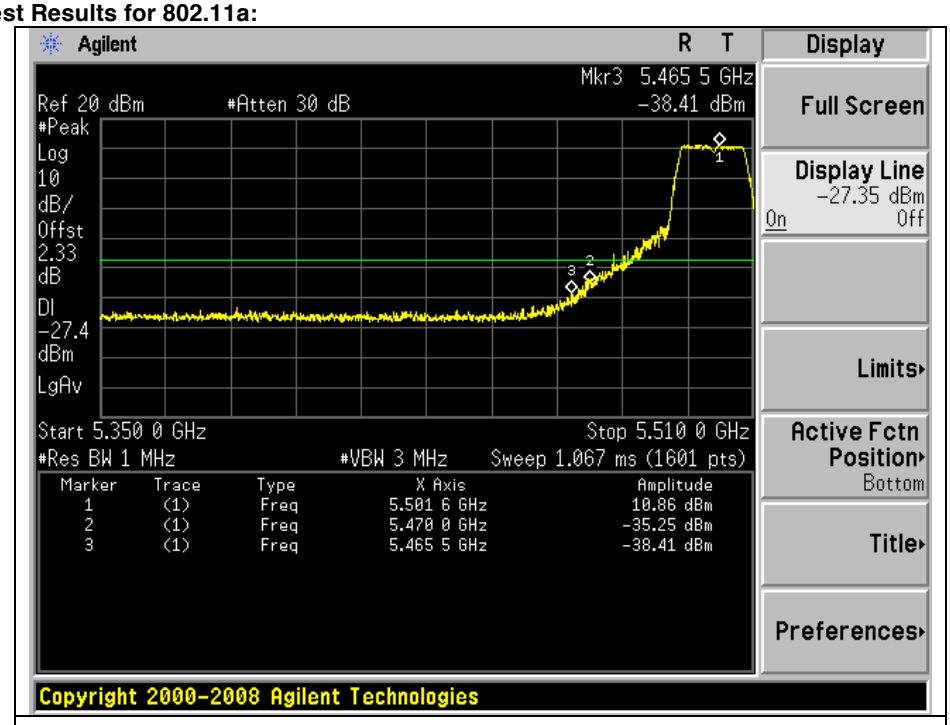
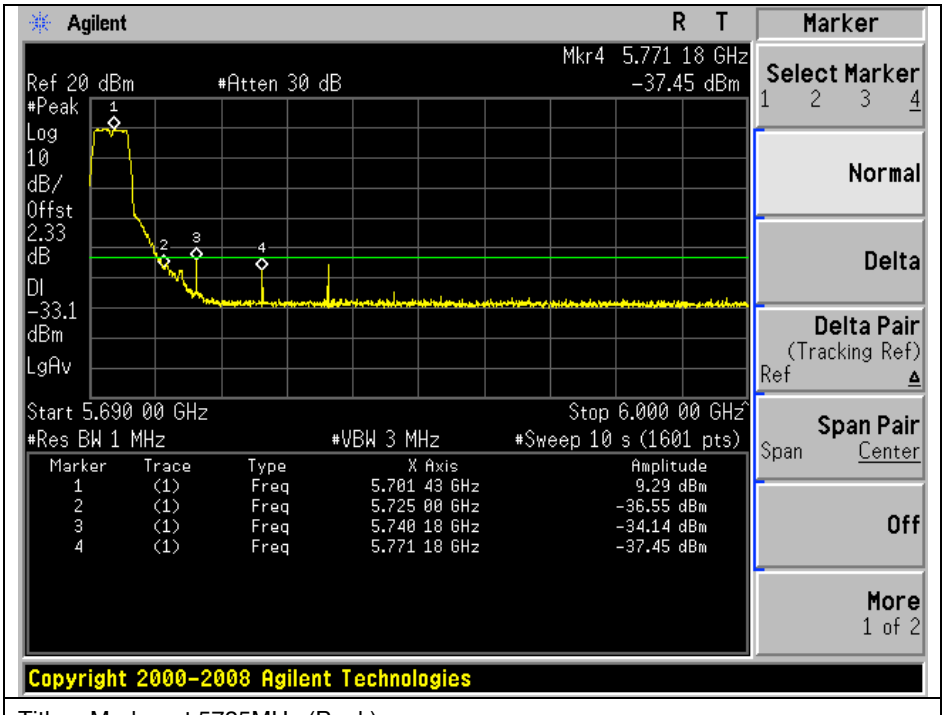
Graphical Test Results for 802.11a:



Title: Marker at 5470MHz (Peak)

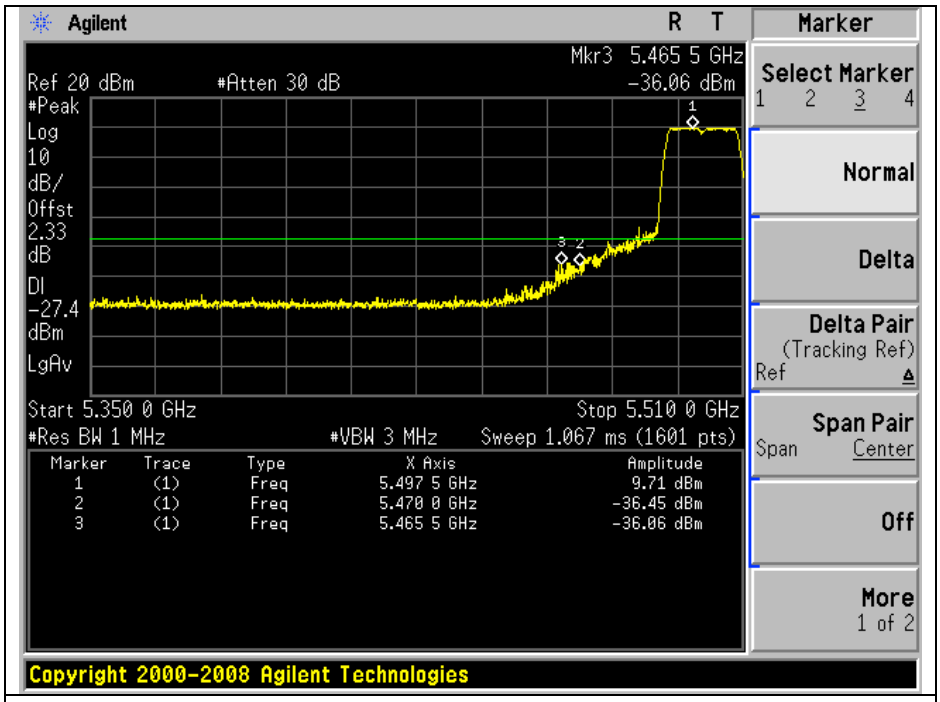


Title: Marker at 5725MHz (Peak)

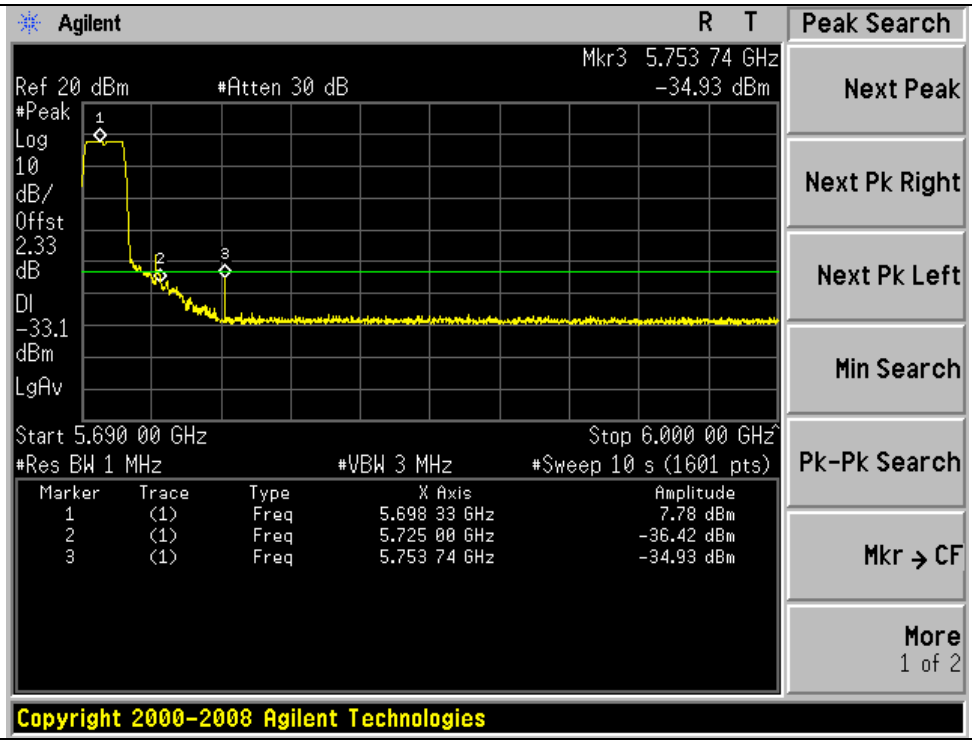
802.11n HT20 Test Results:

Mode	Transmit Frequency (MHz)	Measurement Type	Data Rate (Mbps)	Marker (MHz)	Band Edge Level (dBm)	Limit (dBm)	Limit adjusted for antenna gain (dBm)	Margin (dB)
802.11n HT20	5500	Peak	M0	5470	-36.45	-27	-33.1	-3.35
	5700	Peak	M0	5725	-36.42	-27	-33.1	-3.32

Graphical Test Results for 802.11n HT20:



Title: Marker at 5470MHz (Peak)

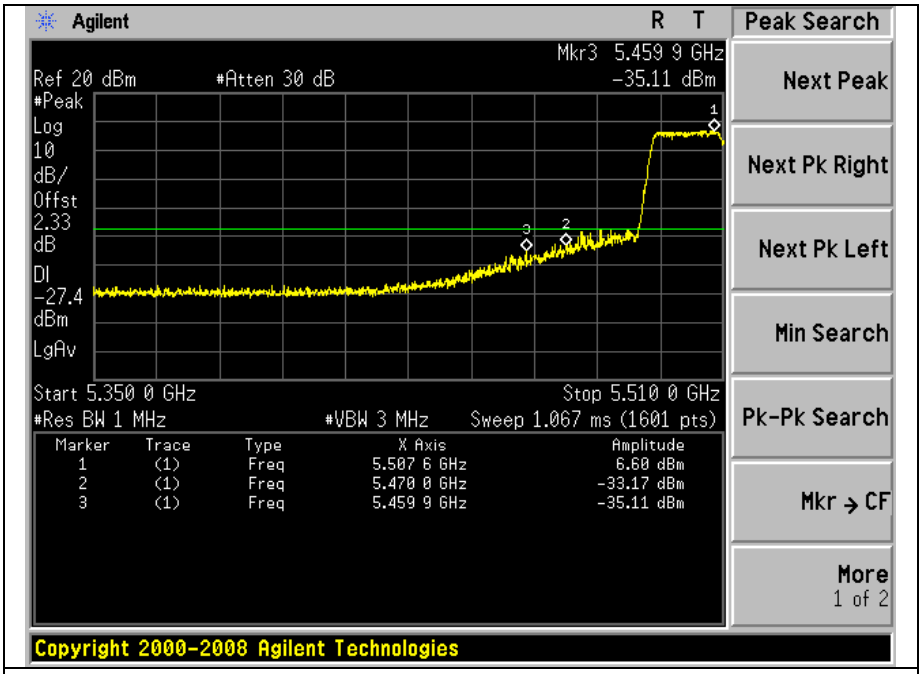


Title: Marker at 5725MHz (Peak)

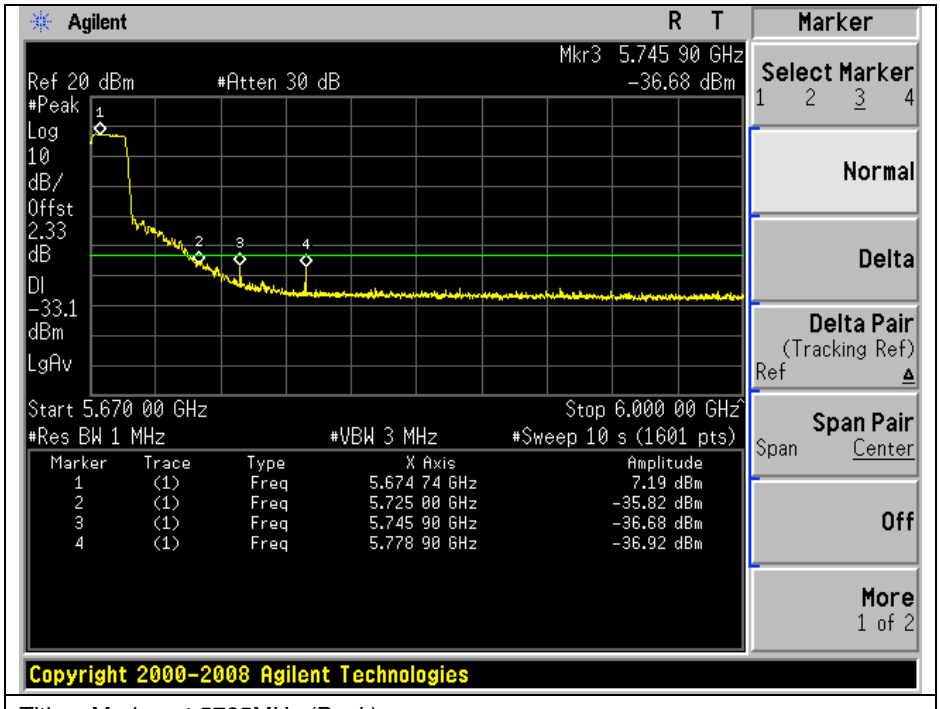
802.11n HT40 Test Results:

Mode	Transmit Frequency (MHz)	Measurement Type	Data Rate (Mbps)	Marker (MHz)	Band Edge Level (dBm)	Limit (dBm)	Limit adjusted for antenna gain (dBm)	Margin (dB)
802.11n HT40	5510	Peak	M0	5470	-33.17	-27	-33.1	-0.07
	5670	Peak	M0	5725	-35.82	-27	-33.1	-2.72

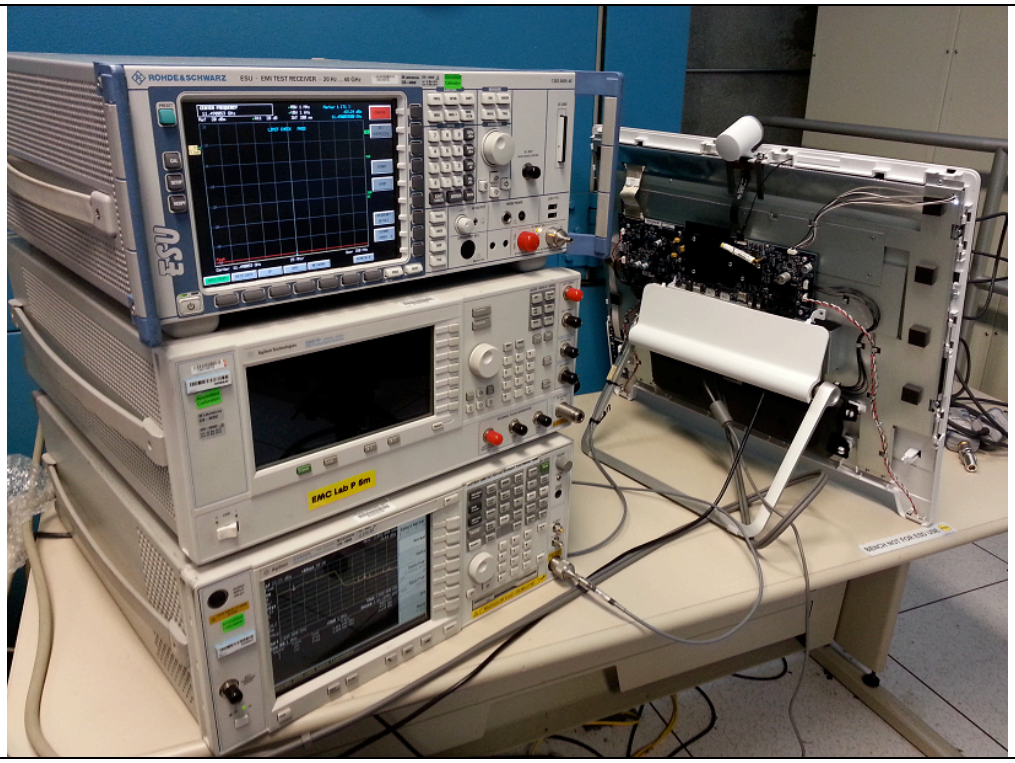
Graphical Test Results for 802.11n HT40:



Title: Marker at 5470MHz (Peak)



Title: Marker at 5725MHz (Peak)



Title: Conducted Test Setup

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 – 18GHz
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

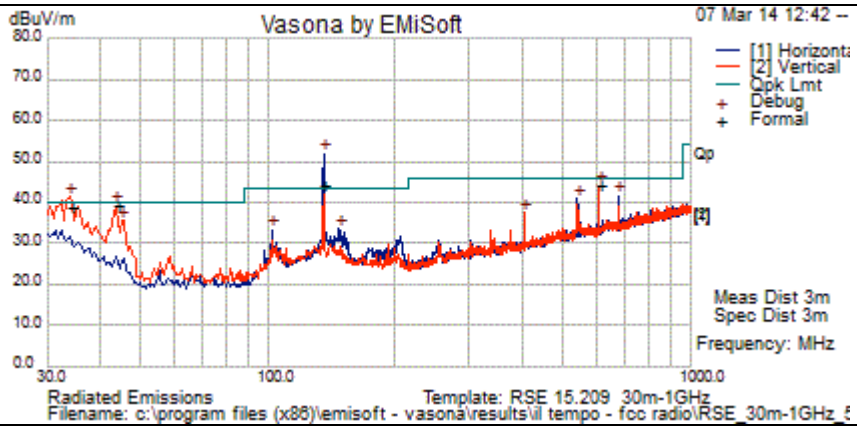
Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands.

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 18 GHz.

Note: A Notch Filter was used during formal testing from 1 – 18GHz 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

Note: Emission at 135MHz will be evaluated during EMC testing and assessed against the applicable limits. The emission at 135MHz was not caused by the radio. A scan was performed with the radio transmitting. Another scan was performed with the radio transmitter turned off. The emission at 135MHz was present in both cases, which proves it was an EMC issue. The source of the emission was determined. There is a cable that is held in place with a piece of foam with a sticky side. The sticky foam had separated from the metal it was originally placed on. For comparison, a measurement was performed with the foam pressed back down. The result was passing (See Graphical Test Results 30MHz – 1000MHz (Transmitter Off) result with -1.6dB margin below).

Graphical Test Results: 30MHz – 1000MHz (Transmitter On)
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: 30MHz - 1000MHz Test Results

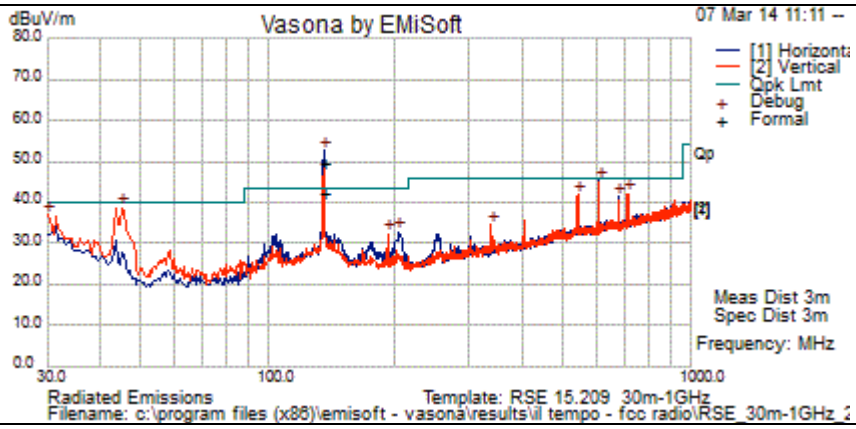
Test Results Table

Formal Data

No	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
1	34.05	20.6	0.5	17.6	38.7	Quasi Peak	V	102	126	40	-1.3	Pass	Digital Emission
2	43.8	27.5	0.6	11.1	39.2	Peak [Scan]	V	100	89	40	-0.8	Pass	Digital Emission
3	608.12	23	2.3	18.8	44	Peak [Scan]	H	300	119	46	-2	Pass	
4	135.168	29.4	1.1	13.6	44.1	Quasi Peak	H	200	0	43.5	0.6	NA	Digital Emission

Graphical Test Results: 30MHz – 1000MHz (Transmitter Off)

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: 30MHz - 1000MHz Test Results

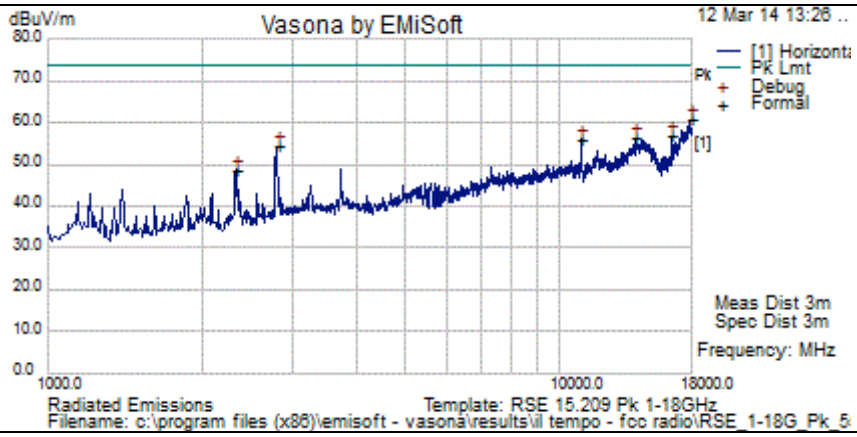
Test Results Table

Formal Data

No	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
1	135.168	34.7	1.1	13.6	49.4	Quasi Peak	H	200	0	43.5	5.9	NA	Digital Emission
2	135.168	27.3	1.1	13.6	41.9	Quasi Peak	H	200	0	43.5	-1.6	Pass	

Graphical Test Results 802.11a: 1- 18GHz (5500MHz – 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



Title: 1- 18GHz Test Results for 5500MHz (Peak)

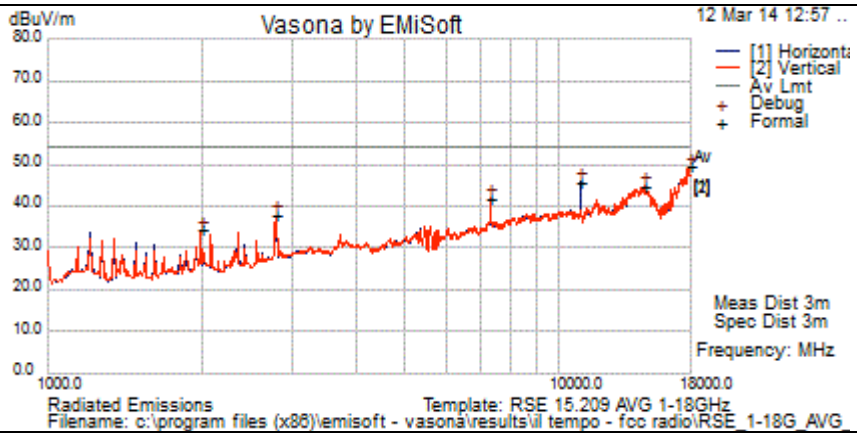
Test Results Table

Formal Data

No	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
1	2334.812	49.3	5	-5.8	48.5	Peak [Scan]	H	100	209	74	-25.5	Pass	
2	2802	54.7	5.5	-5.9	54.3	Peak [Scan]	V	100	207	74	-19.7	Pass	
3	11004.5	39.6	12	4.5	56.1	Peak [Scan]	H	100	207	74	-17.9	Pass	
4	13988	35.6	13.9	6.7	56.2	Peak [Scan]	H	100	207	74	-17.8	Pass	
5	16504	38.9	15.3	2.5	56.7	Peak [Scan]	V	100	207	74	-17.3	Pass	
6	17932	34.7	16.3	9.7	60.6	Peak [Scan]	H	100	207	74	-13.4	Pass	

Graphical Test Results 802.11a: 1 – 18GHz (5500MHz – 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



Title: 1- 18GHz Test Results for 5500MHz (Average)

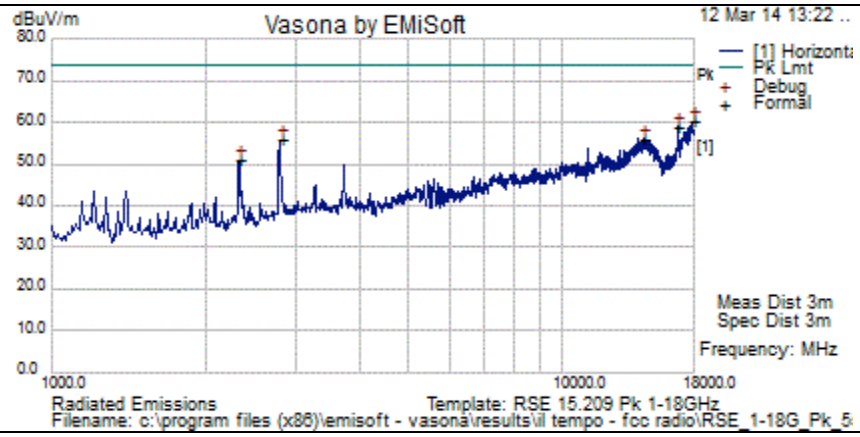
Test Results Table

Formal Data

No	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
1	1994.5	34.8	4.6	-5.3	34.1	Peak [Scan]	H	100	207	54	-19.9	Pass	
2	2793.5	37.9	5.5	-5.8	37.6	Peak [Scan]	V	100	207	54	-16.4	Pass	
3	7332.5	31	9.5	1.5	41.9	Peak [Scan]	V	100	207	54	-12.1	Pass	
4	11004.5	29.3	12	4.5	45.7	Peak [Scan]	H	100	207	54	-8.3	Pass	
5	14625.5	23.7	14.2	6.9	44.8	Peak [Scan]	V	100	207	54	-9.2	Pass	
6	17915	23.4	16.3	9.7	49.3	Peak [Scan]	V	100	207	54	-4.7	Pass	

Graphical Test Results 802.11a: 1- 18GHz (5580MHz – 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



Title: 1- 18GHz Test Results for 5580MHz (Peak)

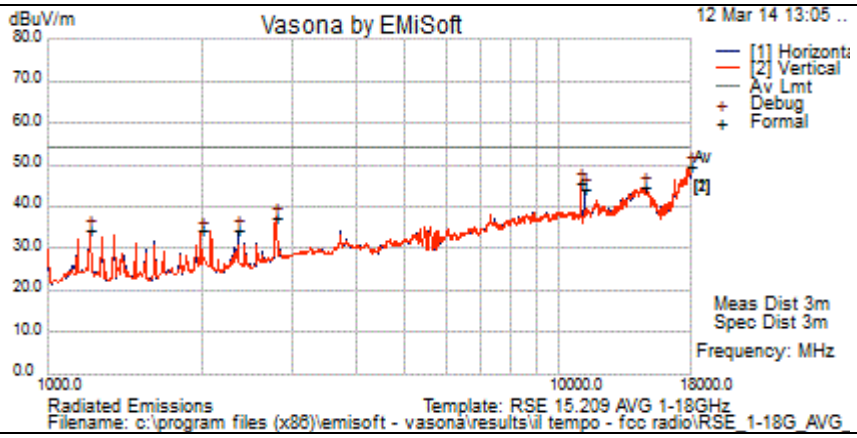
Test Results Table

Formal Data

No	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
1	2333.215	51.6	5	-5.8	50.8	Peak [Scan]	H	100	209	74	-23.2	Pass	
2	2802	56.2	5.5	-5.9	55.9	Peak [Scan]	V	100	207	74	-18.2	Pass	
3	14379	34.7	14.1	7.1	55.9	Peak [Scan]	H	100	207	74	-18.1	Pass	
4	16750.5	38.6	15.5	4.9	58.9	Peak [Scan]	V	100	207	74	-15.1	Pass	
5	17923.5	34.2	16.3	9.7	60.1	Peak [Scan]	V	100	207	74	-13.9	Pass	

Graphical Test Results 802.11a: 1- 18GHz (5580MHz – 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



Title: 1 - 18GHz Test Results for 5580MHz (Average)

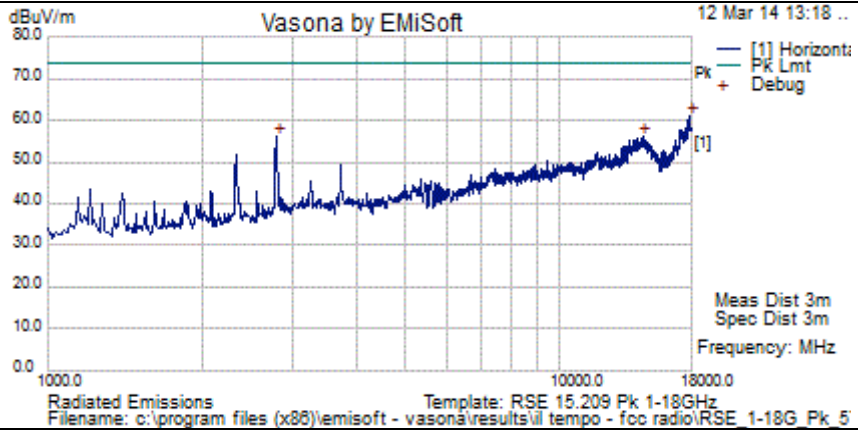
Test Results Table

Formal Data

No	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
1	1212.5	39	3.5	-8.3	34.2	Peak [Scan]	H	100	207	54	-19.8	Pass	
2	1994.5	34.8	4.6	-5.3	34.1	Peak [Scan]	H	100	207	54	-19.9	Pass	
3	2360	35.3	5	-6	34.3	Peak [Scan]	H	100	207	54	-19.7	Pass	
4	2793.5	37.6	5.5	-5.8	37.3	Peak [Scan]	V	100	207	54	-16.7	Pass	
5	11004.5	29.3	12	4.5	45.7	Peak [Scan]	V	100	207	54	-8.3	Pass	
6	11166	27.3	12.1	4.8	44.1	Peak [Scan]	H	100	207	54	-9.9	Pass	
7	14625.5	23.5	14.2	6.9	44.6	Peak [Scan]	H	100	207	54	-9.4	Pass	

Graphical Test Results 802.11a: 1- 18GHz (5700MHz – 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



Title: 1- 18GHz Test Results for 5700MHz (Peak)

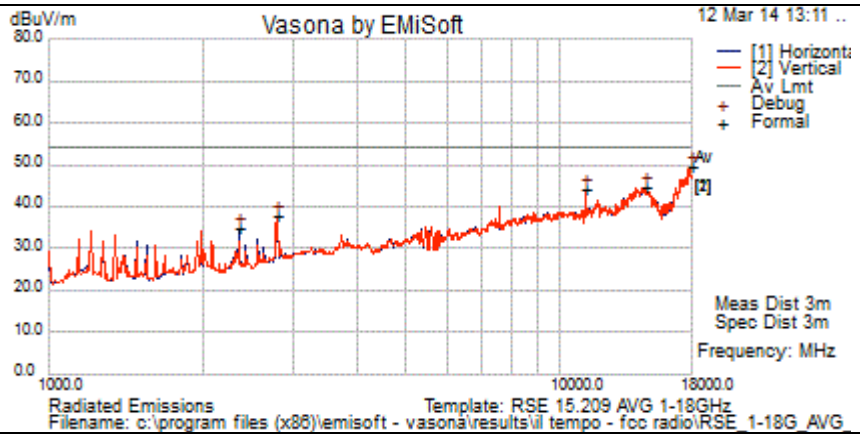
Test Results Table

Formal Data

No	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
1	17932	35.1	16.3	9.7	61	Peak [Scan]	H	100	207	74	-13	Pass	
2	14506.5	34.5	14.2	7.5	56.2	Peak [Scan]	V	100	207	74	-17.8	Pass	
3	2802	56.3	5.5	-5.9	56	Peak [Scan]	V	100	207	74	-18	Pass	

Graphical Test Results 802.11a: 1- 18GHz (5700MHz – 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



Title: 1- 18GHz Test Results for 5700MHz (Average)

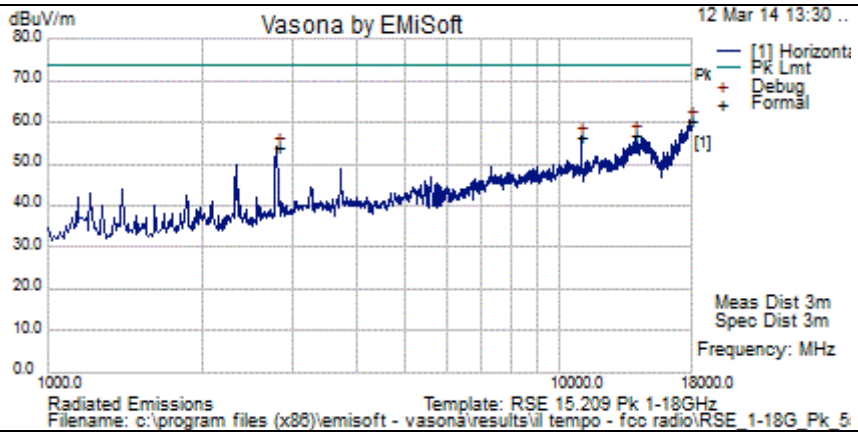
Test Results Table

Formal Data

No	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
1	2360	35.7	5	-6	34.8	Peak [Scan]	H	100	207	54	-19.2	Pass	
2	2793.5	38	5.5	-5.8	37.7	Peak [Scan]	V	100	207	54	-16.4	Pass	
3	11166	27.1	12.1	4.8	43.9	Peak [Scan]	V	100	207	54	-10.1	Pass	
4	14617	23.5	14.2	6.9	44.6	Peak [Scan]	H	100	207	54	-9.4	Pass	
5	17923.5	23.5	16.3	9.7	49.5	Peak [Scan]	V	100	207	54	-4.5	Pass	

Graphical Test Results HT20: 1- 18GHz (5500MHz – 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



Title: 1- 18GHz Test Results for 5500MHz (HT20-Peak)

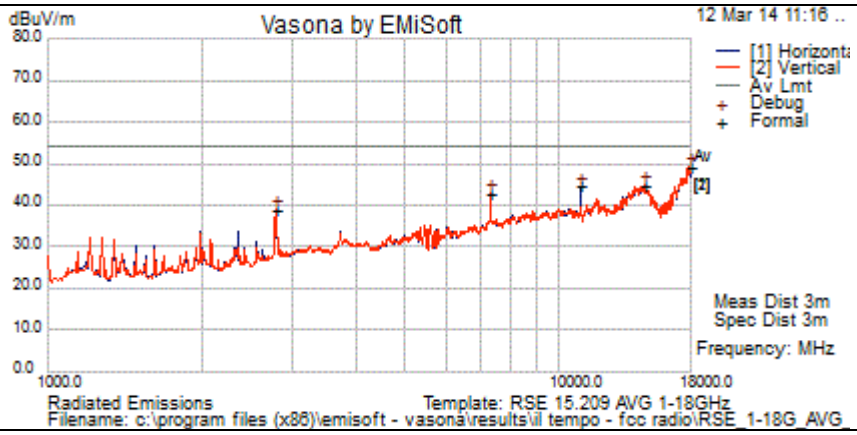
Test Results Table

Formal Data

No	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
1	2802	54.3	5.5	-5.9	54	Peak [Scan]	V	100	207	74	-20	Pass	
2	11004.5	40	12	4.5	56.5	Peak [Scan]	H	100	207	74	-17.5	Pass	
3	13996.5	36	14	6.7	56.7	Peak [Scan]	V	100	207	74	-17.3	Pass	
4	17923.5	34.4	16.3	9.7	60.4	Peak [Scan]	H	100	207	74	-13.7	Pass	

Graphical Test Results HT20: 1- 18GHz (5500MHz – 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



Title: 1- 18GHz Test Results for 5500MHz (HT20-Average)

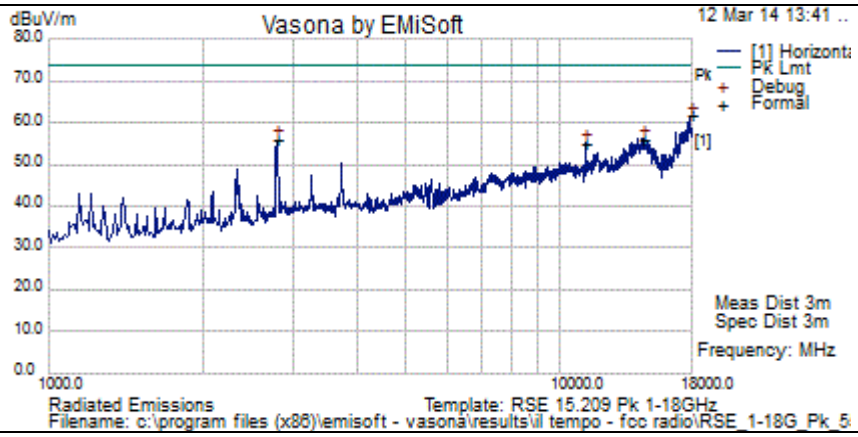
Test Results Table

Formal Data

No	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
1	2793.5	39.1	5.5	-5.8	38.8	Peak [Scan]	V	100	207	54	-15.2	Pass	
2	7332.5	31.8	9.5	1.5	42.7	Peak [Scan]	V	100	207	54	-11.3	Pass	
3	11004.5	27.9	12	4.5	44.4	Peak [Scan]	H	100	207	54	-9.6	Pass	
4	14625.5	23.7	14.2	6.9	44.8	Peak [Scan]	V	100	207	54	-9.2	Pass	
5	17932	23.2	16.3	9.7	49.1	Peak [Scan]	H	100	207	54	-4.9	Pass	

Graphical Test Results HT20: 1- 18GHz (5580MHz – 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



Title: 1- 18GHz Test Results for 5580MHz (HT20-Peak)

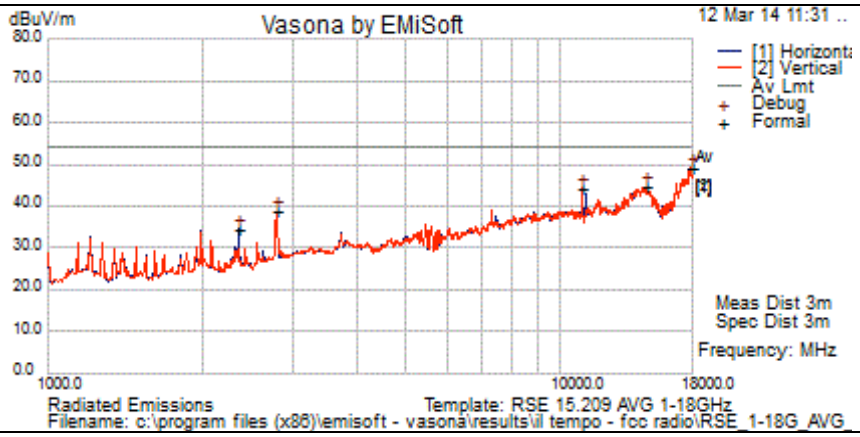
Test Results Table

Formal Data

No	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
1	2793.5	56.1	5.5	-5.8	55.7	Peak [Scan]	V	100	207	74	-18.3	Pass	
2	11166	38.3	12.1	4.8	55.1	Peak [Scan]	H	100	207	74	-18.9	Pass	
3	14464	34	14.2	7.8	56.1	Peak [Scan]	V	100	207	74	-18	Pass	
4	17906.5	35.7	16.2	9.6	61.5	Peak [Scan]	H	100	207	74	-12.5	Pass	

Graphical Test Results HT20: 1- 18GHz (5580MHz – 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



Title: 1- 18GHz Test Results for 5580MHz (HT20Average)

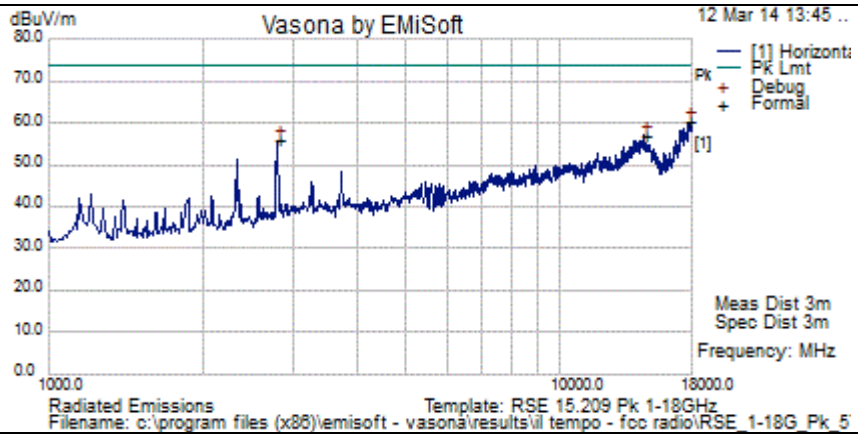
Test Results Table

Formal Data

No	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
1	2360	35.3	5	-6	34.4	Peak [Scan]	H	100	207	54	-19.6	Pass	
2	2793.5	39	5.5	-5.8	38.6	Peak [Scan]	H	100	207	54	-15.4	Pass	
3	11004.5	27.9	12	4.5	44.3	Peak [Scan]	V	100	207	54	-9.7	Pass	
4	14625.5	23.5	14.2	6.9	44.5	Peak [Scan]	H	100	207	54	-9.5	Pass	
5	17915	23.3	16.3	9.7	49.2	Peak [Scan]	H	100	207	54	-4.8	Pass	

Graphical Test Results HT20: 1- 18GHz (5700MHz – 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



Title: 1- 18GHz Test Results for 5700MHz (HT20-Peak)

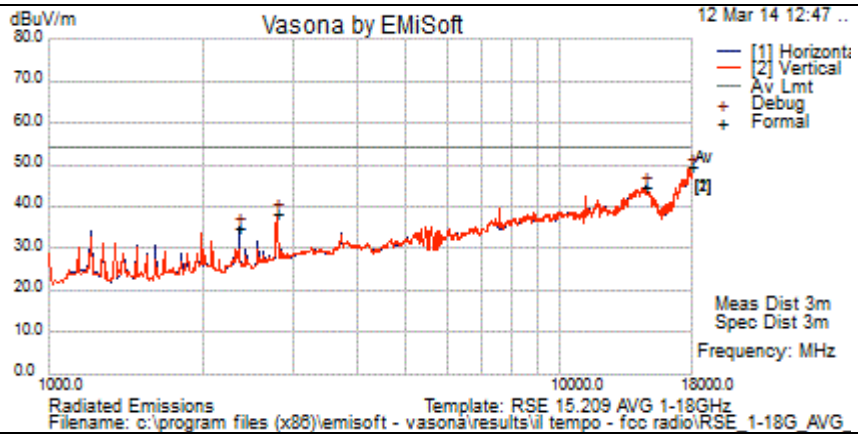
Test Results Table

Formal Data

No	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
1	2802	56.1	5.5	-5.9	55.8	Peak [Scan]	V	100	207	74	-18.3	Pass	
2	14591.5	35.8	14.2	6.9	57	Peak [Scan]	V	100	207	74	-17	Pass	
3	17889.5	34.4	16.2	9.7	60.2	Peak [Scan]	V	100	207	74	-13.8	Pass	

Graphical Test Results HT20: 1- 18GHz (5700MHz – 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



Title: 1- 18GHz Test Results for 5700MHz (HT20-Average)

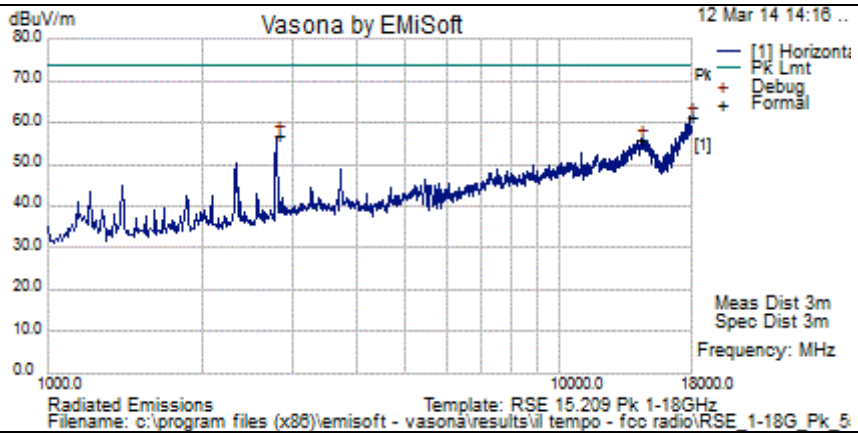
Test Results Table

Formal Data

No	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
1	2360	35.9	5	-6	34.9	Peak [Scan]	H	100	207	54	-19.1	Pass	
2	2793.5	38.6	5.5	-5.8	38.3	Peak [Scan]	V	100	207	54	-15.7	Pass	
3	14625.5	23.7	14.2	6.9	44.8	Peak [Scan]	H	100	207	54	-9.2	Pass	
4	17923.5	23.4	16.3	9.7	49.3	Peak [Scan]	H	100	207	54	-4.7	Pass	

Graphical Test Results HT40: 1- 18GHz (5510MHz – 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



Title: HT40 Test Results for 1- 18GHz at 5510MHz (Peak)

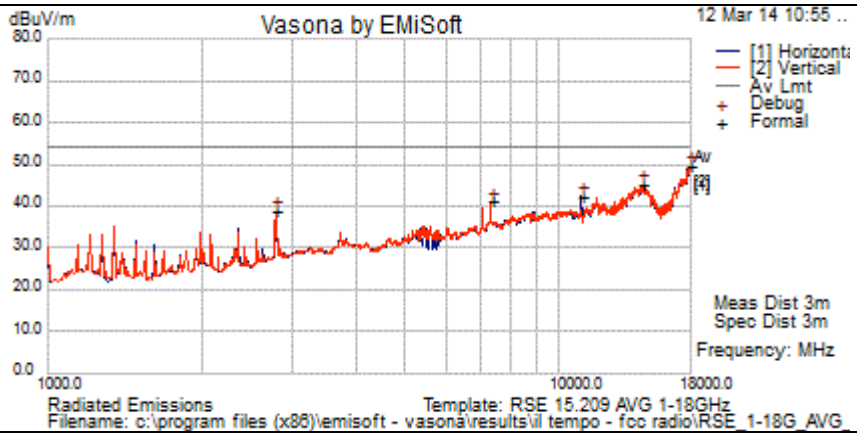
Test Results Table

Formal Data

No	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
1	2802	57.1	5.5	-5.9	56.8	Peak [Scan]	V	100	207	74	-17.2	Pass	
2	14396	34.8	14.2	7	55.9	Peak [Scan]	V	100	207	74	-18.1	Pass	
3	17923.5	35.4	16.3	9.7	61.3	Peak [Scan]	H	100	207	74	-12.7	Pass	

Graphical Test Results HT40: 1- 18GHz (5510MHz – 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



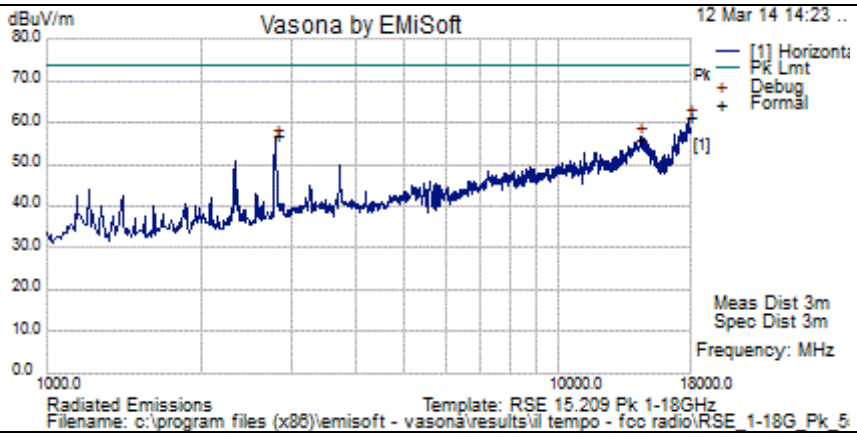
Title: HT40 Test Results for 1 - 18GHz at 5510MHz (Average)

Test Results Table

Formal Data													
No	**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**
1	2793.5	39	5.5	-5.8	38.6	Peak [Scan]	V	100	207	54	-15.4	Pass	
2	7349.5	30	9.5	1.5	41	Peak [Scan]	V	100	207	54	-13	Pass	
3	11021.5	25.9	12	4.4	42.3	Peak [Scan]	H	100	207	54	-11.7	Pass	
4	14540.5	23.1	14.2	7.7	45.1	Peak [Scan]	V	100	207	54	-8.9	Pass	
5	17923.5	23.4	16.3	9.7	49.3	Peak [Scan]	V	100	207	54	-4.7	Pass	

Graphical Test Results HT40: 1- 18GHz (5590MHz – 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



Title: HT40 Test Results for 1- 18GHz at 5590MHz (Peak)

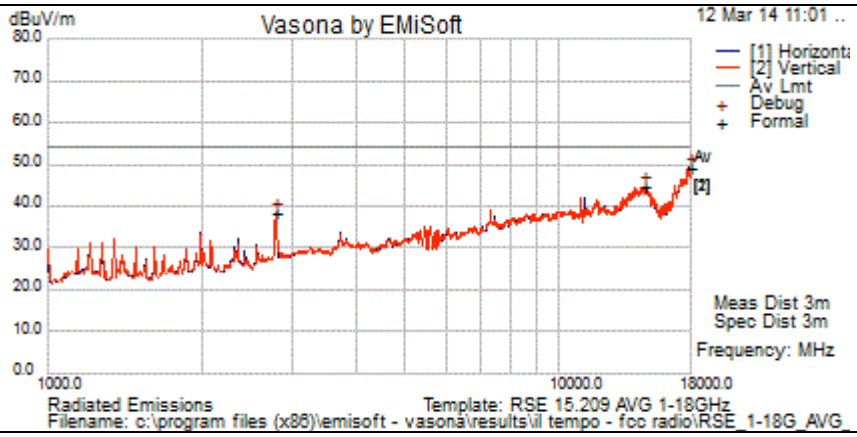
Test Results Table

Formal Data

No	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
1	2802	57.1	5.5	-5.9	56.8	Peak [Scan]	V	100	207	74	-17.2	Pass	
2	14396	34.8	14.2	7	55.9	Peak [Scan]	V	100	207	74	-18.1	Pass	
3	17923.5	35.4	16.3	9.7	61.3	Peak [Scan]	H	100	207	74	-12.7	Pass	

Graphical Test Results HT40: 1- 18GHz (5590MHz – 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



Title: HT40 Test Results for 1- 18GHz at 5590MHz (Average)

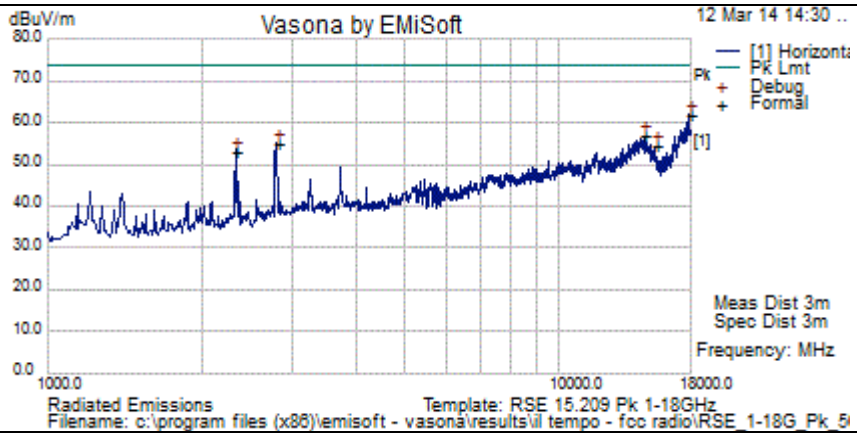
Test Results Table

Formal Data

No	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
1	2793.5	38.7	5.5	-5.8	38.3	Peak [Scan]	V	100	207	54	-15.7	Pass	
2	14625.5	23.5	14.2	6.9	44.6	Peak [Scan]	H	100	207	54	-9.4	Pass	
3	17932	23.2	16.3	9.7	49.2	Peak [Scan]	H	100	207	54	-4.8	Pass	

Graphical Test Results HT40: 1- 18GHz (5670MHz – 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



Title: HT40 Test Results for 1- 18GHz at 5670MHz (Peak)

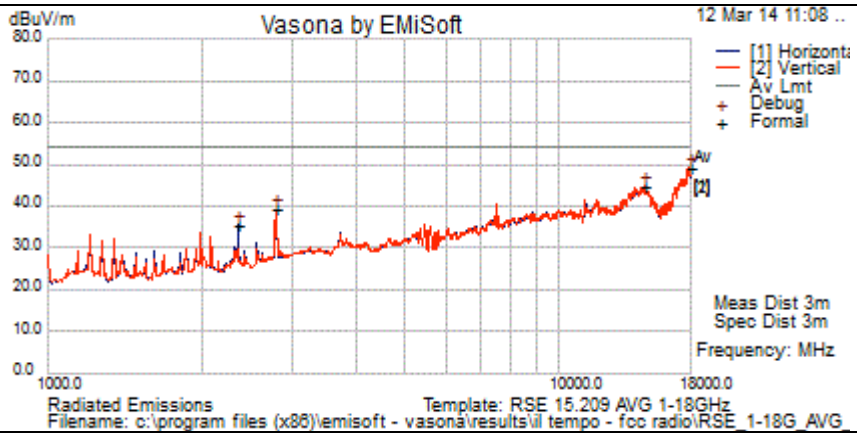
Test Results Table

Formal Data

No	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
1	2333.531	53.6	5	-5.8	52.8	Peak [Scan]	H	100	209	74	-21.2	Pass	
2	2802	55.3	5.5	-5.9	54.9	Peak [Scan]	V	100	207	74	-19.1	Pass	
3	14608.5	35.6	14.2	6.9	56.7	Peak [Scan]	V	100	207	74	-17.3	Pass	
4	15390.5	37	14.6	2.7	54.3	Peak [Scan]	V	100	207	74	-19.7	Pass	
5	17932	35.9	16.3	9.7	61.8	Peak [Scan]	V	100	207	74	-12.2	Pass	

Graphical Test Results HT40: 1- 18GHz (5670MHz – 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



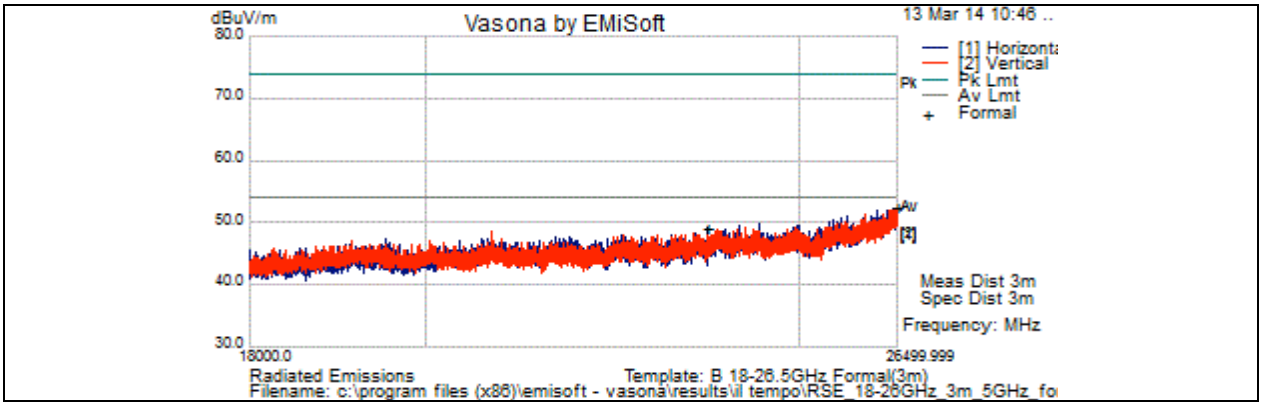
Title: HT40 Test Results for 1- 18GHz at 5670MHz (Average)

Test Results Table

Formal Data													
No	**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**
1	2360	36.5	5	-6	35.5	Peak [Scan]	H	100	207	54	-18.5	Pass	
2	2793.5	39.5	5.5	-5.8	39.2	Peak [Scan]	V	100	207	54	-14.8	Pass	
3	14625.5	23.6	14.2	6.9	44.7	Peak [Scan]	V	100	207	54	-9.3	Pass	
4	17923.5	23.2	16.3	9.7	49.1	Peak [Scan]	V	100	207	54	-4.9	Pass	

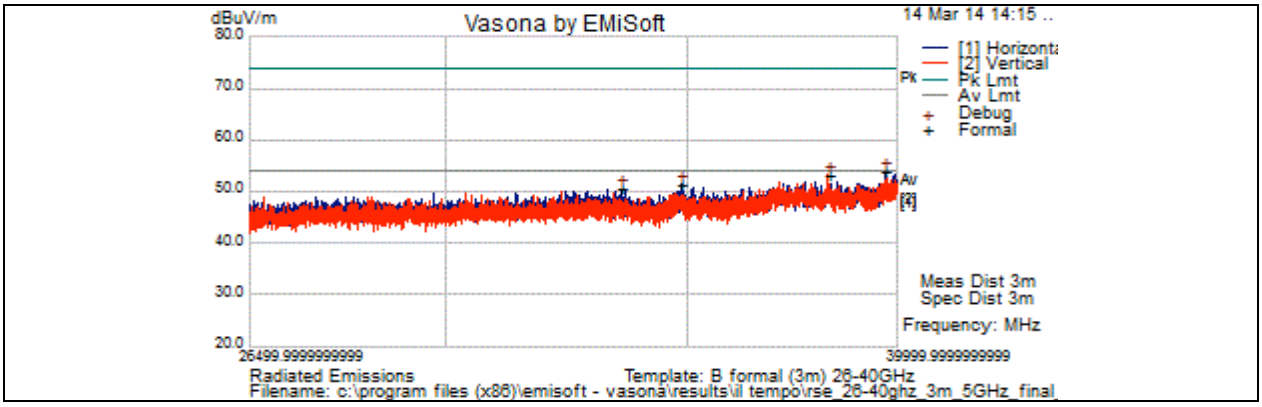
Graphical Test Results: 18 – 26GHz

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: 26 – 40GHz

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



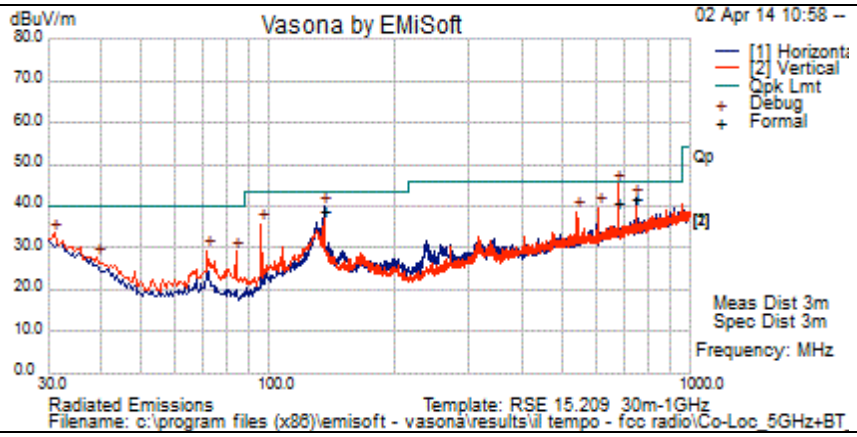
Co-Location Radiated Spurious Emissions

15.205 & RSS-210 sec2.7:

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).

Graphical Test Results: 30 – 1000MHz

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



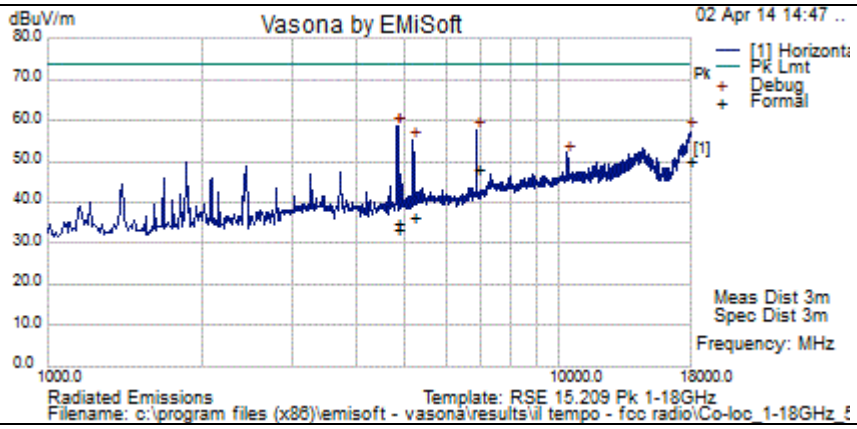
Title: 30 - 1000MHz Test Results Co-Location

Formal Data

No	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
1	135.17	23.9	1.1	13.6	38.5	Quasi Peak	H	102	152	43.5	-5	Pass	Digital signal
2	675.971	18.5	2.4	19.9	40.8	Quasi Peak	V	102	18	46	-5.2	Pass	
3	743.599	18.7	2.5	20.6	41.8	Peak [Scan]	H	100	321	46	-4.2	Pass	

Graphical Test Results for 802.11a & Bluetooth: 1 – 18GHz (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



Title: 1 - 18GHz Test Results for 802.11a & Bluetooth (Peak)

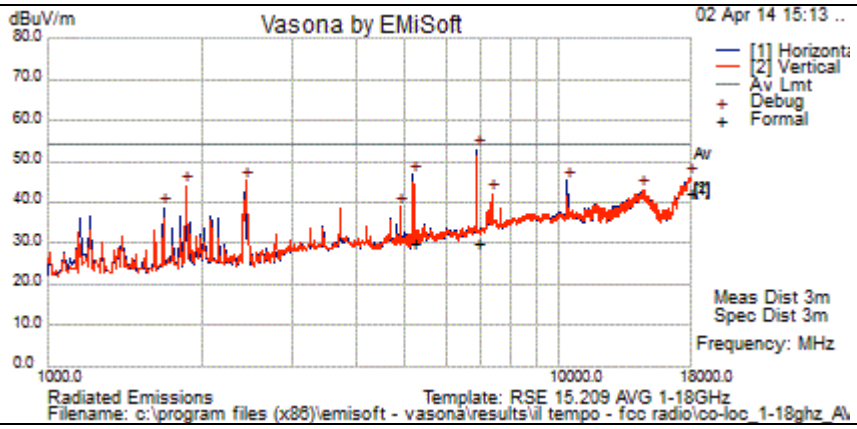
Test Results Table

Formal Data

No	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
1	4816.501	30.3	8.6	-4.2	34.7	Peak [Scan]	V	102	338	74	-39.3	Pass	
2	4833.5	28.8	8.6	-4.2	33.2	Peak [Scan]	V	102	338	74	-40.8	Pass	
3	5173.5	31	8.9	-3.6	36.3	Peak [Scan]	V	102	338	74	-37.7	Pass	
4	6907.501	38.3	10.5	-0.9	47.9	Peak [Scan]	V	102	91	74	-26.1	Pass	
5	17966	21.4	18.9	9.6	49.9	Peak [Scan]	V	102	338	74	-24.1	Pass	

Graphical Test Results for 802.11a & Bluetooth: 1 – 18GHz (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



Title: 1 - 18GHz Test Results for 802.11a & Bluetooth (Average)

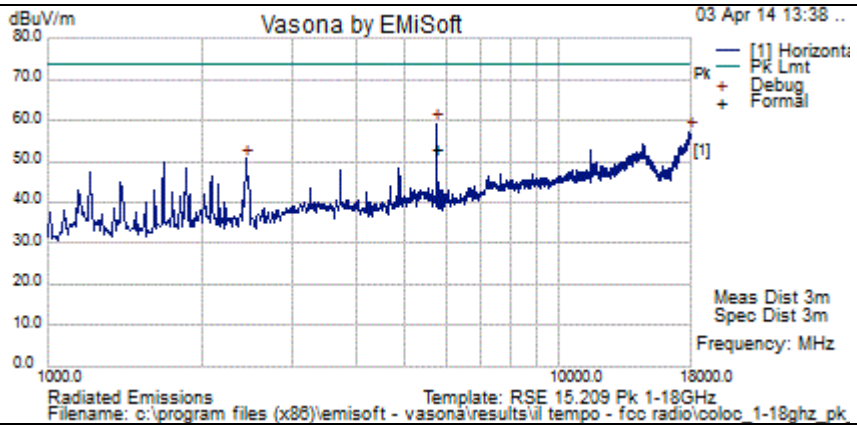
Test Results Table

Formal Data

No	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
1	5182.002	24.7	8.9	-3.6	30	Average	H	102	202	54	-24	Pass	
2	6907.502	20.4	10.5	-0.9	29.9	Average	H	102	202	54	-24.1	Pass	
3	17966	13.7	18.9	9.6	42.3	Average	V	102	202	54	-11.7	Pass	

Graphical Test Results for HT20 & Bluetooth: 1 – 18GHz (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



Title: 1 - 18GHz Test Results for HT20 & Bluetooth (Peak)

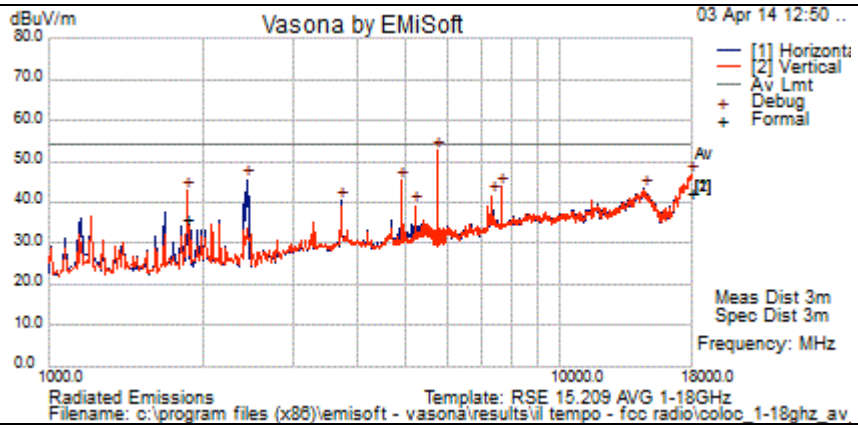
Test Results Table

Formal Data

No	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
1	5743.001	47.5	9.4	-4.1	52.9	Peak	V	100	295	74	-21.1	Pass	

Graphical Test Results for HT20 & Bluetooth: 1 – 18GHz (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



Title: 1 - 18GHz Test Results for HT20 & Bluetooth (Average)

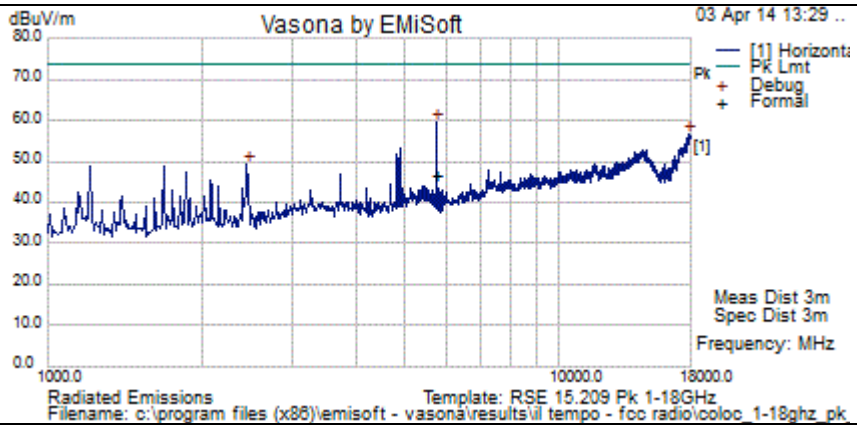
Test Results Table

Formal Data

No	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
1	1867.001	37.7	5.1	-7	35.8	Average	V	102	358	54	-18.2	Pass	
2	18000	13.6	18.9	9.7	42.3	Average	V	102	358	54	-11.7	Pass	

Graphical Test Results for HT40 & Bluetooth: 1 – 18GHz (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



Title: 1 - 18GHz Test Results for HT40 & Bluetooth (Peak)

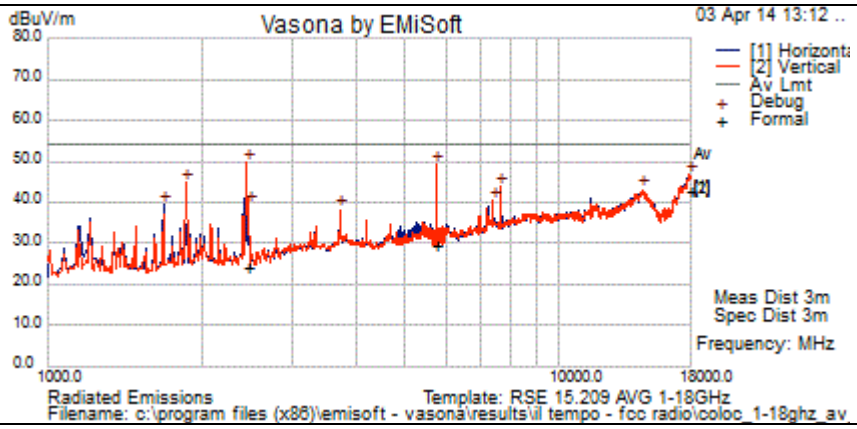
Test Results Table

Formal Data

No	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
1	5743.001	41.2	9.4	-4.1	46.6	Peak	H	100	361	74	-27.4	Pass	

Graphical Test Results for HT40 & Bluetooth: 1 – 18GHz (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



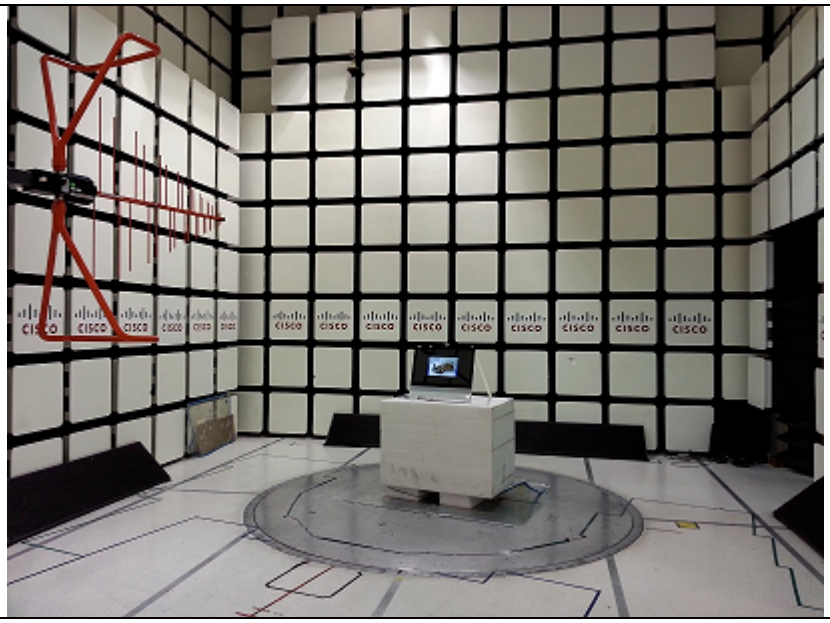
Title: 1 - 18GHz Test Results for HT40 & Bluetooth (Average)

Test Results Table

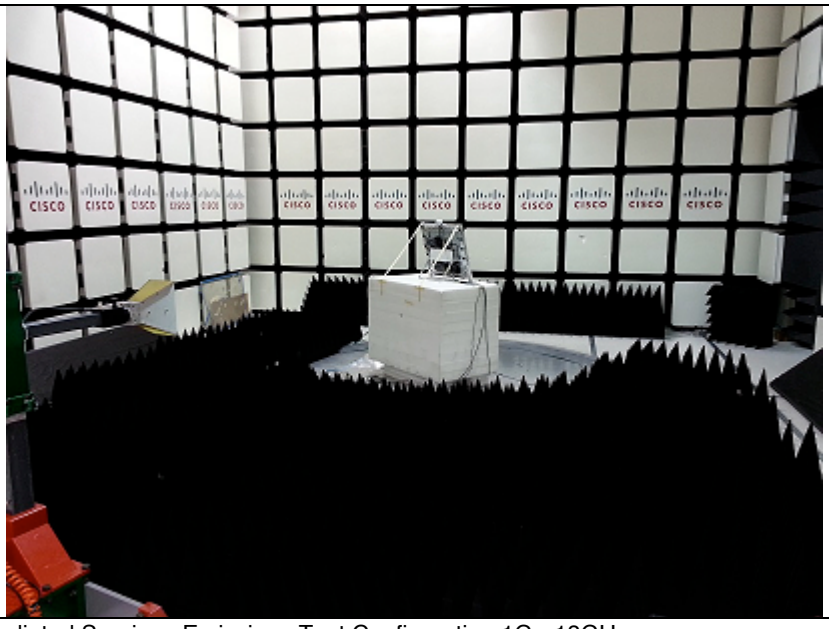
Formal Data

No	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
1	2453.501	24.2	5.9	-6.2	23.9	Average	V	100	364	54	-30.1	Pass	
2	5743	24	9.4	-4.1	29.4	Average	V	100	364	54	-24.6	Pass	
3	17923.5	14.1	18.9	9.7	42.6	Average	V	100	364	54	-11.4	Pass	

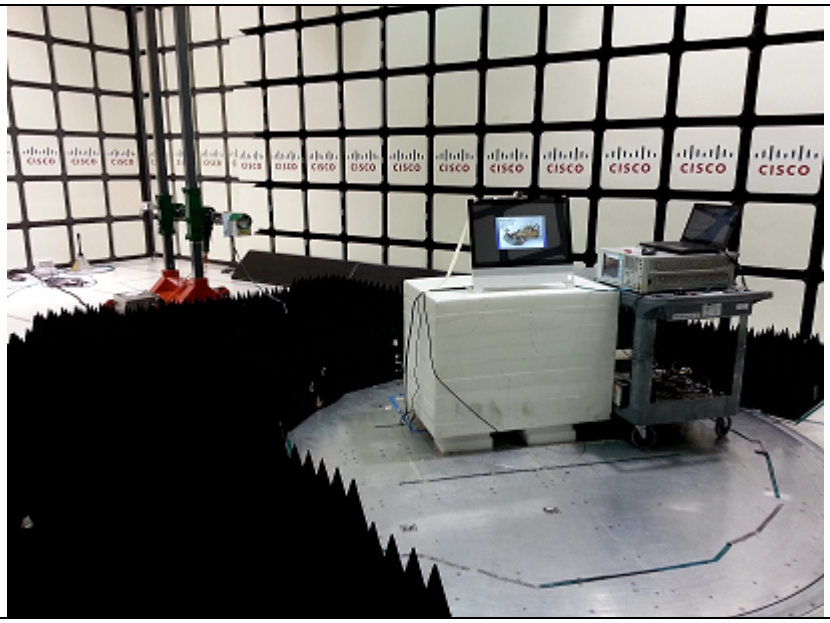
Physical Test arrangement Photograph:



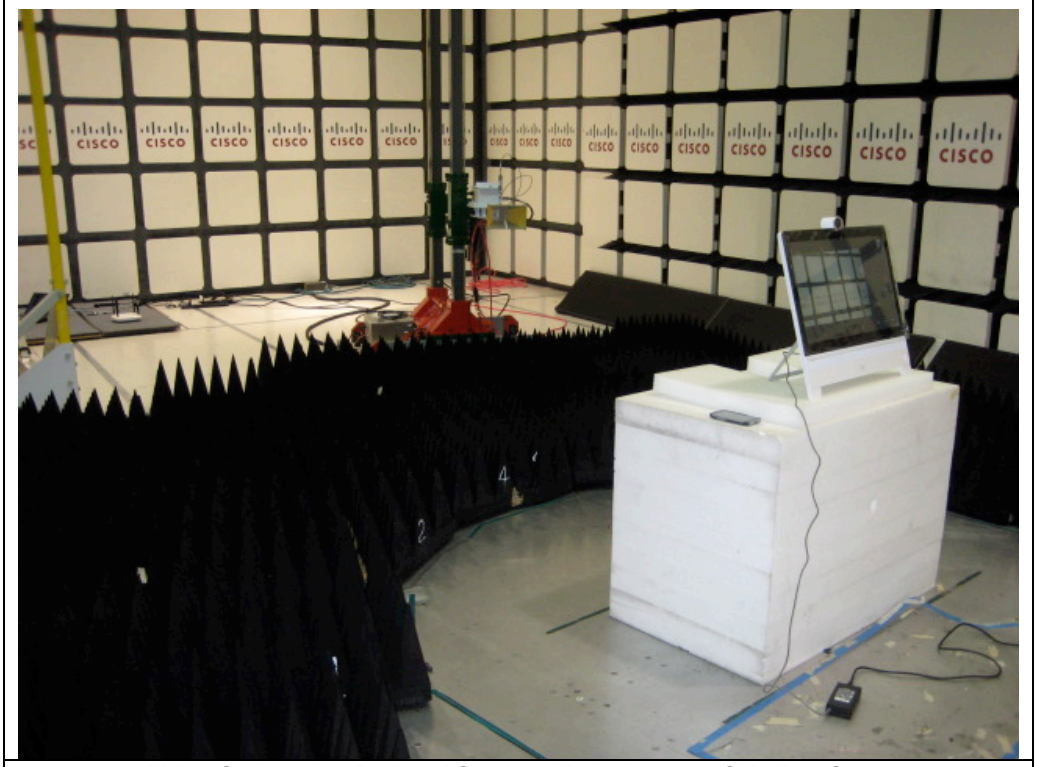
Title: Radiated Spurious Emissions Test Configuration 30M - 1000MHz



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



Title: Radiated Spurious Emissions Test Configuration 18 – 40GHz

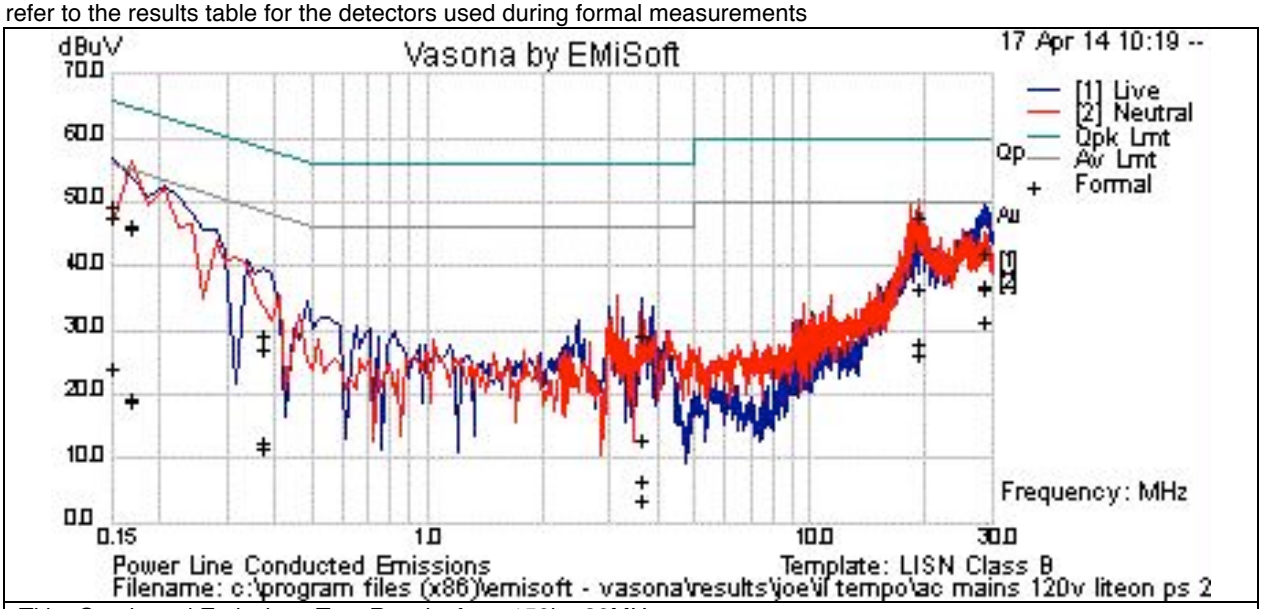


Title: Co-Location Radiated Spurious Emissions 1-18GHz Test Setup

Conducted emissions

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: Conducted Emissions Test Results from 150k - 30MHz

Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement Type	Line	Limit dBuV	Margin dB	Pass /Fail	Comments
0.15	3	21.1	0.1	24.2	Av	N	56	-31.8	Pass	
0.15	28	21.1	0.1	49.2	Qp	L	66	-16.8	Pass	
0.15	26.6	21.1	0.1	47.7	Qp	N	66	-18.3	Pass	
0.15	2.9	21.1	0.1	24	Av	L	56	-32	Pass	
0.169	-2.2	21	0	18.9	Av	N	55	-36.1	Pass	
0.169	25.2	21	0	46.2	Qp	N	65	-18.8	Pass	
0.169	-1.8	21	0	19.3	Av	L	55	-35.8	Pass	
0.169	24.9	21	0	46	Qp	L	65	-19	Pass	
0.3735	-7.8	20.2	0	12.5	Av	N	48.4	-35.9	Pass	
0.3735	-8.9	20.2	0	11.4	Av	L	48.4	-37	Pass	
0.3735	9	20.2	0	29.3	Qp	N	58.4	-29.2	Pass	
0.3735	6.9	20.2	0	27.1	Qp	L	58.4	-31.3	Pass	
3.633	9.2	20	0	29.3	Qp	N	56	-26.7	Pass	
3.633	-13.7	20	0	6.4	Av	L	46	-39.6	Pass	

Frequency MHz	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement Type	Line	Limit dBuV	Margin dB	Pass /Fail	Comments
3.633	-16.7	20	0	3.4	Av	N	46	-42.6	Pass	
3.633	-7.3	20	0	12.8	Qp	L	56	-43.2	Pass	
19.274	7.2	20.4	0.1	27.8	Av	L	50	-22.2	Pass	
19.274	15.9	20.4	0.1	36.5	Qp	L	60	-23.5	Pass	
19.274	27.2	20.4	0.1	47.7	Qp	N	60	-12.3	Pass	
19.274	5.5	20.4	0.1	26	Av	N	50	-24	Pass	
28.473	15.9	20.7	0.2	36.9	Qp	L	60	-23.1	Pass	
28.473	15.7	20.7	0.2	36.6	Av	N	50	-13.4	Pass	
28.473	21.2	20.7	0.2	42.1	Qp	N	60	-17.9	Pass	
28.473	10.5	20.7	0.2	31.4	Av	L	50	-18.6	Pass	

Physical Test arrangement Photograph:

Title: Conducted Emissions Test Configuration

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=√(30*P*G)/d and 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/cm^2

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

d=√((30*P*G)/(3770*S))

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

P(mW)=P(W)/1000 d(cm)=100*d(m)

yields

d=100*√((30*(P/1000)*G)/(3770*S))
d=0.282*√(P*G/S)

where

d=Distance in cm
P=Power in mW
G=Numerica Antenna Gain
S=Power Density in mW/cm^2

Substituting the logarithmic form of power and gain using:

P(mW)=10^(P(dBm)/10) G(numeric)=10^(G(dBi)/10)

yields

d=0.282*10^((P+G)/20)/√S Equation (1)

and

s=((0.282*10^((P+G)/20))/d)^2 Equation (2)

where

d=MPE distance in cm
P=Power in dBm
G=Antenna Gain in dBi

S=Power Density in mW/cm^2

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=1mW/cm^2 maximum. The highest supported antenna gain for 5470-5725MHz is 6.1 dBi. Using the peak power levels recorded in the test report along with Equation 1 above, the MPE distances are calculated as follows.

Frequency (MHz)	Data Rate (Mbps)	Power Density (mW/cm^2)	Peak Transmit Power (dBm)	Antenna Gain (dBi)	MPE Distance (cm)	Limit (cm)	Margin (cm)
5500	6	1	11.47	6.1	2.13	20	17.87
5510	M0	1	13.26	6.1	2.62	20	17.38
5580	6	1	12	6.1	2.27	20	17.73
5590	M0	1	13.92	6.1	2.83	20	17.17
5670	M0	1	12.8	6.1	2.71	20	17.29
5700	6	1	13.56	6.1	2.48	20	17.52

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)	Data Rate (Mbps)	MPE Distance (cm)	Peak Transmit Power (dBm)	Antenna Gain (dBi)	Power Density (mW/cm^2)	Limit (cm)	Margin (cm)
5500	6	20	11.47	6.1	0.01	1	0.99
5510	M0	20	13.26	6.1	0.02	1	0.98
5580	6	20	12	6.1	0.01	1	0.99
5590	M0	20	13.92	6.1	0.02	1	0.98
5670	M0	20	12.8	6.1	0.02	1	0.98
5700	6	20	13.56	6.1	0.02	1	0.98

Appendix C: Test Equipment used to perform the test

Equip#	Manufacturer/ Model	Description	Last Cal	Next Due
40603	Agilent/HP / E4440A	Spectrum Analyzer	1-Nov-13	1-Nov-14
49517	CRISTEK/ MK-AMS-L16-AMS-A060	SMA 5ft cable	04/08/2013	8-Apr-14
41987	MURATA ELECTRONICS/ MXGS83RK3000	Special Radio Test Adaptor Cable	7/3/2013	3-Jul-14
40641	ROHDE & SCHWARZ / ESU26	EMI Test Receiver, 26GHZ	24-Jun-13	24 Jun 2014
25658	MICRO-COAX/ UFB311A-1-0840-504504	Coaxial Cable, 84.0 in. to 18GHz	2/14/2014	14-Feb-15
21117	MICRO-COAX/ UFB311A-0-2484-520520	Coaxial Cable-18Ghz	8/23/2013	23-Aug-14
49563	HUBER + SUHNER/ Sucoflex 106A	Coaxial Cable, 8m	8/23/2013	23-Aug-14
30654	SUNOL SCIENCES/ JB1	Combination Antenna, 30MHz-2GHz	7-Nov-13	31-Oct-14
27236	YORK/ CNE V	COMPARISON NOISE EMITTER	N/A	N/A
41935	NEWPORT/ iBTHP-5-DB9	5 inch Temp/RH/Press Sensor w/20ft cable	25-Mar-13	25-Mar-14
35237	STANLEY/ 33-696	TAPE RULE 5M	5/14/2013	14-May-14
21638	Rosenberger/ 32S15R-0.5E3	SMA Termination (m), 50 Ohm	10/22/2013	22-Oct-14
5971	Agilent/HP / 83712B	SYNTHESIZED CW GENERATOR	5-Jul-13	3-Jul-14
47299	Agilent/HP / N9030A	PXA Signal Analyzer	17-Sep-13	16-Sep-14
41979	Cisco / 1840	18-40GHz EMI Test Head/Verification Fixture	7/9/2013	9-Jul-14
25662	MICRO-COAX/ UFB311A-1-0840-504504	Coaxial Cable, 84.0 in. to 18GHz	2/27/2014	27-Feb-15
5691	MITEQ/ NSP1800-25-S1	PREAMPLIFIER	1/27/2014	27-Jan-15
47286	HUBER + SUHNER/ Sucoflex 102E	40GHz Cable K Connector	5/30/2013	30-May-14
49446	Micro-Tronics/ BRC50705-02	Notch Filter	3/19/2013	19-Mar-14
4882	EMCO/ 3115	HORN ANTENNA	8-Jul-13	28-Jun-14
40597	CISCO/ Above 1GHz Site Cal	1GHz Cispr Site Verification	5/30/2013	30-May-14
49443	Micro-Tronics/ BRM50702-02	Band Reject Filter	3/19/2013	19-Mar-14

49445	Micro-Tronics/ BRC50704-02	Notch Filter	3/19/2013	19-Mar-14
49444	Micro-Tronics/ BRC50703-02	Notch Filter	03/19/2013	19-Mar-14
49447	Micro-Tronics/ BRC50705-02	Notch Filter	3/20/2014	20-Mar-15
35605	Micro-Tronics/ BRC50704-02	Notch Filter	3/20/2014	20-Mar-15
49521	CRISTEK/ MK-AMS-L16-AMS-A060	SMA 5ft cable	4/8/2013	8-Apr-14
47304	FAIRVIEW MICROWAVE/ ST6S-10	SMA Termination 6GHz	10/22/2013	22-Oct-14
4924	Rohde & Schwarz/ ESHS30	EMI Receiver (9KHz-30MHz)	28-JAN-14	28-JAN-15
8195	TTE/ H613-150K-50-21378	Hi Pass Filter - 150KHz cutoff	08-JAN-14	08-JAN-15
8471	Bird/ 5-T-MB	50 Ohm, 5W Terminator,Type BNC	12-SEP-13	12-SEP-14
7036	HP/ E7401A	Spectrum Analyzer	11-SEP-13	11-SEP-14
18981	Fischer Custom Communications/ FCC-801-M2-32A	Power Line Coupling/Decoupling Network	02-MAY-13	02-MAY-14
19337	Fischer Custom Communications/ FCC-LISN-50/250-50-2-01	LISN	06-SEP-13	06-SEP-14
23874	Fischer Custom Communications/ FCC-LISN-PA-NEMA-5-15	Power Adaptor, Polarized 120VAC	06-SEP-13	06-SEP-14
36033	York/ CNE V	Comparison Noise Emitter	Cal Not Required	N/A
37006	Extech/ 380282	Digital Multimeter	09-DEC-13	09-DEC-14
39110	Coleman/ RG-223	25 ft BNC cable	25-NOV-13	25-NOV-14
46075	Newport / iBTHP-5-DB9	5 inch Temp/RH/Press Sensor w/20ft cable	21-OCT-13	21-OCT-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 C63.4
- 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

Carrier Frequency
15.407
(g) Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

Carrier Frequency - 802.11a

Carrier Frequency - Lower sub-band (5 150 MHz to 5 350 MHz)

Test Conditions (see EN 301 893 V1.6.1, clause 5.3.2.1):								
Power Setting (for a single TX chain):		16dBm (5180MHz) 13dBm (5320MHz)		☐ EIRP		☒ Conducted		
Duty Cycle: 100 %				Test results				
Rel. Humidity: 34 %				Measured Frequency (MHz)	Delta Frequency (kHz)	20 ppm Limit (+/- kHz)	Margin (kHz)
Test Frequency:		**5 180 MHz**					
T_{nom} 23 °C		V_{nom} 230 Vac		5179.9545	-45.5	103.6	58.1
T_{min} 0 °C		V_{min} 207 Vac		5180.002	2.0	103.6	101.6
		V_{max} 253 Vac		5179.9355	-64.5	103.6	39.1
T_{max} 45 °C		V_{min} 207 Vac		5179.9655	-34.5	103.6	69.1
		V_{max} 253 Vac		5179.927	-73.0	103.6	30.6
Test Frequency:		**5 320 MHz**					
T_{nom} 23 °C		V_{nom} 230 Vac		5319.9475	-52.5	106.4	53.9
T_{min} 0 °C		V_{min} 207 Vac		5319.9525	-47.5	106.4	58.9
		V_{max} 253 Vac		5319.93	-70.0	106.4	36.4
T_{max} 45 °C		V_{min} 207 Vac		5319.907	-93.0	106.4	13.4
		V_{max} 253 Vac		5319.9075	-92.5	106.4	13.9

Carrier Frequency - Higher Sub-band (5 470 MHz to 5 725 MHz)

Test Conditions (see clause EN 301 893 V1.6.1, clause 5.3.2.1):								
Power Setting (for a single TX chain):		10dBm (5500MHz) 8dBm (5700MHz)		☐ EIRP		☒ Conducted		
Duty Cycle:	100 %			Test results				
Rel. Humidity:	34 %			Measured Frequency (MHz)	Delta Frequency (kHz)	20 ppm Limit (+/- kHz)	Margin (kHz)
Test Frequency:	**5 500 MHz**						
T_{nom}	23 °C	V_{nom}	230 Vac	5499.9630	-37.0	110	73
T_{min}	0 °C	V_{min}	207 Vac	5499.9450	-55.0	110	55
		V_{max}	253 Vac	5499.9600	-40.0	110	70
T_{max}	45 °C	V_{min}	207 Vac	5499.9280	-72.0	110	38
		V_{max}	253 Vac	5499.9045	-95.5	110	14.5
Test Frequency:	**5 700 MHz**						
T_{nom}	23 °C	V_{nom}	230 Vac	5699.9625	-37.5	114	76.5
T_{min}	0 °C	V_{min}	207 Vac	5699.9245	-75.5	114	38.5
		V_{max}	253 Vac	5699.9670	-33.0	114	81
T_{max}	45 °C	V_{min}	207 Vac	5699.9295	-70.5	114	43.5
		V_{max}	253 Vac	5699.8975	-102.5	114	11.5

Carrier Frequency - 802.11n HT20

Carrier Frequency - Lower sub-band (5 150 MHz to 5 350 MHz)

Test Conditions (see EN 301 893 V1.6.1, clause 5.3.2.1):								
Power Setting (for a single TX chain):		15dBm (5180MHz) 13dBm (5320MHz)		☐ EIRP		☒ Conducted		
Duty Cycle:	100 %			Test results				
Rel. Humidity:	34 %			Measured Frequency (MHz)	Delta Frequency (kHz)	20 ppm Limit (+/- kHz)	Margin (kHz)
Test Frequency:		**5 180 MHz**					
T_{nom}	23 °C	V_{nom}	230 Vac	5179.9550	-45.0	103.6	58.6
T_{min}	0 °C	V_{min}	207 Vac	5179.9750	-25.0	103.6	78.6
		V_{max}	253 Vac	5179.9375	-62.5	103.6	41.1
T_{max}	45 °C	V_{min}	207 Vac	5179.9525	-47.5	103.6	56.1
		V_{max}	253 Vac	5179.9115	-88.5	103.6	15.1
Test Frequency:		**5 320 MHz**					
T_{nom}	23 °C	V_{nom}	230 Vac	5319.9420	-58.0	106.4	48.4
T_{min}	0 °C	V_{min}	207 Vac	5319.9570	-43.0	106.4	63.4
		V_{max}	253 Vac	5319.9425	-57.5	106.4	48.9
T_{max}	45 °C	V_{min}	207 Vac	5319.9245	-75.5	106.4	30.9
		V_{max}	253 Vac	5319.9400	-60.0	106.4	46.4

Carrier Frequency - Higher Sub-band (5 470 MHz to 5 725 MHz)

Test Conditions (see clause EN 301 893 V1.6.1, clause 5.3.2.1):								
Power Setting (for a single TX chain):		10dBm (5500MHz) 8dBm (5700MHz)		☐ EIRP		☒ Conducted		
Duty Cycle:	100 %			Test results				
Rel. Humidity:	34 %			Measured Frequency (MHz)	Delta Frequency (kHz)	20 ppm Limit (+/- kHz)	Margin (kHz)
Test Frequency:	**5 500 MHz**						
T_{nom}	23 °C	V_{nom}	230 Vac	5499.9305	-69.5	110	40.5
T_{min}	0 °C	V_{min}	207 Vac	5499.9670	-33.0	110	77
		V_{max}	253 Vac	5499.9715	-28.5	110	81.5
T_{max}	45 °C	V_{min}	207 Vac	5499.9190	-81.0	110	29
		V_{max}	253 Vac	5499.9500	-50.0	110	60
Test Frequency:	**5 700 MHz**						
T_{nom}	23 °C	V_{nom}	230 Vac	5699.9225	-77.5	114	36.5
T_{min}	0 °C	V_{min}	207 Vac	5699.9445	-55.5	114	58.5
		V_{max}	253 Vac	5699.9665	-33.5	114	80.5
T_{max}	45 °C	V_{min}	207 Vac	5699.8970	-103.0	114	11
		V_{max}	253 Vac	5699.9370	-63.0	114	51

Carrier Frequency – 802.11n HT40

Carrier Frequency – Lower sub-band (5 150 MHz to 5 350 MHz)

Test Conditions (see EN 301 893 V1.6.1, clause 5.3.2.1):								
Power Setting (for a single TX chain):		15dBm (5190MHz) 15dBm (5310MHz)		☐ EIRP		☒ Conducted		
Duty Cycle: 100 %				Test results				
Rel. Humidity: 34 %				Measured Frequency (MHz)	Delta Frequency (kHz)	20 ppm Limit (+/- kHz)	Margin (kHz)
Test Frequency:		**5 190 MHz**					
T_{nom}	23 °C	V_{nom}	230 Vac	5190.0320	32.0	103.8	71.8
T_{min}	0 °C	V_{min}	207 Vac	5190.0670	67.0	103.8	36.8
		V_{max}	253 Vac	5190.0980	98.0	103.8	5.8
T_{max}	45 °C	V_{min}	207 Vac	5190.0525	52.5	103.8	51.3
		V_{max}	253 Vac	5190.0675	67.5	103.8	36.3
Test Frequency:		**5 310 MHz**					
T_{nom}	23 °C	V_{nom}	230 Vac	5310.0445	44.50	106.2	61.7
T_{min}	0 °C	V_{min}	207 Vac	5310.0530	53.00	106.2	53.2
		V_{max}	253 Vac	5310.0455	45.50	106.2	60.7
T_{max}	45 °C	V_{min}	207 Vac	5310.0200	20.00	106.2	86.2
		V_{max}	253 Vac	5310.0550	55.00	106.2	51.2

Carrier Frequency – Higher Sub-band (5 470 MHz to 5 725 MHz)

Test Conditions (see clause EN 301 893 V1.6.1, clause 5.3.2.1):								
Power Setting (for a single TX chain):		13dBm (5510MHz) 12dBm (5670MHz)		☐ EIRP		☒ Conducted		
Duty Cycle:	100 %			Test results				
Rel. Humidity:	34 %			Measured Frequency (MHz)	Delta Frequency (kHz)	20 ppm Limit (+/- kHz)	Margin (kHz)
Test Frequency:	**5 510 MHz**						
T_{nom}	23 °C	V_{nom}	230 Vac	5510.0340	34.0	110.2	76.2
T_{min}	0 °C	V_{min}	207 Vac	5510.0850	85.0	110.2	25.2
		V_{max}	253 Vac	5510.0815	81.5	110.2	28.7
T_{max}	45 °C	V_{min}	207 Vac	5510.0025	2.5	110.2	107.7
		V_{max}	253 Vac	5510.0425	42.5	110.2	67.7
Test Frequency:	**5 670 MHz**						
T_{nom}	23 °C	V_{nom}	230 Vac	5670.0750	75.0	113.4	38.4
T_{min}	0 °C	V_{min}	207 Vac	5670.0815	81.5	113.4	31.9
		V_{max}	253 Vac	5670.0955	95.5	113.4	17.9
T_{max}	45 °C	V_{min}	207 Vac	5670.0675	67.5	113.4	45.9
		V_{max}	253 Vac	5670.0395	39.5	113.4	73.9