FCC 47 CFR PART 15 SUBPART C AND ANSI C63.10:2013 TEST REPORT

For

Smart Energy Wireless Router

Model: Billion SG600R2

Data Applies To: Please refer to section 2 (altogether 9 series models)

Trade Name: Billion, BEC

Issued for

Billion Electric Co., Ltd.

8F., No.192, Sec. 2, Zhongxing Rd., Xindian Dist., New Taipei City 231, Taiwan (R.O.C.)

Issued by

Compliance Certification Services Inc.
Hsinchu Lab.
No.989-1, Wenshan Rd., Shangshan Village,
Qionglin Township, Hsinchu County 30741, Taiwan (R.O.C.)
TEL: +886-3-5921698
FAX: +886-3-5921108

http://www.ccsrf.com
E-Mail: service@ccsrf.com

Issued Date: December 16, 2016

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	12/13/2016	Initial Issue	All Page 101	Dola Hsieh
01	12/16/2016	Add Measurement Uncertainty	P.10	Gloria Chang

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TABLE OF CONTENTS

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1. TEST REPORT CERTIFICATION

Applicant	:	Billion Electric Co., Ltd.
Address	:	8F., No.192, Sec. 2, Zhongxing Rd., Xindian Dist., New Taipei City 231, Taiwan (R.O.C.)
Equipment Under Test	:	Smart Energy Wireless Router
Model	:	Billion SG600R2
Data Applies To	:	Please refer to section 2 (altogether 9 series models)
Trade Name	:	Billion, BEC
Tested Date	:	October 20 ~ December 05, 2016

APPLICABLE STANDARD	
Standard	**Test Result**
FCC Part 15 Subpart C AND ANSI C63.10:2013	PASS

WE HEREBY CERTIFY THAT: The above equipment has been tested by Compliance Certification Services Inc., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved by:

Sb. Lu
Sr. Engineer

Reviewed by:

Gundam Lin
Sr. Engineer

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2. EUT DESCRIPTION

Product Name	Smart Energy Wireless Router
Model Number	Billion SG600R2
Data Applies To	Please refer to section 2 (altogether 9 series models)
Identify Number	T161020S01
Received Date	October 20, 2016
Frequency Range	IEEE 802.11b/g, 802.11gn HT20 Mode: 2412MHz ~ 2462MHz IEEE 802.11gn HT40 Mode: 2422MHz ~ 2452MHz
Transmit Power	IEEE 802.11b Mode: 20.41 dBm (0.1099 W) IEEE 802.11g Mode: 25.44 dBm (0.3499 W) IEEE 802.11gn HT20 MCS0 Mode: 24.82 dBm (0.3034 W) IEEE 802.11gn HT40 MCS0 Mode: 24.77 dBm (0.2999 W)
Channel Spacing	IEEE 802.11b/g, 802.11gn HT20/HT40 : 5MHz
Channel Number	IEEE 802.11b/g, 802.11gn HT20 Mode: 11 Channels IEEE 802.11gn HT40 Mode: 7 Channels
Transmit Data Rate	IEEE 802.11b Mode: up to 11 Mbps IEEE 802.11g Mode: up to 54 Mbps IEEE 802.11gn HT20 Mode (800ns GI): up to 65.00 Mbps IEEE 802.11gn HT20 Mode (400ns GI): up to 72.20 Mbps IEEE 802.11gn HT40 Mode (800ns GI): up to 135.0 Mbps IEEE 802.11gn HT40 Mode (400ns GI): up to 150.00 Mbps
Type of Modulation	IEEE 802.11b Mode: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g Mode: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11gn HT20/40 Mode: OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Type	WiFi Dipole Antenna× 1, Antenna Gain: 1.8 dBi
Power Rating	12Vdc
Test Voltage	120Vac, 60Hz
DC Power Cable Type	Non-shielded cable, 1.5 m × 1 (Non-detachable)
I/O Port	LAN Port × 1, WAN Port × 1, USB Port × 1, Power Port × 1

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Power Adapter:

No.	Manufacturer	Model No.	Power Input	Power Output
1	BILLION	BA018-120100AXU	100-240Vac, 0.5A, 50/60Hz	12Vdc, 1.0A

The difference of the series model

Model Number	Difference		
	Brand	Color	Housing
Billion SG600R2	Billion	White	D2
Billion SG600 R2NXL-Std		White	D2
Billion SG600 R2NX-Std		Blue	D2
Billion SG600 R2NXL-SDK		White	D2
Billion SG600 R2NX-SDK		Blue	D2
BEC SG600R2	BEC	White	D2 / B2
BEC SG600 R2NXL-Std		White	D2 / B2
BEC SG600 R2NX-Std		Blue	D2 / B2
BEC SG600 R2NXL-SDK		White	D2 / B2
BEC SG600 R2NX-SDK		Blue	D2 / B2
Note: "O" means all the same, and "X" means the difference			

Remark:

1. *The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.*
2. *For more details, please refer to the User's manual of the EUT.*
3. *This submittal(s) (test report) is intended for FCC ID: QI3BIL-SG600R2 filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.*
4. *The model Billion SG600R2 was considered the main model for testing.*

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3. DESCRIPTION OF TEST MODES

The EUT (Smart Energy Wireless Router) is an 802.11b/g/n transceiver.
For IEEE 802.11b/g, 802.11gn HT20/HT40 Mode: 1TX / 1RX

Conducted Emission / Radiated Emission Test (Below 1 GHz)

1. The following test modes were scanned during the preliminary test:

No.	Pre-Test mode
1	TX Mode
2	Normal Mode

2. After the preliminary scan, the following test mode was found to produce the highest emission level.

Final Test mode		
Emission	Radiated Emission	Mode 1
	Conducted Emission	Mode 2

Remark: *Then, the above highest emission mode of the configuration of the EUT and cable was chosen for all final test items.*

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Conducted / Radiated Emission Test (Above 1 GHz)

IEEE 802.11b/g, 802.11gn HT20 Mode:

The EUT had been tested under operating condition.

There are three channels have been tested as following:

Channel	Frequency (MHz)
Low	2412
Middle	2437
High	2462

IEEE 802.11b Mode: 1Mbps data rate (worst case) was chosen for full testing.
IEEE 802.11g Mode: 6Mbps data rate (worst case) was chosen for full testing.
IEEE 802.11gn HT20 MCS0 Mode: 6.5Mbps data rate (worst case) was chosen for full testing.

IEEE 802.11gn HT40 Mode:

The EUT had been tested under operating condition.

There are three channels have been tested as following:

Channel	Frequency (MHz)
Low	2422
Middle	2437
High	2452

IEEE 802.11gn HT40 MCS0 Mode: 13.5Mbps data rate (worst case) was chosen for full testing.

Remark : *The field strength of spurious emission was measured in the following position: EUT stand-up position(Y axis), lie-down position(X, Z axis). The worst emission was found in stand-up position(Y axis) and the worst case was recorded.*

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4. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10:2013 and FCC CFR 47, 15.207, 15.209 and 15.247.

5. FACILITIES AND ACCREDITATION

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

No.989-1, Wenshan Rd., Shangshan Village,
Qionglin Township, Hsinchu County 30741, Taiwan (R.O.C.)

The sites are constructed in conformance with the requirements of ANSI C63.10:2013 and CISPR 22. All receiving equipment conforms to CISPR 16-1-1, CISPR 16-1-2, CISPR 16-1-3, CISPR 16-1-4 and CISPR 16-1-5.

5.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

Taiwan	TAF

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	INDUSTRY CANADA
Japan	VCCI
Taiwan	BSMI
USA	FCC MRA

Copies of granted accreditation certificates are available for downloading from our web site, http:///www.ccsrf.com

Remark: *FCC Designation Number TW1027.*

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5.3 MEASUREMENT UNCERTAINTY

The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4-2.

PARAMETER	UNCERTAINTY
Semi Anechoic Chamber (966 Chamber_C) / Radiated Emission, 30 to 1000 MHz	+/- 3.97
Semi Anechoic Chamber (966 Chamber_C) / Radiated Emission, 1 to 18GHz	+/- 3.58
Semi Anechoic Chamber (966 Chamber_C) / Radiated Emission, 18 to 26 GHz	+/- 3.59
Semi Anechoic Chamber (966 Chamber_C) / Radiated Emission, 26 to 40 GHz	+/- 3.81
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 30 to 1000 MHz	+/- 3.97
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 1 to 18GHz	+/- 3.58
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 18 to 26 GHz	+/- 3.59
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 26 to 40 GHz	+/- 3.81
Conducted Emission (Mains Terminals), 9kHz to 30MHz	+/- 2.48
6dB Bandwidth, Conducted	$+/- 2.6906*10^{-5}$
RF Output Power, Conducted	+/- 1.3860
Power Spectral Density, Conducted	+/- 2.5290
Conducted Spurious Emission	+/- 2.2727

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Consistent with industry standard (e.g. CISPR 22, clause 11, Measurement Uncertainty) determining compliance with the limits shall be base on the results of the compliance measurement. Consequently the measure emissions being less than the maximum allowed emission result in this be a compliant test or passing test.

The acceptable measurement uncertainty value without requiring revision of the compliance statement is base on conducted and radiated emissions being less than U_{CISPR} which is 3.6dB and 5.2dB respectively. CCS values (called U_{Lab} in CISPR 16-4-2) is less than U_{CISPR} as shown in the table above. Therefore, MU need not be considered for compliance.

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6. SETUP OF EQUIPMENT UNDER TEST

SUPPORT EQUIPMENT

No.	Product	Manufacturer	Model No.	Serial No.
1	Notebook PC	TOSHIBA	PORTEGE R30-A	7F097011H
2	Notebook PC	TOSHIBA	PORTEGE R30-A	1E101235H
3	Notebook PC	TOSHIBA	PORTEGE R30-A	7F096978H
4	Flash Disk	Kingston	DTSE9H/8GB	---
5	Zigbee TX	BILLION	SG200	---

No.	Signal Cable Description
1	Non-shielded RJ-45 cable, 12m × 2

SETUP DIAGRAM FOR TESTS

EUT & peripherals setup diagram is shown in appendix setup photos.

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EUT OPERATING CONDITION

WiFi Mode:

1. EUT & peripherals setup diagram is shown in appendix setup photos.
2. TX mode:
   ⇨ **Data Rate:** 1Mbps Bandwidth 20 (IEEE 802.11b Mode)
   6Mbps Bandwidth 20 (IEEE 802.11g Mode)
   6.5Mbps Bandwidth 20 (IEEE 802.11gn HT20 MCS0 Mode)
   13.5Mbps Bandwidth 40 (IEEE 802.11gn HT40 MCS0 Mode)
   ⇨ **Power control**

Mode	Channel	Frequency (MHz)	Power Set
IEEE 802.11b	Low	2412	12
	Middle	2437	18
	High	2462	19
IEEE 802.11g	Low	2412	1F
	Middle	2437	1F
	High	2462	1D
IEEE 802.11gn HT20 MCS0	Low	2412	1E
	Middle	2437	1F
	High	2462	1C
IEEE 802.11gn HT40 MCS0	Low	2422	18
	Middle	2437	1F
	High	2452	15

3. All of the functions are under run.
4. Start test.

Normal Mode

1. EUT & peripherals setup diagram is shown in appendix setup photos.
2. Turn on the power of all equipments.
3. Notebook PC 1 connect to EUT with LAN and setup a static IP(192.168.5.100).
4. Notebook PC 1 ping 192.168.5.254(EUT IP).
5. Notebook PC 2 connect to EUT with WAN and setup a static IP(192.168.1.101).
6. Notebook PC 2 ping 192.168.1.100(EUT IP).
7. Notebook PC 3 link to EUT with WiFi 2.4G (DHCP).
8. Notebook PC 1~3 ping eachother.
9. EUT USB 2.0 Port link to USB flash disks.
10. Zigbee connect to EUT with SG200
11. All of the functions are under run.
12. Start test

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7. FCC PART 15.247 REQUIREMENTS

7.1 DUTY CYCLE CORRECTION FACTOR

Product Name	Smart Energy Wireless Router	Test By	Allen Liu
Test Model	Billion SG600R2	Test Date	2016/11/03
Test Mode	TX Mode	Temp. & Humidity	17°C, 50%

Mode	TX on (ms)	TX on + off (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
IEEE 802.11b	1.000	1.000	100.00%	0.00	0.010
IEEE 802.11g	1.000	1.000	100.00%	0.00	0.010
IEEE 802.11gn HT20	1.000	1.000	100.00%	0.00	0.010
IEEE 802.11gn HT40	1.000	1.000	100.00%	0.00	0.010

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7.2 6dB BANDWIDTH

LIMITS

§ 15.247(a) (2) For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EXA Signal Analyzer	Agilent	N9010A	MY52220817	03/15/2017
Test S/W	N/A			

Remark: *Each piece of equipment is scheduled for calibration once a year.*

TEST SETUP

TEST PROCEDURE

1. The transmitter output was connected to a spectrum analyzer.
2. Set RBW = 100 kHz.
3. Set the video bandwidth (VBW) ≥ 3 x RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize.
8. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

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TEST RESULTS

Product Name	Smart Energy Wireless Router	Test By	Davis Tseng
Test Model	Billion SG600R2	Test Date	2016/11/23
Test Mode	TX Mode	Temp. & Humidity	23°C, 73%

IEEE 802.11b Mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Result
Low	2412	12.10	500	PASS
Middle	2437	12.08	500	PASS
High	2462	12.09	500	PASS

IEEE 802.11g Mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Result
Low	2412	16.54	500	PASS
Middle	2437	16.51	500	PASS
High	2462	16.56	500	PASS

IEEE 802.11gn HT20 MCS0 Mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Result
Low	2412	17.71	500	PASS
Middle	2437	17.65	500	PASS
High	2462	17.71	500	PASS

IEEE 802.11gn HT40 MCS0 Mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Result
Low	2422	36.38	500	PASS
Middle	2437	36.37	500	PASS
High	2452	36.39	500	PASS

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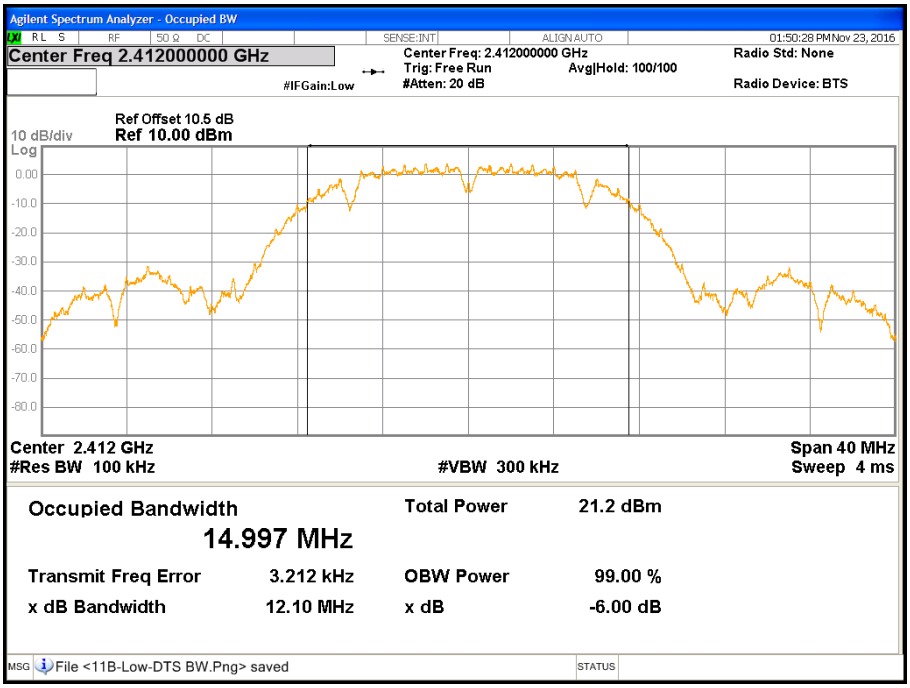
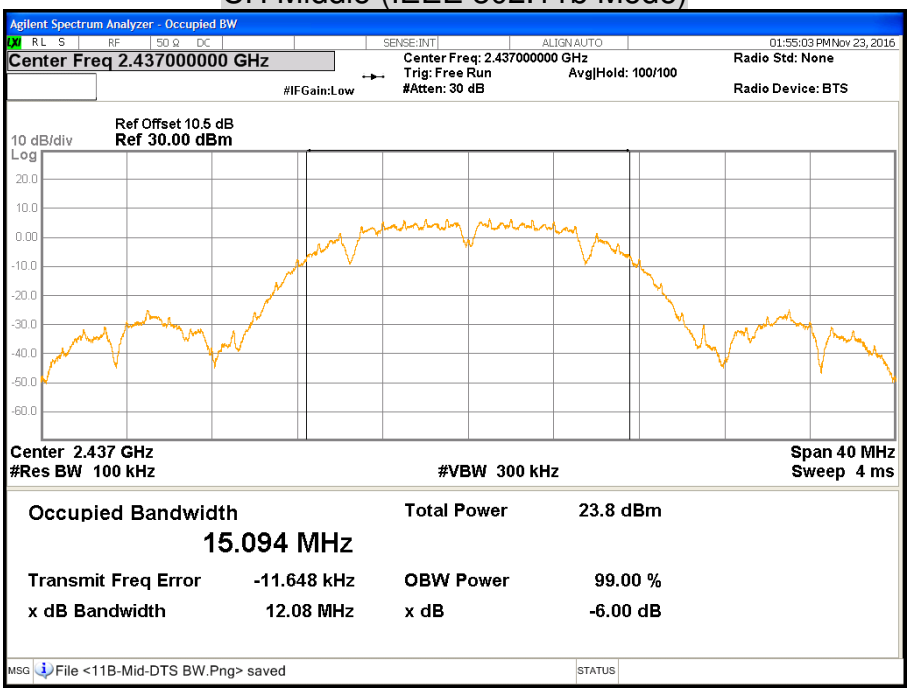
6dB BANDWIDTH

CH Low (IEEE 802.11b Mode)



CH Middle (IEEE 802.11b Mode)



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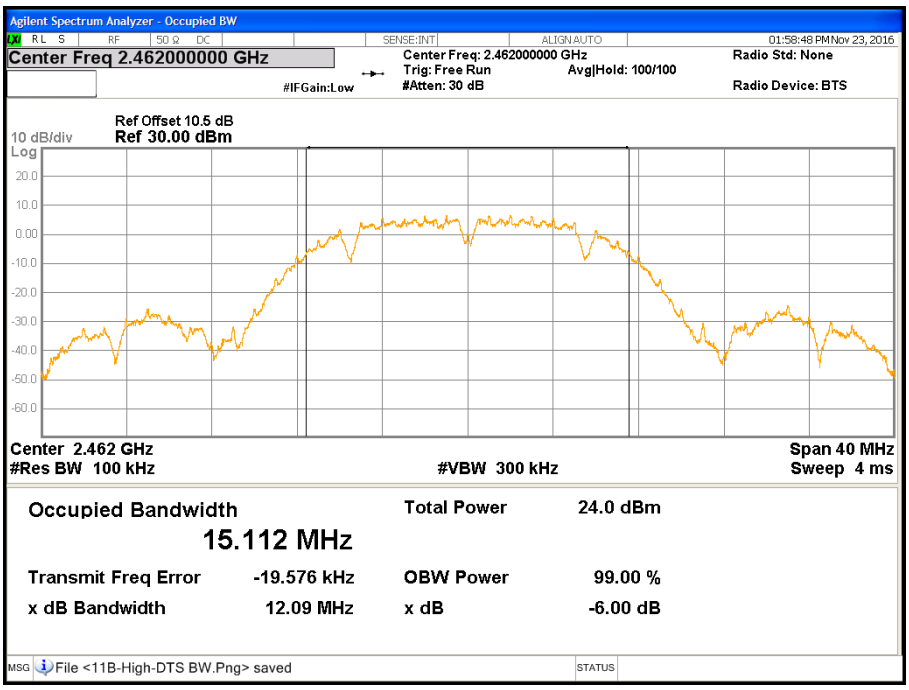
CH High (IEEE 802.11b Mode)



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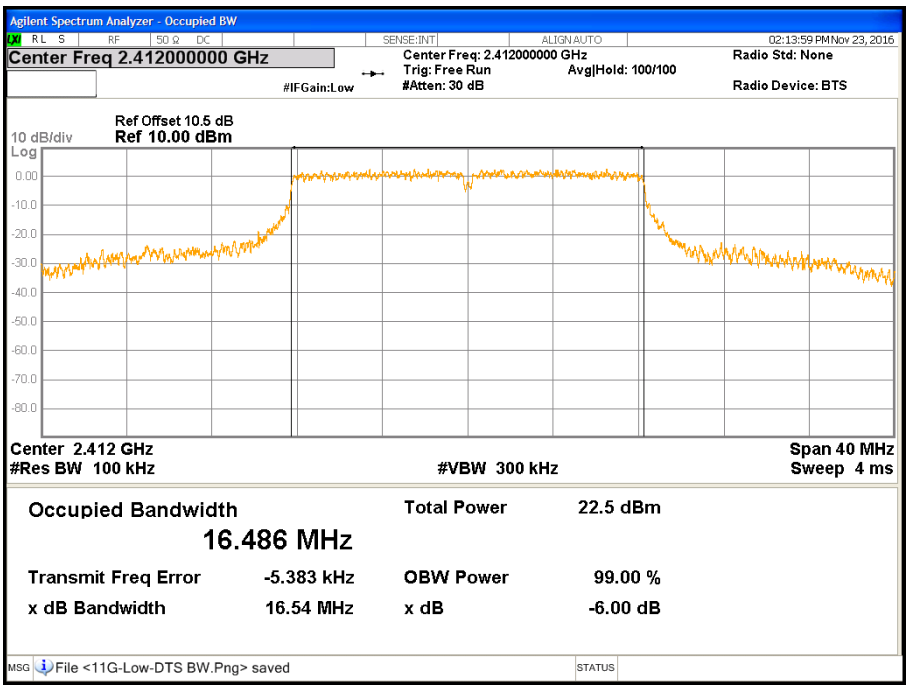
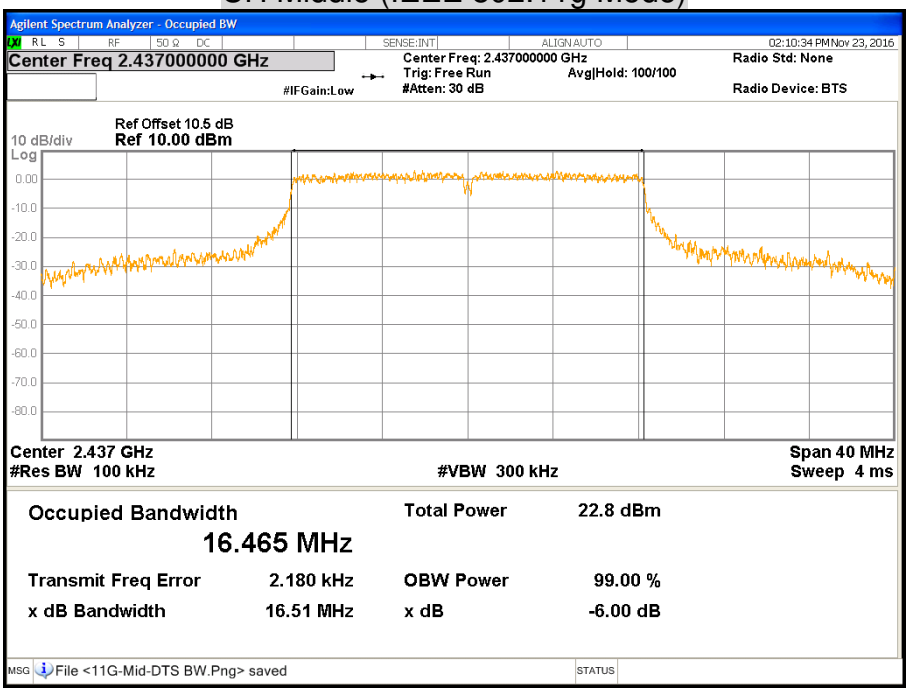
CH Low (IEEE 802.11g Mode)



CH Middle (IEEE 802.11g Mode)



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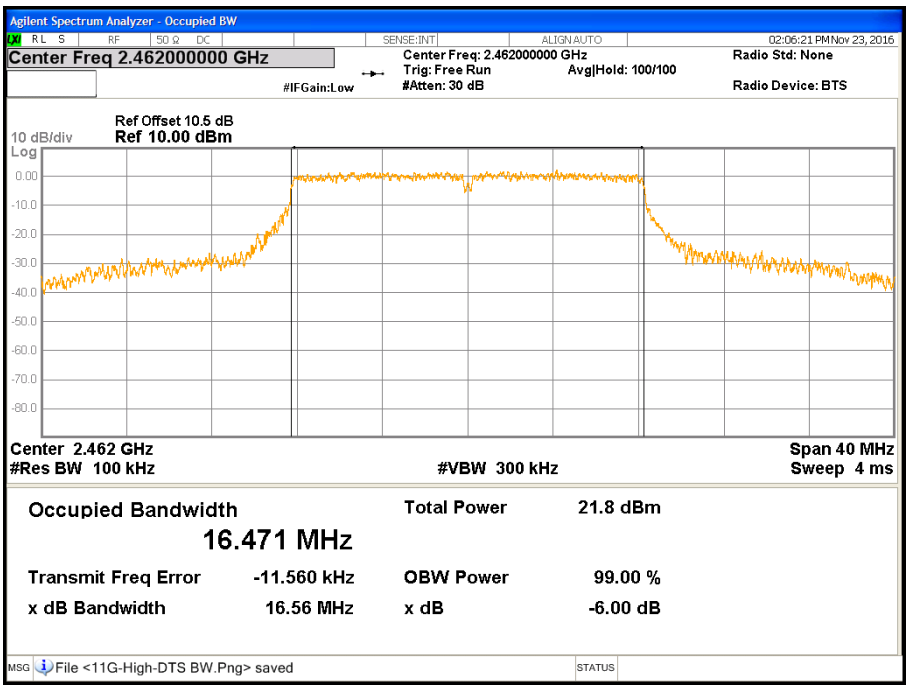
CH High (IEEE 802.11g Mode)



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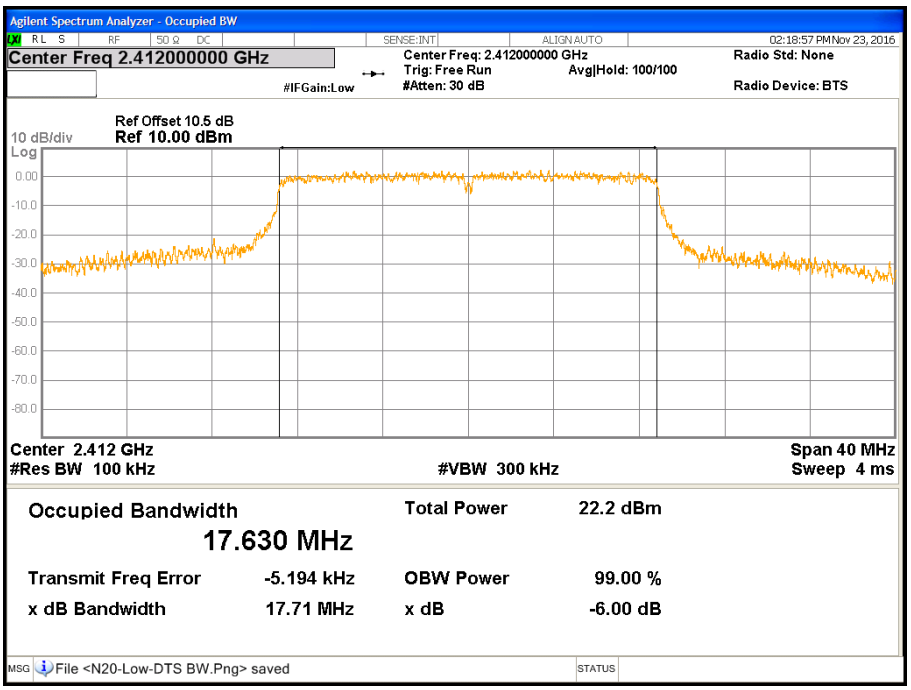
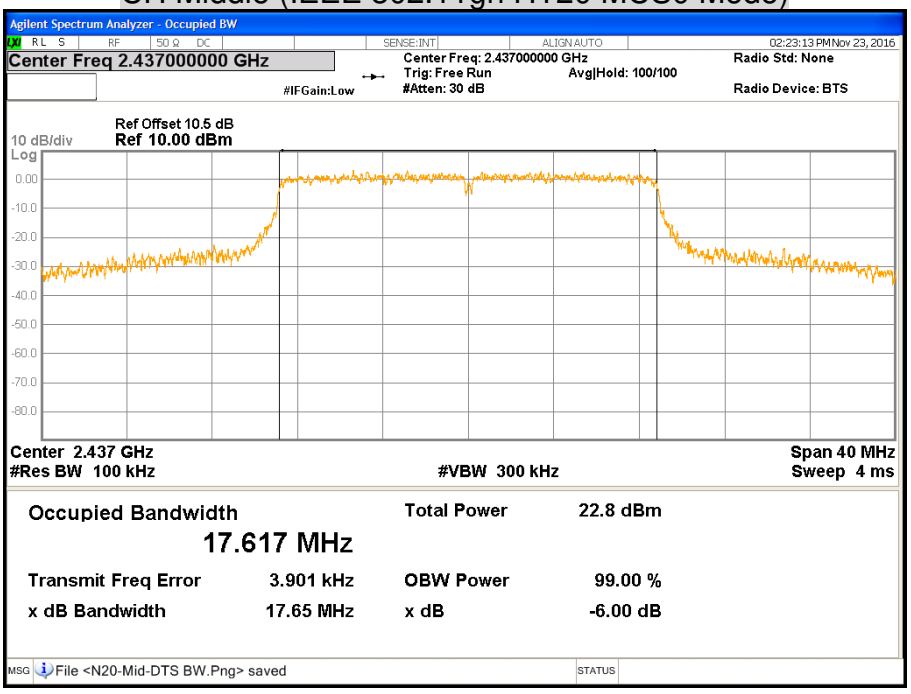
CH Low (IEEE 802.11gn HT20 MCS0 Mode)



CH Middle (IEEE 802.11gn HT20 MCS0 Mode)



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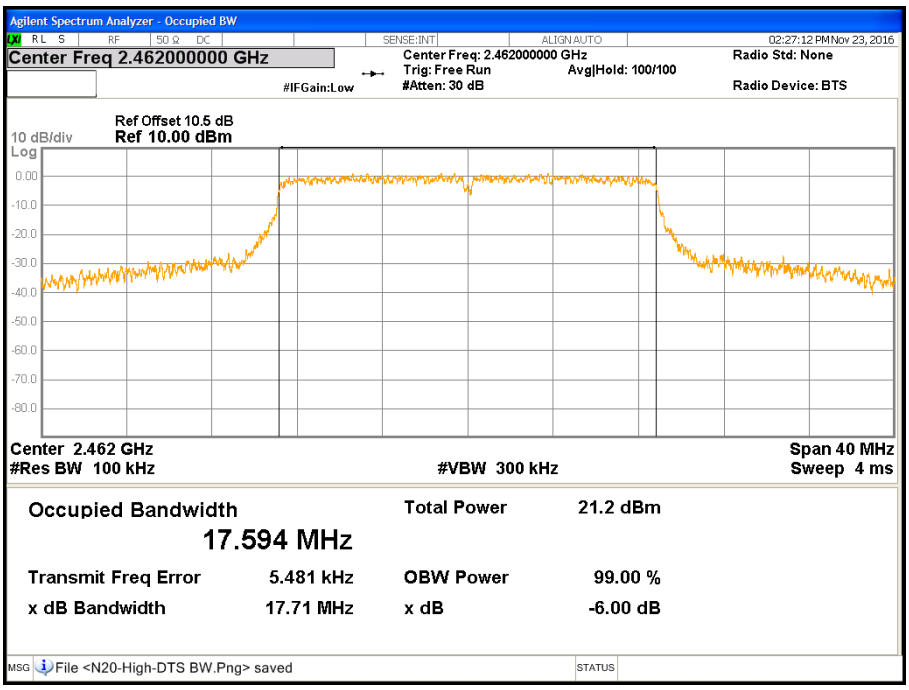
CH High (IEEE 802.11gn HT20 MCS0 Mode)



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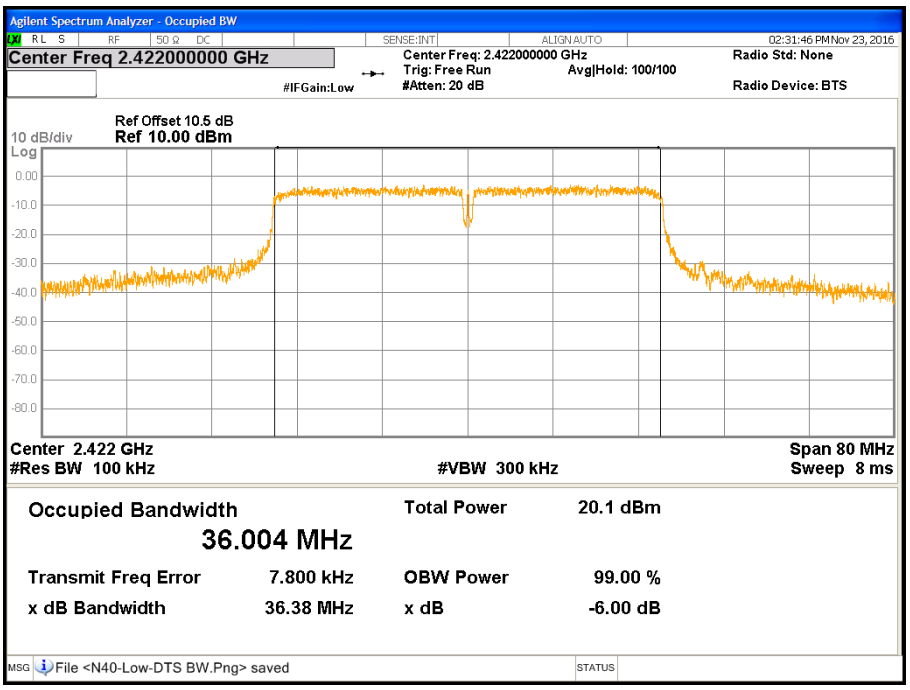
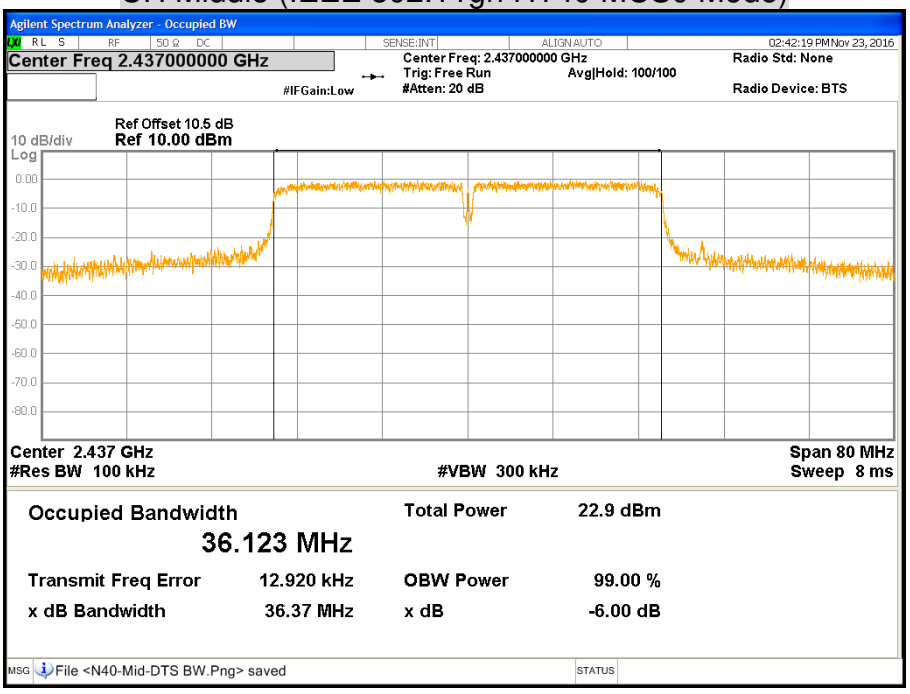
CH Low (IEEE 802.11gn HT40 MCS0 Mode)



CH Middle (IEEE 802.11gn HT40 MCS0 Mode)



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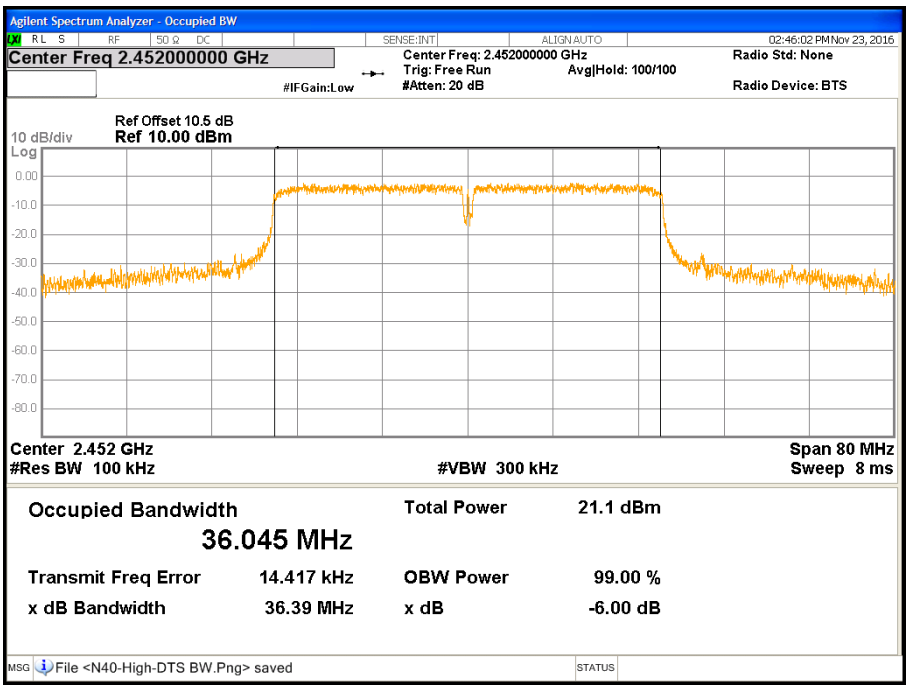
CH High (IEEE 802.11gn HT40 MCS0 Mode)



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7.3 MAXIMUM PEAK OUTPUT POWER

LIMITS

§ 15.247(b) The maximum peak output power of the intentional radiator shall not exceed the following:
§ 15.247(b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 watt.
§ 15.247(b) (4) Except as shown in paragraphs (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

§ KDB 662911:
If all antennas have the same gain, G_{ANT}, Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.
If antenna gains are not equal, the user may use either of the following methods to calculate directional gain, provided that each transmit antenna is driven by only one spatial stream:
Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain; or,

$$DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$$

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Power Meter	Anritsu	ML2495A	1149001	12/08/2016
Power Sensor	Anritsu	MA2411B	1126148	12/08/2016
Test S/W	N/A			

Remark: *Each piece of equipment is scheduled for calibration once a year.*

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TEST SETUP

TEST PROCEDURE

The transmitter output is connected to the power meter. The power meter is set to the peak power detection.

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TEST RESULTS

Product Name	Smart Energy Wireless Router	Test By	Davis Tseng
Test Model	Billion SG600R2	Test Date	2016/11/23
Test Mode	TX Mode	Temp. & Humidity	23°C, 73%

IEEE 802.11b Mode

Channel	Channel Frequency (MHz)	Maximum Peak Output Power		Limit		Result
		(dBm)	(W)	(dBm)	(W)	
Low	2412	17.56	0.0570	30	1.000	PASS
Middle	2437	20.08	0.1019	30	1.000	PASS
High	2462	20.41	0.1099	30	1.000	PASS

Remark:

1. *At finial test to get the worst-case emission at 1Mbps.*
2. *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.*
3. *The maximum antenna gain is 2.22 dBi which is less than 6dBi, the limit should be 1 W.*

IEEE 802.11g Mode

Channel	Channel Frequency (MHz)	Maximum Peak Output Power		Limit		Result
		(dBm)	(W)	(dBm)	(W)	
Low	2412	25.18	0.3296	30	1.000	PASS
Middle	2437	25.44	0.3499	30	1.000	PASS
High	2462	24.88	0.3076	30	1.000	PASS

Remark:

1. *At finial test to get the worst-case emission at 6Mbps.*
2. *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.*
3. *The maximum antenna gain is 2.22 dBi which is less than 6dBi, the limit should be 1 W.*

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IEEE 802.11gn HT20 MCS0 Mode

Channel	Channel Frequency (MHz)	Maximum Peak Output Power		Limit		Result
		(dBm)	(W)	(dBm)	(W)	
Low	2412	24.17	0.2612	30	1.000	PASS
Middle	2437	24.82	0.3034	30	1.000	PASS
High	2462	23.44	0.2208	30	1.000	PASS

Remark:

1. *At finial test to get the worst-case emission at 6.5Mbps.*
2. *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.*
3. *The maximum antenna gain is 2.22 dBi which is less than 6dBi, the limit should be 1 W.*

IEEE 802.11gn HT40 MCS0 Mode

Channel	Channel Frequency (MHz)	Maximum Peak Output Power		Limit		Result
		(dBm)	(W)	(dBm)	(W)	
Low	2422	22.05	0.1603	30	1.000	PASS
Middle	2437	24.77	0.2999	30	1.000	PASS
High	2452	21.51	0.1416	30	1.000	PASS

Remark:

1. *At finial test to get the worst-case emission at 13.5Mbps.*
2. *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.*
3. *The maximum antenna gain is 2.22 dBi which is less than 6dBi, the limit should be 1 W.*

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7.4 AVERAGE POWER

LIMITS

None: For reporting purposes only.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Power Meter	Anritsu	ML2495A	1149001	12/08/2016
Power Sensor	Anritsu	MA2411B	1126148	12/08/2016
Test S/W	N/A			

Remark: *Each piece of equipment is scheduled for calibration once a year.*

TEST SETUP

TEST PROCEDURE

The transmitter output is connected to the power meter. The power meter is set to the average power detection.

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TEST RESULTS

Product Name	Smart Energy Wireless Router	Test By	Davis Tseng
Test Model	Billion SG600R2	Test Date	2016/11/23
Test Mode	TX Mode	Temp. & Humidity	23°C, 73%

IEEE 802.11b Mode

Channel	Channel Frequency (MHz)	Average Power (dBm)
Low	2412	15.12
Middle	2437	17.84
High	2462	18.05

Remark:

1. *At finial test to get the worst-case emission at 1Mbps.*
2. *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.*

IEEE 802.11g Mode

Channel	Channel Frequency (MHz)	Average Power (dBm)
Low	2412	17.04
Middle	2437	17.12
High	2462	16.35

Remark:

1. *At finial test to get the worst-case emission at 6Mbps.*
2. *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.*

IEEE 802.11gn HT20 MCS0 Mode

Channel	Channel Frequency (MHz)	Average Power (dBm)
Low	2412	16.79
Middle	2437	17.14
High	2462	16.12

Remark:

1. *At finial test to get the worst-case emission at 6.5Mbps.*
2. *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.*

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IEEE 802.11gn HT40 MCS0 Mode

Channel	Channel Frequency (MHz)	Average Power (dBm)
Low	2422	14.62
Middle	2437	17.26
High	2452	13.08

Remark:

1. *At finial test to get the worst-case emission at 13.5Mbps.*
2. *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.*

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7.5 POWER SPECTRAL DENSITY

LIMITS

§ 15.247(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

§ KDB 662911:

If all antennas have the same gain, G_{ANT}, Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

If antenna gains are not equal, the user may use either of the following methods to calculate directional gain, provided that each transmit antenna is driven by only one spatial stream:

Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain; or,

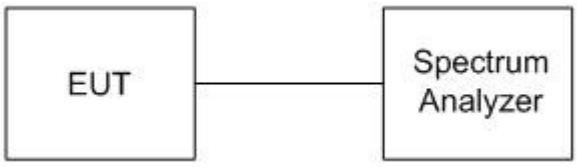
$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EXA Signal Analyzer	Agilent	N9010A	MY52220817	03/15/2017
Test S/W	N/A			

Remark: *Each piece of equipment is scheduled for calibration once a year.*

TEST SETUP



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TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer.
2. Set analyzer center frequency to DTS channel center frequency.
3. Set the span to 1.5 times the DTS channel bandwidth.
4. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
5. Set the VBW ≥ 3 x RBW.
6. Detector = peak.
7. Sweep time = auto couple.
8. Trace mode = max hold.
9. Allow trace to fully stabilize.
10. Use the peak marker function to determine the maximum amplitude level within the RBW.
11. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

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TEST RESULTS

Product Name	Smart Energy Wireless Router	Test By	Davis Tseng
Test Model	Billion SG600R2	Test Date	2016/11/23
Test Mode	TX Mode	Temp. & Humidity	23°C, 73%

IEEE 802.11b Mode

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)		Result
		Measured Value	Limit	
Low	2412	-8.88	8	PASS
Middle	2437	-5.94	8	PASS
High	2462	-6.28	8	PASS

Remark:

1. *At finial test to get the worst-case emission at 1Mbps.*
2. *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.*
3. *The directional gain is 2.22 dBi which is less than 6dBi, the limit should be 8 dBm.*

IEEE 802.11g Mode

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)		Result
		Measured Value	Limit	
Low	2412	-4.86	8	PASS
Middle	2437	-4.63	8	PASS
High	2462	-4.74	8	PASS

Remark:

1. *At finial test to get the worst-case emission at 6Mbps.*
2. *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.*
3. *The directional gain is 2.22 dBi which is less than 6dBi, the limit should be 8 dBm.*

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IEEE 802.11gn HT20 MCS0 Mode

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)		Result
		Measured Value	Limit	
Low	2412	-4.34	8	PASS
Middle	2437	-3.59	8	PASS
High	2462	-5.13	8	PASS

Remark:

1. *At finial test to get the worst-case emission at 6.5Mbps.*
2. *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.*
3. *The directional gain is 2.22 dBi which is less than 6dBi, the limit should be 8 dBm.*

IEEE 802.11gn HT40 MCS0 Mode

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)		Result
		Measured Value	Limit	
Low	2422	-6.77	8	PASS
Middle	2437	-5.08	8	PASS
High	2452	-6.89	8	PASS

Remark:

1. *At finial test to get the worst-case emission at 13.5Mbps.*
2. *The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.*
3. *The directional gain is 2.22 dBi which is less than 6dBi, the limit should be 8 dBm.*

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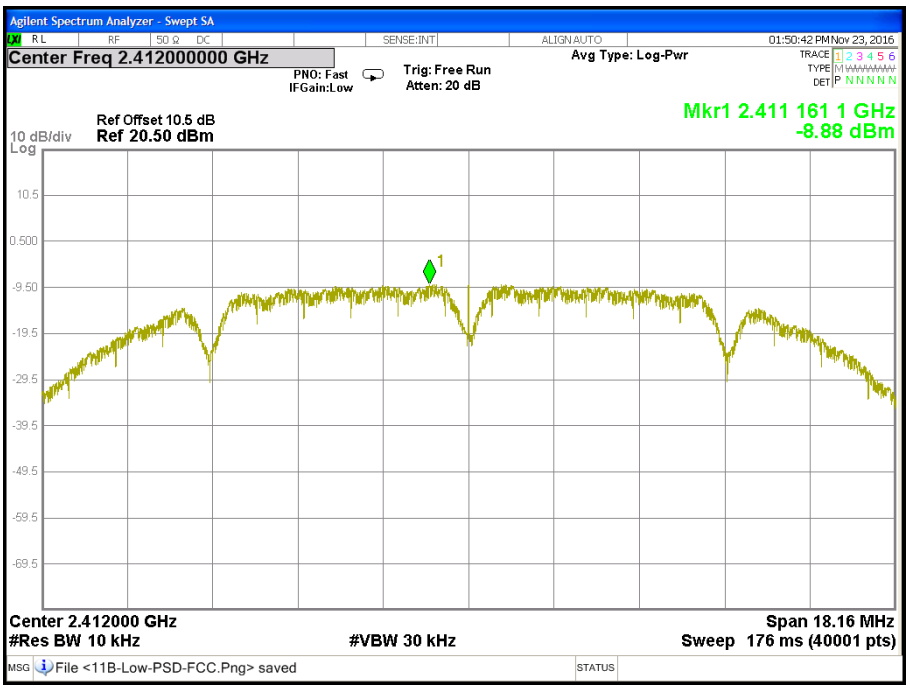
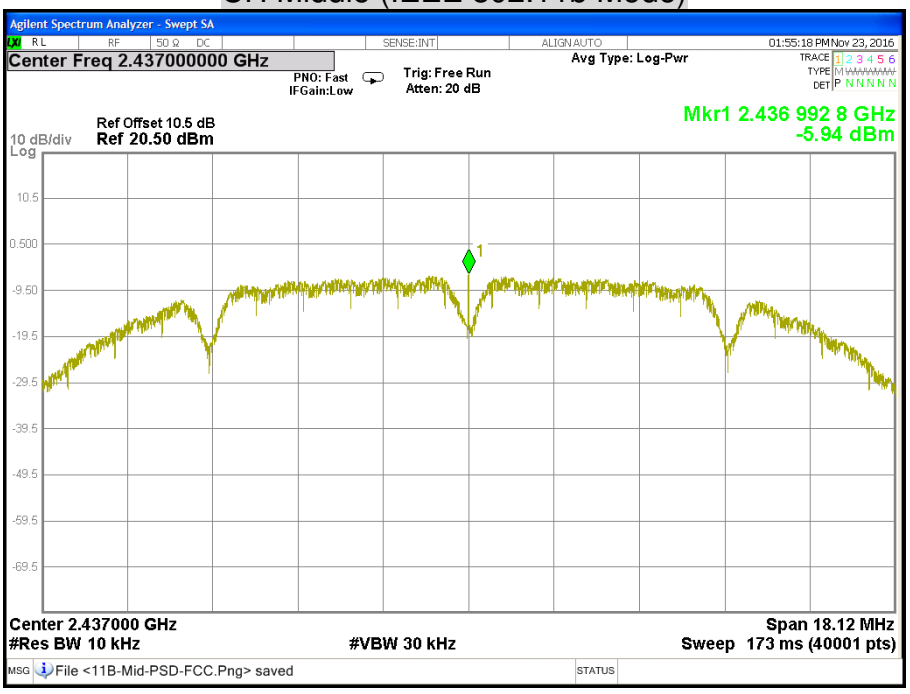
POWER SPECTRAL DENSITY

CH Low (IEEE 802.11b Mode)



CH Middle (IEEE 802.11b Mode)



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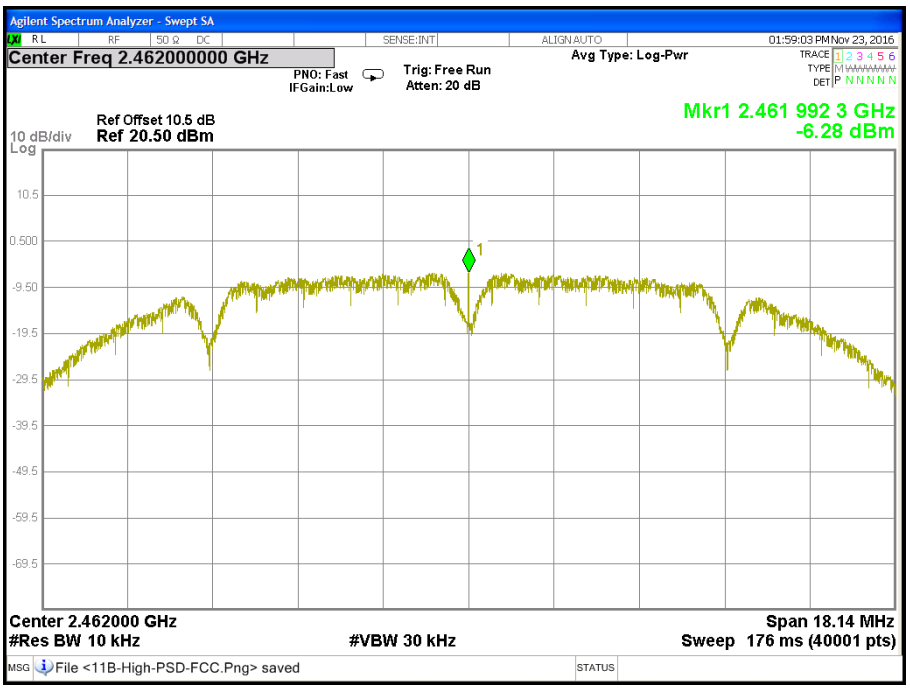
CH High (IEEE 802.11b Mode)



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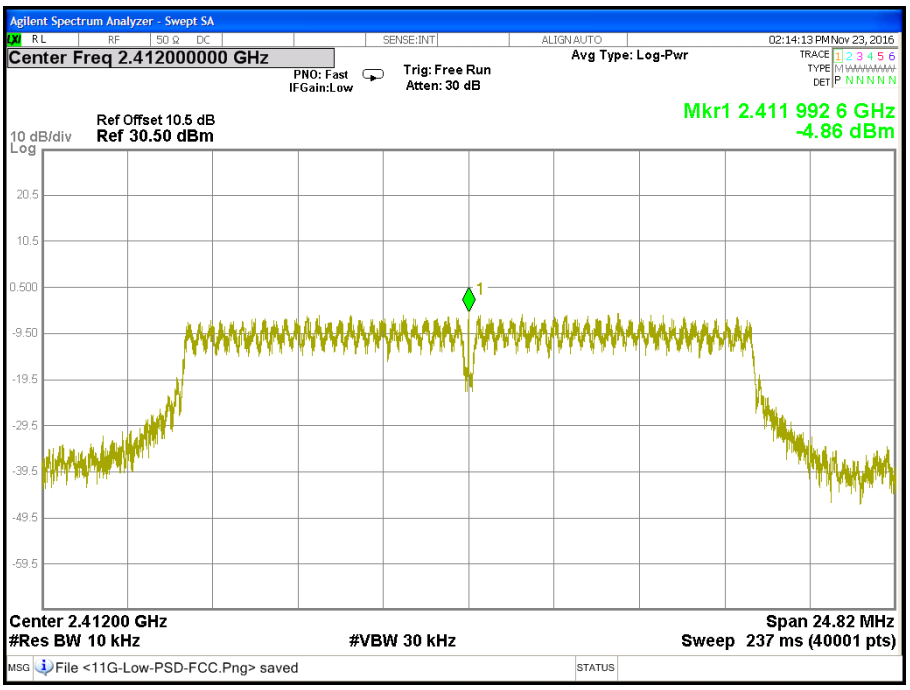
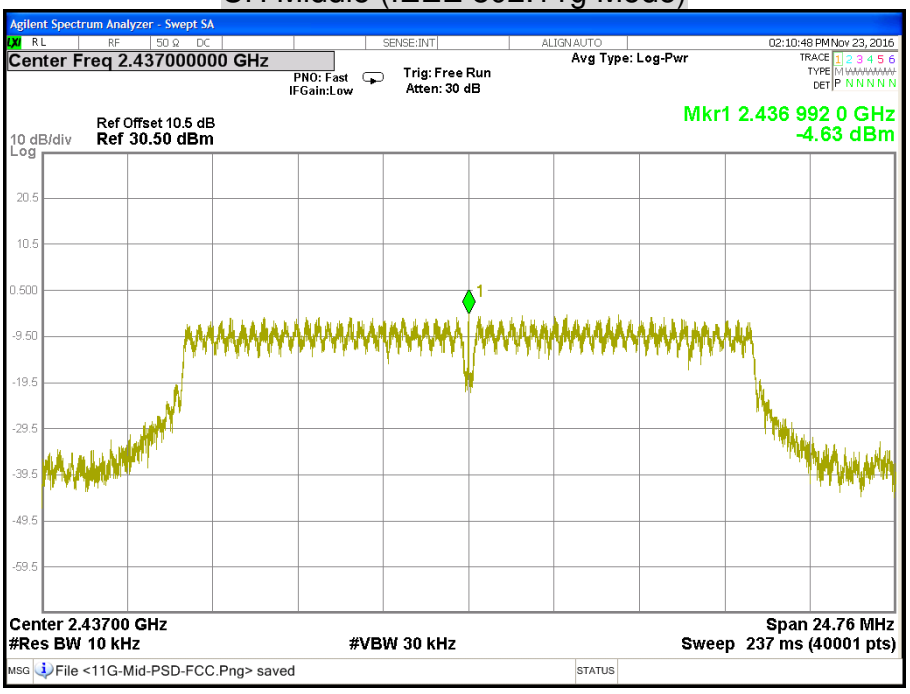
CH Low (IEEE 802.11g Mode)



CH Middle (IEEE 802.11g Mode)



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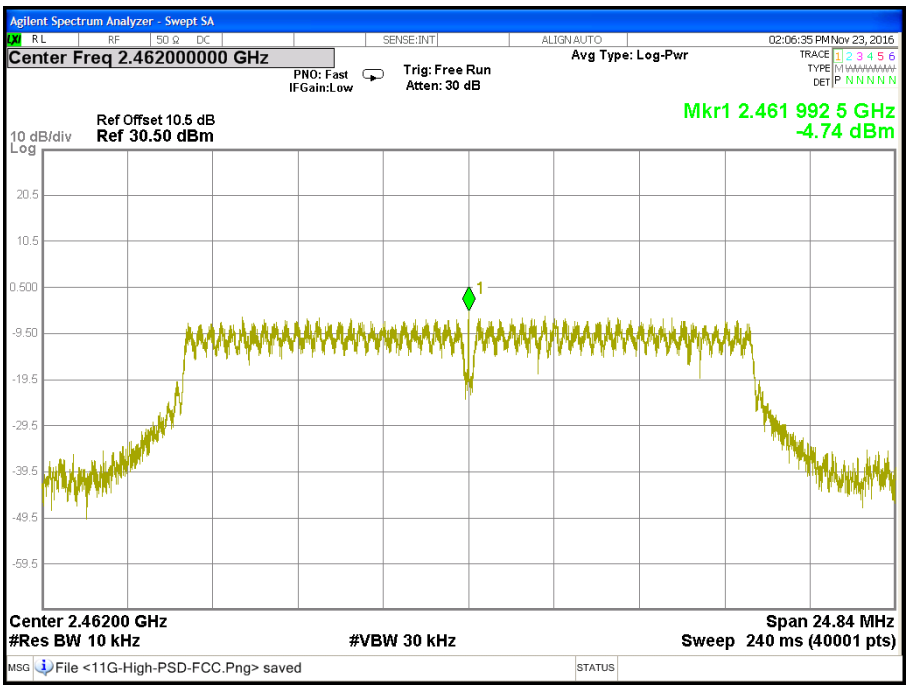
CH High (IEEE 802.11g Mode)



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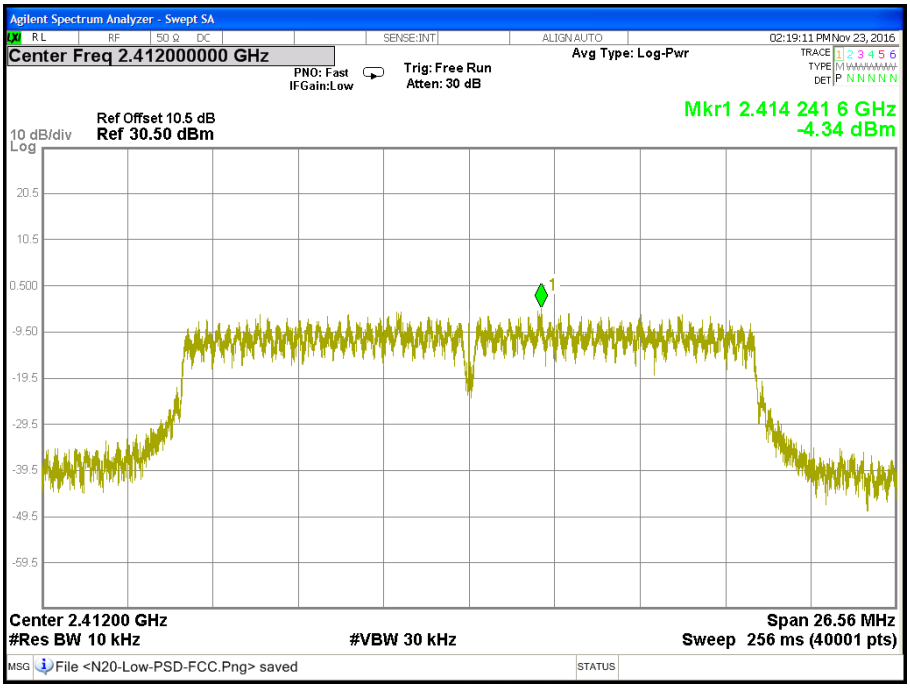
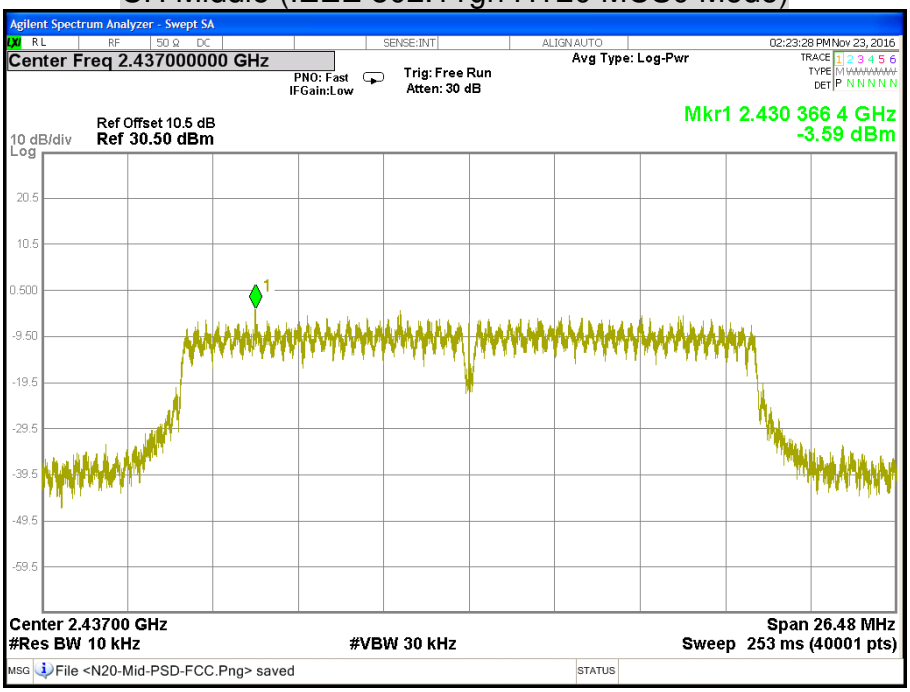
CH Low (IEEE 802.11gn HT20 MCS0 Mode)



CH Middle (IEEE 802.11gn HT20 MCS0 Mode)



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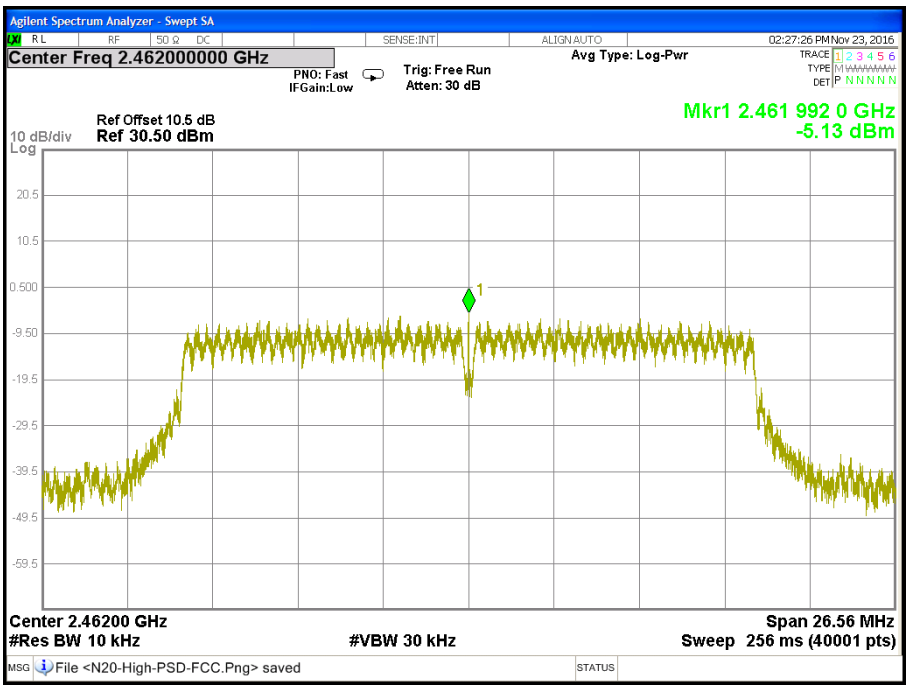
CH High (IEEE 802.11gn HT20 MCS0 Mode)



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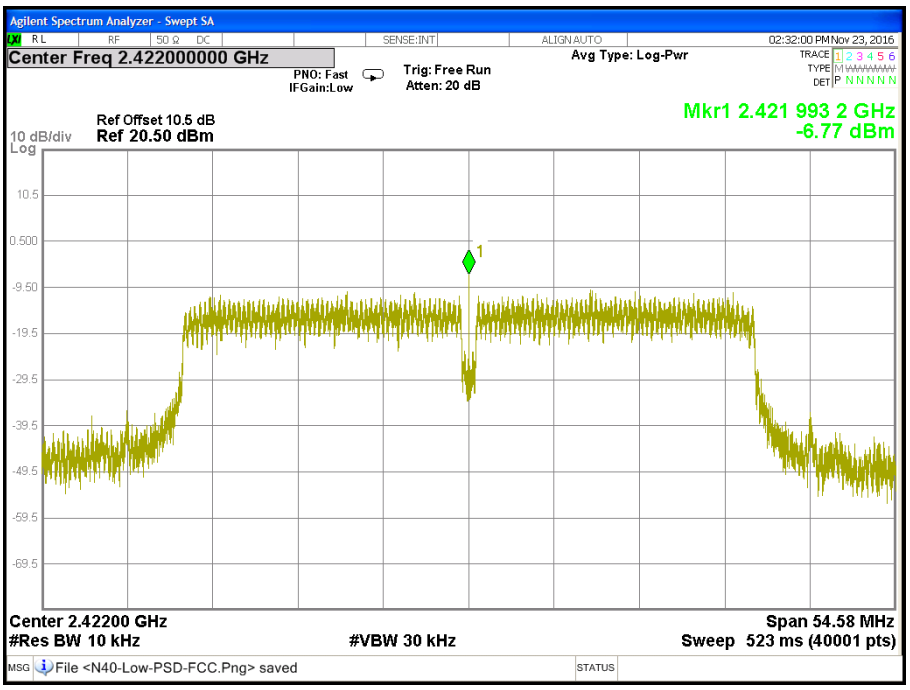
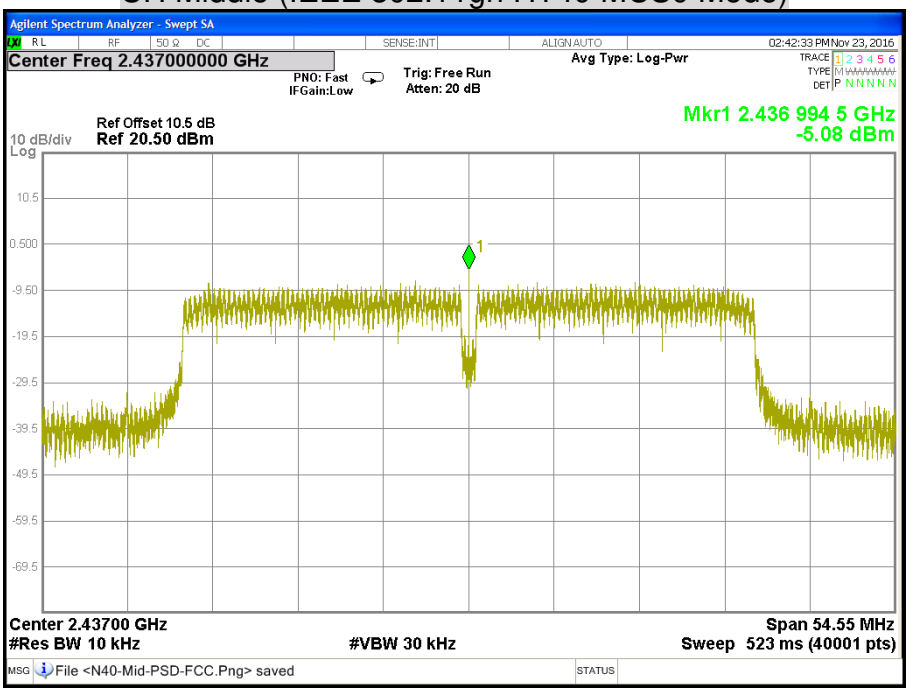
CH Low (IEEE 802.11gn HT40 MCS0 Mode)



CH Middle (IEEE 802.11gn HT40 MCS0 Mode)



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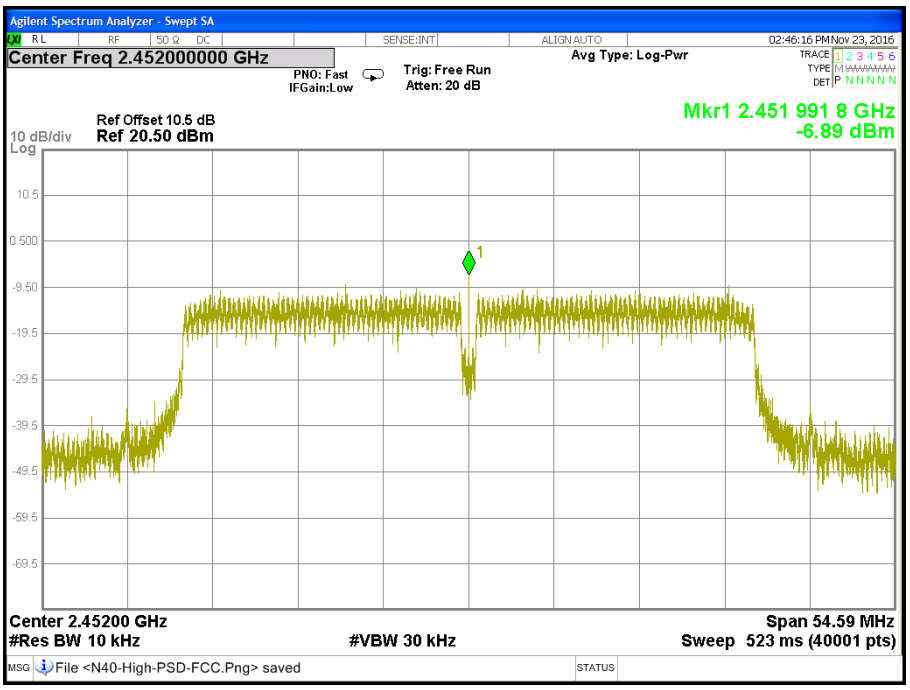
CH High (IEEE 802.11gn HT40 MCS0 Mode)



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7.6 CONDUCTED SPURIOUS EMISSION

LIMITS

§ 15.247(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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 and that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in § 15.209(a) 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)).

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EXA Signal Analyzer	Agilent	N9010A	MY52220817	03/15/2017
Test S/W	N/A			

Remark: *Each piece of equipment is scheduled for calibration once a year.*

TEST SETUP

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.
The spectrum from 30 MHz to 26.5 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

TEST RESULTS

Product Name	Smart Energy Wireless Router	Test By	Davis Tseng
Test Model	Billion SG600R2	Test Date	2016/11/23
Test Mode	TX Mode	Temp. & Humidity	23°C, 73%

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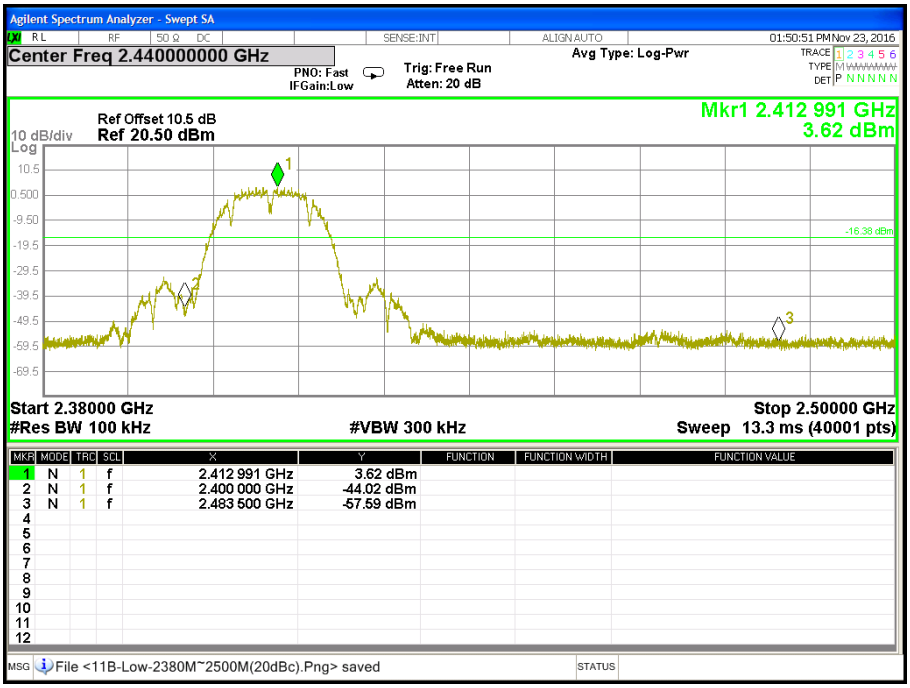
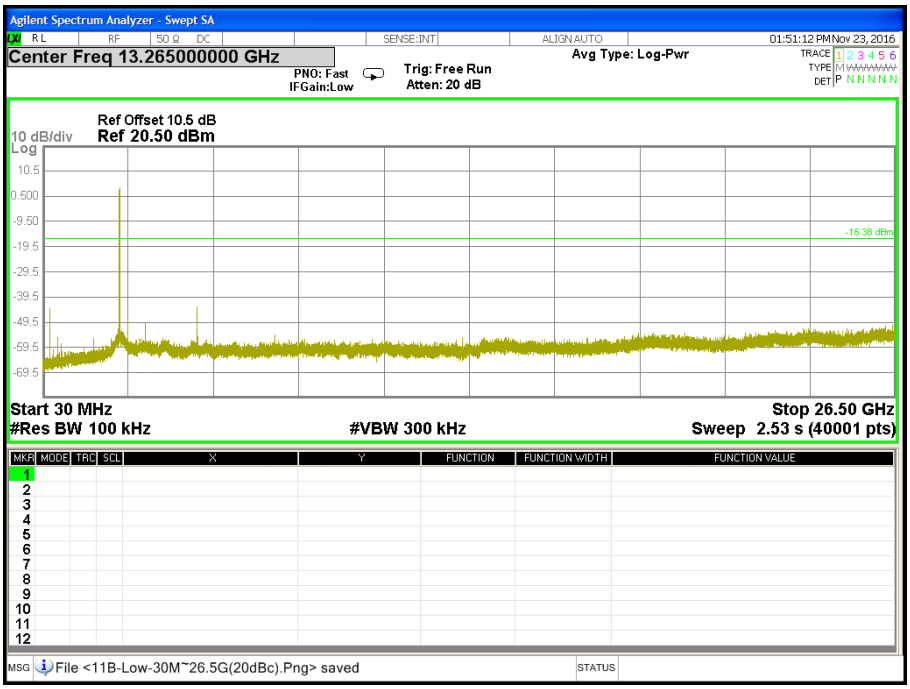
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

CH Low (2.38GHz ~ 2.5GHz / IEEE 802.11b Mode)



CH Low (30MHz ~ 26.5GHz / IEEE 802.11b Mode)



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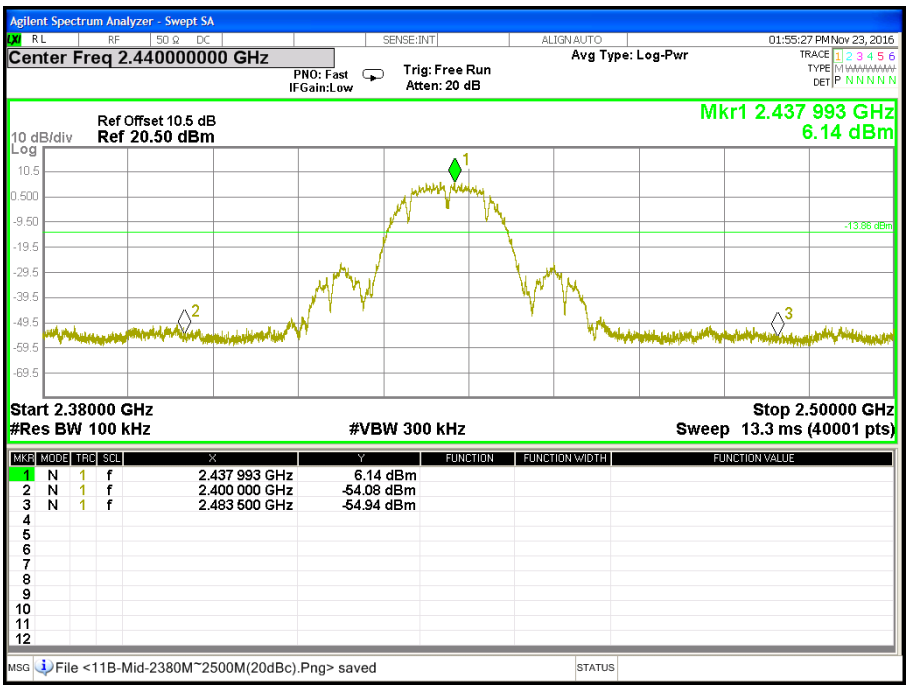
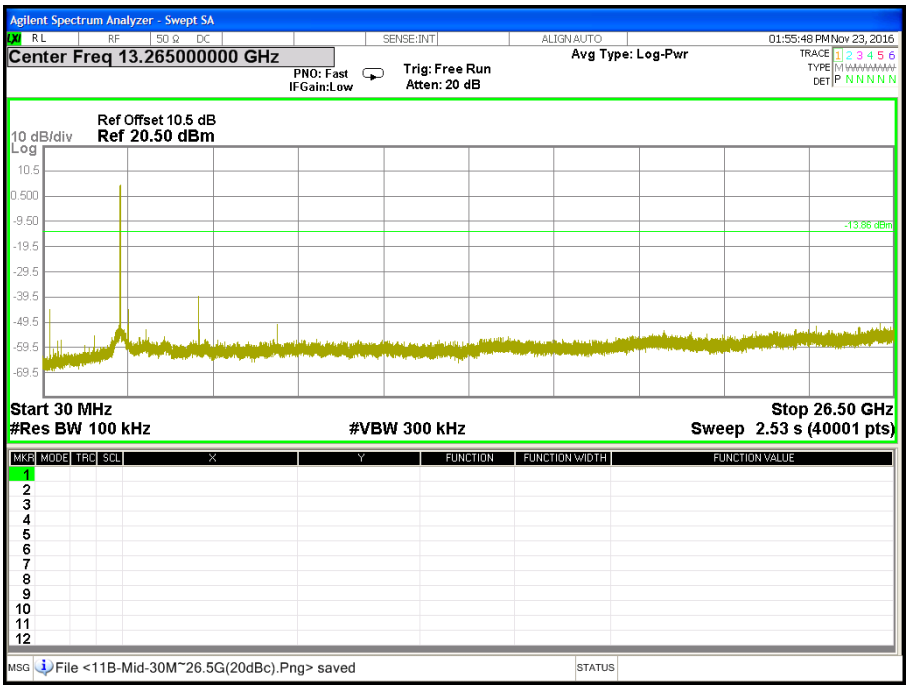
CH Middle (2.38GHz ~ 2.5GHz / IEEE 802.11b Mode)



CH Middle (30MHz ~ 26.5GHz / IEEE 802.11b Mode)



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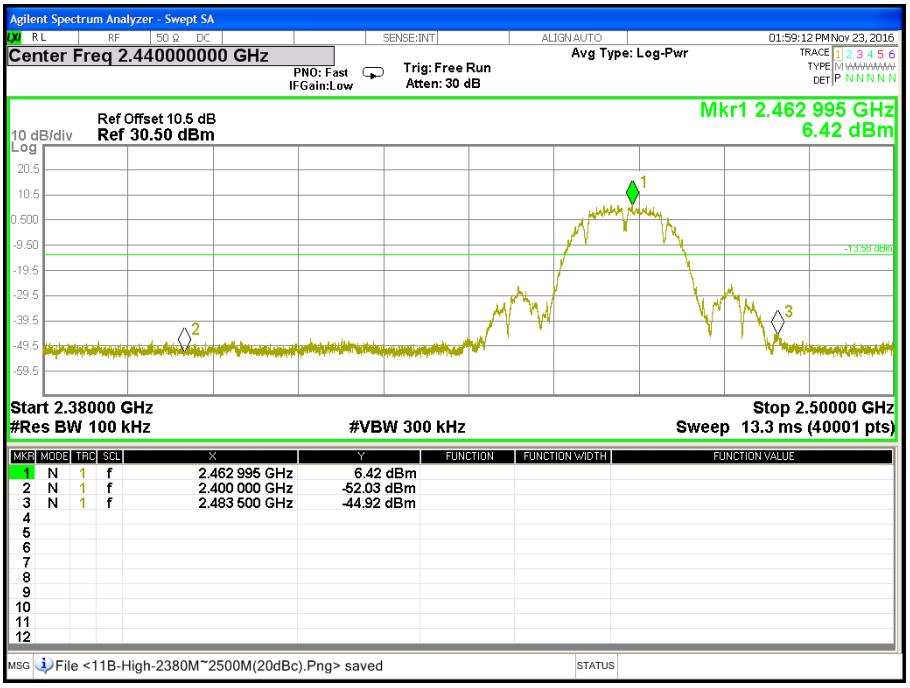
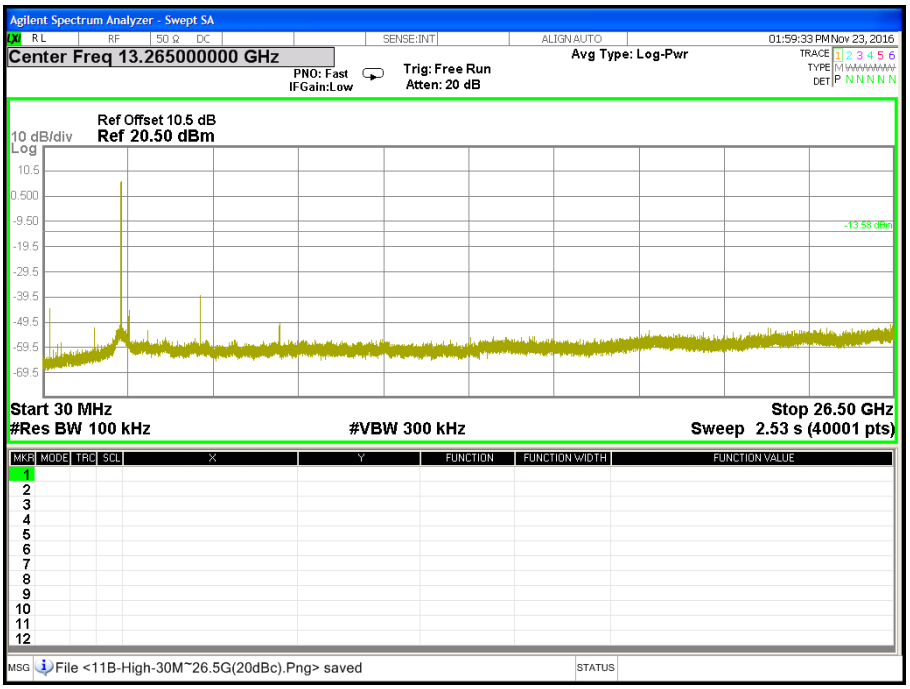
CH High (2.38GHz ~ 2.5GHz / IEEE 802.11b Mode)



CH High (30MHz ~ 26.5GHz / IEEE 802.11b Mode)



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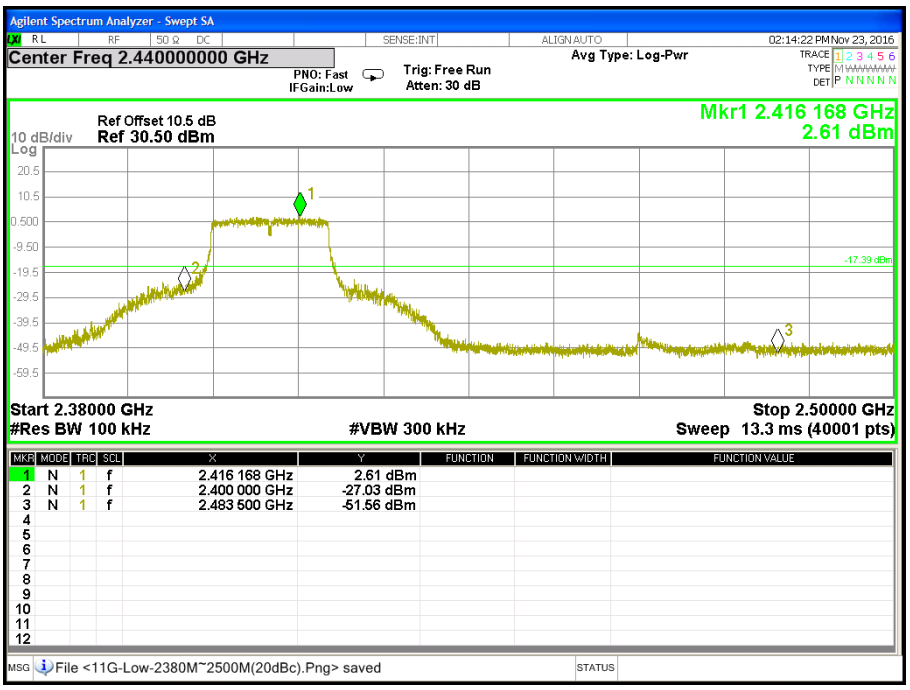
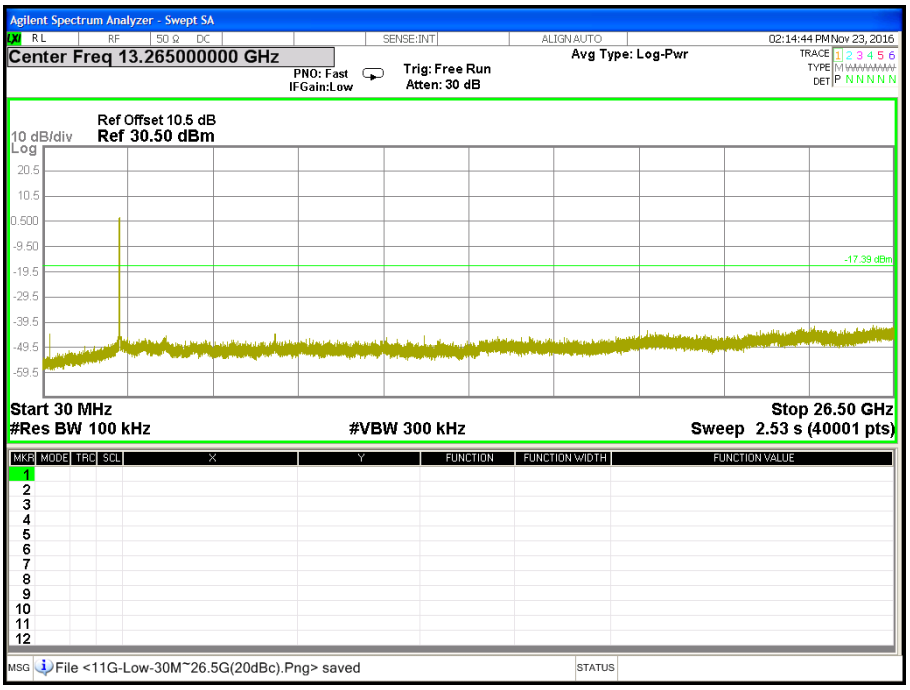
CH Low (2.38GHz ~ 2.5GHz / IEEE 802.11g Mode)



CH Low (30MHz ~ 26.5GHz / IEEE 802.11g Mode)



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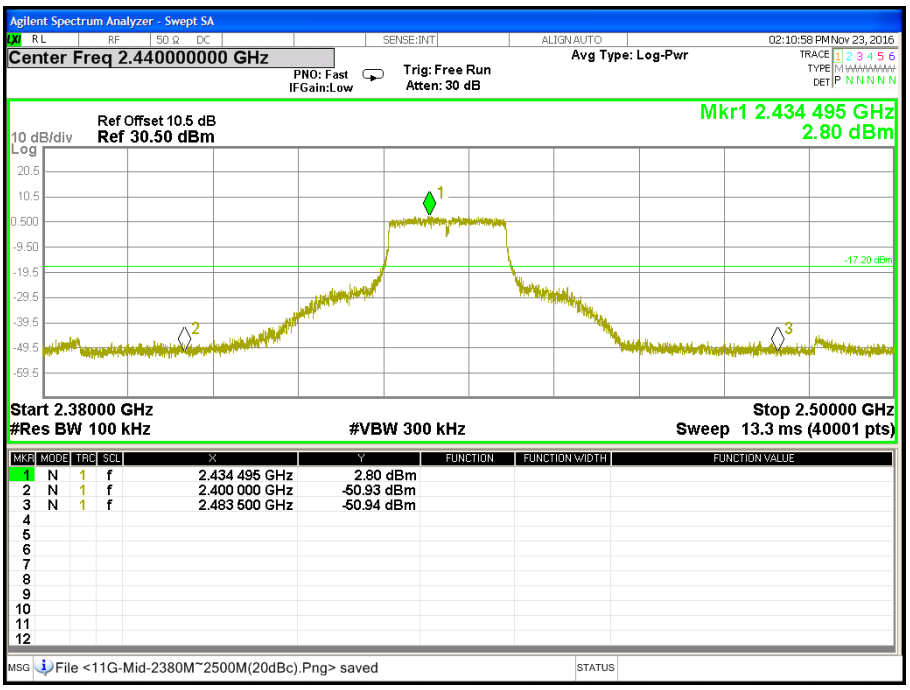
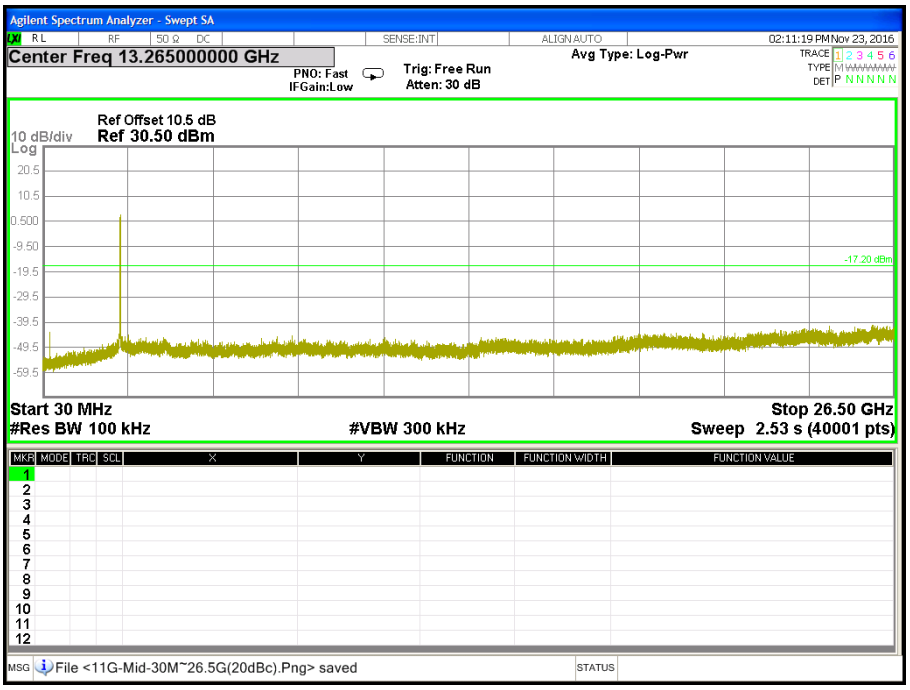
CH Middle (2.38GHz ~ 2.5GHz / IEEE 802.11g Mode)



CH Middle (30MHz ~ 26.5GHz / IEEE 802.11g Mode)



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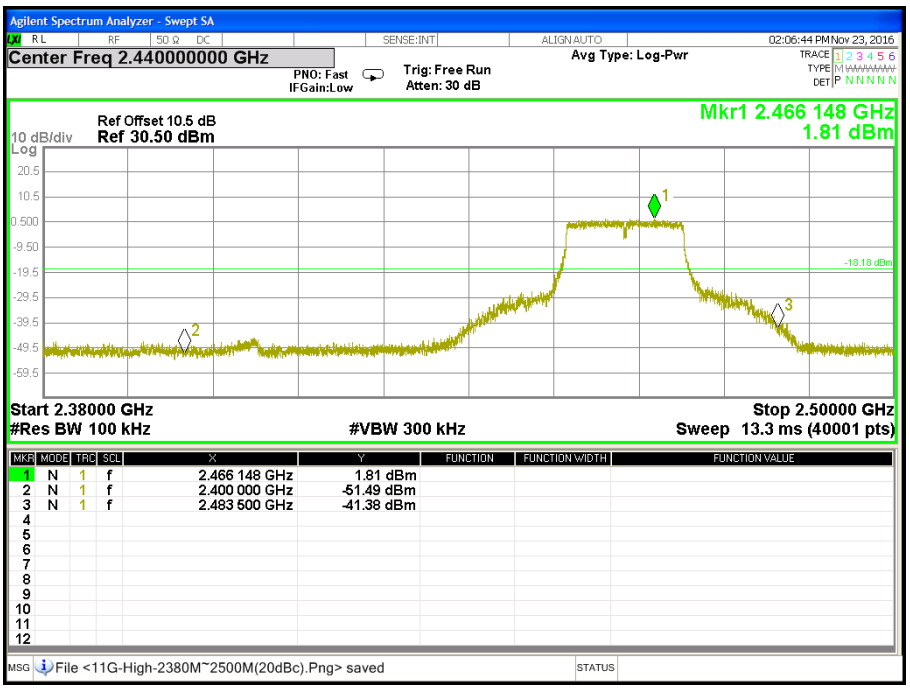
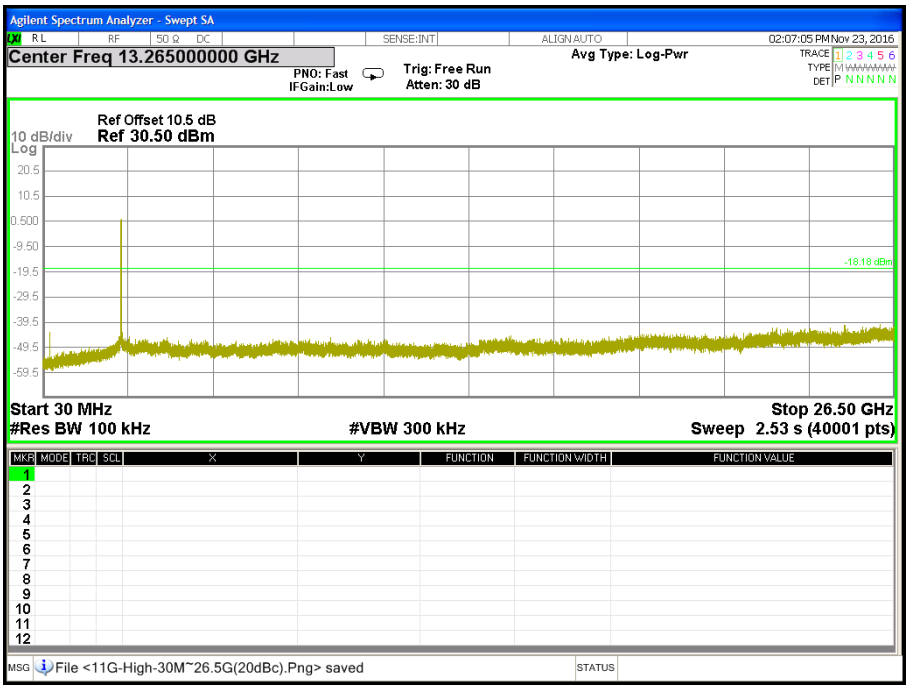
CH High (2.38GHz ~ 2.5GHz / IEEE 802.11g Mode)



CH High (30MHz ~ 26.5GHz / IEEE 802.11g Mode)



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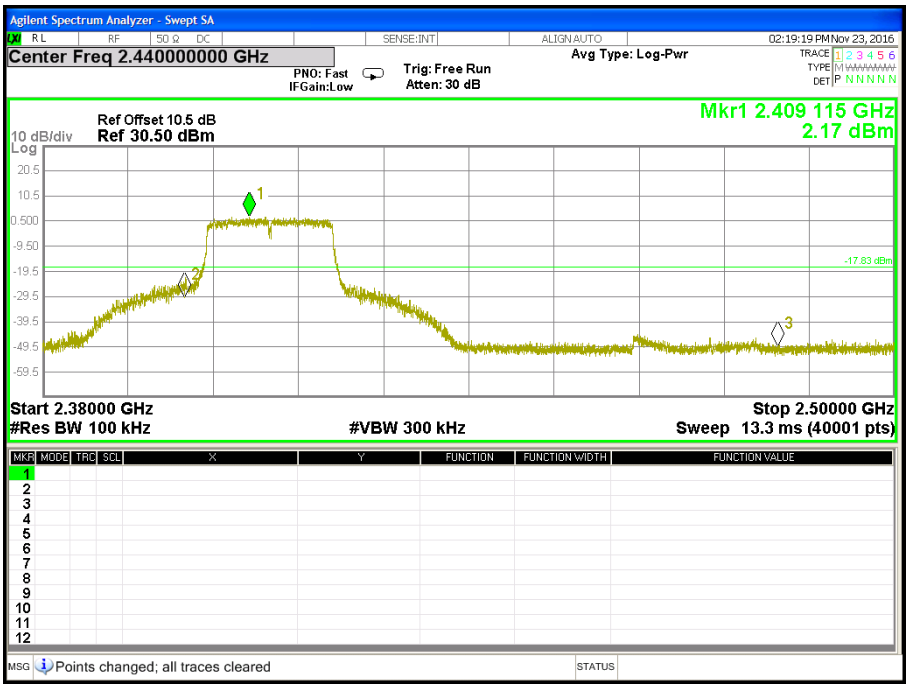
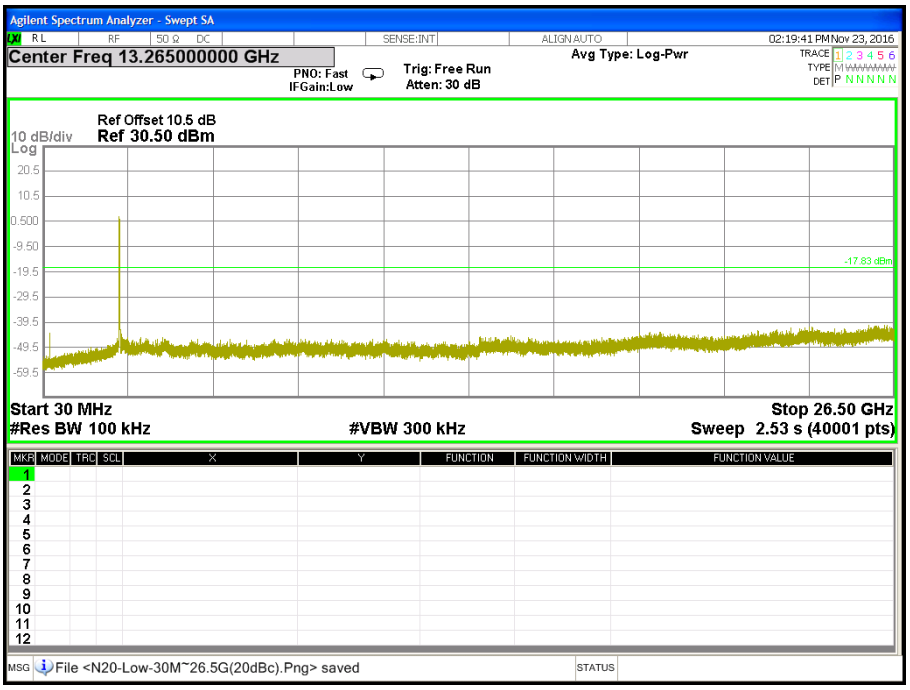
CH Low (2.38GHz ~ 2.5GHz / IEEE 802.11gn HT20 MCS0 Mode)



CH Low (30MHz ~ 26.5GHz / IEEE 802.11gn HT20 MCS0 Mode)



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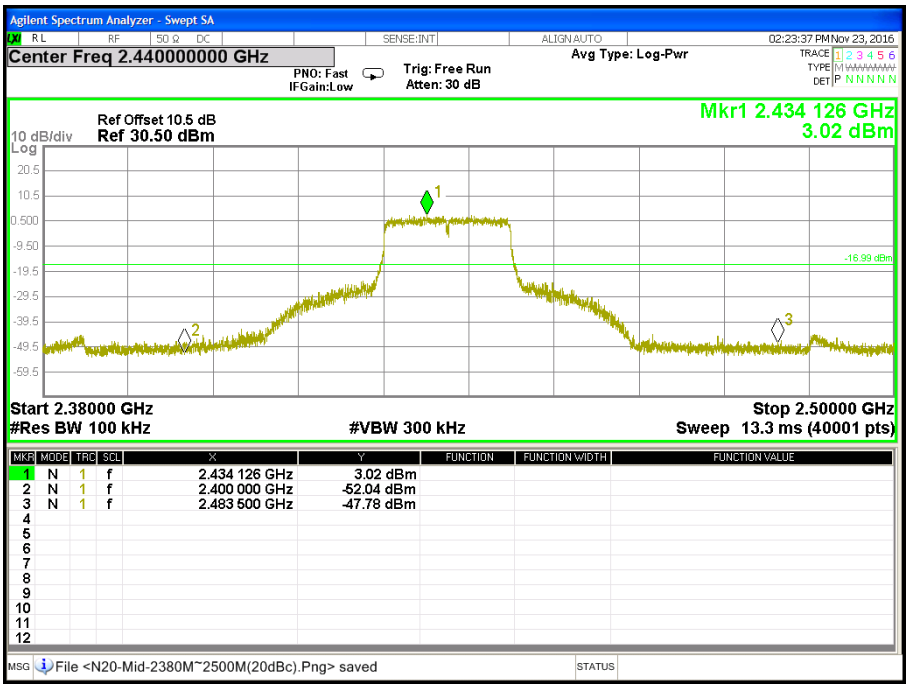
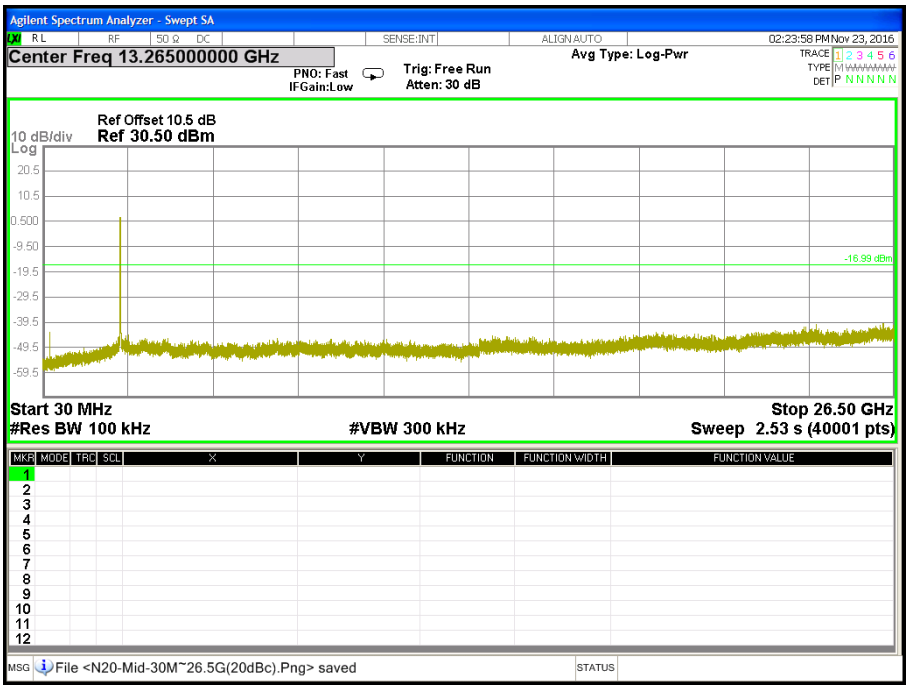
CH Middle (2.38GHz ~ 2.5GHz / IEEE 802.11gn HT20 MCS0 Mode)



CH Middle (30MHz ~ 26.5GHz / IEEE 802.11gn HT20 MCS0 Mode)



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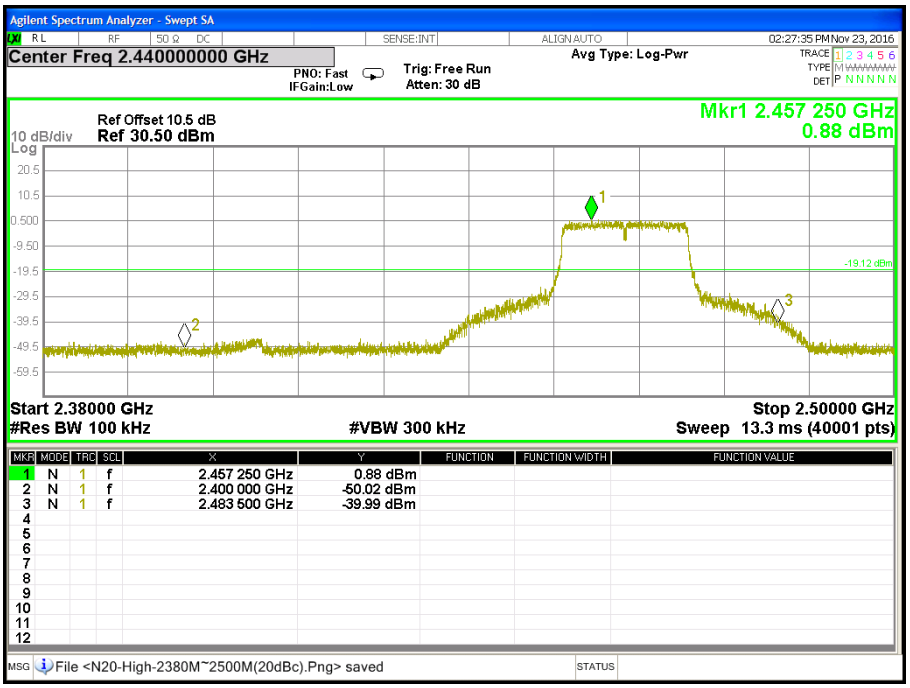
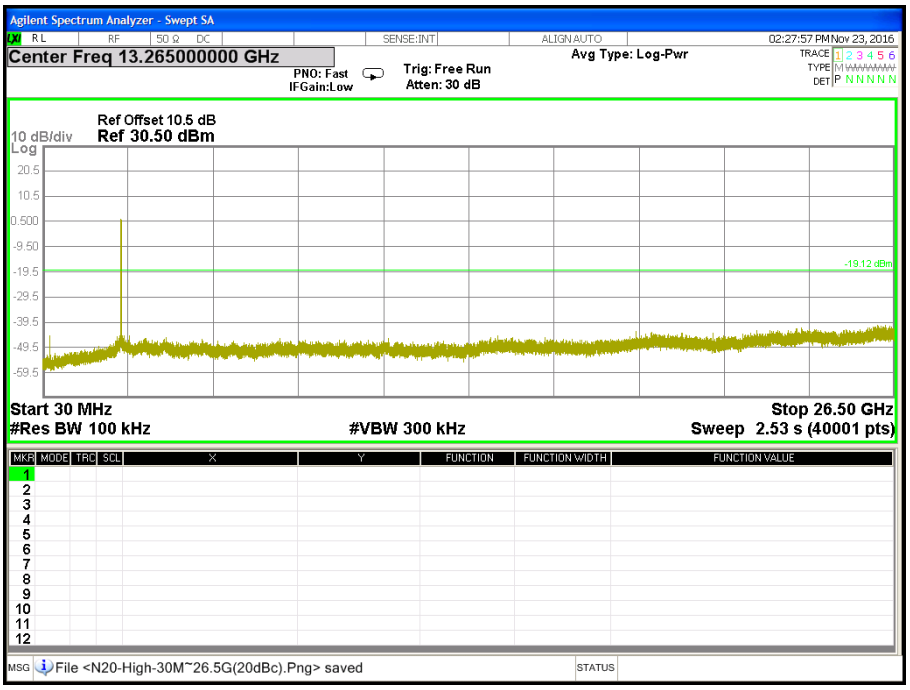
CH High (2.38GHz ~ 2.5GHz / IEEE 802.11gn HT20 MCS0 Mode)



CH High (30MHz ~ 26.5GHz / IEEE 802.11gn HT20 MCS0 Mode)



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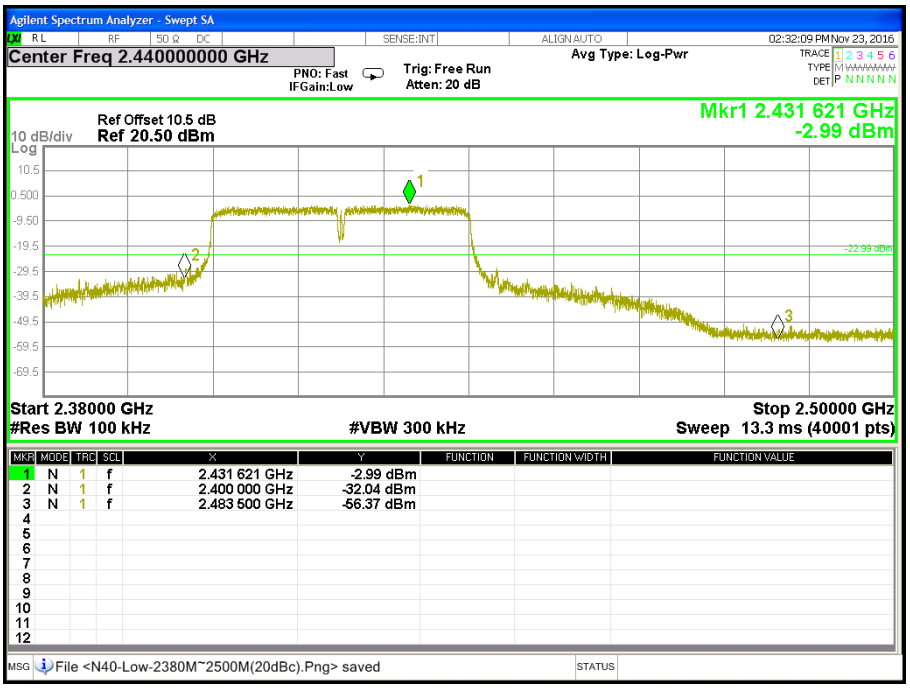
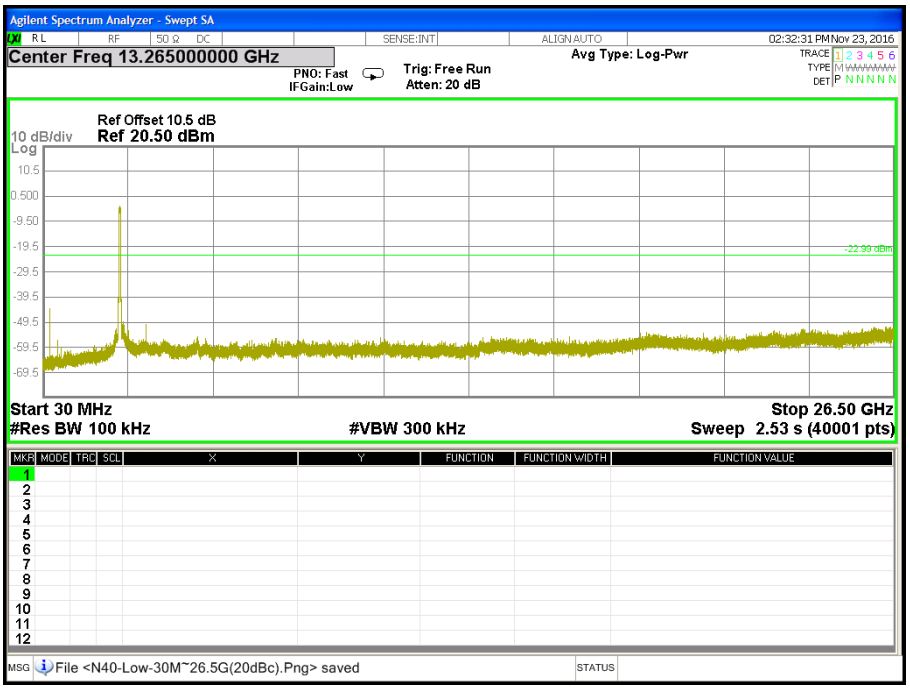
CH Low (2.38GHz ~ 2.5GHz / IEEE 802.11gn HT40 MCS0 Mode)



CH Low (30MHz ~ 26.5GHz / IEEE 802.11gn HT40 MCS0 Mode)



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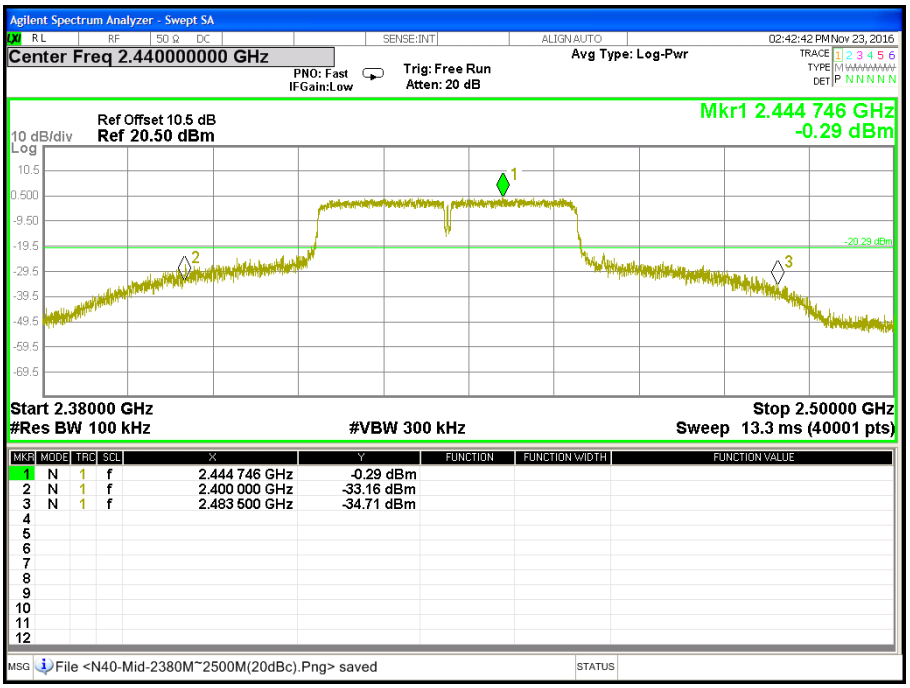
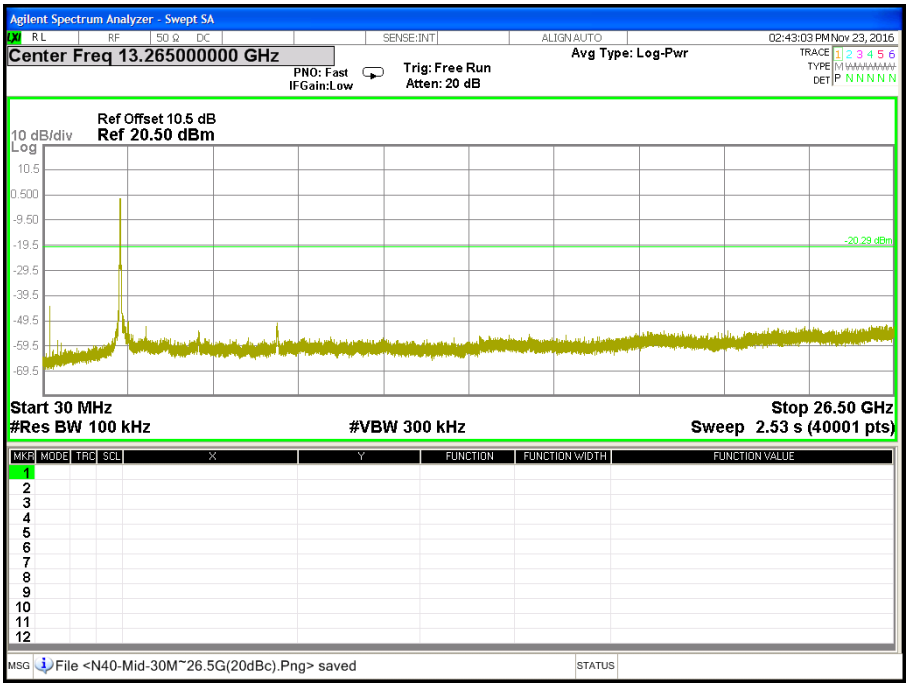
CH Middle (2.38GHz ~ 2.5GHz / IEEE 802.11gn HT40 MCS0 Mode)



CH Middle (30MHz ~ 26.5GHz / IEEE 802.11gn HT40 MCS0 Mode)



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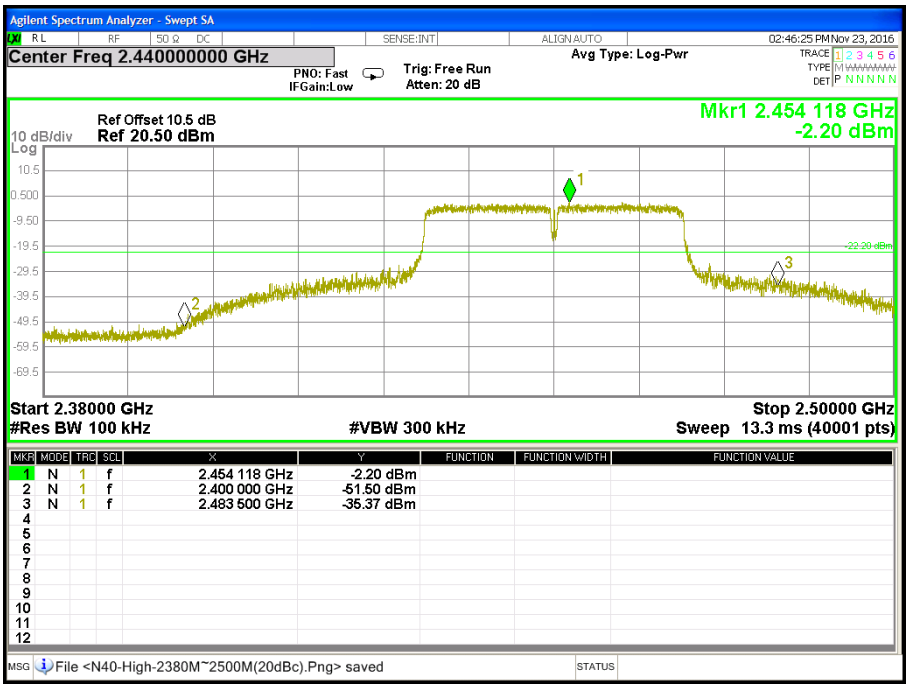
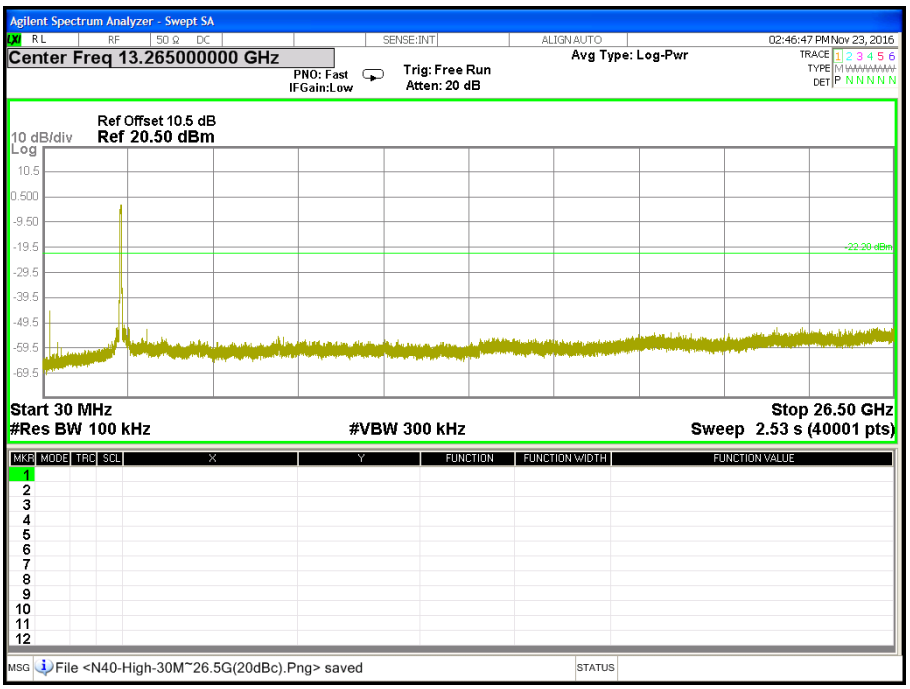
CH High (2.38GHz ~ 2.5GHz / IEEE 802.11gn HT40 MCS0 Mode)



CH High (30MHz ~ 26.5GHz / IEEE 802.11gn HT40 MCS0 Mode)



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7.7 RADIATED EMISSION

LIMITS

(1) According to § 15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 -1710	10.6 -12.7
6.26775 - 6.26825	108 -121.94	1718.8 - 1722.2	13.25 -13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 – 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 -16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3338	36.43 - 36.5
12.57675 - 12.57725	322 -335.4	3600 - 4400	([2])
13.36 - 13.41			

Remark:
1. [1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
2. [2] Above 38.6

(2) According to § 15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown is Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

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(3) According to § 15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(KHz)	300
0.490 – 1.705	24000/F(KHz)	30
1.705 – 30.0	30	30
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

Remark: ***Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.*

(4) According to § 15.209 (b) In the emission table above, the tighter limit applies at the band edges.

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TEST EQUIPMENT

Radiated Emission / 966Chamber_C

Name of Equipment	Manufacture	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY48250064	04/21/2017
EMI Test Receiver	Rohde & Schwarz	ESCI	101387	10/04/2017
Bi-log Antenna	TESEQ	CBL 6112D	35404	07/22/2017
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-285	04/17/2017
Pre-Amplifier	EMCI	EMC001625	980243	04/11/2017
Pre-Amplifier	COM-POWER	PAM-118A	551043	04/11/2017
Double Ridged Guide Horn Antenna	ETS・LINDGREN	3117	00078732	07/10/2017
Horn Antenna	COM-POWER	AH-840	03077	12/01/2017
Loop Antenna	COM-POWER	AL-130	121060	05/23/2017
Test S/W	E3.815206a			

Remark: *Each piece of equipment is scheduled for calibration once a year.*

Radiated Emission / 966Chamber_B

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY46180323	04/12/2017
EMI Test Receiver	Rohde & Schwarz	ESCI	100221	04/26/2017
Bi-log Antenna	TESEQ	CBL 6112D	35403	07/02/2017
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-778	07/14/2017
Double-Ridged Waveguide Horn	ETS-LINDGREN	3117	00078733	11/16/2017
Pre-Amplifier	Agilent	8447D	2944A10052	07/12/2017
Pre-Amplifier	Agilent	8449B	3008A01916	07/12/2017
Test S/W	E3.815206a			

Remark: *Each piece of equipment is scheduled for calibration once a year.*

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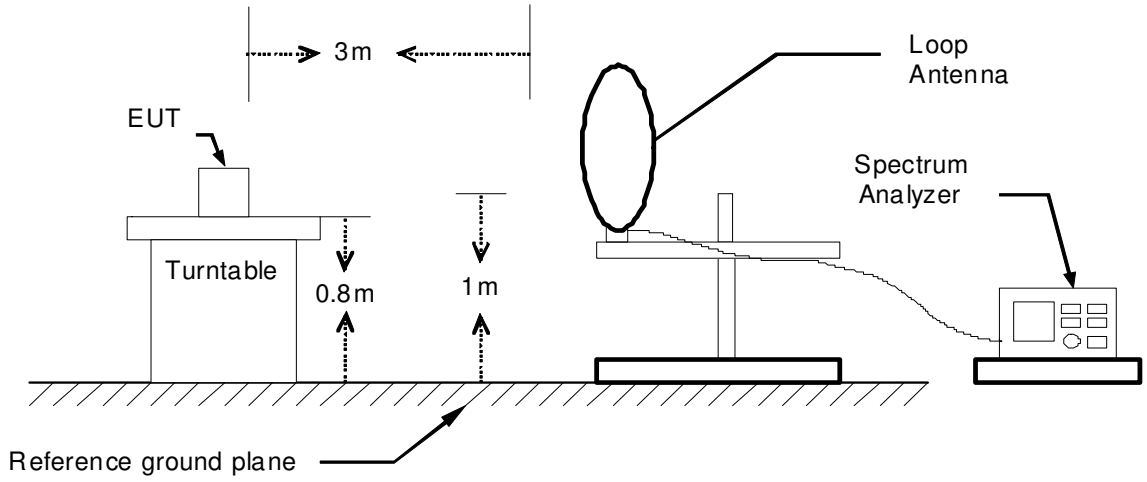
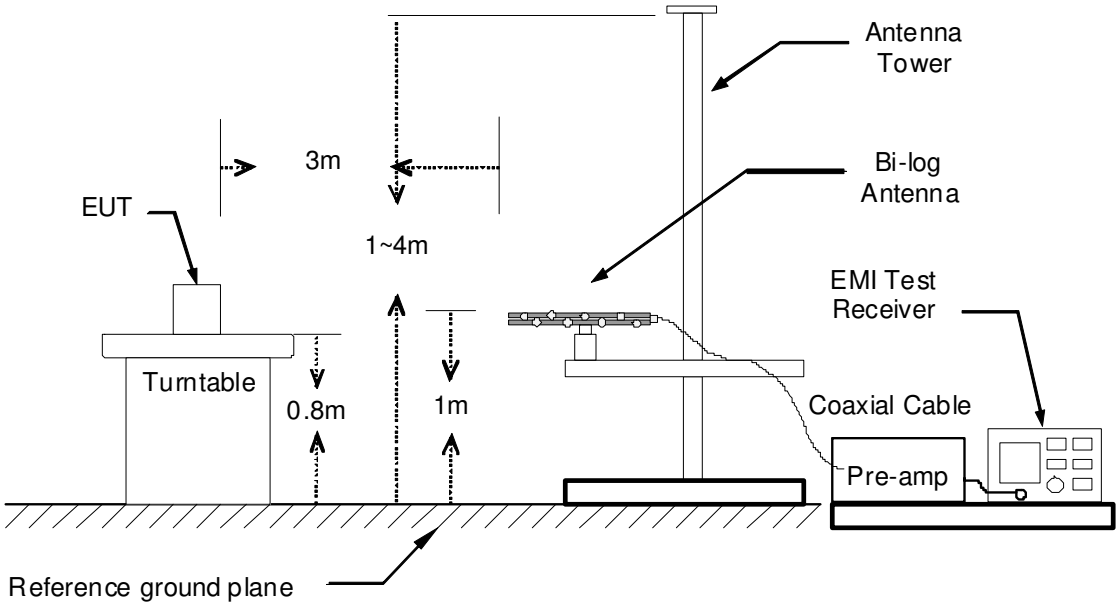
TEST SETUP

The diagram below shows the test setup that is utilized to make the measurements for emission below 1GHz.

9kHz ~ 30MHz



30MHz ~ 1GHz



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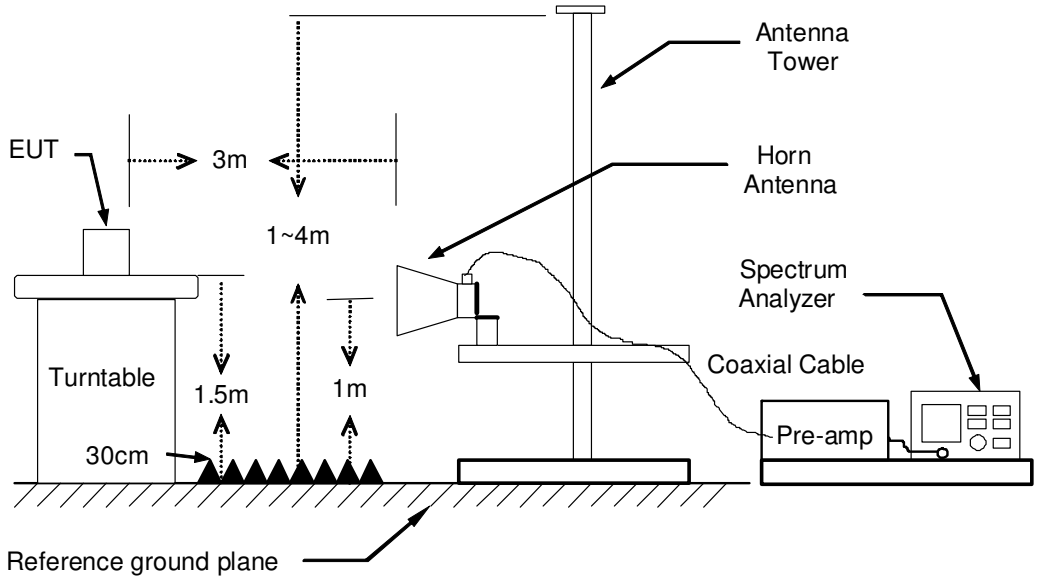
The diagram below shows the test setup that is utilized to make the measurements for emission above 1GHz.



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TEST PROCEDURE

1. The EUT was placed on the top of a rotating table 0.8 and 1.5 meters above the ground. The table was rotated 360 degrees to determine the position of the highest radiation.
2. While measuring the radiated emission below 1GHz, the EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. While measuring the radiated emission above 1GHz, the EUT was set 3 meters away from the interference-receiving antenna.
3. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarization of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold mode.
6. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Remark:

1. *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.*
2. *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection and frequency above 1GHz.*
3. *The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.*

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TEST RESULTS

Below 1 GHz (9kHz ~ 30MHz)

No emission found between lowest internal used/generated frequency to 30MHz.

Below 1 GHz (30MHz ~ 1GHz)

Product Name	Smart Energy Wireless Router	Test By	Allen Liu
Test Model	Billion SG600R2	Test Date	2016/11/04
Test Mode	Mode 1	Temp. & Humidity	17°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
94.02	55.24	-21.19	34.05	43.50	-9.45	139	200	Peak
239.52	52.84	-18.31	34.53	46.00	-11.47	307	150	Peak
542.16	52.50	-11.02	41.48	46.00	-4.52	2	150	Peak
600.36	47.53	-10.24	37.29	46.00	-8.71	327	150	Peak
720.64	46.78	-9.14	37.64	46.00	-8.36	164	100	Peak
780.78	45.59	-8.45	37.14	46.00	-8.86	164	100	Peak
960.23	45.21	-6.81	38.40	54.00	-15.60	156	150	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
31.94	46.47	-12.36	34.11	40.00	-5.89	181	100	Peak
60.07	59.26	-24.52	34.74	40.00	-5.26	261	150	Peak
68.80	59.40	-24.21	35.19	40.00	-4.81	360	100	QP
76.56	59.54	-23.59	35.95	40.00	-4.05	210	150	Peak
480.08	45.15	-11.96	33.19	46.00	-12.81	176	100	Peak
600.36	47.01	-10.24	36.77	46.00	-9.23	138	100	Peak

Remark:

1. *Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit.*
2. *Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) – PreAmp.Gain (dB)*
3. *Result (dBuV/m) = Reading (dBuV) + Correction Factor (dB/m)*
4. *Margin (dB) = Remark result (dBuV/m) - Quasi-peak limit (dBuV/m).*

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Above 1 GHz

Product Name	Smart Energy Wireless Router	Test By	Allen Liu
Test Model	Billion SG600R2	Test Date	2016/11/03
Test Mode	IEEE 802.11b Mode / TX / CH Low	Temp. & Humidity	17°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2494.00	47.98	-0.06	47.92	74.00	-26.08	259	150	Peak
2656.00	49.35	0.45	49.80	74.00	-24.20	231	150	Peak
3975.00	39.46	3.23	42.69	74.00	-31.31	133	150	Peak
4824.00	42.71	5.74	48.45	74.00	-25.55	226	100	Peak
6252.00	42.23	2.63	44.86	74.00	-29.14	127	100	Peak
7068.00	44.08	2.84	46.92	74.00	-27.08	11	200	Peak
7812.00	43.60	3.37	46.97	74.00	-27.03	213	100	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2496.00	49.80	-0.06	49.74	74.00	-24.26	3	150	Peak
2666.00	43.59	0.48	44.07	54.00	-9.93	76	150	Average
2666.00	52.14	0.48	52.62	74.00	-21.38	76	150	Peak
3216.00	40.80	1.77	42.57	74.00	-31.43	338	100	Peak
4824.00	47.31	5.74	53.05	54.00	-0.95	306	200	Average
4824.00	49.42	5.74	55.16	74.00	-18.84	306	200	Peak
6444.00	41.93	2.99	44.92	74.00	-29.08	187	200	Peak
6972.00	43.54	2.81	46.35	74.00	-27.65	263	100	Peak
7704.00	43.81	3.30	47.11	74.00	-26.89	56	150	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

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Product Name	Smart Energy Wireless Router	Test By	Allen Liu
Test Model	Billion SG600R2	Test Date	2016/11/03
Test Mode	IEEE 802.11b Mode / TX / CH Middle	Temp. & Humidity	17°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2328.00	49.98	-0.74	49.24	74.00	-24.76	237	200	Peak
2486.00	48.31	-0.10	48.21	74.00	-25.79	44	100	Peak
2612.00	48.33	0.31	48.64	74.00	-25.36	221	100	Peak
3024.00	38.83	1.57	40.40	74.00	-33.60	0	150	Peak
4875.00	42.34	5.89	48.23	74.00	-25.77	326	150	Peak
6444.00	41.74	2.99	44.73	74.00	-29.27	283	150	Peak
7032.00	44.22	2.81	47.03	74.00	-26.97	153	200	Peak
7764.00	44.62	3.34	47.96	74.00	-26.04	283	100	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2384.00	40.26	-0.51	39.75	54.00	-14.25	104	150	Average
2384.00	51.22	-0.51	50.71	74.00	-23.29	104	150	Peak
2500.00	42.05	-0.04	42.01	54.00	-11.99	7	150	Average
2500.00	52.51	-0.04	52.47	74.00	-21.53	7	150	Peak
2690.00	48.31	0.56	48.87	54.00	-5.13	62	150	Average
2690.00	54.83	0.56	55.39	74.00	-18.61	62	150	Peak
3249.00	40.10	1.81	41.91	74.00	-32.09	327	100	Peak
4875.00	47.66	5.89	53.55	54.00	-0.45	163	150	Average
4875.00	47.90	5.89	53.79	74.00	-20.21	163	150	Peak
6120.00	41.69	2.39	44.08	74.00	-29.92	360	200	Peak
6984.00	43.84	2.80	46.64	74.00	-27.36	246	200	Peak
7308.00	45.58	3.02	48.60	74.00	-25.40	325	150	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

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Product Name	Smart Energy Wireless Router	Test By	Allen Liu
Test Model	Billion SG600R2	Test Date	2016/11/03
Test Mode	IEEE 802.11b Mode / TX / CH High	Temp. & Humidity	17°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
1020.00	53.50	-4.47	49.03	74.00	-24.97	163	100	Peak
1858.00	52.56	-2.42	50.14	74.00	-23.86	256	200	Peak
2376.00	49.81	-0.55	49.26	74.00	-24.74	338	150	Peak
3282.00	39.02	1.84	40.86	74.00	-33.14	158	150	Peak
4923.00	44.36	6.03	50.39	74.00	-23.61	334	200	Peak
6528.00	41.76	3.08	44.84	74.00	-29.16	153	100	Peak
6960.00	44.11	2.81	46.92	74.00	-27.08	9	200	Peak
7716.00	44.20	3.31	47.51	74.00	-26.49	124	150	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
1136.00	53.55	-4.18	49.37	74.00	-24.63	266	200	Peak
2210.00	40.81	-1.22	39.59	54.00	-14.41	124	200	Average
2210.00	52.50	-1.22	51.28	74.00	-22.72	124	200	Peak
2362.00	39.37	-0.60	38.77	54.00	-15.23	3	200	Average
2362.00	51.69	-0.60	51.09	74.00	-22.91	3	200	Peak
3282.00	39.93	1.84	41.77	74.00	-32.23	332	100	Peak
4923.00	47.52	6.03	53.55	54.00	-0.45	315	200	Average
4923.00	48.11	6.03	54.14	74.00	-19.86	315	200	Peak
6456.00	41.98	3.02	45.00	74.00	-29.00	166	150	Peak
6924.00	43.87	2.84	46.71	74.00	-27.29	0	100	Peak
7380.00	44.49	3.07	47.56	74.00	-26.44	0	150	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

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Product Name	Smart Energy Wireless Router	Test By	Allen Liu
Test Model	Billion SG600R2	Test Date	2016/11/03
Test Mode	IEEE 802.11g Mode / TX / CH Low	Temp. & Humidity	17°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2494.00	48.61	-0.06	48.55	74.00	-25.45	22	200	Peak
2514.00	49.10	0.00	49.10	74.00	-24.90	130	150	Peak
3216.00	38.22	1.77	39.99	74.00	-34.01	227	100	Peak
4824.00	42.65	5.74	48.39	74.00	-25.61	217	150	Peak
6432.00	41.60	2.97	44.57	74.00	-29.43	3	150	Peak
7044.00	44.06	2.82	46.88	74.00	-27.12	63	100	Peak
7224.00	44.62	2.96	47.58	74.00	-26.42	102	200	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2488.00	42.43	-0.09	42.34	54.00	-11.66	330	200	Average
2488.00	53.95	-0.09	53.86	74.00	-20.14	330	200	Peak
2516.00	43.10	0.01	43.11	54.00	-10.89	70	150	Average
2516.00	55.10	0.01	55.11	74.00	-18.89	70	150	Peak
2664.00	44.34	0.48	44.82	54.00	-9.18	123	150	Average
2664.00	54.92	0.48	55.40	74.00	-18.60	123	150	Peak
3216.00	41.26	1.77	43.03	74.00	-30.97	336	100	Peak
4821.00	36.88	5.73	42.61	54.00	-11.39	220	200	Average
4821.00	50.19	5.73	55.92	74.00	-18.08	220	200	Peak
6300.00	42.31	2.72	45.03	74.00	-28.97	50	100	Peak
6996.00	44.58	2.79	47.37	74.00	-26.63	180	150	Peak
7236.00	39.28	2.96	42.24	54.00	-11.76	338	150	Average
7236.00	53.06	2.96	56.02	74.00	-17.98	338	150	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

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Product Name	Smart Energy Wireless Router	Test By	Allen Liu
Test Model	Billion SG600R2	Test Date	2016/11/03
Test Mode	IEEE 802.11g Mode / TX / CH Middle	Temp. & Humidity	17°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
1862.00	52.04	-2.41	49.63	74.00	-24.37	267	150	Peak
2320.00	49.55	-0.77	48.78	74.00	-25.22	350	100	Peak
2492.00	49.35	-0.07	49.28	74.00	-24.72	200	100	Peak
3030.00	39.34	1.57	40.91	74.00	-33.09	82	100	Peak
4875.00	40.36	5.89	46.25	74.00	-27.75	342	200	Peak
6528.00	41.71	3.08	44.79	74.00	-29.21	349	100	Peak
6912.00	43.99	2.84	46.83	74.00	-27.17	142	100	Peak
7596.00	44.05	3.23	47.28	74.00	-26.72	118	150	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2384.00	44.36	-0.51	43.85	54.00	-10.15	173	150	Average
2384.00	54.69	-0.51	54.18	74.00	-19.82	173	150	Peak
2490.00	48.98	-0.08	48.90	54.00	-5.10	349	200	Average
2490.00	56.85	-0.08	56.77	74.00	-17.23	349	200	Peak
2690.00	44.60	0.56	45.16	54.00	-8.84	126	200	Average
2690.00	56.53	0.56	57.09	74.00	-16.91	126	200	Peak
3249.00	41.79	1.81	43.60	74.00	-30.40	329	100	Peak
4875.00	34.24	5.89	40.13	54.00	-13.87	163	150	Average
4875.00	46.02	5.89	51.91	74.00	-22.09	163	150	Peak
6300.00	42.18	2.72	44.90	74.00	-29.10	169	200	Peak
7044.00	44.10	2.82	46.92	74.00	-27.08	173	150	Peak
7308.00	36.71	3.02	39.73	54.00	-14.27	357	150	Average
7308.00	50.63	3.02	53.65	74.00	-20.35	357	150	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

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Product Name	Smart Energy Wireless Router	Test By	Allen Liu
Test Model	Billion SG600R2	Test Date	2016/11/03
Test Mode	IEEE 802.11g Mode / TX / CH High	Temp. & Humidity	17°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
1440.00	52.99	-3.43	49.56	74.00	-24.44	11	200	Peak
1544.00	52.95	-3.17	49.78	74.00	-24.22	334	200	Peak
2312.00	50.01	-0.81	49.20	74.00	-24.80	307	150	Peak
3360.00	37.80	1.93	39.73	74.00	-34.27	218	150	Peak
4932.00	39.28	6.05	45.33	74.00	-28.67	340	200	Peak
6396.00	42.04	2.90	44.94	74.00	-29.06	78	150	Peak
6972.00	44.22	2.81	47.03	74.00	-26.97	111	100	Peak
7788.00	43.21	3.36	46.57	74.00	-27.43	81	100	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
1100.00	53.92	-4.27	49.65	74.00	-24.35	53	100	Peak
1134.00	53.77	-4.19	49.58	74.00	-24.42	143	150	Peak
2382.00	38.89	-0.52	38.37	54.00	-15.63	259	200	Average
2382.00	51.79	-0.52	51.27	74.00	-22.73	259	200	Peak
3282.00	41.30	1.84	43.14	74.00	-30.86	333	100	Peak
4926.00	43.33	6.04	49.37	74.00	-24.63	299	200	Peak
6504.00	42.08	3.10	45.18	74.00	-28.82	138	200	Peak
7044.00	44.65	2.82	47.47	74.00	-26.53	261	150	Peak
7392.00	35.33	3.08	38.41	54.00	-15.59	65	150	Average
7392.00	50.96	3.08	54.04	74.00	-19.96	65	150	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

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Product Name	Smart Energy Wireless Router	Test By	Allen Liu
Test Model	Billion SG600R2	Test Date	2016/11/16
Test Mode	IEEE 802.11gn HT20 MCS0 Mode / TX / CH Low	Temp. & Humidity	17°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
1420.00	53.45	-3.48	49.97	74.00	-24.03	96	200	Peak
1860.00	39.53	-2.42	37.11	54.00	-16.89	153	100	Average
1860.00	54.01	-2.42	51.59	74.00	-22.41	153	100	Peak
2666.00	48.88	0.48	49.36	74.00	-24.64	158	150	Peak
3216.00	39.00	1.77	40.77	74.00	-33.23	39	100	Peak
4821.00	41.68	5.73	47.41	74.00	-26.59	221	150	Peak
6552.00	41.99	3.07	45.06	74.00	-28.94	340	200	Peak
6972.00	43.30	2.81	46.11	74.00	-27.89	53	200	Peak
7716.00	44.03	3.31	47.34	74.00	-26.66	313	150	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2492.00	42.32	-0.07	42.25	54.00	-11.75	99	200	Average
2492.00	54.80	-0.07	54.73	74.00	-19.27	99	200	Peak
2530.00	43.52	0.05	43.57	54.00	-10.43	68	200	Average
2530.00	55.24	0.05	55.29	74.00	-18.71	68	200	Peak
2664.00	43.12	0.48	43.60	54.00	-10.40	352	200	Average
2664.00	54.90	0.48	55.38	74.00	-18.62	352	200	Peak
3216.00	40.33	1.77	42.10	74.00	-31.90	338	100	Peak
4824.00	36.24	5.74	41.98	54.00	-12.02	242	200	Average
4824.00	50.37	5.74	56.11	74.00	-17.89	242	200	Peak
6396.00	42.01	2.90	44.91	74.00	-29.09	76	200	Peak
6960.00	43.45	2.81	46.26	74.00	-27.74	220	150	Peak
7224.00	38.62	2.96	41.58	54.00	-12.42	6	150	Average
7224.00	51.10	2.96	54.06	74.00	-19.94	6	150	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

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Product Name	Smart Energy Wireless Router	Test By	Allen Liu
Test Model	Billion SG600R2	Test Date	2016/11/16
Test Mode	IEEE 802.11gn HT20 MCS0 Mode / TX / CH Middle	Temp. & Humidity	17°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
1858.00	52.95	-2.42	50.53	74.00	-23.47	148	200	Peak
2350.00	49.46	-0.65	48.81	74.00	-25.19	132	150	Peak
2488.00	40.37	-0.09	40.28	54.00	-13.72	202	100	Average
2488.00	51.29	-0.09	51.20	74.00	-22.80	202	100	Peak
3249.00	39.35	1.81	41.16	74.00	-32.84	171	150	Peak
4869.00	41.29	5.87	47.16	74.00	-26.84	327	200	Peak
6432.00	41.38	2.97	44.35	74.00	-29.65	141	100	Peak
6972.00	43.92	2.81	46.73	74.00	-27.27	358	200	Peak
7644.00	43.89	3.26	47.15	74.00	-26.85	209	100	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2386.00	44.79	-0.51	44.28	54.00	-9.72	346	200	Average
2386.00	54.45	-0.51	53.94	74.00	-20.06	346	200	Peak
2488.00	48.79	-0.09	48.70	54.00	-5.30	192	200	Average
2488.00	58.39	-0.09	58.30	74.00	-15.70	192	200	Peak
2692.00	44.17	0.57	44.74	54.00	-9.26	323	200	Average
2692.00	55.41	0.57	55.98	74.00	-18.02	323	200	Peak
3249.00	41.77	1.81	43.58	74.00	-30.42	347	100	Peak
4869.00	34.08	5.87	39.95	54.00	-14.05	318	200	Average
4869.00	46.69	5.87	52.56	74.00	-21.44	318	200	Peak
6480.00	42.19	3.06	45.25	74.00	-28.75	248	100	Peak
7020.00	43.77	2.80	46.57	74.00	-27.43	289	200	Peak
7308.00	35.69	3.02	38.71	54.00	-15.29	360	150	Average
7308.00	50.40	3.02	53.42	74.00	-20.58	360	150	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

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Product Name	Smart Energy Wireless Router	Test By	Allen Liu
Test Model	Billion SG600R2	Test Date	2016/11/03
Test Mode	IEEE 802.11gn HT20 MCS0 Mode / TX / CH High	Temp. & Humidity	17°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
1140.00	53.95	-4.17	49.78	74.00	-24.22	212	200	Peak
1800.00	52.53	-2.56	49.97	74.00	-24.03	315	200	Peak
2316.00	49.98	-0.79	49.19	74.00	-24.81	353	100	Peak
3033.00	39.36	1.58	40.94	74.00	-33.06	205	200	Peak
4926.00	39.91	6.04	45.95	74.00	-28.05	340	150	Peak
6372.00	42.22	2.86	45.08	74.00	-28.92	302	150	Peak
7032.00	43.57	2.81	46.38	74.00	-27.62	146	100	Peak
7728.00	43.79	3.32	47.11	74.00	-26.89	65	100	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
1722.00	53.10	-2.75	50.35	74.00	-23.65	27	200	Peak
2390.00	51.10	-0.49	50.61	74.00	-23.39	177	150	Peak
3282.00	42.06	1.84	43.90	74.00	-30.10	334	100	Peak
4926.00	44.75	6.04	50.79	74.00	-23.21	323	200	Peak
6480.00	42.19	3.06	45.25	74.00	-28.75	327	200	Peak
7008.00	44.17	2.80	46.97	74.00	-27.03	119	200	Peak
7392.00	36.80	3.08	39.88	54.00	-14.12	347	150	Average
7392.00	49.94	3.08	53.02	74.00	-20.98	347	150	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

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Product Name	Smart Energy Wireless Router	Test By	Allen Liu
Test Model	Billion SG600R2	Test Date	2016/11/16
Test Mode	IEEE 802.11gn HT40 MCS0 Mode / TX / CH Low	Temp. & Humidity	17°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
1858.00	43.28	-2.42	40.86	54.00	-13.14	281	200	Average
1858.00	53.59	-2.42	51.17	74.00	-22.83	281	200	Peak
2488.00	47.88	-0.09	47.79	74.00	-26.21	79	150	Peak
3228.00	39.31	1.79	41.10	74.00	-32.90	169	150	Peak
4845.00	36.28	5.80	42.08	74.00	-31.92	318	200	Peak
6360.00	42.72	2.84	45.56	74.00	-28.44	0	150	Peak
6972.00	44.25	2.81	47.06	74.00	-26.94	343	100	Peak
7788.00	43.74	3.36	47.10	74.00	-26.90	61	100	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2488.00	41.09	-0.09	41.00	54.00	-13.00	65	200	Average
2488.00	52.57	-0.09	52.48	74.00	-21.52	65	200	Peak
2526.00	44.56	0.04	44.60	54.00	-9.40	187	150	Average
2526.00	56.28	0.04	56.32	74.00	-17.68	187	150	Peak
3228.00	41.18	1.79	42.97	74.00	-31.03	146	100	Peak
4845.00	42.01	5.80	47.81	74.00	-26.19	30	150	Peak
6516.00	41.60	3.09	44.69	74.00	-29.31	39	150	Peak
7020.00	44.17	2.80	46.97	74.00	-27.03	98	200	Peak
7728.00	43.94	3.32	47.26	74.00	-26.74	68	100	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

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Product Name	Smart Energy Wireless Router	Test By	Allen Liu
Test Model	Billion SG600R2	Test Date	2016/11/16
Test Mode	IEEE 802.11gn HT40 MCS0 Mode / TX / CH Middle	Temp. & Humidity	17°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
1860.00	42.58	-2.42	40.16	54.00	-13.84	250	100	Average
1860.00	53.98	-2.42	51.56	74.00	-22.44	250	100	Peak
2390.00	41.77	-0.49	41.28	54.00	-12.72	93	200	Average
2390.00	55.49	-0.49	55.00	74.00	-19.00	93	200	Peak
2484.00	43.43	-0.11	43.32	54.00	-10.68	190	100	Average
2484.00	54.74	-0.11	54.63	74.00	-19.37	190	100	Peak
3171.00	38.58	1.72	40.30	74.00	-33.70	9	100	Peak
4878.00	38.86	5.90	44.76	74.00	-29.24	337	150	Peak
6360.00	42.13	2.84	44.97	74.00	-29.03	282	200	Peak
6996.00	44.18	2.79	46.97	74.00	-27.03	259	200	Peak
7764.00	43.68	3.34	47.02	74.00	-26.98	132	100	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2390.00	50.07	-0.49	49.58	54.00	-4.42	355	100	Average
2390.00	66.54	-0.49	66.05	74.00	-7.95	355	100	Peak
2484.00	52.86	-0.11	52.75	54.00	-1.25	5	200	Average
2484.00	69.62	-0.11	69.51	74.00	-4.49	5	200	Peak
2540.00	48.23	0.09	48.32	54.00	-5.68	349	150	Average
2540.00	58.30	0.09	58.39	74.00	-15.61	349	150	Peak
3249.00	41.20	1.81	43.01	74.00	-30.99	341	100	Peak
4872.00	44.14	5.88	50.02	74.00	-23.98	283	200	Peak
6444.00	42.41	2.99	45.40	74.00	-28.60	221	100	Peak
7044.00	43.77	2.82	46.59	74.00	-27.41	153	200	Peak
7308.00	46.76	3.02	49.78	74.00	-24.22	8	150	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

This report shall not be reproduced, except in full, without the written approval of Compliance Certification Services Inc.

Product Name	Smart Energy Wireless Router	Test By	Allen Liu
Test Model	Billion SG600R2	Test Date	2016/11/03
Test Mode	IEEE 802.11gn HT40 MCS0 Mode / TX / CH High	Temp. & Humidity	17°C, 50%

966Chamber_C at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
1856.00	50.73	-2.43	48.30	74.00	-25.70	35	100	Peak
2264.00	46.31	-1.00	45.31	74.00	-28.69	277	100	Peak
2360.00	45.11	-0.61	44.50	74.00	-29.50	155	100	Peak
3033.00	39.03	1.58	40.61	74.00	-33.39	263	150	Peak
4908.00	36.38	5.99	42.37	74.00	-31.63	181	200	Peak
6456.00	41.72	3.02	44.74	74.00	-29.26	79	150	Peak
6888.00	44.18	2.86	47.04	74.00	-26.96	214	200	Peak
7836.00	43.95	3.39	47.34	74.00	-26.66	86	150	Peak

966Chamber_C at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
1166.00	48.91	-4.11	44.80	74.00	-29.20	104	150	Peak
1638.00	47.91	-2.95	44.96	74.00	-29.04	23	100	Peak
2348.00	48.52	-0.66	47.86	74.00	-26.14	178	150	Peak
3270.00	41.47	1.83	43.30	74.00	-30.70	323	100	Peak
4908.00	36.97	5.99	42.96	74.00	-31.04	93	150	Peak
6444.00	42.42	2.99	45.41	74.00	-28.59	360	150	Peak
7056.00	43.46	2.83	46.29	74.00	-27.71	323	200	Peak
7764.00	43.69	3.34	47.03	74.00	-26.97	315	200	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

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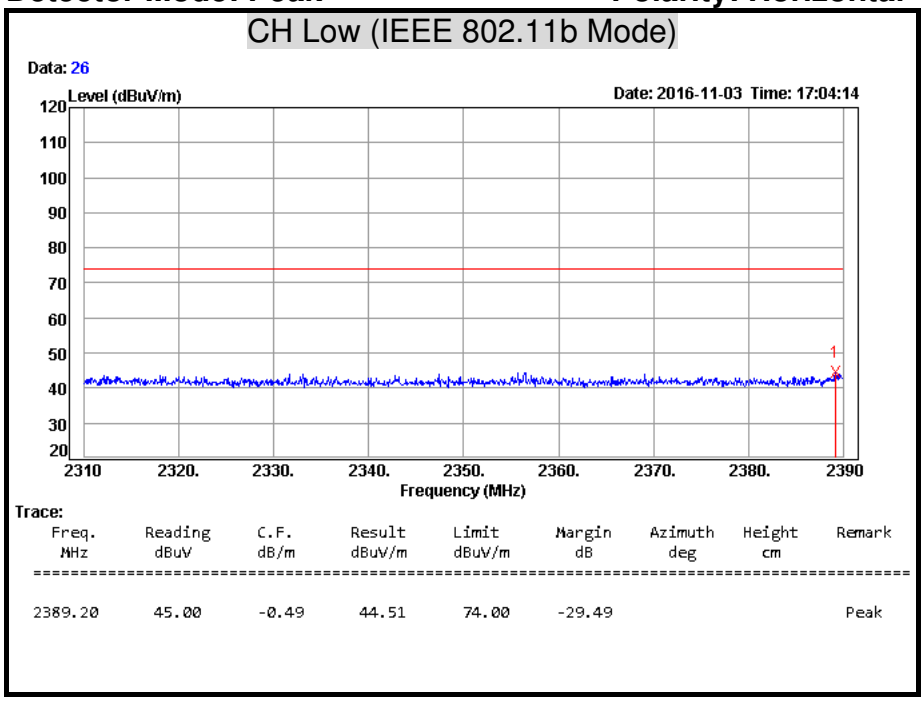
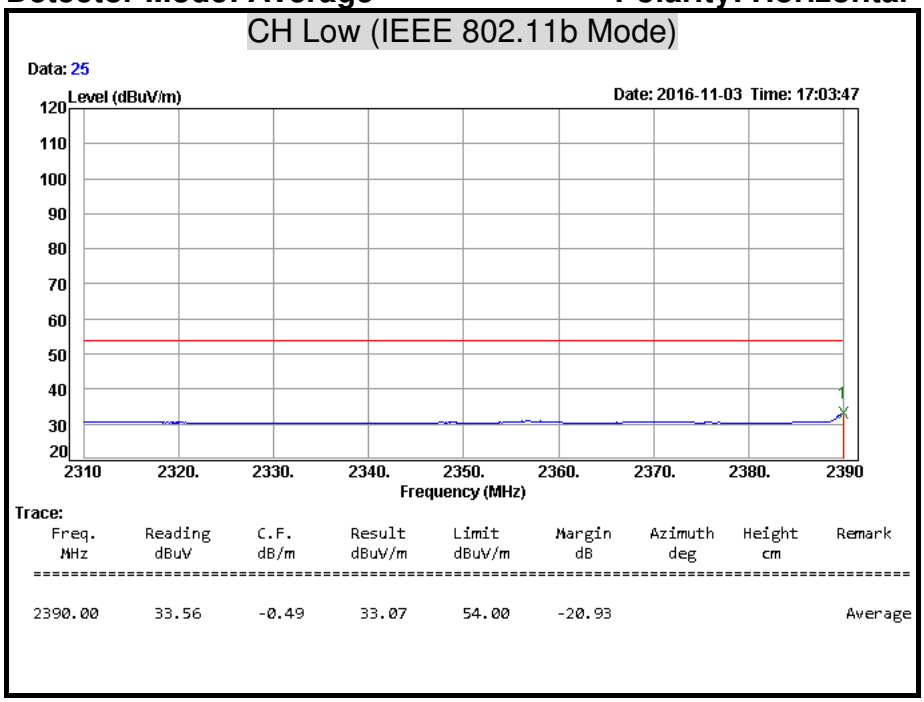
Restricted Band Edges

Detector Mode: Peak **Polarity: Horizontal**



Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Horizontal**



Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

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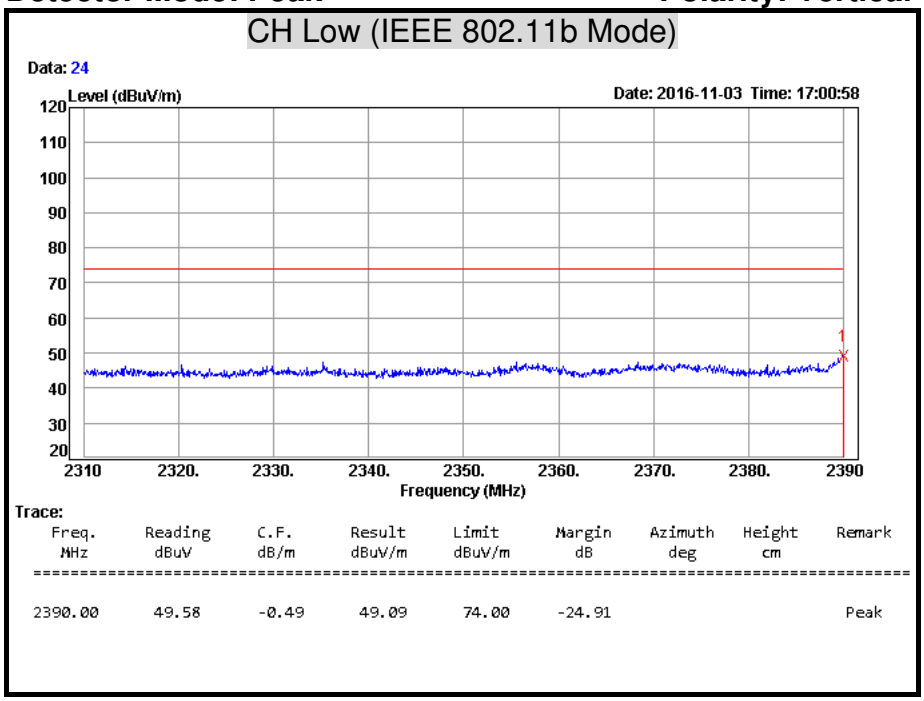
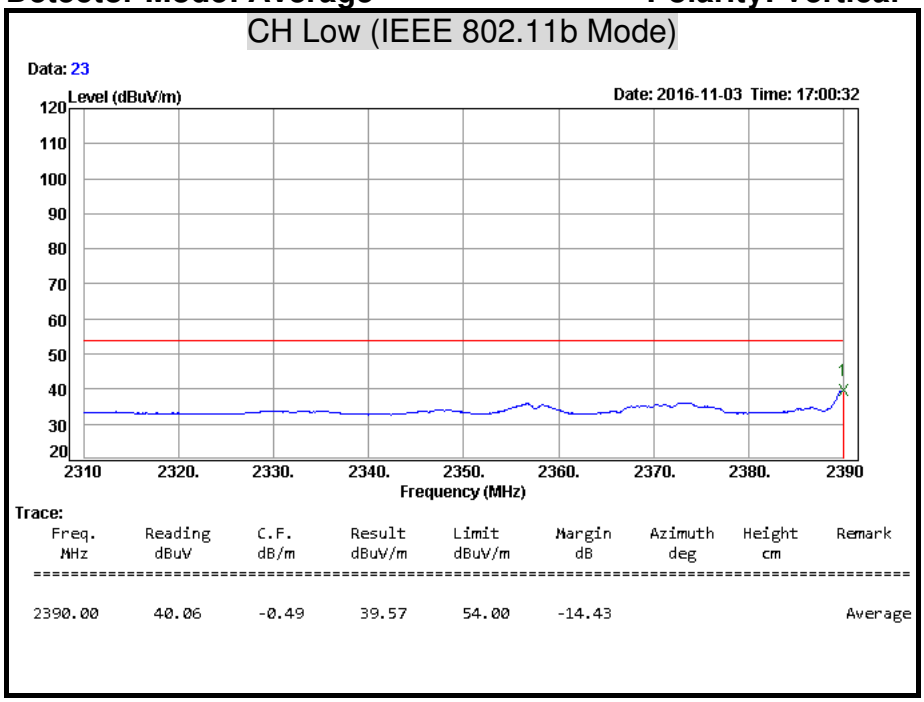
Detector Mode: Peak **Polarity: Vertical**



Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Vertical**



Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

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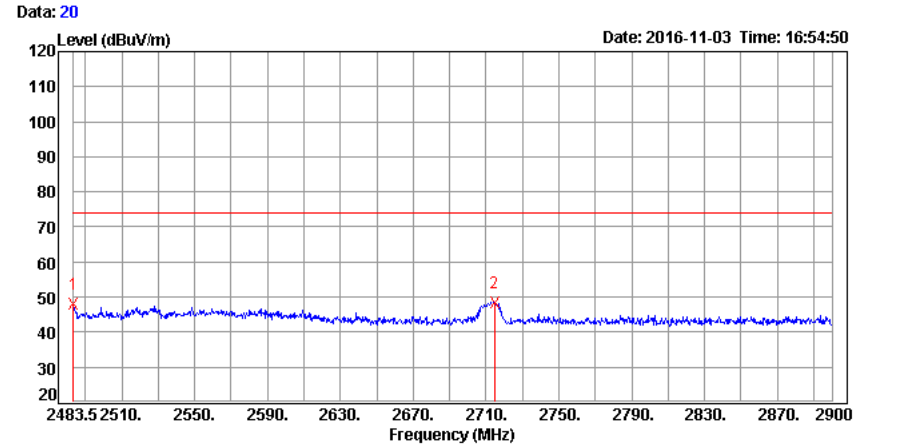
Detector Mode: Peak **Polarity: Horizontal**

CH High (IEEE 802.11b Mode)



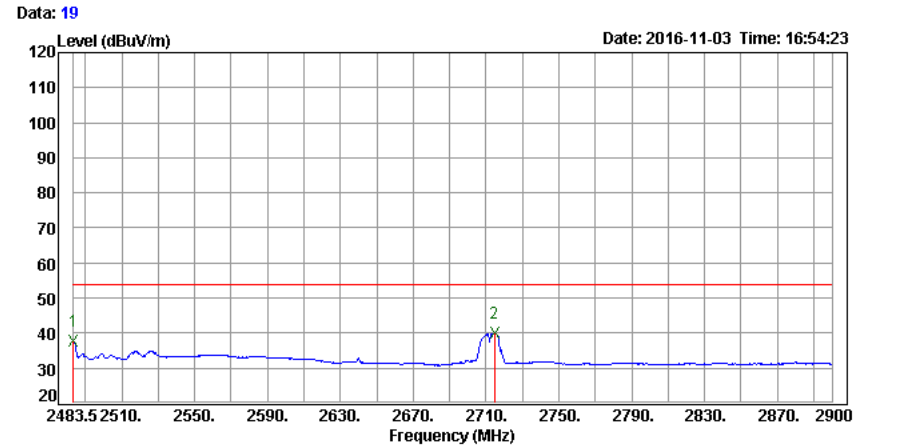
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	48.10	-0.11	47.99	74.00	-26.01			Peak
2714.66	47.85	0.64	48.49	74.00	-25.51			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Horizontal**

CH High (IEEE 802.11b Mode)



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	37.89	-0.11	37.78	54.00	-16.22			Average
2714.66	39.34	0.64	39.98	54.00	-14.02			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

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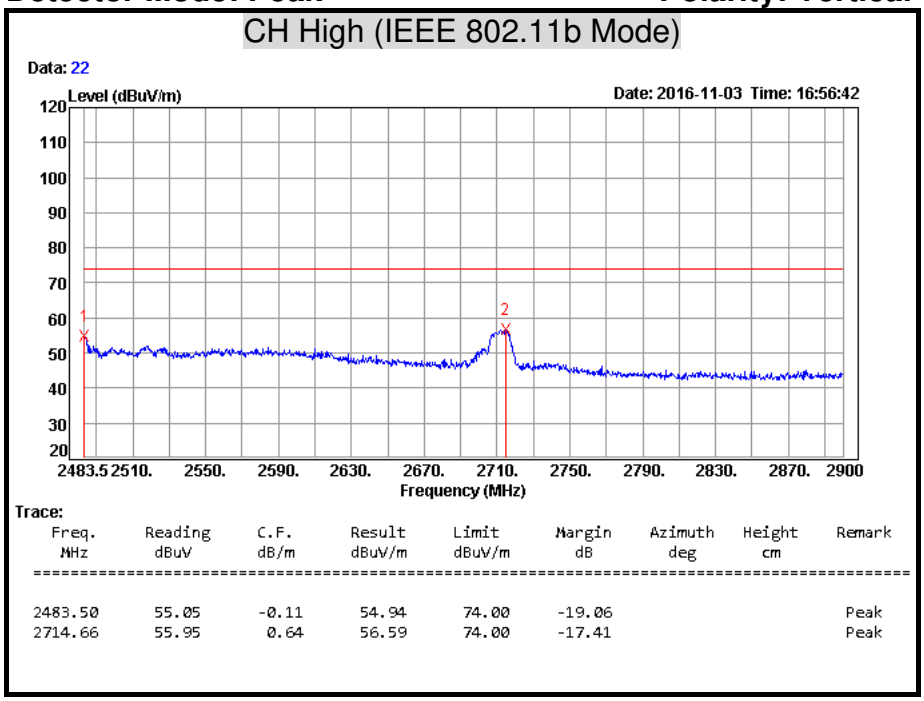
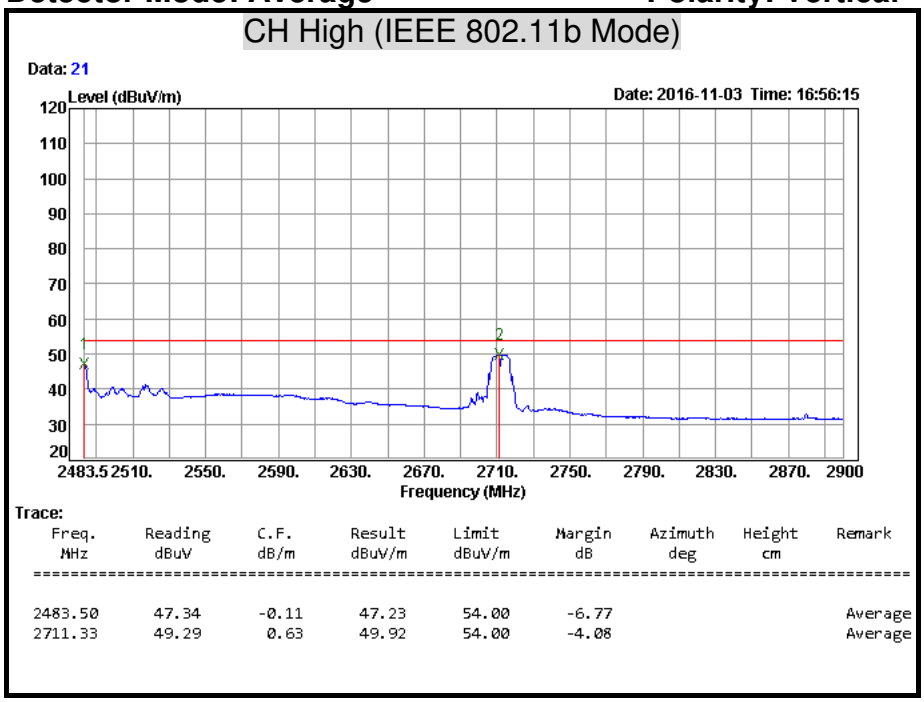
Detector Mode: Peak **Polarity: Vertical**



Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Vertical**



Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

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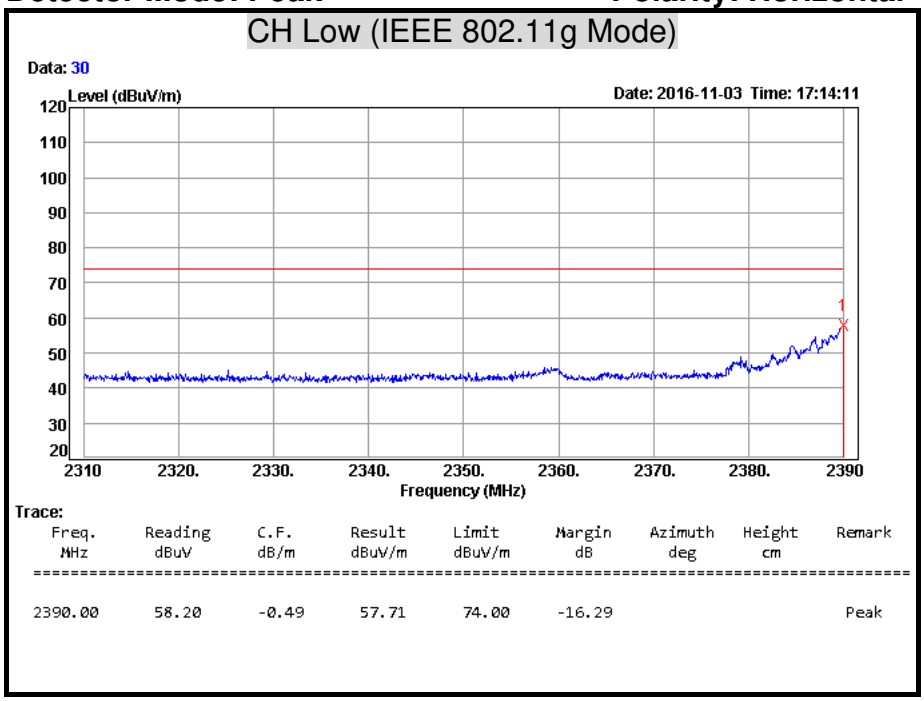
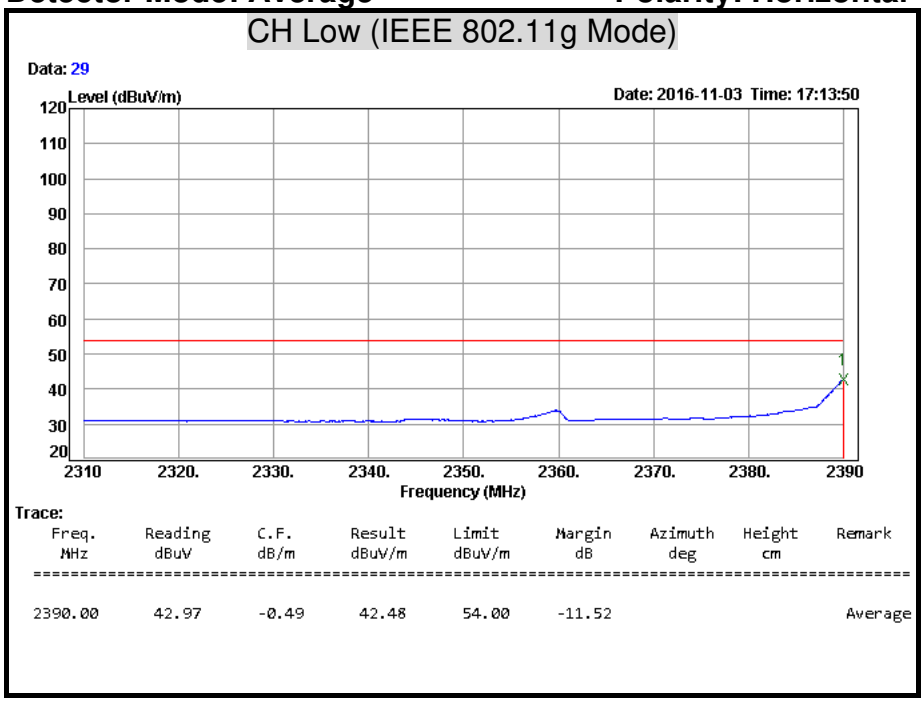
Detector Mode: Peak **Polarity: Horizontal**



Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Horizontal**



Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

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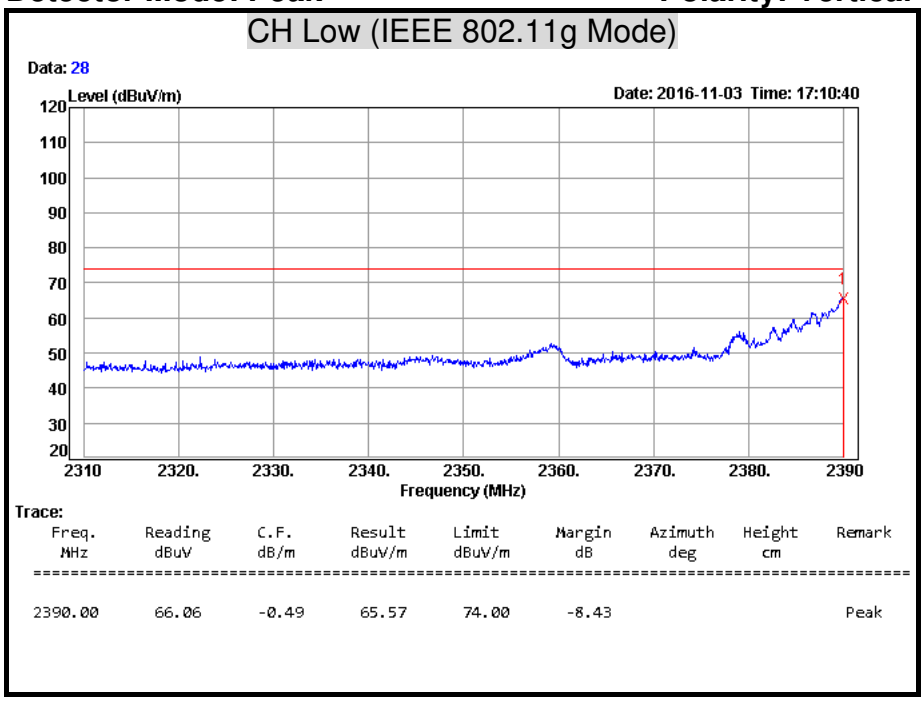
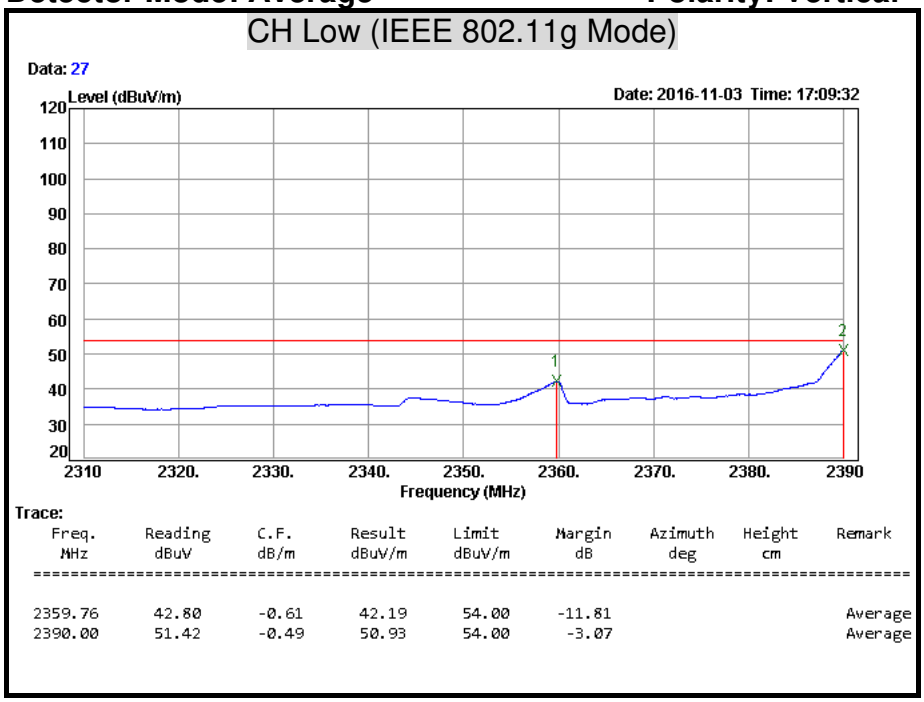
Detector Mode: Peak **Polarity: Vertical**



Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Vertical**



Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

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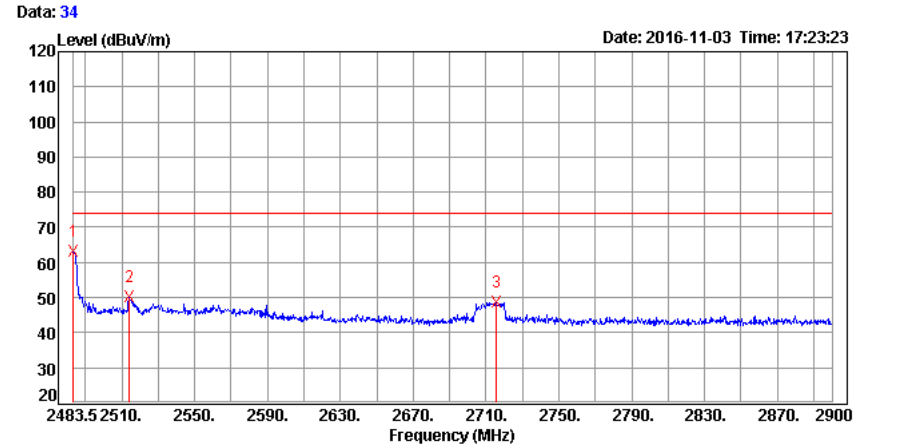
Detector Mode: Peak **Polarity: Horizontal**

CH High (IEEE 802.11g Mode)



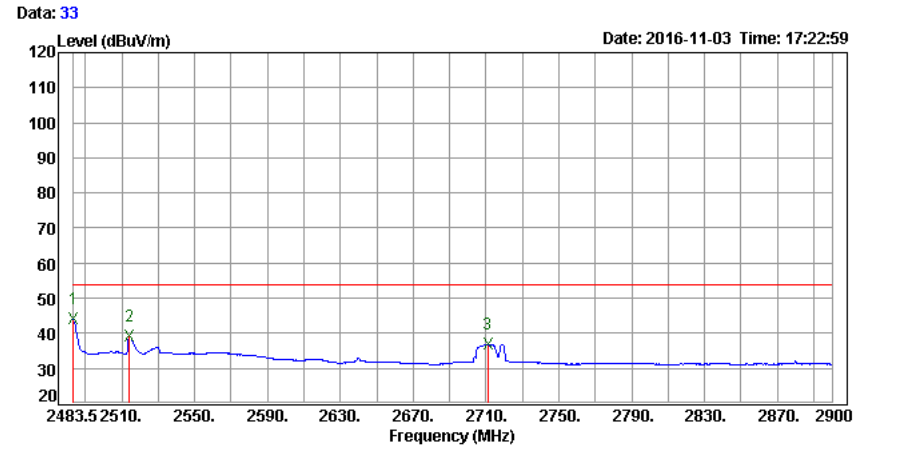
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	63.09	-0.11	62.98	74.00	-11.02			Peak
2514.32	50.15	0.01	50.16	74.00	-23.84			Peak
2715.91	48.04	0.64	48.68	74.00	-25.32			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Horizontal**

CH High (IEEE 802.11g Mode)



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	44.11	-0.11	44.00	54.00	-10.00			Average
2514.32	39.25	0.01	39.26	54.00	-14.74			Average
2710.91	36.19	0.63	36.82	54.00	-17.18			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

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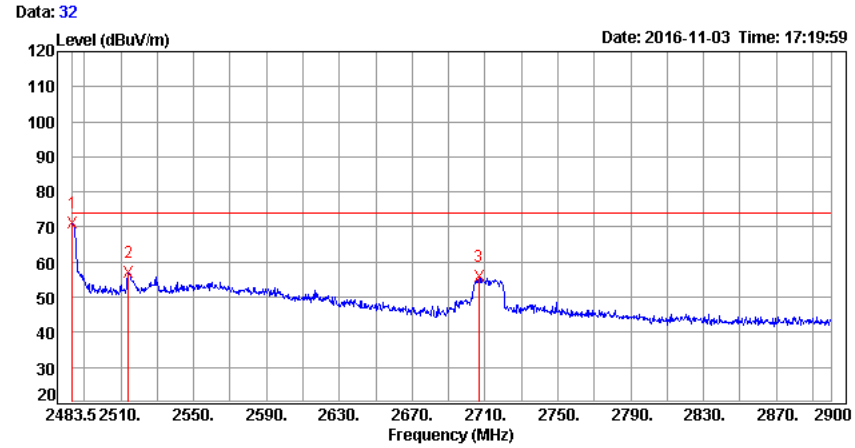
Detector Mode: Peak **Polarity: Vertical**

CH High (IEEE 802.11g Mode)



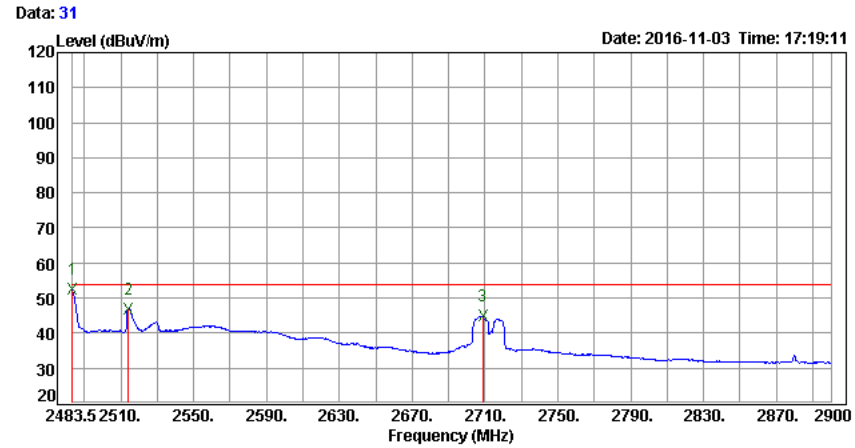
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	71.20	-0.11	71.09	74.00	-2.91			Peak
2514.32	56.94	0.01	56.95	74.00	-17.05			Peak
2706.74	55.50	0.61	56.11	74.00	-17.89			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Vertical**

CH High (IEEE 802.11g Mode)



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	52.47	-0.11	52.36	54.00	-1.64			Average
2514.32	46.98	0.01	46.99	54.00	-7.01			Average
2708.83	44.12	0.62	44.74	54.00	-9.26			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

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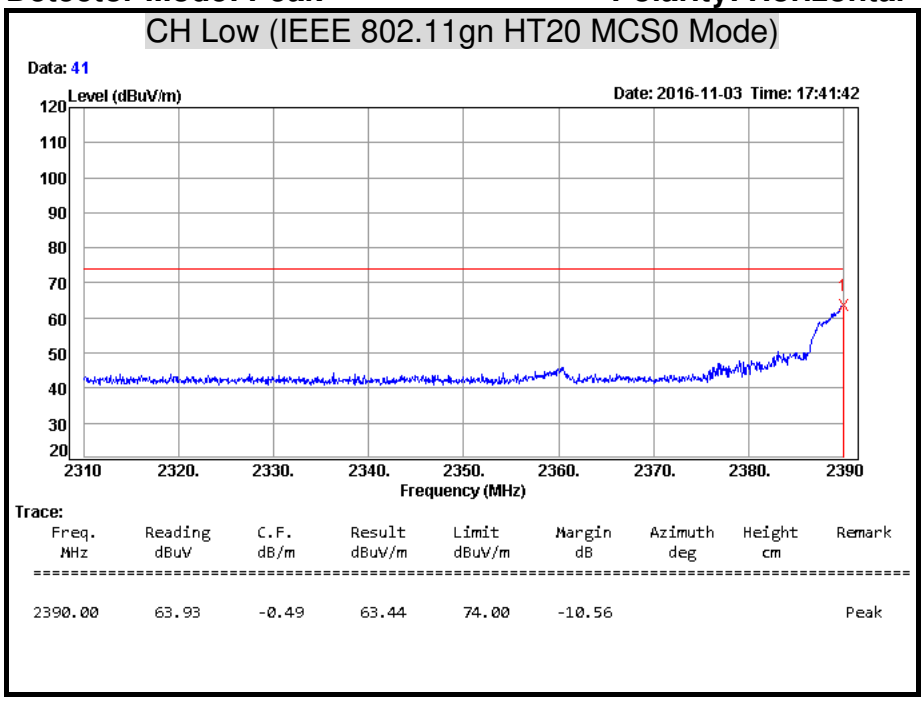
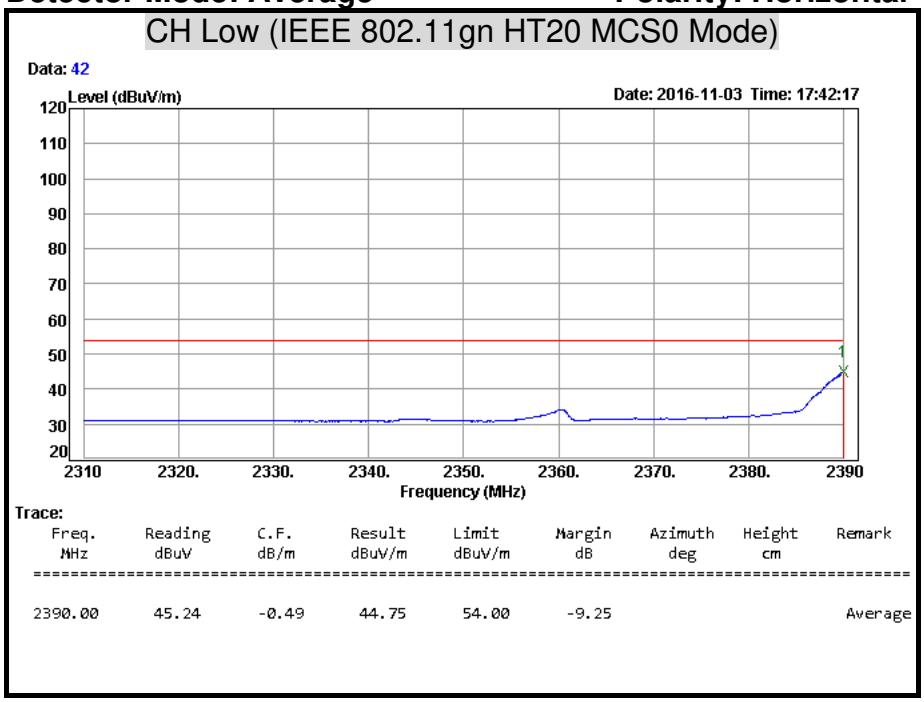
Detector Mode: Peak **Polarity: Horizontal**



Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Horizontal**



Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

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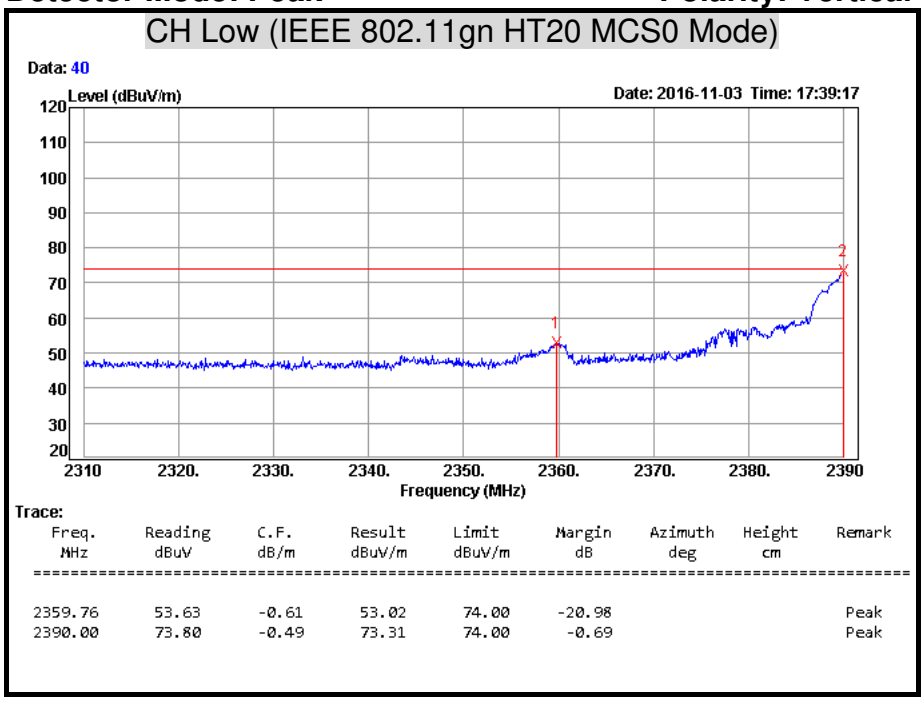
Detector Mode: Peak **Polarity: Vertical**

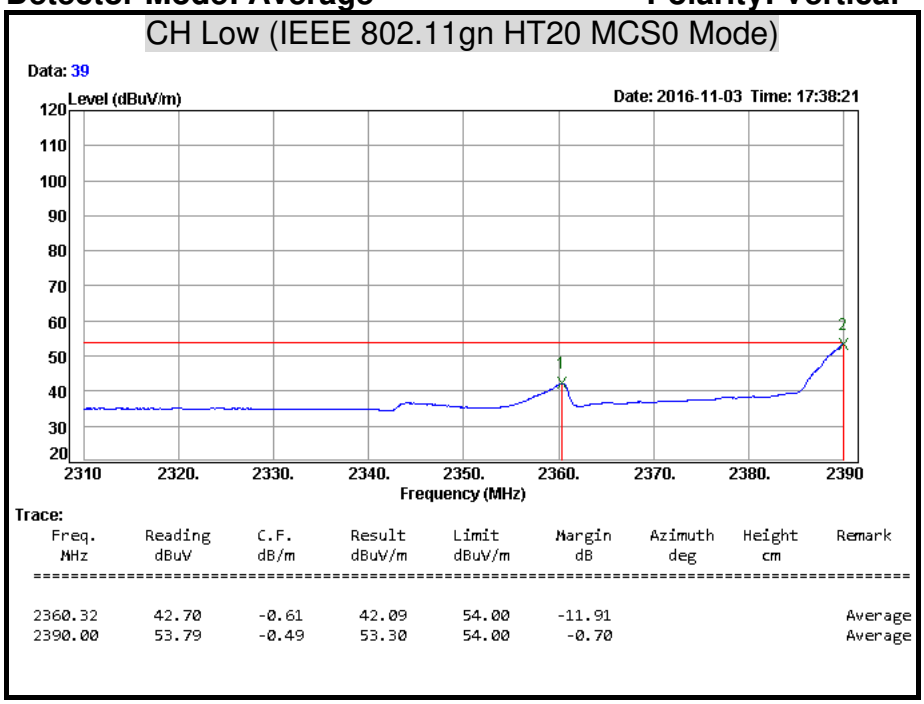


Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2359.76	53.63	-0.61	53.02	74.00	-20.98			Peak
2390.00	73.80	-0.49	73.31	74.00	-0.69			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Vertical**



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2360.32	42.70	-0.61	42.09	54.00	-11.91			Average
2390.00	53.79	-0.49	53.30	54.00	-0.70			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

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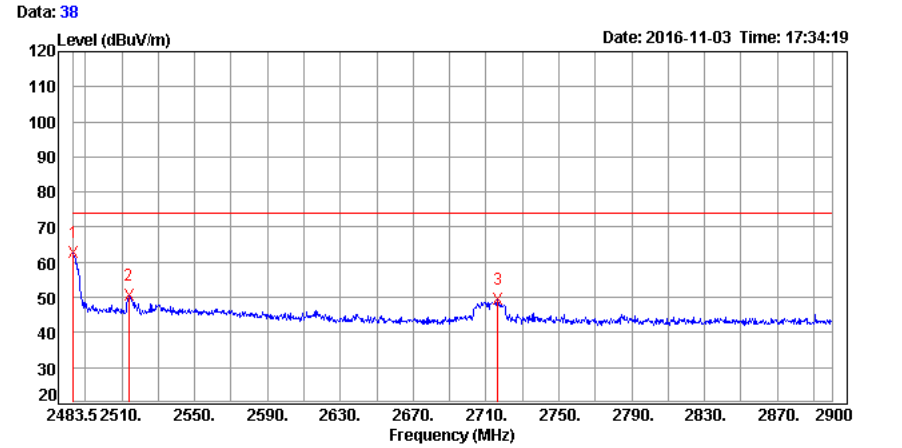
Detector Mode: Peak **Polarity: Horizontal**

CH High (IEEE 802.11gn HT20 MCS0 Mode)



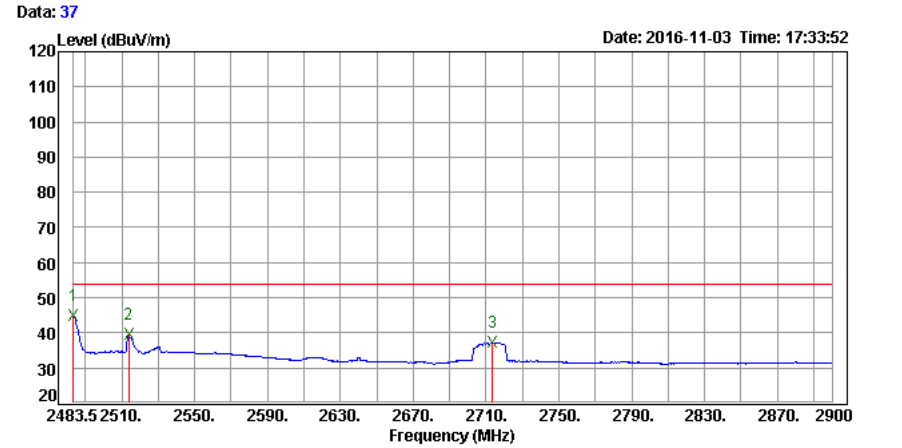
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	62.71	-0.11	62.60	74.00	-11.40			Peak
2513.91	50.47	0.00	50.47	74.00	-23.53			Peak
2716.32	48.79	0.64	49.43	74.00	-24.57			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Horizontal**

CH High (IEEE 802.11gn HT20 MCS0 Mode)



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	45.08	-0.11	44.97	54.00	-9.03			Average
2513.91	39.76	0.00	39.76	54.00	-14.24			Average
2713.41	36.55	0.63	37.18	54.00	-16.82			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

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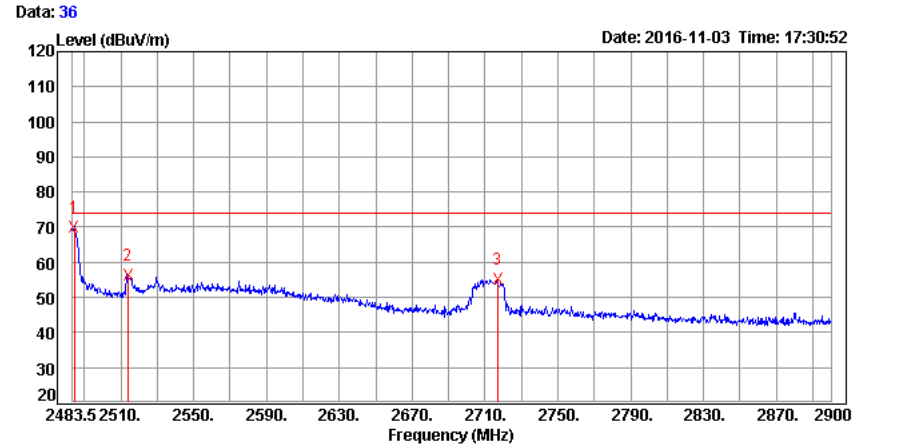
Detector Mode: Peak **Polarity: Vertical**

CH High (IEEE 802.11gn HT20 MCS0 Mode)



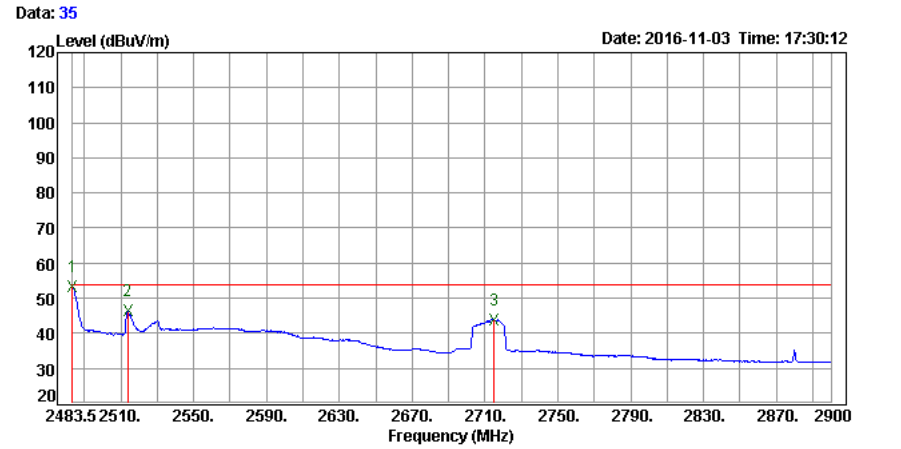
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2484.33	70.14	-0.10	70.04	74.00	-3.96			Peak
2513.91	56.40	0.00	56.40	74.00	-17.60			Peak
2716.74	54.63	0.64	55.27	74.00	-18.73			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Vertical**

CH High (IEEE 802.11gn HT20 MCS0 Mode)



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	53.44	-0.11	53.33	54.00	-0.67			Average
2513.91	46.42	0.00	46.42	54.00	-7.58			Average
2715.07	43.25	0.64	43.89	54.00	-10.11			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

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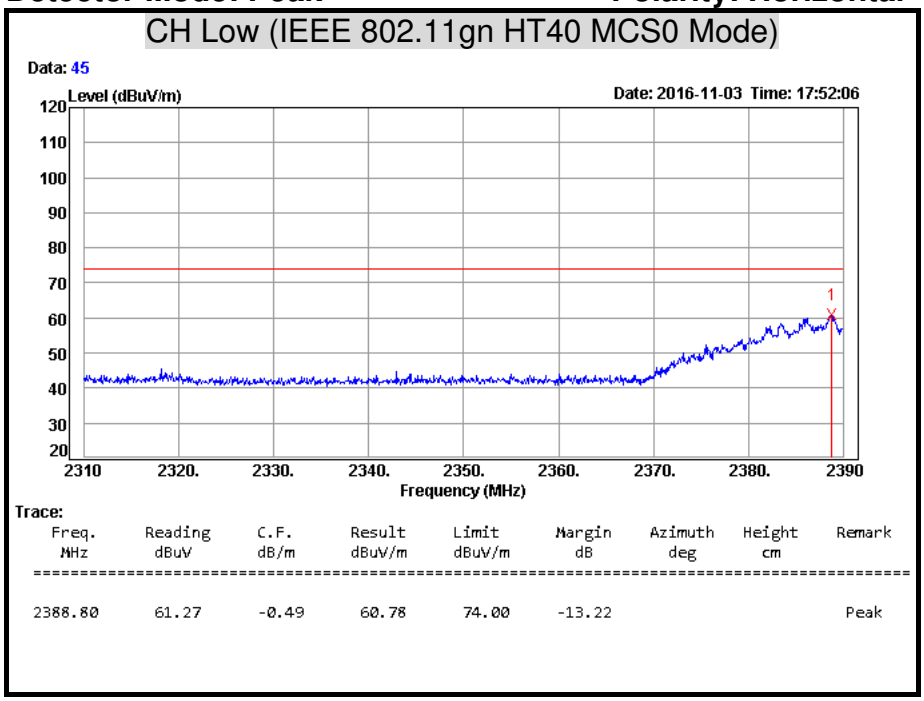
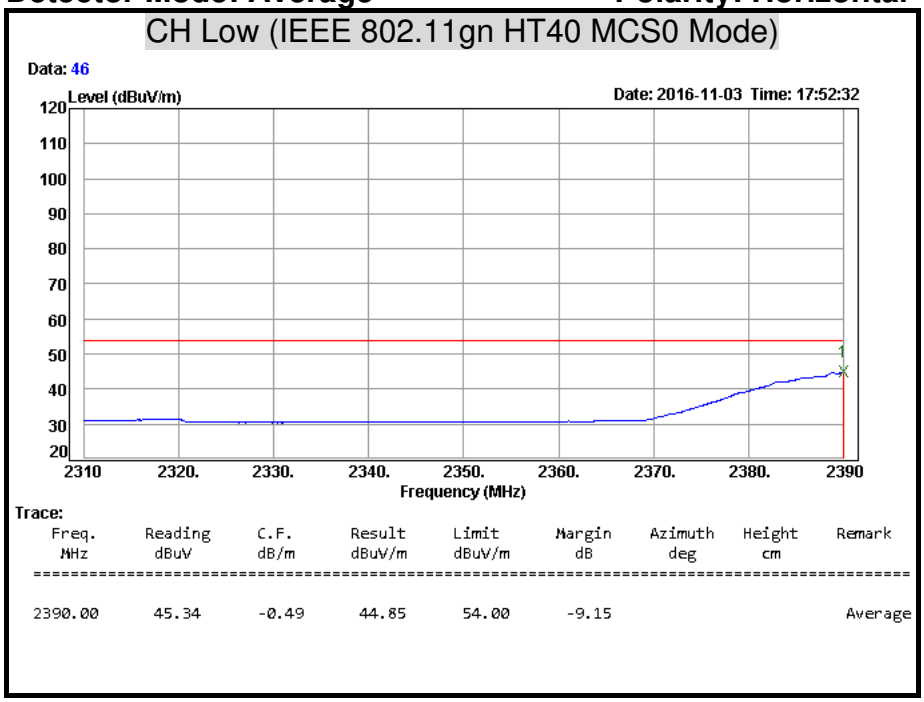
Detector Mode: Peak **Polarity: Horizontal**



Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Horizontal**



Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

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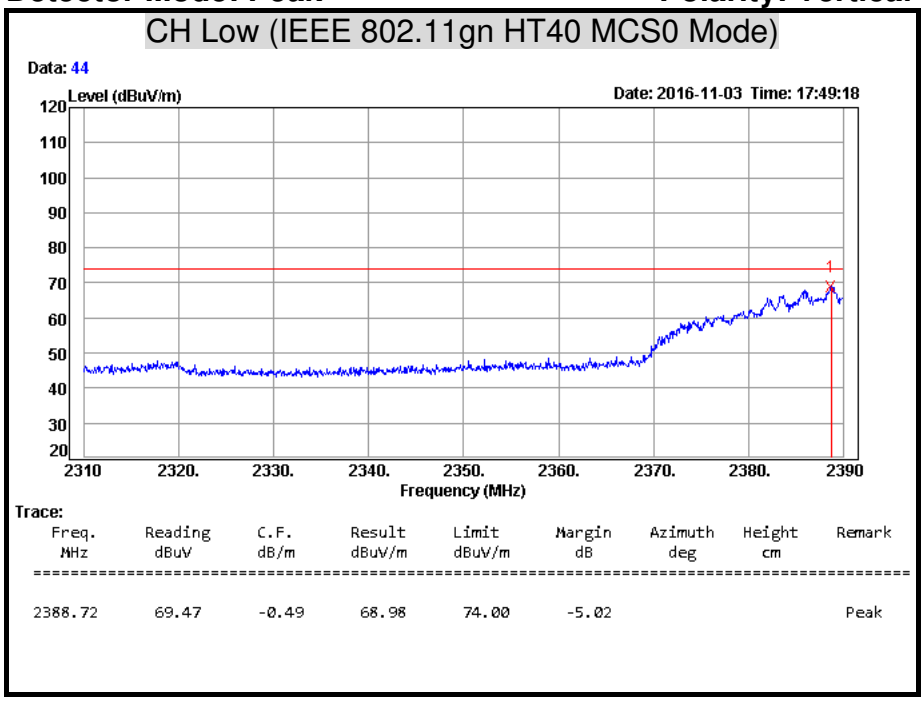
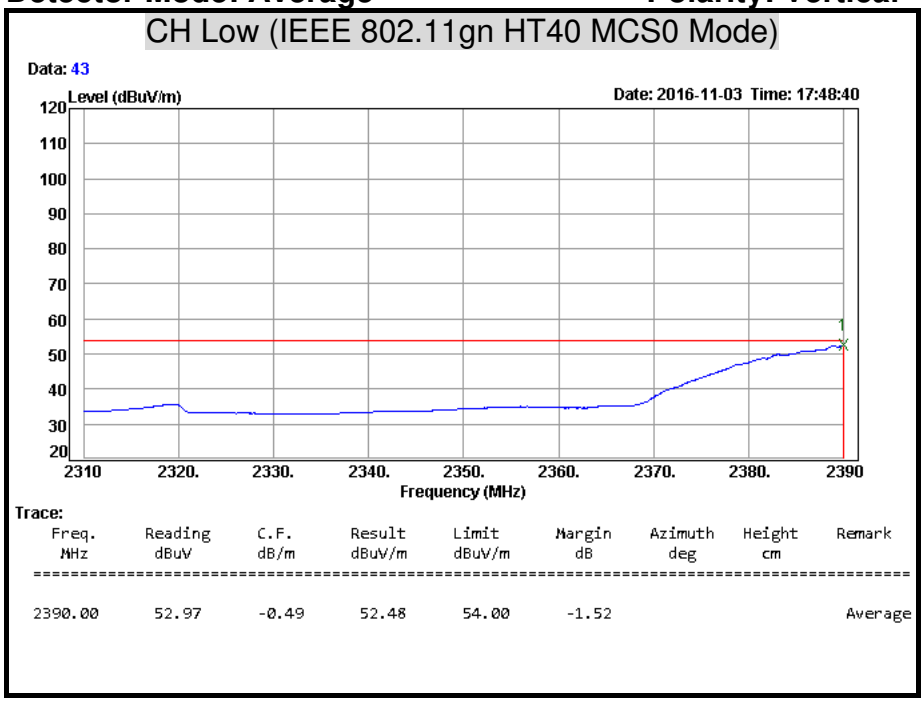
Detector Mode: Peak **Polarity: Vertical**



Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Vertical**



Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

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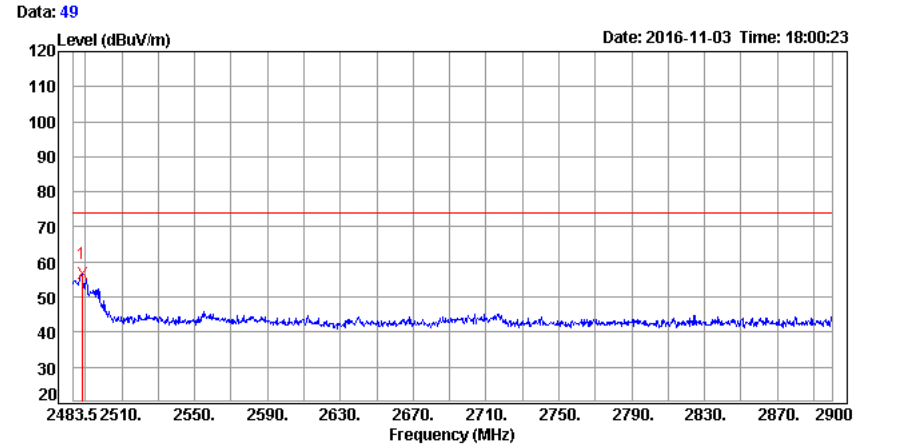
Detector Mode: Peak **Polarity: Horizontal**

CH High (IEEE 802.11gn HT40 MCS0 Mode)



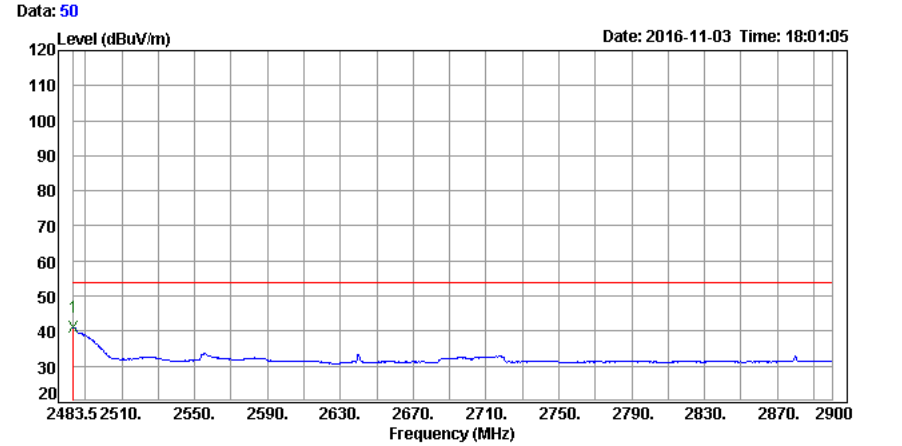
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2488.08	56.71	-0.09	56.62	74.00	-17.38			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Horizontal**

CH High (IEEE 802.11gn HT40 MCS0 Mode)



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	41.07	-0.11	40.96	54.00	-13.04			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

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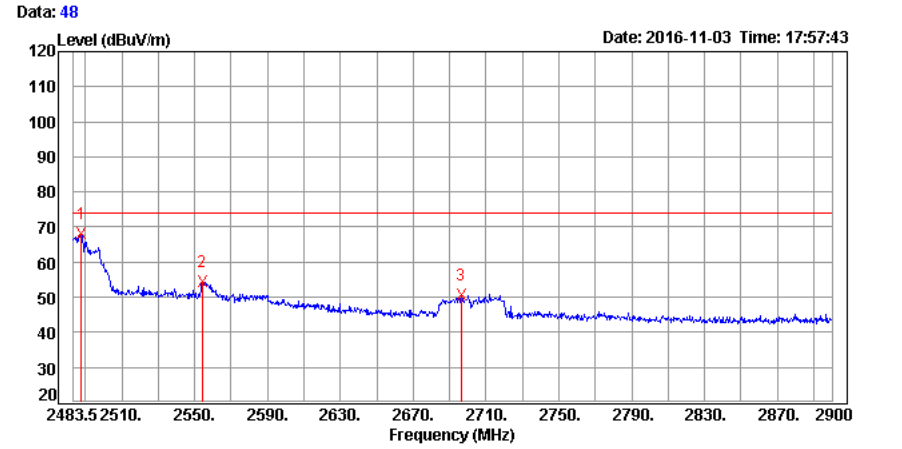
Detector Mode: Peak **Polarity: Vertical**

CH High (IEEE 802.11gn HT40 MCS0 Mode)



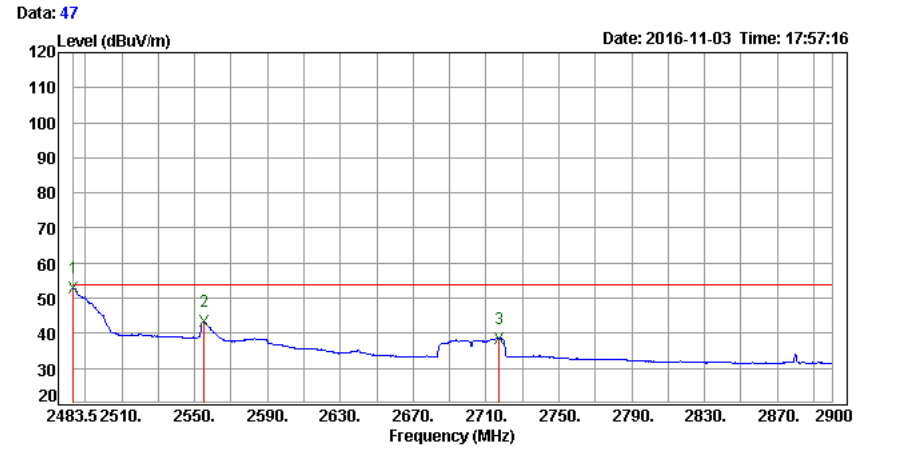
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2487.67	68.24	-0.09	68.15	74.00	-5.85			Peak
2554.31	54.38	0.13	54.51	74.00	-19.49			Peak
2696.33	50.19	0.58	50.77	74.00	-23.23			Peak

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average **Polarity: Vertical**

CH High (IEEE 802.11gn HT40 MCS0 Mode)



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	52.92	-0.11	52.81	54.00	-1.19			Average
2555.14	43.11	0.13	43.24	54.00	-10.76			Average
2717.16	37.97	0.65	38.62	54.00	-15.38			Average

Remark: *Result = Reading + Correction Factor*
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

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7.8 CONDUCTED EMISSION

LIMITS

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

Frequency Range (MHz)	Conducted Limit (dBµv)	
	Quasi-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5.00	56	46
5.00 - 30.0	60	50

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
L.I.S.N	Schwarzbeck	NSLK 8127	8127465	07/28/2017
L.I.S.N	Schwarzbeck	NSLK 8127	8127473	03/10/2017
EMI Test Receiver	Rohde & Schwarz	ESHS 30	838550/003	10/25/2017
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100111	06/27/2017
Test S/W	E3.815206a			

Remark: *Each piece of equipment is scheduled for calibration once a year.*

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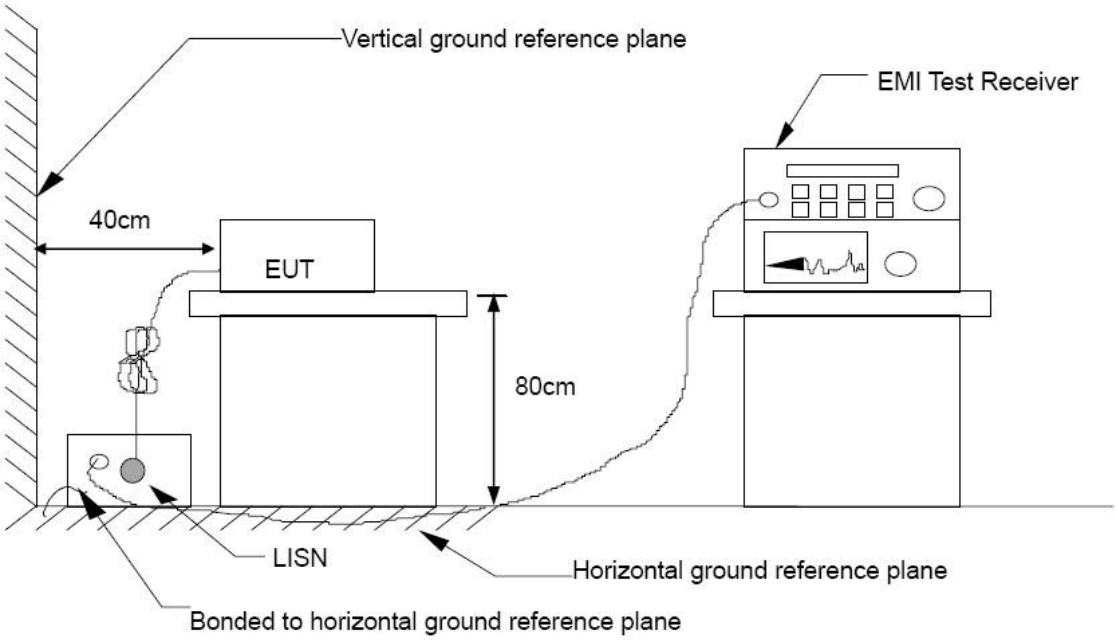
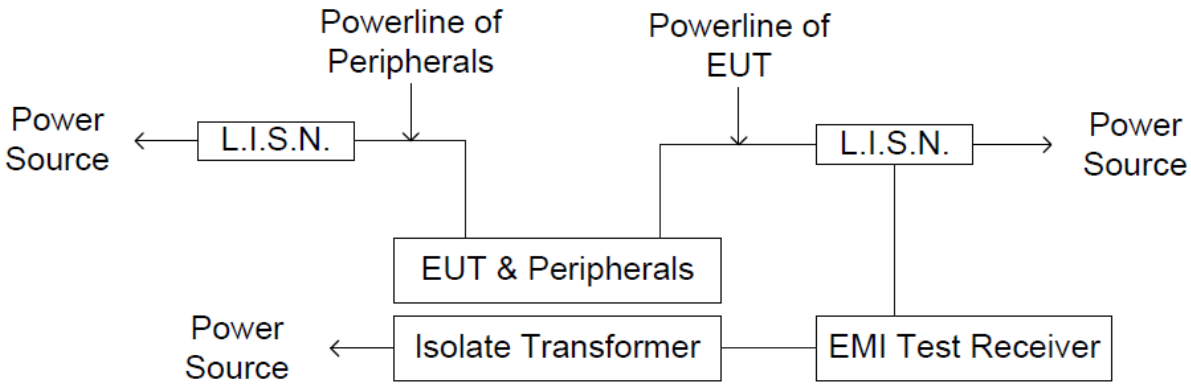
TEST SETUP





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TEST PROCEDURE

The basic test procedure was in accordance with ANSI C63.10:2013.
The test procedure is performed in a 4m × 3m × 2.4m (L×W×H) shielded room.
The EUT along with its peripherals were placed on a 1.0m (W) × 1.5m (L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.
The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room.
The EUT was located so that the distance between the boundary of the EUT and the closest surface of the LISN is 0.8 m. Where a mains flexible cord was provided by the manufacturer shall be 1 m long, or if in excess of 1 m, the excess cable was folded back and forth as far as possible so as to form a bundle not exceeding 0.4 m in length.

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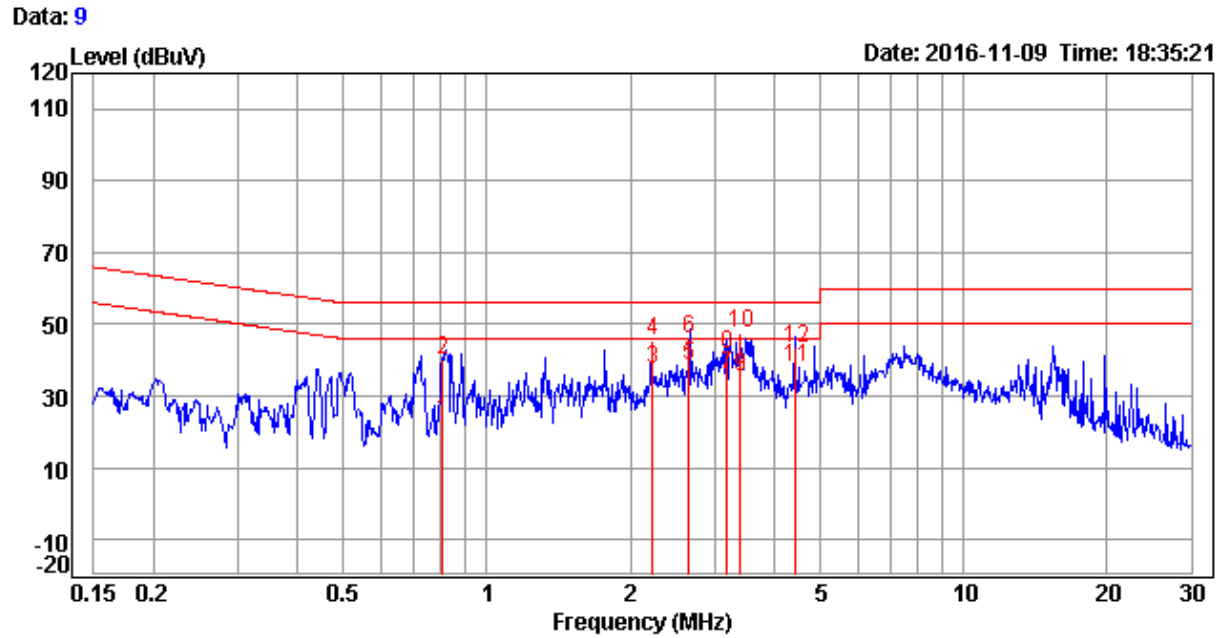
TEST RESULTS

Product Name	Smart Energy Wireless Router	Test By	Gill Yeh
Test Model	Billion SG600R2	Test Date	2016/11/09
Test Mode	Mode 2	Temp. & Humidity	21.9°C, 53%

LINE



Trace:

Freq. MHz	Reading dBuV Q.P.	Reading dBuV AV.	C.F. dB	Result dBuV Q.P.	Result dBuV AV.	Limit dBuV Q.P.	Limit dBuV AV.	Margin dB Q.P.	Margin dB AV.
0.805	30.27	13.26	9.91	40.18	23.17	56.00	46.00	-15.82	-22.83
2.213	35.65	27.43	10.06	45.71	37.49	56.00	46.00	-10.29	-8.51
2.654	36.07	28.46	10.09	46.16	38.55	56.00	46.00	-9.84	-7.45
3.190	31.89	25.57	10.12	42.01	35.69	56.00	46.00	-13.99	-10.31
3.388	37.22	25.03	10.13	47.35	35.16	56.00	46.00	-8.65	-10.84
4.430	32.90	27.66	10.19	43.09	37.85	56.00	46.00	-12.91	-8.15

Remark:

1. *Correction Factor = Insertion loss + Cable loss*
2. *Result level = Reading Value + Correction factor*
3. *Margin value = Result level – Limit value*

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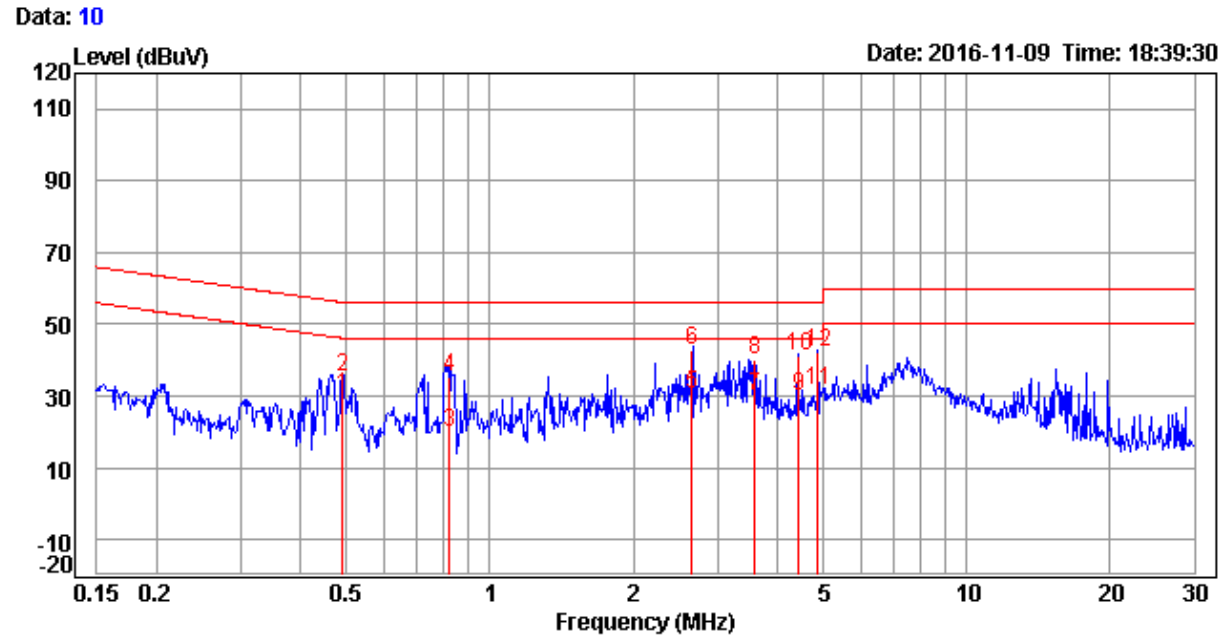
Product Name	Smart Energy Wireless Router	Test By	Gill Yeh
Test Model	Billion SG600R2	Test Date	2016/11/09
Test Mode	Mode 2	Temp. & Humidity	21.9°C, 53%

NEUTRAL



Trace:

Freq. MHz	Reading dBuV Q.P.	Reading dBuV AV.	C.F. dB	Result dBuV Q.P.	Result dBuV AV.	Limit dBuV Q.P.	Limit dBuV AV.	Margin dB Q.P.	Margin dB AV.
0.489	25.52	20.04	9.83	35.35	29.87	56.19	46.19	-20.84	-16.32
0.822	25.68	9.75	9.92	35.60	19.67	56.00	46.00	-20.40	-26.33
2.656	32.62	20.28	10.07	42.69	30.35	56.00	46.00	-13.31	-15.65
3.580	30.07	20.11	10.13	40.20	30.24	56.00	46.00	-15.80	-15.76
4.430	30.84	20.06	10.17	41.01	30.23	56.00	46.00	-14.99	-15.77
4.874	32.10	21.42	10.19	42.29	31.61	56.00	46.00	-13.71	-14.39

Remark:

1. *Correction Factor = Insertion loss + Cable loss*
2. *Result level = Reading Value + Correction factor*
3. *Margin value = Result level – Limit value*

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8. APPENDIX I CO-LOCATION

Product Name	Smart Energy Wireless Router	Test By	Gill Yeh
Test Model	Billion SG600R2	Test Date	2016/11/24
Test Mode	Mode 2	Temp. & Humidity	25°C, 56%

966Chamber_B at 3Meter / Horizontal

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2160.00	43.04	-3.56	39.48	74.00	-34.52	162	100	Peak
2615.00	42.78	-1.86	40.92	74.00	-33.08	360	100	Peak
3245.00	44.24	-0.10	44.14	74.00	-29.86	89	100	Peak
4650.00	41.63	4.79	46.42	74.00	-27.58	360	300	Peak
5440.00	40.61	6.69	47.30	74.00	-26.70	288	200	Peak
7188.00	37.62	12.36	49.98	74.00	-24.02	360	100	Peak
8100.00	36.68	13.14	49.82	74.00	-24.18	1	400	Peak
9624.00	36.67	14.51	51.18	74.00	-22.82	301	100	Peak
10452.00	35.94	16.35	52.29	74.00	-21.71	189	300	Peak
11724.00	22.14	18.96	41.10	54.00	-12.90	106	200	Average
11724.00	35.67	18.96	54.63	74.00	-19.37	106	200	Peak
12276.00	21.93	19.77	41.70	54.00	-12.30	124	300	Average
12276.00	35.21	19.77	54.98	74.00	-19.02	124	300	Peak

966Chamber_B at 3Meter / Vertical

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
1680.00	44.35	-5.40	38.95	74.00	-35.05	128	200	Peak
2145.00	42.38	-3.62	38.76	74.00	-35.24	218	200	Peak
2580.00	42.40	-1.96	40.44	74.00	-33.56	222	100	Peak
3245.00	48.60	-0.10	48.50	74.00	-25.50	12	100	Peak
4040.00	41.87	2.73	44.60	74.00	-29.40	283	300	Peak
5100.00	41.72	5.93	47.65	74.00	-26.35	6	100	Peak
5500.00	39.79	6.83	46.62	74.00	-27.38	31	400	Peak
6456.00	37.18	11.13	48.31	74.00	-25.69	93	200	Peak
7212.00	37.77	12.38	50.15	74.00	-23.85	199	200	Peak
9336.00	37.53	14.10	51.63	74.00	-22.37	118	200	Peak
11280.00	21.03	18.15	39.18	54.00	-14.82	205	400	Average
11280.00	36.13	18.15	54.28	74.00	-19.72	205	400	Peak
11532.00	21.58	18.70	40.28	54.00	-13.72	338	200	Average
11532.00	36.28	18.70	54.98	74.00	-19.02	338	200	Peak
12456.00	22.27	20.06	42.33	54.00	-11.67	360	100	Average
12456.00	35.21	20.06	55.27	74.00	-18.73	360	100	Peak

Remark:

1. *Average test would be performed if the peak result were greater than the average limit.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(PK)
   Remark AVG = Result(AV) – Limit(AV)

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