

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

For

Display Unit

Model: EEMS330xxxxxxx ; EEMSyy330xxxxxxx
(where “x” or “y” may be any alphanumeric character
or blank and where “y” is a country code)

Trade Name: Snap-on

Issued for

Snap-on Diagnostics

420 Barclay Blvd, Lincolnshire, Illinois, USA

Issued by

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Issued Date: April 05, 2017



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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	03/28/2017	Initial Issue	All Page 172	Dola Hsieh
01	04/05/2017	Added Setup Photo	All Page 173	Dola Hsieh

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1. TEST REPORT CERTIFICATION

Applicant : Snap-on Diagnostics
Address : 420 Barclay Blvd, Lincolnshire, Illinois, USA
Equipment Under Test : Display Unit
Model : EEMS330xxxxxxx ; EEMSyy330xxxxxxx
(where "x" or "y" may be any alphanumeric character
or blank and where "y" is a country code)
Trade Name : Snap-on
Tested Date : April 28 ~ June 25, 2015 ;
December 23, 2016 ~ March 15, 2017

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:



Gunden Lin
Sr. Engineer

2. EUT DESCRIPTION

Product Name	Display Unit
Model Number	EEMS330xxxxxxx ; EEMSyy330xxxxxxx (where "x" or "y" may be any alphanumeric character or blank and where "y" is a country code)
Identify Number	T161223D11
Received Date	April 28, 2015
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: 17.72 dBm (0.0592 W) IEEE 802.11g Mode: 28.30 dBm (0.6761 W) IEEE 802.11gn HT20 MCS0 Mode: 29.57 dBm (0.9057 W) IEEE 802.11gn HT40 MCS0 Mode: 29.51 dBm (0.8933 W)
Channel Spacing	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 130.00 Mbps IEEE 802.11gn HT20 Mode (400ns GI): up to 144.40 Mbps IEEE 802.11gn HT40 Mode (800ns GI): up to 270.00 Mbps IEEE 802.11gn HT40 Mode (400ns GI): up to 300.00 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	PIFA Antenna x 2 Ant. 0 (Chain 0), Antenna Gain: 2.02 dBi Ant. 1 (Chain 1), Antenna Gain: 2.20 dBi
Power Rating	11.1Vdc, 5200mAh/58Wh (For Battery) 19Vdc (For Charging)
Test Voltage	120Vac, 60Hz
I/O Port	EUT : RJ-45 Port x 1, USB Port x 2, Power Port x 1, SD Card Port x 1, Audio Port x 1, RS232 Port x 1, Single Port x 5, Control Port x 1(For Docking) Ducking : USB Port x 4, HDMI Port x 1, Power Port x 1, VGA Port x 1, Control Port x 1

The difference of the series model

Model Number	Difference
EEMS330xxxxxxx	1. For marketing purpose only. 2. where "x" or "y" may be any alphanumeric character or blank and where "y" is a country code
EEMSy330xxxxxxx	

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: STO-EEMS330E filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.
4. The model EEMS330 was considered the main model for testing.
5. This report is modified from T150428L12-RP1.

3. DESCRIPTION OF TEST MODES

The EUT (Display Unit) had been tested under operating condition.

For IEEE 802.11b/g Mode (1TX / 1RX) : Ant. 0 (Main) / Chain 0 transmit/receive.

For IEEE 802.11gn HT20/HT40 Mode (2TX / 2RX) :

Ant. 0 (Main) / Chain 0 & Ant. 1 (Aux) / Chain 1 transmit/receive.

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. 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 1

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

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 lie-down position(Z axis) and the worst case was recorded.

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
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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.

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
Conducted Emission (Mains Terminals), 9kHz to 30MHz	+/- 2.48

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 based on the results of the compliance measurement. Consequently the measured emissions being less than the maximum allowed emission result in this being a compliant test or passing test.

The acceptable measurement uncertainty value without requiring revision of the compliance statement is based 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.

6. SETUP OF EQUIPMENT UNDER TEST

SUPPORT EQUIPMENT

No.	Product	Manufacturer	Model No.	Power Input	Power Output
1	Power Adapter	FSP GROUP INC.	FSP065-REBN2	100-240Vac, 1.5A, 50-60Hz	19Vdc, 3.42A

SETUP DIAGRAM FOR TESTS

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

EUT OPERATING CONDITION

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)	Chain	Power Set
IEEE 802.11b	Low	2412	0	16
	Middle	2437	0	15.5
	High	2462	0	14
IEEE 802.11g	Low	2412	0	15
	Middle	2437	0	23
	High	2462	0	17
IEEE 802.11gn HT20 MCS0	Low	2412	0/1	10.5
	Middle	2437	0/1	21
	High	2462	0/1	9.5
IEEE 802.11gn HT40 MCS0	Low	2422	0/1	8
	Middle	2437	0/1	20
	High	2452	0/1	8.5

3. All of the functions are under run.

4. Start test.

7. FCC PART 15.247 REQUIREMENTS

7.1 DUTY CYCLE CORRECTION FACTOR

Product Name	Display Unit	Test By	Waternil Guan
Test Model	EEMS330	Test Date	2015/05/07
Test Mode	TX Mode	Temp. & Humidity	25°C, 50%

Mode	TX on (ms)	TX on + off (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
IEEE 802.11b	8.195	8.237	99.49%	0.02	0.010
IEEE 802.11g	1.361	1.410	96.52%	0.15	0.735
IEEE 802.11gn HT20	1.273	1.322	96.29%	0.16	0.786
IEEE 802.11gn HT40	0.633	0.670	94.52%	0.24	1.580

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	03/19/2016
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) $\geq 3 \times$ 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.

TEST RESULTS

Product Name	Display Unit	Test By	Davis Tseng
Test Model	EEMS330	Test Date	2015/06/03
Test Mode	TX Mode	Temp. & Humidity	24°C, 51%

IEEE 802.11b Mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Result
		Chain 0		
Low	2412	10.080	500	PASS
Middle	2437	10.090	500	PASS
High	2462	9.836	500	PASS

IEEE 802.11g Mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Result
		Chain 0		
Low	2412	16.320	500	PASS
Middle	2437	15.540	500	PASS
High	2462	16.310	500	PASS

IEEE 802.11gn HT20 MCS0 Mode (2TX)

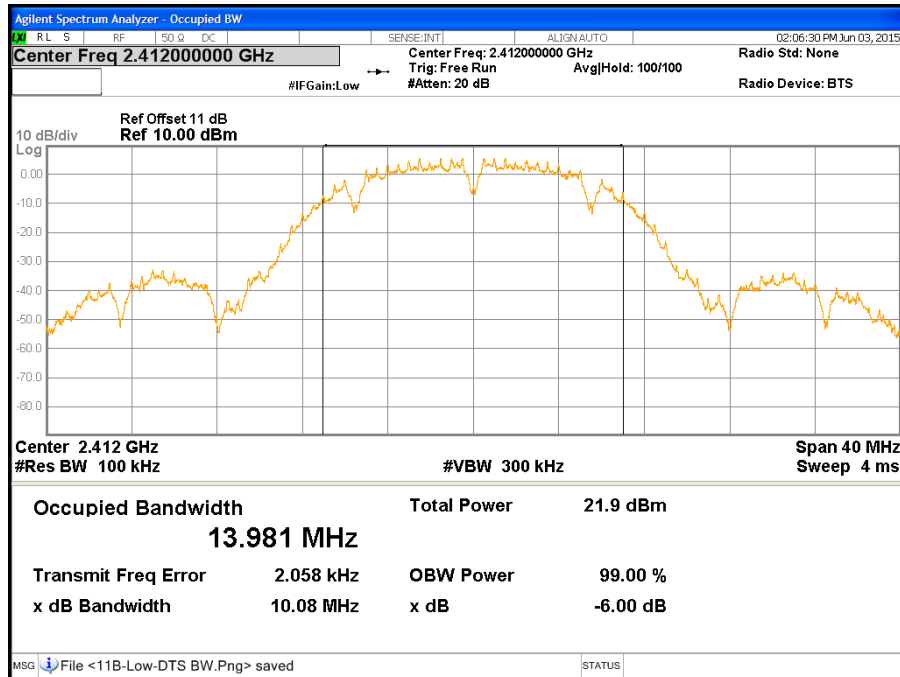
Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (kHz)	Result
		Chain 0	Chain 1		
Low	2412	17.540	17.560	500	PASS
Middle	2437	17.530	16.910	500	PASS
High	2462	17.540	17.550	500	PASS

IEEE 802.11gn HT40 MCS0 Mode (2TX)

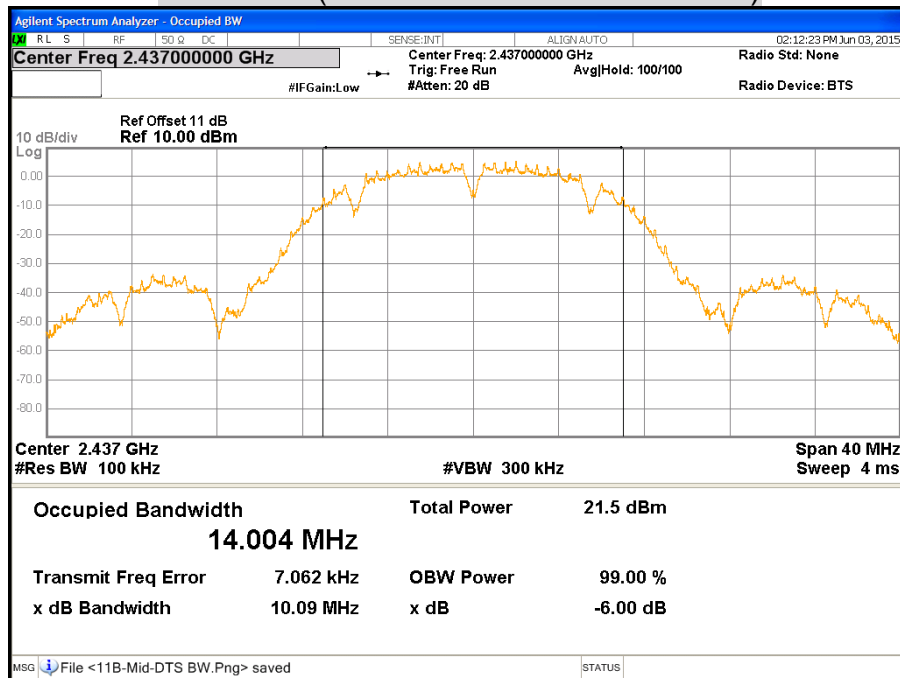
Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (kHz)	Result
		Chain 0	Chain 1		
Low	2422	36.340	36.360	500	PASS
Middle	2437	36.300	36.300	500	PASS
High	2452	36.310	36.370	500	PASS

6dB BANDWIDTH

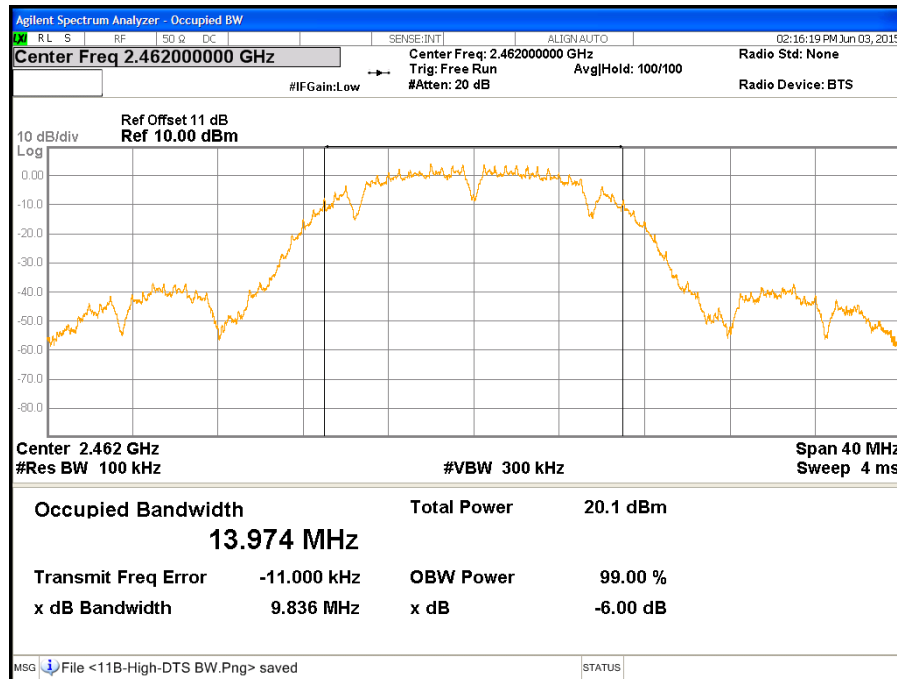
CH Low (IEEE 802.11b Mode / Chain 0)



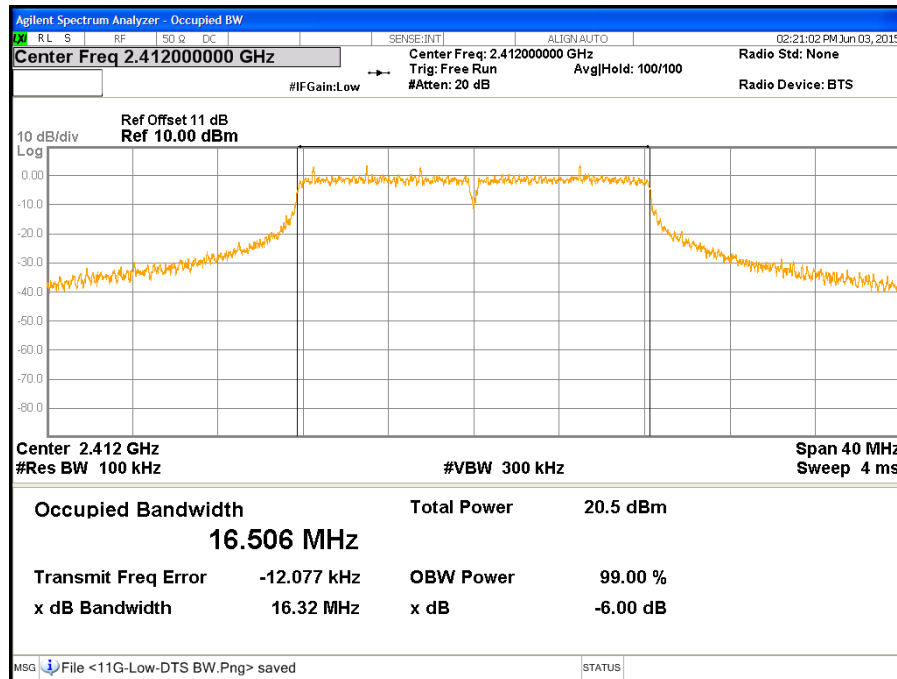
CH Middle (IEEE 802.11b Mode / Chain 0)



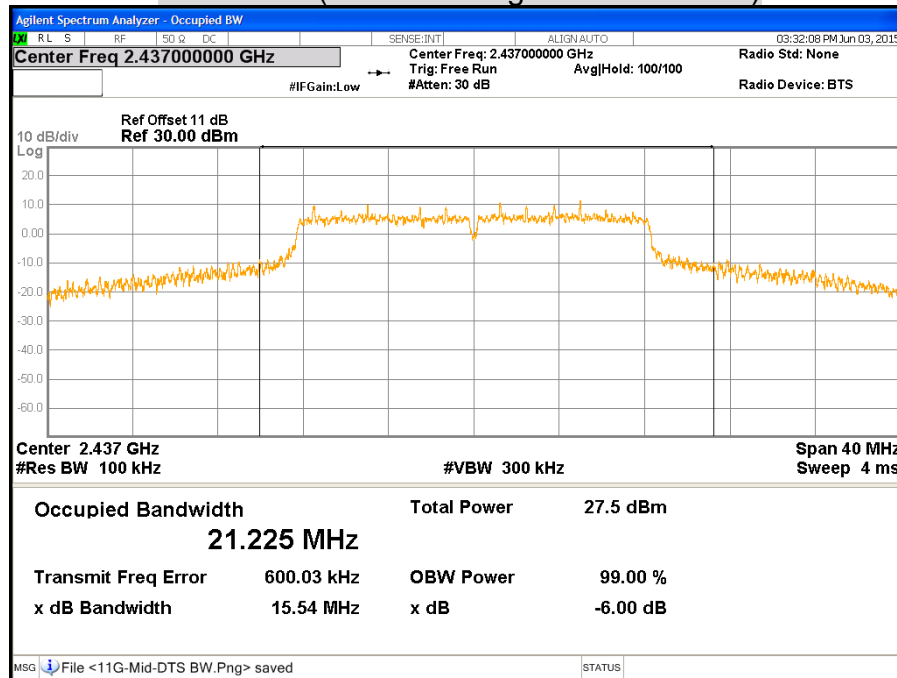
CH High (IEEE 802.11b Mode / Chain 0)



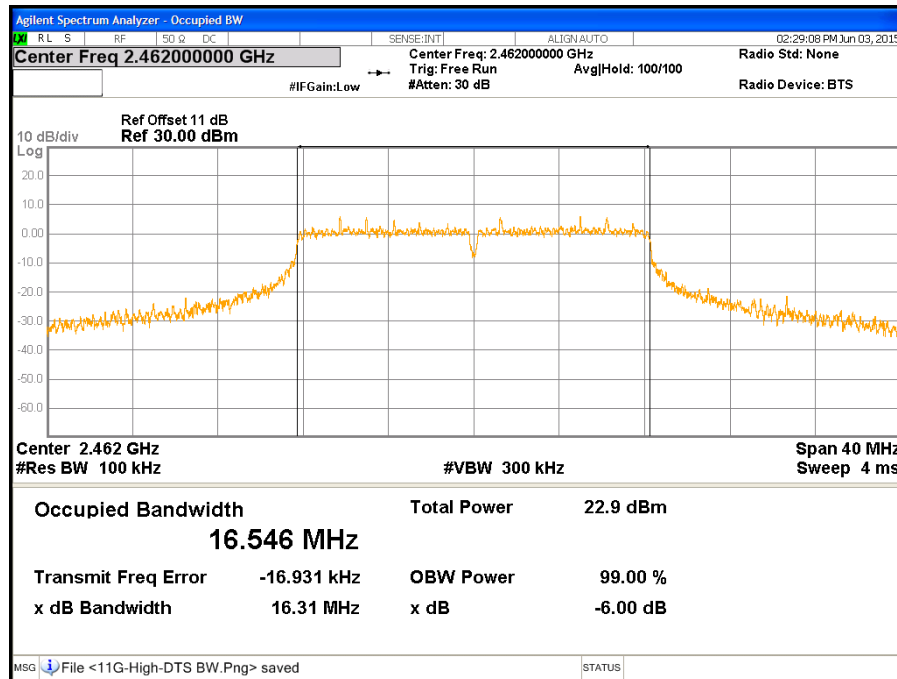
CH Low (IEEE 802.11g Mode / Chain 0)



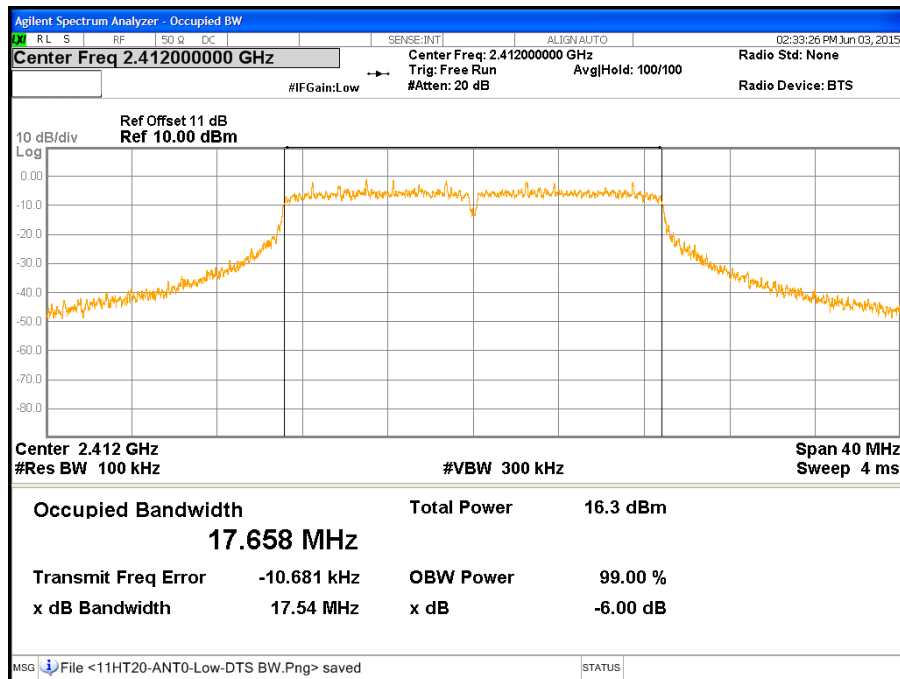
CH Middle (IEEE 802.11g Mode / Chain 0)



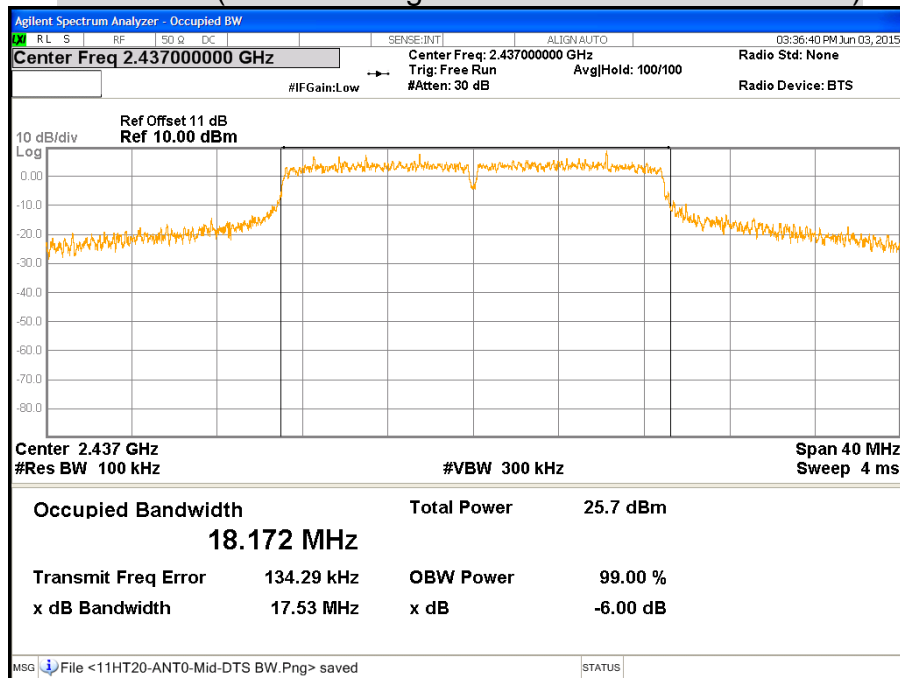
CH High (IEEE 802.11g Mode / Chain 0)



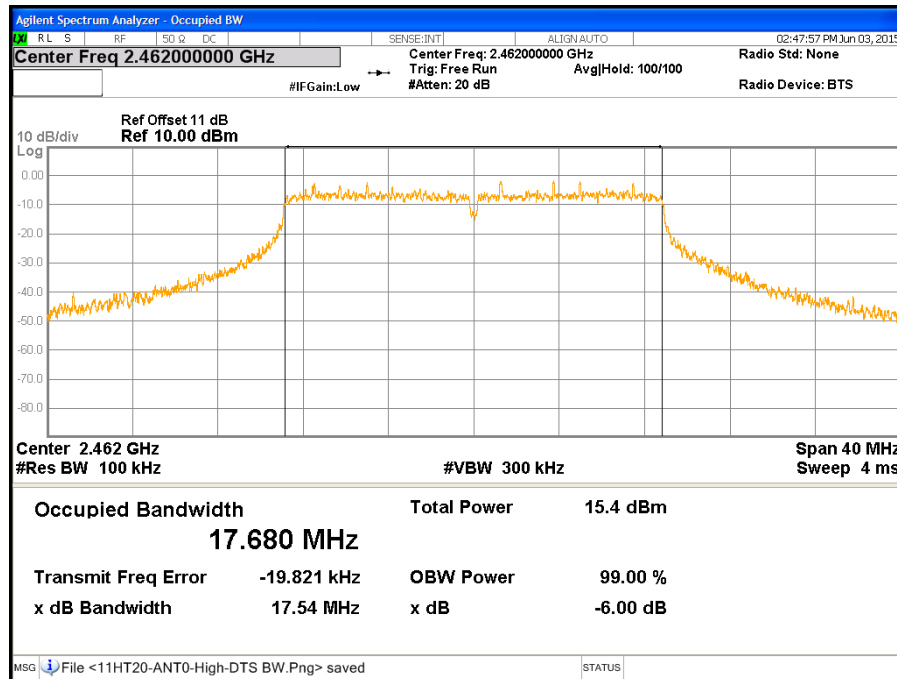
CH Low (IEEE 802.11gn HT20 MCS0 Mode / Chain 0)



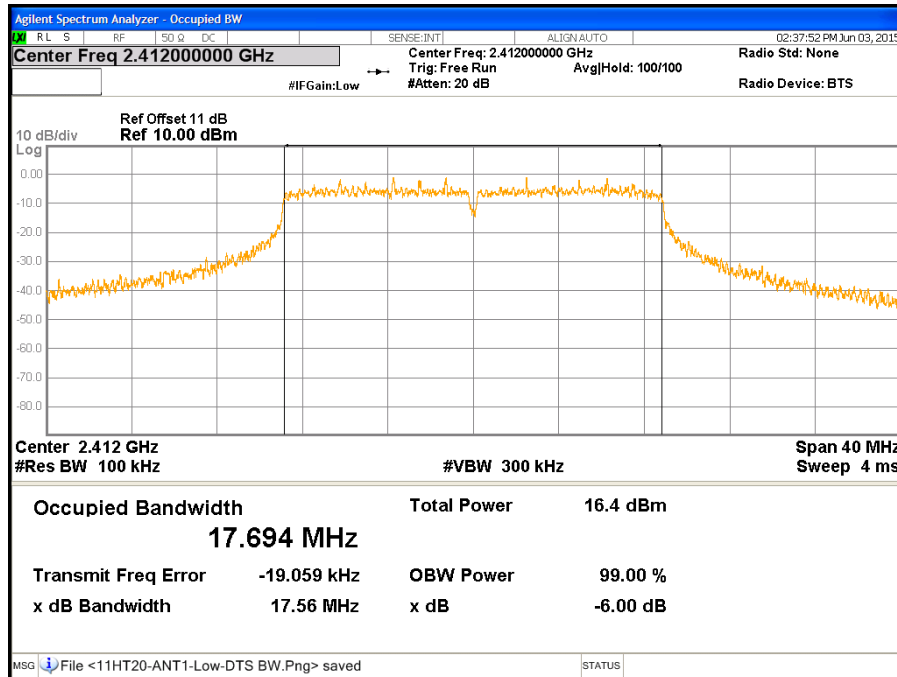
CH Middle (IEEE 802.11gn HT20 MCS0 Mode / Chain 0)



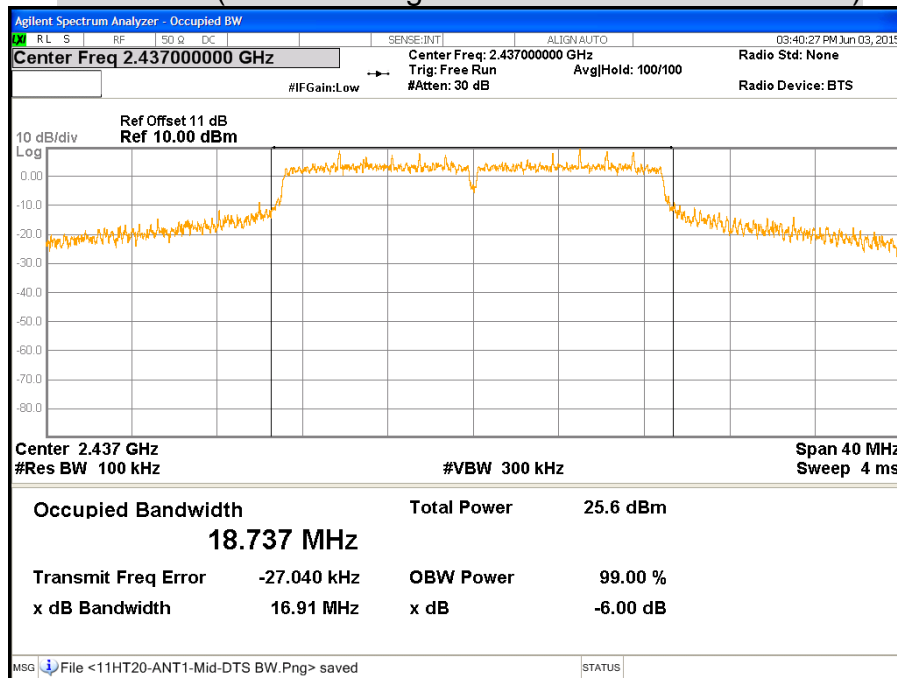
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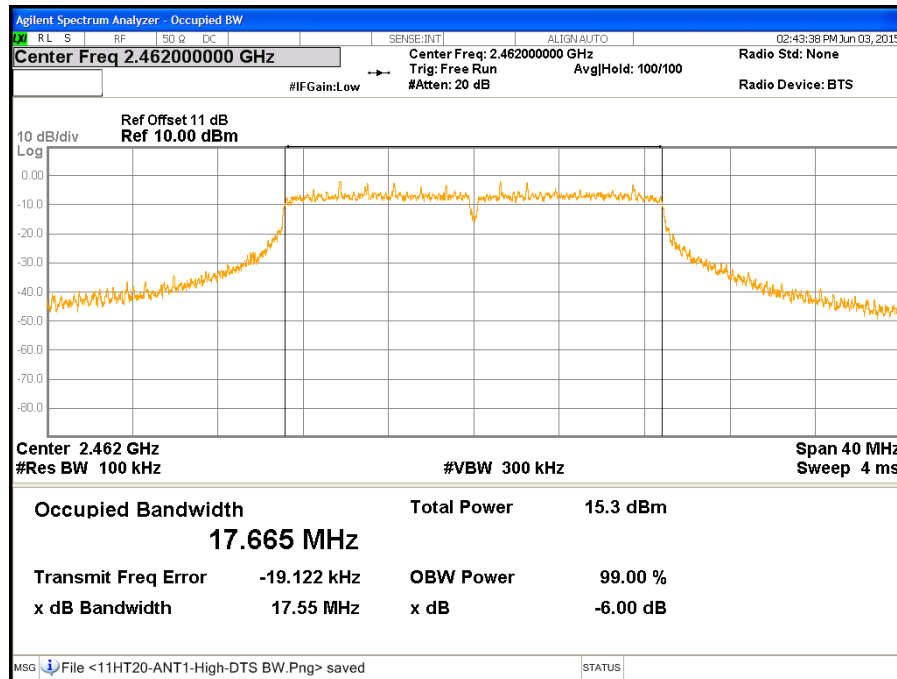
CH Low (IEEE 802.11gn HT20 MCS0 Mode / Chain 1)



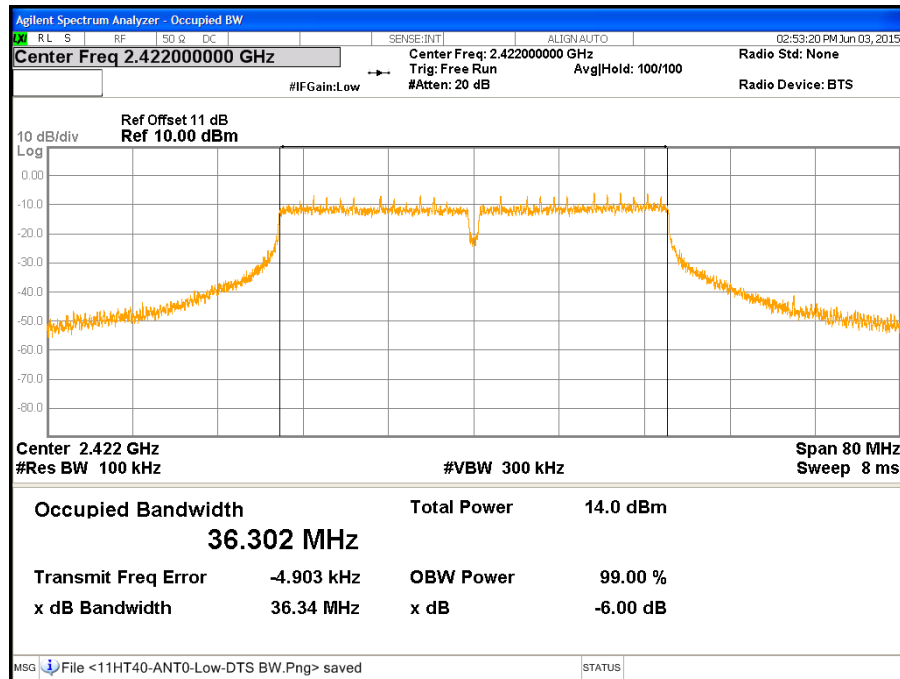
CH Middle (IEEE 802.11gn HT20 MCS0 Mode / Chain 1)



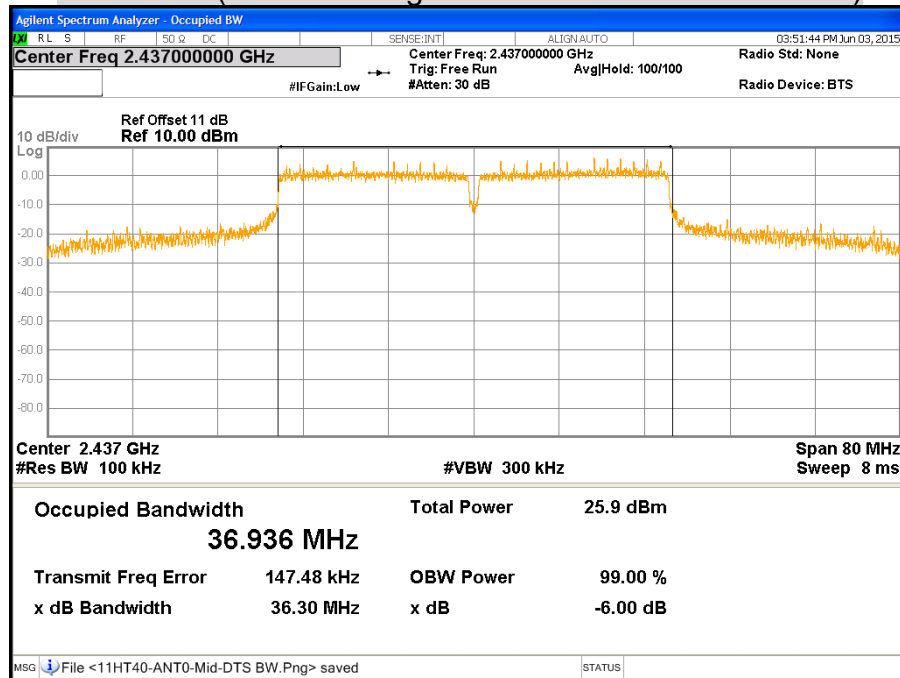
CH High (IEEE 802.11gn HT20 MCS0 Mode / Chain 1)



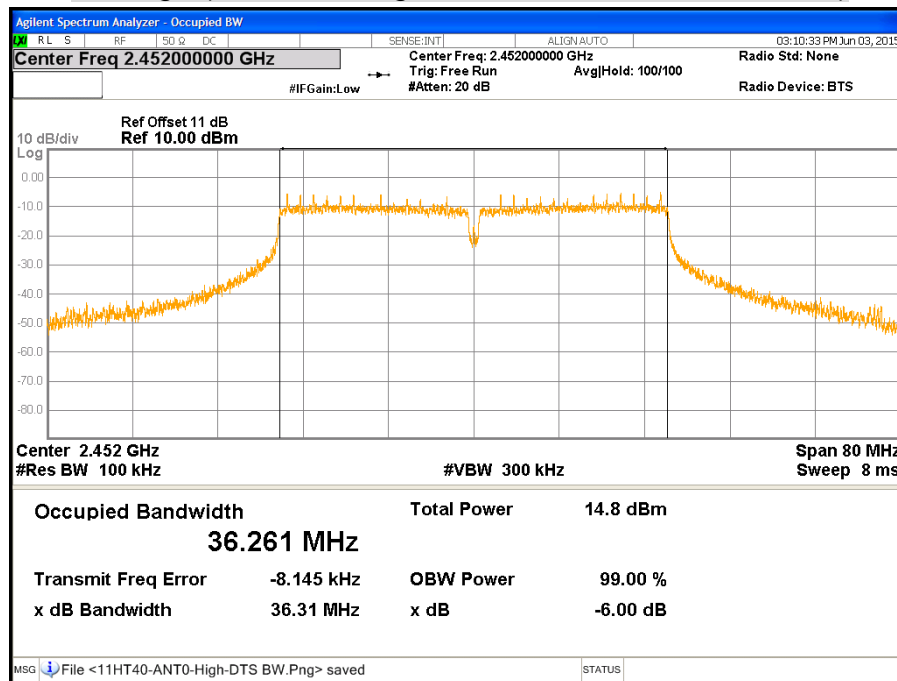
CH Low (IEEE 802.11gn HT40 MCS0 Mode / Chain 0)



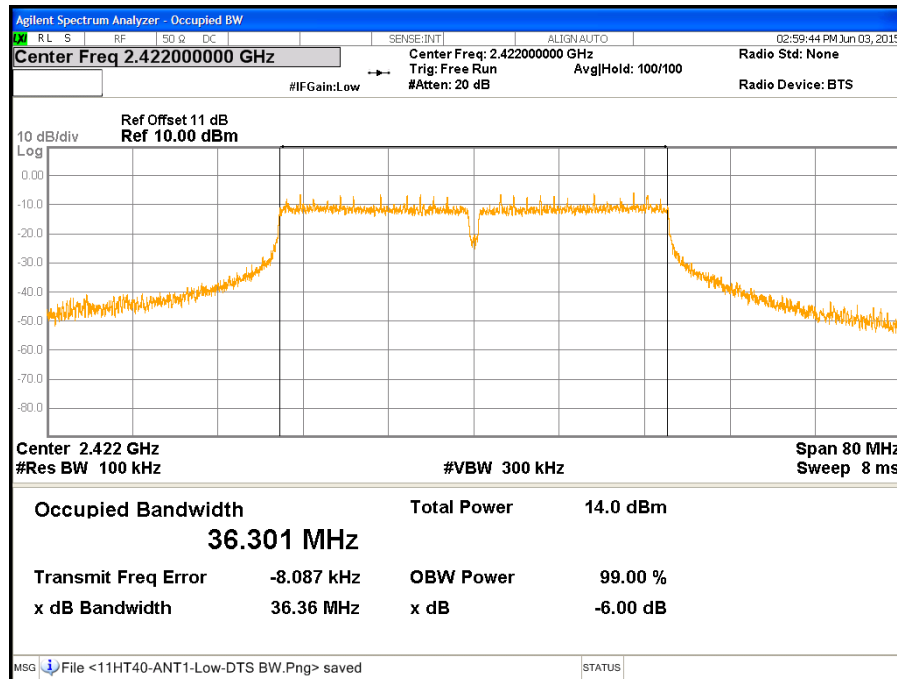
CH Middle (IEEE 802.11gn HT40 MCS0 Mode / Chain 0)



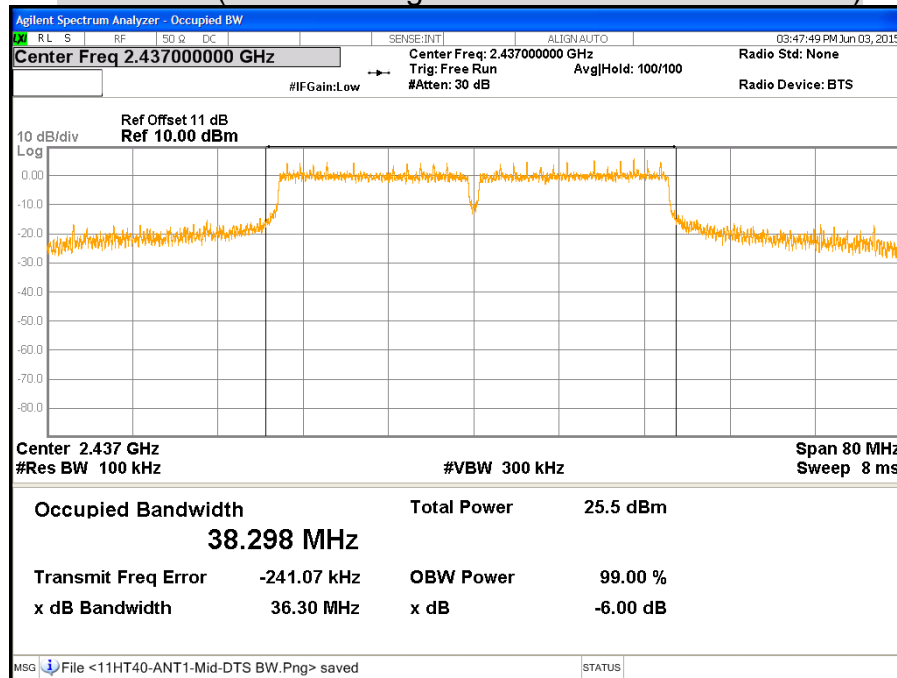
CH High (IEEE 802.11gn HT40 MCS0 Mode / Chain 0)



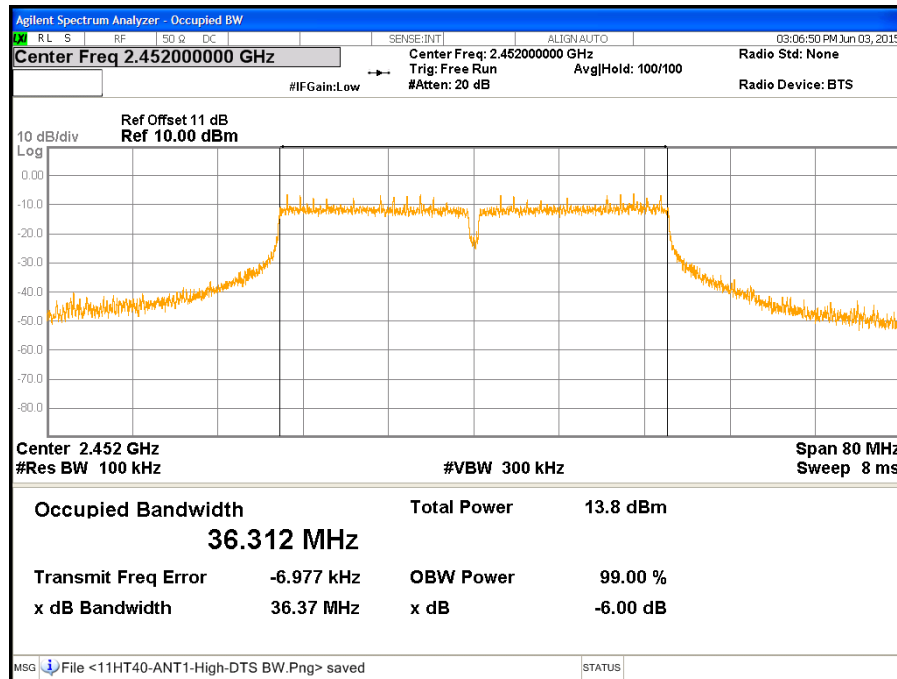
CH Low (IEEE 802.11gn HT40 MCS0 Mode / Chain 1)



CH Middle (IEEE 802.11gn HT40 MCS0 Mode / Chain 1)



CH High (IEEE 802.11gn HT40 MCS0 Mode / Chain 1)



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,

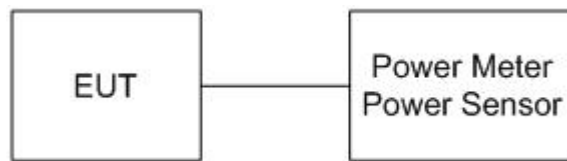
$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Power Meter	Anritsu	ML2495A	1149001	12/11/2015
Power Sensor	Anritsu	MA2411B	1126148	12/11/2015
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 peak power detection.

TEST RESULTS

Product Name	Display Unit	Test By	Davis Tseng
Test Model	EEMS330	Test Date	2015/06/03
Test Mode	TX Mode	Temp. & Humidity	24°C, 51%

IEEE 802.11b Mode

Channel	Channel Frequency (MHz)	Maximum Peak Output Power				Result
		Chain 0		Limit		
		(dBm)	(W)	(dBm)	(W)	
Low	2412	17.72	0.0592	30	1.000	PASS
Middle	2437	17.41	0.0551	30	1.000	PASS
High	2462	15.92	0.0391	30	1.000	PASS

Remark:

1. At final test to get the worst-case emission at 1Mbps.
2. The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.
3. The maximum antenna gain is 2.02 dBi which is less than 6dBi, the limit should be 30 dBm.

IEEE 802.11g Mode

Channel	Channel Frequency (MHz)	Maximum Peak Output Power				Result
		Chain 0		Limit		
		(dBm)	(W)	(dBm)	(W)	
Low	2412	21.53	0.1422	30	1.000	PASS
Middle	2437	28.30	0.6761	30	1.000	PASS
High	2462	23.81	0.2404	30	1.000	PASS

Remark:

1. At final test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.
3. The maximum antenna gain is 2.02 dBi which is less than 6dBi, the limit should be 30 dBm.

IEEE 802.11gn HT20 MCS0 Mode (2TX)

Channel	Channel Frequency (MHz)	Maximum Peak Output Power						Result
		Chain 0	Chain 1	Total		Limit		
		(dBm)	(dBm)	(dBm)	(W)	(dBm)	(W)	
Low	2412	17.34	17.31	20.34	0.1081	30	1.000	PASS
Middle	2437	26.67	26.44	29.57	0.9057	30	1.000	PASS
High	2462	16.30	16.24	19.28	0.0847	30	1.000	PASS

Remark:

1. At final test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.
3. Total peak power = Chain 0 + Chain 1.
4. The maximum antenna gain is 2.20 dBi which is less than 6dBi, the limit should be 30 dBm.

IEEE 802.11gn HT40 MCS0 Mode (2TX)

Channel	Channel Frequency (MHz)	Maximum Peak Output Power						Result
		Chain 0	Chain 1	Total		Limit		
		(dBm)	(dBm)	(dBm)	(W)	(dBm)	(W)	
Low	2422	15.09	15.11	18.11	0.0647	30	1.000	PASS
Middle	2437	26.72	26.27	29.51	0.8933	30	1.000	PASS
High	2452	15.71	14.82	18.30	0.0676	30	1.000	PASS

Remark:

1. At final test to get the worst-case emission at 13.5Mbps.
2. The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.
3. Total peak power = Chain 0 + Chain 1.
4. The maximum antenna gain is 2.20 dBi which is less than 6dBi, the limit should be 30 dBm.

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	12/11/2015
Power Sensor	Anritsu	MA2411B	1126148	12/11/2015
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.

TEST RESULTS

Product Name	Display Unit	Test By	Davis Tseng
Test Model	EEMS330	Test Date	2015/06/03
Test Mode	TX Mode	Temp. & Humidity	24°C, 51%

IEEE 802.11b Mode

Channel	Channel Frequency (MHz)	Average Power (dBm)
		Chain 0
Low	2412	15.53
Middle	2437	14.92
High	2462	13.54

Remark:

1. At final test to get the worst-case emission at 1Mbps.
2. The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 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)
		Chain 0
Low	2412	14.55
Middle	2437	21.63
High	2462	16.92

Remark:

1. At final test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11gn HT20 MCS0 Mode (2TX)

Channel	Channel Frequency (MHz)	Average Power (dBm)	
		Chain 0	Chain 1
Low	2412	10.37	10.33
Middle	2437	19.72	19.40
High	2462	9.34	9.26

Remark:

1. At final test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11gn HT40 MCS0 Mode (2TX)

Channel	Channel Frequency (MHz)	Average Power (dBm)	
		Chain 0	Chain 1
Low	2422	7.75	7.74
Middle	2437	19.66	19.02
High	2452	8.48	7.49

Remark:

1. At final test to get the worst-case emission at 13.5Mbps.
2. The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

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,

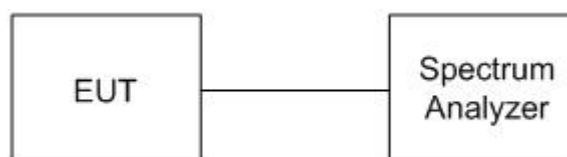
$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EXA Signal Analyzer	Agilent	N9010A	MY52220817	03/19/2016
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 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: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
5. Set the VBW $\geq 3 \times \text{RBW}$.
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.

TEST RESULTS

Product Name	Display Unit	Test By	Davis Tseng
Test Model	EEMS330	Test Date	2015/06/03
Test Mode	TX Mode	Temp. & Humidity	24°C, 51%

IEEE 802.11b Mode

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)		Result
		Chain 0	Limit	
Low	2412	-2.2620	8	PASS
Middle	2437	-2.4750	8	PASS
High	2462	-4.1620	8	PASS

Remark:

1. At final test to get the worst-case emission at 1Mbps.
2. The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. The maximum antenna gain is 2.02 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
		Chain 0	Limit	
Low	2412	-5.4220	8	PASS
Middle	2437	2.1340	8	PASS
High	2462	-2.9430	8	PASS

Remark:

1. At final test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. The maximum antenna gain is 2.02 dBi which is less than 6dBi, the limit should be 8 dBm.

IEEE 802.11gn HT20 MCS0 Mode (2TX)

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)				Result
		Chain 0	Chain 1	Total	Limit	
Low	2412	-9.996	-9.849	-6.91	8	PASS
Middle	2437	-0.209	-0.530	2.64	8	PASS
High	2462	-9.944	-11.080	-7.46	8	PASS

Remark:

1. At final test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. Total power spectral density = Chain 0 + Chain 1.
4. The directional gain is 5.12 dBi which is less than 6dBi, the limit should be 8 dBm.

IEEE 802.11gn HT40 MCS0 Mode (2TX)

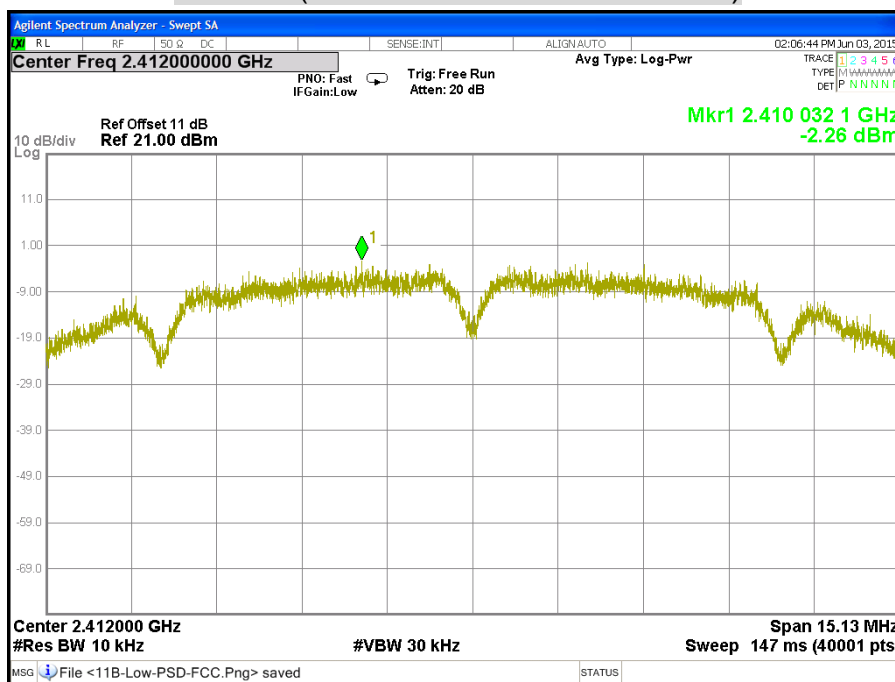
Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)				Result
		Chain 0	Chain 1	Total	Limit	
Low	2422	-14.13	-14.96	-11.51	8	PASS
Middle	2437	-3.58	-3.77	-0.67	8	PASS
High	2452	-15.17	-13.58	-11.29	8	PASS

Remark:

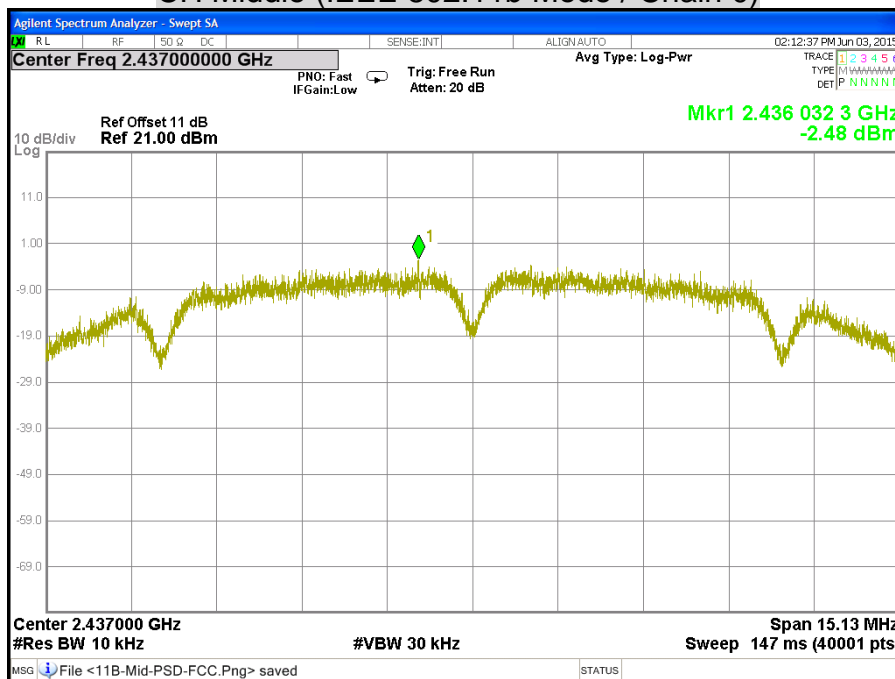
1. At final test to get the worst-case emission at 13.5Mbps.
2. The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. Total power spectral density = Chain 0 + Chain 1.
4. The directional gain is 5.12 dBi which is less than 6dBi, the limit should be 8 dBm.

POWER SPECTRAL DENSITY

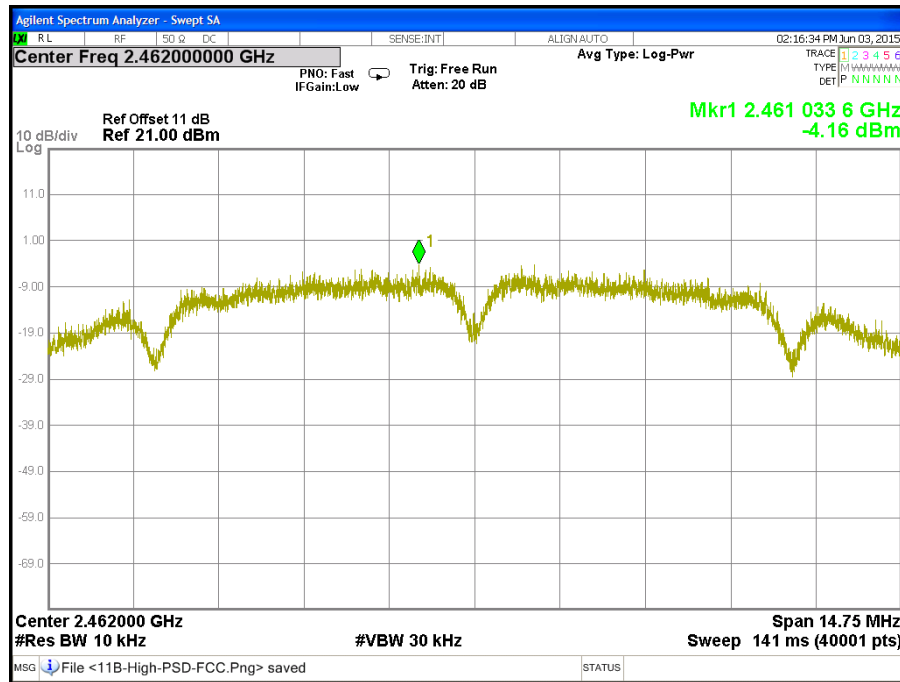
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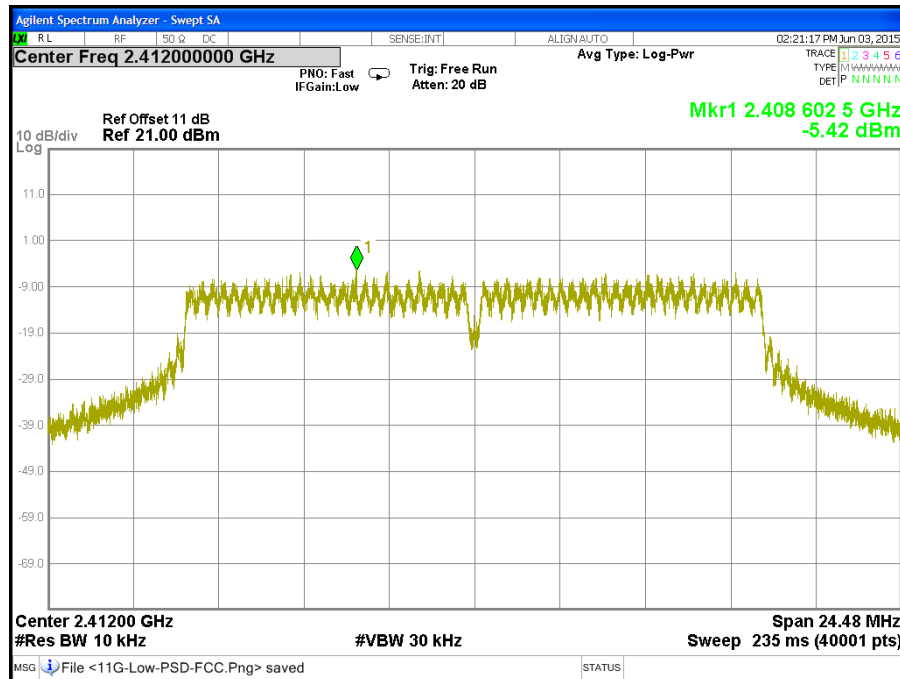
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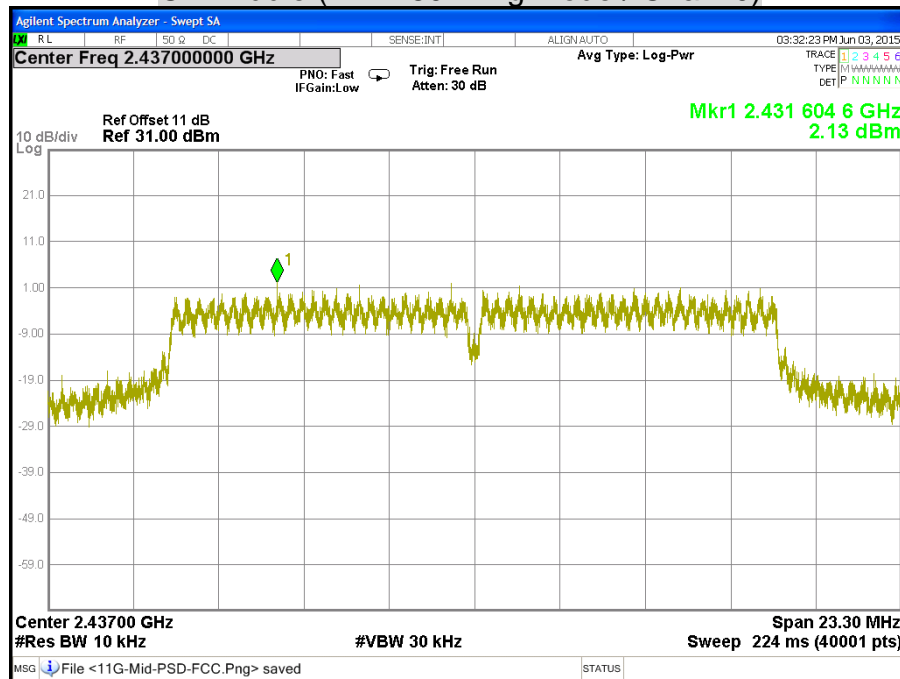
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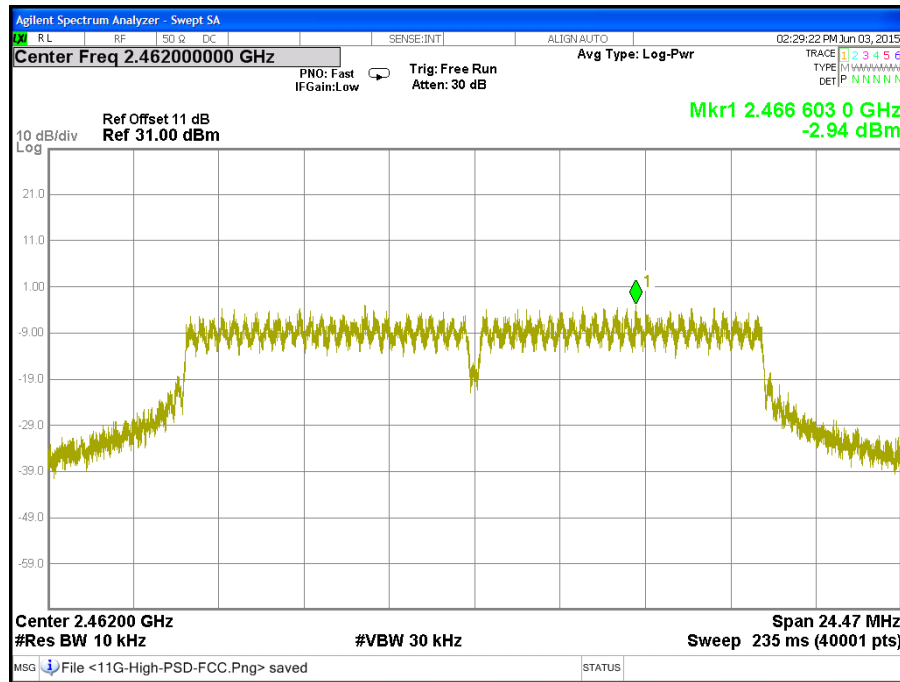
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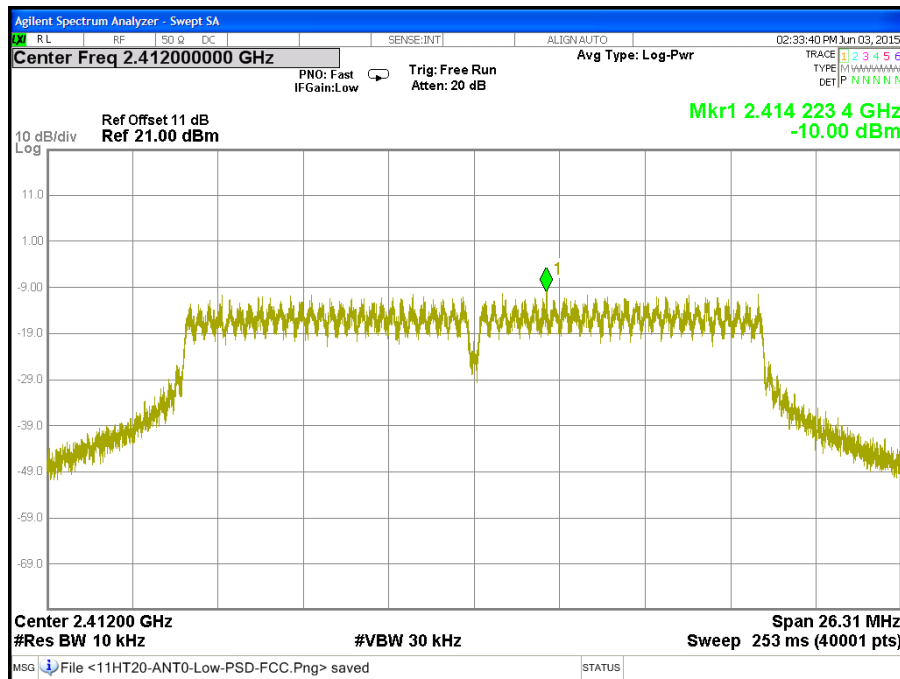
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CH High (IEEE 802.11g Mode / Chain 0)



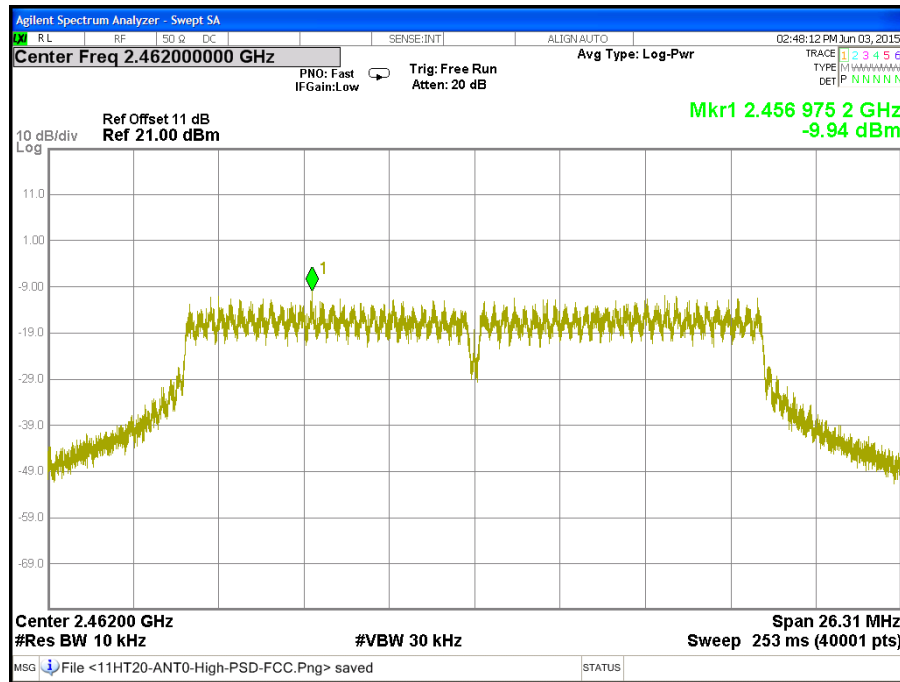
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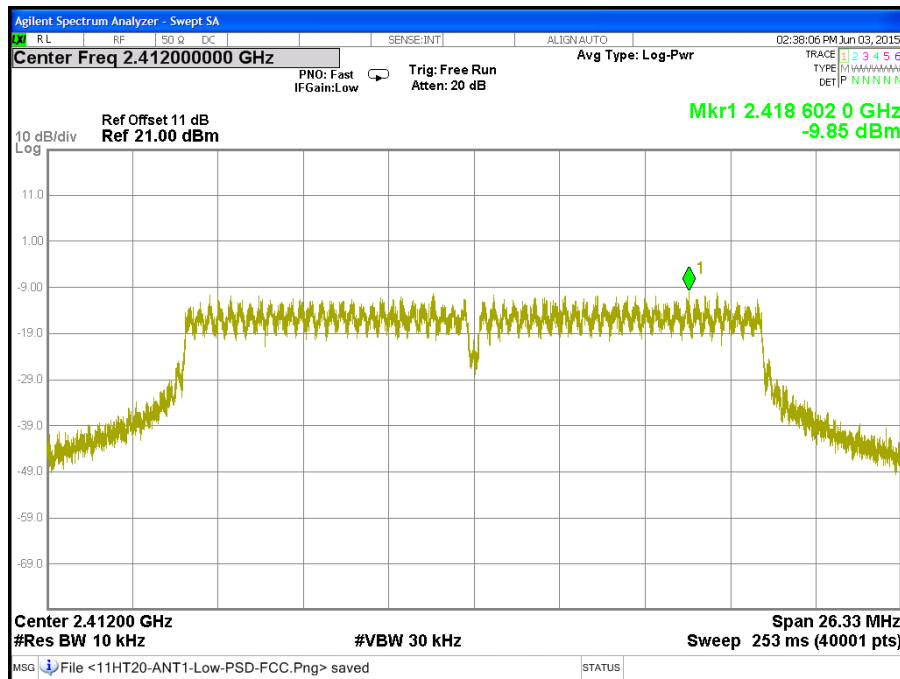
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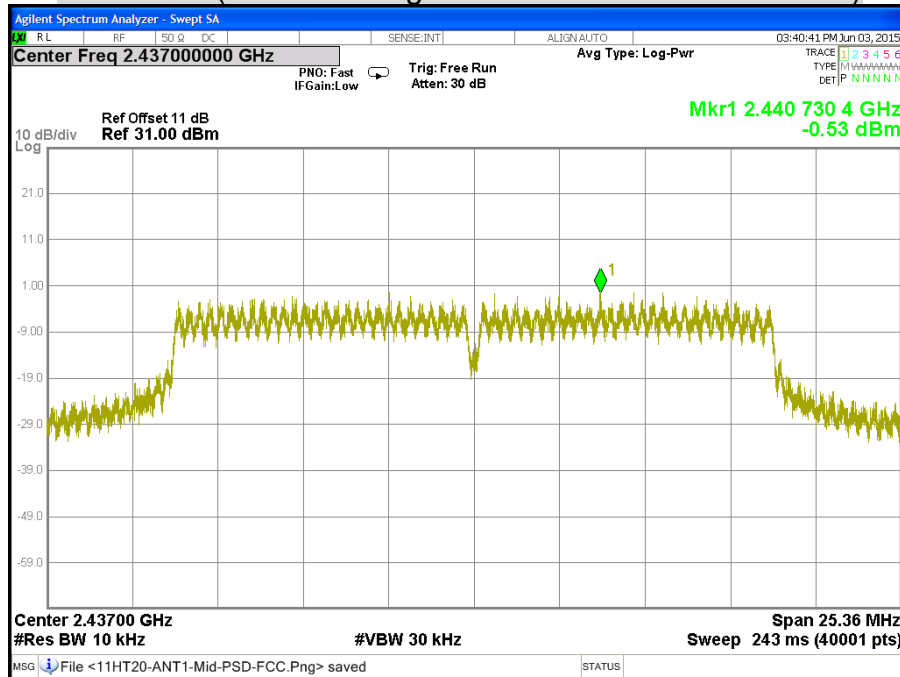
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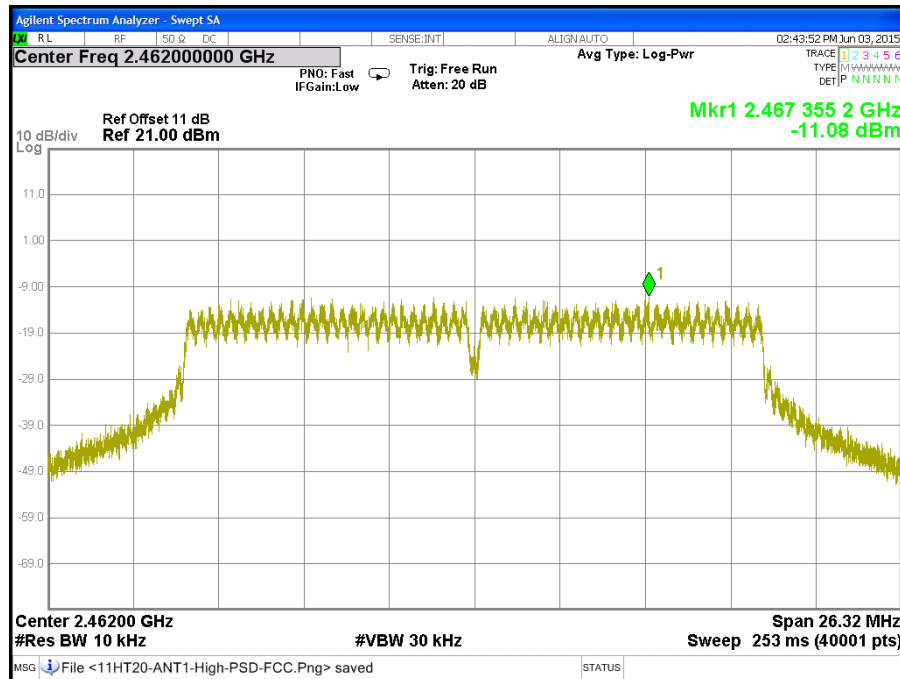
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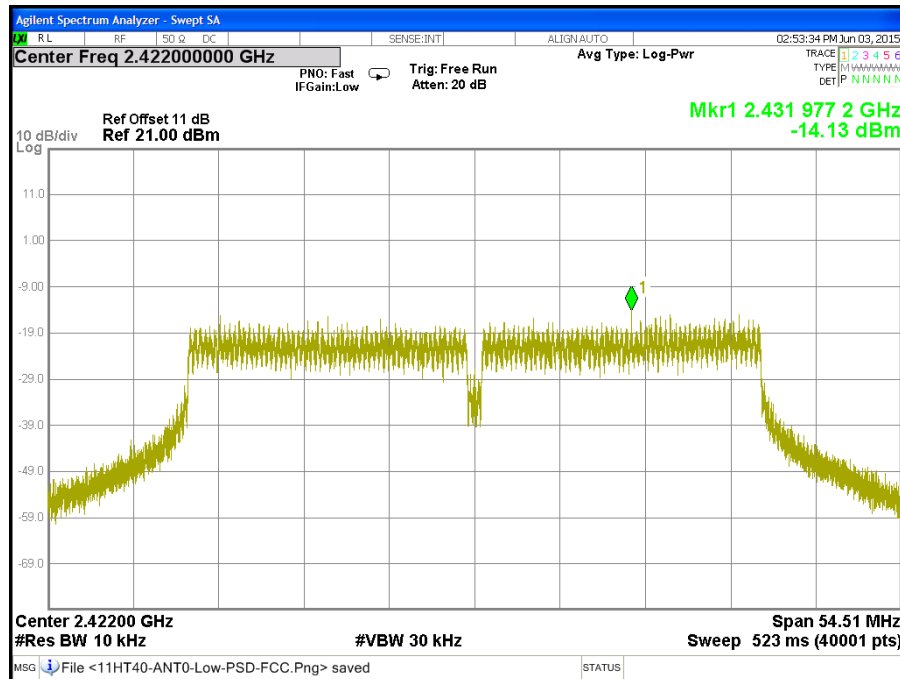
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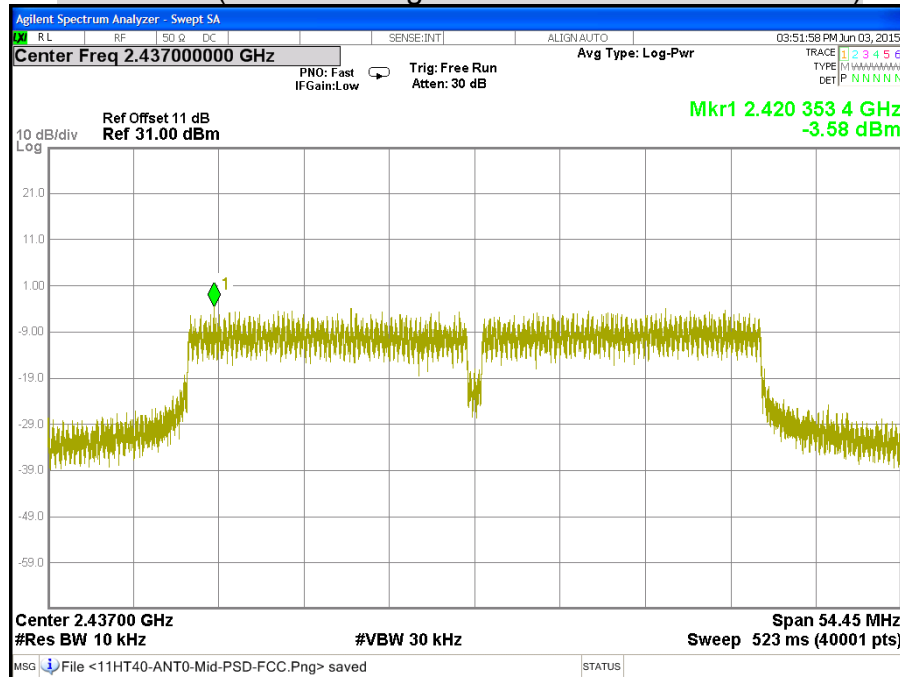
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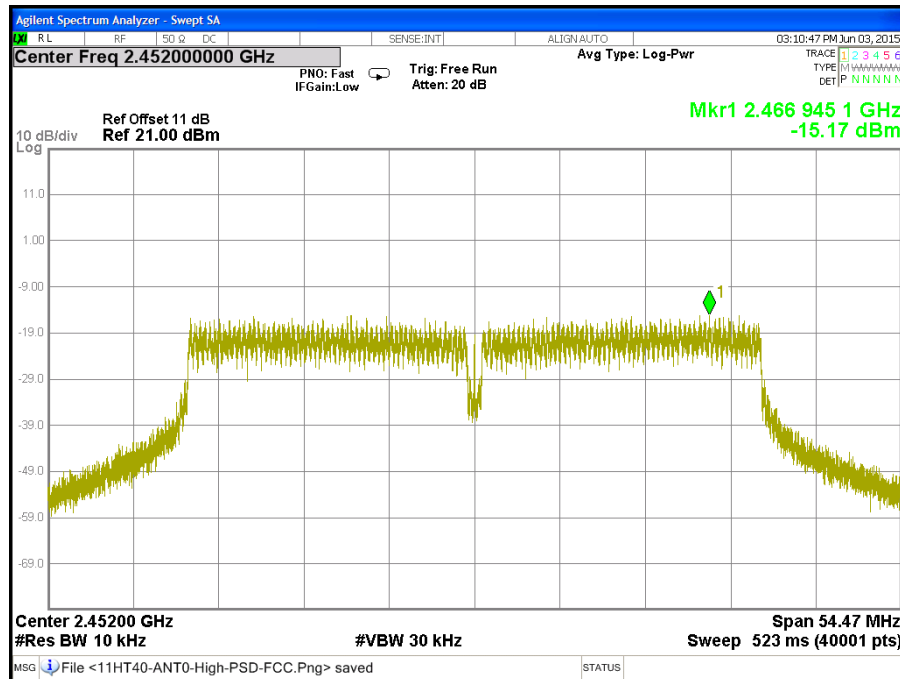
CH Low (IEEE 802.11gn HT40 MCS0 Mode / Chain 0)



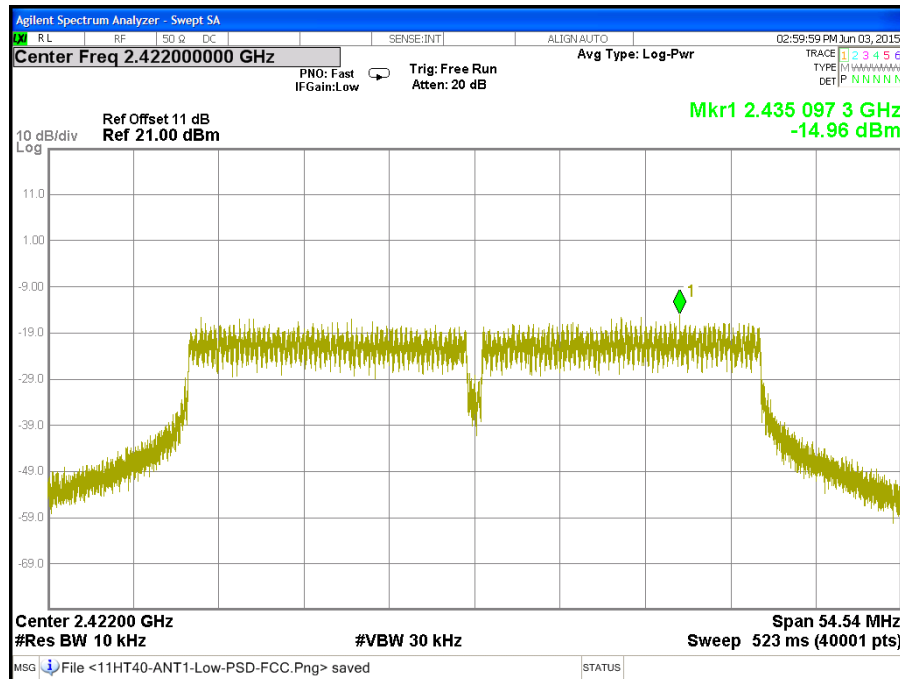
CH Middle (IEEE 802.11gn HT40 MCS0 Mode / Chain 0)



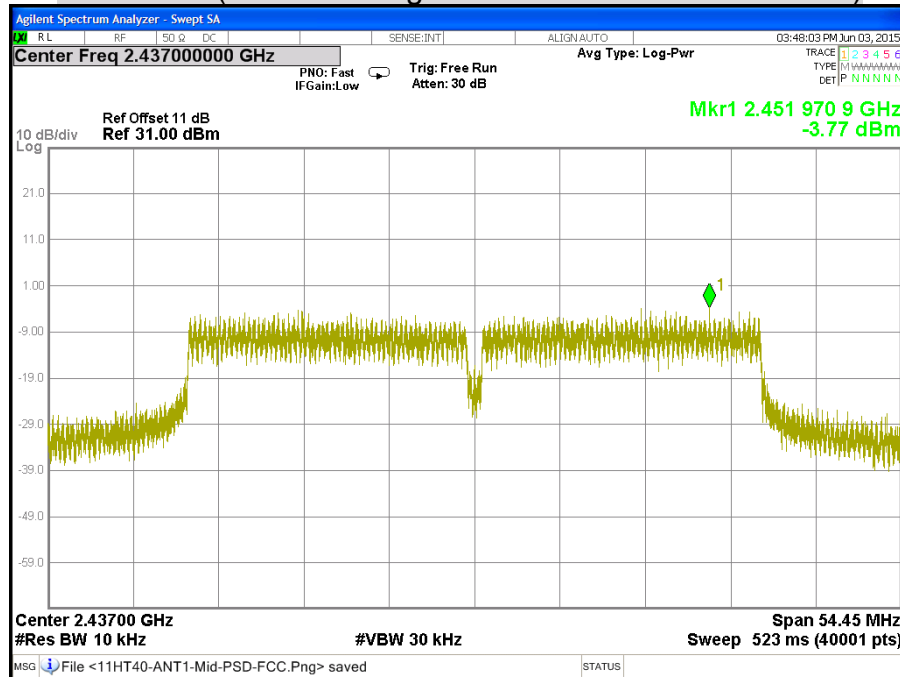
CH High (IEEE 802.11gn HT40 MCS0 Mode / Chain 0)



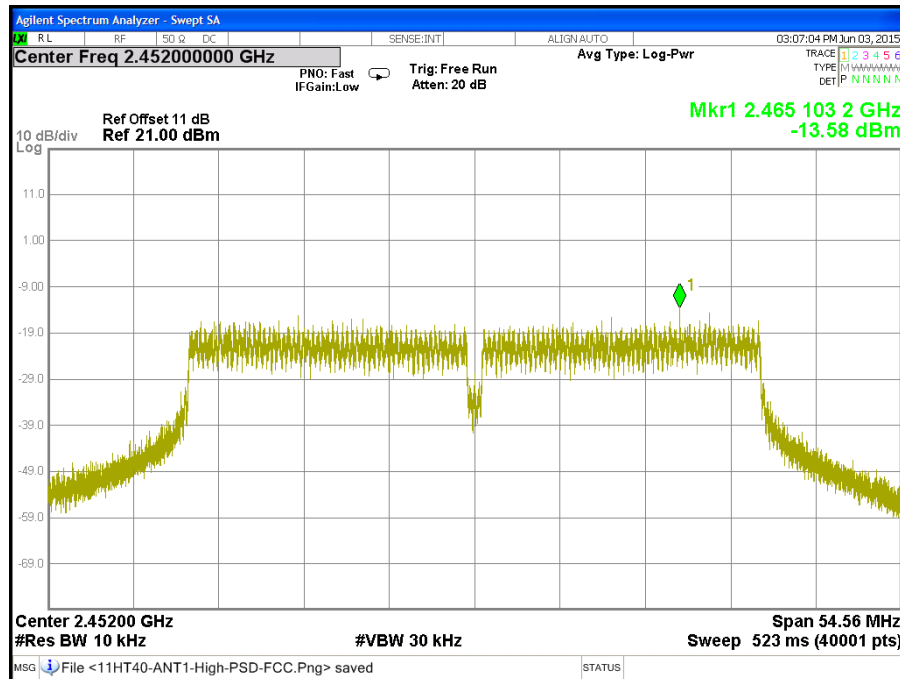
CH Low (IEEE 802.11gn HT40 MCS0 Mode / Chain 1)



CH Middle (IEEE 802.11gn HT40 MCS0 Mode / Chain 1)



CH High (IEEE 802.11gn HT40 MCS0 Mode / Chain 1)



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 band 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	03/19/2016
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 a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

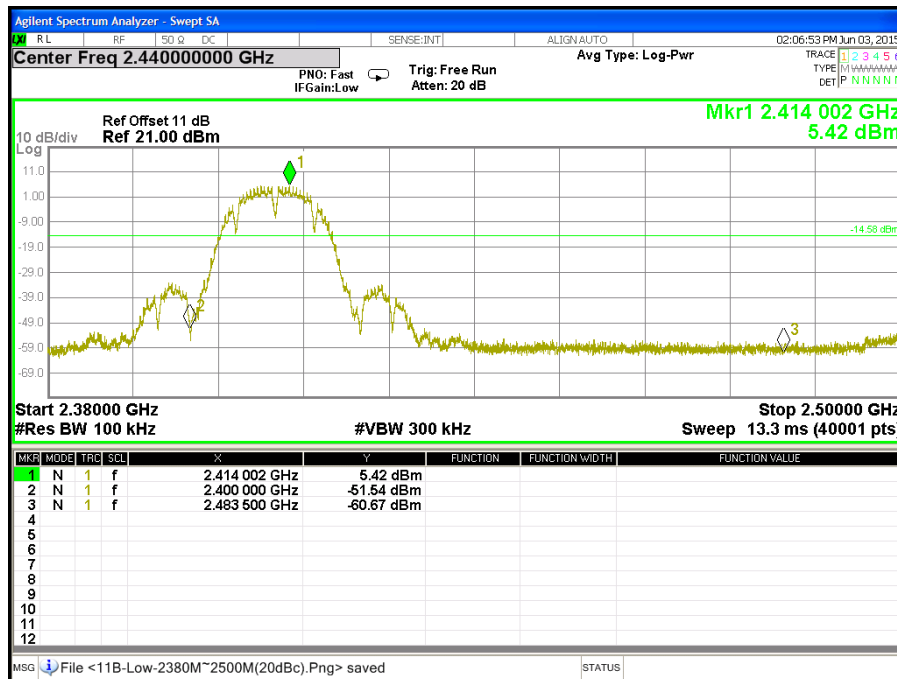
The spectrum from 30 MHz to 26.5 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

TEST RESULTS

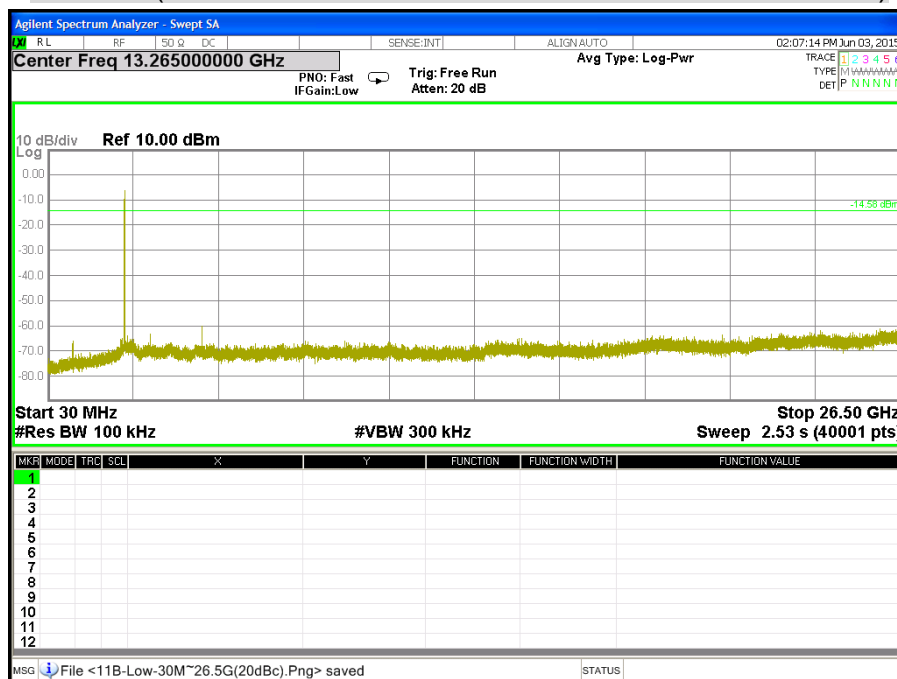
Product Name	Display Unit	Test By	Davis Tseng
Test Model	EEMS330	Test Date	2015/06/03
Test Mode	TX Mode	Temp. & Humidity	24°C, 51%

OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

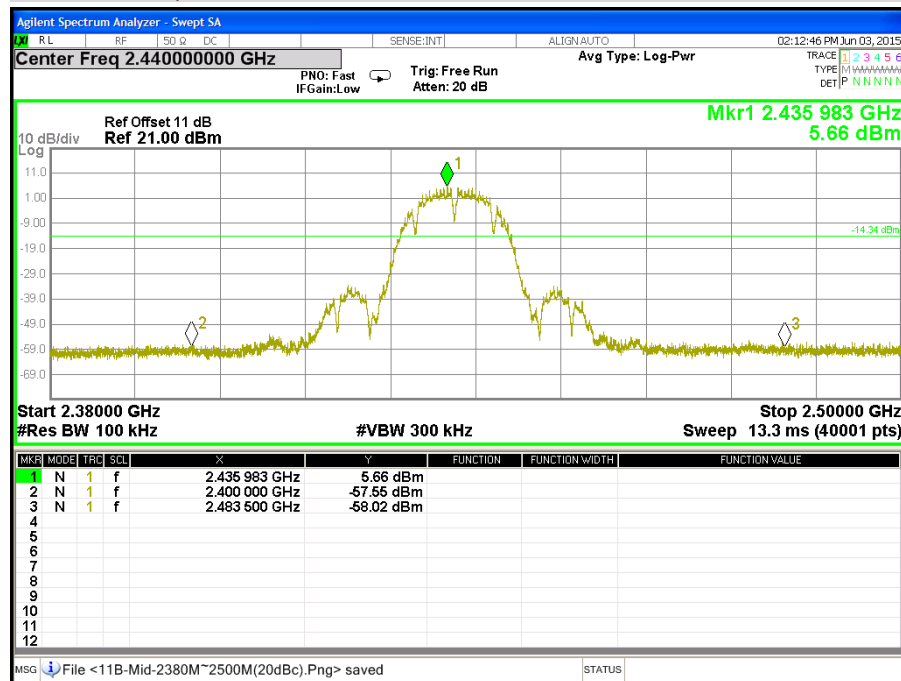
CH Low (2.38GHz ~ 2.5GHz / IEEE 802.11b Mode / Chain 0)



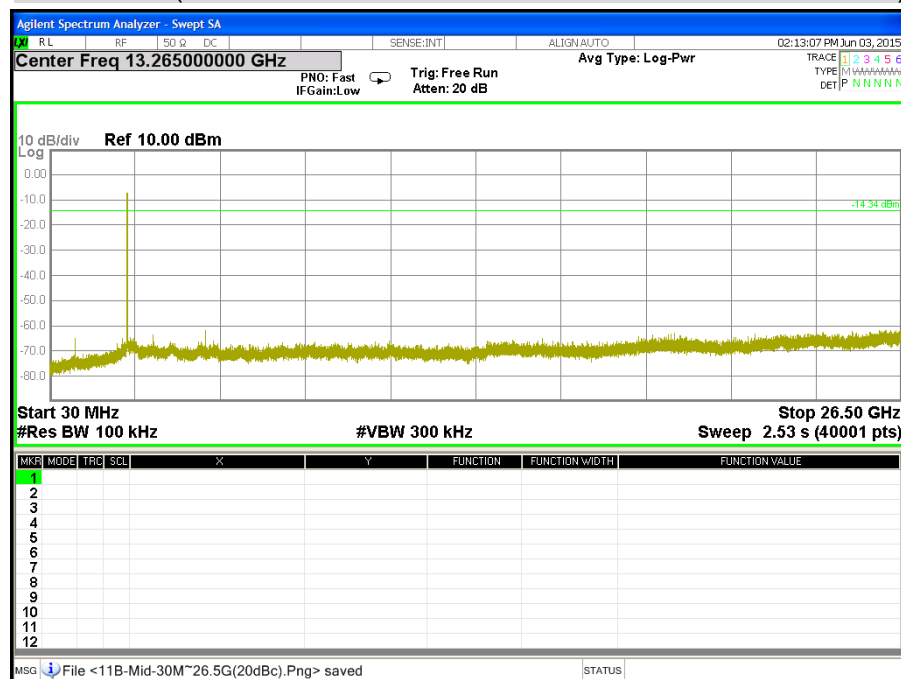
CH Low (30MHz ~ 26.5GHz / IEEE 802.11b Mode / Chain 0)



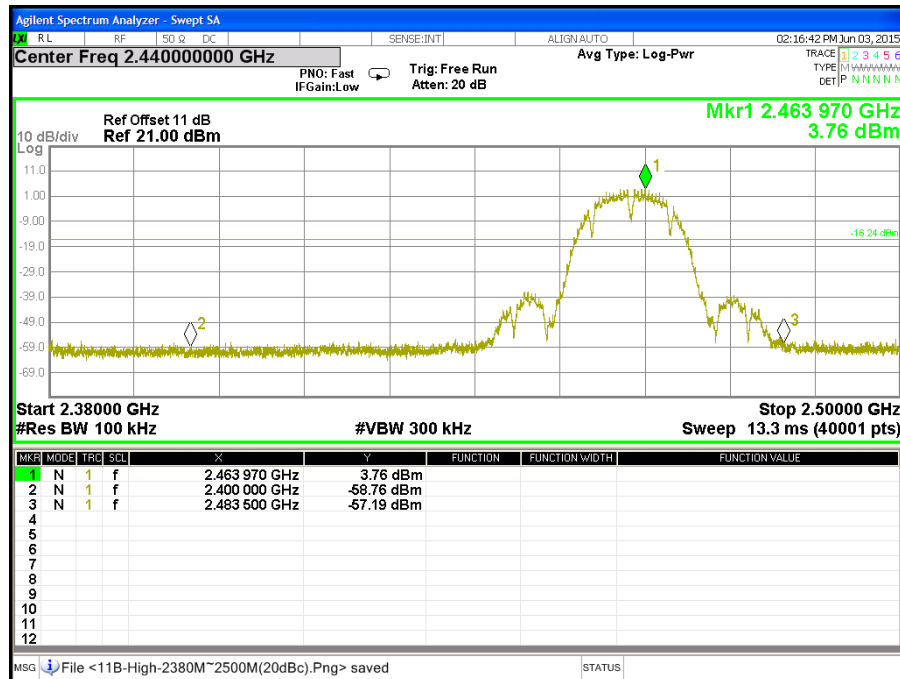
CH Middle (2.38GHz ~ 2.5GHz / IEEE 802.11b Mode / Chain 0)



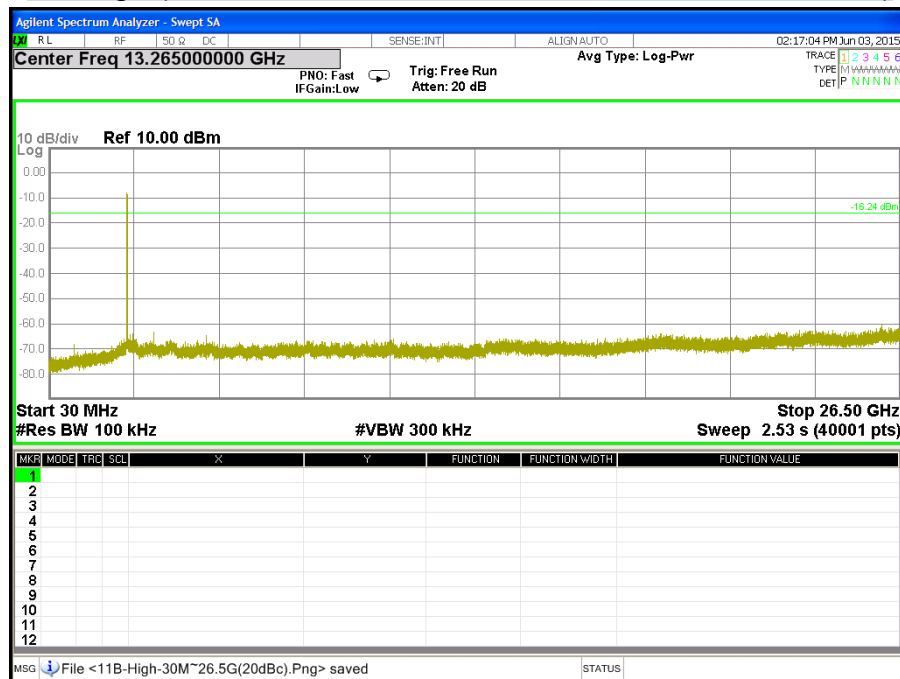
CH Middle (30MHz ~ 26.5GHz / IEEE 802.11b Mode / Chain 0)



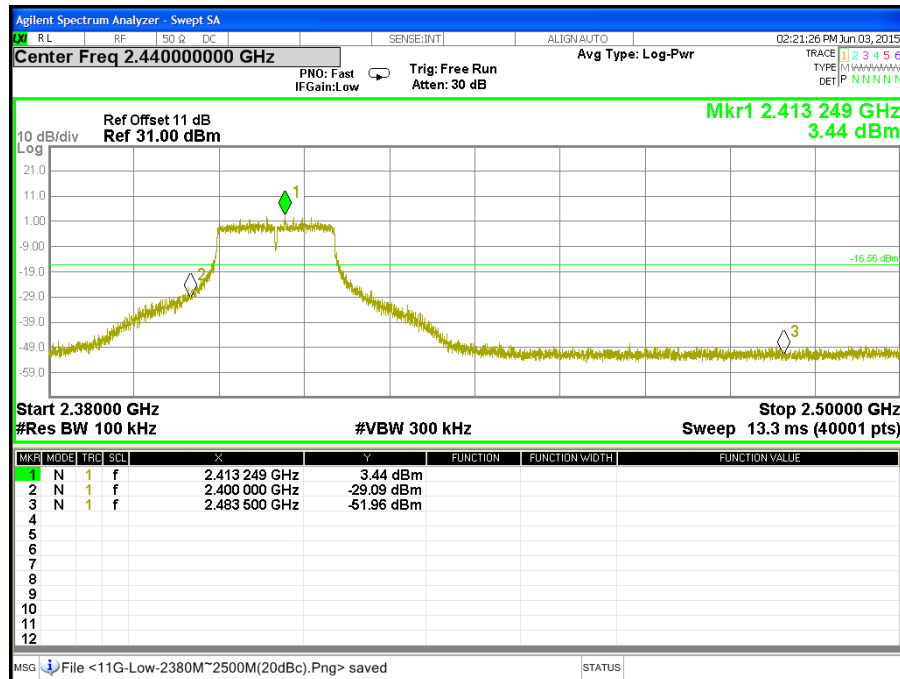
CH High (2.38GHz ~ 2.5GHz / IEEE 802.11b Mode / Chain 0)



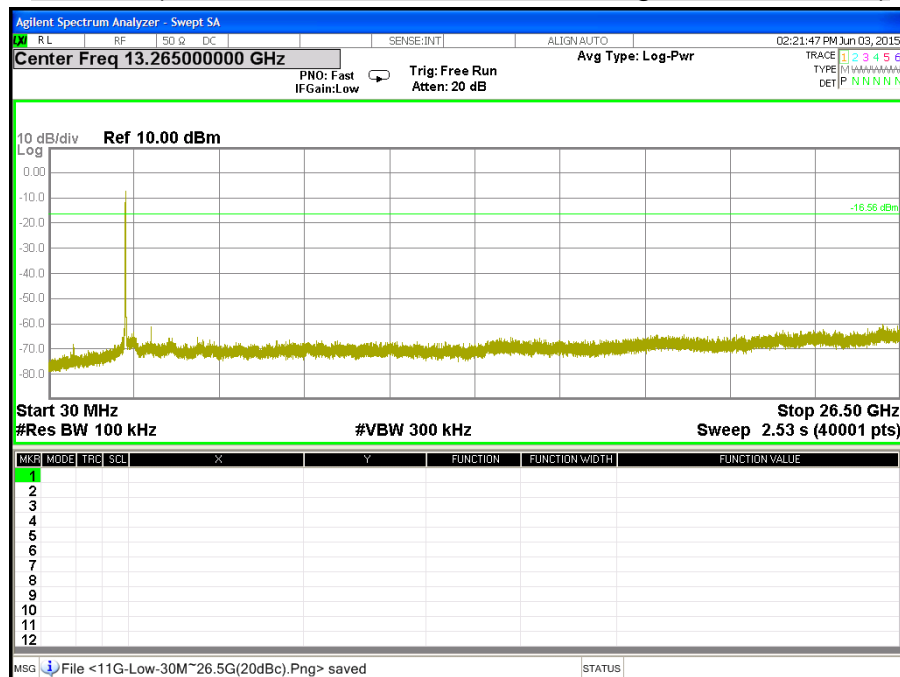
CH High (30MHz ~ 26.5GHz / IEEE 802.11b Mode / Chain 0)



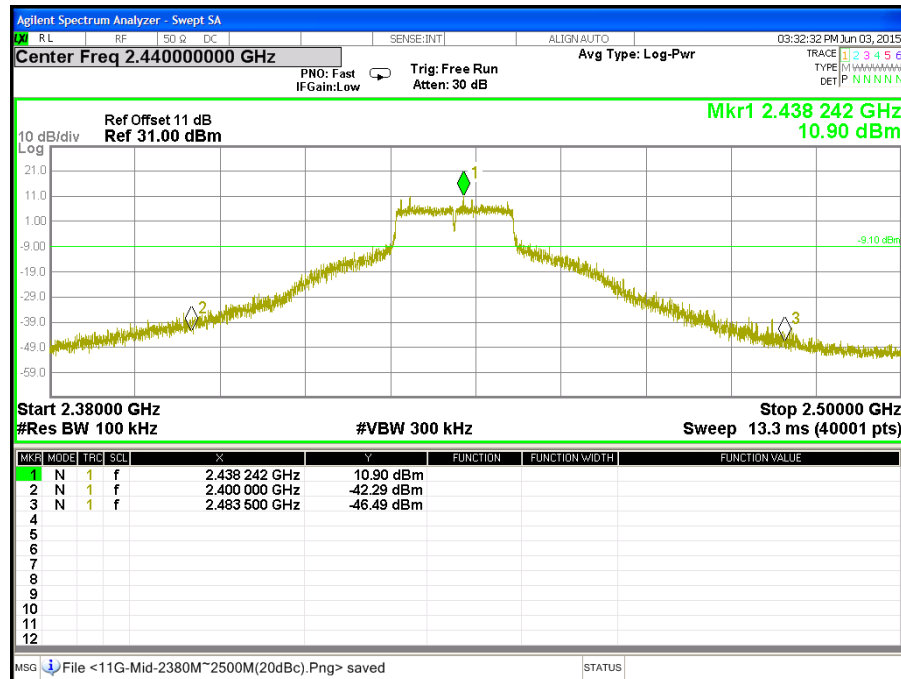
CH Low (2.38GHz ~ 2.5GHz / IEEE 802.11g Mode / Chain 0)



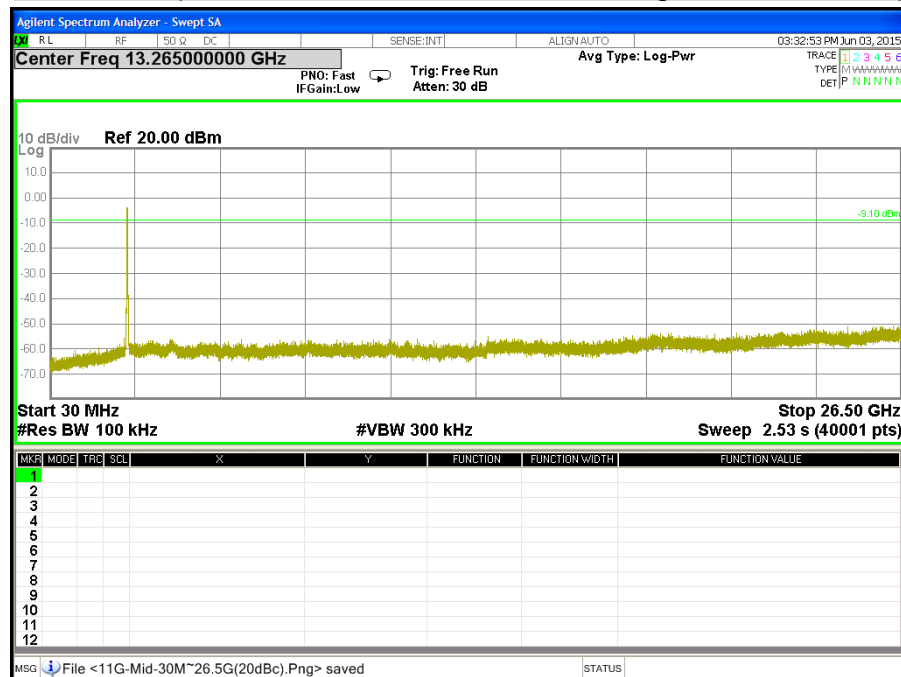
CH Low (30MHz ~ 26.5GHz / IEEE 802.11g Mode / Chain 0)



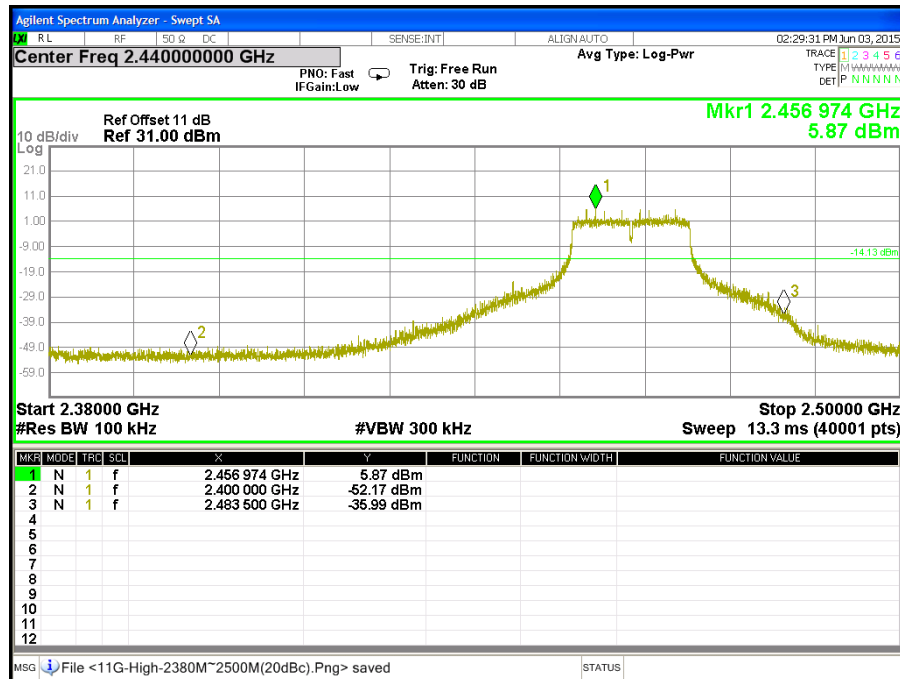
CH Middle (2.38GHz ~ 2.5GHz / IEEE 802.11g Mode / Chain 0)



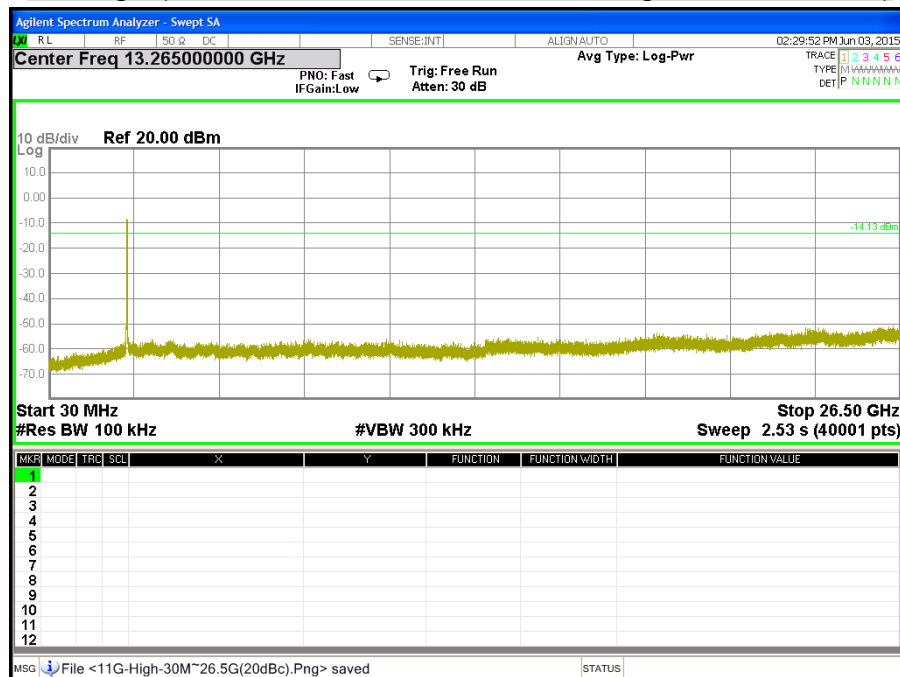
CH Middle (30MHz ~ 26.5GHz / IEEE 802.11g Mode / Chain 0)



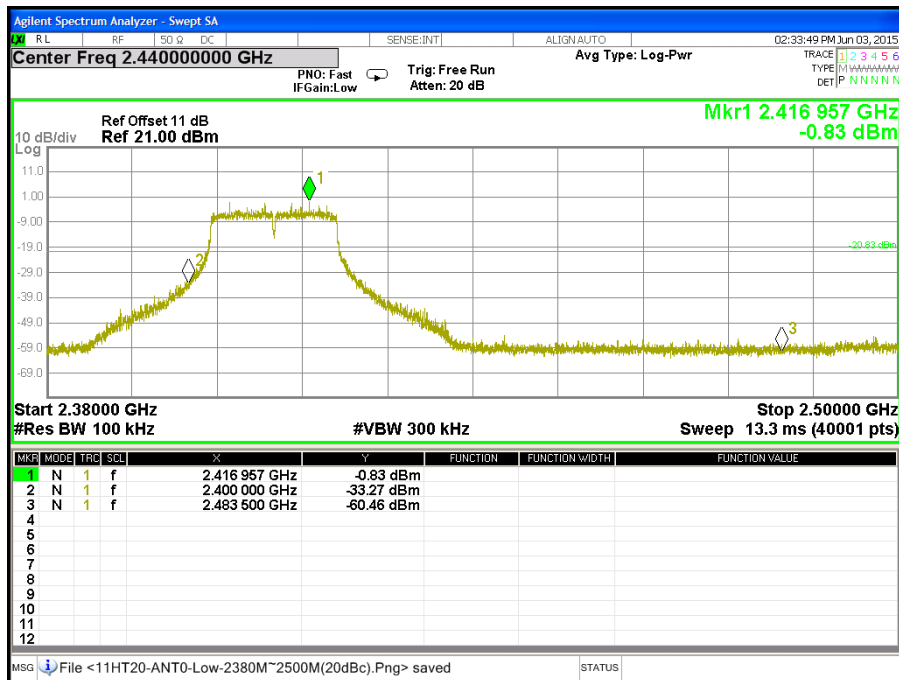
CH High (2.38GHz ~ 2.5GHz / IEEE 802.11g Mode / Chain 0)



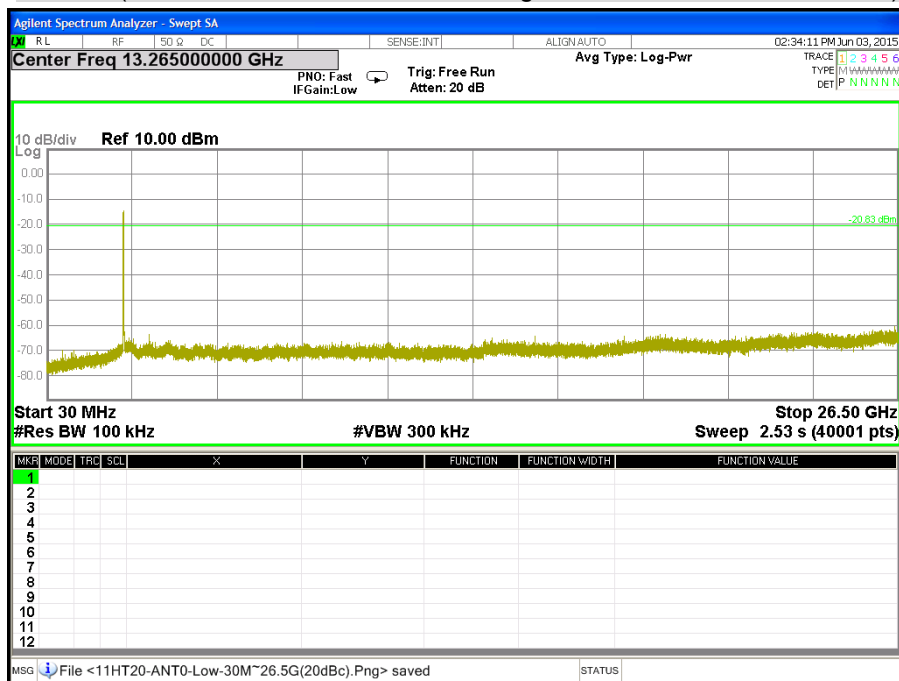
CH High (30MHz ~ 26.5GHz / IEEE 802.11g Mode / Chain 0)



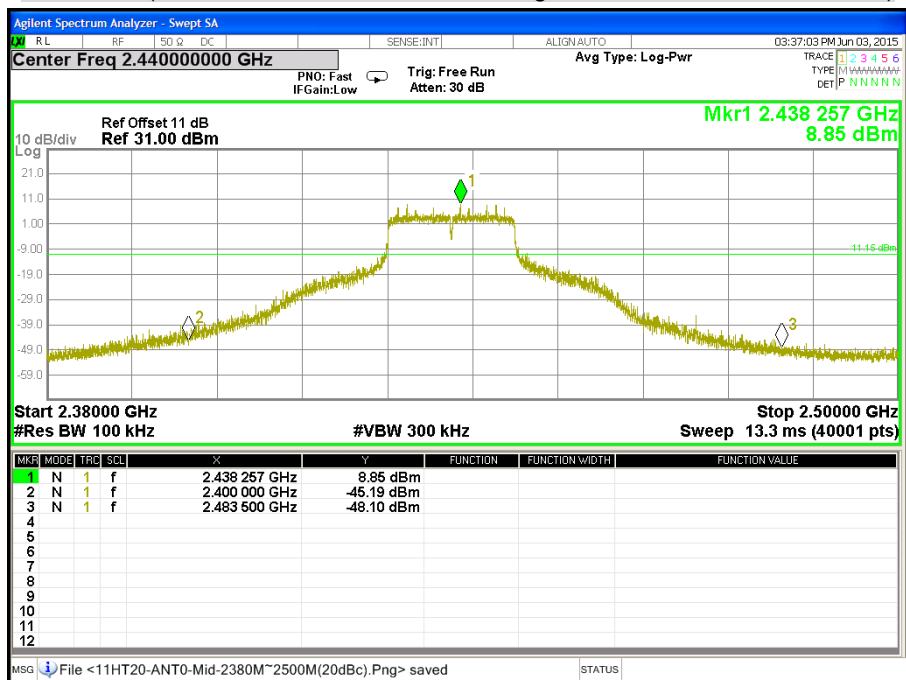
CH Low (2.38GHz ~ 2.5GHz / IEEE 802.11gn HT20 MCS0 Mode / Chain 0)



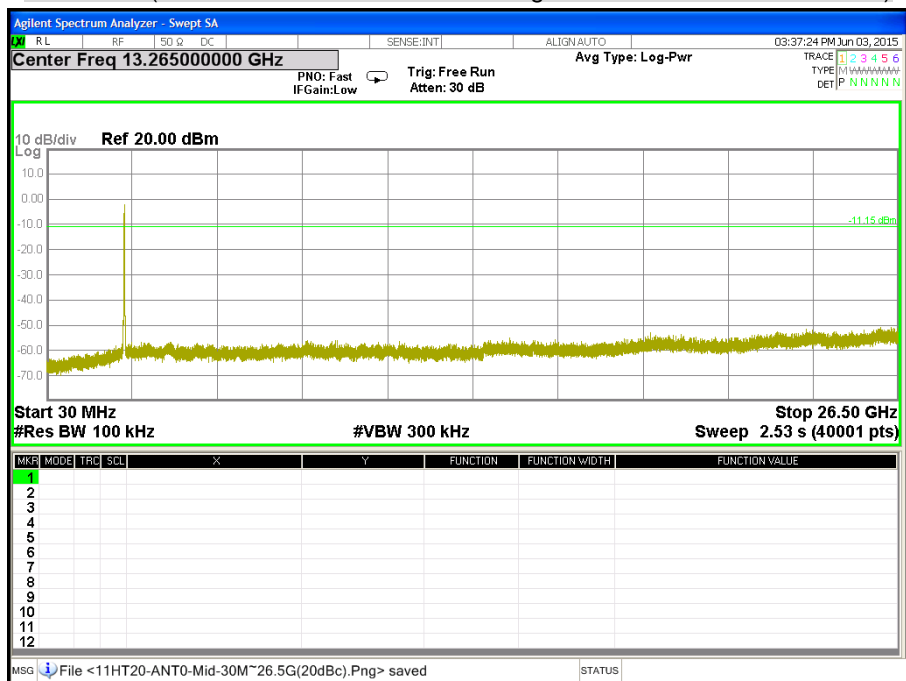
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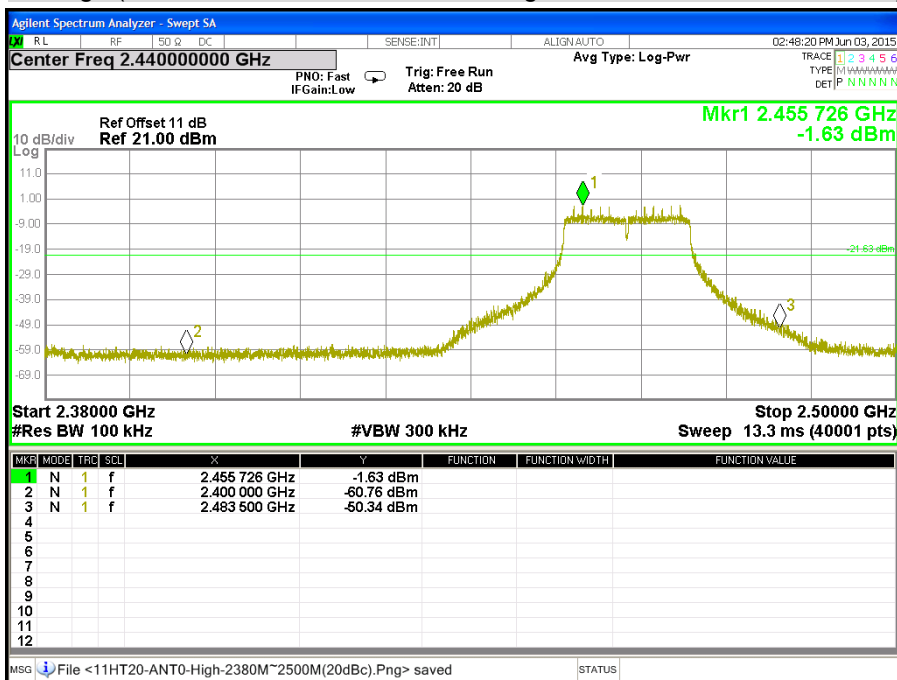
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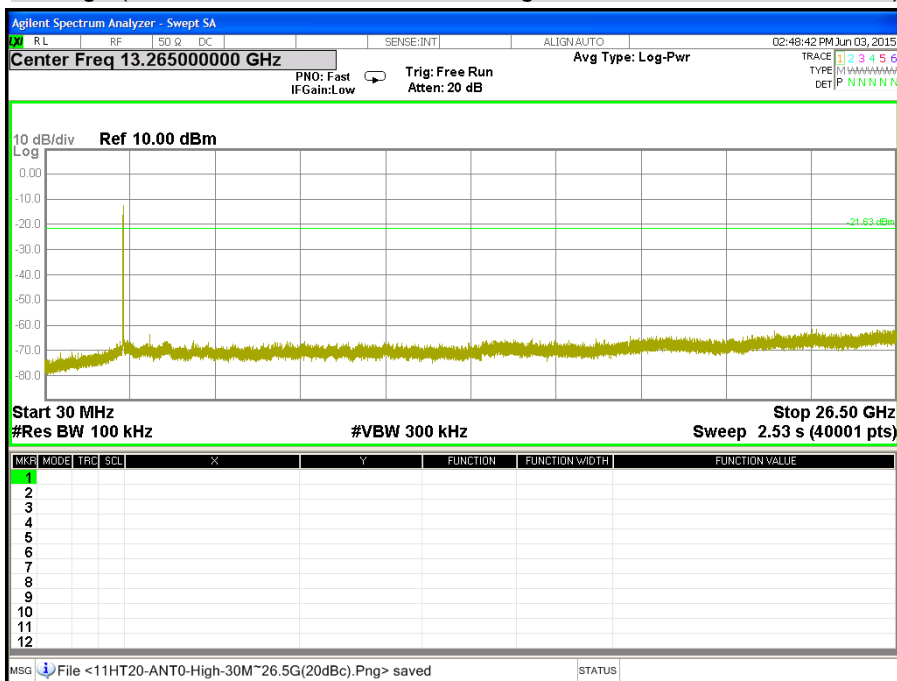
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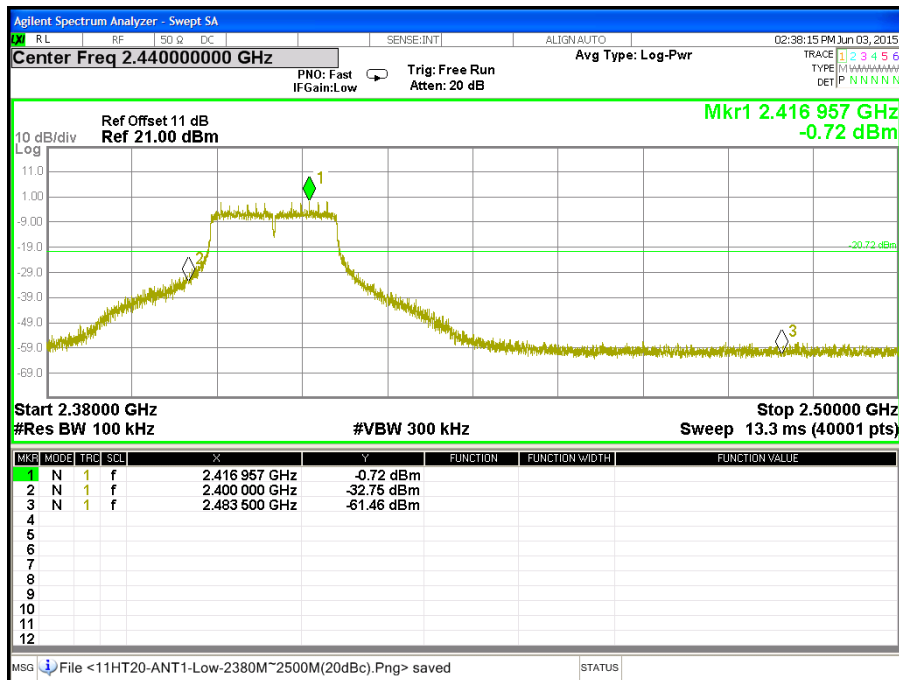
CH High (2.38GHz ~ 2.5GHz / IEEE 802.11gn HT20 MCS0 Mode / Chain 0)



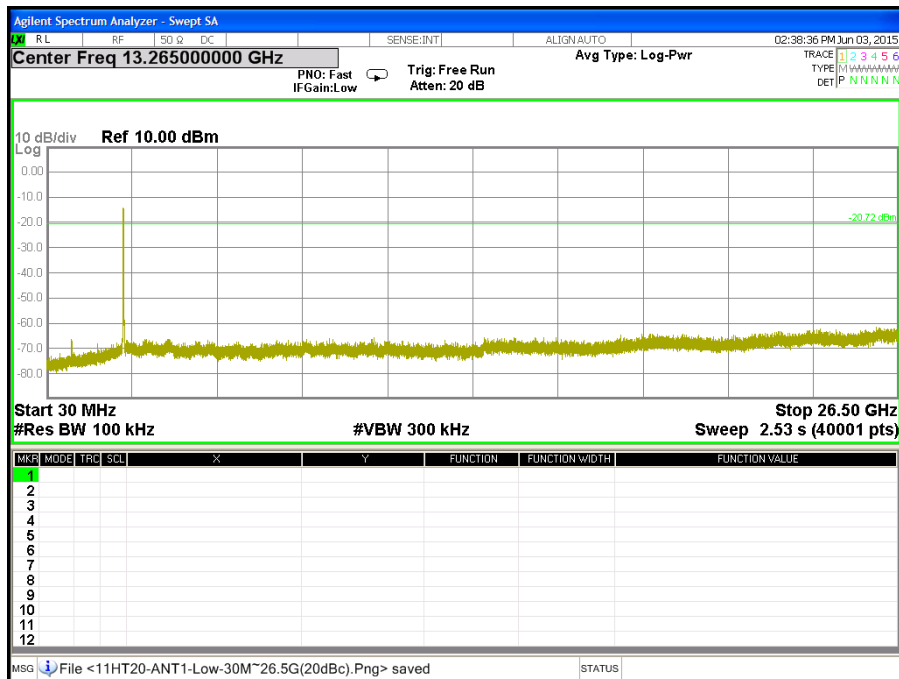
CH High (30MHz ~ 26.5GHz / IEEE 802.11gn HT20 MCS0 Mode / Chain 0)



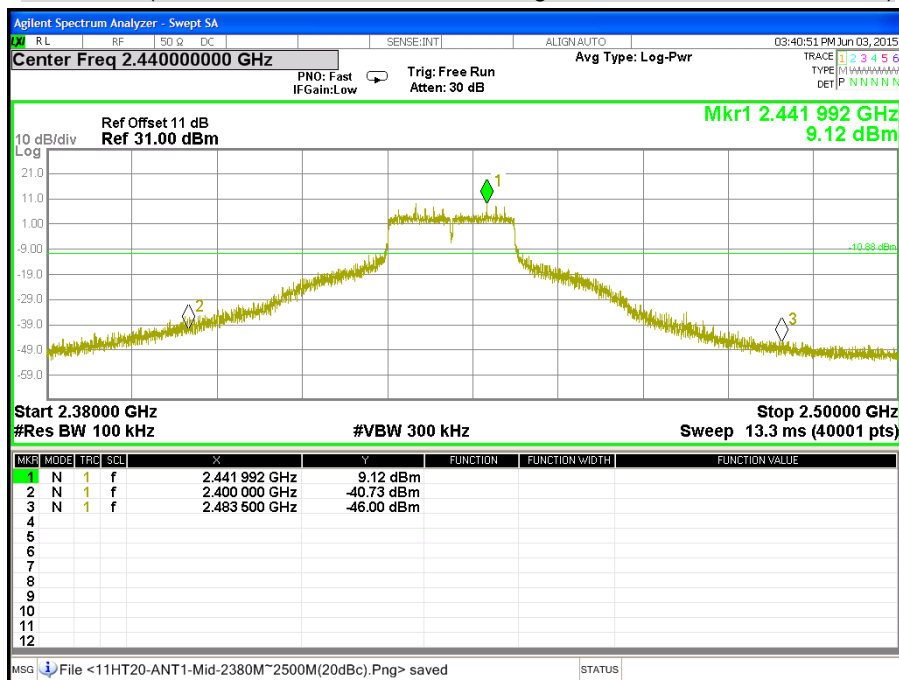
CH Low (2.38GHz ~ 2.5GHz / IEEE 802.11gn HT20 MCS0 Mode / Chain 1)



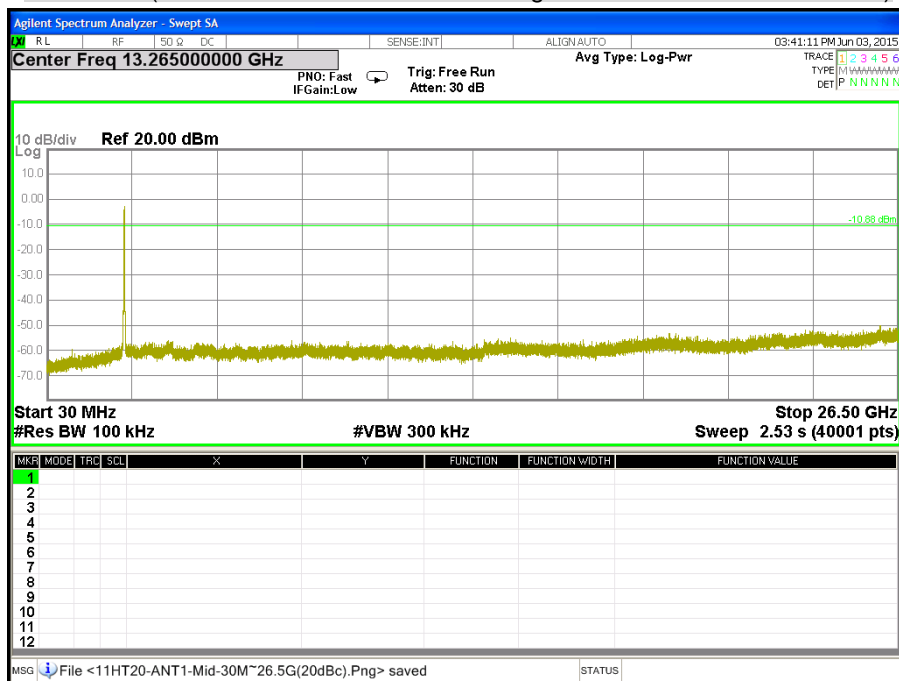
CH Low (30MHz ~ 26.5GHz / IEEE 802.11gn HT20 MCS0 Mode / Chain 1)



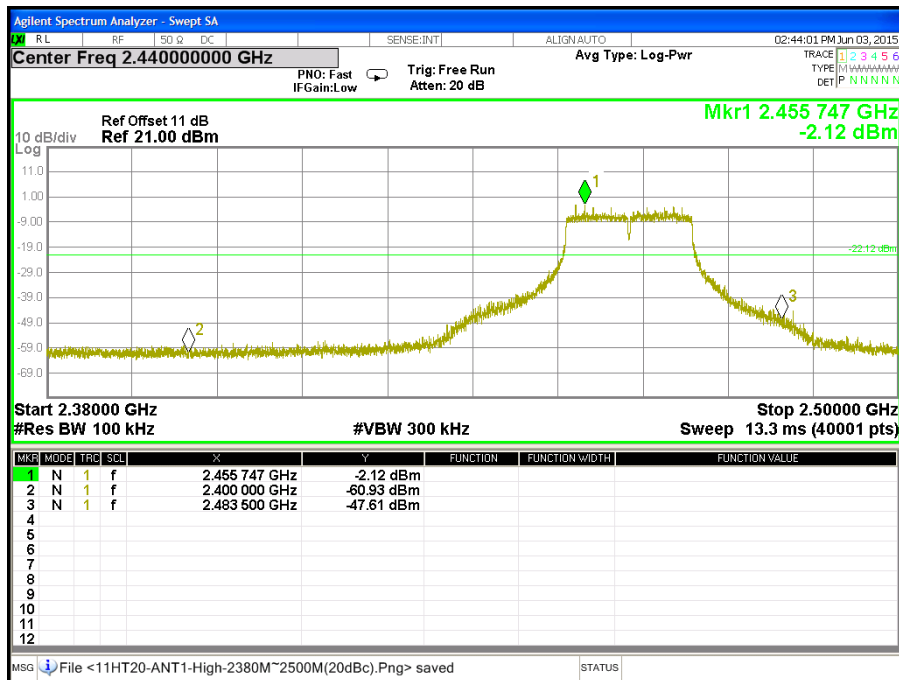
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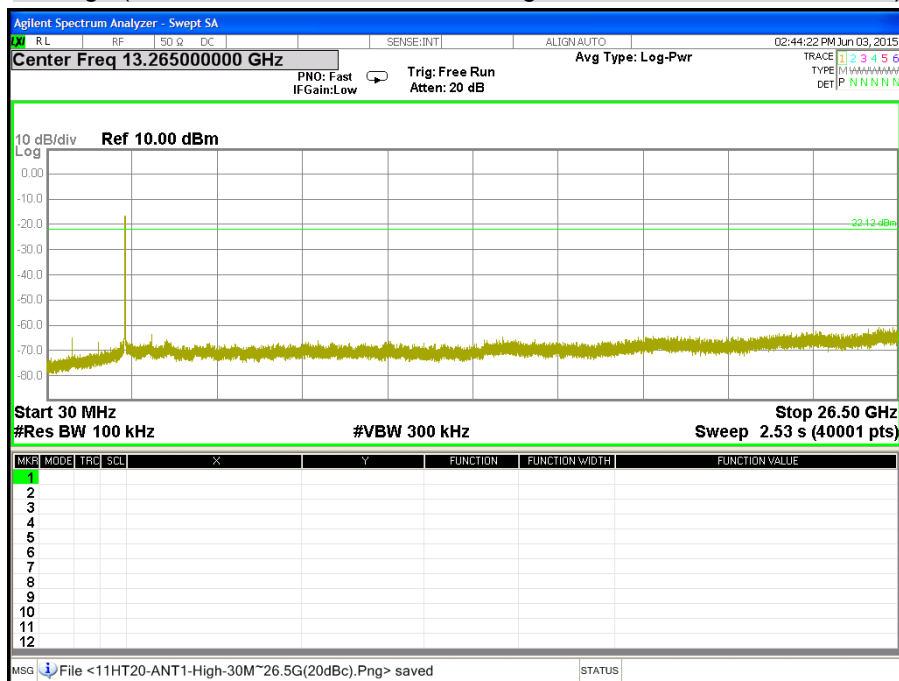
CH Middle (30MHz ~ 26.5GHz / IEEE 802.11gn HT20 MCS0 Mode / Chain 1)



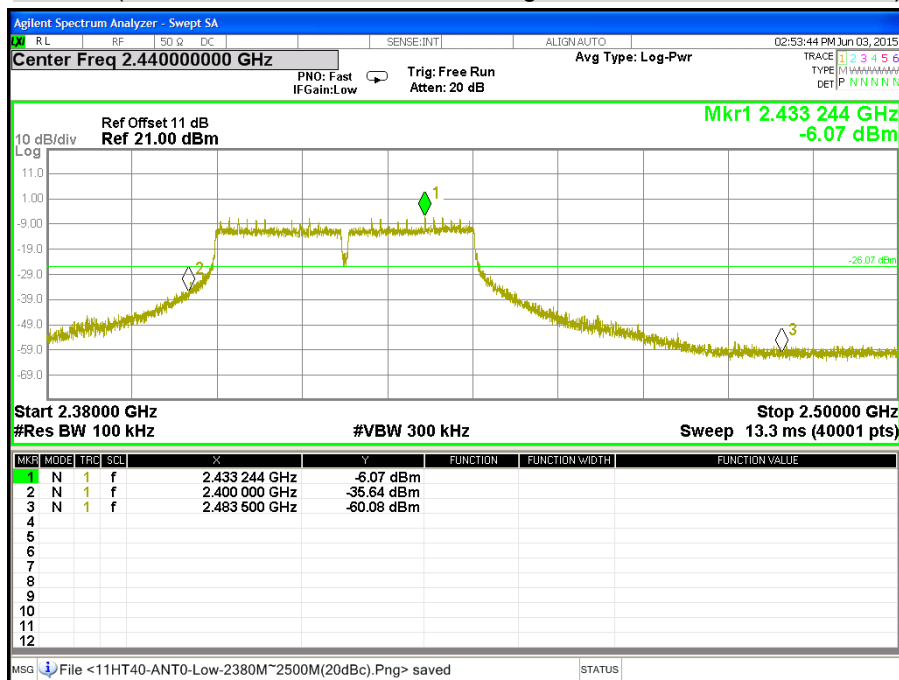
CH High (2.38GHz ~ 2.5GHz / IEEE 802.11gn HT20 MCS0 Mode / Chain 1)



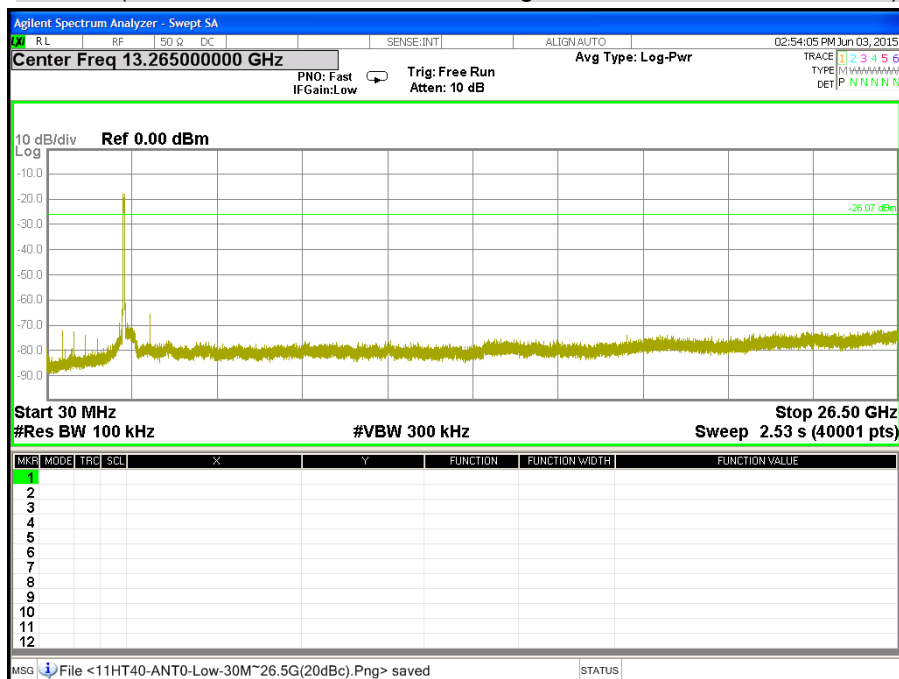
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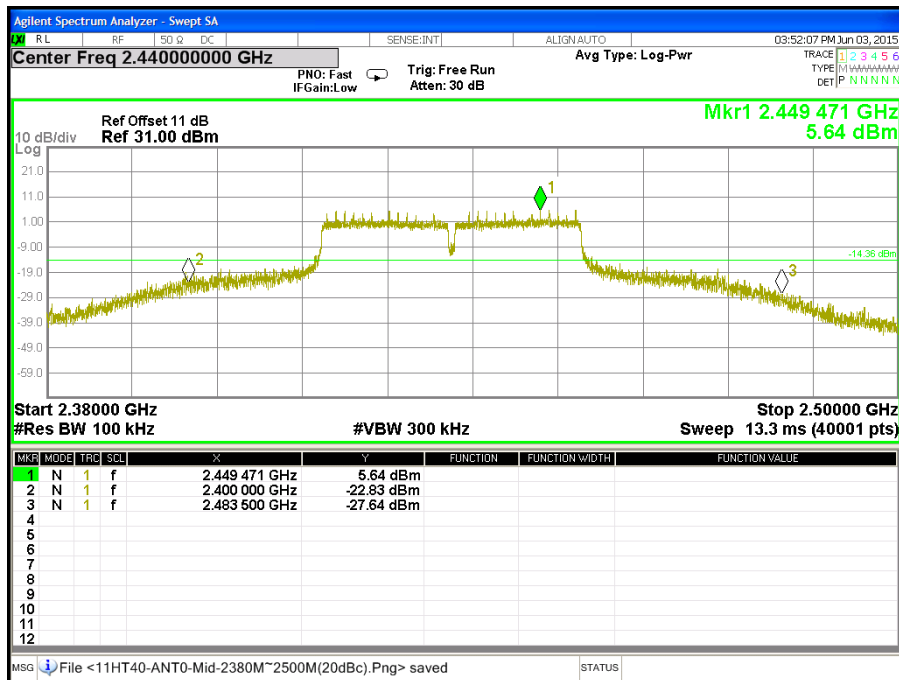
CH Low (2.38GHz ~ 2.5GHz / IEEE 802.11gn HT40 MCS0 Mode / Chain 0)



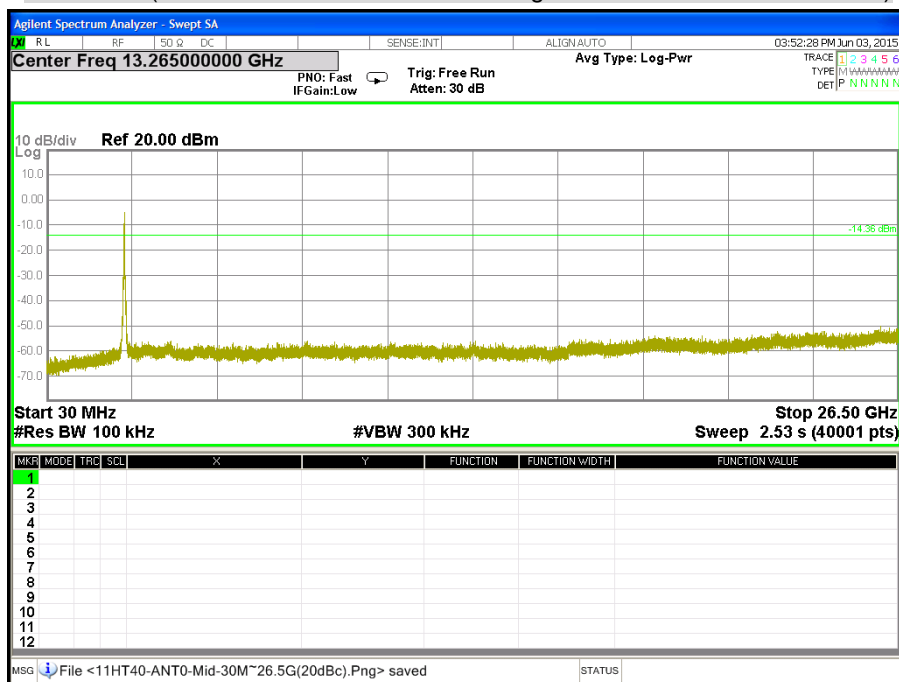
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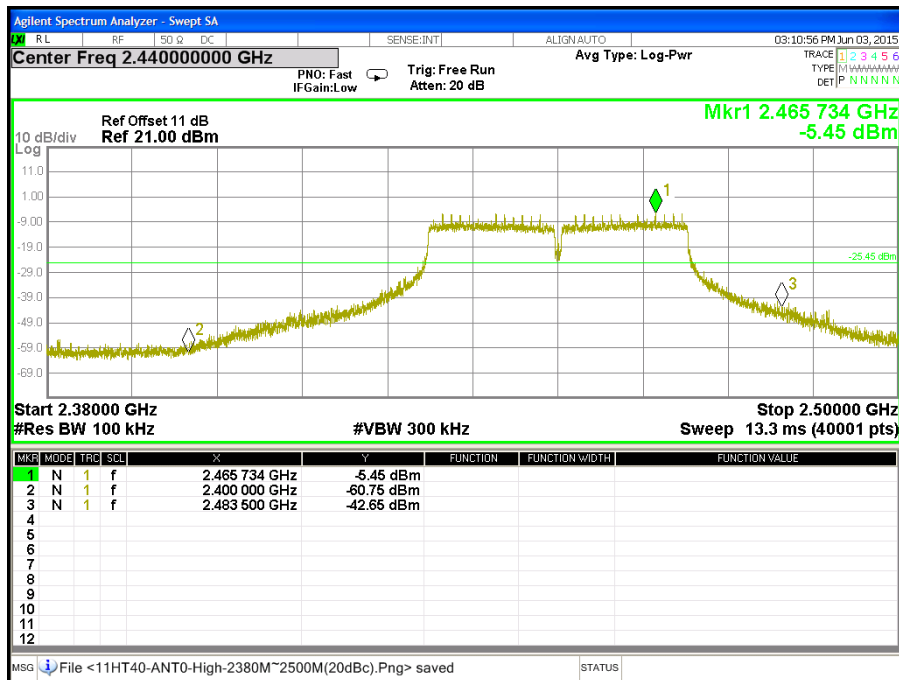
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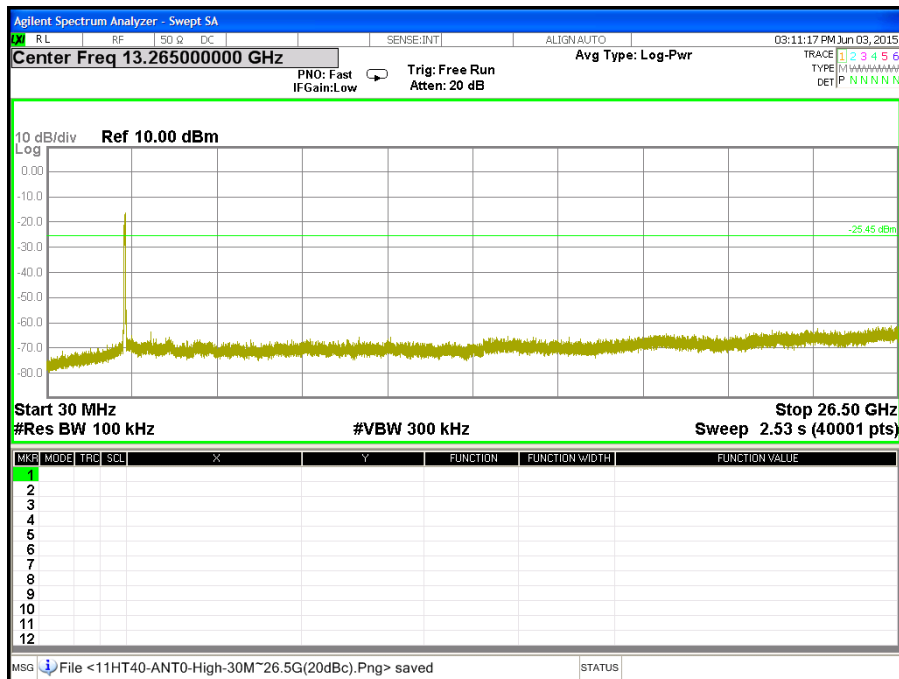
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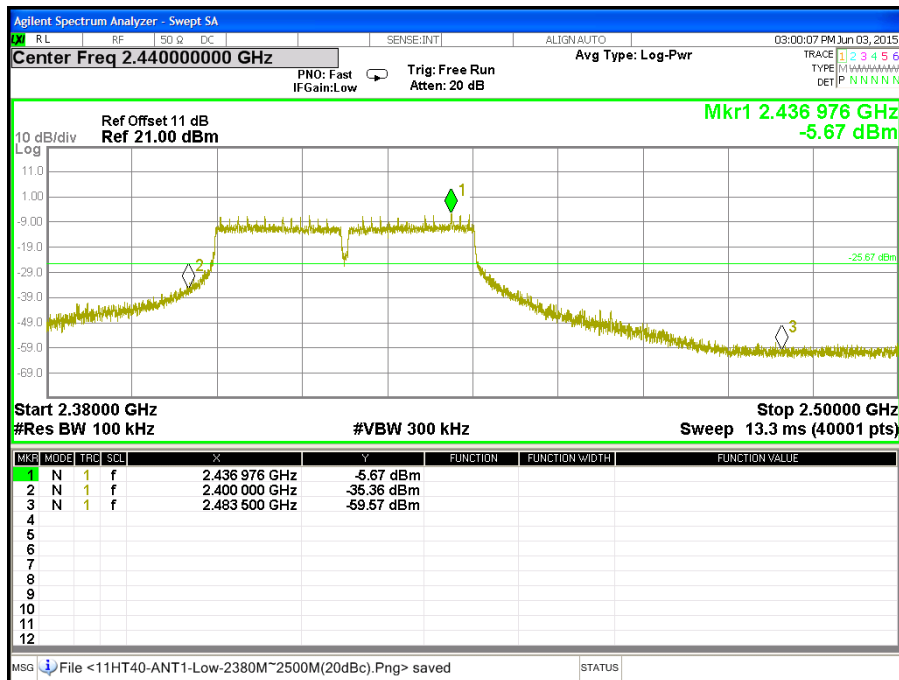
CH High (2.38GHz ~ 2.5GHz / IEEE 802.11gn HT40 MCS0 Mode / Chain 0)



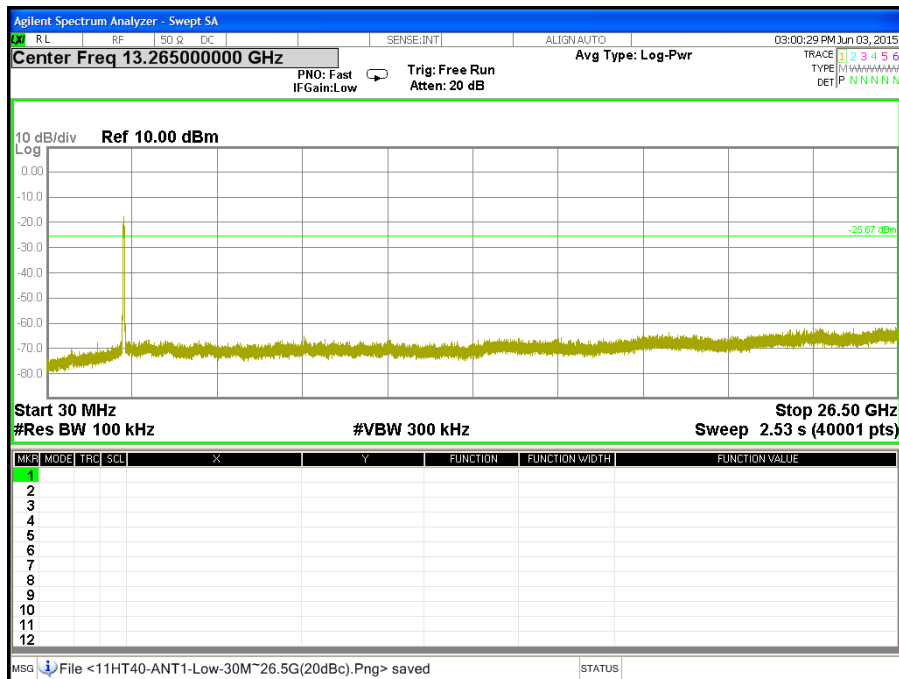
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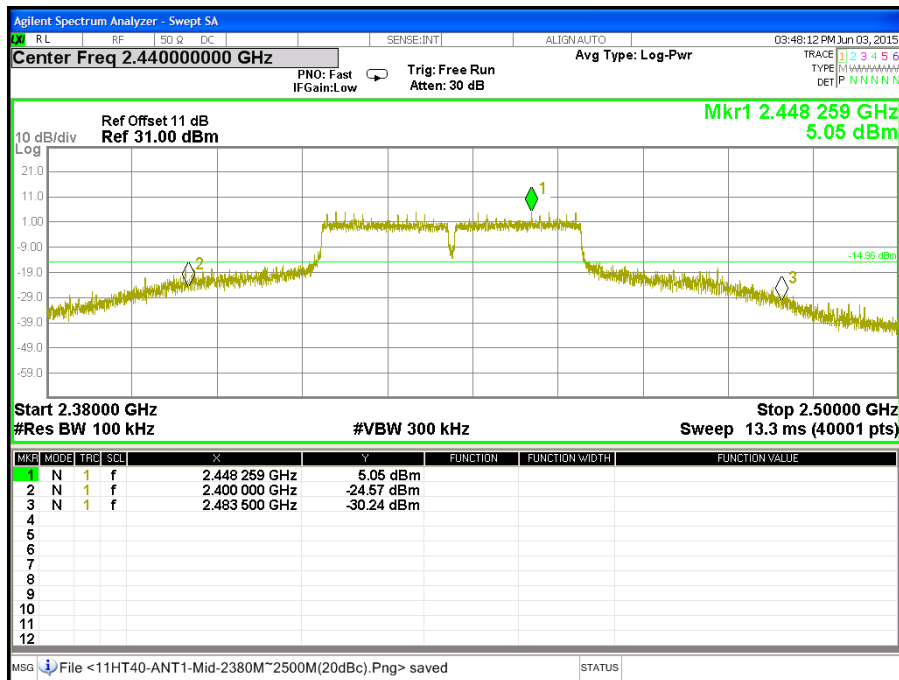
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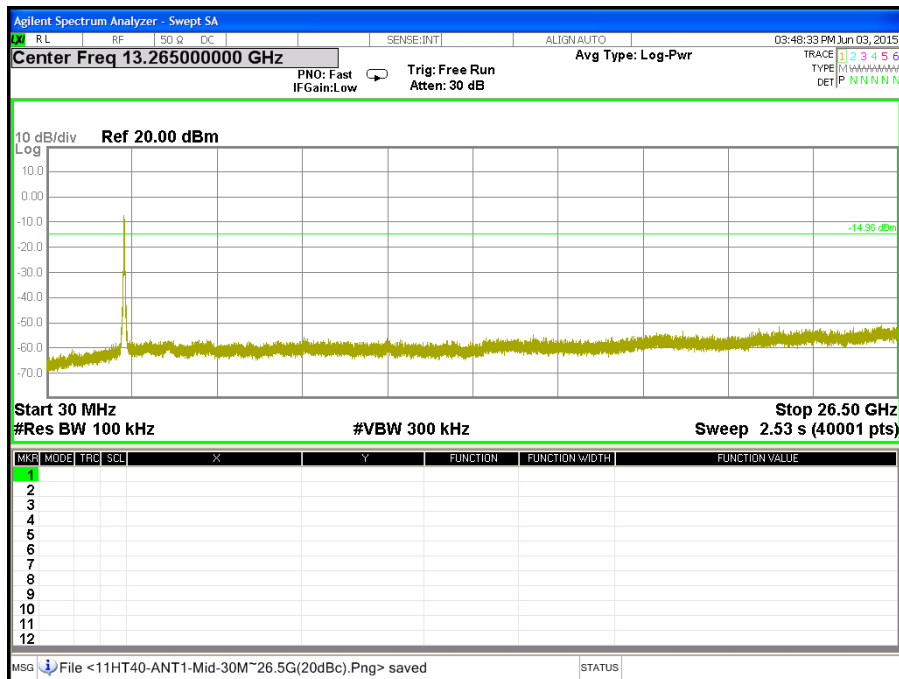
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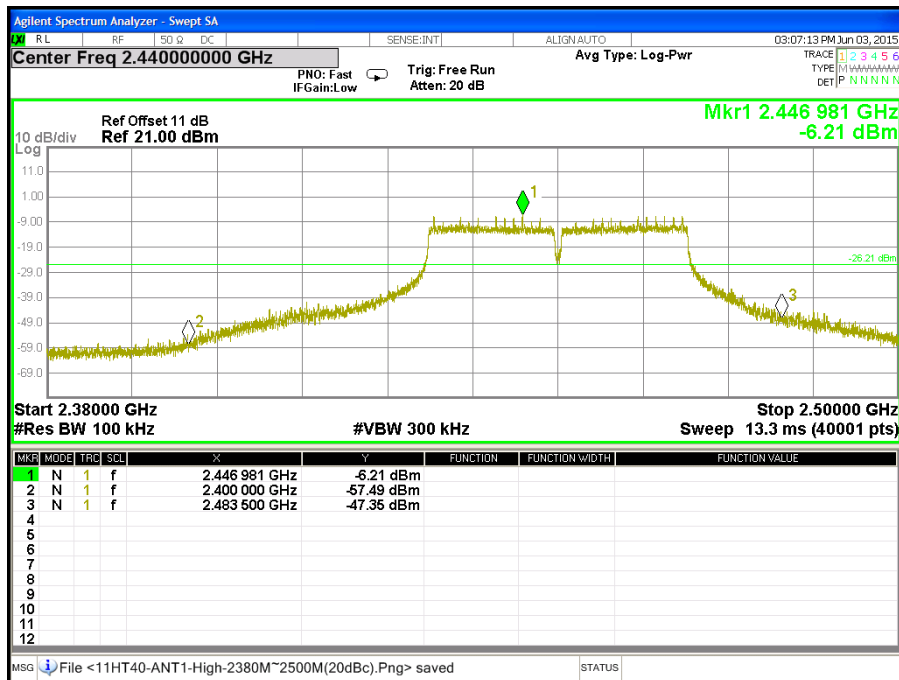
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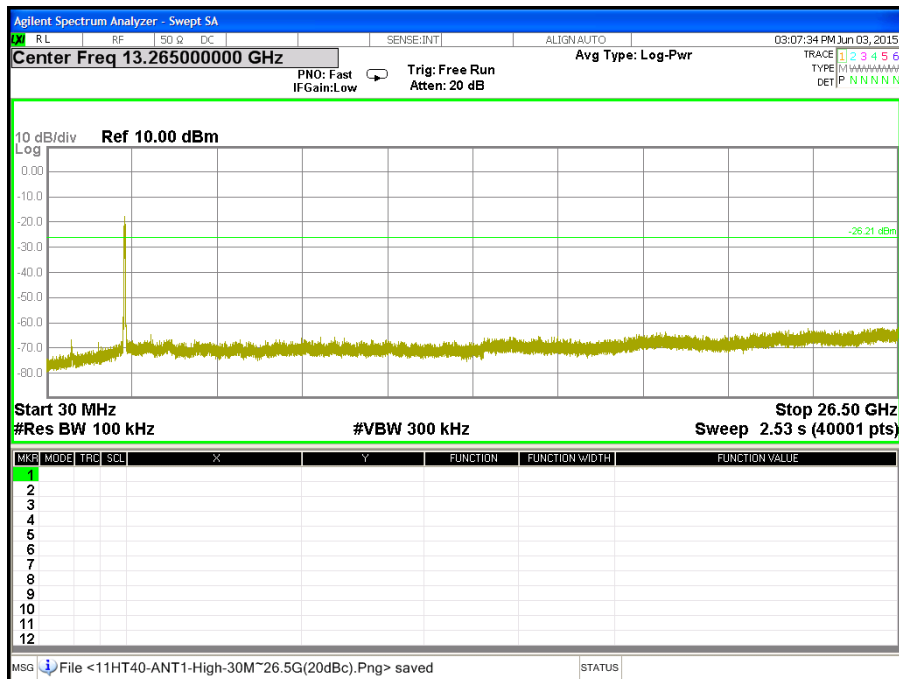
CH Middle (30MHz ~ 26.5GHz / IEEE 802.11gn HT40 MCS0 Mode / Chain 1)



CH High (2.38GHz ~ 2.5GHz / IEEE 802.11gn HT40 MCS0 Mode / Chain 1)



CH High (30MHz ~ 26.5GHz / IEEE 802.11gn HT40 MCS0 Mode / Chain 1)



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 in 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.

- (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.

TEST EQUIPMENT

Radiated Emission / 966Chamber_C

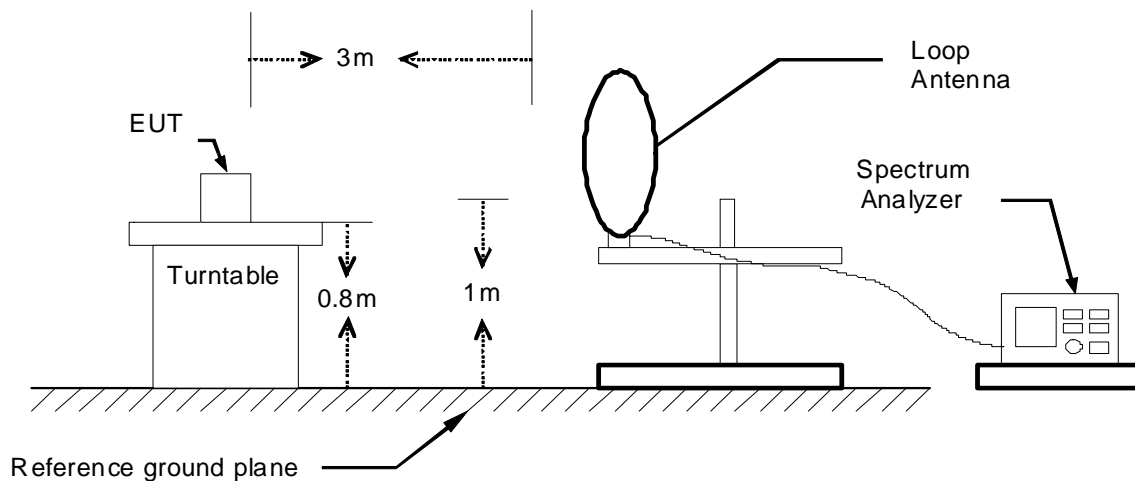
Name of Equipment	Manufacture	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY45280064	03/26/2016
EMI Test Receiver	ROHDE & SCHWARZ	ESCI	101387	10/05/2015
Bi-log Antenna	TESEQ	CBL 6112D	35404	02/24/2016
Double-Ridged Waveguide Horn	ETS-LINDGREN	3117	00078732	07/23/2015
Horn Antenna	COM-POWER	AH-840	03077	12/17/2015
Pre-Amplifier	EMCI	EMC001625	980243	04/12/2016
Pre-Amplifier	COM-POWER	PAM-118A	551043	04/12/2016
Notch Filters Band Reject	Micro-Tronics	BRM50702-01	009	N.C.R
LOOP Antenna	EMCO	6502	8905-2356	09/23/2015
Test S/W	E3.815206a			

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

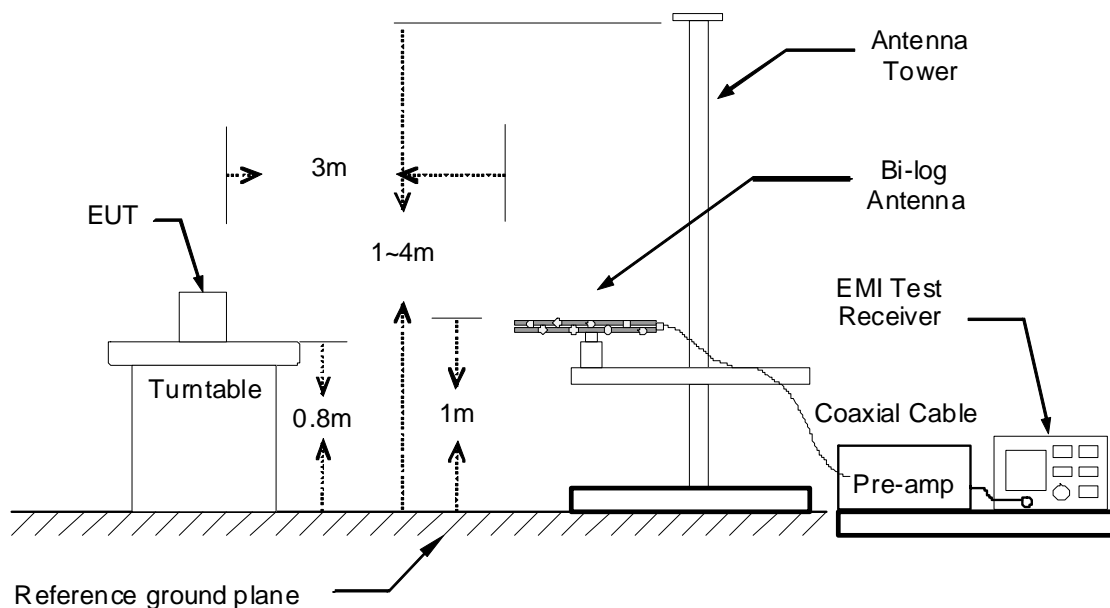
TEST SETUP

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

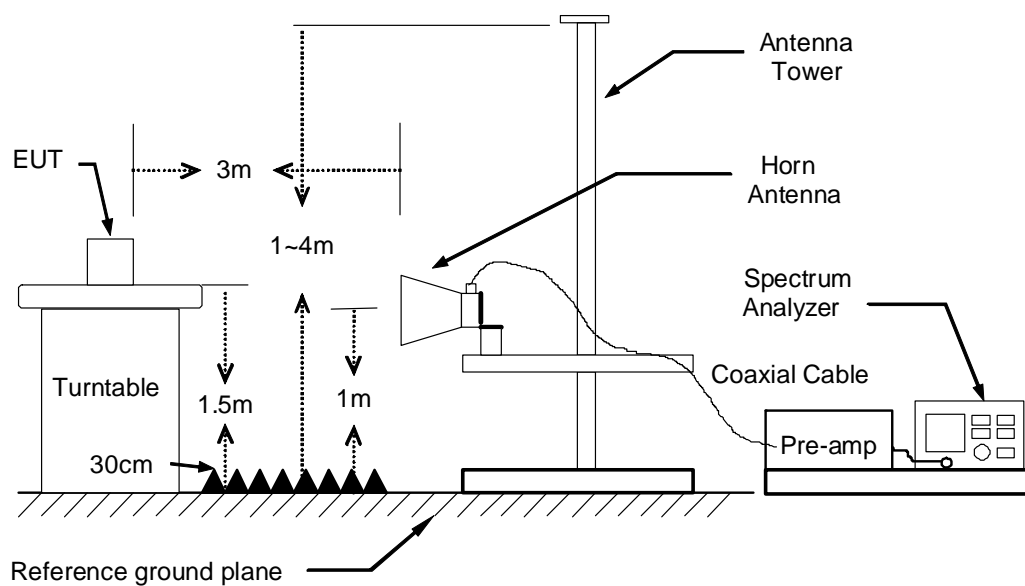
9kHz ~ 30MHz



30MHz ~ 1GHz



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



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.*

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	Display Unit	Test By	Waternil Guan
Test Model	EEMS330	Test Date	2015/05/11
Test Mode	Mode 1	Temp. & Humidity	25°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
=====								
192.96	53.39	-20.94	32.45	43.50	-11.05	341	200	Peak
257.95	54.49	-16.69	37.80	46.00	-8.20	360	100	Peak
321.97	53.57	-15.73	37.84	46.00	-8.16	149	100	Peak
386.96	53.38	-13.81	39.57	46.00	-6.43	320	100	Peak
506.27	51.78	-11.83	39.95	46.00	-6.05	321	200	Peak
515.97	52.81	-11.66	41.15	46.00	-4.85	235	200	Peak
773.99	50.52	-8.84	41.68	46.00	-4.32	345	100	Peak
903.00	46.50	-7.48	39.02	46.00	-6.98	332	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
=====								
33.88	42.83	-13.39	29.44	40.00	-10.56	321	100	Peak
109.54	51.74	-18.85	32.89	43.50	-10.61	207	100	Peak
386.96	47.46	-13.81	33.65	46.00	-12.35	242	200	Peak
507.24	52.35	-11.81	40.54	46.00	-5.46	360	100	Peak
644.01	42.08	-10.01	32.07	46.00	-13.93	233	100	Peak
902.03	41.27	-7.49	33.78	46.00	-12.22	112	100	Peak
967.02	44.33	-7.04	37.29	54.00	-16.71	172	100	Peak
989.33	48.20	-6.82	41.38	54.00	-12.62	202	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).

Above 1 GHz

Product Name	Display Unit	Test By	Waternil Guan
Test Model	EEMS330	Test Date	2015/05/12
Test Mode	IEEE 802.11b Mode / TX / CH Low	Temp. & Humidity	25°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
1400.00	44.09	-0.97	43.12	74.00	-30.88	105	100	Peak
1954.00	45.05	2.95	48.00	74.00	-26.00	359	100	Peak
2000.00	45.19	3.35	48.54	74.00	-25.46	356	100	Peak
3210.00	46.88	-3.31	43.57	74.00	-30.43	107	200	Peak
3795.00	46.89	-2.77	44.12	74.00	-29.88	73	200	Peak
4830.00	52.46	-0.52	51.94	74.00	-22.06	151	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
2000.00	45.45	3.35	48.80	74.00	-25.20	196	100	Peak
2058.00	45.20	3.46	48.66	74.00	-25.34	198	100	Peak
2788.00	44.40	5.05	49.45	74.00	-24.55	202	100	Peak
3330.00	48.88	-3.26	45.62	74.00	-28.38	353	100	Peak
3810.00	50.50	-2.75	47.75	74.00	-26.25	74	100	Peak
4830.00	53.63	-0.52	53.11	54.00	-0.89	90	100	Average
4830.00	55.80	-0.52	55.28	74.00	-18.72	90	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)

Product Name	Display Unit	Test By	Waternil Guan
Test Model	EEMS330	Test Date	2015/05/12
Test Mode	IEEE 802.11b Mode / TX / CH Middle	Temp. & Humidity	25°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
2000.00	44.44	3.35	47.79	74.00	-26.21	358	100	Peak
2346.00	42.31	4.02	46.33	74.00	-27.67	44	100	Peak
2500.00	43.16	4.32	47.48	74.00	-26.52	9	100	Peak
3255.00	47.46	-3.29	44.17	74.00	-29.83	75	200	Peak
3795.00	46.79	-2.77	44.02	74.00	-29.98	126	200	Peak
4875.00	53.45	-0.41	53.04	54.00	-0.96	17	214	Average
4875.00	55.47	-0.41	55.06	74.00	-18.94	17	214	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
2000.00	45.38	3.35	48.73	74.00	-25.27	191	100	Peak
2172.00	43.77	3.68	47.45	74.00	-26.55	338	100	Peak
2500.00	45.14	4.32	49.46	74.00	-24.54	268	100	Peak
3330.00	49.84	-3.26	46.58	74.00	-27.42	208	100	Peak
3795.00	50.43	-2.77	47.66	74.00	-26.34	75	100	Peak
4875.00	53.91	-0.41	53.50	54.00	-0.50	100	112	Average
4875.00	56.02	-0.41	55.61	74.00	-18.39	100	112	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)

Product Name	Display Unit	Test By	Waternil Guan
Test Model	EEMS330	Test Date	2015/05/12
Test Mode	IEEE 802.11b Mode / TX / CH High	Temp. & Humidity	25°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
2000.00	43.93	3.35	47.28	74.00	-26.72	5	100	Peak
2288.00	41.78	3.91	45.69	74.00	-28.31	3	100	Peak
2788.00	42.57	5.05	47.62	74.00	-26.38	298	200	Peak
3285.00	46.59	-3.28	43.31	74.00	-30.69	108	200	Peak
3795.00	46.40	-2.77	43.63	74.00	-30.37	79	200	Peak
4920.00	50.79	-0.31	50.48	74.00	-23.52	153	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
2000.00	45.52	3.35	48.87	74.00	-25.13	194	100	Peak
2548.00	43.34	4.44	47.78	74.00	-26.22	308	100	Peak
2788.00	42.26	5.05	47.31	74.00	-26.69	127	200	Peak
3330.00	46.90	-3.26	43.64	74.00	-30.36	207	100	Peak
3795.00	51.09	-2.77	48.32	74.00	-25.68	68	100	Peak
4920.00	53.14	-0.31	52.83	54.00	-1.17	88	100	Average
4920.00	56.24	-0.31	55.93	74.00	-18.07	88	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)

Product Name	Display Unit	Test By	Waternil Guan
Test Model	EEMS330	Test Date	2015/05/12
Test Mode	IEEE 802.11g Mode / TX / CH Low	Temp. & Humidity	25°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
1334.00	45.25	-0.96	44.29	74.00	-29.71	115	100	Peak
1400.00	44.58	-0.97	43.61	74.00	-30.39	104	100	Peak
1980.00	45.01	3.18	48.19	74.00	-25.81	360	100	Peak
3210.00	48.43	-3.31	45.12	74.00	-28.88	81	200	Peak
4830.00	47.79	-0.52	47.27	74.00	-26.73	157	200	Peak
7530.00	45.87	2.94	48.81	74.00	-25.19	254	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
1950.00	45.01	2.92	47.93	74.00	-26.07	198	100	Peak
2000.00	45.59	3.35	48.94	74.00	-25.06	194	100	Peak
2500.00	44.09	4.32	48.41	74.00	-25.59	262	100	Peak
3810.00	53.15	-2.75	50.40	74.00	-23.60	185	100	Peak
4815.00	49.74	-0.55	49.19	74.00	-24.81	93	100	Peak
7245.00	46.24	2.80	49.04	74.00	-24.96	97	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)

Product Name	Display Unit	Test By	Waternil Guan
Test Model	EEMS330	Test Date	2015/05/12
Test Mode	IEEE 802.11g Mode / TX / CH Middle	Temp. & Humidity	25°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
2000.00	43.78	3.35	47.13	74.00	-26.87	354	100	Peak
2390.00	42.80	4.11	46.91	54.00	-7.09	41	161	Average
2390.00	62.60	4.11	66.71	74.00	-7.29	41	161	Peak
2484.00	47.37	4.29	51.66	74.00	-22.34	154	200	Peak
3255.00	46.98	-3.29	43.69	74.00	-30.31	107	200	Peak
4875.00	44.37	-0.41	43.96	54.00	-10.04	81	179	Average
4875.00	56.98	-0.41	56.57	74.00	-17.43	81	179	Peak
7305.00	45.55	2.83	48.38	54.00	-5.62	148	180	Average
7305.00	57.80	2.83	60.63	74.00	-13.37	148	180	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
2000.00	46.79	3.35	50.14	74.00	-23.86	201	100	Peak
2390.00	42.71	4.11	46.82	54.00	-7.18	257	100	Average
2390.00	62.73	4.11	66.84	74.00	-7.16	257	100	Peak
2492.00	44.46	4.30	48.76	54.00	-5.24	266	100	Average
2492.00	57.98	4.30	62.28	74.00	-11.72	266	100	Peak
3795.00	52.08	-2.77	49.31	74.00	-24.69	79	100	Peak
4875.00	46.47	-0.41	46.06	54.00	-7.94	89	100	Average
4875.00	59.21	-0.41	58.80	74.00	-15.20	89	100	Peak
7320.00	51.60	2.84	54.44	54.00	0.44	98	184	Average
7320.00	64.62	2.84	67.46	74.00	-6.54	98	184	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)

Product Name	Display Unit	Test By	Waternil Guan
Test Model	EEMS330	Test Date	2015/05/12
Test Mode	IEEE 802.11g Mode / TX / CH High	Temp. & Humidity	25°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
1904.00	42.52	2.52	45.04	74.00	-28.96	357	100	Peak
2000.00	44.10	3.35	47.45	74.00	-26.55	0	100	Peak
2706.00	42.54	4.84	47.38	74.00	-26.62	92	200	Peak
3285.00	48.20	-3.28	44.92	74.00	-29.08	56	200	Peak
4920.00	49.49	-0.31	49.18	74.00	-24.82	155	200	Peak
7380.00	47.07	2.86	49.93	74.00	-24.07	145	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
1334.00	43.29	-0.96	42.33	74.00	-31.67	302	100	Peak
2000.00	45.52	3.35	48.87	74.00	-25.13	201	100	Peak
2700.00	42.70	4.83	47.53	74.00	-26.47	18	100	Peak
3795.00	50.14	-2.77	47.37	74.00	-26.63	71	100	Peak
4935.00	42.29	-0.27	42.02	54.00	-11.98	88	100	Average
4935.00	57.55	-0.27	57.28	74.00	-16.72	88	100	Peak
7395.00	49.99	2.87	52.86	74.00	-21.14	178	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)

Product Name	Display Unit	Test By	Waternil Guan
Test Model	EEMS330	Test Date	2015/05/12
Test Mode	IEEE 802.11gn HT20 MCS0 Mode / TX / CH Low	Temp. & Humidity	25°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
2000.00	44.32	3.35	47.67	74.00	-26.33	357	100	Peak
2078.00	42.14	3.50	45.64	74.00	-28.36	308	100	Peak
2500.00	43.97	4.32	48.29	74.00	-25.71	360	200	Peak
3210.00	48.20	-3.31	44.89	74.00	-29.11	82	200	Peak
4830.00	50.25	-0.52	49.73	74.00	-24.27	155	200	Peak
7650.00	45.17	3.03	48.20	74.00	-25.80	58	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
2000.00	46.88	3.35	50.23	74.00	-23.77	193	100	Peak
2500.00	46.45	4.32	50.77	74.00	-23.23	269	100	Peak
2788.00	41.93	5.05	46.98	74.00	-27.02	207	100	Peak
3750.00	50.02	-2.84	47.18	74.00	-26.82	188	100	Peak
4815.00	50.16	-0.55	49.61	74.00	-24.39	94	100	Peak
7380.00	45.76	2.86	48.62	74.00	-25.38	283	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)

Product Name	Display Unit	Test By	Waternil Guan
Test Model	EEMS330	Test Date	2015/05/12
Test Mode	IEEE 802.11gn HT20 MCS0 Mode / TX / CH Middle	Temp. & Humidity	25°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
2000.00	44.91	3.35	48.26	74.00	-25.74	1	100	Peak
2380.00	49.08	4.09	53.17	54.00	-0.83	41	157	Average
2380.00	69.30	4.09	73.39	74.00	-0.61	41	157	Peak
2484.00	44.83	4.29	49.12	54.00	-4.88	122	115	Average
2484.00	66.95	4.29	71.24	74.00	-2.76	122	115	Peak
3255.00	50.55	-3.29	47.26	74.00	-26.74	132	200	Peak
4875.00	49.21	-0.41	48.80	54.00	-5.20	181	192	Average
4875.00	64.48	-0.41	64.07	74.00	-9.93	181	192	Peak
7305.00	50.13	2.83	52.96	54.00	-1.04	146	160	Average
7305.00	63.67	2.83	66.50	74.00	-7.50	146	160	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
2000.00	45.40	3.35	48.75	74.00	-25.25	196	100	Peak
2390.00	48.45	4.11	52.56	54.00	-1.44	286	100	Average
2390.00	67.83	4.11	71.94	74.00	-2.06	286	100	Peak
2484.00	46.19	4.29	50.48	54.00	-3.52	269	100	Average
2484.00	66.63	4.29	70.92	74.00	-3.08	269	100	Peak
4875.00	51.43	-0.41	51.02	54.00	-2.98	89	100	Average
4875.00	65.76	-0.41	65.35	74.00	-8.65	89	100	Peak
7320.00	51.79	2.84	54.63	54.00	0.63	68	139	Average
7320.00	66.51	2.84	69.35	74.00	-4.65	68	139	Peak
9750.00	46.41	4.59	51.00	74.00	-23.00	208	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)

Product Name	Display Unit	Test By	Waternil Guan
Test Model	EEMS330	Test Date	2015/05/12
Test Mode	IEEE 802.11gn HT20 MCS0 Mode / TX / CH High	Temp. & Humidity	25°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
2000.00	44.47	3.35	47.82	74.00	-26.18	1	100	Peak
2334.00	41.37	4.00	45.37	74.00	-28.63	92	100	Peak
2564.00	42.16	4.48	46.64	74.00	-27.36	160	200	Peak
3750.00	47.03	-2.84	44.19	74.00	-29.81	360	200	Peak
4935.00	48.27	-0.27	48.00	74.00	-26.00	70	200	Peak
10155.00	45.09	5.26	50.35	74.00	-23.65	194	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
2000.00	46.08	3.35	49.43	74.00	-24.57	199	100	Peak
2282.00	44.46	3.90	48.36	74.00	-25.64	171	100	Peak
2788.00	42.67	5.05	47.72	74.00	-26.28	208	100	Peak
3810.00	49.50	-2.75	46.75	74.00	-27.25	115	100	Peak
4260.00	47.43	-1.86	45.57	74.00	-28.43	360	100	Peak
4920.00	46.65	-0.31	46.34	74.00	-27.66	89	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)

Product Name	Display Unit	Test By	Waternil Guan
Test Model	EEMS330	Test Date	2015/05/12
Test Mode	IEEE 802.11gn HT40 MCS0 Mode / TX / CH Low	Temp. & Humidity	25°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
1200.00	40.30	-0.94	39.36	74.00	-34.64	172	100	Peak
1400.00	43.58	-0.97	42.61	74.00	-31.39	125	100	Peak
2000.00	45.72	3.35	49.07	74.00	-24.93	359	100	Peak
4170.00	45.73	-2.07	43.66	74.00	-30.34	354	100	Peak
4845.00	46.07	-0.48	45.59	74.00	-28.41	239	200	Peak
9255.00	45.07	4.08	49.15	74.00	-24.85	43	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
2000.00	44.95	3.35	48.30	74.00	-25.70	191	100	Peak
2500.00	46.86	4.32	51.18	74.00	-22.82	272	100	Peak
2786.00	43.47	5.05	48.52	74.00	-25.48	197	100	Peak
3330.00	47.72	-3.26	44.46	74.00	-29.54	360	100	Peak
3795.00	48.59	-2.77	45.82	74.00	-28.18	0	100	Peak
4845.00	44.40	-0.48	43.92	74.00	-30.08	87	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)

Product Name	Display Unit	Test By	Waternil Guan
Test Model	EEMS330	Test Date	2015/05/12
Test Mode	IEEE 802.11gn HT40 MCS0 Mode / TX / CH Middle	Temp. & Humidity	25°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
2000.00	45.28	3.35	48.63	74.00	-25.37	360	100	Peak
2390.00	48.61	4.11	52.72	54.00	-1.28	265	100	Average
2390.00	66.45	4.11	70.56	74.00	-3.44	265	100	Peak
2484.00	48.95	4.29	53.24	54.00	-0.76	122	107	Average
2484.00	66.84	4.29	71.13	74.00	-2.87	122	107	Peak
3255.00	49.88	-3.29	46.59	74.00	-27.41	149	200	Peak
4890.00	48.04	-0.38	47.66	54.00	-6.34	182	192	Average
4890.00	60.45	-0.38	60.07	74.00	-13.93	182	192	Peak
7320.00	48.59	2.84	51.43	54.00	-2.57	146	160	Average
7320.00	59.44	2.84	62.28	74.00	-11.72	146	160	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
2000.00	46.01	3.35	49.36	74.00	-24.64	191	100	Peak
2390.00	49.00	4.11	53.11	54.00	-0.89	359	100	Average
2390.00	68.66	4.11	72.77	74.00	-1.23	359	100	Peak
2484.00	48.28	4.29	52.57	54.00	-1.43	293	100	Average
2484.00	65.89	4.29	70.18	74.00	-3.82	293	100	Peak
3795.00	50.46	-2.77	47.69	74.00	-26.31	186	100	Peak
4875.00	47.13	-0.41	46.72	54.00	-7.28	91	100	Average
4875.00	58.72	-0.41	58.31	74.00	-15.69	91	100	Peak
7320.00	49.62	2.84	52.46	54.00	-1.54	166	100	Average
7320.00	62.61	2.84	65.45	74.00	-8.55	166	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)

Product Name	Display Unit	Test By	Waternil Guan
Test Model	EEMS330	Test Date	2015/05/12
Test Mode	IEEE 802.11gn HT40 MCS0 Mode / TX / CH High	Temp. & Humidity	25°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
1334.00	44.76	-0.96	43.80	74.00	-30.20	105	100	Peak
1608.00	43.33	-0.05	43.28	74.00	-30.72	109	100	Peak
2000.00	44.02	3.35	47.37	74.00	-26.63	7	100	Peak
4290.00	45.98	-1.79	44.19	74.00	-29.81	238	200	Peak
5010.00	46.03	-0.10	45.93	74.00	-28.07	351	200	Peak
6060.00	45.21	2.10	47.31	74.00	-26.69	37	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
1892.00	43.97	2.41	46.38	74.00	-27.62	255	100	Peak
2000.00	45.51	3.35	48.86	74.00	-25.14	196	100	Peak
2788.00	44.20	5.05	49.25	74.00	-24.75	216	200	Peak
3795.00	53.23	-2.77	50.46	74.00	-23.54	74	100	Peak
4965.00	45.77	-0.20	45.57	74.00	-28.43	227	100	Peak
5400.00	46.77	0.59	47.36	74.00	-26.64	0	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)

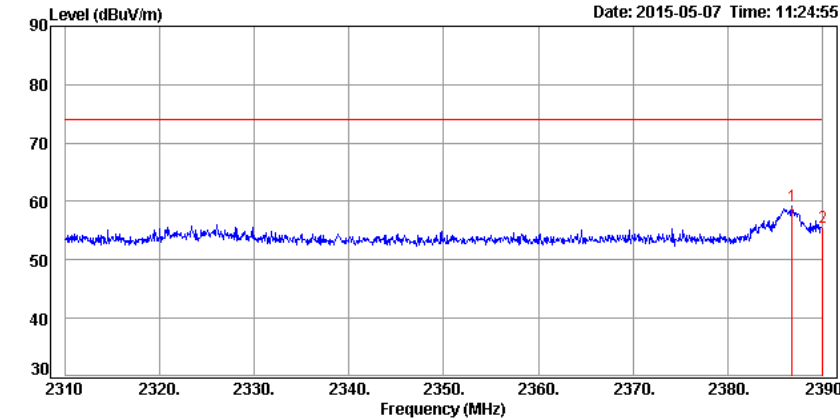
Restricted Band Edges

Detector Mode: Peak

Polarity: Horizontal

CH Low (IEEE 802.11b Mode)

Data: 1



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2386.80	55.08	4.10	59.18	74.00	-14.82			Peak
2390.00	51.42	4.11	55.53	74.00	-18.47			Peak

Remark: Result = Reading + Correction Factor

Margin = Result – Limit

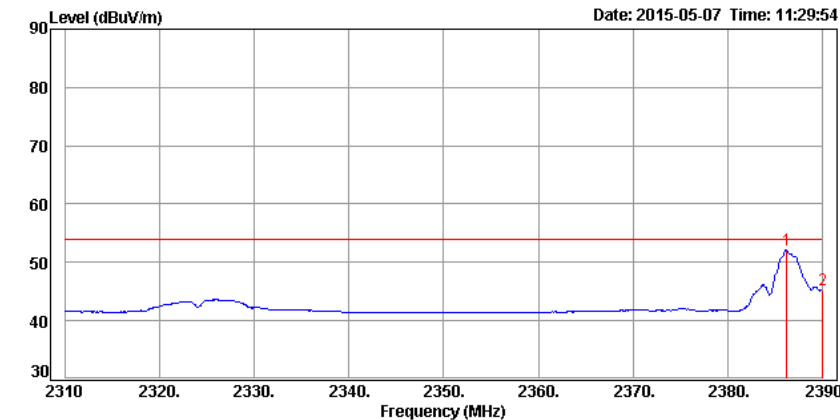
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average

Polarity: Horizontal

CH Low (IEEE 802.11b Mode)

Data: 2



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2386.24	48.11	4.10	52.21	54.00	-1.79			Average
2390.00	41.13	4.11	45.24	54.00	-8.76			Average

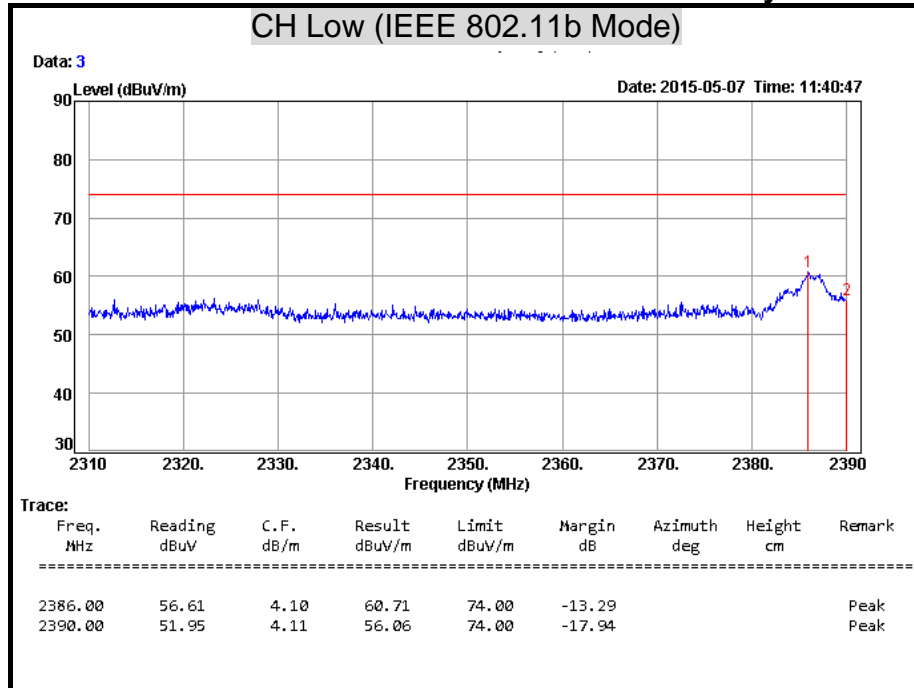
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak

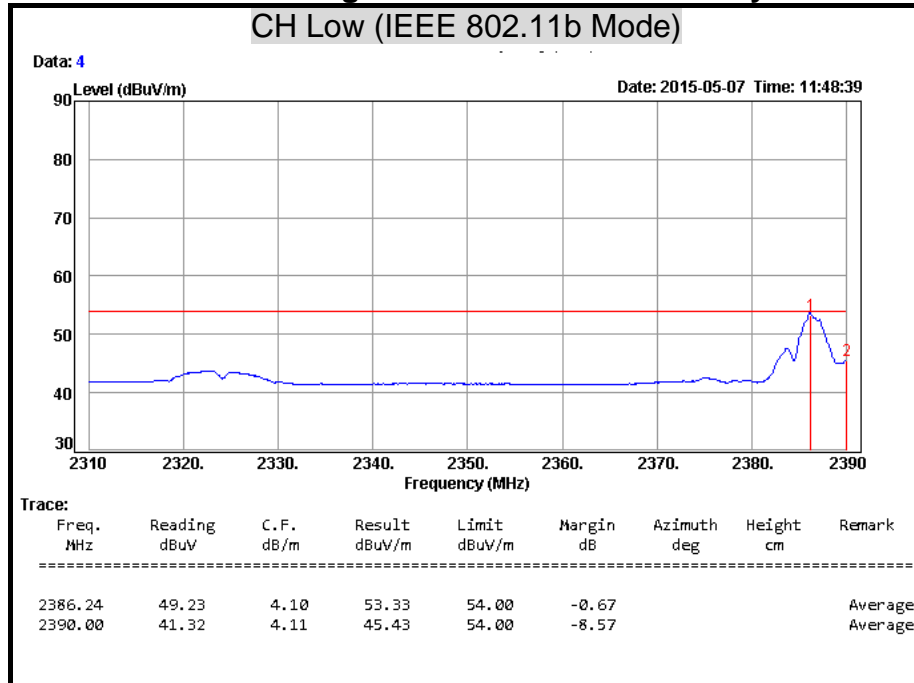
Polarity: Vertical



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)

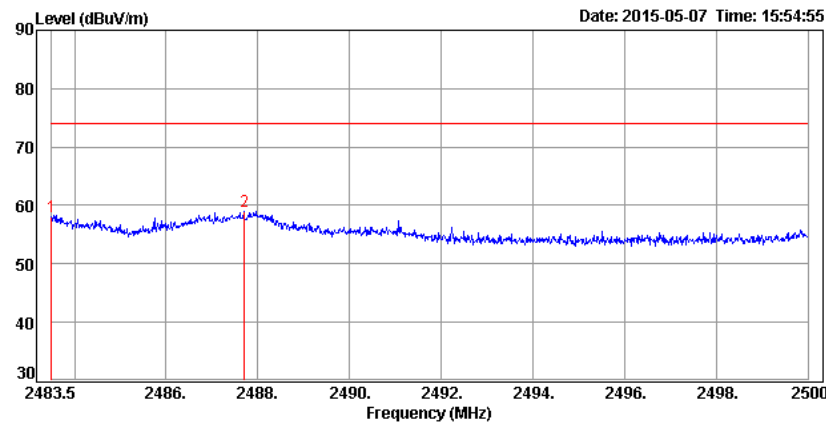
Detector Mode: Peak

Polarity: Horizontal

CH High (IEEE 802.11b Mode)

Data: 23

Date: 2015-05-07 Time: 15:54:55



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	53.75	4.29	58.04	74.00	-15.96			Peak
2487.69	54.77	4.30	59.07	74.00	-14.93			Peak

Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark Peak = Result(PK) – Limit(PK)

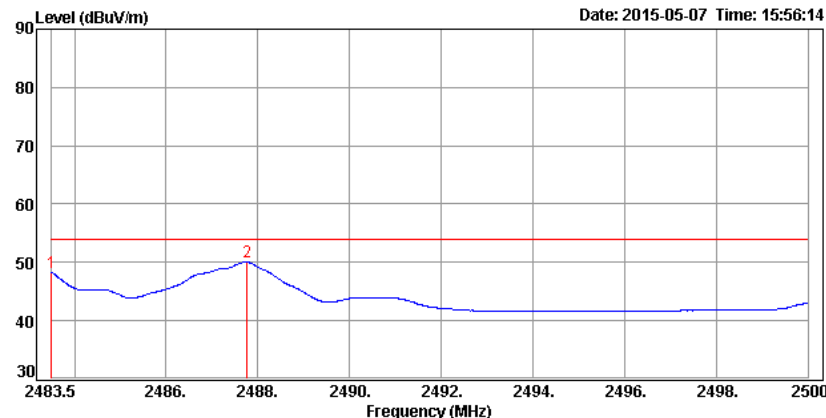
Detector Mode: Average

Polarity: Horizontal

CH High (IEEE 802.11b Mode)

Data: 24

Date: 2015-05-07 Time: 15:56:14



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2483.50	44.02	4.29	48.31	54.00	-5.69			Average
2487.76	45.77	4.30	50.07	54.00	-3.93			Average

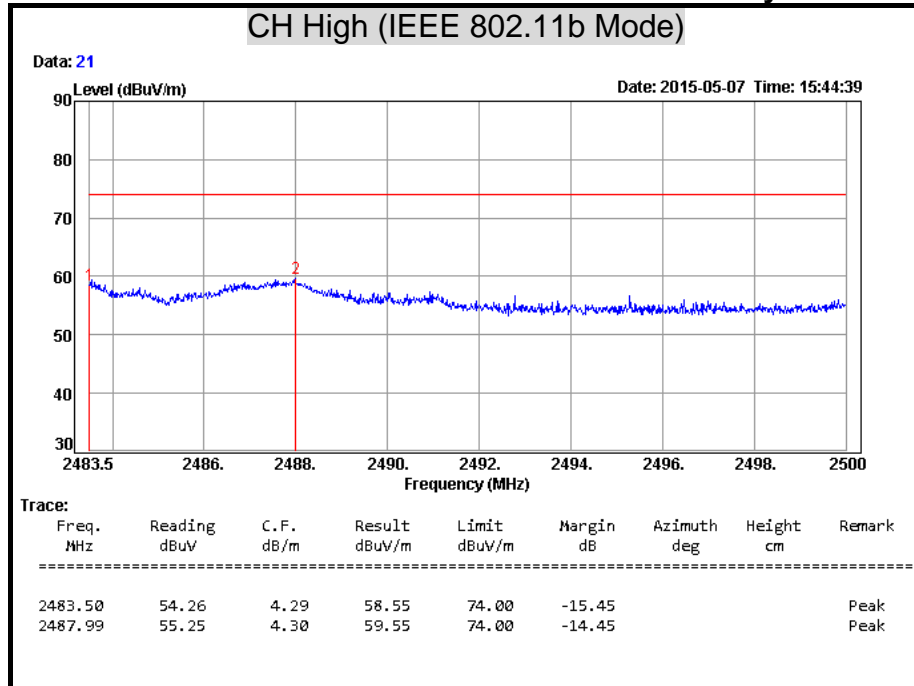
Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak

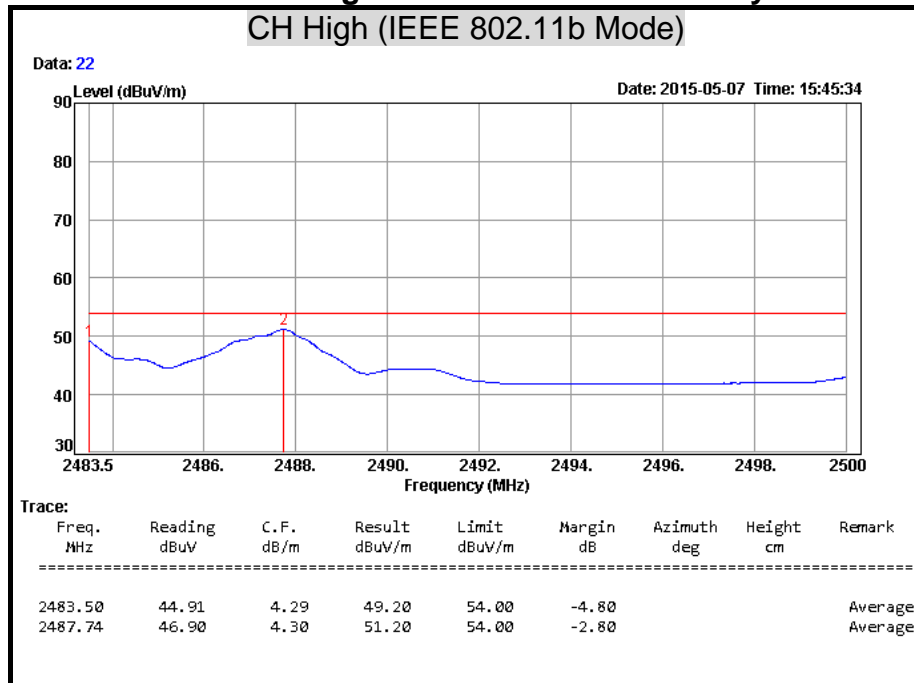
Polarity: Vertical



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

Detector Mode: Average

Polarity: Vertical



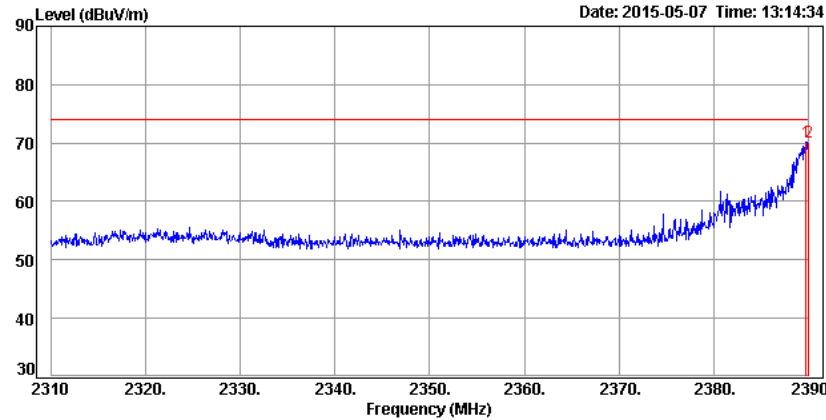
Remark: Result = Reading + Correction Factor
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak

Polarity: Horizontal

CH Low (IEEE 802.11g Mode)

Data: 7



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2389.76	66.07	4.11	70.18	74.00	-3.82			Peak
2390.00	65.96	4.11	70.07	74.00	-3.93			Peak

Remark: Result = Reading + Correction Factor

Margin = Result – Limit

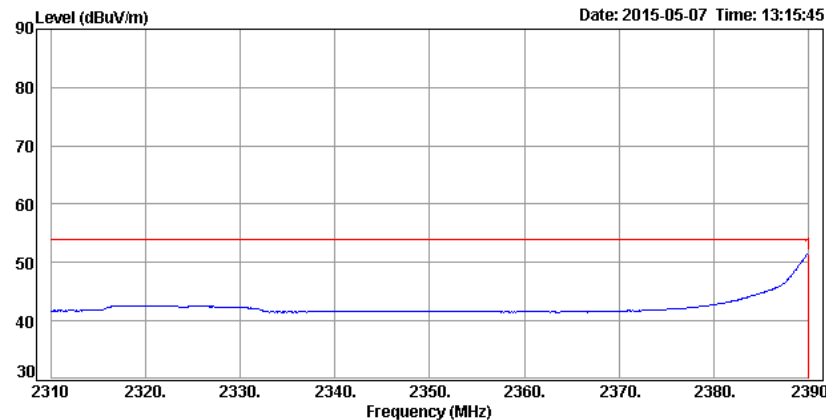
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average

Polarity: Horizontal

CH Low (IEEE 802.11g Mode)

Data: 8



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2390.00	47.25	4.11	51.36	54.00	-2.64			Average

Remark: Result = Reading + Correction Factor

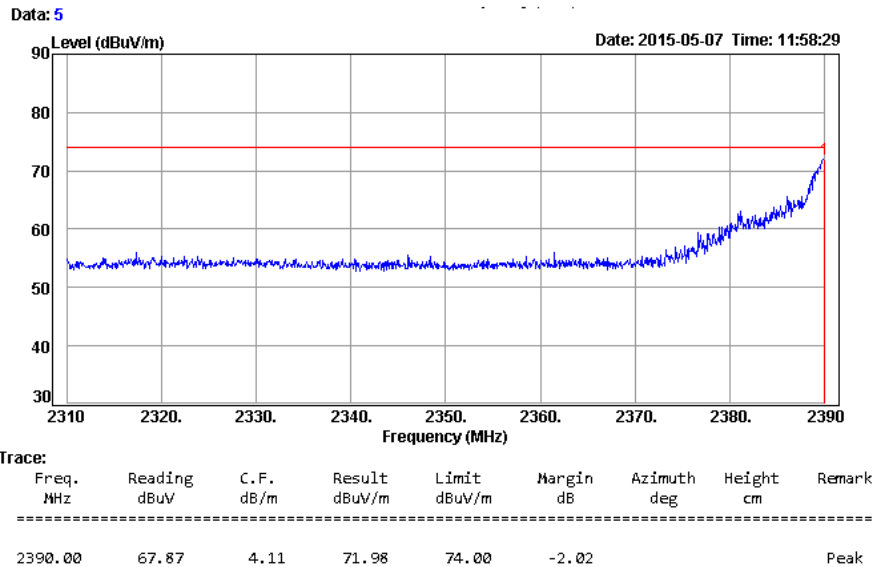
Margin = Result – Limit

Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak

Polarity: Vertical

CH Low (IEEE 802.11g Mode)

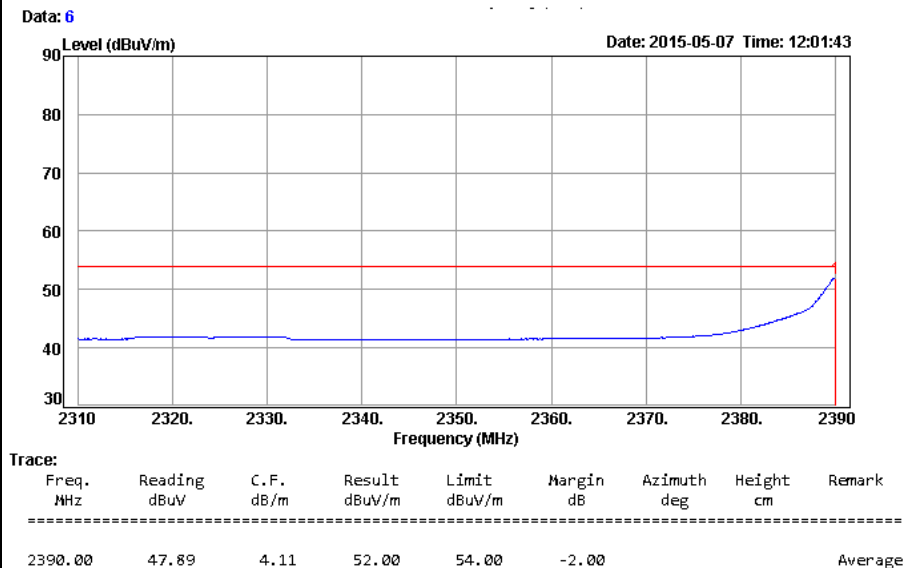


Remark: Result = Reading + Correction Factor
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average

Polarity: Vertical

CH Low (IEEE 802.11g Mode)



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

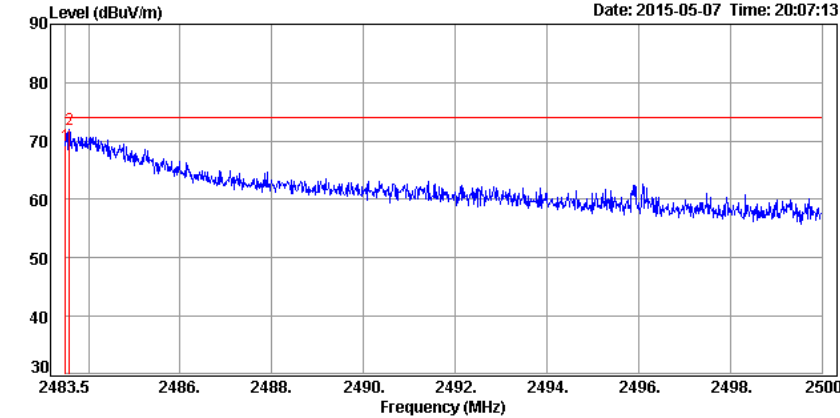
Detector Mode: Peak

Polarity: Horizontal

CH High (IEEE 802.11g Mode)

Data: 25

Date: 2015-05-07 Time: 20:07:13



Trace:									
Freq.	Reading	C.F.	Result	Limit	Margin	Azimuth	Height	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	deg	cm		
2483.50	64.84	4.29	69.13	74.00	-4.87			Peak	
2483.58	67.67	4.29	71.96	74.00	-2.04			Peak	

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

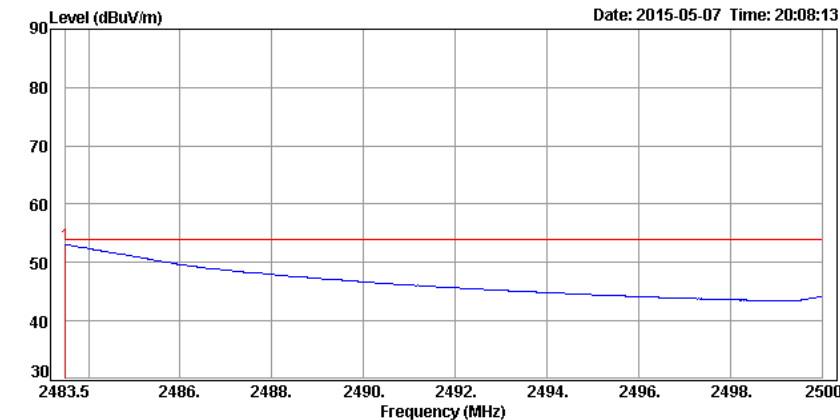
Detector Mode: Average

Polarity: Horizontal

CH High (IEEE 802.11g Mode)

Data: 26

Date: 2015-05-07 Time: 20:08:13

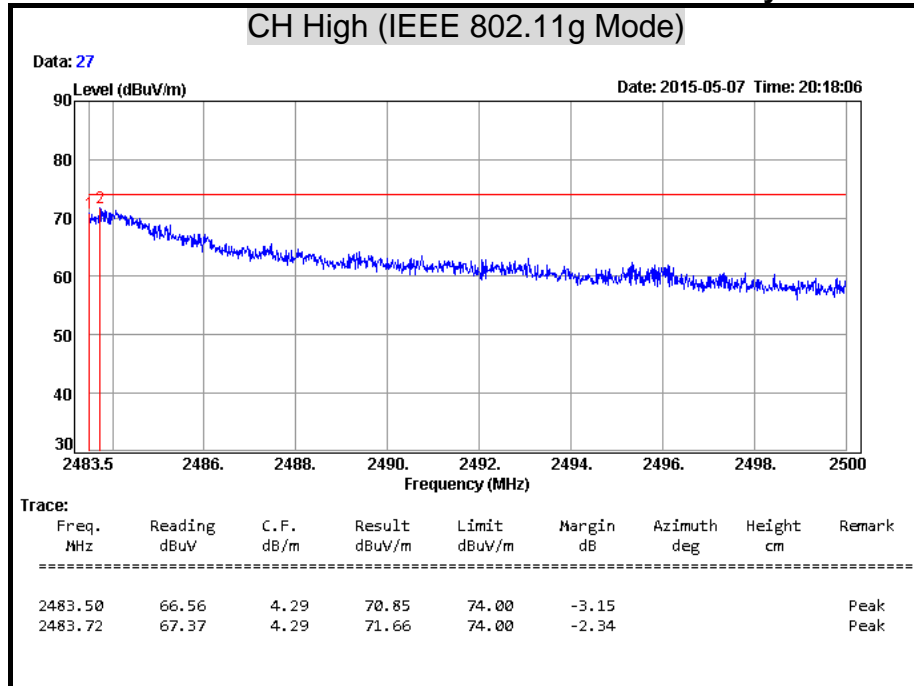


Trace:									
Freq.	Reading	C.F.	Result	Limit	Margin	Azimuth	Height	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	deg	cm		
2483.50	48.72	4.29	53.01	54.00	-0.99			Average	

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

Detector Mode: Peak

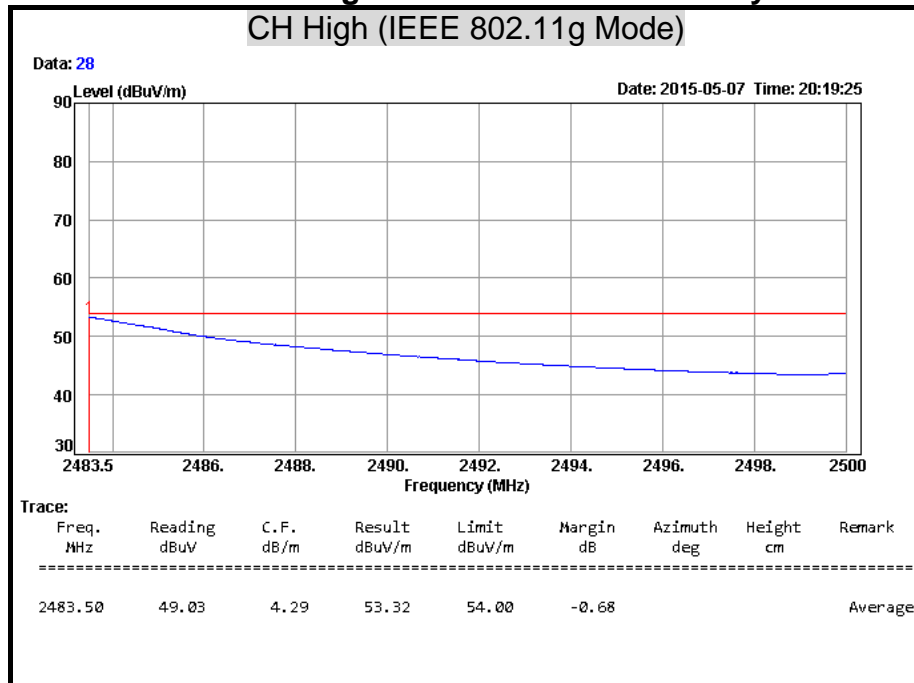
Polarity: Vertical



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

Detector Mode: Average

Polarity: Vertical



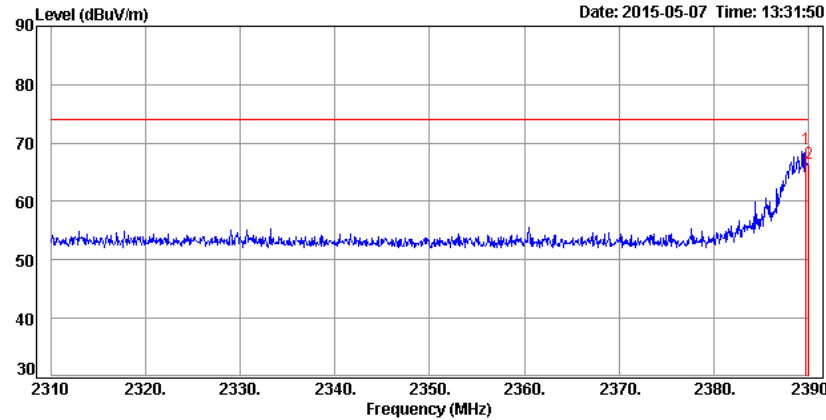
Remark: Result = Reading + Correction Factor
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak

Polarity: Horizontal

CH Low (IEEE 802.11gn HT20 MCS0 Mode)

Data: 9



Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2389.76	64.93	4.11	69.04	74.00	-4.96			Peak
2390.00	62.31	4.11	66.42	74.00	-7.58			Peak

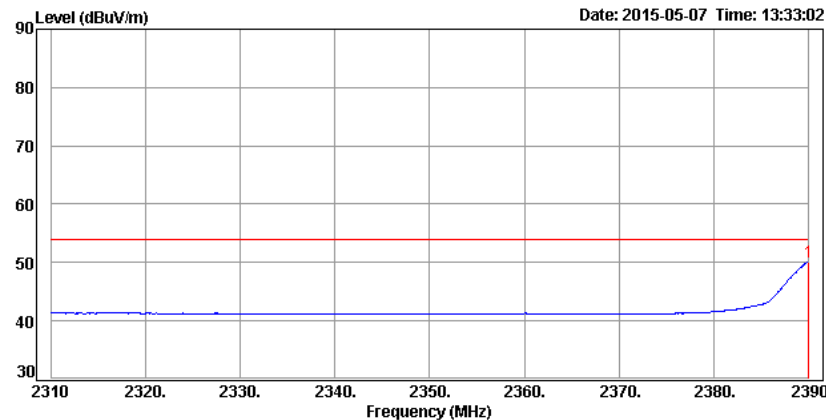
Remark: Result = Reading + Correction Factor
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average

Polarity: Horizontal

CH Low (IEEE 802.11gn HT20 MCS0 Mode)

Data: 10



Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2390.00	45.92	4.11	50.03	54.00	-3.97			Average

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

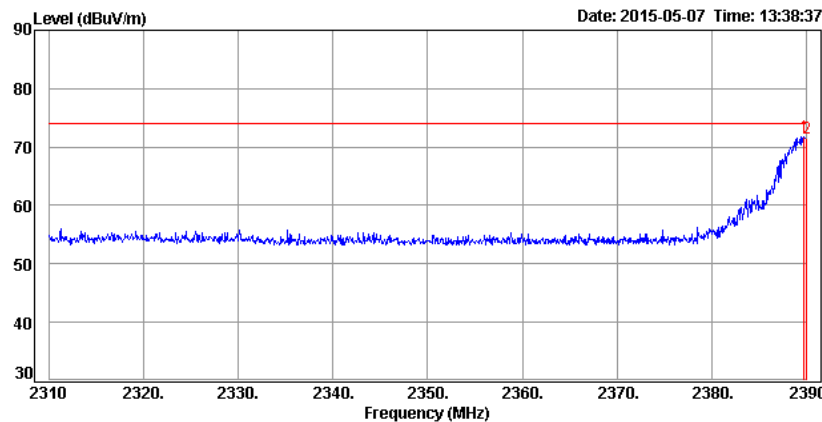
Detector Mode: Peak

Polarity: Vertical

CH Low (IEEE 802.11gn HT20 MCS0 Mode)

Data: 11

Date: 2015-05-07 Time: 13:38:37



Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2389.84	67.73	4.11	71.84	74.00	-2.16			Peak
2390.00	67.36	4.11	71.47	74.00	-2.53			Peak

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

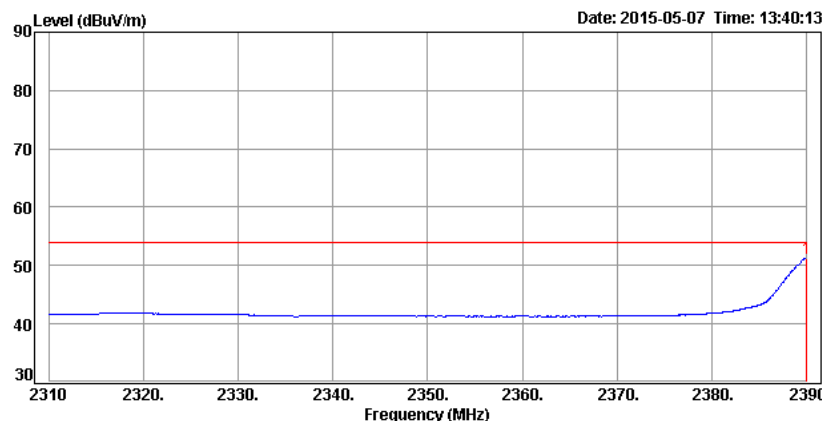
Detector Mode: Average

Polarity: Vertical

CH Low (IEEE 802.11gn HT20 MCS0 Mode)

Data: 12

Date: 2015-05-07 Time: 13:40:13



Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2390.00	47.18	4.11	51.29	54.00	-2.71			Average

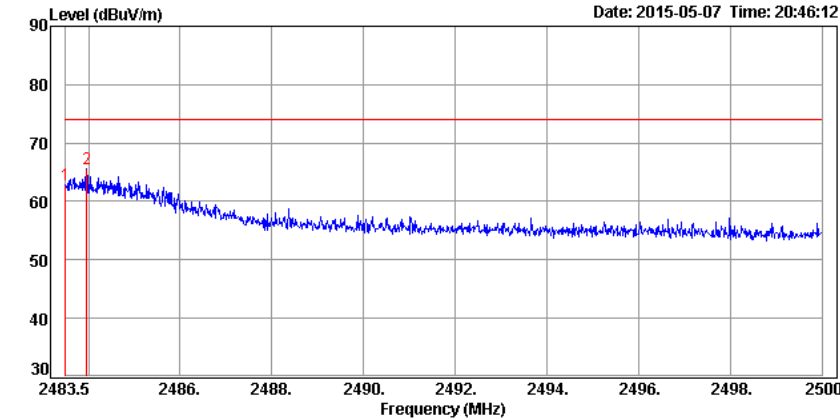
Remark: Result = Reading + Correction Factor
Margin = Result – Limit
Remark AVG = Result(AV) – Limit(AV)

Detector Mode: Peak

Polarity: Horizontal

CH High (IEEE 802.11gn HT20 MCS0 Mode)

Data: 31



Trace:									
Freq.	Reading	C.F.	Result	Limit	Margin	Azimuth	Height	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	deg	cm		
2483.50	58.66	4.29	62.95	74.00	-11.05			Peak	
2483.96	61.22	4.29	65.51	74.00	-8.49			Peak	

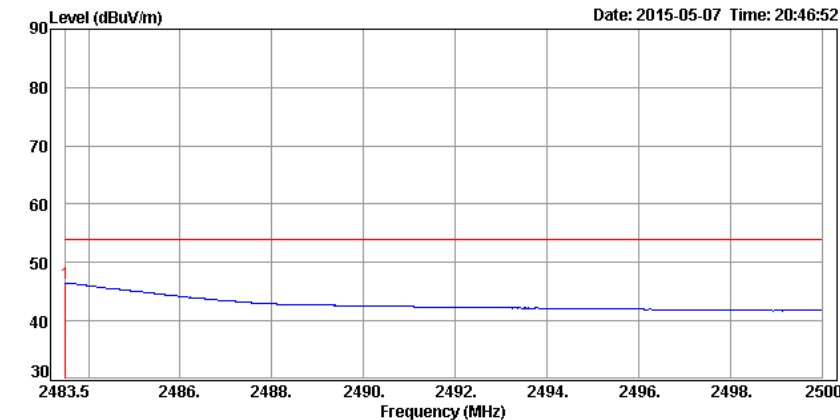
Remark: Result = Reading + Correction Factor
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)

Detector Mode: Average

Polarity: Horizontal

CH High (IEEE 802.11gn HT20 MCS0 Mode)

Data: 32



Trace:									
Freq.	Reading	C.F.	Result	Limit	Margin	Azimuth	Height	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	deg	cm		
2483.50	42.22	4.29	46.51	54.00	-7.49			Average	

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

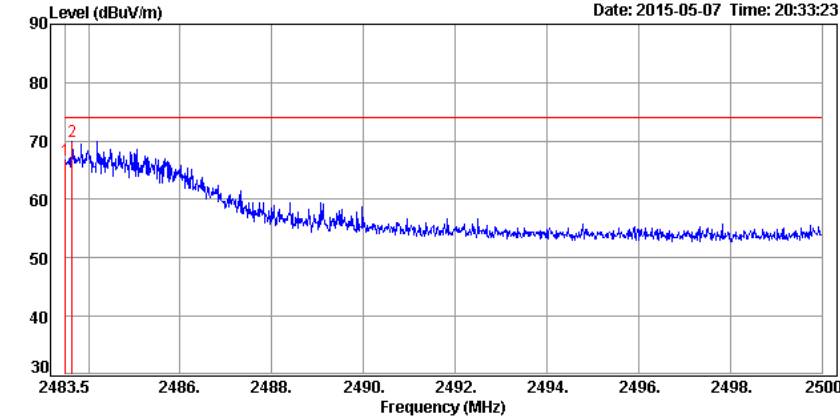
Detector Mode: Peak

Polarity: Vertical

CH High (IEEE 802.11gn HT20 MCS0 Mode)

Data: 29

Date: 2015-05-07 Time: 20:33:23



Trace:									
Freq.	Reading	C.F.	Result	Limit	Margin	Azimuth	Height	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	deg	cm		
2483.50	62.34	4.29	66.63	74.00	-7.37			Peak	
2483.65	65.61	4.29	69.90	74.00	-4.10			Peak	

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

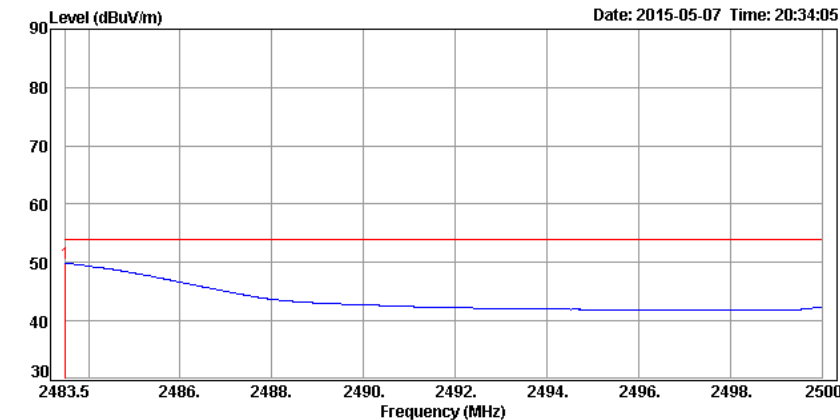
Detector Mode: Average

Polarity: Vertical

CH High (IEEE 802.11gn HT20 MCS0 Mode)

Data: 30

Date: 2015-05-07 Time: 20:34:05



Trace:									
Freq.	Reading	C.F.	Result	Limit	Margin	Azimuth	Height	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	deg	cm		
2483.50	45.56	4.29	49.85	54.00	-4.15			Average	

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

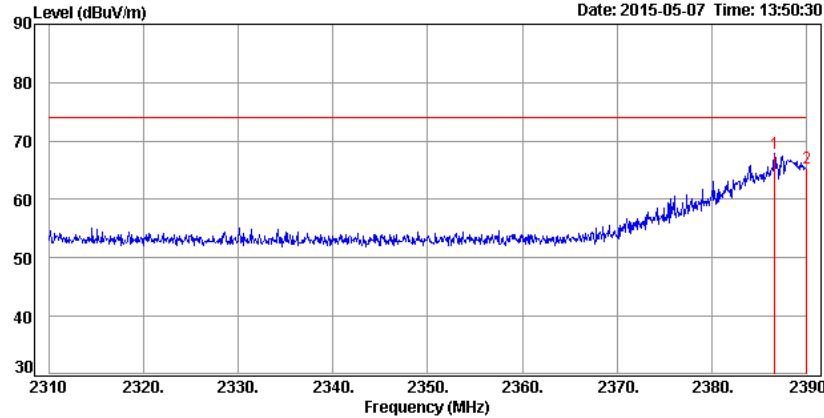
Detector Mode: Peak

Polarity: Horizontal

CH Low (IEEE 802.11gn HT40 MCS0 Mode)

Data: 15

Date: 2015-05-07 Time: 13:50:30



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2386.64	63.82	4.10	67.92	74.00	-6.08			Peak
2390.00	61.19	4.11	65.30	74.00	-8.70			Peak

Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark Peak = Result(PK) – Limit(PK)

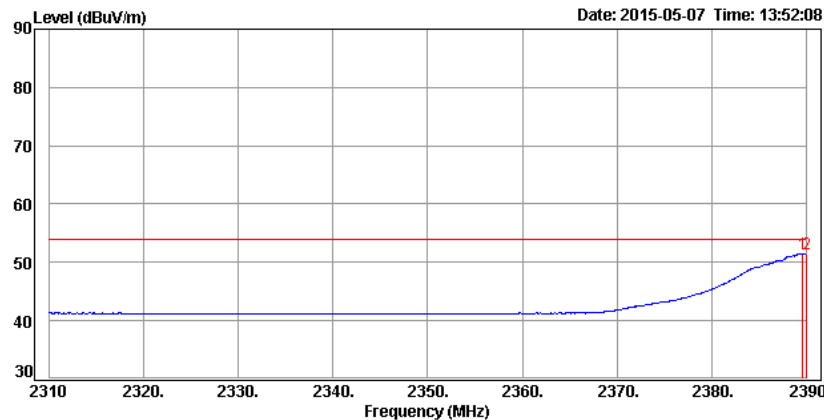
Detector Mode: Average

Polarity: Horizontal

CH Low (IEEE 802.11gn HT40 MCS0 Mode)

Data: 16

Date: 2015-05-07 Time: 13:52:08



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2389.60	47.32	4.11	51.43	54.00	-2.57			Average
2390.00	47.27	4.11	51.38	54.00	-2.62			Average

Remark: Result = Reading + Correction Factor

Margin = Result – Limit

Remark AVG = Result(AV) – Limit(AV)

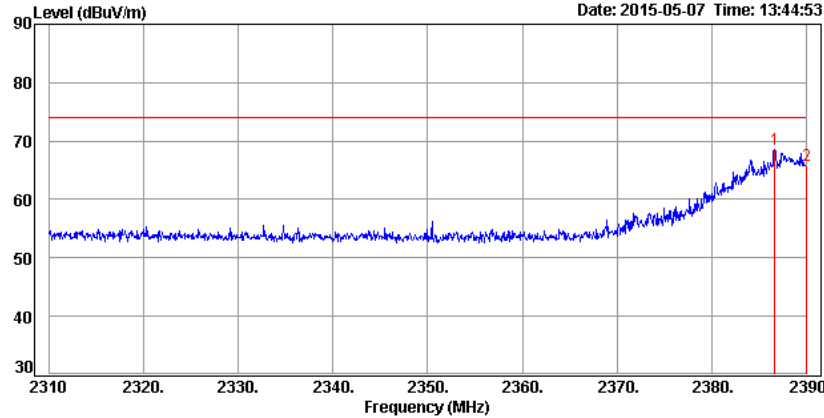
Detector Mode: Peak

Polarity: Vertical

CH Low (IEEE 802.11gn HT40 MCS0 Mode)

Data: 13

Date: 2015-05-07 Time: 13:44:53



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2386.64	64.46	4.10	68.56	74.00	-5.44			Peak
2390.00	61.73	4.11	65.84	74.00	-8.16			Peak

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

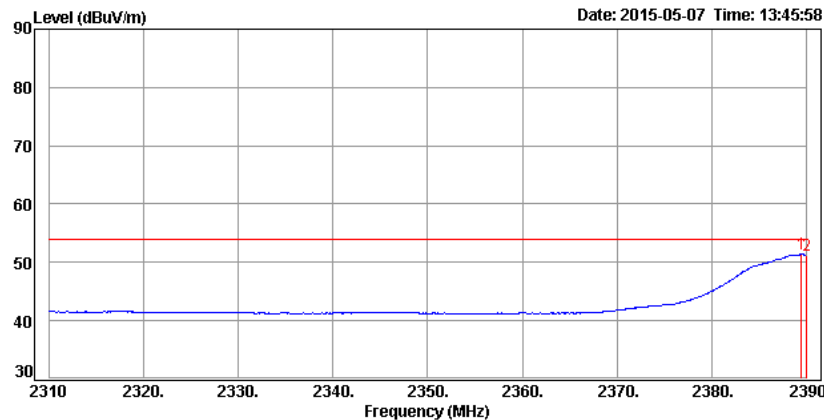
Detector Mode: Average

Polarity: Vertical

CH Low (IEEE 802.11gn HT40 MCS0 Mode)

Data: 14

Date: 2015-05-07 Time: 13:45:58



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
2389.52	47.27	4.11	51.38	54.00	-2.62			Average
2390.00	47.20	4.11	51.31	54.00	-2.69			Average

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

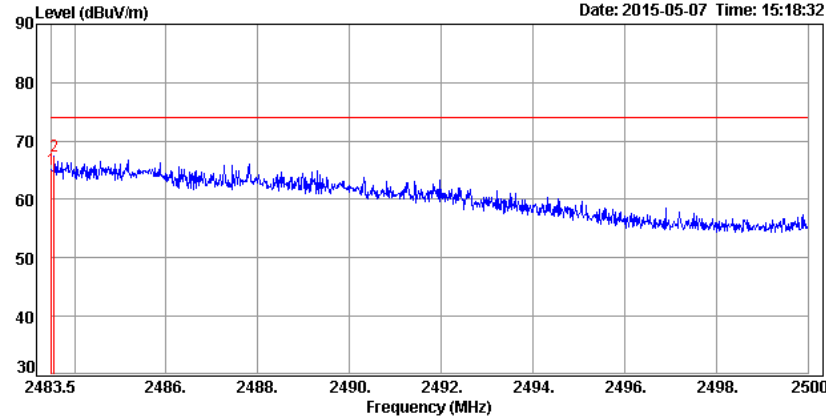
Detector Mode: Peak

Polarity: Horizontal

CH High (IEEE 802.11gn HT40 MCS0 Mode)

Data: 22

Date: 2015-05-07 Time: 15:18:32



Trace:									
Freq.	Reading	C.F.	Result	Limit	Margin	Azimuth	Height	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	deg	cm		
2483.50	60.87	4.29	65.16	74.00	-8.84			Peak	
2483.55	63.08	4.29	67.37	74.00	-6.63			Peak	

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

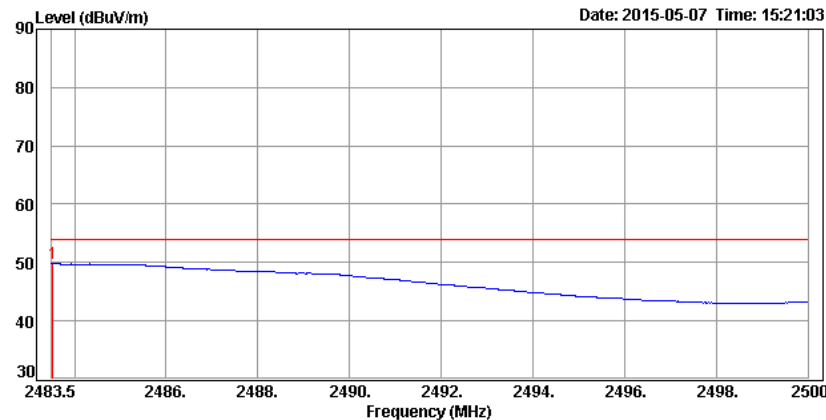
Detector Mode: Average

Polarity: Horizontal

CH High (IEEE 802.11gn HT40 MCS0 Mode)

Data: 23

Date: 2015-05-07 Time: 15:21:03

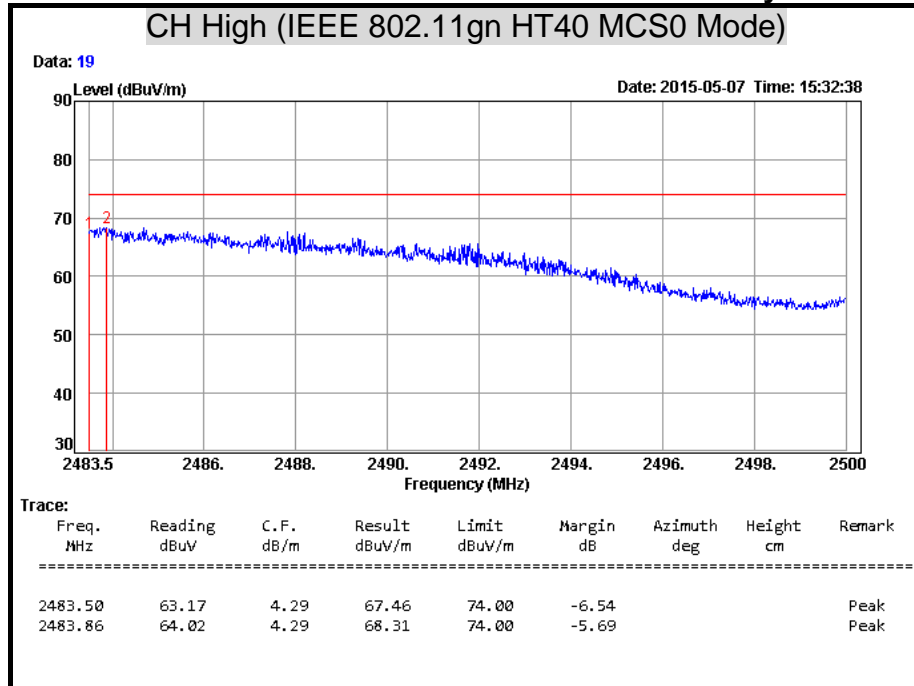


Trace:									
Freq.	Reading	C.F.	Result	Limit	Margin	Azimuth	Height	Remark	
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	deg	cm		
2483.52	45.54	4.29	49.83	54.00	-4.17			Average	

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

Detector Mode: Peak

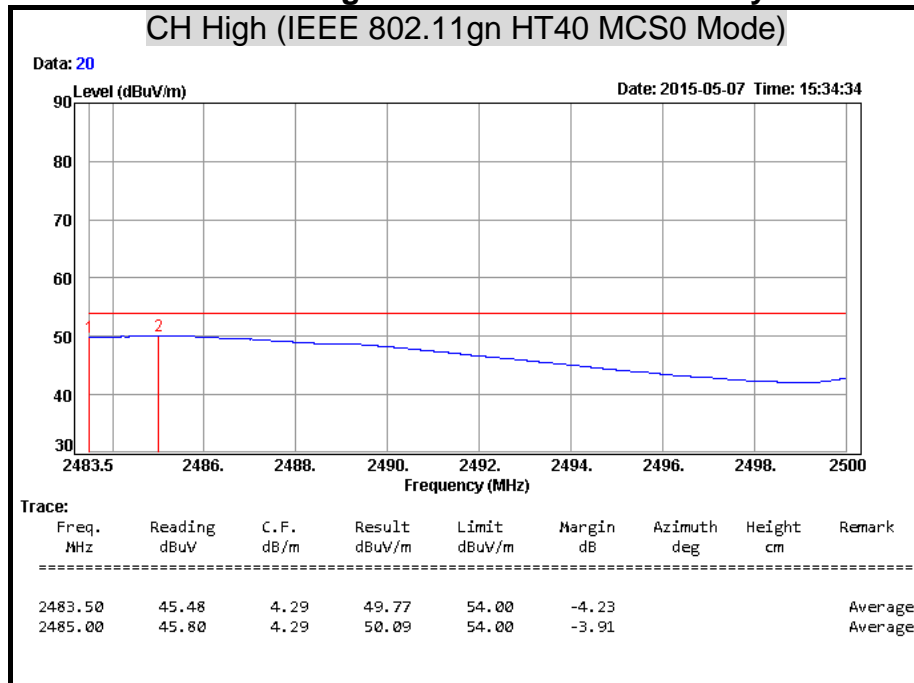
Polarity: Vertical



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)

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 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

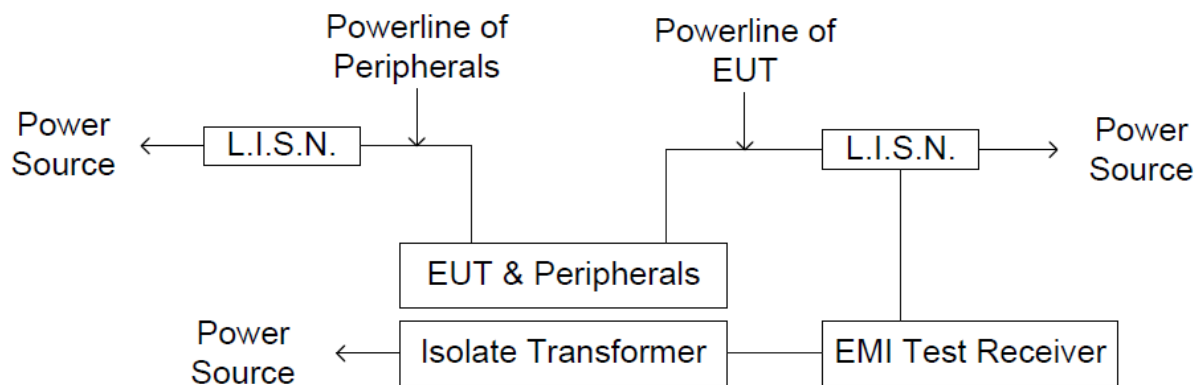
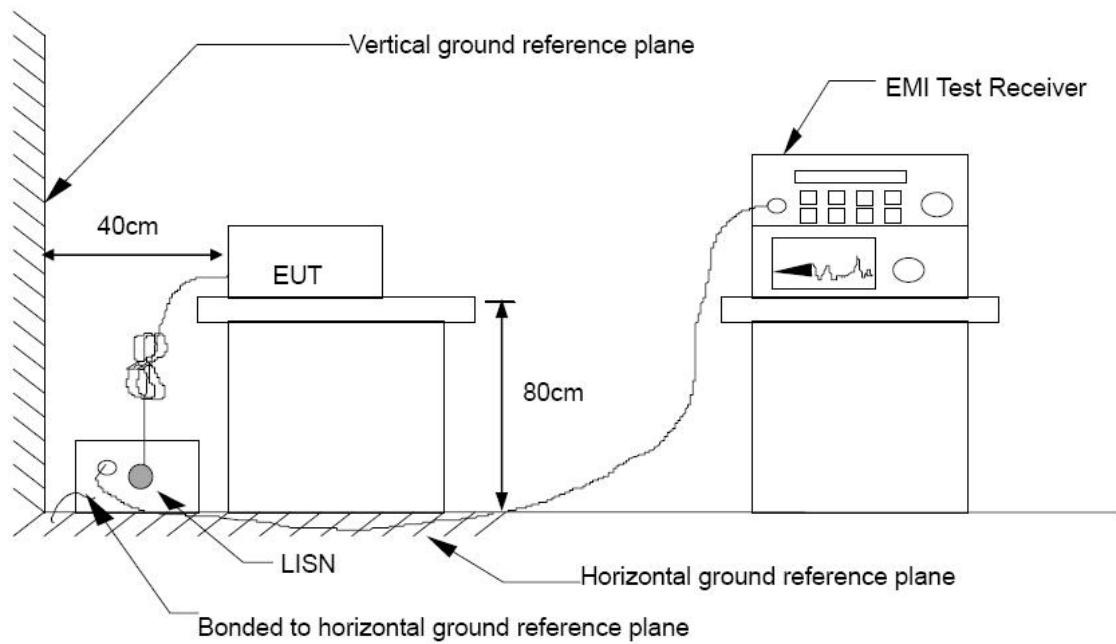
Frequency Range (MHz)	Conducted Limit (dB μ v)	
	Quasi-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5.00	56	46
5.00 - 30.0	60	50

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
L.I.S.N	SCHWARZBECK	NSLK 8127	8127465	08/06/2015
L.I.S.N	SCHWARZBECK	NSLK 8127	8127473	03/09/2016
EMI Test Receiver	ROHDE & SCHWARZ	ESHS 30	838550/003	11/02/2015
Pulse Limiter	ROHDE & SCHWARZ	ESH3-Z2	100111	06/30/2015
Test S/W	E3.815206a			

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

TEST SETUP



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.

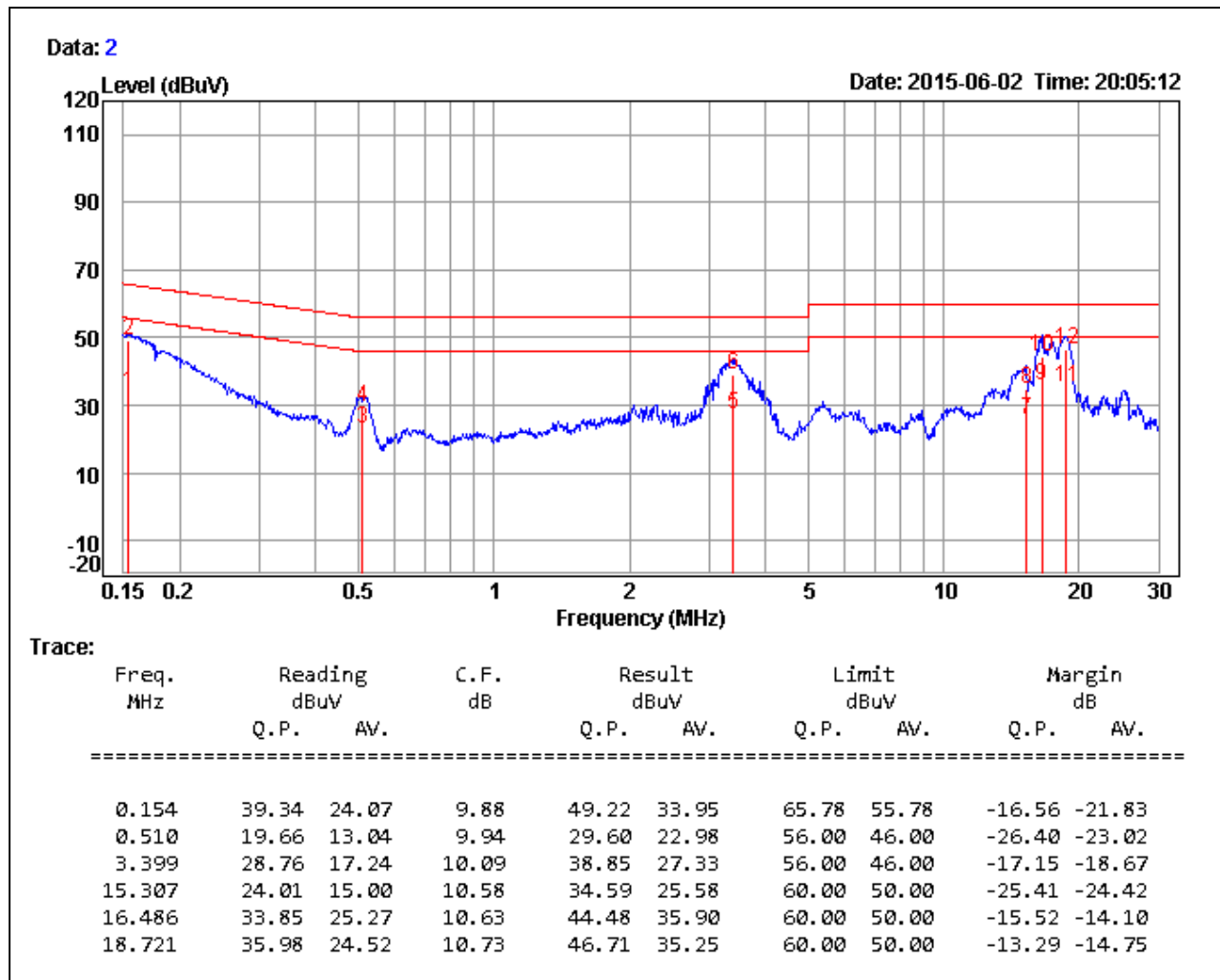
The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room. All peripherals were connected to the second LISN and the chassis 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.

TEST RESULTS

Product Name	Display Unit	Test By	Crystal Wu
Test Model	EEMS330	Test Date	2015/06/02
Test Mode	Mode 1	Temp. & Humidity	27.1°C, 54%

LINE

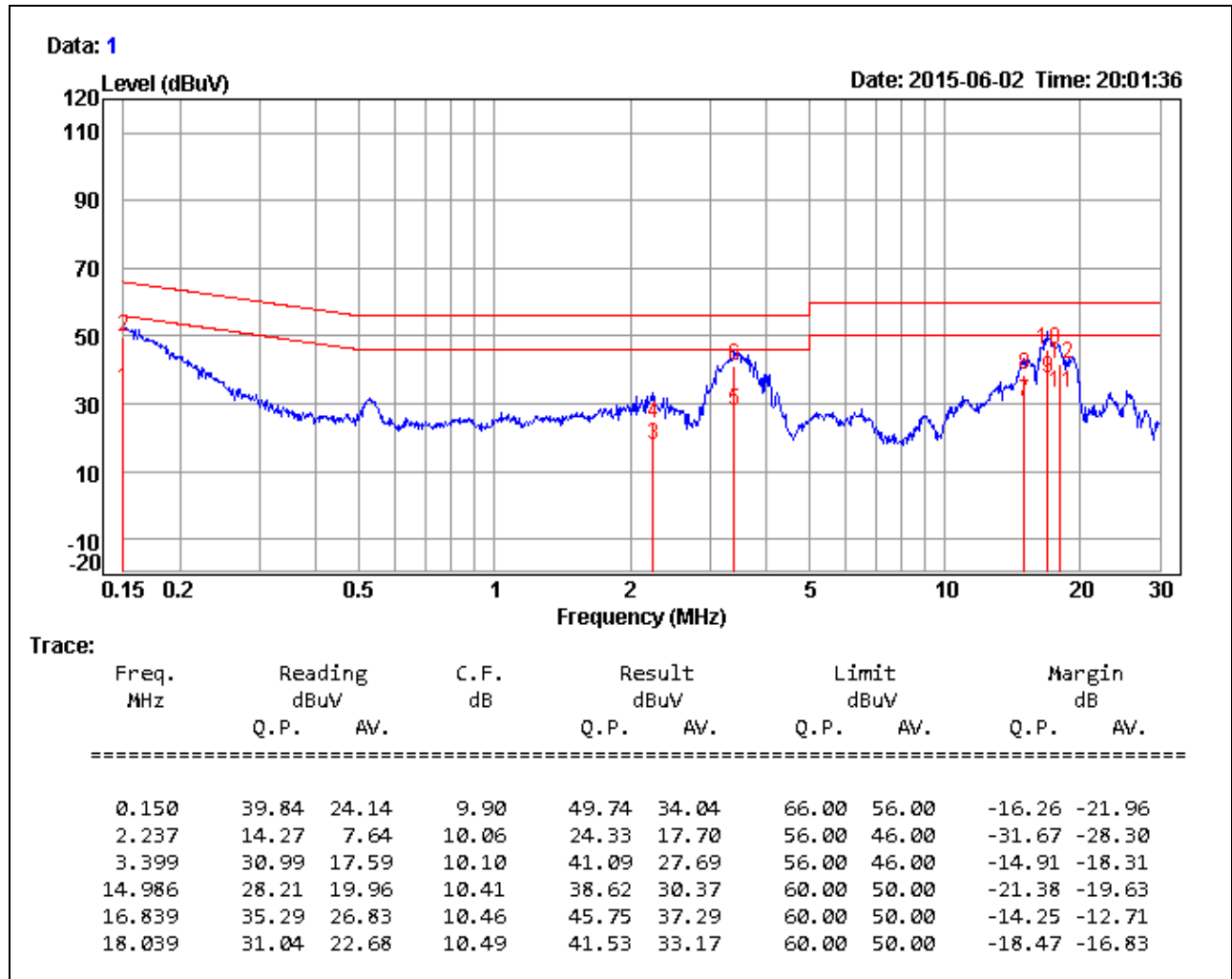


Remark:

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

Product Name	Display Unit	Test By	Crystal Wu
Test Model	EEMS330	Test Date	2015/06/02
Test Mode	Mode 1	Temp. & Humidity	27.1°C, 54%

NEUTRAL



Remark:

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