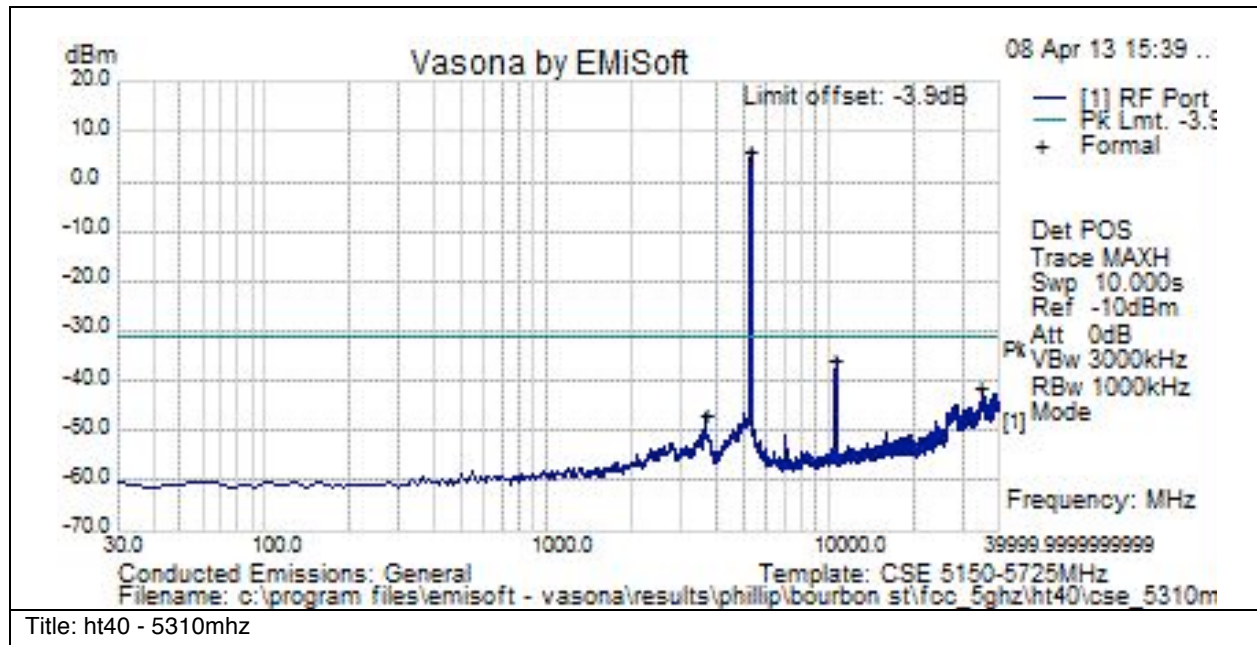


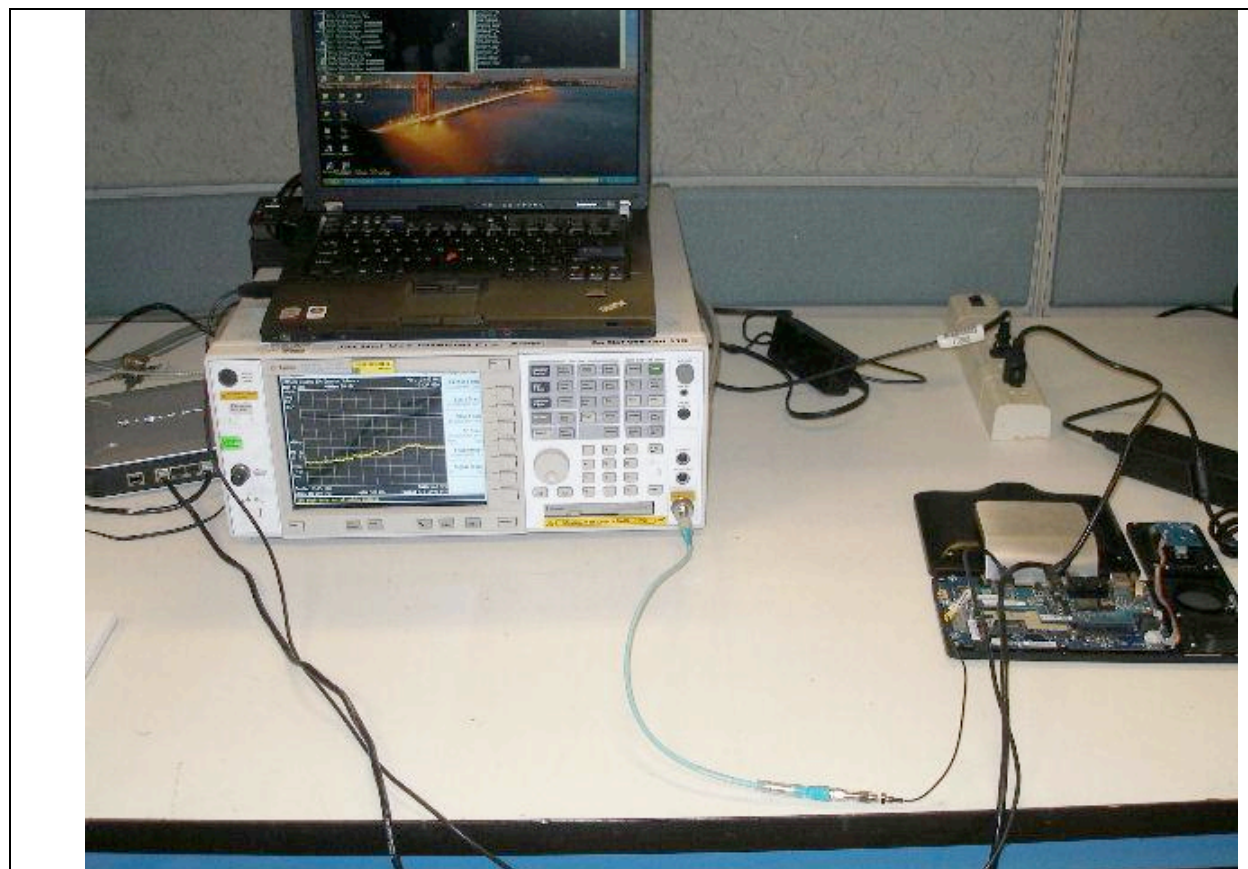
Graphical Test Results for 802.11an (HT-40) at 5310MHz:

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 dBm	Cable Loss	Factors dB	Level dBm	Measurement Type	Line	Limit dBm	Margin dB	Pass /Fail	Comments
5304.195	-15.8	22.1	0	6.3	Pk	RF	-30.9	37.2	Fail	Tx Signal
10623.315	-56.6	20.9	0	-35.7	Pk	RF	-30.9	-4.8	Pass	
35160.25	-64.2	22.8	0	-41.3	Pk	RF	-30.9	-10.4	Pass	
3677.91	-68	21.5	0	-46.5	Pk	RF	-30.9	-15.6	Pass	



Title: Conducted Test Setup



Conducted Bandedge

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)).

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

Reference Level: 10 dBm
Attenuation: 4 dB
Sweep Time: Coupled
Resolution Bandwidth: 1MHz
Video Bandwidth: 1 MHz for peak, 100 Hz for average
Detector: Peak

Save 2 plots: 1) Average Plot (Vertical and Horizontal), Limit= -41.25 dBm eirp (54dBuV @3m)
2) Peak plot (Vertical and Horizontal), Limit = -21.25 dBm eirp (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.

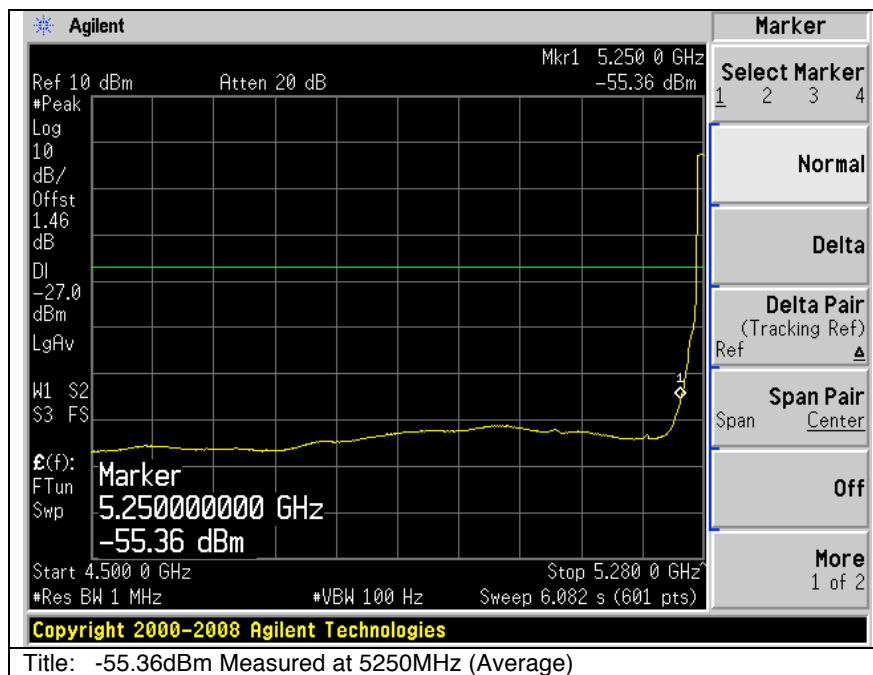
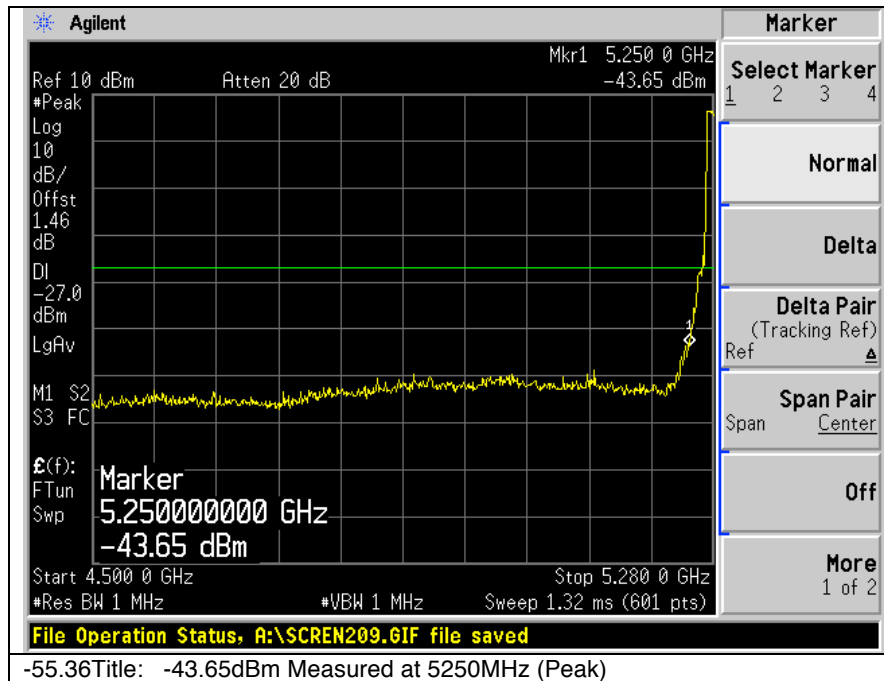
802.11a Bandedge Average Test Results:

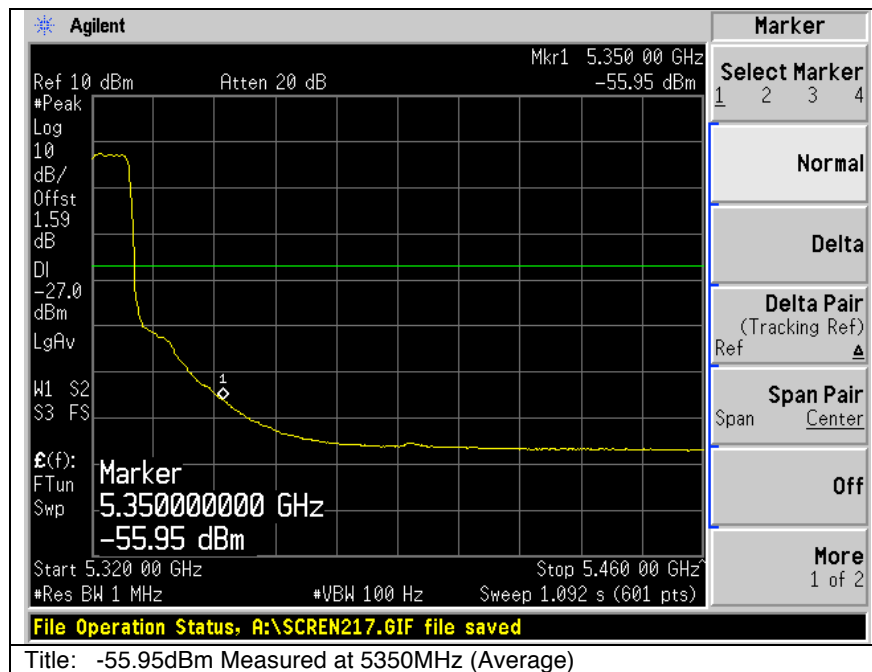
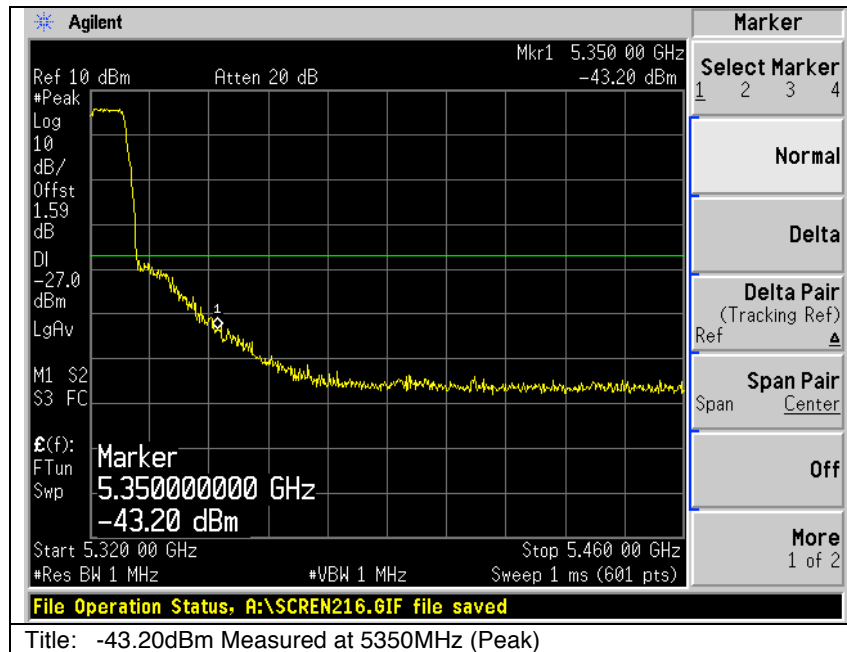
Frequency (MHz)	Data Rate (Mbps)	Bandedge Level (dBm)	Limit (dBm)	Margin (dB)
5280	6	-55.36	-41.25	14.11
5320	6	-55.95	-41.25	14.7

802.11a Bandedge Peak Test Results:

Frequency (MHz)	Data Rate (Mbps)	Bandedge Level (dBm)	Limit (dBm)	Margin (dB)
5280	6	-39.87	-21.25	18.62
5320	6	-43.2	-21.25	21.95

Graphical Test Results for 802.11A:





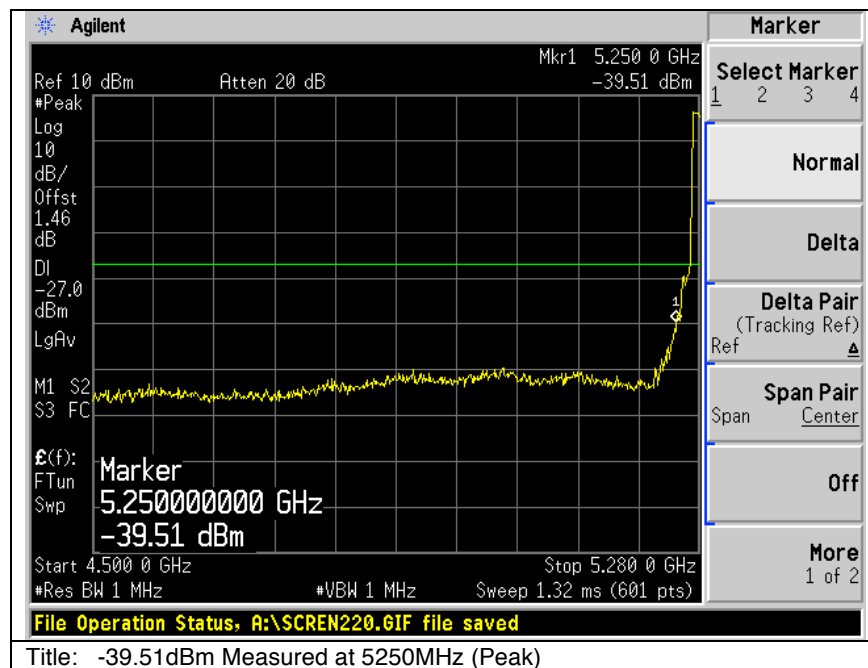
802.11an (HT-20) Bandedge Average Test Results:

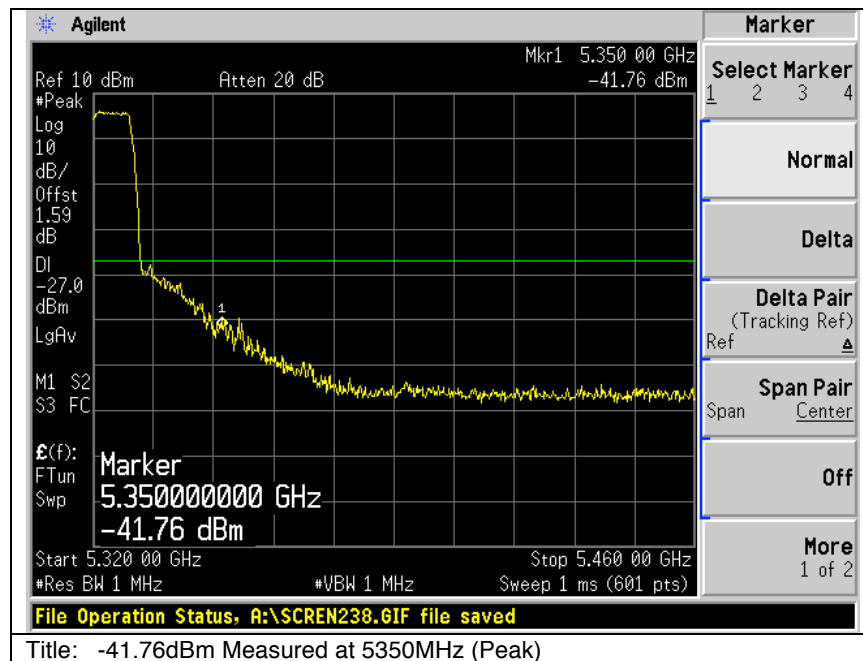
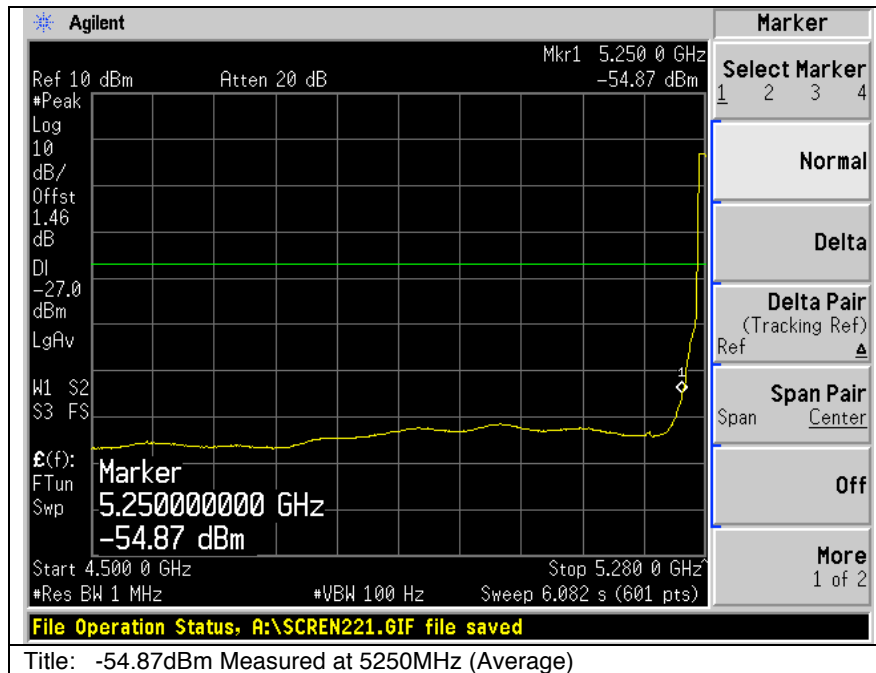
Frequency (MHz)	Data Rate (Mbps)	Bandedge Level (dBm)	Limit (dBm)	Margin (dB)
5280	M0	-54.87	-41.25	13.62
5320	M0	-55.21	-41.25	13.96

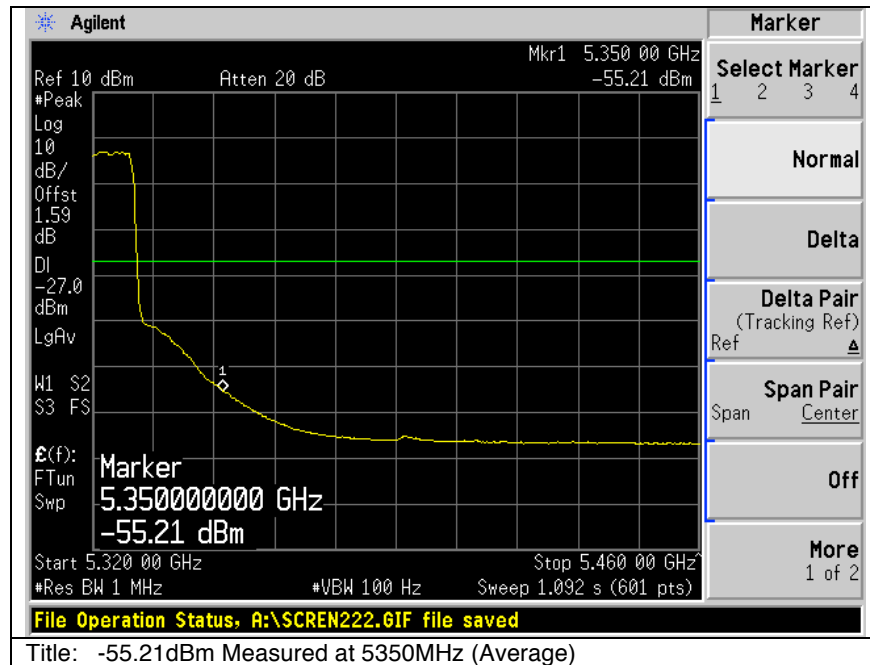
802.11an (HT-20) Bandedge Peak Test Results:

Frequency (MHz)	Data Rate (Mbps)	Bandedge Level (dBm)	Limit (dBm)	Margin (dB)
5280	M0	-39.51	-21.25	18.26
5320	M0	-43.2	-21.25	21.95

Graphical Test Results for 802.11A – HT20 Mode:





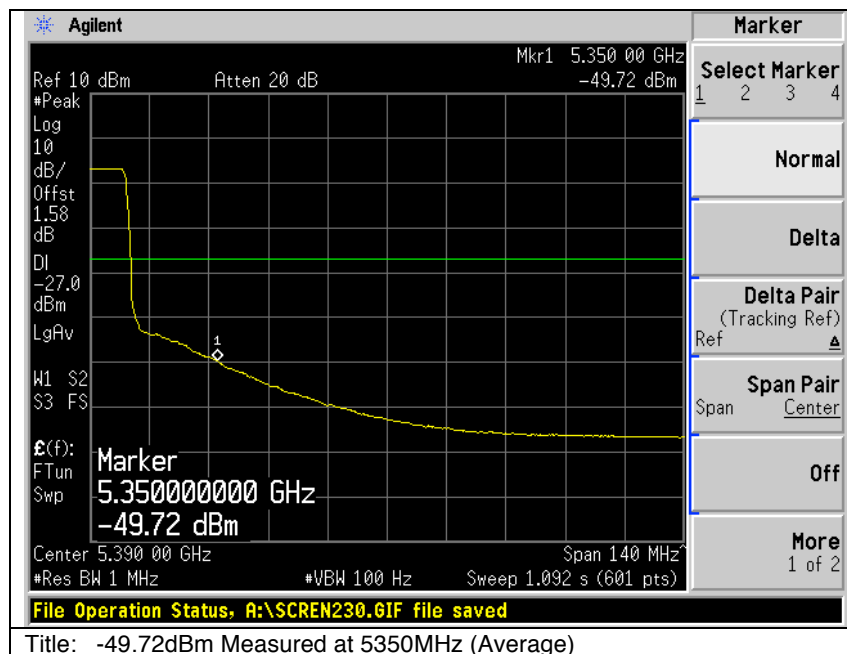
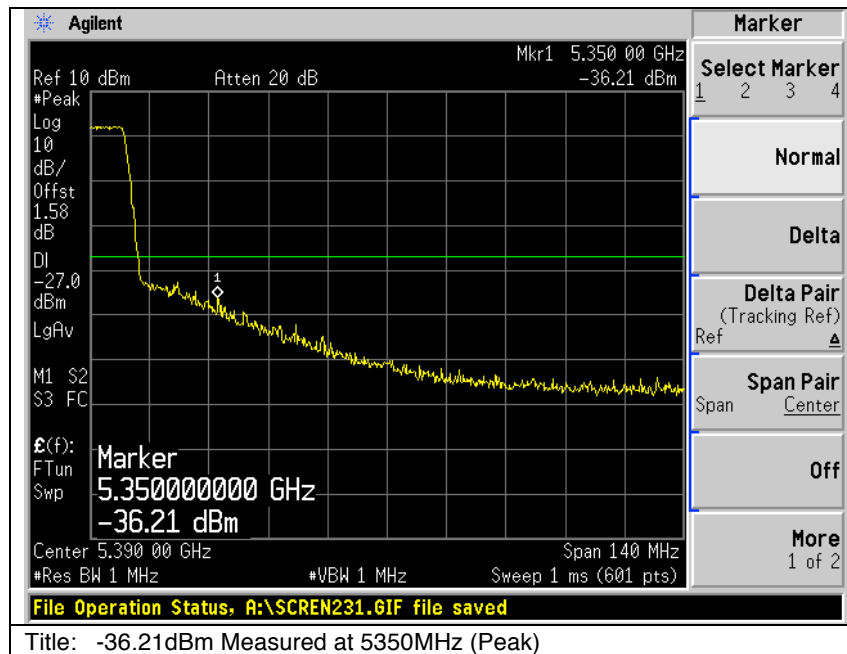


802.11an (HT-40) Bandedge Average Test Results:

Frequency (MHz)	Data Rate (Mbps)	Bandedge Level (dBm)	Limit (dBm)	Margin (dB)
5390	M0	-49.72	-41.25	8.47

802.11an (HT-40) Bandedge Peak Test Results:

Frequency (MHz)	Data Rate (Mbps)	Bandedge Level (dBm)	Limit (dBm)	Margin (dB)
5390	M0	-39.51	-21.25	18.26





Appendix B: Emission Test Results

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

Radiated 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 – 15 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

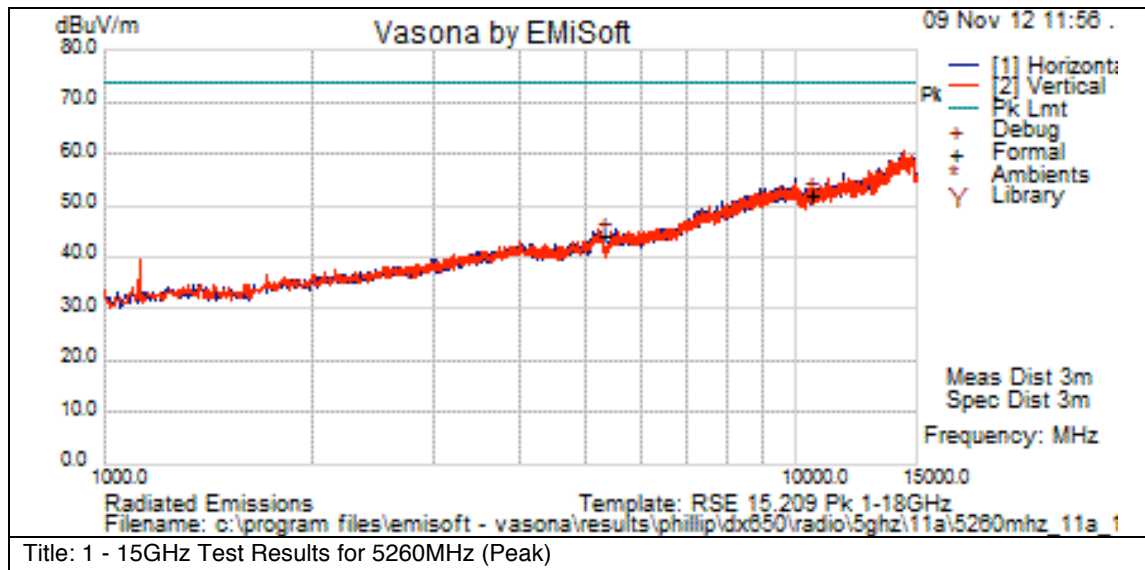
Place a marker at the end of the restricted band closest to the transmit frequency to show compliance.
Also measure any emissions in the restricted bands.

This report represents the worst case data for all supported operating modes and antennas.
System was evaluated up to 40GHz but there were no measurable emissions above 15 GHz.

Note: A Notch Filter was used during formal testing from 1 – 15GHz to help prevent the front end of the analyzer from over loading. The Notch filters used are designed to suppress Tx fundamental frequency but do not effect harmonics of the fundamental frequency from being measured

Graphical Test Results 802.11A: 1 – 15GHz (5260MHz – Peak)

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



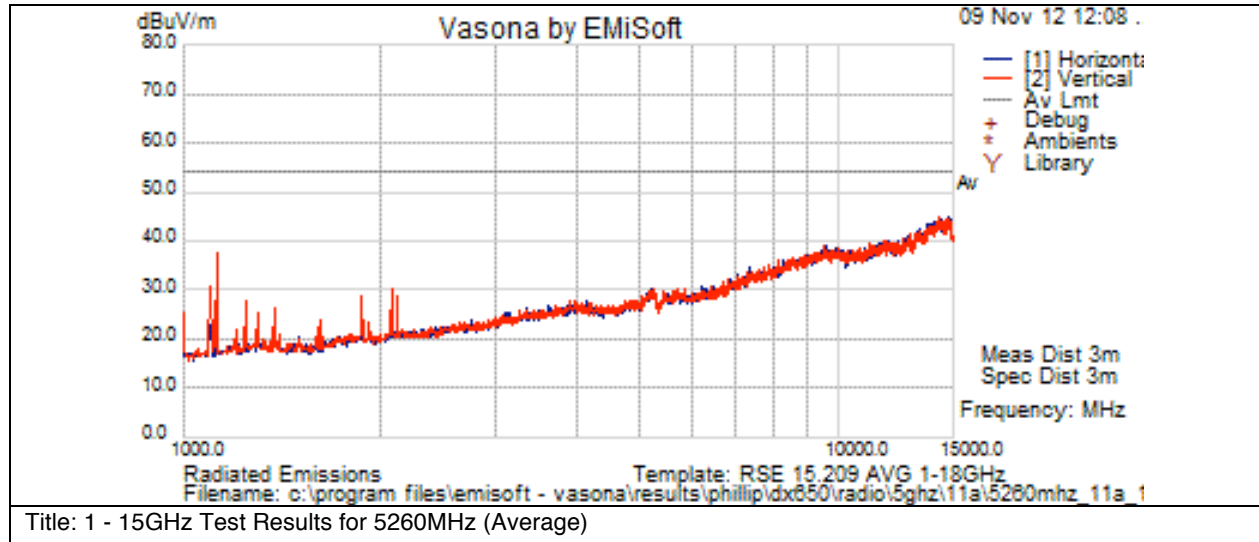
Test Results Table

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
5260.002	40.1	7.1	-3.1	44.1	Pk	H	99	361	74	-29.9	Pass	Tx Signal
10520.02	35.4	10.8	5.6	51.9	Pk	V	99	361	74	-22.1	Pass	



Graphical Test Results 802.11A: 1 – 15GHz (5260MHz – Average)

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



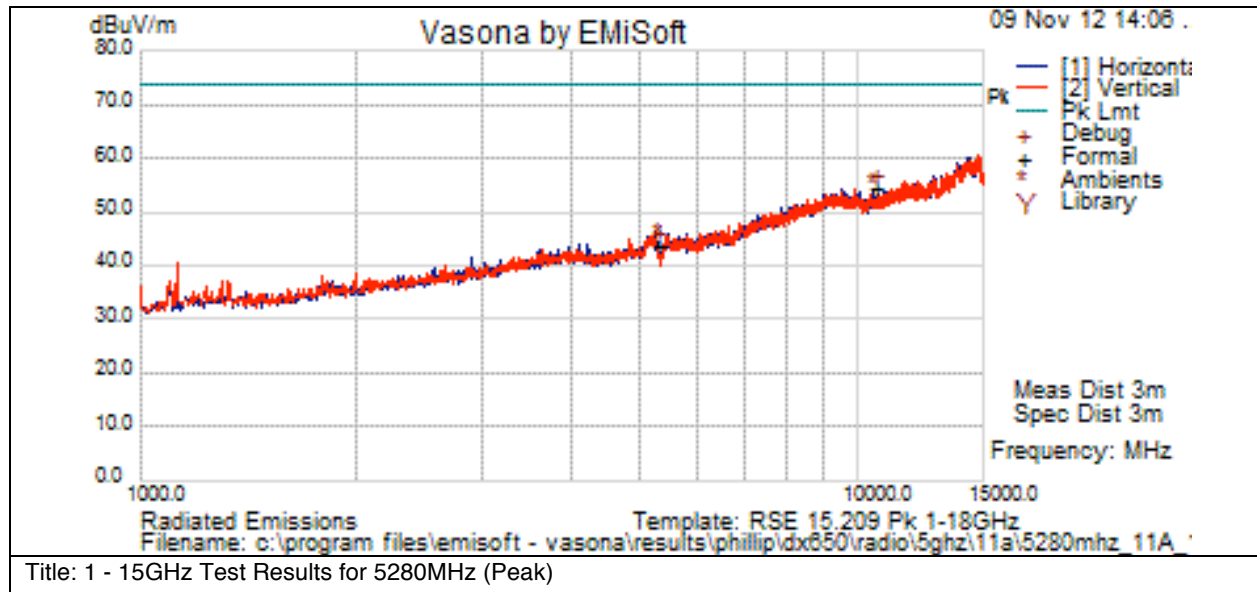
Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measureme nt Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
0	0	0	0	0	NA	U	0	0	0	0	Pass	



Graphical Test Results 802.11A: 1 – 15GHz (5280MHz – Peak)

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



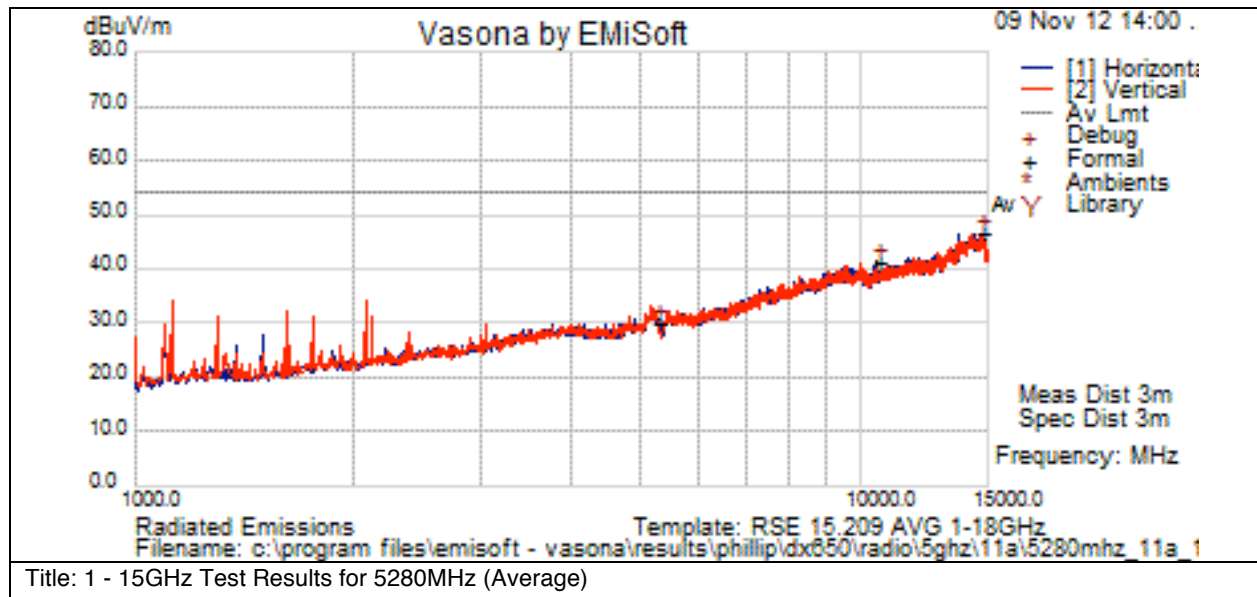
Test Results Table

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
5280.003	39.6	7.1	-3.1	43.6	Pk	H	99	361	74	-30.4	Pass	Tx Signal
10560.006	37.8	10.9	5.7	54.4	Pk	H	99	361	74	-19.7	Pass	



Graphical Test Results 802.11A: 1 – 15GHz (5280MHz – Average)

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

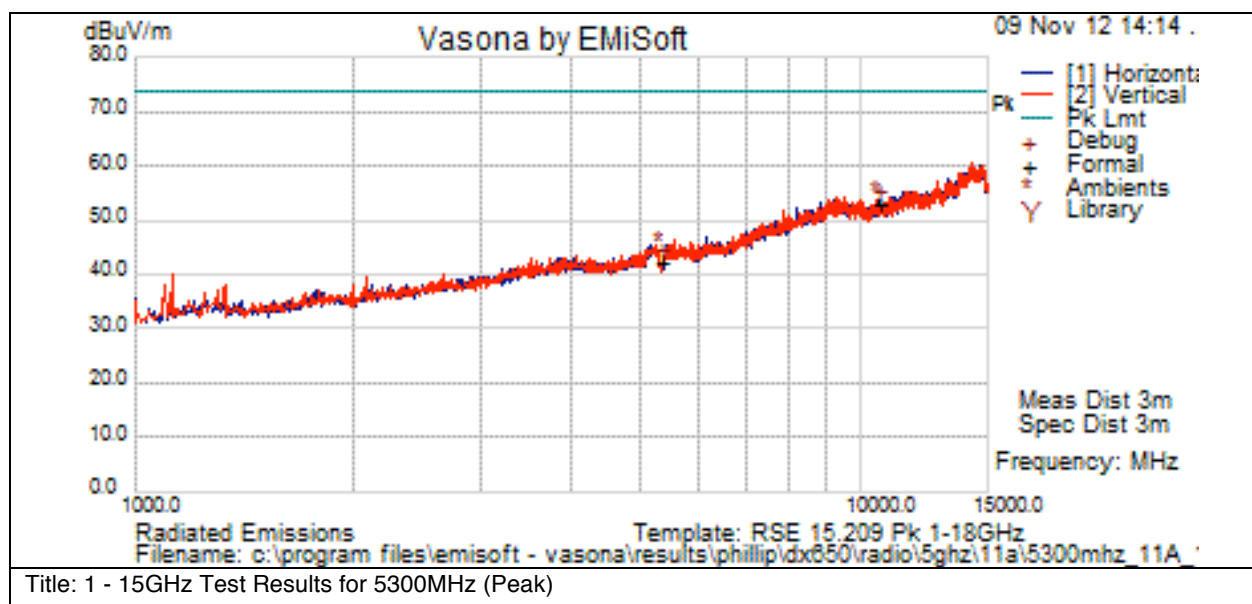


Test Results Table

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
5280.007	26	7.1	-3.1	30	Av	H	99	360	54	-24	Pass	Tx Signal
10560	24.7	10.9	5.7	41.3	Av	H	99	360	54	-12.7	Pass	
14730	25.9	14.3	6.3	46.6	Av	H	100	0	54	-7.4	Pass	Noise Floor

Graphical Test Results 802.11A: 1 – 15GHz (5300Mhz – Peak)

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

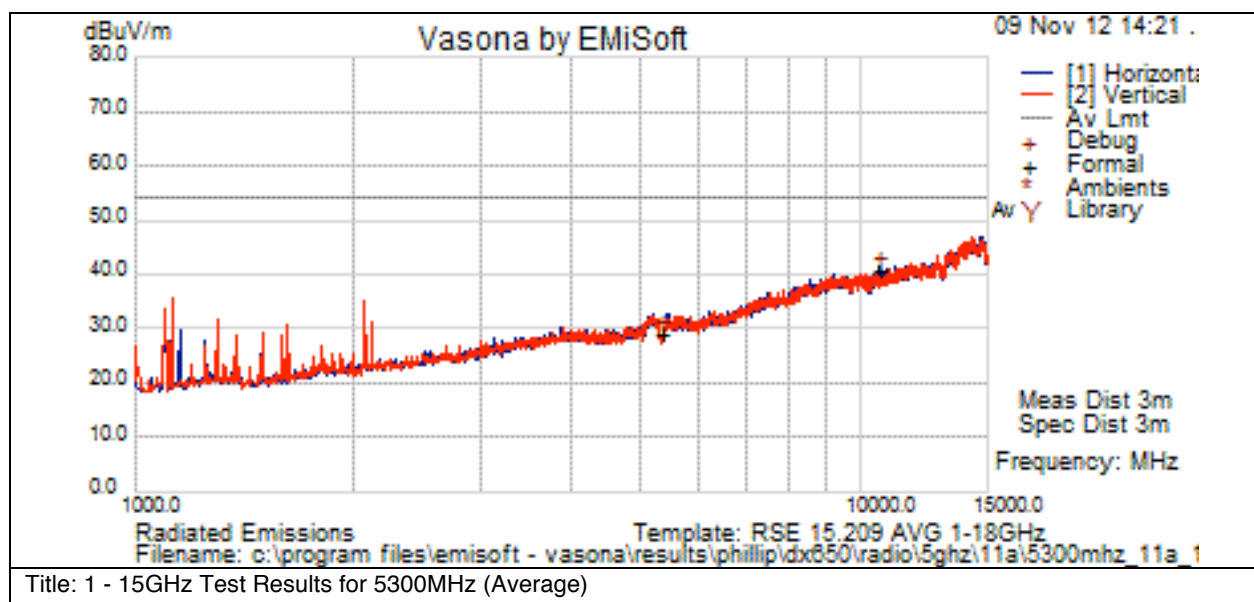


Test Results Table

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
5300.011	38.4	7.1	-3.2	42.2	Pk	H	99	361	74	-31.8	Pass	Tx Signal
10600.016	36.6	10.9	5.6	53.1	Pk	H	99	361	74	-20.9	Pass	

Graphical Test Results 802.11A: 1 – 15GHz (5300MHz – Average)

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

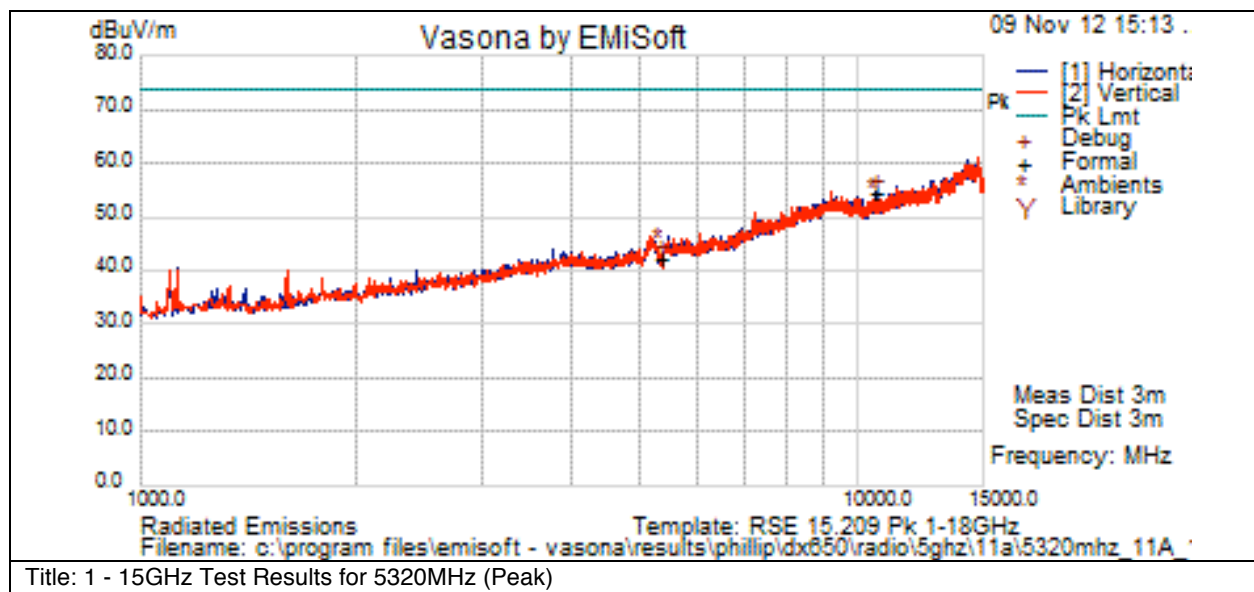


Test Results Table

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
5300	25	7.1	-3.2	28.8	Pk	H	99	361	54	-25.2	Pass	Tx Signal
10600	24.2	10.9	5.6	40.6	Pk	H	99	361	54	-13.4	Pass	

Graphical Test Results 802.11A: 1 – 15GHz (5320MHz – Peak)

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

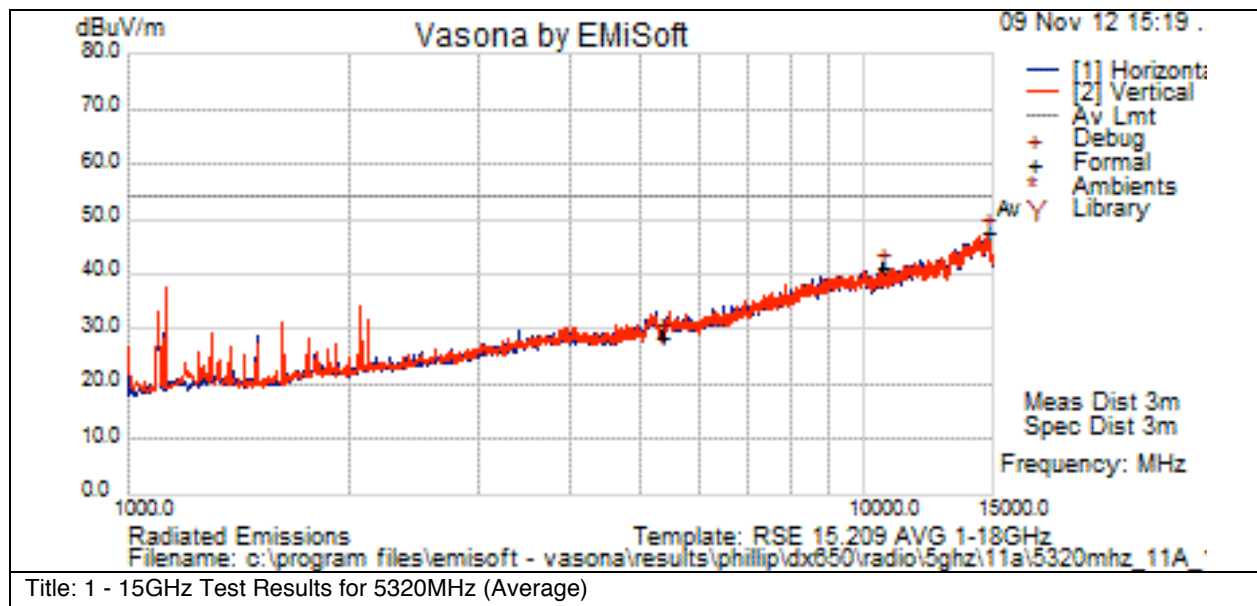


Test Results Table

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
5320.007	38.3	7.1	-3.3	42.1	Pk	V	99	361	74	-31.9	Pass	Tx Signal
10640	38.1	10.9	5.6	54.7	Pk	H	99	361	74	-19.3	Pass	

Graphical Test Results 802.11A: 1 – 15GHz (5320MHz – Average)

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

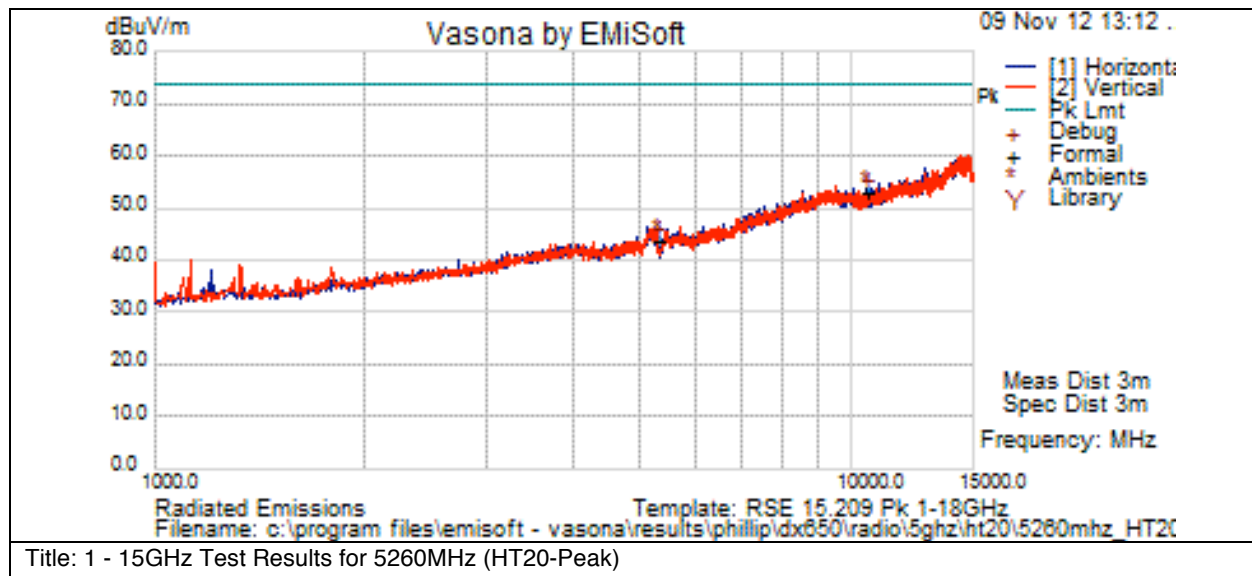


Test Results Table

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
5320.001	24.6	7.1	-3.3	28.4	Av	H	100	361	54	-25.6	Pass	Tx Signal
10640.006	24.6	10.9	5.6	41.1	Av	H	100	361	54	-12.9	Pass	
14727.5	26.8	14.3	6.4	47.4	Av	V	100	0	54	-6.6	Pass	Noise Floor

Graphical Test Results HT20: 1 – 15GHz (5260MHz – Peak)

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

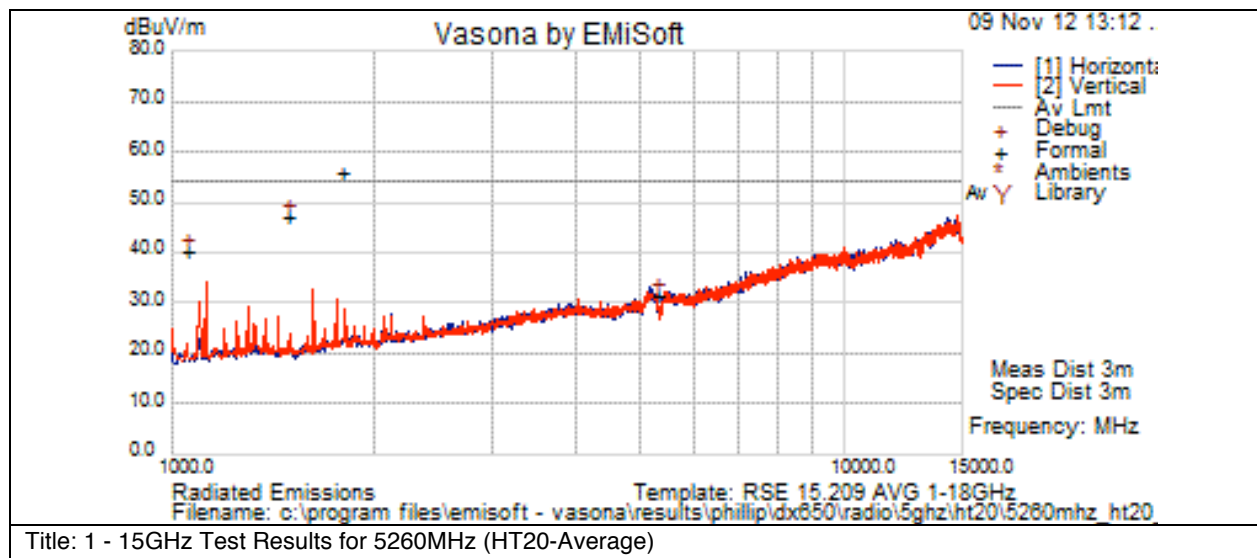


Test Results Table

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
5260.001	39.8	7.1	-3.1	43.7	Pk	V	99	361	74	-30.3	Pass	Tx Signal
10520	36.4	10.8	5.6	52.9	Pk	H	99	361	74	-21.1	Pass	

Graphical Test Results HT20: 1 – 15GHz (5260MHz – Average)

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

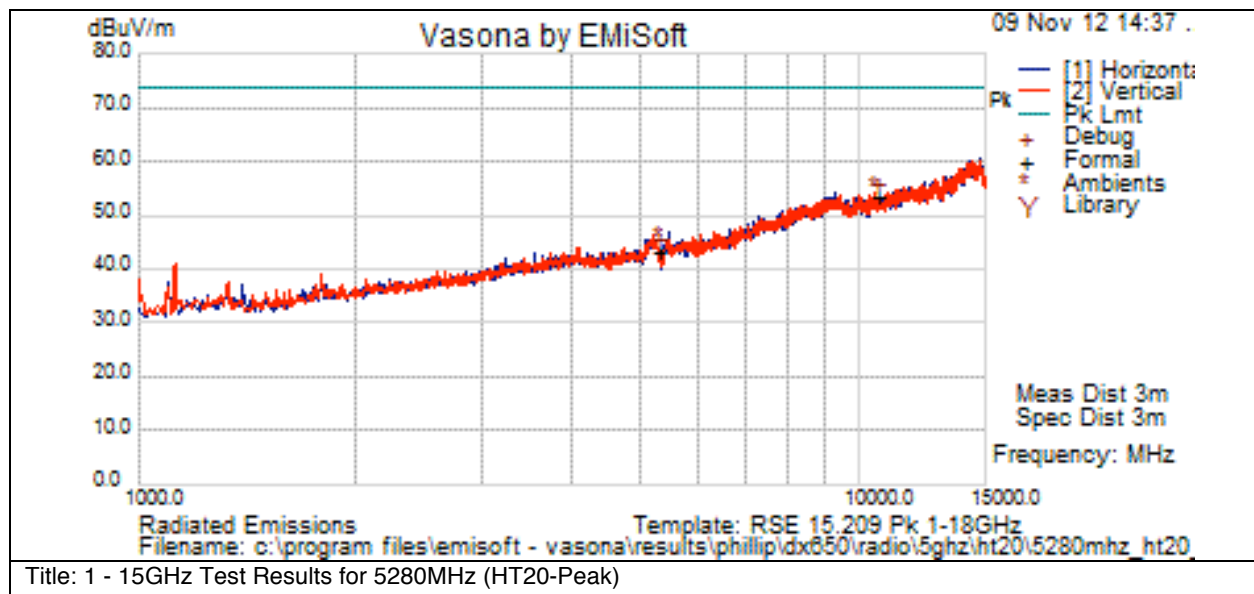


Test Results Table

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
5260.01	27.5	7.1	-3.1	31.4	Av	H	99	360	54	-22.6	Pass	
10520	23.8	10.8	5.6	40.2	Av	H	99	360	54	-13.8	Pass	
14812.5	26.8	14.4	6	47.2	Av	V	100	0	54	-6.8	Pass	Noise Floor

Graphical Test Results HT20: 1 – 15GHz (5280MHz – Peak)

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

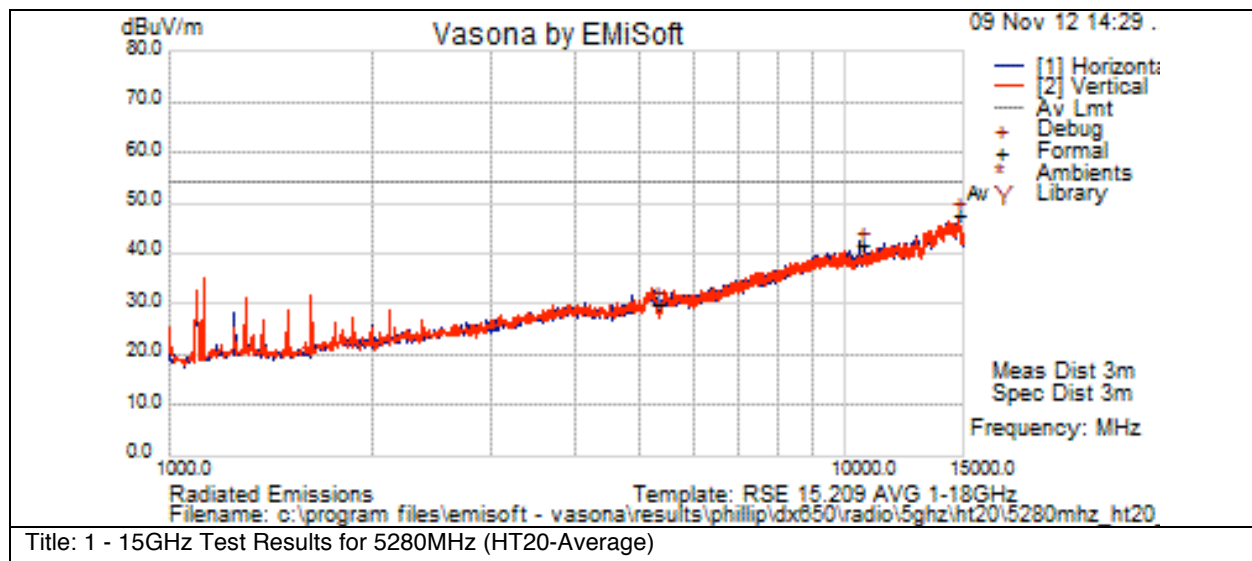


Test Results Table

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
5280.006	39.2	7.1	-3.1	43.2	Pk	H	99	361	74	-30.8	Pass	Tx Signal
10560.002	37.1	10.9	5.7	53.6	Pk	H	99	361	74	-20.4	Pass	

Graphical Test Results HT20: 1 – 15GHz (5280MHz – Average)

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

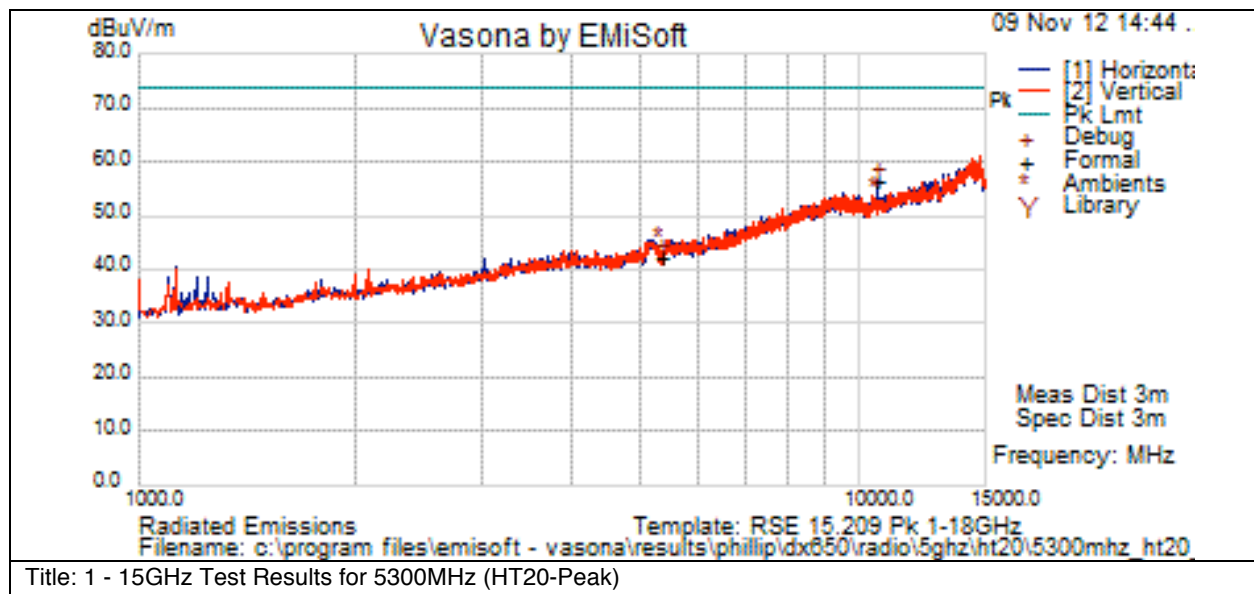


Test Results Table

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
5280.007	25.8	7.1	-3.1	29.7	Av	H	99	360	54	-24.3	Pass	Tx Signal
10560.008	24.9	10.9	5.7	41.5	Av	H	99	360	54	-12.5	Pass	
14748.75	27	14.2	6.3	47.6	Av	V	100	0	54	-6.4	Pass	Noise Floor

Graphical Test Results HT20: 1 – 15GHz (5300MHz – Peak)

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



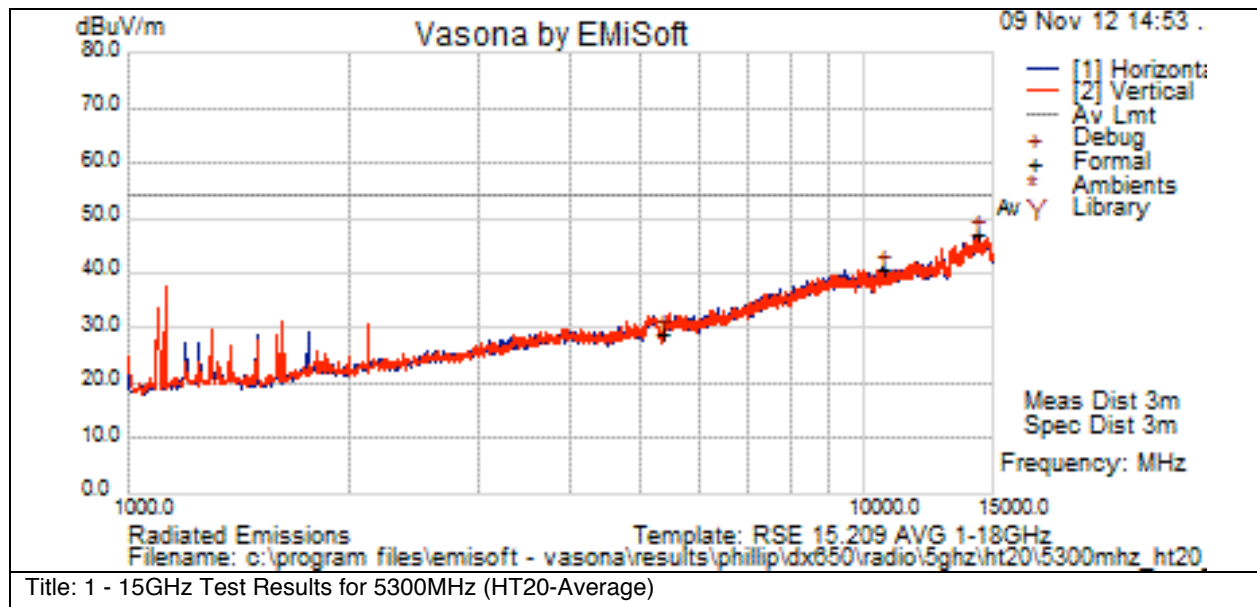
Test Results Table

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
5300	38.5	7.1	-3.2	42.3	Pk	H	99	360	74	-31.7	Pass	Tx Signal
10600.004	40.1	10.9	5.6	56.5	Pk	H	99	360	74	-17.5	Pass	



Graphical Test Results HT20: 1 – 15GHz (5300MHz – Average)

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



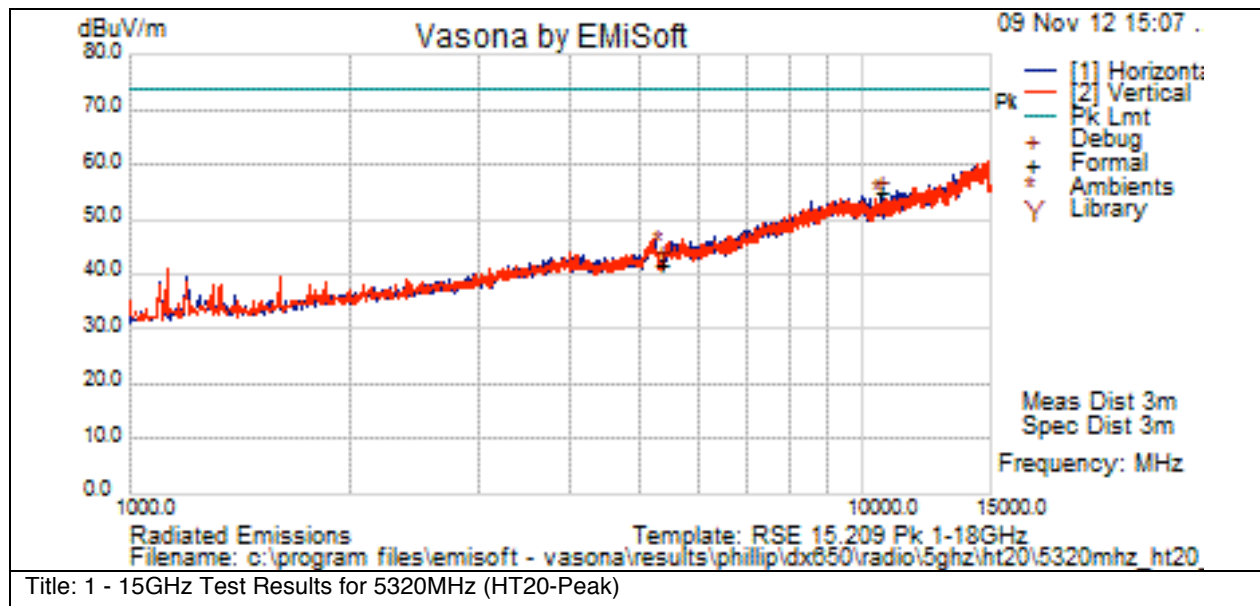
Test Results Table

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
5300	25.2	7.1	-3.2	29.1	Av	H	99	361	54	-24.9	Pass	Tx Signal
10600.013	24.3	10.9	5.6	40.8	Av	H	99	361	54	-13.3	Pass	
14206.875	25.7	13.8	7.3	46.9	Av	H	100	0	54	-7.1	Pass	Noise Floor



Graphical Test Results HT20: 1 – 15GHz (5320MHz – Peak)

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

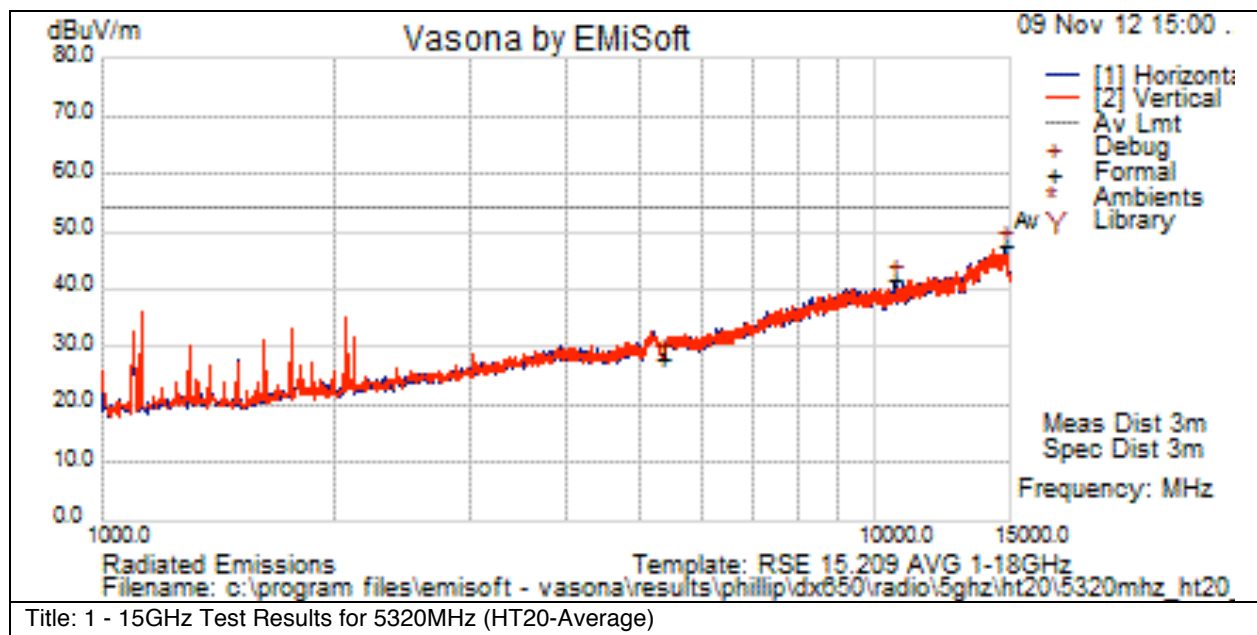


Test Results Table

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
5320.007	38	7.1	-3.3	41.9	Pk	H	99	361	74	-32.1	Pass	Tx Signal
10640.004	38.2	10.9	5.6	54.7	Pk	H	99	361	74	-19.3	Pass	

Graphical Test Results HT20: 1 – 15GHz (5320MHz – Average)

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

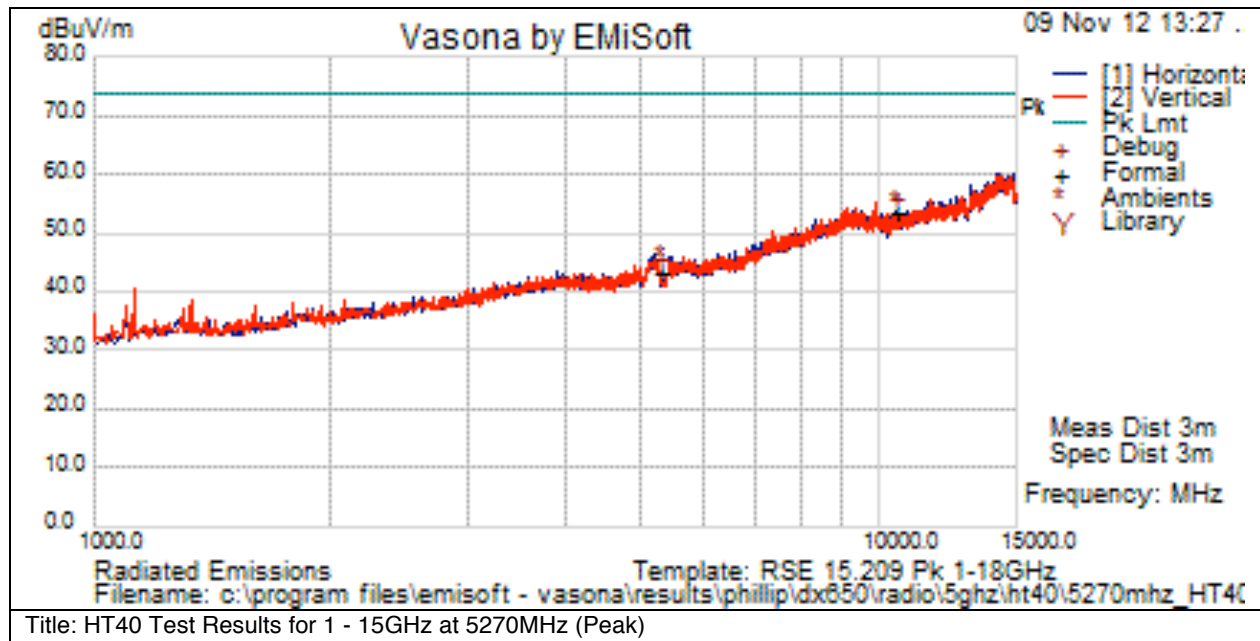
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
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Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5320.001	24.3	7.1	-3.3	28.2	Av	V	99	360	54	-25.9	Pass	Tx Signal
10639.999	25	10.9	5.6	41.5	Av	H	99	360	54	-12.5	Pass	
14732.813	26.9	14.3	6.3	47.5	Av	H	100	0	54	-6.5	Pass	Noise Floor

Graphical Test Results HT40: 1 – 15GHz (5270MHz – Peak)

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

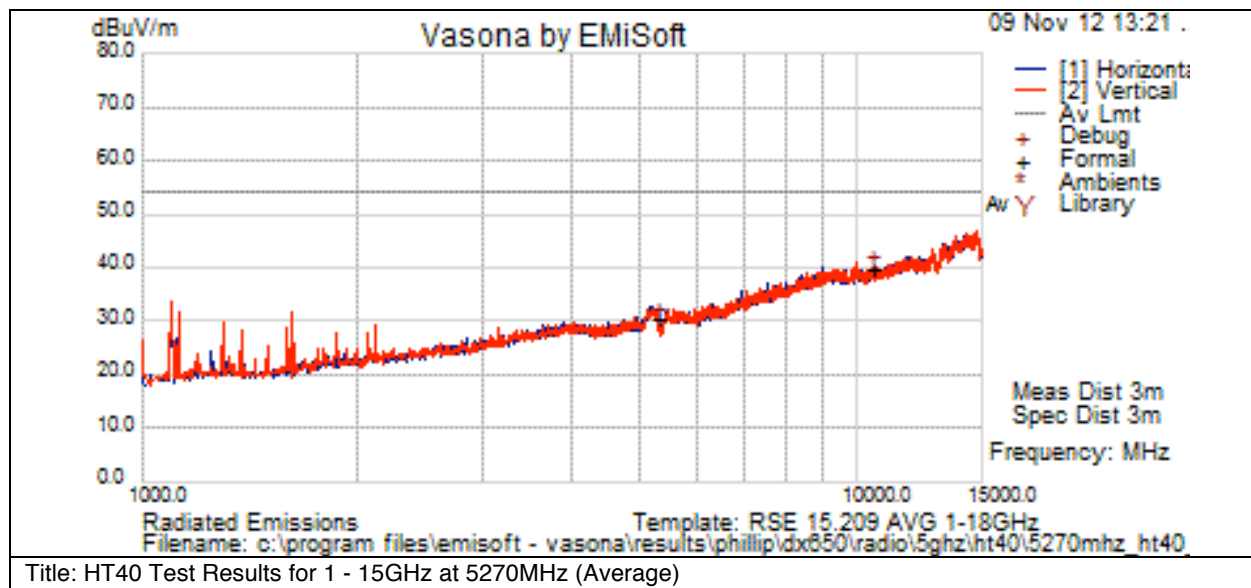


Test Results Table

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
5270.001	39	7.1	-3.1	43	Pk	H	99	361	74	-31	Pass	Tx Signal
10540.001	36.7	10.8	5.7	53.3	Pk	H	99	361	74	-20.7	Pass	

Graphical Test Results HT40: 1 – 15GHz (5270MHz – Average)

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



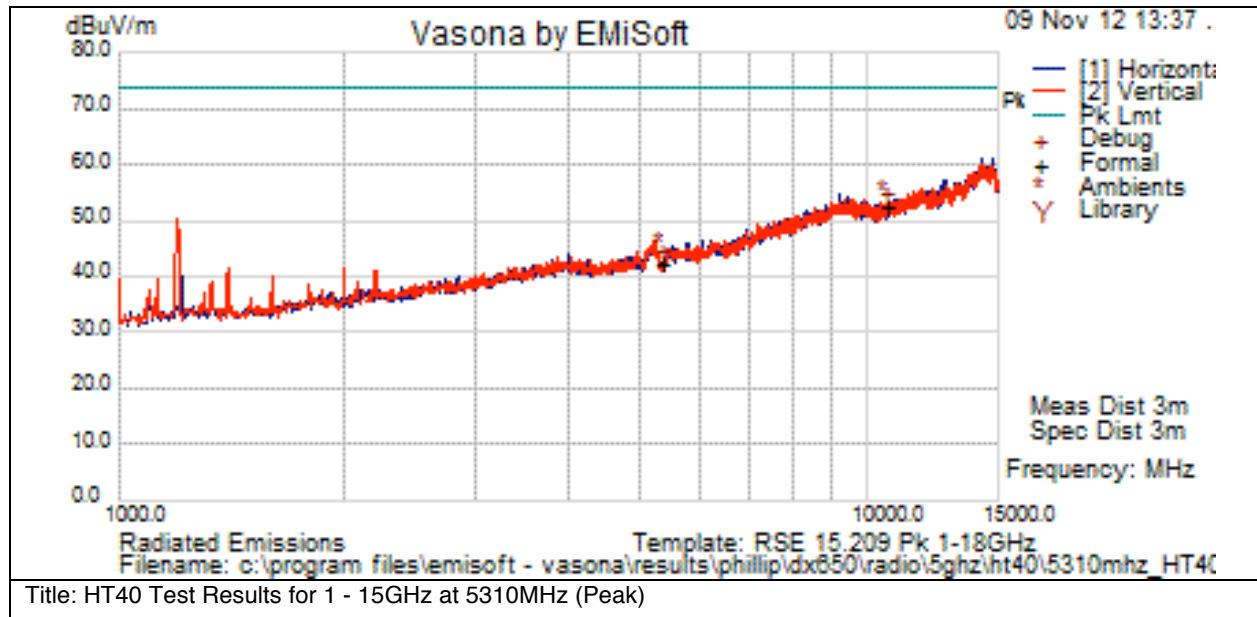


Test Results Table

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
5270.001	26.2	7.1	-3.1	30.2	Av	H	99	361	54	-23.8	Pass	Tx Signal
10540.007	22.9	10.8	5.7	39.5	Av	H	99	361	54	-14.5	Pass	

Graphical Test Results HT40: 1 – 15GHz (5310MHz – Peak)

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

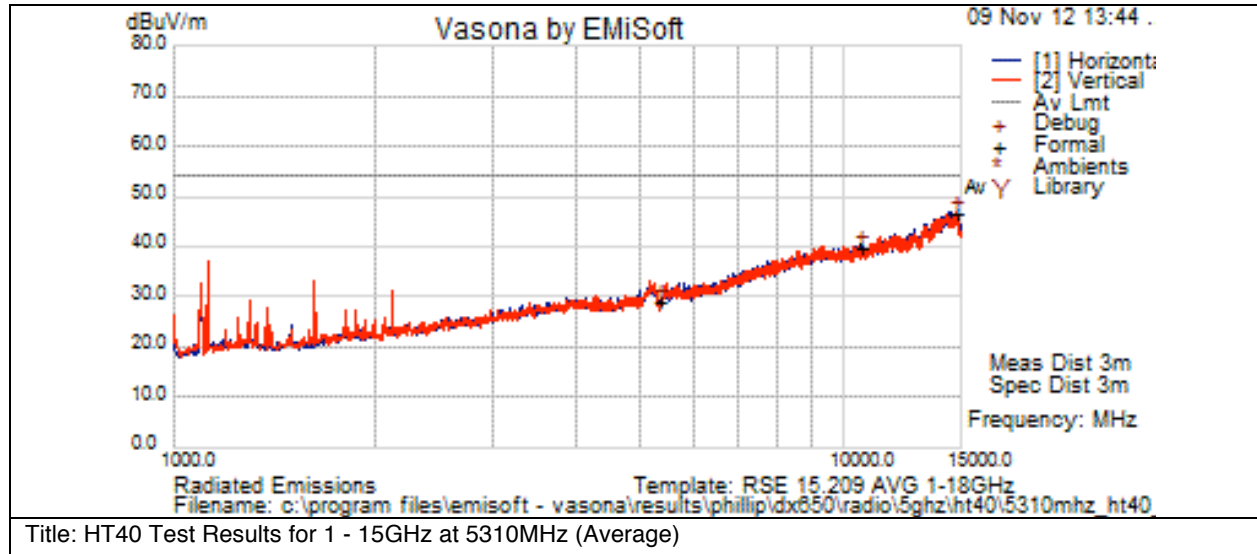


Test Results Table

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
5310.002	38.3	7.1	-3.3	42.1	Pk	H	99	361	74	-31.9	Pass	Tx Signal
10620	36.1	10.9	5.6	52.6	Pk	H	99	361	74	-21.4	Pass	

Graphical Test Results HT40: 1 – 15GHz (5310MHz – Average)

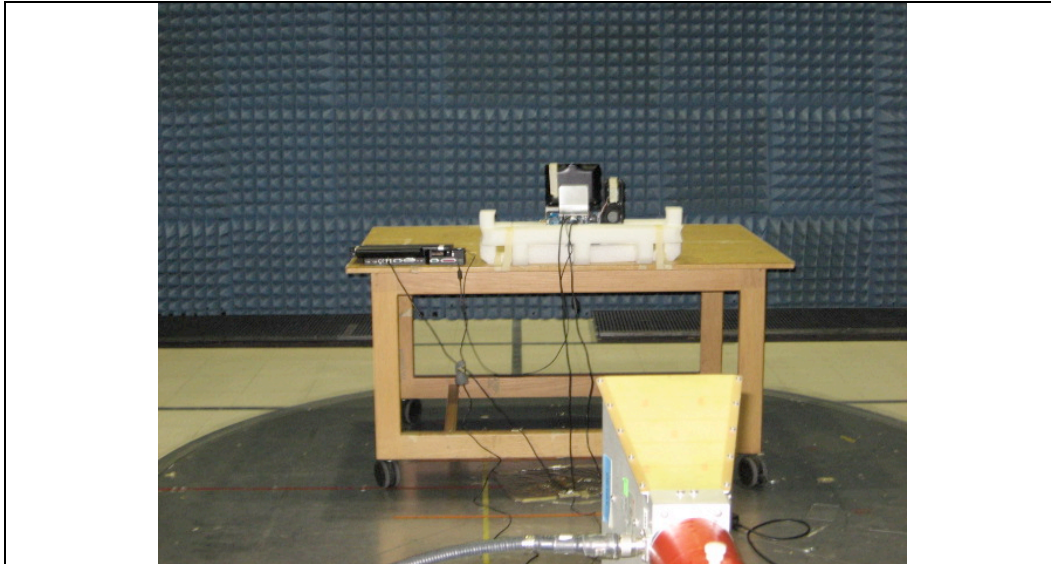
Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



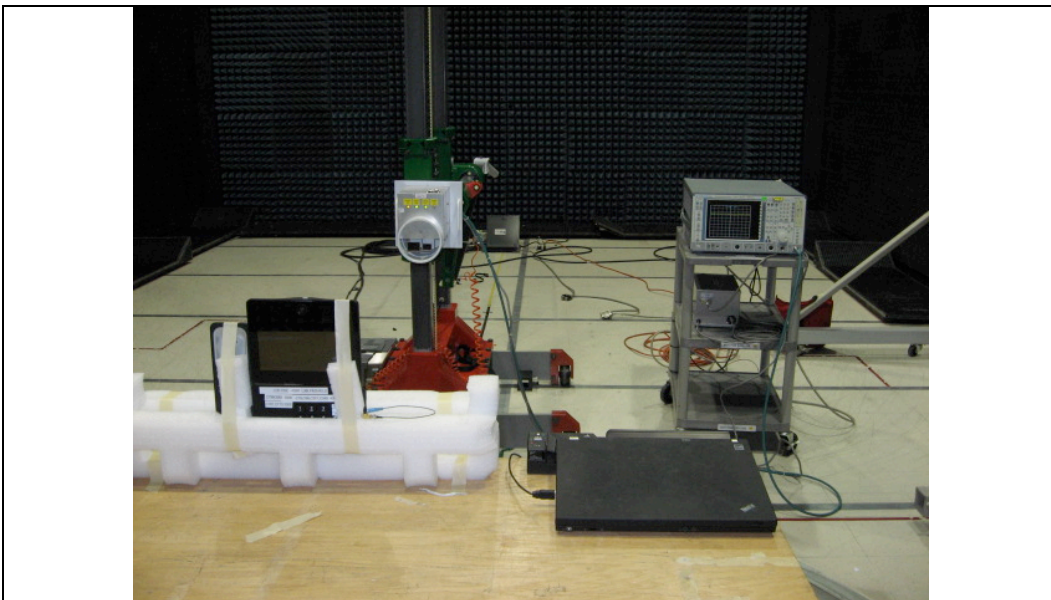
Test Results Table

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
5310.001	25	7.1	-3.3	28.8	Av	H	99	360	54	-25.2	Pass	Tx Signal
10610.004	23.4	10.9	5.6	39.9	Av	H	99	360	54	-14.1	Pass	
14732.813	26.2	14.3	6.3	46.8	Av	V	100	0	54	-7.2	Pass	Noise Floor

Physical Test arrangement Photograph:

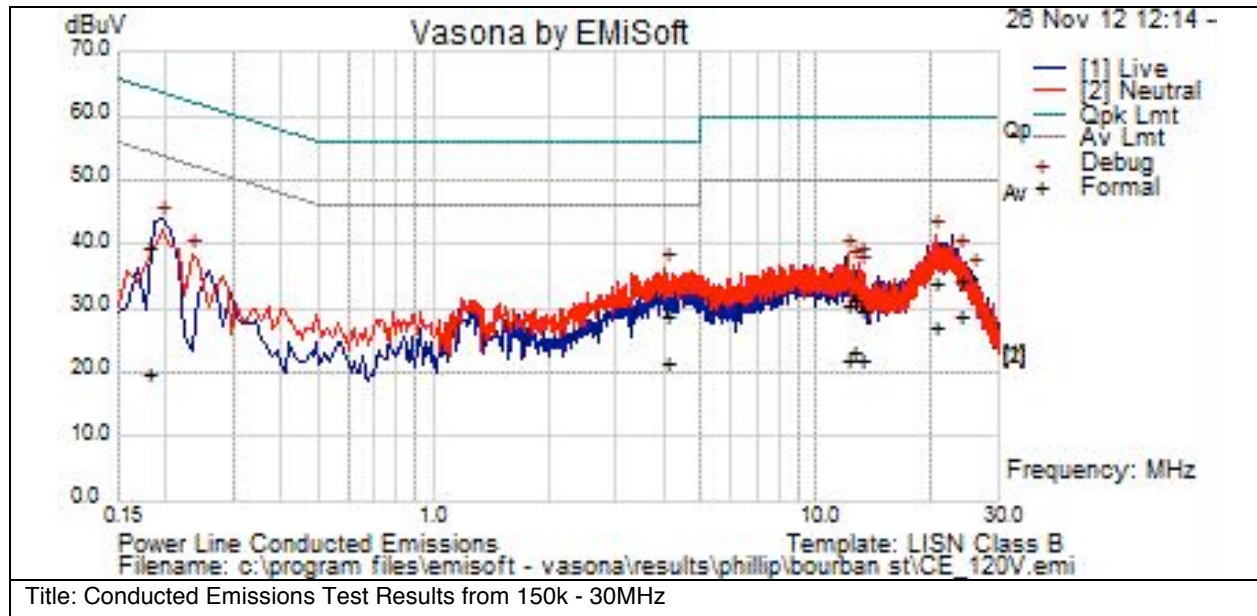


Title: Radiated Spurious Emissions 1G to 18GHz Test Configuration



Title: Radiated Spurious Emissions 18 – 40GHz Test Configuration

Conducted emissions



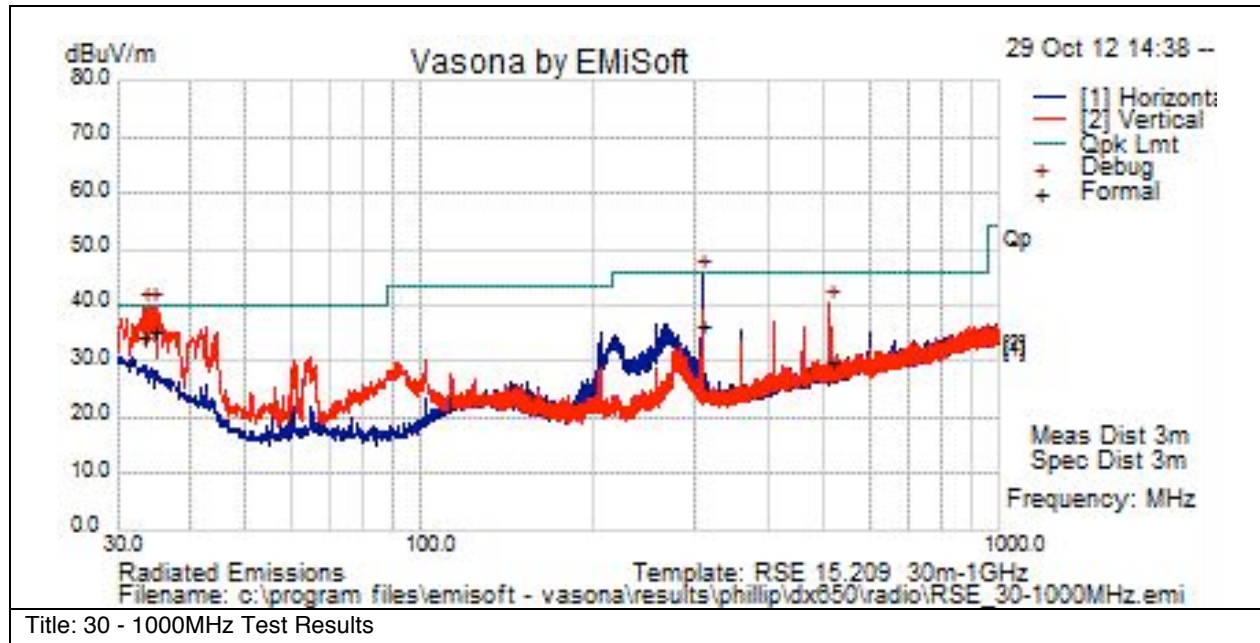
Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement Type	Line	Limit dBuV	Margin dB	Pass /Fail	Comments
23.664	7.5	21	0.2	28.6	Av	L	50	-21.4	Pass	
20.566	6.5	20.4	0.2	27.1	Av	N	50	-22.9	Pass	
4.035	1.5	20	0	21.6	Av	N	46	-24.4	Pass	
0.1799	18.6	21	0	39.6	Qp	L	64.5	-24.9	Pass	
23.664	13.4	21	0.2	34.5	Qp	L	60	-25.5	Pass	
20.566	13.2	20.4	0.2	33.8	Qp	N	60	-26.2	Pass	
12.47	2.7	20.2	0.1	23.1	Av	N	50	-26.9	Pass	
4.035	8.5	20	0	28.6	Qp	N	56	-27.4	Pass	
13.054	1.4	20.3	0.1	21.8	Av	N	50	-28.2	Pass	
12.136	1.5	20.2	0.1	21.8	Av	N	50	-28.2	Pass	
12.47	10.8	20.2	0.1	31.2	Qp	N	60	-28.8	Pass	
12.136	10	20.2	0.1	30.3	Qp	N	60	-29.7	Pass	
13.054	9.1	20.3	0.1	29.5	Qp	N	60	-30.5	Pass	
0.1799	-1.2	21	0	19.8	Av	L	54.5	-34.7	Pass	



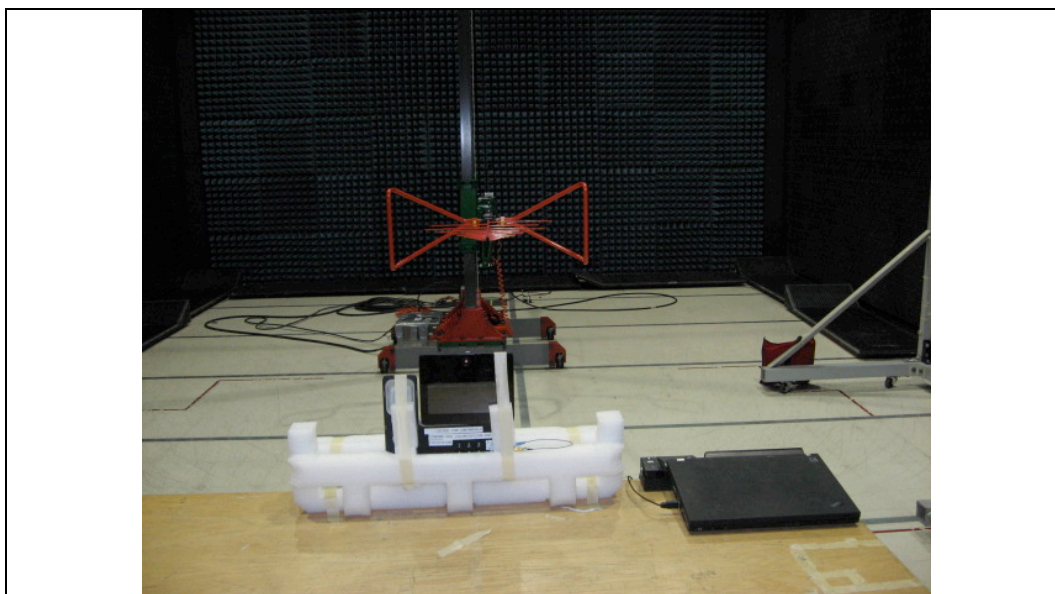
Title: Conducted Emissions Configuration Photograph

Radiated emissions



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
34.38	16.9	0.5	18	35.4	Qp	V	110	66	40	-4.6	Pass	
33.179	14.9	0.5	18.9	34.3	Qp	V	105	38	40	-5.7	Pass	
307.047	21.2	1.6	13.6	36.4	Qp	H	103	97	46	-9.6	Pass	
511.908	10	2.1	17.8	29.8	Qp	V	101	148	46	-16.2	Pass	



Title: Radiated Spurious Emissions Test Configuration from 30M to 1000MHz

Maximum Permissible Exposure (MPE) Calculations

15.407: U-NII devices are subject to the radio frequency radiation exposure requirements specified in Sec. 1.1307(b), Sec. 2.1091 and Sec. 2.1093 of this chapter, as appropriate. All equipment shall be considered to operate in a "general population/uncontrolled" environment. Applications for equipment authorization of devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request.

Given

$$E = \sqrt{(30 \cdot P \cdot G)/d} \quad \text{and} \quad S = E^2/3770$$

where

E=Field Strength in Volts/meter

P=Power in Watts

G=Numeric Antenna Gain

d=Distance in meters

S=Power Density in mW/cm²

Combine equations and rearrange the terms to express the distance as a function of the remaining variables:

$$d = \sqrt{((30 \cdot P \cdot G)/(3770 \cdot S))}$$

Changing to units of power in mW and distance in cm, using:

$$P(\text{mW}) = P(\text{W})/1000 \quad d(\text{cm}) = 100 \cdot d(\text{m})$$

yields

$$d = 100 \cdot \sqrt{((30 \cdot (P/1000) \cdot G)/(3770 \cdot S))}$$

$$d = 0.282 \cdot \sqrt{(P \cdot G/S)}$$

where

d=Distance in cm

P=Power in mW

G=Numerica Antenna Gain

S=Power Density in mW/cm²

Substituting the logarithmic form of power and gain using:

$$P(\text{mW}) = 10^{(P(\text{dBm})/10)} \quad G(\text{numeric}) = 10^{(G(\text{dBi})/10)}$$

yields

$$d = 0.282 \cdot 10^{((P+G)/20)} / \sqrt{S} \quad \text{Equation (1)}$$

and

$$s = ((0.282 \cdot 10^{((P+G)/20)})/d)^2 \quad \text{Equation (2)}$$

where

d=MPE distance in cm

P=Power in dBm

G=Antenna Gain in dBi

S=Power Density in mW/cm²



Equation (1) and the measured peak power are used to calculate the MPE distance. Note that for mobile or fixed location transmitters such as an access point, the minimum separation distance is 20 cm even if the calculations indicate that the MPE distance may be less.

$S=1\text{mW/cm}^2$ maximum. The highest supported antenna gain is 6 dBi (9dBi with beamforming). Using the peak power levels recorded in the test report along with Equation 1 above, the MPE distances are calculated as follows.

Frequency (MHz)	Bit Rate (Mbps)	Power Density (mW/cm ²)	Peak Transmit Power (dBm)	Antenna Gain (dBi)	MPE Distance (cm)	Limit (cm)	Margin (cm)
5260	6	1	14.29	3.9	2.29	20	17.71
5270	M0	1	14.07	3.9	2.23	20	17.77
5320	6	1	13.99	3.9	2.21	20	17.79

MPE Calculations

To maintain compliance, installations will assure a separation distance of at least 20cm.

Using Equation 2, the MPE levels (s) at 20 cm are calculated as follows:

Frequency (MHz)	Bit Rate (Mbps)	MPE Distance (cm)	Peak Transmit Power (dBm)	Antenna Gain (dBi)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Margin (mW/cm ²)
5260	6	20	14.29	3.9	0.013	1	0.99
5270	M0	20	14.07	3.9	0.012	1	0.99
5320	6	20	13.99	3.9	0.012	1	0.99



Appendix C: Test Equipment Used to perform the test

Equip#	Manufacturer/ Model	Description	Last Cal	Next Due
041986	Murata Electronics MXGS83RK3000	Special Radio Test Adaptor Cable	29-MAY-2012	29-MAY-2013
034974	Midwest Microwave ATT-0640-20-29M-02	Attenuator, 20dB, DC-40GHz	25-MAY-2012	25-MAY-2013
035609	Micro-Tronics BRC50703-02	Notch Filter, SB: 5.150-5.350 GHz, to 11 GHz	06-JUL-2012	06-JUL-2013
033988	Agilent E4446A	Precision Spectrum Analyzer	27-NOV-2012	27-NOV-2013
008024	Huber + Suhner SF106A	3 meter Sucoflex cable	05-NOV-2012	05-NOV-2013
030443	Micro-Coax UFB311A-0-1560-520520	RF Coaxial Cable, to 18GHz, 156 In.	05-NOV-2012	05-NOV-2013
033602	Midwest Microwave CSY-NMNM-80-273001	RF Coaxial Cable, 27ft. to 18GHz	05-NOV-2012	05-NOV-2013
045588	Sunol Sciences JB1	Combination Antenna	14-DEC-2011	14-DEC-2012
045051	Rohde & Schwarz ESCI	EMI Test Receiver	02-NOV-2012	02-NOV-2013
002119	EMC Test Systems/ 3115	Double Ridged Guide Horn Antenna	07-AUG-2012	07-AUG-2013
008022	Huber + Suhner SF106A	1m Sucoflex cable	16-DEC-2011	16-DEC-2012
005691	Miteq NSP1800-25-S1	Broadband Preamplifier (1-18GHz)	31-JAN-2012	31-JAN-2013
035613	Micro-Tronics BRM50702-02	Notch Filter, SB: 2.4 - 2.5 GHz, to 18 GHz	30-MAY-2012	30-MAY-2013
042000	Agilent E4440A	Spectrum Analyzer	29-JUN-2012	29-JUN-2013
024201	Rohde & Schwarz FSEK30	EMI Test Receiver	30-NOV-2012	30-NOV-2013
028072	CISCO 1840	18-40GHz EMI Test Fixture	15-FEB-2012	15-FEB-2013
035095	Micro-Coax UFA147A-0-0180-110200	RF Coax Cable to 40 GHz, 18in	25-OCT-2012	25-OCT-2-13
043023	Anritsu MT8852B	Bluetooth Test Set	14-SEP-2012	14-SEP-2013
035639	Micro-Tronics BRC50704-02	Notch Filter, SB: 5.470-5.725 GHz, to 12 GHz	09-AUG-2012	09-AUG-2013
031700	Micro-Tronics BRC50705	Notch Filter, SB: 5.725-5.875 GHz, to 12 GHz	30-MAY-2012	30-MAY-2013
008097	Huber + Suhner/ RG-223	RG-223 Cable 9m	24-JUL-2012	24-JUL-2013
004924	Rohde & Schwarz/ ESHS30	EMI Receiver (9KHz-30MHz)	29-NOV-12	29-NOV-13
008185	Fischer Custom Communications/ FCC-450B-2.4-N	Instrumentation Limiter	01-AUG-2012	01-AUG-2013
008197	TTE/ H613-150K-50-21378	Hi Pass Filter - 150KHz cutoff	10-APR-2012	10-APR-2013
008394	Coleman/ RG-223	RG-223 Cable 6 ft	23-MAY-2012	23-MAY-2013



008490	Bird/ 5-T-MN	5W 50 Ohm Terminator	01-JUN-2012	01-JUN-2013
007036	HP/ E7401A	Spectrum Analyzer	12-SEP-2012	12-SEP-2013
018981	Fischer Custom Communications/ FCC-801-M2-32A	Power Line Coupling/Decoupling Network	03-MAY-2012	03-MAY-2013
020767	Fischer Custom Communications/ FCC-450B-2.4-N	Instrumentation Limiter	01-AUG-2012	01-AUG-2013
023874	Fischer Custom Communications/ FCC-LISN-PA-NEMA-5-15	Power Adaptor, Polarized 120VAC	07-SEP-2012	07-SEP-2013
036033	York/ CNE V	Comparison Noise Emitter	Cal Not Required	N/A
044940	Rohde & Schwarz/ ESU40	EMI Test Receiver, 20Hz-40GHz	08-MAY-12	08-MAY-13

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 C63.4
- ANSI C63.10/D8

Test procedures are summarized below

6dB Bandwidth	EDCS # - 422115
26dB Bandwidth	EDCS # - 422115
Average Output Power	EDCS # - 422117
Co-Located Transmitter	EDCS # - 422118
Conducted Spurious Test	EDCS # - 422119
Peak Transmit Power Measurement	EDCS # - 422123
Power Spectral Density	EDCS # - 422113
Peak Excursion Test	EDCS # - 422121
Radiated Band Edge	EDCS # - 422124
Radiated Spurious Test	EDCS # - 422125

