

FCC DTS RF TEST REPORT



Vista Labs
TEST • CERTIFY • COMPLY

Test Report Number.....	HVN-19020101-LC-RF-FCC-DTS
Applicant.....	KINO-MO LTD
Applicant Address.....	2 nd Floor, Soho Wharf, 1 Click Street, London, United Kingdom, SE1 9DG
Product Name.....	High-definition 3D holographic emulating device
Product Brand.....	HYPERVSN
Model Number.....	MS
Family Product/Model.....	N/A
FCC ID.....	2ANPD20181010
Date of EUT received.....	02/25/2019
Date of Test.....	02/25/2019 – 02/27/2019
Report Issue Date.....	03/01/2019
Test Standards.....	47CFR Part 15.247: 2018
Test Result.....	Pass

Issued By:

Vista Laboratories

1261 Puerta Del Sol, San Clemente, CA 92673 USA

www.vista-compliance.com

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Tested by:

David Zhang/Test Engineer

Approved By:

Sherwin Lee/Engineering Reviewer

Report Number:	HVN-19020101-LC-RF-FCC-DTS
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Model Number:	MS



Laboratory Introduction

Vista Labs is an A2LA accredited 17025 compliant regulatory compliance testing laboratories (Cert. number: 4848-01) strategically located in Orange County, providing services in the electrical and telecommunication industries. Vista labs is also recognized testing facility for Australia (ACMA), Chinese Taipei (BSMI), Chinese Taipei (NCC), Hong Kong (OFCA), Israel (MOC), Korea (RRA), Singapore (IMDA), Vietnam (MIC), etc.

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San Clemente, CA


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Presented this 21st day of June 2018.


 President and CEO
 For the Accreditation Council
 Certificate Number 4848.01
 Valid to July 31, 2020

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17025 Product Testing Accreditation Certificate



Electromagnetic Compatibility
 Radio Frequency
 Product Certification
 International Approval

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TABLE OF CONTENTS

1	GENERAL INFORMATION	5
1.1	Applicant	5
1.2	Product information	5
1.3	Test standard and method	6
1.4	Test Purpose and statement	6
2	TEST SITE INFORMATION	7
3	MODIFICATION OF EUT	7
4	TEST CONFIGURATION AND OPERATION	7
4.1	EUT test configuration	7
4.2	EUT test mode	7
4.3	Supporting Equipment	8
4.4	EUT setup diagram	8
4.5	EUT operation	8
4.6	Test software	8
5	EUT AND TEST SETUP PICTURES	9
5.1	EUT pictures	9
5.2	EUT test setup pictures	10
6	TEST SUMMARY	14
7	UNCERTAINTY OF MEASUREMENT	15
8	TEST SUMMARY AND RESULT	16
8.1	Antenna Requirement	16
8.2	DTS (6 dB) Bandwidth	17
8.3	Maximum Peak Output Power	21
8.4	Power Spectral Density	25
8.5	Conducted Band-Edge & Unwanted Emissions Measurement	29
8.6	Radiated Band-Edge & Spurious Emissions into Restricted Frequency Bands	34
8.7	Conducted Emissions	58
9	TEST INSTRUMENT LIST	62

Report Number: HVN-19020101-LC-RF-FCC-DTS
Product: High-definition 3D holographic emulating device
Model Number: MS



REVISION HISTORY

Revision	Issue Date	Description	Note
Original	03/01/2019	Original release	N/A

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1 General Information

1.1 Applicant

Applicant:	KINO-MO LTD
Applicant address:	2nd Floor, Soho Wharf, 1 Click Street, London, United Kingdom, SE1 9DG
Manufacturer:	KINO-MO LTD
Manufacturer Address:	2nd Floor, Soho Wharf, 1 Click Street, London, United Kingdom, SE1 9DG

1.2 Product information

Product Name	High-definition 3D holographic emulating device
Model Number	MS
Family Model Number	N/A
Serial Number	H-S1900025 IV2018
Frequency Band	802.11b/g/n-20MHz: 2412-2462MHz
Type of modulation	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g: OFDM-CCK (BPSK, QPSK, 16QAM, 64QAM)
Equipment Class/ Category	DTS
Maximum output power	15.53 dBm
Antenna Information	Staight Whip antenna / 3 dBi
Clock Frequencies	N/A
Port/Connectors	RJ-485, micro-USB
Input Power	100-240VAC, 50/60Hz
Power Adapter Manu/Model	N/A
Power Adapter SN	N/A
Hardware version	N/A
Software version	N/A
Simultaneous Transmission	N/A
Additional Info	The Device is a cutting-edge visual solution, designed for creating, managing and displaying 3D video content perceived by viewers as high-resolution holograms floating in mid-air.

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1.3 Test standard and method

Test standard	47CFR Part 15.247: 2018
Test method	ANSI C63.10: 2013 558074 D01 15.247 Meas Guidance v05r01

1.4 Test Purpose and statement

The purpose of this test report is intended to demonstrate the compliance of product listed in section 1.2, received from company listed in section 1.1, to the requirements of standard and method listed in section 1.3. Based on our test results, we conclude that the product tested complies with the requirements of the standards indicated.

2 Test site information

Lab performing tests	Vista Laboratories
Lab Address	1261 Puerta Del Sol, San Clemente, CA 92673 USA
Phone Number	+1 (949) 393-1123
Website	www. Vista-compliance.com

Test condition	Test Engineer	Test Environment	Test Date
RF conducted	David Zhang	21.5°C / 58.2%/996 mbar	02/25/2019 – 02/27/2019
Radiated	David Zhang	21.5°C / 58.2%/996 mbar	02/25/2019 – 02/27/2019

3 Modification of EUT

N/A

4 Test configuration and operation

4.1 EUT test configuration

The radio of EUT is connected to and controlled by and laptop that is installed with Radio test software. The radio can be set to transmit continuously in different modulation, test channel and data rate.

4.2 EUT test mode

Radio	Channel	Frequency (MHz)
802.11-b	1	2412
802.11-b	6	2437
802.11-b	11	2462
802.11-g	1	2412
802.11-g	6	2437
802.11-g	11	2462
802.11-n-20	1	2412
802.11-n-20	6	2437
802.11-n-20	11	2462



4.3 Supporting Equipment

Index	Description	Model	S/N	Brand	Remark
-	-	-	-	-	-

4.4 EUT setup diagram



4.5 EUT operation

The radio can be set to transmit continuously in different modulation, test channel and data rate.

4.6 Test software

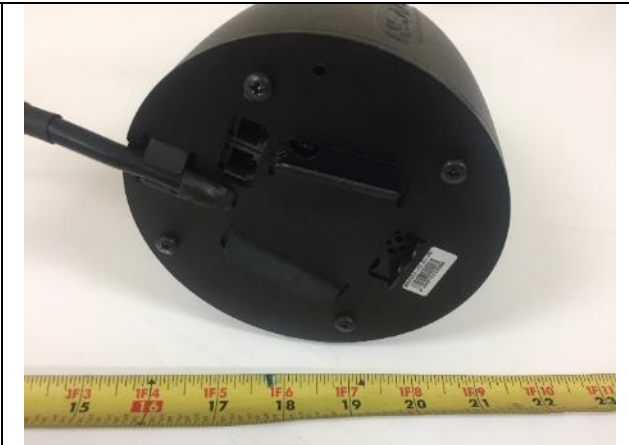
Index	Description	Remark
1	EMISoft Vasona 6.0049	EMC/Spurious emission test software used during testing

5 EUT and test setup pictures

5.1 EUT pictures



EUT Top View



EUT Bottom View

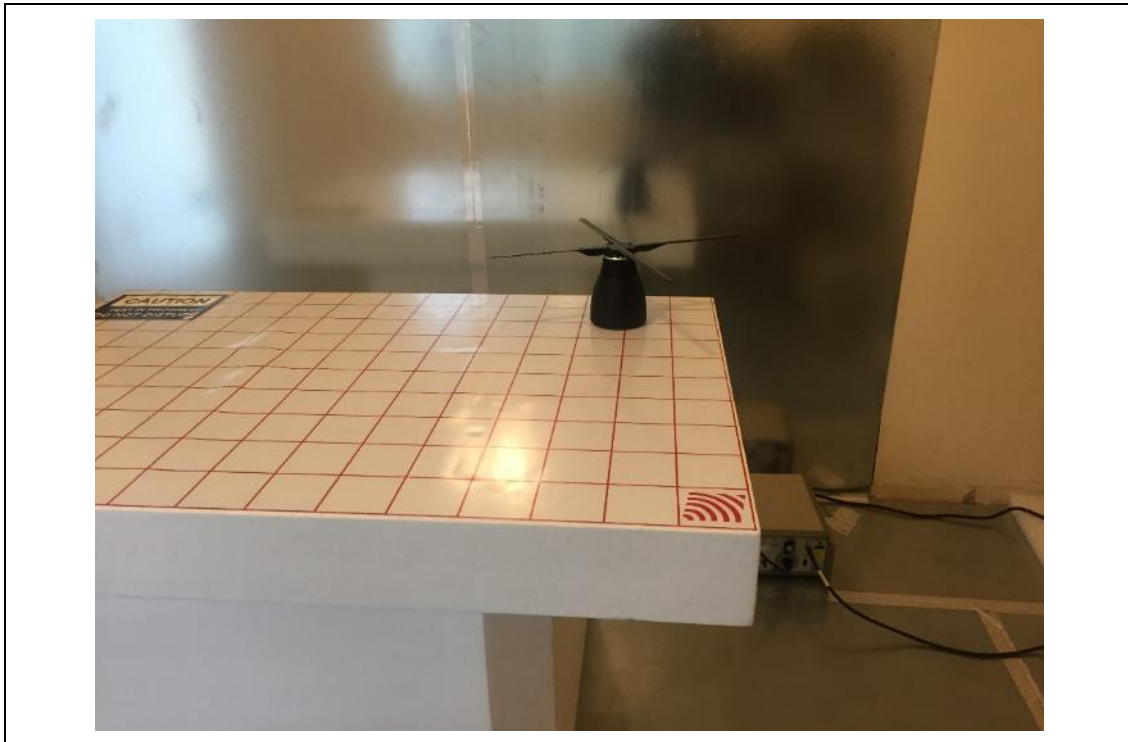


EUT Front View

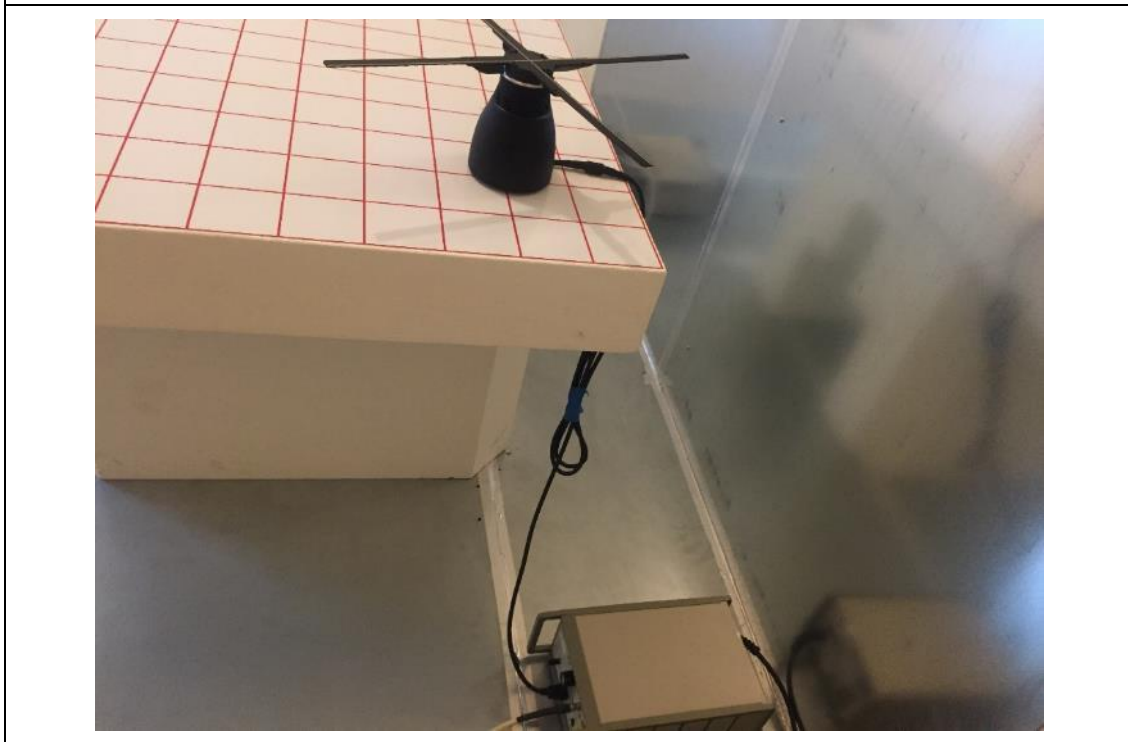


EUT Rear View

5.2 EUT test setup pictures



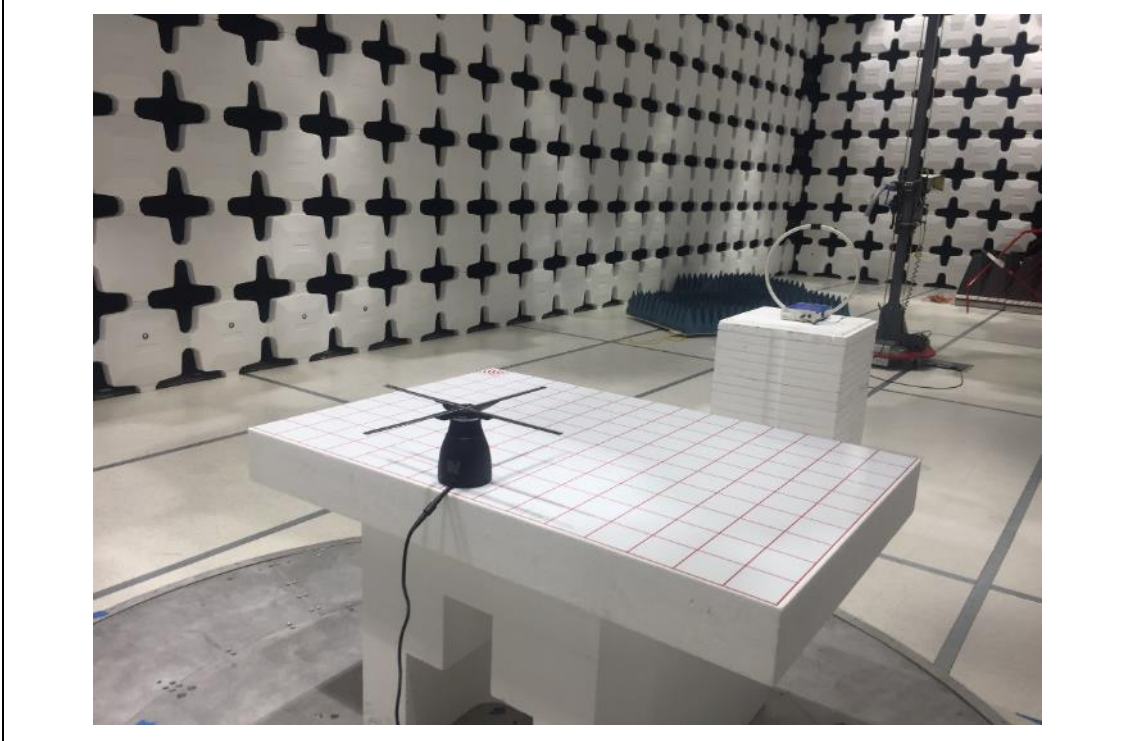
AC Line Conducted Emission setup – Front



AC Line Conducted Emission setup – Rear



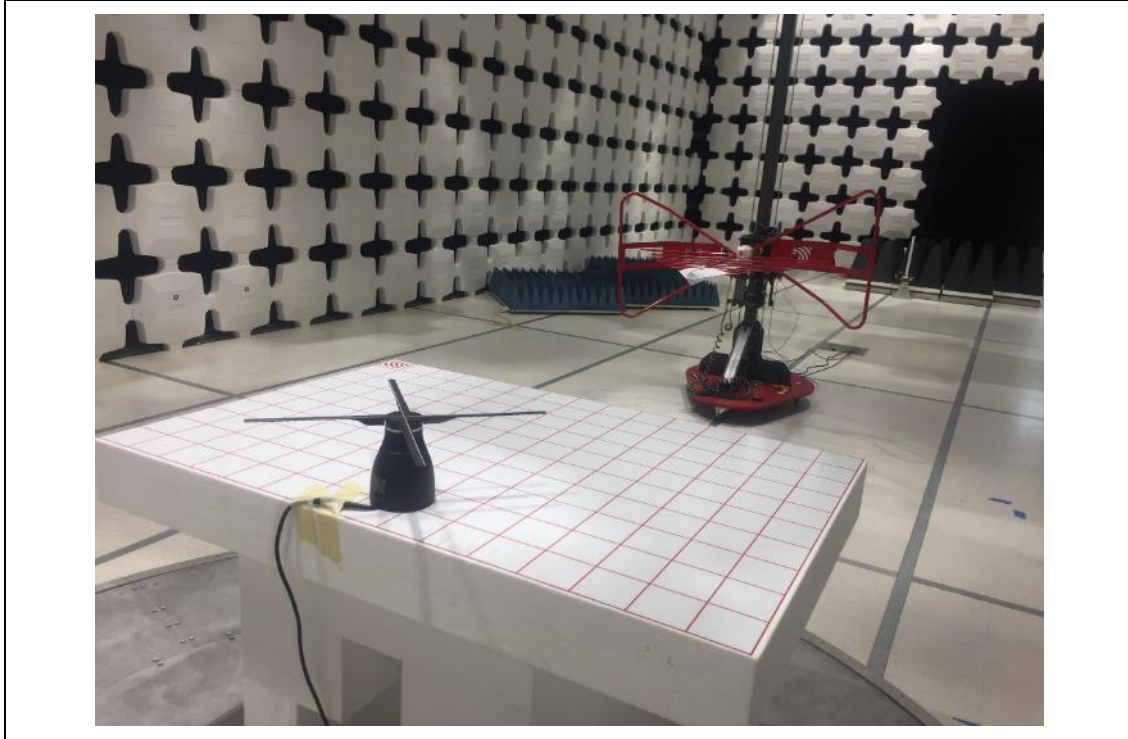
Radiated Emissions Below 30MHz setup – Front



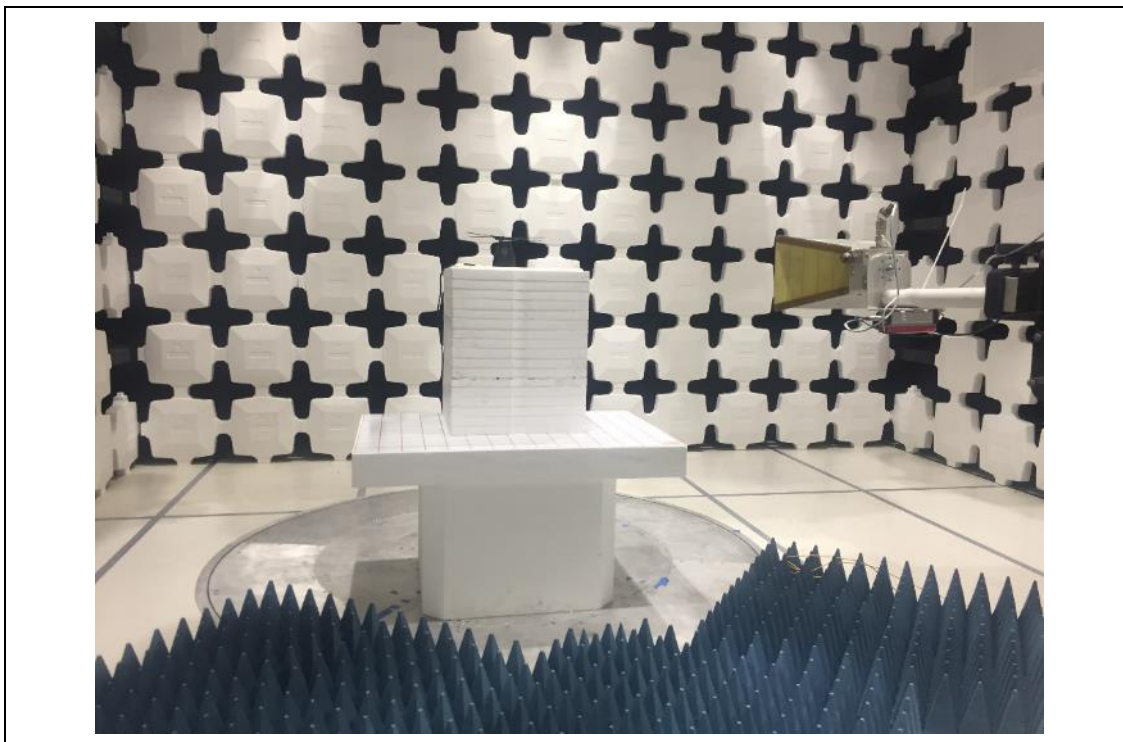
Radiated Emissions Below 30MHz setup – Rear



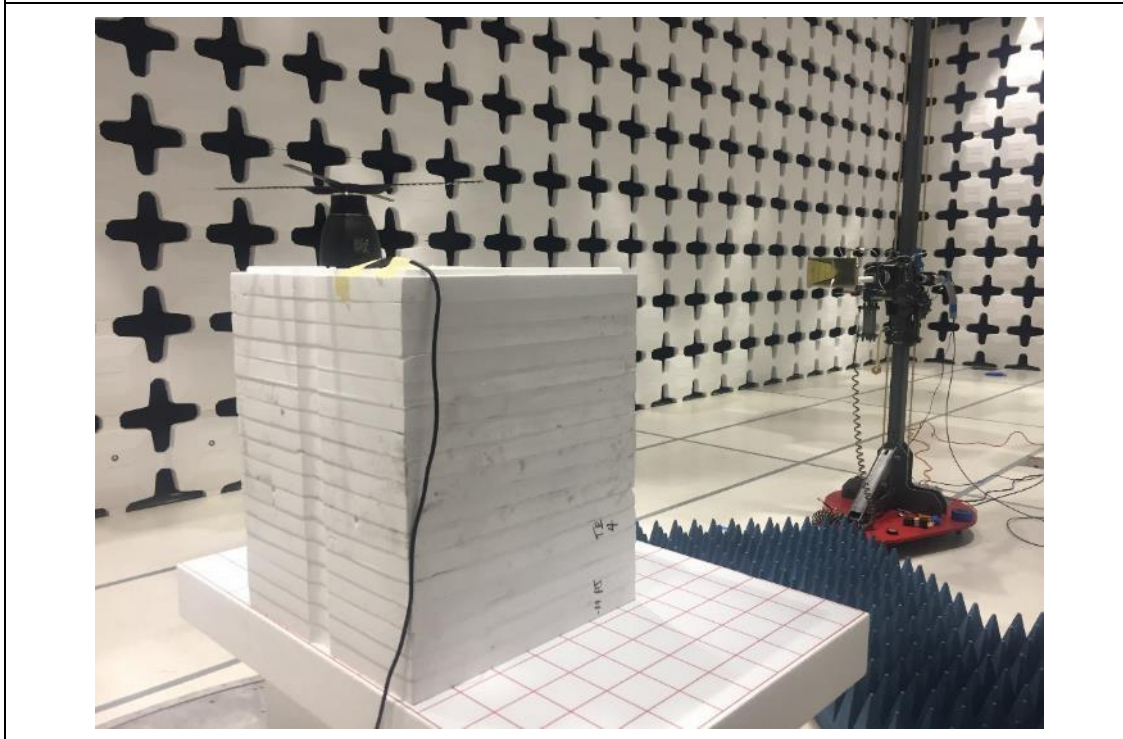
Radiated Emissions Below 1GHz setup – Front



Radiated Emissions Below 1GHz setup – Rear



Radiated Emissions Above 1GHz setup – Front



Radiated Emissions Above 1GHz setup – Rear



6 Test Summary

FCC Rules	Test Item	Section	Verdict
§15.203	Antenna Requirement	8.1	Pass
§15.247 (a)(2)	DTS (6 dB) Channel Bandwidth	8.2	Pass
§15.247(b)(3)	Conducted Maximum Output Power	8.3	Pass
§15.247(e)	Power Spectral Density	8.4	Pass
§15.247(d)	Conducted Band-Edge & Unwanted Emissions	8.5	Pass
§15.205, §15.209, §15.247(d)	Radiated Emissions & Unwanted Emissions into Restricted Frequency Bands	8.6	Pass
§15.207 (a)	AC Power Line Conducted Emissions	8.7	Pass



7 Uncertainty of Measurement

Test item	Measurement Uncertainty (dB)
RF Output Power (Conducted)	±1.2 dB
Power Spectral Density	±0.9 dB
Unwanted Emission (conducted)	±2.6 dB
Occupied Channel Bandwidth	±5 %
Radiated Emission (9KHz-30MHz)	±3.5 dB
Radiated Emission (30MHz-1GHz)	±4.6 dB
Radiated Emission (1-18GHz)	±4.9 dB
Radiated Emission (18-40GHz)	±3.5 dB

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8 Test summary and result

8.1 Antenna Requirement

8.1.1 Requirement

Per § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

8.1.2 Result

Analysis:

- EUT has one removable whip antennas which connect to the main board through unique U. FL RF connectors.

Conclusion:

EUT complies with antenna requirement in § 15.203.

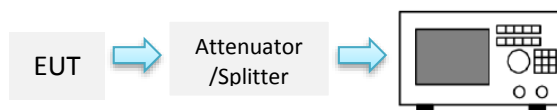
8.2 DTS (6 dB) Bandwidth

8.2.1 Requirement

§ 15.247 (a)(2)

Systems using digital modulation techniques may operate in the 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz bands. The minimum 6 dB bandwidth shall be at least 500 KHz.

8.2.2 Test setup



8.2.3 Test Procedure

According to section 8.2, option 2, in KDB 558074 D01 DTS Meas Guidance v05r01 and subclause 11.8 of ANSI C63.10-2013:

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described above (i.e., RBW = 100 kHz, VBW $\geq 3 \times$ RBW, peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Use automatic bandwidth measurement capability on instrument to obtain BW result.

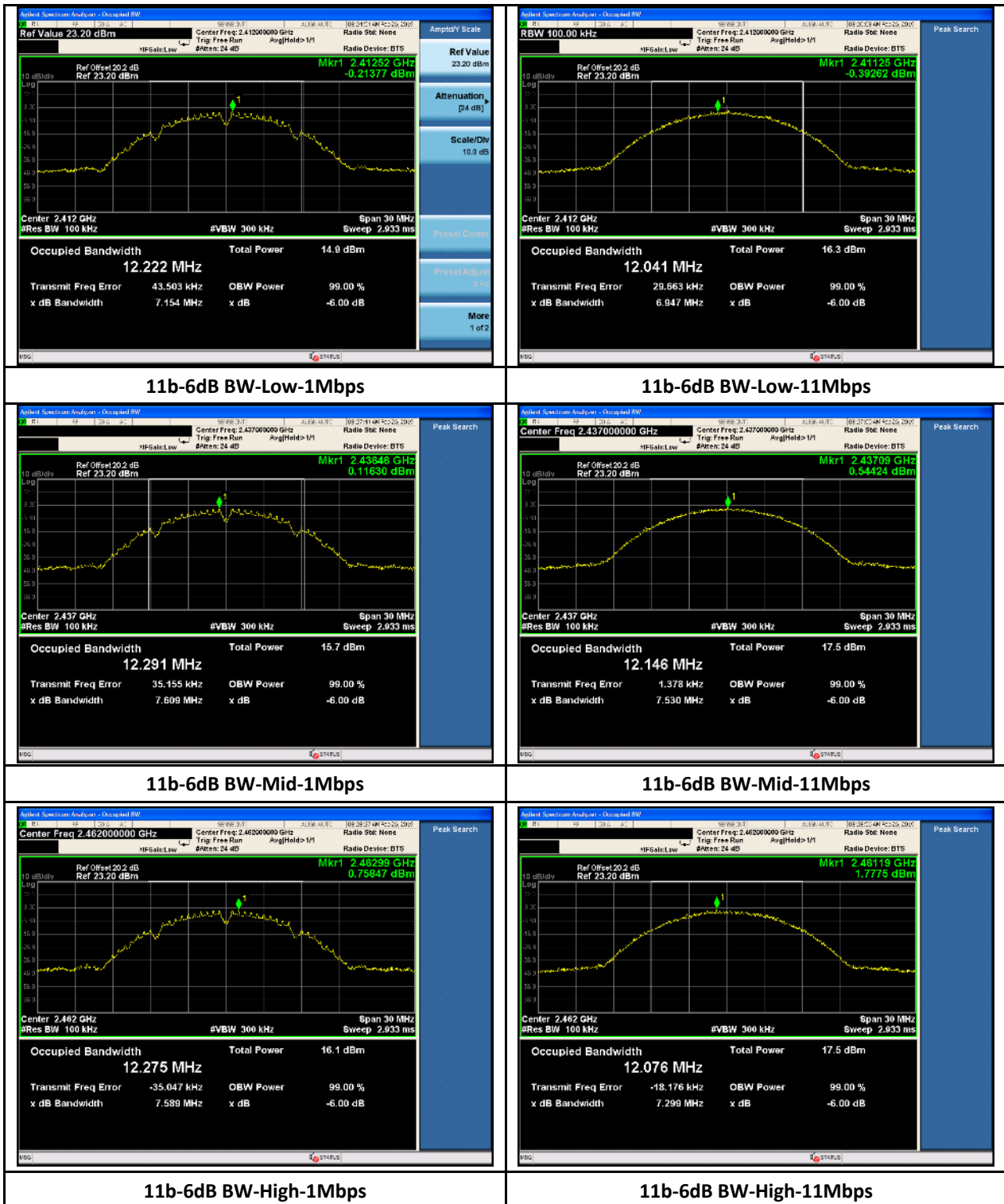


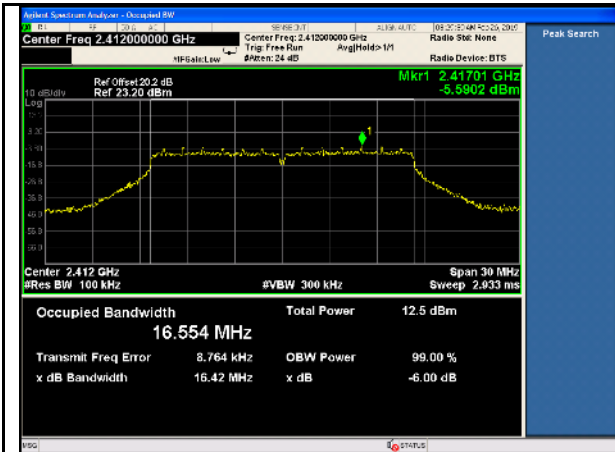
8.2.4 Test Result

Mode/ Bandwidth	Frequency (MHz)	Data rate	Measured Bandwidth (KHz)	Minimum Bandwidth (KHz)	Result
11b	2412	1Mbps	7154	500	Pass
11b	2437	1Mbps	7609	500	Pass
11b	2462	1Mbps	7589	500	Pass
11b	2412	11Mbps	6947	500	Pass
11b	2437	11Mbps	7530	500	Pass
11b	2462	11Mbps	7299	500	Pass
11g	2412	6Mbps	1642	500	Pass
11g	2437	6Mbps	1643	500	Pass
11g	2462	6Mbps	1642	500	Pass
11g	2412	54Mbps	1651	500	Pass
11g	2437	54Mbps	1650	500	Pass
11g	2462	54Mbps	1650	500	Pass

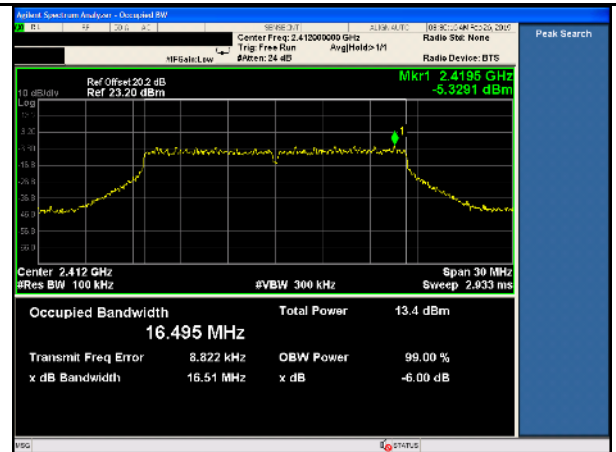


8.2.5 Test Plots

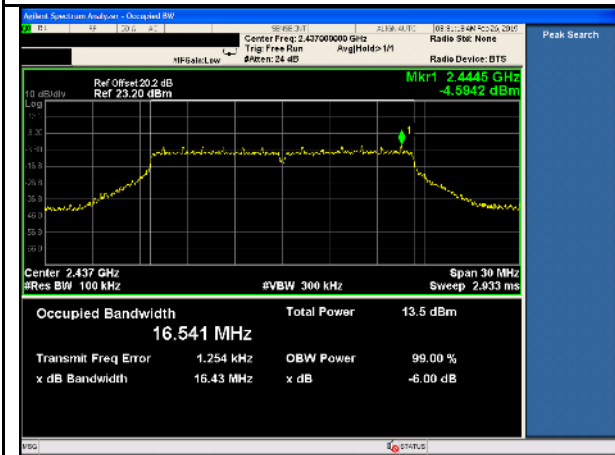




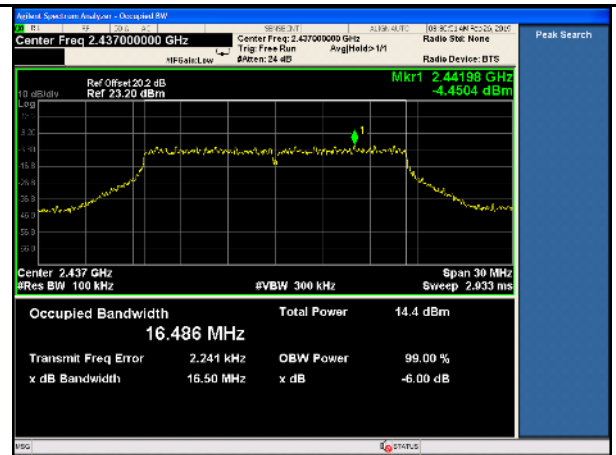
11g-6dB BW-Low-6Mbps



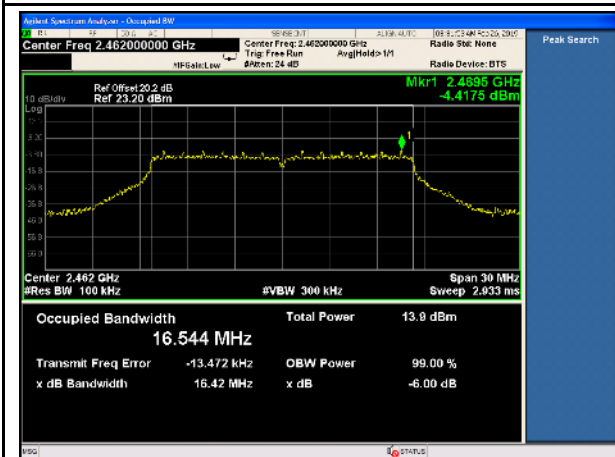
11g-6dB BW-Low-54Mbps



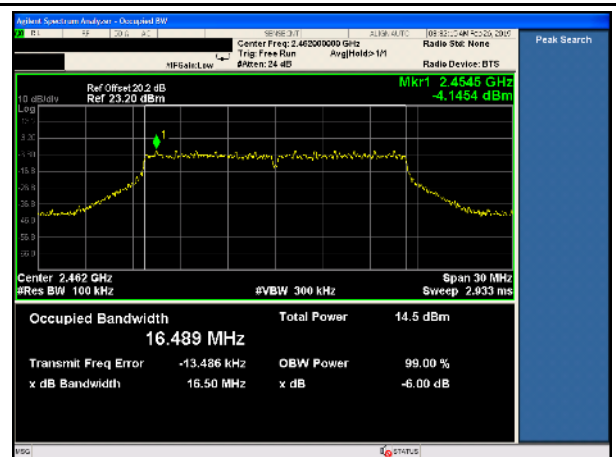
11b-6dB BW-Mid-6Mbps



11g-6dB BW-Mid-54Mbps



11b-6dB BW-High-6Mbps



11g-6dB BW-High-54Mbps

8.3 Maximum Peak Output Power

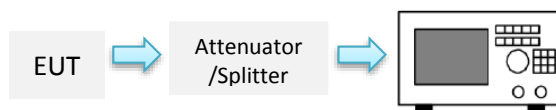
8.3.1 Requirement

§ 15.247 (b)(3)

or systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: the maximum output power is 1 Watt.

If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

8.3.2 Test setup



8.3.3 Test Procedure

According to subclause 11.9.1.2 of ANSI C63.10-2013:

1. Set span to at least 1.5 times of the DTS BW.
2. Set the RBW = 1MHz
2. Set VBW $\geq 3 \times$ RBW.
3. Set number of points in sweep $\geq [2 \times \text{span} / \text{RBW}]$
4. Sweep time = auto couple.
5. Detector = PEAK
6. Trace mode = max hold
7. Allow trace to fully stabilize
8. Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges (for some instruments, this may require a manual override to select the peak detector). If the instrument does not have a band power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the DTS channel bandwidth.

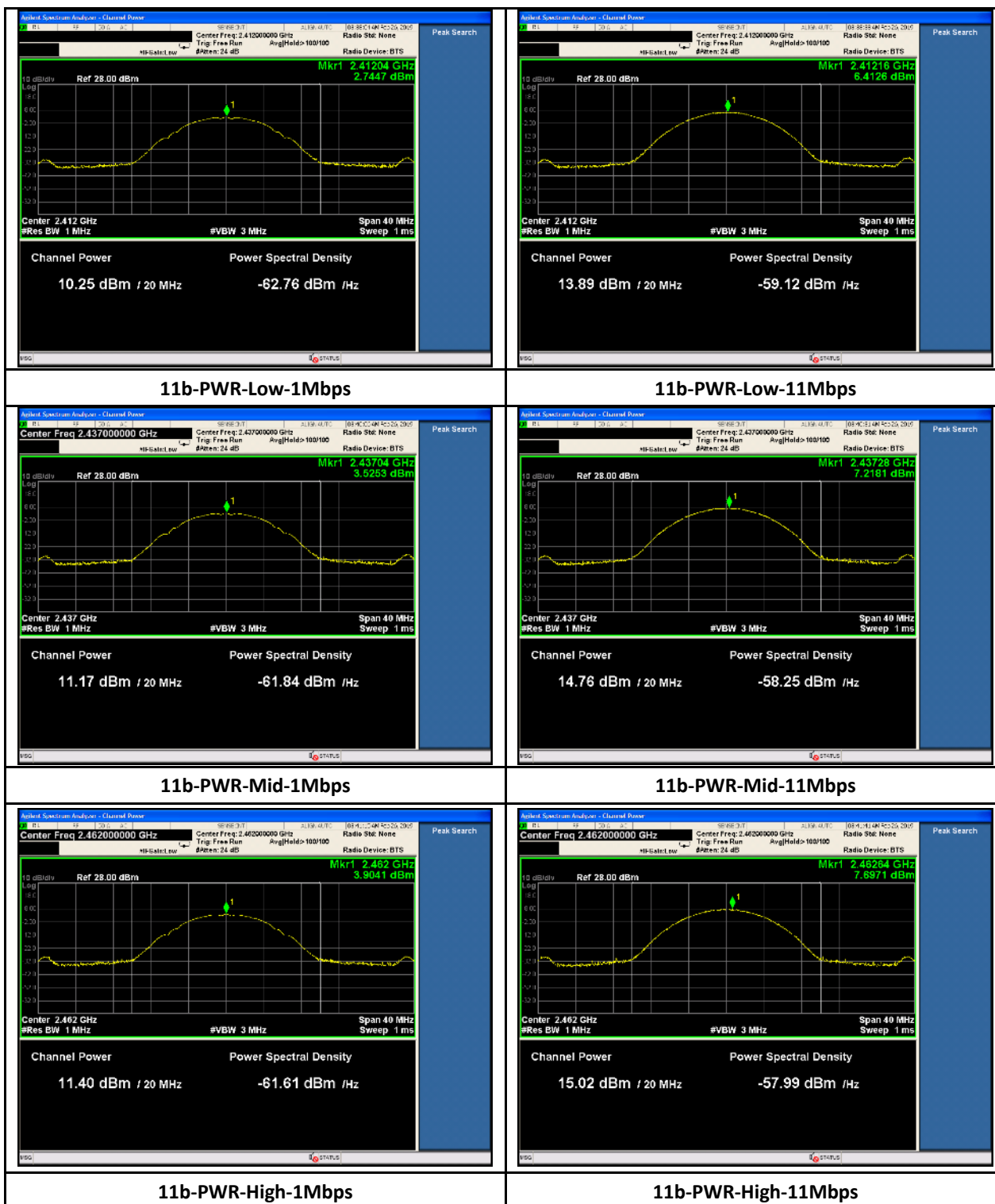


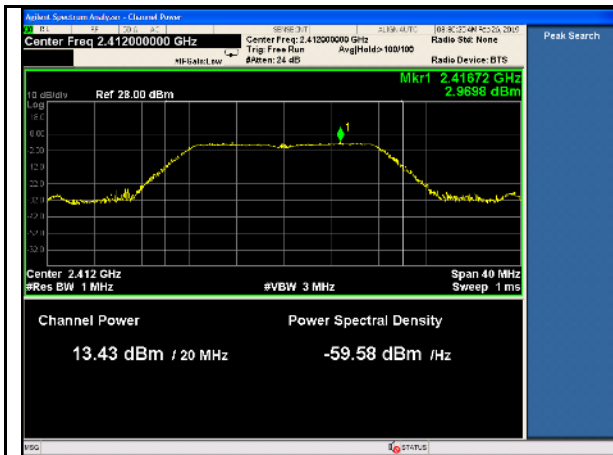
8.3.4 Test Result

Mode/ Bandwidth	Frequency (MHz)	Data rate	Peak Output Power (dBm)	Max Output Power (dBm)	Result
11b	2412	1Mbps	10.25	30	Pass
11b	2437	1Mbps	11.17	30	Pass
11b	2462	1Mbps	11.40	30	Pass
11b	2412	11Mbps	13.89	30	Pass
11b	2437	11Mbps	14.76	30	Pass
11b	2462	11Mbps	15.02	30	Pass
11g	2412	6Mbps	13.43	30	Pass
11g	2437	6Mbps	14.45	30	Pass
11g	2462	54Mbps	14.67	30	Pass
11g	2412	54Mbps	14.41	30	Pass
11g	2437	54Mbps	14.70	30	Pass
11g	2462	54Mbps	15.53	30	Pass

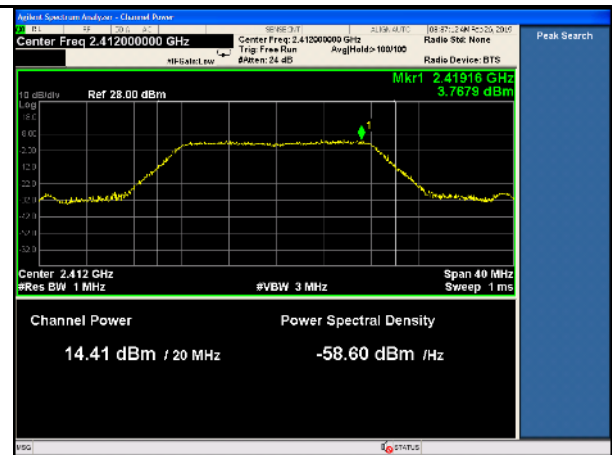


8.3.5 Test Plots





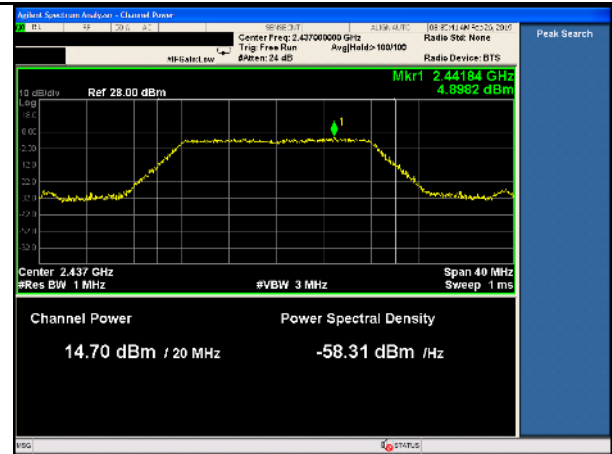
11g-PWR-Low-6Mbps



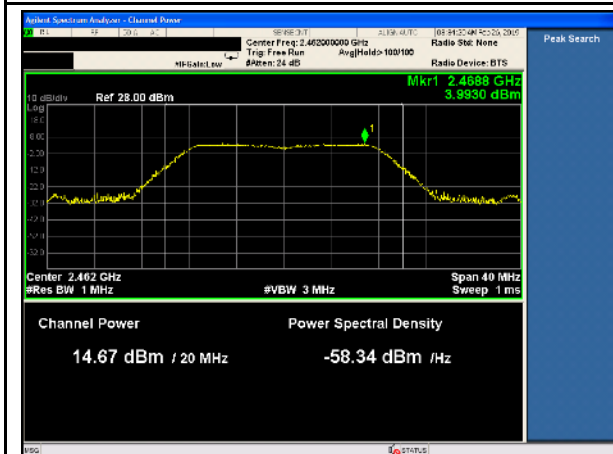
11g-PWR-Low-54Mbps



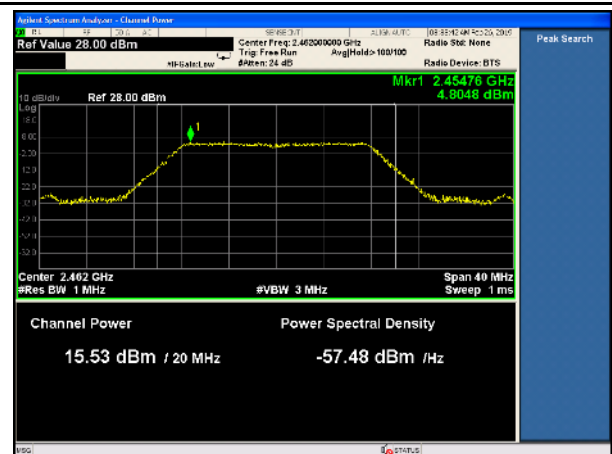
11g-PWR-Mid-6Mbps



11g-PWR-Mid-54Mbps



11g-PWR-High-6Mbps



11g-PWR-High-54Mbps



Report Number:	HVN-19020101-LC-RF-FCC-DTS
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8.4 Power Spectral Density

8.4.1 Requirement

§ 15.247 (e)

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power is used to determine the power spectral density.

8.4.2 Test setup



8.4.3 Test Procedure

According to section 8.4 in KDB 558074 D01 DTS Meas Guidance v05r01 and subclause 11.10.2 PKPSD of ANSI C63.10-2013:

1. Set analyser centre frequency to DTS channel centre frequency.
2. Set the span to 1.5 X DTS bandwidth.
3. Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
4. Set the VBW $\geq 3 \times \text{RBW}$.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

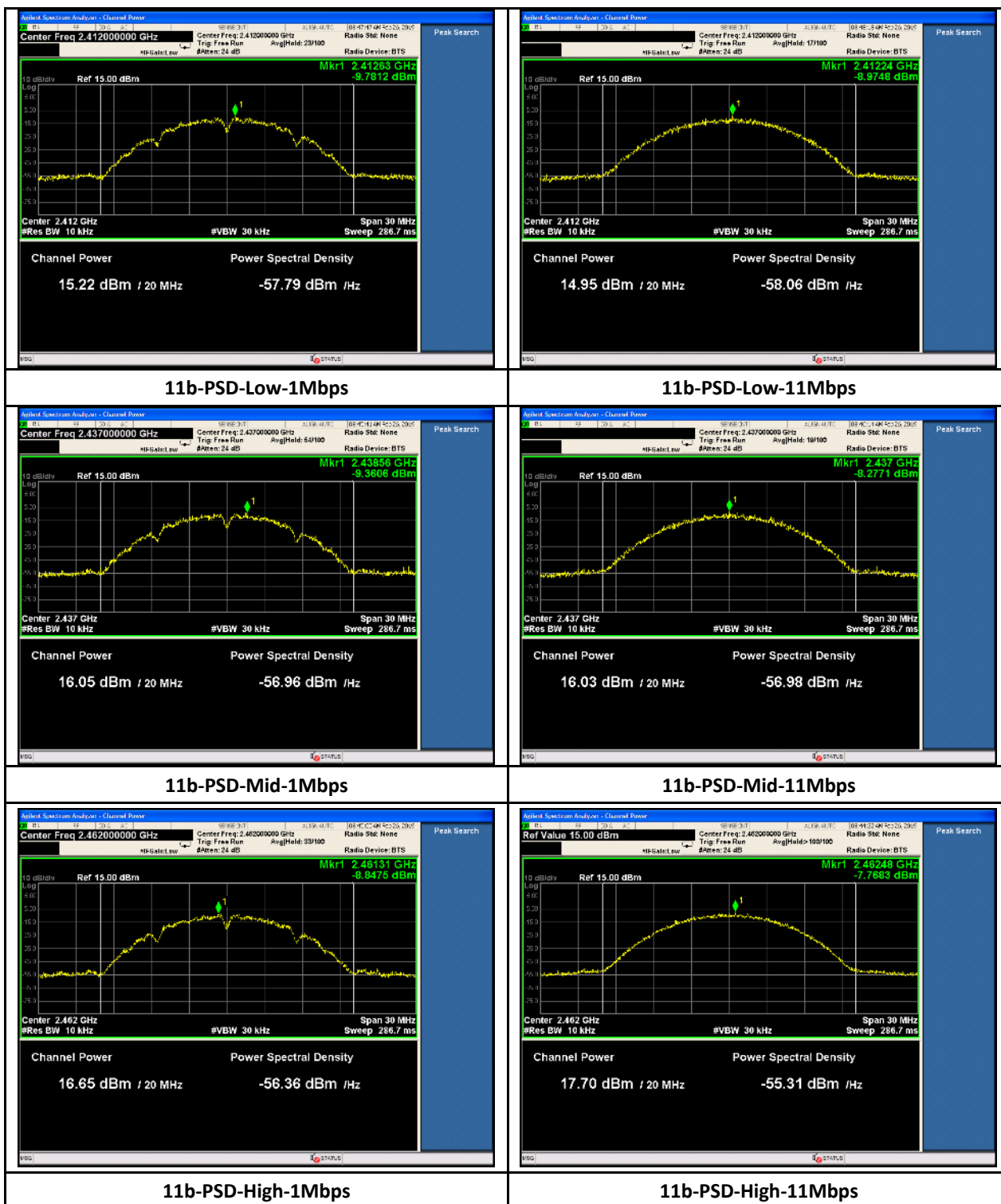


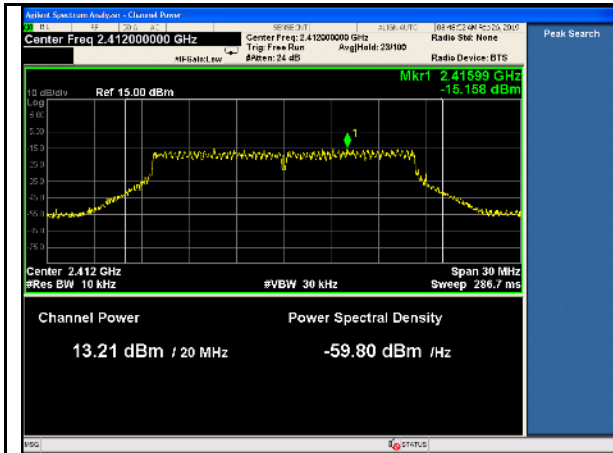
8.4.4 Test Result

Mode/ Bandwidth	Frequency (MHz)	Data rate	Peak PSD (dBm/3KHz)	Max PSD (dBm/3KHz)	Result
11b	2412	1Mbps	-9.78	8	Pass
11b	2437	1Mbps	-9.36	8	Pass
11b	2462	1Mbps	-8.84	8	Pass
11b	2412	11Mbps	-8.97	8	Pass
11b	2437	11Mbps	-8.27	8	Pass
11b	2462	11Mbps	-7.76	8	Pass
11g	2412	6Mbps	-15.15	8	Pass
11g	2437	6Mbps	-12.99	8	Pass
11g	2462	54Mbps	-13.32	8	Pass
11g	2412	54Mbps	-14.11	8	Pass
11g	2437	54Mbps	-13.27	8	Pass
11g	2462	54Mbps	-14.80	8	Pass

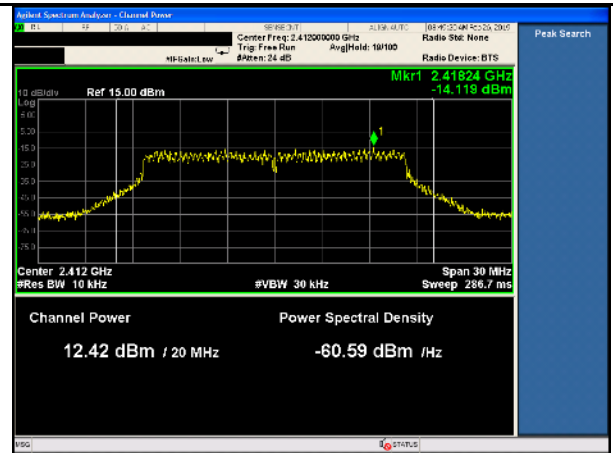


8.4.5 Test Plots

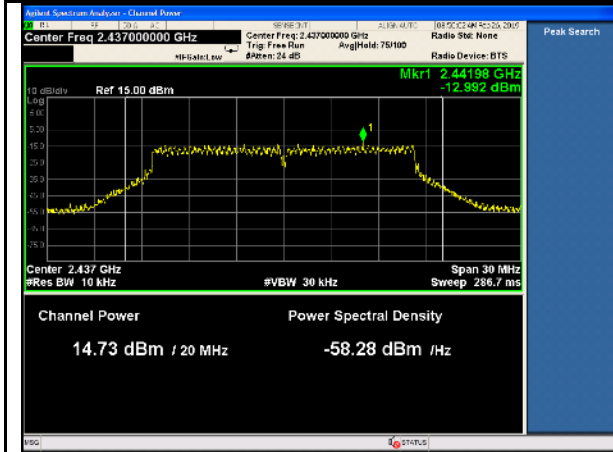




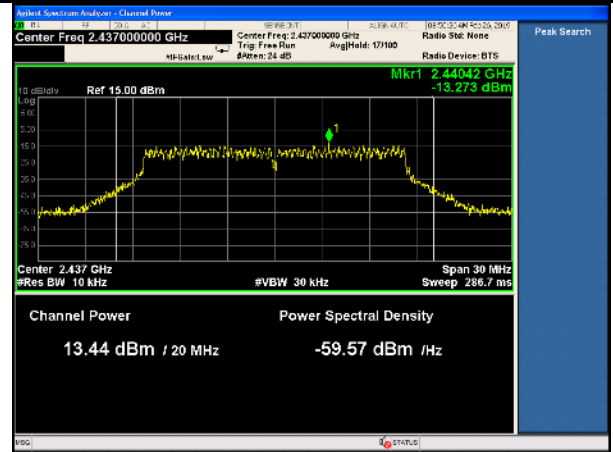
11g-PSD-Low-6Mbps



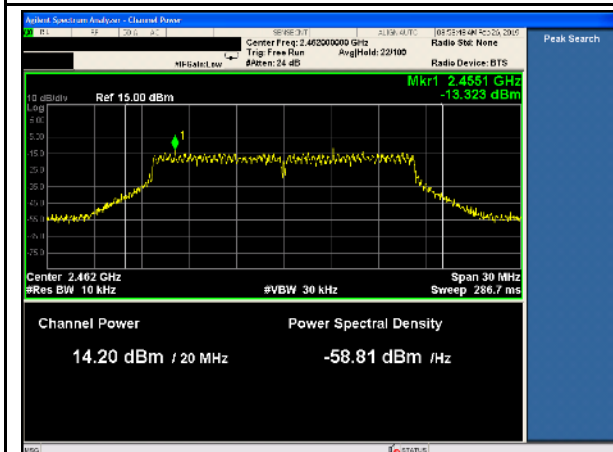
11g-PSD-Low-54Mbps



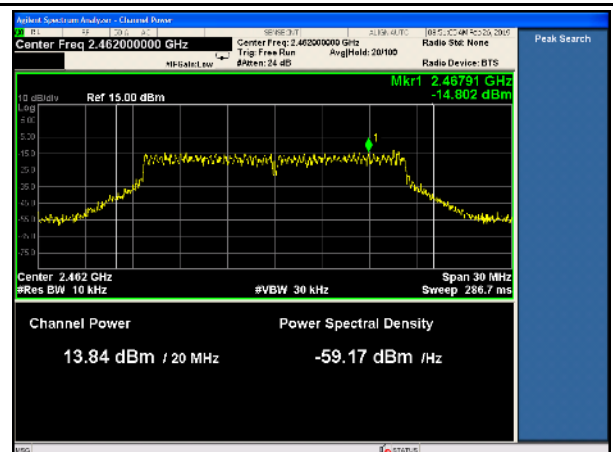
11g-PSD-Mid-6Mbps



11g-PSD-Mid-54Mbps



11g-PSD-High-6Mbps



11g-PSD-High-54Mbps

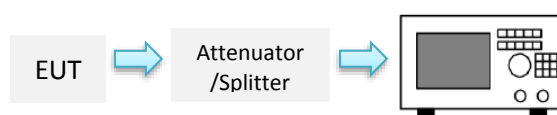
8.5 Conducted Band-Edge & Unwanted Emissions Measurement

8.5.1 Requirement

§ 15.247 (d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

8.5.2 Test setup



8.5.3 Test Procedure

According to section 8.5 Emission level measurement, in KDB 558074 D01 DTS Meas Guidance v05r01 and subclause 11.11.3 in ANSI C63.10-2013:

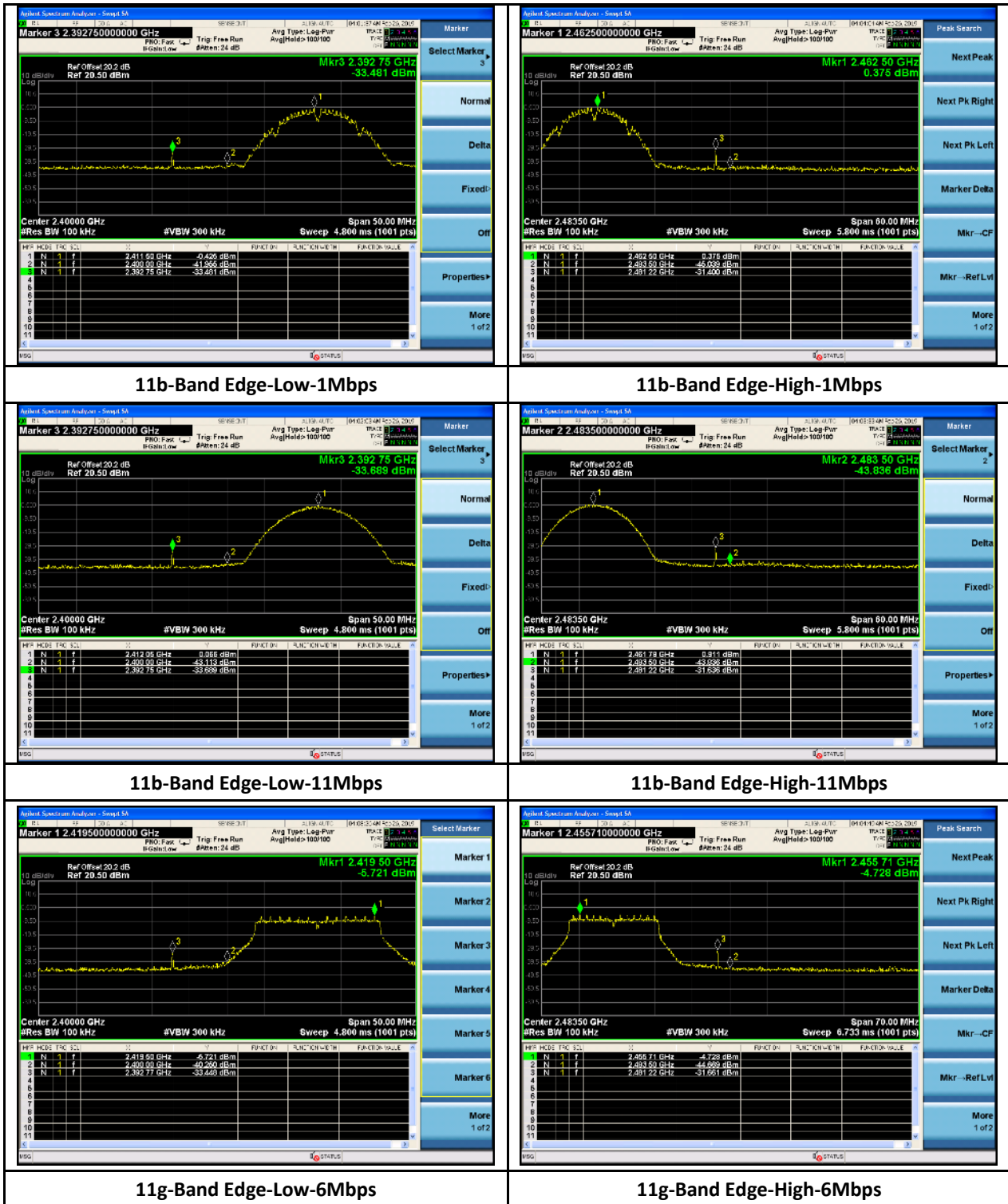
1. Set the centre frequency and span to encompass frequency range to be measured.
2. Set the RBW = 100 kHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the maximum amplitude level.

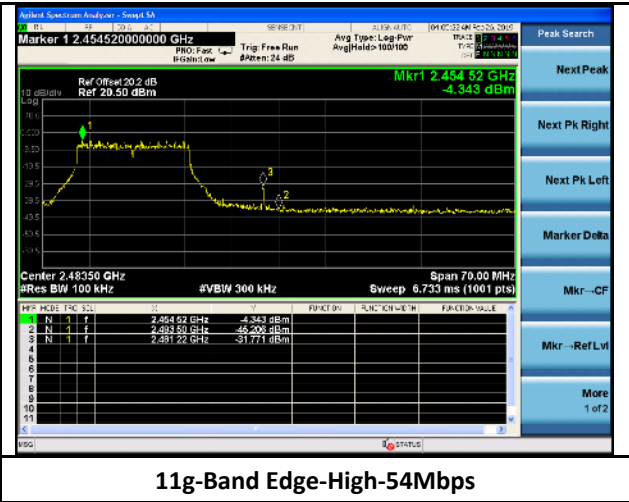
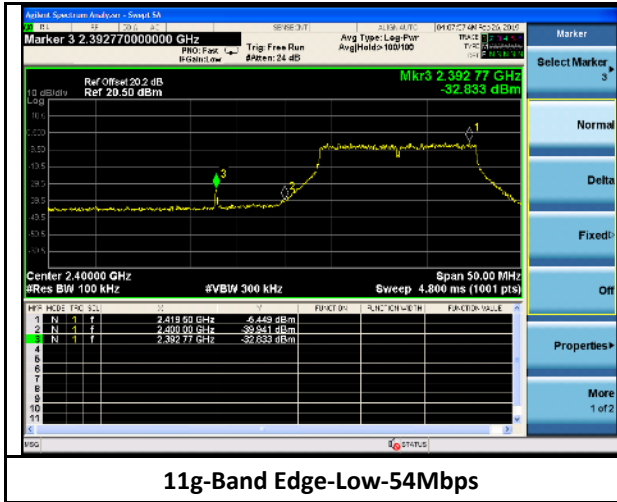
8.5.4 Test Result

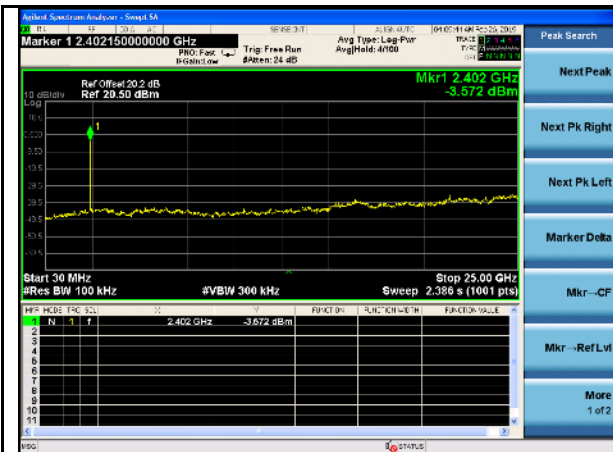
See test plots



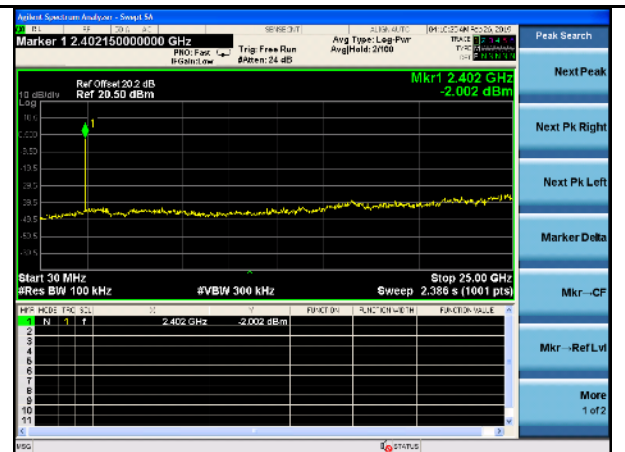
8.5.5 Test Plots



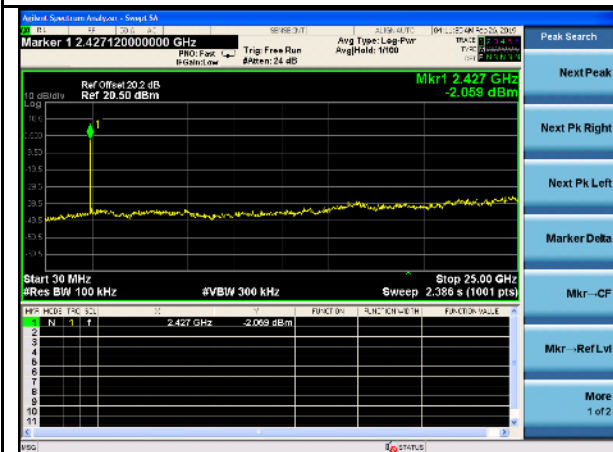




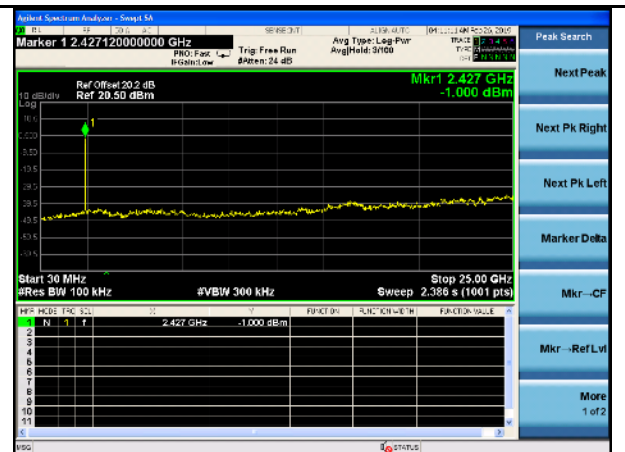
11b-Out Of Band Emission-Low-1Mbps



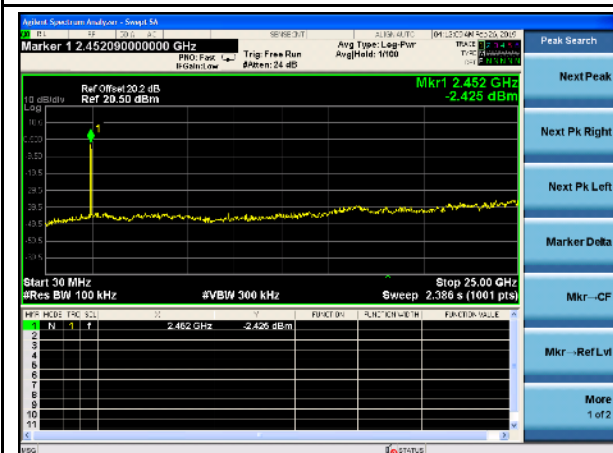
11b-Out Of Band Emission-Low-11Mbps



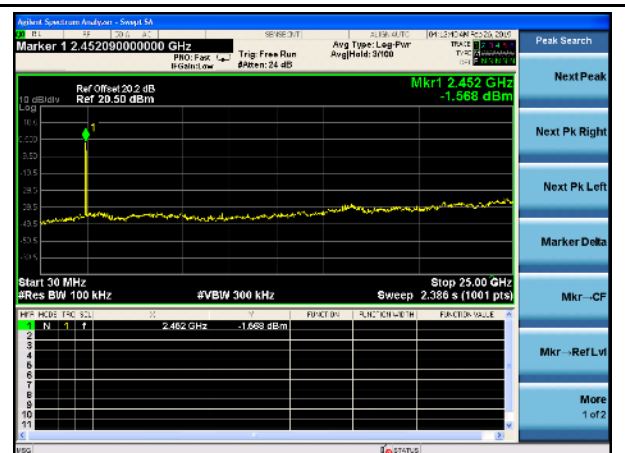
11b-Out Of Band Emission-Mid-1Mbps



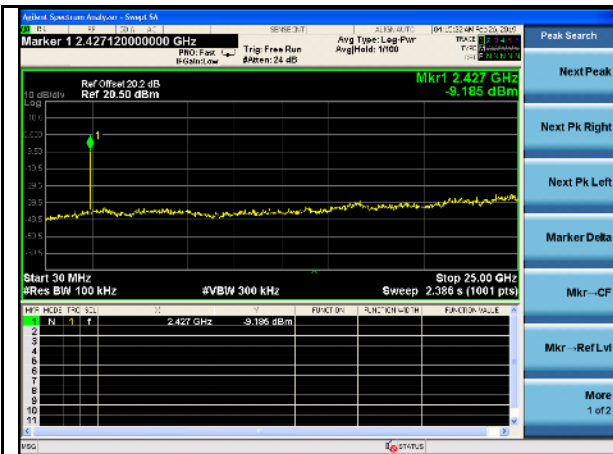
11b-Out Of Band Emission-Mid-11Mbps



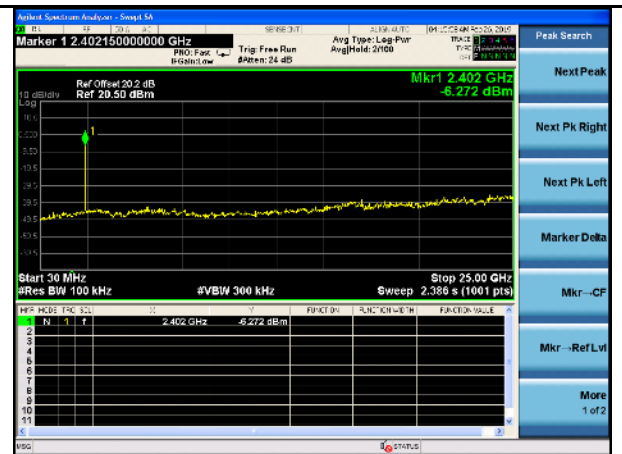
11b-Out Of Band Emission-High-1Mbps



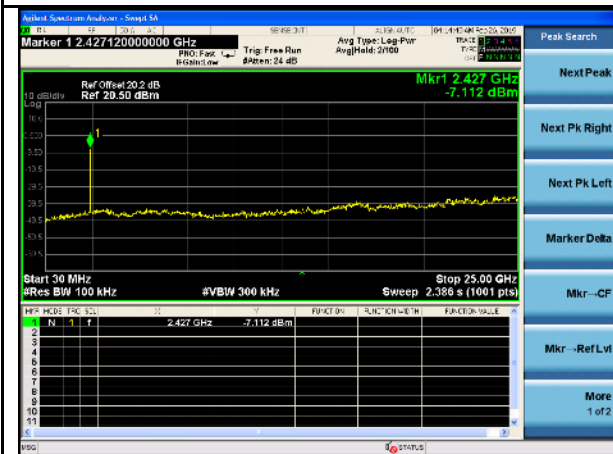
11b-Out Of Band Emission-High-11Mbps



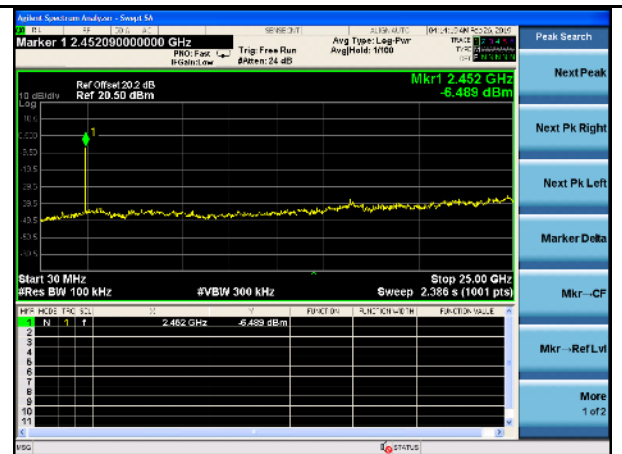
11g-Out Of Band Emission-Low-6Mbps



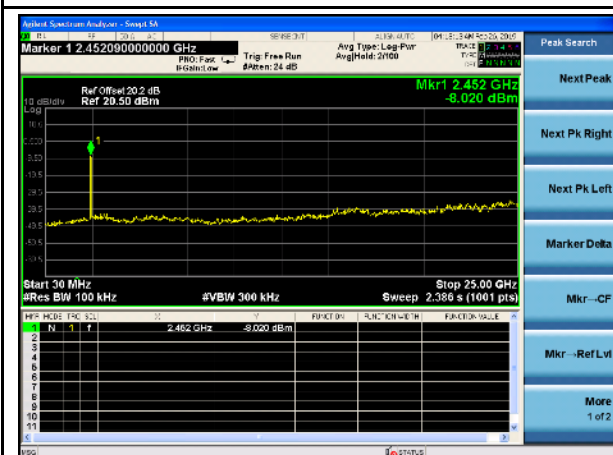
11g-Out Of Band Emission-Low-54Mbps



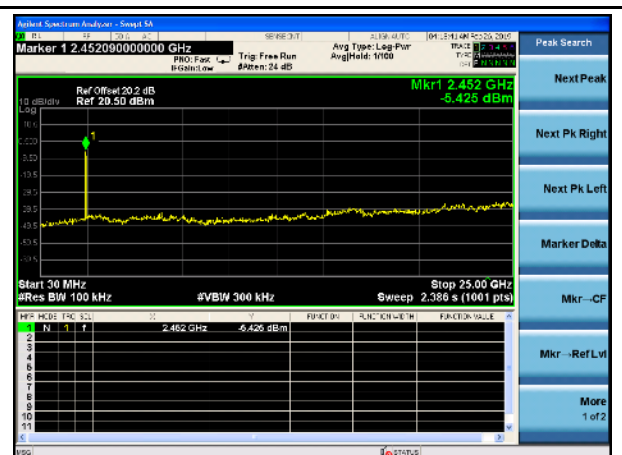
11g-Out Of Band Emission-Mid-6Mbps



11g-Out Of Band Emission-Mid-54Mbps



11g-Out Of Band Emission-High-6Mbps



11g-Out Of Band Emission-High-54Mbps

8.6 Radiated Band-Edge & Spurious Emissions into Restricted Frequency Bands

8.6.1 Requirement

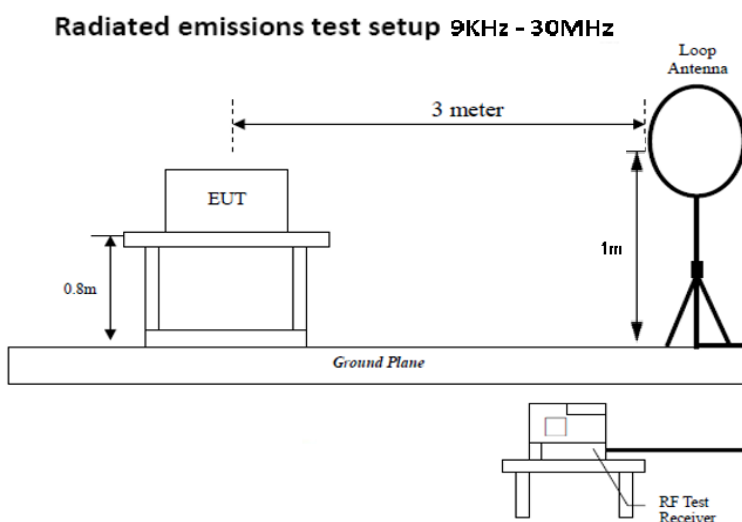
§ 15.247 (d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

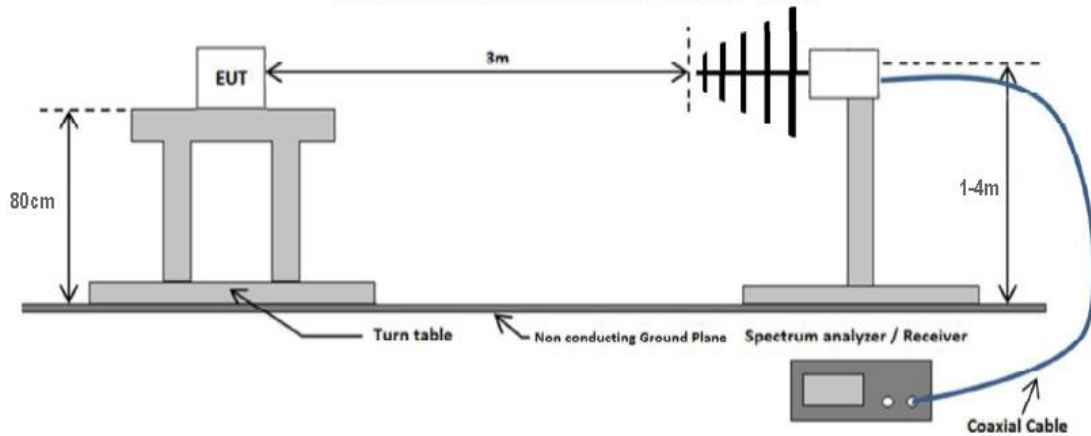
Attenuation below the general limits specified in §15.209(a) and RSS-Gen is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Frequency range (MHz)	Field Strength ($\mu\text{V}/\text{m}$)
0.009~0.490	2400/F(KHz)
0.490~1.705	24000/F(KHz)
1.705~30.0	30
30 – 88	100
88 – 216	150
216 960	200
Above 960	500

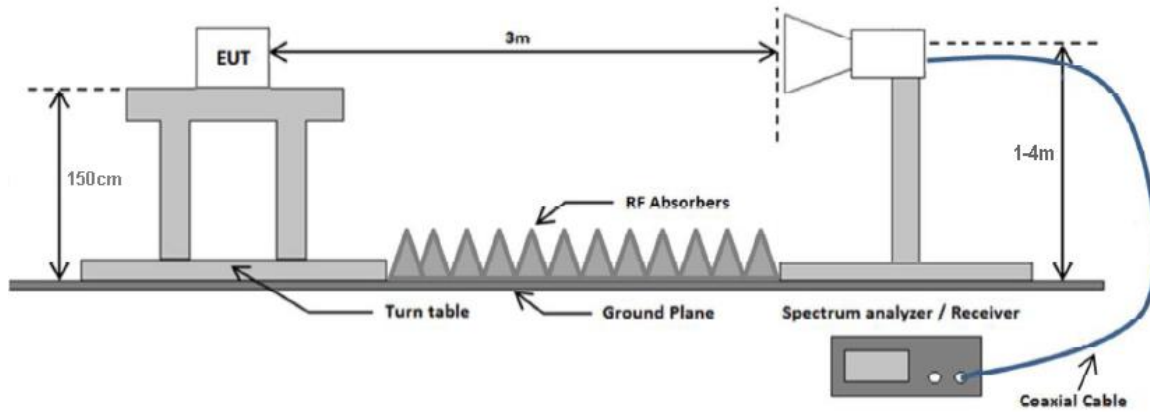
8.6.2 Test setup



Radiated emissions test setup 30 MHz - 1 GHz



Radiated emissions test setup above 1 GHz



8.6.3 Test Procedure

According to section 8.6 in KDB 558074 D01 DTS Meas Guidance v05r01 and subclause 11.12.2.7 Radiated spurious emission measurements in ANSI C62.10-2013 as well as the procedures for maximizing and measuring radiated emissions that are described in ANSI C63.10 was followed. Boresight antenna mast was used during the scanning to point to EUT to maximize the emission. The process will be repeated in 3 EUT orientations.

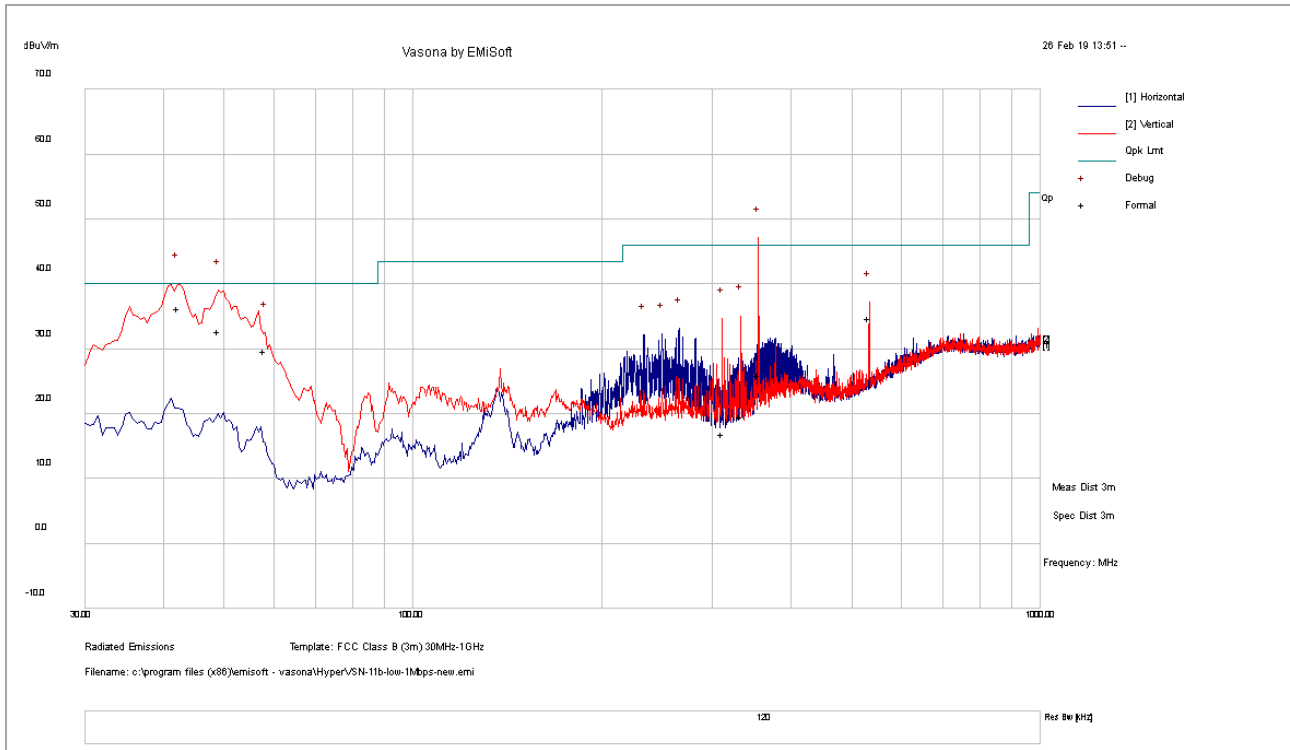
1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. The test was carried out at the selected frequency points obtained from the EUT characterization. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:
 - a. Vertical or horizontal polarization (whichever gave the higher emission level over a full rotation of the EUT) was chosen.
 - b. The EUT was then rotated to the direction that gave the maximum emission.
 - c. Finally, the antenna height was adjusted to the height that gave the maximum emission.
3. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 300 Hz for frequency below 150KHz.
4. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 10 kHz for frequency between 150KHz – 30MHz.
5. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-Peak detection at frequency between 30MHz - 1GHz.
6. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz with Peak detection for Peak and average measurement at frequency above 1GHz.
7. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.



8.6.4 Test Result

30-1000MHz test result

Test Standard:	15.209	Mode:	802.11b-2412MHz
Frequency Range:	30-1000MHz	Test Date:	02/27/2019
Antenna Type/Polarity:	Bi-Log/Hor & Ver	Test Personnel:	David Zhang
Remark:	N/A	Test Result:	Pass



Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
42.18	55.40	2.60	-21.59	36.40	QP	V	100	132	40.00	-3.60
48.95	54.24	2.77	-24.23	32.78	QP	V	168	76	40.00	-7.22
57.89	51.52	2.96	-24.70	29.77	QP	V	163	142	40.00	-10.23
310.91	29.35	5.76	-18.12	16.99	QP	V	153	344	46.00	-29.01
332.88	30.68	5.93	-16.97	19.64	QP	V	175	36	46.00	-26.36
355.44	35.77	6.09	-15.81	26.04	QP	V	202	324	46.00	-19.96
533.32	40.06	6.46	-11.73	34.80	QP	H	214	314	46.00	-11.20

Note:

- 1) For below 1GHz, all different channel and modes were verified but only the worst case result is shown here.
- 2) No outstanding result was found for below 30MHz other than ambient noise floor.



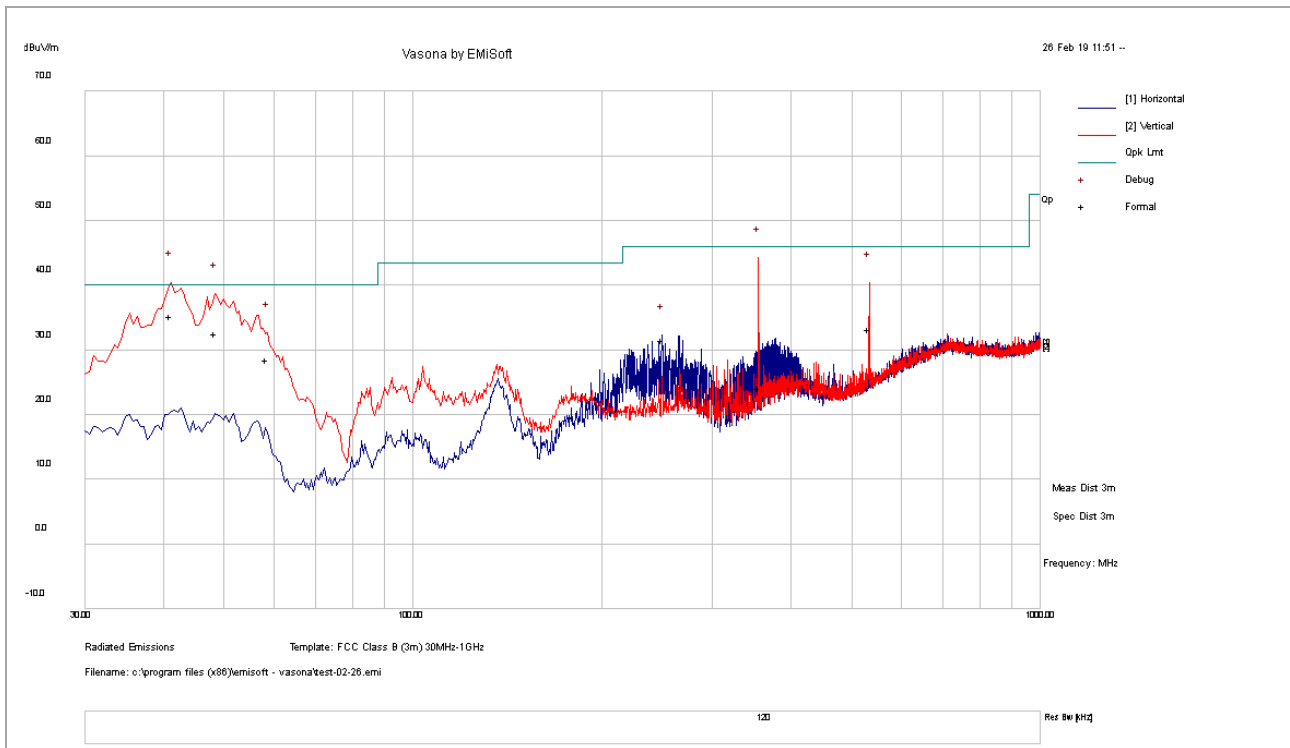
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30-1000MHz test result

Test Standard:	15.209	Mode:	802.11b-2437MHz
Frequency Range:	30-1000MHz	Test Date:	02/27/2019
Antenna Type/Polarity:	Bi-Log/Hor & Ver	Test Personnel:	David Zhang
Remark:	N/A	Test Result:	Pass



Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
41.03	53.82	2.57	-21.00	35.40	QP	V	100	360	40.00	-4.60
48.35	53.92	2.75	-24.06	32.62	QP	V	191	297	40.00	-7.38
58.43	50.32	2.97	-24.69	28.59	QP	V	158	337	40.00	-11.41
249.58	45.69	5.25	-19.27	31.66	QP	H	100	266	46.00	-14.34
355.24	33.99	6.08	-15.83	24.25	QP	V	143	324	46.00	-21.75
533.35	38.63	6.46	-11.72	33.37	QP	V	115	230	46.00	-12.63

Note:

- 1) For below 1GHz, all different channel and modes were verified but only the worst case result is shown here.



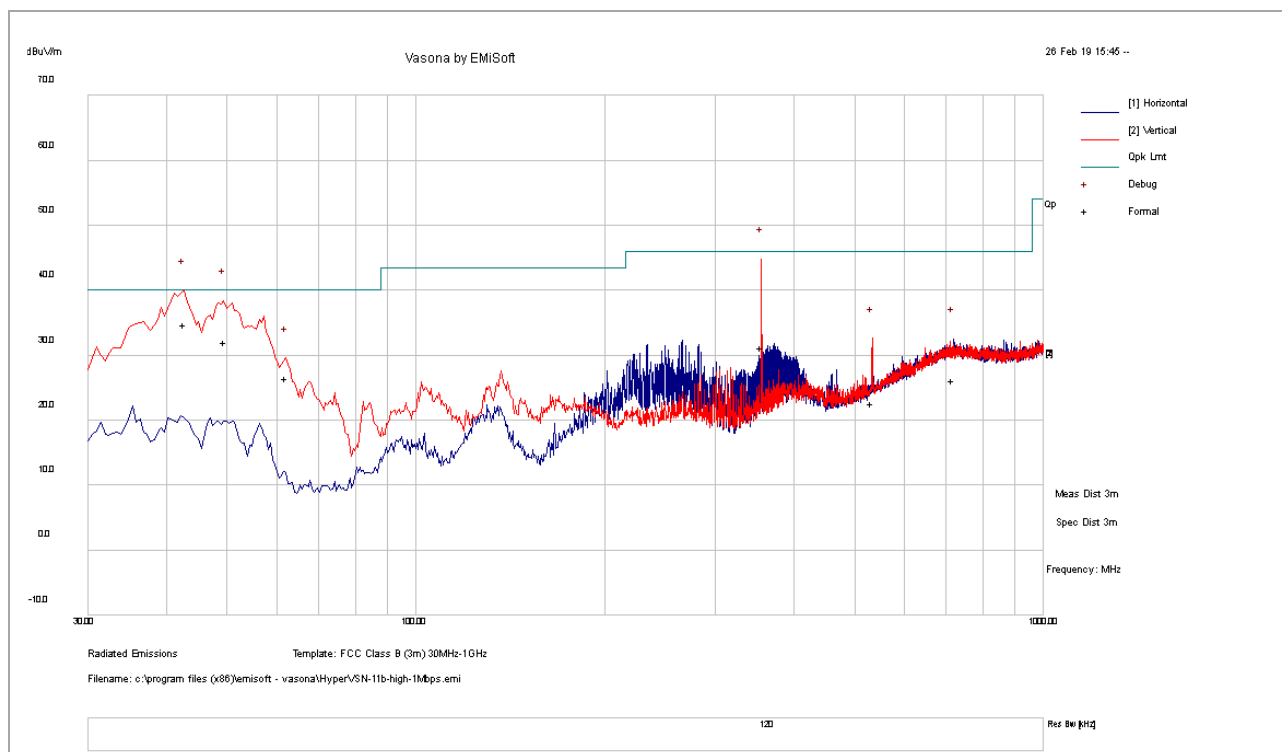
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30-1000MHz test result

Test Standard:	15.209	Mode:	802.11b-2462MHz
Frequency Range:	30-1000MHz	Test Date:	02/27/2019
Antenna Type/Polarity:	Bi-Log/Hor & Ver	Test Personnel:	David Zhang
Remark:	N/A	Test Result:	Pass



Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
42.74	54.01	2.62	-21.88	34.75	QP	V	140	222	40.00	-5.25
49.57	53.75	2.78	-24.41	32.13	QP	V	202	104	40.00	-7.87
62.10	48.12	3.03	-24.57	26.58	QP	V	123	134	40.00	-13.42
355.62	41.00	6.09	-15.80	31.28	QP	V	200	27	46.00	-14.72
533.25	28.02	6.46	-11.73	22.75	QP	V	277	8	46.00	-23.25
718.17	25.45	7.30	-6.50	26.25	QP	H	218	310	46.00	-19.75

Note:

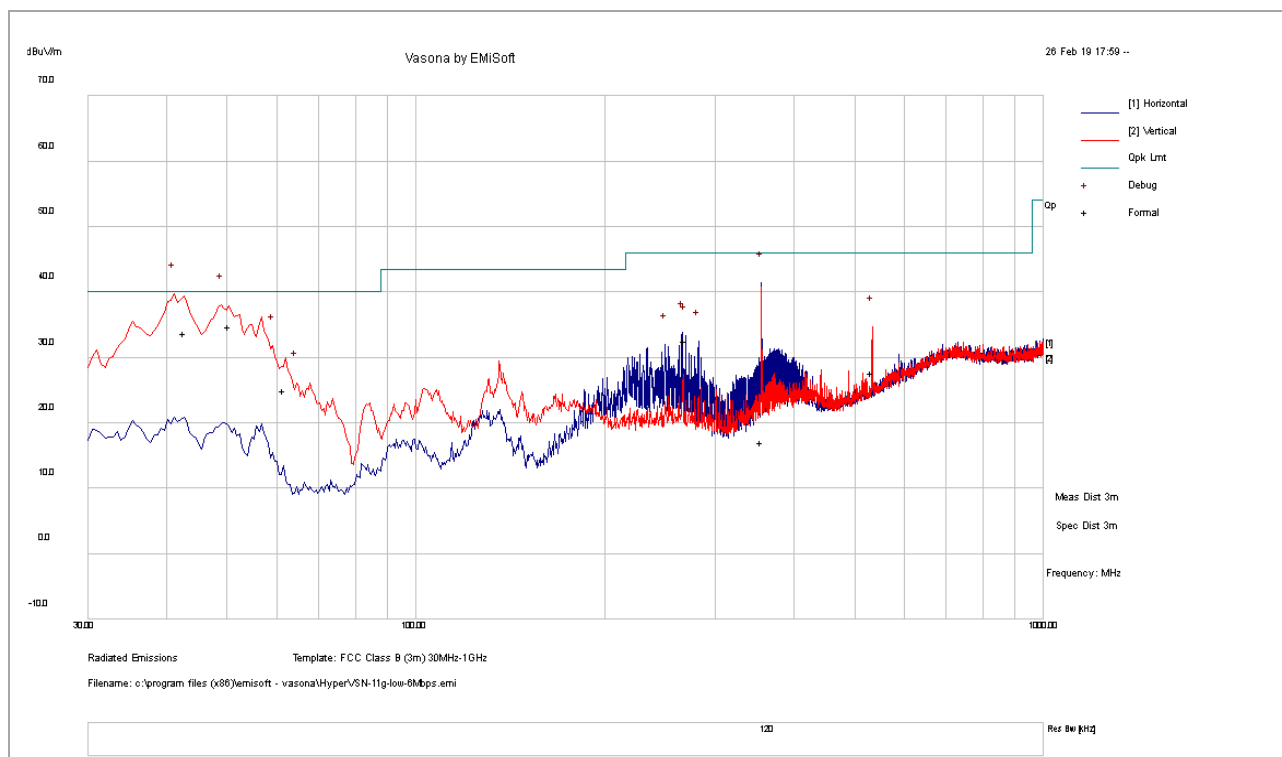
- 1) For below 1GHz, all different channel and modes were verified but only the worst case result is shown here.





30-1000MHz test result

Test Standard:	15.209	Mode:	802.11g-2412MHz
Frequency Range:	30-1000MHz	Test Date:	02/27/2019
Antenna Type/Polarity:	Bi-Log/Hor & Ver	Test Personnel:	David Zhang
Remark:	N/A	Test Result:	Pass



Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
41.20	53.61	2.58	-21.09	35.10	QP	V	102	350	40.00	-4.90
48.68	56.08	2.76	-24.15	34.68	QP	V	100	291	40.00	-5.32
59.02	50.52	2.98	-24.69	28.80	QP	V	125	135	40.00	-11.20
355.55	42.68	6.09	-15.81	32.96	QP	H	244	129	46.00	-13.04

Note:

- 1) For below 1GHz, all different channel and modes were verified but only the worst case result is shown here.

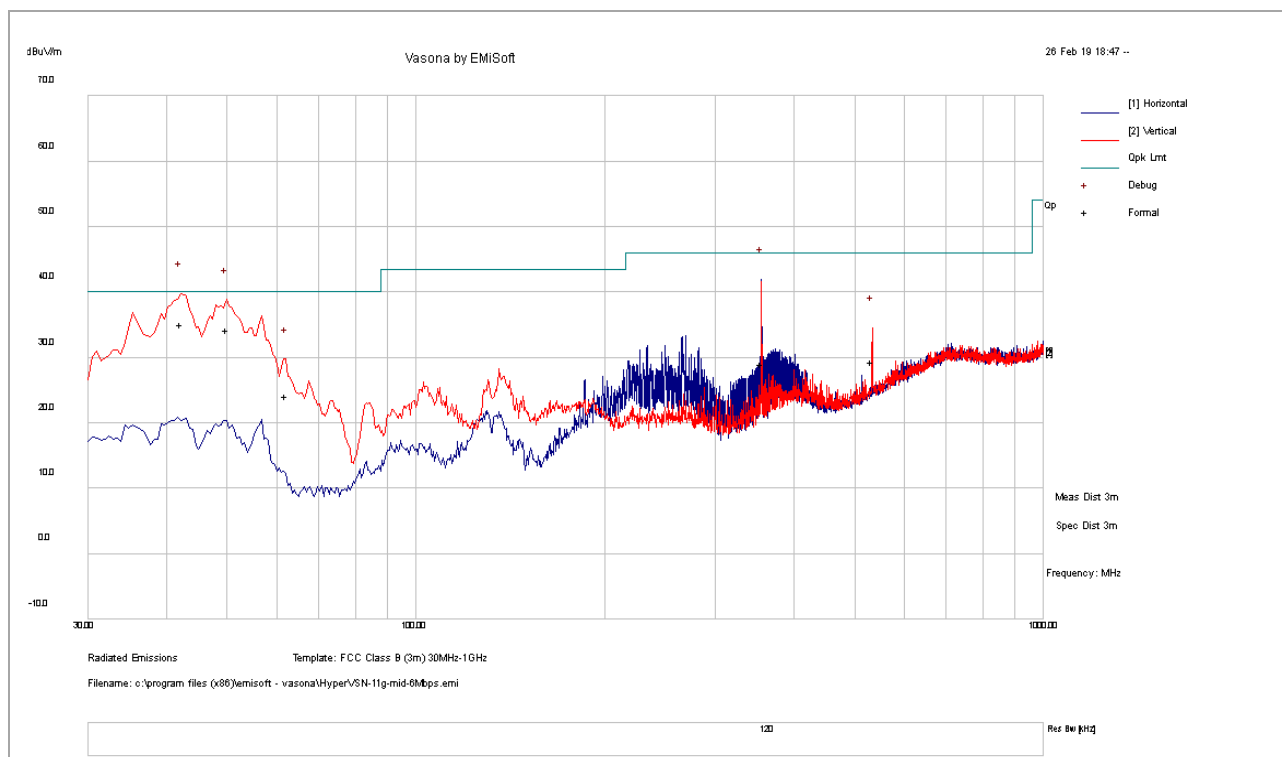


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30-1000MHz test result

Test Standard:	15.209	Mode:	802.11g-2437MHz
Frequency Range:	30-1000MHz	Test Date:	02/27/2019
Antenna Type/Polarity:	Bi-Log/Hor & Ver	Test Personnel:	David Zhang
Remark:	N/A	Test Result:	Pass



Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
42.27	54.12	2.61	-21.64	35.08	QP	V	114	62	40.00	-4.92
50.05	55.99	2.79	-24.54	34.25	QP	V	109	57	40.00	-5.75
62.15	45.66	3.03	-24.57	24.12	QP	V	218	75	40.00	-15.88
355.66	38.72	6.09	-15.80	29.01	QP	H	204	13	46.00	-16.99
533.34	34.66	6.46	-11.72	29.39	QP	V	121	350	46.00	-16.61

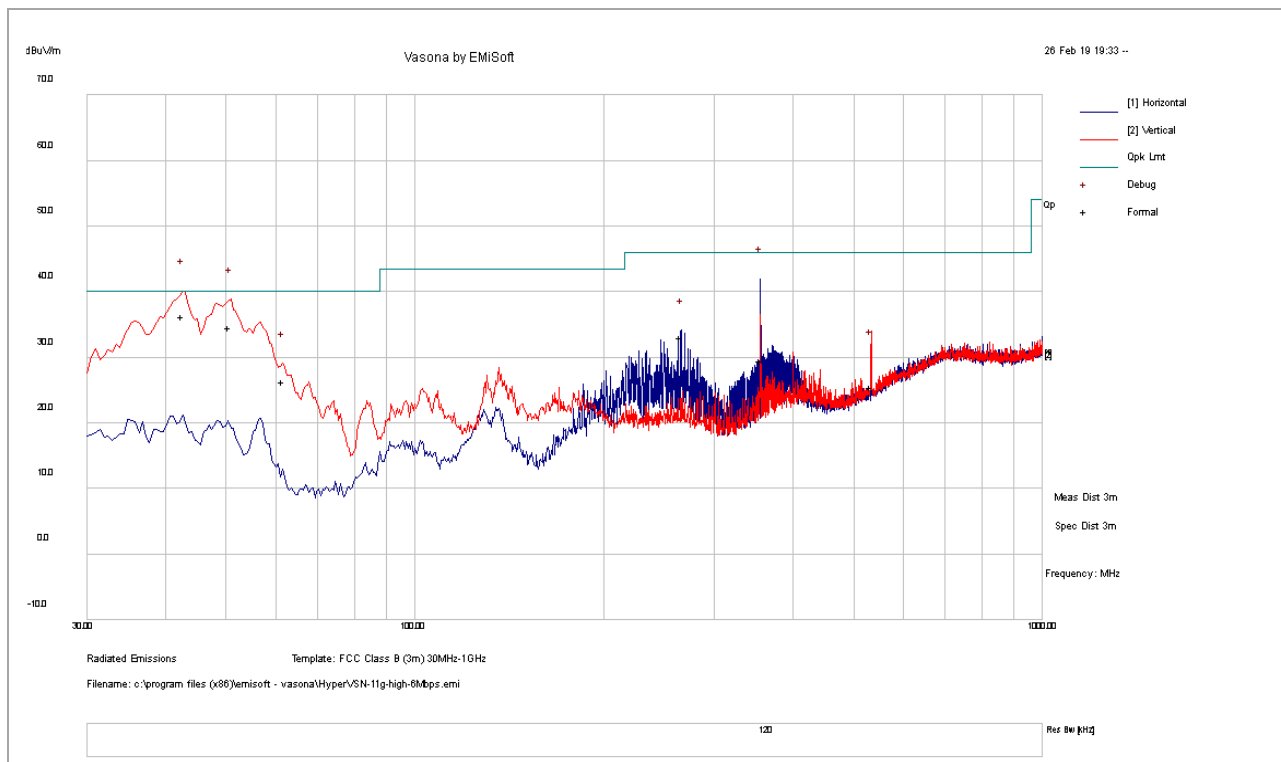
Note:

- 1) For below 1GHz, all different channel and modes were verified but only the worst case result is shown here.



30-1000MHz test result

Test Standard:	15.209	Mode:	802.11g-2462MHz
Frequency Range:	30-1000MHz	Test Date:	02/27/2019
Antenna Type/Polarity:	Bi-Log/Hor & Ver	Test Personnel:	David Zhang
Remark:	N/A	Test Result:	Pass



Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
42.57	55.53	2.61	-21.79	36.35	QP	V	104	281	40.00	-3.65
50.66	56.40	2.81	-24.61	34.59	QP	V	100	133	40.00	-5.41
61.63	48.01	3.03	-24.60	26.44	QP	V	153	138	40.00	-13.56
265.58	46.87	5.39	-19.08	33.18	QP	H	108	5	46.00	-12.82
355.66	39.31	6.09	-15.80	29.60	QP	H	225	234	46.00	-16.40
533.40	30.80	6.46	-11.72	25.54	QP	H	288	0	46.00	-20.46

Note:

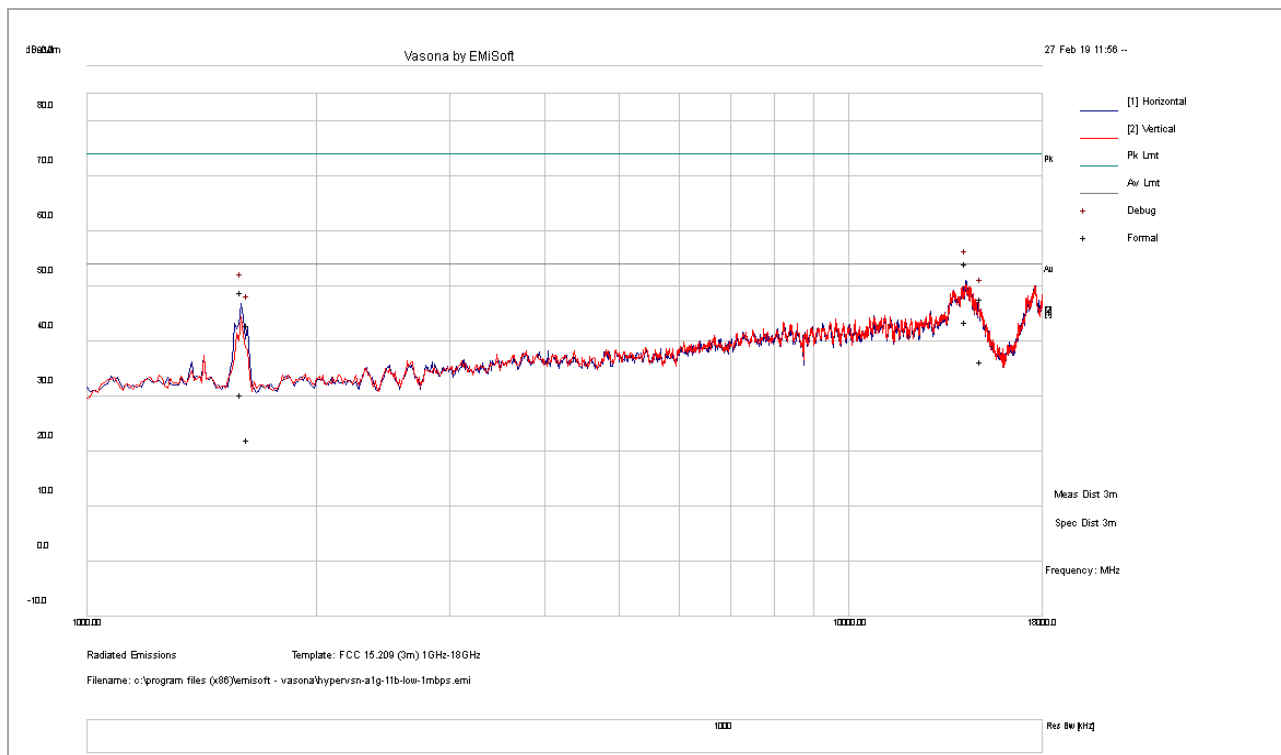
- 1) For below 1GHz, all different channel and modes were verified but only the worst case result is shown here.





1GHz – 18GHz test result

Test Standard:	15.209	Mode:	802.11b-2412MHz
Frequency Range:	1GHz-18GHz	Test Date:	02/27/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	David Zhang
Remark:	1Mbps	Test Result:	Pass



Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14281.58	25.64	20.35	8.18	54.18	PK	H	298	249	74	-19.82
1596.61	50.41	10.45	-11.80	49.07	PK	H	103	227	74	-24.93
14950.52	20.44	21.95	5.49	47.89	PK	V	272	222	74	-26.11
1628.88	44.52	10.45	-11.90	43.07	PK	H	113	237	74	-30.93
14281.58	15.18	20.35	8.18	43.71	AV	H	298	249	54	-10.29
1596.61	31.72	10.45	-11.80	30.38	AV	H	103	227	54	-23.62
14950.52	8.93	21.95	5.49	36.38	AV	V	272	222	54	-17.62
1628.88	23.60	10.45	-11.90	22.14	AV	H	113	237	54	-31.86



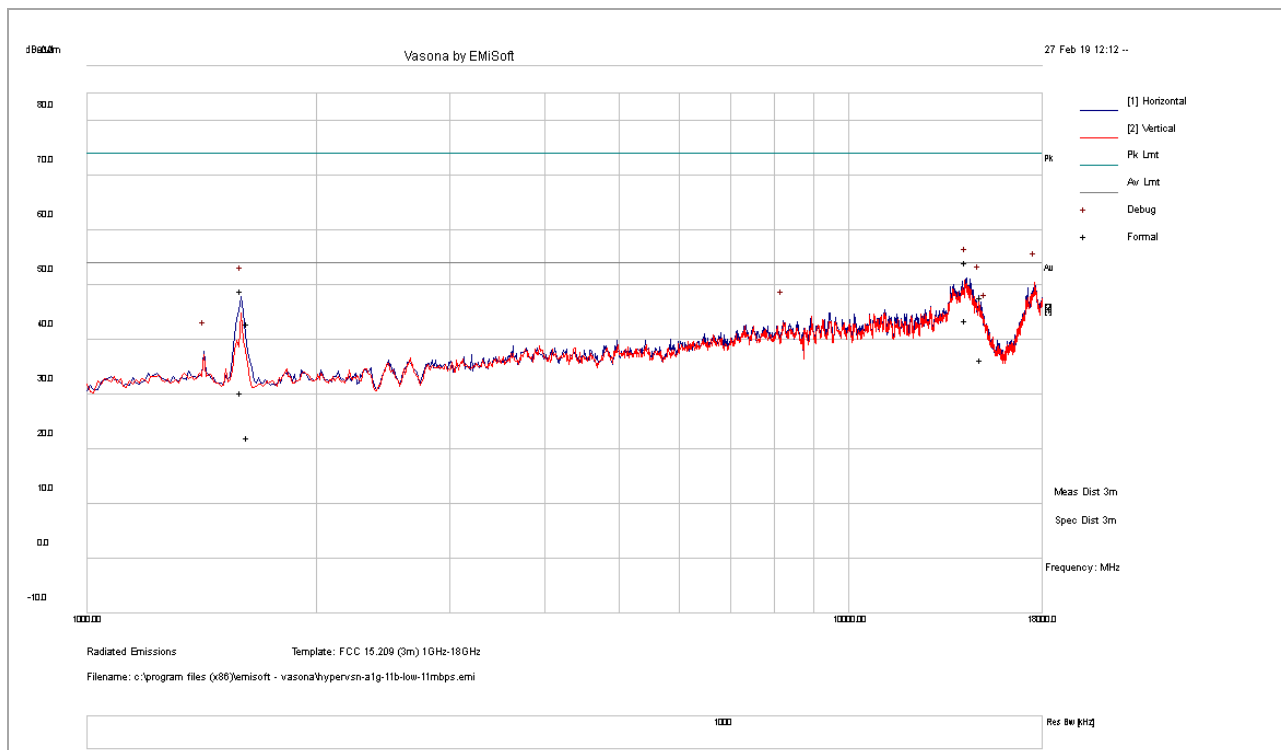
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1GHz – 18GHz test result

Test Standard:	15.209	Mode:	802.11b-2412MHz
Frequency Range:	1GHz-18GHz	Test Date:	02/27/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	David Zhang
Remark:	11Mbps	Test Result:	Pass



Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
1425.00	39.13	10.34	-11.59	37.88	PK	H	172	224	74	-36.12
1595.00	49.23	10.45	-11.80	47.88	PK	H	197	161	74	-26.12
8203.75	28.08	15.81	-0.44	43.45	PK	V	100	298	74	-30.55
14302.50	22.56	20.40	8.25	51.21	PK	H	114	329	74	-22.79
1425.00	35.91	10.34	-11.59	34.66	AV	H	172	224	54	-19.34
1595.00	42.73	10.45	-11.80	41.38	AV	H	197	161	54	-12.62
8203.75	25.83	15.81	-0.44	41.20	AV	V	100	298	54	-12.80
14302.50	16.56	20.40	8.25	45.21	AV	H	114	329	54	-8.79



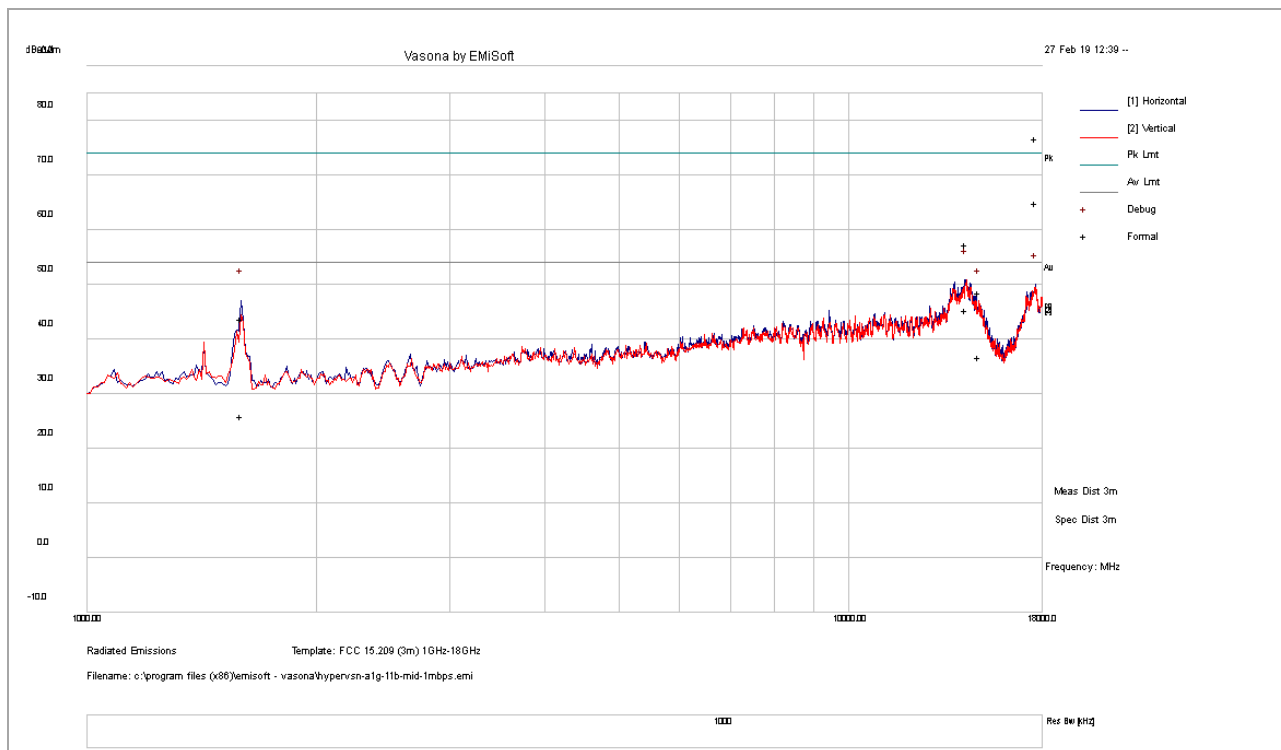
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1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11b-2437MHz
Frequency Range:	1GHz-18GHz	Test Date:	02/27/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	David Zhang
Remark:	1Mbps	Test Result:	Pass



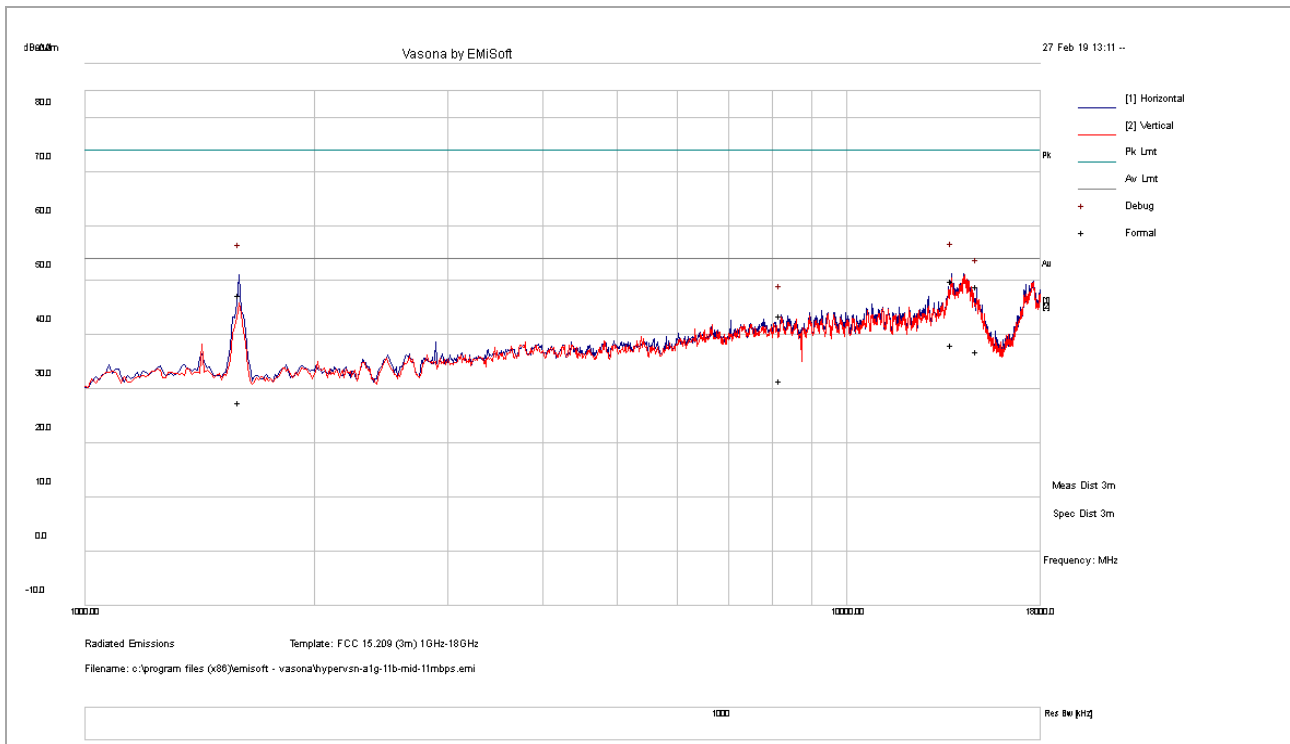
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14301.31	28.83	20.40	8.25	57.48	PK	V	245	38	74	-16.52
17640.41	28.41	23.34	11.13	62.88	PK	H	238	238	74	-11.12
14854.83	21.17	21.73	5.69	48.59	PK	H	108	138	74	-25.41
1596.83	45.27	10.45	-11.80	43.92	PK	H	118	207	74	-30.08
14301.31	16.73	20.40	8.25	45.38	AV	V	245	38	54	-8.62
17640.41	14.52	23.34	11.13	48.99	AV	H	238	238	54	-5.01
14854.83	9.41	21.73	5.69	36.83	AV	H	108	138	54	-17.17
1596.83	27.44	10.45	-11.80	26.09	AV	H	118	207	54	-27.91





1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11b-2437MHz
Frequency Range:	1GHz-18GHz	Test Date:	02/27/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	David Zhang
Remark:	11Mbps	Test Result:	Pass

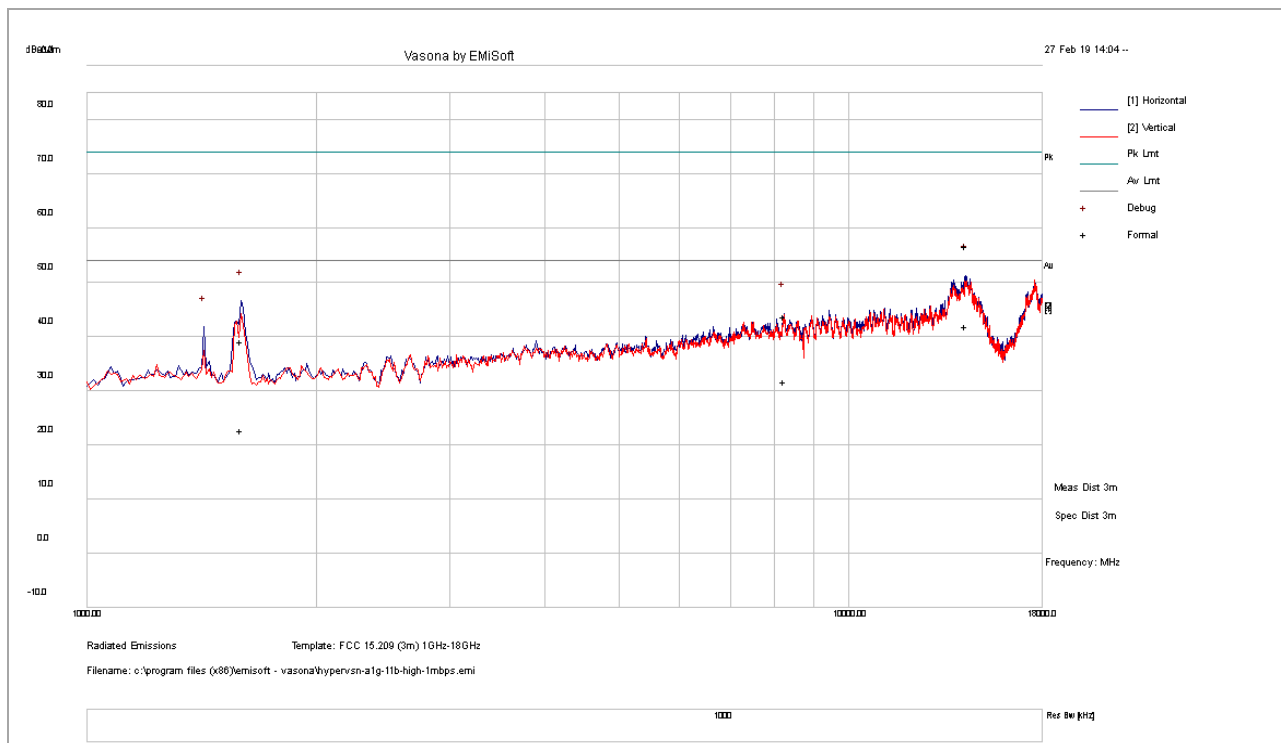


Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
13759.63	25.11	19.56	5.35	50.01	PK	V	106	125	74	-23.99
1596.73	48.72	10.45	-11.80	47.37	PK	H	155	190	74	-26.63
14845.25	21.63	21.71	5.72	49.06	PK	V	166	162	74	-24.94
8204.14	28.22	15.81	-0.44	43.60	PK	H	107	50	74	-30.40
13759.63	13.26	19.56	5.35	38.17	AV	V	106	125	54	-15.83
1596.73	28.87	10.45	-11.80	27.53	AV	H	155	190	54	-26.47
14845.25	9.62	21.71	5.72	37.04	AV	V	166	162	54	-16.96
8204.14	16.23	15.81	-0.44	31.61	AV	H	107	50	54	-22.39



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11b-2462MHz
Frequency Range:	1GHz-18GHz	Test Date:	02/27/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	David Zhang
Remark:	1Mbps	Test Result:	Pass



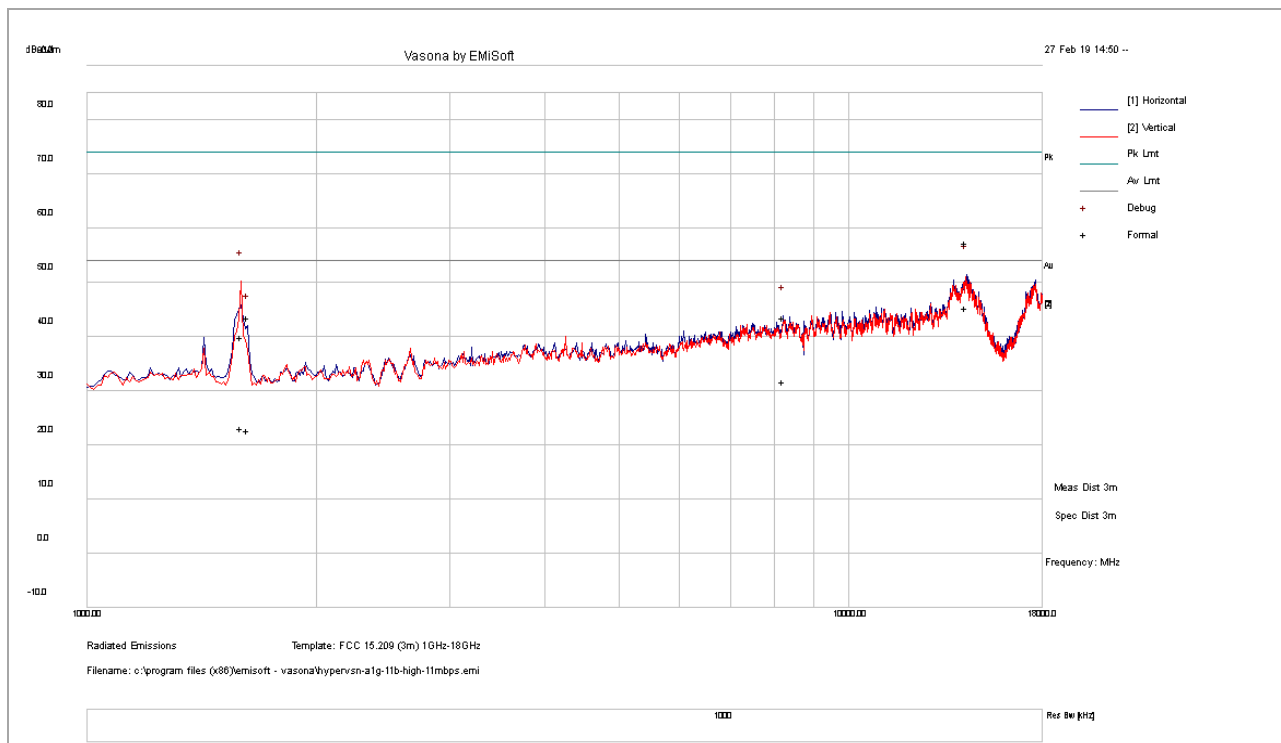
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14260.53	28.35	20.30	8.11	56.77	PK	H	369	303	74	-17.23
1596.27	40.62	10.45	-11.80	39.27	PK	H	162	166	74	-34.73
8235.83	28.27	15.82	-0.32	43.77	PK	H	112	231	74	-30.23
1425.34	47.23	10.34	-11.59	45.98	PK	H	135	347	74	-28.02
14260.53	13.60	20.30	8.11	42.01	AV	H	369	303	54	-11.99
1596.27	24.20	10.45	-11.80	22.86	AV	H	162	166	54	-31.14
8235.83	16.27	15.82	-0.32	31.77	AV	H	112	231	54	-22.23
1425.34	32.09	10.34	-11.59	30.84	AV	H	135	347	54	-23.16





1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11b-2462MHz
Frequency Range:	1GHz-18GHz	Test Date:	02/27/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	David Zhang
Remark:	11Mbps	Test Result:	Pass



Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14292.23	28.89	20.38	8.22	57.49	PK	H	363	126	74	-16.51
1596.49	41.35	10.45	-11.80	40.00	PK	V	335	284	74	-34.00
8214.61	28.23	15.82	-0.40	43.65	PK	H	291	192	74	-30.35
1626.89	45.09	10.45	-11.90	43.65	PK	H	101	248	74	-30.35
14292.23	16.85	20.38	8.22	45.45	AV	H	363	126	54	-8.55
1596.49	24.46	10.45	-11.80	23.11	AV	V	335	284	54	-30.89
8214.61	16.39	15.82	-0.40	31.80	AV	H	291	192	54	-22.20
1626.89	24.34	10.45	-11.90	22.90	AV	H	101	248	54	-31.11



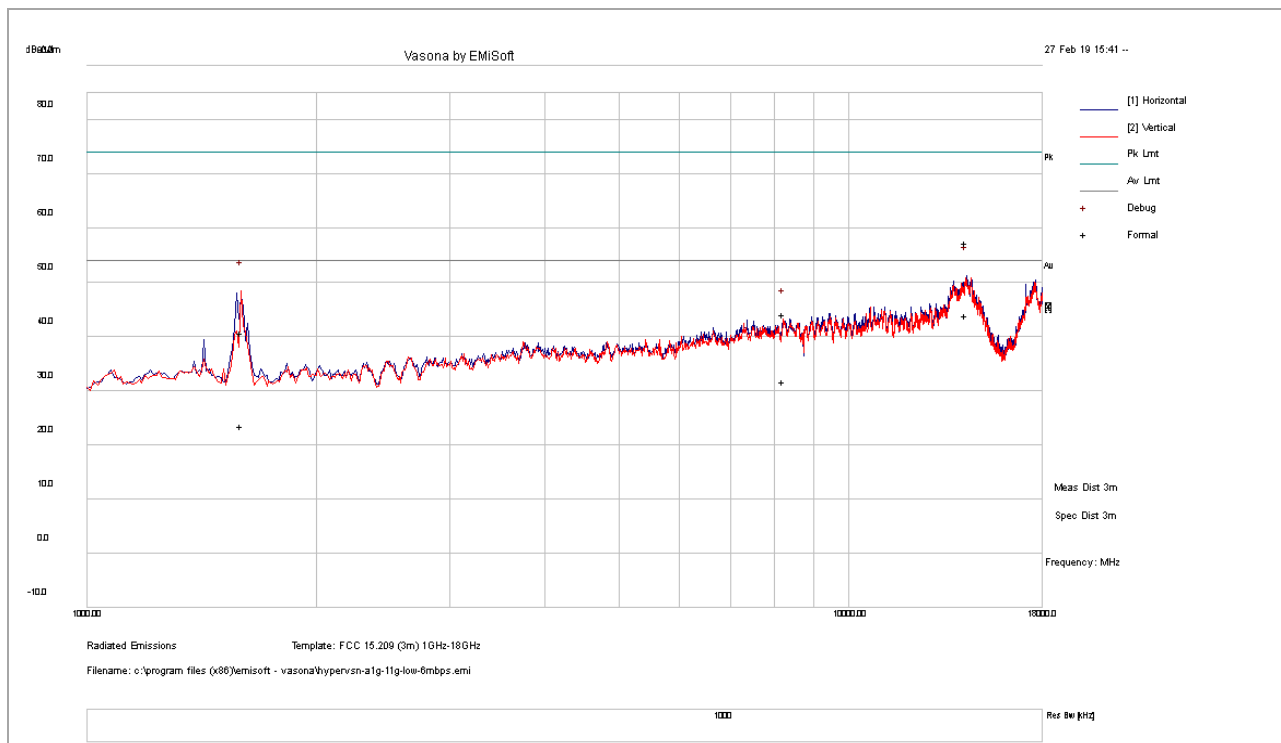
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1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11g-2412MHz
Frequency Range:	1GHz-18GHz	Test Date:	02/27/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	David Zhang
Remark:	6Mbps	Test Result:	Pass

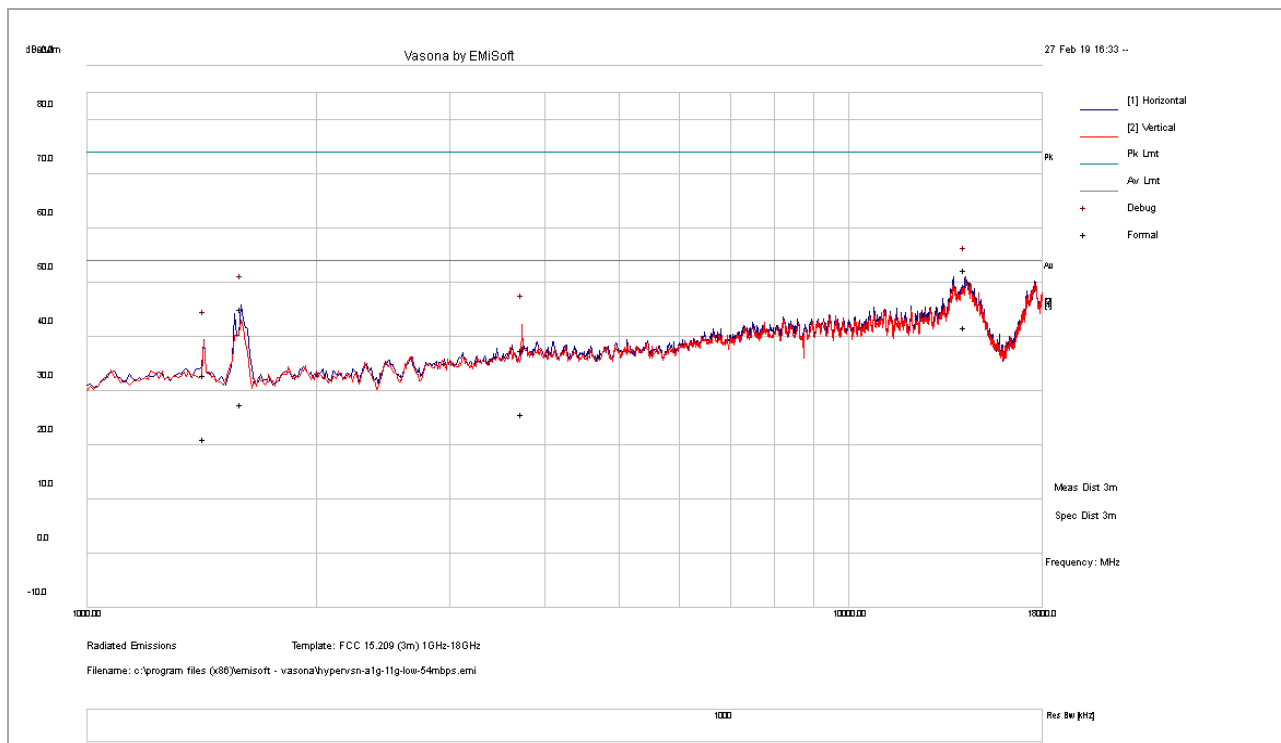


Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14281.58	25.64	20.35	8.18	54.18	PK	H	298	249	74	-19.82
1596.61	50.41	10.45	-11.80	49.07	PK	H	103	227	74	-24.93
14950.52	20.44	21.95	5.49	47.89	PK	H	272	222	74	-26.11
1628.88	44.52	10.45	-11.90	43.07	PK	H	113	237	74	-30.93
14281.58	15.18	20.35	8.18	43.71	AV	H	298	249	54	-10.29
1596.61	31.72	10.45	-11.80	30.38	AV	H	103	227	54	-23.62
14950.52	8.93	21.95	5.49	36.38	AV	H	272	222	54	-17.62
1628.88	23.60	10.45	-11.90	22.14	AV	H	113	237	54	-31.86



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11g-2412MHz
Frequency Range:	1GHz-18GHz	Test Date:	02/27/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	David Zhang
Remark:	54Mbps	Test Result:	Pass



Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14251.16	24.15	20.28	8.08	52.51	PK	H	363	70	74	-21.49
1596.86	46.52	10.45	-11.80	45.17	PK	H	178	242	74	-28.83
3728.99	32.32	12.14	-6.74	37.72	PK	V	150	25	74	-36.28
1424.63	34.19	10.34	-11.59	32.94	PK	V	137	34	74	-41.06
14251.16	13.51	20.28	8.08	41.87	AV	H	363	70	54	-12.13
1596.86	28.91	10.45	-11.80	27.57	AV	H	178	242	54	-26.43
3728.99	20.39	12.14	-6.74	25.79	AV	V	150	25	54	-28.21
1424.63	22.41	10.34	-11.59	21.17	AV	V	137	34	54	-32.83



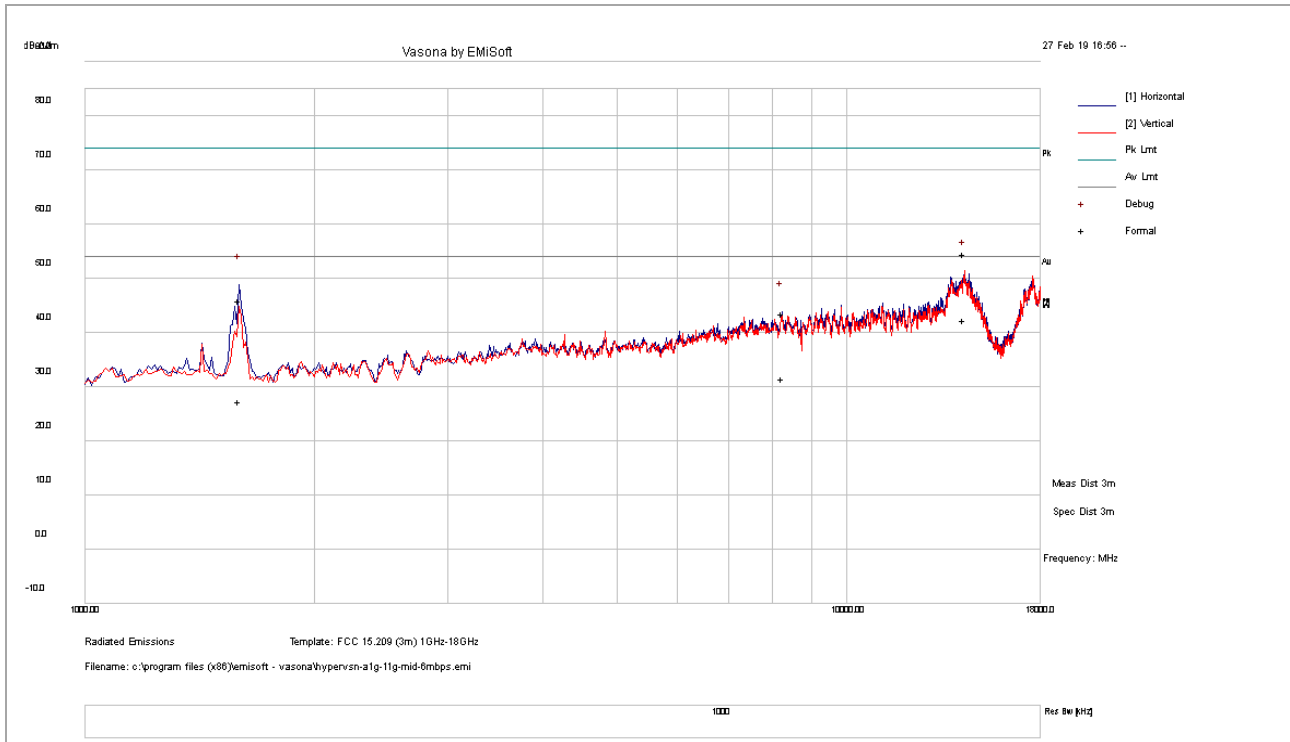
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1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11g-2437MHz
Frequency Range:	1GHz-18GHz	Test Date:	02/27/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	David Zhang
Remark:	6Mbps	Test Result:	Pass

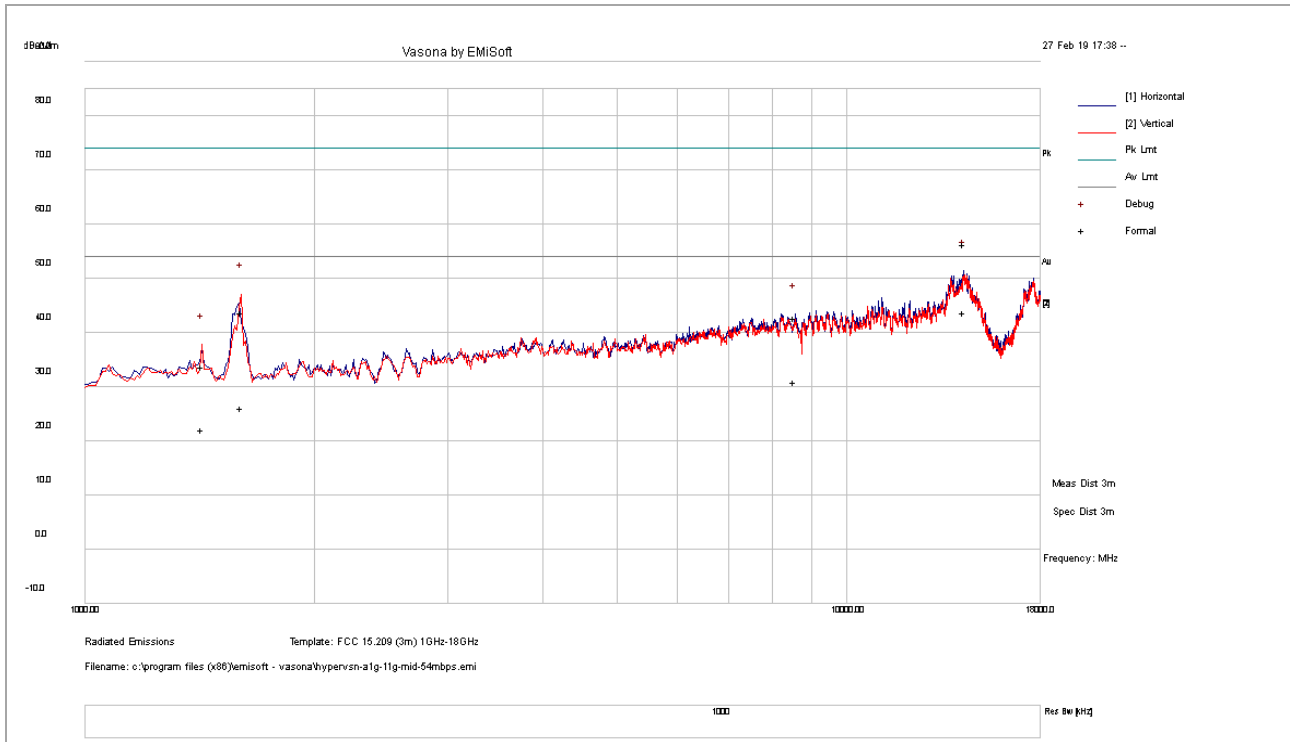


Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14291.42	26.12	20.38	8.22	54.72	PK	V	215	0	74	-19.28
1596.67	47.47	10.45	-11.80	46.13	PK	H	123	184	74	-27.87
8237.42	28.04	15.82	-0.32	43.54	PK	H	397	348	74	-30.46
14291.42	13.80	20.38	8.22	42.40	AV	V	215	0	54	-11.60
1596.67	28.74	10.45	-11.80	27.39	AV	H	123	184	54	-26.61
8237.42	16.13	15.82	-0.32	31.63	AV	H	397	348	54	-22.37



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11g-2437MHz
Frequency Range:	1GHz-18GHz	Test Date:	02/27/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	David Zhang
Remark:	54Mbps	Test Result:	Pass

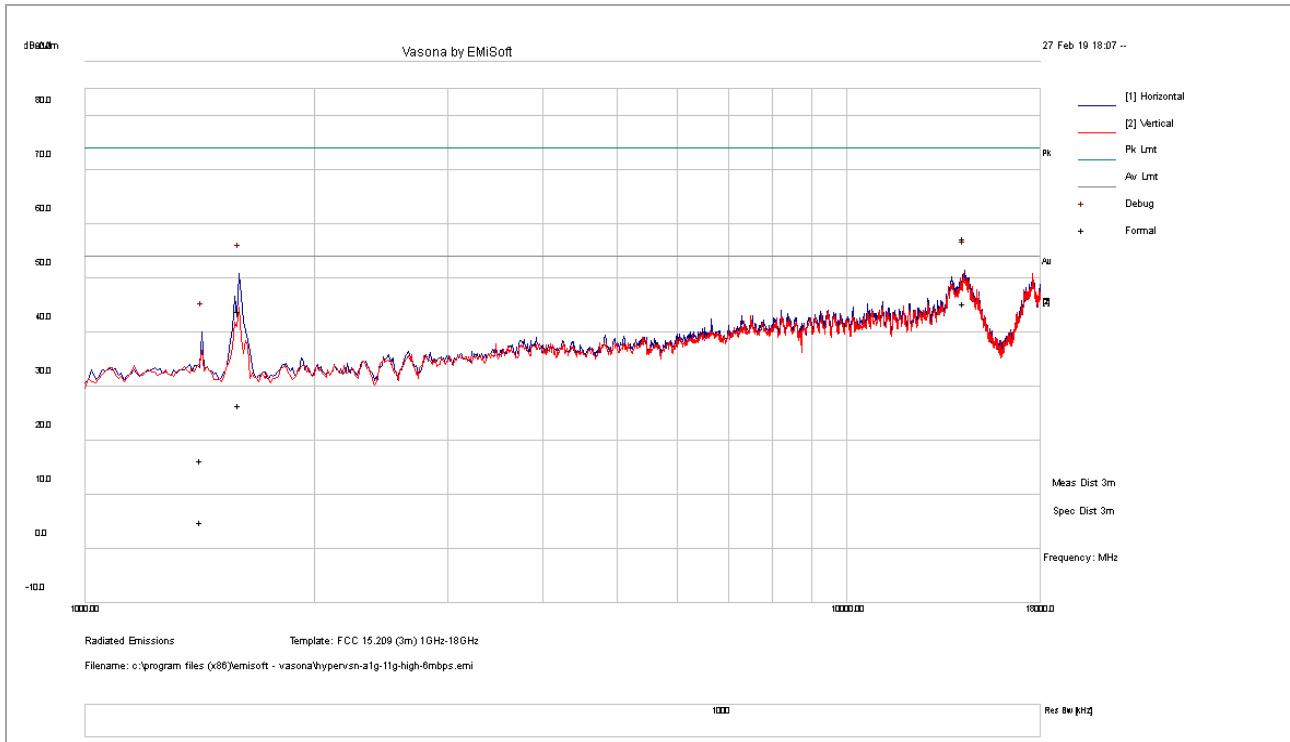


Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14279.85	27.92	20.35	8.18	56.44	PK	H	391	149	74	-17.56
1603.66	45.24	10.45	-11.81	43.89	PK	V	223	128	74	-30.11
8566.92	26.98	15.88	0.01	42.86	PK	H	246	232	74	-31.14
1426.37	35.17	10.34	-11.60	33.92	PK	V	176	248	74	-40.08
14279.85	15.24	20.35	8.18	43.77	AV	H	391	149	54	-10.23
1603.66	27.63	10.45	-11.81	26.28	AV	V	223	128	54	-27.73
8566.92	15.18	15.88	0.01	31.06	AV	H	246	232	54	-22.94
1426.37	23.53	10.34	-11.60	22.28	AV	V	176	248	54	-31.72



1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11g-2462MHz
Frequency Range:	1GHz-18GHz	Test Date:	02/27/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	David Zhang
Remark:	6Mbps	Test Result:	Pass



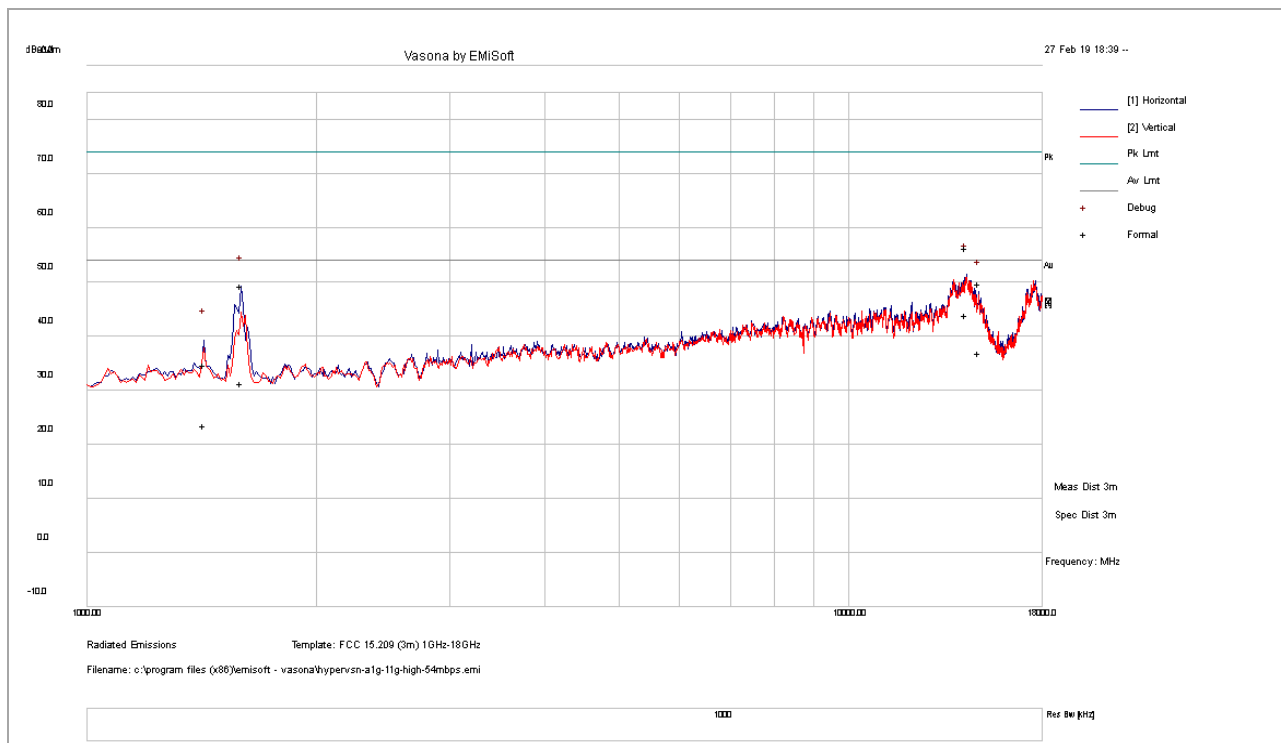
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14290.51	28.94	20.38	8.22	57.53	PK	H	399	223	74	-16.47
1596.70	45.41	10.45	-11.80	44.06	PK	H	169	204	74	-29.94
1423.01	17.73	10.34	-11.58	16.49	PK	H	241	117	74	-57.51
14290.51	16.84	20.38	8.22	45.43	AV	H	399	223	54	-8.57
1596.70	27.99	10.45	-11.80	26.65	AV	H	169	204	54	-27.35
1423.01	6.18	10.34	-11.58	4.94	AV	H	241	117	54	-49.06





1GHz – 18GHz test result

Test Standard:	15.209	Mode:	11g-2462MHz
Frequency Range:	1GHz-18GHz	Test Date:	02/27/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	David Zhang
Remark:	54Mbps	Test Result:	Pass



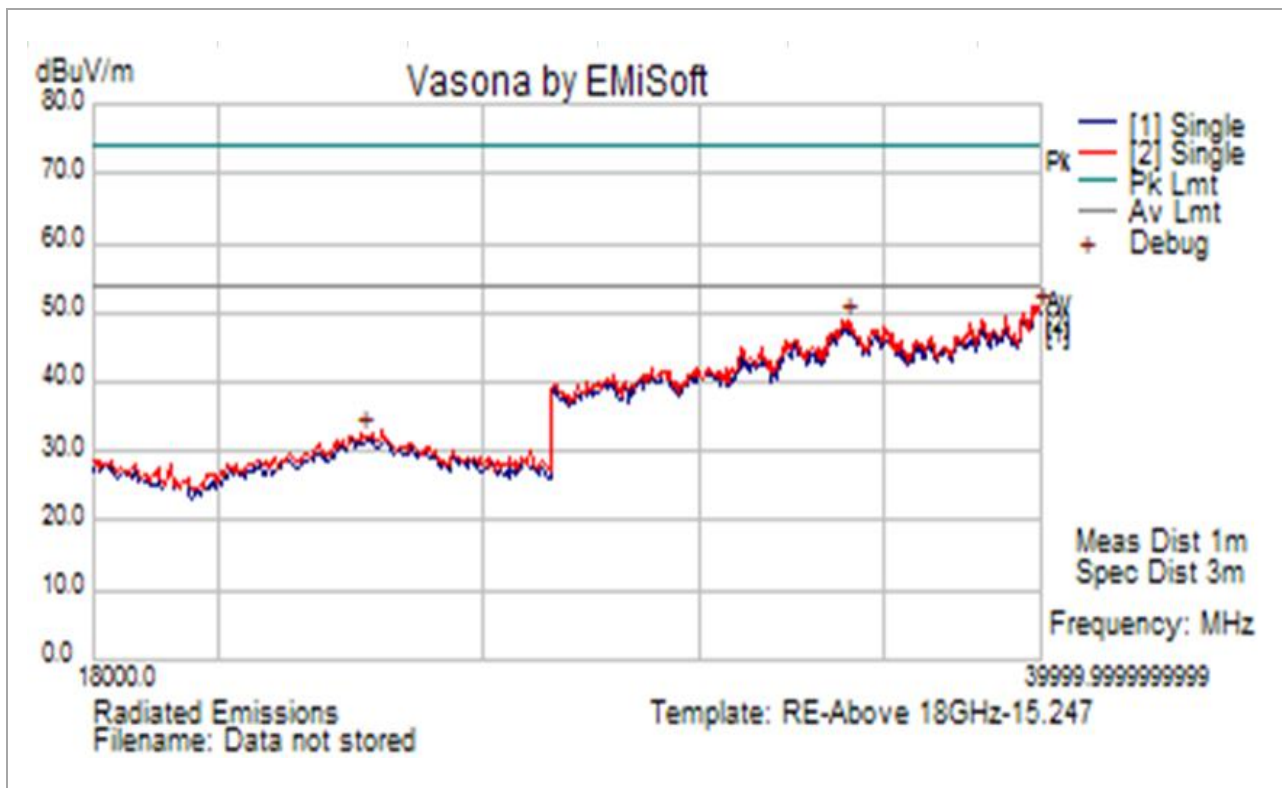
Frequency MHz	Raw dB	Cable dB	AF dB	Level dBuV/m	Det	Pol deg	Height cm	Table cm	Limit dBuV/m	Margin dB
14291.36	27.79	20.38	8.22	56.39	PK	V	363	277	74	-17.61
1597.00	50.76	10.45	-11.80	49.42	PK	H	100	225	74	-24.58
14844.51	22.35	21.70	5.72	49.78	PK	H	126	171	74	-24.22
1426.56	36.00	10.34	-11.60	34.74	PK	H	100	94	74	-39.26
14291.36	15.39	20.38	8.22	43.98	AV	V	363	277	54	-10.02
1597.00	32.73	10.45	-11.80	31.38	AV	H	100	225	54	-22.62
14844.51	9.59	21.70	5.72	37.02	AV	H	126	171	54	-16.98
1426.56	24.84	10.34	-11.60	23.58	AV	H	100	94	54	-30.42





18GHz – 40GHz test result

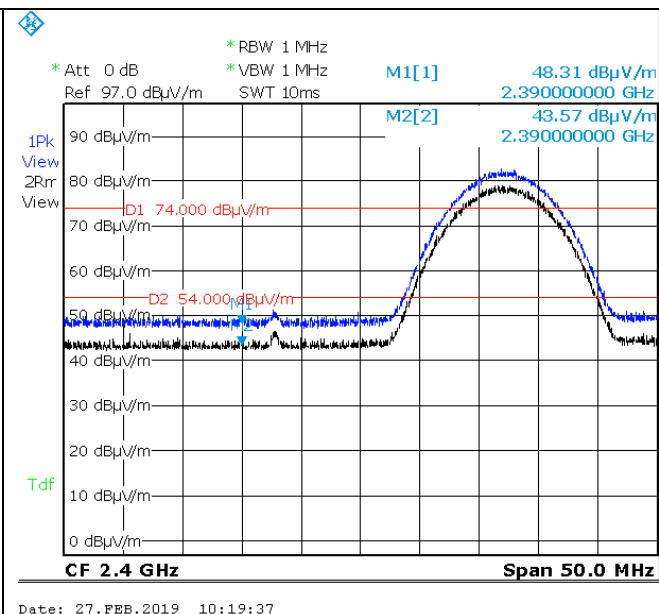
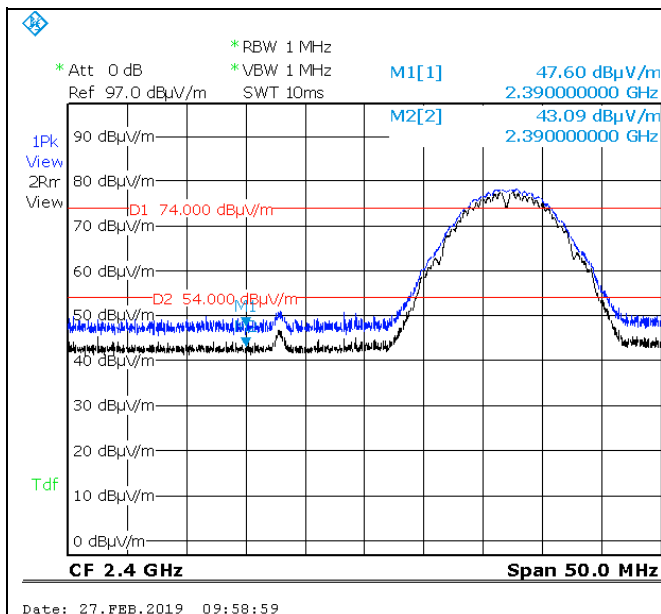
Test Standard:	15.209	Mode:	11g-2437MHz
Frequency Range:	18GHz-40GHz	Test Date:	02/27/2019
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	David Zhang
Remark:	N/A	Test Result:	Pass



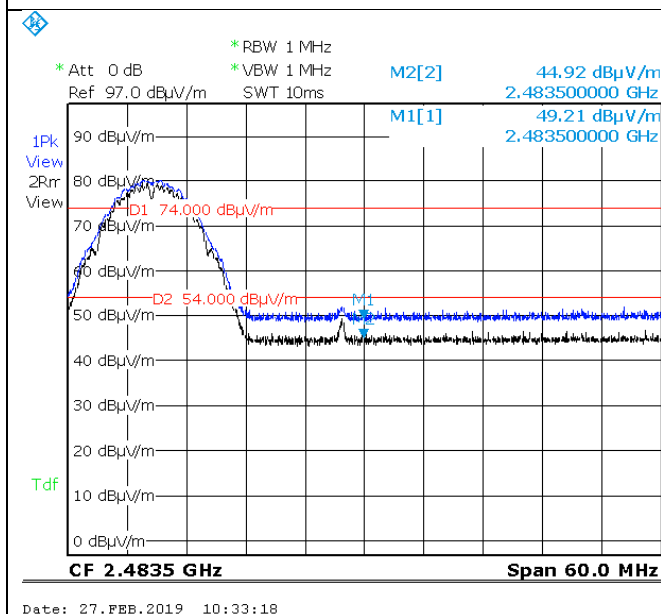
Note: no substantial emission is found other than the noise floor. Different modes have been verified and the worst case one is presented here.



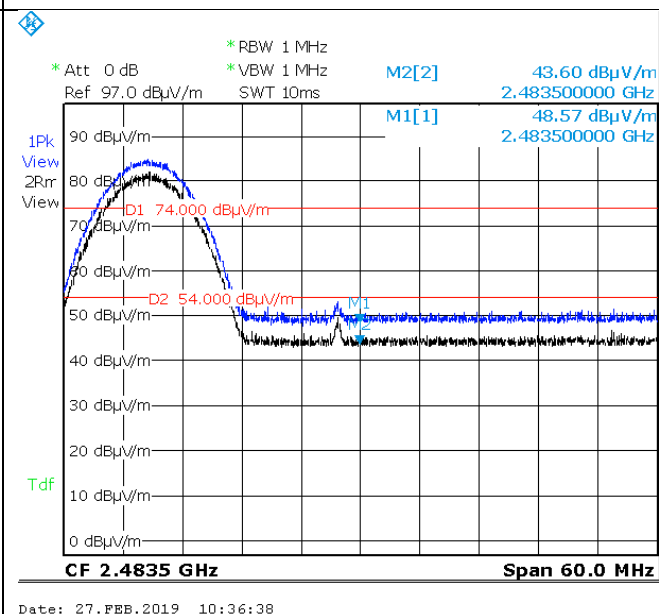
Restricted Band Measurement Plots:



802.11b 2412M-1Mbps



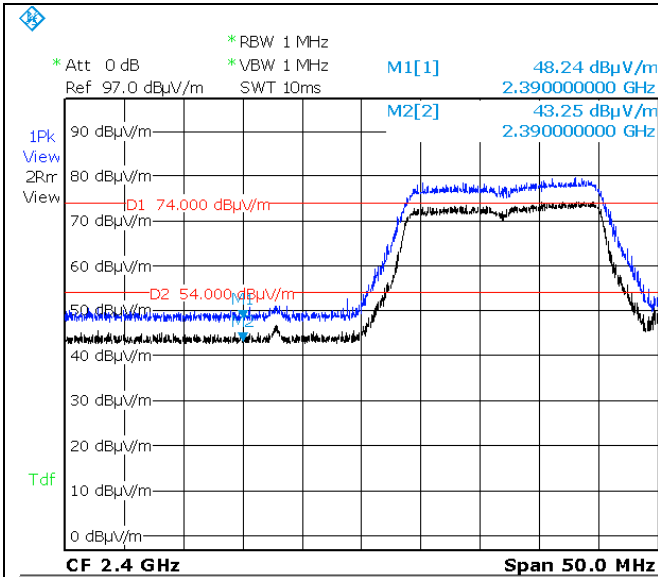
802.11b 2412M-11Mbps



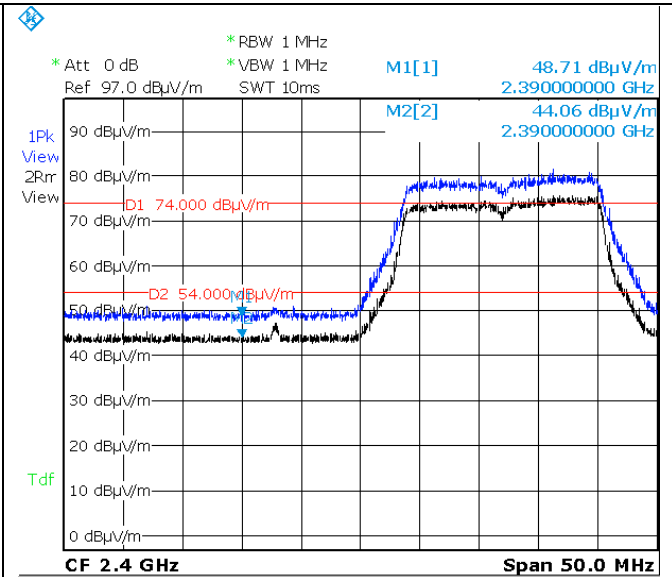
802.11b 2462M-1Mbps

802.11b 2462M-11Mbps



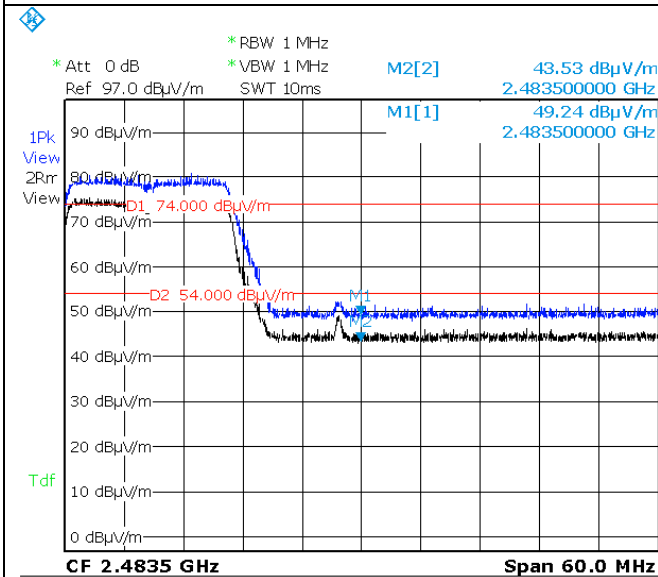


Date: 27.FEB.2019 10:23:36



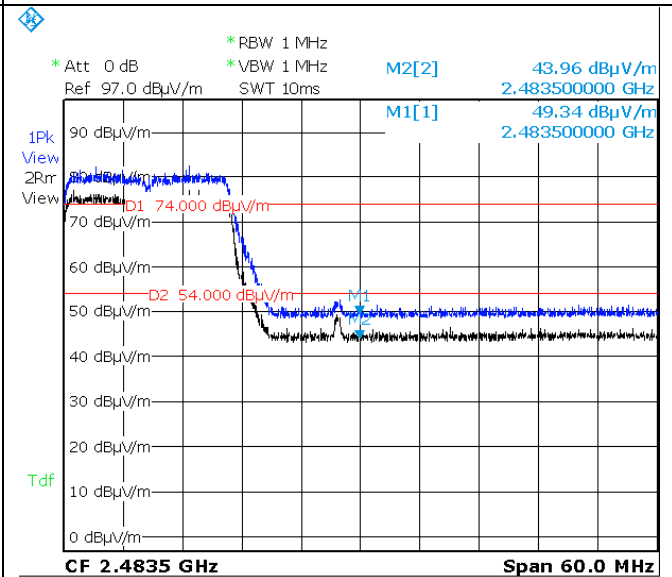
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802.11g-2412M-6Mbps



Date: 27.FEB.2019 10:39:36

802.11g-2412M-54Mbps



Date: 27.FEB.2019 10:43:09

802.11g-2462M-6Mbps

802.11g-2462M-54Mbps



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8.7 Conducted Emissions

8.7.1 Requirement

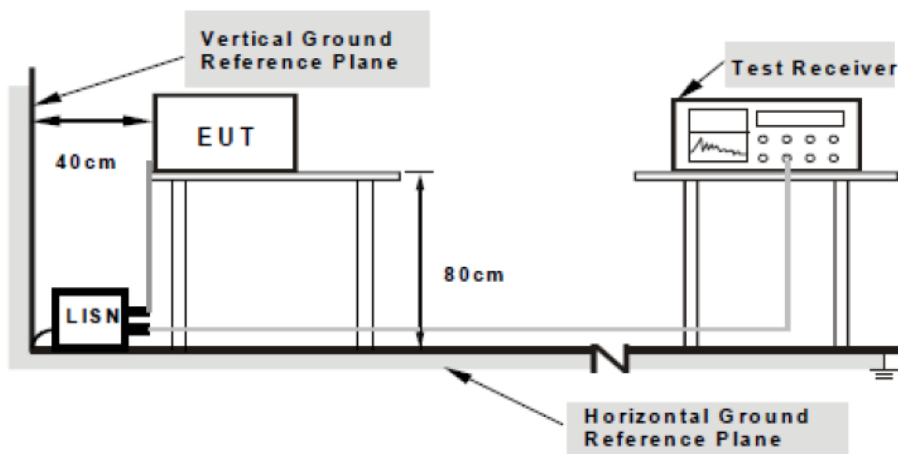
Per § 15.207 (a), an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following 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.

Limits for Conducted Emissions at the Mains Ports

Section	Frequency ranges (MHz)	Limit (dBuV)	
		QP	Average
Class B devices	0.15 – 0.5	66 – 56	56 – 46
	0.5 – 5	56	46
	5 - 30	60	50

NOTE 1 The lower limit shall apply at the transition frequencies.

8.7.2 Test setup



- Note:**
1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.

Report Number:	HVN-19020101-LC-RF-FCC-DTS
Product:	High-definition 3D holographic emulating device
Model Number:	MS



8.7.3 Test Procedure

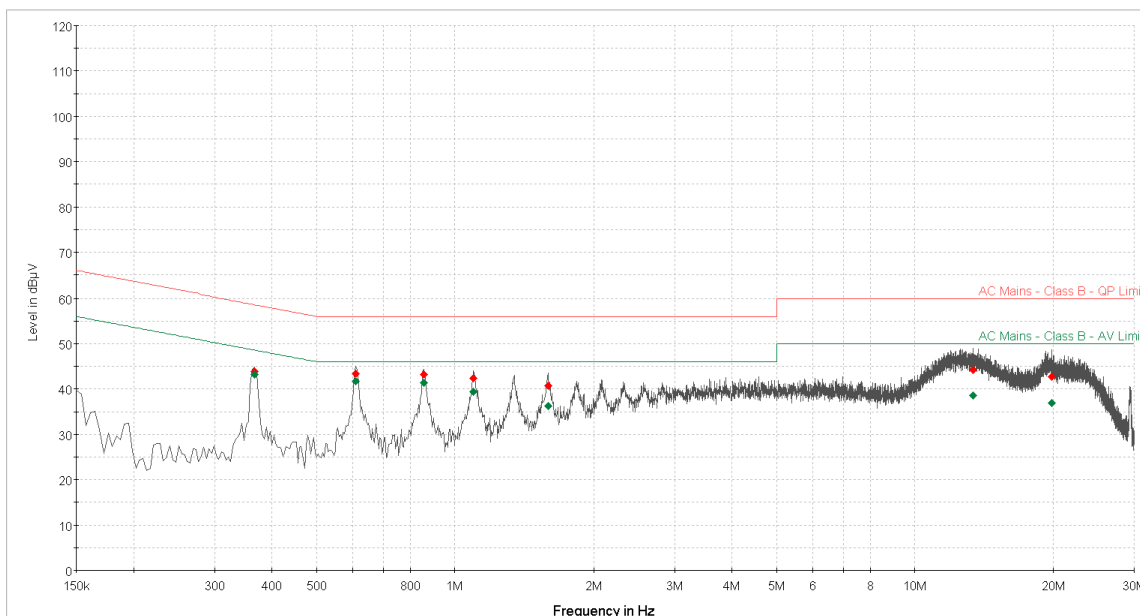
1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table.
2. The power supply for the EUT was fed through a 50Ω/50μH EUT LISN, connected to filtered mains.
3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.
4. All other supporting equipment was powered separately from another main supply.
5. The EUT was switched on and allowed to warm up to its normal operating condition.
6. A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver.
7. High peaks, relative to the limit line, were then selected.
8. The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10 kHz. For FCC tests, only Quasi-peak measurements were made; while for CISPR/EN tests, both Quasi-peak and Average measurements were made.
9. All possible modes of operation were investigated. Only the worst case emissions were measured and reported. All other emissions were relatively insignificant.



8.7.4 Test Result

Live Line

Test Standard:	47CFR 15.207	Mode:	Line
Frequency Range:	0.15-30MHz	Test Date:	02/27/2019
Antenna Type/Polarity:	N/A	Test Personnel:	David Zhang
Remark:	120VAC, 60Hz	Test Result:	Pass

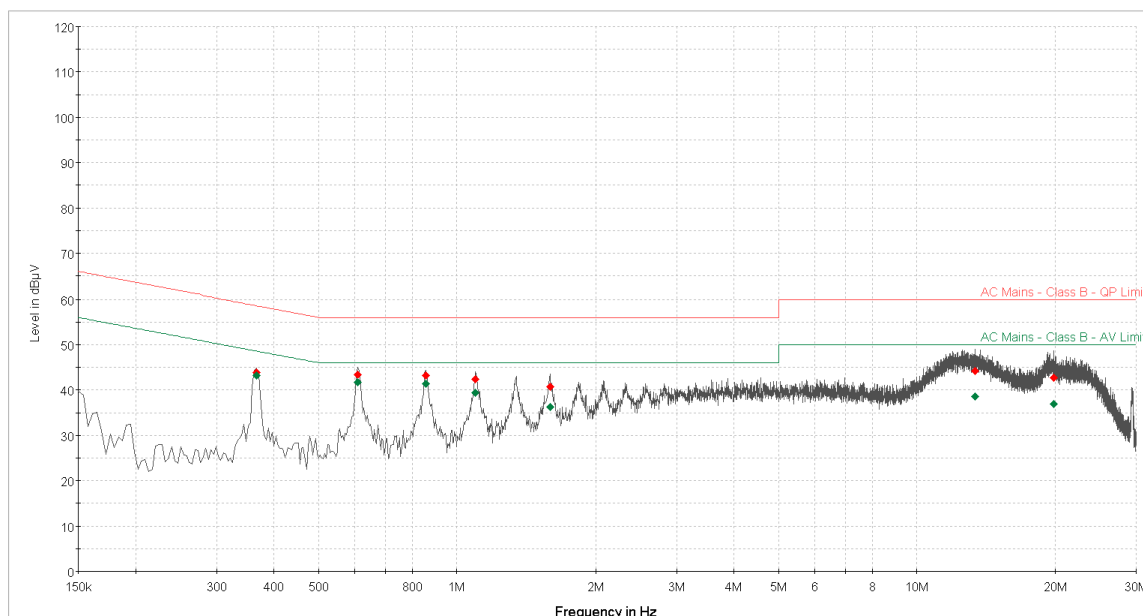


Frequency (MHz)	Level (dBuV/m)	Meas. Type	Line	Limit (dBuV/m)	Margin (dB)	Pass /Fail
0.609	43.286	QP	Live	56.00	-12.71	Pass
0.855	43.175	QP	Live	56.00	-12.83	Pass
1.098	42.296	QP	Live	56.00	-13.70	Pass
0.366	43.929	QP	Live	58.58	-14.65	Pass
1.590	40.671	QP	Live	56.00	-15.33	Pass
13.374	44.272	QP	Live	60.00	-15.73	Pass
0.609	41.687	AV	Live	46.00	-4.31	Pass
0.855	41.451	AV	Live	46.00	-4.55	Pass
1.098	43.193	AV	Live	48.58	-5.39	Pass
0.366	39.463	AV	Live	46.00	-6.54	Pass
1.590	36.199	AV	Live	46.00	-9.80	Pass
13.374	38.493	AV	Live	50.00	-11.51	Pass



Neutral Line

Test Standard:	47CFR 15.207	Mode:	Line
Frequency Range:	0.15-30MHz	Test Date:	02/27/2019
Antenna Type/Polarity:	N/A	Test Personnel:	David Zhang
Remark:	120VAC, 60Hz	Test Result:	Pass



Frequency (MHz)	Level (dBuV/m)	Meas. Type	Line	Limit (dBuV/m)	Margin (dB)	Pass /Fail
0.855	43.643	QP	Neutral	56.00	-12.36	Pass
0.609	43.532	QP	Neutral	56.00	-12.47	Pass
1.101	42.805	QP	Neutral	56.00	-13.20	Pass
1.340	41.572	QP	Neutral	56.00	-14.43	Pass
0.363	44.267	QP	Neutral	60.00	-15.73	Pass
12.821	43.576	QP	Neutral	60.00	-16.42	Pass
19.433	41.073	QP	Neutral	58.67	-17.59	Pass
23.321	41.698	QP	Neutral	60.00	-18.30	Pass
0.855	41.929	AV	Neutral	46.00	-4.07	Pass
0.609	41.903	AV	Neutral	46.00	-4.10	Pass
1.101	40.162	AV	Neutral	46.00	-5.84	Pass
1.340	37.284	AV	Neutral	46.00	-8.72	Pass
0.363	38.971	AV	Neutral	48.67	-9.70	Pass
12.821	38.563	AV	Neutral	50.00	-11.44	Pass
19.433	37.740	AV	Neutral	50.00	-12.26	Pass
23.321	36.002	AV	Neutral	50.00	-14.00	Pass



9 Test instrument list

Equipment	Manufacturer	Model	Serial Number	Cal. Date	Cal. Due
Semi-Anechoic Chamber	ETS-Lindgren	10M	VL001	5/11/2018	5/11/2019
Shielding Control Room	ETS-Lindgren	Series 81	VL006	N/A	N/A
Spectrum Analyzer	Keysight	N9020A	MY50110074	5/4/2018	5/4/2019
EMC Test Receiver	R&S	ESL6	100230	5/7/2018	5/7/2019
LISN (9KHz – 30MHz)	EMCO	3816/2	9705-1066	5/4/2018	5/4/2019
Bi-Log Antenna	ETS-Lindgren	3142E	217921	11/15/2018	11/15/2019
Horn Antenna (1-18GHz)	Electro-Metrics	EM-6961	6292	5/2/2018	5/2/2019
Horn Antenna (18-40GHz)	Com-Power	AH-840	101109	5/2/2018	5/2/2019
Preamplifier	RF Bay, Inc.	LPA-10-20	11180621	5/10/2018	5/10/2019
True RMS Multi-meter	UNI-T	UT181A	C173014829	5/10/2018	5/10/2019
Temp / Humidity / Pressure Meter	PCE Instruments	PCE-THB 40	R062028	5/9/2018	5/9/2019
RF Attenuator	Pasternack	PE7005-3	VL061	5/10/2018	5/10/2019
Preamplifier 100KHz - 40GHz	Aeroflex	33711-392- 77150-11	064	5/10/2018	5/10/2019
EM Center Control	ETS-Lindgren	7006-001	160136	N/A	N/A
Turn Table	ETS-Lindgren	2181-3.03	VL002	N/A	N/A
Boresight Antenna Tower	ETS-Lindgren	2171B	VL003	N/A	N/A
Loop Antenna (9k-30MHz)	Com-Power	AL-130	121012	5/9/2018	5/9/2019
RE test cable(below 6GHz)	Vista	RE-6GHz-01	RE-6GHz-01	5/10/2018	5/10/2019
RE test cable (1-18GHz)	PhaseTrack	II-240	RE-18GHz-01	5/10/2018	5/10/2019
RE test cable (>18GHz)	Sucoflex	104	344903/4	5/10/2018	5/10/2019
Pulse limiter	Com-Power	LIT-930A	531727	5/15/2018	5/15/2019
CE test cable #1	FIRST RF	FRF-C-1002-001	CE-6GHz-01	5/10/2018	5/10/2019
CE test cable#2	FIRST RF	FRF-C-1002-001	CE-6GHz-02	5/9/2018	5/9/2019