



MEASUREMENT REPORT

FCC PART 15.247 / IC RSS-247 WLAN 802.11b/g/n

FCC ID: O9C-BJNGABB0038

IC: 2299L-BJNGABB0038

APPLICANT: Hewlett Packard Company

Application Type: Certification

Product: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr

Model No.: BJNGA-BB0038

Trademark: Hewlett Packard Enterprise

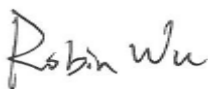
FCC Classification: Digital Transmission System (DTS)

FCC Rule Part(s): Part 15.247

IC Specification(s): RSS-247 Issue 1

Test Procedure(s): ANSI C63.10-2013, KDB 558074 D01v03r03,
KDB 662911 D01v02r01

Test Date: April 08 ~ 15, 2015

Reviewed By : 
(Robin Wu)

Approved By : 
(Marlin Chen)



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB 558074 D01v03r03. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date
1504RSU00601	Rev. 01	Initial report	10-08-2015

CONTENTS

Description	Page
§2.1033 General Information.....	5
1. INTRODUCTION	6
1.1. Scope.....	6
1.2. MRT Test Location	6
2. PRODUCT INFORMATION	7
2.1. Equipment Description	7
2.2. Product Specification Subjective to this Standard.....	7
2.3. Operation Frequency / Channel List	7
2.4. Description of Available Antennas	8
2.5. Description of Antenna RF Port.....	9
2.6. Test Mode	9
2.7. Test Software	9
2.8. Device Capabilities.....	10
2.9. Test Configuration	11
2.10. EMI Suppression Device(s)/Modifications.....	11
2.11. Labeling Requirements.....	11
3. DESCRIPTION of TEST.....	12
3.1. Evaluation Procedure	12
3.2. AC Line Conducted Emissions	12
3.3. Radiated Emissions.....	13
4. ANTENNA REQUIREMENTS.....	14
5. TEST EQUIPMENT CALIBRATION DATE.....	15
6. MEASUREMENT UNCERTAINTY	16
7. TEST RESULT	17
7.1. Summary.....	17
7.2. 6dB Bandwidth Measurement.....	18
7.2.1. Test Limit	18
7.2.2. Test Procedure used.....	18
7.2.3. Test Setting.....	18
7.2.4. Test Setup	18
7.2.5. Test Result.....	19
7.3. Output Power Measurement.....	28

7.3.1.	Test Limit	28
7.3.2.	Test Procedure Used	28
7.3.3.	Test Setting.....	28
7.3.4.	Test Setup	28
7.3.5.	Test Result of Output Power	29
7.3.6.	Test Result of Average Output Power (Reporting Only)	32
7.4.	Power Spectral Density Measurement.....	33
7.4.1.	Test Limit	33
7.4.2.	Test Procedure Used	33
7.4.3.	Test Setting.....	33
7.4.4.	Test Setup	33
7.4.5.	Test Result.....	34
7.5.	Conducted Band Edge and Out-of-Band Emissions	43
7.5.1.	Test Limit	43
7.5.2.	Test Procedure Used	43
7.5.3.	Test Setting.....	43
7.5.4.	Test Setup	44
7.5.5.	Test Result.....	45
7.6.	Radiated Spurious Emission Measurement	62
7.6.1.	Test Limit	62
7.6.2.	Test Procedure Used	62
7.6.3.	Test Setting.....	62
7.6.4.	Test Setup	64
7.6.5.	Test Result.....	66
7.7.	Radiated Restricted Band Edge Measurement.....	84
7.7.1.	Test Result.....	84
7.8.	AC Conducted Emissions Measurement	116
7.8.1.	Test Limit	116
7.8.2.	Test Setup	116
7.8.3.	Test Result.....	117
8.	CONCLUSION	119

§2.1033 General Information

Applicant:	Hewlett Packard Company
Applicant Address:	153 Taylor Street Littleton Massachusetts, United States 01460-1407
Manufacturer:	Hewlett Packard Company
Manufacturer Address:	153 Taylor Street Littleton Massachusetts, United States 01460-1407
Test Site:	MRT Technology (Suzhou) Co., Ltd
Test Site Address:	D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China
MRT FCC Registration No.:	809388
MRT IC Registration No.:	11384A
FCC Rule Part(s):	Part 15.247
IC Specification(s):	RSS-247 Issue 1
Model No.:	BJNGA-BB0038
FCC ID:	O9C-BJNGABB0038
IC:	2299L-BJNGABB0038
Test Device Serial No.:	N/A ☐ Production ☒ Pre-Production ☐ Engineering
FCC Classification:	Digital Transmission System (DTS)

Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Tian'edang Rd., Suzhou, China.

- MRT facility is a FCC registered (MRT Reg. No. 809388) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules.
- MRT facility is an IC registered (MRT Reg. No. 11384A-1) test laboratory with the site description on file at Industry Canada.
- MRT facility is a VCCI registered (R-4179, G-814, C-4664, T-2206) test laboratory with the site description on file at VCCI Council.
- MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (A2LA) under the American Association for Laboratory Accreditation Program (A2LA Cert. No. 3628.01) in EMC, Telecommunications and Radio testing for FCC, Industry Canada, EU and TELEC Rules.



1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taihu Lake. These measurement tests were conducted at the MRT Technology (Suzhou) Co., Ltd. Facility located at D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2009 on September 30, 2013.



2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name	HPE MSR954-W 1GbE+SFP LTE (AM) Rtr
Model No.	BJNGA-BB0038
Wi-Fi Specification	802.11b/g/n
Built-in MC7354 Module Specification	
FCC ID	N7NMC7355
IC	2417C-MC7355
Supported Bands	GPRS/EDGE 850/1900 WCDMA Band II/V CDMA2000 BC0/BC1/BC10 LTE Band 2/4/5/13/17/25

2.2. Product Specification Subjective to this Standard

Frequency Range	802.11b/g/n-HT20: 2412 ~ 2462 MHz 802.11n-HT40: 2422 ~ 2452 MHz
Maximum Peak Output Power	802.11b: 23.00dBm 802.11g: 28.99dBm 802.11n-HT20: 28.96dBm 802.11n-HT40: 28.09dBm
Type of Modulation	802.11b: DSSS 802.11g/n: OFDM

2.3. Operation Frequency / Channel List

802.11b/g/n-HT20

Channel	Frequency	Channel	Frequency	Channel	Frequency
01	2412 MHz	02	2417 MHz	03	2422 MHz
04	2427 MHz	05	2432 MHz	06	2437 MHz
07	2442 MHz	08	2447 MHz	09	2452 MHz
10	2457 MHz	11	2462 MHz	N/A	N/A

802.11n-HT40

Channel	Frequency	Channel	Frequency	Channel	Frequency
03	2422 MHz	04	2427 MHz	05	2432 MHz
06	2437 MHz	07	2442 MHz	08	2447 MHz
09	2452 MHz	N/A	N/A	N/A	N/A

2.4. Description of Available Antennas

Antenna Type	Frequency Band (GHz)	Manufacturer	Tx Paths	Max Peak Gain (dBi)	Directional Gain (dBi)	
					For Power	For PSD
Dipole Antenna	2.4	DONGGUAN SENLING INDUSTRIAL CO., LTD	2	3	3	6.01

Note: The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.

For CDD transmissions, directional gain is calculated as follows, $N_{ANT} = 2$, $N_{SS} = 1$.

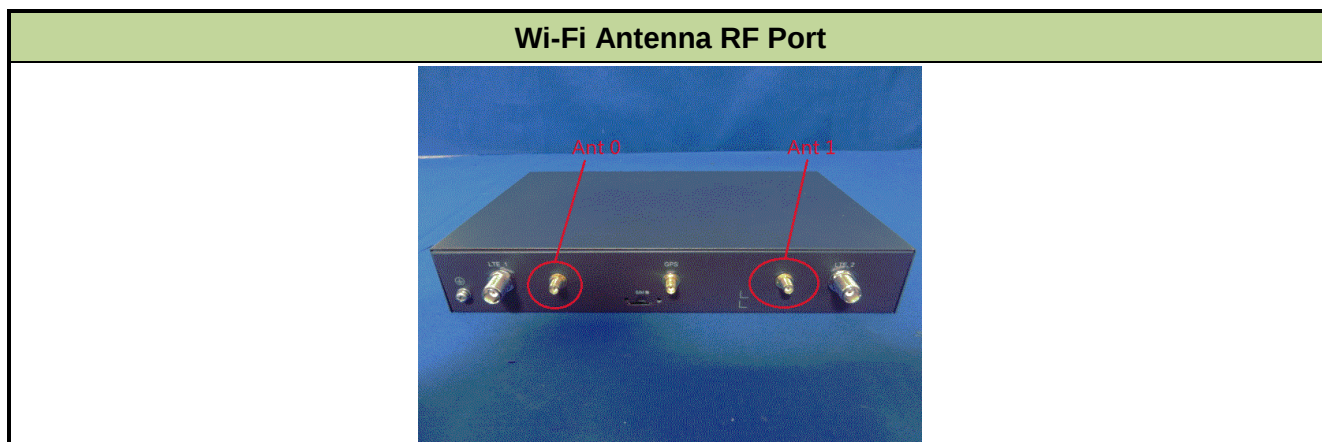
- 1) If all antennas have the same gain, G_{ANT} , Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.
 - For power spectral density (PSD) measurements on all devices,
Array Gain = $10 \log (N_{ANT}/ N_{SS})$ dB = 3.01;
 - For power measurements on IEEE 802.11 devices,
Array Gain = 0 dB for $N_{ANT} \leq 4$;
- 2) If antenna gains are not equal, the user may use either of the following methods to calculate directional gain, provided that each transmit antenna is driven by only one spatial stream:
 - Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain;

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

$g_{j,k} = 10^{G_k/20}$ if the kth antenna is being fed by spatial stream j, or zero if it is not;

G_k is the gain in dBi of the kth antenna.

2.5. Description of Antenna RF Port



2.6. Test Mode

Test Mode	Mode 1: Transmit by 802.11b
	Mode 2: Transmit by 802.11g
	Mode 3: Transmit by 802.11n-HT20
	Mode 4: Transmit by 802.11n-HT40

2.7. Test Software

The test utility software used during testing was “ARTGUI”.

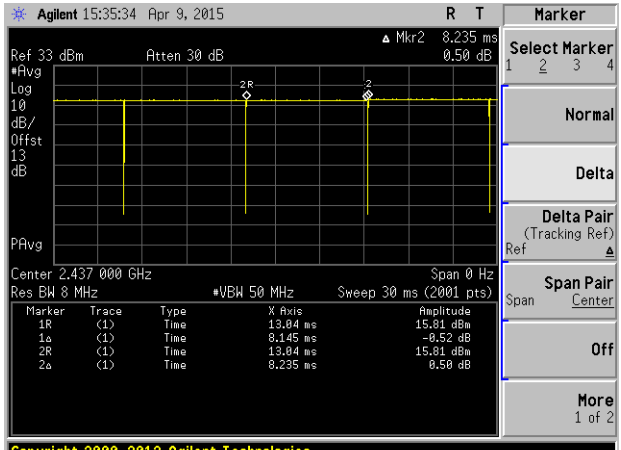
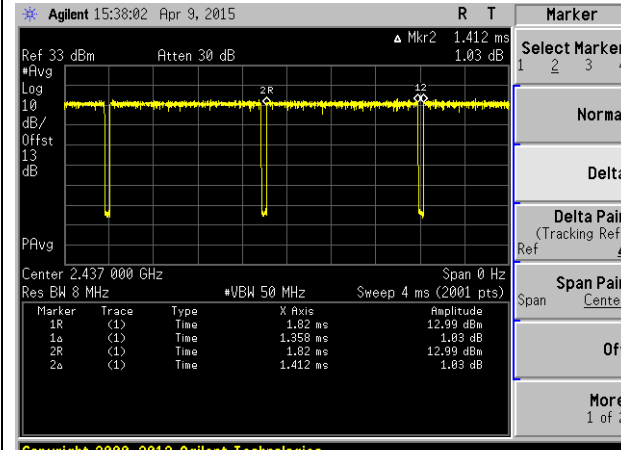
2.8. Device Capabilities

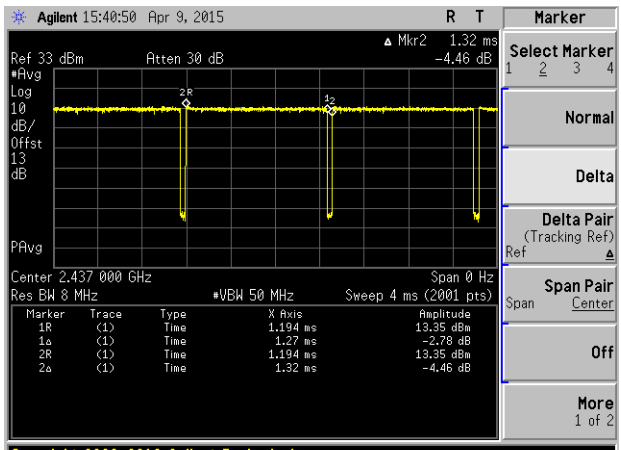
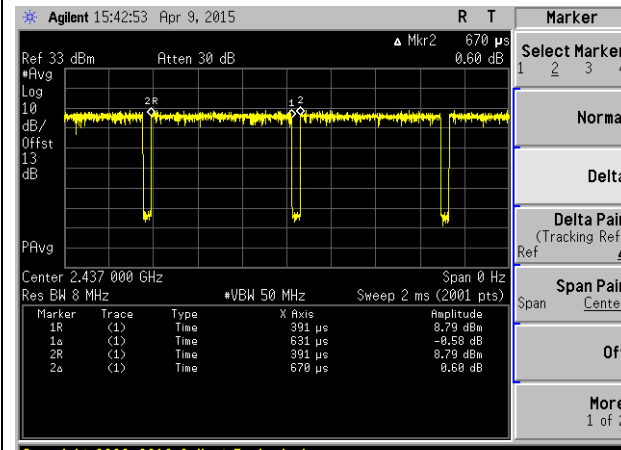
This device contains the following capabilities:

2.4GHz WLAN (DTS)

Note: 2.4GHz WLAN (DTS) operation is possible in 20MHz, and 40MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = average per the guidance of Section 6.0 b) of KDB 558074 D01v03r03. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

Test Mode	Duty Cycle
802.11b	98.9%
802.11g	96.2%
802.11n-HT20	96.2%
802.11n-HT40	94.2%

802.11 b – Duty Cycle	802.11 g – Duty Cycle
 Copyright 2000–2012 Agilent Technologies	 Copyright 2000–2012 Agilent Technologies

802.11 n-HT20 – Duty Cycle	802.11 n-HT40 – Duty Cycle
 Copyright 2000–2012 Agilent Technologies	 Copyright 2000–2012 Agilent Technologies

2.9. Test Configuration

The **HPE MSR954-W 1GbE+SFP LTE (AM) Rtr FCC ID: O9C-BJNGABB0038** was tested per the guidance of KDB 558074 D01v03r03. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.

2.10. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

2.11. Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase.

However, when the device is so small wherein placement of the label with specified statement is not practical, only the trade name and FCC ID must be displayed on the device per Section 15.19(a)(5).

Please see attachment for FCC ID label and label location.

3. DESCRIPTION of TEST

3.1. Evaluation Procedure

The measurement procedures described in the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2013), and the guidance provided in KDB 558074 D01v03r03 were used in the measurement of the **HPE MSR954-W 1GbE+SFP LTE (AM) Rtr FCC ID: O9C-BJNGABB0038.**

Deviation from measurement procedure.....None

3.2. AC Line Conducted Emissions

The line-conducted facility is located inside an 8'x4'x4' shielded enclosure. A 1m x 2m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground-plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the receiver and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The receiver was scanned from 150kHz to 30MHz. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or data exchange speed, or support equipment whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions are used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

An extension cord was used to connect to a single LISN which powered by EUT. The extension cord was calibrated with LISN, the impedance and insertion loss are compliance with the requirements as stated in ANSI C63.10-2013.

Line conducted emissions test results are shown in Section 7.8.

3.3. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. A MF Model 210SS turntable is used for radiated measurement. It is a continuously rotatable, remote controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm high PVC support structure is placed on top of the turntable.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up for frequencies below 1GHz was placed on top of the 0.8 meter high, 1 x 1.5 meter table; and test set-up for frequencies 1-40GHz was placed on top of the 1.5 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions. According to 3dB Beam-Width of horn antenna, the horn antenna should be always directed to the EUT when rising height.

4. ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

- The antenna of the **HPE MSR954-W 1GbE+SFP LTE (AM) Rtr** uses a unique connector.

Conclusion:

The **HPE MSR954-W 1GbE+SFP LTE (AM) Rtr FCC ID: O9C-BJNGABB0038** unit complies with the requirement of §15.203.

5. TEST EQUIPMENT CALIBRATION DATE

Conducted Emissions

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2015/11/07
Two-Line V-Network	R&S	ENV216	MRTSUE06002	1 year	2015/11/07
Two-Line V-Network	R&S	ENV216	MRTSUE06003	1 year	2015/11/07
Temperature/Humidity Meter	Ouleinuo	N/A	MRTSUE06114	1 year	2015/11/20

Radiated Emission

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	E4447A	MRTSUE06028	1 year	2015/10/09
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2015/11/07
Preamplifier	Agilent	83017A	MRTSUE06020	1 year	2015/12/13
Loop Antenna	Schwarzbeck	FMZB1519	MRTSUE06025	1 year	2015/11/08
TRILOG Antenna	Schwarzbeck	VULB9162	MRTSUE06022	1 year	2015/11/08
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06023	1 year	2015/11/08
Broadband Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06024	1 year	2016/01/05
Temperature/Humidity Meter	Ouleinuo	N/A	MRTSUE06115	1 year	2015/11/20

Conducted Test Equipment

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2015/04/23
USB Wideband Power Sensor	Boonton	55006	MRTSUE06109	1 year	2015/10/15
Temperature/Humidity Meter	Ouleinuo	N/A	MRTSUE06112	1 year	2015/11/20

Software	Version	Function
e3	V8.3.5	EMI Test Software

6. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

AC Conducted Emission Measurement
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 150kHz~30MHz: 3.46dB
Radiated Emission Measurement
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 9kHz ~ 1GHz: 4.18dB 1GHz ~ 25GHz: 4.76dB

7. TEST RESULT

7.1. Summary

Product Name: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr
FCC ID: O9C-BJNGABB0038
IC: 2299L-BJNGABB0038
FCC Classification: Digital Transmission System (DTS)
Data Rate(s) Tested: 1Mbps ~ 11Mbps (b); 6Mbps ~ 54Mbps (g);
6.5/7.2Mbps ~ 130/144.4Mbps (n-HT20);
13.5/15Mbps ~ 270/300Mbps (n-HT40)

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.247(a)(2)	RSS-247 [5.2]	6dB Bandwidth	$\geq 500\text{kHz}$	Conducted	Pass	Section 7.2
15.247(b)(3)	RSS-247 [5.4(4)]	Output Power	$\leq 30\text{dBm}$ E.I.R.P $\leq 36\text{dBm}$		Pass	Section 7.3
15.247(e)	RSS-247 [5.2]	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$		Pass	Section 7.4
15.247(d)	RSS-247 [5.5]	Band Edge / Out-of-Band Emissions	$\geq 20\text{dBc(Peak)}$		Pass	Section 7.5
15.205 15.209	RSS-247 [5.5]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209	Radiated	Pass	Section 7.6 & 7.7
15.207	RSS-Gen [8.8]	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits < RSS-Gen [7.2.4] limits	Line Conducted	Pass	Section 7.8

Notes:

- 1) All modes of operation and data rates were investigated. For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.

7.2. 6dB Bandwidth Measurement

7.2.1. Test Limit

The minimum 6dB bandwidth shall be at least 500 kHz.

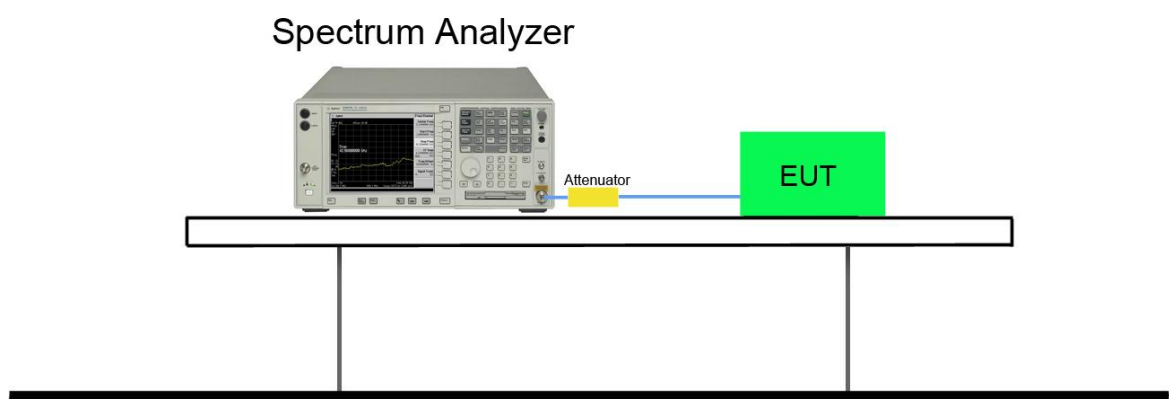
7.2.2. Test Procedure used

KDB 558074 D01v03r03 - Section 8.2 Option 2

7.2.3. Test Setting

1. The Spectrum's automatic bandwidth measurement capability was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to $X = 6$. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. Set RBW = 100 kHz
3. VBW $\geq 3 \times$ RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. Allow the trace was allowed to stabilize

7.2.4. Test Setup

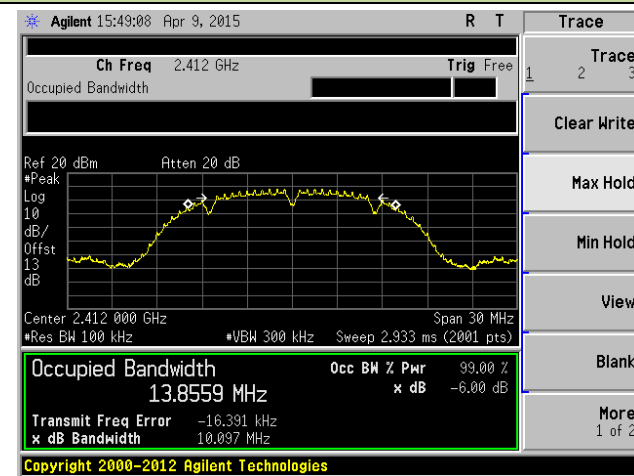


7.2.5. Test Result

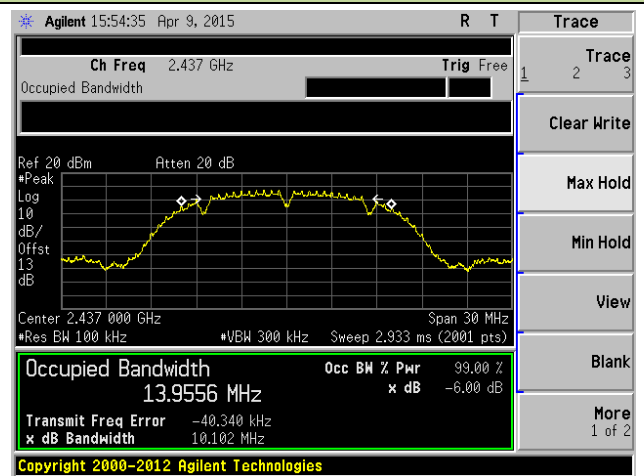
Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
Ant 0 / Ant 0 + 1						
802.11b	1	01	2412	10.10	≥0.5	Pass
802.11b	1	06	2437	10.10	≥0.5	Pass
802.11b	1	11	2462	10.10	≥0.5	Pass
802.11g	6	01	2412	16.06	≥0.5	Pass
802.11g	6	06	2437	16.34	≥0.5	Pass
802.11g	6	11	2462	16.35	≥0.5	Pass
802.11n-HT20	13	01	2412	17.63	≥0.5	Pass
802.11n-HT20	13	06	2437	17.65	≥0.5	Pass
802.11n-HT20	13	11	2462	17.67	≥0.5	Pass
802.11n-HT40	27	03	2422	36.15	≥0.5	Pass
802.11n-HT40	27	06	2437	36.38	≥0.5	Pass
802.11n-HT40	27	09	2452	36.44	≥0.5	Pass
Ant 1 / Ant 0 + 1						
802.11b	1	01	2412	10.10	≥0.5	Pass
802.11b	1	06	2437	10.09	≥0.5	Pass
802.11b	1	11	2462	10.10	≥0.5	Pass
802.11g	6	01	2412	16.36	≥0.5	Pass
802.11g	6	06	2437	16.35	≥0.5	Pass
802.11g	6	11	2462	16.33	≥0.5	Pass
802.11n-HT20	13	01	2412	17.60	≥0.5	Pass
802.11n-HT20	13	06	2437	17.61	≥0.5	Pass
802.11n-HT20	13	11	2462	17.60	≥0.5	Pass
802.11n-HT40	27	03	2422	36.42	≥0.5	Pass
802.11n-HT40	27	06	2437	36.15	≥0.5	Pass
802.11n-HT40	27	09	2452	36.43	≥0.5	Pass

802.11b 6dB Bandwidth - Ant 0 / Ant 0 + 1

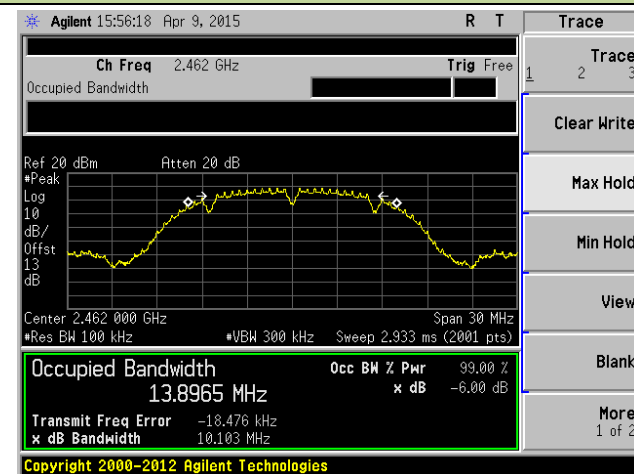
Channel 01 (2412MHz)



Channel 06 (2437MHz)

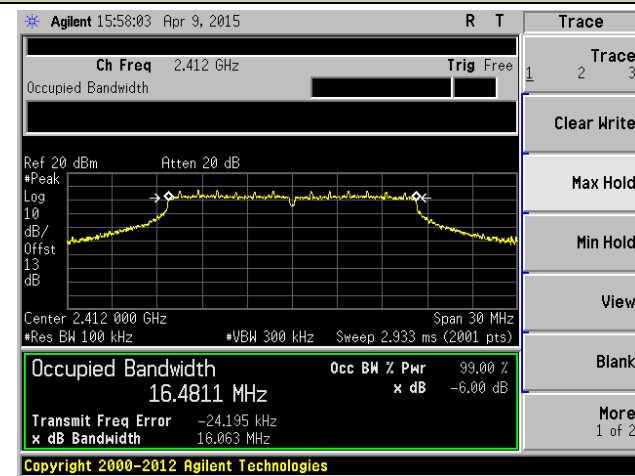


Channel 11 (2462MHz)

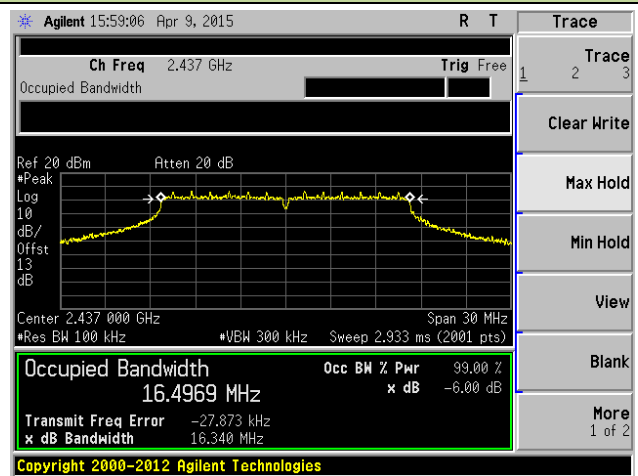


802.11g 6dB Bandwidth - Ant 0 / Ant 0 + 1

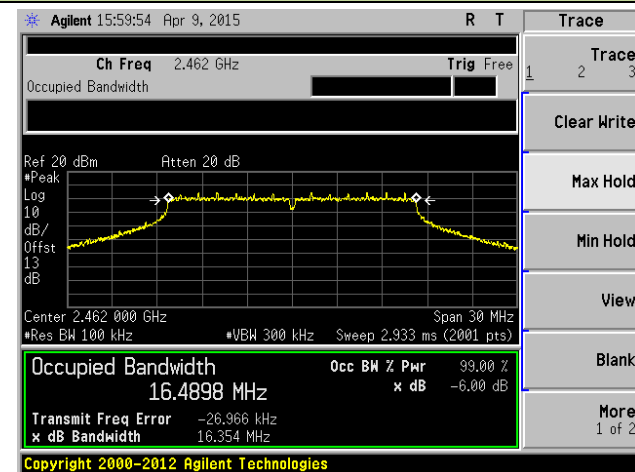
Channel 01 (2412MHz)



Channel 06 (2437MHz)

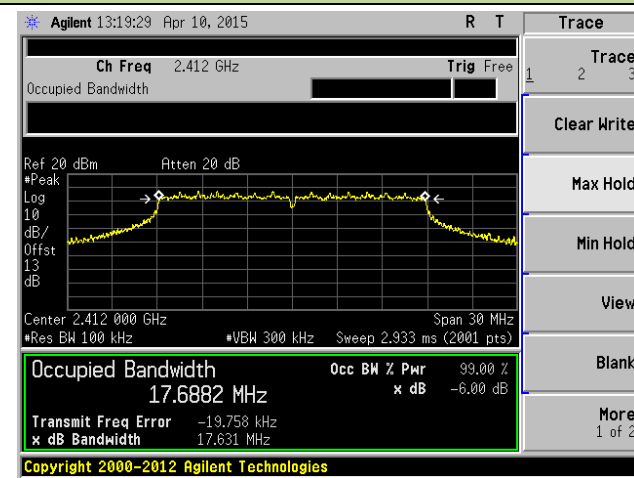


Channel 11 (2462MHz)

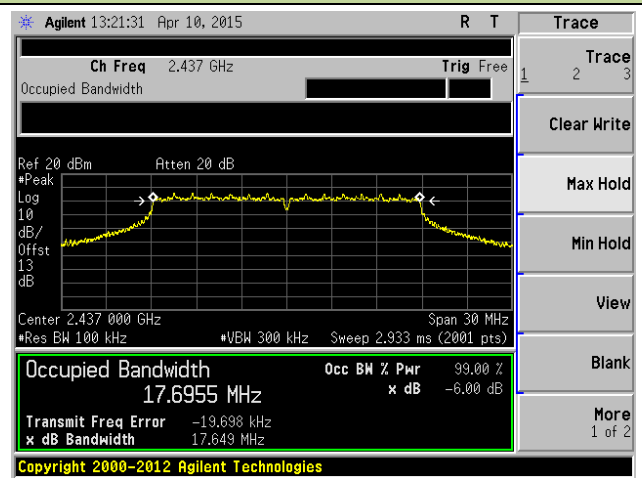


802.11n-HT20 6dB Bandwidth - Ant 0 / Ant 0 + 1

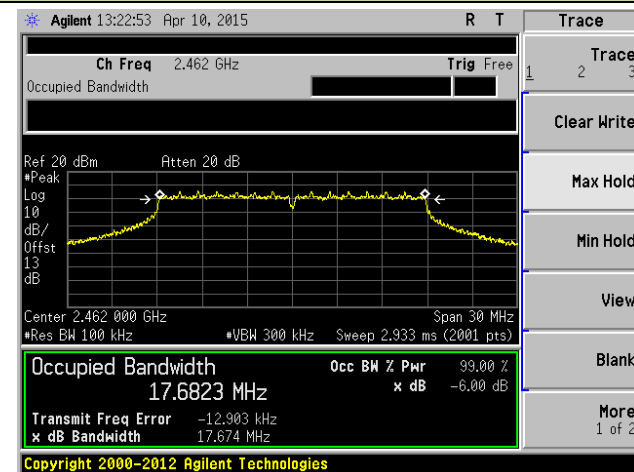
Channel 01 (2412MHz)



Channel 06 (2437MHz)

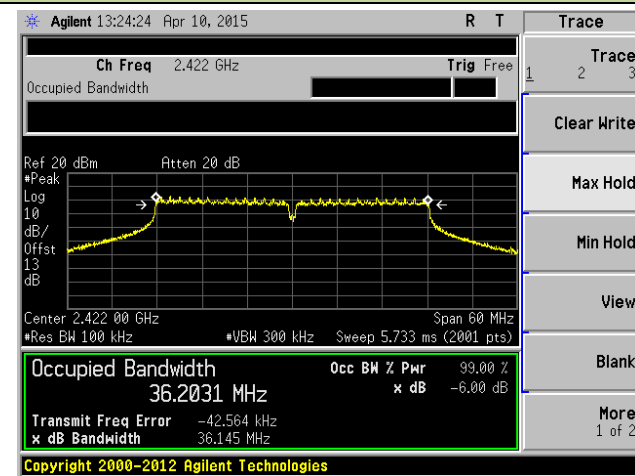


Channel 11 (2462MHz)

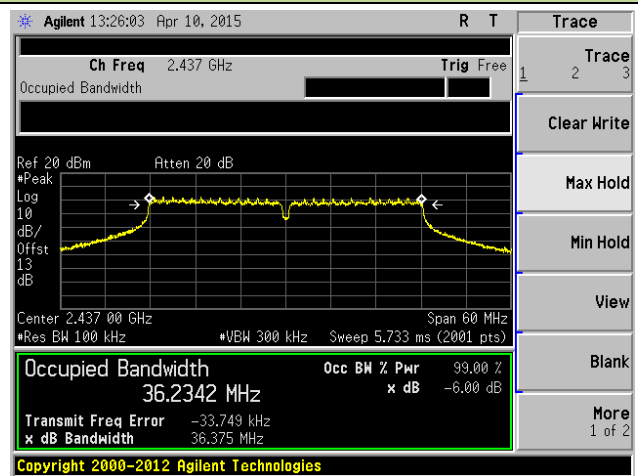


802.11n-HT40 6dB Bandwidth - Ant 0 / Ant 0 + 1

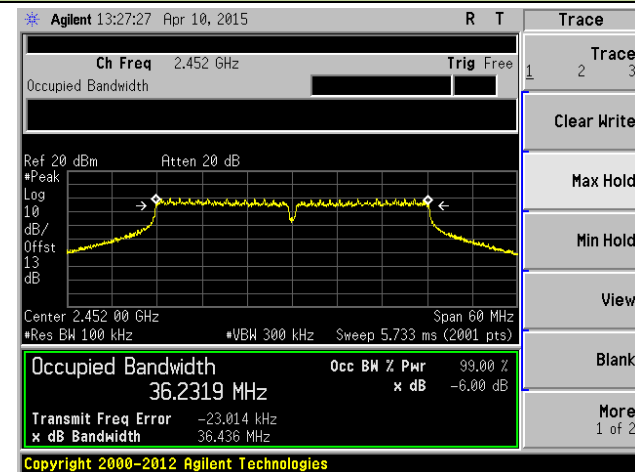
Channel 03 (2422MHz)



Channel 06 (2437MHz)

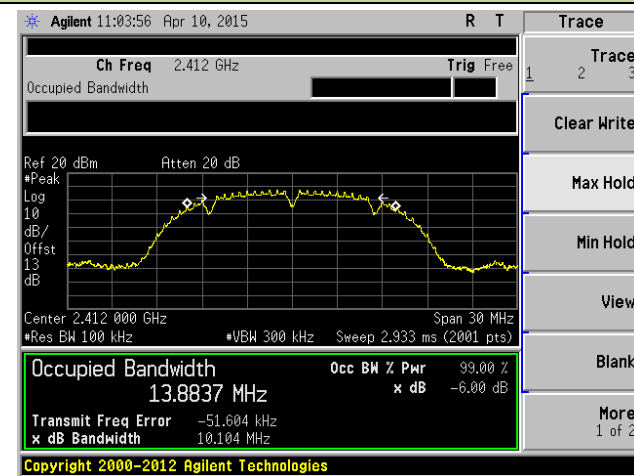


Channel 09 (2452MHz)

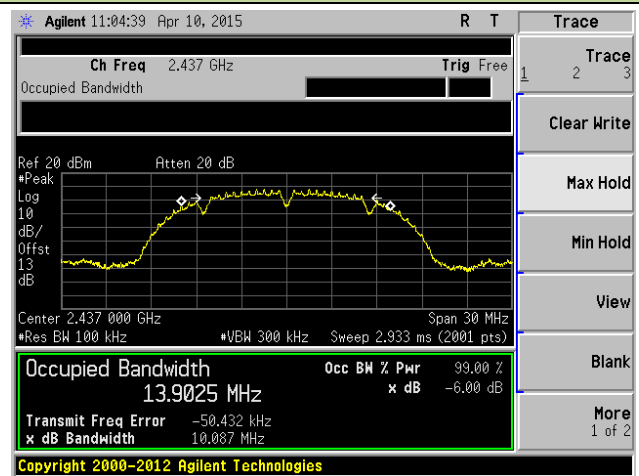


802.11b 6dB Bandwidth - Ant 1 / Ant 0 + 1

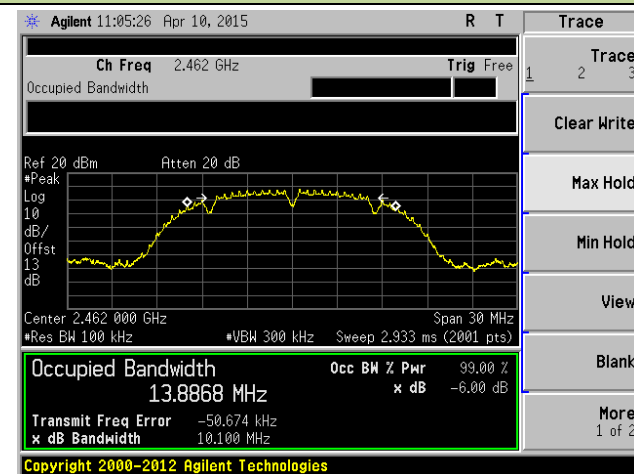
Channel 01 (2412MHz)



Channel 06 (2437MHz)

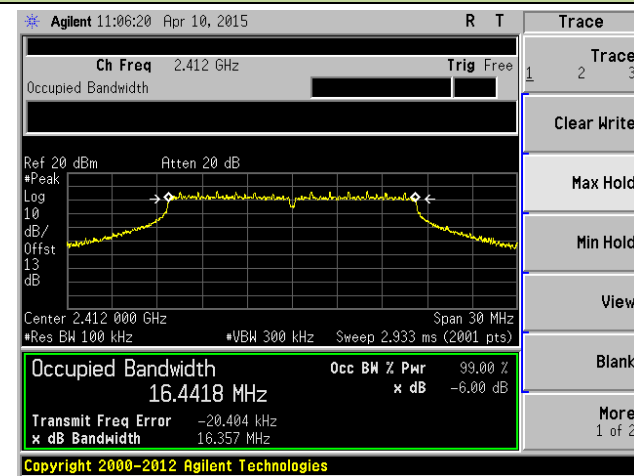


Channel 11 (2462MHz)

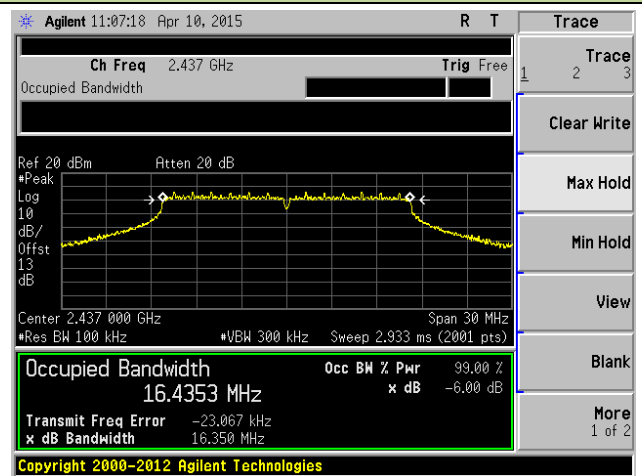


802.11g 6dB Bandwidth - Ant 1 / Ant 0 + 1

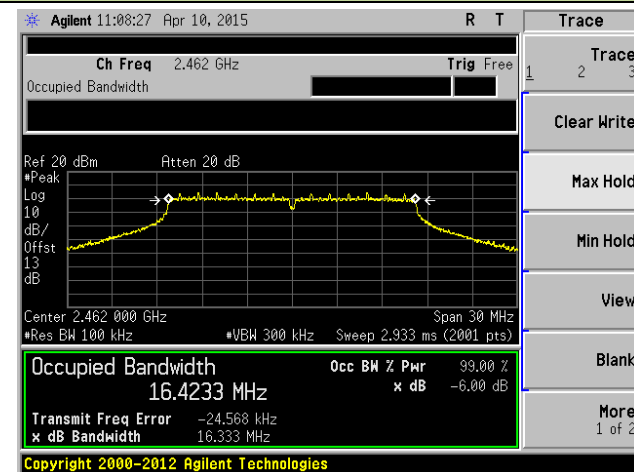
Channel 01 (2412MHz)



Channel 06 (2437MHz)

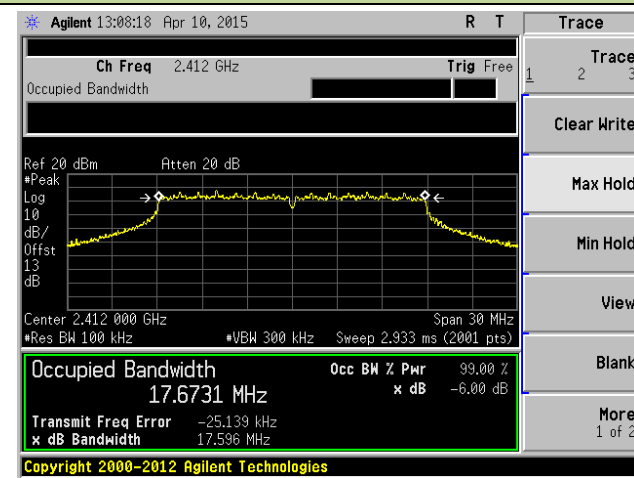


Channel 11 (2462MHz)

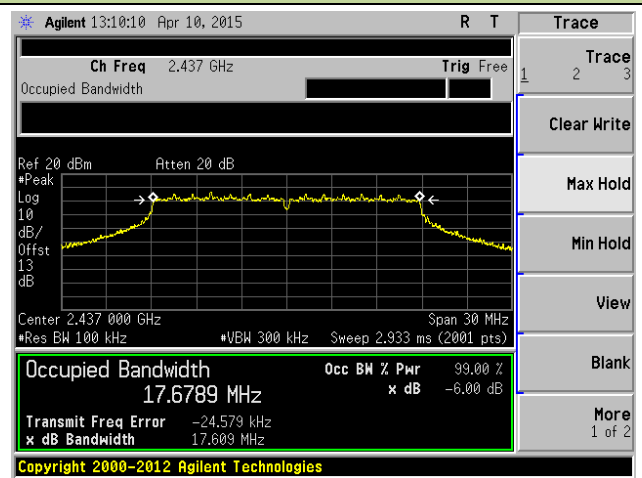


802.11n-HT20 6dB Bandwidth - Ant 1 / Ant 0 + 1

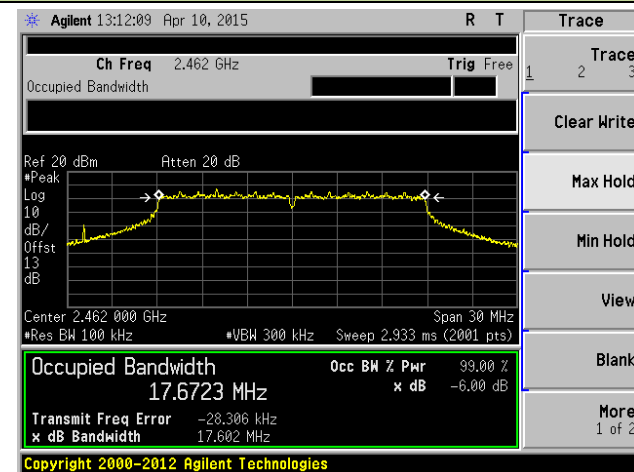
Channel 01 (2412MHz)



Channel 06 (2437MHz)

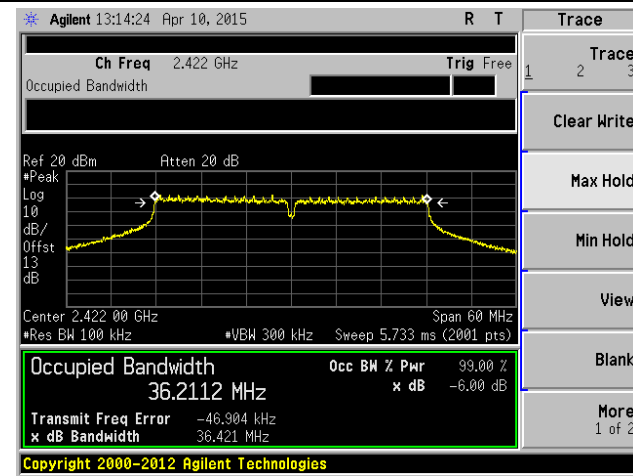


Channel 11 (2462MHz)

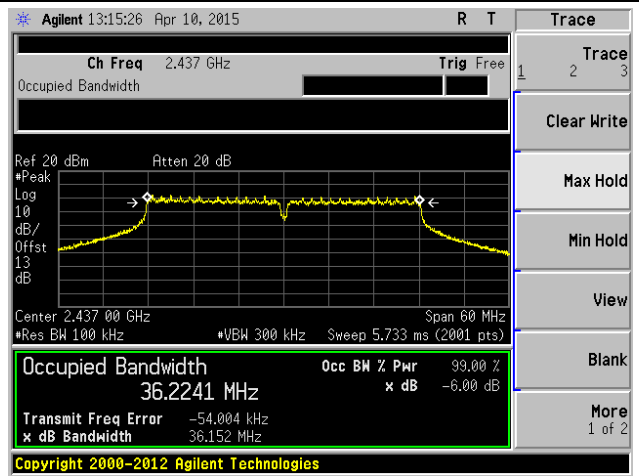


802.11n-HT40 6dB Bandwidth - Ant 1 / Ant 0 + 1

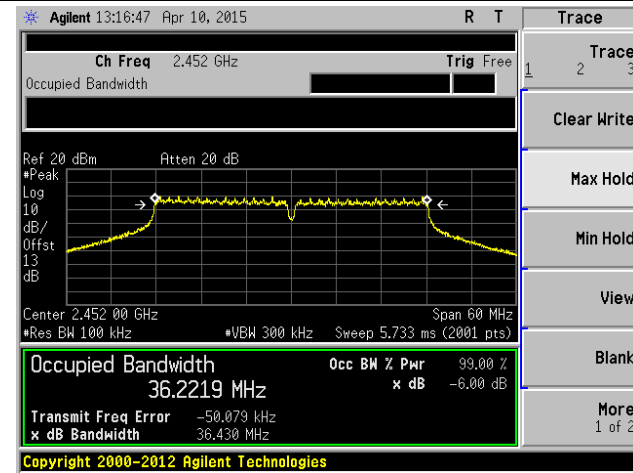
Channel 03 (2422MHz)



Channel 06 (2437MHz)



Channel 09 (2452MHz)



7.3. Output Power Measurement

7.3.1. Test Limit

The maximum out power shall be less 1 Watt (30dBm).

The E.I.R.P. shall not exceed 4 W.

7.3.2. Test Procedure Used

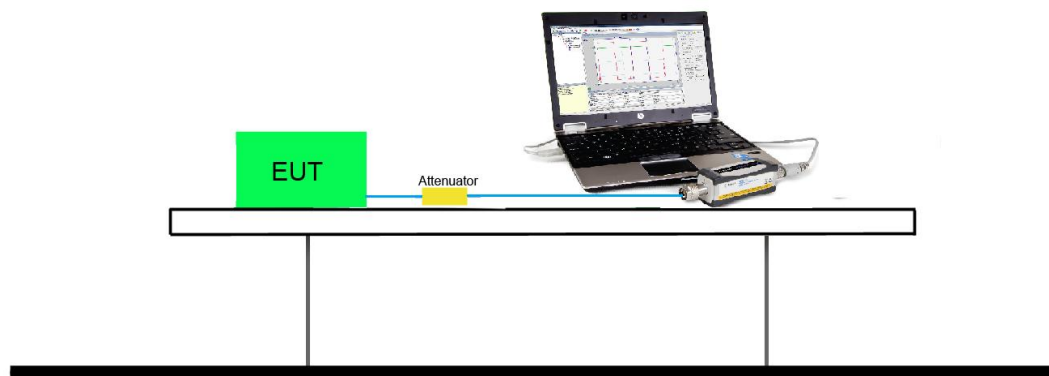
KDB 558074 D01v03r03 - Section 9.1.2 PKPM1 Peak Power Method

7.3.3. Test Setting

Method PKPM1 (Peak Power Measurement of Signals with DTS BW $\leq$ 50MHz)

Peak power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The pulse sensor employs a VBW = 50MHz so this method was only used for signals whose DTS bandwidth was less than or equal to 50MHz.

7.3.4. Test Setup



7.3.5. Test Result of Output Power

Power output test was verified over all data rates of each mode shown as below, and then choose the maximum power output (yellow marker) for final test of each channel.

MCS Index for 802.11n	N _{TX}	Data Rate (Mbps)					
		802.11b	802.11g	20MHz Bandwidth		40MHz Bandwidth	
				800ns GI	400ns GI	800ns GI	400ns GI
0	1	1	6	6.5	7.2	13.5	15.0
1	1	2	9	13.0	14.4	27.0	30.0
2	1	5.5	12	19.5	21.7	40.5	45.0
3	1	11	18	26.0	28.9	54.0	60.0
4	1	--	24	39.0	43.3	81.0	90.0
5	1	--	36	52.0	57.8	108.0	120.0
6	1	--	48	58.5	65.0	121.5	135.0
7	1	--	54	65.0	72.2	135.0	150.0
8	2	1	6	13.0	14.4	27.0	30.0
9	2	2	9	26.0	28.9	54.0	60.0
10	2	5.5	12	39.0	43.3	81.0	90.0
11	2	11	18	52.0	57.8	108.0	120.0
12	2	--	24	78.0	86.7	162.0	180.0
13	2	--	36	104.0	115.6	216.0	240.0
14	2	--	48	117.0	130.0	243.0	270.0
15	2	--	54	130.0	144.0	270.0	300.0

Output power at various data rates for Ant 0:

Test Mode	Bandwidth (MHz)	Channel No.	Frequency (MHz)	Data Rate (Mbps)	Peak Power (dBm)
802.11b	20	6	2437	1	19.74
				5.5	19.56
				11	19.34
802.11g	20	6	2437	6	25.53
				24	25.35
				54	25.24
802.11n	20	6	2437	13	25.21
				14.4	25.13
				78	25.09
				86.7	24.93
				130	24.88
				144	24.69
802.11n	40	6	2437	27	25.17
				30	25.04
				162	24.97
				180	24.85
				270	24.74
				300	24.63

Test Result of Peak Output Power

Test Mode	N _{TX}	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 0 Peak Power (dBm)	Ant 1 Peak Power (dBm)	Total Peak Power (dBm)	Power Limit (dBm)	Max EIRP (dBm)	EIRP Limit (dBm)	Result
11b	2	1	1	2412	19.93	19.84	22.90	≤ 30	25.90	≤ 36	Pass
11b	2	1	6	2437	19.74	19.57	22.67	≤ 30	25.67	≤ 36	Pass
11b	2	1	11	2462	20.02	19.96	23.00	≤ 30	26.00	≤ 36	Pass
11g	2	6	1	2412	25.84	26.12	28.99	≤ 30	31.99	≤ 36	Pass
11g	2	6	6	2437	25.53	25.92	28.74	≤ 30	31.74	≤ 36	Pass
11g	2	6	11	2462	24.39	24.64	27.53	≤ 30	30.53	≤ 36	Pass
11n-HT20	2	13	1	2412	25.85	26.04	28.96	≤ 30	31.96	≤ 36	Pass
11n-HT20	2	13	6	2437	25.21	25.75	28.50	≤ 30	31.50	≤ 36	Pass
11n-HT20	2	13	11	2462	25.14	25.19	28.18	≤ 30	31.18	≤ 36	Pass
11n-HT40	2	27	3	2422	25.06	25.09	28.09	≤ 30	31.09	≤ 36	Pass
11n-HT40	2	27	6	2437	25.17	24.94	28.07	≤ 30	31.07	≤ 36	Pass
11n-HT40	2	27	9	2452	23.42	23.15	26.30	≤ 30	29.30	≤ 36	Pass

Note 1: Total Peak Power (dBm) = $10 \cdot \log\{10^{(\text{Ant 0 Peak Power}/10)} + 10^{(\text{Ant 1 Peak Power}/10)}\}$.

Note 2: Max EIRP = Total Peak Power + Antenna Directional Gain.

7.3.6. Test Result of Average Output Power (Reporting Only)

Test Mode	N _{TX}	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 0 Average Power (dBm)	Ant 1 Average Power (dBm)	Total Average Power (dBm)	Power Limit (dBm)	Max EIRP (dBm)	EIRP Limit (dBm)	Result
11b	2	1	1	2412	17.26	17.03	20.16	≤ 30	23.16	≤ 36	Pass
11b	2	1	6	2437	16.92	16.78	19.86	≤ 30	22.86	≤ 36	Pass
11b	2	1	11	2462	17.31	17.14	20.24	≤ 30	23.24	≤ 36	Pass
11g	2	6	1	2412	17.68	17.41	20.56	≤ 30	23.56	≤ 36	Pass
11g	2	6	6	2437	17.27	17.13	20.21	≤ 30	23.21	≤ 36	Pass
11g	2	6	11	2462	15.25	15.15	18.21	≤ 30	21.21	≤ 36	Pass
11n-HT20	2	13	1	2412	17.45	17.27	20.37	≤ 30	23.37	≤ 36	Pass
11n-HT20	2	13	6	2437	16.28	15.97	19.14	≤ 30	22.14	≤ 36	Pass
11n-HT20	2	13	11	2462	16.35	15.85	19.12	≤ 30	22.12	≤ 36	Pass
11n-HT40	2	27	3	2422	15.23	14.69	17.98	≤ 30	20.98	≤ 36	Pass
11n-HT40	2	27	6	2437	15.52	14.91	18.24	≤ 30	21.24	≤ 36	Pass
11n-HT40	2	27	9	2452	13.32	12.77	16.06	≤ 30	19.06	≤ 36	Pass

Note 1: Total Average Power (dBm) = $10 \cdot \log\{10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)}\}$.

Note 2: Max EIRP = Total Average Power + Antenna Directional Gain.

7.4. Power Spectral Density Measurement

7.4.1. Test Limit

The maximum permissible power spectral density is 8dBm in any 3 kHz band.

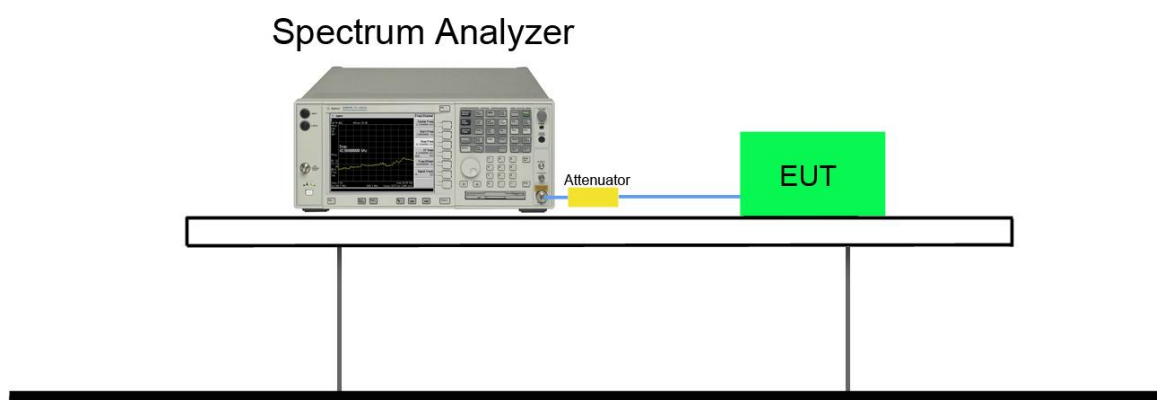
7.4.2. Test Procedure Used

KDB 558074 D01v03r03 - Section 10.2 Method PKPSD

7.4.3. Test Setting

1. Analyzer was set to the center frequency of the DTS channel under investigation
2. Span = 1.5 times the DTS channel bandwidth
3. RBW = 10kHz
4. VBW = 30kHz
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Trace was allowed to stabilize
9. Add Constant Factor = $10 \cdot \log(3\text{kHz} / 10\text{kHz}) = -5.23$

7.4.4. Test Setup



7.4.5. Test Result

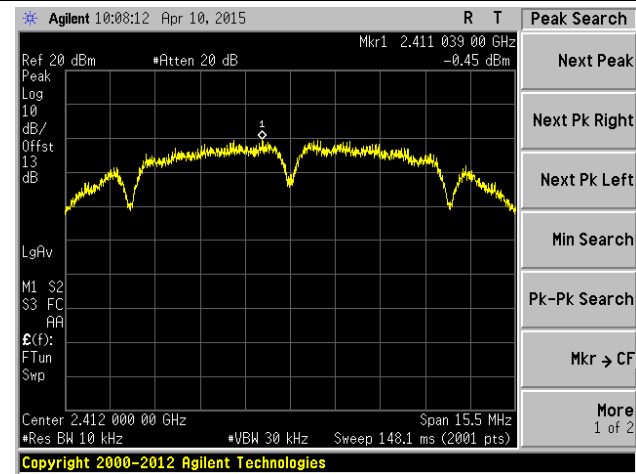
Test Mode	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Ant 0 PSD (dBm / 10kHz)	Ant 1 PSD (dBm / 10kHz)	Constant Factor	Total PSD (dBm / 3kHz)	Limit (dBm / 3kHz)	Result
Ant 0 + 1									
11b	1	01	2412	-0.45	-1.20	-5.23	-3.03	≤7.99	Pass
11b	1	06	2437	-0.78	-0.84	-5.23	-3.03	≤7.99	Pass
11b	1	11	2462	-1.04	-0.73	-5.23	-3.10	≤7.99	Pass
11g	6	01	2412	-1.34	-2.28	-5.23	-4.00	≤7.99	Pass
11g	6	06	2437	-1.46	-2.46	-5.23	-4.15	≤7.99	Pass
11g	6	11	2462	-3.80	-4.36	-5.23	-6.29	≤7.99	Pass
11n-HT20	13	1	2412	-2.19	-0.66	-5.23	-3.58	≤7.99	Pass
11n-HT20	13	6	2437	-3.20	-2.51	-5.23	-5.06	≤7.99	Pass
11n-HT20	13	11	2462	-3.24	-2.52	-5.23	-5.08	≤7.99	Pass
11n-HT40	27	3	2422	-5.97	-6.61	-5.23	-8.50	≤7.99	Pass
11n-HT40	27	6	2437	-5.87	-6.61	-5.23	-8.44	≤7.99	Pass
11n-HT40	27	9	2452	-6.79	-8.86	-5.23	-9.92	≤7.99	Pass

Note: The total PSD = $10 \cdot \log\{10^{(\text{Ant 0 PSD}/10)} + 10^{(\text{Ant 1 PSD}/10)}\} + \text{Constant Factor}$.

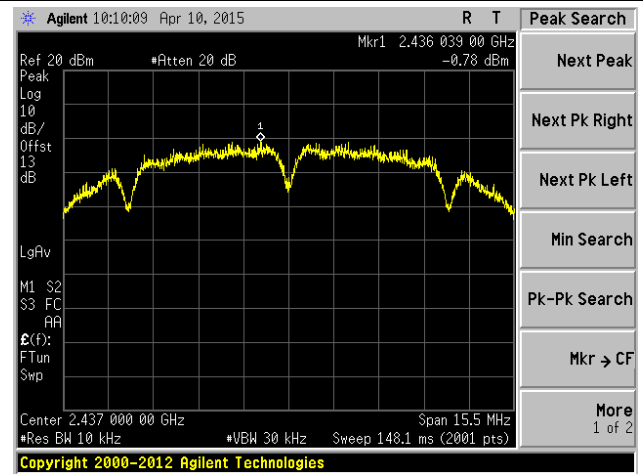
Constant Factor = $10 \cdot \log(3\text{kHz} / 10\text{kHz}) = -5.23$.

802.11b PKPSD - Ant 0 / Ant 0 + 1

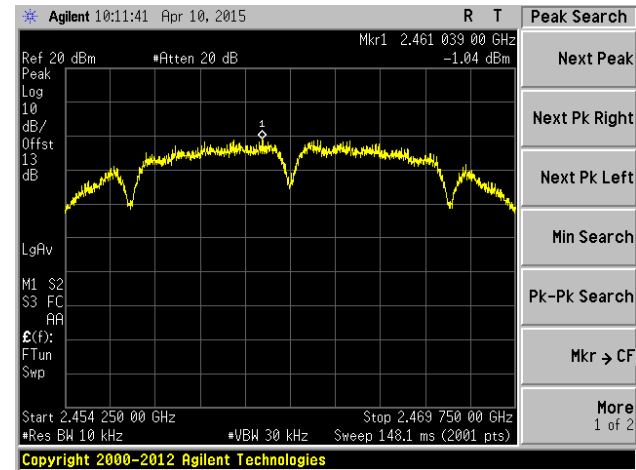
Channel 01 (2412MHz)



Channel 06 (2437MHz)

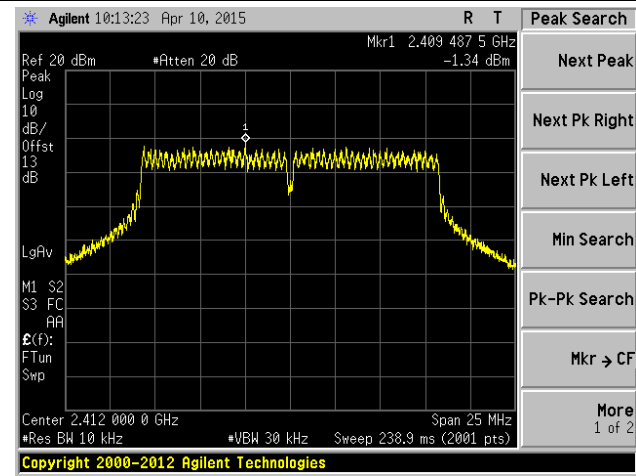


Channel 11 (2462MHz)

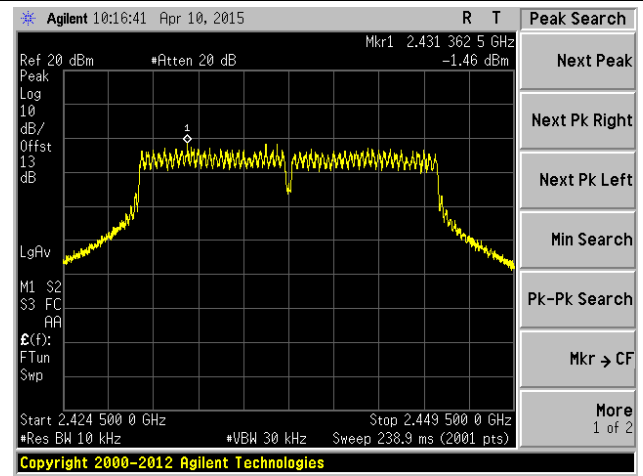


802.11g PKPSD - Ant 0 / Ant 0 + 1

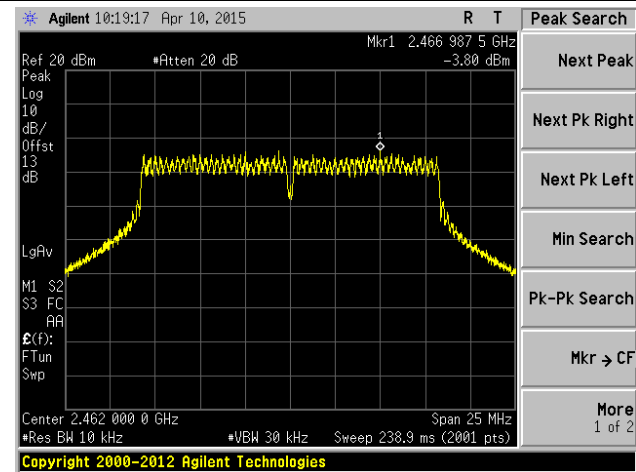
Channel 01 (2412MHz)



Channel 06 (2437MHz)

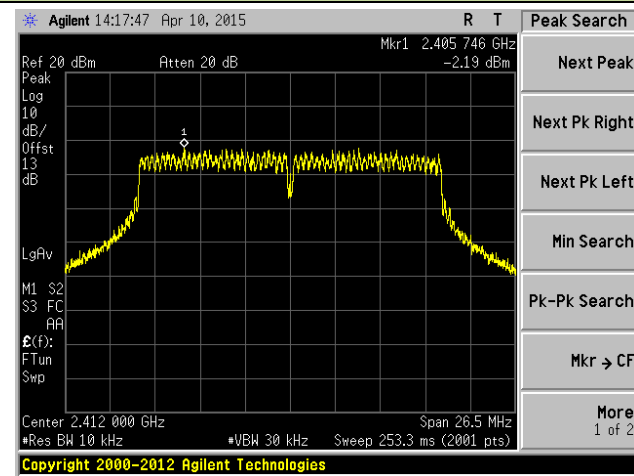


Channel 11 (2462MHz)

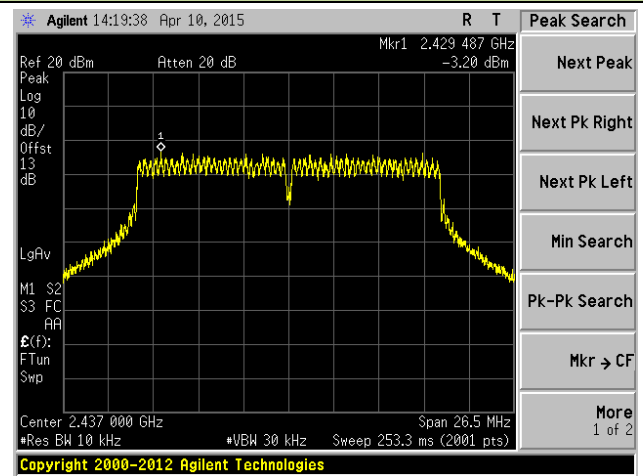


802.11n-HT20 PKPSD - Ant 0 / Ant 0 + 1

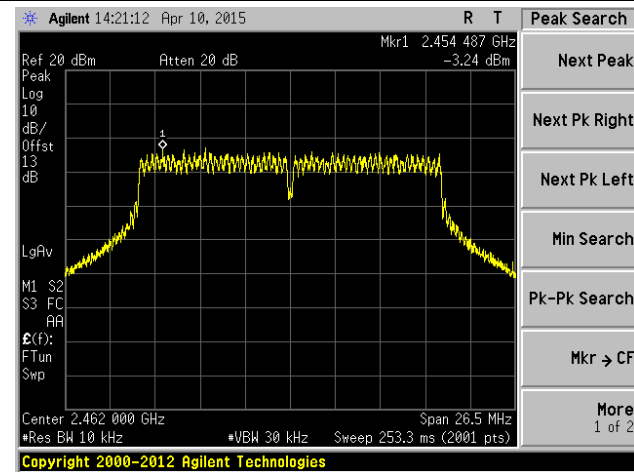
Channel 01 (2412MHz)



Channel 06 (2437MHz)

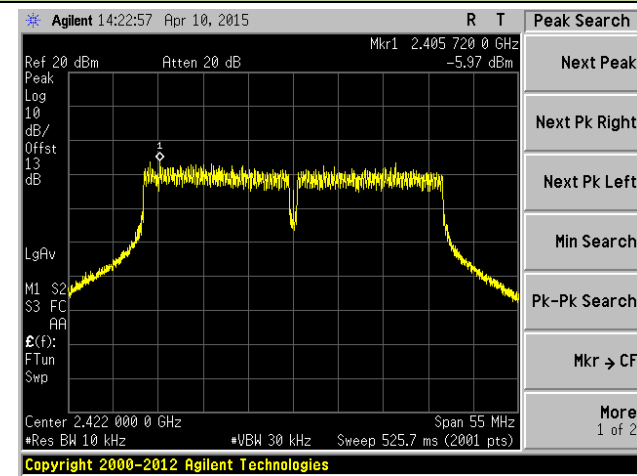


Channel 11 (2462MHz)

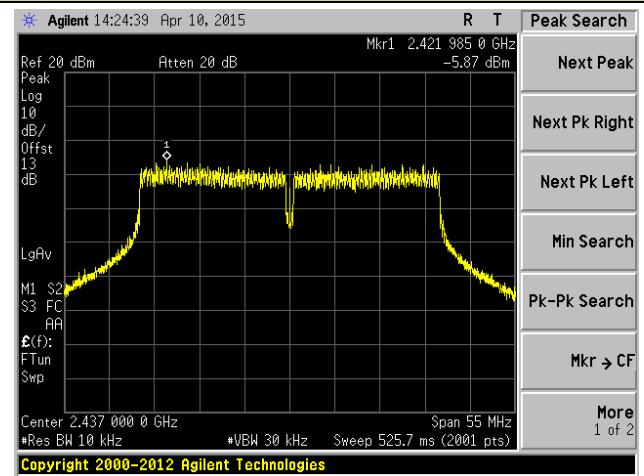


802.11n-HT40 PKPSD - Ant 0 / Ant 0 + 1

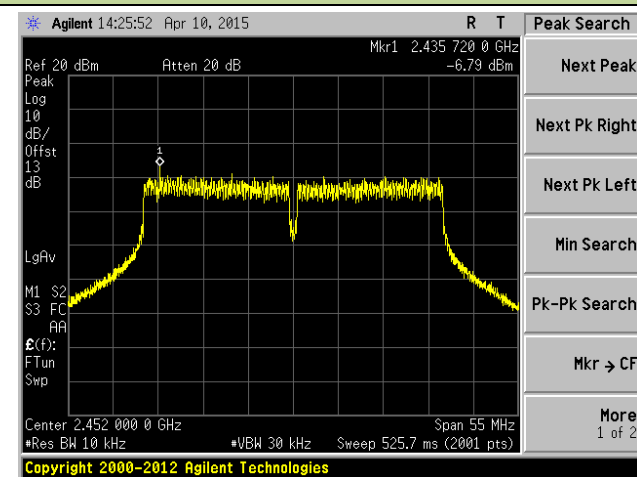
Channel 03 (2422MHz)



Channel 06 (2437MHz)

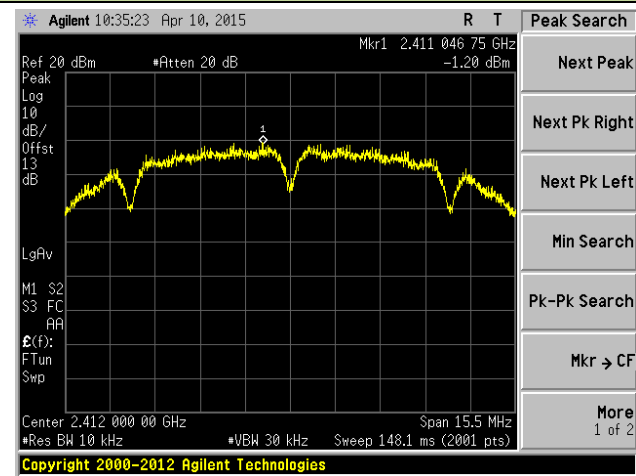


Channel 09 (2452MHz)

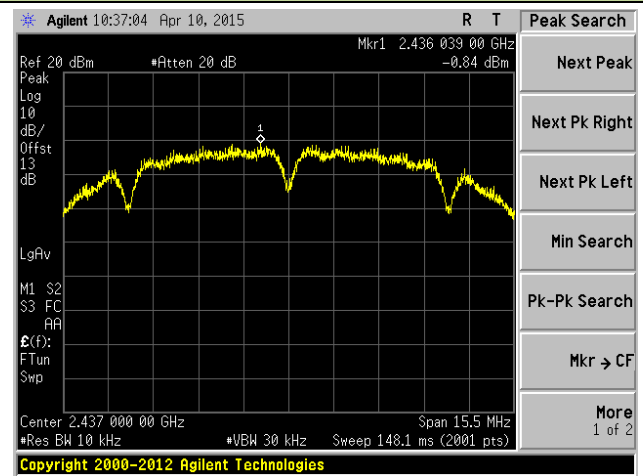


802.11b PKPSD - Ant 1 / Ant 0 + 1

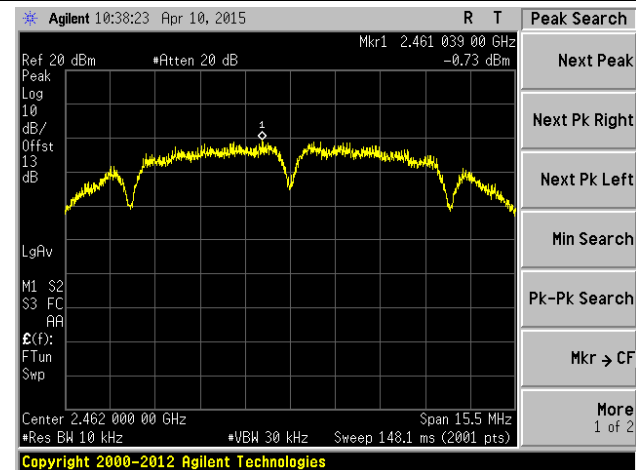
Channel 01 (2412MHz)



Channel 06 (2437MHz)

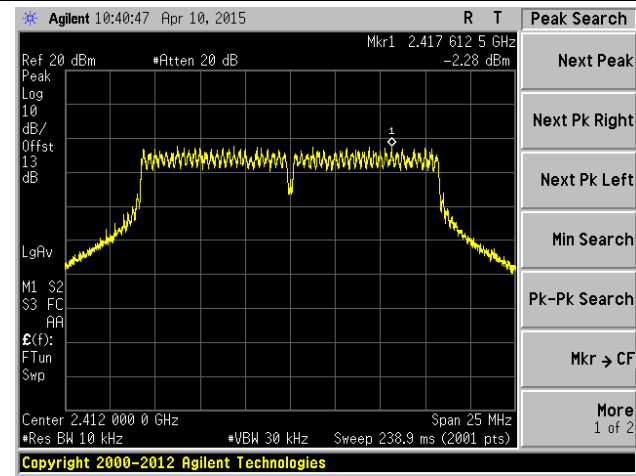


Channel 11 (2462MHz)

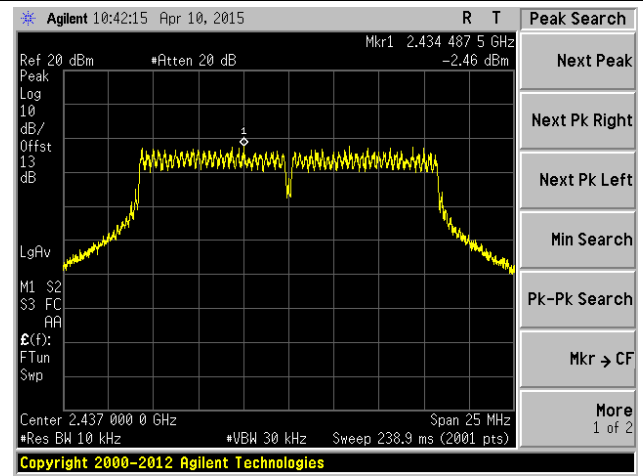


802.11g PKPSD - Ant 1 / Ant 0 + 1

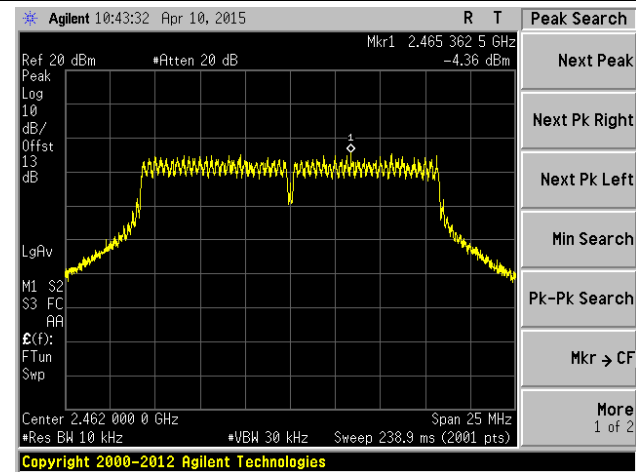
Channel 01 (2412MHz)



Channel 06 (2437MHz)

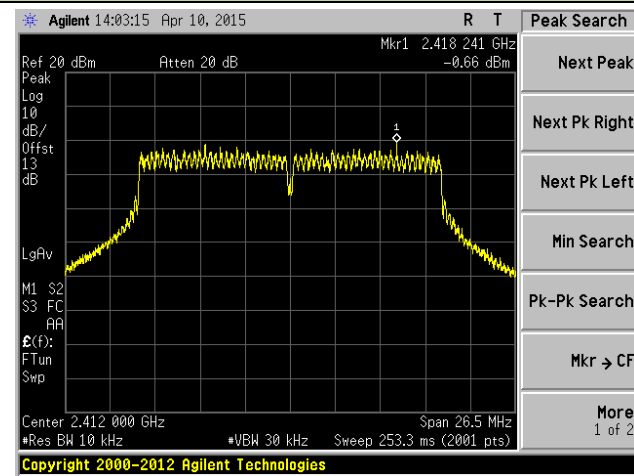


Channel 11 (2462MHz)

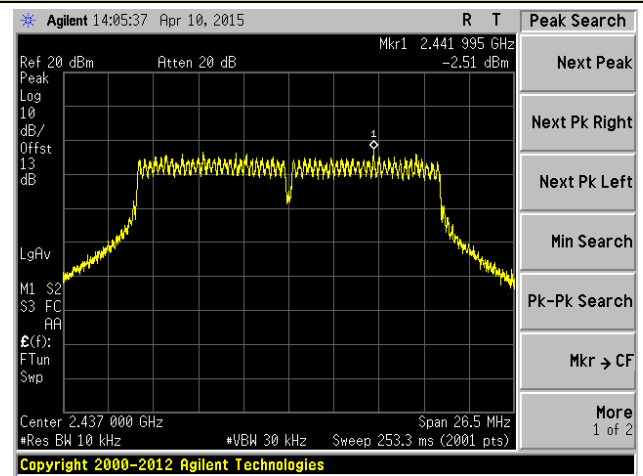


802.11n-HT20 PKPSD - Ant 1 / Ant 0 + 1

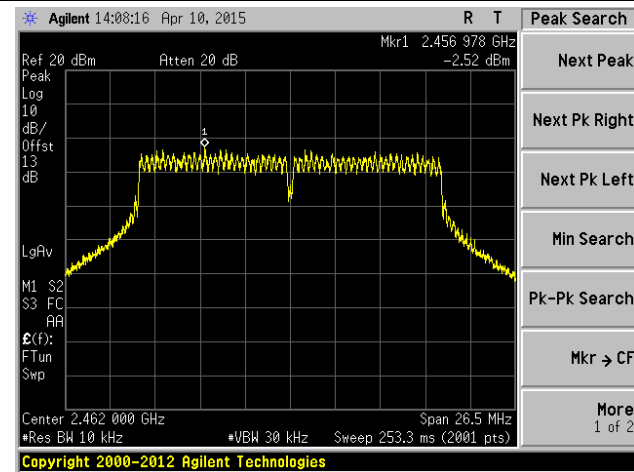
Channel 01 (2412MHz)



Channel 06 (2437MHz)

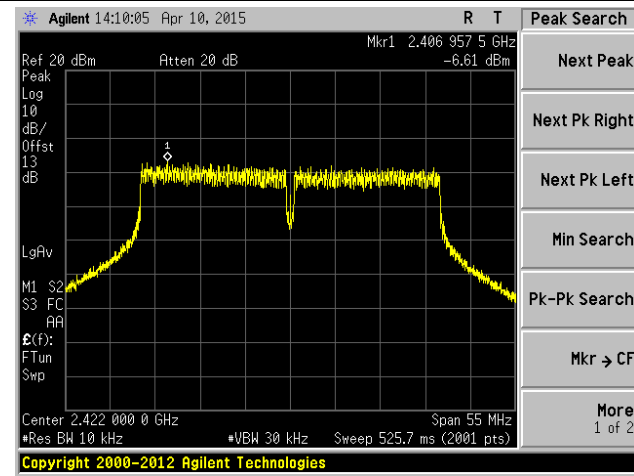


Channel 11 (2462MHz)

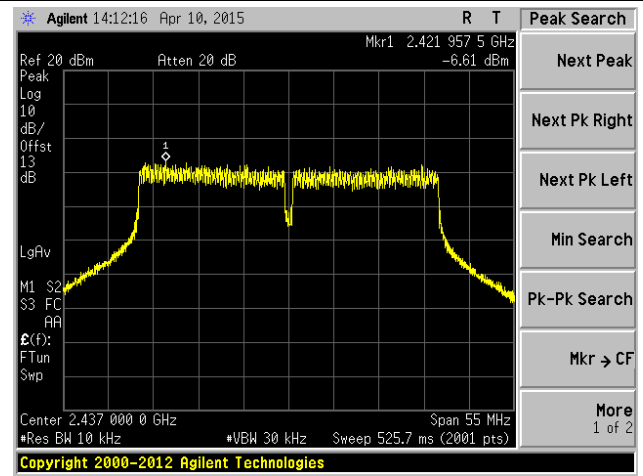


802.11n-HT40 PKPSD - Ant 1 / Ant 0 + 1

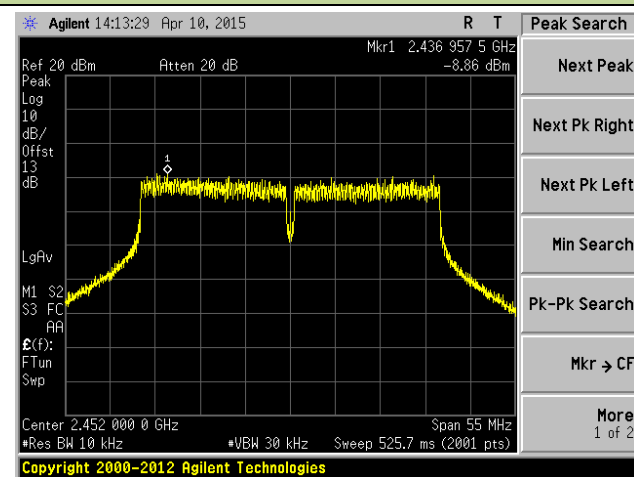
Channel 03 (2422MHz)



Channel 06 (2437MHz)



Channel 09 (2452MHz)



7.5. Conducted Band Edge and Out-of-Band Emissions

7.5.1. Test Limit

The limit for out-of-band spurious emissions at the band edge is 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100kHz bandwidth per the PSD procedure.

7.5.2. Test Procedure Used

KDB 558074 D01v03r03 - Section 11.2 & Section 11.3

7.5.3. Test Settling

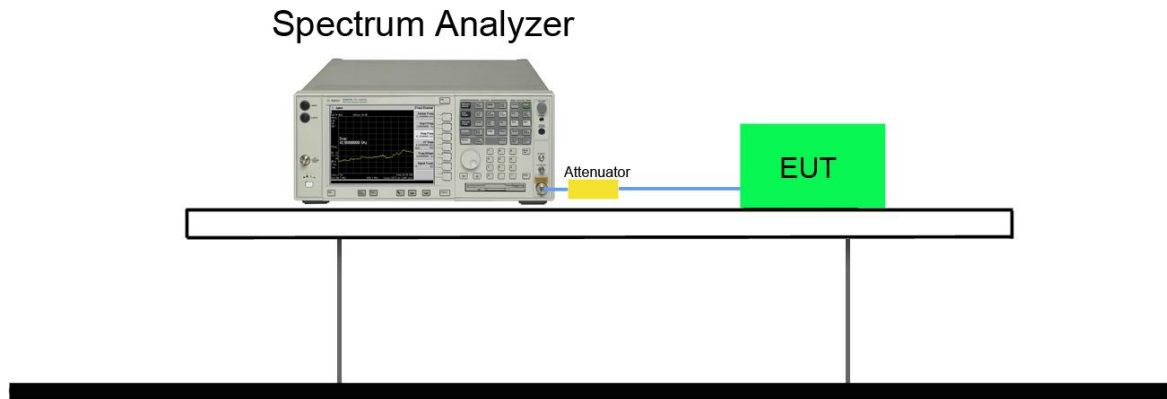
1. Reference level measurement

- (a) Set instrument center frequency to DTS channel center frequency
- (b) Set the span to ≥ 1.5 times the DTS bandwidth
- (c) Set the RBW = 100 kHz
- (d) Set the VBW $\geq 3 \times$ RBW
- (e) Detector = peak
- (f) Sweep time = auto couple
- (g) Trace mode = max hold
- (h) Allow trace to fully stabilize

2. Emission level measurement

- (a) Set the center frequency and span to encompass frequency range to be measured
- (b) RBW = 100kHz
- (c) VBW = 300kHz
- (d) Detector = Peak
- (e) Trace mode = max hold
- (f) Sweep time = auto couple
- (g) The trace was allowed to stabilize

7.5.4. Test Setup



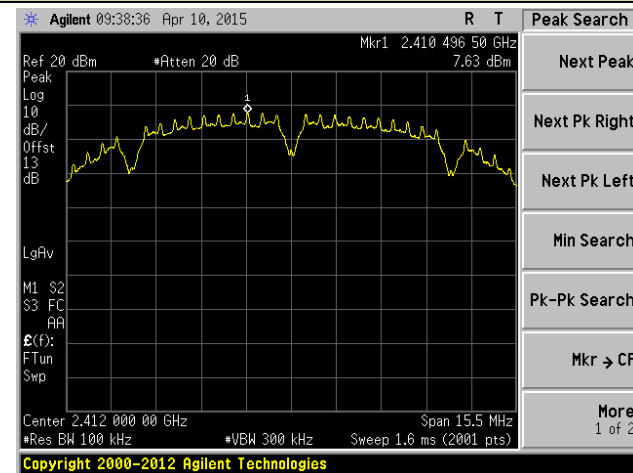
7.5.5. Test Result

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Limit	Result
Ant 0 / Ant 0 + 1					
802.11b	1	01	2412	20dBc	Pass
802.11b	1	06	2437	20dBc	Pass
802.11b	1	11	2462	20dBc	Pass
802.11g	6	01	2412	20dBc	Pass
802.11g	6	06	2437	20dBc	Pass
802.11g	6	11	2462	20dBc	Pass
802.11n-HT20	13	01	2412	20dBc	Pass
802.11n-HT20	13	06	2437	20dBc	Pass
802.11n-HT20	13	11	2462	20dBc	Pass
802.11n-HT40	27	03	2422	20dBc	Pass
802.11n-HT40	27	06	2437	20dBc	Pass
802.11n-HT40	27	09	2452	20dBc	Pass
Ant 1 / Ant 0 + 1					
802.11b	1	01	2412	20dBc	Pass
802.11b	1	06	2437	20dBc	Pass
802.11b	1	11	2462	20dBc	Pass
802.11g	6	01	2412	20dBc	Pass
802.11g	6	06	2437	20dBc	Pass
802.11g	6	11	2462	20dBc	Pass
802.11n-HT20	13	01	2412	20dBc	Pass
802.11n-HT20	13	06	2437	20dBc	Pass
802.11n-HT20	13	11	2462	20dBc	Pass
802.11n-HT40	27	03	2422	20dBc	Pass
802.11n-HT40	27	06	2437	20dBc	Pass
802.11n-HT40	27	09	2452	20dBc	Pass

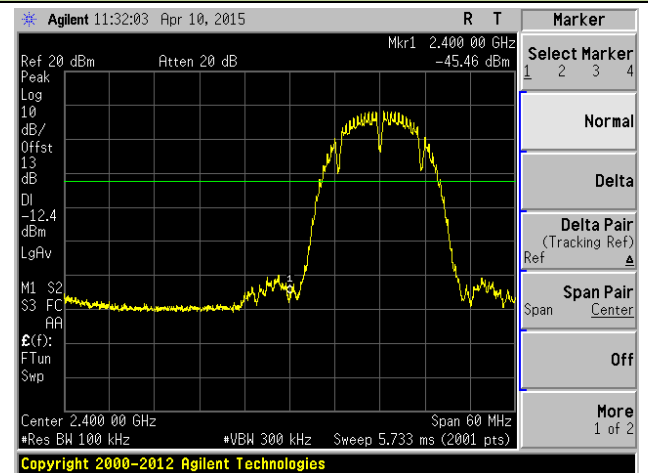
802.11b Out-of-Band Emissions - Ant 0 / Ant 0 + 1

Channel 01 (2412MHz)

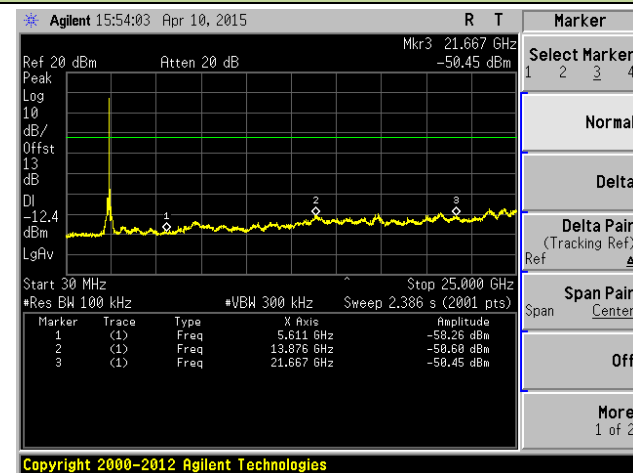
100kHz PSD Reference Level



Low Band Edge

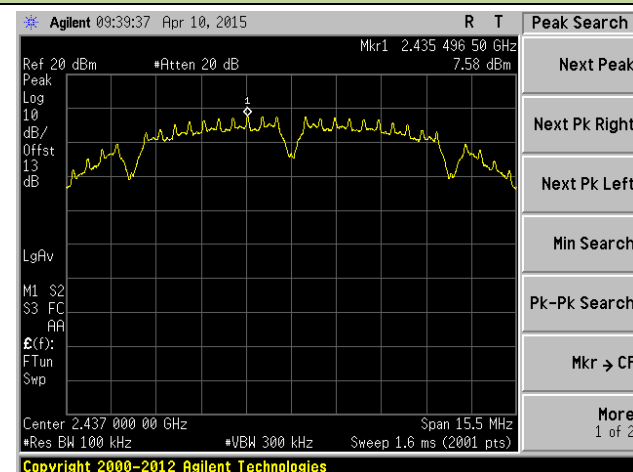


Spurious Emission 30MHz ~ 25GHz

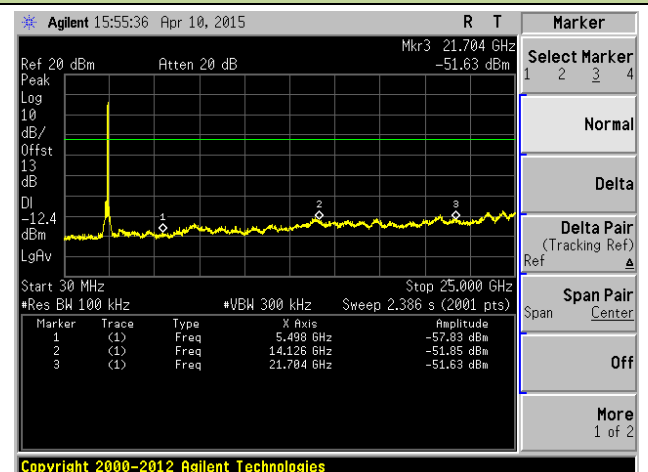


Channel 06 (2437MHz)

100kHz PSD Reference Level

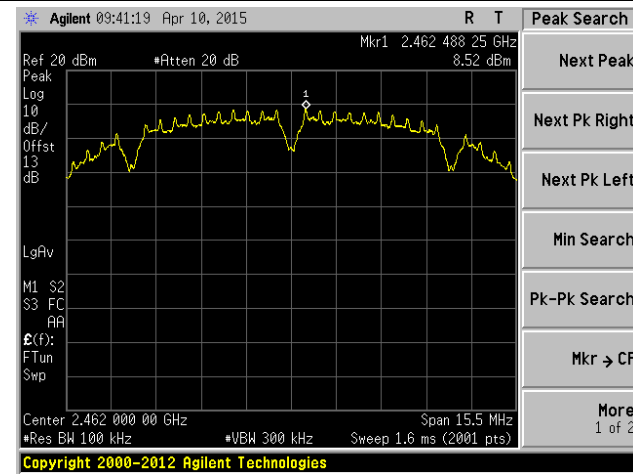


Spurious Emission 30MHz ~ 25GHz

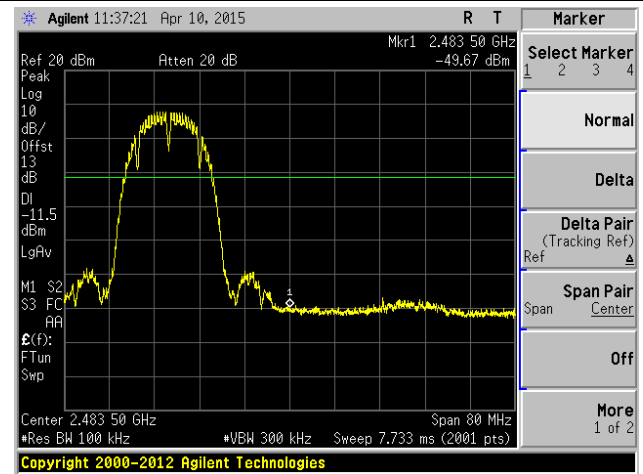


Channel 11 (2462MHz)

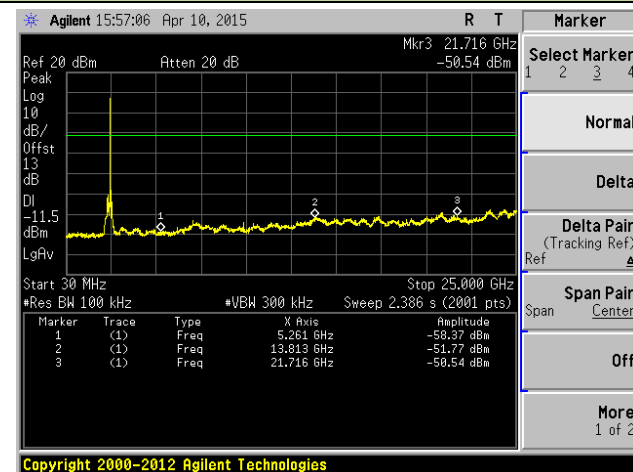
100kHz PSD Reference Level



High Band Edge



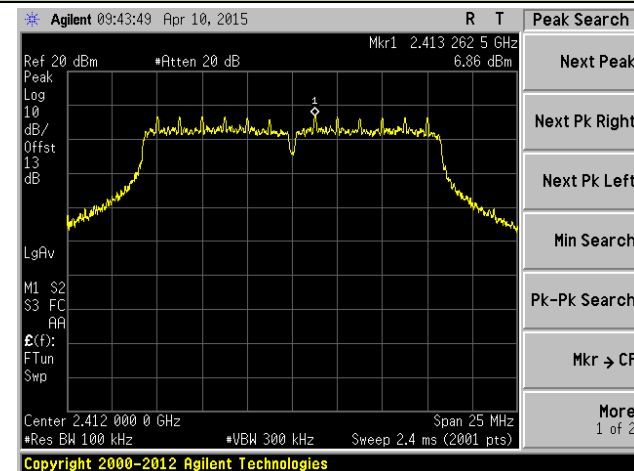
Spurious Emission 30MHz ~ 25GHz



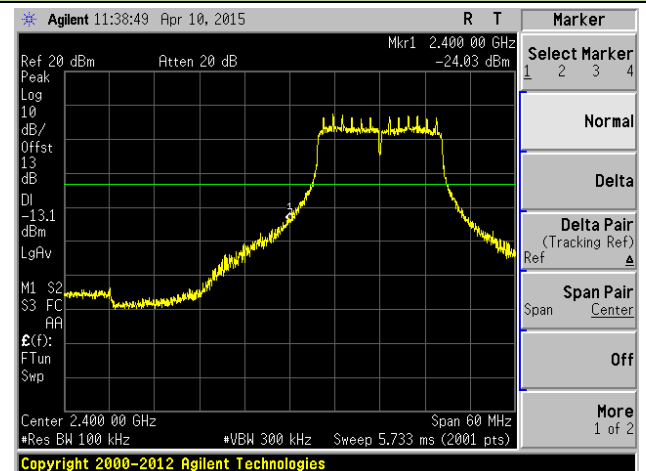
802.11g Out-of-Band Emissions - Ant 0 / Ant 0 + 1

Channel 01 (2412MHz)

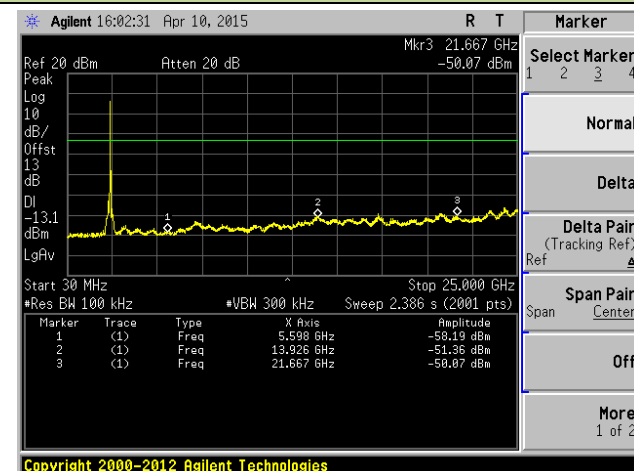
100kHz PSD Reference Level



Low Band Edge

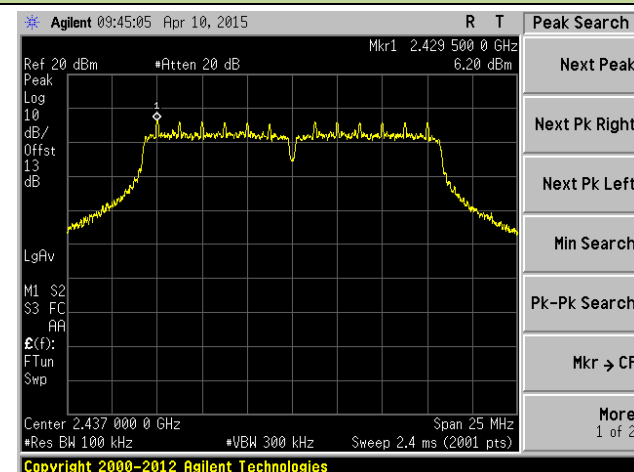


Spurious Emission 30MHz ~ 25GHz

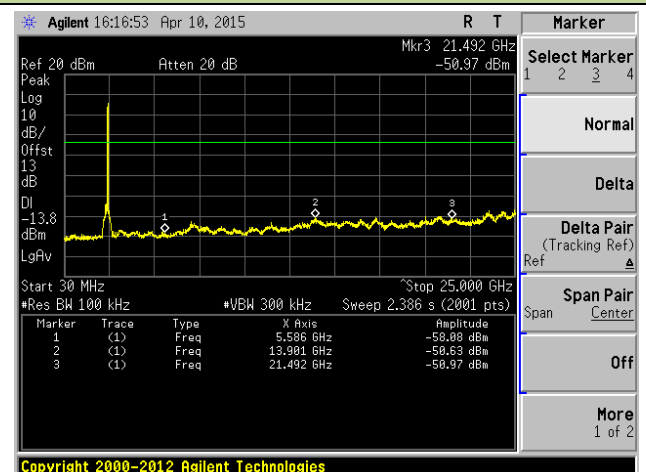


Channel 06 (2437MHz)

100kHz PSD Reference Level

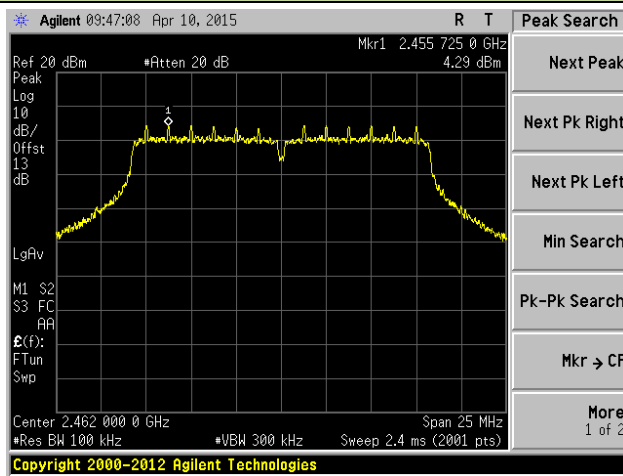


Spurious Emission 30MHz ~ 25GHz

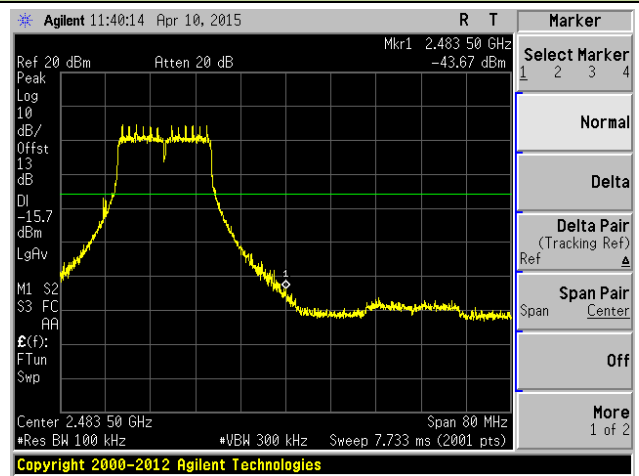


Channel 11 (2462MHz)

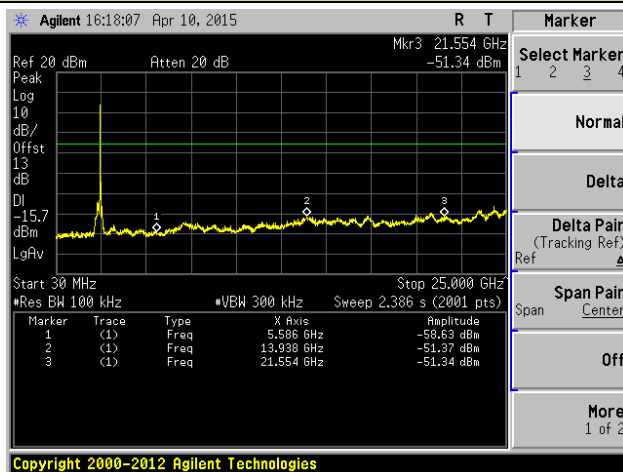
100kHz PSD Reference Level



High Band Edge



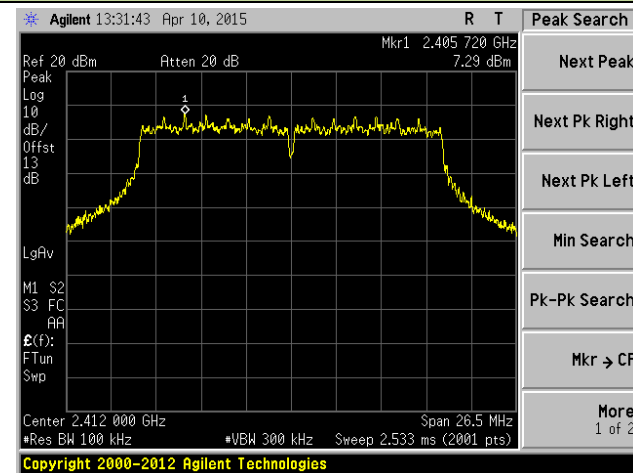
Spurious Emission 30MHz ~ 25GHz



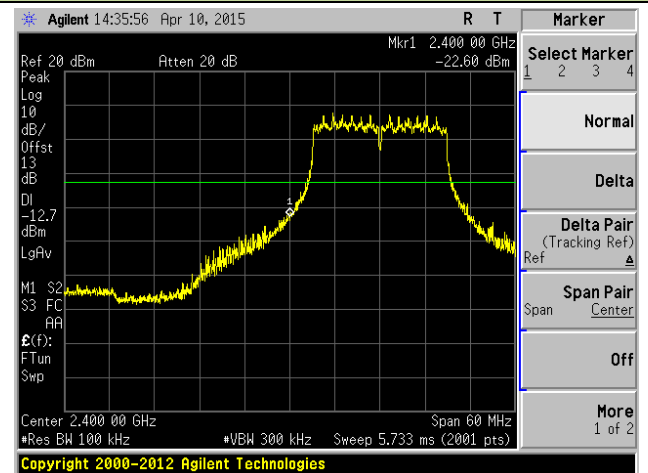
802.11n-HT20 Out-of-Band Emissions - Ant 0 / Ant 0 + 1

Channel 01 (2412MHz)

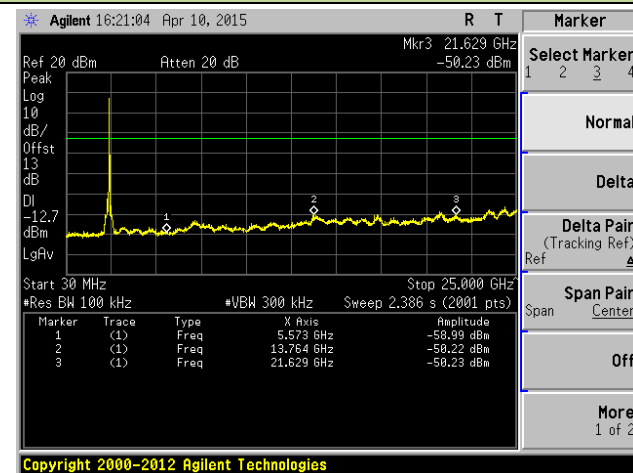
100kHz PSD Reference Level



Low Band Edge

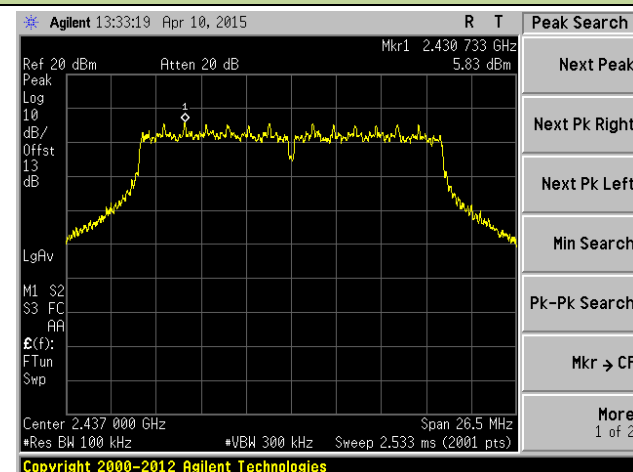


Spurious Emission 30MHz ~ 25GHz

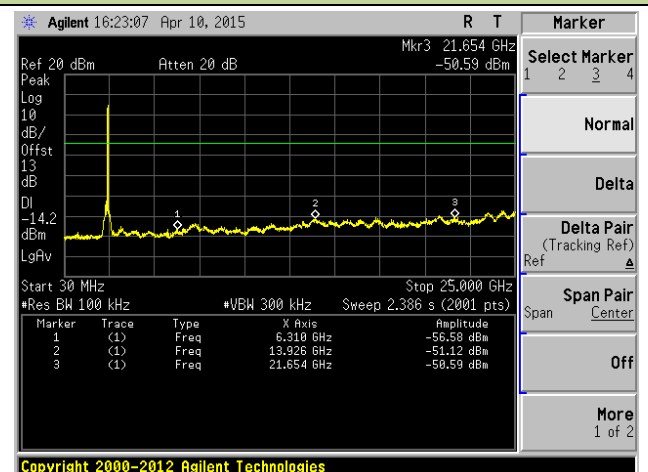


Channel 06 (2437MHz)

100kHz PSD Reference Level

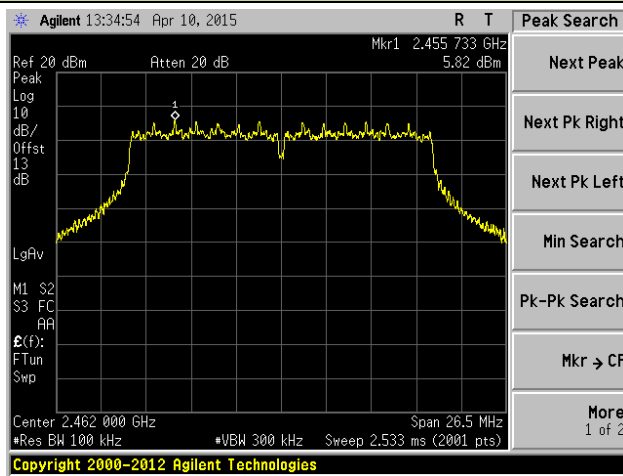


Spurious Emission 30MHz ~ 25GHz

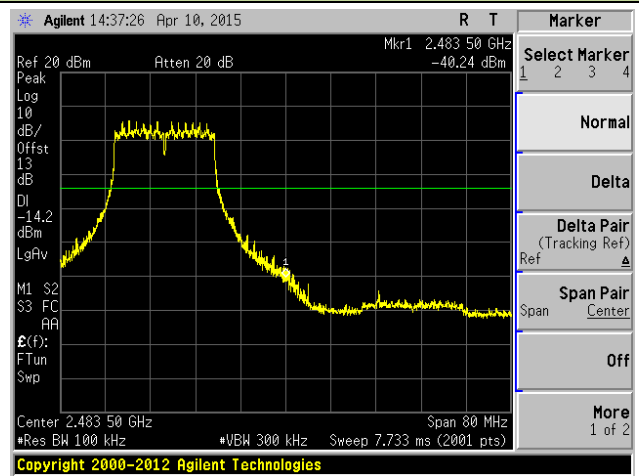


Channel 11 (2462MHz)

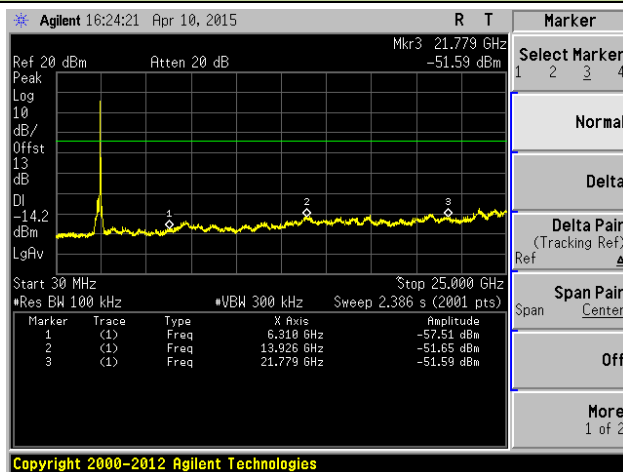
100kHz PSD Reference Level



High Band Edge



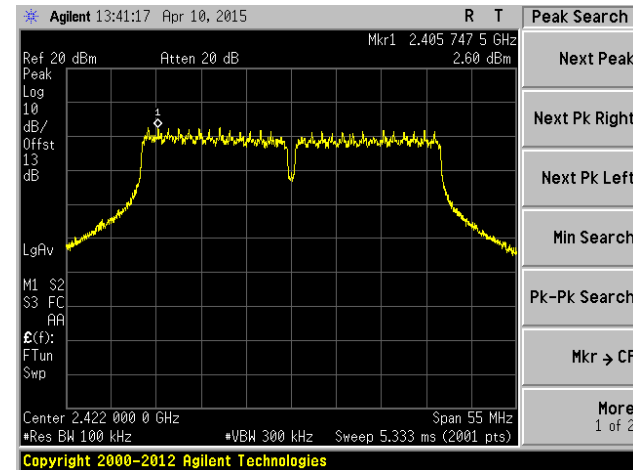
Spurious Emission 30MHz ~ 25GHz



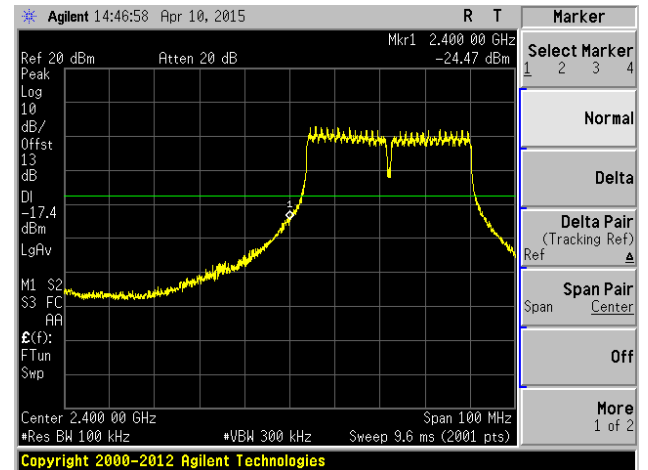
802.11n-HT40 Out-of-Band Emissions - Ant 0 / Ant 0 + 1

Channel 03 (2422MHz)

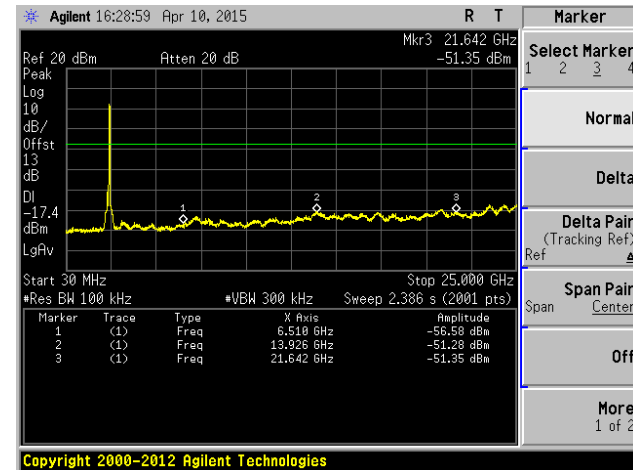
100kHz PSD Reference Level



Low Band Edge

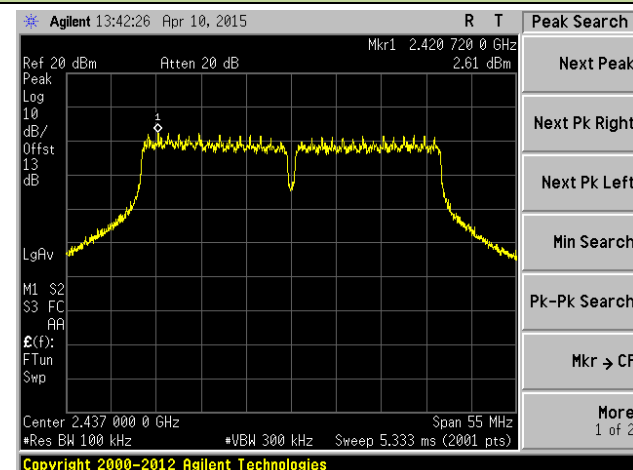


Spurious Emission 30MHz ~ 25GHz

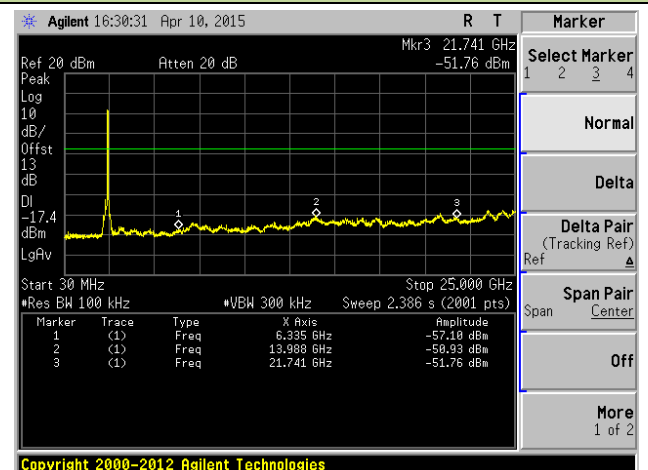


Channel 06 (2437MHz)

100kHz PSD Reference Level

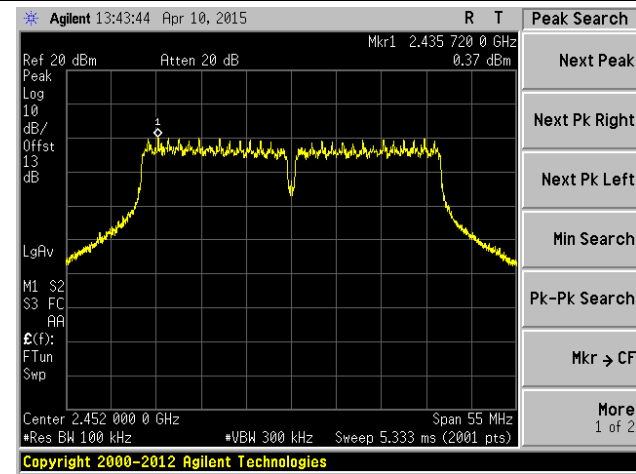


Spurious Emission 30MHz ~ 25GHz

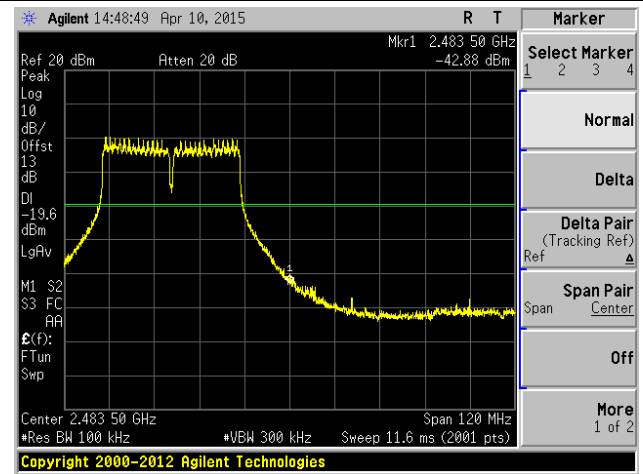


Channel 09 (2452MHz)

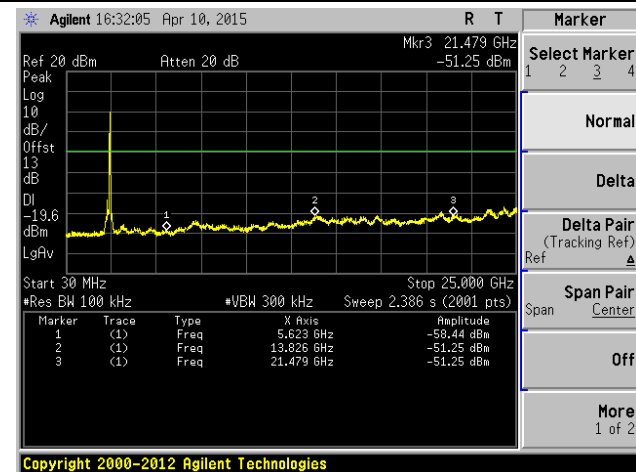
100kHz PSD Reference Level



High Band Edge



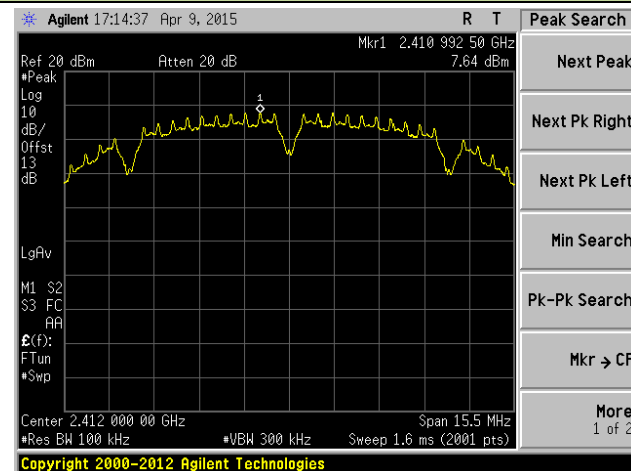
Spurious Emission 30MHz ~ 25GHz



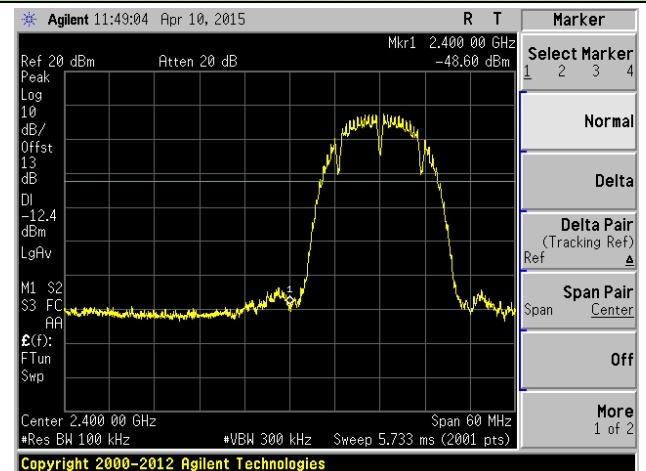
802.11b Out-of-Band Emissions - Ant 1 / Ant 0 + 1

Channel 01 (2412MHz)

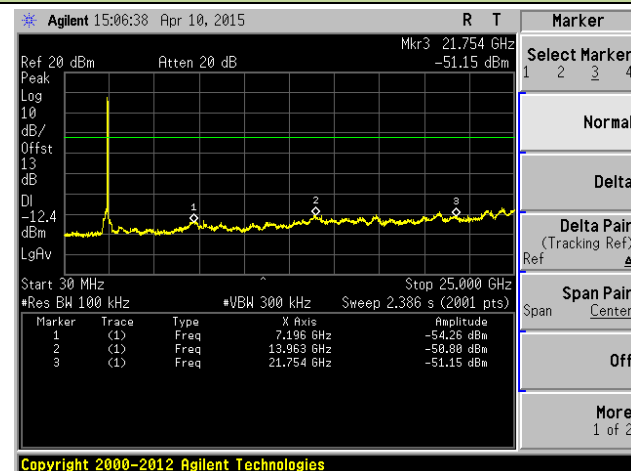
100kHz PSD Reference Level



Low Band Edge

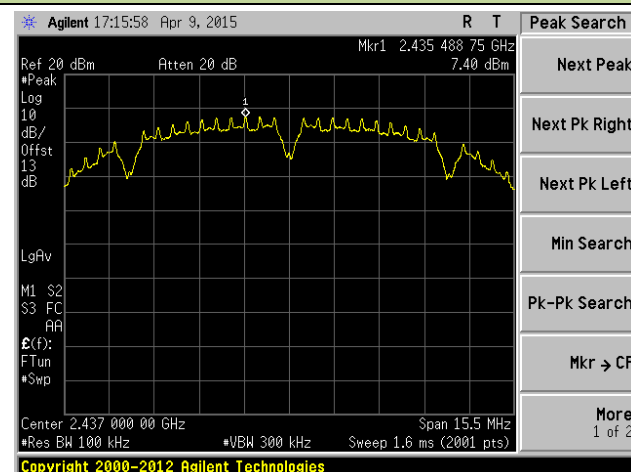


Spurious Emission 30MHz ~ 25GHz

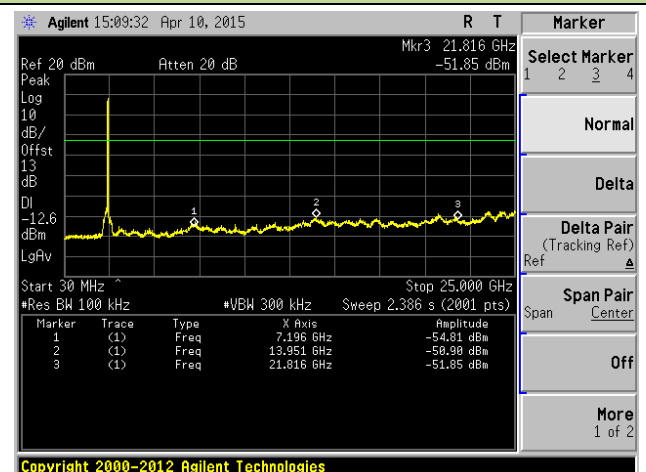


Channel 06 (2437MHz)

100kHz PSD Reference Level

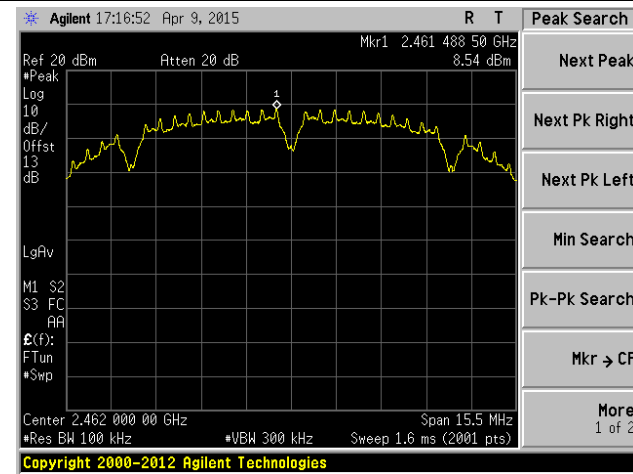


Spurious Emission 30MHz ~ 25GHz

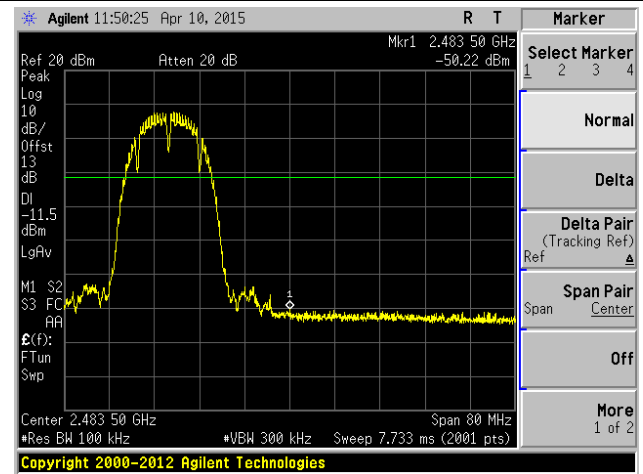


Channel 11 (2462MHz)

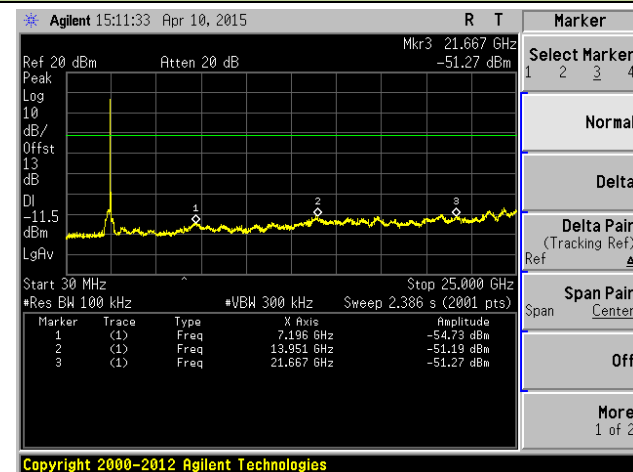
100kHz PSD Reference Level



High Band Edge



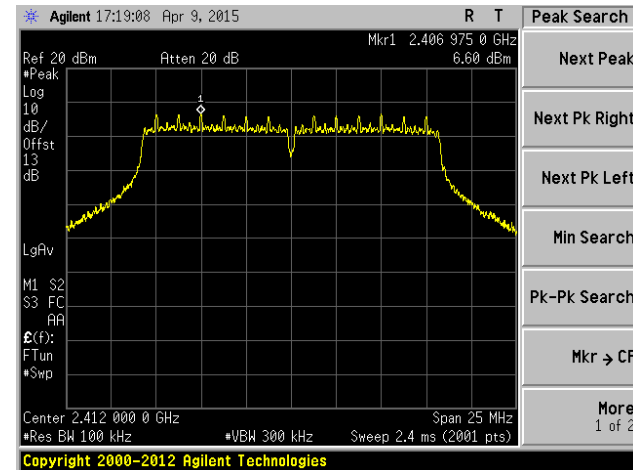
Spurious Emission 30MHz ~ 25GHz



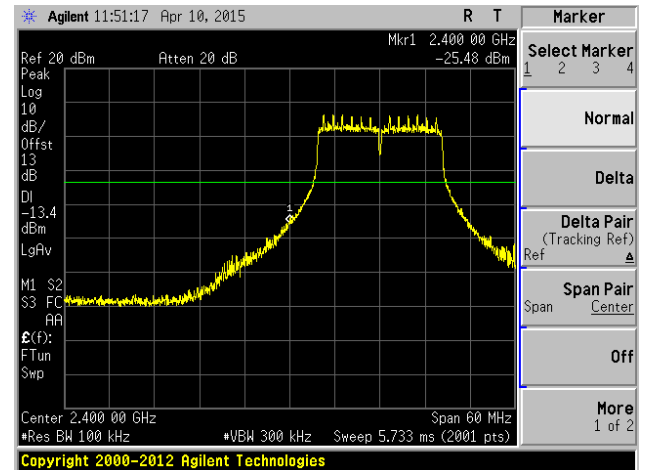
802.11g Out-of-Band Emissions - Ant 1 / Ant 0 + 1

Channel 01 (2412MHz)

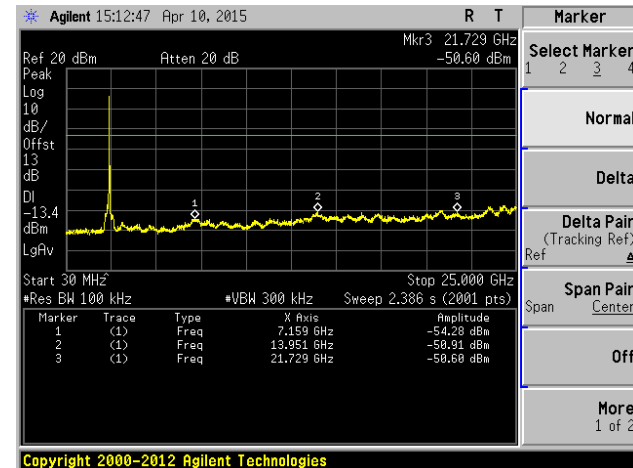
100kHz PSD Reference Level



Low Band Edge

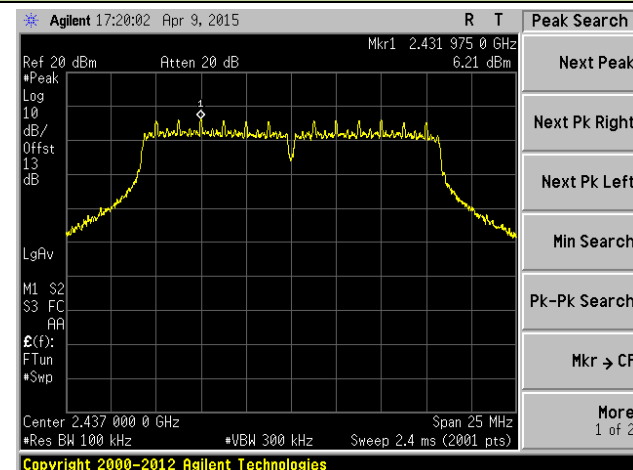


Spurious Emission 30MHz ~ 25GHz

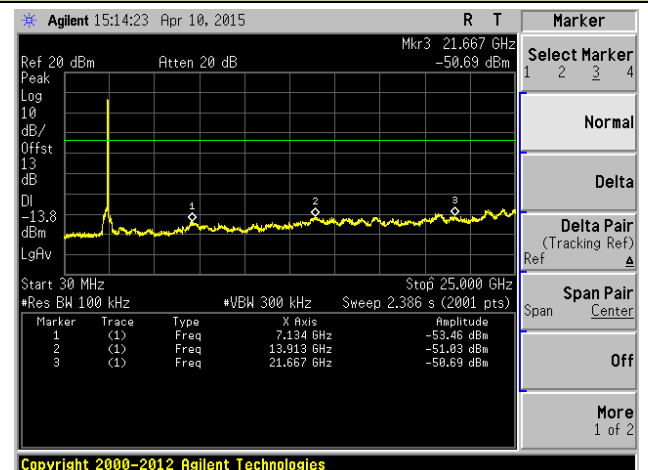


Channel 06 (2437MHz)

100kHz PSD Reference Level

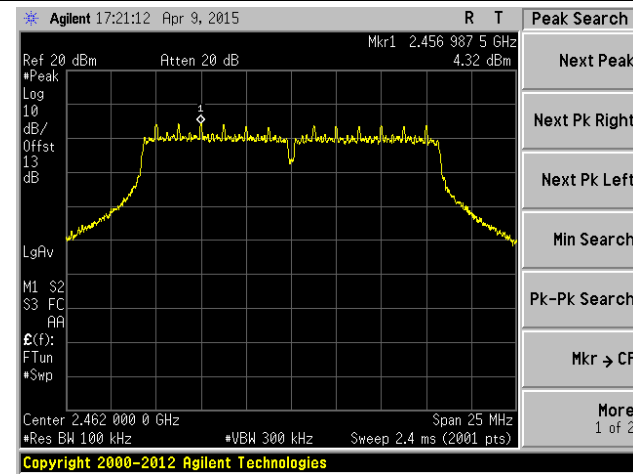


Spurious Emission 30MHz ~ 25GHz

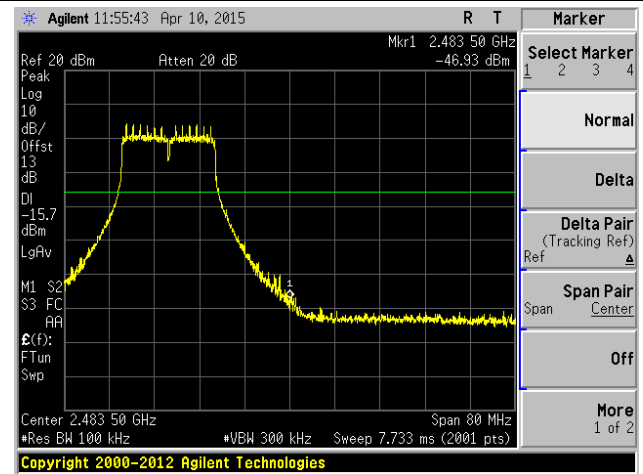


Channel 11 (2462MHz)

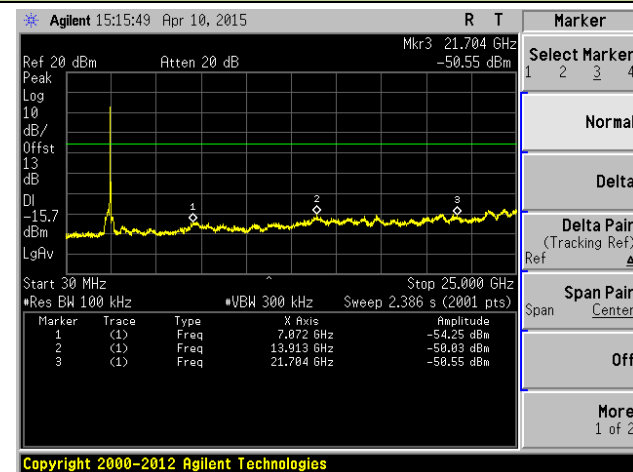
100kHz PSD Reference Level



High Band Edge



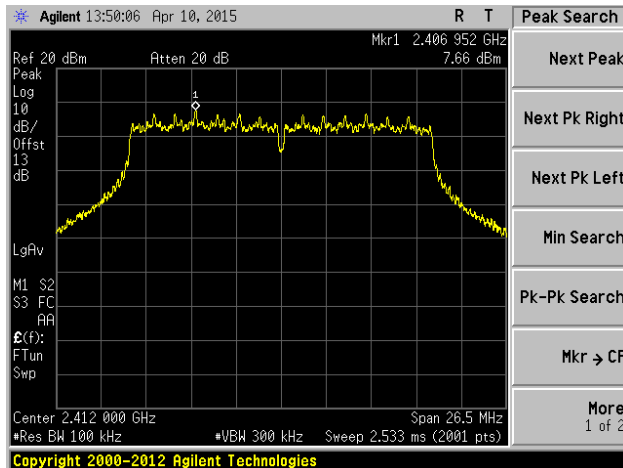
Spurious Emission 30MHz ~ 25GHz



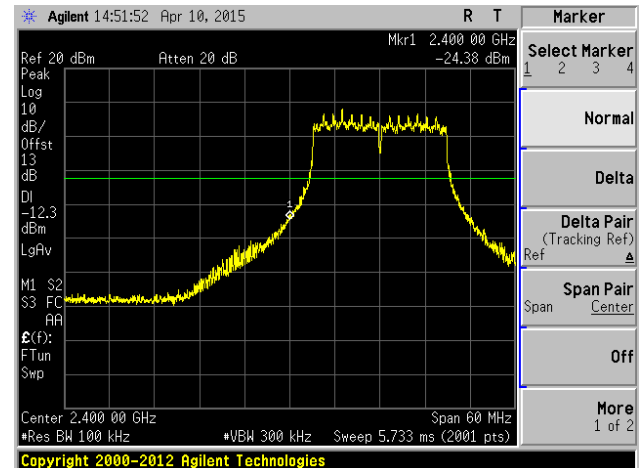
802.11n-HT20 Out-of-Band Emissions - Ant 1 / Ant 0 + 1

Channel 01 (2412MHz)

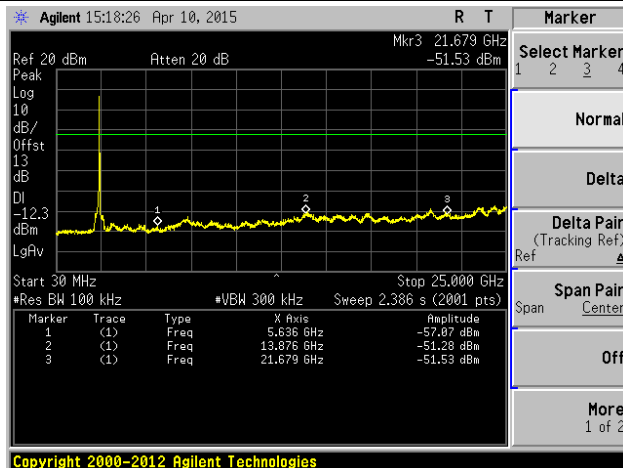
100kHz PSD Reference Level



Low Band Edge

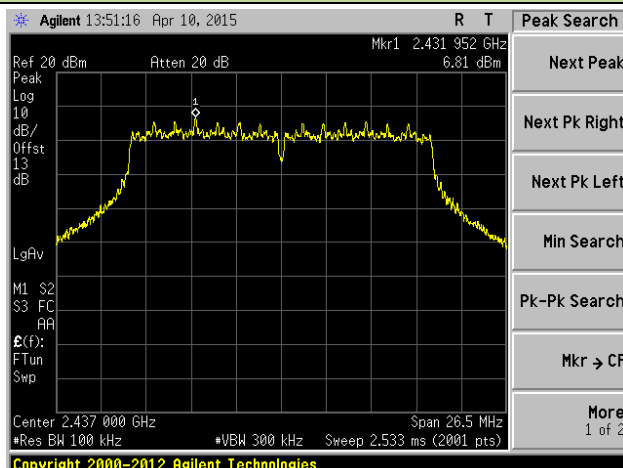


Spurious Emission 30MHz ~ 25GHz

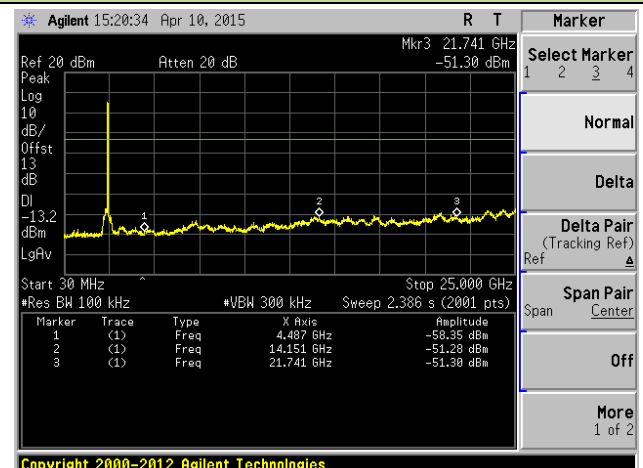


Channel 06 (2437MHz)

100kHz PSD Reference Level

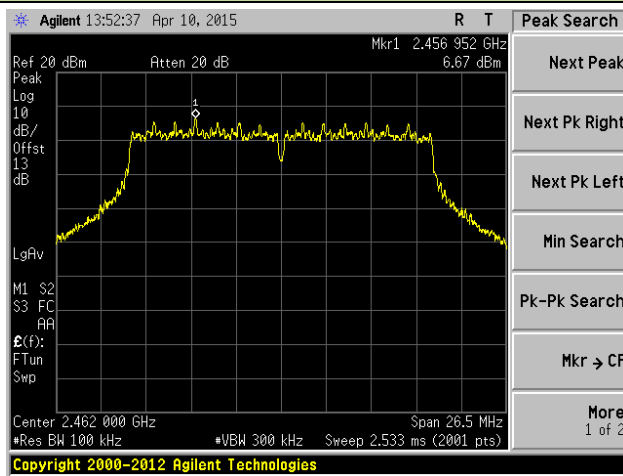


Spurious Emission 30MHz ~ 25GHz

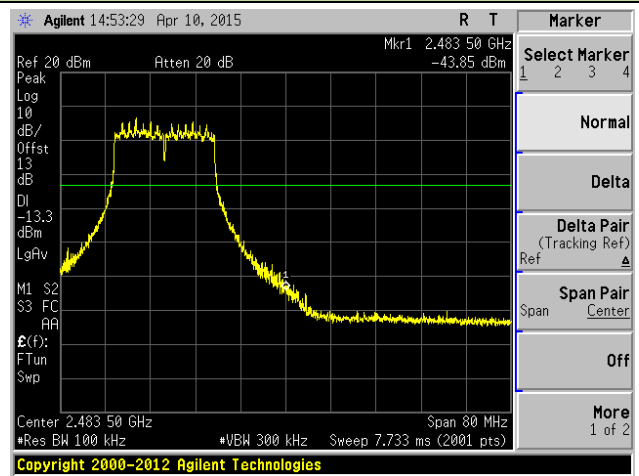


Channel 11 (2462MHz)

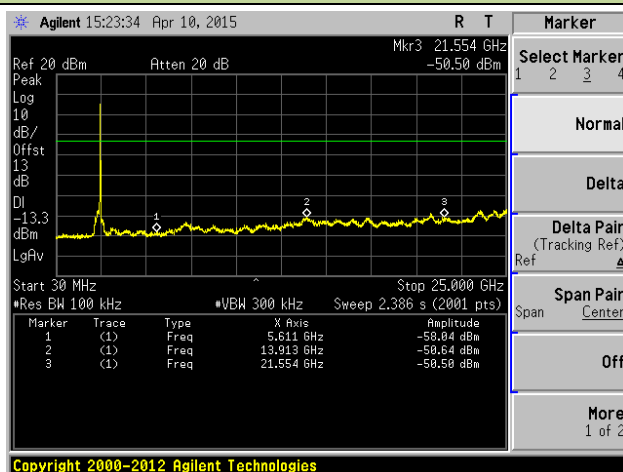
100kHz PSD Reference Level



High Band Edge



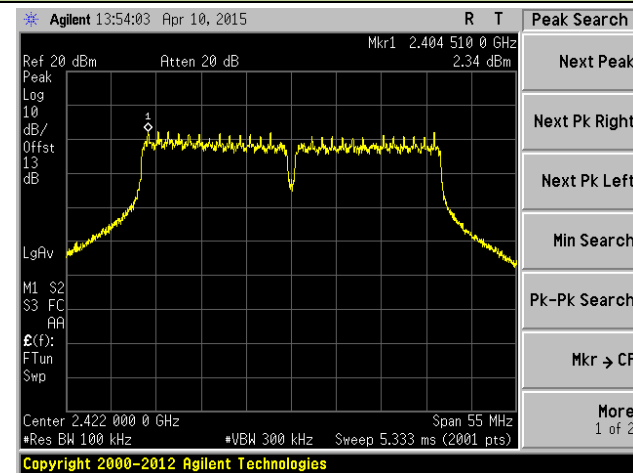
Spurious Emission 30MHz ~ 25GHz



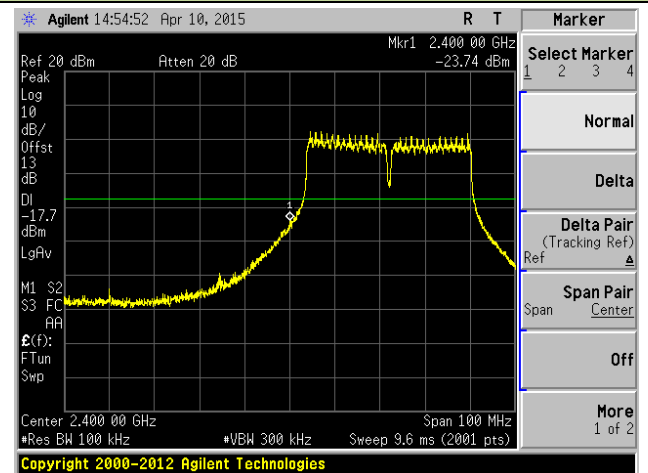
802.11n-HT40 Out-of-Band Emissions - Ant 1 / Ant 0 + 1

Channel 03 (2422MHz)

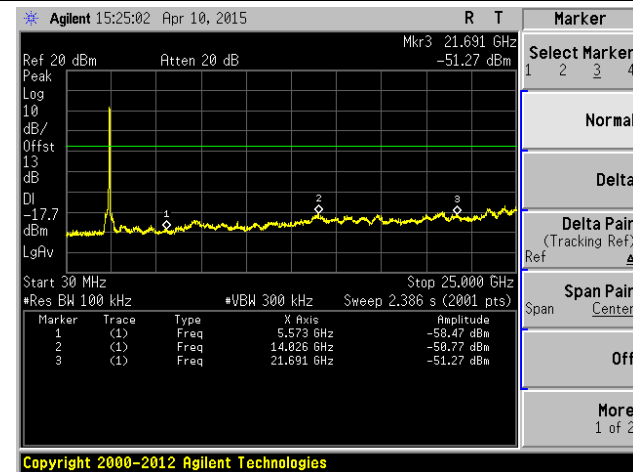
100kHz PSD Reference Level



Low Band Edge

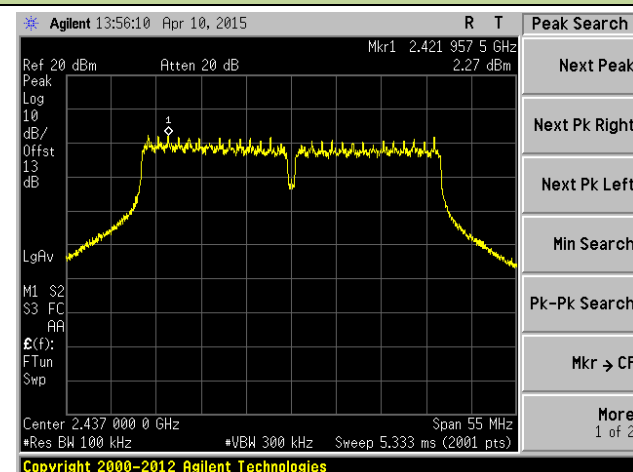


Spurious Emission 30MHz ~ 25GHz

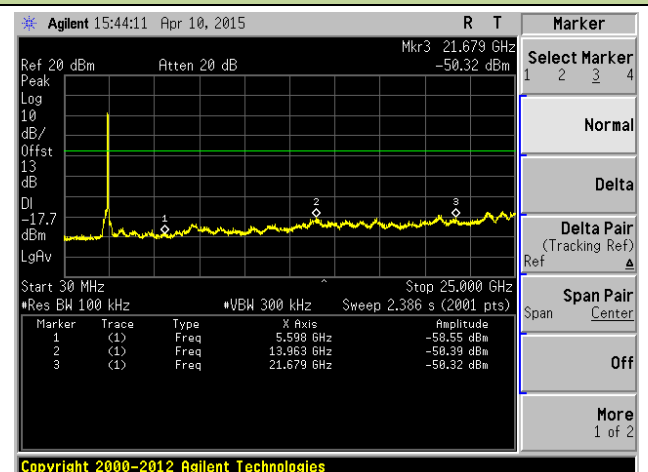


Channel 06 (2437MHz)

100kHz PSD Reference Level

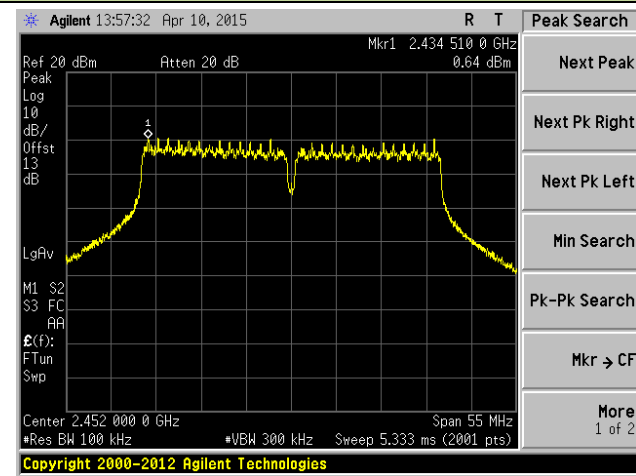


Spurious Emission 30MHz ~ 25GHz

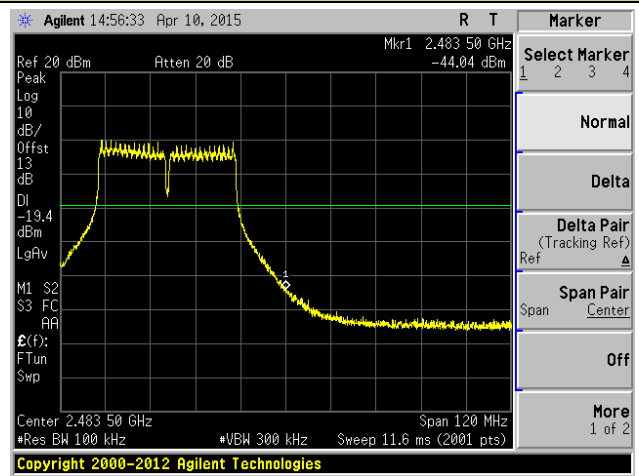


Channel 09 (2452MHz)

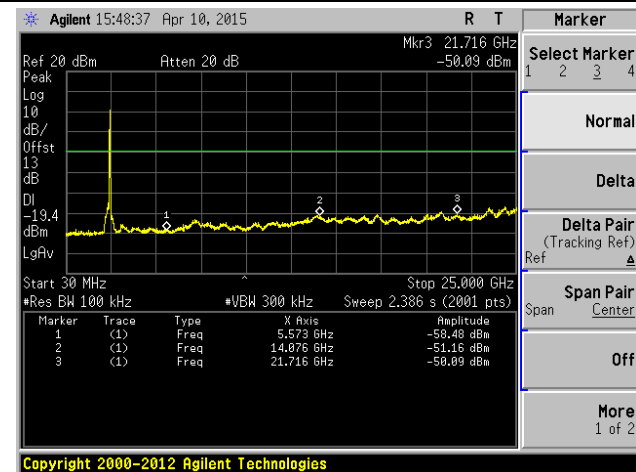
100kHz PSD Reference Level



High Band Edge



Spurious Emission 30MHz ~ 25GHz



7.6. Radiated Spurious Emission Measurement

7.6.1. Test Limit

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [V/m]	Measured Distance [Meters]
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

7.6.2. Test Procedure Used

KDB 558074 D01v03r03 - Section 12.2.3 (quasi-peak measurements)

KDB 558074 D01v03r03 - Section 12.2.4 (peak power measurements)

KDB 558074 D01v03r03 - Section 12.2.5 (average power measurements)

7.6.3. Test Setting

Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = as specified in Table 1
3. VBW = 3MHz
4. Detector = peak

5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Table 1 - RBW as a function of frequency

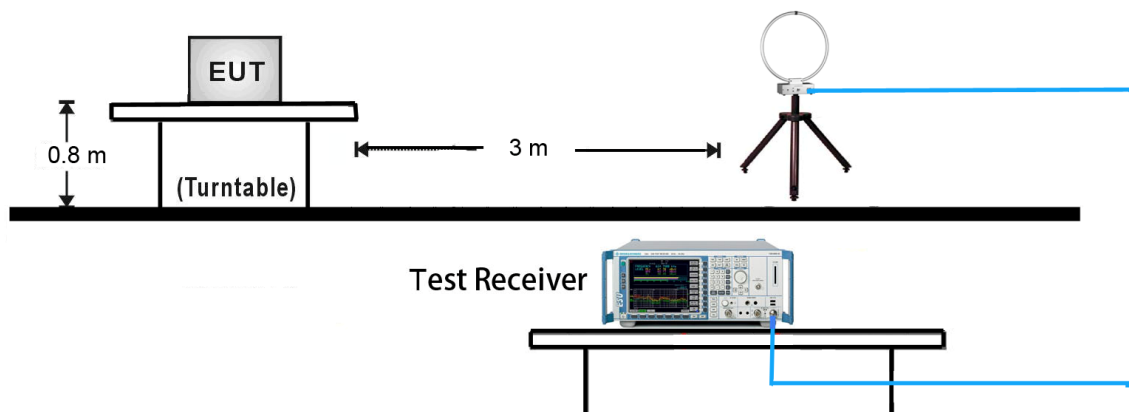
Frequency	RBW
9 ~ 150 kHz	200 ~ 300 Hz
0.15 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz
> 1000 MHz	1 MHz

Average Field Strength Measurements

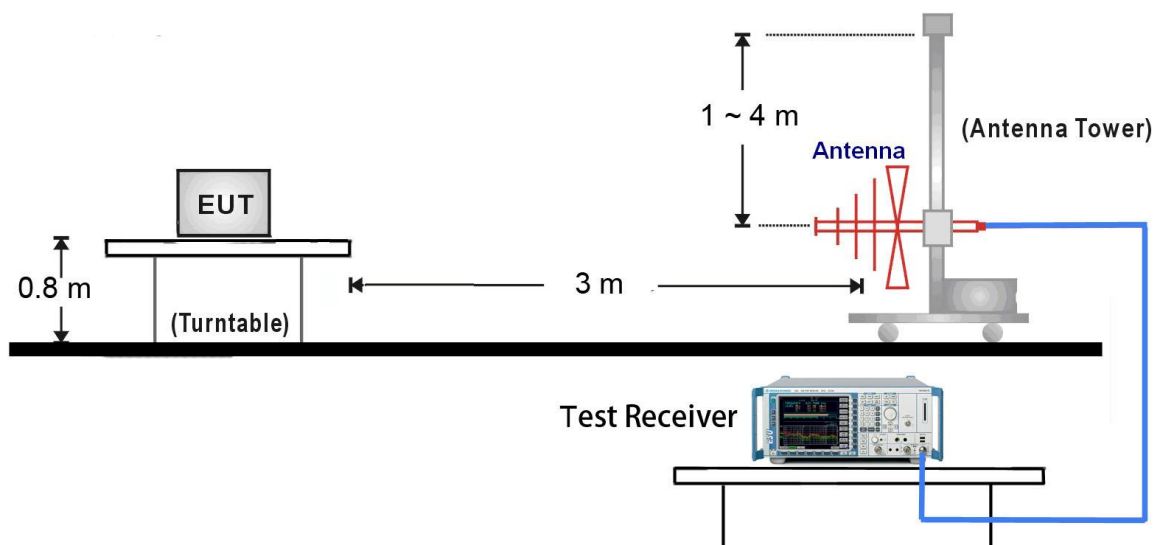
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW $\geq 1/T$
4. De As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to "Voltage" regardless of the display mode
5. Detector = Peak
6. Sweep time = auto
7. Trace mode = max hold
8. Allow max hold to run for at least 50 times (1/duty cycle) traces

7.6.4. Test Setup

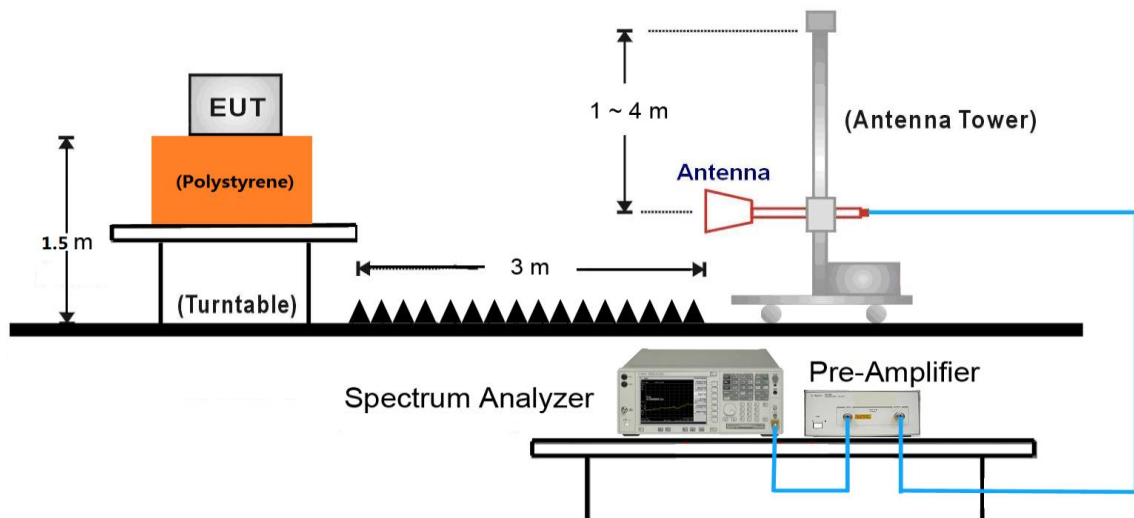
9kHz ~ 30MHz Test Setup:



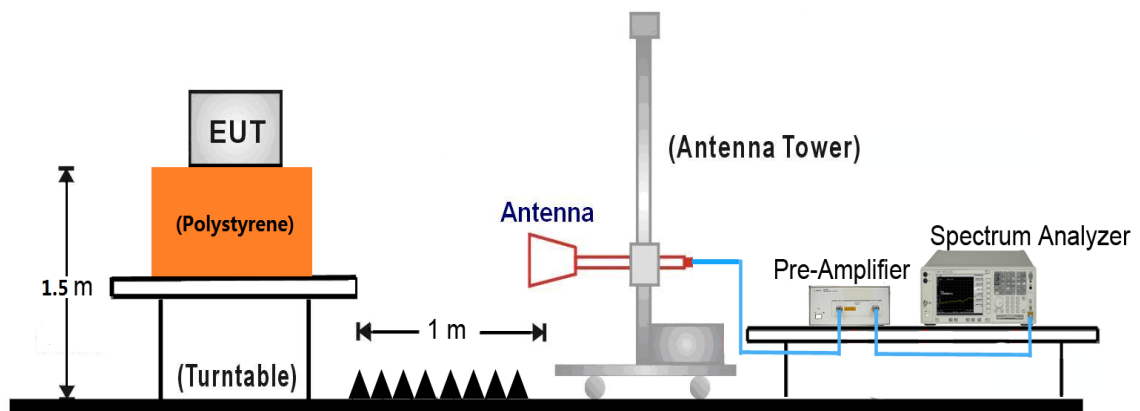
30MHz ~ 1GHz Test Setup:



1GHz ~ 18GHz Test Setup:



18GHz ~ 25GHz Test Setup:



7.6.5. Test Result

Test Mode:	802.11b	Test Site:	AC1
Test Channel:	01	Test Engineer:	Roy Cheng
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	3167.0	40.1	-1.5	38.6	91.7	-53.1	Peak	Horizontal
*	3412.0	38.6	-1.6	37.0	91.7	-54.7	Peak	Horizontal
	4824.0	36.3	2.7	39.0	74.0	-35.0	Peak	Horizontal
	7256.0	37.1	7.9	45.0	74.0	-29.0	Peak	Horizontal
*	3127.0	39.8	-1.6	38.2	91.7	-53.5	Peak	Vertical
*	3244.0	40.2	-1.7	38.5	91.7	-53.2	Peak	Vertical
	4824.0	37.3	2.7	40.0	74.0	-34.0	Peak	Vertical
	7256.0	36.0	7.9	43.9	74.0	-30.1	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (111.7dBμV/m).

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	802.11b	Test Site:	AC1
Test Channel:	06	Test Engineer:	Roy Cheng
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	3219.0	39.5	-1.6	37.9	92.0	-54.1	Peak	Horizontal
*	3412.0	38.4	-1.6	36.8	92.0	-55.2	Peak	Horizontal
	4874.0	36.4	2.7	39.1	74.0	-34.9	Peak	Horizontal
	7311.0	36.1	8.0	44.1	74.0	-29.9	Peak	Horizontal
*	3052.0	39.3	-2.0	37.3	92.0	-54.7	Peak	Vertical
*	3244.0	40.4	-1.7	38.7	92.0	-53.3	Peak	Vertical
	4874.0	35.9	2.7	38.6	74.0	-35.4	Peak	Vertical
	7311.0	36.1	8.0	44.1	74.0	-29.9	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (112.0dBμV/m).

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	802.11b	Test Site:	AC1
Test Channel:	11	Test Engineer:	Roy Cheng
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	3195.0	39.0	-1.6	37.4	92.3	-54.9	Peak	Horizontal
*	3412.0	38.3	-1.6	36.7	92.3	-55.6	Peak	Horizontal
	4924.0	36.4	2.8	39.2	74.0	-34.8	Peak	Horizontal
	7386.0	36.7	7.9	44.6	74.0	-29.4	Peak	Horizontal
*	3105.0	38.7	-1.8	36.9	92.3	-55.4	Peak	Vertical
*	3244.0	40.3	-1.7	38.6	92.3	-53.7	Peak	Vertical
	4924.0	36.2	2.8	39.0	74.0	-35.0	Peak	Vertical
	7386.0	36.5	7.9	44.4	74.0	-29.6	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (112.3dBμV/m).

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	802.11g	Test Site:	AC1
Test Channel:	01	Test Engineer:	Roy Cheng
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	3076.0	38.9	-1.9	37.0	93.7	-56.7	Peak	Horizontal
*	3412.0	38.6	-1.6	37.0	93.7	-56.7	Peak	Horizontal
	4824.0	35.6	2.7	38.3	74.0	-35.7	Peak	Horizontal
	7256.0	36.3	7.9	44.2	74.0	-29.8	Peak	Horizontal
*	3184.0	38.8	-1.6	37.2	93.7	-56.5	Peak	Vertical
*	3244.0	40.5	-1.7	38.8	93.7	-54.9	Peak	Vertical
	4824.0	36.1	2.7	38.8	74.0	-35.2	Peak	Vertical
	7256.0	36.2	7.9	44.1	74.0	-29.9	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (113.7dBμV/m).

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	802.11g	Test Site:	AC1
Test Channel:	06	Test Engineer:	Roy Cheng
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	3165.0	39.2	-1.5	37.7	93.2	-55.5	Peak	Horizontal
*	3412.0	38.9	-1.6	37.3	93.2	-55.9	Peak	Horizontal
	4874.0	35.8	2.7	38.5	74.0	-35.5	Peak	Horizontal
	7311.0	35.8	8.0	43.8	74.0	-30.2	Peak	Horizontal
*	3109.0	39.4	-1.7	37.7	93.2	-55.5	Peak	Vertical
*	3244.0	40.2	-1.7	38.5	93.2	-54.7	Peak	Vertical
	4874.0	36.2	2.7	38.9	74.0	-35.1	Peak	Vertical
	7311.0	35.9	8.0	43.9	74.0	-30.1	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (113.2dBμV/m).

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	802.11g	Test Site:	AC1
Test Channel:	11	Test Engineer:	Roy Cheng
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	3085.0	38.8	-1.8	37.0	92.8	-55.8	Peak	Horizontal
*	3412.0	38.4	-1.6	36.8	92.8	-56.0	Peak	Horizontal
	4924.0	35.9	2.8	38.7	74.0	-35.3	Peak	Horizontal
	7386.0	36.6	7.9	44.5	74.0	-29.5	Peak	Horizontal
*	3172.0	39.2	-1.6	37.6	92.8	-55.2	Peak	Vertical
*	3244.0	40.4	-1.7	38.7	92.8	-54.1	Peak	Vertical
	4924.0	36.9	2.8	39.7	74.0	-34.3	Peak	Vertical
	7386.0	35.6	7.9	43.5	74.0	-30.5	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (112.8dBμV/m).

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	802.11n-HT20	Test Site:	AC1
Test Channel:	01	Test Engineer:	Roy Cheng
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	3183.0	39.7	-1.6	38.1	92.8	-54.7	Peak	Horizontal
*	3412.0	38.3	-1.6	36.7	92.8	-56.1	Peak	Horizontal
	4824.0	35.8	2.7	38.5	74.0	-35.5	Peak	Horizontal
	7256.0	36.1	7.9	44.0	74.0	-30.0	Peak	Horizontal
*	3114.0	38.4	-1.7	36.7	92.8	-56.1	Peak	Vertical
*	3244.0	40.3	-1.7	38.6	92.8	-54.2	Peak	Vertical
	4824.0	35.4	2.7	38.1	74.0	-35.9	Peak	Vertical
	7256.0	36.2	7.9	44.1	74.0	-29.9	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (112.8dBμV/m).

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	802.11n-HT20	Test Site:	AC1
Test Channel:	06	Test Engineer:	Roy Cheng
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	3184.0	39.2	-1.6	37.6	92.9	-55.3	Peak	Horizontal
*	3412.0	38.6	-1.6	37.0	92.9	-55.9	Peak	Horizontal
	4874.0	35.5	2.7	38.2	74.0	-35.8	Peak	Horizontal
	7311.0	35.6	8.0	43.6	74.0	-30.4	Peak	Horizontal
*	3168.0	38.7	-1.5	37.2	92.9	-55.7	Peak	Vertical
*	3244.0	39.9	-1.7	38.2	92.9	-54.7	Peak	Vertical
	4874.0	35.7	2.7	38.4	74.0	-35.6	Peak	Vertical
	7311.0	35.9	8.0	43.9	74.0	-30.1	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (112.9dBμV/m).

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	802.11n-HT20	Test Site:	AC1
Test Channel:	11	Test Engineer:	Roy Cheng
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	3056.0	38.8	-1.9	36.9	93.0	-56.1	Peak	Horizontal
*	3412.0	38.5	-1.6	36.9	93.0	-56.1	Peak	Horizontal
	4924.0	35.8	2.8	38.6	74.0	-35.4	Peak	Horizontal
	7386.0	36.0	7.9	43.9	74.0	-30.1	Peak	Horizontal
*	3207.0	39.2	-1.6	37.6	93.0	-55.4	Peak	Vertical
*	3244.0	40.3	-1.7	38.6	93.0	-54.4	Peak	Vertical
	4924.0	36.2	2.8	39.0	74.0	-35.0	Peak	Vertical
	7386.0	36.1	7.9	44.0	74.0	-30.0	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (113.0dBμV/m).

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	802.11n-HT40	Test Site:	AC1
Test Channel:	03	Test Engineer:	Roy Cheng
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	3166.0	39.1	-1.5	37.6	88.3	-50.7	Peak	Horizontal
*	3412.0	38.8	-1.6	37.2	88.3	-51.1	Peak	Horizontal
	4844.0	35.4	2.7	38.1	74.0	-35.9	Peak	Horizontal
	7266.0	35.6	7.9	43.5	74.0	-30.5	Peak	Horizontal
*	3188.0	38.2	-1.6	36.6	88.3	-51.7	Peak	Vertical
*	3244.0	40.0	-1.7	38.3	88.3	-50.0	Peak	Vertical
	4844.0	35.3	2.7	38.0	74.0	-36.0	Peak	Vertical
	7266.0	35.4	7.9	43.3	74.0	-30.7	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (108.3dBμV/m).

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	802.11n-HT40	Test Site:	AC1
Test Channel:	06	Test Engineer:	Roy Cheng
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	3127.0	38.9	-1.6	37.3	87.4	-50.1	Peak	Horizontal
*	3412.0	38.6	-1.6	37.0	87.4	-50.4	Peak	Horizontal
	4874.0	35.5	2.7	38.2	74.0	-35.8	Peak	Horizontal
	7311.0	35.5	8.0	43.5	74.0	-30.5	Peak	Horizontal
*	3159.0	38.6	-1.5	37.1	87.4	-50.3	Peak	Vertical
*	3244.0	40.3	-1.7	38.6	87.4	-48.8	Peak	Vertical
	4874.0	36.3	2.7	39.0	74.0	-35.0	Peak	Vertical
	7311.0	35.4	8.0	43.4	74.0	-30.6	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (107.4dBμV/m).

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Mode:	802.11n-HT40	Test Site:	AC1
Test Channel:	09	Test Engineer:	Roy Cheng
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	3065.0	39.0	-1.9	37.1	86.8	-49.7	Peak	Horizontal
*	3412.0	38.5	-1.6	36.9	86.8	-49.9	Peak	Horizontal
	4904.0	35.6	2.7	38.3	74.0	-35.7	Peak	Horizontal
	7356.0	36.3	8.0	44.3	74.0	-29.7	Peak	Horizontal
*	3128.0	38.6	-1.6	37.0	86.8	-49.8	Peak	Vertical
*	3244.0	40.1	-1.7	38.4	86.8	-48.4	Peak	Vertical
	4904.0	36.3	2.7	39.0	74.0	-35.0	Peak	Vertical
	7356.0	35.6	8.0	43.6	74.0	-30.4	Peak	Vertical

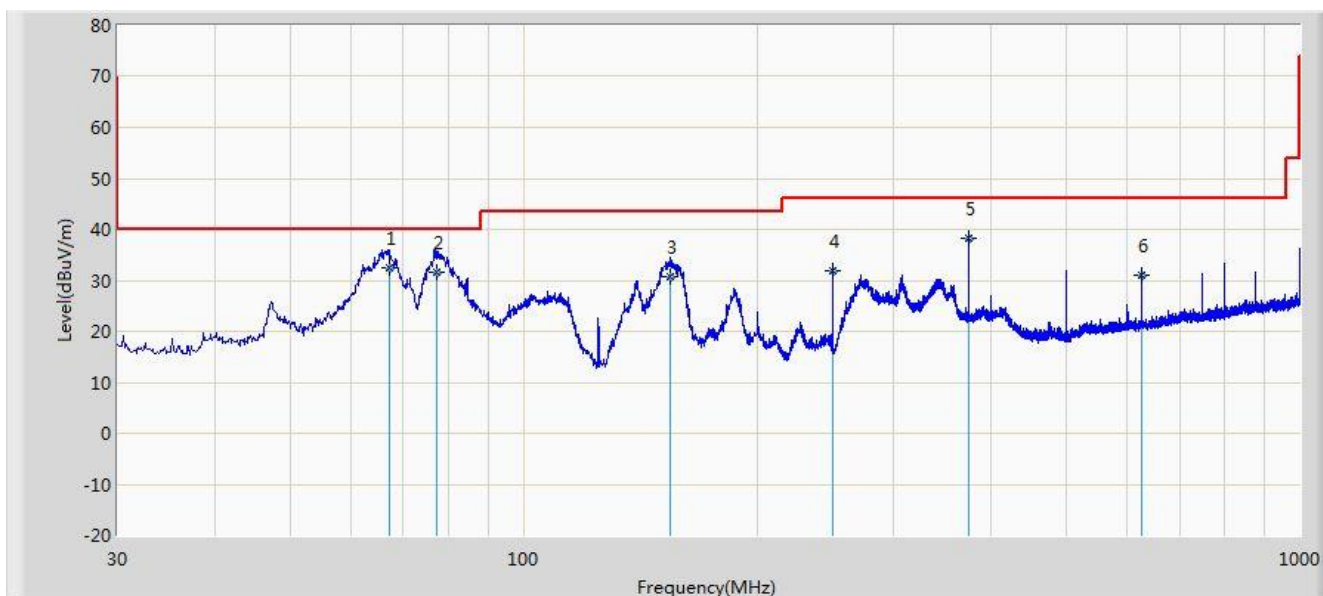
Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (106.8dBμV/m).

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

The worst case of Radiated Emission below 1GHz:

Site: AC1	Time: 2015/05/06 - 20:23
Limit: FCC_Part15.209_RE(3m)	Engineer: Milo Li
Probe: VULB9162_0.03-8GHz	Polarity: Horizontal
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Worst Mode: Transmit at channel 2412MHz by 802.11b	

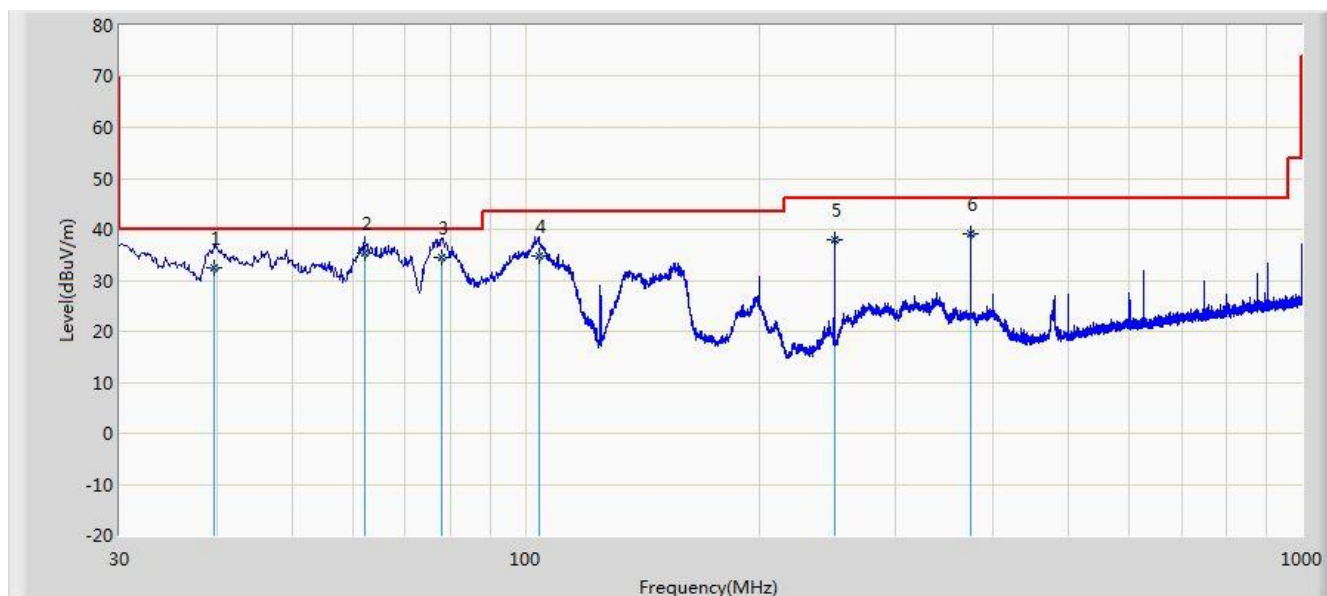


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	67.103	32.507	20.690	-7.493	40.000	11.817	QP
2			77.409	31.460	22.308	-8.540	40.000	9.152	QP
3			154.538	30.679	21.070	-12.821	43.500	9.609	QP
4			249.987	31.877	18.250	-14.123	46.000	13.627	QP
5			374.996	38.302	22.150	-7.698	46.000	16.152	QP
6			624.975	31.100	10.840	-14.900	46.000	20.261	QP

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/05/06 - 20:24
Limit: FCC_Part15.209_RE(3m)	Engineer: Milo Li
Probe: VULB9162_0.03-8GHz	Polarity: Vertical
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Worst Mode: Transmit at channel 2412MHz by 802.11b	

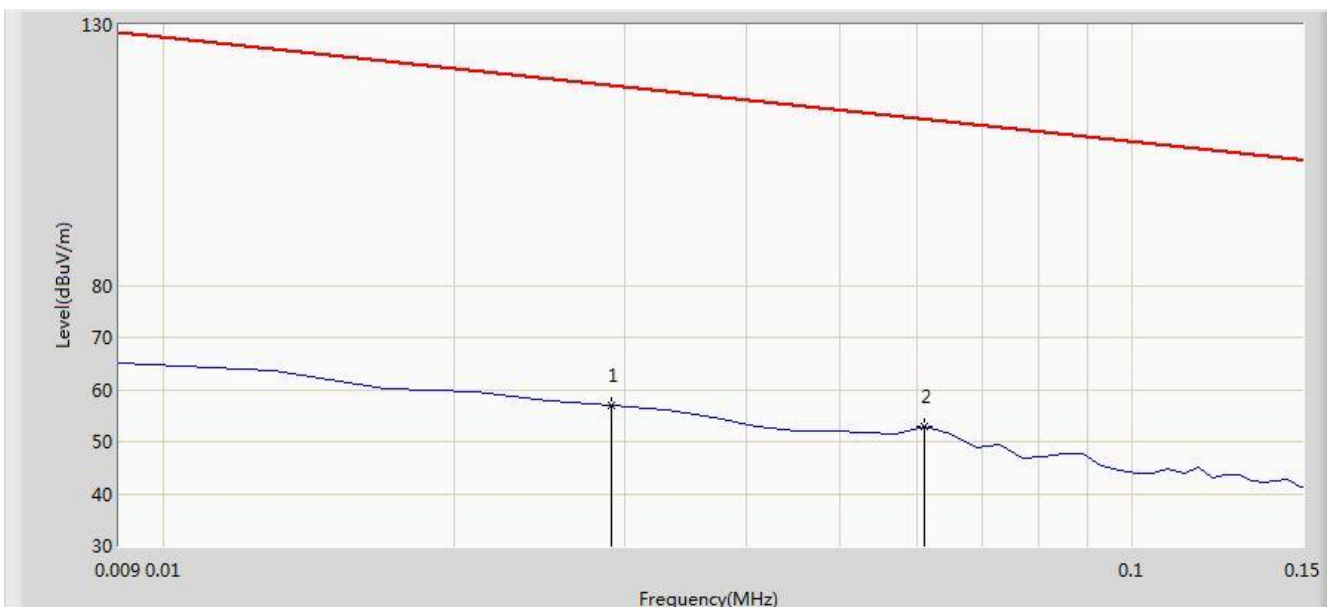


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			39.702	32.325	18.537	-7.675	40.000	13.788	QP
2		*	62.215	35.297	21.860	-4.703	40.000	13.437	QP
3			78.130	34.447	25.347	-5.553	40.000	9.100	QP
4			104.095	34.770	21.670	-8.730	43.500	13.100	QP
5			249.975	37.907	24.280	-8.093	46.000	13.626	QP
6			374.998	39.082	22.930	-6.918	46.000	16.152	QP

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/04/10 - 09:44
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng
Probe: FMZB1519_0.009-30MHz	Polarity: Face on
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Note: There is the ambient noise within frequency range 9kHz~30MHz.	

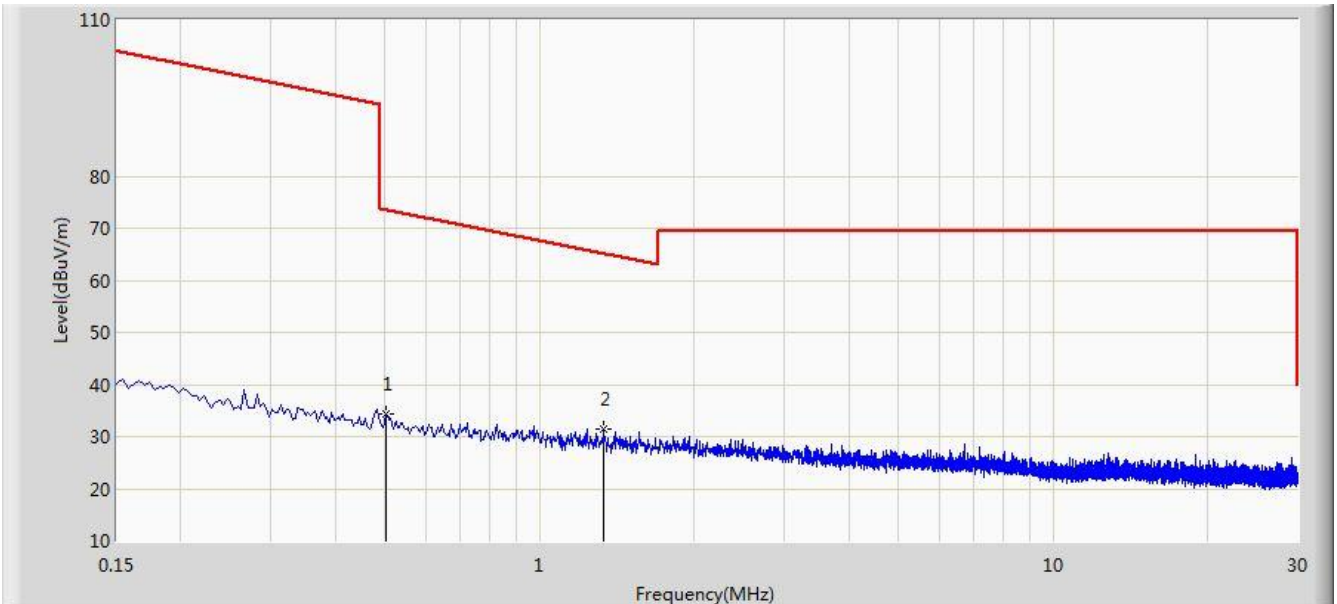


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			0.029	56.893	35.844	-61.463	118.356	21.049	QP
2		*	0.061	52.853	32.542	-59.045	111.898	20.311	QP

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/04/10 - 09:44
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng
Probe: FMZB1519_0.009-30MHz	Polarity: Face on
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Note: There is the ambient noise within frequency range 9kHz~30MHz.	

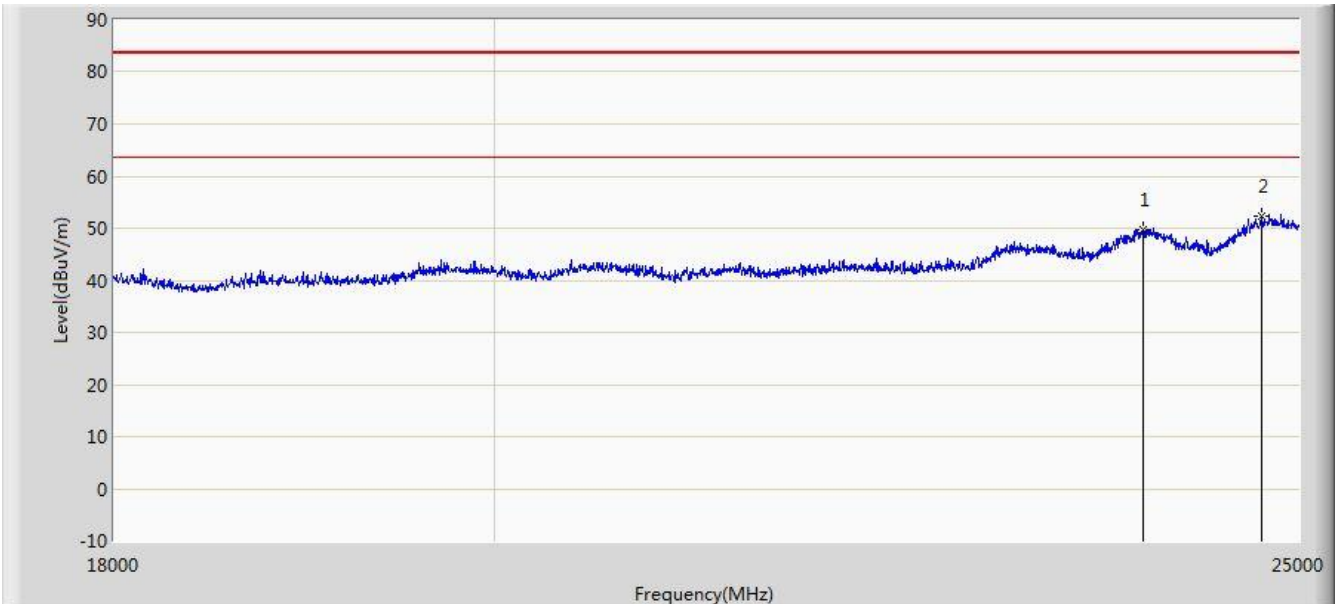


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			0.502	34.370	13.947	-39.220	73.590	20.423	QP
2		*	1.334	31.595	11.104	-33.530	65.125	20.491	QP

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/04/10 - 10:21
Limit: FCC_Part15.209_RE(1m)	Engineer: Roy Cheng
Probe: BBHA9170_18-40GHz	Polarity: Horizontal
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Note: There is the ambient noise within frequency range 18GHz~25GHz.	

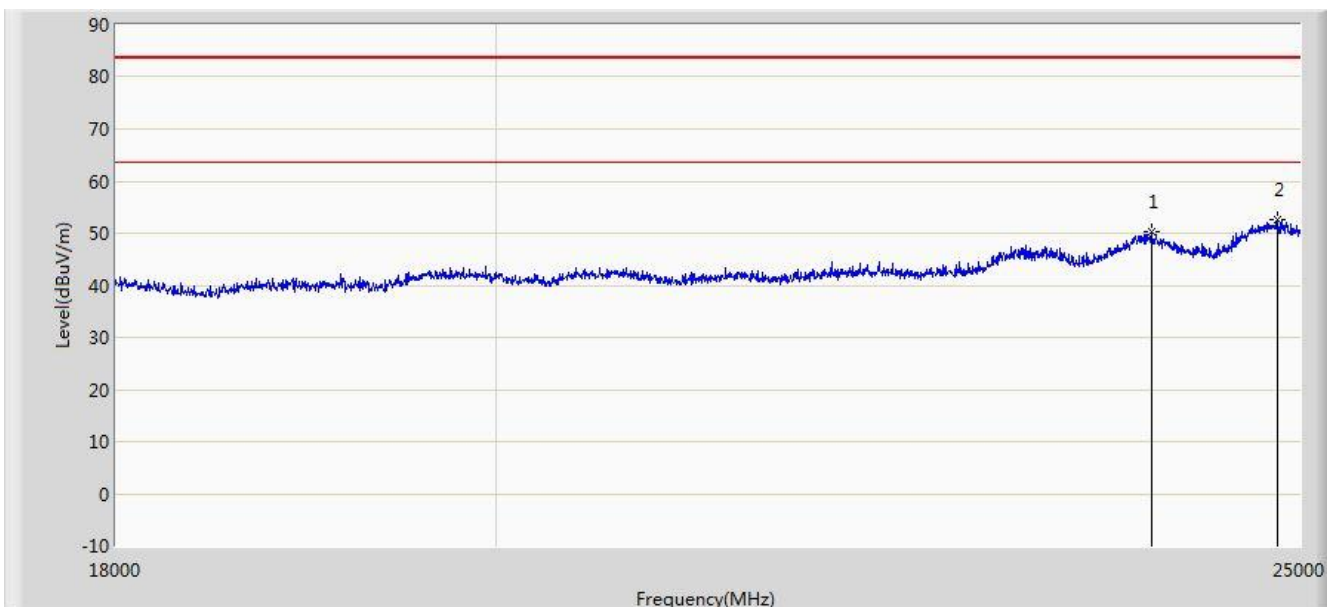


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			23943.000	49.776	35.866	-33.724	83.500	13.910	PK
2		*	24741.000	52.375	37.681	-31.125	83.500	14.694	PK

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Site: AC1	Time: 2015/04/10 - 10:21
Limit: FCC_Part15.209_RE(1m)	Engineer: Roy Cheng
Probe: BBHA9170_18-40GHz	Polarity: Vertical
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Note: There is the ambient noise within frequency range 18GHz~25GHz.	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			23999.000	50.379	36.435	-33.121	83.500	13.944	PK
2		*	24846.000	52.503	37.735	-30.997	83.500	14.768	PK

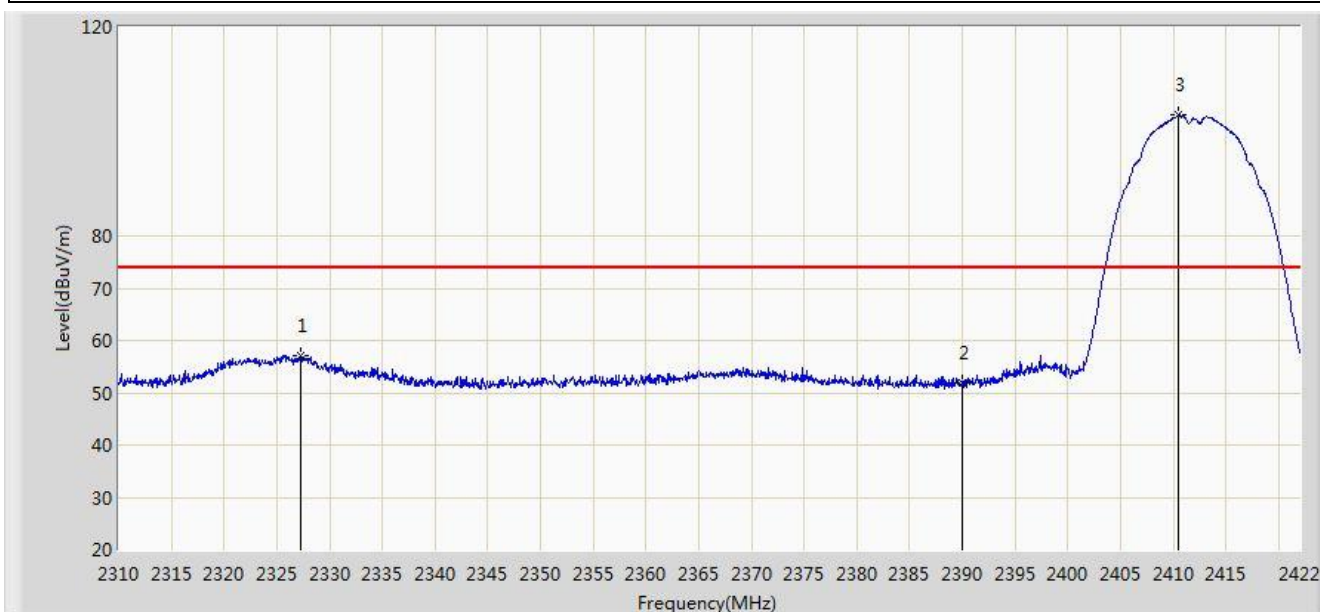
Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

7.7. Radiated Restricted Band Edge Measurement

7.7.1. Test Result

Site: AC1	Time: 2015/04/07 - 16:19
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2412MHz by 802.11b	

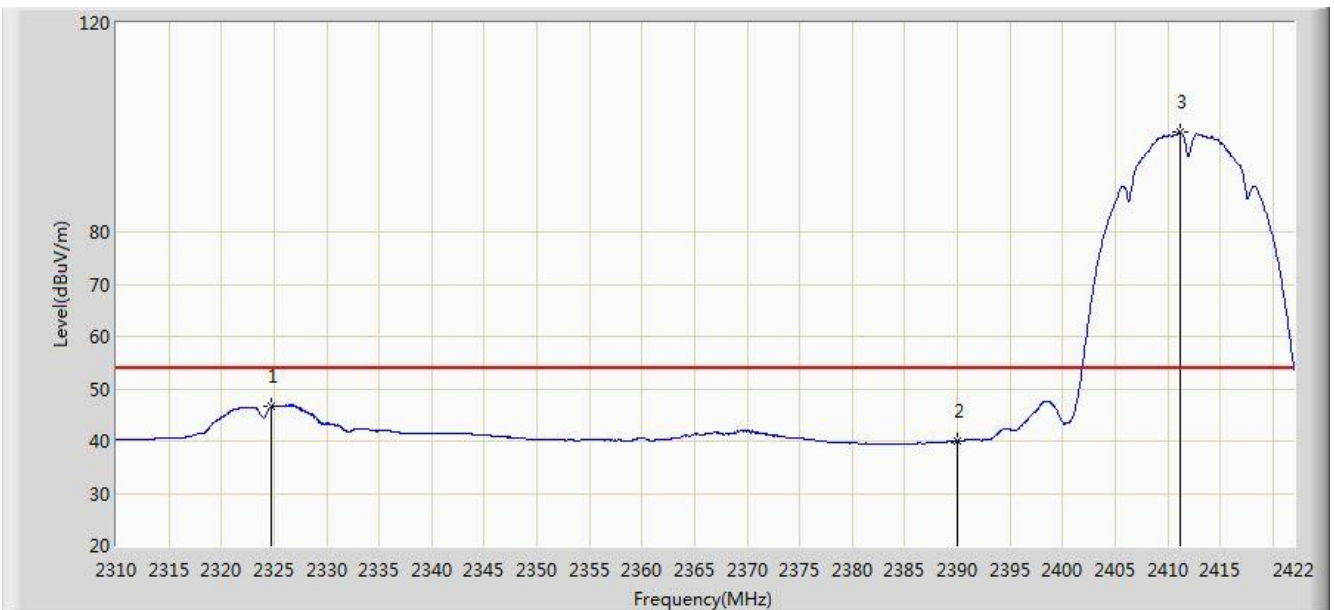


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2327.304	57.156	26.653	-16.844	74.000	30.503	PK
2			2390.000	51.743	21.467	-22.257	74.000	30.276	PK
3		*	2410.520	103.076	72.852	N/A	N/A	30.224	PK

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 16:22
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2412MHz by 802.11b	

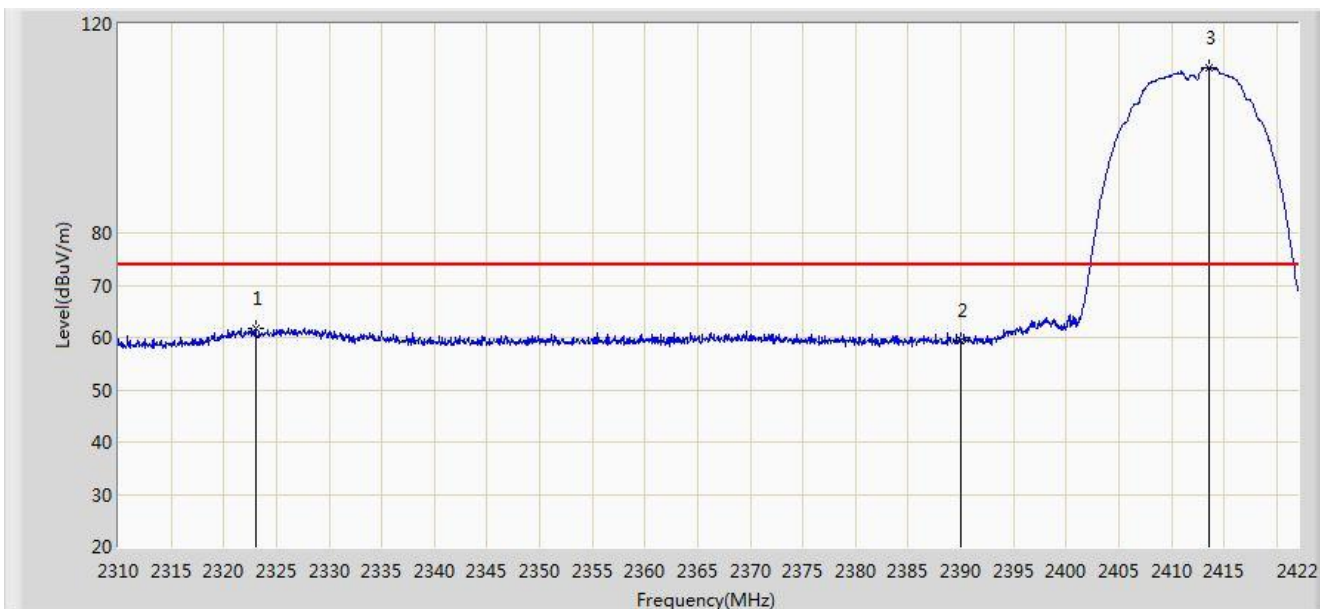


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2324.784	46.564	16.048	-7.436	54.000	30.516	AV
2			2390.000	39.940	9.664	-14.060	54.000	30.276	AV
3		*	2411.136	99.128	68.905	N/A	N/A	30.223	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 16:16
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2412MHz by 802.11b	

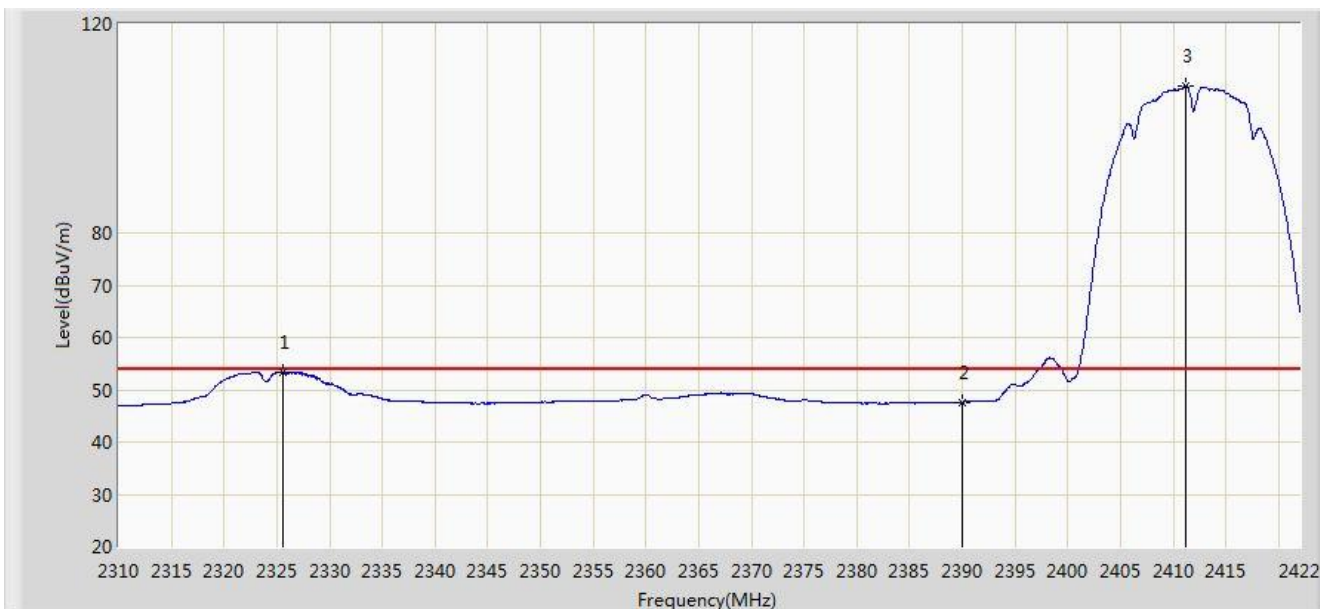


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2322.992	61.834	31.308	-12.166	74.000	30.526	PK
2			2390.000	59.417	29.141	-14.583	74.000	30.276	PK
3		*	2413.600	111.704	81.487	N/A	N/A	30.217	PK

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 16:09
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2412MHz by 802.11b	

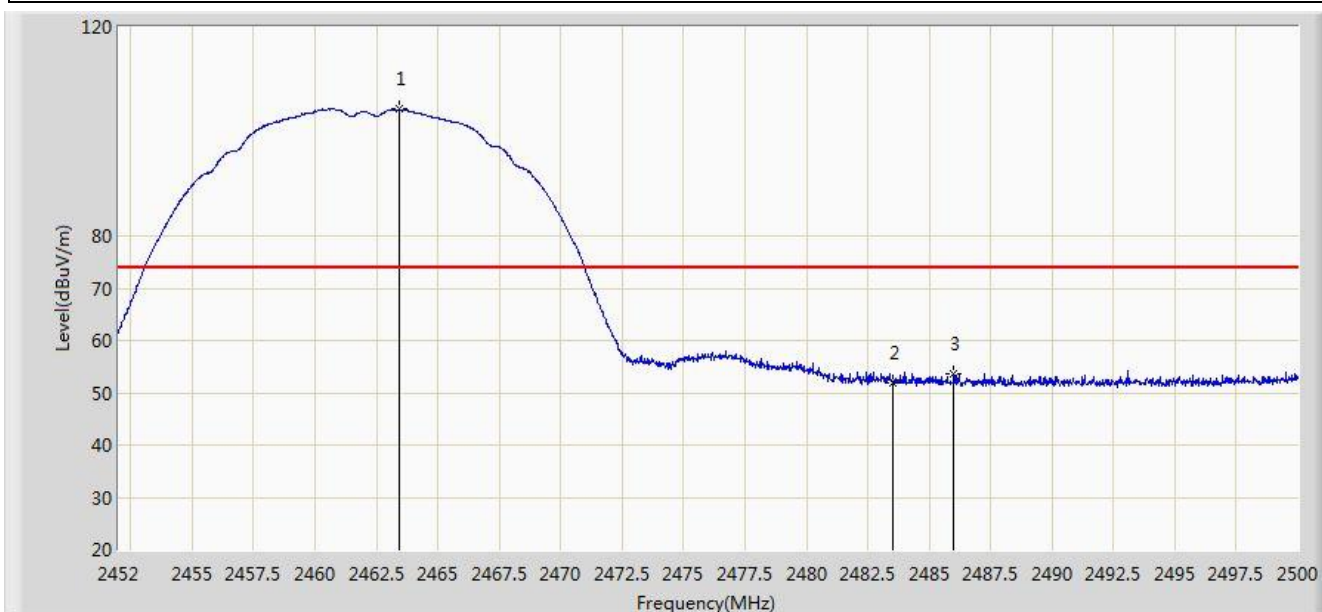


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2325.624	53.403	22.891	-0.597	54.000	30.512	AV
2			2390.000	47.640	17.364	-6.360	54.000	30.276	AV
3		*	2411.136	108.057	77.834	N/A	N/A	30.223	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 16:26
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2412MHz by 802.11b	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2463.424	104.353	74.198	N/A	N/A	30.155	PK
2			2483.500	51.999	21.808	-22.001	74.000	30.191	PK
3			2486.008	53.584	23.389	-20.416	74.000	30.195	PK

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 16:30
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2412MHz by 802.11b	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2461.240	98.547	68.394	N/A	N/A	30.153	AV
2			2483.500	39.538	9.347	-14.462	54.000	30.191	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 16:31
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2412MHz by 802.11b	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2460.568	112.265	82.113	N/A	N/A	30.152	PK
2			2483.500	59.487	29.296	-14.513	74.000	30.191	PK
3			2485.384	60.640	30.446	-13.360	74.000	30.194	PK

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 16:33
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2412MHz by 802.11b	

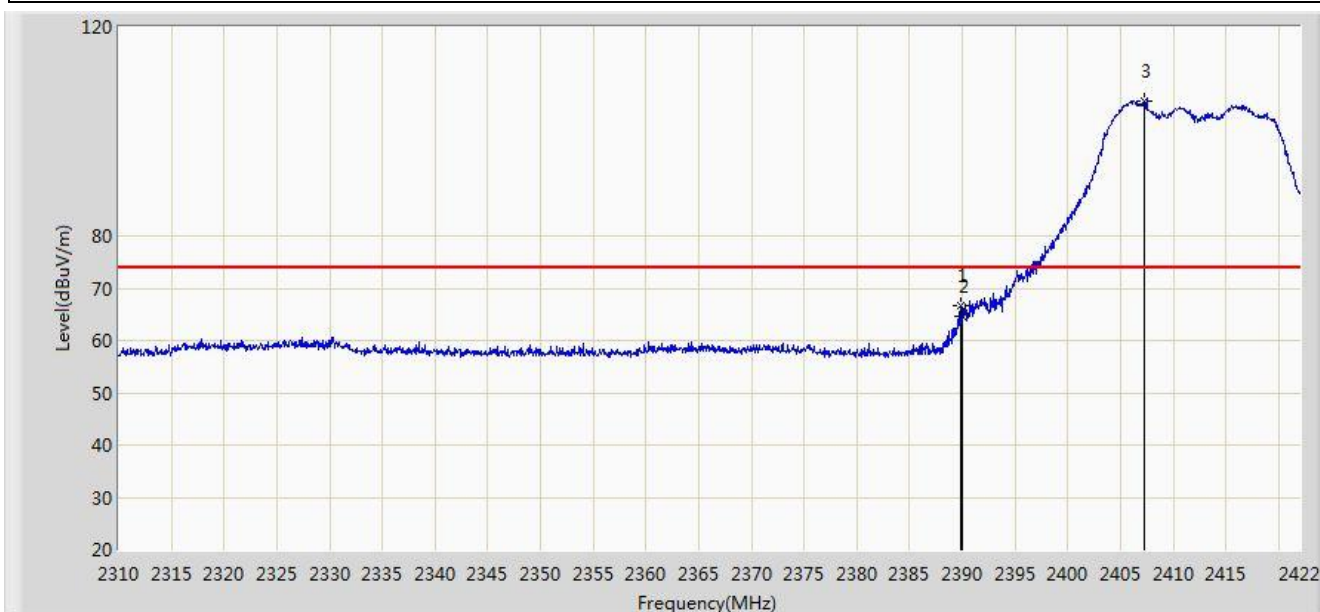


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2461.168	107.955	77.802	N/A	N/A	30.153	AV
2			2483.500	46.308	16.117	-7.692	54.000	30.191	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 16:47
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2412MHz by 802.11g	

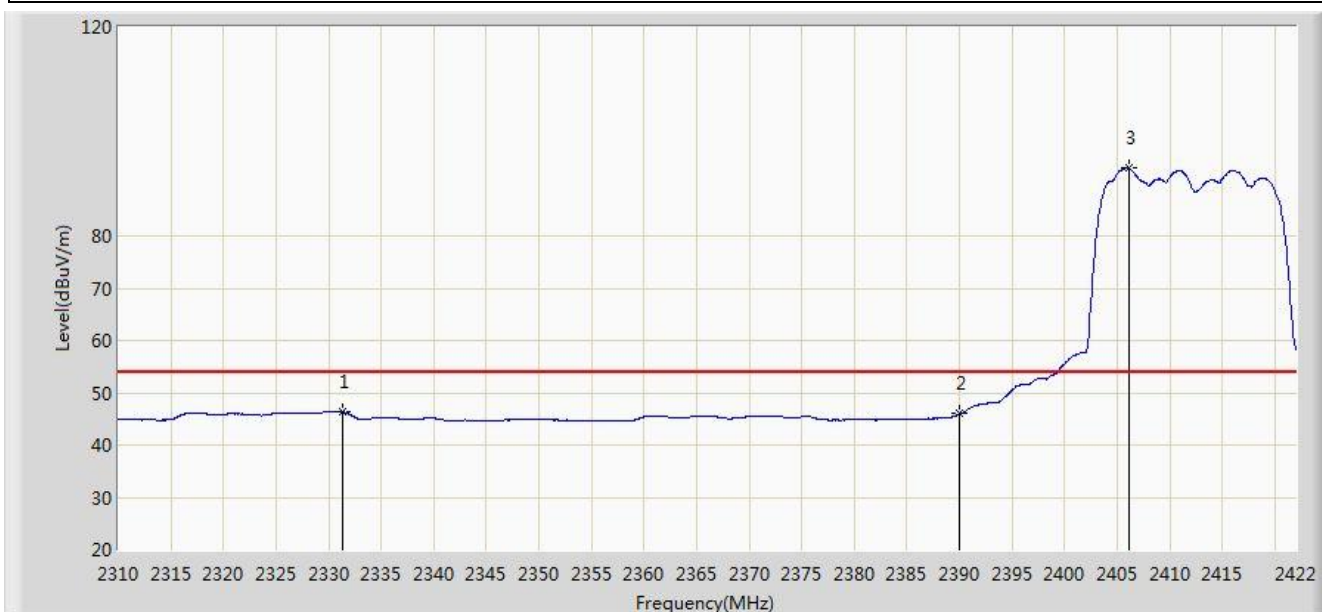


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2389.856	66.528	36.252	-7.472	74.000	30.276	PK
2			2390.000	64.604	34.328	-9.396	74.000	30.276	PK
3		*	2407.216	105.915	75.682	N/A	N/A	30.233	PK

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 16:49
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2412MHz by 802.11g	

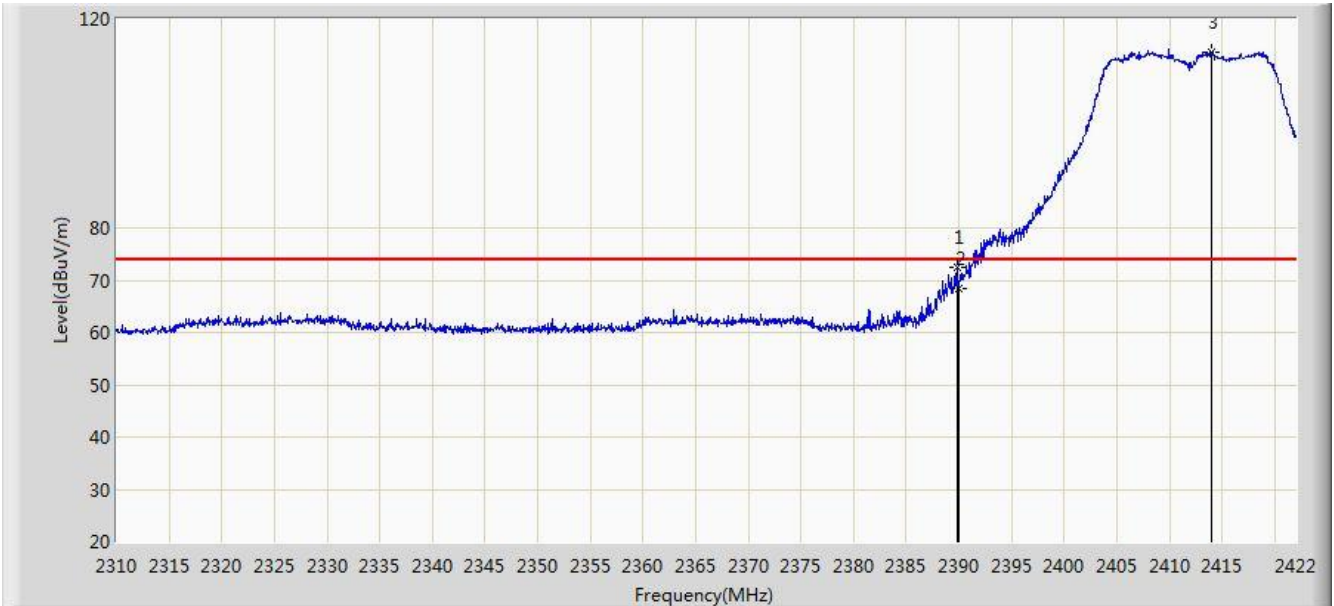


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2331.392	46.287	15.806	-7.713	54.000	30.481	AV
2			2390.000	45.961	15.685	-8.039	54.000	30.276	AV
3		*	2406.096	92.921	62.686	N/A	N/A	30.235	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 16:39
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2412MHz by 802.11g	

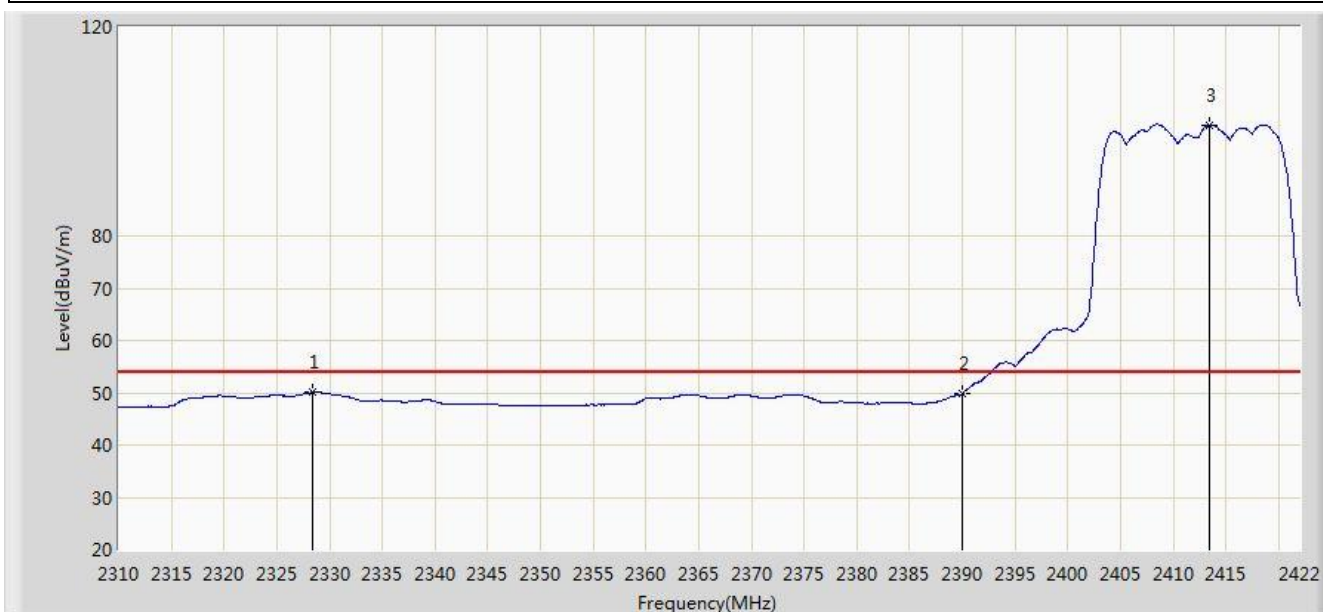


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2389.800	72.350	42.074	-1.650	74.000	30.276	PK
2			2390.000	68.497	38.221	-5.503	74.000	30.276	PK
3		*	2413.992	113.733	83.517	N/A	N/A	30.216	PK

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 16:43
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2412MHz by 802.11g	

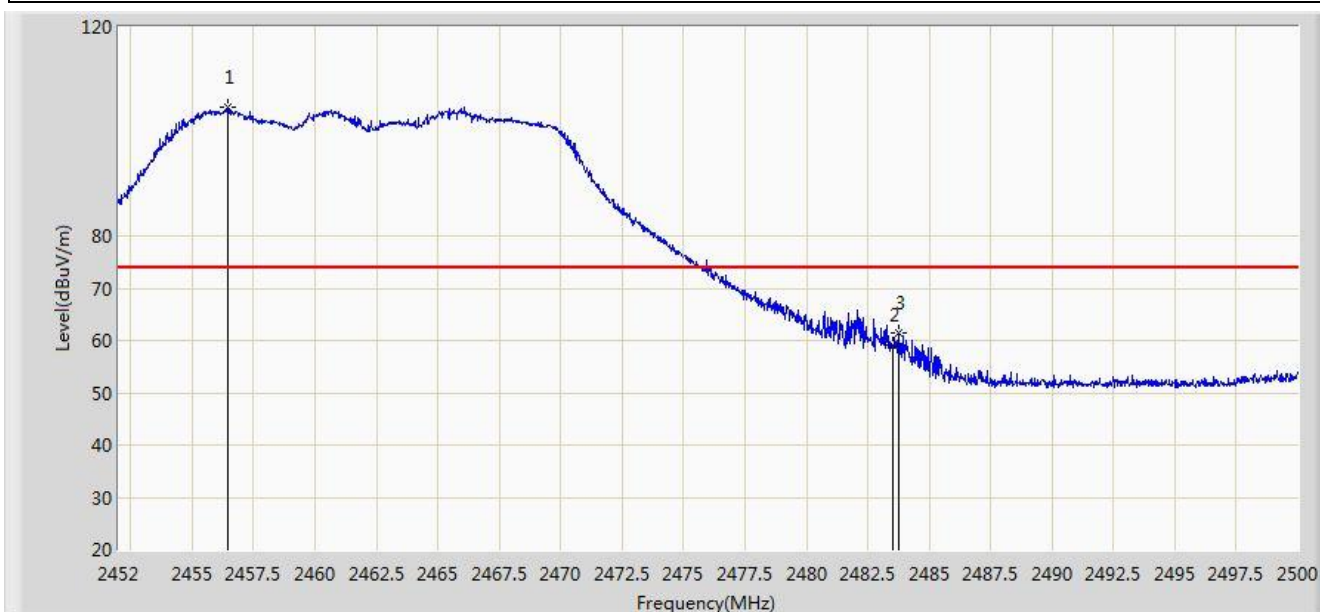


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2328.424	50.008	19.511	-3.992	54.000	30.497	AV
2			2390.000	49.835	19.559	-4.165	54.000	30.276	AV
3		*	2413.376	101.230	71.012	N/A	N/A	30.218	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 17:06
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2462MHz by 802.11g	

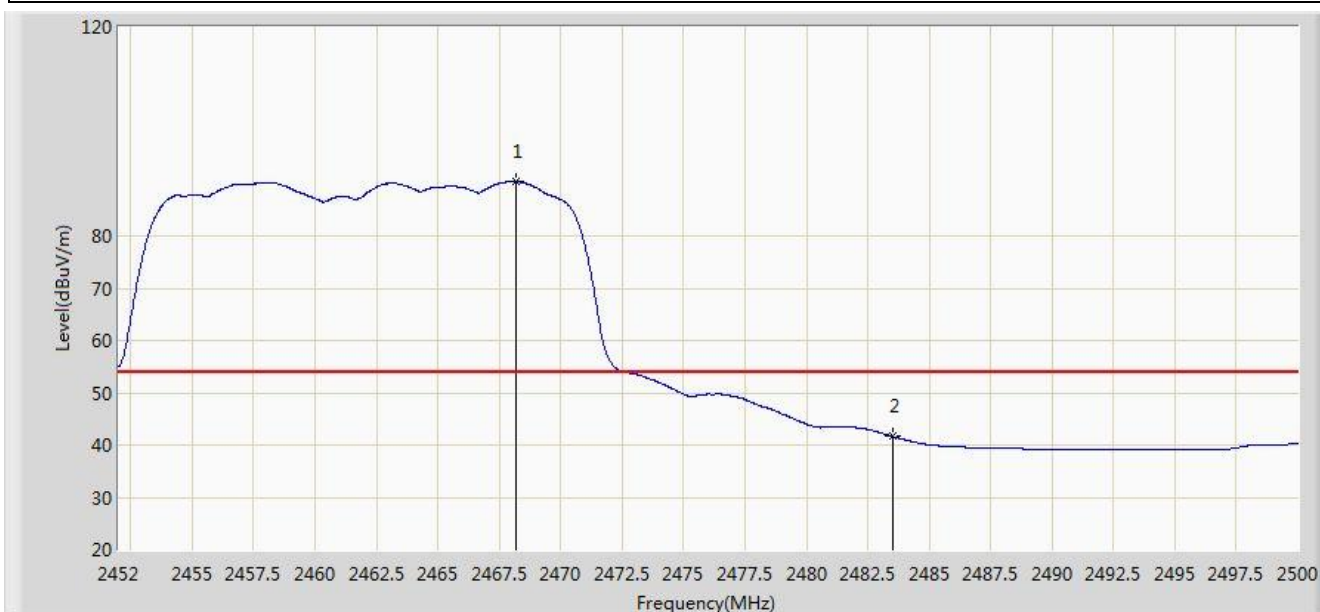


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2456.464	104.564	74.416	N/A	N/A	30.148	PK
2			2483.500	58.998	28.807	-15.002	74.000	30.191	PK
3			2483.776	61.488	31.297	-12.512	74.000	30.191	PK

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 17:09
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2462MHz by 802.11g	

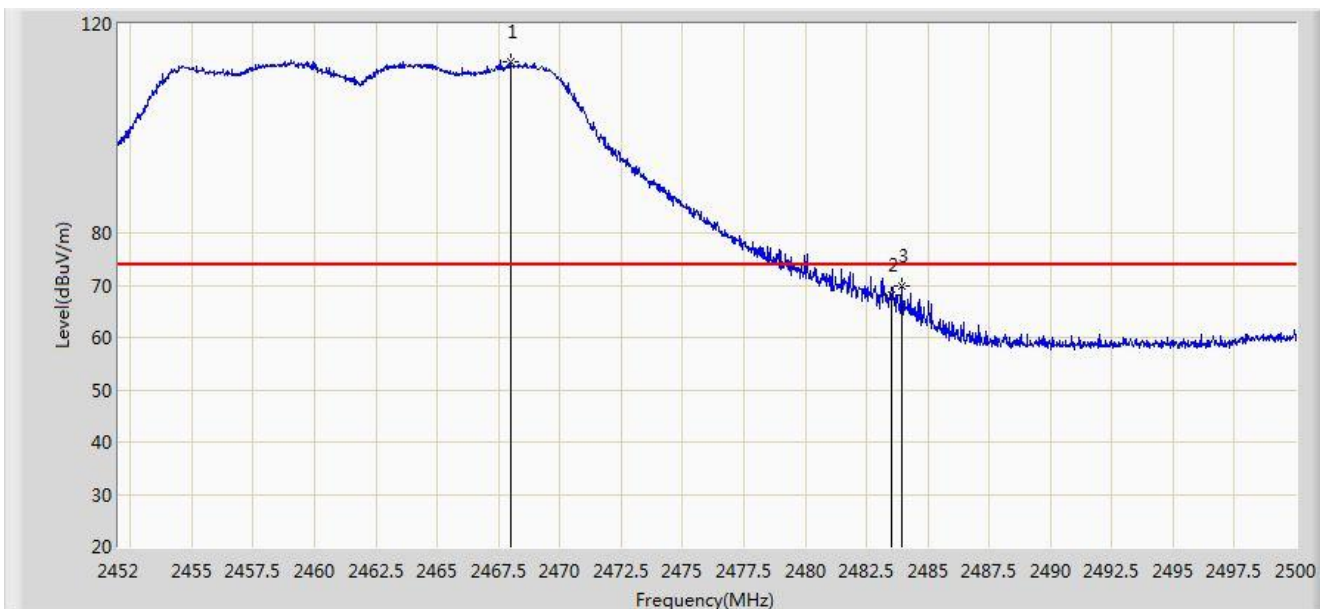


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2468.176	90.346	60.183	N/A	N/A	30.163	AV
2			2483.500	41.668	11.477	-12.332	54.000	30.191	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 17:02
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2462MHz by 802.11g	

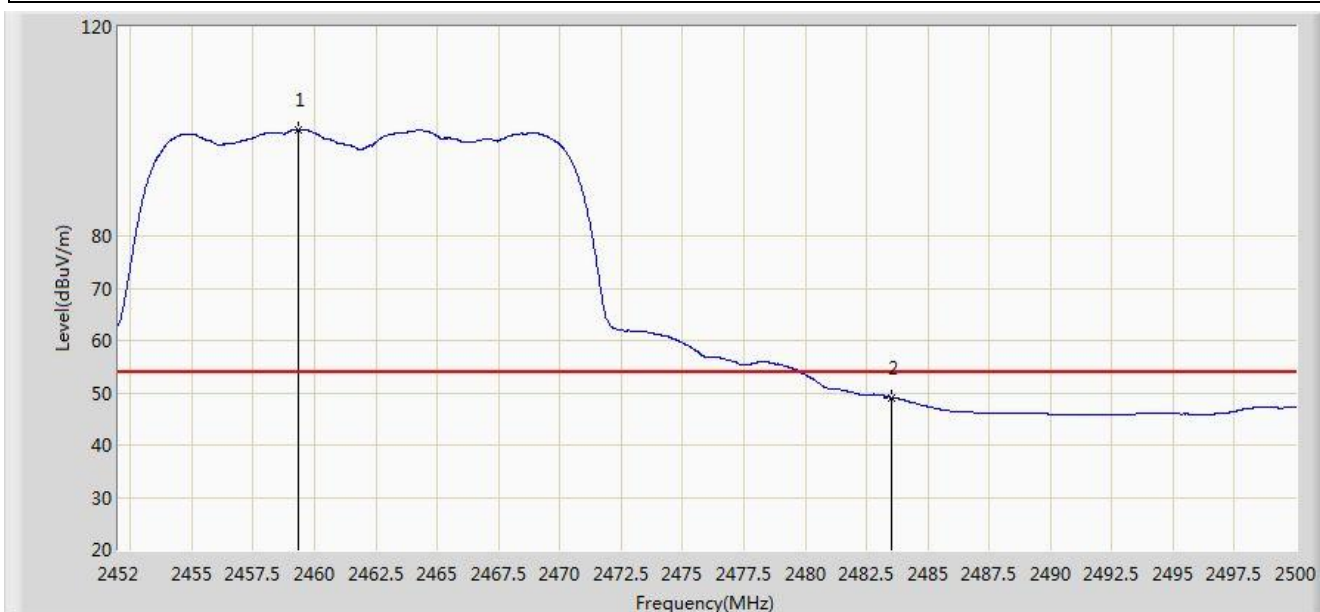


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2467.984	112.845	82.682	N/A	N/A	30.163	PK
2			2483.500	68.138	37.947	-5.862	74.000	30.191	PK
3			2483.944	69.719	39.528	-4.281	74.000	30.191	PK

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 17:04
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2462MHz by 802.11g	

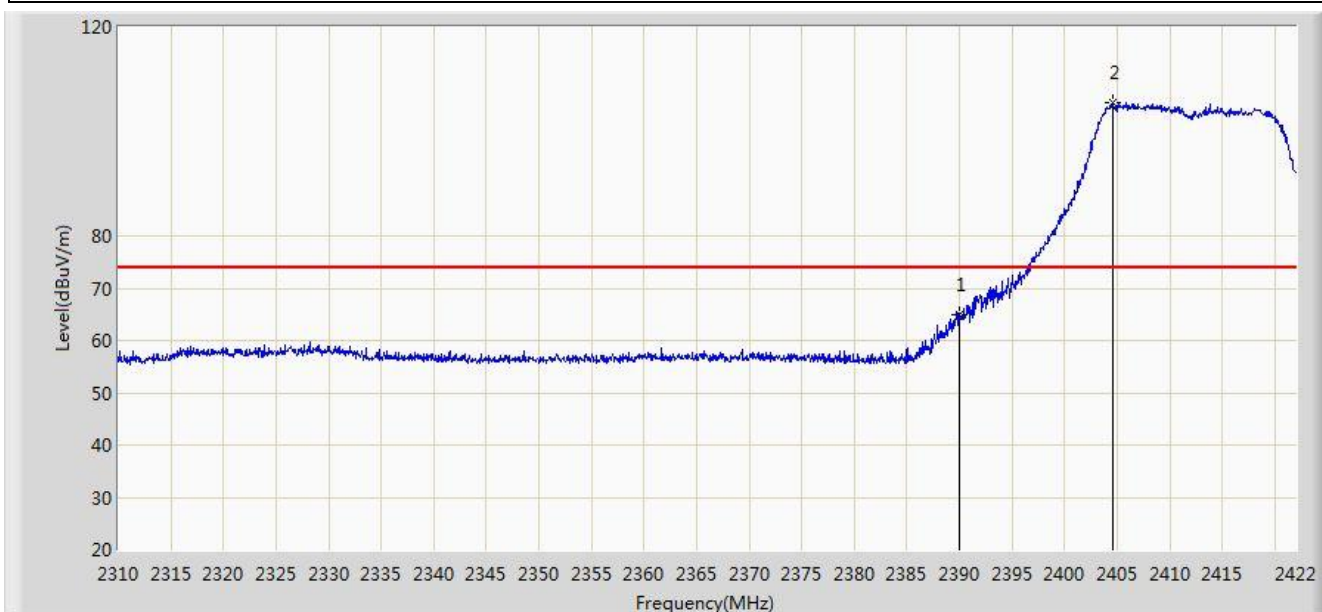


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2459.368	100.346	70.195	N/A	N/A	30.151	AV
2			2483.500	49.017	18.826	-4.983	54.000	30.191	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 17:27
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2412MHz by 802.11n-HT20	

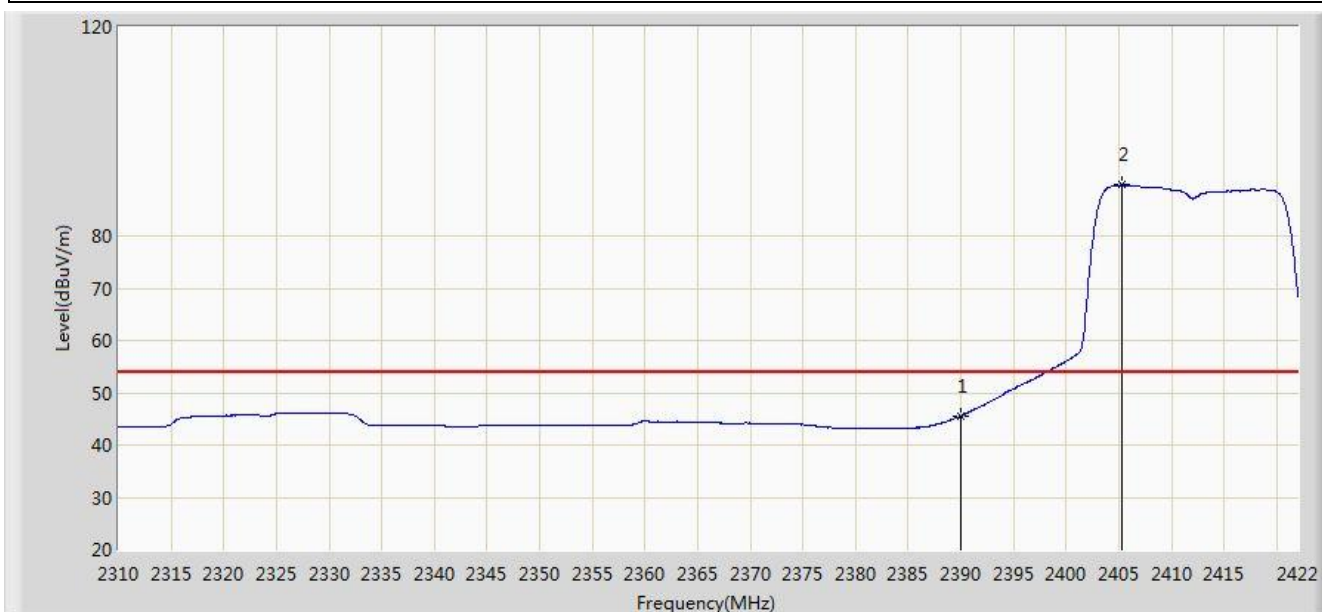


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	64.826	34.550	-9.174	74.000	30.276	PK
2		*	2404.528	105.471	75.232	N/A	N/A	30.239	PK

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 17:31
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2412MHz by 802.11n-HT20	

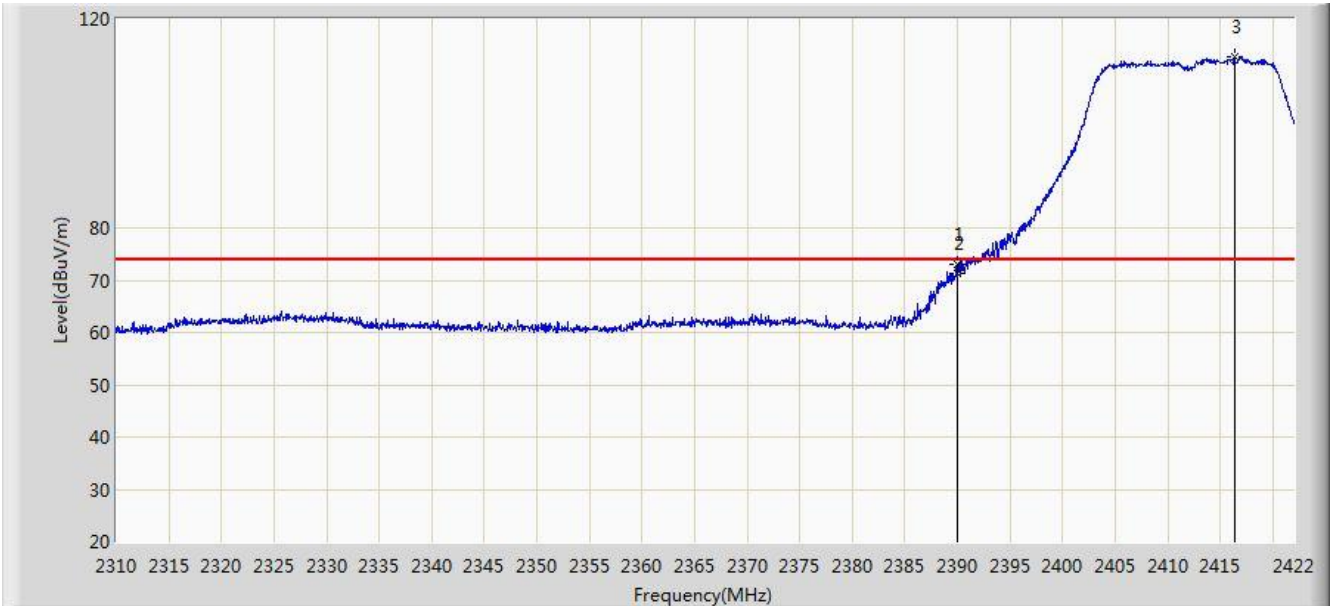


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	45.555	15.279	-8.445	54.000	30.276	AV
2		*	2405.368	89.755	59.518	N/A	N/A	30.237	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 17:17
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2412MHz by 802.11n-HT20	

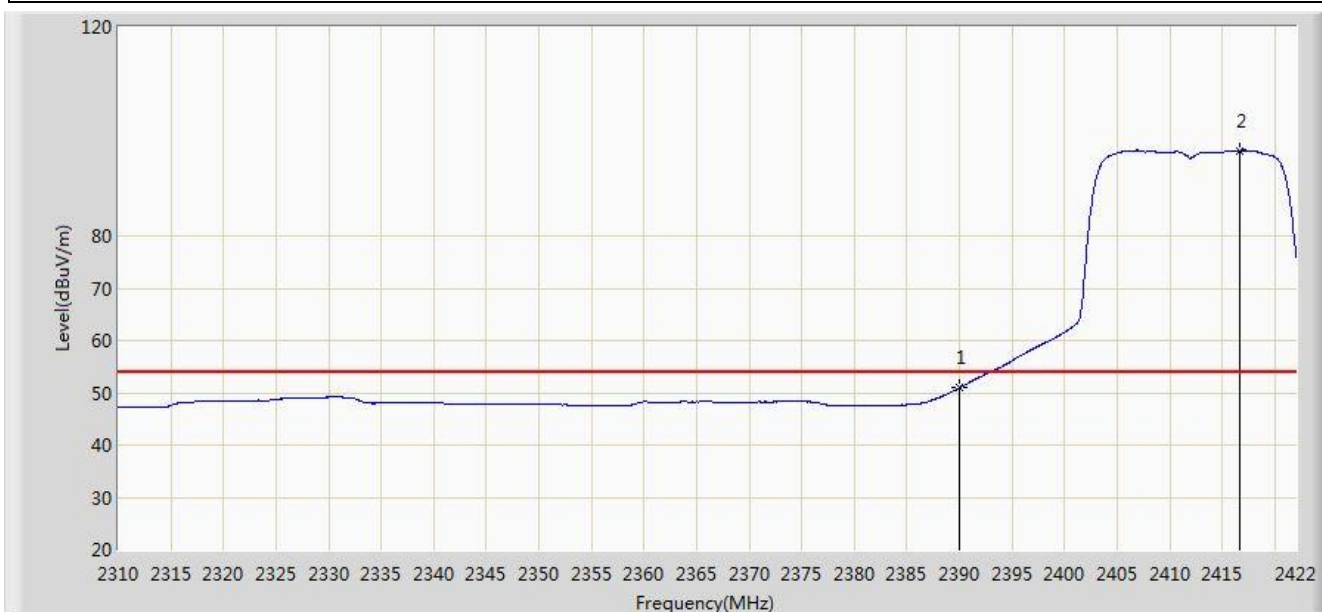


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2389.968	73.125	42.849	-0.875	74.000	30.276	PK
2			2390.000	71.406	41.130	-2.594	74.000	30.276	PK
3		*	2416.400	112.787	82.577	N/A	N/A	30.210	PK

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 17:23
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2412MHz by 802.11n-HT20	

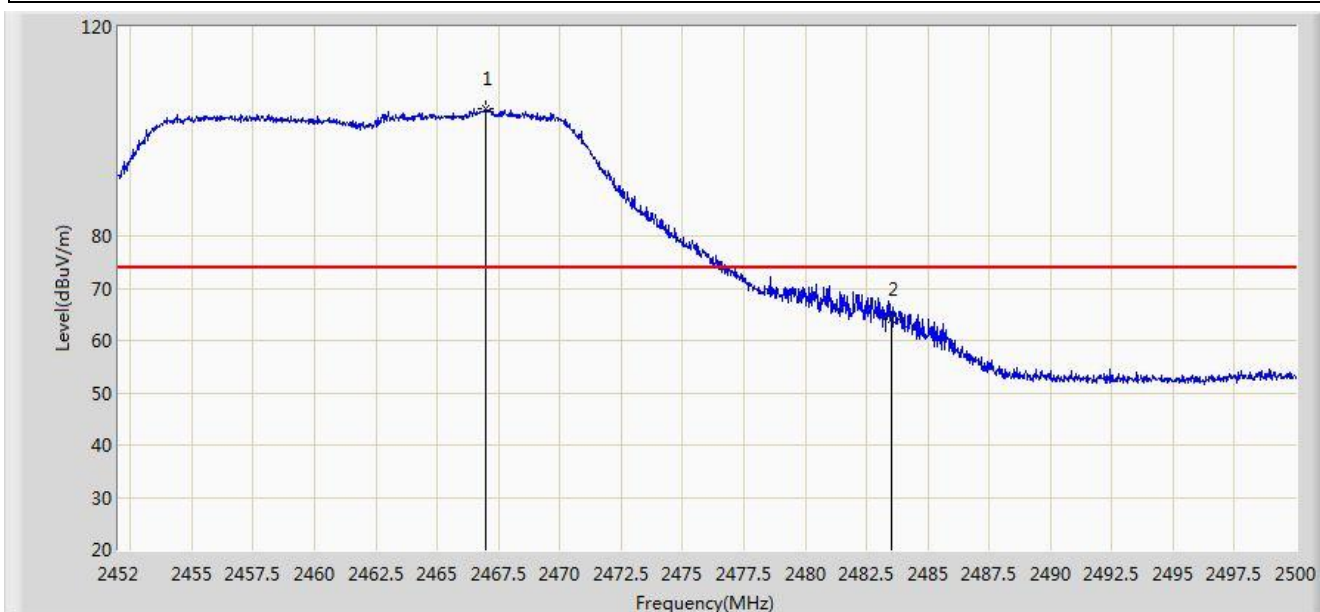


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	50.895	20.619	-3.105	54.000	30.276	AV
2		*	2416.736	96.358	66.148	N/A	N/A	30.210	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 17:46
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2462MHz by 802.11n-HT20	

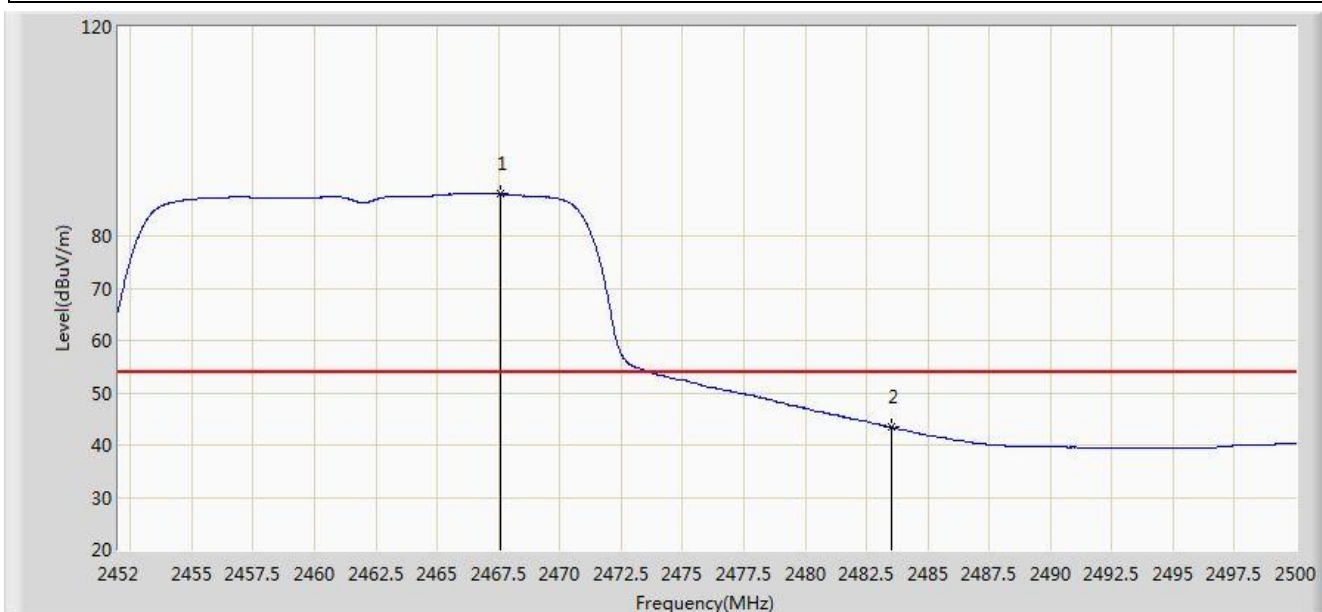


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2467.000	104.288	74.127	N/A	N/A	30.161	PK
2			2483.500	64.066	33.875	-9.934	74.000	30.191	PK

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 17:51
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2462MHz by 802.11n-HT20	

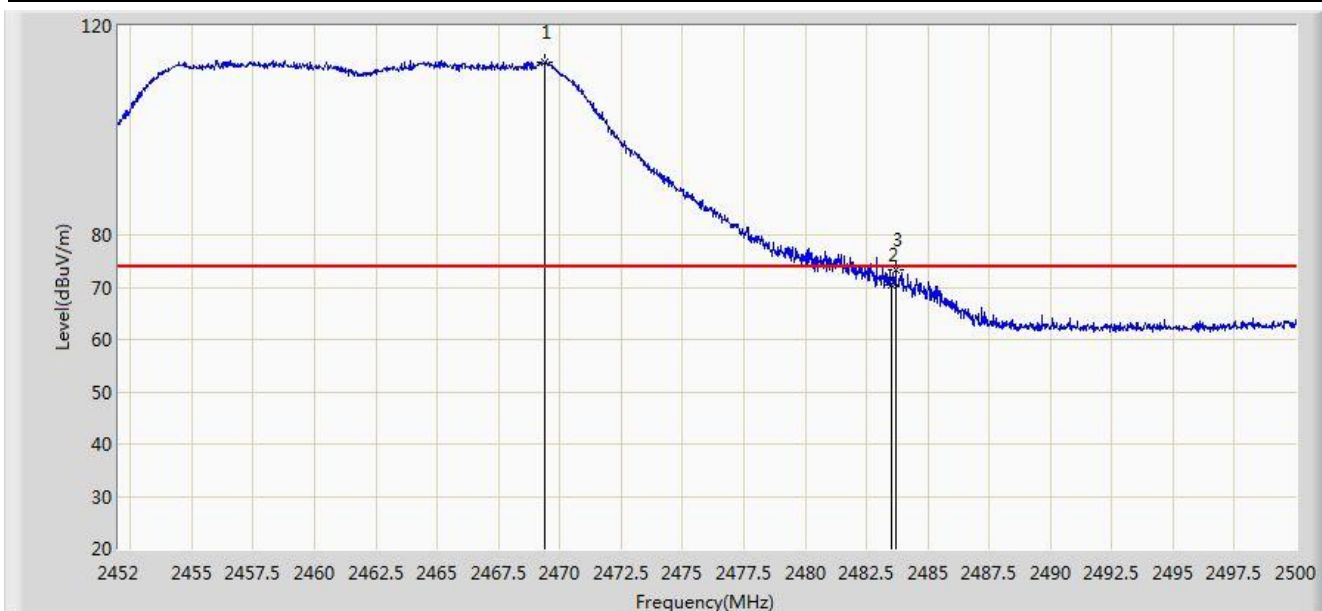


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2467.576	88.006	57.844	N/A	N/A	30.162	AV
2			2483.500	43.437	13.246	-10.563	54.000	30.191	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 17:42
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2462MHz by 802.11n-HT20	

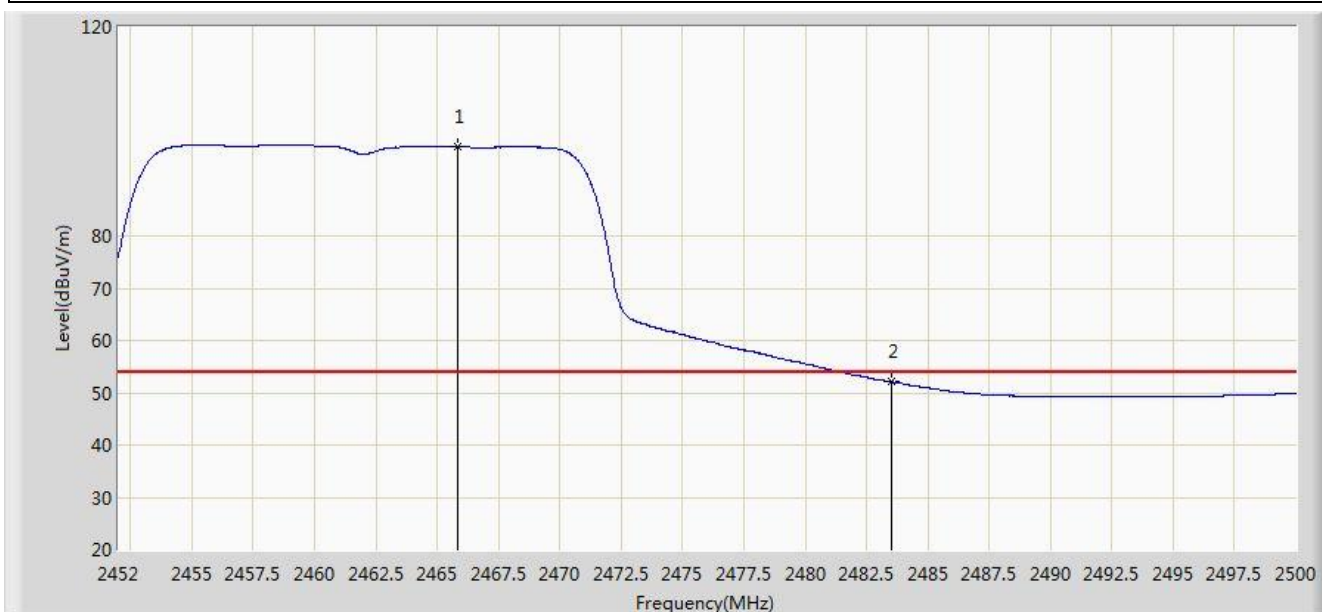


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2469.400	113.042	82.877	N/A	N/A	30.165	PK
2			2483.500	70.448	40.257	-3.552	74.000	30.191	PK
3			2483.680	73.299	43.108	-0.701	74.000	30.191	PK

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 17:45
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2462MHz by 802.11n-HT20	

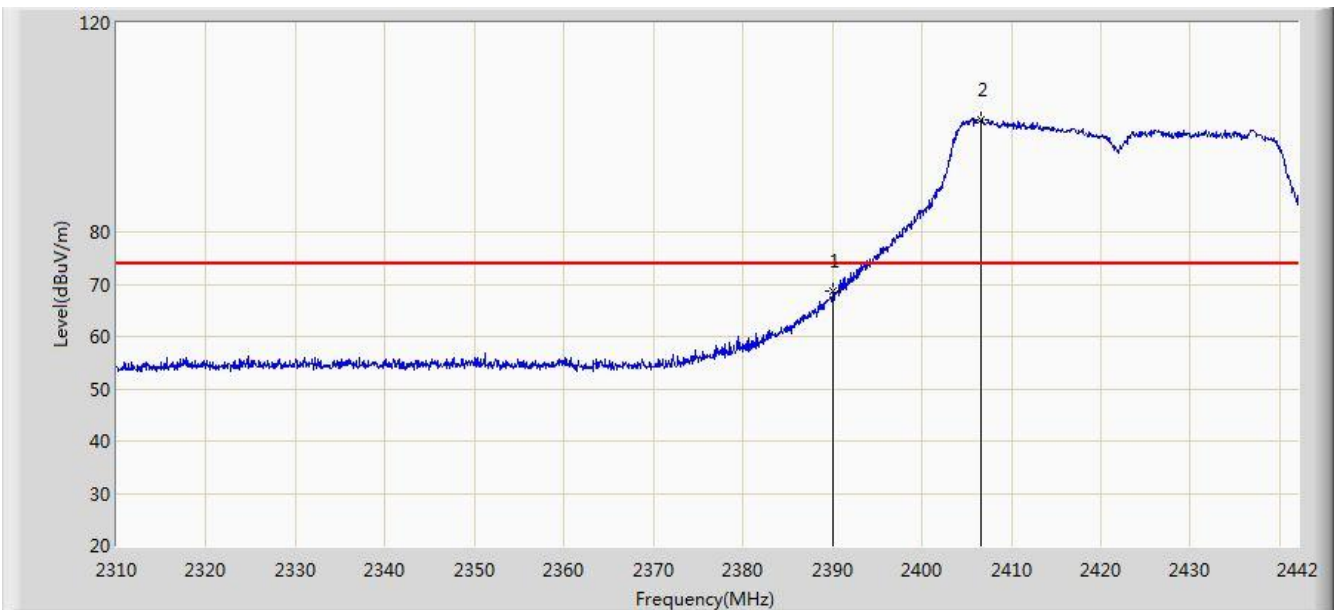


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2465.848	97.177	67.018	N/A	N/A	30.159	AV
2			2483.500	52.084	21.893	-1.916	54.000	30.191	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 18:48
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2422MHz by 802.11n-HT40	

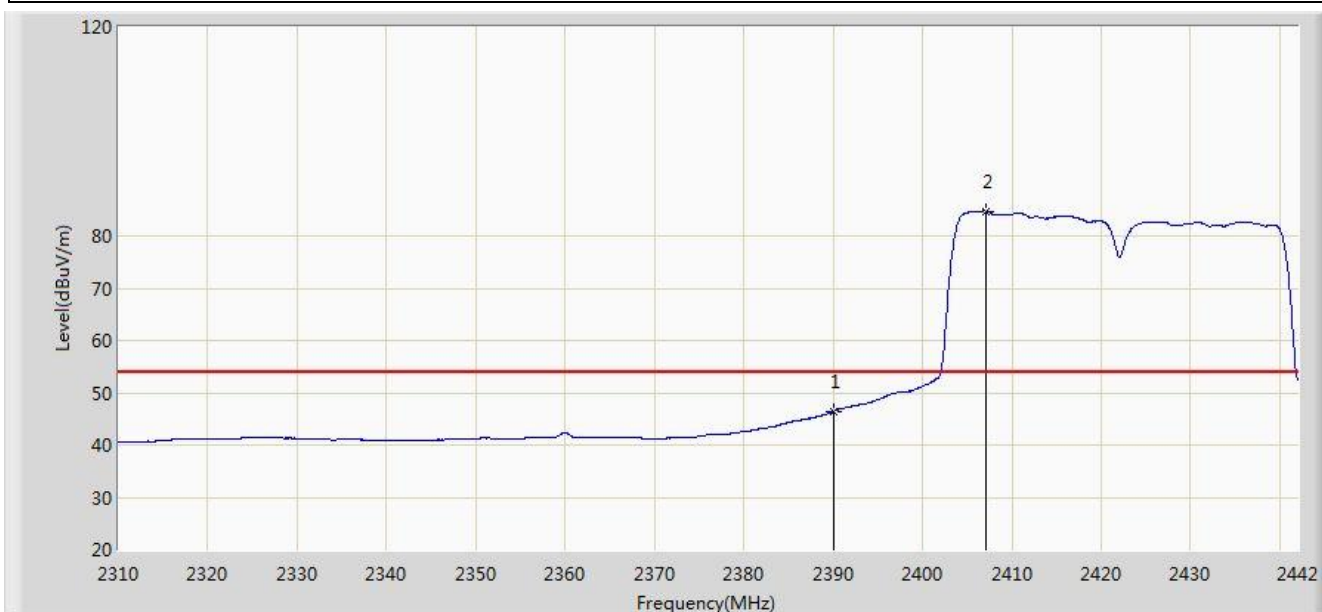


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	68.630	38.354	-5.370	74.000	30.276	PK
2		*	2406.624	101.524	71.290	N/A	N/A	30.234	PK

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 18:51
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2422MHz by 802.11n-HT40	

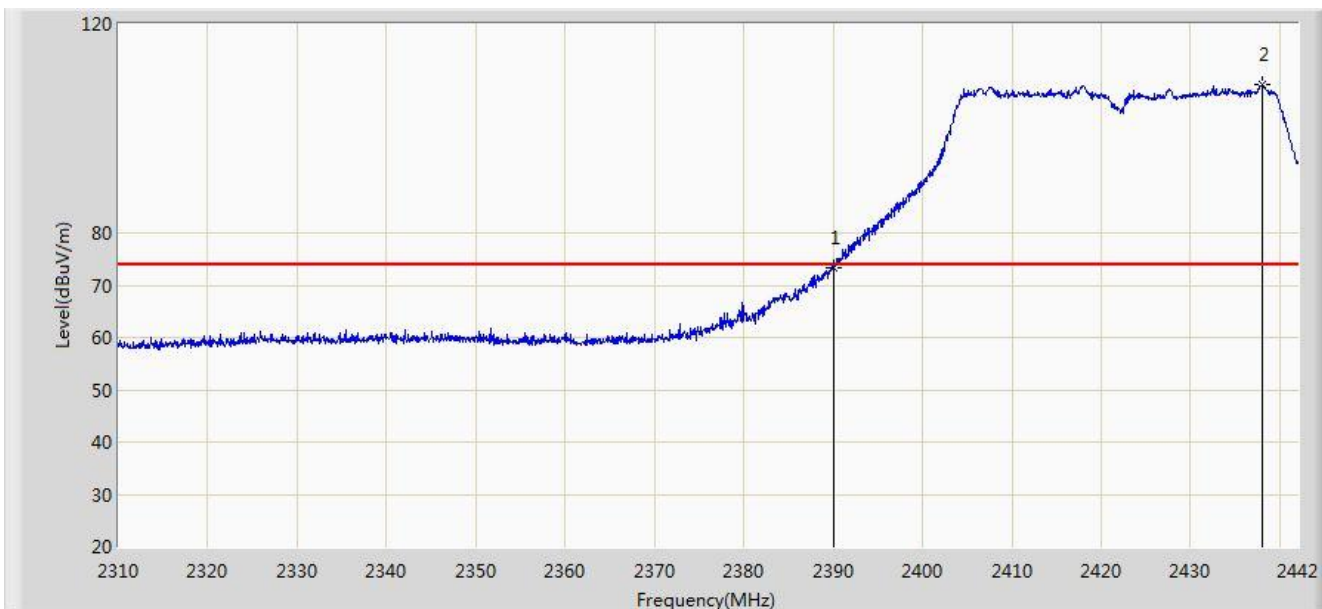


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	46.383	16.107	-7.617	54.000	30.276	AV
2		*	2407.020	84.782	54.549	N/A	N/A	30.233	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 18:03
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2422MHz by 802.11n-HT40	

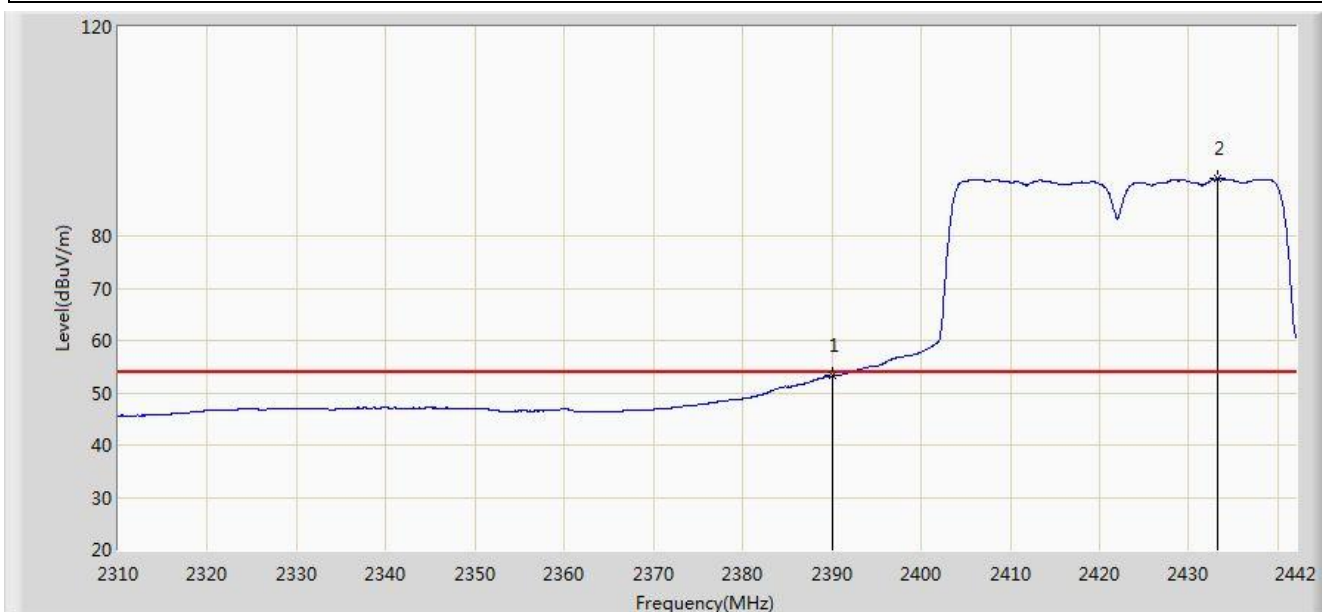


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	73.224	42.948	-0.776	74.000	30.276	PK
2		*	2438.040	108.287	78.128	N/A	N/A	30.159	PK

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 18:04
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2422MHz by 802.11n-HT40	

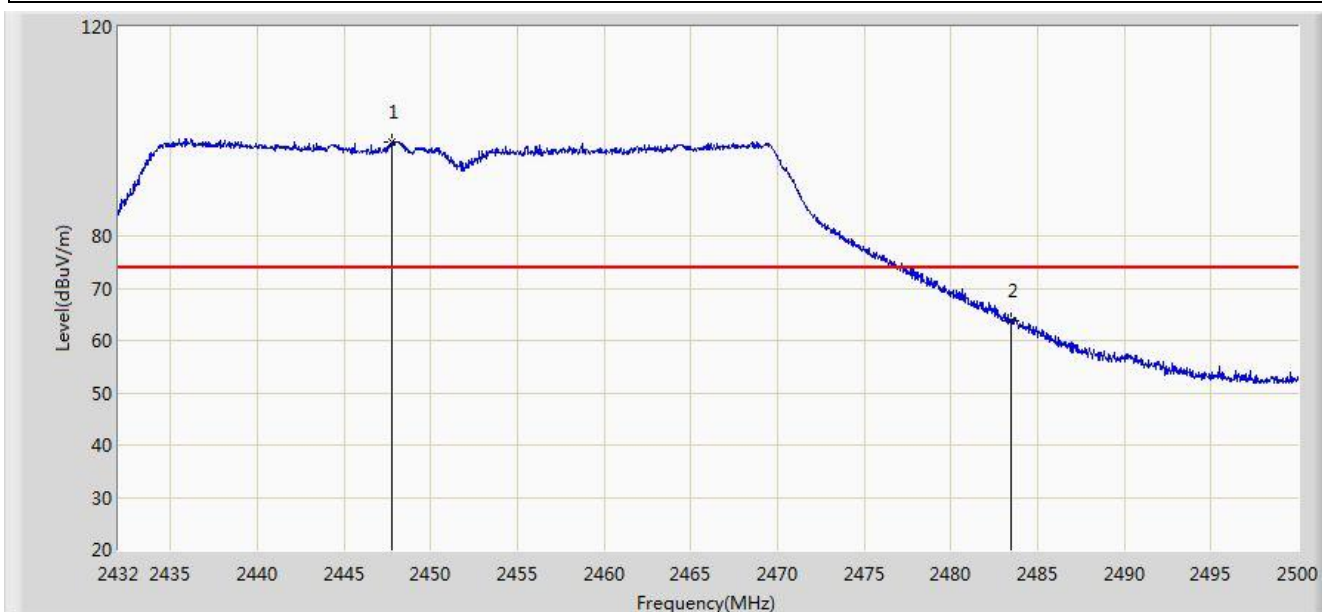


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	53.196	22.920	-0.804	54.000	30.276	AV
2		*	2433.288	90.967	60.797	N/A	N/A	30.170	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 19:18
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2452MHz by 802.11n-HT40	

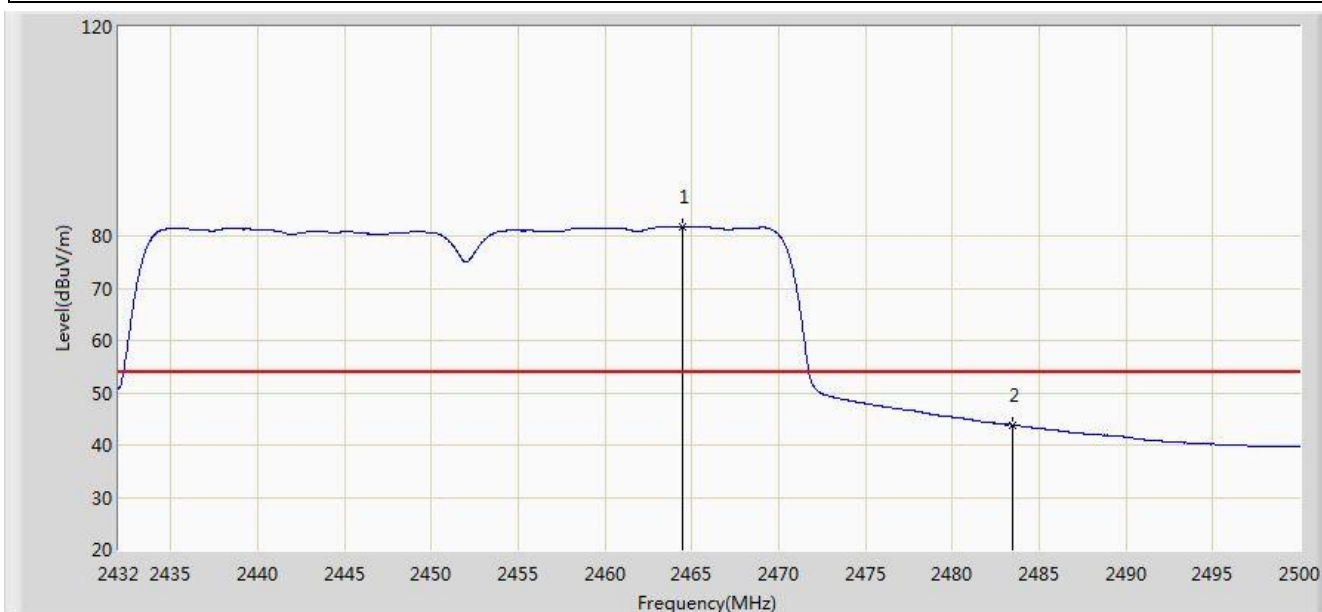


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2447.776	97.896	67.755	N/A	N/A	30.141	PK
2			2483.500	63.792	33.601	-10.208	74.000	30.191	PK

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 19:21
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2452MHz by 802.11n-HT40	

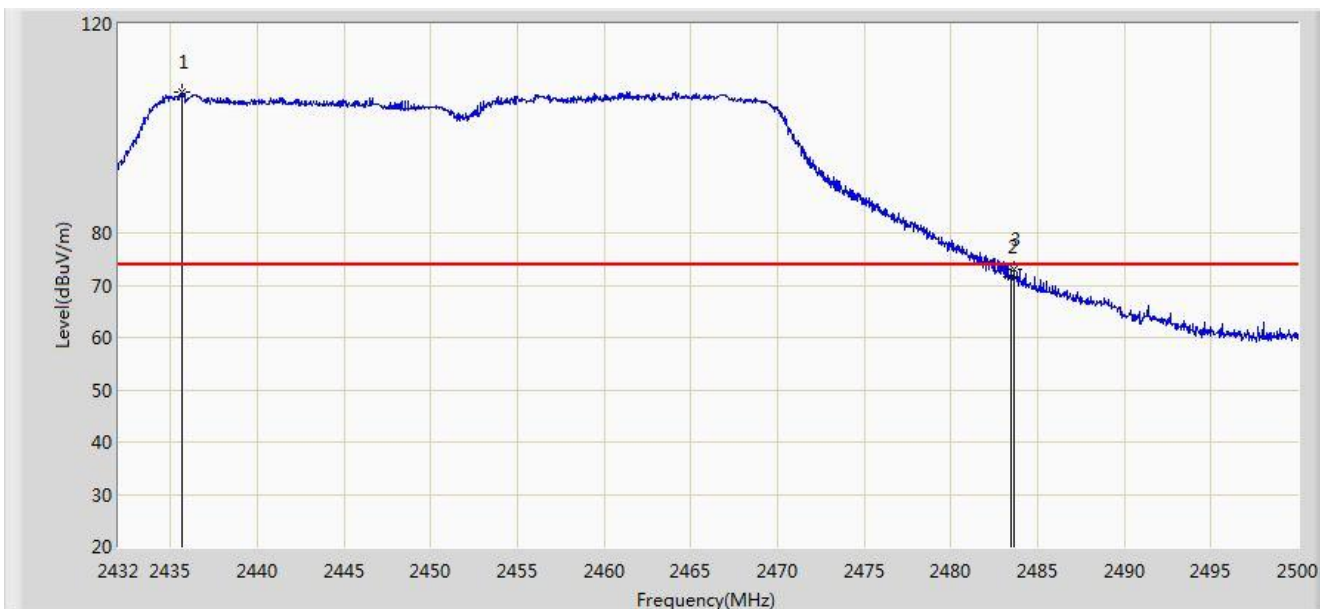


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2464.436	81.753	51.597	N/A	N/A	30.156	AV
2			2483.500	43.821	13.630	-10.179	54.000	30.191	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 19:12
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2452MHz by 802.11n-HT40	

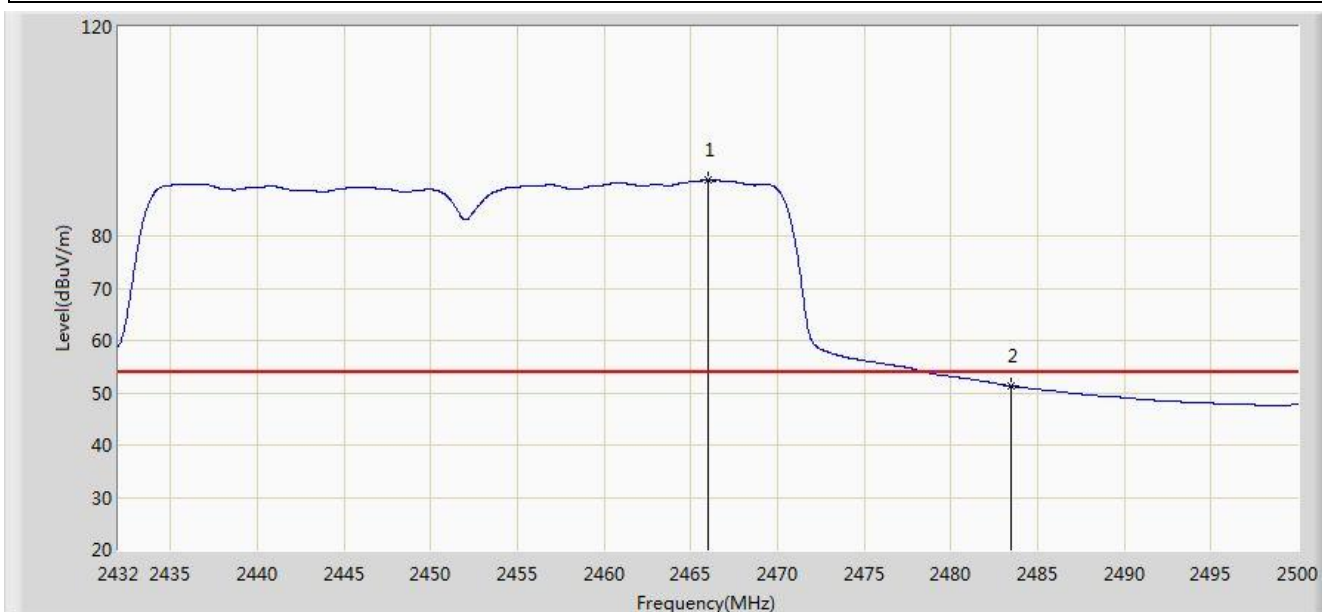


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2435.706	106.819	76.655	N/A	N/A	30.164	PK
2			2483.500	71.723	41.532	-2.277	74.000	30.191	PK
3			2483.646	73.150	42.959	-0.850	74.000	30.191	PK

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: AC1	Time: 2015/04/07 - 19:14
Limit: FCC_Part15.209_RE(3m)	Engineer: Line Chen
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Test Mode: Transmit at channel 2452MHz by 802.11n-HT40	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2466.000	90.623	60.464	N/A	N/A	30.159	AV
2			2483.500	51.246	21.055	-2.754	54.000	30.191	AV

Note: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

7.8. AC Conducted Emissions Measurement

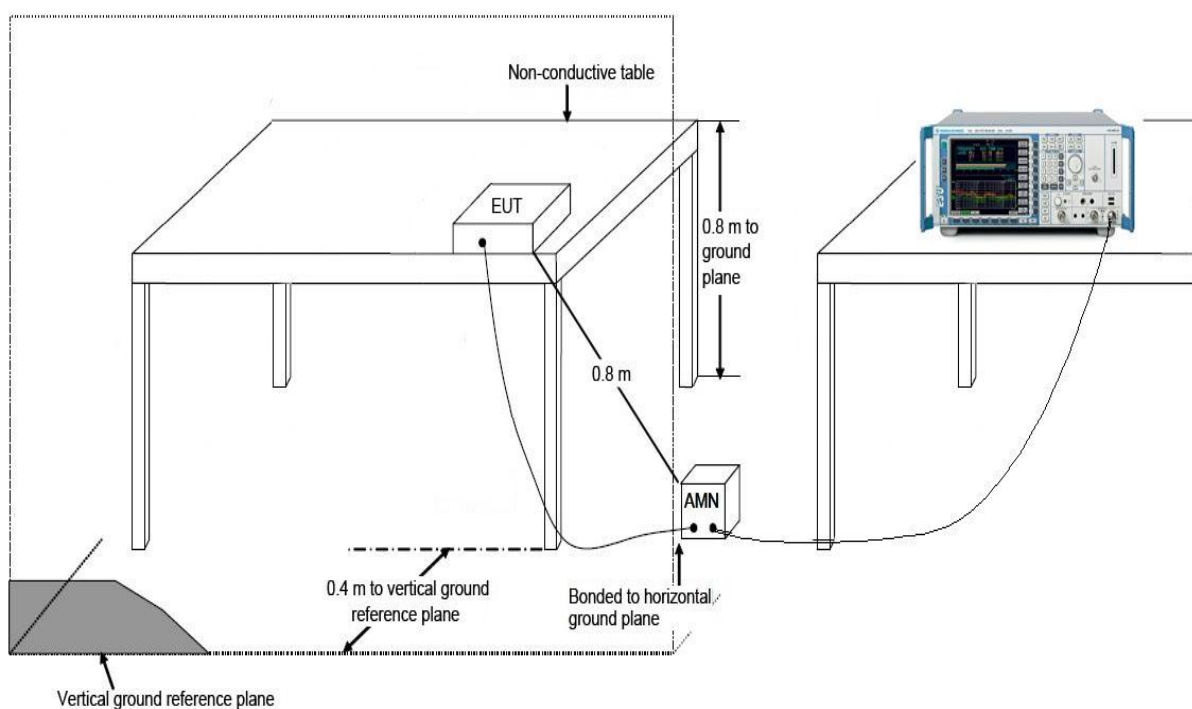
7.8.1. Test Limit

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

Note 1: The lower limit shall apply at the transition frequencies.

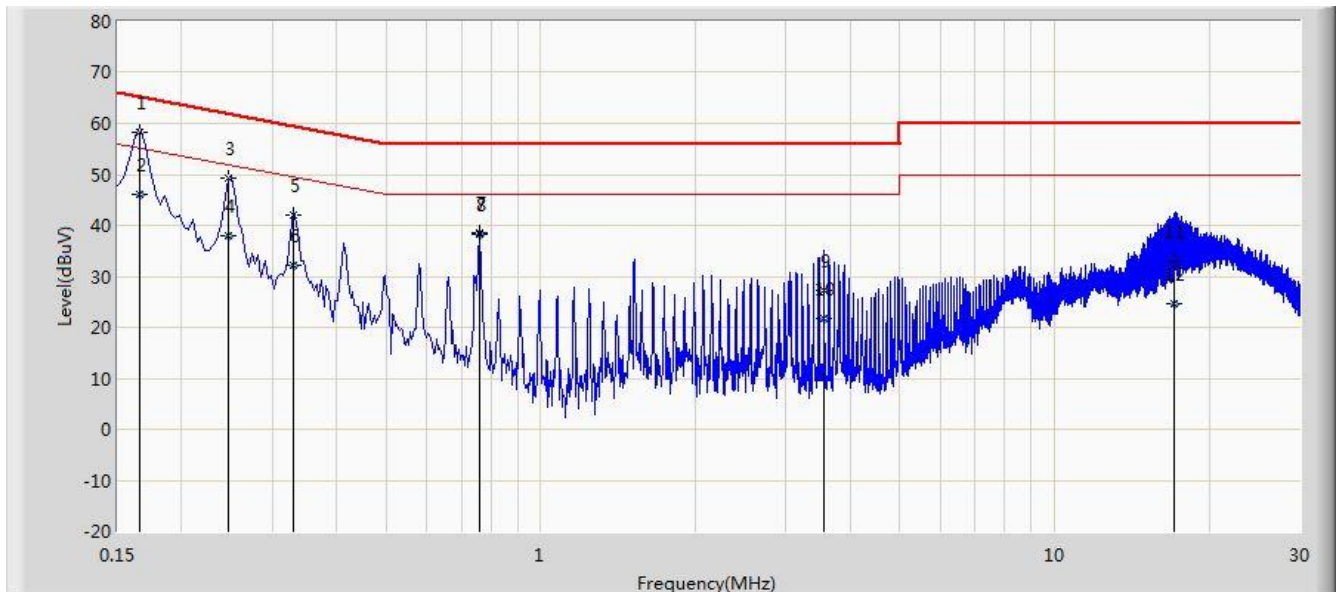
Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

7.8.2. Test Setup



7.8.3. Test Result

Site: SR2	Time: 2015/04/09 - 11:10
Limit: FCC_Part15.207_CE_AC Power	Engineer: Line Chen
Probe: ENV216_101683_Filter On	Polarity: Line
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Note: Mode 1	

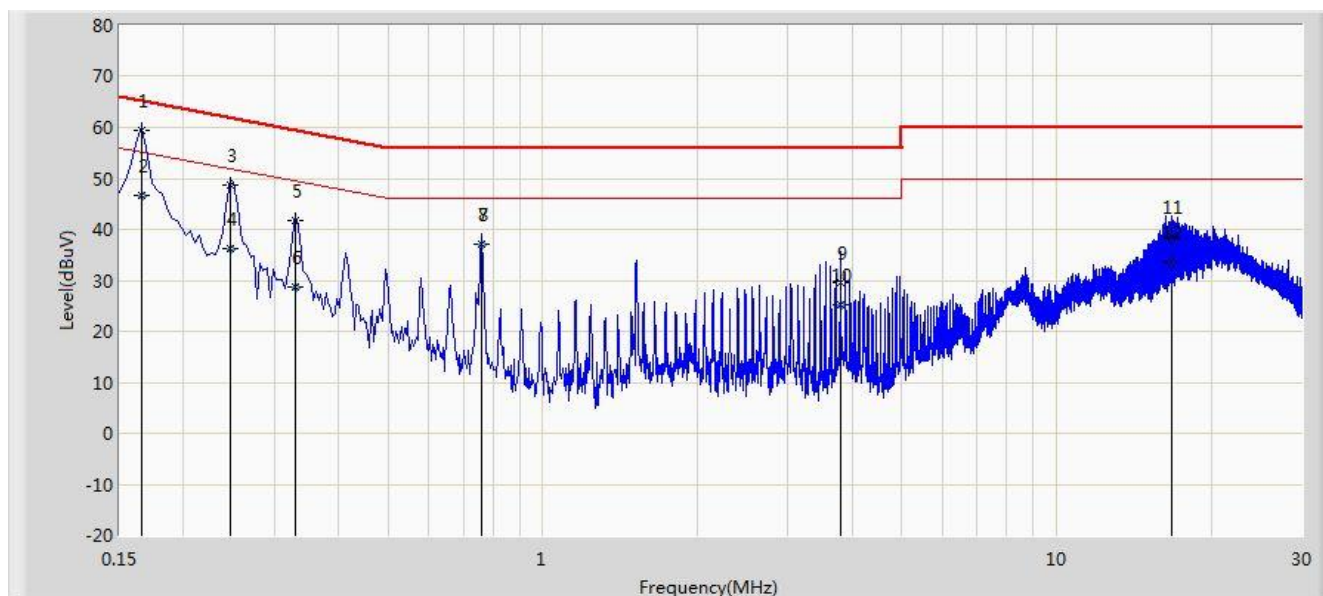


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		*	0.166	58.372	48.284	-6.787	65.158	10.087	QP
2			0.166	46.142	36.055	-9.016	55.158	10.087	AV
3			0.246	49.346	39.385	-12.545	61.891	9.961	QP
4			0.246	37.960	27.999	-13.931	51.891	9.961	AV
5			0.330	41.992	31.964	-17.459	59.451	10.028	QP
6			0.330	32.155	22.127	-17.296	49.451	10.028	AV
7			0.762	38.408	28.377	-17.592	56.000	10.031	QP
8			0.762	38.353	28.322	-7.647	46.000	10.031	AV
9			3.558	27.340	17.426	-28.660	56.000	9.913	QP
10			3.558	21.825	11.911	-24.175	46.000	9.913	AV
11			17.114	33.155	23.067	-26.845	60.000	10.088	QP
12			17.114	24.514	14.426	-25.486	50.000	10.088	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

Site: SR2	Time: 2015/04/09 - 11:15
Limit: FCC_Part15.207_CE_AC Power	Engineer: Line Chen
Probe: ENV216_101683_Filter On	Polarity: Neutral
EUT: HPE MSR954-W 1GbE+SFP LTE (AM) Rtr	Power: AC 120V/60Hz
Note: Mode 1	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1		*	0.166	59.308	49.236	-5.873	65.181	10.072	QP
2			0.166	46.749	36.677	-8.432	55.181	10.072	AV
3			0.246	48.837	38.839	-13.054	61.891	9.998	QP
4			0.246	36.316	26.318	-15.575	51.891	9.998	AV
5			0.330	41.800	31.741	-17.651	59.451	10.060	QP
6			0.330	28.600	18.540	-20.852	49.451	10.060	AV
7			0.758	37.178	27.135	-18.822	56.000	10.043	QP
8			0.758	37.080	27.037	-8.920	46.000	10.043	AV
9			3.802	29.619	19.654	-26.381	56.000	9.965	QP
10			3.802	25.143	15.178	-20.857	46.000	9.965	AV
11			16.754	38.587	28.474	-21.413	60.000	10.113	QP
12			16.754	33.607	23.494	-16.393	50.000	10.113	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

8. CONCLUSION

The data collected relate only the item(s) tested and show that the **HPE MSR954-W 1GbE+SFP LTE (AM) Rtr FCC ID: O9C-BJNGABB0038** is in compliance with Part 15C of the FCC Rules.

The End