



41039 Boyce Road
Fremont, CA. 94538

510-578-3500 Phone
510-440-9525 Fax

EMC Test Report

Application for FCC Grant of Equipment Authorization Canada Certification

Innovation, Science and Economic Development Canada RSS-Gen Issue 5 / RSS-247 Issue 2 FCC Part 15 Subpart C

Model: APIN0555

IC CERTIFICATION #: 4675A-APIN0555
FCC ID: Q9DAPIN0555

APPLICANT: Aruba, a Hewlett Packard Enterprise company
3333 Scott Blvd
Santa Clara, CA 95054

TEST SITE(S): National Technical Systems
41039 Boyce Road.
Fremont, CA. 94538-2435

IC SITE REGISTRATION #: 2845B-3, 2845B-4, 2845B-5 and 2845B-7

PROJECT NUMBER: PR075848

REPORT DATE: March 14, 2019

RE-ISSUED DATE: May 3, 2019

FINAL TEST DATES: October 18, 19, 22 and 26, November 13,
December 3 and 31, 2018 and January 18, 19,
20, 21 and 22, 2019

TOTAL NUMBER OF PAGES: 199



This report and the information contained herein represent the results of testing test articles identified and selected by the client performed to specifications and/or procedures selected by the client. National Technical Systems (NTS) makes no representations, expressed or implied, that such testing is adequate (or inadequate) to demonstrate efficiency, performance, reliability, or any other characteristic of the articles being tested, or similar products. This report should not be relied upon as an endorsement or certification by NTS of the equipment tested, nor does it represent any statement whatsoever as to its merchantability or fitness of the test article, or similar products, for a particular purpose. This report shall not be reproduced except in full



VALIDATING SIGNATORIES

PROGRAM MGR

David W. Bare
Chief Engineer

TECHNICAL REVIEWER:

David W. Bare
Chief Engineer

FINAL REPORT PREPARER:

David Guidotti
Senior Technical Writer

QUALITY ASSURANCE DELEGATE

Gary Izard
Quality Assurance Representative



REVISION HISTORY

Rev#	Date	Comments	Modified By
-	March 14, 2019	First release	
1	May 3, 2019	Revised peak antenna gain values listed on page 12	dwb

TABLE OF CONTENTS

VALIDATING SIGNATORIES	2
REVISION HISTORY	3
TABLE OF CONTENTS	4
SCOPE.....	5
OBJECTIVE	5
STATEMENT OF COMPLIANCE	6
DEVIATIONS FROM THE STANDARDS.....	6
TEST RESULTS SUMMARY	7
DIGITAL TRANSMISSION SYSTEMS (2400 – 2483.5MHZ) (BLE)	7
DIGITAL TRANSMISSION SYSTEMS (2400 – 2483.5MHZ) (ZIGBEE)	8
DIGITAL TRANSMISSION SYSTEMS (2400 – 2483.5 MHZ)	9
MEASUREMENT UNCERTAINTIES	11
EQUIPMENT UNDER TEST (EUT) DETAILS	12
GENERAL	12
OTHER EUT DETAILS	12
ENCLOSURE	12
MODIFICATIONS	12
SUPPORT EQUIPMENT	13
EUT INTERFACE PORTS	13
EUT OPERATION	13
TEST SITE.....	14
GENERAL INFORMATION	14
CONDUCTED EMISSIONS CONSIDERATIONS	14
RADIATED EMISSIONS CONSIDERATIONS	14
MEASUREMENT INSTRUMENTATION	15
RECEIVER SYSTEM	15
INSTRUMENT CONTROL COMPUTER	15
LINE IMPEDANCE STABILIZATION NETWORK (LISN)	15
FILTERS/ATTENUATORS	16
ANTENNAS	16
ANTENNA MAST AND EQUIPMENT TURNABLE	16
INSTRUMENT CALIBRATION	16
TEST PROCEDURES	17
EUT AND CABLE PLACEMENT	17
CONDUCTED EMISSIONS	17
RADIATED EMISSIONS	17
CONDUCTED EMISSIONS FROM ANTENNA PORT	21
BANDWIDTH MEASUREMENTS	21
SPECIFICATION LIMITS AND SAMPLE CALCULATIONS	22
CONDUCTED EMISSIONS SPECIFICATION LIMITS: FCC 15.207; FCC 15.107(A), RSS GEN	22
GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS	23
OUTPUT POWER LIMITS – DIGITAL TRANSMISSION SYSTEMS	23
TRANSMIT MODE SPURIOUS RADIATED EMISSIONS LIMITS – FHSS AND DTS SYSTEMS	23
SAMPLE CALCULATIONS - CONDUCTED EMISSIONS	24
SAMPLE CALCULATIONS - RADIATED EMISSIONS	24
SAMPLE CALCULATIONS - FIELD STRENGTH TO EIRP CONVERSION	25
APPENDIX A TEST EQUIPMENT CALIBRATION DATA	26
APPENDIX B TEST DATA	31
END OF REPORT	199

SCOPE

An electromagnetic emissions test has been performed on the Aruba, a Hewlett Packard Enterprise company model APIN0555, pursuant to the following rules:

RSS-Gen Issue 5 “General Requirements for Compliance of Radio Apparatus”

RSS 247 Issue 2 “Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSS) and Licence-Exempt Local Area Network (LE-LAN) Devices”

FCC Part 15 Subpart C

Conducted and radiated emissions data has been collected, reduced, and analyzed within this report in accordance with measurement guidelines set forth in the following reference standards and as outlined in National Technical Systems test procedures:

ANSI C63.10-2013

FCC DTS Measurement Guidance KDB558074

The intentional radiator above has been tested in a simulated typical installation to demonstrate compliance with the relevant Industry Canada performance and procedural standards.

Final system data was gathered in a mode that tended to maximize emissions by varying orientation of EUT, orientation of power and I/O cabling, antenna search height, and antenna polarization.

Every practical effort was made to perform an impartial test using appropriate test equipment of known calibration. All pertinent factors have been applied to reach the determination of compliance.

National Technical Systems is accredited by the A2LA, certificate number 0214.26, to perform the test(s) listed in this report, except where noted otherwise.

OBJECTIVE

The primary objective of the manufacturer is compliance with the regulations outlined in the previous section.

Prior to marketing in the USA, all unlicensed transmitters and transceivers require certification. Receive-only devices operating between 30 MHz and 960 MHz are subject to either certification or a manufacturer’s declaration of conformity, with all other receive-only devices exempt from the technical requirements.

Prior to marketing in Canada, Class I transmitters, receivers and transceivers require certification. Class II devices are required to meet the appropriate technical requirements but are exempt from certification requirements.

Certification is a procedure where the manufacturer submits test data and technical information to a certification body and receives a certificate or grant of equipment authorization upon successful completion of the certification body's review of the submitted documents. Once the equipment authorization has been obtained, the label indicating compliance must be attached to all identical units, which are subsequently manufactured.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

STATEMENT OF COMPLIANCE

The tested samples of Aruba, a Hewlett Packard Enterprise company model APIN0555 complied with the requirements of the following regulations:

RSS-Gen Issue 5 "General Requirements for Compliance of Radio Apparatus"

RSS 247 Issue 2 "Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSS) and Licence-Exempt Local Area Network (LE-LAN) Devices"

FCC Part 15 Subpart C

Maintenance of compliance is the responsibility of the manufacturer. Any modifications to the product should be assessed to determine their potential impact on the compliance status of the device with respect to the standards detailed in this test report.

The test results recorded herein are based on a single type test of Aruba, a Hewlett Packard Enterprise company model APIN0555 and therefore apply only to the tested samples. The samples were selected and prepared by Mark Hill of Aruba, a Hewlett Packard Enterprise company.

DEVIATIONS FROM THE STANDARDS

No deviations were made from the published requirements listed in the scope of this report.

TEST RESULTS SUMMARY

DIGITAL TRANSMISSION SYSTEMS (2400 – 2483.5MHz) (BLE)

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.247(a)	RSS 247 5.2	Digital Modulation	Systems uses GFSK modulation	System must utilize a digital transmission technology	Complies
15.247 (a) (2)	RSS 247 5.2 (1)	6dB Bandwidth	713 kHz	>500kHz	Complies
15.247 (b) (3)	RSS 247 5.4 (4)	Output Power (multipoint systems)	6.9 dBm (0.0049 Watts) EIRP = 0.0114 W Note 1	1Watt, EIRP limited to 4 Watts.	Complies
15.247(e)	RSS 247 5.2 (2)	Power Spectral Density	-3.3 dBm/10kHz	8dBm/3kHz	Complies
15.247(d)	RSS 247 5.5	Antenna Port Spurious Emissions 30MHz – 25 GHz	<20 dBc	< -20dBc	Complies
15.247(d) / 15.209	RSS 247 5.5	Radiated Spurious Emissions 30MHz – 25 GHz	53.9 dBuV/m @ 2487.4 MHz (-0.1dB)	Refer to the limits section (p23) for restricted bands, all others < -20dBc	Complies
Note 1: EIRP calculated using antenna gains of 4.5 dBi for the highest EIRP system.					

DIGITAL TRANSMISSION SYSTEMS (2400 – 2483.5MHz) (Zigbee)

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.247(a)	RSS 247 5.2	Digital Modulation	Systems uses O-QPSK modulation	System must utilize a digital transmission technology	Complies
15.247 (a) (2)	RSS 247 5.2 (1)	Minimum 6dB Bandwidth	1.18 MHz	>500kHz	Complies
15.247 (b) (3)	RSS 247 5.4 (4)	Output Power (multipoint systems)	7.6 dBm (0.0058 Watts) EIRP = 0.0121 W Note 1	1Watt, EIRP limited to 4 Watts.	Complies
15.247(e)	RSS 247 5.2 (2)	Power Spectral Density	-2.0 dBm/10kHz	8dBm/3kHz	Complies
15.247(d)	RSS 247 5.5	Antenna Port Spurious Emissions 30MHz – 25 GHz	< 20 dBc	< -20dBc	Complies
15.247(d) / 15.209	RSS 247 5.5	Radiated Spurious Emissions 30MHz – 25 GHz	51.2 dBuV/m @ 2388.0 MHz (-2.8dB)	Refer to the limits section (p23) for restricted bands, all others < -20dBc	Complies
Note 1: EIRP calculated using antenna gains of 4.5 dBi for the highest EIRP system.					

DIGITAL TRANSMISSION SYSTEMS (2400 – 2483.5 MHz)

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.247(a)	RSS 247 5.2	Digital Modulation	Systems uses OFDM / DSSS techniques	System must utilize a digital transmission technology	Complies
15.247 (a) (2)	RSS 247 5.2 (1)	Minimum 6dB Bandwidth	11b: 7.7 MHz 11g: 16.5 MHz 11n20: 16.6 MHz 11ax20: 18.7 MHz 11n40: 35.3 MHz 11ax40: 36.9 MHz	>500kHz	Complies
15.247 (b) (3)	RSS 247 5.4 (4)	Output Power (multipoint systems)	11b: 26.6 dBm 11g: 24.7 dBm 11ax20: 26.3 dBm 11ax40: 23.9 dBm (0.457 Watts) EIRP = 1.121 W ^{Note 1}	1Watt, EIRP limited to 4 Watts.	Complies
15.247(e)	RSS 247 5.2 (2)	Power Spectral Density	11b: 1.9 dBm/3kHz 11g: 3.9 dBm/10kHz n20: 6.8 dBm/10kHz ax20: 5.5 dBm/10kHz n40: 1.0 dBm/10kHz ax40: -1.0 dBm/10kHz	Maximum permitted is 8dBm/3kHz	Complies
15.247(d)	RSS 247 5.5	Antenna Port Spurious Emissions –30MHz – 40 GHz	All spurious emissions < -30dBc	< -30dBc ^{Note 2}	Complies
15.247(d) / 15.209	RSS 247 5.5	Radiated Spurious Emissions 30MHz – 40 GHz	53.9 dBuV/m @ 2487.4 MHz (-0.1dB)	Refer to the limits section (p23) for restricted bands, all others <-30dBc ^{Note 2}	Complies
Note 1: EIRP calculated using antenna gain of 3.9 dBi for the highest EIRP system. Note 2: Limit of -30dBc used because the power was measured using the UNII test procedure (maximum power averaged over a transmission burst).					

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	Integral antenna	Unique or integral antenna required	Complies
15.407 (b) (6)	RSS-Gen Table 4	AC Conducted Emissions (AC Power)	38.5 dBμV @ 0.46 MHz (-8.3 dB)	Refer to page 22	Complies
		AC Conducted Emissions (POE)	34.6 dBμV @ 0.45 MHz (-12.2 dB)		
15.247 (i) 15.407 (f)	RSS 102	RF Exposure Requirements	Refer to MPE calculations in separate exhibit, RSS 102 declaration and User Manual statements.	Refer to OET 65, FCC Part 1 and RSS 102	Complies
-	RSS-Gen 6.8	User Manual	Integral antenna	Statement for products with detachable antenna	N/As
-	RSS-Gen 8.4	User Manual	Refer to User Manual	Statement for all products	Complies
-	RSP-100 RSS-Gen 6.7	Occupied Bandwidth	BLE	1.055 MHz	Information only
			Zigbee	2.24 MHz	
			Wi-Fi	11b: 13.2 MHz 11g: 17.1 MHz 11n20: 18.0 MHz 11ax20: 19.2 MHz 11n40: 36.2 MHz 11ax40: 37.8 MHz	

MEASUREMENT UNCERTAINTIES

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level and were calculated in accordance with UKAS document LAB 34.

Measurement Type	Measurement Unit	Frequency Range	Expanded Uncertainty
RF power, conducted (power meter)	dBm	25 to 7000 MHz	± 0.52 dB
RF power, conducted (Spectrum analyzer)	dBm	25 to 7000 MHz	± 0.7 dB
Conducted emission of transmitter	dBm	25 to 26500 MHz	± 0.7 dB
Conducted emission of receiver	dBm	25 to 26500 MHz	± 0.7 dB
Radiated emission (substitution method)	dBm	25 to 26500 MHz	± 2.5 dB
Radiated emission (field strength)	dB μ V/m	25 to 1000 MHz	± 3.6 dB
		1000 to 40000 MHz	± 6.0 dB
Conducted Emissions (AC Power)	dB μ V	0.15 to 30 MHz	± 2.4 dB

EQUIPMENT UNDER TEST (EUT) DETAILS**GENERAL**

The Aruba, a Hewlett Packard Enterprise company model APIN0555 is an enterprise grade Wi-Fi Access Point with two radios (one for 5 GHz bands and a second for 2.4 GHz bands). In addition, it incorporates a Bluetooth Low Energy (BLE) and ZigBee radio. Since the EUT could be placed in any position during operation, the EUT was treated as tabletop equipment during testing to simulate the end-user environment. The electrical rating of the EUT is 56VDC, 0.6A.

The samples were received on October 12, 2018 and tested on October 18, 19, 22 and 26, November 13, December 3 and 31, 2018 and January 18, 19, 20, 21 and 22, 2019. The following samples were used for testing:

Company	Model	Description	Serial Number	FCC ID
Aruba	APIN0555	Wi-Fi Access Point	CNGFK9Y02N	Q9DAPIN0555
Aruba	APIN0555	Wi-Fi Access Point	CNGFK9Y005	Q9DAPIN0555
Aruba	APIN0555	Wi-Fi Access Point	CNGXK9Y07P	Q9DAPIN0555

OTHER EUT DETAILS

The following EUT details should be noted:

Maximum antenna gains for internal antennas (details in test results):

2.4GHz: 4.3dBi max

5GHz: 5.8dBi max

BLE/ZigBee: 4.5dBi

The Aruba APIN0555 802.11ax mode does not support partial RU configurations.

ENCLOSURE

The EUT enclosure is primarily constructed of plastic. It measures approximately 26 cm wide by 26 cm deep by 5.5 cm high.

MODIFICATIONS

No modifications were made to the EUT during the time the product was at NTS Silicon Valley.

SUPPORT EQUIPMENT

The following equipment was used as support equipment for testing:

Company	Model	Description	Serial Number	FCC ID
		AC Adapter		

The following equipment was used as remote support equipment for emissions testing:

Company	Model	Description	Serial Number	FCC ID
Dell	LatitudeE5440	Laptop	TS-0000342	-
Microsemi	PD-9001GR/AT/AC	POE adapter	None	-

EUT INTERFACE PORTS

The I/O cabling configuration during testing was as follows:

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
AC Adapter	Mains	Two wire	Unshielded	1.3
POE adapter	Laptop	Cat 6	Unshielded	4
POE adapter	Mains	Three wire	Unshielded	1.3

EUT OPERATION

During emissions testing the EUT was set to transmit continuously in the 2.4 GHz and 5 GHz bands on the selected channel at the stated power level. Both Wi-Fi and BLE or ZigBee were transmitting.

TEST SITE**GENERAL INFORMATION**

Final test measurements were taken at the test sites listed below. Pursuant to section 2.948 of the FCC's Rules and section 3.3 of RSP-100, construction, calibration, and equipment data has been filed with the Commission and with industry Canada.

Site	Designation / Registration FCC	Numbers Canada	Location
Chamber 3	US0027	2845B-3	41039 Boyce Road Fremont, CA 94538-2435
Chamber 4		2845B-4	
Chamber 5		2845B-5	
Chamber 7		2845B-7	

ANSI C63.4 recommends that ambient noise at the test site be at least 6 dB below the allowable limits. Ambient levels are below this requirement. The test site(s) contain separate areas for radiated and conducted emissions testing. Results from testing performed in this chamber have been correlated with results from an open area test site. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent requirements of ANSI C63.4.

CONDUCTED EMISSIONS CONSIDERATIONS

Conducted emissions testing is performed in conformance with ANSI C63.10. Measurements are made with the EUT connected to the public power network through a nominal, standardized RF impedance, which is provided by a line impedance stabilization network, known as a LISN. A LISN is inserted in series with each current-carrying conductor in the EUT power cord.

RADIATED EMISSIONS CONSIDERATIONS

The FCC has determined that radiation measurements made in a shielded enclosure are not suitable for determining levels of radiated emissions. Radiated measurements are performed in an open field environment or in a semi-anechoic chamber. The test sites are maintained free of conductive objects within the CISPR defined elliptical area incorporated in ANSI C63.4 guidelines and meet the Normalized Site Attenuation (NSA) requirements of ANSI C63.4.

MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

An EMI receiver as specified in CISPR 16-1-1 is used for emissions measurements. The receivers used can measure over the frequency range of 9 kHz up to 2000 MHz. These receivers allow both ease of measurement and high accuracy to be achieved. The receivers have Peak, Average, and CISPR (Quasi-peak) detectors built into their design so no external adapters are necessary. The receiver automatically sets the required bandwidth for the CISPR detector used during measurements. If the repetition frequency of the signal being measured is below 20Hz, peak measurements are made in lieu of Quasi-Peak measurements.

For measurements above the frequency range of the receivers, a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis. Average measurements above 1000MHz are performed on the spectrum analyzer using the linear-average method with a resolution bandwidth of 1 MHz and a video bandwidth of 10 Hz, unless the signal is pulsed in which case the average (or video) bandwidth of the measuring instrument is reduced to onset of pulse desensitization and then increased.

INSTRUMENT CONTROL COMPUTER

Software is used to view and convert receiver measurements to the field strength at an antenna or voltage developed at the LISN measurement port, which is then compared directly with the appropriate specification limit. This provides faster, more accurate readings by performing the conversions described under Sample Calculations within the Test Procedures section of this report. Results are printed in a graphic and/or tabular format, as appropriate. A personal computer is used to record all measurements made with the receivers. The software used for radiated and conducted emissions measurements is NTS EMI Test Software (rev 2.10)

LINE IMPEDANCE STABILIZATION NETWORK (LISN)

Line conducted measurements utilize a fifty microhenry Line Impedance Stabilization Network as the monitoring point. The LISN used also contains a 250 uH CISPR adapter. This network provides for calibrated radio frequency noise measurements by the design of the internal low pass and high pass filters on the EUT and measurement ports, respectively.

FILTERS/ATTENUATORS

External filters and precision attenuators are often connected between the receiving antenna or LISN and the receiver. This eliminates saturation effects and non-linear operation due to high amplitude transient events.

ANTENNAS

A loop antenna is used below 30 MHz. For the measurement range 30 MHz to 1000 MHz either a combination of a biconical antenna and a log periodic or a bi-log antenna is used. Above 1000 MHz, horn antennas are used. The antenna calibration factors to convert the received voltage to an electric field strength are included with appropriate cable loss and amplifier gain factors to determine an overall site factor, which is then programmed into the test receivers or incorporated into the test software.

ANTENNA MAST AND EQUIPMENT TURNTABLE

The antennas used to measure the radiated electric field strength are mounted on a non-conductive antenna mast equipped with a motor-drive to vary the antenna height. Measurements below 30 MHz are made with the loop antenna at a fixed height of 1m above the ground plane.

ANSI C63.10 specifies that the test height above ground for table mounted devices shall be 80 centimeters for testing below 1 GHz and 1.5m for testing above 1 GHz. Floor mounted equipment shall be placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material from 3 to 12 mm if the device is normally used on a non-conductive floor as specified in ANSI C63.4. During radiated measurements, the EUT is positioned on a motorized turntable in conformance with this requirement.

INSTRUMENT CALIBRATION

All test equipment is regularly checked to ensure that performance is maintained in accordance with the manufacturer's specifications. All antennas are calibrated at regular intervals with respect to tuned half-wave dipoles. An exhibit of this report contains the list of test equipment used and calibration information.

TEST PROCEDURES

EUT AND CABLE PLACEMENT

The regulations require that interconnecting cables be connected to the available ports of the unit and that the placement of the unit and the attached cables simulate the worst case orientation that can be expected from a typical installation, so far as practicable. To this end, the position of the unit and associated cabling is varied within the guidelines of ANSI C63.10, and the worst-case orientation is used for final measurements.

CONDUCTED EMISSIONS

Conducted emissions are measured at the plug end of the power cord supplied with the EUT. Excess power cord length is wrapped in a bundle between 30 and 40 centimeters in length near the center of the cord. Preliminary measurements are made to determine the highest amplitude emission relative to the specification limit for all the modes of operation. Placement of system components and varying of cable positions are performed in each mode. A final peak mode scan is then performed in the position and mode for which the highest emission was noted on all current carrying conductors of the power cord.

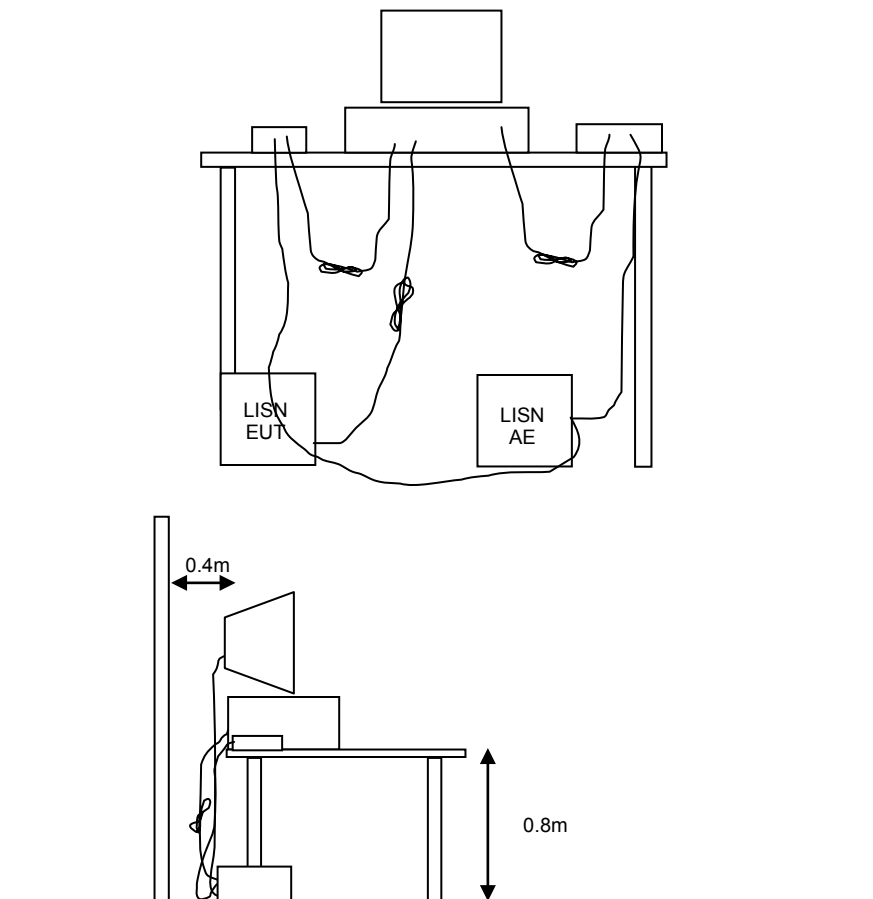


Figure 1 Typical Conducted Emissions Test Configuration

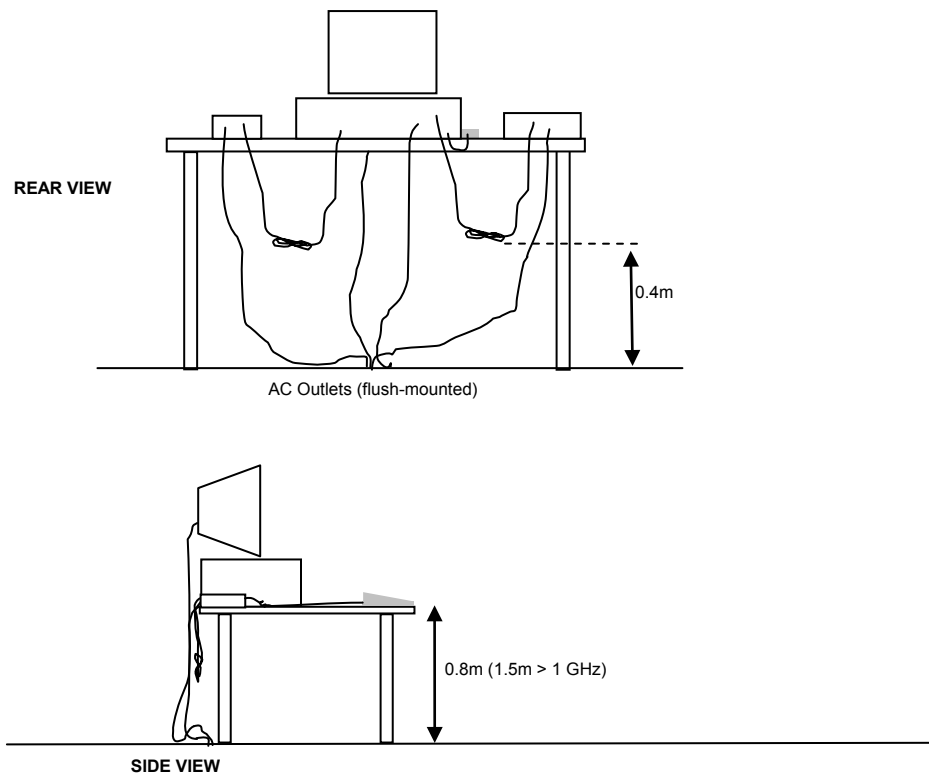
RADIATED EMISSIONS

A preliminary scan of the radiated emissions is performed in which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed, one scan for each antenna polarization (horizontal and vertical; loop parallel and perpendicular to the EUT). During the preliminary scans, the EUT is rotated through 360°, the antenna height is varied (for measurements above 30 MHz) and cable positions are varied to determine the highest emission relative to the limit. Preliminary scans may be performed in a fully anechoic chamber for the purposes of identifying the frequencies of the highest emissions from the EUT.

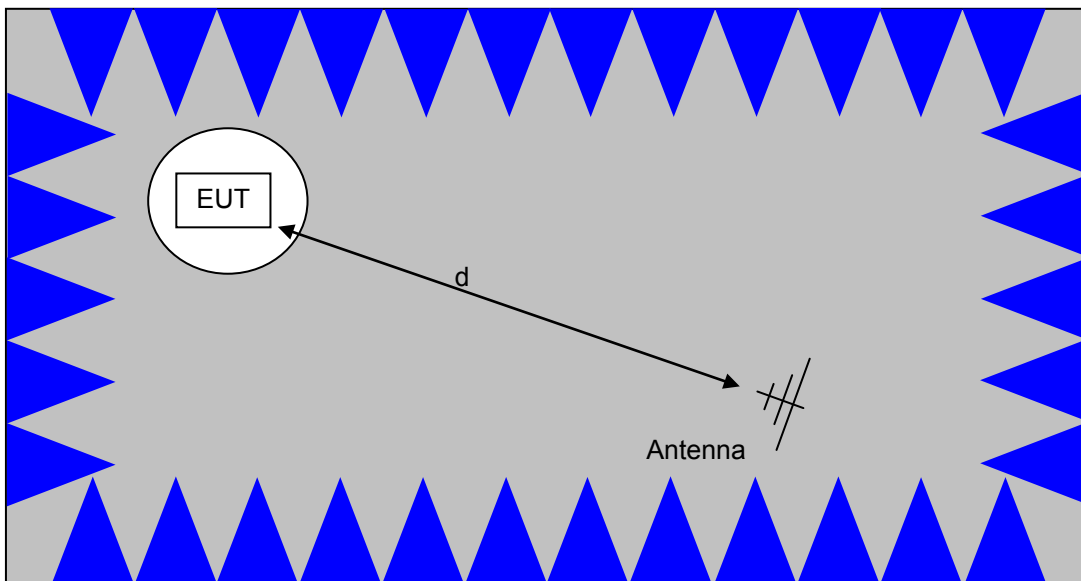
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

Final maximization is a phase in which the highest amplitude emissions identified in the spectral search are viewed while the EUT azimuth angle is varied from 0 to 360 degrees relative to the receiving antenna. The azimuth, which results in the highest emission is then maintained while varying the antenna height from one to four meters (for measurements above 30 MHz, measurements below 30 MHz are made with the loop antenna at a fixed height of 1m). The result is the identification of the highest amplitude for each of the highest peaks. Each recorded level is corrected in the receiver using appropriate factors for cables, connectors, antennas, and preamplifier gain.

When testing above 18 GHz, the receive antenna is located at 1 meter from the EUT and the antenna height is restricted to a maximum of 2.5 meters.

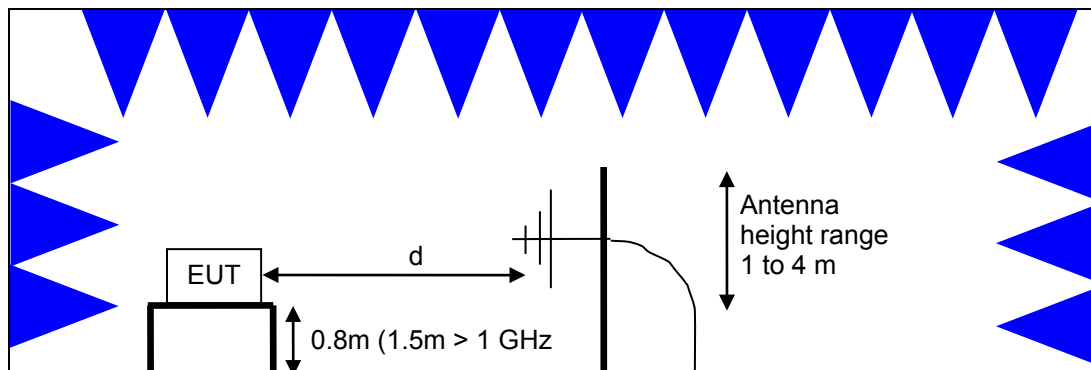


Typical Test Configuration for Radiated Field Strength Measurements



The anechoic materials on the walls and ceiling ensure compliance with the normalized site attenuation requirements of CISPR 16 / CISPR 22 / ANSI C63.4 for an alternate test site at the measurement distances used.

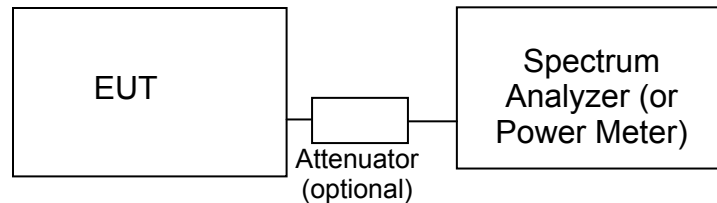
Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.



Test Configuration for Radiated Field Strength Measurements
Semi-Anechoic Chamber, Plan and Side Views

CONDUCTED EMISSIONS FROM ANTENNA PORT

Direct measurements of power, bandwidth and power spectral density are performed, where possible, with the antenna port of the EUT connected to either the power meter or spectrum analyzer via a suitable attenuator and/or filter. These are used to ensure that the front end of the measurement instrument is not overloaded by the fundamental transmission.

Test Configuration for Antenna Port Measurements

Measurement bandwidths (video and resolution) are set in accordance with the relevant standards and NTS Silicon Valley's test procedures for the type of radio being tested. When power measurements are made using a resolution bandwidth less than the signal bandwidth the power is calculated by summing the power across the signal bandwidth using either the analyzer channel power function or by capturing the trace data and calculating the power using software. In both cases the summed power is corrected to account for the equivalent noise bandwidth (ENBW) of the resolution bandwidth used.

If power averaging is used (typically for certain digital modulation techniques), the EUT is configured to transmit continuously. Power averaging is performed using either the built-in function of the analyzer or, if the analyzer does not feature power averaging, using external software. In both cases the average power is calculated over a number of sweeps (typically 100). When the EUT cannot be configured to continuously transmit then either the analyzer is configured to perform a gated sweep to ensure that the power is averaged over periods that the device is transmitting or power averaging is disabled and a max-hold feature is used.

If a power meter is used to make output power measurements the sensor head type (peak or average) is stated in the test data table.

BANDWIDTH MEASUREMENTS

The 6dB, 20dB, 26dB and/or 99% signal bandwidth are measured using the bandwidths recommended by ANSI C63.10 and RSS GEN.

SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

The limits for conducted emissions are given in units of microvolts, and the limits for radiated emissions are given in units of microvolts per meter at a specified test distance. Data is measured in the logarithmic form of decibels relative to one microvolt, or dB microvolts (dBuV). For radiated emissions, the measured data is converted to the field strength at the antenna in dB microvolts per meter (dBuV/m). The results are then converted to the linear forms of uV and uV/m for comparison to published specifications.

For reference, converting the specification limits from linear to decibel form is accomplished by taking the base ten logarithm, then multiplying by 20. These limits in both linear and logarithmic form are as follows:

CONDUCTED EMISSIONS SPECIFICATION LIMITS: FCC 15.207; FCC 15.107(a), RSS GEN

The table below shows the limits for the emissions on the AC power line from an intentional radiator and a receiver.

Frequency (MHz)	Average Limit (dBuV)	Quasi Peak Limit (dBuV)
0.150 to 0.500	Linear decrease on logarithmic frequency axis between 56.0 and 46.0	Linear decrease on logarithmic frequency axis between 66.0 and 56.0
0.500 to 5.000	46.0	56.0
5.000 to 30.000	50.0	60.0

GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from transmitters that fall in restricted bands¹.

Frequency Range (MHz)	Limit (uV/m)	Limit (dBuV/m @ 3m)
0.009-0.490	2400/F _{KHz} @ 300m	67.6-20*log ₁₀ (F _{KHz}) @ 300m
0.490-1.705	24000/F _{KHz} @ 30m	87.6-20*log ₁₀ (F _{KHz}) @ 30m
1.705 to 30	30 @ 30m	29.5 @ 30m
30 to 88	100 @ 3m	40 @ 3m
88 to 216	150 @ 3m	43.5 @ 3m
216 to 960	200 @ 3m	46.0 @ 3m
Above 960	500 @ 3m	54.0 @ 3m

OUTPUT POWER LIMITS – DIGITAL TRANSMISSION SYSTEMS

The table below shows the limits for output power and output power density. Where the signal bandwidth is less than 20 MHz the maximum output power is reduced to the power spectral density limit plus 10 times the log of the bandwidth (in MHz).

Operating Frequency (MHz)	Output Power	Power Spectral Density
902 – 928	1 Watt (30 dBm)	8 dBm/3kHz
2400 – 2483.5	1 Watt (30 dBm)	8 dBm/3kHz
5725 – 5850	1 Watt (30 dBm)	8 dBm/3kHz

The maximum permitted output power is reduced by 1dB for every dB the antenna gain exceeds 6dBi. Fixed point-to-point applications using the 5725 – 5850 MHz band are not subject to this restriction.

TRANSMIT MODE SPURIOUS RADIATED EMISSIONS LIMITS – FHSS and DTS SYSTEMS

The limits for unwanted (spurious) emissions from the transmitter falling in the restricted bands are those specified in the general limits sections of FCC Part 15 and RSS 210. All other unwanted (spurious) emissions shall be at least 20dB below the level of the highest in-band signal level (30dB if the power is measured using the sample detector/power averaging method).

¹ The restricted bands are detailed in FCC 15.205 and RSS-Gen Table 7

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

Receiver readings are compared directly to the conducted emissions specification limit (decibel form) as follows:

$$R_r - S = M$$

where:

R_r = Receiver Reading in dBuV

S = Specification Limit in dBuV

M = Margin to Specification in +/- dB

SAMPLE CALCULATIONS - RADIATED EMISSIONS

Receiver readings are compared directly to the specification limit (decibel form). The receiver internally corrects for cable loss, preamplifier gain, and antenna factor. The calculations are in the reverse direction of the actual signal flow, thus cable loss is added and the amplifier gain is subtracted. The Antenna Factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

A distance factor, when used for electric field measurements above 30MHz, is calculated by using the following formula:

$$F_d = 20 * \log_{10} (D_m/D_s)$$

where:

F_d = Distance Factor in dB

D_m = Measurement Distance in meters

D_s = Specification Distance in meters

For electric field measurements below 30MHz the extrapolation factor is either determined by making measurements at multiple distances or a theoretical value is calculated using the formula:

$$F_d = 40 * \log_{10} (D_m/D_s)$$

Measurement Distance is the distance at which the measurements were taken and Specification Distance is the distance at which the specification limits are based. The antenna factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

The margin of a given emission peak relative to the limit is calculated as follows:

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:

R_r = Receiver Reading in dBuV/m

F_d = Distance Factor in dB

R_c = Corrected Reading in dBuV/m

L_s = Specification Limit in dBuV/m

M = Margin in dB Relative to Spec

SAMPLE CALCULATIONS - FIELD STRENGTH TO EIRP CONVERSION

Where the radiated electric field strength is expressed in terms of the equivalent isotropic radiated power (eirp), or where a field strength measurement of output power is made in lieu of a direct measurement, the following formula is used to convert between eirp and field strength at a distance of d (meters) from the equipment under test:

$$E = \frac{1000000 \sqrt{30 P}}{d} \quad \text{microvolts per meter}$$

where P is the eirp (Watts)

For a measurement at 3m the conversion from a logarithmic value for field strength (dBuV/m) to an eirp power (dBm) is -95.3dB.

Appendix A Test Equipment Calibration Data

<u>Manufacturer</u>	<u>Description</u>	<u>Model</u>	<u>Asset #</u>	<u>Calibrated</u>	<u>Cal Due</u>
Radiated Emissions - Band Edge, 18-Oct-18					
National Technical Systems	NTS EMI Software (rev 2.10)	N/A	0		N/A
National Technical Systems	NTS Capture Analyzer Software (rev 3.8)	N/A	0		N/A
EMCO	Antenna, Horn, 1-18GHz	3115	868	7/9/2018	7/9/2020
Rohde & Schwarz	EMI Test Receiver, 20 Hz-40 GHz	ESI 40	2493	3/22/2018	3/22/2019
Radiated Spurious Emissions, 1000 - 6,500 MHz, 19-Oct-18					
National Technical Systems	NTS EMI Software (rev 2.10)	N/A	0		N/A
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	9/18/2018	9/18/2020
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB 7	1538	2/10/2018	2/10/2019
Radiated Spurious Emissions, 1000 - 6,000 MHz, 22-Oct-18					
Rohde & Schwarz	EMI Test Receiver, 20 Hz-40 GHz	ESI 40	2493	3/22/2018	3/22/2019
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	9/18/2018	9/18/2020
Radiated Spurious Emissions, 1000 - 18,000 MHz, 25-Oct-18					
National Technical Systems	NTS EMI Software (rev 2.10)	N/A	0		N/A
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	9/18/2018	9/18/2020
Hewlett Packard	Spectrum Analyzer (SA40) Blue 9 kHz - 40 GHz	8564E (84125C)	1393	12/8/2017	12/8/2018
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1683	4/18/2018	4/18/2019
Micro-Tronics	Band Reject Filter, 5150-5350 MHz 12GHz	BRC50703-02	1729	4/18/2018	4/18/2019
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB 7	1756	7/7/2018	7/7/2019
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	1780	8/30/2018	8/30/2019
Radiated Spurious Emissions, 1-18 GHz, 29-Oct-18					
National Technical Systems	NTS EMI Software (rev 2.10)	N/A	0		N/A
Hewlett Packard	EMC Spectrum Analyzer, 9 KHz-26.5 GHz	8593EM	1141	1/25/2018	1/25/2019
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	9/18/2018	9/18/2020
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	10/8/2018	10/8/2020
Hewlett Packard	Spectrum Analyzer (SA40) Blue 9 kHz - 40 GHz	8564E (84125C)	1393	12/8/2017	12/8/2018
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1683	4/18/2018	4/18/2019



<u>Manufacturer</u>	<u>Description</u>	<u>Model</u>	<u>Asset #</u>	<u>Calibrated</u>	<u>Cal Due</u>
Micro-Tronics	Band Reject Filter, 5470-5725 MHz	BRC50704-02	1730	6/20/2018	6/20/2019
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	1780	8/30/2018	8/30/2019
Micro-Tronics	Band Reject Filter, 2400-2500 MHz 18GHz	BRM50702-02	2238	5/1/2018	5/1/2019
Micro-Tronics	Band Reject Filter, 5470-5725 MHz	BRC50704-02	2240	8/17/2018	8/17/2019
Micro-Tronics	Band Reject Filter, 5725-5875 MHz	BRC50705-01	2738	8/18/2018	8/18/2019
Radiated Emissions, 1,000 - 12,000 MHz, 29-Oct-18					
National Technical Systems	NTS EMI Software (rev 2.10)	N/A	0		N/A
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	10/8/2018	10/8/2020
Hewlett Packard	Spectrum Analyzer (SA40) Blue 9 kHz - 40 GHz	8564E (84125C)	1393	12/8/2017	12/8/2018
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	1780	8/30/2018	8/30/2019
Micro-Tronics	Band Reject Filter, 2400-2500 MHz 18GHz	BRM50702-02	2238	5/1/2018	5/1/2019
Micro-Tronics	Band Reject Filter, 5725-5875 MHz	BRC50705-01	2738	8/18/2018	8/18/2019
Radiated Spurious Emissions, 1 - 40 GHz, 01-Nov-18					
National Technical Systems	NTS EMI Software (rev 2.10)	N/A	0		N/A
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	9/18/2018	9/18/2020
Hewlett Packard	Spectrum Analyzer (SA40) Blue 9 kHz - 40 GHz	8564E (84125C)	1393	12/8/2017	12/8/2018
HP / Miteq	SA40 B Head HF preAmplifier, 18-40 GHz (w/1393)	TTA1840-45-5P-HG-S	1620	1/9/2018	1/9/2019
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	1780	8/30/2018	8/30/2019
A. H. Systems	Blue System Horn, 18-40GHz	SAS-574, p/n: 2581	2159	9/5/2017	8/8/2020
Micro-Tronics	Band Reject Filter, 2400-2500 MHz 18GHz	BRM50702-02	2238	5/1/2018	5/1/2019
Micro-Tronics	Band Reject Filter, 5470-5725 MHz	BRC50704-02	2240	8/17/2018	8/17/2019
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	2251	8/17/2018	8/17/2019
Radiated Spurious Emissions, 1 - 18 GHz, 02-Nov-18					
National Technical Systems	NTS EMI Software (rev 2.10)	N/A	0		N/A
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	9/18/2018	9/18/2020
Hewlett Packard	Spectrum Analyzer (SA40) Blue 9 kHz - 40 GHz	8564E (84125C)	1393	12/8/2017	12/8/2018
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	1780	8/30/2018	8/30/2019



Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
Micro-Tronics	Band Reject Filter, 2400-2500 MHz 18GHz	BRM50702-02	2238	5/1/2018	5/1/2019
EMCO	Antenna, Horn, 1-18GHz	3115	868	7/9/2018	7/9/2020
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	2199	8/30/2018	8/30/2019
Hewlett Packard	Spectrum Analyzer (SA40) Purple 9 kHz - 40 GHz,	8564E (84125C)	2415	2/16/2018	2/16/2019
Rx Radiated spurious Emissions, 05-Nov-18					
National Technical Systems	NTS EMI Software (rev 2.10)	N/A	0		N/A
EMCO	Antenna, Horn, 1-18GHz	3115	868	7/9/2018	7/9/2020
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1549	5/30/2017	5/30/2019
HP / Miteq	SA40 P Head HF preAmplifier, 18-40 GHz (w/2415)	TTA1840-45-5P-HG-S	1772	9/12/2018	N/A
A. H. Systems	System Horn, 18-40GHz	SAS-574, p/n: 2581	2161	7/21/2017	7/21/2019
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	2199	8/30/2018	8/30/2019
Hewlett Packard	Spectrum Analyzer (SA40) Purple 9 kHz - 40 GHz,	8564E (84125C)	2415	2/16/2018	2/16/2019
Hewlett Packard	9KHz-1300MHz pre-amp	8447F	2777	12/27/2017	12/27/2018
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB 7	9482	10/13/2018	10/13/2019
Conducted Emissions - AC Power and Telecommunications Ports, 05-Nov-18					
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	1401	1/8/2018	1/8/2019
Fischer Custom Comm	LISN, 25A, 150kHz to 30MHz, 25 Amp,	FCC-LISN-50-25-2-09	2001	8/15/2018	8/15/2019
Com-Power	ISN, T8 unscreened	ISN-T8	3260	2/20/2018	2/20/2019
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB 7	9482	10/13/2018	10/13/2019
Radiated Spurious Emissions, 30 - 1,000 MHz, 06-Nov-18					
National Technical Systems	NTS EMI Software (rev 2.10)	N/A	0		N/A
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1549	5/30/2017	5/30/2019
Micro-Tronics	Band Reject Filter, 2400-2500 MHz 18GHz	BRM50702-02	2238	5/1/2018	5/1/2019
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	2251	8/17/2018	8/17/2019
Hewlett Packard	9KHz-1300MHz pre-amp	8447F	2777	12/27/2017	12/27/2018
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB 7	9482	10/13/2018	10/13/2019
Radiated Spurious Emissions, 1000 - 6,500 MHz, 13-Nov-18					
National Technical Systems	NTS EMI Software (rev 2.10)	N/A	0		N/A
EMCO	Antenna, Horn, 1-18 GHz	3115	1242	4/11/2017	4/19/2019
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB 7	1756	7/7/2018	7/7/2019
Radiated Band edge, 13-Nov-18					
National Technical Systems	NTS EMI Software (rev 2.10)	N/A	0		N/A



<u>Manufacturer</u>	<u>Description</u>	<u>Model</u>	<u>Asset #</u>	<u>Calibrated</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18 GHz	3115	1242	4/11/2017	4/19/2019
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB 7	9482	10/13/2018	10/13/2019
Radiated Emissions, Band-edge, 03-Dec-18					
National Technical Systems	NTS EMI Software (rev 2.10)	N/A	0		N/A
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	10/8/2018	10/8/2020
Rohde & Schwarz	EMI Test Receiver, 20 Hz-40 GHz	ESI 40	2493	3/22/2018	3/22/2019
Radiated Emissions, 27-Dec-18					
EMCO	Antenna, Horn, 1-18 GHz	3115	1242	4/11/2017	4/19/2019
Hewlett Packard	High Pass filter, 8.2 GHz (Blu System)	P/N 84300-80039 (84125C)	1392	5/1/2018	5/1/2019
Hewlett Packard	Spectrum Analyzer (SA40) Blue 9 kHz - 40 GHz	8564E (84125C)	1393	12/8/2018	12/8/2019
Micro-Tronics	Band Reject Filter, 5470-5725 MHz 12GHz	BRC50704-02	1681	3/23/2018	3/23/2019
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	1780	8/30/2018	8/30/2019
Micro-Tronics	Band Reject Filter, 2400-2500 MHz 18GHz	BRM50702-02	2238	5/1/2018	5/1/2019
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	2239	8/17/2018	8/17/2019
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB 7	9482	10/13/2018	10/13/2019
HP / Miteq	SA40 B Head HF preAmplifier, 18-40 GHz (w/1393)	TTA1840-45-5P-HG-S	1620	1/9/2018	1/9/2019
A. H. Systems	Blue System Horn, 18-40GHz	SAS-574, p/n: 2581	2159	9/5/2017	8/8/2020
Radiated Emissions, 1000 - 6,000 MHz, 31-Dec-18					
EMCO	Antenna, Horn, 1-18 GHz	3115	1242	4/11/2017	4/19/2019
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB 7	9482	10/13/2018	10/13/2019
Radiated Emissions, 30 - 1,000 MHz, 14-Jan-19					
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB 7	1538	2/10/2018	2/10/2019
Com-Power	Preamplifier, 30-1000 MHz	PA-103	1632	1/7/2019	1/7/2020
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	2197	10/4/2017	10/4/2019
Radiated Emissions, 1,000 - 12,000 MHz, 15-Jan-19					
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	9/5/2018	9/5/2019
Hewlett Packard	Spectrum Analyzer (SA40) Red 30 Hz -40 GHz	8564E (84125C)	1148	9/27/2018	9/27/2019
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	10/8/2018	10/8/2020
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1683	4/18/2018	4/18/2019
Micro-Tronics	Band Reject Filter, 5470-5725 MHz	BRC50704-02	1730	6/20/2018	6/20/2019



<u>Manufacturer</u>	<u>Description</u>	<u>Model</u>	<u>Asset #</u>	<u>Calibrated</u>	<u>Cal Due</u>
Rohde & Schwarz	EMI Test Receiver, 20 Hz-40 GHz	ESI 40	2493	3/22/2018	3/22/2019
Radio Antenna Port (Power and Spurious Emissions), 17-Jan-19					
Rohde & Schwarz	Signal Analyzer 20 Hz - 26.5 GHz	FSQ26	2327	6/25/2018	6/25/2019
Rohde & Schwarz	Open Switch and Control Unit with integrated power meter	OSP120 with OSP-B157 module	3000	5/1/2018	5/1/2019
Radio Antenna Port (Power and Spurious Emissions), 18-21-Jan-19					
Rohde & Schwarz	Signal Analyzer 20 Hz - 26.5 GHz	FSQ26	2327	6/25/2018	6/25/2019
Rohde & Schwarz	Open Switch and Control Unit with integrated power meter	OSP120 with OSP-B157 module	3000	5/1/2018	5/1/2019
National Technical Systems	NTS UNII Power Software (rev 3.8)	N/A	0		N/A
National Technical Systems	NTS Capture Analyzer Software (rev 3.8)	N/A	0		N/A
Rohde & Schwarz	Signal Analyzer 20 Hz - 26.5 GHz	FSQ26	2327	6/25/2018	6/25/2019
Rohde & Schwarz	Open Switch and Control Unit with integrated power meter	OSP120 with OSP-B157 module	3000	5/1/2018	5/1/2019
Radio Antenna Port (Power and Spurious Emissions), 22-Jan-19					
National Technical Systems	NTS EMI Software (rev 2.10)	N/A	0		N/A
National Technical Systems	NTS UNII Power Software (rev 3.8)	N/A	0		N/A
National Technical Systems	NTS Capture Analyzer Software (rev 3.8)	N/A	0		N/A
Rohde & Schwarz	Signal Analyzer 20 Hz - 26.5 GHz	FSQ26	2327	6/25/2018	6/25/2019
Rohde & Schwarz	Open Switch and Control Unit with integrated power meter	OSP120 with OSP-B157 module	3000	5/1/2018	5/1/2019



Appendix B Test Data

TL075848-RA-FCC Pages 32 – 198



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR075848
Product	APIN0555	T-Log Number:	TL075848-RA-FCC
System Configuration:	-	Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Engineer:	David Bare
Emissions Standard(s):	FCC §15.247 & §15.407	Class:	
Immunity Standard(s):	-	Environment:	Radio

EMC Test Data

For The

Aruba, a Hewlett Packard Enterprise company

Product

APIN0555

Date of Last Test: 2/27/2019



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

RSS-247 and FCC 15.247 (DTS) Antenna Port Measurements Power, PSD, Bandwidth and Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 1/22/2019
Test Engineer: Rafael Varelas
Test Location: FT Lab #3

Config. Used: 1
Config Change: -
EUT Voltage: POE

General Test Configuration

The EUT was connected to the spectrum analyzer or power meter via a suitable attenuator. All measurements were made on a single chain.

All measurements have been corrected to allow for the external attenuators used.

Ambient Conditions: Temperature: 22.6 °C
 Rel. Humidity: 41 %

Summary of Results

Run #	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
1	8		Output Power	15.247(b)	Pass	6.9 dBm
2	8		Power spectral Density (PSD)	15.247(d)	Pass	-3.3 dBm/10kHz
3	8		Minimum 6dB Bandwidth	15.247(a)	Pass	713 kHz
3	8		99% Bandwidth	RSS GEN	-	1.055 MHz
4	8		Spurious emissions	15.247(b)	Pass	All below limit

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Sample Notes

Sample S/N: CNGFK9Y02N (BLE) & CNGFK9Y005 (Zigbee)

Driver: P4 V0.4.5

Internal 8 antennas for 5 GHz radio and 4 antennas for 2.4 GHz radio (5GHz radio may also use 4 antennas but

Antenna: with 3 dB higher power and can operate in both lower and upper 5 GHz bands simultaneously). Tests performed with 8 antennas at the 4 antenna power levels. Tests performed with 4 antennas at the target power.

Testing note: Both the Primary BLE (J11) and Div BLE (J23) ports were evaluated for power prior to testing. The final testing was performed for the Primary BLE port since both ports measured the same power output during evaluation.



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Procedure Comments:

Measurements performed in accordance with FCC KDB 558074

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
BLE	1 Mb/s	0.65	Yes	0.424	1.9	3.8	2358

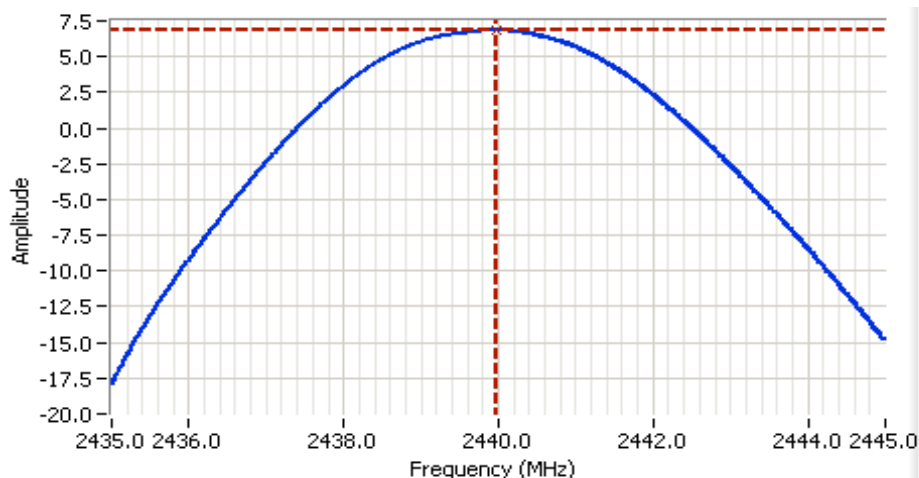
Run #1: Output Power

Power Setting ²	Frequency (MHz)	Output Power		Antenna Gain (dBi)	Result	EIRP		Output Power	
		(dBm) ¹	mW			dBm	W	(dBm) ³	mW
8, DIV	2402	6.7	4.7	4.5	Pass	11.2	0.013		
8, PRI	2402	6.7	4.7	4.5	Pass	11.2	0.013		
8, PRI	2440	6.9	4.9	4.5	Pass	11.4	0.014		
8, PRI	2480	6.8	4.8	4.5	Pass	11.3	0.013		

Note 1: Output power measured using a spectrum analyzer (see plots below) with RBW=3 MHz, VB=10 MHz, Peak detector, spurious limit is -20dBc.

Note 2: Power setting - the software power setting used during testing, included for reference only.

Note 3: Power measured using average power meter (non-gated) and is included for reference only.



Cursor 1	2439.976000	6.9	
	0.000000	0.0	





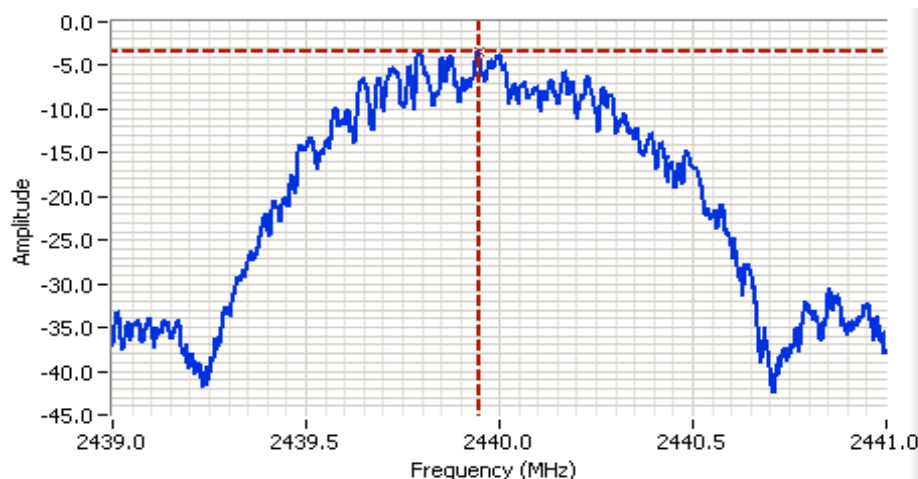
EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD	Limit dBm/3kHz	Result
		(dBm/10kHz) Note 1		
8	2402	-3.4	8.0	Pass
8	2440	-3.3	8.0	Pass
8	2480	-3.3	8.0	Pass

Note 1: Test performed per method PKSPD, in KDB 558074. Power spectral density measured using: $3\text{kHz} \leq \text{RBW} \leq 100\text{kHz}$, $\text{VBW}=3*\text{RBW}$, peak detector, span = $1.5*\text{DTS BW}$, auto sweep time, max hold.



Analyzer Settings

Rohde&Schwarz,FSQ
CF: 2440.000 MHz
SPAN: 2.000 MHz
RB: 10.0 kHz
VB: 30.0 kHz
Detector: POS
Attn: 10 DB
RL Offset: 19.4 DB
Sweep Time: 80.0ms
Ref Lvl: 15.0 DBM

Comments

PSD: -3.3 dBm/10kHz
BLE Primary



Run #3: Signal Bandwidth

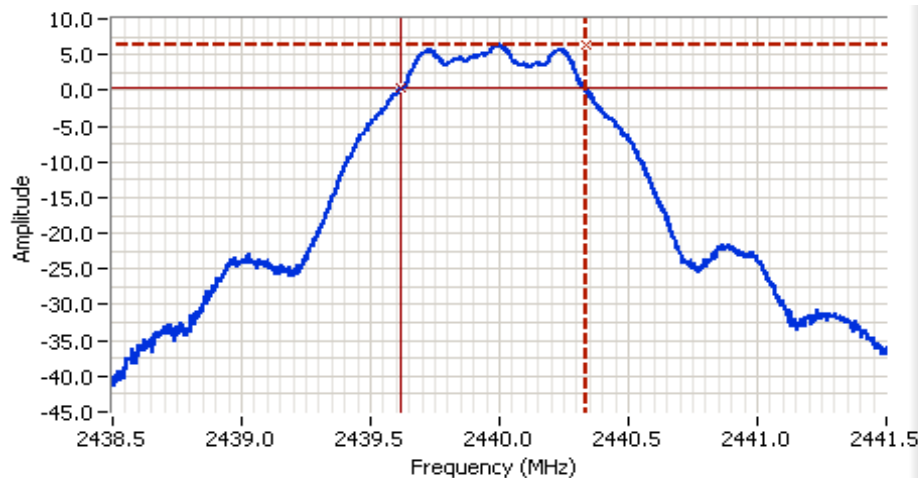
Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (kHz)	
		6dB	99%	6dB	99%
8	2402	0.718	1.048	100	30
8	2440	0.713	1.05	100	30
8	2480	0.722	1.055	100	30

Note 1: DTS BW: $\text{RBW}=100\text{kHz}$, $\text{VBW} \geq 3*\text{RBW}$, peak detector, max hold, auto sweep time, Span 2-5 times measured BW.
99% BW: $\text{RBW}=1\text{-}5\%$ of 99%BW, $\text{VBW} \geq 3*\text{RBW}$, peak detector, max hold, auto sweep time. Span 1.5-5 times OBW.



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A



Analyzer Settings

Rohde&Schwarz,FSQ
CF: 2440.000 MHz
SPAN: 3.000 MHz
RB: 100 kHz
VB: 300 kHz
Detector: POS
Attn: 10 DB
RL Offset: 19.4 DB
Sweep Time: 10.0ms
Ref Lvl: 15.0 DBM

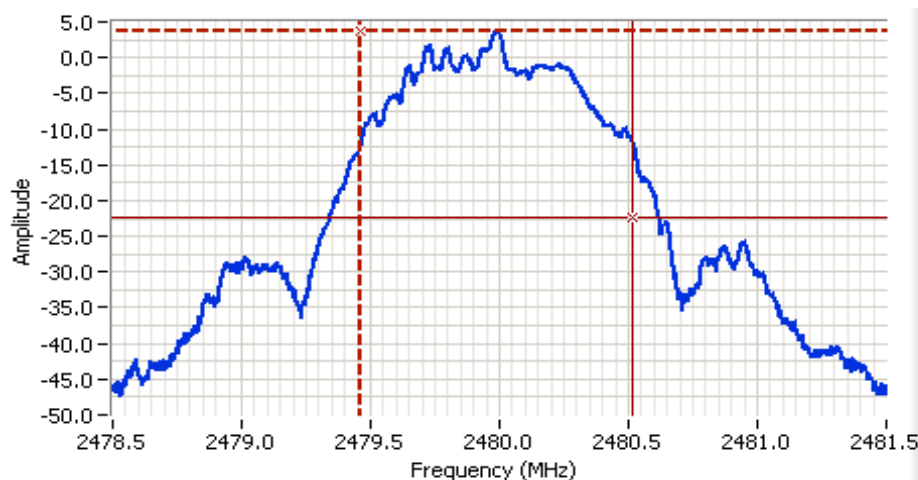
Comments

DTS BW: 713 kHz
BLE Primary

Cursor 1 2440.333600 6.3
Cursor 2 2439.620800 0.3

Delta Freq. 713 kHz

Delta Amplitude 6.0



Analyzer Settings

Rohde&Schwarz,FSQ
CF: 2480.000 MHz
SPAN: 3.000 MHz
RB: 30.0 kHz
VB: 100 kHz
Detector: POS
Attn: 10 DB
RL Offset: 19.4 DB
Sweep Time: 15.0ms
Ref Lvl: 15.0 DBM

Comments

99% BW: 1.055 MHz
BLE Primary

Cursor 1 2479.459233 3.8
Cursor 2 2480.514388 -22.2

Delta Freq. 1.055

Delta Amplitude 26.0





EMC Test Data

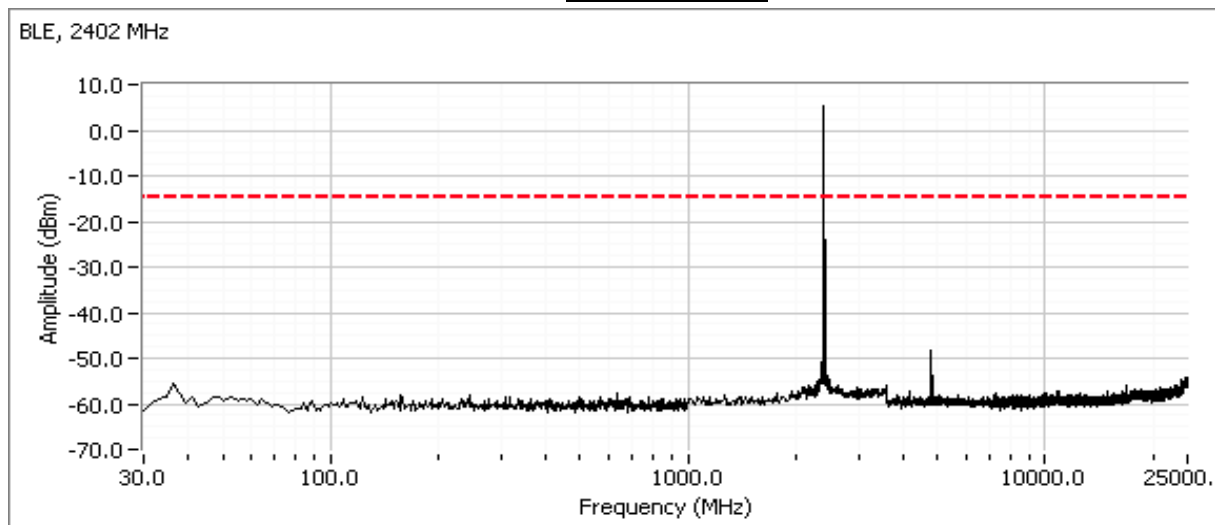
Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #4: Out of Band Spurious Emissions

Frequency (MHz)	Power Setting	Mode	Limit	Result
2402	8	BLE	-20dBc	Pass
2440	8	BLE	-20dBc	Pass
2480	8	BLE	-20dBc	Pass

Note 1: All plots use 100 kHz RBW and VBW at least 3 times the RBW

Plots for low channel



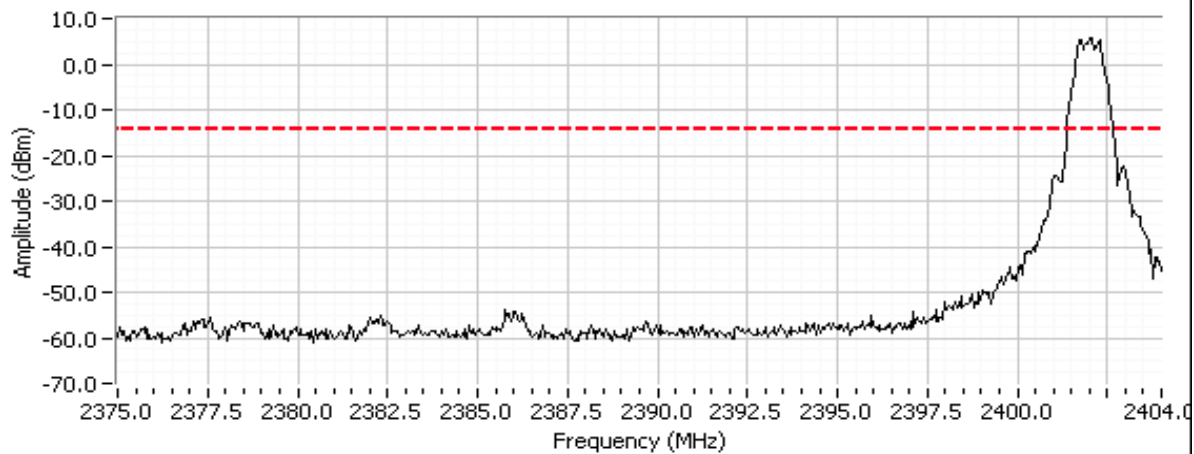
Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.



EMC Test Data

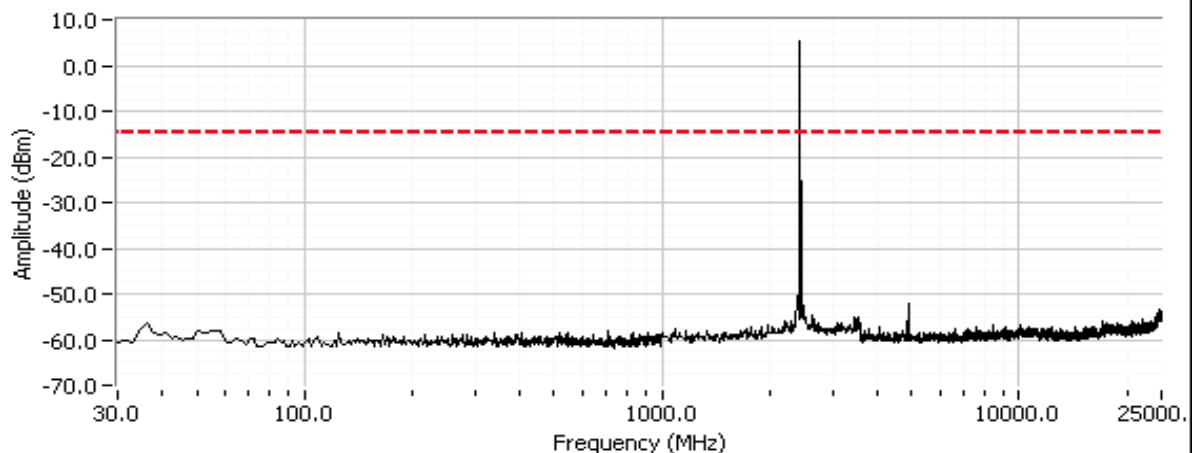
Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

BLE, 2402 MHz



Plots for center channel

BLE, 2440 MHz

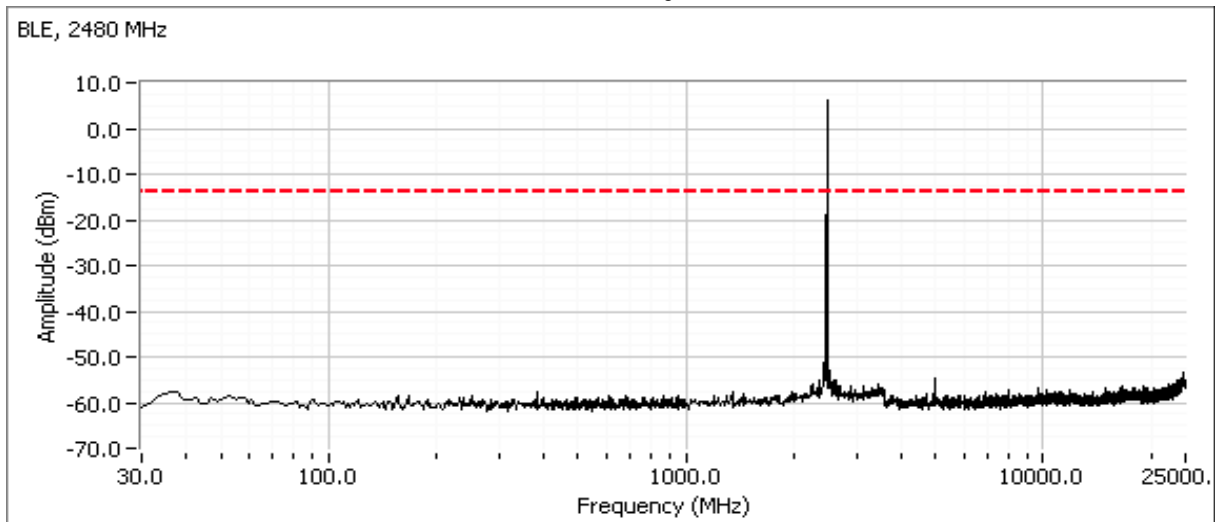




EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Plots for high channel





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

RSS-247 and FCC 15.247 (DTS) Antenna Port Measurements Power, PSD, Bandwidth and Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 1/22/2019
Test Engineer: M. Birgani
Test Location: Lab 3

Config. Used: 1
Config Change: -
EUT Voltage: POE

General Test Configuration

The EUT was connected to the spectrum analyzer or power meter via a suitable attenuator. All measurements were made on a single chain.

All measurements have been corrected to allow for the external attenuators used.

Ambient Conditions: Temperature: 20-23 °C
 Rel. Humidity: 38-42 %

Summary of Results

Run #	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
1	8		Output Power	15.247(b)	Pass	7.6 dBm
2	8		Power spectral Density (PSD)	15.247(d)	Pass	-2.0 dBm/10kHz
3	8		Minimum DTS Bandwidth	15.247(a)	Pass	1.18 MHz
3	8		99% Bandwidth	RSS GEN	-	2.24 MHz
4	8		Spurious emissions	15.247(b)	Pass	All below limit

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Sample Notes

Sample S/N: CNGFK9Y02N (BLE) & CNGFK9Y005 (Zigbee)

Driver: P4 V0.4.5

Antenna: Internal 8 antennas for 5 GHz radio and 4 antennas for 2.4 GHz radio (5GHz radio may also use 4 antennas but with 3 dB higher power and can operate in both lower and upper 5 GHz bands simultaneously). Tests performed with 8 antennas at the 4 antenna power levels. Tests performed with 4 antennas at the target power.



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Procedure Comments:

Measurements performed in accordance with FCC KDB 558074

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
ZigBee	-	0.43	Yes	0.858	3.7	7.4	1166

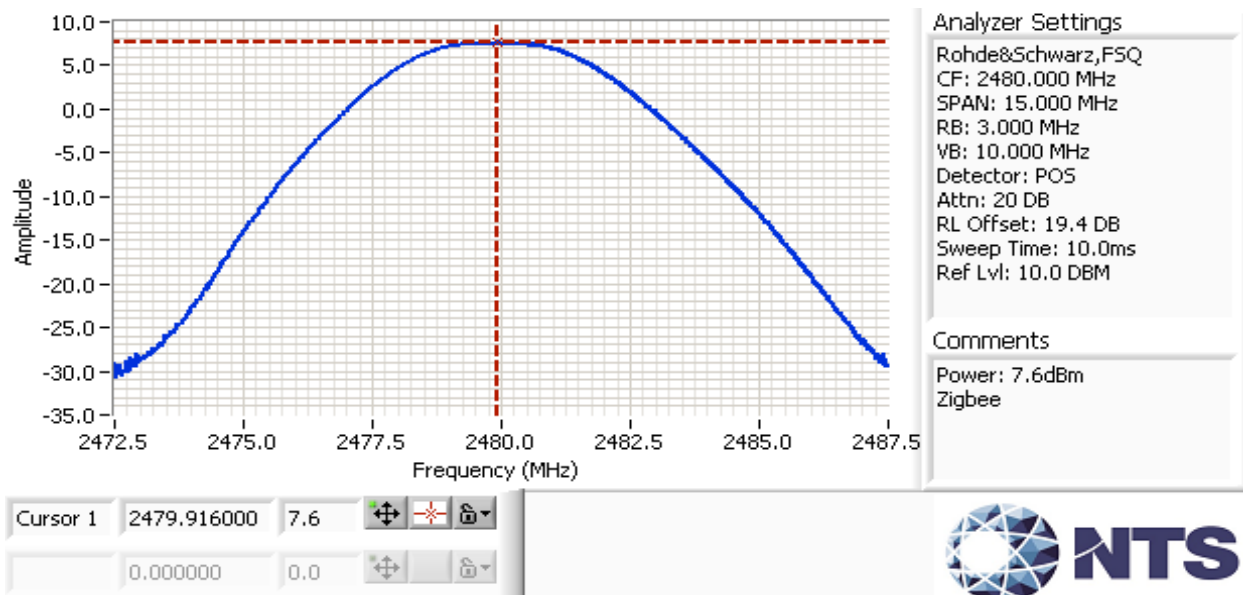
Run #1: Output Power

Power Setting ²	Frequency (MHz)	Output Power		Antenna Gain (dBi)	Result	EIRP		Output Power	
		(dBm) ¹	mW			dBm	W	(dBm) ³	mW
8	2405	7.4	5.5	4.5	Pass	11.9	0.015		
8	2440	7.6	5.8	4.5	Pass	12.1	0.016		
8	2480	7.6	5.8	4.5	Pass	12.1	0.016		

Note 1: Output power measured using a spectrum analyzer (see plots below) with RBW=3 MHz, VB=10 MHz, Peak detector, spurious limit is -20dBc.

Note 2: Power setting - the software power setting used during testing, included for reference only.

Note 3: Power measured using average power meter (non-gated) and is included for reference only.





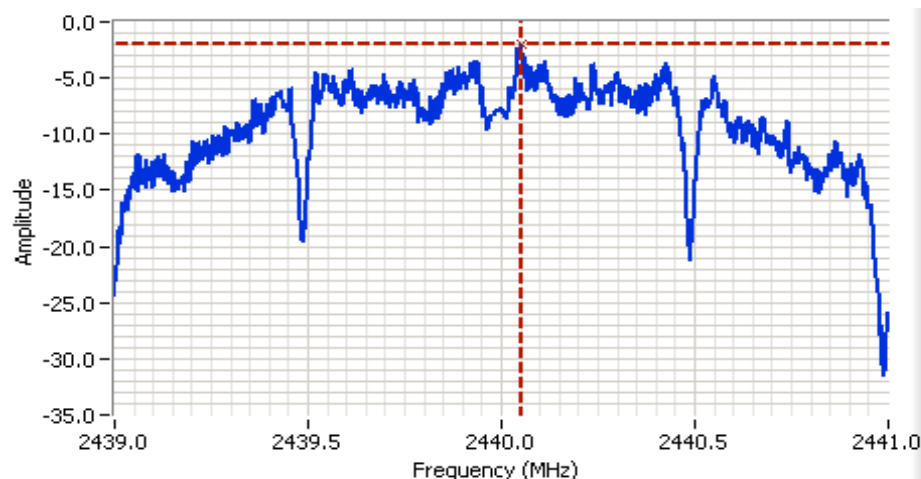
EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD	Limit dBm/3kHz	Result
		(dBm/10kHz) Note 1		
8	2405	-2.1	8.0	Pass
8	2440	-2.0	8.0	Pass
8	2480	-2.1	8.0	Pass

Note 1: Test performed per method PKSPD, in KDB 558074. Power spectral density measured using: $3\text{kHz} \leq \text{RBW} \leq 100\text{kHz}$, $\text{VBW}=3*\text{RBW}$, peak detector, span = $1.5*\text{DTS BW}$, auto sweep time, max hold.



Analyzer Settings
Rohde&Schwarz,FSQ
CF: 2440.000 MHz
SPAN: 2.000 MHz
RB: 10.0 kHz
VB: 30.0 kHz
Detector: POS
Attn: 10 DB
RL Offset: 19.4 DB
Sweep Time: 80.0ms
Ref Lvl: 10.0 DBM

Comments
PSD: -2.0 dBm/10kHz
Zigbee

Cursor 1	2440.051200	-2.0		
	0.000000	0.0		



Run #3: Signal Bandwidth

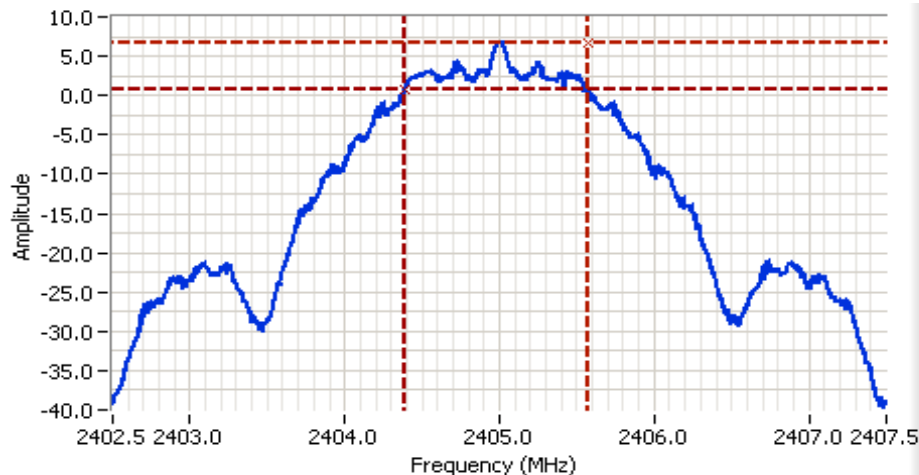
Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (kHz)	
		6dB	99%	DTS	99%
8	2405	1.18	2.23	100	30
8	2440	1.20	2.23	100	30
8	2480	1.18	2.24	100	30

Note 1: DTS BW: $\text{RBW}=100\text{kHz}$, $\text{VBW} \geq 3*\text{RBW}$, peak detector, max hold, auto sweep time, Span 2-5 times measured BW.
99% BW: $\text{RBW}=1\text{-}5\%$ of 99%BW, $\text{VBW} \geq 3*\text{RBW}$, peak detector, max hold, auto sweep time. Span 1.5-5 times OBW.



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A



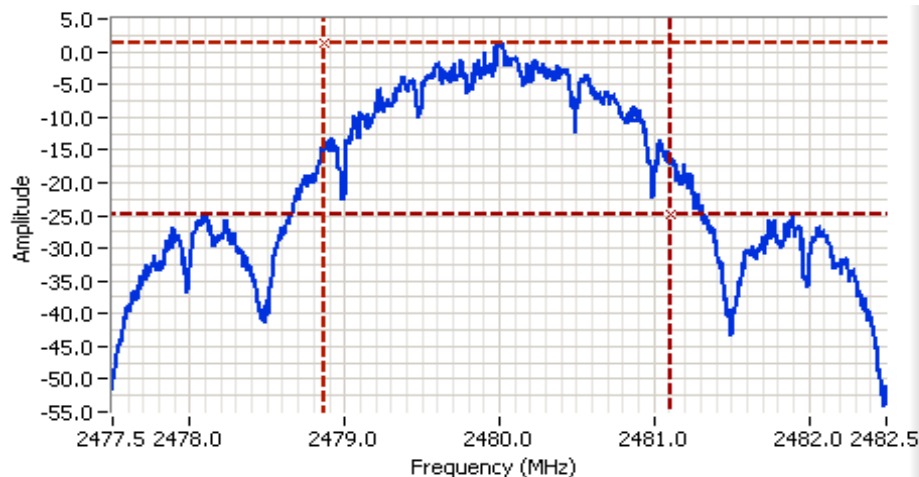
Analyzer Settings

Rohde&Schwarz,FSQ
CF: 2405.000 MHz
SPAN: 5.000 MHz
RB: 100 kHz
VB: 300 kHz
Detector: POS
Attn: 10 DB
RL Offset: 19.4 DB
Sweep Time: 10.0ms
Ref Lvl: 10.0 DBM

Comments

DTS BW: 1.18 MHz
Zigbee

Cursor 1 2405.576000 6.7
Cursor 2 2404.392000 0.7
Delta Freq. 1.184
Delta Amplitude 6.0



Analyzer Settings

Rohde&Schwarz,FSQ
CF: 2480.000 MHz
SPAN: 5.000 MHz
RB: 30.0 kHz
VB: 100 kHz
Detector: POS
Attn: 10 DB
RL Offset: 19.4 DB
Sweep Time: 25.0ms
Ref Lvl: 10.0 DBM

Comments

99% BW: 2.24 MHz
Zigbee

Cursor 1 2478.862910 1.2
Cursor 2 2481.101119 -24.8
Delta Freq. 2.238
Delta Amplitude 26.0





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

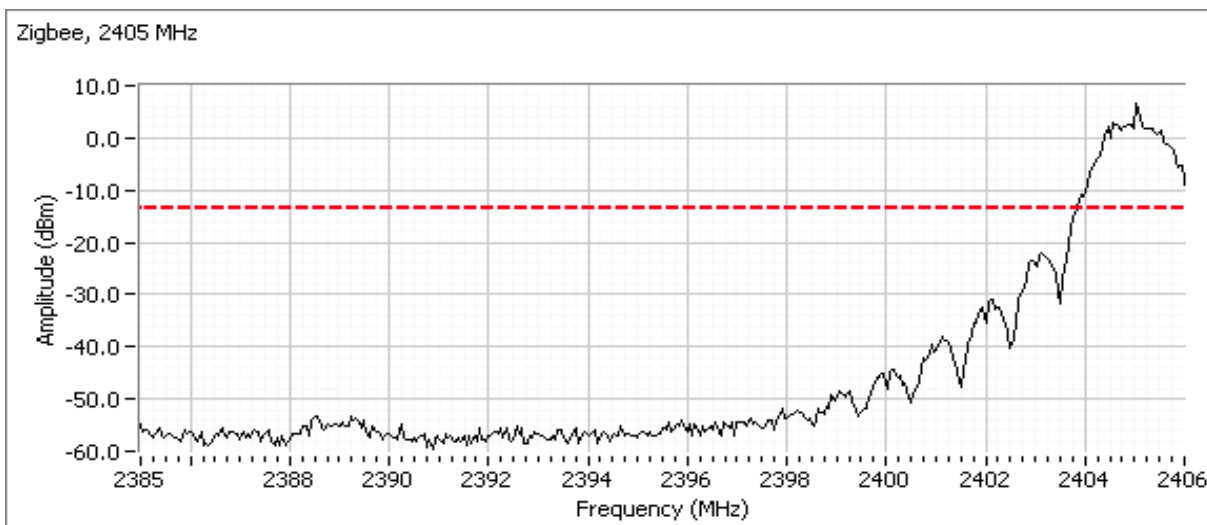
Run #4: Out of Band Spurious Emissions

Frequency (MHz)	Power Setting	Mode	Limit	Result
2405	8	Zigbee	-20dBc	Pass
2440	8	Zigbee	-20dBc	Pass
2480	8	Zigbee	-20dBc	Pass

Note 1: All plots use 100 kHz RBW and VBW at least 3 times the RBW

Plots for low channel

Plot showing compliance with -20dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.

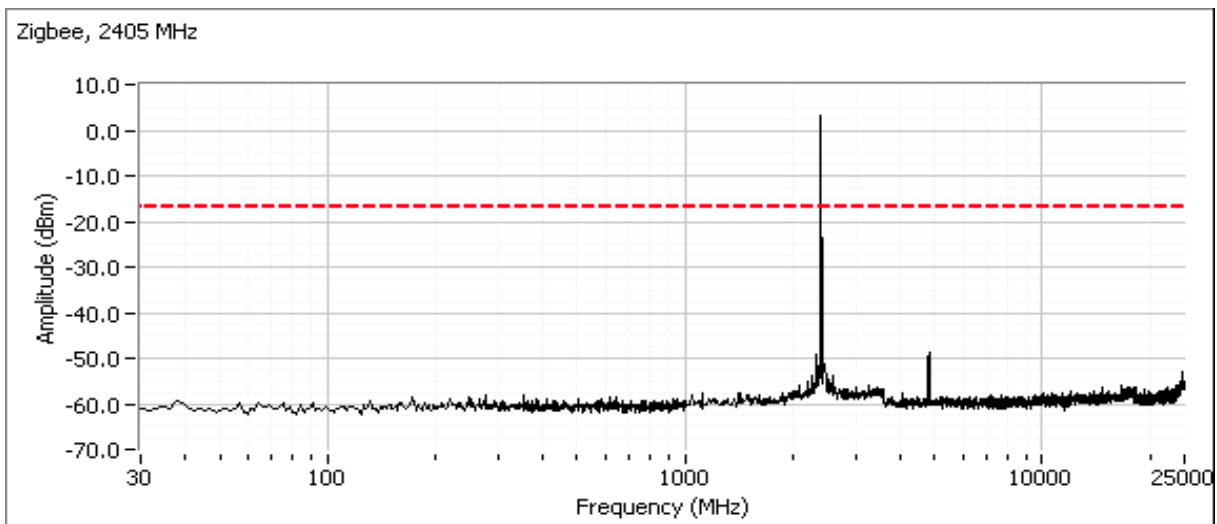




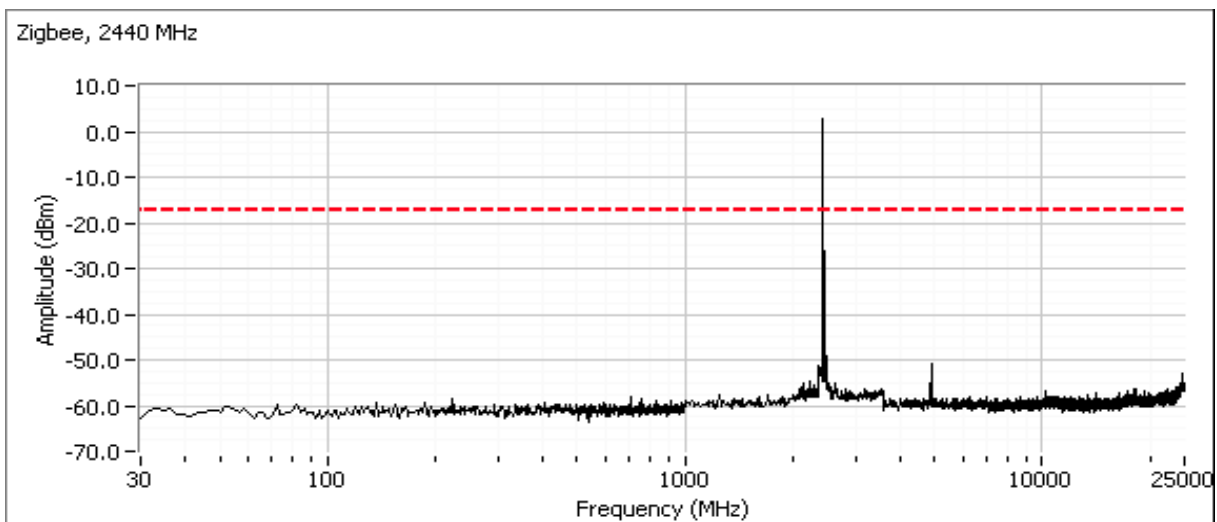
EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Plots for Low channel



Plots for Center channel

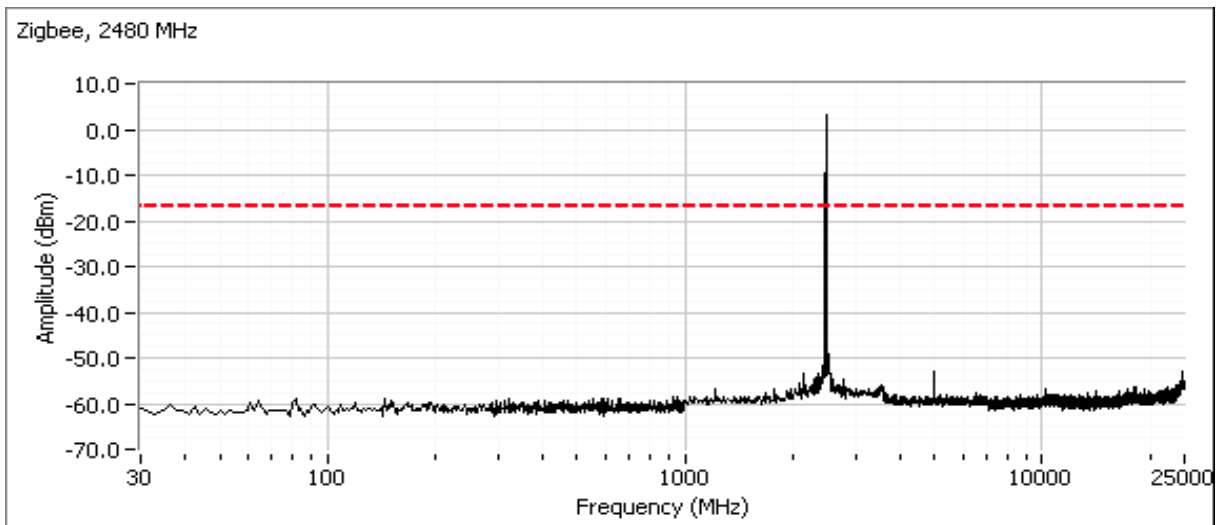




EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Plots for High channel





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

RSS-247 and FCC 15.247 (DTS) Antenna Port Measurements MIMO and Smart Antenna Systems Power, PSD, Bandwidth and Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

General Test Configuration

The EUT was connected to the spectrum analyzer or power meter via a suitable attenuator. All measurements were made on a single chain.

All measurements have been corrected to allow for the external attenuators used.

Ambient Conditions:

Temperature: 20-23 °C
Rel. Humidity: 38-42 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Sample Notes

Sample S/N: CNGFK9Y02N (BLE) & CNGFK9Y005 (Zigbee)

Driver: P4 V0.4.5

Antenna: Internal 8 antennas for 5 GHz radio and 4 antennas for 2.4 GHz radio (5GHz radio may also use 4 antennas but with 3 dB higher power and can operate in both lower and upper 5 GHz bands simultaneously). Tests performed with 8 antennas at the 4 antenna power levels. Tests performed with 4 antennas at the target power.

Date of Test: 1/18-21/2019
Test Engineer: M. Birgani and R. Varelas
Test Location: Lab 3

Config. Used: 1
Config Change: -
EUT Voltage: POE



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Summary of Results

Run #	Pwr setting		Test Performed	Limit	Pass / Fail	Result / Margin
1	See below		Output Power	15.247(b)	Pass	11b: 26.6 dBm 11g: 24.7 dBm 11ax20: 26.3 dBm 11ax40: 23.9 dBm
2	See below		Power spectral Density (PSD)	15.247(d)	Pass	11b: 1.9 dBm/3kHz 11g: 3.9 dBm/10kHz n20: 6.8 dBm/10kHz ax20: 5.5 dBm/10kHz n40: 1.0 dBm/10kHz ax40: -0.1 dBm/10kHz
3	See below		Minimum DTS Bandwidth	15.247(a)	Pass	11b: 7.7 MHz 11g: 16.5 MHz 11n20: 16.6 MHz 11ax20: 18.7 MHz 11n40: 35.3 MHz 11ax40: 36.9 MHz
3	See below		99% Bandwidth	RSS GEN	-	11b: 13.2 MHz 11g: 17.1 MHz 11n20: 18.0 MHz 11ax20: 19.2 MHz 11n40: 36.2 MHz 11ax40: 37.8 MHz
4	See below		Spurious emissions	15.247(b)	Pass	All below the limit.



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Procedure Comments:

Measurements performed in accordance with FCC KDB 558074

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
11b	1 Mb/s	0.78	Yes	0.667	1.1	2.2	1499
11g	6 Mb/s	0.92	Yes	1.437	0.4	0.7	696
11n20	MCS0	0.96	Yes	5.432	0.2	0.3	184
11ax20	MCS0	0.96	Yes	5.448	0.2	0.3	184
11n40	MCS0	0.96	Yes	5.401	0.2	0.4	185
11ax40	MCS0	0.96	Yes	5.414	0.2	0.4	185

Antenna Gain Information

Freq	Antenna Gain (dBi) / Chain				BF	MultiChain Legacy	CDD	Sectorized / Xpol	Dir G (PWR)	Dir G (PSD)
	1	2	3	4						
2450	2.5	4.3	3	3.5	X	X	X	X	3.9	6.9

4x4 mode uses 2 V and 2 H polarized antennas, directional gain used is the highest of the two.

Legacy modes operate on all chains

Power for BF mode is reduced by 3 dB so effective antenna gain does not change

CDD active for single stream modes

For devices that support CDD modes

Min # of spatial streams: 1

Max # of spatial streams: 4

Notes:	BF = beamforming mode supported, Multichain Legacy = 802.11 legacy data rates supported for multichain transmissions, CDD = Cyclic Delay Diversity (or Cyclic Shift Diversity) modes supported, Sectorized / Xpol = antennas are sectorized or cross polarized
Notes:	Dir G (PWR) = total gain (Gant + Array Gain) for power calculations; Dir G (PSD) = total gain for PSD calculations based on FCC KDB 662911. Depending on the modes supported, the Array Gain value for power could be different from the PSD value.
Notes:	Array gain for power/psd calculated per KDB 662911 D01, v01r02.



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #1: Output Power

Operating Mode: 802.11b
Directional Gain (dBi): 3.9

Max EIRP (mW): 1121.1

Frequency (MHz)	Chain	Software Setting	Power ¹		Total		Max Power (W)	Limit dBm	Result	Power (dBm) ³
			dBm	mW	mW	dBm				
2412	1	20	19.9	97.7	442.4	26.5	0.457	30.0	Pass	
	2		20.8	120.2						
	3		20.4	109.6						
	4		20.6	114.8						
2437	1	20	20.0	100.0	445.2	26.5		30.0	Pass	
	2		20.8	120.2						
	3		20.8	120.2						
	4		20.2	104.7						
2462	1	20	19.9	97.7	456.7	26.6	30.0	Pass		
	2		20.9	123.0						
	3		21.1	128.8						
	4		20.3	107.2						

Operating Mode: 802.11g
Directional Gain (dBi): 3.9

Max EIRP (mW): 728.2

Frequency (MHz)	Chain	Software Setting	Power ¹		Total		Max Power (W)	Limit dBm	Result	Power (dBm) ³
			dBm	mW	mW	dBm				
2412	1	15.5	16.1	40.7	190.0	22.8	0.297	30.0	Pass	
	2		17.1	51.3						
	3		17.0	50.1						
	4		16.8	47.9						
2437	1	20	18.7	74.1	296.6	24.7		30.0	Pass	
	2		18.8	75.9						
	3		18.5	70.8						
	4		18.8	75.9						
2462	1	15.5	16.2	41.7	191.1	22.8		30.0	Pass	
	2		17.2	52.5						
	3		17.0	50.1						
	4		16.7	46.8						



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Operating Mode: 802.11ax20
Directional Gain (dBi): 3.9

Max EIRP (mW): 1051.8

Frequency (MHz)	Chain	Software Setting	Power ¹		Total		Max Power (W)	Limit dBm	Result	Power (dBm) ³
			dBm	mW	mW	dBm				
2412	1	17	16.7	46.8	229.1	23.6	0.428	30.0	Pass	
	2		18.1	64.6						
	3		17.8	60.3						
	4		17.6	57.5						
2437	1	20	19.5	89.1	428.5	26.3		30.0	Pass	
	2		20.7	117.5						
	3		20.5	112.2						
	4		20.4	109.6						
2462	1	15.5	15.3	33.9	169.0	22.3		30.0	Pass	
	2		16.7	46.8						
	3		16.5	44.7						
	4		16.4	43.7						

Operating Mode: 802.11ax40
Directional Gain (dBi): 3.9

Max EIRP (mW): 602.5

Frequency (MHz)	Chain	Software Setting	Power ¹		Total		Max Power (W)	Limit dBm	Result	Power (dBm) ³
			dBm	mW	mW	dBm				
2422	1	17	16.7	46.8	197.3	23.0	0.245	30.0	Pass	
	2		17.1	51.3						
	3		17.2	52.5						
	4		16.7	46.8						
2437	1	18	17.7	58.9	245.5	23.9		30.0	Pass	
	2		18.2	66.1						
	3		17.8	60.3						
	4		17.8	60.3						
2452	1	16.5	16.6	45.7	184.0	22.6		30.0	Pass	
	2		16.9	49.0						
	3		16.5	44.7						
	4		16.5	44.7						

Note 1: Duty Cycle < 98%. Output power measured using a spectrum analyzer (see plots below) with RBW= 1-5% of OBW and ≤ 1 MHz, VB≥3* RBW, Span ≥ 1.5 of OBW, auto sweep time, RMS detector, power averaging on, GATING enabled, and power integration over the OBW, trace average 100 traces (option AVGSA-1 in C63.10). Spurious limit becomes -30dBc.



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Spectrum Analyzer Settings

CF: 2462.000 MHz
SPAN: 30.000 MHz
RB: 300 kHz
VB: 1.000 MHz
Detector: RMS
Attn: 30 DB
RL Offset: 0.0 DB
Sweep Time: 10.0ms
Ref Lvl: 0.0 DBM
Pwr avg: 100 sweeps
Amp corr: 19.4dB
Bin size: 24.0 kHz

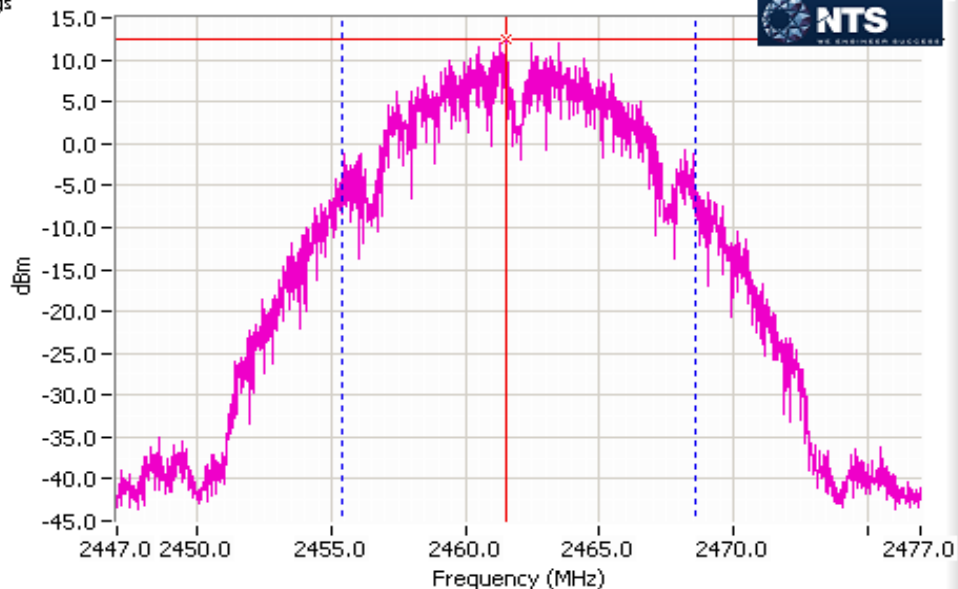
99% Bandwidth

13.19 MHz

Power Over Span

128.747 mW

21.1 dBm



Power Over Span

Spectrum Analyzer Settings

CF: 2437.000 MHz
SPAN: 30.000 MHz
RB: 300 kHz
VB: 1.000 MHz
Detector: RMS
Attn: 30 DB
RL Offset: 0.0 DB
Sweep Time: 10.0ms
Ref Lvl: 5.0 DBM
Pwr avg: 100 sweeps
Amp corr: 19.4dB
Bin size: 24.0 kHz

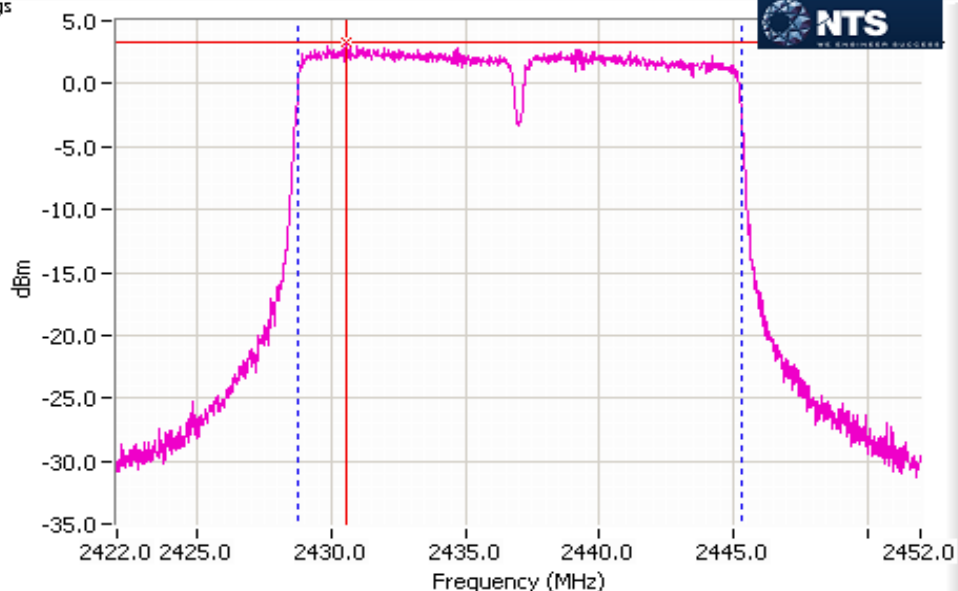
99% Bandwidth

16.57 MHz

Power Over Span

76.442 mW

18.8 dBm

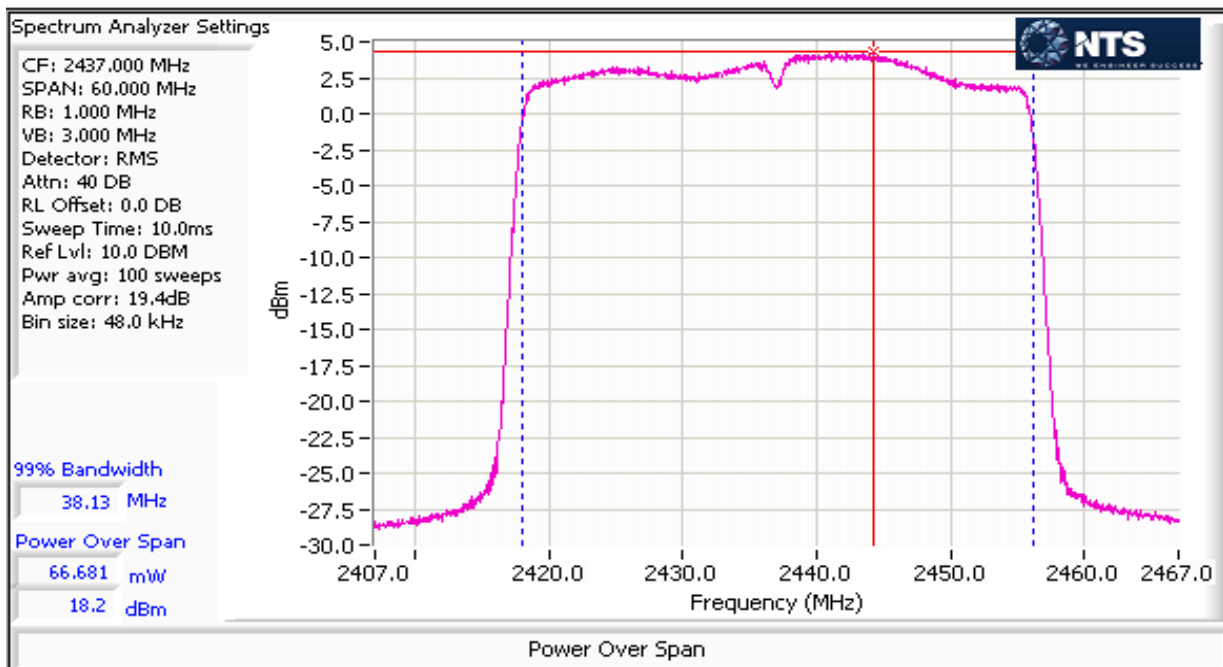
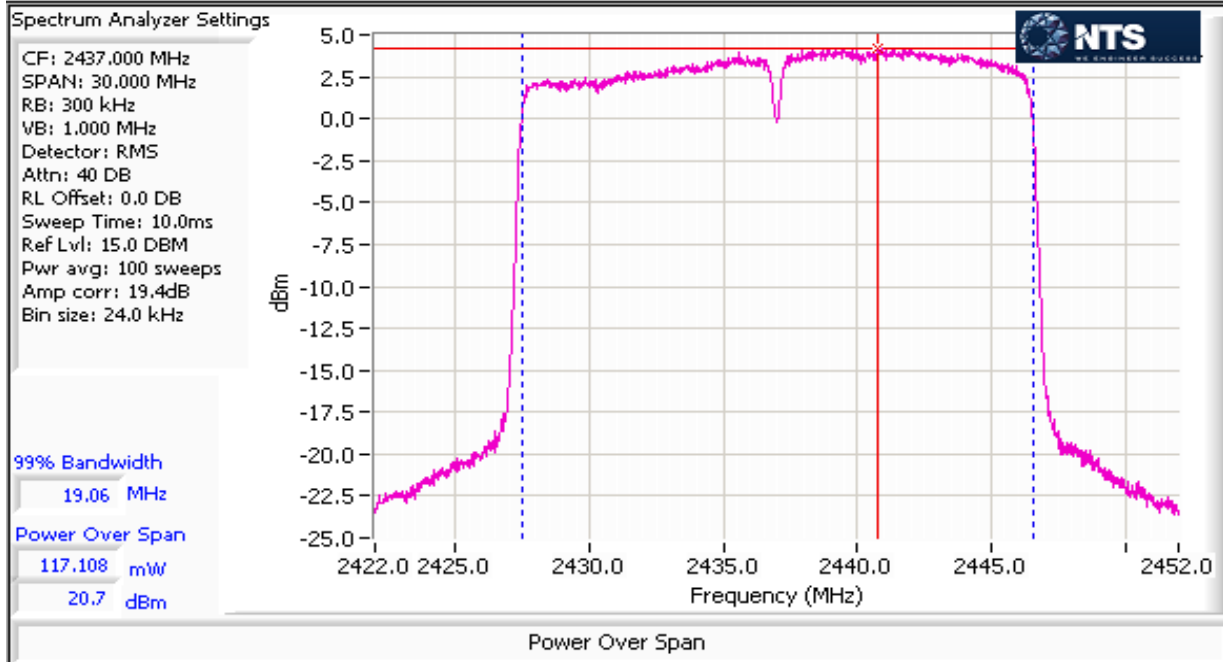


Power Over Span



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #2: Power spectral Density

Mode: 11b

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) ^{Note 1}				Total	Limit dBm/3kHz	Result
		Chain 1	Chain 2	Chain 3	Chain 4			
20	2412	-4.6	-4.3	-3.8	-3.8	1.9	8.0	Pass
20	2437	-5.3	-4.2	-3.7	-5.4	1.4	8.0	Pass
20	2462	-5.3	-3.7	-3.5	-4.6	1.8	8.0	Pass

Mode: 11g

Power Setting	Frequency (MHz)	PSD (dBm/10kHz) ^{Note 1}				Total	Limit dBm/3kHz	Result
		Chain 1	Chain 2	Chain 3	Chain 4			
15.5	2412	-4.8	-2.2	-2.7	-3.5	2.8	8.0	Pass
20	2437	-2.7	-2.1	-2.3	-1.4	3.9	8.0	Pass
15.5	2462	-5.1	-3.0	-2.9	-4.6	2.2	8.0	Pass

Mode: n20

Power Setting	Frequency (MHz)	PSD (dBm/10kHz) ^{Note 1}				Total	Limit dBm/3kHz	Result
		Chain 1	Chain 2	Chain 3	Chain 4			
17	2412	-2.4	-2.2	-2.1	-2.1	3.8	8.0	Pass
20	2437	-0.4	1.3	1.4	0.4	6.8	8.0	Pass
15.5	2462	-3.9	-2.6	-3.3	-4.2	2.6	8.0	Pass

Mode: ax20

Power Setting	Frequency (MHz)	PSD (dBm/10kHz) ^{Note 1}				Total	Limit dBm/3kHz	Result
		Chain 1	Chain 2	Chain 3	Chain 4			
17	2412	-3.5	-2.3	-3.0	-3.3	3.0	8.0	Pass
20	2437	-1.4	0.0	-0.1	-0.6	5.5	8.0	Pass
15.5	2462	-3.9	-3.8	-4.6	-4.3	1.9	8.0	Pass



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

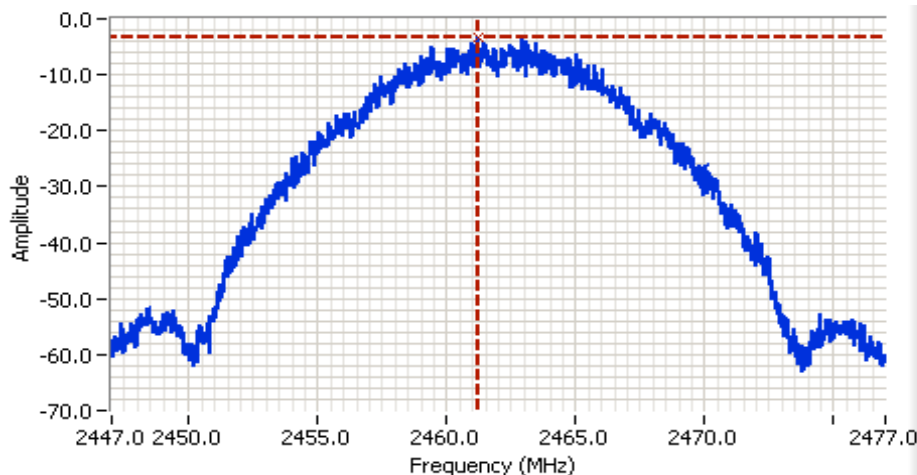
Mode: n40

Power Setting	Frequency (MHz)	PSD (dBm/10kHz) ^{Note 1}				Total	Limit dBm/3kHz	Result
Chain 1	Chain 2	Chain 3	Chain 4					
17	2422	-5.7	-5.4	-4.9	-5.5	0.7	8.0	Pass
18	2437	-5.5	-4.8	-5.0	-4.7	1.0	8.0	Pass
16.5	2452	-6.9	-5.5	-6.0	-6.0	-0.1	8.0	Pass

Mode: ax40

Power Setting	Frequency (MHz)	PSD (dBm/10kHz) ^{Note 1}				Total	Limit dBm/3kHz	Result
Chain 1	Chain 2	Chain 3	Chain 4					
17	2422	-7.5	-6.6	-6.7	-7.7	-1.1	8.0	Pass
18	2437	-6.6	-5.5	-6.2	-6.4	-0.1	8.0	Pass
16.5	2452	-7.3	-7.7	-8.3	-7.9	-1.8	8.0	Pass

Note 1: Test performed per method PKSPD, in KDB 558074. Power spectral density measured using: $3\text{ kHz} \leq \text{RBW} \leq 100\text{ kHz}$, $\text{VBW}=3*\text{RBW}$, peak detector, span = $1.5*\text{DTS BW}$, auto sweep time, max hold.



Analyzer Settings

Rohde&Schwarz,FSQ
 CF: 2462.000 MHz
 SPAN: 30.000 MHz
 RB: 3.00 kHz
 VB: 10.0 kHz
 Detector: POS
 Attn: 10 DB
 RL Offset: 19.4 DB
 Sweep Time: 17.0s
 Ref Lvl: 0.0 DBM

Comments

PSD: -3.5 dBm/3kHz
 b mode chain 3
 setting: 20

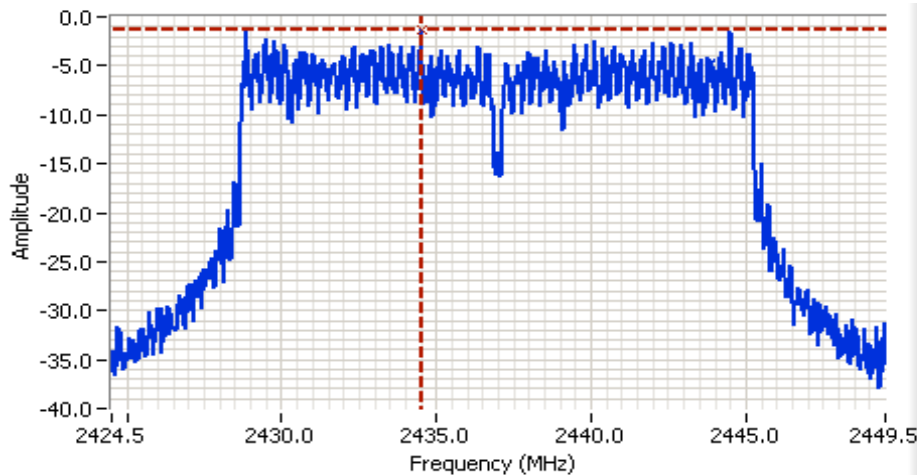
Cursor 1 2461.208000 -3.5
 0.000000 0.0





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A



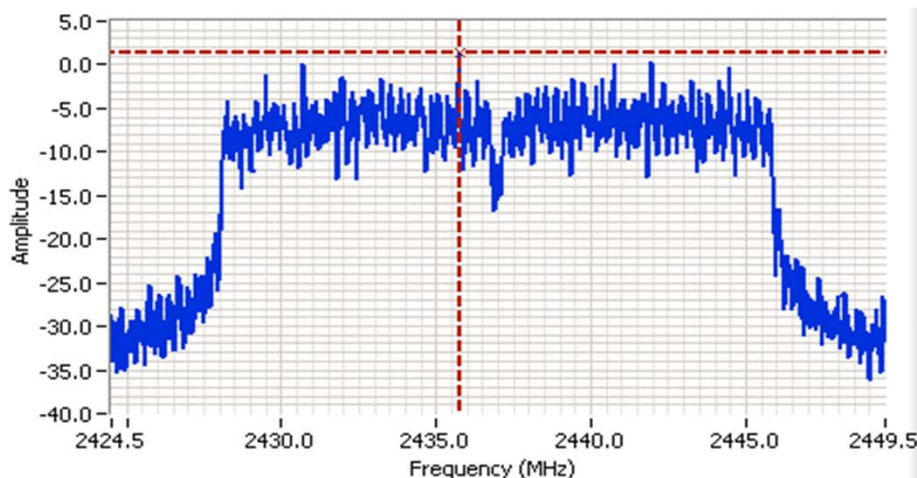
Analyzer Settings

Rohde&Schwarz,FSQ
CF: 2437.000 MHz
SPAN: 25.000 MHz
RB: 10.0 kHz
VB: 30.0 kHz
Detector: POS
Attn: 20 DB
RL Offset: 19.4 DB
Sweep Time: 1.2s
Ref Lvl: 10.0 DBM

Comments

PSD: -1.4 dBm/10kHz
g mode chain 4
setting: 20.0

Cursor 1 2434.500000 -1.4
0.000000 0.0



Analyzer Settings

Rohde&Schwarz,FSQ
CF: 2437.000 MHz
SPAN: 25.000 MHz
RB: 10.0 kHz
VB: 30.0 kHz
Detector: POS
Attn: 20 DB
RL Offset: 19.4 DB
Sweep Time: 1.2s
Ref Lvl: 10.0 DBM

Comments

PSD: 1.4 dBm/10kHz
n20 mode chain 3
setting: 20.0

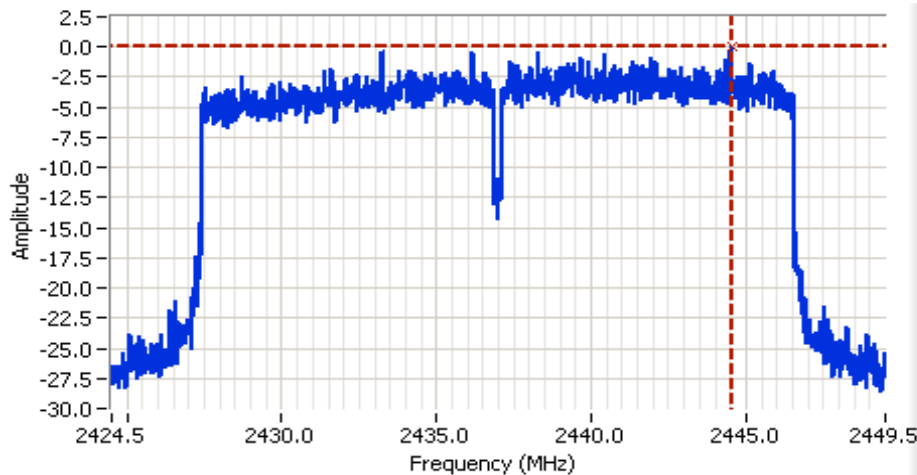
Cursor 1 2435.740000 1.4
0.000000 0.0





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A



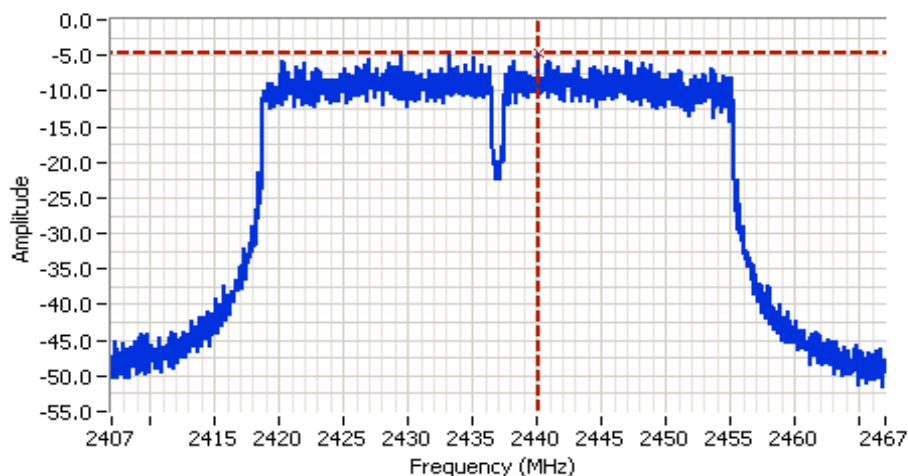
Analyzer Settings

Rohde&Schwarz,FSQ
CF: 2437.000 MHz
SPAN: 25.000 MHz
RB: 10.0 kHz
VB: 30.0 kHz
Detector: POS
Attn: 20 DB
RL Offset: 19.4 DB
Sweep Time: 250.0ms
Ref Lvl: 10.0 DBM

Comments

PSD: 0 dBm/10kHz
ax20 mode chain 2
setting: 20

Cursor 1 2444.520000 0.0
0.000000 0.0



Analyzer Settings

Rohde&Schwarz,FSQ
CF: 2437.000 MHz
SPAN: 60.000 MHz
RB: 10.0 kHz
VB: 30.0 kHz
Detector: POS
Attn: 20 DB
RL Offset: 19.4 DB
Sweep Time: 0.6s
Ref Lvl: 10.0 DBM

Comments

PSD: -4.7 dBm/10kHz
n40 mode chain 4
setting: 18.0

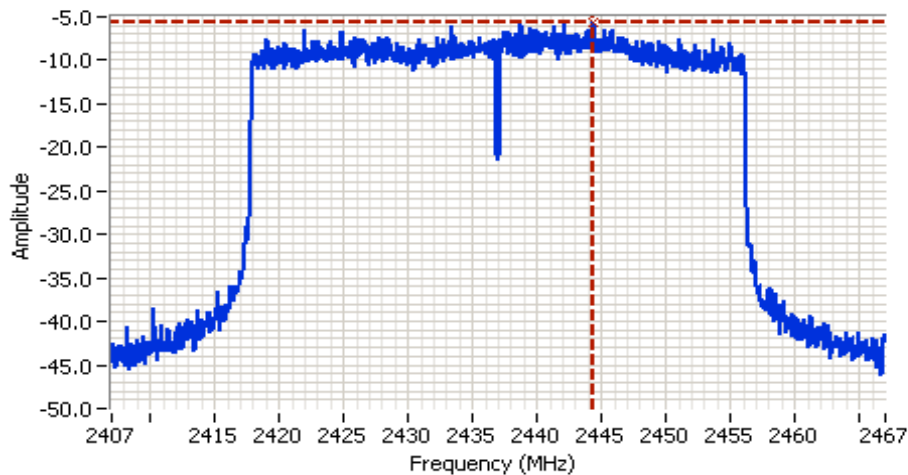
Cursor 1 2440.120000 -4.7
0.000000 0.0





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A



Analyzer Settings

Rohde&Schwarz,FSQ
CF: 2437.000 MHz
SPAN: 60.000 MHz
RB: 10.0 kHz
VB: 30.0 kHz
Detector: POS
Attn: 20 DB
RL Offset: 19.4 DB
Sweep Time: 0.6s
Ref Lvl: 10.0 DBM

Comments

PSD: -5.5 dBm/10kHz
ax40 mode chain 2
setting: 18.0

Cursor 1 2444.392000 -5.5

0.000000 0.0





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #3: Signal Bandwidth

Mode:	Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (MHz)	
			DTS	99%	DTS	99%
b	20	2412	7.7	13.0	0.1	0.3
	20	2437	7.7	13.1	0.1	0.3
	20	2462	7.7	13.2	0.1	0.3

Mode:	Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (MHz)	
			DTS	99%	DTS	99%
g	15.5	2412	16.5	16.9	0.1	0.3
	20	2437	16.5	17.1	0.1	0.3
	15.5	2462	16.5	17.0	0.1	0.3

Mode:	Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (MHz)	
			DTS	99%	DTS	99%
n20	17	2412	17.3	17.7	0.1	0.3
	20	2437	17.5	18.0	0.1	0.3
	15.5	2462	16.6	17.7	0.1	0.3

Mode:	Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (MHz)	
			DTS	99%	DTS	99%
ax20	17	2412	18.8	19.1	0.1	0.3
	20	2437	18.9	19.2	0.1	0.3
	15.5	2462	18.7	19.0	0.1	0.3

Mode:	Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (MHz)	
			DTS	99%	DTS	99%
n40	17	2422	35.3	36.1	0.1	0.5
	18	2437	35.6	36.2	0.1	0.5
	16.5	2452	35.9	36.2	0.1	0.5

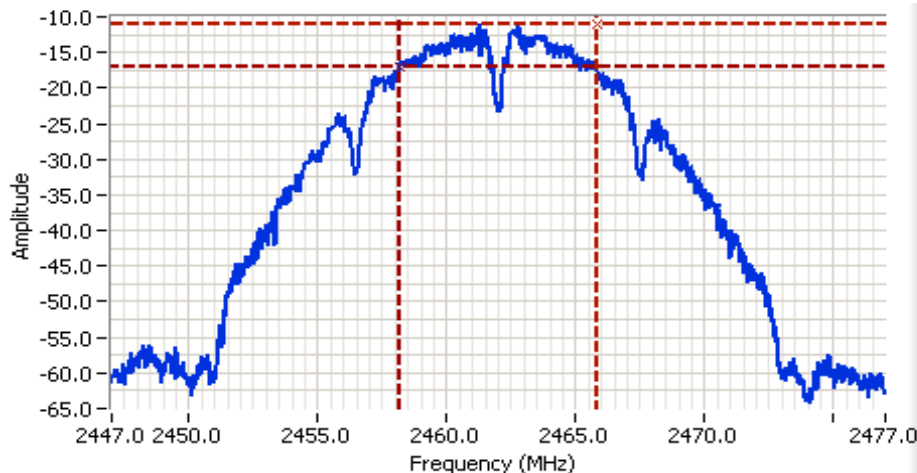
Mode:	Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (MHz)	
			DTS	99%	DTS	99%
ax40	17	2422	36.9	37.7	0.1	0.5
	18	2437	37.8	37.8	0.1	0.5
	16.5	2452	37.5	37.8	0.1	0.5

Note 1:	DTS BW: RBW=100kHz, VBW ≥ 3*RBW, peak detector, max hold, auto sweep time, Span 2-5 times measured BW. 99% BW: RBW=1-5% of 99%BW, VBW ≥ 3*RBW, peak detector, max hold, auto sweep time. Span 1.5-5 times OBW.
Note 2:	Measurements performed on chain 1



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A



Analyzer Settings

Rohde&Schwarz,FSQ
CF: 2462.000 MHz
SPAN: 30.000 MHz
RB: 100 kHz
VB: 300 kHz
Detector: POS
Attn: 25 DB
RL Offset: 0.0 DB
Sweep Time: 40.0ms
Ref Lvl: 0.0 DBM

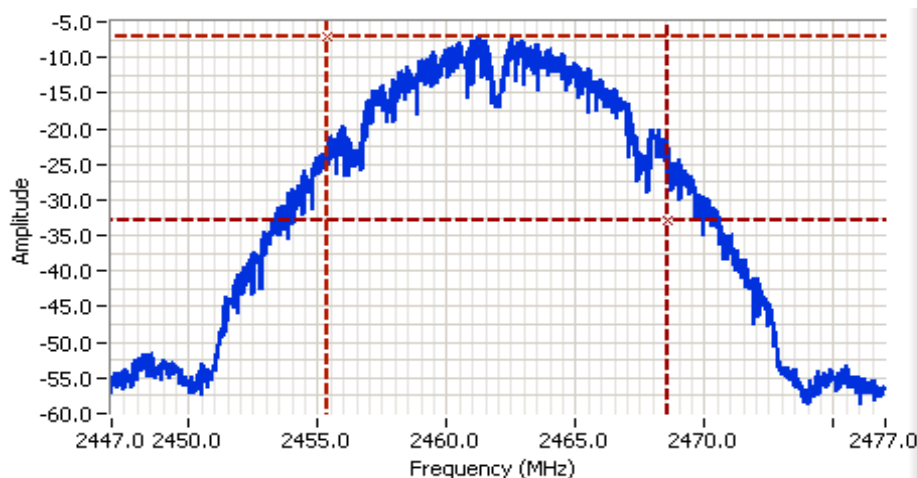
Comments

DTS BW: 7.656 MHz
b mode chain 1
setting: 20

Cursor 1 2465.840000 -11.1
Cursor 2 2458.184000 -17.1

Delta Freq. 7.656

Delta Amplitude 6.0



Analyzer Settings

Rohde&Schwarz,FSQ
CF: 2462.000 MHz
SPAN: 30.000 MHz
RB: 300 kHz
VB: 1.000 MHz
Detector: POS
Attn: 25 DB
RL Offset: 0.0 DB
Sweep Time: 10.0ms
Ref Lvl: 0.0 DBM

Comments

99% BW: 13.2 MHz
b mode chain 1
setting: 20

Cursor 1 2455.321343 -7.0
Cursor 2 2468.534772 -33.0

Delta Freq. 13.213

Delta Amplitude 26.0





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #4: Out of Band Spurious Emissions

Power Setting Per Chain (all the same)				Mode	Frequency (MHz)	Limit	Result
#1	#2	#3	#4				
20				11b	2412	-30 dBc	Pass
20				11b	2437	-30 dBc	Pass
20				11b	2462	-30 dBc	Pass
15.5				11g	2412	-30 dBc	Pass
20				11g	2437	-30 dBc	Pass
20				11g	2462	-30 dBc	Pass
17				11n20	2412	-30 dBc	Pass
20				11n20	2437	-30 dBc	Pass
20				11n20	2462	-30 dBc	Pass
17				11ax20	2412	-30 dBc	Pass
20				11ax20	2437	-30 dBc	Pass
20				11ax20	2462	-30 dBc	Pass
17				11n40	2422	-30 dBc	Pass
20				11n40	2437	-30 dBc	Pass
20				11n40	2452	-30 dBc	Pass
17				11ax40	2422	-30 dBc	Pass
20				11ax40	2437	-30 dBc	Pass
20				11ax40	2452	-30 dBc	Pass

Note 1: All plots use 100 kHz RBW and VBW at least 3 times the RBW

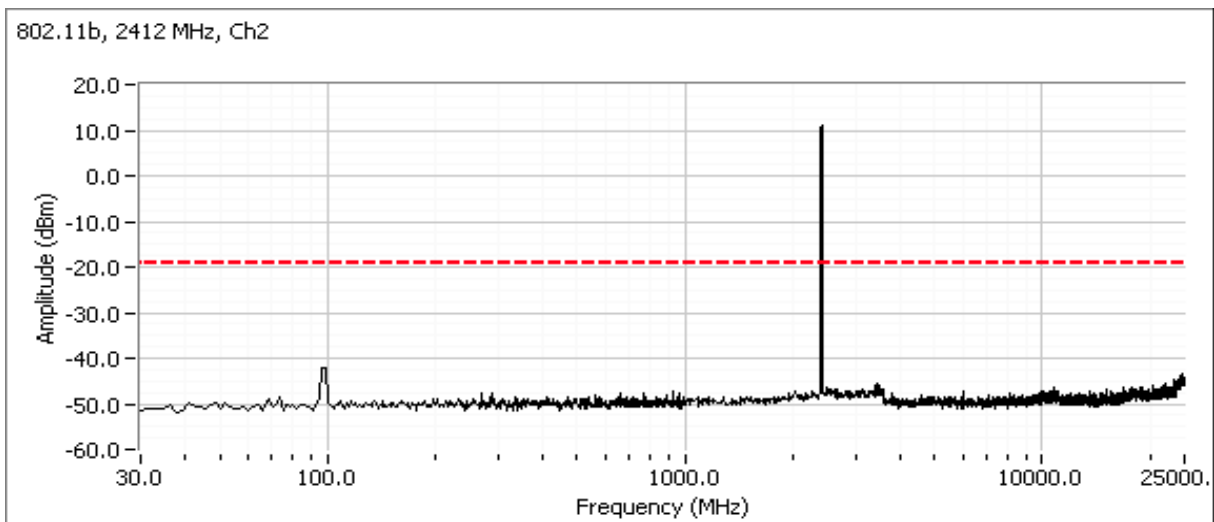
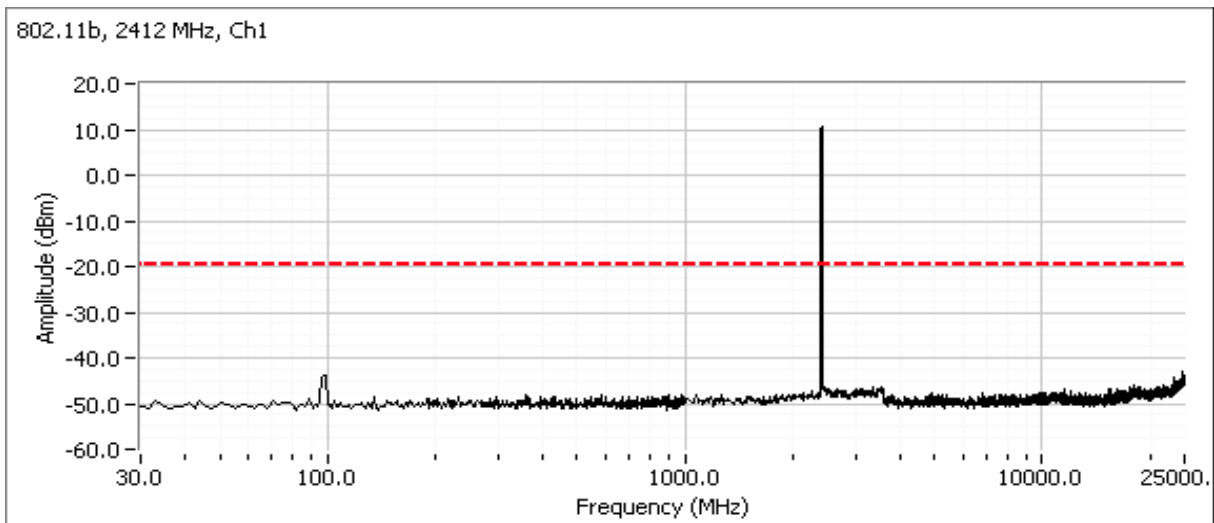
Note 2: Measured on each chain individually and compared with the corresponding chain output for comparison to the limit.



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

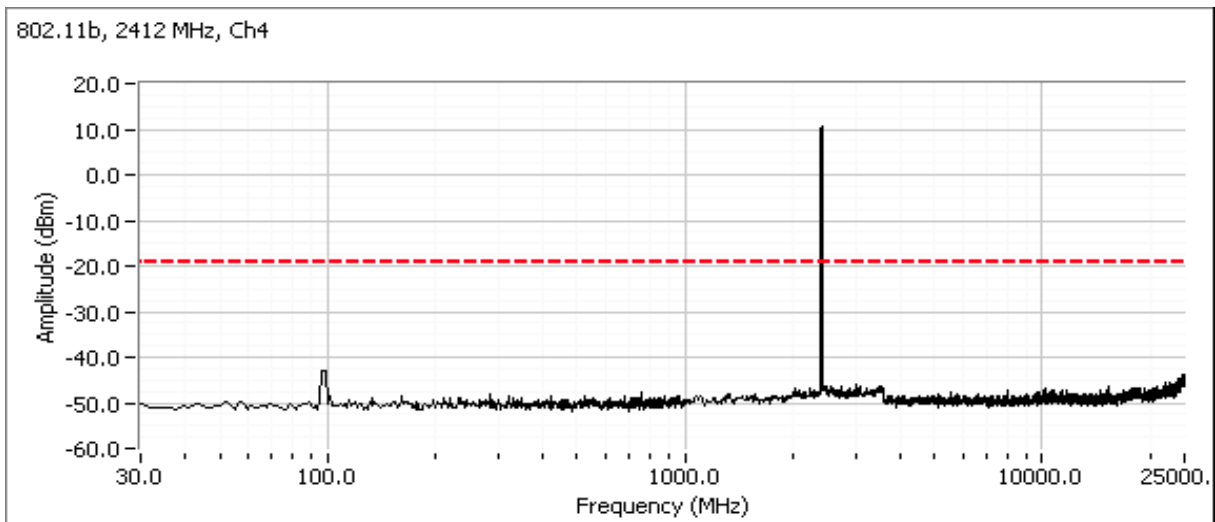
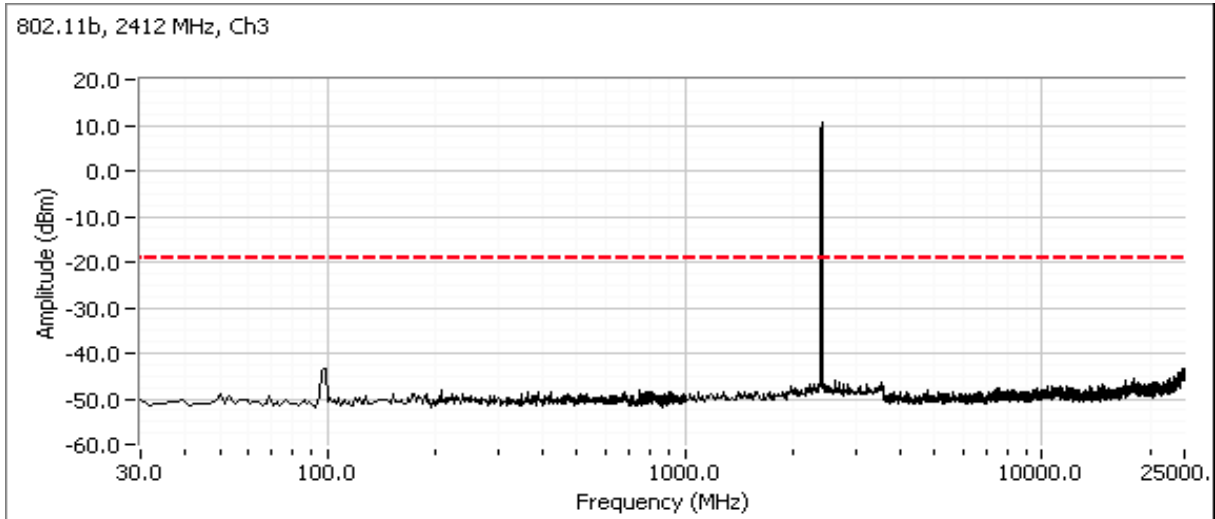
Plots for low channel





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

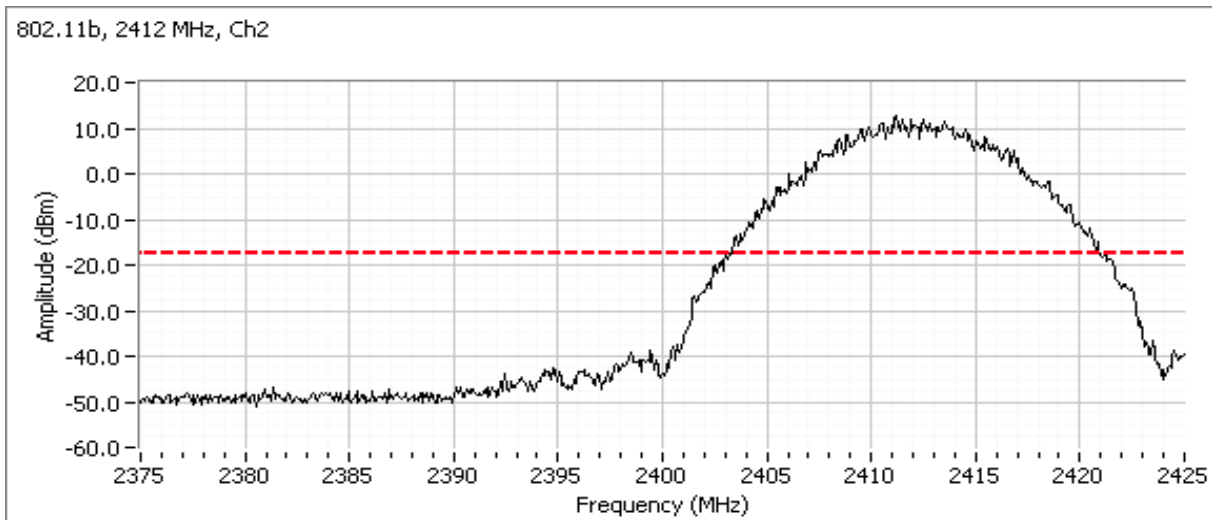
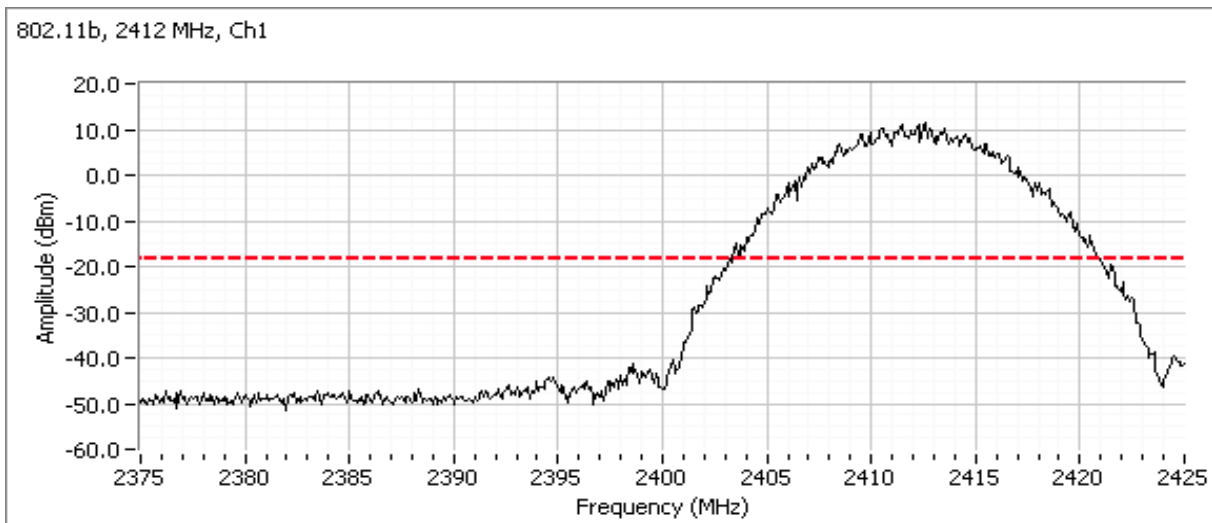




EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

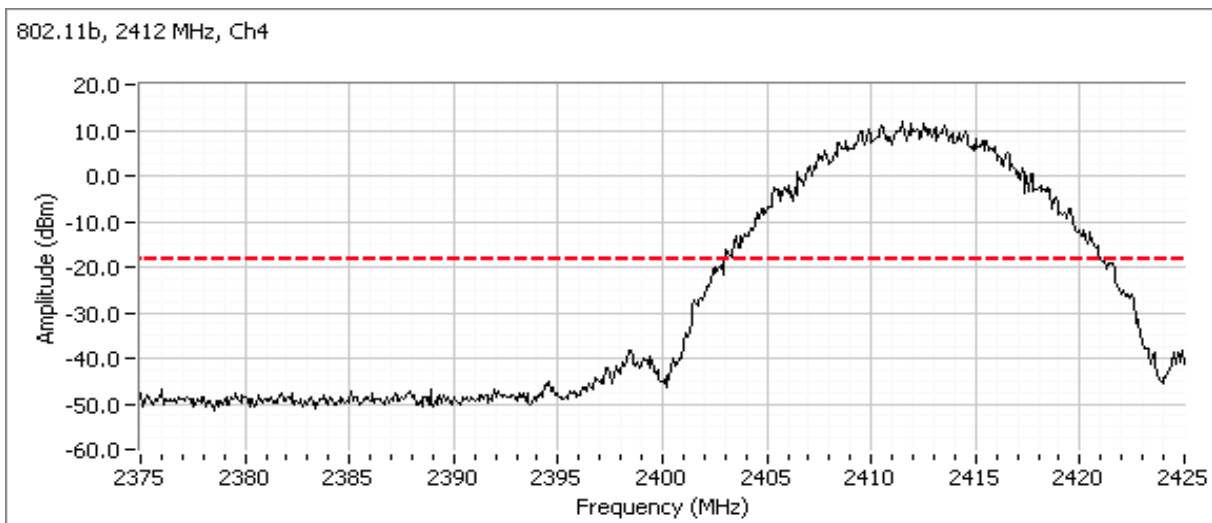
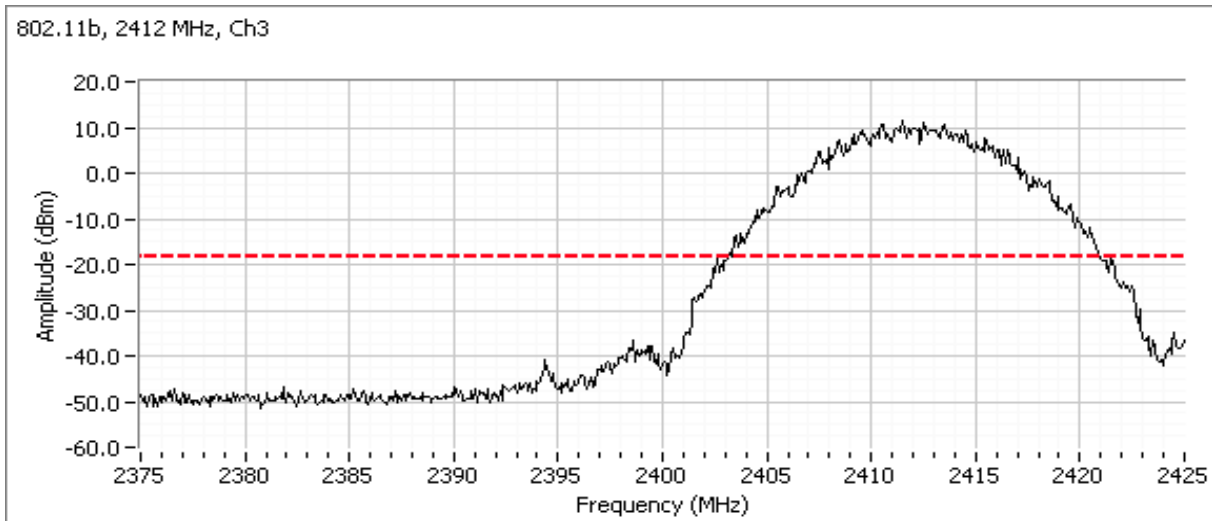
Additional plot showing compliance with -30 dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

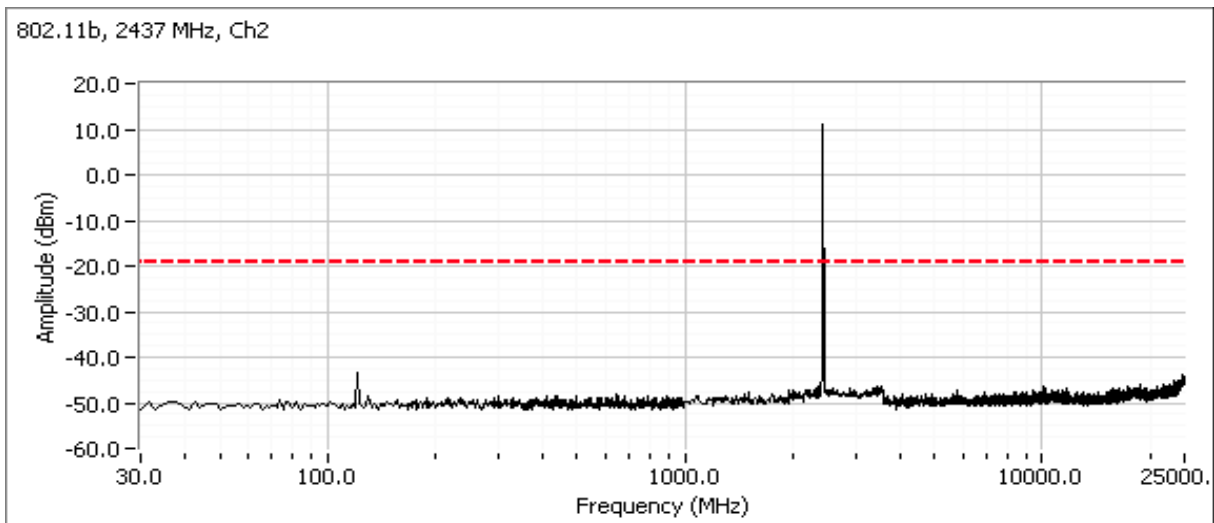
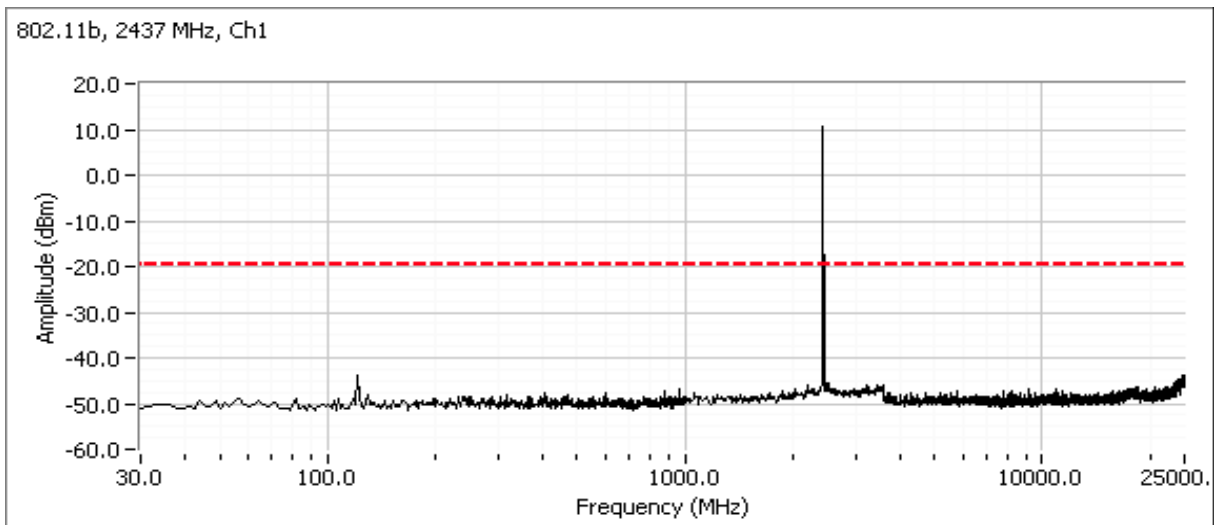




EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

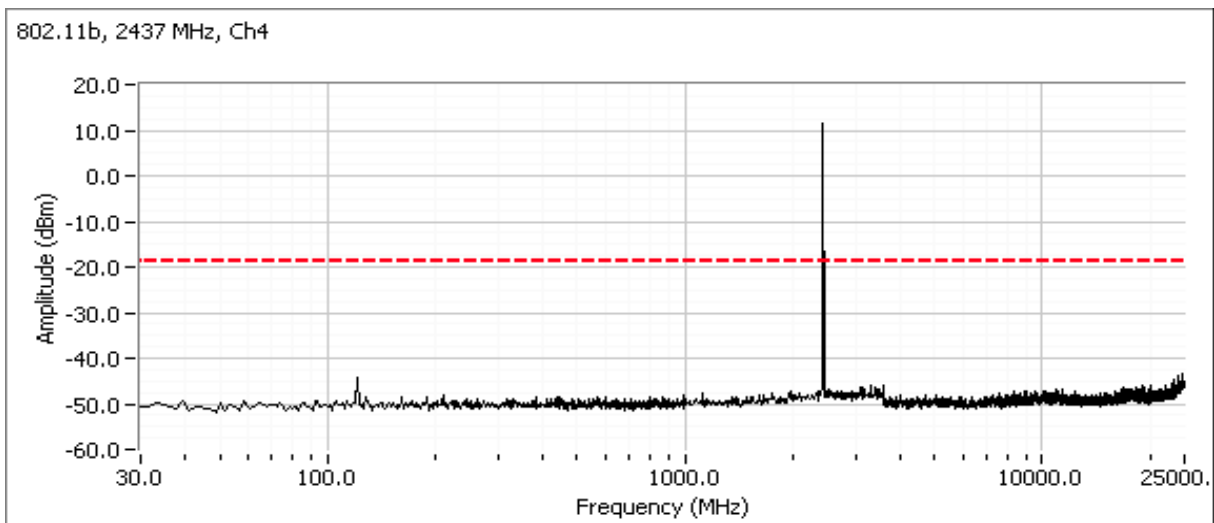
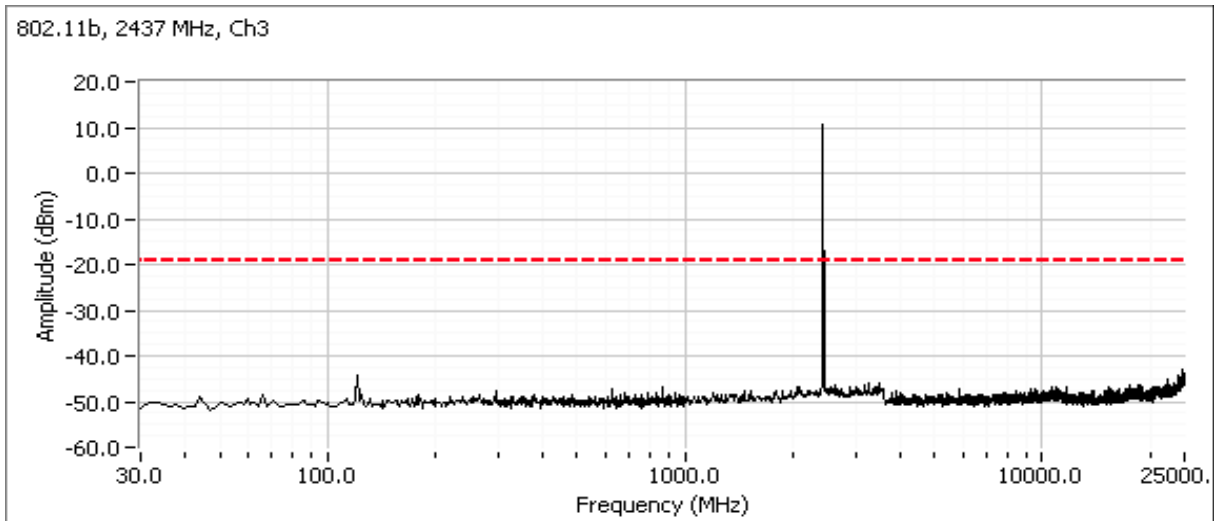
Plots for center channel





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

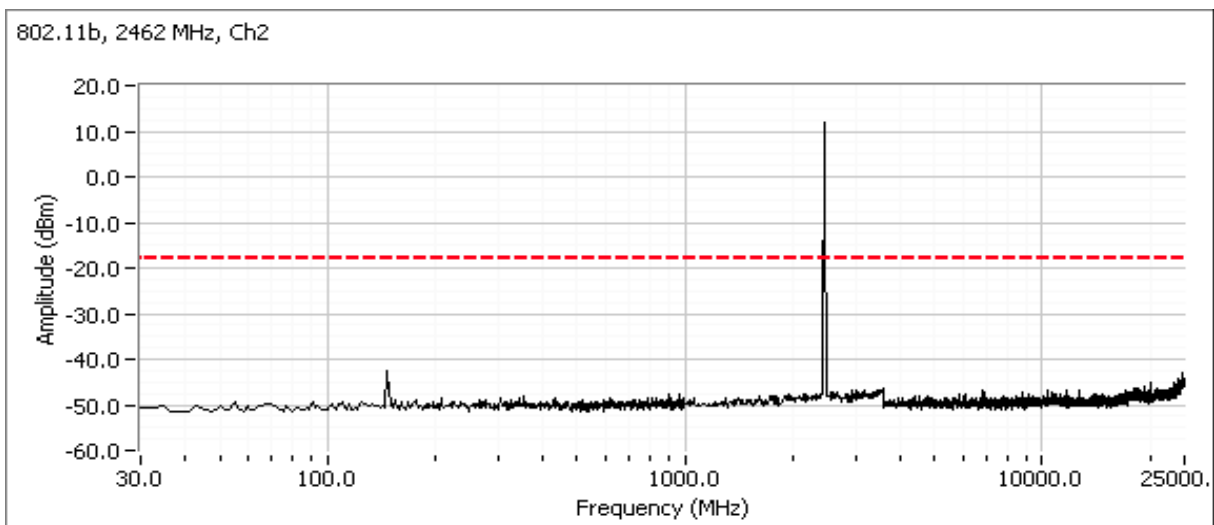
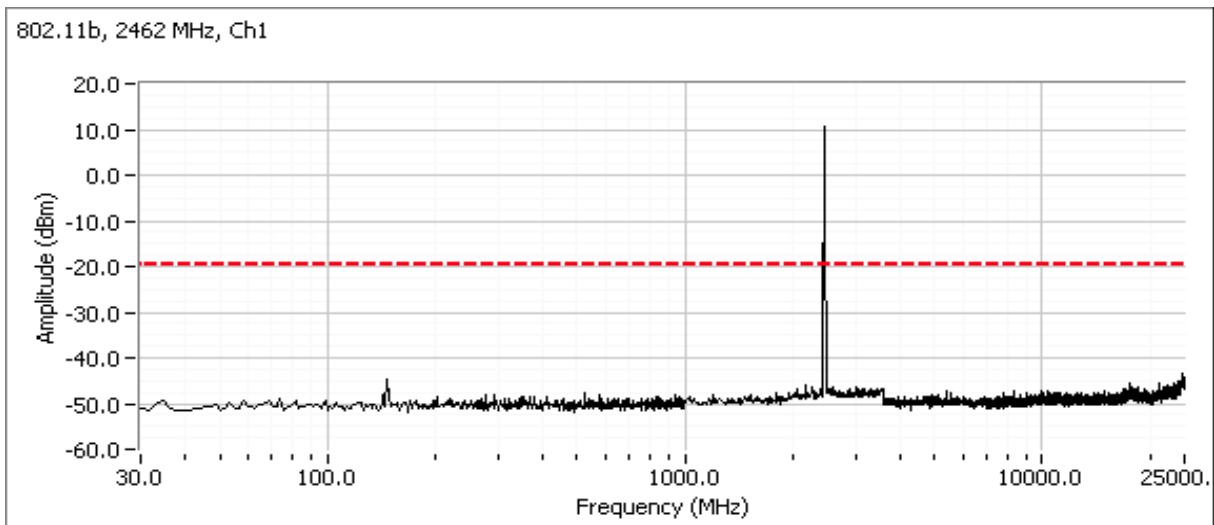




EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

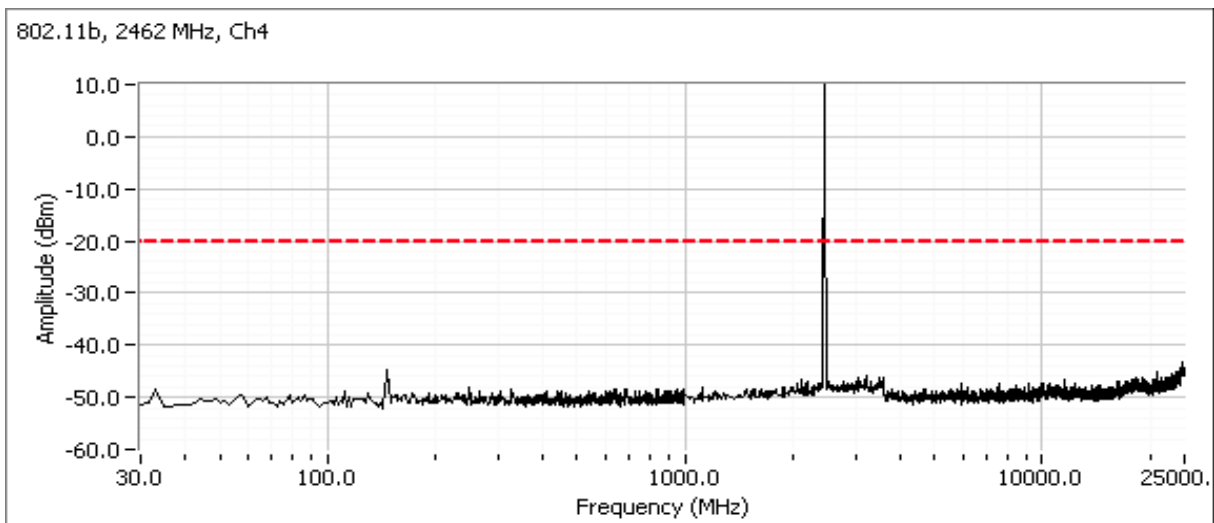
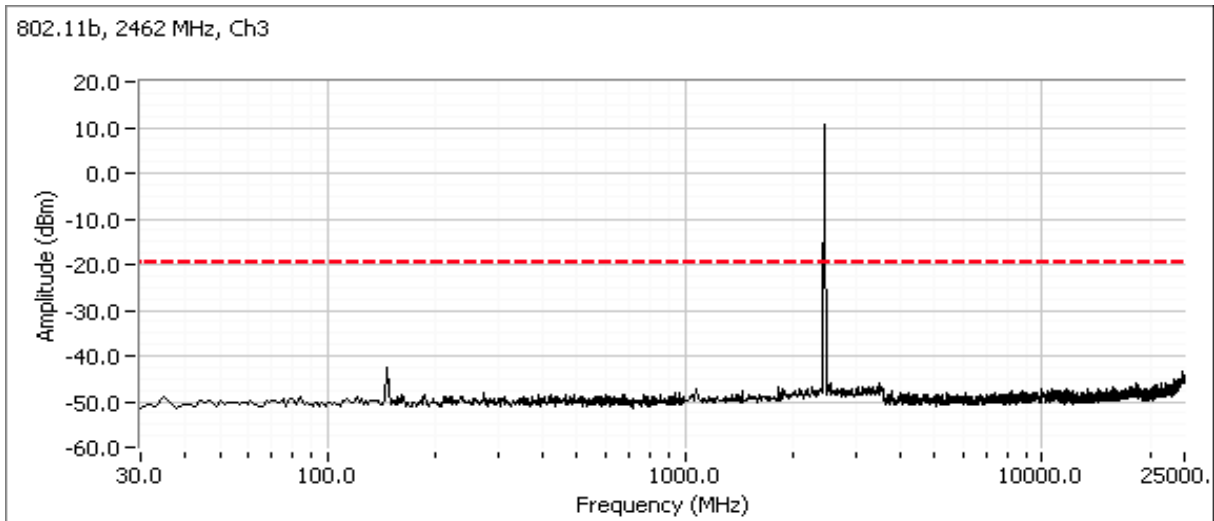
Plots for high channel





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

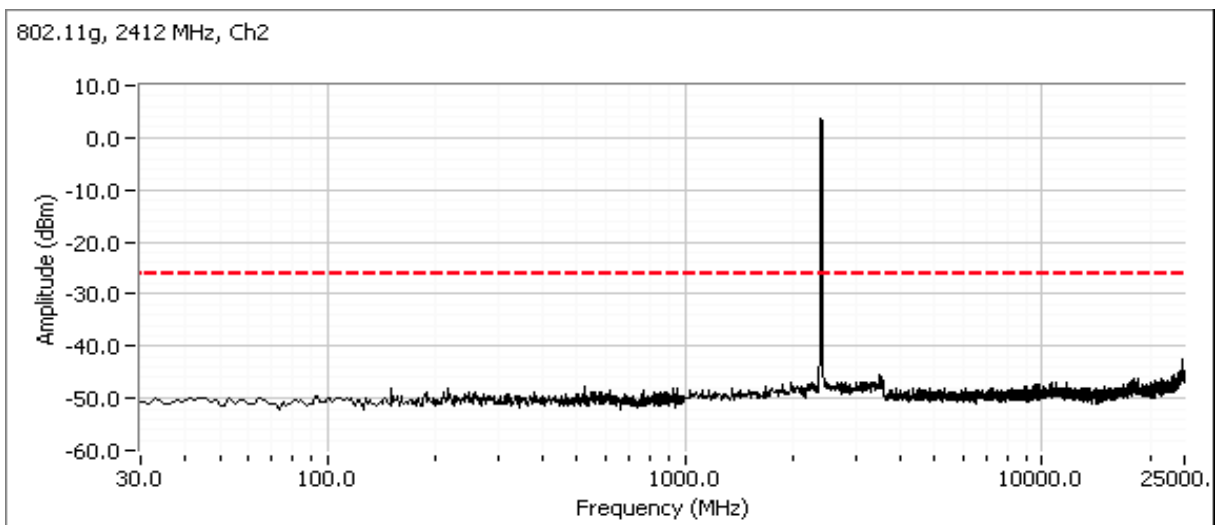
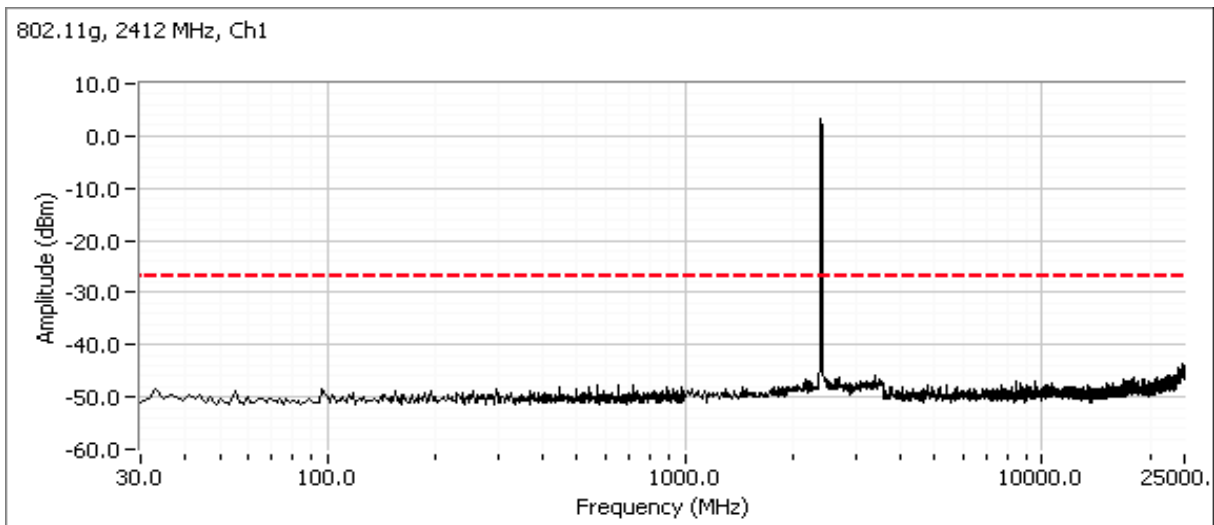




EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

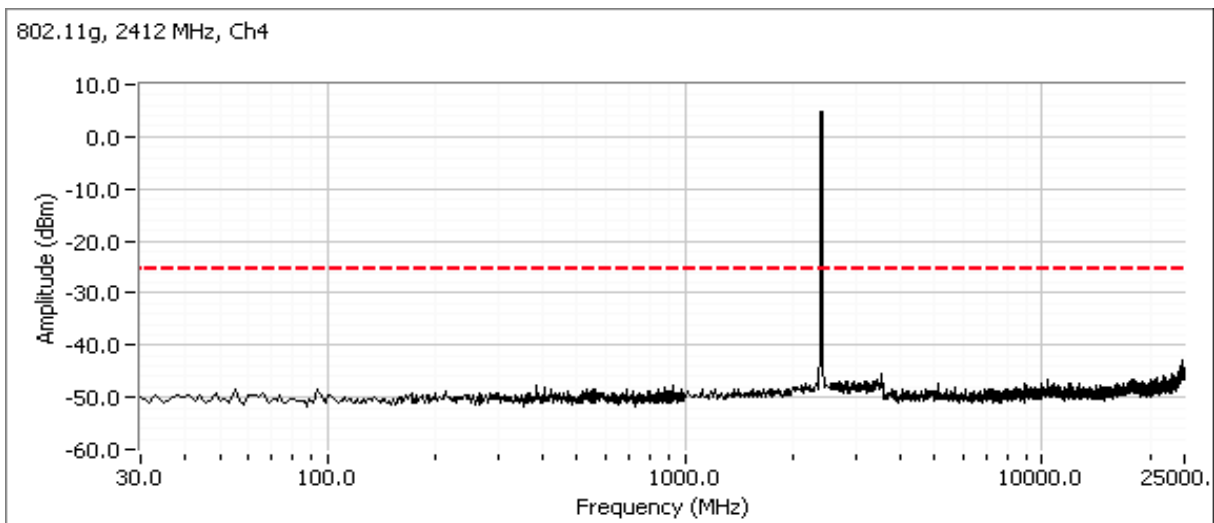
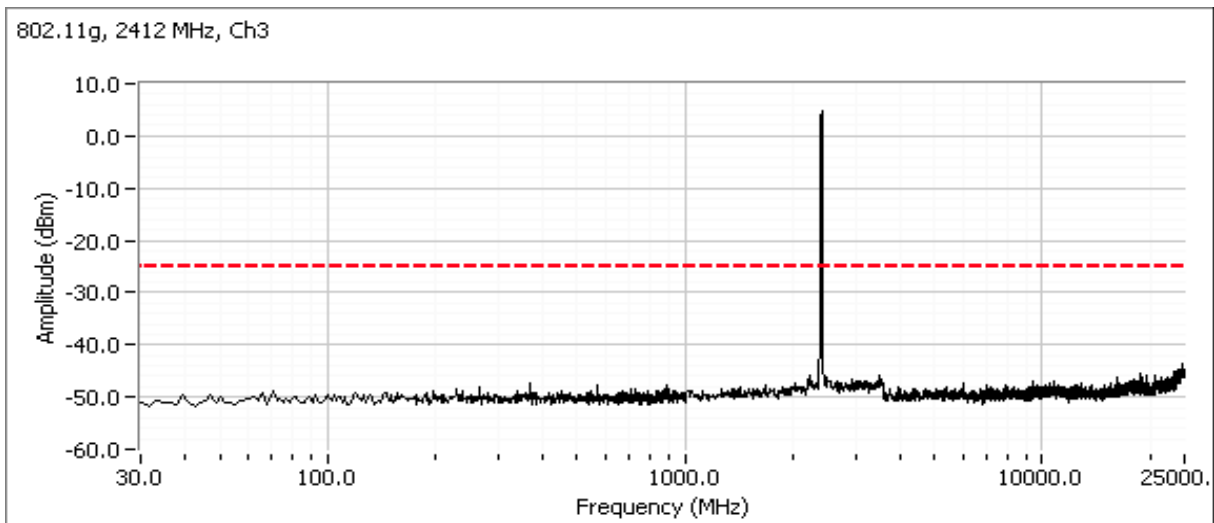
Plots for low channel





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

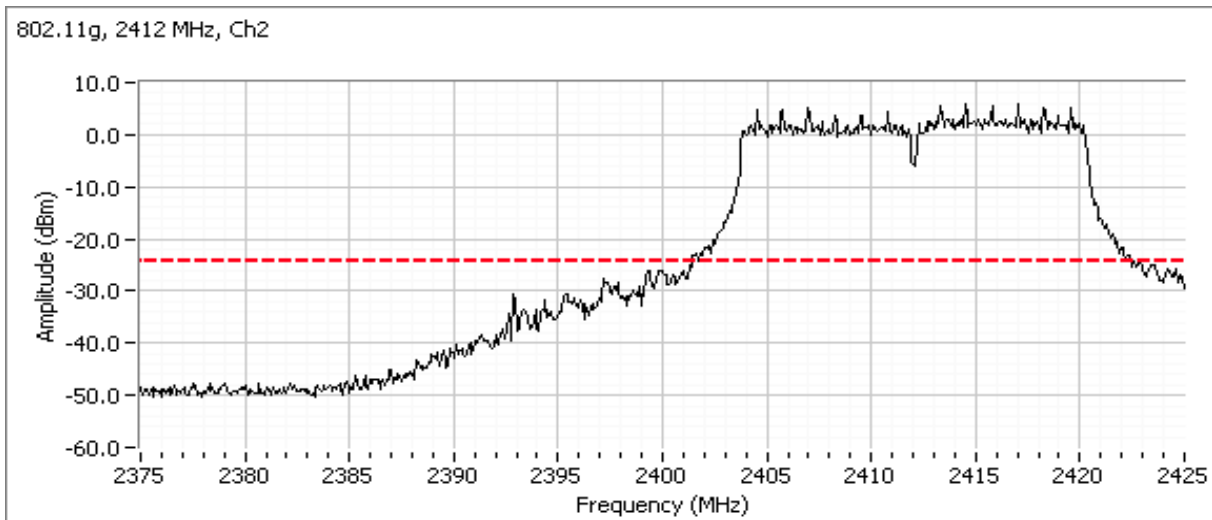
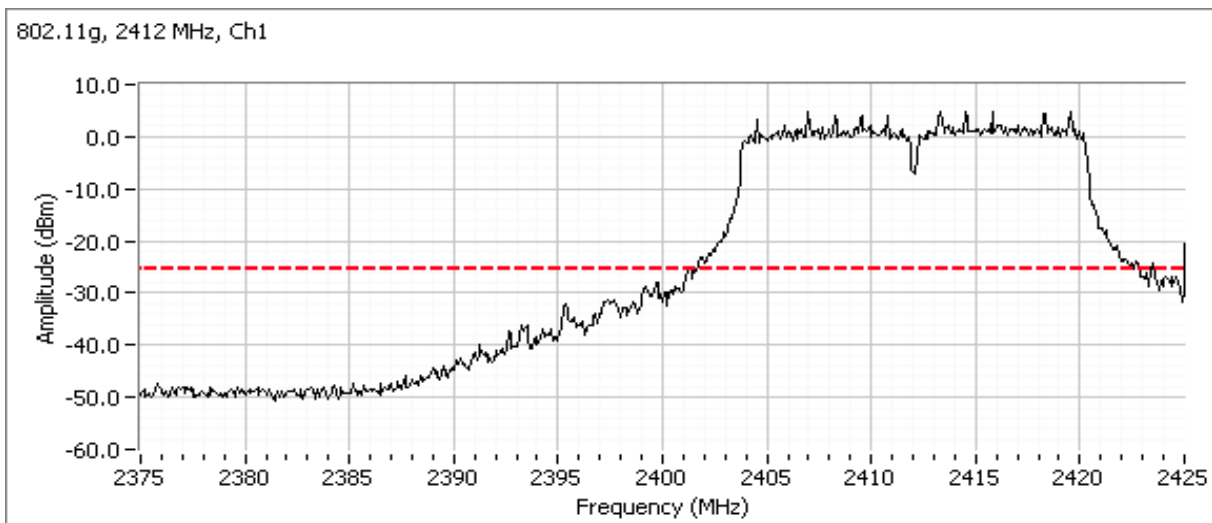




EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

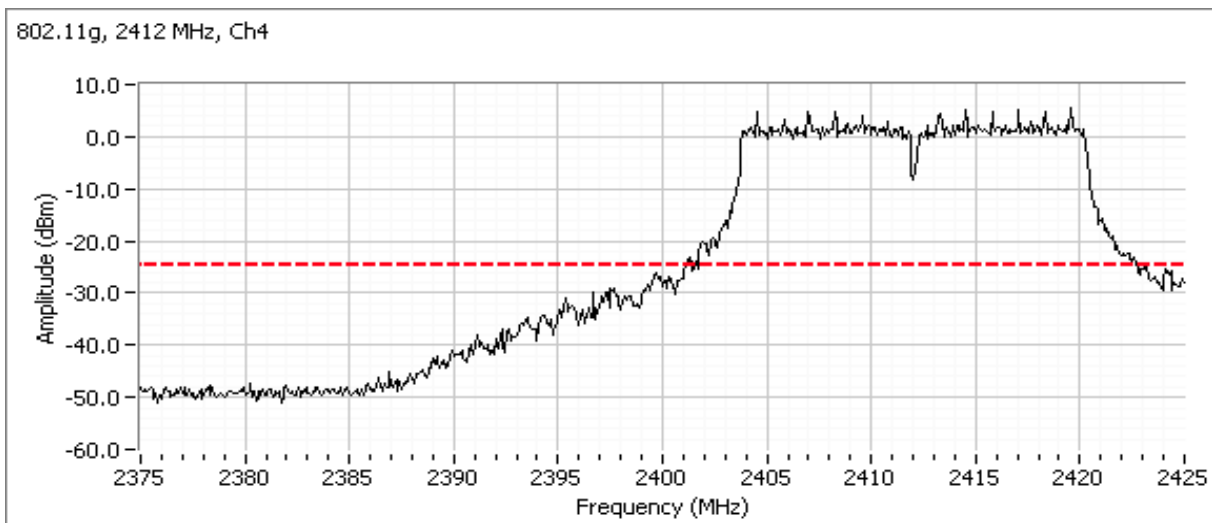
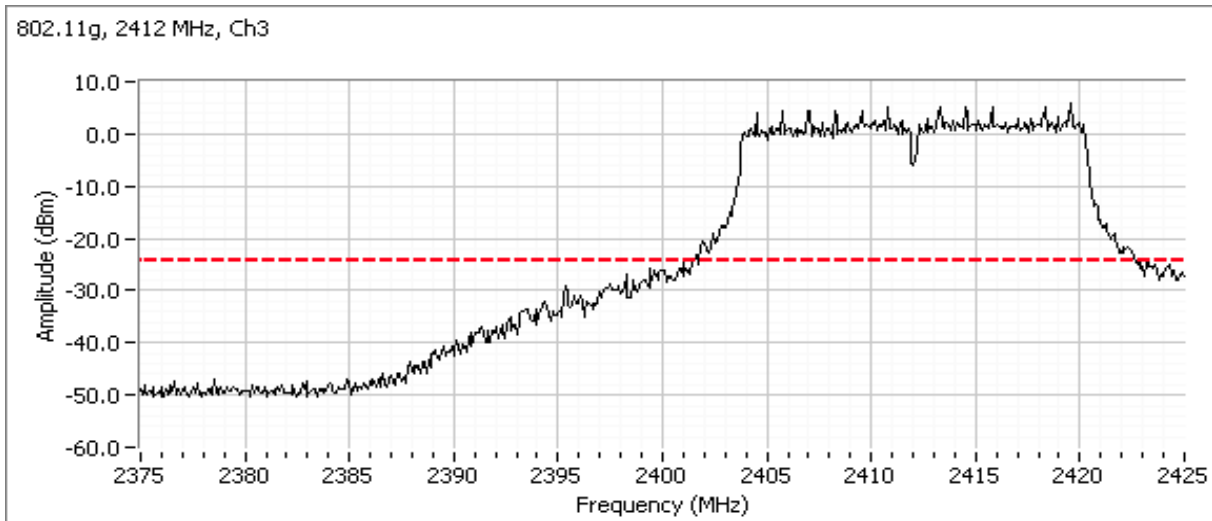
Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

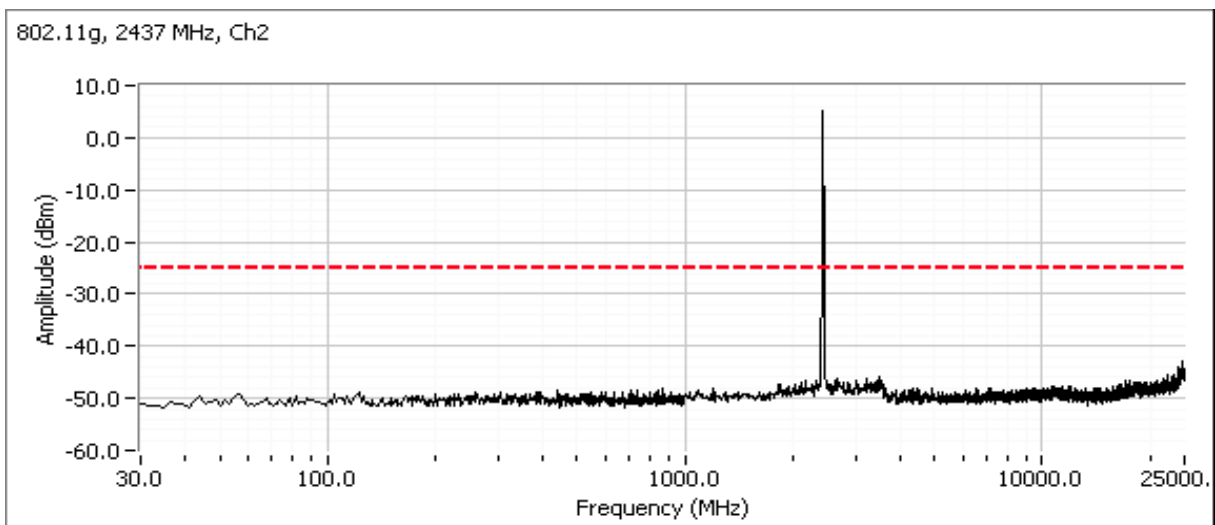
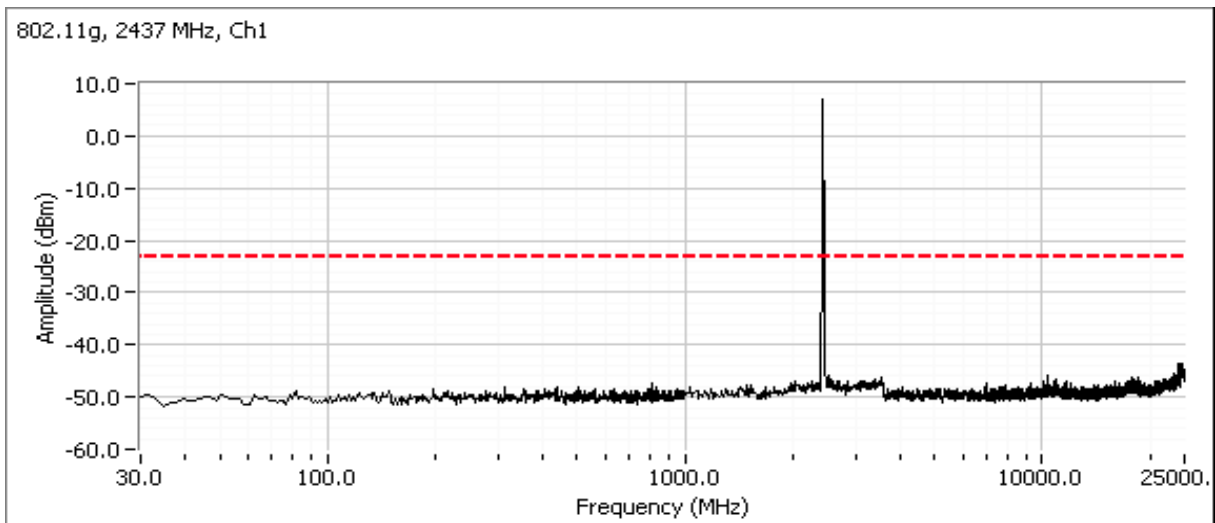




EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

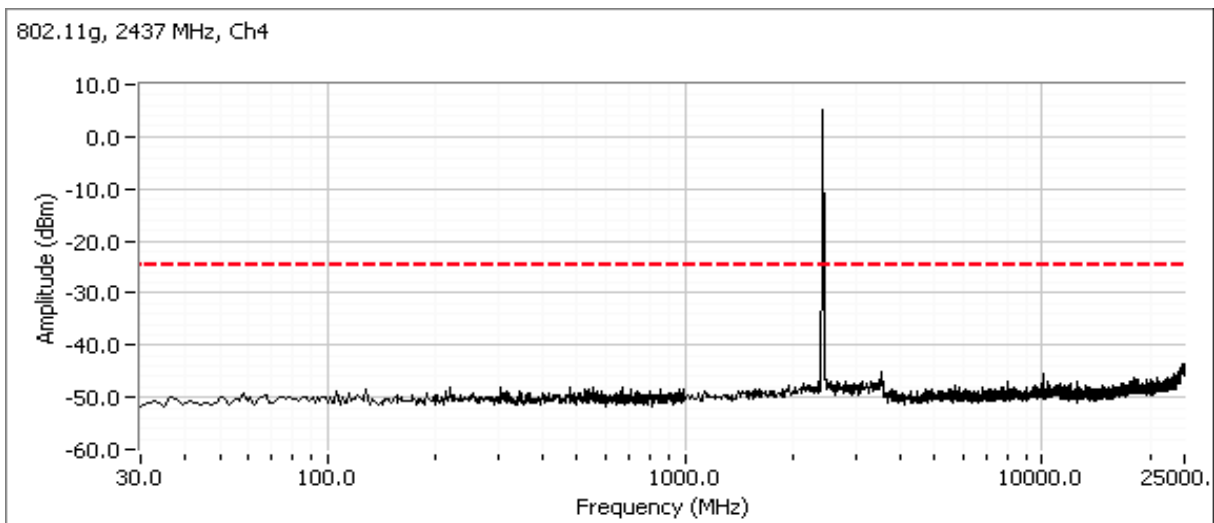
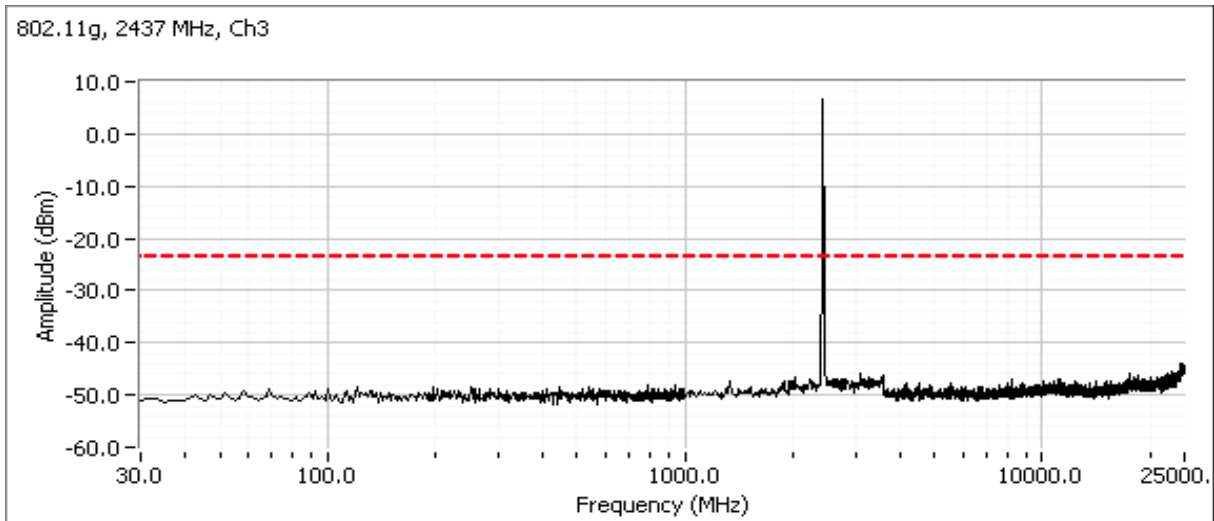
Plots for center channel





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

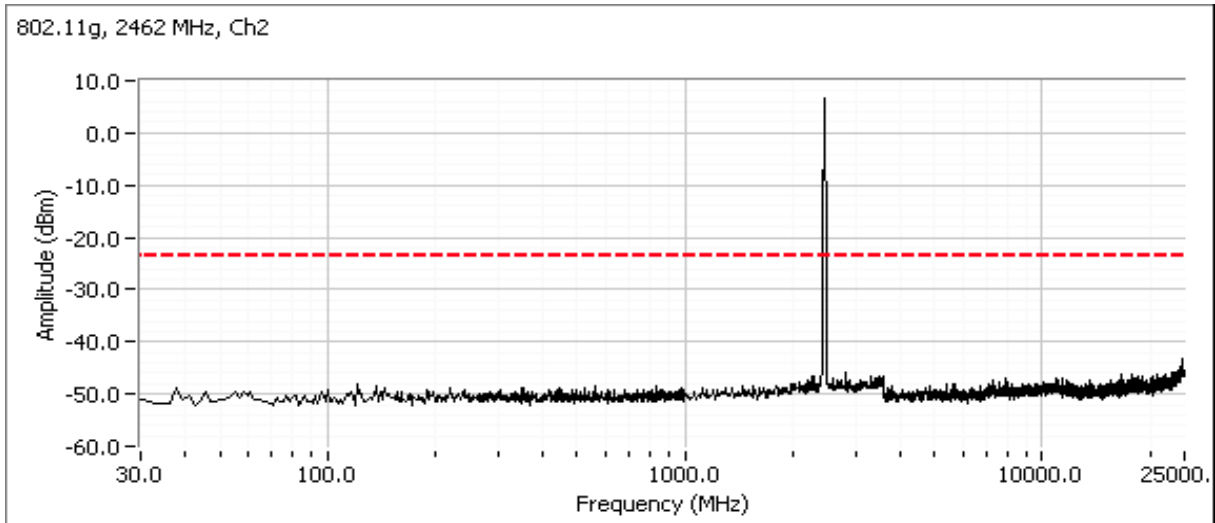
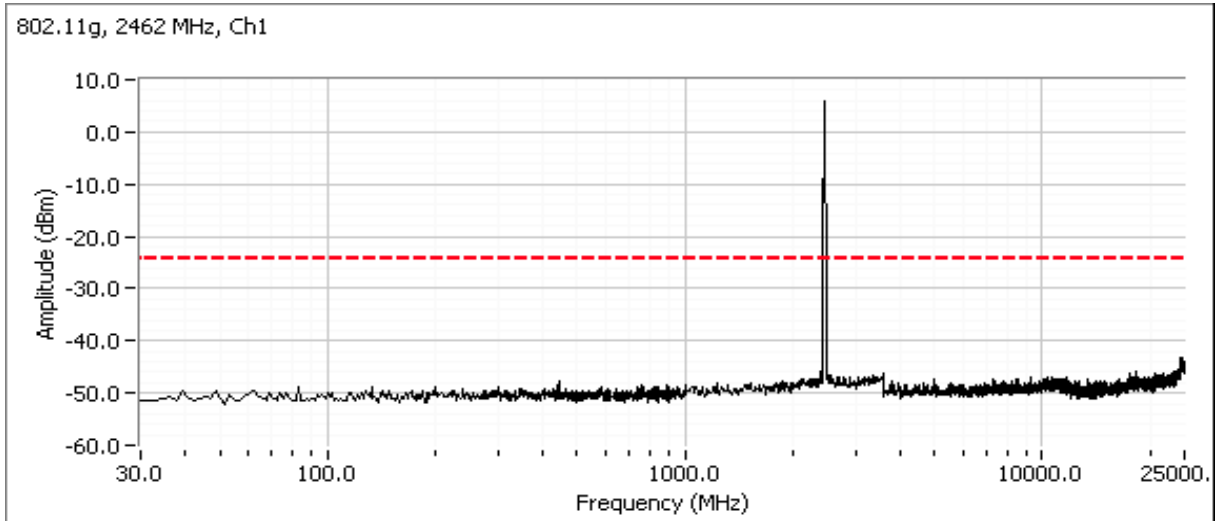




EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

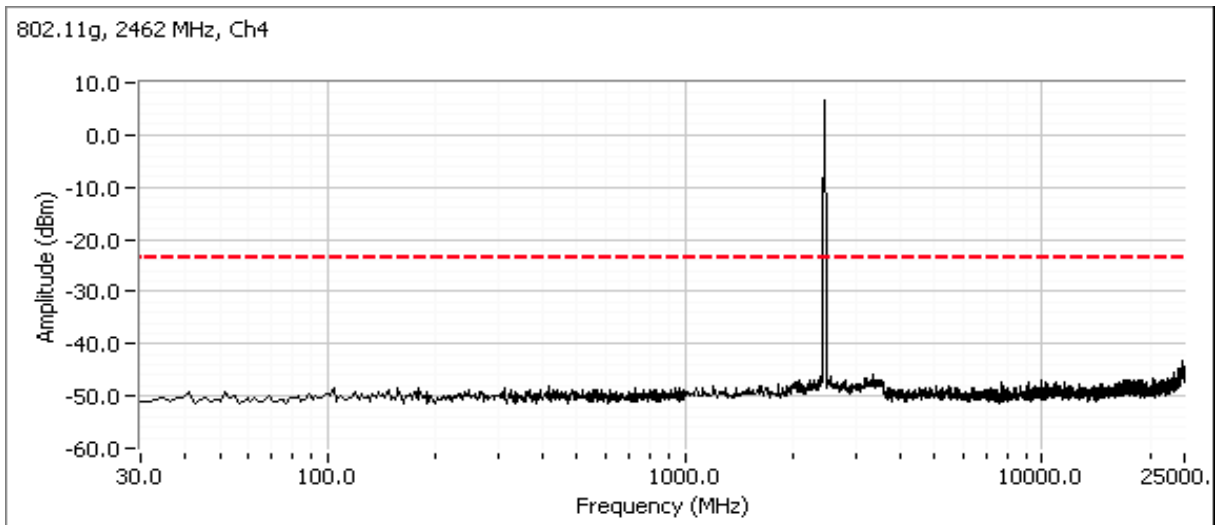
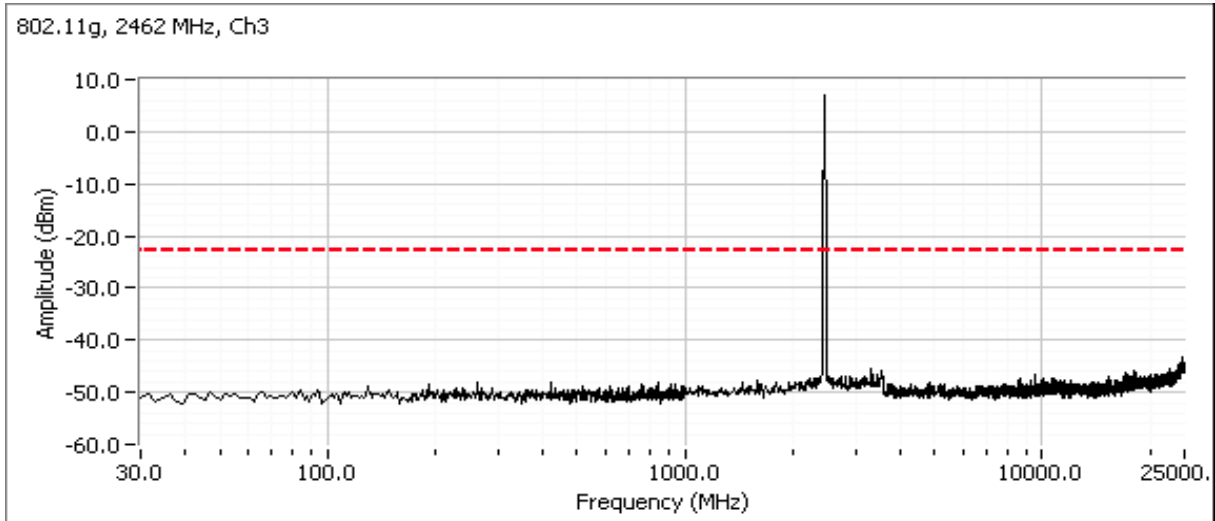
Plots for high channel





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

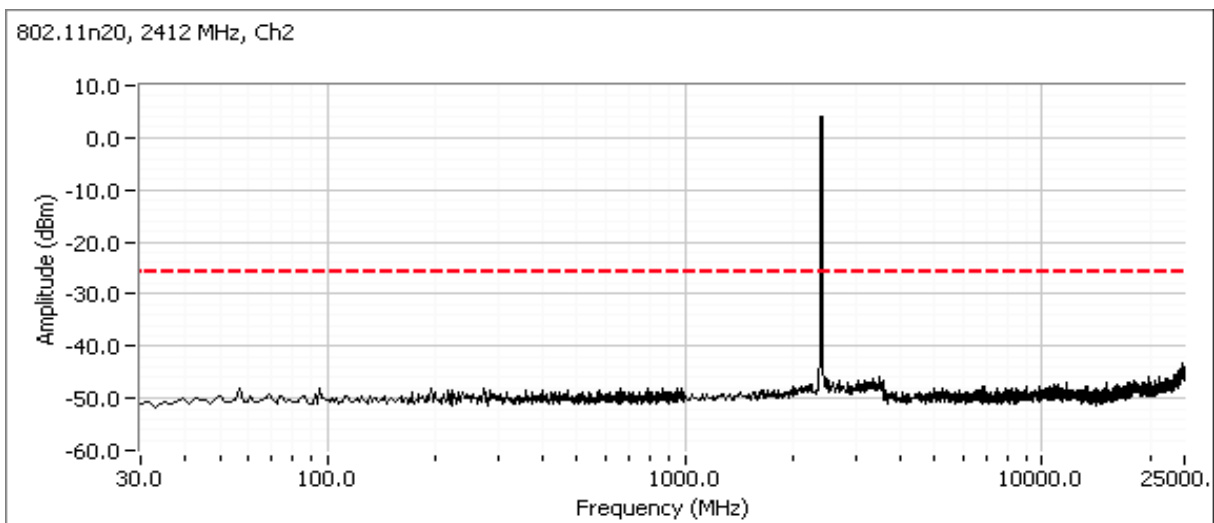
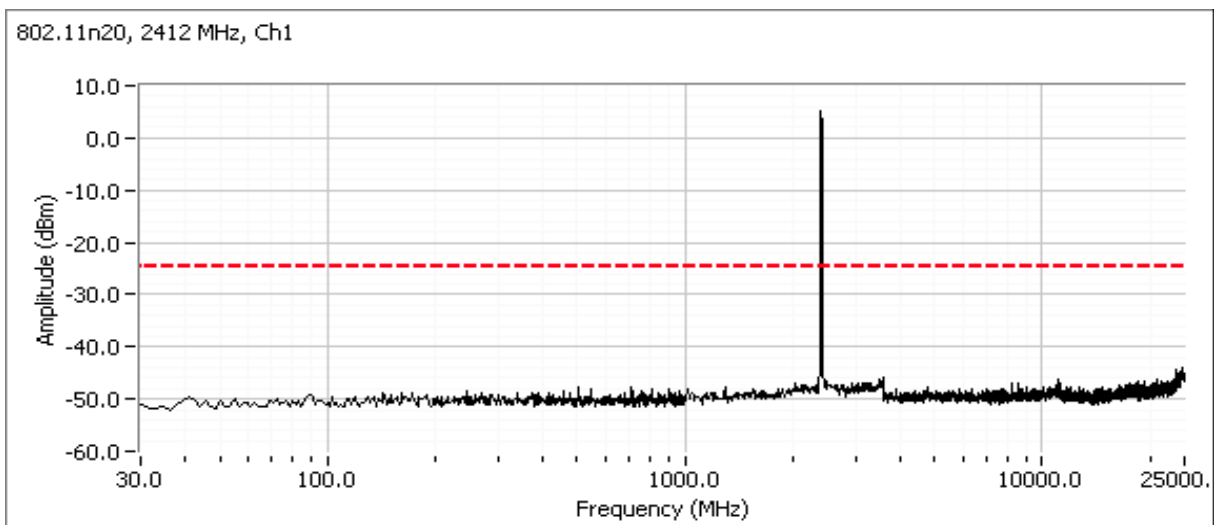




EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

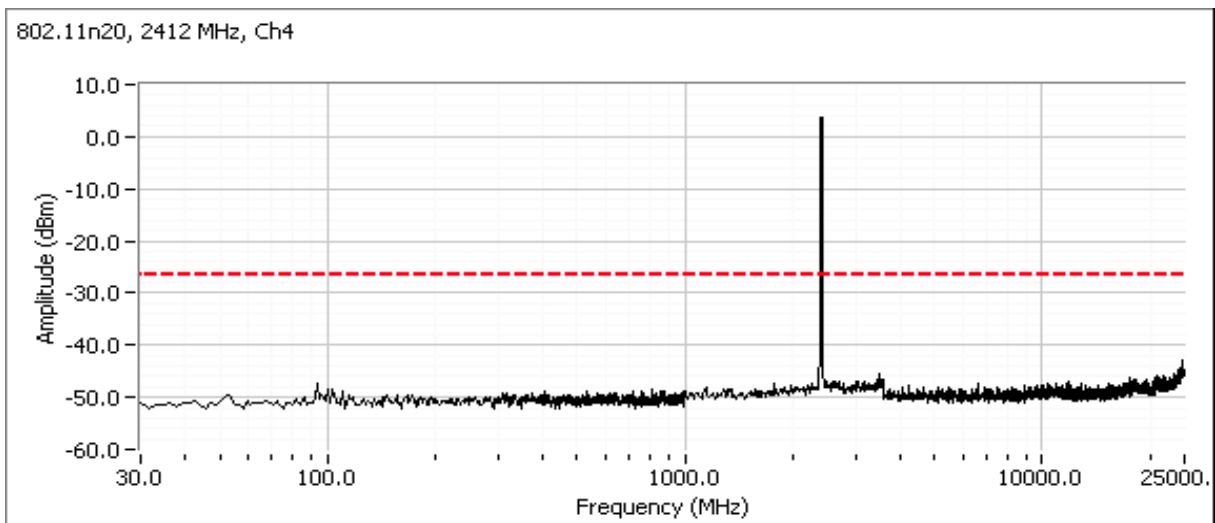
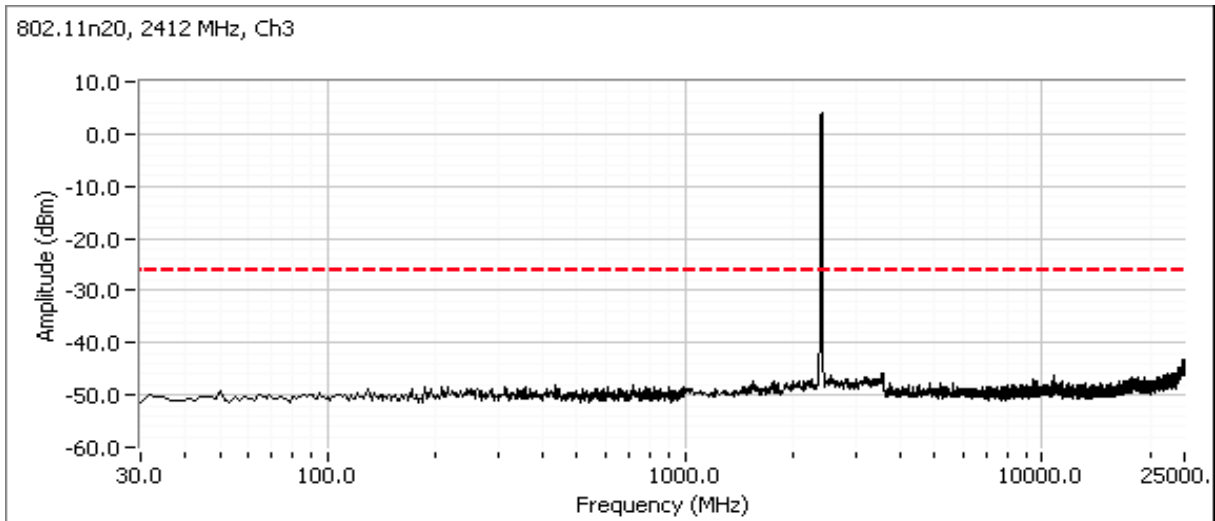
Plots for low channel





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

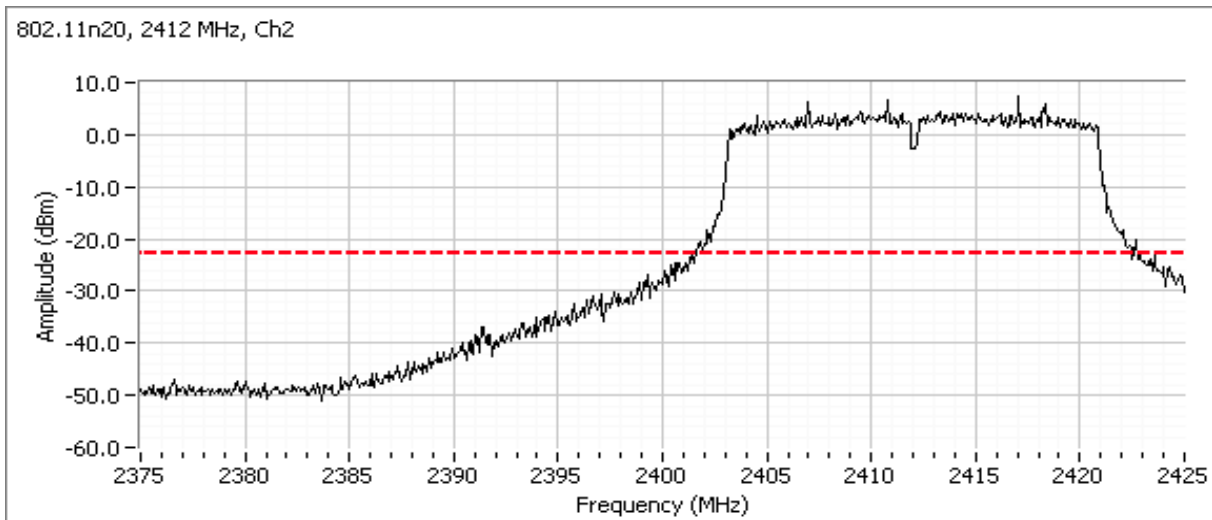
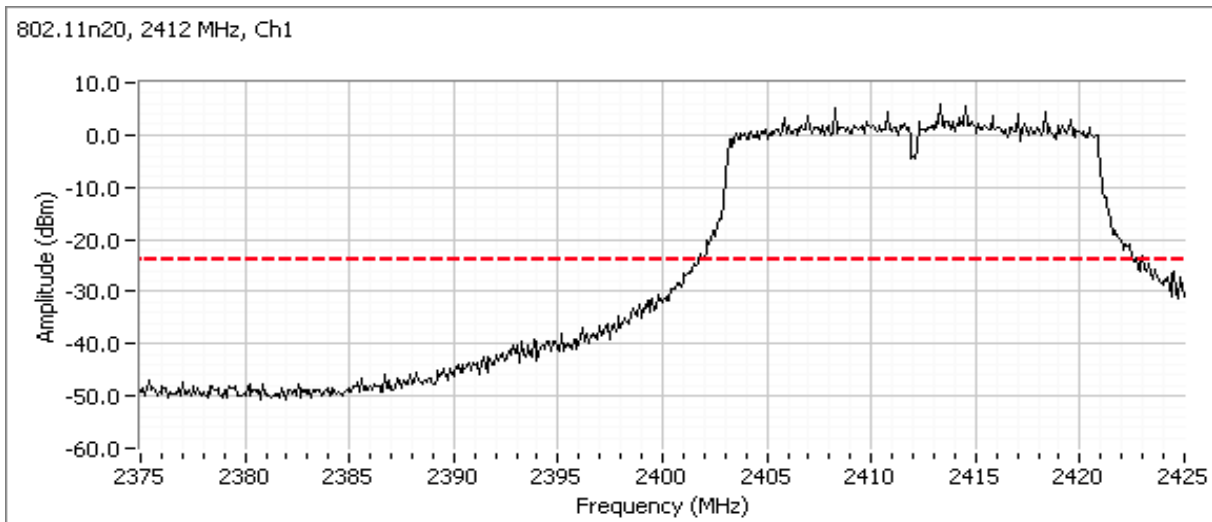




EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

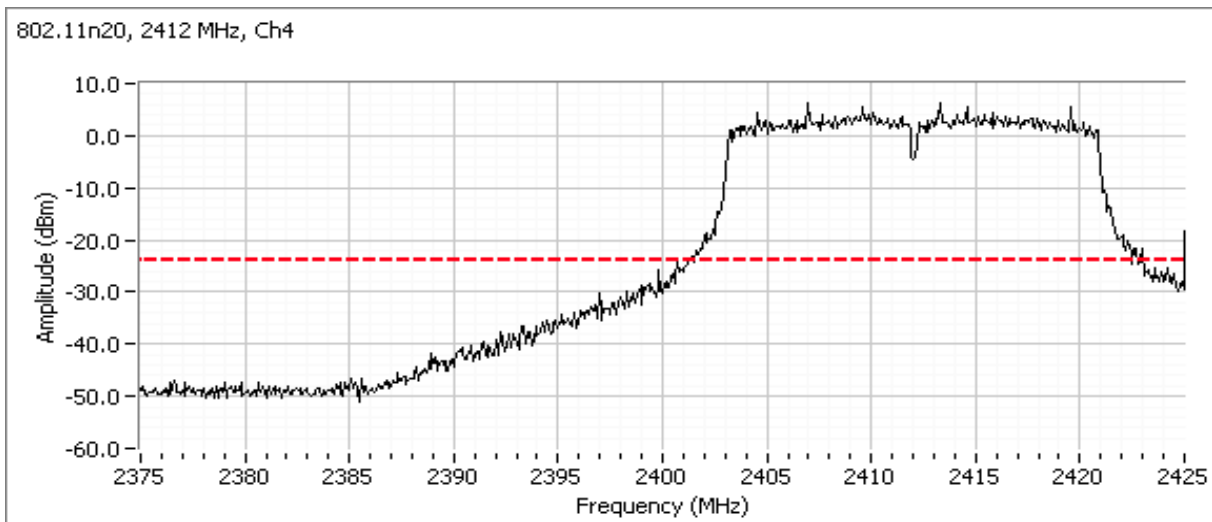
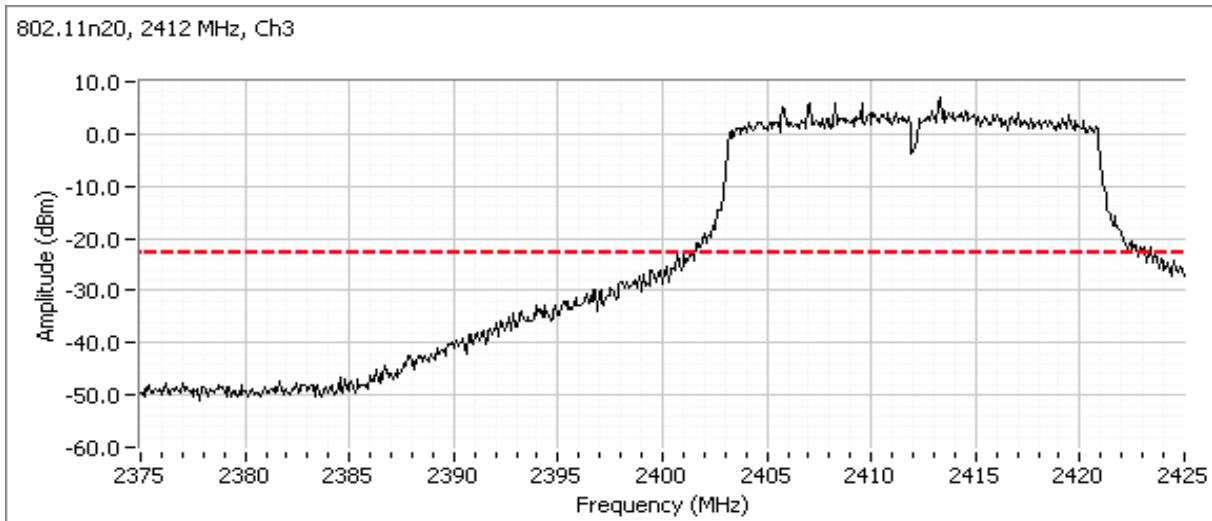
Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

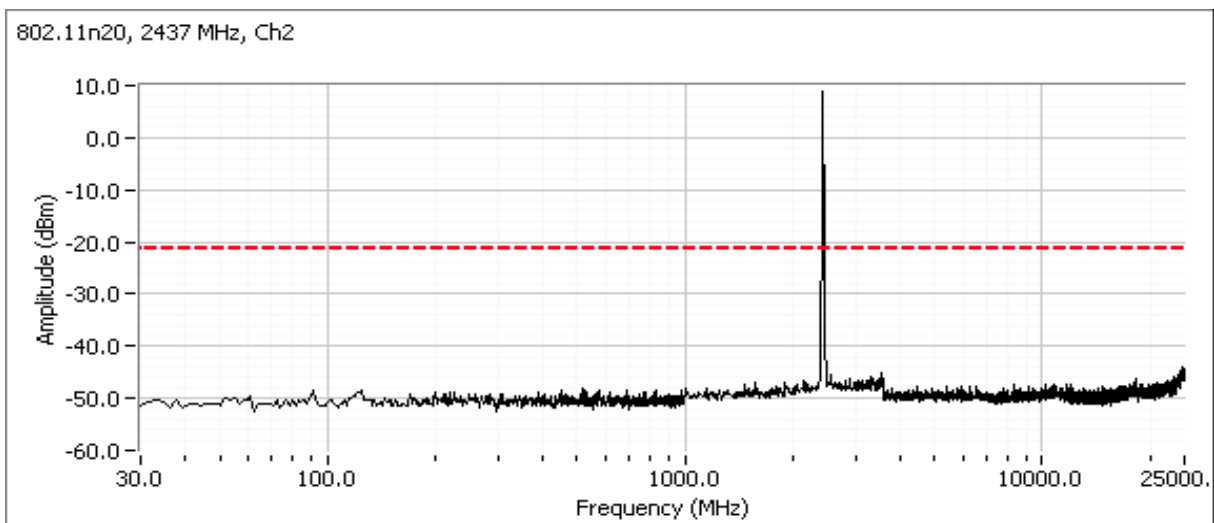
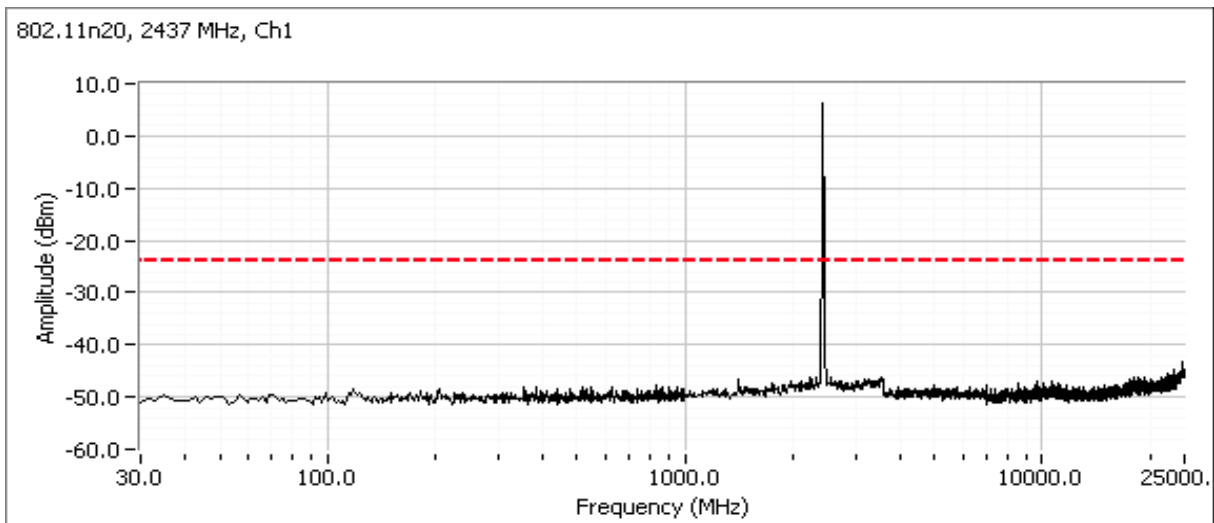




EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

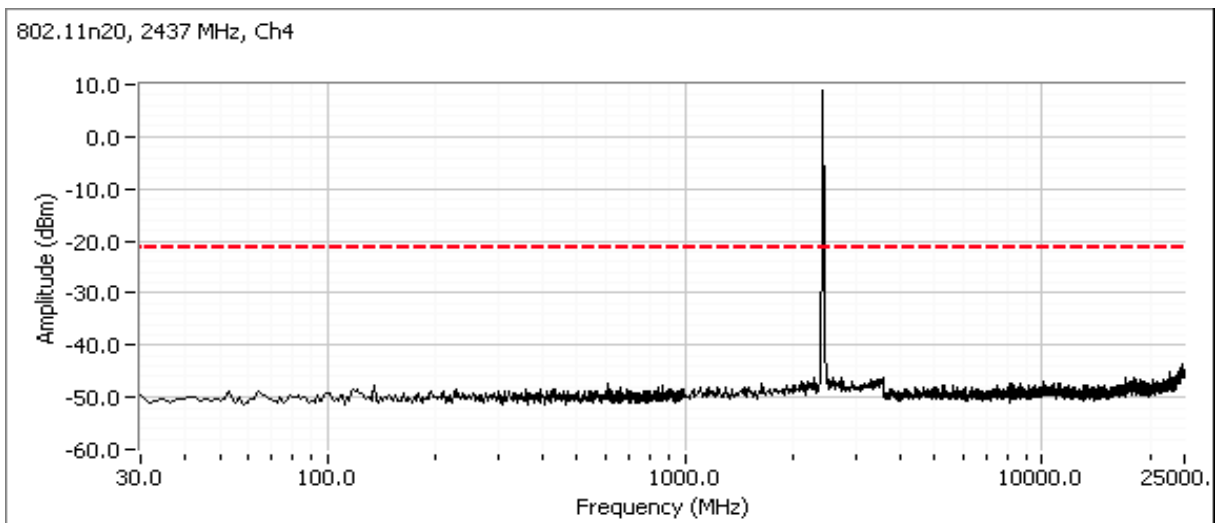
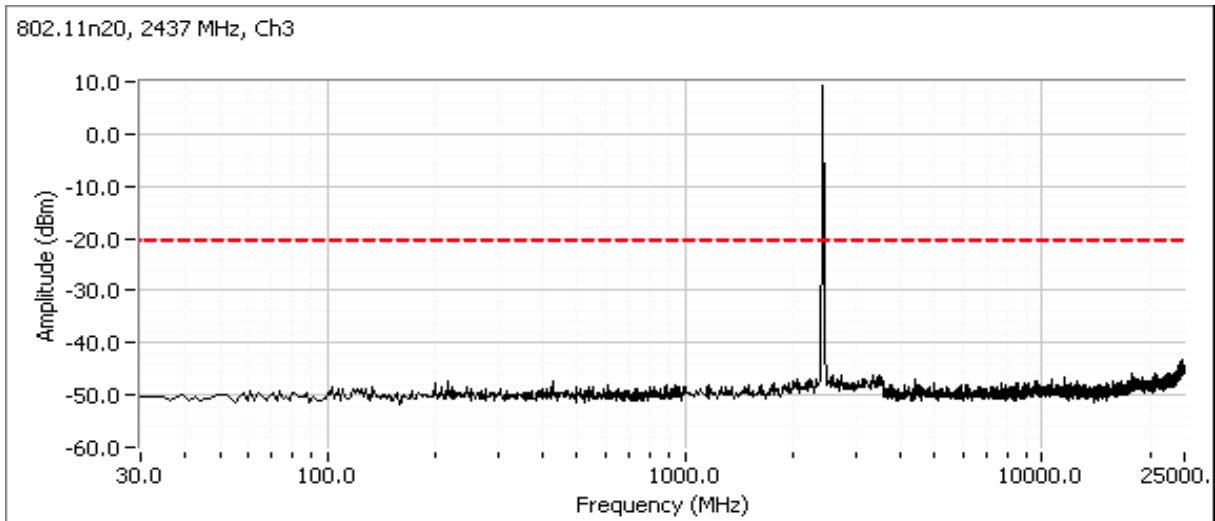
Plots for center channel





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

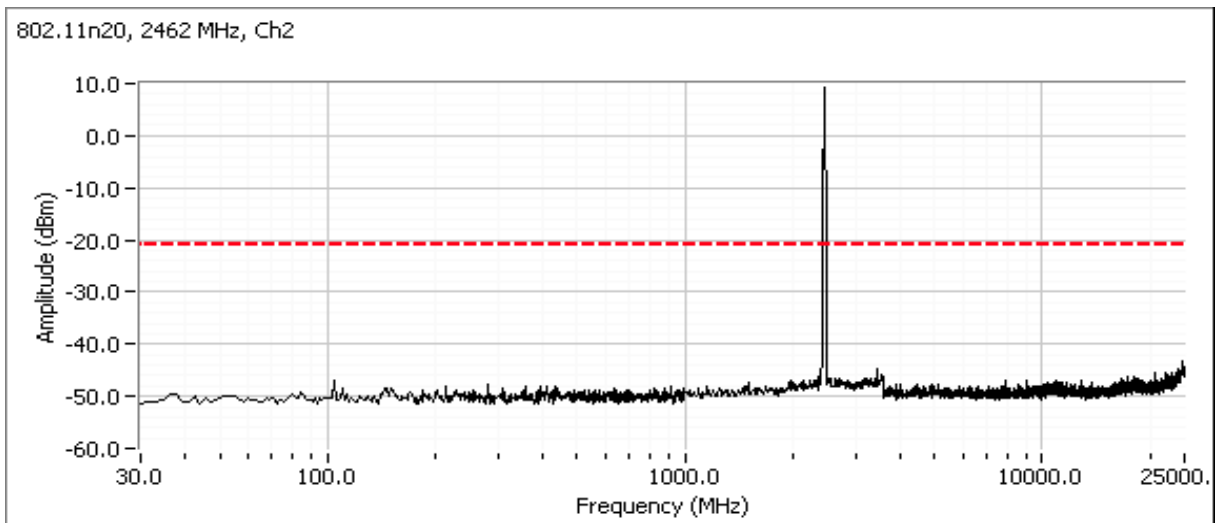
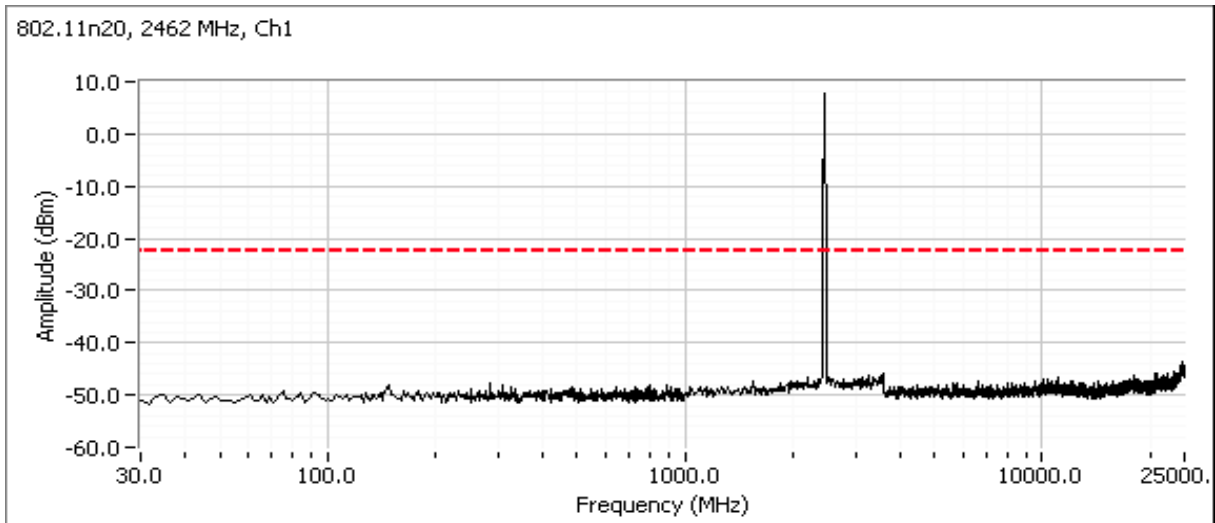




EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

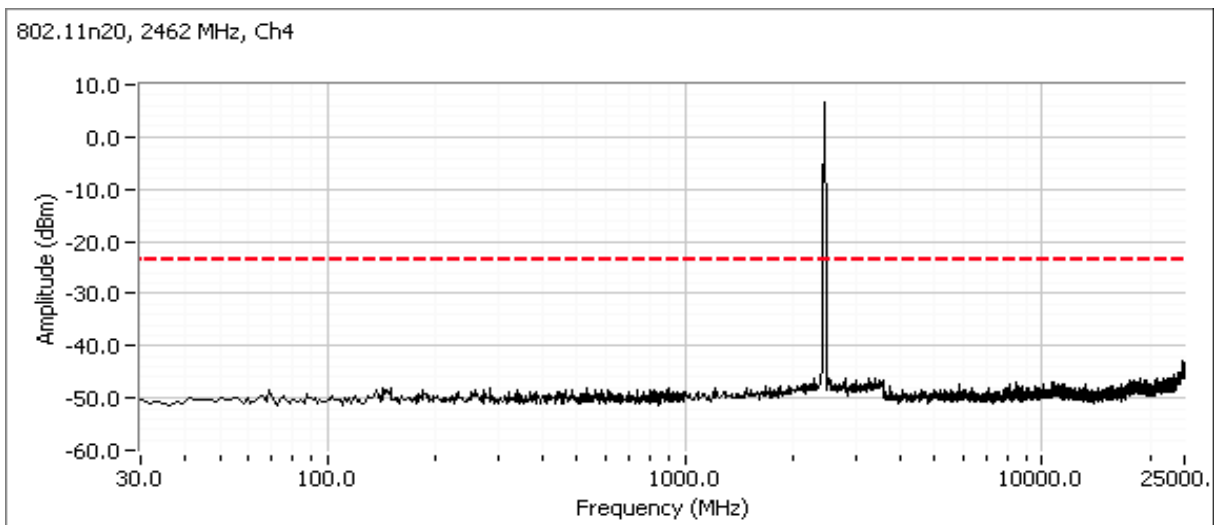
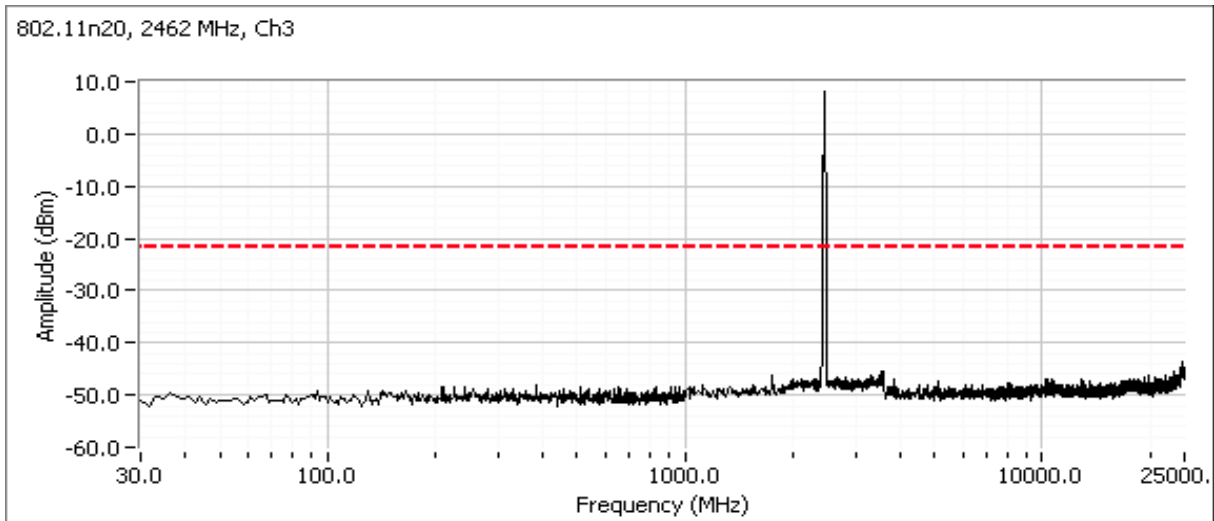
Plots for high channel





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

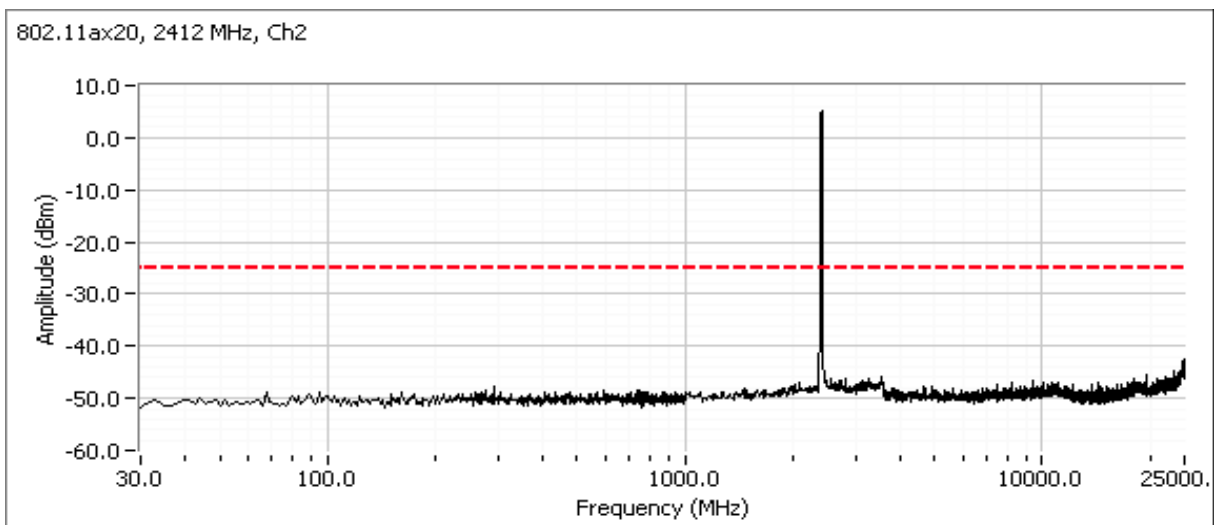
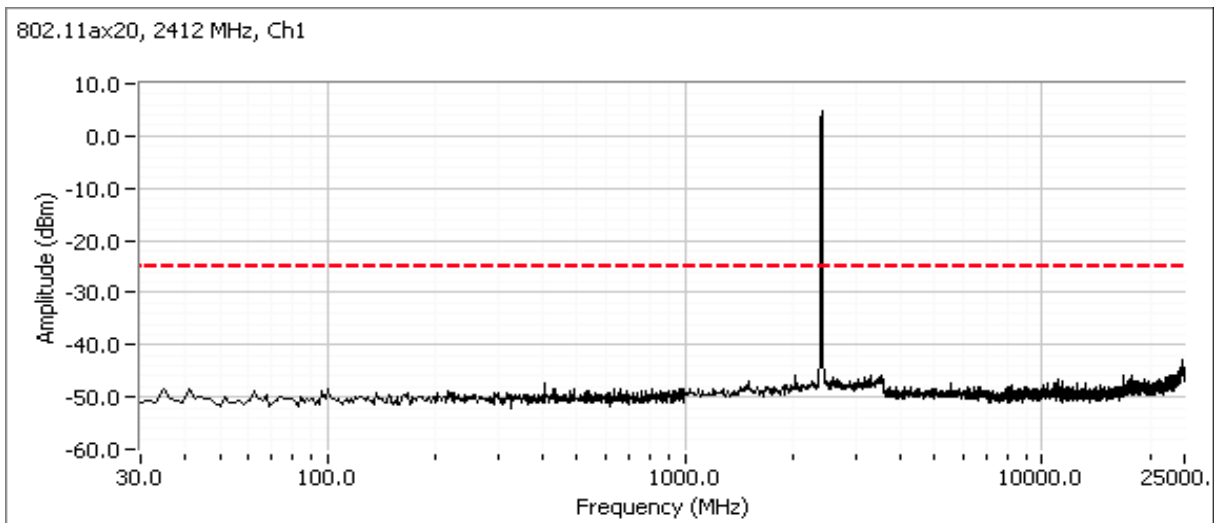




EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

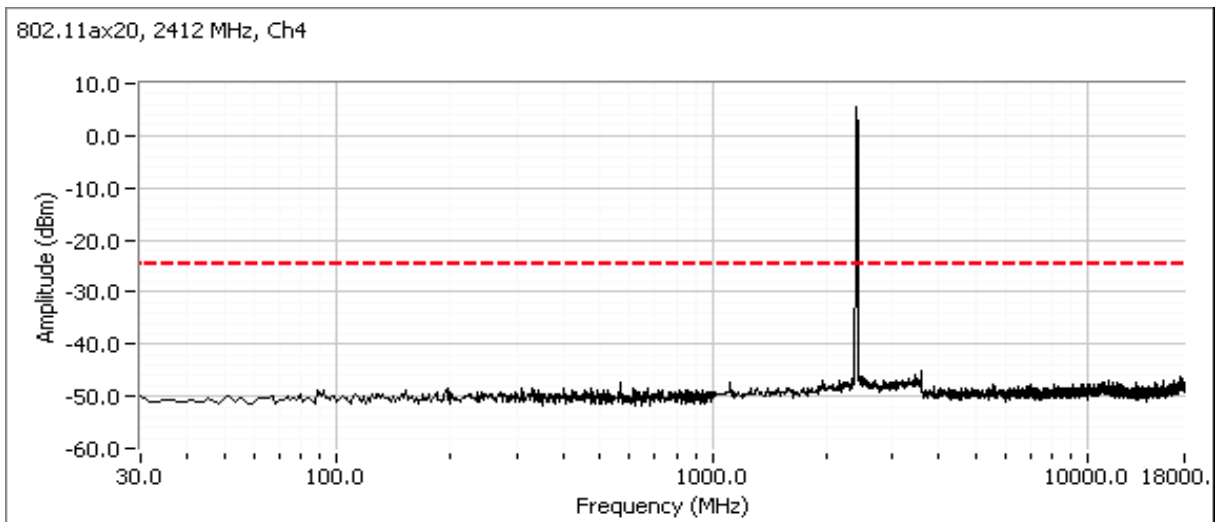
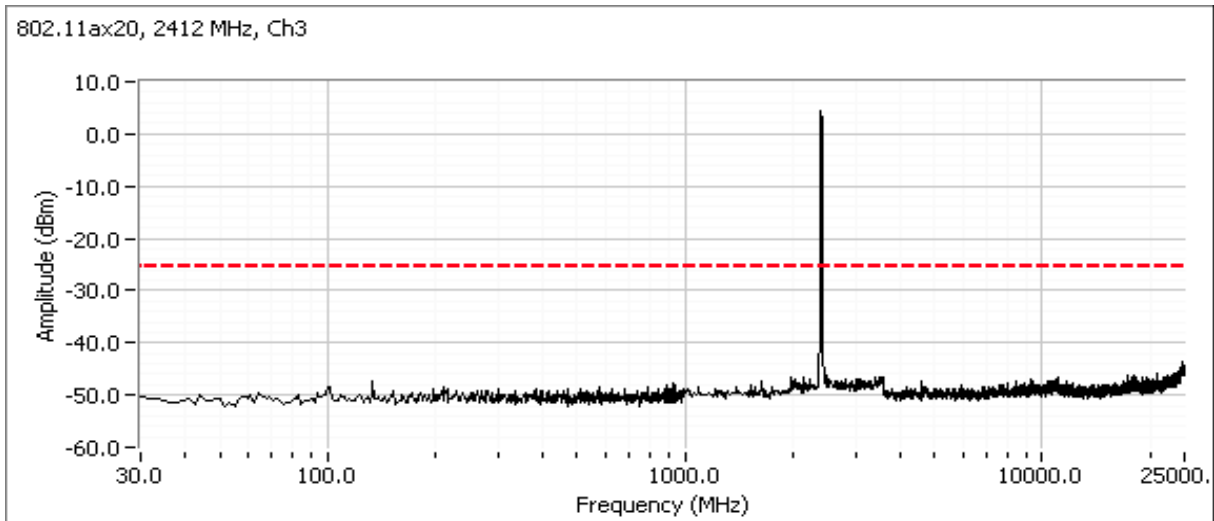
Plots for low channel





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

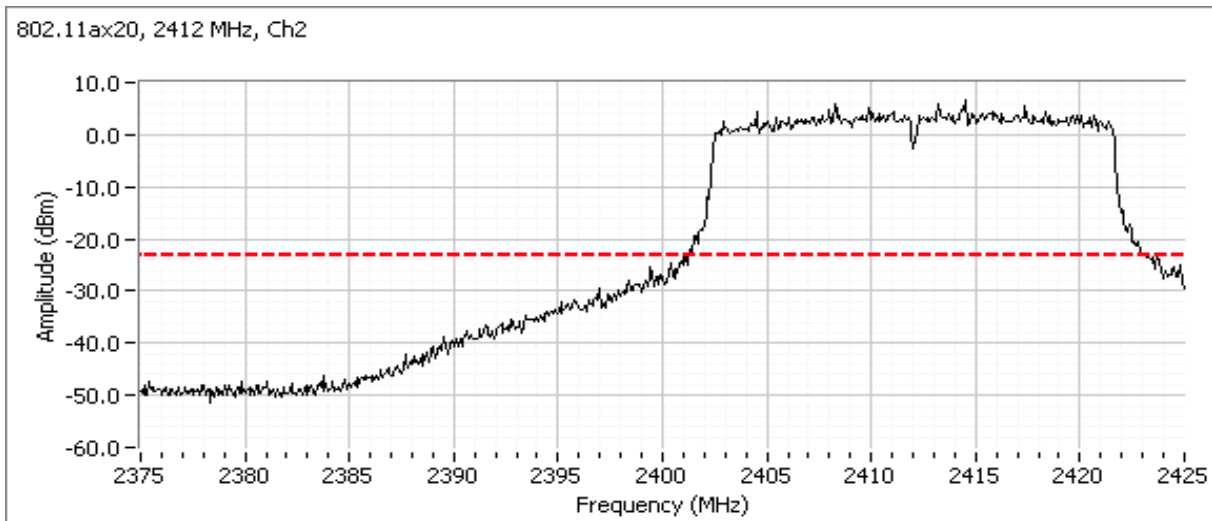
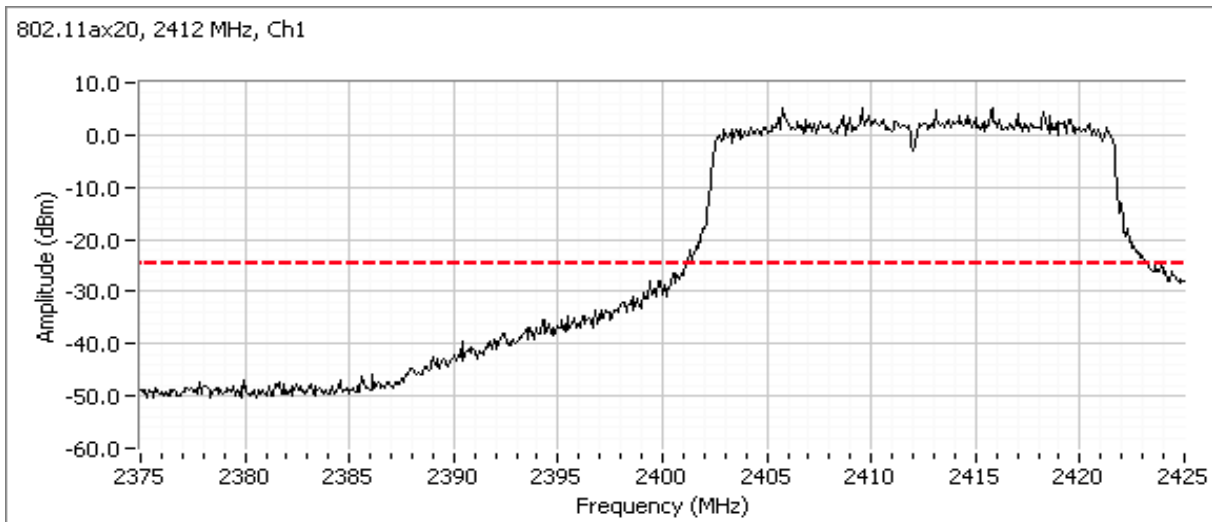




EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

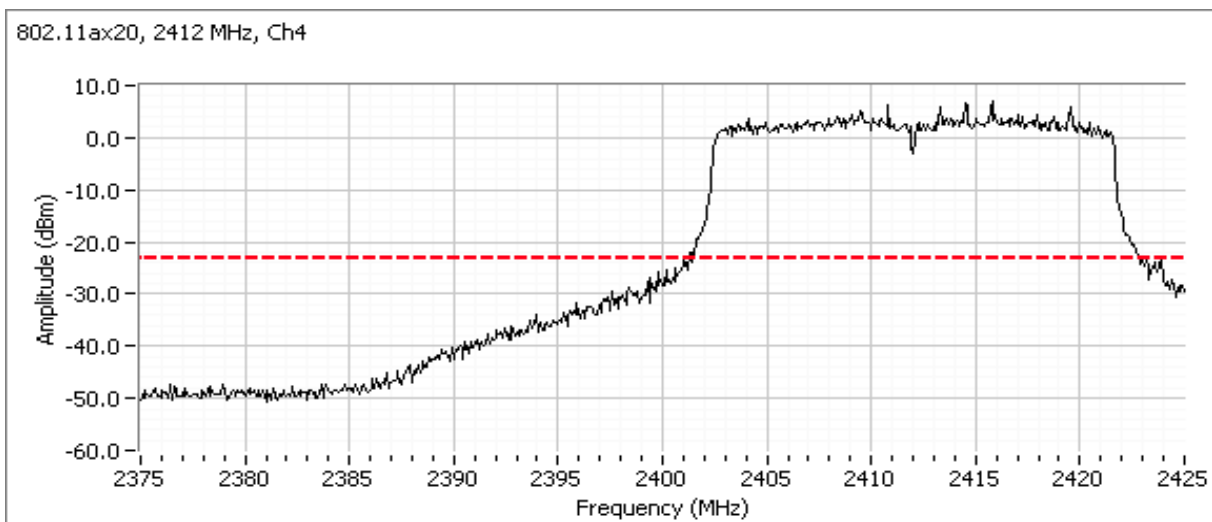
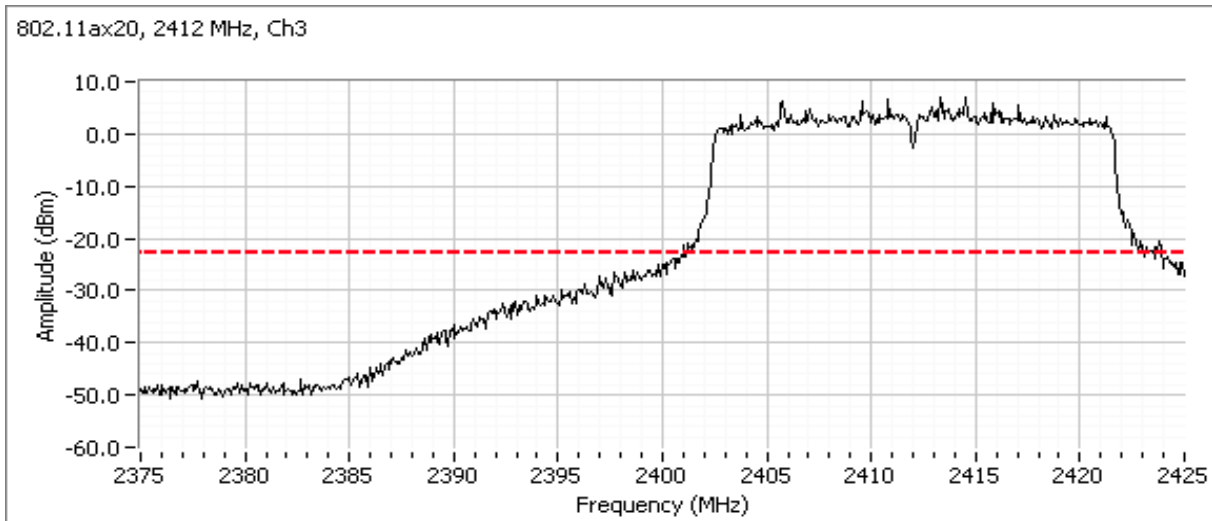
Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

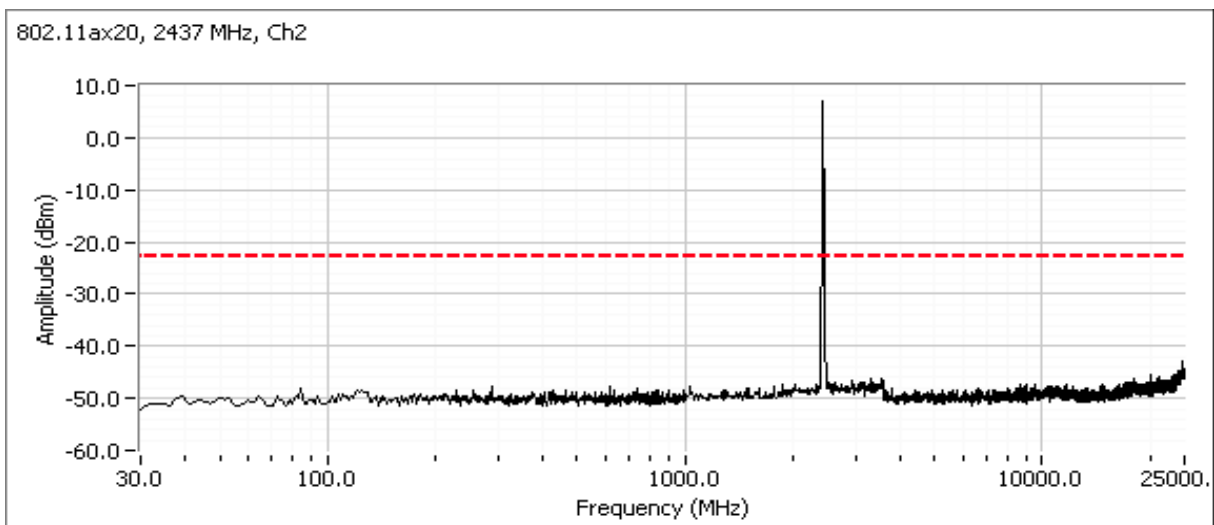
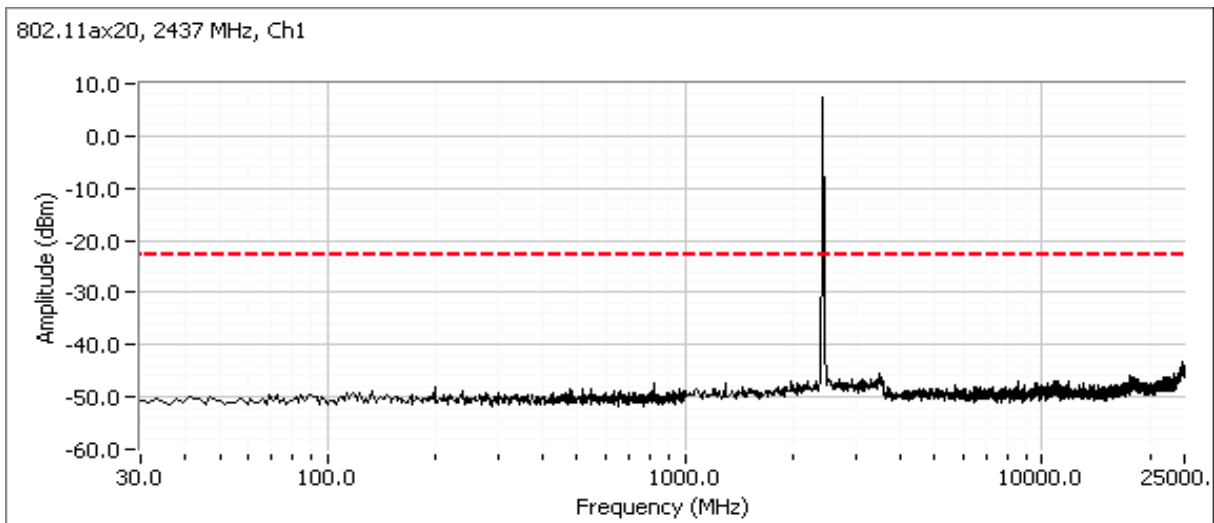




EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

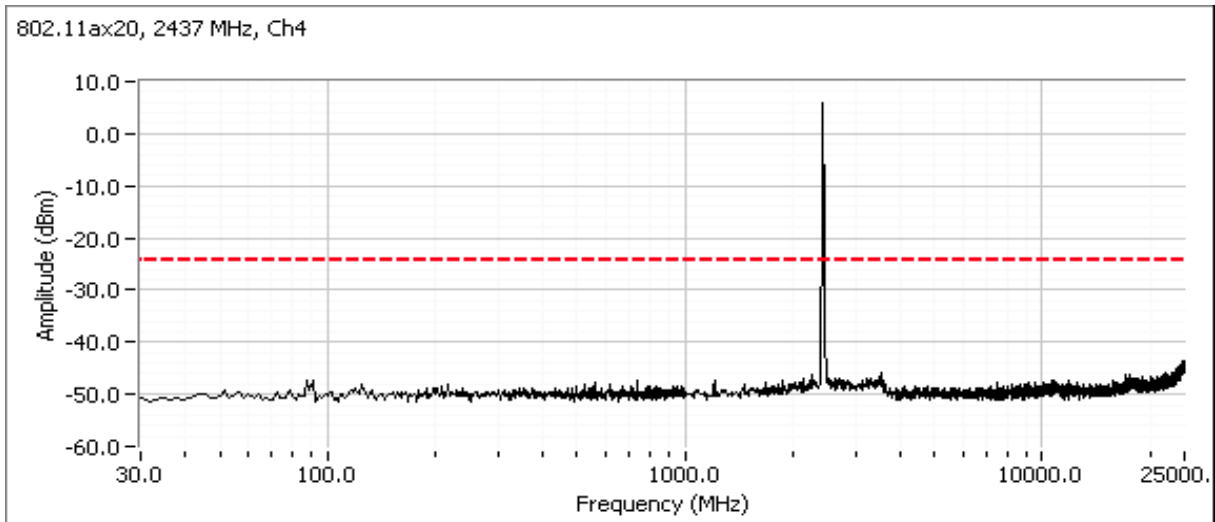
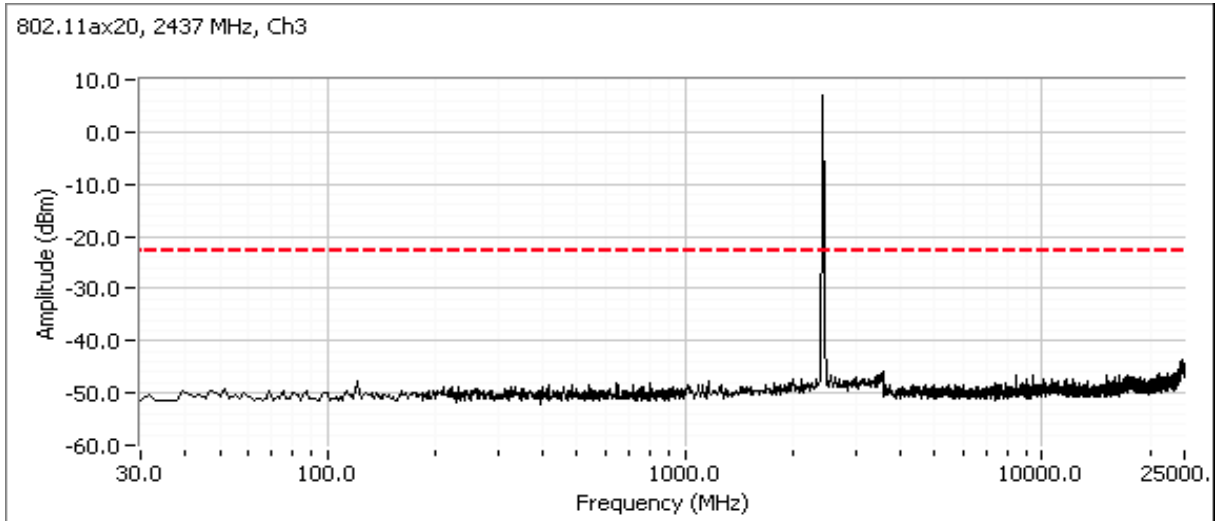
Plots for center channel





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

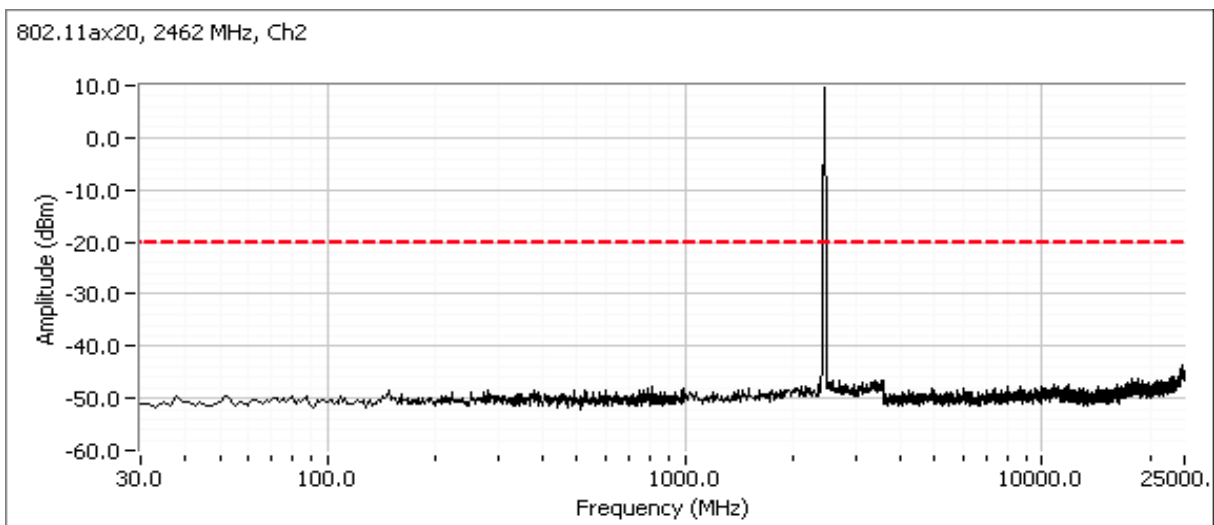
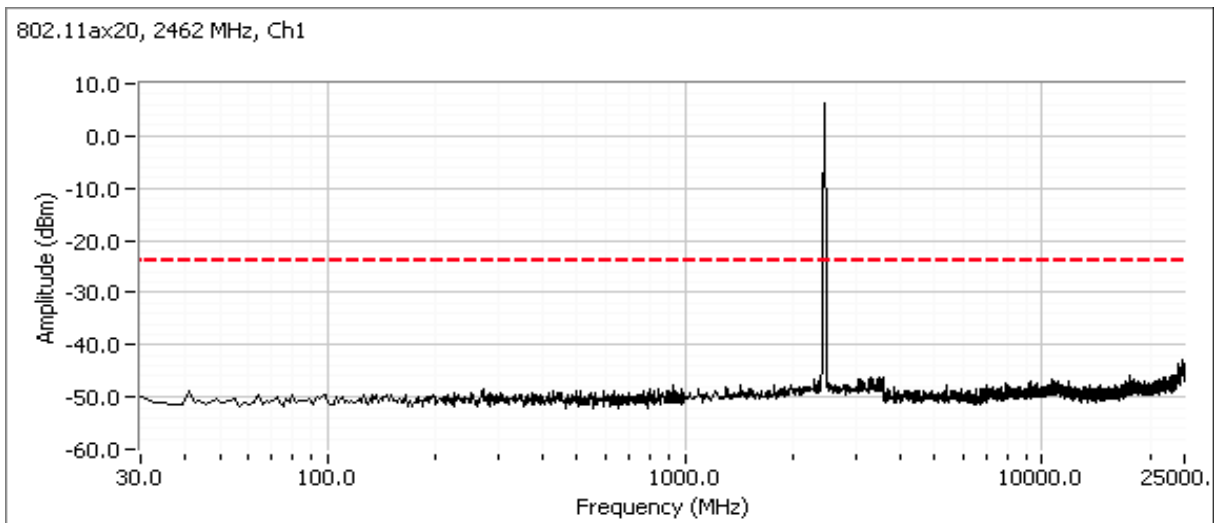




EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

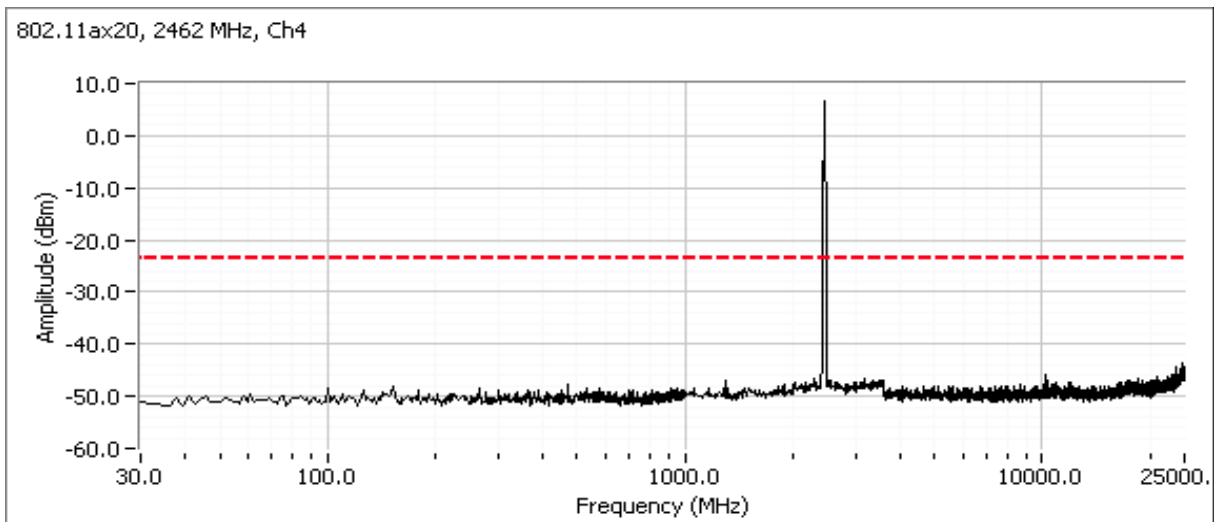
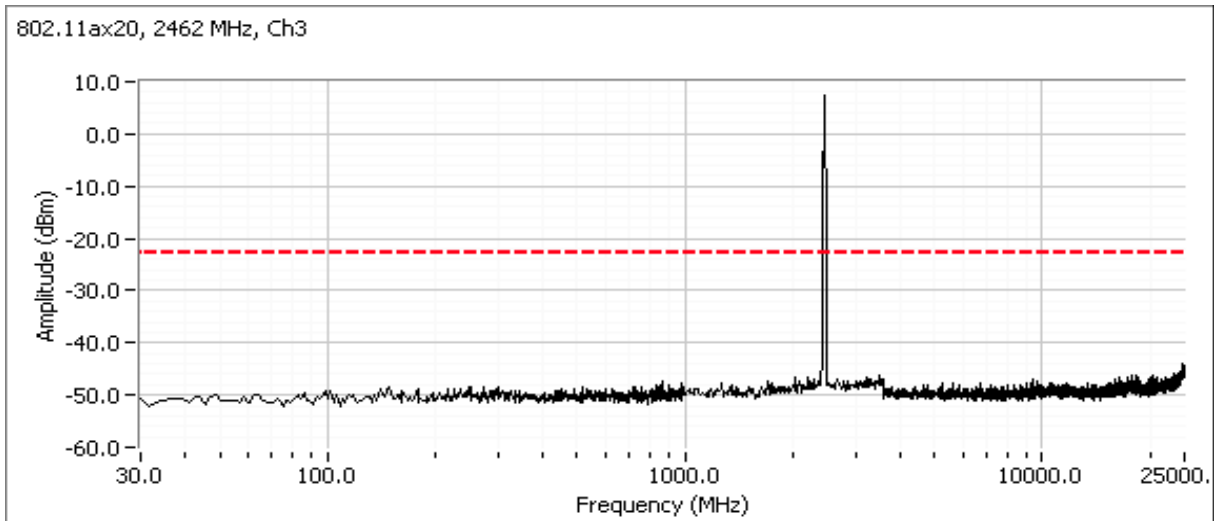
Plots for high channel





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

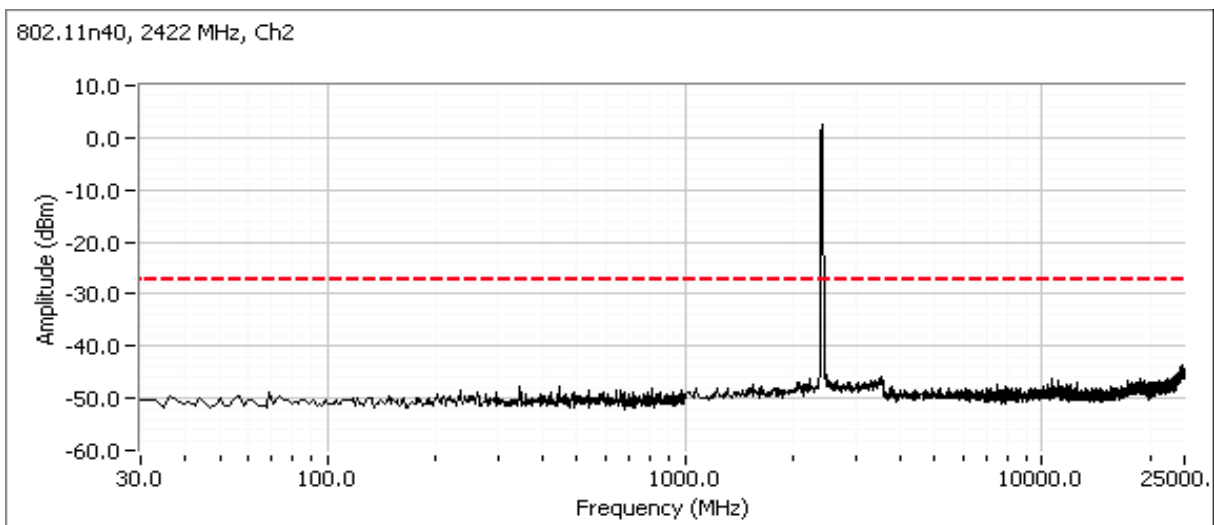
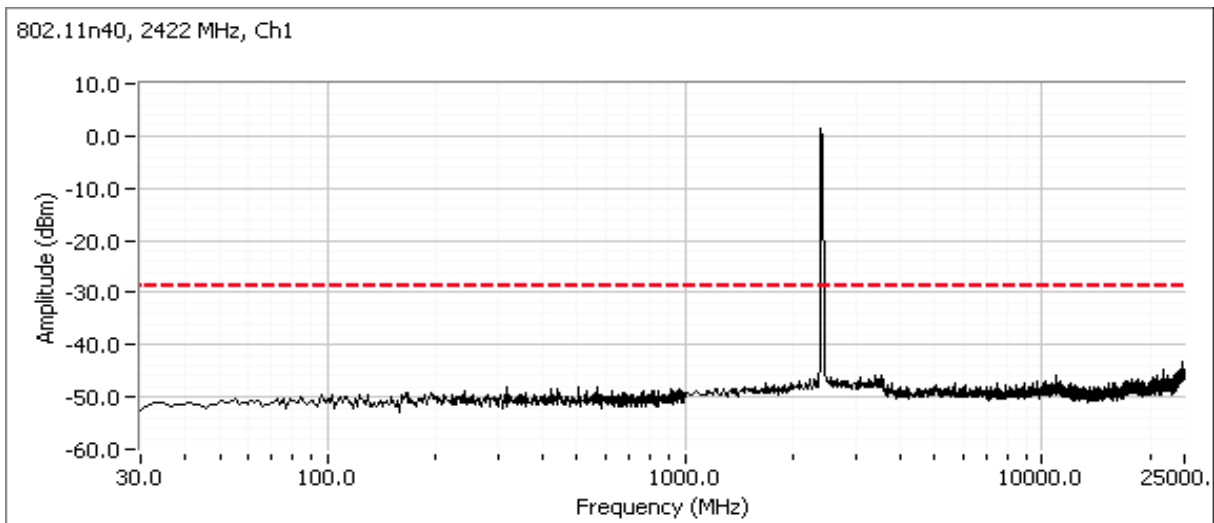




EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

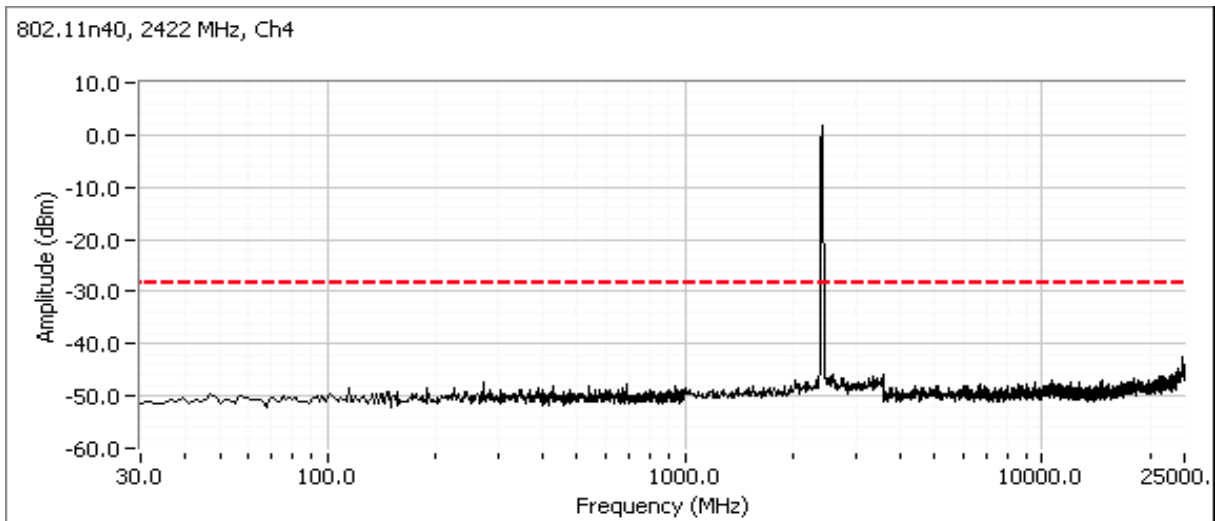
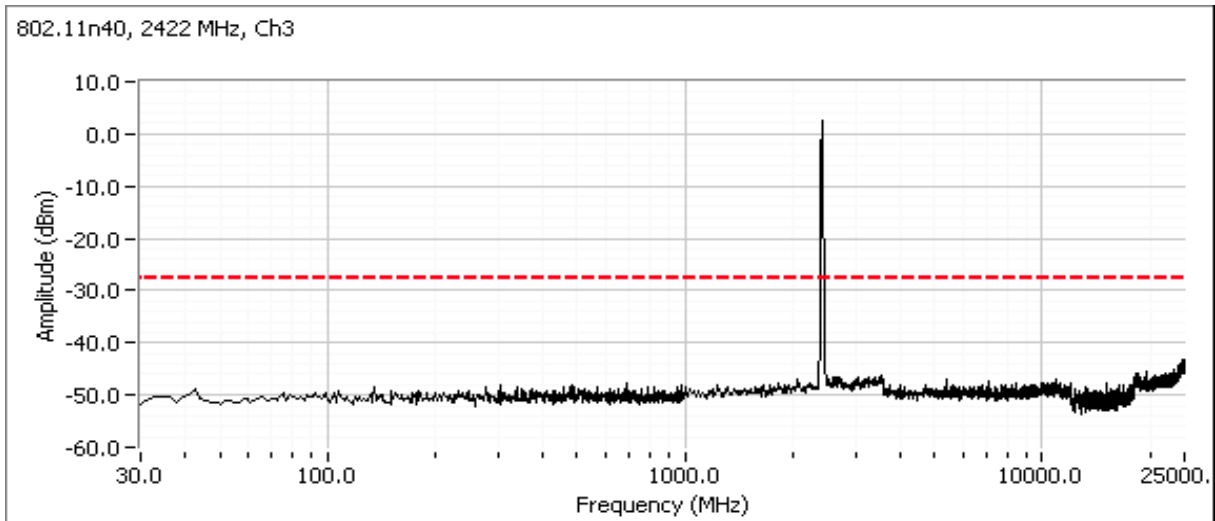
Plots for low channel





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

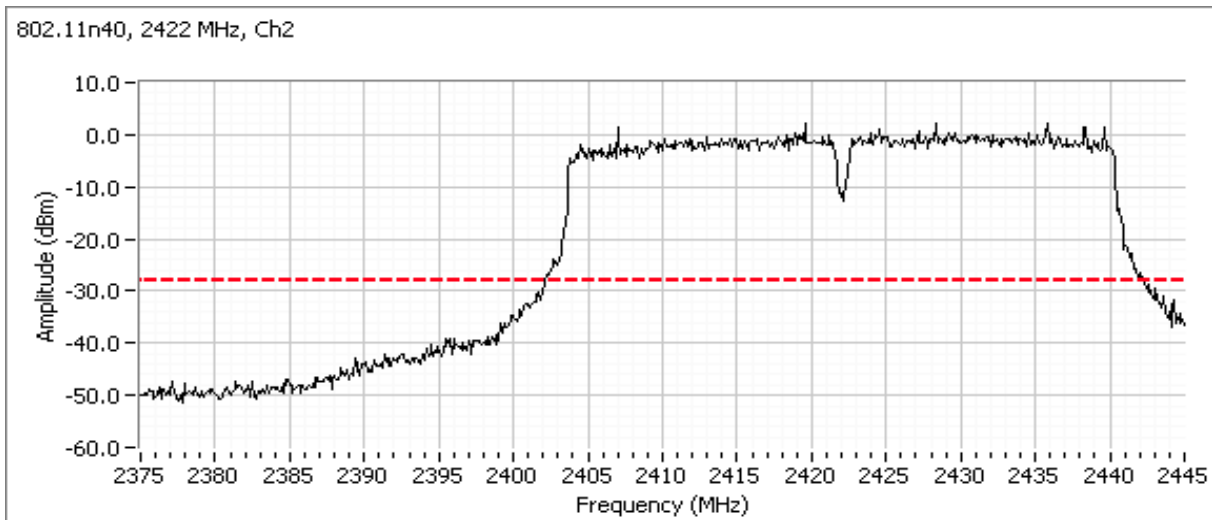
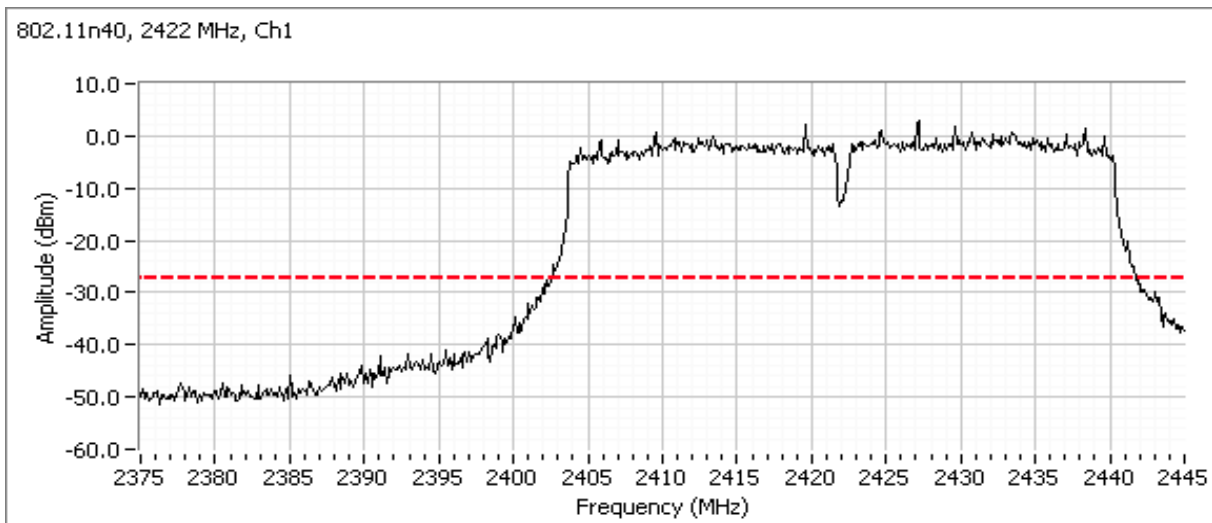




EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

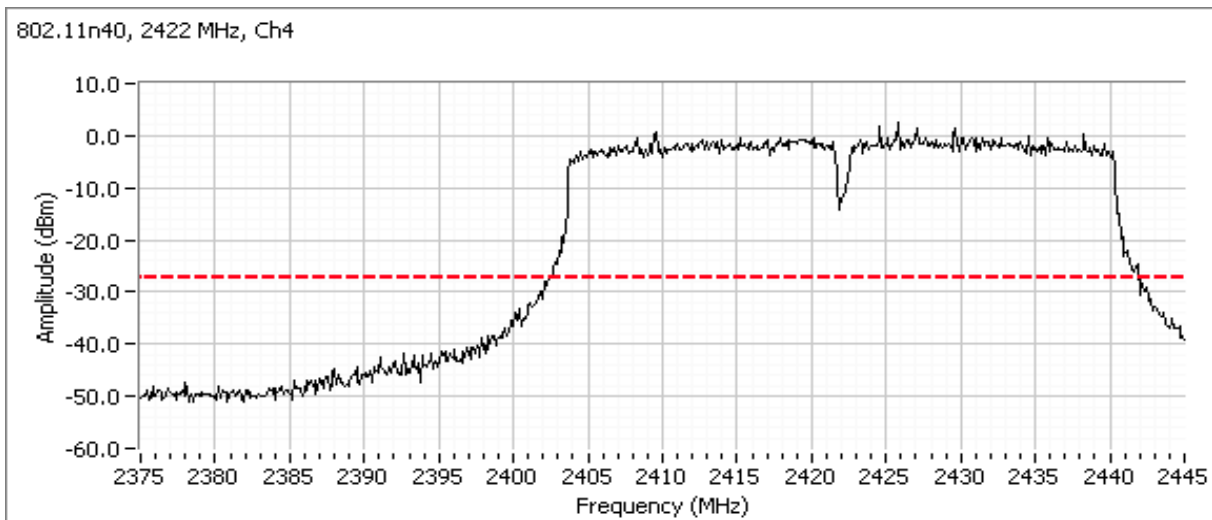
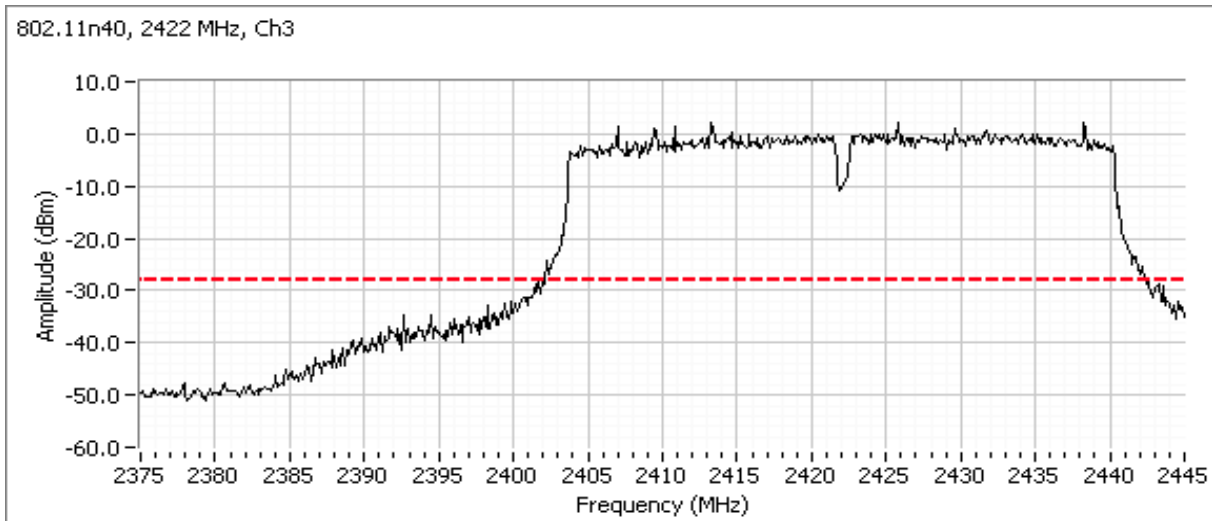
Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

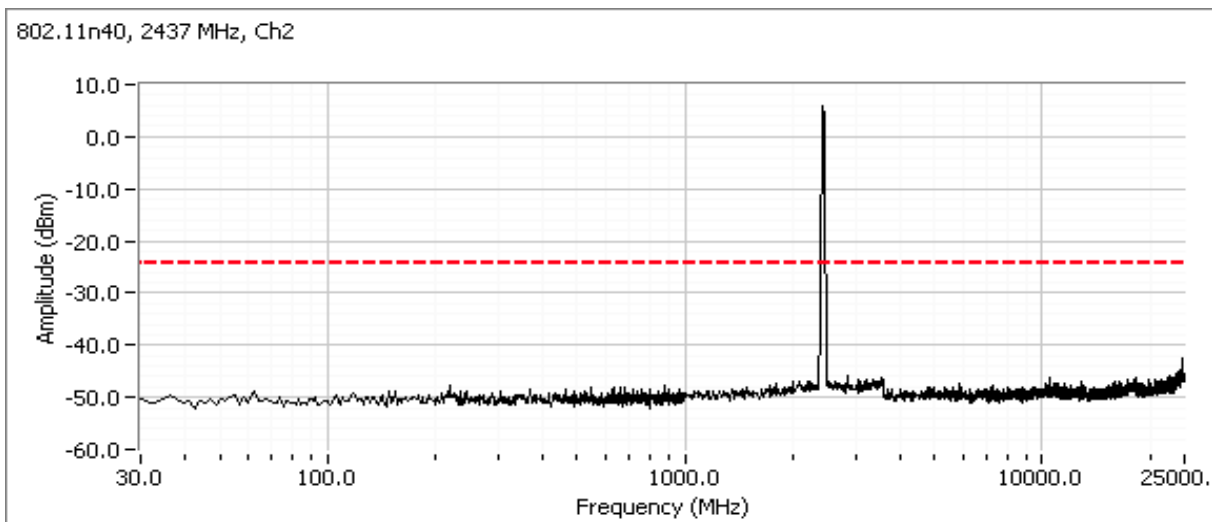
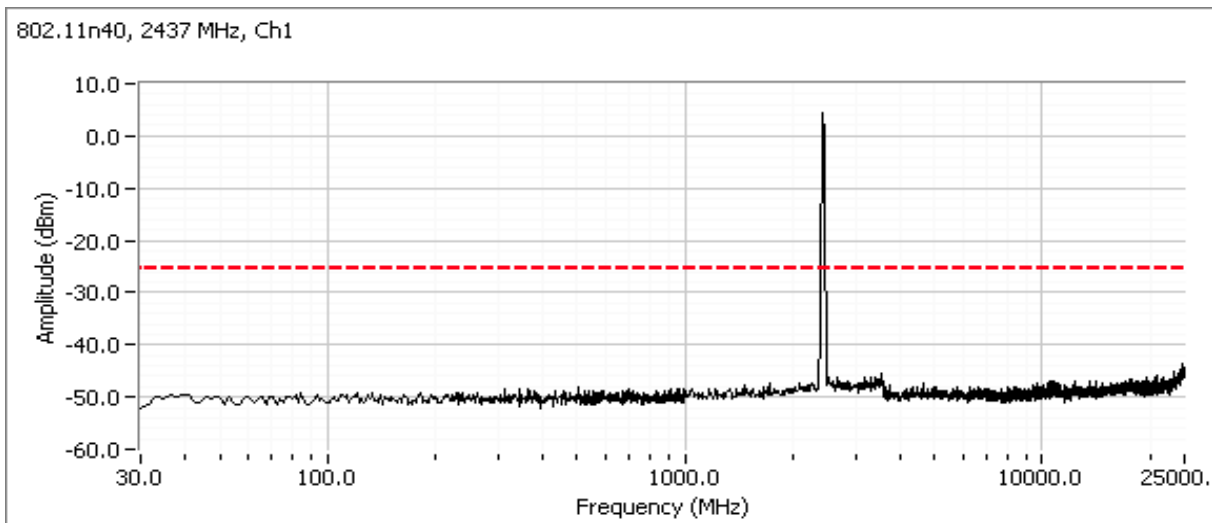




EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

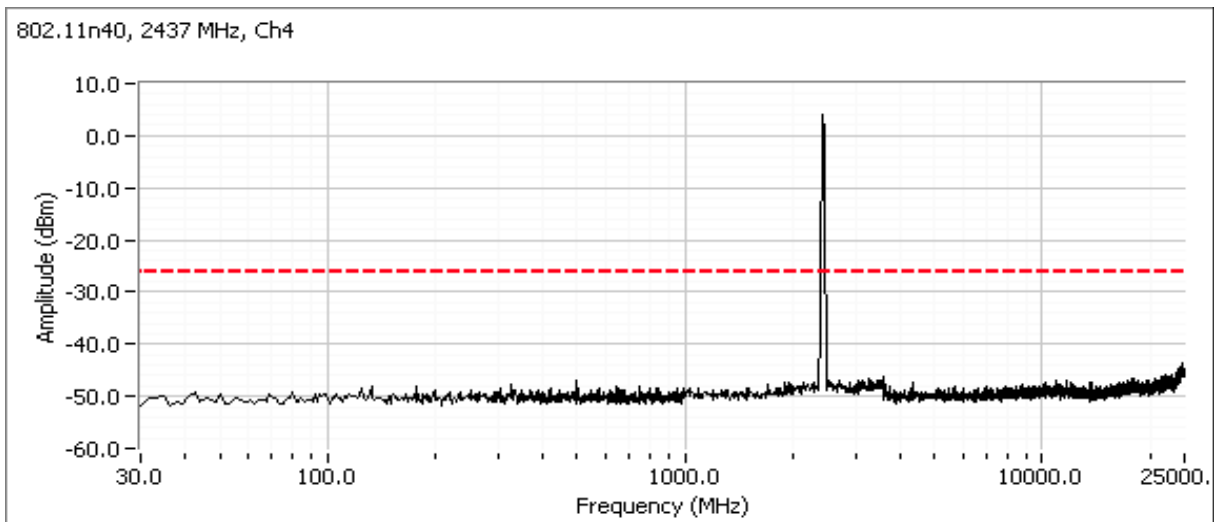
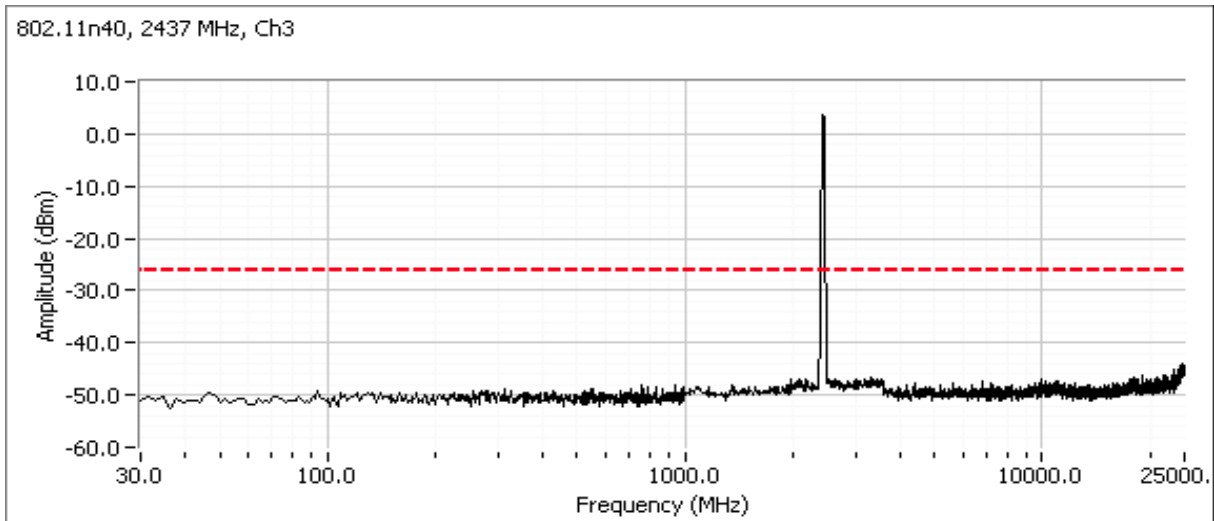
Plots for center channel





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

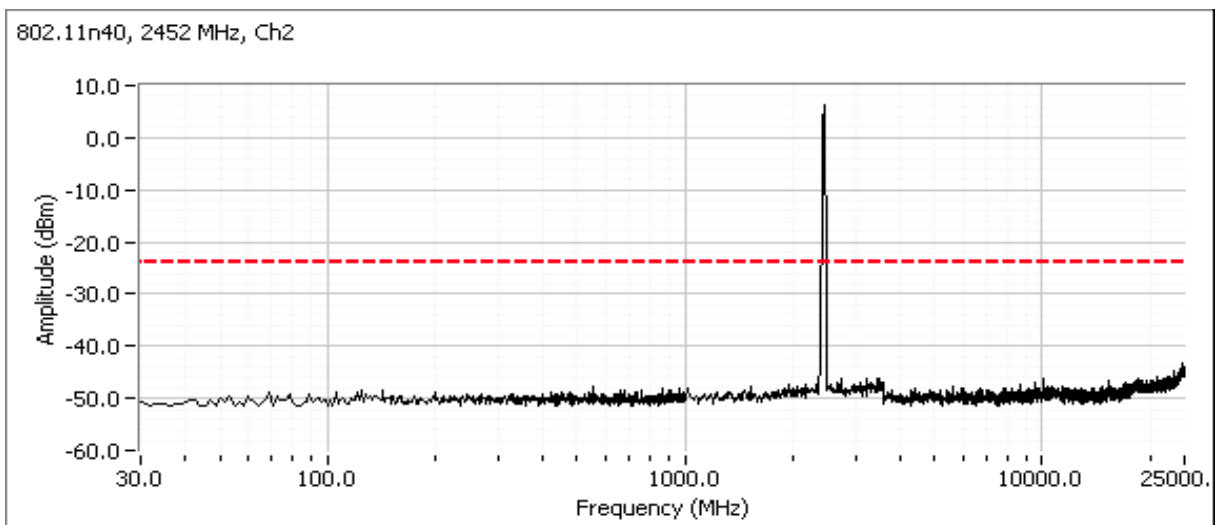
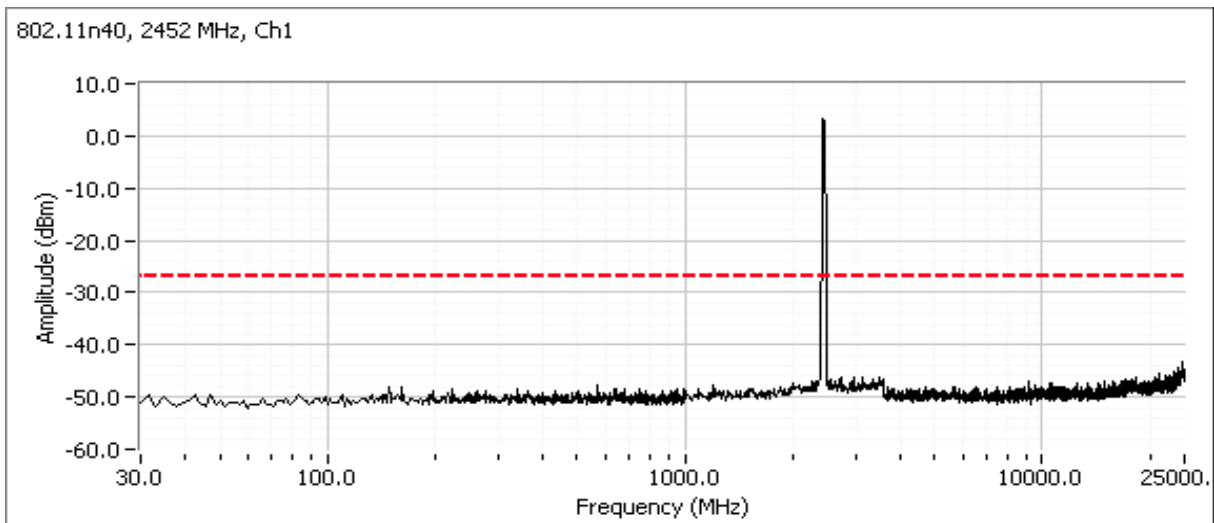




EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

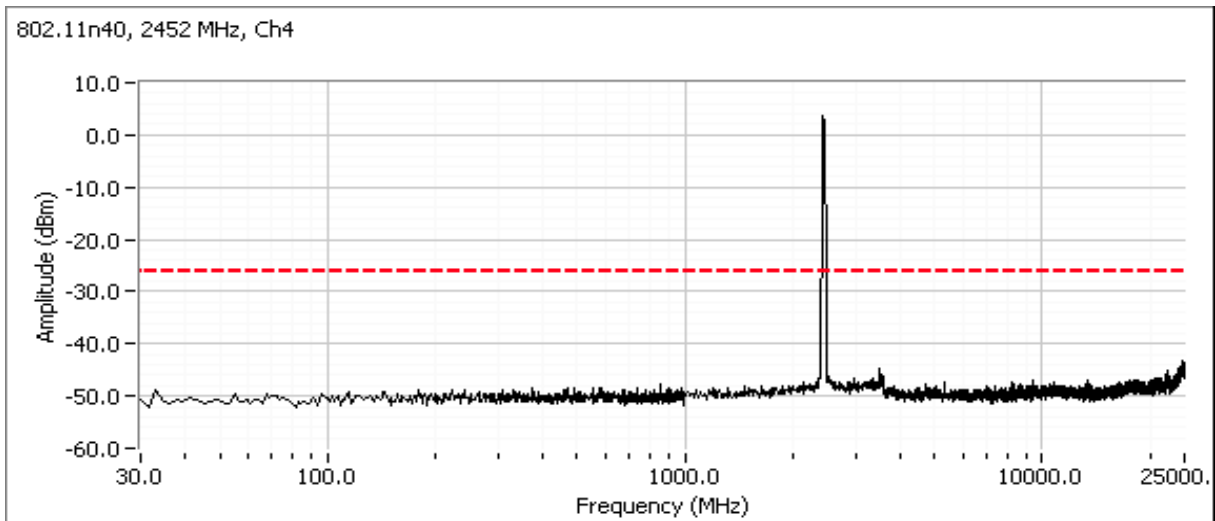
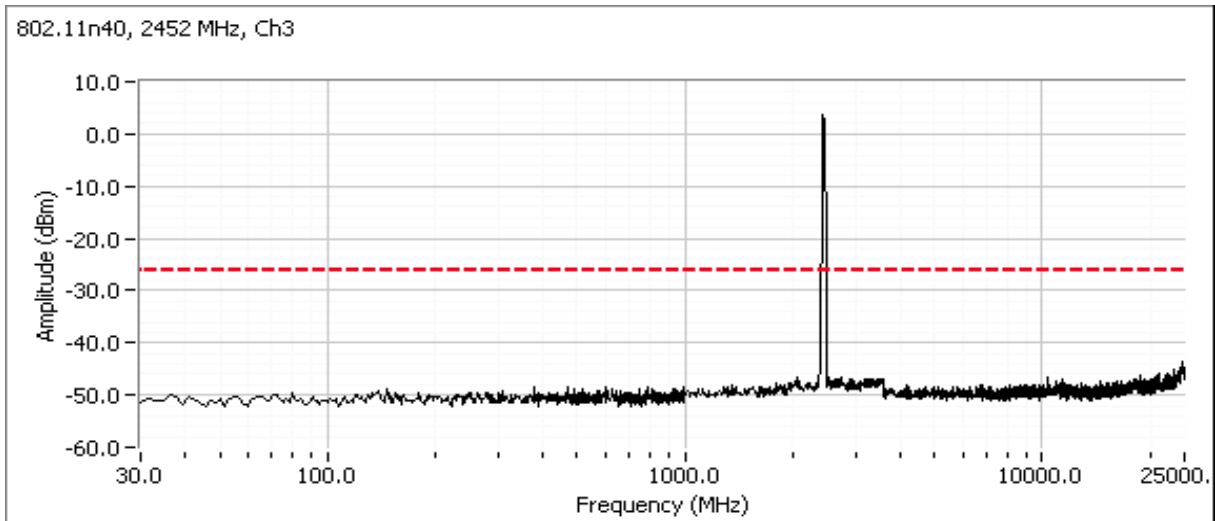
Plots for high channel





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

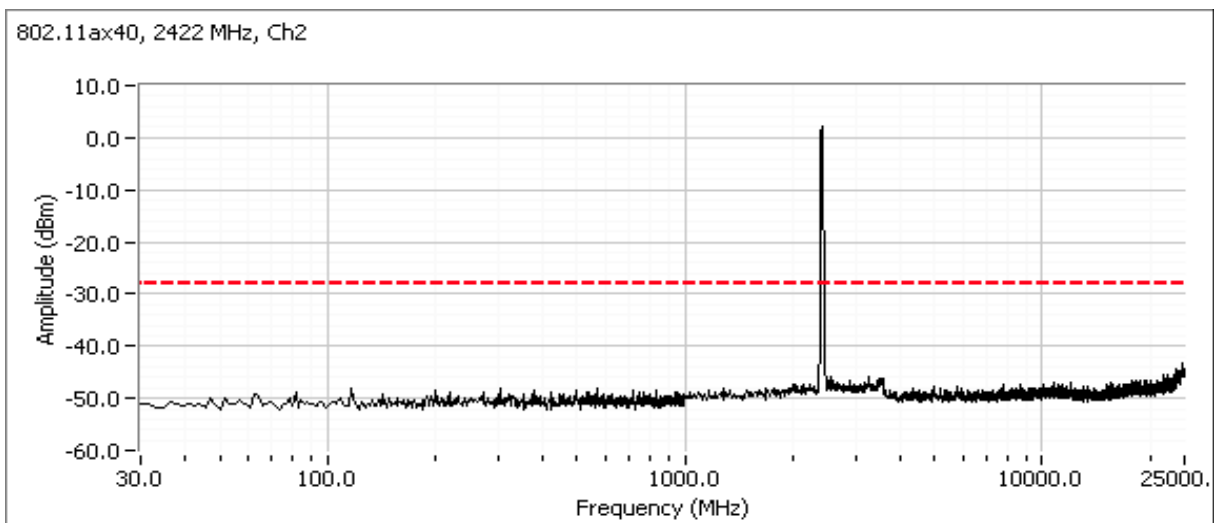
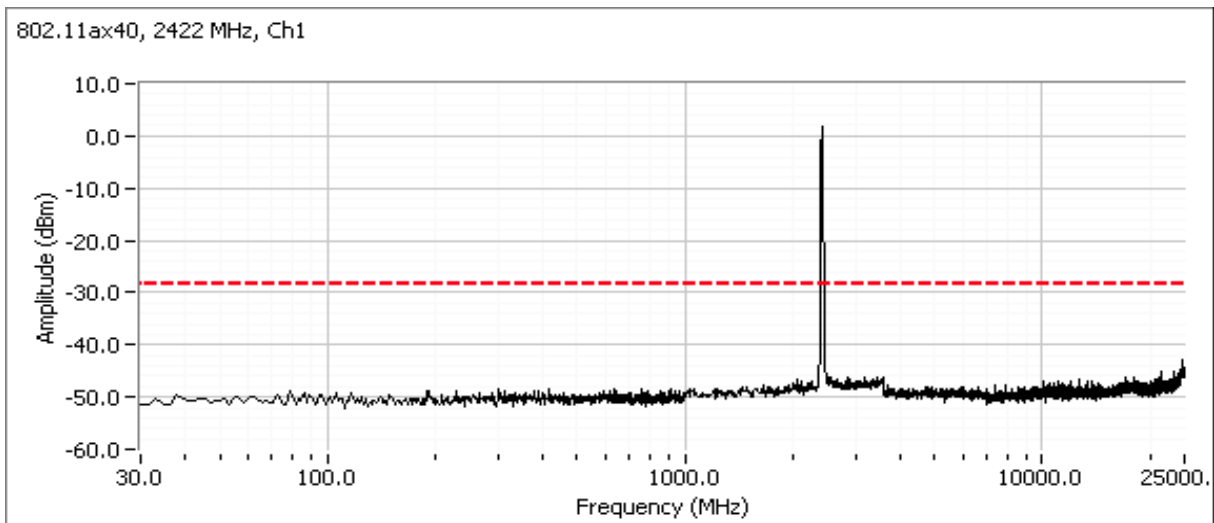




EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

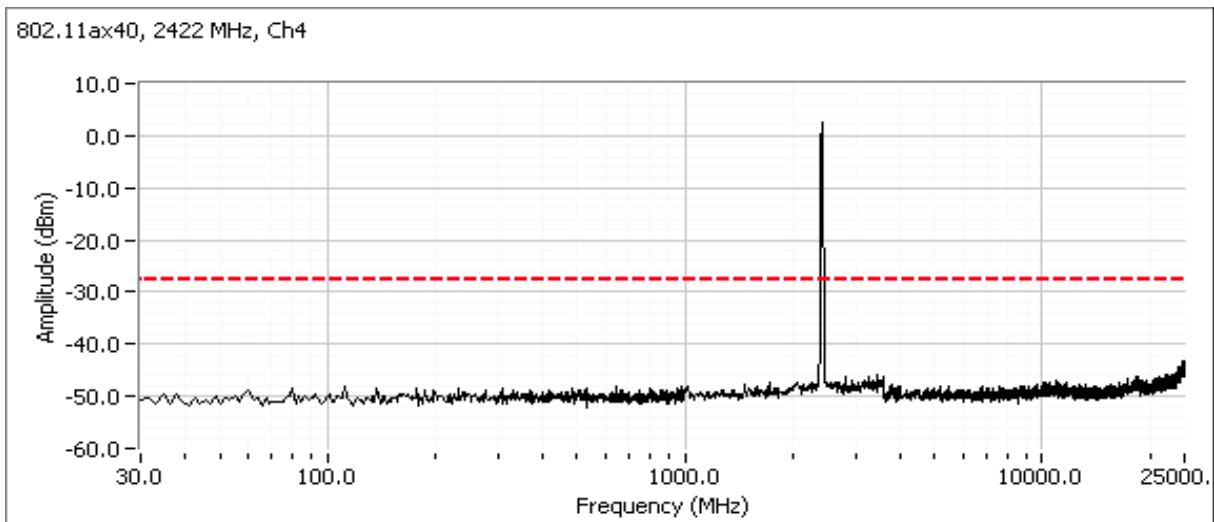
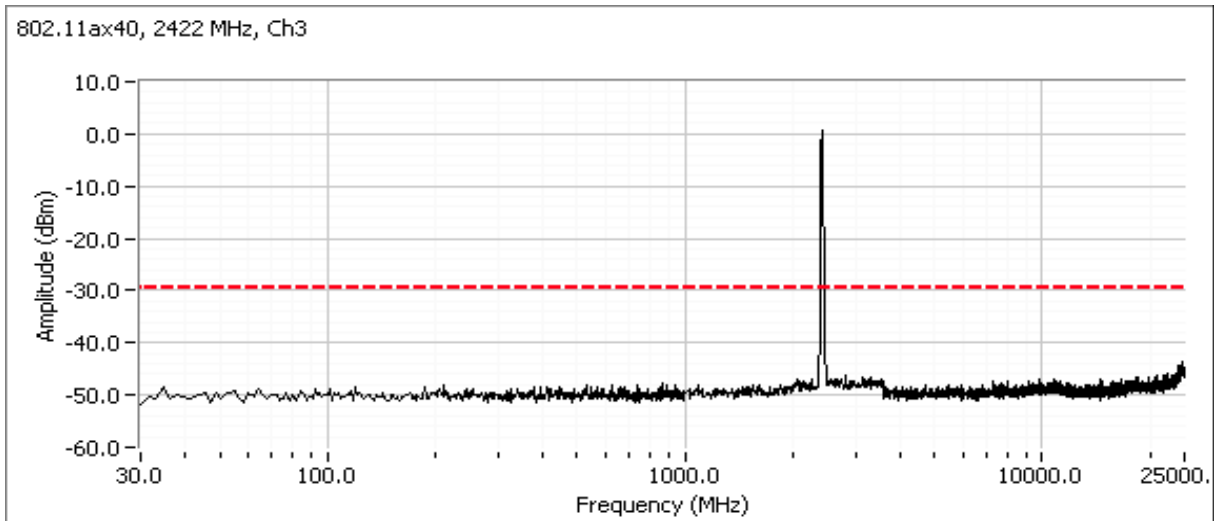
Plots for low channel





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

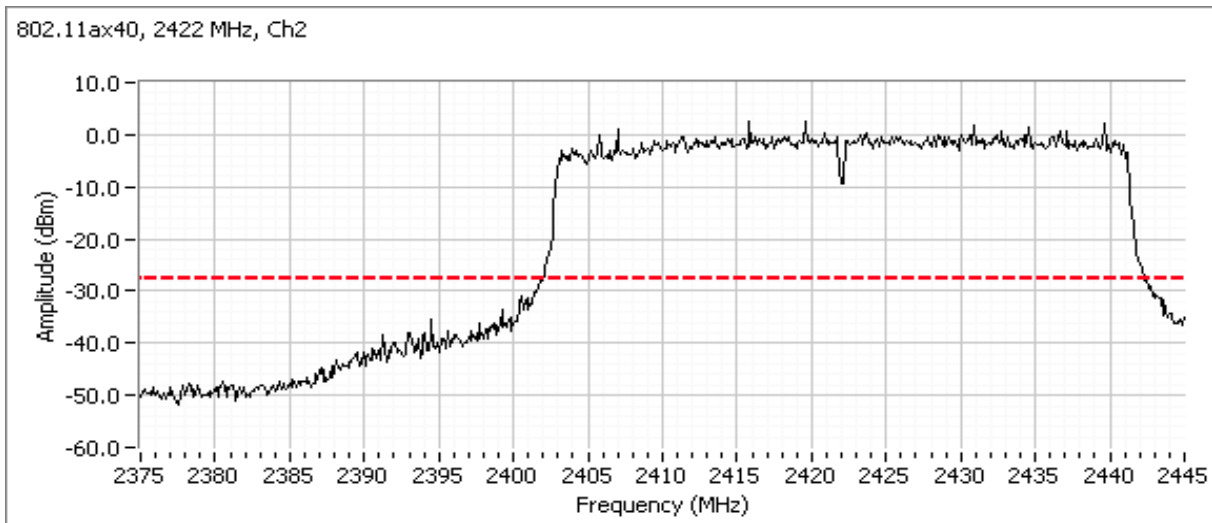
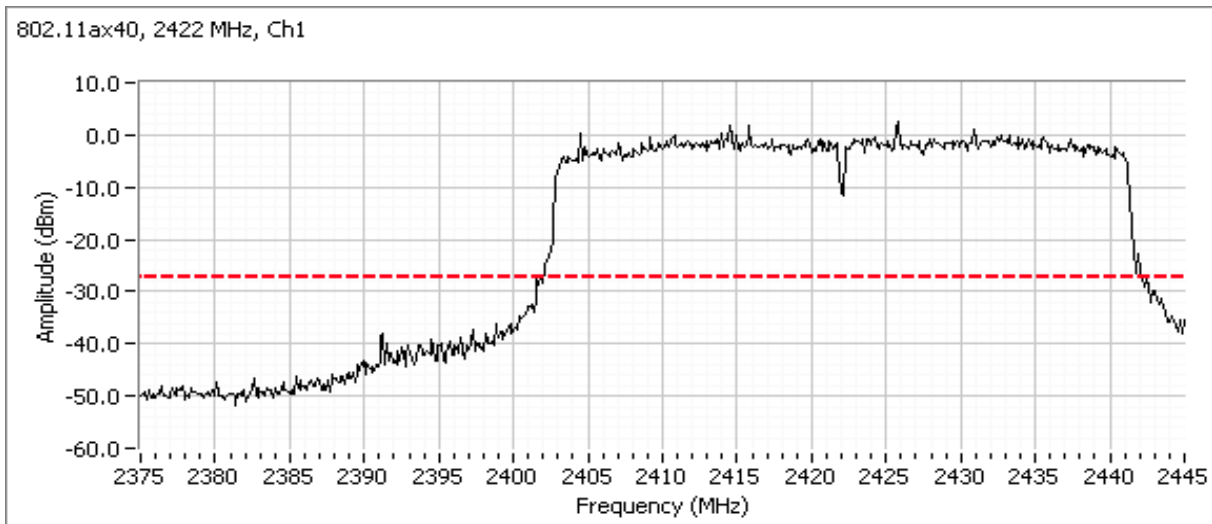




EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

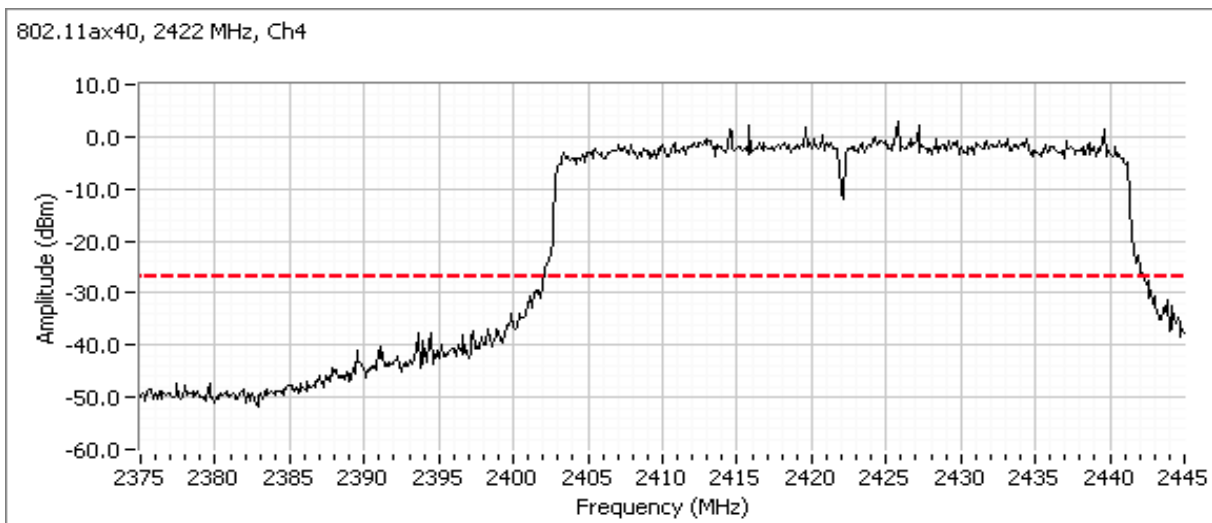
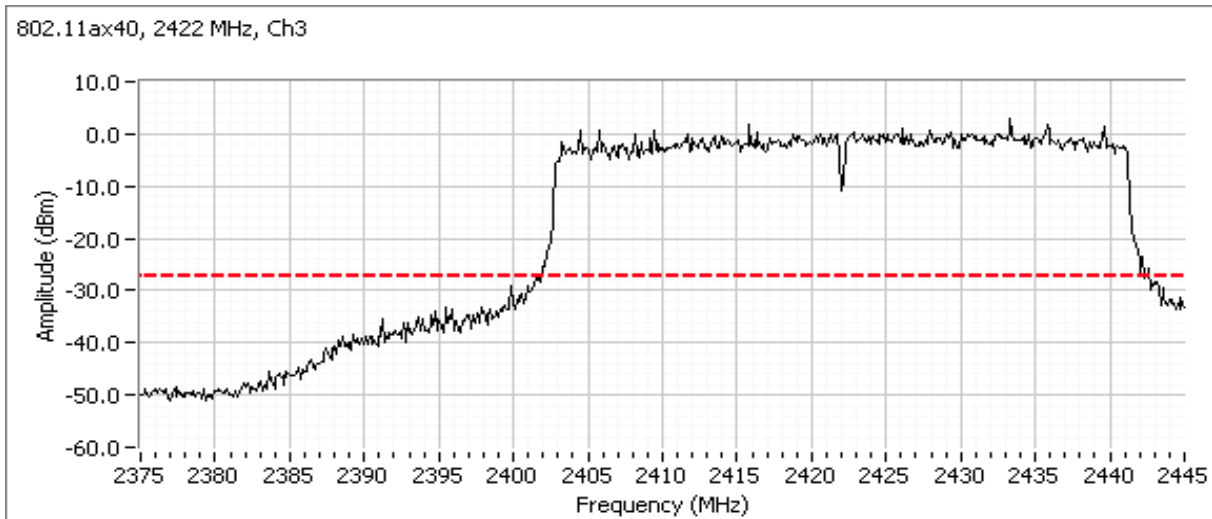
Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

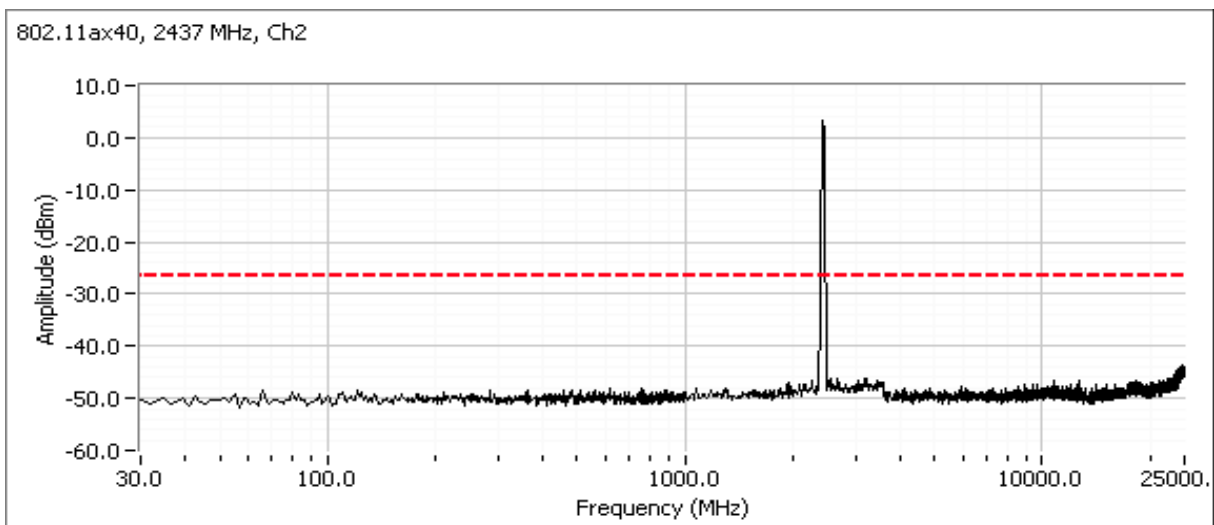
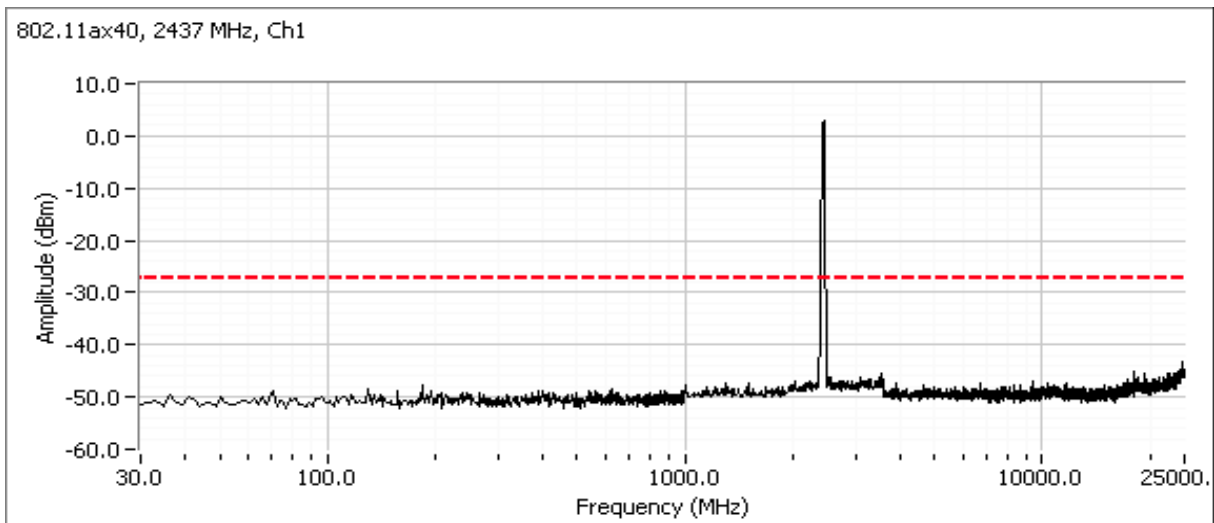




EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

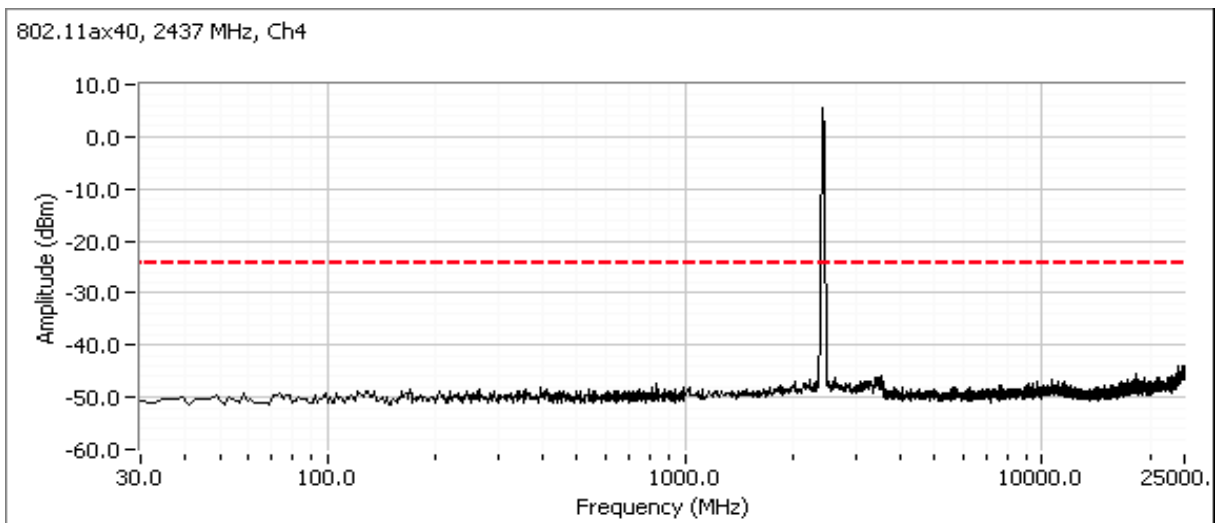
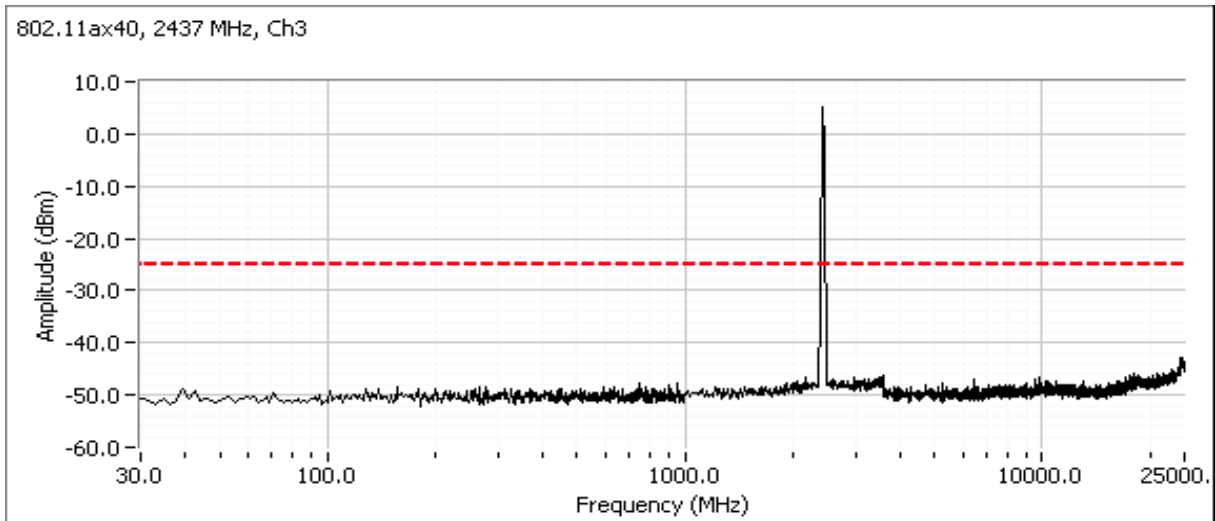
Plots for center channel





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

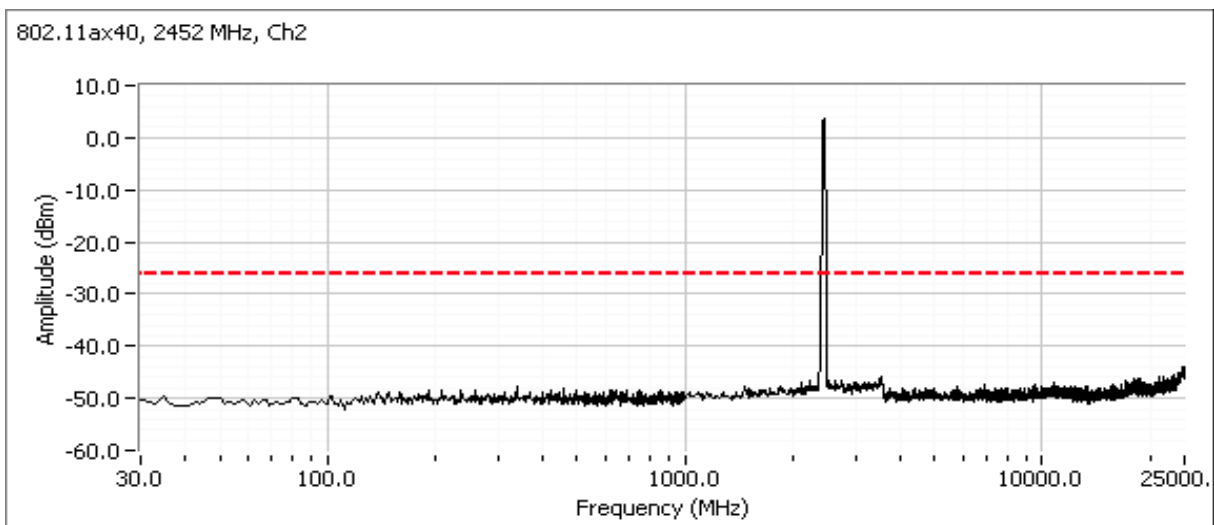
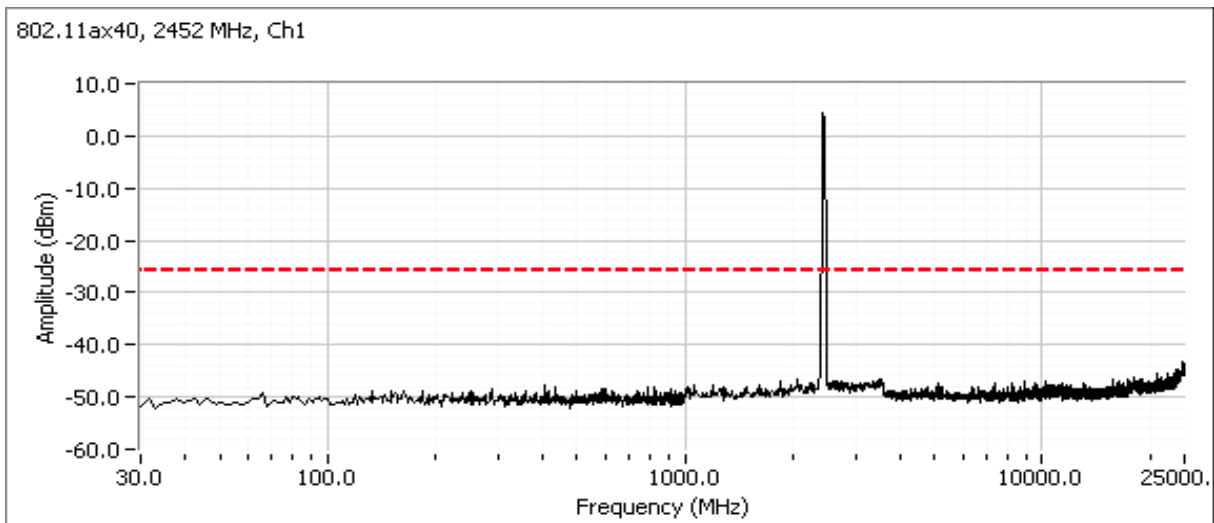




EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

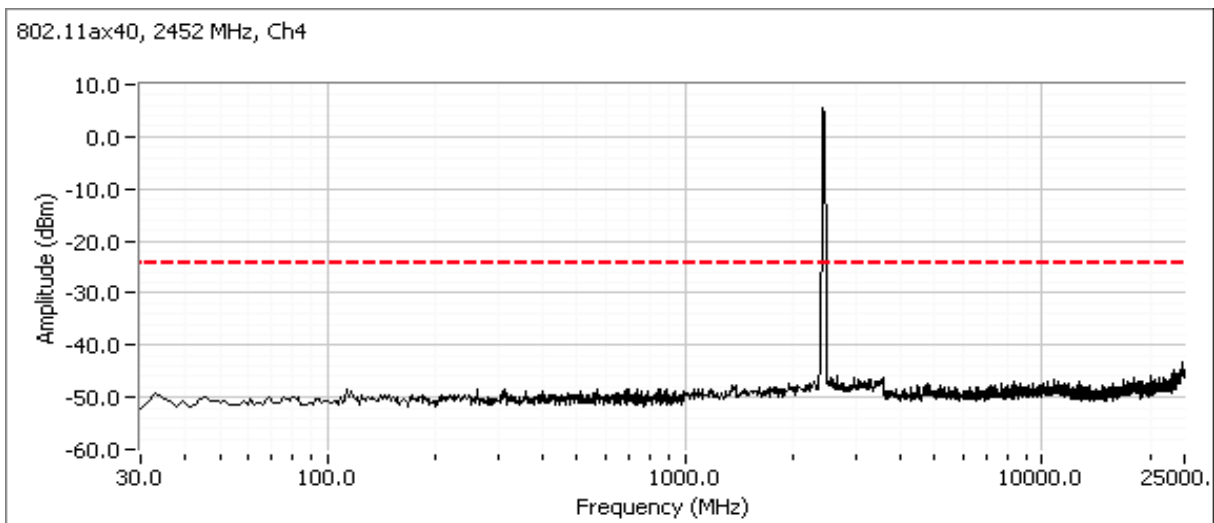
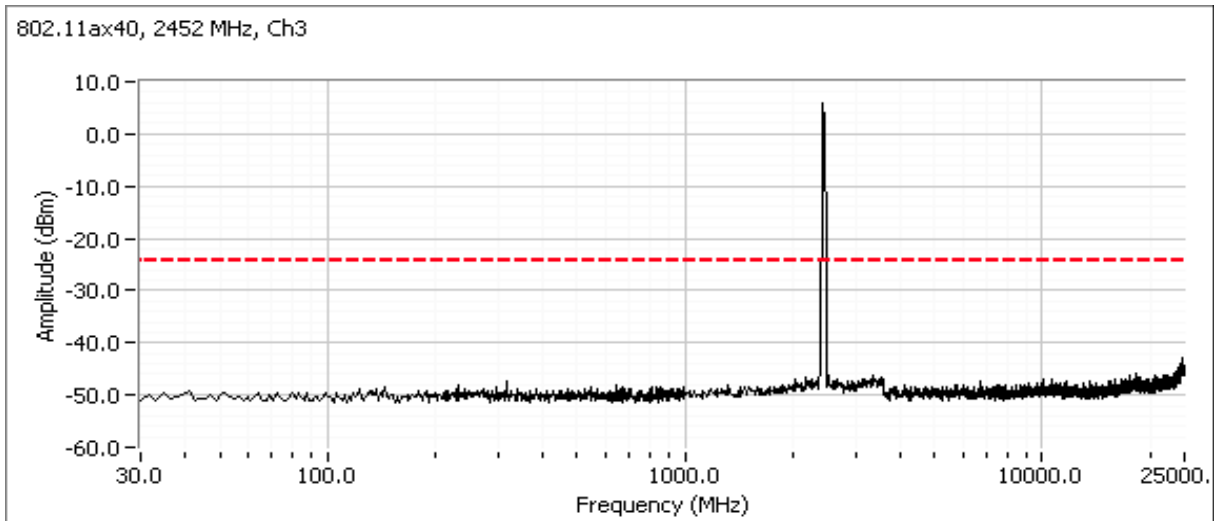
Plots for high channel





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

RSS-247 and FCC 15.247 (DTS) Radiated Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT, unless otherwise noted.

Ambient Conditions:

Temperature: 19-23 °C

Rel. Humidity: 37-45 %

Summary of Results - Device Operating in the 2400-2483.5 MHz Band

Run #	Mode	Frequency	Target Power	Power Setting	Test Performed	Limit	Result / Margin
1	b & BLE	2412MHz	20	17	Restricted Band Edge (2390 MHz) 10/18/18	FCC Part 15.209 / 15.247(c)	53.2 dBµV/m @ 2389.7 MHz (-0.8 dB)
	b & BLE	2402MHz	8	8			53.0 dBµV/m @ 2485.7 MHz (-1.0 dB)
	b & BLE	2412MHz	20	9	Restricted Band Edge (2483.5 MHz)		51.4 dBµV/m @ 2483.7 MHz (-2.6 dB)
	b & BLE	2448MHz	8	8			53.6 dBµV/m @ 2486.8 MHz (-0.4 dB)
	b & BLE	2412MHz	20	20	Restricted Band Edge (2483.5 MHz)		53.7 dBµV/m @ 2389.6 MHz (-0.3 dB)
	b & BLE	2480MHz	8	8	Restricted Band Edge (2390 MHz)		53.8 dBµV/m @ 2496.7 MHz (-0.2 dB)
2	b & BLE	2462MHz	20	14	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	54.0 dBµV/m @ 2385.1 MHz (0.0 dB)
	b & BLE	2426MHz	8	8			53.7 dBµV/m @ 2486.8 MHz (-0.3 dB)
	b & BLE	2462MHz	20	7	Restricted Band Edge (2483.5 MHz)		46.8 dBµV/m @ 2483.5 MHz (-7.2 dB)
	b & BLE	2480MHz	8	8			53.2 dBµV/m @ 2488.4 MHz (-0.8 dB)
	b & BLE	2412MHz	15.5	15.5	Restricted Band Edge (2483.5 MHz)		53.4 dBµV/m @ 2383.0 MHz (-0.6 dB)
	b & BLE	2474MHz	8	8	Restricted Band Edge (2390 MHz)		53.6 dBµV/m @ 2491.2 MHz (-0.4 dB)
	g & BLE	2462MHz	15.5	10	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	53.6 dBµV/m @ 2491.2 MHz (-0.4 dB)
	g & BLE	2426MHz	8	8			
	g & BLE	2462MHz	15.5	15.5	Restricted Band Edge (2390 MHz)		
	g & BLE	2480MHz	8	8			
	g & BLE	2412MHz	15.5	10.5	Restricted Band Edge (2483.5 MHz)		
	g & BLE	2448MHz	8	8			



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #	Mode	Channel	Target Power	Power Setting	Test Performed	Limit	Result / Margin
3	ax20 & BLE	2412MHz 2402MHz	16 8	16 8	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	53.1 dBµV/m @ 2390.0 MHz (-0.9 dB)
	ax20 & BLE	2412MHz 2448MHz	16 8	9.5 8	Restricted Band Edge (2483.5 MHz)		53.5 dBµV/m @ 2487.6 MHz (-0.5 dB)
	ax20 & BLE	2412MHz 2480MHz	16 8	16 8	Restricted Band Edge (2483.5 MHz)		47.7 dBµV/m @ 2483.6 MHz (-6.3 dB)
	ax20 & BLE	2462MHz 2474MHz	15.5 8	10 8	Restricted Band Edge (2483.5 MHz)		53.4 dBµV/m @ 2490.1 MHz (-0.6 dB)
	ax20 & BLE	2462MHz 2426MHz	15.5 8	15.5 8	Restricted Band Edge (2390 MHz)		49.7 dBµV/m @ 2390.0 MHz (-4.3 dB)
	ax20 & BLE	2462MHz 2480 MHz	15.5 8	12 8	Restricted Band Edge (2483.5 MHz)		53.9 dBµV/m @ 2499.9 MHz (-0.1 dB)
	4	ax40 & BLE	2422MHz 2402MHz	17 8	17 8		Restricted Band Edge (2390 MHz)
ax40 & BLE		2422MHz 2454MHz	17 9	13 9	Restricted Band Edge (2483.5 MHz)	53.8 dBµV/m @ 2490.0 MHz (-0.2 dB)	
ax40 & BLE		2422MHz 2480MHz	17 10	17 10	Restricted Band Edge (2483.5 MHz)	48.0 dBµV/m @ 2483.5 MHz (-6.0 dB)	
ax40 & BLE		2452MHz 2420MHz	16.5 8	16.5 8	Restricted Band Edge (2390 MHz)	52.6 dBµV/m @ 2484.3 MHz (-1.4 dB)	
ax40 & BLE		2452MHz 2468MHz	16.5 8	13.0 8	Restricted Band Edge (2483.5 MHz)	53.9 dBµV/m @ 2487.4 MHz (-0.1 dB)	
ax40 & BLE		2452MHz 2480MHz	16.5 8	16.5 8	Restricted Band Edge (2483.5 MHz)	53.8 dBµV/m @ 2492.0 MHz (-0.2 dB)	
Measurements on low and high channels in worst-case based on Simultaneous operation in BLE mode							
5	b & ZigBee	2412MHz 2405MHz	20 8	20 8	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	51.2 dBµV/m @ 2388.0 MHz (-2.8 dB)
	b & ZigBee	2462MHz 2480 MHz	20 8	20 8	Restricted Band Edge (2483.5 MHz)		66.2 dBµV/m @ 2483.7 MHz (-7.8 dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Sample Notes

Sample S/N: CNGFK9Y02N (BLE), CNGFK9Y02R (ZigBee)

Driver: P4 V0.4.5

Antenna: Integral 4x4 and BLE/ZigBee

Procedure Comments:

Measurements performed in accordance with FCC KDB 558074

Peak measurements performed with: RBW=1MHz, VBW=3MHz, peak detector, max hold, auto sweep time

Unless otherwise stated/noted, emission has a duty cycle $\geq 98\%$ and was measured using RBW=1MHz, VBW=10Hz, peak detector, linear average mode, auto sweep time, max hold.

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
ZigBee	-	0.43	Yes	0.858	3.7	7.4	1166
BLE	1 Mb/s	0.72	Yes	0.586	1.4	2.9	1706
11b	1 Mb/s	0.78	Yes	0.669	1.1	2.1	1495
11g	6 Mb/s	0.92	Yes	1.432	0.3	0.7	698
ax20	MCS0	0.96	Yes	5.485	0.2	0.3	182
ax40	MCS0	0.96	Yes	5.401	0.2	0.4	185

2 kHz

Measurement Specific Notes:

Note 4:	Emission has constant duty cycle $< 98\%$, average measurement performed: RBW=1MHz, VBW $>1/T$ but not less than 10Hz, peak detector, linear averaging, auto sweep, trace average 100 traces, measurement corrected by Linear voltage correction factor
Note 8:	Plots of the average and peak bandedge do not account for any duty cycle correction. Refer to the tabular results for final measurements.
Note 9:	-20 dB correction factor was used for ZigBee as 10% operational duty cycle



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #1: Radiated Bandedge Measurements

Date of Test: 11/13/2018

Test Engineer: John Caizzi

Test Location: Fremont Chamber #4

Config. Used: 1

Config Change: None

EUT Voltage: 120V & PoE

Channel: 1 Mode: b Mode: BLE
Tx Chain: 4 Data Rate: 1 Mb/s Channel.: 37
Intermod: 2392MHz

Band Edge Signal Field Strength - Direct measurement of field strength Data from 10/18/18

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.660	53.1	H	54.0	-0.9	Avg	65	1.83	VB 2 kHz, note 4
2389.840	60.7	H	74.0	-13.3	PK	65	1.83	

Channel: 1 Mode: b Mode: BLE
Tx Chain: 4 Data Rate: 1 Mb/s Channel.: 21
Intermod: 2484MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2485.700	53.0	H	54.0	-1.0	Avg	53	1.99	VB: 2 kHz, note 4.
2483.720	61.0	H	74.0	-13.0	PK	53	1.99	POS; RB 1 MHz; VB: 3 MHz

Channel: 1 Mode: b Mode: BLE
Tx Chain: 4 Data Rate: 1 Mb/s Channel.: 39
Intermod: 2548MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.660	51.4	H	54.0	-2.6	Avg	56	2.03	VB: 2 kHz, note 4.
2483.710	62.6	H	74.0	-11.4	PK	56	2.03	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Channel: 11 Mode: b Mode: BLE
 Tx Chain: 4 Data Rate: 1 Mb/s Channel.: 34
 Intermod: 2486MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2486.820	53.6	H	54.0	-0.4	Avg	60	2.02	VB: 2 kHz, note 4.
2486.310	61.3	H	74.0	-12.7	PK	60	2.02	POS; RB 1 MHz; VB: 3 MHz

Channel: 11 Mode: b Mode: BLE
 Tx Chain: 4 Data Rate: 1 Mb/s Channel.: 38
 Intermod: 2390MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.560	53.7	H	54.0	-0.3	Avg	59	1.76	VB: 2 kHz, note 4.
2388.600	61.7	H	74.0	-12.3	PK	59	1.76	

Channel: 11 Mode: b Mode: BLE
 Tx Chain: 4 Data Rate: 1 Mb/s Channel.: 39
 Intermod: 2498MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Data from 10/18/18

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2496.660	53.8	H	54.0	-0.2	Avg	58	1.72	VB 2 kHz, note 4
2496.100	61.6	H	74.0	-12.4	PK	58	1.72	



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #2: Radiated Bandedge Measurements

Date of Test: 11/13/2018

Test Engineer: John Caizzi

Test Location: Fremont Chamber #4

Config. Used: 1

Config Change: None

EUT Voltage: 120V & PoE

Channel: 1 Mode: g Mode: BLE
Tx Chain: 4 Data Rate: 6 Mb/s Channel.: 37
Intermod: 2392MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2385.110	54.0	H	54.0	0.0	Avg	59	1.73	VB: 1 kHz, note 4
2390.000	71.9	H	74.0	-2.1	PK	59	1.73	POS; RB 1 MHz; VB: 3 MHz

Channel: 1 Mode: g Mode: BLE
Tx Chain: 4 Data Rate: 6 Mb/s Channel.: 21
Intermod: 2484MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2486.820	53.7	H	54.0	-0.3	Avg	62	2.19	VB: 1 kHz, note 4
2486.010	64.8	H	74.0	-9.2	PK	62	2.19	POS; RB 1 MHz; VB: 3 MHz

Channel: 1 Mode: g Mode: BLE
Tx Chain: 4 Data Rate: 6 Mb/s Channel.: 39
Intermod: 2548MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.530	46.8	H	54.0	-7.2	Avg	62	1.72	VB: 1 kHz, note 4
2483.550	61.5	H	74.0	-12.5	PK	62	1.72	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Channel: 11 Mode: g Mode: BLE
Tx Chain: 4 Data Rate: 6 Mb/s Channel.: 34
Intermod: 2486MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2488.400	53.2	H	54.0	-0.8	Avg	63	2.21	VB: 1 kHz, note 4
2488.340	64.7	H	74.0	-9.3	PK	63	2.21	POS; RB 1 MHz; VB: 3 MHz

Channel: 11 Mode: g Mode: BLE
Tx Chain: 4 Data Rate: 6 Mb/s Channel.: 38
Intermod: 2390MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2382.970	53.4	H	54.0	-0.6	Avg	58	1.71	VB: 1 kHz, note 4
2382.570	65.0	H	74.0	-9.0	PK	58	1.71	POS; RB 1 MHz; VB: 3 MHz

Channel: 11 Mode: g Mode: BLE
Tx Chain: 4 Data Rate: 6 Mb/s Channel.: 39
Intermod: 2498MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2491.200	53.6	H	54.0	-0.4	Avg	60	1.65	VB: 1 kHz, note 4
2490.500	65.1	H	74.0	-8.9	PK	60	1.65	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #3: Radiated Bandedge Measurements

Date of Test: 11/13/2018

Test Engineer: John Caizzi

Test Location: Fremont Chamber #4

Config. Used: 1

Config Change: None

EUT Voltage: 120V & PoE

Channel: 1 Mode: ax20 Mode: BLE
Tx Chain: 4 Data Rate: MCS0 Channel.: 37
Intermod: 2392MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Data from 10/18/18

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.000	53.1	H	54.0	-0.9	Avg	27	2.25	VB 200 Hz, note 4
2389.680	67.3	H	74.0	-6.7	PK	27	2.25	

Channel: 1 Mode: ax20 Mode: BLE
Tx Chain: 4 Data Rate: MCS0 Channel.: 21
Intermod: 2484MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2487.600	53.5	H	54.0	-0.5	Avg	61	1.65	VB 200 Hz, note 4
2487.330	68.7	H	74.0	-5.3	PK	61	1.65	POS; RB 1 MHz; VB: 3 MHz

Channel: 1 Mode: ax20 Mode: BLE
Tx Chain: 4 Data Rate: MCS0 Channel.: 39
Intermod: 2548MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.550	47.7	H	54.0	-6.3	Avg	62	1.65	VB 200 Hz, note 4
2483.630	63.8	H	74.0	-10.2	PK	62	1.65	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Channel: 11 Mode: ax20 Mode: BLE
Tx Chain: 4 Data Rate: MCS0 Channel.: 34
Intermod: 2486MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2490.090	53.4	H	54.0	-0.6	Avg	60	1.64	VB: 200 Hz, note 4
2489.930	68.8	H	74.0	-5.2	PK	60	1.64	POS; RB 1 MHz; VB: 3 MHz

Channel: 11 Mode: ax20 Mode: BLE
Tx Chain: 4 Data Rate: MCS0 Channel.: 38
Intermod: 2390MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.000	49.7	H	54.0	-4.3	Avg	63	1.88	VB: 200 Hz, note 4
2388.580	63.0	H	74.0	-11.0	PK	63	1.88	POS; RB 1 MHz; VB: 3 MHz

Channel: 11 Mode: ax20 Mode: BLE
Tx Chain: 4 Data Rate: MCS0 Channel.: 39
Intermod: 2498MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Data from 10/18/18

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2499.940	53.9	H	54.0	-0.1	Avg	60	1.3	VB: 200 Hz, note 4
2499.330	68.3	H	74.0	-5.7	PK	60	1.3	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #4: Radiated Bandedge Measurements

Date of Test: 11/13/2018

Test Engineer: John Caizzi

Test Location: Fremont Chamber #4

Config. Used: 1

Config Change: None

EUT Voltage: 120V & PoE

Channel: 3 Mode: ax40 Mode: BLE
Tx Chain: 4 Data Rate: MCS0 Channel.: 37
Intermod: 2382MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2386.010	53.1	H	54.0	-0.9	Avg	56	1.70	VB: 200 Hz, note 4
2385.610	68.3	H	74.0	-5.7	PK	56	1.70	POS; RB 1 MHz; VB: 3 MHz

Channel: 3 Mode: ax40 Mode: BLE
Tx Chain: 4 Data Rate: MCS0 Channel.: 24
Intermod: 2486MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2490.040	53.8	H	54.0	-0.2	Avg	59	2.01	VB: 200 Hz, note 4
2490.080	68.3	H	74.0	-5.7	PK	59	2.01	POS; RB 1 MHz; VB: 3 MHz

Channel: 3 Mode: ax40 Mode: BLE
Tx Chain: 4 Data Rate: MCS0 Channel.: 39
Intermod: 2538MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.540	48.0	H	54.0	-6.0	Avg	62	2.04	VB: 200 Hz, note 4
2483.580	62.3	H	74.0	-11.7	PK	62	2.04	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Channel: 9 Mode: ax40 Mode: BLE
 Tx Chain: 4 Data Rate: MCS0 Channel.: 8
 Intermod: 2388MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2484.320	52.6	H	54.0	-1.4	Avg	45	1.0	VB: 200 Hz, note 4
2485.540	70.3	H	74.0	-3.7	PK	45	1.0	POS; RB 1 MHz; VB: 3 MHz
2389.820	44.9	H	54.0	-9.1	Avg	52	1.7	VB: 200 Hz, note 4
2389.910	62.3	H	74.0	-11.7	PK	52	1.7	POS; RB 1 MHz; VB: 3 MHz

Channel: 9 Mode: ax40 Mode: BLE
 Tx Chain: 4 Data Rate: MCS0 Channel.: 31
 Intermod: 2484MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2487.430	53.9	H	54.0	-0.1	Avg	51	1.8	VB: 200 Hz, note 4
2486.990	67.2	H	74.0	-6.8	PK	51	1.8	POS; RB 1 MHz; VB: 3 MHz

Channel: 9 Mode: ax40 Mode: BLE
 Tx Chain: 4 Data Rate: MCS0 Channel.: 39
 Intermod: 2508MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2492.000	53.8	H	54.0	-0.2	Avg	50	1.7	VB: 200 Hz, note 4
2492.000	67.4	H	74.0	-6.6	PK	50	1.7	POS; RB 1 MHz; VB: 3 MHz
2452.760	100.9	H	-	-	PK	52	2.4	Fundamental RB=VB=100 kHz
2511.030	57.9	H	70.9	-13.0	PK	55	2.0	POS; RB 100 kHz; VB: 300 kHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #5: Radiated Bandedge Measurements

Date of Test: 12/31/2018

Test Engineer: Roy Zheng

Test Location: Fremont Chamber #5

Config. Used: 1

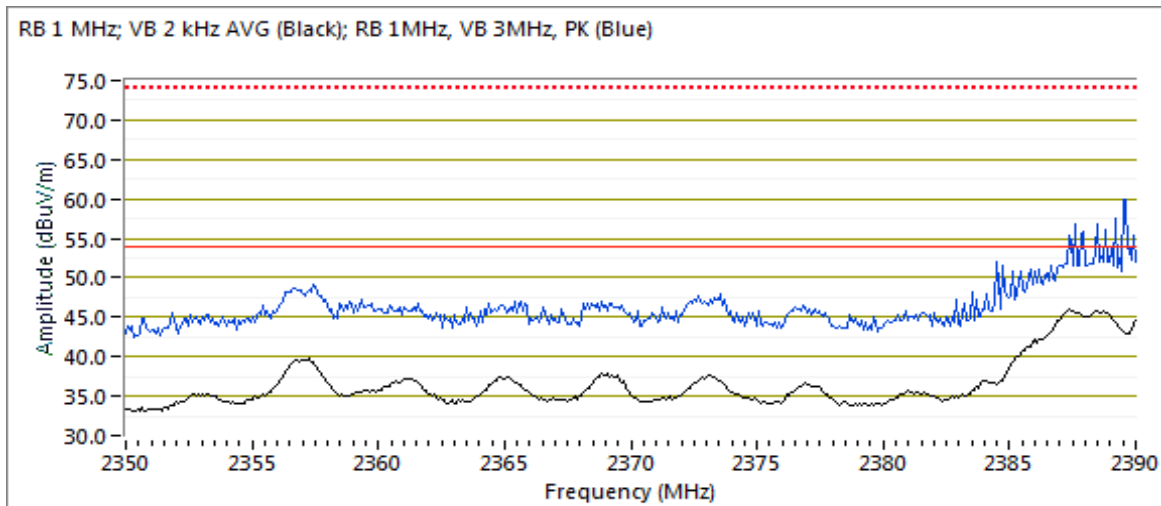
Config Change: None

EUT Voltage: 120V & PoE

Channel: 1 Mode: b Mode: ZigBee
 Tx Chain: 4 Data Rate: 1 Mb/s Channel.: 11
 Intermod: 2398MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2387.000	51.7	V	54.0	-2.3	VAVG	144	1.5	Note 4; RB 1 MHz; VB: 2 kHz
2389.570	59.4	V	74.0	-14.6	PK	144	1.5	POS; RB 1 MHz; VB: 3 MHz





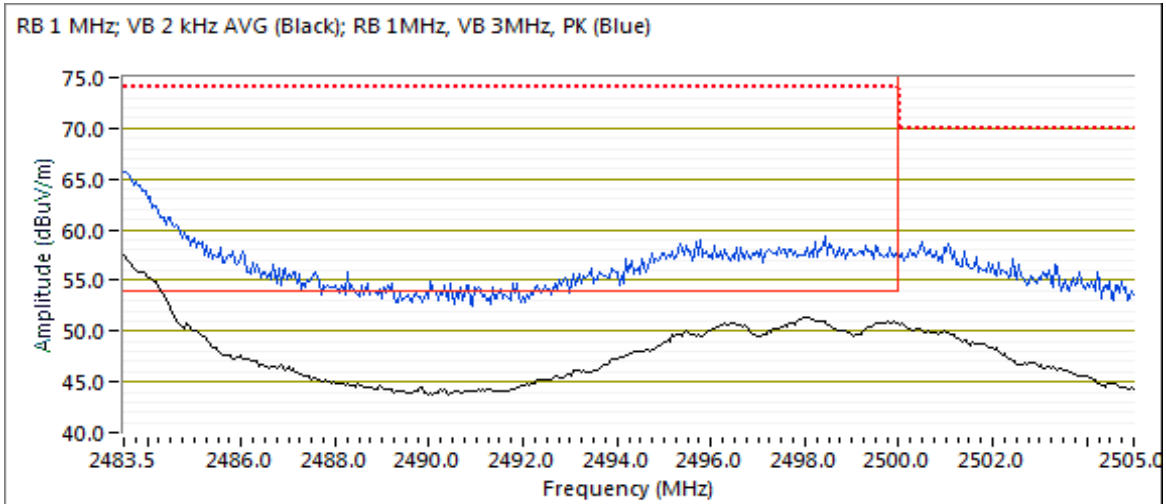
EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Channel: 11 Mode: b Mode: ZigBee
 Tx Chain: 4 Data Rate: 1 Mb/s Channel.: 26
 Intermod: 2498MHz

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.670	66.2	V	74.0	-7.8	PK	226	1.5	POS; RB 1 MHz; VB: 3 MHz
2483.500	37.0	V	54.0	-17.0	VAVG	226	1.5	Note 4, 9; RB 1 MHz; VB: 2 kHz
2461.370	111.5	V	-	-	PK	324	1.7	Fundamental RB=VB=100 kHz
2500.900	57.4	V	81.5	-24.1	PK	226	1.5	POS; RB 1 MHz; VB: 3 MHz





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

RSS-247 and FCC 15.247 (DTS) Radiated Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform engineering evaluation testing of the EUT with respect to the specification listed above.

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.
For radiated emissions testing the measurement antenna was located 3 meters from the EUT, unless otherwise noted.

Ambient Conditions:

Temperature: 19 °C
Rel. Humidity: 44 %

Summary of Results - Device Operating in the 2400-2483.5 MHz Band

Run #	Mode	Channel	Target Power	Power Setting	Test Performed	Limit	Result / Margin
1	b & BLE	1 - 2412MHz 21 - 2448MHz	20 8	Various	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	Refer to data below
	b & BLE	11 - 2462MHz 39 - 2480 MHz	20 8	Various	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	Refer to data below

Modifications Made During Testing

No modifications were made to the EUT during testing other than to adjust output power

Deviations From The Standard

No deviations were made from the requirements of the standard.

Sample Notes

Sample S/N: CNGFK9Y02N

Driver: P4 V0.4.5

Antenna: 4 Integral for Wi-Fi, 1 integral for BLE with second for diversity, worst case was primary antenna



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Procedure Comments:

Measurements performed in accordance with FCC KDB 558074

Peak measurements performed with: RBW=1MHz, VBW=3MHz, peak detector, max hold, auto sweep time

Unless otherwise stated/noted, emission has a duty cycle $\geq 98\%$ and was measured using RBW=1MHz, VBW=10Hz, peak detector, linear average mode, auto sweep time, max hold.

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
11b	1 Mb/s	0.78	Yes	0.669	1.1	2.1	1495

2 kHz

Measurement Specific Notes:

Note 4:	Emission has constant duty cycle $< 98\%$, average measurement performed: RBW=1MHz, VBW $>1/T$ but not less than 10Hz, peak detector, linear averaging, auto sweep, trace average 100 traces, measurement corrected by Linear voltage correction factor
---------	--



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #1: Radiated Bandedge Measurements

Date of Test: 12/3/2018 9:00

Test Engineer: David Bare

Test Location: Fremont Chamber #7

Config. Used: 1

Config Change: None

EUT Voltage: POE

Channel: 1 & 21

Mode: b

BLE

Tx Chain: 4

Data Rate: 1 Mb/s

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Wi-Fi set to 9, BLE set to 8								
2485.030	52.0	H	54.0	-2.0	Avg	42	1.6	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set 20, BLE set to 2								
2485.030	51.2	H	54.0	-2.8	Avg	42	1.6	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set 9, BLE set to 0								
2485.030	51.4	H	54.0	-2.6	Avg	42	1.6	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set 11, BLE set to 0								
2485.030	53.4	H	54.0	-0.6	Avg	42	1.6	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set 20, BLE set to -40								
2484.700	36.0	H	54.0	-18.0	Avg	42	1.6	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set 20, BLE set to 3								
2485.030	53.9	H	54.0	-0.1	Avg	42	1.6	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set 19, BLE set to 3								
2485.030	52.5	H	54.0	-1.5	Avg	42	1.6	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set 18, BLE set to 4								
2485.030	53.9	H	54.0	-0.1	Avg	42	1.6	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set 17, BLE set to 4								
2485.030	52.7	H	54.0	-1.3	Avg	42	1.6	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set 16.5, BLE set to 5								
2485.030	53.5	H	54.0	-0.5	Avg	42	1.6	Note 4; RB 1 MHz; VB: 2 kHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Wi-Fi set 16, BLE set to 5								
2485.030	53.0	H	54.0	-1.0	Avg	42	1.6	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set 13, BLE set to 6								
2485.030	53.2	H	54.0	-0.8	Avg	42	1.6	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set 11, BLE set to 7								
2485.030	52.6	H	54.0	-1.4	Avg	42	1.6	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set 11.5, BLE set to 7								
2485.030	53.4	H	54.0	-0.6	Avg	42	1.6	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set 20, BLE set to -4								
2485.030	53.8	H	54.0	-0.2	Avg	42	1.6	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set 19, BLE set to -4								
2485.030	53.3	H	54.0	-0.7	Avg	42	1.6	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set 20, BLE set to -12								
2485.030	43.2	H	54.0	-10.8	Avg	42	1.6	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set 20, BLE set to -20								
2485.030	36.2	H	54.0	-17.8	Avg	42	1.6	Note 4; RB 1 MHz; VB: 2 kHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Channel: 11 + 39 Mode: b BLE
Tx Chain: 4 Data Rate: 1 Mb/s

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Wi-Fi set to 10.5, BLE set to 8								
2497.070	52.6	H	54.0	-1.4	Avg	46	1.8	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set to 20, BLE set to 2								
2496.700	51.4	H	54.0	-2.6	Avg	46	1.8	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set to 19, BLE set to 3								
2496.700	52.6	H	54.0	-1.4	Avg	46	1.8	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set to 17.5, BLE set to 4								
2497.030	52.9	H	54.0	-1.1	Avg	46	1.8	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set to 16.5, BLE set to 5								
2497.030	52.9	H	54.0	-1.1	Avg	46	1.8	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set to 13.5, BLE set to 6								
2497.030	52.6	H	54.0	-1.4	Avg	46	1.8	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set to 12.5, BLE set to 7								
2496.700	53.0	H	54.0	-1.0	Avg	46	1.8	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set to 12.5, BLE set to 0								
2496.700	52.9	H	54.0	-1.1	Avg	46	1.8	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set to 20, BLE set to -4								
2496.700	51.6	H	54.0	-2.4	Avg	46	1.8	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set to 20, BLE set to -12								
2497.030	40.7	H	54.0	-13.3	Avg	46	1.8	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set to 20, BLE set to -20								
2496.700	35.2	H	54.0	-18.8	Avg	46	1.8	Note 4; RB 1 MHz; VB: 2 kHz
Wi-Fi set to 20, BLE set to -40								
2496.700	34.9	H	54.0	-19.1	Avg	46	1.8	Note 4; RB 1 MHz; VB: 2 kHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

RSS-247 and FCC 15.247 (DTS) Radiated Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.
For radiated emissions testing the measurement antenna was located 3 meters from the EUT, unless otherwise noted.

Ambient Conditions:

Temperature:	20-24 °C
Rel. Humidity:	38-46 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Summary of Results - Device Operating in the 2400-2483.5 MHz Band

Run #	Mode	Channel	Target Power	Power Setting	Test Performed	Limit	Result / Margin	
1	b	1	20	20.0	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	49.1 dBµV/m @ 2388.7 MHz (-4.9 dB)	
		11		20.0	Restricted Band Edge (2483.5 MHz)		53.1 dBµV/m @ 2483.5 MHz (-0.9 dB)	
2	g	1	20	15.5	Restricted Band Edge (2390 MHz)		53.9 dBµV/m @ 2390.0 MHz (-0.1 dB)	
		2		20.0			73.0 dBµV/m @ 2389.9 MHz (-1.0 dB)	
		11	20	15.5	Restricted Band Edge (2483.5 MHz)		53.2 dBµV/m @ 2483.5 MHz (-0.8 dB)	
		10		17.0			53.3 dBµV/m @ 2483.6 MHz (-0.7 dB)	
3	ax20	1	20	17.0	Restricted Band Edge (2390 MHz)		53.1 dBµV/m @ 2390.0 MHz (-0.9 dB)	
		2		19.0			52.2 dBµV/m @ 2390.0 MHz (-1.8 dB)	
		11		20	15.5		Restricted Band Edge (2483.5 MHz)	50.7 dBµV/m @ 2483.5 MHz (-3.3 dB)
		10			18.5			52.6 dBµV/m @ 2483.5 MHz (-1.4 dB)
4	ax40	3	20	17.0	Restricted Band Edge (2390 MHz)		52.9 dBµV/m @ 2390.0 MHz (-1.1 dB)	
		4		17.0			52.9 dBµV/m @ 2390.0 MHz (-1.1 dB)	
		5		17.5			51.5 dBµV/m @ 2390.0 MHz (-2.5 dB)	
		9		20	16.5		Restricted Band Edge (2483.5 MHz)	51.2 dBµV/m @ 2483.8 MHz (-2.8 dB)
		8			16.5			51.3 dBµV/m @ 2484.7 MHz (-2.7 dB)
		7			17.0			52.0 dBµV/m @ 2483.5 MHz (-2.0 dB)
		6			18.0			53.4 dBµV/m @ 2483.5 MHz (-0.6 dB)



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Summary of Results - Device Operating in the 2400-2483.5 MHz Band

Run #	Mode	Channel	Target Power	Power Setting	Test Performed	Limit	Result / Margin
5	BLE	37 2402MHz	8.0	8.0	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	49.8 dBμV/m @ 2370.2 MHz (-24.2 dB)
		39 2480MHz		8.0	Restricted Band Edge (2483.5 MHz)		58.4 dBμV/m @ 2484.3 MHz (-15.6 dB)
6	ZigBee	11 2405MHz	8.0	8.0	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	48.5 dBμV/m @ 2373.5 MHz (-25.5 dB)
		26 2480MHz		8.0	Restricted Band Edge (2483.5 MHz)		68.7 dBμV/m @ 2483.5 MHz (-5.3 dB)

Sample Notes

Sample S/N: CNGFK9Y02N (BLE), CNGFK9Y02R (ZigBee)

Driver: P4 V0.4.5

Antenna: Internal 8 antennas for 5 GHz radio and 4 antennas for 2.4 GHz radio (5GHz radio may also use 4 antennas but with 3 dB higher power and can operate in both lower and upper 5 GHz bands simultaneously). Tests performed with 4 antennas at the target power.

Procedure Comments:

Measurements performed in accordance with FCC KDB 558074

Peak measurements performed with: RBW=1MHz, VBW=3MHz, peak detector, max hold, auto sweep time

Unless otherwise stated/noted, emission has a duty cycle $\geq 98\%$ and was measured using RBW=1MHz, VBW=10Hz, peak detector, linear average mode, auto sweep time, max hold.

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
BLE	-	0.65	Yes	0.424	1.9	3.8	2358
ZigBee	-	0.43	Yes	0.858	3.7	7.4	1166
11b	1 Mb/s	0.78	Yes	0.667	1.1	2.2	1499
11g	6 Mb/s	0.92	Yes	1.437	0.4	0.7	696
ax20	MCS0	0.96	Yes	5.485	0.2	0.3	182
ax40	MCS0	0.96	Yes	5.401	0.2	0.4	185

3 kHz

2 kHz

2 kHz

1 kHz

200 Hz

200 Hz

Measurement Specific Notes:

Note 4:	Emission has constant duty cycle $< 98\%$, average measurement performed: RBW=1MHz, VBW $> 1/T$ but not less than 10Hz, peak detector, linear averaging, auto sweep, trace average 100 traces, measurement corrected by linear voltage correction factor
Note 8:	Plots of the average and peak bandedge do not account for any duty cycle correction. Refer to the tabular results for final measurements.



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #1: Radiated Bandedge Measurements

Date of Test: 10/18/2018

Test Engineer: John Caizzi

Test Location: Fremont Chamber #7

Config. Used: 1

Config Change: None

EUT Voltage: POE & 120 V, 60 Hz

Channel: 1 - Wi-Fi

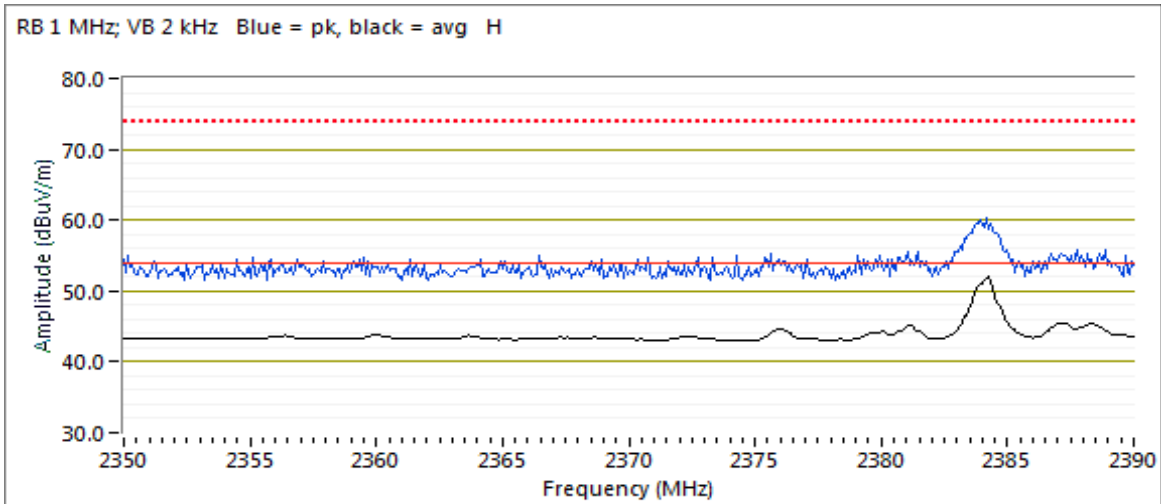
Mode: b

Tx Chain: 4

Data Rate: 1Mbps

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2388.720	49.1	H	54.0	-4.9	Avg	45	2.50	Vavg 100, VB 2 kHz, note 4
2387.680	49.0	V	54.0	-5.0	Avg	303	2.34	Vavg 100, VB 2 kHz, note 4
2386.230	57.4	V	74.0	-16.6	PK	303	2.34	
2389.360	57.1	H	74.0	-16.9	PK	45	2.50	





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

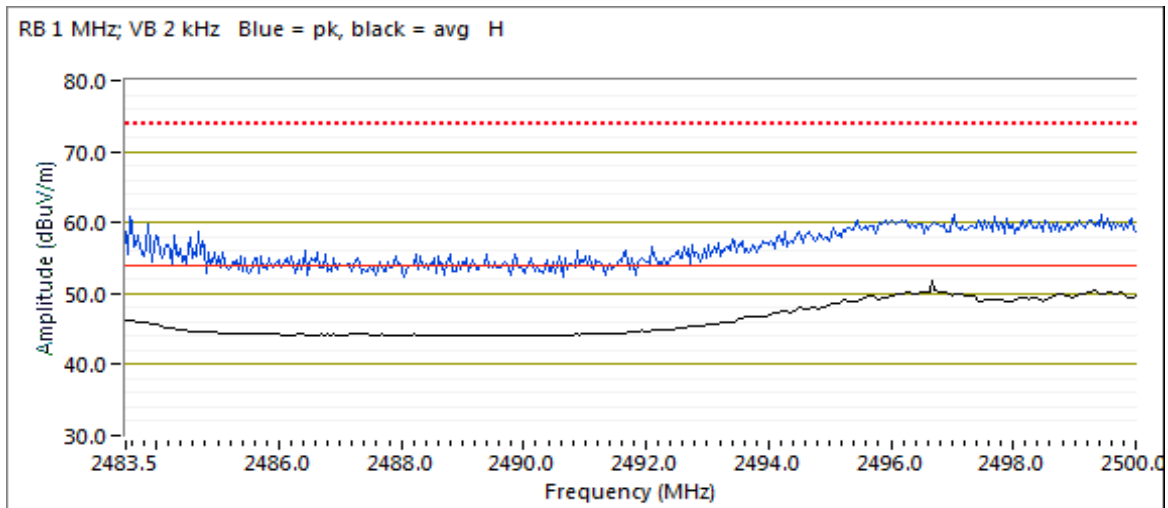
Date of Test: 10/18/2018
 Test Engineer: John Caizzi
 Test Location: Fremont Chamber #7

Config. Used: 1
 Config Change: None
 EUT Voltage: POE & 120 V, 60 Hz

Channel: 11 - Wi-Fi Mode: b
 Tx Chain: 4 Data Rate: 1Mbps

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit Margin	Pk/QP/Avg	degrees	meters	
2483.500	53.1	V	54.0 -0.9	Avg	318	2.19	Vavg 100, VB 2 kHz, note 4
2483.500	47.5	H	54.0 -6.5	Avg	65	2.13	Vavg 100, VB 2 kHz, note 4
2486.310	59.8	V	74.0 -14.2	PK	318	2.19	
2483.570	53.4	H	74.0 -20.6	PK	65	2.13	





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #2: Radiated Bandedge Measurements

Date of Test: 10/22/18

Test Engineer: David Bare

Test Location: Fremont Chamber #7

Config. Used: 1

Config Change: None

EUT Voltage: POE & 120 V, 60 Hz

Channel: 1 - Wi-Fi

Mode: g

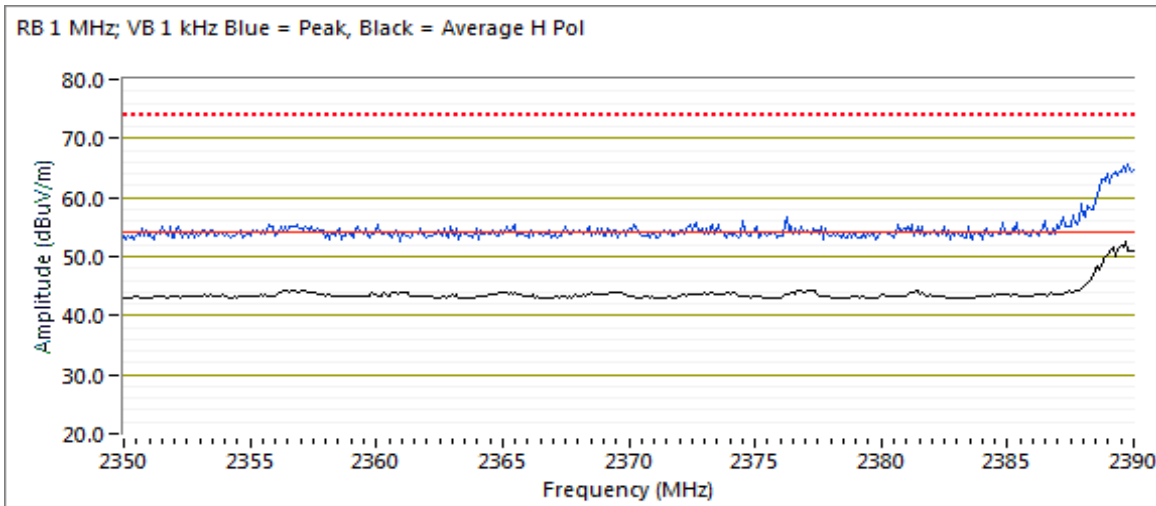
Power: 15.5

Tx Chain: 4

Data Rate: 6 Mb/s

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.960	53.9	H	54.0	-0.1	Avg	51	2.0	POS; RB 1 MHz; VB: 1 kHz, Note 4
2389.870	69.4	H	74.0	-4.6	PK	51	2.0	POS; RB 1 MHz; VB: 3 MHz





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

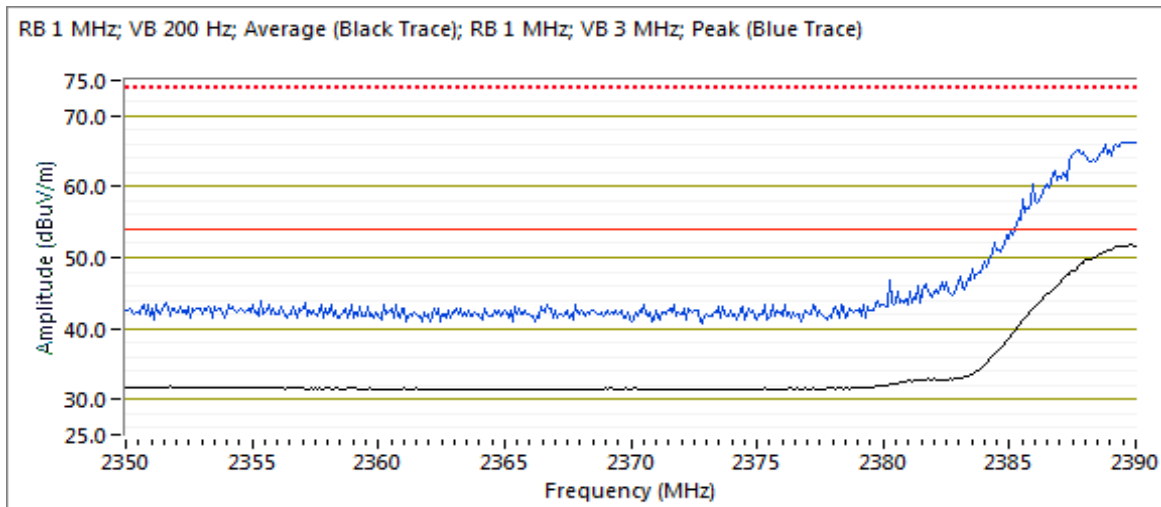
Date of Test: 10/26/18
 Test Engineer: M. Birgani
 Test Location: Fremont Chamber #4

Config. Used: 1
 Config Change: None
 EUT Voltage: POE & 120 V, 60 Hz

Channel: 2 - Wi-Fi Mode: g Power: 20
 Tx Chain: 4 Data Rate: 6 Mb/s

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.940	73.0	H	74.0	-1.0	PK	58	2.6	POS; RB 1 MHz; VB: 3 MHz
2389.800	52.1	H	54.0	-1.9	VAVG	58	2.6	POS Vavg;100; RB 1 MHz; VB: 200 Hz





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

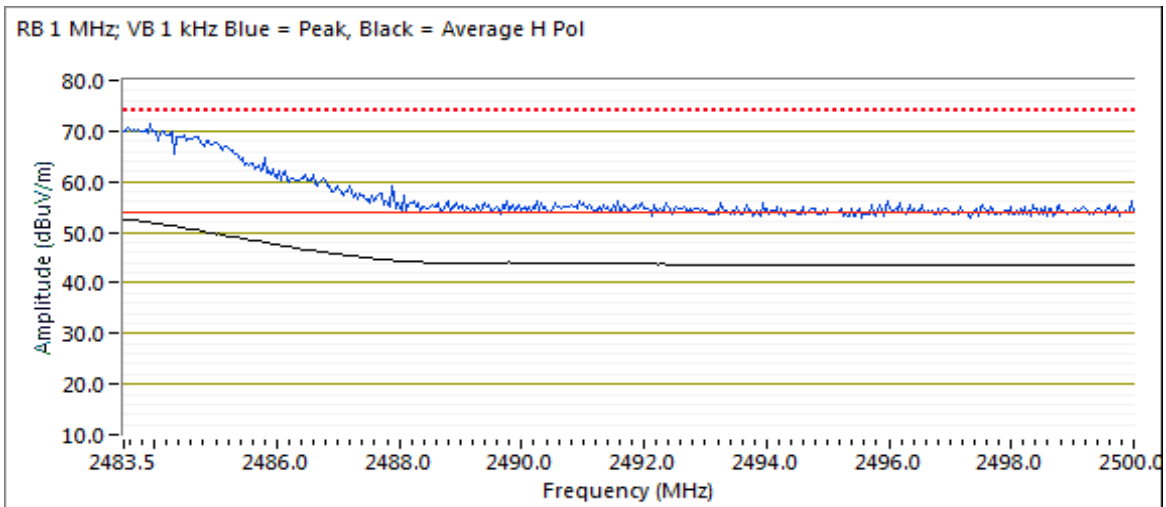
Date of Test: 10/22/18
Test Engineer: David Bare
Test Location: Fremont Chamber #7

Config. Used: 1
Config Change: None
EUT Voltage: POE & 120 V, 60 Hz

Channel: 11 - Wi-Fi Mode: g Power: 15.5
Tx Chain: 4 Data Rate: 6 Mb/s

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.500	53.2	H	54.0	-0.8	Avg	60	2.3	POS; RB 1 MHz; VB: 1 kHz, Note 4
2483.860	70.4	H	74.0	-3.6	PK	60	2.3	POS; RB 1 MHz; VB: 3 MHz





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

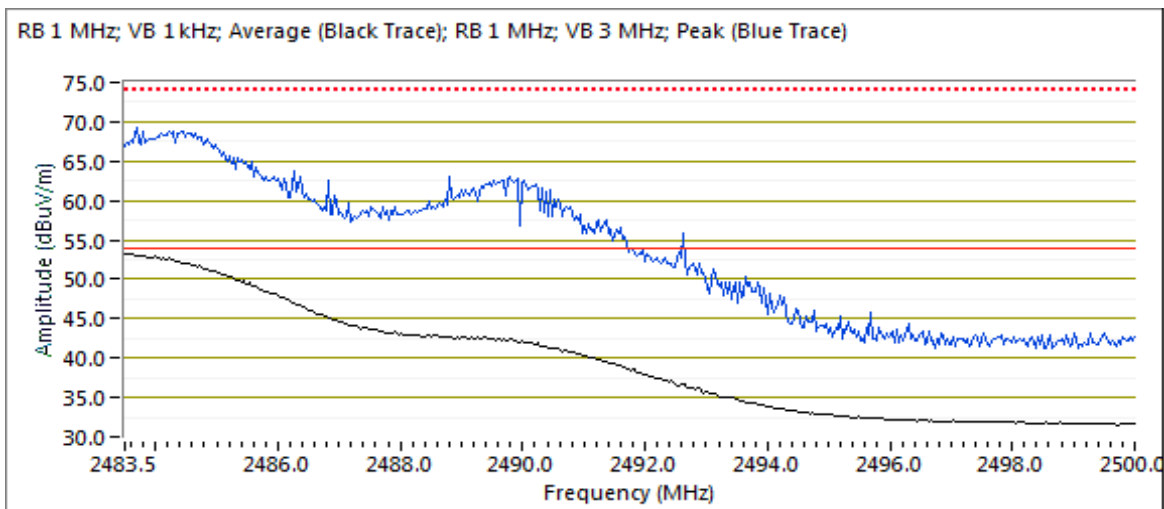
Date of Test: 10/22/18
 Test Engineer: M. Birgani
 Test Location: Fremont Chamber #7

Config. Used: 1
 Config Change: None
 EUT Voltage: POE & 120 V, 60 Hz

Channel: 10 - Wi-Fi Mode: g Power: 17.0
 Tx Chain: 4 Data Rate: 6 Mb/s

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
2483.570	53.3	H	54.0	-0.7	VAVG	38	2.7
2484.320	70.3	H	74.0	-3.7	PK	38	2.7





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #3: Radiated Bandedge Measurements

Date of Test: 10/26/2018

Test Engineer: M. Birgani

Test Location: Fremont Chamber #4

Config. Used: 1

Config Change: None

EUT Voltage: POE & 120 V, 60 Hz

Channel: 1 - Wi-Fi

Mode: ax20

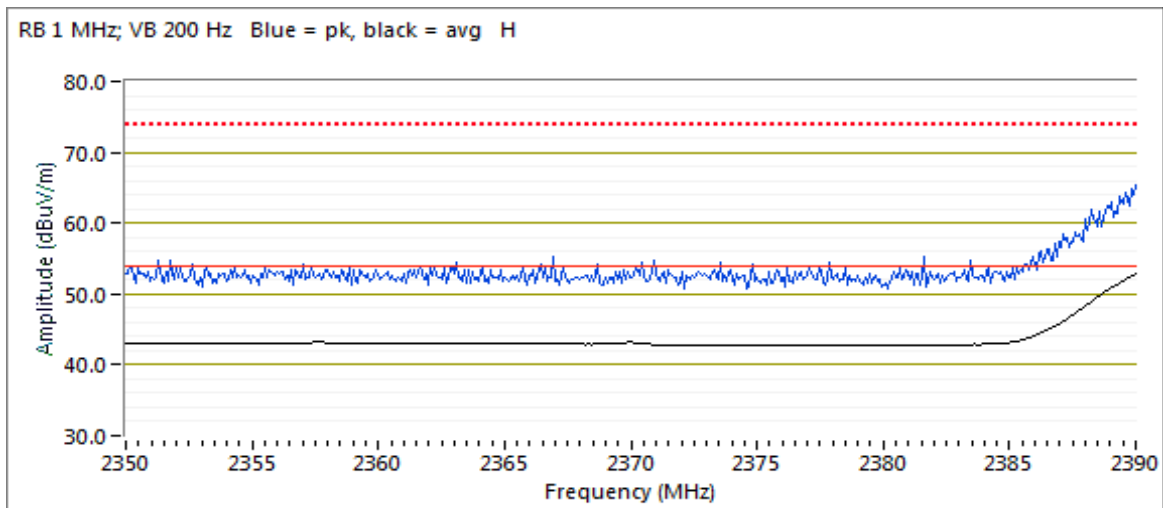
Power: 17.0

Tx Chain: 4

Data Rate: MCS0

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
2390.000	53.1	H	54.0	-0.9	VAVG	54	1.7
2389.400	68.3	H	74.0	-5.7	PK	54	1.7





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

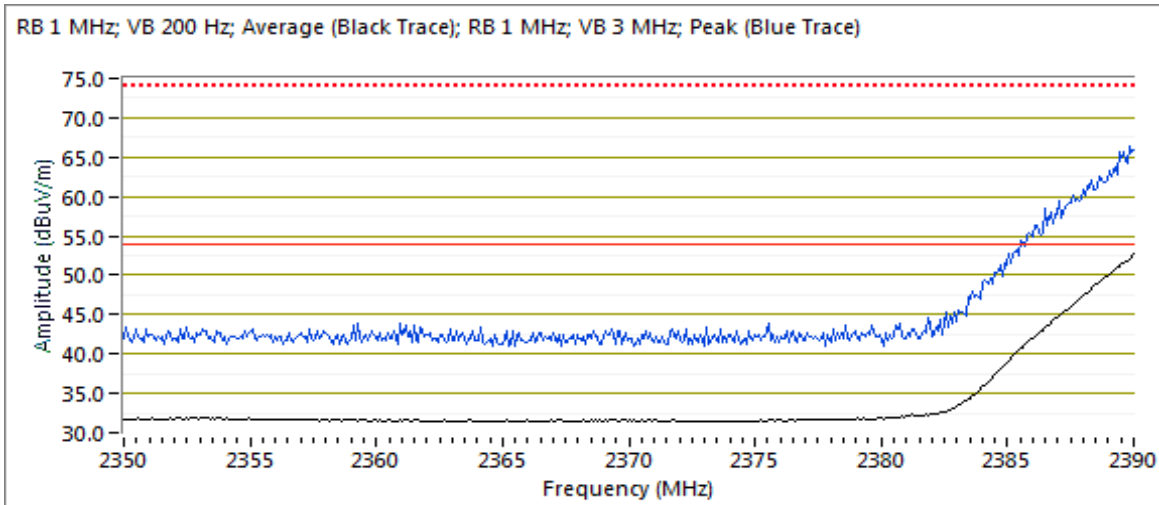
Date of Test: 10/26/2018
 Test Engineer: M. Birgani
 Test Location: Fremont Chamber #4

Config. Used: 1
 Config Change: None
 EUT Voltage: POE & 120 V, 60 Hz

Channel: 2 - Wi-Fi Mode: ax20 Power: 19.0
 Tx Chain: 4 Data Rate: MCS0

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
2390.000	52.2	H	54.0	-1.8	VAVG	42	1.1
2389.570	67.7	H	74.0	-6.3	PK	42	1.1





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

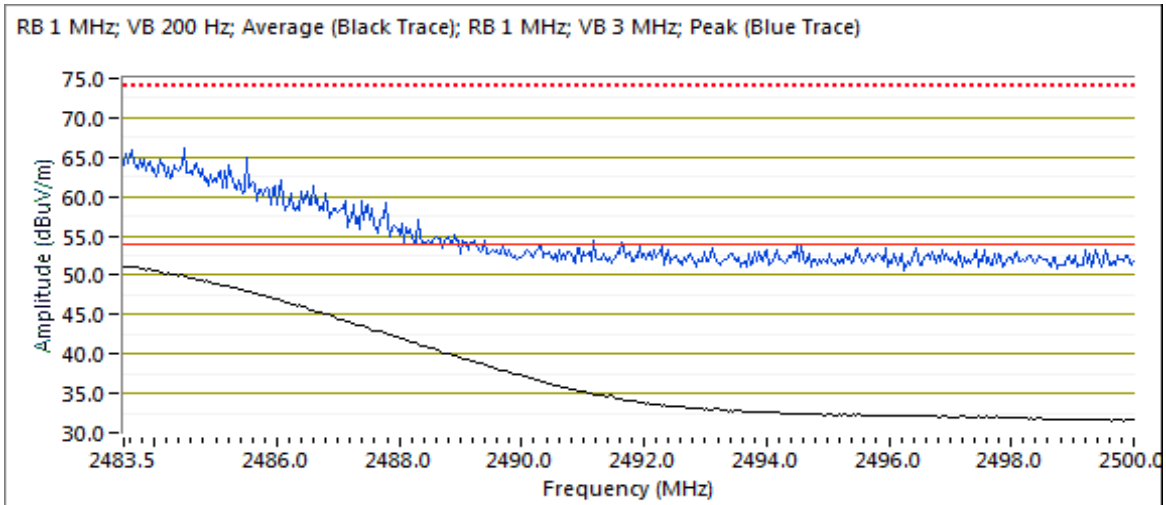
Date of Test: 10/26/2018
 Test Engineer: M. Birgani
 Test Location: Fremont Chamber #4

Config. Used: 1
 Config Change: None
 EUT Voltage: POE & 120 V, 60 Hz

Channel: 11 Mode: ax20 Power: 15.5
 Tx Chain: 4 Data Rate: MCS0

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
2483.510	50.7	H	54.0	-3.3	VAVG	37	1.0
2483.920	66.9	H	74.0	-7.1	PK	37	1.0





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

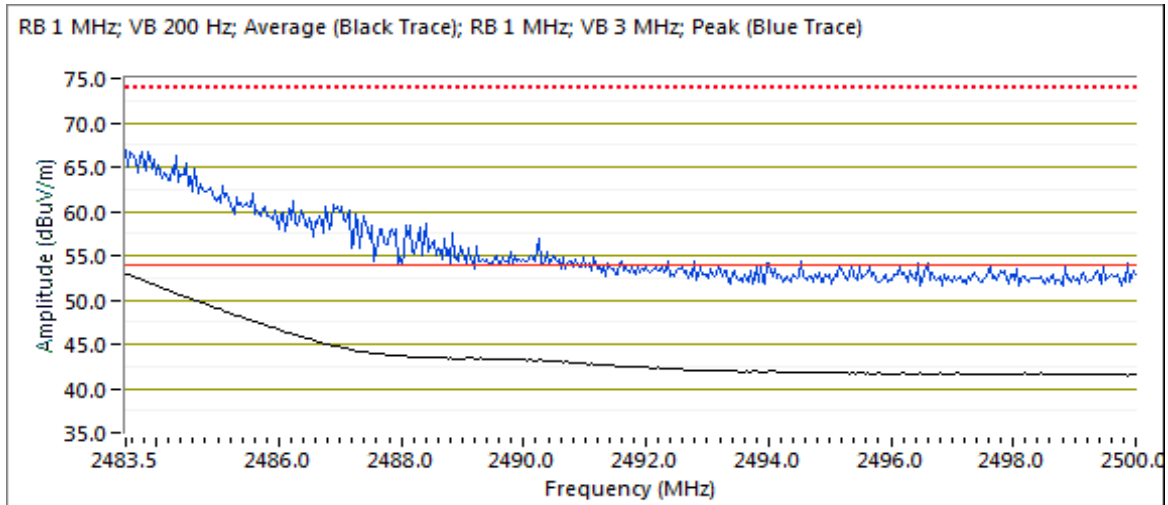
Date of Test: 10/26/2018
 Test Engineer: M. Birgani
 Test Location: Fremont Chamber #4

Config. Used: 1
 Config Change: None
 EUT Voltage: POE & 120 V, 60 Hz

Channel: 10 Mode: ax20 Power: 18.5
 Tx Chain: 4 Data Rate: MCS0

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
2483.540	52.6	H	54.0	-1.4	VAVG	37	1.0
2483.640	68.0	H	74.0	-6.0	PK	37	1.0





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #4: Radiated Bandedge Measurements

Date of Test: 10/19/2018

Test Engineer: John Caizzi

Test Location: Fremont Chamber #3

Config. Used: 1

Config Change: None

EUT Voltage: 120V / 60Hz & PoE

Channel: 3 - Wi-Fi

Mode: ax40

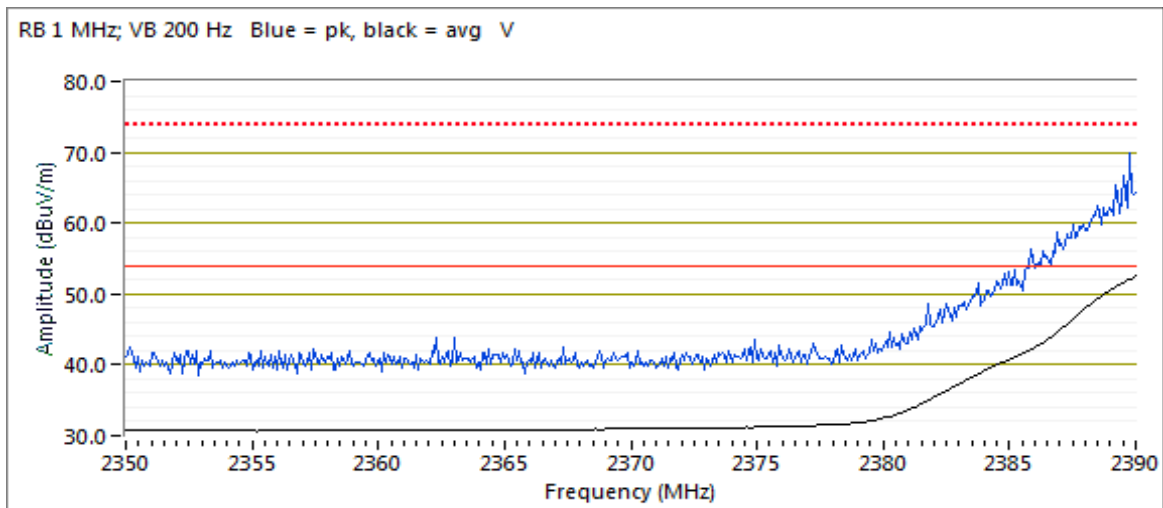
Power: 17.0

Tx Chain: 4

Data Rate: MCS0

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.960	52.9	V	54.0	-1.1	VAVG	17	1.89	RB 1 MHz; VB: 200 Hz
2389.980	69.2	V	74.0	-4.8	PK	17	1.89	RB 1 MHz; VB: 3 MHz





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

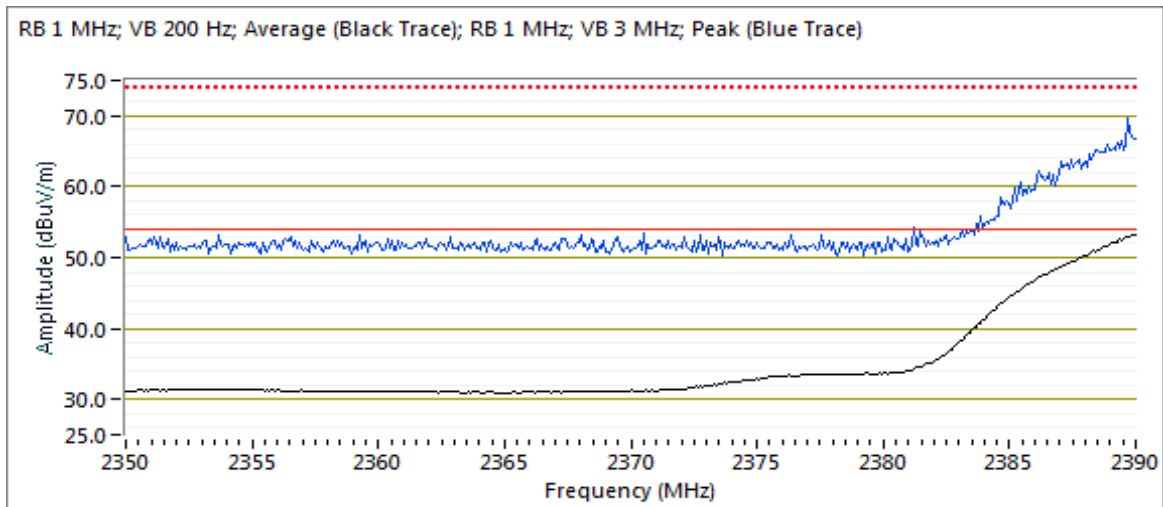
Date of Test: 10/26/2018
 Test Engineer: M. Birgani
 Test Location: Fremont Chamber #3

Config. Used: 1
 Config Change: None
 EUT Voltage: 120V / 60Hz & PoE

Channel: 4 - Wi-Fi Mode: ax40 Power: 17.0
 Tx Chain: 4 Data Rate: MCS0

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
2389.970	53.3	H	54.0	-0.7	VAVG	61	2.0
2389.800	70.6	H	74.0	-3.4	PK	61	2.0





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

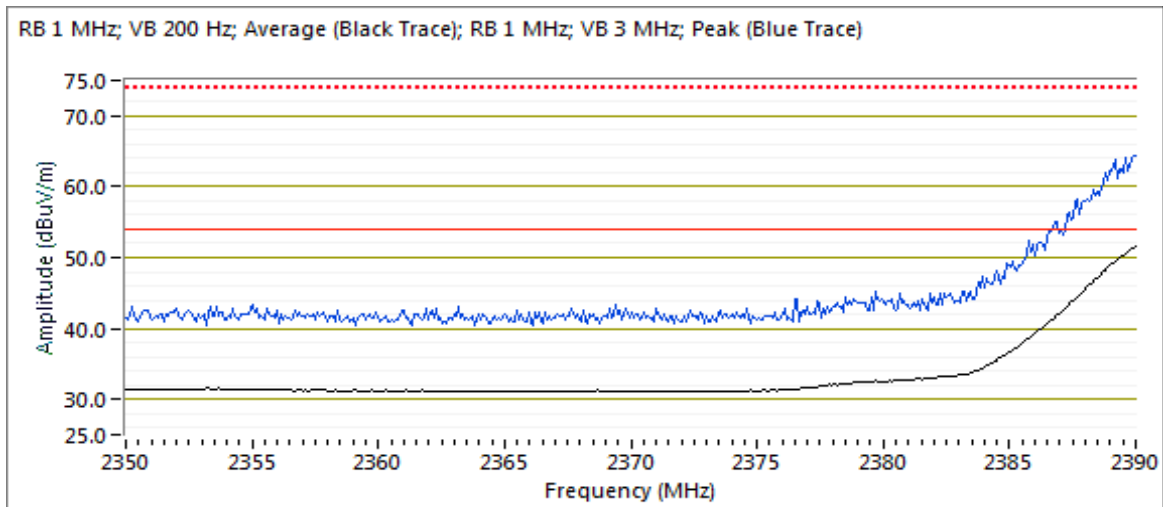
Date of Test: 10/26/2018
Test Engineer: M. Birgani
Test Location: Fremont Chamber #3

Config. Used: 1
Config Change: None
EUT Voltage: 120V / 60Hz & PoE

Channel: 5 - Wi-Fi Mode: ax40 Power: 17.5
Tx Chain: 4 Data Rate: MCS0

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.960	51.5	H	54.0	-2.5	VAVG	58	1.9	RB 1 MHz; VB: 200 Hz
2389.730	67.1	H	74.0	-6.9	PK	58	1.9	RB 1 MHz; VB: 3 MHz





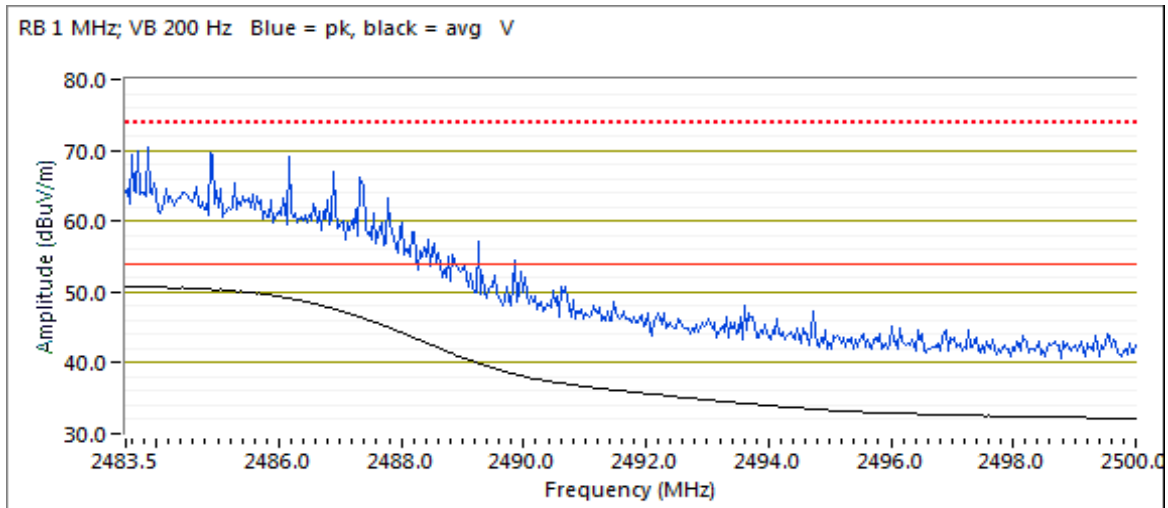
EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Channel: 9 - Wi-Fi Mode: ax40 Power: 16.5
Tx Chain: 4 Data Rate: MCS0

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.810	51.2	V	54.0	-2.8	Avg	30	1.85	Vavg 100, VB 200 Hz, note 4
2484.350	70.8	V	74.0	-3.2	PK	30	1.85	





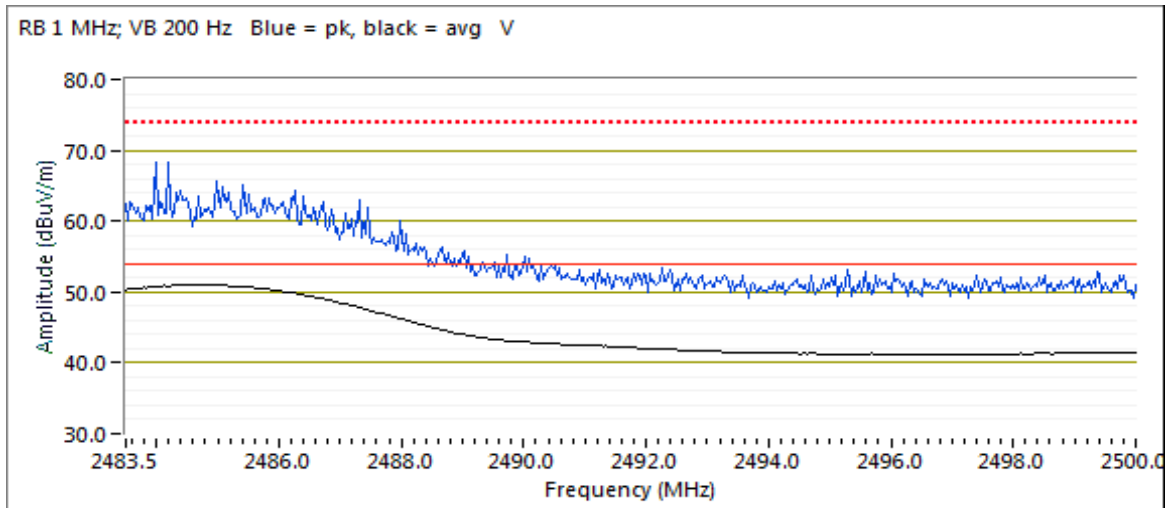
EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Channel: 8 - Wi-Fi Mode: ax40 Power: 16.5
 Tx Chain: 4 Data Rate: MCS0

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2484.740	51.3	V	54.0	-2.7	Avg	309	2.09	Vavg 100, VB 200 Hz, note 4
2486.010	70.1	V	74.0	-3.9	PK	309	2.09	





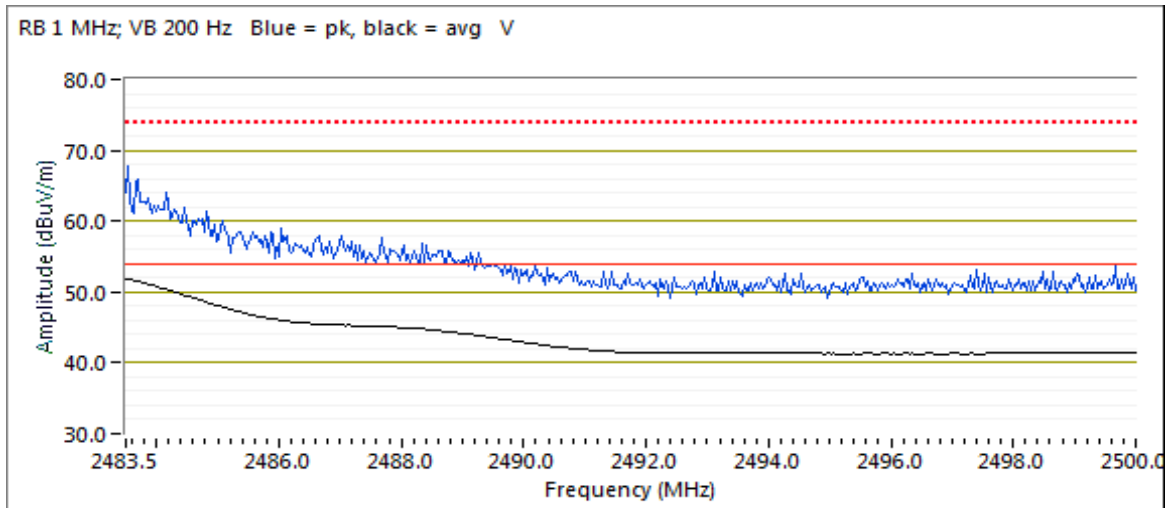
EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Channel: 7 - Wi-Fi Mode: ax40 Power: 17.0
 Tx Chain: 4 Data Rate: MCS0

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
2483.520	52.0	V	54.0	-2.0	Avg	317	2.50
2483.670	67.3	V	74.0	-6.7	PK	317	2.50





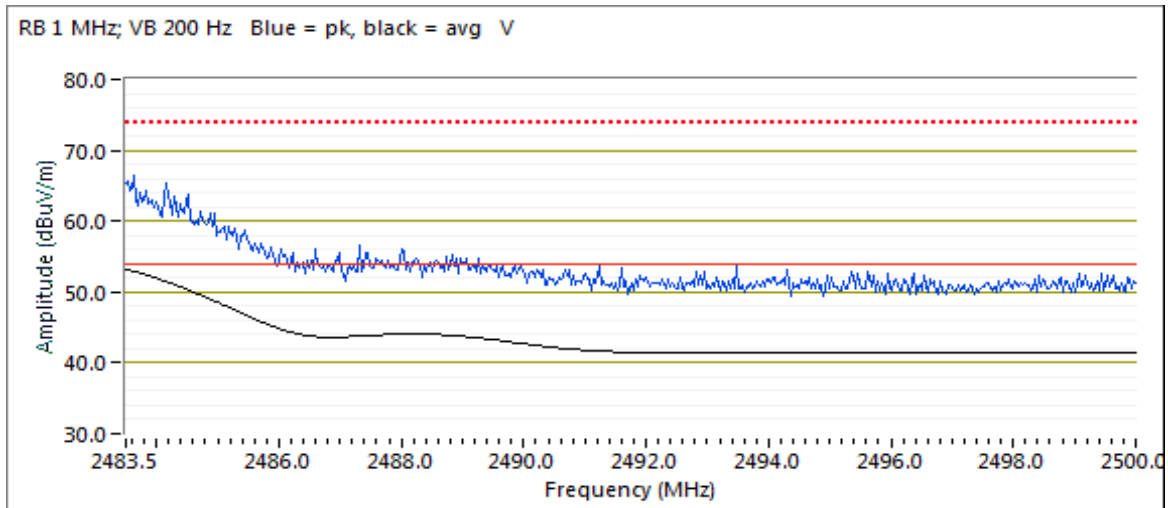
EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Channel: 6 - Wi-Fi Mode: ax40 Power: 18.0
 Tx Chain: 4 Data Rate: MCS0

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.530	53.4	V	54.0	-0.6	Avg	319	2.04	Vavg 100, VB 200 Hz, note 4
2483.800	66.7	V	74.0	-7.3	PK	319	2.04	





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #5: Radiated Bandedge Measurements

Date of Test: 10/26/2018

Test Engineer: M. Birgani

Test Location: Fremont Chamber #3

Config. Used: 1

Config Change: None

EUT Voltage: 120V / 60Hz & PoE

Channel: 37 - BLE

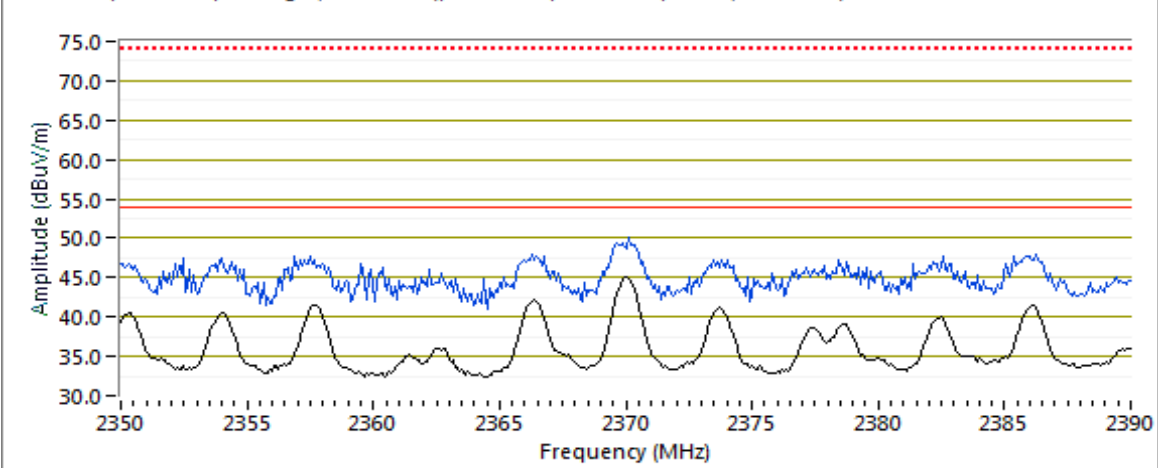
TX Chain: 1

Power: 8.0

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2370.200	49.8	H	74.0	-24.2	PK	62	1.7	RB 1 MHz; VB: 3 MHz
2369.880	28.7	H	54.0	-25.3	VAVG	62	1.7	RB 1 MHz; VB: 3 kHz
2370.040	47.9	V	74.0	-26.1	PK	360	1.8	RB 1 MHz; VB: 3 MHz
2369.800	25.4	V	54.0	-28.6	VAVG	360	1.8	RB 1 MHz; VB: 3 kHz

RB 1 MHz; VB 3 kHz; Average (Black Trace); RB 1 MHz; VB 3 MHz; Peak (Blue Trace)





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

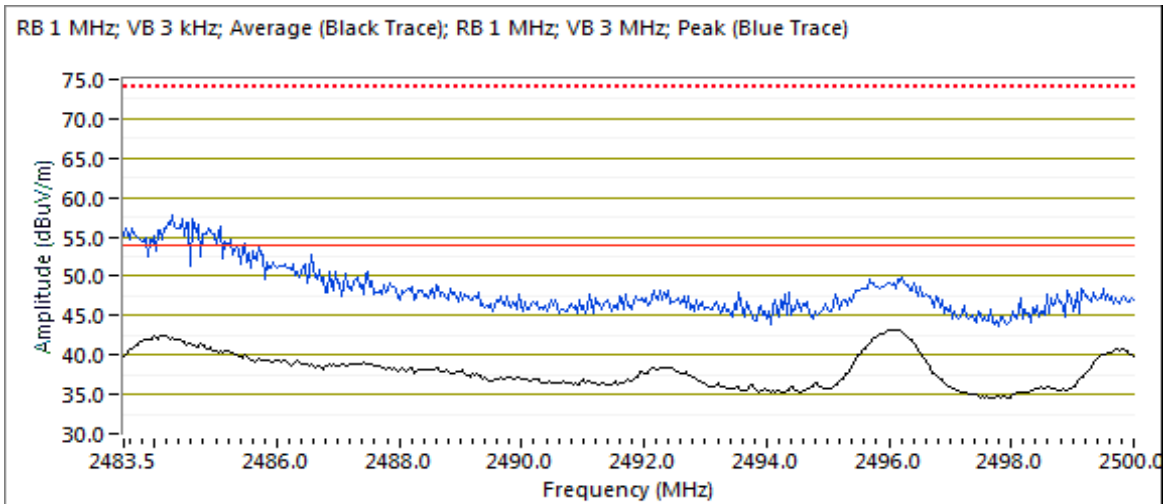
Date of Test: 10/26/2018
 Test Engineer: M. Birgani
 Test Location: Fremont Chamber #3

Config. Used: 1
 Config Change: None
 EUT Voltage: 120V / 60Hz & PoE

Channel: 39 - BLE TX Chain: 1 Power: 8.0

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2484.330	58.4	H	74.0	-15.6	PK	53	1.9	RB 1 MHz; VB: 3 MHz
2496.230	26.9	H	54.0	-27.1	VAVG	53	1.9	RB 1 MHz; VB: 3 kHz





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #6: Radiated Bandedge Measurements

Date of Test: 10/26/2018

Test Engineer: M. Birgani

Test Location: Fremont Chamber #4

Config. Used: 1

Config Change: None

EUT Voltage: 120V / 60Hz & PoE

Channel: 11 - Zigbee

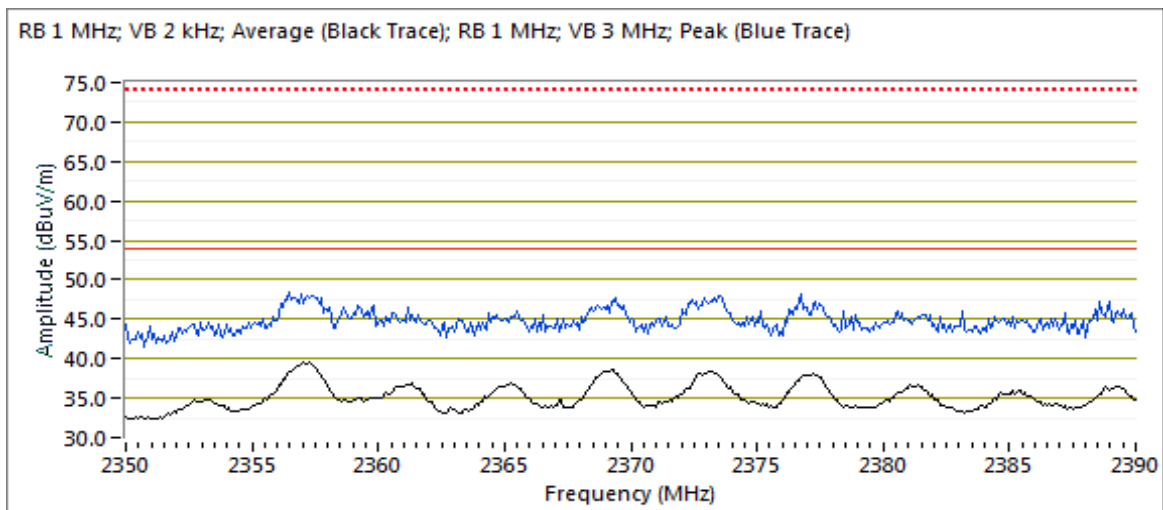
TX Chain: 1

Power: 8.0

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2373.490	48.5	H	74.0	-25.5	PK	10	2.5	RB 1 MHz; VB: 3 MHz
2356.410	25.3	H	54.0	-28.7	VAVG	10	2.5	RB 1 MHz; VB: 2 kHz

Note: Average value in table includes both duty cycle corrections.





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Date of Test: 10/22/2018
 Test Engineer: David Bare
 Test Location: Fremont Chamber #7

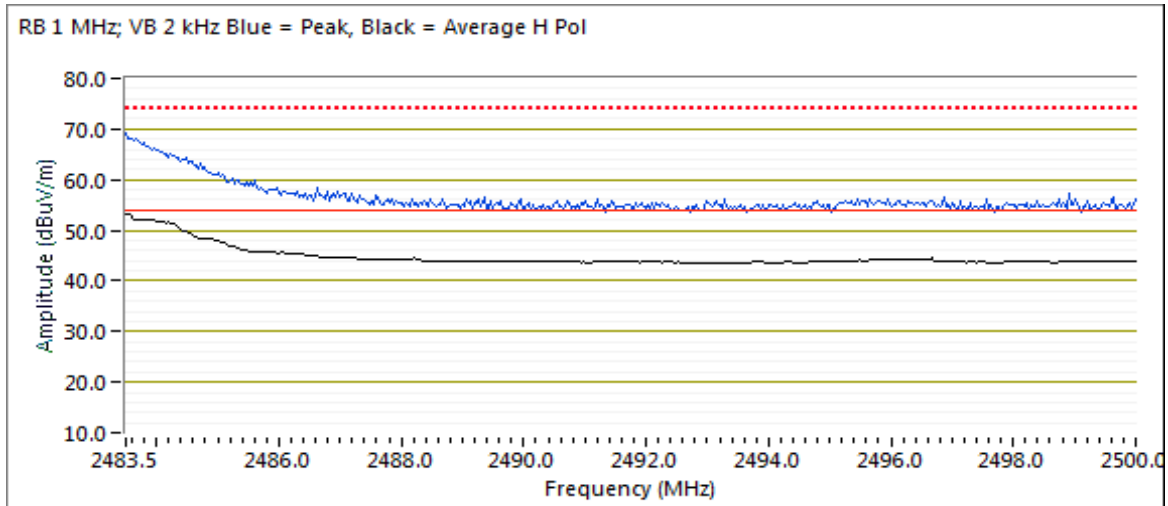
Config. Used: 1
 Config Change: None
 EUT Voltage: POE & 120 V, 60 Hz

Channel: 26 - Zigbee TX Chain: 1 Power: 8.0

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
2483.530	68.7	H	74.0	-5.3	PK	60	2.3
2483.500	41.2	H	54.0	-12.8	Avg	60	2.3

Note: Average value in table includes both duty cycle corrections.





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

RSS-247, FCC 15.247 and FCC 15.407 Radiated Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.
For radiated emissions testing the measurement antenna was located 3 meters from the EUT, unless otherwise noted.

Ambient Conditions:

Temperature: 20-24 °C
Rel. Humidity: 35-45 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Summary of Results

Run #	Mode	Channel	Target Powers	Power Settings	Test Performed	Limit	Result / Margin
Scans on "center" channel in all five OFDM modes to determine the worst case mode (8x8 in 5 GHz bands and 4x4 in 2.4 GHz band).							
1	a / g	6 & 40	15 / 20	20 /20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	45.9dBµV/m @ 20798.9MHz (-8.1dB)
	ax20	6 & 40	20 / 20	20 /20			43.9dBµV/m @ 20798.2MHz (-10.1dB)
	ax40	6 & 38	20 / 20	20 / 20			39.1 dBµV/m @ 20758.5MHz (-14.9dB)
	ax80 / b	6 & 42	20 / 20	20 / 20			48.0 dBµV/m @ 7216.2 MHz (-6.0 dB)
Scans on worst case mode above with BLE or ZigBee also active.							
2	a / b, ZigBee	6, 40 Wi-Fi 18 - ZB	15 / 20 / 8	15 / 20 / 8	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	44.8 dBµV/m @ 7311.6 MHz (-9.2 dB)
	a / b, BLE	6, 40 Wi-Fi 17 - BLE	15 / 20 / 8	15 / 20 / 8			50.9 dBµV/m @ 7205.2 MHz (-3.1 dB)
Measurements on low and high channels in worst-case OFDM mode.							
3	a / g	1 & 36	20 / 20	20 / 20	Radiated Emissions, 1 - 12 GHz	FCC 15.209/ 15.247 / 15 E	44.8 dBµV/m @ 20726.1 MHz (-9.2 dB)
	a / g	11 & 48	20 / 20	20 / 20			47.4 dBµV/m @ 20957.2 MHz (-6.6 dB)
Scans on "center" channel in all four OFDM modes to determine the worst case mode. (8x8 in 5 GHz bands and 4x4 in 2.4 GHz band).							
8	a / g	6 & 157	20 / 20	20 / 20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	42.5dBµV/m @ 11571.5MHz (-11.5dB)
	ax20	6 & 157	20 / 20	20 / 20			40.7dBµV/m @ 4738.8MHz (-13.3dB)
	ax40	6 & 159	20 / 20	20 / 20			51.1dBµV/m @ 23181.9MHz (-17.2dB)
	ax80 / b	6 & 155	20 / 20	20 / 20			37.7dBµV/m @ 23101.2MHz (-16.3dB)
9	a / g	1 & 149	20 / 20	20 /20	Radiated Emissions, 1 - 12 GHz	FCC 15.209/ 15.247 / 15 E	43.6dBµV/m @ 22979.7MHz (-10.4dB)
		11 & 165		20 / 20			43.9dBµV/m @ 11649.9MHz (-10.1dB)



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #	Mode	Channel	Target Powers	Power Settings	Test Performed	Limit	Result / Margin
Measurements on low and high channels in worst-case OFDM mode.							
10	BLE	37	8	8	Radiated Emissions, 1 - 25 GHz	FCC 15.209/ 15.247	53.3 dBµV/m @ 4803.9 MHz (-0.7 dB)
		17					48.9 dBµV/m @ 7319.3 MHz (-5.1 dB)
		39					50.8 dBµV/m @ 7439.3 MHz (-3.2 dB)
11	ZigBee	11					36.2dBµV/m @ 11020.0MHz (-17.8dB)
		18					53.6dBµV/m @ 7321.5MHz (-20.4dB)
		26					54.5 dBµV/m @ 7438.3 MHz (-19.5 dB)

Procedure Comments:

Measurements performed in accordance with FCC KDB 789033

Peak measurements performed with: RBW=1MHz, VBW=3MHz, peak detector, max hold, auto sweep time

Unless otherwise stated/noted, emission has duty cycle ≥ 98% and was measured using RBW=1MHz, VBW=10Hz, peak detector, linear average mode, auto sweep time, max hold 50 traces. (method VB of KDB 789033)



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)	
BLE	1 Mb/s	0.65	Yes	0.424	1.9	3.8	2358	3 kHz
ZigBee	-	0.43	Yes	0.858	3.7	7.4	1166	2 kHz
11b	1 Mb/s	0.78	Yes	0.667	1.1	2.2	1499	2 kHz
11g	6 Mb/s	0.92	Yes	1.437	0.4	0.7	696	1 kHz
11a	6 Mb/s	0.92	Yes	1.437	0.3	0.7	696	1 kHz
ax20	MCS0	0.96	Yes	5.485	0.2	0.3	182	200 Hz
ax40	MCS0	0.96	Yes	5.401	0.2	0.4	185	200 Hz
ax80	MCS0	0.96	Yes	5.401	0.2	0.4	185	200 Hz
ax80+80	MCS0	0.95	Yes	5.401	0.2	0.4	185	200 Hz

Sample Notes

Sample S/N: CNGFK9Y02N (BLE) & CNGFK9Y005 (Zigbee)

Driver: P4 V0.4.5

Antenna: Internal 8 antennas for 5 GHz radio and 4 antennas for 2.4 GHz radio (5GHz radio may also use 4 antennas but with 3 dB higher power and can operate in both lower and upper 5 GHz bands simultaneously). Tests performed with 8 antennas at the 4 antenna power levels.

Measurement Specific Notes:

Note 1:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m) for emissions related to UNII operation. The measurement method required is a peak measurement (RBW=1MHz, VB≥3MHz, peak detector).
Note 2:	Emission in non-restricted band, but limit of 15.209 used.
Note 3:	Emission has constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW>1/T but not less than 10Hz, peak detector, linear averaging, auto sweep, max hold 50*1/DC traces (method VB of KDB 789033)
Note 4:	Emission has constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW>1/T but not less than 10Hz, peak detector, linear averaging, auto sweep, trace average 100 traces, measurement corrected by linear voltage correction factor
Note 5:	-20 dB correction factor was used for ZigBee as 10% operational duty cycle
Note 6:	Digital device emission, class A limit extrapolated to 3m applied, peak reading vs peak or average limit.



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #1, Radiated Spurious Emissions, 1,000 - 40,000 MHz. Operation in the 5150-5250 MHz Band

Date of Test: 10/25/2018

Config. Used: 1

Test Engineer: M. Birgani

Config Change: None

Test Location: Fremont Chamber #4

EUT Voltage: POE & 120 V, 60 Hz

Run #1a: Center Channel

Channel, Mode, Chain, Level: 6, g, 4, 20

Channel, Mode, Chain, Level: 40, a, 8, 20

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
20798.900	45.9	V	54.0	-8.1	AVG	338	1.1	RB 1 MHz;VB 1 kHz, note 3
20798.550	57.8	V	74.0	-16.2	PK	338	1.1	RB 1 MHz;VB 3 MHz;Peak
20799.660	41.9	H	54.0	-12.1	AVG	32	1.2	RB 1 MHz;VB 1 kHz, note 3
20800.320	54.5	H	74.0	-19.5	PK	32	1.2	RB 1 MHz;VB 3 MHz;Peak
7644.350	36.8	V	54.0	-17.2	AVG	224	1.0	RB 1 MHz;VB 10 Hz;Peak
7644.850	49.5	V	74.0	-24.5	PK	224	1.0	RB 1 MHz;VB 3 MHz;Peak
1500.010	36.1	V	60.0	-23.9	AVG	180	1.0	RB 1 MHz;VB 10 Hz;Peak
1499.950	40.5	V	80.0	-39.5	PK	180	1.0	RB 1 MHz;VB 3 MHz;Peak

Note: Scans made between 18 - 40 GHz with the measurement antenna moved around the EUT 30 from the device indicated there were no significant emissions in this frequency range other than the 4th harmonic of the 5GHz fundamental.

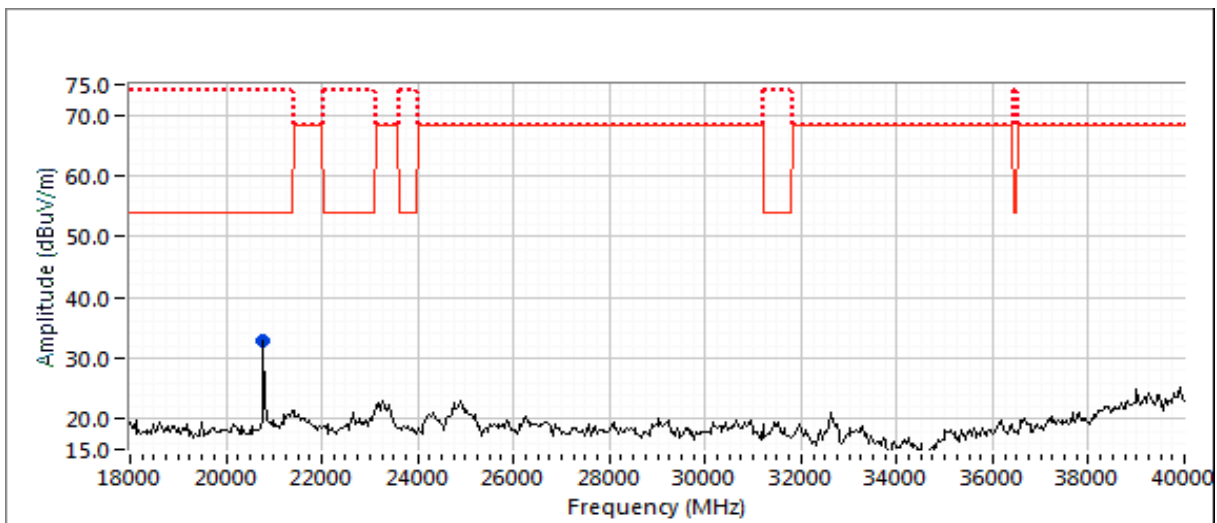
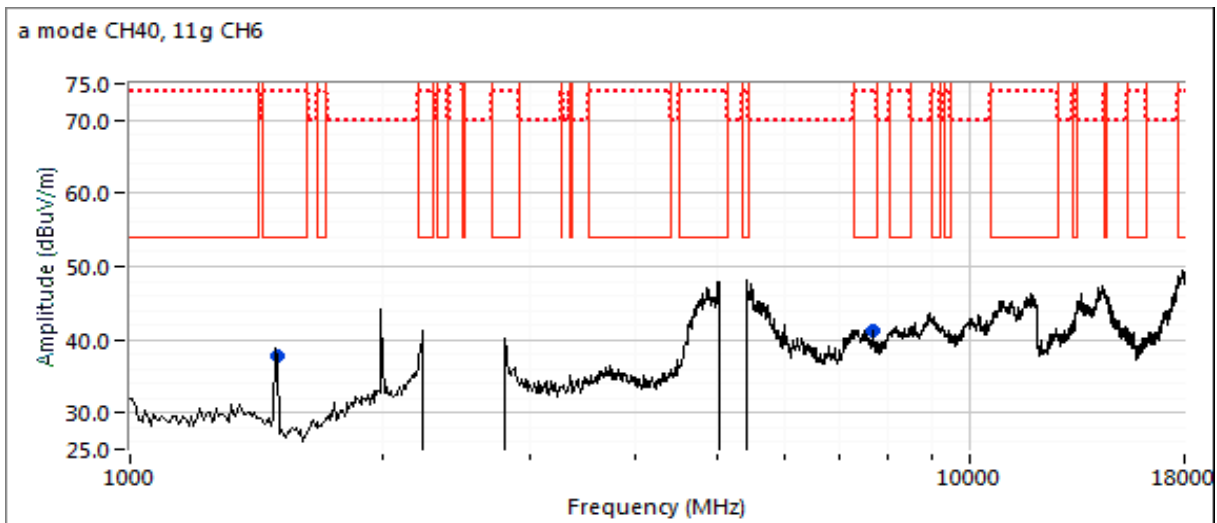
Note 1: For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.

Note 2: For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m) for emissions related to UNII operation. The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #1b: Center Channel

Date of Test: 10/25/2018

Test Engineer: M. Birgani

Test Location: Fremont Chamber #4

Config. Used: 1

Config Change: None

EUT Voltage: POE & 120 V, 60 Hz

Channel, Mode, Chain, Level: 6, b, 4, 20

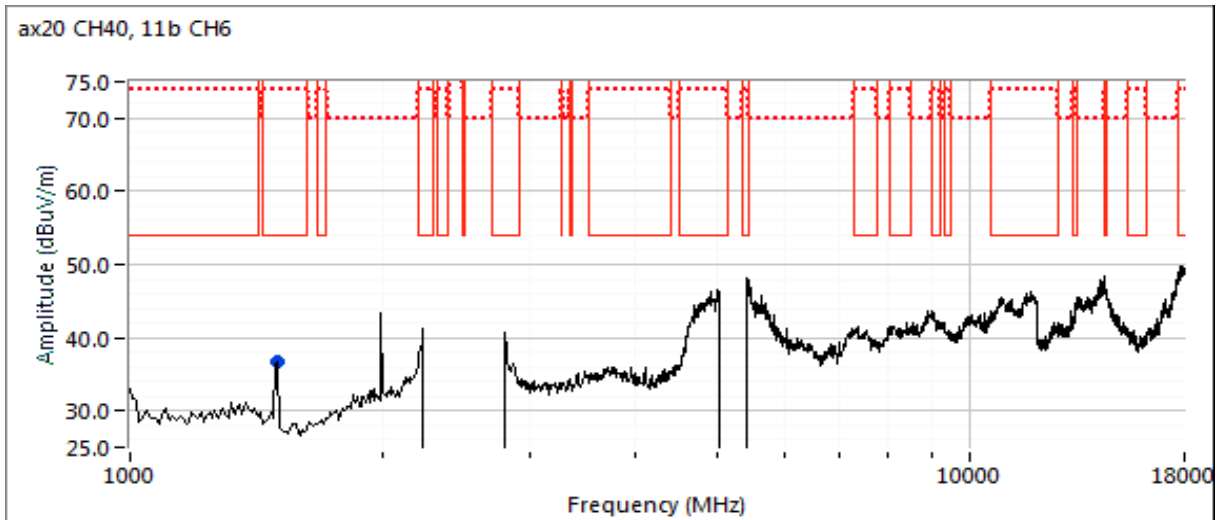
Channel, Mode, Chain, Level: 40, ax20, 8, 20

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
20798.180	43.9	V	54.0	-10.1	AVG	336	1.2	Note 3; RB 1 MHz;VB 300 Hz
20798.780	58.7	V	74.0	-15.3	PK	336	1.2	RB 1 MHz;VB 3 MHz;Peak
1500.010	40.4	V	54.0	-13.6	PK	206	1.0	RB 1 MHz;VB 3 MHz;Peak

Note: Scans made between 18 - 40 GHz with the measurement antenna moved around the EUT 30 from the device indicated there were no significant emissions in this frequency range other than the 4th harmonic of the 5GHz fundamental.

Note 1: For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.

Note 2: For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m) for emissions related to UNII operation. The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #1c: Center Channel

Date of Test: 10/25/2018

Test Engineer: M. Birgani

Test Location: Fremont Chamber #4

Config. Used: 1

Config Change: None

EUT Voltage: POE & 120 V, 60 Hz

Channel, Mode, Chain, Level: 6, b, 4, 20

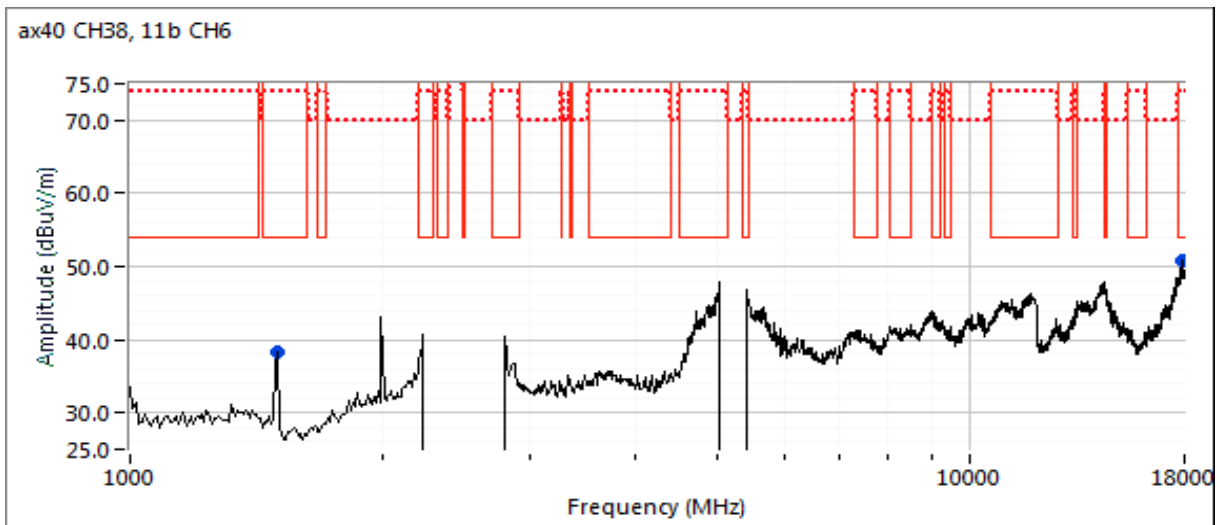
Channel, Mode, Chain, Level: 38, ax40, 8, 20

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
20758.480	39.1	V	54.0	-14.9	AVG	338	1.2	RB 1 MHz;VB 300 Hz; note 3
20759.830	53.6	V	74.0	-20.4	PK	338	1.2	RB 1 MHz;VB 3 MHz;Peak
1500.010	40.4	V	54.0	-13.6	PK	206	1.0	RB 1 MHz;VB 3 MHz;Peak

Note: Scans made between 18 - 40 GHz with the measurement antenna moved around the EUT 30 from the device indicated there were no significant emissions in this frequency range other than the 4th harmonic of the 5GHz fundamental.

Note 1: For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.

Note 2: For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m) for emissions related to UNII operation. The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

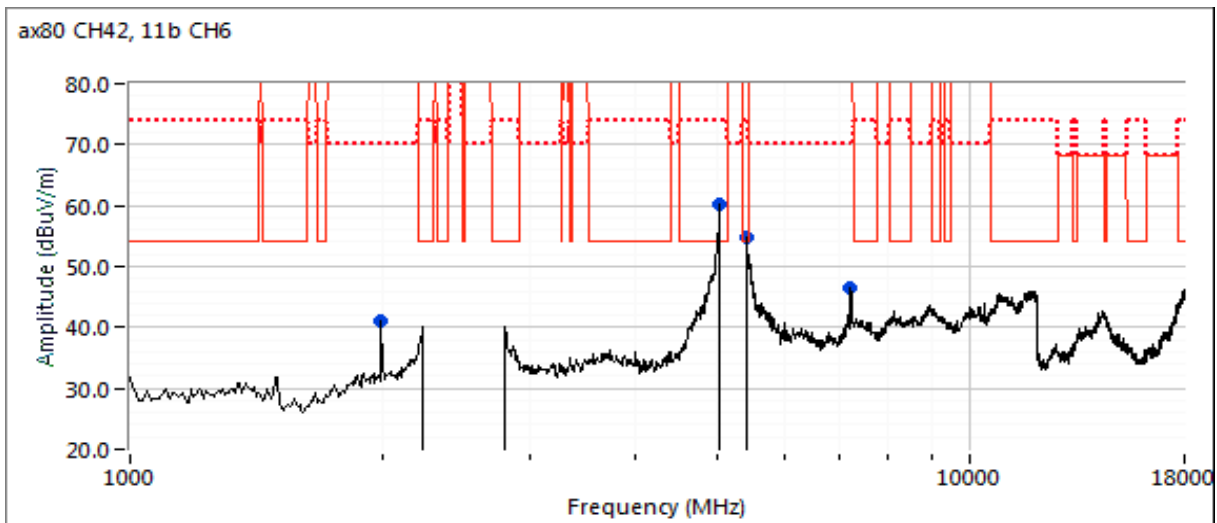
Run #1d: Center Channel

Channel, Mode, Chain, Level: 6, b, 4, 20

Channel, Mode, Chain, Level: 42, ax80, 8, 20

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7216.200	48.0	H	54.0	-6.0	Avg	53	2.0	Note 2, 3; RB 1 MHz; VB 3 kHz
7216.550	53.0	H	74.0	-21.0	PK	53	2.0	RB 1 MHz;VB 3 MHz;Peak
20839.770	38.4	V	54.0	-15.6	AVG	338	1.2	Note 3; RB 1 MHz;VB 300 Hz
20838.560	52.4	V	74.0	-21.6	PK	338	1.2	RB 1 MHz;VB 3 MHz;Peak
2000.000	41.2	V	60.0	-18.8	Peak	196	1.5	Note 6
5041.670	60.3	H			Peak	300	2.0	See bandedge measurements.
5416.670	54.8	H			Peak	46	1.5	See bandedge measurements.

Note:	Scans made between 18 - 40 GHz with the measurement antenna moved around the EUT 30 from the device indicated there were no significant emissions in this frequency range other than the 4th harmonic of the 5GHz fundamental.
Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dB μ V/m) for emissions related to UNII operation. The measurement method required is a peak measurement (RB=1MHz, VB $\geq$ 3MHz, peak detector).





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #2, Radiated Spurious Emissions, 1,000 - 40,000 MHz.

Date of Test: 12/27/2018 0:00

Test Engineer: Rafael Varelas

Test Location: Ft Chamber #5

Config. Used: 1

Config Change: None

EUT Voltage: PoE

Run #2a: Center Channel

Channel: 6, 40 Wi-Fi, 18 - ZigBee

Tx Chain: 8 (5GHz), 4 (2.4 GHz)

Mode: a, b

Data Rate: 6Mbps, 1

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.000	43.9	H	54.0	-10.1	Peak	133	1.0	
2000.000	49.4	H	60.0	-10.6	Peak	139	2.5	Note 6
4874.520	41.7	H	54.0	-12.3	Vavg	125	1.5	Note 3; RB 1 MHz;VB 300 Hz
4875.370	51.1	H	74.0	-22.9	PK	125	1.5	RB 1 MHz;VB 3 MHz;Peak
7213.390	34.8	V	54.0	-19.2	Avg	206	1.1	Note 5
7213.390	54.8	V	74.0	-19.2	PK	206	1.1	RB 1 MHz;VB 3 MHz;Peak
7311.630	44.8	V	54.0	-9.2	Vavg	178	1.0	Note 3; RB 1 MHz; VB 2 kHz
7311.610	44.7	V	74.0	-29.3	PK	178	1.0	RB 1 MHz;VB 3 MHz;Peak
10375.250	51.7	V	68.3	-16.6	PK	186	2.5	RB 1 MHz;VB 3 MHz;Peak

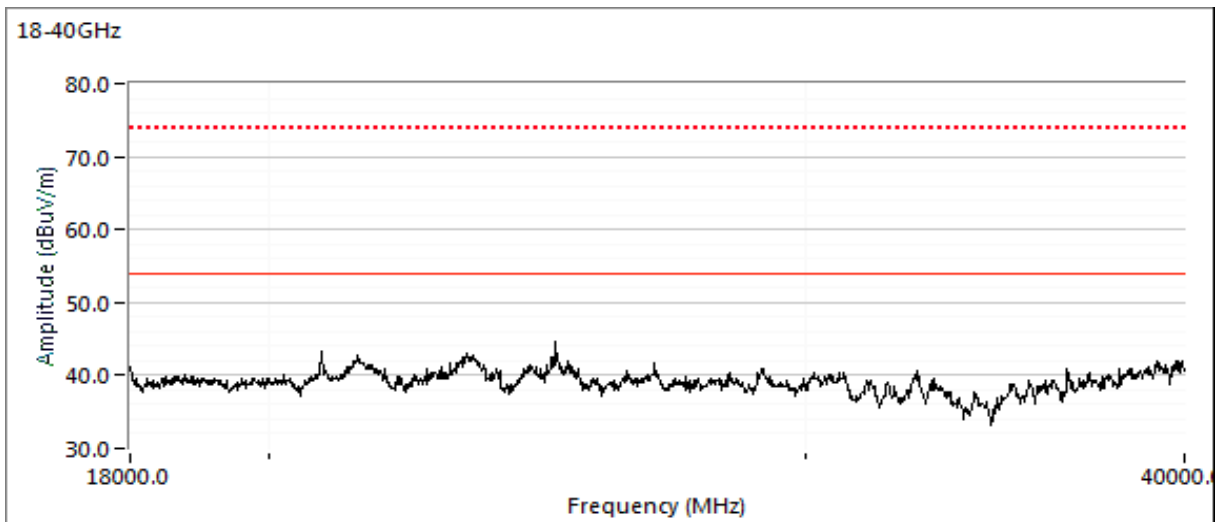
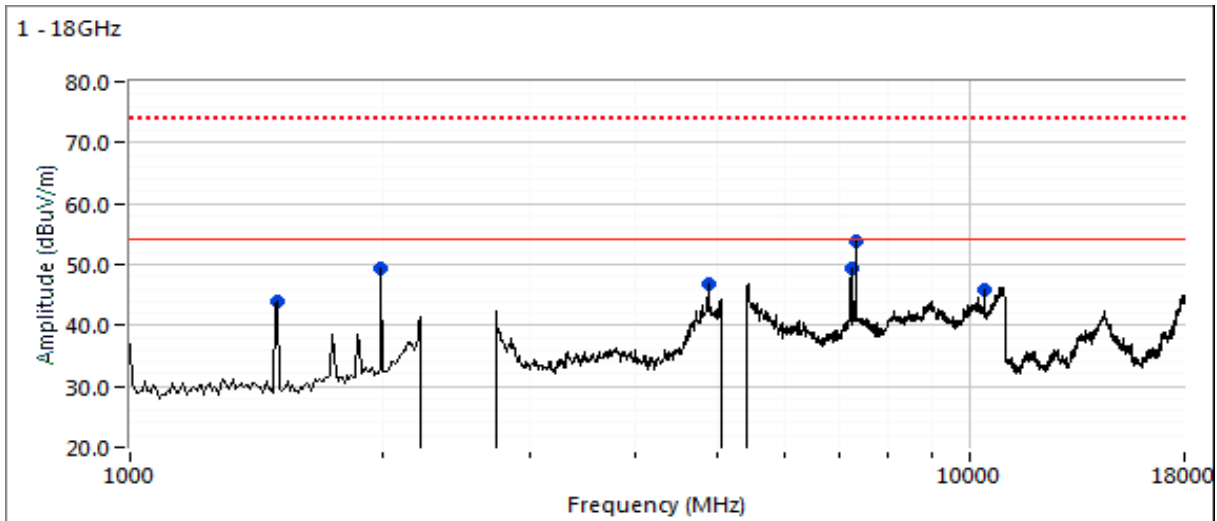
Note 1: For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.

Note 2: For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m) for emissions related to UNII operation. The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #2d: Center Channel

Channel: 6, 40 Wi-Fi, 17 - BLE

Tx Chain: 8 (5GHz), 4 (2.4 GHz)

Mode: a, b

Data Rate: 6Mbps, 1

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2000.000	45.7	H	60.0	-14.3	Peak	93	1.3	Note 6
7205.190	50.9	V	54.0	-3.1	Vavg	217	1.2	Note 3; RB 1 MHz; VB 3 kHz
7206.740	55.2	V	74.0	-18.8	PK	217	1.2	RB 1 MHz;VB 3 MHz;Peak
4803.680	50.7	H	54.0	-3.3	Vavg	233	1.1	Note 3; RB 1 MHz; VB 3 kHz
4804.350	55.4	H	74.0	-18.6	PK	233	1.1	RB 1 MHz;VB 3 MHz;Peak

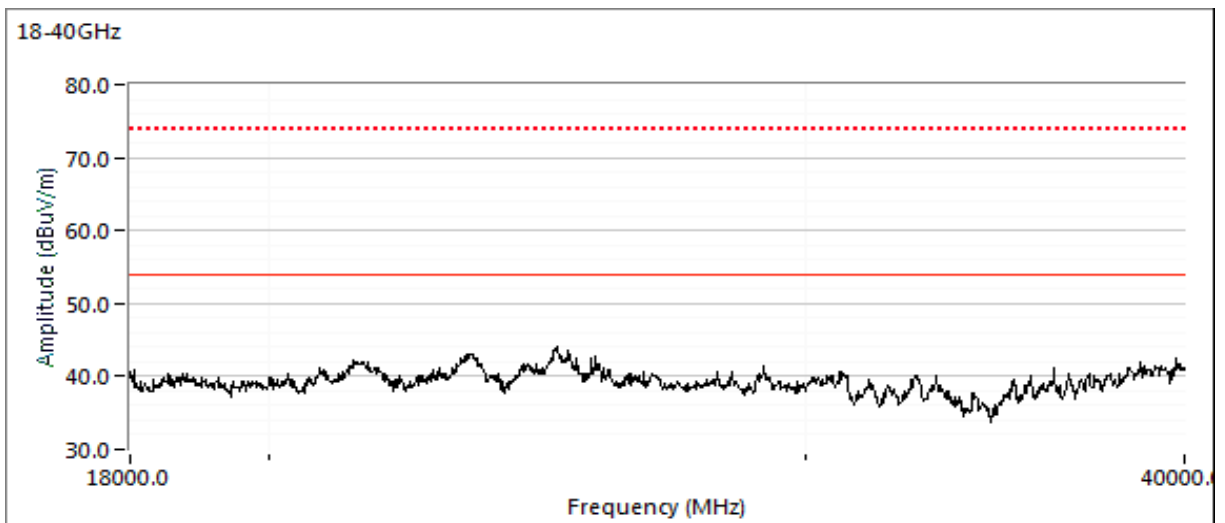
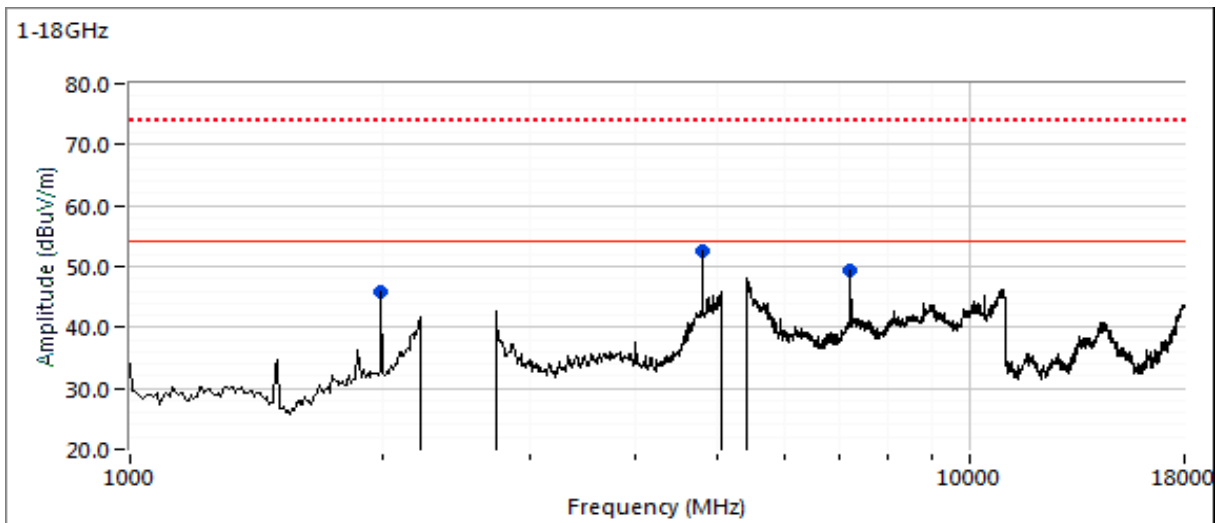
Note 1: For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.

Note 2: For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dB μ V/m) for emissions related to UNII operation. The measurement method required is a peak measurement (RB=1MHz, VB $\geq$ 3MHz, peak detector).



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #3: Radiated Spurious Emissions, 1,000 - 40000 MHz. Operating Mode: Worse case from Runs #1 and 2

Date of Test: 11/1/2018 0:00

Config. Used: 1

Test Engineer: John Caizzi

Config Change: none

Test Location: Chamber 7

EUT Voltage: PoE & 120V / 60Hz

Run #3a: Low Channel

Channel: 1 & 36

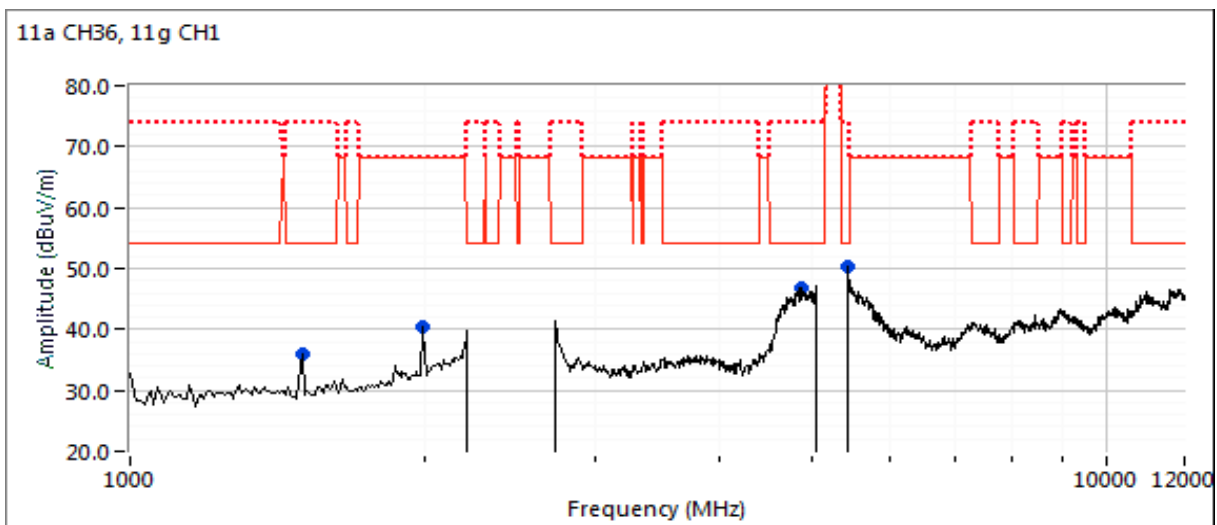
Mode: a / g

Tx Chain: 8

Data Rate: 6Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.000	35.8	V	60.0	-18.2	Peak	221	1.0	Note 6
2000.000	40.4	V	60.0	-27.9	Peak	336	1.0	Note 6
4889.500	43.7	H	54.0	-10.3	PK	298	1.7	Note 3; RB 1 MHz; VB 1 kHz
4886.650	55.3	H	74.0	-18.7	PK	298	1.7	RB 1 MHz;VB 3 MHz;Peak
5425.000	50.3	H			Peak	66	2.0	See bandedge measurements.
20726.100	44.8	V	54.0	-9.2	Avg	342	1.90	Note 3; RB 1 MHz; VB 1 kHz
20727.200	57.0	V	74.0	-17.0	PK	342	1.90	RB 1 MHz;VB 3 MHz;Peak

Note: Scans made between 12 - 40 GHz with the measurement antenna moved around the EUT 30 from the device indicated there were no significant emissions in this frequency range other than the 4th harmonic of the 5GHz fundamental.





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #3b: High Channel

Channel: 11 & 48

Mode: a / g

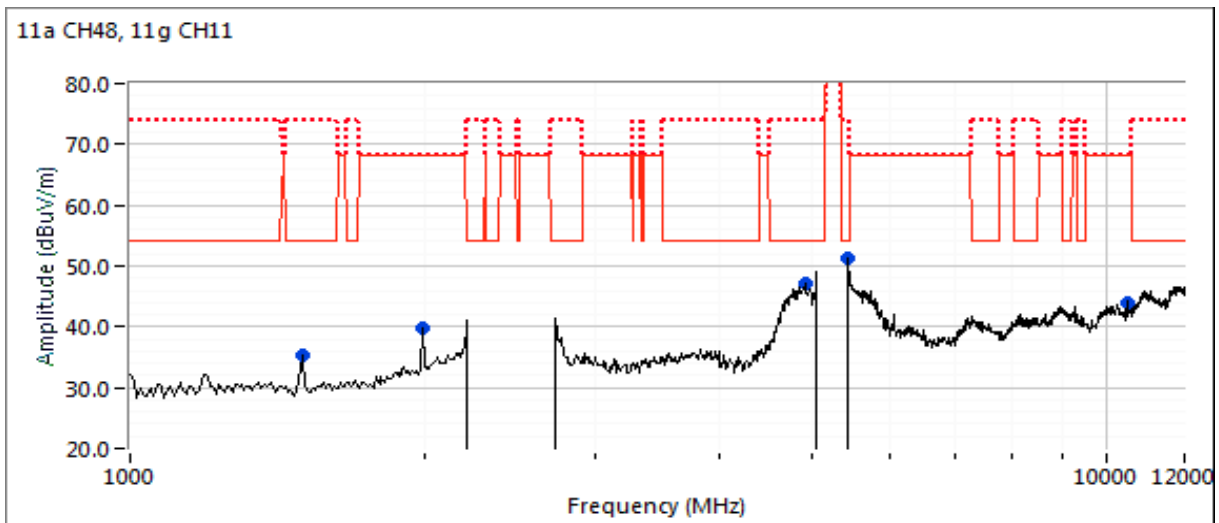
Tx Chain: 8

Data Rate:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.000	35.3	V	60.0	-18.7	Peak	8	1.0	Note 6
2000.000	39.8	V	60.0	-28.5	Peak	308	1.5	Note 6
4881.180	43.6	H	54.0	-10.4	Avg	298	1.74	Note 3; RB 1 MHz; VB 1 kHz
4873.750	56.1	H	74.0	-17.9	PK	298	1.74	RB 1 MHz;VB 3 MHz;Peak
5425.000	51.4	V			Peak	76	1.5	See bandedge measurements.
10480.000	51.1	V	68.3	-17.2	PK	30	1.99	RB 1 MHz;VB 3 MHz;Peak
20957.200	47.4	V	54.0	-6.6	Avg	32	1.88	Note 3; RB 1 MHz; VB 1 kHz
20957.620	59.7	V	74.0	-14.3	PK	32	1.88	RB 1 MHz;VB 3 MHz;Peak

Note:

Scans made between 12 - 40 GHz with the measurement antenna moved around the EUT 30 from the device indicated there were no significant emissions in this frequency range other than the 4th harmonic of the 5GHz fundamental.





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #8, Radiated Spurious Emissions, 1,000 - 40,000 MHz. Operation in the 5725-5850 MHz Band

Date of Test: 10/29/2018 0:00

Config. Used: 1

Test Engineer: John Caizzi

Config Change: none

Test Location: Chamber 7

EUT Voltage: PoE & 120V / 60Hz

Run #8a: Center Channel

Channel: 6 & 157 Wi-Fi

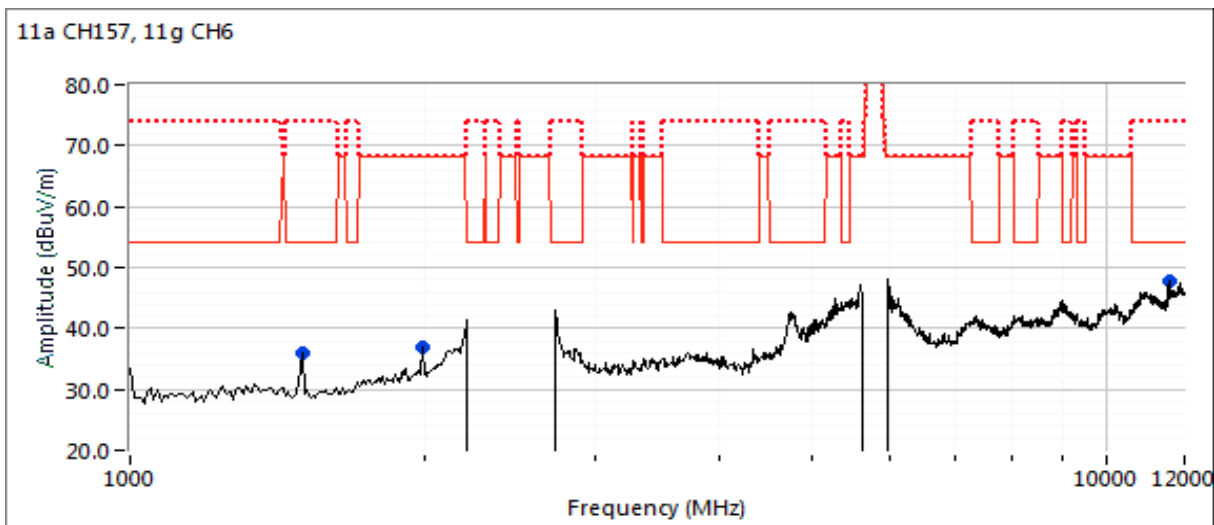
Mode: a, g

Tx Chain: 8 (5GHz), 4 (2.4 GHz)

Data Rate: 6 Mb/s / 1 Mb/s

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.000	36.1	V	60.0	-23.9	Peak	123	1.0	Note 6
2000.000	36.9	H	60.0	-23.1	Peak	83	2.0	Note 6
11571.470	42.5	V	54.0	-11.5	Avg	342	1.00	VB 300 Hz, note 3
11571.470	54.8	V	74.0	-19.2	PK	342	1.00	RB 1 MHz;VB 3 MHz;Peak
23143.470	54.6	V	68.3	-13.7	PK	356	1.00	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 12 - 40 GHz with the measurement antenna moved around the EUT 30 from the device indicated there were no significant emissions in this frequency range other than the 4th harmonic of the 5GHz fundamental.
Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m) for emissions related to UNII operation. The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #8b: Center Channel

Channel: 6 & 157 Wi-Fi

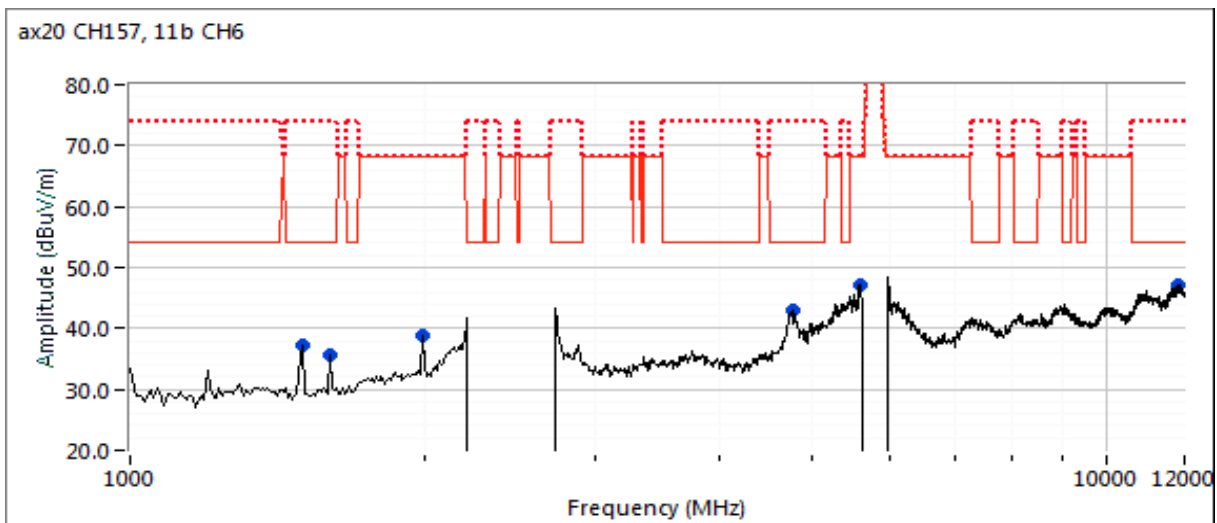
Mode: ax20

Tx Chain: 8 (5GHz), 4 (2.4 GHz)

Data Rate: MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.000	37.1	H	60.0	-22.9	Peak	52	2.5	Note 6
2000.000	38.9	V	60.0	-21.1	Peak	227	1.0	Note 6
4738.800	40.7	H	54.0	-13.3	Avg	298	1.6	VB 3 kHz, note 3
4742.400	52.1	H	74.0	-21.9	PK	298	1.6	RB 1 MHz;VB 3 MHz;Peak
5583.330	47.2	H			Peak	67	1.0	See bandedge measurements.
11850.130	40.3	H	54.0	-13.7	Avg	286	2.5	VB 300 Hz, note 3
11854.100	52.9	H	74.0	-21.1	PK	286	2.5	RB 1 MHz;VB 3 MHz;Peak
23138.000	54.3	V	68.3	-14.0	PK	356	1.0	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 12 - 40 GHz with the measurement antenna moved around the EUT 30 from the device indicated there were no significant emissions in this frequency range other than the 4th harmonic of the 5GHz fundamental.
Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m) for emissions related to UNII operation. The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Date of Test: 10/29/2018
 Test Engineer: Deniz Demirci
 Test Location: Chamber 7

Config. Used: 1
 Config Change: none
 EUT Voltage: PoE & 120V / 60Hz

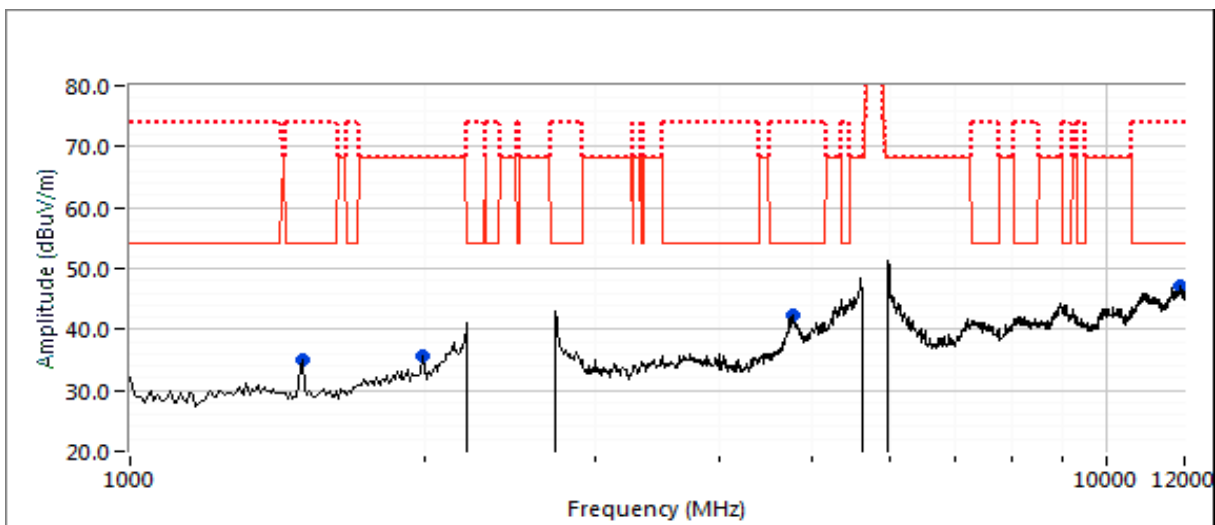
Run #8c: Center Channel

Channel: 6 & 159 Wi-Fi
 Tx Chain: 8 (5GHz), 4 (2.4 GHz)

Mode: 11ax40
 Data Rate: MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.000	34.9	H	60.0	-25.1	Peak	60	2.5	Note 6
2000.000	35.6	V	60.0	-24.4	Peak	356	1.0	Note 6
4759.250	36.6	H	54.0	-17.4	Avg	75	2.1	RB 1 MHz;VB 300 Hz; note 3
4731.750	50.0	H	74.0	-24.0	PK	75	2.1	RB 1 MHz;VB 3 MHz;Peak
23181.930	51.1	V	68.3	-17.2	PK	21	1.0	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 12 - 40 GHz with the measurement antenna moved around the EUT 30 from the device indicated there were no significant emissions in this frequency range other than the 4th harmonic of the 5GHz fundamental.
Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m) for emissions related to UNII operation. The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Date of Test: 10/29/2018
 Test Engineer: Deniz Demirci
 Test Location: Chamber 7

Config. Used: 1
 Config Change: none
 EUT Voltage: PoE & 120V / 60Hz

Run #8d: Center Channel

Channel: 6 & 155

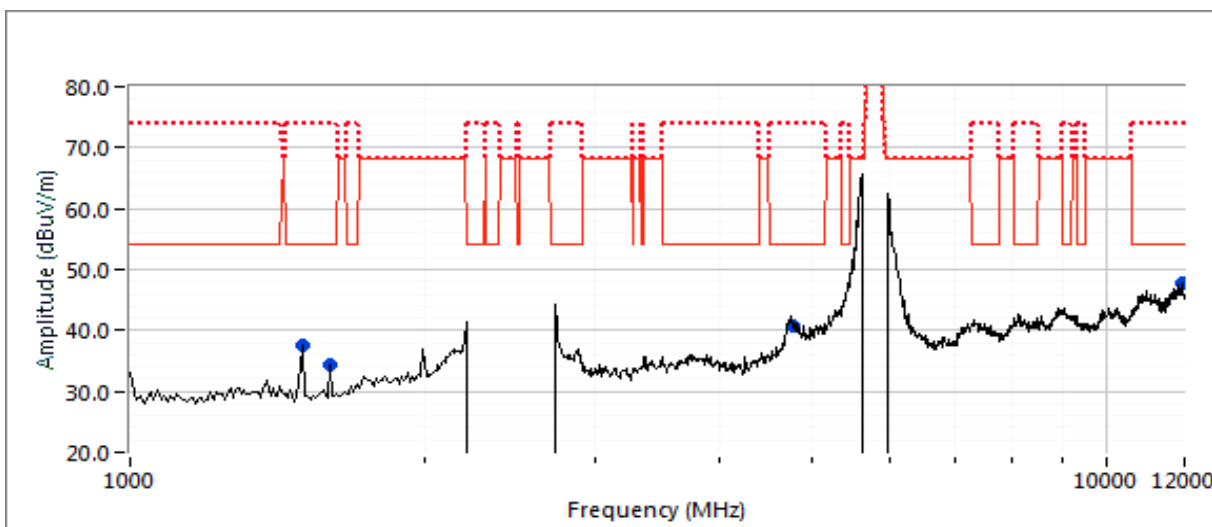
Tx Chain: 8 (5GHz), 4 (2.4 GHz)

Mode: ax80 / b

Data Rate: MCS0 / 1 Mb/s

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.000	37.6	H	60.0	-22.4	Peak	79	1.5	Note 6
1600.000	34.5	H	60.0	-25.5	Peak	29	2.5	Note 6
4759.540	36.8	H	54.0	-17.2	Avg	288	1.9	RB 1 MHz;VB 300 Hz; note 3
4760.820	50.4	H	74.0	-23.6	PK	288	1.9	RB 1 MHz;VB 3 MHz;Peak
23101.180	37.7	V	54.0	-16.3	Avg	21	1.0	RB 1 MHz;VB 300 Hz; note 3
23099.530	49.6	V	74.0	-24.4	PK	21	1.0	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 12 - 40 GHz with the measurement antenna moved around the EUT 30 from the device indicated there were no significant emissions in this frequency range other than the 4th harmonic of the 5GHz fundamental.
Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m) for emissions related to UNII operation. The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #9: Radiated Spurious Emissions, 1,000 - 40000 MHz. Operating Mode: Worse case from Run #8

Date of Test: 11/01/18

Config. Used: 1

Test Engineer: John Caizzi

Config Change: none

Test Location: Chamber 7

EUT Voltage: PoE & 120V / 60Hz

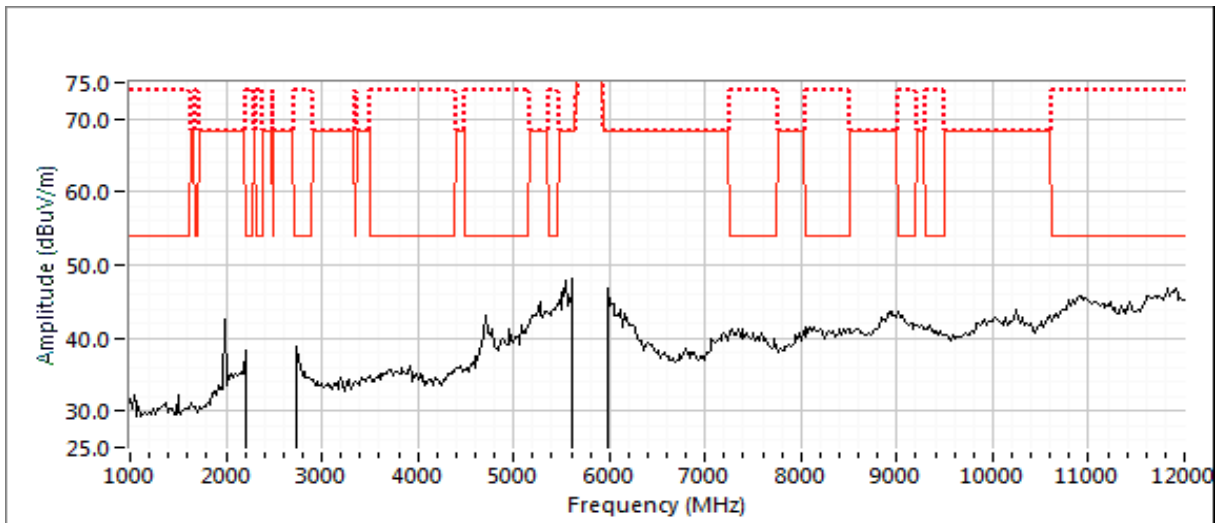
Run #9a: Low Channel

Channel/Mode/Rate/Chains/Power: 1/g/6Mbps/4/20

Channel/Mode/Rate/Chains/Power: 149/a/6Mbps/8/20

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
22979.670	43.6	V	54.0	-10.4	Avg	37	1.82	VB 1 kHz, note 3
22979.800	54.3	V	74.0	-19.7	PK	37	1.82	RB 1 MHz;VB 3 MHz;Peak

Note: Scans made between 12 - 40 GHz with the measurement antenna moved around the EUT 30 from the device indicated there were no significant emissions in this frequency range other than the 4th harmonic of the 5GHz fundamental.





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Date of Test: 11/01/18
Test Engineer: M. Birgani
Test Location: Chamber 7

Config. Used: 1
Config Change: None
EUT Voltage: PoE & 120V / 60Hz

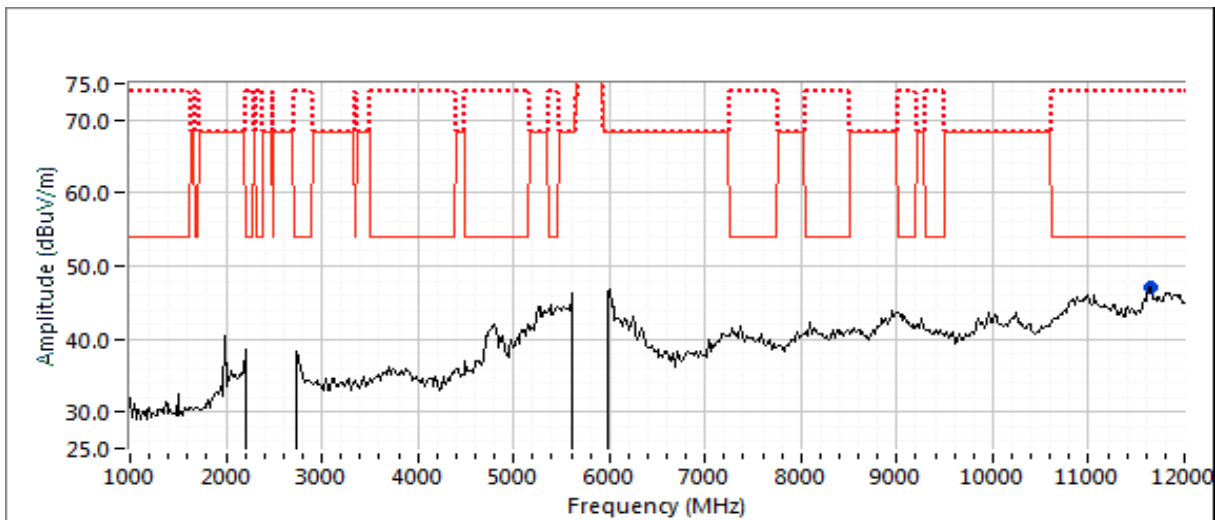
Run #9b: High Channel

Channel/Mode/Rate/Chains/Power: 11/g/6Mbps/4/20

Channel/Mode/Rate/Chains/Power: 165/a/6Mbps/8/20

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11649.880	43.9	V	54.0	-10.1	VAVG	342	1.03	RB 1 MHz;VB 1 kHz
23301.600	56.2	V	68.3	-12.1	PK	344	1.72	RB 1 MHz;VB 3 MHz;Peak
11649.790	54.7	V	74.0	-19.3	PK	342	1.03	RB 1 MHz;VB 3 MHz;Peak

Note: Scans made between 12 - 40 GHz with the measurement antenna moved around the EUT 30 from the device indicated there were no significant emissions in this frequency range other than the 4th harmonic of the 5GHz fundamental.





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #10, Radiated Spurious Emissions, 1,000 - 25,000 MHz

Date of Test: 11/2/2018 0:00

Test Engineer: John Caizzi

Test Location: Chamber 7

Config. Used: 1

Config Change: none

EUT Voltage: PoE & 120V / 60Hz

Run #10a: Low Channel

Channel: 37

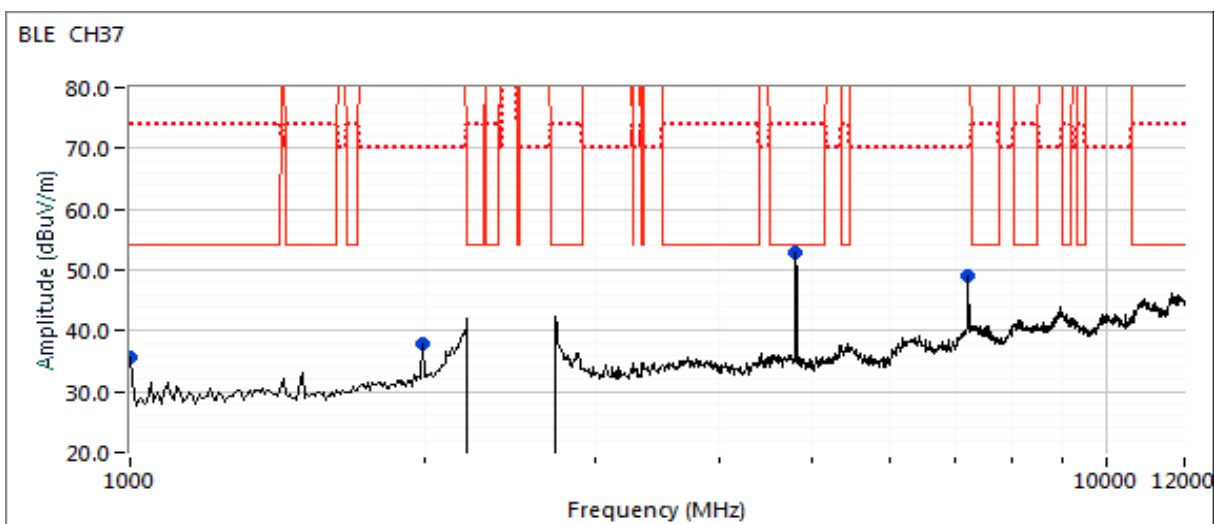
Mode: BLE

Tx Chain: Primary

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1000.000	35.5	V	60.0	-24.5	Peak	294	1.0	Note 6
2000.000	38.0	V	60.0	-22.0	Peak	291	1.5	Note 6
4803.890	53.3	H	54.0	-0.7	Avg	296	1.87	RB 1 MHz; VB 3 kHz, Note 4
4803.490	56.2	H	74.0	-17.8	PK	296	1.87	RB 1 MHz; VB 3 MHz; Peak
7205.430	47.4	V	54.0	-6.6	Avg	28	1.00	RB 1 MHz; VB 3 kHz, Notes 2 & 4
7206.880	53.1	V	74.0	-20.9	PK	28	1.00	RB 1 MHz; VB 3 MHz; Peak, Note 2

Note: Scans made between 12 - 25 GHz with the measurement antenna moved around the EUT 30cm from the device indicated there were no significant emissions in this frequency range.

Note 1: For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #10b: Center Channel

Channel: 17 Mode: BLE Tx Chain: Primary

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1600.000	36.6	V	60.0	-23.4	Peak	325	2.0	Note 6
2000.000	39.2	V	60.0	-20.8	Peak	201	1.5	Note 6
4879.810	47.4	H	54.0	-6.6	Avg	300	2.18	RB 1 MHz; VB 3 kHz, Note 4
4880.440	51.0	H	74.0	-23.0	PK	300	2.18	RB 1 MHz;VB 3 MHz;Peak
7319.250	48.9	V	54.0	-5.1	Avg	318	1.00	RB 1 MHz; VB 3 kHz, Note 4
7320.700	53.9	V	74.0	-20.1	PK	318	1.00	RB 1 MHz;VB 3 MHz;Peak

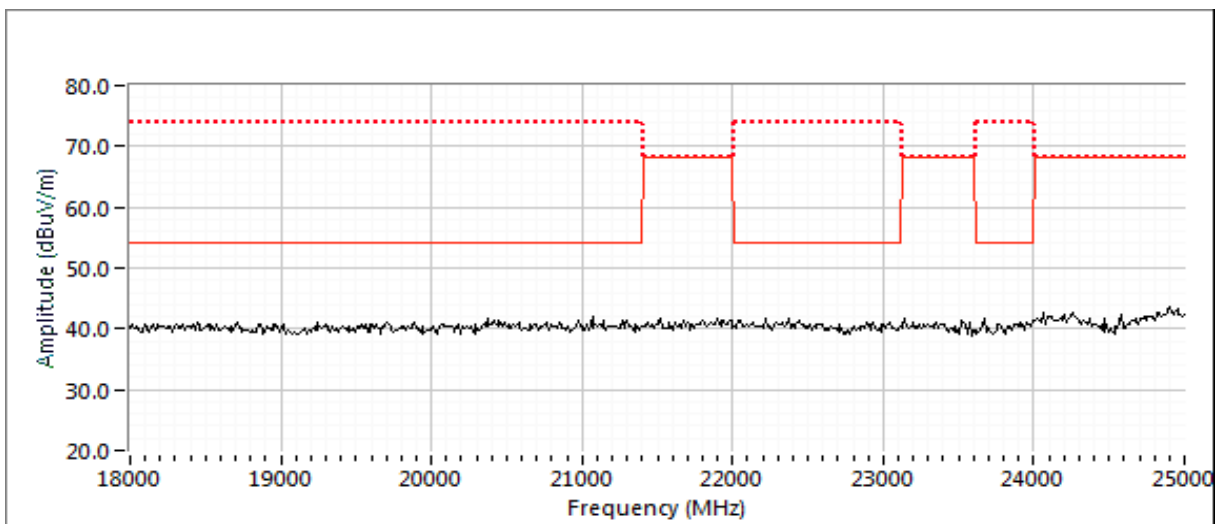
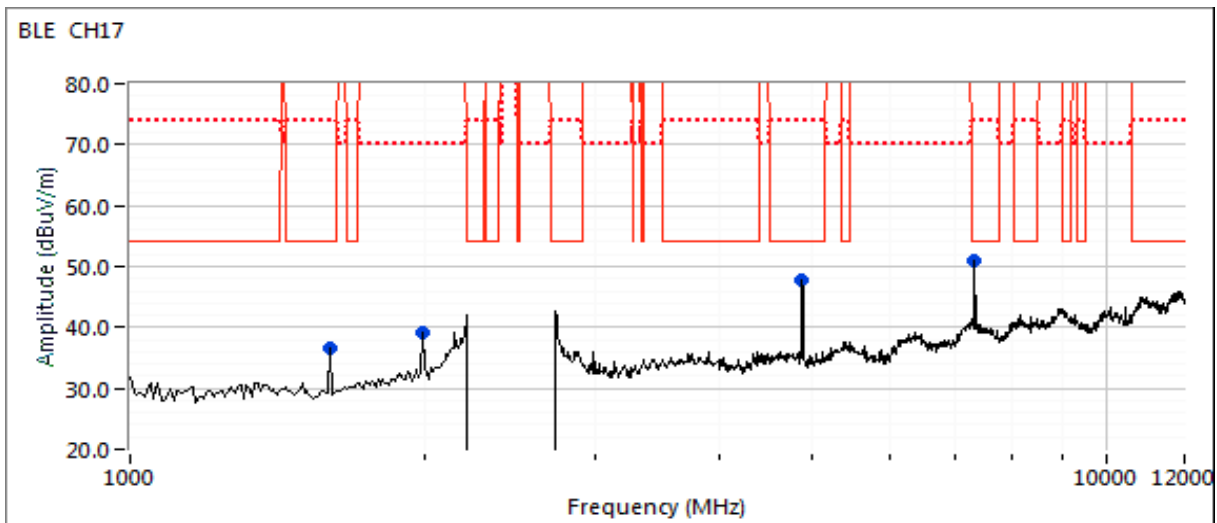
Note 1: For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.

Note: Scans made between 12 - 25 GHz with the measurement antenna moved around the EUT 30cm from the device indicated there were no significant emissions in this frequency range.



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #10c: High Channel

Channel: 39

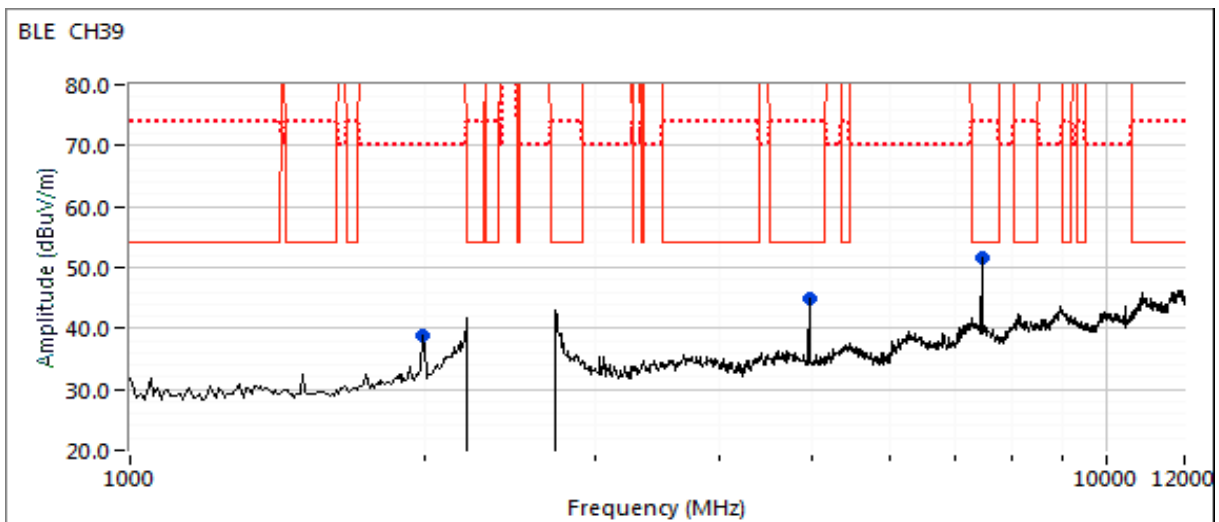
Mode: BLE

Tx Chain: Primary

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2000.000	38.7	V	60.0	-21.3	Peak	74	1.5	Note 6
4959.910	45.5	V	54.0	-8.5	Avg	1	1.70	RB 1 MHz; VB 3 kHz, Note 4
4960.430	49.4	V	74.0	-24.6	PK	1	1.70	RB 1 MHz; VB 3 MHz; Peak
7439.330	50.8	V	54.0	-3.2	Avg	306	1.00	RB 1 MHz; VB 3 kHz, Note 4
7439.350	55.9	V	74.0	-18.1	PK	306	1.00	RB 1 MHz; VB 3 MHz; Peak

Note: Scans made between 12 - 25 GHz with the measurement antenna moved around the EUT 30cm from the device indicated there were no significant emissions in this frequency range.

Note 1: For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #11, Radiated Spurious Emissions, 1,000 - 25,000 MHz. Operation in the 2400-2483.5 MHz Band

Date of Test: 11/01/18

Config. Used: 1

Test Engineer: M. Birgani

Config Change: None

Test Location: Chamber 7

EUT Voltage: PoE & 120V / 60Hz

Run #11a: Low Channel

Channel: 11

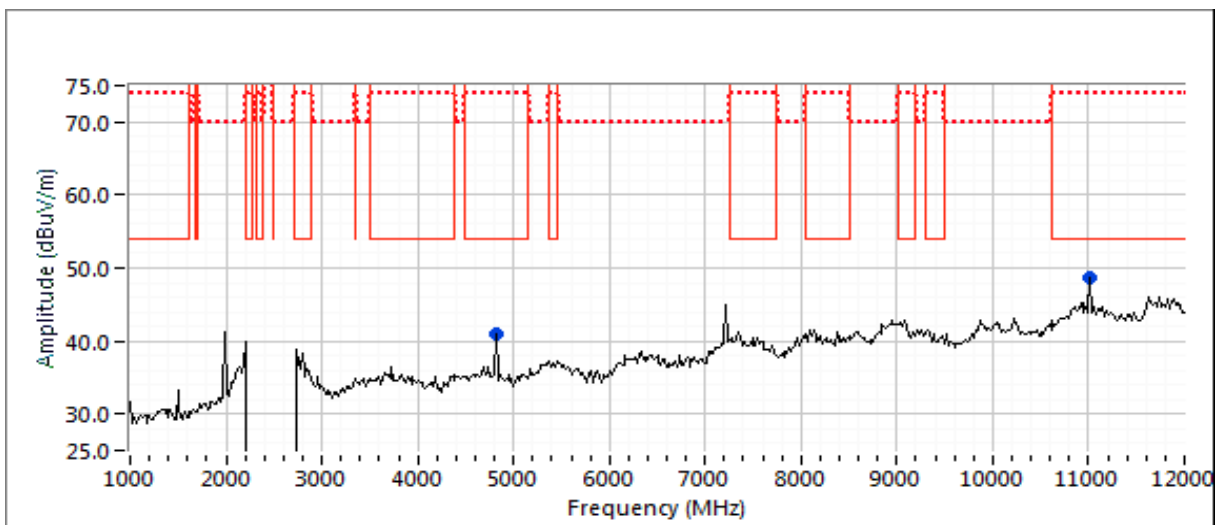
Mode: Zigbee

Tx Chain: Primary

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11019.960	36.2	V	54.0	-17.8	VAVG	26	1.0	RB 1 MHz;VB 3 kHz, Note 4, 5
11019.990	54.8	V	74.0	-19.2	PK	26	1.0	RB 1 MHz;VB 3 MHz;Peak
4809.000	47.2	H	74.0	-26.8	PK	294	2.3	RB 1 MHz;VB 3 MHz;Peak
4811.010	22.6	H	54.0	-31.4	VAVG	294	2.3	RB 1 MHz;VB 3 kHz, Note 4, 5

Note: Scans made between 12 - 25 GHz with the measurement antenna moved around the EUT 30cm from the device indicated there were no significant emissions in this frequency range.

Note 1: For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Date of Test: 11/01/18
 Test Engineer: M. Birgani
 Test Location: Chamber 7

Config. Used: 1
 Config Change: None
 EUT Voltage: PoE & 120V / 60Hz

Run #11b: Center Channel

Channel: 18 Mode: Zigbee Tx Chain: Primary

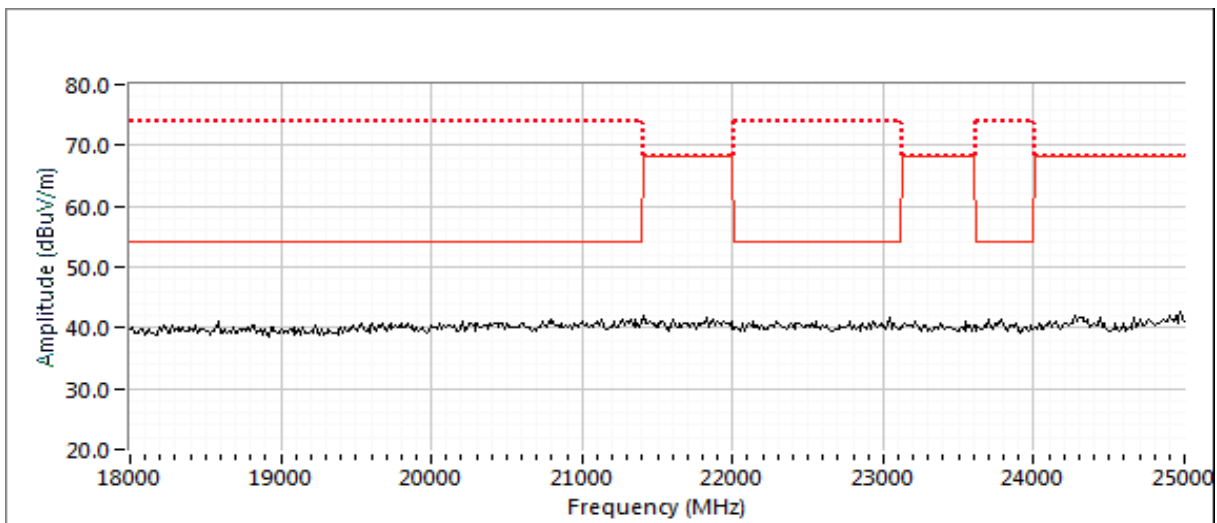
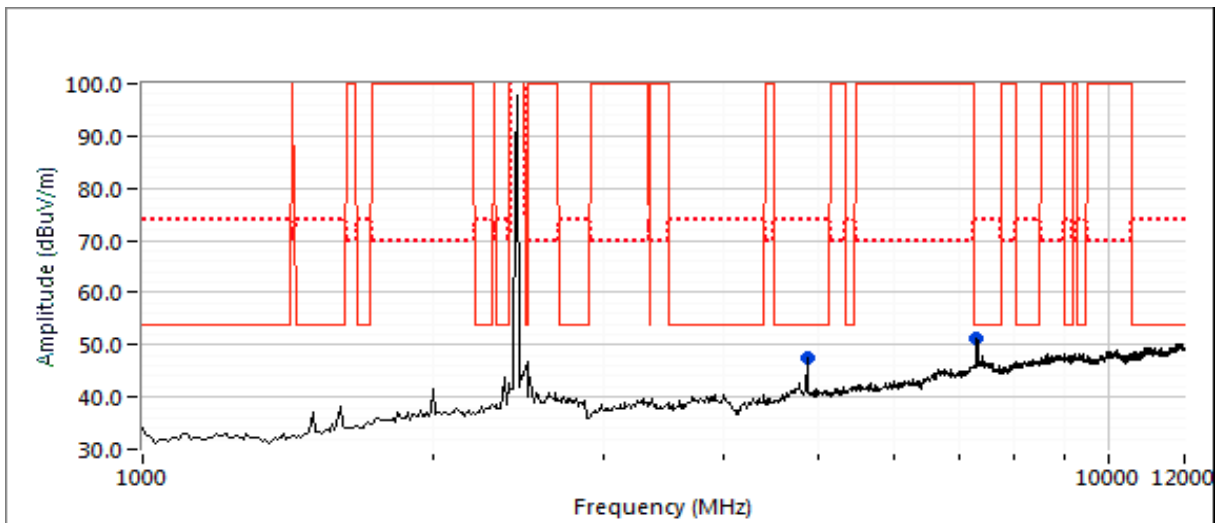
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7321.530	53.6	H	74.0	-20.4	PK	290	2.0	RB 1 MHz;VB 3 MHz;Peak
7321.150	30.0	H	54.0	-24.0	VAVG	290	2.0	RB 1 MHz;VB 3 kHz, Note 4, 5
4879.050	47.0	V	74.0	-27.0	PK	322	1.9	RB 1 MHz;VB 3 MHz;Peak
4880.910	22.7	V	54.0	-31.3	VAVG	322	1.9	RB 1 MHz;VB 3 kHz, Note 4, 5

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note:	Scans made between 12 - 25 GHz with the measurement antenna moved around the EUT 30cm from the device indicated there were no significant emissions in this frequency range.



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Coordinator:	David Bare
		Class:	N/A

Run #11c: High Channel

Date of Test: 11/2/2018 0:00

Test Engineer: John Caizzi

Test Location: Chamber 7

Config. Used: 1

Config Change: none

EUT Voltage: PoE & 120V / 60Hz

Channel: 26

Mode: ZigBee

Tx Chain: Primary

Data Rate:

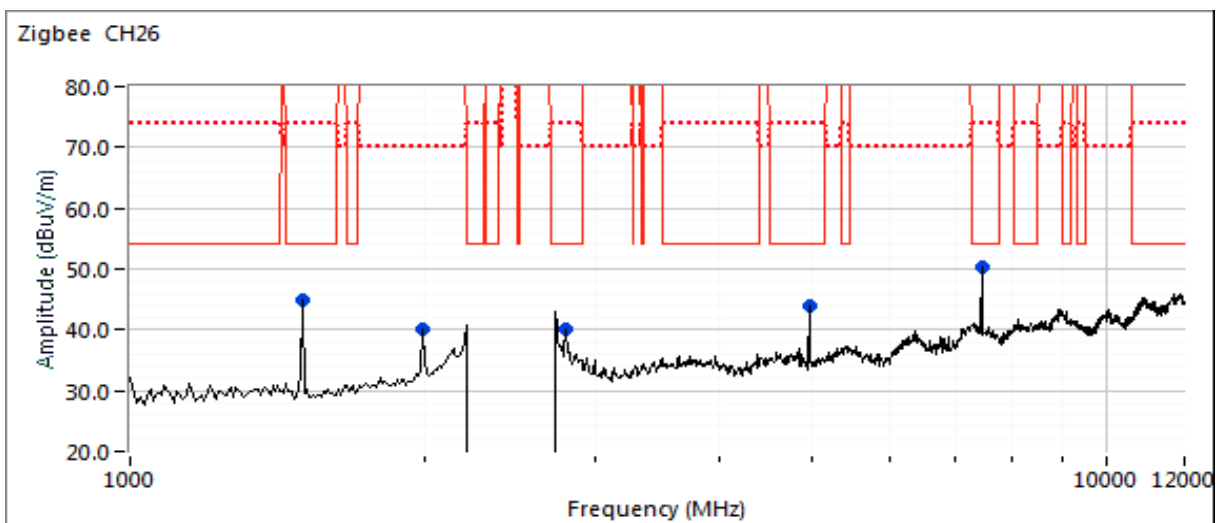
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2800.110	24.8	V	54.0	-29.2	Avg	50	1.86	RB 1 MHz;VB 3 kHz, Note 4
2799.980	48.2	V	74.0	-25.8	PK	50	1.86	RB 1 MHz;VB 3 MHz;Peak
4961.180	25.0	V	54.0	-29.0	Avg	29	1.17	RB 1 MHz;VB 3 kHz, Note 4
4960.910	48.6	V	74.0	-25.4	PK	29	1.17	RB 1 MHz;VB 3 MHz;Peak
7441.220	31.2	H	54.0	-22.8	Avg	69	2.50	RB 1 MHz;VB 3 kHz, Note 4
7438.300	54.5	H	74.0	-19.5	PK	69	2.50	RB 1 MHz;VB 3 MHz;Peak
1500.000	45.0	H	60.0	-15.0	Peak	246	1.5	Note 6
2000.000	40.2	V	60.0	-19.8	Peak	91	1.0	Note 6

Note:

Scans made between 12 - 25 GHz with the measurement antenna moved around the EUT 30cm from the device indicated there were no significant emissions in this frequency range.

Note 1:

For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Engineer:	David Bare
		Class:	Enter on cover sheet

Radiated Emissions

(NTS Silicon Valley, Fremont Facility, Semi-Anechoic Chamber)

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 11/6/2018
Test Engineer: John Caizzi
Test Location: Chamber #5

Config. Used: 1
Config Change: None
EUT Voltage: PoE & 120 V / 60Hz

General Test Configuration

The EUT and any local support equipment were located on the turntable for radiated emissions testing. Any remote support equipment was located outside the semi-anechoic chamber. Any cables running to remote support equipment were routed through metal conduit and passed through a ferrite clamp upon exiting the chamber.

Ambient Conditions: Temperature: 24 °C
 Rel. Humidity: 40 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1a	Radiated Spurious Emissions 30 - 1000 MHz, WiFi	15.247	Pass	36.8 dBµV/m @ 45.29 MHz (-3.2 dB)
1b		15E 15.209	Pass	36.0 dBµV/m @ 43.61 MHz (-4.0 dB)
2a	Radiated Spurious Emissions 30 - 1000 MHz, BLE	15.247 15.209	Pass	36.6 dBµV/m @ 45.26 MHz (-3.4 dB)
2b			Pass	36.3 dBµV/m @ 43.61 MHz (-3.7 dB)
3a	Radiated Spurious Emissions 30 - 1000 MHz, Zigbee		Pass	36.2 dBµV/m @ 43.79 MHz (-3.8 dB)
3b			Pass	36.2 dBµV/m @ 43.65 MHz (-3.8 dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Engineer:	David Bare
		Class:	Enter on cover sheet

Sample Notes

Sample S/N: CNGFK9Y02N (BLE) & CNGFK9Y005 (Zigbee)

Run #1a, Radiated Spurious Emissions, 30 - 1000 MHz, Wi-Fi

Channel, Mode, Chain, Level: 6, g, 4, 20

Channel, Mode, Chain, Level: 40, a, 8, 20

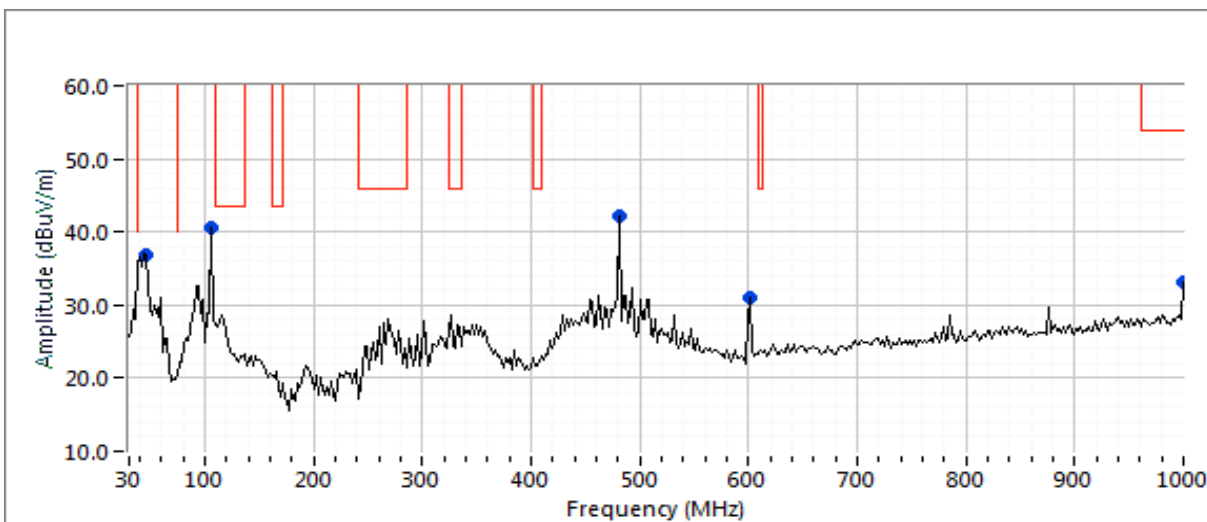
Preliminary peak readings captured during pre-scan (peak readings vs. QP limit)

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
45.286	36.9	V	40.0	-3.1	Peak	320	1.0	Note 1
105.731	40.7	V	43.5	-2.8	Peak	0	1.5	Note 1
480.057	42.2	V	46.0	-3.8	Peak	324	1.0	Note 1
600.019	30.9	V	46.0	-15.1	Peak	200	1.0	Note 1
1000.000	33.1	H	54.0	-20.9	Peak	72	4.0	

Final QP readings

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
45.286	36.8	V	40.0	-3.2	QP	325	1.00	Note 1
105.731	37.2	V	43.5	-6.3	QP	320	1.00	Note 1
480.057	37.5	V	46.0	-8.5	QP	301	1.16	Note 1
600.019	25.2	V	46.0	-20.8	QP	216	1.00	Note 1

Note 1 | Emission in non-restricted band, but limit of 15.209 used.





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Engineer:	David Bare
		Class:	Enter on cover sheet

Run #1b, Radiated Spurious Emissions, 30 - 1000 MHz, Wi-Fi

Channel, Mode, Chain, Level: 11, b, 4, 20

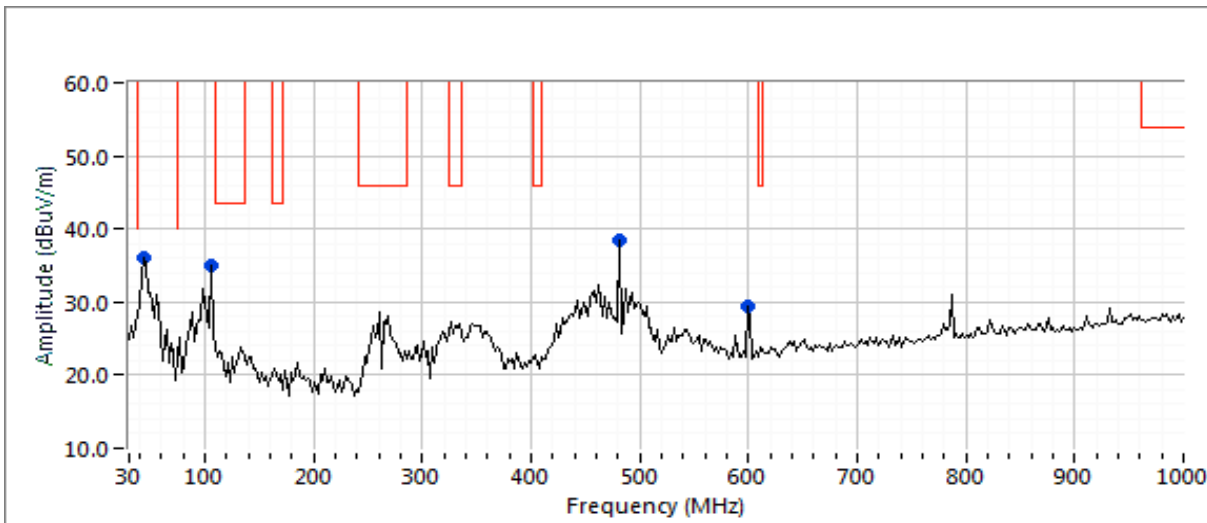
Channel, Mode, Chain, Level: 165, ax20, 8, 20

Preliminary peak readings captured during pre-scan (peak readings vs. QP limit)

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
43.607	36.0	V	40.0	-4.0	Peak	315	1.0	Note 1
105.812	35.0	V	43.5	-8.5	Peak	107	1.0	Note 1
480.982	38.5	H	46.0	-7.5	Peak	66	1.5	Note 1
599.559	29.5	H	46.0	-16.5	Peak	253	1.5	Note 1

Note 1 Emission in non-restricted band, but limit of 15.209 used.

Note 2 Emissions were the same as run 1a, though the channels and modes were different. Therefore, it is likely that none of these emissions are radio signals. Testing on other channels in other modes was not done, since the emissions would not change.





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Engineer:	David Bare
		Class:	Enter on cover sheet

Run #2a, Radiated Spurious Emissions, 30 - 1000 MHz, BLE
Channel, Chain, Level: 37, 1, 8

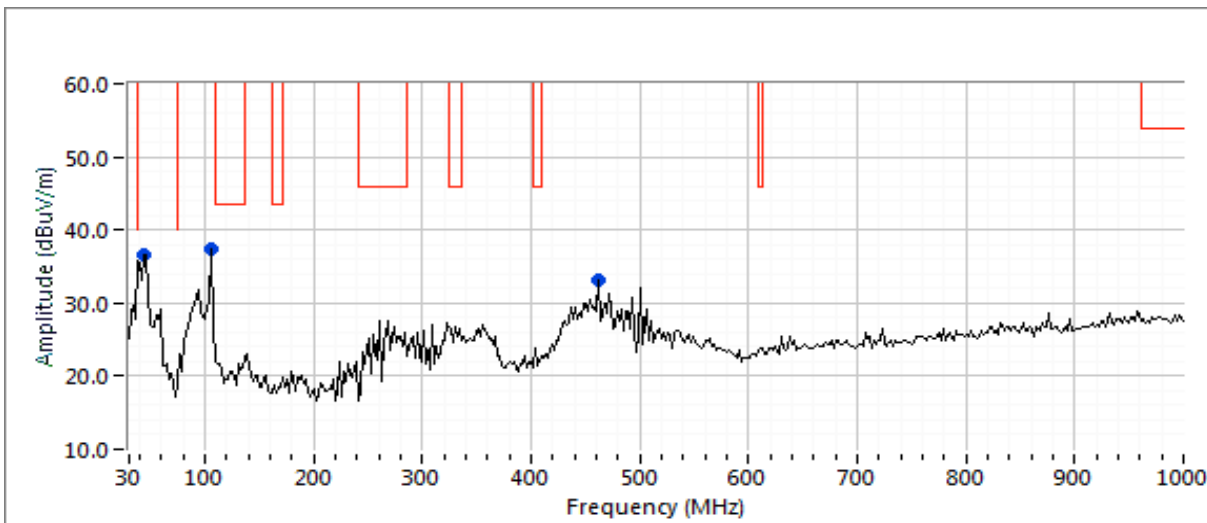
Preliminary peak readings captured during pre-scan (peak readings vs. QP limit)

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
45.263	36.7	V	40.0	-3.3	Peak	360	1.0	Note 1
105.750	37.4	V	43.5	-6.1	Peak	269	1.0	Note 1
460.832	33.1	V	46.0	-12.9	Peak	311	1.5	Note 1

Final QP readings

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
45.263	36.6	V	40.0	-3.4	QP	360	1.00	Note 1
105.750	37.6	V	43.5	-5.9	QP	322	1.04	Note 1
460.832	32.6	V	46.0	-13.4	QP	319	1.23	Note 1

Note 1 | Emission in non-restricted band, but limit of 15.209 used.





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Engineer:	David Bare
		Class:	Enter on cover sheet

Run #2b, Radiated Spurious Emissions, 30 - 1000 MHz, BLE
Channel, Chain, Level: 39, 1, 8

Preliminary peak readings captured during pre-scan (peak readings vs. QP limit)

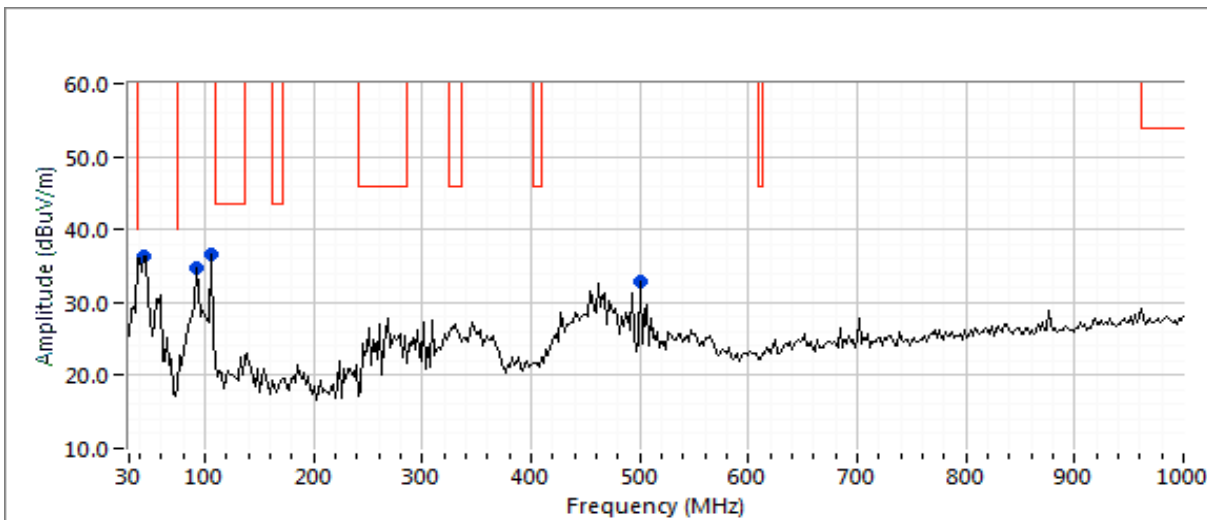
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
43.607	36.3	V	40.0	-3.7	Peak	274	1.0	Note 1
92.357	34.8	V	43.5	-8.7	Peak	118	1.0	Note 1
105.812	36.7	V	43.5	-6.8	Peak	291	1.0	Note 1
499.196	33.0	V	46.0	-13.0	Peak	235	1.0	Note 1

Final QP readings

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
92.357	32.7	V	43.5	-10.8	QP	106	1.10	Note 1
499.196	33.6	V	46.0	-12.4	QP	227	1.00	Note 1

Note 1 Emission in non-restricted band, but limit of 15.209 used.

Note 2 Emissions were the same as run 2a, though the channel was different. Therefore, it is likely that none of these emissions are radio signals. Testing on the middle channel was not done, since the emissions would not change.





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Engineer:	David Bare
		Class:	Enter on cover sheet

Run #3a, Radiated Spurious Emissions, 30 - 1000 MHz, Zigbee
Channel, Chain, Level: 11, 1, 8

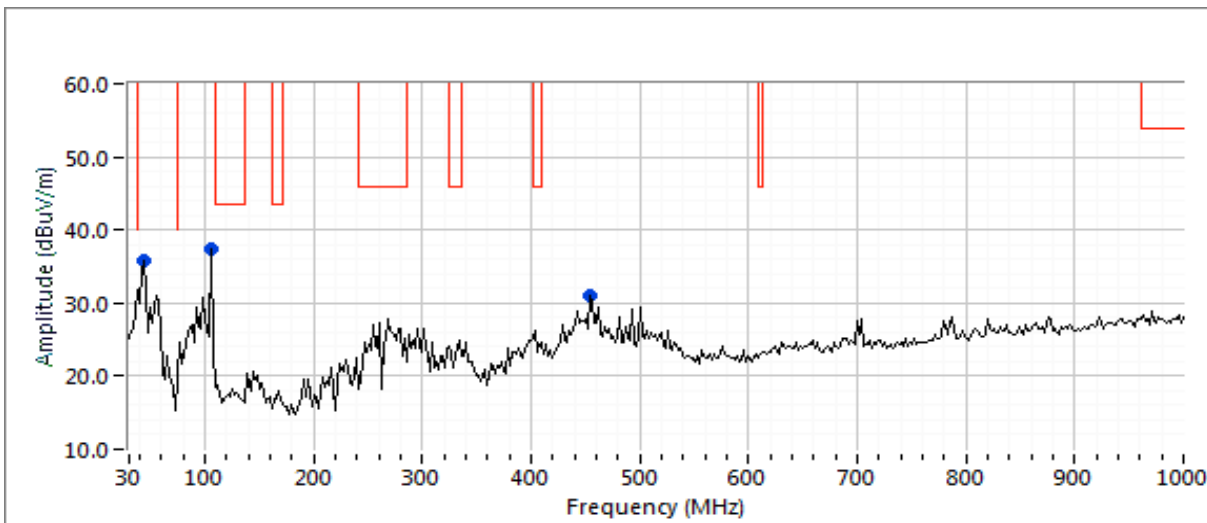
Preliminary peak readings captured during pre-scan (peak readings vs. QP limit)

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
43.791	35.8	V	40.0	-4.2	Peak	312	1.0	Note 1
105.724	37.5	V	43.5	-6.0	Peak	124	1.0	Note 1
454.415	30.9	V	46.0	-15.1	Peak	321	1.5	Note 1

Final QP readings

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
43.791	36.2	V	40.0	-3.8	QP	4	1.01	Note 1
105.724	37.5	V	43.5	-6.0	QP	79	1.01	Note 1
454.415	28.7	V	46.0	-17.3	QP	321	1.50	Note 1

Note 1 | Emission in non-restricted band, but limit of 15.209 used.





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Engineer:	David Bare
		Class:	Enter on cover sheet

Run #3b, Radiated Spurious Emissions, 30 - 1000 MHz, Zigbee
Channel, Chain, Level: 26, 1, 8

Preliminary peak readings captured during pre-scan (peak readings vs. QP limit)

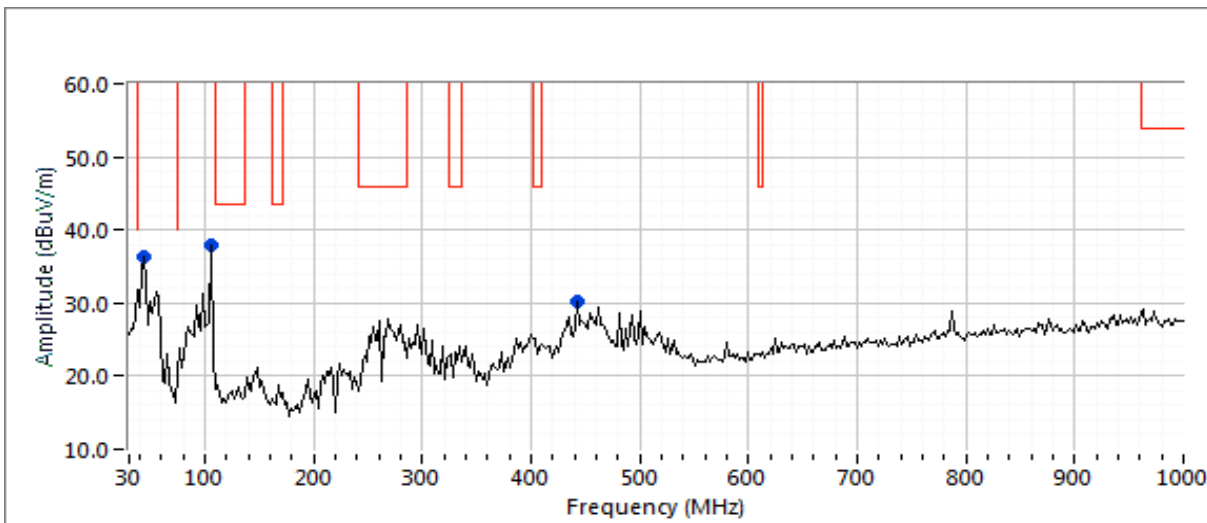
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
43.607	36.4	V	40.0	-3.6	Peak	329	1.0	
105.812	38.0	V	43.5	-5.5	Peak	89	1.0	
442.104	30.3	V	46.0	-15.7	Peak	305	1.0	

Final QP readings

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
43.649	36.2	V	40.0	-3.8	QP	4	1.01	Note 1

Note 1 Emission in non-restricted band, but limit of 15.209 used.

Note 2 Emissions were the same as run 3a, though the channel was different. Therefore, it is likely that none of these emissions are radio signals. Testing on the middle channel was not done, since the emissions would not change.





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Engineer:	David Bare
		Class:	Enter on cover sheet

Conducted Emissions

(NTS Silicon Valley, Fremont Facility, Semi-Anechoic Chamber)

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 11/5/2018
Test Engineer: John Caizzi
Test Location: Chamber 5

Config. Used: 1
Config Change: none
EUT Voltage: PoE & 110V / 60Hz, 220V / 60Hz, 230V / 50Hz

General Test Configuration

For tabletop equipment, the EUT and POE adapter were located on a wooden table inside the semi-anechoic chamber, 40 cm from a vertical coupling plane and 80cm from the LISN. A second LISN was used for all local support equipment. Remote support equipment was located outside of the semi-anechoic chamber. Any cables running to remote support equipment were routed through metal conduit and passed through a ferrite clamp upon exiting the chamber.

Ambient Conditions: Temperature: 23-24 °C
 Rel. Humidity: 35-38 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power, 110V/60Hz	EN 55032 Class B	Pass	38.5 dBµV @ 0.46 MHz (-8.3 dB)
2	CE, AC Power, 230V/50Hz	EN 55032 Class B	Pass	42.2 dBµV @ 0.50 MHz (-3.8 dB)
3	CE, AC Power, 220V/60Hz	EN 55032 Class B	Pass	41.5 dBµV @ 0.50 MHz (-4.5 dB)
4	CE, AC Power, PoE, 220V/60Hz	EN 55032 Class B	Pass	34.6 dBµV @ 0.45 MHz (-12.2 dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

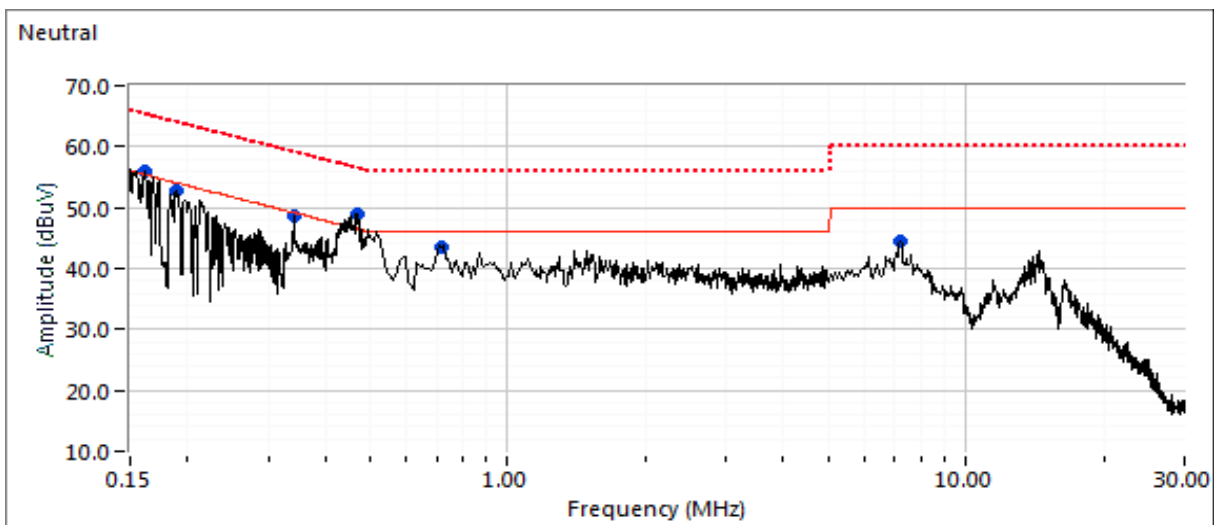
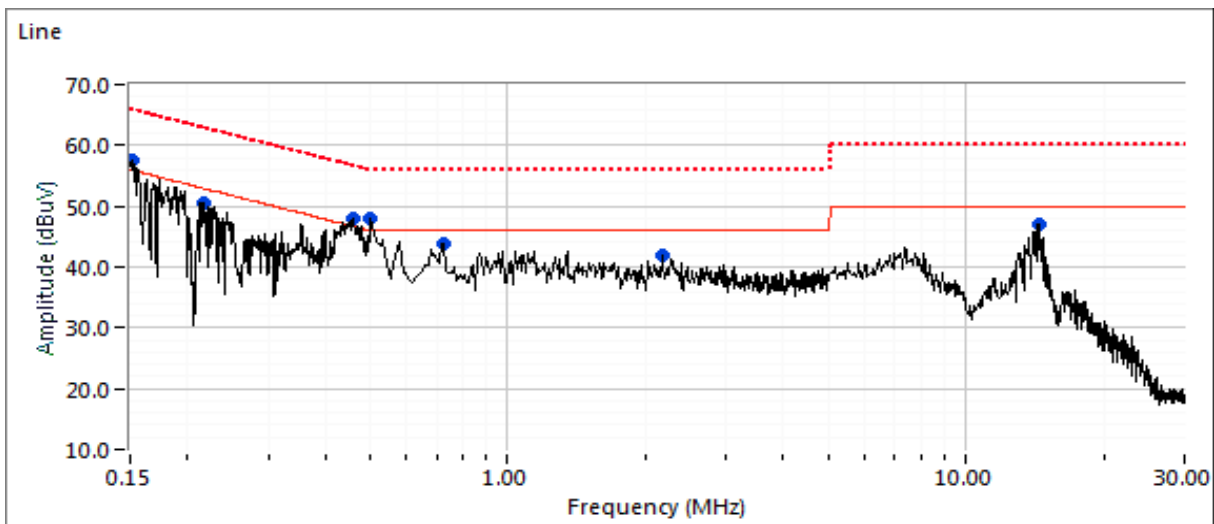
Note: The unit was transmitting at 2412MHz in 802.11b mode and 5180MHz in 802.11a mode.



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Engineer:	David Bare
		Class:	Enter on cover sheet

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 110V/60Hz





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Engineer:	David Bare
		Class:	Enter on cover sheet

Preliminary peak readings captured during pre-scan (peak readings vs. average limit)

Frequency MHz	Level dB μ V	AC Line	Class B		Detector QP/Ave	Comments
			Limit	Margin		
0.154	57.4	Line	55.9	1.5	Peak	
0.214	50.4	Line	52.9	-2.5	Peak	
0.455	47.9	Line	46.7	1.2	Peak	
0.499	48.0	Line	46.0	2.0	Peak	
0.721	43.7	Line	46.0	-2.3	Peak	
2.121	42.0	Line	46.0	-4.0	Peak	
14.502	46.9	Line	50.0	-3.1	Peak	
0.155	55.9	Neutral	55.4	0.5	Peak	
0.186	52.8	Neutral	54.1	-1.3	Peak	
0.348	48.6	Neutral	49.2	-0.6	Peak	
0.463	49.0	Neutral	46.5	2.5	Peak	
0.722	43.5	Neutral	46.0	-2.5	Peak	
7.115	44.5	Neutral	50.0	-5.5	Peak	



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Engineer:	David Bare
		Class:	Enter on cover sheet

Final quasi-peak and average readings

Frequency MHz	Level dB μ V	AC Line	Class B		Detector QP/Ave	Comments
			Limit	Margin		
0.455	38.5	Line	46.8	-8.3	AVG	
0.154	33.5	Line	55.8	-22.3	AVG	
0.154	49.7	Line	65.8	-16.1	QP	
0.214	20.8	Line	53.1	-32.3	AVG	
0.214	43.2	Line	63.1	-19.9	QP	
0.455	38.5	Line	46.8	-8.3	AVG	
0.455	45.4	Line	56.8	-11.4	QP	
0.499	35.6	Line	46.0	-10.4	AVG	
0.499	43.2	Line	56.0	-12.8	QP	
0.721	34.6	Line	46.0	-11.4	AVG	
0.721	41.2	Line	56.0	-14.8	QP	
2.121	29.9	Line	46.0	-16.1	AVG	
2.121	36.2	Line	56.0	-19.8	QP	
14.502	31.5	Line	50.0	-18.5	AVG	
14.502	39.3	Line	60.0	-20.7	QP	
0.155	32.8	Neutral	55.7	-22.9	AVG	
0.155	49.5	Neutral	65.7	-16.2	QP	
0.186	27.0	Neutral	54.2	-27.2	AVG	
0.186	46.0	Neutral	64.2	-18.2	QP	
0.348	34.4	Neutral	49.0	-14.6	AVG	
0.348	41.7	Neutral	59.0	-17.3	QP	
0.463	37.4	Neutral	46.6	-9.2	AVG	
0.463	44.8	Neutral	56.6	-11.8	QP	
0.722	35.6	Neutral	46.0	-10.4	AVG	
0.722	41.7	Neutral	56.0	-14.3	QP	
7.115	31.4	Neutral	50.0	-18.6	AVG	
7.115	37.1	Neutral	60.0	-22.9	QP	

Note 1:

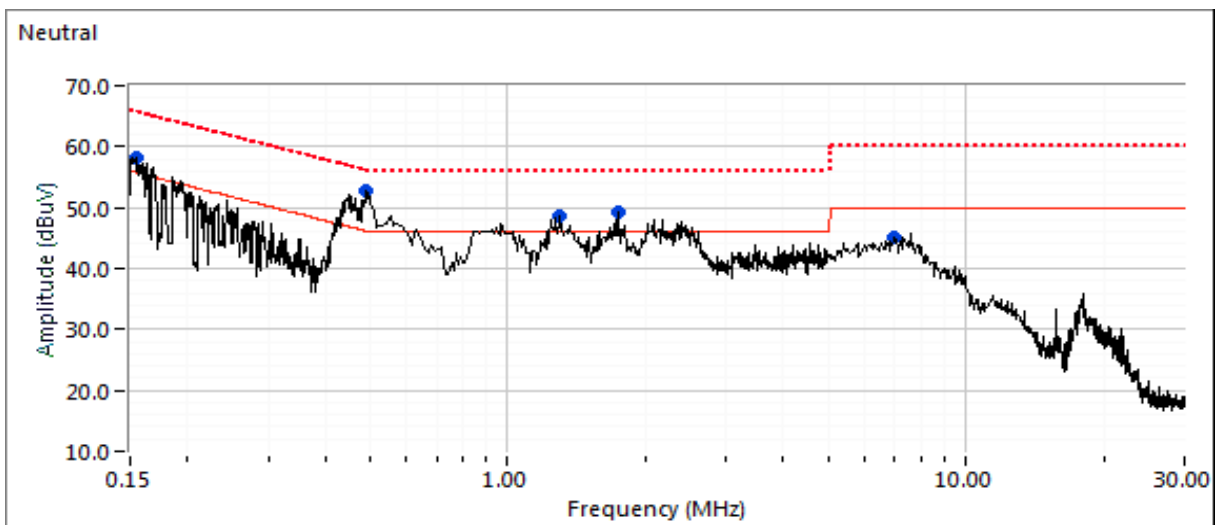
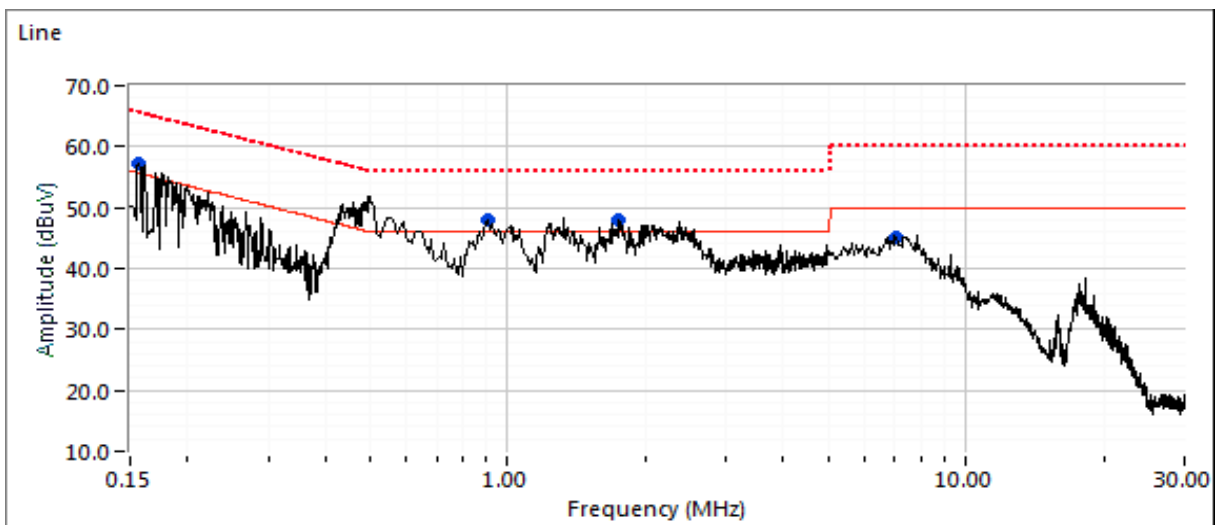
Note 2:



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Engineer:	David Bare
		Class:	Enter on cover sheet

Run #2: AC Power Port Conducted Emissions, 0.15 - 30MHz, 230V/50Hz





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Engineer:	David Bare
		Class:	Enter on cover sheet

Preliminary peak readings captured during pre-scan (peak readings vs. average limit)

Frequency MHz	Level dBμV	AC Line	Class B		Detector QP/Ave	Comments
			Limit	Margin		
0.150	57.3	Line	55.6	1.7	Peak	
0.497	51.9	Line	46.0	5.9	Peak	
0.904	48.0	Line	46.0	2.0	Peak	
1.680	47.9	Line	46.0	1.9	Peak	
7.310	45.0	Line	50.0	-5.0	Peak	
0.152	58.1	Neutral	55.8	2.3	Peak	
0.492	52.7	Neutral	46.2	6.5	Peak	
1.359	48.7	Neutral	46.0	2.7	Peak	
1.747	49.1	Neutral	46.0	3.1	Peak	
7.071	45.2	Neutral	50.0	-4.8	Peak	

Final quasi-peak and average readings

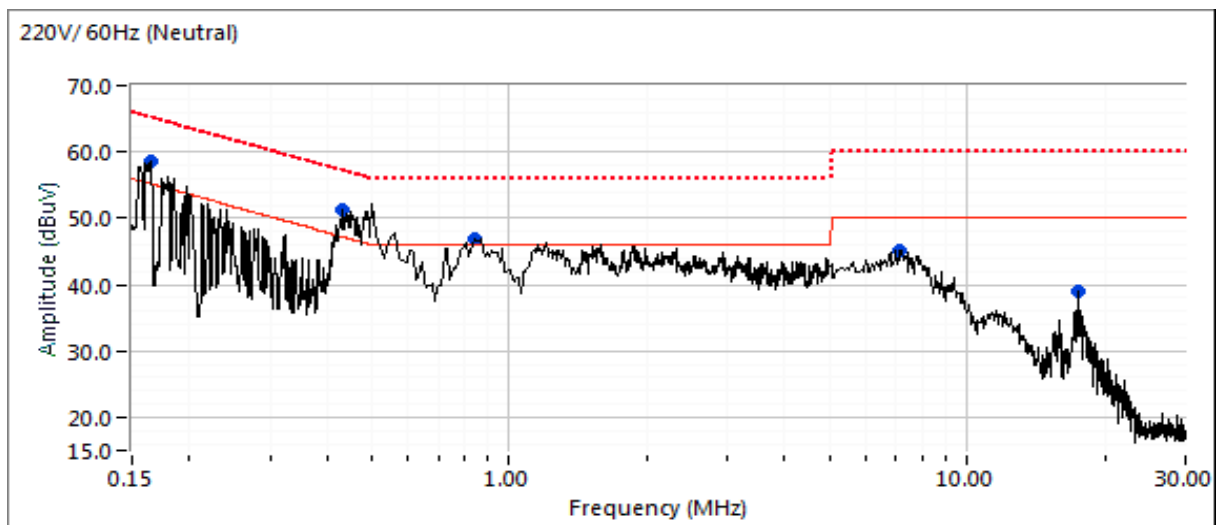
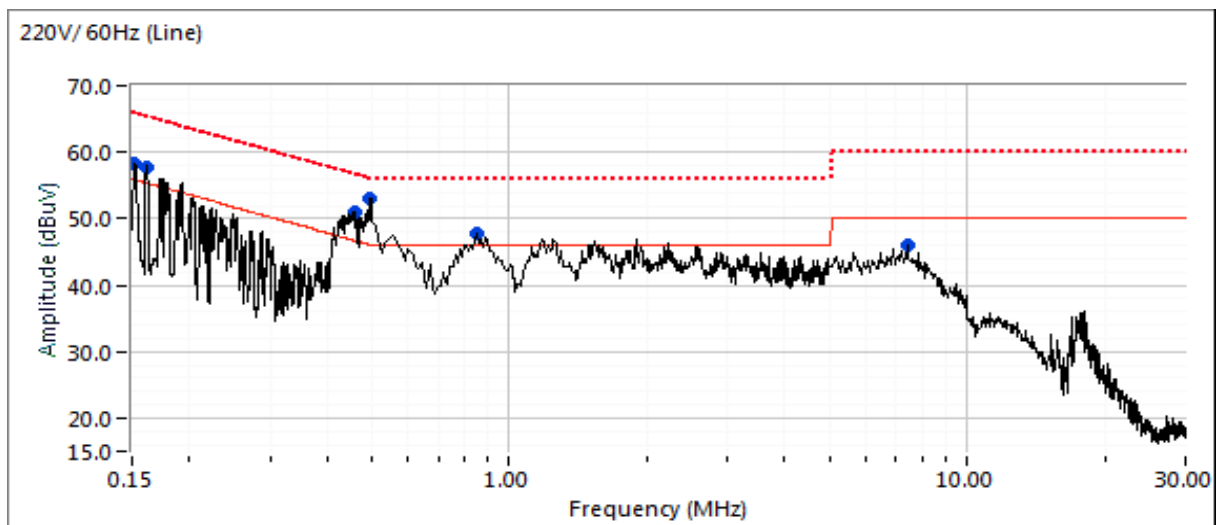
Frequency MHz	Level dBμV	AC Line	Class B		Detector QP/Ave	Comments
			Limit	Margin		
0.150	36.9	Line	56.0	-19.1	AVG	
0.150	51.4	Line	66.0	-14.6	QP	
0.497	42.2	Line	46.0	-3.8	AVG	
0.497	49.5	Line	56.0	-6.5	QP	
0.904	37.0	Line	46.0	-9.0	AVG	
0.904	43.6	Line	56.0	-12.4	QP	
1.680	37.5	Line	46.0	-8.5	AVG	
1.680	44.0	Line	56.0	-12.0	QP	
7.310	34.8	Line	50.0	-15.2	AVG	
7.310	40.9	Line	60.0	-19.1	QP	
0.152	35.4	Neutral	55.9	-20.5	AVG	
0.152	51.0	Neutral	65.9	-14.9	QP	
0.492	42.3	Neutral	46.1	-3.8	AVG	
0.492	50.0	Neutral	56.1	-6.1	QP	
1.359	38.0	Neutral	46.0	-8.0	AVG	
1.359	43.8	Neutral	56.0	-12.2	QP	
1.747	37.7	Neutral	46.0	-8.3	AVG	
1.747	43.6	Neutral	56.0	-12.4	QP	
7.071	34.7	Neutral	50.0	-15.3	AVG	
7.071	40.6	Neutral	60.0	-19.4	QP	



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Engineer:	David Bare
		Class:	Enter on cover sheet

Run #3: AC Power Port Conducted Emissions, 0.15 - 30MHz, 220V/60Hz





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Engineer:	David Bare
		Class:	Enter on cover sheet

Run #3: AC Power Port Conducted Emissions, 0.15 - 30MHz, 220V/60Hz

Preliminary peak readings captured during pre-scan (peak readings vs. average limit)

Frequency MHz	Level dB μ V	AC Line	Class B		Detector QP/Ave	Comments
			Limit	Margin		
0.498	53.1	Line	46.0	7.1	Peak	
0.500	51.6	Neutral	46.0	5.6	Peak	
0.457	51.0	Line	46.7	4.3	Peak	
0.432	51.4	Neutral	47.2	4.2	Peak	
0.500	49.5	Line	46.0	3.5	Peak	
0.163	58.5	Neutral	55.2	3.3	Peak	
0.152	58.4	Line	55.9	2.5	Peak	
0.160	57.8	Line	55.4	2.4	Peak	
0.866	46.8	Neutral	46.0	0.8	Peak	
7.400	45.9	Line	50.0	-4.1	Peak	
7.245	45.2	Neutral	50.0	-4.8	Peak	
17.510	39.1	Neutral	50.0	-10.9	Peak	

Final quasi-peak and average readings

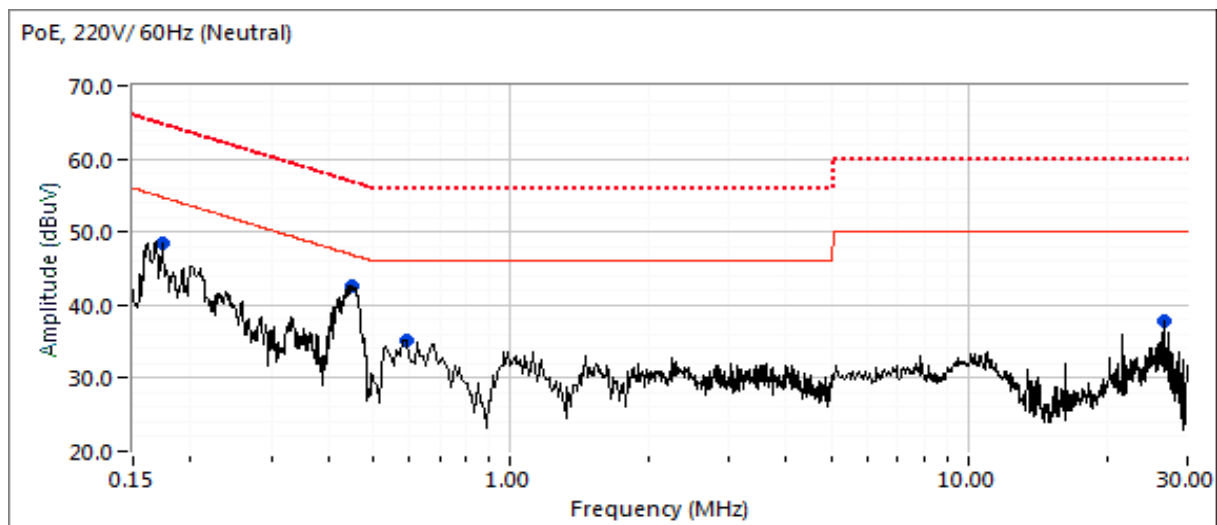
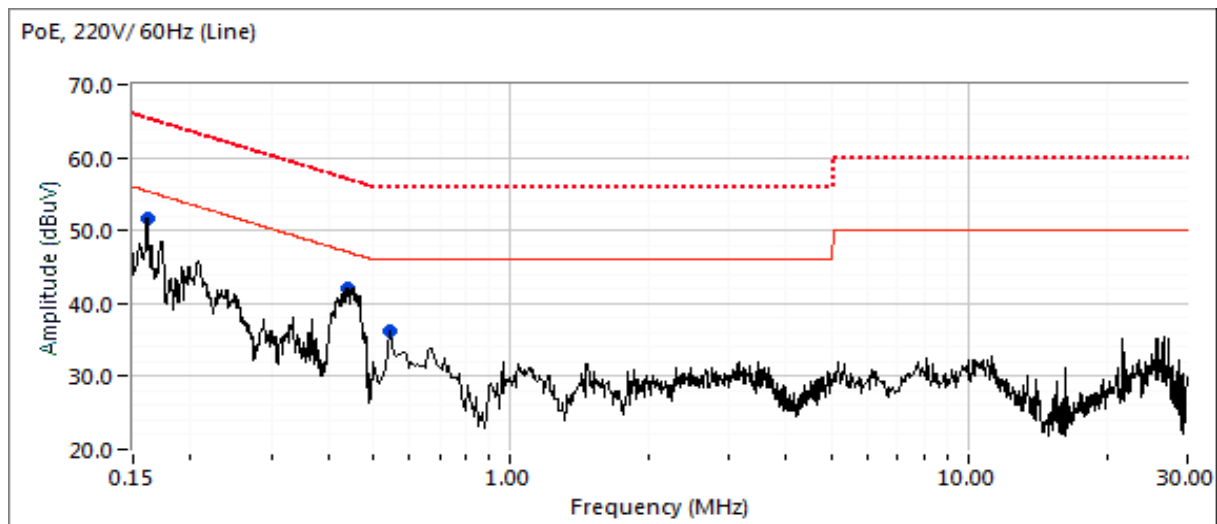
Frequency MHz	Level dB μ V	AC Line	Class B		Detector QP/Ave	Comments
			Limit	Margin		
0.498	41.5	Line	46.0	-4.5	AVG	AVG (0.10s)
0.500	41.5	Line	46.0	-4.5	AVG	AVG (0.10s)
0.500	41.4	Neutral	46.0	-4.6	AVG	AVG (0.10s)
0.498	50.1	Line	56.0	-5.9	QP	QP (1.00s)
0.500	49.8	Neutral	56.0	-6.2	QP	QP (1.00s)
0.500	49.6	Line	56.0	-6.4	QP	QP (1.00s)
0.432	40.7	Neutral	47.2	-6.5	AVG	AVG (0.10s)
0.457	39.7	Line	46.8	-7.1	AVG	AVG (0.10s)
0.866	37.2	Neutral	46.0	-8.8	AVG	AVG (0.10s)
0.457	47.7	Line	56.8	-9.1	QP	QP (1.00s)
0.432	48.1	Neutral	57.2	-9.1	QP	QP (1.00s)
0.866	44.3	Neutral	56.0	-11.7	QP	QP (1.00s)
0.152	52.6	Line	65.9	-13.3	QP	QP (1.00s)
0.160	51.5	Line	65.4	-13.9	QP	QP (1.00s)
0.163	51.2	Neutral	65.3	-14.1	QP	QP (1.00s)
7.245	34.0	Neutral	50.0	-16.0	AVG	AVG (0.10s)
7.245	40.5	Neutral	60.0	-19.5	QP	QP (1.00s)
0.152	35.0	Line	55.9	-20.9	AVG	AVG (0.10s)
0.160	30.6	Line	55.4	-24.8	AVG	AVG (0.10s)
0.163	30.4	Neutral	55.3	-24.9	AVG	AVG (0.10s)



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Engineer:	David Bare
		Class:	Enter on cover sheet

Run #4: PoE AC Power Port Conducted Emissions, 0.15 - 30MHz, 220V/60Hz





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR075848
Model:	APIN0555	T-Log Number:	TL075848-RA-FCC
Contact:	Mark Hill	Project Manager:	Christine Krebill
Standard:	FCC §15.247 & §15.407	Project Engineer:	David Bare
		Class:	Enter on cover sheet

Run #3: AC Power Port Conducted Emissions, 0.15 - 30MHz, 220V/60Hz

Preliminary peak readings captured during pre-scan (peak readings vs. average limit)

Frequency MHz	Level dB μ V	AC Line	Class B		Detector QP/Ave	Comments
			Limit	Margin		
0.160	51.6	Line	55.4	-3.8	Peak	
0.453	42.7	Neutral	46.8	-4.1	Peak	
0.444	42.1	Line	47.0	-4.9	Peak	
0.174	48.5	Neutral	54.8	-6.3	Peak	
0.549	36.3	Line	46.0	-9.7	Peak	
0.583	35.2	Neutral	46.0	-10.8	Peak	
26.611	37.7	Neutral	50.0	-12.3	Peak	

Final quasi-peak and average readings

Frequency MHz	Level dB μ V	AC Line	Class B		Detector QP/Ave	Comments
			Limit	Margin		
0.453	34.6	Neutral	46.8	-12.2	AVG	AVG (0.10s)
0.444	34.6	Line	47.0	-12.4	AVG	AVG (0.10s)
0.453	41.2	Neutral	56.8	-15.6	QP	QP (1.00s)
0.444	41.4	Line	57.0	-15.6	QP	QP (1.00s)
26.611	31.0	Neutral	50.0	-19.0	AVG	AVG (0.10s)
0.160	36.4	Line	55.5	-19.1	AVG	AVG (0.10s)
0.160	45.3	Line	65.5	-20.2	QP	QP (1.00s)
0.174	34.0	Neutral	54.8	-20.8	AVG	AVG (0.10s)
0.583	25.0	Neutral	46.0	-21.0	AVG	AVG (0.10s)
0.549	33.9	Line	56.0	-22.1	QP	QP (1.00s)
0.174	41.4	Neutral	64.8	-23.4	QP	QP (1.00s)
0.583	32.6	Neutral	56.0	-23.4	QP	QP (1.00s)
0.549	20.9	Line	46.0	-25.1	AVG	AVG (0.10s)
26.611	34.9	Neutral	60.0	-25.1	QP	QP (1.00s)

End of Report

This page is intentionally blank and marks the last page of this test report.