	Coupled
Resolution Bandwidth:	1MHz
Video Bandwidth:	1 MHz for peak, 10 Hz for average
Detector:	Peak

Notch Filter used for both Radios

Maximize Turntable (find worst case table angle),
Maximize Antenna (find worst case height)

Save 2 plots: 1) Average Plot (Vertical and Horizontal), Limit= 54dBuV @3m
 2) Peak plot (Vertical and Horizontal), Limit = 74dBuV @3m

Case scenario 1 :
5GHz radio (5470MHz – 5725MHz band) & 2.4GHz Bluetooth radio (2400MHz – 2483.5MHz)

Case scenario 2 :
5GHz radio (5250MHz – 5350MHz band) & 2.4GHz Bluetooth radio (2400MHz – 2483.5MHz)

This report represents the worst case data for all supported operating modes and antennas. There were no measurable emissions above 15 GHz.



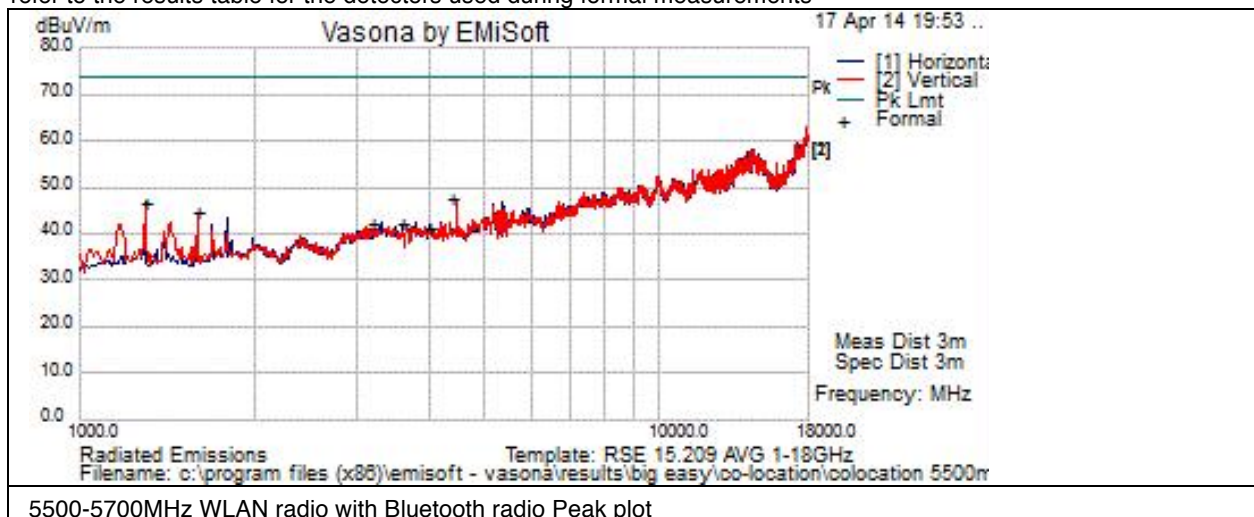
Radiated Emissions 1GHz to 18GHz Peak plot

5500-5700MHz WLAN radio with Bluetooth radio Peak plot

Subtest Number: 164061 - 8		Subtest Date: 17-Apr-2014	
Engineer	Jose Aguirre		
Lab Information	Building P, 5m Anechoic		
Subtest Results			
Subtest Title	5500-5700MHz WLAN radio with Bluetooth radio Peak plot		
Subtest Result	Pass		
Highest Frequency	18000.0		
Lowest Frequency	1000.0		
Comments on the above Test Results	5500-5700MHz WLAN radio with Bluetooth radio Peak plot		

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

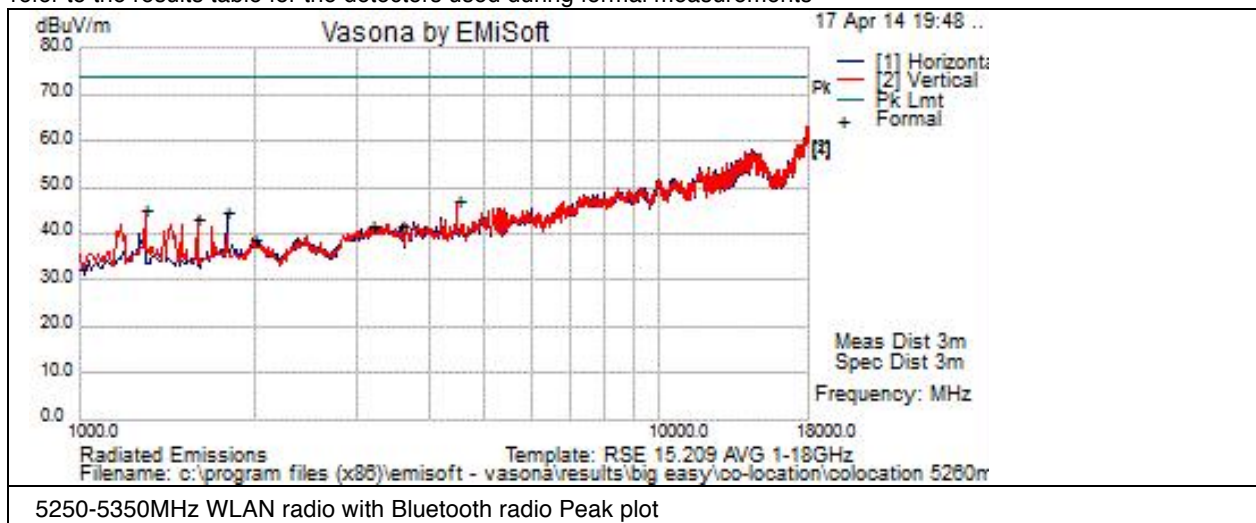
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1297.5	51.5	3.9	-8.8	46.6	Pk	H	100	44	74	-27.4	Pass	
1595	48.2	4.3	-8	44.5	Pk	V	100	10	74	-29.5	Pass	
3197.277	40.2	6.2	-4.3	42.1	Pk	V	100	318	74	-31.9	Pass	
3596.828	40.4	6.7	-4.8	42.3	Pk	H	102	229	74	-31.7	Pass	
4000.959	37.9	7.1	-3.7	41.2	Pk	H	102	165	74	-32.8	Pass	
4357.5	44.9	7.4	-4.7	47.6	Pk	V	101	264	74	-26.4	Pass	



Subtest Number: 164061 - 7		Subtest Date: 17-Apr-2014	
Engineer	Jose Aguirre		
Lab Information	Building P, 5m Anechoic		
Subtest Results			
Subtest Title	5250-5350MHz WLAN radio with Bluetooth radio Peak plot		
Subtest Result	Pass		
Highest Frequency	18000.0		
Lowest Frequency	1000.0		
Comments on the above Test Results	5250-5350MHz WLAN radio with Bluetooth radio Peak plot		

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

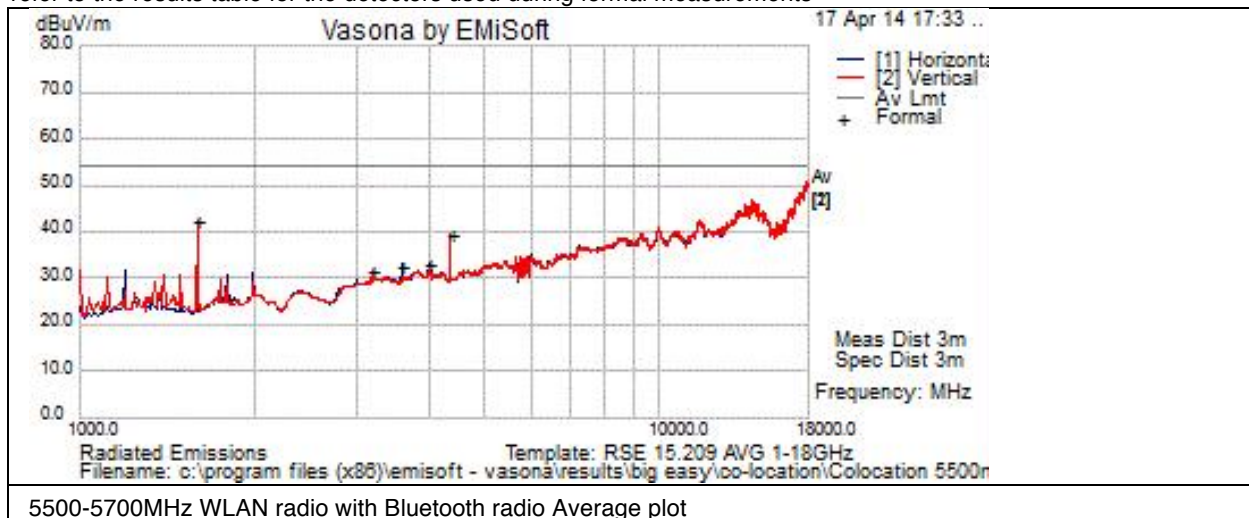
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1595	47	4.3	-8	43.3	Pk	V	100	0	74	-30.7	Pass	
4485	43.9	7.5	-4.2	47.2	Pk	V	100	240	74	-26.8	Pass	
3601.105	39.6	6.7	-4.8	41.5	Pk	H	102	230	74	-32.5	Pass	
3197.651	39.8	6.2	-4.3	41.7	Pk	V	100	180	74	-32.3	Pass	
1994.094	39	4.9	-5.3	38.6	Pk	V	100	180	74	-35.4	Pass	
1799	47.2	4.6	-7.2	44.6	Pk	H	100	177	74	-29.4	Pass	
1297.5	49.8	3.9	-8.8	44.9	Pk	V	110	182	74	-29.1	Pass	



Subtest Number: 164061 - 4		Subtest Date: 17-Apr-2014	
Engineer	Jose Aguirre		
Lab Information	Building P, 5m Anechoic		
Subtest Results			
Subtest Title	5500-5700MHz WLAN radio with Bluetooth radio Average plot		
Subtest Result	Pass		
Highest Frequency	18000.0		
Lowest Frequency	1000.0		
Comments on the above Test Results	5500-5700MHz WLAN radio with Bluetooth radio Average plot		

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

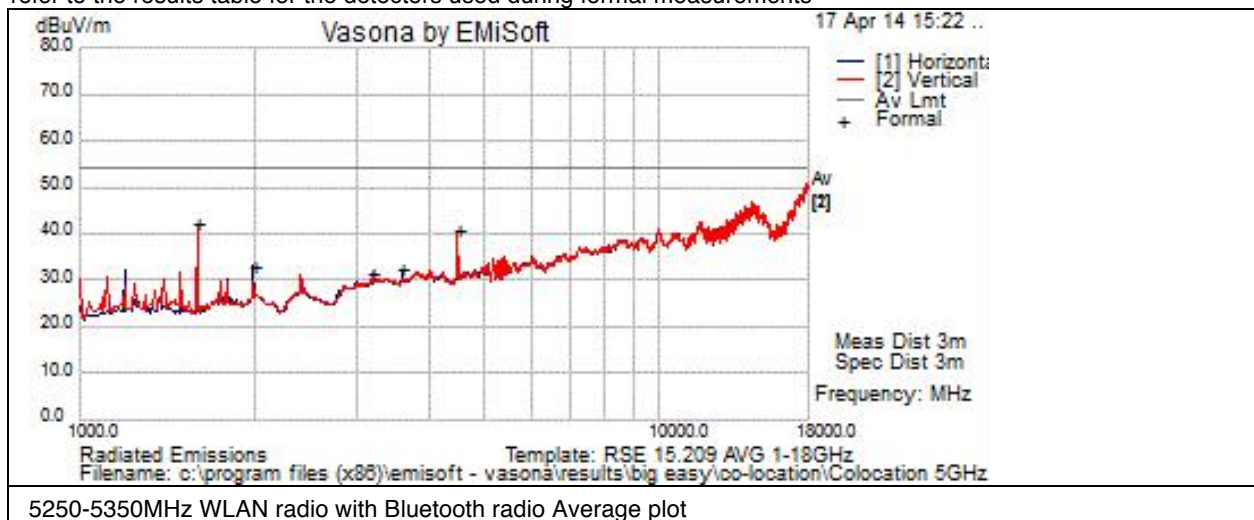
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1595	45.9	4.4	-8	42.2	Av	V	100	0	54	-11.8	Pass	
4357.5	36.6	7.4	-4.7	39.3	Av	V	100	264	54	-14.7	Pass	
3197.277	29.5	6.2	-4.3	31.4	Av	V	101	318	54	-22.6	Pass	
3596.828	30.6	6.7	-4.8	32.4	Av	H	101	229	54	-21.6	Pass	
4000.959	29.4	7.1	-3.7	32.8	Av	H	101	165	54	-21.2	Pass	



Subtest Number: 164061 - 2		Subtest Date: 17-Apr-2014	
Engineer	Jose Aguirre		
Lab Information	Building P, 5m Anechoic		
Subtest Results			
Subtest Title	5250-5350MHz WLAN radio with Bluetooth radio Average plot		
Subtest Result	Pass		
Highest Frequency	18000.0		
Lowest Frequency	1000.0		
Comments on the above Test Results	5250-5350MHz WLAN radio with Bluetooth radio Average plot		

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1595	45.8	4.4	-8	42.2	Av	V	100	0	54	-11.8	Pass	
4485	37.4	7.5	-4.2	40.6	Av	V	100	242	54	-13.4	Pass	
3601.105	30.3	6.7	-4.8	32.3	Av	H	100	230	54	-21.7	Pass	
3197.651	29.3	6.2	-4.3	31.2	Av	V	100	180	54	-22.8	Pass	
1994.094	33.3	4.9	-5.3	32.9	Av	V	100	180	54	-21.1	Pass	



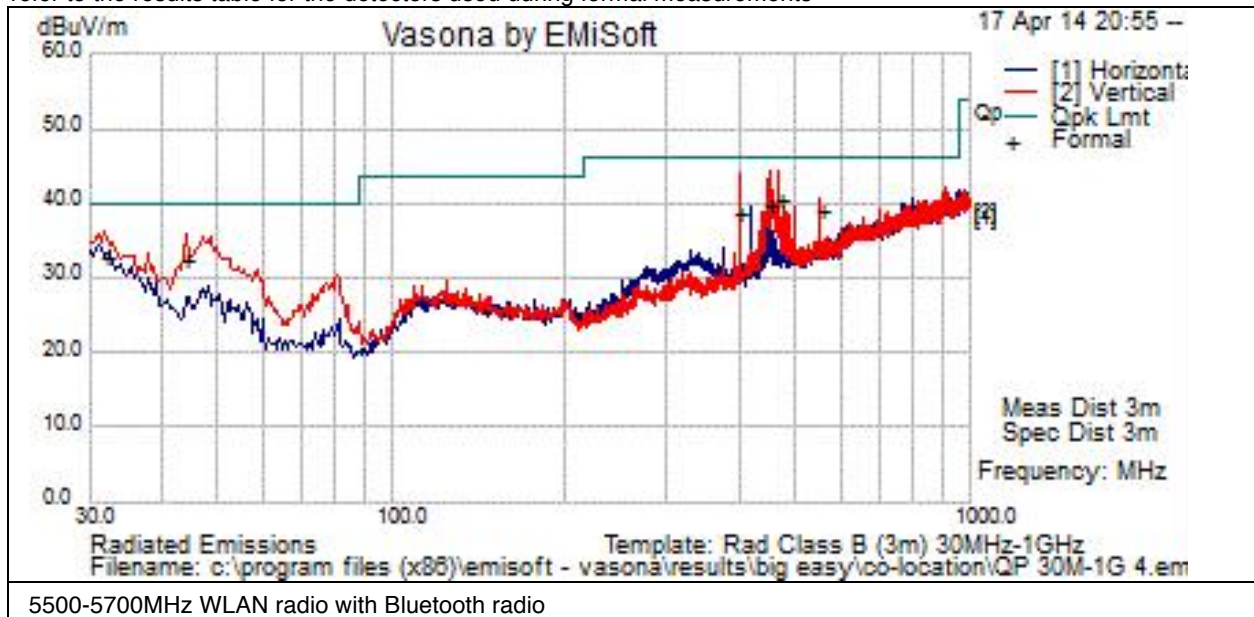
Radiated emissions 30MHz to 1GHz

5500-5700MHz WLAN radio with Bluetooth radio

Subtest Number: 164061 - 14		Subtest Date: 17-Apr-2014	
Engineer	Jose Aguirre		
Lab Information	Building P, 5m Anechoic		
Subtest Results			
Subtest Title	5500-5700MHz WLAN radio with Bluetooth radio QP 30M-1GHz		
Subtest Result	Pass		
Highest Frequency	1000.0		
Lowest Frequency	30.0		
Comments on the above Test Results	5500-5700MHz WLAN radio with Bluetooth radio QP 30M-1GHz		

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurem ent Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
468.906	20.6	2.3	17.4	40.3	Qp	V	166	15	46	-5.7	Pass	
450.015	20.5	2.3	16.8	39.6	Qp	V	142	140	46	-6.4	Pass	
550.901	18.2	2.5	18.4	39.1	Qp	V	150	171	46	-6.9	Pass	
31.944	13.2	0.6	19	32.7	Qp	V	156	201	40	-7.3	Pass	
44.123	20.9	0.7	10.9	32.5	Qp	V	127	18	40	-7.5	Pass	
400.056	20.7	2.1	15.7	38.5	Qp	V	113	155	46	-7.5	Pass	



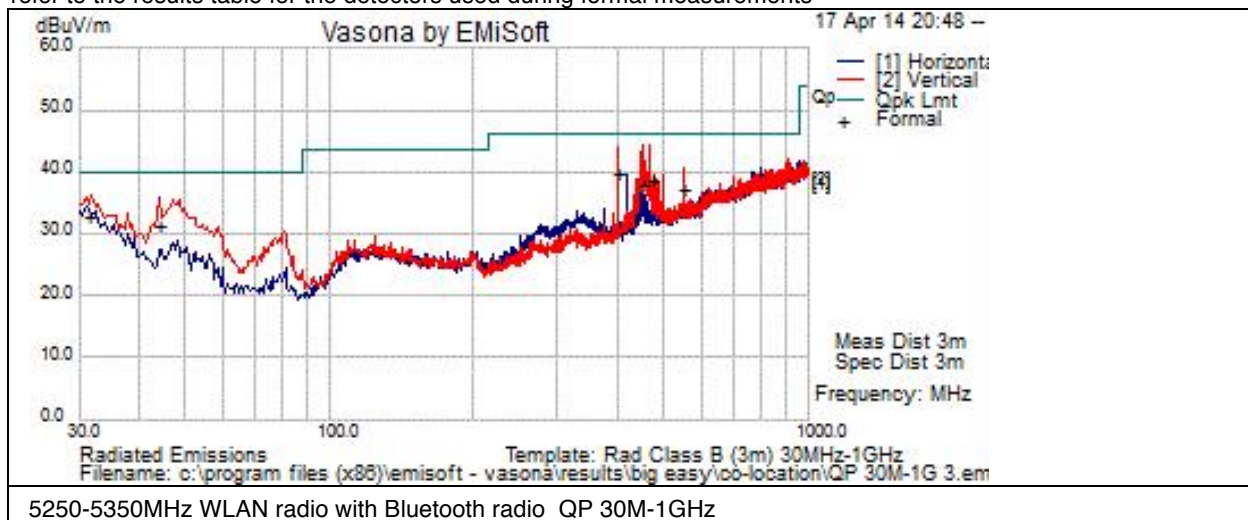
Radiated emissions 30MHz to 1GHz

5250-5350MHz WLAN radio with Bluetooth radio

Subtest Number: 164061 - 13		Subtest Date: 17-Apr-2014	
Engineer	Jose Aguirre		
Lab Information	Building P, 5m Anechoic		
Subtest Results			
Subtest Title	5250-5350MHz WLAN radio with Bluetooth radio QP 30M-1GHz		
Subtest Result	Pass		
Highest Frequency	1000.0		
Lowest Frequency	30.0		
Comments on the above Test Results	5250-5350MHz WLAN radio with Bluetooth radio QP 30M-1GHz		

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



5250-5350MHz WLAN radio with Bluetooth radio QP 30M-1GHz

Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
31.411	12.9	0.6	19.3	32.8	Qp	V	140	33	40	-7.2	Pass	
44.01	19.7	0.7	10.9	31.3	Qp	V	134	175	40	-8.7	Pass	
400.016	21.8	2.1	15.7	39.6	Qp	V	110	122	46	-6.4	Pass	
450.018	18.7	2.3	16.8	37.8	Qp	V	135	136	46	-8.2	Pass	
468.798	18.9	2.3	17.4	38.6	Qp	V	171	166	46	-7.4	Pass	
550.562	16.4	2.5	18.4	37.3	Qp	V	174	80	46	-8.7	Pass	



AC Mains Conducted emissions

15.207 & RSS GEN sec 7.2.4

(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

Using Vasona, configure the spectrum analyzer as shown below (be sure to enter all losses between the transmitter output and the spectrum analyzer). Place the radio in continuous transmit mode.

Span:	150kHz – 30Hz
Reference Level:	70 dB μ V
Attenuation:	10 dB
Sweep Time:	Auto
Resolution Bandwidth:	9Hz
Video Bandwidth:	30kHz
Detector:	Quasi-Peak

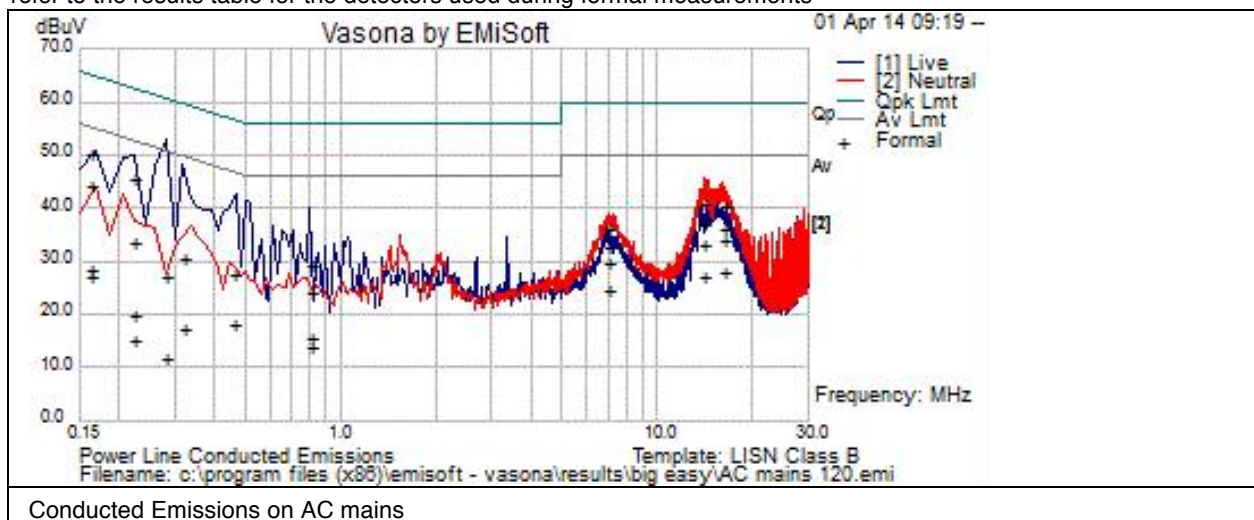
This report represents the worst case data for all supported operating modes and antennas.



Subtest Number: 162052 - 1		Subtest Date: 01-Apr-2014	
Engineer	Jose Aguirre		
Lab Information	Building P, 10m Anechoic		
Subtest Results			
Line Under Test	[A] AC mains		
Transducer	LISN		
Subtest Result	Pass		
Highest Frequency	30.0		
Lowest Frequency	0.15		
Comments on the above Test Results	Conducted Emissions on AC mains		

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement Type	Line	Limit dBuV	Margin dB	Pass /Fail	Comments
0.164	23	21.3	0	44.4	Qp	N	65.3	-20.9	Pass	
0.164	7	21.3	0	28.3	Av	L	55.3	-26.9	Pass	
0.164	5.9	21.3	0	27.2	Av	N	55.3	-28.1	Pass	
0.164	28.8	21.3	0	50.2	Qp	L	65.3	-15.1	Pass	
0.224	-1.4	20.9	0	19.6	Av	L	52.7	-33.1	Pass	
0.224	-6	20.9	0	15	Av	N	52.7	-37.7	Pass	
0.224	24.5	20.9	0	45.5	Qp	L	62.7	-17.2	Pass	
0.224	12.4	20.9	0	33.4	Qp	N	62.7	-29.3	Pass	
0.280594	6.1	20.6	0.1	26.8	Qp	N	60.8	-34	Pass	



Frequency MHz	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurem ent Type	Line	Limit dBuV	Margin dB	Pass /Fail	Comments
0.280594	-9.1	20.6	0.1	11.6	Av	N	50.8	-39.2	Pass	
0.321	-3.2	20.5	0.1	17.3	Av	N	49.7	-32.4	Pass	
0.321	9.8	20.5	0.1	30.4	Qp	N	59.7	-29.3	Pass	
0.464	-2	20.1	0.1	18.2	Av	N	46.6	-28.4	Pass	
0.464	7.1	20.1	0.1	27.3	Qp	N	56.6	-29.4	Pass	
0.801	8.9	20.1	0.1	29.1	Qp	L	56	-26.9	Pass	
0.801	-4.7	20.1	0.1	15.5	Av	N	46	-30.5	Pass	
0.801	3.8	20.1	0.1	24	Qp	N	56	-32	Pass	
0.801	-6.3	20.1	0.1	13.9	Av	L	46	-32.1	Pass	
7.027	12.6	20.1	0	32.7	Qp	L	60	-27.3	Pass	
7.027	15.9	20.1	0	36	Qp	N	60	-24	Pass	
7.027	9.6	20.1	0	29.8	Av	N	50	-20.2	Pass	
7.027	4.4	20.1	0	24.6	Av	L	50	-25.4	Pass	
14.045	12.5	20.3	0.1	32.9	Av	N	50	-17.1	Pass	
14.045	6.5	20.3	0.1	26.9	Av	L	50	-23.1	Pass	
14.045	20.3	20.3	0.1	40.6	Qp	N	60	-19.4	Pass	
14.045	16.4	20.3	0.1	36.7	Qp	L	60	-23.3	Pass	
16.138	7.4	20.4	0.2	28	Av	L	50	-22	Pass	
16.138	15.5	20.4	0.2	36.1	Qp	L	60	-23.9	Pass	
16.138	13.1	20.4	0.2	33.7	Av	N	50	-16.3	Pass	
16.138	20	20.4	0.2	40.5	Qp	N	60	-19.5	Pass	



Appendix B: Abbreviation Key and Definitions

The following table defines abbreviations used within this test report.

Abbreviation	Description	Abbreviation	Description
EMC	Electro Magnetic Compatibility	°F	Degrees Fahrenheit
EMI	Electro Magnetic Interference	°C	Degrees Celsius
EUT	Equipment Under Test	Temp	Temperature
ITE	Information Technology Equipment	S/N	Serial Number
TAP	Test Assessment Schedule	Qty	Quantity
ESD	Electro Static Discharge	emf	Electromotive force
EFT	Electric Fast Transient	RMS	Root mean square
EDCS	Engineering Document Control System	Qp	Quasi Peak
Config	Configuration	Av	Average
CIS#	Cisco Number (unique identification number for Cisco test equipment)	Pk	Peak
Cal	Calibration	kHz	Kilohertz (1x10 ³)
EN	European Norm	MHz	MegaHertz (1x10 ⁶)
IEC	International Electro technical Commission	GHz	Gigahertz (1x10 ⁹)
CISPR	International Special Committee on Radio Interference	H	Horizontal
CDN	Coupling/Decoupling Network	V	Vertical
LISN	Line Impedance Stabilization Network	dB	decibel
PE	Protective Earth	V	Volt
GND	Ground	kV	Kilovolt (1x10 ³)
L1	Line 1	μV	Microvolt (1x10 ⁻⁶)
L2	Line2	A	Amp
L3	Line 3	μA	Micro Amp (1x10 ⁻⁶)
DC	Direct Current	mS	Milli Second (1x10 ⁻³)
RAW	Uncorrected measurement value, as indicated by the measuring device	μS	Micro Second (1x10 ⁻⁶)
RF	Radio Frequency	μS	Micro Second (1x10 ⁻⁶)
SLCE	Signal Line Conducted Emissions	m	Meter
Meas dist	Measurement distance	Spec dist	Specification distance
N/A or NA	Not Applicable	SL	Signal Line (or Telecom Line)
P	Power Line	L	Live Line
N	Neutral Line	R	Return
S	Supply	AC	Alternating Current


Appendix C: Test Equipment/Software Used to perform the test

Equipment No	Manufacturer	Model	Description	Last Cal	Next Cal Due Date
CIS004882	EMC Test Systems	3115	Double Ridged Guide Horn Antenna	28-JUN-13	28-JUN-14
CIS005691	Miteq	NSP1800-25-S1	Broadband Preamplifier (1-18GHz)	27-JAN-14	27-JAN-15
CIS008448	Cisco	NSA 5m Chamber	NSA 5m Chamber	03-OCT-13	03-OCT-14
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in	23-AUG-13	23-AUG-14
CIS024998	Micro-Coax	UFB197C-1-0240-504504	RF Coaxial Cable, to 18GHz, 24 in	27-FEB-14	27-FEB-15
CIS027245	Stanley	33-158	Measuring tape	29-JUN-13	29-JUN-14
CIS025658	Micro-Coax	UFB311A-1-0840-504504	RF Coaxial Cable, to 18GHz, 84 in	14-FEB-14	14-FEB-15
CIS040597	Cisco	Above 1GHz Site Cal	Above 1GHz Cisp Site Verification	30-MAY-13	30-MAY-14
CIS040641	Rohde & Schwarz	ESU26	EMI Test Receiver	24-JUN-13	24-JUN-14
CIS041935	Newport	iBTHP-5-DB9	5 inch Temp/RH/Press Sensor w/20ft cable	25-MAR-13	25-MAR-14
CIS049563	Huber + Suhner	Sucoflex 106A	N Type Cable 18GHz	23-AUG-13	23-AUG-14
CIS008375	Andrew	F4A-PNMNM	49 ft Helix Cable	16-APR-13	16-APR-14
CIS005707	Fischer Custom Communications	FCC-LISN-50-50	LISN	16-APR-13	16-APR-14
CIS019206	TTE	H785-150K-50-21378	High Pas Filter, Fo=150kHz	12-SEP-13	12-SEP-14
CIS008591	Fischer Custom Communications	FCC-RFM2F-520R	LISN AC Adaptor - Std 120V outlet	16-APR-13	16-APR-14
CIS030562	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in	26-JUN-13	26-JUN-14
CIS033649	Midwest Microwave	CSY-NMNM-14-010-FS	RF Coaxial Cable, RG-214, 10ft	16-APR-13	16-APR-14
CIS041929	Newport	iBTHP-5-DB9	5 inch Temp/RH/Press Sensor w/20ft cable	16-DEC-13	16-DEC-14
CIS047300	Agilent Technologies	N9038A	MXE EMI Receiver 20Hz to 26.5 Ghz	17-DEC-13	17-DEC-14
CIS033988	Agilent	E4446A	PSA Spectrum Analyzer	04-DEC-13	04-DEC-14
CIS035098	Micro-Coax	UFA147A-0-0180-110200	RF Coaxial Cable, to 40 GHz, 18 in	24-OCT-13	24-OCT-14

Radio Test Report No: **EDCS-1393370**

FCC ID: LDK88611057

IC: 2461B-88611057



CIS037553	Murata Electronics	MXGS83RK3000	Special Radio Test Adaptor Cable	03-JUL-13	03-JUL-14
-----------	-----------------------	--------------	-------------------------------------	-----------	-----------



Appendix D: Test Procedures

Measurements were made in accordance with

- KDB Publication No. 789033
- measurement method of spurious emission tolerance to the International Telecommunication Union (ITU) Recommendation SM329.
- ANSI C63.10
- ANSI C63.4

Test procedures are summarized below

Document Reference	Scope of Document
EDCS #: 420238	Internal Radio Test Procedures
EDCS #: 420238	Test Plan