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

For

MoCA to WiFi extender

Model : HT-EMN2

Trade Name : hitron

Issued for

Hitron Technologies,Inc.

No. 1-8,Lihsin 1st Rd.,HsinChu Science Park,HisnChu,Taiwan 300,R.O.C.

Issued by

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1. TEST REPORT CERTIFICATION

Applicant	：	Hitron Technologies,Inc.
Address	：	No. 1-8,Lihsin 1st Rd.,HsinChu Science Park, HisnChu, Taiwan 300,R.O.C.
Equipment Under Test	：	MoCA to WiFi extender
Model	：	HT-EMN2
Trade Name	：	hitron
Tested Date	：	May 29 ~ June 05, 2015

APPLICABLE STANDARD	
Standard	**Test Result**
FCC Part 15 Subpart E AND ANSI C63.10:2013 and ANSI C63.4:2014	PASS

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

Approved by:

Sb. Lu
Sr. Engineer

Reviewed by:

Gundam Lin
Sr. Engineer

2. EUT DESCRIPTION

Product Name	MoCA to WiFi extender
Model Number	HT-EMN2
Identify Number	T150529S02
Received Date	May 29, 2015
Frequency Range	UNII Band 1: IEEE 802.11a, 802.11ac VHT20 : 5180 MHz ~ 5240 MHz IEEE 802.11ac VHT40 : 5190 MHz ~ 5230 MHz IEEE 802.11ac VHT80 : 5210 MHz UNII Band 3: IEEE 802.11a, 802.11ac VHT20 : 5745 MHz ~ 5825 MHz IEEE 802.11ac VHT40 : 5755 MHz ~ 5795 MHz IEEE 802.11ac VHT80 : 5775 MHz
Transmit Power	UNII Band 1: IEEE 802.11a : 16.82dBm (0.0481W) IEEE 802.11ac VHT20 : 15.79dBm (0.0379W) IEEE 802.11ac VHT40 : 15.86dBm (0.0385W) IEEE 802.11ac VHT80 : 15.89 dBm (0.0388W) UNII Band 3: IEEE 802.11a : 17.39dBm (0.0548W) IEEE 802.11ac VHT20 : 16.67dBm (0.0465W) IEEE 802.11ac VHT40 : 16.59dBm (0.0456W) IEEE 802.11ac VHT80 : 16.40 dBm (0.0437W)
Channel Spacing	IEEE 802.11a, 802.11ac VHT20 : 20MHz IEEE 802.11ac VHT40 : 40MHz IEEE 802.11ac VHT80 : 80MHz
Channel Number	IEEE 802.11a, 802.11ac VHT20 : 5150MHz ~ 5250MHz : 4 Channels 5725MHz ~ 5850MHz : 5 Channels IEEE 802.11ac VHT40 : 5150MHz ~ 5250MHz : 2 Channels 5725MHz ~ 5850MHz : 2 Channels IEEE 802.11ac VHT80 : 5210MHz : 1 Channels 5775MHz : 1 Channels

Transmit Data Rate	IEEE 802.11a : up to 54 Mbps IEEE 802.11ac (VHT20,800ns GI) : up to 156 Mbps IEEE 802.11ac (VHT20,400ns GI) : up to 173.4 Mbps IEEE 802.11ac (VHT40,800ns GI) : up to 360 Mbps IEEE 802.11ac (VHT40,400ns GI) : up to 400 Mbps IEEE 802.11ac (VHT80,800ns GI) : up to 780 Mbps IEEE 802.11ac (VHT80,400ns GI) : up to 866.3 Mbps
Type of Modulation	IEEE 802.11a : OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac VHT20/VHT40 : OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac VHT80 : OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK)
Antenna Type	Airgain Embedded Antenna × 2 : Antenna 0 (Chain 0), Antenna Gain 3.2dBi Antenna 1 (Chain 1), Antenna Gain 3.1dBi
Power Rating	12Vdc
Test Voltage	120Vac, 60Hz
DC Power Cable Type	Non-shielded cable 1.5m × 1 (Non-detachable)
I/O Port	RJ-45 Port × 1, Coaxial Port × 2, Power Port × 1,
Signal Cable	Non-shielded RJ-45 Cable 1.4m × 1 (Detachable)

Power Adapter :

No.	Manufacturer	Model No.	Power Input	Power Output
1	AOEM	ADS012PM-W 120100	100-240Vac, 50-60Hz, 0.5A	12Vdc, 1.0A

Remark :

1. *The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.*
2. *For more details, please refer to the User's manual of the EUT.*
3. *This submittal(s) (test report) is intended for FCC ID: U4P-HTEMN2 filing to comply with Section 15.207, 15.209 and 15.407 of the FCC Part 15, Subpart E Rules.*

3. DESCRIPTION OF TEST MODES

The EUT (MoCA to WiFi extender) had been tested under operating condition.

For IEEE 802.11a, 802.11ac VHT20/VHT40/VHT80 mode (2TX/2RX) :

Chain 0 & Chain 1 transmit/receive.

Conducted Emission / Radiated Emission Test (Below 1 GHz)

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

No.	Pre-Test Mode
1	Normal Operating

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

Final Test Mode		
Emission	Radiated Emission	Normal Operating
	Conducted Emission	Normal Operating

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

Conducted / Radiated Emission Test (Above 1 GHz)

IEEE 802.11a, 802.11ac VHT20 mode

The EUT had been tested under operating condition.

There are three channels have been tested as following :

UNII	Channel	Frequency (MHz)
Band 1	Low	5180
	Middle	5220
	High	5240
Band 3	Low	5745
	Middle	5785
	High	5825

IEEE 802.11a mode : 6Mbps data rate (worst case) were chosen for full testing.

IEEE 802.11ac VHT20 mode : 6.5Mbps data rate (worst case) were chosen for full testing.

IEEE 802.11ac VHT40 mode

The EUT had been tested under operating condition.

There are two channels have been tested as following :

UNII	Channel	Frequency (MHz)
Band 1	Low	5190
	High	5230
Band 3	Low	5755
	High	5795

IEEE 802.11ac VHT40 mode : 13.5Mbps data rate (worst case) were chosen for full testing.

IEEE 802.11ac VHT80 mode

The EUT had been tested under operating condition.

There are one channels have been tested as following :

UNII	Channel	Frequency (MHz)
Band 1	Low	5210
Band 3	Low	5775

IEEE 802.11ac VHT80 mode : 29.3 Mbps data rate (worst case) were chosen for full testing.

4. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10: 2013 and ANSI C63.4: 2014 and FCC CFR 47, 15.207, 15.209 and 15. 407.

5. FACILITIES AND ACCREDITATION

5.1 FACILITIES

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

NO. 989-1 Wen Shan Rd., Shang Shan Village,
Qionglin Shiang Hsinchu County 30741, Taiwan, R.O.C

The sites are constructed in conformance with the requirements of ANSI C63.10:2013 and ANSI C63.4: 2014 and CISPR 22. All receiving equipment conforms to CISPR 16-1-1, CISPR 16-1-2, CISPR 16-1-3, CISPR 16-1-4, CISPR 16-1-5.

5.2 ACCREDITATIONS

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

Taiwan	TAF

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

Canada	INDUSTRY CANADA
Japan	VCCI
Taiwan	BSMI
USA	FCC MRA

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

Remark: *FCC Designation Number TW1027.*

5.3 MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 30 to 1000 MHz	+/- 3.97
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 1 to 18GHz	+/- 3.58
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 18 to 26 GHz	+/- 3.59
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 26 to 40 GHz	+/- 3.81
Semi Anechoic Chamber (966 Chamber_C) / Radiated Emission, 30 to 1000 MHz	+/- 3.97
Semi Anechoic Chamber (966 Chamber_C) / Radiated Emission, 1 to 18GHz	+/- 3.58
Semi Anechoic Chamber (966 Chamber_C) / Radiated Emission, 18 to 26 GHz	+/- 3.59
Semi Anechoic Chamber (966 Chamber_C) / Radiated Emission, 26 to 40 GHz	+/- 3.81
Conducted Emission (Mains Terminals), 9kHz to 30MHz	+/- 2.48

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

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

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

6. SETUP OF EQUIPMENT UNDER TEST

SUPPORT EQUIPMENT

No.	Product	Manufacturer	Model No.	Serial No.
1	Notebook PC	TOSHIBA	M840	9C104267C
2	Notebook PC	TOSHIBA	PORTEGE R30-A	1E101235H
3	Notebook PC	HP	ProBook 4421s	CNF03242PJ
4	Notebook PC	HP	Latitude D610 pp01L	CN-0XD762-48643-637-1743
5	Monitor	Sony	KDL-22Ex420	3711394
6	TV Generator	DEKTEC	DTA2115	---
7	Moca	Hitron	HT-EM2	24214B003808

No.	Power & Signal Cable Description
1	Non-shielded RJ-45 cable, 10m × 1
2	Shielded coaxial cable, 1m × 1
3	Shielded coaxial cable, 10m × 1

SETUP DIAGRAM FOR TESTS

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

EUT OPERATING CONDITION

RF Mode :

1. EUT & peripherals setup diagram is shown in appendix setup photos.
2. Run Test software. “Mtool”
3. TX Mode:

⇨ **Tx Data Rate:** 6Mbps Bandwidth 20 (IEEE 802.11a mode)
6.5Mbps Bandwidth 20 (IEEE 802.11ac VHT20 mode)
13.5Mbps Bandwidth 40 (IEEE 802.11ac VHT40 mode)
29.3Mbps Bandwidth 80 (IEEE 802.11ac VHT80 mode)

⇨ **Power control**

UNII Band 1:
IEEE 802.11a Channel Low (5180MHz) Chain0/Chain1 Power set 0D/0D
IEEE 802.11a Channel Mid (5200MHz) Chain0/Chain1 Power set 0B/0B
IEEE 802.11a Channel High (5240MHz) Chain0/Chain1 Power set 09/09
IEEE 802.11ac VHT20 Cannel Low (5180MHz) Chain0/Chain1 Power set 0F/0F
IEEE 802.11ac VHT20 Channel Mid (5200MHz) Chain0/Chain1 Power set 12/12
IEEE 802.11ac VHT20 Channel High (5240MHz) Chain0/Chain1 Power set 0A/0A

IEEE 802.11ac VHT40 Channel Low (5190MHz) Chain0/Chain1 Power set 11/11
IEEE 802.11ac VHT40 Channel High (5230MHz) Chain0/Chain1 Power set 13/13
IEEE 802.11ac VHT80 Channel High (5210MHz) Chain0/Chain1 Power set 0E/0E

UNII Band 3:
IEEE 802.11a Channel Low (5745MHz) Chain0/Chain1 Power set 05/05
IEEE 802.11a Channel Mid (5785MHz) Chain0/Chain1 Power set 08/08
IEEE 802.11a Channel High (5825MHz) Chain0/Chain1 Power set 09/09
IEEE 802.11ac VHT20 Cannel Low (5745MHz) Chain0/Chain1 Power set 08/08
IEEE 802.11ac VHT20 Channel Mid (5785MHz) Chain0/Chain1 Power set 08/08
IEEE 802.11ac VHT20 Channel High (5825MHz) Chain0/Chain1 Power set 0B/0B
IEEE 802.11ac VHT40 Channel Low (5755MHz) Chain0/Chain1 Power set 07/07
IEEE 802.11ac VHT40 Channel High (5795MHz) Chain0/Chain1 Power set 12/12
IEEE 802.11ac VHT80 Channel High (5775MHz) Chain0/Chain1 Power set 05/05

5. All of the functions are under run.
6. Start test.

Normal Mode :

All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

1. EUT & peripherals setup diagram is shown in appendix setup photos.
2. EUT RJ-45 port link to Notebook PC 4.
3. EUT coaxial port Link to DTV Generator and Moca.
4. EUT VHF/UHF port Link to TV.
5. Moca RJ-45 port Link to Notebook PC 3
6. Notebook PC 1, 2 with WiFi (192.168.0.80, 192.168.0.33).
7. Notebook PC 1, 2, 3 ping Notebook PC 4 (192.168.0.163).
8. All of the functions are under run.
9. Start test.

7. FCC PART 15.407 REQUIREMENTS

7.1 6dB BANDWIDTH

LIMITS

According to§ 15.407 (e), within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EXA Signal Analyzer	Agilent	N9010A	MY52220817	03/19/2016

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

TEST SETUP

TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 100kHz, VBW = 300kHz, Sweep = auto.
4. Mark the peak frequency and –6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

TEST RESULTS

IEEE 802.11a Mode (Two TX)

UNII	Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	
			Chain 0	Chain 1
Band 3	Low	5475	16.3100	16.3200
	Middle	5785	16.3500	16.3300
	High	5825	16.2900	16.3000

IEEE 802.11ac VHT20 Mode (Two TX)

UNII	Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	
			Chain 0	Chain 1
Band 3	Low	5475	17.4400	17.4700
	Middle	5785	17.5300	17.4500
	High	5825	17.4300	17.4900

IEEE 802.11ac VHT40 Mode (Two TX)

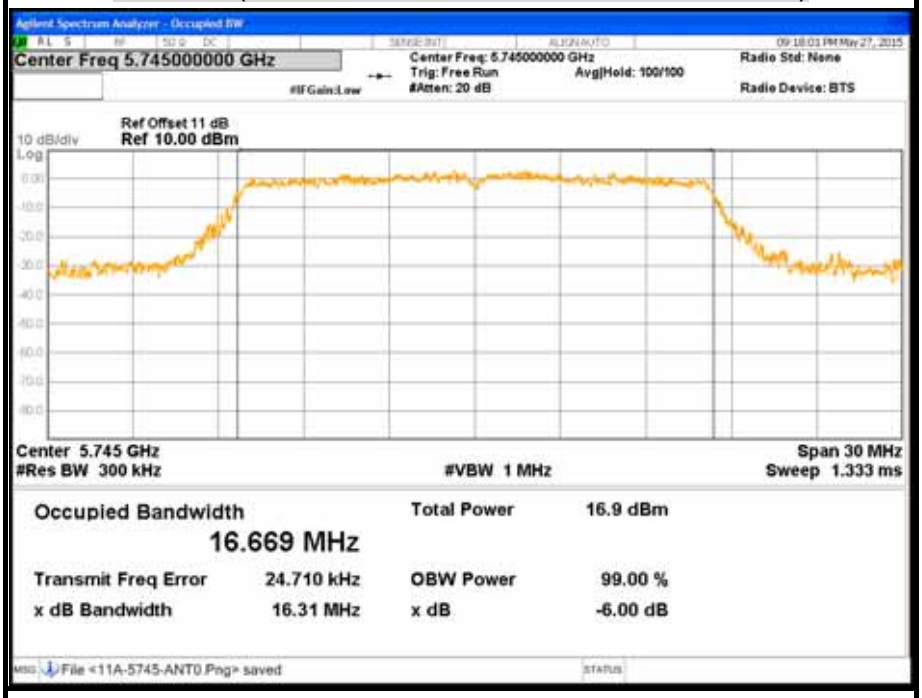
UNII	Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	
			Chain 0	Chain 1
Band 3	Low	5755	35.9000	36.0900
	High	5795	36.0600	36.1000

IEEE 802.11ac VHT80 Mode (Two TX)

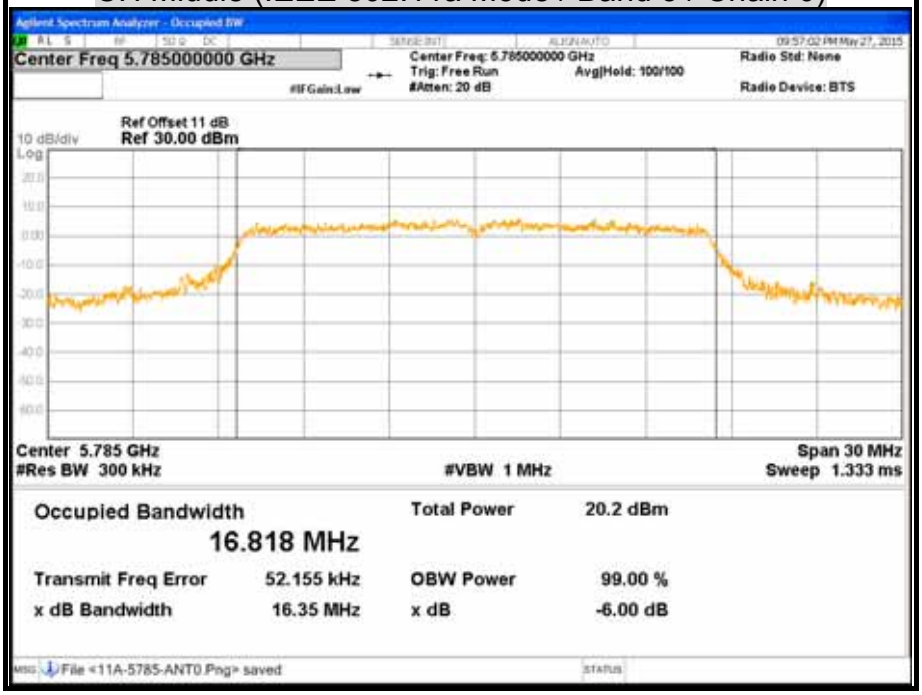
UNII	Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	
			Chain 0	Chain 1
Band 3	Low	5775	75.2000	74.7900

6dB BANDWIDTH

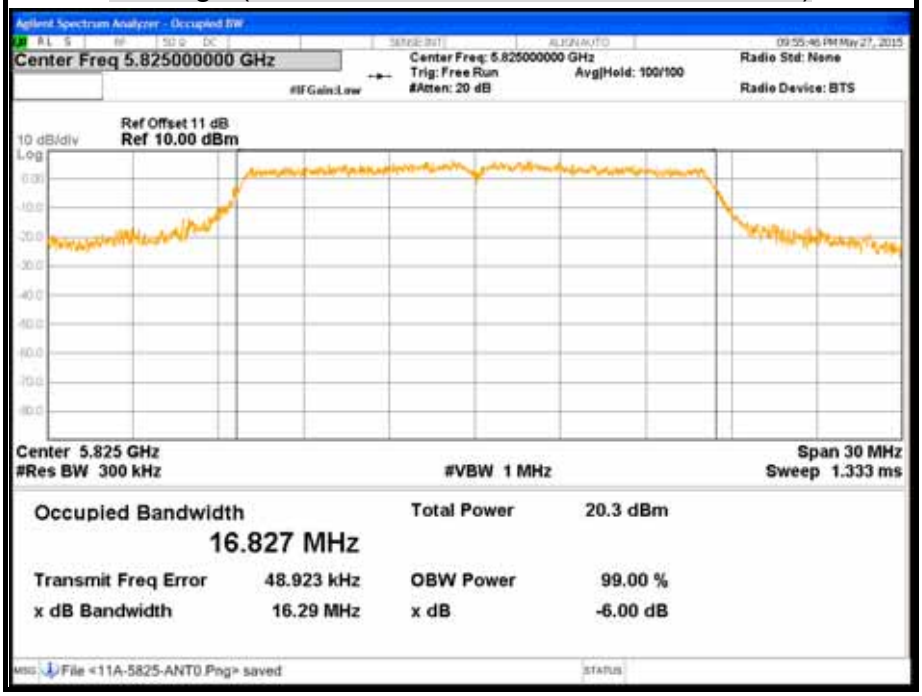
CH Low (IEEE 802.11a Mode / Band 3 / Chain 0)



CH Middle (IEEE 802.11a Mode / Band 3 / Chain 0)



CH High (IEEE 802.11a Mode / Band 3 / Chain 0)



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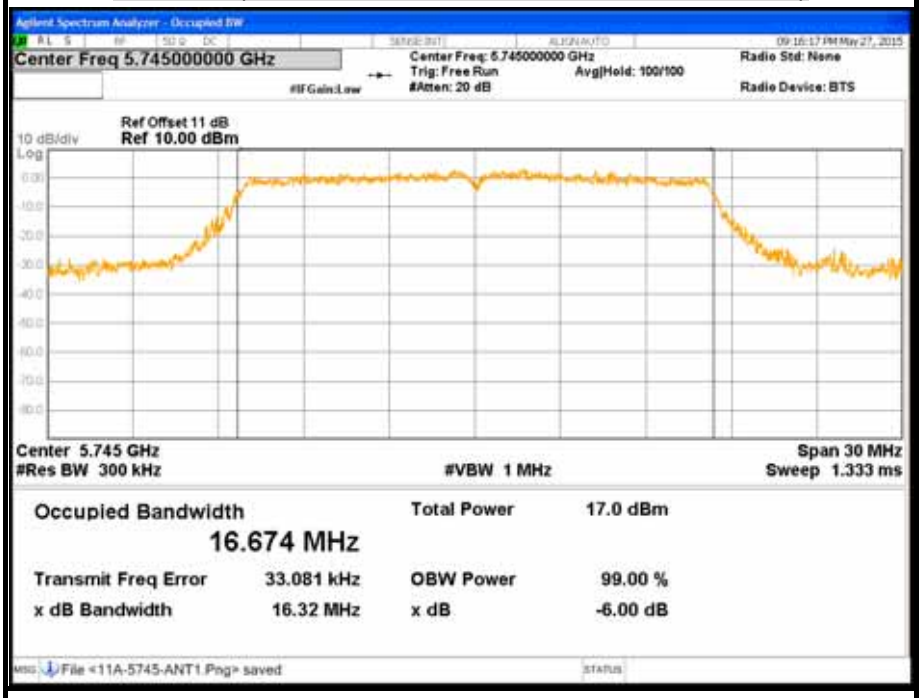

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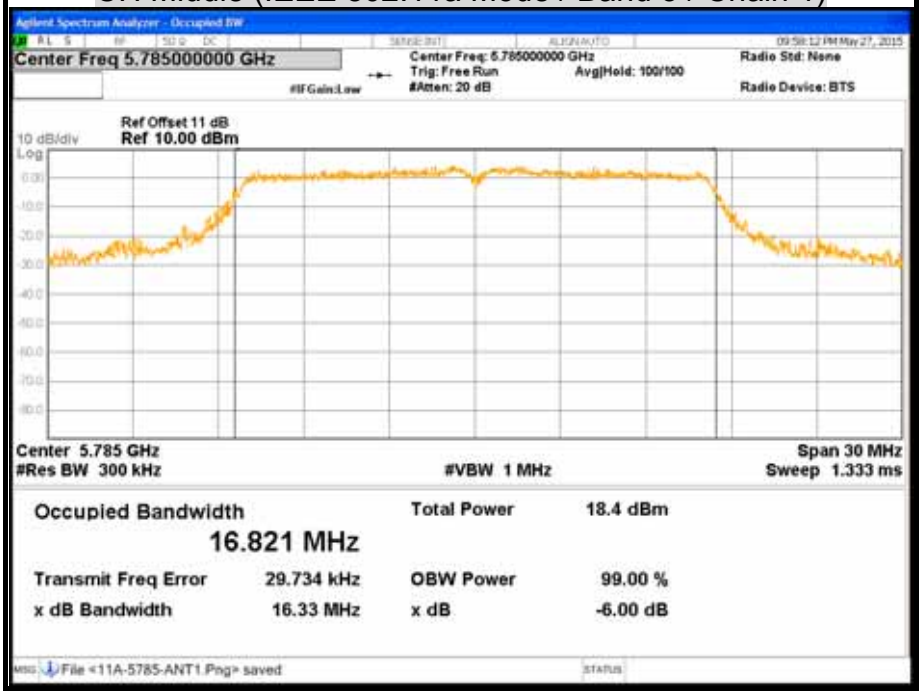

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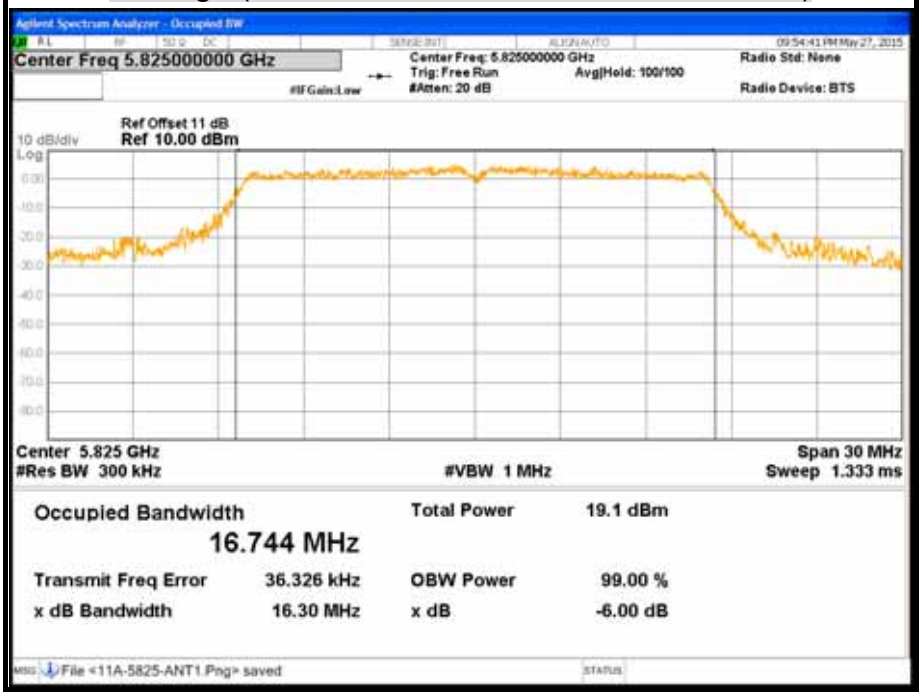

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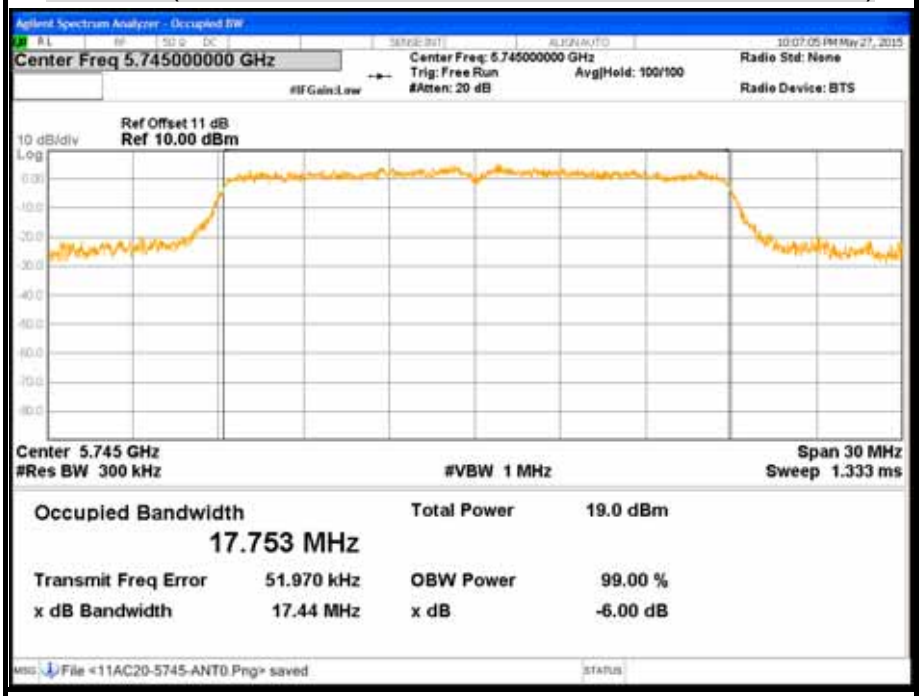

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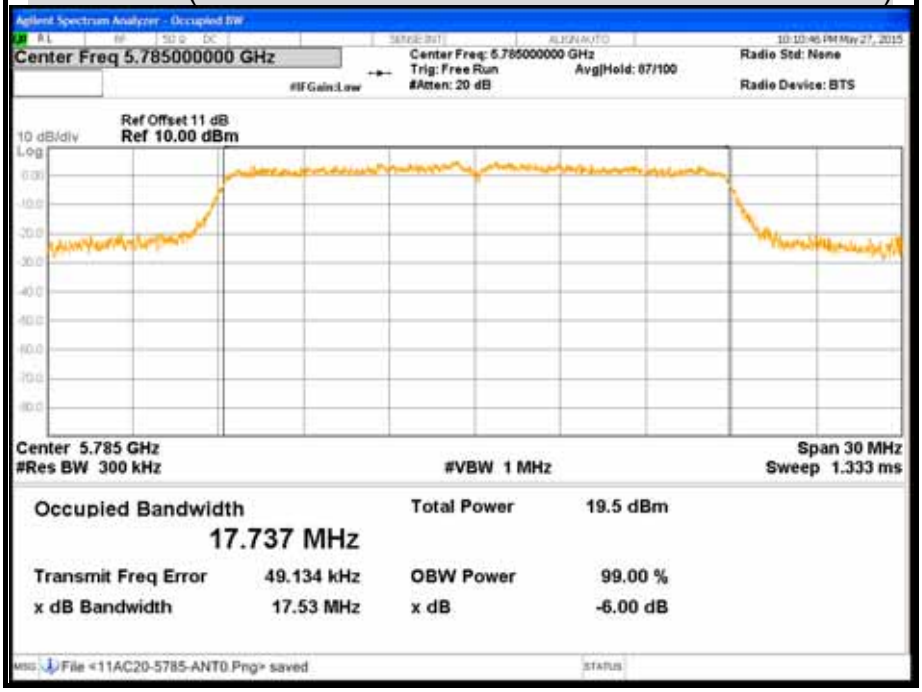

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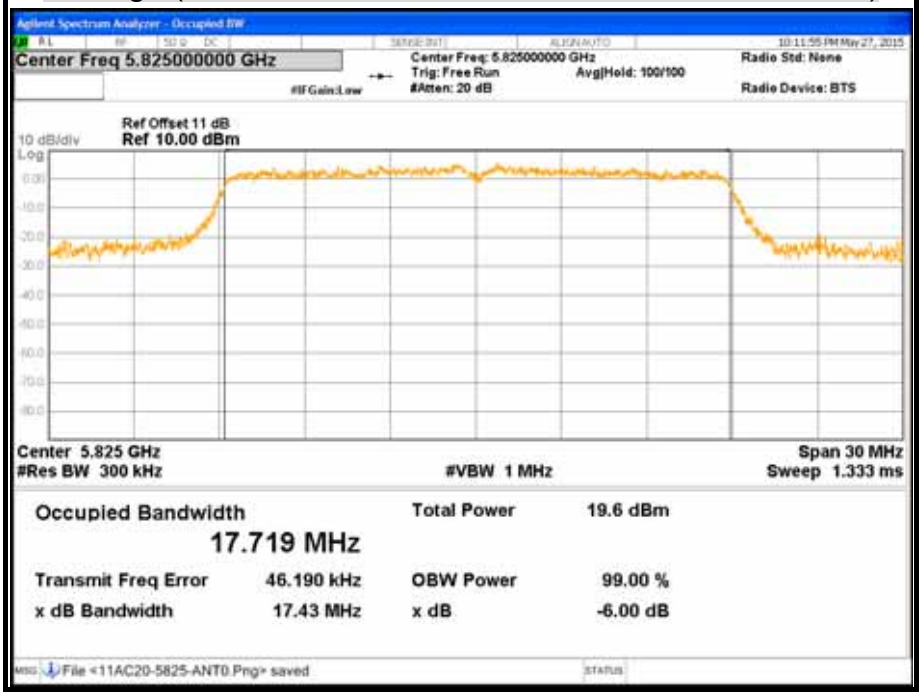

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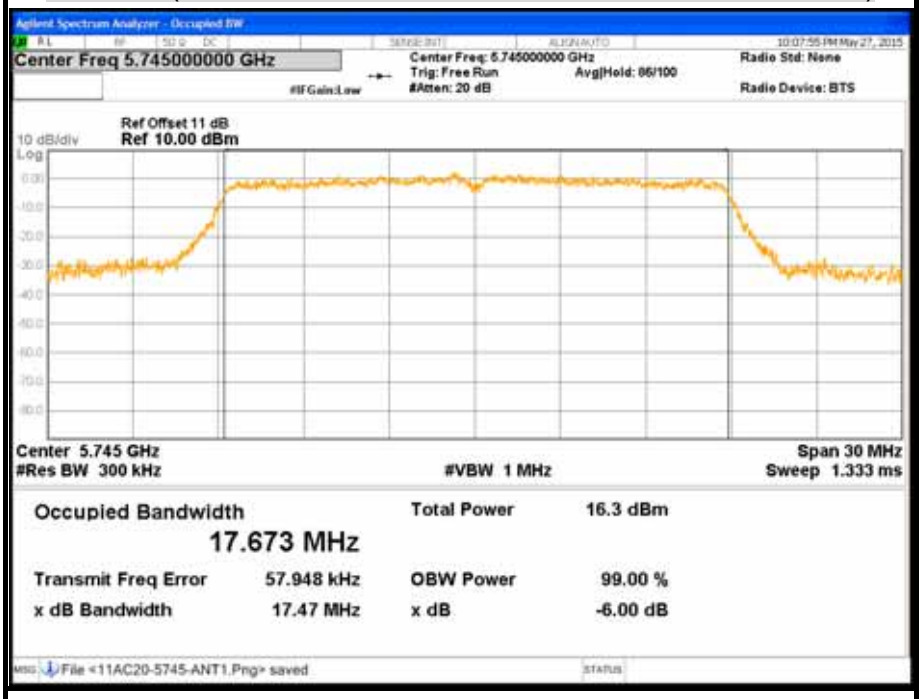
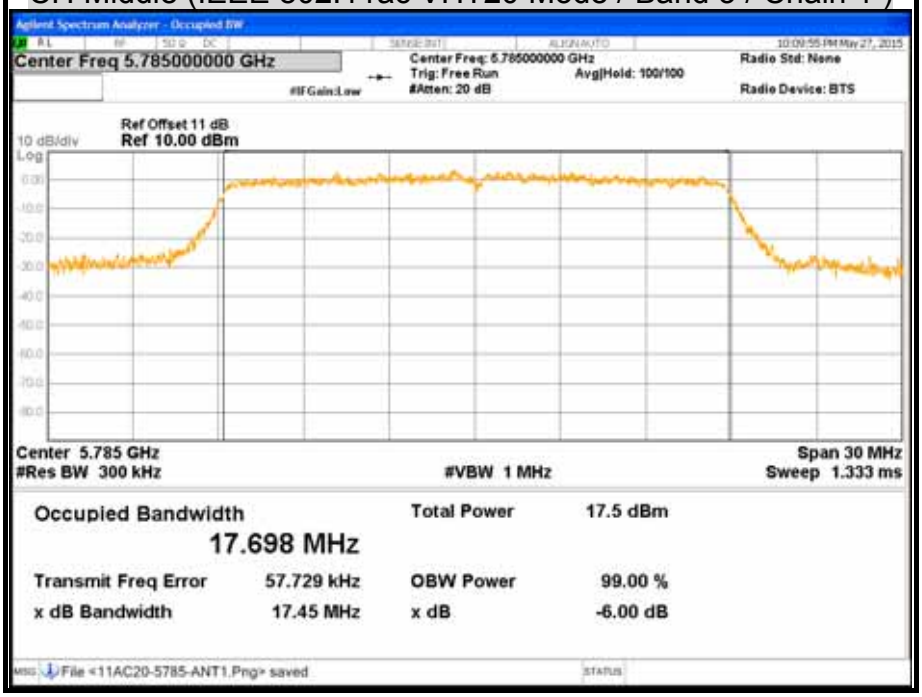
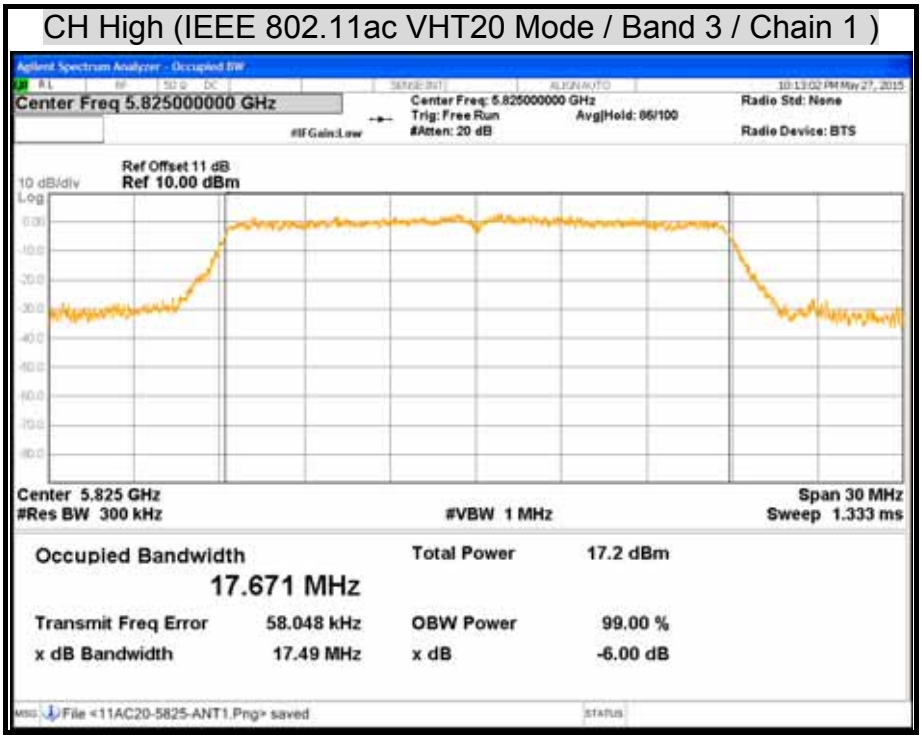


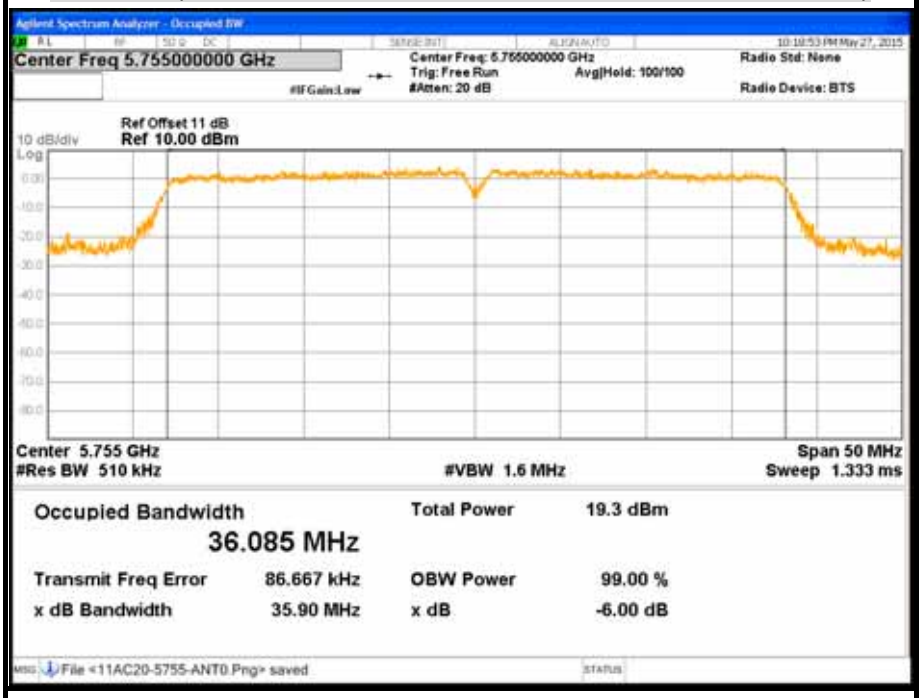
CH Middle (IEEE 802.11ac VHT20 Mode / Band 3 / Chain 1)



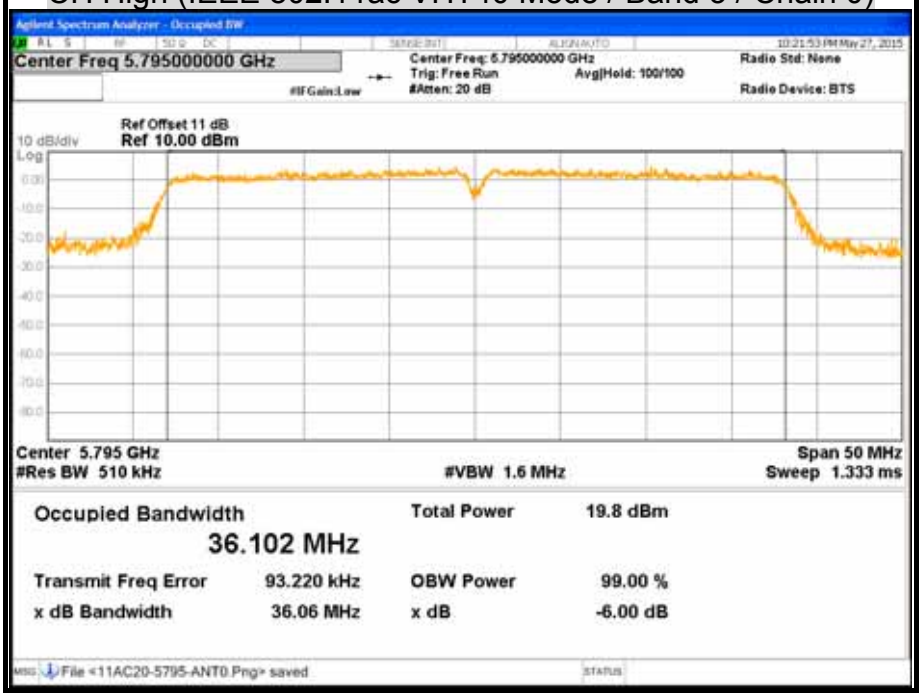
CH High (IEEE 802.11ac VHT20 Mode / Band 3 / Chain 1)



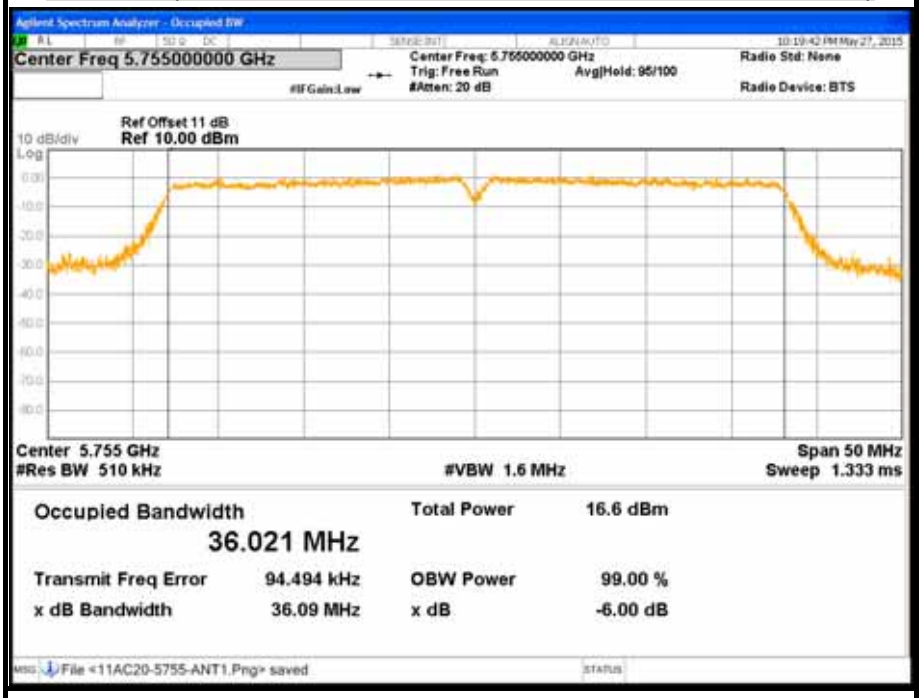
CH Low (IEEE 802.11ac VHT40 Mode / Band 3 / Chain 0)



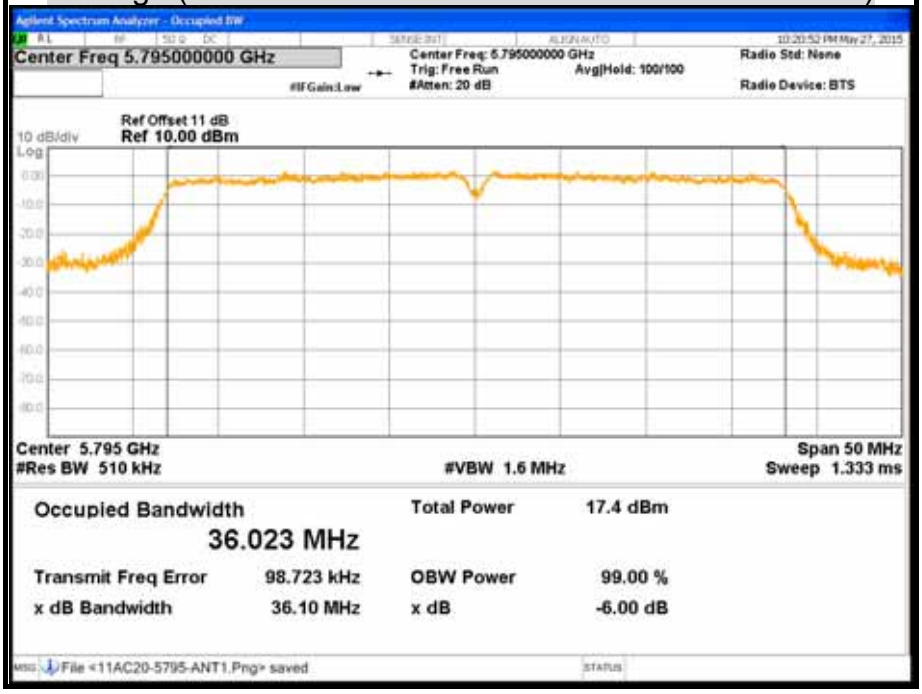
CH High (IEEE 802.11ac VHT40 Mode / Band 3 / Chain 0)



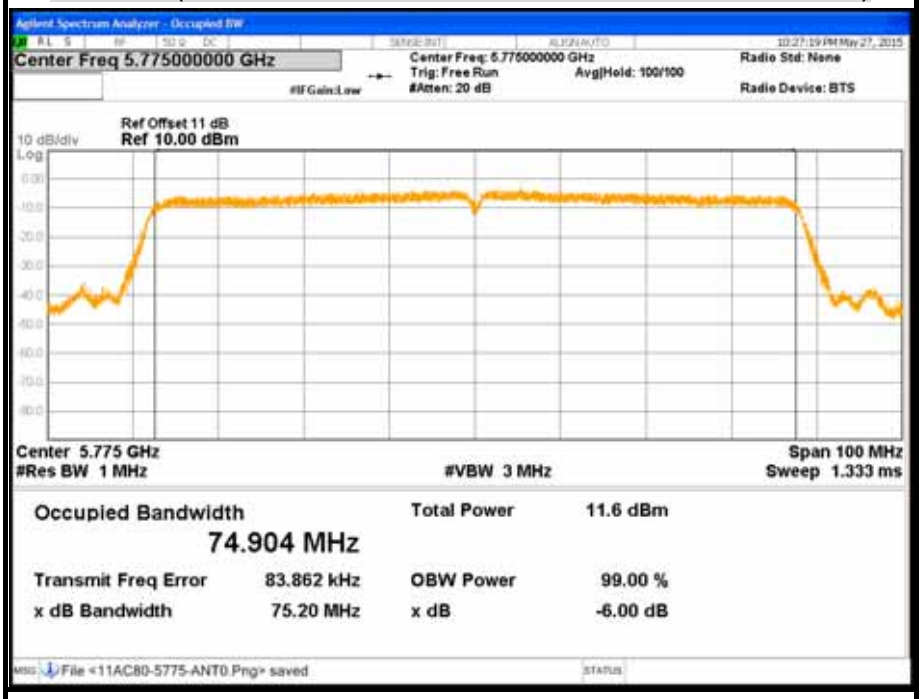
CH Low (IEEE 802.11ac VHT40 Mode / Band 3 / Chain 1)



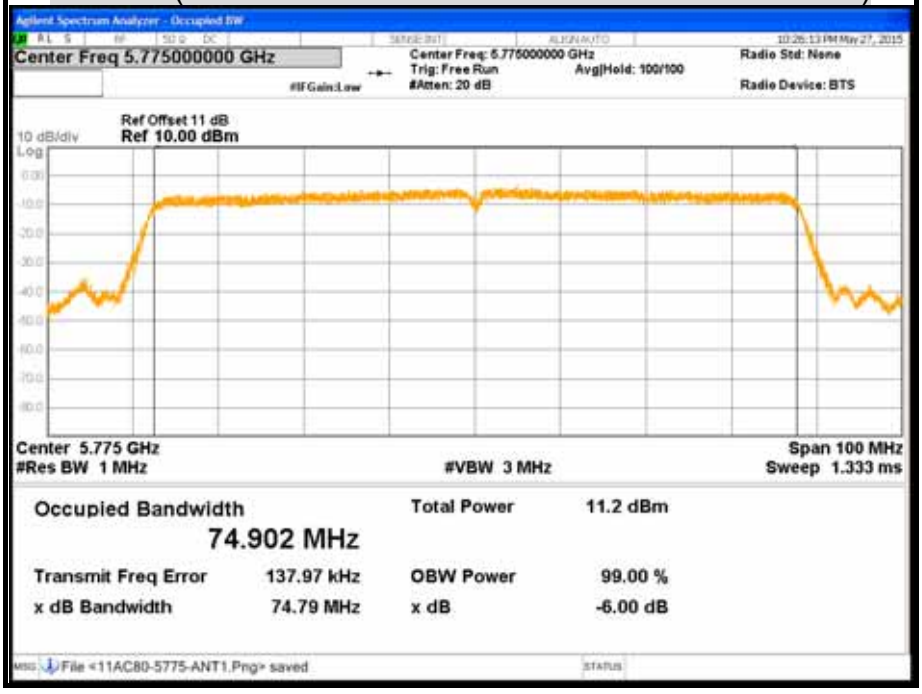
CH High (IEEE 802.11ac VHT40 Mode / Band 3 / Chain 1)



CH Low (IEEE 802.11ac VHT80 Mode / Band 3 / Chain 0)



CH Low (IEEE 802.11ac VHT80 Mode / Band 3 / Chain 1)



7.2 MAXIMUM CONDUCTED OUTPUT POWER

LIMITS

§ 15.407(a)

(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 1W provided the maximum antenna gain does not exceed 6 dBi. In addition, 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, both the maximum conducted output power and the maximum power spectral density 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 1W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

(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 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, 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, both the maximum conducted output power and 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 conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, 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, both the maximum conducted output power and 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 conducted output power over the frequency band of operation shall not exceed 1 W. In addition, 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, both the maximum conducted output power and 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 U-NII 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.

§ KDB 662911 : For power measurements on IEEE 802.11 devices

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

TEST EQUIPMENT

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

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

TEST SETUP

TEST PROCEDURE

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

TEST RESULTS

IEEE 802.11a Mode / UNII Band 1 (Two TX)

Channel	Channel Frequency (MHz)	Power (dBm)		Power Total		Power Limit		Pass / Fail
		Chain 0	Chain 1	(dBm)	(W)	(dBm)	(W)	
Low	5180	13.47	12.50	16.02	0.0400	30	1	PASS
Middle	5220	14.02	12.70	16.42	0.0439	30	1	PASS
High	5240	14.11	13.49	16.82	0.0481	30	1	PASS

Remark:

1. *At finial test to get the worst-case emission at 6 Mbps.*
2. *The cable assembly insertion loss of 11dB (including 10 dB pad and 1dB cable) was Entered as an offset in the power meter to allow for direct reading of power.*
3. *Array gain = 0 dB for $N_{ANT} \leq 4$, power limit do not reduce.*
4. *Total power = Chain 0 + Chain 1.*

IEEE 802.11ac VHT20 Mode / UNII Band 1 (Two TX)

Channel	Channel Frequency (MHz)	Power (dBm)		Power Total		Power Limit		Pass / Fail
		Chain 0	Chain 1	(dBm)	(W)	(dBm)	(W)	
Low	5180	10.69	11.46	14.10	0.0257	30	1	PASS
Middle	5220	10.47	11.71	14.14	0.0259	30	1	PASS
High	5240	12.94	12.61	15.79	0.0379	30	1	PASS

Remark:

1. *At finial test to get the worst-case emission at 6.5 Mbps.*
2. *The cable assembly insertion loss of 11dB (including 10 dB pad and 1dB cable) was Entered as an offset in the power meter to allow for direct reading of power.*
3. *Array gain = 0 dB for $N_{ANT} \leq 4$, power limit do not reduce.*
4. *Total power = Chain 0 + Chain 1.*

IEEE 802.11ac VHT40 Mode / UNII Band 1 (Two TX)

Channel	Channel Frequency (MHz)	Power (dBm)		Power Total		Power Limit		Pass / Fail
		Chain 0	Chain 1	(dBm)	(W)	(dBm)	(W)	
Low	5190	13.32	11.63	15.57	0.0361	30	1	PASS
High	5230	13.37	12.26	15.86	0.0385	30	1	PASS

Remark:

1. *At finial test to get the worst-case emission at 13.5 Mbps.*
2. *The cable assembly insertion loss of 11dB (including 10 dB pad and 1dB cable) was Entered as an offset in the power meter to allow for direct reading of power.*
3. *Array gain = 0 dB for $N_{ANT} \leq 4$, power limit do not reduce.*
4. *Total power = Chain 0 + Chain 1.*

IEEE 802.11ac VHT80 Mode / UNII Band 1 (Two TX)

Channel	Channel Frequency (MHz)	Power (dBm)		Power Total		Power Limit		Pass / Fail
		Chain 0	Chain 1	(dBm)	(W)	(dBm)	(W)	
Low	5210	13.22	12.52	15.89	0.0388	30	1	PASS

Remark:

1. *At finial test to get the worst-case emission at 29.3 Mbps.*
2. *The cable assembly insertion loss of 11dB (including 10 dB pad and 1dB cable) was Entered as an offset in the power meter to allow for direct reading of power.*
3. *Array gain = 0 dB for $N_{ANT} \leq 4$, power limit do not reduce.*
4. *Total power = Chain 0 + Chain 1.*

IEEE 802.11a Mode / UNII Band 3 (Two TX)

Channel	Channel Frequency (MHz)	Power (dBm)		Power Total		Power Limit		Pass / Fail
		Chain 0	Chain 1	(dBm)	(W)	(dBm)	(W)	
Low	5745	14.46	13.02	16.81	0.0480	30	1	PASS
Middle	5785	14.85	13.57	17.27	0.0533	30	1	PASS
High	5825	15.37	13.09	17.39	0.0548	30	1	PASS

Remark:

1. *At finial test to get the worst-case emission at 6 Mbps.*
2. *The cable assembly insertion loss of 11dB (including 10 dB pad and 1dB cable) was Entered as an offset in the power meter to allow for direct reading of power.*
3. *Array gain = 0 dB for $N_{ANT} \leq 4$, power limit do not reduce.*
4. *Total power = Chain 0 + Chain 1.*

IEEE 802.11ac VHT20 Mode / UNII Band 3 (Two TX)

Channel	Channel Frequency (MHz)	Power (dBm)		Power Total		Power Limit		Pass / Fail
		Chain 0	Chain 1	(dBm)	(W)	(dBm)	(W)	
Low	5745	14.27	12.22	16.38	0.0435	30	1	PASS
Middle	5785	14.02	12.45	16.32	0.0429	30	1	PASS
High	5825	14.22	13.02	16.67	0.0465	30	1	PASS

Remark:

1. *At finial test to get the worst-case emission at 6.5 Mbps.*
2. *The cable assembly insertion loss of 11dB (including 10 dB pad and 1dB cable) was Entered as an offset in the power meter to allow for direct reading of power.*
3. *Array gain = 0 dB for $N_{ANT} \leq 4$, power limit do not reduce.*
4. *Total power = Chain 0 + Chain 1.*

IEEE 802.11ac VHT40 Mode / UNII Band 3 (Two TX)

Channel	Channel Frequency (MHz)	Power (dBm)		Power Total		Power Limit		Pass / Fail
		Chain 0	Chain 1	(dBm)	(W)	(dBm)	(W)	
Low	5755	14.07	12.02	16.18	0.0415	30	1	PASS
High	5795	14.34	12.66	16.59	0.0456	30	1	PASS

Remark:

1. *At finial test to get the worst-case emission at 13.5 Mbps.*
2. *The cable assembly insertion loss of 11dB (including 10 dB pad and 1dB cable) was Entered as an offset in the power meter to allow for direct reading of power.*
3. *Array gain = 0 dB for $N_{ANT} \leq 4$, power limit do not reduce.*
4. *Total power = Chain 0 + Chain 1.*

IEEE 802.11ac VHT80 Mode / UNII Band 3 (Two TX)

Channel	Channel Frequency (MHz)	Power (dBm)		Power Total		Power Limit		Pass / Fail
		Chain 0	Chain 1	(dBm)	(W)	(dBm)	(W)	
Low	5775	14.24	12.33	16.40	0.0437	30	1	PASS

Remark:

1. *At finial test to get the worst-case emission at 29.3 Mbps.*
2. *The cable assembly insertion loss of 11dB (including 10 dB pad and 1dB cable) was Entered as an offset in the power meter to allow for direct reading of power.*
3. *Array gain = 0 dB for $N_{ANT} \leq 4$, power limit do not reduce.*
4. *Total power = Chain 0 + Chain 1.*

7.3 PEAK POWER SPECTRAL DENSITY

LIMITS

§ 15.407 (a)

(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. In addition, 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, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. 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, 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, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

(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, 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, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

(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 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, 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, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

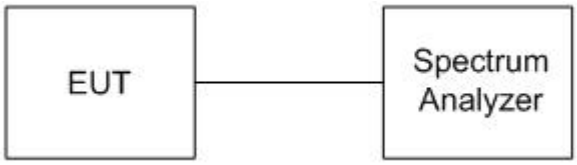
(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and 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 U-NII 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.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EXA Signal Analyzer	Agilent	N9010A	MY52220817	03/19/2016

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

TEST SETUP



TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
   Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 1MHz, VBW = 3MHz, Span = Sweep= AUTO
3. Record the max. reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.

TEST RESULTS

IEEE 802.11a Mode (Two TX)

UNII	Channel	Channel Frequency (MHz)	PPSD (e.i.r.p) (dBm)		PSD Total (dBm)	Minimum Limit (e.i.r.p) (dBm)	Pass / Fail
			Chain 0	Chain 1			
Band 1	Low	5180	2.876	2.852	5.87	16.84	PASS
	Middle	5220	3.626	1.553	5.72	16.84	PASS
	High	5240	3.980	2.259	6.21	16.84	PASS

Remark:

1. *At finial test to get the worst-case emission at 6Mbps.*
2. *The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.*
3. *The maximum antenna gain is 6.16dBi which is more than 6dBi, the limit should be 16.84dBm.*
4. *Total power spectral density = Chain 0 + Chain 1.*

IEEE 802.11ac VHT20 Mode (Two TX)

UNII	Channel	Channel Frequency (MHz)	PPSD (e.i.r.p) (dBm)		PSD Total (dBm)	Minimum Limit (e.i.r.p) (dBm)	Pass / Fail
			Chain 0	Chain 1			
Band 1	Low	5180	1.791	0.286	4.11	16.84	PASS
	Middle	5220	2.118	0.291	4.31	16.84	PASS
	High	5240	2.371	1.149	4.81	16.84	PASS

Remark:

1. *At finial test to get the worst-case emission at 6.5Mbps.*
2. *The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.*
3. *The maximum antenna gain is 6.16dBi which is more than 6dBi, the limit should be 16.84dBm.*
4. *Total power spectral density = Chain 0 + Chain 1.*

IEEE 802.11ac VHT40 Mode (Two TX)

UNII	Channel	Channel Frequency (MHz)	PPSD (e.i.r.p) (dBm)		PSD Total (dBm)	Minimum Limit (e.i.r.p) (dBm)	Pass / Fail
			Chain 0	Chain 1			
Band 1	Low	5190	-0.609	-2.792	1.45	16.84	PASS
	High	5230	-0.664	-2.271	1.62	16.84	PASS

Remark:

1. *At finial test to get the worst-case emission at 13.5Mbps.*
2. *The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.*
3. *The maximum antenna gain is 6.16dBi which is more than 6dBi, the limit should be 16.84dBm.*
4. *Total power spectral density = Chain 0 + Chain 1.*

IEEE 802.11ac VHT80 Mode (Two TX)

UNII	Channel	Channel Frequency (MHz)	PPSD (e.i.r.p) (dBm)		PSD Total (dBm)	Minimum Limit (e.i.r.p) (dBm)	Pass / Fail
			Chain 0	Chain 1			
Band 1	Low	5210	-3.296	-4.706	-0.93	16.84	PASS

Remark:

1. *At finial test to get the worst-case emission at 29.3Mbps.*
2. *The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.*
3. *The maximum antenna gain is 6.16dBi which is more than 6dBi, the limit should be 16.84dBm.*
4. *Total power spectral density = Chain 0 + Chain 1.*

IEEE 802.11a Mode (Two TX)

UNII	Channel	Channel Frequency (MHz)	PPSD (e.i.r.p) (dBm)		PSD Total (dBm)	Minimum Limit (e.i.r.p) (dBm)	Pass / Fail
			Chain 0	Chain 1			
Band 3	Low	5745	-0.149	-0.960	2.47	29.84	PASS
	Middle	5785	0.493	-0.471	3.05	29.84	PASS
	High	5825	1.063	0.952	4.02	29.84	PASS

Remark:

1. At finial test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. The maximum antenna gain is 6.16dBi which is more than 6dBi, the limit should be 29.84dBm.
4. Total power spectral density = Chain 0 + Chain 1.

IEEE 802.11ac VHT20 Mode (Two TX)

UNII	Channel	Channel Frequency (MHz)	PPSD (e.i.r.p) (dBm)		PSD Total (dBm)	Minimum Limit (e.i.r.p) (dBm)	Pass / Fail
			Chain 0	Chain 1			
Band 3	Low	5745	-0.810	-1.402	1.91	29.84	PASS
	Middle	5785	-0.251	-0.954	2.42	29.84	PASS
	High	5825	-0.132	-0.875	2.52	29.84	PASS

Remark:

1. At finial test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. The maximum antenna gain is 8.51dBi which is more than 6dBi, the limit should be 29.84dBm.
4. Total power spectral density = Chain 0 + Chain 1.

IEEE 802.11ac VHT40 Mode (Two TX)

UNII	Channel	Channel Frequency (MHz)	PPSD (e.i.r.p) (dBm)		PSD Total (dBm)	Minimum Limit (e.i.r.p) (dBm)	Pass / Fail
			Chain 0	Chain 1			
Band 3	Low	5755	-3.445	-4.396	-0.88	29.84	PASS
	High	5795	-3.076	-3.753	-0.39	29.84	PASS

Remark:

1. *At finial test to get the worst-case emission at 13.5Mbps.*
2. *The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.*
3. *The maximum antenna gain is 6.16dBi which is more than 6dBi, the limit should be 29.84dBm.*
4. *Total power spectral density = Chain 0 + Chain 1.*

IEEE 802.11ac VHT80 Mode (Two TX)

UNII	Channel	Channel Frequency (MHz)	PPSD (e.i.r.p) (dBm)		PSD Total (dBm)	Minimum Limit (e.i.r.p) (dBm)	Pass / Fail
			Chain 0	Chain 1			
Band 3	High	5775	-5.811	-6.648	-3.20	29.84	PASS

Remark:

1. *At finial test to get the worst-case emission at 29.3Mbps.*
2. *The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.*
3. *The maximum antenna gain is 6.16dBi which is more than 6dBi, the limit should be 29.84dBm.*
4. *Total power spectral density = Chain 0 + Chain 1.*

POWER SPECTRAL DENSITY

CH Low (IEEE 802.11a Mode / Band 1 / Chain 0)

CH Middle (IEEE 802.11a Mode / Band 1 / Chain 0)

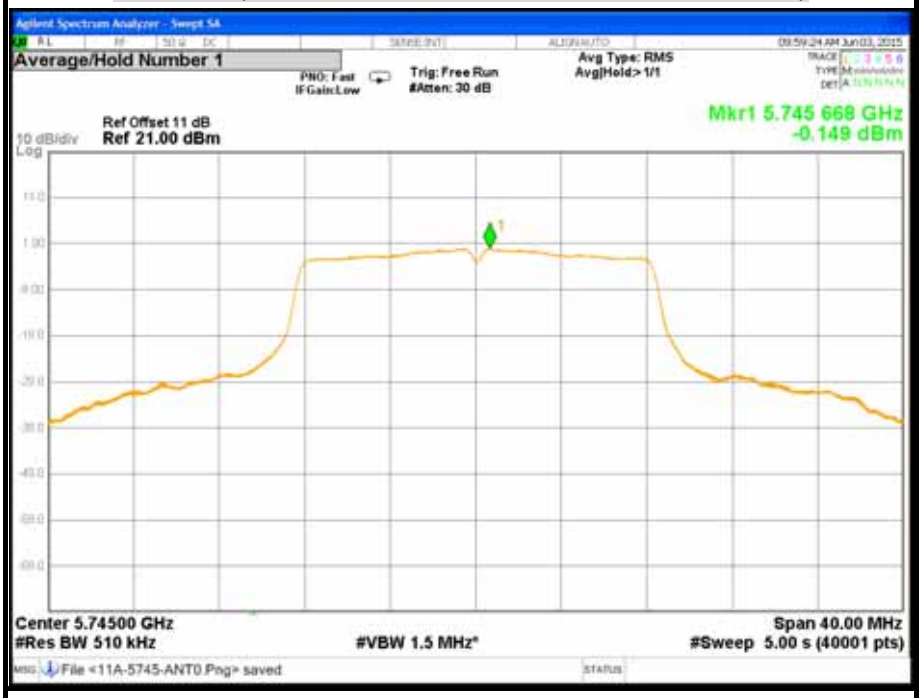
CH High (IEEE 802.11a Mode / Band 1 / Chain 0)

CH Low (IEEE 802.11a Mode / Band 1 / Chain 1)

CH Middle (IEEE 802.11a Mode / Band 1 / Chain 1)

CH High (IEEE 802.11a Mode / Band 1 / Chain 1)

CH Low (IEEE 802.11a Mode / Band 3 / Chain 0)



CH Middle (IEEE 802.11a Mode / Band 3 / Chain 0)

CH High (IEEE 802.11a Mode / Band 3 / Chain 0)

CH Low (IEEE 802.11a Mode / Band 3 / Chain 1)

CH Middle (IEEE 802.11a Mode / Band 3 / Chain 1)

CH High (IEEE 802.11a Mode / Band 3 / Chain 1)

CH Low (IEEE 802.11ac Mode VHT20 / Band 1 / Chain 0)

CH Middle (IEEE 802.11ac Mode VHT20 / Band 1 / Chain 0)

CH High (IEEE 802.11ac Mode VHT20 / Band 1 / Chain 0)

CH Low (IEEE 802.11ac Mode VHT20 / Band 1 / Chain 1)

CH Middle (IEEE 802.11ac Mode VHT20 / Band 1 / Chain 1)

CH High (IEEE 802.11ac Mode VHT20 / Band 1 / Chain 1)

CH Low (IEEE 802.11ac Mode VHT20 / Band 3 / Chain 0)

CH Middle (IEEE 802.11ac Mode VHT20 / Band 3 / Chain 0)

CH High (IEEE 802.11ac Mode VHT20 / Band 3 / Chain 0)

CH Low (IEEE 802.11ac Mode VHT20 / Band 3 / Chain 1)

CH Middle (IEEE 802.11ac Mode VHT20 / Band 3 / Chain 1)

CH High (IEEE 802.11ac Mode VHT20 / Band 3 / Chain 1)

CH Low (IEEE 802.11ac Mode VHT40 / Band 1 / Chain 0)

CH High (IEEE 802.11ac Mode VHT40 / Band 1 / Chain 0)

CH Low (IEEE 802.11ac Mode VHT40 / Band 1 / Chain 1)

CH High (IEEE 802.11ac Mode VHT40 / Band 1 / Chain 1)

CH Low (IEEE 802.11ac Mode VHT40 / Band 3 / Chain 0)

CH High (IEEE 802.11ac Mode VHT40 / Band 3 / Chain 0)

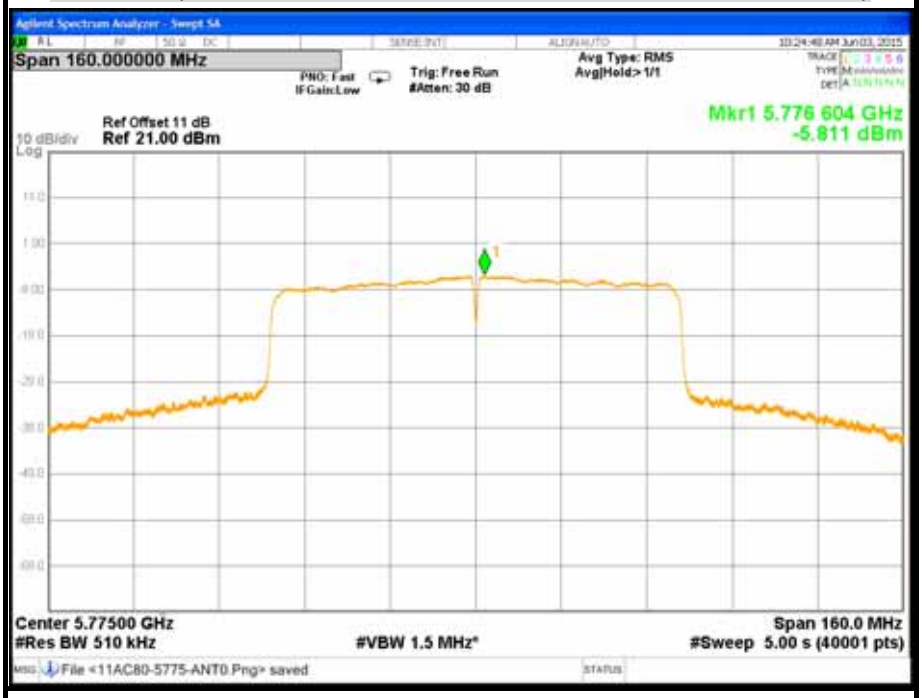
CH Low (IEEE 802.11ac Mode VHT40 / Band 3 / Chain 1)

CH High (IEEE 802.11ac Mode VHT40 / Band 3 / Chain 1)

CH Low (IEEE 802.11ac Mode VHT80 / Band 3 / Chain 0)

CH Low (IEEE 802.11ac Mode VHT80 / Band 3 / Chain 1)

CH Low (IEEE 802.11ac Mode VHT80 / Band 3 / Chain 0)



CH Low (IEEE 802.11ac Mode VHT80 / Band 3 / Chain 1)

7.4 RADIATED EMISSION

LIMITS

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

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

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

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

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

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

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

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

TEST EQUIPMENT

Radiated Emission / 966Chamber_B

Name of Equipment	Manufacture	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY46180323	04/14/2016
EMI Test Receiver	ROHDE & SCHWARZ	ESCS 30	835418/008	10/14/2015
Bi-log Antenna	SCHWARZBECK	VULB 9168	9168-250	08/21/2015
Double-Ridged Waveguide Horn	ETS-LINDGREN	3117	00078733	12/02/2015
Horn Antenna	COM-POWER	AH-840	03077	12/17/2015
Pre-Amplifier	Agilent	8447D	2944A10052	07/15/2015
Pre-Amplifier	Agilent	8449B	3008A01916	07/15/2015
LOOP Antenna	EMCO	6502	8905-2356	09/23/2015
Notch Filters Band Reject	Micro-Tronics	BRM05702-01	026	N.C.R.
Band Reject Filter	Micro-Tronics	BRC50703-01	004	N.C.R.
Band Reject Filter	Micro-Tronics	BRC50705-01	007	N.C.R.

Remark: *1. Each piece of equipment is scheduled for calibration once a year.*
2. N.C.R = No Calibration Request.

Radiated Emission / 966Chamber_C

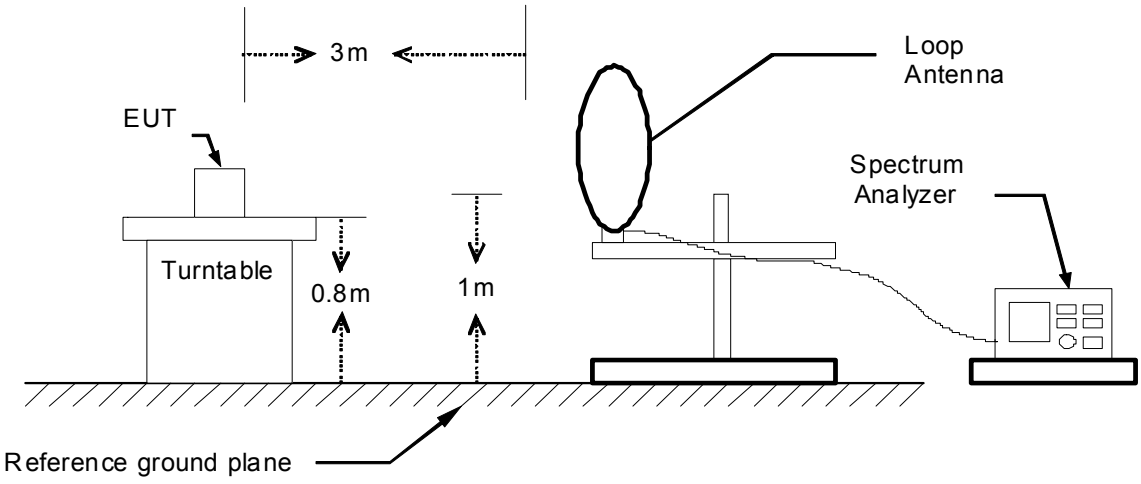
Name of Equipment	Manufacture	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY45280064	03/26/2016
EMI Test Receiver	ROHDE & SCHWARZ	ESCI	101387	10/05/2015
Bi-log Antenna	TESEQ	CBL 6112D	35404	02/24/2016
Double-Ridged Waveguide Horn	ETS-LINDGREN	3117	00078732	07/23/2015
Horn Antenna	COM-POWER	AH-840	03077	12/17/2015
Pre-Amplifier	EMCI	EMC001625	980243	04/12/2016
Pre-Amplifier	COM-POWER	PAM-118A	551043	04/12/2016
Notch Filters Band Reject	Micro-Tronics	BRM50702-01	009	N.C.R.
Band Reject Filter	Micro-Tronics	BRC50703-01	004	N.C.R.
Band Reject Filter	Micro-Tronics	BRC50705-01	007	N.C.R.

Remark: *1. Each piece of equipment is scheduled for calibration once a year.*
2. N.C.R = No Calibration Request.

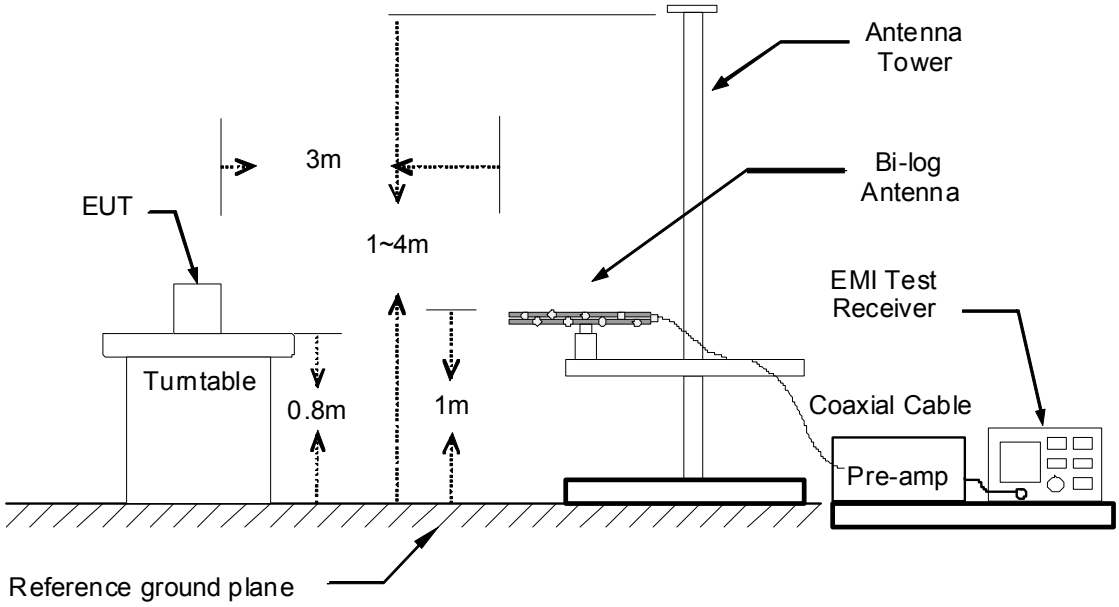
TEST SETUP

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

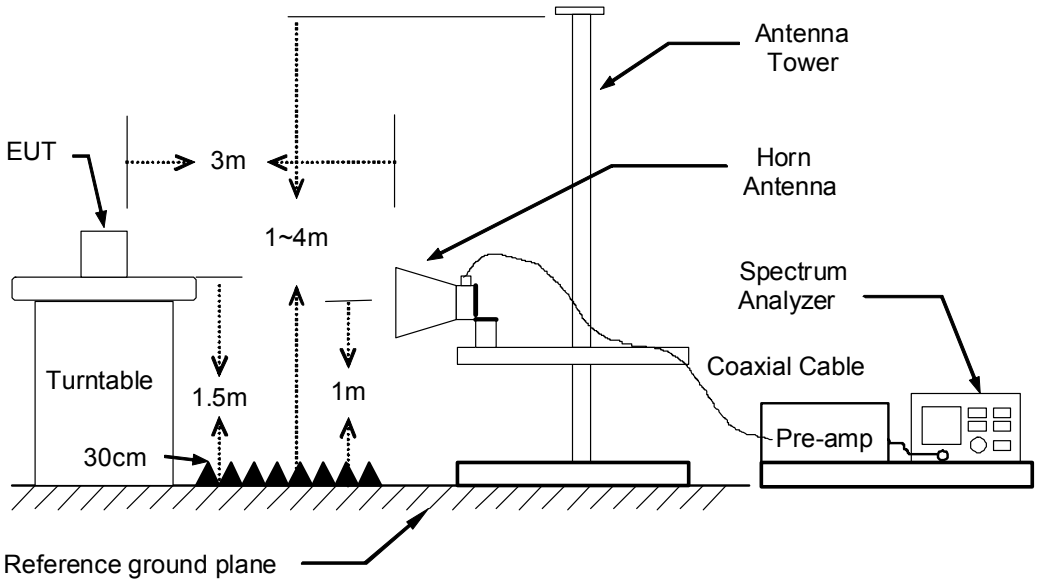
9kHz ~ 30MHz



30MHz ~ 1GHz



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



TEST PROCEDURE

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

Remark：

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

TEST RESULTS

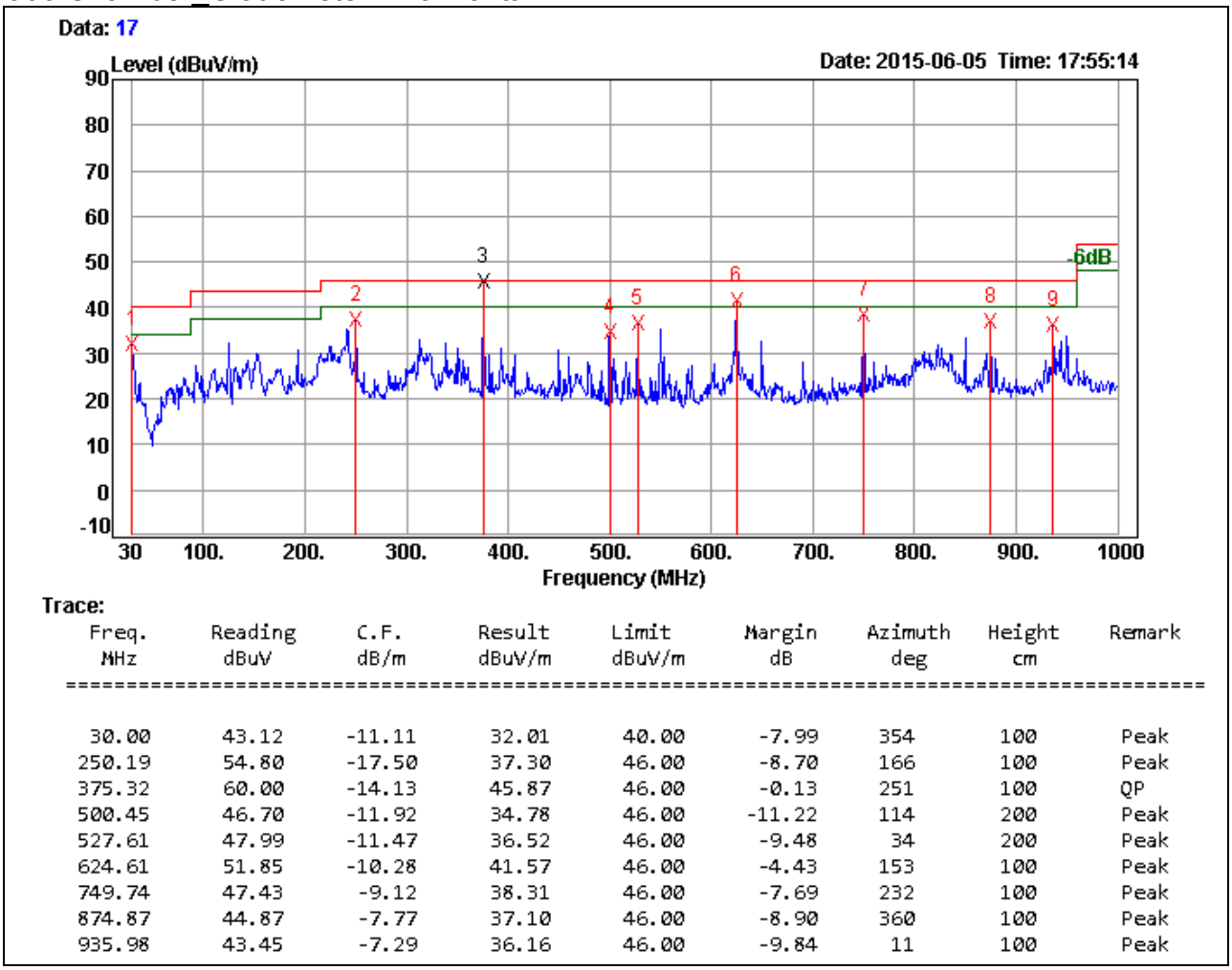
Below 1 GHz (9kHz ~ 30MHz)

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

Below 1 GHz (30MHz ~ 1GHz)

Product Name	MoCA to WiFi extender	Test By	Crystal Wu
Test Model	HT-EMN2	Test Date	2015/06/05
Test Mode	Normal Operating	Temp. & Humidity	25°C, 57%

966 Chamber_C at 3Meter / Horizontal



Trace:

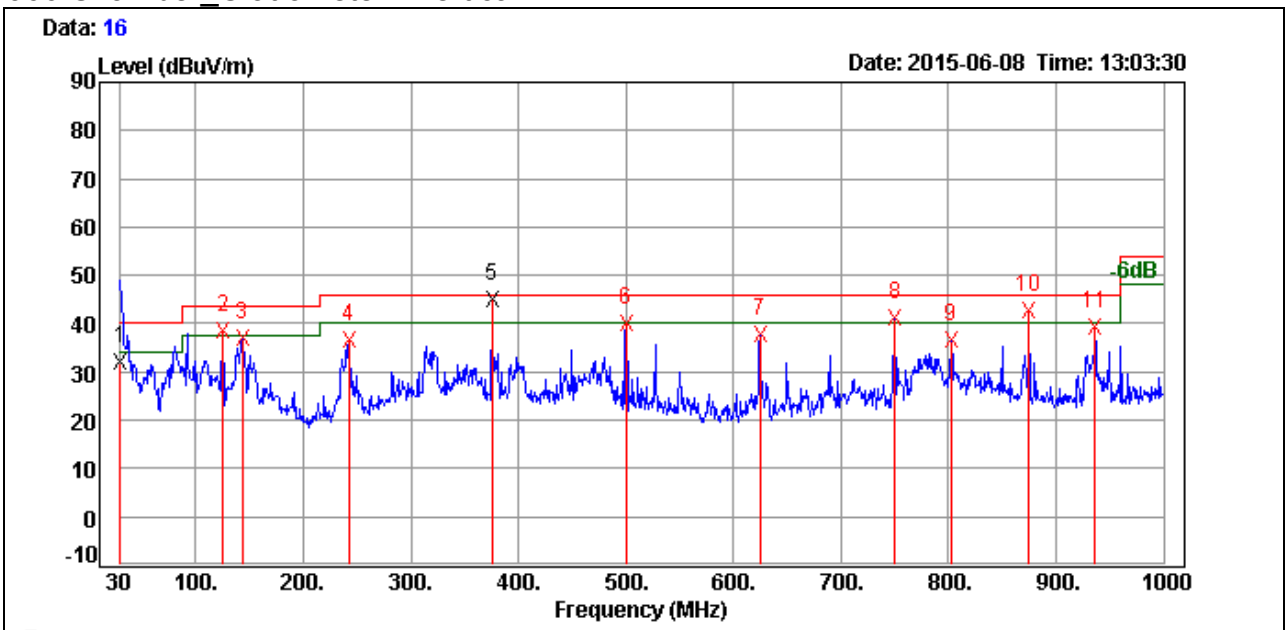
Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
30.00	43.12	-11.11	32.01	40.00	-7.99	354	100	Peak
250.19	54.80	-17.50	37.30	46.00	-8.70	166	100	Peak
375.32	60.00	-14.13	45.87	46.00	-0.13	251	100	QP
500.45	46.70	-11.92	34.78	46.00	-11.22	114	200	Peak
527.61	47.99	-11.47	36.52	46.00	-9.48	34	200	Peak
624.61	51.85	-10.28	41.57	46.00	-4.43	153	100	Peak
749.74	47.43	-9.12	38.31	46.00	-7.69	232	100	Peak
874.87	44.87	-7.77	37.10	46.00	-8.90	360	100	Peak
935.98	43.45	-7.29	36.16	46.00	-9.84	11	100	Peak

Remark:

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

Product Name	MoCA to WiFi extender	Test By	Crystal Wu
Test Model	HT-EMN2	Test Date	2015/06/02
Test Mode	Normal Operating	Temp. & Humidity	25°C, 57%

966 Chamber_C at 3Meter / Vertical



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
30.00	43.00	-11.11	31.89	40.00	-8.11	173	100	QP
125.06	56.89	-18.39	38.50	43.50	-5.00	360	100	Peak
143.49	56.02	-19.17	36.85	43.50	-6.65	154	100	Peak
242.43	54.75	-18.08	36.67	46.00	-9.33	19	200	Peak
375.32	59.10	-14.13	44.97	46.00	-1.03	203	141	QP
500.45	51.94	-11.92	40.02	46.00	-5.98	175	100	Peak
624.61	47.89	-10.28	37.61	46.00	-8.39	99	100	Peak
749.74	50.19	-9.12	41.07	46.00	-4.93	148	100	Peak
802.12	45.04	-8.51	36.53	46.00	-9.47	148	100	Peak
874.87	50.44	-7.77	42.67	46.00	-3.33	154	100	Peak
935.98	46.62	-7.29	39.33	46.00	-6.67	160	100	Peak

Remark:

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

Above 1 GHz

Product Name	MoCA to WiFi extender	Test By	Rex Chiu
Test Model	HT-EMN2	Test Date	2015/06/04
Test Mode	IEEE 802.11a TX / CH Low / Band 1	Temp. & Humidity	25°C, 58%

966 Chamber_B at 3Meter / Horizontal									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1225.00	53.89	---	-3.15	50.73	---	74.00	54.00	-3.27	Peak
1580.00	53.36	---	-2.12	51.25	---	74.00	54.00	-2.75	Peak
5380.00	50.30	41.29	9.62	59.93	50.91	74.00	54.00	-3.09	AVG
6168.00	38.98	---	11.58	50.56	---	74.00	54.00	-3.44	Peak
7452.00	38.67	---	11.27	49.94	---	74.00	54.00	-4.06	Peak
9276.00	38.33	---	13.22	51.55	---	74.00	54.00	-2.45	Peak

966 Chamber_B at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1135.00	54.47	---	-3.25	51.22	---	74.00	54.00	-2.78	Peak
1670.00	52.84	---	-1.28	51.56	---	74.00	54.00	-2.44	Peak
5375.00	49.94	40.14	9.60	59.54	49.74	74.00	54.00	-4.26	AVG
6252.00	39.56	---	11.60	51.16	---	74.00	54.00	-2.84	Peak
8268.00	37.37	---	12.61	49.99	---	74.00	54.00	-4.01	Peak
10356.00	42.29	32.06	15.26	57.55	47.32	74.00	54.00	-6.68	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MoCA to WiFi extender	Test By	Rex Chiu
Test Model	HT-EMN2	Test Date	2015/06/04
Test Mode	IEEE 802.11a TX / CH Middle / Band 1	Temp. & Humidity	25°C, 58%

966 Chamber_B at 3Meter / Horizontal

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1435.00	53.71	---	-2.93	50.78	---	74.00	54.00	-3.22	Peak
5080.00	52.38	42.87	8.45	60.84	51.32	74.00	54.00	-2.68	AVG
5400.00	50.26	40.17	9.70	59.96	49.87	74.00	54.00	-4.13	AVG
6168.00	38.42	---	11.58	50.00	---	74.00	54.00	-4.00	Peak
7548.00	38.82	---	11.28	50.11	---	74.00	54.00	-3.89	Peak
9288.00	37.84	---	13.26	51.10	---	74.00	54.00	-2.90	Peak

966 Chamber_B at 3Meter / Vertical

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1390.00	53.68	---	-2.98	50.71	---	74.00	54.00	-3.29	Peak
5075.00	51.50	42.92	8.43	59.93	51.35	74.00	54.00	-2.65	AVG
5360.00	50.09	41.81	9.54	59.64	51.35	74.00	54.00	-2.65	AVG
6216.00	38.31	---	11.59	49.91	---	74.00	54.00	-4.09	Peak
8148.00	39.18	---	12.53	51.72	---	74.00	54.00	-2.28	Peak
10404.00	43.20	33.10	15.34	58.54	48.44	74.00	54.00	-5.56	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MoCA to WiFi extender	Test By	Rex Chiu
Test Model	HT-EMN2	Test Date	2015/06/04
Test Mode	IEEE 802.11a TX / CH High / Band 1	Temp. & Humidity	25°C, 58%

966 Chamber_B at 3Meter / Horizontal

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1515.00	53.58	---	-2.72	50.86	---	74.00	54.00	-3.14	Peak
5120.00	51.37	41.68	8.61	59.98	50.29	74.00	54.00	-3.71	AVG
5355.00	52.86	41.56	9.52	62.38	51.08	74.00	54.00	-2.92	AVG
6192.00	39.12	---	11.59	50.71	---	74.00	54.00	-3.29	Peak
7896.00	38.08	---	12.17	50.26	---	74.00	54.00	-3.74	Peak
9408.00	37.27	---	13.64	50.92	---	74.00	54.00	-3.08	Peak

966 Chamber_B at 3Meter / Vertical

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1365.00	54.25	---	-3.00	51.24	---	74.00	54.00	-2.76	Peak
5120.00	52.40	41.21	8.61	61.01	49.82	74.00	54.00	-4.18	AVG
5360.00	53.47	42.34	9.54	63.02	51.88	74.00	54.00	-2.12	AVG
6396.00	39.44	---	11.63	51.07	---	74.00	54.00	-2.93	Peak
8280.00	38.21	---	12.62	50.83	---	74.00	54.00	-3.17	Peak
10476.00	43.35	33.46	15.47	58.82	48.93	74.00	54.00	-5.07	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MoCA to WiFi extender	Test By	Rex Chiu
Test Model	HT-EMN2	Test Date	2015/06/04
Test Mode	IEEE 802.11ac VHT20 TX / CH Low / Band 1	Temp. & Humidity	25°C, 58%

966 Chamber_B at 3Meter / Horizontal

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1200.00	55.13	---	-3.18	51.95	---	74.00	54.00	-2.05	Peak
1530.00	53.32	---	-2.58	50.73	---	74.00	54.00	-3.27	Peak
5380.00	49.88	39.75	9.62	59.50	49.37	74.00	54.00	-4.63	AVG
6576.00	38.84	---	11.75	50.59	---	74.00	54.00	-3.41	Peak
7908.00	39.30	---	12.20	51.50	---	74.00	54.00	-2.50	Peak
10356.00	40.97	30.85	15.26	56.23	46.11	74.00	54.00	-7.89	AVG

966 Chamber_B at 3Meter / Vertical

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1130.00	54.89	---	-3.25	51.64	---	74.00	54.00	-2.36	Peak
1645.00	53.09	---	-1.51	51.58	---	74.00	54.00	-2.42	Peak
5385.00	50.64	41.52	9.64	60.29	51.16	74.00	54.00	-2.84	AVG
6336.00	39.40	---	11.62	51.02	---	74.00	54.00	-2.98	Peak
7704.00	38.87	---	11.68	50.55	---	74.00	54.00	-3.45	Peak
10356.00	40.61	31.95	15.26	55.87	47.21	74.00	54.00	-6.79	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MoCA to WiFi extender	Test By	Rex Chiu
Test Model	HT-EMN2	Test Date	2015/06/04
Test Mode	IEEE 802.11ac VHT20 TX / CH Middle / Band 1	Temp. & Humidity	25°C, 58%

966 Chamber_B at 3Meter / Horizontal

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1355.00	54.99	---	-3.01	51.98	---	74.00	54.00	-2.02	Peak
5115.00	54.47	43.32	8.59	63.06	51.91	74.00	54.00	-2.09	AVG
5360.00	51.20	40.40	9.54	60.75	49.94	74.00	54.00	-4.06	AVG
6192.00	40.32	---	11.59	51.90	---	74.00	54.00	-2.10	Peak
7908.00	38.90	---	12.20	51.11	---	74.00	54.00	-2.89	Peak
9264.00	37.96	---	13.18	51.14	---	74.00	54.00	-2.86	Peak

966 Chamber_B at 3Meter / Vertical

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1570.00	53.32	---	-2.21	51.11	---	74.00	54.00	-2.89	Peak
5115.00	54.99	43.11	8.59	63.58	51.70	74.00	54.00	-2.30	AVG
5395.00	53.27	41.37	9.68	62.95	51.05	74.00	54.00	-2.95	AVG
6156.00	38.84	---	11.58	50.42	---	74.00	54.00	-3.58	Peak
8508.00	38.26	---	12.75	51.02	---	74.00	54.00	-2.98	Peak
10404.00	44.39	33.26	15.34	59.73	48.60	74.00	54.00	-5.40	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MoCA to WiFi extender	Test By	Rex Chiu
Test Model	HT-EMN2	Test Date	2015/06/04
Test Mode	IEEE 802.11ac VHT20 TX / CH High / Band 1	Temp. & Humidity	25°C, 58%

966 Chamber_B at 3Meter / Horizontal

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1460.00	54.35	---	-2.90	51.45	---	74.00	54.00	-2.55	Peak
5120.00	52.04	41.72	8.61	60.65	50.33	74.00	54.00	-3.67	AVG
5360.00	52.88	42.42	9.54	62.42	51.96	74.00	54.00	-2.04	AVG
6312.00	39.14	---	11.61	50.76	---	74.00	54.00	-3.24	Peak
7428.00	39.20	---	11.33	50.53	---	74.00	54.00	-3.47	Peak
8748.00	38.21	---	12.55	50.76	---	74.00	54.00	-3.24	Peak

966 Chamber_B at 3Meter / Vertical

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1460.00	53.81	---	-2.90	50.91	---	74.00	54.00	-3.09	Peak
5115.00	52.23	41.81	8.59	60.82	50.40	74.00	54.00	-3.60	AVG
5360.00	52.81	41.73	9.54	62.36	51.27	74.00	54.00	-2.73	AVG
6060.00	39.75	---	11.56	51.31	---	74.00	54.00	-2.69	Peak
8748.00	38.95	---	12.55	51.50	---	74.00	54.00	-2.50	Peak
10476.00	40.67	30.24	15.47	56.13	45.71	74.00	54.00	-8.29	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MoCA to WiFi extender	Test By	Rex Chiu
Test Model	HT-EMN2	Test Date	2015/06/04
Test Mode	IEEE 802.11ac VHT40 TX / CH Low / Band 1	Temp. & Humidity	25°C, 58%

966 Chamber_B at 3Meter / Horizontal

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1375.00	50.04	---	-2.99	47.05	---	74.00	54.00	-6.95	Peak
3840.00	43.18	---	5.67	48.85	---	74.00	54.00	-5.15	Peak
5350.00	46.02	35.76	9.51	55.52	45.27	74.00	54.00	-8.73	AVG
6060.00	38.89	---	11.56	50.45	---	74.00	54.00	-3.55	Peak
7308.00	39.22	---	11.60	50.83	---	74.00	54.00	-3.17	Peak
8832.00	37.96	---	12.47	50.43	---	74.00	54.00	-3.57	Peak

966 Chamber_B at 3Meter / Vertical

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1375.00	46.99	---	-2.99	44.00	---	74.00	54.00	-10.00	Peak
3255.00	44.18	---	4.54	48.72	---	74.00	54.00	-5.28	Peak
5350.00	45.19	34.96	9.51	54.70	44.47	74.00	54.00	-9.53	AVG
6132.00	39.19	---	11.58	50.77	---	74.00	54.00	-3.23	Peak
7308.00	39.82	---	11.60	51.42	---	74.00	54.00	-2.58	Peak
8808.00	38.67	---	12.50	51.16	---	74.00	54.00	-2.84	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MoCA to WiFi extender	Test By	Rex Chiu
Test Model	HT-EMN2	Test Date	2015/06/04
Test Mode	IEEE 802.11ac VHT40 TX / CH High / Band 1	Temp. & Humidity	25°C, 58%

966 Chamber_B at 3Meter / Horizontal

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
2545.00	48.65	---	3.10	51.75	---	74.00	54.00	-2.25	Peak
5105.00	50.79	41.32	8.55	59.34	49.87	74.00	54.00	-4.13	AVG
5350.00	50.99	42.12	9.51	60.50	51.63	74.00	54.00	-2.37	AVG
6132.00	38.74	---	11.58	50.32	---	74.00	54.00	-3.68	Peak
7416.00	38.61	---	11.35	49.96	---	74.00	54.00	-4.04	Peak
9108.00	37.38	---	12.68	50.06	---	74.00	54.00	-3.94	Peak

966 Chamber_B at 3Meter / Vertical

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
3850.00	49.04	39.31	5.69	54.73	45.00	74.00	54.00	-9.00	AVG
5105.00	51.27	41.45	8.55	59.82	50.00	74.00	54.00	-4.00	AVG
5355.00	51.92	41.16	9.52	61.45	50.68	74.00	54.00	-3.32	AVG
6132.00	39.09	---	11.58	50.67	---	74.00	54.00	-3.33	Peak
8148.00	38.67	---	12.53	51.20	---	74.00	54.00	-2.80	Peak
9288.00	37.58	---	13.26	50.84	---	74.00	54.00	-3.16	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MoCA to WiFi extender	Test By	Rex Chiu
Test Model	HT-EMN2	Test Date	2015/06/04
Test Mode	IEEE 802.11ac VHT80 TX / CH Low / Band 1	Temp. & Humidity	25°C, 58%

966 Chamber_B at 3Meter / Horizontal

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1375.00	50.61	---	-2.99	47.62	---	74.00	54.00	-6.38	Peak
3265.00	44.14	---	4.56	48.70	---	74.00	54.00	-5.30	Peak
5360.00	45.07	35.24	9.54	54.61	44.78	74.00	54.00	-9.22	AVG
6132.00	39.85	---	11.58	51.42	---	74.00	54.00	-2.58	Peak
7764.00	38.87	---	11.84	50.70	---	74.00	54.00	-3.30	Peak
9108.00	38.54	---	12.68	51.22	---	74.00	54.00	-2.78	Peak

966 Chamber_B at 3Meter / Vertical

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
3150.00	43.50	---	4.33	47.83	---	74.00	54.00	-6.17	Peak
3885.00	42.58	---	5.75	48.34	---	74.00	54.00	-5.66	Peak
5355.00	46.06	36.45	9.52	55.58	45.97	74.00	54.00	-8.03	AVG
6624.00	39.20	---	11.81	51.02	---	74.00	54.00	-2.98	Peak
7992.00	38.45	---	12.42	50.87	---	74.00	54.00	-3.13	Peak
9228.00	38.04	---	13.06	51.11	---	74.00	54.00	-2.89	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MoCA to WiFi extender	Test By	Rex Chiu
Test Model	HT-EMN2	Test Date	2015/06/04
Test Mode	IEEE 802.11a TX / CH Low / Band 3	Temp. & Humidity	25°C, 58%

966 Chamber_B at 3Meter / Horizontal

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1540.00	53.67	---	-2.49	51.18	---	74.00	54.00	-2.82	Peak
5630.00	49.86	39.64	10.47	60.33	50.11	74.00	54.00	-3.89	AVG
5975.00	48.21	38.05	11.48	59.68	49.53	74.00	54.00	-4.47	AVG
6144.00	38.89	---	11.58	50.46	---	74.00	54.00	-3.54	Peak
7644.00	38.88	---	11.53	50.41	---	74.00	54.00	-3.59	Peak
9264.00	38.79	---	13.18	51.97	---	74.00	54.00	-2.03	Peak

966 Chamber_B at 3Meter / Vertical

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1335.00	53.91	---	-3.03	50.88	---	74.00	54.00	-3.12	Peak
5620.00	50.11	41.00	10.44	60.55	51.44	74.00	54.00	-2.56	AVG
5875.00	47.21	37.33	11.19	58.40	48.52	74.00	54.00	-5.48	AVG
6168.00	39.27	---	11.58	50.85	---	74.00	54.00	-3.15	Peak
7992.00	38.88	---	12.42	51.30	---	74.00	54.00	-2.70	Peak
9936.00	37.01	---	14.55	51.57	---	74.00	54.00	-2.43	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MoCA to WiFi extender	Test By	Rex Chiu
Test Model	HT-EMN2	Test Date	2015/06/04
Test Mode	IEEE 802.11a TX / CH Middle / Band 3	Temp. & Humidity	25°C, 58%

966 Chamber_B at 3Meter / Horizontal									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1460.00	53.56	---	-2.90	50.65	---	74.00	54.00	-3.35	Peak
5660.00	49.73	39.47	10.56	60.28	50.03	74.00	54.00	-3.97	AVG
5910.00	49.24	39.01	11.29	60.53	50.30	74.00	54.00	-3.70	AVG
6216.00	38.41	---	11.59	50.01	---	74.00	54.00	-3.99	Peak
7704.00	38.68	---	11.68	50.36	---	74.00	54.00	-3.64	Peak
9384.00	38.07	---	13.57	51.63	---	74.00	54.00	-2.37	Peak

966 Chamber_B at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1440.00	53.44	---	-2.92	50.52	---	74.00	54.00	-3.48	Peak
5660.00	52.23	41.43	10.56	62.78	51.99	74.00	54.00	-2.01	AVG
5910.00	50.10	39.80	11.29	61.39	51.09	74.00	54.00	-2.91	AVG
6312.00	38.84	---	11.61	50.46	---	74.00	54.00	-3.54	Peak
7896.00	38.28	---	12.17	50.45	---	74.00	54.00	-3.55	Peak
9180.00	37.86	---	12.91	50.77	---	74.00	54.00	-3.23	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MoCA to WiFi extender	Test By	Rex Chiu
Test Model	HT-EMN2	Test Date	2015/06/04
Test Mode	IEEE 802.11a TX / CH High / Band 3	Temp. & Humidity	25°C, 58%

966 Chamber_B at 3Meter / Horizontal									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1375.00	54.53	---	-2.99	51.54	---	74.00	54.00	-2.46	Peak
5705.00	49.42	39.86	10.69	60.11	50.55	74.00	54.00	-3.45	AVG
5945.00	49.91	40.13	11.39	61.30	51.52	74.00	54.00	-2.48	AVG
6024.00	45.98	38.74	11.55	57.53	50.29	74.00	54.00	-3.71	AVG
7176.00	38.86	---	11.91	50.77	---	74.00	54.00	-3.23	Peak
8424.00	39.13	---	12.71	51.84	---	74.00	54.00	-2.16	Peak

966 Chamber_B at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1290.00	54.38	---	-3.08	51.30	---	74.00	54.00	-2.70	Peak
5710.00	50.94	41.30	10.70	61.64	52.00	74.00	54.00	-2.00	AVG
5940.00	51.04	40.15	11.37	62.42	51.52	74.00	54.00	-2.48	AVG
6024.00	45.15	37.46	11.55	56.71	49.01	74.00	54.00	-4.99	AVG
7296.00	39.20	---	11.63	50.83	---	74.00	54.00	-3.17	Peak
9132.00	38.00	---	12.76	50.75	---	74.00	54.00	-3.25	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MoCA to WiFi extender	Test By	Rex Chiu
Test Model	HT-EMN2	Test Date	2015/06/04
Test Mode	IEEE 802.11ac VHT20 TX / CH Low / Band 3	Temp. & Humidity	25°C, 58%

966 Chamber_B at 3Meter / Horizontal

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1535.00	53.26	---	-2.54	50.72	---	74.00	54.00	-3.28	Peak
5625.00	49.73	39.46	10.45	60.18	49.91	74.00	54.00	-4.09	AVG
5980.00	49.04	39.01	11.49	60.53	50.50	74.00	54.00	-3.50	AVG
6228.00	38.36	---	11.60	49.96	---	74.00	54.00	-4.04	Peak
7752.00	38.71	---	11.81	50.51	---	74.00	54.00	-3.49	Peak
8760.00	38.63	---	12.54	51.16	---	74.00	54.00	-2.84	Peak

966 Chamber_B at 3Meter / Vertical

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1295.00	54.42	---	-3.08	51.34	---	74.00	54.00	-2.66	Peak
5625.00	49.97	40.76	10.45	60.43	51.21	74.00	54.00	-2.79	AVG
5955.00	48.51	38.39	11.42	59.93	49.81	74.00	54.00	-4.19	AVG
6384.00	38.92	---	11.63	50.54	---	74.00	54.00	-3.46	Peak
7920.00	38.23	---	12.24	50.47	---	74.00	54.00	-3.53	Peak
9324.00	38.05	---	13.37	51.42	---	74.00	54.00	-2.58	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MoCA to WiFi extender	Test By	Rex Chiu
Test Model	HT-EMN2	Test Date	2015/06/04
Test Mode	IEEE 802.11ac VHT20 TX / CH Middle / Band 3	Temp. & Humidity	25°C, 58%

966 Chamber_B at 3Meter / Horizontal

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1505.00	53.76	---	-2.81	50.95	---	74.00	54.00	-3.05	Peak
5670.00	48.57	38.34	10.59	59.16	48.93	74.00	54.00	-5.07	AVG
5910.00	49.58	39.41	11.29	60.86	50.70	74.00	54.00	-3.30	AVG
6384.00	39.07	---	11.63	50.69	---	74.00	54.00	-3.31	Peak
7728.00	38.55	---	11.74	50.29	---	74.00	54.00	-3.71	Peak
9180.00	38.27	---	12.91	51.18	---	74.00	54.00	-2.82	Peak

966 Chamber_B at 3Meter / Vertical

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1395.00	53.51	---	-2.97	50.54	---	74.00	54.00	-3.46	Peak
5665.00	51.13	41.23	10.57	61.70	51.80	74.00	54.00	-2.20	AVG
5900.00	49.47	39.34	11.26	60.72	50.60	74.00	54.00	-3.40	AVG
6060.00	38.90	---	11.56	50.47	---	74.00	54.00	-3.53	Peak
7764.00	38.52	---	11.84	50.35	---	74.00	54.00	-3.65	Peak
9156.00	38.22	---	12.83	51.06	---	74.00	54.00	-2.94	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MoCA to WiFi extender	Test By	Rex Chiu
Test Model	HT-EMN2	Test Date	2015/06/04
Test Mode	IEEE 802.11ac VHT20 TX / CH High / Band 3	Temp. & Humidity	25°C, 58%

966 Chamber_B at 3Meter / Horizontal									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1375.00	53.57	---	-2.99	50.58	---	74.00	54.00	-3.42	Peak
5700.00	48.93	38.82	10.67	59.61	49.49	74.00	54.00	-4.51	AVG
5940.00	49.08	39.25	11.37	60.45	50.62	74.00	54.00	-3.38	AVG
6024.00	43.17	35.04	11.55	54.72	46.59	74.00	54.00	-7.41	AVG
7608.00	39.03	---	11.44	50.47	---	74.00	54.00	-3.53	Peak
9156.00	37.54	---	12.83	50.37	---	74.00	54.00	-3.63	Peak

966 Chamber_B at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1440.00	54.06	---	-2.92	51.13	---	74.00	54.00	-2.87	Peak
5700.00	49.70	39.57	10.67	60.38	50.24	74.00	54.00	-3.76	AVG
5945.00	50.44	37.92	11.39	61.83	49.31	74.00	54.00	-4.69	AVG
6024.00	44.56	38.96	11.55	56.12	50.51	74.00	54.00	-3.49	AVG
8004.00	38.57	---	12.44	51.02	---	74.00	54.00	-2.98	Peak
9324.00	38.50	---	13.37	51.88	---	74.00	54.00	-2.12	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MoCA to WiFi extender	Test By	Rex Chiu
Test Model	HT-EMN2	Test Date	2015/06/04
Test Mode	IEEE 802.11ac VHT40 TX / CH Low / Band 3	Temp. & Humidity	25°C, 58%

966 Chamber_B at 3Meter / Horizontal									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1405.00	53.36	---	-2.96	50.40	---	74.00	54.00	-3.60	Peak
5725.00	47.72	39.56	10.75	58.47	50.31	74.00	54.00	-3.69	AVG
6000.00	48.40	39.59	11.55	59.95	51.14	74.00	54.00	-2.86	AVG
6216.00	42.60	34.32	11.59	54.20	45.91	74.00	54.00	-8.09	AVG
7380.00	39.01	---	11.44	50.44	---	74.00	54.00	-3.56	Peak
9312.00	37.80	---	13.33	51.14	---	74.00	54.00	-2.86	Peak

966 Chamber_B at 3Meter / Vertical									
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1435.00	54.44	---	-2.93	51.51	---	74.00	54.00	-2.49	Peak
5725.00	51.48	40.56	10.75	62.23	51.31	74.00	54.00	-2.69	AVG
5875.00	48.80	38.79	11.19	59.98	49.98	74.00	54.00	-4.02	AVG
6216.00	43.29	35.84	11.59	54.89	47.43	74.00	54.00	-6.57	AVG
7260.00	38.61	---	11.71	50.32	---	74.00	54.00	-3.68	Peak
9156.00	37.79	---	12.83	50.63	---	74.00	54.00	-3.37	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MoCA to WiFi extender	Test By	Rex Chiu
Test Model	HT-EMN2	Test Date	2015/06/04
Test Mode	IEEE 802.11ac VHT40 TX / CH High / Band 3	Temp. & Humidity	25°C, 58%

966 Chamber_B at 3Meter / Horizontal

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1390.00	53.78	---	-2.98	50.80	---	74.00	54.00	-3.20	Peak
5670.00	50.23	37.83	10.59	60.82	48.42	74.00	54.00	-5.58	AVG
5910.00	49.46	37.24	11.29	60.75	48.53	74.00	54.00	-5.47	AVG
6000.00	39.71	---	11.55	51.26	---	74.00	54.00	-2.74	Peak
7200.00	39.61	---	11.85	51.46	---	74.00	54.00	-2.54	Peak
8892.00	38.02	---	12.42	50.44	---	74.00	54.00	-3.56	Peak

966 Chamber_B at 3Meter / Vertical

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1530.00	53.67	---	-2.58	51.08	---	74.00	54.00	-2.92	Peak
5670.00	52.41	41.34	10.59	62.99	51.93	74.00	54.00	-2.07	AVG
5905.00	50.56	39.84	11.27	61.83	51.11	74.00	54.00	-2.89	AVG
6000.00	40.35	---	11.55	51.90	---	74.00	54.00	-2.10	Peak
7284.00	38.93	---	11.66	50.59	---	74.00	54.00	-3.41	Peak
8868.00	38.22	---	12.44	50.67	---	74.00	54.00	-3.33	Peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Product Name	MoCA to WiFi extender	Test By	Rex Chiu
Test Model	HT-EMN2	Test Date	2015/06/04
Test Mode	IEEE 802.11ac VHT80 TX / CH Low / Band 3	Temp. & Humidity	25°C, 58%

966 Chamber_B at 3Meter / Horizontal

Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1350.00	54.17	---	-3.02	51.15	---	74.00	54.00	-2.85	Peak
5725.00	50.96	40.83	10.75	61.71	51.58	74.00	54.00	-2.42	AVG
6000.00	48.87	39.56	11.55	60.42	51.11	74.00	54.00	-2.89	AVG
6228.00	45.13	37.25	11.60	56.73	48.85	74.00	54.00	-5.15	AVG
6912.00	39.70	---	12.19	51.89	---	74.00	54.00	-2.11	Peak
8244.00	38.65	---	12.60	51.24	---	74.00	54.00	-2.76	Peak

966 Chamber_B at 3Meter / Vertical

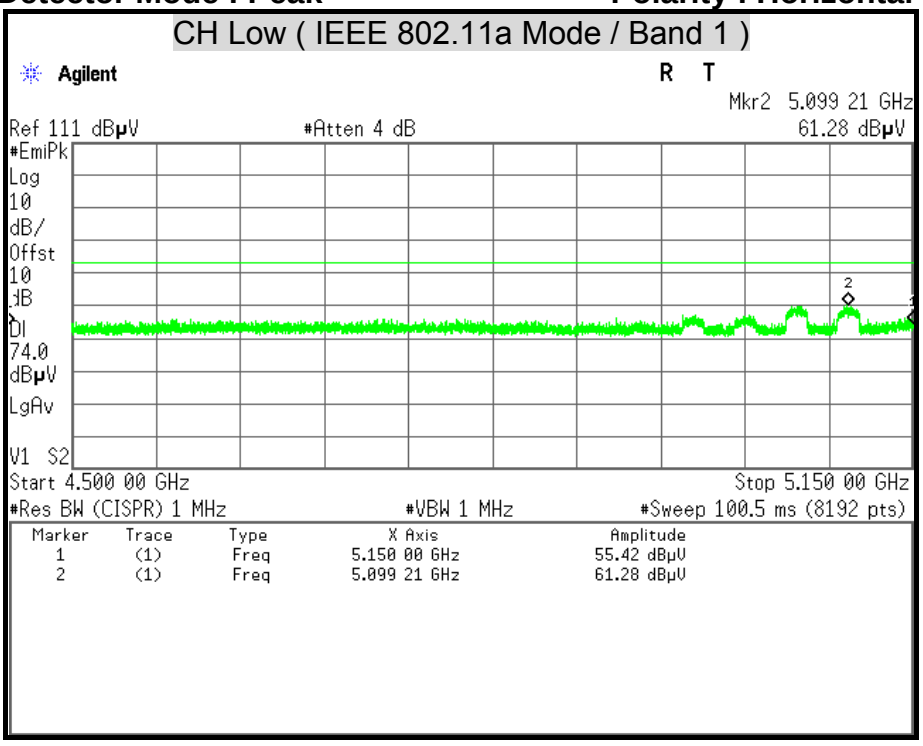
Frequency (MHz)	Reading-PK (dBuV)	Reading-AV (dBuV)	Correction Factor (dB/m)	Result-PK (dBuV/m)	Result-AV (dBuV/m)	Limit-PK (dBuV/m)	Limit-AV (dBuV/m)	Margin (dB)	Remark
1470.00	53.62	---	-2.89	50.73	---	74.00	54.00	-3.27	Peak
5725.00	52.55	40.20	10.75	63.30	50.95	74.00	54.00	-3.05	AVG
5955.00	48.93	38.64	11.42	60.35	50.06	74.00	54.00	-3.94	AVG
6216.00	45.32	37.77	11.59	56.92	49.36	74.00	54.00	-4.64	AVG
7356.00	39.30	---	11.49	50.79	---	74.00	54.00	-3.21	Peak
8820.00	38.70	---	12.48	51.18	---	74.00	54.00	-2.82	Peak

Remark:

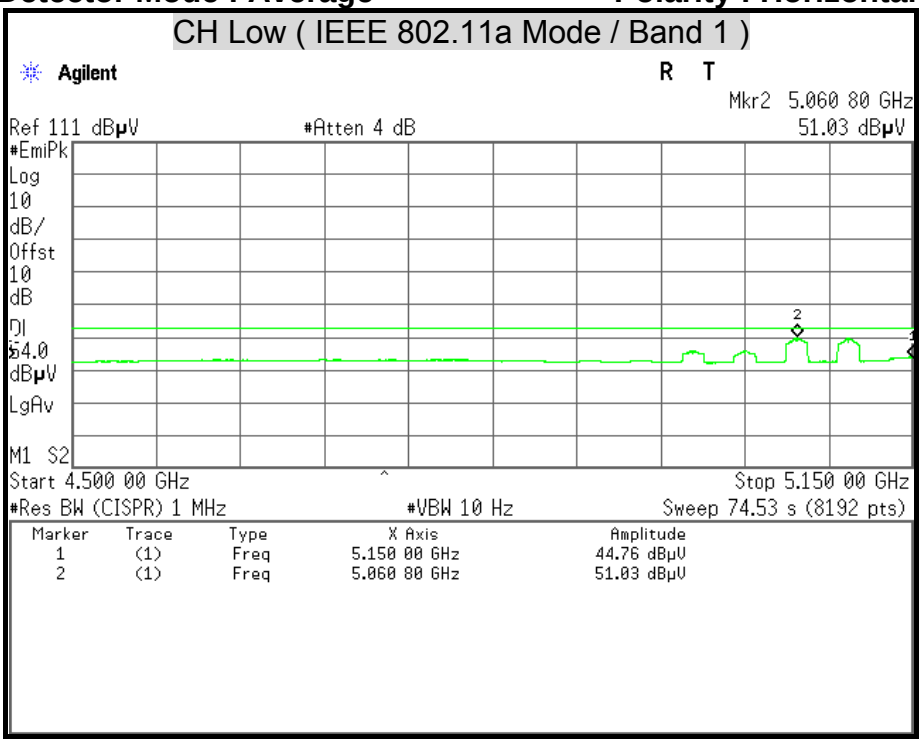
1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Average test would be performed if the peak result were greater than the average limit.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Result = Reading + Correction Factor*
   Margin = Result – Limit
   Remark Peak = Result(PK) – Limit(AV)
   Remark AVG = Result(AV) – Limit(AV)

Restricted Band Edges

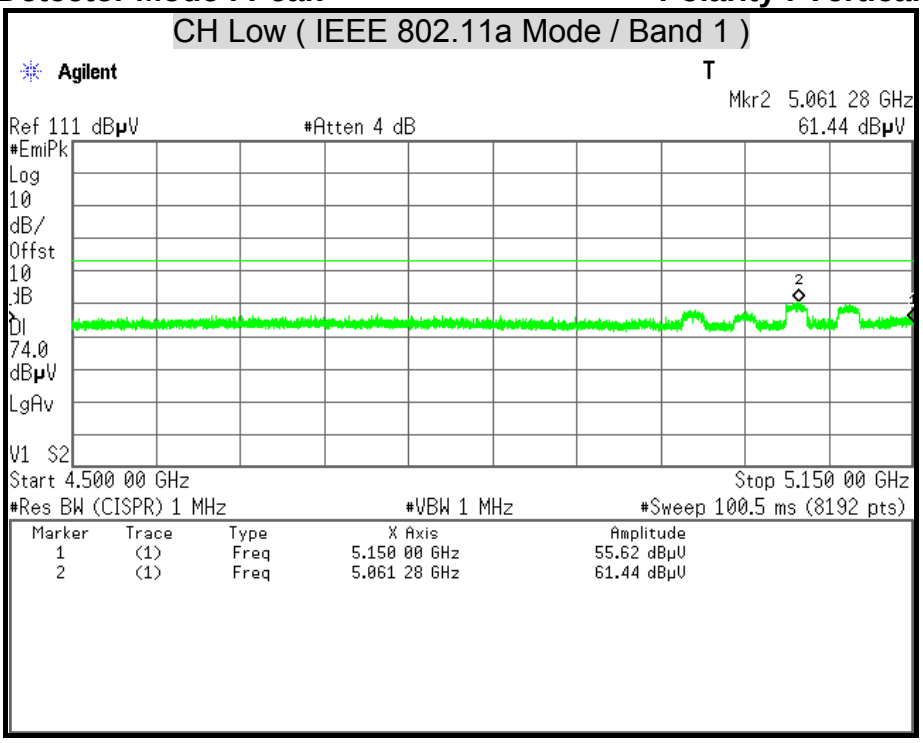
Detector Mode : Peak **Polarity : Horizontal**



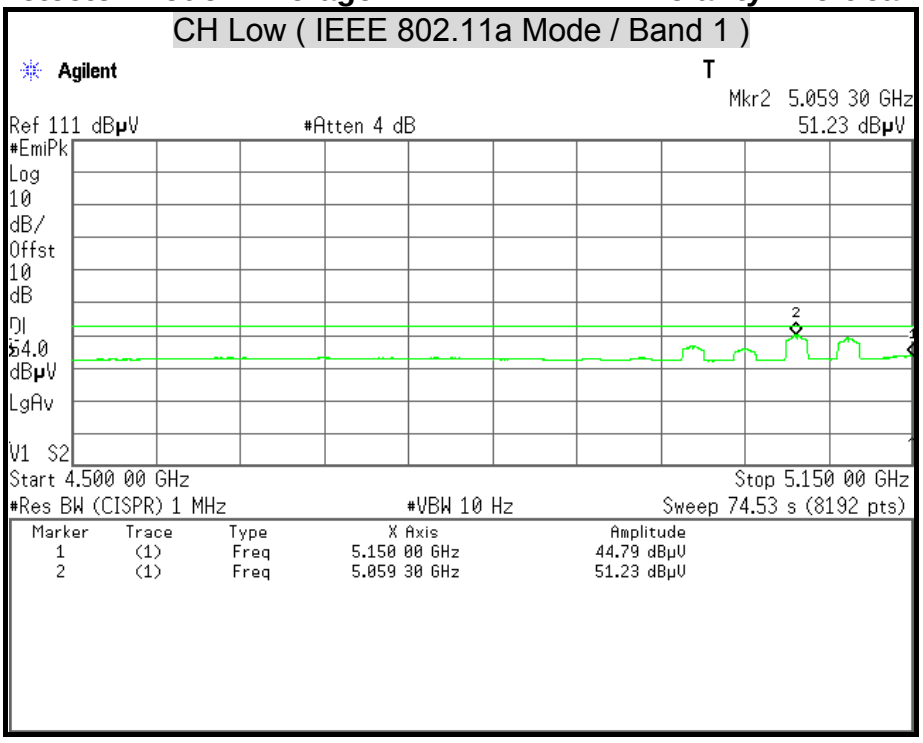
Detector Mode : Average **Polarity : Horizontal**



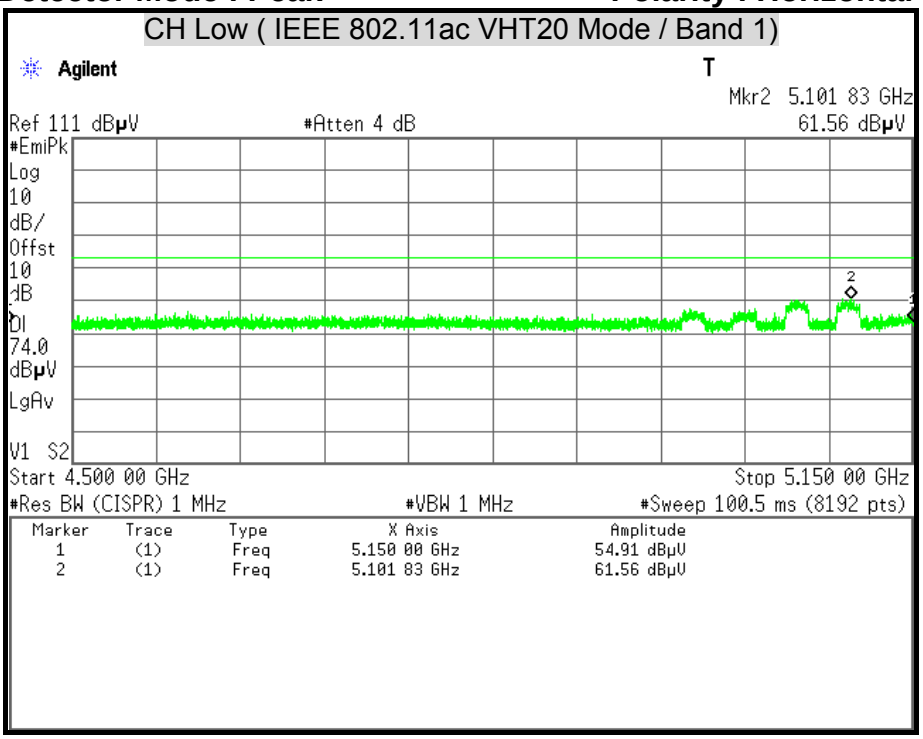
Detector Mode : Peak **Polarity : Vertical**



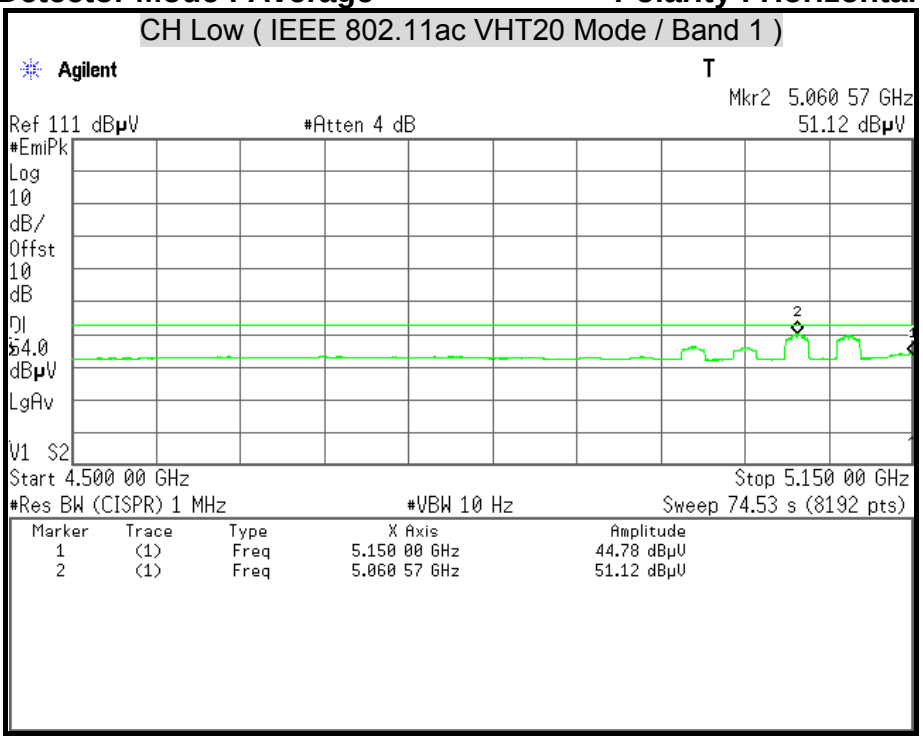
Detector Mode : Average **Polarity : Vertical**



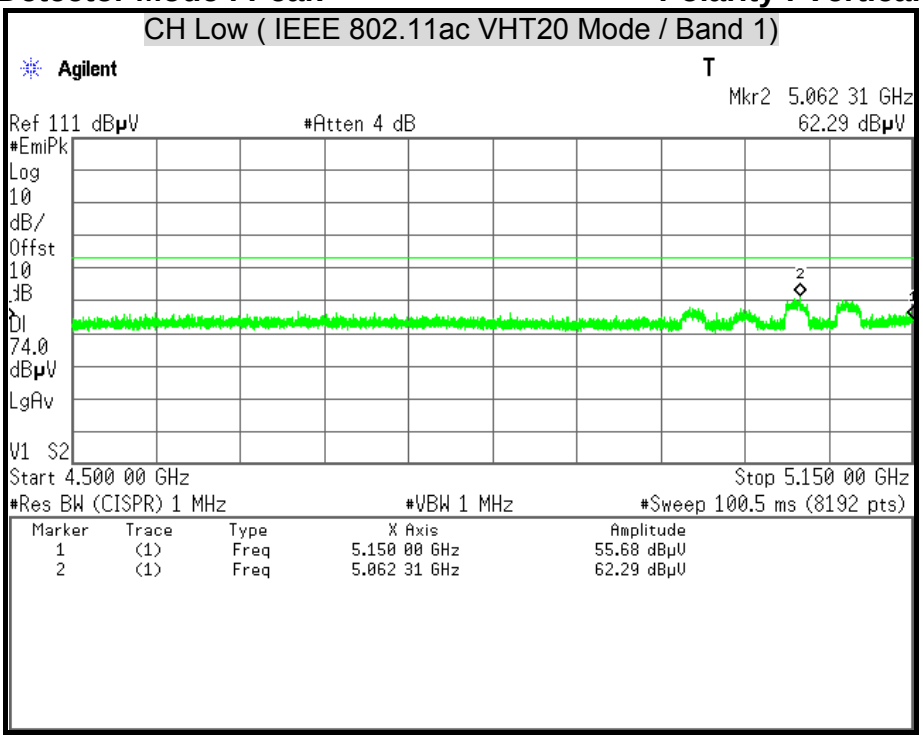
Detector Mode : Peak **Polarity : Horizontal**



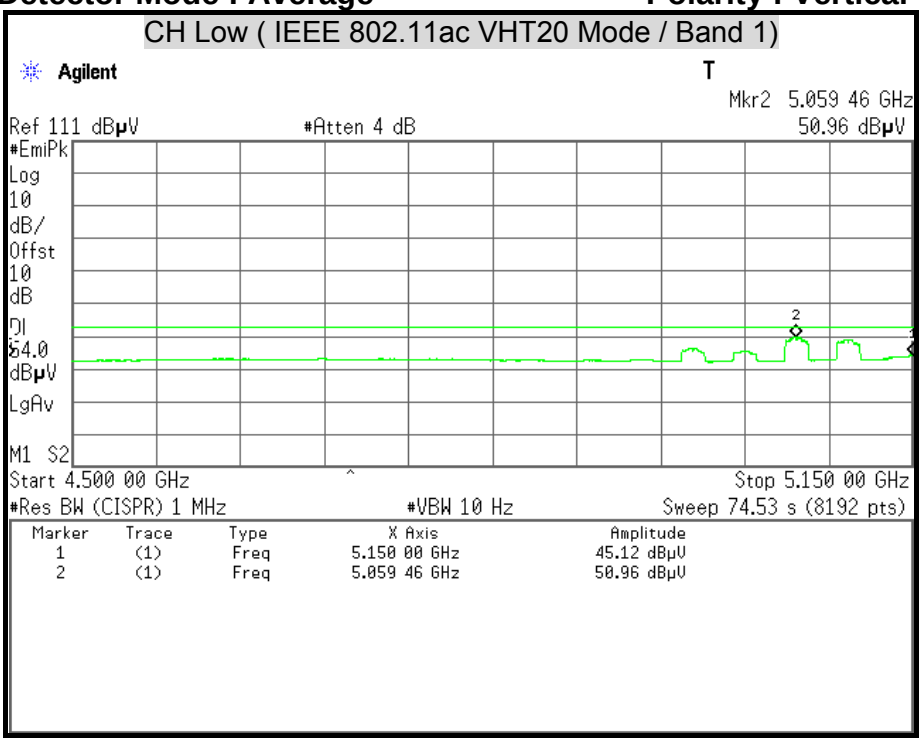
Detector Mode : Average **Polarity : Horizontal**



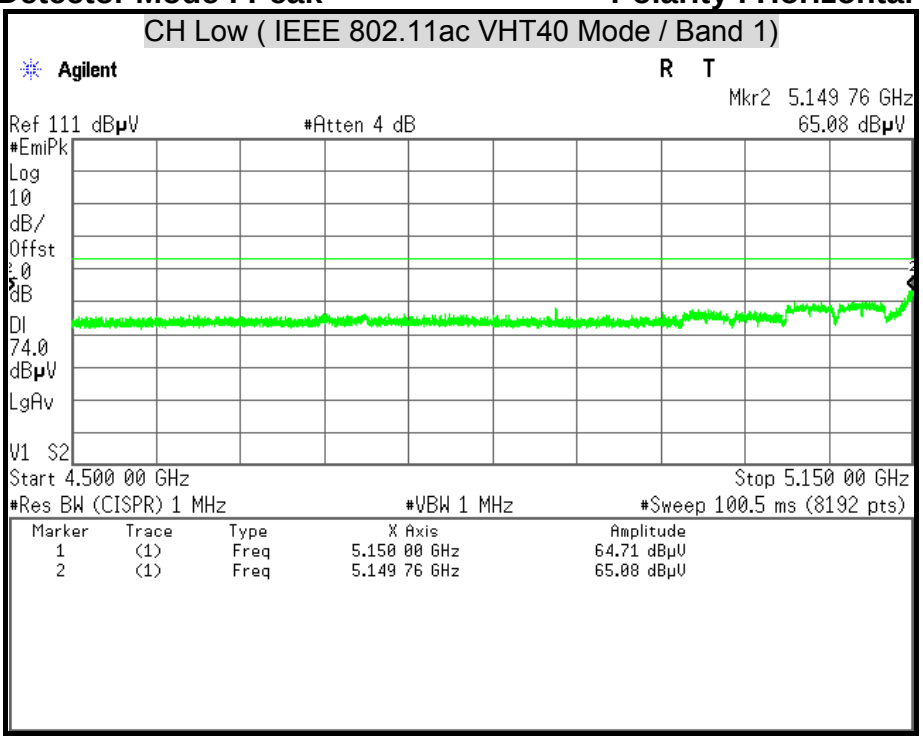
Detector Mode : Peak **Polarity : Vertical**



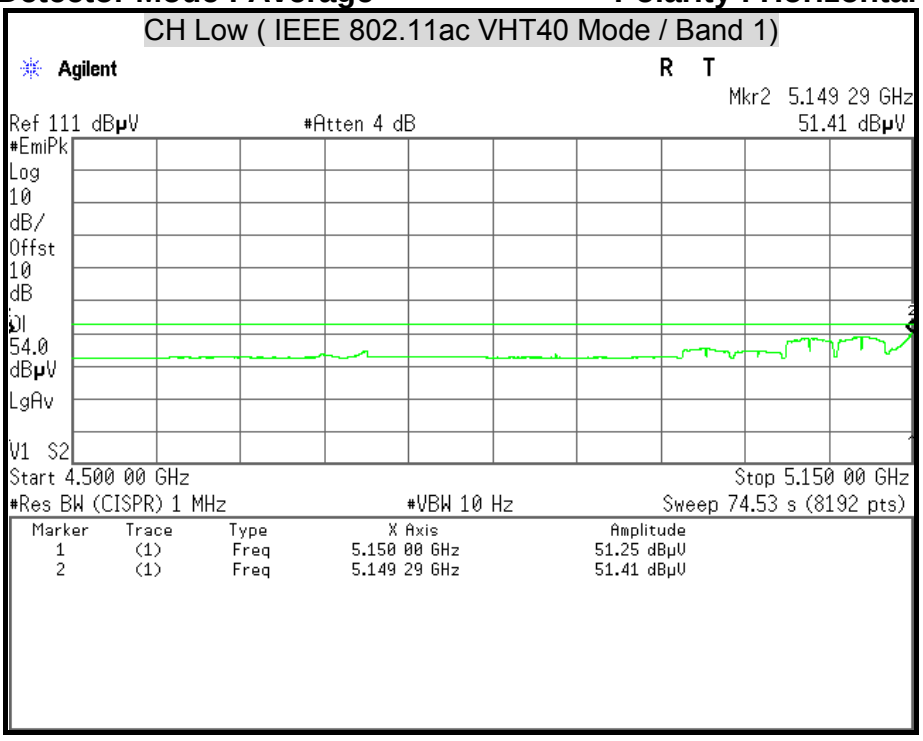
Detector Mode : Average **Polarity : Vertical**



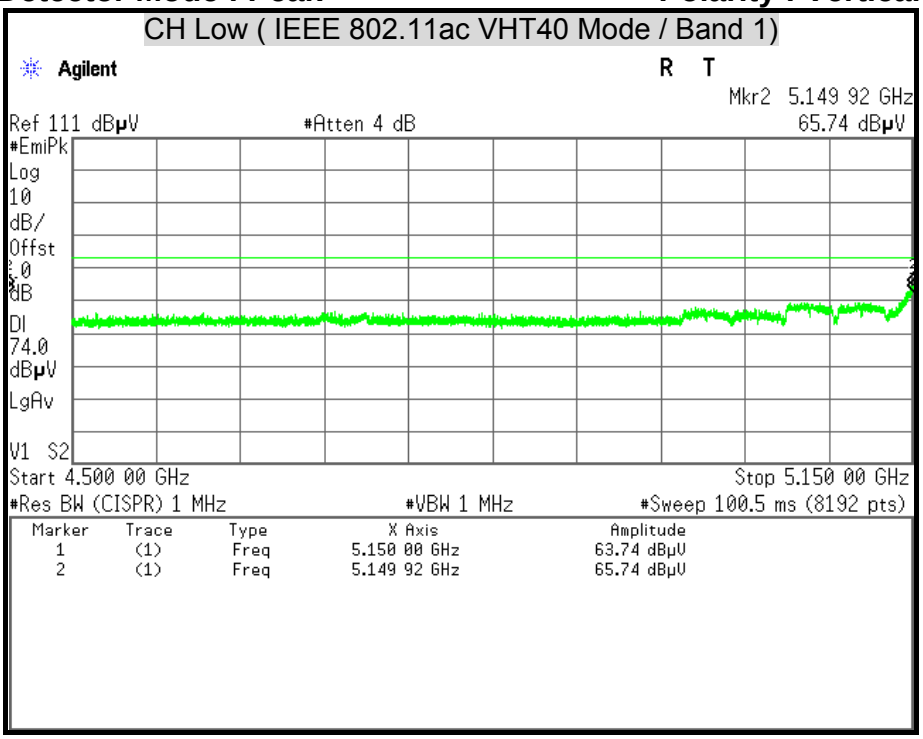
Detector Mode : Peak **Polarity : Horizontal**



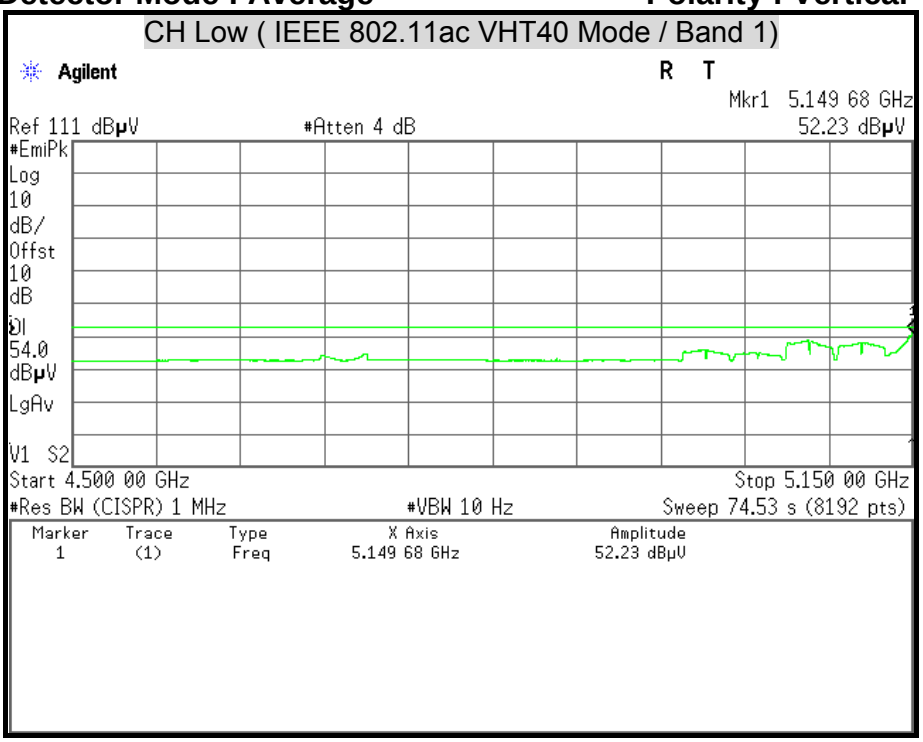
Detector Mode : Average **Polarity : Horizontal**



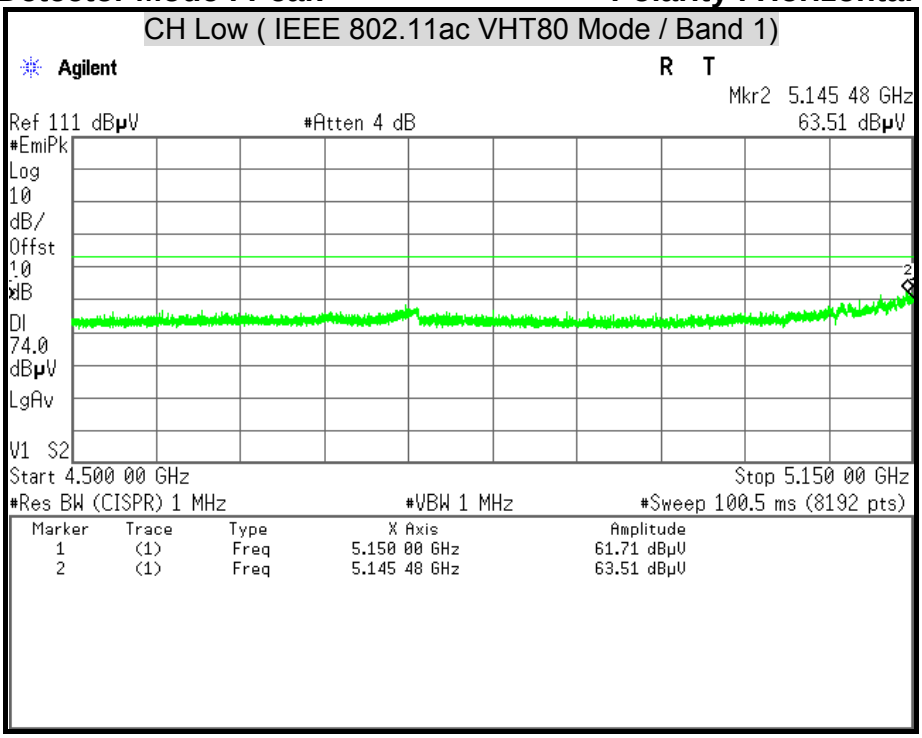
Detector Mode : Peak **Polarity : Vertical**



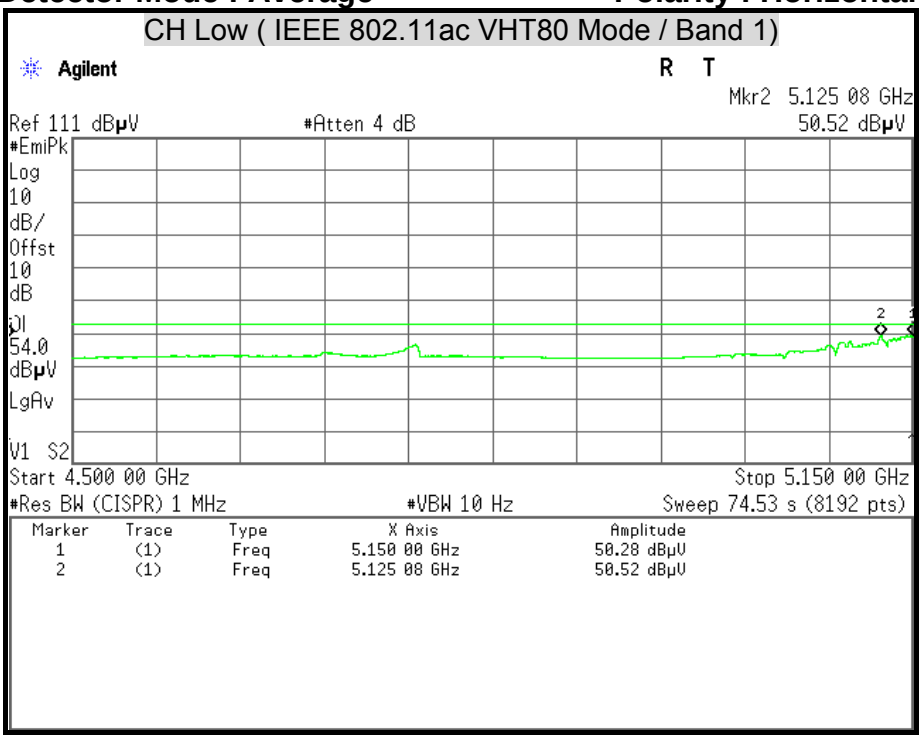
Detector Mode : Average **Polarity : Vertical**



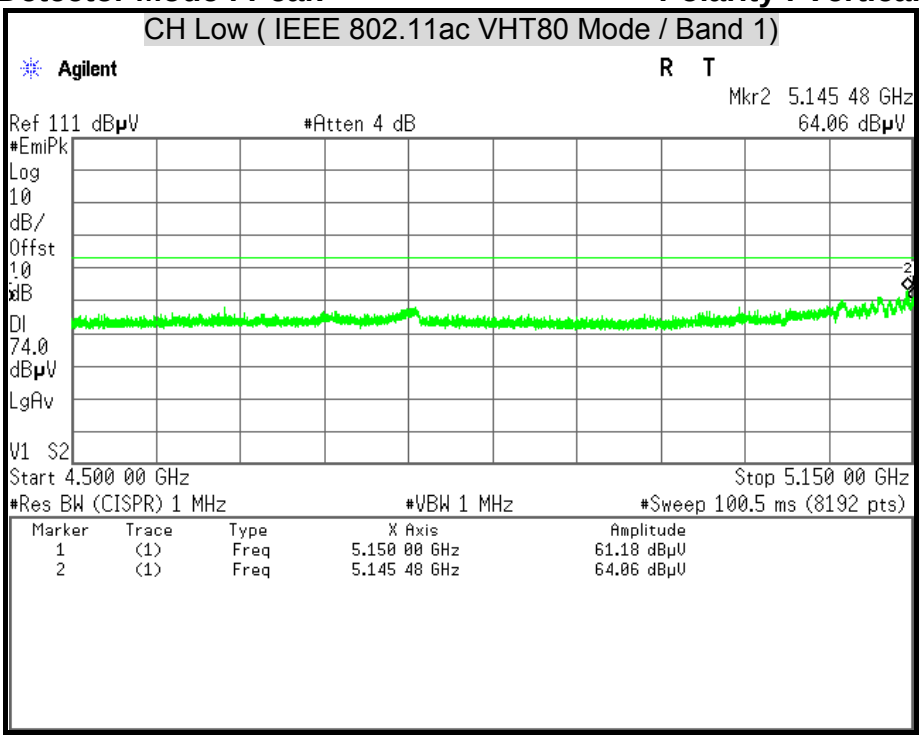
Detector Mode : Peak **Polarity : Horizontal**



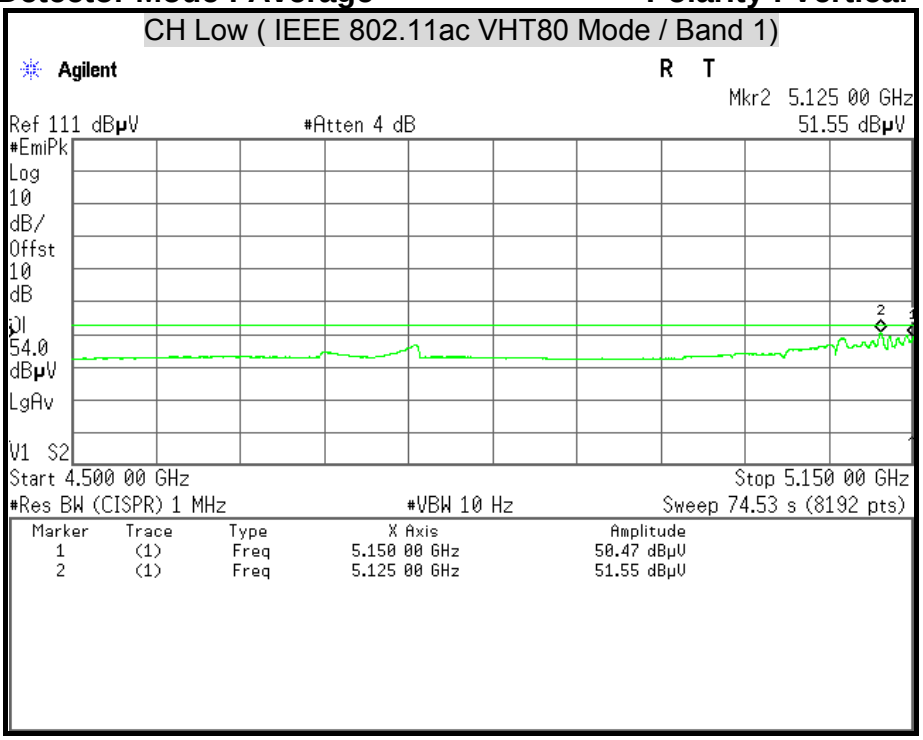
Detector Mode : Average **Polarity : Horizontal**



Detector Mode : Peak **Polarity : Vertical**



Detector Mode : Average **Polarity : Vertical**



7.5 CONDUCTED EMISSION

LIMITS

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

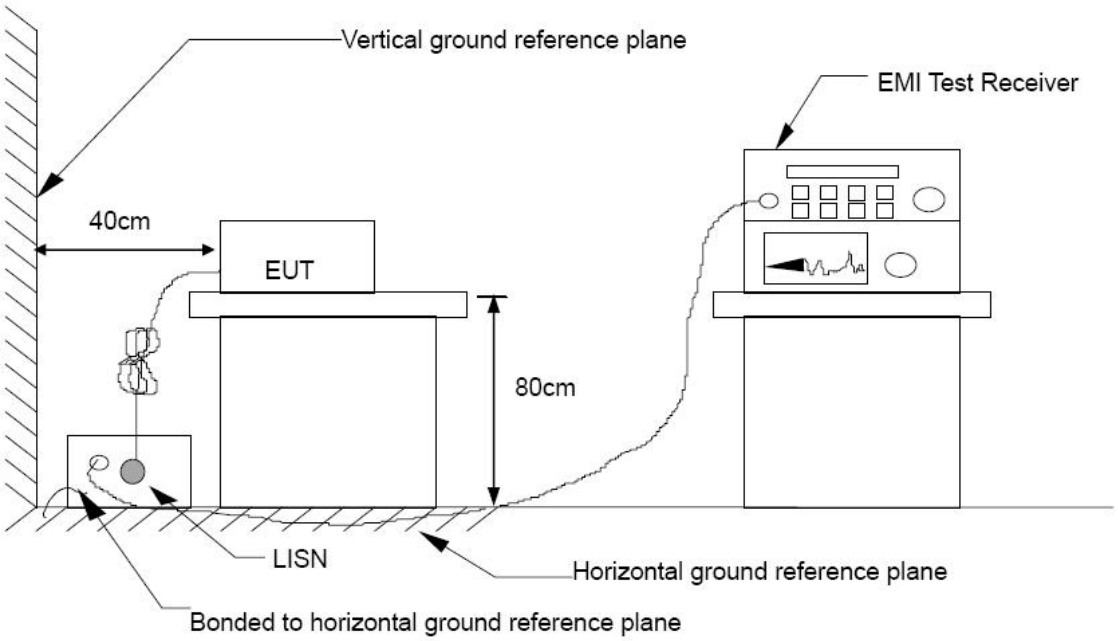
Frequency Range (MHz)	Conducted Limit (dBμv)	
	Quasi-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5.00	56	46
5.00 - 30.0	60	50

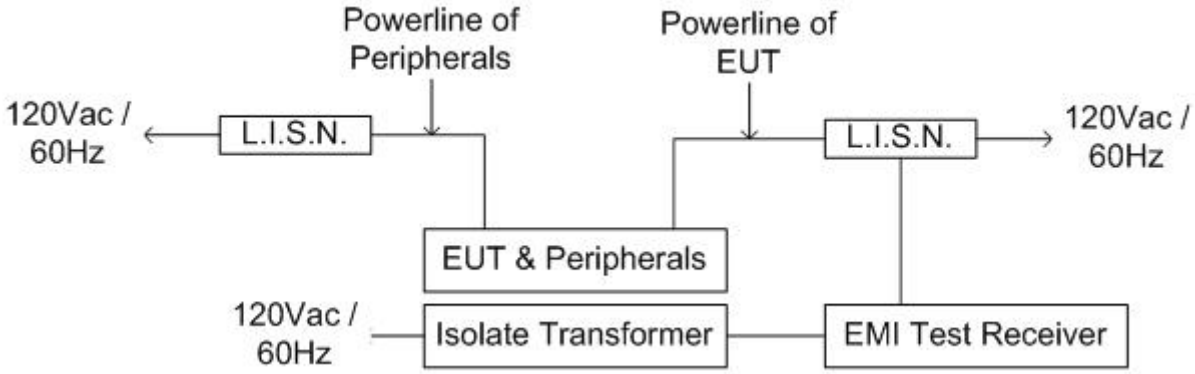
TEST EQUIPMENT

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

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

TEST SETUP





TEST PROCEDURE

The basic test procedure was in accordance with ANSI C63.10:2013.

The test procedure is performed in a 4m × 3m × 2.4m (L×W×H) shielded room.

The EUT along with its peripherals were placed on a 1.0m (W) × 1.5m (L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.

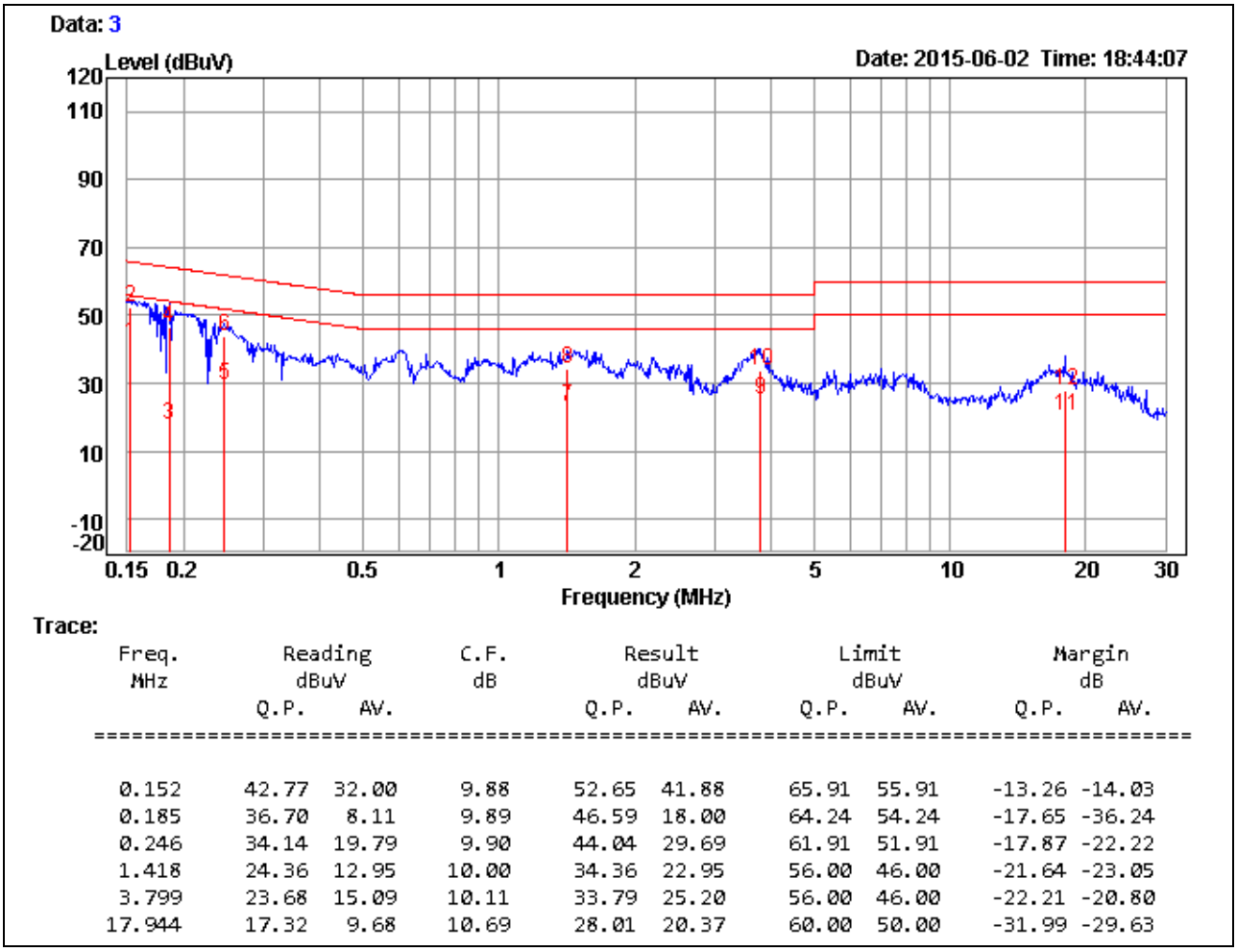
The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room. All peripherals were connected to the second LISN and the chassis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

The EUT was located so that the distance between the boundary of the EUT and the closest surface of the LISN is 0.8 m. Where a mains flexible cord was provided by the manufacturer shall be 1 m long, or if in excess of 1 m, the excess cable was folded back and forth as far as possible so as to form a bundle not exceeding 0.4 m in length.

TEST RESULTS

Product Name	MoCA to WiFi extender	Test By	Crystal Wu
Test Model	HT-EMN2	Test Date	2015/06/02
Test Mode	Normal Operating	Temp. & Humidity	27.5°C, 54%

LINE



Trace:

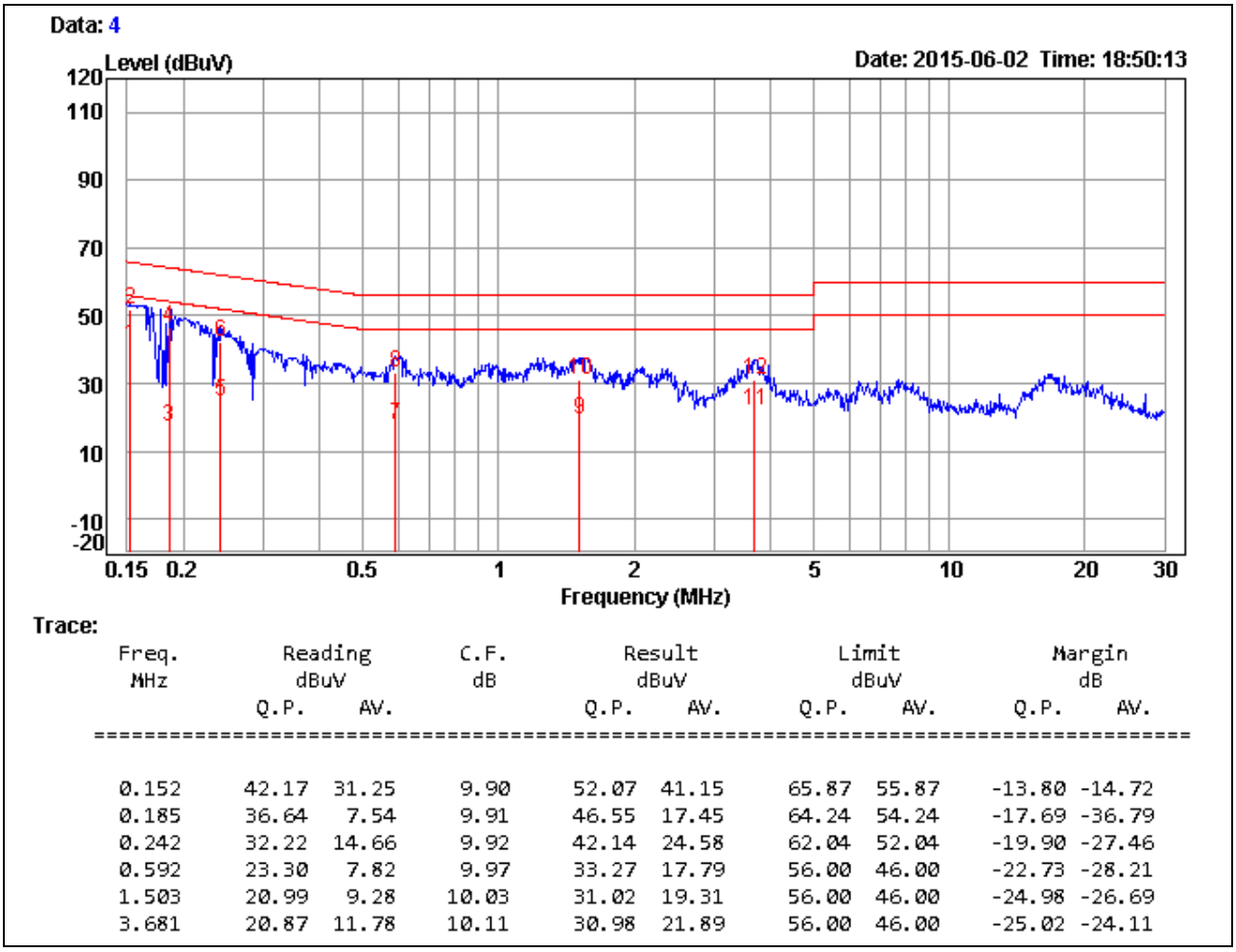
Freq. MHz	Reading dBuV Q.P.	Reading dBuV AV.	C.F. dB	Result dBuV Q.P.	Result dBuV AV.	Limit dBuV Q.P.	Limit dBuV AV.	Margin dB Q.P.	Margin dB AV.
0.152	42.77	32.00	9.88	52.65	41.88	65.91	55.91	-13.26	-14.03
0.185	36.70	8.11	9.89	46.59	18.00	64.24	54.24	-17.65	-36.24
0.246	34.14	19.79	9.90	44.04	29.69	61.91	51.91	-17.87	-22.22
1.418	24.36	12.95	10.00	34.36	22.95	56.00	46.00	-21.64	-23.05
3.799	23.68	15.09	10.11	33.79	25.20	56.00	46.00	-22.21	-20.80
17.944	17.32	9.68	10.69	28.01	20.37	60.00	50.00	-31.99	-29.63

Remark:

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

Product Name	MoCA to WiFi extender	Test By	Crystal Wu
Test Model	HT-EMN2	Test Date	2015/06/02
Test Mode	Normal Operating	Temp. & Humidity	27.5°C, 54%

NEUTRAL



Trace:

Freq. MHz	Reading dBuV Q.P.	Reading dBuV AV.	C.F. dB	Result dBuV Q.P.	Result dBuV AV.	Limit dBuV Q.P.	Limit dBuV AV.	Margin dB Q.P.	Margin dB AV.
0.152	42.17	31.25	9.90	52.07	41.15	65.87	55.87	-13.80	-14.72
0.185	36.64	7.54	9.91	46.55	17.45	64.24	54.24	-17.69	-36.79
0.242	32.22	14.66	9.92	42.14	24.58	62.04	52.04	-19.90	-27.46
0.592	23.30	7.82	9.97	33.27	17.79	56.00	46.00	-22.73	-28.21
1.503	20.99	9.28	10.03	31.02	19.31	56.00	46.00	-24.98	-26.69
3.681	20.87	11.78	10.11	30.98	21.89	56.00	46.00	-25.02	-24.11

Remark:

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

7.6 FREQUENCY STABILITY

LIMITS

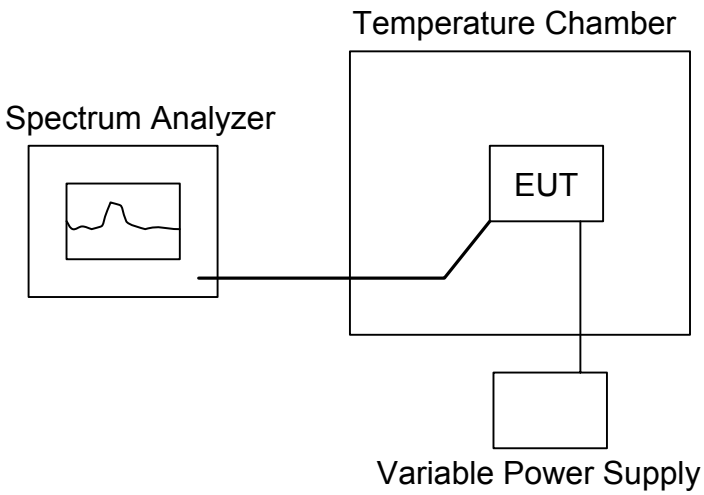
§ 15.407 (g) manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EXA Signal Analyzer	Agilent	N9010A	MY52220817	03/19/2016
Temp. & Humid. Chamber	TERCHY	MHC-120L	960424	09/09/2015

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

TEST SETUP



TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the environment into appropriate environment.
4. Set the spectrum analyzer as RBW=1kHz, VBW = RBW, Span = 200kHz, Sweep = auto.
5. Mark the peak frequency and measure the frequency tolerance using frequency counter function.
6. Repeat until all the results are investigated.

TEST RESULTS

IEEE 802.11a mode

UNII	Channel	Channel Frequency (MHz)	Measured Frequency (MHz)	Delta Frequency (kHz)	20 ppm Limit (kHz)	Margin (kHz)
Band 1	Low	5180	5180.050730	50.73	103.60	-52.87
	Middle	5200	5200.039370	39.37	104.00	-64.63
	High	5240	5240.035460	35.46	104.80	-69.34
Band 3	Low	5745	5745.036920	36.92	114.90	-77.98
	Middle	5785	5785.036640	36.64	115.70	-79.06
	High	5825	5825.036330	36.33	116.50	-80.17

IEEE 802.11ac VHT20 Mode

UNII	Channel	Channel Frequency (MHz)	Measured Frequency (MHz)	Delta Frequency (kHz)	20 ppm Limit (kHz)	Margin (kHz)
Band 1	Low	5180	5180.031220	31.22	103.60	-72.38
	Middle	5200	5200.031830	31.83	104.00	-72.17
	High	5240	5240.031880	31.88	104.80	-72.92
Band 3	Low	5745	5745.034850	34.85	114.90	-80.05
	Middle	5785	5785.035120	35.12	115.70	-80.58
	High	5825	5825.036080	36.08	116.50	-80.42

IEEE 802.11ac VHT40 Mode

UNII	Channel	Channel Frequency (MHz)	Measured Frequency (MHz)	Delta Frequency (kHz)	20 ppm Limit (kHz)	Margin (kHz)
Band 1	Low	5190	5190.032640	32.64	103.80	-71.16
	High	5230	5230.032420	32.42	104.60	-72.18
Band 3	Low	5755	5755.034540	34.54	115.10	-80.56
	High	5795	5795.034500	34.50	115.90	-81.40

IEEE 802.11ac VHT80 Mode

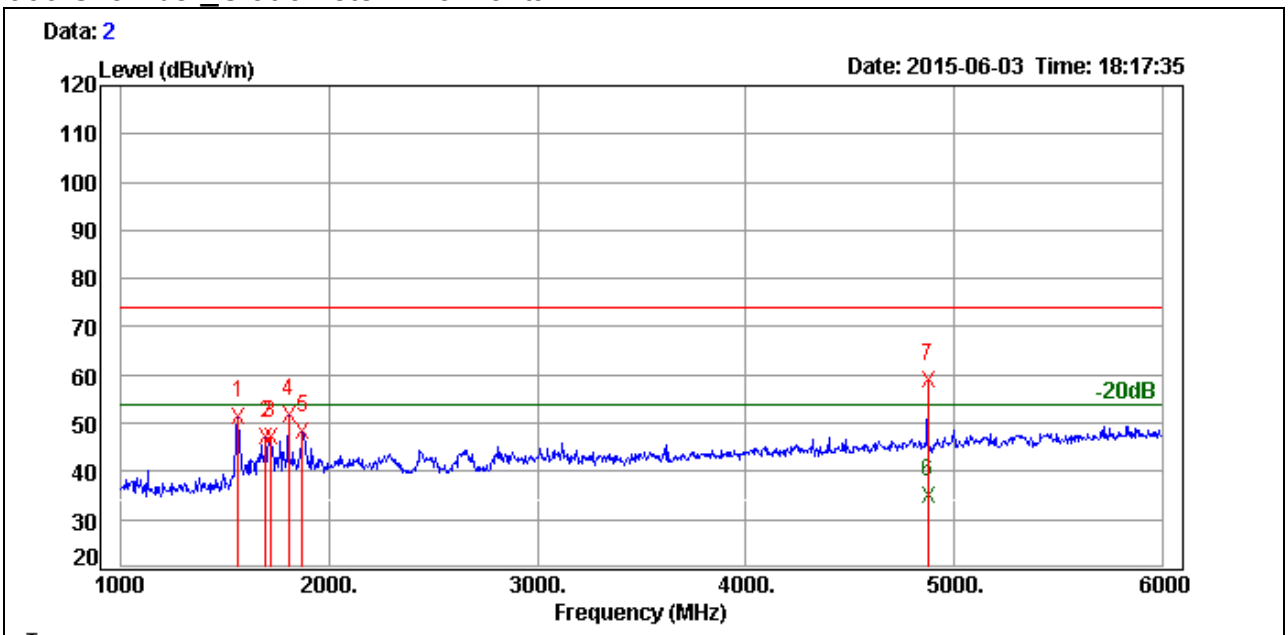
UNII	Channel	Channel Frequency (MHz)	Measured Frequency (MHz)	Delta Frequency (kHz)	20 ppm Limit (kHz)	Margin (kHz)
Band 1	Low	5210	5210.032730	32.73	104.20	-71.47
Band 3	Low	5775	5775.034580	34.58	115.50	-80.92

APPENDIX I CO-LOCATION

Above 1 GHz

Product Name	MoCA to WiFi extender	Test By	Crystal Wu
Test Model	HT-EMN2	Test Date	2015/06/03
Test Mode	Normal Operating	Temp. & Humidity	25°C, 57%

966 Chamber_C at 3Meter / Horizontal



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
1560.00	51.69	-0.47	51.22	74.00	-22.78	169	100	Peak
1695.00	46.41	0.70	47.11	74.00	-26.89	179	100	Peak
1715.00	46.46	0.88	47.34	74.00	-26.66	205	100	Peak
1805.00	50.04	1.66	51.70	74.00	-22.30	157	200	Peak
1870.00	46.07	2.22	48.29	74.00	-25.71	166	200	Peak
4875.00	26.17	8.94	35.11	54.00	-18.89	118	139	Average
4875.00	50.17	8.94	59.11	74.00	-14.89	118	139	Peak

Remark:

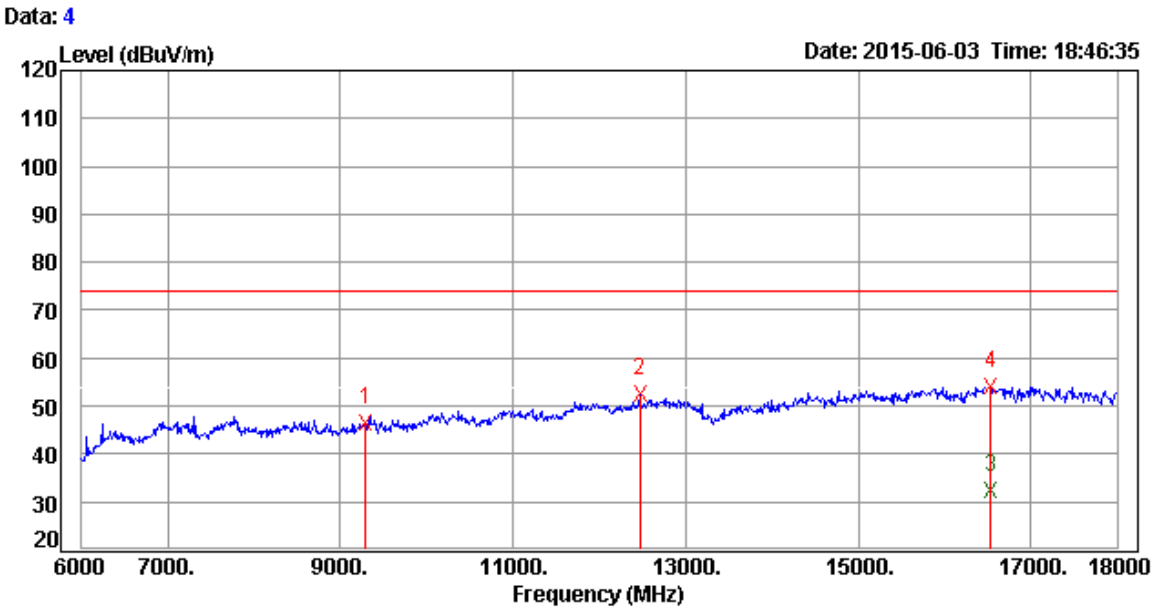
1. Average test would be performed if the peak result were greater than the average limit.

3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

3. Result = Reading + Correction Factor
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)
Remark AVG = Result(AV) – Limit(AV)

Product Name	MoCA to WiFi extender	Test By	Crystal Wu
Test Model	HT-EMN2	Test Date	2015/06/03
Test Mode	Normal Operating	Temp. & Humidity	25°C, 57%

966 Chamber_C at 3Meter / Horizontal



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
9288.00	42.37	4.09	46.46	74.00	-27.54	222	100	Peak
12468.00	44.27	8.13	52.40	74.00	-21.60	0	300	Peak
16536.00	21.80	10.62	32.42	54.00	-21.58	70	300	Average
16536.00	43.42	10.62	54.04	74.00	-19.96	70	300	Peak

Remark:

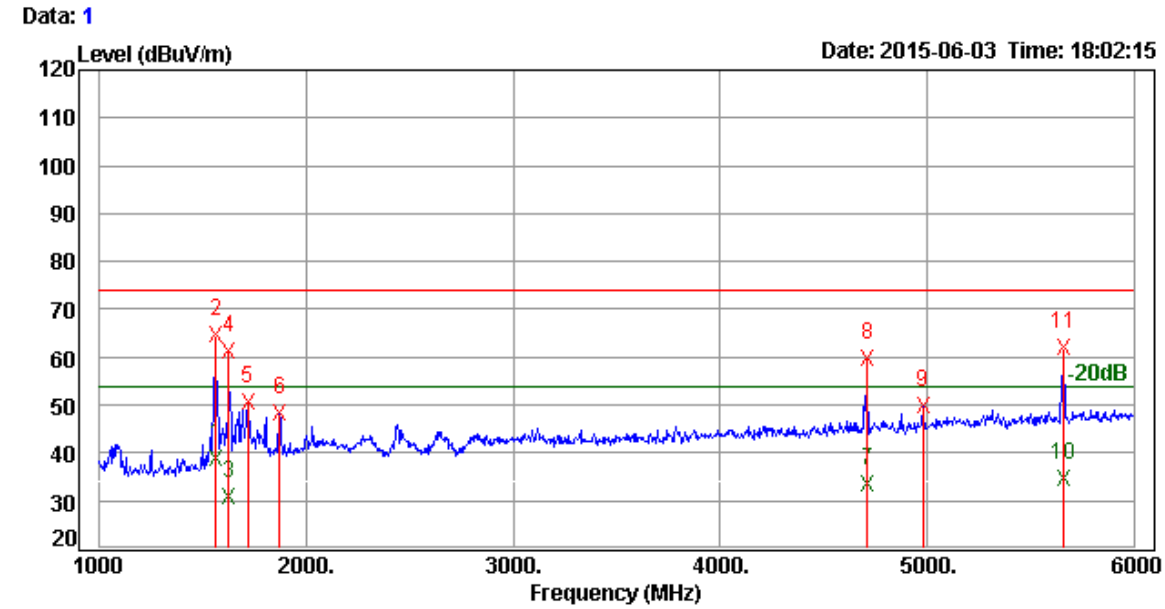
1. Average test would be performed if the peak result were greater than the average limit.

3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

3. Result = Reading + Correction Factor
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)
Remark AVG = Result(AV) – Limit(AV)

Product Name	MoCA to WiFi extender	Test By	Crystal Wu
Test Model	HT-EMN2	Test Date	2015/06/03
Test Mode	Normal Operating	Temp. & Humidity	25°C, 57%

966 Chamber_C at 3Meter / Vertical



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
1560.00	39.33	-0.47	38.86	54.00	-15.14	185	100	Average
1560.00	65.11	-0.47	64.64	74.00	-9.36	185	100	Peak
1625.00	30.76	0.10	30.86	54.00	-23.14	164	100	Average
1625.00	61.32	0.10	61.42	74.00	-12.58	164	100	Peak
1715.00	49.78	0.88	50.66	74.00	-23.34	184	200	Peak
1870.00	46.04	2.22	48.26	74.00	-25.74	215	100	Peak
4710.00	24.92	8.52	33.44	54.00	-20.56	285	100	Average
4710.00	51.36	8.52	59.88	74.00	-14.12	285	100	Peak
4980.00	40.55	9.20	49.75	74.00	-24.25	289	100	Peak
5660.00	23.30	11.34	34.64	54.00	-19.36	262	100	Average
5660.00	50.55	11.34	61.89	74.00	-12.11	262	100	Peak

Remark:

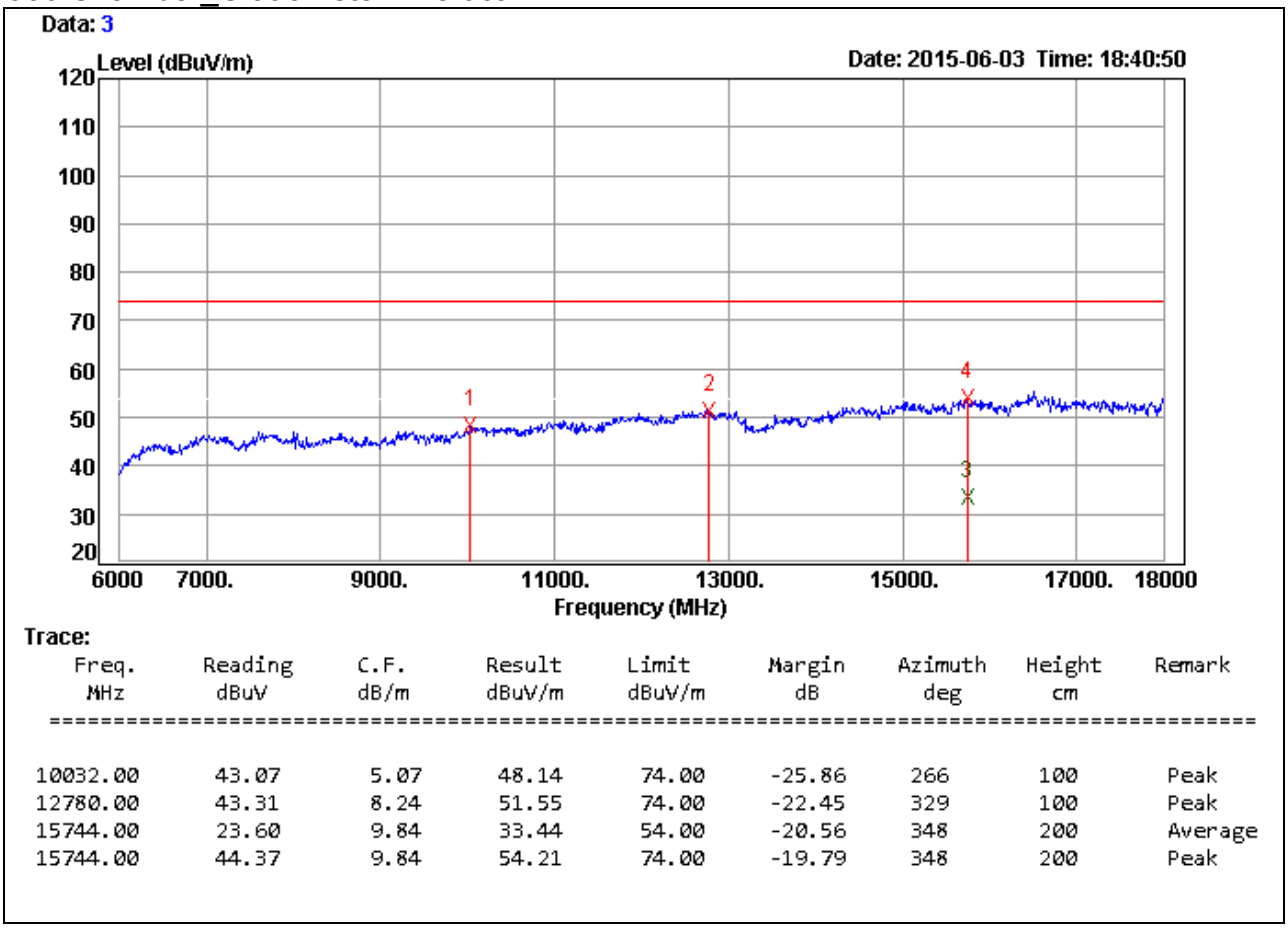
1. Average test would be performed if the peak result were greater than the average limit.

3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

3. Result = Reading + Correction Factor
Margin = Result – Limit
Remark Peak = Result(PK) – Limit(PK)
Remark AVG = Result(AV) – Limit(AV)

Product Name	MoCA to WiFi extender	Test By	Crystal Wu
Test Model	HT-EMN2	Test Date	2015/06/03
Test Mode	Normal Operating	Temp. & Humidity	25°C, 57%

966 Chamber_C at 3Meter / Vertical



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
10032.00	43.07	5.07	48.14	74.00	-25.86	266	100	Peak
12780.00	43.31	8.24	51.55	74.00	-22.45	329	100	Peak
15744.00	23.60	9.84	33.44	54.00	-20.56	348	200	Average
15744.00	44.37	9.84	54.21	74.00	-19.79	348	200	Peak

Remark:

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