



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

For

Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router

Model : BiPAC 8920AX

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

Issued for

Billion Electric Co., Ltd.

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

Issued by

**Compliance Certification Services Inc.
Hsinchu Lab.**

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

TEL: +886-3-5921698

FAX: +886-3-5921108

<http://www.ccsrf.com>

E-Mail : service@ccsrf.com

Issued Date: August 26, 2015



Note: This report shall not be reproduced except in full, without the written approval of Compliance Certification Services Inc. This document may be altered or revised by Compliance Certification Services Inc. personnel only, and shall be noted in the revision section of the document. The client should not use it to claim product endorsement by TAF or any government agencies. The test results of this report relate only to the tested sample identified in this report.



Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	06/03/2015	Initial Issue	All Page 171	Michelle Chiu
01	08/26/2015	Revise Remark Description	P.40-42	Gloria Chang



TABLE OF CONTENTS

TITLE	PAGE NO.
1. TEST REPORT CERTIFICATION	4
2. EUT DESCRIPTION	5
3. DESCRIPTION OF TEST MODES	9
4. TEST METHODOLOGY	11
5. FACILITIES AND ACCREDITATION	11
5.1 FACILITIES	11
5.2 ACCREDITATIONS.....	11
5.3 MEASUREMENT UNCERTAINTY	12
6. SETUP OF EQUIPMENT UNDER TEST.....	13
7. FCC PART 15.407 REQUIREMENTS	15
7.1 6dB BANDWIDTH	15
7.2 MAXIMUM CONDUCTED OUTPUT POWER.....	30
7.3 PEAK POWER SPECTRAL DENSITY	37
7.4 RADIATED EMISSION.....	69
7.5 CONDUCTED EMISSION	155
7.6 FREQUENCY STABILITY	160
APPENDIX I CO-LOCATION	164
APPENDIX II SETUP PHOTOS	168



1. TEST REPORT CERTIFICATION

Applicant : Billion Electric Co., Ltd.
Address : 8F., No.192, Sec. 2, Zhongxing Rd., Xindian Dist., New Taipei
City 231, Taiwan (R.O.C.)
Equipment Under Test : Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN
Firewall Router
Model : BiPAC 8920AX
Data Applies To : Please refer to section 2 (altogether 9 series models)
Tested Date : May 05 ~ June 03, 2015

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

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

Approved by:

Sb. Lu
Sr. Engineer

Reviewed by:

Gundam Lin
Sr. Engineer



2. EUT DESCRIPTION

Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router
Model Number	BiPAC 8920AX
Data Applies To	Please refer to section 2 (altogether 9 series models)
Identify Number	T150505S06
Received Date	May 05, 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 : 18.98 dBm (0.0791 W) IEEE 802.11ac VHT20 : 14.56 dBm (0.0286 W) IEEE 802.11ac VHT40 : 19.43 dBm (0.0877 W) IEEE 802.11ac VHT80 : 16.51 dBm (0.0448 W) UNII Band 3: IEEE 802.11a : 20.04 dBm (0.1009 W) IEEE 802.11ac VHT20 : 21.42 dBm (0.1387 W) IEEE 802.11ac VHT40 : 19.34 dBm (0.0859 W) IEEE 802.11ac VHT80 : 16.00 dBm (0.0398 W)
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 234 Mbps IEEE 802.11ac (VHT20,400ns GI) : up to 260.1 Mbps IEEE 802.11ac (VHT40,800ns GI) : up to 540Mbps IEEE 802.11ac (VHT40,400ns GI) : up to 600 Mbps IEEE 802.11ac (VHT80,800ns GI) : up to 1170 Mbps IEEE 802.11ac (VHT80,400ns GI) : up to 1299.9 Mbps
Type of Modulation	IEEE 802.11a : OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac VHT20/VHT40 : OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac VHT80 : OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK)
Antenna Type	Dipole Antenna × 3 : Antenna 0 (Chain 0), Antenna Gain 5 dBi Antenna 1 (Chain 1), Antenna Gain 5.7dBi Antenna 2 (Chain 2), Antenna Gain 5.7dBi
Power Rating	12Vdc
Test Voltage	120Vac, 60Hz
DC Power Cable Type	Non-shielded cable 1.5m × 1 (Non-detachable)
I/O Port	LAN Port × 4, WAN Port × 1, USB Port × 1, Power Port × 1, DSL Port × 1

Power Adapter :

No.	Manufacturer	Model No.	Power Input	Power Output
1	Ktec	KSAS0251500200HU	100-240Vac, 50/60Hz, 0.9A	15Vdc, 2.0A

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: QI3BIL-8920AX filing to comply with Section 15.207, 15.209 and 15.407 of the FCC Part 15, Subpart E Rules.
4. The model BiPAC 8920AX was considered the main model for testing.

**The difference of the model :**

Difference Item Model	Trade Name	xDSL Dual-lines	Wireless AC	USB	VPN
BiPAC 8920AX	Billion	O	O	O	O
BiPAC 8920AXL	Billion	O	O	O	X
BiPAC 8921AXL	Billion	O	O	O	X
BiPAC 8900AX	Billion	X	O	O	O
BiPAC 8900AXL	Billion	X	O	O	X
Note : " O " means all the same and " X " means the difference.					



Difference Item Model	Trade Name	xDSL Dual-lines	Wireless AC	USB	VPN
BEC 8920X	BEC	O	O	O	O
BEC 8920AC	BEC	O	O	O	X
BEC 8920ACS	BEC	O	O	O	X
BEC 8900X	BEC	X	O	O	O
BEC 8900AC	BEC	X	O	O	X
Note : " O " means all the same and " X " means the difference.					



3. DESCRIPTION OF TEST MODES

The EUT is an 802.11n transceiver in Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router form factor.

For IEEE 802.11a mode: (1TX / 1RX) : Chain 0 (Ant 0) transmit/receive.

For IEEE 802.11ac VHT20/VHT40/VHT80 mode (3TX / 3RX) :

Chain 0 (Ant 0) & Chain 1 (Ant 1) & Chain 2 (Ant 2) 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 Band 1:

Channel	Frequency (MHz)
Low	5180
Middle	5200
High	5240

UNII Band 3:

Channel	Frequency (MHz)
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 or three channels have been tested as following :

UNII Band 1:

Channel	Frequency (MHz)
Low	5190
High	5230

UNII Band 3:

Channel	Frequency (MHz)
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 Band 1:

Channel	Frequency (MHz)
Low	5210

UNII Band 3:

Channel	Frequency (MHz)
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 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 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_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	IBM (Lenovo)	ThinkPad T61 7663-AS6	L3F3864
5	CMTS	ZyXEL	IES-1000	S2Z3322195
6	USB2.0 Flash Disk	Kingston	DTSE9H/8GB	---

No.	Power & Signal Cable Description
1	Non-shielded RJ-45 cable, 12m × 2
2	Non-shielded RJ-45 cable, 1.5m × 3
3	Non-shielded RJ-11 cable, 12m × 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:

- 6 Mbps Bandwidth 20 (IEEE 802.11a mode)
- 6.5 Mbps Bandwidth 20 (IEEE 802.11ac VHT20 mode)
- 13.5 Mbps Bandwidth 40 (IEEE 802.11ac VHT40 mode)
- 29.3 Mbps Bandwidth 80 (IEEE 802.11ac VHT80 mode)

Power control

- IEEE 802.11a Channel Low (5180MHz) Chain0 Power set 72
- IEEE 802.11a Channel Mid (5200MHz) Chain0 Power set 72
- IEEE 802.11a Channel High (5240MHz) Chain0 Power set 72
- IEEE 802.11ac VHT20 Channel Low (5180MHz) Chain0/Chain1/Chain2 Power set 35
- IEEE 802.11ac VHT20 Channel Mid (5200MHz) Chain0/Chain1/Chain2 Power set 35
- IEEE 802.11ac VHT20 Channel High (5240MHz) Chain0/Chain1/Chain2 Power set 35



IEEE 802.11ac VHT40 Channel Low (5190MHz) Chain0/Chain1/Chain2 Power set 48
IEEE 802.11ac VHT40 Channel High (5230MHz) Chain0/Chain1/Chain2 Power set 54
IEEE 802.11ac VHT80 Channel Low (5210MHz) Chain0/Chain1/Chain2 Power set 44

IEEE 802.11a Channel Low (5745MHz) Chain0 Power set 44
IEEE 802.11a Channel Mid (5785MHz) Chain0 Power set 80
IEEE 802.11a Channel High (5825MHz) Chain0 Power set 62
IEEE 802.11ac VHT20 Channel Low (5745MHz) Chain0/Chain1/Chain2 Power set 44
IEEE 802.11ac VHT20 Channel Mid (5785MHz) Chain0/Chain1/Chain2 Power set 66
IEEE 802.11ac VHT20 Channel High (5825MHz) Chain0/Chain1/Chain2 Power set 62
IEEE 802.11ac VHT40 Channel Low (5755MHz) Chain0/Chain1/Chain2 Power set 44
IEEE 802.11ac vHT40 Channel High (5795MHz) Chain0/Chain1/Chain2 Power set 56
IEEE 802.11ac VHT80 Channel Low (5775MHz) Chain0/Chain1/Chain2 Power set 44

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 1, 2 (DHCP).
2. EUT link to Notebook PC 3 with WiFi (DHCP).
4. CMTS RJ-45 port link to Notebook PC 4 (IP192.168.1.XXX).
5. EUT RJ-11 port link to CMTS.
6. Notebook PC 1, 2, 3 ping Notebook PC 4 192.168.1.xxx.
7. All of the functions are under run.
8. 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**

U-NII	Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)
			Chain 0
Band 3	Low	5745	16.3800
	Middle	5785	16.4500
	High	5825	16.3900

IEEE 802.11ac VHT20 Mode (Three TX)

U-NII	Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)		
			Chain 0	Chain 1	Chain 2
Band 3	Low	5475	17.6600	17.6300	17.6700
	Middle	5785	17.6200	17.5600	17.7100
	High	5825	17.6000	17.6700	17.7200

IEEE 802.11ac VHT40 Mode (Three TX)

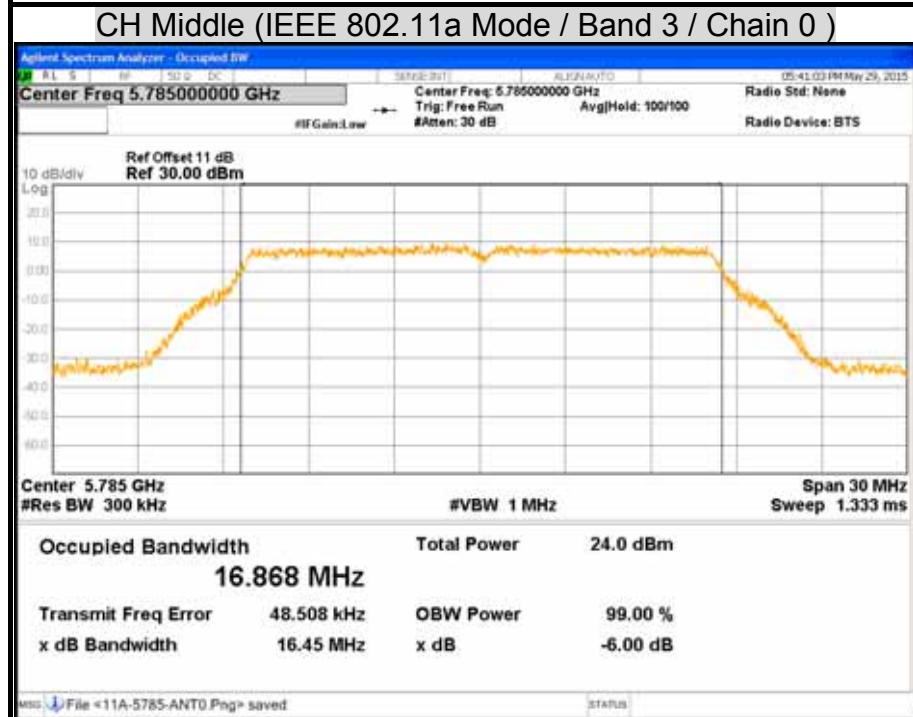
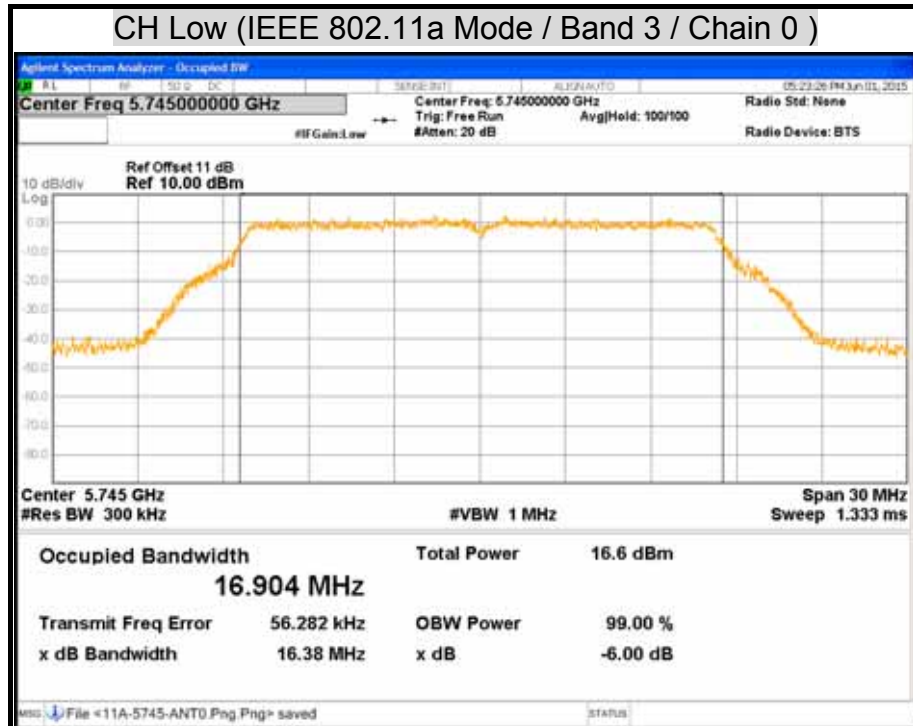
U-NII	Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)		
			Chain 0	Chain 1	Chain 2
Band 3	Low	5755	36.5100	36.3300	36.1600
	High	5795	36.5700	36.4900	36.3500

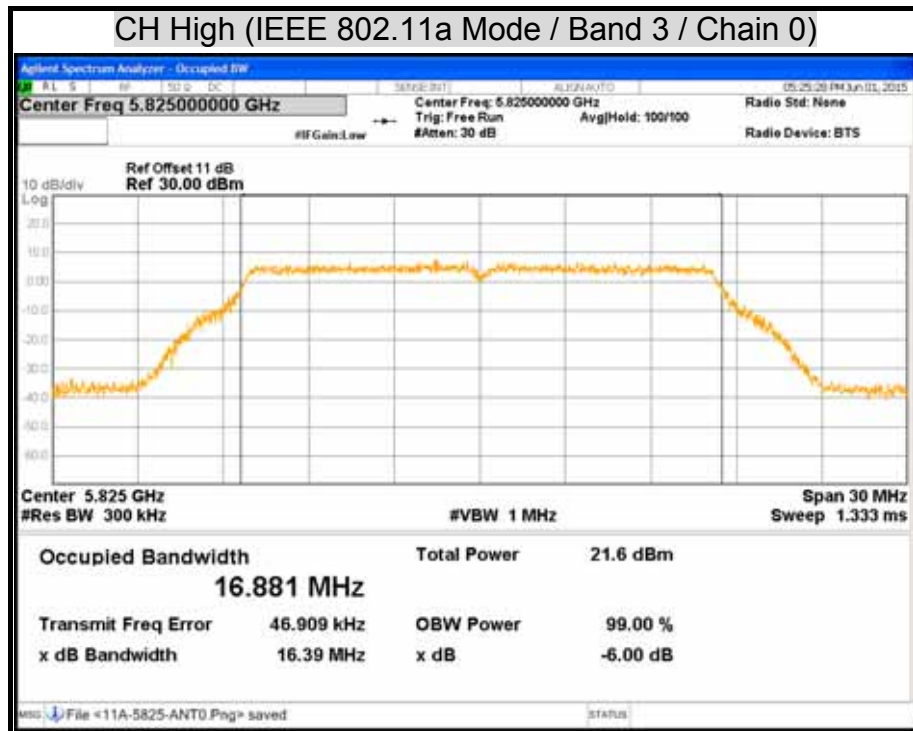
IEEE 802.11ac VHT80 Mode (Three TX)

U-NII	Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)		
			Chain 0	Chain 1	Chain 2
Band 3	Low	5775	76.2000	76.1200	75.6200



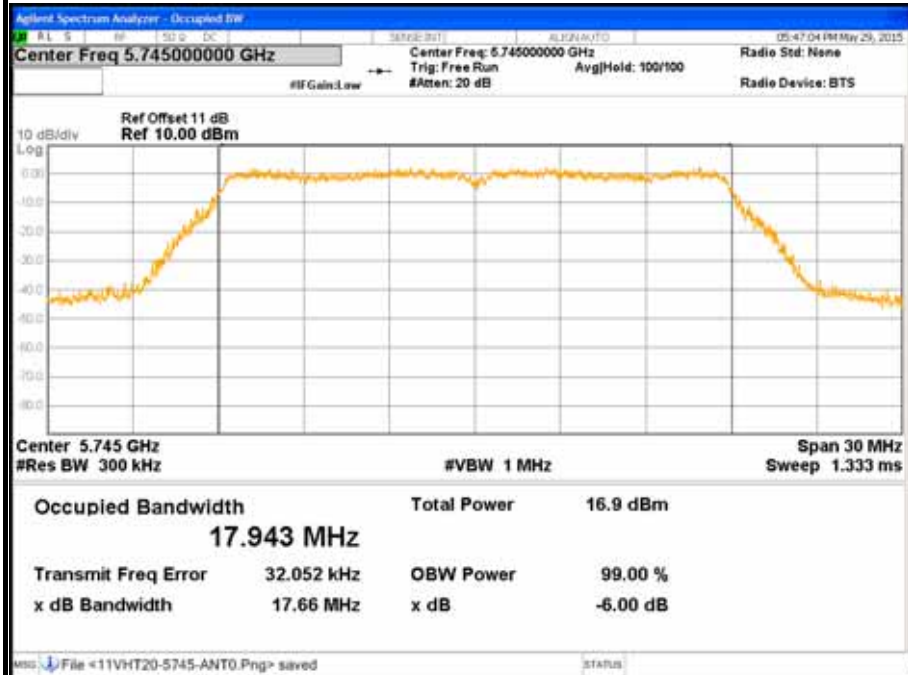
6dB BANDWIDTH



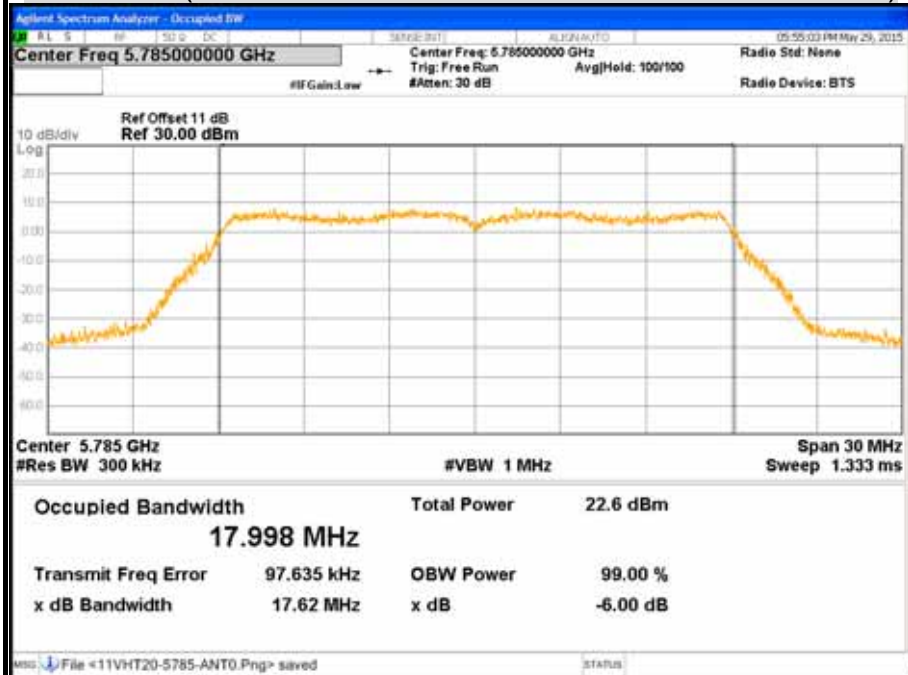




CH Low (IEEE 802.11ac VHT20 Mode / Band 3 / Chain 0)

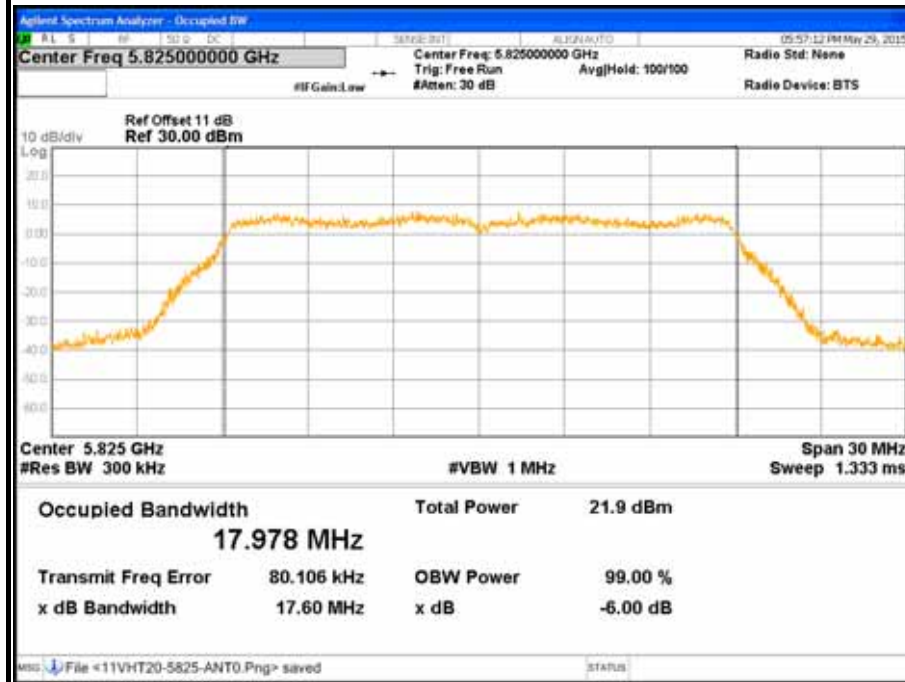


CH Middle (IEEE 802.11ac VHT20 Mode / Band 3 / Chain 0)



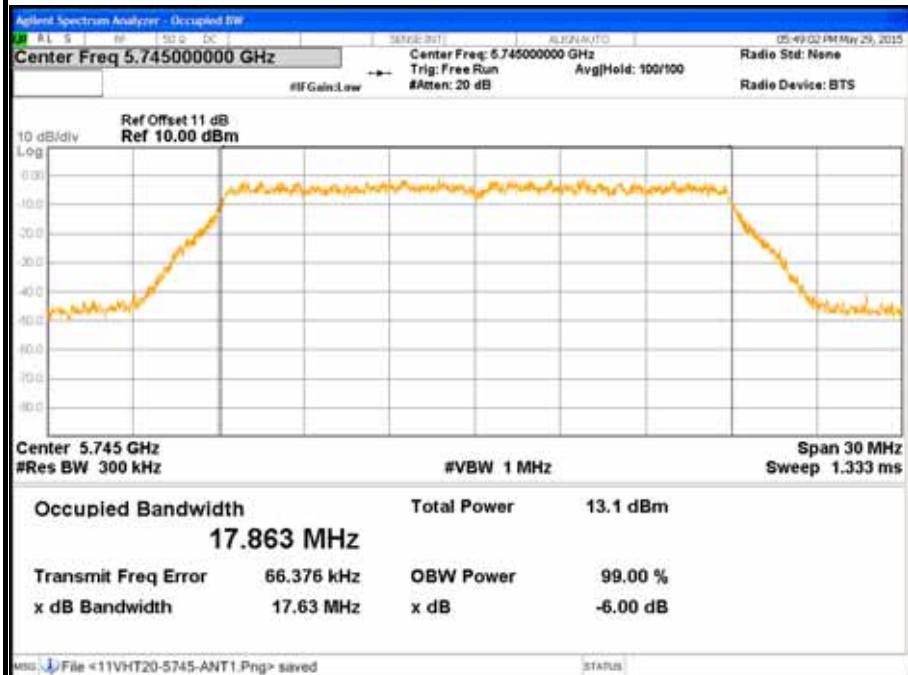


CH High (IEEE 802.11ac VHT20 Mode / Band 3 / Chain 0)

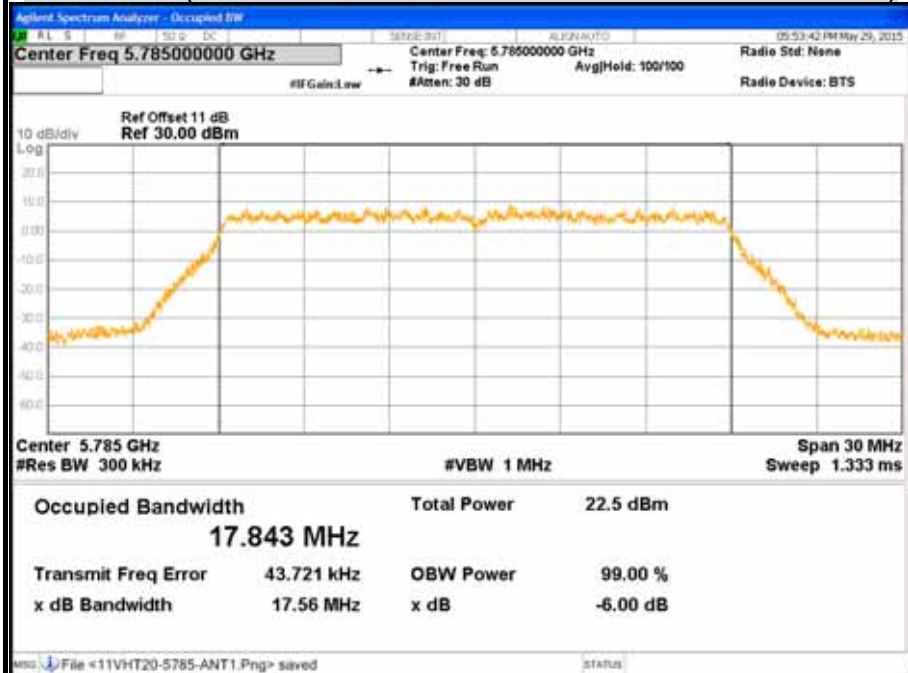




CH Low (IEEE 802.11ac VHT20 Mode / Band 3 / Chain 1)

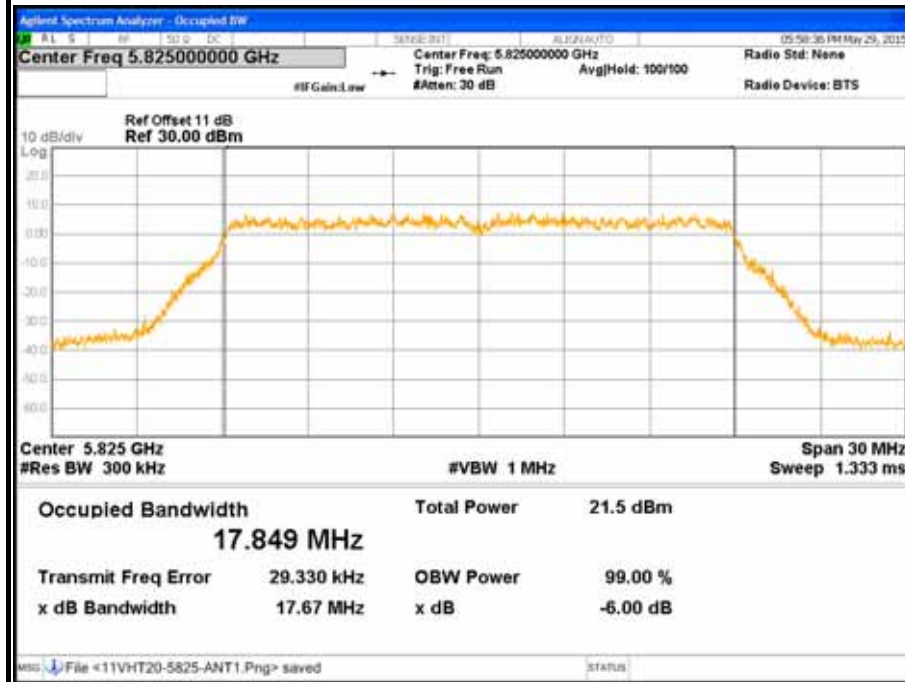


CH Middle (IEEE 802.11ac VHT20 Mode / Band 3 / Chain 1)



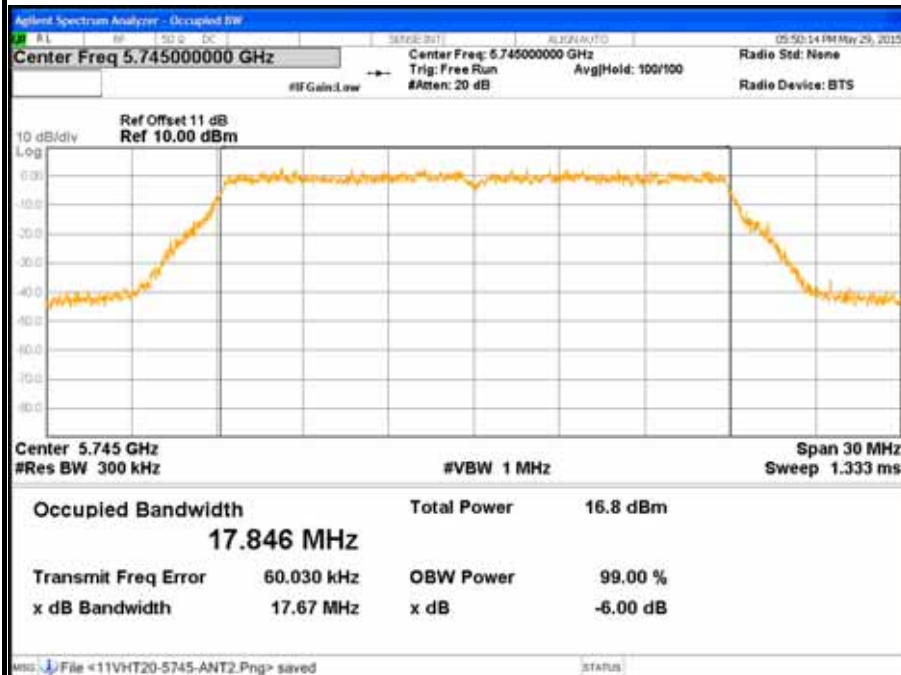


CH High (IEEE 802.11ac VHT20 Mode / Band 3 / Chain 1)

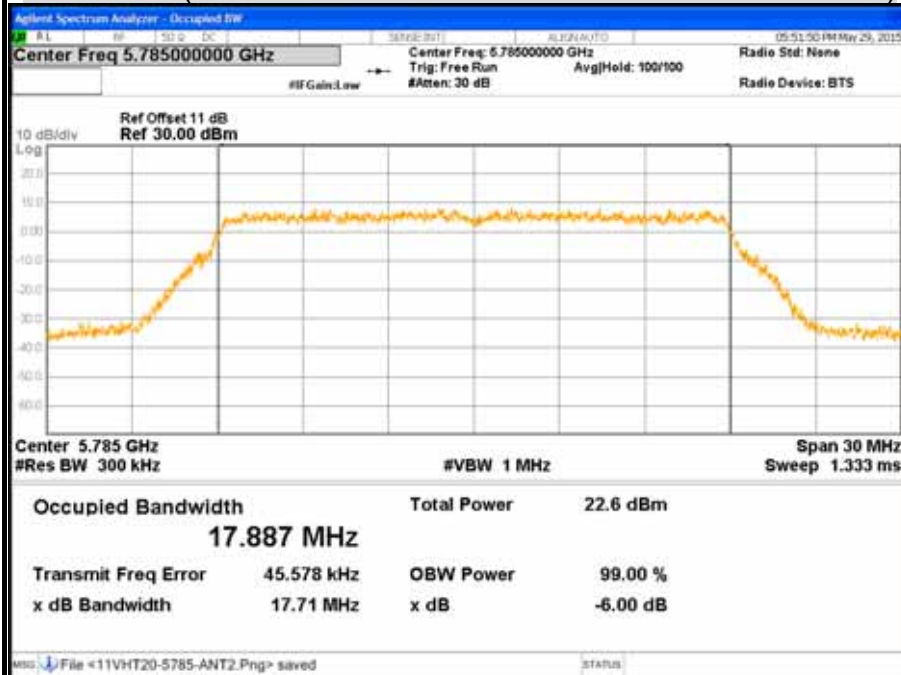




CH Low (IEEE 802.11ac VHT20 Mode / Band 3 / Chain 2)

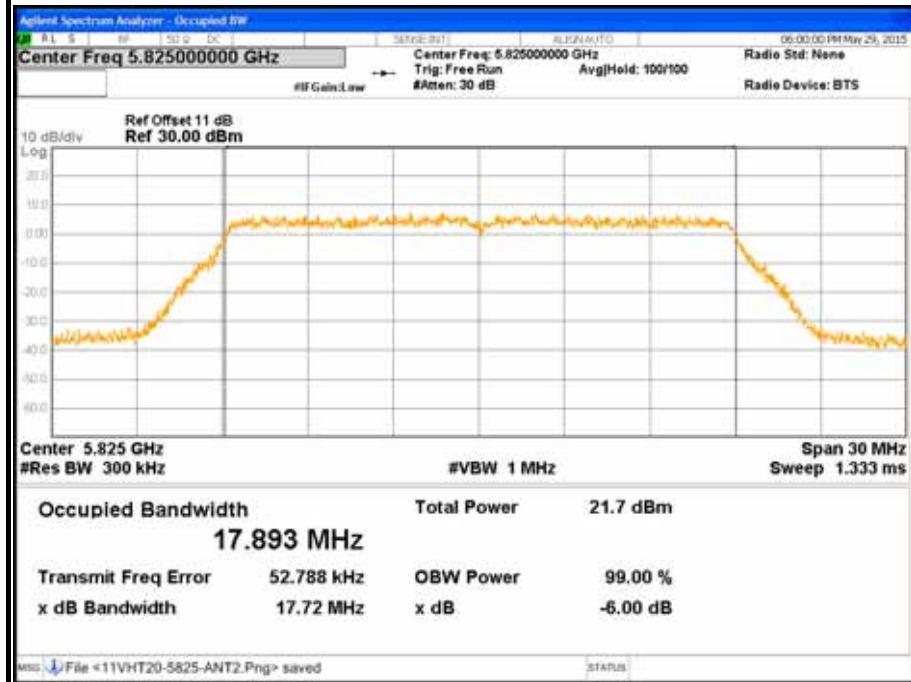


CH Middle (IEEE 802.11ac VHT20 Mode / Band 3 / Chain 2)





CH High (IEEE 802.11ac VHT20 Mode / Band 3 / Chain 2)

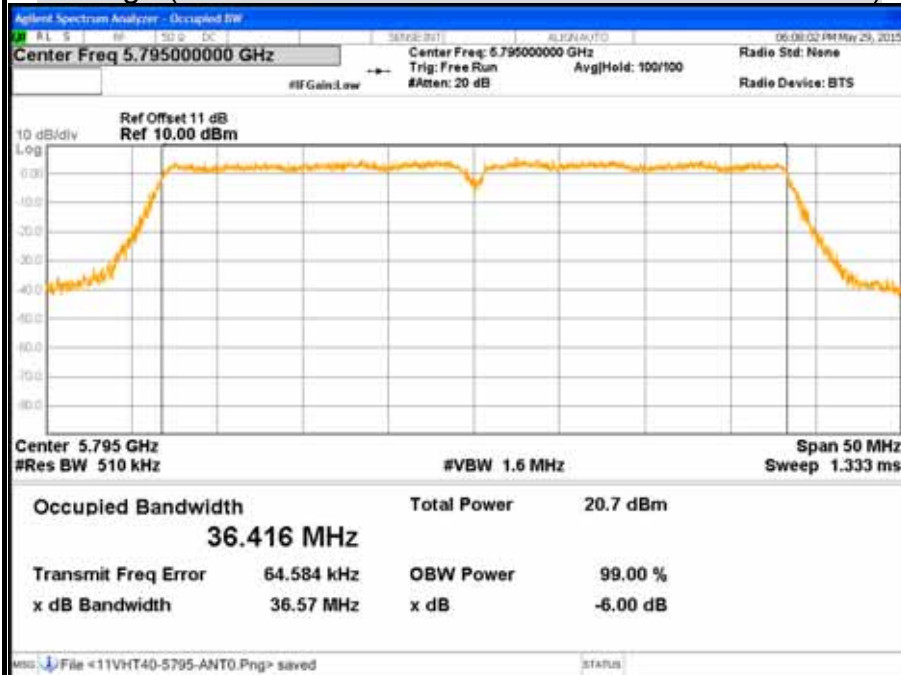




CH Low (IEEE 802.11ac VHT40 Mode / Band 3 / Chain 0)

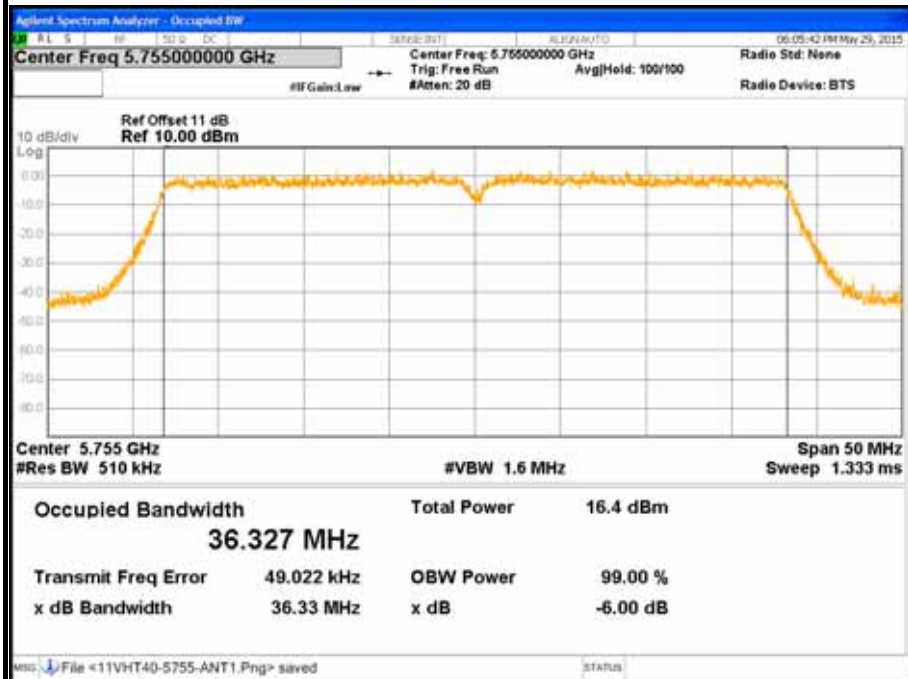


CH High (IEEE 802.11ac VHT40 Mode / Band 3 / Chain 0)

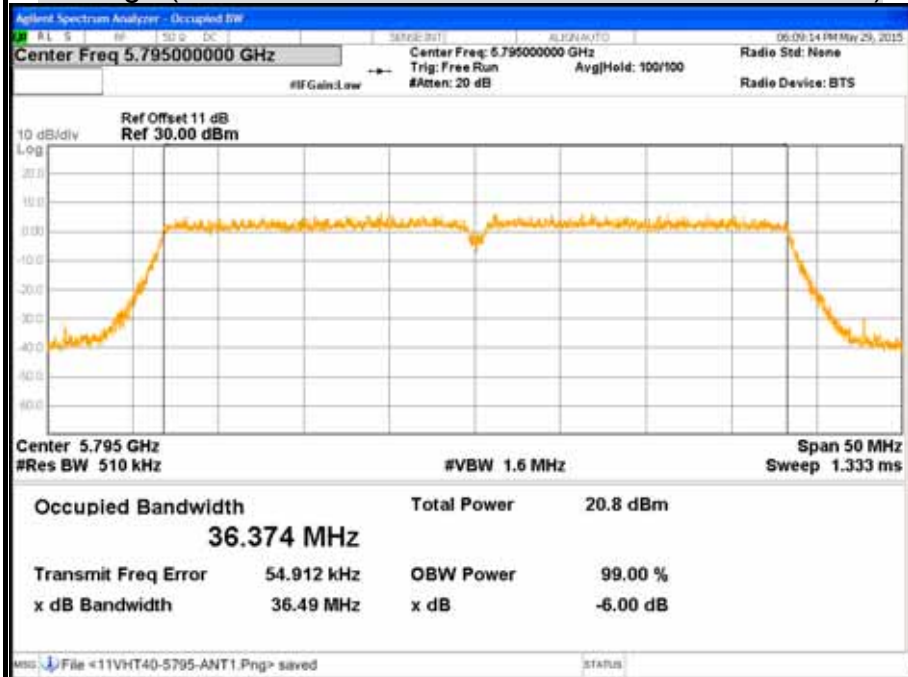




CH Low (IEEE 802.11ac VHT40 Mode / Band 3 / Chain 1)

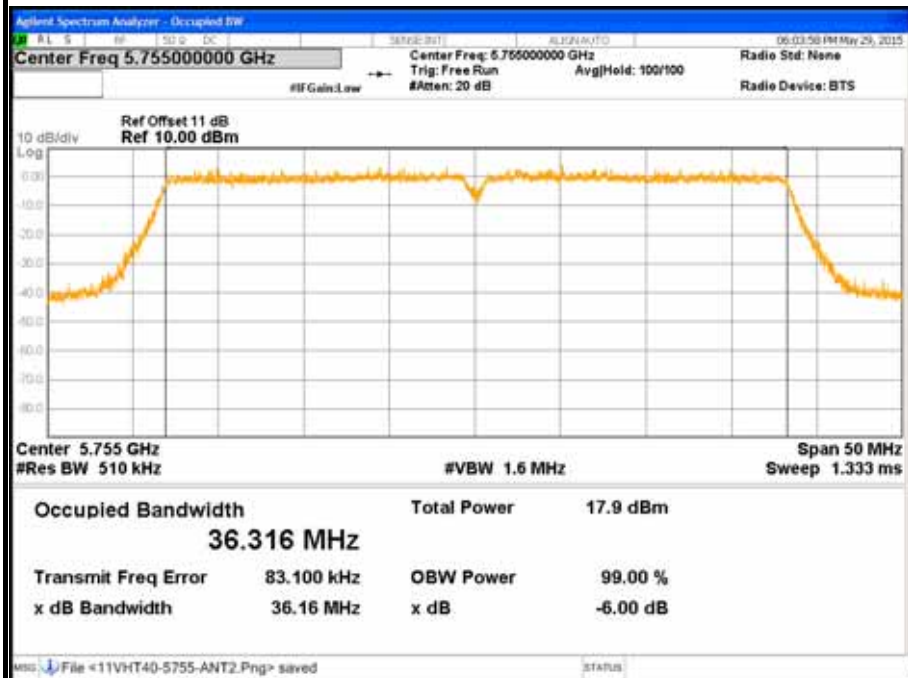


CH High (IEEE 802.11ac VHT40 Mode / Band 3 / Chain 1)

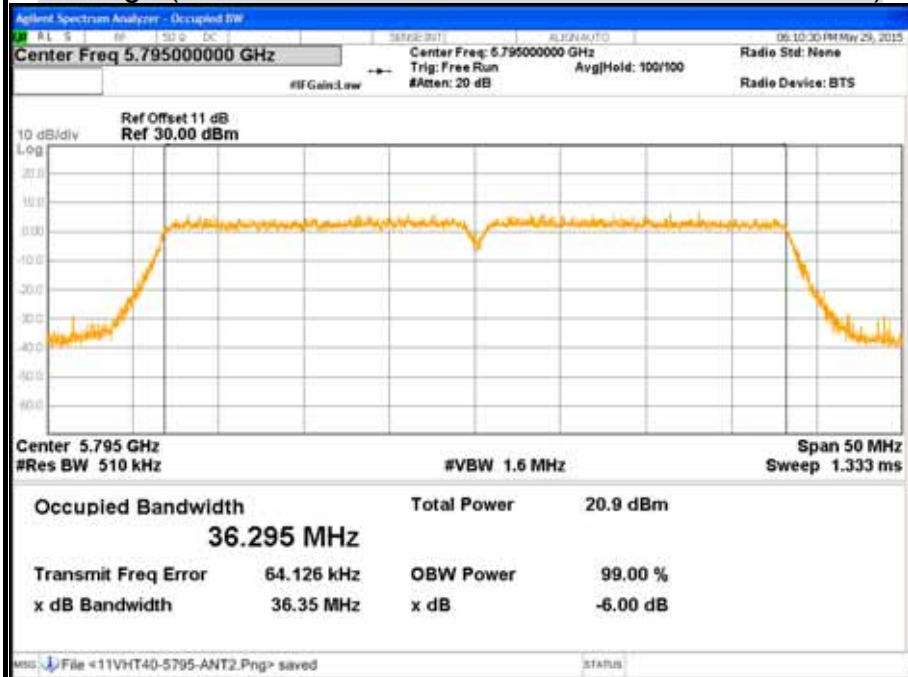




CH Low (IEEE 802.11ac VHT40 Mode / Band 3 / Chain 2)

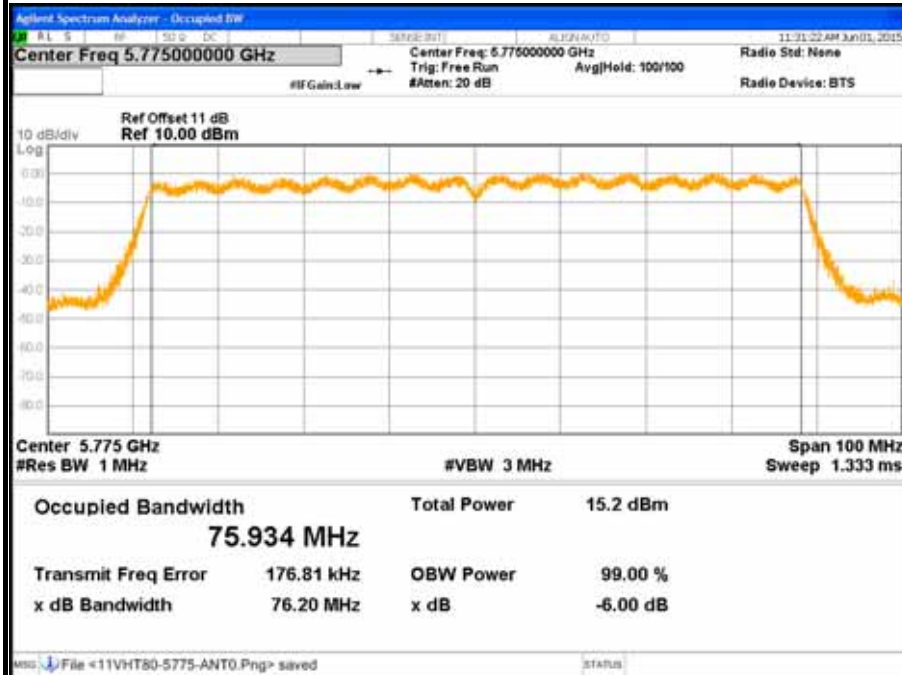


CH High (IEEE 802.11ac VHT40 Mode / Band 3 / Chain 2)

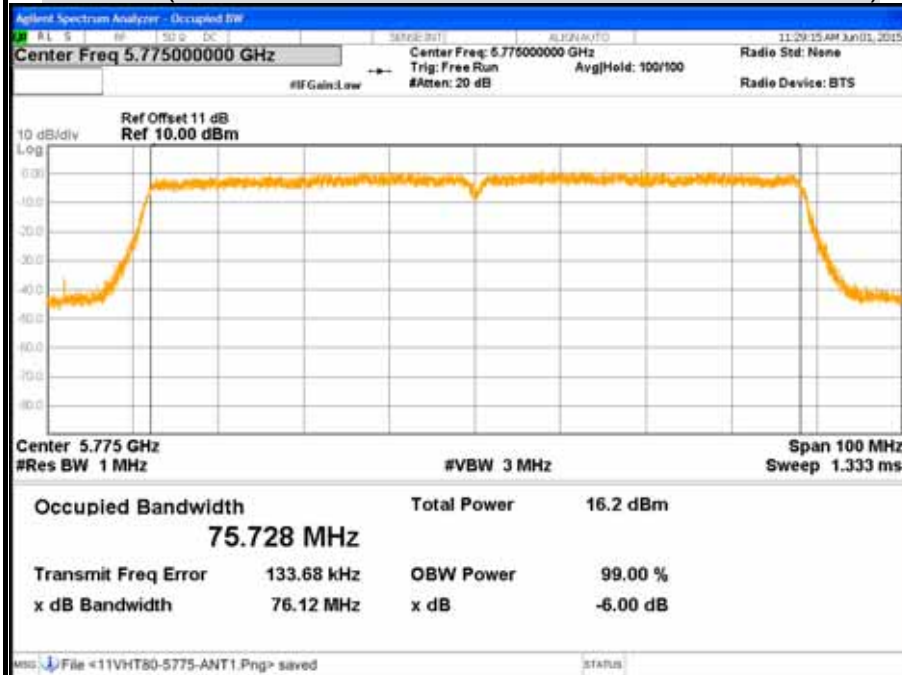


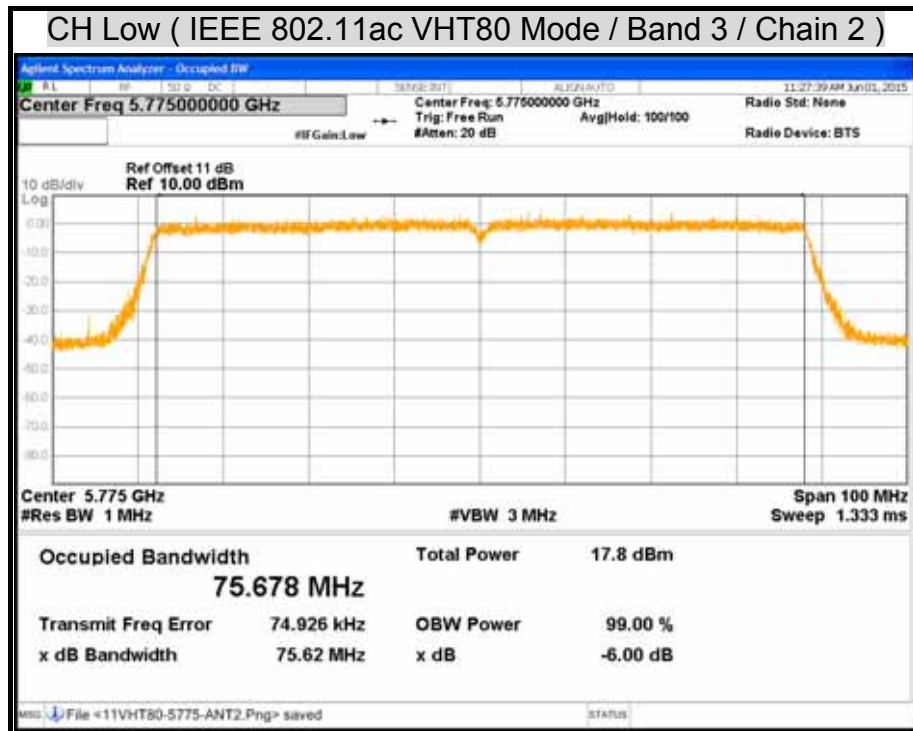


CH Low (IEEE 802.11ac VHT80 Mode / Band 3 / Chain 0)



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**

Channel	Channel Frequency (MHz)	Power		Power Limit		Pass / Fail
		Chain 0				
		(dBm)	(W)	(dBm)	(W)	
Low	5180	18.84	0.0766	30	1	PASS
Middle	5200	18.94	0.0783	30	1	PASS
High	5240	18.98	0.0791	30	1	PASS

Remark:

1. At final 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.

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

Channel	Channel Frequency (MHz)	Power (dBm)			Power Total		Power Limit		Pass / Fail
		Chain 0	Chain 1	Chain 2	(dBm)	(W)	(dBm)	(W)	
Low	5180	10.17	6.35	10.88	14.31	0.0270	30	1	PASS
Middle	5200	10.50	6.17	10.96	14.45	0.0279	30	1	PASS
High	5240	10.47	6.27	11.21	14.56	0.0286	30	1	PASS

Remark:

1. At final 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+ Chain 2.

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

Channel	Channel Frequency (MHz)	Power (dBm)			Power Total		Power Limit		Pass / Fail
		Chain 0	Chain 1	Chain 2	(dBm)	(W)	(dBm)	(W)	
Low	5190	13.56	11.16	13.22	17.54	0.0568	30	1	PASS
High	5230	15.26	13.46	15.04	19.43	0.0877	30	1	PASS

Remark:

1. At final 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+ Chain 2.

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

Channel	Channel Frequency (MHz)	Power (dBm)			Power Total		Power Limit		Pass / Fail
		Chain 0	Chain 1	Chain 2	(dBm)	(W)	(dBm)	(W)	
Low	5210	12.61	9.13	12.64	16.51	0.0448	30	1	PASS

Remark:

1. At final 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+ Chain 2.



IEEE 802.11a Mode / UNII Band 3

Channel	Channel Frequency (MHz)	Power		Power Limit		Pass / Fail
		Chain 0				
		(dBm)	(W)	(dBm)	(W)	
Low	5745	11.78	0.0151	30	1	PASS
Middle	5785	20.04	0.1009	30	1	PASS
High	5825	15.84	0.0384	30	1	PASS

Remark:

1. At final 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.

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

Channel	Channel Frequency (MHz)	Power (dBm)			Power Total		Power Limit		Pass / Fail
		Chain 0	Chain 1	Chain 2	(dBm)	(W)	(dBm)	(W)	
Low	5745	11.67	10.33	11.49	15.97	0.0395	30	1	PASS
Middle	5785	16.59	16.53	16.82	21.42	0.1387	30	1	PASS
High	5825	15.92	15.37	15.61	20.41	0.1099	30	1	PASS

Remark:

1. At final 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+ Chain 2.

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

Channel	Channel Frequency (MHz)	Power (dBm)			Power Total		Power Limit		Pass / Fail
		Chain 0	Chain 1	Chain 2	(dBm)	(W)	(dBm)	(W)	
Low	5755	11.67	10.62	12.01	16.24	0.0421	30	1	PASS
High	5795	14.87	14.26	14.54	19.34	0.0859	30	1	PASS

Remark:

1. At final 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+ Chain 2.

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

Channel	Channel Frequency (MHz)	Power (dBm)			Power Total		Power Limit		Pass / Fail
		Chain 0	Chain 1	Chain 2	(dBm)	(W)	(dBm)	(W)	
Low	5775	11.64	10.14	11.72	16.00	0.0398	30	1	PASS

Remark:

1. At final 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+ Chain 2.



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**

U-NII	Channel	Channel Frequency (MHz)	PPSD (dBm)	Minimum Limit (dBm/MHz)	Pass / Fail
			Chain 0		
Band 1	Low	5180	7.987	17.00	PASS
	Middle	5200	7.954	17.00	PASS
	High	5240	7.969	17.00	PASS

Remark:

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

IEEE 802.11ac VHT20 Mode (Three TX)

U-NII	Channel	Channel Frequency (MHz)	PPSD (dBm)			PSD Total (dBm)	Minimum Limit (dBm)	Pass / Fail
			Chain 0	Chain 1	Chain 2			
Band 1	Low	5180	-0.587	-4.622	-0.397	3.29	12.75	PASS
	Middle	5200	-0.554	-4.561	-0.343	3.33	12.75	PASS
	High	5240	-0.690	-4.554	-0.086	3.39	12.75	PASS

Remark:

1. At final test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. The maximum antenna gain is 10.25dBi which is more than 6dBi, the limit should be 12.75dBm.
4. Total power spectral density = Chain 0 + Chain 1+ Chain 2.

IEEE 802.11ac VHT40 Mode (Three TX)

U-NII	Channel	Channel Frequency (MHz)	PPSD (dBm)			PSD Total (dBm)	Minimum Limit (dBm)	Pass / Fail
			Chain 0	Chain 1	Chain 2			
Band 1	Low	5190	0.173	-2.872	0.292	4.19	12.75	PASS
	High	5230	1.332	-0.397	1.222	5.56	12.75	PASS

Remark:

1. At final test to get the worst-case emission at 13.5Mbps.
2. The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. The maximum antenna gain is 10.25dBi which is more than 6dBi, the limit should be 12.75dBm.
4. Total power spectral density = Chain 0 + Chain 1+ Chain 2.



IEEE 802.11ac VHT80 Mode (Three TX)

U-NII	Channel	Channel Frequency (MHz)	PPSD (dBm)			PSD Total (dBm)	Minimum Limit (dBm)	Pass / Fail
			Chain 0	Chain 1	Chain 2			
Band 1	Low	5210	-4.990	-8.099	-4.761	-0.94	12.75	PASS

Remark:

1. At final 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 10.25dBi which is more than 6dBi, the limit should be 12.75dBm.
4. Total power spectral density = Chain 0 + Chain 1+ Chain 2.

IEEE 802.11a Mode

U-NII	Channel	Channel Frequency (MHz)	PPSD (dBm)	Minimum Limit (dBm/500kHz)	Pass / Fail
			Chain 0		
Band 3	Low	5745	-2.071	30.00	PASS
	Middle	5785	6.245	30.00	PASS
	High	5825	2.268	30.00	PASS

Remark:

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

IEEE 802.11ac VHT20 Mode (Three TX)

U-NII	Channel	Channel Frequency (MHz)	PPSD (dBm)			PSD Total (dBm)	Minimum Limit (dBm/500kHz)	Pass / Fail
			Chain 0	Chain 1	Chain 2			
Band 3	Low	5745	-2.444	-4.357	-3.020	1.57	25.75	PASS
	Middle	5785	3.130	2.604	2.661	7.58	25.75	PASS
	High	5825	2.264	1.963	1.912	6.82	25.75	PASS

Remark:

1. At final test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. The maximum antenna gain is 10.25dBi which is more than 6dBi, the limit should be 25.75dBm.
4. Total power spectral density = Chain 0 + Chain 1+ Chain 2.

**IEEE 802.11ac VHT40 Mode (Three TX)**

U-NII	Channel	Channel Frequency (MHz)	PPSD (dBm)			PSD Total (dBm)	Minimum Limit (dBm/500kHz)	Pass / Fail
			Chain 0	Chain 1	Chain 2			
Band 3	Low	5755	-4.955	-6.558	-5.433	-0.83	25.75	PASS
	High	5795	-1.534	-2.179	-2.032	2.87	25.75	PASS

Remark:

1. At final test to get the worst-case emission at 13.5Mbps.
2. The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. The maximum antenna gain is 10.25dBi which is more than 6dBi, the limit should be 25.75dBm.
4. Total power spectral density = Chain 0 + Chain 1+ Chain 2.

IEEE 802.11ac VHT80 Mode (Three TX)

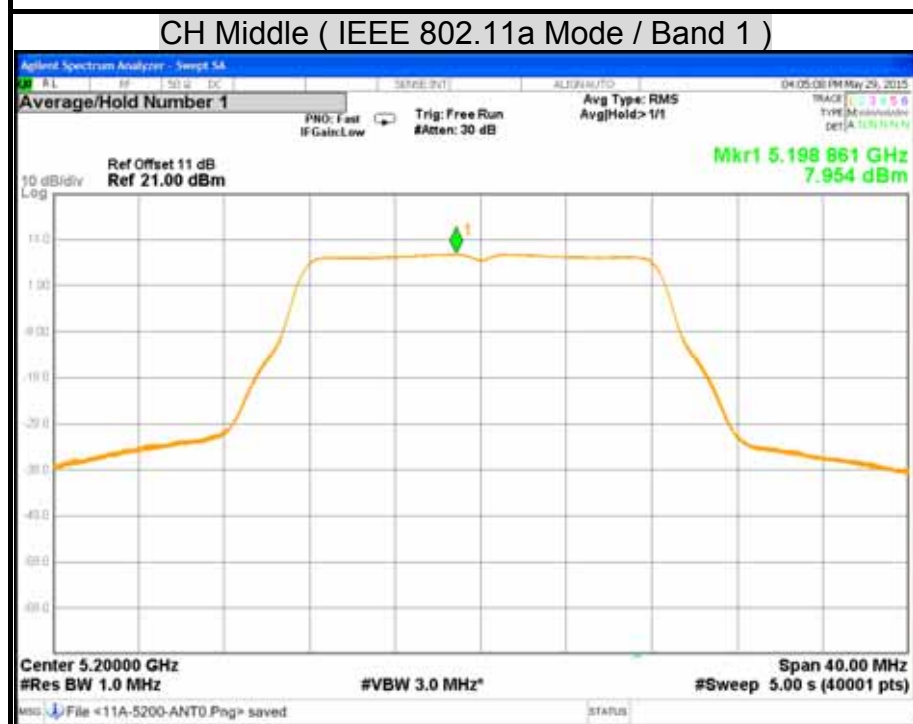
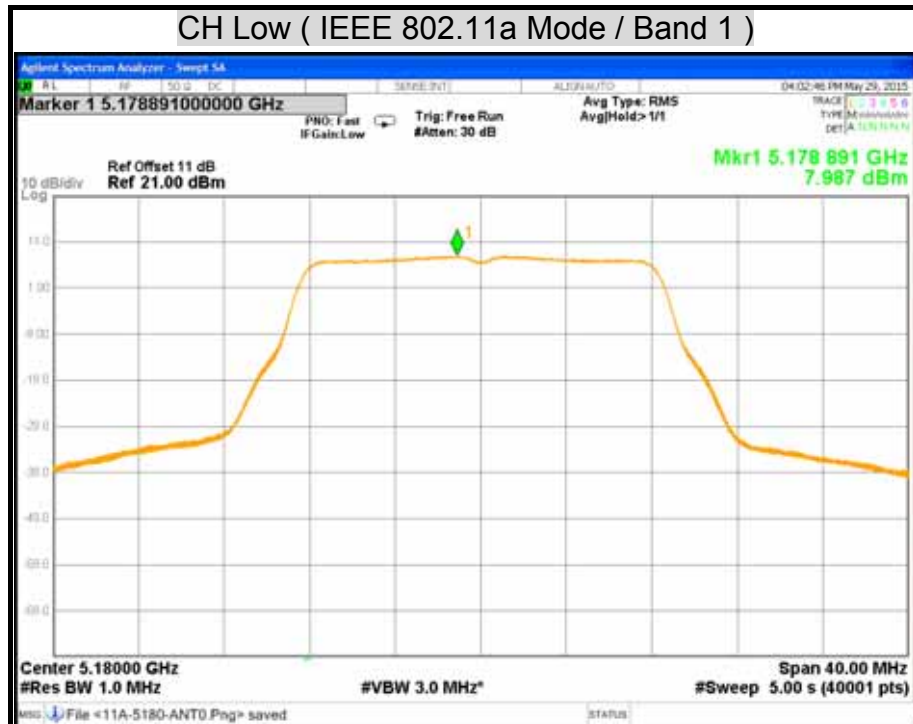
U-NII	Channel	Channel Frequency (MHz)	PPSD (dBm)			PSD Total (dBm)	Minimum Limit (dBm/500kHz)	Pass / Fail
			Chain 0	Chain 1	Chain 2			
Band 3	High	5775	-8.110	-9.855	-8.501	-3.99	25.75	PASS

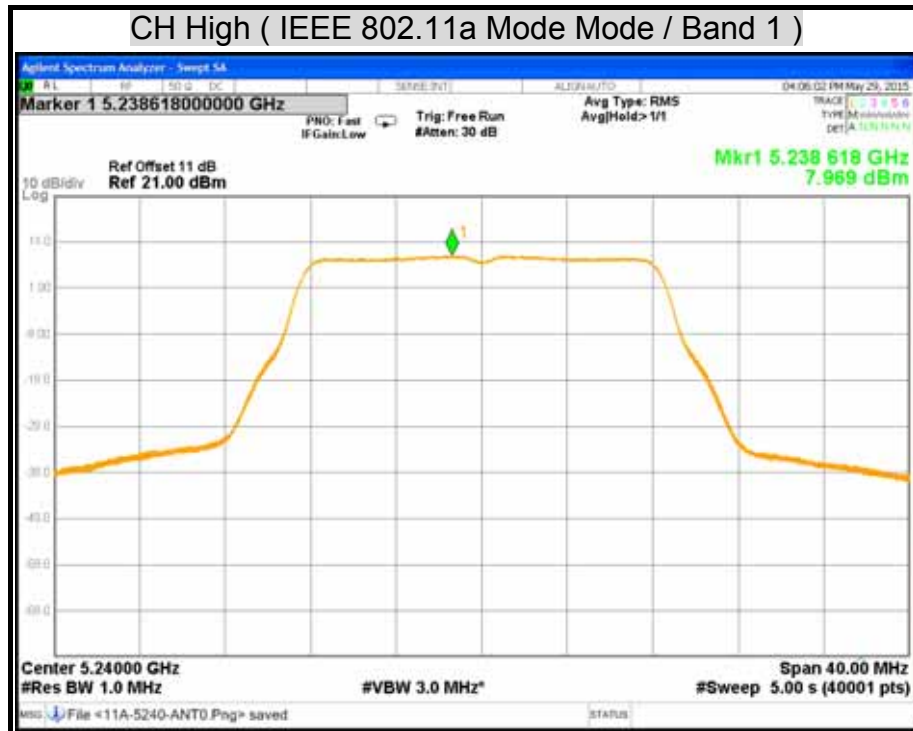
Remark:

1. At final 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 10.25dBi which is more than 6dBi, the limit should be 25.75dBm.
4. Total power spectral density = Chain 0 + Chain 1+ Chain 2.



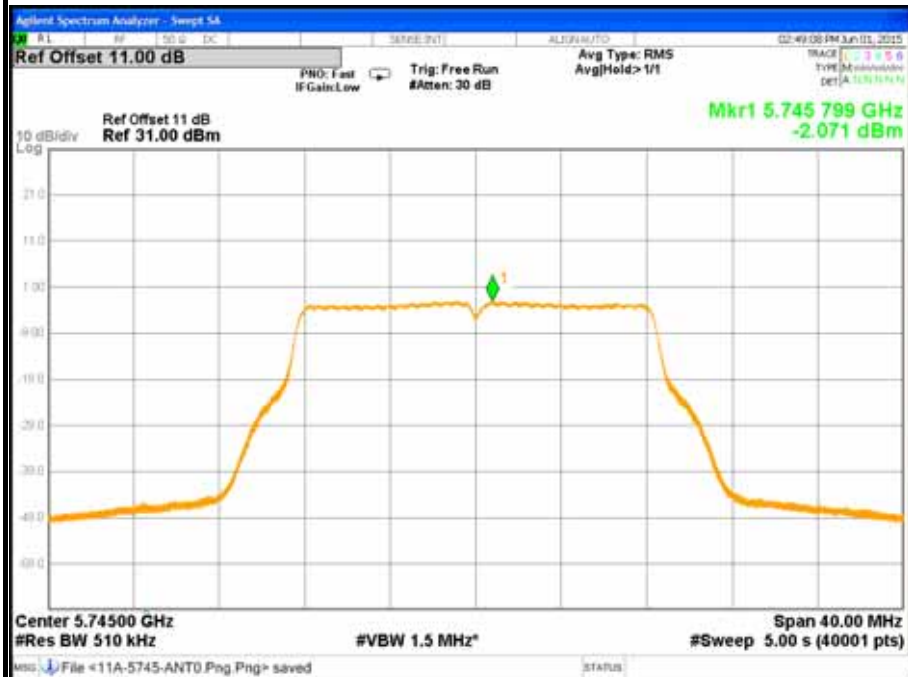
POWER SPECTRAL DENSITY





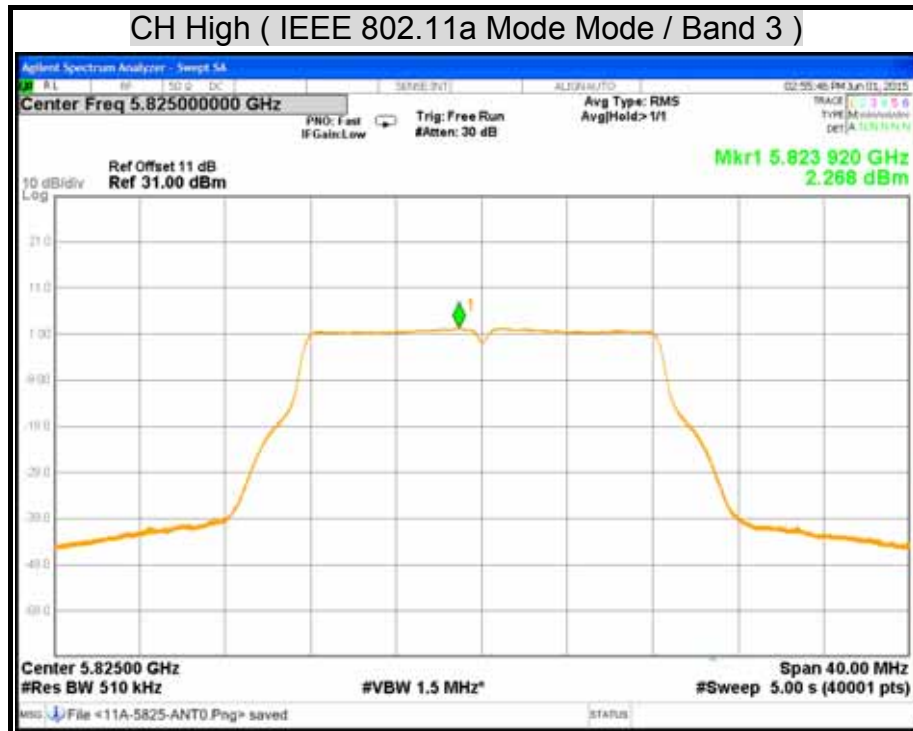


CH Low (IEEE 802.11a Mode / Band 3)



CH Middle (IEEE 802.11a Mode / Band 3)







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



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





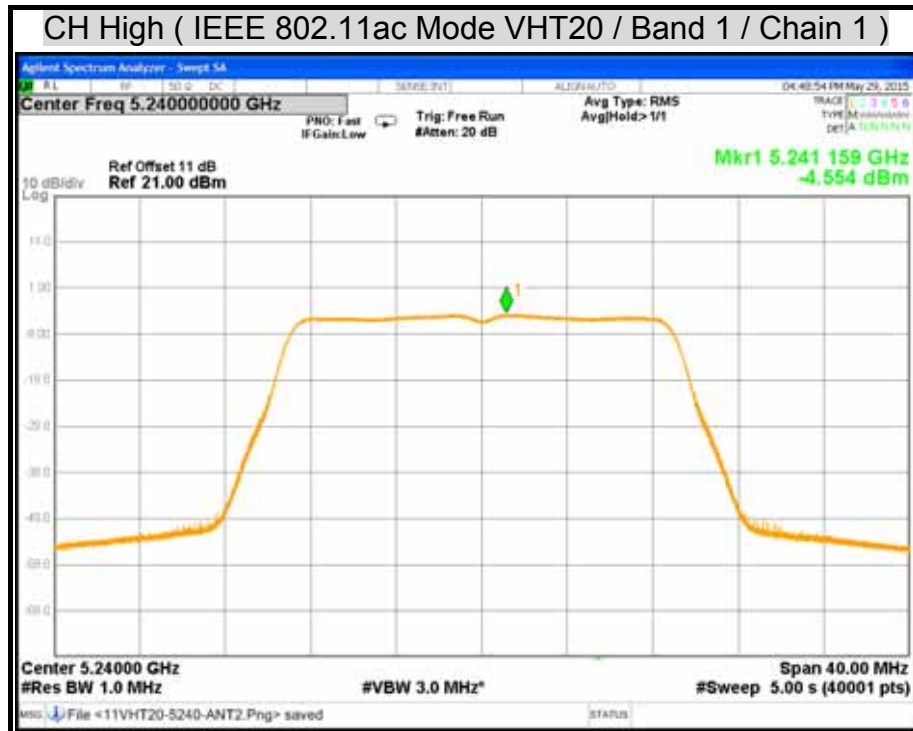


CH Low (IEEE 802.11ac Mode VHT20 / Band 1 / Chain 1)



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





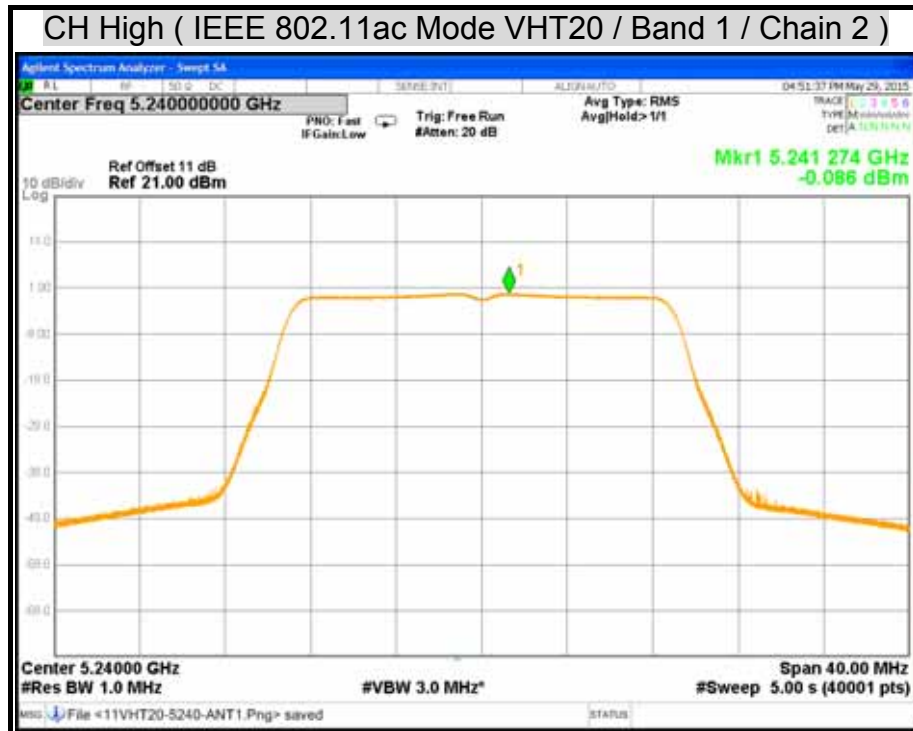


CH Low (IEEE 802.11ac Mode VHT20 / Band 1 / Chain 2)



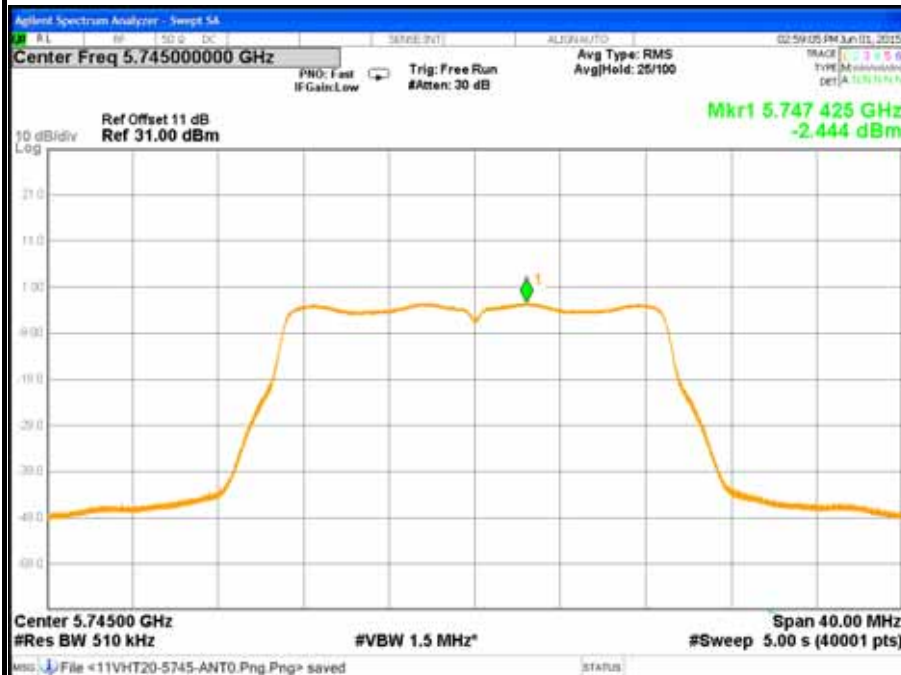
CH Middle (IEEE 802.11ac Mode VHT20 / Band 1 / Chain 2)





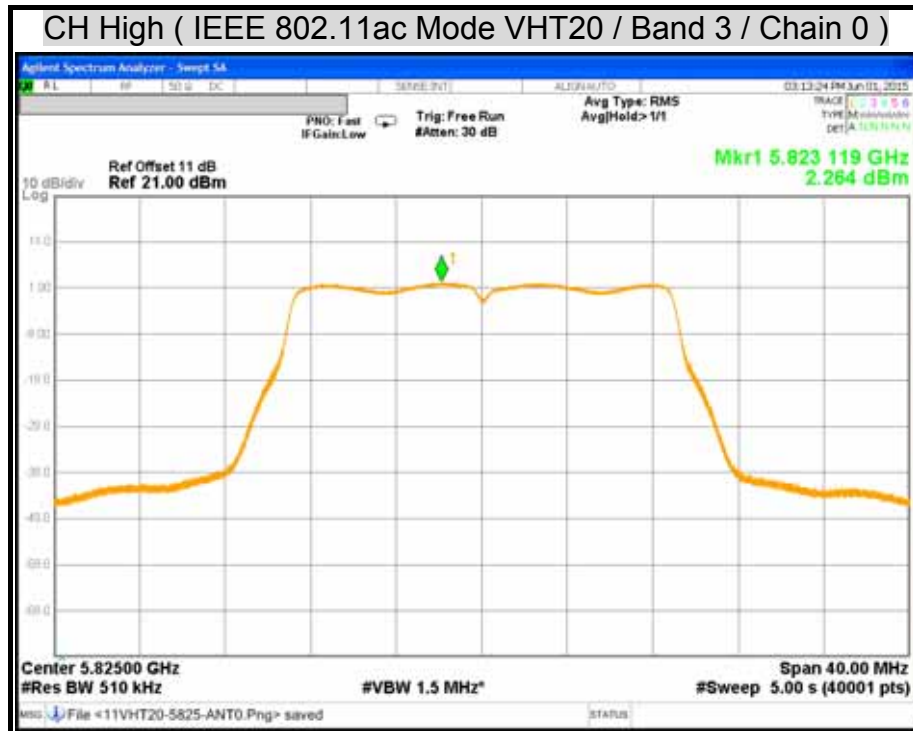


CH Low (IEEE 802.11ac Mode VHT20 / Band 3 / Chain 0)



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





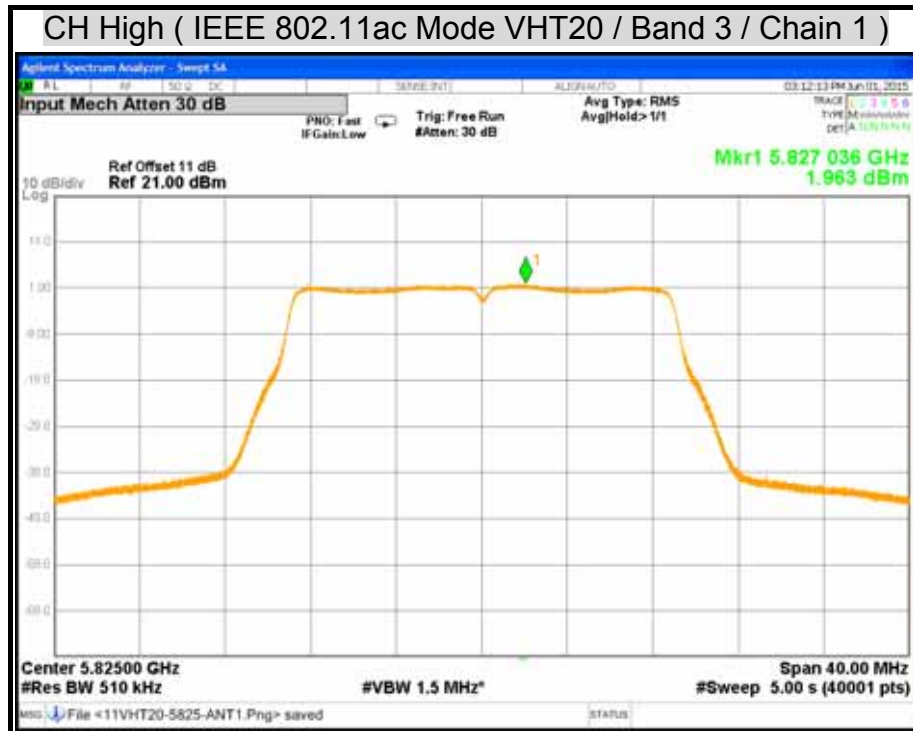


CH Low (IEEE 802.11ac Mode VHT20 / Band 3 / Chain 1)



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



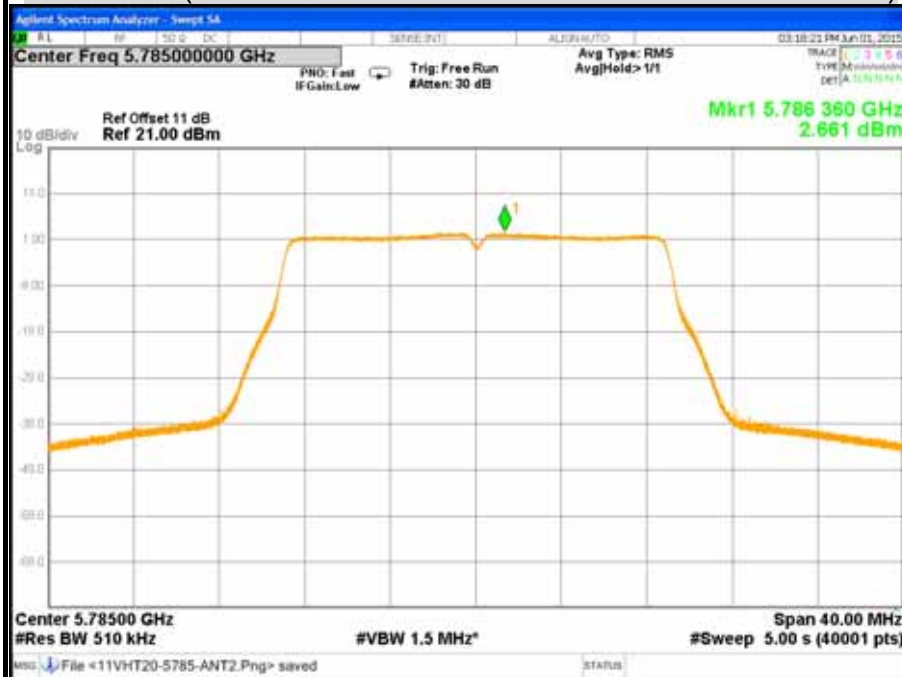


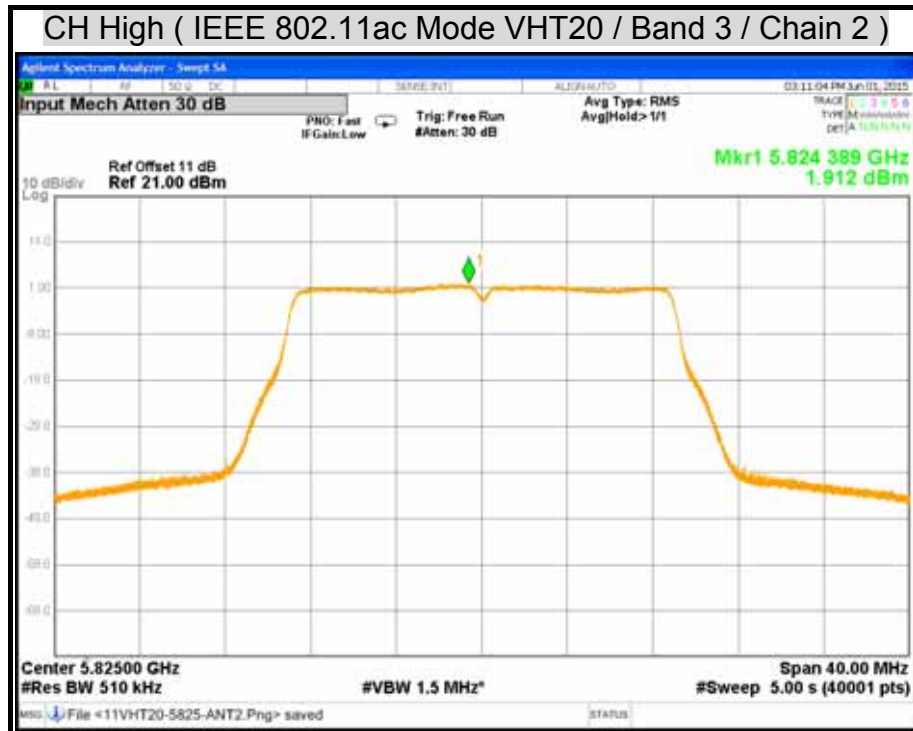


CH Low (IEEE 802.11ac Mode VHT20 / Band 3 / Chain 2)



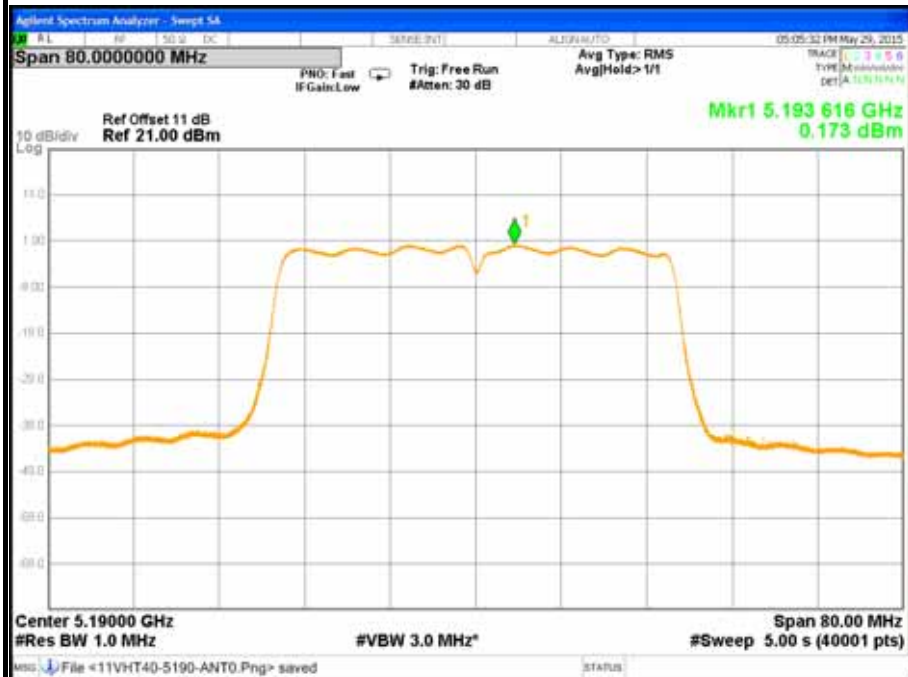
CH Middle (IEEE 802.11ac Mode VHT20 / Band 3 / Chain 2)



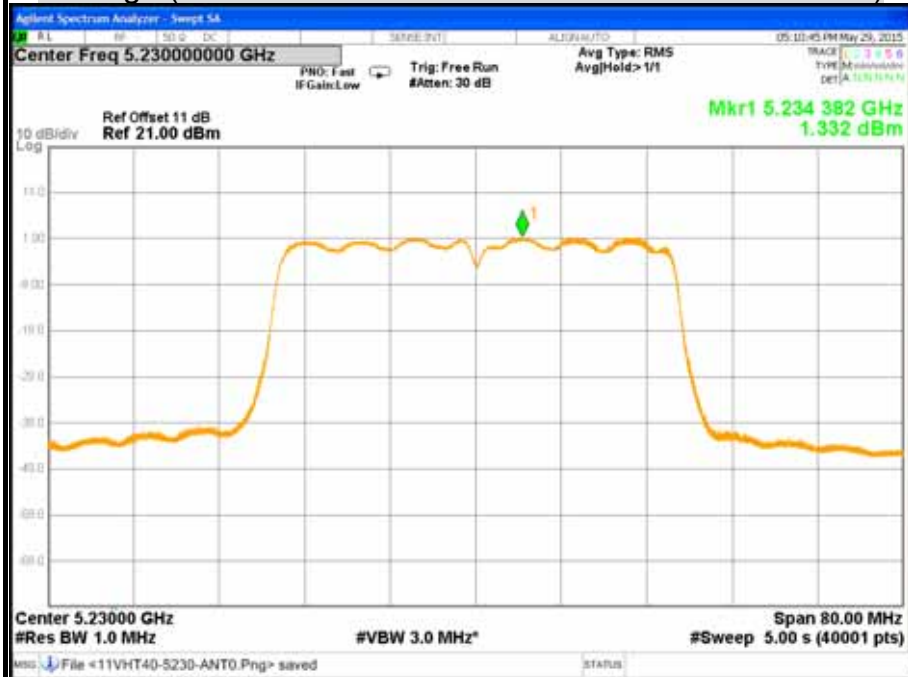




CH Low (IEEE 802.11ac Mode VHT40 / Band 1 / Chain 0)



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 1 / Chain 2)



CH High (IEEE 802.11ac Mode VHT40 / Band 1 / Chain 2)





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 VHT40 / Band 3 / Chain 2)



CH High (IEEE 802.11ac Mode VHT40 / Band 3 / Chain 2)



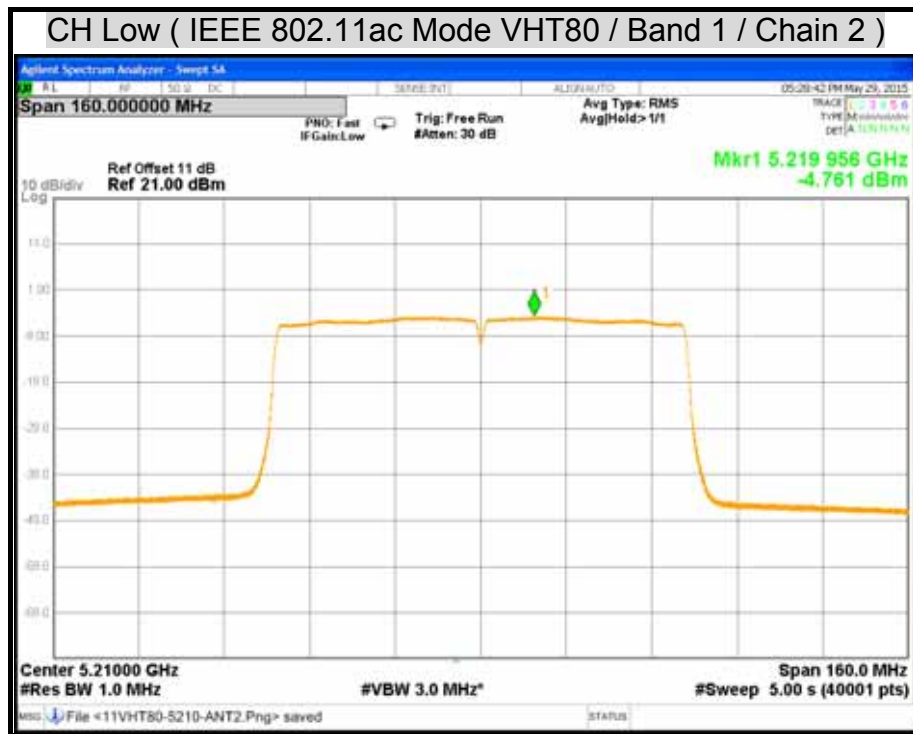


CH Low (IEEE 802.11ac Mode VHT80 / Band 1 / Chain 0)



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





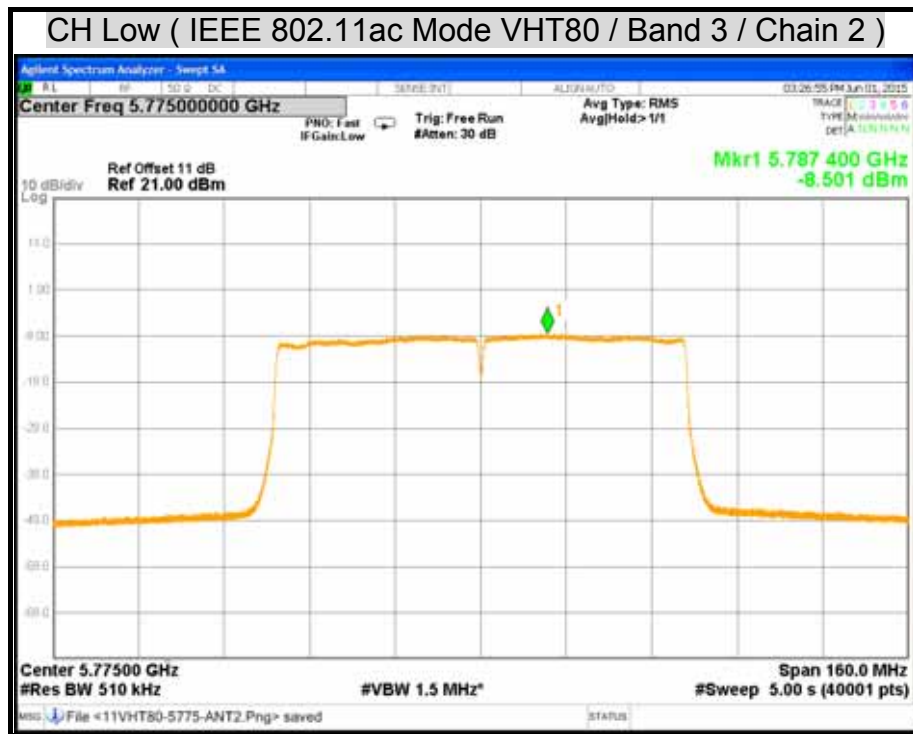


CH Low (IEEE 802.11ac Mode VHT80 / Band 3 / Chain 0)



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_C

Name of Equipment	Manufacture	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360132	06/10/2015
EMI Test Receiver	ROHDE & SCHWARZ	ESCI	101387	10/05/2015
Bi-log Antenna	TESEQ	CBL 6112D	35404	02/24/2016
Double-Ridged Waveguide Horn	ETS-LINDGREN	3117	00078732	07/23/2015
Horn Antenna	COM-POWER	AH-840	03077	12/17/2015
Pre-Amplifier	EMCI	EMC001625	980243	04/12/2016
Pre-Amplifier	COM-POWER	PAM-118A	551043	04/12/2016
Notch Filters Band Reject	Micro-Tronics	BRM50702-01	009	N.C.R
LOOP Antenna	EMCO	6502	8905-2356	09/23/2015

Remark: 1. Each piece of equipment is scheduled for calibration once a year.

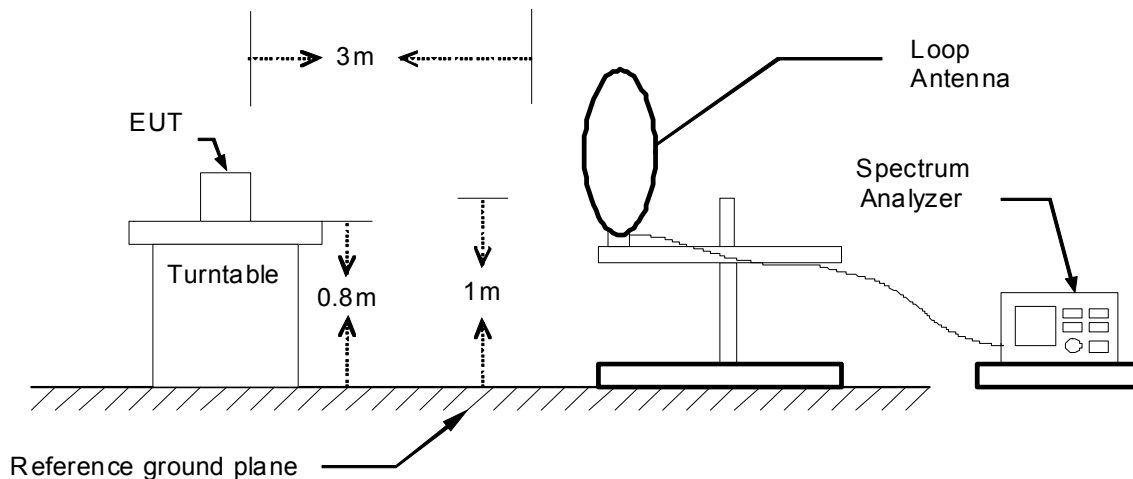
2. N.C.R = No Calibration Request.



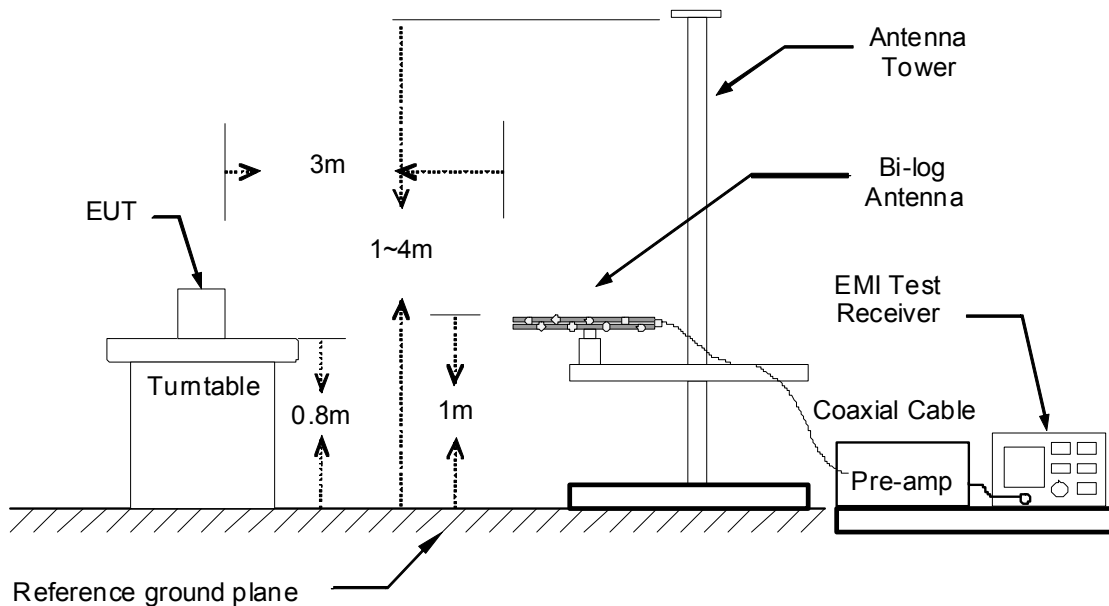
TEST SETUP

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

9kHz ~ 30MHz

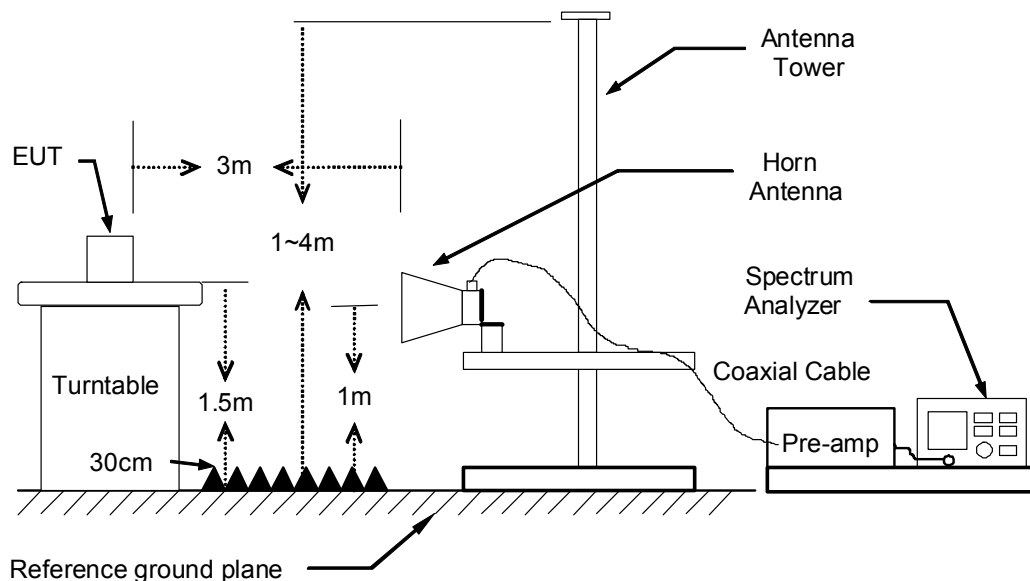


30MHz ~ 1GHz





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.

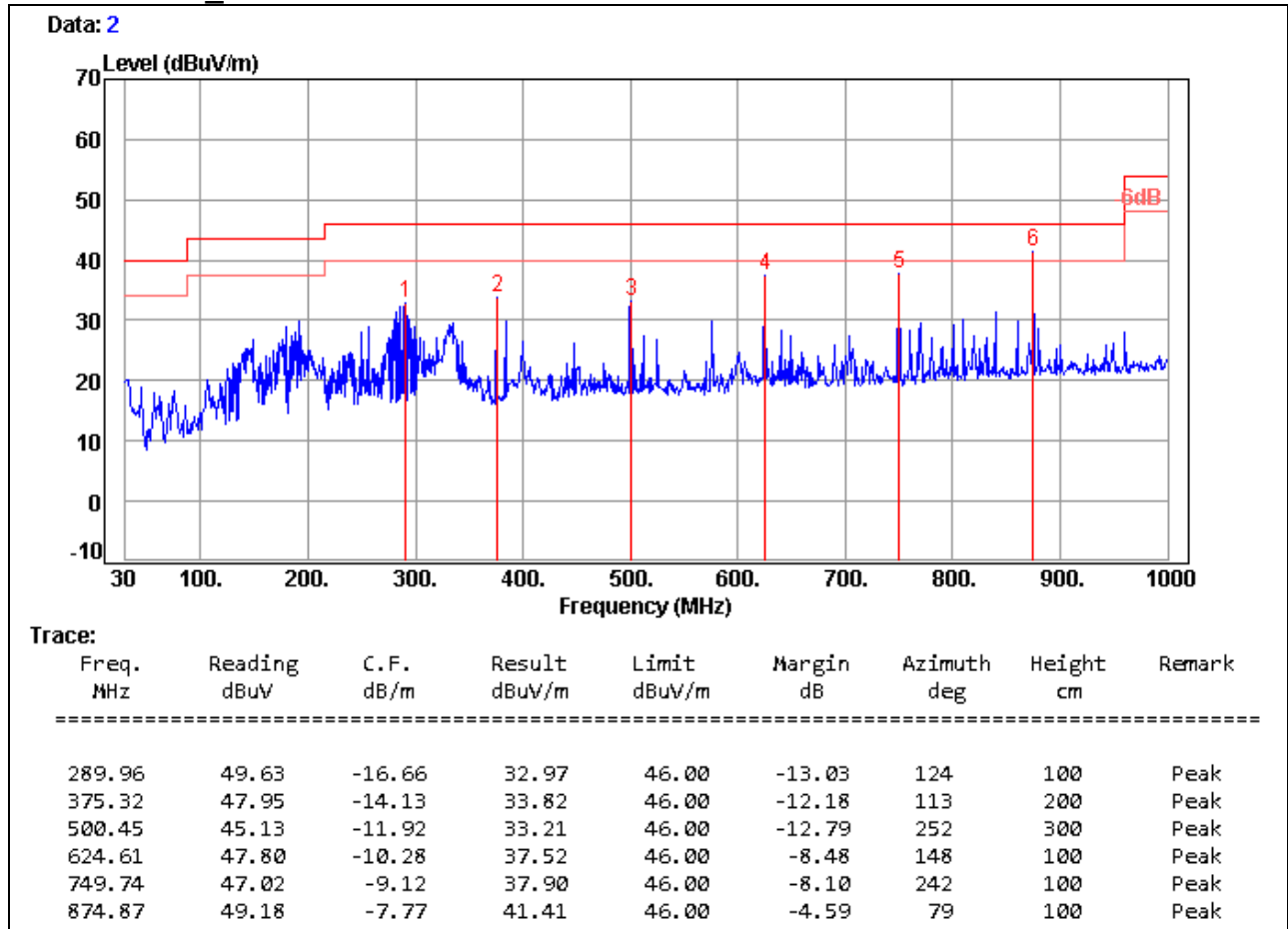
**TEST RESULTS****Below 1 GHz (9kHz ~ 30MHz)**

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

Below 1 GHz (30MHz ~ 1GHz)

Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Jey Li
Test Model	BiPAC 8920AX	Test Date	2015/05/13
Test Mode	Normal Operating	Temp. & Humidity	25°C, 50%

966 Chamber_C at 3Meter / Horizontal

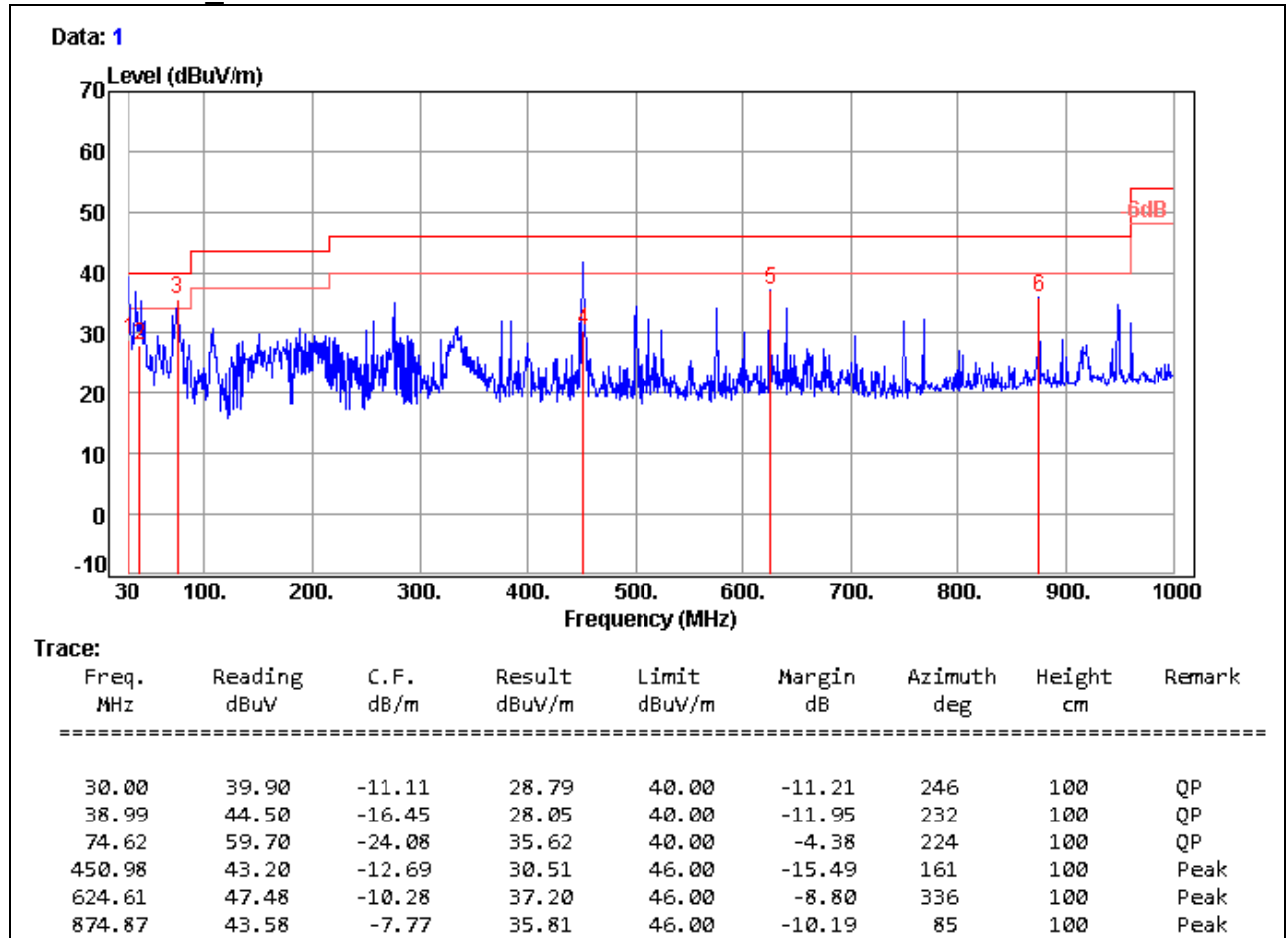
**Remark:**

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	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Jey Li
Test Model	BiPAC 8920AX	Test Date	2015/05/13
Test Mode	Normal Operating	Temp. & Humidity	25°C, 50%

966 Chamber_C at 3Meter / Vertical

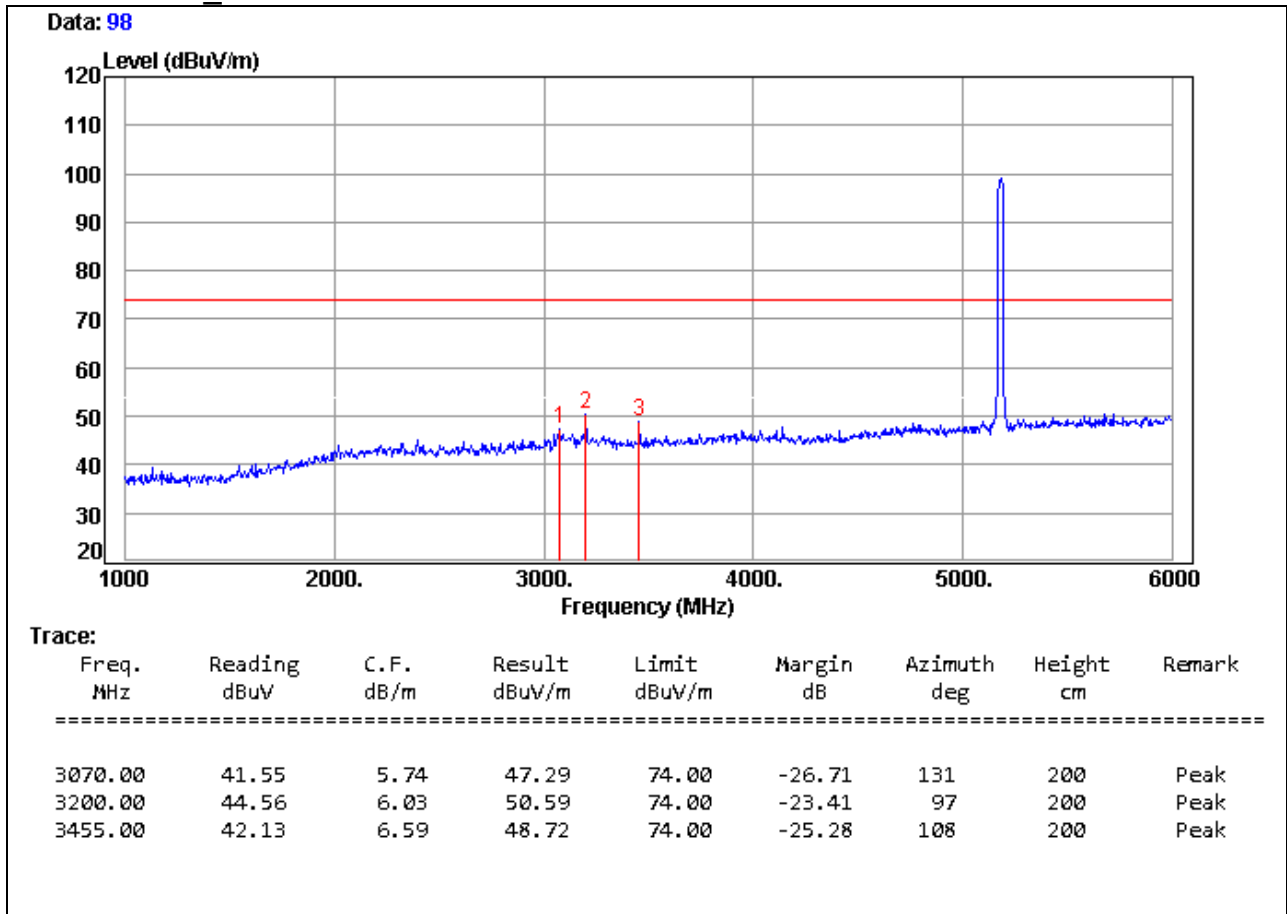


Remark:

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**

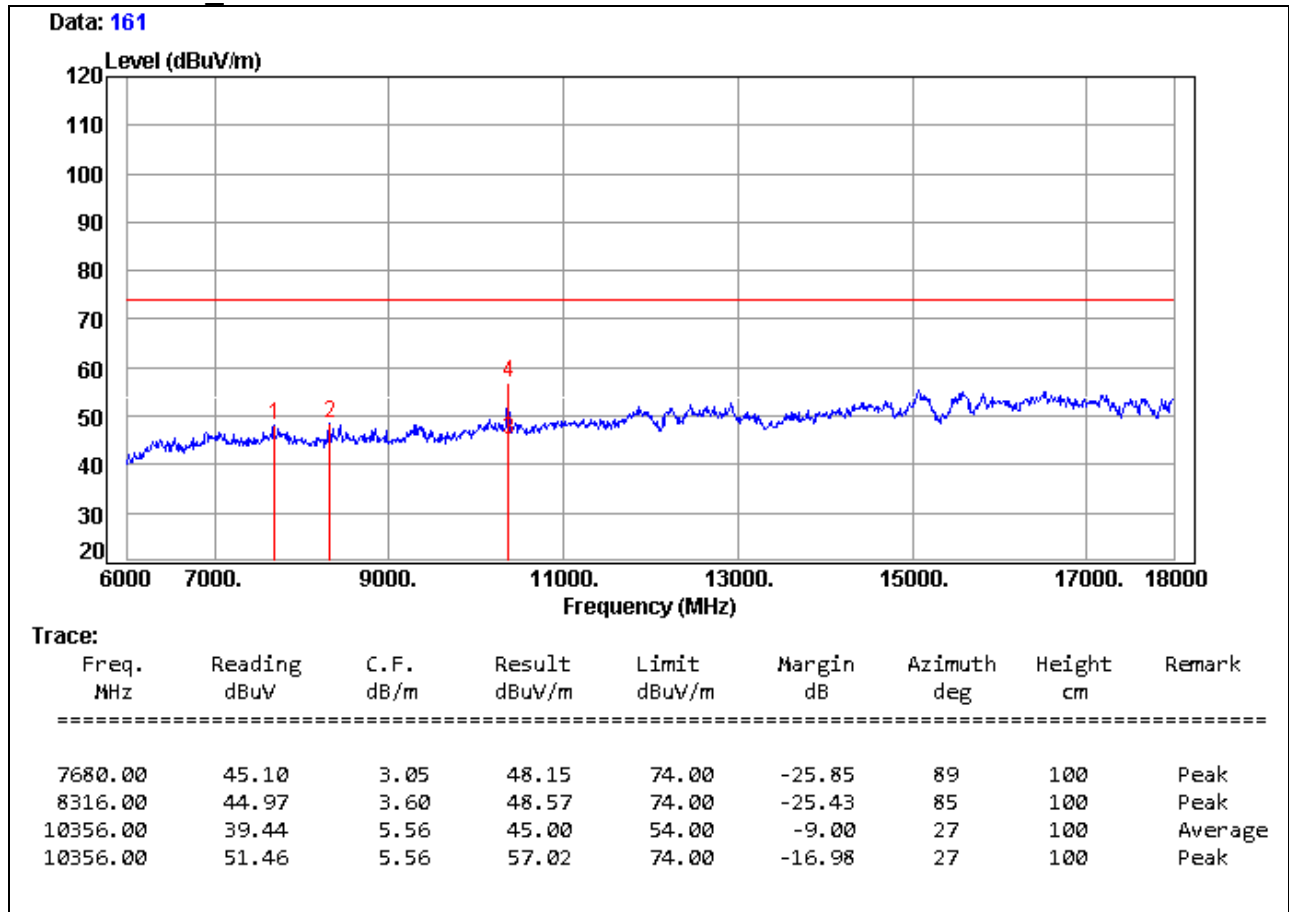
Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/19
Test Mode	UNII Band 1/ IEEE 802.11a TX / CH Low	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Horizontal**Remark:**

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 1/ IEEE 802.11a TX / CH Low	Temp. & Humidity	25°C, 53%

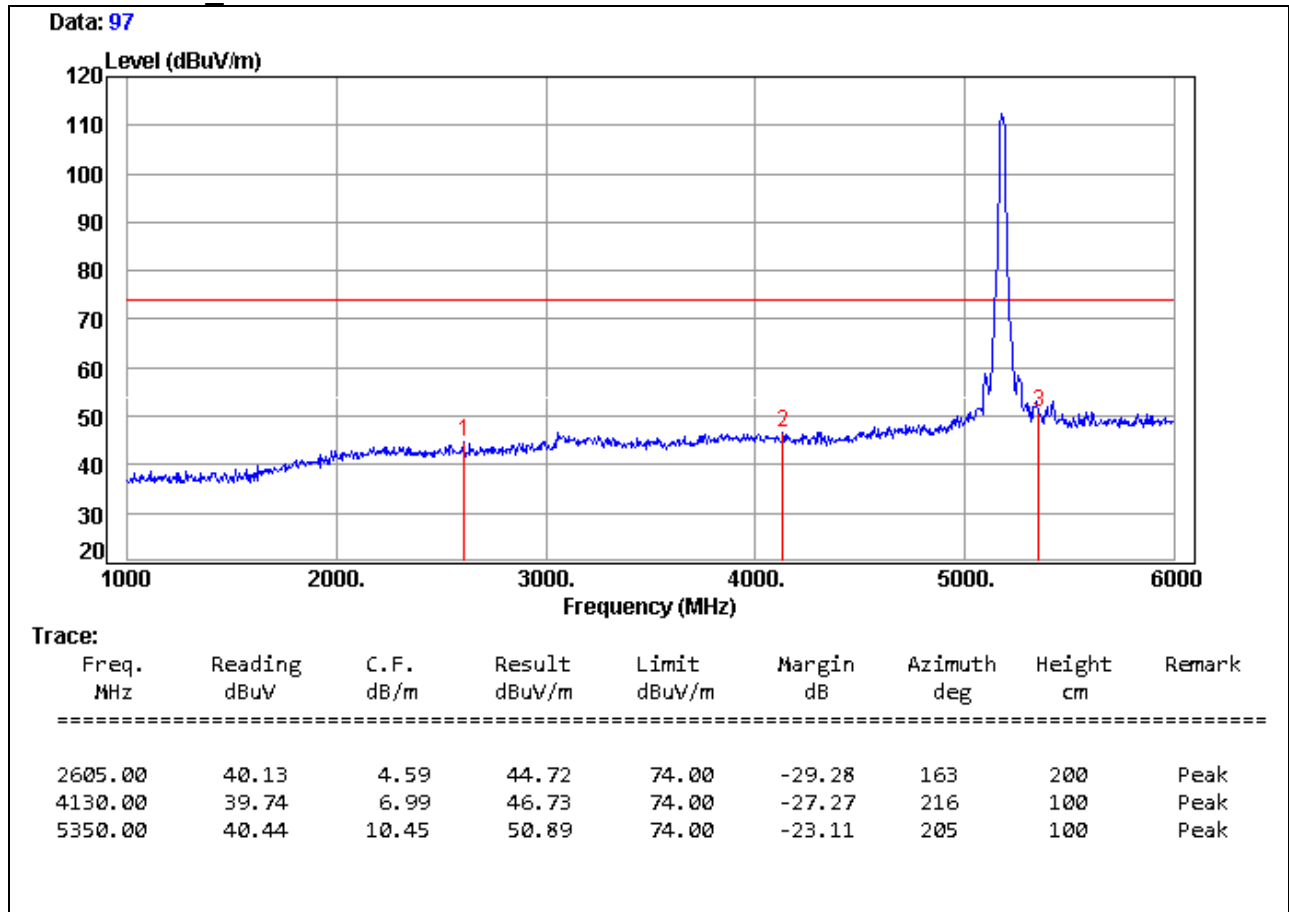
966 Chamber_C at 3Meter / Horizontal**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/19
Test Mode	UNII Band 1/ IEEE 802.11a TX / CH Low	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical

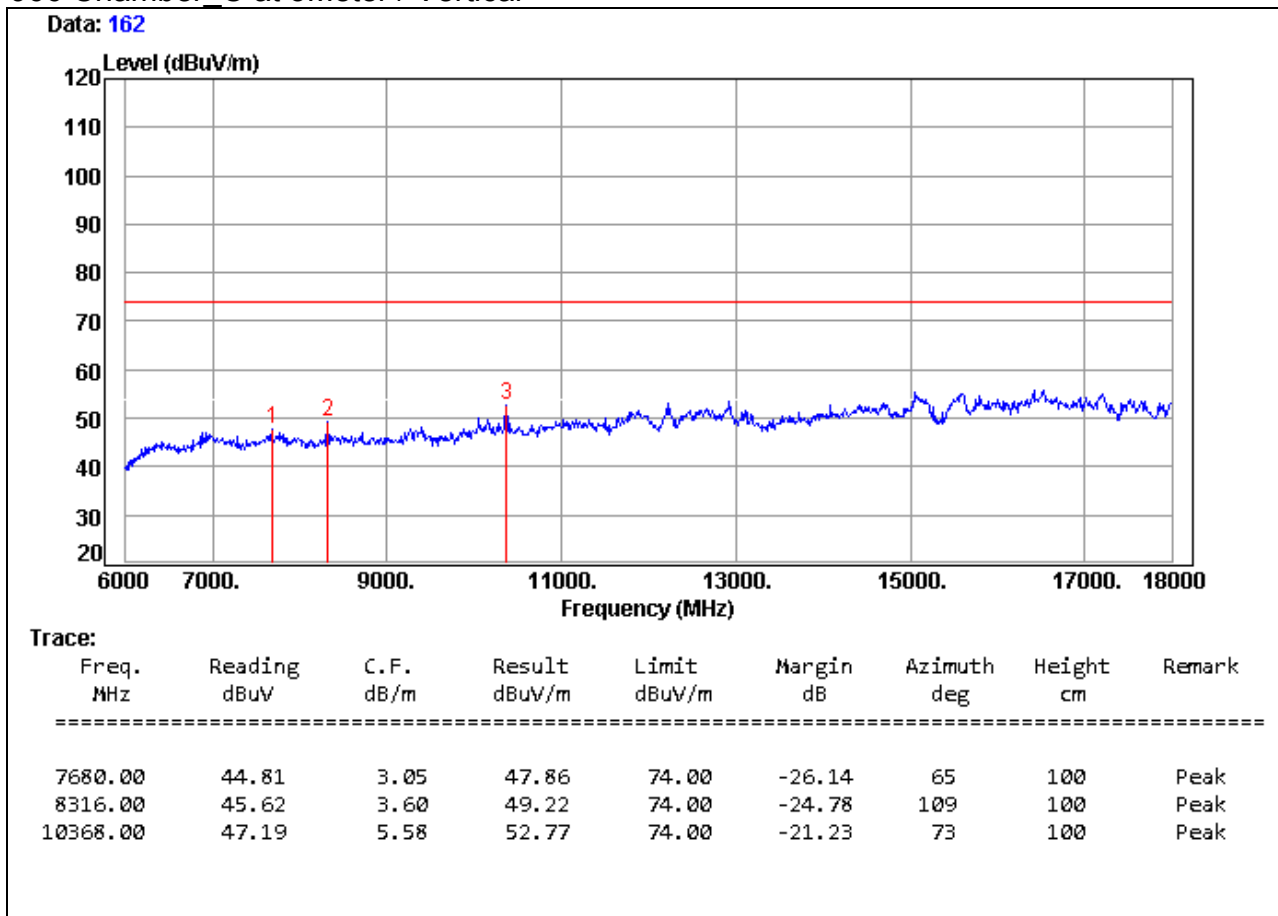
**Remark:**

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 1/ IEEE 802.11a TX / CH Low	Temp. & Humidity	25°C, 53%

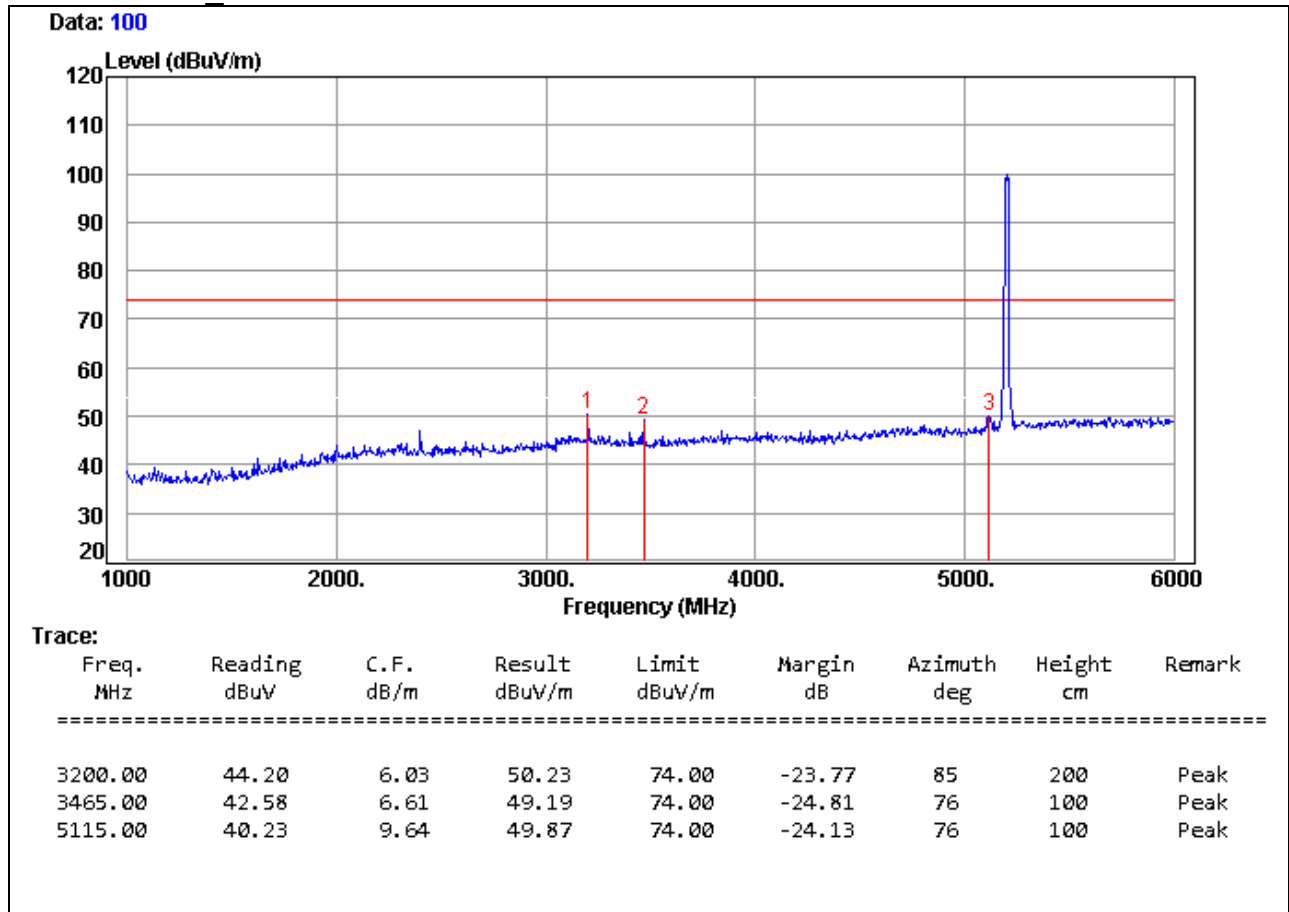
966 Chamber_C at 3Meter / Vertical

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/19
Test Mode	UNII Band 1/ IEEE 802.11a TX / CH Middle	Temp. & Humidity	25°C, 53%

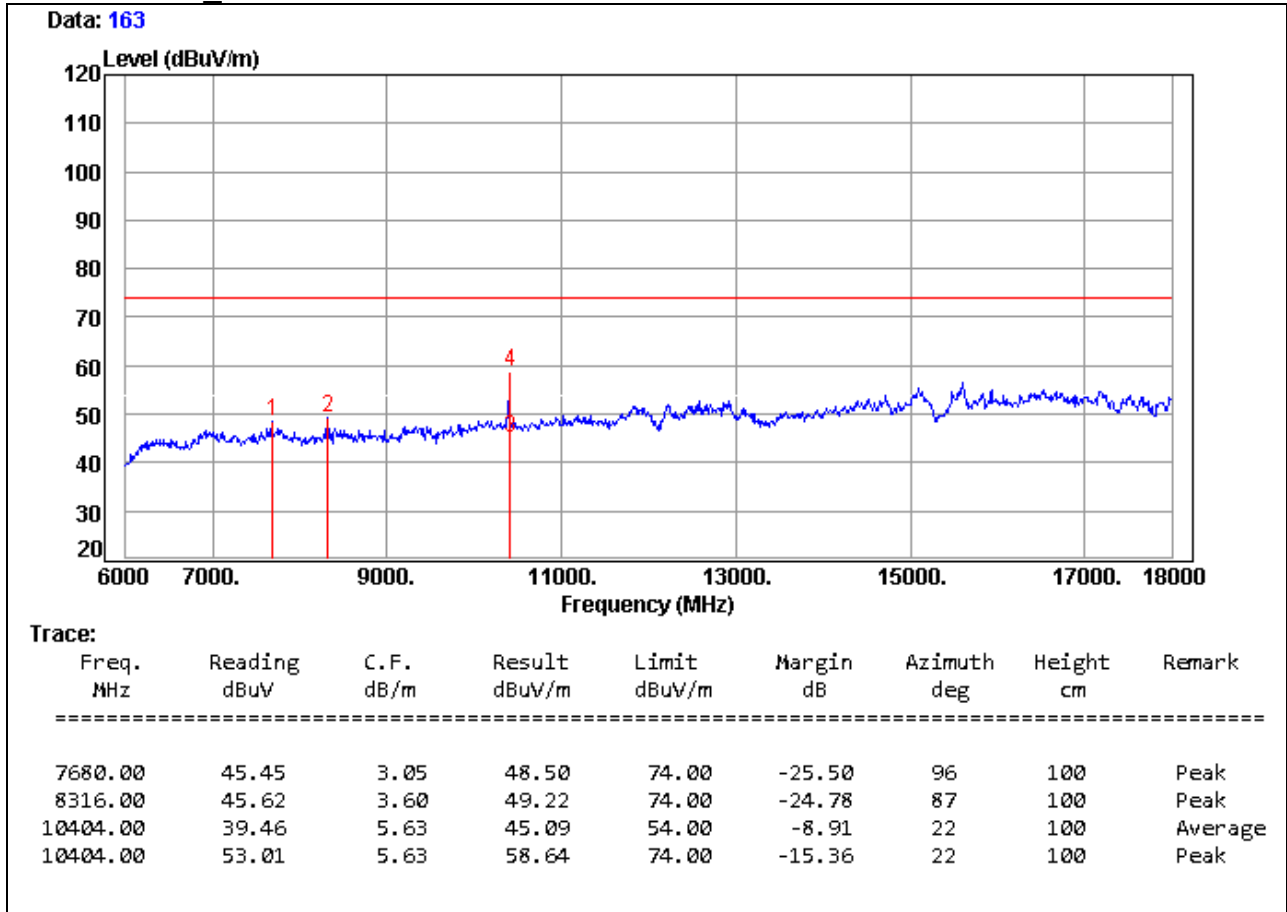
966 Chamber_C at 3Meter / Horizontal**Remark:**

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 1/ IEEE 802.11a TX / CH Middle	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Horizontal

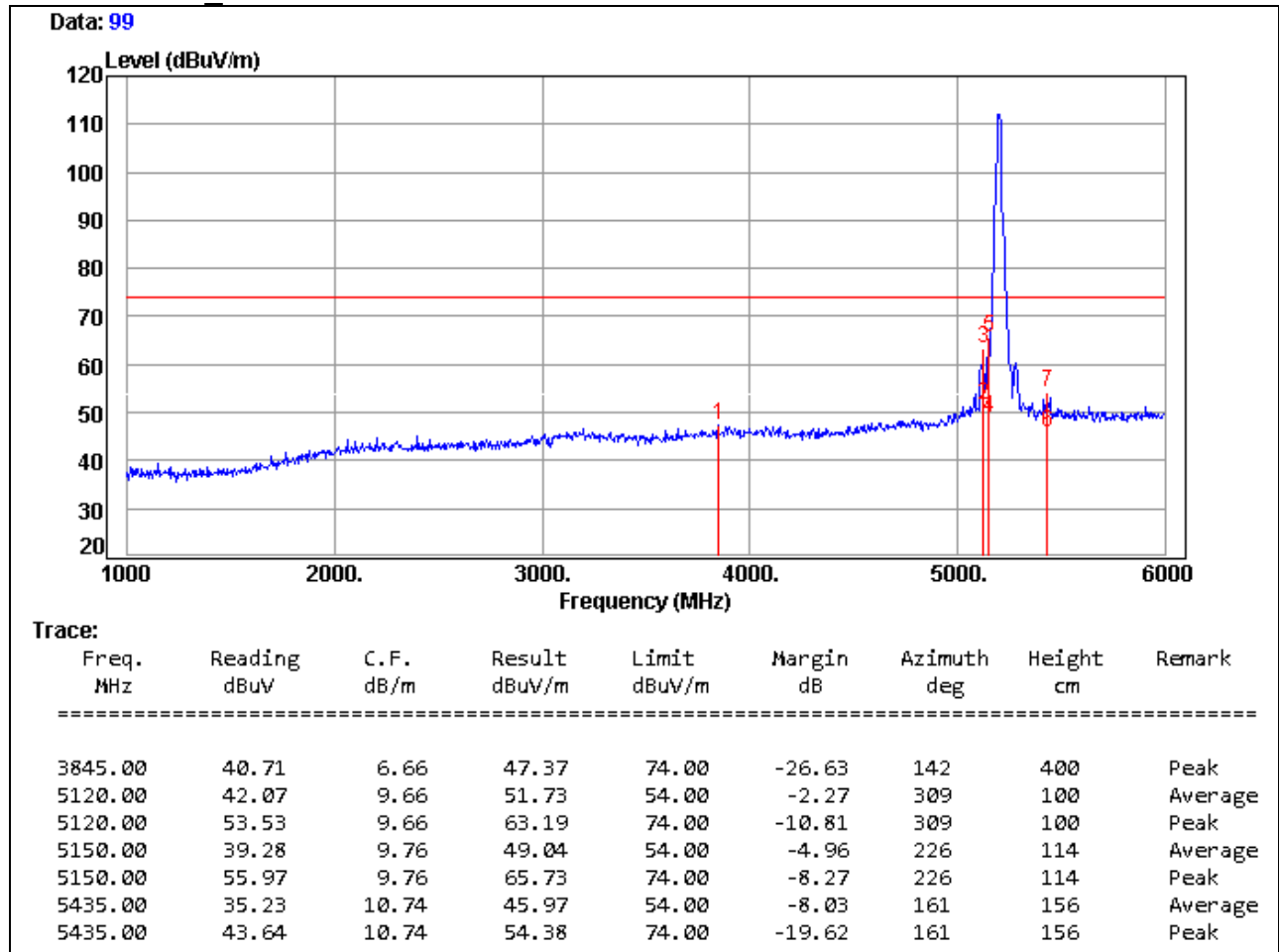
**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/19
Test Mode	UNII Band 1/ IEEE 802.11a TX / CH Middle	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical



Remark:

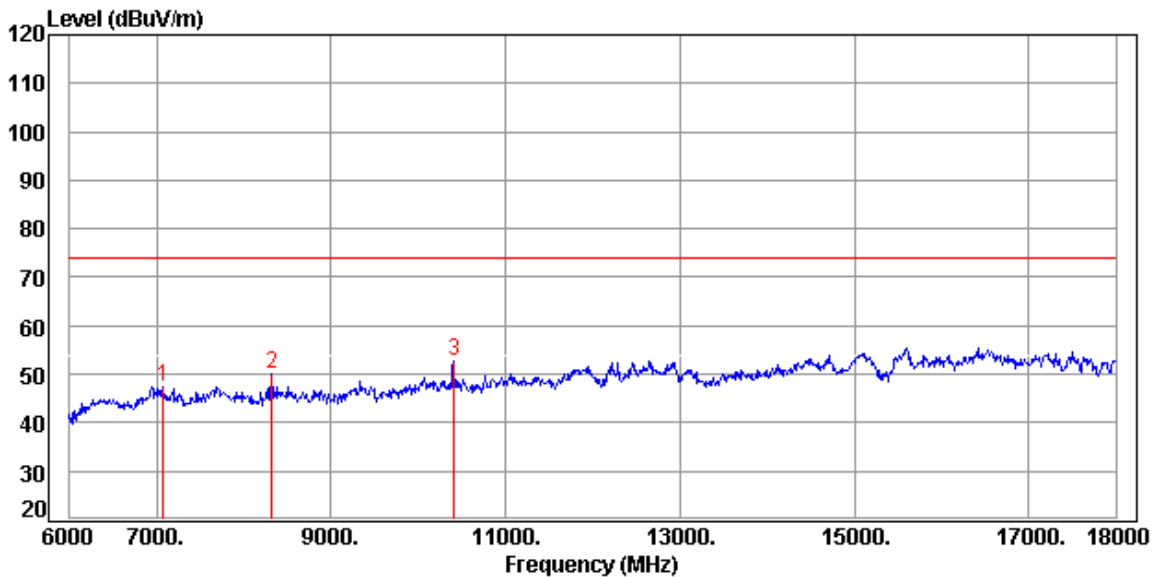
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 1/ IEEE 802.11a TX / CH Middle	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical

Data: 164



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
7068.00	44.69	2.72	47.41	74.00	-26.59	164	200	Peak
8316.00	46.56	3.60	50.16	74.00	-23.84	98	100	Peak
10404.00	46.90	5.63	52.53	74.00	-21.47	24	100	Peak

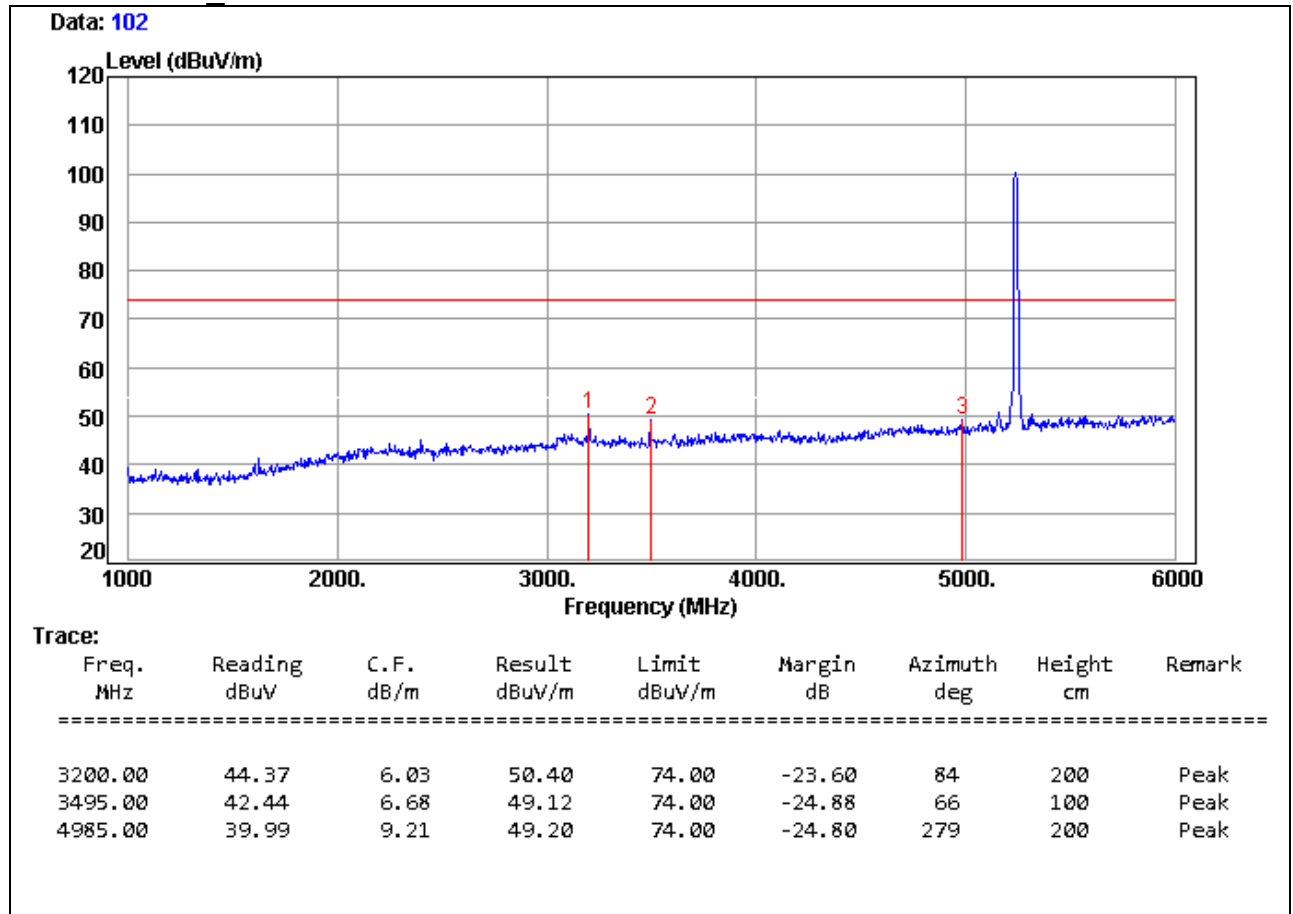
Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/19
Test Mode	UNII Band 1/ IEEE 802.11a TX / CH High	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Horizontal



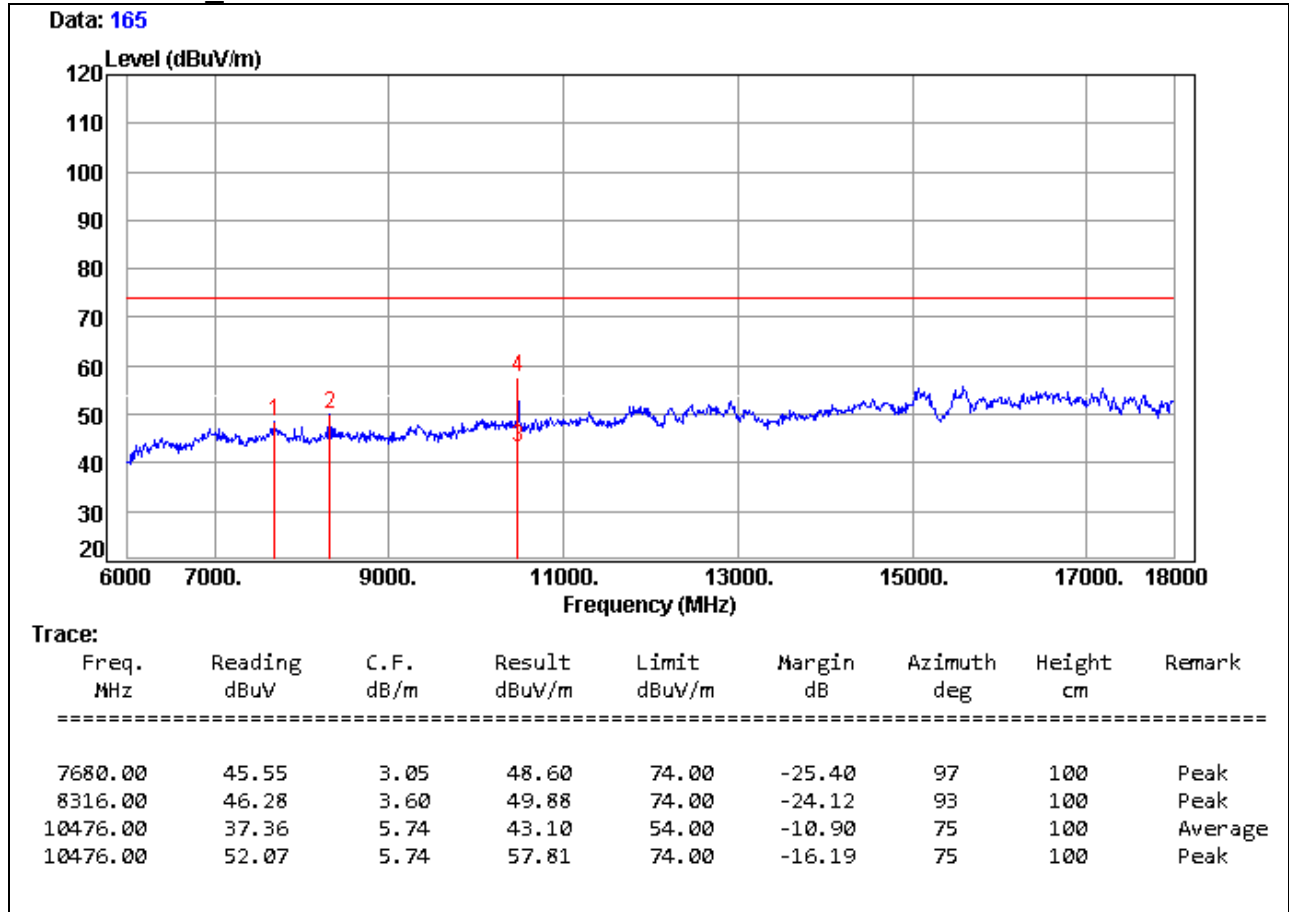
Remark:

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 1/ IEEE 802.11a TX / CH High	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Horizontal

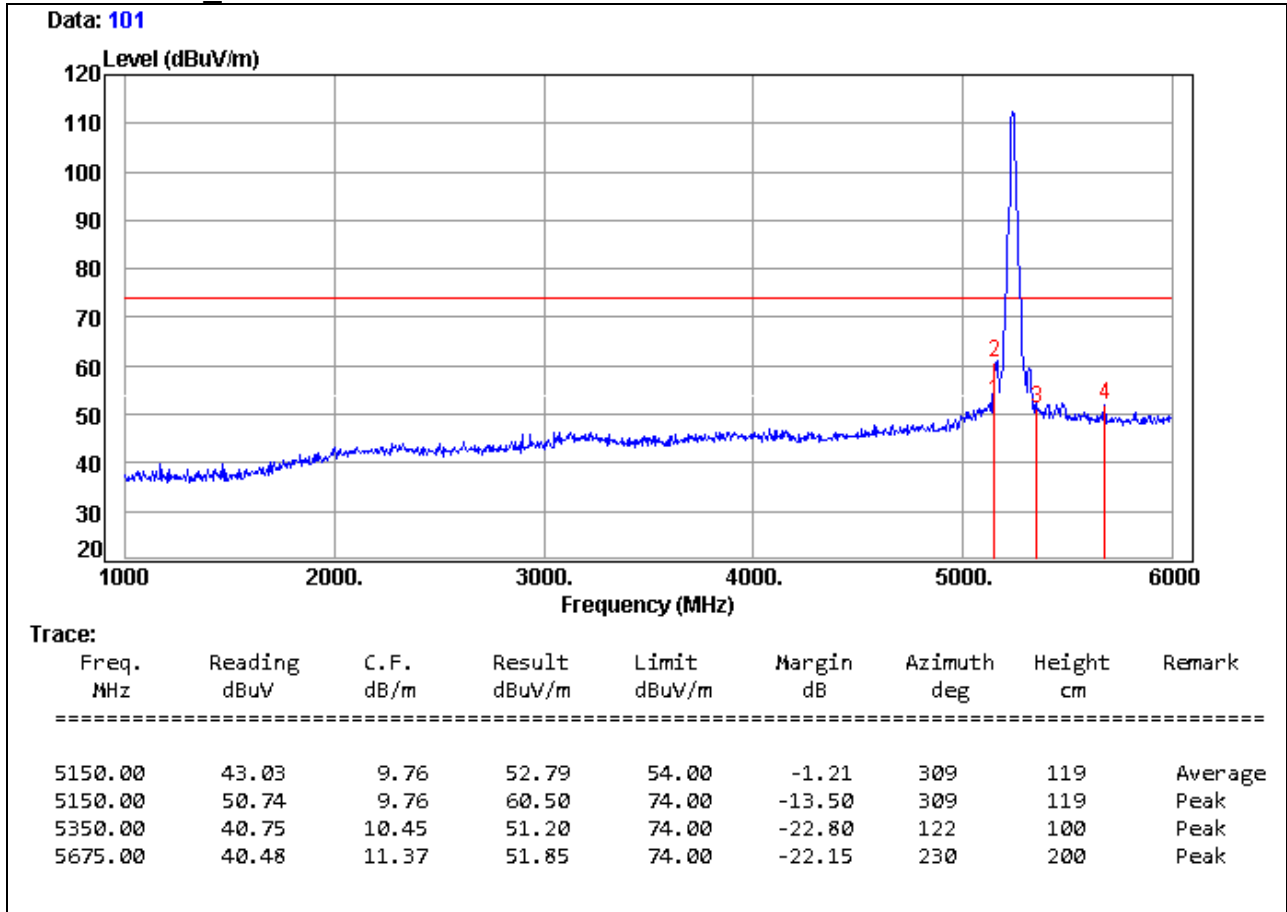
**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/19
Test Mode	UNII Band 1/ IEEE 802.11a TX / CH High	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical

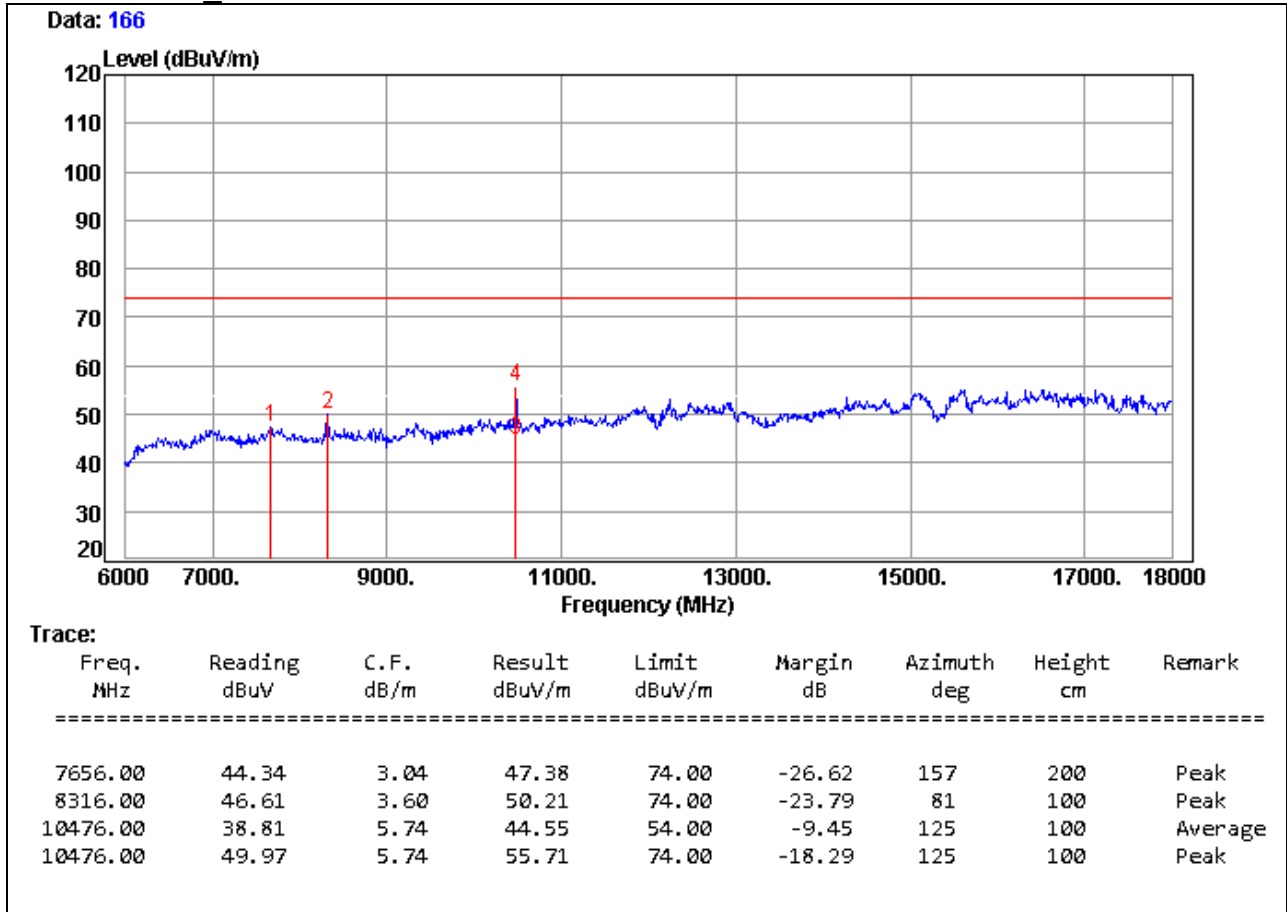
**Remark:**

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 1/ IEEE 802.11a TX / CH High	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical



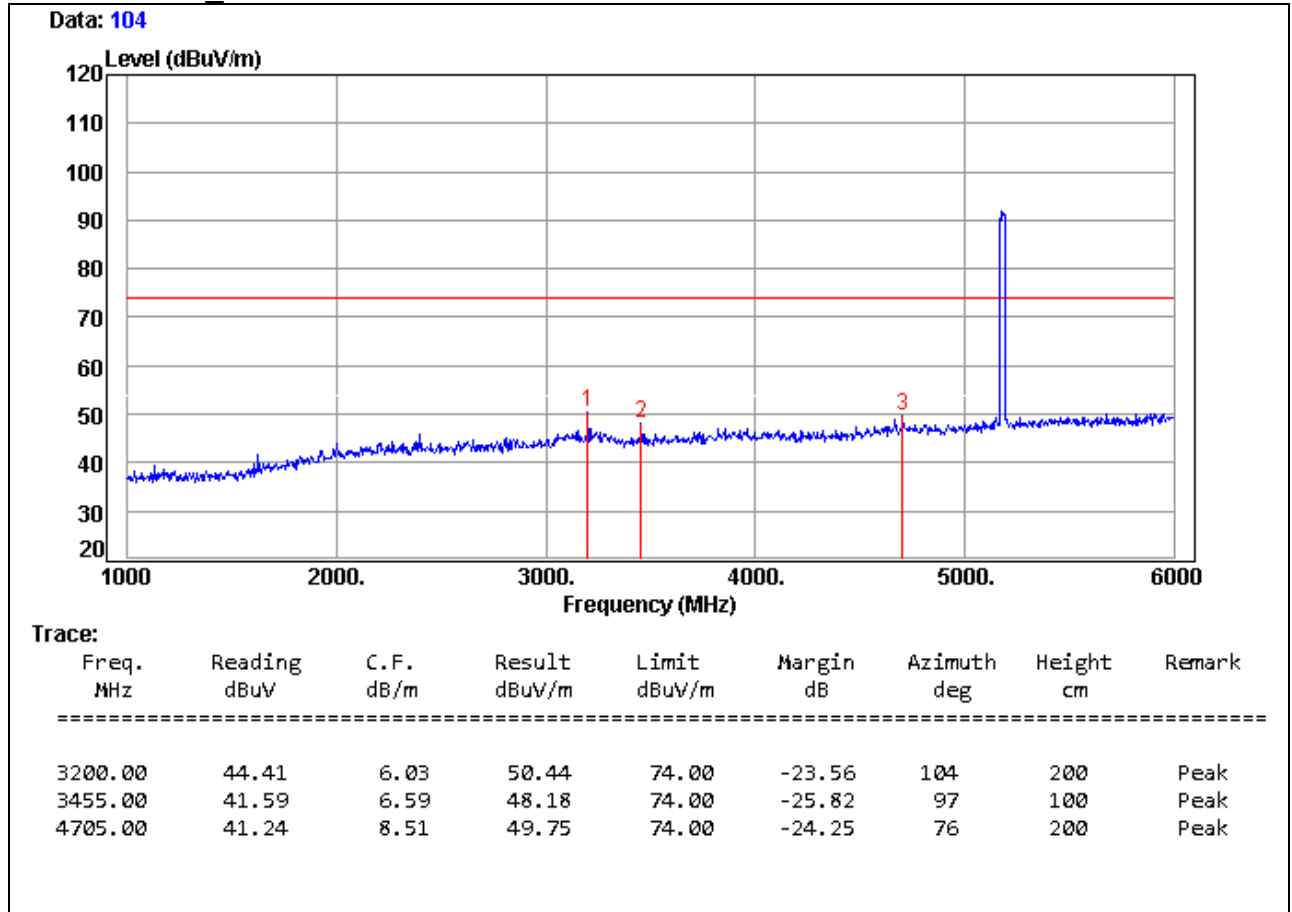
Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/19
Test Mode	UNII Band 1/ IEEE 802.11ac VHT20 TX / CH Low	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Horizontal



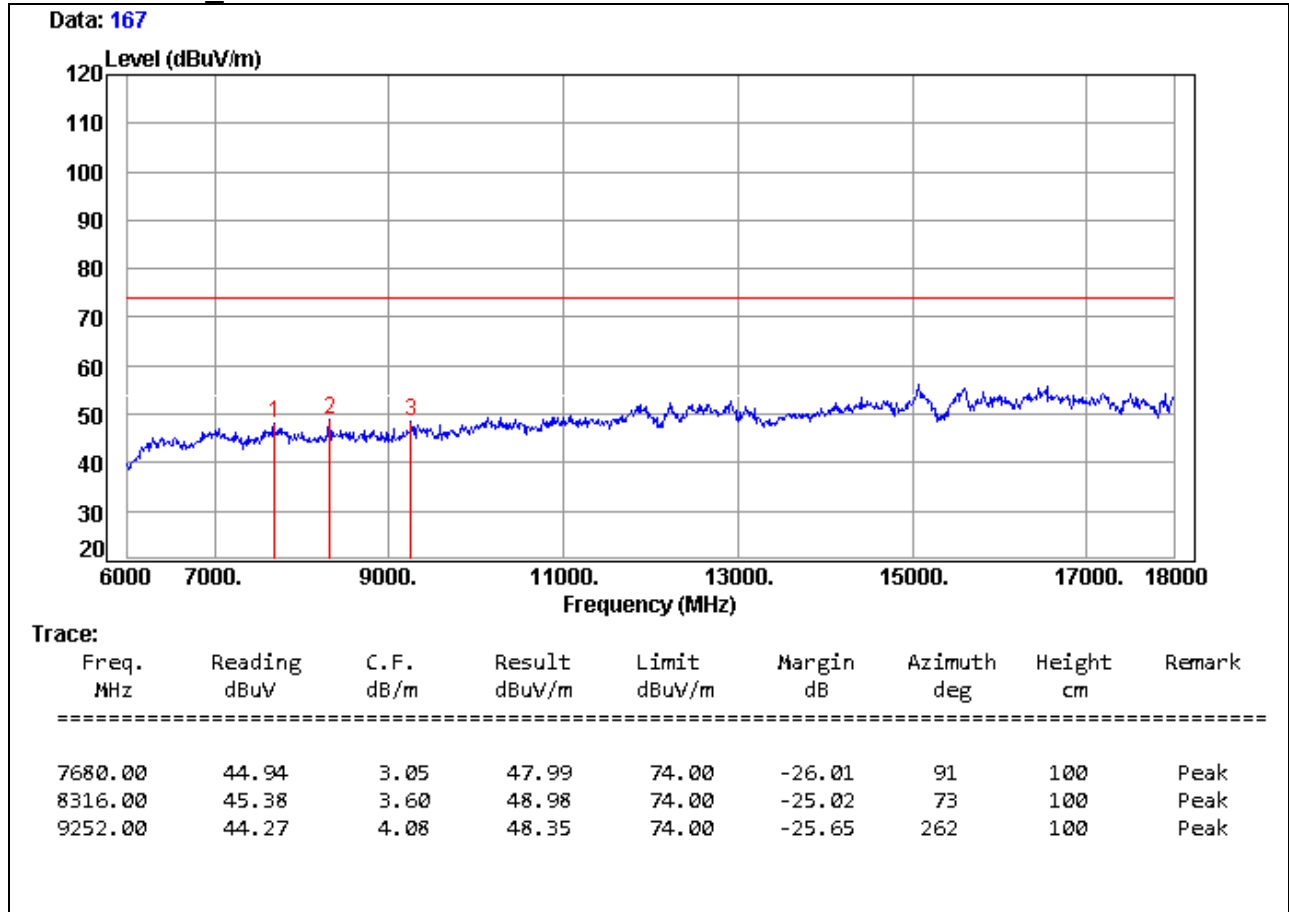
Remark:

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 1/ IEEE 802.11ac VHT20 TX / CH Low	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Horizontal



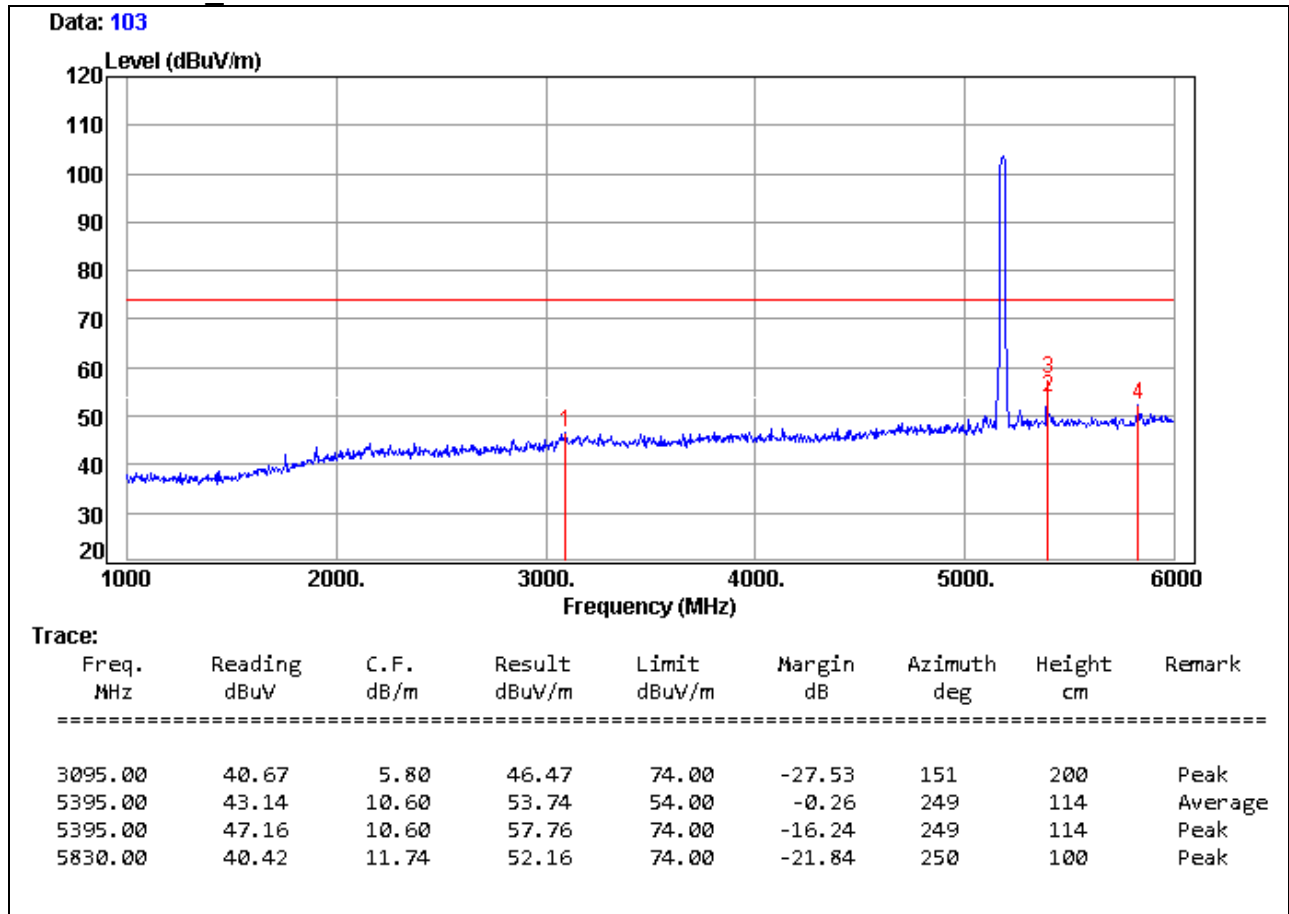
Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/29
Test Mode	UNII Band 1/ IEEE 802.11ac VHT20 TX / CH Low	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical

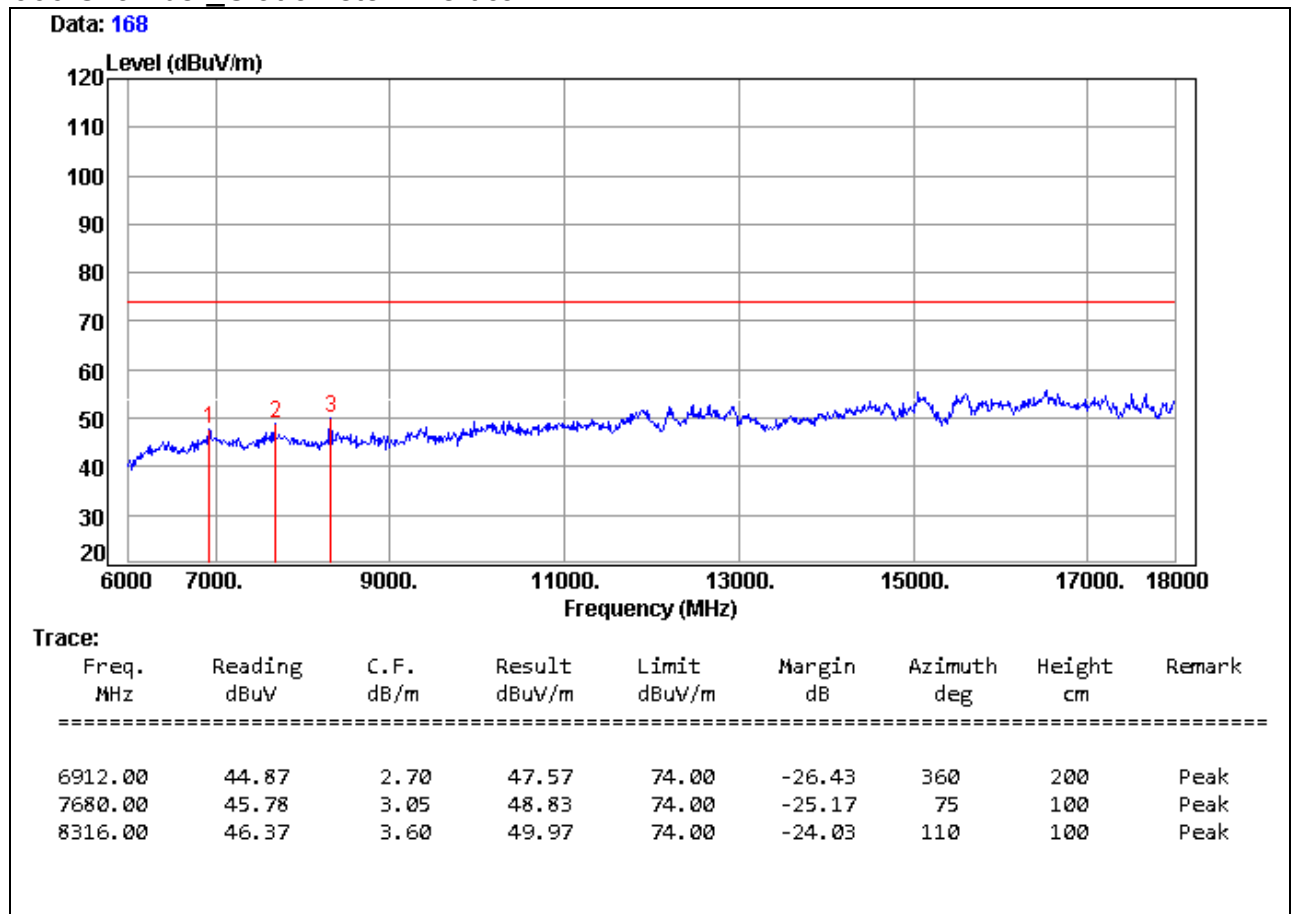
**Remark:**

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 1/ IEEE 802.11ac VHT20 TX / CH Low	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical

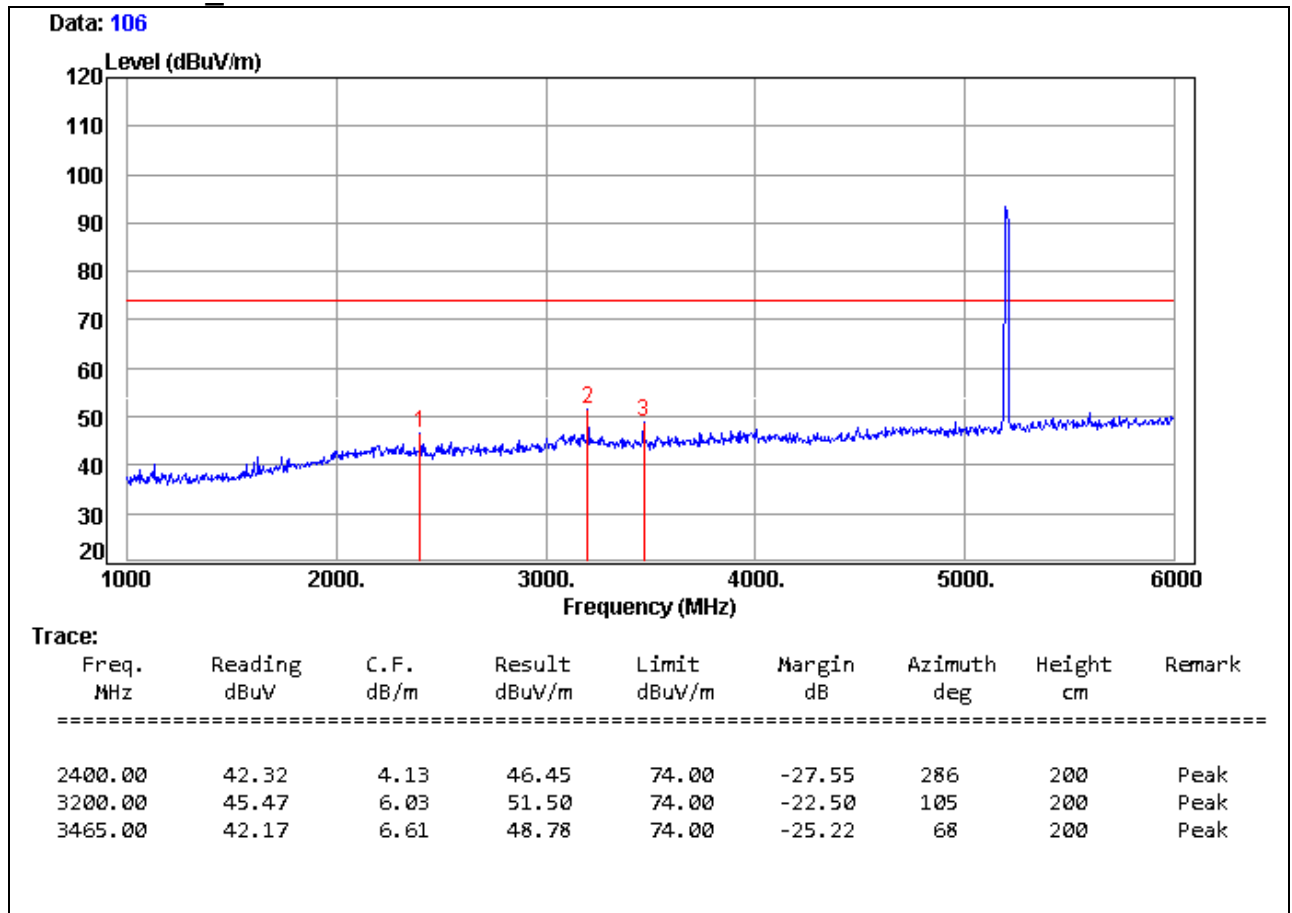
**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/19
Test Mode	UNII Band 1/ IEEE 802.11ac VHT20 TX / CH Middle	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Horizontal

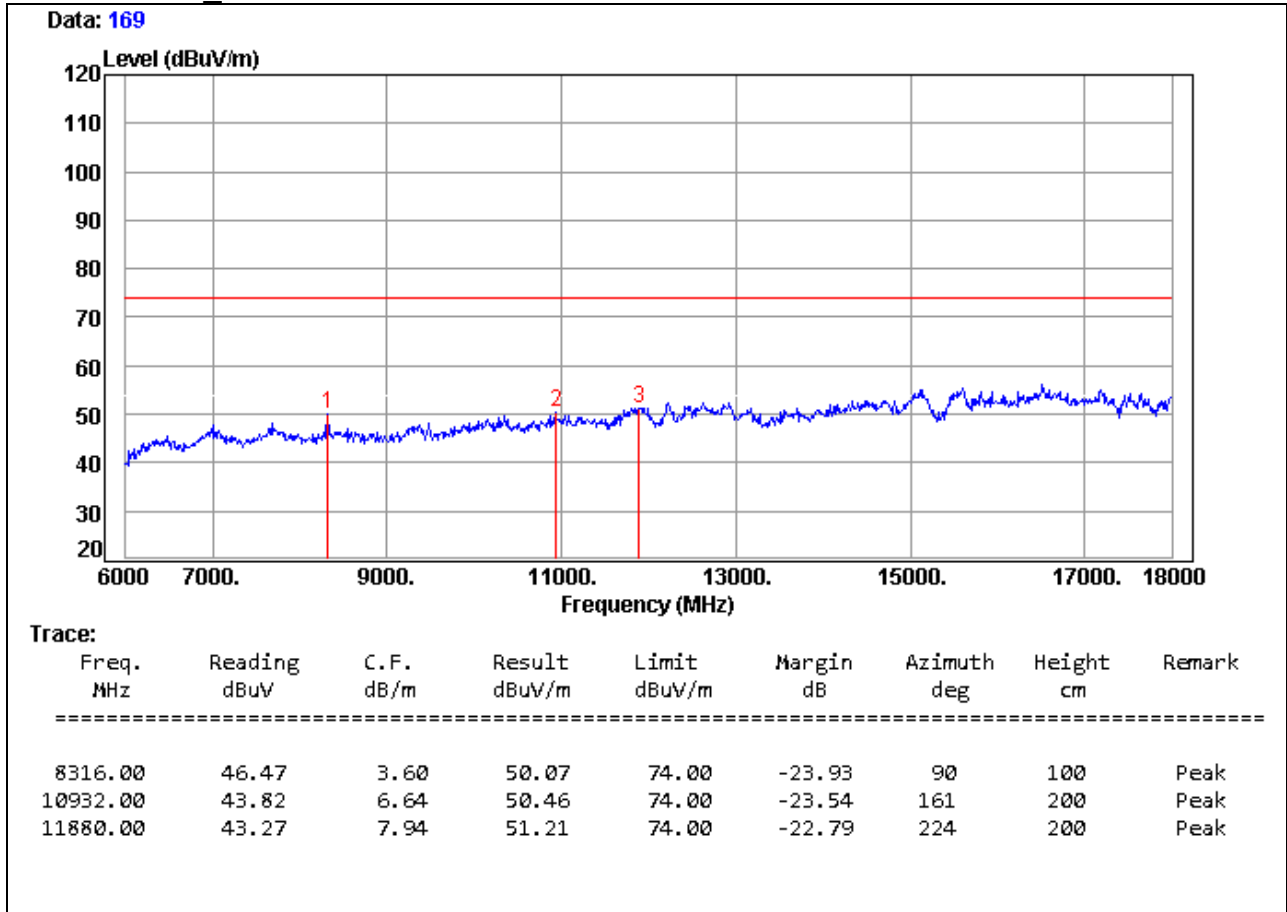


Remark:

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 1/ IEEE 802.11ac VHT20 TX / CH Middle	Temp. & Humidity	25°C, 53%

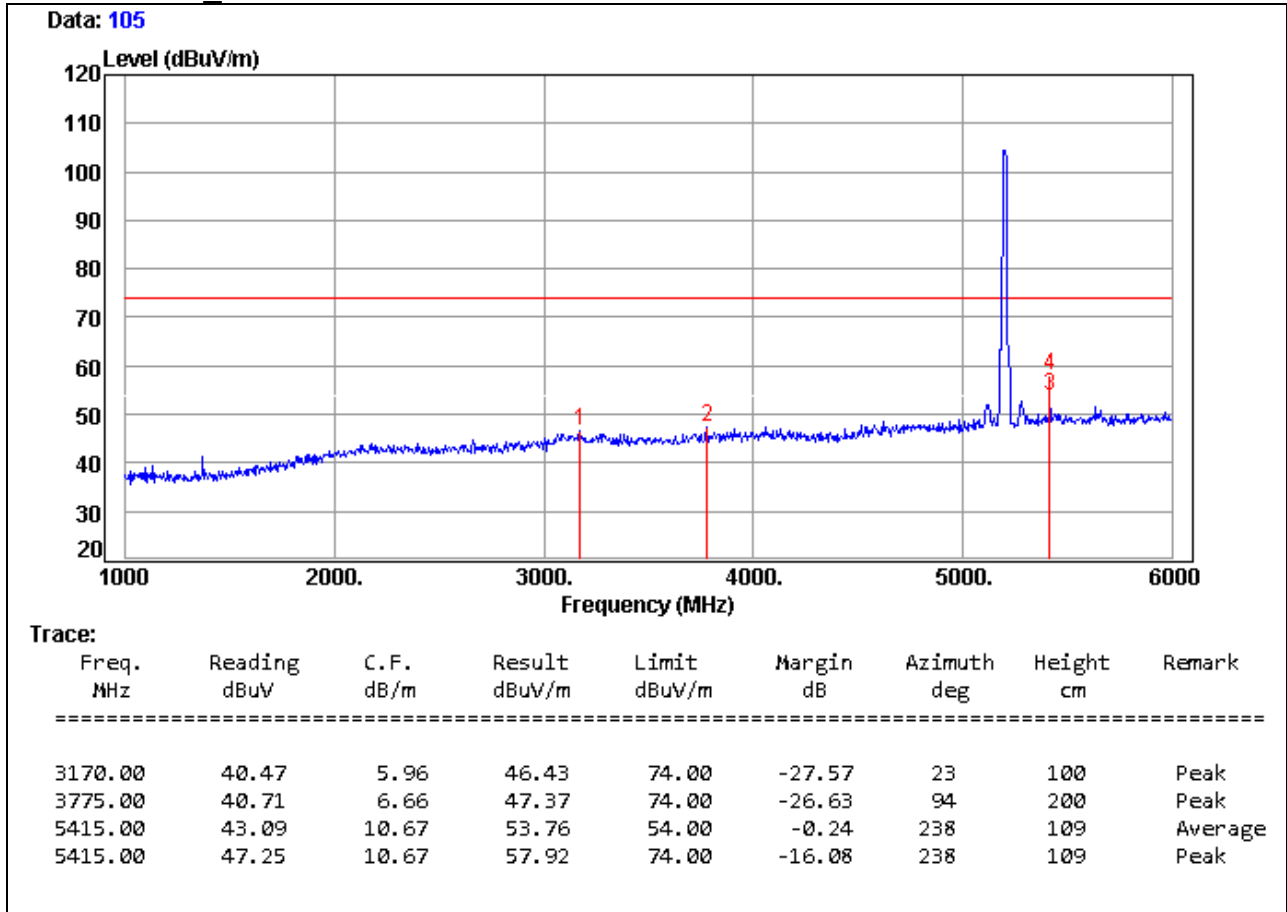
966 Chamber_C at 3Meter / Horizontal**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/29
Test Mode	UNII Band 1/ IEEE 802.11ac VHT20 TX / CH Middle	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical

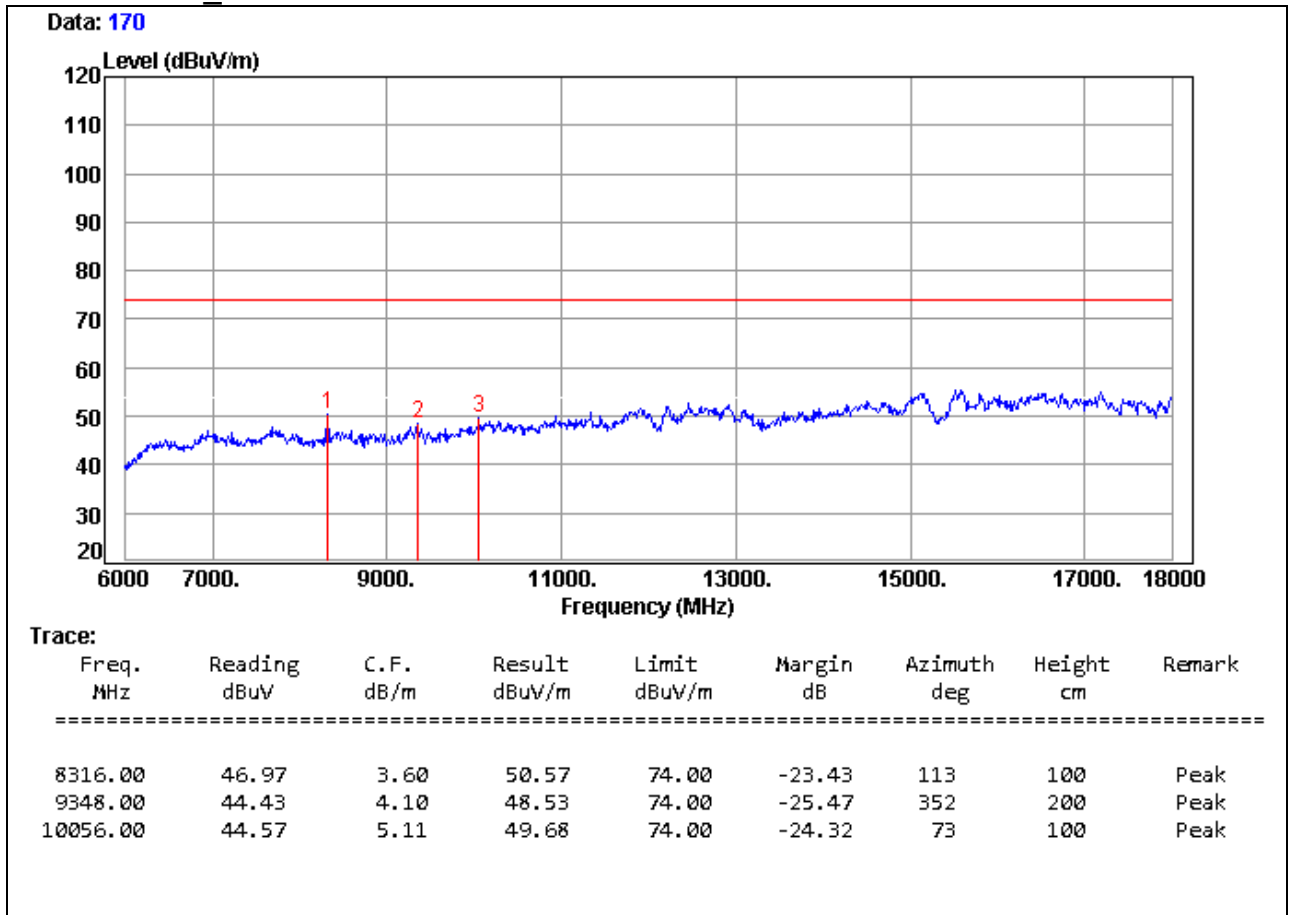
**Remark:**

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 1/ IEEE 802.11ac VHT20 TX / CH Middle	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical

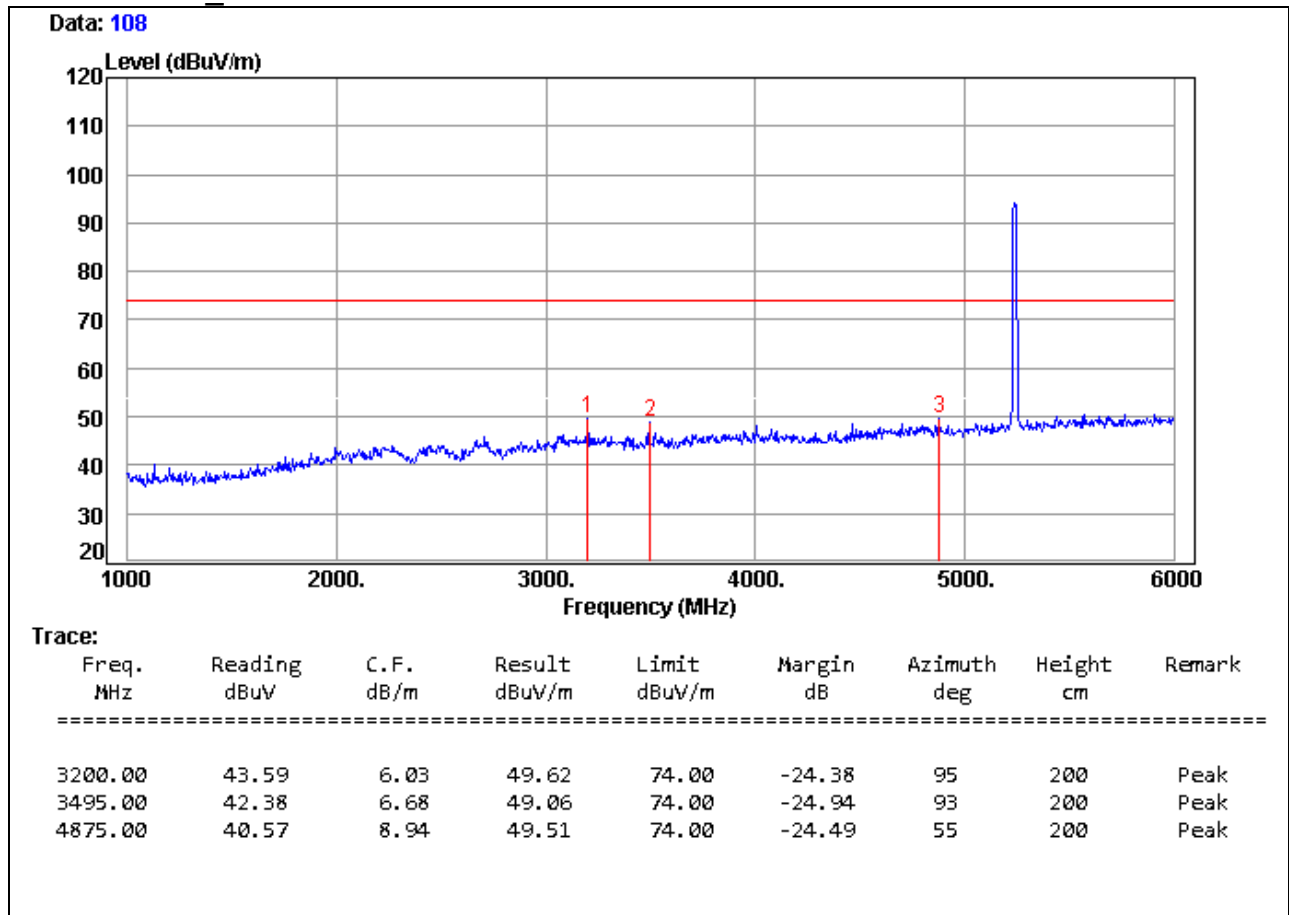
**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/22
Test Mode	UNII Band 1/ IEEE 802.11ac VHT20 TX / CH High	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Horizontal

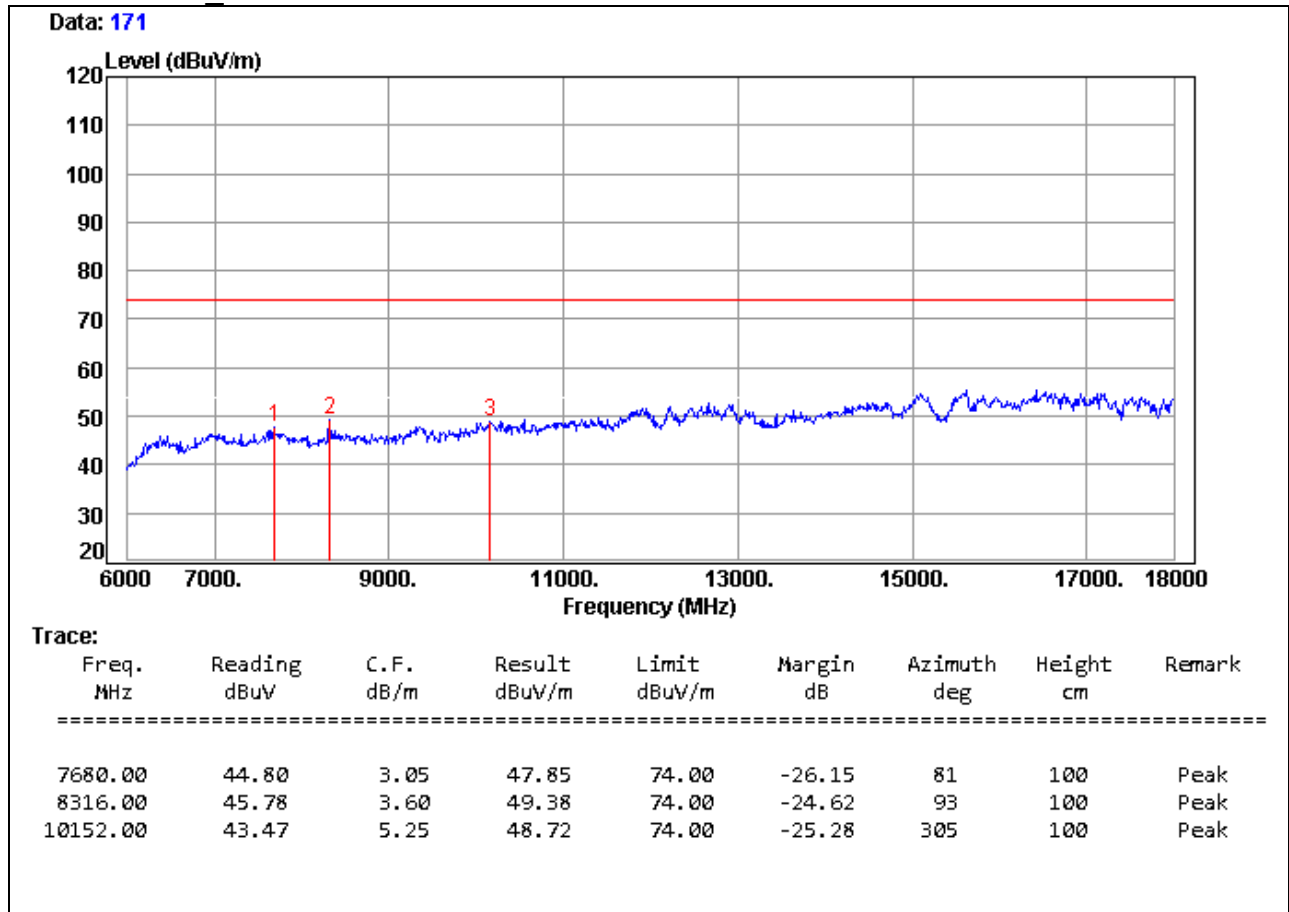


Remark:

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 1/ IEEE 802.11ac VHT20 TX / CH High	Temp. & Humidity	25°C, 53%

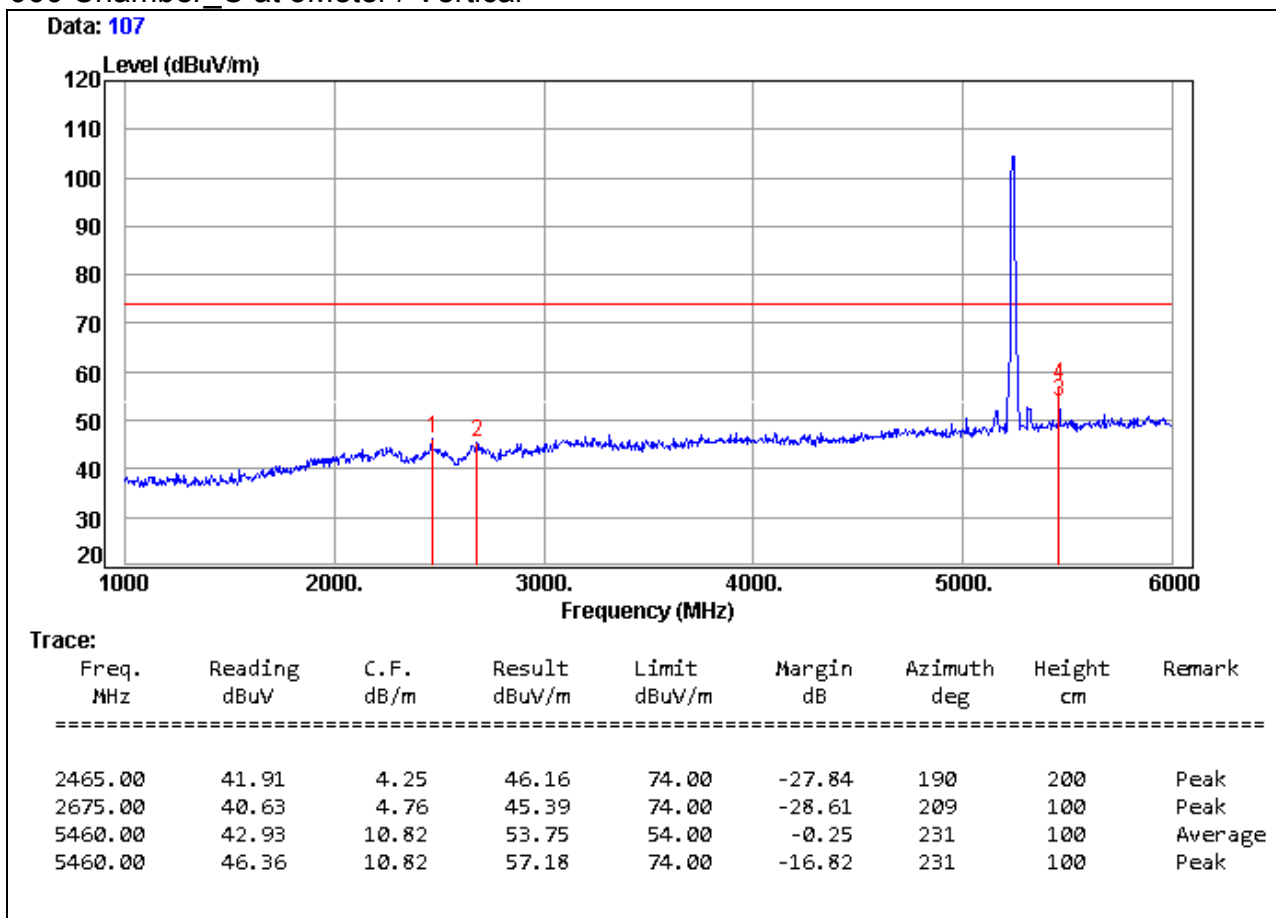
966 Chamber_C at 3Meter / Horizontal**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/29
Test Mode	UNII Band 1/ IEEE 802.11ac VHT20 TX / CH High	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical



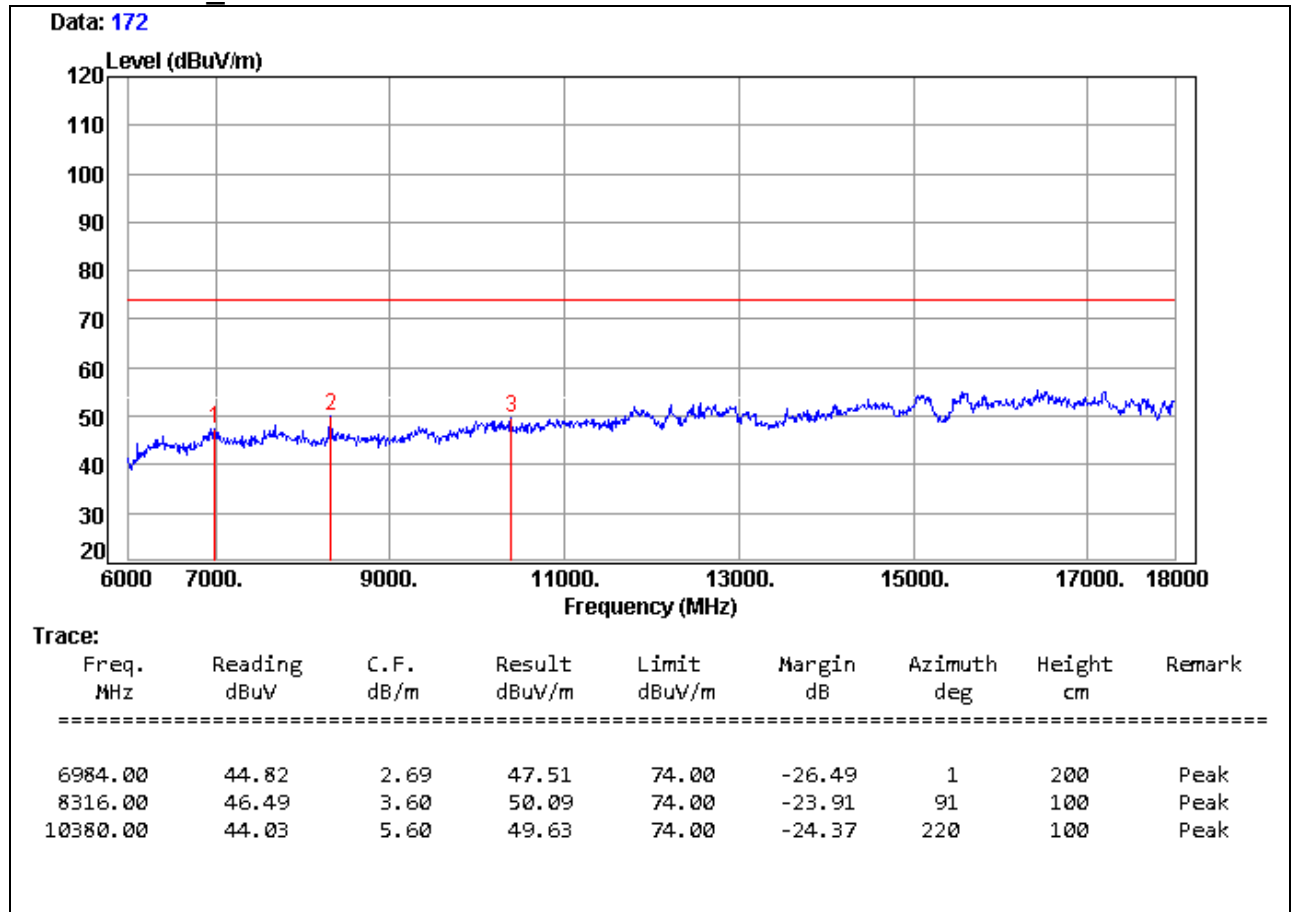
Remark:

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 1/ IEEE 802.11ac VHT20 TX / CH High	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical



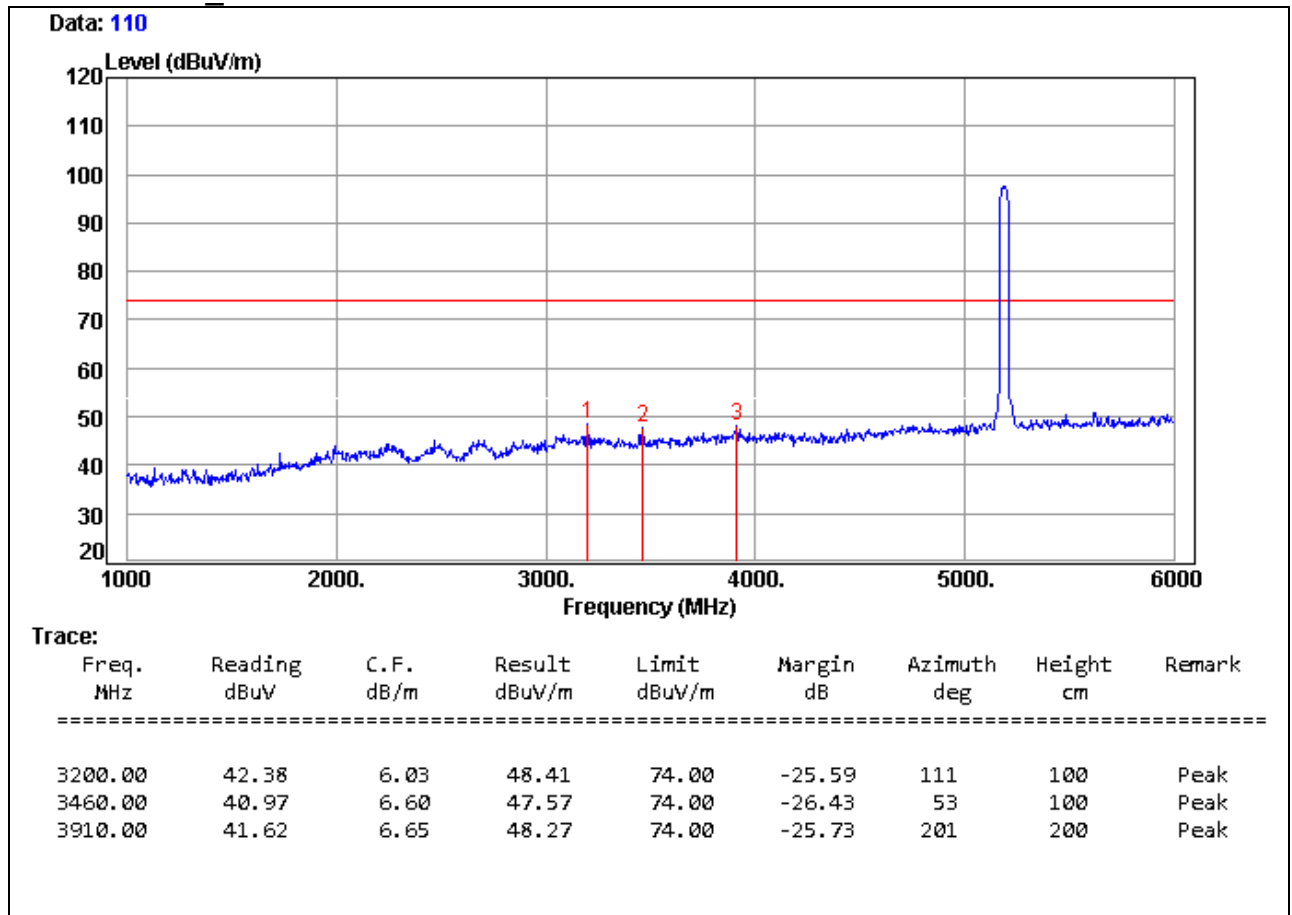
Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/22
Test Mode	UNII Band 1/ IEEE 802.11ac VHT40 TX / CH Low	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Horizontal

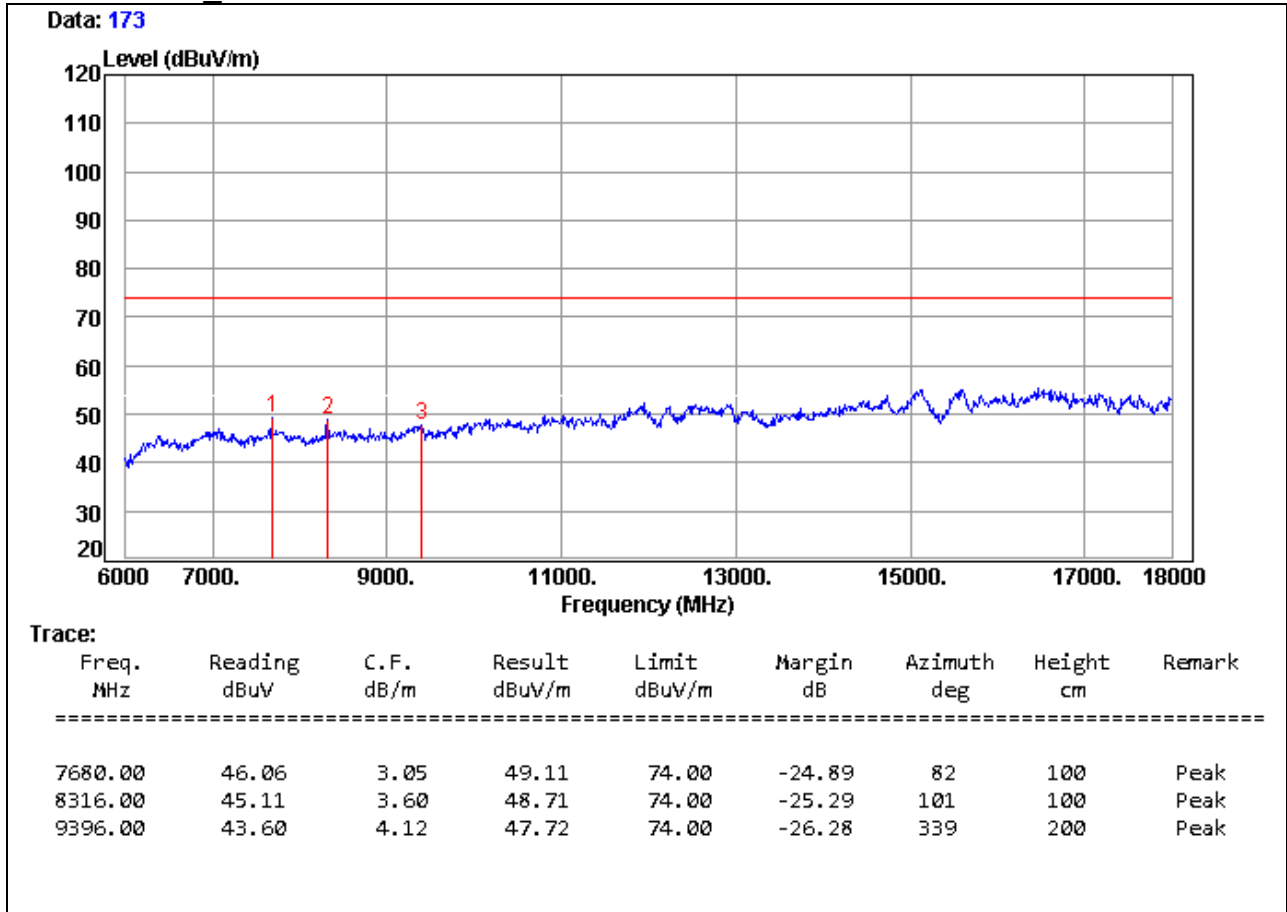


Remark:

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 1/ IEEE 802.11ac VHT40 TX / CH Low	Temp. & Humidity	25°C, 53%

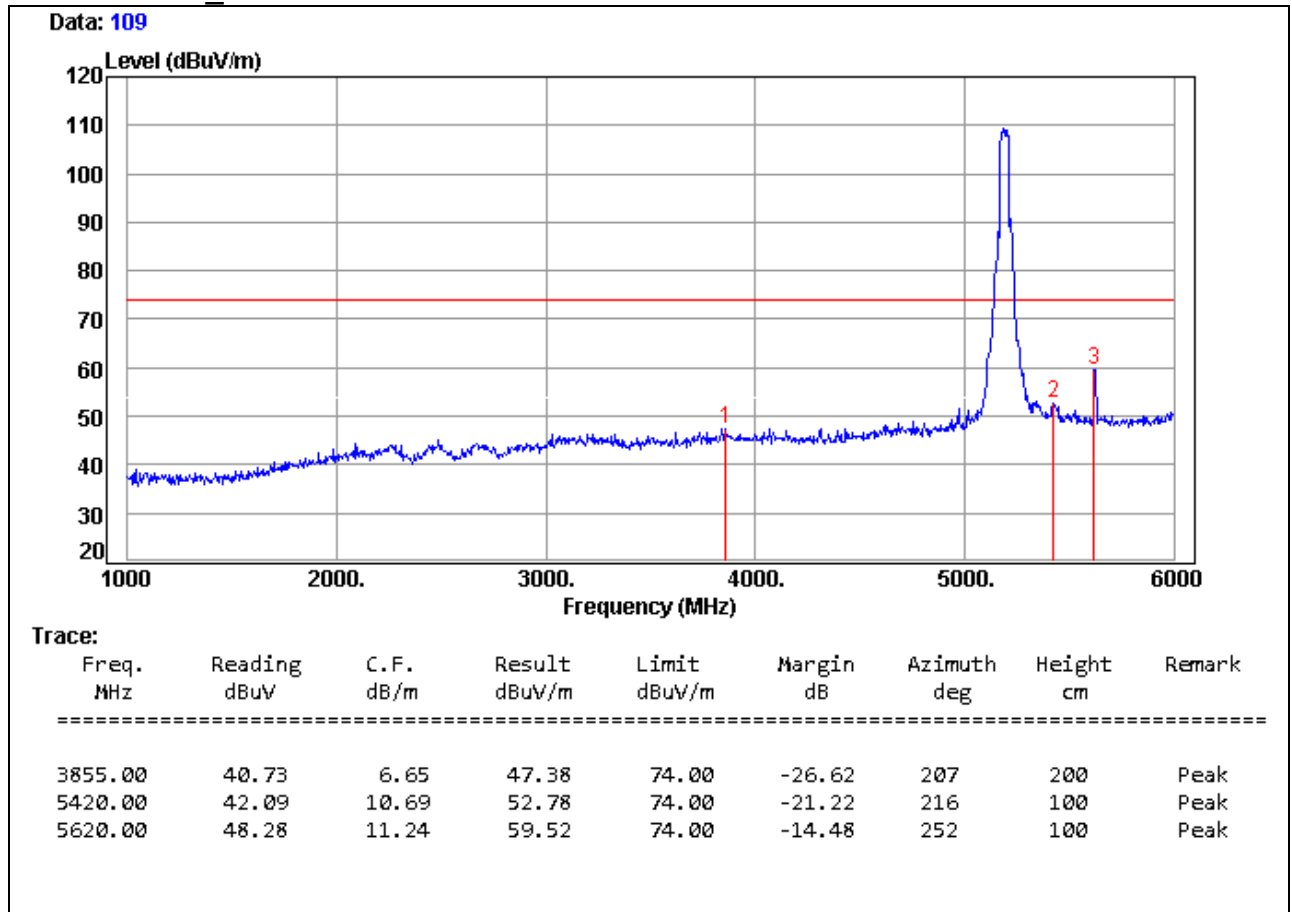
966 Chamber_C at 3Meter / Horizontal**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2014/05/22
Test Mode	UNII Band 1/ IEEE 802.11ac VHT40 TX / CH Low	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical



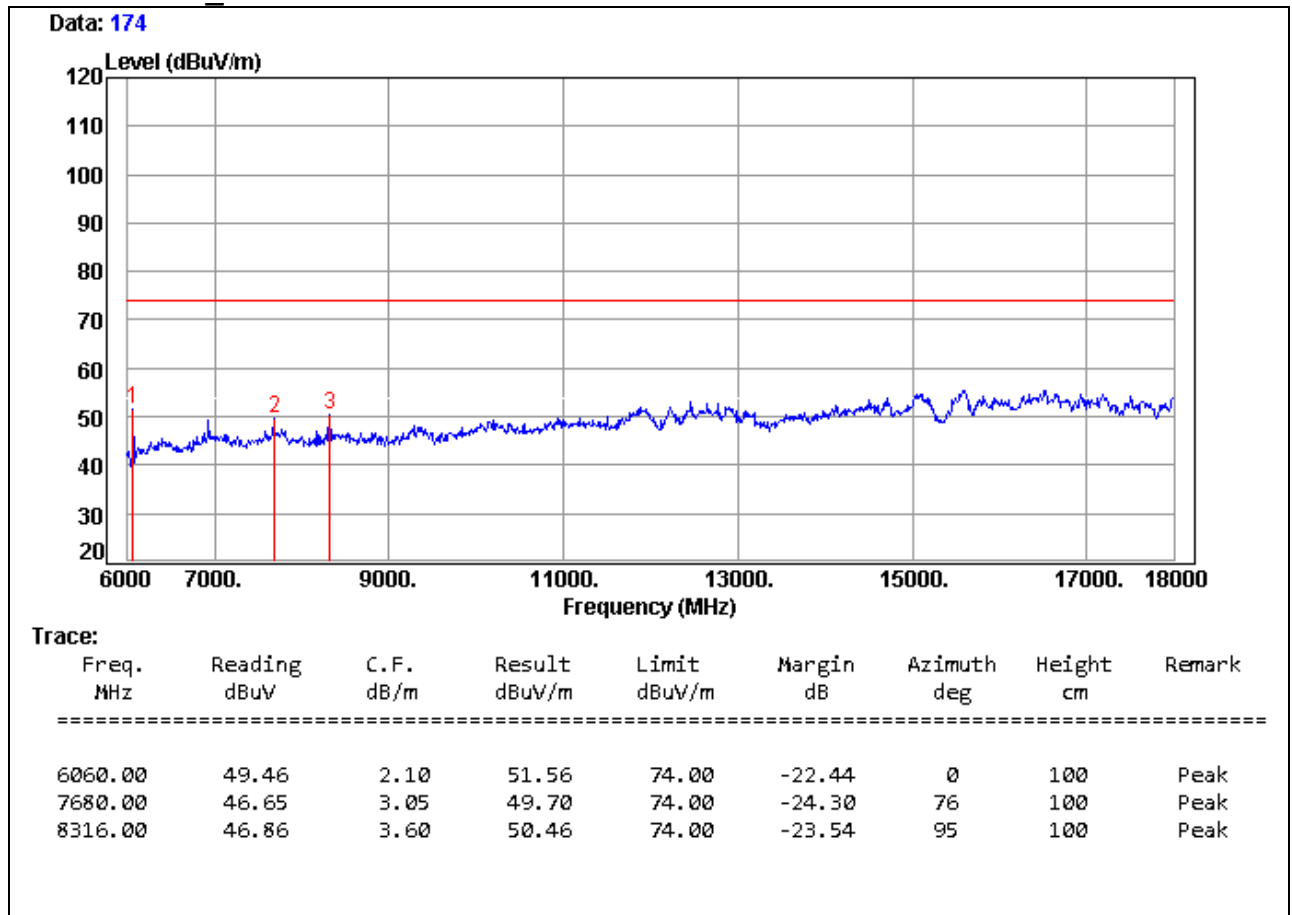
Remark:

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 1/ IEEE 802.11ac VHT40 TX / CH Low	Temp. & Humidity	25°C, 53%

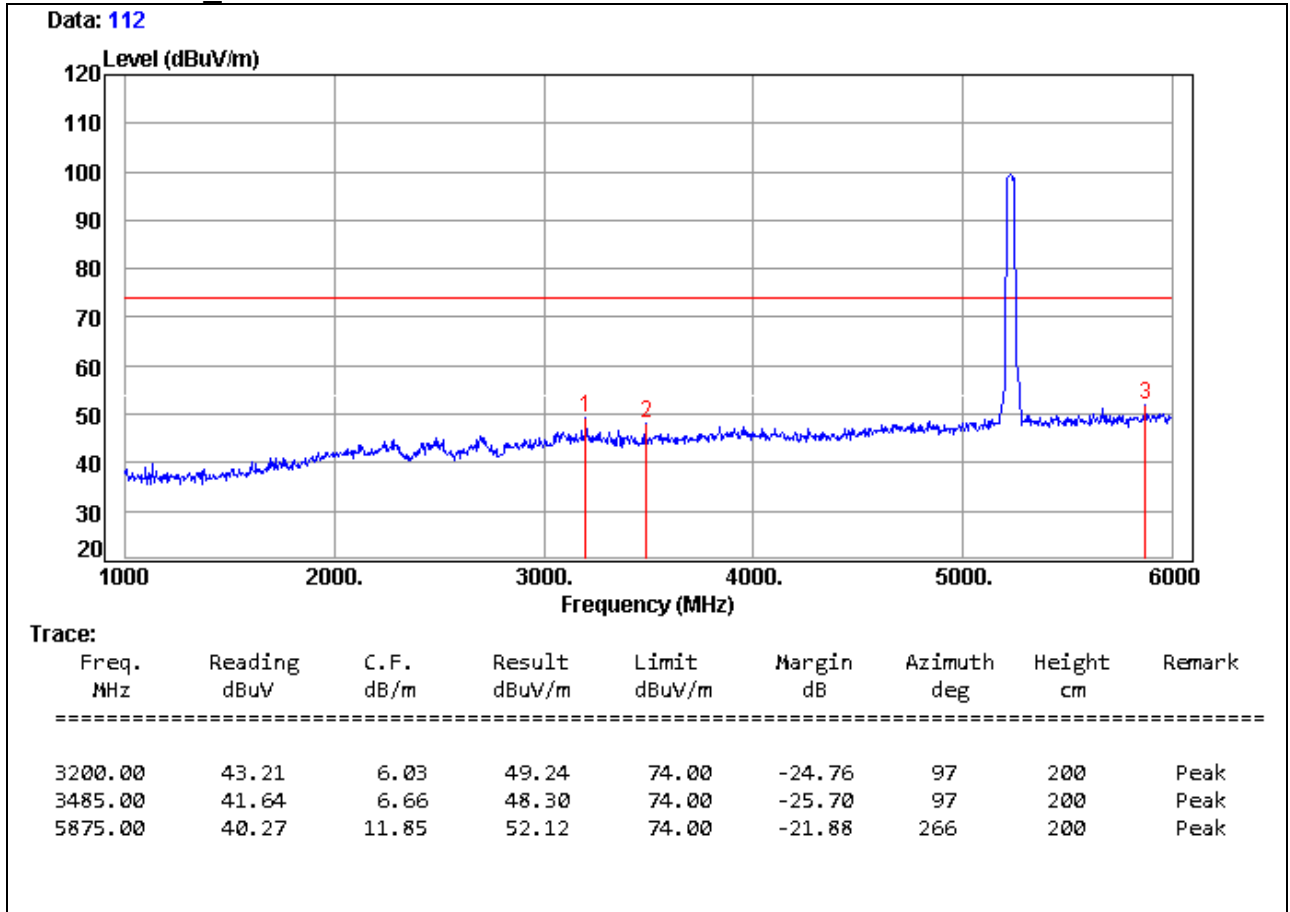
966 Chamber_C at 3Meter / Vertical

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



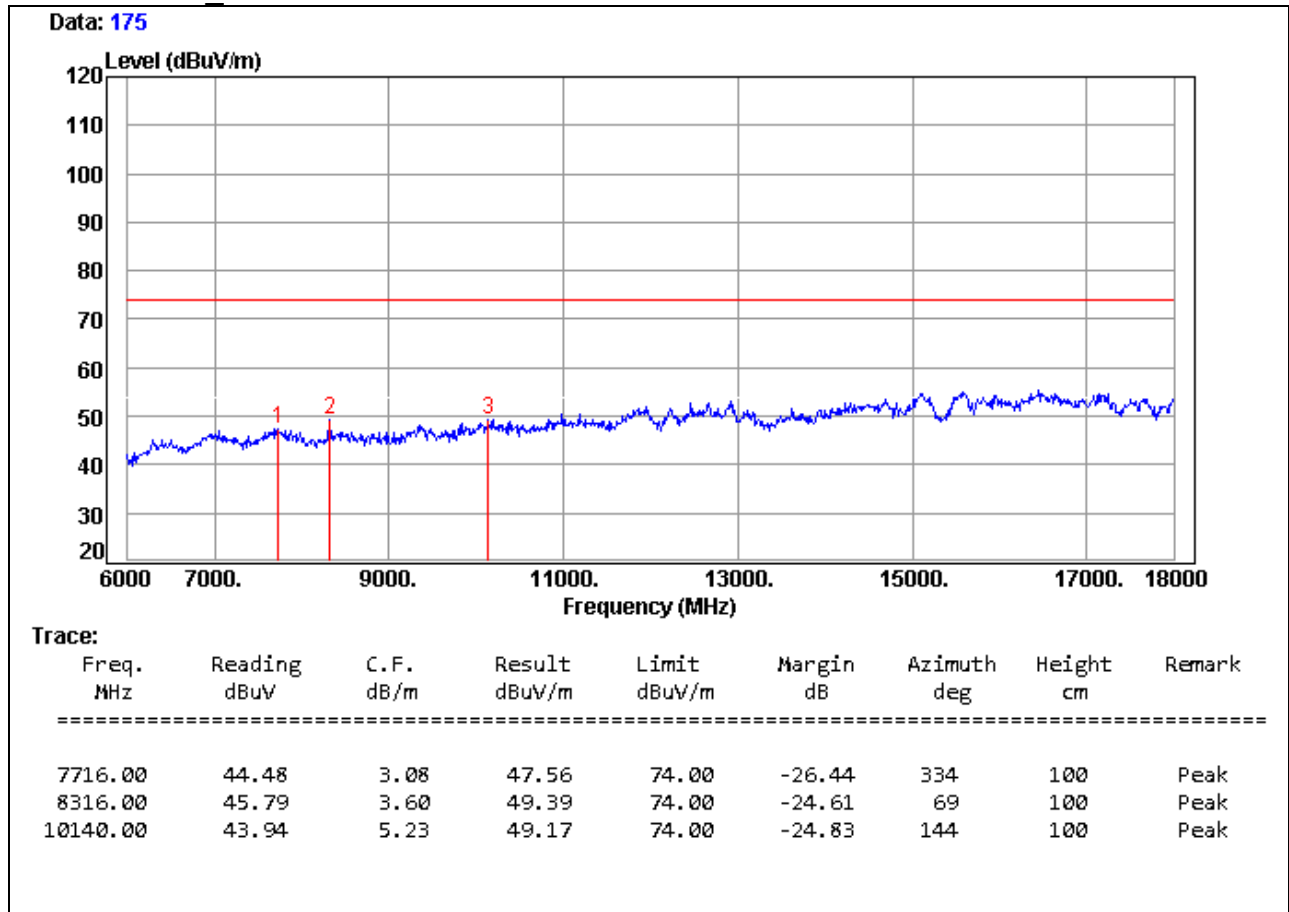
Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/22
Test Mode	UNII Band 1/ IEEE 802.11ac VHT40 TX / CH High	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Horizontal**Remark:**

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



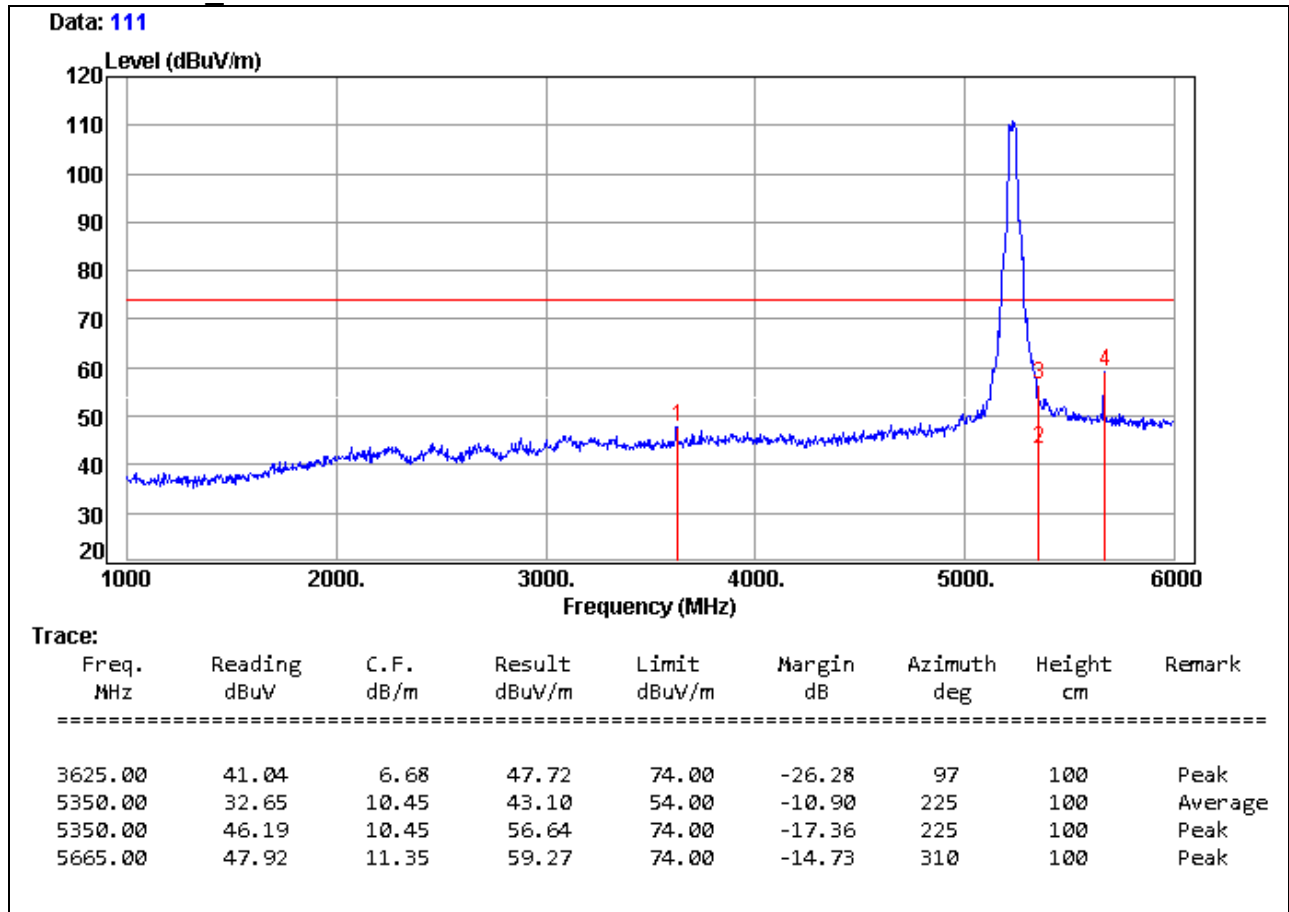
Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 1/ IEEE 802.11ac VHT40 TX / CH High	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Horizontal**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



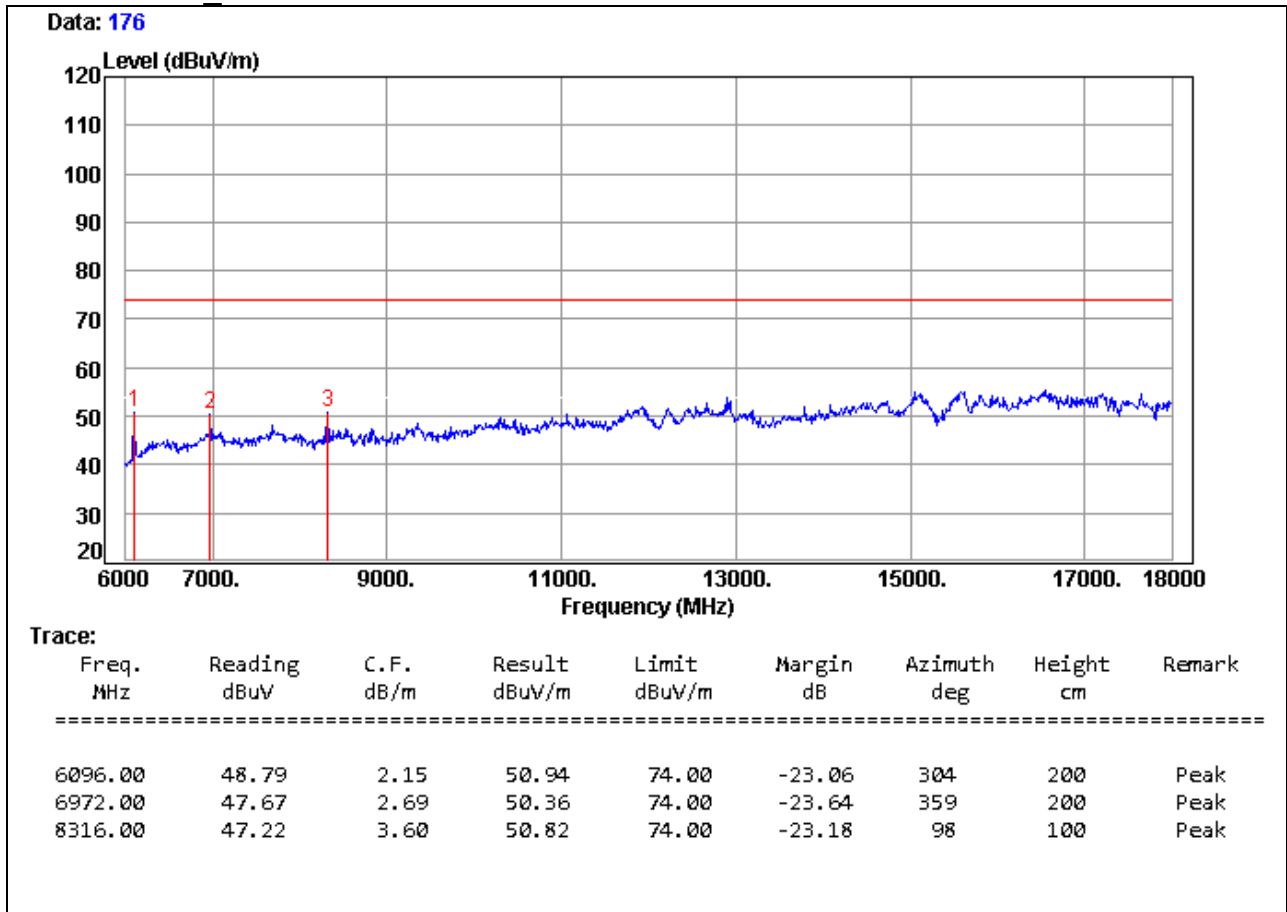
Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/22
Test Mode	UNII Band 1/ IEEE 802.11ac VHT40 TX / CH High	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical**Remark:**

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



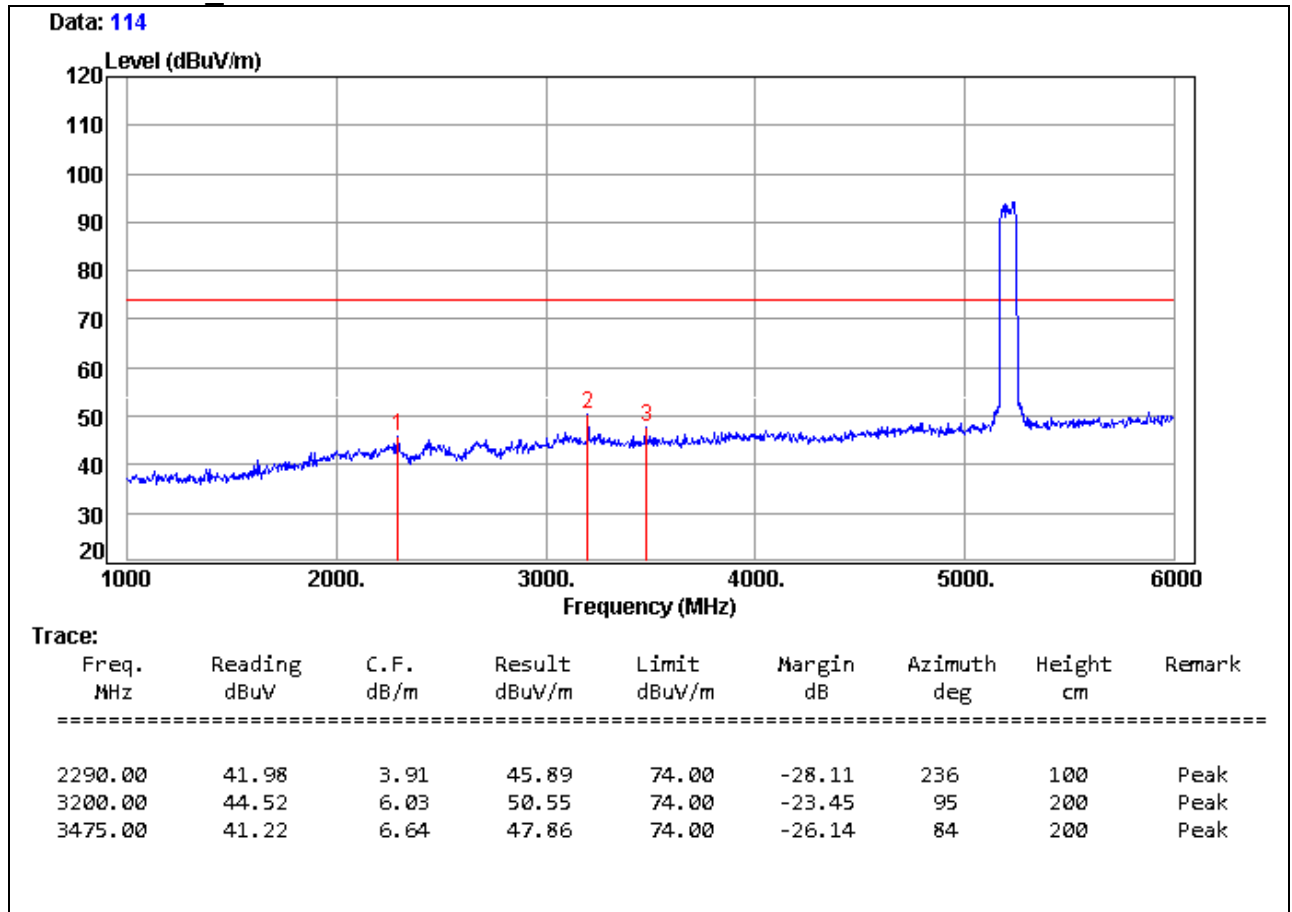
Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 1/ IEEE 802.11ac VHT40 TX / CH High	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



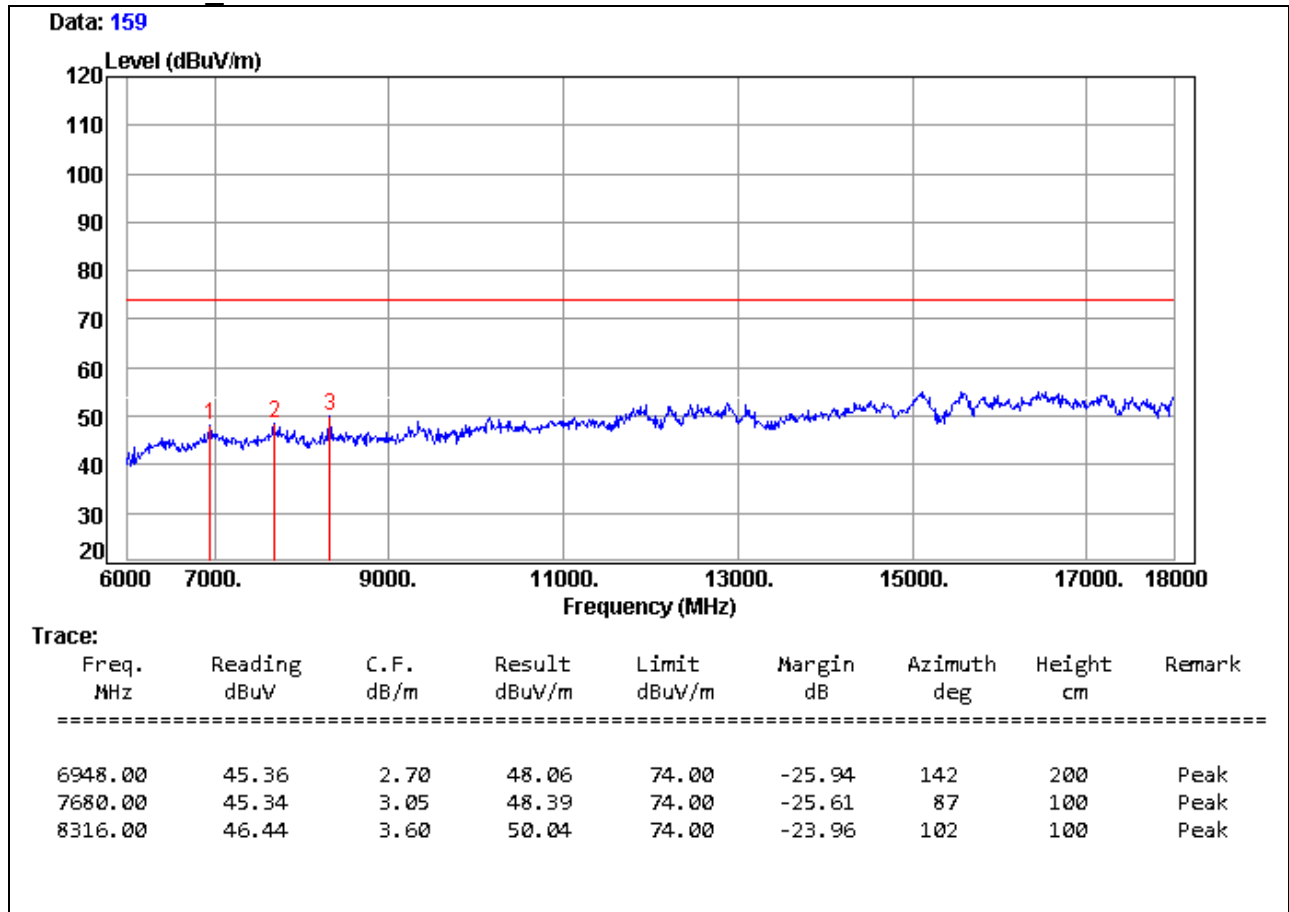
Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/22
Test Mode	UNII Band 1/ IEEE 802.11ac VHT80 TX / CH Low	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Horizontal**Remark:**

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



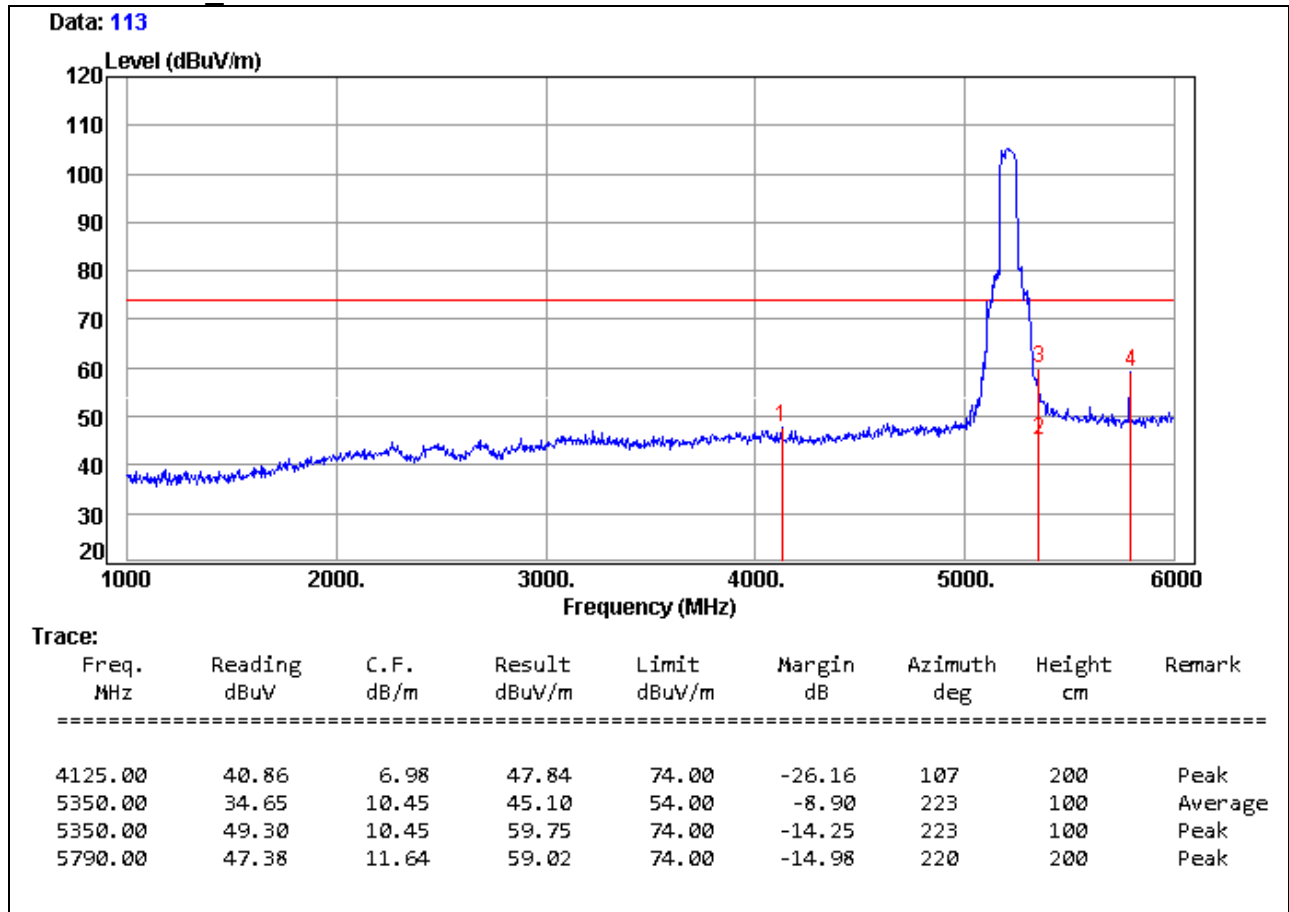
Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 1/ IEEE 802.11ac VHT80 TX / CH Low	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Horizontal**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



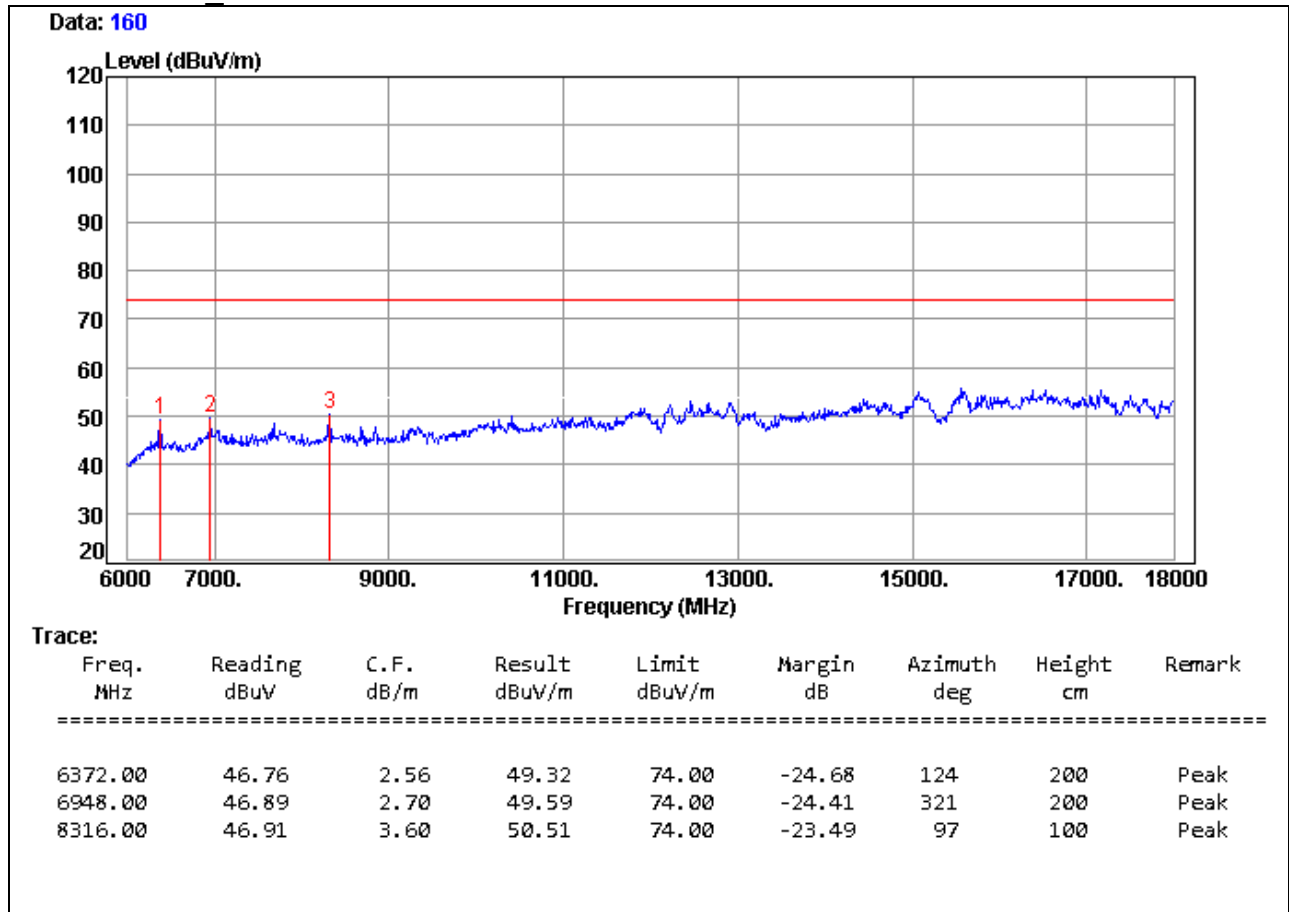
Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/22
Test Mode	UNII Band 1/ IEEE 802.11ac VHT80 TX / CH Low	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical**Remark:**

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



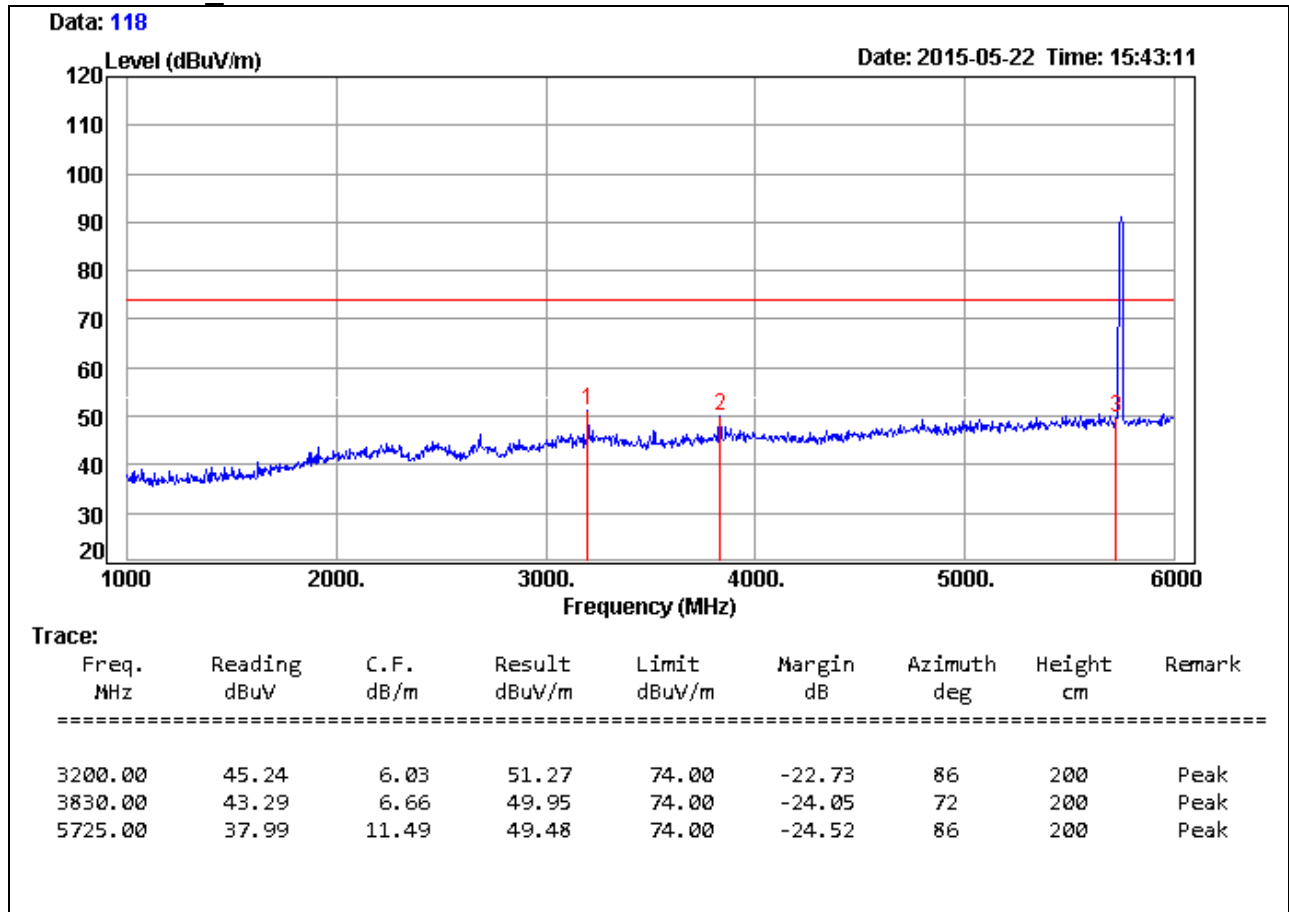
Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 1/ IEEE 802.11ac VHT80 TX / CH Low	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



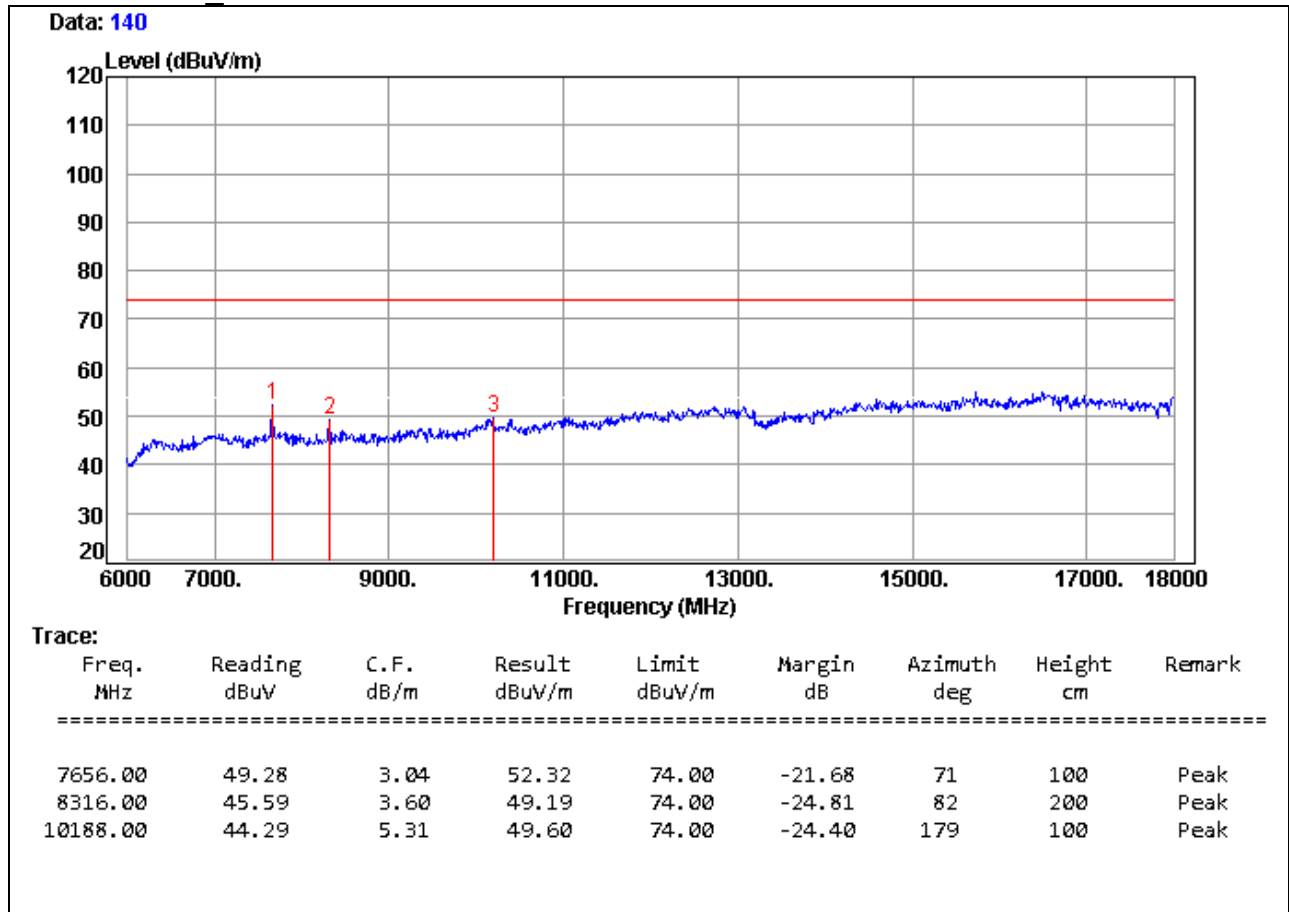
Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/22
Test Mode	UNII Band 3 / IEEE 802.11a TX / CH Low	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Horizontal**Remark:**

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 3 / IEEE 802.11a TX / CH Low	Temp. & Humidity	25°C, 53%

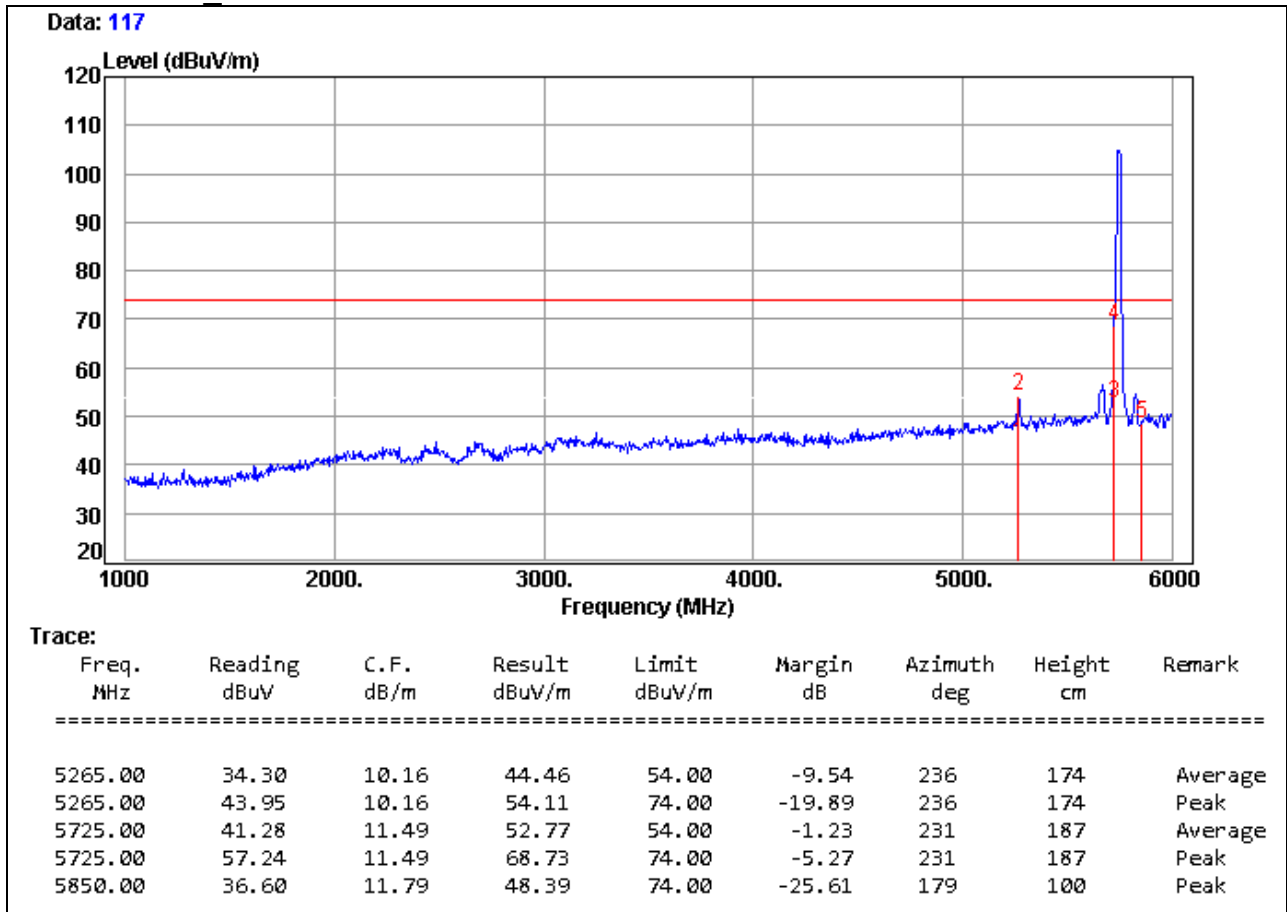
966 Chamber_C at 3Meter / Horizontal**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/22
Test Mode	UNII Band 3 / IEEE 802.11a TX / CH Low	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical

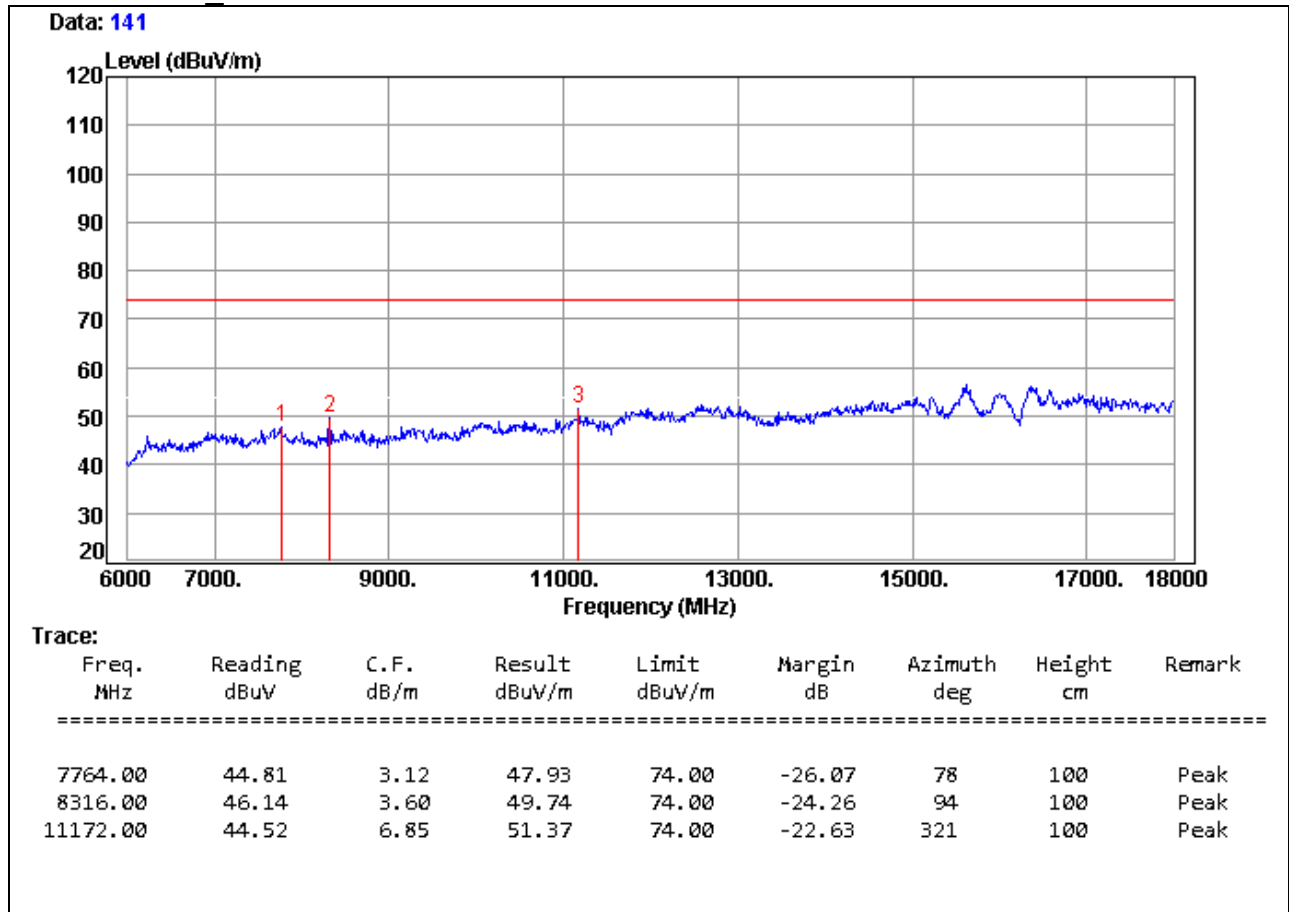
**Remark:**

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 3 / IEEE 802.11a TX / CH Low	Temp. & Humidity	25°C, 53%

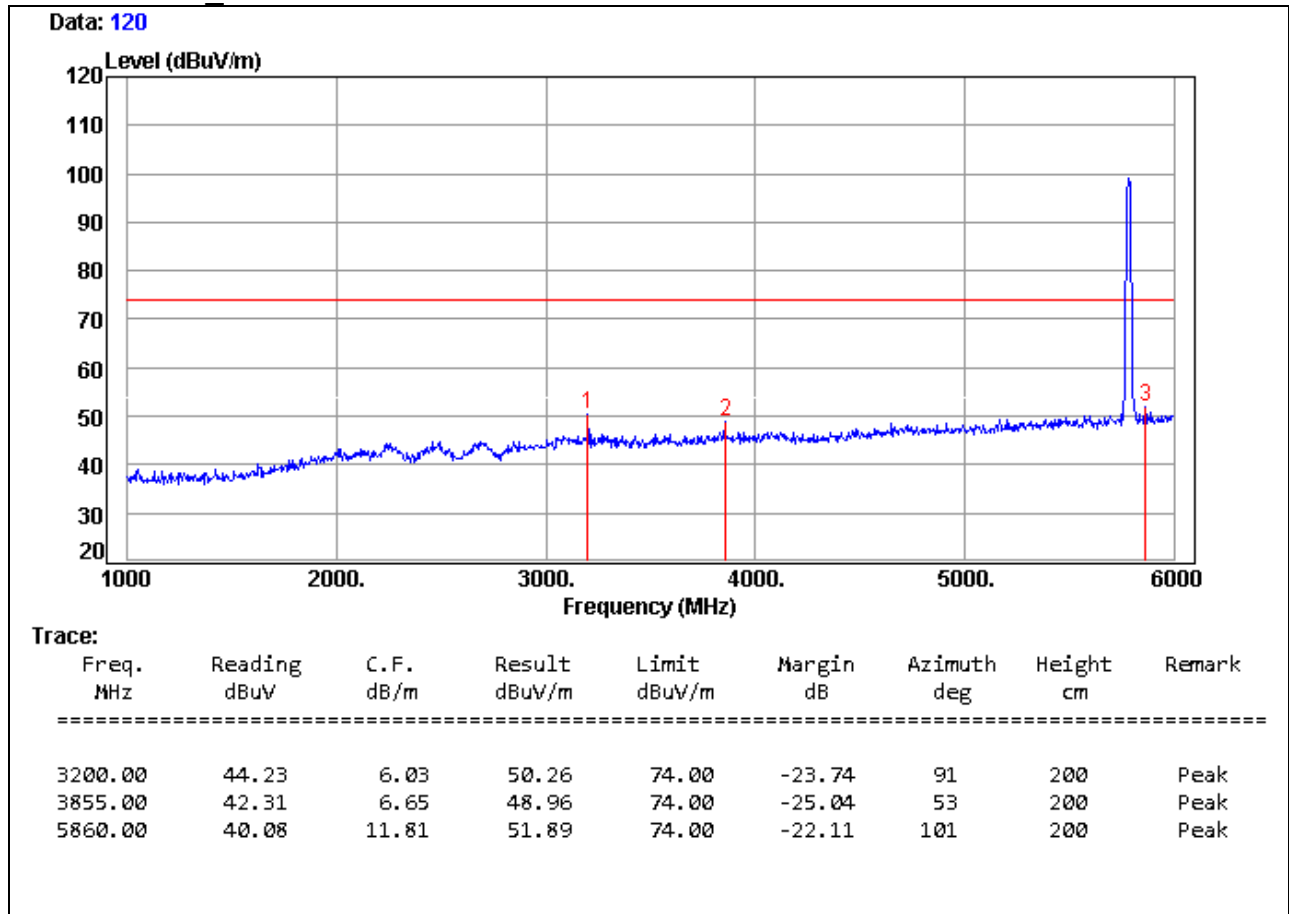
966 Chamber_C at 3Meter / Vertical

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/22
Test Mode	UNII Band 3 / IEEE 802.11a TX / CH Middle	Temp. & Humidity	25°C, 53%

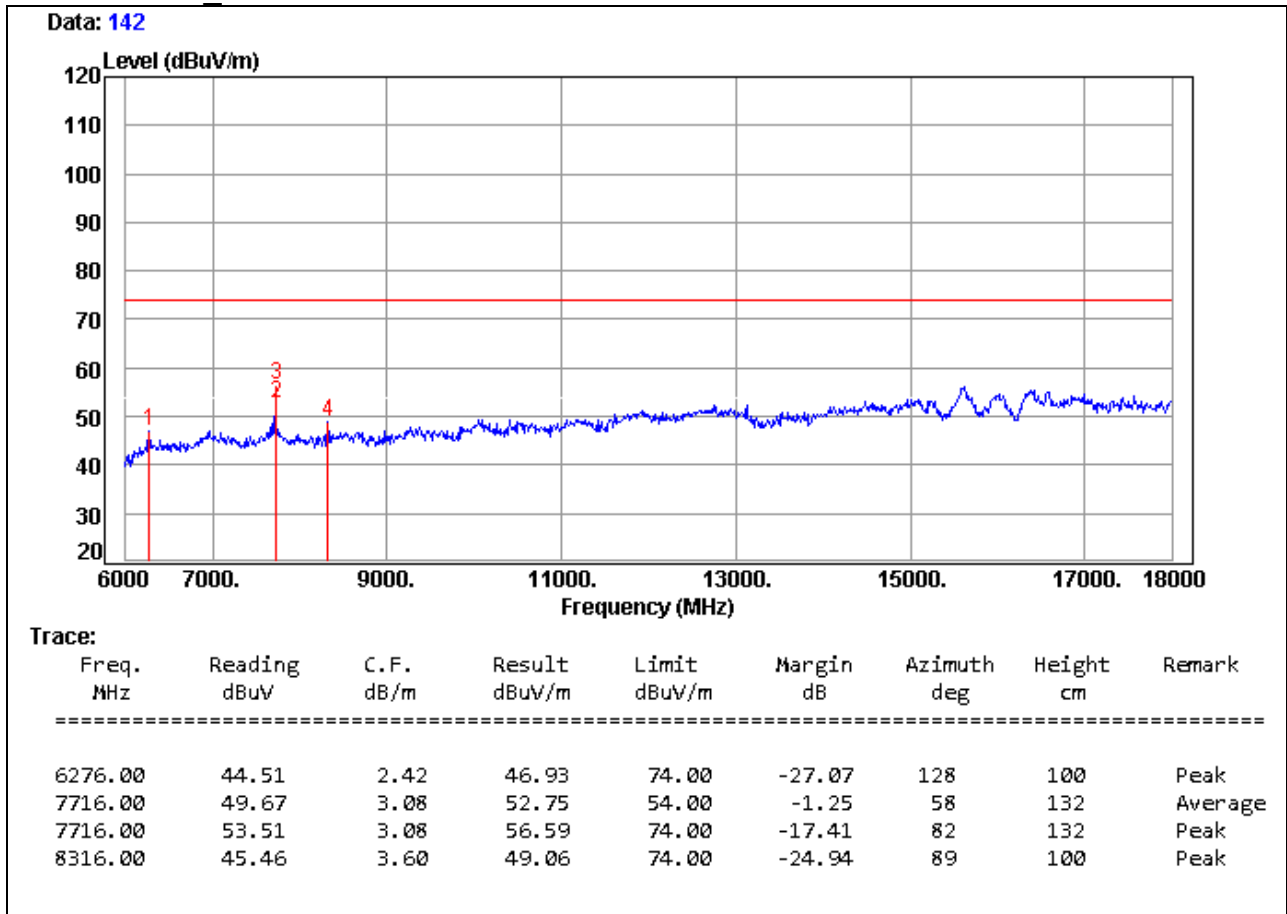
966 Chamber_C at 3Meter / Horizontal**Remark:**

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 3 / IEEE 802.11a TX / CH Middle	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Horizontal



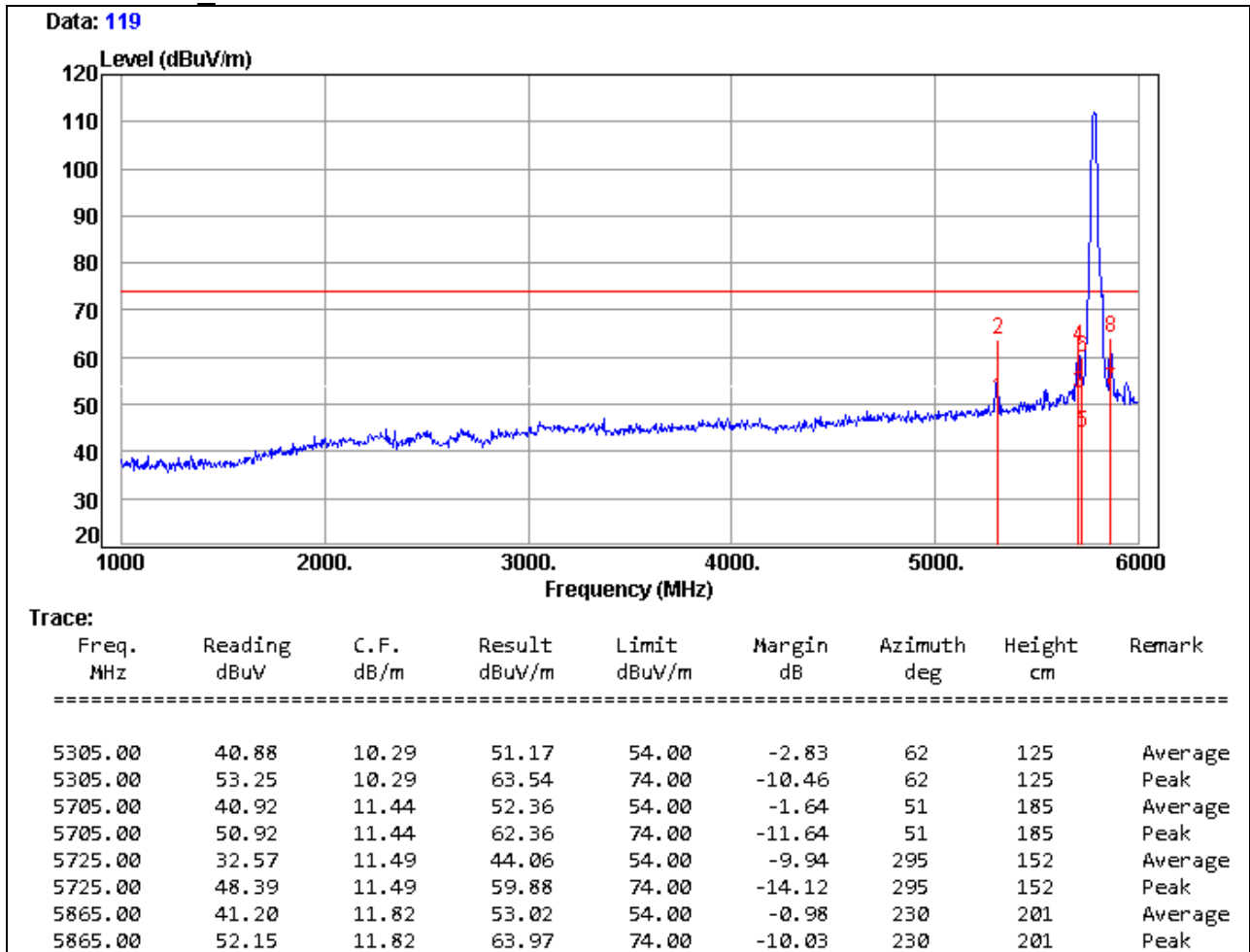
Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/25
Test Mode	UNII Band 3 / IEEE 802.11a TX / CH Middle	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical

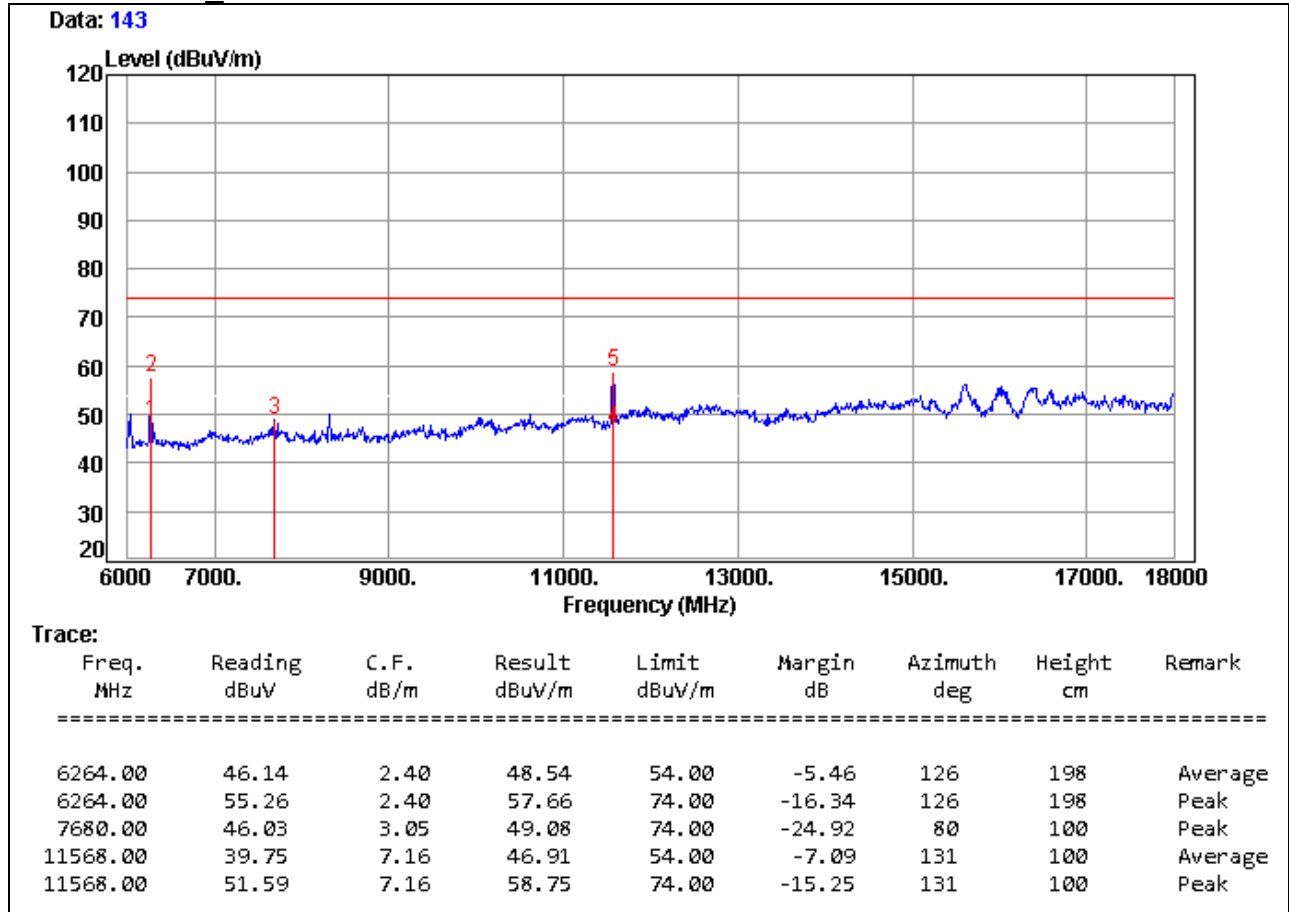
**Remark:**

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 3 / IEEE 802.11a TX / CH Middle	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical



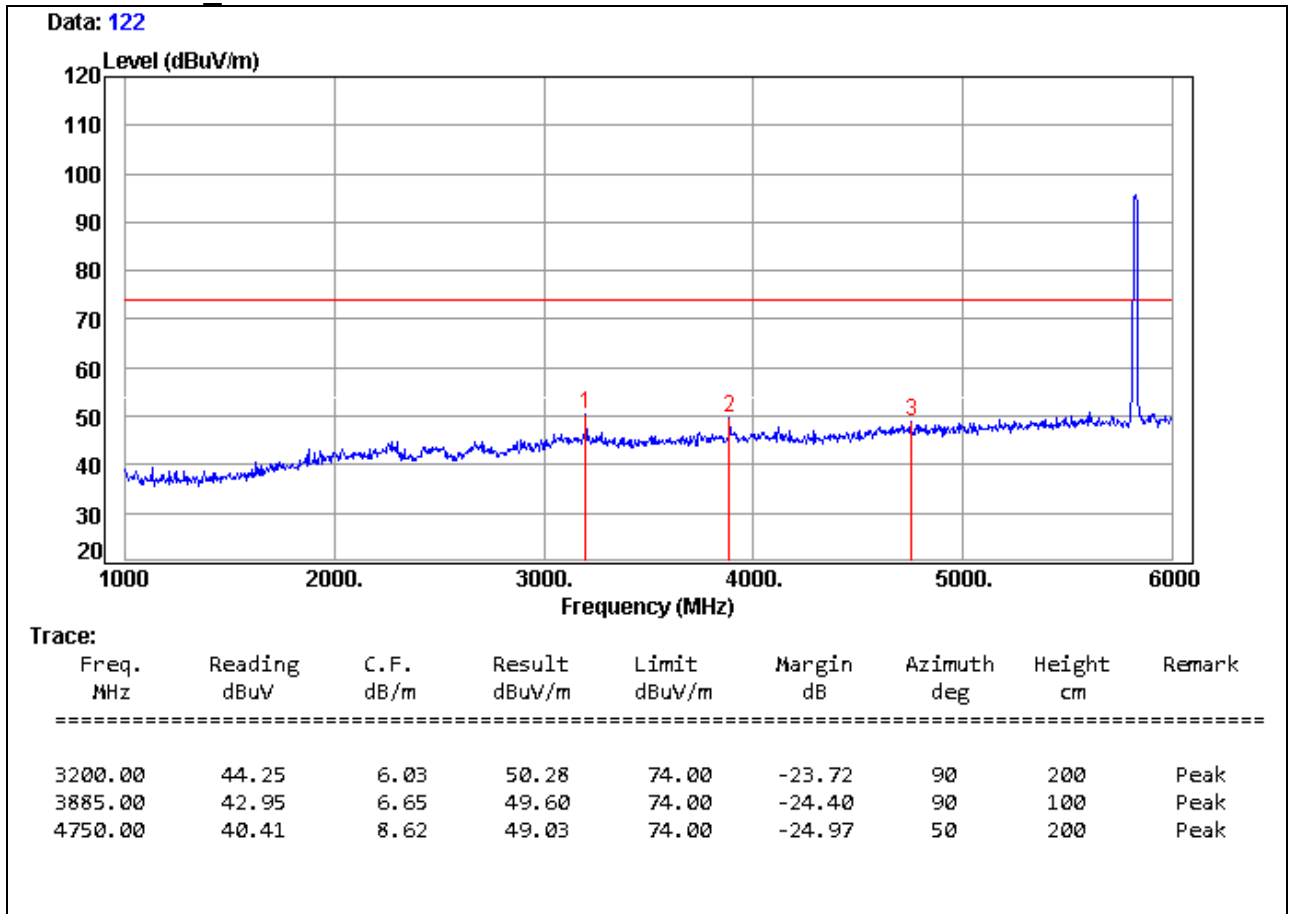
Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/22
Test Mode	UNII Band 3 / IEEE 802.11a TX / CH High	Temp. & Humidity	25°C, 53%

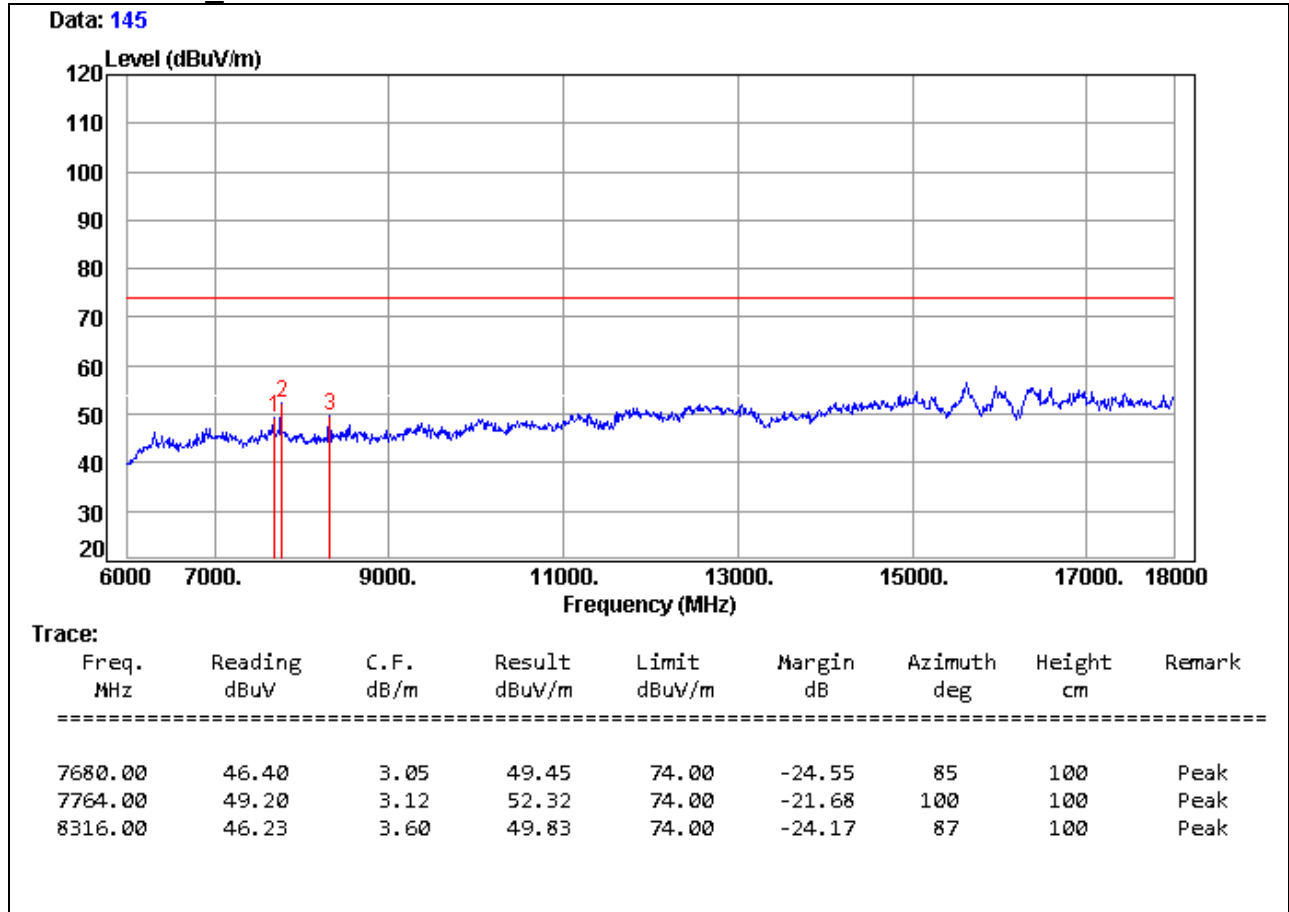
966 Chamber_C at 3Meter / Horizontal

**Remark:**

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 3 / IEEE 802.11a TX / CH High	Temp. & Humidity	25°C, 53%

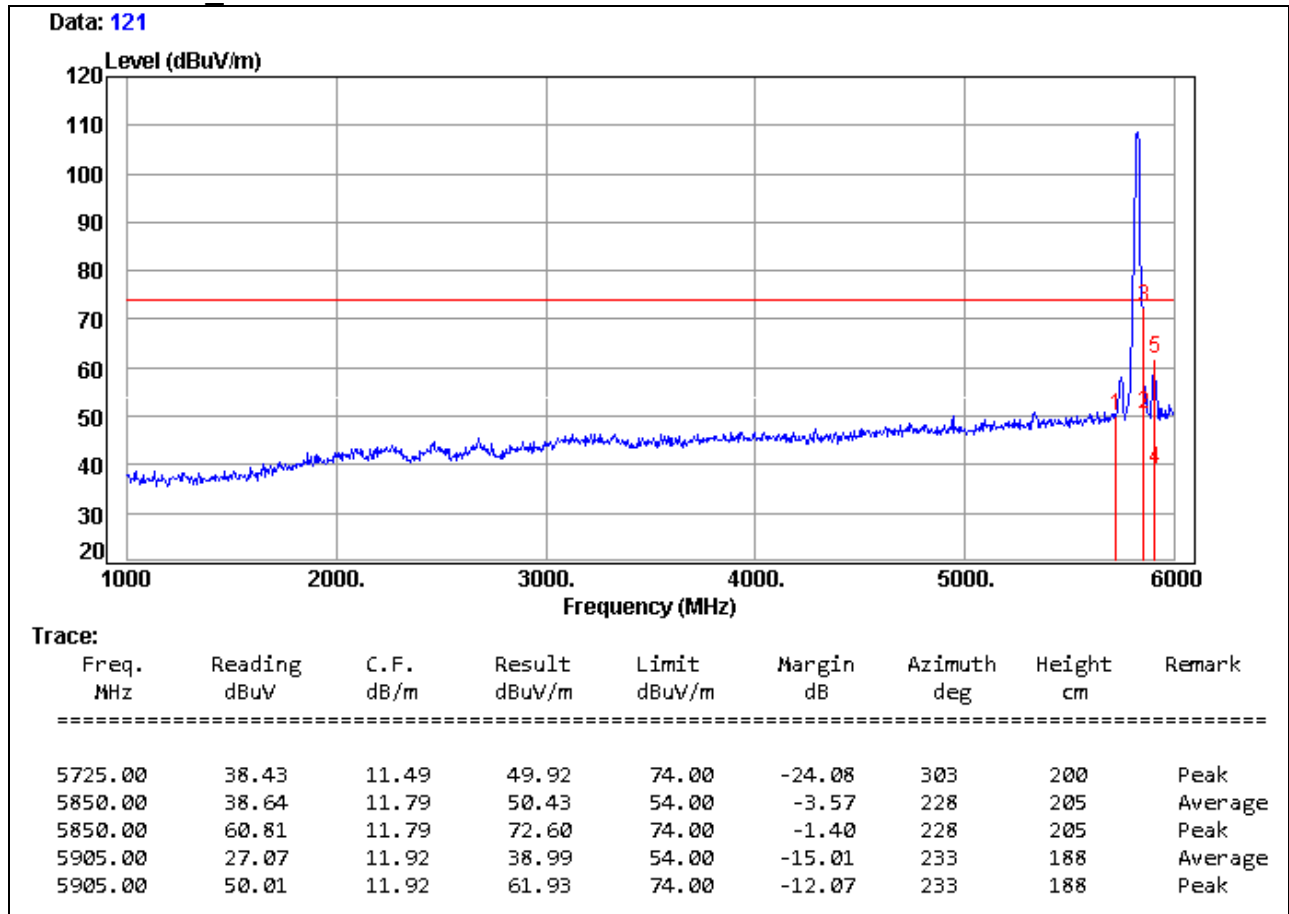
966 Chamber_C at 3Meter / Horizontal**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/22
Test Mode	UNII Band 3 / IEEE 802.11a TX / CH High	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical



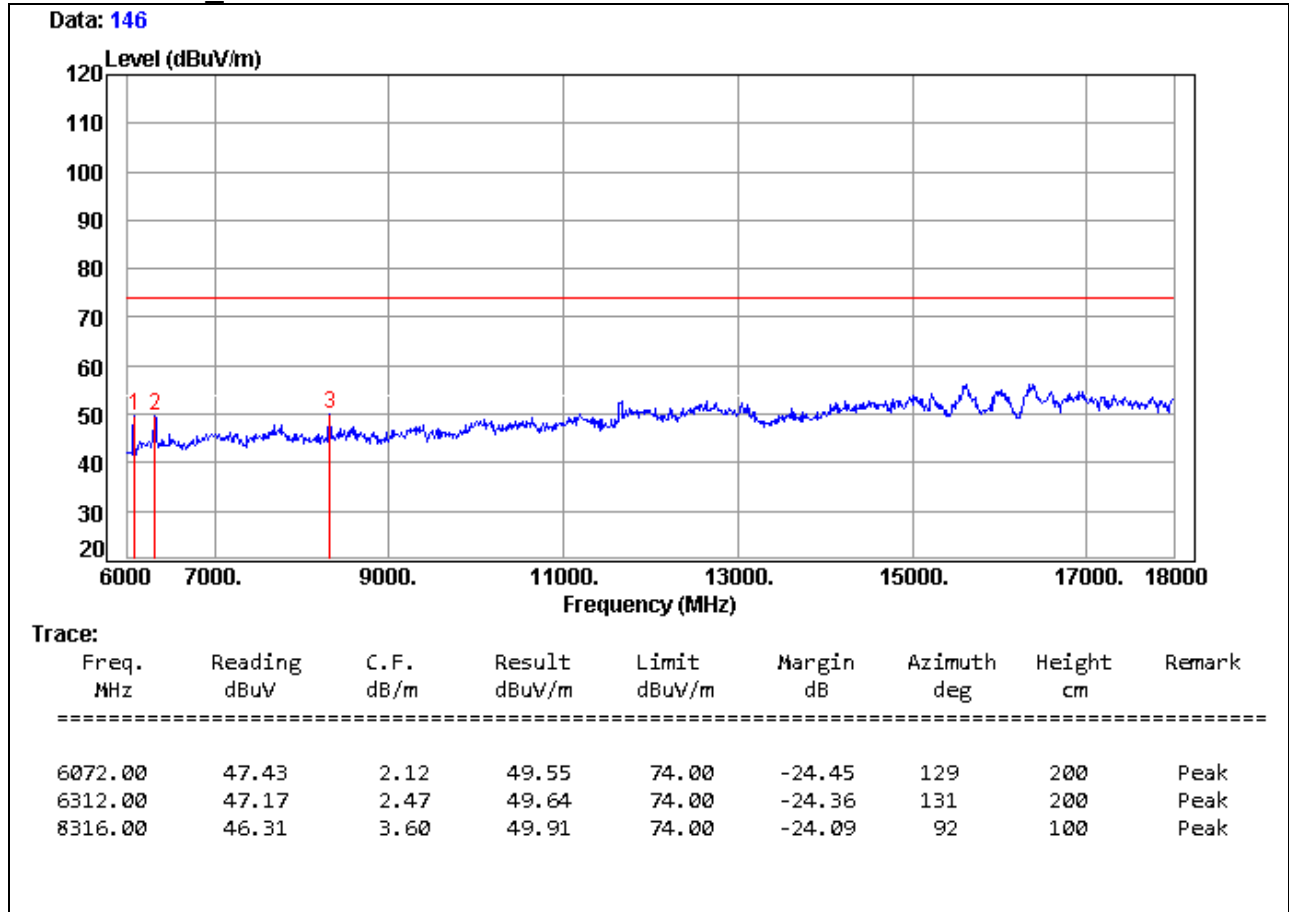
Remark:

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 3 / IEEE 802.11a TX / CH High	Temp. & Humidity	25°C, 53%

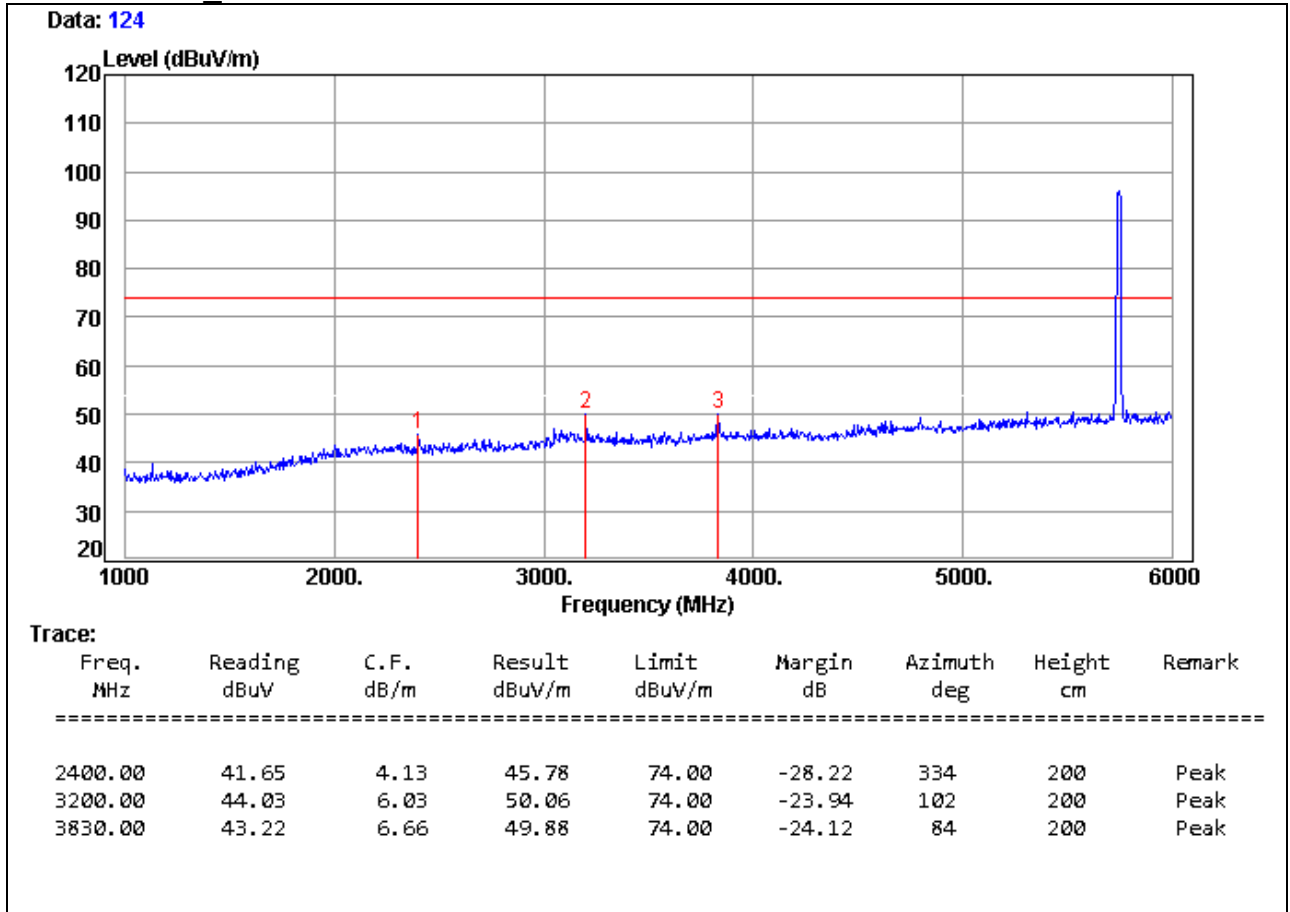
966 Chamber_C at 3Meter / Vertical

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



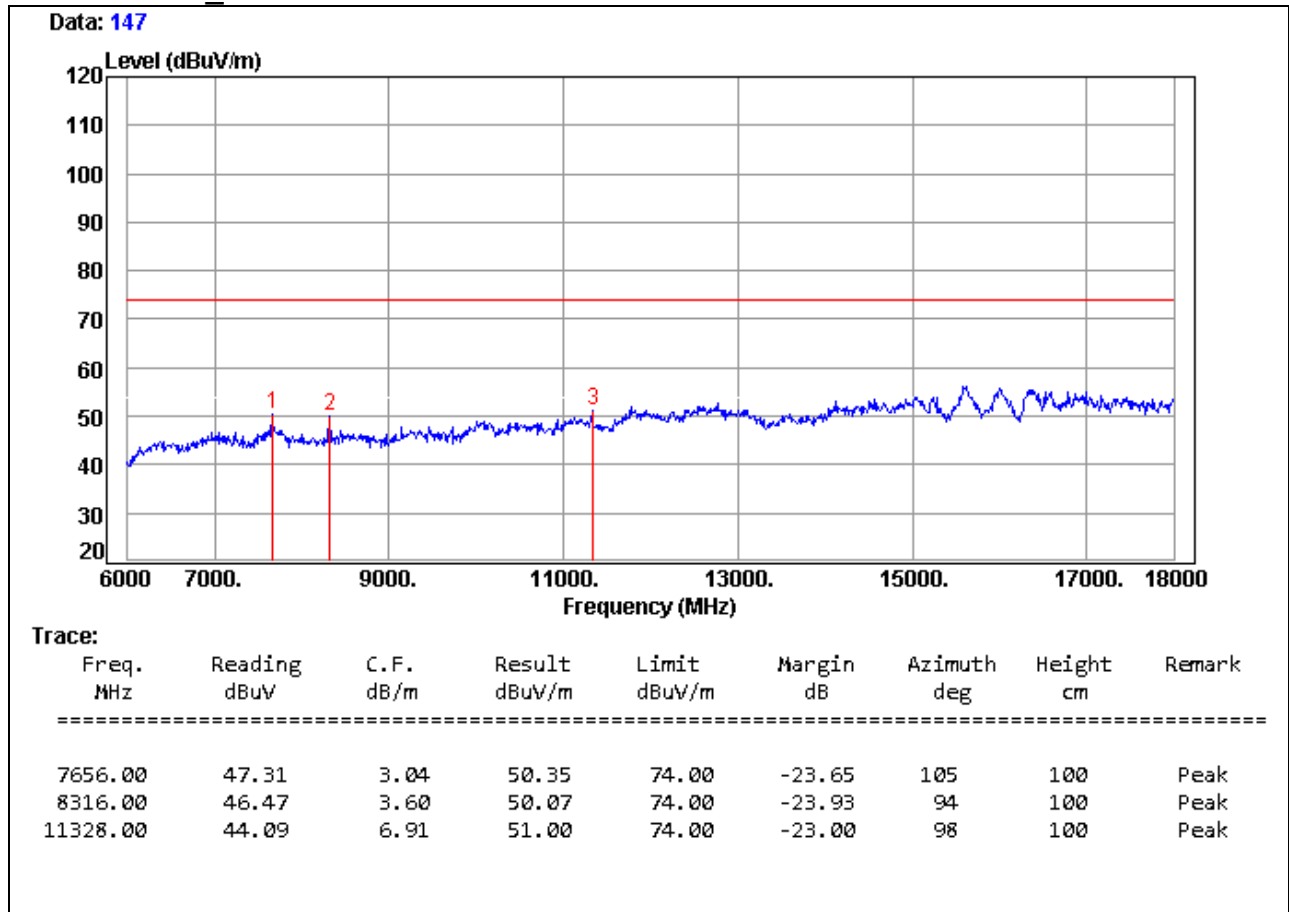
Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/22
Test Mode	UNII Band 3 / IEEE 802.11ac VHT20 TX / CH Low	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Horizontal**Remark:**

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 3 / IEEE 802.11ac VHT20 TX / CH Low	Temp. & Humidity	25°C, 53%

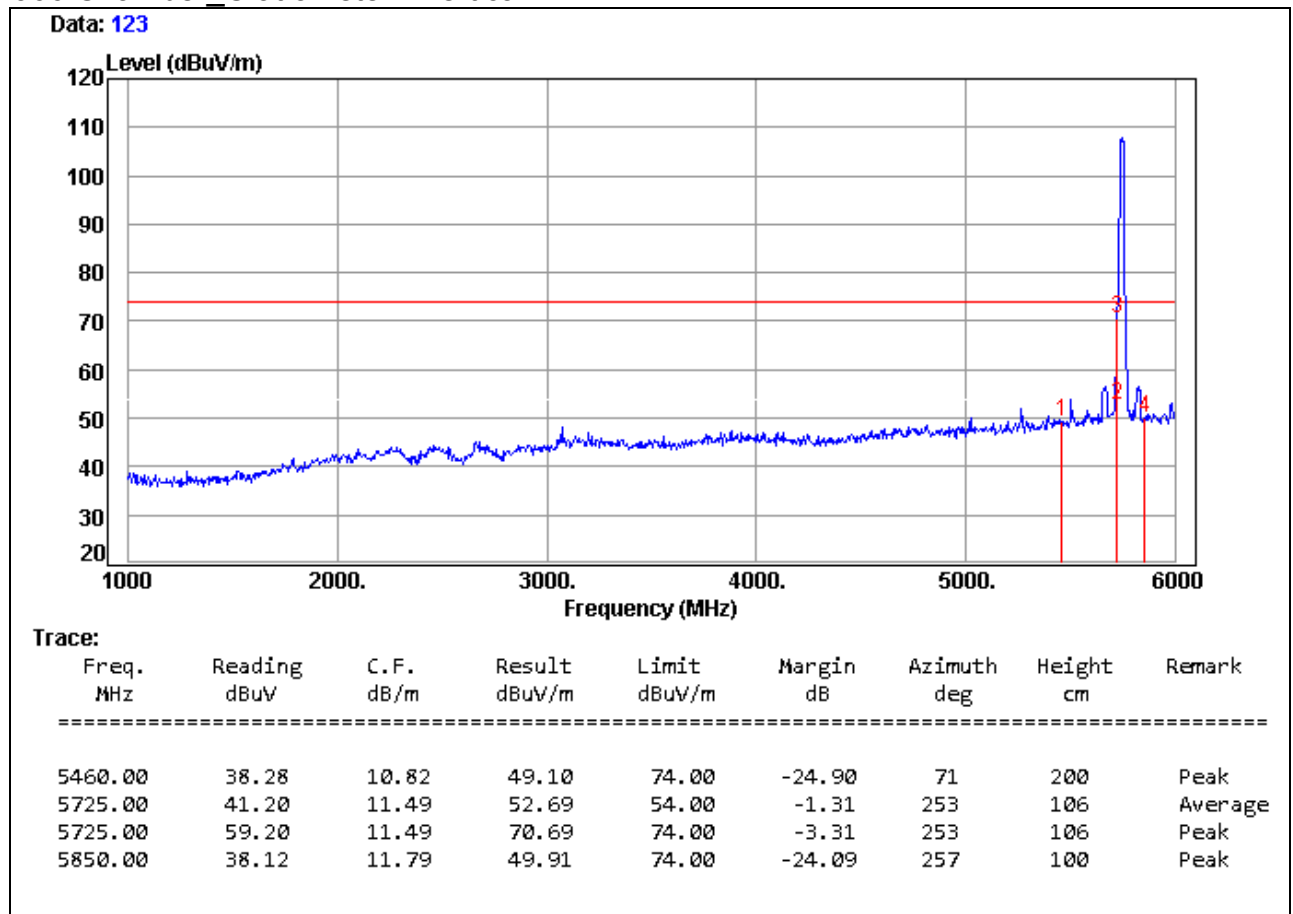
966 Chamber_C at 3Meter / Horizontal**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/22
Test Mode	UNII Band 3 / IEEE 802.11ac VHT20 TX / CH Low	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical



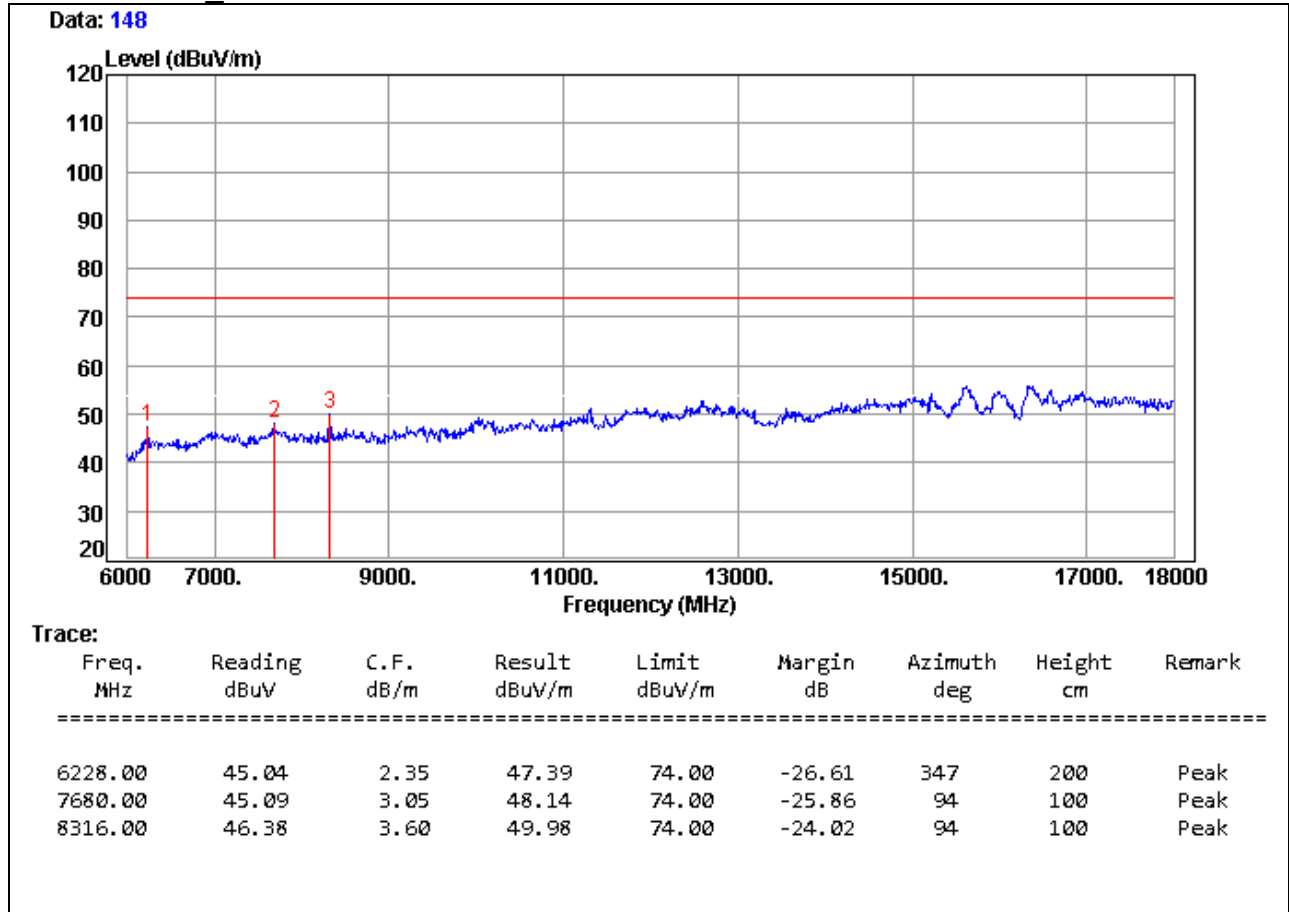
Remark:

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 3 / IEEE 802.11ac VHT20 TX / CH Low	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical

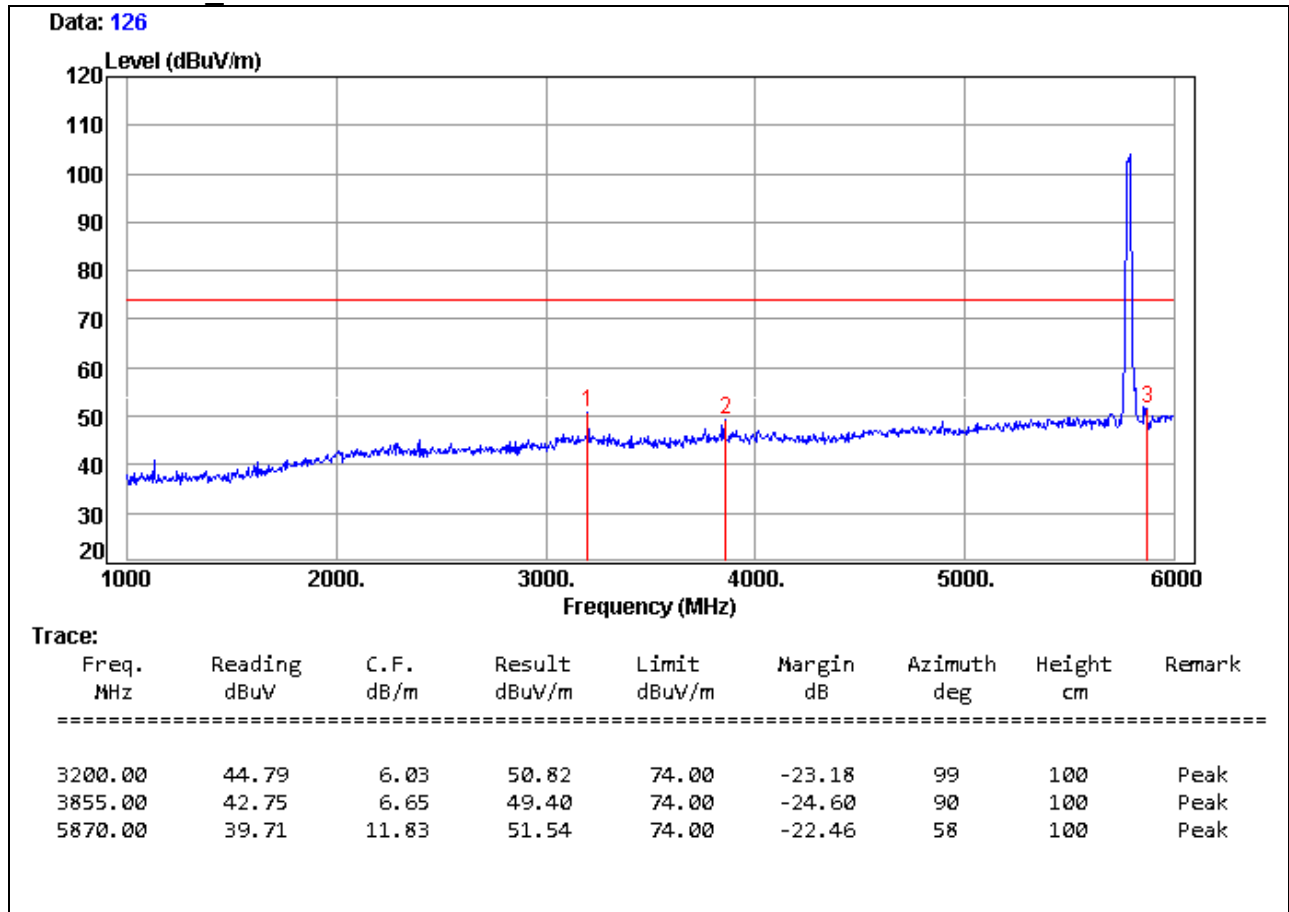


Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



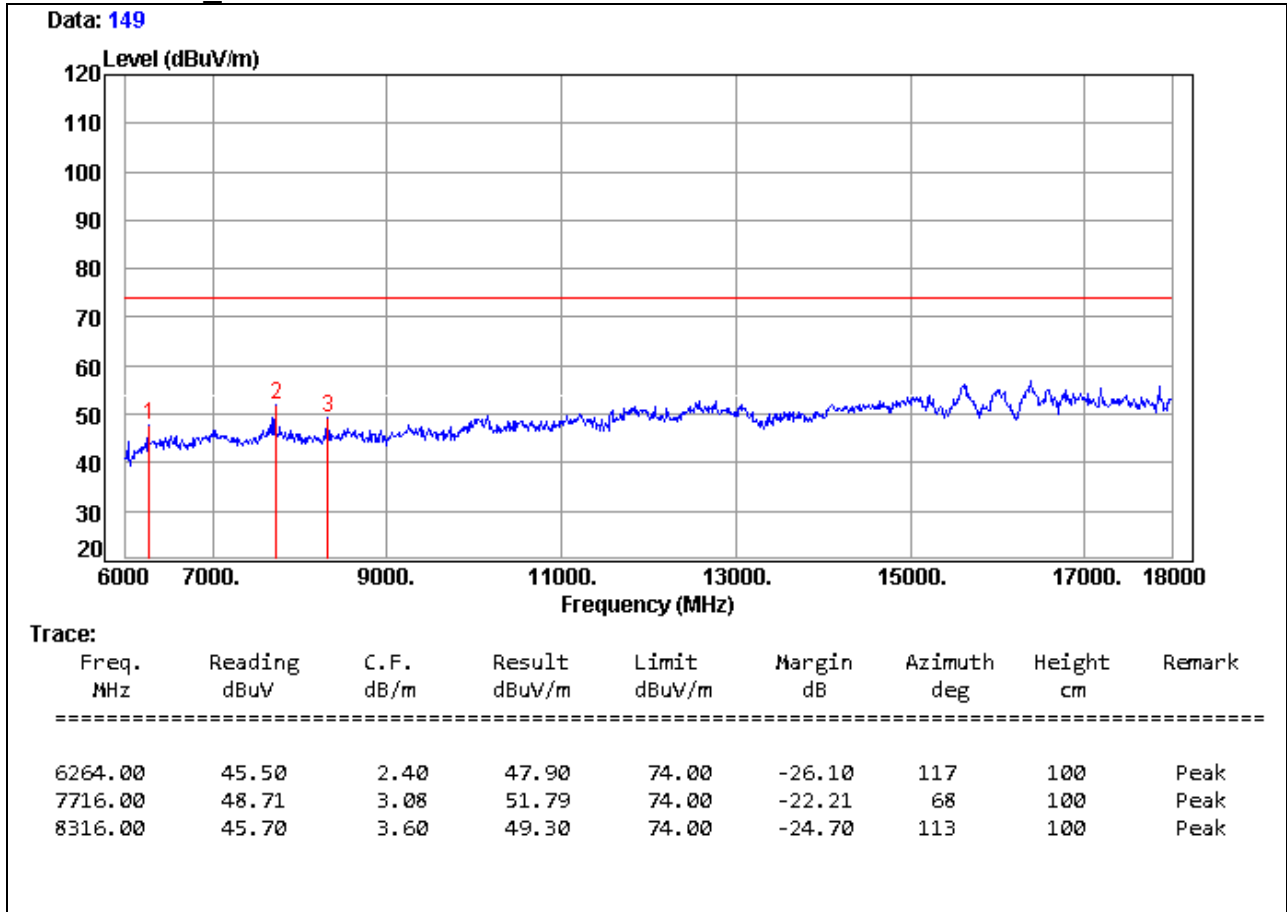
Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/22
Test Mode	UNII Band 3 / IEEE 802.11ac VHT20 TX / CH Middle	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Horizontal**Remark:**

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 3 / IEEE 802.11ac VHT20 TX / CH Middle	Temp. & Humidity	25°C, 53%

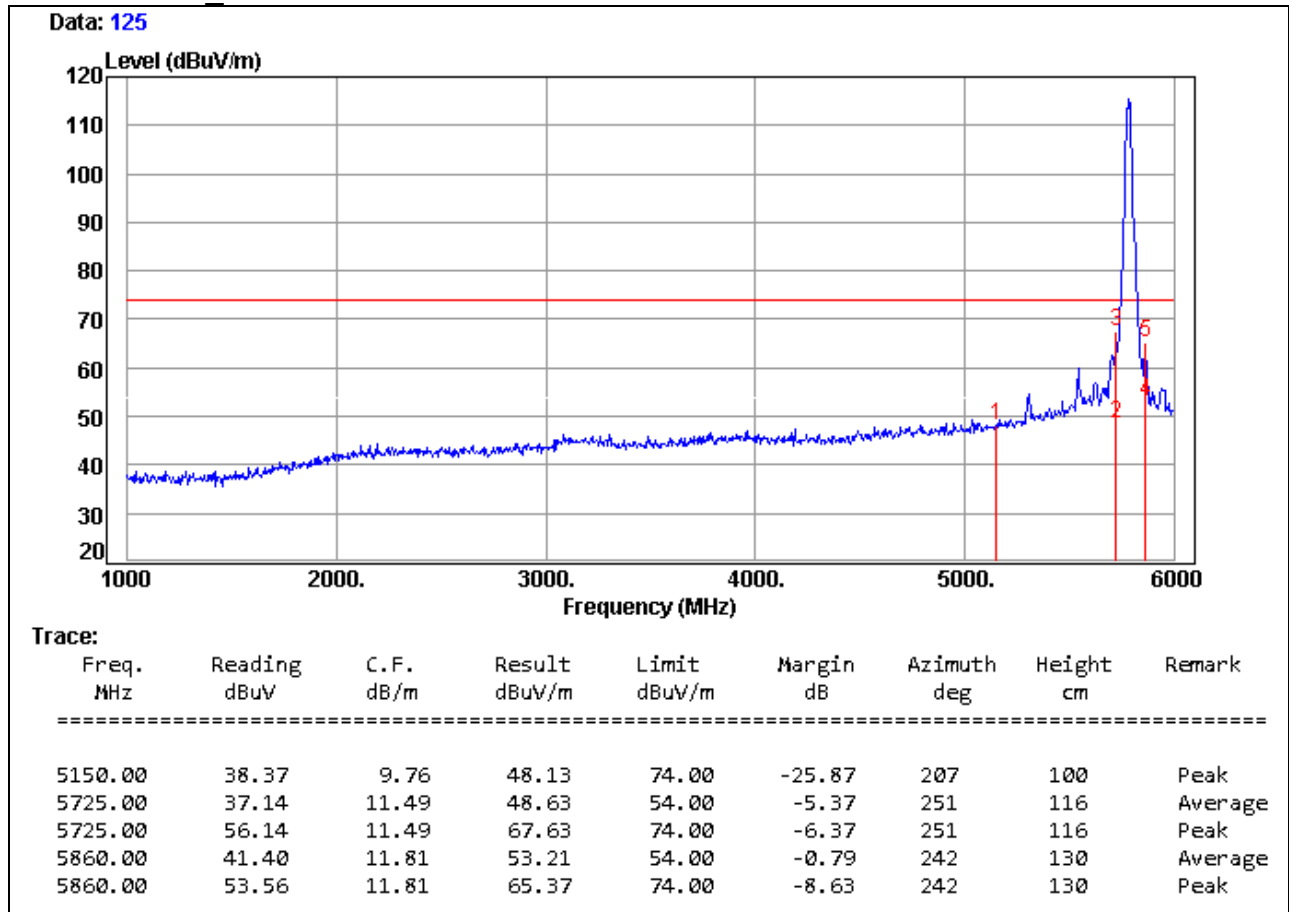
966 Chamber_C at 3Meter / Horizontal**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/22
Test Mode	UNII Band 3 / IEEE 802.11ac VHT20 TX / CH Middle	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical

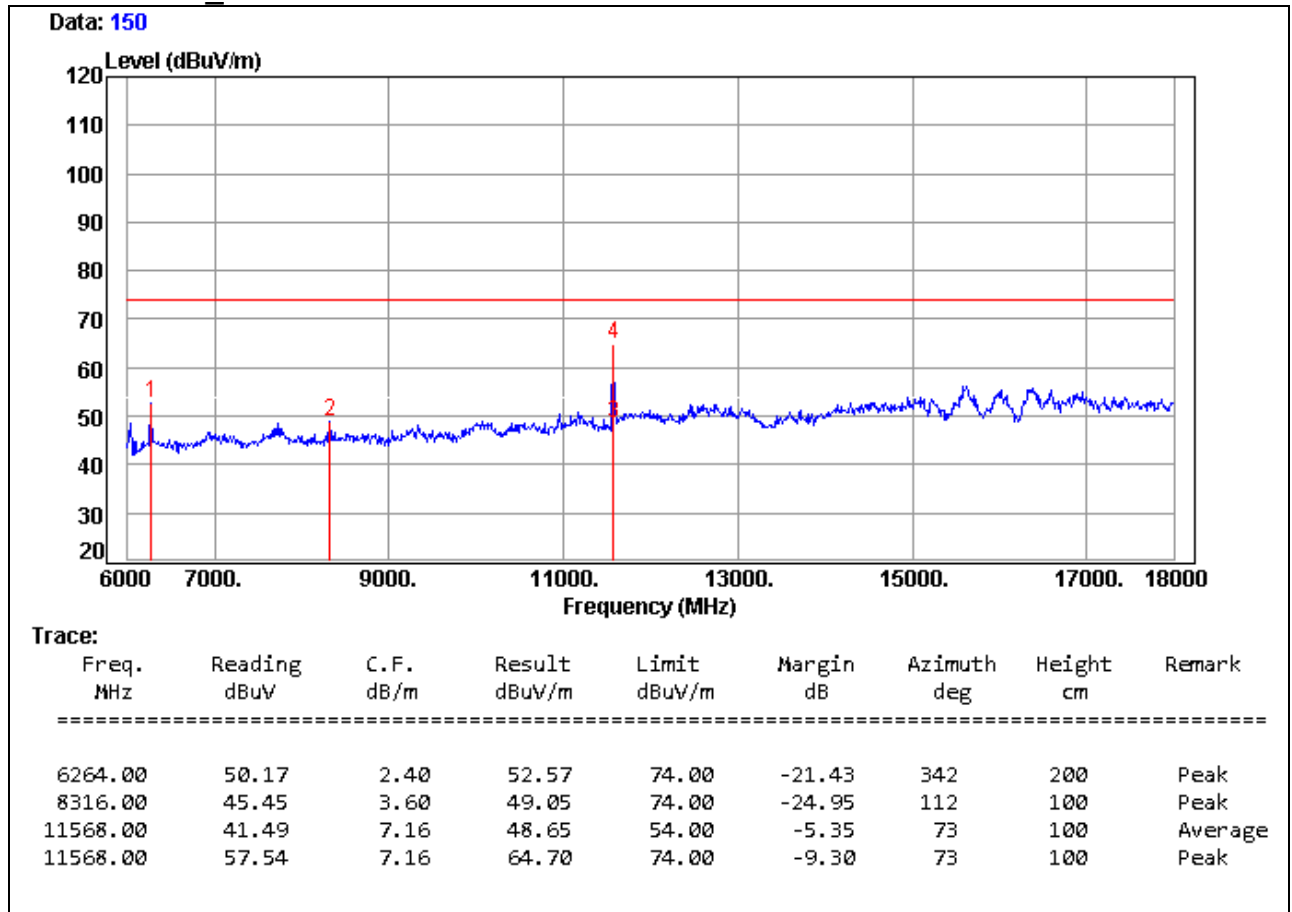
**Remark:**

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 3 / IEEE 802.11ac VHT20 TX / CH Middle	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical

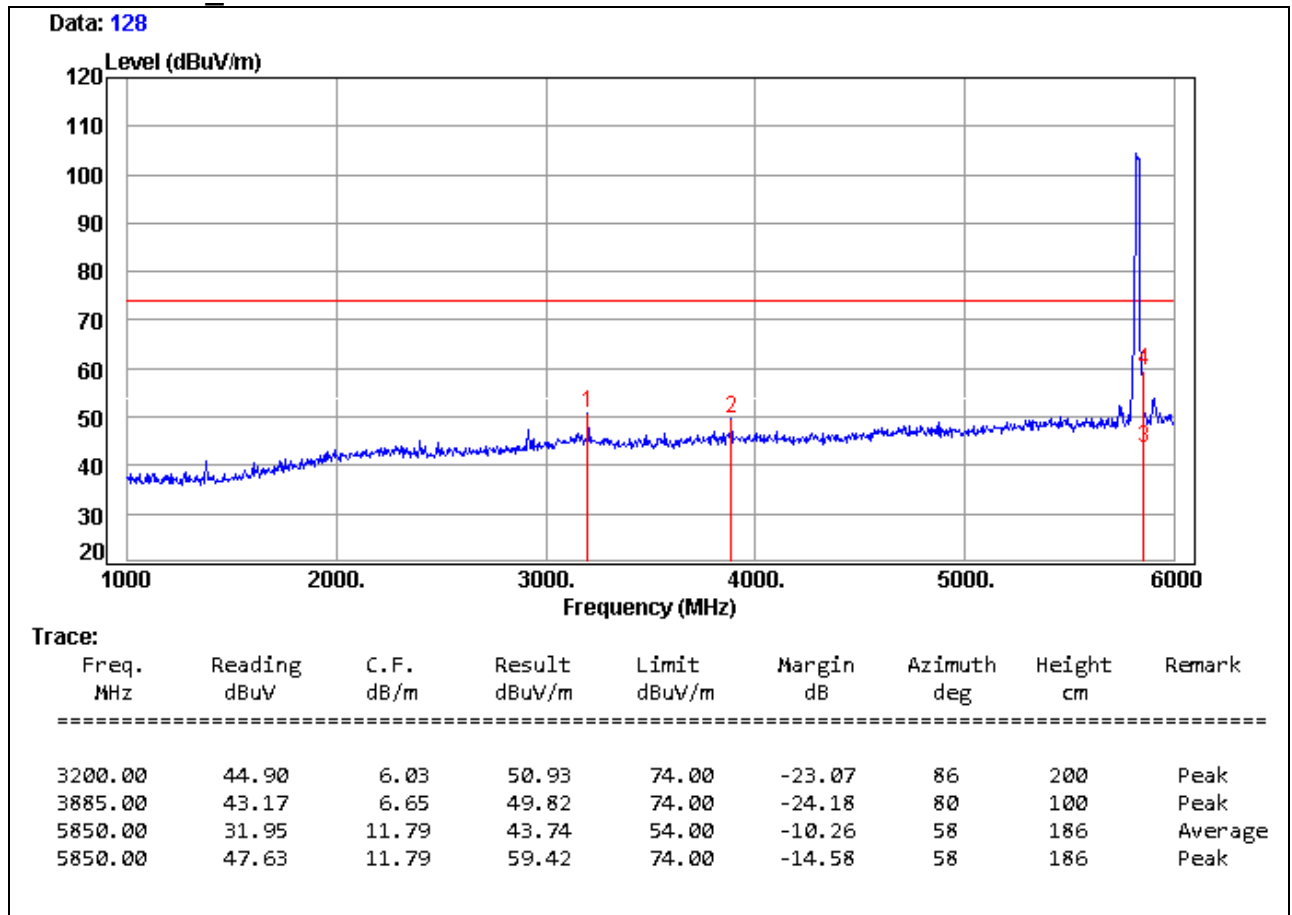
**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/22
Test Mode	UNII Band 3 / IEEE 802.11ac VHT20 TX / CH High	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Horizontal



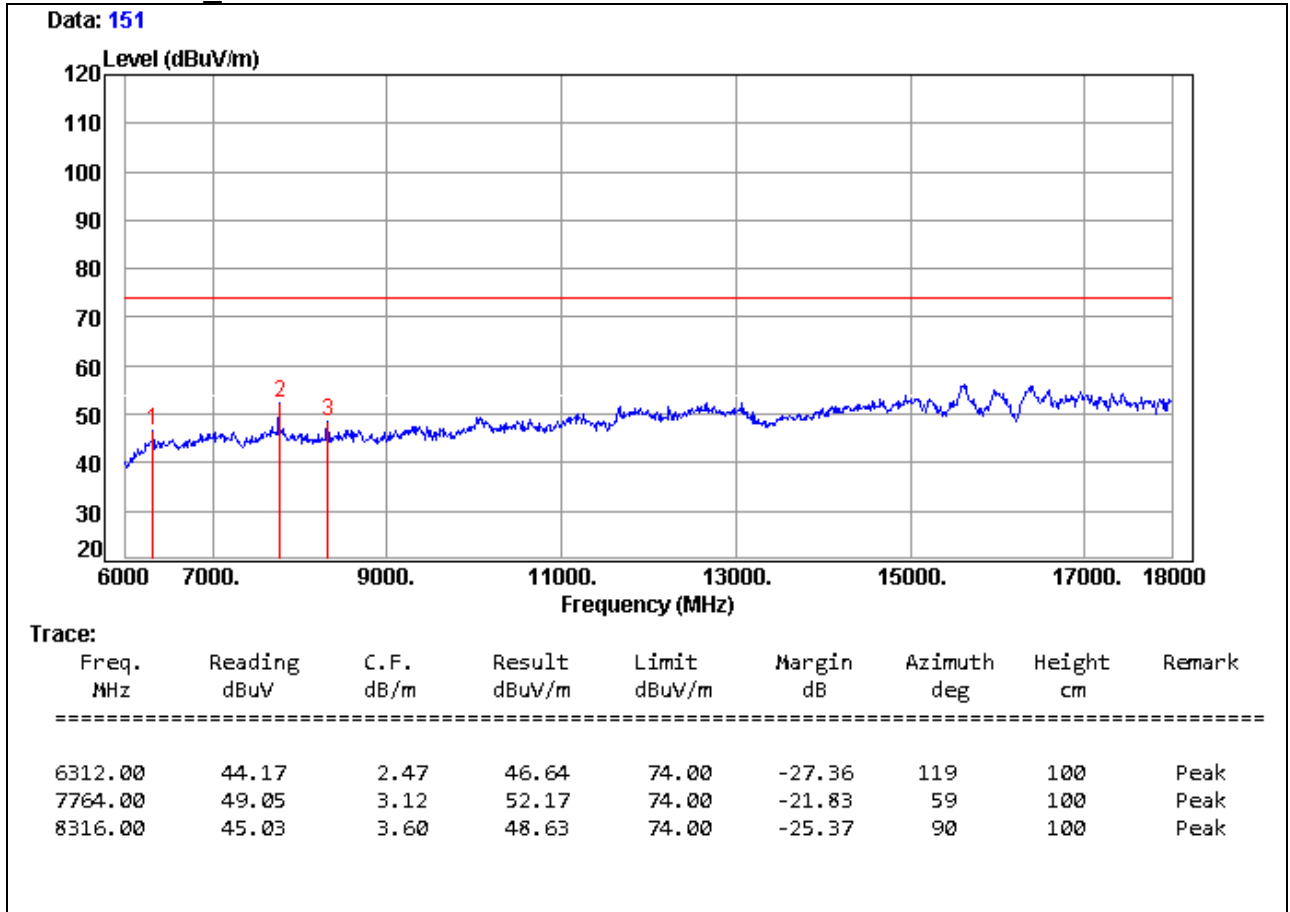
Remark:

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 3 / IEEE 802.11ac VHT20 TX / CH High	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Horizontal



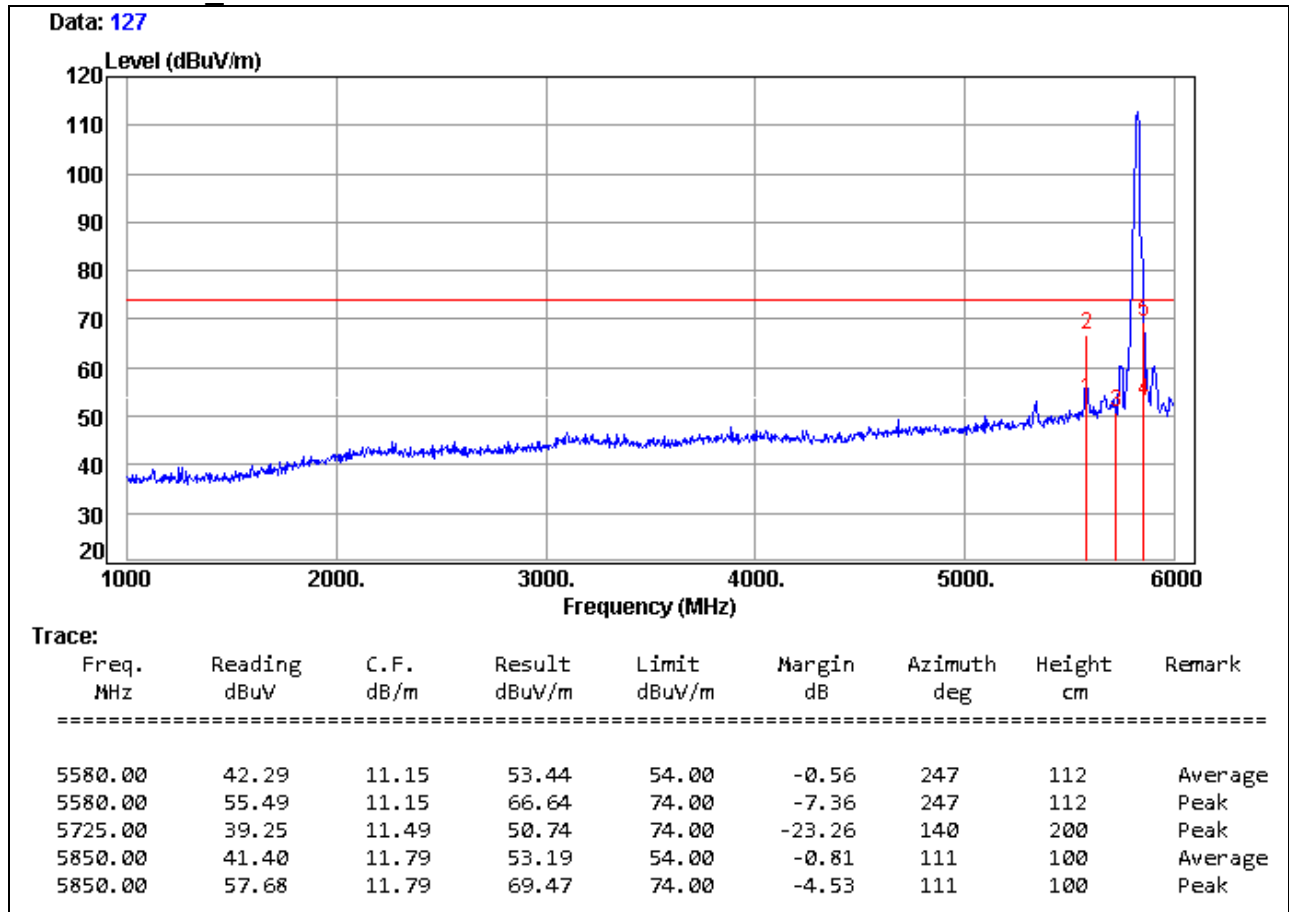
Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/22
Test Mode	UNII Band 3 / IEEE 802.11ac VHT20 TX / CH High	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical

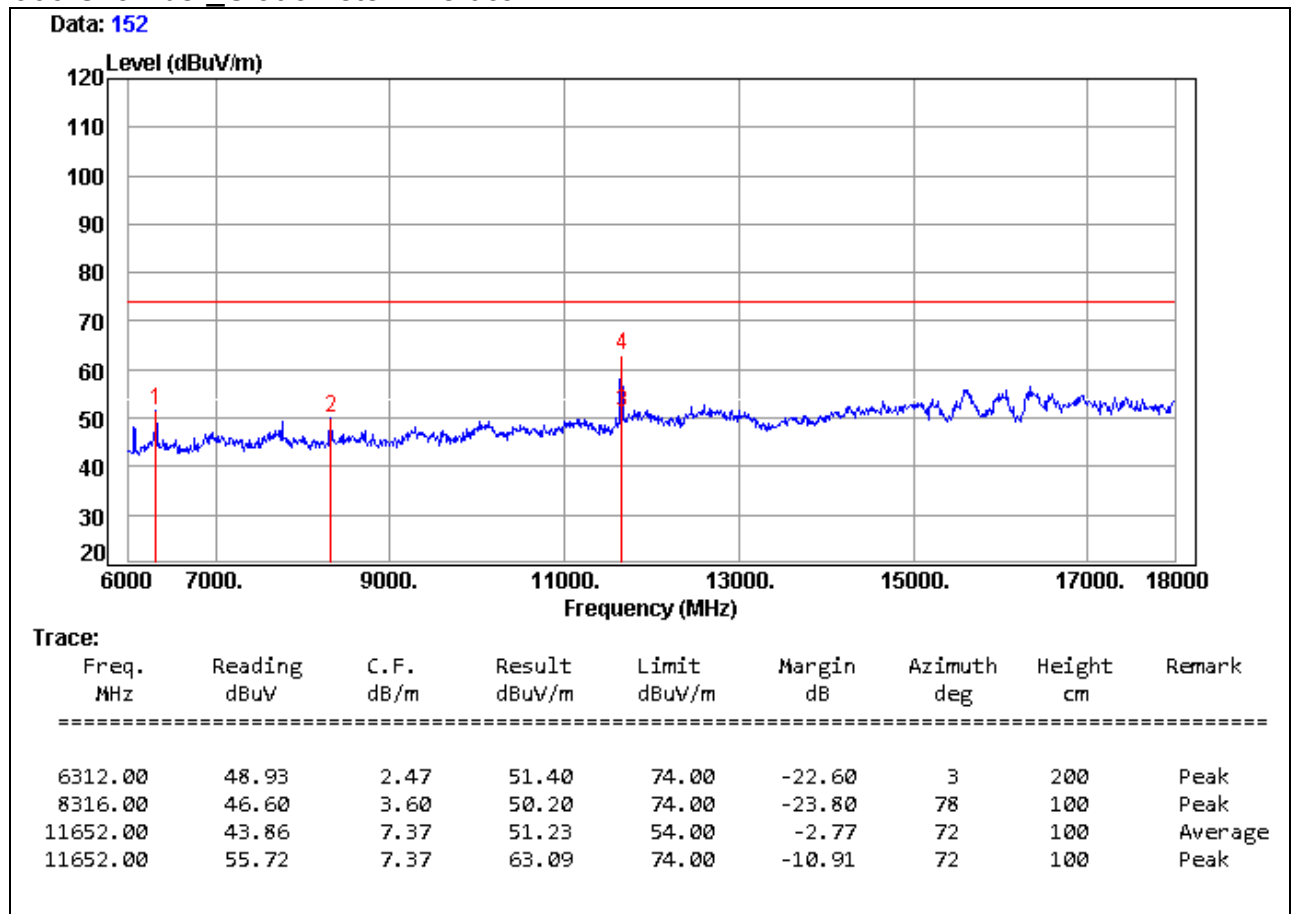
**Remark:**

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 3 / IEEE 802.11ac VHT20 TX / CH High	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical



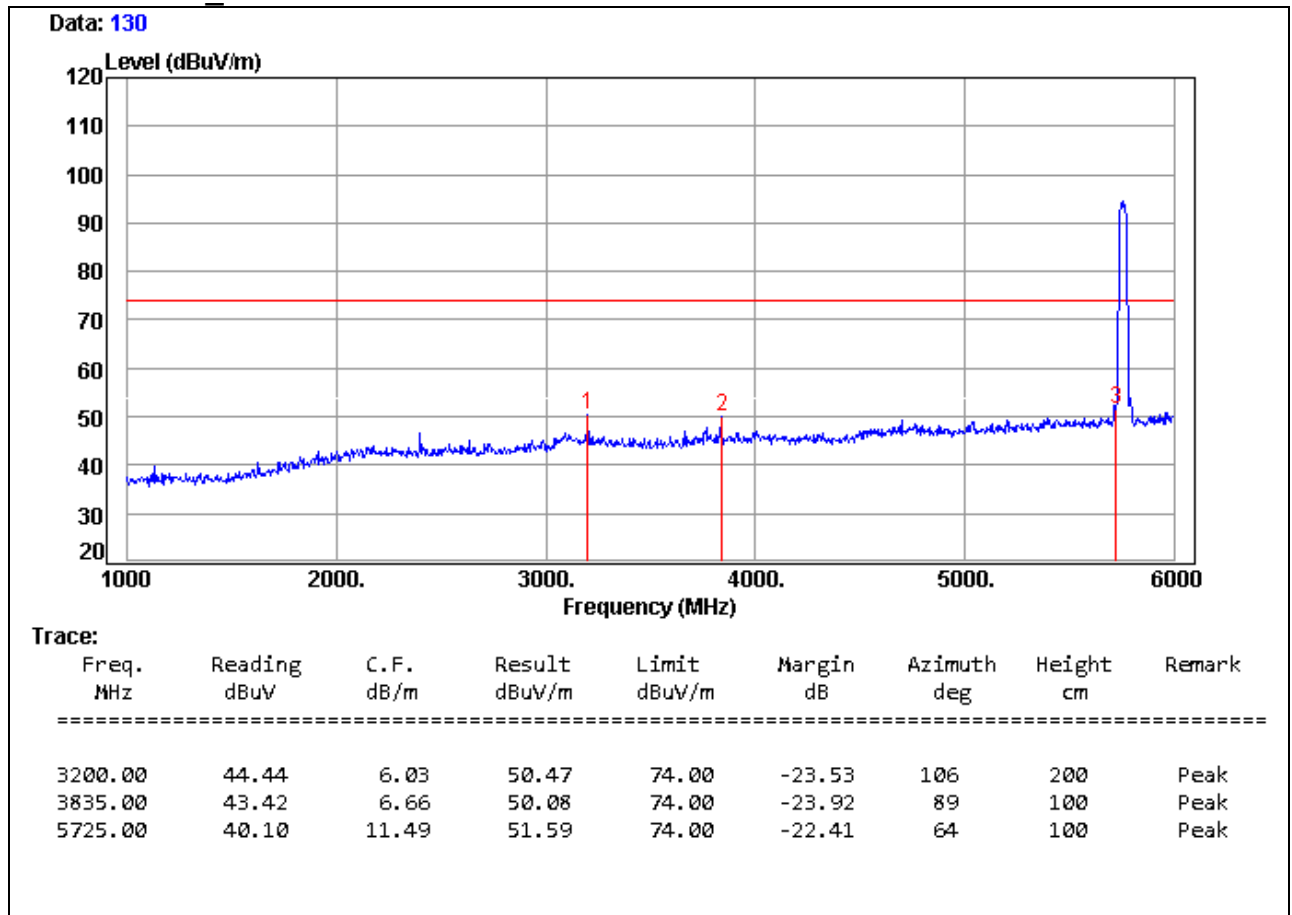
Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	TREK-674	Test Date	2015/05/25
Test Mode	UNII Band 3 / IEEE 802.11ac VHT40 TX / CH Low	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Horizontal

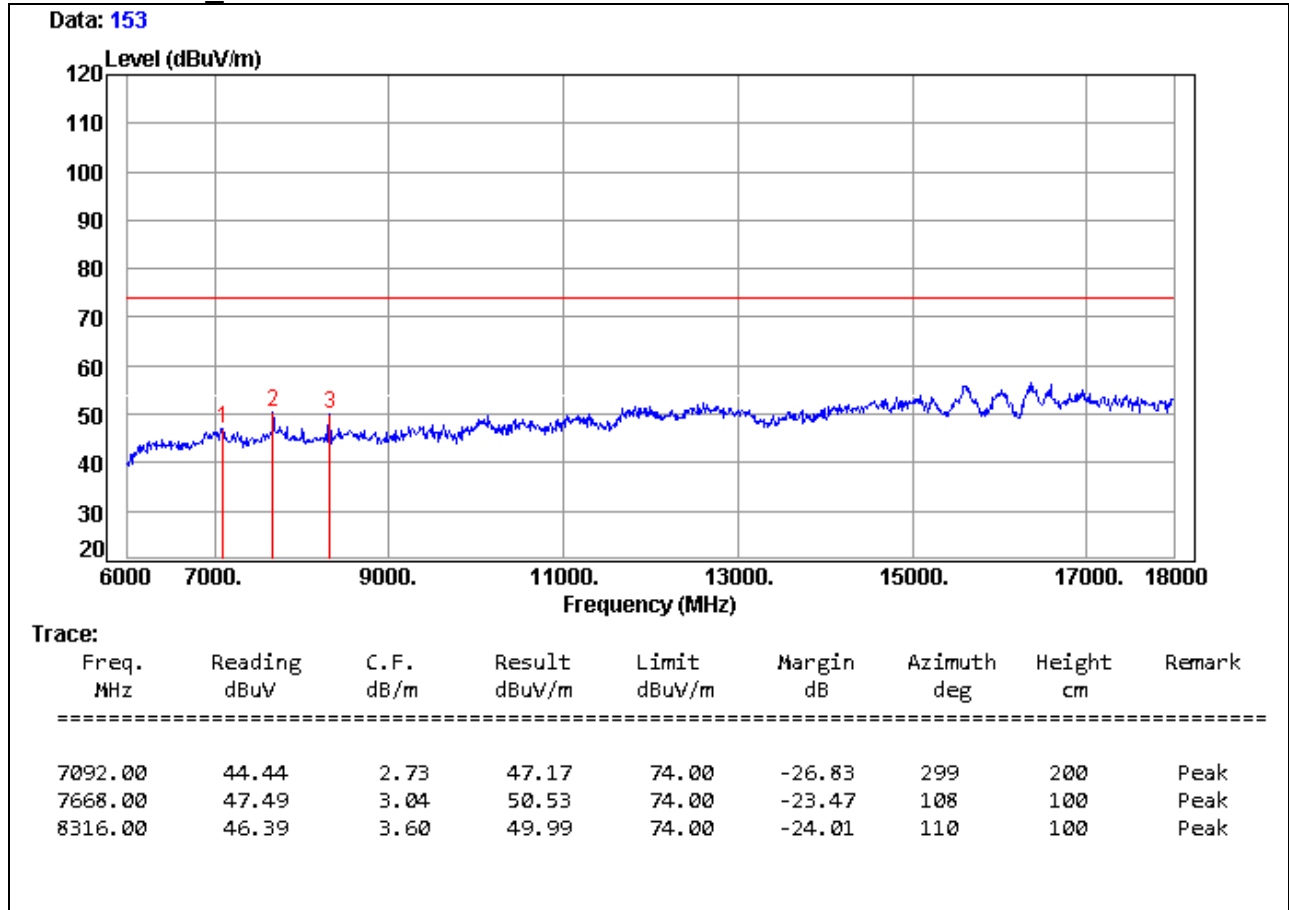


Remark:

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	TREK-674	Test Date	2015/05/28
Test Mode	UNII Band 3 / IEEE 802.11ac VHT40 TX / CH Low	Temp. & Humidity	25°C, 53%

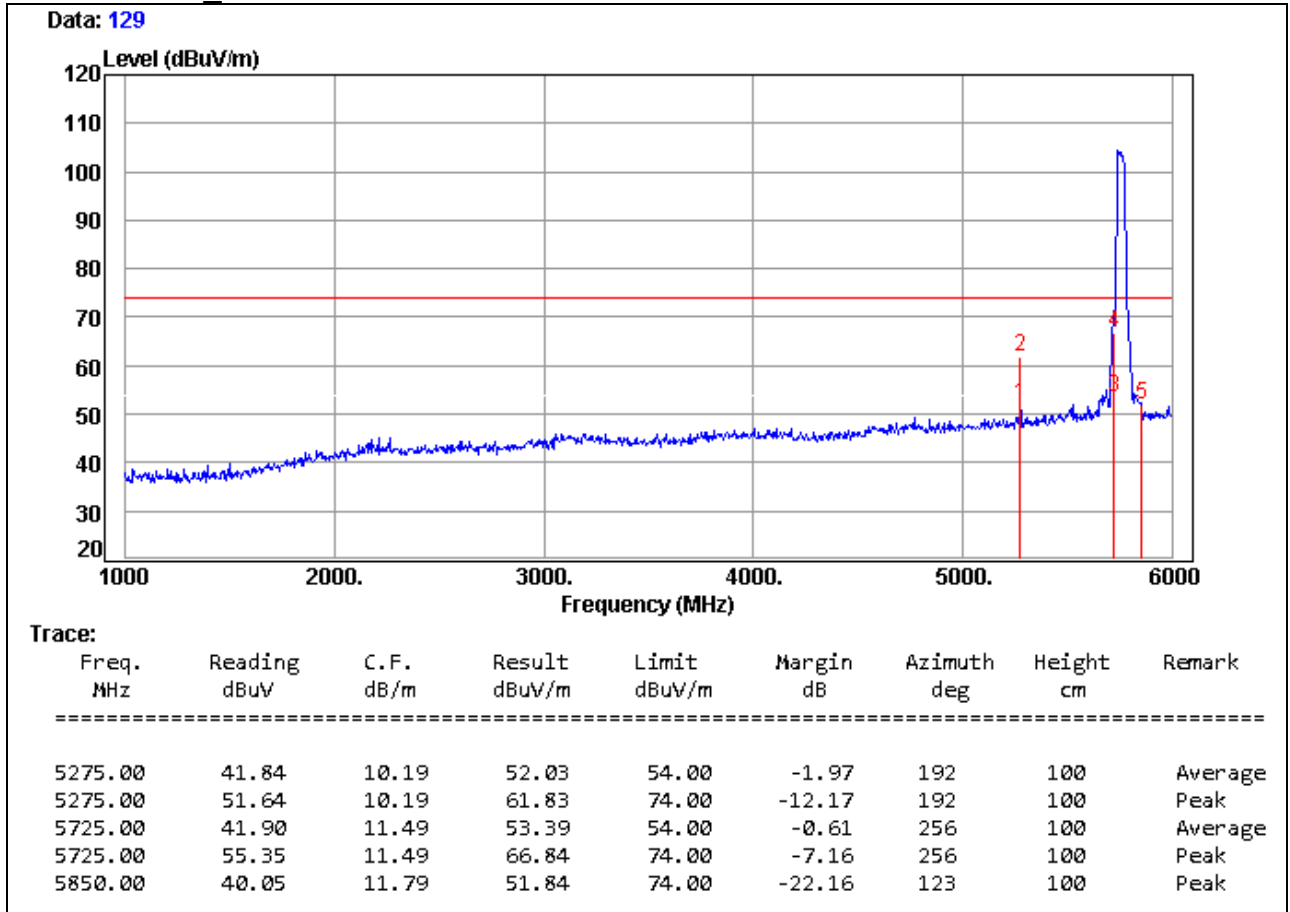
966 Chamber_C at 3Meter / Horizontal**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	TREK-674	Test Date	2015/05/25
Test Mode	UNII Band 3 / IEEE 802.11ac VHT40 TX / CH Low	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical

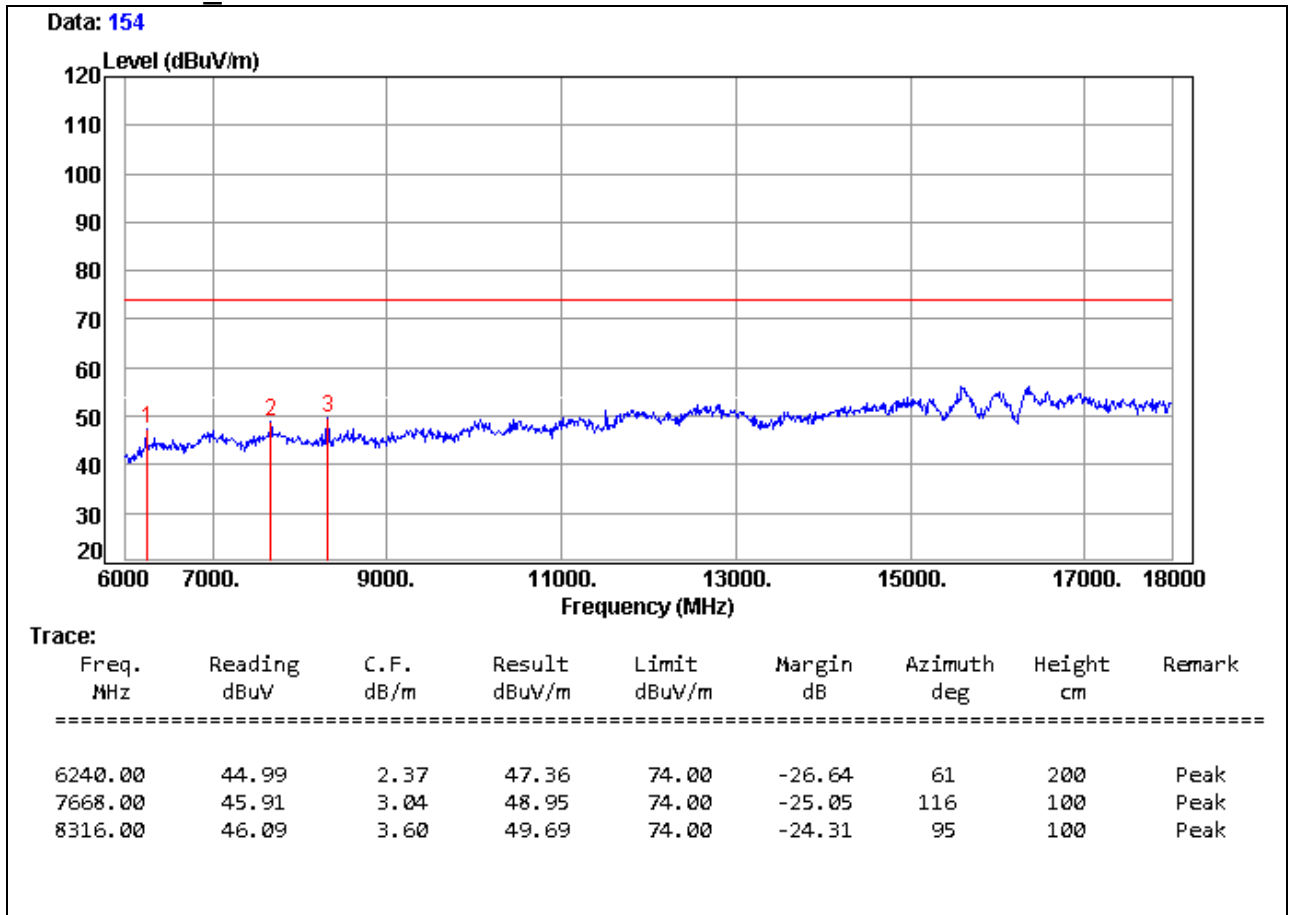
**Remark:**

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	TREK-674	Test Date	2015/05/28
Test Mode	UNII Band 3 / IEEE 802.11ac VHT40 TX / CH Low	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical

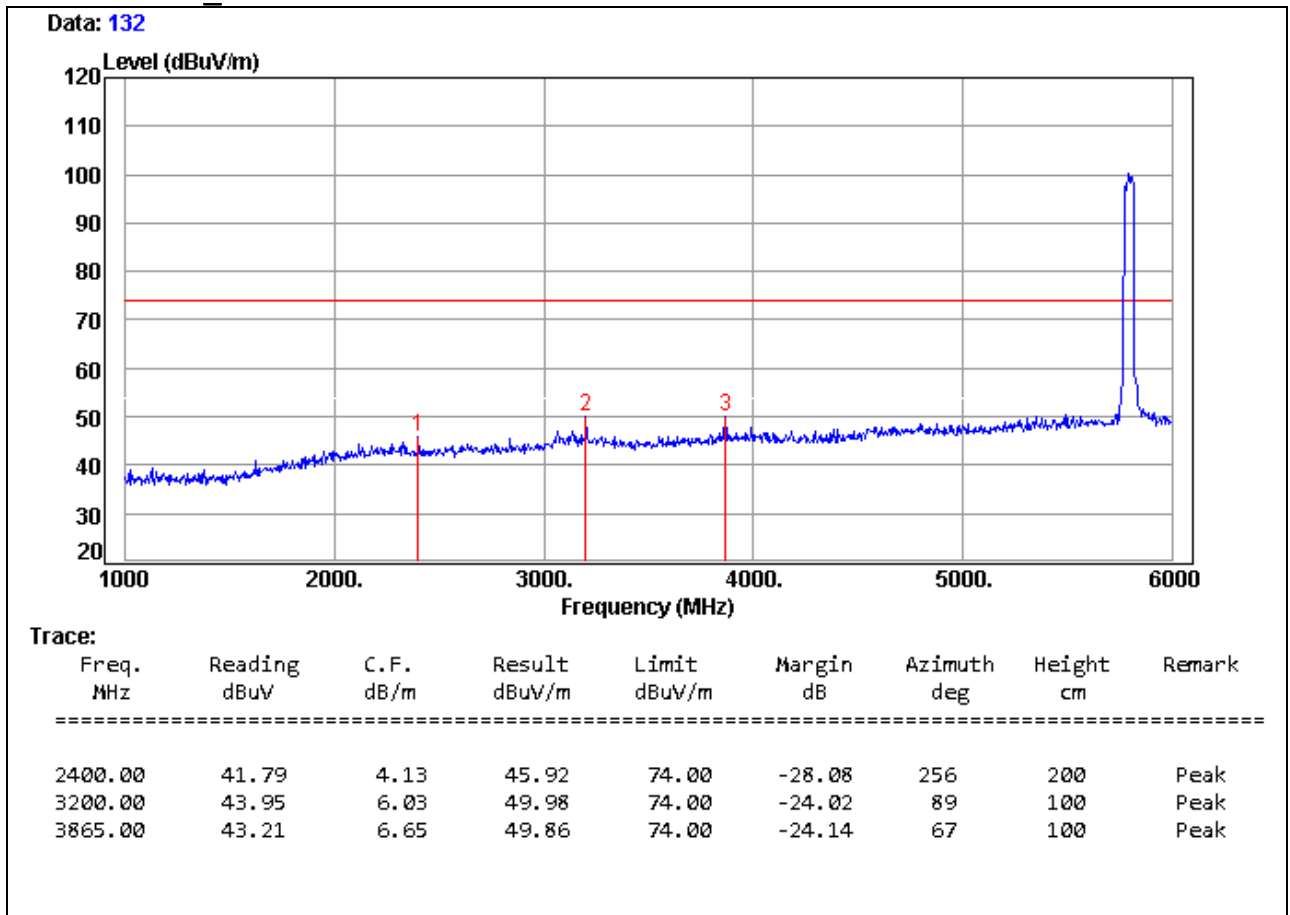
**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/25
Test Mode	UNII Band 3 / IEEE 802.11ac VHT40 TX / CH High	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Horizontal



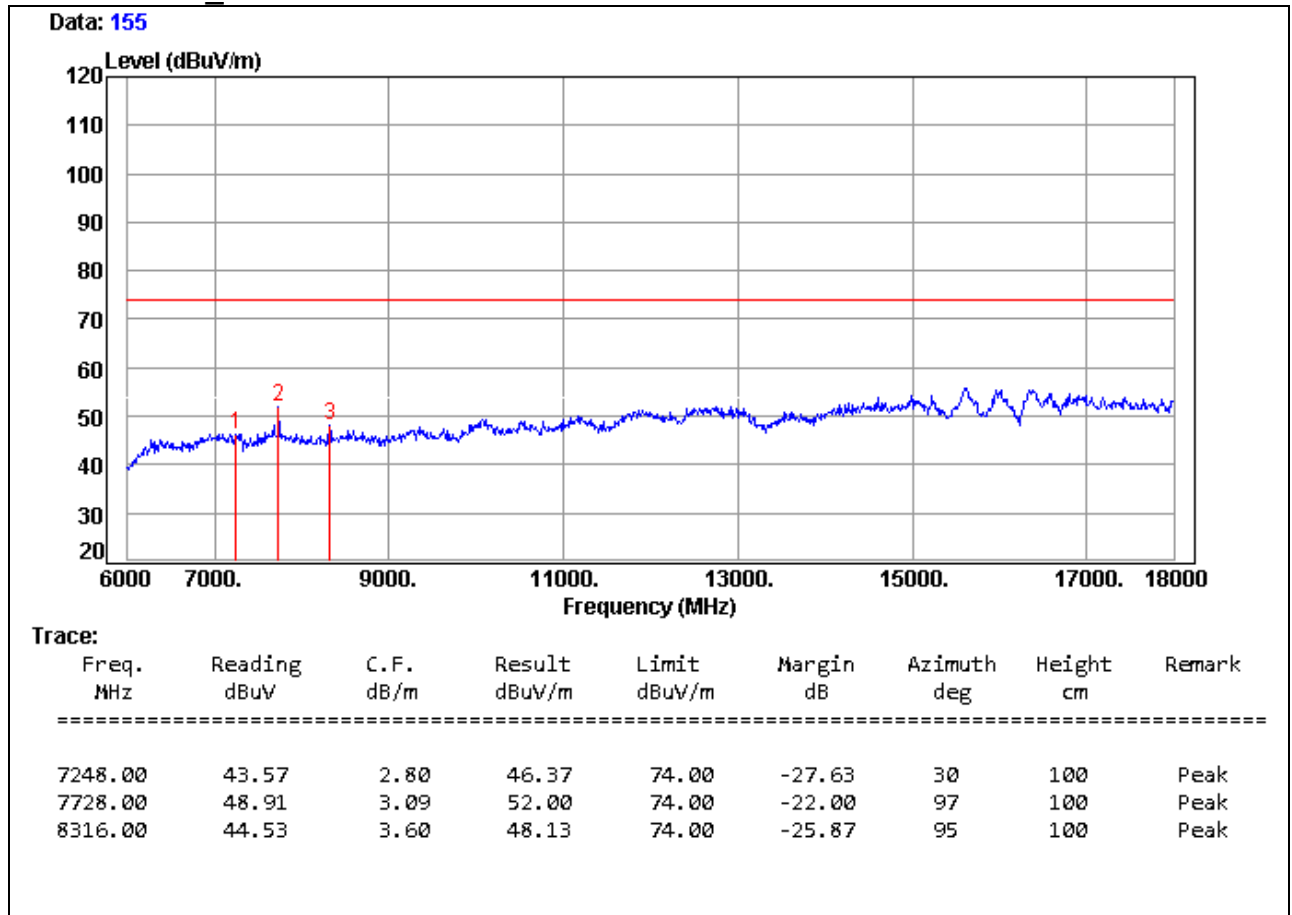
Remark:

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 3 / IEEE 802.11ac VHT40 TX / CH High	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Horizontal

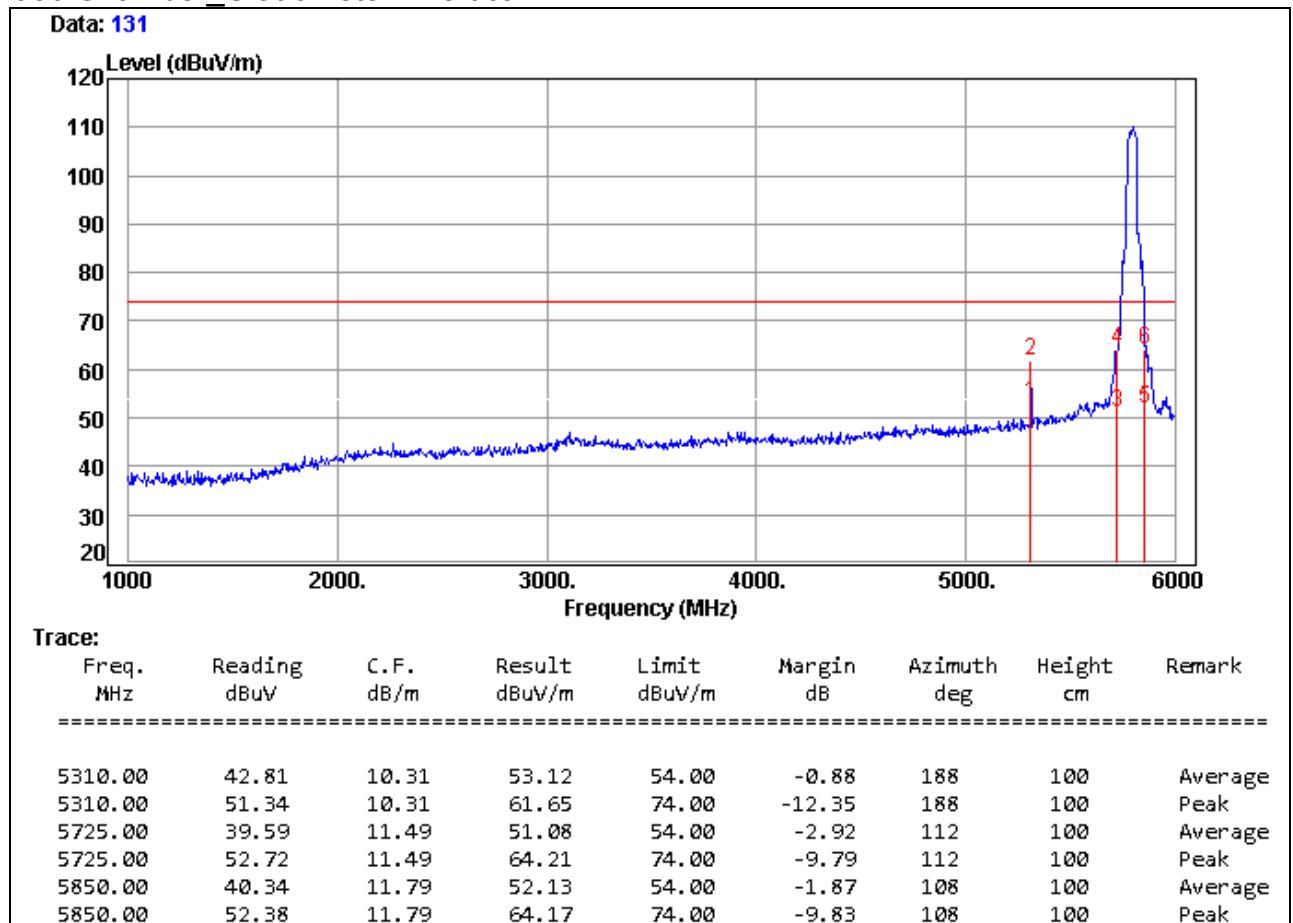
**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/25
Test Mode	UNII Band 3 / IEEE 802.11ac VHT40 TX / CH High	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical

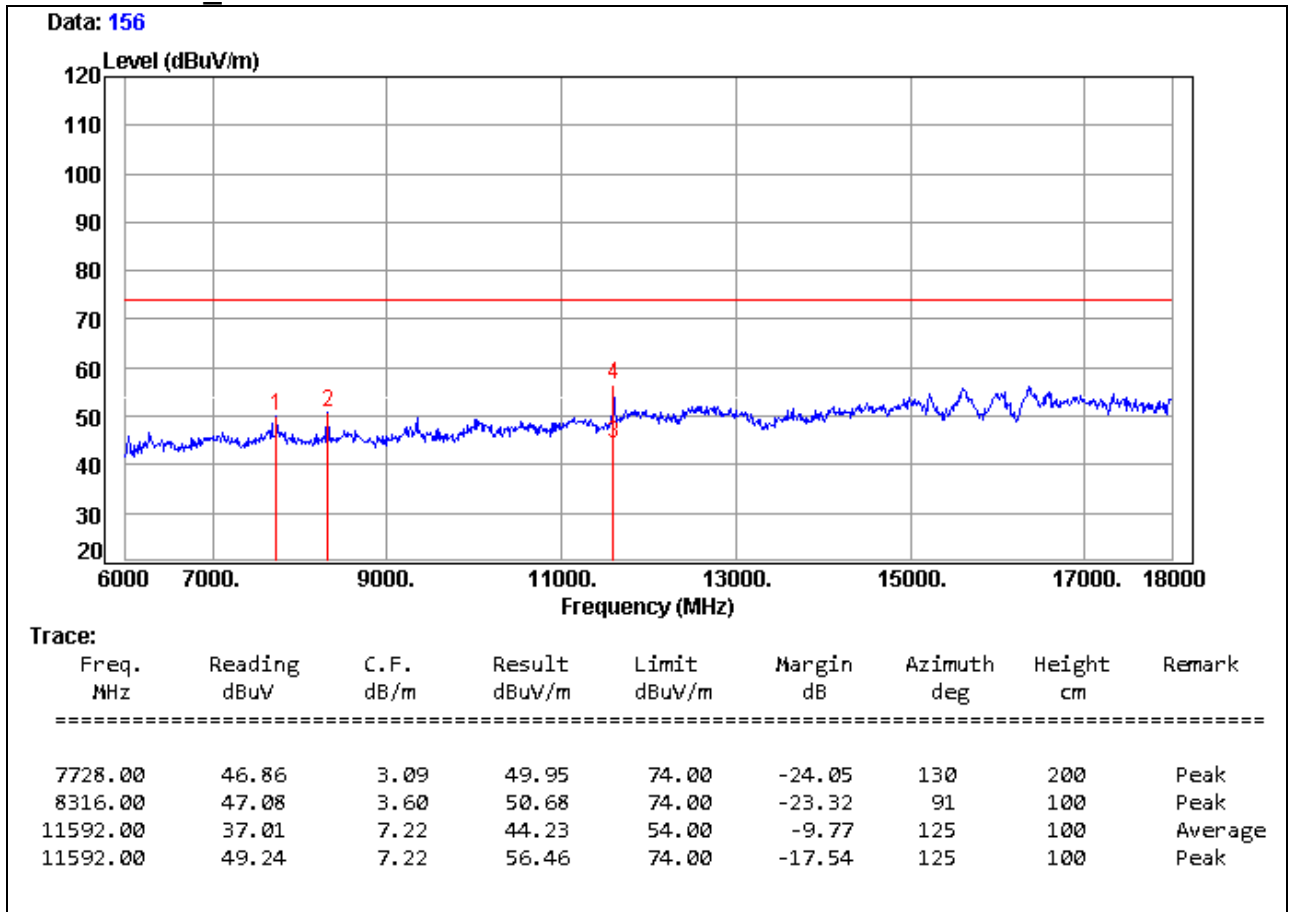
**Remark:**

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 3 / IEEE 802.11ac VHT40 TX / CH High	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical

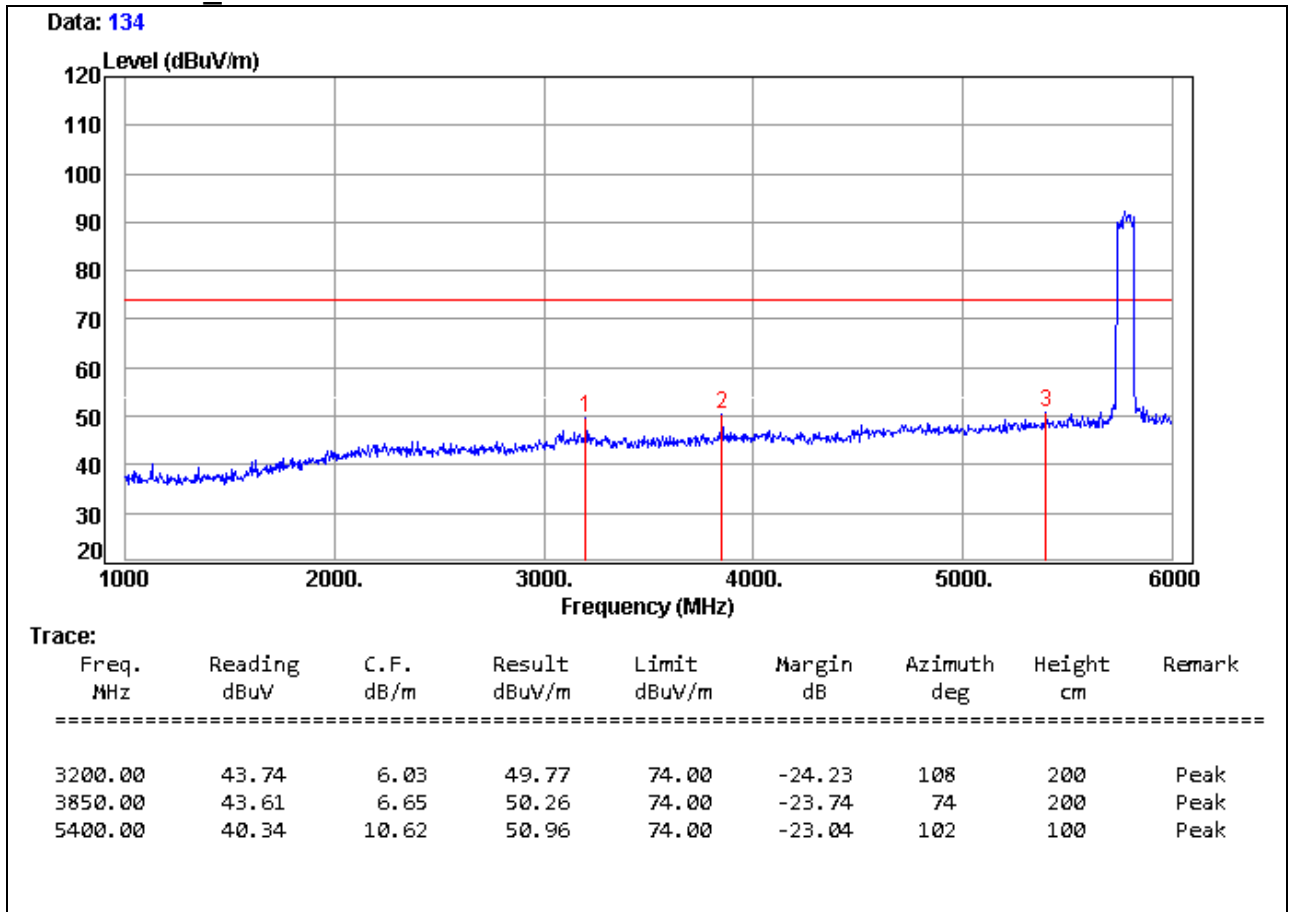
**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/25
Test Mode	UNII Band 3 / IEEE 802.11ac VHT80 TX / CH Low	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Horizontal



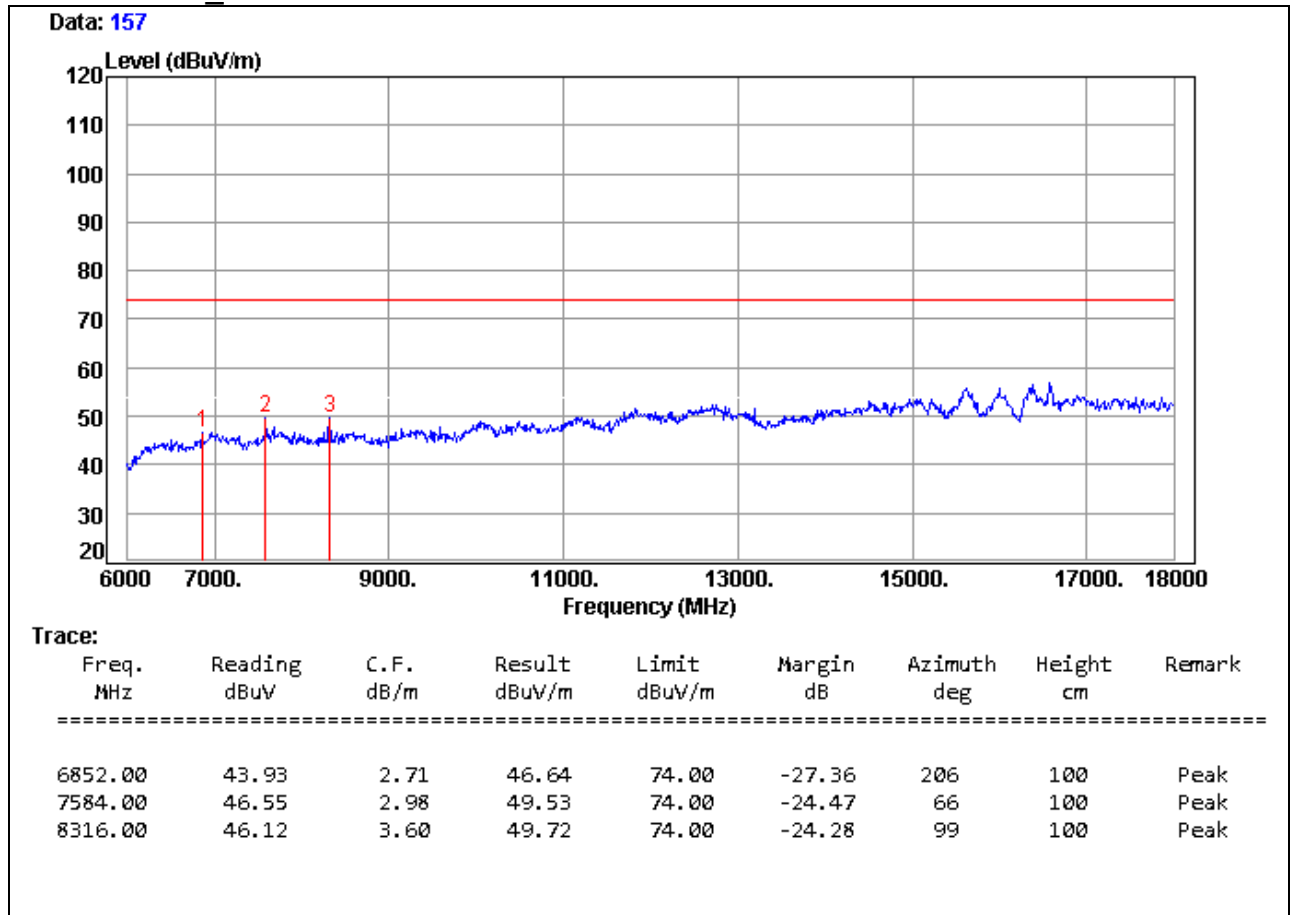
Remark:

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 3 / IEEE 802.11ac VHT80 TX / CH Low	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Horizontal

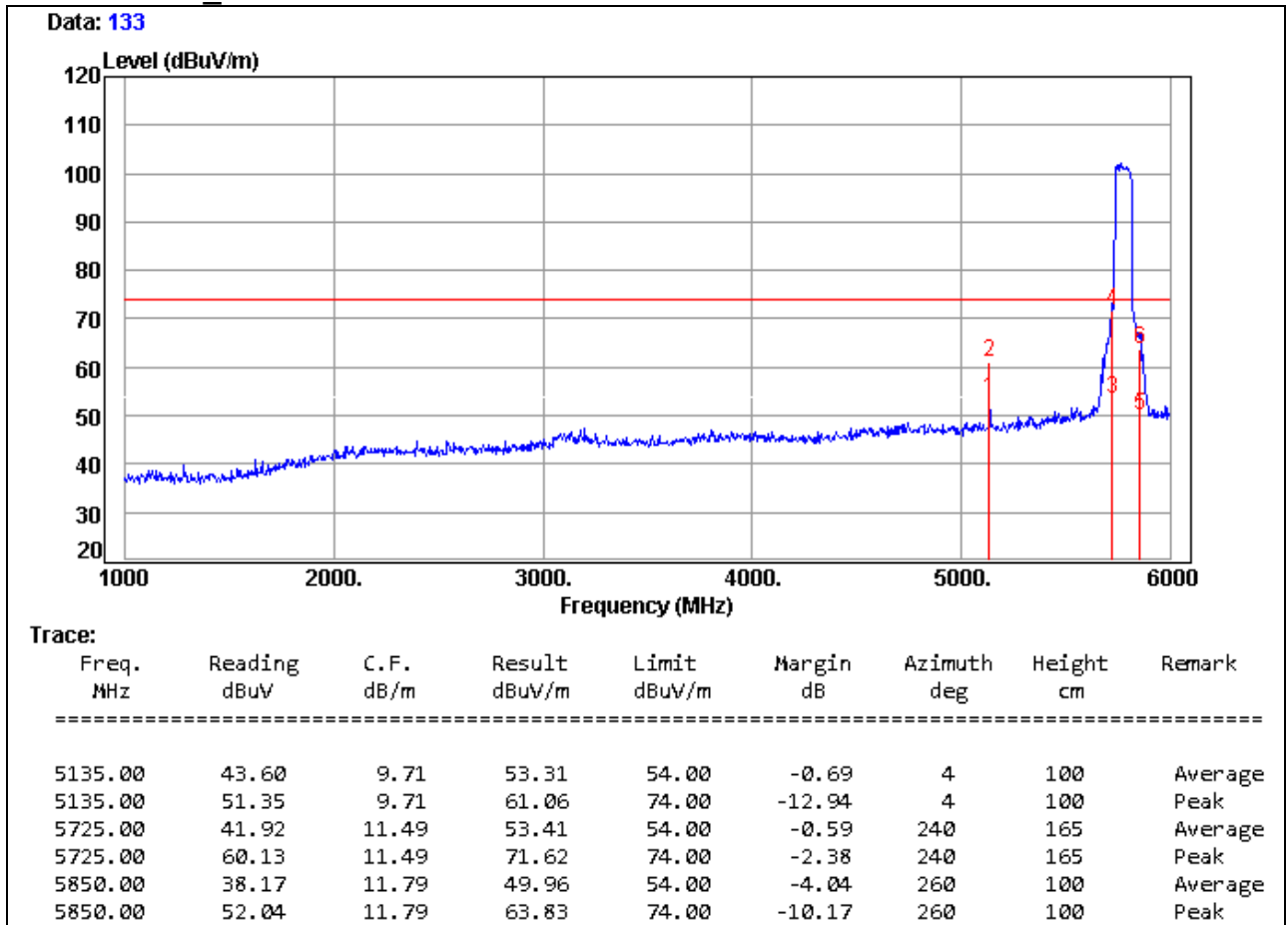
**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/25
Test Mode	UNII Band 3 / IEEE 802.11ac VHT80 TX / CH Low	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical

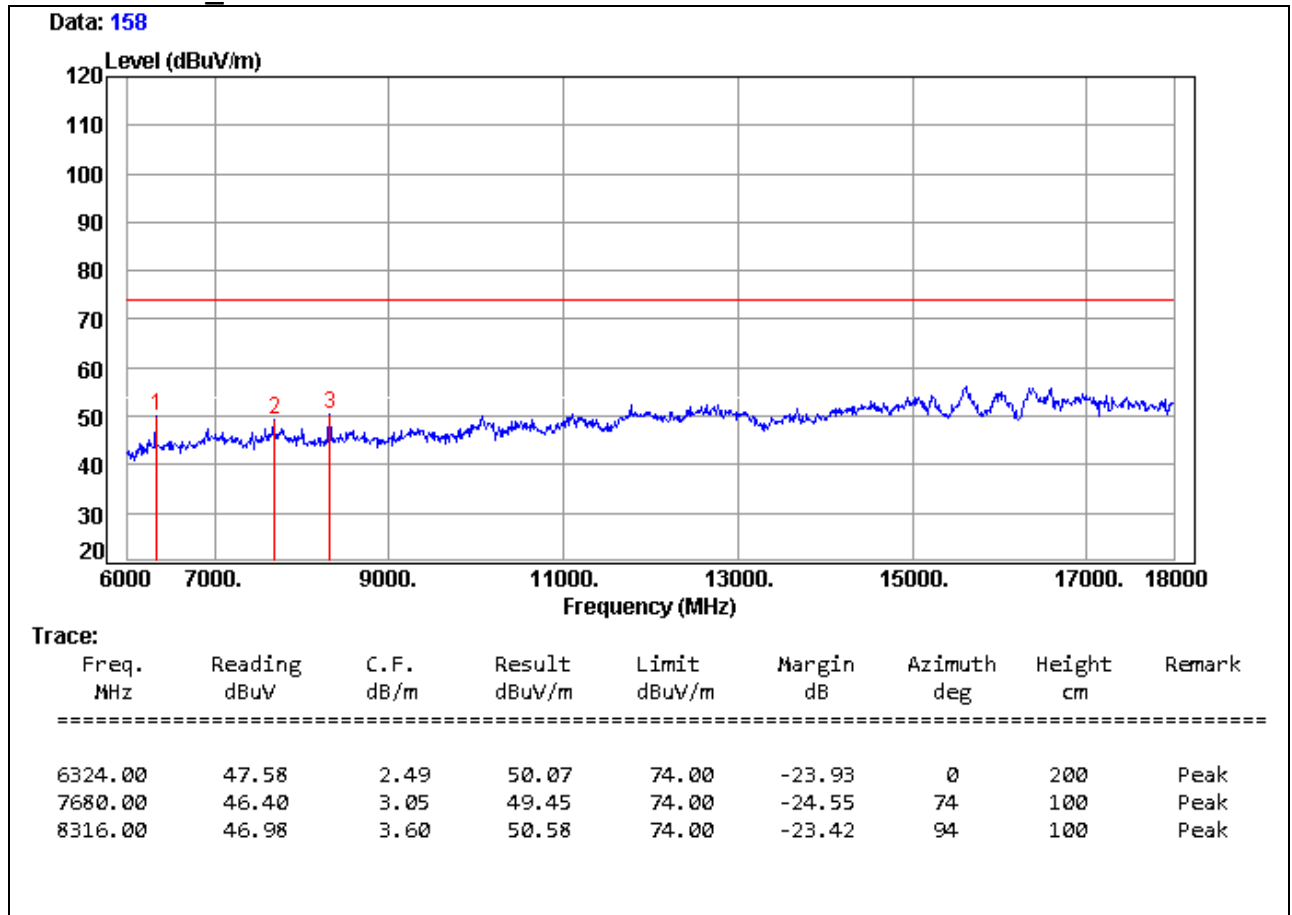
**Remark:**

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Waternil Guan
Test Model	BiPAC 8920AX	Test Date	2015/05/28
Test Mode	UNII Band 3 / IEEE 802.11ac VHT80 TX / CH Low	Temp. & Humidity	25°C, 53%

966 Chamber_C at 3Meter / Vertical

**Remark:**

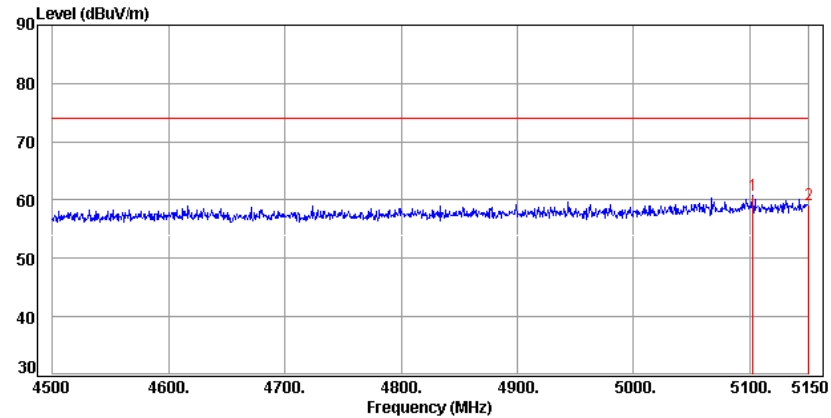
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Average test would be performed if the peak result were greater than the average limit.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Result = Reading + Correction Factor
Margin = Result - Limit
Remark Peak = Result(PK) - Limit(PK)
Remark AVG = Result(AV) - Limit(AV)
5. There is no emission in 18GHz ~ 40GHz.



Restricted Band Edges

Detector Mode : Peak**Polarity : Horizontal****CH Low (IEEE 802.11a Mode / Band 1)**

Data: 83

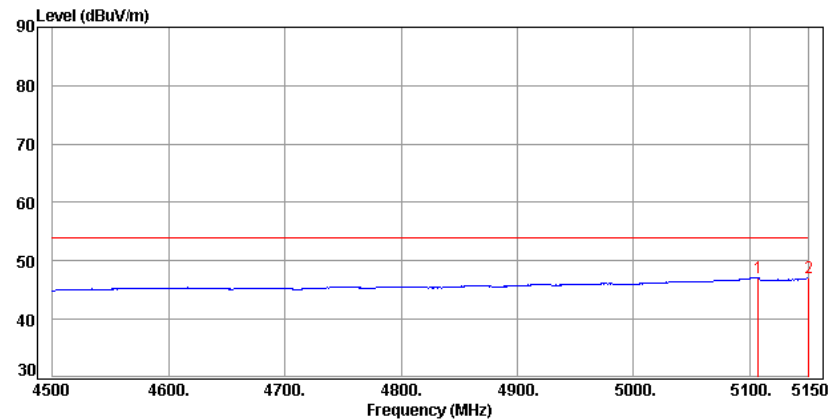


Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5101.90	51.15	9.60	60.75	74.00	-13.25			Peak
5150.00	49.45	9.76	59.21	74.00	-14.79			Peak

Detector Mode : Average**Polarity : Horizontal****CH Low (IEEE 802.11a Mode / Band 1)**

Data: 84

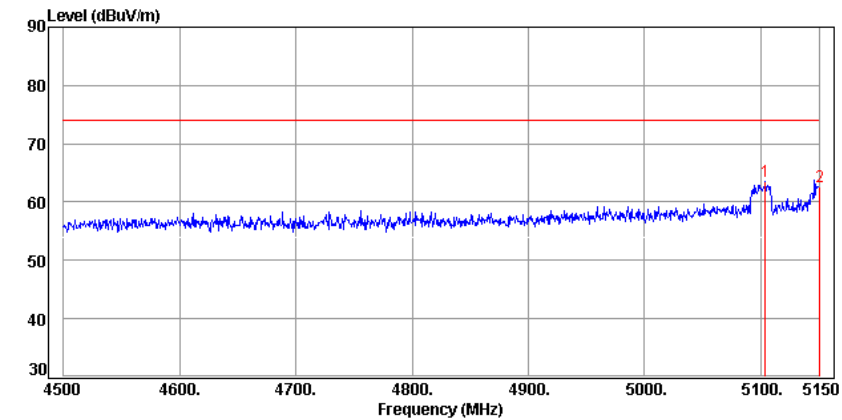


Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5106.45	37.47	9.61	47.08	54.00	-6.92			Average
5150.00	37.25	9.76	47.01	54.00	-6.99			Average

**Detector Mode : Peak****Polarity : Vertical****CH Low (IEEE 802.11a Mode / Band 1)**

Data: 81

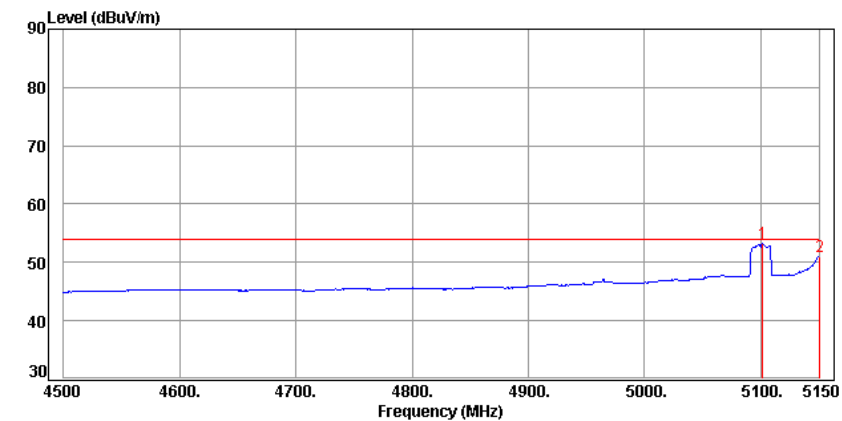


Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5103.85	53.86	9.61	63.47	74.00	-10.53			Peak
5150.00	52.88	9.76	62.64	74.00	-11.36			Peak

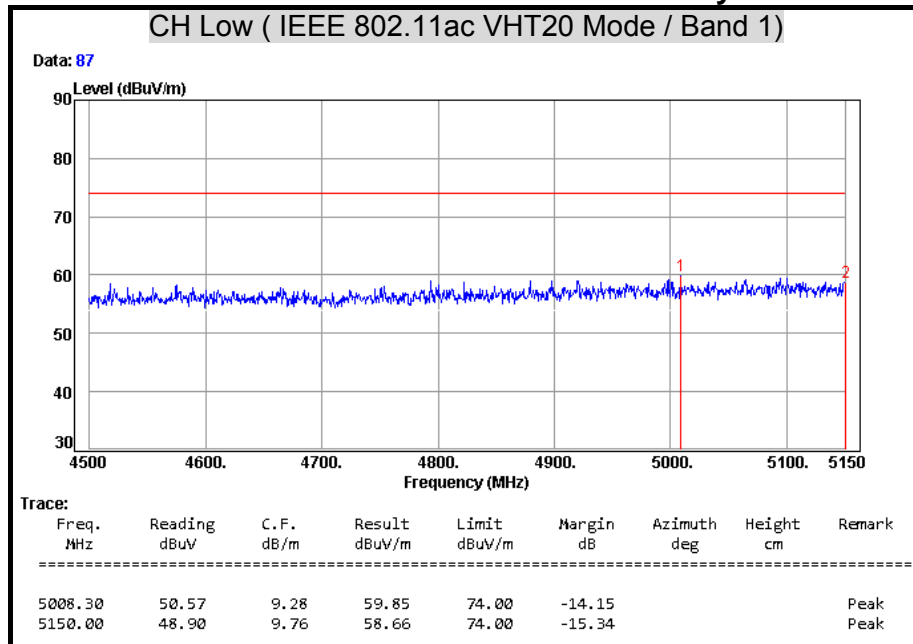
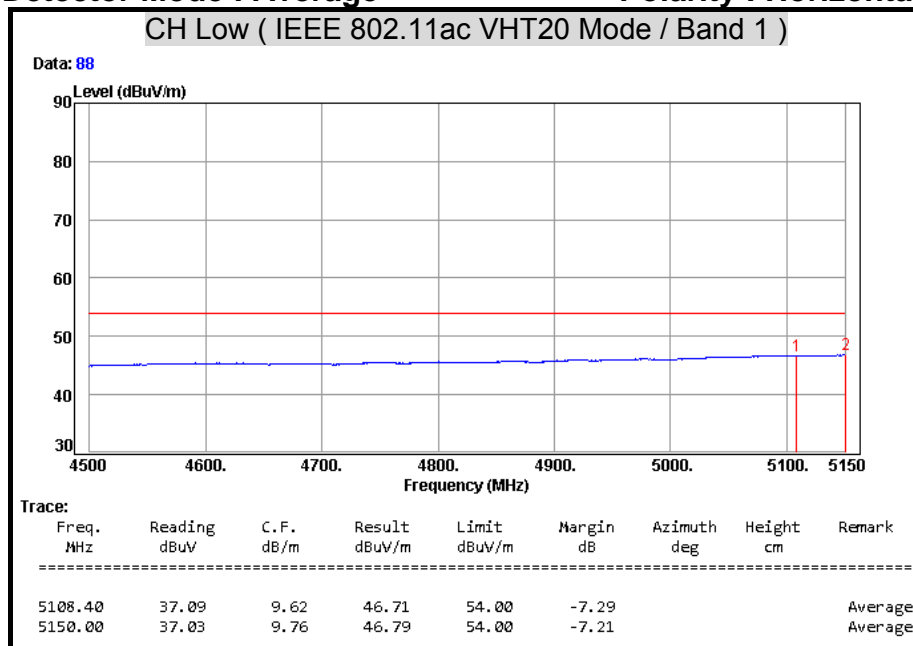
Detector Mode : Average**Polarity : Vertical****CH Low (IEEE 802.11a Mode / Band 1)**

Data: 82



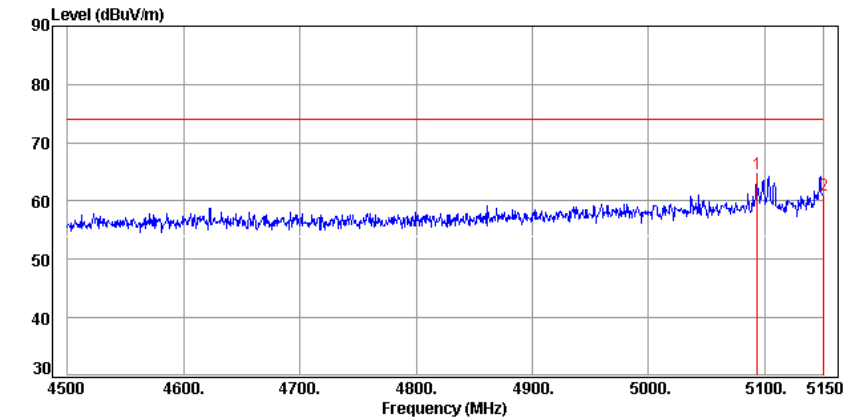
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5101.25	43.60	9.60	53.20	54.00	-0.80			Average
5150.00	41.23	9.76	50.99	54.00	-3.01			Average

**Detector Mode : Peak****Polarity : Horizontal****Detector Mode : Average****Polarity : Horizontal**

**Detector Mode : Peak****Polarity : Vertical****CH Low (IEEE 802.11ac VHT20 Mode / Band 1)**

Data: 85

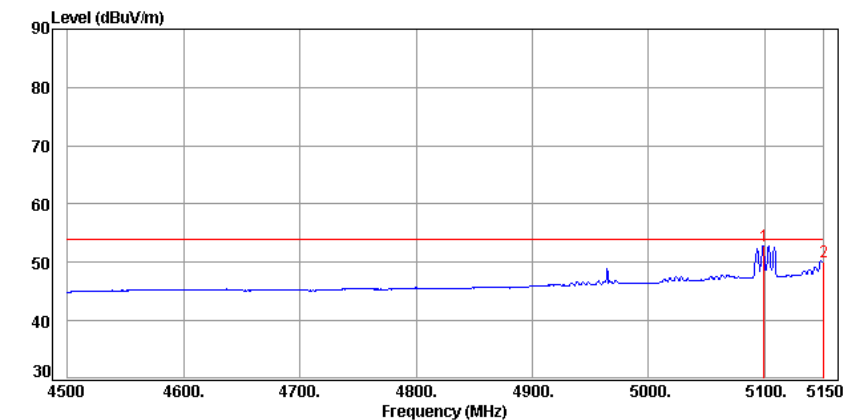


Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5092.80	55.05	9.57	64.62	74.00	-9.38			Peak
5150.00	51.33	9.76	61.09	74.00	-12.91			Peak

Detector Mode : Average**Polarity : Vertical****CH Low (IEEE 802.11ac VHT20 Mode / Band 1)**

Data: 86



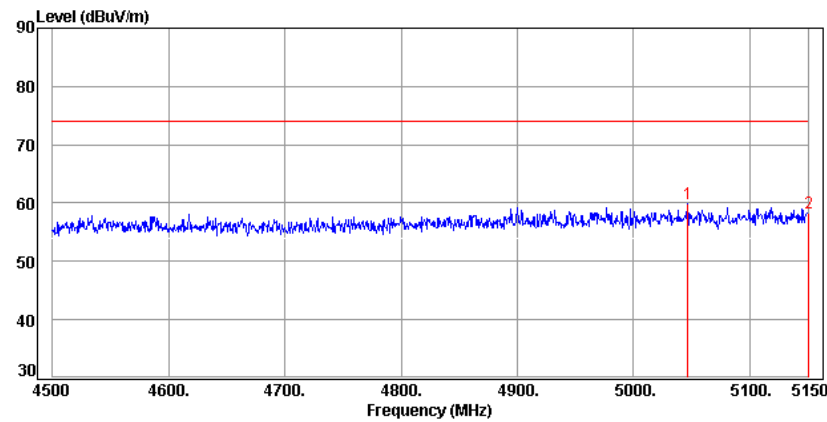
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5098.65	43.32	9.59	52.91	54.00	-1.09			Average
5150.00	40.21	9.76	49.97	54.00	-4.03			Average

**Detector Mode : Peak****Polarity : Horizontal**

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

Data: 91



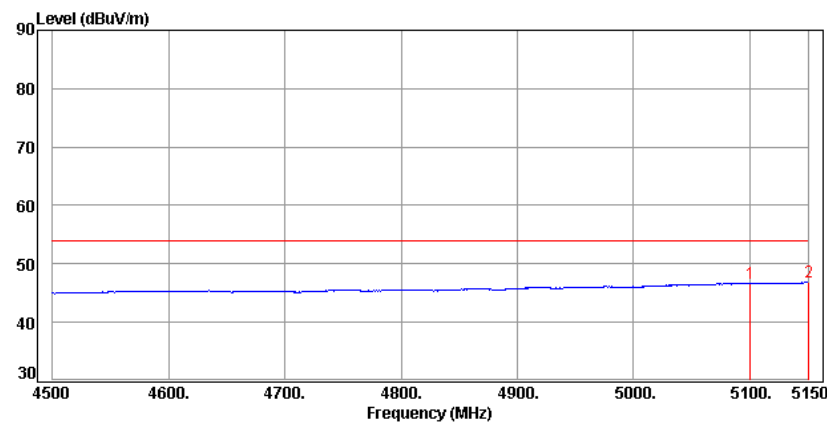
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5046.00	50.40	9.41	59.81	74.00	-14.19			Peak
5150.00	48.54	9.76	58.30	74.00	-15.70			Peak

Detector Mode : Average**Polarity : Horizontal**

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

Data: 92



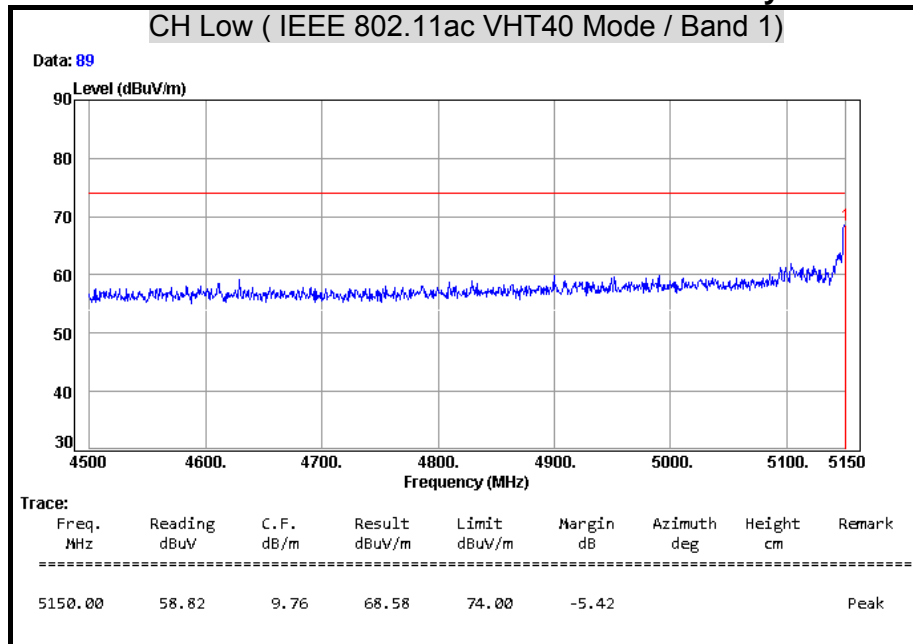
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5099.95	37.12	9.59	46.71	54.00	-7.29			Average
5150.00	37.08	9.76	46.84	54.00	-7.16			Average



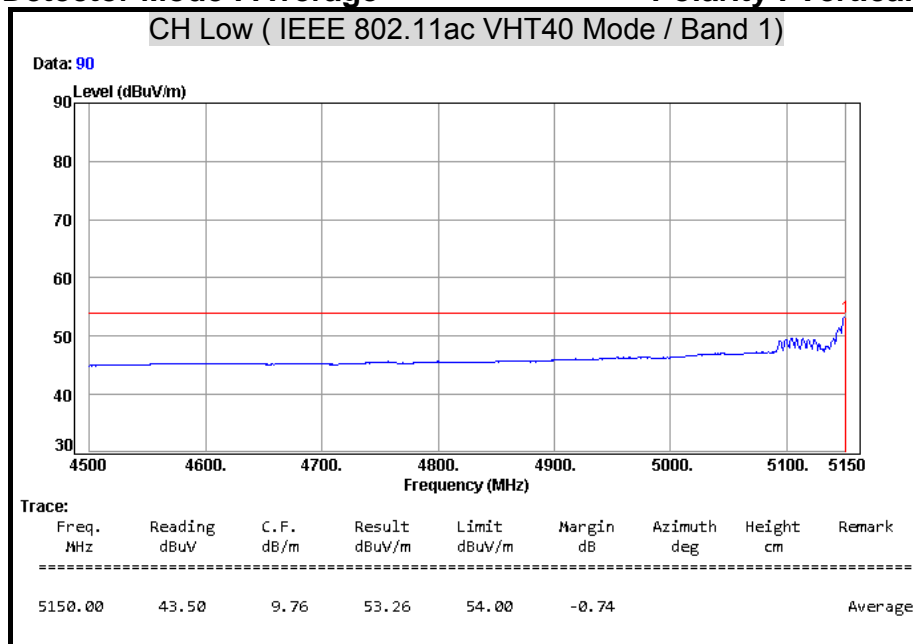
Detector Mode : Peak

Polarity : Vertical



Detector Mode : Average

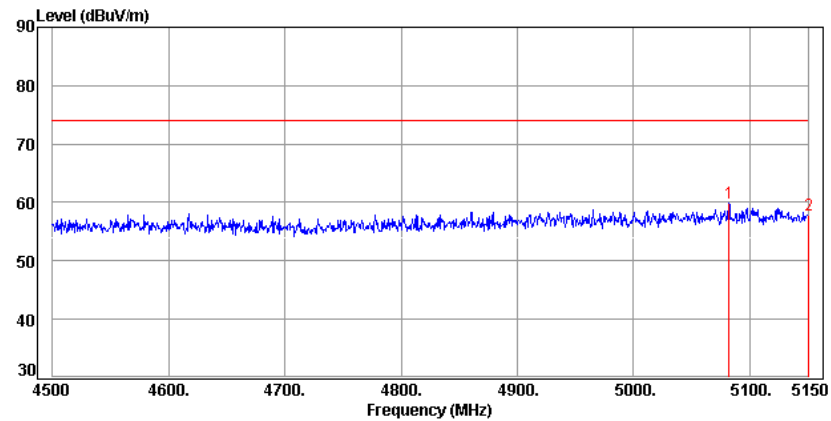
Polarity : Vertical



**Detector Mode : Peak****Polarity : Horizontal**

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

Data: 95



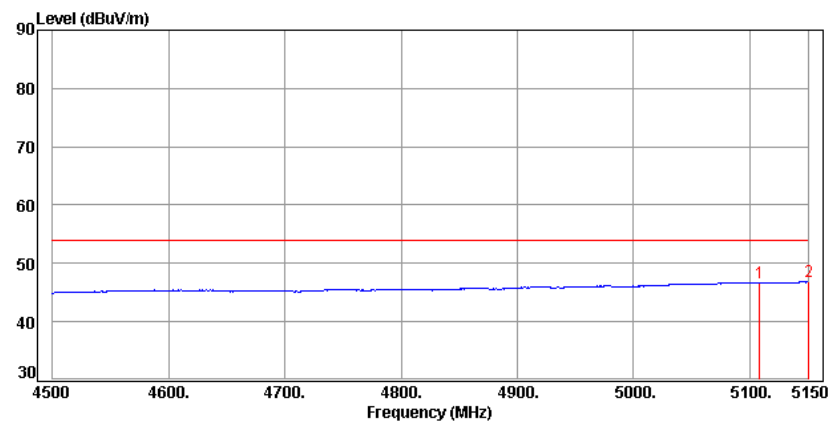
Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5081.75	50.36	9.53	59.89	74.00	-14.11			Peak
5150.00	48.11	9.76	57.87	74.00	-16.13			Peak

Detector Mode : Average**Polarity : Horizontal**

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

Data: 96

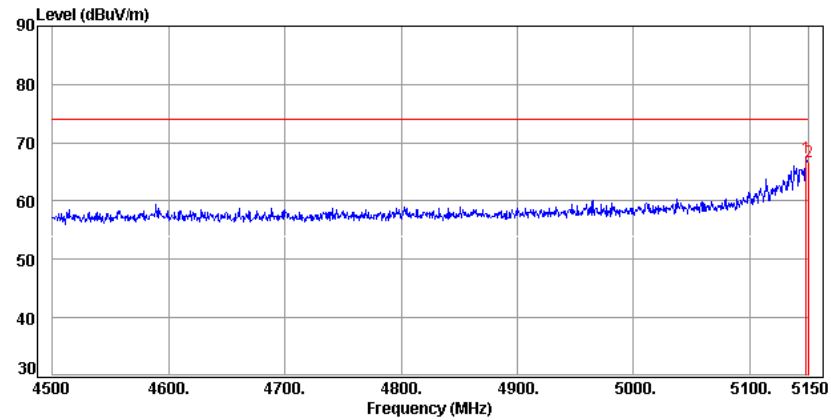


Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5107.75	37.11	9.62	46.73	54.00	-7.27			Average
5150.00	37.10	9.76	46.86	54.00	-7.14			Average

**Detector Mode : Peak****Polarity : Vertical****CH Low (IEEE 802.11ac VHT80 Mode / Band 1)**

Data: 93

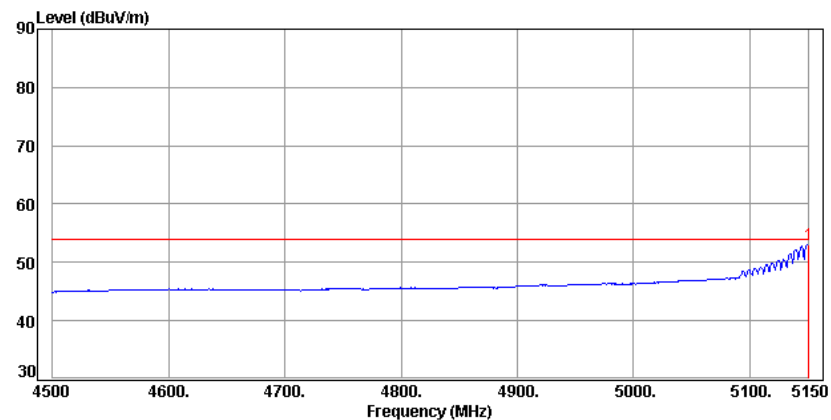


Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5148.70	57.60	9.76	67.36	74.00	-6.64			Peak
5150.00	56.95	9.76	66.71	74.00	-7.29			Peak

Detector Mode : Average**Polarity : Vertical****CH Low (IEEE 802.11ac VHT80 Mode / Band 1)**

Data: 94



Trace:

Freq. MHz	Reading dBuV	C.F. dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Azimuth deg	Height cm	Remark
5150.00	43.34	9.76	53.10	54.00	-0.90			Average



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

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

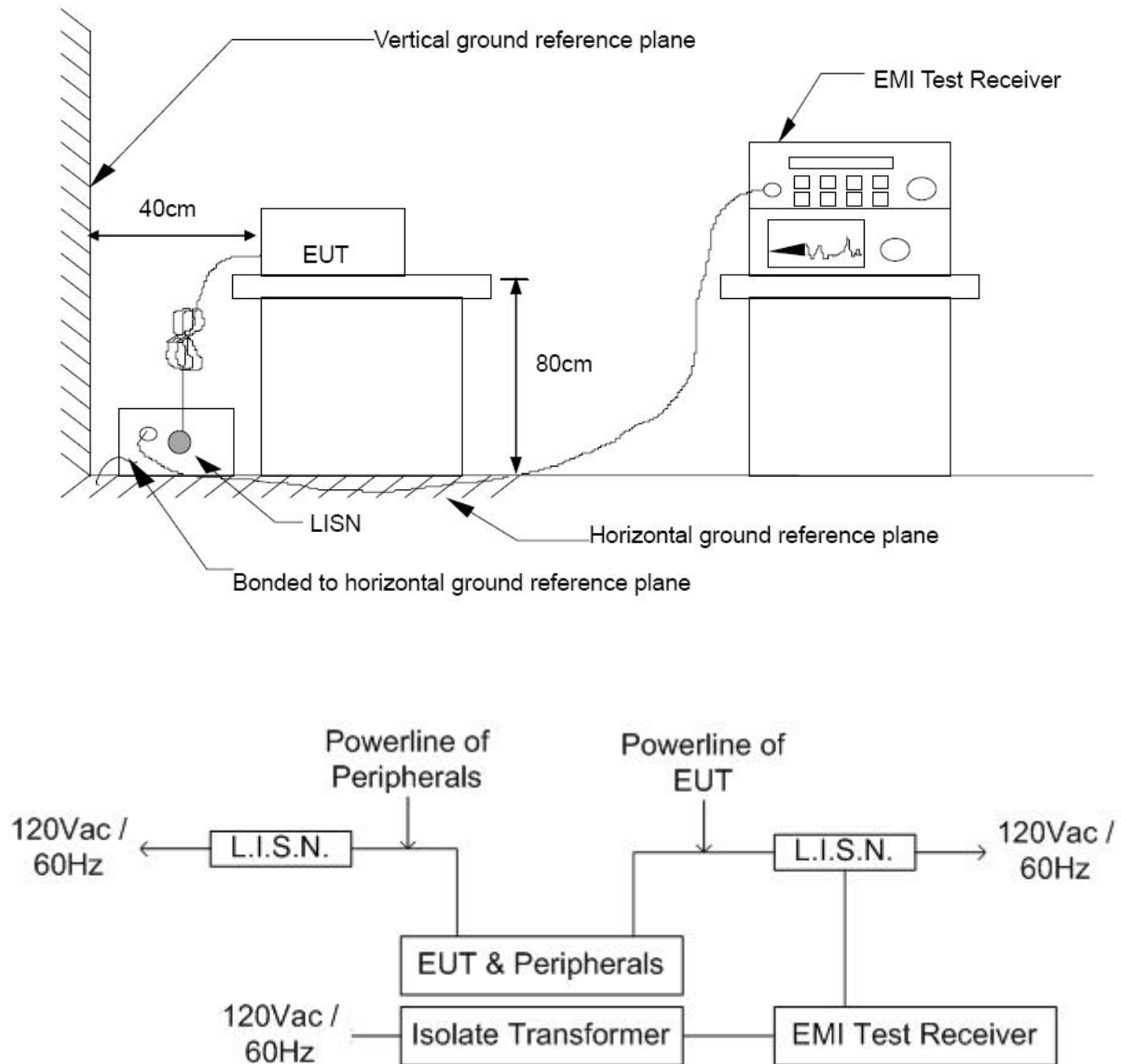
TEST EQUIPMENT

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

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.

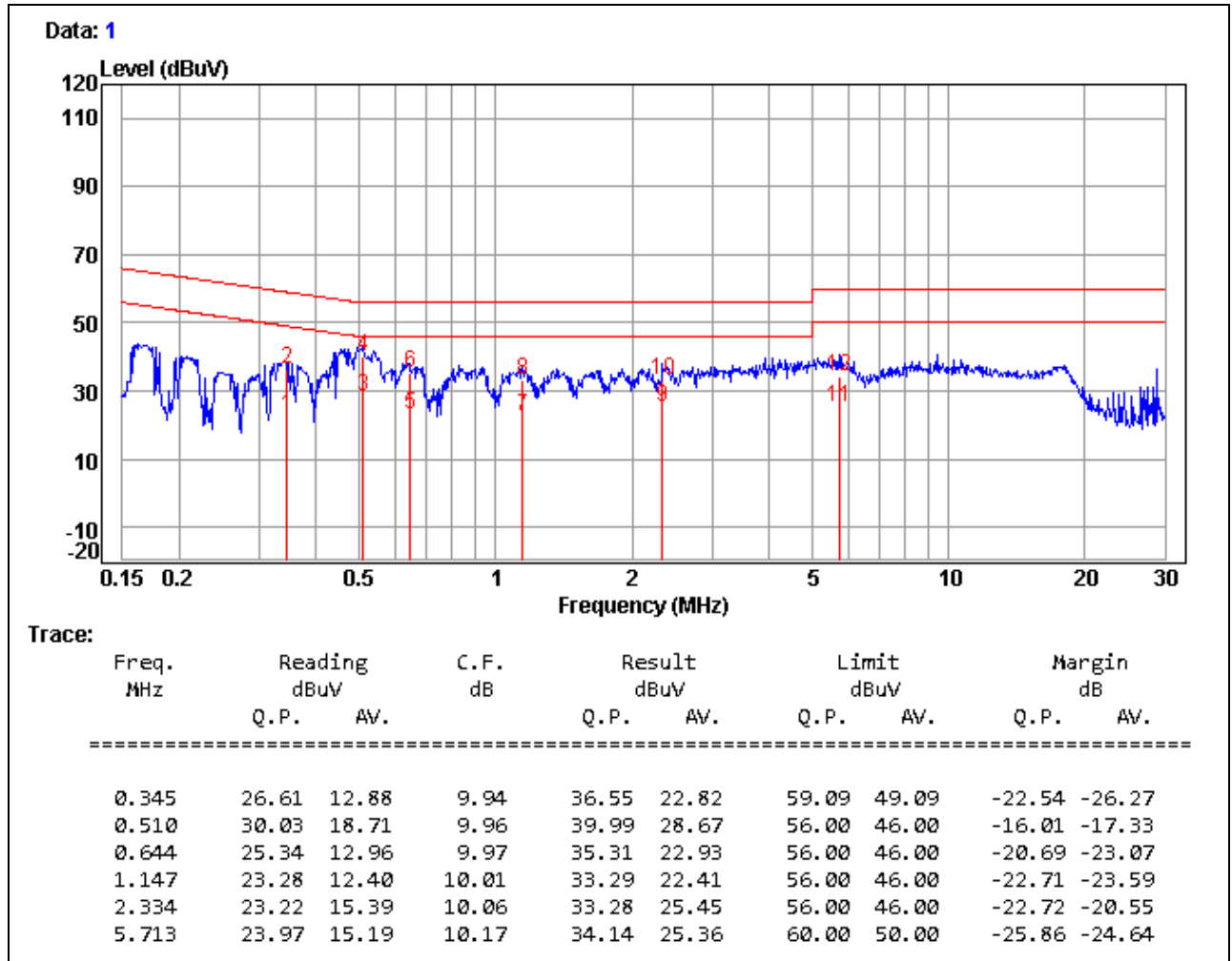
The EUT was located so that the distance between the boundary of the EUT and the closest surface of the LISN is 0.8 m. Where a mains flexible cord was provided by the manufacturer shall be 1 m long, or if in excess of 1 m, the excess cable was folded back and forth as far as possible so as to form a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



TEST RESULTS

Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Jey Li
Test Model	BiPAC 8920AX	Test Date	2015/05/13
Test Mode	Normal Operating	Temp. & Humidity	21.6°C, 48%

LINE



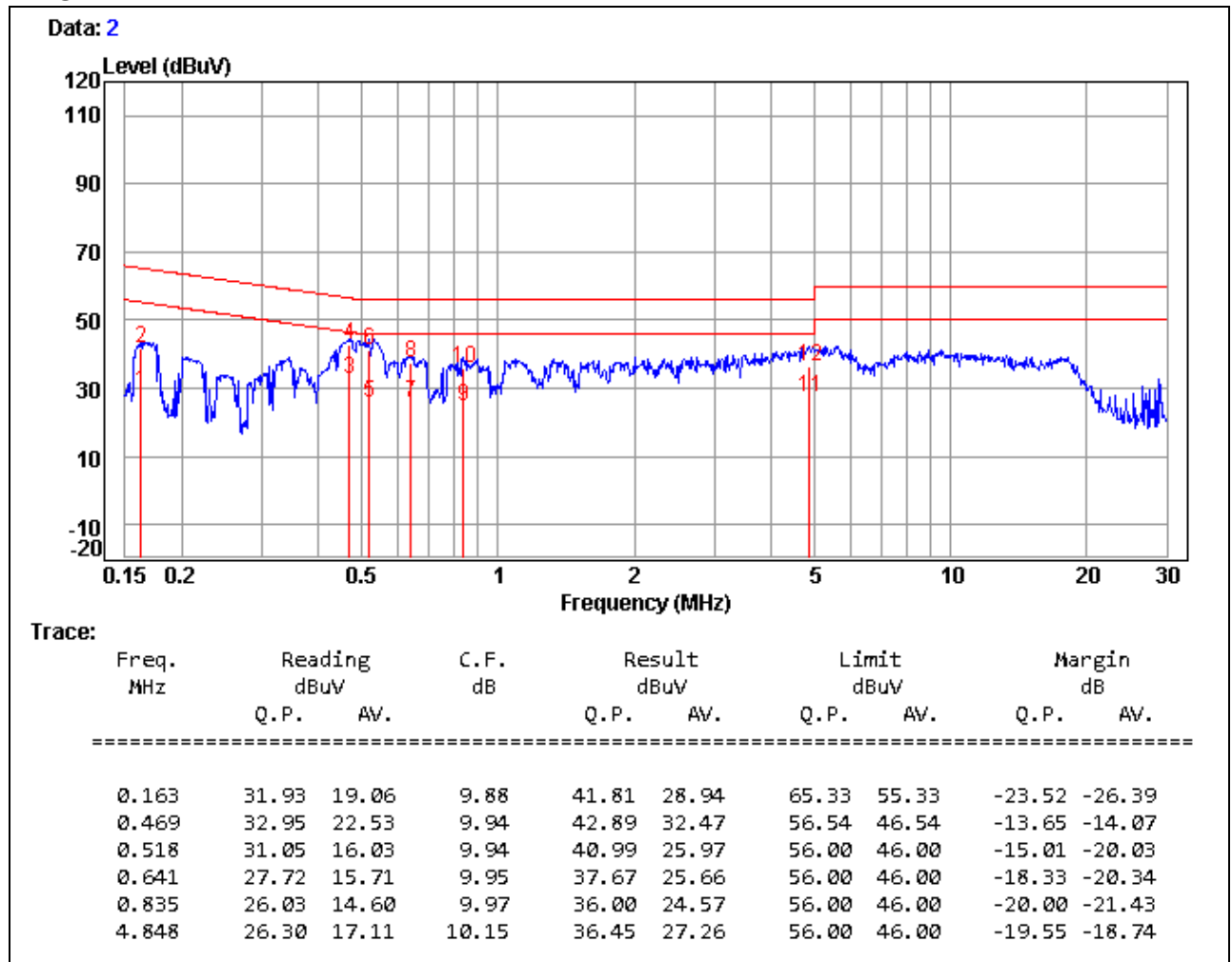
Remark:

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Jey Li
Test Model	BiPAC 8920AX	Test Date	2015/05/13
Test Mode	Normal Operating	Temp. & Humidity	21.6°C, 48%

NEUTRAL



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

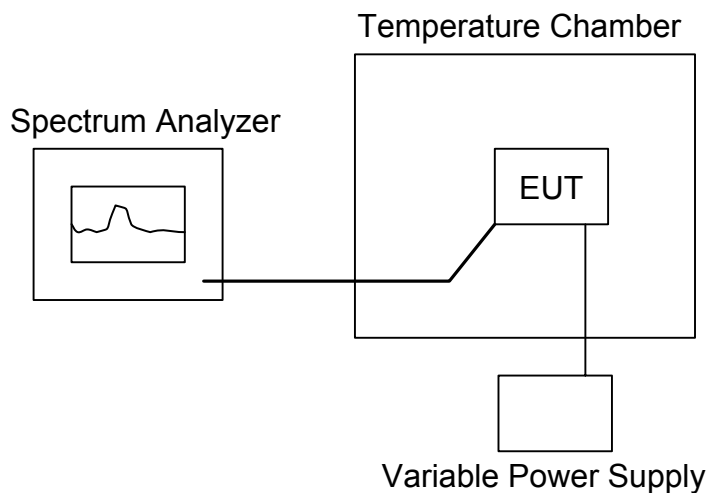
§ 15.407 (g) manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

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**

U-NII	Channel	Channel Frequency (MHz)	Measured Frequency (MHz)	Delta Frequency (kHz)	20 ppm Limit (kHz)	Margin (kHz)
Band 1	Low	5180	5180.021045	21.05	103.60	-82.55
	Middle	5200	5200.025935	25.93	104.00	-78.07
	High	5240	5240.027780	27.78	104.80	-77.02
Band 3	Low	5745	5745.029797	29.80	114.90	-85.10
	Middle	5785	5785.031552	31.55	115.70	-84.15
	High	5825	5825.031335	31.33	116.50	-85.17

IEEE 802.11ac VHT20 Mode

U-NII	Channel	Channel Frequency (MHz)	Measured Frequency (MHz)	Delta Frequency (kHz)	20 ppm Limit (kHz)	Margin (kHz)
Band 1	Low	5180	5180.024683	24.68	103.60	-78.92
	Middle	5200	5200.025470	25.47	104.00	-78.53
	High	5240	5240.025762	25.76	104.80	-79.04
Band 3	Low	5745	5745.028635	28.63	114.90	-86.27
	Middle	5785	5785.028837	28.84	115.70	-86.86
	High	5825	5825.029383	29.38	116.50	-87.12

**IEEE 802.11ac VHT40 Mode**

U-NII	Channel	Channel Frequency (MHz)	Measured Frequency (MHz)	Delta Frequency (kHz)	20 ppm Limit (kHz)	Margin (kHz)
Band 1	Low	5190	5190.021705	21.71	103.80	-82.09
	High	5230	5230.027112	27.11	104.60	-77.49
Band 3	Low	5755	5755.029602	29.60	115.10	-85.50
	High	5795	5795.031080	31.08	115.90	-84.82

IEEE 802.11ac VHT80 Mode

U-NII	Channel	Channel Frequency (MHz)	Measured Frequency (MHz)	Delta Frequency (kHz)	20 ppm Limit (kHz)	Margin (kHz)
Band 1	Low	5210	5210.023400	23.40	104.20	-80.80
Band 3	Low	5775	5775.028200	28.20	115.50	-87.30

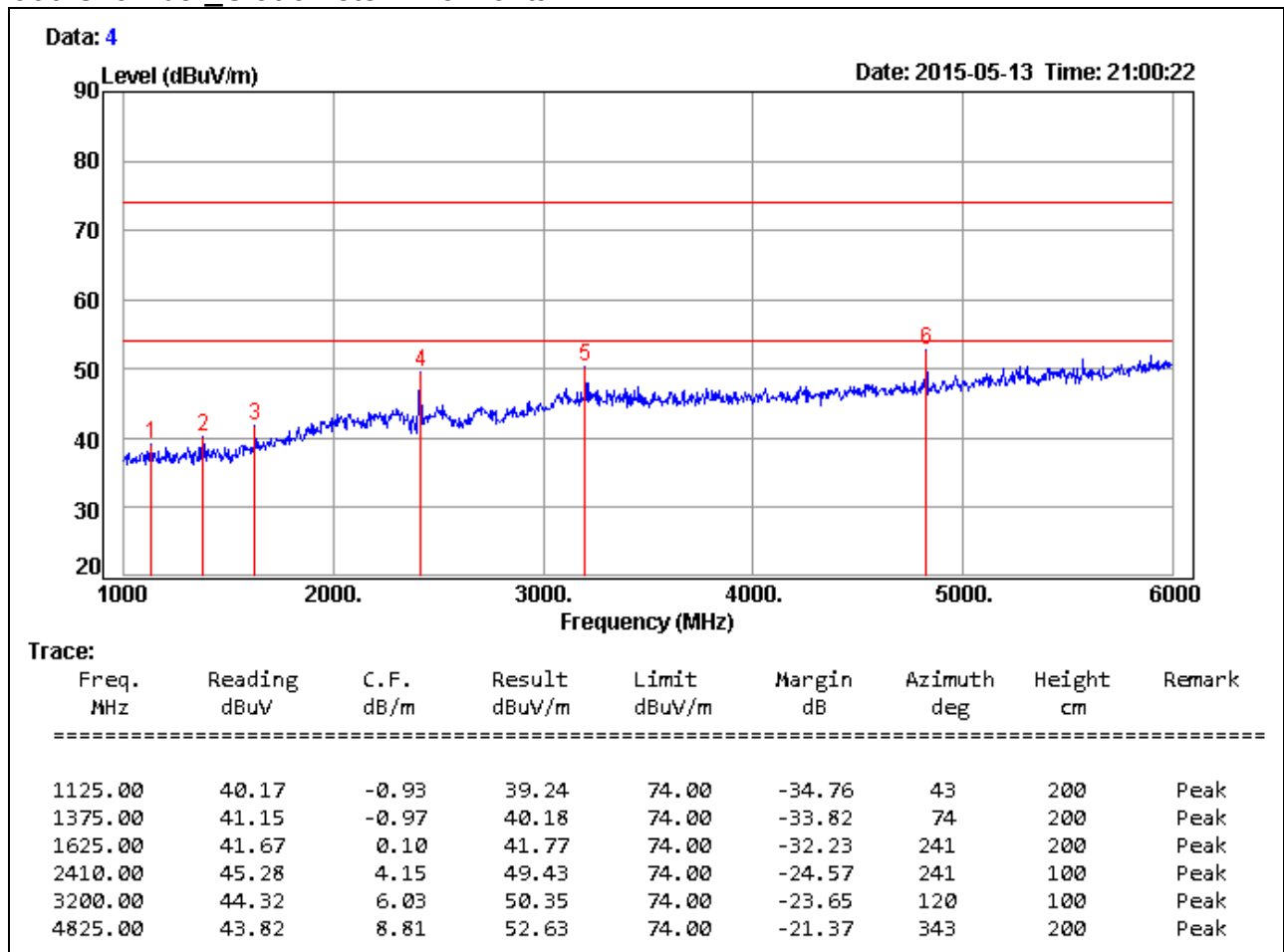


APPENDIX I CO-LOCATION

Above 1 GHz

Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Jey Li
Test Model	BiPAC 8920AX	Test Date	2015/05/13
Test Mode	Normal Operating	Temp. & Humidity	25°C, 50%

966 Chamber_C at 3Meter / Horizontal



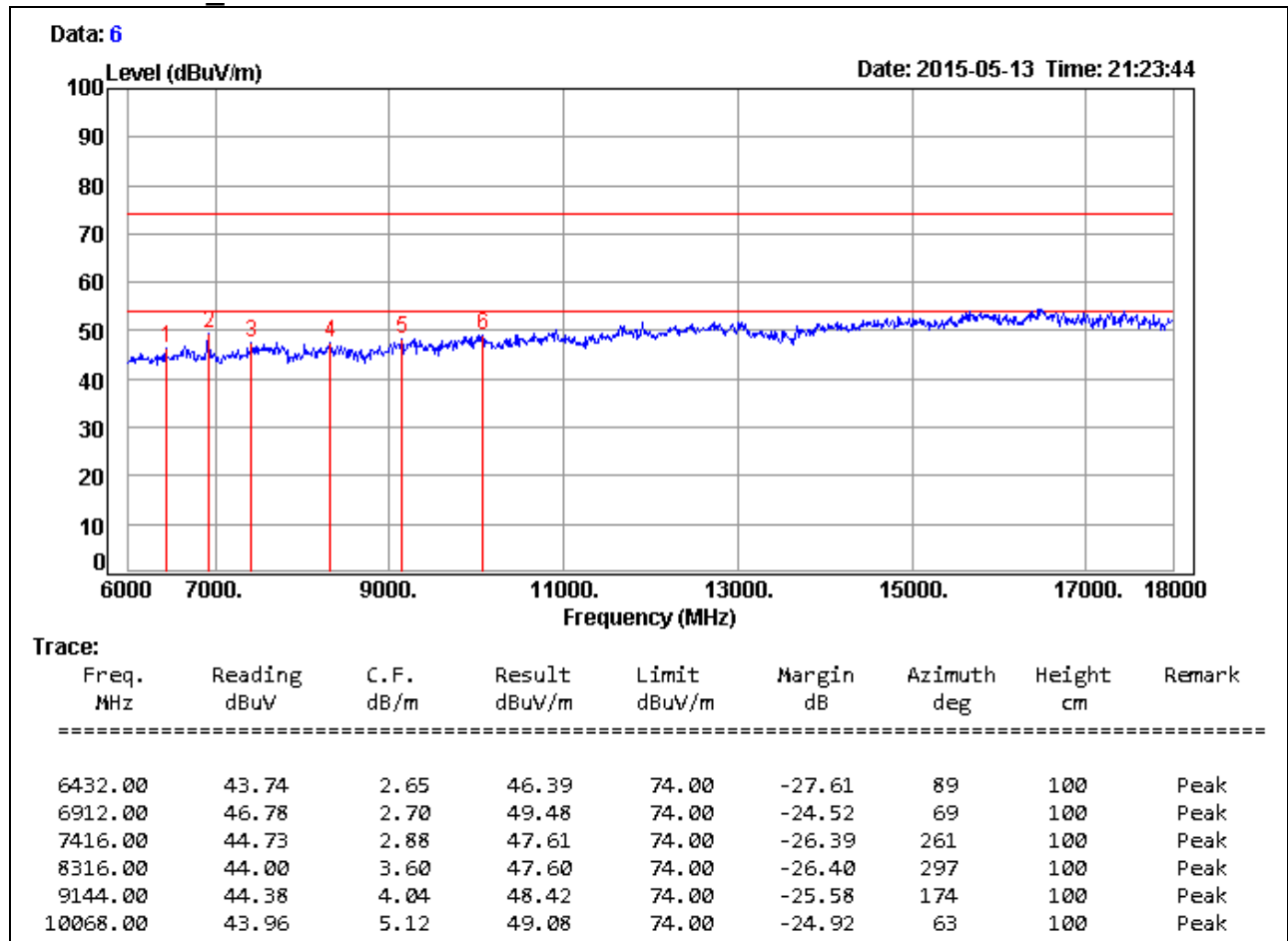
Remark:

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Jey Li
Test Model	BiPAC 8920AX	Test Date	2015/05/13
Test Mode	Normal Operating	Temp. & Humidity	25°C, 50%

966 Chamber_C at 3Meter / Horizontal



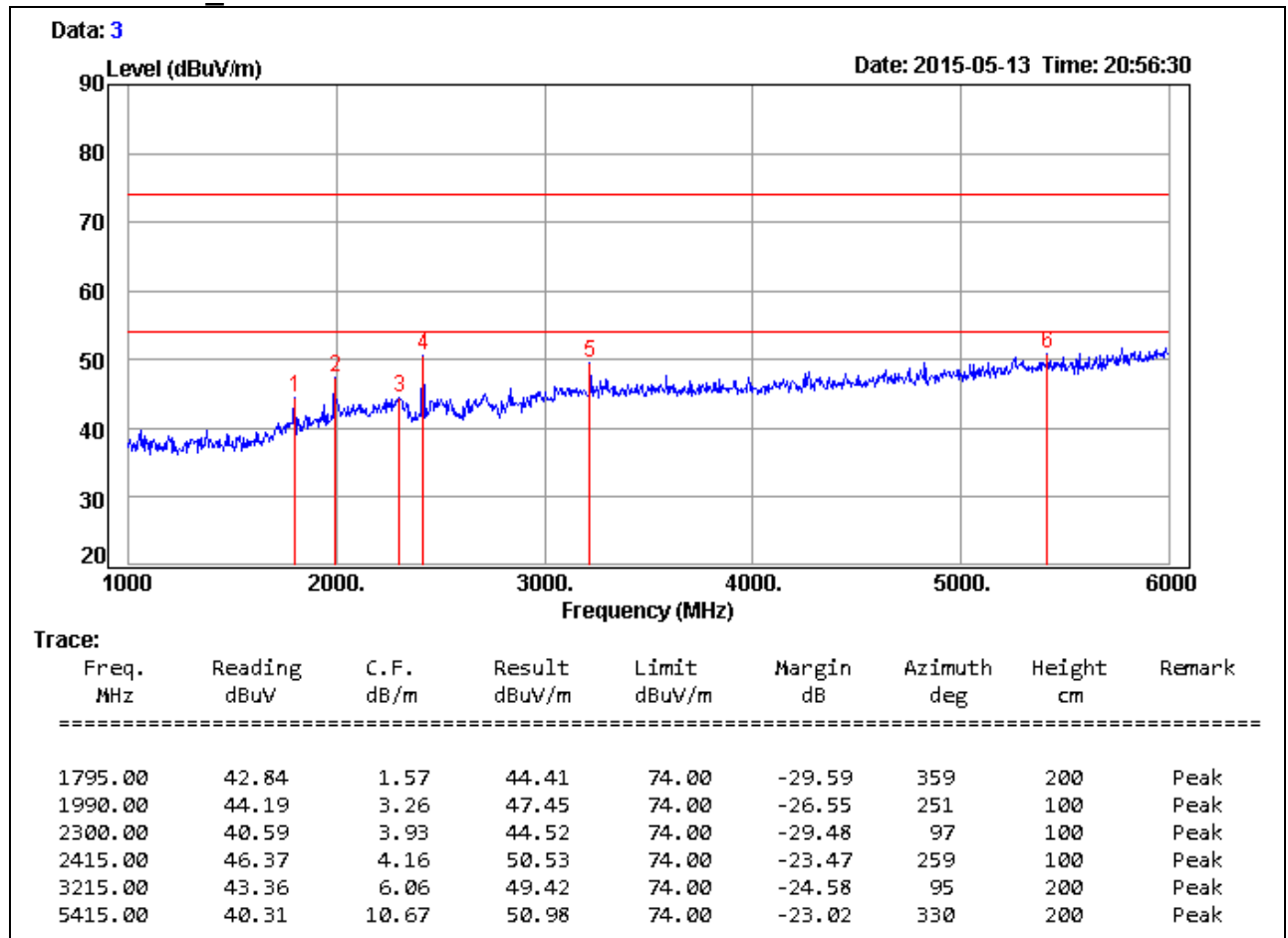
Remark:

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Jey Li
Test Model	BiPAC 8920AX	Test Date	2015/05/13
Test Mode	Normal Operating	Temp. & Humidity	25°C, 50%

966 Chamber_C at 3Meter / Vertical

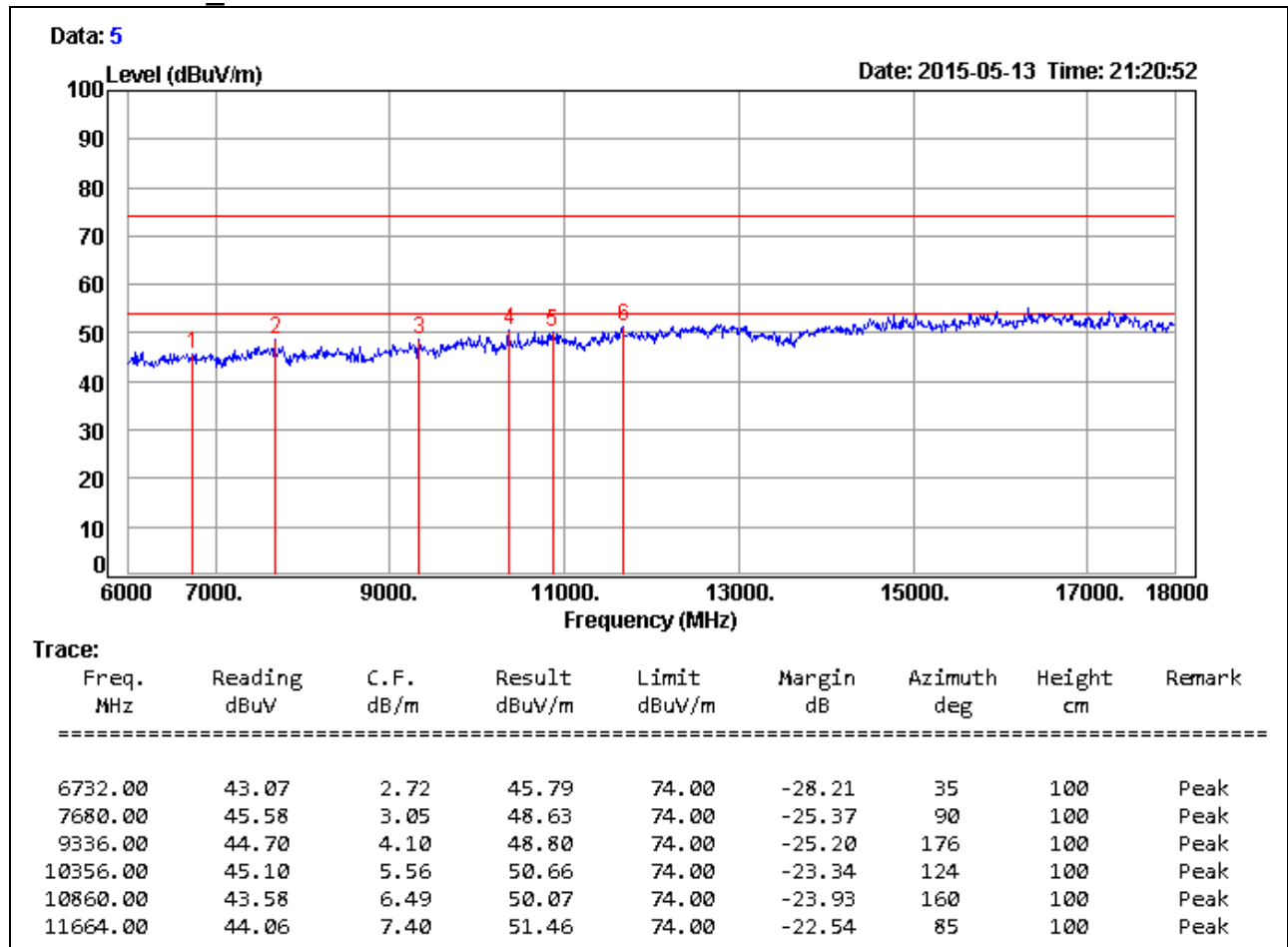
**Remark:**

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



Product Name	Dual-lines VDSL2/ADSL2+ Wireless-AC 3G/4G LTE VPN Firewall Router	Test By	Jey Li
Test Model	BiPAC 8920AX	Test Date	2015/05/13
Test Mode	Normal Operating	Temp. & Humidity	25°C, 50%

966 Chamber_C at 3Meter / Vertical

**Remark:**

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