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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 E

Model: APIN0534 and APIN0535

IC CERTIFICATION #:	4675A-APIN0534535
FCC ID:	Q9DAPIN0534535
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-4 and 2845B-5
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TOTAL NUMBER OF PAGES:	284

ACCREDITED
Testing Cert #0214.26

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

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REVISION HISTORY

Rev#	Date	Comments	Modified By
-	March 14, 2019	First release	
1	April 10, 2019	Removed statements about use of 15.209 limits in lieu of 15.407 limits in the test log.	David Guidotti / David Bare

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SCOPE

An electromagnetic emissions test has been performed on the Aruba, a Hewlett Packard Enterprise company models APIN0534 and APIN0535, 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 E requirements for UNII Devices

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 General UNII Test Procedures KDB789033

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 models APIN0534 and APIN0535 complied with the requirements of the following regulations:

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 E requirements for UNII Devices

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 models APIN0534 and APIN0535 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

UNII / LELAN DEVICES

OPERATION IN THE 5.15 – 5.25 GHZ BAND – ACCESS POINTS

FCC Rule Part		Description	Measured Value / Comments	Limit / Requirement	Result
15.407 (a) (1) (ii)		Output Power	a: 224.2 mW ax20: 213.7 mW ax40: 170.4 mW ax80: 51.1 mW (Max eirp: 0.355 W)	30 dBm EIRP <= 4W	Complies
15.407 (a) (1) (ii)		Power Spectral Density	a: 19.2 mW/MHz ax20: 17.4 mW/MHz ax40: 6.9 mW/MHz ax80: 1.1 mW/MHz	17 dBm/MHz	Complies
15.407(b) (1) / 15.209		Spurious Emissions above 1GHz	53.6 dBµV/m @ 5149.990 MHz (margin: -0.4 dB)	Refer to the limits section (p23) for restricted bands, all others -27 dBm/MHz EIRP	Complies

OPERATION IN THE 5.15 – 5.25 GHZ BAND

	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
	RSS-247 6.2.1	Indoor operation only	Refer to user's manual	N/A	Complies
	RSS-247 6.2.1 (1)	99% Bandwidth	a: 16.83 MHz ax20: 19.11 MHz ax40: 37.81 MHz ax80: 77.12 MHz	N/A – limits output power if < 20MHz	N/A
	RSS-247 6.2.1 (1)	EIRP Output Power	a: 32.4 mW ax20: 33.9 mW ax40: 63.1 mW ax80: 81.3 mW	23 dBm (200 mW)	Complies
	RSS-247 6.2.1 (1)	Power Spectral Density	a: 1.5 mW/MHz ax20: 1.5 mW/MHz ax40: 1.5 mW/MHz ax80: 1.1 mW/MHz	2 dBm/MHz	Complies
	RSS-247 6.2.1 (2)	Spurious Emissions above 1GHz	53.6 dBµV/m @ 5149.990 MHz (margin: -0.4 dB)	Refer to the limits section (p23) for restricted bands, all others -27 dBm/MHz EIRP 26 dBc in 5.25-5.35 GHz band	Complies

OPERATION IN THE 5.725 – 5.85 GHZ BAND

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.407(e)	RSS-247 6.2.4 (1)	6dB Bandwidth	All greater than 10 MHz	<= 500 kHz	Complies
15.407(a) (3)	RSS-210 A9.2(2)	Output Power (multipoint systems)	a: 196 mW ax20: 188.4 mW ax40: 194.3 mW ax80: 153.2 mW (Max eirp: 0.311 W)	30 dBm (1 W) EIRP <= 4W	Complies
15.407(a) (3)	RSS-247 6.2.3 (1)	Power Spectral Density	a: 16.8 mW/MHz ax20: 15 mW/MHz ax40: 7.8 mW/MHz ax80: 3.1 mW/MHz	30 dBm / 500 kHz	Complies
15.407(b) (4) / 15.209	RSS-247 6.2.4 (2)	Spurious Emissions above 1GHz	67.8 dBµV/m @ 5648.8 MHz (-0.5 dB)	Refer to the limits section (p23) for restricted bands, all others -17 dBm/MHz EIRP bandedge and -27 dBm/MHz EIRP	Complies

REQUIREMENTS FOR ALL U-NII/LELAN BANDS

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.407	RSS-247 6.1	Modulation	System uses OFDM techniques	Digital modulation is required	Complies
15.407(b) (6) / 15.209	RSS-247 6.2.1 (2)	Spurious Emissions below 1GHz	34.2 dBµV/m @ 34.13 MHz (margin: -5.8 dB)	Refer to page 24	Complies
15.31 (m)	RSS-247 6.4 (1) RSS-Gen 6.9	Channel Selection	Emissions tested at outermost and middle channels in each band	Device was tested on the top, bottom and center channels in each band	N/A
15.407 (c)	RSS-247 6.4 (2)	Operation in the absence of information to transmit	Operation is discontinued in the absence of information (Operational Description page 9)	Device shall automatically discontinue operation in the absence of information to transmit	Complies
15.407 (g)		Frequency Stability	Frequency stability is such that the emissions stay in band (Operational Description page 4)	Signal shall remain within the allocated band	Complies
15.407 (h1)	RSS-247 6.2.2 (1) 6.2.3 (1)	Transmit Power Control	TPC is not required as the device does not operate in either 5470 – 5725 or 5250 – 5350 MHz bands	The U-NII device shall have the capability to operate with a mean EIRP value lower than 24dBm (250mW)	Complies
15.407 (h2)	RSS-247 6.3	Dynamic frequency Selection (device with radar detection)	Device does not operate in either 5470 – 5725 or 5250 – 5350 MHz bands.		N/A
	RSS-247 6.4 (5)	User manual information	Refer to manual for details	Warning regarding Indoor use for 5150-5250 MHz band	Complies

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	Either integral or unique external connector	Unique or integral antenna required	Complies
15.407 (b) (6)	RSS-Gen Table 4	AC Conducted Emissions (AC Power)	39.3 dBµV @ 0.422 MHz (-8.1 dB)	Refer to page 22	Complies
		AC Conducted Emissions (POE)	38.4 dBµV @ 0.458 MHz (-8.3 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	(User Manual page 9)	Statement for products with detachable antenna	Complies
-	RSS-Gen 8.4	User Manual	(User Manual page 9)	Statement for all products	Complies
-	RSP-100 RSS-Gen 6.7	Occupied Bandwidth 5725-5850 MHz	a: 16.93 MHz ax20: 19.21 MHz ax40: 37.81 MHz ax80: 77.12 MHz	Information only	N/A

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)	dBµV/m	25 to 1000 MHz	± 3.6 dB
		1000 to 40000 MHz	± 6.0 dB
Conducted Emissions (AC Power)	dBµV	0.15 to 30 MHz	± 2.4 dB

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The Aruba, a Hewlett Packard Enterprise company models APIN0534 and APIN0535 are enterprise grade Wi-Fi access points 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 48 Volts DC, 0.75 Amps or POE (57 Volts DC, 0.95Amps).

The samples were received on October 1, 2018 and tested on October 2, 3, 5, 8, 9, 11, 12, 16, 17, 18, 19, 22, 23, 25, 26 and 31, and November 1, 7, 8, 9, 12 and 29 and December 26 and 27, 2018 and January 14, 2019. The following samples were used during testing:

Company	Model	Description	Serial Number	FCC ID
Aruba	APIN0524	Wi-Fi Access Point	CNG6K9V019	Q9DAPIN0534535
Aruba	APIN0525	Wi-Fi Access Point	CNG6K9W01F	
Aruba	APIN0524	Wi-Fi Access Point	CNG6K9V00M	
Aruba	APIN0525	Wi-Fi Access Point	CNG6K9W00R	
Aruba	APIN0525	Wi-Fi Access Point	CNG6K9V00C	

OTHER EUT DETAILS

The following EUT details should be noted:
Model APIN0534 uses external Wi-Fi antennas. Model APIN0535 uses internal Wi-Fi antennas. Both models use a separate internal BLE/ZigBee antenna.
Maximum antenna gains for internal antennas (details in test results):
2.4GHz: 3.5dBi max
5GHz: 5.4dBi max
BLE/ZigBee: 5.0 dBi (APIN0534), 3.1 dBi (APIN0535)

Maximum antenna gains for external antennas.

Antenna Model #	Description	2.4 Gain / 5G Gain
AP-ANT-1W	Whip/dipole antenna	3.8dBi/5.8dBi
AP-ANT-20	Whip/dipole antenna	2dBi/2dBi
AP-ANT-19	Whip/dipole antenna	3dBi/6dBi
AP-ANT-13B	Patch antenna	2.3dBi/4dBi
AP-ANT-40	Panel	4dBi/5dBi (4 element)
AP-ANT-45	Panel	5.5dBi/4.5dBi (4 element)
AP-ANT-48	Panel	8.5dBi/8.5dBi (4 element

The 802.11ax mode does not support partial RU configurations.

ENCLOSURE

The EUT enclosure measures approximately 24.5 by 24.5 by 5 centimeters. It is primarily constructed of aluminum and uncoated plastic.

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
CUI Inc	ATS048T-A480	AC Adapter	-	-

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

Company	Model	Description	Serial Number	FCC ID
HP	840 G3	Laptop	5CG75124D0	-
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)
DC Input	AC Adapter	two wire	Unshielded	1.2
Ethernet	POE Adatper	Cat 6	Unshielded	7.6
USB	Not connected	-	-	-
micro USB	Not connected	-	-	-
AC Adapter	Mains	Two wire	Unshileded	1.3
POE adapter	HP Laptop	Cat 6	Unshileded	1.5
POE adapter	Mains	Three wire	Unshileded	1.3

The micro USB and USB ports are for debug only.

EUT OPERATION

During testing, the EUT was was configured using the laptop to transmit continuously from all radios (2.4 GHz Wi-Fi, 5 GHz Wi-Fi and BLE/ZigBee) simultaneously on the selected channels and at the maximum power level. The BLE/ZigBee radio cannot transmit BLE and ZigBee simultaneously.

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 Numbers		Location
	FCC	Canada	
Chamber 4	US0027	2845B-4	41039 Boyce Road Fremont, CA 94538-2435
Chamber 5	US0027	2845B-5	

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.

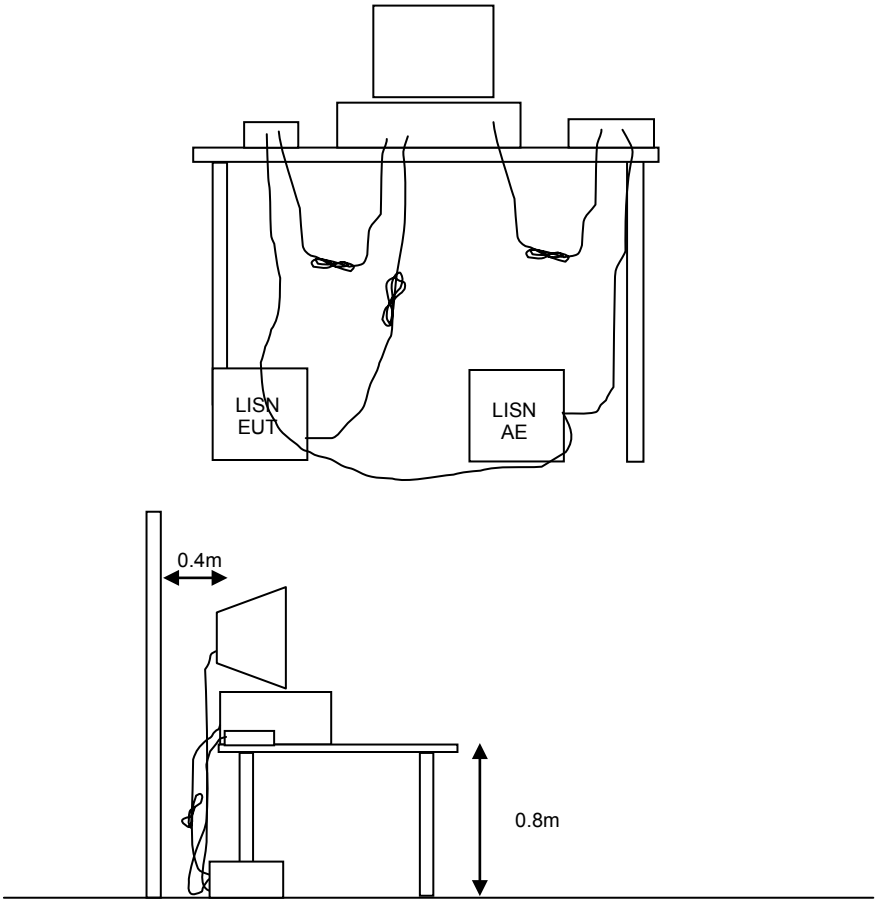


Figure 1 Typical Conducted Emissions Test Configuration

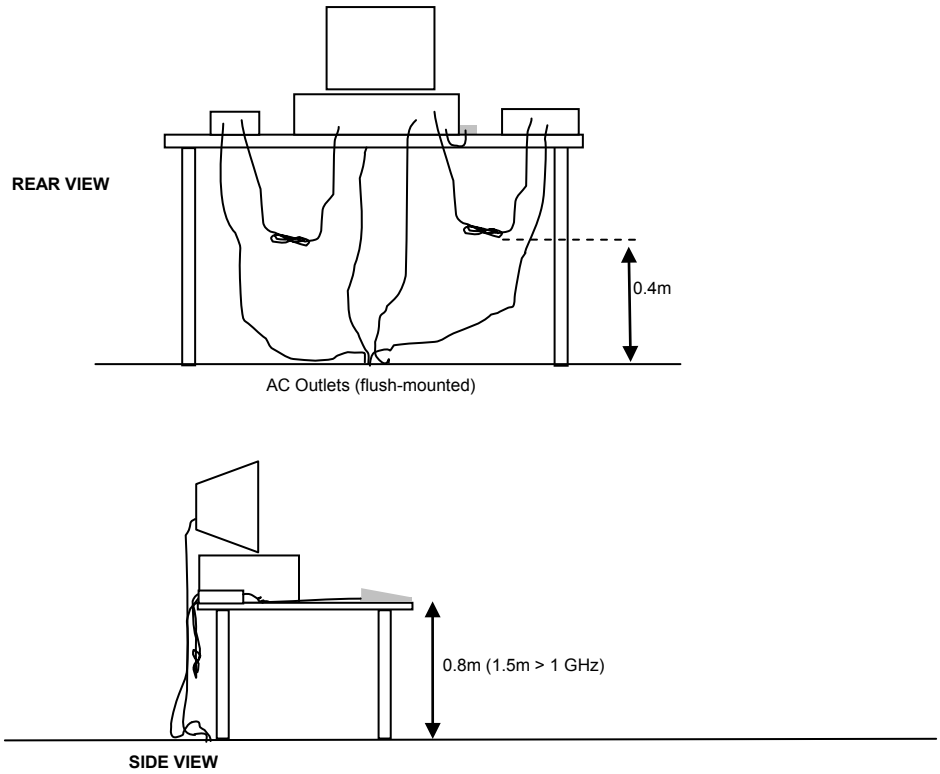
RADIATED EMISSIONS

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.

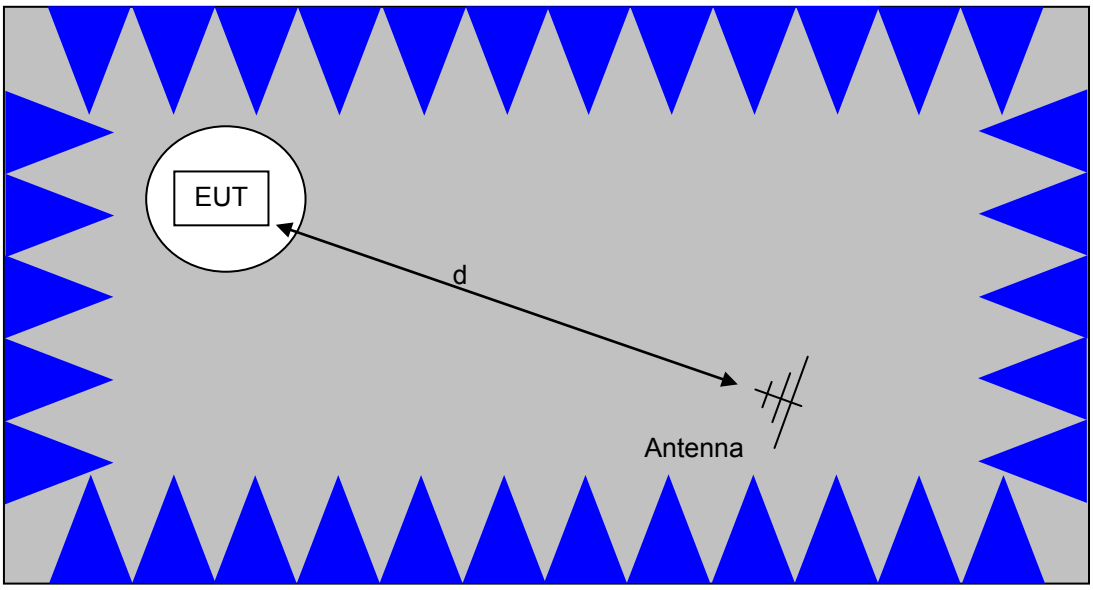
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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 1meter from the EUT and the antenna height is restricted to a maximum of 2.5 meters.

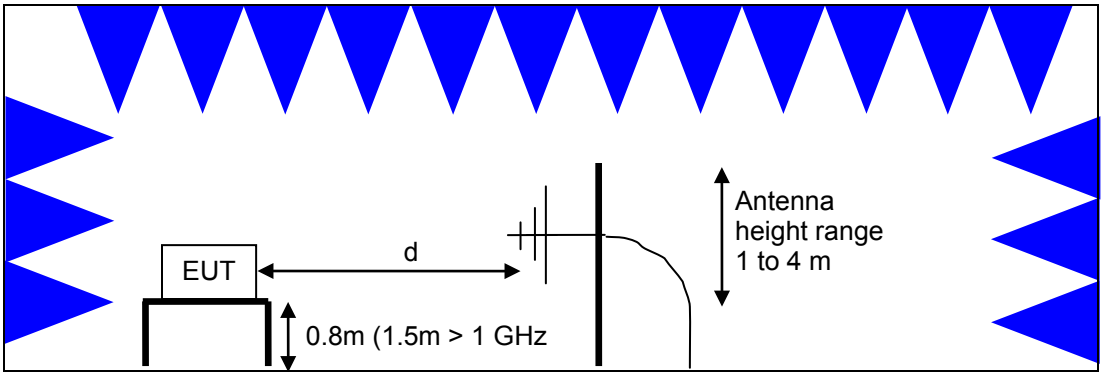


Typical Test Configuration for Radiated Field Strength Measurements



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.

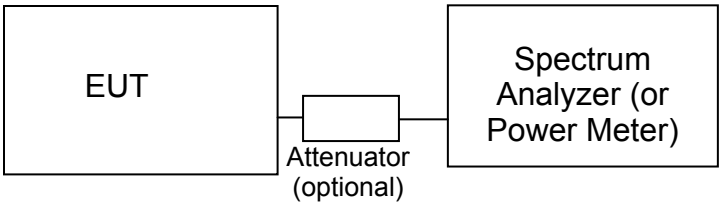
Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.



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 bands[1].

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

FCC 15.407 (a) OUTPUT POWER LIMITS

The table below shows the limits for output power and output power density. For the 5250-5350 and 5470-5725 MHz bands, 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
5150 – 5250	1Watt (30 dBm)	17 dBm/MHz
5250 – 5350 and 5470-5725	250 mW (24 dBm)	11 dBm/MHz
5725 – 5825	1 Watt (30 dBm)	30 dBm/500kHz

For system using antennas with gains exceeding 6dBi, the output power and power spectral density limits are reduced by 1dB for every dB the antenna gain exceeds 6dBi. Fixed point-to-point applications using the 5725 – 5825 MHz band may use antennas with gains of up to 23dBi without this limitation. If the gain exceeds 23dBi then the output power limit of 1 Watt is reduced by 1dB for every dB the gain exceeds 23dBi.

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

OUTPUT POWER LIMITS –LELAN DEVICES

The table below shows the limits for output power and output power density defined by RSS 247. 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
5150 – 5250	200mW (23 dBm) eirp	10 dBm/MHz eirp
5250 – 5350 and 5470 - 5725	250 mW (24 dBm)2 1W (30dBm) eirp	11 dBm/MHz
5725 – 5825	1 Watt (30 dBm) 4W eirp	30 dBm/500kHz

Fixed point-to-point applications using the 5725 – 5825 MHz band may use antennas with gains of up to 23dBi without this limitation. If the gain exceeds 23dBi then the output power limit of 1 Watt is reduced by 1dB for every dB the gain exceeds 23dBi.

SPURIOUS EMISSIONS LIMITS –UNII and LELAN DEVICES

The spurious emissions limits for signals below 1GHz are the FCC/RSS-Gen general limits. For emissions above 1GHz, signals in restricted bands are subject to the FCC/RSS-Gen general limits. All other signals have a limit of –27dBm/MHz, which is field strength of 68.3dBuV/m/MHz at a distance of 3m. For devices operating in the 5725-5850 MHz bands under the LELAN/UNII rules, the limit within 10MHz of the allocated band is increased to –17dBm/MHz.

[2] If EIRP exceeds 500mW the device must employ TPC

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

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
Radiated Emissions, Bandedge, 05-Oct-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	1756	7/7/2018	7/7/2019
Radiated Emissions, Bandedge UNII , 12-Oct-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 Emissions, 1000 - 40,000 MHz, 16-Oct-18					
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	9/5/2018	9/5/2019
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	9/18/2018	9/18/2020
HP / Miteq	SA40 R Head HF preAmplifier, 18-40 GHz (w/1148)	TTA1840-45-5P-HG-S	1145	9/8/2018	9/8/2019
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	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
A. H. Systems	Spare System Horn, 18-40GHz	SAS-574, p/n: 2581	2162	8/4/2017	8/4/2019
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	2239	8/17/2018	8/17/2019
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	2249	5/1/2018	5/1/2019
Radiated Emissions, 1000 - 40,000 MHz, 17-Oct-18					
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	9/5/2018	9/5/2019
HP / Miteq	SA40 R Head HF preAmplifier, 18-40 GHz (w/1148)	TTA1840-45-5P-HG-S	1145	9/8/2018	9/8/2019
Hewlett Packard	Spectrum Analyzer (SA40) Red 30 Hz -40 GHz	8564E (84125C)	1148	9/27/2018	9/27/2019
Hewlett Packard	High Pass filter, 8.2 GHz (Blu System)	P/N 84300-80039 (84125C)	1392	5/1/2018	5/1/2019
Micro-Tronics	Band Reject Filter, 5470-5725 MHz 12GHz	BRC50704-02	1681	3/23/2018	3/23/2019
A. H. Systems	Spare System Horn, 18-40GHz	SAS-574, p/n: 2581	2162	8/4/2017	8/4/2019
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	2239	8/17/2018	8/17/2019
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	2249	5/1/2018	5/1/2019
EMCO	Antenna, Horn, 1-18 GHz	3115	1242	4/11/2017	4/19/2019

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
Radiated Emissions, 1000 - 40,000 MHz, 18-Oct-18					
Micro-Tronics	Band Reject Filter, 5725-5875 MHz 12GHz	BRC50705-02	1728	3/23/2018	3/23/2019
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	9/5/2018	9/5/2019
HP / Miteq	SA40 R Head HF preAmplifier, 18-40 GHz (w/1148)	TTA1840-45-5P-HG-S	1145	9/8/2018	9/8/2019
Hewlett Packard	Spectrum Analyzer (SA40) Red 30 Hz -40 GHz	8564E (84125C)	1148	9/27/2018	9/27/2019
Hewlett Packard	High Pass filter, 8.2 GHz (Blu System)	P/N 84300-80039 (84125C)	1392	5/1/2018	5/1/2019
Micro-Tronics	Band Reject Filter, 5470-5725 MHz 12GHz	BRC50704-02	1681	3/23/2018	3/23/2019
A. H. Systems	Spare System Horn, 18-40GHz	SAS-574, p/n: 2581	2162	8/4/2017	8/4/2019
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	2249	5/1/2018	5/1/2019
EMCO	Antenna, Horn, 1-18 GHz	3115	1242	4/11/2017	4/19/2019
Radiated Emissions, 1000 - 40,000 MHz, 19-Oct-18					
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	9/5/2018	9/5/2019
HP / Miteq	SA40 R Head HF preAmplifier, 18-40 GHz (w/1148)	TTA1840-45-5P-HG-S	1145	9/8/2018	9/8/2019
Hewlett Packard	Spectrum Analyzer (SA40) Red 30 Hz -40 GHz	8564E (84125C)	1148	9/27/2018	9/27/2019
Hewlett Packard	High Pass filter, 8.2 GHz (Blu System)	P/N 84300-80039 (84125C)	1392	5/1/2018	5/1/2019
A. H. Systems	Spare System Horn, 18-40GHz	SAS-574, p/n: 2581	2162	8/4/2017	8/4/2019
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	2249	5/1/2018	5/1/2019
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	2239	8/17/2018	8/17/2019
EMCO	Antenna, Horn, 1-18 GHz	3115	1242	4/11/2017	4/19/2019
Radiated Emissions, 1000 - 40,000 MHz, 22-Oct-18					
Micro-Tronics	Band Reject Filter, 5725-5875 MHz 12GHz	BRC50705-02	1728	3/23/2018	3/23/2019
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	9/5/2018	9/5/2019
HP / Miteq	SA40 R Head HF preAmplifier, 18-40 GHz (w/1148)	TTA1840-45-5P-HG-S	1145	9/8/2018	9/8/2019
Hewlett Packard	Spectrum Analyzer (SA40) Red 30 Hz -40 GHz	8564E (84125C)	1148	9/27/2018	9/27/2019
Hewlett Packard	High Pass filter, 8.2 GHz (Blu System)	P/N 84300-80039 (84125C)	1392	5/1/2018	5/1/2019
Micro-Tronics	Band Reject Filter, 5470-5725 MHz 12GHz	BRC50704-02	1681	3/23/2018	3/23/2019
A. H. Systems	Spare System Horn, 18-40GHz	SAS-574, p/n: 2581	2162	8/4/2017	8/4/2019
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	2249	5/1/2018	5/1/2019

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
EMCO	Antenna, Horn, 1-18 GHz	3115	1242	4/11/2017	4/19/2019
Radiated Emissions, 1000 - 40,000 MHz, 23-Oct-18					
Micro-Tronics	Band Reject Filter, 5725-5875 MHz 12GHz	BRC50705-02	1728	3/23/2018	3/23/2019
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	9/5/2018	9/5/2019
HP / Miteq	SA40 R Head HF preAmplifier, 18-40 GHz (w/1148)	TTA1840-45-5P-HG-S	1145	9/8/2018	9/8/2019
Hewlett Packard	Spectrum Analyzer (SA40) Red 30 Hz -40 GHz	8564E (84125C)	1148	9/27/2018	9/27/2019
Hewlett Packard	High Pass filter, 8.2 GHz (Blu System)	P/N 84300-80039 (84125C)	1392	5/1/2018	5/1/2019
Micro-Tronics	Band Reject Filter, 5470-5725 MHz 12GHz	BRC50704-02	1681	3/23/2018	3/23/2019
A. H. Systems	Spare System Horn, 18-40GHz	SAS-574, p/n: 2581	2162	8/4/2017	8/4/2019
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	2249	5/1/2018	5/1/2019
EMCO	Antenna, Horn, 1-18 GHz	3115	1242	4/11/2017	4/19/2019
Radiated Emissions, 1000 - 40,000 MHz, 25-Oct-18					
Micro-Tronics	Band Reject Filter, 5725-5875 MHz 12GHz	BRC50705-02	1728	3/23/2018	3/23/2019
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	9/5/2018	9/5/2019
HP / Miteq	SA40 R Head HF preAmplifier, 18-40 GHz (w/1148)	TTA1840-45-5P-HG-S	1145	9/8/2018	9/8/2019
Hewlett Packard	Spectrum Analyzer (SA40) Red 30 Hz -40 GHz	8564E (84125C)	1148	9/27/2018	9/27/2019
Hewlett Packard	High Pass filter, 8.2 GHz (Blu System)	P/N 84300-80039 (84125C)	1392	5/1/2018	5/1/2019
Micro-Tronics	Band Reject Filter, 5470-5725 MHz 12GHz	BRC50704-02	1681	3/23/2018	3/23/2019
A. H. Systems	Spare System Horn, 18-40GHz	SAS-574, p/n: 2581	2162	8/4/2017	8/4/2019
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	2249	5/1/2018	5/1/2019
EMCO	Antenna, Horn, 1-18 GHz	3115	1242	4/11/2017	4/19/2019
Radiated Emissions, 1000 - 40,000 MHz, 26-Oct-18					
Micro-Tronics	Band Reject Filter, 5725-5875 MHz 12GHz	BRC50705-02	1728	3/23/2018	3/23/2019
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	9/5/2018	9/5/2019
HP / Miteq	SA40 R Head HF preAmplifier, 18-40 GHz (w/1148)	TTA1840-45-5P-HG-S	1145	9/8/2018	9/8/2019
Hewlett Packard	Spectrum Analyzer (SA40) Red 30 Hz -40 GHz	8564E (84125C)	1148	9/27/2018	9/27/2019
Hewlett Packard	High Pass filter, 8.2 GHz (Blu System)	P/N 84300-80039 (84125C)	1392	5/1/2018	5/1/2019
Micro-Tronics	Band Reject Filter, 5470-5725 MHz 12GHz	BRC50704-02	1681	3/23/2018	3/23/2019

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
A. H. Systems	Spare System Horn, 18-40GHz	SAS-574, p/n: 2581	2162	8/4/2017	8/4/2019
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	2249	5/1/2018	5/1/2019
EMCO	Antenna, Horn, 1-18 GHz	3115	1242	4/11/2017	4/19/2019
Radiated Emissions, 30 - 1,000 MHz, 31-Oct-18					
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1657	8/1/2018	8/1/2020
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB 7	1756	7/7/2018	7/7/2019
Com-Power	Preamplifier, 30-1000 MHz	PA-103	2465	5/24/2018	5/24/2019
Radiated Emissions, 1000 - 6,000 MHz, 31-Oct-18					
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
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	2249	5/1/2018	5/1/2019
EMCO	Antenna, Horn, 1-18 GHz	3115	1242	4/11/2017	4/19/2019
Micro-Tronics	Band Reject Filter, 5470-5725 MHz 12GHz	BRC50704-02	1681	3/23/2018	3/23/2019
Radiated Emissions, 1000 - 6,000 MHz, 01-Nov-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	1756	7/7/2018	7/7/2019
Radio Antenna Port (Power and Spurious Emissions), 07-Nov-18					
Agilent Technologies	PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX,	E4446A	2139	7/27/2018	7/27/2019
Rohde & Schwarz	Power Meter, Dual Channel	NRVD	1071	4/4/2018	4/4/2019
Rohde & Schwarz	Peak Power Sensor 100 uW - 2 Watts use with 20dB attenuator sn:1031.6959.00 only	NRV-Z32	3225	11/5/2017	12/5/2018
Rohde & Schwarz	20dB attenuator sn:1031.6959.00 only for Peak Power Sensor 100 uW - 2 Watts	NRV-Z32 atten	3226	11/5/2017	12/5/2018
Radio Antenna Port (Power and Spurious Emissions), 12-Nov-18					
Agilent Technologies	PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX,	E4446A	2139	7/27/2018	7/27/2019
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

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
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
Radiated Emissions, 27-Dec-18					
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
Micro-Tronics	Band Reject Filter, 5470-5725 MHz	BRC50704-02	2240	8/17/2018	8/17/2019

Appendix B Test Data

TL077654-RA-FCC Pages 33 – 283

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR077654
Product	APIN0534 and APIN0535	T-Log Number:	TL077654-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

APIN0534 and APIN0535

Date of Last Test: 1/31/2019

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

RSS-247 (LELAN) and FCC 15.407(UNII)
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.

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Power, 5150 - 5250MHz	15.407(a) (1), (2), (3) RSS-247 6.2	Pass	a: 224.2 mW ax20: 213.7 mW ax40: 170.4 mW ax80: 51.1 mW
1	PSD, 5150 - 5250MHz	15.407(a) (1), (2), (3) RSS-247 6.2	Pass	a: 19.2 mW/MHz ax20: 17.4 mW/MHz ax40: 6.9 mW/MHz ax80: 1.1 mW/MHz
1	99% Bandwidth	RSS-247 (Information only)	N/A	a: 16.83 MHz ax20: 19.11 MHz ax40: 37.81 MHz ax80: 77.12 MHz
2	Antenna Conducted - Out of Band Spurious	15.407(b) -27dBm/MHz		All emissions below the -27dBm/MHz limit

General Test Configuration

When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators and cables used.

Ambient Conditions:

Temperature: 22.6 °C
Rel. Humidity: 38 %

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

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.

Procedure Comments:

Measurements performed in accordance with FCC KDB 789033 D01

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
11a	MCS0	92.3%	Yes	1.4	0.3	0.7	698
n20	MCS0	95.6%	Yes	4.8	0.2	0.4	208
11ax20	MCS0	95.6%	Yes	5.4	0.2	0.4	184
11ax40	MCS0	95.9%	Yes	5.4	0.2	0.4	184
n40	MCS0	94.5%	Yes	4.7	0.2	0.5	212
11ax80	MCS0	94.9%	Yes	5.4	0.2	0.5	185
ac80	MCS0	95.3%	Yes	4.8	0.2	0.4	210
11ax80+80	MCS0	95.3%	Yes	4.8	0.2	0.4	210
11ac80+80	MCS0	96.5%	Yes	5.4	0.2	0.3	184

Sample Notes

Sample S/N: CNG6K9V00M
Driver: P2 WNC 0.4.3a

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #1: Bandwidth, Output Power and Power Spectral Density - MIMO Systems

Date of Test: 11/7/2018 Config. Used: 1
Test Engineer: Rafael Varelas / Roy Zheng Config Change: None
Test Location: FT Lab #4b EUT Voltage: POE & 120V/60Hz

Note 1:	Constant Duty Cycle < 98%. Output power measured using a spectrum analyzer (see plots below). RBW=1MHz, VB=3 MHz, Span > OBW, # of points in sweep ≥ 2*span/RBW, RMS sample detector, trace average 100 traces (at least 100 traces, increase the number to get true average), power averaging on and power integration over the OBW. Tthe measurements were adjusted by adding YY dB. This is based on 10log(1/x), where x is the duty cycle. (method SA-2 of ANSI C63.10)
Note 2:	Measured using the same analyzer settings used for output power.
Note 3:	For RSS-247 the limit for the 5150 - 5250 MHz band accounts for the antenna gain as the maximum eirp allowed is 10dBm/MHz. The limits are also corrected for instances where the highest measured value of the PSD exceeds the average PSD (calculated from the measured power divided by the measured 99% bandwidth) by more than 3dB by the amount that the measured value exceeds the average by more than 3dB.
Note 4:	99% Bandwidth measured in accordance with C63.10 - RB between 1-5 % of OBW and VB ≥ 3*RB, Span between 1.5 and 5 times OBW.
Note 5:	For MIMO systems the total output power and total PSD are calculated from the sum of the powers of the individual chains (in linear terms). The antenna gain used to determine the EIRP and limits for PSD/Output power depends on the operating mode of the MIMO device. If the signals on the non-coherent between the transmit chains then the gain used to determine the limits is the highest gain of the individual chains and the EIRP is the sum of the products of gain and power on each chain. If the signals are coherent then the effective antenna gain is the sum (in linear terms) of the gains for each chain and the EIRP is the product of the effective gain and total power.

Antenna Gain Information

Freq	Antenna Gain (dBi) / Chain								Dir G (PWR)	Dir G (PSD)
	1	2	3	4	5	6	7	8		
5150-5250	2.0	2.0	2.0	2.0					2.0	8.0

Higher gain antennas used for model APIN0534 and internal antennas of the APIN0535 use a corresponding lower power settings
Legacy modes operate on all chains
Power for BF mode is reduced by 6 dB so effective antenna gain does not change
CDD active for single stream modes

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

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; GA (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.
Notes:	For systems with Beamforming and CDD, choose one the following options: Option 1: Delays are optimized for beamforming, rather than being selected from cyclic delay table of 802.11; Array gains calculated based on beamforming criteria. Option 2: Antennas are paired for beamforming, and the pairs are configured to use the cyclic delay diversity of 802.11; the array gain associated with beamforming with 2 antennas (3dB), and the array gain associated with CDD with two antennas (3dB for PSD and 0 dB for power)

FCC UNII-1 Limits		Pwr	PSD
	Outdoor AP	30	17
X	Indoor AP	30	17
	Station (e.g. Client)	24	11
	Outdoor AP (>30° Elv.)	21	-

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

MIMO Device - 5150-5250 MHz Band - FCC

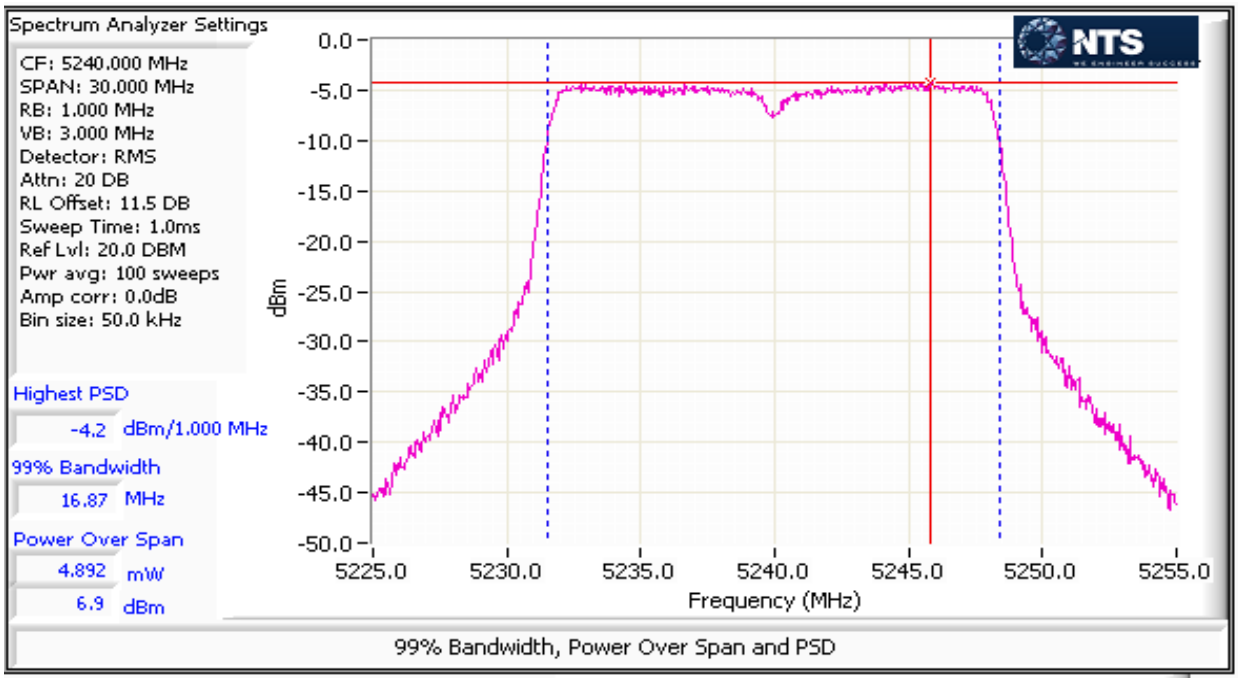
Mode: 11a — Max EIRP (mW): 355.3

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power mW	Total Power dBm	FCC Limit dBm	Max Power (W)	Result
5180	0	16.5		92.3	13.3	98.3	19.9	30.0	0.224	Pass
	1				13.6					
	2				13.9					
	3				13.4					
5200	0	20		92.3	16.6	210.1	23.2	30.0		Pass
	1				17.0					
	2				17.1					
	3				16.7					
5240	0	20		92.3	17.1	224.2	23.5	30.0		Pass
	1				17.4					
	2				17.4					
	3				16.6					

MIMO Device - 5150-5250 MHz Band - ISEDC

Mode: 11a — Max EIRP (mW): 32.4

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power dBm	Total Power dBm (eirp)	IC limit dBm (eirp)	Max Power (W)	Result
5180	0	9	15.83	92.3	6.8	13.0	15.0	22.0	0.020	Pass
	1				6.6					
	2				6.6					
	3				6.7					
5200	0	9	16.83	92.3	6.9	13.0	15.0	22.3		Pass
	1				6.5					
	2				6.6					
	3				6.6					
5240	0	8.5	16.83	92.3	6.9	13.1	15.1	22.3		Pass
	1				7.0					
	2				6.7					
	3				6.2					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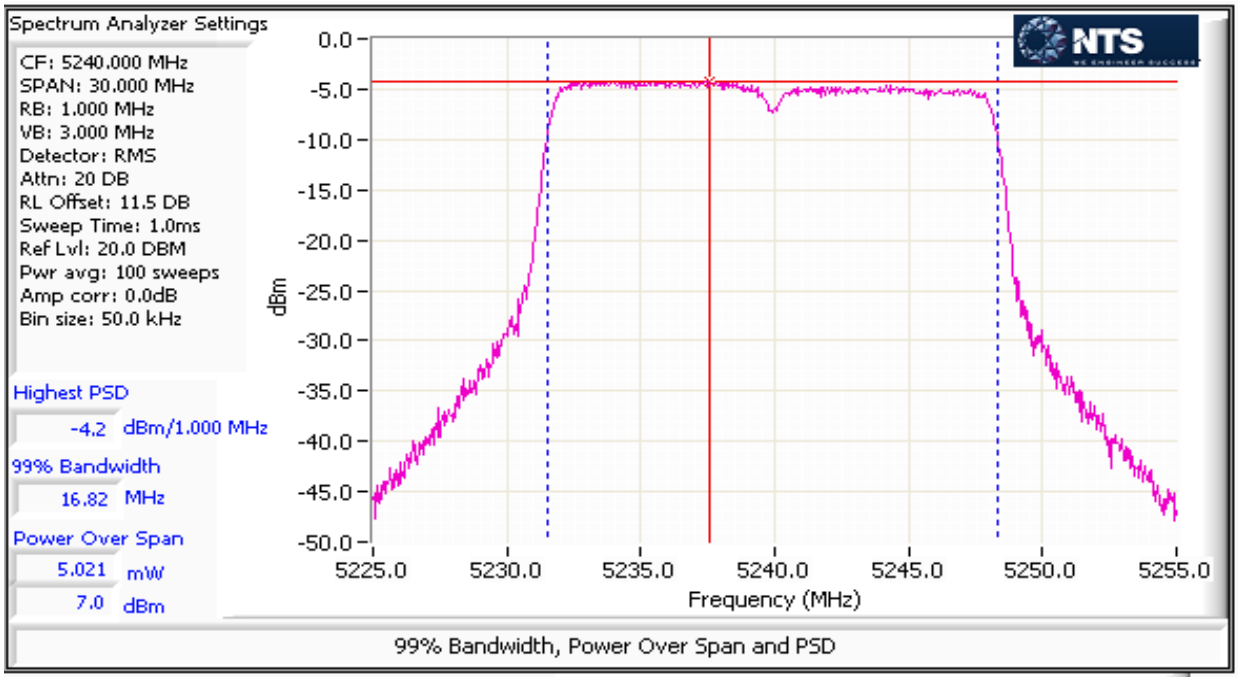
SPAN: 30.000 MHz
RB: 1.000 MHz
VB: 3.000 MHz
Detector: RMS
Attn: 20 DB
RL Offset: 11.5 DB
Sweep Time: 1.0ms
Ref Lvl: 20.0 DBM
Pwr avg: 100 sweeps
Amp corr: 0.0dB
Bin size: 50.0 kHz
Highest PSD
-4.2 dBm/1.000 MHz
99% Bandwidth
16.87 MHz
Power Over Span
4.892 mW
6.9 dBm
dBm
Frequency (MHz)
99% Bandwidth, Power Over Span and PSD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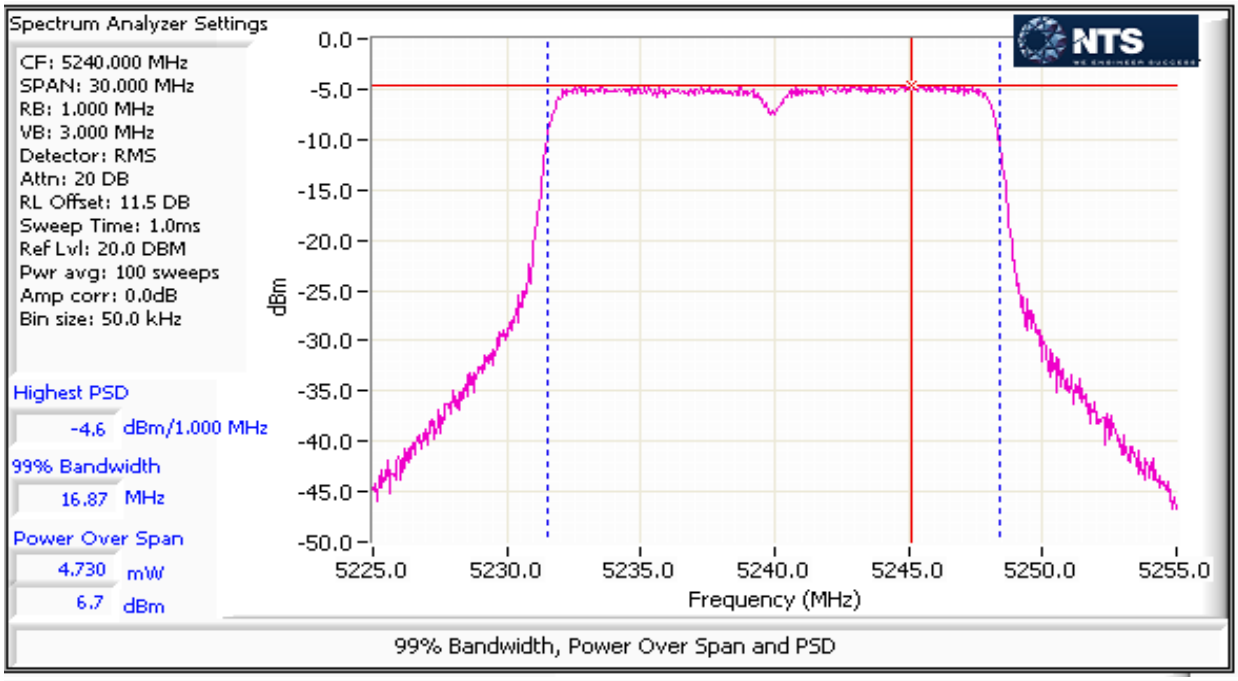
SPAN: 30.000 MHz
RB: 1.000 MHz
VB: 3.000 MHz
Detector: RMS
Attn: 20 DB
RL Offset: 11.5 DB
Sweep Time: 1.0ms
Ref Lvl: 20.0 DBM
Pwr avg: 100 sweeps
Amp corr: 0.0dB
Bin size: 50.0 kHz
Highest PSD
-4.2 dBm/1.000 MHz
99% Bandwidth
16.82 MHz
Power Over Span
5.021 mW
7.0 dBm
dBm
Frequency (MHz)
99% Bandwidth, Power Over Span and PSD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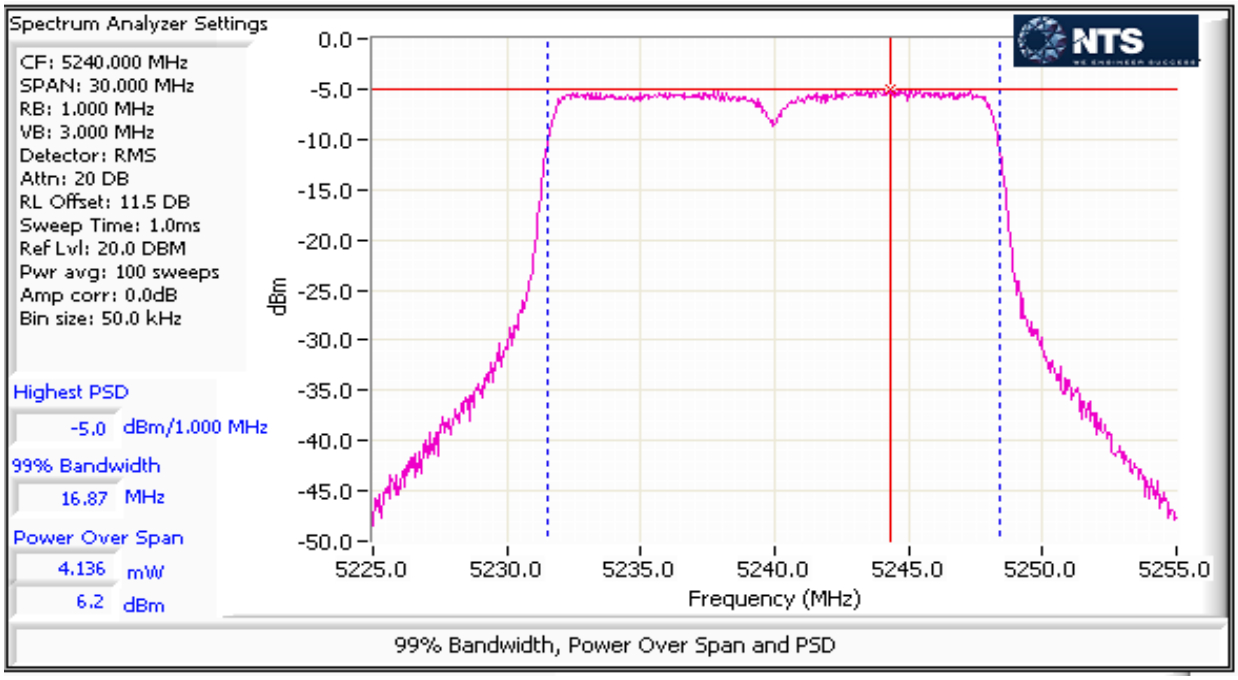
SPAN: 30.000 MHz
RB: 1.000 MHz
VB: 3.000 MHz
Detector: RMS
Attn: 20 DB
RL Offset: 11.5 DB
Sweep Time: 1.0ms
Ref Lvl: 20.0 DBM
Pwr avg: 100 sweeps
Amp corr: 0.0dB
Bin size: 50.0 kHz
Highest PSD
-4.6 dBm/1.000 MHz
99% Bandwidth
16.87 MHz
Power Over Span
4.730 mW
6.7 dBm
dBm
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
-45.0
-50.0
5225.0
5230.0
5235.0
5240.0
5245.0
5250.0
5255.0
Frequency (MHz)
99% Bandwidth, Power Over Span and PSD


Spectrum Analyzer Settings
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SPAN: 30.000 MHz
RB: 1.000 MHz
VB: 3.000 MHz
Detector: RMS
Attn: 20 DB
RL Offset: 11.5 DB
Sweep Time: 1.0ms
Ref Lvl: 20.0 DBM
Pwr avg: 100 sweeps
Amp corr: 0.0dB
Bin size: 50.0 kHz
Highest PSD
-5.0 dBm/1.000 MHz
99% Bandwidth
16.87 MHz
Power Over Span
4.136 mW
6.2 dBm
dBm
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
-45.0
-50.0
5225.0
5230.0
5235.0
5240.0
5245.0
5250.0
5255.0
Frequency (MHz)
99% Bandwidth, Power Over Span and PSD

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

5150-5250 PSD - FCC
Mode: 11a

Frequency (MHz)	Chain	Software Setting		Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	Result
5180	0	16.5		92.3	2.6	8.8	9.4	15.0	Pass
	1				3.3				
	2				3.4				
	3				2.9				
5200	0	20		92.3	5.8	17.9	12.5	15.0	Pass
	1				6.4				
	2				6.4				
	3				6.0				
5240	0	20		92.3	6.3	19.2	12.8	15.0	Pass
	1				6.8				
	2				6.8				
	3				5.9				

5150-5250 PSD - ISEDC
Mode: 11a

Frequency (MHz)	Chain	Software Setting		Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	IC Limit dBm/MHz	Result
5180	0	9		92.3	-4.6	1.5	1.8	2.0	Pass
	1				-4.4				
	2				-4.6				
	3				-4.3				
5200	0	9		92.3	-4.3	1.5	1.8	2.0	Pass
	1				-4.7				
	2				-4.6				
	3				-4.4				
5240	0	8.5		92.3	-4.2	1.5	1.8	2.0	Pass
	1				-4.2				
	2				-4.6				
	3				-5.0				

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

MIMO Device - 5150-5250 MHz Band - FCC

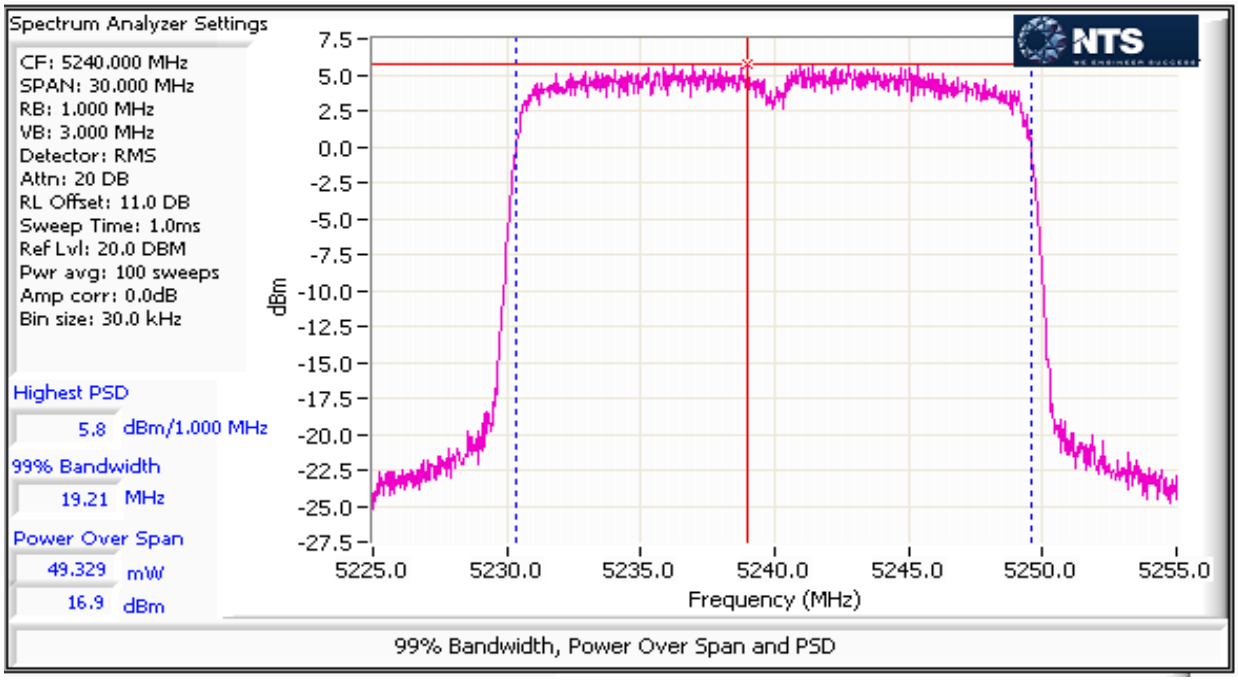
Mode: ax20 Max EIRP (mW): 338.7

Frequency (MHz)	Chain	Software Setting		Duty Cycle %	Power[1] dBm	Total Power mW	Total Power dBm	FCC Limit dBm	Max Power (W)	Result
5180	0	16		95.6	12.7	83.2	19.2	30.0	0.214	Pass
	1				13.3					
	2				13.2					
	3				12.7					
5200	0	20		95.6	16.6	199.3	23.0	30.0		Pass
	1				16.9					
	2				17.0					
	3				16.6					
5240	0	20		95.6	16.9	213.7	23.3	30.0		Pass
	1				17.2					
	2				17.4					
	3				16.8					

MIMO Device - 5150-5250 MHz Band - ISEDC

Mode: ax20 Max EIRP (mW): 33.9

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power dBm	Total Power dBm (eirp)	IC limit dBm (eirp)	Max Power (W)	Result
5180	0	9	19.11	95.6	6.9	12.8	14.8	22.8	0.021	Pass
	1				6.4					
	2				6.7					
	3				6.5					
5200	0	9.5	19.11	95.6	7.3	13.3	15.3	22.8		Pass
	1				7.2					
	2				6.8					
	3				7.1					
5240	0	9	19.11	95.6	7.1	13.3	15.3	22.8		Pass
	1				7.2					
	2				7.3					
	3				6.9					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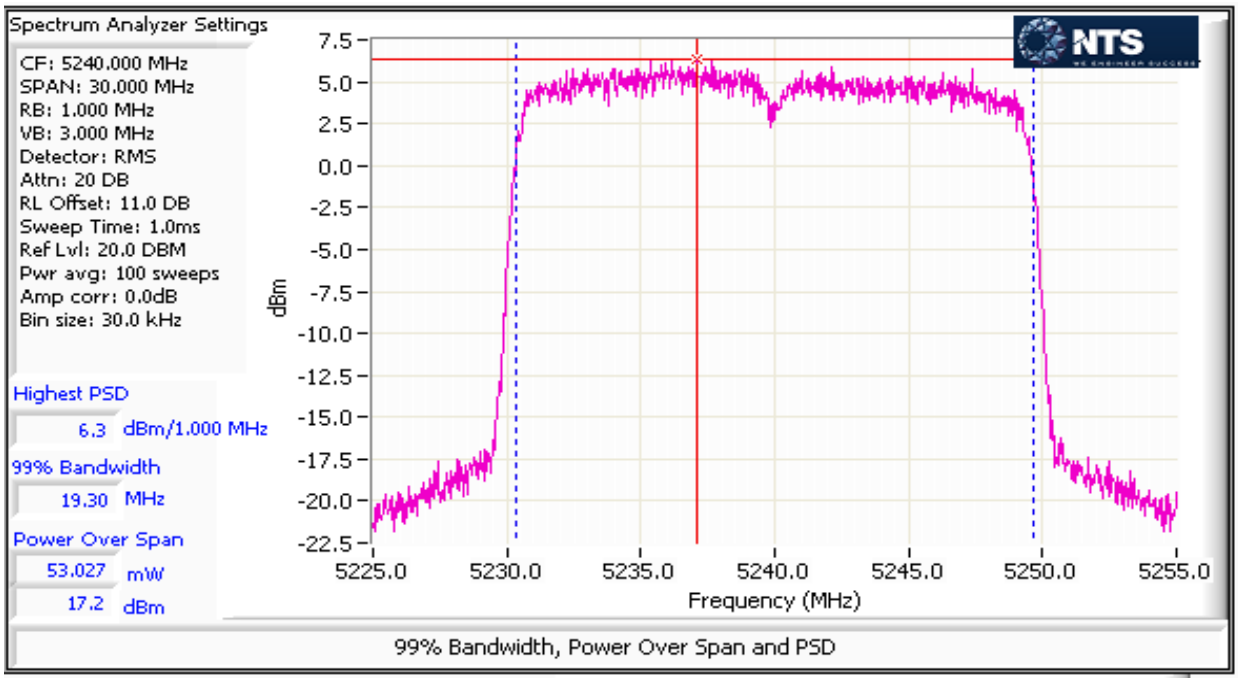
SPAN: 30.000 MHz
RB: 1.000 MHz
VB: 3.000 MHz
Detector: RMS
Attn: 20 DB
RL Offset: 11.0 DB
Sweep Time: 1.0ms
Ref Lvl: 20.0 DBM
Pwr avg: 100 sweeps
Amp corr: 0.0dB
Bin size: 30.0 kHz
Highest PSD
5.8 dBm/1.000 MHz
99% Bandwidth
19.21 MHz
Power Over Span
49.329 mW
16.9 dBm
dBm
Frequency (MHz)
99% Bandwidth, Power Over Span and PSD


Spectrum Analyzer Settings
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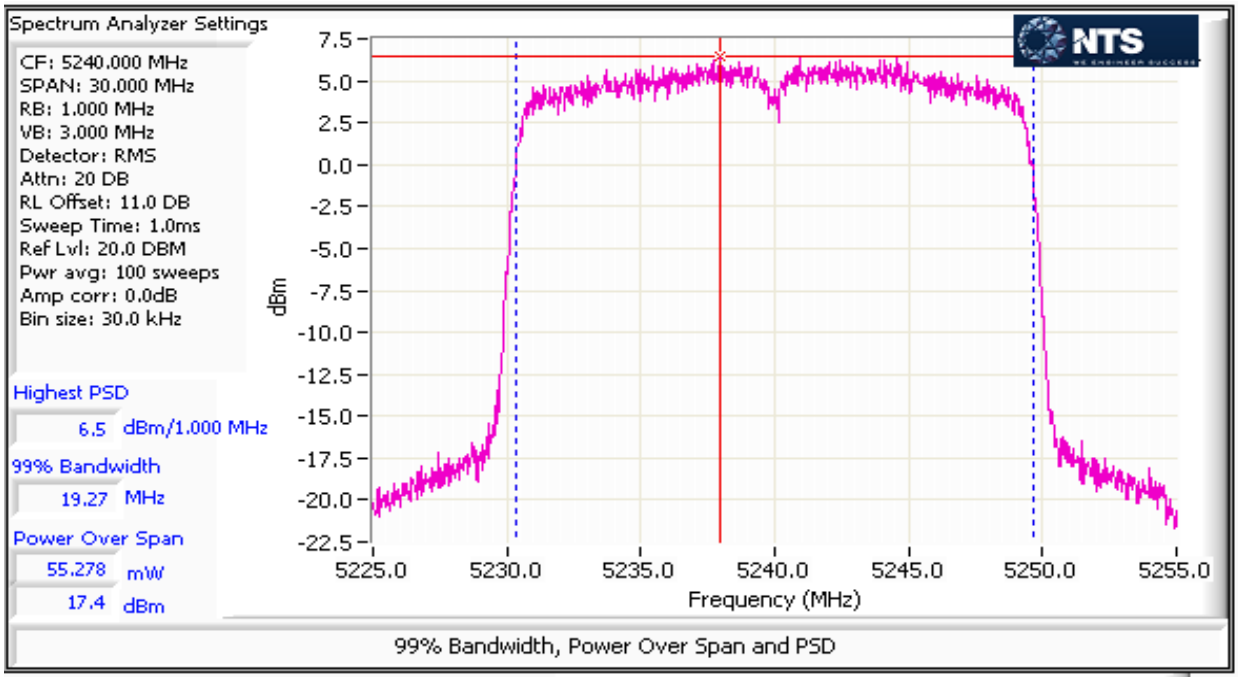
SPAN: 30.000 MHz
RB: 1.000 MHz
VB: 3.000 MHz
Detector: RMS
Attn: 20 DB
RL Offset: 11.0 DB
Sweep Time: 1.0ms
Ref Lvl: 20.0 DBM
Pwr avg: 100 sweeps
Amp corr: 0.0dB
Bin size: 30.0 kHz
Highest PSD
6.3 dBm/1.000 MHz
99% Bandwidth
19.30 MHz
Power Over Span
53.027 mW
17.2 dBm
dBm
Frequency (MHz)
99% Bandwidth, Power Over Span and PSD


Spectrum Analyzer Settings
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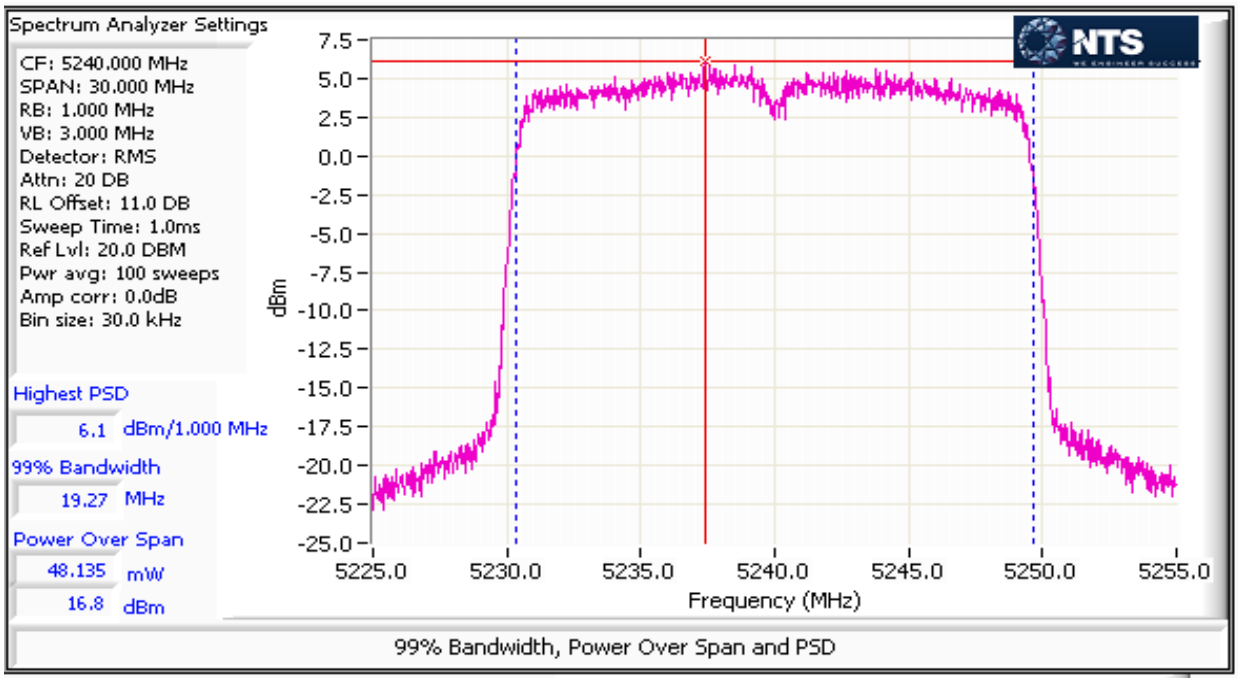
SPAN: 30.000 MHz
RB: 1.000 MHz
VB: 3.000 MHz
Detector: RMS
Attn: 20 DB
RL Offset: 11.0 DB
Sweep Time: 1.0ms
Ref Lvl: 20.0 DBM
Pwr avg: 100 sweeps
Amp corr: 0.0dB
Bin size: 30.0 kHz
Highest PSD
6.5 dBm/1.000 MHz
99% Bandwidth
19.27 MHz
Power Over Span
55.278 mW
17.4 dBm
dBm
7.5
5.0
2.5
0.0
-2.5
-5.0
-7.5
-10.0
-12.5
-15.0
-17.5
-20.0
-22.5
5225.0
5230.0
5235.0
5240.0
5245.0
5250.0
5255.0
Frequency (MHz)
99% Bandwidth, Power Over Span and PSD


Spectrum Analyzer Settings
CF: 5240.000 MHz
SPAN: 30.000 MHz
RB: 1.000 MHz
VB: 3.000 MHz
Detector: RMS
Attn: 20 DB
RL Offset: 11.0 DB
Sweep Time: 1.0ms
Ref Lvl: 20.0 DBM
Pwr avg: 100 sweeps
Amp corr: 0.0dB
Bin size: 30.0 kHz
Highest PSD
6.1 dBm/1.000 MHz
99% Bandwidth
19.27 MHz
Power Over Span
48.135 mW
16.8 dBm
dBm
7.5
5.0
2.5
0.0
-2.5
-5.0
-7.5
-10.0
-12.5
-15.0
-17.5
-20.0
-22.5
-25.0
5225.0
5230.0
5235.0
5240.0
5245.0
5250.0
5255.0
Frequency (MHz)
99% Bandwidth, Power Over Span and PSD

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

5150-5250 PSD - FCC
Mode: ax20

Frequency (MHz)	Chain	Software Setting		Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	Result
5180	0	16		95.6	1.9	6.6	8.2	15.0	Pass
	1				2.3				
	2				2.2				
	3				1.6				
5200	0	20		95.6	5.7	16.1	12.1	15.0	Pass
	1				6.3				
	2				6.0				
	3				5.4				
5240	0	20		95.6	5.8	17.4	12.4	15.0	Pass
	1				6.3				
	2				6.5				
	3				6.1				

5150-5250 PSD - ISEDC
Mode: ax20

Frequency (MHz)	Chain	Software Setting		Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	IC Limit dBm/MHz	Result
5180	0	9		95.6	-4.6	1.4	1.5	2.0	Pass
	1				-4.6				
	2				-4.8				
	3				-5.0				
5200	0	9.5		95.6	-4.1	1.5	1.8	2.0	Pass
	1				-4.3				
	2				-4.6				
	3				-4.3				
5240	0	9		95.6	-4.3	1.5	1.8	2.0	Pass
	1				-4.2				
	2				-4.3				
	3				-4.5				

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

5150-5250 PSD - FCC n20 mode tested to demonstrate PSD is same as for ax20 mode

Mode: n20

Frequency (MHz)	Chain	Software Setting		Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	Result
5180	0	16		95.6	2.1	6.8	8.3	15.0	Pass
	1				2.2				
	2				2.2				
	3				2.0				
5200	0	20		95.6	5.3	16.2	12.1	15.0	Pass
	1				6.2				
	2				6.2				
	3				5.8				
5240	0	20		95.6	5.9	17.7	12.5	15.0	Pass
	1				6.4				
	2				6.7				
	3				6.0				

5150-5250 PSD - ISEDC

Mode: n20

Frequency (MHz)	Chain	Software Setting		Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	IC Limit dBm/MHz	Result
5180	0	9		95.6	-4.3	1.5	1.8	2.0	Pass
	1				-4.7				
	2				-4.5				
	3				-4.7				
5200	0	9.5		95.6	-4.2	1.5	1.8	2.0	Pass
	1				-4.8				
	2				-4.2				
	3				-4.3				
5240	0	9		95.6	-4.8	1.5	1.8	2.0	Pass
	1				-4.5				
	2				-4.0				
	3				-4.5				

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

MIMO Device - 5150-5250 MHz Band - FCC

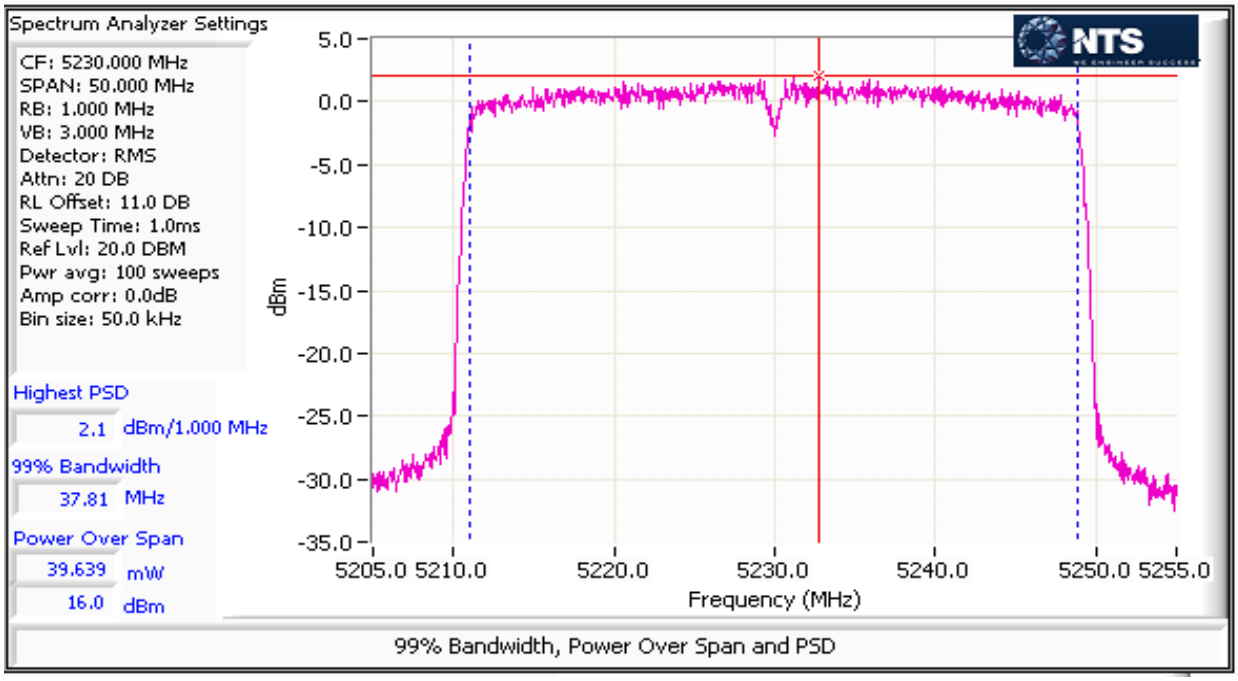
Mode: ax40 Max EIRP (mW): 270.1

Frequency (MHz)	Chain	Software Setting		Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5190	0	13		95.9	10.1	43.9	16.4	30.0	0.170	Pass
	1				10.3					
	2				10.3					
	3				10.2					
5230	0	18.5		95.9	16.0	170.4	22.3	30.0		Pass
	1				16.5					
	2				16.3					
	3				15.6					

MIMO Device - 5150-5250 MHz Band - ISEDC

Mode: ax40 Max EIRP (mW): 63.1

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power dBm	Total Power dBm (eirp)	IC limit dBm (eirp)	Max Power (W)	Result
5190	0	11.5	37.81	95.9	9.5	15.6	17.6	23.0	0.040	Pass
	1				9.3					
	2				9.5					
	3				9.3					
5230	0	11.5	37.81	95.9	9.9	16.0	18.0	23.0		Pass
	1				9.9					
	2				9.8					
	3				9.6					


Spectrum Analyzer Settings
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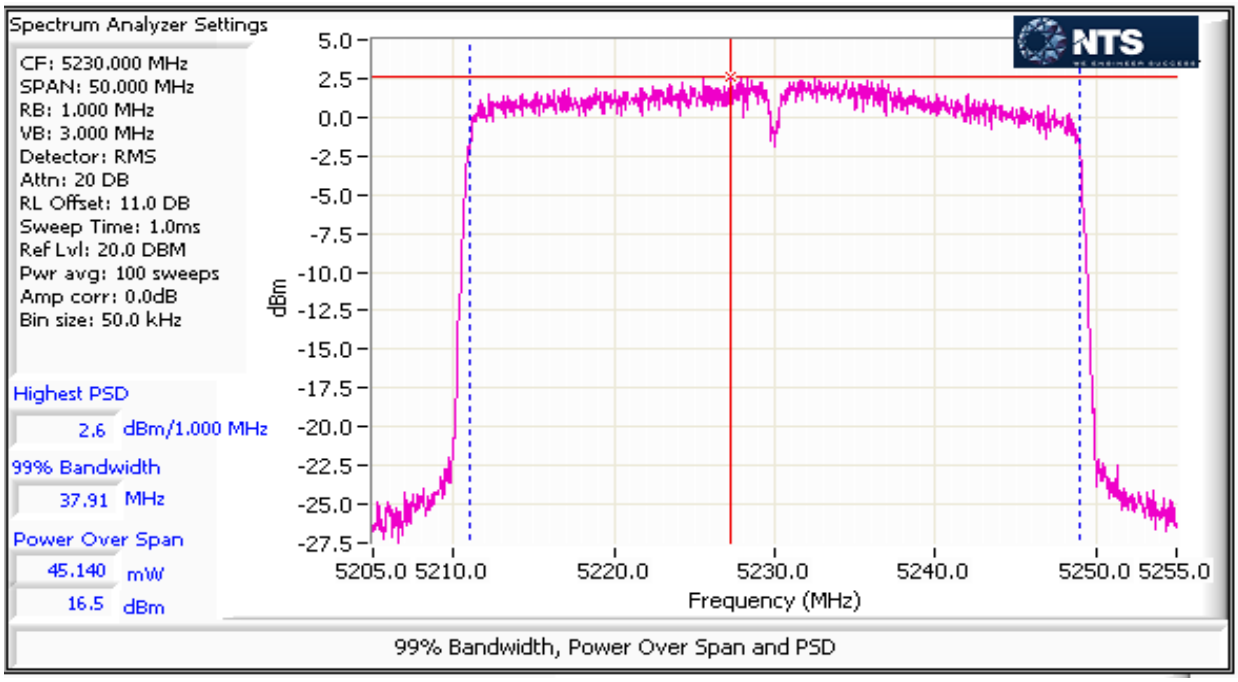
SPAN: 50.000 MHz
RB: 1.000 MHz
VB: 3.000 MHz
Detector: RMS
Attn: 20 DB
RL Offset: 11.0 DB
Sweep Time: 1.0ms
Ref Lvl: 20.0 DBM
Pwr avg: 100 sweeps
Amp corr: 0.0dB
Bin size: 50.0 kHz
Highest PSD
2.1 dBm/1.000 MHz
99% Bandwidth
37.81 MHz
Power Over Span
39.639 mW
16.0 dBm
dBm
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
5205.0 5210.0 5220.0 5230.0 5240.0 5250.0 5255.0
Frequency (MHz)
99% Bandwidth, Power Over Span and PSD


Spectrum Analyzer Settings
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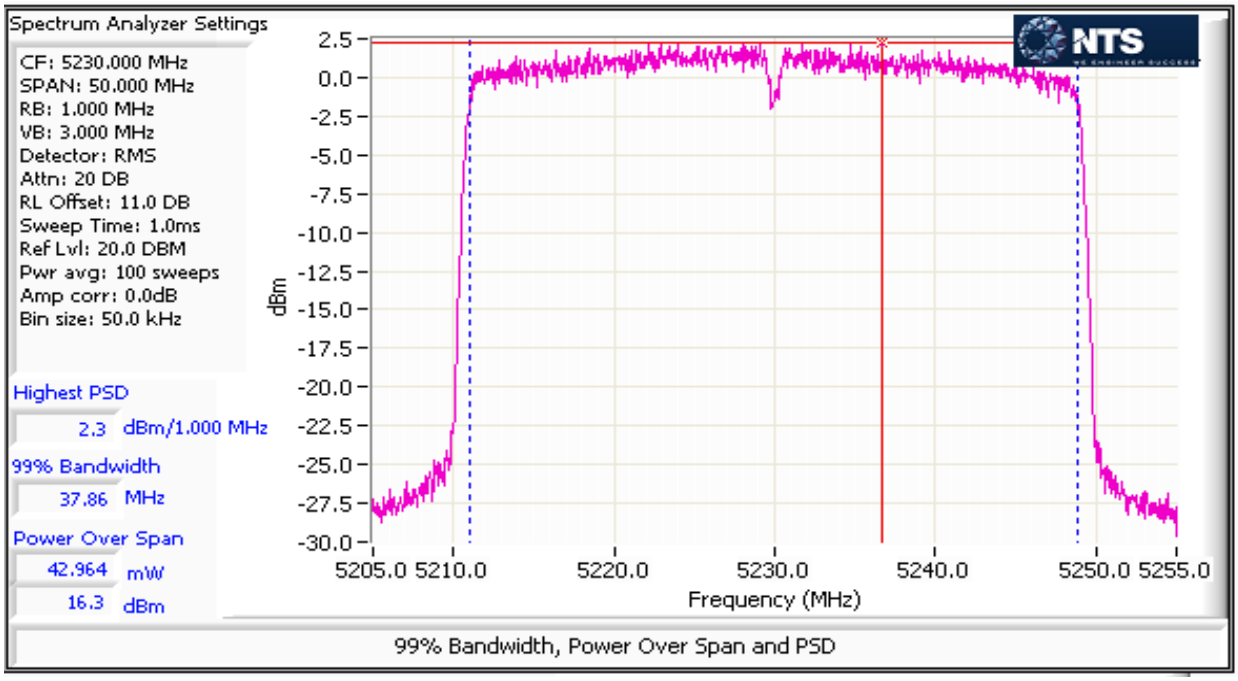
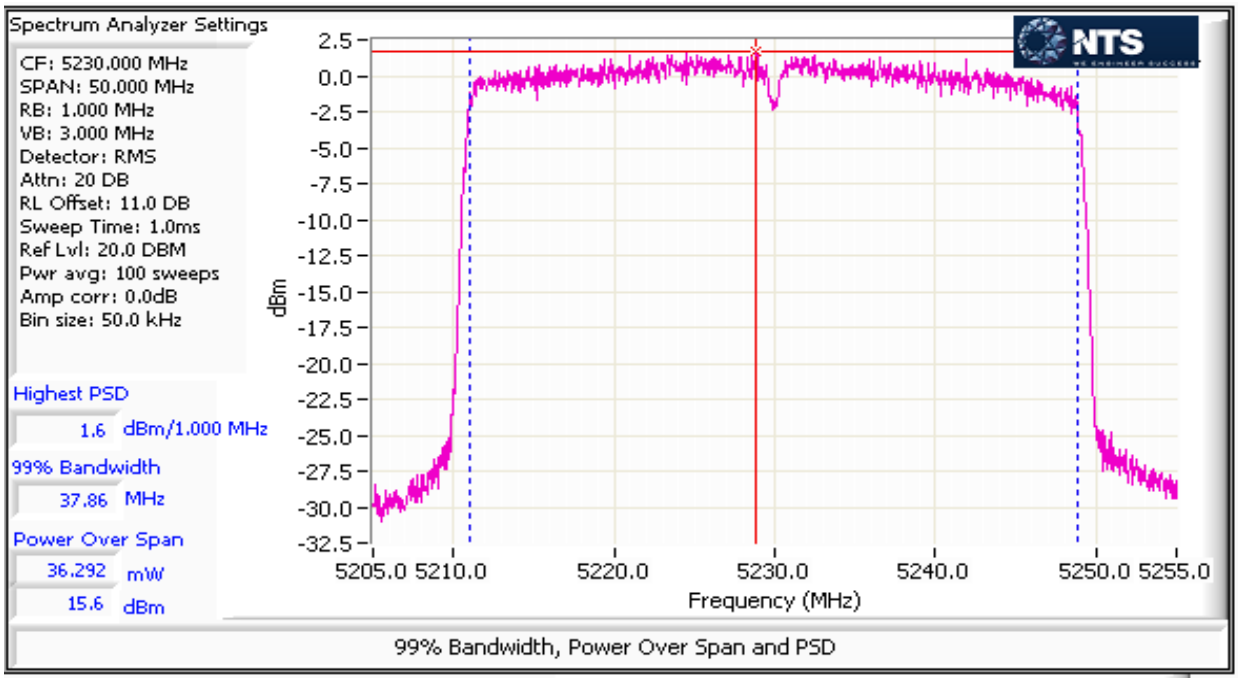
SPAN: 50.000 MHz
RB: 1.000 MHz
VB: 3.000 MHz
Detector: RMS
Attn: 20 DB
RL Offset: 11.0 DB
Sweep Time: 1.0ms
Ref Lvl: 20.0 DBM
Pwr avg: 100 sweeps
Amp corr: 0.0dB
Bin size: 50.0 kHz
Highest PSD
2.6 dBm/1.000 MHz
99% Bandwidth
37.91 MHz
Power Over Span
45.140 mW
16.5 dBm
dBm
5.0
2.5
0.0
-2.5
-5.0
-7.5
-10.0
-12.5
-15.0
-17.5
-20.0
-22.5
-25.0
-27.5
5205.0 5210.0 5220.0 5230.0 5240.0 5250.0 5255.0
Frequency (MHz)
99% Bandwidth, Power Over Span and PSD

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

5150-5250 PSD - FCC
Mode: ax40

Frequency (MHz)	Chain	Software Setting		Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	Result
5190	0	13		95.9	-3.8	1.8	2.6	15.0	Pass
	1				-3.6				
	2				-3.7				
	3				-3.4				
5230	0	18.5		95.9	2.1	6.9	8.4	15.0	Pass
	1				2.6				
	2				2.3				
	3				1.6				

5150-5250 PSD - ISEDC
Mode: ax40

Frequency (MHz)	Chain	Software Setting		Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	IC Limit dBm/MHz	Result
5190	0	11.5		95.9	-4.8	1.4	1.5	2.0	Pass
	1				-5.1				
	2				-4.7				
	3				-4.9				
5230	0	11.5		95.9	-4.4	1.5	1.8	2.0	Pass
	1				-4.4				
	2				-4.6				
	3				-4.6				

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

5150-5250 PSD - FCC n40 mode tested to demonstrate PSD is same as for ax40 mode

Mode: n40

Frequency (MHz)	Chain	Software Setting		Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	Result
5190	0	13		94.5	-3.8	2.0	3.0	15.0	Pass
	1				-3.1				
	2				-3.2				
	3				-3.3				
5230	0	18.5		94.5	2.2	7.3	8.6	15.0	Pass
	1				2.8				
	2				2.4				
	3				1.9				

5150-5250 PSD - ISEDC

Mode: n40

Frequency (MHz)	Chain	Software Setting		Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	IC Limit dBm/MHz	Result
5190	0	11.5		94.5	-4.8	1.4	1.5	2.0	Pass
	1				-4.9				
	2				-4.6				
	3				-4.8				
5230	0	11.5		94.5	-4.3	1.5	1.8	2.0	Pass
	1				-4.2				
	2				-4.5				
	3				-4.5				

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

MIMO Device - 5150-5250 MHz Band - FCC

Mode: ax80 Max EIRP (mW): 81.0

Frequency (MHz)	Chain	Software Setting		Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5210	0	13		94.9	10.4	51.1	17.1	30.0	0.051	Pass
	1				11.1					
	2				11.2					
	3				10.6					

MIMO Device - 5150-5250 MHz Band - ISEDC

Mode: ax80 Max EIRP (mW): 81.3

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power dBm	Total Power dBm (eirp)	IC limit dBm (eirp)	Max Power (W)	Result
5210	0	13	77.12	94.9	10.4	17.1	19.1	23.0	0.051	Pass
	1				11.1					
	2				11.2					
	3				10.6					

5150-5250 PSD - FCC

Mode: ax80

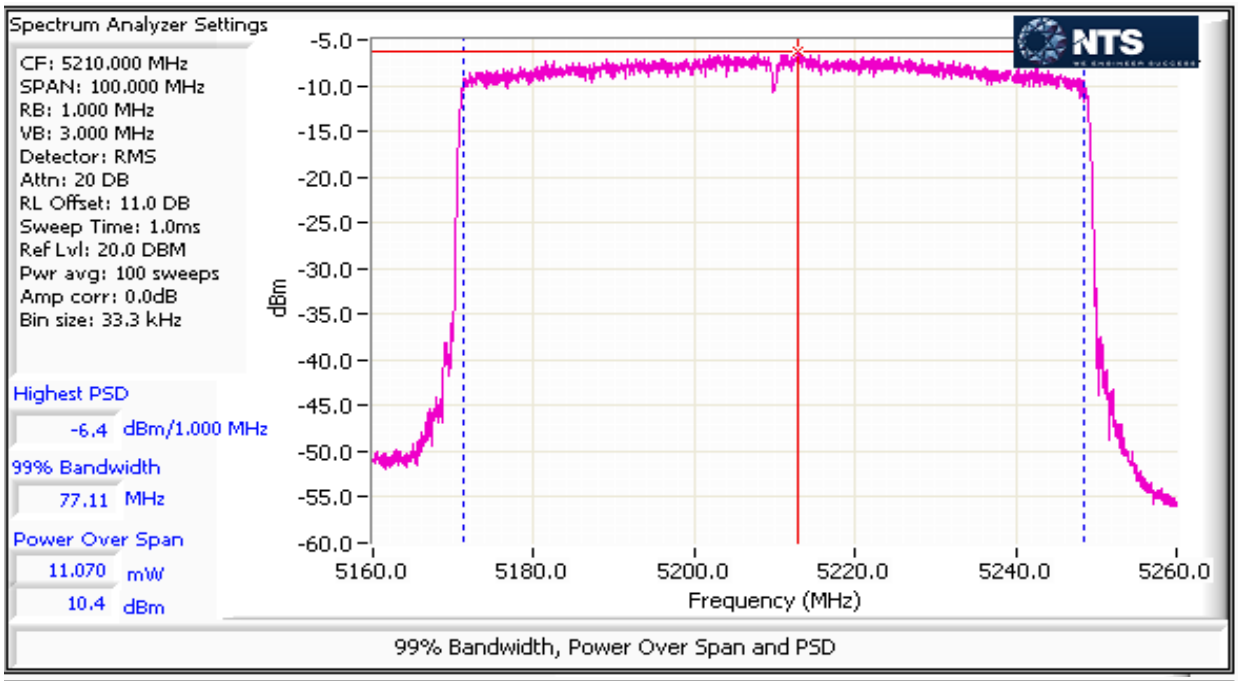
Frequency (MHz)	Chain	Software Setting		Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	Result
5210	0	13		94.9	-6.4	1.1	0.4	15.0	Pass
	1				-5.8				
	2				-5.2				
	3				-6.2				

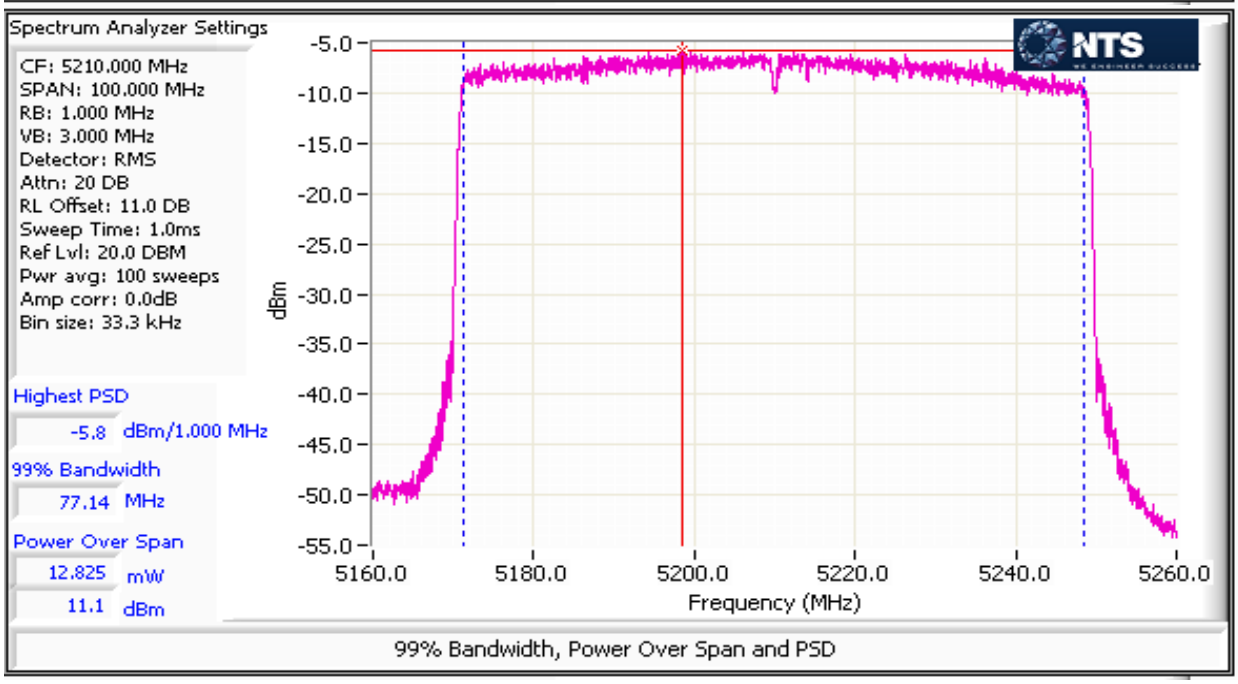
5150-5250 PSD - ISEDC

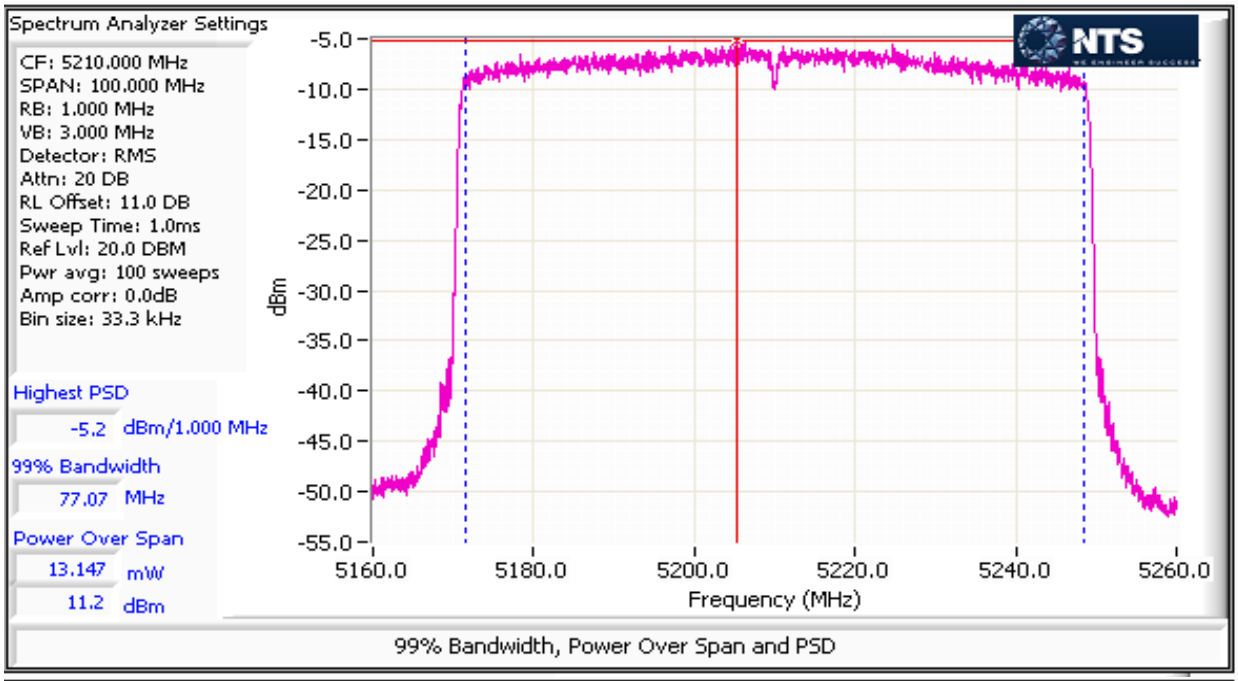
Mode: ax80

Frequency (MHz)	Chain	Software Setting		Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	IC Limit dBm/MHz	Result
5210	0	13		94.9	-6.4	1.1	0.4	2.0	Pass
	1				-5.8				
	2				-5.2				
	3				-6.2				

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A






Spectrum Analyzer Settings
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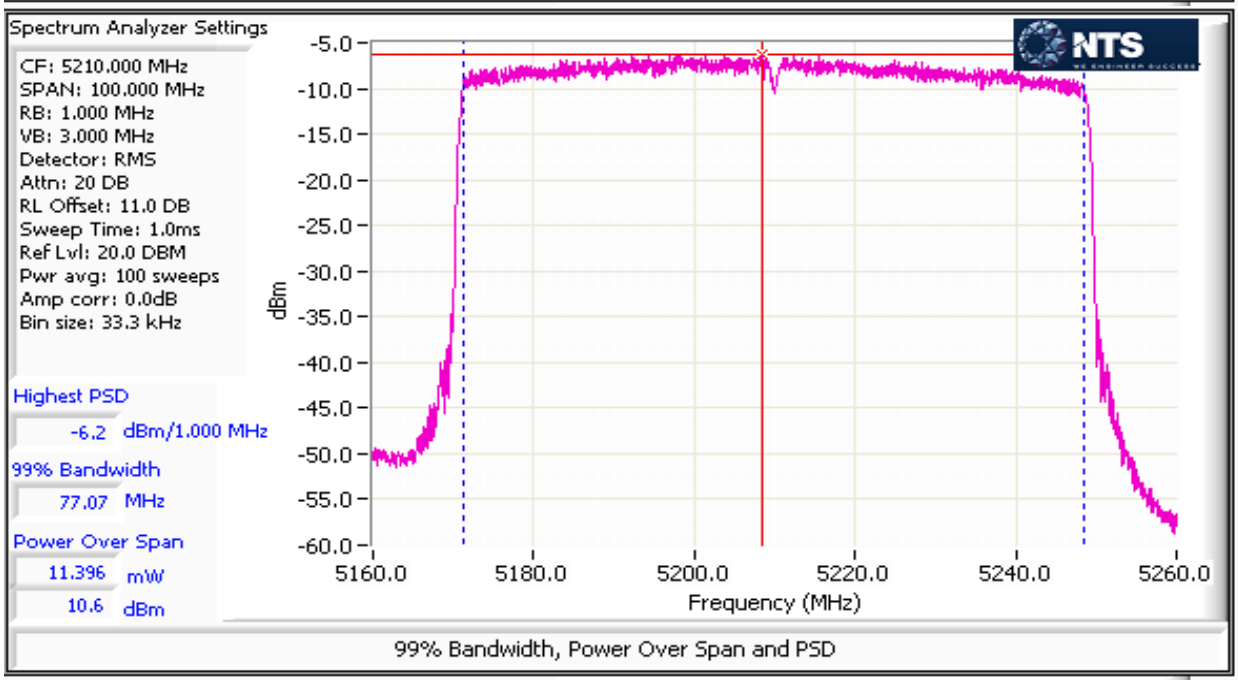
SPAN: 100.000 MHz
RB: 1.000 MHz
VB: 3.000 MHz
Detector: RMS
Attn: 20 DB
RL Offset: 11.0 DB
Sweep Time: 1.0ms
Ref Lvl: 20.0 DBM
Pwr avg: 100 sweeps
Amp corr: 0.0dB
Bin size: 33.3 kHz
Highest PSD
-5.2 dBm/1.000 MHz
99% Bandwidth
77.07 MHz
Power Over Span
13.147 mW
11.2 dBm
dBm
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
-45.0
-50.0
-55.0
5160.0
5180.0
5200.0
5220.0
5240.0
5260.0
Frequency (MHz)
NTS
99% Bandwidth, Power Over Span and PSD


Spectrum Analyzer Settings
CF: 5210.000 MHz
SPAN: 100.000 MHz
RB: 1.000 MHz
VB: 3.000 MHz
Detector: RMS
Attn: 20 DB
RL Offset: 11.0 DB
Sweep Time: 1.0ms
Ref Lvl: 20.0 DBM
Pwr avg: 100 sweeps
Amp corr: 0.0dB
Bin size: 33.3 kHz
Highest PSD
-6.2 dBm/1.000 MHz
99% Bandwidth
77.07 MHz
Power Over Span
11.396 mW
10.6 dBm
dBm
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
-45.0
-50.0
-55.0
-60.0
5160.0
5180.0
5200.0
5220.0
5240.0
5260.0
Frequency (MHz)
NTS
99% Bandwidth, Power Over Span and PSD

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

5150-5250 PSD - FCC ac80 mode also tested to demonstrate PSD is same as for ax80 mode

Mode: ac80

Frequency (MHz)	Chain	Software Setting		Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	Result
5210	0	13		95.3	-6.6	1.1	0.4	15.0	Pass
	1				-5.7				
	2				-5.6				
	3				-6.0				

5150-5250 PSD - ISEDC

Mode: ac80

Frequency (MHz)	Chain	Software Setting		Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	IC Limit dBm/MHz	Result
5210	0	13		95.3	-6.6	1.1	0.4	2.0	Pass
	1				-5.7				
	2				-5.6				
	3				-6.0				

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

RSS-247 (LELAN) and FCC 15.407(UNII)
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.

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Power, 5725 - 5850MHz	15.407(a) (1), (2), (3) RSS-247 6.2	Pass	a: 196 mW ax20: 188.4 mW ax40: 194.3 mW ax80: 153.2 mW
1	PSD, 5725 - 5850MHz	15.407(a) (1), (2), (3) RSS-247 6.2	Pass	a: 16.8 mW/MHz ax20: 15 mW/MHz ax40: 7.8 mW/MHz ax80: 3.1 mW/MHz
1	99% Bandwidth	RSS-GEN (Information only)	N/A	a: 16.93 MHz ax20: 19.21 MHz ax40: 37.81 MHz ax80: 77.12 MHz
2	Antenna Conducted - Out of Band Spurious	15.407(b) -27dBm/MHz		All emissions below the -27dBm/MHz limit

General Test Configuration

When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators and cables used.

Ambient Conditions:

Temperature: 22.5 °C
Rel. Humidity: 37.8 %

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

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.

Procedure Comments:

Measurements performed in accordance with FCC KDB 789033 D01

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
11a	MCS0	92.3%	Yes	1.4	0.3	0.7	698
11ax20	MCS0	95.6%	Yes	5.4	0.2	0.4	184
11ax40	MCS0	95.9%	Yes	5.4	0.2	0.4	184
11ax80	MCS0	94.9%	Yes	5.4	0.2	0.5	185

Sample Notes

Sample S/N: CNG6K9V00M
Driver: P2 WNC 0.4.3a

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #1: Bandwidth, Output Power and Power Spectral Density - MIMO Systems

Date of Test: 11/12/2018 Config. Used: 1
Test Engineer: Roy Zheng / R. Varelas Config Change: None
Test Location: FT Lab #4b EUT Voltage: POE & 120V/60Hz

Note 1:	Constant Duty Cycle < 98%. Output power measured using a spectrum analyzer (see plots below). RBW=1MHz, VB=3 MHz, Span > OBW, # of points in sweep ≥ 2*span/RBW, RMS sample detector, trace average 100 traces (at least 100 traces, increase the number to get true average), power averaging on and power integration over the OBW. Tthe measurements were adjusted by adding YY dB. This is based on 10log(1/x), where x is the duty cycle. (method SA-2 of ANSI C63.10)
Note 2:	Measured using the same analyzer settings used for output power.
Note 3:	99% Bandwidth measured in accordance with C63.10 - RB between 1-5 % of OBW and VB ≥ 3*RB, Span between 1.5 and 5 times OBW.
Note 4:	For MIMO systems the total output power and total PSD are calculated from the sum of the powers of the individual chains (in linear terms). The antenna gain used to determine the EIRP and limits for PSD/Output power depends on the operating mode of the MIMO device. If the signals on the non-coherent between the transmit chains then the gain used to determine the limits is the highest gain of the individual chains and the EIRP is the sum of the products of gain and power on each chain. If the signals are coherent then the effective antenna gain is the sum (in linear terms) of the gains for each chain and the EIRP is the product of the effective gain and total power.

Antenna Gain Information

Freq	Antenna Gain (dBi) / Chain								Dir G (PWR)	Dir G (PSD)
	1	2	3	4	5	6	7	8		
5725-5825	2.0	2.0	2.0	2.0					2.0	8.0

Higher gain antennas used for model APIN0534 and internal antennas of the APIN0535 use a corresponding lower power settings
Legacy modes operate on all chains
Power for BF mode is reduced by 36 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

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

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; GA (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.
Notes:	For systems with Beamforming and CDD, choose one the following options: Option 1: Delays are optimized for beamforming, rather than being selected from cyclic delay table of 802.11; Array gains calculated based on beamforming criteria. Option 2: Antennas are paired for beamforming, and the pairs are configured to use the cyclic delay diversity of 802.11; the array gain associated with beamforming with 2 antennas (3dB), and the array gain associated with CDD with two antennas (3dB for PSD and 0 dB for power)
Notes:	Based on PSD results for 802.11n modes in the 5150-5250 Mhz band, only 802.11ax modes tested for 5725-5850 MHz.

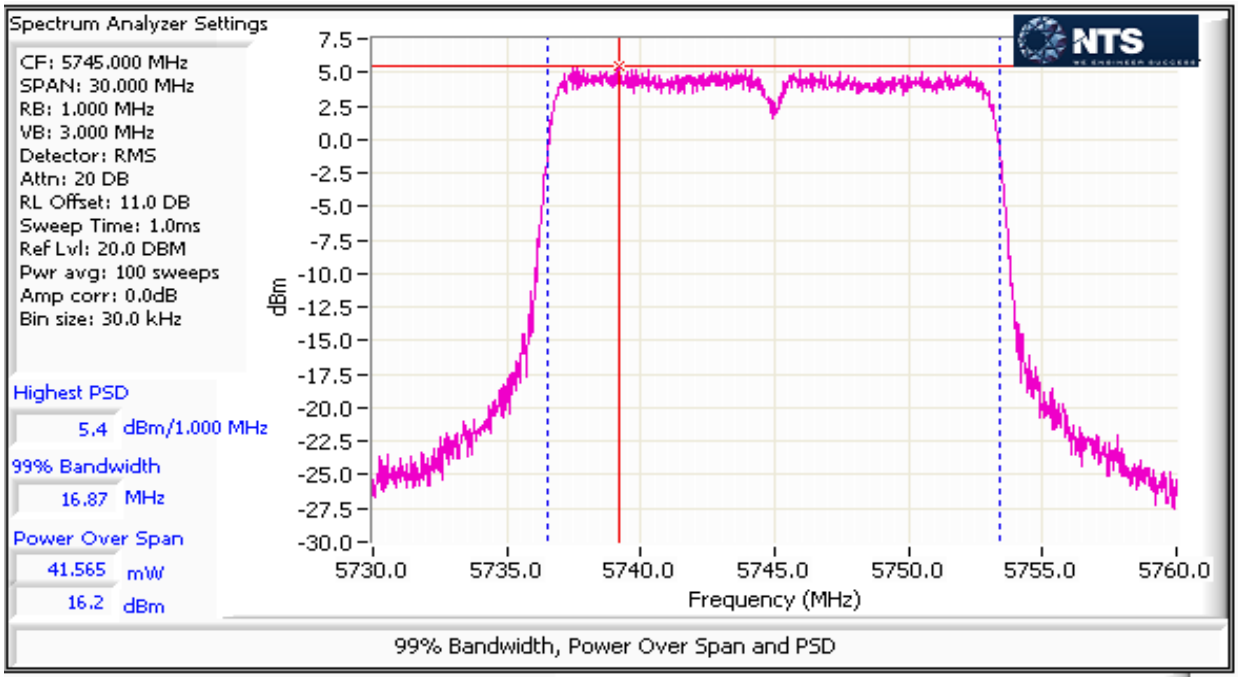
EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

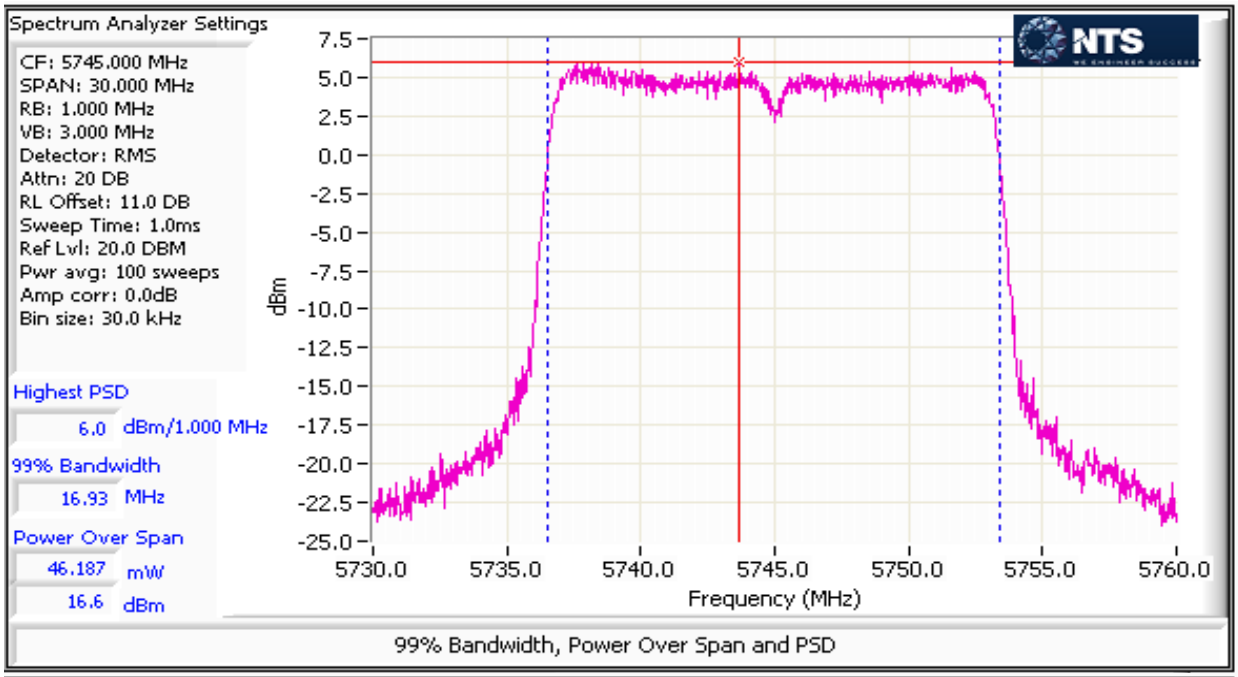
MIMO Device - 5725-5850 MHz Band - FCC/ISEDC

Mode: 11a Max EIRP (mW): 310.6

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	Limit dBm	Max Power (W)	Result
5745	0	20	16.87	92.3	16.2	196.0	22.9	30.0	0.196	Pass
	1				16.7					
	2				16.7					
	3				16.6					
5785	0	20	16.84	92.3	16.2	186.1	22.7	30.0		Pass
	1				16.4					
	2				16.6					
	3				16.1					
5825	0	20	16.93	92.3	16.2	183.8	22.6	30.0		Pass
	1				16.3					
	2				16.3					
	3				16.3					



99% Bandwidth, Power Over Span and PSD


Spectrum Analyzer Settings
CF: 5745.000 MHz
SPAN: 30.000 MHz
RB: 1.000 MHz
VB: 3.000 MHz
Detector: RMS
Attn: 20 DB
RL Offset: 11.0 DB
Sweep Time: 1.0ms
Ref Lvl: 20.0 DBM
Pwr avg: 100 sweeps
Amp corr: 0.0dB
Bin size: 30.0 kHz
Highest PSD
6.0 dBm/1.000 MHz
99% Bandwidth
16.93 MHz
Power Over Span
46.187 mW
16.6 dBm
dBm
7.5
5.0
2.5
0.0
-2.5
-5.0
-7.5
-10.0
-12.5
-15.0
-17.5
-20.0
-22.5
-25.0
5730.0
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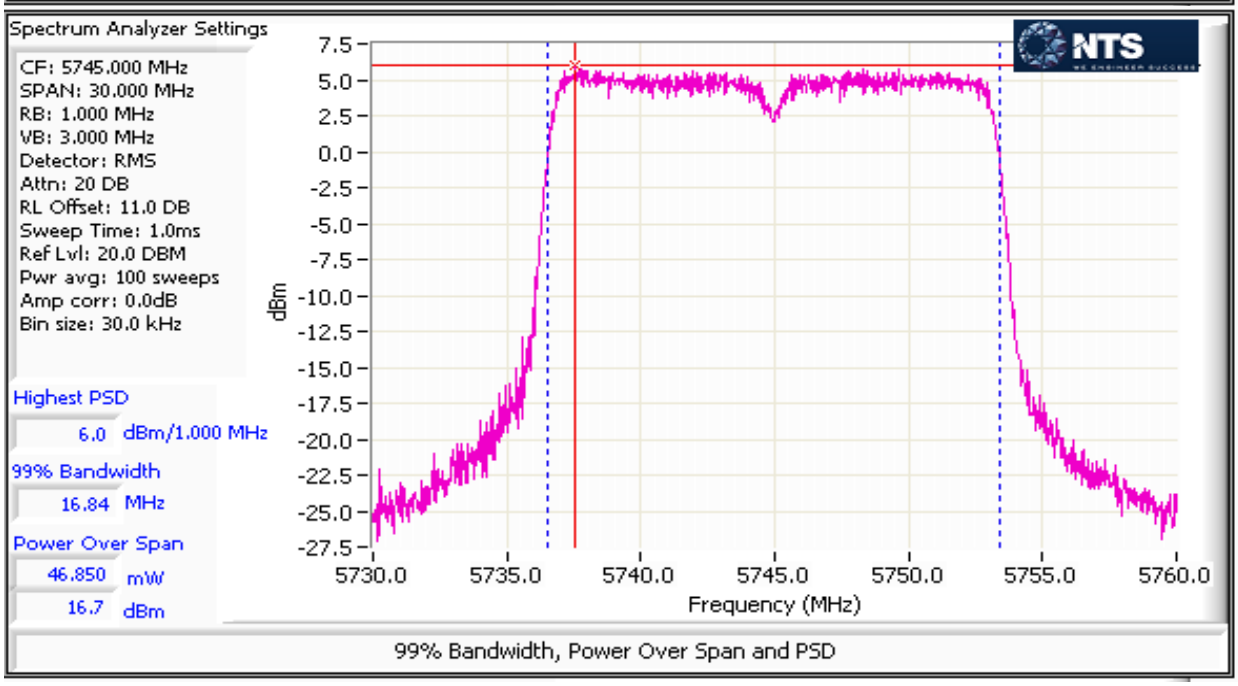
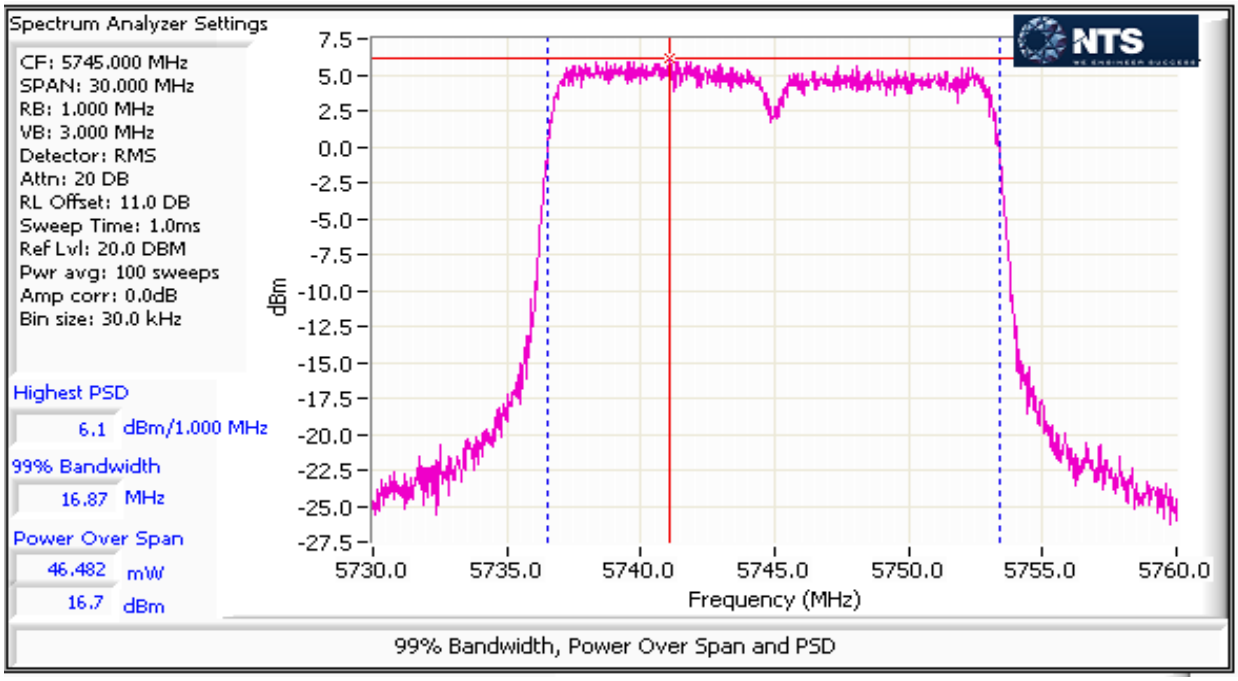
5760.0
Frequency (MHz)
99% Bandwidth, Power Over Span and PSD


Spectrum Analyzer Settings
CF: 5745.000 MHz
SPAN: 30.000 MHz
RB: 1.000 MHz
VB: 3.000 MHz
Detector: RMS
Attn: 20 DB
RL Offset: 11.0 DB
Sweep Time: 1.0ms
Ref Lvl: 20.0 DBM
Pwr avg: 100 sweeps
Amp corr: 0.0dB
Bin size: 30.0 kHz
Highest PSD
6.0 dBm/1.000 MHz
99% Bandwidth
16.84 MHz
Power Over Span
46.850 mW
16.7 dBm
dBm
7.5
5.0
2.5
0.0
-2.5
-5.0
-7.5
-10.0
-12.5
-15.0
-17.5
-20.0
-22.5
-25.0
-27.5
5730.0
5735.0
5740.0
5745.0
5750.0
5755.0
5760.0
Frequency (MHz)
99% Bandwidth, Power Over Span and PSD

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



5725-5850 PSD - FCC/ISEDC

Mode: 11a

Frequency (MHz)	Chain	Software Setting		Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/500kHz	IC Limit dBm/500kHz	Result
5745	0	20		92.3	5.4	16.8	12.3	28.0	28.0	Pass
	1				6.1					
	2				6.0					
	3				6.0					
5785	0	20		92.3	5.7	15.9	12.0	28.0	28.0	Pass
	1				5.6					
	2				6.0					
	3				5.3					
5825	0	20		92.3	5.7	16.3	12.1	28.0	28.0	Pass
	1				5.6					
	2				5.8					
	3				5.9					

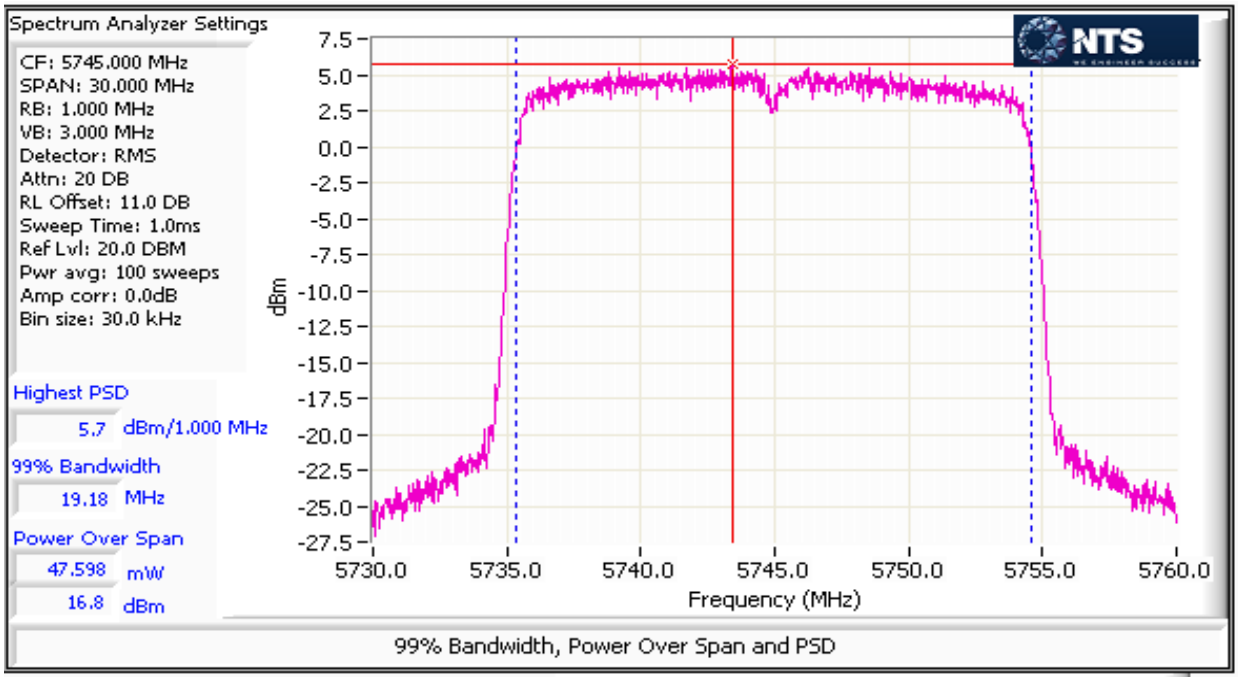
EMC Test Data

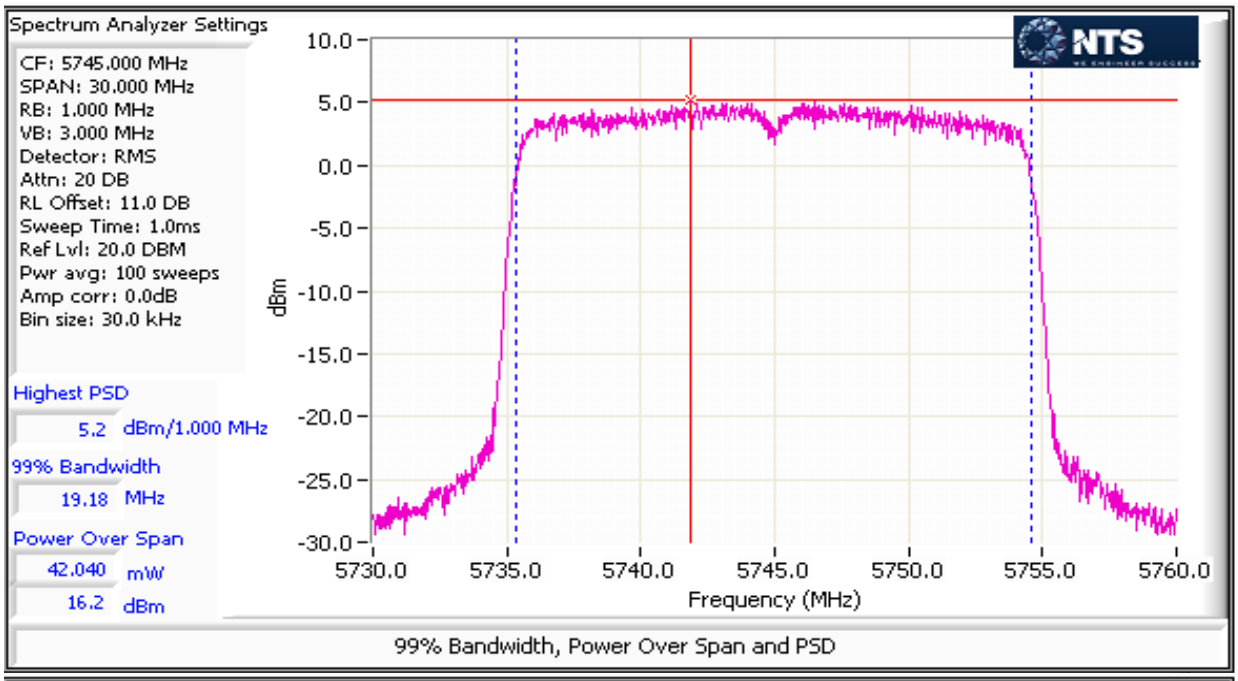
Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

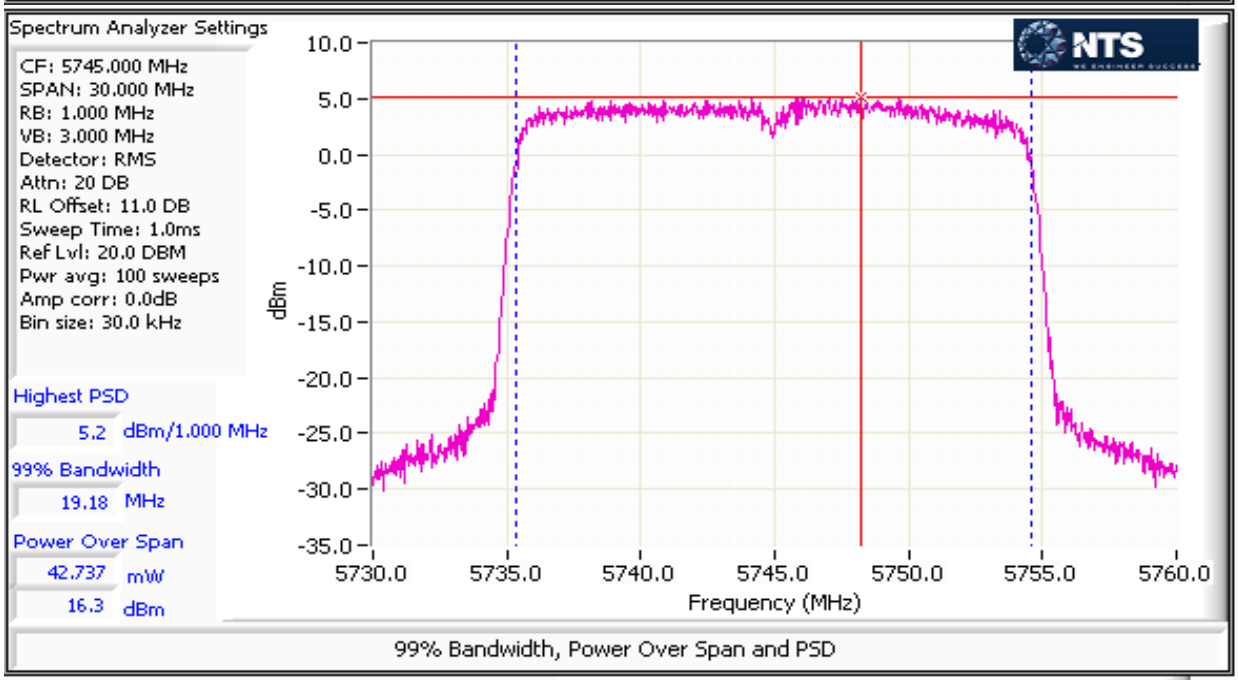
MIMO Device - 5725-5850 MHz Band - FCC/ISEDC

Mode: ax20 Max EIRP (mW): 298.6

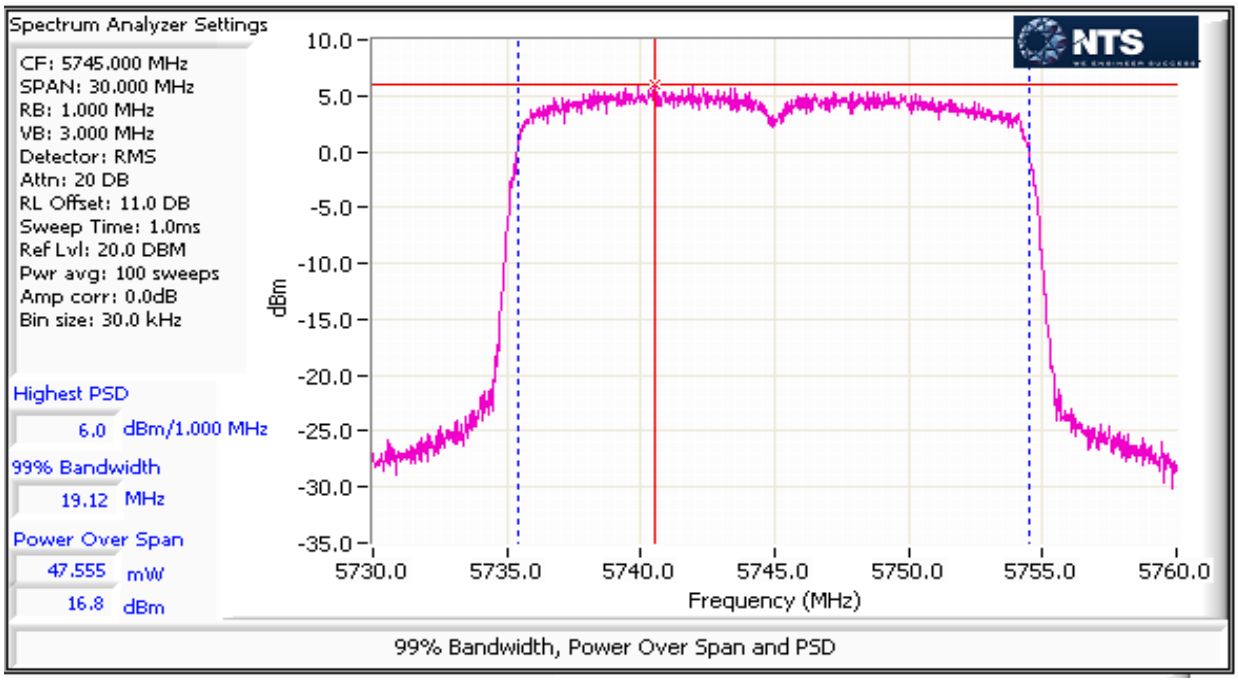
Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5745	0	20	19.12	95.6	16.2	188.4	22.8	30.0	0.188	Pass
	1				16.3					
	2				16.8					
	3				16.8					
5785	0	20	19.18	95.6	16.1	175.6	22.4	30.0		Pass
	1				16.3					
	2				16.5					
	3				16.0					
5825	0	20	19.21	95.6	16.1	181.7	22.6	30.0		Pass
	1				16.6					
	2				16.4					
	3				16.4					




Spectrum Analyzer Settings
CF: 5745.000 MHz
SPAN: 30.000 MHz
RB: 1.000 MHz
VB: 3.000 MHz
Detector: RMS
Attn: 20 DB
RL Offset: 11.0 DB
Sweep Time: 1.0ms
Ref Lvl: 20.0 DBM
Pwr avg: 100 sweeps
Amp corr: 0.0dB
Bin size: 30.0 kHz
Highest PSD
5.2 dBm/1.000 MHz
99% Bandwidth
19.18 MHz
Power Over Span
42.040 mW
16.2 dBm
dBm
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
5730.0
5735.0
5740.0
5745.0
5750.0
5755.0
5760.0
Frequency (MHz)
99% Bandwidth, Power Over Span and PSD


Spectrum Analyzer Settings
CF: 5745.000 MHz
SPAN: 30.000 MHz
RB: 1.000 MHz
VB: 3.000 MHz
Detector: RMS
Attn: 20 DB
RL Offset: 11.0 DB
Sweep Time: 1.0ms
Ref Lvl: 20.0 DBM
Pwr avg: 100 sweeps
Amp corr: 0.0dB
Bin size: 30.0 kHz
Highest PSD
5.2 dBm/1.000 MHz
99% Bandwidth
19.18 MHz
Power Over Span
42.737 mW
16.3 dBm
dBm
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
5730.0
5735.0
5740.0
5745.0
5750.0
5755.0
5760.0
Frequency (MHz)
99% Bandwidth, Power Over Span and PSD

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



5250-5350 PSD - FCC/ISEDC

Mode: ax20

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	IC Limit dBm/MHz	Result
5745	0	20		95.6	5.2	15.0	11.8	28.0	28.0	Pass
	1				5.2					
	2				6.0					
	3				5.7					
5785	0	20		95.6	5.2	14.0	11.5	28.0	28.0	Pass
	1				5.1					
	2				5.6					
	3				5.0					
5825	0	20		95.6	5.3	14.3	11.6	28.0	28.0	Pass
	1				5.4					
	2				5.3					
	3				5.3					

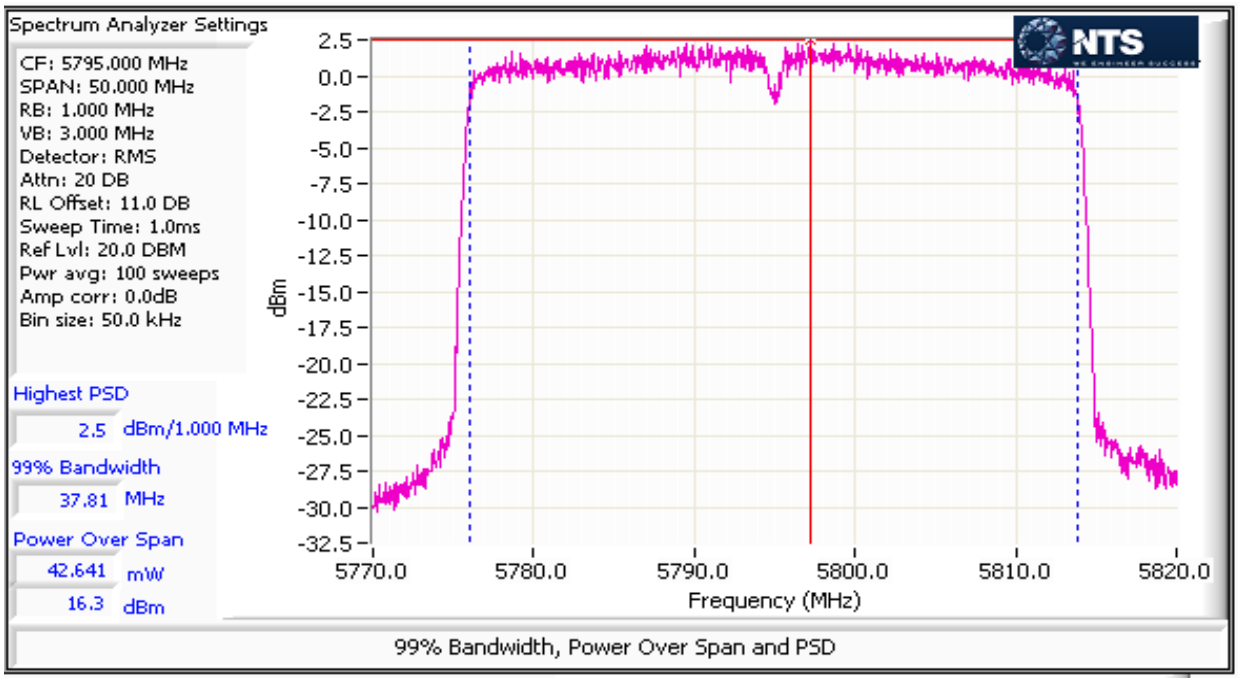
EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

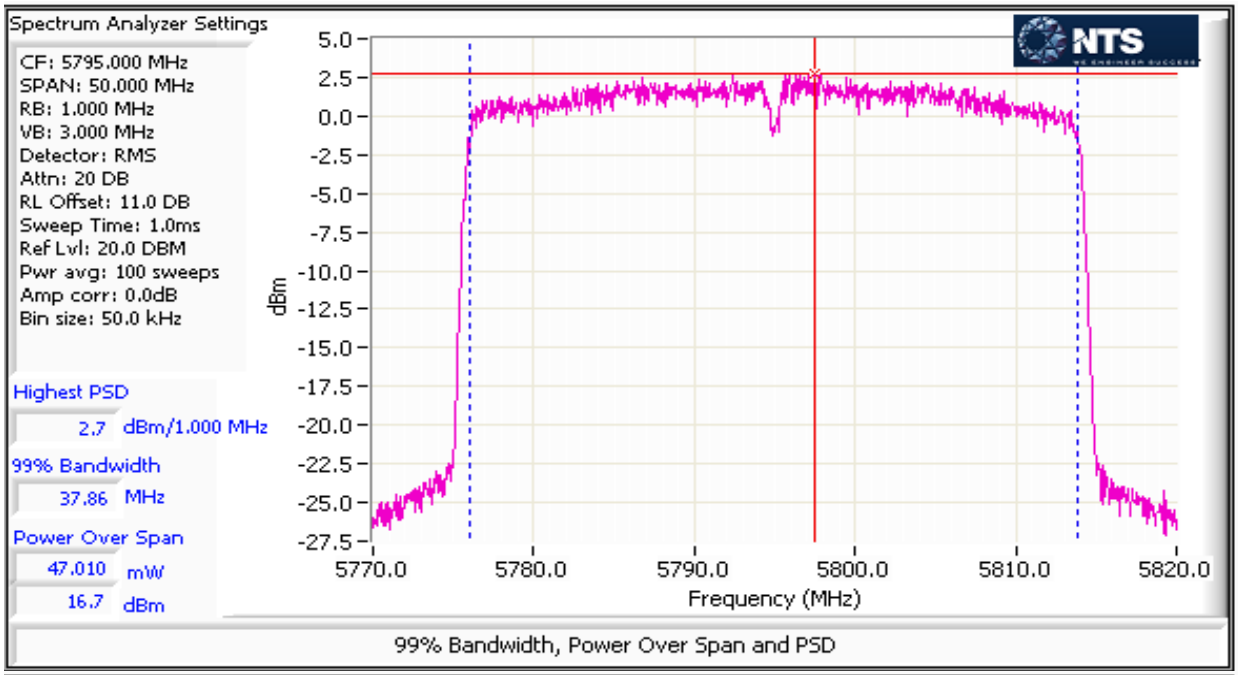
MIMO Device - 5725-5850 MHz Band - FCC/ISEDC

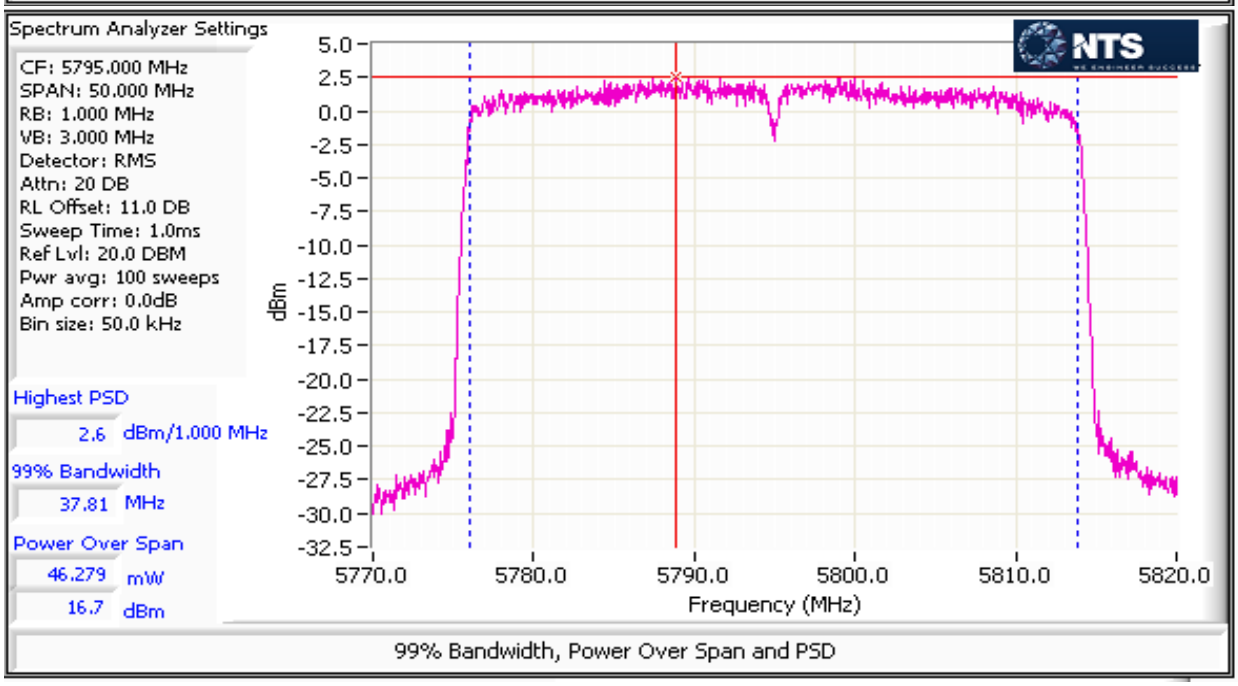
Mode: ax40 Max EIRP (mW): 307.9

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5755	0	19	37.81	95.9	15.5	164.5	22.2	30.0	0.194	Pass
	1				16.1					
	2				16.0					
	3				16.2					
5795	0	20	37.81	95.9	16.7	194.3	22.9	30.0		Pass
	1				16.7					
	2				17.0					
	3				16.3					

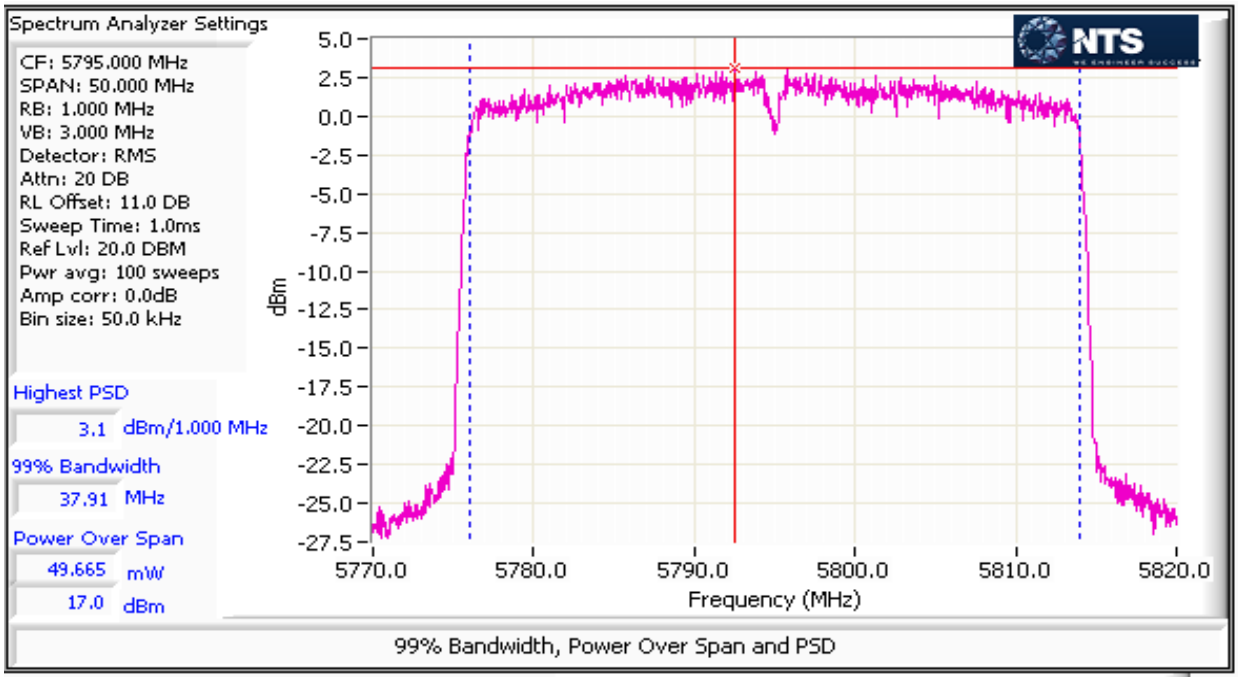


99% Bandwidth, Power Over Span and PSD


Spectrum Analyzer Settings
CF: 5795.000 MHz
SPAN: 50.000 MHz
RB: 1.000 MHz
VB: 3.000 MHz
Detector: RMS
Attn: 20 DB
RL Offset: 11.0 DB
Sweep Time: 1.0ms
Ref Lvl: 20.0 DBM
Pwr avg: 100 sweeps
Amp corr: 0.0dB
Bin size: 50.0 kHz
Highest PSD
2.7 dBm/1.000 MHz
99% Bandwidth
37.86 MHz
Power Over Span
47.010 mW
16.7 dBm
dBm
5.0
2.5
0.0
-2.5
-5.0
-7.5
-10.0
-12.5
-15.0
-17.5
-20.0
-22.5
-25.0
-27.5
5770.0
5780.0
5790.0
5800.0
5810.0
5820.0
Frequency (MHz)
99% Bandwidth, Power Over Span and PSD


Spectrum Analyzer Settings
CF: 5795.000 MHz
SPAN: 50.000 MHz
RB: 1.000 MHz
VB: 3.000 MHz
Detector: RMS
Attn: 20 DB
RL Offset: 11.0 DB
Sweep Time: 1.0ms
Ref Lvl: 20.0 DBM
Pwr avg: 100 sweeps
Amp corr: 0.0dB
Bin size: 50.0 kHz
Highest PSD
2.6 dBm/1.000 MHz
99% Bandwidth
37.81 MHz
Power Over Span
46.279 mW
16.7 dBm
dBm
5.0
2.5
0.0
-2.5
-5.0
-7.5
-10.0
-12.5
-15.0
-17.5
-20.0
-22.5
-25.0
-27.5
-30.0
-32.5
5770.0
5780.0
5790.0
5800.0
5810.0
5820.0
Frequency (MHz)
99% Bandwidth, Power Over Span and PSD

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



MIMO Device 5725-5850 PSD - FCC/ISEDC

Mode: ax40

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	IC Limit dBm/MHz	Result
5755	0	19		95.9	1.5	6.7	8.3	28.0	28.0	Pass
	1				2.5					
	2				2.2					
	3				2.1					
5795	0	20		95.9	2.7	7.8	8.9	28.0	28.0	Pass
	1				2.6					
	2				3.1					
	3				2.5					

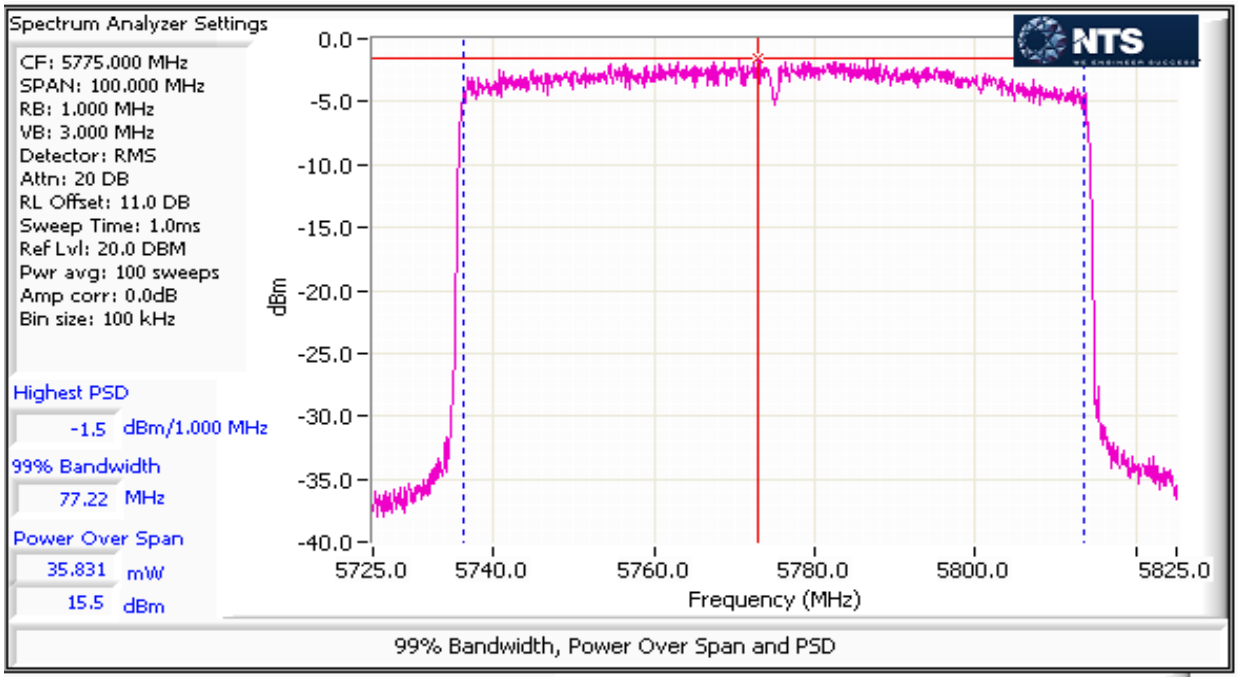
EMC Test Data

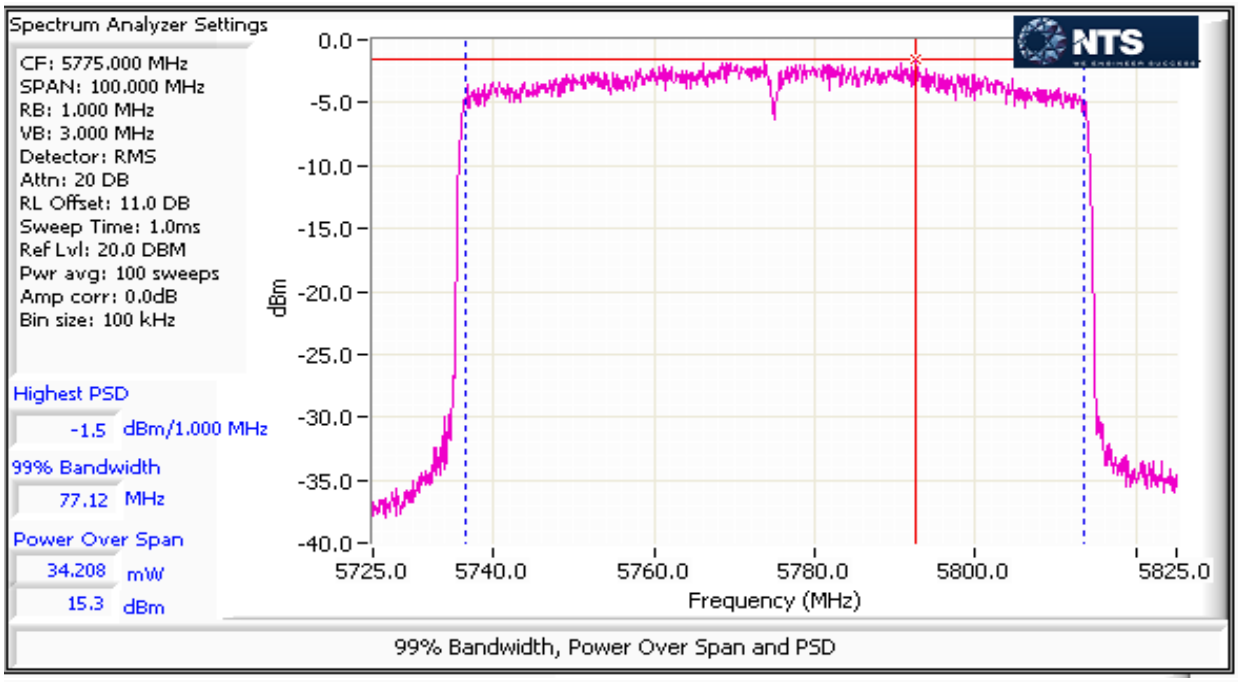
Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

MIMO Device - 5725-5850 MHz Band - FCC/ISEDC

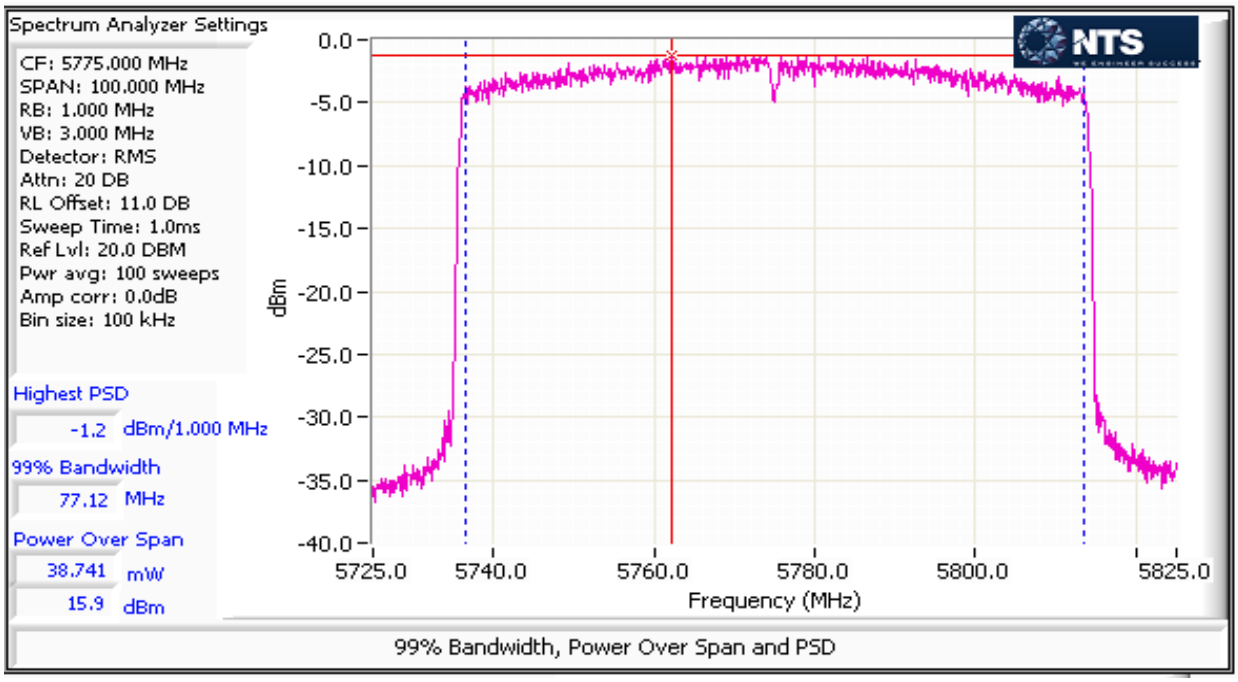
Mode: ax80 Max EIRP (mW): 242.8

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5775	0	19	77.12	94.9	15.3	153.2	21.9	30.0	0.153	Pass
	1				15.9					
	2				15.7					
	3				15.5					



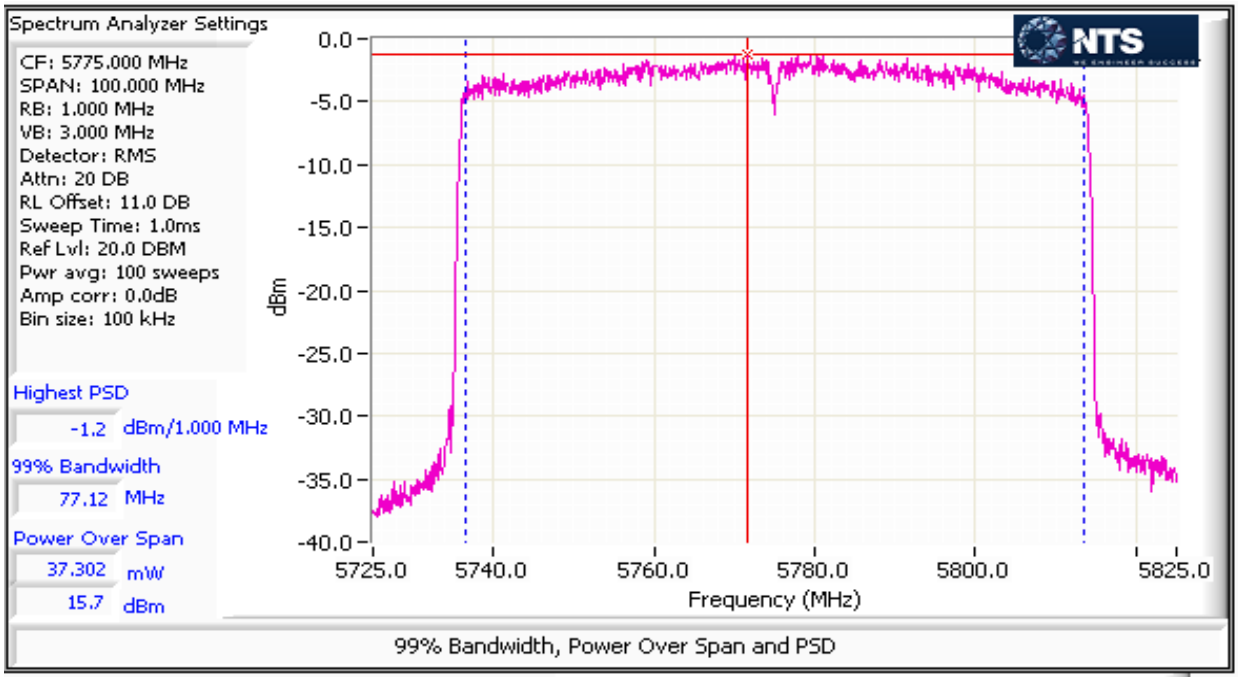


99% Bandwidth, Power Over Span and PSD



99% Bandwidth, Power Over Span and PSD

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



MIMO Device 5250-5350 PSD - FCC/ISEDC

Mode: ax80

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	IC Limit dBm/MHz	Result
5775	0	19		94.90	-1.5	3.1	4.9	28.0	28.0	Pass
	1				-1.2					
	2				-1.2					
	3				-1.5					

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

RSS-247 and FCC 15.407 (UNII) 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: 23.7 °C
Rel. Humidity: 39 %

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

BLE Sample SN: CNG6K9W00R and Zigbee Sample SN: CNG6K9W01F
Driver: P2 WNC 0.4.3a
Antenna: Integral 4x4 and BLE/ZigBee

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Summary of Results

Run #	Mode	Channel	Target Setting	Final Setting	Test Performed	Limit	Result / Margin
20MHz Bandwith Modes							
1	a	36 - 5180MHz	20.0	16.5	Restricted Band Edge at 5150 MHz	15.209	53.0 dBµV/m @ 5148.5 MHz (-1.0 dB)
		40 - 5200MHz	20.0	20.0	Restricted Band Edge at 5150 MHz		67.8 dBµV/m @ 5150.0 MHz (-6.2 dB)
4		149 - 5745MHz	20.0	20.0	Mask	15.E	55.7 dBµV/m @ 5623.7 MHz (-12.6 dB)
		165 - 5825MHz	20.0	20.0	Mask		55.3 dBµV/m @ 5938.9 MHz (-13.0 dB)
5	ax20	36 - 5180MHz	20.0	18.0	Restricted Band Edge at 5150 MHz	15.209	53.3 dBµV/m @ 5150.0 MHz (-0.7 dB)
8		149 - 5745MHz	20.0	20.0	Mask	15.E	55.5 dBµV/m @ 5614.1 MHz (-12.8 dB)
		165 - 5825MHz	20.0	20.0	Mask		56.1 dBµV/m @ 5958.9 MHz (-12.2 dB)
40MHz Bandwith Modes							
9	ax40	38 - 5190MHz	20.0	14.0	Restricted Band Edge at 5150 MHz	15.209	53.5 dBµV/m @ 5149.8 MHz (-0.5 dB)
		46 - 5230MHz	20.0	19.0	Restricted Band Edge at 5150 MHz		53.0 dBµV/m @ 5110.0 MHz (-1.0 dB)
12		151 - 5755MHz	20.0	20.0	Band Edge 5725 MHz	15.E	66.5 dBµV/m @ 5634.6 MHz (-1.8 dB)
		159 - 5795MHz	20.0	20.0	Band Edge 5850MHz		59.2 dBµV/m @ 5915.1 MHz (-16.4 dB)
80MHz Bandwith Modes							
13	ax80	42 - 5210MHz	20.0	13.0	Restricted Band Edge at 5150 MHz	15.209	53.4 dBµV/m @ 5150.0 MHz (-0.6 dB)
16		155 - 5775MHz	17.5	19.0	Band Edge 5725 MHz	15.E	67.8 dBµV/m @ 5648.8 MHz (-0.5 dB)
		155 - 5775MHz	17.5	19.0	Band Edge 5850MHz		59.1 dBµV/m @ 5929.2 MHz (-9.2 dB)

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Procedure Comments:

Measurements performed in accordance with FCC KDB 789033
Limits from 15.209 instead of 15.407(b)(1-3) acceptable until January 1, 2019 per FCC KDB 789033 D01
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)

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
11a	MCS0	92.3%	Yes	1.4	0.3	0.7	698
11ax20	MCS0	95.6%	Yes	5.4	0.2	0.4	184
11ax40	MCS0	95.9%	Yes	5.4	0.2	0.4	184
11ax80	MCS0	94.9%	Yes	5.4	0.2	0.5	185
11ac80+80	MCS0	96.5%	Yes	5.4	0.2	0.3	184

Measurement Specific Notes:

Note 1:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector). Per KDB 789033 2) c) (i), compliance can be demonstrated by meeting the average and peak limits of 15.209, as an alternative.
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 5:	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:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #1: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 10/2/2018 — Config. Used: 1

Test Engineer: Roy Zheng — Config Change: None

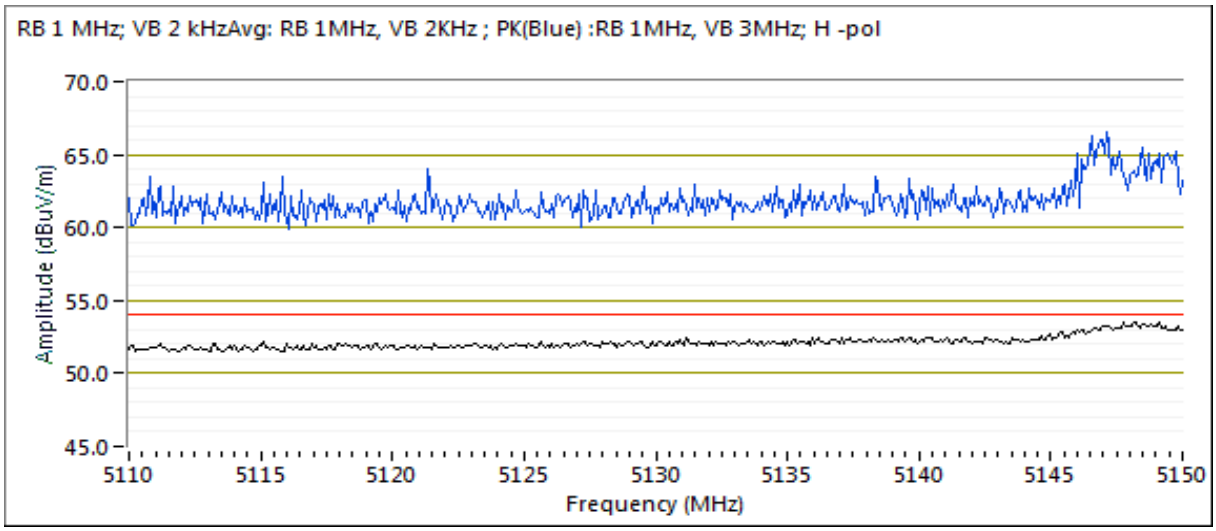
Test Location: Fremont Chamber #5 — EUT Voltage: PoE & 120V/60Hz

Channel: 36 - 5180 MHz at 16.5 dBm — Mode: BLE at 8 dBm

Chain: 4Tx — Mode: a — Ch.Freq.: 2440 MHz

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5148.480	53.0	H	54.0	-1.0	VAVG	313	2.03	Note 3: RB 1MHz; VB: 2kHz
5146.550	70.6	H	74.0	-3.4	PK	313	2.03	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Date of Test: 10/2/2018
Test Engineer: M. Birgani
Test Location: Fremont Chamber #5

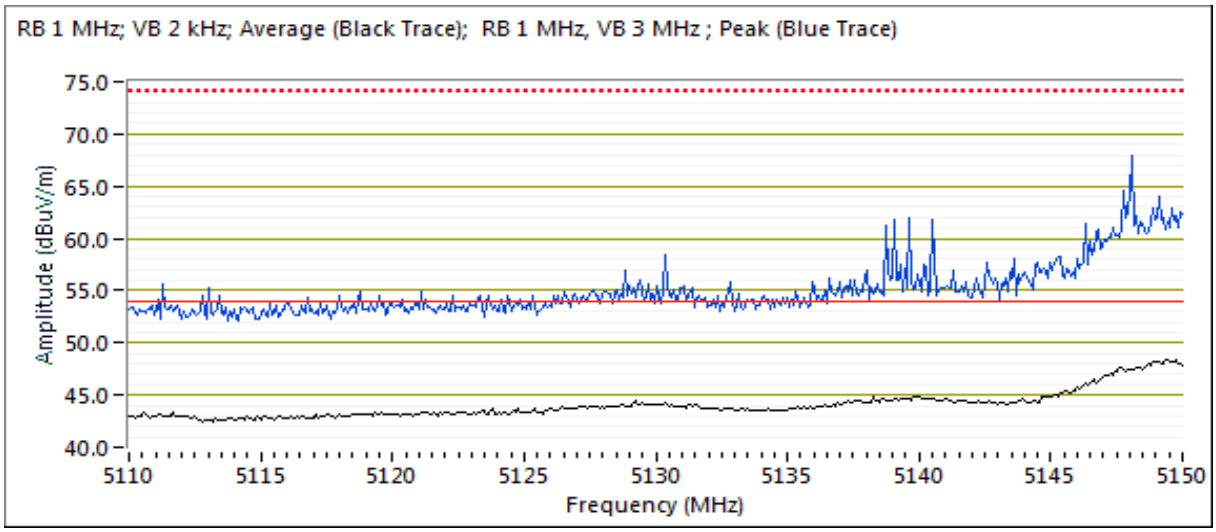
Config. Used: 1
Config Change: None
EUT Voltage: PoE & 120V/60Hz

Channel: 40 - 5200 MHz at 20 dBm
Chain: 4Tx
Mode: a

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.950	67.8	H	74.0	-6.2	PK	40	1.8	RB 1 MHz; VB: 3 MHz
5149.560	47.4	H	54.0	-6.6	VAVG	40	1.8	Note 3: RB 1MHz; VB: 2kHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #4: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 10/2/2018 — Config. Used: 1

Test Engineer: M. Birgani — Config Change: None

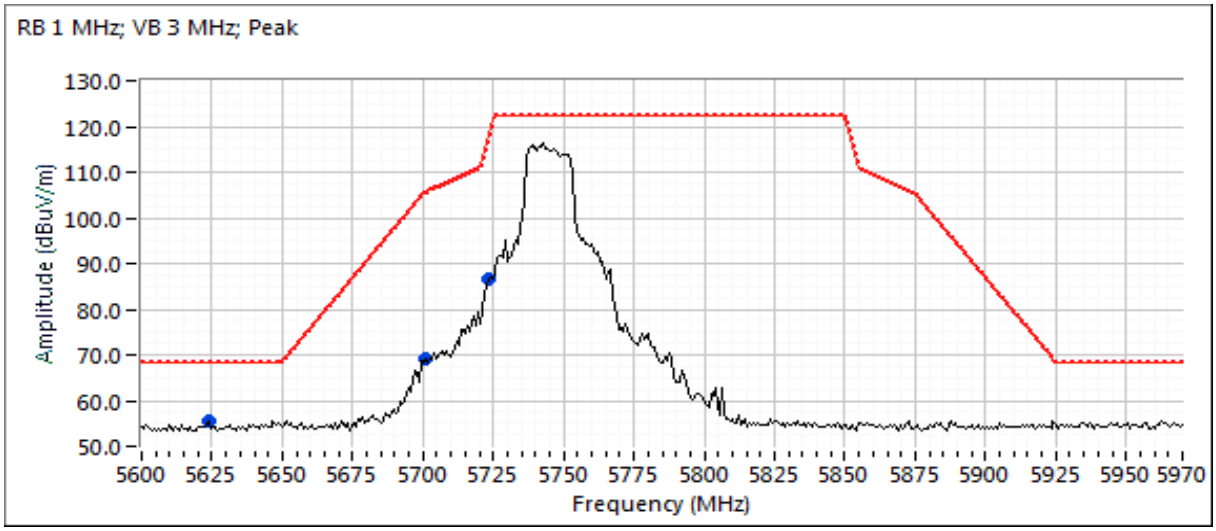
Test Location: Fremont Chamber #5 — EUT Voltage: PoE & 120V/60Hz

Channel: 149 - 5745MHz at 20dBm — Mode: BLE at 8 dBm

Tx Chain: 4Tx — Mode: a — Ch.Freq.: 2440 MHz

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5623.730	55.7	H	68.3	-12.6	Peak	38	1.5	
5723.090	86.5	H	117.9	-31.4	Peak	308	1.5	
5700.840	69.1	H	105.5	-36.4	Peak	50	2.0	



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

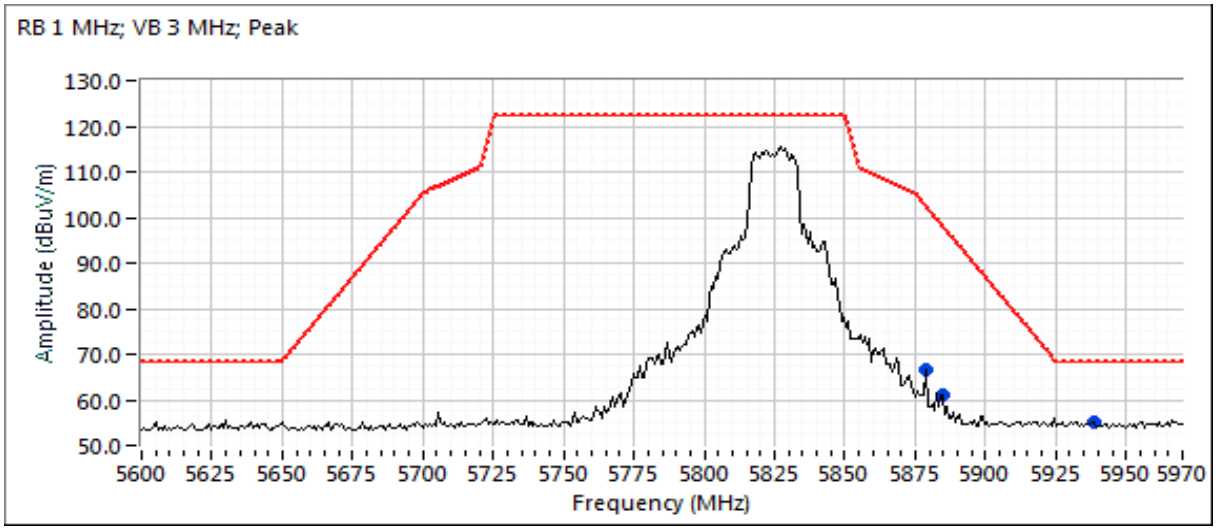
Date of Test: 10/2/2018
Test Engineer: M. Birgani / R. Varelas
Test Location: Fremont Chamber #5

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

Channel: 165 - 5825MHz at 20dBm
Mode: BLE at 8 dBm
Tx Chain: 4Tx
Mode: a
Ch.Freq.: 2440 MHz

5850 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5938.860	55.3	V	68.3	-13.0	Peak	347	1.5	
5878.800	66.4	H	102.5	-36.1	Peak	20	1.5	
5884.730	61.0	H	98.1	-37.1	Peak	33	1.5	



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #5: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 10/2/2018 — Config. Used: 1

Test Engineer: Rafael Varelas — Config Change: None

Test Location: Fremont Chamber #5 — EUT Voltage: PoE & 120V/60Hz

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Evaluation for worse case moudlation								
ac20/n20								
5149.920	50.7	H	54.0	-3.3	VAVG	308	2.0	Note 3: RB 1 MHz; VB: 200 Hz
5149.920	66.1	H	74.0	-7.9	PK	308	2.0	RB 1 MHz; VB: 3 MHz
ax20								
5149.750	52.6	H	54.0	-1.4	VAVG	308	2.0	Note 3: RB 1 MHz; VB: 200 Hz
5148.460	69.1	H	74.0	-4.9	PK	308	2.0	RB 1 MHz; VB: 3 MHz

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Date of Test: 10/2/2018
Test Engineer: Rafael Varelas
Test Location: Fremont Chamber #5

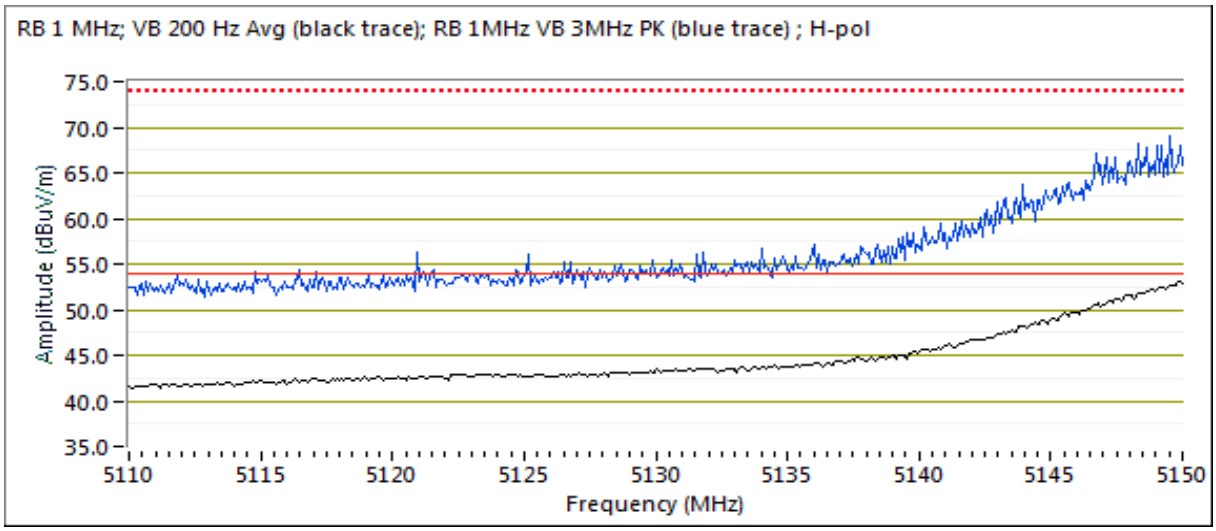
Config. Used: 1
Config Change: None
EUT Voltage: PoE & 120V/60Hz

Channel: 36 - 5180 MHz at 18dBm
Tx Chain: 4Tx Mode: ax20

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.970	53.3	H	54.0	-0.7	Avg	304	1.0	POS; RB 1 MHz; VB: 200 Hz
5148.680	68.4	H	74.0	-5.6	PK	304	1.0	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #8: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 10/2/2018 — Config. Used: 1

Test Engineer: Rafael Varelas/ Roy Zheng — Config Change: None

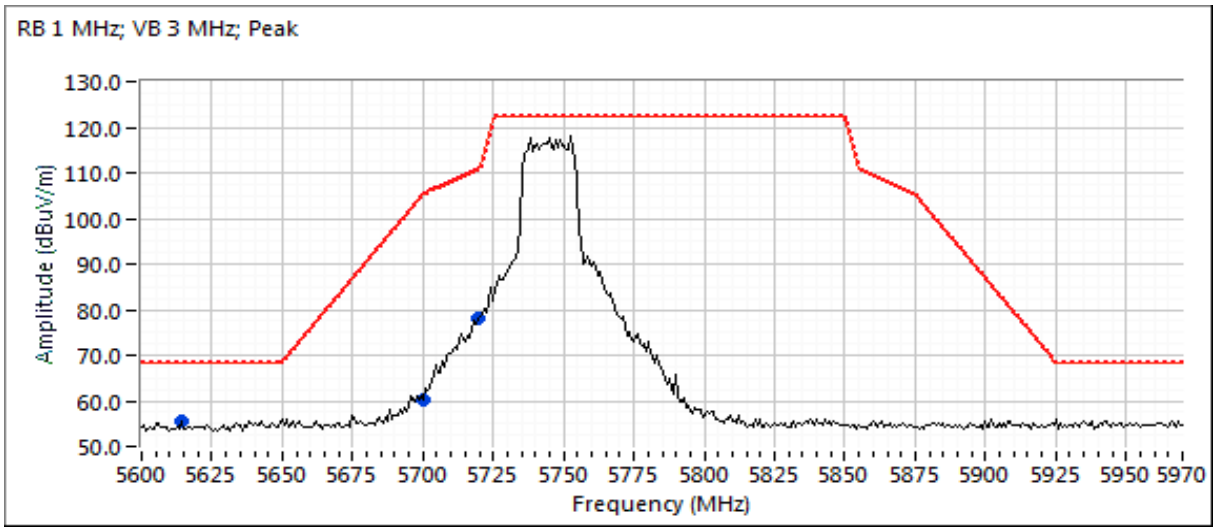
Test Location: Fremont Chamber #5 — EUT Voltage: PoE & 120V/60Hz

Channel: 149 - 5745MHz at 20dBm — Mode: BLE at 8 dBm

Tx Chain: 4Tx — Mode: ax20 — Ch.Freq.: 2440 MHz

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5614.090	55.5	V	68.3	-12.8	Peak	33	1.5	
5719.380	77.9	H	110.7	-32.8	Peak	299	2.5	
5700.100	60.4	H	105.3	-44.9	Peak	27	2.0	



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Date of Test: 10/2/2018
Test Engineer: Rafael Varelas/ Roy Zheng
Test Location: Fremont Chamber #5

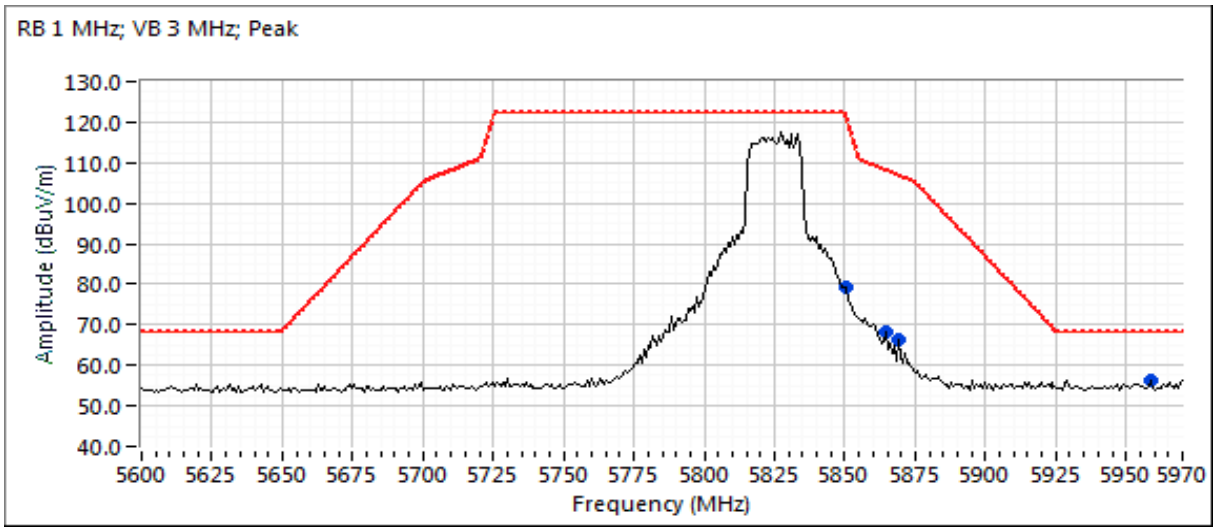
Config. Used: 1
Config Change: None
EUT Voltage: PoE & 120V/60Hz

Channel: 165 - 5825MHz at 20dBm
Tx Chain: 4Tx Mode: ax20

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5850 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5958.880	56.1	H	68.3	-12.2	Peak	292	1.0	
5864.710	68.1	H	108.2	-40.1	Peak	47	1.5	
5869.160	66.1	H	106.9	-40.8	Peak	311	2.0	
5850.620	79.3	H	120.9	-41.6	Peak	40	1.5	



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #9: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 10/3/2018 — Config. Used: 1

Test Engineer: Roy Zheng — Config Change: None

Test Location: Fremont Chamber #5 — EUT Voltage: PoE & 120V/60Hz

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Evaluation for worse case modulation								
ac40/ n40								
5149.750	52.5	H	54.0	-1.5	VAVG	22	1.1	Note 3: RB 1 MHz; VB: 200 Hz
5148.290	71.9	H	74.0	-2.1	PK	22	1.1	RB 1 MHz; VB: 3 MHz
ax40								
5149.750	53.9	H	54.0	-0.1	VAVG	22	1.1	Note 3: RB 1 MHz; VB: 200 Hz
5149.620	73.6	H	74.0	-0.4	PK	22	1.1	RB 1 MHz; VB: 3 MHz

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Date of Test: 10/3/2018
Test Engineer: Roy Zheng
Test Location: Fremont Chamber #5

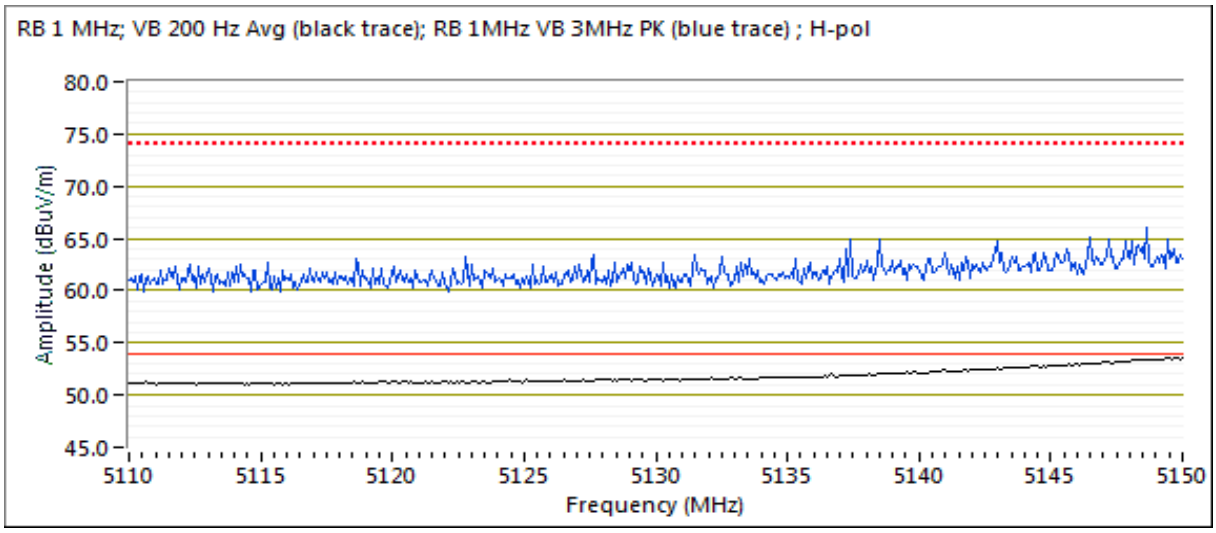
Config. Used: 1
Config Change: None
EUT Voltage: PoE & 120V/60Hz

Channel: 38 - 5190 MHz at 14dBm
Tx Chain: 4Tx Mode: ax40

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.840	53.5	H	54.0	-0.5	AVG	295	1.8	POS; RB 1 MHz; VB: 200 Hz
5140.380	64.8	H	74.0	-9.2	PK	295	1.8	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Date of Test: 10/3/2018
Test Engineer: M. Birgani
Test Location: Fremont Chamber #5

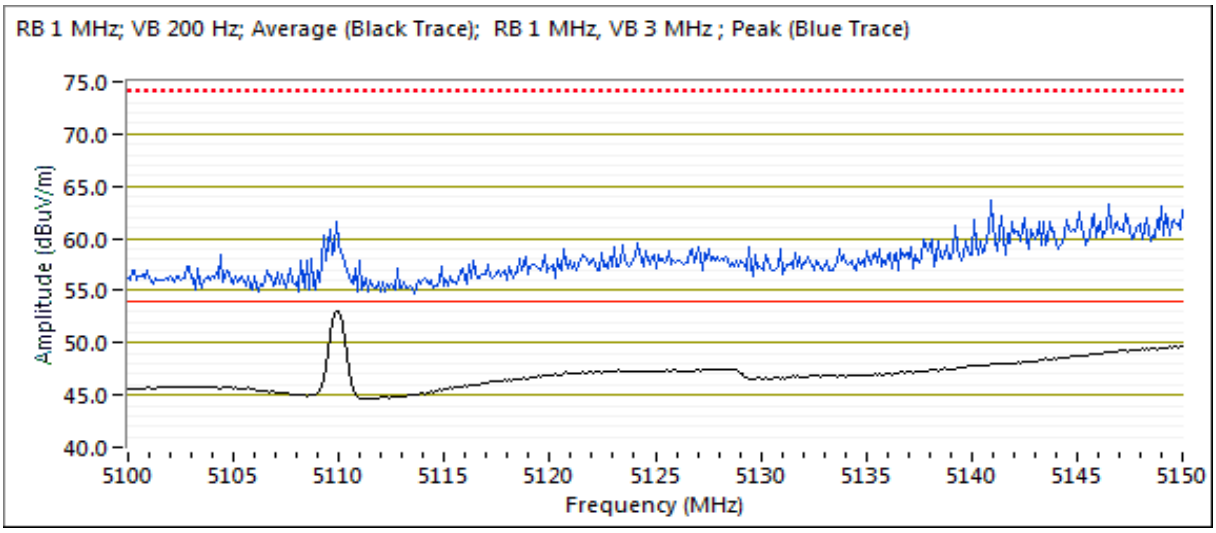
Config. Used: 1
Config Change: None
EUT Voltage: PoE & 120V/60Hz

Channel: 46 - 5230 MHz at 19dBm
Tx Chain: 4Tx Mode: ax40

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5109.990	53.0	H	54.0	-1.0	AVG	67	1.1	POS; RB 1 MHz; VB: 10 Hz
5141.180	65.3	H	74.0	-8.7	PK	67	1.1	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #12: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 10/3/2018 — Config. Used: 1

Test Engineer: Roy Zheng — Config Change: None

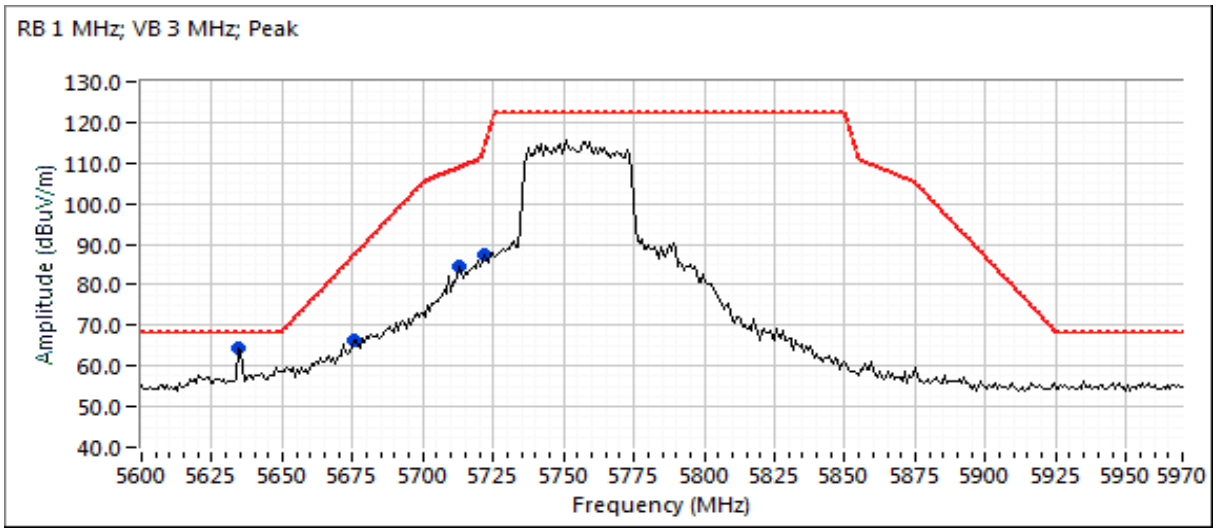
Test Location: Fremont Chamber #5 — EUT Voltage: PoE & 120V/60Hz

Channel: 151 - 5755MHz at 20dBm — Mode: BLE at 8 dBm

Tx Chain: 4Tx — Mode: ax40 — Ch.Freq.: 2440 MHz

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5634.590	66.5	H	68.3	-1.8	Peak	323	1.8	
5675.630	66.4	H	87.3	-20.9	Peak	281	2.0	
5712.710	84.7	H	108.9	-24.2	Peak	285	2.0	
5721.600	87.4	H	114.6	-27.2	Peak	292	2.0	



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Date of Test: 10/3/2018
Test Engineer: Roy Zheng
Test Location: Fremont Chamber #5

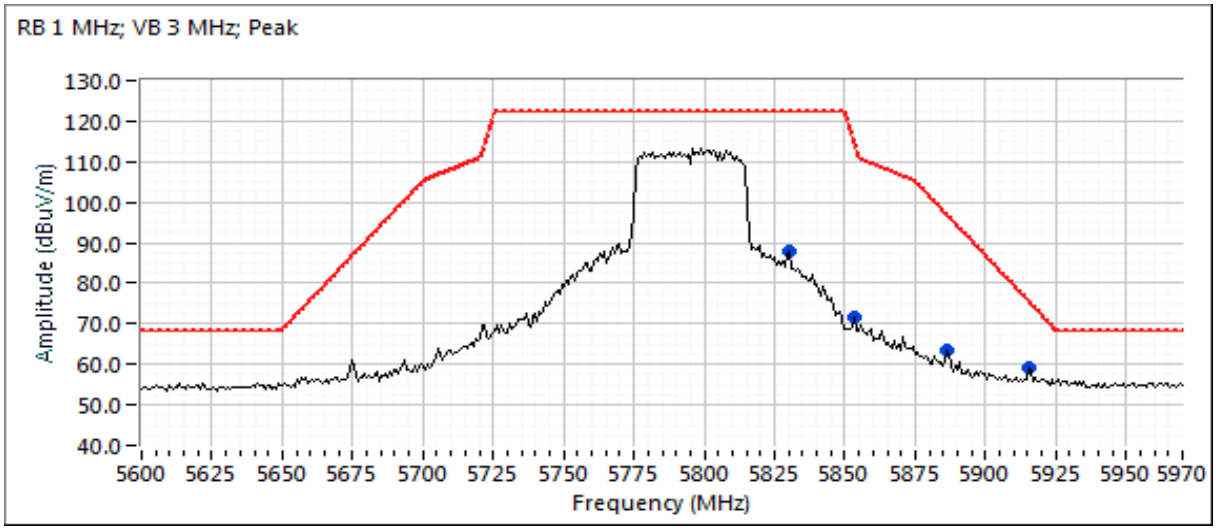
Config. Used: 1
Config Change: None
EUT Voltage: PoE & 120V/60Hz

Channel: 159 - 5795MHz at 20dBm
Tx Chain: 4Tx Mode: ax40

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5850 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5915.130	59.2	H	75.6	-16.4	Peak	79	1.5	
5886.210	63.3	H	97.0	-33.7	Peak	316	1.5	
5829.860	88.0	H	122.3	-34.3	Peak	306	2.5	
5853.590	71.6	H	114.1	-42.5	Peak	66	1.5	



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #13: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 10/3/2018 — Config. Used: 1

Test Engineer: Roy Zheng — Config Change: None

Test Location: Fremont Chamber #5 — EUT Voltage: PoE & 120V/60Hz

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Evaluation for worse case moudlation								
ac80/ n80								
5149.750	52.5	H	54.0	-1.5	VAVG	67	1.1	Note 3: RB 1 MHz; VB: 200 Hz
5148.250	67.2	H	74.0	-6.8	PK	67	1.1	RB 1 MHz; VB: 3 MHz
ax80								
5149.130	52.9	H	54.0	-1.1	VAVG	67	1.1	Note 3: RB 1 MHz; VB: 200 Hz
5149.340	68.4	H	74.0	-5.6	PK	67	1.1	RB 1 MHz; VB: 3 MHz

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Date of Test: 10/3/2018
Test Engineer: Roy Zheng
Test Location: Fremont Chamber #5

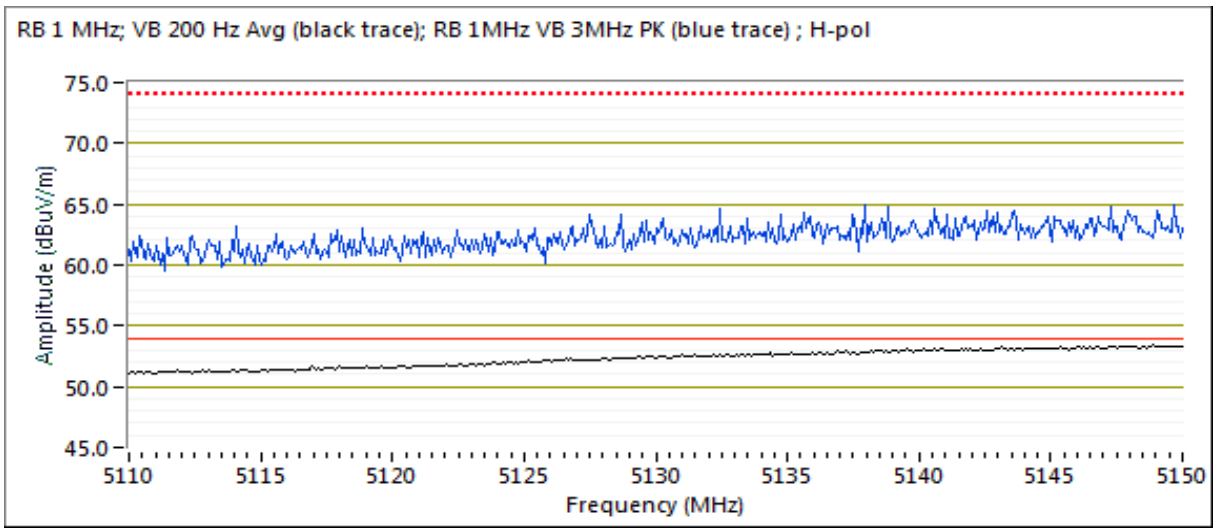
Config. Used: 1
Config Change: None
EUT Voltage: PoE & 120V/60Hz

Channel: 42 - 5210MHz at 13dBm
Tx Chain: 4Tx Mode: ax80

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5150.000	53.4	H	54.0	-0.6	VAVG	301	1.2	Note 3: RB 1 MHz; VB: 200 Hz
5149.280	49.6	V	54.0	-4.4	VAVG	69	1.5	Note 3: RB 1 MHz; VB: 200 Hz
5133.970	65.5	H	74.0	-8.5	PK	301	1.2	RB 1 MHz; VB: 3 MHz
5148.720	62.3	V	74.0	-11.7	PK	69	1.5	RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #16: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 10/3/2018 — Config. Used: 1

Test Engineer: Roy Zheng — Config Change: None

Test Location: Fremont Chamber #5 — EUT Voltage: PoE & 120V/60Hz

Channel: 155 - 5775MHz at 19dBm — Mode: BLE at 8 dBm

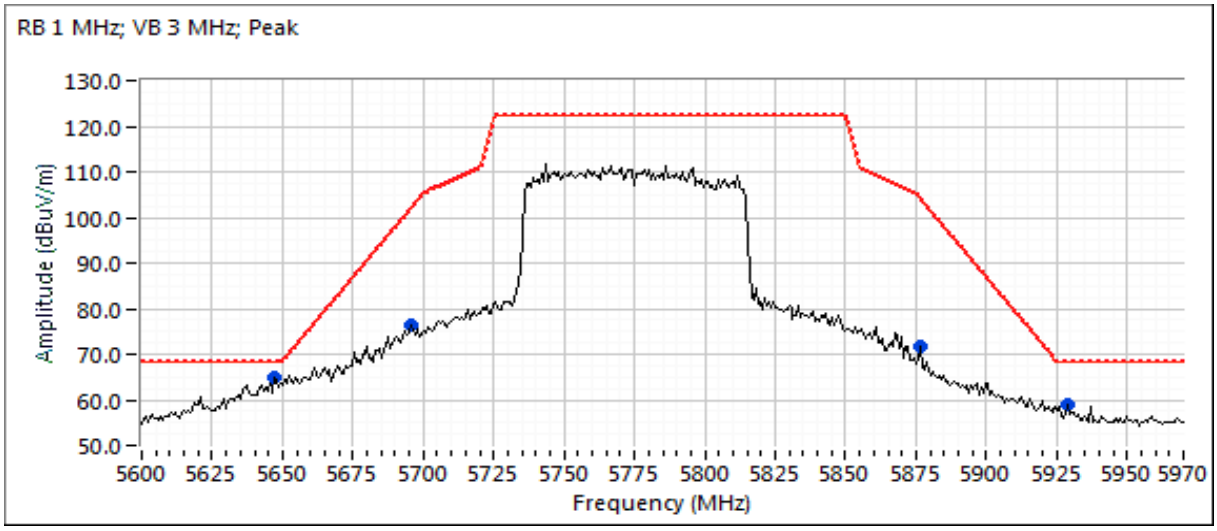
Tx Chain: 4Tx — Mode: ax80 — Ch.Freq.: 2440 MHz

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5648.750	67.8	H	68.3	-0.5	PK	44	1.4	
5695.650	76.4	H	102.1	-25.7	Peak	37	1.5	

5850 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5929.220	59.1	H	68.3	-9.2	Peak	34	1.5	
5876.570	71.5	H	104.1	-32.6	Peak	38	1.5	



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

RSS-247 and FCC 15.407 (UNII) 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: 24.5 °C
Rel. Humidity: 41 %

Summary of Results

Run #	Mode	Channel	Power Setting	Final Setting	Test Performed	Limit	Result / Margin
20MHz Bandwith Modes							
1	a	36 - 5180MHz	20	16.0	Restricted Band Edge at 5150 MHz	15.209	53.4 dBµV/m @ 5149.9 MHz (-0.6 dB)
		40 - 5200MHz	20	20.0	Restricted Band Edge at 5150 MHz		49.1 dBµV/m @ 5149.8 MHz (-4.9 dB)
4		149 - 5745MHz	20	20.0	Band Edge 5725 MHz	15.E	59.8 dBµV/m @ 5623.0 MHz (-8.5 dB)
		165 - 5825MHz	20	20.0	Band Edge 5850MHz		59.1 dBµV/m @ 5929.2 MHz (-9.2 dB)
5	ax20	36 - 5180MHz	20	17.0	Restricted Band Edge at 5150 MHz	15.209	52.0 dBµV/m @ 5150.0 MHz (-2.0 dB)
		40 - 5200MHz	20	20.0	Restricted Band Edge at 5150 MHz		53.0 dBµV/m @ 5149.6 MHz (-1.0 dB)
8		149 - 5745MHz	20	20.0	Band Edge 5725 MHz	15.E	60.6 dBµV/m @ 5653.4 MHz (-10.2 dB)
		165 - 5825MHz	20	20.0	Band Edge 5850MHz		60.2 dBµV/m @ 5922.5 MHz (-9.9 dB)

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Summary of Results

Run #	Mode	Channel	Power Setting	Final Setting	Test Performed	Limit	Result / Margin
40MHz Bandwith Modes							
9	ax40	38 - 5190MHz	20	11.5	Restricted Band Edge at 5150 MHz	15.209	52.6 dBµV/m @ 5149.9 MHz (-1.4 dB)
		46 - 5230MHz	20	19.0	Restricted Band Edge at 5150 MHz		52.6 dBµV/m @ 5149.9 MHz (-1.4 dB)
12		151 - 5755MHz	20	20	Band Edge 5725 MHz	15.E	67.2 dBµV/m @ 5634.9 MHz (-1.1 dB)
		159 - 5795MHz	20	20	Band Edge 5850MHz		66.4 dBµV/m @ 5915.1 MHz (-9.2 dB)
80MHz Bandwith Modes							
13	ax80	42 - 5210MHz	20.0	12.0	Restricted Band Edge at 5150 MHz	15.209	50.9 dBµV/m @ 5149.6 MHz (-3.1 dB)
16		155 - 5775MHz	20.0	18.0	Band Edge 5725 MHz	15.E	67.9 dBµV/m @ 5651.6 MHz (-1.6 dB)
		155 - 5775MHz	20.0	18.0	Band Edge 5850MHz		63.8 dBµV/m @ 5932.9 MHz (-4.5 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:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Procedure Comments:

Measurements performed in accordance with FCC KDB 789033
Limits from 15.209 instead of 15.407(b)(1-3) acceptable until January 1, 2019 per FCC KDB 789033 D01
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)

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
11a	6 MB/s	0.93	Yes	1.438	0.3	0.6	695
ax20	MCS0	0.96	Yes	5.444	0.2	0.4	184
11ax40	MCS0	0.96	Yes	5.444	0.2	0.4	184
11ax80	MCS0	0.95	Yes	5.408	0.2	0.5	185
11ax160	MCS0	0.96	Yes	5.444	0.2	0.3	184

Sample Notes

BLE Sample SN: CNG6K9V019 and Zigbee Sample SN: CNG6K9V00C
Driver: P2 WNC 0.4.3a
Antenna: AP-ANT-19 Wi-Fi and Integral BLE/ZigBee

Measurement Specific Notes:

Note 1:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector). Per KDB 789033 2) c) (i), compliance can be demonstrated by meeting the average and peak limits of 15.209, as an alternative.
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 5:	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:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #1: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 10/11/2018
Test Engineer: Roy Zheng
Test Location: Fremont Chamber #5

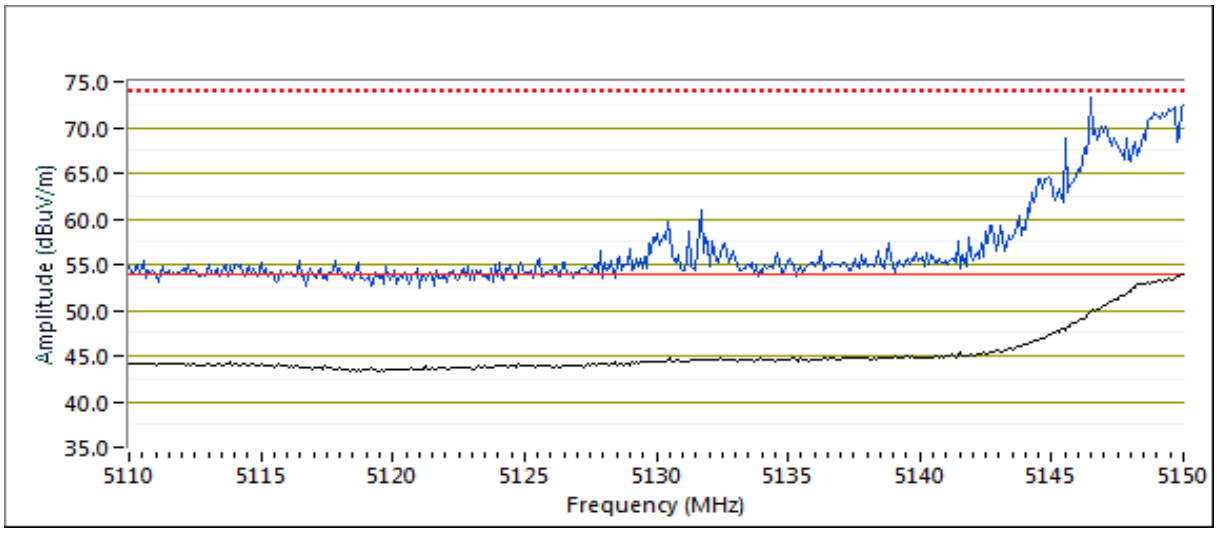
Config. Used: 1
Config Change: none
EUT Voltage: PoE

Channel: 36 - 5180 MHz at 16dBm
Tx Chain: 4Tx
Mode: a

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5150.000	41.5	H	54.0	-12.5	AVG	111	1.4	POS; RB 1 MHz; VB: 1 kHz
5149.200	56.7	H	74.0	-17.3	PK	111	1.4	POS; RB 1 MHz; VB: 3 MHz
5148.800	72.6	V	74.0	-1.4	PK	329	1.5	POS; RB 1 MHz; VB: 3 MHz
5149.850	53.4	V	54.0	-0.6	AVG	329	1.5	Note 3; RB 1 MHz; VB: 1 kHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Date of Test: 10/11/2018
Test Engineer: Roy Zheng
Test Location: Fremont Chamber #5

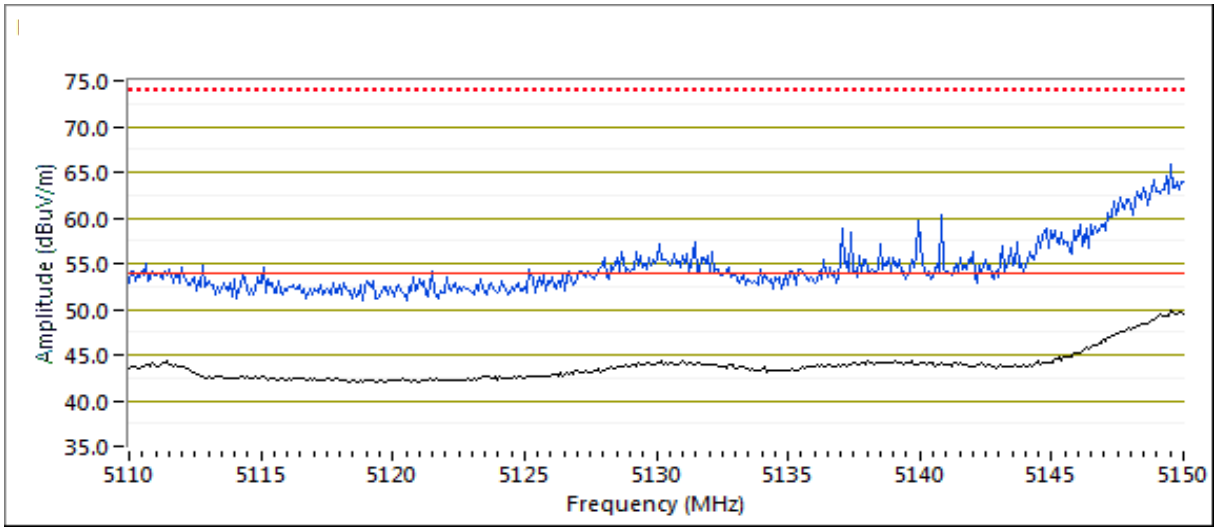
Config. Used: 1
Config Change: none
EUT Voltage: PoE

Channel: 40 - 5200MHz
Tx Chain: 4Tx
Mode: a

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.750	49.1	V	54.0	-4.9	AVG	82	1.4	Note 3; RB 1 MHz; VB: 1 kHz
5149.920	64.9	V	74.0	-9.1	PK	82	1.4	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #4: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 10/11/2018
Test Engineer: Roy Zheng
Test Location: Fremont Chamber #5

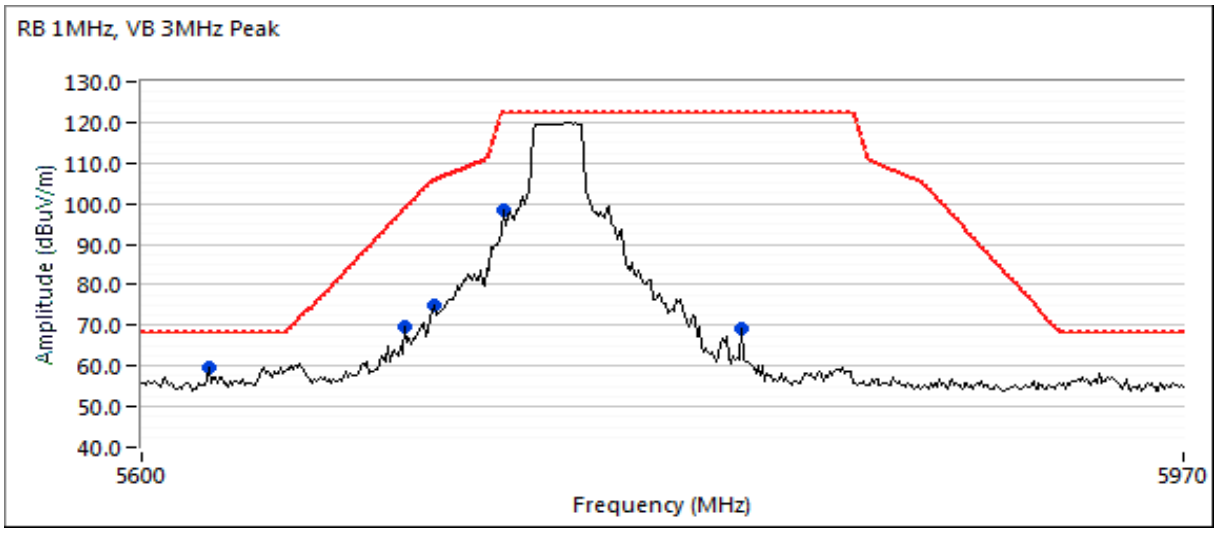
Config. Used: 1
Config Change: none
EUT Voltage: PoE & 120V/60Hz

Channel: 149 - 5745MHz at 20dBm
Tx Chain: 4Tx
Mode: a

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5622.990	59.8	V	68.3	-8.5	Peak	154	2.0	
5726.050	98.3	V	122.3	-24.0	Peak	319	1.5	
5701.580	74.8	V	105.7	-30.9	Peak	171	2.0	
5691.200	69.5	V	98.8	-29.3	Peak	197	2.0	
5809.840	69.2	V	122.3	-53.1	Peak	326	1.5	



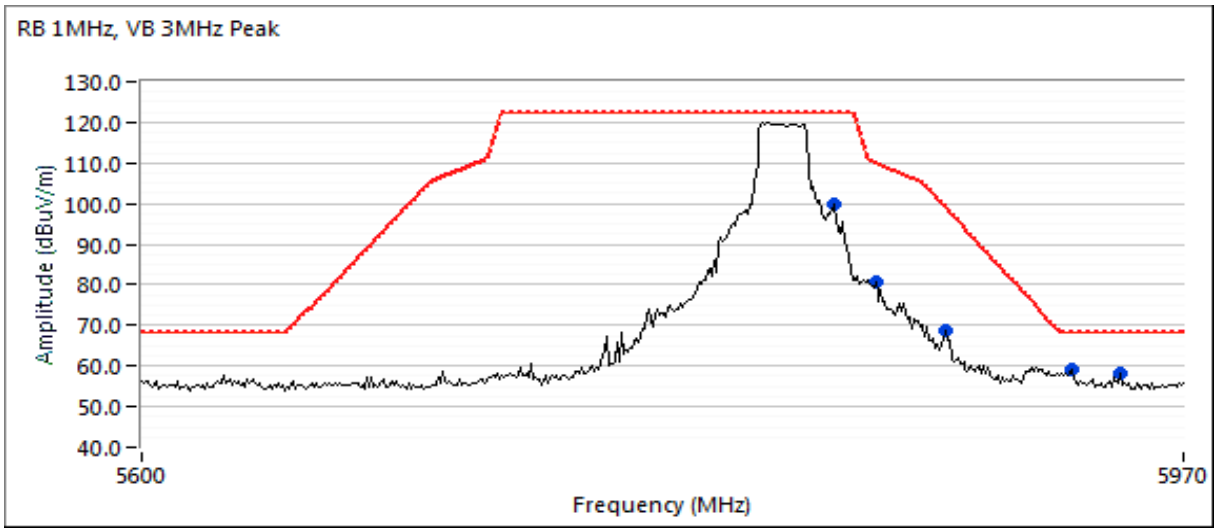
EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Channel: 165 - 5825MHz at 20dBm Mode: BLE at 8 dBm
Tx Chain: 4Tx Mode: a Ch.Freq.: 2440 MHz

5850 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5929.220	59.1	V	68.3	-9.2	Peak	307	1.5	
5843.210	99.8	V	122.3	-22.5	Peak	23	1.5	
5858.040	80.9	V	110.0	-29.1	Peak	147	1.5	
5883.250	68.6	V	99.2	-30.6	Peak	147	1.5	
5947.010	58.3	V	68.3	-10.0	Peak	142	1.5	



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #5: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 10/11/2018
Test Engineer: Roy Zheng
Test Location: Fremont Chamber #5

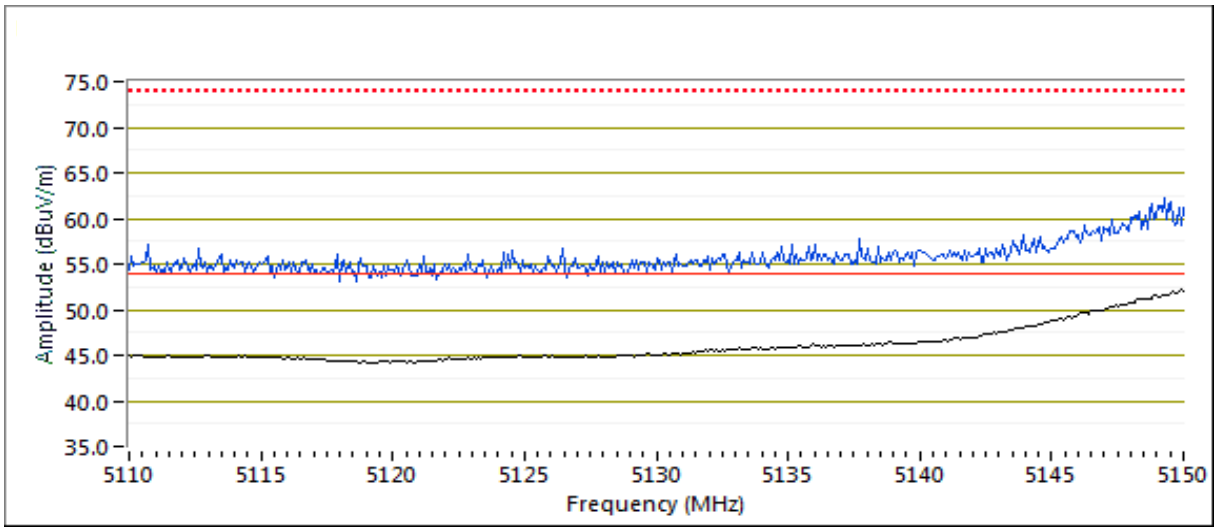
Config. Used: 1
Config Change: none
EUT Voltage: PoE & 120V/60Hz

Channel: 36 - 5180 MHz at 17dBm
Tx Chain: 4Tx
Mode: ax20

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.520	40.2	H	54.0	-13.8	AVG	332	1.3	POS; RB 1 MHz; VB: 200 Hz
5148.880	52.7	H	74.0	-21.3	PK	332	1.3	POS; RB 1 MHz; VB: 3 MHz
5149.680	66.9	V	74.0	-7.1	PK	323	1.5	POS; RB 1 MHz; VB: 3 MHz
5150.000	52.0	V	54.0	-2.0	AVG	323	1.5	POS; RB 1 MHz; VB: 200 Hz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Date of Test: 10/11/2018
Test Engineer: Roy Zheng
Test Location: Fremont Chamber #5

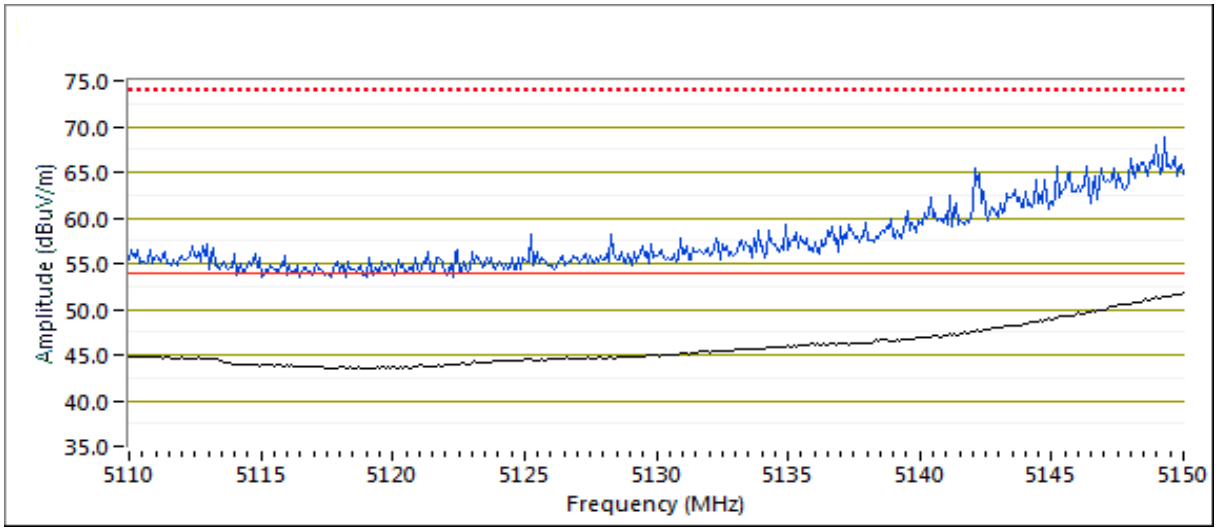
Config. Used: 1
Config Change: none
EUT Voltage: PoE & 120V/60Hz

Channel: 40 - 5200 MHz at 20dBm
Tx Chain: 4Tx
Mode: ax20

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.600	53.0	V	54.0	-1.0	AVG	46	1.4	POS; RB 1 MHz; VB: 200 Hz
5146.230	67.3	V	74.0	-6.7	PK	46	1.4	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #8: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 10/11/2018
Test Engineer: Roy Zheng
Test Location: Fremont Chamber #5

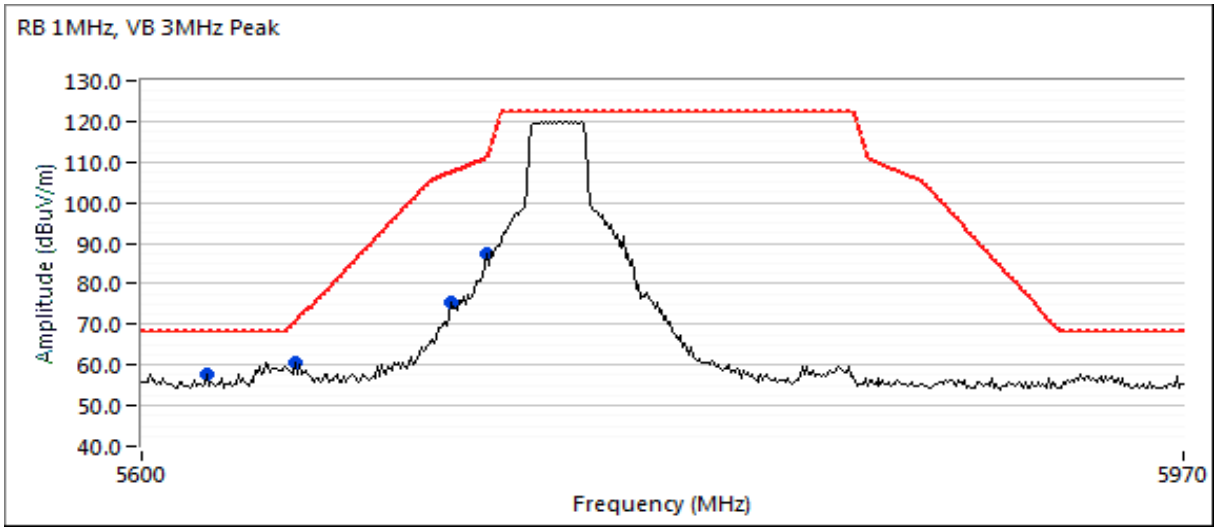
Config. Used: 1
Config Change: none
EUT Voltage: PoE & 120V/60Hz

Channel: 149 - 5745MHz at 20dBm
Tx Chain: 4Tx
Mode: ax20

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5653.390	60.6	V	70.8	-10.2	Peak	8	1.5	
5720.120	87.2	V	111.2	-24.0	Peak	219	2.0	
5707.520	75.5	V	107.4	-31.9	Peak	218	2.0	
5622.240	57.8	V	68.3	-10.5	Peak	323	1.5	



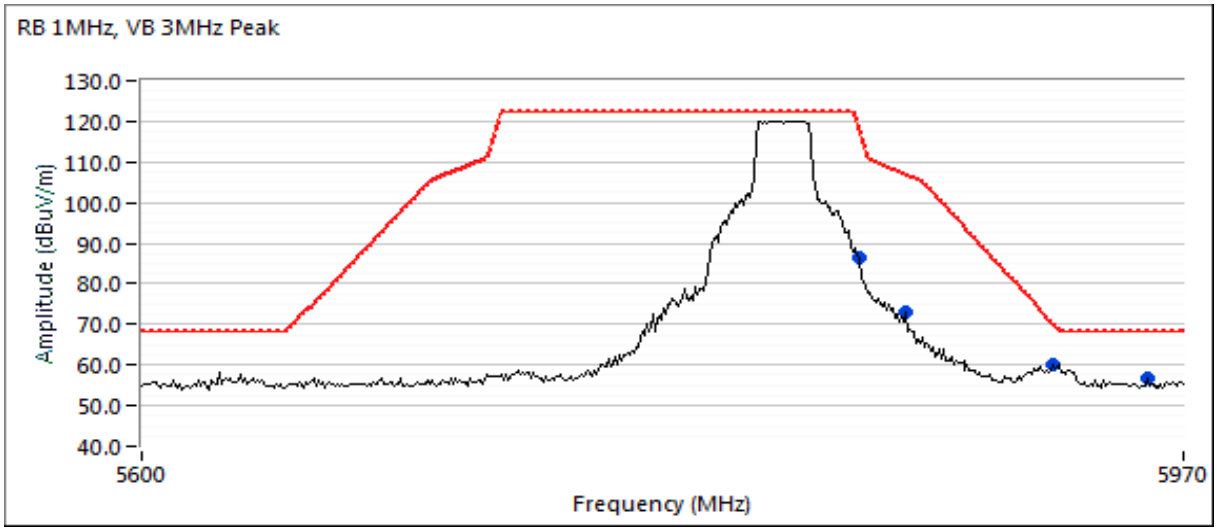
EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Channel: 165 - 5825MHz Mode: BLE at 8 dBm
Tx Chain: 4Tx Mode: ax20 Ch.Freq.: 2440 MHz

5850 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5922.540	60.2	V	70.1	-9.9	Peak	142	2.0	
5852.100	86.6	V	117.5	-30.9	Peak	33	1.5	
5869.160	73.2	V	106.9	-33.7	Peak	144	1.5	
5956.650	56.6	V	68.3	-11.7	Peak	318	1.0	



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #9: Radiated Bandedge Measurements, 5150-5250MHz

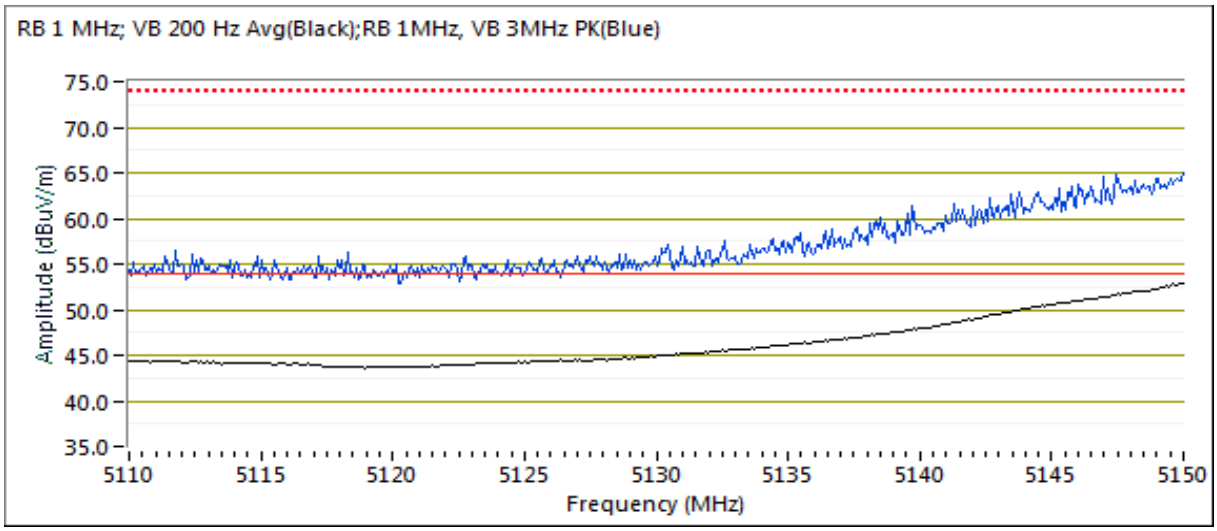
Date of Test: 10/11/2018
Test Engineer: Roy Zheng
Test Location: Fremont Chamber #5

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

Channel: 38 - 5190 MHz at 11.5dBm
Tx Chain: 4Tx
Mode: ax40

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.680	40.8	H	54.0	-13.2	AVG	63	1.3	POS; RB 1 MHz; VB: 200 Hz
5149.040	53.0	H	74.0	-21.0	PK	63	1.3	POS; RB 1 MHz; VB: 3 MHz
5149.840	52.4	V	54.0	-1.6	AVG	318	1.3	POS; RB 1 MHz; VB: 200 Hz
5148.400	65.9	V	74.0	-8.1	PK	318	1.3	POS; RB 1 MHz; VB: 3 MHz



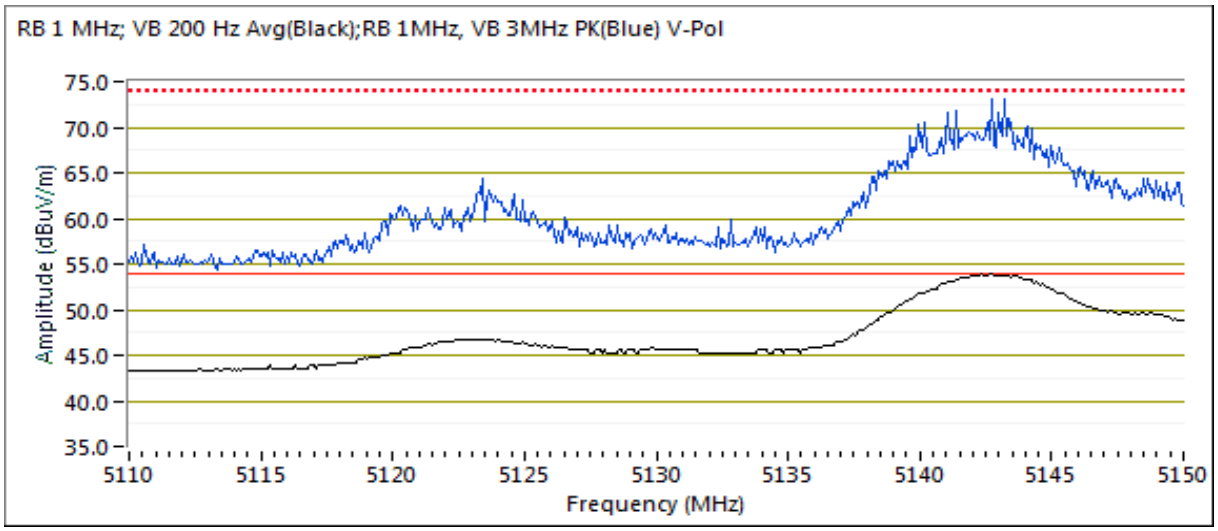
EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Date of Test: 10/12/2018
Test Engineer: Jude Semana
Test Location: Fremont Chamber #4

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

Channel: 46 - 5230 MHz
Tx Chain: 4Tx
Mode: ax40



5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5142.710	53.7	V	54.0	-0.3	Avg	311	1.5	POS; RB 1 MHz; VB: 200 Hz
5143.110	69.6	V	74.0	-4.4	PK	311	1.5	POS; RB 1 MHz; VB: 3 MHz
5149.680	44.0	H	54.0	-10.0	Avg	161	1.0	POS; RB 1 MHz; VB: 200 Hz
5147.440	59.2	H	74.0	-14.8	PK	161	1.0	POS; RB 1 MHz; VB: 3 MHz

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #12: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 10/11/2018
Test Engineer: Roy Zheng
Test Location: Fremont Chamber #5

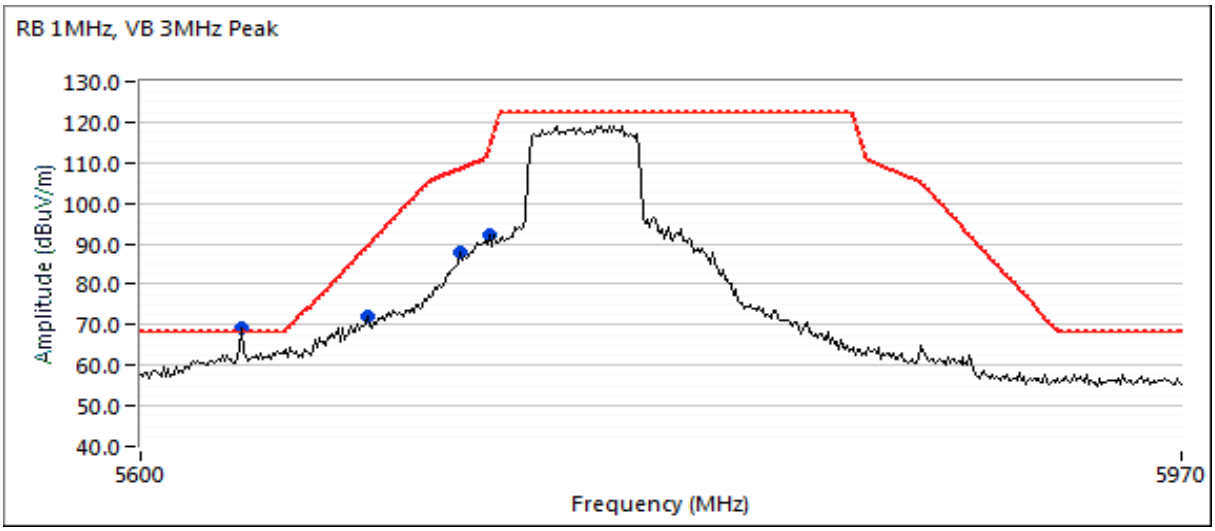
Config. Used: 1
Config Change: none
EUT Voltage: PoE & 120V/60Hz

Channel: 151 - 5755MHz at 20dBm
Tx Chain: 4Tx
Mode: ax40

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5634.870	67.2	V	68.3	-1.1	PK	300	1.5	POS; RB 1 MHz; VB: 3 MHz
5721.600	92.3	V	114.6	-22.3	Peak	118	2.0	POS; RB 1 MHz; VB: 3 MHz
5711.220	88.0	V	108.4	-20.4	Peak	109	2.0	POS; RB 1 MHz; VB: 3 MHz
5678.600	72.2	V	89.5	-17.3	Peak	55	2.0	POS; RB 1 MHz; VB: 3 MHz



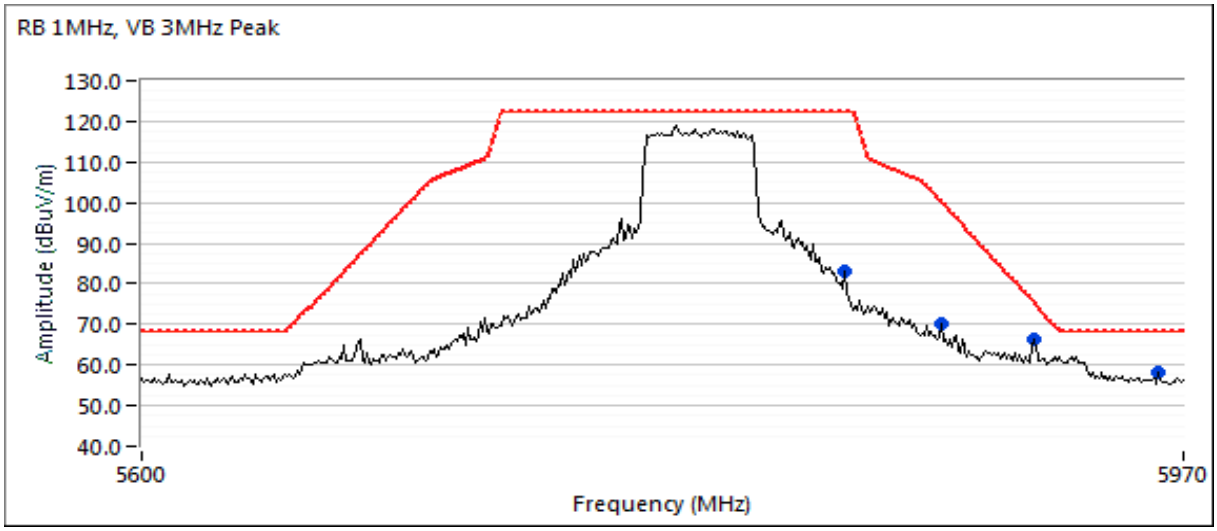
EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Channel: 159 - 5795MHz
Tx Chain: 4Tx Mode: ax40

5850 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5915.130	66.4	V	75.6	-9.2	Peak	25	1.5	POS; RB 1 MHz; VB: 3 MHz
5846.910	82.9	V	122.3	-39.4	Peak	203	2.0	POS; RB 1 MHz; VB: 3 MHz
5881.760	70.0	V	100.3	-30.3	Peak	43	1.5	POS; RB 1 MHz; VB: 3 MHz
5961.100	58.1	V	68.3	-10.2	Peak	211	2.0	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #13: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 10/12/2018 — Config. Used: 1

Test Engineer: Jude Semana — Config Change: None

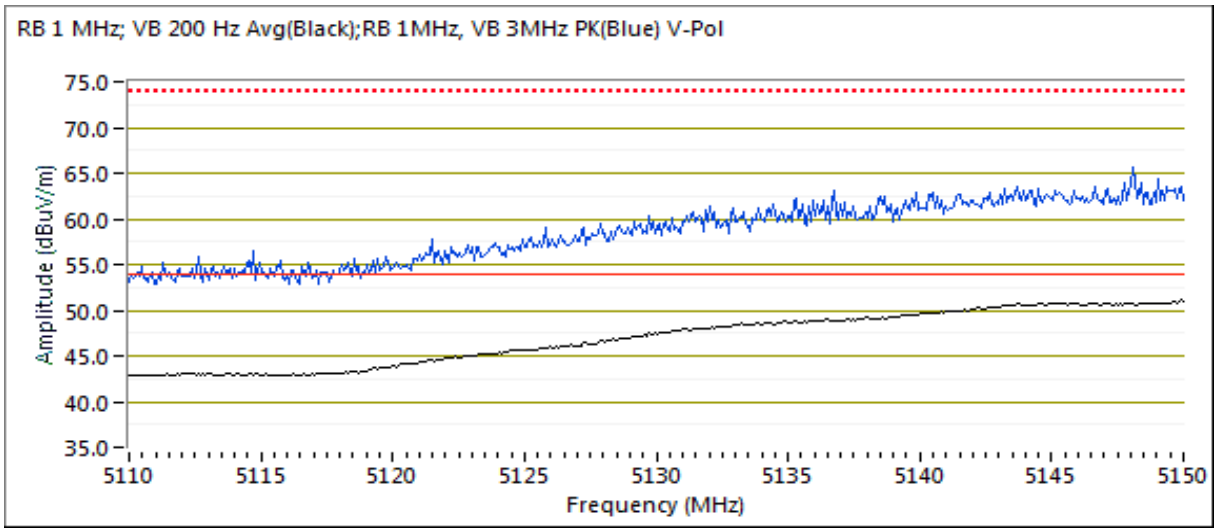
Test Location: Fremont Chamber #4 — EUT Voltage: PoE & 120V/60Hz

Channel: 42 - 5210 MHz at 12dBm — Mode: BLE at 8 dBm

Tx Chain: 4Tx — Mode: ax80 — Ch.Freq.: 2440 MHz

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.600	50.9	V	54.0	-3.1	Avg	341	1.4	POS; RB 1 MHz; VB: 200 Hz
5144.470	63.9	V	74.0	-10.1	PK	341	1.4	POS; RB 1 MHz; VB: 3 MHz
5147.680	42.5	H	54.0	-11.5	Avg	104	1.0	POS; RB 1 MHz; VB: 200 Hz
5149.360	55.8	H	74.0	-18.2	PK	104	1.0	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #16: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 10/11/2018
Test Engineer: Roy Zheng
Test Location: Fremont Chamber #5

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

Channel: 155 - 5775MHz at 18dBm
Tx Chain: 4Tx
Mode: ax80

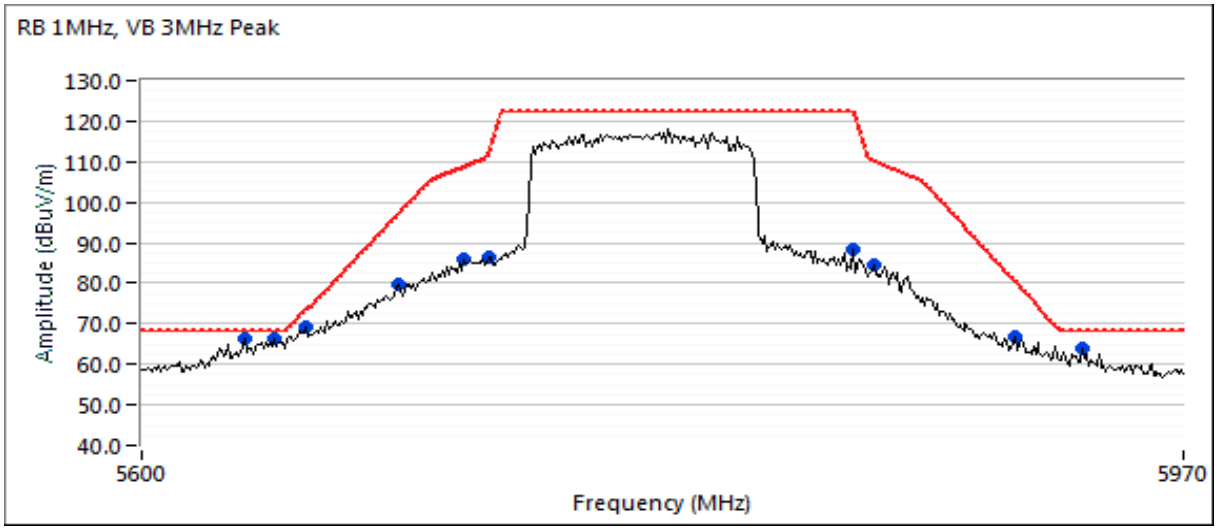
Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5657.090	69.1	V	73.5	-4.4	PK	195	2.0	POS; RB 1 MHz; VB: 3 MHz
5645.970	66.4	V	68.3	-1.9	PK	36	1.5	POS; RB 1 MHz; VB: 3 MHz
5635.590	66.5	V	68.3	-1.8	PK	38	1.5	POS; RB 1 MHz; VB: 3 MHz
5637.340	66.7	V	68.3	-1.6	PK	337	1.5	POS; RB 1 MHz; VB: 3 MHz
5651.590	67.9	V	69.5	-1.6	PK	337	1.5	POS; RB 1 MHz; VB: 3 MHz

5850 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5908.460	66.9	V	80.5	-13.6	Peak	141	2.0	POS; RB 1 MHz; VB: 3 MHz
5932.930	63.8	V	68.3	-4.5	Peak	142	2.0	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

RSS-247 and FCC 15.407 (UNII) 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: 24.1 °C
Rel. Humidity: 39 %

Summary of Results

Run #	Mode	Channel	Power Setting	Final Setting	Test Performed	Limit	Result / Margin
20MHz Bandwith Modes							
1	a	36 - 5180MHz	20.0	16.5	Restricted Band Edge at 5150 MHz	15.209	72.7 dBµV/m @ 5149.6 MHz (-1.3 dB)
		40 - 5200MHz	20.0	20.0	Restricted Band Edge at 5150 MHz		49.3 dBµV/m @ 5149.60 MHz (-4.7 dB)
4		149 - 5745MHz	20.0	20.0	Band Edge 5725 MHz	15.E	60.4 dBµV/m @ 5641.52 MHz (-7.9 dB)
		165 - 5825MHz	20.0	20.0	Band Edge 5850MHz		56.9 dBµV/m @ 5952.9 MHz (-11.4 dB)
5	ax20	36 - 5180MHz	20.0	16.0	Restricted Band Edge at 5150 MHz	15.209	52.8 dBµV/m @ 5149.1 MHz (-1.2 dB)
		40 - 5200MHz	20.0	20.0	Restricted Band Edge at 5150 MHz		53.6 dBµV/m @ 5149.99 MHz (-0.4 dB)
8		149 - 5745MHz	20.0	20.0	Band Edge 5725 MHz	15.E	59.2 dBµV/m @ 5649.68 MHz (-9.1 dB)
		165 - 5825MHz	20.0	20.0	Band Edge 5850MHz		59.3 dBµV/m @ 5926.99 MHz (-9.0 dB)

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Summary of Results

Run #	Mode	Channel	Power Setting	Final Setting	Test Performed	Limit	Result / Margin
40MHz Bandwith Modes							
9	ax40	38 - 5190MHz	20.0	13.0	Restricted Band Edge at 5150 MHz	15.209	53 dBµV/m @ 5149.98 MHz (-1.0 dB)
		46 - 5230MHz	20.0	18.5	Restricted Band Edge at 5150 MHz		51.0 dBµV/m @ 5148.6 MHz (-3.0 dB)
12		151 - 5755MHz	20	19.0	Band Edge 5725 MHz	15.E	67.8dBµV/m @ 5634.79 MHz (-0.5 dB)
		159 - 5795MHz	20	20.0	Band Edge 5850MHz		58.1dBµV/m @ 5961.8 MHz (-10.2 dB)
80MHz Bandwith Modes							
13	ax80	42 - 5210MHz	20.0	13.0	Restricted Band Edge at 5150 MHz	15.209	52.5dBµV/m @ 5149.75 MHz (-1.5 dB)
16		155 - 5775MHz	20.0	19.0	Band Edge 5725 MHz	15.E	68.5 dBµV/m @ 5653.15 MHz (-2.1 dB)
		155 - 5775MHz	20.0	19.0	Band Edge 5850MHz		63.1 dBµV/m @ 5929.96 MHz (-5.2 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.

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Procedure Comments:

Measurements performed in accordance with FCC KDB 789033
Limits from 15.209 instead of 15.407(b)(1-3) acceptable until January 1, 2019 per FCC KDB 789033 D01
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)

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
11a	6 MB/s	0.93	Yes	1.438	0.3	0.6	695
ax20	MCS0	0.96	Yes	5.444	0.2	0.4	184
11ax40	MCS0	0.96	Yes	5.444	0.2	0.4	184
11ax80	MCS0	0.95	Yes	5.408	0.2	0.5	185
11ax160	MCS0	0.96	Yes	5.444	0.2	0.3	184

Sample Notes

BLE Sample SN: CNG6K9V019 and Zigbee Sample SN: CNG6K9V00C
Driver: P2 WNC 0.4.3a or 0.4.4
Antenna: AP-ANT-20 Wi-Fi and Integral BLE/ZigBee

Measurement Specific Notes:

Note 1:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector). Per KDB 789033 2) c) (i), compliance can be demonstrated by meeting the average and peak limits of 15.209, as an alternative.
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 5:	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:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #1: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 10/8/2018
Test Engineer: Roy Zheng
Test Location: Fremont Chamber #5

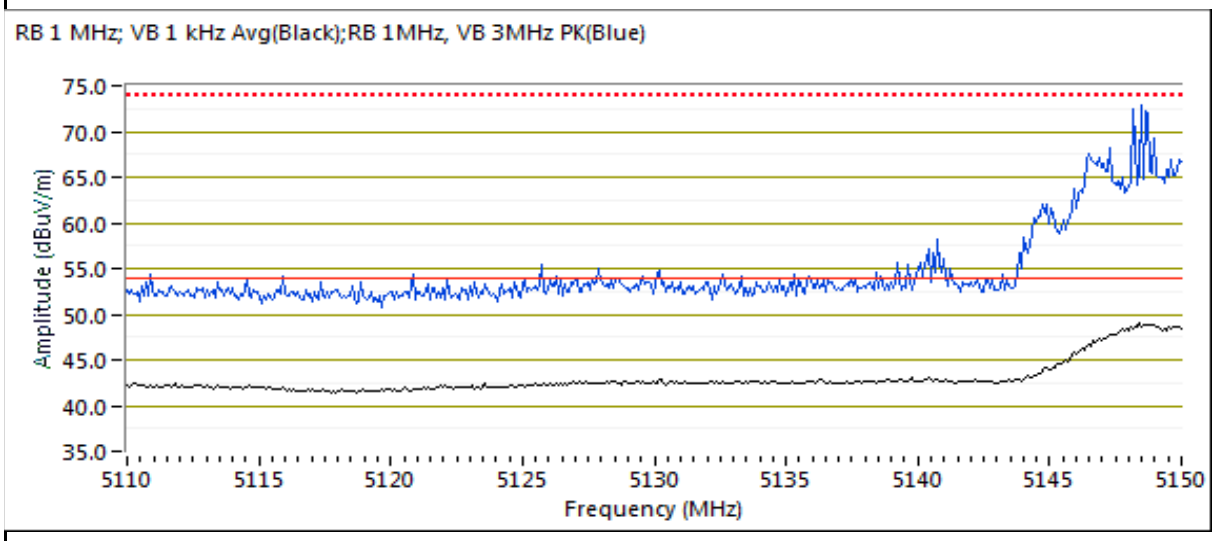
Config. Used: 1
Config Change: none
EUT Voltage: PoE

Channel: 36 - 5180 MHz at 16.5dBm
Tx Chain: 4Tx
Mode: a

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.600	72.7	V	74.0	-1.3	PK	273	1.9	POS; RB 1 MHz; VB: 3 MHz
5148.990	48.7	V	54.0	-5.3	AVG	273	1.9	Note 3; RB 1 MHz; VB: 1 kHz
5150.000	42.4	H	54.0	-11.6	AVG	288	1.6	Note 3; RB 1 MHz; VB: 1 kHz
5149.760	66.0	H	74.0	-8.0	PK	288	1.6	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #1: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 10/8/2018
Test Engineer: Roy Zheng
Test Location: Fremont Chamber #5

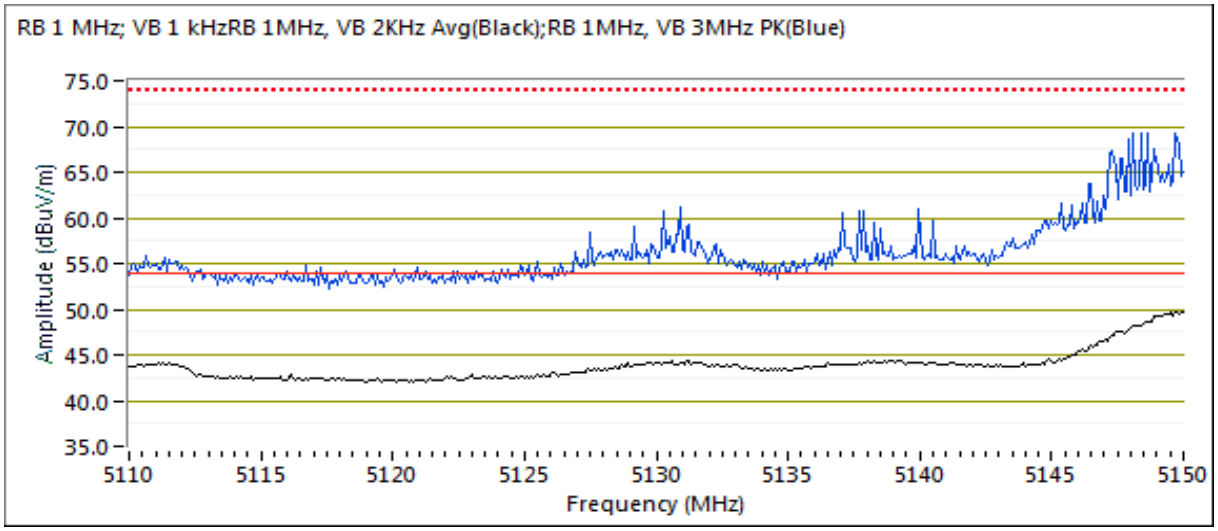
Config. Used: 1
Config Change: none
EUT Voltage: PoE

Channel: 40 - 5200 MHz at 20dBm
Tx Chain: 4Tx
Mode: a

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5150.000	49.4	V	54.0	-4.6	AVG	82	1.4	Note 3; RB 1 MHz; VB: 1 kHz
5148.240	65.1	V	74.0	-8.9	PK	82	1.4	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #4: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 10/9/2018
Test Engineer: Roy Zheng
Test Location: Fremont Chamber #5

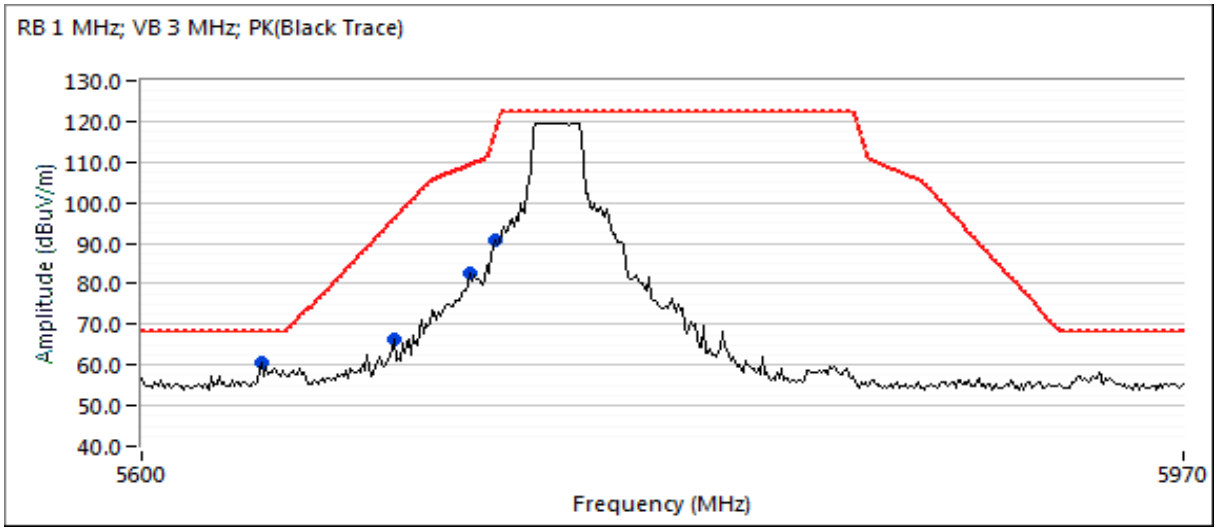
Config. Used: 1
Config Change: none
EUT Voltage: PoE

Channel: 149 - 5745MHz at 20dBm
Tx Chain: 4Tx
Mode: a

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5723.090	90.6	V	117.9	-27.3	Peak	310	1.5	POS; RB 1 MHz; VB: 3 MHz
5714.190	82.4	V	109.3	-26.9	Peak	59	2.5	POS; RB 1 MHz; VB: 3 MHz
5687.500	66.1	V	96.0	-29.9	Peak	333	2.5	POS; RB 1 MHz; VB: 3 MHz
5641.520	60.4	V	68.3	-7.9	Peak	325	2.0	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

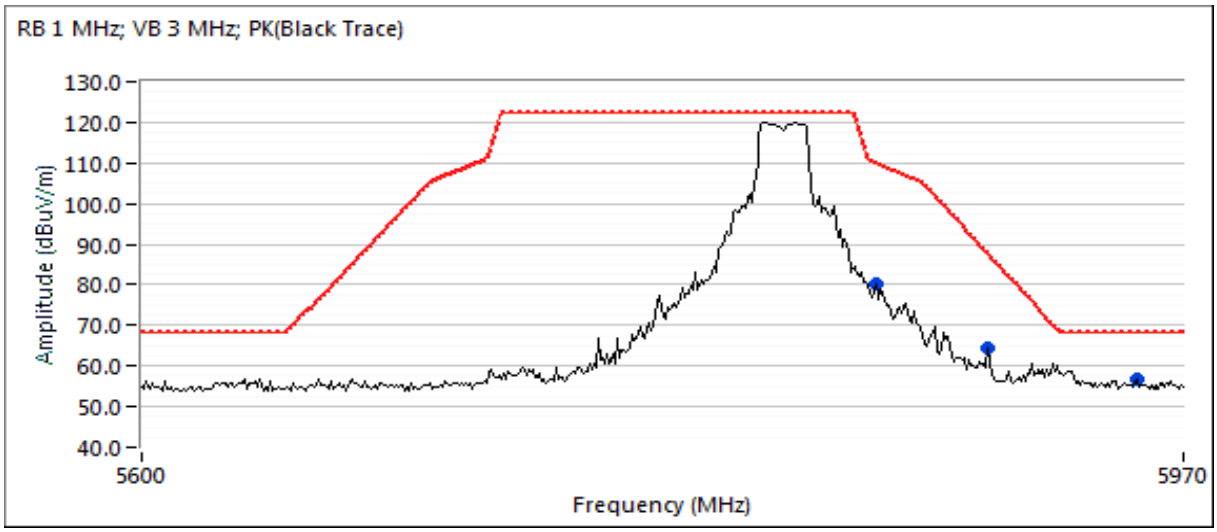
Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Channel: 165 - 5825MHz at 20dBm
Tx Chain: 4
Mode: a

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5850 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5858.040	80.2	V	110.0	-29.8	Peak	51	2.0	POS; RB 1 MHz; VB: 3 MHz
5898.820	64.4	V	87.7	-23.3	Peak	322	2.0	POS; RB 1 MHz; VB: 3 MHz
5952.950	56.9	V	68.3	-11.4	Peak	304	2.0	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #5: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 10/9/2018
Test Engineer: Roy Zheng
Test Location: Fremont Chamber #5

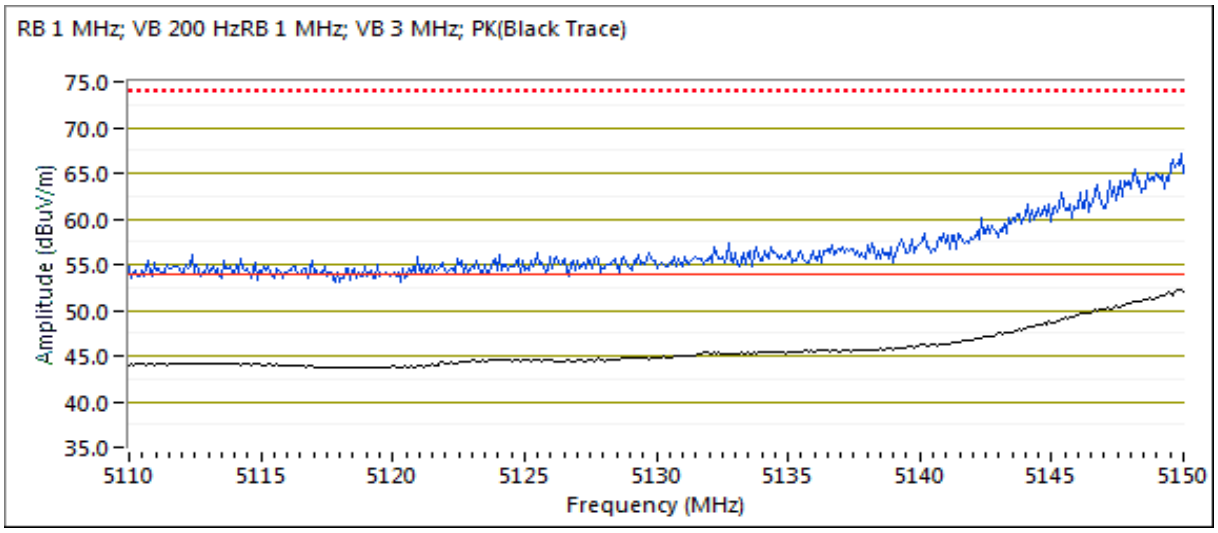
Config. Used: 1
Config Change: none
EUT Voltage: PoE

Channel: 36 - 5180 MHz at 16dBm
Tx Chain: 4Tx
Mode: ax20

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.760	42.5	H	54.0	-11.5	AVG	57	1.2	Note 3; RB 1 MHz; VB: 200 Hz
5148.880	55.9	H	74.0	-18.1	PK	57	1.2	POS; RB 1 MHz; VB: 3 MHz
5149.120	52.8	V	54.0	-1.2	AVG	320	1.4	Note 3; RB 1 MHz; VB: 200 Hz
5149.760	66.6	V	74.0	-7.4	PK	320	1.4	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #5: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 10/9/2018
Test Engineer: Roy Zheng
Test Location: Fremont Chamber #5

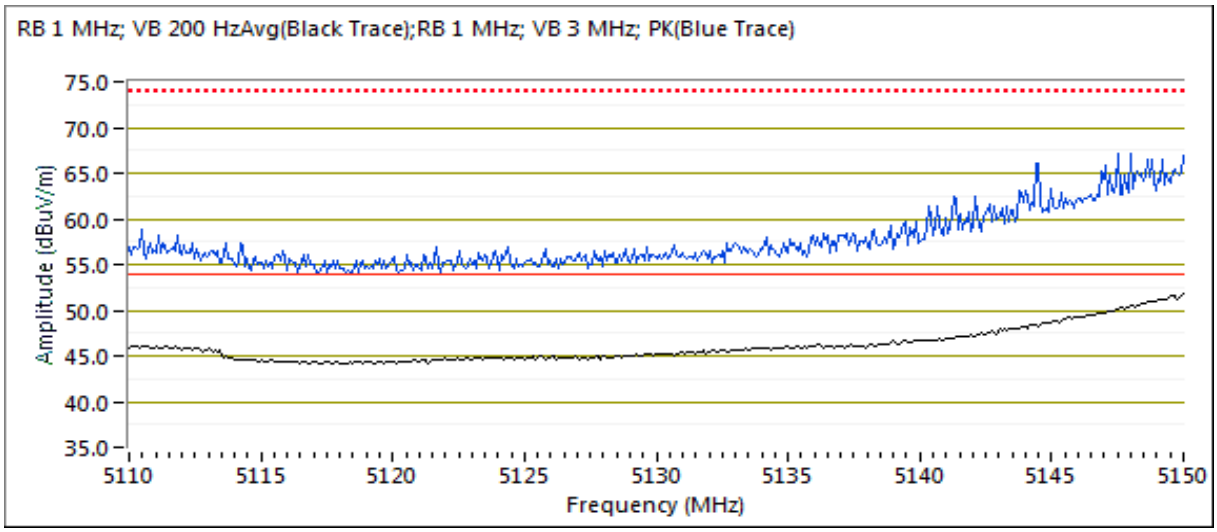
Config. Used: 1
Config Change: none
EUT Voltage: PoE

Channel: 40 - 5200 MHz at 20dBm
Tx Chain: 4Tx
Mode: ax20

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5144.070	66.7	V	74.0	-7.3	PK	309	1.5	POS; RB 1 MHz; VB: 3 MHz
5149.990	53.6	V	54.0	-0.4	VAVG	309	1.5	Note 3; RB 1 MHz; VB: 200 Hz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #8: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 10/9/2018
Test Engineer: Roy Zheng
Test Location: Fremont Chamber #5

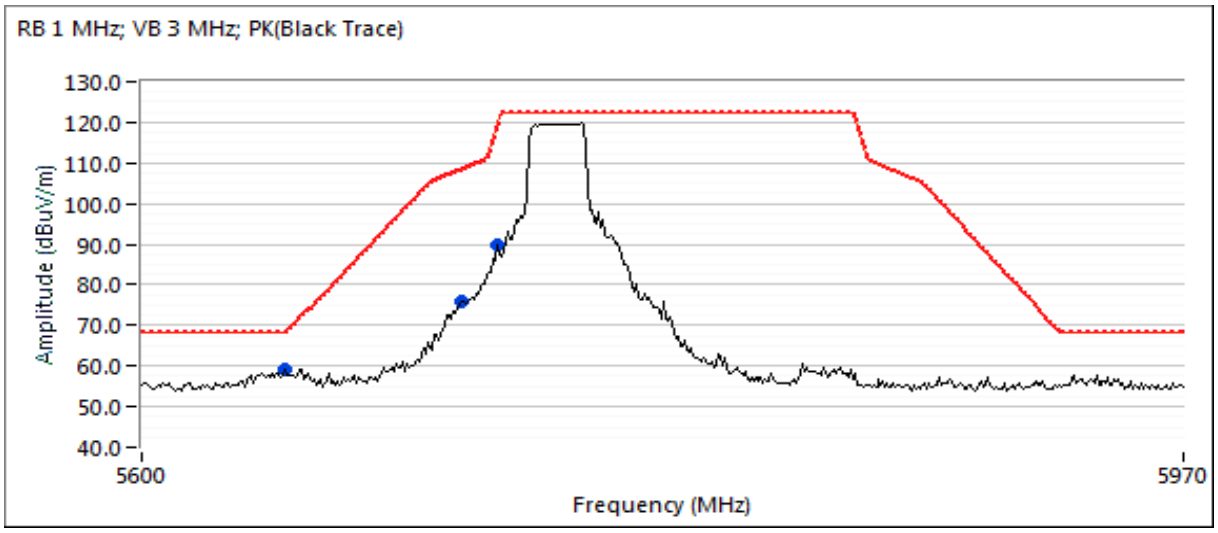
Config. Used: 1
Config Change: none
EUT Voltage: PoE

Channel: 149 - 5745MHz at 20dBm
Tx Chain: 4Tx
Mode: ax20

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5723.830	89.9	V	119.6	-29.7	Peak	50	2.0	POS; RB 1 MHz; VB: 3 MHz
5711.220	75.7	V	108.4	-32.7	Peak	312	1.0	POS; RB 1 MHz; VB: 3 MHz
5649.680	59.2	V	68.3	-9.1	Peak	49	2.0	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

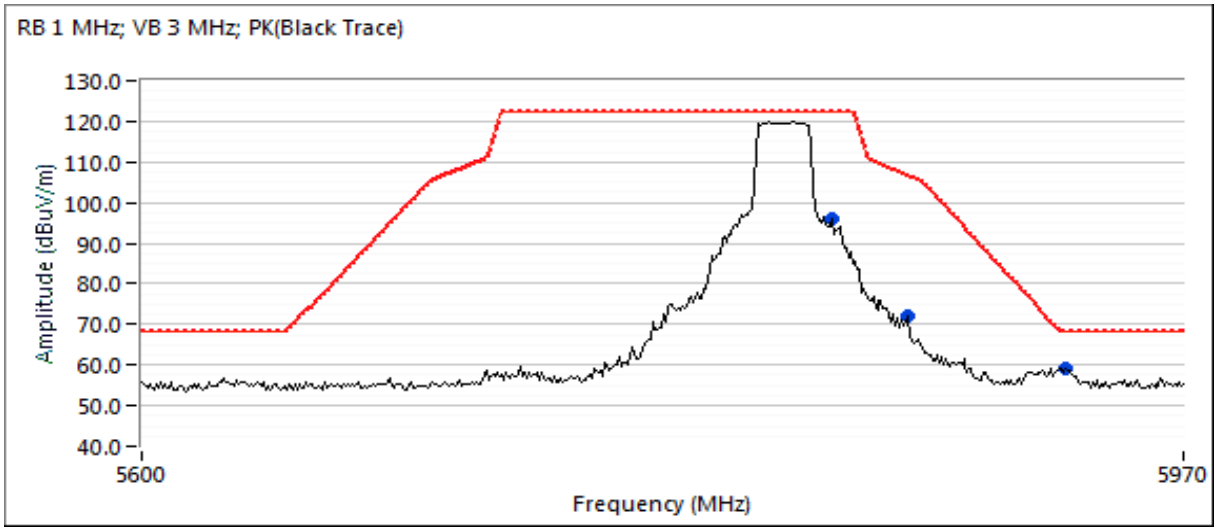
Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Channel: 165 - 5825MHz at 20dBm
Tx Chain: 4
Mode: ax20

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5850 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5842.460	96.1	V	122.3	-26.2	Peak	60	1.5	POS; RB 1 MHz; VB: 3 MHz
5869.900	72.3	V	106.7	-34.4	Peak	315	2.0	POS; RB 1 MHz; VB: 3 MHz
5926.990	59.3	V	68.3	-9.0	Peak	305	1.5	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #9: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 10/9/2018
Test Engineer: Roy Zheng
Test Location: Fremont Chamber #5

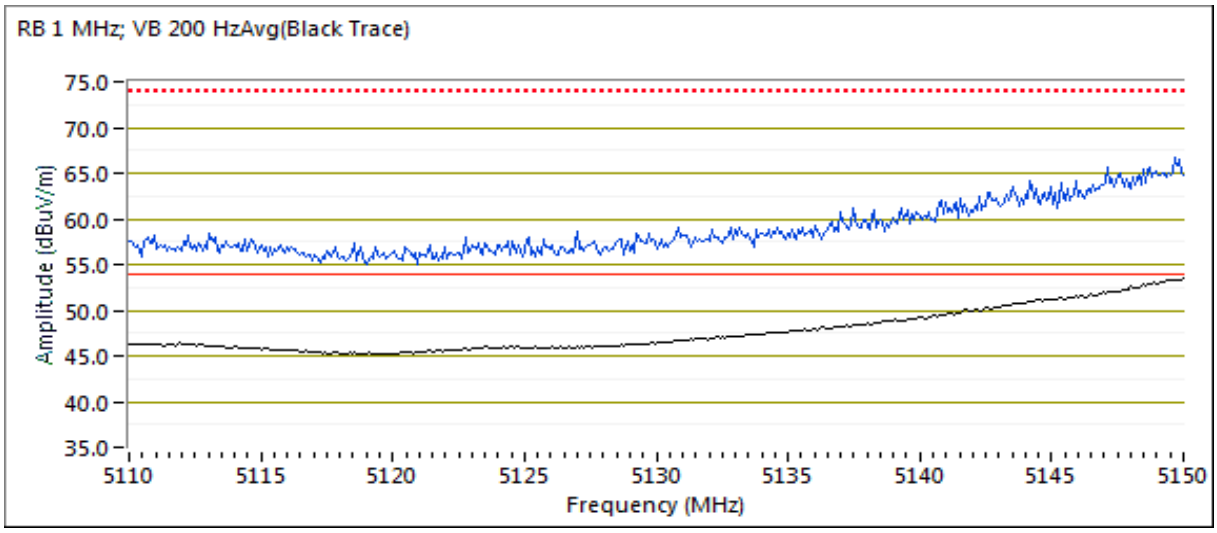
Config. Used: 1
Config Change: none
EUT Voltage: PoE

Channel: 38 - 5190 MHz at 13dBm
Tx Chain: 4Tx
Mode: ax40

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5148.400	41.1	H	54.0	-12.9	AVG	36	1.8	Note 3; RB 1 MHz; VB: 200 Hz
5149.680	53.5	H	74.0	-20.5	PK	36	1.8	POS; RB 1 MHz; VB: 3 MHz
5149.200	65.6	V	74.0	-8.4	PK	314	1.8	POS; RB 1 MHz; VB: 3 MHz
5149.980	53.0	V	54.0	-1.0	AVG	314	1.8	Note 3; RB 1 MHz; VB: 200 Hz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #9: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 10/12/2018
Test Engineer: Rafael Varelas
Test Location: Fremont Chamber #4

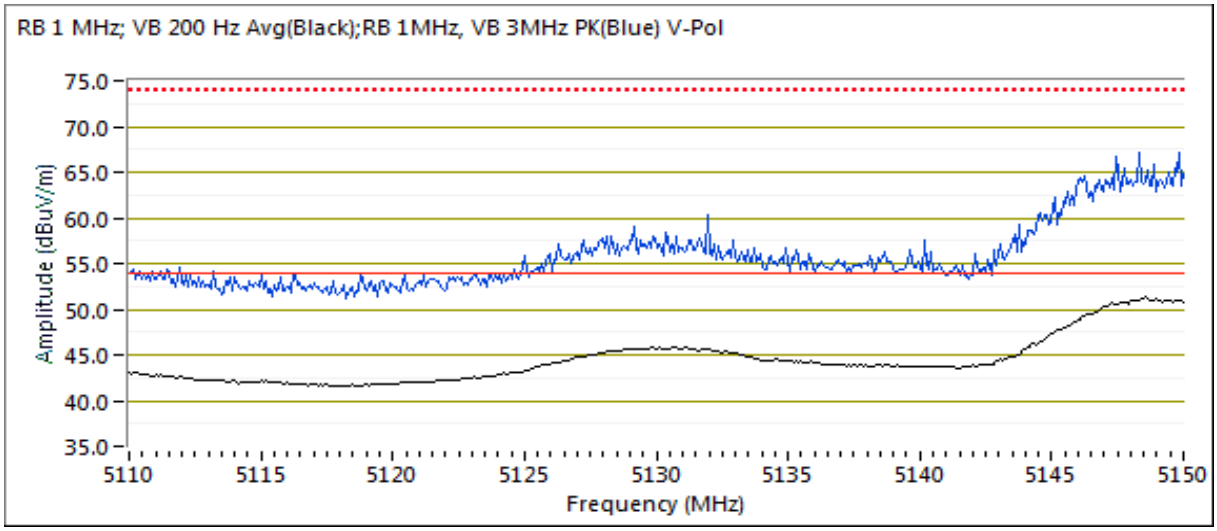
Config. Used: 1
Config Change: none
EUT Voltage: PoE

Channel: 46 - 5230 MHz at 18.5dBm
Tx Chain: 4Tx
Mode: ax40

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5148.620	51.0	V	54.0	-3.0	Avg	209	1.1	Note 3; RB 1 MHz; VB: 200 Hz
5149.940	69.6	V	74.0	-4.4	PK	209	1.1	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #12: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 10/9/2018
Test Engineer: Roy Zheng
Test Location: Fremont Chamber #5

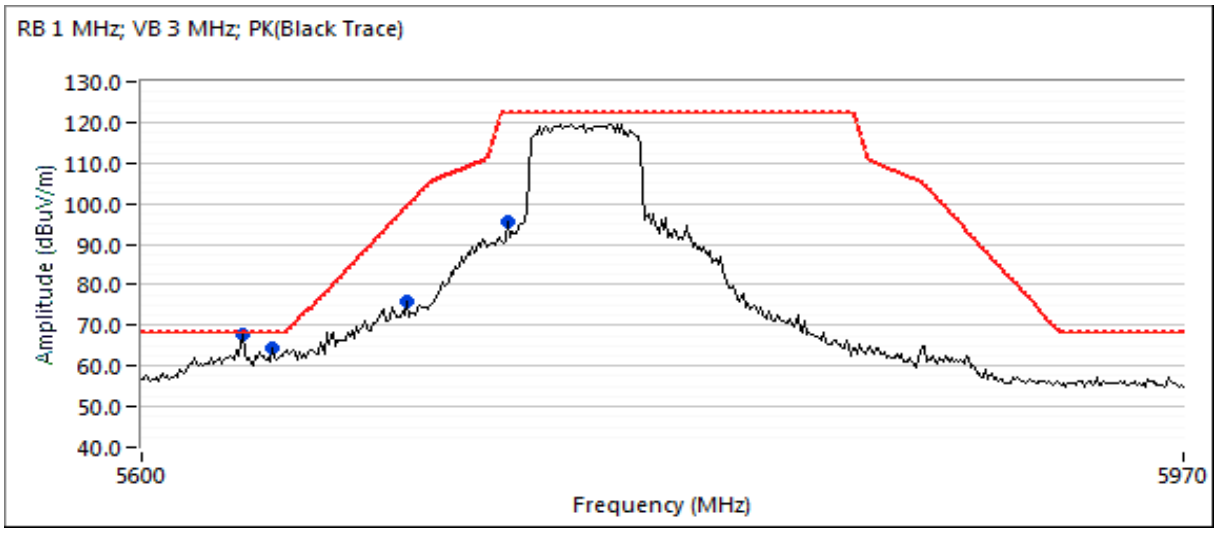
Config. Used: 1
Config Change: none
EUT Voltage: PoE

Channel: 151 - 5755MHz at 19dBm
Tx Chain: 4Tx
Mode: ax40

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5727.540	95.3	V	122.3	-27.0	Peak	310	1.5	POS; RB 1 MHz; VB: 3 MHz
5691.940	75.9	V	99.3	-23.4	Peak	310	1.5	POS; RB 1 MHz; VB: 3 MHz
5645.230	64.6	V	68.3	-3.7	Peak	305	1.5	POS; RB 1 MHz; VB: 3 MHz
5634.790	67.8	V	68.3	-0.5	PK	312	1.2	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

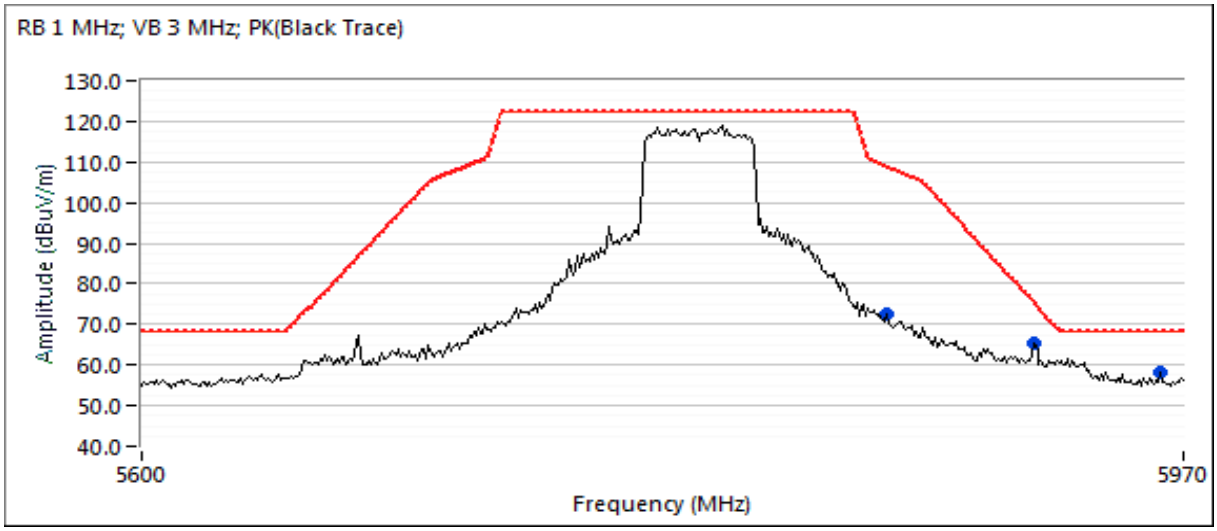
Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Channel: 159 - 5795MHz at 20dBm
Tx Chain: 4Tx
Mode: ax40

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5850 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5862.480	72.5	V	108.8	-36.3	Peak	47	2.0	POS; RB 1 MHz; VB: 3 MHz
5915.130	65.2	V	75.6	-10.4	Peak	50	2.0	POS; RB 1 MHz; VB: 3 MHz
5961.840	58.1	V	68.3	-10.2	Peak	310	2.0	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #13: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 10/9/2018
Test Engineer: Roy Zheng
Test Location: Fremont Chamber #5

Config. Used: 1
Config Change: none
EUT Voltage: PoE

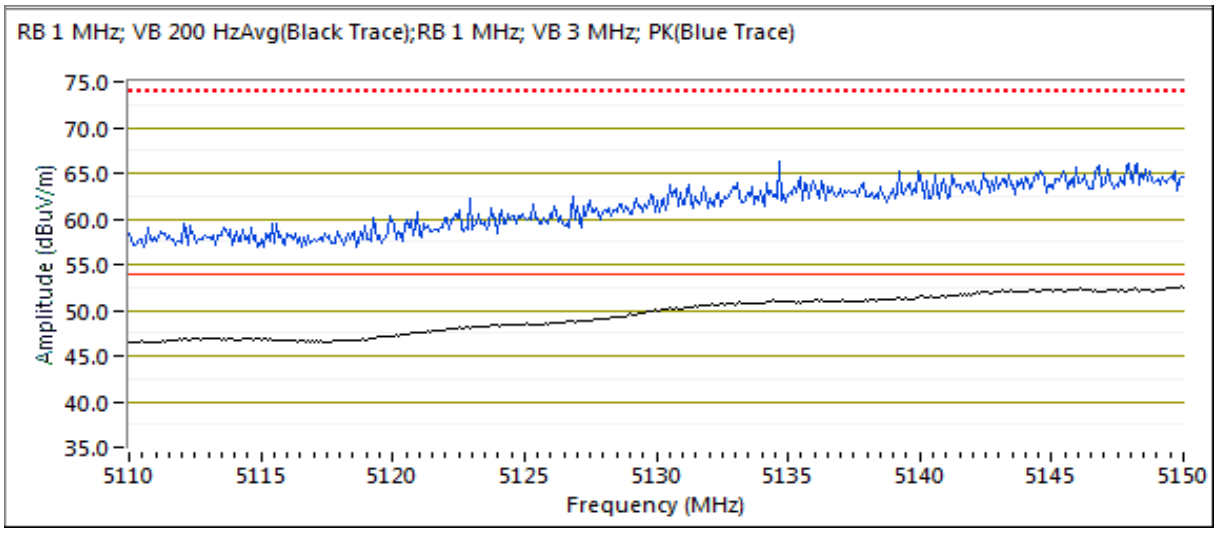
Channel: 42 - 5210MHz at 13dBm
Tx Chain: 4Tx
Mode: ax80

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

ax modes use different # of carriers than n and ac modes, perform remainder of tests in worst case mode, n or ax

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5146.310	43.5	H	54.0	-10.5	AVG	299	1.5	Note 3; RB 1 MHz; VB: 200 Hz
5143.670	55.9	H	74.0	-18.1	PK	299	1.5	POS; RB 1 MHz; VB: 3 MHz
5147.840	68.2	V	74.0	-5.8	PK	306	2.2	POS; RB 1 MHz; VB: 3 MHz
5149.750	52.5	V	54.0	-1.5	AVG	306	2.2	Note 3; RB 1 MHz; VB: 200 Hz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #16: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 10/9/2018
Test Engineer: Roy Zheng
Test Location: Fremont Chamber #5

Config. Used: 1
Config Change: none
EUT Voltage: PoE

Channel: 155 - 5775MHz at 19dBm
Tx Chain: 4Tx
Mode: ax80

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

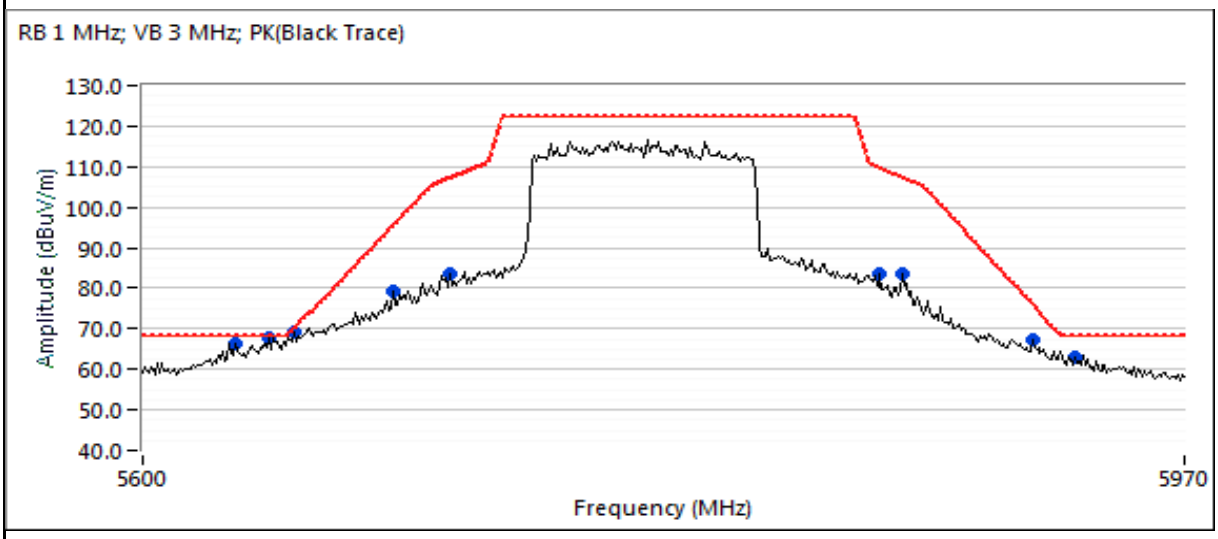
5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5631.880	66.3	V	68.3	-2.0	PK	326	1.5	POS; RB 1 MHz; VB: 3 MHz
5643.750	67.9	V	68.3	-0.4	PK	55	2.5	POS; RB 1 MHz; VB: 3 MHz
5652.650	69.4	V	70.3	-0.9	PK	322	1.5	POS; RB 1 MHz; VB: 3 MHz
5686.750	79.1	V	95.5	-16.4	PK	307	2.5	POS; RB 1 MHz; VB: 3 MHz
5706.770	83.6	V	107.2	-23.6	PK	322	2.5	POS; RB 1 MHz; VB: 3 MHz
5644.070	65.3	V	68.3	-3.0	PK	313	1.9	POS; RB 1 MHz; VB: 3 MHz
5653.150	68.5	V	70.6	-2.1	PK	320	1.1	POS; RB 1 MHz; VB: 3 MHz

5850 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5859.520	83.8	V	109.6	-25.8	PK	58	2.5	POS; RB 1 MHz; VB: 3 MHz
5867.680	83.5	V	107.4	-23.9	PK	69	2.0	POS; RB 1 MHz; VB: 3 MHz
5914.390	67.3	V	76.2	-8.9	PK	305	1.5	POS; RB 1 MHz; VB: 3 MHz
5929.960	63.1	V	68.3	-5.2	PK	304	2.5	POS; RB 1 MHz; VB: 3 MHz

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

RSS-247 and FCC 15.407 (UNII) 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: 23.6 °C
Rel. Humidity: 40 %

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

BLE Sample SN: CNG6K9V019 and Zigbee Sample SN: CNG6K9V00C
Driver: P2 WNC 0.4.3a or 0.4.4
Antenna: AP-ANT-48 Wi-Fi and Integral BLE/ZigBee

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Summary of Results

Run #	Mode	Channel	Target Setting	Final Setting	Test Performed	Limit	Result / Margin
20MHz Bandwith Modes							
1	a	36 - 5180MHz	20.0	16.0	Restricted Band Edge at 5150 MHz	15.209	72.7 dBµV/m @ 5149.3 MHz (-1.3 dB)
		40 - 5200MHz	20.0	20.0	Restricted Band Edge at 5150 MHz		52.8 dBµV/m @ 5149.9 MHz (-1.2 dB)
4		149 - 5745MHz	20.0	20.0	Mask	15E	60.2 dBµV/m @ 5643.8 MHz (-8.1 dB)
		165 - 5825MHz	20.0	20.0	Mask		99.8 dBµV/m @ 5842.5 MHz (-22.5 dB)
5	ax20	36 - 5180MHz	20.0	17.0	Restricted Band Edge at 5150 MHz	15.209	51.2 dBµV/m @ 5150.0 MHz (-2.8 dB)
		40 - 5200MHz	20.0	20.0	Restricted Band Edge at 5150 MHz		52.4 dBµV/m @ 5149.8 MHz (-1.6 dB)
8		149 - 5745MHz	20.0	20.0	Mask	15E	56.9 dBµV/m @ 5608.2 MHz (-11.4 dB)
		165 - 5825MHz	20.0	20.0	Mask		58.3 dBµV/m @ 5912.9 MHz (-18.9 dB)
40MHz Bandwith Modes							
9	ax40	38 - 5190MHz	20.0	14.0	Restricted Band Edge at 5150 MHz	15.209	53.1 dBµV/m @ 5150.0 MHz (-0.9 dB)
		46 - 5230MHz	20.0	18.5	Restricted Band Edge at 5150 MHz		52.0 dBµV/m @ 5149.9 MHz (-2.0 dB)
12		151 - 5755MHz	20.0	20.0	Band Edge 5725 MHz	15E	65.5 dBµV/m @ 5739.99 MHz (-2.8 dB)
		159 - 5795MHz	20.0	20.0	Band Edge 5850MHz		52 dBµV/m @5150 MHz (2.0 dB)
80MHz Bandwith Modes							
13	ax80	42 - 5210MHz	20.0	9.0	Restricted Band Edge at 5150 MHz	15.209	52.3 dBµV/m @5149.75 MHz (-1.7 dB)
16		155 - 5775MHz	17.5	19.0	Band Edge 5725 MHz	15E	67.7 dBµV/m @5649.18 MHz (-0.6 dB)
		155 - 5775MHz	17.5	19.0	Band Edge 5850MHz		61.6 dBµV/m @5942.56 MHz (-6.7 dB)

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Procedure Comments:

Measurements performed in accordance with FCC KDB 789033
Limits from 15.209 instead of 15.407(b)(1-3) acceptable until January 1, 2019 per FCC KDB 789033 D01
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)

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
11a	MCS0	92.3%	Yes	1.4	0.3	0.7	698
11ax20	MCS0	95.6%	Yes	5.4	0.2	0.4	184
11ax40	MCS0	95.9%	Yes	5.4	0.2	0.4	184
11ax80	MCS0	94.9%	Yes	5.4	0.2	0.5	185
11ac80+80	MCS0	96.5%	Yes	5.4	0.2	0.3	184

Measurement Specific Notes:

Note 1:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector). Per KDB 789033 2) c) (i), compliance can be demonstrated by meeting the average and peak limits of 15.209, as an alternative.
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 5:	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:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #1: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 10/5/2018 — Config. Used: 1

Test Engineer: Roy Zheng — Config Change: none

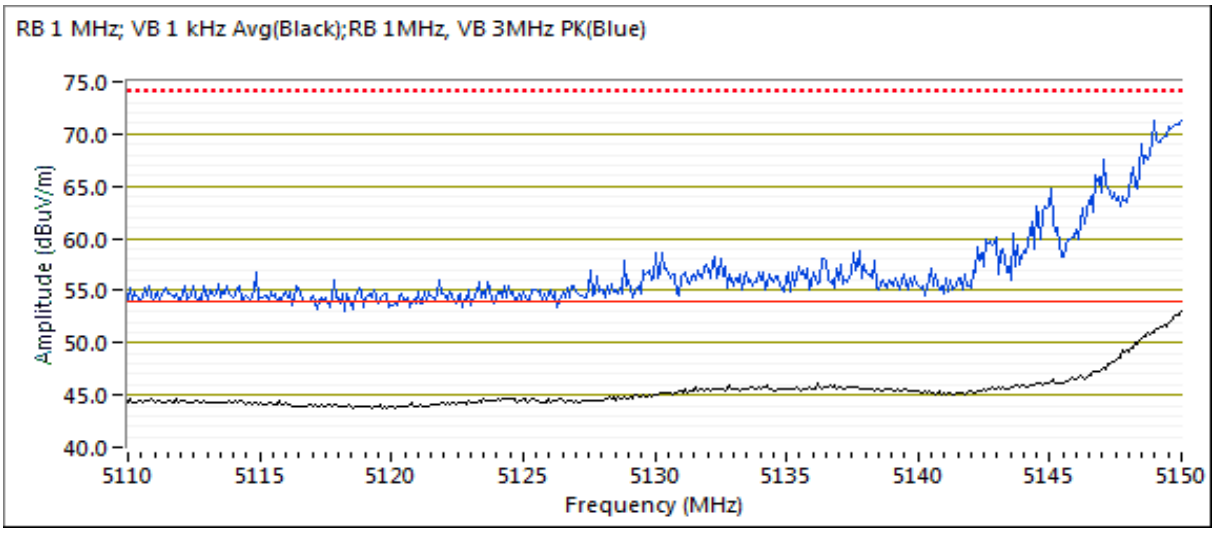
Test Location: Fremont Chamber #5 — EUT Voltage: PoE & 120V/60Hz

Channel: 36 - 5180 MHz at 16dBm — Mode: BLE at 8 dBm

Tx Chain: 4Tx — Mode: a — Ch.Freq.: 2440 MHz

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5150.000	52.4	H	54.0	-1.7	AVG	347	1.6	Note 3; RB 1 MHz; VB: 1 kHz
5148.880	71.5	H	74.0	-2.5	PK	347	1.6	POS; RB 1 MHz; VB: 3 MHz
5149.920	50.6	V	54.0	-3.6	AVG	13	1.0	Note 3; RB 1 MHz; VB: 1 kHz
5149.310	72.7	V	74.0	-1.3	PK	13	1.0	POS; RB 1 MHz; VB: 3 MHz



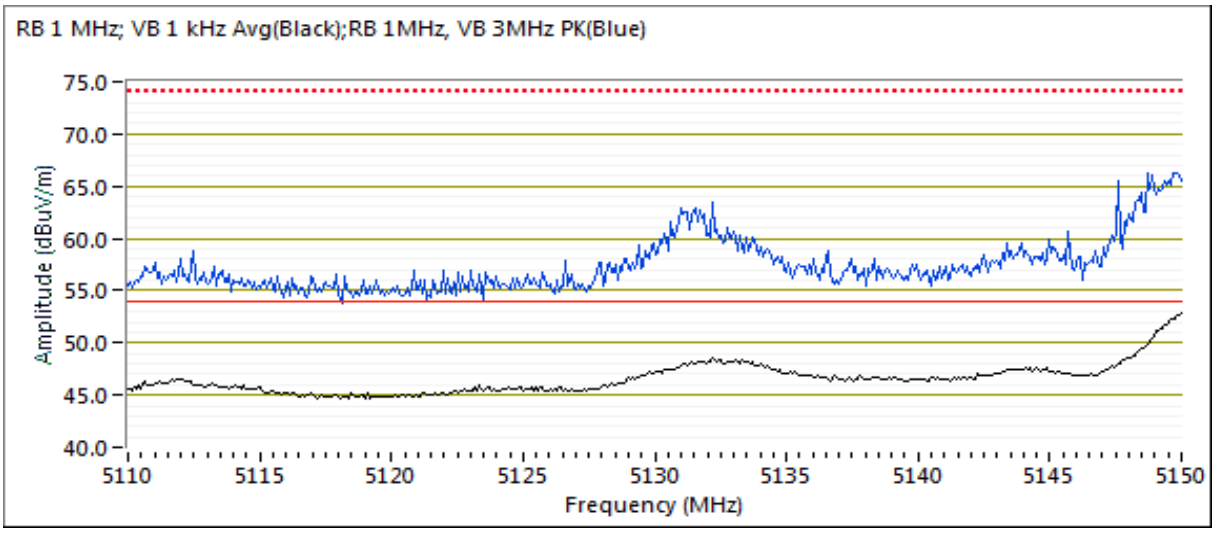
EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Channel: 40 - 5200 MHz at 20dBm Mode: BLE at 8 dBm
Tx Chain: 4Tx Mode: a Ch.Freq.: 2440 MHz

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.880	52.8	H	54.0	-1.2	AVG	12	1.8	Note 3; RB 1 MHz; VB: 1 kHz
5149.840	68.6	H	74.0	-5.4	PK	9	2.0	POS; RB 1 MHz; VB: 3 MHz
5148.990	50.4	V	54.0	-3.6	AVG	360	1.0	Note 3; RB 1 MHz; VB: 1 kHz
5149.680	68.6	V	74.0	-5.4	PK	360	1.0	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #4: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 10/5/2018 — Config. Used: 1

Test Engineer: Roy Zheng — Config Change: none

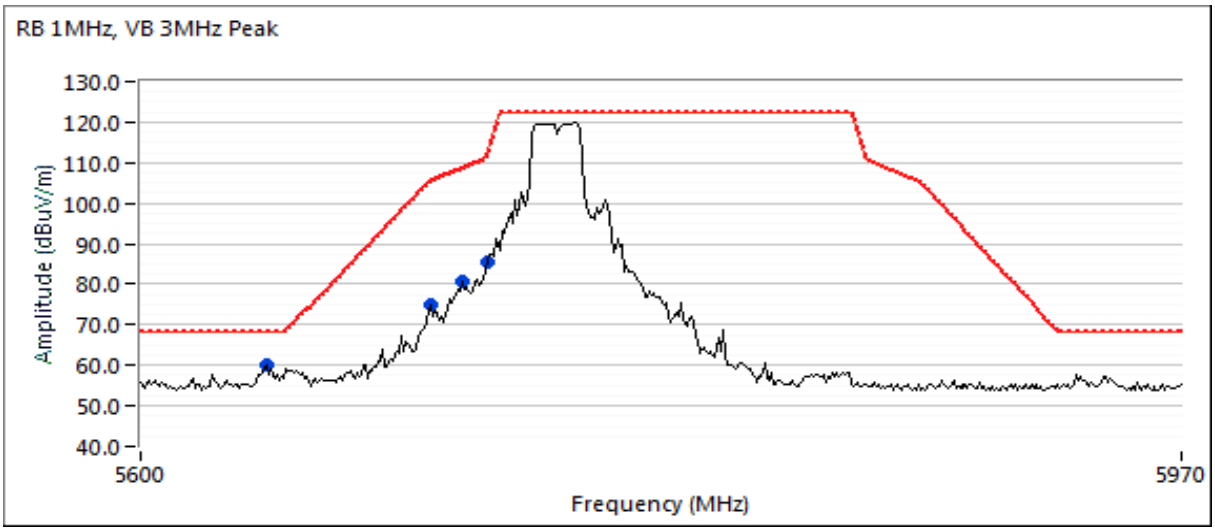
Test Location: Fremont Chamber #5 — EUT Voltage: PoE & 120V/60Hz

Channel: 149 - 5745MHz at 20dBm — Mode: BLE at 8 dBm

Tx Chain: 4Tx — Mode: a — Ch.Freq.: 2440 MHz

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5643.750	60.2	V	68.3	-8.1	Peak	0	2.0	POS; RB 1 MHz; VB: 3 MHz
5720.860	85.5	V	112.9	-27.4	Peak	358	2.5	POS; RB 1 MHz; VB: 3 MHz
5711.960	80.5	H	108.6	-28.1	Peak	355	2.0	POS; RB 1 MHz; VB: 3 MHz
5700.840	75.0	V	105.5	-30.5	Peak	2	2.0	POS; RB 1 MHz; VB: 3 MHz



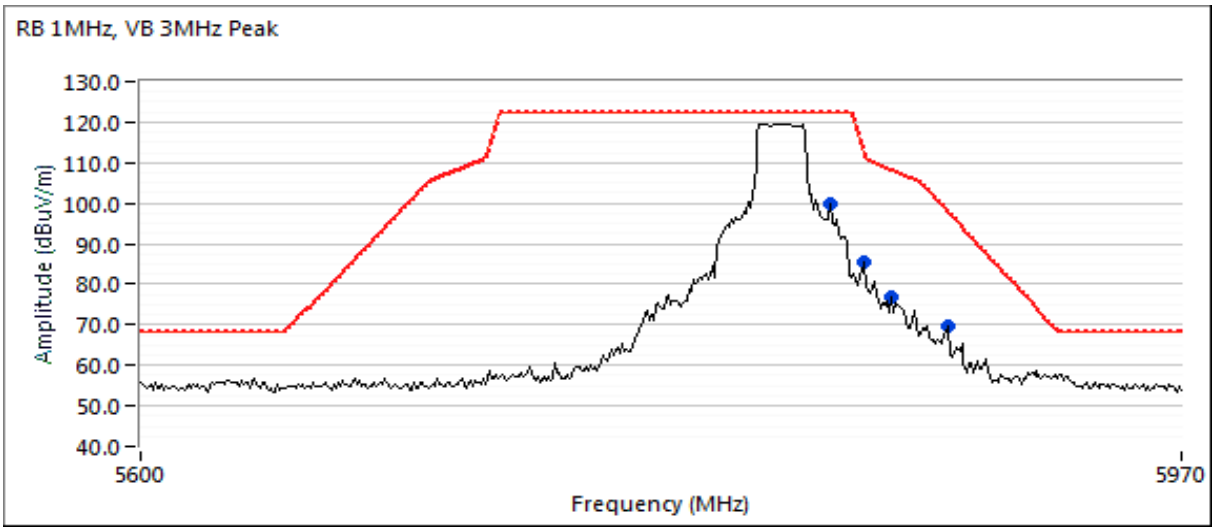
EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Channel: 165 - 5825MHz at 20dBm Mode: BLE at 8 dBm
Tx Chain: 4Tx Mode: a Ch.Freq.: 2440 MHz

5850 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5842.460	99.8	V	122.3	-22.5	Peak	358	2.5	POS; RB 1 MHz; VB: 3 MHz
5854.330	85.6	H	112.4	-26.8	Peak	360	2.0	POS; RB 1 MHz; VB: 3 MHz
5884.730	69.5	V	98.1	-28.6	Peak	353	2.0	POS; RB 1 MHz; VB: 3 MHz
5864.710	77.1	V	108.2	-31.1	Peak	349	2.0	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #5: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 10/5/2018 — Config. Used: 1

Test Engineer: Roy Zheng — Config Change: none

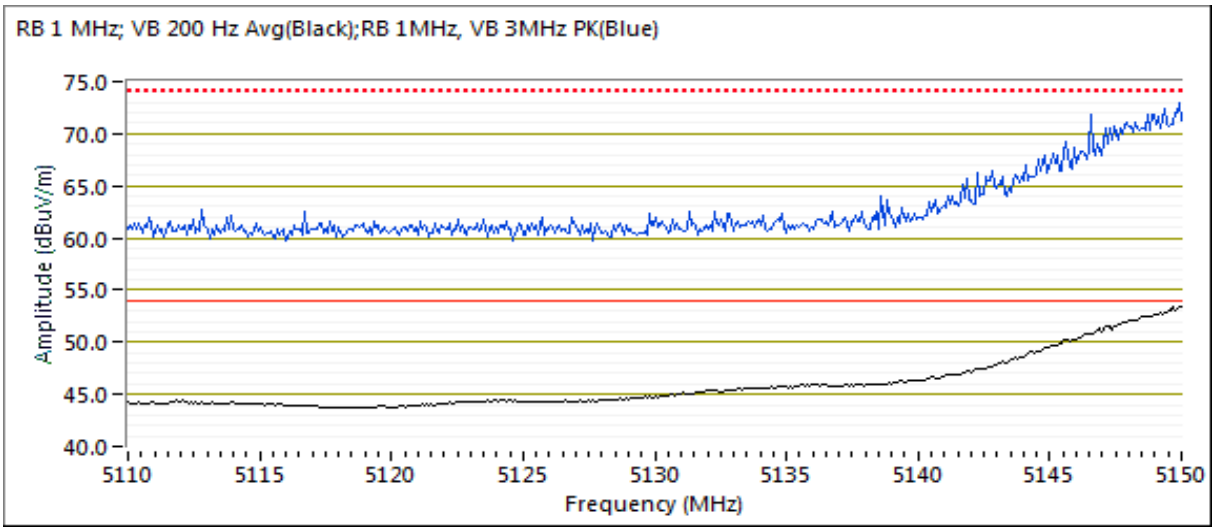
Test Location: Fremont Chamber #5 — EUT Voltage: PoE & 120V/60Hz

Channel: 36 - 5180 MHz @ 17.0dBm — Mode: BLE at 8 dBm

Tx Chain: 4Tx — Mode: ax20 — Ch.Freq.: 2440 MHz

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5150.000	51.2	V	54.0	-2.8	AVG	22	1.4	Note 3; RB 1 MHz; VB: 1 kHz
5148.240	66.1	V	74.0	-7.9	PK	22	1.4	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Date of Test: 10/5/2018
Test Engineer: Rafael Varelas
Test Location: Fremont Chamber #5

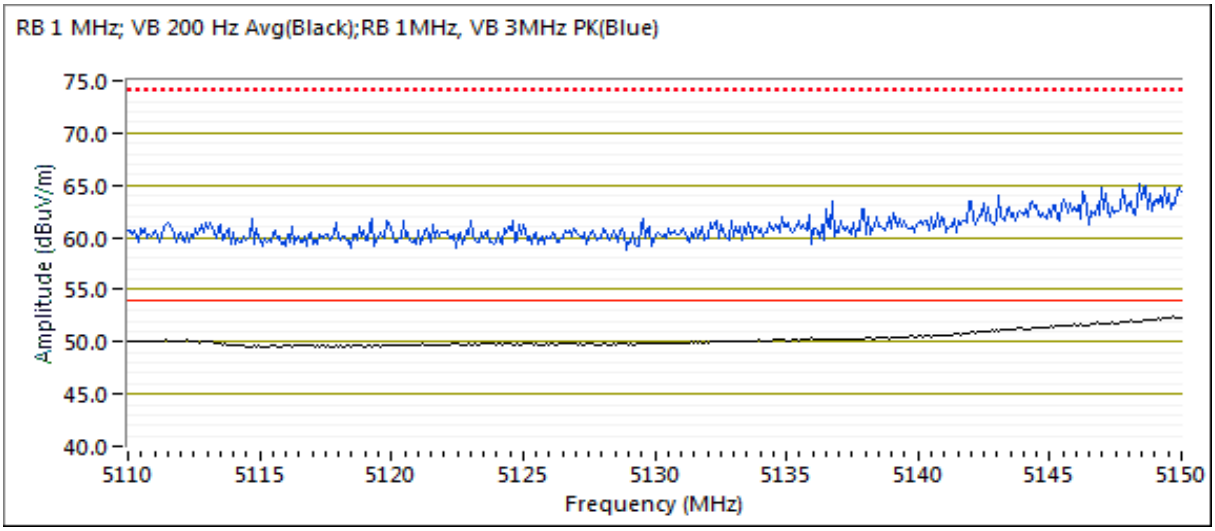
Config. Used: 1
Config Change: none
EUT Voltage: PoE & 120V/60Hz

Channel: 40 - 5200 MHz @ 20.0dBm
Tx Chain: 4Tx
Mode: ax20

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.750	52.4	H	54.0	-1.6	Avg	0	1.1	Note 3; RB 1 MHz; VB: 200 Hz
5149.770	66.5	H	74.0	-7.5	PK	0	1.1	POS; RB 1 MHz; VB: 3 MHz
5149.960	49.5	V	54.0	-4.5	Avg	5	1.9	Note 3; RB 1 MHz; VB: 200 Hz
5149.080	63.4	V	74.0	-10.6	PK	5	1.9	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #8: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 10/5/2018
Test Engineer: Roy Zheng
Test Location: Fremont Chamber #5

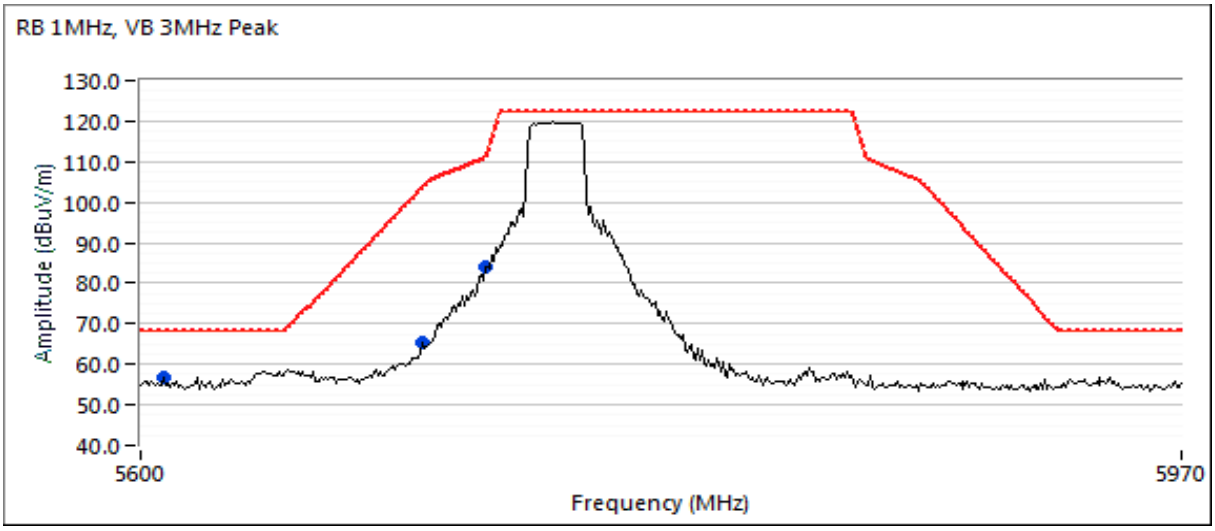
Config. Used: 1
Config Change: none
EUT Voltage: PoE & 120V/60Hz

Channel: 149 - 5745MHz @ 20.0dBm
Tx Chain: 4Tx
Mode: ax20

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5608.160	56.9	H	68.3	-11.4	Peak	5	2.0	POS; RB 1 MHz; VB: 3 MHz
5720.120	84.0	V	111.2	-27.2	Peak	0	2.0	POS; RB 1 MHz; VB: 3 MHz
5697.880	65.4	V	103.7	-38.3	Peak	358	2.5	POS; RB 1 MHz; VB: 3 MHz



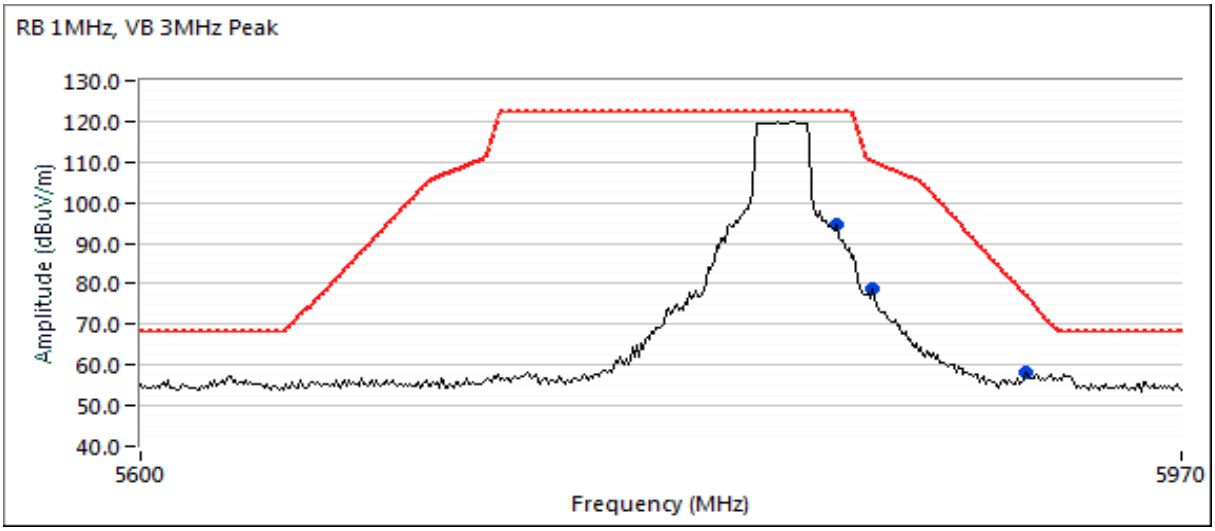
EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Channel: 165 - 5825MHz @ 20.0dBm Mode: BLE at 8 dBm
Tx Chain: 4Tx Mode: ax20 Ch.Freq.: 2440 MHz

5850 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5912.910	58.3	V	77.2	-18.9	Peak	342	1.5	POS; RB 1 MHz; VB: 3 MHz
5844.690	94.5	H	122.3	-27.8	Peak	13	1.5	POS; RB 1 MHz; VB: 3 MHz
5857.290	78.6	V	110.3	-31.7	Peak	338	1.5	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #9: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 10/5/2018 — Config. Used: 1

Test Engineer: Rafael Varelas — Config Change: none

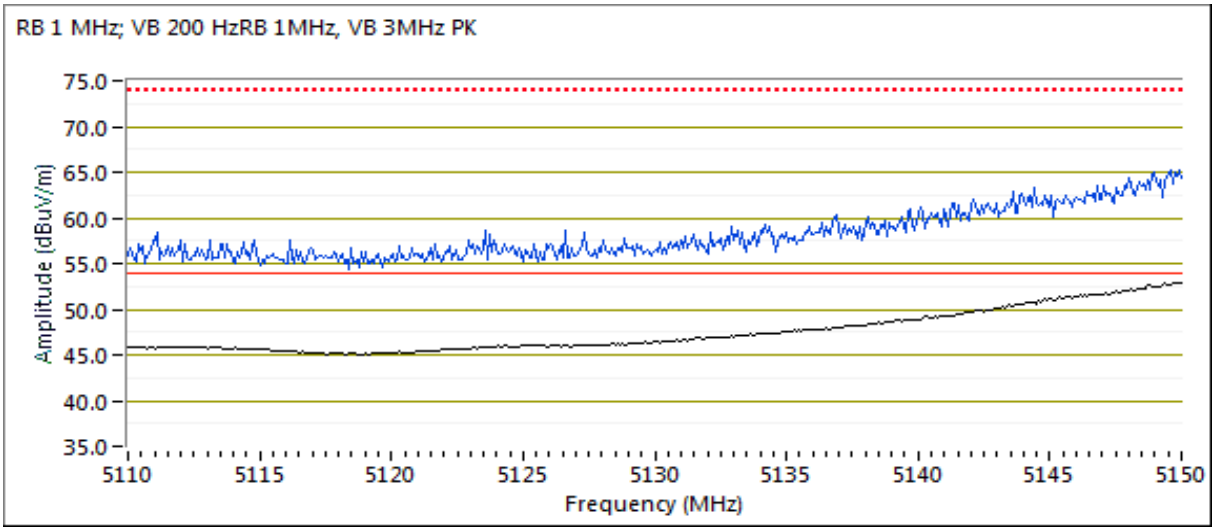
Test Location: Fremont Chamber #5 — EUT Voltage: PoE & 120V/60Hz

Channel: 38 - 5190MHz @ 14.0dBm — Mode: BLE at 8 dBm

Tx Chain: 4Tx — Mode: ax40 — Ch.Freq.: 2440 MHz

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5150.000	53.1	H	54.0	-0.9	Avg	344	1.6	Note 3; RB 1 MHz; VB: 200 Hz
5150.000	66.3	H	74.0	-7.7	PK	344	1.6	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Date of Test: 11/1/2018
Test Engineer: Rafael Varelas
Test Location: Fremont Chamber #4

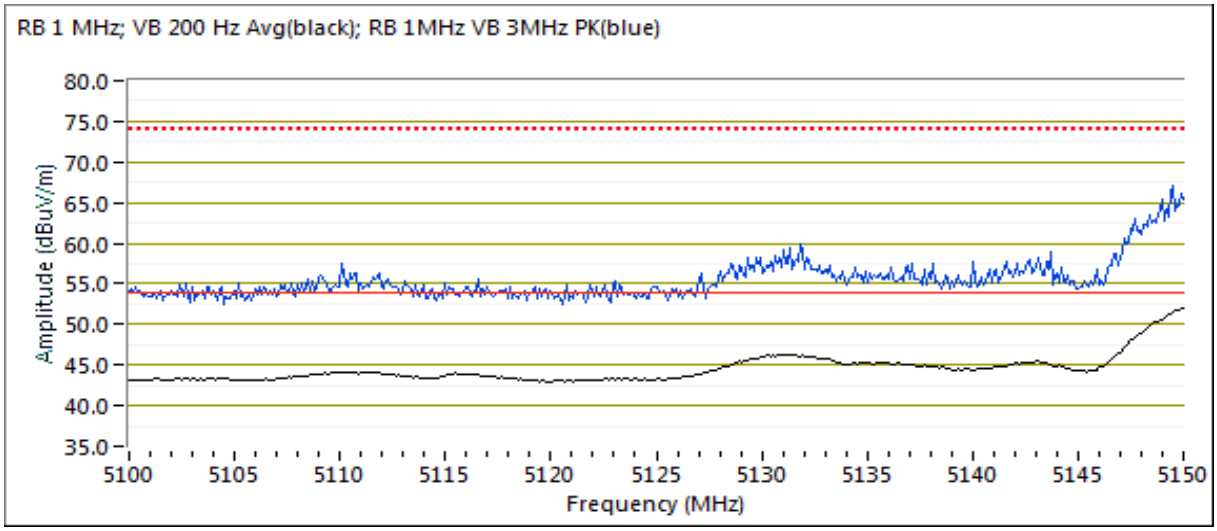
Config. Used: 1
Config Change: none
EUT Voltage: PoE & 120V/60Hz

Channel: 46 - 5230MHz @18.5dBm
Tx Chain: 4Tx
Mode: ax40

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.930	52.0	H	54.0	-2.0	Avg	194	1.1	Note 3; RB 1 MHz; VB: 200 Hz
5149.980	68.9	H	74.0	-5.1	PK	194	1.1	POS; RB 1 MHz; VB: 3 MHz
5146.690	51.1	V	54.0	-2.9	Avg	195	1.4	Note 3; RB 1 MHz; VB: 200 Hz
5145.410	66.8	V	74.0	-7.2	PK	195	1.4	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #12: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 10/5/2018 — Config. Used: 1

Test Engineer: Roy Zheng — Config Change: none

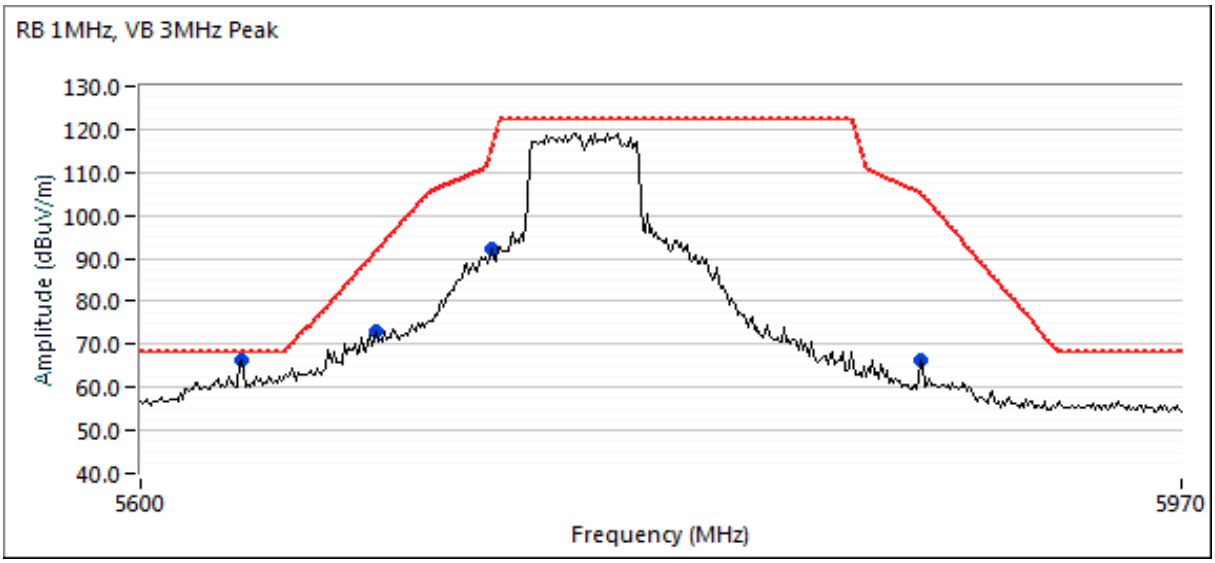
Test Location: Fremont Chamber #5 — EUT Voltage: PoE & 120V/60Hz

Channel: 151 - 5755MHz at 20dBm — Mode: BLE at 8 dBm

Tx Chain: 4Tx — Mode: ax40 — Ch.Freq.: 2440 MHz

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5722.340	92.3	V	116.2	-23.9	Peak	0	2.0	POS; RB 1 MHz; VB: 3 MHz
5681.560	73.1	V	91.7	-18.6	Peak	1	2.0	POS; RB 1 MHz; VB: 3 MHz
5875.090	66.4	V	105.2	-38.8	Peak	5	2.5	POS; RB 1 MHz; VB: 3 MHz
5635.050	67.6	H	68.3	-0.7	Peak	349	2.0	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Date of Test: 10/5/2018
Test Engineer: Roy Zheng
Test Location: Fremont Chamber #5

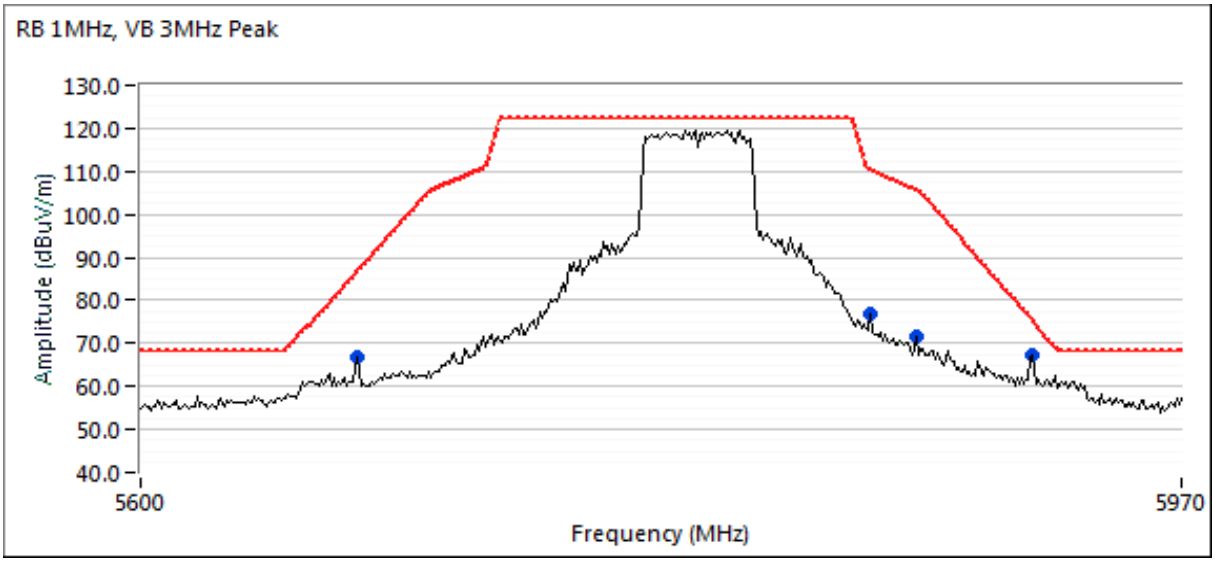
Config. Used: 1
Config Change: none
EUT Voltage: PoE & 120V/60Hz

Channel: 159 - 5795MHz at 20dBm
Tx Chain: 4Tx
Mode: ax40

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz

5850 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5674.890	67.0	H	86.7	-19.7	Peak	345	1.5	POS; RB 1 MHz; VB: 3 MHz
5856.550	76.7	H	110.5	-33.8	Peak	356	2.0	POS; RB 1 MHz; VB: 3 MHz
5873.610	71.8	H	105.7	-33.9	Peak	2	1.5	POS; RB 1 MHz; VB: 3 MHz
5915.130	67.4	V	75.6	-8.2	Peak	11	1.5	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #13: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 10/8/2018 — Config. Used: 1

Test Engineer: Roy Zheng — Config Change: none

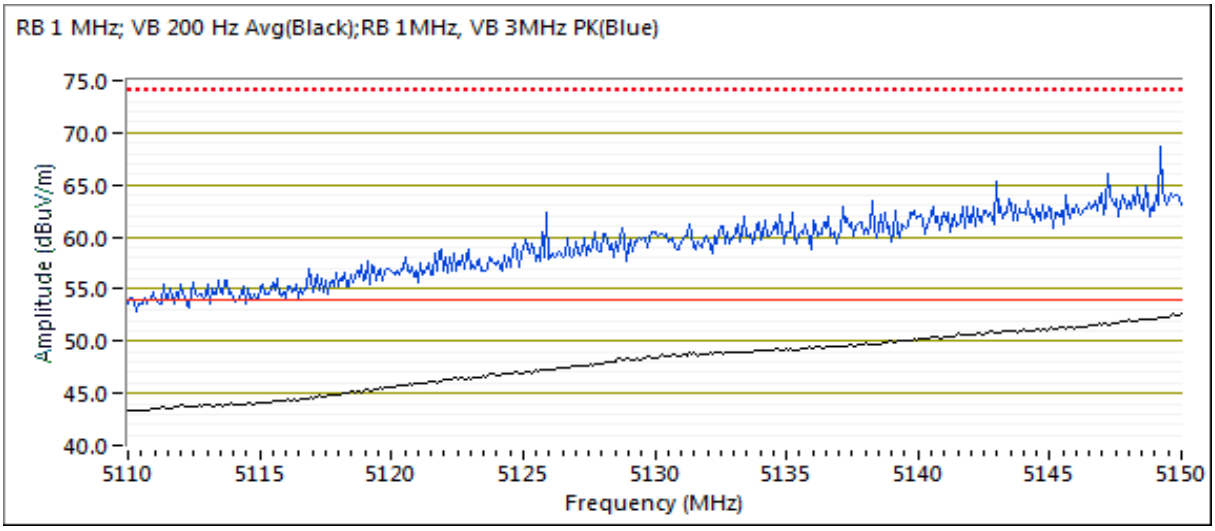
Test Location: Fremont Chamber #5 — EUT Voltage: PoE & 120V/60Hz

Channel: 42 - 5210MHz at 9dBm — Mode: BLE at 8 dBm

Tx Chain: 4Tx — Mode: ax80 — Ch.Freq.: 2440 MHz

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5148.000	67.5	H	74.0	-6.5	PK	347	1.8	POS; RB 1 MHz; VB: 3 MHz
5149.750	52.3	H	54.0	-1.7	VAVG	347	1.8	Note 3; RB 1 MHz; VB: 200 Hz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #16: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 10/5/2018 — Config. Used: 1

Test Engineer: Roy Zheng — Config Change: none

Test Location: Fremont Chamber #5 — EUT Voltage: PoE & 120V/60Hz

Channel: 155 - 5775MHz at 19dBm — Mode: BLE at 8 dBm

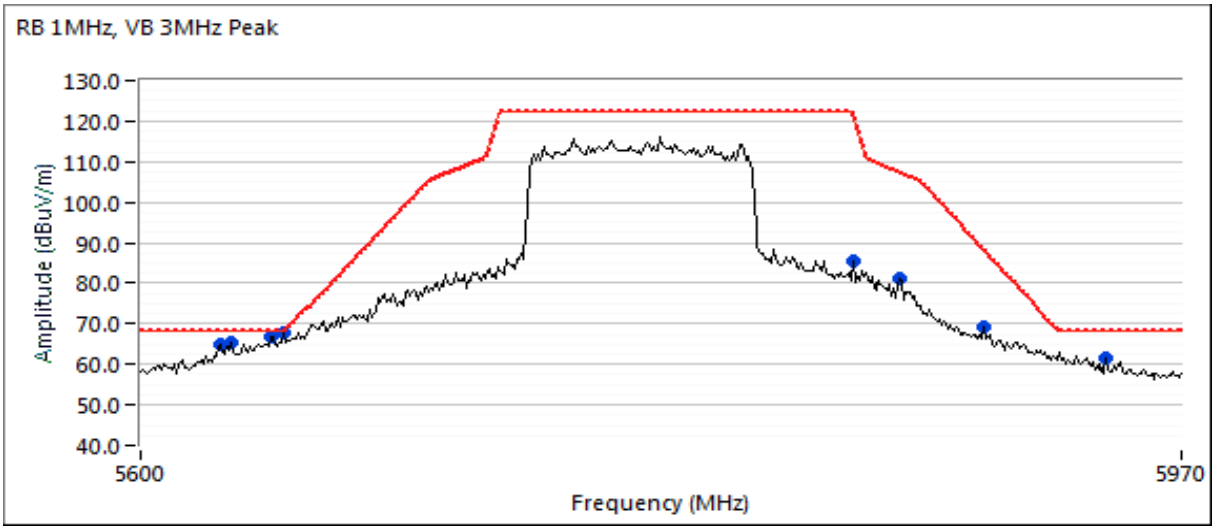
Tx Chain: 4Tx — Mode: ax80 — Ch.Freq.: 2440 MHz

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5631.140	65.3	H	68.3	-3.0	Peak	344	2.0	POS; RB 1 MHz; VB: 3 MHz
5649.180	67.7	H	68.3	-0.6	Peak	348	2.4	POS; RB 1 MHz; VB: 3 MHz
5645.230	66.3	H	68.3	-1.5	Peak	348	2.4	POS; RB 1 MHz; VB: 3 MHz
5631.830	64.4	H	68.3	-2.9	Peak	348	2.4	POS; RB 1 MHz; VB: 3 MHz
5627.640	65.1	V	68.3	-3.2	Peak	348	2.1	POS; RB 1 MHz; VB: 3 MHz

5850 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5850.620	85.6	H	120.9	-35.3	Peak	6	2.0	POS; RB 1 MHz; VB: 3 MHz
5867.680	81.3	H	107.4	-26.1	Peak	6	1.5	POS; RB 1 MHz; VB: 3 MHz
5898.080	69.1	H	88.2	-19.1	Peak	345	2.0	POS; RB 1 MHz; VB: 3 MHz
5942.560	61.6	H	68.3	-6.7	Peak	351	2.0	POS; RB 1 MHz; VB: 3 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	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: 38-42 %

Summary of Results

Run #	Mode	Channel	Power Settings		Test Performed	Limit	Result / Margin
Scans on "center" channel in all five OFDM modes to determine the worst case mode.							
1	a / g, BLE	6, 40 Wi-Fi 37 - BLE	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	43.4 dBµV/m @ 20795.3 MHz (-10.6 dB)
	ax20, BLE	6, 40 Wi-Fi 17 - BLE	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	41.9 dBµV/m @ 4879.91 MHz (-12.1 dB)
	ax40, BLE	6, 38 Wi-Fi 39 - BLE	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	46.8 dBµV/m @ 20769.33 MHz (-7.2 dB)
	ax80 / b	6 & 42	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	44.9 dBµV/m @ 9747.87 MHz (-9.1 dB)

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #	Mode	Channel	Power Settings		Test Performed	Limit	Result / Margin
Scans on worst case mode above with BLE or ZigBee also active.							
2	ax40 / b, ZigBee	6, 46 Wi-Fi 11 - ZB	20 / 20 / 8	20 / 20 / 8	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	50.0 dBµV/m @ 9747.9 MHz (-4.0 dB)
	ax40 / b, BLE	6, 46 Wi-Fi 37 - BLE	20 / 20 / 8	20 / 20 / 8	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	38.1 dBµV/m @ 4803.8 MHz (-15.9 dB)
40MHz - use if worse case from 1 & 2 but must do highest 20 MHz channel also							
3	ax40, BLE	3, 38 Wi-Fi 37 - BLE	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	51.7 dBµV/m @ 20930.08 MHz (-2.3 dB)
	ax20, BLE	11, 48 Wi-Fi 39 - BLE	20	19.5	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	44.8 dBµV/m @ 20978.09 MHz (-9.2 dB)
Scans on "center" channel in all four OFDM modes to determine the worst case mode.. No ac160 mode in this band.							
8	a / g, BLE	6, 157 Wi-Fi 37 - BLE	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	53.4 dBµV/m @ 17356.8 MHz (-1.9 dB)
	ax20, BLE	6, 157 Wi-Fi 17 - BLE	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	62.2 dBµV/m @ 17362.4 MHz (-6.1 dB)
	ax40, BLE	6, 159 Wi-Fi 39 - BLE	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	66.3 dBµV/m @ 17375.5 MHz (-2.0 dB)
	ac80 / b, BLE	6, 155 Wi-Fi 17 - BLE	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	58.6 dBµV/m @ 17333.5 MHz (-9.7 dB)
Measurements on low and high channels in worst-case OFDM mode.							
9	ax40	3, 151 Wi-Fi 37 - BLE	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	66.1 dBµV/m @ 17272.5 MHz (-2.2 dB)
	ax20	11, 165 Wi-Fi 39 - BLE	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	59.0 dBµV/m @ 23305.4 MHz (-9.3 dB)

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #	Mode	Channel	Power Settings		Test Performed	Limit	Result / Margin
10	BLE	37	8	8	Radiated Emissions, 1 - 25 GHz	FCC 15.209/ 15.247	40.9 dBµV/m @ 4803.850 MHz (-13.1 dB)
		17	8	8	Radiated Emissions, 1 - 25 GHz	FCC 15.209/ 15.247	44.3 dBµV/m @ 4879.97 MHz (-9.7 dB)
		39	8	8	Radiated Emissions, 1 - 25 GHz	FCC 15.209/ 15.247	41.3 dBµV/m @ 5999.99 MHz (-12.7 dB)
11	ZigBee	11	8	8	Radiated Emissions, 1 - 25 GHz	FCC 15.209/ 15.247	31.4 dBµV/m @ 2893.6 MHz (-22.6 dB)
		18	8	8	Radiated Emissions, 1 - 25 GHz	FCC 15.209/ 15.247	44.1 dBµV/m @ 7321.5 MHz (-9.9 dB)
		26	8	8	Radiated Emissions, 1 - 25 GHz	FCC 15.209/ 15.247	40.9 dBµV/m @ 9474.5 MHz (-13.1 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:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Procedure Comments:

Measurements performed in accordance with FCC KDB 789033
Limits from 15.209 instead of 15.407(b)(1-3) acceptable until January 1, 2019 per FCC KDB 789033 D01
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)

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
ZigBee	250 kb/s	0.43	Yes	0.863	3.7	7.4	1159
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
11a	MCS0	92.3%	Yes	1.4	0.3	0.7	698
11ax20	MCS0	95.6%	Yes	5.4	0.2	0.4	184
11ax40	MCS0	95.9%	Yes	5.4	0.2	0.4	184
11ax80	MCS0	94.9%	Yes	5.4	0.2	0.5	185
11ac80+80	MCS0	96.5%	Yes	5.4	0.2	0.3	184

Sample Notes

BLE Sample SN: CNG6K9W00R and Zigbee Sample SN: CNG6K9W01F
Driver: P2 WNC 0.4.4
Antenna: Integral. 4 antennas for 5 GHz radio and 4 antennas for 2.4 GHz radio.

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 (RB=1MHz, VB≥3MHz, peak detector).
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 5:	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:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

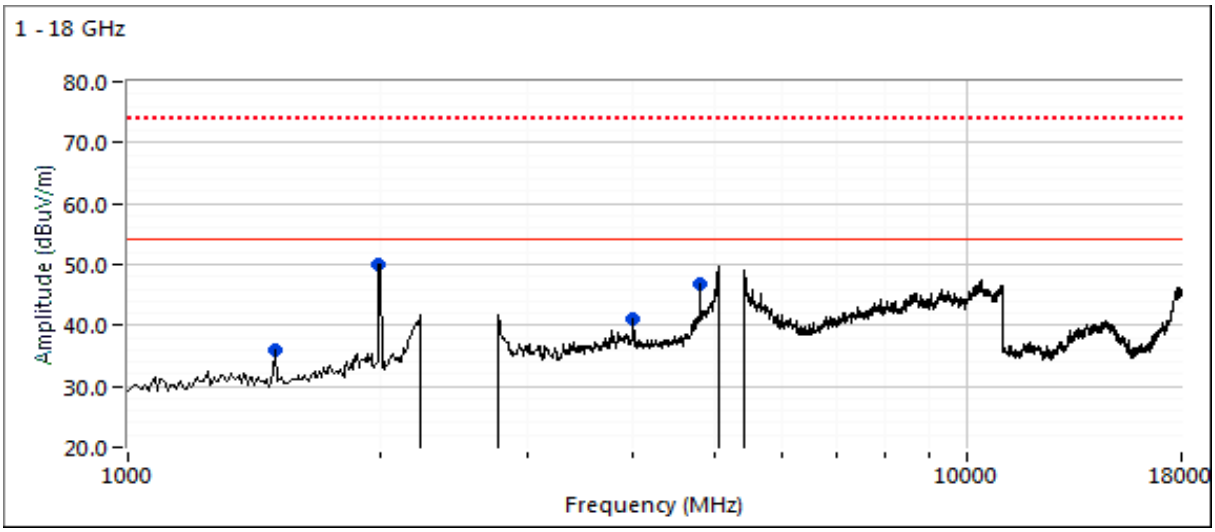
Run #1, Radiated Spurious Emissions, 1,000 - 40,000 MHz. Operation in the 5150-5250 MHz Band

Date of Test: 10/25/2018 Config. Used: Internal
Test Engineer: Roy Zheng Config Change: none
Test Location: Chamber 5 EUT Voltage: PoE

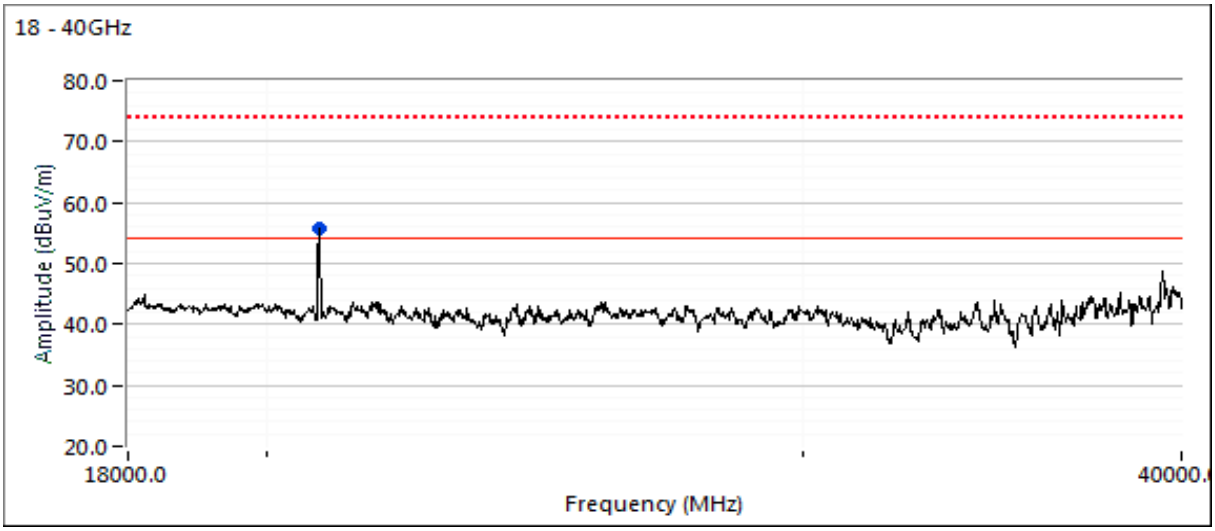
Run #1a: Center Channel

Channel: 40 Wi-Fi, 2412 MHz, 37 - BLE Mode: 11a/g + BLE Pwr setting 20
Tx Chain: 4 Tx Data Rate: 6 Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.000	36.0	V	60.0	-24.0	Peak	38	1.0	Note 5
2000.030	47.1	H	60.0	-12.9	VAVG	145	1.0	Note 5
2000.000	51.3	H	80.0	-28.7	PK	145	1.0	Note 5
3999.990	37.4	V	54.0	-16.6	VAVG	211	1.3	RB 1 MHz;VB 1 kHz; Note 3
3999.510	47.2	V	74.0	-26.8	PK	211	1.3	RB 1 MHz;VB 3 MHz;Peak
4804.130	42.9	H	54.0	-11.1	VAVG	219	1.3	RB 1 MHz;VB 1 kHz; Note 3
4804.370	51.9	H	74.0	-22.1	PK	219	1.3	RB 1 MHz;VB 3 MHz;Peak
20795.330	43.4	V	54.0	-10.6	VAVG	192	1.3	RB 1 MHz;VB 1 kHz;Note 3
20780.000	43.4	V	74.0	-30.6	PK	192	1.3	RB 1 MHz;VB 3 MHz;Peak



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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

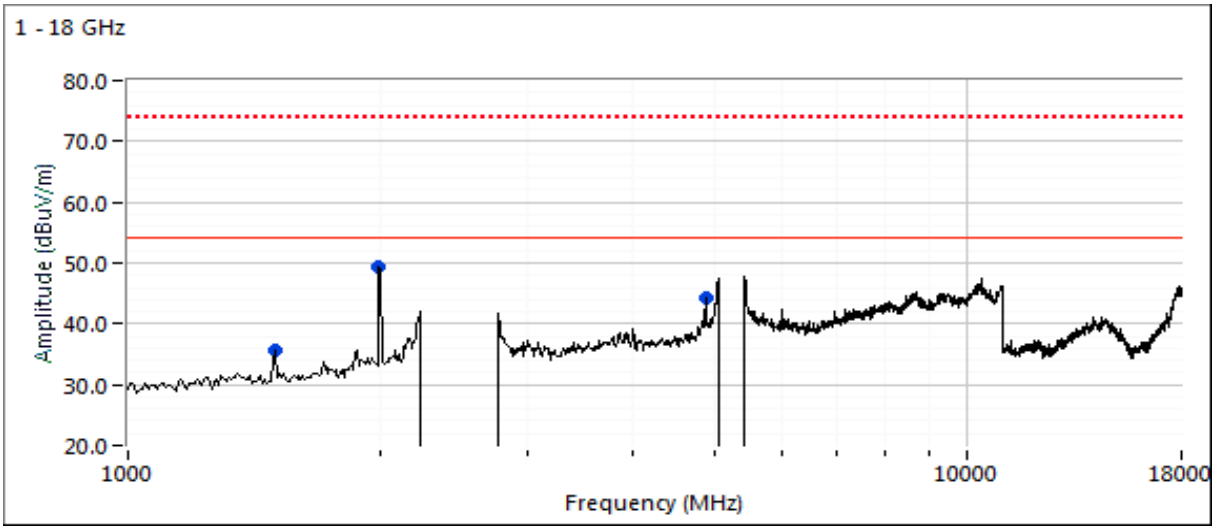
Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #1b: Center Channel

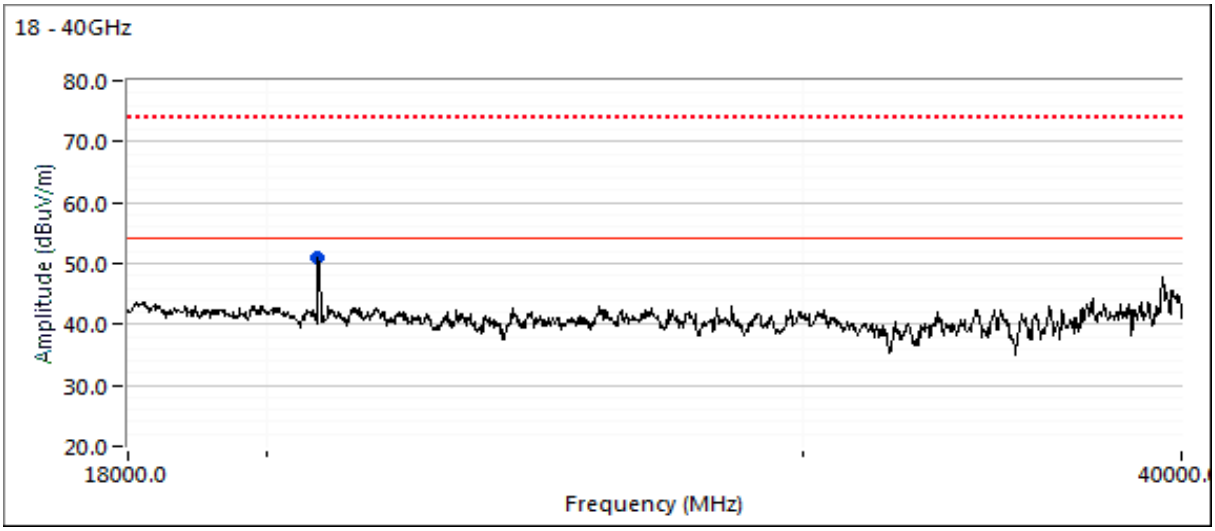
Channel: 6 & 40 Wi-Fi, 17 - BLE Mode: 11ax20

Tx Chain: 4 (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	35.5	V	60.0	-24.5	Peak	44	1.0	Note 5
2000.030	50.0	V	60.0	-10.0	VAVG	56	1.6	Note 5
2000.010	51.0	V	80.0	-29.0	PK	56	1.6	Note 5
4879.910	41.9	H	54.0	-12.1	VAVG	233	1.0	RB 1 MHz;VB 300 Hz;Note 3
4880.580	52.5	H	74.0	-21.5	PK	233	1.0	RB 1 MHz;VB 3 MHz;Peak
5999.980	41.5	V	54.0	-12.5	VAVG	173	1.0	RB 1 MHz;VB 300 Hz;Note 3
6000.190	50.0	V	74.0	-24.0	PK	173	1.0	RB 1 MHz;VB 3 MHz;Peak
20800.020	40.0	V	54.0	-14.0	VAVG	179	1.3	RB 1 MHz;VB 300 Hz;Note 3
20800.020	58.2	V	74.0	-15.8	PK	179	1.3	RB 1 MHz;VB 3 MHz;Peak



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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

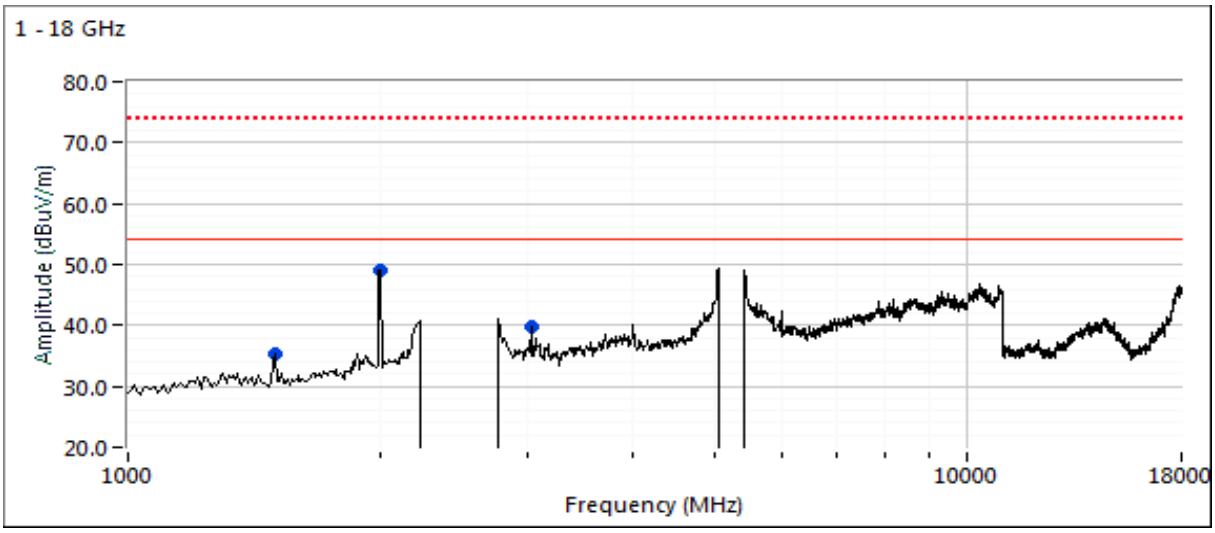
Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #1c: Center Channel

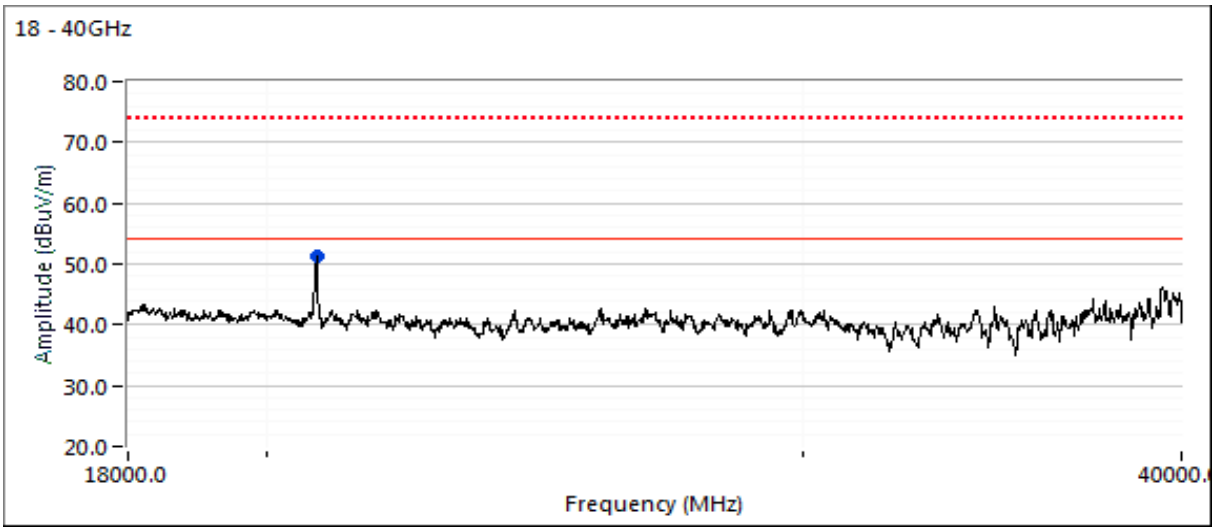
Channel: 6 & 38 Wi-Fi, 39 - BLE Mode: 11ax40

Tx Chain: 4 (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	35.4	V	60.0	-24.6	Peak	352	1.9	Note 5
2000.000	49.1	V	60.0	-10.9	Peak	67	1.6	Note 5
3023.950	37.7	H	54.0	-16.3	VAVG	120	1.5	RB 1 MHz;VB 300 Hz;Note 3
3023.980	47.2	H	74.0	-26.8	PK	120	1.5	RB 1 MHz;VB 3 MHz;Peak
20769.330	46.8	V	54.0	-7.2	VAVG	190	1.7	RB 1 MHz;VB 300 Hz;Note 3
20750.500	66.0	V	74.0	-8.0	PK	190	1.7	RB 1 MHz;VB 3 MHz;Peak



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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

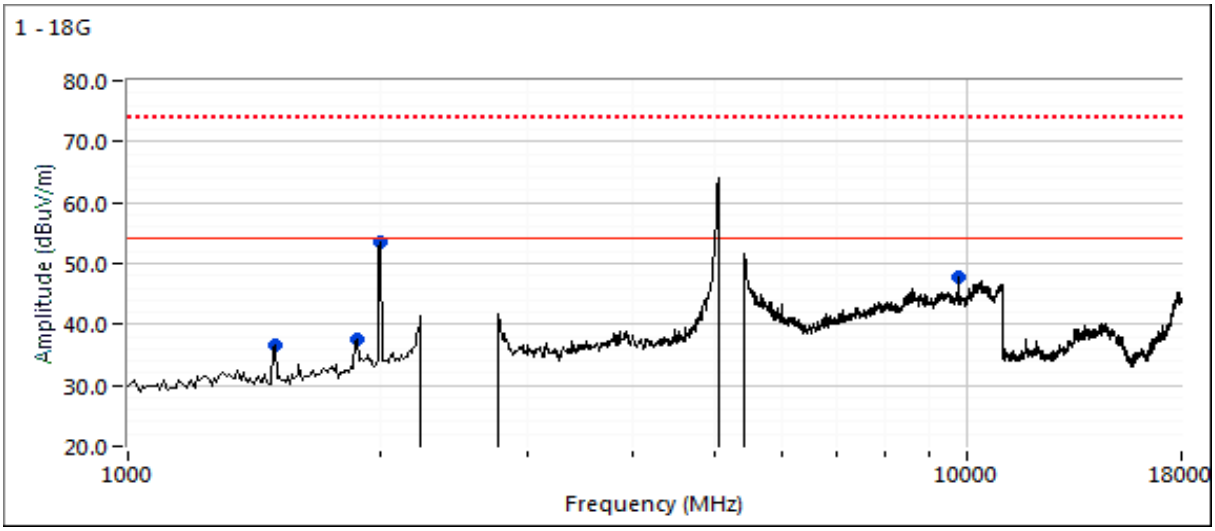
Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #1d: Center Channel

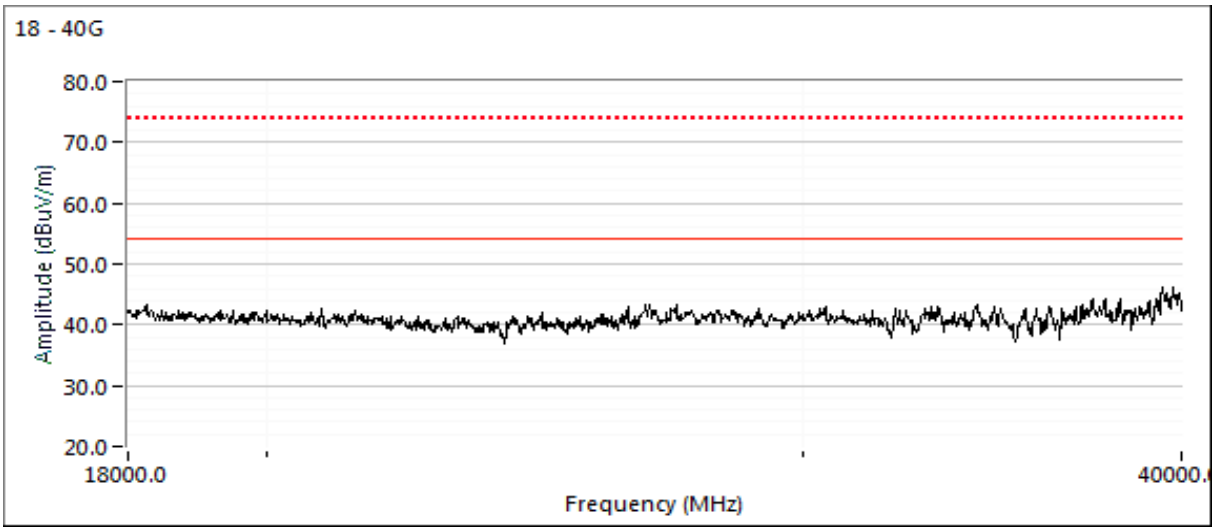
Channel: 6 & 42 Wi-Fi Mode: ac80 / b

Tx Chain: 4 (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	36.5	H	60.0	-23.5	Peak	139	1.3	Note 5
1875.000	37.4	H	60.0	-22.6	Peak	210	1.0	Note 5
2000.000	53.4	V	60.0	-6.6	Peak	83	1.0	Note 5
9747.870	44.9	V	54.0	-9.1	VAVG	173	1.0	RB 1 MHz;VB 300 Hz;Note 3
9747.860	55.1	V	74.0	-18.9	PK	173	1.0	RB 1 MHz;VB 3 MHz;Peak



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

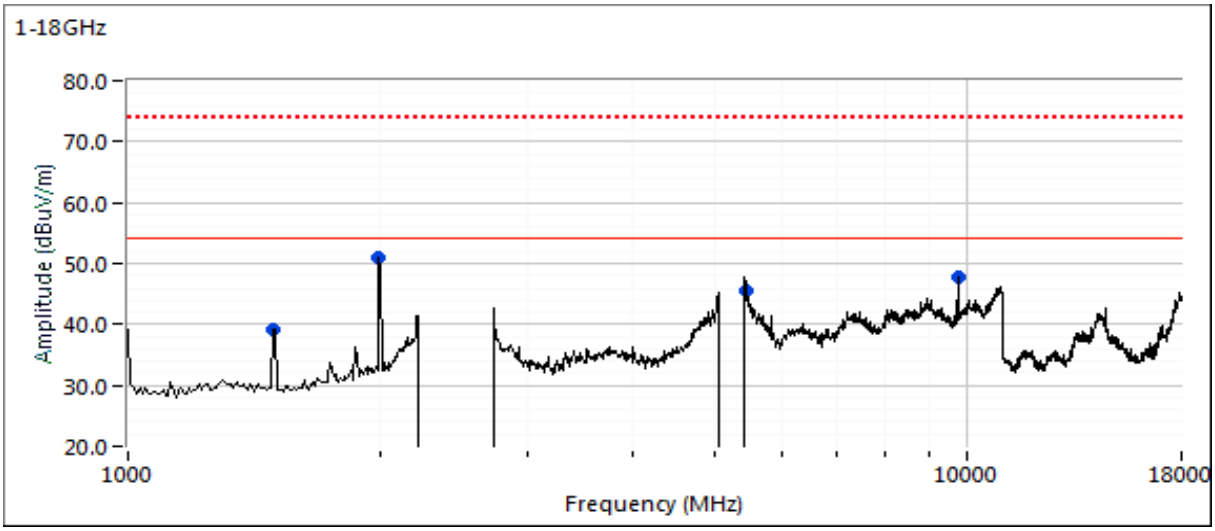
Run #2, Radiated Spurious Emissions, 1,000 - 40,000 MHz.

Date of Test: 12/26/18 — Config. Used: 1
Test Engineer: Roy Zheng / R. Varelas — Config Change: None
Test Location: FT Chamber #5 — EUT Voltage: PoE

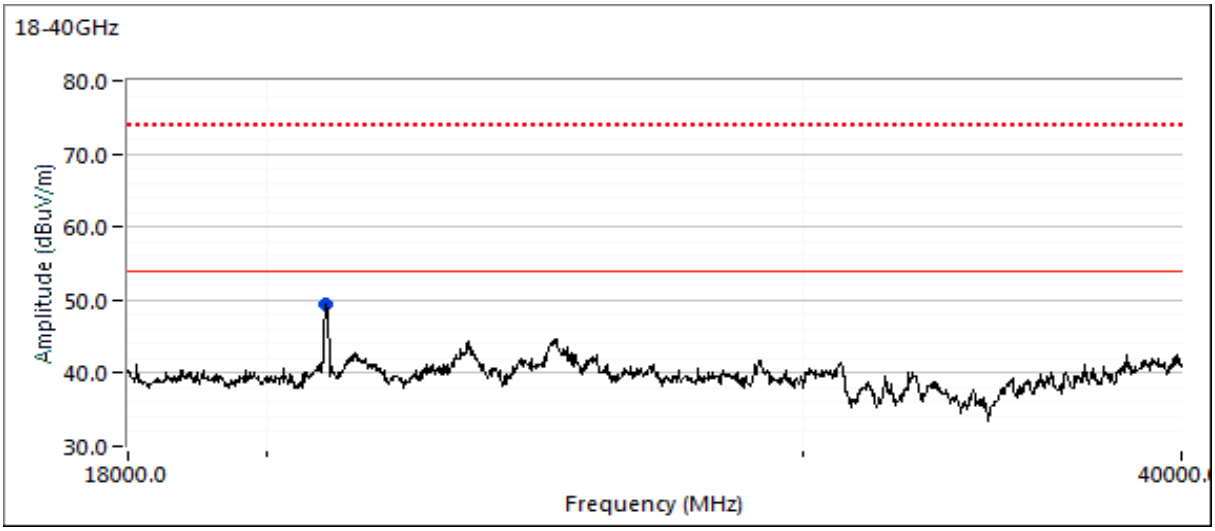
Run #2a: Center Channel

Channel: 6, 46 Wi-Fi, 11 - ZigBee — Mode: ax40, b
Tx Chain: 4 — Data Rate: MCS0, 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	39.2	V	60.0	-20.8	Peak	50	1.0	Note 5
2000.000	51.0	H	60.0	-9.0	Peak	224	1.9	Note 5
9747.910	50.0	H	54.0	-4.0	Vavg	194	1.0	Note 4;VB 3 kHz;Peak VAVG 100
9747.920	53.8	H	74.0	-20.2	PK	194	1.0	RB 1 MHz;VB 3 MHz;Peak
5464.040	40.6	V	54.0	-13.4	Vavg	236	1.6	Note 4;VB 300 Hz;Peak VAVG 100
5461.430	52.2	V	74.0	-21.8	PK	236	1.6	RB 1 MHz;VB 3 MHz;Peak
20916.210	46.7	V	54.0	-7.3	Vavg	219	1.7	Note 4;VB 300 Hz;Peak VAVG 100
20916.610	61.7	V	74.0	-12.3	PK	219	1.7	RB 1 MHz;VB 3 MHz;Peak



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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

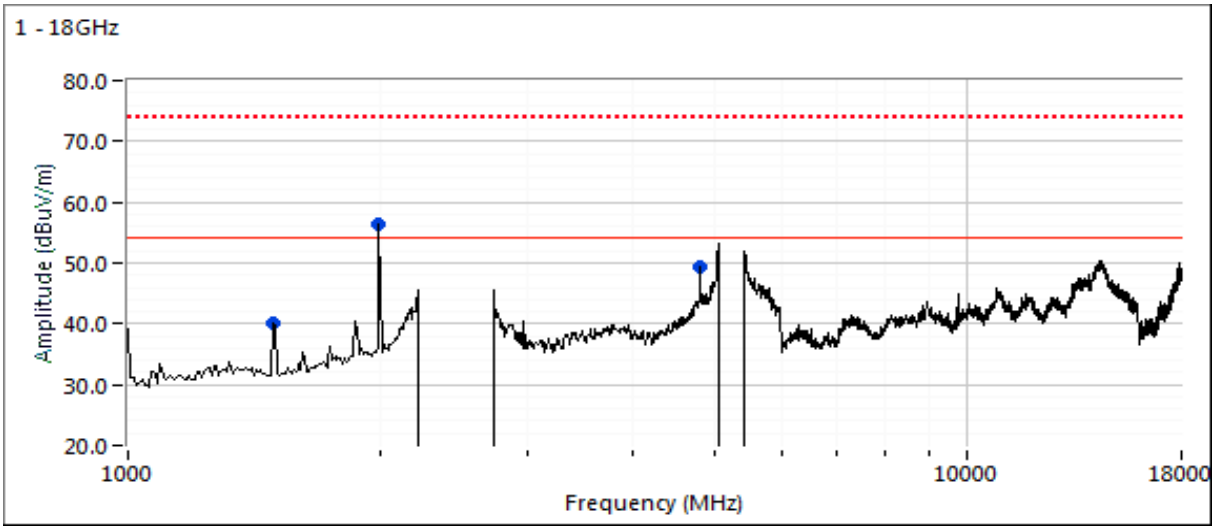
Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #2d: Center Channel

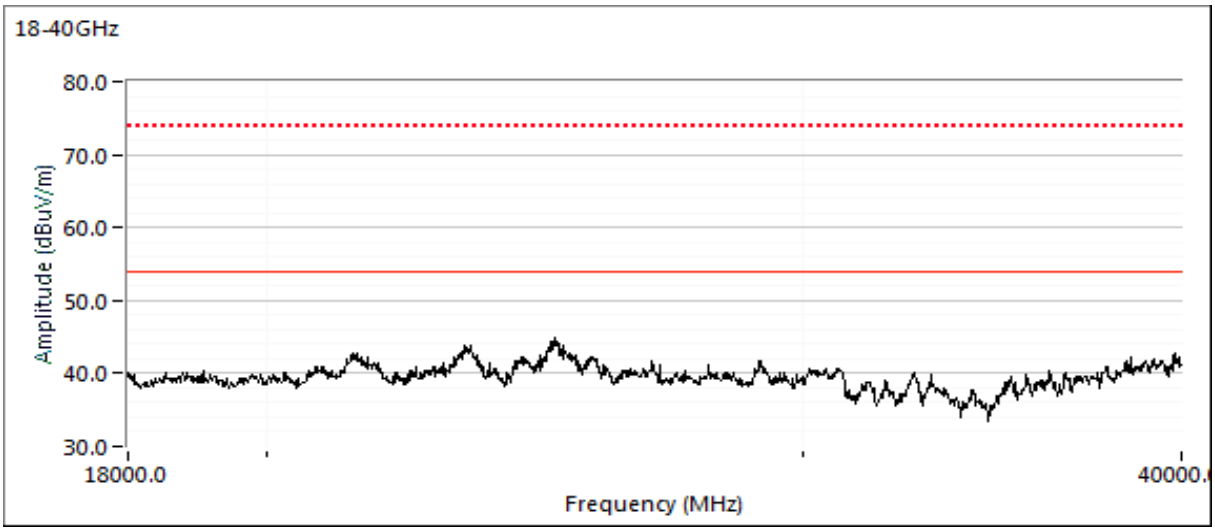
Channel: 6, 46 Wi-Fi, 37 - BLE — Mode: ax40, b

Tx Chain: 4 — Data Rate: MCS0, 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	40.1	H	60.0	-19.9	Peak	222	1.9	Note 5
2000.000	56.5	H	60.0	-3.5	Peak	72	1.6	Note 5
4803.780	38.1	H	54.0	-15.9	VAVG	138	1.0	Note 4;VB 300 Hz;Peak VAVG 100
4803.830	49.1	H	74.0	-24.9	PK	138	1.0	RB 1 MHz;VB 3 MHz;Peak



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

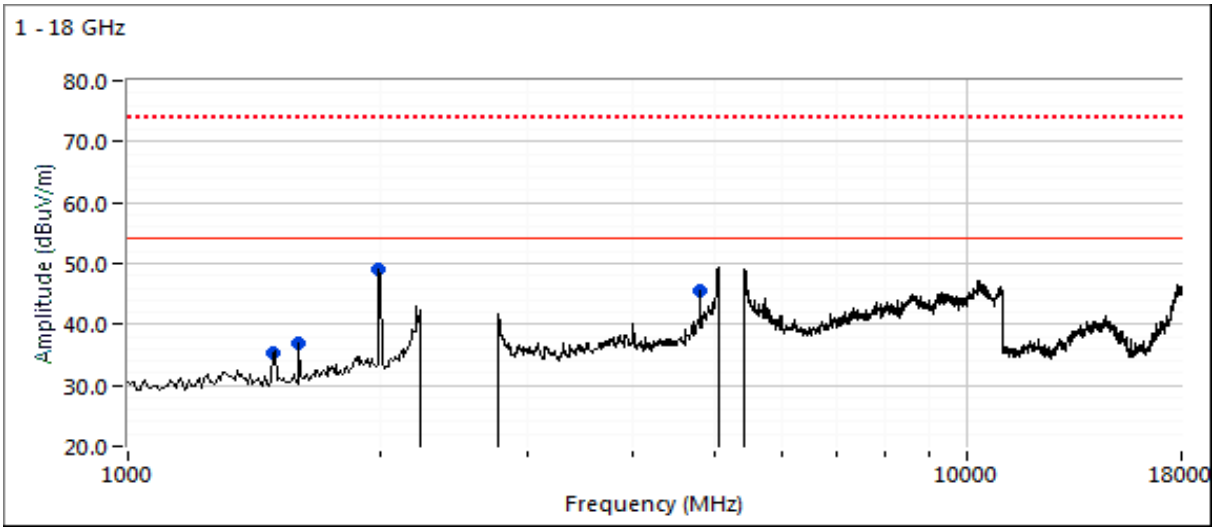
Run #3: Radiated Spurious Emissions, 1,000 - 40000 MHz. Operating Mode: Worse case from Runs #1 and 2

Date of Test: 10/25/2018 Config. Used: Internal
Test Engineer: Roy Zheng Config Change: none
Test Location: Chamber 5 EUT Voltage: PoE

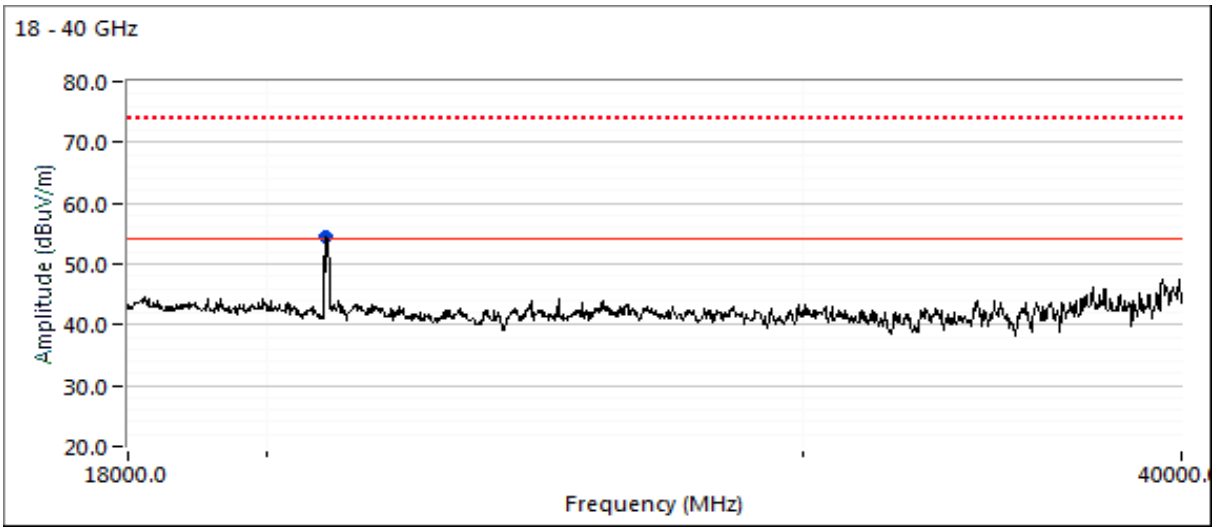
Run #3a: Low Channel

Channel: 3 & 38 Wi-Fi, 37 - BLE Mode: ax40 + BLE Pwr setting 20
Tx Chain: 4 Tx 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	35.3	H	60.0	-24.7	Peak	135	1.0	Note 5
1600.000	36.9	V	60.0	-23.1	Peak	184	2.2	Note 5
2000.070	50.6	H	60.0	-9.4	Peak	198	1.7	Note 5
4799.880	36.1	H	54.0	-17.9	VAVG	210	1.7	RB 1 MHz;VB 300 Hz;Note 3
4799.810	48.3	H	74.0	-25.7	PK	210	1.7	RB 1 MHz;VB 3 MHz;Peak
20930.080	51.7	V	54.0	-2.3	VAVG	193	1.8	RB 1 MHz;VB 300 Hz;Note 3
20929.420	68.2	V	74.0	-5.8	PK	193	1.8	RB 1 MHz;VB 3 MHz;Peak



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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).

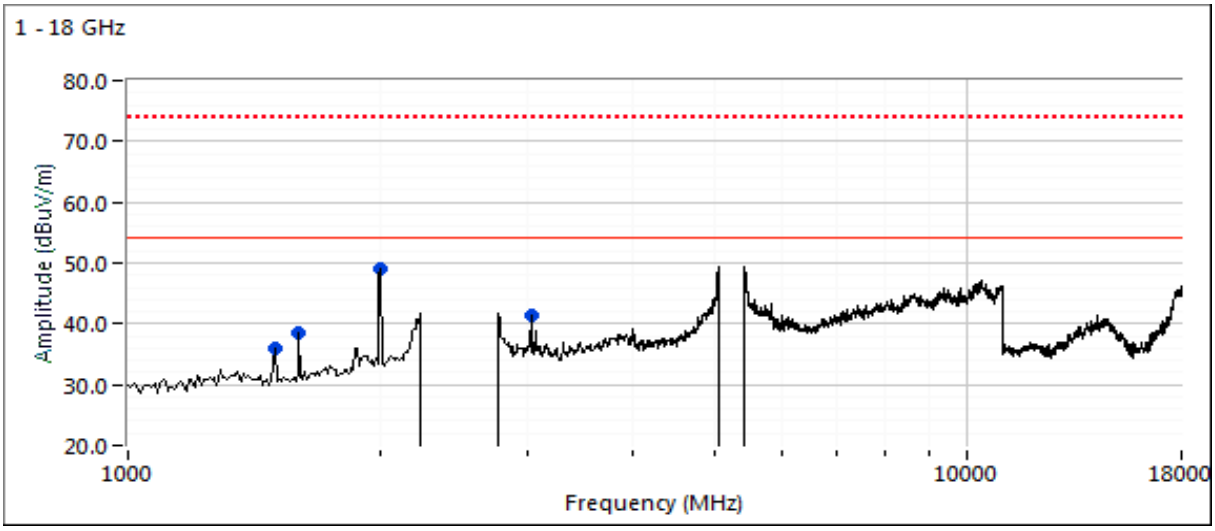
EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

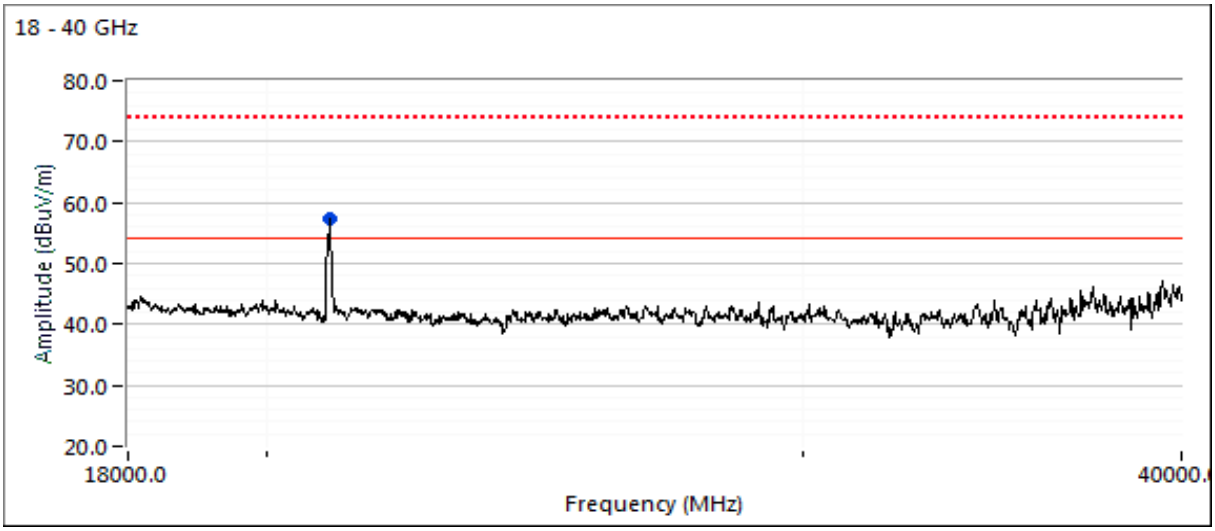
Run #3b: High Channel

Channel: 11 & 48 Wi-Fi, 39 - BLE Mode: ax20 + BLE Pwr setting 20
Tx Chain: 4 Tx 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	35.9	V	60.0	-24.1	Peak	43	1.3	Note 5
1600.000	38.4	V	60.0	-21.6	Peak	207	1.3	Note 5
3025.000	41.4	H	60.0	-18.6	Peak	94	1.6	Note 5
2000.070	51.1	H	60.0	-8.9	Peak	144	1.0	Note 5
3023.920	35.0	H	54.0	-19.0	VAVG	210	1.0	RB 1 MHz;VB 300 Hz;Note 3
3023.570	46.9	H	74.0	-27.1	PK	210	1.0	RB 1 MHz;VB 3 MHz;Peak
20976.96	44.8	V	54	-9.2	VAVG	189	1.33	RB 1 MHz;VB 300 Hz;Note 3
20978.09	61.1	V	74	-12.9	PK	189	1.33	RB 1 MHz;VB 3 MHz;Peak



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

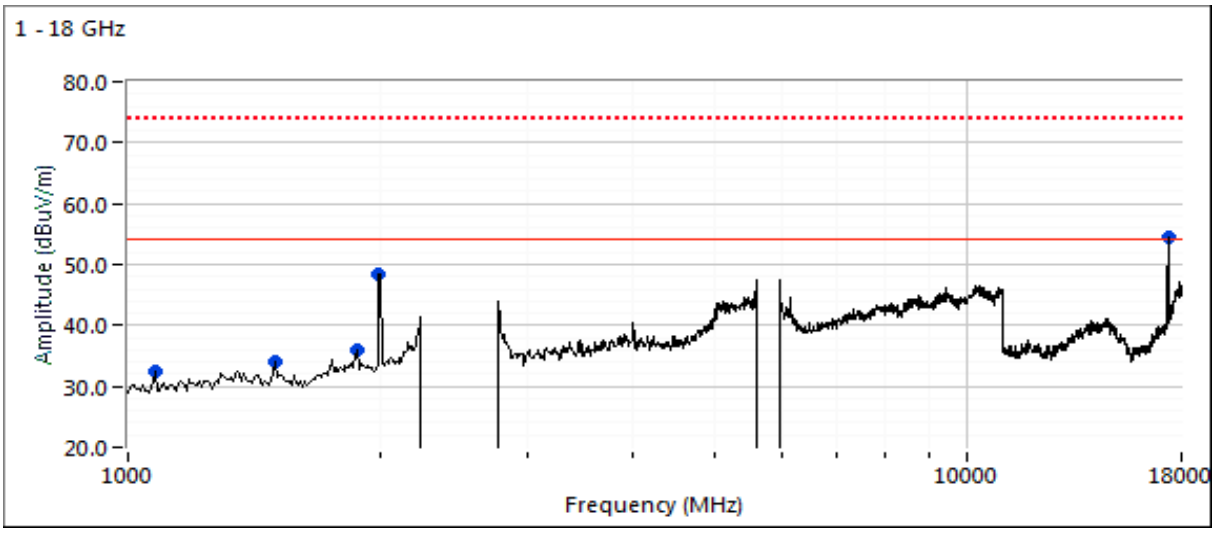
Run #8, Radiated Spurious Emissions, 1,000 - 40,000 MHz. Operation in the 5725-5850 MHz Band

Date of Test: 10/25/2018 Config. Used: Internal
Test Engineer: Roy Zheng Config Change: none
Test Location: Chamber 5 EUT Voltage: PoE

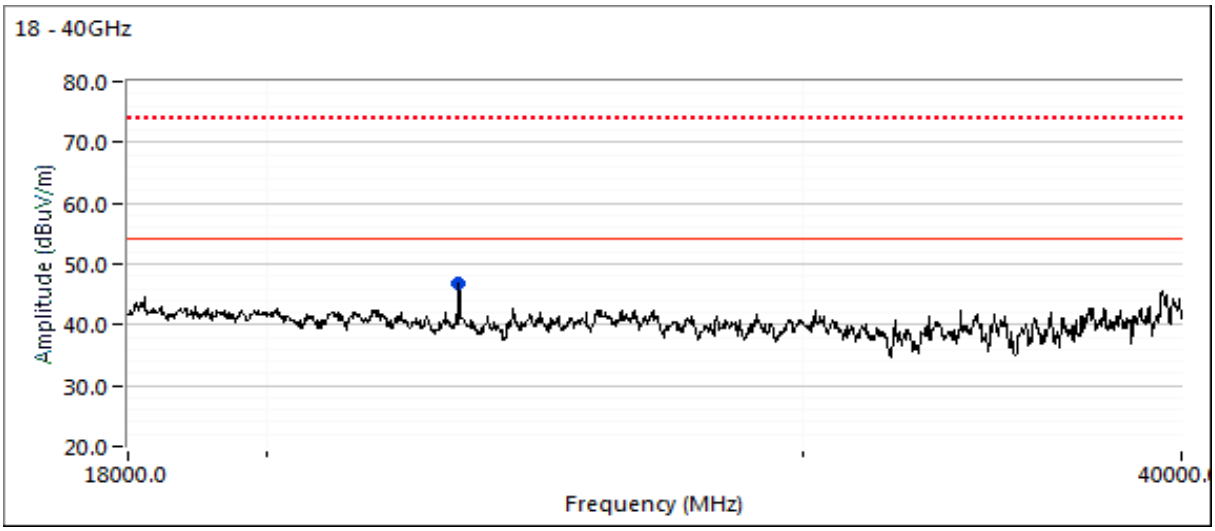
Run #8a: Center Channel

Channel: 6 & 157 Wi-Fi, 37 - BLE Mode: a, g
Tx Chain: 4 (5GHz), 4 (2.4 GHz) Data Rate: 6MB/s

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1075.000	32.4	H	60.0	-27.6	Peak	188	1.3	Note 5
1500.000	33.9	V	60.0	-26.1	Peak	16	1.3	Note 5
1875.000	35.9	V	60.0	-24.1	Peak	98	1.6	Note 5
2000.000	48.5	V	60.0	-11.5	Peak	177	1.0	Note 5
17356.800	66.4	H	68.3	-1.9	PK	198	1.3	RB 1 MHz;VB 3 MHz;Peak
23146.270	53.4	V	68.3	-14.9	PK	159	1.0	RB 1 MHz;VB 3 MHz;Peak



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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).

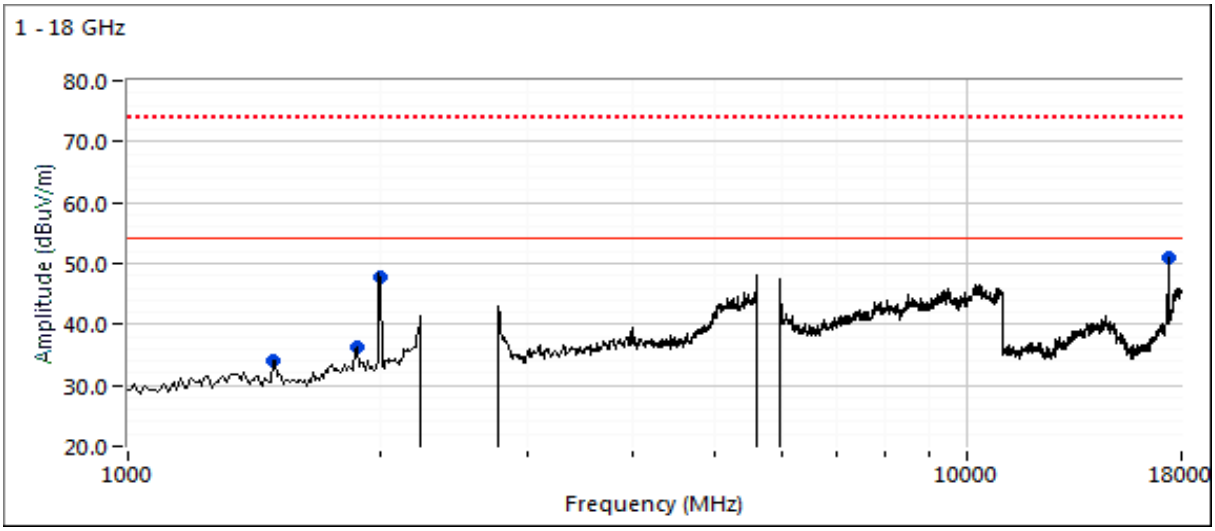
EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

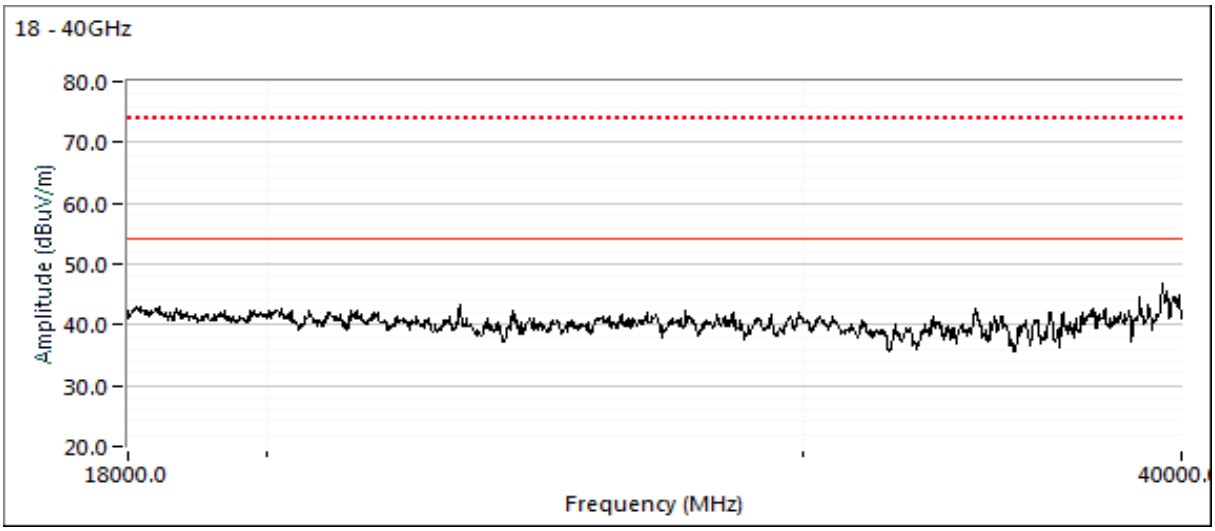
Run #8b: Center Channel

Channel: 6 & 157 Wi-Fi, 17 - BLE Mode: 11ax20
Tx Chain: 4 (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	33.9	V	60.0	-26.1	Peak	354	1.9	Note 5
1875.000	36.4	V	60.0	-23.6	Peak	105	1.6	Note 5
2000.000	47.9	H	60.0	-12.1	Peak	160	2.2	Note 5
9501.210	40.1	V	54.0	-13.9	VAVG	192	1.9	RB 1 MHz;VB 300 Hz;Note 3
9498.660	54.0	V	74.0	-20.0	PK	192	1.9	RB 1 MHz;VB 3 MHz;Peak
17362.400	62.2	H	68.3	-6.1	PK	192	1.8	RB 1 MHz;VB 3 MHz;Peak



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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).

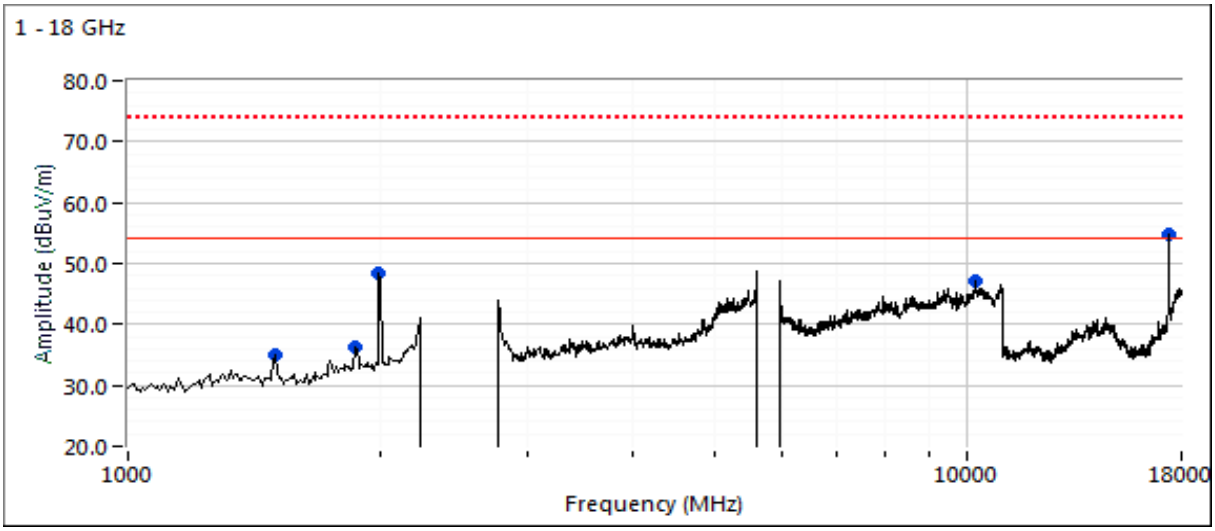
EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

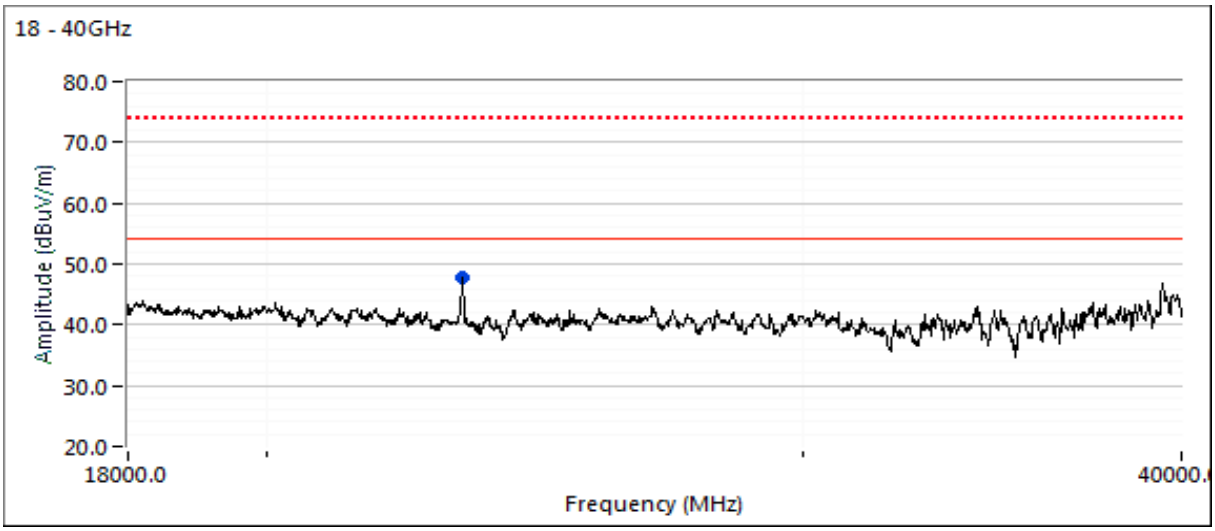
Run #8c: Center Channel

Channel: 6 & 159 Wi-Fi, 39 - BLE Mode: 11ax40
Tx Chain: 4 (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	35.1	H	60.0	-24.9	Peak	138	1.0	Note 5
1875.000	36.3	H	60.0	-23.7	Peak	109	1.0	Note 5
2000.000	48.3	H	60.0	-11.7	Peak	172	1.9	Note 5
10242.230	54.6	V	68.3	-13.7	PK	36	1.6	RB 1 MHz;VB 3 MHz;Peak
17375.500	66.3	V	68.3	-2.0	PK	189	1.7	RB 1 MHz;VB 3 MHz;Peak
23168.530	52.2	V	68.3	-16.1	PK	204	1.3	RB 1 MHz;VB 3 MHz;Peak



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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).

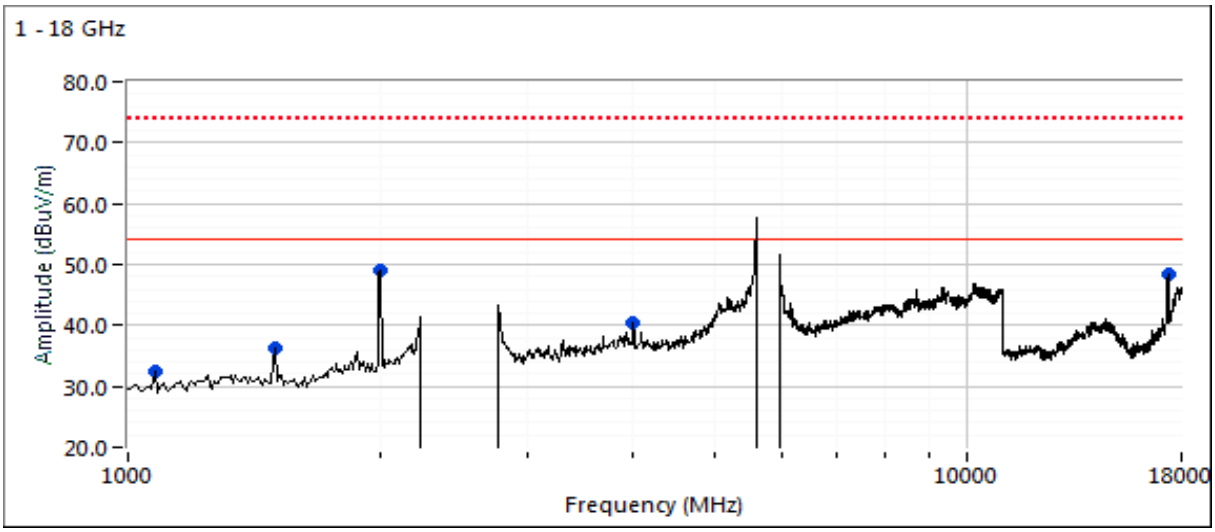
EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

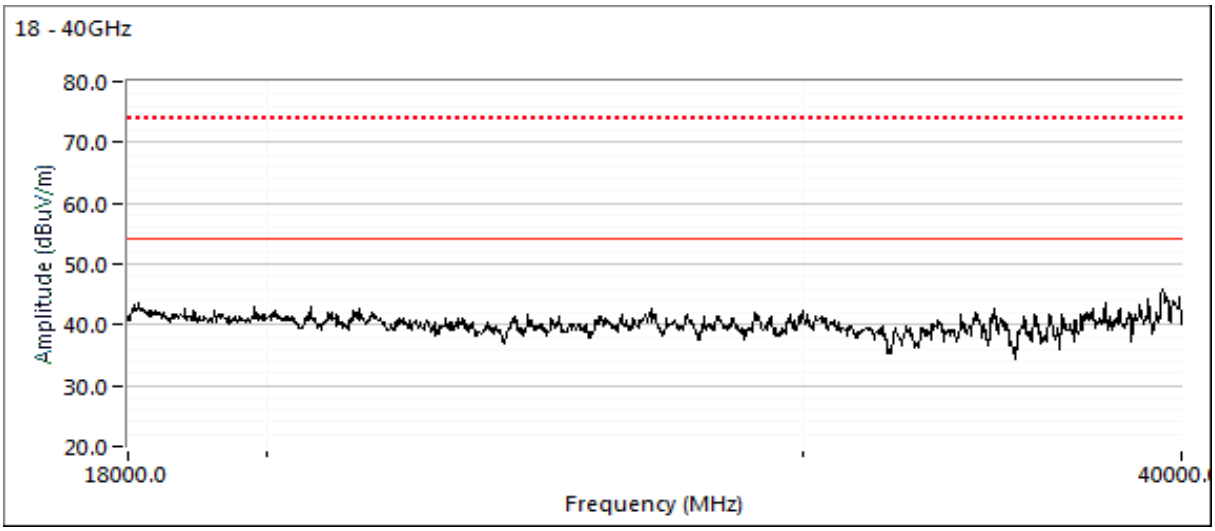
Run #8d: Center Channel

Channel: 6 & 155 Wi-Fi, 17 - BLE Mode: ac80 / b
Tx Chain: 4 (5GHz), 4 (2.4 GHz) Data Rate: MCS0 / 1

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1075.000	32.4	H	60.0	-27.6	Peak	176	1.0	Note 5
1500.000	36.4	H	60.0	-23.6	Peak	103	2.2	Note 5
1999.990	49.0	H	60.0	-11.0	VAVG	170	2.2	Note 5
1999.870	51.3	H	80.0	-28.7	PK	170	2.2	Note 5
4000.020	37.8	V	54.0	-16.2	VAVG	208	1.3	RB 1 MHz;VB 300 Hz;Note 3
3999.900	47.7	V	74.0	-26.3	PK	208	1.3	RB 1 MHz;VB 3 MHz;Peak
17333.500	58.6	V	68.3	-9.7	PK	180	1.6	RB 1 MHz;VB 3 MHz;Peak



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

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

Date of Test: 10/26/2018 8:00
Test Engineer: Roy Zheng / R. Varelas
Test Location: Chamber #5

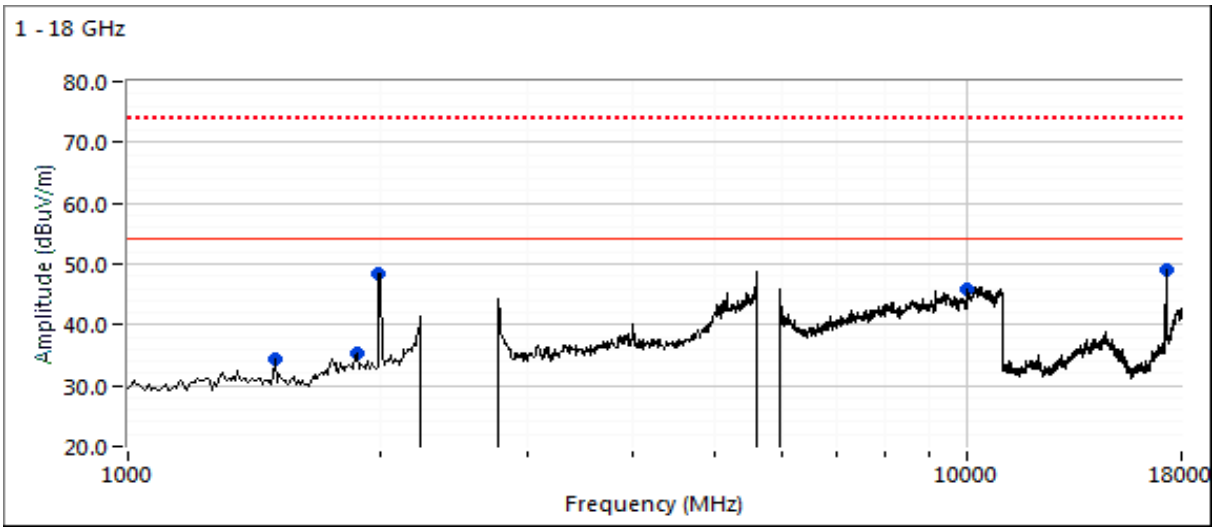
Config. Used: integral
Config Change: none
EUT Voltage: PoE & 120V/60Hz

Run #9a: Low Channel

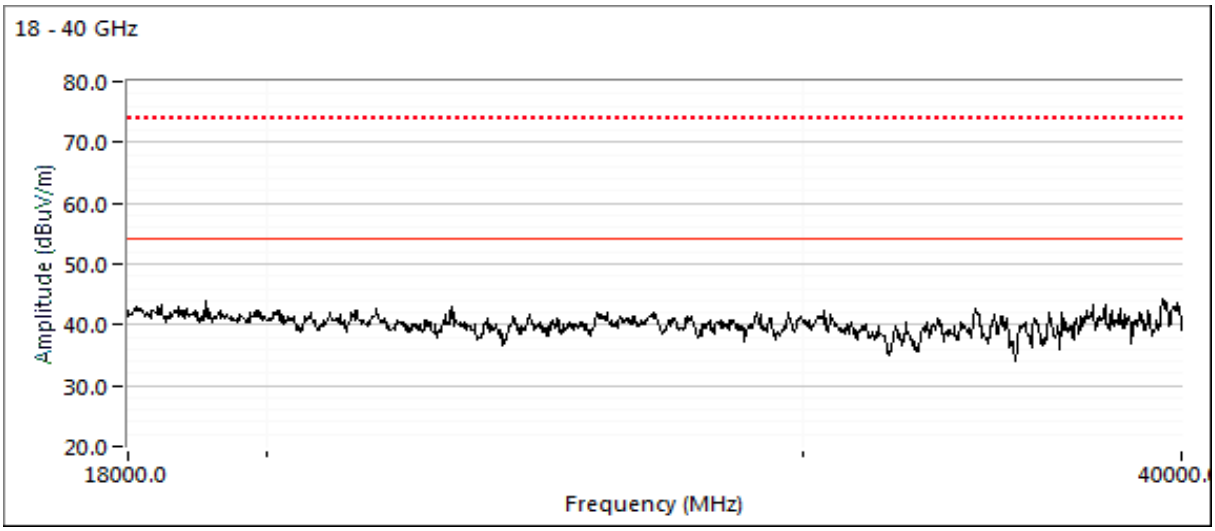
Channel: 3 & 151 Wi-Fi, 37 - BLE
Tx Chain: 4

Mode: ax40
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	34.4	V	60.0	-25.6	Peak	348	1.9	Note 5
1875.000	35.2	V	60.0	-24.8	Peak	99	1.3	Note 5
1999.950	48.5	H	60.0	-11.5	VAVG	167	2.3	Note 5
1999.920	51.5	H	80.0	-28.5	PK	167	2.3	Note 5
9990.940	41.1	V	54.0	-12.9	VAVG	167	2.3	RB 1 MHz;VB 300 Hz;Note 3
9990.240	53.4	V	74.0	-20.6	PK	167	2.3	RB 1 MHz;VB 3 MHz;Peak
17272.500	66.1	V	68.3	-2.2	PK	193	1.6	RB 1 MHz;VB 3 MHz;Peak



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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

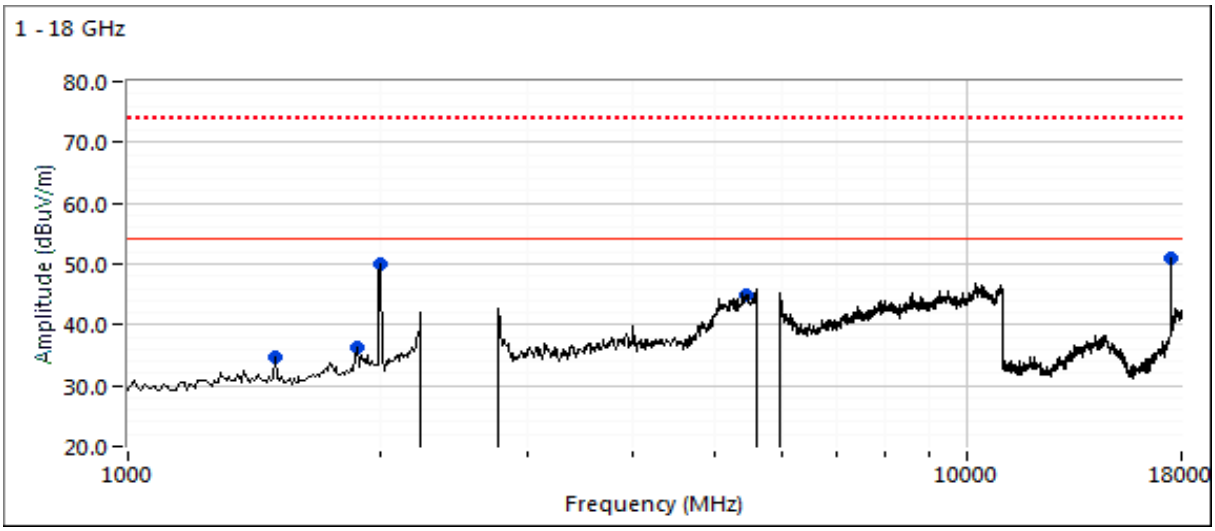
Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #9b: High Channel

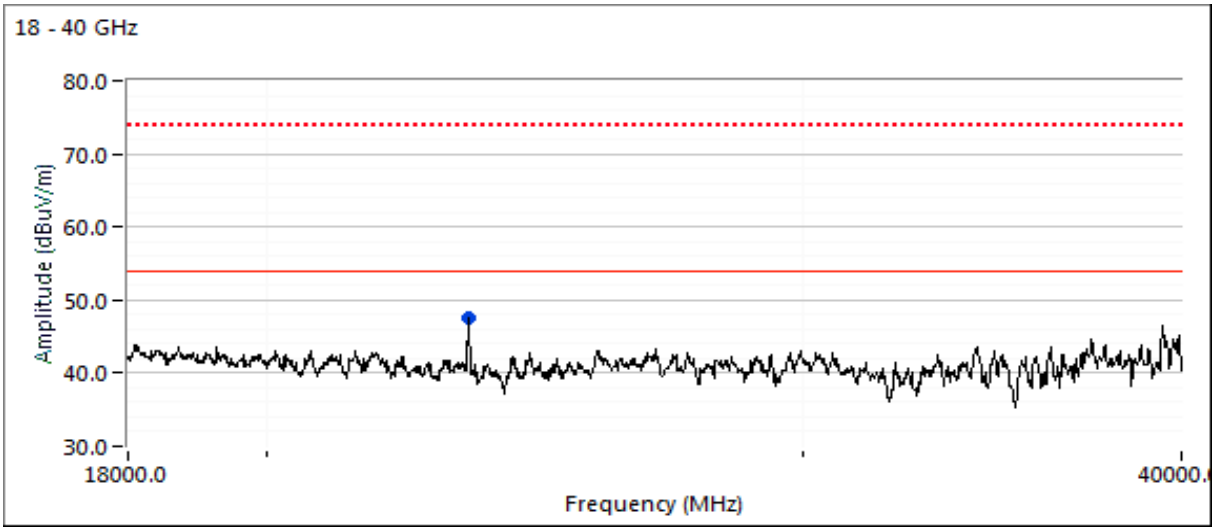
Channel: 11 & 165 Wi-Fi, 39 - BLE
Tx Chain: 4

Mode: ax20
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	
23305.410	59.0	H	68.3	-9.3	PK	218	1.0	RB 1 MHz;VB 3 MHz;Peak
5479.630	41.3	H	54.0	-12.7	Vavg	102	2.0	RB 1 MHz;VB 300 Hz;Note 3
5482.130	53.5	H	74.0	-20.5	PK	102	2.0	RB 1 MHz;VB 3 MHz;Peak
17470.780	58.6	H	68.3	-9.7	PK	188	1.3	RB 1 MHz;VB 3 MHz;Peak
1500.000	34.8	V	60.0	-25.2	Peak	360	1.9	Note 5
1875.000	36.2	H	60.0	-23.8	Peak	112	1.0	Note 5
2000.000	48.8	H	60.0	-11.2	Peak	170	2.2	Note 5



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #10: Radiated Spurious Emissions, 1,000 - 25,000 MHz. Operating Mode: BLE

Date of Test: 10/26/2018 0:00
Test Engineer: Roy Zheng / R. Varelas
Test Location: Chamber #5

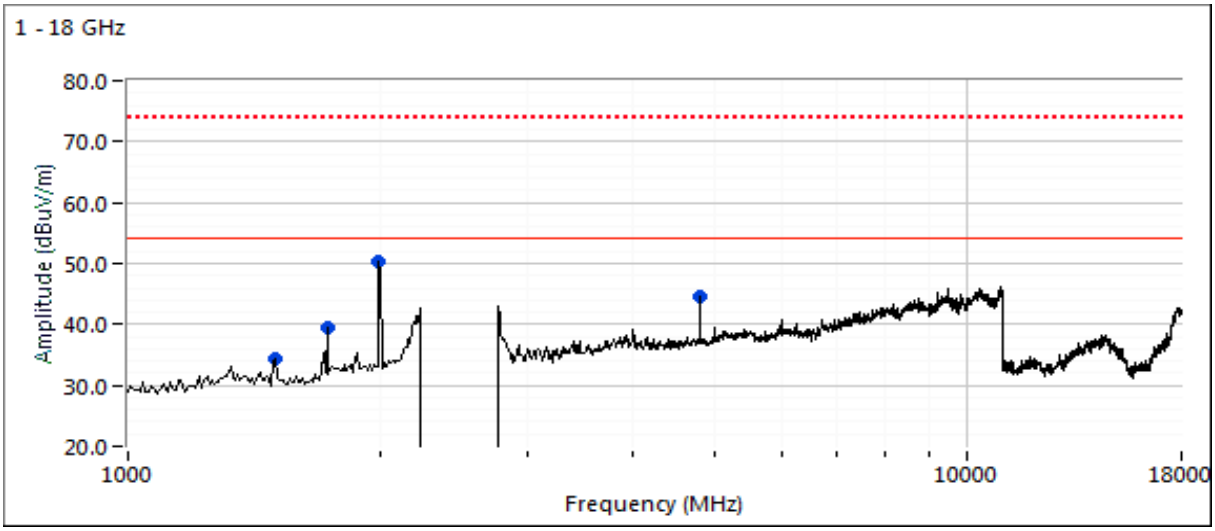
Config. Used: integral
Config Change: none
EUT Voltage: PoE & 120V/60Hz

Run #10a: Low Channel

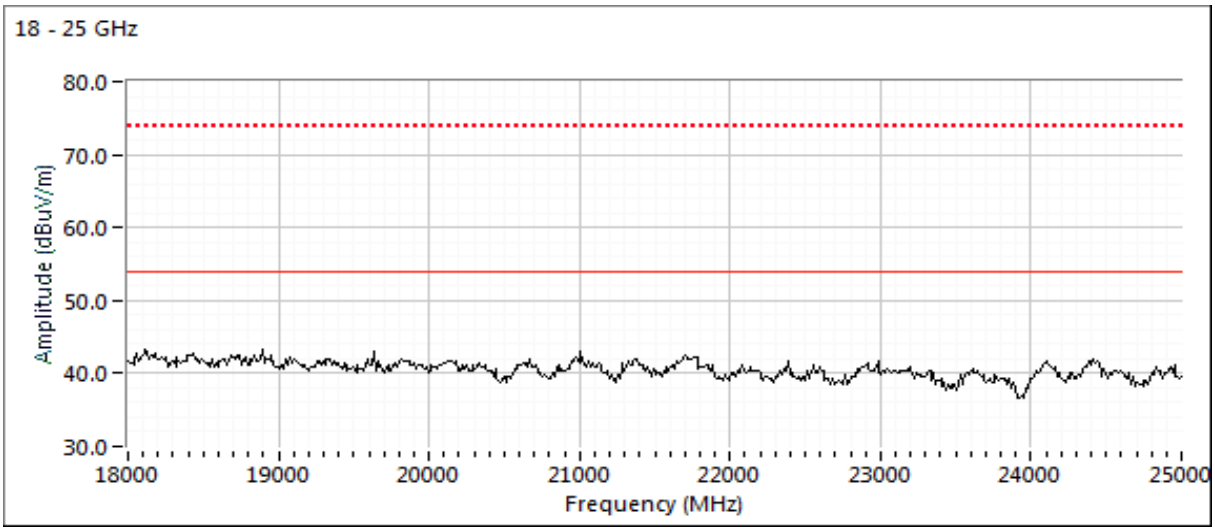
Channel: 37 (2402 MHz)
Tx Chain: BLE

Mode: BLE
Data Rate: 1 Mb/s

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.000	34.2	V	60.0	-25.8	Peak	37	1.0	Note 5
2000.000	50.2	V	60.0	-9.8	Peak	174	1.0	Note 5
4803.850	40.9	V	54.0	-13.1	VAVG	221	1.3	RB 1 MHz;VB 3 kHz;Note 3
4803.630	48.7	V	74.0	-25.3	PK	221	1.3	RB 1 MHz;VB 3 MHz;Peak



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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

EMC Test Data

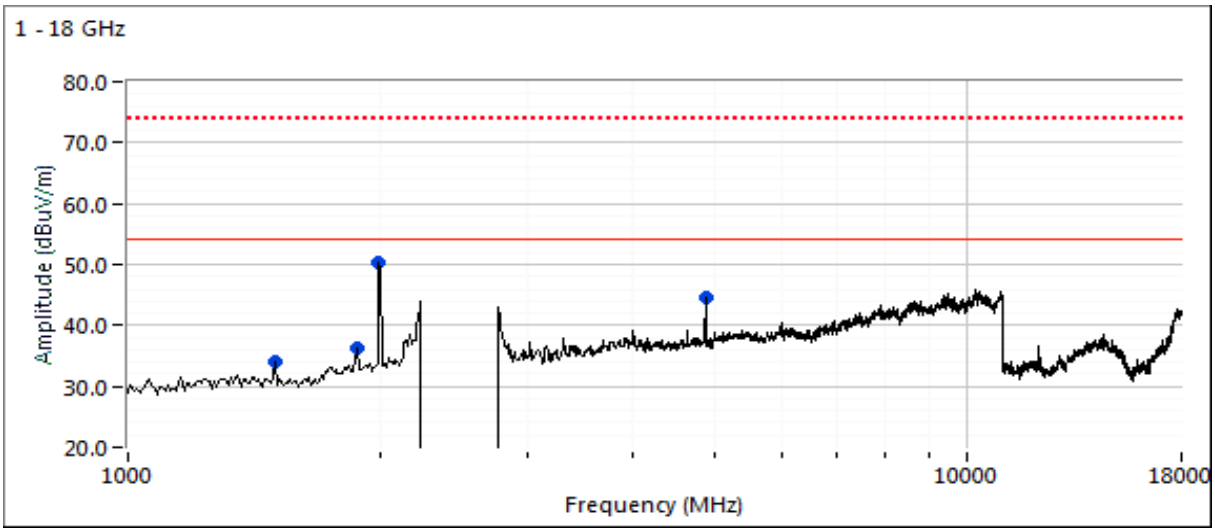
Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #10b: Middle Channel

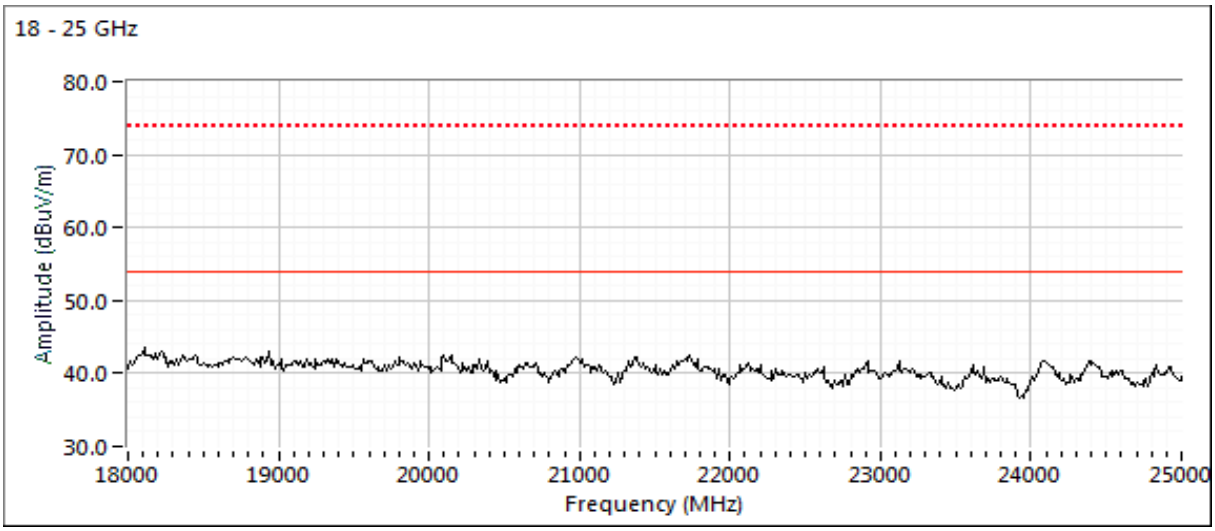
Channel: 17 (2440 MHz)
Tx Chain: BLE

Mode: BLE
Data Rate: 1 Mb/s

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.000	34.2	V	60.0	-25.8	Peak	360	1.9	Note 5
1875.000	36.3	H	60.0	-23.7	Peak	115	1.0	Note 5
2000.000	50.4	V	60.0	-9.6	Peak	177	1.0	Note 5
4879.970	44.3	H	54.0	-9.7	VAVG	222	1.4	RB 1 MHz;VB 3 kHz;Note 3
4880.350	50.0	H	74.0	-24.0	PK	222	1.4	RB 1 MHz;VB 3 MHz;Peak



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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

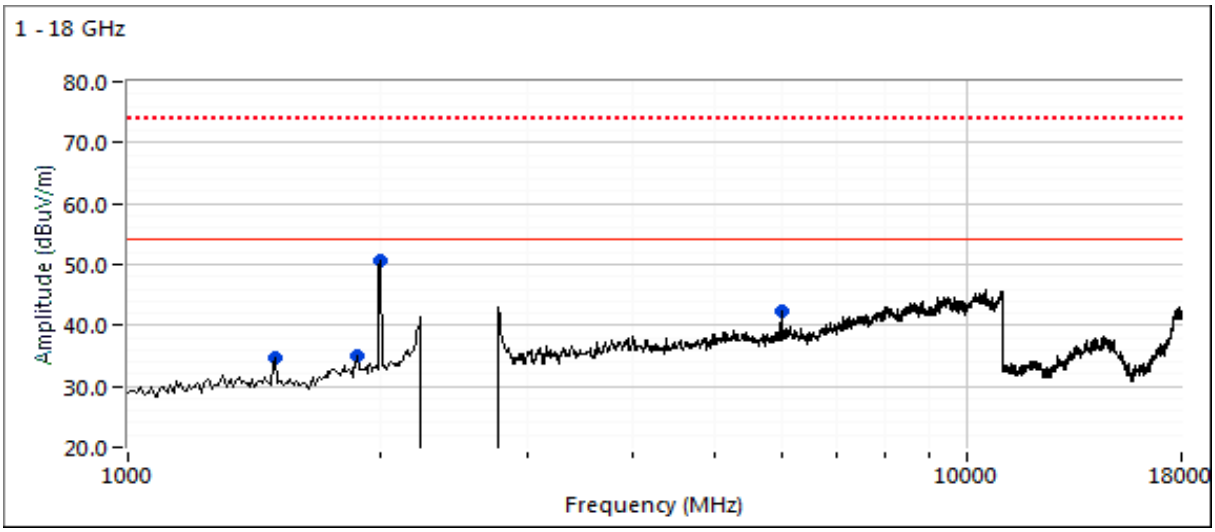
EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

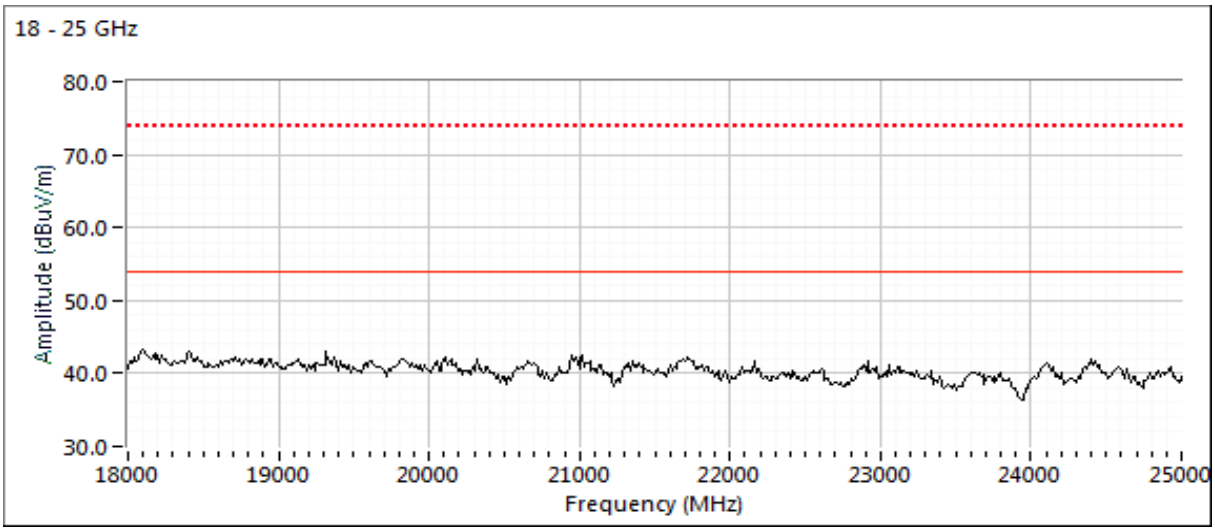
Run #10c: High Channel

Channel: 39 (2480 MHz) Mode: BLE
Tx Chain: BLE Data Rate: 1 Mb/s

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.000	34.7	V	60.0	-25.3	Peak	360	1.9	Note 5
1875.000	35.0	V	60.0	-25.0	Peak	85	1.6	Note 5
2000.000	50.6	V	60.0	-9.4	Peak	183	1.0	Note 5
5999.990	41.3	V	54.0	-12.7	VAVG	142	1.3	RB 1 MHz;VB 3 kHz;Note 3
5999.770	48.9	V	74.0	-25.1	PK	142	1.3	RB 1 MHz;VB 3 MHz;Peak



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #11: Radiated Spurious Emissions, 1,000 - 25,000 MHz. Operating Mode: ZigBee

Date of Test: 11/29/18 — Config. Used: 1

Test Engineer: M. Birgani — Config Change: -

Test Location: Chamber 5 — EUT Voltage: PoE, 120V/60Hz

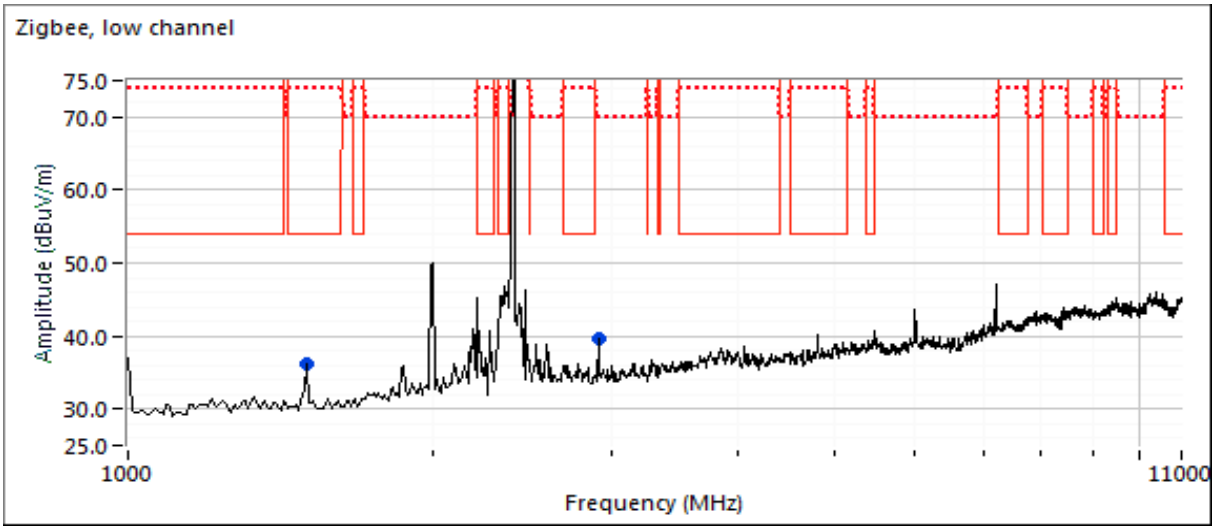
Run #11a: Low Channel

Channel: 11, 2405MHz — Mode: Zigbee

Tx Chain: 1

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2893.570	31.4	H	54.0	-22.6	AVG	105	2.2	RB 1 MHz;VB 1 kHz;Peak
1499.910	24.8	V	54.0	-29.2	AVG	243	2.5	RB 1 MHz;VB 1 kHz;Peak
2896.400	42.8	H	74.0	-31.2	PK	105	2.2	RB 1 MHz;VB 3 MHz;Peak
1498.980	39.3	V	74.0	-34.7	PK	243	2.5	RB 1 MHz;VB 3 MHz;Peak

Note 1:	Scans made between 11 - 25 GHz with the measurement antenna moved around the card and its antennas 20-50cm 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:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

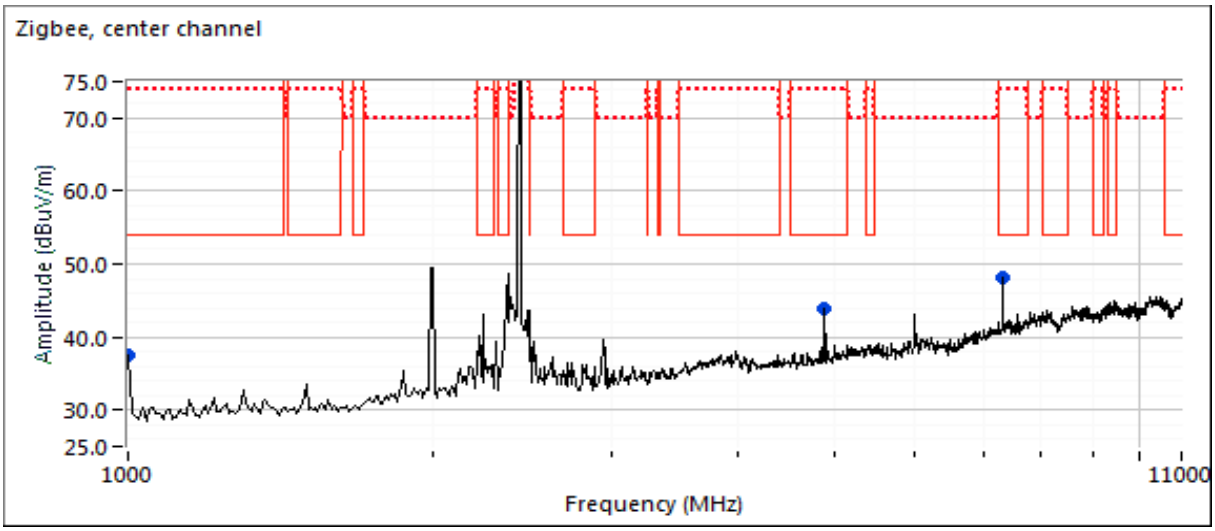
Run #11b: Middle Channel

Channel: 18, 2440MHz Mode: Zigbee

Tx Chain: 1

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7321.450	44.1	H	54.0	-9.9	AVG	221	1.9	RB 1 MHz;VB 10 kHz;Peak
4905.500	34.1	H	54.0	-19.9	AVG	116	1.9	RB 1 MHz;VB 10 kHz;Peak
7320.960	53.6	H	74.0	-20.4	PK	221	1.9	RB 1 MHz;VB 3 MHz;Peak
1009.970	27.2	H	54.0	-26.8	AVG	346	1.9	RB 1 MHz;VB 10 kHz;Peak
4907.850	45.8	H	74.0	-28.2	PK	116	1.9	RB 1 MHz;VB 3 MHz;Peak
1009.030	38.7	H	74.0	-35.3	PK	346	1.9	RB 1 MHz;VB 3 MHz;Peak

Note 1:	Scans made between 11 - 25 GHz with the measurement antenna moved around the card and its antennas 20-50cm 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:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

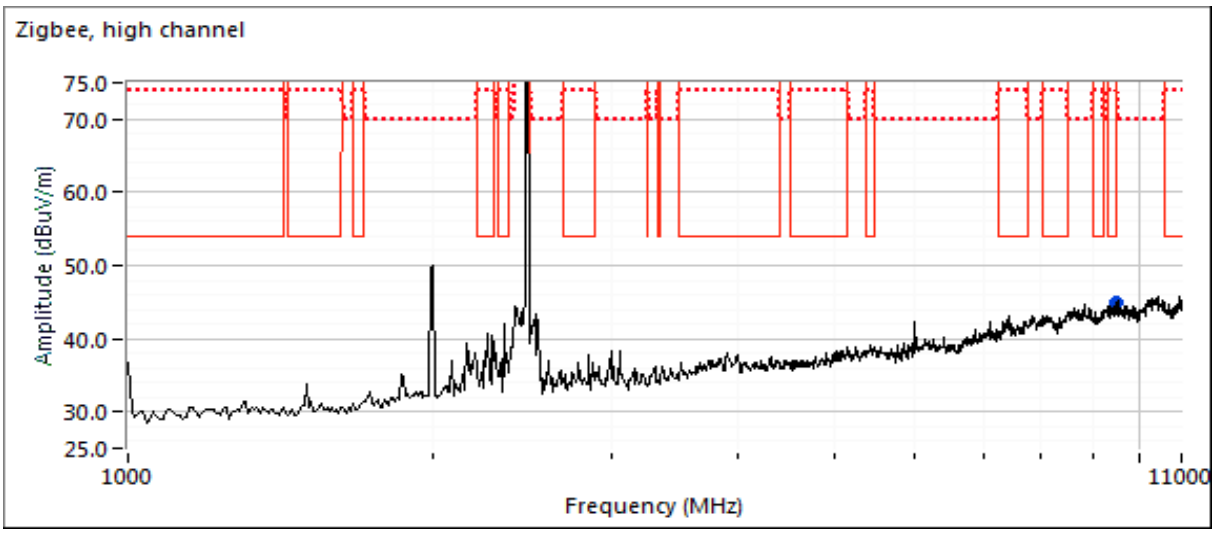
Run #11c: High Channel

Channel: 26, 2480MHz Mode: Zigbee

Tx Chain: 1

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
9474.540	40.9	H	54.0	-13.1	AVG	350	2.2	RB 1 MHz;VB 1 kHz;Peak
9474.710	52.7	H	74.0	-21.3	PK	350	2.2	RB 1 MHz;VB 3 MHz;Peak

Note 1:	Scans made between 11 - 25 GHz with the measurement antenna moved around the card and its antennas 20-50cm 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:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	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: 23.4 °C
Rel. Humidity: 40 %

Summary of Results

Run #	Mode	Channel	Power Settings		Test Performed	Limit	Result / Margin
Scans on "center" channel in all five OFDM modes to determine the worst case mode (4X4 in 5 GHz bands and 4x4 in 2.4 GHz band).							
1	a / g BLE	6 & 40 Wi-Fi 37 - BLE	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	52.4 dBµV/m @ 17947.7 MHz (-1.6 dB)
	ax20, BLE	6 & 40 Wi-Fi 17 - BLE	20	19	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	52.9 dBµV/m @ 5759.5 MHz (-15.4 dB)
	ax40, BLE	6 & 38 Wi-Fi 39 - BLE	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	51.1 dBµV/m @ 5052.3 MHz (-2.9 dB)
	ax80 / b	6 & 42 Wi-Fi	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	45.0 dBµV/m @ 4800.0 MHz (-9.0 dB)
Scans on worst case mode above with ZigBee also active.							
2	a / b, ZigBee	6, 40 Wi-Fi 11 - ZB	20 / 20 / 8	20 / 20 / 8	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	45.0 dBµV/m @ 20795.5 MHz (-9.0 dB)

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Measurements on low and high channels in worst-case OFDM mode.							
3	a/g, BLE	1 & 36 Wi-Fi 37 - BLE	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	45.9 dBµV/m @ 5035.8 MHz (-8.1 dB)
	a/g, BLE	11 & 48 Wi-Fi 39 - BLE	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	47.9 dBµV/m @ 5043.4 MHz (-6.1 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). No ac160 mode in this band.							
8	a / g, BLE	6 & 157 Wi-Fi 37 - BLE	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	44.7 dBµV/m @ 4800.0 MHz (-9.3 dB)
	ax20, BLE	6 & 157 Wi-Fi 37 - BLE	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	43.7 dBµV/m @ 5390.3 MHz (-10.3 dB)
	ax40, BLE	6 & 159 Wi-Fi 37 - BLE	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	45.4 dBµV/m @ 4800.0 MHz (-8.6 dB)
	ac80 / b, BLE	6 & 155 Wi-Fi 37 - BLE	20	19.5 5GHz	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	66.2 dBµV/m @ 5981.78 MHz (-2.1 dB)
Measurements on low and high channels in worst-case OFDM mode.							
9	ac80 / b, BLE	1 & 149 Wi-Fi 37 - BLE	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	61.9 dBµV/m @ 5494.4 MHz (-6.4 dB)
	ac80 / b, BLE	11 & 165 Wi-Fi 39 - BLE	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	47.7 dBµV/m @ 9847.9 MHz (-6.3 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:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Procedure Comments:

Measurements performed in accordance with FCC KDB 789033
Limits from 15.209 instead of 15.407(b)(1-3) acceptable until January 1, 2019 per FCC KDB 789033 D01
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)

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
ZigBee	250 kb/s	0.43	Yes	0.863	3.7	7.4	1159
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
11a	MCS0	0.92	Yes	1.4	0.3	0.7	698
11ax20	MCS0	0.96	Yes	5.4	0.2	0.4	184
11ax40	MCS0	0.96	Yes	5.4	0.2	0.4	184
11ax80	MCS0	0.95	Yes	5.4	0.2	0.5	185
11ac80+80	MCS0	0.96	Yes	5.4	0.2	0.3	184

Sample Notes

BLE Sample SN: CNG6K9V019 and Zigbee Sample SN: CNG6K9V00C
Driver: P2 WNC 0.4.4
Antenna: AP-ANT-19 Wi-Fi, Integral BLE/ZigBee. 4 antennas for 5 GHz radio and 4 antennas for 2.4 GHz radio.

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 (RB=1MHz, VB≥3MHz, peak detector).
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 5:	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:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

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

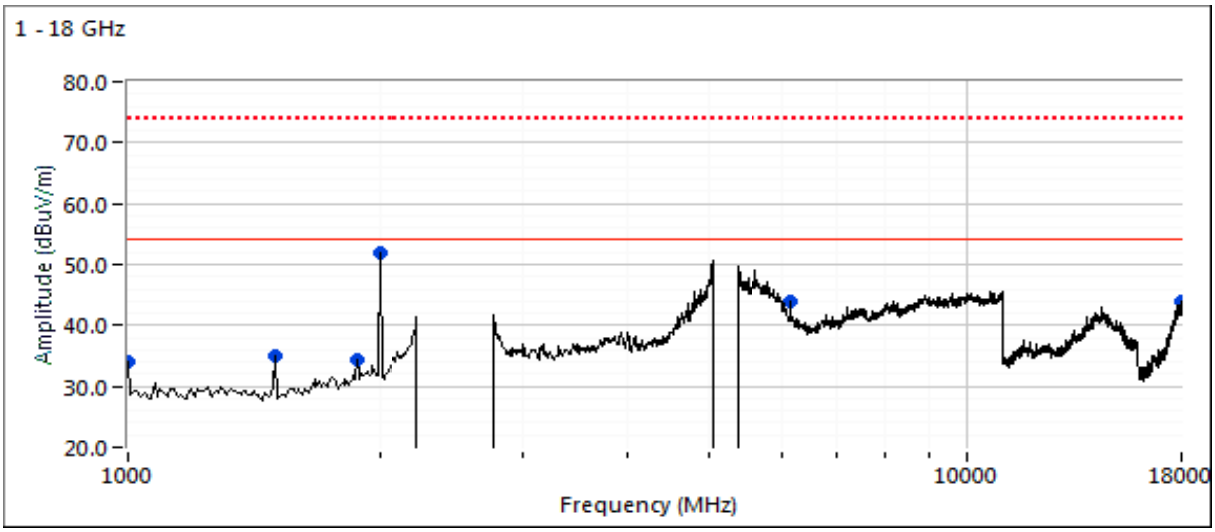
Date of Test: 10/16/2018 0:00
Test Engineer: Roy Zheng / R. Varelas
Test Location: Chamber #5

Config. Used: Ant 19
Config Change: none
EUT Voltage: PoE & 120V/60Hz

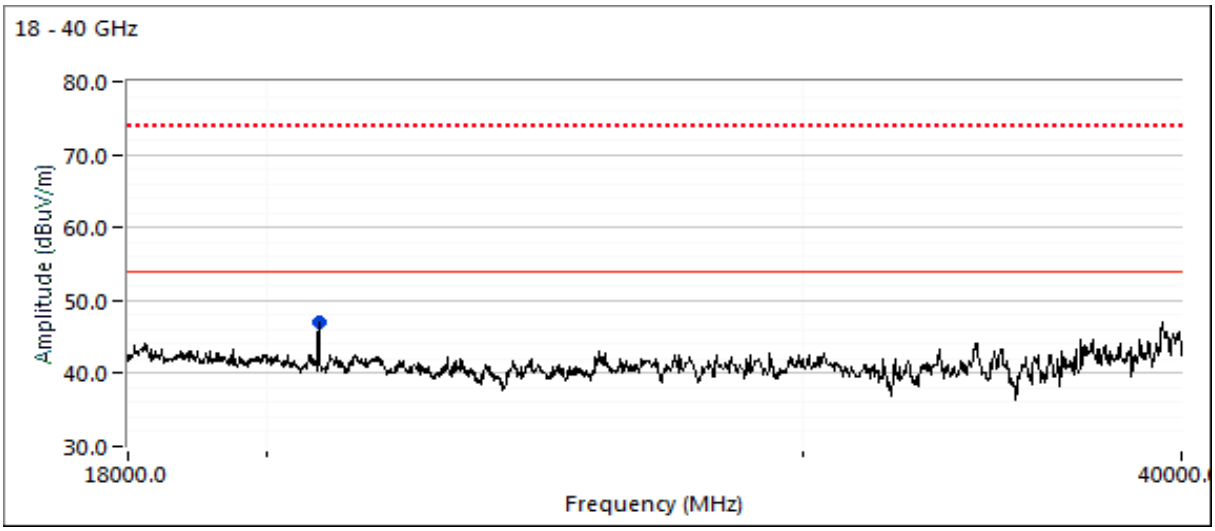
Run #1a: Center Channel

Channel: 6 & 40 Wi-Fi, 37 - BLE
Mode: 11a/g + BLE
Pwr setting 20
Tx Chain: 4 Tx
Data Rate: 6 Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1000.000	34.0	V	60.0	-26.0	Peak	56	1.9	Note 5
1500.060	34.9	V	60.0	-25.1	Peak	56	1.0	Note 5
1875.030	34.5	V	60.0	-25.5	Peak	360	1.9	Note 5
2000.040	52.3	V	60.0	-7.7	Peak	283	1.0	Note 5
6144.130	48.7	V	68.3	-19.6	PK	351	1.8	RB 1 MHz;VB 3 MHz;Peak
17947.740	52.4	H	54.0	-1.6	VAVG	237	2.0	RB 1 MHz;VB 1 kHz; Note 3
17948.980	64.5	H	74.0	-9.5	PK	237	2.0	RB 1 MHz;VB 3 MHz;Peak
20795.030	42.0	V	54.0	-12.0	VAVG	151	1.3	RB 1 MHz;VB 1 kHz; Note 3
20795.350	60.1	V	74.0	-13.9	PK	151	1.3	RB 1 MHz;VB 3 MHz;Peak



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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

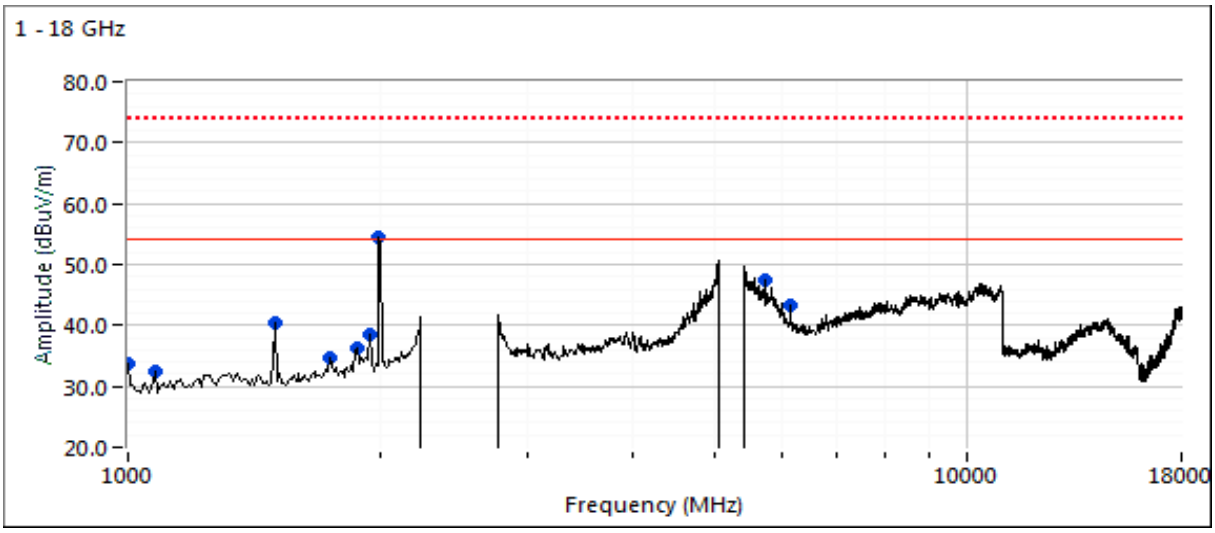
Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #1b: Center Channel

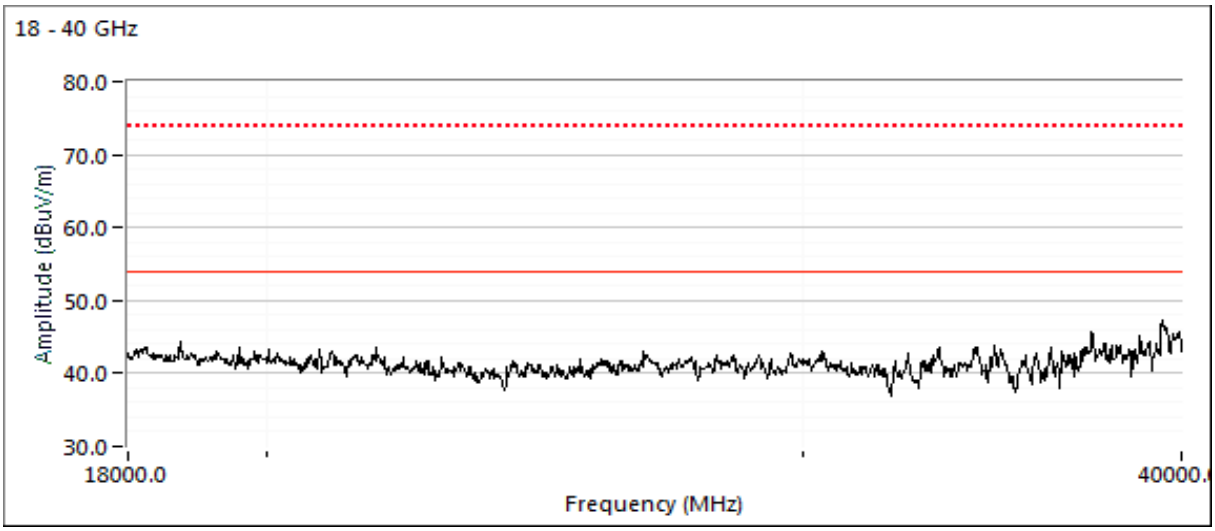
Channel: 6 & 40 Wi-Fi, 17 - BLE Mode: 11ax20

Tx Chain: 4 (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	
1005.350	33.8	H	60.0	-26.2	Peak	22	2.5	Note 5
1073.920	32.4	V	60.0	-27.6	Peak	182	1.0	Note 5
1740.890	34.6	V	60.0	-25.4	Peak	46	1.9	Note 5
1878.800	36.4	V	60.0	-23.6	Peak	92	1.6	Note 5
1936.820	38.6	V	60.0	-21.4	Peak	195	1.0	Note 5
2000.130	55.7	V	60.0	-4.3	PK	21	1.4	Note 5
1500.090	41.6	V	60.0	-18.4	PK	17	1.4	Note 5
5759.510	52.9	V	68.3	-15.4	PK	54	1.4	RB 1 MHz;VB 3 MHz;Peak
6143.830	49.9	V	68.3	-18.4	PK	50	1.7	RB 1 MHz;VB 3 MHz;Peak



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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

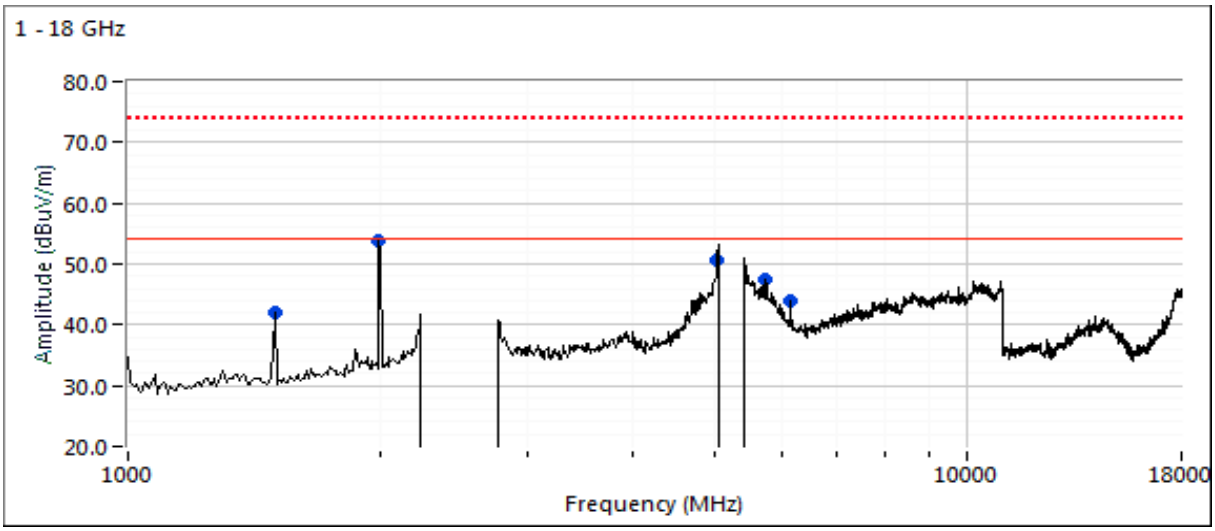
Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #1c: Center Channel

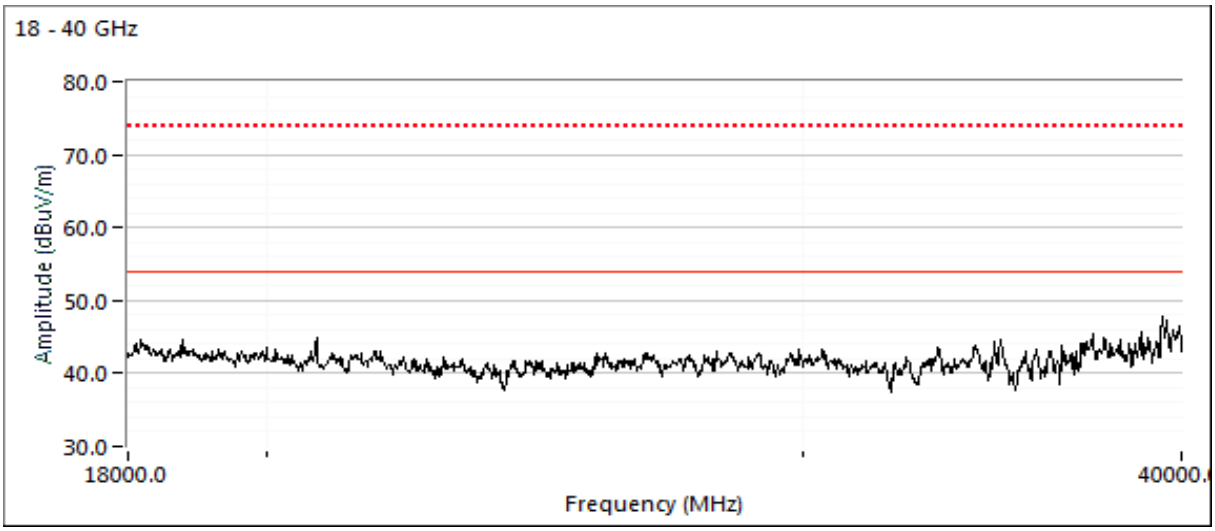
Channel: 6 & 38 Wi-Fi, 39 - BLE Mode: 11ax40

Tx Chain: 4 (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	
5052.300	51.1	V	54.0	-2.9	VAVG	206	1.5	RB 1 MHz;VB 300Hz; Note 3
5052.350	66.7	V	74.0	-7.3	PK	206	1.5	RB 1 MHz;VB 3 MHz;Peak
5760.070	55.7	V	68.3	-12.6	PK	176	1.6	RB 1 MHz;VB 3 MHz;Peak
6144.030	51.1	V	68.3	-17.2	PK	139	1.6	RB 1 MHz;VB 3 MHz;Peak
2000.030	49.1	V	54.0	-4.9	VAVG	97	1.0	RB 1 MHz;VB 300Hz; Note 3
1999.950	51.7	V	74.0	-22.3	PK	97	1.0	RB 1 MHz;VB 3 MHz;Peak
1499.980	37.6	V	54.0	-16.4	VAVG	56	1.9	RB 1 MHz;VB 300Hz; Note 3
1499.890	43.8	V	74.0	-30.2	PK	56	1.9	RB 1 MHz;VB 3 MHz;Peak



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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

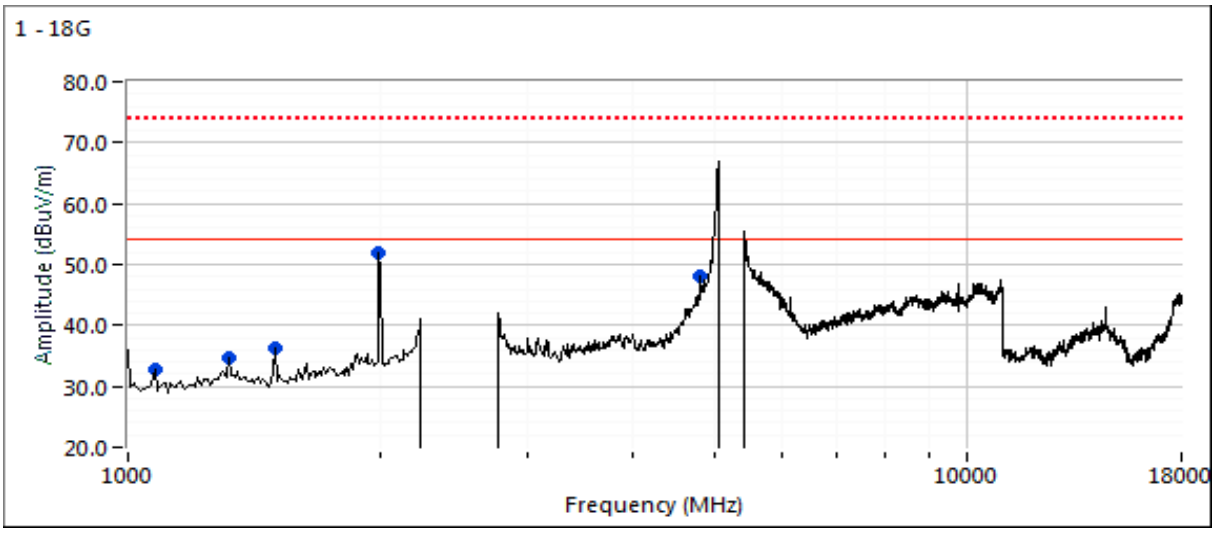
Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #1d: Center Channel

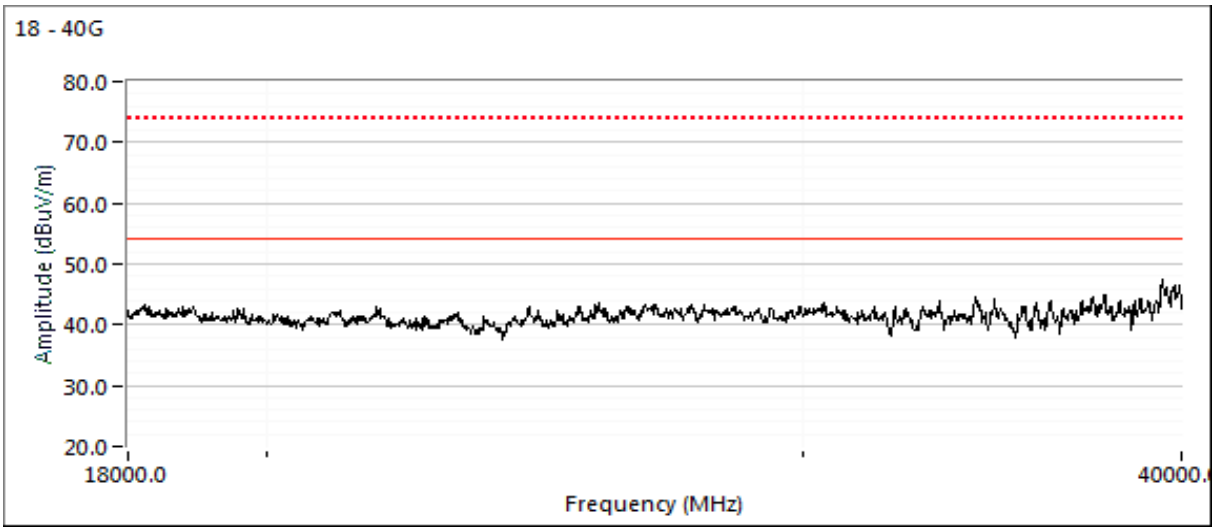
Channel: 6 & 42 Wi-Fi Mode: ax80 / b

Tx Chain: 4 (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	
1075.000	32.9	V	60.0	-27.1	Peak	276	1.0	Note 5
1316.670	34.8	H	60.0	-25.2	Peak	237	1.0	Note 5
1500.000	36.4	V	60.0	-23.6	Peak	58	1.0	Note 5
2000.000	51.9	V	60.0	-8.1	Peak	45	1.0	Note 5
4799.960	45.0	V	54.0	-9.0	VAVG	338	1.8	RB 1 MHz;VB 300 Hz;Note 3
4800.440	56.0	V	74.0	-18.0	PK	338	1.8	RB 1 MHz;VB 3 MHz;Peak



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

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

Date of Test: 12/27/2018
Test Engineer: Roy Zheng / R. Varelas
Test Location: Chamber #5

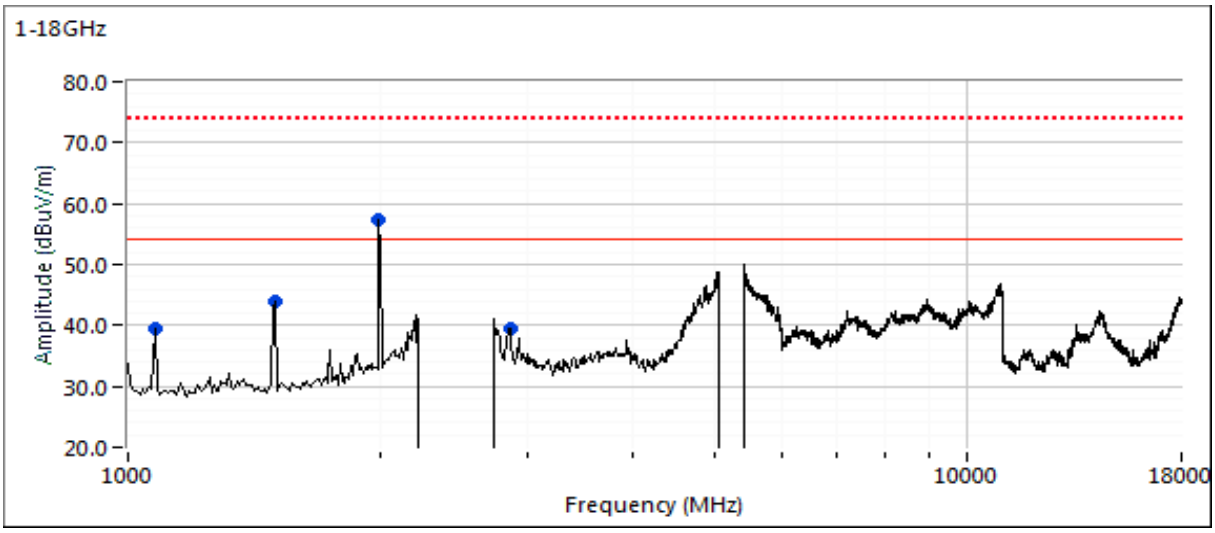
Config. Used: Ant 19
Config Change: none
EUT Voltage: PoE & 120V/60Hz

Run #2a: Center Channel

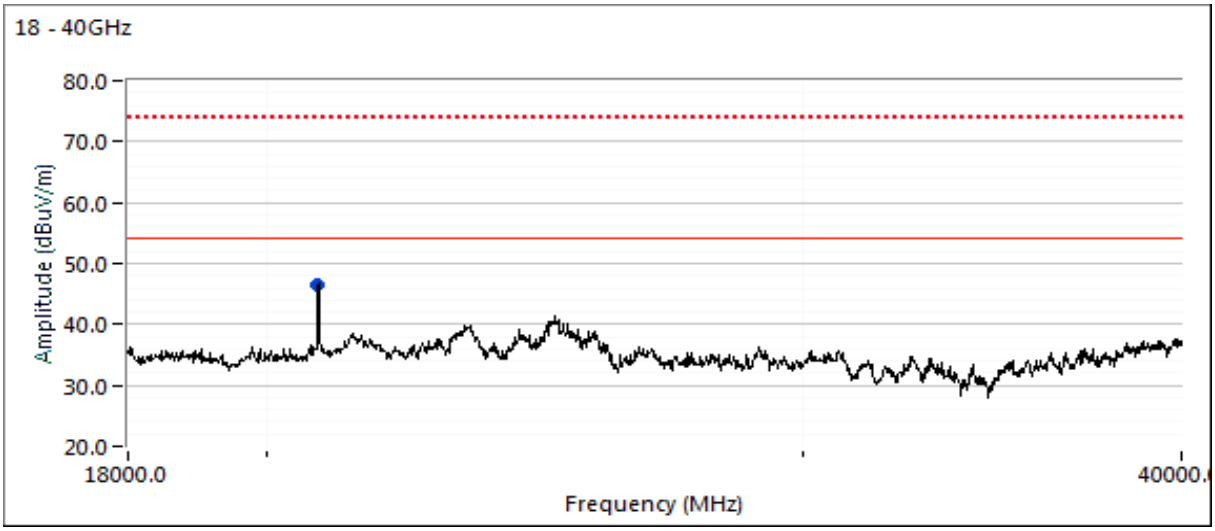
Channel: 6, 40 Wi-Fi, 11 - ZigBee
Tx Chain: 4

Mode: a, b
Data Rate: MCS0, 1

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1075.000	39.5	H	60.0	-20.5	Peak	154	2.2	Note 5
1500.000	43.9	V	60.0	-16.1	Peak	126	1.6	Note 5
2000.000	57.5	V	60.0	-2.5	Peak	62	1.0	Note 5
2850.000	39.4	H	54.0	-14.6	Peak	219	1.0	Peak reqading vs. average limit
20795.530	45.0	V	54.0	-9.0	VAVG	141	1.8	RB 1 MHz;VB 1 kHz;Note 4
20795.850	52.5	V	74.0	-21.5	PK	141	1.8	RB 1 MHz;VB 3 MHz;Peak



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

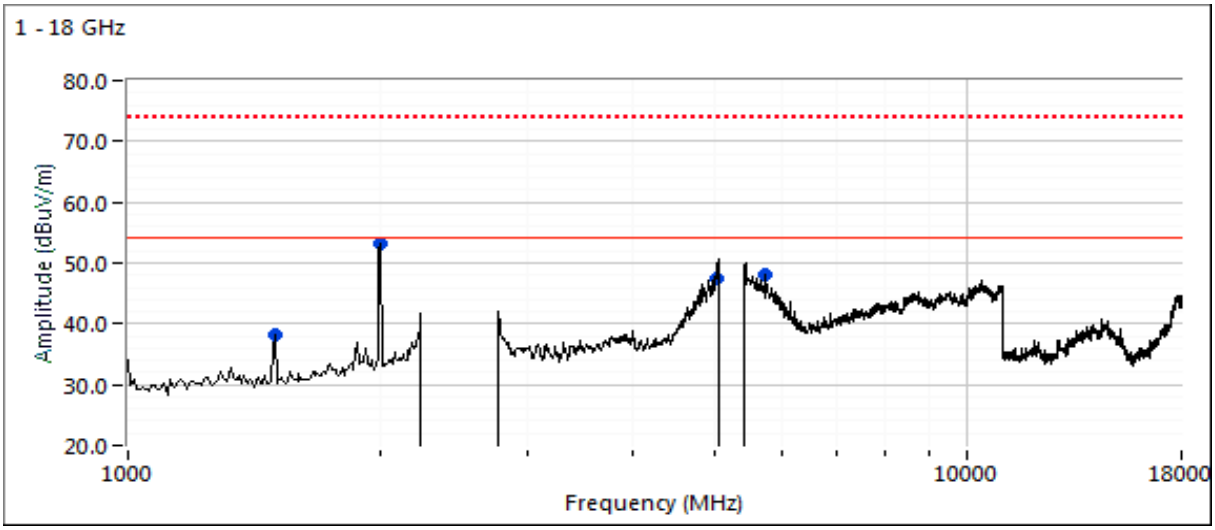
Run #3: Radiated Spurious Emissions, 1,000 - 40000 MHz. Operating Mode: Worse case from Runs #1 and 2

Date of Test: 10/16/2018 20:00 — Config. Used: Ant 19
Test Engineer: Rafael Varelas — Config Change: none
Test Location: Chamber #5 — EUT Voltage: PoE & 120V/60Hz

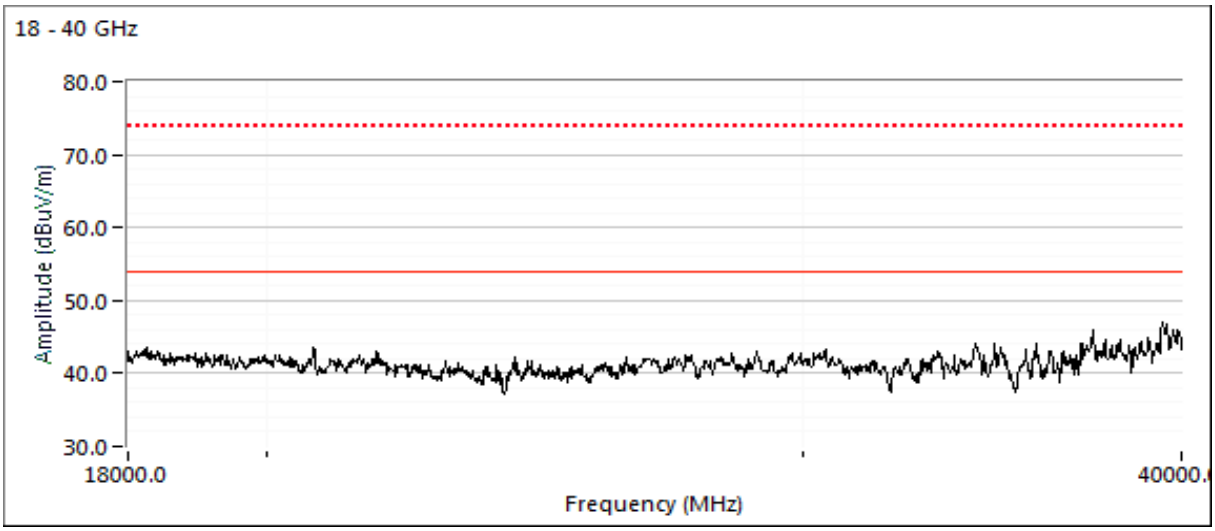
Run #3a: Low Channel

Channel: 1 & 36 Wi-Fi, 37 - BLE — Mode: a/g
Tx Chain: 4 (5GHz), 4 (2.4 GHz) — Data Rate: 6Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1499.970	36.9	V	60.0	-23.1	VAVG	70	2.0	Note 5
1499.910	43.1	V	80.0	-36.9	PK	70	2.0	Note 5
2000.040	52.7	V	60.0	-7.3	VAVG	13	1.3	Note 5
2000.060	56.8	V	80.0	-23.2	PK	13	1.3	Note 5
5760.190	56.2	V	68.3	-12.1	PK	210	1.6	RB 1 MHz;VB 3 MHz;Peak
5035.830	45.9	V	54.0	-8.1	VAVG	212	1.5	RB 1 MHz;VB 300 Hz; Note 3
5035.820	58.2	V	74.0	-15.8	PK	212	1.5	RB 1 MHz;VB 3 MHz;Peak



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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

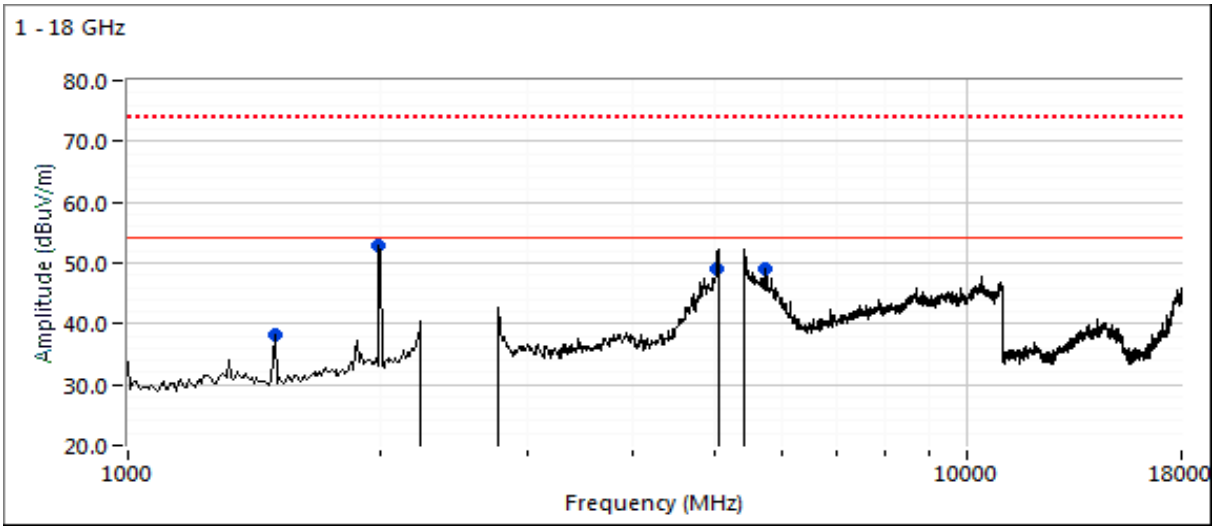
Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #3b: High Channel

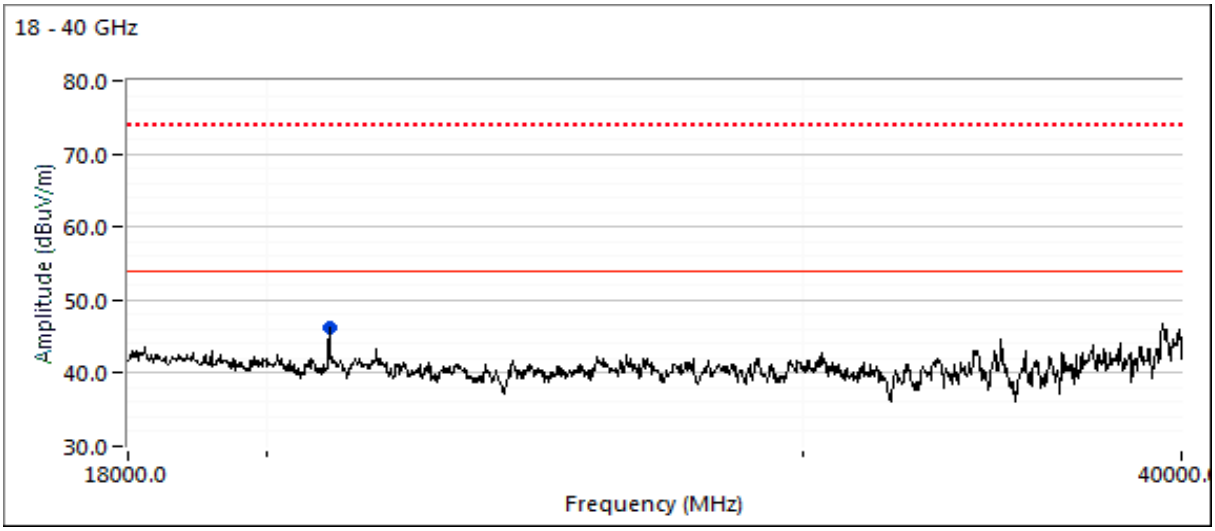
Channel: 11 & 48 Wi-Fi, 39 - BLE Mode: a/g

Tx Chain: 4 (5GHz), 4 (2.4 GHz) Data Rate: 6Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2000.070	52.6	V	60.0	-7.4	VAVG	18	1.3	Note 5
2000.070	54.5	V	80.0	-25.5	PK	18	1.3	Note 5
1500.000	36.7	V	60.0	-23.3	VAVG	74	2.0	Note 5
1499.790	43.2	V	80.0	-36.8	PK	74	2.0	Note 5
5043.360	47.9	V	54.0	-6.1	VAVG	215	1.4	RB 1 MHz;VB 300 Hz; Note 3
5045.060	61.7	V	74.0	-12.3	PK	215	1.4	RB 1 MHz;VB 3 MHz;Peak
5760.240	56.0	V	68.3	-12.3	PK	326	1.6	RB 1 MHz;VB 3 MHz;Peak
20961.030	40.5	V	54.0	-13.5	VAVG	176	1.2	RB 1 MHz;VB 300 Hz; Note 3
20962.760	61.3	V	74.0	-12.7	PK	176	1.2	RB 1 MHz;VB 3 MHz;Peak



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

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

Date of Test: 10/18/2018 0:00
Test Engineer: Rafael Varelas
Test Location: Chamber #4

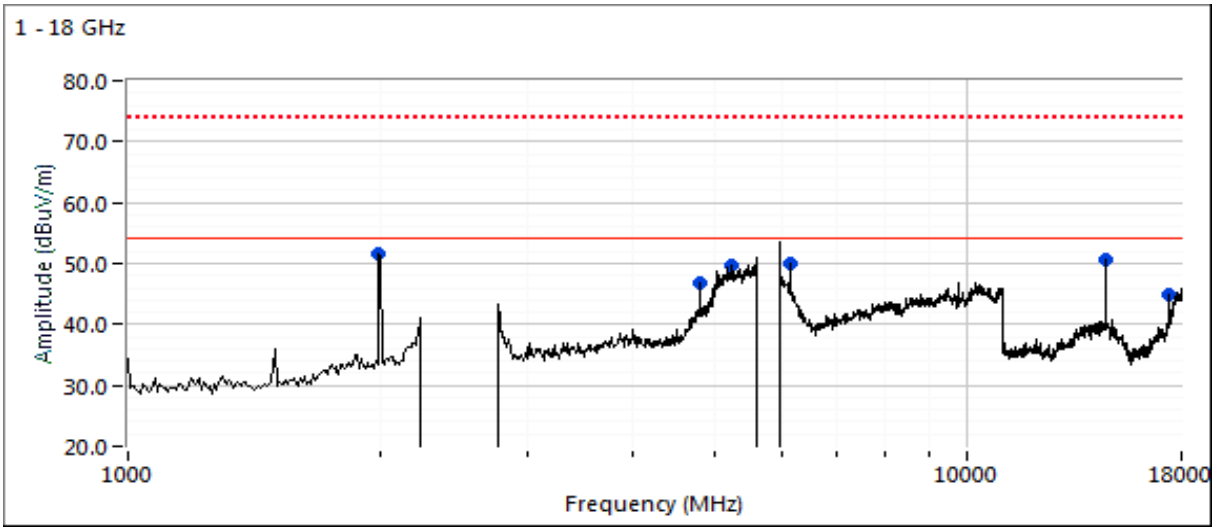
Config. Used: Ant 19
Config Change: none
EUT Voltage: PoE & 120V/60Hz

Run #8a: Center Channel

Channel: 6 & 157 Wi-Fi, 37 - BLE
Tx Chain: 4 (5GHz), 4 (2.4 GHz)

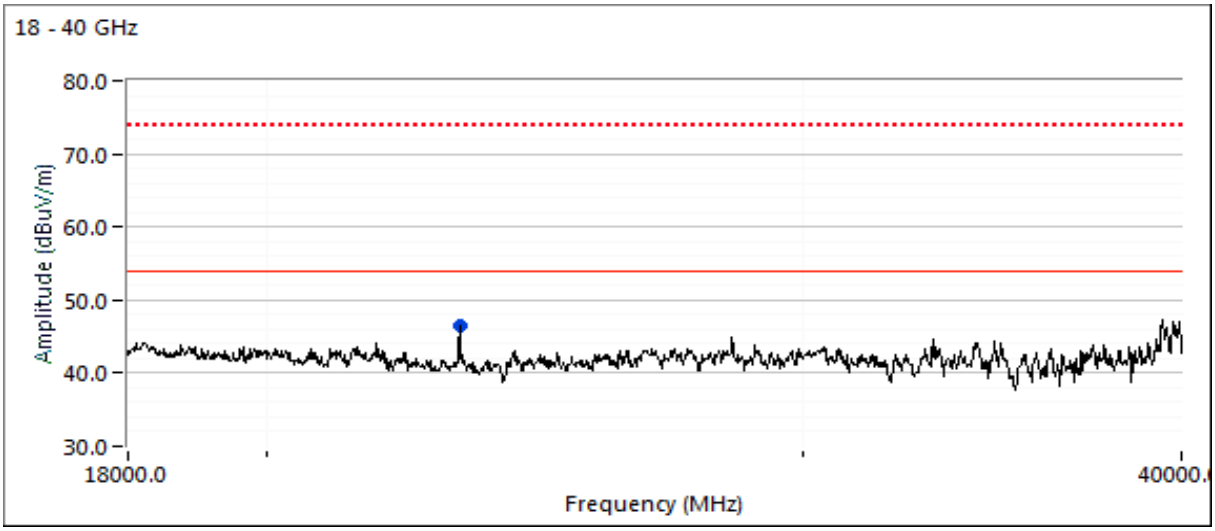
Mode: a, g
Data Rate: 6Mb/s

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
14621.950	50.6	V	54.0	-3.4	VAVG	122	1.2	RB 1 MHz;VB 1 kHz;Note 3
14622.000	55.8	V	74.0	-18.2	PK	122	1.2	RB 1 MHz;VB 3 MHz;Peak
17362.440	56.7	V	68.3	-11.6	PK	199	1.5	RB 1 MHz;VB 3 MHz;Peak
4800.020	44.7	V	54.0	-9.3	VAVG	15	1.7	RB 1 MHz;VB 1 kHz;Note 3
4799.960	52.4	V	74.0	-21.6	PK	15	1.7	RB 1 MHz;VB 3 MHz;Peak
2000.070	50.8	V	60.0	-9.2	Avg	169	1.5	Note 5
2000.010	52.5	V	80.0	-27.5	PK	169	1.5	Note 5
6144.170	54.7	V	68.3	-13.6	PK	192	1.6	RB 1 MHz;VB 3 MHz;Peak
5250.370	57.5	V	68.3	-10.8	PK	312	1.7	RB 1 MHz;VB 3 MHz;Peak
23135.490	57.3	H	68.3	-11.0	PK	230	1.0	RB 1 MHz;VB 3 MHz;Peak



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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

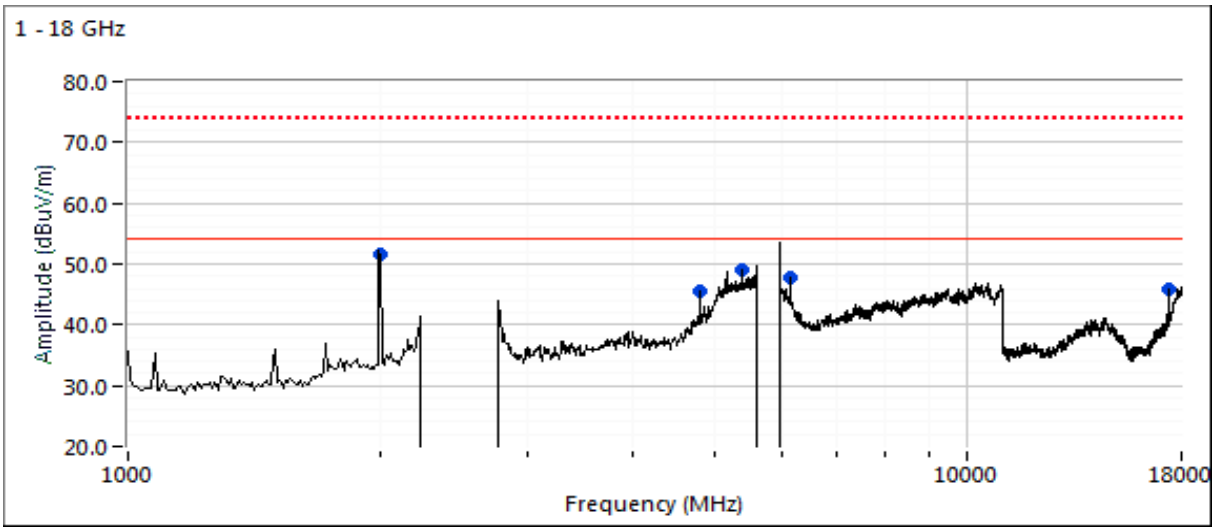
Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #8b: Center Channel

Channel: 6 & 157 Wi-Fi, 17 - BLE Mode: 11ax20

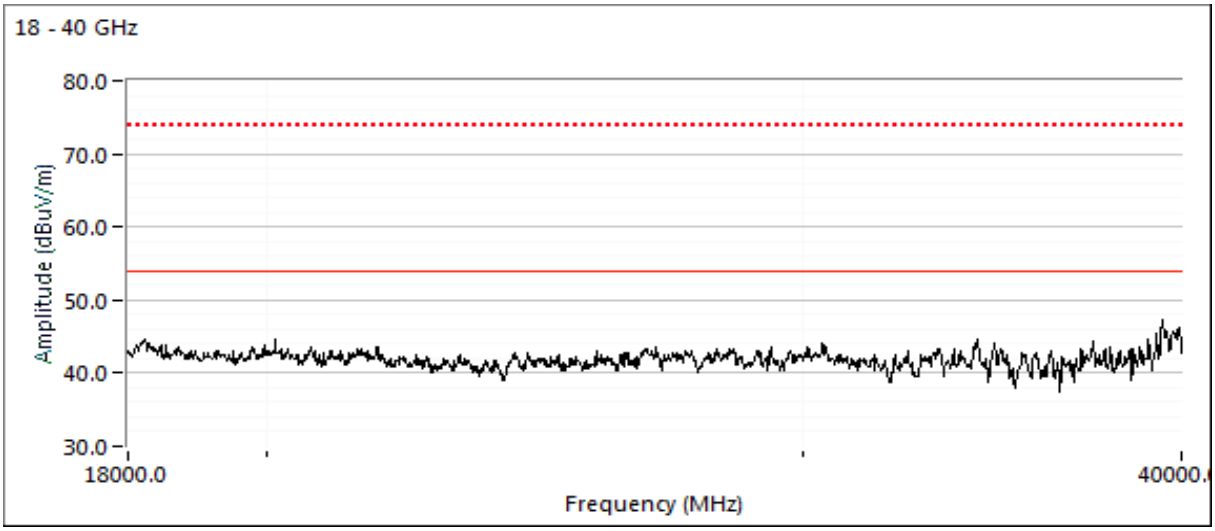
Tx Chain: 4 (5GHz), 4 (2.4 GHz) Data Rate: MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
17358.330	45.8	H	68.3	-22.5	Peak	215	1.3	RB 1 MHz;VB 3 MHz;Peak
2000.040	51.1	V	60.0	-8.9	Avg	0	1.0	Note 5
2000.030	55.0	V	80.0	-25.0	PK	0	1.0	Note 5
4786.670	37.5	V	54.0	-16.5	VAVG	135	1.7	RB 1 MHz;VB 300 Hz;Note 3
4787.030	50.4	V	74.0	-23.6	PK	135	1.7	RB 1 MHz;VB 3 MHz;Peak
6143.850	53.7	V	68.3	-14.6	PK	192	1.6	RB 1 MHz;VB 3 MHz;Peak
5390.280	43.7	V	54.0	-10.3	VAVG	319	1.7	RB 1 MHz;VB 300 Hz;Note 3
5390.910	56.1	V	74.0	-17.9	PK	319	1.7	RB 1 MHz;VB 3 MHz;Peak



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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

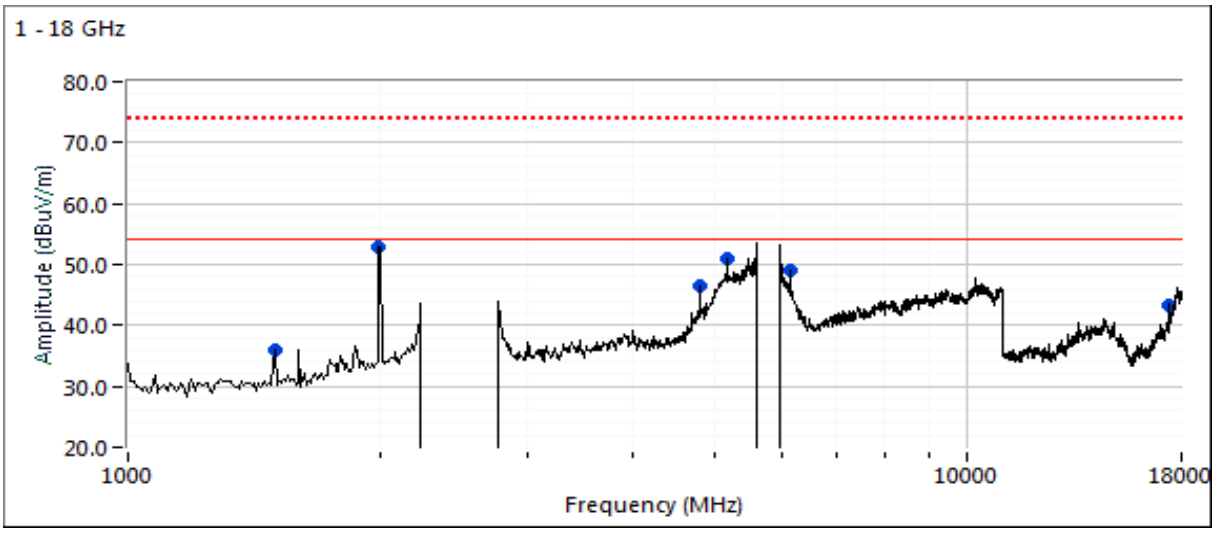
Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #8c: Center Channel

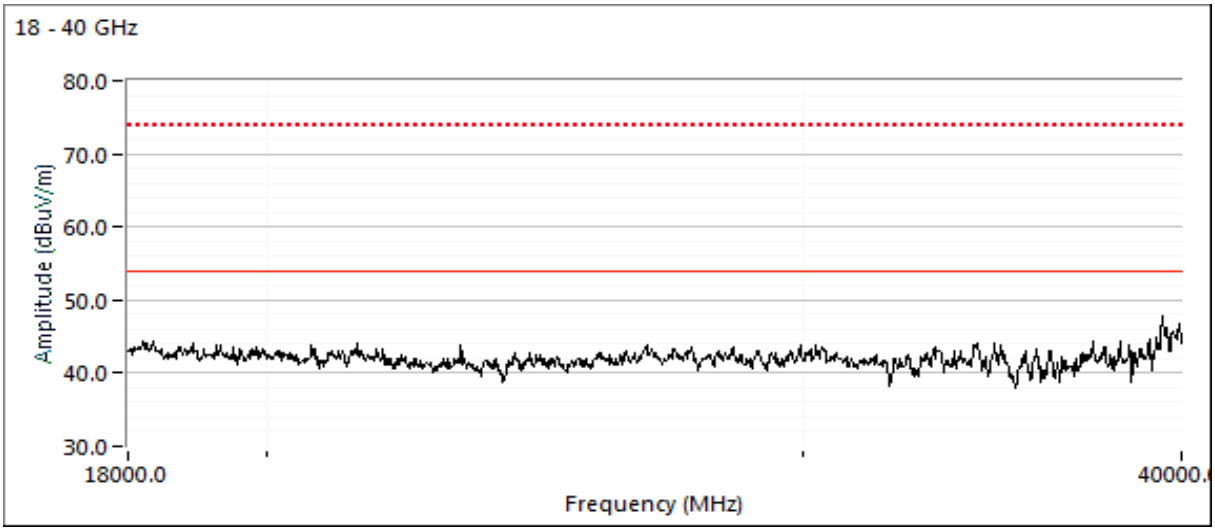
Channel: 6 & 159 Wi-Fi, 39 - BLE Mode: 11ax40

Tx Chain: 4 (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	
1500.080	35.9	V	60.0	-24.1	Peak	23	1.9	Note 5
17370.000	43.4	V	68.3	-24.9	Peak	187	1.6	RB 1 MHz;VB 3 MHz;Peak
2000.050	52.1	H	60.0	-7.9	Avg	193	1.8	Note 5
2000.000	54.0	H	80.0	-26.0	PK	193	1.8	Note 5
5184.090	57.7	V	68.3	-10.6	PK	161	1.6	RB 1 MHz;VB 3 MHz;Peak
6133.670	55.9	V	68.3	-12.4	PK	203	1.5	RB 1 MHz;VB 3 MHz;Peak
4800.030	45.4	V	54.0	-8.6	VAVG	153	1.7	RB 1 MHz;VB 300 Hz;Peak VAVG 100
4799.790	54.3	V	74.0	-19.7	PK	153	1.7	RB 1 MHz;VB 3 MHz;Peak



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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

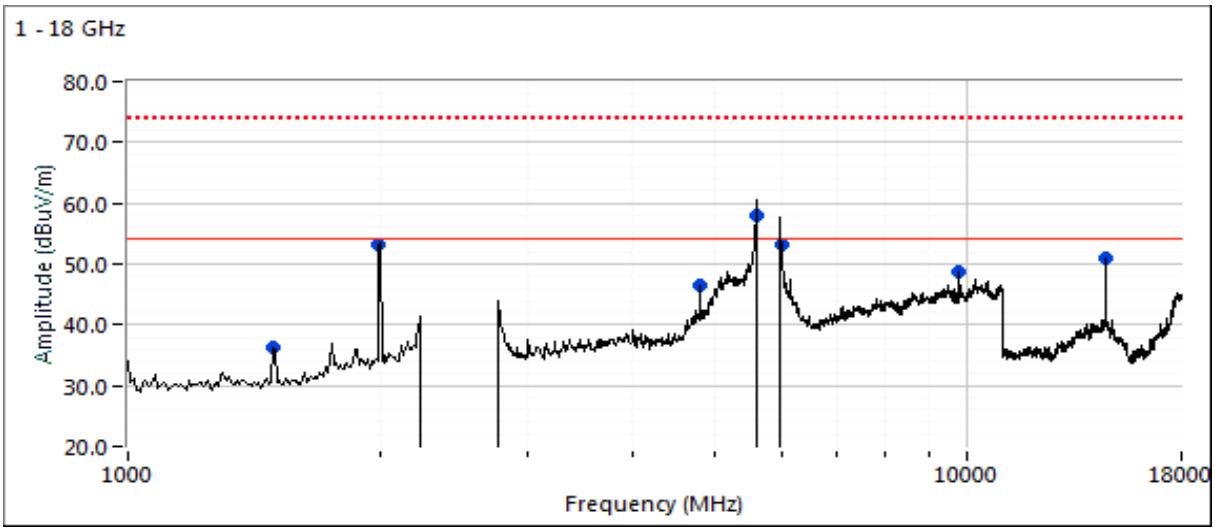
Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #8d: Center Channel

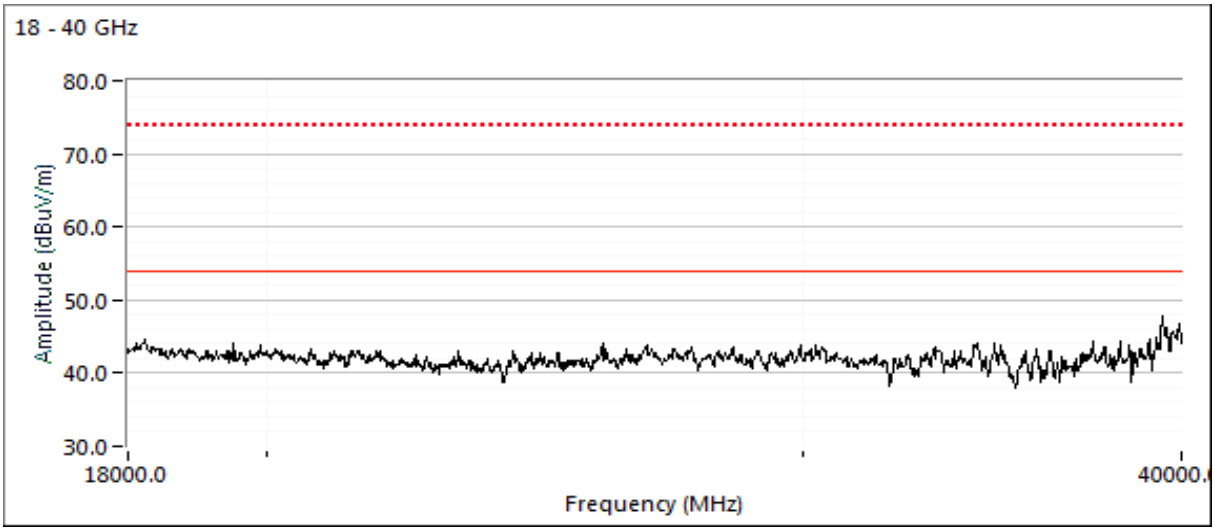
Channel: 6 & 155 Wi-Fi, 17 - BLE Mode: ac80 / b

Tx Chain: 4 (5GHz), 4 (2.4 GHz) Data Rate: MCS0 / 1

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.070	36.2	V	60.0	-23.8	Peak	28	1.3	Note 5
4800.060	44.0	V	54.0	-10.0	VAVG	11	1.8	RB 1 MHz;VB 300 Hz;Note 3
4799.730	52.3	V	74.0	-21.7	PK	11	1.8	RB 1 MHz;VB 3 MHz;Peak
2000.070	50.8	V	60.0	-9.2	Avg	62	1.1	Note 5
2000.050	52.8	V	80.0	-27.2	PK	62	1.1	Note 5
9741.660	40.8	V	54.0	-13.2	VAVG	183	1.0	RB 1 MHz;VB 300 Hz;Note 3
9741.820	53.0	V	74.0	-21.0	PK	183	1.0	RB 1 MHz;VB 3 MHz;Peak
5981.780	66.2	V	68.3	-2.1	PK	144	1.6	RB 1 MHz;VB 3 MHz;Peak
14621.960	49.7	V	54.0	-4.3	VAVG	117	1.2	RB 1 MHz;VB 300 Hz;Note 3
14621.830	55.7	V	74.0	-18.3	PK	117	1.2	RB 1 MHz;VB 3 MHz;Peak
5600.400	61.5	V	68.3	-6.8	PK	360	2.3	POS; RB 1 MHz; VB: 3 MHz



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

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

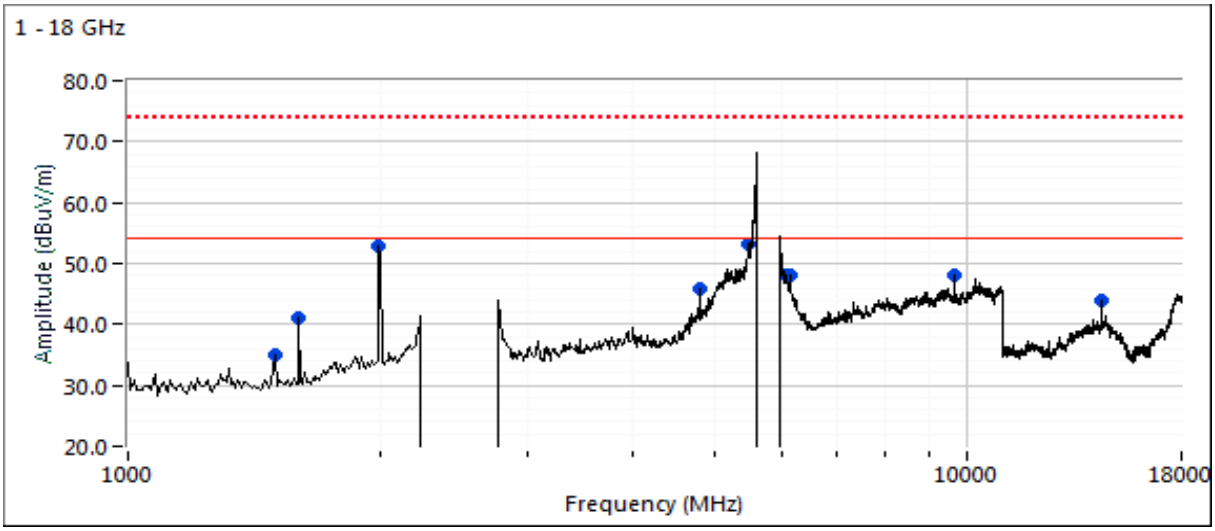
Date of Test: 10/16/2018 Config. Used: Ant 19
Test Engineer: Roy Zheng / R. Varelas Config Change: none
Test Location: Chamber #5 EUT Voltage: PoE & 120V/60Hz

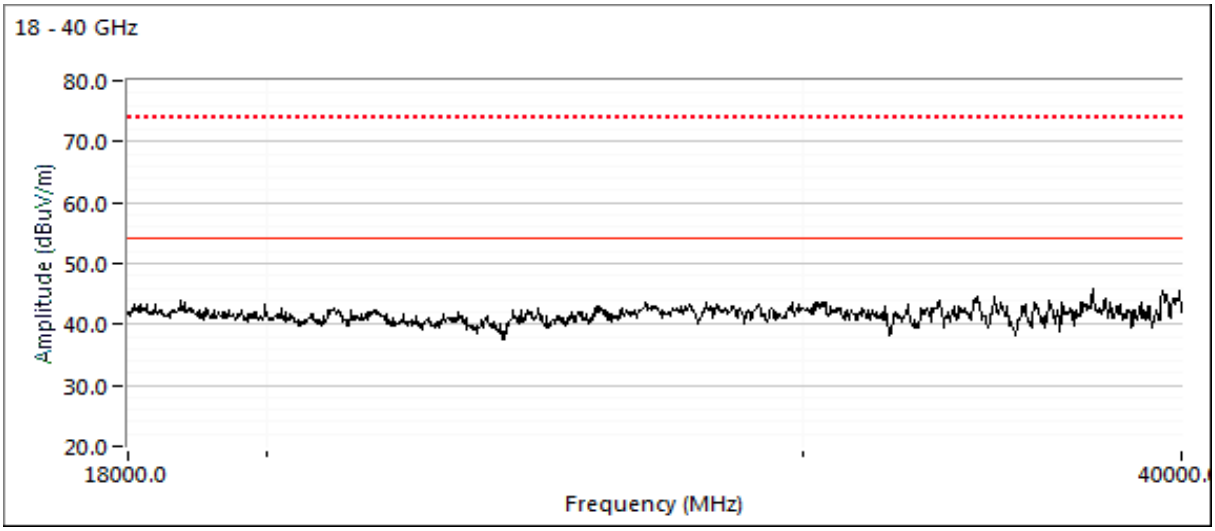
Run #9a: Low Channel

Channel: 1 & 149 Wi-Fi, 37 - BLE Mode: ac80 / b
Tx Chain: 4 Data Rate: MCS0, 1MB/s

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.000	35.1	V	60.0	-24.9	Peak	147	2.4	Note 5
1600.000	41.1	V	60.0	-18.9	Peak	62	2.5	Note 5
2000.080	53.3	V	60.0	-6.7	Avg	360	1.0	Note 5
2000.040	54.5	V	80.0	-25.5	PK	360	1.0	Note 5
4800.000	44.4	V	54.0	-9.6	VAVG	163	1.6	RB 1 MHz;VB 300 Hz;Note 3
4799.700	52.3	V	74.0	-21.7	PK	163	1.6	RB 1 MHz;VB 3 MHz;Peak
5494.430	61.9	V	68.3	-6.4	PK	18	1.9	RB 1 MHz;VB 3 MHz;Peak
6098.880	55.6	V	68.3	-12.7	PK	31	1.7	RB 1 MHz;VB 3 MHz;Peak
6149.200	54.5	V	68.3	-13.8	PK	31	1.7	RB 1 MHz;VB 3 MHz;Peak
9647.910	44.0	V	54.0	-10.0	VAVG	140	1.7	RB 1 MHz;VB 300 Hz;Note 3
9647.950	55.0	V	74.0	-19.0	PK	140	1.7	RB 1 MHz;VB 3 MHz;Peak
14471.890	42.0	V	54.0	-12.0	VAVG	131	1.0	RB 1 MHz;VB 300 Hz;Note 3
14471.780	51.8	V	74.0	-22.2	PK	131	1.0	RB 1 MHz;VB 3 MHz;Peak

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





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

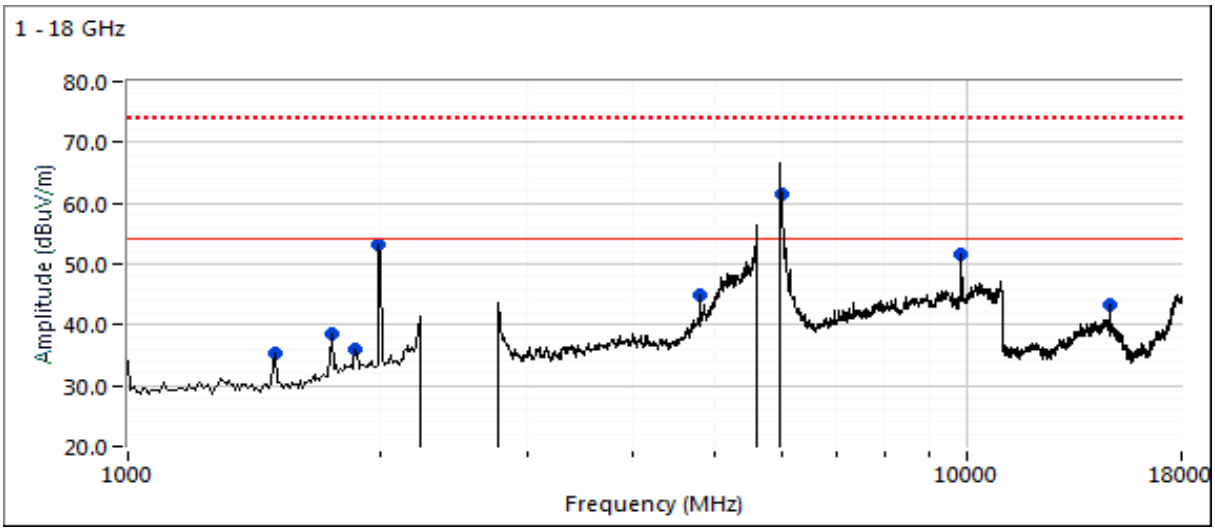
Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #9b: High Channel

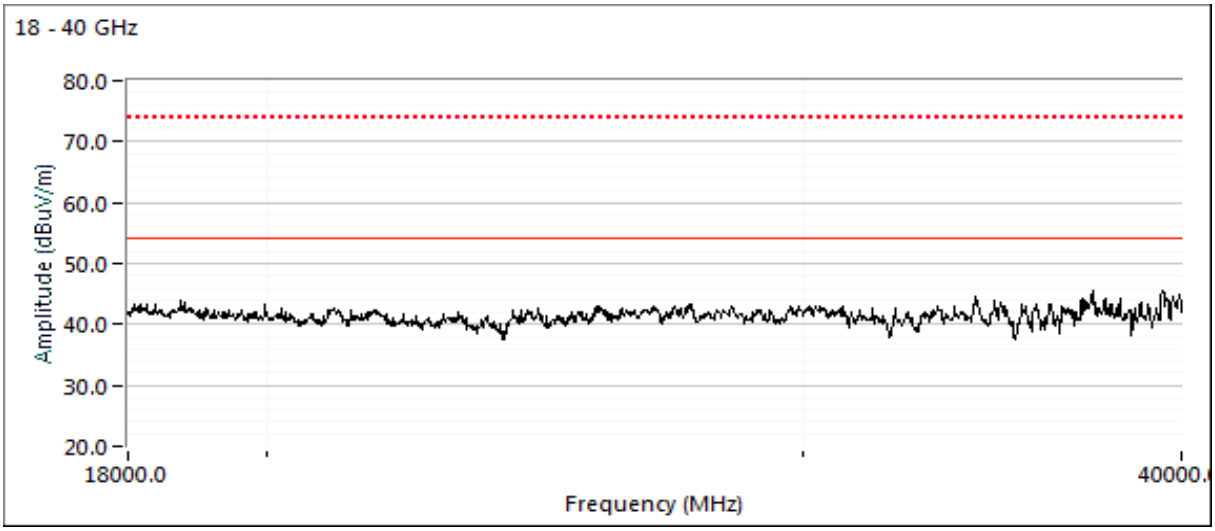
Channel: 11 & 165 Wi-Fi, 39 - BLE Mode: ac80 / b

Tx Chain: 4 Data Rate: MCS0, 1MB/s

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.000	35.4	V	60.0	-24.6	Peak	205	2.5	Note 5
1750.000	38.5	H	60.0	-21.5	Peak	6	1.3	Note 5
1866.670	35.8	V	60.0	-24.2	Peak	324	1.0	Note 5
2000.010	51.9	V	60.0	-8.1	Avg	360	1.0	Note 5
2000.070	55.3	V	80.0	-24.7	PK	360	1.0	Note 5
4799.940	40.1	V	54.0	-13.9	VAVG	24	2.3	RB 1 MHz;VB 300 Hz;Note 3
4799.990	49.5	V	74.0	-24.5	PK	24	2.3	RB 1 MHz;VB 3 MHz;Peak
9847.950	47.7	V	54.0	-6.3	VAVG	188	1.5	RB 1 MHz;VB 300 Hz;Note 3
9848.200	56.0	V	74.0	-18.0	PK	188	1.5	RB 1 MHz;VB 3 MHz;Peak
14771.530	50.7	H	68.3	-17.6	PK	279	1.0	RB 1 MHz;VB 3 MHz;Peak



Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



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:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	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: 23-24 °C
Rel. Humidity: 37-39 %

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.

Summary of Results

Run #	Mode	Channel	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	g & a BLE	6 & 40 37	20 & 20 8	20 & 20 8	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	47.2 dBµV/m @ 5446.43 MHz (-6.8 dB)
	ax20 BLE	6 & 40 17	20 & 20 8	20 & 20 8	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	45.6 dBµV/m @ 5045.39 MHz (-8.4 dB)
	ax40 BLE	6 & 38 39	20 & 20 8	20 & 20 8	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	44.0 dBµV/m @ 5479.8 MHz (-10.0 dB)
	b ax80	6 42	20 8	20 8	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	39.5 dBµV/m @ 14624.9MHz (-14.5dB)
	b ax80+80	6 50	20 20	16 20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	42.4 dBµV/m @ 14621.8MHz (-11.6dB)

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Scans on worst case mode above with BLE or ZigBee also active.							
2	g & a Zigbee	6 & 40 11	20 & 20 8	20 & 20 8	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	42.1 dBµV/m @ 1075.0 MHz (-11.9 dB)
	g & a Zigbee	6 & 116 18	15 & 20 8	15 & 20 8	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	All radio emissions were below the limit.
	g & a Zigbee	6 & 60 26	15 & 20 8	15 & 20 8	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	All radio emissions were below the limit.
Measurements on low and high channels in worst-case OFDM mode.							
3	ax20 BLE	1 & 36 37	20 6	20 6	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	35.8 dBµV/m @ 5000.0 MHz (-18.2 dB)
	ax20 BLE	11 & 48 39	20 6	20 6	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	44.7 dBµV/m @ 4800.0 MHz (-9.3 dB)
Scans on "lowest" and "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). ac160 mode performed in Run 1.							
4	g & a	1 & 60	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	45.0 dBµV/m @ 4800.1 MHz (-9.0 dB)
	ax20	1 & 60	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	46.1 dBµV/m @ 4800.0 MHz (-7.9 dB)
	b & ax40 BLE	1 & 54 17	20 6	20 6	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	43.8 dBµV/m @ 4799.9 MHz (-10.2 dB)
	b & ac80 BLE	1 & 58 37	20 6	18.5 6	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	52.6 dBµV/m @ 5437.6 MHz (-1.4 dB)
Measurements on low and high channels in worst-case OFDM mode.							
5	b & ac80 BLE	1 & 52 37	20 6	20 6	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	49.7 dBµV/m @ 2000.03 MHz (-4.3 dB)
	b & ac80 BLE	11 & 64 39	20 6	20 6	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	44.1 dBµV/m @ 4899.1 MHz (-9.9 dB)
Scans on "highest" and "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). ac160 mode performed in Run 1.							
6	g & a BLE	11 & 116 39	20 6	20 6	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	58.0 dBµV/m @ 5169.0 MHz (-10.3 dB)
	ax20 BLE	11 & 116 39	20 6	20 6	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	58.6 dBµV/m @ 5200.1 MHz (-9.7 dB)
	ax40 BLE	9 & 110 39	20 6	20 6	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	48.1 dBµV/m @ 5348.2 MHz (-5.9 dB)
	b & ac80 BLE	11 & 122 39	20 6	20 6	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	49.6 dBµV/m @ 5371.9 MHz (-4.4 dB)

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Measurements on low and high channels in worst-case OFDM mode.							
7	ax40 BLE	3 & 102 37	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	47.5 dBµV/m @ 5184 MHz (-6.5 dB)
	ax40 BLE	9 & 142 39	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	38.2 dBµV/m @ 4849.1 MHz (-15.8 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). No ac160 mode in this band.							
8	g & a BLE	6 & 157 37	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	40.6 dBµV/m @ 4800.0 MHz (-13.4 dB)
	ax20 BLE	6 & 157 37	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	42.3 dBµV/m @ 5035.9 MHz (-11.7 dB)
	ax40 BLE	6 & 159 37	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	43.6 dBµV/m @ 4800.0 MHz (-10.4 dB)
	b & ac80 BLE	6 & 155 37	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	54.8 dBµV/m @ 9748.0 MHz (-13.5 dB)
Measurements on low and high channels in worst-case OFDM mode.							
9	ax40 BLE	3 & 151 37	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	47.1 dBµV/m @ 5574.3 MHz (-6.9 dB)
	ax20 BLE	11 & 165 39	20	20	Radiated Emissions, 1 - 40 GHz	FCC 15.209/ 15.247 / 15 E	45.0 dBµV/m @ 5446.4 MHz (-9.0 dB)

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Procedure Comments:

Measurements performed in accordance with FCC KDB 789033
Limits from 15.209 instead of 15.407(b)(1-3) acceptable until January 1, 2019 per FCC KDB 789033 D01
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)

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
ZigBee	250 kb/s	42.7%	Yes	0.9	3.7	7.4	1159
BLE	1 Mb/s	72.0%	Yes	0.6	1.4	2.9	1706
11b	1 Mb/s	78.4%	Yes	0.7	1.1	2.1	1495
11a	MCS0	92.3%	Yes	1.4	0.3	0.7	698
11ax20	MCS0	95.6%	Yes	5.4	0.2	0.4	184
11ax40	MCS0	95.9%	Yes	5.4	0.2	0.4	184
11ax80	MCS0	94.9%	Yes	5.4	0.2	0.5	185
11ac80+80	MCS0	96.5%	Yes	5.4	0.2	0.3	184

Sample Notes

BLE Sample SN: CNG6K9V019 and Zigbee Sample SN: CNG6K9V00C
Driver: P2 WNC 0.4.3a
Antenna: AP-ANT-48 Wi-Fi, Integral BLE/ZigBee. 5GHz radio may also use 2 elements but with 3 dB higher power and can operate in both lower and upper 5 GHz bands simutaneously. Tests performed with at the 2 elements power levels. Tests performed with 4 antennas at the target power.

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 (RB=1MHz, VB≥3MHz, peak detector).
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 5:	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:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

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

Date of Test: 10/19/18 — Config. Used: Panel antenna
Test Engineer: Roy Zheng / R. Varelas — Config Change: none
Test Location: Chamber #4 — EUT Voltage: PoE & 120V/60Hz

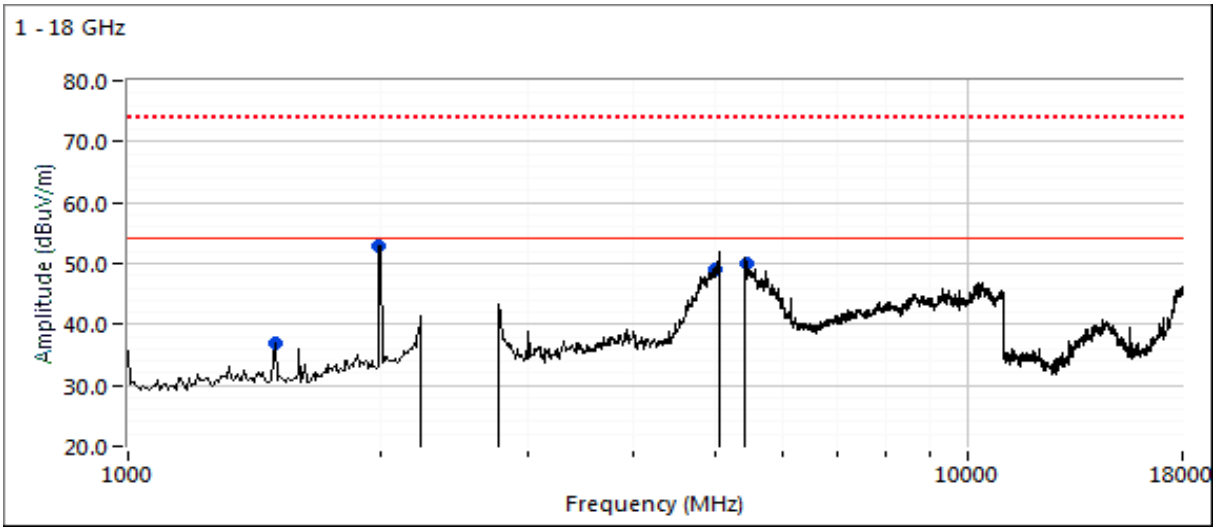
Run #1a: Center Channel

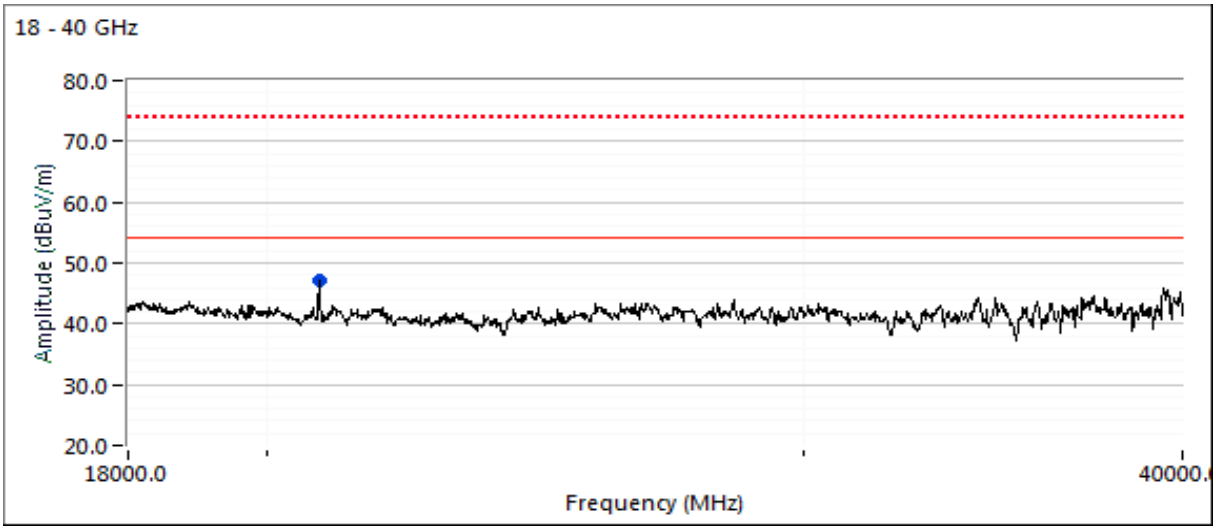
Channel: 6 &40 Wi-Fi, 2480 MHz BLE — Mode: g & a — Pwr setting 20
Tx Chain: 4 Tx — Data Rate: 6 Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.190	36.9	H	60.0	-23.1	Peak	33	1.3	Note 5
2000.020	53.0	H	60.0	-7.0	Peak	308	1.9	Note 5
5446.430	47.2	V	54.0	-6.8	VAVG	171	1.6	RB 1 MHz;VB 1 kHz;Note 3
5446.190	59.6	V	74.0	-14.4	PK	171	1.6	RB 1 MHz;VB 3 MHz;Peak
5020.730	46.8	V	54.0	-7.2	VAVG	176	1.5	RB 1 MHz;VB 1 kHz;Note 3
5019.980	58.8	V	74.0	-15.2	PK	176	1.5	RB 1 MHz;VB 3 MHz;Peak
20795.570	44.3	H	54.0	-9.7	VAVG	217	1.4	RB 1 MHz;VB 1 kHz;Note 3
20795.380	62.3	H	74.0	-11.7	PK	217	1.4	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.

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #1b: Center Channel

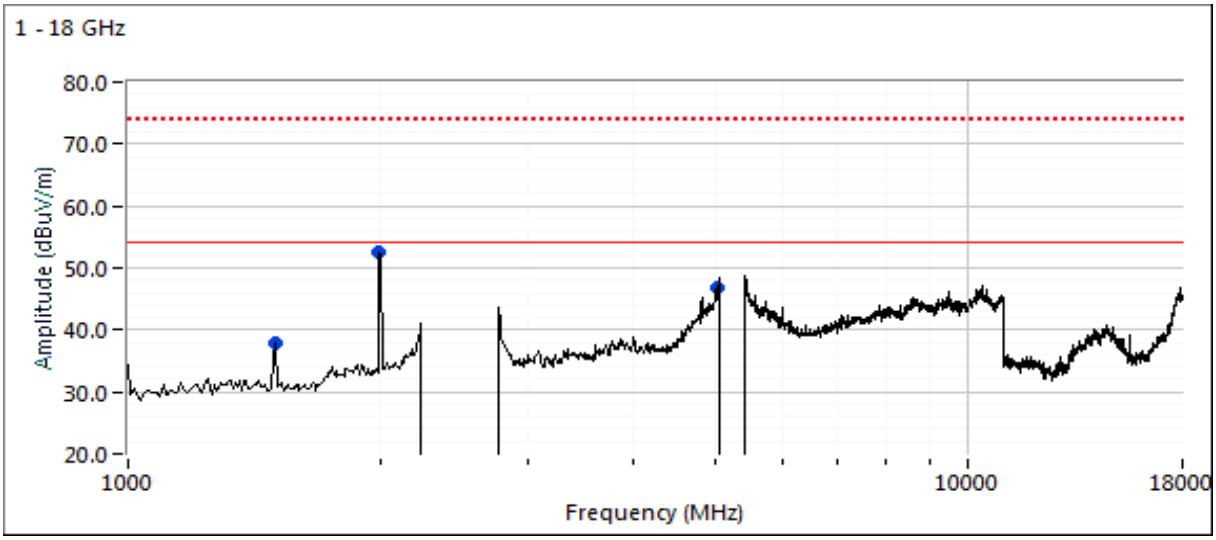
Channel: 6 & 40 Wi-Fi, 17 - BLE Mode: ax20

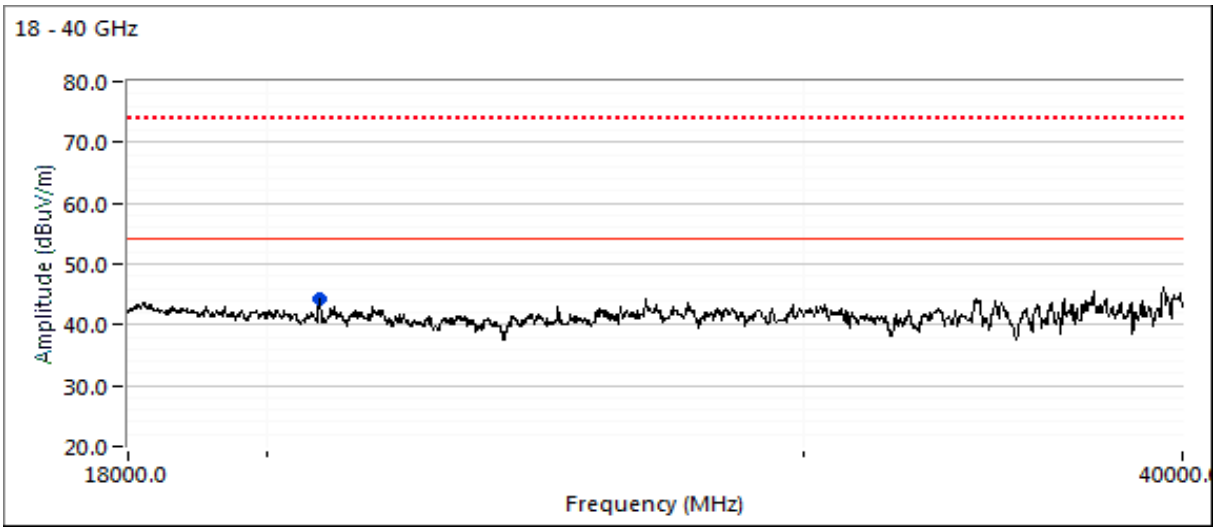
Tx Chain: 4 (5GHz), 4 (2.4 GHz) Data Rate: MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.100	38.0	H	60.0	-22.0	Peak	166	1.3	Note 5
2000.020	52.4	V	60.0	-7.6	Peak	344	1.6	Note 5
5045.390	45.6	V	54.0	-8.4	VAVG	173	1.6	RB 1 MHz;VB 300 Hz;Note 3
5044.740	58.2	V	74.0	-15.8	PK	173	1.6	RB 1 MHz;VB 3 MHz;Peak
20797.420	40.0	H	54.0	-14.0	VAVG	215	1.5	RB 1 MHz;VB 300 Hz;Note 3
20796.680	60.7	H	74.0	-13.3	PK	215	1.5	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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #1c: Center Channel

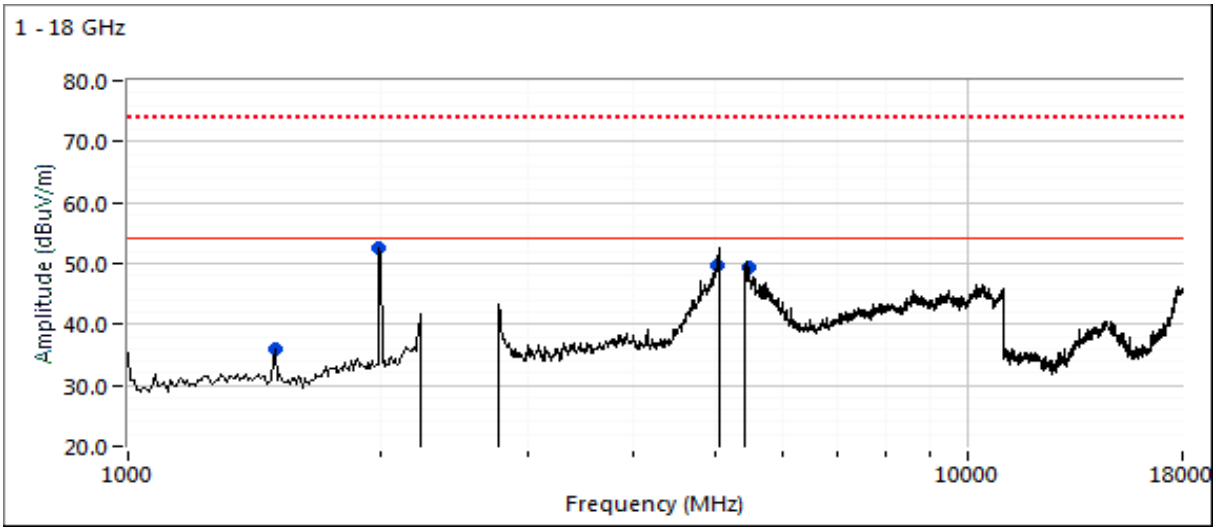
Channel: 6 & 38 Wi-Fi, 39 - BLE Mode: ax40

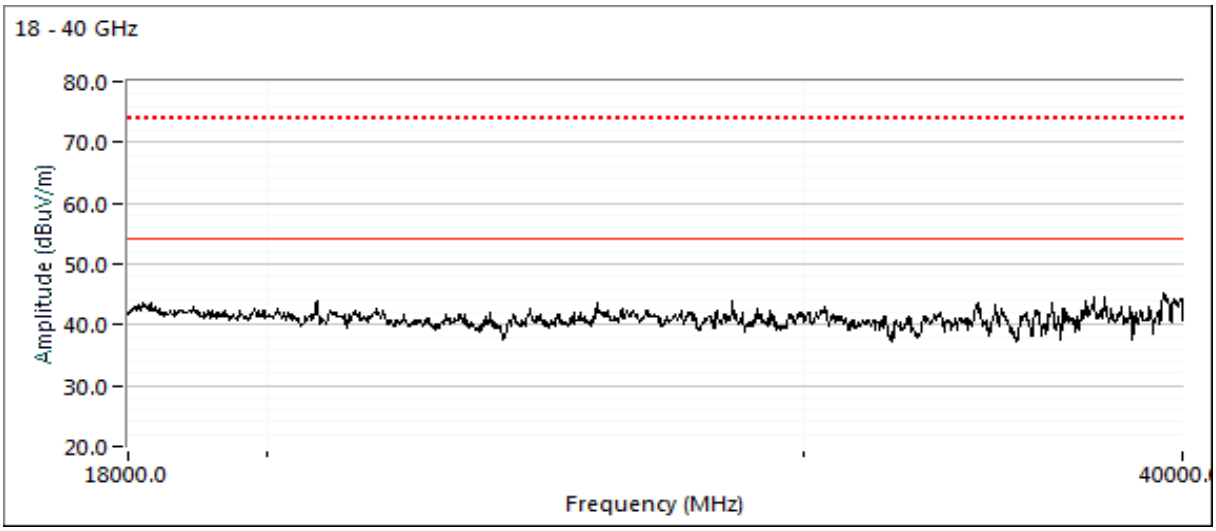
Tx Chain: 4 (5GHz), 4 (2.4 GHz) Data Rate: MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1500.100	35.9	V	60.0	-24.1	Peak	210	1.0	Note 5
2000.020	52.7	H	60.0	-7.3	Peak	313	1.9	Note 5
5043.570	43.2	H	54.0	-10.8	VAVG	175	1.3	RB 1 MHz;VB 300 Hz;Note 3
5042.840	61.5	H	74.0	-12.5	PK	175	1.3	RB 1 MHz;VB 3 MHz;Peak
5479.780	44.0	V	54.0	-10.0	VAVG	171	1.4	RB 1 MHz;VB 300 Hz;Note 3
5481.660	56.9	V	74.0	-17.1	PK	171	1.4	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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #1d: Center Channel

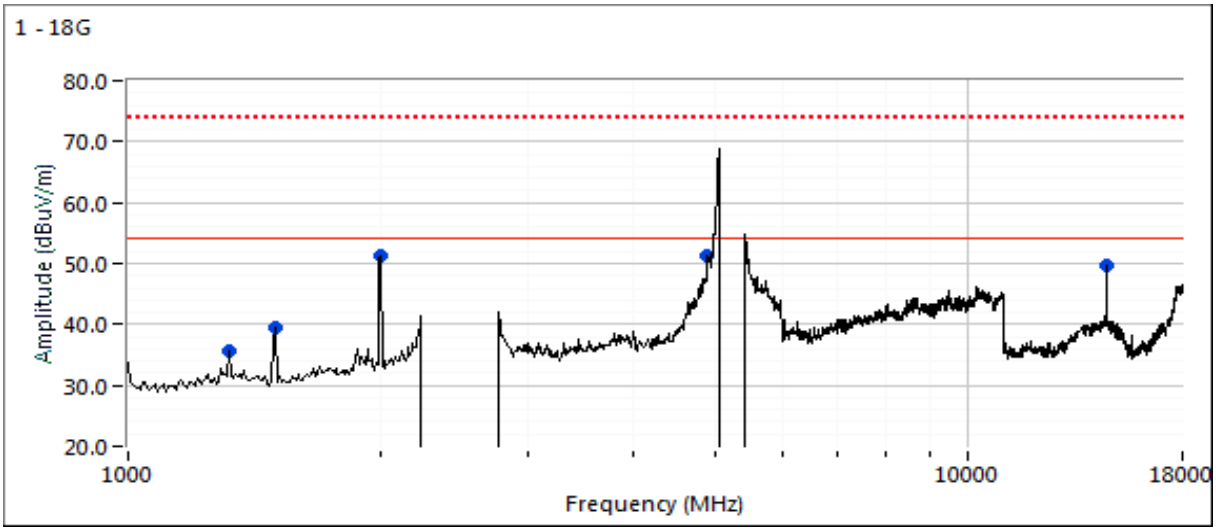
Channel: 6 & 42 Wi-Fi Mode: b & ac80

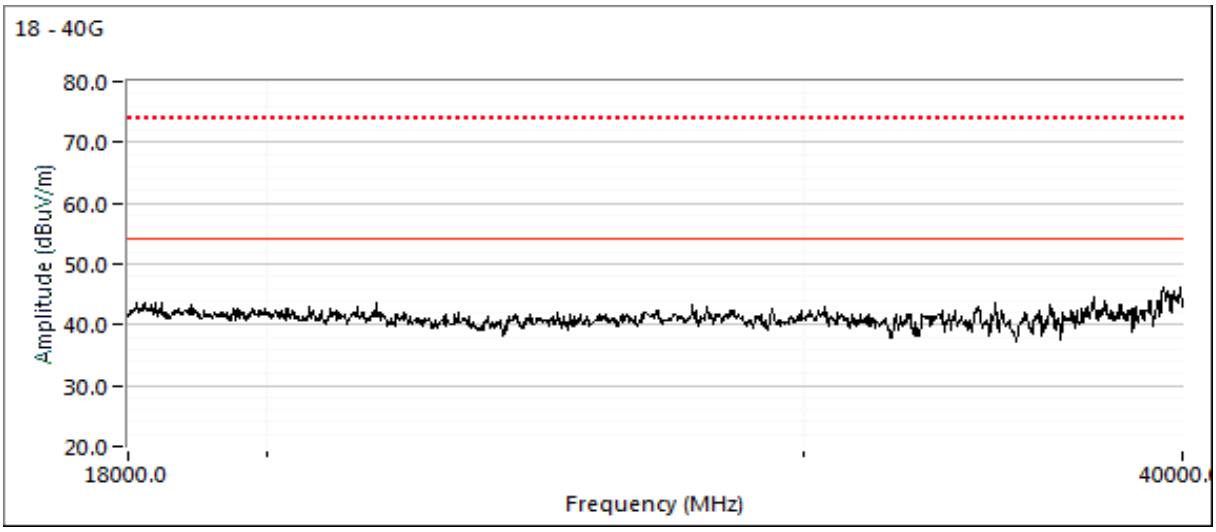
Tx Chain: 4 (5GHz), 4 (2.4 GHz) Data Rate: 1Mbps & MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1316.670	35.5	H	60.0	-24.5	Peak	33	1.3	Note 5
1500.000	39.4	V	60.0	-20.6	Peak	54	1.0	Note 5
2000.000	51.2	H	60.0	-8.8	Peak	78	1.3	Note 5
4908.100	47.5	V	54.0	-6.5	VAVG	163	1.7	RB 1 MHz;VB 300 Hz;Note 3
4907.700	60.4	V	74.0	-13.6	PK	163	1.7	RB 1 MHz;VB 3 MHz;Peak
14624.900	39.5	V	54.0	-14.5	VAVG	163	1.8	RB 1 MHz;VB 300 Hz;Note 3
14626.100	50.9	V	74.0	-23.1	PK	163	1.8	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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #1e: Center Channel

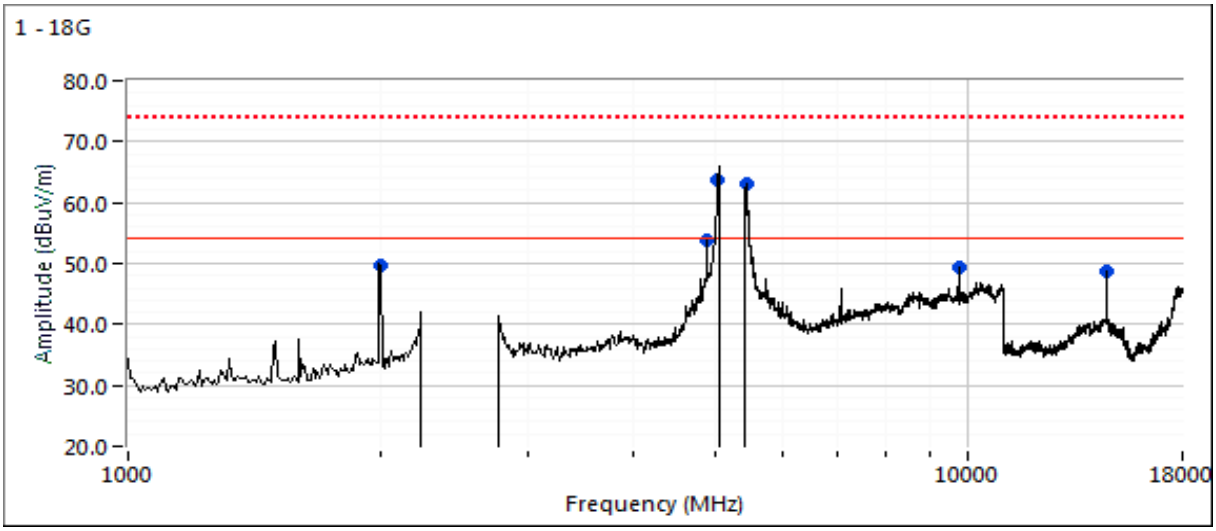
Channel: 6 & 50 Wi-Fi Mode: b & ac80+80

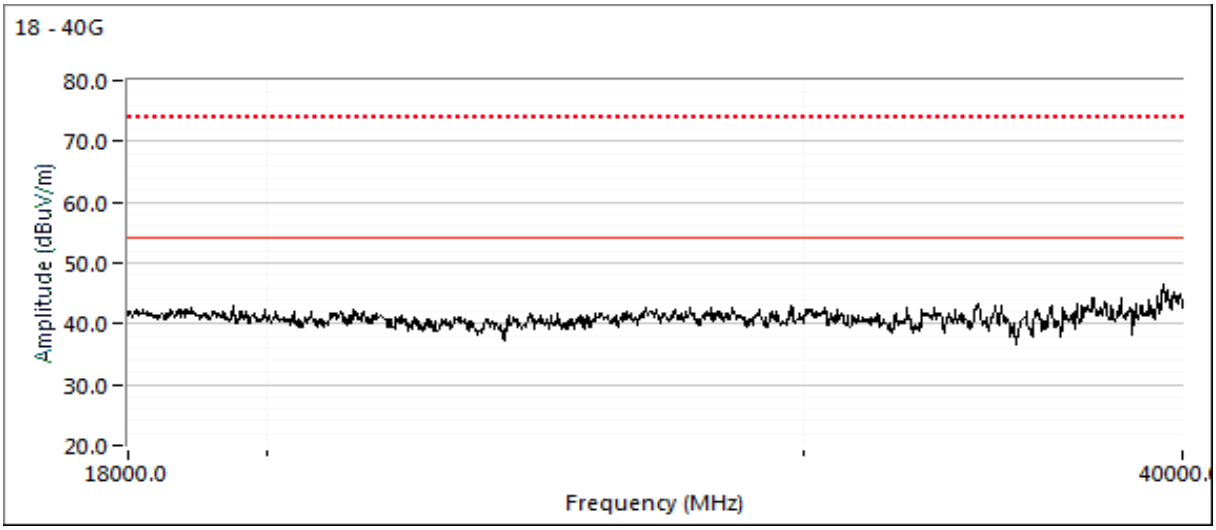
Tx Chain: 4 Data Rate: 1Mbps & MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
14621.790	42.4	V	54.0	-11.6	VAVG	162	1.9	RB 1 MHz;VB 300 Hz;Note 3
14621.990	52.4	V	74.0	-21.6	PK	162	1.9	RB 1 MHz;VB 3 MHz;Peak
5050.000	53.0	H	-	-	PK	162	2.1	Done during BE measurment
5437.570	57.7	V	-	-	PK	169	1.1	Done during BE measurment

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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

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

Date of Test: 12/27/2018 0:00
Test Engineer: Roy Zheng / R. Varelas
Test Location: Chamber #5

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

Run #2a: Center Channel

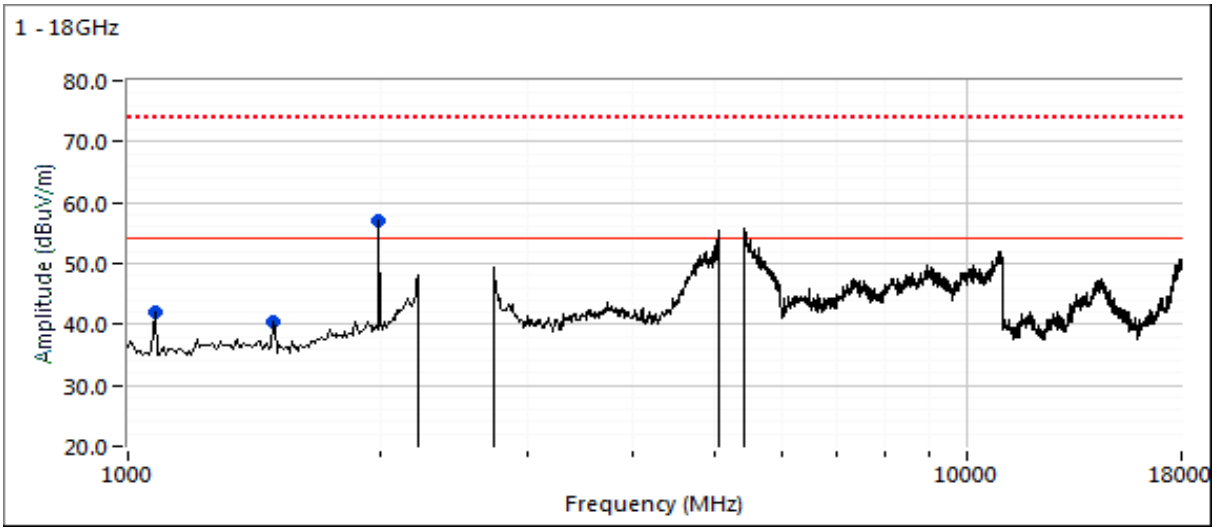
Channel: 6, 40 Wi-Fi, 11 - ZigBee
Tx Chain: 4

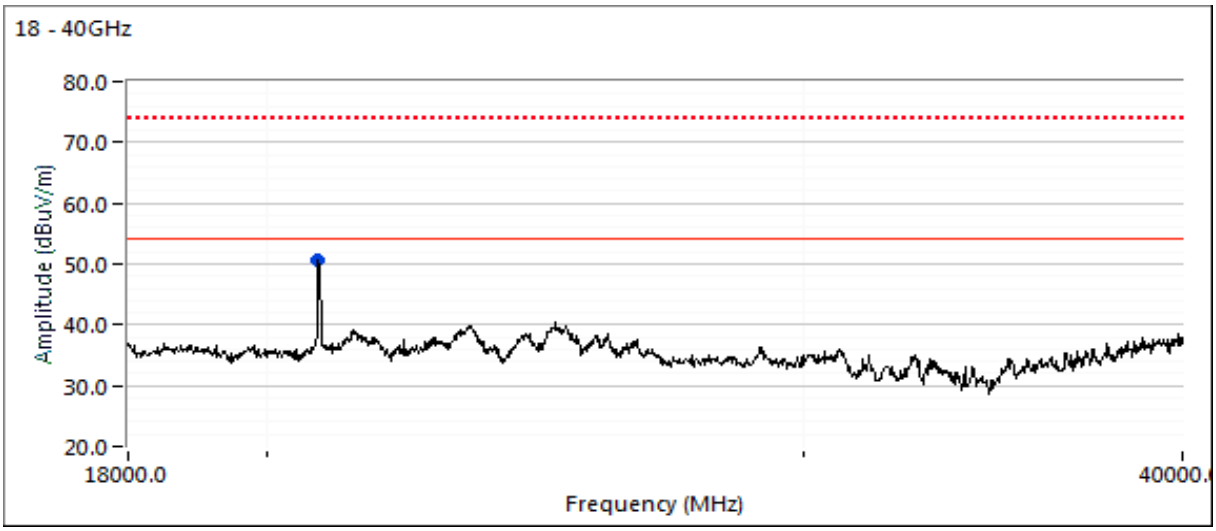
Mode: g & a
Data Rate: 6Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2000.000	56.9	H	60.0	-3.1	Peak	87	1.6	Note 5
1500.000	40.5	H	60.0	-19.5	Peak	141	1.0	Note 5
1075.000	42.1	H	60.0	-17.9	Peak	265	2.2	Note 5
20797.270	34.1	V	54.0	-19.9	VAVG	138	1.2	RB 1 MHz;VB 1 kHz;Note 4
20797.500	53.2	V	74.0	-20.8	PK	138	1.2	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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





EMC Test Data

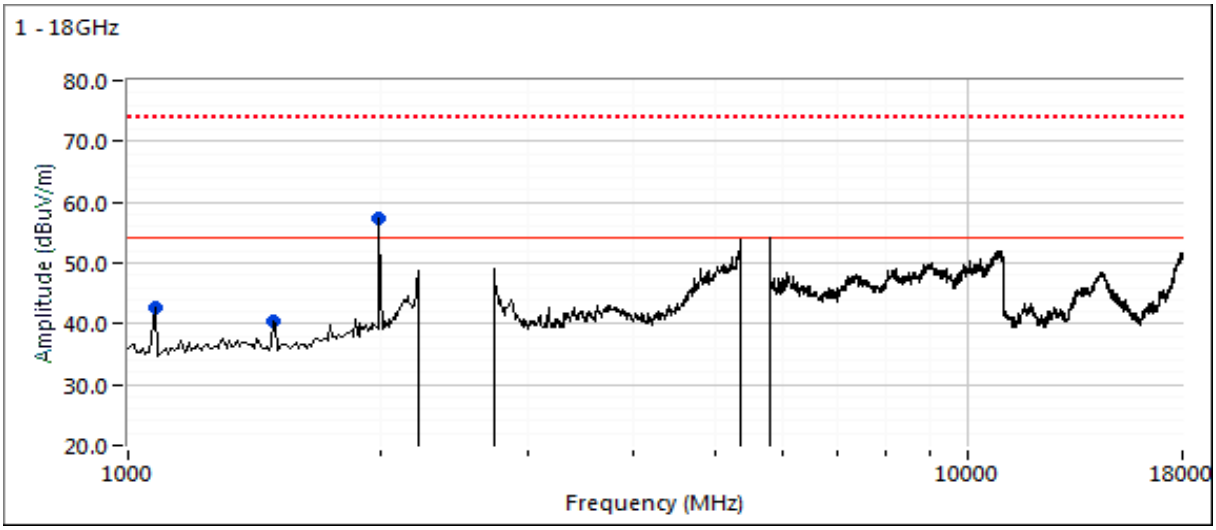
Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

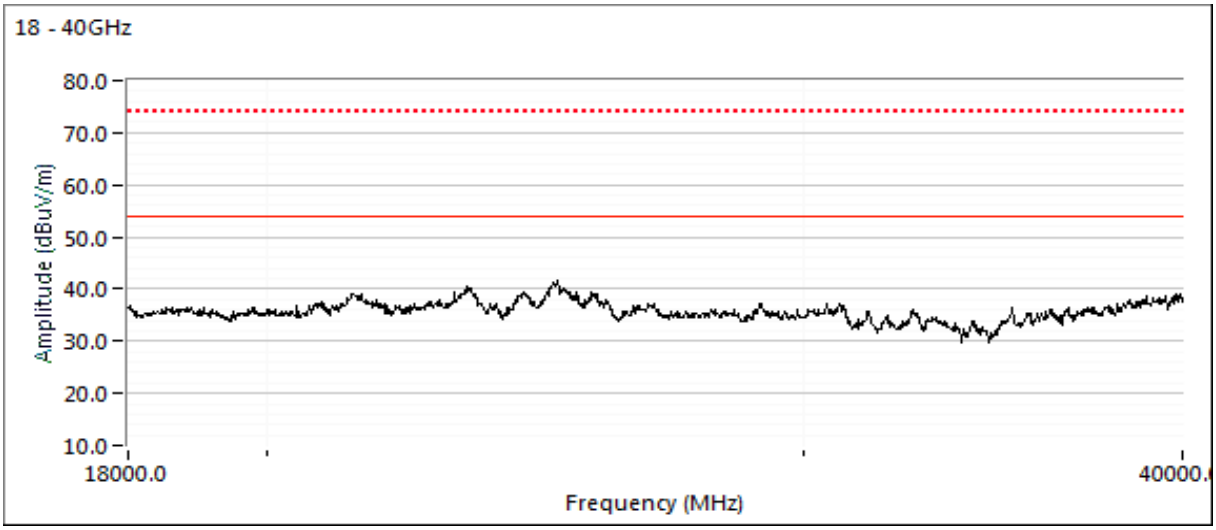
Run #2b: Center Channel

Channel: 6, 116 Wi-Fi, 18 - ZigBee Mode: g & a

Tx Chain: 4 Data Rate: 6Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2000.000	57.2	H	60.0	-2.8	Peak	71	2.2	Note 5





EMC Test Data

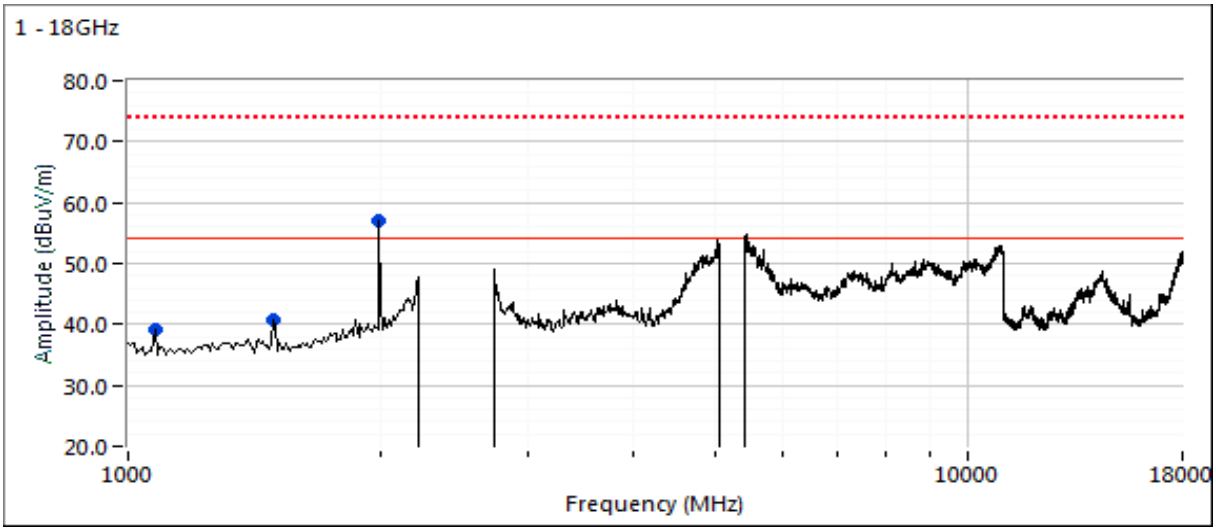
Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

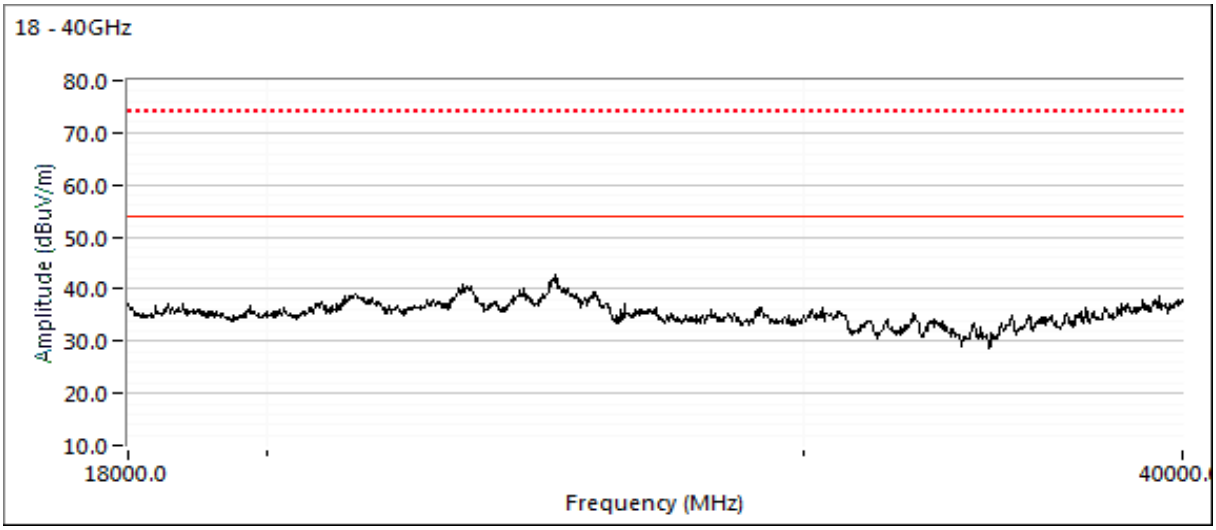
Run #2c: Center Channel

Channel: 6, 60 Wi-Fi, 26 - ZigBee — Mode: g & a

Tx Chain: 4 — Data Rate: 6Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2000.000	56.9	V	60.0	-3.1	Peak	73	1.3	Note 5





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

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

Date of Test: 10/22/2018
Test Engineer: Roy Zheng
Test Location: Chamber #4

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

Run #3a: Low Channel

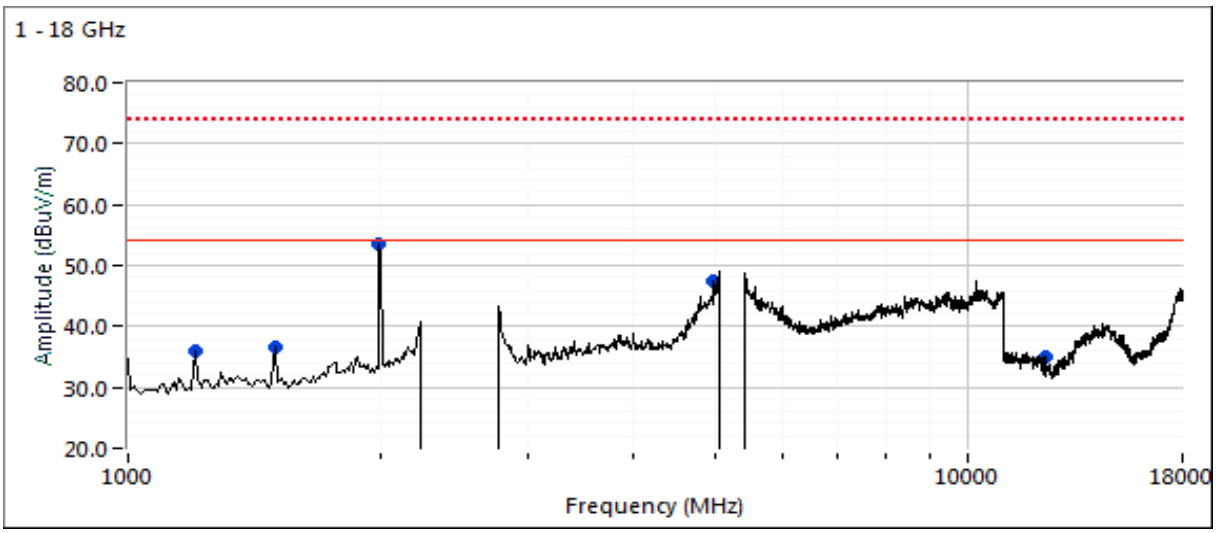
Channel: 1 & 36 Wi-Fi, 37 - BLE
Tx Chain: 4 (5GHz), 4 (2.4 GHz)

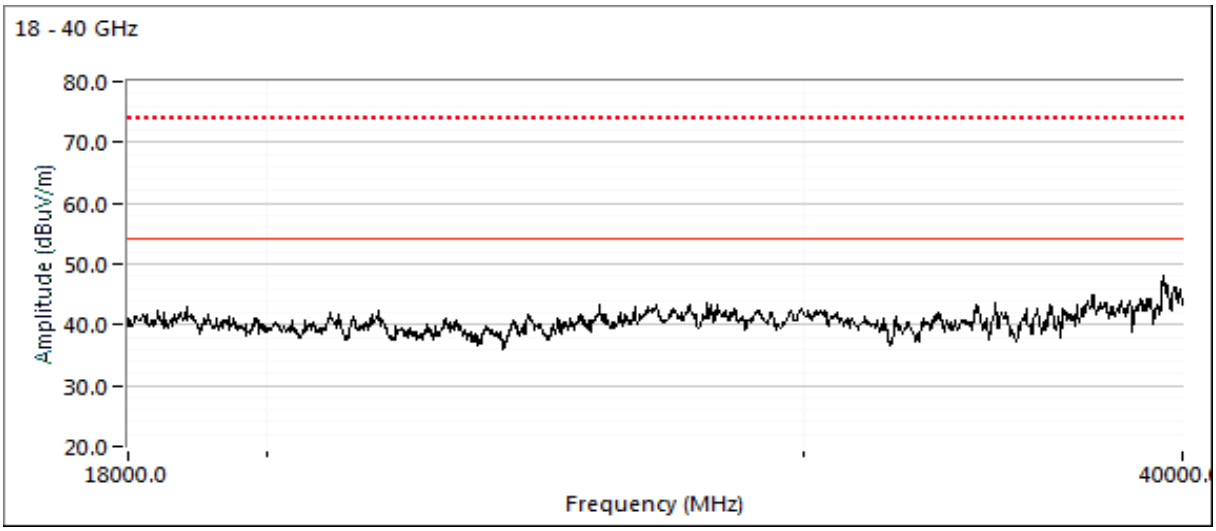
Mode: ax20
Data Rate: MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4999.950	35.8	H	54.0	-18.2	VAVG	313	1.0	RB 1 MHz;VB 300 Hz;Note 3
5000.100	47.3	H	74.0	-26.7	PK	313	1.0	RB 1 MHz;VB 3 MHz;Peak
1200.000	36.0	V	60.0	-24.0	Peak	125	1.0	Note 5
1500.000	36.5	H	60.0	-23.5	Peak	36	1.3	Note 5
2000.000	53.5	V	60.0	-6.5	Peak	351	1.6	Note 5
12341.670	35.1	V	54.0	-18.9	Peak	50	1.6	Noise Floor

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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #3b: High Channel

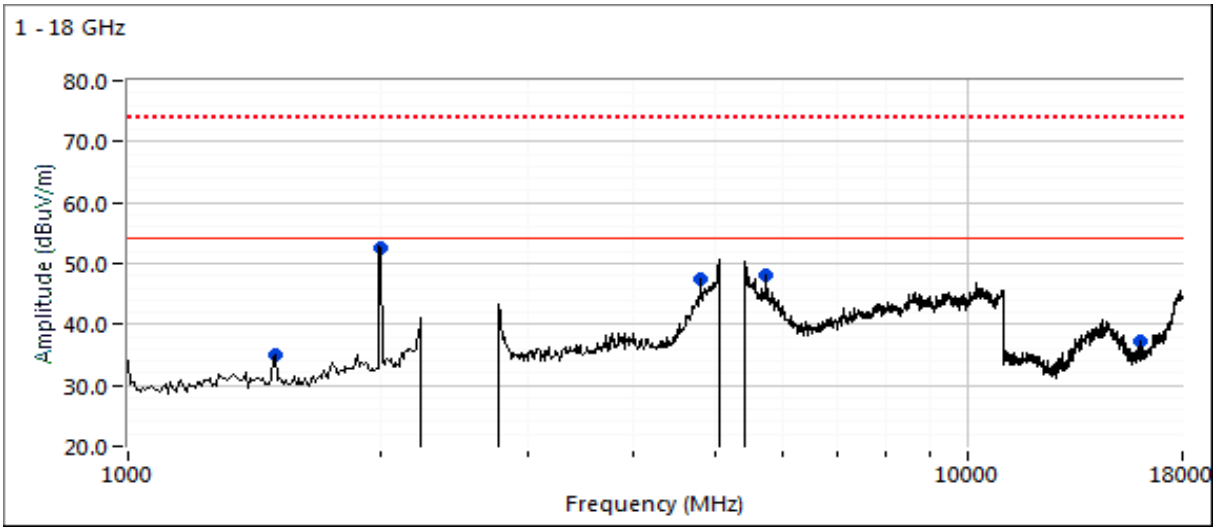
Channel: 11 & 48 Wi-Fi, 39 - BLE Mode: ax20

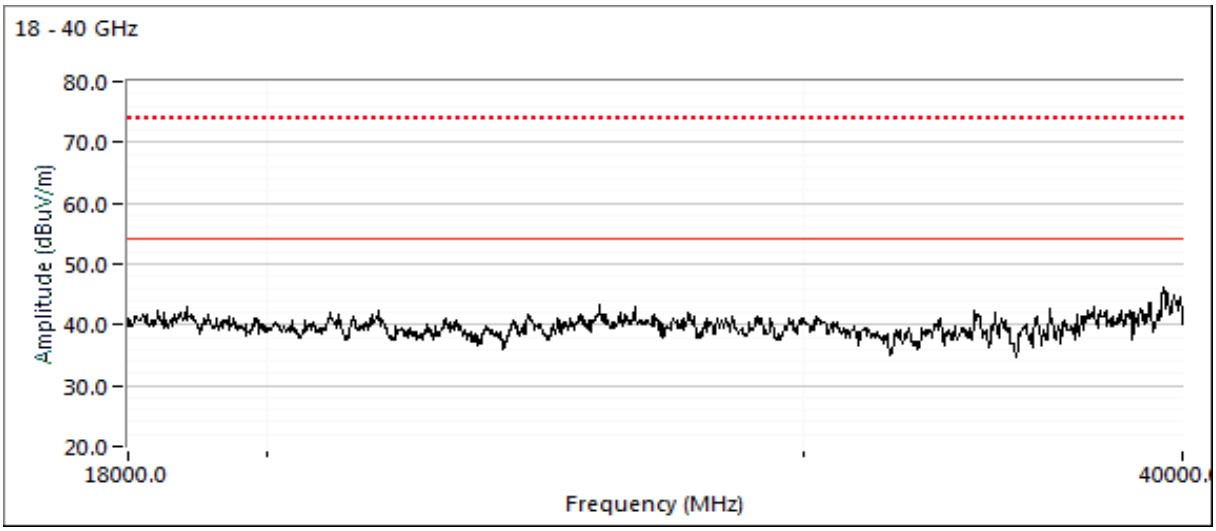
Tx Chain: 4 (5GHz), 4 (2.4 GHz) Data Rate: MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4800.000	44.7	V	54.0	-9.3	VAVG	158	1.5	RB 1 MHz;VB 300 Hz;Note 3
4799.620	54.9	V	74.0	-19.1	PK	158	1.5	RB 1 MHz;VB 3 MHz;Peak
5759.960	43.8	H	54.0	-10.2	VAVG	163	1.4	RB 1 MHz;VB 300 Hz;Note 3
5759.870	54.7	H	74.0	-19.3	PK	163	1.4	RB 1 MHz;VB 3 MHz;Peak
1500.000	35.0	H	60.0	-25.0	Peak	29	1.3	Note 5
2000.000	52.6	V	60.0	-7.4	Peak	352	1.9	Note 5
15993.330	37.3	V	54.0	-16.7	Peak	60	1.0	Noise floor

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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #4, Radiated Spurious Emissions, 1,000 - 40,000 MHz. Operation in the 5250-5350 MHz Band

Date of Test: 10/19/2018 0:00
Test Engineer: Roy Zheng / R. Varelas
Test Location: FT Chamber #4

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

Run #4a: Center Channel

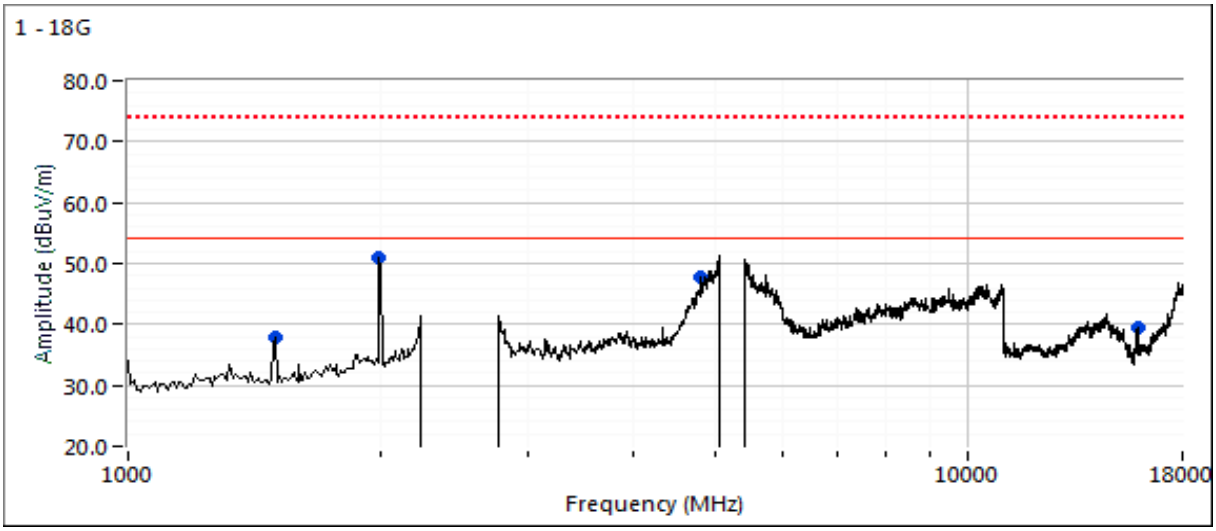
Channel: 1 & 60 Wi-Fi, 17 - BLE
Tx Chain: 4 (5GHz), 4 (2.4 GHz)

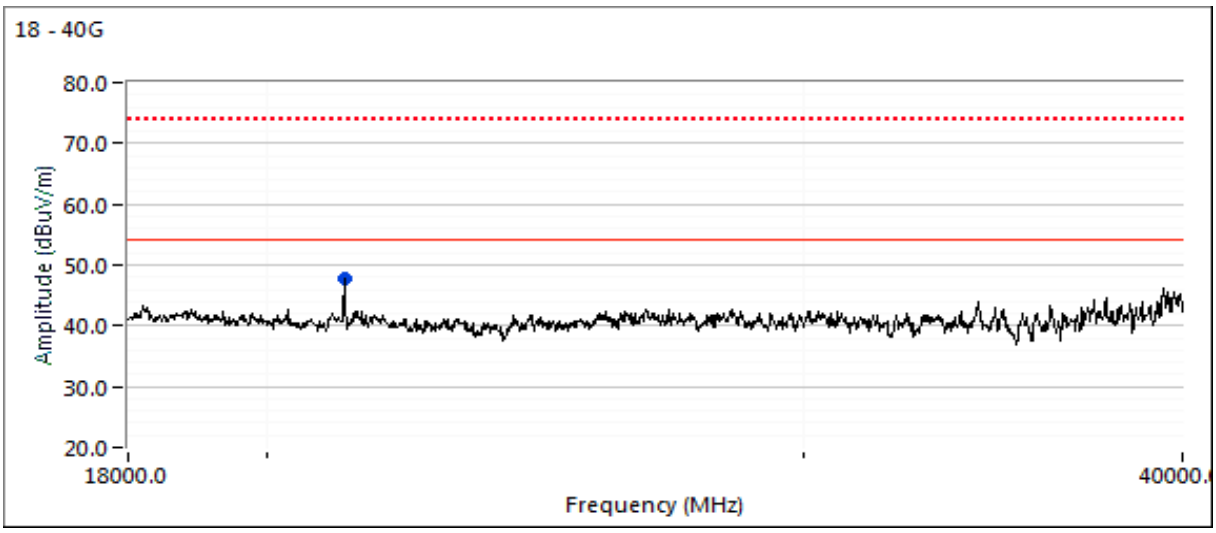
Mode: g & a
Data Rate: 6Mb/s

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4800.100	45.0	H	54.0	-9.0	VAVG	172	2.1	RB 1 MHz;VB 1 kHz;Note 3
4799.800	54.9	H	74.0	-19.1	PK	172	2.1	RB 1 MHz;VB 3 MHz;Peak
21194.640	44.8	V	54.0	-9.2	VAVG	159	1.0	RB 1 MHz;VB 1 kHz;Note 3
21195.510	62.5	V	74.0	-11.5	PK	159	1.0	RB 1 MHz;VB 3 MHz;Peak
1500.000	37.9	V	54.0	-16.1	Peak	63	1.6	Note 5
2000.000	50.9	V	54.0	-3.1	Peak	63	1.6	Note 5
15911.670	39.6	H	54.0	-14.4	Peak	218	1.3	Note 5

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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #4b: Center Channel

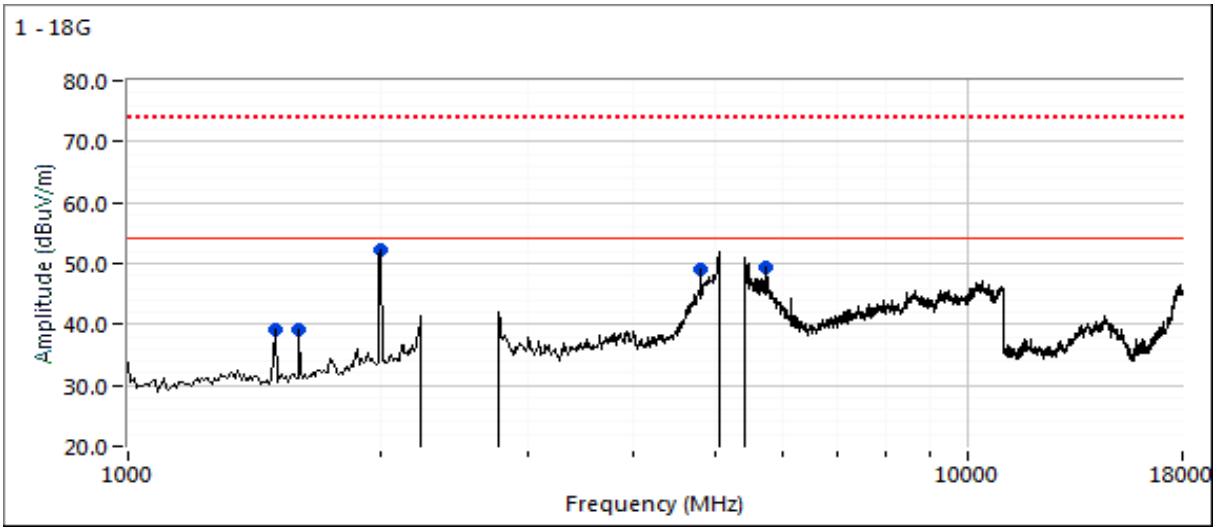
Channel: 1 & 60 Wi-Fi Mode: 11ax20

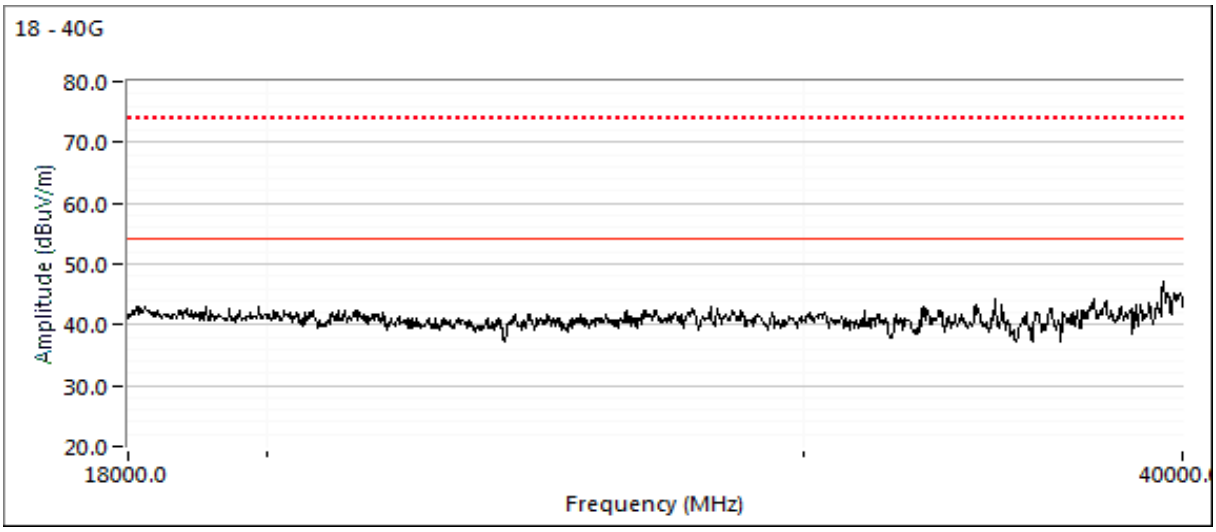
Tx Chain: 4 (5GHz), 4 (2.4 GHz) Data Rate: MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4800.020	46.1	V	54.0	-7.9	VAVG	158	1.6	RB 1 MHz;VB 300 Hz;Note 3
4799.830	56.3	V	74.0	-17.7	PK	158	1.6	RB 1 MHz;VB 3 MHz;Peak
5758.100	57.0	V	68.3	-11.3	PK	160	1.6	RB 1 MHz;VB 3 MHz;Peak
1500.000	39.0	V	60.0	-21.0	Peak	38	1.0	Note 5
1600.000	39.2	H	60.0	-20.8	Peak	17	1.6	Note 5
2000.000	52.2	H	60.0	-7.8	Peak	71	1.3	Note 5

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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #4c: Center Channel

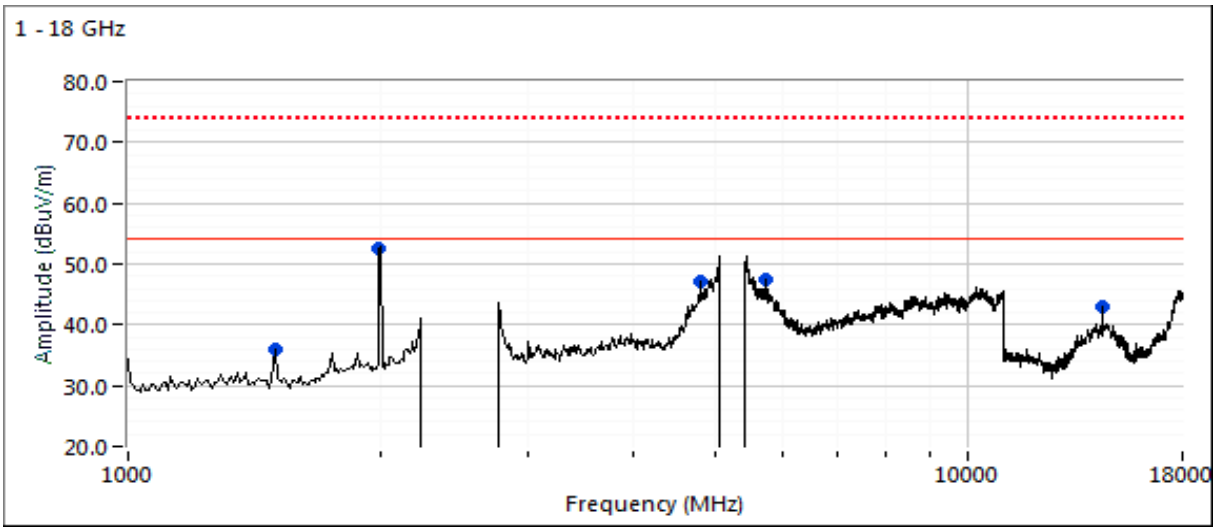
Channel: 1 & 54 Wi-Fi, 17 - BLE Mode: ax40

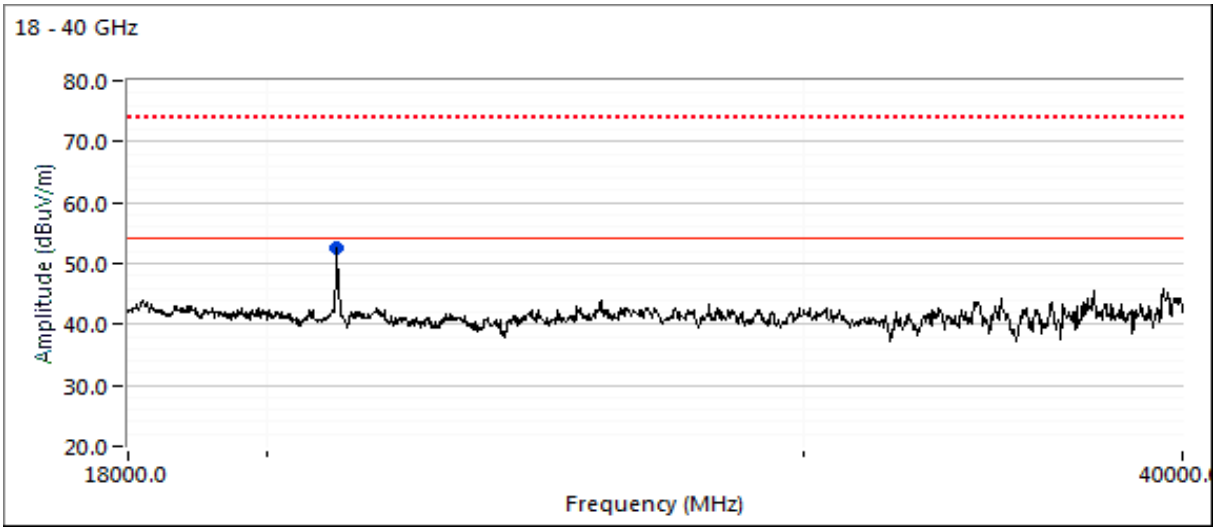
Tx Chain: 4 (5GHz), 4 (2.4 GHz) Data Rate: MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4799.940	43.8	H	54.0	-10.2	VAVG	179	1.9	RB 1 MHz;VB 300 Hz;Note 3
4800.250	55.1	H	74.0	-18.9	PK	179	1.9	RB 1 MHz;VB 3 MHz;Peak
5760.260	56.1	V	68.3	-12.2	PK	177	1.6	RB 1 MHz;VB 3 MHz;Peak
21057.750	56.7	V	68.3	-11.6	PK	212	1.4	RB 1 MHz;VB 3 MHz;Peak
1500.000	35.9	H	60.0	-24.1	Peak	31	1.3	Note 5
2000.070	53.2	V	60.0	-6.8	PK	356	1.6	Note 5

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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #4d: Center Channel

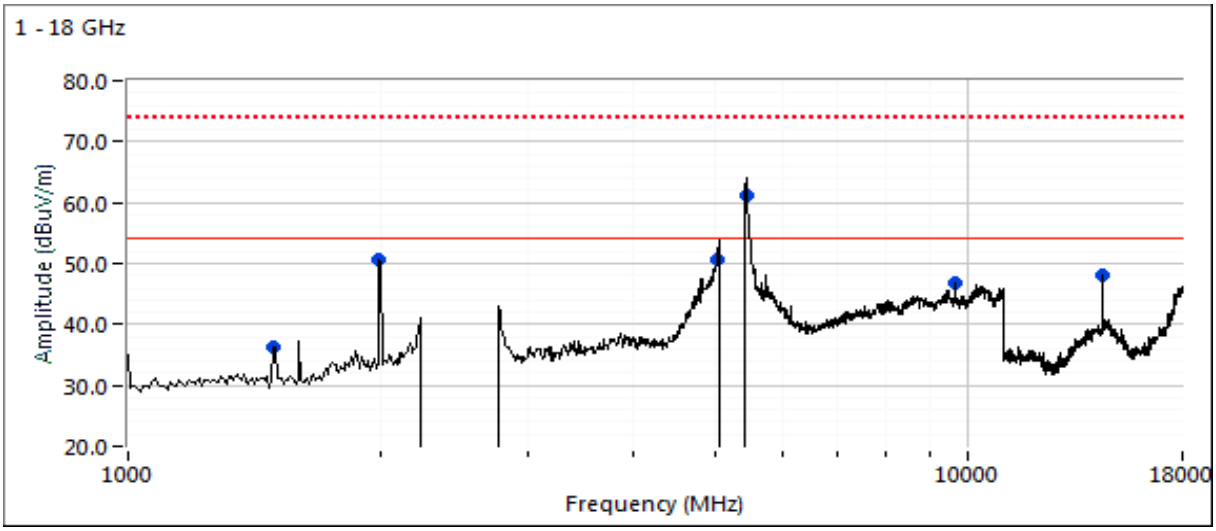
Channel: 1 & 58 Wi-Fi, 17 - BLE Mode: b & ac80

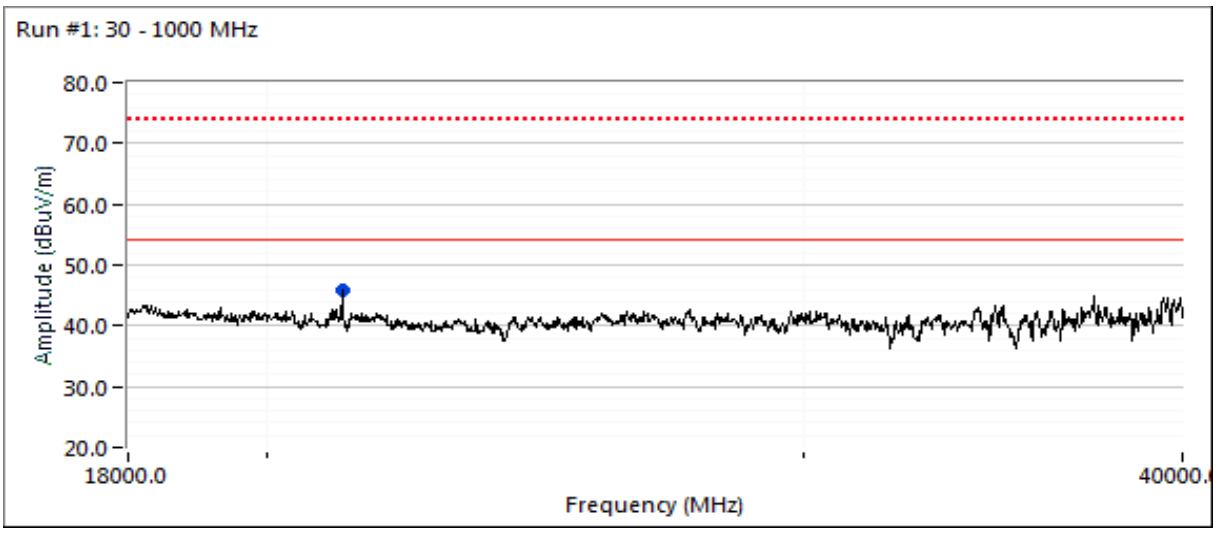
Tx Chain: 4 (5GHz), 4 (2.4 GHz) Data Rate: 1Mbps & MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5437.620	52.6	H	54.0	-1.4	VAVG	184	1.2	RB 1 MHz;VB 300 Hz;Note 3
5438.310	69.0	H	74.0	-5.0	PK	184	1.2	RB 1 MHz;VB 3 MHz;Peak
9645.340	53.2	H	68.3	-15.1	PK	100	1.0	RB 1 MHz;VB 3 MHz;Peak
5052.800	51.4	H	54.0	-2.6	VAVG	165	1.5	RB 1 MHz;VB 300 Hz;Note 3
5054.230	65.8	H	74.0	-8.2	PK	165	1.5	RB 1 MHz;VB 3 MHz;Peak
14471.970	44.1	V	54.0	-9.9	VAVG	102	1.4	RB 1 MHz;VB 300 Hz;Note 3
14471.890	52.3	V	74.0	-21.7	PK	102	1.4	RB 1 MHz;VB 3 MHz;Peak
21146.500	42.1	V	54.0	-11.9	VAVG	157	1.6	RB 1 MHz;VB 300 Hz;Note 3
21166.300	57.8	V	74.0	-16.2	PK	157	1.6	RB 1 MHz;VB 3 MHz;Peak
1500.110	36.3	H	54.0	-17.7	Peak	339	1.0	Note 5
2000.020	50.7	H	60.0	-9.3	Peak	357	1.6	Note 5

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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #5: Radiated Spurious Emissions, 1,000 - 40000 MHz. Operating Mode: Worse case from Runs #4 and 5

Date of Test: 10/19/2018
Test Engineer: Roy Zheng
Test Location: Chamber #4

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

Run #5a: Low Channel

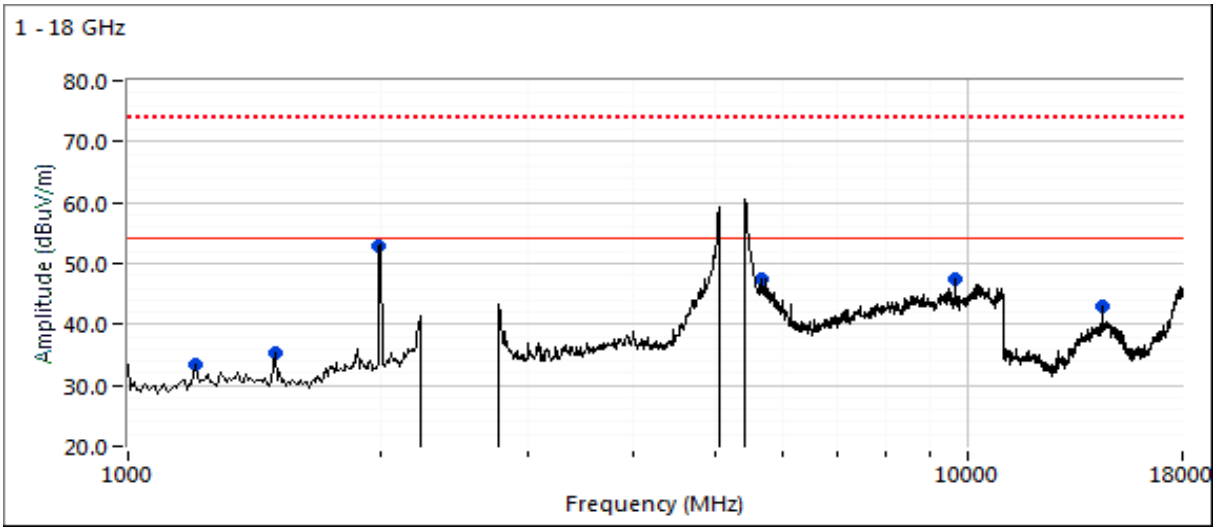
Channel: 1 & 52 Wi-Fi, 37 - BLE
Tx Chain: 4 (5GHz), 4 (2.4 GHz)

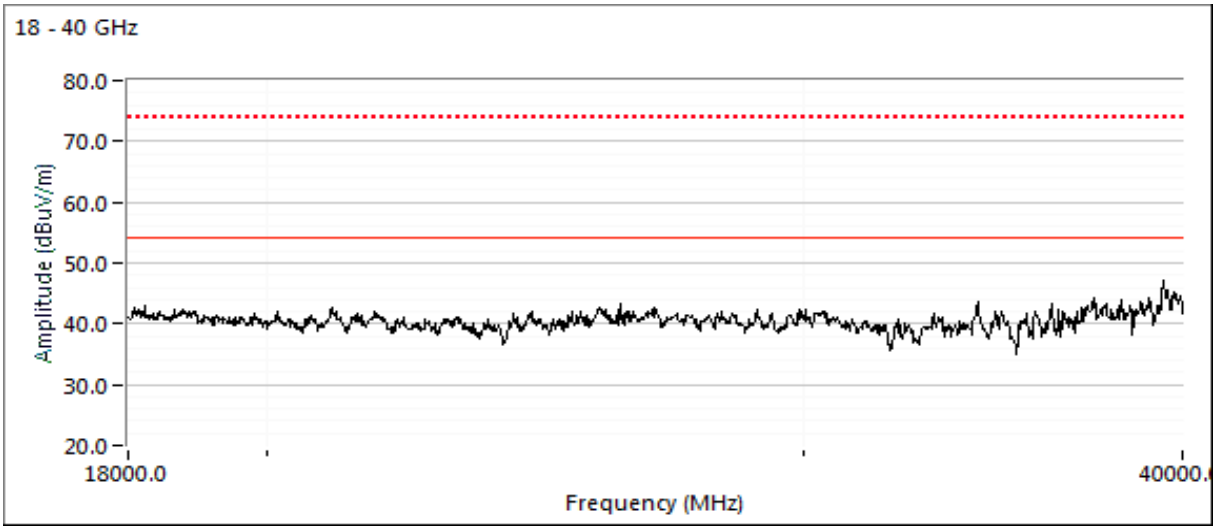
Mode: ac80/b
Data Rate: MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
14471.820	41.4	V	54.0	-12.6	VAVG	137	1.0	RB 1 MHz;VB 300 Hz;Note 3
14472.170	51.2	V	74.0	-22.8	PK	137	1.0	RB 1 MHz;VB 3 MHz;Peak
5691.670	47.5	H	68.3	-20.8	PK	185	1.9	RB 1 MHz;VB 3 MHz;Peak
9647.950	43.3	V	54.0	-10.7	VAVG	156	1.7	RB 1 MHz;VB 300 Hz;Note 3
9647.830	53.9	V	74.0	-20.1	PK	156	1.7	RB 1 MHz;VB 3 MHz;Peak
1500.000	35.4	H	60.0	-24.6	Peak	30	1.3	Note 5
1200.000	33.5	H	60.0	-26.5	Peak	312	1.0	Note 5
2000.100	52.0	V	60.0	-8.0	PK	307	1.0	Note 5

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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #5b: High Channel

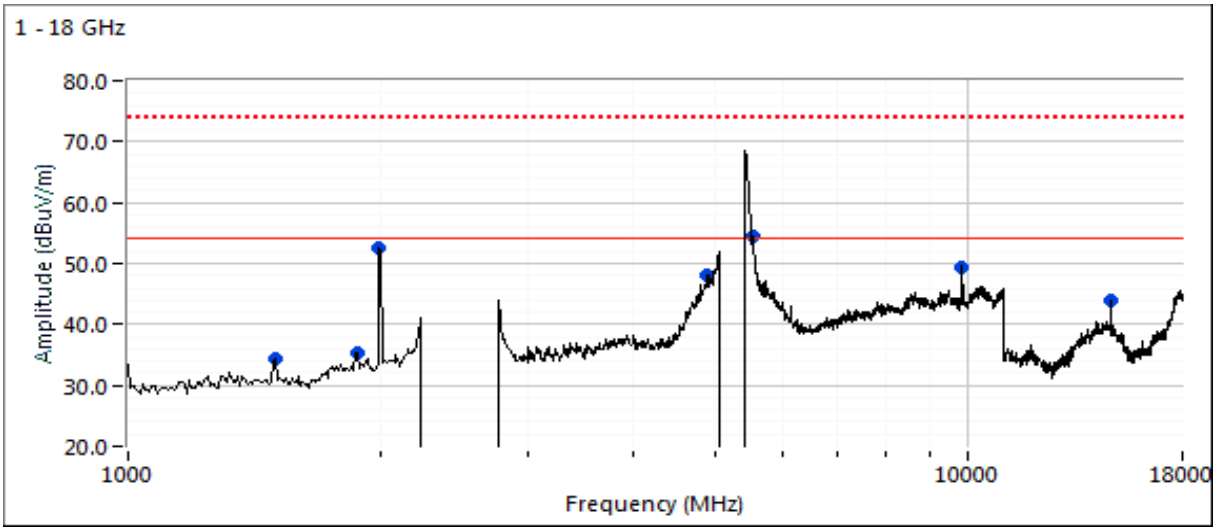
Channel: 11 & 64 Wi-Fi, 39 - BLE Mode: ac80/b

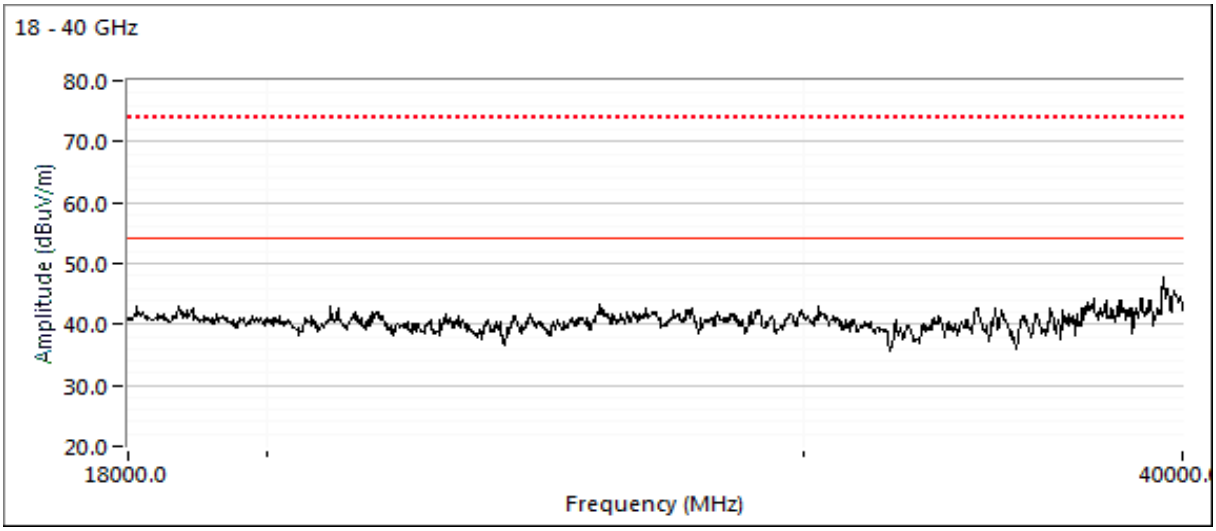
Tx Chain: 4 (5GHz), 4 (2.4 GHz) Data Rate: MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4899.140	44.1	H	54.0	-9.9	VAVG	171	1.5	RB 1 MHz;VB 300 Hz;Note 3
4899.150	56.7	H	74.0	-17.3	PK	171	1.5	RB 1 MHz;VB 3 MHz;Peak
9847.850	46.7	H	54.0	-7.3	VAVG	160	1.4	RB 1 MHz;VB 300 Hz;Note 3
9847.860	55.1	H	74.0	-18.9	PK	160	1.4	RB 1 MHz;VB 3 MHz;Peak
14771.820	43.0	V	54.0	-11.0	VAVG	139	2.1	RB 1 MHz;VB 300 Hz;Note 3
14771.860	51.8	V	74.0	-22.2	PK	139	2.1	RB 1 MHz;VB 3 MHz;Peak
1500.000	34.5	H	60.0	-25.5	Peak	142	1.9	Note 5
1875.000	35.4	V	60.0	-24.6	Peak	92	1.9	Note 5
2000.000	52.1	V	60.0	-7.9	PK	308	1.0	Note 5

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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #6, Radiated Spurious Emissions, 1,000 - 40,000 MHz. Operation in the 5470-5725 MHz Band

Date of Test: 10/22/2018 0:00
Test Engineer: Roy Zheng / R. Varelas
Test Location: FT Chamber #4

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

Run #6a: Center Channel

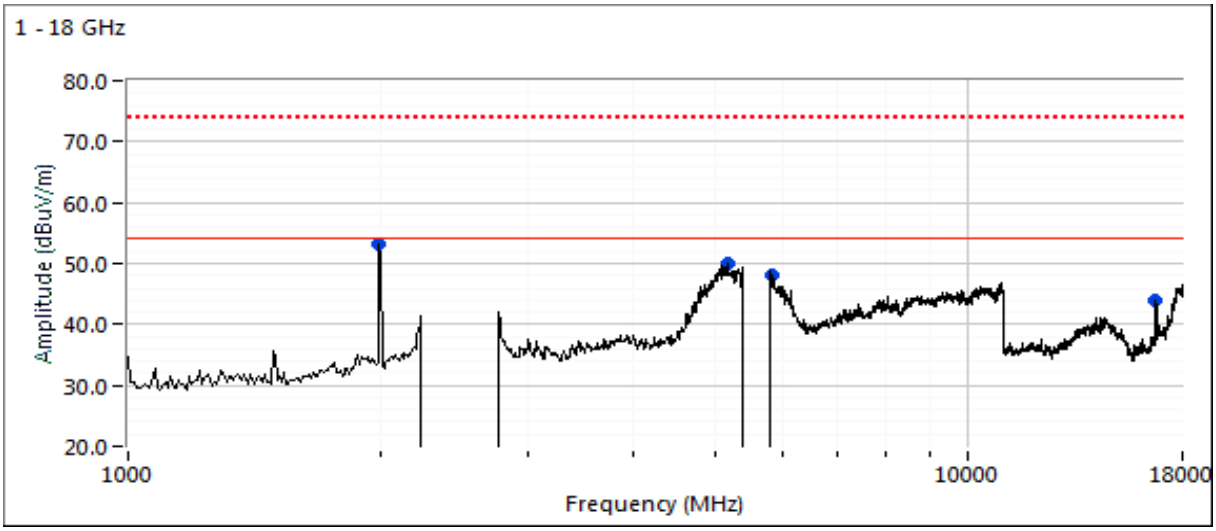
Channel: 11 & 116 Wi-Fi, 39 - BLE
Tx Chain: 4 (5GHz), 4 (2.4 GHz)

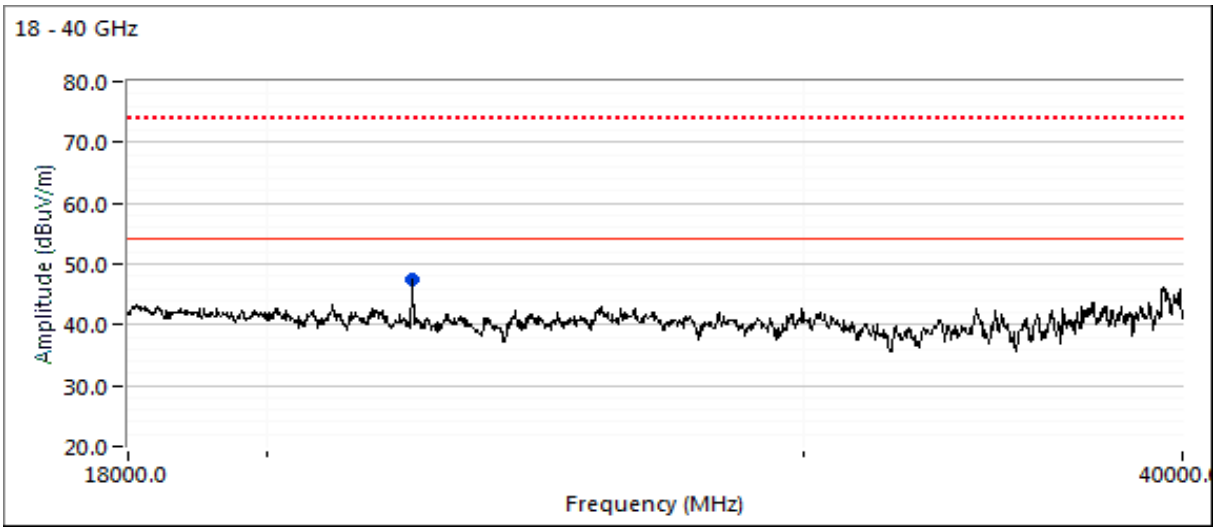
Mode: g & a
Data Rate: 6Mb/s

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5169.020	58.0	V	68.3	-10.3	PK	179	1.5	RB 1 MHz;VB 3 MHz;Peak
16736.700	53.7	V	68.3	-14.6	PK	197	1.9	RB 1 MHz;VB 3 MHz;Peak
5827.280	56.0	V	68.0	-12.0	PK	177	1.3	RB 1 MHz;VB 3 MHz;Peak
22320.580	43.0	H	54.0	-11.0	VAVG	147	1.7	RB 1 MHz;VB 1 kHz;Note 3
22322.250	59.2	H	74.0	-14.8	PK	147	1.7	RB 1 MHz;VB 3 MHz;Peak
2000.000	53.3	V	60.0	-6.7	Peak	340	1.6	Note 5

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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #6b: Center Channel

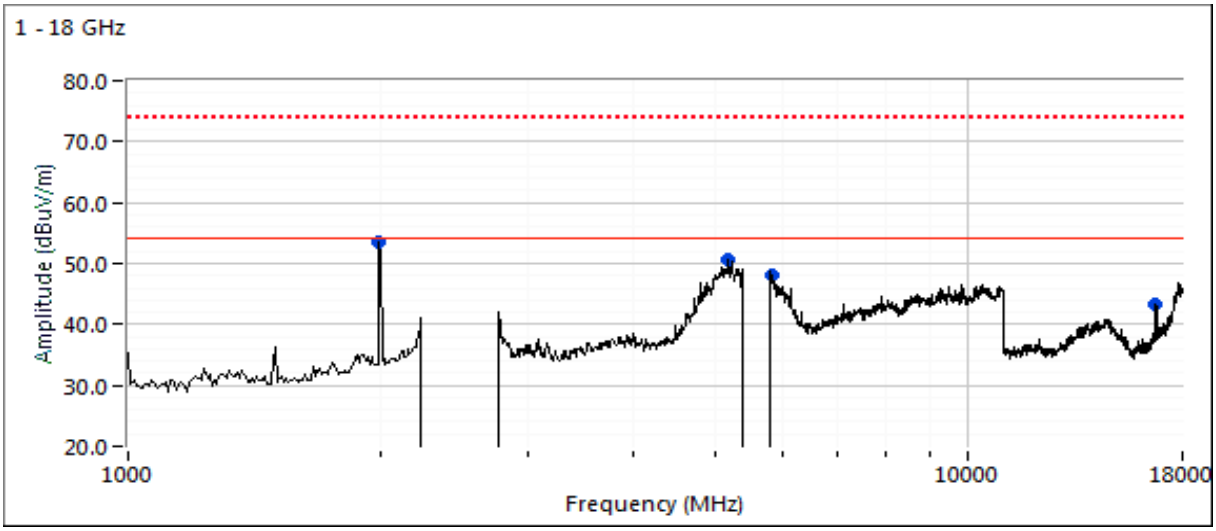
Channel: 11 & 116 Wi-Fi, 39 - BLE Mode: ax20

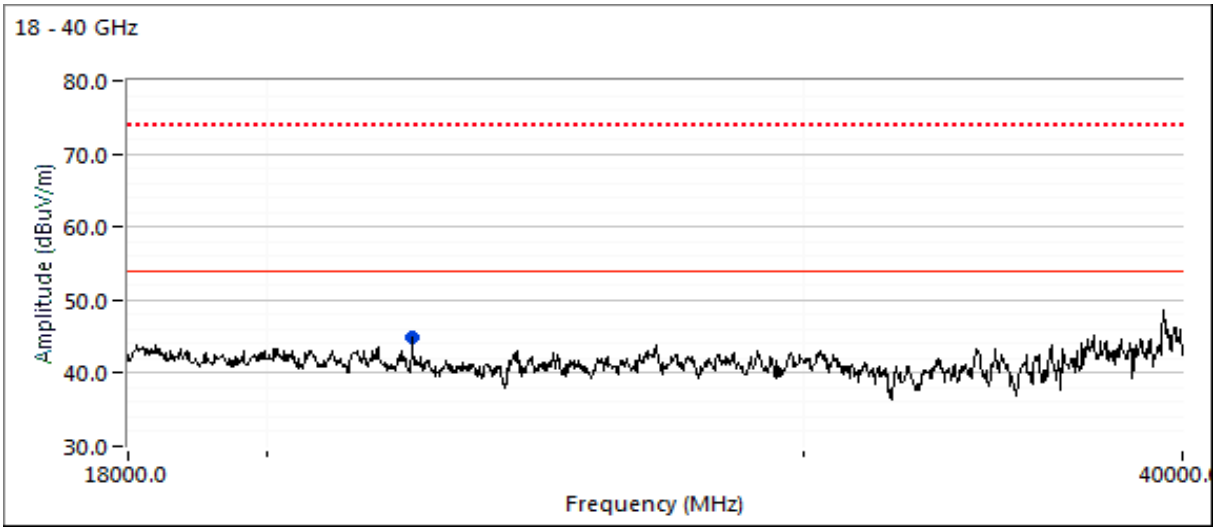
Tx Chain: 4 (5GHz), 4 (2.4 GHz) Data Rate: MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5200.140	58.6	V	68.3	-9.7	PK	170	1.8	RB 1 MHz;VB 3 MHz;Peak
5829.100	56.3	H	68.3	-12.0	PK	180	1.7	RB 1 MHz;VB 3 MHz;Peak
22319.670	40.0	H	54.0	-14.0	VAVG	109	2.1	RB 1 MHz;VB 300 Hz;Note 3
22322.130	59.7	H	74.0	-14.3	PK	109	2.1	RB 1 MHz;VB 3 MHz;Peak
2000.000	53.5	V	60.0	-6.5	Peak	346	1.6	Note 5
16740.000	43.2	V	54.0	-10.8	Peak	144	1.3	Peak reading vs average limit

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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #6c: Center Channel

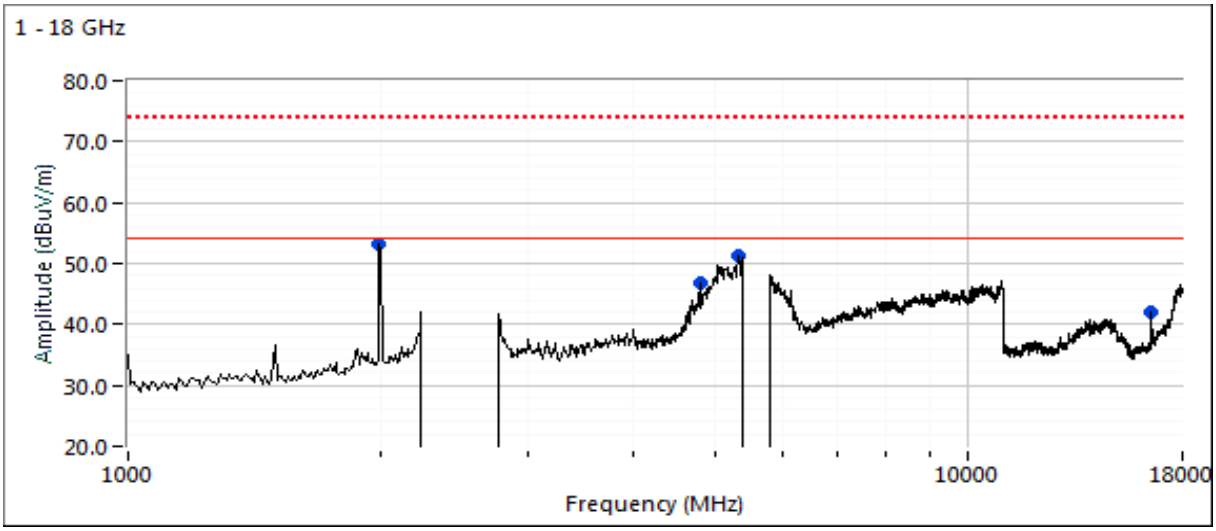
Channel: 9 & 110 Wi-Fi, 39 - BLE Mode: ax40

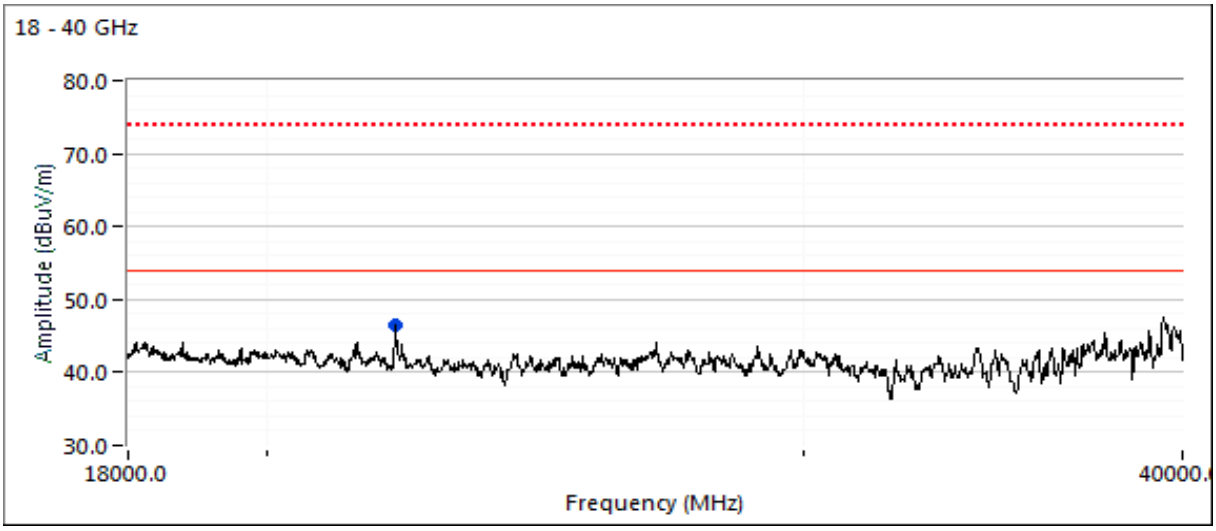
Tx Chain: 4 (5GHz), 4 (2.4 GHz) Data Rate: MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5348.170	48.1	V	54.0	-5.9	VAVG	172	1.5	RB 1 MHz;VB 300 Hz;Note 3
5347.660	61.9	V	74.0	-12.1	PK	172	1.5	RB 1 MHz;VB 3 MHz;Peak
4805.410	40.6	V	54.0	-13.4	VAVG	172	1.6	RB 1 MHz;VB 300 Hz;Note 3
4803.400	53.1	V	74.0	-20.9	PK	172	1.6	RB 1 MHz;VB 3 MHz;Peak
22038.620	43.1	V	54.0	-10.9	VAVG	198	1.0	RB 1 MHz;VB 300 Hz;Note 3
22038.050	58.4	V	74.0	-15.6	PK	198	1.0	RB 1 MHz;VB 3 MHz;Peak
16530.000	42.1	H	54.0	-11.9	Peak	112	1.9	Peak reading vs average limit
2000.130	54.1	V	60.0	-5.9	PK	342	1.6	Note 5

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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #6d: Center Channel

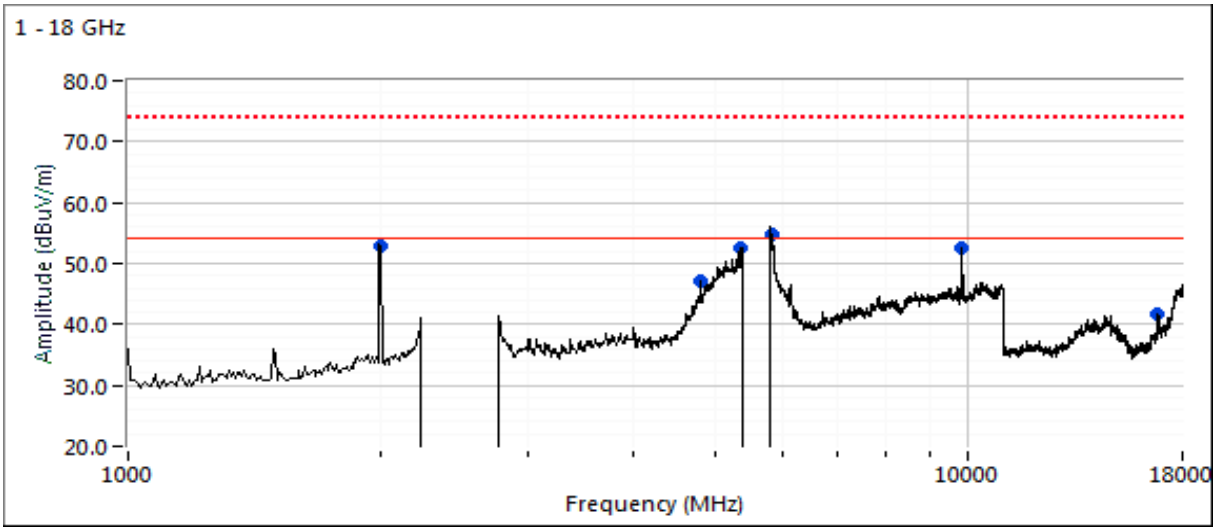
Channel: 11 & 122 Wi-Fi, 39 - BLE Mode: ac80 / b Note: Channel 122 not used in Canada

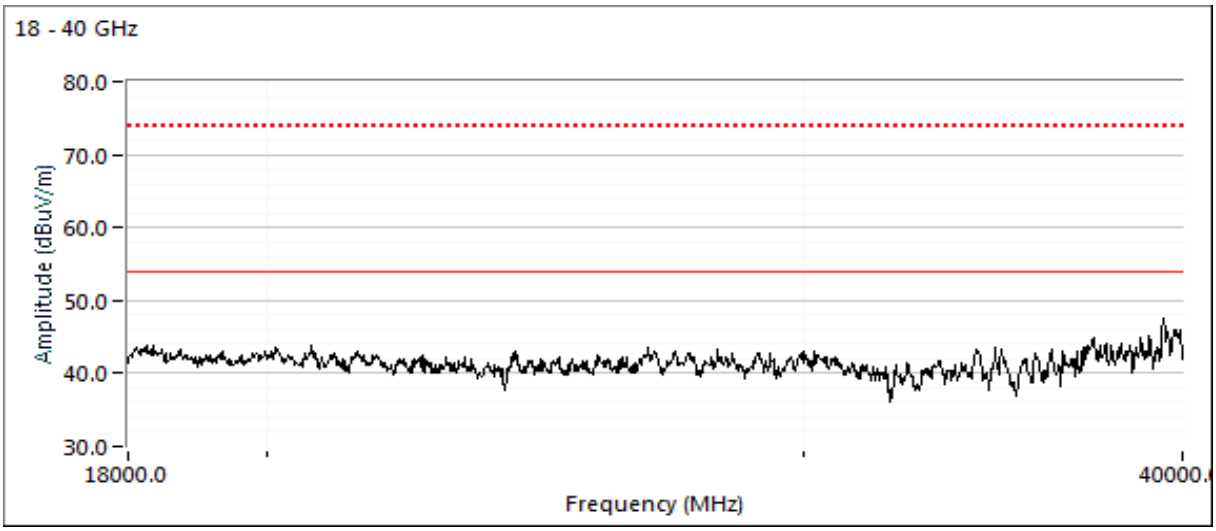
Tx Chain: 4 (5GHz), 4 (2.4 GHz) Data Rate: MCS0 / 1Mb/s

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5371.850	49.6	V	54.0	-4.4	VAVG	180	1.3	RB 1 MHz;VB 300 Hz;Note 3
5371.150	64.7	V	74.0	-9.3	PK	180	1.3	RB 1 MHz;VB 3 MHz;Peak
4806.640	40.8	H	54.0	-13.2	VAVG	181	1.7	RB 1 MHz;VB 300 Hz;Note 3
4805.480	53.1	H	74.0	-20.9	PK	181	1.7	RB 1 MHz;VB 3 MHz;Peak
9847.960	49.1	V	54.0	-4.9	VAVG	159	1.1	RB 1 MHz;VB 300 Hz;Note 3
9848.000	56.7	V	74.0	-17.3	PK	159	1.1	RB 1 MHz;VB 3 MHz;Peak
2000.000	53.0	V	60.0	-7.0	Peak	352	1.9	Note 5
16810.000	41.6	V	54.0	-12.4	Peak	139	1.3	Peak reading vs average limit

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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #7: Radiated Spurious Emissions, 1,000 - 40000 MHz. Operating Mode: Worse case from Runs #7 and 8

Date of Test: 10/23/2018 0:00
Test Engineer: Roy Zheng
Test Location: FT Chamber #5

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

Run #7a: Low Channel

Channel: 3 & 102 Wi-Fi, 37 - BLE
Tx Chain: 4 (5GHz), 4 (2.4 GHz)

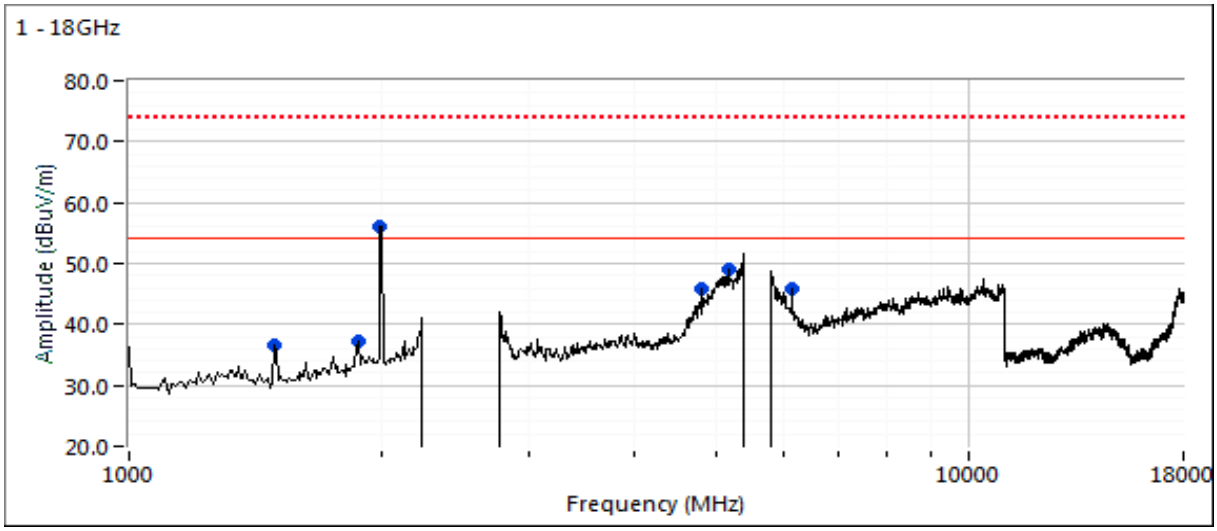
Mode: ac40
Data Rate: MCS 0

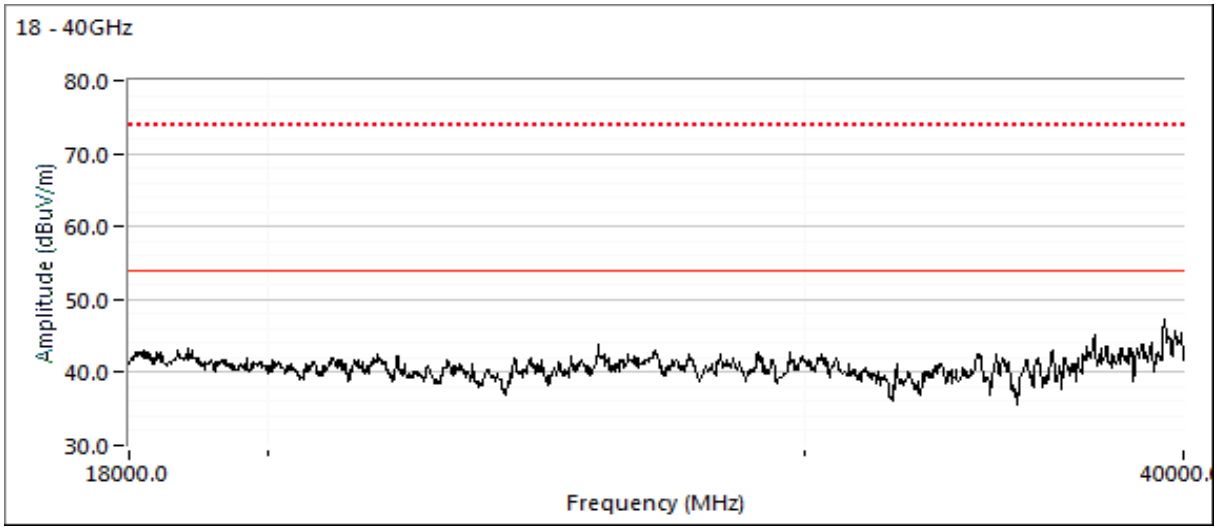
Note: Channel 122 not used in Canada

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5183.380	59.4	V	68.3	-8.9	PK	163	2.0	RB 1 MHz;VB 3 MHz;Peak
4799.960	43.1	V	54.0	-10.9	VAVG	147	2.0	RB 1 MHz;VB 300 Hz;Note 3
4800.080	53.1	V	74.0	-20.9	PK	147	2.0	RB 1 MHz;VB 3 MHz;Peak
6144.360	53.6	V	68.3	-14.7	PK	160	1.6	RB 1 MHz;VB 3 MHz;Peak
1500.000	36.5	V	60.0	-23.5	Peak	286	1.0	Note 5
2000.000	56.2	V	60.0	-3.8	Peak	66	1.3	Note 5
1875.000	37.1	V	60.0	-22.9	Peak	81	1.6	Note 5

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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #7b: High Channel

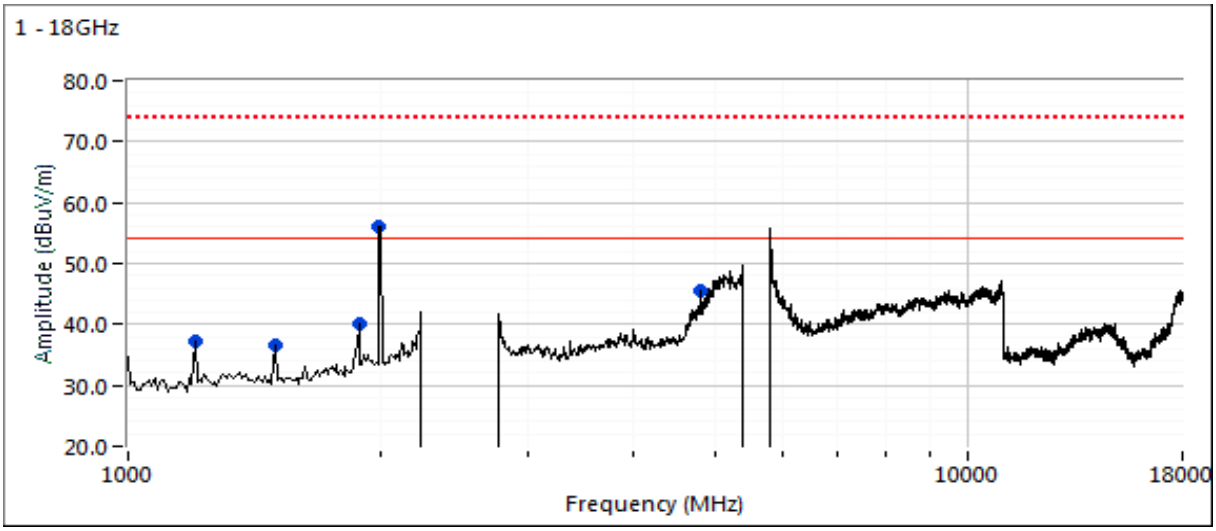
Channel: 9 & 142 Wi-Fi, 39 - BLE Mode: ac40 Note: Channel 122 not used in Canada

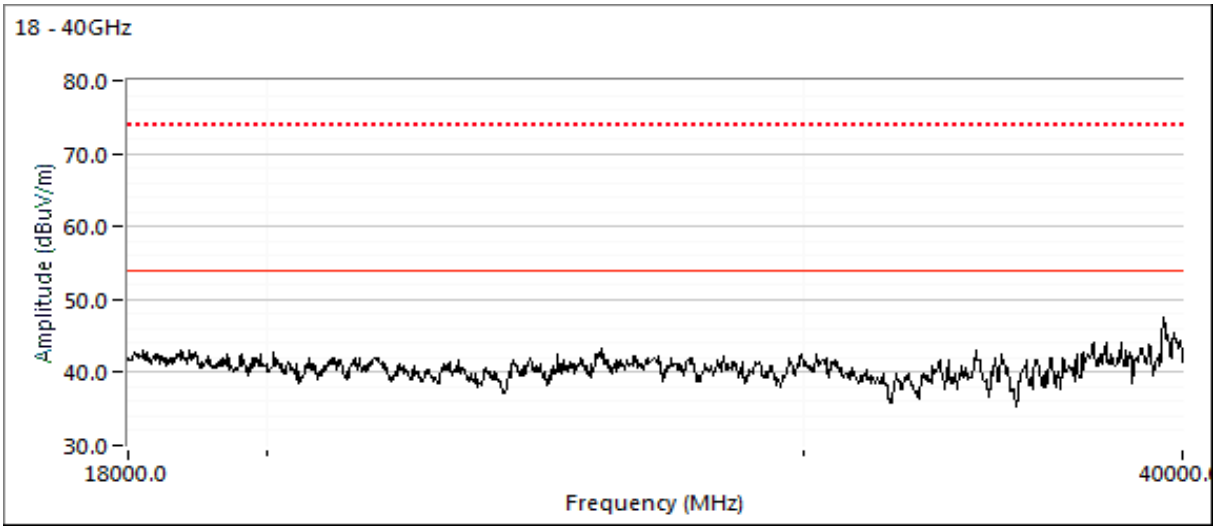
Tx Chain: 4 (5GHz), 4 (2.4 GHz) Data Rate: MCS 0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4849.120	38.2	H	54.0	-15.8	VAVG	143	1.5	RB 1 MHz;VB 300 Hz;Note 3
4745.000	39.6	H	74.0	-34.4	PK	143	1.5	RB 1 MHz;VB 3 MHz;Peak
1200.000	37.1	V	60.0	-22.9	Peak	61	1.0	Note 5
1500.000	36.6	H	60.0	-23.4	Peak	39	1.0	Note 5
1883.330	40.2	V	60.0	-19.8	Peak	298	1.3	Note 5
2000.000	56.2	V	60.0	-3.8	Peak	65	1.3	Note 5

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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

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

Date of Test: 10/23/2018 0:00
Test Engineer: Roy Zheng
Test Location: FT Chamber #5

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

Run #8a: Center Channel

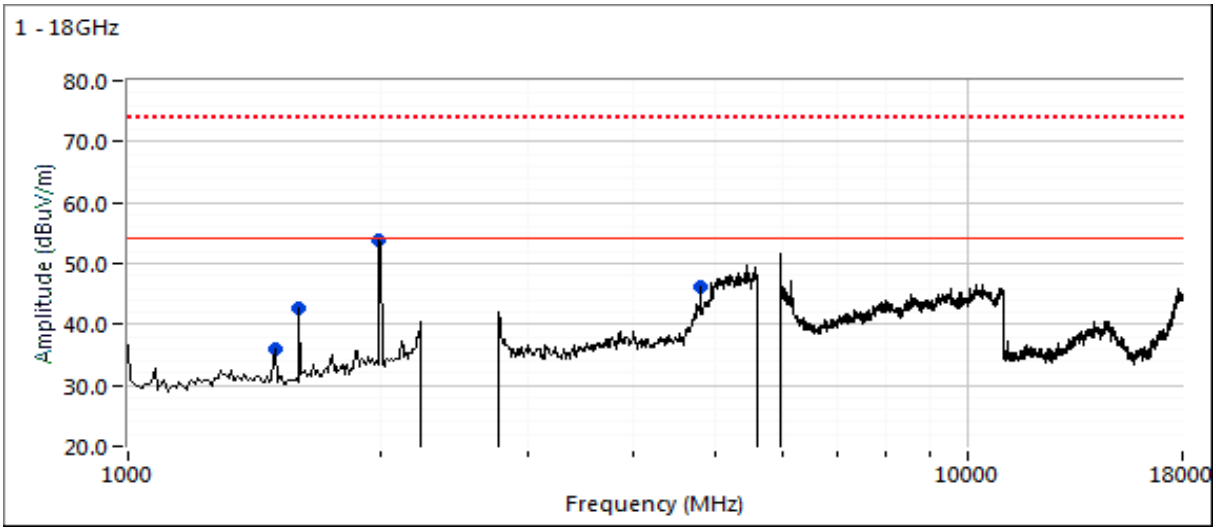
Channel: 6 & 157 Wi-Fi, 37 - BLE
Tx Chain: 8 (5GHz), 4 (2.4 GHz)

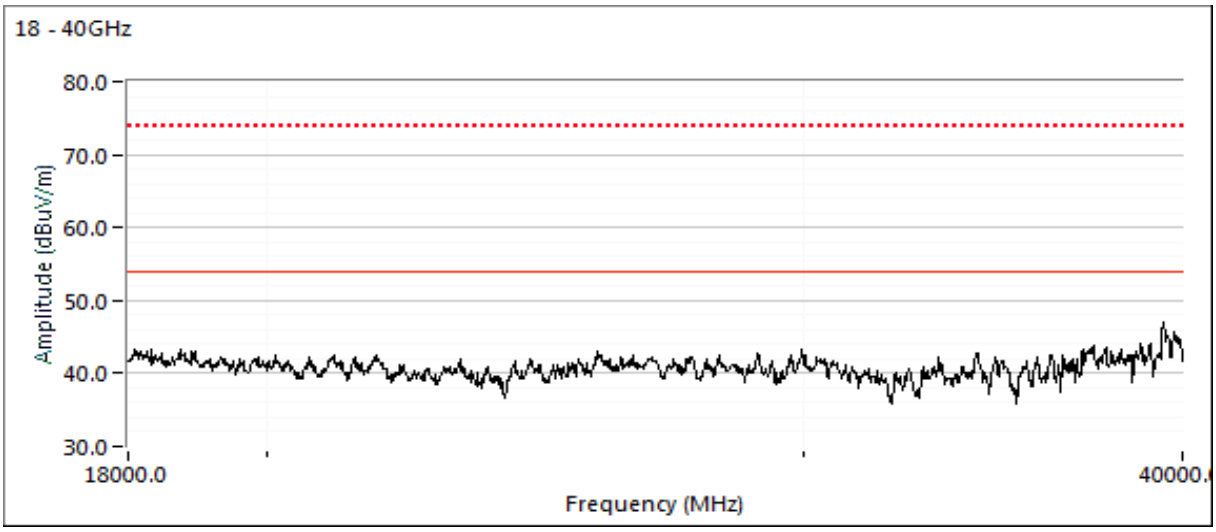
Mode: g & a
Data Rate: 6Mb/s

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4799.980	40.6	V	54.0	-13.4	VAVG	134	2.5	RB 1 MHz;VB 300 Hz;Note 3
4799.710	49.4	V	74.0	-24.6	PK	134	2.5	RB 1 MHz;VB 3 MHz;Peak
1500.000	35.8	V	60.0	-24.2	Peak	148	1.0	Note 5
1600.000	42.6	H	60.0	-17.4	Peak	122	1.6	Note 5
2000.000	53.8	V	60.0	-6.2	Peak	158	1.0	Note 5

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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #8b: Center Channel

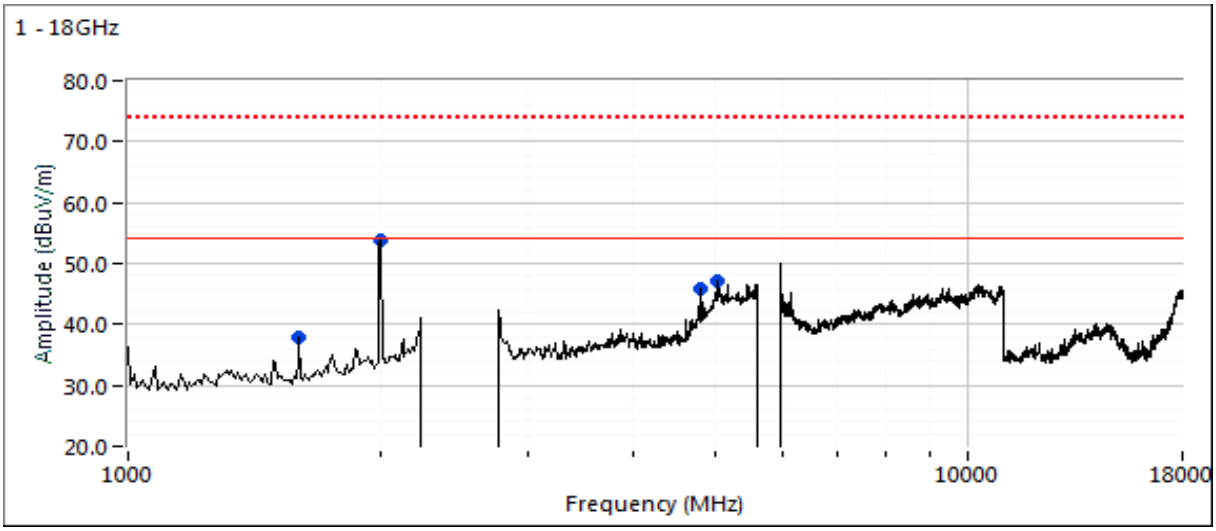
Channel: 6 & 157 Wi-Fi, 17 - BLE Mode: ax20

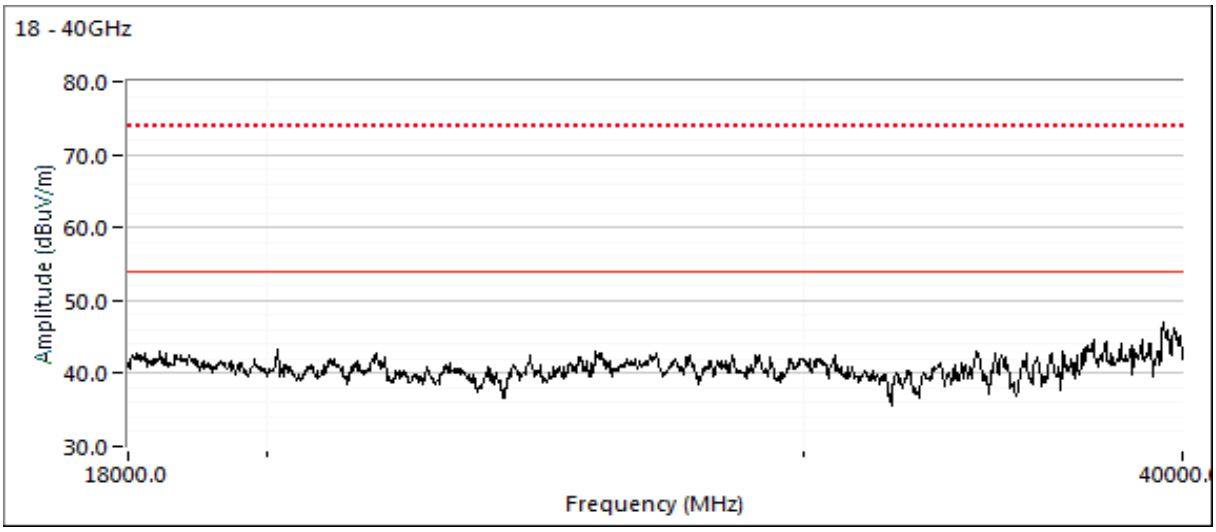
Tx Chain: 4 (5GHz), 4 (2.4 GHz) Data Rate: MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5035.900	42.3	H	54.0	-11.7	VAVG	164	1.5	RB 1 MHz;VB 300 Hz;Note 3
5026.400	53.9	H	74.0	-20.1	PK	164	1.5	RB 1 MHz;VB 3 MHz;Peak
4799.960	41.7	V	54.0	-12.3	VAVG	132	1.9	RB 1 MHz;VB 300 Hz;Note 3
4800.350	50.8	V	74.0	-23.2	PK	132	1.9	RB 1 MHz;VB 3 MHz;Peak
1600.000	38.0	H	60.0	-22.0	Peak	201	1.6	Note 5
2000.000	53.9	V	60.0	-6.1	Peak	244	1.3	Note 5

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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #8c: Center Channel

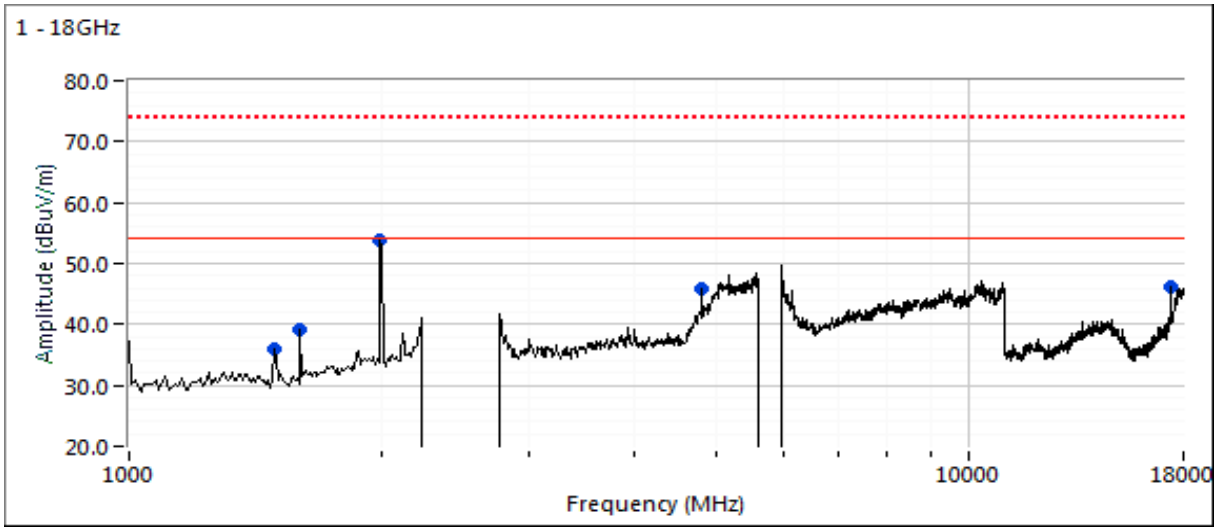
Channel: 6 & 159 Wi-Fi, 39 - BLE Mode: 11ax40

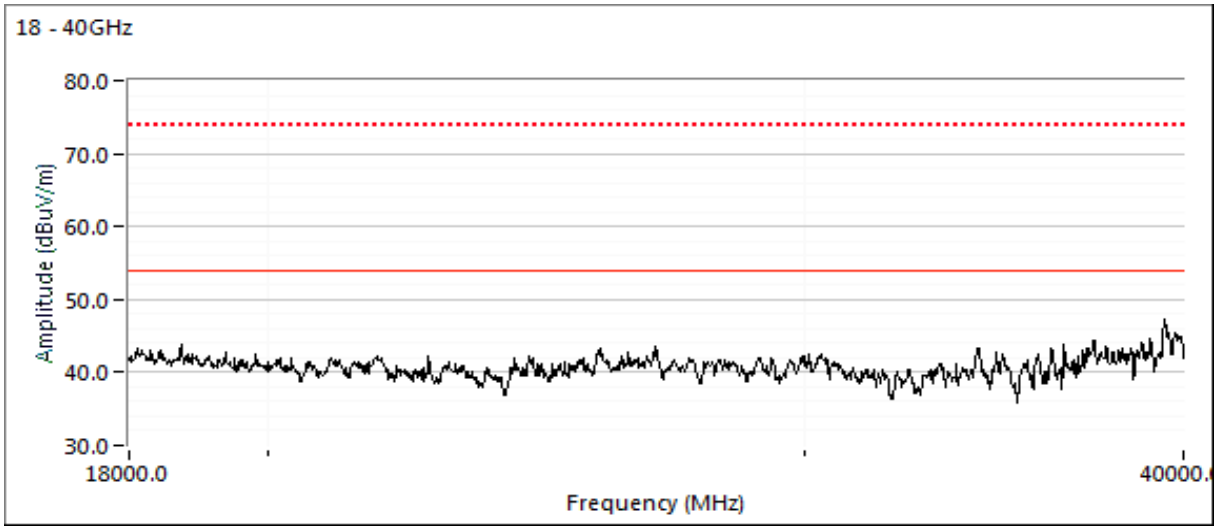
Tx Chain: 8 (5GHz), 4 (2.4 GHz) Data Rate: MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4799.940	43.6	V	54.0	-10.4	VAVG	151	1.4	RB 1 MHz;VB 300 Hz;Note 3
4800.100	52.9	V	74.0	-21.1	PK	151	1.4	RB 1 MHz;VB 3 MHz;Peak
17397.330	54.1	V	68.3	-14.2	PK	204	1.3	RB 1 MHz;VB 3 MHz;Peak
1500.000	35.9	V	60.0	-24.1	Peak	48	1.3	Note 5
1600.000	39.1	H	60.0	-20.9	Peak	164	1.6	Note 5
2000.000	53.8	V	60.0	-6.2	Peak	79	1.6	Note 5

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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #8d: Center Channel

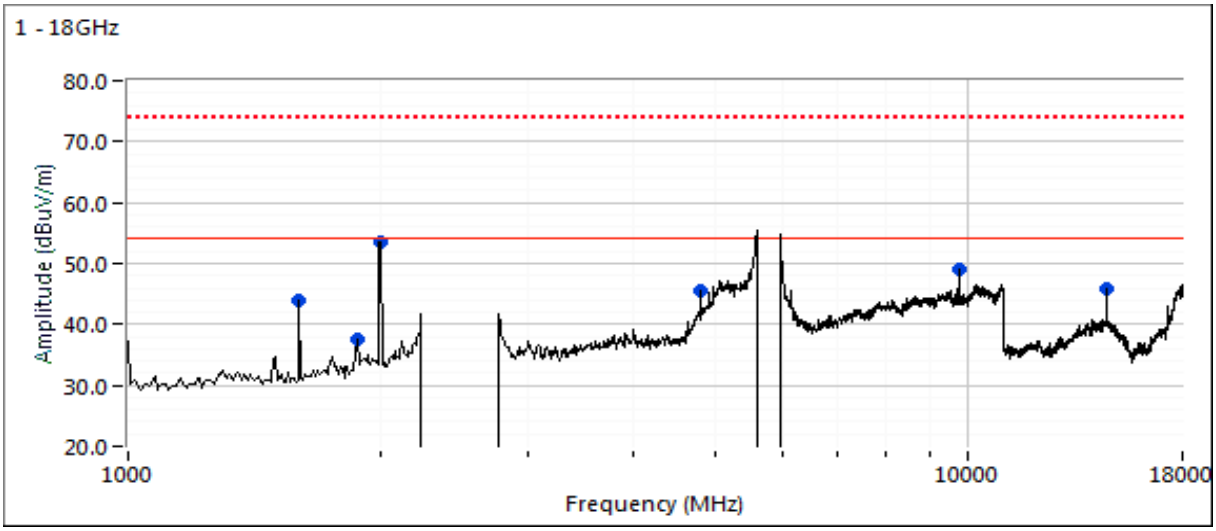
Channel: 6 & 155 Wi-Fi, 17 - BLE Mode: b & ac80

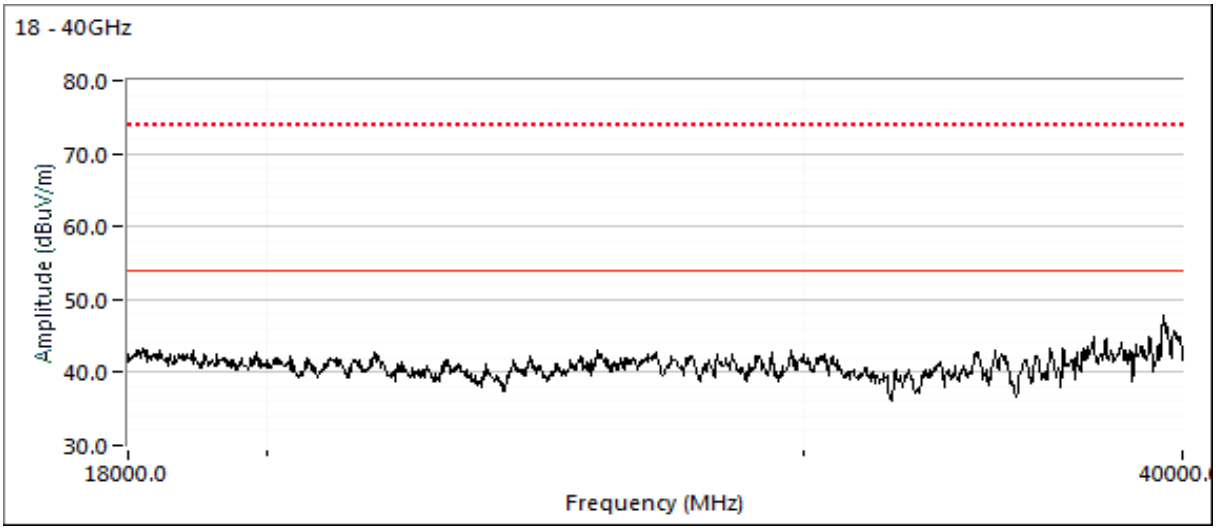
Tx Chain: 8 (5GHz), 4 (2.4 GHz) Data Rate: 1Mbps & MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
9748.030	45.2	V	54.0	-8.8	VAVG	189	2.2	RB 1 MHz;VB 300 Hz;Note 3
9747.970	54.8	V	74.0	-19.2	PK	189	2.2	RB 1 MHz;VB 3 MHz;Peak
4800.030	38.0	V	54.0	-16.0	VAVG	191	2.5	RB 1 MHz;VB 300 Hz;Note 3
4798.500	39.4	V	74.0	-34.6	PK	191	2.5	RB 1 MHz;VB 3 MHz;Peak
14619.280	41.2	V	68.3	-27.1	PK	226	1.1	RB 1 MHz;VB 3 MHz;Peak
1600.000	44.0	H	60.0	-16.0	Peak	36	1.3	Note 5
1875.000	37.5	V	60.0	-22.5	Peak	57	1.6	Note 5
2000.000	53.5	V	60.0	-6.5	Peak	250	1.3	Note 5

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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #9: Radiated Spurious Emissions, 1,000 - 40000 MHz. Operating Mode: Worse case from Run #5

Date of Test: 10/23/2018 0:00
Test Engineer: Rafael Varelas
Test Location: FT Chamber #5

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

Run #9a: Low Channel

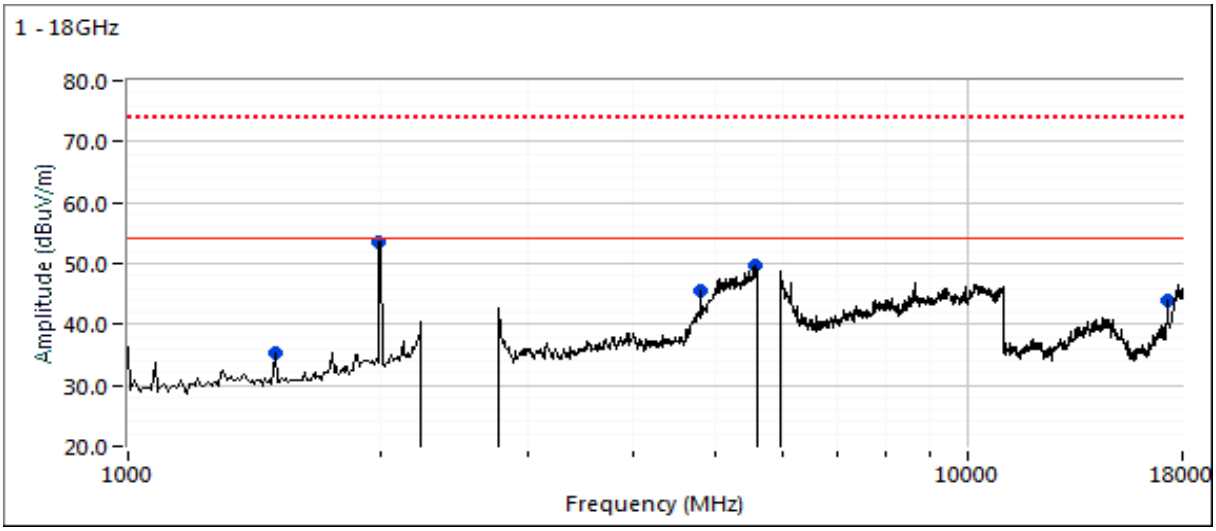
Channel: 3 & 151 Wi-Fi, 37 - BLE
Tx Chain: 4 (5GHz), 4 (2.4 GHz)

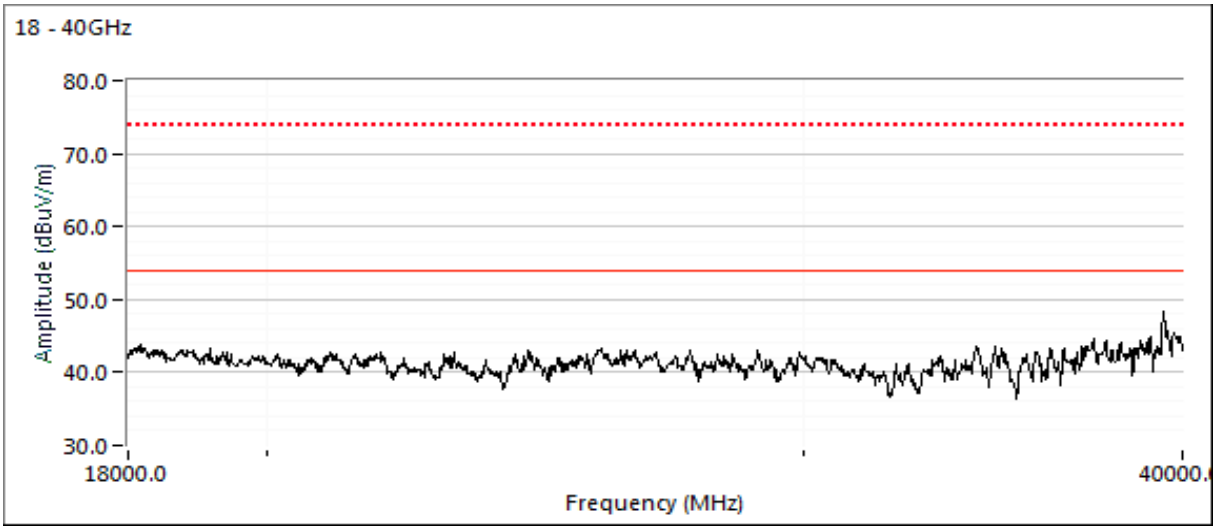
Mode: ax40
Data Rate: MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5574.360	59.9	V	68.3	-8.4	PK	167	1.7	RB 1 MHz;VB 3 MHz;Peak
4794.710	39.0	V	54.0	-15.0	VAVG	151	1.5	RB 1 MHz;VB 300 Hz; Note 3
4796.150	51.1	V	74.0	-22.9	PK	151	1.5	RB 1 MHz;VB 3 MHz;Peak
1500.080	35.4	V	60.0	-24.6	Peak	31	1.0	Note 5
2000.000	53.6	H	60.0	-6.4	Peak	139	1.9	Note 5
17265.000	43.9	V	68.3	-24.4	Peak	92	1.3	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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #9b: High Channel

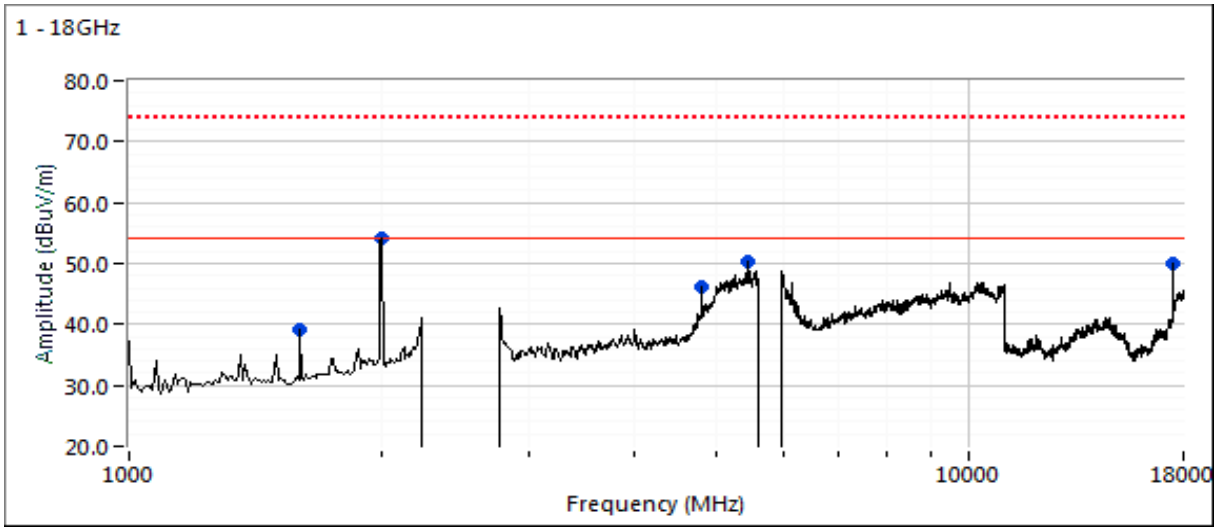
Channel: 11 & 157 Wi-Fi, 39 - BLE Mode: ax20

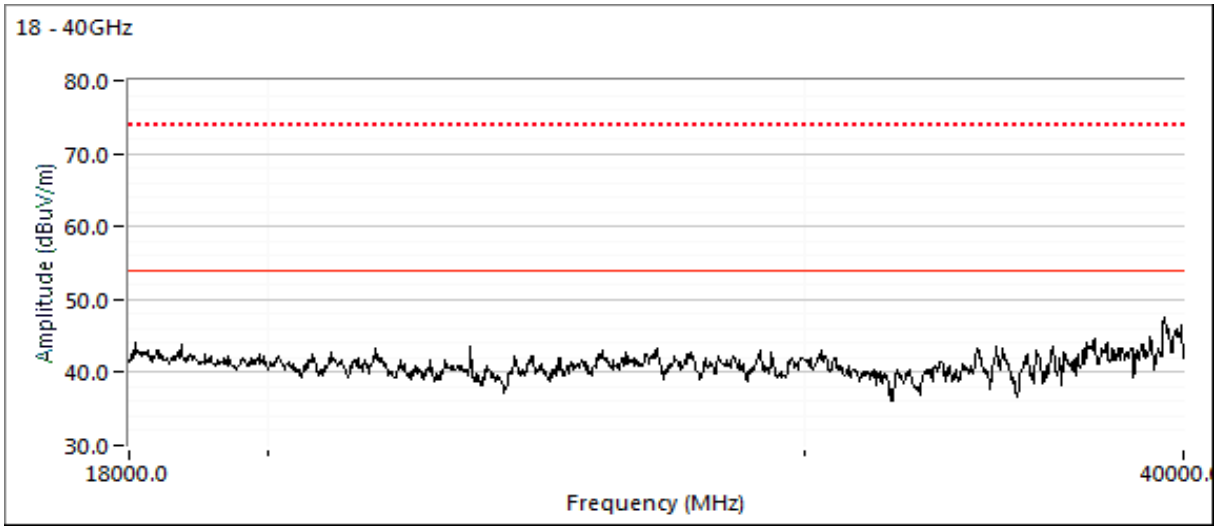
Tx Chain: 4 (5GHz), 4 (2.4 GHz) Data Rate: MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5446.430	45.0	V	54.0	-9.0	VAVG	161	1.6	RB 1 MHz;VB 300 Hz; Note 3
5449.150	57.8	V	74.0	-16.2	PK	161	1.6	RB 1 MHz;VB 3 MHz;Peak
4799.980	44.4	H	54.0	-9.6	VAVG	163	2.0	RB 1 MHz;VB 300 Hz; Note 3
4800.210	53.1	H	74.0	-20.9	PK	163	2.0	RB 1 MHz;VB 3 MHz;Peak
17475.680	52.9	V	68.3	-15.4	PK	99	1.0	RB 1 MHz;VB 3 MHz;Peak
1602.500	39.3	V	60.0	-20.7	Peak	316	1.0	Note 5
2000.000	54.2	H	60.0	-5.8	Peak	139	1.9	Note 5

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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Aruba, a Hewlett Packard Enterprise company	Job Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Coordinator:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Engineer:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

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: 10/31/2018
Test Engineer: Rafael Varelas
Test Location: FT Chamber #4

Config. Used: Integral and AP-ANT-19
Config Change: None
EUT Voltage: PoE & 120V/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 when possible passed through a ferrite clamp upon exiting the chamber.

Radiated emissions tests above 1 GHz to FCC Part 15 were performed with floor absorbers in place in accordance with the test methods of ANSI C63.4 and CISPR 16-1-4.

The test distance and extrapolation factor (if applicable) are detailed under each run description.

Note, preliminary testing indicates that the emissions were maximized by orientation of the EUT and elevation of the measurement antenna. Maximized testing indicated that the emissions were maximized by orientation of the EUT, elevation of the measurement antenna, and manipulation of the EUT's interface cables.

Ambient Conditions:

Temperature: 22.4 °C
Rel. Humidity: 39 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
2	Radiated Emissions 30 - 1000 MHz, Maximized	15.209	Pass	32.8 dBµV/m @ 53.84 MHz (-7.2 dB)
4	Radiated Emissions 30 - 1000 MHz, Maximized	15.209	Pass	34.2 dBµV/m @ 34.13 MHz (-5.8 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

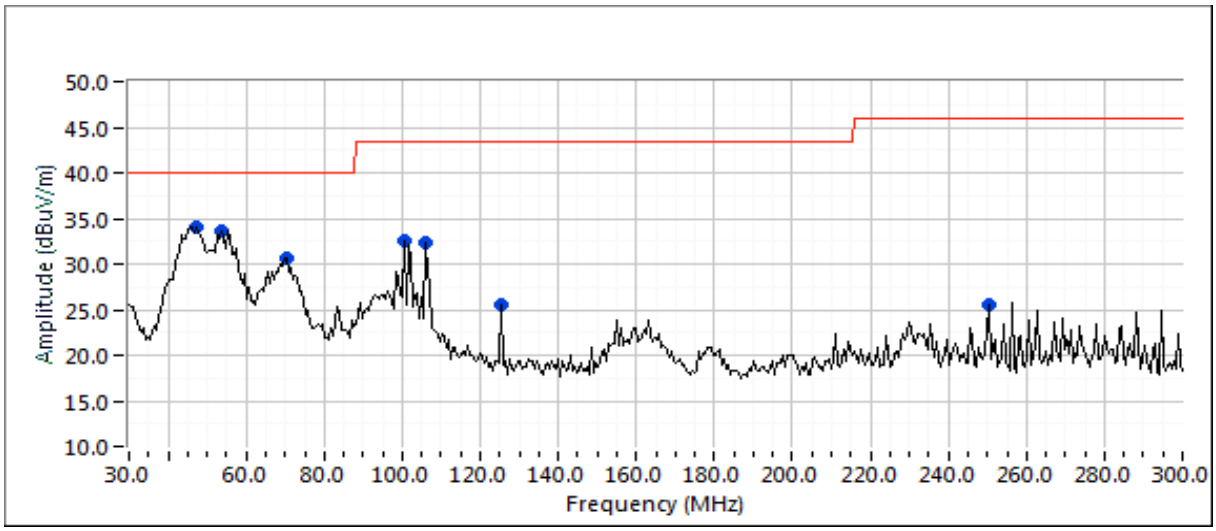
Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Engineer:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Sample Notes

Sample S/N: CNG6K9V019 & CNG6K9W00R
Driver: P2 WNC 0.4.4
Antenna: Integral and AP-ANT-19

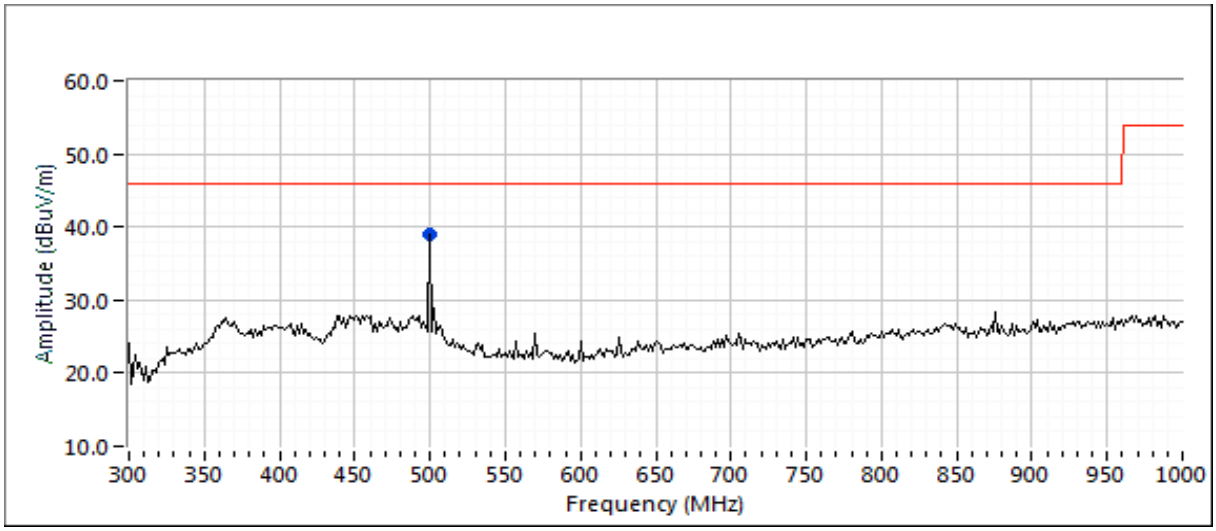
Test Parameters for Preliminary Scan(s)			
Frequency Range (MHz)	Prescan Distance (meters)	Limit Distance (meters)	Extrapolation Factor (dB, applied to data)
30 - 1000	3	3	0.0

Run #1: Preliminary Radiated Emissions, 30 - 1000 MHz



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Engineer:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



Preliminary peak readings captured during pre-scan

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
46.940	34.1	V	40.0	-5.9	Peak	196	1.0	
53.842	33.7	V	40.0	-6.3	Peak	94	1.0	
71.842	30.6	V	40.0	-9.4	Peak	57	1.0	
100.269	32.5	V	43.5	-11.0	Peak	309	1.0	
105.688	32.3	V	43.5	-11.2	Peak	279	1.5	
124.999	25.6	V	43.5	-17.9	Peak	46	1.0	
250.004	25.6	V	46.0	-20.4	Peak	264	1.5	
499.993	38.9	V	46.0	-7.1	Peak	235	2.0	

Note 1:	Integral Antennas. EUT configured for operation on Channels 1 (b mode) & 100 (a mode) Wi-Fi, 37 - BLE

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Engineer:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #2: Maximized Readings From Run #1

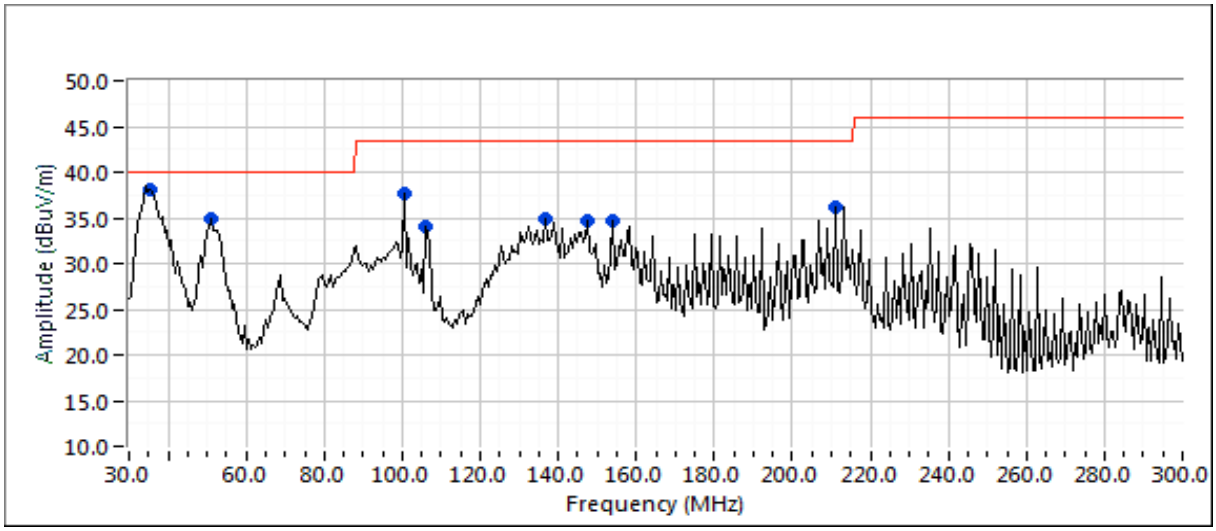
Test Parameters for Maximized Reading(s)			
Frequency Range (MHz)	Test Distance (meters)	Limit Distance (meters)	Extrapolation Factor (dB, applied to data)
30 - 1000	3	3	0.0

Maximized quasi-peak readings (includes manipulation of EUT interface cables)

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
53.842	32.8	V	40.0	-7.2	QP	95	1.0	QP (1.00s)
46.940	29.5	V	40.0	-10.5	QP	196	1.0	QP (1.00s)
71.842	28.0	V	40.0	-12.0	QP	57	1.0	QP (1.00s)
105.688	31.2	V	43.5	-12.3	QP	289	1.0	QP (1.00s)
100.269	30.9	V	43.5	-12.6	QP	319	1.0	QP (1.00s)
499.993	30.5	V	46.0	-15.5	QP	207	1.0	QP (1.00s)

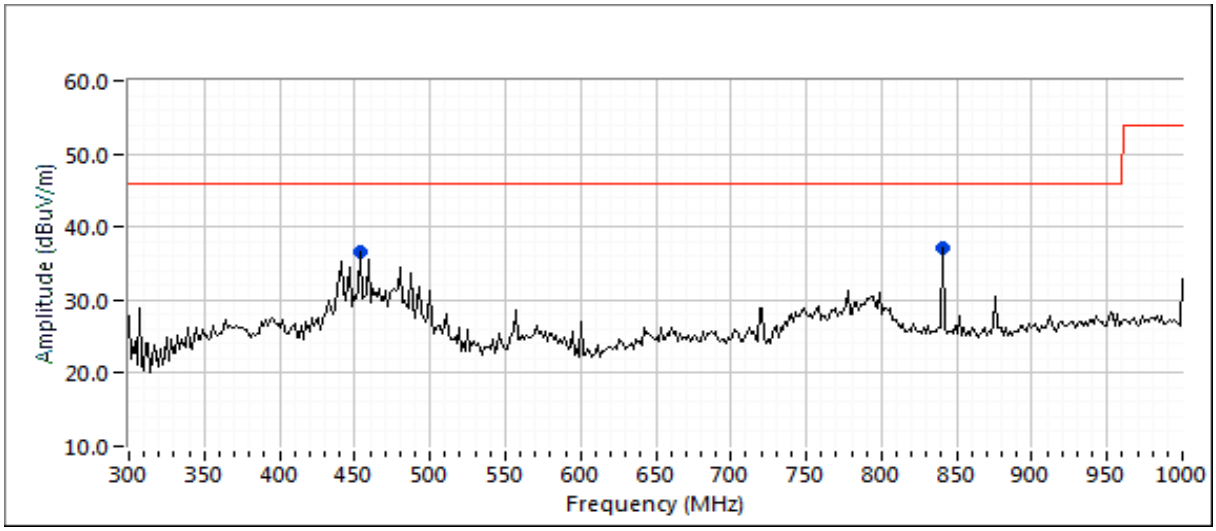
Run #3: Preliminary Radiated Emissions, 30 - 1000 MHz

Test Parameters for Preliminary Scan(s)			
Frequency Range (MHz)	Prescan Distance (meters)	Limit Distance (meters)	Extrapolation Factor (dB, applied to data)
30 - 1000	3	3	0.0



EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Engineer:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A



Preliminary peak readings captured during pre-scan

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
34.127	38.1	V	40.0	-1.9	Peak	8	1.0	
50.962	34.8	V	40.0	-5.2	Peak	210	1.0	
100.299	37.7	V	43.5	-5.8	Peak	125	1.0	
105.665	34.1	V	43.5	-9.4	Peak	254	1.0	
136.536	34.9	V	43.5	-8.6	Peak	183	1.0	
147.207	34.7	V	43.5	-8.8	Peak	104	1.0	
153.601	34.6	H	43.5	-8.9	Peak	228	2.5	
211.206	36.2	V	43.5	-7.3	Peak	42	1.0	
454.417	36.7	V	46.0	-9.3	Peak	58	1.0	
841.936	37.1	V	46.0	-8.9	Peak	150	1.0	

Note 1:	AP-ANT-19 Wi-Fi Antenna, Integral BLE Antenna. EUT configured for operation on Channels 11 (g mode) & 116 Wi-Fi (ax20), 39 - BLE

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Engineer:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #4: Maximized Readings From Run #3

Test Parameters for Maximized Reading(s)			
Frequency Range (MHz)	Test Distance (meters)	Limit Distance (meters)	Extrapolation Factor (dB, applied to data)
30 - 1000	3	3	0.0

Maximized quasi-peak readings (includes manipulation of EUT interface cables)

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
34.127	34.2	V	40.0	-5.8	QP	8	1.0	QP (1.00s)
211.206	36.3	V	43.5	-7.2	QP	42	1.0	QP (1.00s)
100.299	33.5	V	43.5	-10.0	QP	104	1.0	QP (1.00s)
153.601	33.3	H	43.5	-10.2	QP	228	1.8	QP (1.00s)
136.536	32.7	V	43.5	-10.8	QP	183	1.0	QP (1.00s)
50.962	28.9	V	40.0	-11.1	QP	209	1.0	QP (1.00s)
454.417	33.8	V	46.0	-12.2	QP	64	1.0	QP (1.00s)
147.207	30.3	V	43.5	-13.2	QP	104	1.0	QP (1.00s)
105.665	30.3	V	43.5	-13.2	QP	253	1.8	QP (1.00s)
841.936	22.0	V	46.0	-24.0	QP	142	1.0	QP (1.00s)

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Engineer:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

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: 11/1/2018
Test Engineer: Roy Zheng
Test Location: FT Chamber #4

Config. Used: ANT-19
Config Change: None
EUT Voltage: PoE & 120V/60Hz

General Test Configuration

The EUT and POE adapter were located on a table inside the semi-anechoic chamber, 40 cm from a vertical coupling plane and 80cm from the LISN. Remote support equipment was located outside of the semi-anechoic chamber. Any cables running to remote support equipment where routed through metal conduit and when possible passed through a ferrite clamp upon exiting the chamber.

Ambient Conditions:

Temperature: 22-23 °C
Rel. Humidity: 38-40 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power,120V/60Hz	FCC §15.207 "Class B"	Pass	39.3 dBµV @ 0.422 MHz (-8.1 dB)
2	CE, POE	FCC §15.207 "Class B"	Pass	38.4 dBµV @ 0.458 MHz (-8.3 dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

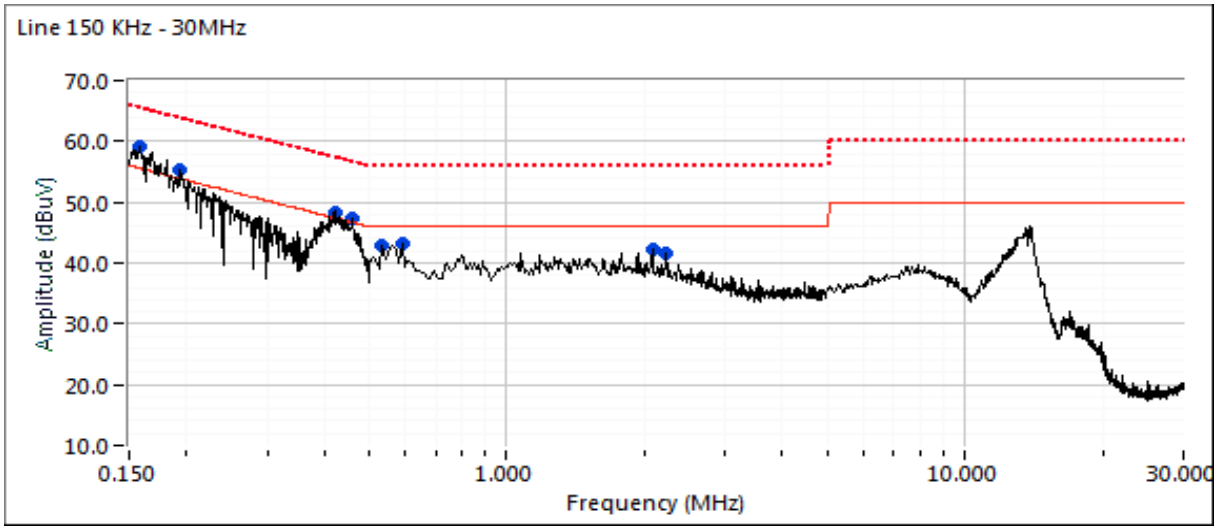
Deviations From The Standard

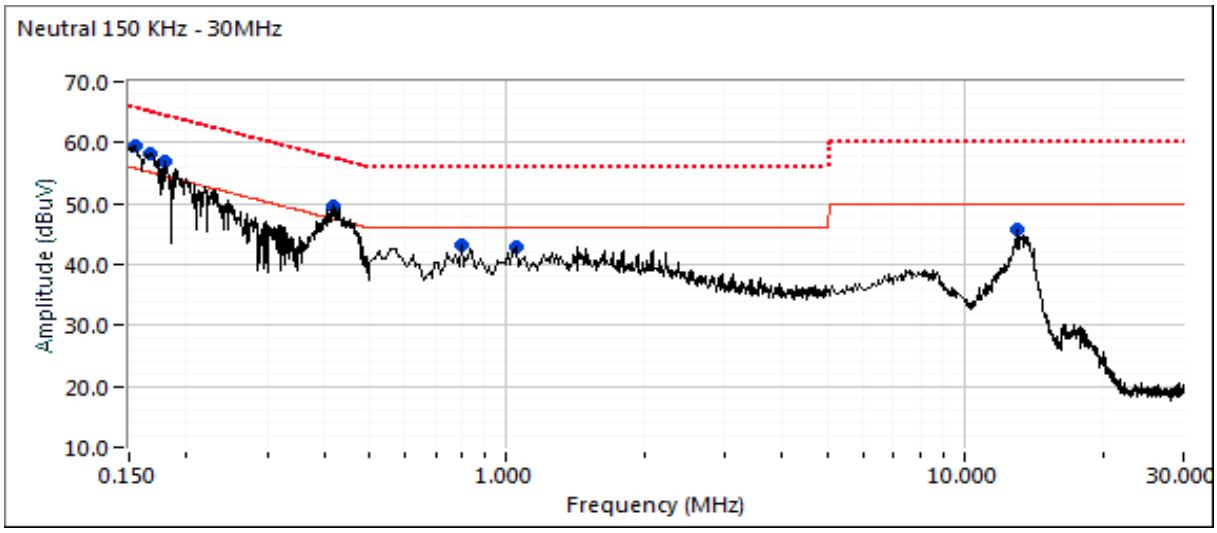
No deviations were made from the requirements of the standard.

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Engineer:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Engineer:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz
Preliminary peak readings captured during pre-scan (peak readings vs. average limit)

Frequency MHz	Level dBμV	AC Line	FCC §15.207 Limit	Margin	Detector QP/Ave	Comments
0.156	59.4	Neutral	55.7	3.7	Peak	
0.158	59.2	Line	55.5	3.7	Peak	
0.166	58.2	Neutral	55.1	3.1	Peak	
0.179	56.8	Neutral	54.5	2.3	Peak	
0.419	49.7	Neutral	47.5	2.2	Peak	
0.194	55.4	Line	53.9	1.5	Peak	
0.422	48.4	Line	47.4	1.0	Peak	
0.460	47.2	Line	46.7	0.5	Peak	
0.806	43.2	Neutral	46.0	-2.8	Peak	
0.590	43.1	Line	46.0	-2.9	Peak	
0.536	43.0	Line	46.0	-3.0	Peak	
1.046	42.9	Neutral	46.0	-3.1	Peak	
2.078	42.2	Line	46.0	-3.8	Peak	
13.818	46.2	Line	50.0	-3.8	Peak	
13.918	46.0	Line	50.0	-4.0	Peak	
2.222	41.6	Line	46.0	-4.4	Peak	
13.062	45.6	Neutral	50.0	-4.4	Peak	

EMC Test Data

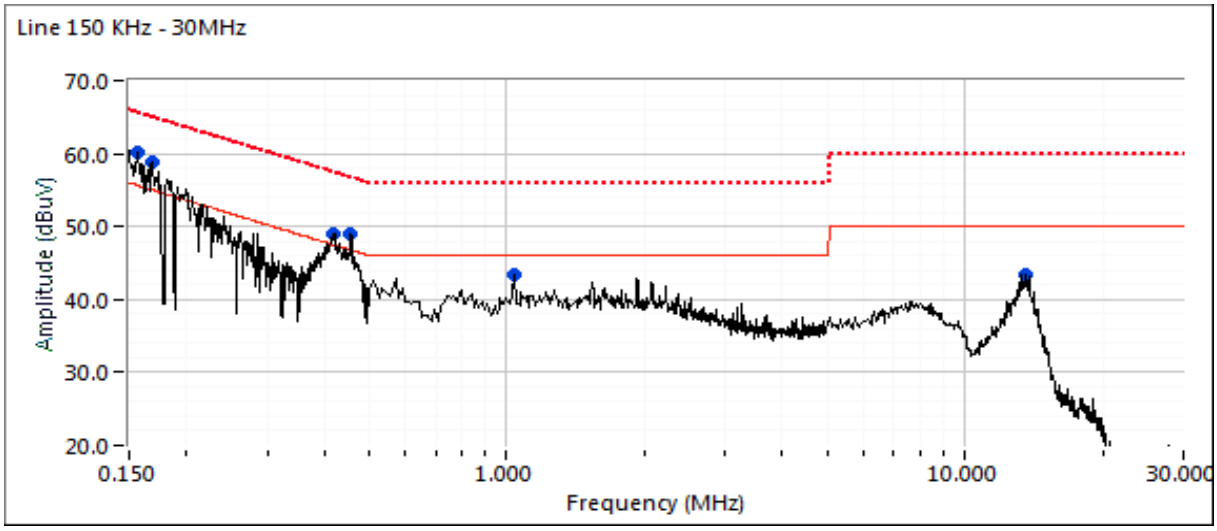
Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Engineer:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

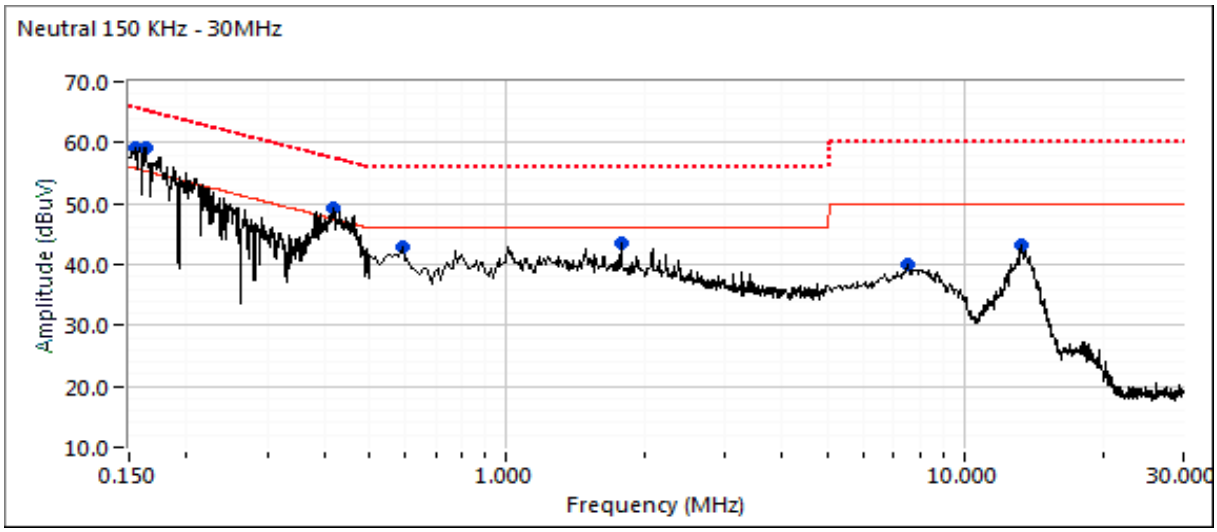
Final quasi-peak and average readings

Frequency MHz	Level dBμV	AC Line	FCC §15.207 Limit	Margin	Detector QP/Ave	Comments
0.419	39.4	Neutral	47.5	-8.1	AVG	AVG (0.10s)
0.422	39.3	Line	47.4	-8.1	AVG	AVG (0.10s)
0.460	37.9	Line	46.7	-8.8	AVG	AVG (0.10s)
0.419	45.6	Neutral	57.5	-11.9	QP	QP (1.00s)
2.078	33.7	Line	46.0	-12.3	AVG	AVG (0.10s)
0.422	45.0	Line	57.4	-12.4	QP	QP (1.00s)
0.158	52.2	Line	65.5	-13.3	QP	QP (1.00s)
0.460	43.4	Line	56.7	-13.3	QP	QP (1.00s)
2.222	32.6	Line	46.0	-13.4	AVG	AVG (0.10s)
0.156	52.1	Neutral	65.7	-13.6	QP	QP (1.00s)
0.166	50.8	Neutral	65.1	-14.3	QP	QP (1.00s)
0.590	31.3	Line	46.0	-14.7	AVG	AVG (0.10s)
0.806	31.2	Neutral	46.0	-14.8	AVG	AVG (0.10s)
1.046	31.0	Neutral	46.0	-15.0	AVG	AVG (0.10s)
0.179	49.0	Neutral	64.5	-15.5	QP	QP (1.00s)
0.194	48.3	Line	63.9	-15.6	QP	QP (1.00s)
0.536	28.6	Line	46.0	-17.4	AVG	AVG (0.10s)
2.078	38.6	Line	56.0	-17.4	QP	QP (1.00s)
2.222	37.9	Line	56.0	-18.1	QP	QP (1.00s)
0.590	37.6	Line	56.0	-18.4	QP	QP (1.00s)
0.806	37.2	Neutral	56.0	-18.8	QP	QP (1.00s)
1.046	37.0	Neutral	56.0	-19.0	QP	QP (1.00s)
0.536	36.2	Line	56.0	-19.8	QP	QP (1.00s)
13.918	28.8	Line	50.0	-21.2	AVG	AVG (0.10s)
13.818	28.5	Line	50.0	-21.5	AVG	AVG (0.10s)
13.818	38.5	Line	60.0	-21.5	QP	QP (1.00s)
13.918	37.9	Line	60.0	-22.1	QP	QP (1.00s)
13.062	26.7	Neutral	50.0	-23.3	AVG	AVG (0.10s)
13.062	36.7	Neutral	60.0	-23.3	QP	QP (1.00s)
0.158	29.1	Line	55.5	-26.4	AVG	AVG (0.10s)
0.166	28.7	Neutral	55.1	-26.4	AVG	AVG (0.10s)
0.156	29.2	Neutral	55.7	-26.5	AVG	AVG (0.10s)
0.179	27.1	Neutral	54.5	-27.4	AVG	AVG (0.10s)
0.194	24.4	Line	53.9	-29.5	AVG	AVG (0.10s)

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Engineer:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #2: POE Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz





EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Engineer:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Run #2: POE Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz
Preliminary peak readings captured during pre-scan (peak readings vs. average limit)

Frequency MHz	Level dBμV	AC Line	FCC §15.207 Limit	Margin	Detector QP/Ave	Comments
0.157	60.1	Line	55.6	4.5	Peak	
0.163	59.1	Neutral	55.3	3.8	Peak	
0.168	58.8	Line	55.0	3.8	Peak	
0.155	59.2	Neutral	55.7	3.5	Peak	
0.458	48.9	Line	46.7	2.2	Peak	
0.419	49.3	Neutral	47.5	1.8	Peak	
0.418	49.0	Line	47.5	1.5	Peak	
1.038	43.5	Line	46.0	-2.5	Peak	
1.781	43.4	Neutral	46.0	-2.6	Peak	
0.590	42.8	Neutral	46.0	-3.2	Peak	
13.598	43.4	Line	50.0	-6.6	Peak	
13.267	43.2	Neutral	50.0	-6.8	Peak	
7.505	40.0	Neutral	50.0	-10.0	Peak	

EMC Test Data

Client:	Aruba, a Hewlett Packard Enterprise company	PR Number:	PR077654
Model:	APIN0534 and APIN0535	T-Log Number:	TL077654-RA-FCC
		Project Manager:	Christine Krebill
Contact:	Mark Hill	Project Engineer:	David Bare
Standard:	FCC §15.247 & 15.407	Class:	N/A

Final quasi-peak and average readings

Frequency MHz	Level dBμV	AC Line	FCC §15.207 Limit	Margin	Detector QP/Ave	Comments
0.419	39.2	Neutral	47.5	-8.3	AVG	AVG (0.10s)
0.458	38.4	Line	46.7	-8.3	AVG	AVG (0.10s)
0.418	39.1	Line	47.5	-8.4	AVG	AVG (0.10s)
1.781	33.6	Neutral	46.0	-12.4	AVG	AVG (0.10s)
0.418	45.0	Line	57.5	-12.5	QP	QP (1.00s)
0.419	44.9	Neutral	57.5	-12.6	QP	QP (1.00s)
0.458	43.8	Line	56.7	-12.9	QP	QP (1.00s)
0.163	51.4	Neutral	65.3	-13.9	QP	QP (1.00s)
0.155	51.6	Neutral	65.7	-14.1	QP	QP (1.00s)
0.157	51.5	Line	65.6	-14.1	QP	QP (1.00s)
0.590	31.9	Neutral	46.0	-14.1	AVG	AVG (0.10s)
1.038	31.9	Line	46.0	-14.1	AVG	AVG (0.10s)
0.168	49.5	Line	65.0	-15.5	QP	QP (1.00s)
1.781	39.1	Neutral	56.0	-16.9	QP	QP (1.00s)
1.038	38.2	Line	56.0	-17.8	QP	QP (1.00s)
0.590	37.8	Neutral	56.0	-18.2	QP	QP (1.00s)
7.505	27.7	Neutral	50.0	-22.3	AVG	AVG (0.10s)
13.598	26.6	Line	50.0	-23.4	AVG	AVG (0.10s)
13.598	36.1	Line	60.0	-23.9	QP	QP (1.00s)
13.267	25.4	Neutral	50.0	-24.6	AVG	AVG (0.10s)
13.267	35.0	Neutral	60.0	-25.0	QP	QP (1.00s)
7.505	33.6	Neutral	60.0	-26.4	QP	QP (1.00s)
0.155	29.2	Neutral	55.7	-26.5	AVG	AVG (0.10s)
0.163	28.8	Neutral	55.3	-26.5	AVG	AVG (0.10s)
0.157	28.6	Line	55.6	-27.0	AVG	AVG (0.10s)
0.168	28.0	Line	55.0	-27.0	AVG	AVG (0.10s)

End of Report

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