

FCC Test Report

Product Name	G.hn Powerline Wireless Extender
Model No	PWS-8121, PWS-8131
FCC ID	YG7-PWS812131

Applicant	Zinwell Corporation
Address	7F., No.512, Yuanshan Rd., Zhonghe Dist., New Taipei City 235, Taiwan (R.O.C.)

Date of Receipt	Jun. 21, 2017
Issued Date	Jul. 25, 2017
Report No.	1760527R-RFUSP63V00
Report Version	V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.

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Product Name	G.hn Powerline Wireless Extender
Applicant	Zinwell Corporation
Address	7F., No.512, Yuanshan Rd., Zhonghe Dist., New Taipei City 235, Taiwan (R.O.C.)
Manufacturer	Zinwell Corporation
Model No.	PWS-8121, PWS-8131
FCC ID.	YG7-PWS812131
EUT Rated Voltage	AC 100-240V, 50/60Hz
EUT Test Voltage	AC 120V/60Hz
Trade Name	ZINWELL
Applicable Standard	FCC CFR Title 47 Part 15 Subpart E: 2016 ANSI C63.4: 2014, ANSI C63.10: 2013 789033 D02 General UNII Test Procedures New Rules v01r04
Test Result	Complied

Documented By :



(Senior Adm. Specialist / Jinn Chen)

Tested By :



(Engineer / Nova Chu)

Approved By :



(Director / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	G.hn Powerline Wireless Extender
Trade Name	ZINWELL
FCC ID.	YG7-PWS812131
Model No.	PWS-8121, PWS-8131
Frequency Range	802.11a/n-20MHz: 5180-5240MHz, 5745-5825MHz 802.11n-40MHz: 5190-5230, 5755-5795MHz 802.11ac-80MHz: 5210MHz, 5775MHz
Number of Channels	802.11a/n-20MHz: 7; 802.11n-40MHz: 4; 802.11ac-80MHz: 2
Data Rate	802.11a: 6 - 54Mbps 802.11n: up to 300Mbps 802.11ac-80MHz: up to 866.7MHz
Channel Control	Auto
Type of Modulation	802.11a/n:OFDM, BPSK, QPSK, 16QAM, 64QAM, 256QAM
Antenna type	Printed on PCB Antenna
Antenna Gain	Refer to the table “Antenna List”

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	ZINWELL	PWS-8131	PCB Antenna	3.66dBi For 5GHz

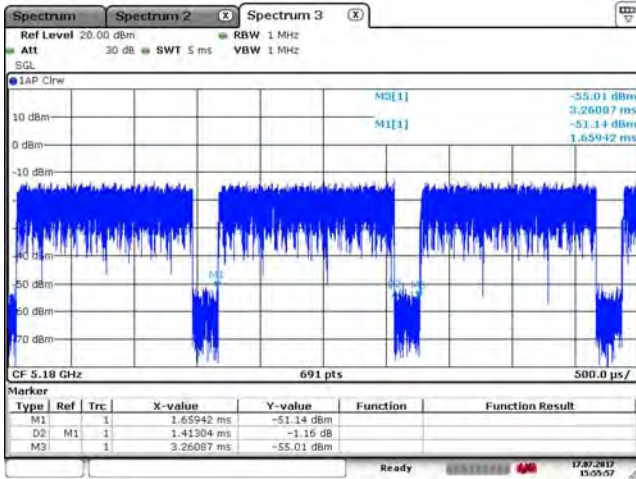
Note: The antenna of EUT is conform to FCC 15.203

Duty Cycle:

802.11a	0.882
802.11n-20	0.876
802.11n-40	0.780
802.11ac-80	0.644

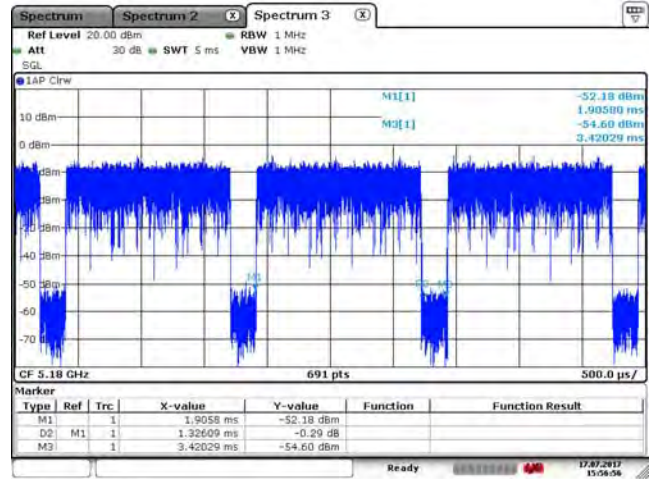
*Duty cycle = Ton / (Ton + Toff)

802.11a:



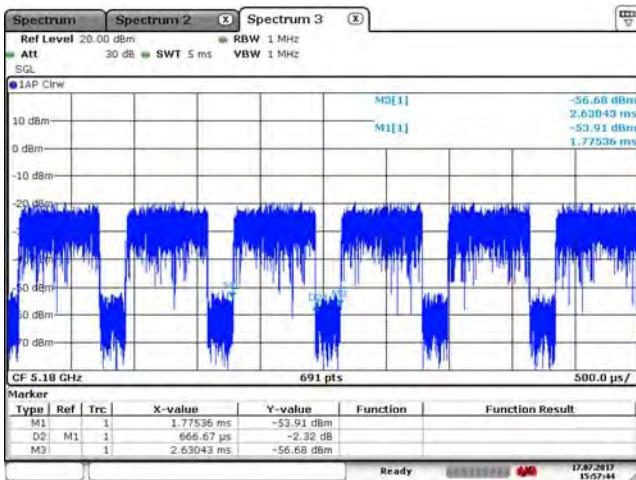
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802.11n-20:



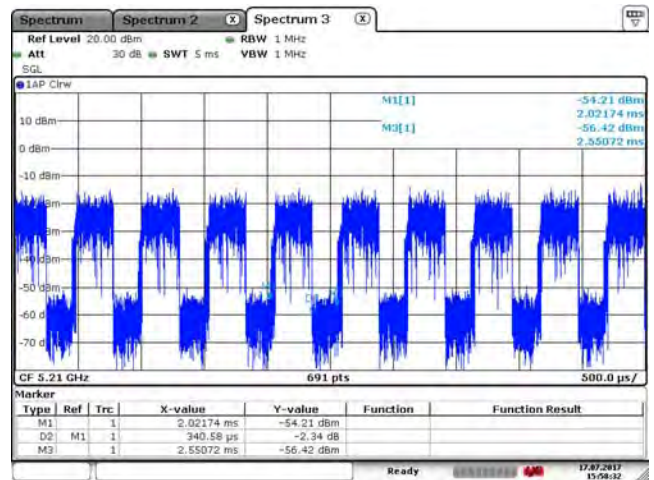
Date: 17.JUL 2017 15:56:57

802.11n-40:



Date: 17.JUL 2017 15:57:44

802.11ac-80:



Date: 17.JUL 2017 15:58:32

802.11a/n-20MHz Center Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 36:	5180 MHz	Channel 40:	5200 MHz	Channel 44:	5220 MHz	Channel 48:	5240 MHz
Channel 149:	5745 MHz	Channel 153:	5765 MHz	Channel 157:	5785 MHz	Channel 161:	5805 MHz
Channel 165:	5825 MHz						

802.11n-40MHz Center Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 38:	5190 MHz	Channel 46:	5230 MHz	Channel 151:	5755 MHz	Channel 159:	5795 MHz

802.11ac-80MHz Center Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 42:	5210 MHz	Channel 155:	5775 MHz				

Note:

1. This device is a G.hn Powerline Wireless Extender with a built-in 802.11a/b/g/n/ac WLAN transceiver.
2. The EUT is including two models, PWS-8131 with outlet, PWS-8121 without outlet, all models are the same electrical.
3. Each model through the pretest, only the worst case PWS-8131 is shown in the test report.
4. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
5. Lowest and highest data rates are tested in each mode. Only worst case is shown in the report. (802.11a is 6Mbps 、 802.11n-20BW is 14.4Mbps 、 802.11n-40BW is 30Mbps and 802.11ac(80M-BW) is 65 Mbps)
6. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart E for Unlicensed National Information Infrastructure devices.
7. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode	Mode 1: Transmit (802.11a-6Mbps) Mode 2: Transmit (802.11n-20BW 14.4Mbps) Mode 3: Transmit (802.11n-40BW 30Mbps) Mode 4 Transmit (802.11ac-80BW-65Mbps)
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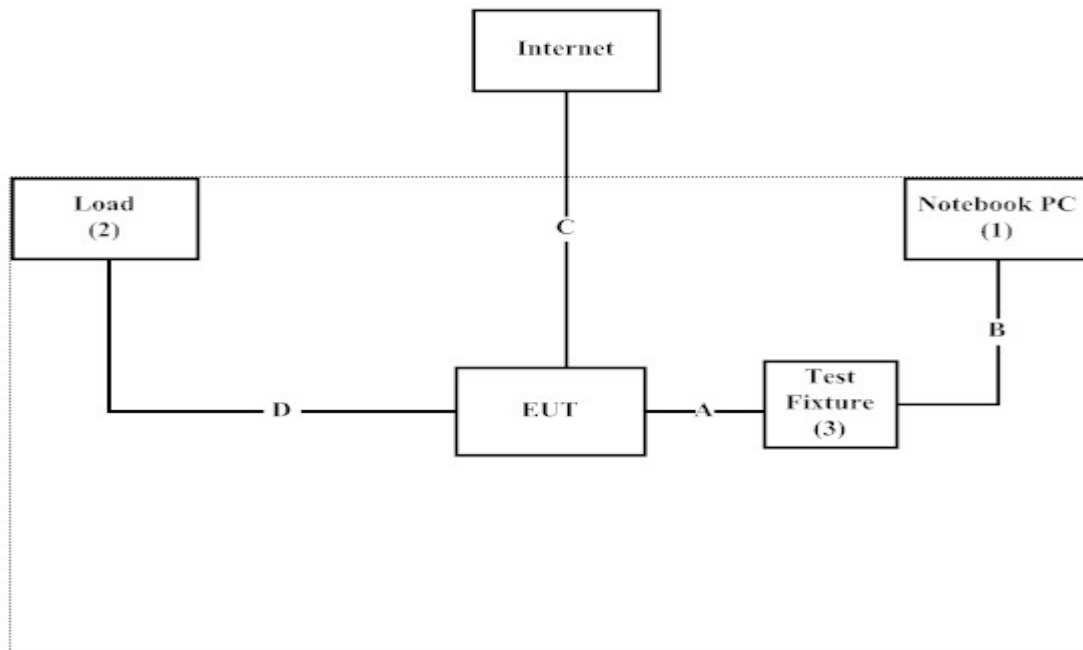
1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

	Product	Manufacturer	Model No.	Serial No.	Power Cord
(1)	Notebook PC	DELL	P62G	416FJC2	Non-Shielded, 1.8m
(2)	Load	N/A	N/A	N/A	N/A
(3)	Test Fixture	ZINWELL	N/A	N/A	N/A

	Signal Cable Type	Signal cable Description
A	Single Cable	Shielded, 1.0m
B	USB Cable	Shielded, 0.25m
C	LAN Cable	Non-Shielded, 2m
D	Power Cable	Non-Shielded, 1.7m

1.4. Configuration of tested System



1.5. EUT Exercise Software

- (1) Setup the EUT as shown on 1.4
- (2) Execute "Putty V0.63.0.0" program on the EUT.
- (3) Configure the test mode, the test channel, and the data rate.
- (4) Start the continuous transmission.
- (5) Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

The related certificate for our laboratories about the test site and management system can be downloaded from DEKRA Testing and Certification Co., Ltd. Web Site:

<http://www.dekra.com.tw/english/about/certificates.aspx?bval=5>

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E-Mail : info.tw@dekra.com

FCC Accreditation Number: TW1014

1.7. List of Test Equipment

For Conduction measurements /ASR1

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	EMI Test Receiver	R&S	ESR7	161601	2017.01.06	2018.01.05
X	Two-Line V-Network	R&S	ENV216	101306	2017.02.16	2018.02.15
X	Two-Line V-Network	R&S	ENV216	101307	2017.03.17	2018.03.16
X	Coaxial Cable	Quietek	RG400_BNC	RF001	2017.05.24	2018.05.23

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : QuieTek EMI 2.0 V2.1.113

For Conducted measurements /ASR3

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	Temperature Chamber	KSON	THS-D4T-100	A0606	2017.03.31	2018.03.30
X	Spectrum Analyzer	R&S	FSV40	101149	2016.12.14	2017.12.13
X	Power Meter	Anritsu	ML2496A	1548003	2016.12.15	2017.12.14
X	Power Sensor	Anritsu	MA2411B	1531024	2016.12.15	2017.12.14
X	Power Sensor	Anritsu	MA2411B	1531025	2016.12.15	2017.12.14

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : QuieTek Conduction Test System V8.0.110

For Radiated measurements /ACB1

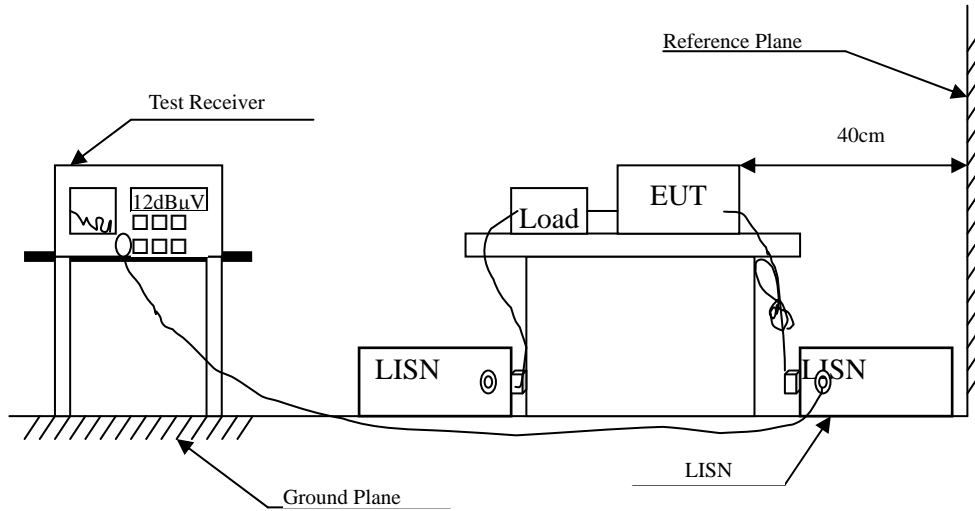
	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	Loop Antenna	TESEQ	HLA6121	37133	2016.03.18	2018.03.17
X	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-674	2017.02.09	2018.02.08
X	Horn Antenna	ETS-Lindgren	3117	00203800	2016.10.13	2017.10.12
X	Horn Antenna	Com-Power	AH-840	101087	2017.05.24	2018.05.23
X	Pre-Amplifier	EMCI	EMC001330	980316	2017.05.14	2018.05.13
X	Pre-Amplifier	EMCI	EMC051835SE	980311	2017.05.15	2018.05.14
X	Pre-Amplifier	EMCI	EMC05820SE	980310	2017.05.15	2018.05.14
X	Pre-Amplifier	EMCI	EMC184045SE	980314	2017.05.17	2018.05.16
	Filter	MICRO TRONICS	BRM50702	G251	2016.08.11	2017.08.10
X	Filter	MICRO TRONICS	BRM50716	G188	2016.08.11	2017.08.10
X	EMI Test Receiver	R&S	ESR7	101602	2016.12.15	2017.12.14
X	Spectrum Analyzer	R&S	FSV40	101149	2017.01.24	2018.01.23
X	Coaxial Cable	SUHNER	SUCOFLEX 106	RF002	2017.05.25	2018.05.24
X	Mircoflex Cable	HUBER SUHNER	SUCOFLEX 102	MY3381/2	2016.08.11	2017.08.10

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : QuieTek EMI 2.0 V2.1.113

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dB μ V) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks : In the above table, the tighter limit applies at the band edges.

2.3. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4:2014 on conducted measurement.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

The EUT was setup to ANSI C63.4, 2014; tested to UNII test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

2.4. Uncertainty

± 2.35 dB

2.5. Test Result of Conducted Emission

Product : G.hn Powerline Wireless Extender
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Date : 2017/07/21
 Test Mode : Mode 4 Transmit (802.11ac-80BW-65Mbps) (5210MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V	Margin dB	Limit dB μ V
LINE 1					
Quasi-Peak					
0.310	9.702	10.889	20.590	-40.839	61.429
0.520	9.740	18.802	28.541	-27.459	56.000
0.880	9.750	17.873	27.623	-28.377	56.000
3.200	9.842	16.774	26.616	-29.384	56.000
6.800	9.942	7.253	17.195	-42.805	60.000
15.520	10.084	33.436	43.520	-16.480	60.000
Average					
0.310	9.702	4.884	14.585	-36.844	51.429
0.520	9.740	10.265	20.005	-25.995	46.000
0.880	9.750	8.235	17.985	-28.015	46.000
3.200	9.842	9.554	19.396	-26.604	46.000
6.800	9.942	3.218	13.160	-36.840	50.000
15.520	10.084	31.687	41.771	-8.229	50.000

Note:

- All Reading Levels are Quasi-Peak and average value.
- “” means the worst emission level.
- Measurement Level = Reading Level + Correct Factor

Product : G.hn Powerline Wireless Extender
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Date : 2017/07/21
 Test Mode : Mode 4 Transmit (802.11ac-80BW-65Mbps) (5210MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V	Margin dB	Limit dB μ V
LINE 2					
Quasi-Peak					
0.249	9.693	11.656	21.349	-41.822	63.171
0.460	9.722	25.089	34.811	-22.332	57.143
0.850	9.750	16.949	26.699	-29.301	56.000
2.600	9.808	17.082	26.890	-29.110	56.000
4.200	9.881	12.699	22.581	-33.419	56.000
6.400	9.918	14.719	24.637	-35.363	60.000
Average					
0.249	9.693	2.033	11.726	-41.445	53.171
0.460	9.722	15.700	25.422	-21.721	47.143
0.850	9.750	6.718	16.468	-29.532	46.000
2.600	9.808	9.404	19.212	-26.788	46.000
4.200	9.881	5.593	15.474	-30.526	46.000
6.400	9.918	12.950	22.868	-27.132	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : G.hn Powerline Wireless Extender
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Date : 2017/07/21
 Test Mode : Mode 4 Transmit (802.11ac-80BW-65Mbps) (5775MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V	Margin dB	Limit dB μ V
LINE 1					
Quasi-Peak					
0.281	9.698	13.613	23.312	-38.945	62.257
0.840	9.750	17.904	27.654	-28.346	56.000
1.900	9.783	19.439	29.222	-26.778	56.000
3.600	9.852	17.163	27.016	-28.984	56.000
8.800	9.961	16.730	26.692	-33.308	60.000
23.000	10.159	15.223	25.382	-34.618	60.000
Average					
0.281	9.698	5.509	15.207	-37.050	52.257
0.840	9.750	13.626	23.376	-22.624	46.000
1.900	9.783	10.198	19.981	-26.019	46.000
3.600	9.852	10.240	20.093	-25.907	46.000
8.800	9.961	10.297	20.259	-29.741	50.000
23.000	10.159	11.108	21.267	-28.733	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : G.hn Powerline Wireless Extender
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Date : 2017/07/21
 Test Mode : Mode 4 Transmit (802.11ac-80BW-65Mbps) (5775MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V	Margin dB	Limit dB μ V
LINE 2					
Quasi-Peak					
0.185	9.695	23.149	32.844	-32.156	65.000
0.340	9.701	7.689	17.390	-43.181	60.571
0.770	9.755	15.707	25.462	-30.538	56.000
2.600	9.808	16.705	26.512	-29.488	56.000
6.200	9.922	13.831	23.754	-36.246	60.000
24.000	10.212	12.419	22.631	-37.369	60.000
Average					
0.185	9.695	10.647	20.343	-34.657	55.000
0.340	9.701	1.286	10.987	-39.584	50.571
0.770	9.755	7.130	16.885	-29.115	46.000
2.600	9.808	9.058	18.865	-27.135	46.000
6.200	9.922	11.584	21.507	-28.493	50.000
24.000	10.212	7.194	17.406	-32.594	50.000

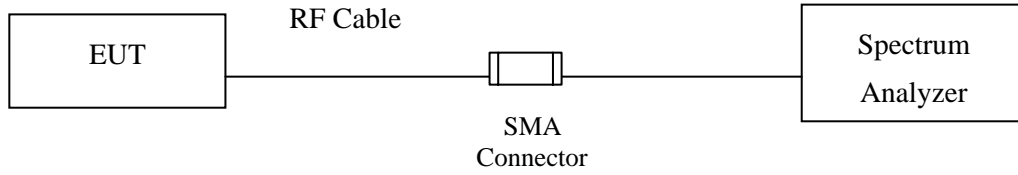
Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

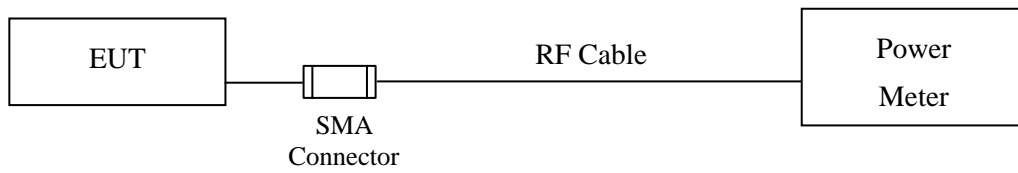
3. Maximun conducted output power

3.1. Test Setup

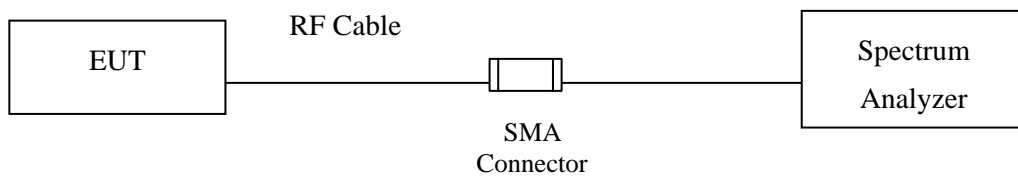
99% Occupied Bandwidth



Conduction Power Measurement (for 802.11a)



Conduction Power Measurement (for 802.11ac)



3.2. Limits

3.2.1. For the band 5.15-5.25 GHz,

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W, provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, if transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, if transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.2.2. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.2.3. For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, if transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point UNII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any

corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

3.3. Test Procedure

As an alternative to FCC KDB-789033, the EUT maximum conducted output power was measured with an average power meter employing a video bandwidth greater the 6dB BW of the emission under test. Maximum conducted output power was read directly from the meter across all data rates, and across three channels within each sub-band. Special care was used to make sure that the EUT was transmitting in continuous mode. This method exceeds the limitations of FCC KDB-789033, and provides more accurate measurements.

802.11an (BW \leq 40MHz) Maximum conducted output power using KDB 789033 section E)3)b) Method PM-G (Measurement using a gated RF average power meter)

Note: the power meter have a video bandwidth that is greater than or equal to the measurement bandwidth, (Anritsu/ MA2411B video bandwidth: 65MHz)

802.11ac (BW=80MHz) Maximum conducted output power using KDB 789033 section E)2)d) Method SA-2 (trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

When transmitted signals consist of two or more non-contiguous spectrum segments (e.g., 80+80 MHz mode) or when a single spectrum segment of a transmission crosses the boundary between two adjacent U-NII bands, KDB 644545 D03 section D) procedure is used for measurements.

3.4. Uncertainty

Power Meter: ± 0.95 dB

Spectrum Analyzer: ± 1.30 dB

3.5. Test Result of Maximum conducted output power

Product : G.hn Powerline Wireless Extender
 Test Item : Maximum conducted output power
 Test Site : No.3 OATS
 Test Date : 2017/07/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)

CHAIN A

Cable loss=1dB		Maximum conducted output power							
Channel No.	Frequency (MHz)	Data Rate (Mbps)							
		6	9	12	18	24	36	48	54
		Measurement Level (dBm)							
36	5180	18.87	--	--	--	--	--	--	--
44	5220	18.93	18.34	18.29	18.24	18.19	18.13	18.09	18.03
48	5240	18.83	--	--	--	--	--	--	--
149	5745	19.02	--	--	--	--	--	--	--
157	5785	18.94	18.35	18.3	18.27	18.23	18.19	18.14	18.08
165	5825	19.05	--	--	--	--	--	--	--

Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

CHAIN B

Cable loss=1dB		Maximum conducted output power							
Channel No.	Frequency (MHz)	Data Rate (Mbps)							
		6	9	12	18	24	36	48	54
		Measurement Level (dBm)							
36	5180	18.97	--	--	--	--	--	--	--
44	5220	18.89	18.29	18.23	18.19	18.13	18.08	18.03	17.98
48	5240	19.03	--	--	--	--	--	--	--
149	5745	19.05	--	--	--	--	--	--	--
157	5785	19.03	18.43	18.38	18.32	18.27	18.23	18.18	18.15
165	5825	19.01	--	--	--	--	--	--	--

Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

Maximum conducted output power Measurement:
(CHAIN A+ B)

Channel Number	Frequency (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Output Power (dBm)	Output Power Limit
					(dBm)
36	5180	18.87	18.97	21.93	30
44	5220	18.93	18.89	21.92	30
48	5240	18.83	19.03	21.94	30
149	5745	19.02	19.05	22.05	30
157	5785	18.94	19.03	22.00	30
165	5825	19.05	19.01	22.04	30

Note:

1. Power Output Value = Reading value on average power meter + cable loss
2. Output Power (dBm) = 10LOG (Chain A Power (mW)+ Chain B Power (mW))

Product : G.hn Powerline Wireless Extender
 Test Item : Maximum conducted output power
 Test Site : No.3 OATS
 Test Date : 2017/07/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps)

CHAIN A

Cable loss=1dB		Maximum conducted output power							
Channel No.	Frequency (MHz)	Data Rate (Mbps)							
		14.4	28.9	43.3	57.8	86.7	115.6	130	144.4
		Measurement Level (dBm)							
36	5180	19.08	--	--	--	--	--	--	--
44	5220	19	18.37	18.32	18.27	18.21	18.16	18.11	18.07
48	5240	18.89	--	--	--	--	--	--	--
149	5745	18.92	--	--	--	--	--	--	--
157	5785	19.03	18.39	18.34	18.31	18.27	18.24	18.19	18.13
165	5825	18.94	--	--	--	--	--	--	--

Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

CHAIN B

Cable loss=1dB		Maximum conducted output power							
Channel No.	Frequency (MHz)	Data Rate (Mbps)							
		14.4	28.9	43.3	57.8	86.7	115.6	130	144.4
		Measurement Level (dBm)							
36	5180	18.93	--	--	--	--	--	--	--
44	5220	19.14	18.51	18.47	18.43	18.37	18.32	18.27	18.23
48	5240	19.04	--	--	--	--	--	--	--
149	5745	19.11	--	--	--	--	--	--	--
157	5785	18.92	18.3	18.25	18.21	18.16	18.11	18.06	18.01
165	5825	19.04	--	--	--	--	--	--	--

Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

Maximum conducted output power Measurement:
(CHAIN A+ B)

Channel Number	Frequency (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Output Power (dBm)	Output Power Limit
					(dBm)
36	5180	19.08	18.93	22.02	30
44	5220	19	19.14	22.08	30
48	5240	18.89	19.04	21.98	30
149	5745	18.92	19.11	22.03	30
157	5785	19.03	18.92	21.99	30
165	5825	18.94	19.04	22.00	30

Note:

3. Power Output Value = Reading value on average power meter + cable loss
4. Output Power (dBm) = 10LOG (Chain A Power (mW)+ Chain B Power (mW))

Product : G.hn Powerline Wireless Extender
 Test Item : Maximum conducted output power
 Test Site : No.3 OATS
 Test Date : 2017/07/20
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps)

CHAIN A

Cable loss=1dB		Maximum conducted output power							
Channel No.	Frequency (MHz)	Data Rate (Mbps)							
		30	60	90	120	180	240	270	300
		Measurement Level (dBm)							
38	5190	18.04	--	--	--	--	--	--	--
46	5230	18.95	17.79	17.73	17.68	17.62	17.57	17.53	17.49
151	5755	19.06	--	--	--	--	--	--	--
159	5795	18.83	17.67	17.63	17.57	17.52	17.48	17.43	17.39

Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

CHAIN B

Cable loss=1dB		Maximum conducted output power							
Channel No.	Frequency (MHz)	Data Rate (Mbps)							
		30	60	90	120	180	240	270	300
		Measurement Level (dBm)							
38	5190	19.03	--	--	--	--	--	--	--
46	5230	18.98	17.83	17.79	17.73	17.68	17.62	17.57	17.52
151	5755	18.89	--	--	--	--	--	--	--
159	5795	19.02	17.86	17.81	17.76	17.72	17.67	17.63	17.58

Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

**Maximum conducted output power Measurement:
(CHAIN A+ B)**

Channel Number	Frequency (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Output Power (dBm)	Output Power Limit
					(dBm)
38	5190	18.04	19.03	21.57	30
46	5230	18.95	18.98	21.98	30
151	5755	19.06	18.89	21.99	30
159	5795	18.83	19.02	21.94	30

Note:

1. Power Output Value =Reading value on average power meter + cable loss
2. Output Power (dBm) = 10LOG (Chain A Power (mW)+ Chain B Power (mW))

Product : G.hn Powerline Wireless Extender
 Test Item : Maximum conducted output power
 Test Site : No.3 OATS
 Test Date : 2017/07/20
 Test Mode : Mode 4 Transmit (802.11ac-80BW-65Mbps)

Chain A

Cable loss=1dB Duty factor=1.93dBm		Maximum conducted output power									
Channel No	Frequency (MHz)	Data Rate (Mbps)									
		VTH0	VTH1	VTH2	VTH3	VTH4	VTH5	VTH6	VTH7	VTH8	VTH9
42	5210	18.18	18.14	18.10	18.04	18.00	17.95	17.89	17.84	17.80	17.76
155	5775	18.95	19.60	19.55	19.50	19.46	19.42	19.36	19.31	19.25	19.19

Note: Maximum conducted output power Value =Reading value on average power meter + cable loss + Duty factor

Chain B

Cable loss=1dB Duty factor=1.93dBm		Maximum conducted output power									
Channel No	Frequency (MHz)	Data Rate (Mbps)									
		VTH0	VTH1	VTH2	VTH3	VTH4	VTH5	VTH6	VTH7	VTH8	VTH9
42	5210	17.73	17.69	17.62	17.56	17.52	17.46	17.41	17.35	17.30	17.25
155	5775	18.87	18.82	18.76	18.71	18.65	18.60	18.55	18.50	17.45	17.40

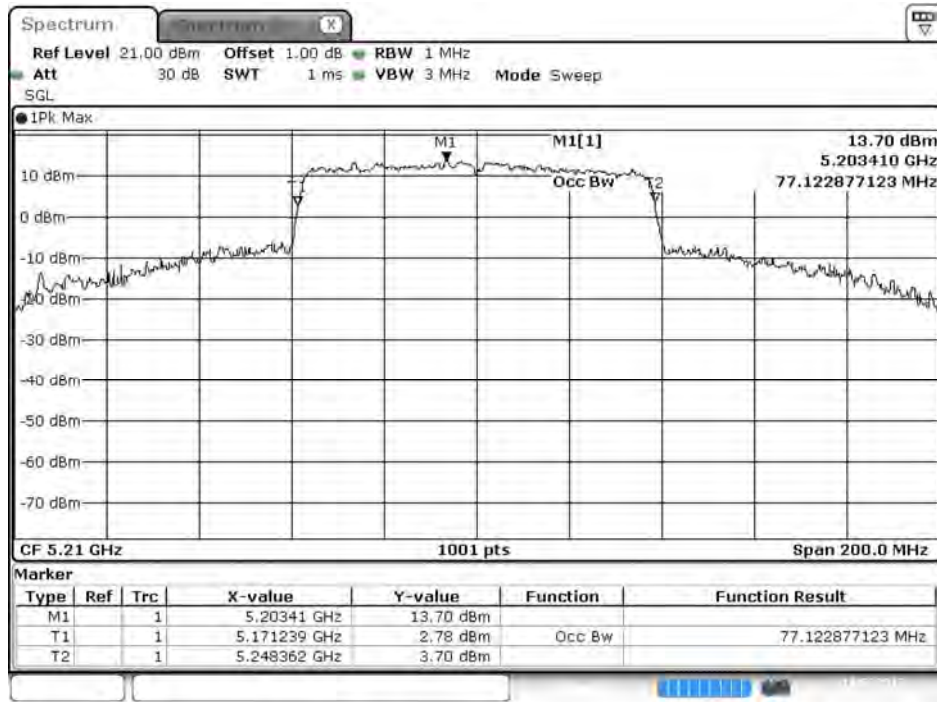
Note: Maximum conducted output power Value =Reading value on average power meter + cable loss + Duty factor

Maximum conducted output power Measurement:

Channel No	Frequency Range (MHz)	26dB Bandwidth (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Output Power (dBm)	Output Power Limit	Result
						(dBm)	
42	5210	--	18.18	17.73	20.97	30	Pass
155	5775	--	18.95	18.87	21.92	30	Pass

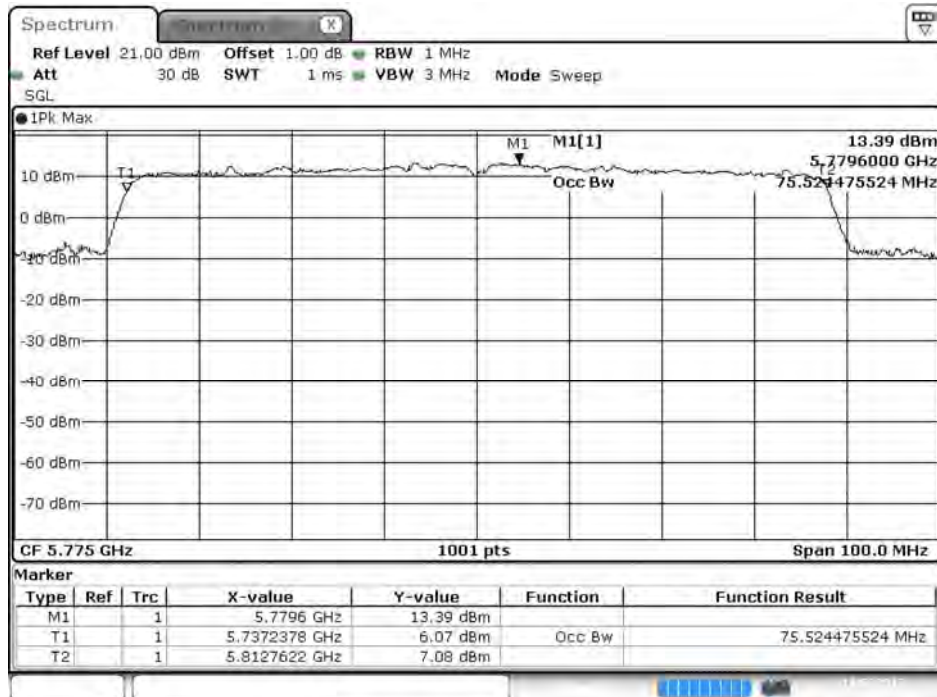
Note: Output Power (dBm) = 10LOG (Chain A Power (mW)+ Chain B Power (mW))

**26dBc Occupied Bandwidth:
Channel 42 – Chain A**



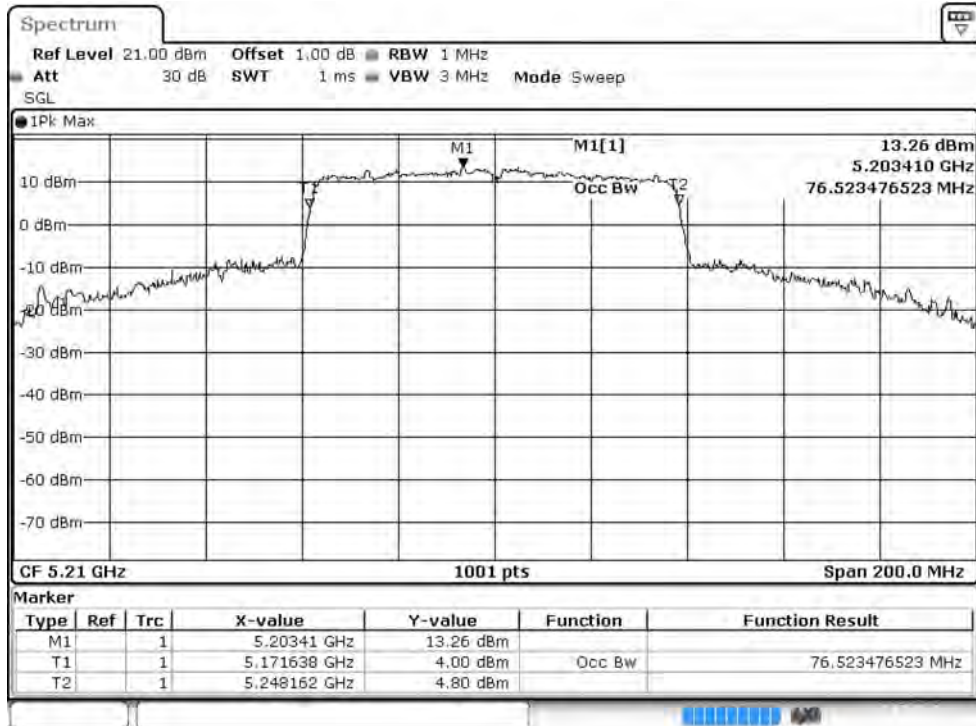
Date: 11.JUL.2017 19:08:33

Channel 155 – Chain A

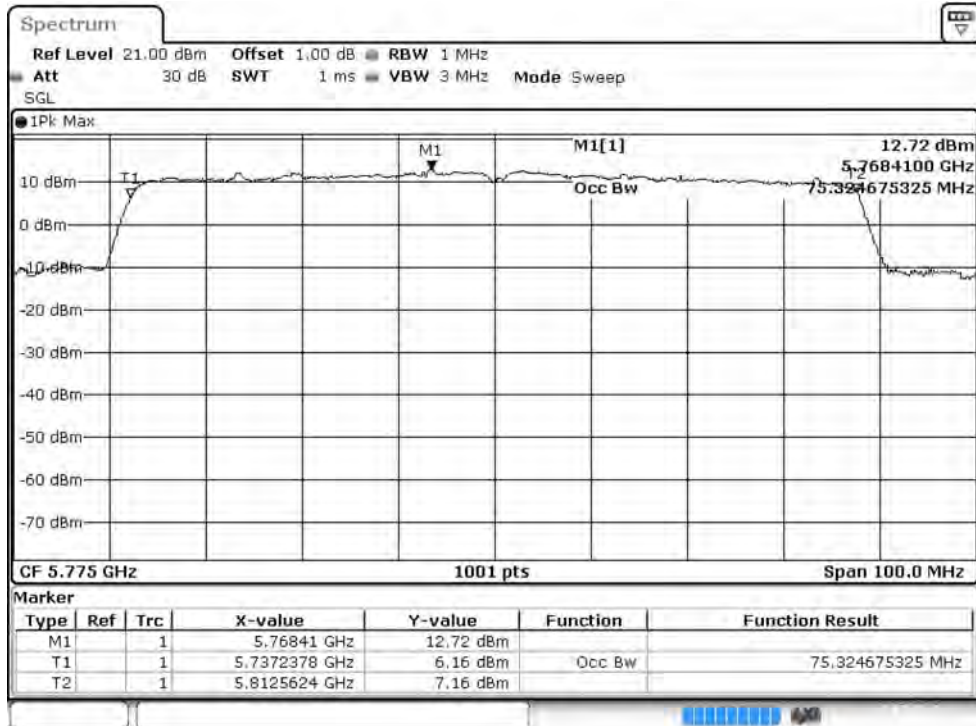


Date: 11.JUL.2017 19:57:00

**26dBc Occupied Bandwidth:
Channel 42 – Chain B**

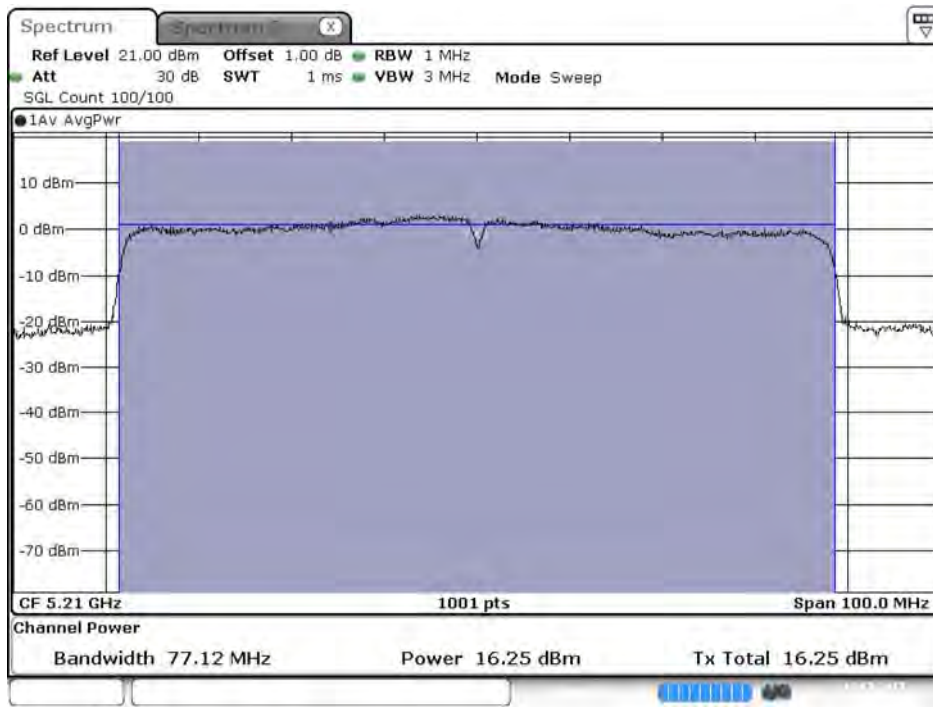


Channel 155 – Chain B



Maximum conducted output power:

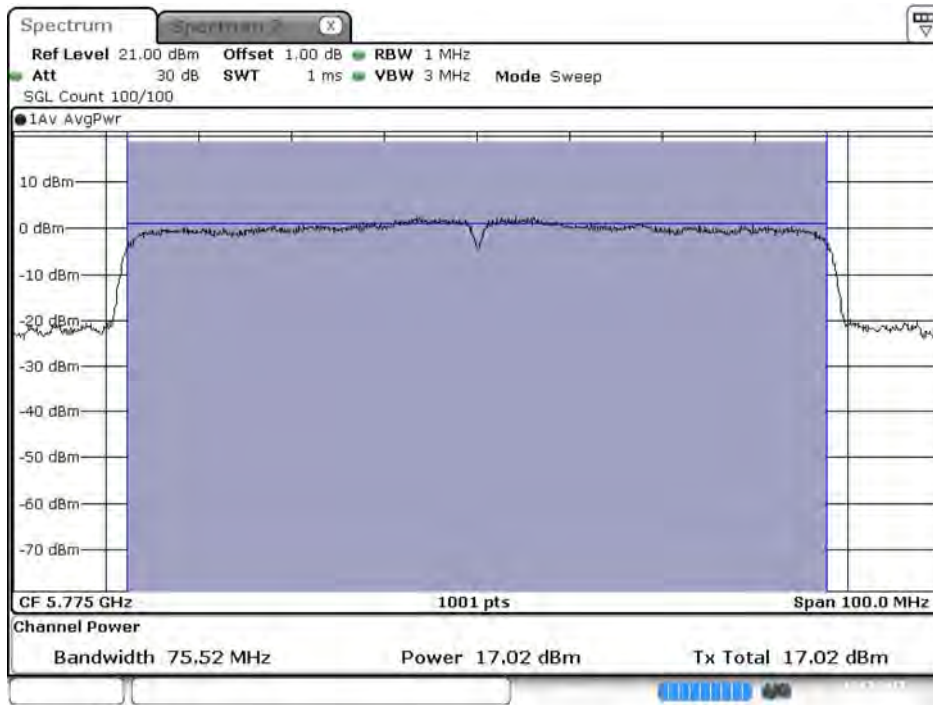
Channel 42 – Chain A



Date: 11.JUL.2017 19:10:30

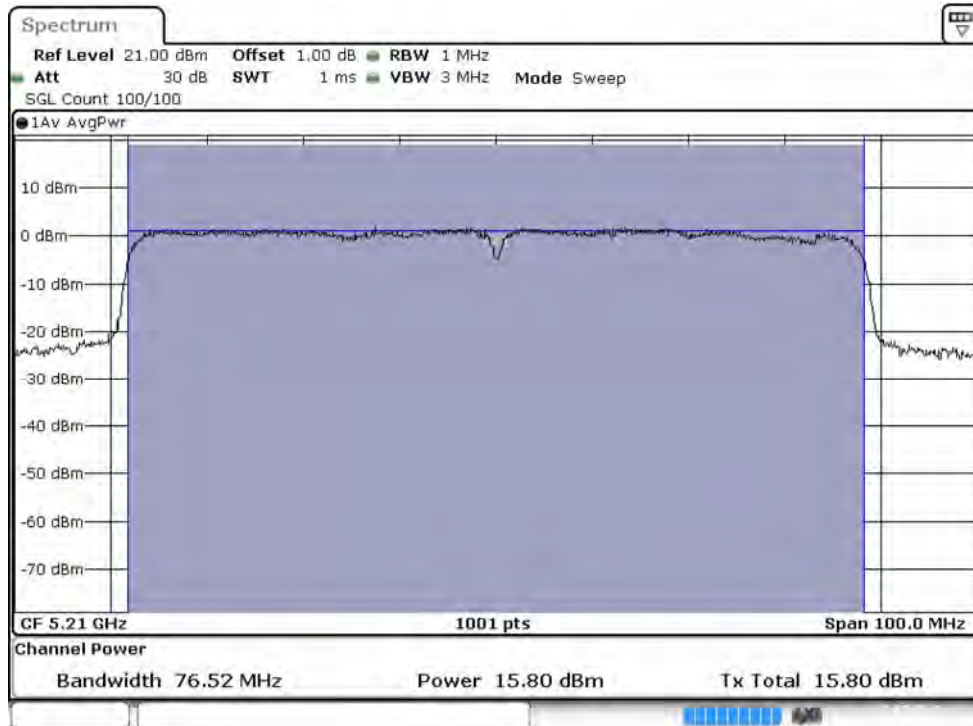
Maximum conducted output power:

Channel 155 – Chain A

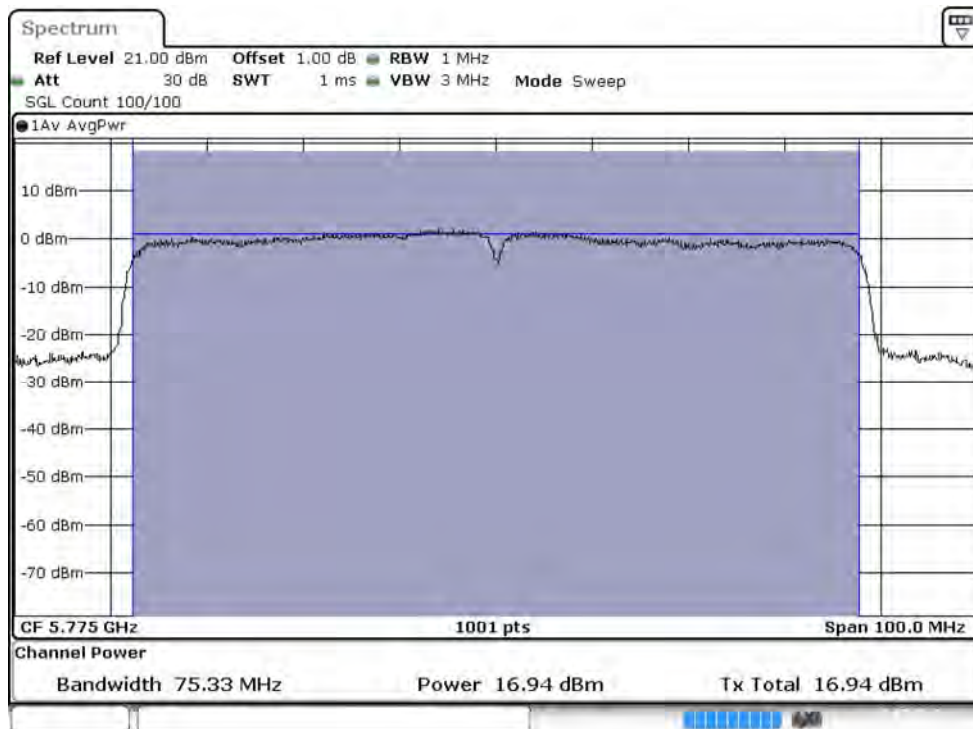


Date: 11.JUL.2017 19:58:22

**Maximum conducted output power:
Channel 42 – Chain B**

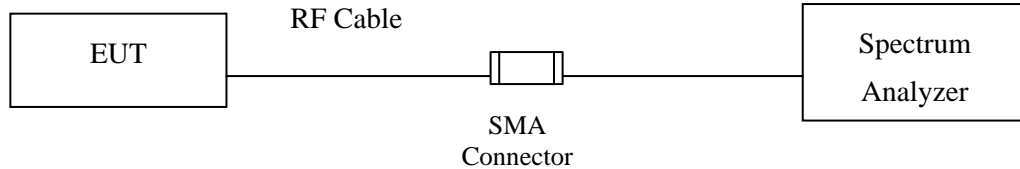


**Maximum conducted output power:
Channel 155 – Chain B**



4. Peak Power Spectral Density

4.1. Test Setup



4.2. Limits

- (1) For the band 5.15-5.25 GHz,
 - (i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
 - (ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
 - (iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.
 - (iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.+
- (2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
- (3) For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, the

maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point UNII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

4.3. Test Procedure

The EUT was setup to ANSI C63.10, 2013; tested to UNII test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

The Peak Power Spectral Density using KDB 789033 section F) procedure, Create an average power spectrum for the EUT operating mode being tested by following the instructions in section E)2) for measuring maximum conducted output power using a spectrum analyzer.

SA-1 method is selected to run the test.

For the band 5.725-5.85 GHz, Scale the observed power level to an equivalent value in 500 kHz by adjusting (increase) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(500\text{ kHz}/100\text{ kHz}) = 6.98\text{ dB}$.

4.4. Uncertainty

$\pm 1.62\text{ dB}$

4.5. Test Result of Peak Power Spectral Density

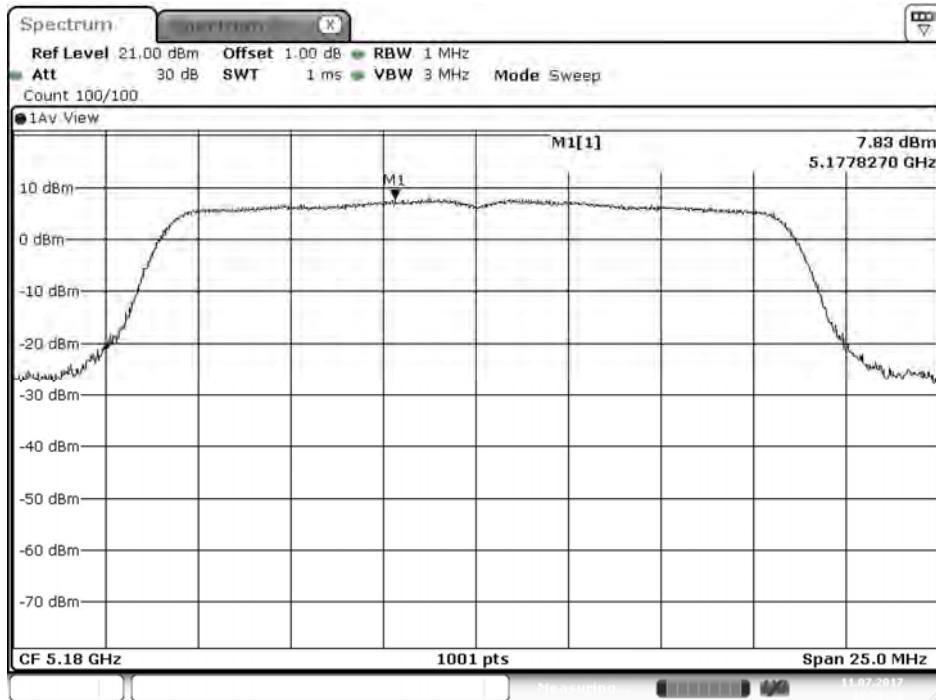
Product : G.hn Powerline Wireless Extender
 Test Item : Peak Power Spectral Density
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)

Channel Number	Frequency (MHz)	Chain	PPSD (dBm)	Total PPSD (dBm) ¹	Required Limit (dBm)	Result
36	5180	A	7.930	10.940	17	Pass
		B	7.800	10.810	17	Pass
44	5220	A	8.290	11.300	17	Pass
		B	8.530	11.540	17	Pass
48	5240	A	6.030	9.040	17	Pass
		B	6.270	9.280	17	Pass

Channel Number	Frequency (MHz)	Chain	PPSD (dBm)	BWCF (dB)	Total PPSD (dBm) ¹	Required Limit (dBm)	Result
149	5745	A	0.940	6.980	10.930	<30	Pass
		B	2.150	6.980	12.140	<30	Pass
157	5785	A	-0.010	6.980	9.980	<30	Pass
		B	1.840	6.980	11.830	<30	Pass
165	5825	A	0.450	6.980	10.440	<30	Pass
		B	0.930	6.980	10.920	<30	Pass

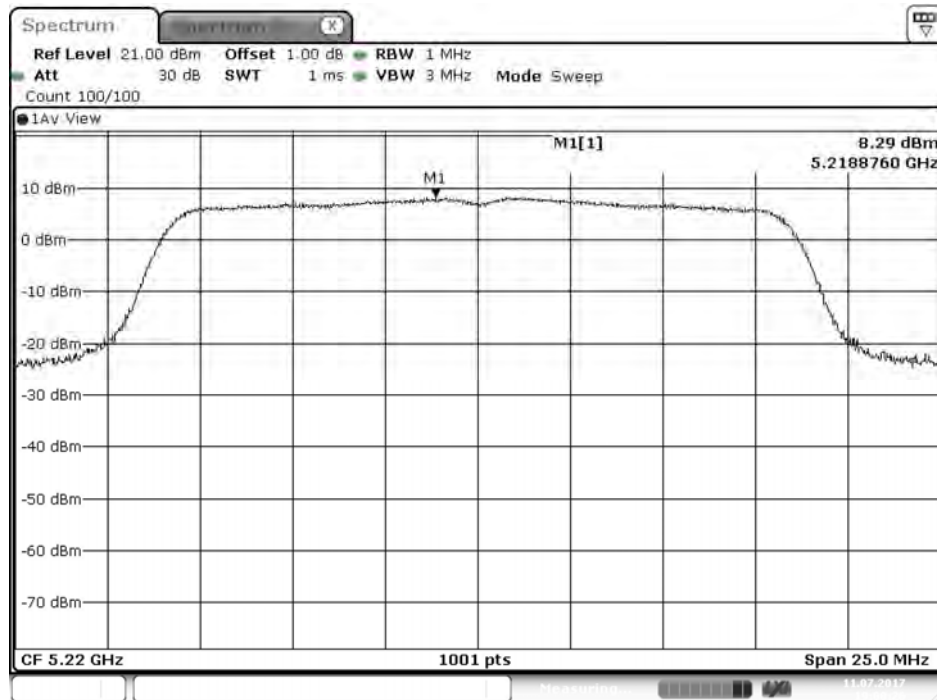
Note 1: The quantity $10 \cdot \log 2$ (two antennas) is added to the spectrum peak value according to document 662911 D01.

Channel 36 – Chain A



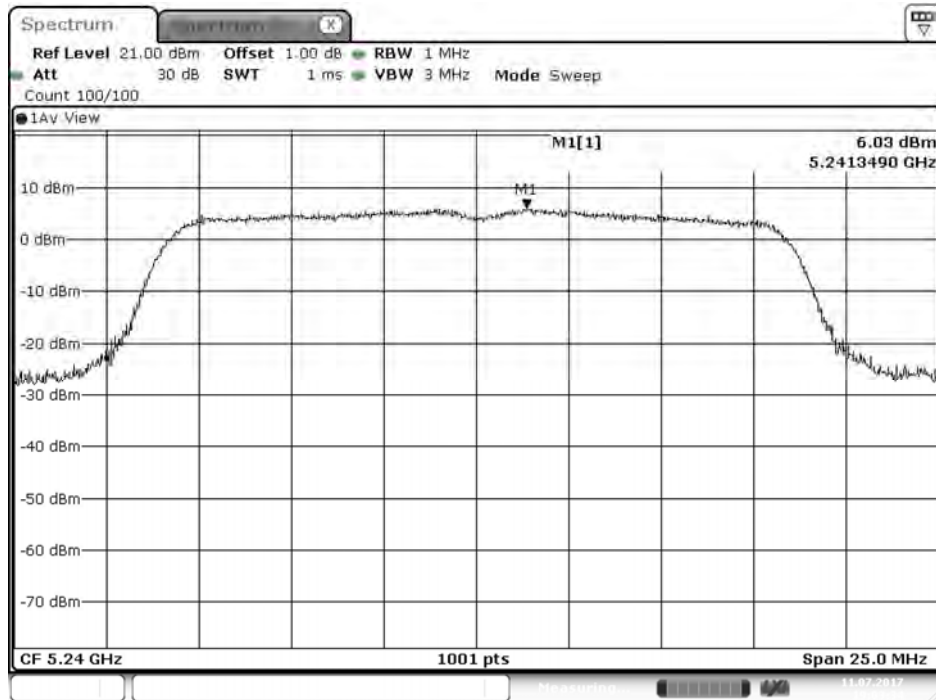
Date: 11.JUL.2017 18:56:27

Channel 44 – Chain A



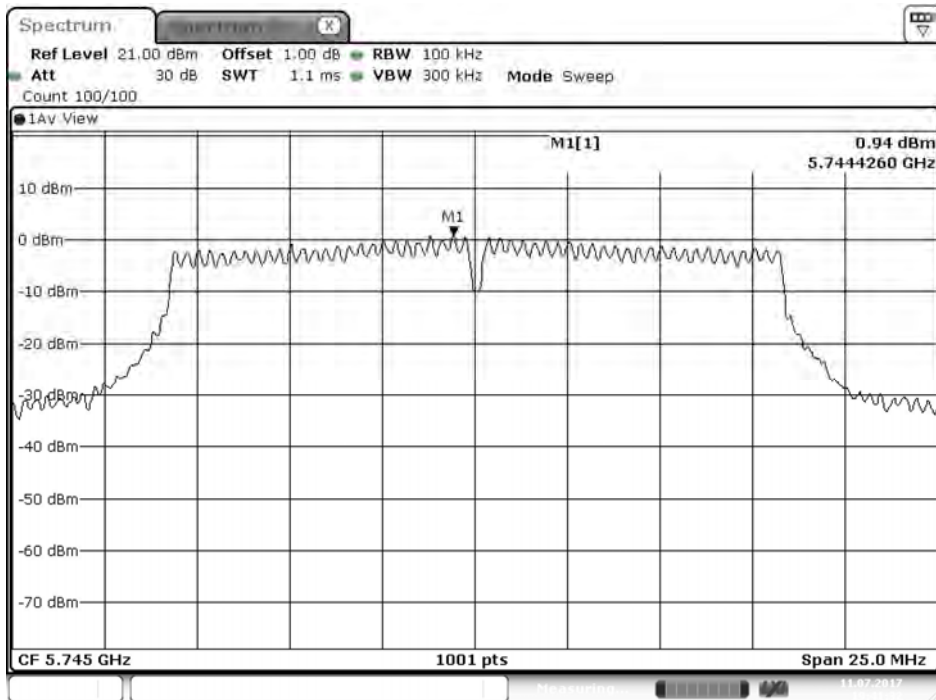
Date: 11.JUL.2017 19:00:27

Channel 48 – Chain A



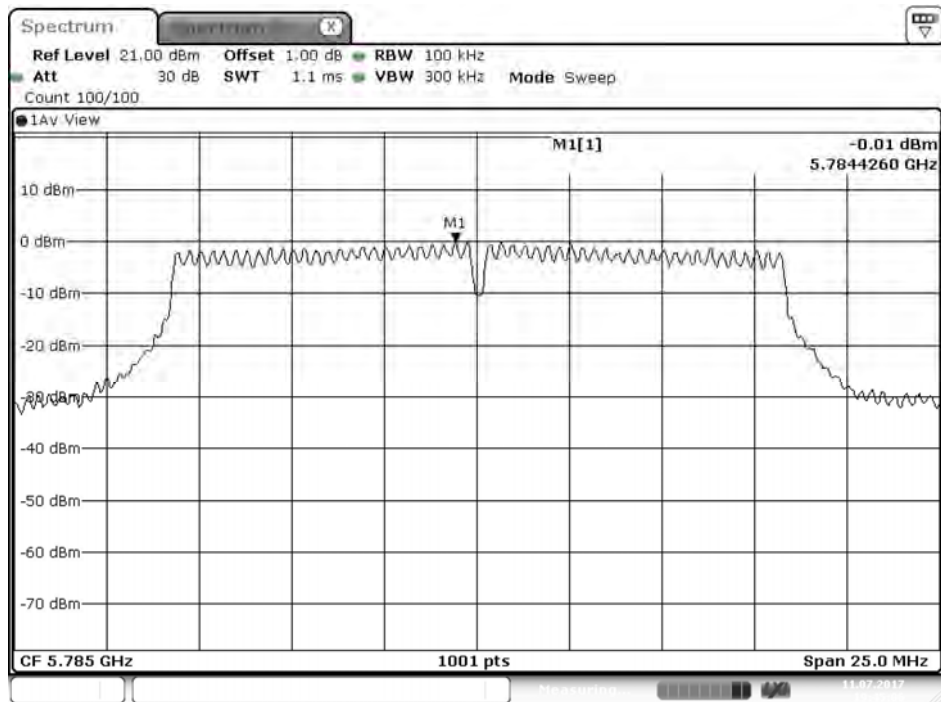
Date: 11.JUL.2017 19:03:34

.Channel 149 – Chain A



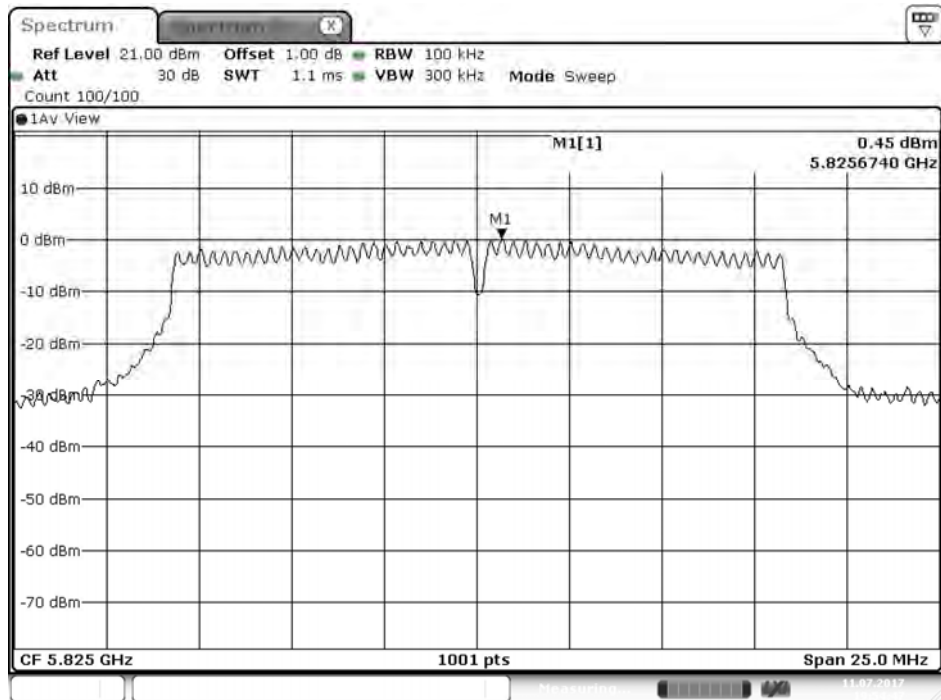
Date: 11.JUL.2017 19:41:33

Channel 157 – Chain A



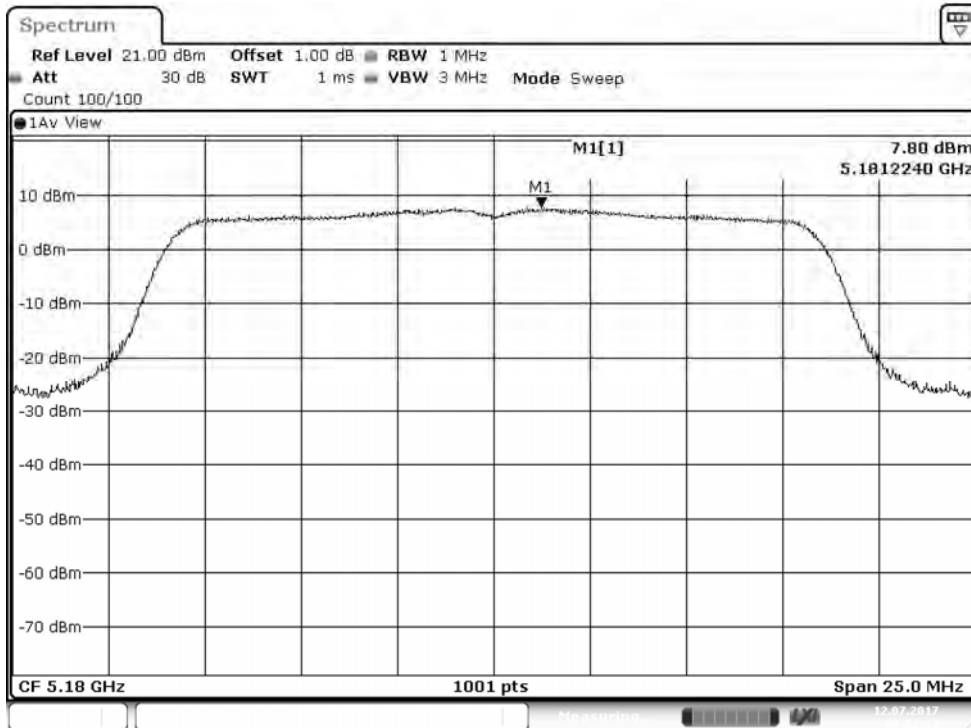
Date: 11.JUL.2017 19:45:06

Channel 165 – Chain A

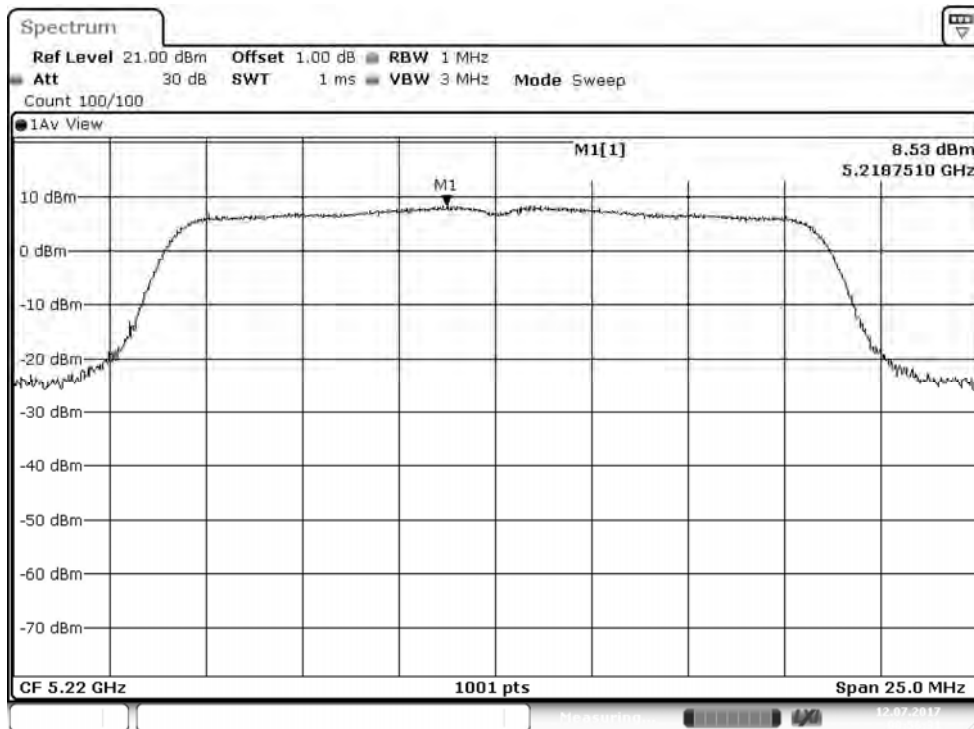


Date: 11.JUL.2017 19:54:48

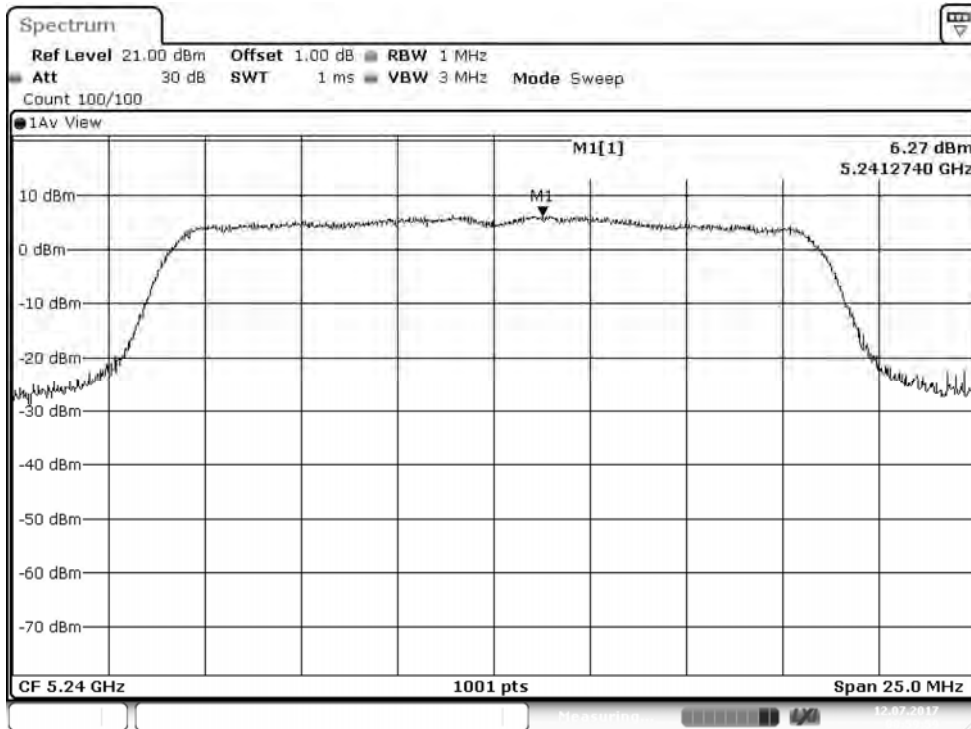
Channel 36 – Chain B



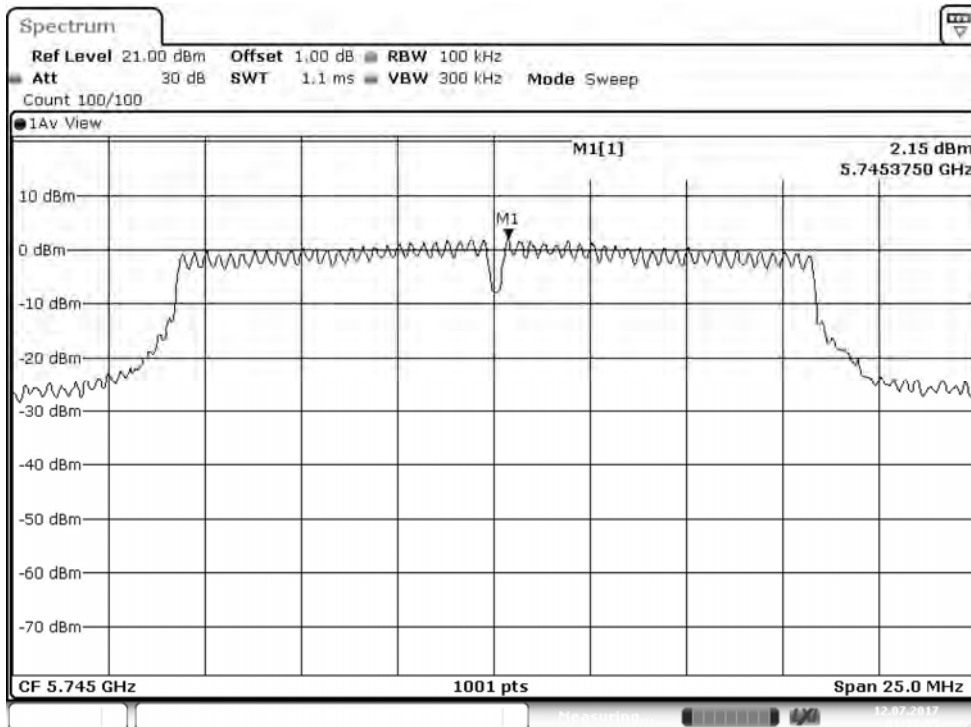
Channel 44 – Chain B



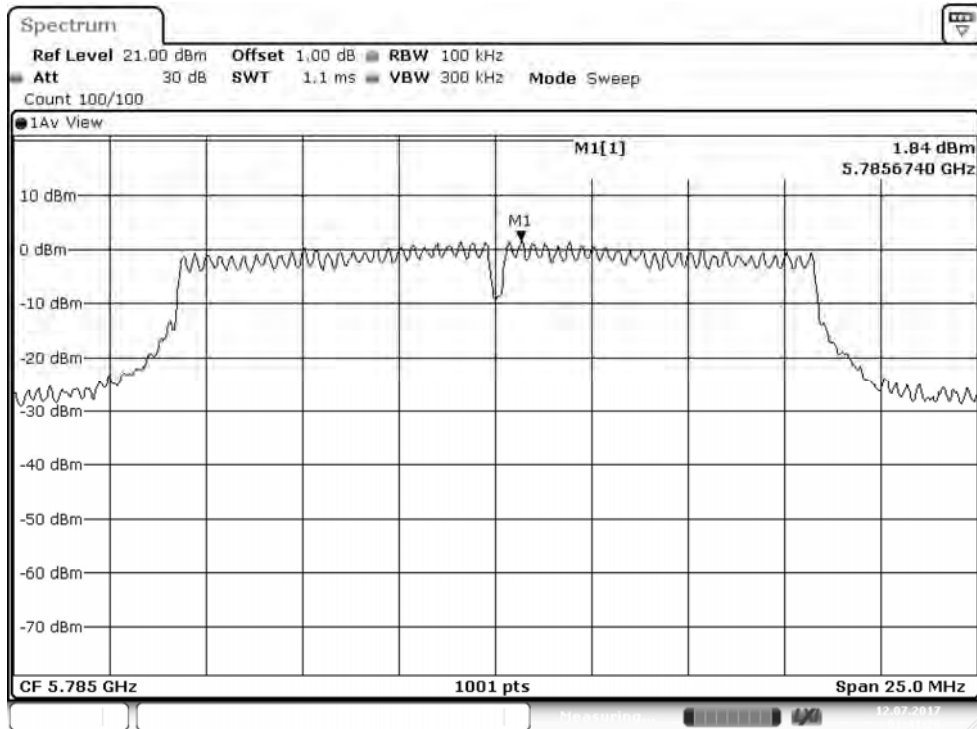
Channel 48 – Chain B



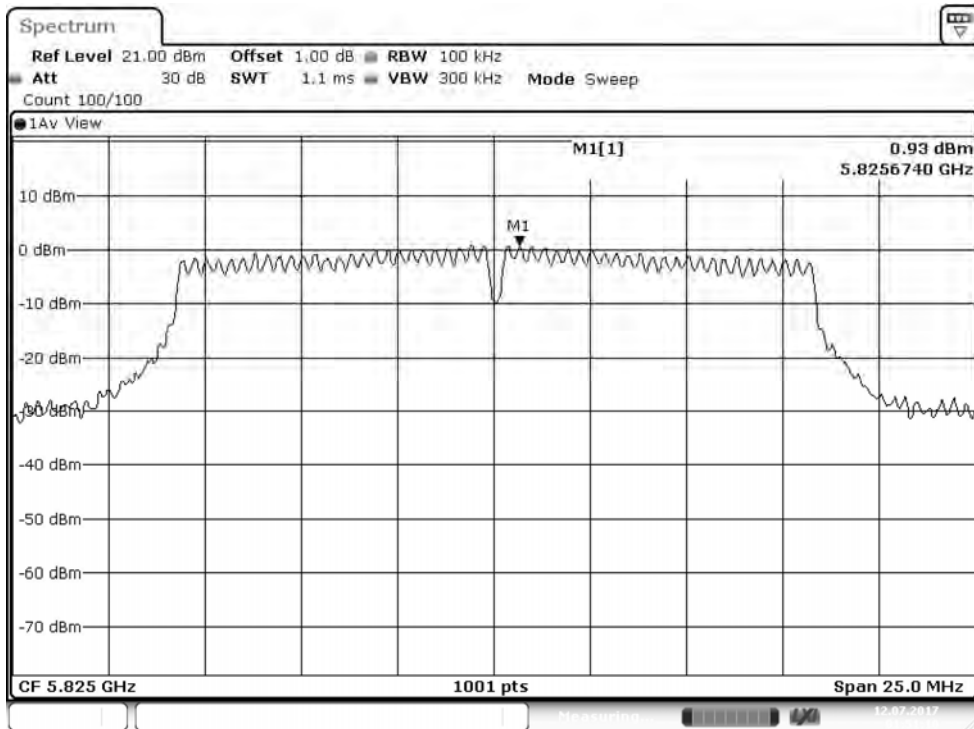
Channel 149 – Chain B



Channel 157 – Chain B



Channel 165 – Chain B



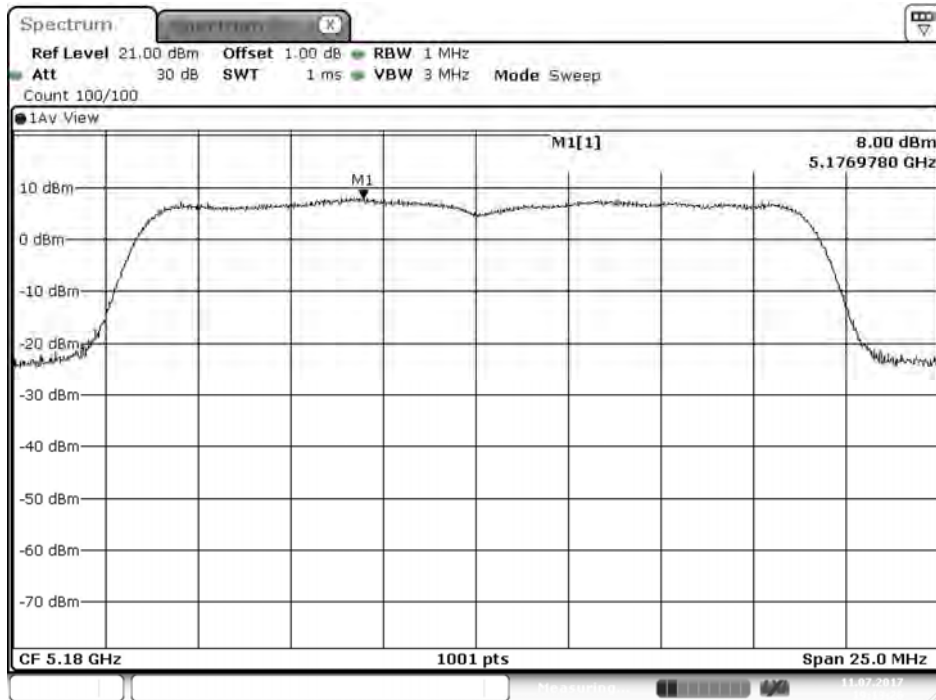
Product : G.hn Powerline Wireless Extender
 Test Item : Peak Power Spectral Density
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps)

Channel Number	Frequency (MHz)	Chain	PPSD (dBm)	Total PPSD (dBm) ¹	Required Limit (dBm)	Result
36	5180	A	8.000	11.010	17	Pass
		B	7.320	10.330	17	Pass
44	5220	A	7.950	10.960	17	Pass
		B	8.290	11.300	17	Pass
48	5240	A	7.620	10.630	17	Pass
		B	8.170	11.180	17	Pass

Channel Number	Frequency (MHz)	Chain	PPSD (dBm)	BWCF (dB)	Total PPSD (dBm) ¹	Required Limit (dBm)	Result
149	5745	A	-0.480	6.980	9.510	<30	Pass
		B	1.440	6.980	11.430	<30	Pass
157	5785	A	-0.260	6.980	9.730	<30	Pass
		B	0.670	6.980	10.660	<30	Pass
165	5825	A	-0.940	6.980	9.050	<30	Pass
		B	0.550	6.980	10.540	<30	Pass

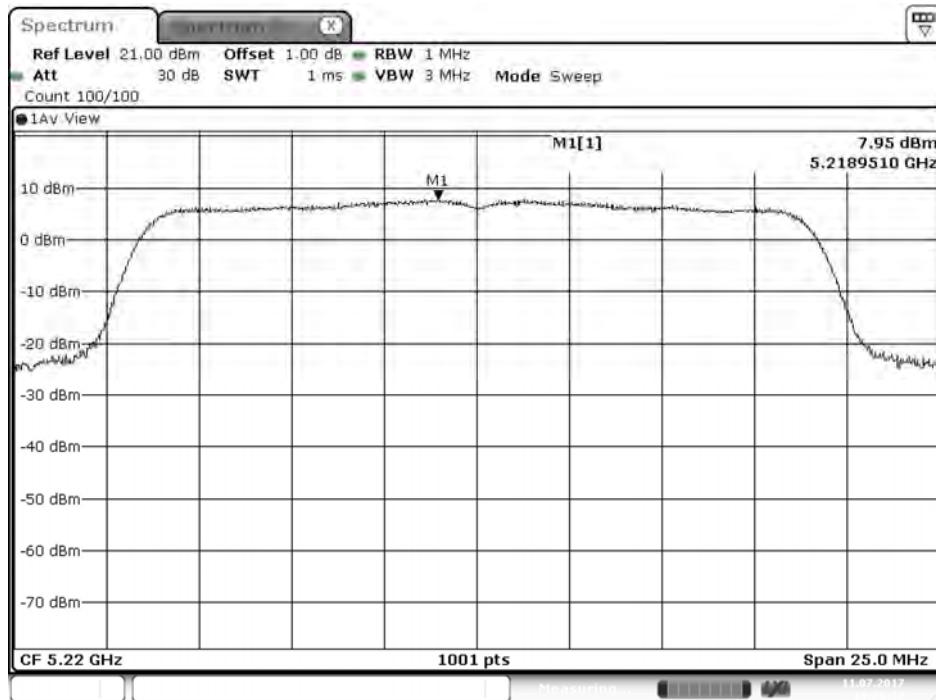
Note 1: The quantity $10 \cdot \log 2$ (two antennas) is added to the spectrum peak value according to document 662911 D01.

Channel 36 – Chain A



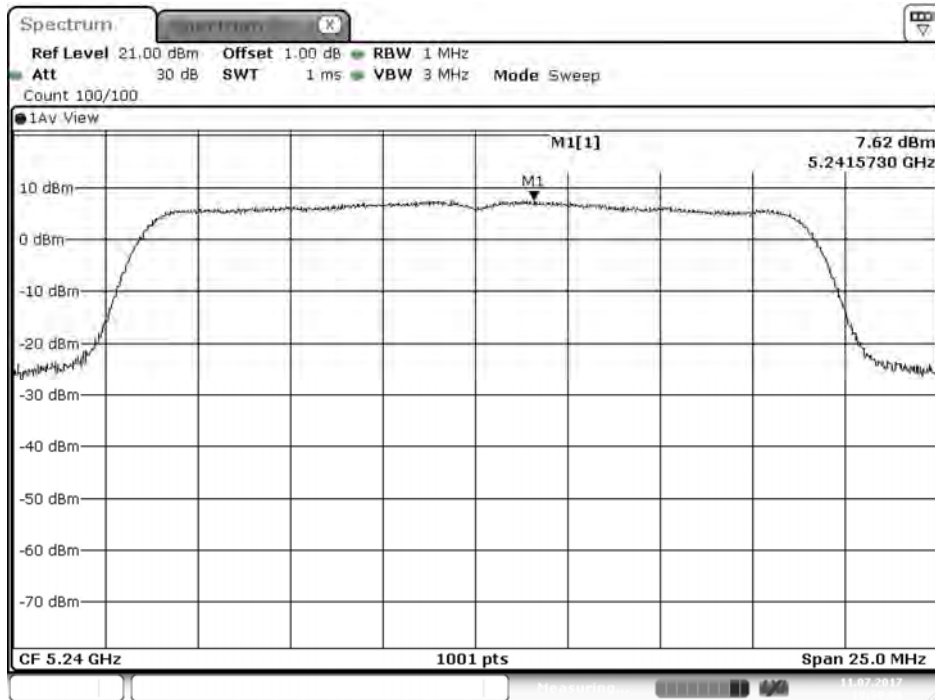
Date: 11.JUL.2017 19:13:27

Channel 44 – Chain A



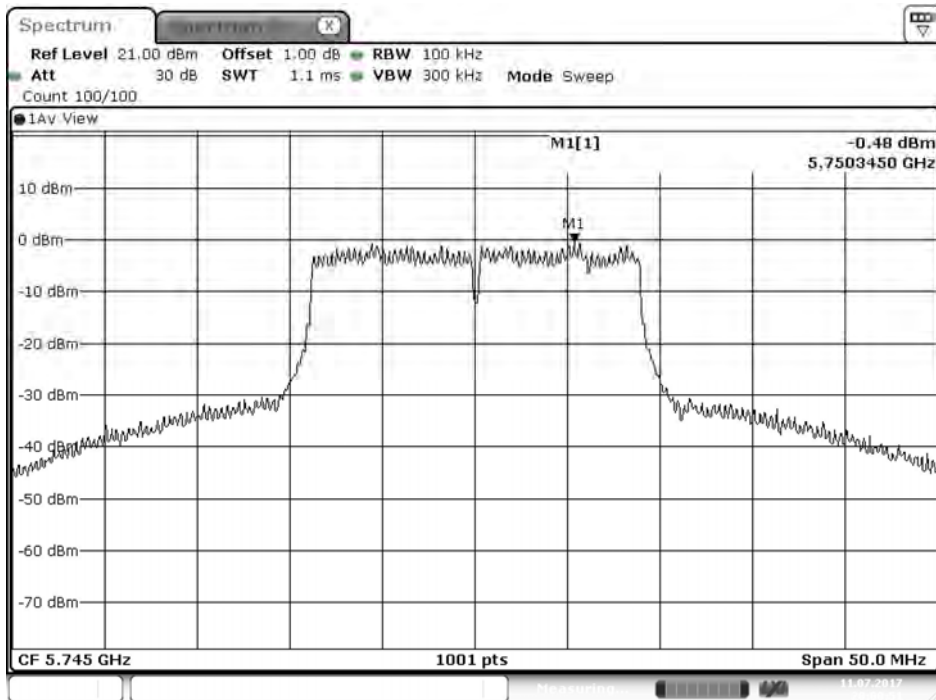
Date: 11.JUL.2017 19:26:38

Channel 48 – Chain A



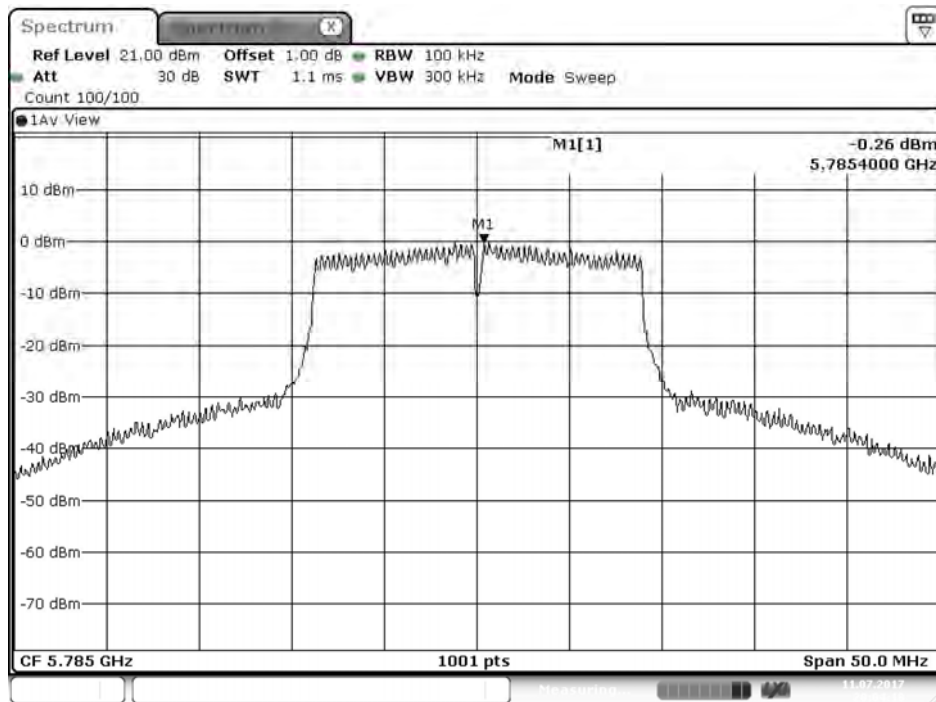
Date: 11.JUL.2017 19:30:08

.Channel 149 – Chain A



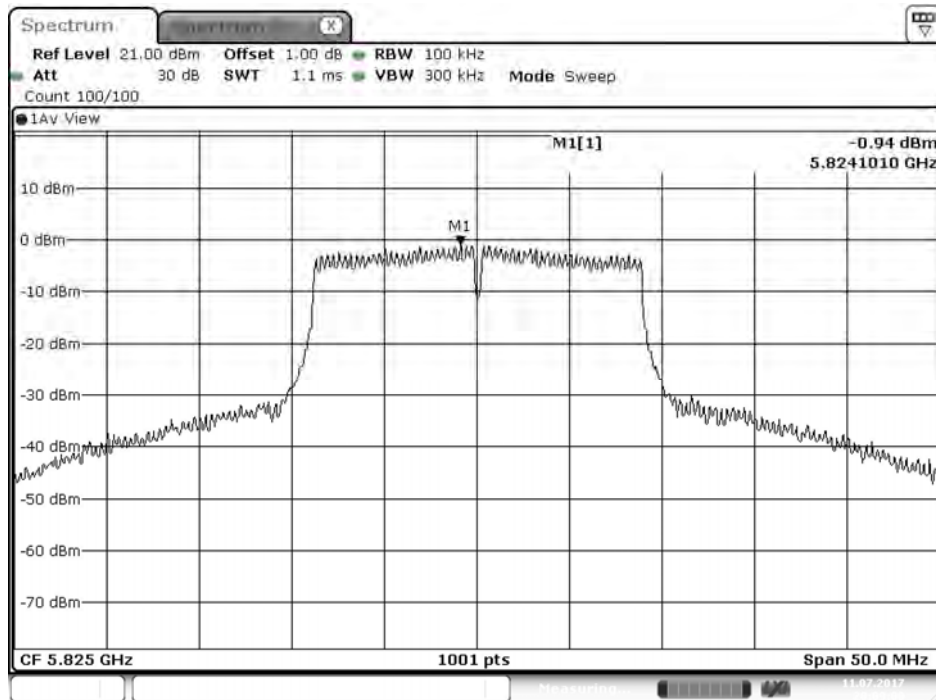
Date: 11.JUL.2017 20:00:52

Channel 157 – Chain A



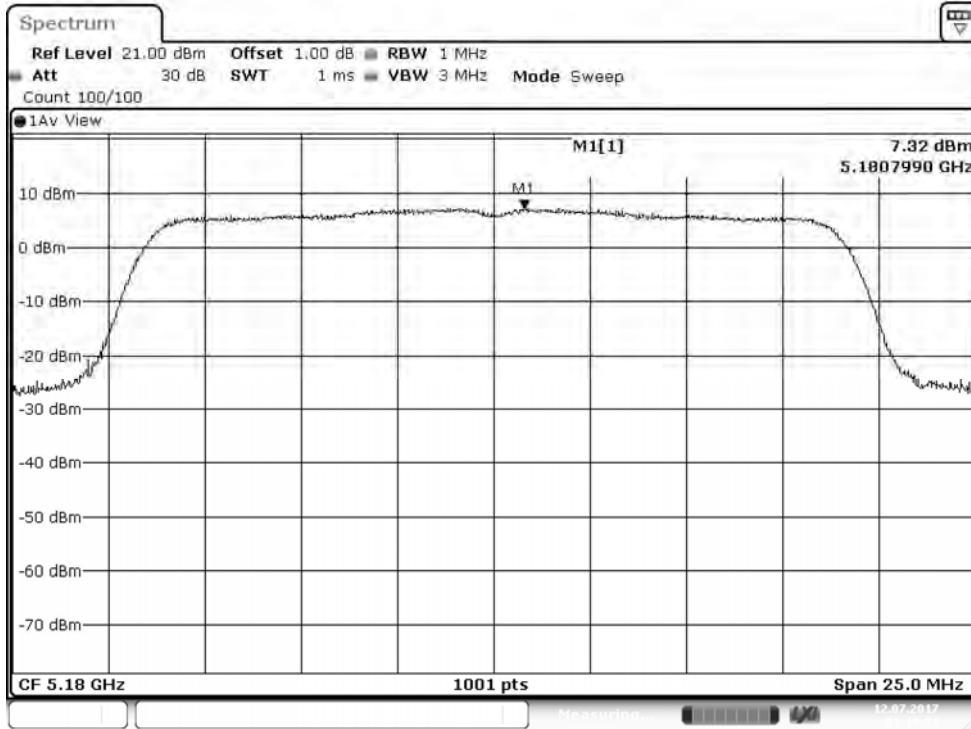
Date: 11.JUL.2017 20:04:19

Channel 165 – Chain A

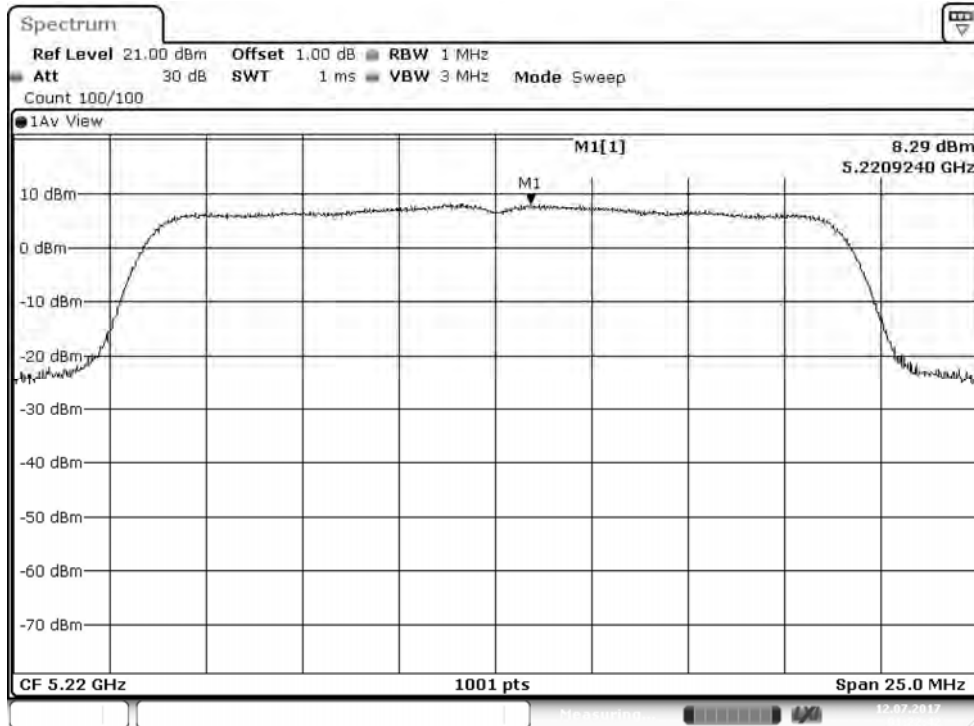


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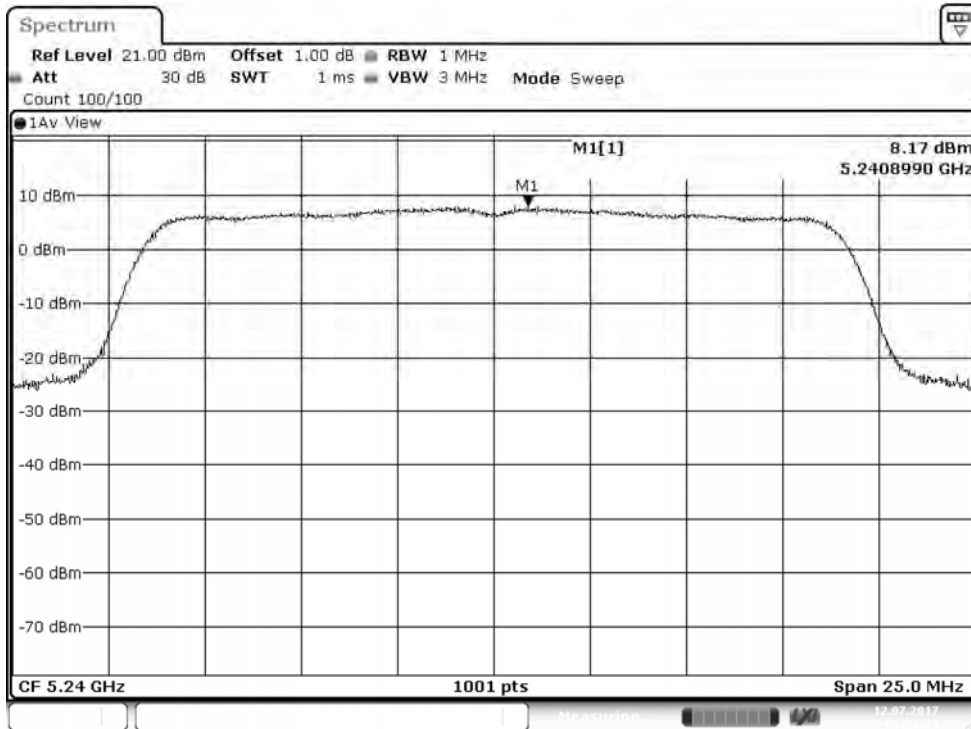
Channel 36 – Chain B



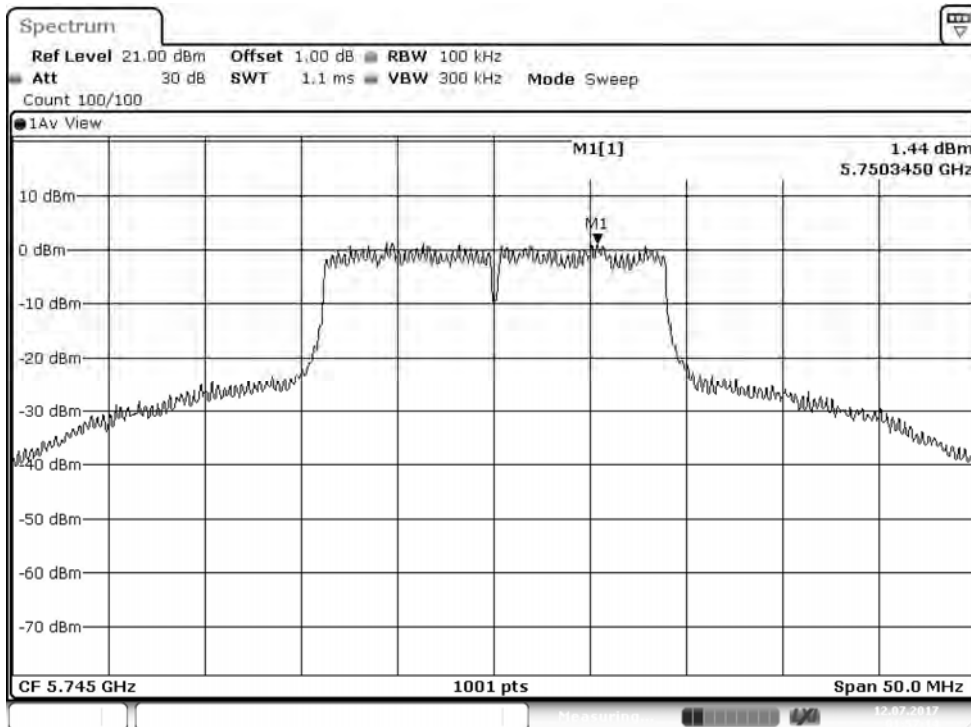
Channel 44 – Chain B



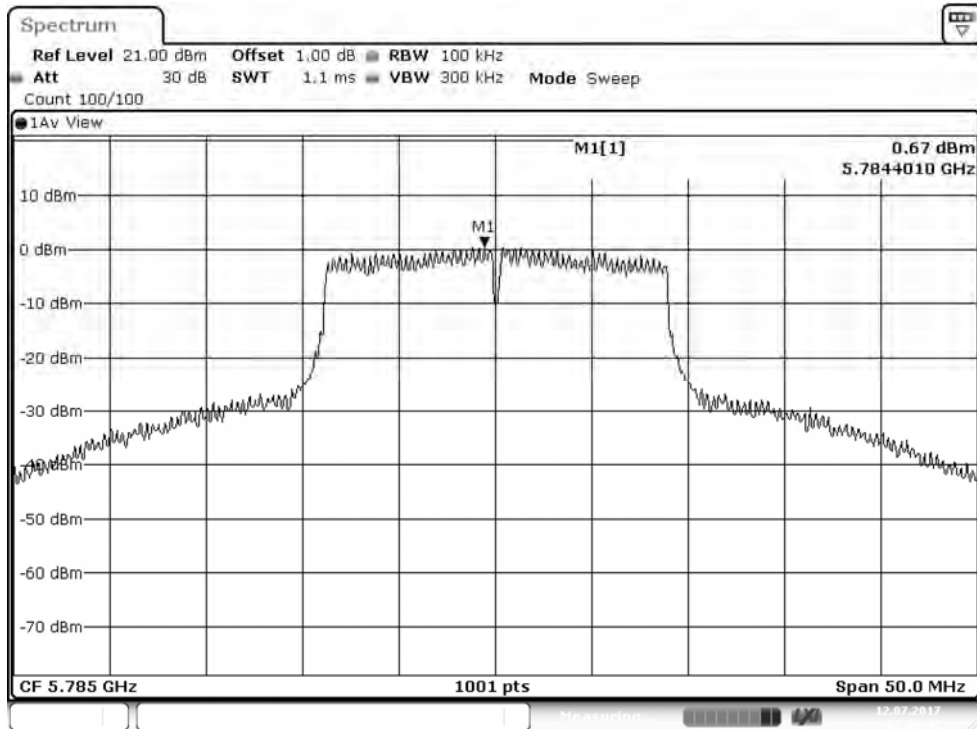
Channel 48 – Chain B



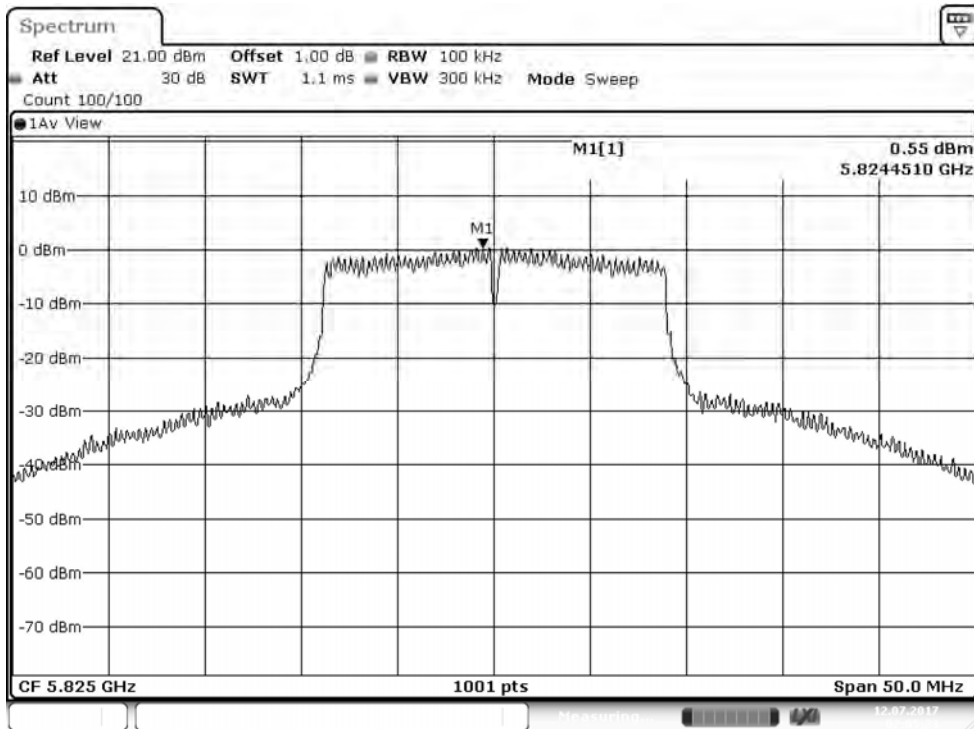
Channel 149 – Chain B



Channel 157 – Chain B



Channel 165 – Chain B



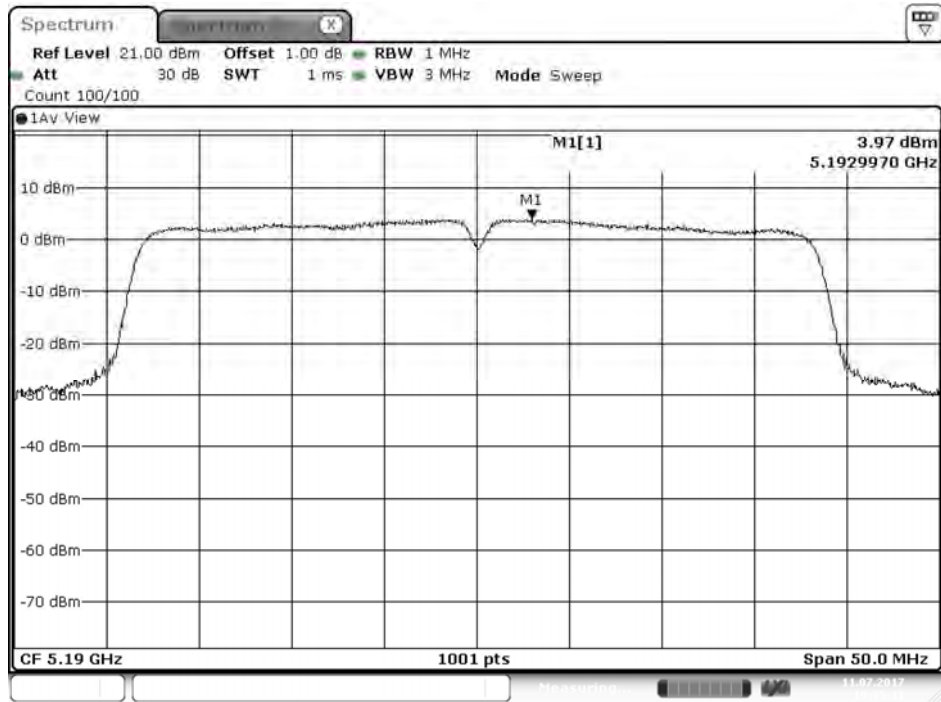
Product : G.hn Powerline Wireless Extender
 Test Item : Peak Power Spectral Density
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps)

Channel Number	Frequency (MHz)	Chain	PPSD (dBm)	Total PPSD (dBm) ¹	Required Limit (dBm)	Result
38	5190	A	3.970	6.980	17	Pass
		B	5.470	8.480	17	Pass
46	5230	A	3.630	6.640	17	Pass
		B	5.260	8.270	17	Pass

Channel Number	Frequency (MHz)	Chain	PPSD (dBm)	BWCF (dB)	Total PPSD (dBm) ¹	Required Limit (dBm)	Result
151	5755	A	-4.060	6.980	5.930	<30	Pass
		B	-1.660	6.980	8.330	<30	Pass
159	5795	A	-2.470	6.980	7.520	<30	Pass
		B	-2.340	6.980	7.650	<30	Pass

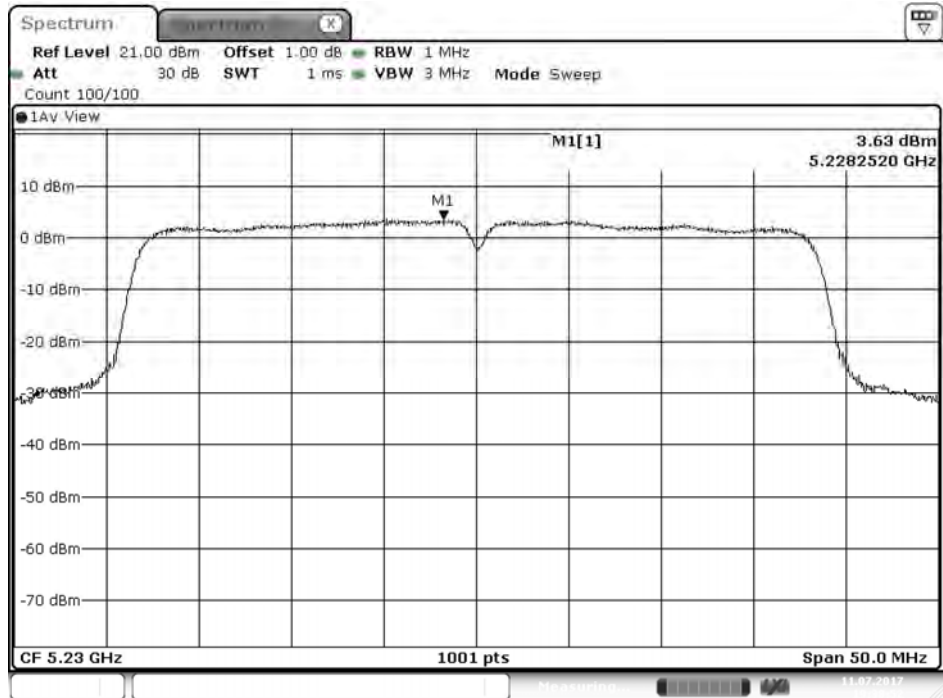
Note 1: The quantity $10 \cdot \log 2$ (two antennas) is added to the spectrum peak value according to document 662911 D01.

Channel 38 – Chain A



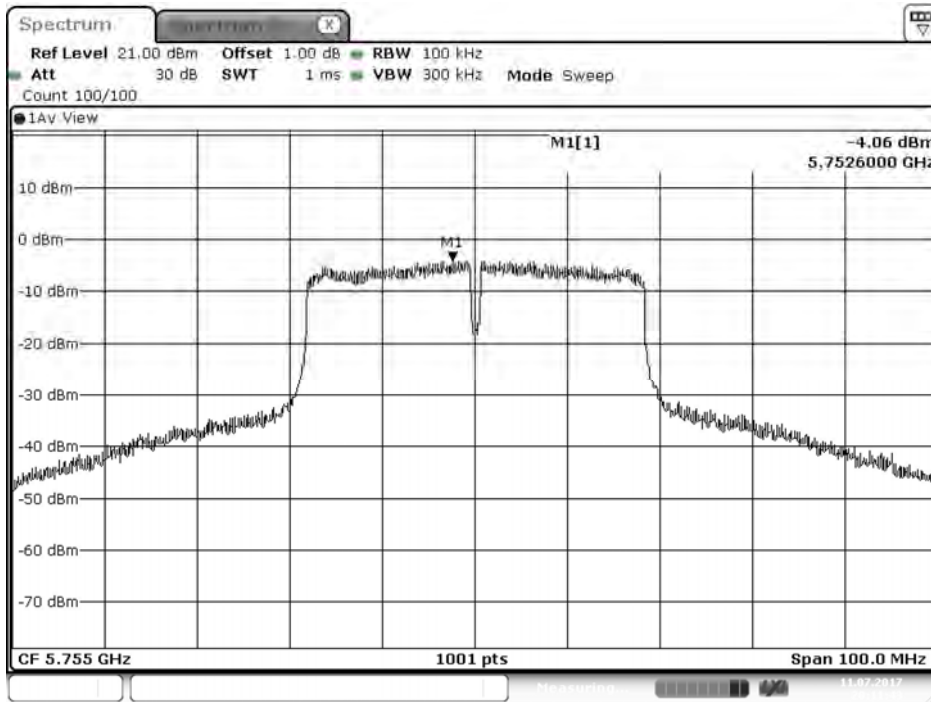
Date: 11.JUL.2017 19:35:11

Channel 46 – Chain A



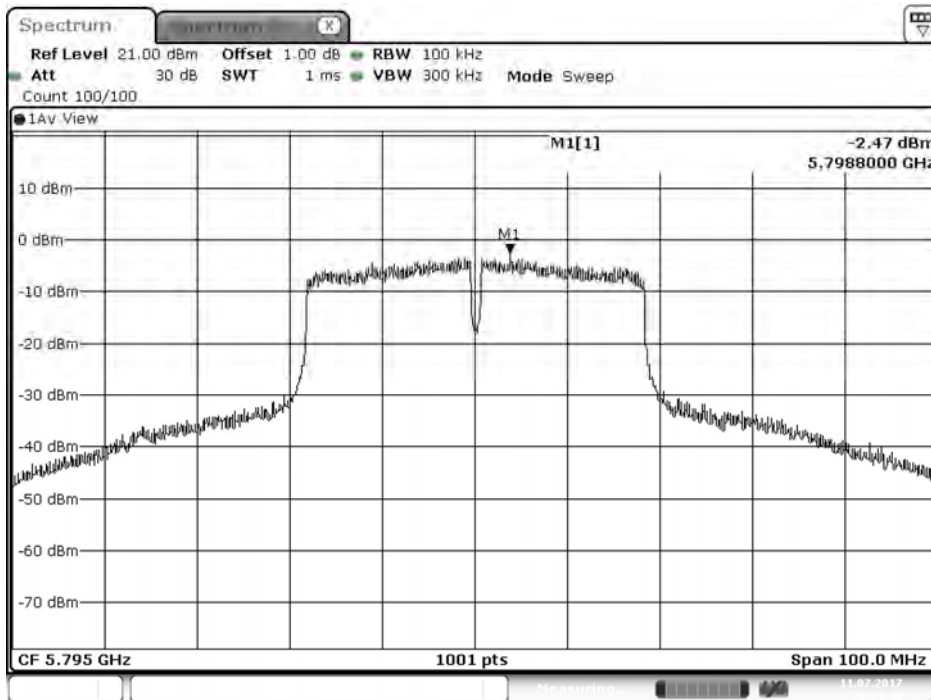
Date: 11.JUL.2017 19:38:53

Channel 151 – Chain A



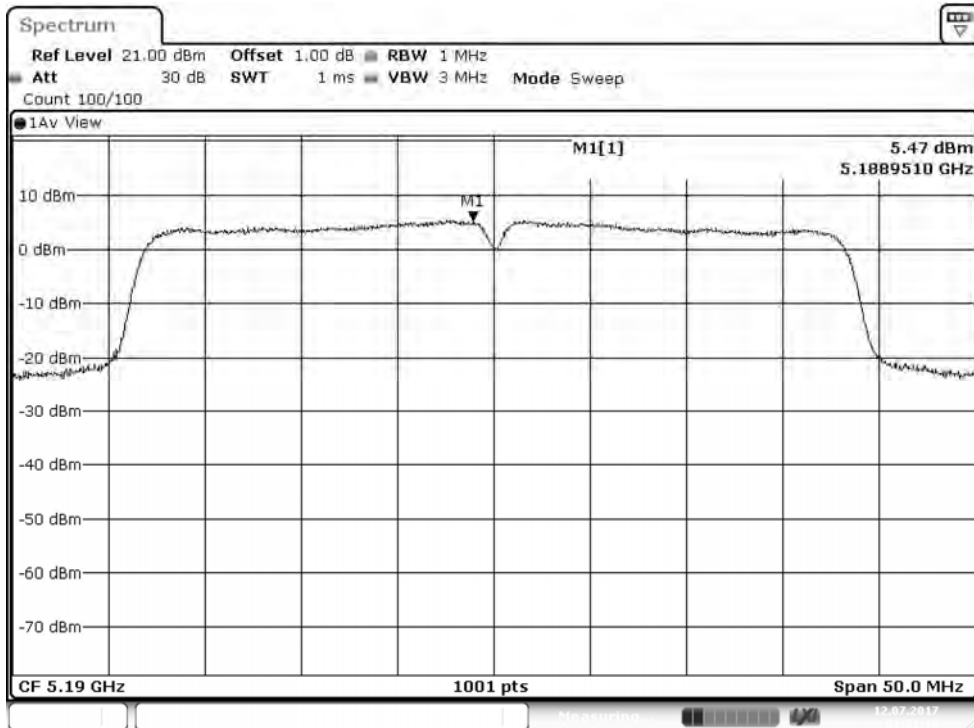
Date: 11.JUL.2017 20:11:44

Channel 159 – Chain A

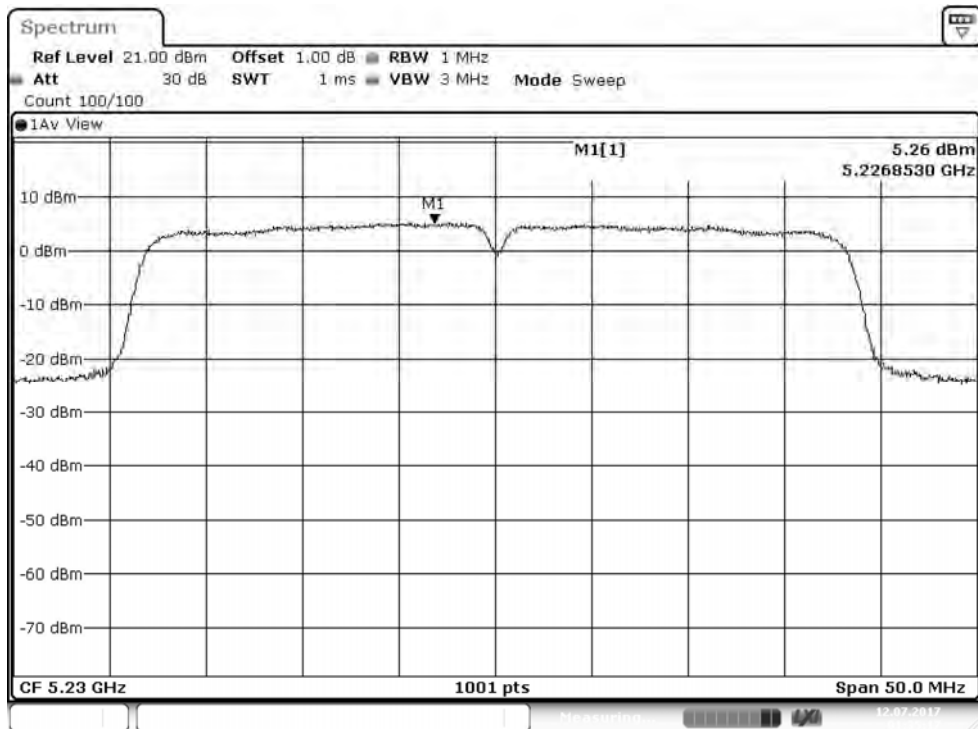


Date: 11.JUL.2017 20:14:47

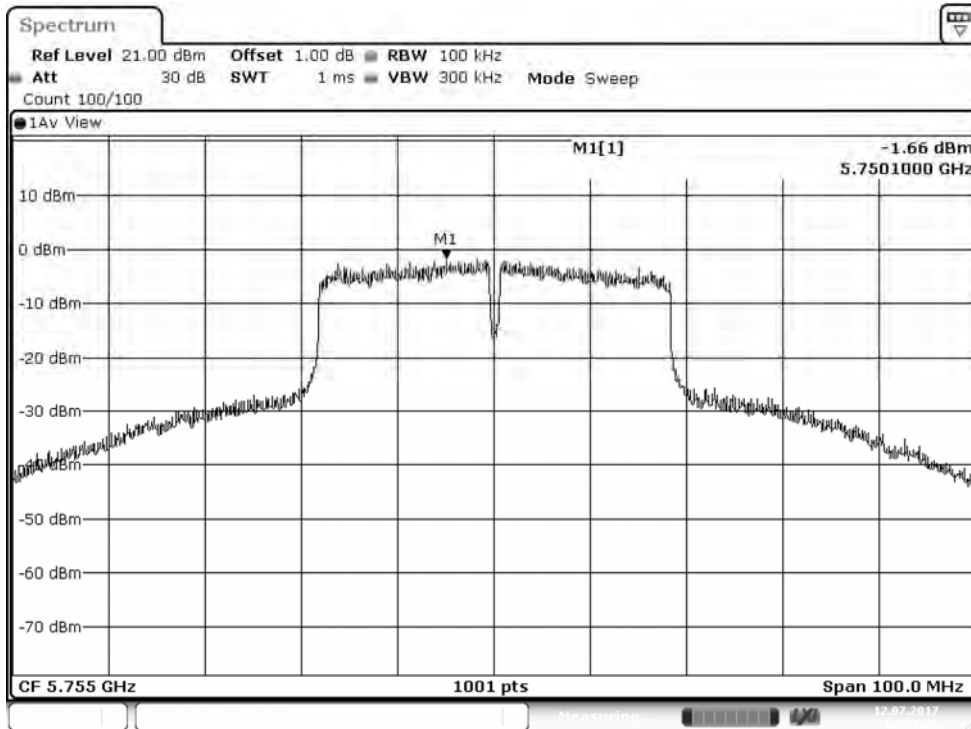
Channel 38 – Chain B



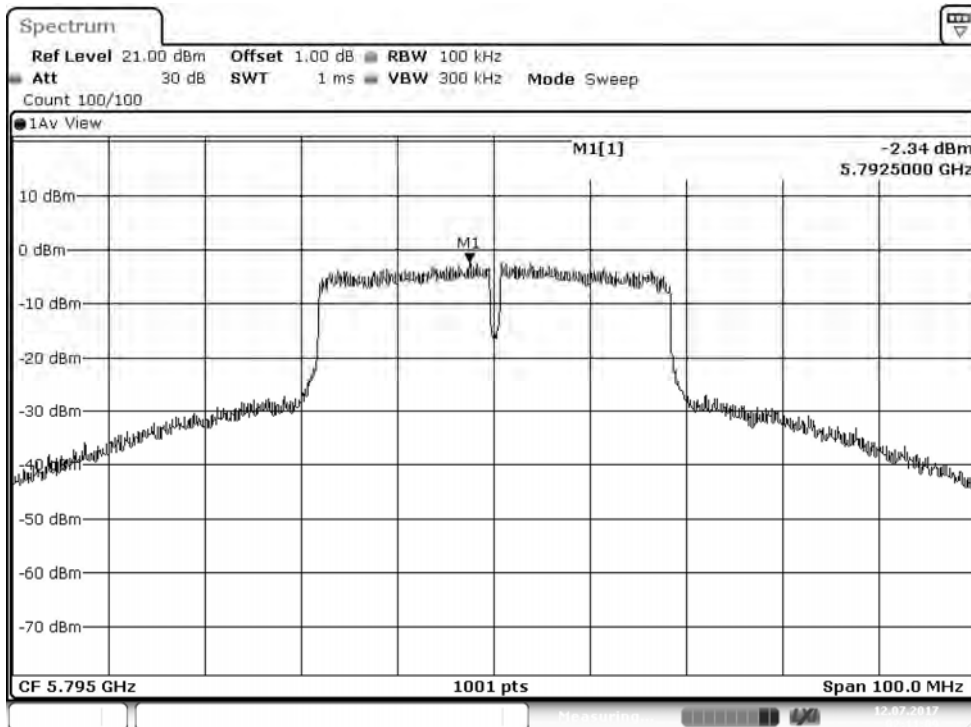
Channel 46 – Chain B



Channel 151 – Chain B



Channel 159 – Chain B



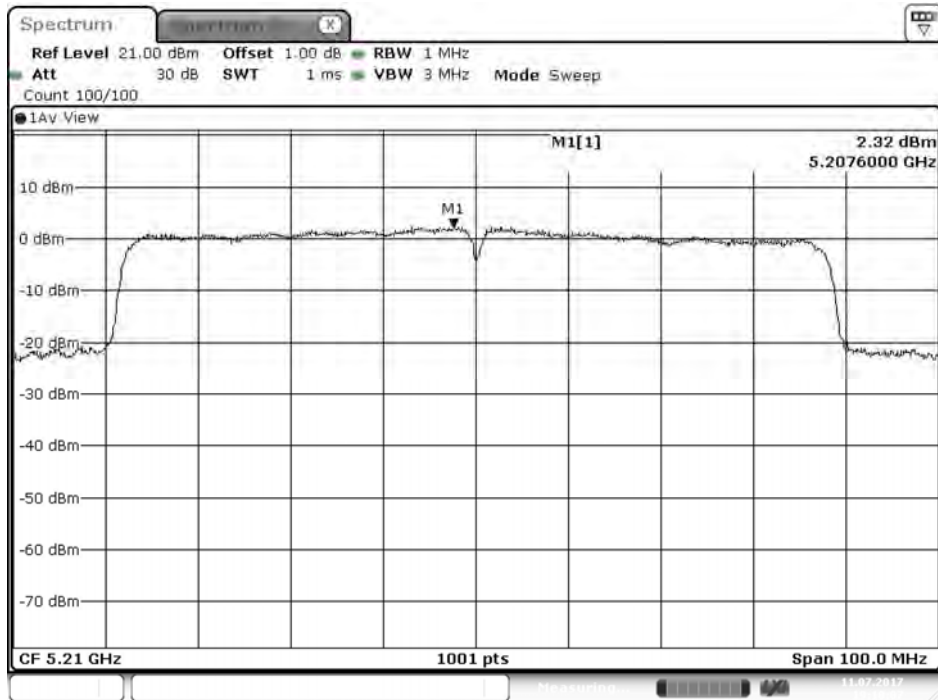
Product : G.hn Powerline Wireless Extender
 Test Item : Peak Power Spectral Density
 Test Site : No.3 OATS
 Test Mode : Mode 4 Transmit (802.11ac-80BW-65Mbps)

Channel Number	Frequency (MHz)	Chain	PPSD (dBm)	Total PPSD (dBm) ¹	Required Limit (dBm)	Result
42	5210	A	2.320	5.330	17	Pass
		B	1.960	4.970	17	Pass

Channel Number	Frequency (MHz)	Chain	PPSD (dBm)	BWCF (dB)	Total PPSD (dBm) ¹	Required Limit (dBm)	Result
155	5775	A	-5.350	6.98	4.640	<30	Pass
		B	-6.110	6.98	3.880	<30	Pass

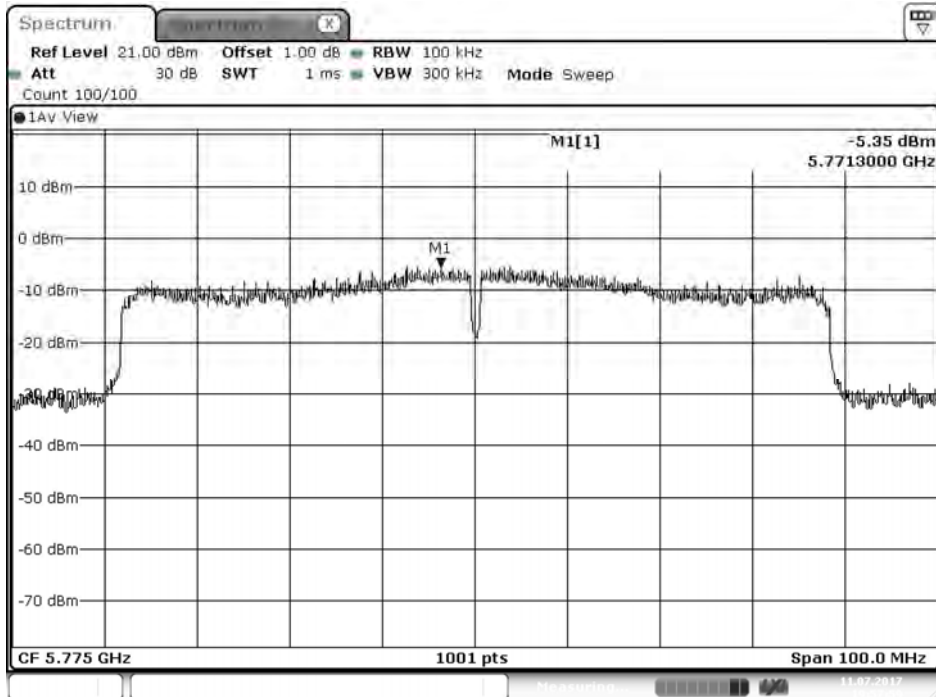
Note 1: The quantity $10 \cdot \log 2$ (two antennas) is added to the spectrum peak value according to document 662911 D01.

Channel 42 – Chain A



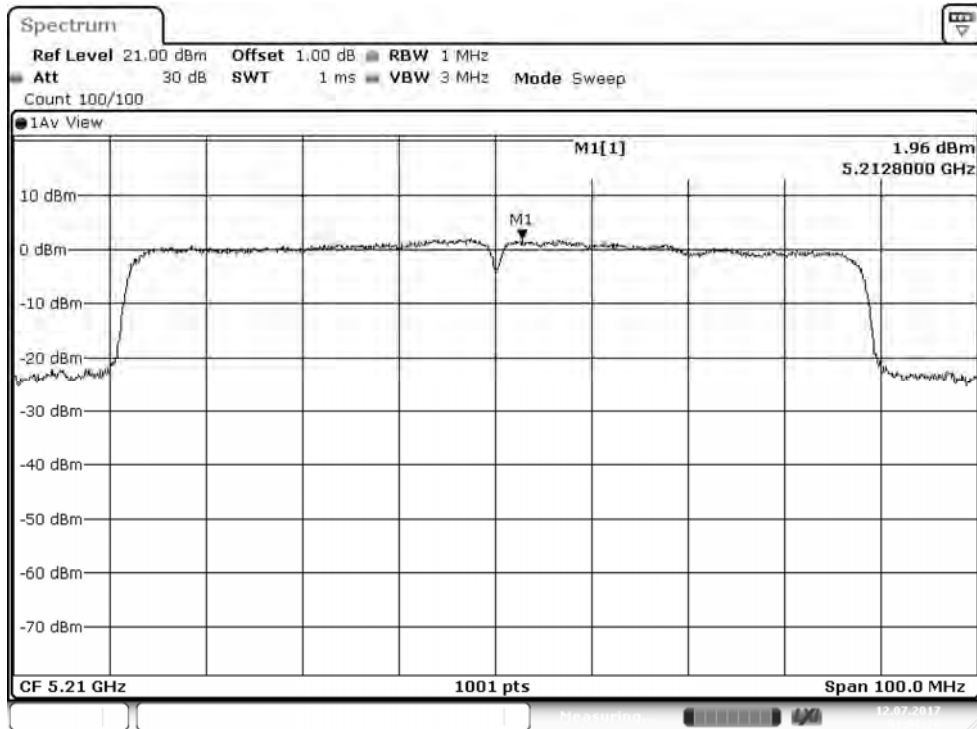
Date: 11.JUL.2017 19:10:08

Channel 155: CHAIN A

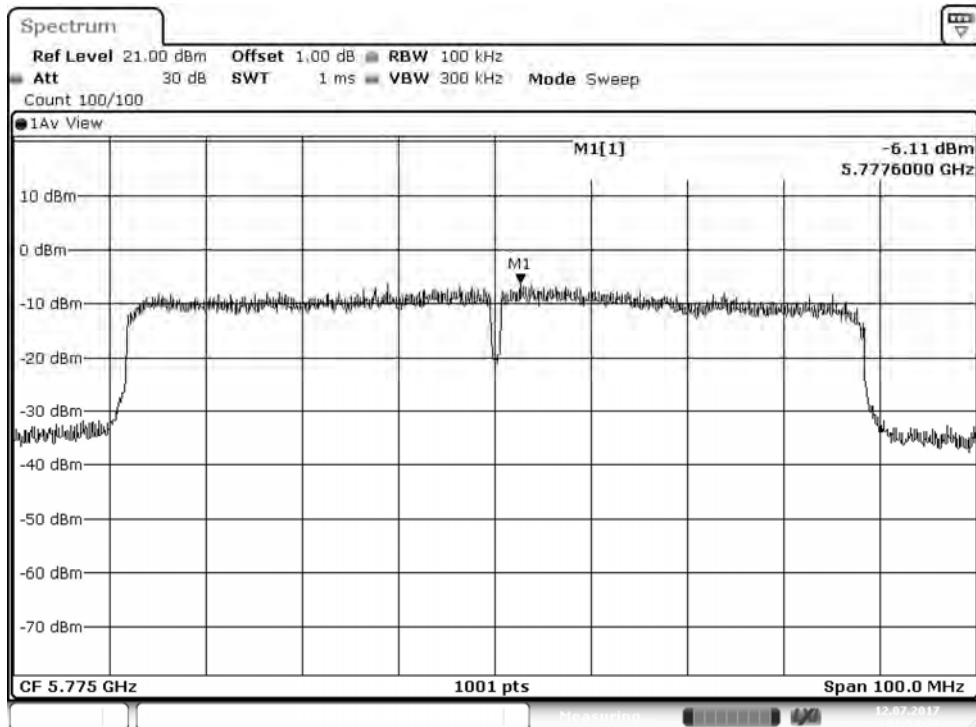


Date: 11.JUL.2017 19:57:59

Channel 42 – Chain B



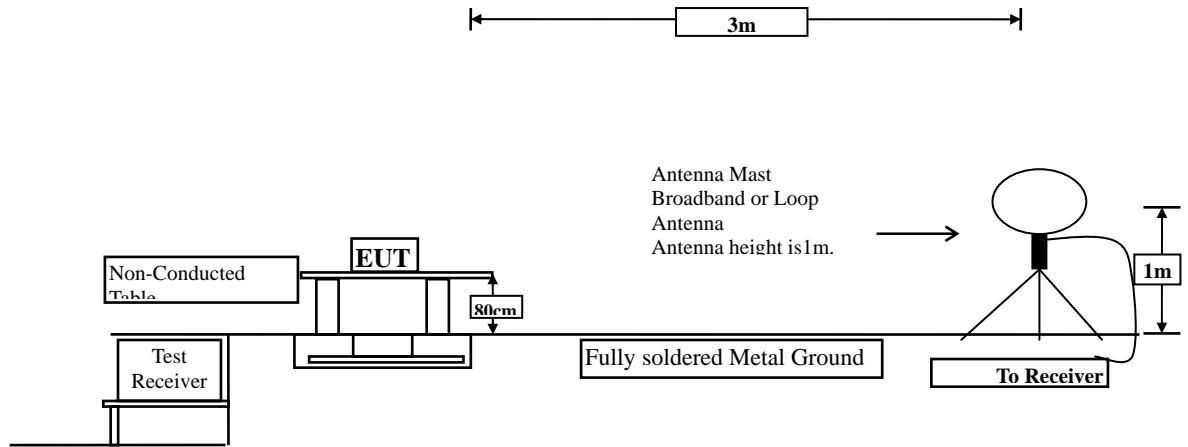
Channel 155: CHAIN B



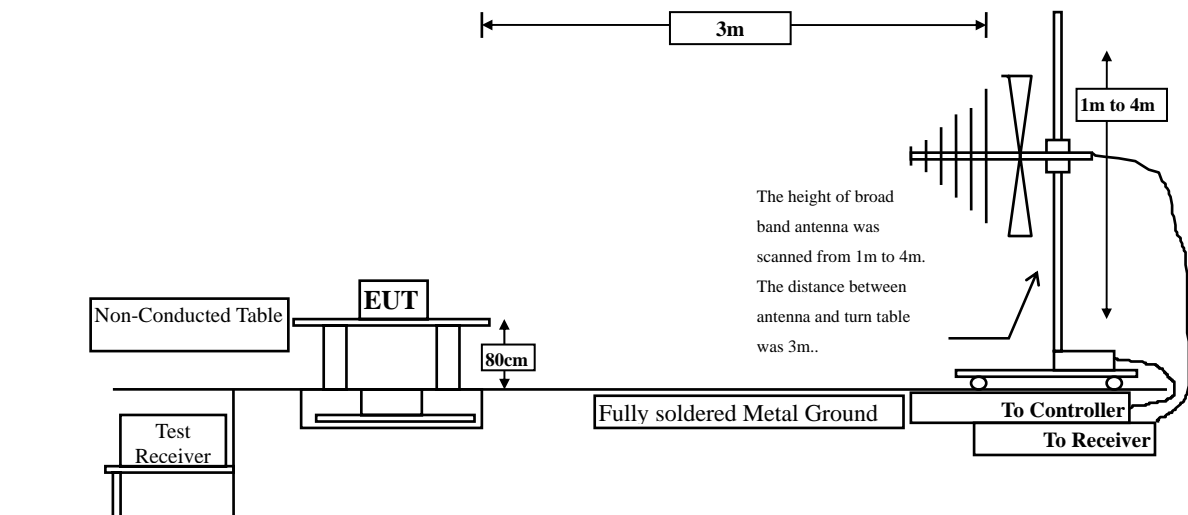
5. Radiated Emission

5.1. Test Setup

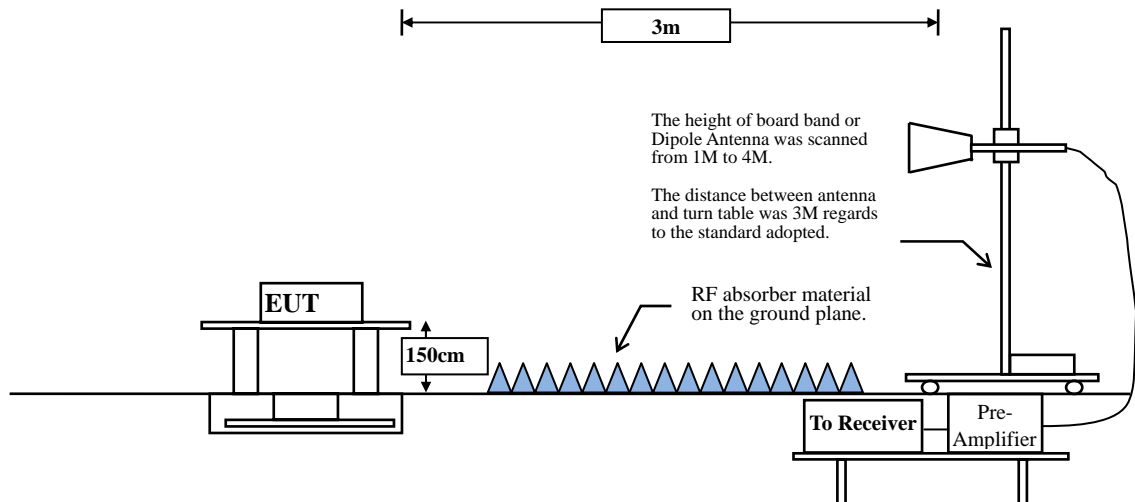
Radiated Emission Under 30MHz



Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



5.2. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209(a) Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remarks: E field strength (dB μ V/m) = 20 log E field strength (uV/m)

5.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested according to FCC KDB-789033 test procedure for compliance to FCC 47CFR 15. 407 requirements.

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground, when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level.

The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The worst radiated emission is measured in the Open Area Test Site on the Final Measurement.

The measurement frequency range from 9kHz - 10th Harmonic of fundamental was investigated.

The average measurement tested according to KDB 789033 section H)6)d) Method VB (Averaging using reduced video bandwidth).

VBW \geq 1/T:

Mode	Duty Cycle	T	1/T	VBW Setting
802.11a	0.882	1.41 ms	707 Hz	1 KHz
802.11n-20	0.876	1.32 ms	754 Hz	1 KHz
802.11n-40	0.780	0.66 ms	1499 Hz	2 KHz
802.11ac-80	0.644	0.34 ms	2936 Hz	3 KHz

5.4. Uncertainty

Horizontal polarization :

30-300MHz: \pm 4.08dB ; 300M-1GHz: \pm 3.86dB ; 1-18GHz: \pm 3.77dB ; 18-40GHz: \pm 3.98dB

Vertical polarization :

30-300MHz: \pm 4.81dB ; 300M-1GHz: \pm 3.87dB ; 1-18GHz : \pm 3.83dB ; 18-40GHz: \pm 3.98dB

5.5. Test Result of Radiated Emission

Product : G.hn Powerline Wireless Extender
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2017/07/18
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5180MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
10360.000	0.102	67.090	67.192	-6.808	74.000
Average Detector:					
10360.000	0.102	53.330	53.432	-0.568	54.000
Vertical					
Peak Detector:					
10360.000	0.102	68.567	68.669	-5.331	74.000
Average Detector:					
10360.000	0.102	53.807	53.909	-0.091	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 1kHz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : G.hn Powerline Wireless Extender
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2017/07/18
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5220MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
10440.000	0.149	66.820	66.969	-7.031	74.000
Average Detector:					
10440.000	0.149	52.280	52.429	-1.571	54.000
Vertical					
Peak Detector:					
10440.000	0.149	67.243	67.392	-6.608	74.000
Average Detector:					
10440.000	0.149	53.763	53.912	-0.088	54.000

Note:

- All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- Average measurements: RBW = 1MHz, VBW = 1kHz, Sweep: Auto.
- Measurement Level = Reading Level + Correct Factor.
- Correct Factor = Antenna factor + Cable loss – Amplifier gain.
- The average measurement was not performed when the peak measured data under the limit of average detection.
- The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : G.hn Powerline Wireless Extender
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2017/07/18
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5240MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
10480.000	0.181	64.090	64.270	-9.730	74.000
Average Detector:					
10480.000	0.181	50.050	50.230	-3.770	54.000
Vertical					
Peak Detector:					
10480.000	0.181	68.005	68.185	-5.815	74.000
Average Detector:					
10480.000	0.181	53.585	53.765	-0.235	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 1kHz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : G.hn Powerline Wireless Extender
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2017/07/18
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5745MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
11490.000	1.619	64.380	65.999	-8.001	74.000
Average Detector:					
11490.000	1.619	51.380	52.999	-1.001	54.000
Vertical					
Peak Detector:					
11490.000	1.619	65.879	67.498	-6.502	74.000
Average Detector:					
11490.000	1.619	51.899	53.518	-0.482	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 1kHz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : G.hn Powerline Wireless Extender
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2017/07/18
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5785MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
11570.000	1.728	65.290	67.018	-6.982	74.000
Average Detector:					
11570.000	1.728	51.420	53.148	-0.852	54.000
Vertical					
Peak Detector:					
11570.000	1.728	64.562	66.290	-7.710	74.000
Average Detector:					
11570.000	1.728	50.392	52.120	-1.880	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 1kHz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : G.hn Powerline Wireless Extender
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2017/07/18
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5825MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
11650.000	1.846	66.260	68.106	-5.894	74.000
Average Detector:					
11650.000	1.846	51.940	53.786	-0.214	54.000
Vertical					
Peak Detector:					
11650.000	1.846	65.830	67.676	-6.324	74.000
Average Detector:					
11650.000	1.846	50.520	52.366	-1.634	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 1kHz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : G.hn Powerline Wireless Extender
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2017/07/18
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5180MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
10360.000	0.102	64.630	64.732	-9.268	74.000
Average Detector:					
10360.000	0.102	49.860	49.962	-4.038	54.000
Vertical					
Peak Detector:					
10360.000	0.102	70.467	70.569	-3.431	74.000
Average Detector:					
10360.000	0.102	53.807	53.909	-0.091	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 1kHz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : G.hn Powerline Wireless Extender
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2017/07/18
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5220MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
10440.000	0.149	67.180	67.329	-6.671	74.000
Average Detector:					
10440.000	0.149	51.890	52.039	-1.961	54.000
Vertical					
Peak Detector:					
10440.000	0.149	68.943	69.092	-4.908	74.000
Average Detector:					
10440.000	0.149	53.783	53.932	-0.068	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 1kHz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : G.hn Powerline Wireless Extender
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2017/07/18
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5240MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
10480.000	0.181	63.030	63.210	-10.790	74.000
Average Detector:					
10480.000	0.181	47.530	47.710	-6.290	54.000
Vertical					
Peak Detector:					
10480.000	0.181	70.455	70.635	-3.365	74.000
Average Detector:					
10480.000	0.181	53.755	53.935	-0.065	54.000

Note:

- All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- Average measurements: RBW = 1MHz, VBW = 1kHz, Sweep: Auto.
- Measurement Level = Reading Level + Correct Factor.
- Correct Factor = Antenna factor + Cable loss – Amplifier gain.
- The average measurement was not performed when the peak measured data under the limit of average detection.
- The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : G.hn Powerline Wireless Extender
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2017/07/18
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5745MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
11490.000	1.619	64.550	66.169	-7.831	74.000
Average Detector:					
11490.000	1.619	51.210	52.829	-1.171	54.000
Vertical					
Peak Detector:					
11490.000	1.619	63.565	65.184	-8.816	74.000
Average Detector:					
11490.000	1.619	51.559	53.178	-0.822	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 1kHz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : G.hn Powerline Wireless Extender
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2017/07/18
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5785MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
11570.000	1.728	64.940	66.668	-7.332	74.000
Average Detector:					
11570.000	1.728	51.170	52.898	-1.102	54.000
Vertical					
Peak Detector:					
11570.000	1.728	66.432	68.160	-5.840	74.000
Average Detector:					
11570.000	1.728	51.772	53.500	-0.500	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 1kHz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : G.hn Powerline Wireless Extender
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2017/07/18
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5825MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
11650.000	1.846	65.340	67.186	-6.814	74.000
Average Detector:					
11650.000	1.846	51.560	53.406	-0.594	54.000
Vertical					
Peak Detector:					
11650.000	1.846	64.860	66.706	-7.294	74.000
Average Detector:					
11650.000	1.846	50.120	51.966	-2.034	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 1kHz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : G.hn Powerline Wireless Extender
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2017/07/18
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5190MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
10380.000	0.131	64.450	64.581	-9.419	74.000
Average Detector:					
10380.000	0.131	52.180	52.311	-1.689	54.000
Vertical					
Peak Detector:					
4726.950	-6.171	58.654	52.483	-21.517	74.000
10380.000	0.131	64.616	64.747	-9.253	74.000
Average Detector:					
10380.000	0.131	53.836	53.967	-0.033	54.000

Note:

- All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- Average measurements: RBW = 1MHz, VBW = 2kHz, Sweep: Auto.
- Measurement Level = Reading Level + Correct Factor.
- Correct Factor = Antenna factor + Cable loss – Amplifier gain.
- The average measurement was not performed when the peak measured data under the limit of average detection.
- The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : G.hn Powerline Wireless Extender
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2017/07/18
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5230MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
10460.000	0.150	61.920	62.070	-11.930	74.000
Average Detector:					
10460.000	0.150	52.120	52.270	-1.730	54.000
Vertical					
Peak Detector:					
4767.180	-6.139	60.095	53.956	-20.044	74.000
10460.000	0.150	67.457	67.607	-6.393	74.000
Average Detector:					
10460.000	0.150	53.387	53.537	-0.463	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 2kHz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : G.hn Powerline Wireless Extender
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2017/07/18
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5755MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
11510.000	1.620	62.030	63.651	-10.349	74.000
Average Detector:					
11510.000	1.620	50.890	52.511	-1.489	54.000
Vertical					
Peak Detector:					
1762.930	-11.117	79.206	68.090	-5.910	74.000
11510.000	1.620	63.443	65.064	-8.936	74.000
Average Detector:					
1762.930	-11.117	64.946	53.830	-0.170	54.000
11510.000	1.620	50.383	52.004	-1.996	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 2kHz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : G.hn Powerline Wireless Extender
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2017/07/18
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5795MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
11590.000	1.753	62.816	64.569	-9.431	74.000
Average Detector:					
11590.000	1.753	48.896	50.649	-3.351	54.000
Vertical					
Peak Detector:					
11590.000	1.753	63.690	65.443	-8.557	74.000
Average Detector:					
11590.000	1.753	50.450	52.203	-1.797	54.000

Note:

- All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- Average measurements: RBW = 1MHz, VBW = 2kHz, Sweep: Auto.
- Measurement Level = Reading Level + Correct Factor.
- Correct Factor = Antenna factor + Cable loss – Amplifier gain.
- The average measurement was not performed when the peak measured data under the limit of average detection.
- The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : G.hn Powerline Wireless Extender
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2017/07/18
 Test Mode : Mode 4 Transmit (802.11ac-80BW-65Mbps) (5210MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
10420.000	0.107	59.890	59.997	-14.003	74.000
Average Detector:					
10420.000	0.107	52.190	52.297	-1.703	54.000
Vertical					
Peak Detector:					
4731.600	-6.166	66.883	60.717	-13.283	74.000
10420.000	0.107	61.600	61.707	-12.293	74.000
Average Detector:					
4731.600	-6.166	57.023	50.857	-3.143	54.000
10420.000	0.107	48.611	48.718	-5.282	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 3kHz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : G.hn Powerline Wireless Extender
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2017/07/18
 Test Mode : Mode 4 Transmit (802.11ac-80BW-65Mbps) (5775MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
11550.000	1.718	60.920	62.638	-11.362	74.000
Average Detector:					
11550.000	1.718	50.400	52.118	-1.882	54.000
Vertical					
Peak Detector:					
1351.800	-12.906	62.840	49.934	-24.066	74.000
11550.000	1.718	62.760	64.478	-9.522	74.000
Average Detector:					
11550.000	1.718	50.470	52.188	-1.812	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 3kHz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : G.hn Powerline Wireless Extender
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2017/07/12
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5220MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector					
124.188	-12.662	44.422	31.761	-11.739	43.500
290.072	-10.298	43.949	33.651	-12.349	46.000
337.870	-9.245	50.526	41.281	-4.719	46.000
374.420	-8.297	54.013	45.716	-0.284	46.000
717.435	-1.689	29.857	28.169	-17.831	46.000
874.884	0.235	43.294	43.529	-2.471	46.000
Vertical					
Peak Detector					
37.029	-11.511	51.122	39.612	-0.388	40.000
193.072	-13.561	42.654	29.094	-14.406	43.500
374.420	-8.297	48.977	40.680	-5.320	46.000
531.870	-4.903	37.104	32.202	-13.798	46.000
676.667	-2.389	35.185	32.796	-13.204	46.000
874.884	0.235	35.245	35.480	-10.520	46.000

Note:

- All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- Average measurements: RBW = 1MHz, VBW = 1kHz, Sweep: Auto.
- Measurement Level = Reading Level + Correct Factor.
- Correct Factor = Antenna factor + Cable loss – Amplifier gain.
- The average measurement was not performed when the peak measured data under the limit of average detection.
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- No emission found between lowest internal used/generated frequency to 30MHz.

Product : G.hn Powerline Wireless Extender
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2017/07/12
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5785MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector					
124.188	-12.662	44.422	31.761	-11.739	43.500
337.870	-9.245	50.921	41.676	-4.324	46.000
374.420	-8.297	53.913	45.616	-0.384	46.000
531.870	-4.903	32.420	27.518	-18.482	46.000
730.087	-1.510	35.850	34.339	-11.661	46.000
874.884	0.235	43.294	43.529	-2.471	46.000
Vertical					
Peak Detector					
41.246	-11.085	49.942	38.857	-1.143	40.000
290.072	-10.298	41.779	31.481	-14.519	46.000
374.420	-8.297	48.977	40.680	-5.320	46.000
579.667	-3.816	33.746	29.930	-16.070	46.000
746.957	-1.285	38.437	37.152	-8.848	46.000
874.884	0.235	35.245	35.480	-10.520	46.000

Note:

- All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- Average measurements: RBW = 1MHz, VBW = 1kHz, Sweep: Auto.
- Measurement Level = Reading Level + Correct Factor.
- Correct Factor = Antenna factor + Cable loss – Amplifier gain.
- The average measurement was not performed when the peak measured data under the limit of average detection.
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- No emission found between lowest internal used/generated frequency to 30MHz.

Product : G.hn Powerline Wireless Extender
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2017/07/12
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5220MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector					
96.072	-16.475	39.454	22.979	-20.521	43.500
290.072	-10.298	45.395	35.097	-10.903	46.000
374.420	-8.297	54.013	45.716	-0.284	46.000
576.855	-3.884	29.945	26.061	-19.939	46.000
759.609	-1.130	29.259	28.130	-17.870	46.000
879.101	0.286	29.041	29.327	-16.673	46.000
Vertical					
Peak Detector					
41.246	-11.085	50.342	39.257	-0.743	40.000
374.420	-8.297	48.977	40.680	-5.320	46.000
482.667	-5.847	45.030	39.183	-6.817	46.000
624.652	-3.141	39.610	36.469	-9.531	46.000
749.768	-1.247	37.395	36.148	-9.852	46.000
874.884	0.235	35.245	35.480	-10.520	46.000

Note:

- All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- Average measurements: RBW = 1MHz, VBW = 1kHz, Sweep: Auto.
- Measurement Level = Reading Level + Correct Factor.
- Correct Factor = Antenna factor + Cable loss – Amplifier gain.
- The average measurement was not performed when the peak measured data under the limit of average detection.
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- No emission found between lowest internal used/generated frequency to 30MHz.

Product : G.hn Powerline Wireless Extender
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2017/07/12
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5785MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector					
124.188	-12.662	44.422	31.761	-11.739	43.500
232.435	-12.508	33.614	21.107	-24.893	46.000
332.246	-9.369	45.512	36.144	-9.856	46.000
374.420	-8.297	53.813	45.516	-0.484	46.000
773.667	-0.965	37.816	36.851	-9.149	46.000
874.884	0.235	43.294	43.529	-2.471	46.000
Vertical					
Peak Detector					
41.246	-11.085	49.742	38.657	-1.343	40.000
337.870	-9.245	47.619	38.374	-7.626	46.000
482.667	-5.847	45.030	39.183	-6.817	46.000
628.870	-3.104	35.958	32.854	-13.146	46.000
746.957	-1.285	38.437	37.152	-8.848	46.000
859.420	0.052	28.748	28.801	-17.199	46.000

Note:

- All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- Average measurements: RBW = 1MHz, VBW = 1kHz, Sweep: Auto.
- Measurement Level = Reading Level + Correct Factor.
- Correct Factor = Antenna factor + Cable loss – Amplifier gain.
- The average measurement was not performed when the peak measured data under the limit of average detection.
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- No emission found between lowest internal used/generated frequency to 30MHz.

Product : G.hn Powerline Wireless Extender
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2017/07/12
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5190MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector					
142.464	-11.007	29.466	18.459	-25.041	43.500
285.855	-10.393	39.809	29.416	-16.584	46.000
337.870	-9.245	53.028	43.783	-2.217	46.000
374.420	-8.297	54.013	45.716	-0.284	46.000
649.957	-2.922	33.154	30.231	-15.769	46.000
876.290	0.251	40.568	40.820	-5.180	46.000
Vertical					
Peak Detector					
37.029	-11.511	51.480	39.970	-0.030	40.000
193.072	-13.561	42.654	29.094	-14.406	43.500
374.420	-8.297	48.977	40.680	-5.320	46.000
531.870	-4.903	37.778	32.876	-13.124	46.000
746.957	-1.285	38.437	37.152	-8.848	46.000
874.884	0.235	35.245	35.480	-10.520	46.000

Note:

- All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- Average measurements: RBW = 1MHz, VBW = 2kHz, Sweep: Auto.
- Measurement Level = Reading Level + Correct Factor.
- Correct Factor = Antenna factor + Cable loss – Amplifier gain.
- The average measurement was not performed when the peak measured data under the limit of average detection.
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- No emission found between lowest internal used/generated frequency to 30MHz.

Product : G.hn Powerline Wireless Extender
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2017/07/12
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5755MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector					
124.188	-12.662	44.422	31.761	-11.739	43.500
337.870	-9.245	53.028	43.783	-2.217	46.000
374.420	-8.297	53.913	45.616	-0.384	46.000
482.667	-5.847	41.607	35.760	-10.240	46.000
749.768	-1.247	36.133	34.886	-11.114	46.000
950.797	1.095	34.158	35.253	-10.747	46.000
Vertical					
Peak Detector					
37.029	-11.511	51.480	39.970	-0.030	40.000
337.870	-9.245	47.619	38.374	-7.626	46.000
482.667	-5.847	45.030	39.183	-6.817	46.000
649.957	-2.922	37.322	34.399	-11.601	46.000
746.957	-1.285	38.437	37.152	-8.848	46.000
874.884	0.235	35.245	35.480	-10.520	46.000

Note:

- All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- Average measurements: RBW = 1MHz, VBW = 2kHz, Sweep: Auto.
- Measurement Level = Reading Level + Correct Factor.
- Correct Factor = Antenna factor + Cable loss – Amplifier gain.
- The average measurement was not performed when the peak measured data under the limit of average detection.
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- No emission found between lowest internal used/generated frequency to 30MHz.

Product : G.hn Powerline Wireless Extender
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2017/07/18
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5220MHz)_Loop

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector					
8.104	19.870	24.700	44.570	-24.970	69.540
12.221	20.000	20.160	40.160	-29.380	69.540
16.350	20.090	24.700	44.790	-24.750	69.540
18.385	20.070	20.360	40.430	-29.110	69.540
22.643	20.060	21.200	41.260	-28.280	69.540
25.331	20.172	25.190	45.362	-24.178	69.540
Vertical					
Peak Detector					
3.526	19.810	23.900	43.710	-25.830	69.540
10.325	19.930	25.890	45.820	-23.720	69.540
13.654	20.020	36.800	56.820	-12.720	69.540
18.712	20.060	25.490	45.550	-23.990	69.540
23.036	20.076	35.300	55.376	-14.164	69.540
26.352	20.200	26.350	46.550	-22.990	69.540

Note:

- All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- Average measurements: RBW = 1MHz, VBW = 1kHz, Sweep: Auto.
- Measurement Level = Reading Level + Correct Factor.
- Correct Factor = Antenna factor + Cable loss – Amplifier gain.
- The average measurement was not performed when the peak measured data under the limit of average detection.
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- No emission found between lowest internal used/generated frequency to 30MHz.

Product : G.hn Powerline Wireless Extender
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2017/07/18
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5785MHz) _Loop

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector					
4.623	19.890	10.060	29.950	-39.590	69.540
8.788	19.870	23.420	43.290	-26.250	69.540
16.159	20.090	21.190	41.280	-28.260	69.540
23.558	20.110	24.320	44.430	-25.110	69.540
24.115	20.140	22.460	42.600	-26.940	69.540
25.312	20.170	23.610	43.780	-25.760	69.540
Vertical					
Peak Detector					
8.628	19.870	24.680	44.550	-24.990	69.540
13.169	20.020	39.100	59.120	-10.420	69.540
13.457	20.020	39.400	59.420	-10.120	69.540
18.224	20.070	25.710	45.780	-23.760	69.540
22.254	20.040	39.230	59.270	-10.270	69.540
28.065	20.160	24.625	44.785	-24.755	69.540

Note:

- All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- Average measurements: RBW = 1MHz, VBW = 1kHz, Sweep: Auto.
- Measurement Level = Reading Level + Correct Factor.
- Correct Factor = Antenna factor + Cable loss – Amplifier gain.
- The average measurement was not performed when the peak measured data under the limit of average detection.
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- No emission found between lowest internal used/generated frequency to 30MHz.

Product : G.hn Powerline Wireless Extender
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2017/07/18
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5220MHz)_Loop

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector					
8.991	19.870	23.700	43.570	-25.970	69.540
16.470	20.094	21.400	41.494	-28.046	69.540
20.335	20.010	20.540	40.550	-28.990	69.540
23.850	20.130	24.630	44.760	-24.780	69.540
24.113	20.140	22.900	43.040	-26.500	69.540
26.335	20.200	16.980	37.180	-32.360	69.540
Vertical					
Peak Detector					
13.490	20.020	40.110	60.130	-9.410	69.540
13.985	20.020	40.600	60.620	-8.920	69.540
19.326	20.040	20.360	40.400	-29.140	69.540
22.753	20.060	40.030	60.090	-9.450	69.540
24.356	20.150	24.850	45.000	-24.540	69.540
28.111	20.160	25.060	45.220	-24.320	69.540

Note:

- All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- Average measurements: RBW = 1MHz, VBW = 1kHz, Sweep: Auto.
- Measurement Level = Reading Level + Correct Factor.
- Correct Factor = Antenna factor + Cable loss – Amplifier gain.
- The average measurement was not performed when the peak measured data under the limit of average detection.
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- No emission found between lowest internal used/generated frequency to 30MHz.

Product : G.hn Powerline Wireless Extender
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2017/07/18
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5785MHz) _Loop

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector					
8.654	19.870	16.710	36.580	-32.960	69.540
13.167	20.020	21.300	41.320	-28.220	69.540
17.010	20.100	13.700	33.800	-35.740	69.540
22.913	20.070	20.200	40.270	-29.270	69.540
23.030	20.074	23.750	43.824	-25.716	69.540
27.745	20.170	24.621	44.791	-24.749	69.540
Vertical					
Peak Detector					
8.525	19.870	20.570	40.440	-29.100	69.540
13.746	20.020	38.520	58.540	-11.000	69.540
13.951	20.020	39.030	59.050	-10.490	69.540
15.675	20.080	20.650	40.730	-28.810	69.540
23.265	20.090	39.060	59.150	-10.390	69.540
28.159	20.160	24.350	44.510	-25.030	69.540

Note:

- All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- Average measurements: RBW = 1MHz, VBW = 1kHz, Sweep: Auto.
- Measurement Level = Reading Level + Correct Factor.
- Correct Factor = Antenna factor + Cable loss – Amplifier gain.
- The average measurement was not performed when the peak measured data under the limit of average detection.
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- No emission found between lowest internal used/generated frequency to 30MHz.

Product : G.hn Powerline Wireless Extender
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2017/07/18
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5190MHz) _Loop

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector					
7.665	19.880	18.240	38.120	-31.420	69.540
13.540	20.020	22.000	42.020	-27.520	69.540
17.060	20.100	14.500	34.600	-34.940	69.540
22.991	20.070	23.800	43.870	-25.670	69.540
23.450	20.100	21.600	41.700	-27.840	69.540
27.332	20.190	22.740	42.930	-26.610	69.540
Vertical					
Peak Detector					
4.552	19.890	20.650	40.540	-29.000	69.540
13.597	20.020	38.030	58.050	-11.490	69.540
14.113	20.027	39.010	59.037	-10.503	69.540
19.335	20.040	21.260	41.300	-28.240	69.540
23.060	20.080	39.200	59.280	-10.260	69.540
25.638	20.190	25.110	45.300	-24.240	69.540

Note:

- All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- Average measurements: RBW = 1MHz, VBW = 2kHz, Sweep: Auto.
- Measurement Level = Reading Level + Correct Factor.
- Correct Factor = Antenna factor + Cable loss – Amplifier gain.
- The average measurement was not performed when the peak measured data under the limit of average detection.
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- No emission found between lowest internal used/generated frequency to 30MHz.

Product : G.hn Powerline Wireless Extender
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2017/07/18
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5755MHz) _Loop

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector					
9.032	19.870	24.030	43.900	-25.640	69.540
13.695	20.020	21.360	41.380	-28.160	69.540
16.820	20.100	22.400	42.500	-27.040	69.540
23.810	20.130	25.160	45.290	-24.250	69.540
24.853	20.160	22.490	42.650	-26.890	69.540
27.215	20.190	25.010	45.200	-24.340	69.540
Vertical					
Peak Detector					
7.446	19.880	21.060	40.940	-28.600	69.540
13.740	20.020	40.200	60.220	-9.320	69.540
13.885	20.020	39.500	59.520	-10.020	69.540
18.659	20.060	20.690	40.750	-28.790	69.540
22.778	20.060	39.400	59.460	-10.080	69.540
24.854	20.160	25.620	45.780	-23.760	69.540

Note:

- All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- Average measurements: RBW = 1MHz, VBW = 2kHz, Sweep: Auto.
- Measurement Level = Reading Level + Correct Factor.
- Correct Factor = Antenna factor + Cable loss – Amplifier gain.
- The average measurement was not performed when the peak measured data under the limit of average detection.
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- No emission found between lowest internal used/generated frequency to 30MHz.

Product : G.hn Powerline Wireless Extender
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2017/07/12
 Test Mode : Mode 4 Transmit (802.11ac-80BW-65Mbps) (5210MHz) Loop

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector					
49.681	-10.911	44.607	33.696	-6.304	40.000
290.072	-10.298	44.857	34.559	-11.441	46.000
374.420	-8.297	54.071	45.774	-0.226	46.000
434.870	-6.771	45.657	38.886	-7.114	46.000
624.652	-3.141	35.522	32.381	-13.619	46.000
773.667	-0.965	37.024	36.059	-9.941	46.000
Vertical					
Peak Detector					
37.029	-11.511	50.481	38.971	-1.029	40.000
249.304	-11.829	36.929	25.100	-20.900	46.000
374.420	-8.297	49.978	41.681	-4.319	46.000
624.652	-3.141	40.618	37.477	-8.523	46.000
649.957	-2.922	36.186	33.263	-12.737	46.000
874.884	0.235	34.863	35.098	-10.902	46.000

Note:

- All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- Average measurements: RBW = 1MHz, VBW = 3kHz, Sweep: Auto.
- Measurement Level = Reading Level + Correct Factor.
- Correct Factor = Antenna factor + Cable loss – Amplifier gain.
- The average measurement was not performed when the peak measured data under the limit of average detection.
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- No emission found between lowest internal used/generated frequency to 30MHz.

Product : G.hn Powerline Wireless Extender
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2017/07/12
 Test Mode : Mode 4 Transmit (802.11ac-80BW-65Mbps) (5775MHz) Loop

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector					
124.188	-12.662	44.425	31.764	-11.736	43.500
290.072	-10.298	45.921	35.623	-10.377	46.000
374.420	-8.297	53.971	45.674	-0.326	46.000
531.870	-4.903	33.322	28.420	-17.580	46.000
676.667	-2.389	32.526	30.137	-15.863	46.000
874.884	0.235	43.729	43.964	-2.036	46.000
Vertical					
Peak Detector					
41.246	-11.085	49.116	38.031	-1.969	40.000
337.870	-9.245	48.934	39.689	-6.311	46.000
482.667	-5.847	43.947	38.100	-7.900	46.000
579.667	-3.816	34.002	30.186	-15.814	46.000
821.464	-0.402	30.241	29.838	-16.162	46.000
862.232	0.085	28.611	28.696	-17.304	46.000

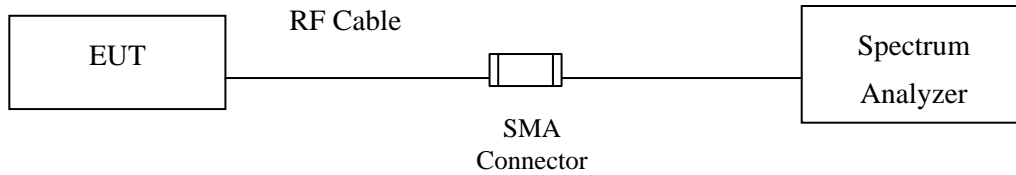
Note:

- All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- Average measurements: RBW = 1MHz, VBW = 3kHz, Sweep: Auto.
- Measurement Level = Reading Level + Correct Factor.
- Correct Factor = Antenna factor + Cable loss – Amplifier gain.
- The average measurement was not performed when the peak measured data under the limit of average detection.
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- No emission found between lowest internal used/generated frequency to 30MHz.

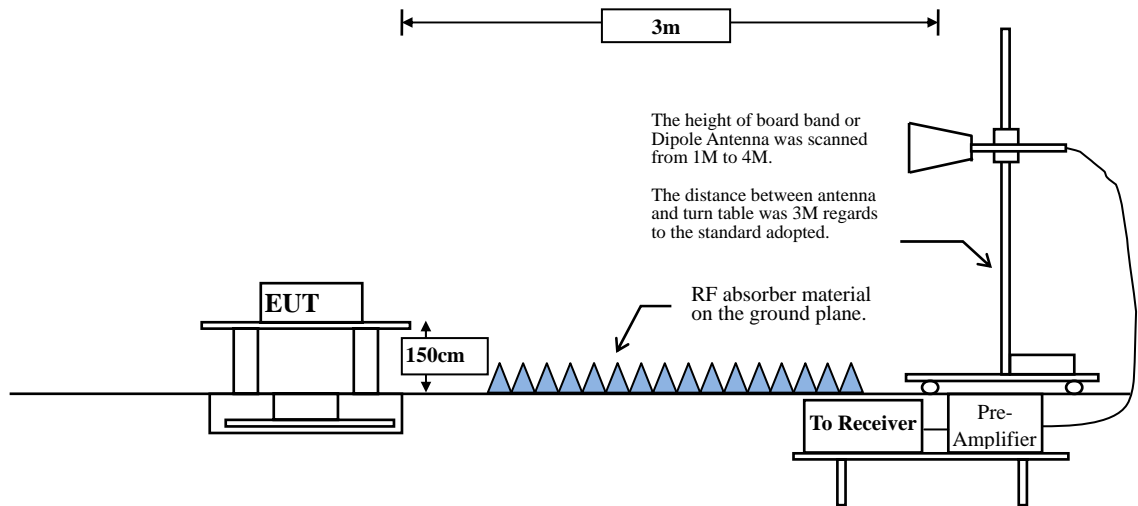
6. Band Edge

6.1. Test Setup

RF Conducted Measurement:



RF Radiated Measurement:



6.2. Limits

The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.

Radiated emissions which fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209:

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	uV/m @3m	dBµV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

- Remarks :
1. RF Voltage (dBµV) = 20 log RF Voltage (uV)
 2. In the Above Table, the tighter limit applies at the band edges.
 3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

6.3. Test Procedure

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10:2013 on radiated measurement.

The bandwidth below 1GHz setting on the field strength meter is 120 kHz, above 1GHz are 1 MHz. The EUT was setup to ANSI C63.10, 2013; tested to UNII test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

The average measurement tested according to KDB 789033 section H)6)d) Method VB (Averaging using reduced video bandwidth).

VBW \geq 1/T:

Mode	Duty Cycle	T	1/T	VBW Setting
802.11a	0.882	1.41 ms	707 Hz	1 KHz
802.11n-20	0.876	1.32 ms	754 Hz	1 KHz
802.11n-40	0.780	0.66 ms	1499 Hz	2 KHz
802.11ac-80	0.644	0.34 ms	2936 Hz	3 KHz

6.4. Uncertainty

Conducted: ± 1.23 dB

Radiated:

Horizontal polarization : 1-18GHz: ± 3.77 dB

Vertical polarization : 1-18GHz : ± 3.83 dB

6.5. Test Result of Band Edge

Product : G.hn Powerline Wireless Extender
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2017/07/10
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)-Channel 36

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
36 (Peak)	5148.696	17.384	42.020	59.404	74.00	54.00	Pass
36 (Peak)	5150.000	17.386	39.599	56.985	74.00	54.00	Pass
36 (Peak)	5175.362	17.427	91.715	109.142	--	--	--
36 (Average)	5150.000	17.386	24.543	41.929	74.00	54.00	Pass
36 (Average)	5179.130	17.437	82.152	99.588	--	--	--

Figure Channel 36: Horizontal (Peak)

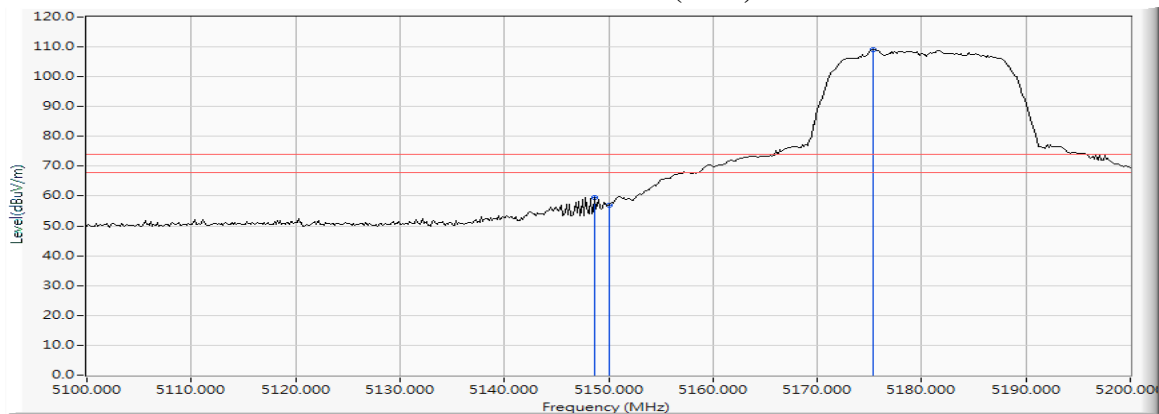
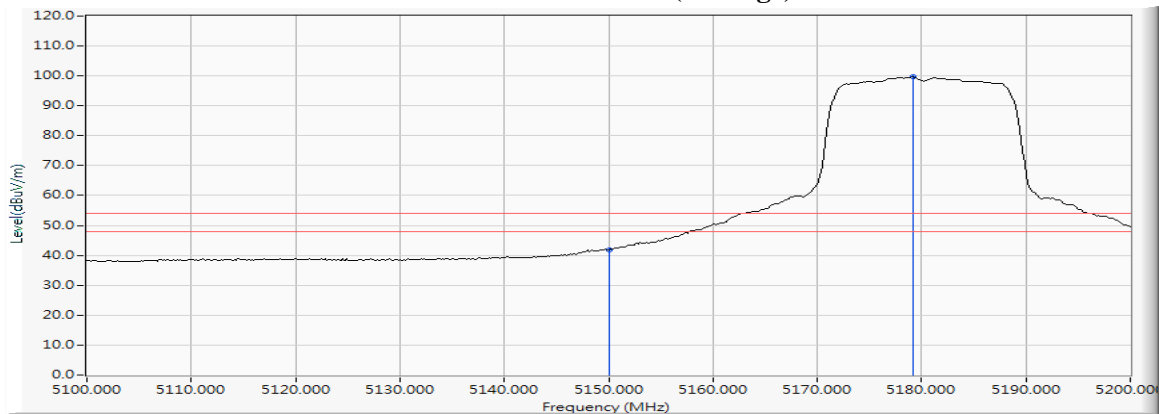


Figure Channel 36: Horizontal (Average)



- Note: 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
 3. Average measurements: RBW = 1MHz, VBW = 1kHz, Sweep: Auto.
 4. “ * ”, means this data is the worst emission level.
 5. Measurement Level = Reading Level + Correct Factor.
 6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : G.hn Powerline Wireless Extender
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2017/07/10
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)-Channel 36

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
36 (Peak)	5146.522	17.381	48.729	66.111	74.00	54.00	Pass
36 (Peak)	5150.000	17.386	46.034	63.420	74.00	54.00	Pass
36 (Peak)	5175.362	17.427	98.592	116.019	--	--	--
36 (Average)	5150.000	17.386	32.228	49.614	74.00	54.00	Pass
36 (Average)	5179.130	17.437	88.362	105.798	--	--	--

Figure Channel 36: Vertical (Peak)

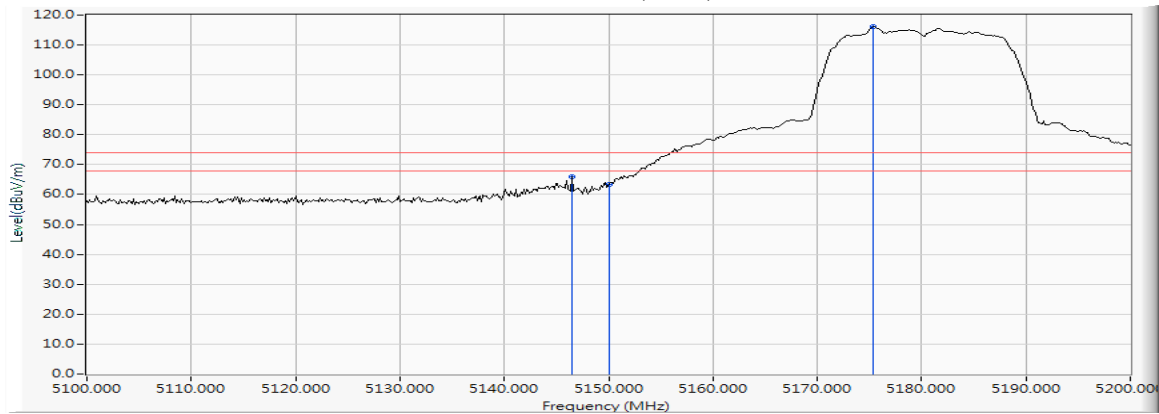
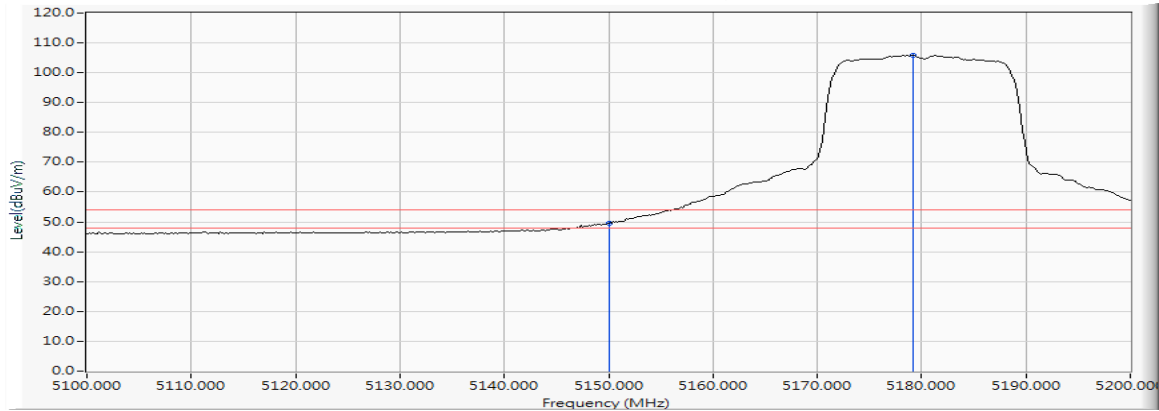


Figure Channel 36: Vertical (Average)

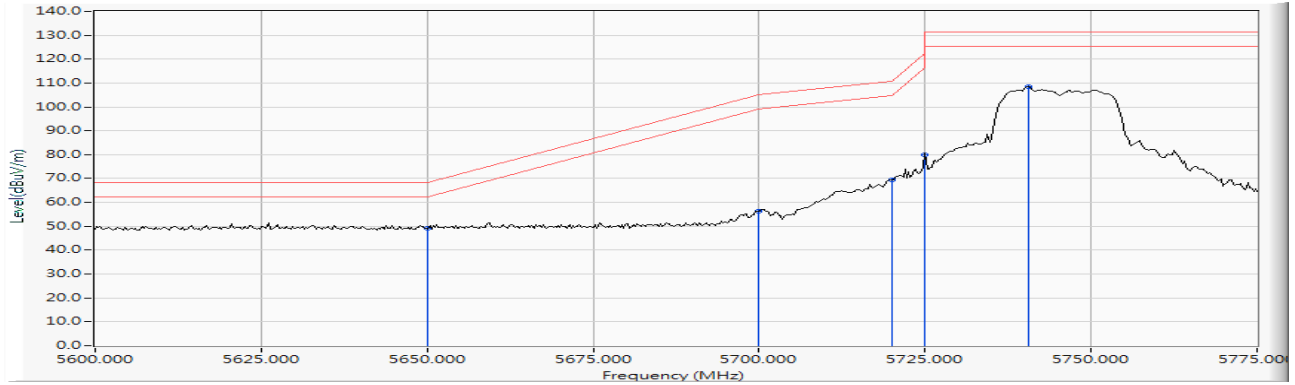


Note:

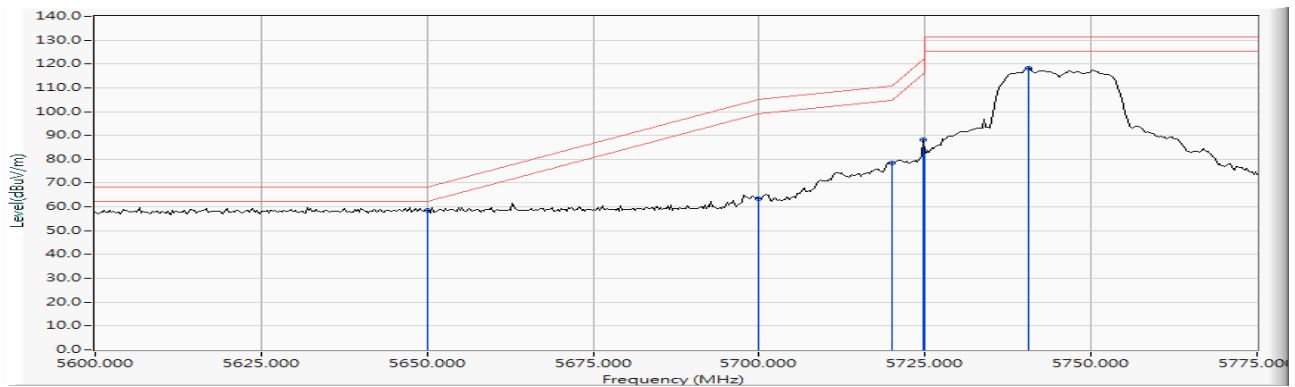
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 1kHz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : G.hn Powerline Wireless Extender
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2017/07/10
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)-Channel 149

RF Radiated Measurement:



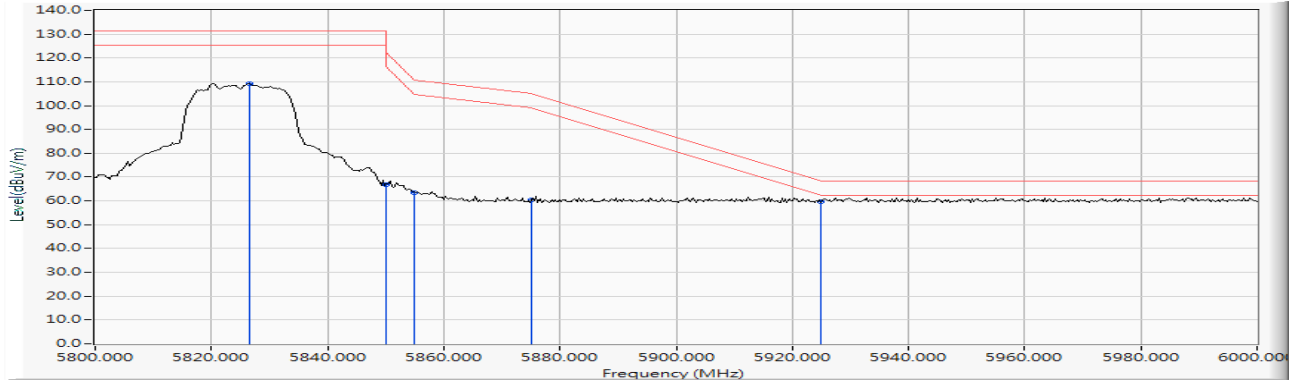
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Horizontal	5650.000	18.483	30.547	49.029	-19.191	68.220	Pass
Horizontal	5700.000	18.632	37.574	56.206	-48.994	105.200	Pass
Horizontal	5720.000	18.693	50.712	69.405	-41.395	110.800	Pass
Horizontal	5725.000	18.711	61.198	79.909	-42.291	122.200	Pass
Horizontal	5740.507	18.765	89.757	108.522	--	--	--



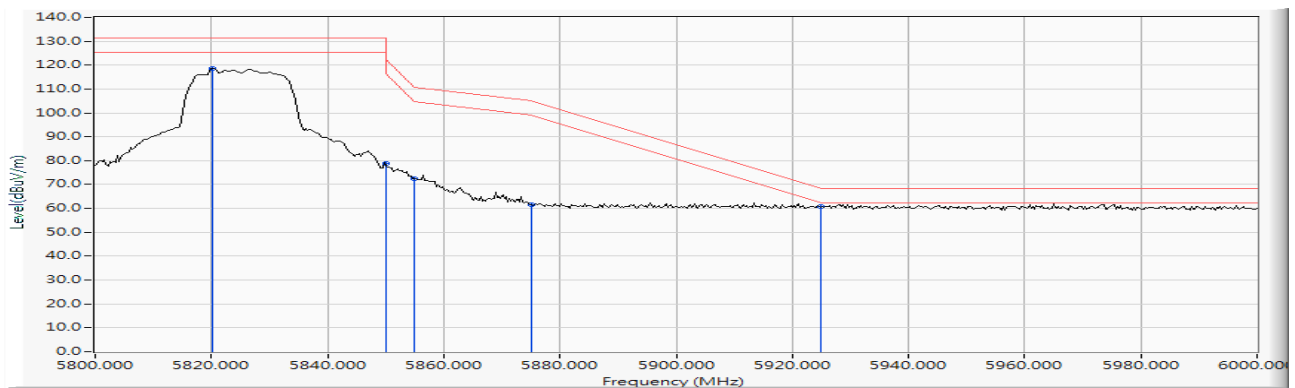
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Vertical	5650.000	18.483	39.917	58.399	-9.821	68.220	Pass
Vertical	5700.000	18.632	44.863	63.495	-41.705	105.200	Pass
Vertical	5720.000	18.693	59.701	78.394	-32.406	110.800	Pass
Vertical	5724.783	18.709	69.626	88.336	-33.369	121.705	Pass
Vertical	5725.000	18.711	64.734	83.445	-38.755	122.200	Pass
Vertical	5740.507	18.765	99.468	118.233	--	--	--

Product : G.hn Powerline Wireless Extender
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2017/07/10
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)-Channel 165

RF Radiated Measurement:



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Horizontal	5826.667	19.027	90.198	109.225	--	--	--
Horizontal	5850.000	19.103	47.776	66.879	-55.321	122.200	Pass
Horizontal	5855.000	19.115	44.400	63.516	-47.284	110.800	Pass
Horizontal	5875.000	19.177	41.070	60.247	-44.953	105.200	Pass
Horizontal	5925.000	19.333	40.178	59.510	-8.690	68.200	Pass



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Vertical	5820.290	41.195	99.613	118.628	--	--	--
Vertical	5850.000	41.246	59.589	78.692	-43.508	122.200	Pass
Vertical	5855.000	41.251	53.321	72.437	-38.363	110.800	Pass
Vertical	5875.000	41.288	42.489	61.666	-43.534	105.200	Pass
Vertical	5925.000	41.380	41.308	60.640	-7.560	68.200	Pass

Product : G.hn Powerline Wireless Extender
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2017/07/10
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) -Channel 36

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
36 (Peak)	5150.000	17.386	45.149	62.535	74.00	54.00	Pass
36 (Peak)	5183.043	17.445	91.345	108.790	--	--	--
36 (Average)	5150.000	17.386	29.133	46.519	74.00	54.00	Pass
36 (Average)	5181.739	17.442	82.367	99.809	--	--	--

Figure Channel 36: Horizontal (Peak)

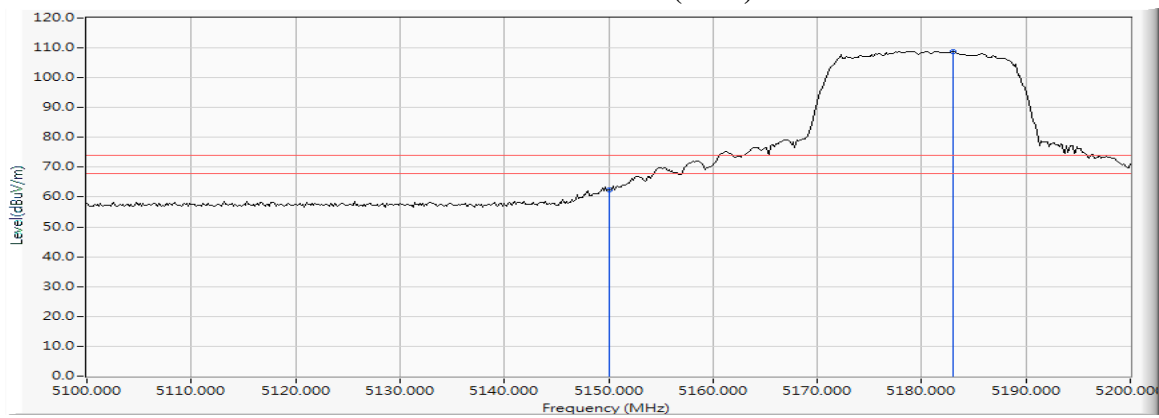
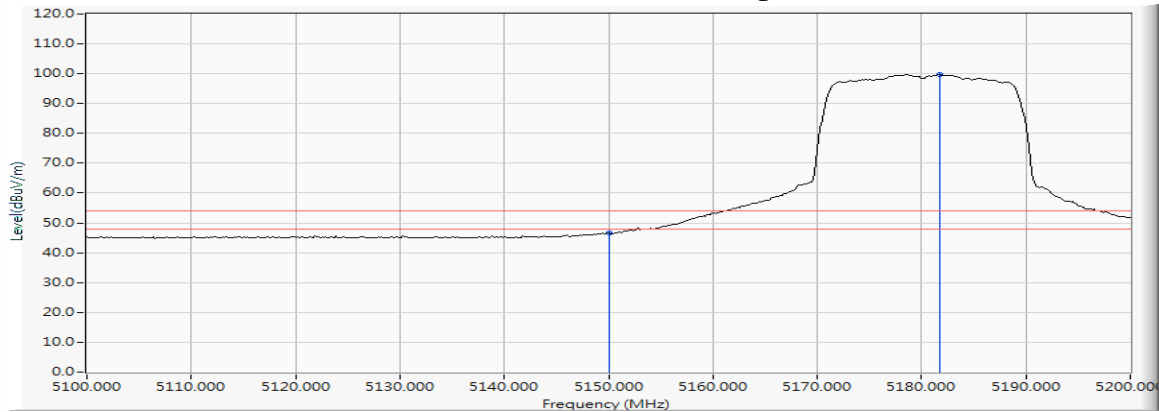


Figure Channel 36: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 1kHz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : G.hn Powerline Wireless Extender
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2017/07/10
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) -Channel 36

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
36 (Peak)	5150.000	17.386	52.079	69.465	74.00	54.00	Pass
36 (Peak)	5177.536	17.433	98.075	115.507	--	--	--
36 (Average)	5150.000	17.386	32.799	50.185	74.00	54.00	Pass
36 (Average)	5178.696	17.435	89.019	106.454	--	--	--

Figure Channel 36: Vertical (Peak)

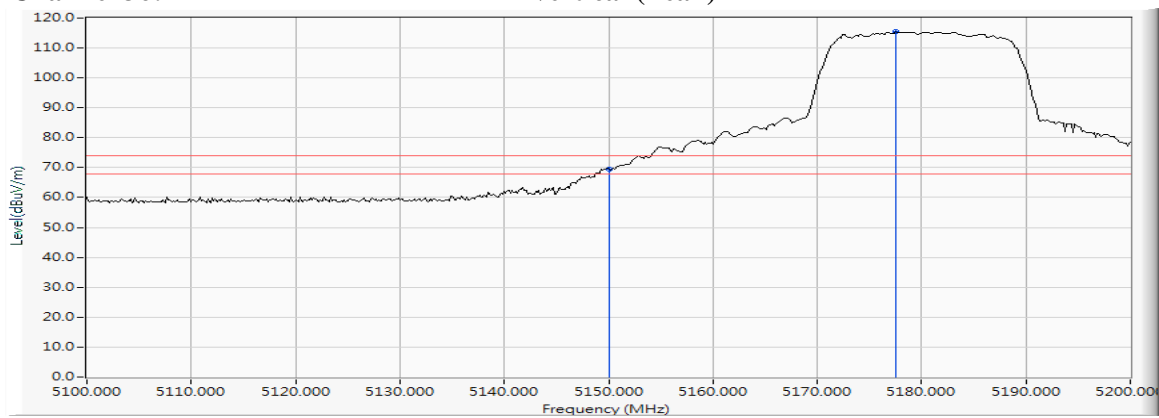
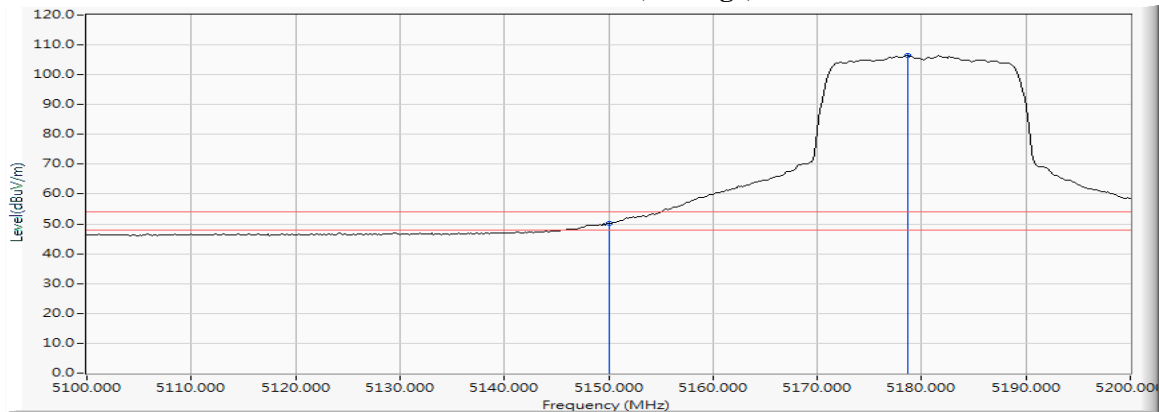


Figure Channel 36: Vertical (Average)

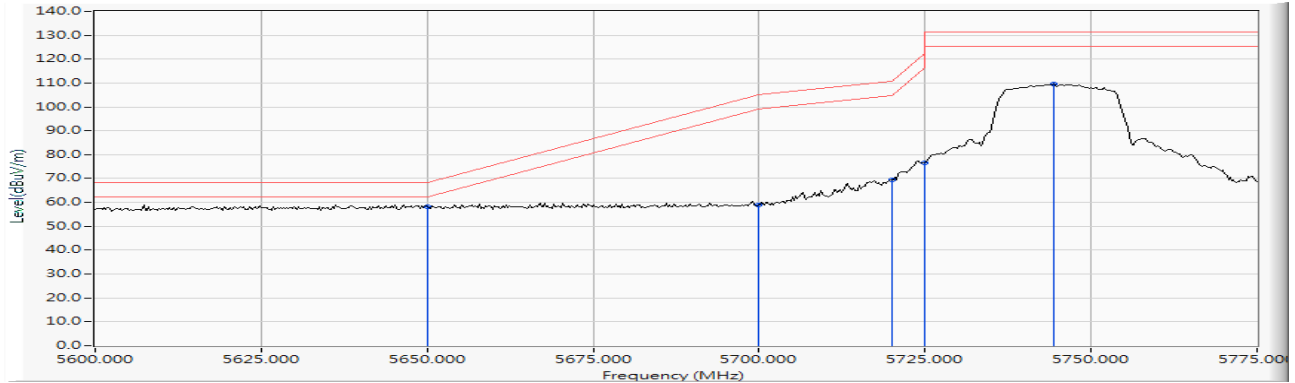


Note:

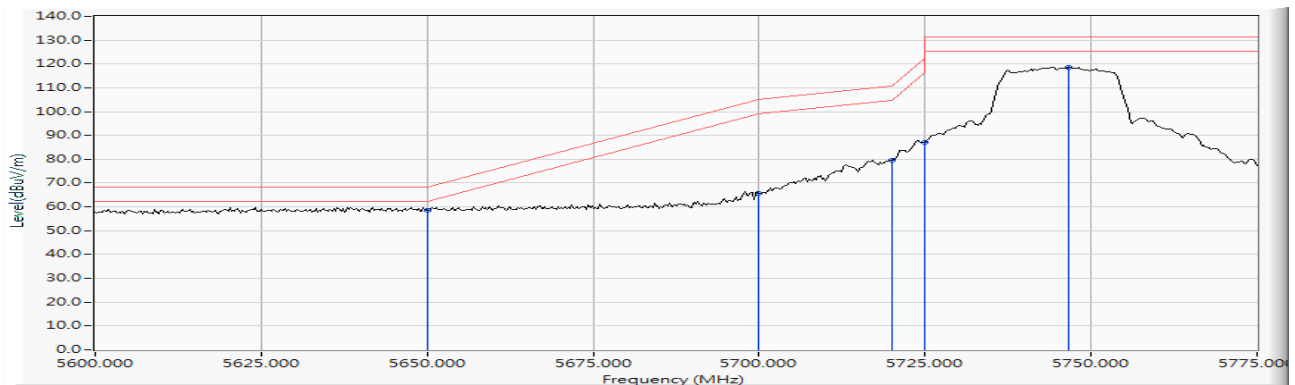
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 1kHz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : G.hn Powerline Wireless Extender
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2017/07/10
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps)-Channel 149

RF Radiated Measurement:



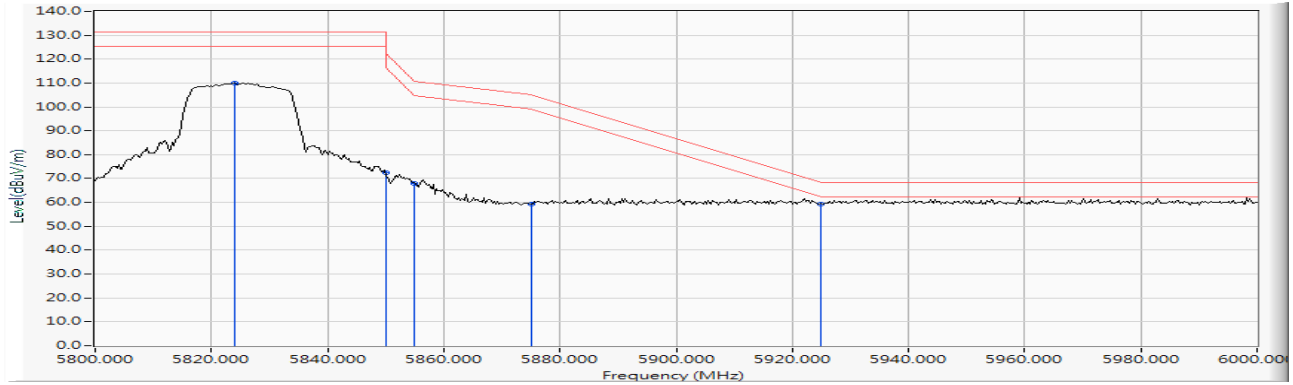
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Horizontal	5650.000	18.483	39.605	58.087	-10.133	68.220	Pass
Horizontal	5700.000	18.632	40.294	58.926	-46.274	105.200	Pass
Horizontal	5720.000	18.693	50.754	69.447	-41.353	110.800	Pass
Horizontal	5725.000	18.711	57.842	76.553	-45.647	122.200	Pass
Horizontal	5744.312	18.773	90.665	109.439	--	--	--



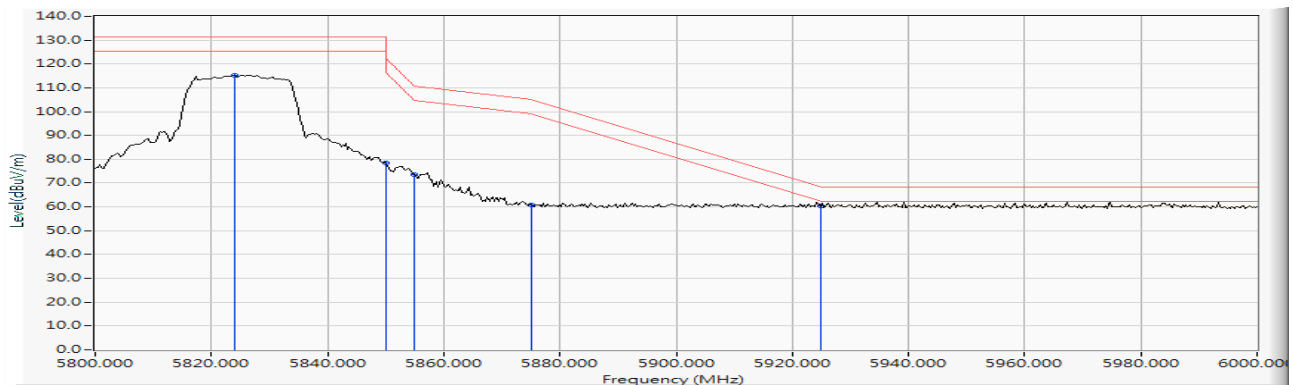
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Vertical	5650.000	18.483	40.074	58.556	-9.664	68.220	Pass
Vertical	5700.000	18.632	47.020	65.652	-39.548	105.200	Pass
Vertical	5720.000	18.693	60.799	79.492	-31.308	110.800	Pass
Vertical	5725.000	18.711	68.496	87.207	-34.993	122.200	Pass
Vertical	5746.594	18.779	99.766	118.545	--	--	--

Product : G.hn Powerline Wireless Extender
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2017/07/10
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps)-Channel 165

RF Radiated Measurement:



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV / m)	Margin (dB)	Limit (dBµV / m)	Result
Horizontal	5824.058	19.022	90.942	109.964	--	--	--
Horizontal	5850.000	19.103	53.468	72.571	-49.629	122.200	Pass
Horizontal	5855.000	19.115	48.970	68.086	-42.714	110.800	Pass
Horizontal	5875.000	19.177	40.109	59.286	-45.914	105.200	Pass
Horizontal	5925.000	19.333	40.156	59.488	-8.712	68.200	Pass



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV / m)	Margin (dB)	Limit (dBµV / m)	Result
Vertical	5824.058	19.022	96.266	115.288	--	--	--
Vertical	5850.000	19.103	59.298	78.401	-43.799	122.200	Pass
Vertical	5855.000	19.115	54.322	73.438	-37.362	110.800	Pass
Vertical	5875.000	19.177	41.599	60.776	-44.424	105.200	Pass
Vertical	5925.000	19.333	41.223	60.555	-7.645	68.200	Pass

Product : G.hn Powerline Wireless Extender
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2017/07/10
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps)-Channel 38

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
38 (Peak)	5150.000	17.386	46.939	64.325	74.00	54.00	Pass
38 (Peak)	5184.493	17.448	87.644	105.092	--	--	--
38 (Average)	5150.000	17.386	30.879	48.265	74.00	54.00	Pass
38 (Average)	5191.739	17.465	78.719	96.183	--	--	--

Figure Channel 38: Horizontal (Peak)

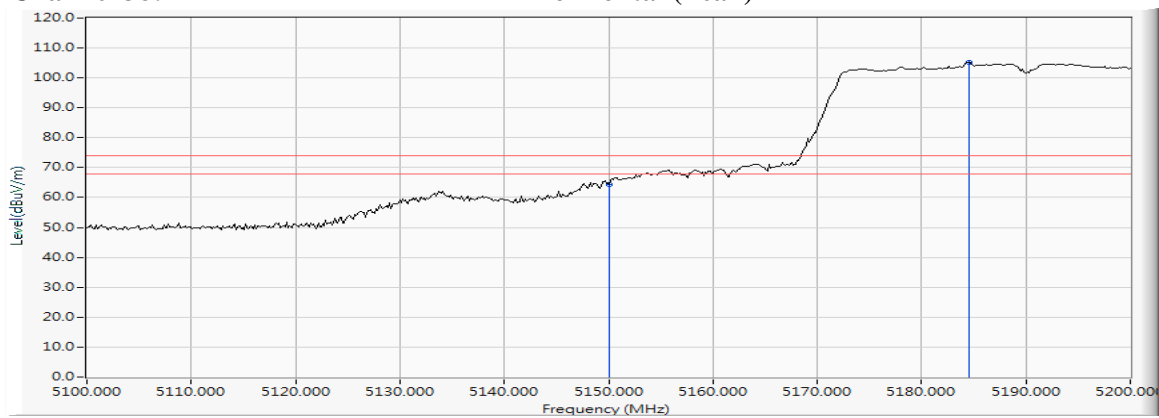
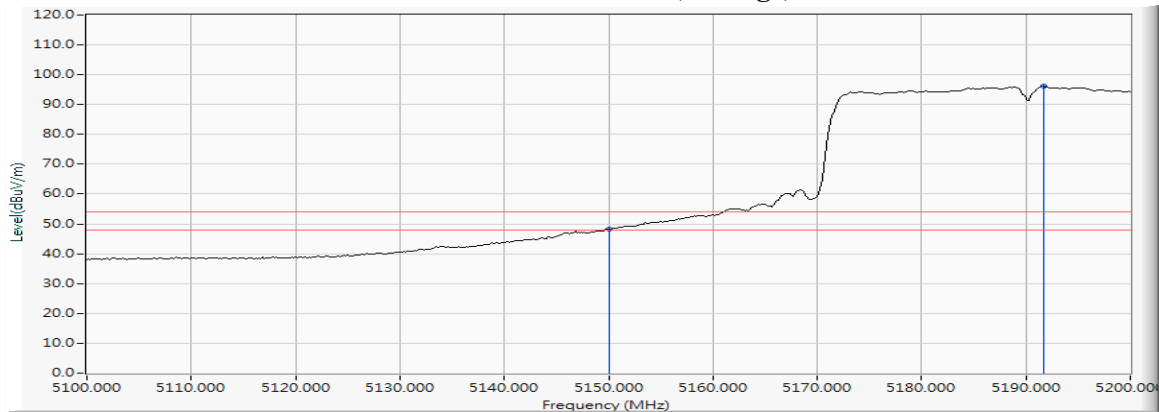


Figure Channel 38: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 2kHz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : G.hn Powerline Wireless Extender
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2017/07/10
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps)-Channel 38

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
38 (Peak)	5150.000	17.386	48.673	66.059	74.00	54.00	Pass
38 (Peak)	5199.130	17.481	83.376	100.857	--	--	--
38 (Average)	5150.000	17.386	30.582	47.968	74.00	54.00	Pass
38 (Average)	5191.449	17.462	73.928	91.391	--	--	--

Figure Channel 38: Vertical (Peak)

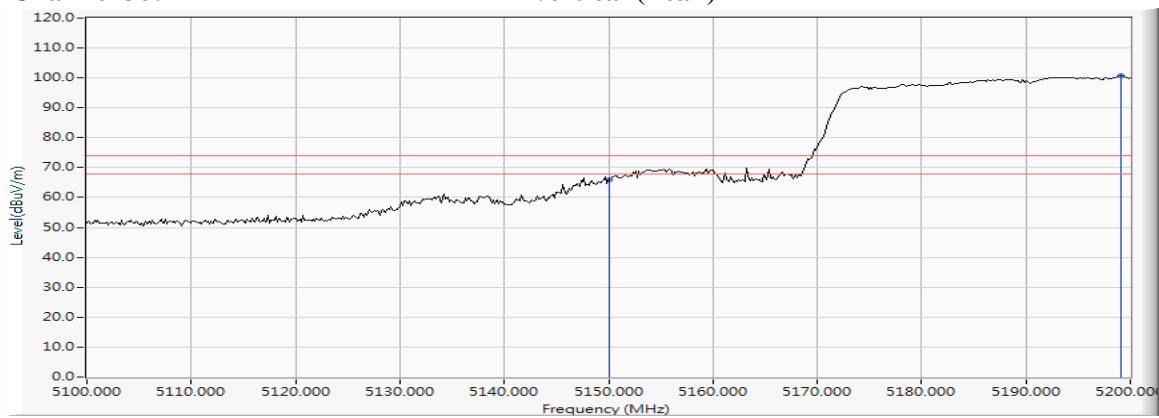
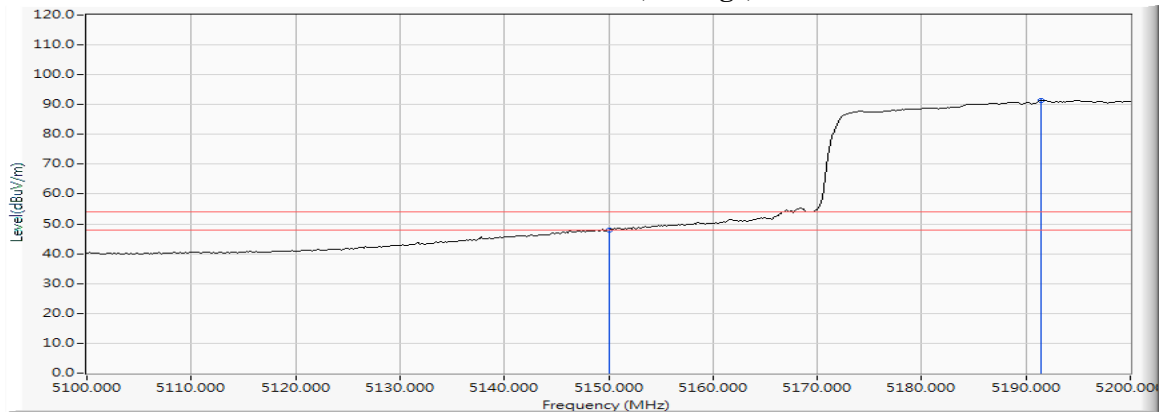


Figure Channel 38: Vertical (Average)

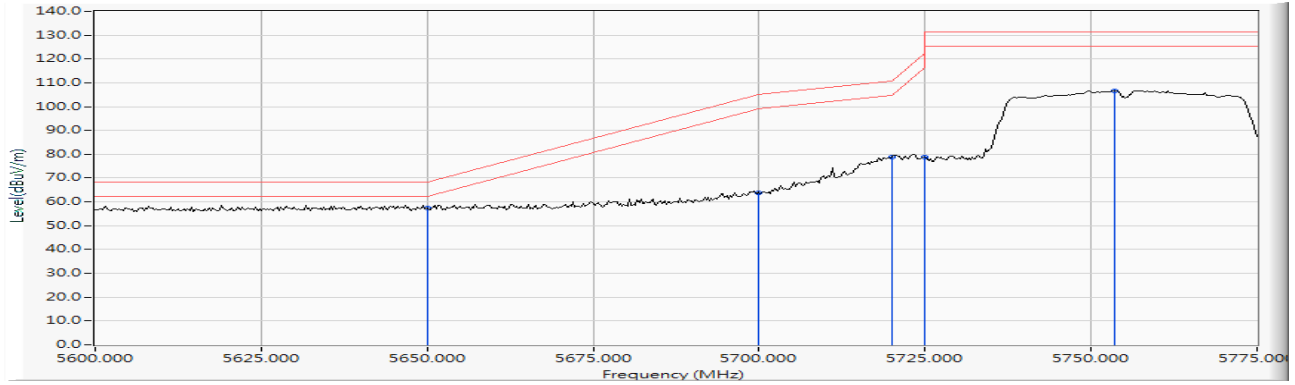


Note:

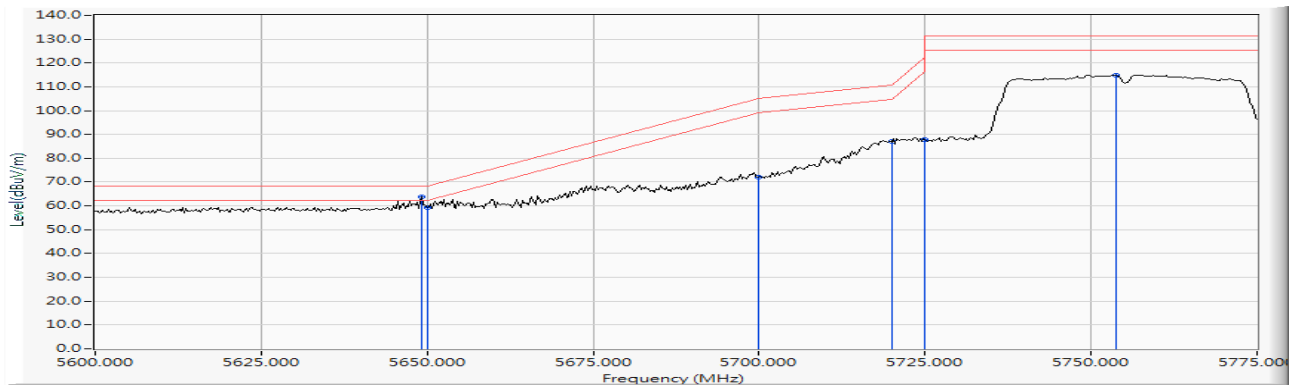
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 2kHz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : G.hn Powerline Wireless Extender
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2017/07/10
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) -Channel 151

RF Radiated Measurement :



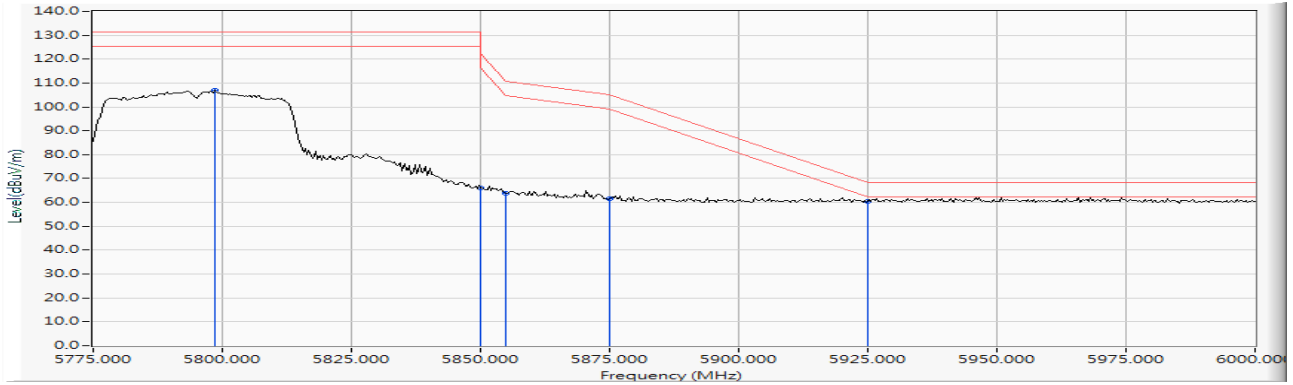
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Horizontal	5650.000	18.483	38.883	57.365	-10.855	68.220	Pass
Horizontal	5700.000	18.632	45.212	63.844	-41.356	105.200	Pass
Horizontal	5720.000	18.693	60.240	78.933	-31.867	110.800	Pass
Horizontal	5725.000	18.711	59.970	78.681	-43.519	122.200	Pass
Horizontal	5753.442	18.796	87.945	106.740	--	--	--



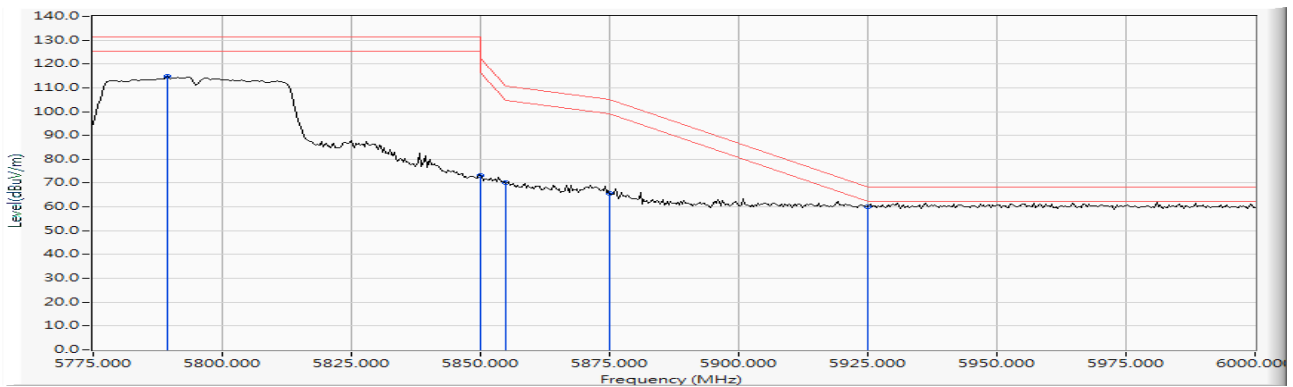
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Vertical	5649.203	18.479	45.172	63.651	-4.569	68.220	Pass
Vertical	5650.000	18.483	41.001	59.483	-8.737	68.220	Pass
Vertical	5700.000	18.632	53.612	72.244	-32.956	105.200	Pass
Vertical	5720.000	18.693	68.245	86.938	-23.862	110.800	Pass
Vertical	5725.000	18.711	69.300	88.011	-34.189	122.200	Pass
Vertical	5753.696	18.796	96.230	115.026	--	--	--

Product : G.hn Powerline Wireless Extender
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2017/07/10
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps)-Channel 159

RF Radiated Measurement:



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Horizontal	5798.478	18.947	87.958	106.904	--	--	--
Horizontal	5850.000	19.103	47.057	66.160	-56.040	122.200	Pass
Horizontal	5855.000	19.115	44.865	63.981	-46.819	110.800	Pass
Horizontal	5875.000	19.177	42.295	61.472	-43.728	105.200	Pass
Horizontal	5925.000	19.333	41.152	60.484	-7.716	68.200	Pass



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Vertical	5789.348	18.913	95.791	114.704	--	--	--
Vertical	5850.000	19.103	53.918	73.021	-49.179	122.200	Pass
Vertical	5855.000	19.115	50.890	70.006	-40.794	110.800	Pass
Vertical	5875.000	19.177	46.546	65.723	-39.477	105.200	Pass
Vertical	5925.000	19.333	40.819	60.151	-8.049	68.200	Pass

Product : G.hn Powerline Wireless Extender
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2017/07/10
 Test Mode : Mode 4 Transmit (802.11ac-80BW-65Mbps)-Channel 42

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
42 (Peak)	5135.797	17.369	39.424	56.793	74.00	54.00	Pass
42 (Peak)	5150.000	17.386	38.567	55.953	74.00	54.00	Pass
42 (Peak)	5197.681	17.477	81.845	99.323	--	--	--
42 (Average)	5150.000	17.386	27.038	44.424	74.00	54.00	Pass
42 (Average)	5197.681	17.477	70.821	88.299	--	--	--

Figure Channel 42: Horizontal (Peak)

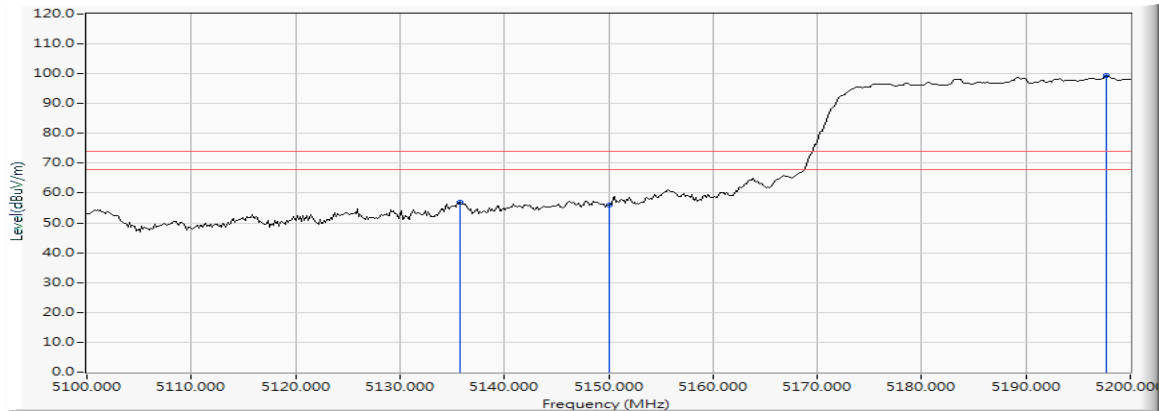
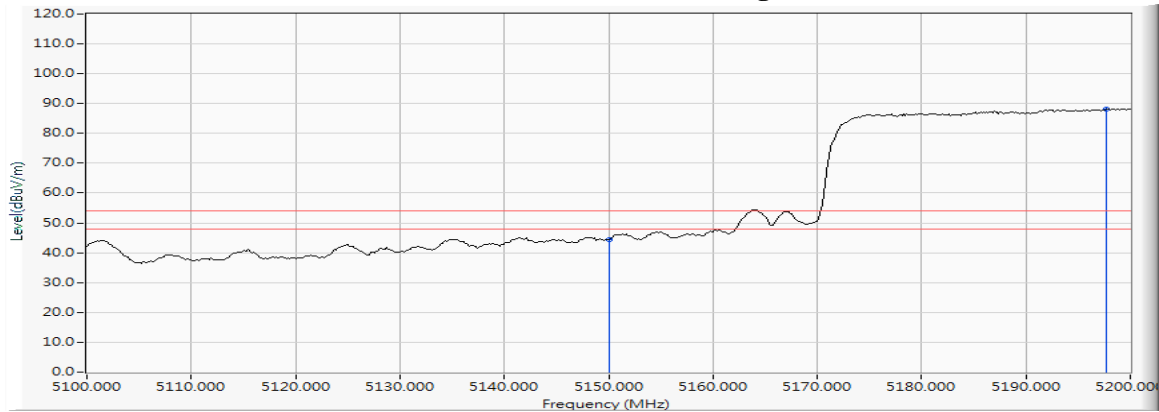


Figure Channel 42: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 3kHz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : G.hn Powerline Wireless Extender
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2017/07/10
 Test Mode : Mode 4 Transmit (802.11ac-80BW-65Mbps) -Channel 42

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
42 (Peak)	5135.652	17.369	46.913	64.282	74.00	54.00	Pass
42 (Peak)	5150.000	17.386	46.574	63.960	74.00	54.00	Pass
42 (Peak)	5197.826	17.477	87.697	105.175	--	--	--
42 (Average)	5147.971	17.383	34.868	52.251	74.00	54.00	Pass
42 (Average)	5150.000	17.386	34.212	51.598	74.00	54.00	Pass
42 (Average)	5197.826	17.477	76.578	94.056	--	--	--

Figure Channel 42: Vertical (Peak)

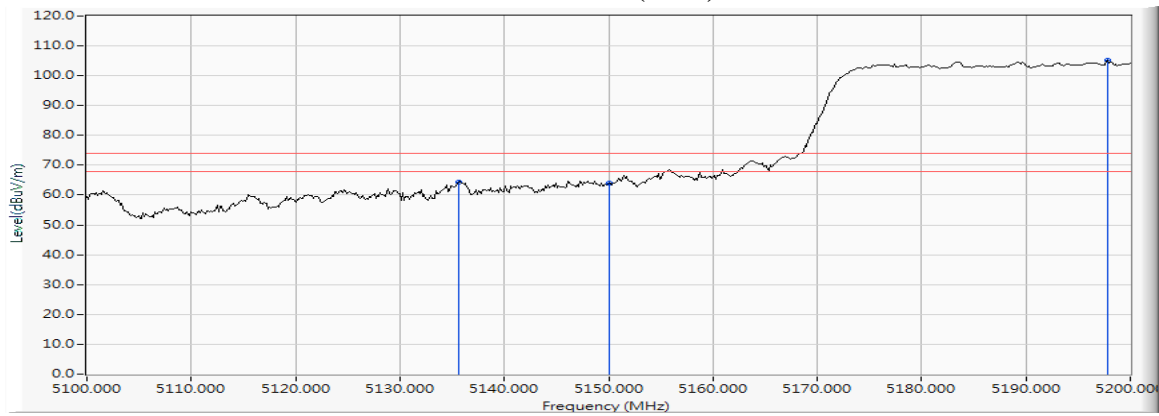
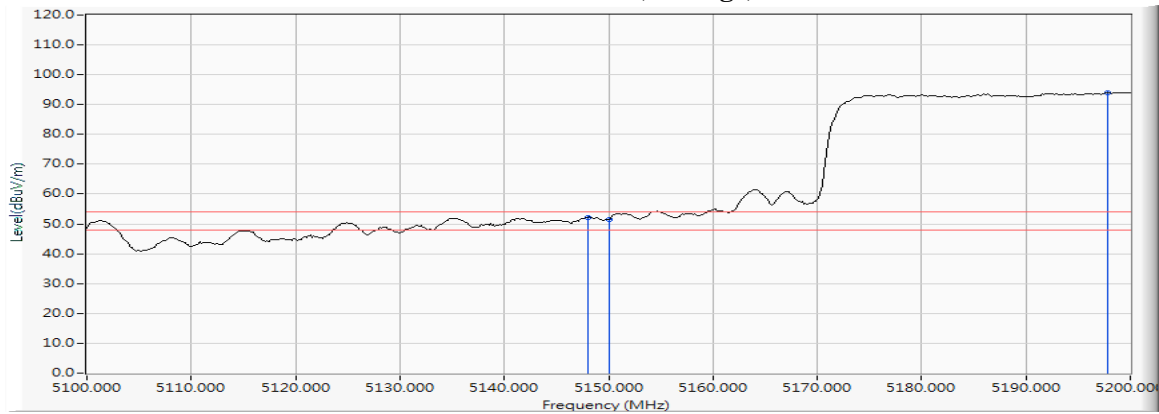


Figure Channel 42: Vertical (Average)

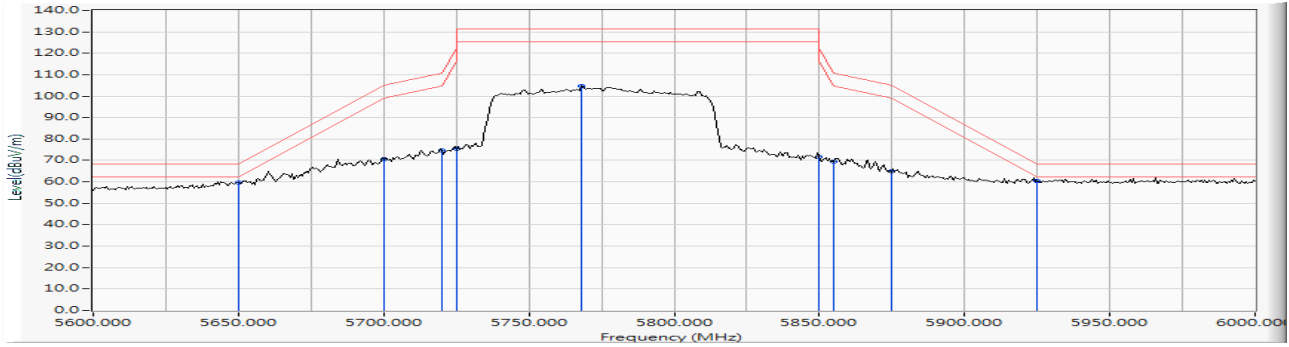


Note:

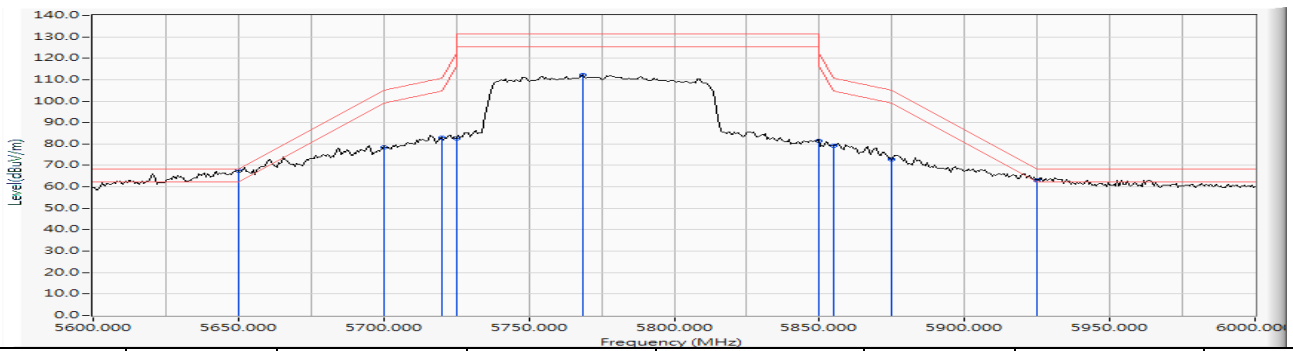
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 3kHz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : G.hn Powerline Wireless Extender
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2017/07/10
 Test Mode : Mode 4 Transmit (802.11ac-80BW-65Mbps)-Channel 155

RF Radiated Measurement:



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Horizontal	5650.000	18.483	41.055	59.537	-8.683	68.220	Pass
Horizontal	5700.000	18.632	51.978	70.610	-34.590	105.200	Pass
Horizontal	5720.000	18.693	55.900	74.593	-36.207	110.800	Pass
Horizontal	5725.000	18.711	56.694	75.405	-46.795	122.200	Pass
Horizontal	5768.116	18.844	85.842	104.686	--	--	--
Horizontal	5850.000	19.103	52.645	71.748	-50.452	122.200	Pass
Horizontal	5855.000	19.115	50.182	69.298	-41.502	110.800	Pass
Horizontal	5875.000	19.177	45.849	65.026	-40.174	105.200	Pass
Horizontal	5925.000	19.333	41.062	60.394	-7.806	68.200	Pass



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Vertical	5650.000	18.483	48.943	67.425	-0.795	68.220	Pass
Vertical	5700.000	18.632	59.800	78.432	-26.768	105.200	Pass
Vertical	5720.000	18.693	64.426	83.119	-27.681	110.800	Pass
Vertical	5725.000	18.711	63.927	82.638	-39.562	122.200	Pass
Vertical	5768.696	18.846	93.479	112.325	--	--	--
Vertical	5850.000	19.103	62.316	81.419	-40.781	122.200	Pass
Vertical	5855.000	19.115	60.121	79.237	-31.563	110.800	Pass
Vertical	5875.000	19.177	53.620	72.797	-32.403	105.200	Pass
Vertical	5925.000	19.333	43.907	63.239	-4.961	68.200	Pass

Product : G.hn Powerline Wireless Extender
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2017/07/10
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5240MHz)

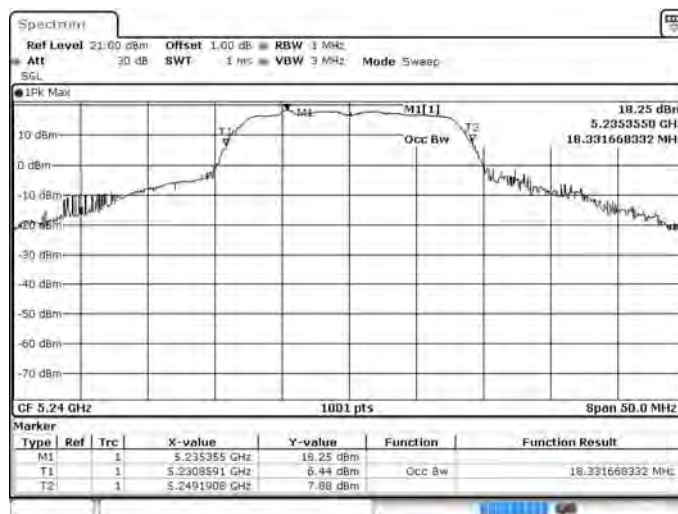
Chain	Test Frequency (MHz)	Measurement Level (20dB BW) (MHz)	Limit (MHz)	Result
A	5240	5249.24	<5250	PASS
B	5240	5249.19	<5250	PASS

NOTE: Accordance with 15.215 requirement.

Chain A



Chain B

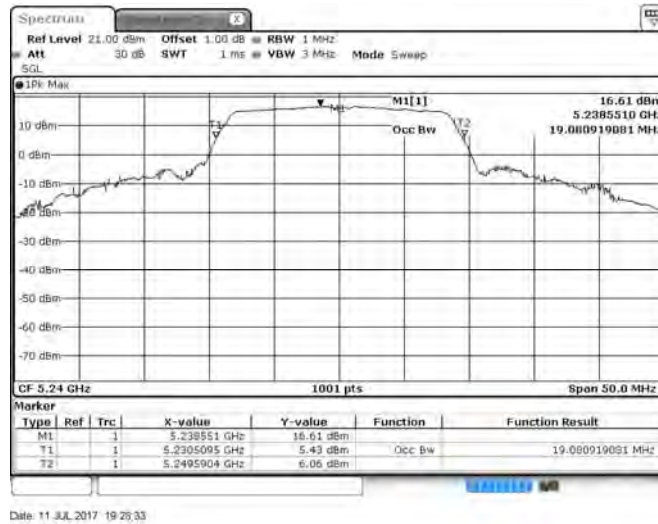


Product : G.hn Powerline Wireless Extender
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2017/07/10
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5240MHz)

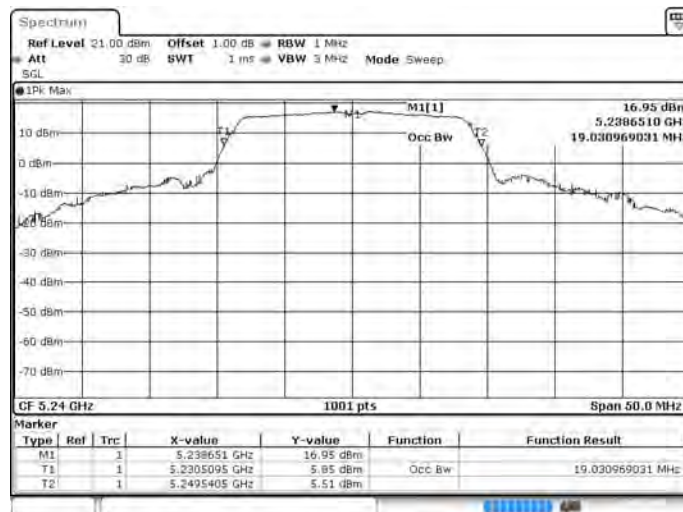
Chain	Test Frequency (MHz)	Measurement Level (20dB BW) (MHz)	Limit (MHz)	Result
A	5240	5249.59	<5250	PASS
B	5240	5249.54	<5250	PASS

NOTE: Accordance with 15.215 requirement.

Chain A



Chain B

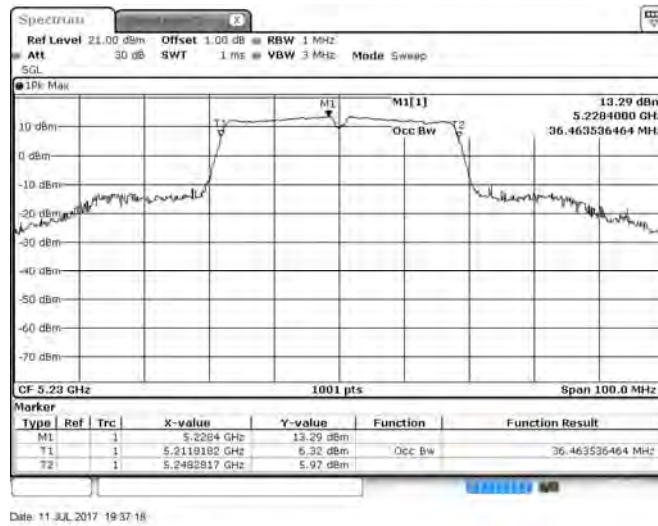


Product : G.hn Powerline Wireless Extender
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2017/07/10
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5230MHz)

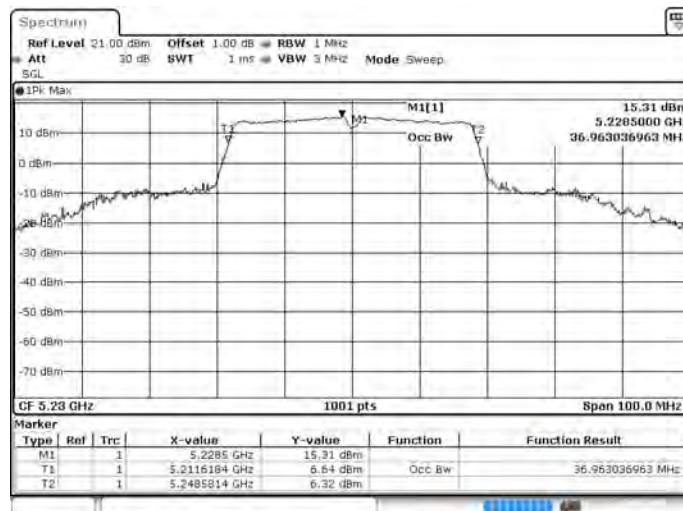
Chain	Test Frequency (MHz)	Measurement Level (20dB BW) (MHz)	Limit (MHz)	Result
A	5230	5248.28	<5250	PASS
B	5230	5248.58	<5250	PASS

NOTE: Accordance with 15.215 requirement.

Chain A



Chain B

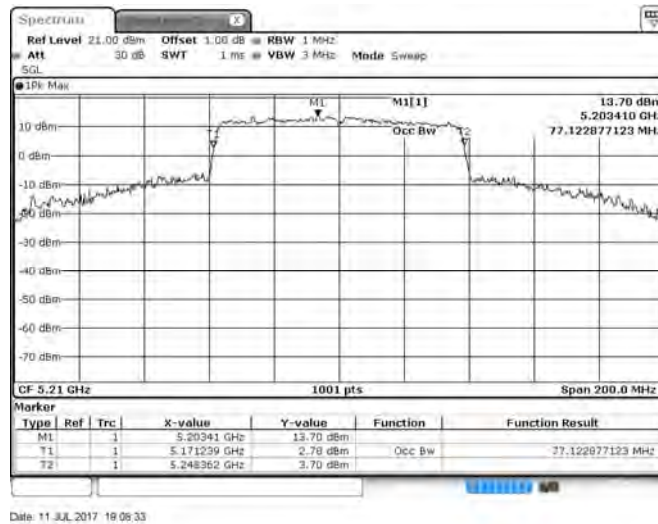


Product : G.hn Powerline Wireless Extender
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2017/07/10
 Test Mode : Mode 4 Transmit (802.11ac-80BW-65Mbps) (5210MHz)

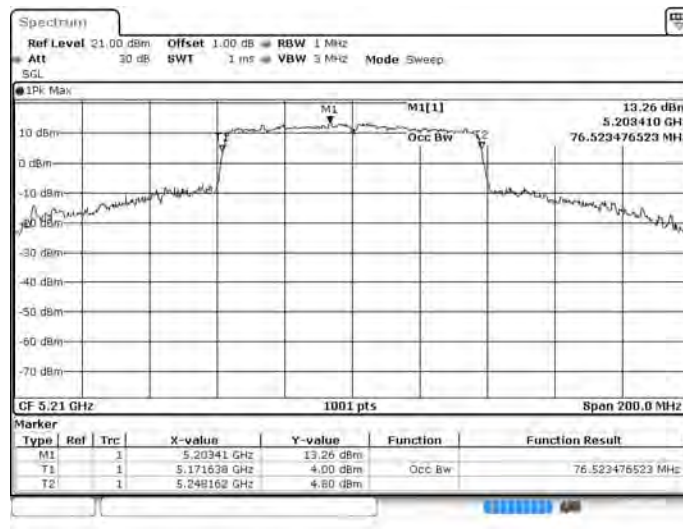
Chain	Test Frequency (MHz)	Measurement Level (20dB BW) (MHz)	Limit (MHz)	Result
A	5210	5248.36	<5250	PASS
B	5210	5248.16	<5250	PASS

NOTE: Accordance with 15.215 requirement.

Chain A

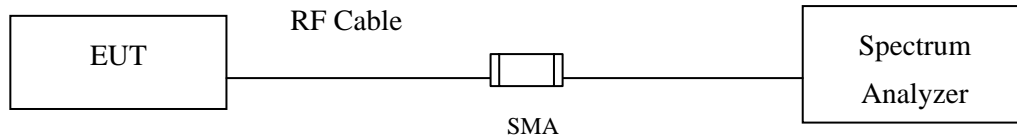


Chain B



7. Occupied Bandwidth

7.1. Test Setup



7.2. Limits

For the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz

7.3. Test Procedure

The EUT was setup to ANSI C63.10, 2013; tested to UNII test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

7.4. Uncertainty

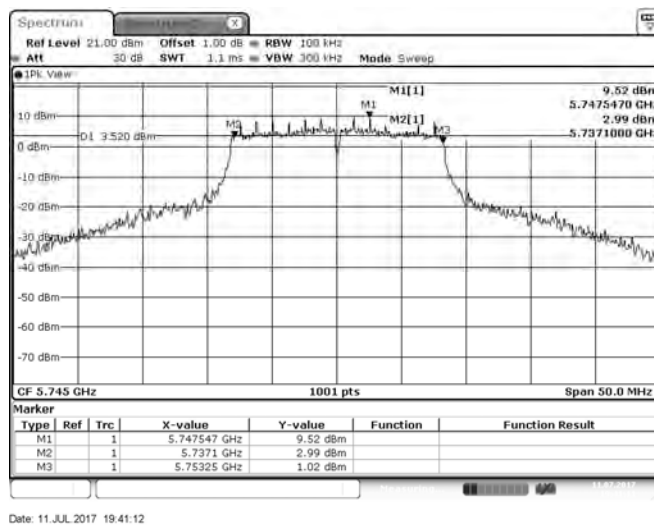
$\pm 671.83\text{Hz}$

7.5. Test Result of Occupied Bandwidth

Product : G.hn Powerline Wireless Extender
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5745MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
149	5745.00	18480	>500	Pass

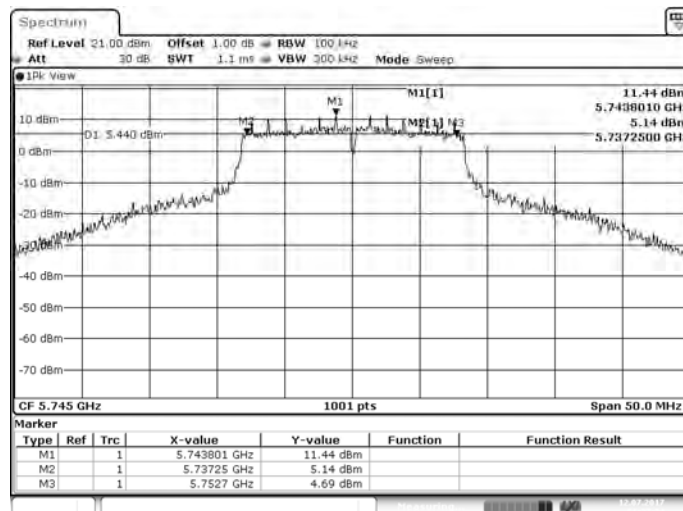
Figure Channel 149: (Chain A)



Date: 11.JUL.2017 19:41:12

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
149	5745.00	19430	>500	Pass

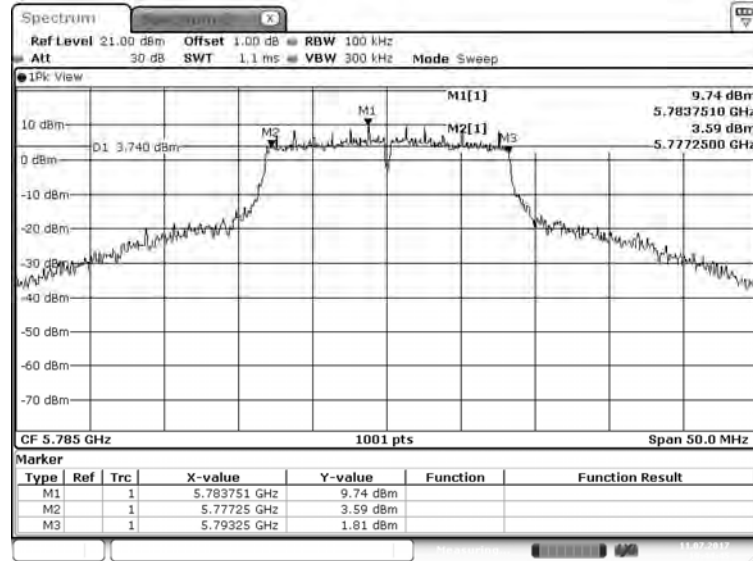
Figure Channel 149: (Chain B)



Product : G.hn Powerline Wireless Extender
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5785MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
157	5785.00	18630	>500	Pass

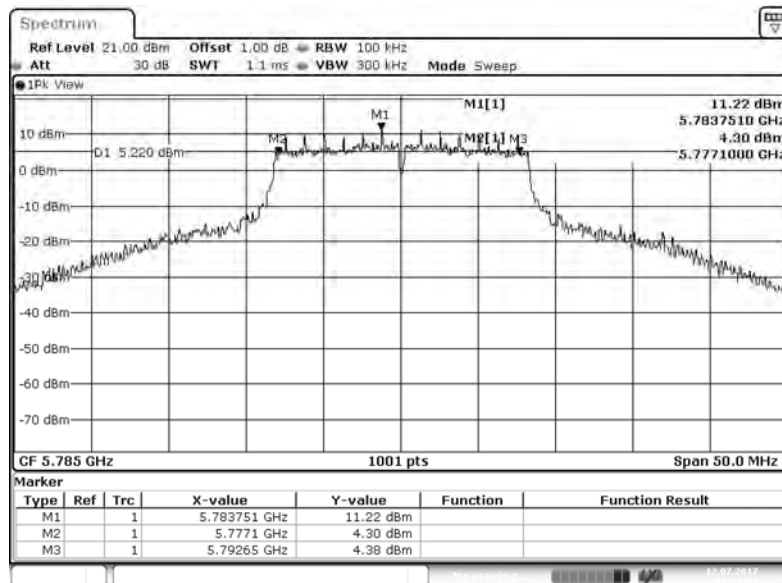
Figure Channel 157: (Chain A)



Date: 11.JUL.2017 19:44:45

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
157	5785.00	19330	>500	Pass

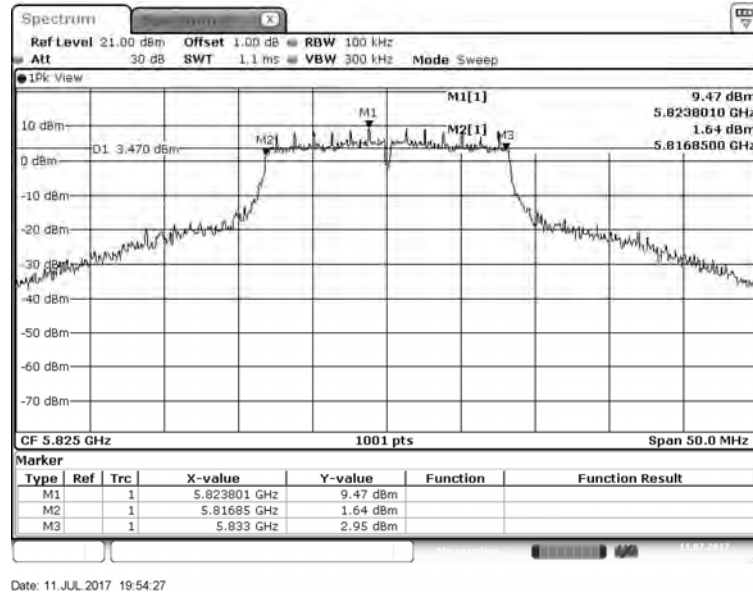
Figure Channel 157: (Chain B)



Product : G.hn Powerline Wireless Extender
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5825MHz)

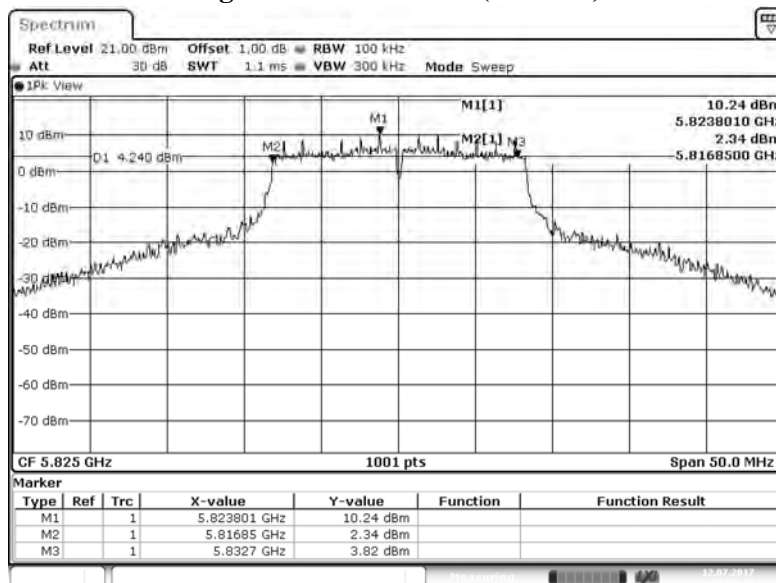
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
165	5825.00	18630	>500	Pass

Figure Channel 165: (Chain A)



Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
165	5825.00	18680	>500	Pass

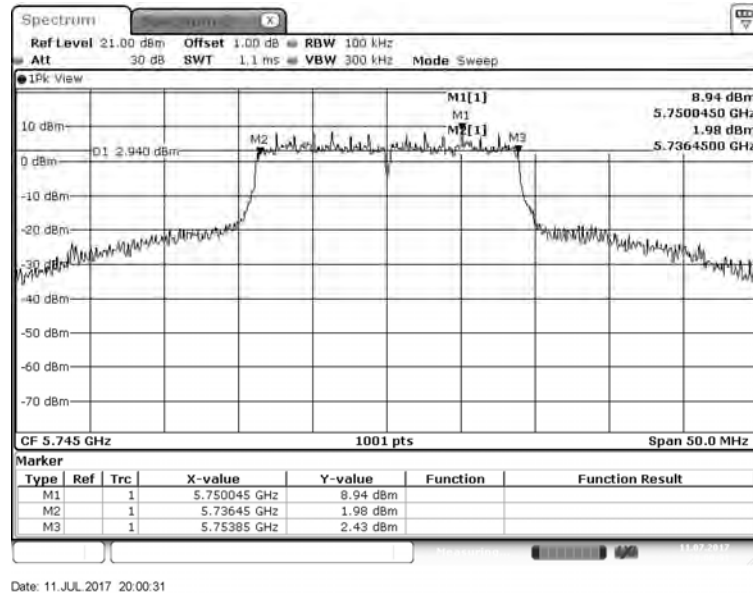
Figure Channel 165: (Chain B)



Product : G.hn Powerline Wireless Extender
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5745MHz)

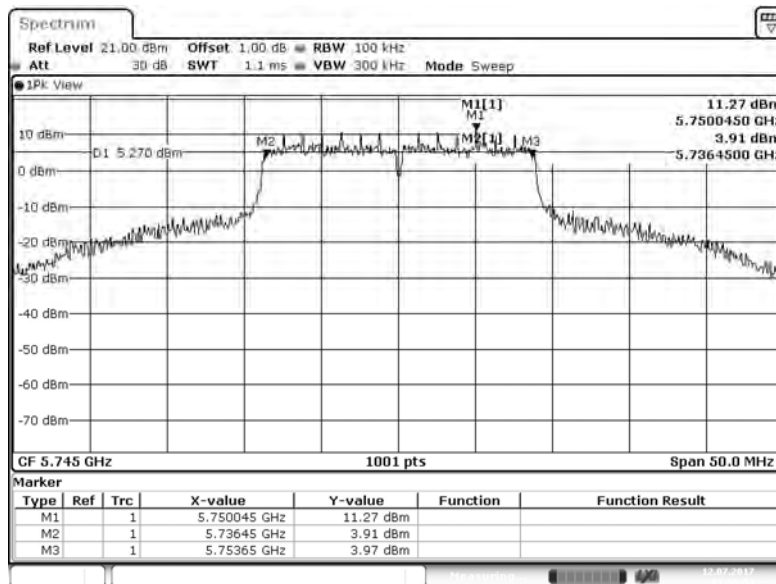
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
149	5745.00	19830	>500	Pass

Figure Channel 149: (Chain A)



Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
149	5745.00	26470	>500	Pass

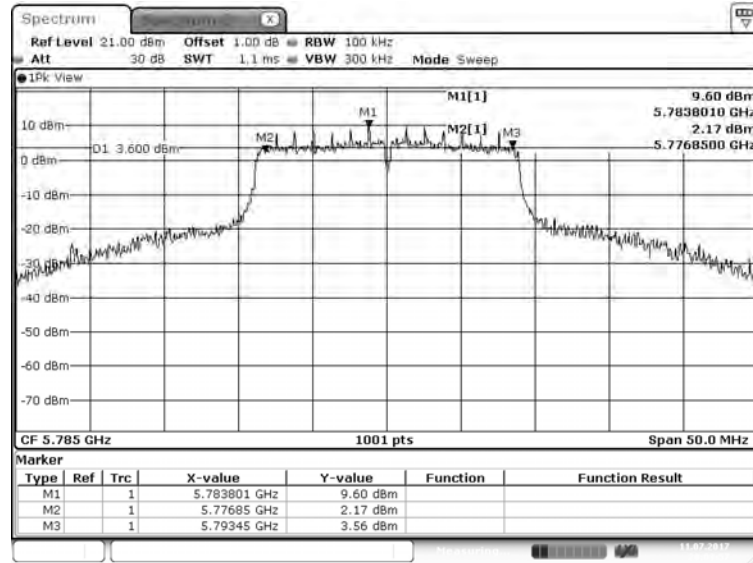
Figure Channel 149: (Chain B)



Product : G.hn Powerline Wireless Extender
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5785MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
157	5785.00	19980	>500	Pass

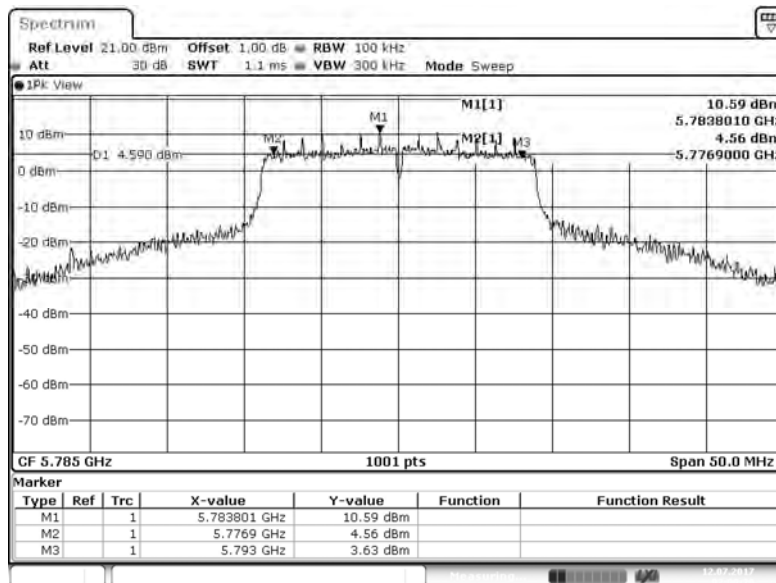
Figure Channel 157: (Chain A)



Date: 11.JUL.2017 20:03:58

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
157	5785.00	21930	>500	Pass

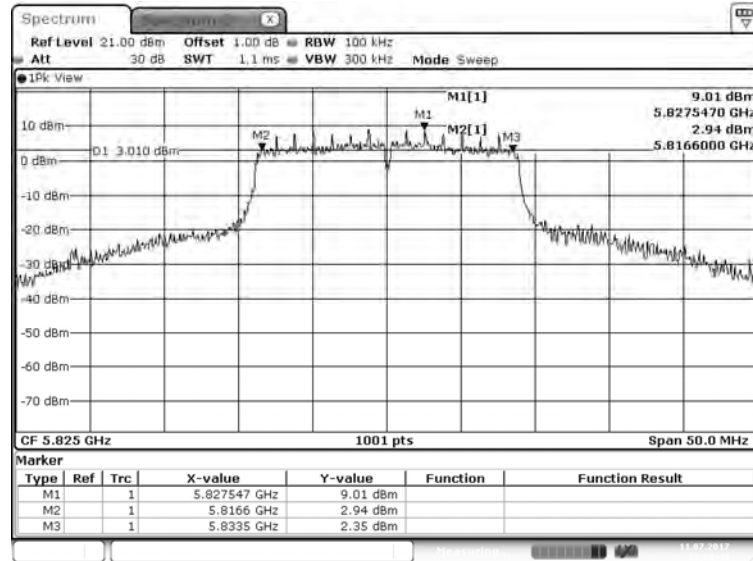
Figure Channel 157: (Chain B)



Product : G.hn Powerline Wireless Extender
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5825MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
165	5825.00	19430	>500	Pass

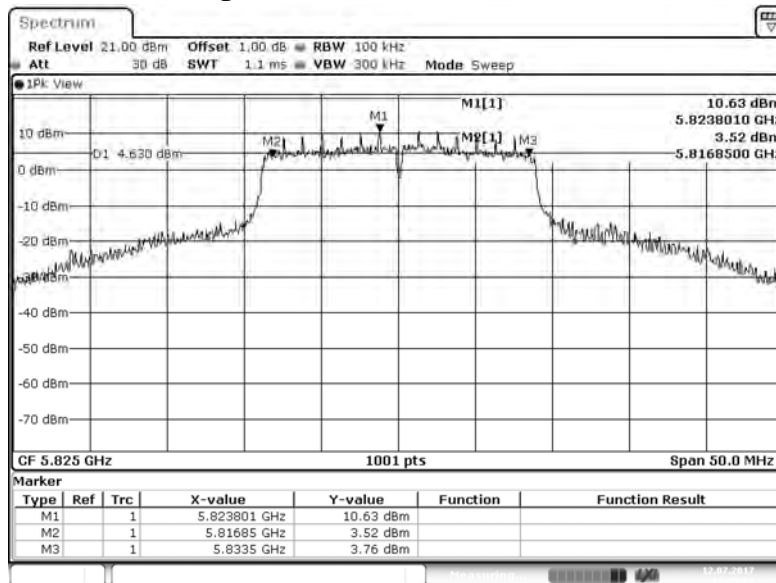
Figure Channel 165: (Chain A)



Date: 11.JUL.2017 20:08:40

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
165	5825.00	21930	>500	Pass

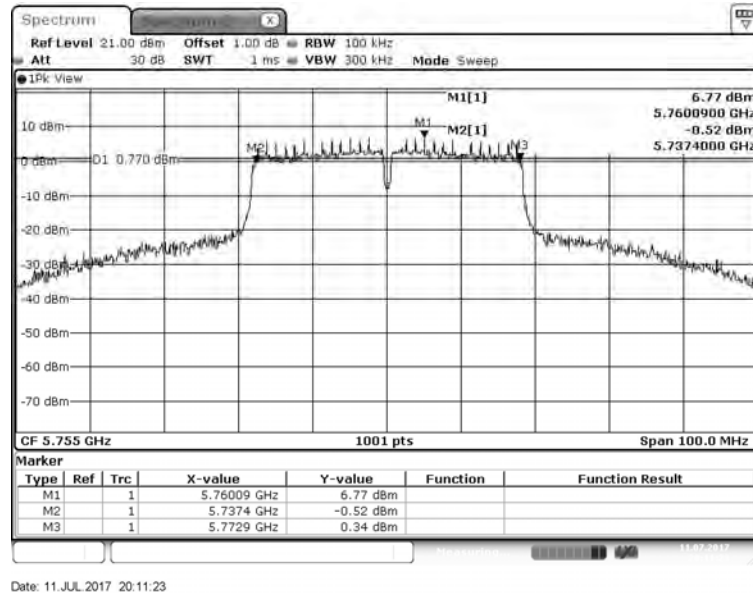
Figure Channel 165: (Chain B)



Product : G.hn Powerline Wireless Extender
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5755MHz)

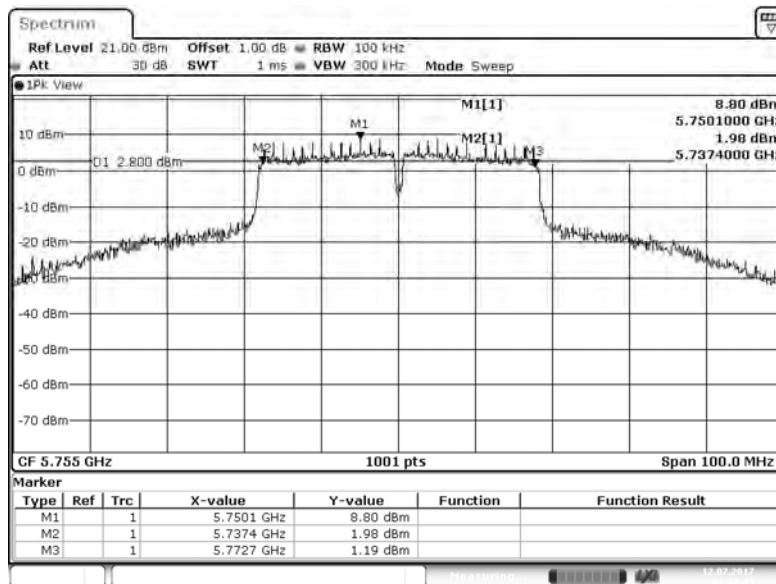
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
151	5755.00	36860	>500	Pass

Figure Channel 151: (Chain A)



Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
151	5755.00	38260	>500	Pass

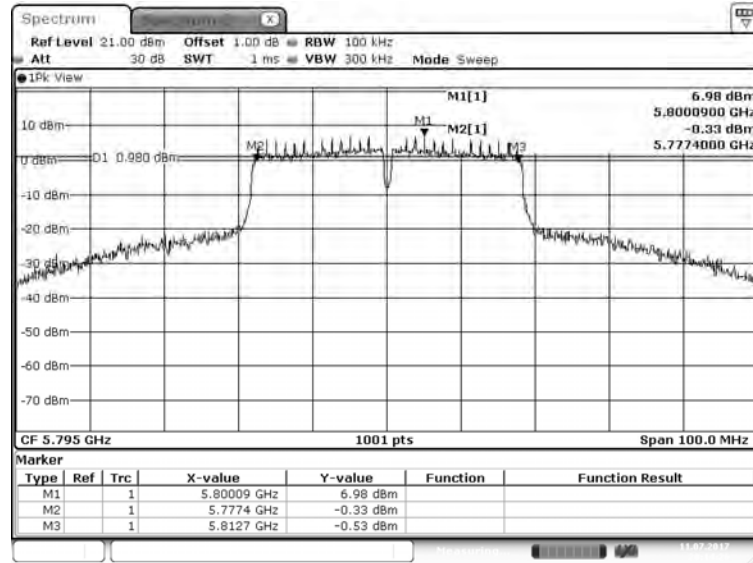
Figure Channel 151: (Chain B)



Product : G.hn Powerline Wireless Extender
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5795MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
159	5795.00	37160	>500	Pass

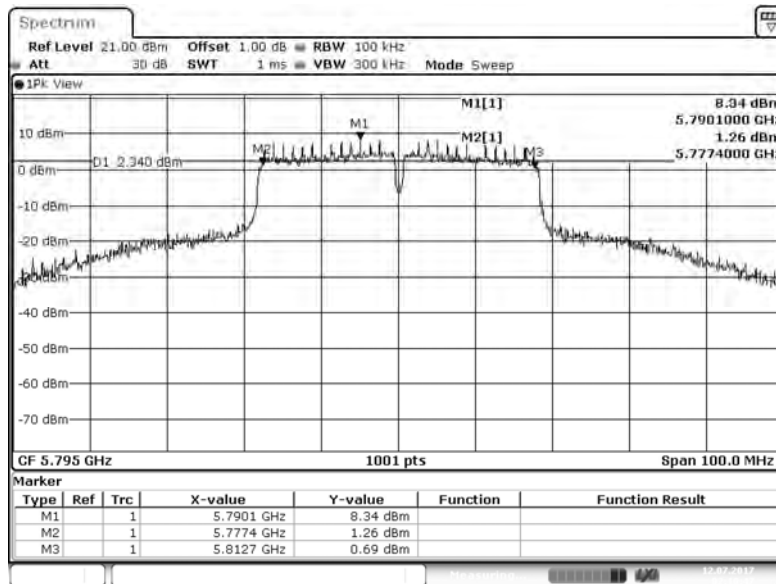
Figure Channel 159: (Chain A)



Date: 11.JUL.2017 20:14:26

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
159	5795.00	37860	>500	Pass

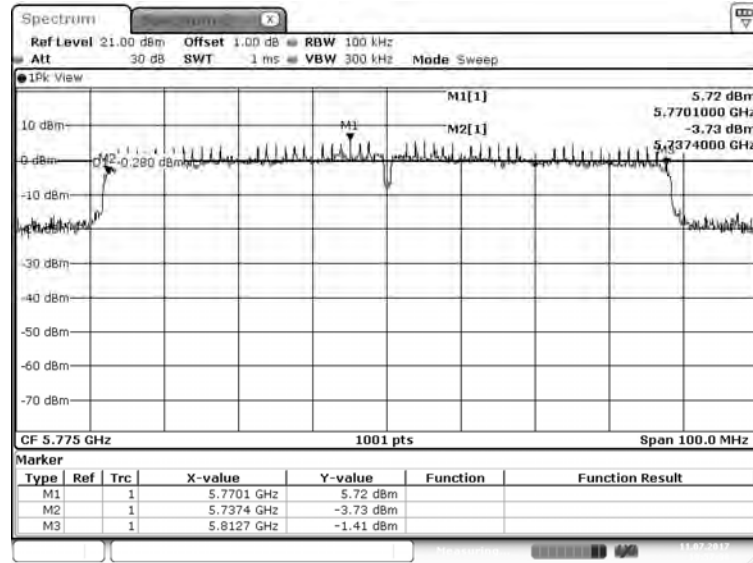
Figure Channel 159: (Chain B)



Product : G.hn Powerline Wireless Extender
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 4 Transmit (802.11ac-80BW-65Mbps) (5775MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
155	5775.00	75300	>500	Pass

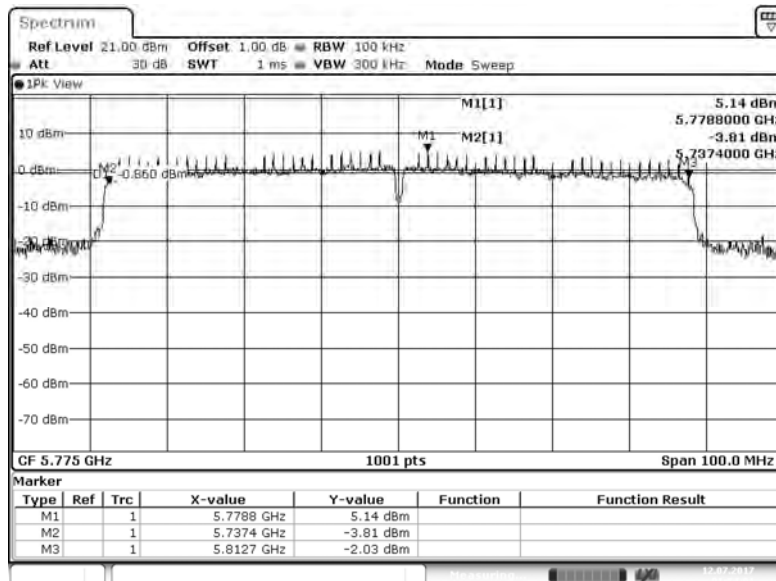
Figure Channel 155: (Chain A)



Date: 11.JUL.2017 19:57:38

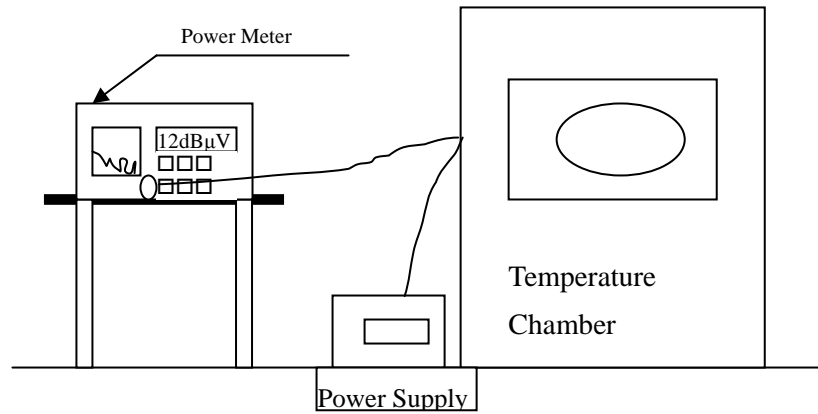
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
155	5775.00	75300	>500	Pass

Figure Channel 155: (Chain B)



8. Frequency Stability

8.1. Test Setup



8.2. Limits

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified

8.3. Test Procedure

The EUT was setup to ANSI C63.10, 2013; tested to UNII test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

8.4. Uncertainty

$\pm 671.83\text{Hz}$

8.5. Test Result of Frequency Stability

Product : G.hn Powerline Wireless Extender
 Test Item : Frequency Stability
 Test Site : Temperature Chamber
 Test Date : 2017/07/20
 Test Mode : Carrier Wave

Chain A

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tnom (20) oC	Vnom (120)V	36	5180.0000	5180.0011	-0.0011
		38	5190.0000	5190.0036	-0.0036
		44	5220.0000	5220.0046	-0.0046
		46	5230.0000	5230.0085	-0.0085
		48	5240.0000	5240.0002	-0.0002
		149	5745.0000	5745.0074	-0.0074
		151	5755.0000	5755.0115	-0.0115
		155	5785.0000	5785.0136	-0.0136
		157	5795.0000	5795.0075	-0.0075
		159	5825.0000	5825.0077	-0.0077
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tnom (50) oC	Vnom (138)V	36	5180.0000	5180.0051	-0.0051
		38	5190.0000	5190.0109	-0.0109
		44	5220.0000	5220.0066	-0.0066
		46	5230.0000	5230.0014	-0.0014
		48	5240.0000	5240.0067	-0.0067
		149	5745.0000	5745.0069	-0.0069
		151	5755.0000	5755.0058	-0.0058
		155	5785.0000	5785.0072	-0.0072
		157	5795.0000	5795.0034	-0.0034
		159	5825.0000	5825.0052	-0.0052

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tnom (50) oC	Vnom (102)V	36	5180.0000	5180.0047	-0.0047
		38	5190.0000	5190.0052	-0.0052
		44	5220.0000	5220.0101	-0.0101
		46	5230.0000	5230.0068	-0.0068
		48	5240.0000	5240.0039	-0.0039
		149	5745.0000	5745.0056	-0.0056
		151	5755.0000	5755.0016	-0.0016
		155	5785.0000	5785.0077	-0.0077
		157	5795.0000	5795.0046	-0.0046
		159	5825.0000	5825.0024	-0.0024
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tnom (-20) oC	Vnom (138)V	36	5180.0000	5180.0041	-0.0041
		38	5190.0000	5190.0036	-0.0036
		44	5220.0000	5220.0043	-0.0043
		46	5230.0000	5230.0074	-0.0074
		48	5240.0000	5240.0042	-0.0042
		149	5745.0000	5745.0033	-0.0033
		151	5755.0000	5755.0091	-0.0091
		155	5785.0000	5785.0019	-0.0019
		157	5795.0000	5795.0092	-0.0092
		159	5825.0000	5825.0097	-0.0097
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tnom (-20) oC	Vnom (102)V	36	5180.0000	5180.0041	-0.0041
		38	5190.0000	5190.0036	-0.0036
		44	5220.0000	5220.0043	-0.0043
		46	5230.0000	5230.0074	-0.0074
		48	5240.0000	5240.0042	-0.0042
		149	5745.0000	5745.0033	-0.0033
		151	5755.0000	5755.0091	-0.0091
		155	5785.0000	5785.0019	-0.0019
		157	5795.0000	5795.0092	-0.0092
		159	5825.0000	5825.0097	-0.0097

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tnom (20) °C	Vnom (120)V	42	5210.0000	5210.0032	-0.0032
		155	5775.0000	5775.0031	-0.0031
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tmax (50) °C	Vmax (138)V	42	5210.0000	5210.0074	-0.0074
		155	5775.0000	5775.0055	-0.0055
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tmax (50) °C	Vmin (102)V	42	5210.0000	5210.0038	-0.0038
		155	5775.0000	5775.0019	-0.0019
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tmax (-20) °C	Vmax (138)V	42	5210.0000	5210.0036	-0.0036
		155	5775.0000	5775.0011	-0.0011
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tmax (-20) °C	Vmin (102)V	42	5210.0000	5210.0085	-0.0085
		155	5775.0000	5775.0046	-0.0046

Chain B

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tnom (20) oC	Vnom (120)V	36	5180.0000	5180.0021	-0.0021
		38	5190.0000	5190.0073	-0.0073
		44	5220.0000	5220.0102	-0.0102
		46	5230.0000	5230.0082	-0.0082
		48	5240.0000	5240.0082	-0.0082
		149	5745.0000	5745.0012	-0.0012
		151	5755.0000	5755.0074	-0.0074
		155	5785.0000	5785.0041	-0.0041
		157	5795.0000	5795.0036	-0.0036
		159	5825.0000	5825.0010	-0.0010
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tnom (50) oC	Vnom (138)V	36	5180.0000	5180.0057	-0.0057
		38	5190.0000	5190.0046	-0.0046
		44	5220.0000	5220.0067	-0.0067
		46	5230.0000	5230.0430	-0.0430
		48	5240.0000	5240.0086	-0.0086
		149	5745.0000	5745.0076	-0.0076
		151	5755.0000	5755.0055	-0.0055
		155	5785.0000	5785.0012	-0.0012
		157	5795.0000	5795.0033	-0.0033
		159	5825.0000	5825.0021	-0.0021

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tnom (50) oC	Vnom (102)V	36	5180.0000	5180.0051	-0.0051
		38	5190.0000	5190.0022	-0.0022
		44	5220.0000	5220.0021	-0.0021
		46	5230.0000	5230.0136	-0.0136
		48	5240.0000	5240.0035	-0.0035
		149	5745.0000	5745.0082	-0.0082
		151	5755.0000	5755.0027	-0.0027
		155	5785.0000	5785.0042	-0.0042
		157	5795.0000	5795.0008	-0.0008
		159	5825.0000	5825.0014	-0.0014
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tnom (-20) oC	Vnom (138)V	36	5180.0000	5180.0052	-0.0052
		38	5190.0000	5190.0051	-0.0051
		44	5220.0000	5220.0102	-0.0102
		46	5230.0000	5230.0024	-0.0024
		48	5240.0000	5240.0038	-0.0038
		149	5745.0000	5745.0056	-0.0056
		151	5755.0000	5755.0074	-0.0074
		155	5785.0000	5785.0011	-0.0011
		157	5795.0000	5795.0096	-0.0096
		159	5825.0000	5825.0051	-0.0051
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tnom (-20) oC	Vnom (102)V	36	5180.0000	5180.0082	-0.0082
		38	5190.0000	5190.0041	-0.0041
		44	5220.0000	5220.0092	-0.0092
		46	5230.0000	5230.0010	-0.0010
		48	5240.0000	5240.0101	-0.0101
		149	5745.0000	5745.0069	-0.0069
		151	5755.0000	5755.0089	-0.0089
		155	5785.0000	5785.0054	-0.0054
		157	5795.0000	5795.0025	-0.0025
		159	5825.0000	5825.0051	-0.0051

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tnom (20) °C	Vnom (120)V	42	5210.0000	5210.0063	-0.0063
		155	5775.0000	5775.0083	-0.0083
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tmax (50) °C	Vmax (138)V	42	5210.0000	5210.0043	-0.0043
		155	5775.0000	5775.0089	-0.0089
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tmax (50) °C	Vmin (102)V	42	5210.0000	5210.0019	-0.0019
		155	5775.0000	5775.0048	-0.0048
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tmax (-20) °C	Vmax (138)V	42	5210.0000	5210.0065	-0.0065
		155	5775.0000	5775.0087	-0.0087
Test Conditions			Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tmax (-20) °C	Vmin (102)V	42	5210.0000	5210.0014	-0.0014
		155	5775.0000	5775.0056	-0.0056

9. EMI Reduction Method During Compliance Testing

No modification was made during testing.