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# *EMC Test Report*

## *Application for FCC Grant of Equipment Authorization*
## *Canada Certification*
## *Class III Permissive Change*

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

## *Model: APIN0555*

| | |
|---|---|
| IC CERTIFICATION #: | 4675A-APIN0555 |
| FCC ID: | Q9DAPIN0555 |
| APPLICANT: | Aruba, a Hewlett Packard Enterprise Company<br>3333 Scott Blvd.<br>Santa Clara, CA 95054 |
| TEST SITE(S): | National Technical Systems<br>41039 Boyce Road.<br>Fremont, CA. 94538-2435 |
| IC SITE REGISTRATION #: | 2845B-3; 2845B-4, 2845B-5, 2845B-7 |
| PROJECT NUMBER: | PR075848 |
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| FINAL TEST DATES: | October 12, 15, 16, 17, 22, 25, 26, 29 and 31, November 1 and 2, December 2, 3, 4, 5, 6 and 27, 2018, January 14 and 15, February 14, 15 and 19, 2019 |
| TOTAL NUMBER OF PAGES: | 166 |

ACCREDITED
Testing Cert #0214.26

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## *VALIDATING SIGNATORIES*

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## REVISION HISTORY

| Rev# | Date | Comments | Modified By |
|---|---|---|---|
| - | July 3, 2019 | First release | |
| 1 | July 25, 2019 | Corrected antenna gain value on page 12 and chain designations throughout the report. | dwb |

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## SCOPE

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

RSS-Gen Issue 5 " General Requirements for Compliance of Radio Apparatus"
RSS 247 Issue 2 "Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSS) and Licence-Exempt Local Area Network (LE-LAN) Devices"
FCC Part 15, Subpart 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:

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.

## STATEMENT OF COMPLIANCE

The tested sample of Aruba, a Hewlett Packard Enterprise Company model APIN0555 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 model APIN0555 and therefore apply only to the tested samples. The samples were selected and prepared by Mark Hill of Aruba, a Hewlett Packard Enterprise Company.

## DEVIATIONS FROM THE STANDARDS

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

## TEST RESULTS SUMMARY

### UNII / LELAN DEVICES

#### OPERATION IN THE 5.25 – 5.35 GHZ BAND

| FCC Rule Part | RSS Rule Part | Description | Measured Value / Comments | Limit / Requirement | Result (margin) |
|---|---|---|---|---|---|
| 15.407(a) (2) | | 26dB Bandwidth | All > 20 MHz | N/A – limits output power if < 20MHz | N/A |
| | RSS-247 6.2.2 (1) | 99% Bandwidth | a: 16.8 MHz<br>ax20: 19.1 MHz<br>ax40: 38.2 MHz<br>ax80: 78.1 MHz | N/A – limits EIRP if < 20MHz | N/A |
| 15.407(a) (2) | RSS-247 6.2.1 (2) | Output Power | 802.11a: 36.5 mW<br>ax20: 37.6 mW<br>ax40: 75.5 mW<br>ax80: 97.5 mW<br>(Max eirp: 0.326 W) | 24 dBm<br>(250 mW)<br>EIRP <= 1W | Complies |
| 15.407(a) (2) | RSS-247 6.2.2 (1) | Power Spectral Density | 802.11a: 3.2 dBm/MHz<br>ax20: 3.2 dBm/MHz<br>ax40: 3.2 dBm/MHz<br>ax80: 1.8 dBm/MHz | 11 dBm/MHz | Complies |
| 15.407(b) (2) / 15.209 | RSS-247 6.2.2 (2) | Spurious Emissions above 1GHz | 53.6 dBµV/m @ 5350.1 MHz (-0.4 dB) | Refer to the limits section (p24) for restricted bands, all others<br>-27 dBm/MHz EIRP | Complies |

#### OPERATION IN THE 5.47 – 5.725 GHZ BAND

| FCC Rule Part | RSS Rule Part | Description | Measured Value / Comments | Limit / Requirement | Result (margin) |
|---|---|---|---|---|---|
| 15.407(a) (2) | | 26dB Bandwidth | All > 20 MHz | N/A – limits output power if < 20MHz | N/A |
| | | 99% Bandwidth | a: 16.8 MHz<br>ax20: 19.1 MHz<br>ax40: 38.2 MHz<br>ax80: 78.1 MHz | N/A – limits EIRP if < 20MHz | N/A |
| 15.407(a) (2) | | Output Power | 802.11a: 40.5 mW<br>ax20: 40.3 mW<br>ax40: 89.1 mW<br>ax80: 162.8 mW<br>(Max eirp: 0.620 W) | 24 dBm<br>(250 mW)<br>EIRP <= 1W | Complies |
| 15.407(a) (2) | | Power Spectral Density | 802.11a: 3.6 dBm/MHz<br>n20: 3.6 dBm/MHz<br>n40: 3.7 dBm/MHz<br>ac80: 3.7 dBm/MHz | 11 dBm/MHz | Complies |
| 15.407(b) (3) / 15.209 | | Spurious Emissions above 1GHz | 68.2 dBµV/m @ 5469.6 MHz (-0.1 dB) | Refer to the limits section (p24) for restricted bands, all others<br>-27 dBm/MHz EIRP | Complies |
| | | Non-operation in 5600 – 5650 MHz sub band | Device cannot operate in the 5600 – 5650 MHz band –refer to Operational Description | | Complies |

***OPERATION IN THE 5.47 – 5.725 GHZ BAND***

| | RSS Rule Part | Description | Measured Value / Comments | Limit / Requirement | Result (margin) |
|---|---|---|---|---|---|
| | RSS-247 6.2.3 (1) | 99% Bandwidth | a: 16.8 MHz<br>ax20: 19.1 MHz<br>ax40: 38.2 MHz<br>ax80: 78.1 MHz | N/A – limits EIRP if < 20MHz | N/A |
| | RSS-210 A9.2(2) | Output Power | 802.11a: 40.5 mW<br>ax20: 40.3 mW<br>ax40: 89.1 mW<br>ax80: 162.8 mW<br>(Max eirp: 0.620 W) | 24 dBm<br>(250 mW)<br>EIRP <= 1W | Complies |
| | RSS-247 6.2.3 (1) | Power Spectral Density | 802.11a: 3.6 dBm/MHz<br>n20: 3.6 dBm/MHz<br>n40: 3.7 dBm/MHz<br>ac80: 3.7 dBm/MHz | 11 dBm/MHz | Complies |
| | RSS-247 6.2.3 (2) | Spurious Emissions above 1GHz | 68.2 dBµV/m @ 5469.6 MHz (-0.1 dB) | Refer to the limits section (p24) for restricted bands, all others<br>-27 dBm/MHz EIRP | Complies |
| | RSS-247 6.2.3 | Non-operation in 5600 – 5650 MHz sub band | Device cannot operate in the 5600 – 5650 MHz band –refer to Operational Description | | 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 | | Refer to page 25 | 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 | No change from original filing | Device shall automatically discontinue operation in the absence of information to transmit | Complies |
| 15.407 (g) | | Frequency Stability | No change from original filing | Signal shall remain within the allocated band | Complies |
| 15.407 (h1) | RSS-247 6.2.2 (1) 6.2.3 (1) | Transmit Power Control | TCP mechanism is discussed in the Operational Description | 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 without radar detection) | Refer to separate test report, reference FR-075848.21 | Threshold -62dBm (-64dBm if eirp > 200mW) Channel Availability Check > 60s Channel closing transmission time < 260ms Channel move time < 10s Non occupancy period > 30minutes | Complies |
| | RSS-247 6.4 (5) | User manual information | No change from original filing | Warning regarding Tilt angle for EIRP compliance, Indoor use for 5150-5250 MHz band and Radar are primary user of some bands | 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 | No change from original filing | Unique or integral antenna required | Complies |
| 15.407 (b) (6) | RSS-Gen Table 4 | AC Conducted Emissions | 39.3 dBµV @ 0.422 MHz (-8.1 dB) | Refer to page 23 | Complies |
| 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 | No change from original filing | Statement for products with detachable antenna | Complies |
| - | RSS-Gen 8.4 | User Manual | No change from original filing | Statement for all products | Complies |

***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 model APIN0555 is a enterprise grade Wi-Fi Access Point with two radios (one for 5 GHz bands and a second for 2.4 GHz bands). In addition, it incorporates a Bluetooh Low Energy (BLE) and ZigBee radio. Since the EUT could be placed in any position during operation, the EUT was treated as tabletop equipment during testing to simulate the end-user environment. The electrical rating of the EUT is 56VDC, 0.6A.
The sample was received on October 12, 2018 and tested on October 12, 15, 16, 17, 22, 25, 26, 29 and 31, November 1 and 2, December 2, 3, 4, 5, 6 and 27, 2018, January 14 and 15, February 14, 15 and 19, 2019. The EUT consisted of the following component(s):

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

### OTHER EUT DETAILS

The following EUT details should be noted: Maximum Antenna Gains (details in test results):
2.4GHz: 3.9dBi max
5GHz: 5.8dBi max
BLE/ZigBee: 4.5dBi

### ANTENNA SYSTEM

The antenna system consists of many custom designed integral antennas.

### ENCLOSURE

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

### MODIFICATIONS

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

### SUPPORT EQUIPMENT

The following equipment was used as support equipment for testing:

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

### EUT INTERFACE PORTS

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

EUT

| Port | Connected To | Cable(s) | | |
|---|---|---|---|---|
| | | Description | Shielded or Unshielded | Length(m) |
| en0 | Remote POE Adapter | Cat 6 | Unshileded | 7.6 |
| en1 | Unterminated | Cat 6 | Unshileded | 2 |
| DC power | AC Adapter | Two wire with ferrite | Unshileded | 1.4 |
| USB | Not connected | - | - | - |
| micro USB | Not connected | - | - | - |

Additional on Support Equipment

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

The micro USB and USB ports are for debug use 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.

## PROPOSED MODIFICATION DETAILS

### GENERAL

This section details the modifications to the Aruba, a Hewlett Packard Enterprise Company model APIN0555 being proposed. All performance and construction deviations from the characteristics originally reported to the FCC are addressed

### SOFTWARE

The AurbaOS was modified to enable channel operating in the 5250-5350 MHz and 5470-5725 MHz bands.

## 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 FCC | Canada | Location |
|---|---|---|---|
| Chamber 4 | US1031 | US0027 (2845B) | 41039 Boyce Road<br>Fremont,<br>CA 94538-2435 |
| Chamber 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.

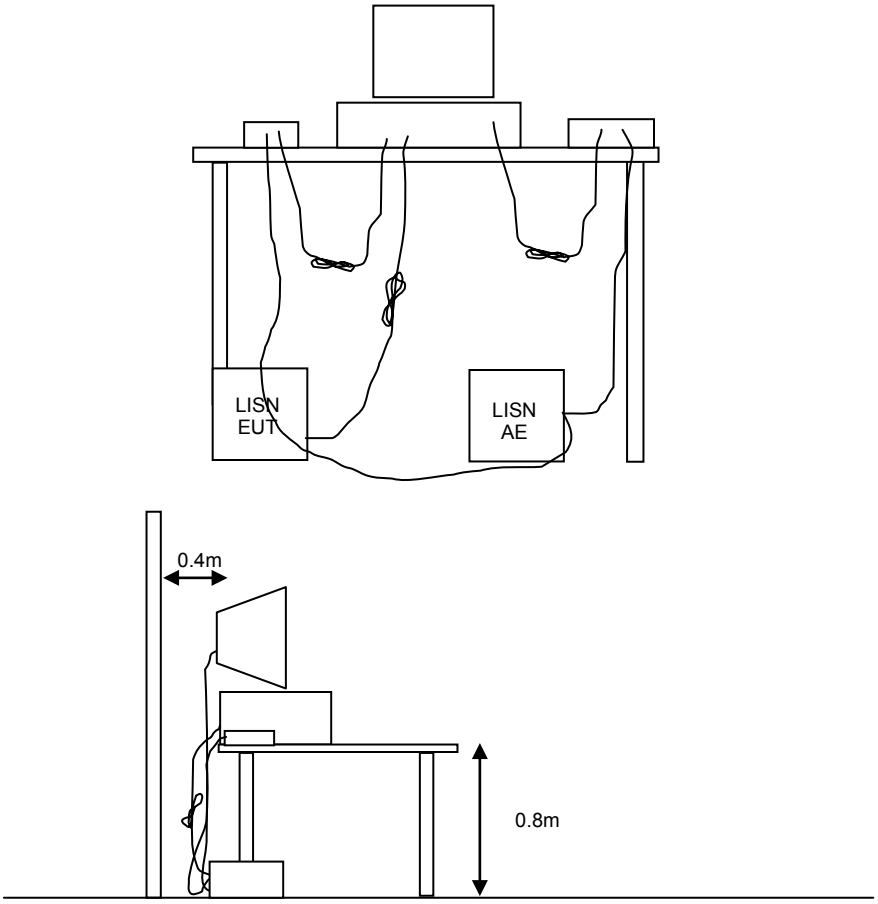



**Figure 1 Typical Conducted Emissions Test Configuration**

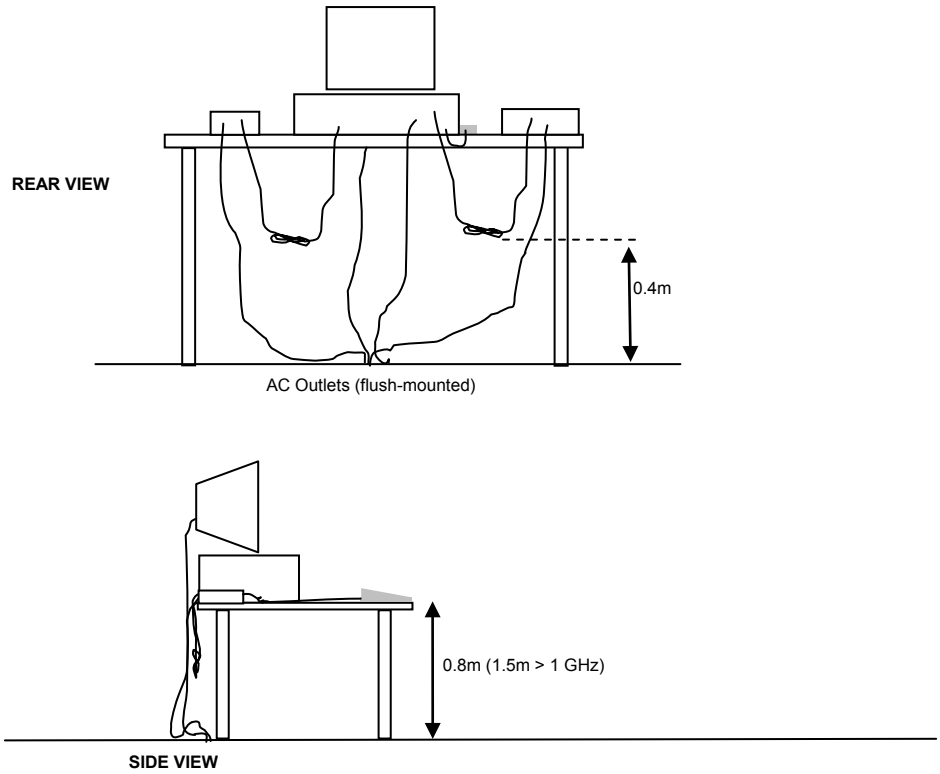
***RADIATED EMISSIONS***

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.

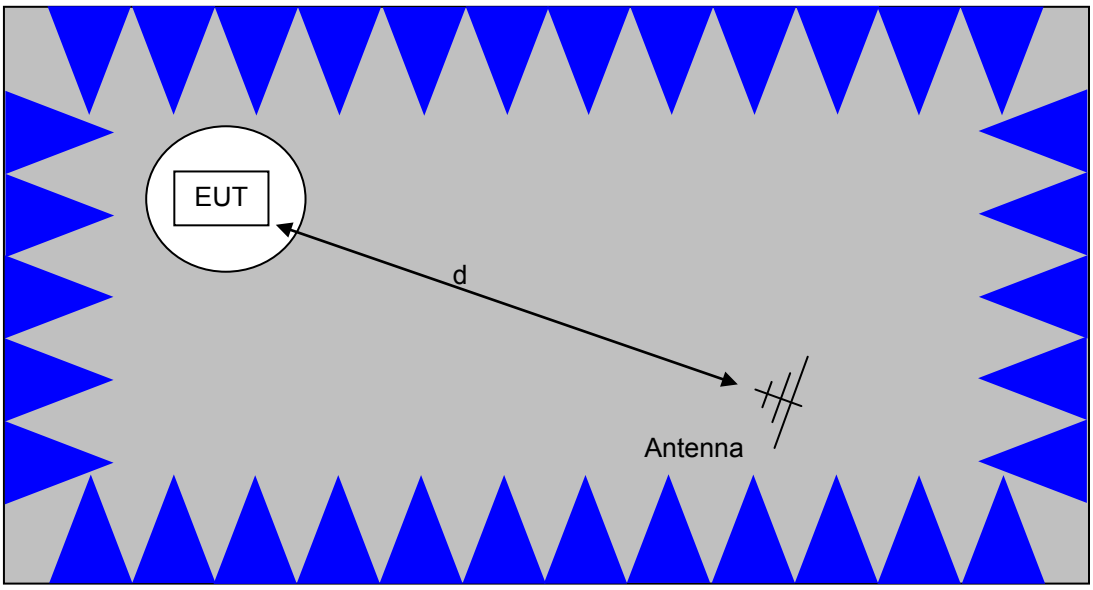
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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.

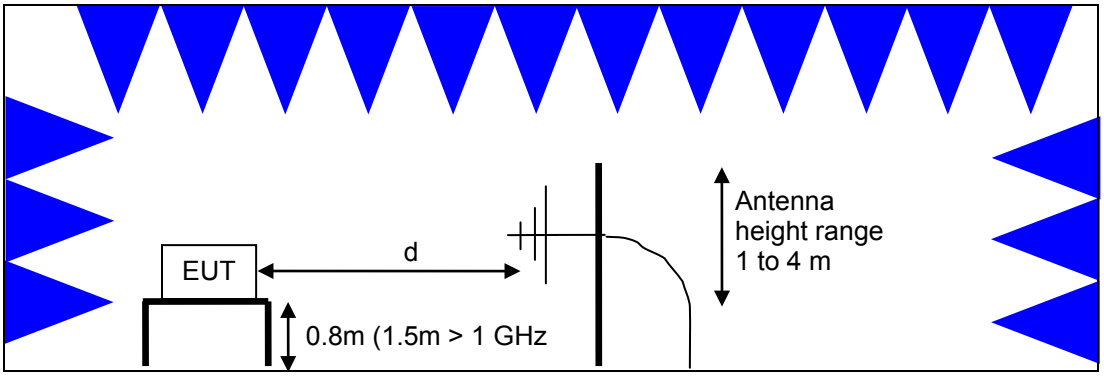



Typical Test Configuration for Radiated Field Strength Measurements




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.

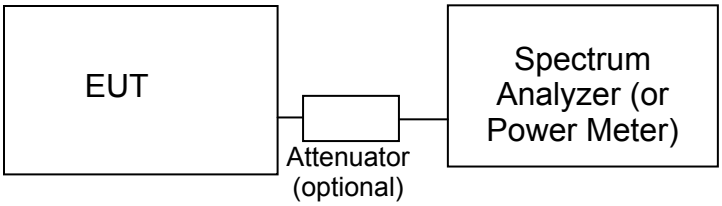
Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.




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 |

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

### 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.

### 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<br>1W (30dBm) eirp | 11 dBm/MHz |
| 5725 – 5825 | 1 Watt (30 dBm)<br>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 Spurious Emissions, 1000 - 6,500 MHz, 21-Mar-18** | | | | | |
| National Technical Systems | NTS EMI Software (rev 2.10) | N/A | 0 | | N/A |
| National Technical Systems | NTS Capture Analyzer Software (rev 3.8) | N/A | 0 | | N/A |
| EMCO | Antenna, Horn, 1-18 GHz (SA40-Red) | 3115 | 1142 | 9/29/2016 | 9/29/2018 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-7 GHz | ESIB 7 | 9482 | 10/28/2016 | 10/28/2018 |
| **Radiated Emissions, 1000 - 6,000 MHz, 02-Apr-18** | | | | | |
| EMCO | Antenna, Horn, 1-18GHz | 3115 | 868 | 6/30/2016 | 6/30/2018 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-7 GHz | ESIB 7 | 1756 | 7/8/2017 | 7/8/2018 |
| **Spurious Emissions, 16-Jul-18** | | | | | |
| National Technical Systems | NTS EMI Software (rev 2.10) | N/A | 0 | | N/A |
| EMCO | Antenna, Horn, 1-18 GHz | 3115 | 487 | 8/18/2016 | 8/18/2018 |
| Hewlett Packard | Microwave Preamplifier, 1-26.5GHz | 8449B | 2199 | 8/30/2017 | 8/30/2018 |
| Hewlett Packard | Spectrum Analyzer (SA40) Purple 9 kHz - 40 GHz, | 8564E (84125C) | 2415 | 2/16/2018 | 2/16/2019 |
| **Radiated Spurious Emissions, 1000 - 6,500 MHz, 15-Oct-18** | | | | | |
| National Technical Systems | NTS EMI Software (rev 2.10) | N/A | 0 | | N/A |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-7 GHz | ESIB 7 | 1538 | 2/10/2018 | 2/10/2019 |
| EMCO | Antenna, Horn, 1-18 GHz | 3115 | 2870 | 8/24/2017 | 8/24/2019 |
| **Radiated Emissions - Band Edge, 16-Oct-18** | | | | | |
| EMCO | Antenna, Horn, 1-18GHz | 3115 | 868 | 7/9/2018 | 7/9/2020 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-40 GHz | ESI 40 | 2493 | 3/22/2018 | 3/22/2019 |
| **Radiated Emissions - Band Edge, 17-Oct-18** | | | | | |
| National Technical Systems | NTS EMI Software (rev 2.10) | N/A | 0 | | N/A |
| National Technical Systems | NTS Capture Analyzer Software (rev 3.8) | N/A | 0 | | N/A |
| EMCO | Antenna, Horn, 1-18GHz | 3115 | 868 | 7/9/2018 | 7/9/2020 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-40 GHz | ESI 40 | 2493 | 3/22/2018 | 3/22/2019 |
| **Radiated Spurious Emissions, 1000 - 6,500 MHz, 19-Oct-18** | | | | | |
| National Technical Systems | NTS EMI Software (rev 2.10) | N/A | 0 | | N/A |
| EMCO | Antenna, Horn, 1-18 GHz (SA40-Red) | 3115 | 1142 | 9/18/2018 | 9/18/2020 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-7 GHz | ESIB 7 | 1538 | 2/10/2018 | 2/10/2019 |

| Manufacturer | Description | Model | Asset # | Calibrated | Cal Due |
|---|---|---|---|---|---|
| **Radiated Emissions, 1000 - 6,000 MHz, 22-Oct-18** | | | | | |
| EMCO | Antenna, Horn, 1-18 GHz (SA40-Red) | 3115 | 1142 | 9/18/2018 | 9/18/2020 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-7 GHz | ESIB 7 | 2493 | 3/22/2018 | 3/22/2019 |
| **Radiated Emissions, 1000 - 6,000 MHz, 24-Oct-18** | | | | | |
| EMCO | Antenna, Horn, 1-18 GHz (SA40-Red) | 3115 | 1142 | 9/18/2018 | 9/18/2020 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-7 GHz | ESIB 7 | 1756 | 7/7/2018 | 7/7/2019 |
| **Radiated Spurious Emissions, 1000 - 18,000 MHz, 25-Oct-18** | | | | | |
| National Technical Systems | NTS EMI Software (rev 2.10) | N/A | 0 | | N/A |
| EMCO | Antenna, Horn, 1-18 GHz (SA40-Red) | 3115 | 1142 | 9/18/2018 | 9/18/2020 |
| Hewlett Packard | Spectrum Analyzer (SA40) Blue 9 kHz - 40 GHz | 8564E (84125C) | 1393 | 12/8/2017 | 12/8/2018 |
| Micro-Tronics | Band Reject Filter, 2400-2500 MHz | BRM50702-02 | 1683 | 4/18/2018 | 4/18/2019 |
| Micro-Tronics | Band Reject Filter, 5150-5350 MHz 12GHz | BRC50703-02 | 1729 | 4/18/2018 | 4/18/2019 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-7 GHz | ESIB 7 | 1756 | 7/7/2018 | 7/7/2019 |
| Hewlett Packard | Microwave Preamplifier, 1-26.5GHz | 8449B | 1780 | 8/30/2018 | 8/30/2019 |
| **Radiated Spurious Emissions, 1-18 GHz, 29-Oct-18** | | | | | |
| National Technical Systems | NTS EMI Software (rev 2.10) | N/A | 0 | | N/A |
| Hewlett Packard | EMC Spectrum Analyzer, 9 KHz-26.5 GHz | 8593EM | 1141 | 1/25/2018 | 1/25/2019 |
| EMCO | Antenna, Horn, 1-18 GHz (SA40-Red) | 3115 | 1142 | 9/18/2018 | 9/18/2020 |
| EMCO | Antenna, Horn, 1-18 GHz (SA40-Blu) | 3115 | 1386 | 10/8/2018 | 10/8/2020 |
| Hewlett Packard | Spectrum Analyzer (SA40) Blue 9 kHz - 40 GHz | 8564E (84125C) | 1393 | 12/8/2017 | 12/8/2018 |
| Micro-Tronics | Band Reject Filter, 2400-2500 MHz | BRM50702-02 | 1683 | 4/18/2018 | 4/18/2019 |
| Micro-Tronics | Band Reject Filter, 5470-5725 MHz | BRC50704-02 | 1730 | 6/20/2018 | 6/20/2019 |
| Hewlett Packard | Microwave Preamplifier, 1-26.5GHz | 8449B | 1780 | 8/30/2018 | 8/30/2019 |
| Micro-Tronics | Band Reject Filter, 2400-2500 MHz 18GHz | BRM50702-02 | 2238 | 5/1/2018 | 5/1/2019 |
| Micro-Tronics | Band Reject Filter, 5470-5725 MHz | BRC50704-02 | 2240 | 8/17/2018 | 8/17/2019 |
| Micro-Tronics | Band Reject Filter, 5725-5875 MHz | BRC50705-01 | 2738 | 8/18/2018 | 8/18/2019 |
| **Radiated Emissions, 1,000 - 12,000 MHz, 29-Oct-18** | | | | | |
| National Technical Systems | NTS EMI Software (rev 2.10) | N/A | 0 | | N/A |

| Manufacturer | Description | Model | Asset # | Calibrated | Cal Due |
|---|---|---|---|---|---|
| EMCO | Antenna, Horn, 1-18 GHz (SA40-Blu) | 3115 | 1386 | 10/8/2018 | 10/8/2020 |
| Hewlett Packard | Spectrum Analyzer (SA40) Blue 9 kHz - 40 GHz | 8564E (84125C) | 1393 | 12/8/2017 | 12/8/2018 |
| Hewlett Packard | Microwave Preamplifier, 1-26.5GHz | 8449B | 1780 | 8/30/2018 | 8/30/2019 |
| Micro-Tronics | Band Reject Filter, 2400-2500 MHz 18GHz | BRM50702-02 | 2238 | 5/1/2018 | 5/1/2019 |
| Micro-Tronics | Band Reject Filter, 5725-5875 MHz | BRC50705-01 | 2738 | 8/18/2018 | 8/18/2019 |
| **Radiated Emissions, 1 - 40 GHz, 30-Oct-18** | | | | | |
| National Technical Systems | NTS EMI Software (rev 2.10) | N/A | 0 | | N/A |
| Narda West | High Pass Filter, 8 GHz | HPF 180 | 821 | 1/8/2018 | 1/8/2019 |
| EMCO | Antenna, Horn, 1-18 GHz (SA40-Blu) | 3115 | 1386 | 10/8/2018 | 10/8/2020 |
| Hewlett Packard | Spectrum Analyzer (SA40) Blue 9 kHz - 40 GHz | 8564E (84125C) | 1393 | 12/8/2017 | 12/8/2018 |
| Hewlett Packard | Microwave Preamplifier, 1-26.5GHz | 8449B | 1780 | 8/30/2018 | 8/30/2019 |
| A. H. Systems | Blue System Horn, 18-40GHz | SAS-574, p/n: 2581 | 2159 | 9/5/2017 | 8/8/2020 |
| **Radiated Emissions, 1 - 40 GHz, 31-Oct-18** | | | | | |
| EMCO | Antenna, Horn, 1-18GHz | 3115 | 868 | 7/9/2018 | 7/9/2020 |
| HP / Miteq | SA40 P Head HF preAmplifier, 18-40 GHz (w/2415) | TTA1840-45-5P-HG-S | 1772 | 9/12/2018 | 9/12/2019 |
| A. H. Systems | System Horn, 18-40GHz | SAS-574, p/n: 2581 | 2161 | 7/21/2017 | 7/21/2019 |
| Hewlett Packard | Microwave Preamplifier, 1-26.5GHz | 8449B | 2199 | 8/30/2018 | 8/30/2019 |
| Hewlett Packard | Spectrum Analyzer (SA40) Purple 9 kHz - 40 GHz, | 8564E (84125C) | 2415 | 2/16/2018 | 2/16/2019 |
| **Radiated Spurious Emissions, 1 - 40 GHz, 01-Nov-18** | | | | | |
| National Technical Systems | NTS EMI Software (rev 2.10) | N/A | 0 | | N/A |
| EMCO | Antenna, Horn, 1-18 GHz (SA40-Red) | 3115 | 1142 | 9/18/2018 | 9/18/2020 |
| Hewlett Packard | Spectrum Analyzer (SA40) Blue 9 kHz - 40 GHz | 8564E (84125C) | 1393 | 12/8/2017 | 12/8/2018 |
| HP / Miteq | SA40 B Head HF preAmplifier, 18-40 GHz (w/1393) | TTA1840-45-5P-HG-S | 1620 | 1/9/2018 | 1/9/2019 |
| Hewlett Packard | Microwave Preamplifier, 1-26.5GHz | 8449B | 1780 | 8/30/2018 | 8/30/2019 |
| A. H. Systems | Blue System Horn, 18-40GHz | SAS-574, p/n: 2581 | 2159 | 9/5/2017 | 8/8/2020 |
| Micro-Tronics | Band Reject Filter, 2400-2500 MHz 18GHz | BRM50702-02 | 2238 | 5/1/2018 | 5/1/2019 |
| Micro-Tronics | Band Reject Filter, 5470-5725 MHz | BRC50704-02 | 2240 | 8/17/2018 | 8/17/2019 |
| Micro-Tronics | Band Reject Filter, 5150-5350 MHz | BRC50703-02 | 2251 | 8/17/2018 | 8/17/2019 |

| Manufacturer | Description | Model | Asset # | Calibrated | Cal Due |
|---|---|---|---|---|---|
| **Radiated Spurious Emissions, 1 - 18 GHz, 02-Nov-18** | | | | | |
| National Technical Systems | NTS EMI Software (rev 2.10) | N/A | 0 | | N/A |
| EMCO | Antenna, Horn, 1-18 GHz (SA40-Red) | 3115 | 1142 | 9/18/2018 | 9/18/2020 |
| Hewlett Packard | Spectrum Analyzer (SA40) Blue 9 kHz - 40 GHz | 8564E (84125C) | 1393 | 12/8/2017 | 12/8/2018 |
| Hewlett Packard | Microwave Preamplifier, 1-26.5GHz | 8449B | 1780 | 8/30/2018 | 8/30/2019 |
| Micro-Tronics | Band Reject Filter, 2400-2500 MHz 18GHz | BRM50702-02 | 2238 | 5/1/2018 | 5/1/2019 |
| EMCO | Antenna, Horn, 1-18GHz | 3115 | 868 | 7/9/2018 | 7/9/2020 |
| Hewlett Packard | Microwave Preamplifier, 1-26.5GHz | 8449B | 2199 | 8/30/2018 | 8/30/2019 |
| Hewlett Packard | Spectrum Analyzer (SA40) Purple 9 kHz - 40 GHz, | 8564E (84125C) | 2415 | 2/16/2018 | 2/16/2019 |
| **Rx Radiated spurious Emissions, 05-Nov-18** | | | | | |
| National Technical Systems | NTS EMI Software (rev 2.10) | N/A | 0 | | N/A |
| EMCO | Antenna, Horn, 1-18GHz | 3115 | 868 | 7/9/2018 | 7/9/2020 |
| Sunol Sciences | Biconilog, 30-3000 MHz | JB3 | 1549 | 5/30/2017 | 5/30/2019 |
| HP / Miteq | SA40 P Head HF preAmplifier, 18-40 GHz (w/2415) | TTA1840-45-5P-HG-S | 1772 | 9/12/2018 | N/A |
| A. H. Systems | System Horn, 18-40GHz | SAS-574, p/n: 2581 | 2161 | 7/21/2017 | 7/21/2019 |
| Hewlett Packard | Microwave Preamplifier, 1-26.5GHz | 8449B | 2199 | 8/30/2018 | 8/30/2019 |
| Hewlett Packard | Spectrum Analyzer (SA40) Purple 9 kHz - 40 GHz, | 8564E (84125C) | 2415 | 2/16/2018 | 2/16/2019 |
| Hewlett Packard | 9KHz-1300MHz pre-amp | 8447F | 2777 | 12/27/2017 | 12/27/2018 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-7 GHz | ESIB 7 | 9482 | 10/13/2018 | 10/13/2019 |
| **Conducted Emissions - AC Power and Telecommunications Ports, 05-Nov-18** | | | | | |
| Rohde & Schwarz | Pulse Limiter | ESH3 Z2 | 1401 | 1/8/2018 | 1/8/2019 |
| Fischer Custom Comm | LISN, 25A, 150kHz to 30MHz, 25 Amp, | FCC-LISN-50-25-2-09 | 2001 | 8/15/2018 | 8/15/2019 |
| Com-Power | ISN, T8 unscreened | ISN-T8 | 3260 | 2/20/2018 | 2/20/2019 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-7 GHz | ESIB 7 | 9482 | 10/13/2018 | 10/13/2019 |
| **Radiated Spurious Emissions, 30 - 1,000 MHz, 06-Nov-18** | | | | | |
| National Technical Systems | NTS EMI Software (rev 2.10) | N/A | 0 | | N/A |
| Sunol Sciences | Biconilog, 30-3000 MHz | JB3 | 1549 | 5/30/2017 | 5/30/2019 |
| Micro-Tronics | Band Reject Filter, 2400-2500 MHz 18GHz | BRM50702-02 | 2238 | 5/1/2018 | 5/1/2019 |
| Micro-Tronics | Band Reject Filter, 5150-5350 MHz | BRC50703-02 | 2251 | 8/17/2018 | 8/17/2019 |
| Hewlett Packard | 9KHz-1300MHz pre-amp | 8447F | 2777 | 12/27/2017 | 12/27/2018 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-7 GHz | ESIB 7 | 9482 | 10/13/2018 | 10/13/2019 |

| Manufacturer | Description | Model | Asset # | Calibrated | Cal Due |
|---|---|---|---|---|---|
| **Radiated Spurious Emissions, 1000 - 6,500 MHz, 13-Nov-18** | | | | | |
| National Technical Systems | NTS EMI Software (rev 2.10) | N/A | 0 | | N/A |
| EMCO | Antenna, Horn, 1-18 GHz | 3115 | 1242 | 4/11/2017 | 4/19/2019 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-7 GHz | ESIB 7 | 1756 | 7/7/2018 | 7/7/2019 |
| **Radiated Band edge, 13-Nov-18** | | | | | |
| National Technical Systems | NTS EMI Software (rev 2.10) | N/A | 0 | | N/A |
| EMCO | Antenna, Horn, 1-18 GHz | 3115 | 1242 | 4/11/2017 | 4/19/2019 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-7 GHz | ESIB 7 | 9482 | 10/13/2018 | 10/13/2019 |
| **Radiated Emissions, Band-edge, 03-Dec-18** | | | | | |
| National Technical Systems | NTS EMI Software (rev 2.10) | N/A | 0 | | N/A |
| EMCO | Antenna, Horn, 1-18 GHz (SA40-Blu) | 3115 | 1386 | 10/8/2018 | 10/8/2020 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-40 GHz | ESI 40 | 2493 | 3/22/2018 | 3/22/2019 |
| **Radio Antenna Port (Power and Spurious Emissions), 03-Dec-18** | | | | | |
| Rohde & Schwarz | Signal Analyzer 20 Hz - 26.5 GHz | FSQ26 | 2327 | 6/25/2018 | 6/25/2019 |
| **Radio Antenna Port (Power and Spurious Emissions), 04-Dec-18** | | | | | |
| Rohde & Schwarz | Signal Analyzer 20 Hz - 26.5 GHz | FSQ26 | 2327 | 6/25/2018 | 6/25/2019 |
| Rohde & Schwarz | Open Switch and Control Unit with integrated power meter | OSP120 with OSP-B157 module | 3000 | 5/1/2018 | 5/1/2019 |
| **Radio Antenna Port (Power and Spurious Emissions), 05-Dec-18** | | | | | |
| Rohde & Schwarz | Signal Analyzer 20 Hz - 26.5 GHz | FSQ26 | 2327 | 6/25/2018 | 6/25/2019 |
| Rohde & Schwarz | Open Switch and Control Unit with integrated power meter | OSP120 with OSP-B157 module | 3000 | 5/1/2018 | 5/1/2019 |
| **Radio Antenna Port (Power and Spurious Emissions), 06-Dec-18** | | | | | |
| Rohde & Schwarz | Signal Analyzer 20 Hz - 26.5 GHz | FSQ26 | 2327 | 6/25/2018 | 6/25/2019 |
| Rohde & Schwarz | Open Switch and Control Unit with integrated power meter | OSP120 with OSP-B157 module | 3000 | 5/1/2018 | 5/1/2019 |
| **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 |
| HP / Miteq | SA40 B Head HF preAmplifier, 18-40 GHz (w/1393) | TTA1840-45-5P-HG-S | 1620 | 1/9/2018 | 1/9/2019 |
| A. H. Systems | Blue System Horn, 18-40GHz | SAS-574, p/n: 2581 | 2159 | 9/5/2017 | 8/8/2020 |
| **Radiated Emissions, 1000 - 6,000 MHz, 28-Dec-18** | | | | | |
| EMCO | Antenna, Horn, 1-18 GHz | 3115 | 1242 | 4/11/2017 | 4/19/2019 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-7 GHz | ESIB 7 | 9482 | 10/13/2018 | 10/13/2019 |
| **Radiated Emissions, 30 - 1,000 MHz, 14-Jan-19** | | | | | |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-7 GHz | ESIB 7 | 1538 | 2/10/2018 | 2/10/2019 |
| Com-Power | Preamplifier, 30-1000 MHz | PA-103 | 1632 | 1/7/2019 | 1/7/2020 |
| Sunol Sciences | Biconilog, 30-3000 MHz | JB3 | 2197 | 10/4/2017 | 10/4/2019 |
| **Radiated Emissions, 1,000 - 12,000 MHz, 15-Jan-19** | | | | | |
| Hewlett Packard | Microwave Preamplifier, 1-26.5GHz | 8449B | 785 | 9/5/2018 | 9/5/2019 |
| Hewlett Packard | Spectrum Analyzer (SA40) Red 30 Hz -40 GHz | 8564E (84125C) | 1148 | 9/27/2018 | 9/27/2019 |
| EMCO | Antenna, Horn, 1-18 GHz (SA40-Blu) | 3115 | 1386 | 10/8/2018 | 10/8/2020 |
| Micro-Tronics | Band Reject Filter, 2400-2500 MHz | BRM50702-02 | 1683 | 4/18/2018 | 4/18/2019 |
| Micro-Tronics | Band Reject Filter, 5470-5725 MHz | BRC50704-02 | 1730 | 6/20/2018 | 6/20/2019 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-40 GHz | ESI 40 | 2493 | 3/22/2018 | 3/22/2019 |
| **Radio Antenna Port (Power and Spurious Emissions), 17-Jan-19** | | | | | |
| Rohde & Schwarz | Signal Analyzer 20 Hz - 26.5 GHz | FSQ26 | 2327 | 6/25/2018 | 6/25/2019 |
| Rohde & Schwarz | Open Switch and Control Unit with integrated power meter | OSP120 with OSP-B157 module | 3000 | 5/1/2018 | 5/1/2019 |
| **Radio Antenna Port (Power and Spurious Emissions), 18-Jan-19** | | | | | |
| Rohde & Schwarz | Signal Analyzer 20 Hz - 26.5 GHz | FSQ26 | 2327 | 6/25/2018 | 6/25/2019 |
| Rohde & Schwarz | Open Switch and Control Unit with integrated power meter | OSP120 with OSP-B157 module | 3000 | 5/1/2018 | 5/1/2019 |
| **Radio Antenna Port (Power and Spurious Emissions), 21-Jan-19** | | | | | |
| National Technical Systems | NTS UNII Power Software (rev 3.8) | N/A | 0 | | N/A |

| Manufacturer | Description | Model | Asset # | Calibrated | Cal Due |
|---|---|---|---|---|---|
| National Technical Systems | NTS Capture Analyzer Software (rev 3.8) | N/A | 0 | | N/A |
| Rohde & Schwarz | Signal Analyzer 20 Hz - 26.5 GHz | FSQ26 | 2327 | 6/25/2018 | 6/25/2019 |
| Rohde & Schwarz | Open Switch and Control Unit with integrated power meter | OSP120 with OSP-B157 module | 3000 | 5/1/2018 | 5/1/2019 |
| **Radio Antenna Port (Power and Spurious Emissions), 22-Jan-19** | | | | | |
| National Technical Systems | NTS EMI Software (rev 2.10) | N/A | 0 | | N/A |
| National Technical Systems | NTS UNII Power Software (rev 3.8) | N/A | 0 | | N/A |
| National Technical Systems | NTS Capture Analyzer Software (rev 3.8) | N/A | 0 | | N/A |
| Rohde & Schwarz | Signal Analyzer 20 Hz - 26.5 GHz | FSQ26 | 2327 | 6/25/2018 | 6/25/2019 |
| Rohde & Schwarz | Open Switch and Control Unit with integrated power meter | OSP120 with OSP-B157 module | 3000 | 5/1/2018 | 5/1/2019 |
| **Radiated Emissions, 1,000 - 6,000 MHz, 15-Feb-19** | | | | | |
| EMCO | Antenna, Horn, 1-18 GHz (SA40-Red) | 3115 | 1142 | 9/18/2018 | 9/18/2020 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-40 GHz | ESI 40 | 2493 | 3/22/2018 | 3/22/2019 |
| **Radiated Emissions, 1,000 - 18,000 MHz, 19-Feb-19** | | | | | |
| National Technical Systems | NTS EMI Software (rev 2.10) | N/A | 0 | | N/A |
| Hewlett Packard | Microwave Preamplifier, 1-26.5GHz | 8449B | 785 | 9/5/2018 | 9/5/2019 |
| Hewlett Packard | Spectrum Analyzer (SA40) Red 30 Hz -40 GHz | 8564E (84125C) | 1148 | 9/27/2018 | 9/27/2019 |
| EMCO | Antenna, Horn, 1-18 GHz (SA40-Blu) | 3115 | 1386 | 10/8/2018 | 10/8/2020 |
| 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, 5150-5350 MHz 12GHz | BRC50703-02 | 1729 | 4/18/2018 | 4/18/2019 |
| Micro-Tronics | Band Reject Filter, 2400-2500 MHz 18GHz | BRM50702-02 | 2238 | 5/1/2018 | 5/1/2019 |
| Micro-Tronics | Band Reject Filter, 5470-5725 MHz | BRC50704-02 | 2240 | 8/17/2018 | 8/17/2019 |
| **Radiated Emissions, 1,000 - 40,000, 20-Feb-19** | | | | | |
| Hewlett Packard | Microwave Preamplifier, 1-26.5GHz | 8449B | 785 | 9/5/2018 | 9/5/2019 |
| Hewlett Packard | Spectrum Analyzer (SA40) Red 30 Hz -40 GHz | 8564E (84125C) | 1148 | 9/27/2018 | 9/27/2019 |
| EMCO | Antenna, Horn, 1-18 GHz (SA40-Blu) | 3115 | 1386 | 10/8/2018 | 10/8/2020 |
| 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, 5150-5350 MHz 12GHz | BRC50703-02 | 1729 | 4/18/2018 | 4/18/2019 |

| Manufacturer | Description | Model | Asset # | Calibrated | Cal Due |
|---|---|---|---|---|---|
| Micro-Tronics | Band Reject Filter, 2400-2500 MHz 18GHz | BRM50702-02 | 2238 | 5/1/2018 | 5/1/2019 |
| Micro-Tronics | Band Reject Filter, 5470-5725 MHz | BRC50704-02 | 2240 | 8/17/2018 | 8/17/2019 |
| Micro-Tronics | Band Reject Filter, 5725-5875 MHz | BRC50705-02 | 2241 | 8/17/2018 | 8/17/2019 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-40 GHz | ESI 40 | 2493 | 3/22/2018 | 3/22/2019 |
| HP / Miteq | SA40 R Head HF preAmplifier, 18-40 GHz (w/1148) | TTA1840-45-5P-HG-S | 1145 | 9/8/2018 | 9/8/2019 |
| A. H. Systems | Spare System Horn, 18-40GHz | SAS-574, p/n: 2581 | 2162 | 8/4/2017 | 8/4/2019 |

# Appendix B Test Data

TL075848-RA-FCC Pages 37 - 165

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

# EMC Test Data

For The

# Aruba, a Hewlett Packard Enterprise company

Product

APIN0555

Date of Last Test: 6/20/2019

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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, 5250 - 5350MHz | 15.407(a) (1), (2), (3)<br>RSS-247 6.2 | Pass | a: 36.5 mW<br>20: 37.6 mW<br>40: 75.5 mW<br>80: 97.1 mW |
| 1 | PSD, 5250 - 5350MHz | 15.407(a) (1), (2), (3)<br>RSS-247 6.2 | Pass | a: 3.2 mW/MHz<br>20: 3.2 mW/MHz<br>40: 3.2 mW/MHz<br>80: 1.8 mW/MHz |
| 1 | Max EIRP<br>5250 - 5350MHz | TPC required if EIRP≥ 500mW (27dBm).<br>EIRP ≥ 200mW (23dBm) DFS threshold = -64dBm. | Pass | EIRP = 21.9 dBm (153.9 mW) |
| 1 | 26dB Bandwidth | 15.407<br>(Information only) | - | > 20MHz for all modes |
| 1 | 99% Bandwidth | RSS-247<br>(Information only) | N/A | a: 16.8 MHz<br>20: 19.06 MHz<br>40: 38.2 MHz<br>80: 78.1 MHz |

## 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.

# EMC Test Data

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

## Ambient Conditions:

Temperature: 22-23 °C
Rel. Humidity: 38-40 %

## 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.

## 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 | 6 MB/s | 92.3% | Yes | 1.44 | 0.3 | 0.7 | 696 | 5 GHz only |
| 11ax20 | MCS0 | 96.2% | Yes | 5.45 | 0.2 | 0.3 | 184 | |
| 11n20 | MCS0 | 96.2% | Yes | 5.43 | 0.2 | 0.3 | 184 | |
| 11ax40 | MCS0 | 95.5% | Yes | 5.41 | 0.2 | 0.4 | 185 | |
| 11n40 | MCS0 | 95.6% | Yes | 4.78 | 0.2 | 0.4 | 209 | |
| ax80 | MCS0 | 95.9% | Yes | 5.40 | 0.2 | 0.4 | 185 | 5 GHz only |
| ac80 | MCS0 | 95.1% | Yes | 4.75 | 0.2 | 0.4 | 210 | 5 GHz only |

## Sample Notes

Sample S/N: CNGFK9Y02N (BLE) & CNGFK9Y005 (Zigbee)
Driver: P4 V0.4.5
Antenna: Internal 8 antennas for 5 GHz radio and 4 antennas for 2.4 GHz radio.

# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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: 12/04/18
Test Engineer: Roy Zheng / Rafael Varelas
Test Location: FT Lab #4a

Config. Used: 1 (Zigbee EUT setup)
Config Change: None
EUT Voltage: PoE

| | |
|---|---|
| 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 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 the Pwr Cor Factor in 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 | | |
| 5250-5350 | 5.5 | 3.7 | 5.3 | 2.9 | 4.3 | 4.5 | 5.8 | 3.9 | 2.0 | 10.8 |

8x8 mode uses 4 V and 4 H polarized antennas, directional gain used is the highest of the two.
4x4 mode uses 2 V and 2 H polarized antennas, directional gain used is the highest of the two.
Legacy modes operate on all chains
Power for BF mode is reduced by 3 dB so effective antenna gain does not change
CDD active for single stream modes

For devices that support CDD modes

Min # of spatial streams: 1
Max # of spatial streams: 8

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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:<br>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.<br>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) |

# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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 MHz Band - FCC

Mode: 11a

Max EIRP (mW): 57.8

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power dBm | Total Power[1] mW | Total Power[1] dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5260 | 0 | 6.0 | 23.654 | 92 | 6.3 | 32.3 | 15.1 | 24.0 | 0.037 | Pass |
| | 1 | | | | 5.8 | | | | | |
| | 2 | | | | 4.8 | | | | | |
| | 3 | | | | 6.1 | | | | | |
| | 4 | | | | 5.4 | | | | | |
| | 5 | | | | 4.7 | | | | | |
| | 6 | | | | 5.5 | | | | | |
| | 7 | | | | 6.7 | | | | | |
| 5300 | 0 | 5.0 | 23.606 | 92 | 5.4 | 30.0 | 14.8 | 24.0 | | Pass |
| | 1 | | | | 5.5 | | | | | |
| | 2 | | | | 6.4 | | | | | |
| | 3 | | | | 6.0 | | | | | |
| | 4 | | | | 4.3 | | | | | |
| | 5 | | | | 4.7 | | | | | |
| | 6 | | | | 4.3 | | | | | |
| | 7 | | | | 6.0 | | | | | |
| 5320 | 0 | 5.0 | 23.702 | 92 | 5.8 | 36.5 | 15.6 | 24.0 | | Pass |
| | 1 | | | | 6.1 | | | | | |
| | 2 | | | | 7.1 | | | | | |
| | 3 | | | | 6.6 | | | | | |
| | 4 | | | | 5.3 | | | | | |
| | 5 | | | | 5.6 | | | | | |
| | 6 | | | | 6.3 | | | | | |
| | 7 | | | | 6.8 | | | | | |

# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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 MHz Band - ISEDC

Mode: 11a

Max EIRP (mW): 57.8

| Frequency (MHz) | Chain | Software Setting | 99% BW (MHz) | Duty Cycle % | Power[1] dBm | Total Power mW | Total Power dBm | IC limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5260 | 0 | 6.0 | 16.6 | 92.3 | 6.3 | 32.3 | 15.1 | 23.2 | 0.037 | Pass |
| | 1 | | | | 5.8 | | | | | |
| | 2 | | | | 4.8 | | | | | |
| | 3 | | | | 6.1 | | | | | |
| | 4 | | | | 5.4 | | | | | |
| | 5 | | | | 4.7 | | | | | |
| | 6 | | | | 5.5 | | | | | |
| | 7 | | | | 6.7 | | | | | |
| 5300 | 0 | 5.0 | 16.6 | 92.3 | 5.4 | 30.0 | 14.8 | 23.2 | | Pass |
| | 1 | | | | 5.5 | | | | | |
| | 2 | | | | 6.4 | | | | | |
| | 3 | | | | 6.0 | | | | | |
| | 4 | | | | 4.3 | | | | | |
| | 5 | | | | 4.7 | | | | | |
| | 6 | | | | 4.3 | | | | | |
| | 7 | | | | 6.0 | | | | | |
| 5320 | 0 | 5.0 | 16.8 | 92.3 | 5.8 | 36.5 | 15.6 | 23.3 | | Pass |
| | 1 | | | | 6.1 | | | | | |
| | 2 | | | | 7.1 | | | | | |
| | 3 | | | | 6.6 | | | | | |
| | 4 | | | | 5.3 | | | | | |
| | 5 | | | | 5.6 | | | | | |
| | 6 | | | | 6.3 | | | | | |
| | 7 | | | | 6.8 | | | | | |

# EMC Test Data

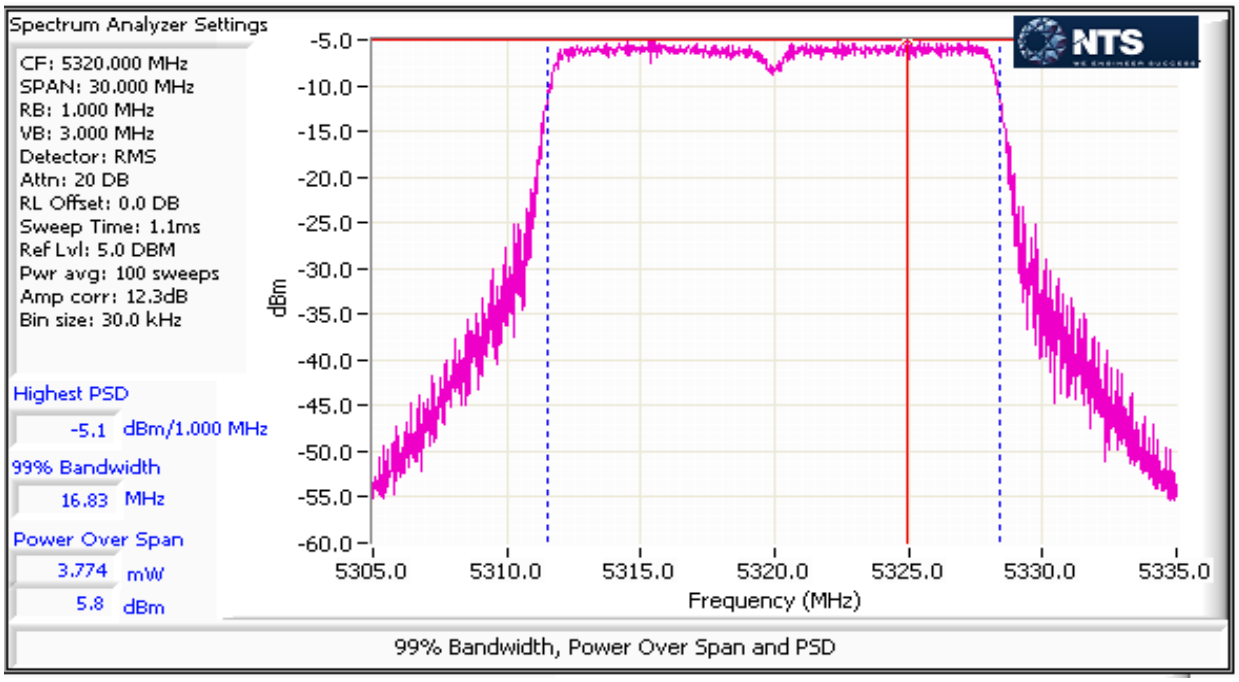
| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-RA-FCC |
| | | Project Manager: | Christine Krebill |
| Contact: | Mark Hill | Project Coordinator: | David Bare |
| Standard: | FCC §15.247 &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

5250-5350 PSD - FCC/ISEDC

Mode: 11a

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 5260 | 0 | 6.0 | | 92 | -4.4 | 3.1 | 4.9 | 6.2 | 11.0 | Pass |
| | 1 | | | | -4.5 | | | | | |
| | 2 | | | | -5.8 | | | | | |
| | 3 | | | | -4.5 | | | | | |
| | 4 | | | | -4.5 | | | | | |
| | 5 | | | | -5.4 | | | | | |
| | 6 | | | | -4.2 | | | | | |
| | 7 | | | | -3.3 | | | | | |
| 5300 | 0 | 5.0 | | 92 | -5.3 | 3.2 | 5.1 | 6.2 | 11.0 | Pass |
| | 1 | | | | -4.9 | | | | | |
| | 2 | | | | -3.5 | | | | | |
| | 3 | | | | -3.9 | | | | | |
| | 4 | | | | -4.8 | | | | | |
| | 5 | | | | -4.5 | | | | | |
| | 6 | | | | -4.9 | | | | | |
| | 7 | | | | -3.5 | | | | | |
| 5320 | 0 | 5.0 | | 92 | -5.1 | 3.2 | 5.1 | 6.2 | 11.0 | Pass |
| | 1 | | | | -4.8 | | | | | |
| | 2 | | | | -3.8 | | | | | |
| | 3 | | | | -4.2 | | | | | |
| | 4 | | | | -4.9 | | | | | |
| | 5 | | | | -4.1 | | | | | |
| | 6 | | | | -4.0 | | | | | |
| | 7 | | | | -3.7 | | | | | |

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



99% Bandwidth, Power Over Span and PSD

# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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 MHz Band - FCC

Mode: ax20 Max EIRP (mW): 59.6

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power dBm | Total Power[1] mW | Total Power[1] dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5260 | 0 | 6.0 | 21.5 | 96.2 | 6.0 | 32.3 | 15.1 | 24.0 | 0.038 | Pass |
| | 1 | | | | 5.9 | | | | | |
| | 2 | | | | 6.5 | | | | | |
| | 3 | | | | 6.4 | | | | | |
| | 4 | | | | 5.2 | | | | | |
| | 5 | | | | 5.1 | | | | | |
| | 6 | | | | 6.0 | | | | | |
| | 7 | | | | 5.8 | | | | | |
| 5300 | 0 | 6.5 | 21.7 | 96.2 | 6.5 | 37.6 | 15.8 | 24.0 | | Pass |
| | 1 | | | | 6.6 | | | | | |
| | 2 | | | | 7.2 | | | | | |
| | 3 | | | | 7.2 | | | | | |
| | 4 | | | | 5.7 | | | | | |
| | 5 | | | | 5.8 | | | | | |
| | 6 | | | | 6.8 | | | | | |
| | 7 | | | | 6.4 | | | | | |
| 5320 | 0 | 6.0 | 21.3 | 96.2 | 6.0 | 33.8 | 15.3 | 24.0 | | Pass |
| | 1 | | | | 6.1 | | | | | |
| | 2 | | | | 6.8 | | | | | |
| | 3 | | | | 6.6 | | | | | |
| | 4 | | | | 5.3 | | | | | |
| | 5 | | | | 5.4 | | | | | |
| | 6 | | | | 7.2 | | | | | |
| | 7 | | | | 4.8 | | | | | |

# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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 MHz Band - ISEDC

Mode: ax20 Max EIRP (mW): 59.6

| Frequency (MHz) | Chain | Software Setting | 99% BW (MHz) | Duty Cycle % | Power[1] dBm | Total Power[1] mW | Total Power[1] dBm | IC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5260 | 0 | 6.0 | 19.06 | 96.2 | 6.0 | 32.3 | 15.1 | 23.8 | 0.038 | Pass |
| | 1 | | | | 5.9 | | | | | |
| | 2 | | | | 6.5 | | | | | |
| | 3 | | | | 6.4 | | | | | |
| | 4 | | | | 5.2 | | | | | |
| | 5 | | | | 5.1 | | | | | |
| | 6 | | | | 6.0 | | | | | |
| | 7 | | | | 5.8 | | | | | |
| 5300 | 0 | 6.5 | 19.06 | 96.2 | 6.5 | 37.6 | 15.8 | 23.8 | | Pass |
| | 1 | | | | 6.6 | | | | | |
| | 2 | | | | 7.2 | | | | | |
| | 3 | | | | 7.2 | | | | | |
| | 4 | | | | 5.7 | | | | | |
| | 5 | | | | 5.8 | | | | | |
| | 6 | | | | 6.8 | | | | | |
| | 7 | | | | 6.4 | | | | | |
| 5320 | 0 | 6.0 | 18.9 | 96.2 | 6.0 | 33.8 | 15.3 | 23.8 | | Pass |
| | 1 | | | | 6.1 | | | | | |
| | 2 | | | | 6.8 | | | | | |
| | 3 | | | | 6.6 | | | | | |
| | 4 | | | | 5.3 | | | | | |
| | 5 | | | | 5.4 | | | | | |
| | 6 | | | | 7.2 | | | | | |
| | 7 | | | | 4.8 | | | | | |

# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 5260 | 0 | 6.0 | | 96.2 | -4.9 | 2.8 | 4.5 | 6.2 | 11.0 | Pass |
| | 1 | | | | -4.6 | | | | | |
| | 2 | | | | -4.4 | | | | | |
| | 3 | | | | -4.3 | | | | | |
| | 4 | | | | -5.0 | | | | | |
| | 5 | | | | -5.1 | | | | | |
| | 6 | | | | -4.4 | | | | | |
| | 7 | | | | -4.9 | | | | | |
| 5300 | 0 | 6.5 | | 96.2 | -4.5 | 3.2 | 5.1 | 6.2 | 11.0 | Pass |
| | 1 | | | | -4.1 | | | | | |
| | 2 | | | | -3.7 | | | | | |
| | 3 | | | | -3.6 | | | | | |
| | 4 | | | | -4.5 | | | | | |
| | 5 | | | | -4.1 | | | | | |
| | 6 | | | | -4.1 | | | | | |
| | 7 | | | | -4.4 | | | | | |
| 5320 | 0 | 6.0 | | 96.2 | -4.7 | 3.2 | 5.1 | 6.2 | 11.0 | Pass |
| | 1 | | | | -4.2 | | | | | |
| | 2 | | | | -3.6 | | | | | |
| | 3 | | | | -3.9 | | | | | |
| | 4 | | | | -4.5 | | | | | |
| | 5 | | | | -4.4 | | | | | |
| | 6 | | | | -3.3 | | | | | |
| | 7 | | | | -5.0 | | | | | |

# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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 MHz Band - FCC

Mode: ax40 Max EIRP (mW): 119.7

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power dBm | Total Power[1] mW | Total Power[1] dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5270 | 0 | 10.5 | 44.7 | 95.5 | 9.7 | 73.7 | 18.7 | 24.0 | 0.076 | Pass |
| | 1 | | | | 9.6 | | | | | |
| | 2 | | | | 10.2 | | | | | |
| | 3 | | | | 10.1 | | | | | |
| | 4 | | | | 8.7 | | | | | |
| | 5 | | | | 8.5 | | | | | |
| | 6 | | | | 8.7 | | | | | |
| | 7 | | | | 9.7 | | | | | |
| 5310 | 0 | 10.5 | 44.1 | 95.5 | 9.6 | 75.5 | 18.8 | 24.0 | | Pass |
| | 1 | | | | 9.7 | | | | | |
| | 2 | | | | 10.3 | | | | | |
| | 3 | | | | 10.3 | | | | | |
| | 4 | | | | 9.0 | | | | | |
| | 5 | | | | 8.5 | | | | | |
| | 6 | | | | 8.3 | | | | | |
| | 7 | | | | 10.2 | | | | | |

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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 MHz Band - ISEDC

Mode: ax40 Max EIRP (mW): 119.7

| Frequency (MHz) | Chain | Software Setting | 99% BW (MHz) | Duty Cycle % | Power[1] dBm | Total Power[1] mW | Total Power[1] dBm | IC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5270 | 0 | 10.5 | 38.2 | 95.5 | 9.7 | 73.7 | 18.7 | 24.0 | 0.076 | Pass |
| | 1 | | | | 9.6 | | | | | |
| | 2 | | | | 10.2 | | | | | |
| | 3 | | | | 10.1 | | | | | |
| | 4 | | | | 8.7 | | | | | |
| | 5 | | | | 8.5 | | | | | |
| | 6 | | | | 8.7 | | | | | |
| | 7 | | | | 9.7 | | | | | |
| 5310 | 0 | 10.5 | 38.2 | 95.5 | 9.6 | 75.5 | 18.8 | 24.0 | | Pass |
| | 1 | | | | 9.7 | | | | | |
| | 2 | | | | 10.3 | | | | | |
| | 3 | | | | 10.3 | | | | | |
| | 4 | | | | 9.0 | | | | | |
| | 5 | | | | 8.5 | | | | | |
| | 6 | | | | 8.3 | | | | | |
| | 7 | | | | 10.2 | | | | | |

# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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: 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 5270 | 0 | 10.5 | | 95.5 | -4.5 | 3.1 | 4.9 | 6.2 | 11.0 | Pass |
| | 1 | | | | -4.3 | | | | | |
| | 2 | | | | -4.1 | | | | | |
| | 3 | | | | -4.2 | | | | | |
| | 4 | | | | -4.7 | | | | | |
| | 5 | | | | -4.4 | | | | | |
| | 6 | | | | -4.7 | | | | | |
| | 7 | | | | -4.2 | | | | | |
| 5310 | 0 | 10.5 | | 95.5 | -4.5 | 3.2 | 5.1 | 6.2 | 11.0 | Pass |
| | 1 | | | | -4.2 | | | | | |
| | 2 | | | | -3.7 | | | | | |
| | 3 | | | | -3.7 | | | | | |
| | 4 | | | | -4.3 | | | | | |
| | 5 | | | | -4.8 | | | | | |
| | 6 | | | | -5.1 | | | | | |
| | 7 | | | | -3.3 | | | | | |

# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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 MHz Band - FCC

Mode: ax80 Max EIRP (mW): 153.9

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power dBm | Total Power[1] mW | Total Power[1] dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5290 | 0 | 11.5 | 87.5 | 95.9 | 11.6 | 97.1 | 19.9 | 24.0 | 0.097 | Pass |
| | 1 | | | | 10.4 | | | | | |
| | 2 | | | | 11.5 | | | | | |
| | 3 | | | | 11.2 | | | | | |
| | 4 | | | | 9.7 | | | | | |
| | 5 | | | | 9.6 | | | | | |
| | 6 | | | | 9.4 | | | | | |
| | 7 | | | | 11.2 | | | | | |

MIMO Device - 5250-5350 MHz Band - ISEDC

Mode: ax80 Max EIRP (mW): 153.9

| Frequency (MHz) | Chain | Software Setting | 99% BW (MHz) | Duty Cycle % | Power[1] dBm | Total Power[1] mW | Total Power[1] dBm | IC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5290 | 0 | 11.5 | 78.1 | 95.9 | 11.6 | 97.1 | 19.9 | 24.0 | 0.097 | Pass |
| | 1 | | | | 10.4 | | | | | |
| | 2 | | | | 11.5 | | | | | |
| | 3 | | | | 11.2 | | | | | |
| | 4 | | | | 9.7 | | | | | |
| | 5 | | | | 9.6 | | | | | |
| | 6 | | | | 9.4 | | | | | |
| | 7 | | | | 11.2 | | | | | |

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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 5290 | 0 | 11.5 | | 95.9 | -6.2 | 1.8 | 2.6 | 6.2 | 11.0 | Pass |
| | 1 | | | | -7.2 | | | | | |
| | 2 | | | | -6.5 | | | | | |
| | 3 | | | | -6.5 | | | | | |
| | 4 | | | | -7.0 | | | | | |
| | 5 | | | | -7.2 | | | | | |
| | 6 | | | | -7.5 | | | | | |
| | 7 | | | | -5.8 | | | | | |

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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.

## 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: 21-23 °C
Rel. Humidity: 38-42 %

## Modifications Made During Testing

No modifications were made to the EUT during testing

## Deviations From The Standard

No deviations were made from the requirements of the standard.

## Sample Notes

Sample S/N: CNGFK9Y02N (BLE) & CNGFK9Y005 (Zigbee)
Driver: P4 V0.4.5
Antenna: Internal 8 antennas for 5 GHz radio and 4 antennas for 2.4 GHz radio (5GHz radio may also use 4 antennas but with 3 dB higher power and can operate in both lower and upper 5 GHz bands simutaneously). Tests performed with 8 antennas at the 4 antenna power levels. Tests performed with 4 antennas at the target power.

# EMC Test Data

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

## Summary of Results

| Run # | Test Performed | Limit | Pass / Fail | Result / Margin |
|---|---|---|---|---|
| 1 | Power, 5470 - 5725MHz | 15.407(a) (1), (2), (3)<br>RSS-247 6.2 | Pass | a: 40.5 mW<br>20: 40.3 mW<br>40: 89.1 mW<br>80: 162.8 mW |
| 1 | PSD, 5470 - 5725MHz | 15.407(a) (1), (2), (3)<br>RSS-247 6.2 | Pass | a: 3.6 mW/MHz<br>20: 3.6 mW/MHz<br>40: 3.7 mW/MHz<br>80: 3.7 mW/MHz |
| 1 | Max EIRP<br>5470 - 5725MHz | TPC required if EIRP≥ 500mW (27dBm).<br>EIRP ≥ 200mW (23dBm) DFS threshold | Pass | EIRP = 22.6 dBm (182.7 mW) |
| 1 | 26dB Bandwidth | 15.407<br>(Information only) | - | > 20MHz for all modes |
| 1 | 99% Bandwidth | RSS-247<br>(Information only) | N/A | a: 18.24 MHz<br>20: 19.52 MHz<br>40: 38.91 MHz<br>80: 78.336 MHz |

## 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 | 6 MB/s | 0.923 | Yes | 1.437 | 0.3 | 0.7 | 696 | 5 GHz only |
| 11ax20 | MCS0 | 0.962 | Yes | 5.448 | 0.2 | 0.3 | 184 | |
| 11ax40 | MCS0 | 0.955 | Yes | 5.414 | 0.2 | 0.4 | 185 | |
| ax80 | MCS0 | 0.959 | Yes | 5.401 | 0.2 | 0.4 | 185 | 5 GHz only |

For devices that support CDD modes

Min # of spatial streams: 1

Max # of spatial streams: 8

# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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: 12/5/2018 0:00
Test Engineer: Roy Zheng
Test Location: FT Lab #4a

Config. Used: 1 (Zigbee EUT setup)
Config Change: None
EUT Voltage: PoE

| | |
|---|---|
| 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 | | |
| 5470-5725 | 3.2 | 3.4 | 2.8 | 3.6 | 4.5 | 3.3 | 5.4 | 3.6 | 0.5 | 9.3 |

8x8 mode uses 4 V and 4 H polarized antennas, directional gain used is the highest of the two.
4x4 mode uses 2 V and 2 H polarized antennas, directional gain used is the highest of the two.
Legacy modes operate on all chains
Power for BF mode is reduced by 3 dB so effective antenna gain does not change
CDD active for single stream modes

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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:<br>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.<br>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) |

# EMC Test Data

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

MIMO Device - 5470-5725 MHz Band - FCC

Mode: 11a

Max EIRP (mW): 45.4

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power dBm | Total Power mW | Total Power dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5500 | 0 | 7.0 | 20.962 | 92.3 | 6.9 | 40.5 | 16.1 | 24.0 | 0.041 | Pass |
| | 1 | | | | 6.6 | | | | | |
| | 2 | | | | 7.3 | | | | | |
| | 3 | | | | 6.8 | | | | | |
| | 4 | | | | 6.6 | | | | | |
| | 5 | | | | 6.5 | | | | | |
| | 6 | | | | 6.1 | | | | | |
| | 7 | | | | 6.7 | | | | | |
| 5580 | 0 | 6.5 | 23.702 | 92.3 | 6.2 | 37.1 | 15.7 | 24.0 | | Pass |
| | 1 | | | | 6.0 | | | | | |
| | 2 | | | | 6.8 | | | | | |
| | 3 | | | | 5.8 | | | | | |
| | 4 | | | | 6.3 | | | | | |
| | 5 | | | | 6.1 | | | | | |
| | 6 | | | | 7.1 | | | | | |
| | 7 | | | | 6.1 | | | | | |
| 5700 | 0 | 6.5 | 22.885 | 92.3 | 6.2 | 37.4 | 15.7 | 24.0 | | Pass |
| | 1 | | | | 6.1 | | | | | |
| | 2 | | | | 6.4 | | | | | |
| | 3 | | | | 5.9 | | | | | |
| | 4 | | | | 6.1 | | | | | |
| | 5 | | | | 6.7 | | | | | |
| | 6 | | | | 6.8 | | | | | |
| | 7 | | | | 6.5 | | | | | |
| 5720 | 0 | 7.0 | 22.837 | 92.3 | 5.9 | 32.9 | 15.2 | 24.0 | | Pass |
| | 1 | | | | 5.7 | | | | | |
| | 2 | | | | 5.3 | | | | | |
| | 3 | | | | 5.5 | | | | | |
| | 4 | | | | 5.9 | | | | | |
| | 5 | | | | 6.3 | | | | | |
| | 6 | | | | 6.2 | | | | | |
| | 7 | | | | 5.4 | | | | | |

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

Portion within 5725-5850 MHz band (UNII-3)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 5720 | 0 | 7.0 | | 92.3 | 2.6 | 16.2 | 12.1 | 30.0 | 0.0162 | Pass |
| | 1 | | | | 2.5 | | | | | |
| | 2 | | | | 2.2 | | | | | |
| | 3 | | | | 2.1 | | | | | |
| | 4 | | | | 2.4 | | | | | |
| | 5 | | | | 3.4 | | | | | |
| | 6 | | | | 4.0 | | | | | |
| | 7 | | | | 2.2 | | | | | |

# EMC Test Data

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

MIMO Device - 5470-5725 MHz Band - ISEDC

Mode: 11a

Max EIRP (mW): 45.4

| Frequency (MHz) | Chain | Software Setting | 99% BW (MHz) | Duty Cycle % | Power[1] dBm | Total Power mW | Total Power dBm | IC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5500 | 0 | 7.0 | 17.424 | 92.3 | 6.9 | 40.5 | 16.1 | 23.4 | 0.041 | Pass |
| | 1 | | | | 6.6 | | | | | |
| | 2 | | | | 7.3 | | | | | |
| | 3 | | | | 6.8 | | | | | |
| | 4 | | | | 6.6 | | | | | |
| | 5 | | | | 6.5 | | | | | |
| | 6 | | | | 6.1 | | | | | |
| | 7 | | | | 6.7 | | | | | |
| 5580 | 0 | 6.5 | 18.24 | 92.3 | 6.2 | 37.1 | 15.7 | 23.6 | | Pass |
| | 1 | | | | 6.0 | | | | | |
| | 2 | | | | 6.8 | | | | | |
| | 3 | | | | 5.8 | | | | | |
| | 4 | | | | 6.3 | | | | | |
| | 5 | | | | 6.1 | | | | | |
| | 6 | | | | 7.1 | | | | | |
| | 7 | | | | 6.1 | | | | | |
| 5700 | 0 | 6.5 | 17.808 | 92.3 | 6.2 | 37.4 | 15.7 | 23.5 | | Pass |
| | 1 | | | | 6.1 | | | | | |
| | 2 | | | | 6.4 | | | | | |
| | 3 | | | | 5.9 | | | | | |
| | 4 | | | | 6.1 | | | | | |
| | 5 | | | | 6.7 | | | | | |
| | 6 | | | | 6.8 | | | | | |
| | 7 | | | | 6.5 | | | | | |
| 5720 | 0 | 7.0 | 17.856 | 92.3 | 5.9 | 32.9 | 15.2 | 23.5 | | Pass |
| | 1 | | | | 5.7 | | | | | |
| | 2 | | | | 5.3 | | | | | |
| | 3 | | | | 5.5 | | | | | |
| | 4 | | | | 5.9 | | | | | |
| | 5 | | | | 6.3 | | | | | |
| | 6 | | | | 6.2 | | | | | |
| | 7 | | | | 5.4 | | | | | |

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

Portion within 5725-5850 MHz band (UNII-3)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 5720 | 0 | 7.0 | | 92.3 | 2.6 | 16.2 | 12.1 | 30.0 | 0.0162 | Pass |
| | 1 | | | | 2.5 | | | | | |
| | 2 | | | | 2.2 | | | | | |
| | 3 | | | | 2.1 | | | | | |
| | 4 | | | | 2.4 | | | | | |
| | 5 | | | | 3.4 | | | | | |
| | 6 | | | | 4.0 | | | | | |
| | 7 | | | | 2.2 | | | | | |

# EMC Test Data

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

5470-5700 PSD - FCC/ISEDC

Mode: 11a

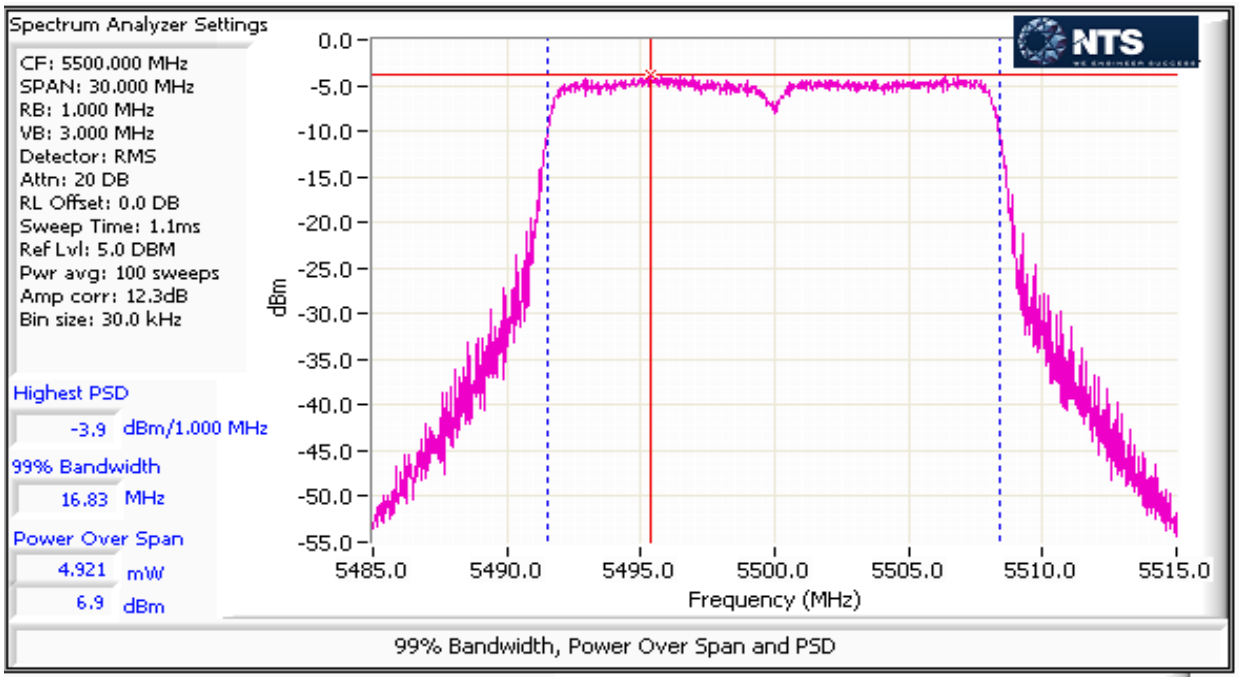
| Frequency (MHz) | Chain | Software Setting | 99% BW (MHz) | Duty Cycle % | PSD dBm/MHz | Total PSD[1] mW/MHz | Total PSD[1] dBm/MHz | FCC Limit dBm/MHz | IC limit dBm/MHz | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5500 | 0 | 7.0 | | 92.3 | -3.9 | 3.5 | 5.4 | 7.7 | 11.0 | Pass |
| | 1 | | | | -4.2 | | | | | |
| | 2 | | | | -3.8 | | | | | |
| | 3 | | | | -4.2 | | | | | |
| | 4 | | | | -3.7 | | | | | |
| | 5 | | | | -3.8 | | | | | |
| | 6 | | | | -4.1 | | | | | |
| | 7 | | | | -4.3 | | | | | |
| 5580 | 0 | 6.5 | | 92.3 | -4.1 | 3.6 | 5.6 | 7.7 | 11.0 | Pass |
| | 1 | | | | -4.4 | | | | | |
| | 2 | | | | -3.9 | | | | | |
| | 3 | | | | -4.9 | | | | | |
| | 4 | | | | -3.6 | | | | | |
| | 5 | | | | -3.6 | | | | | |
| | 6 | | | | -2.6 | | | | | |
| | 7 | | | | -4.3 | | | | | |
| 5700 | 0 | 6.5 | | 92.3 | -4.4 | 3.4 | 5.3 | 7.7 | 11.0 | Pass |
| | 1 | | | | -4.4 | | | | | |
| | 2 | | | | -4.6 | | | | | |
| | 3 | | | | -4.8 | | | | | |
| | 4 | | | | -4.2 | | | | | |
| | 5 | | | | -3.9 | | | | | |
| | 6 | | | | -2.5 | | | | | |
| | 7 | | | | -4.3 | | | | | |
| 5720 | 0 | 7.0 | | 92.3 | -3.6 | 3.6 | 5.6 | 7.7 | 11.0 | Pass |
| | 1 | | | | -4.3 | | | | | |
| | 2 | | | | -4.5 | | | | | |
| | 3 | | | | -4.4 | | | | | |
| | 4 | | | | -3.7 | | | | | |
| | 5 | | | | -3.1 | | | | | |
| | 6 | | | | -3.1 | | | | | |
| | 7 | | | | -4.5 | | | | | |

# EMC Test Data

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

Portion within 5725-5850 MHz band (UNII-3)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 5720 | 0 | 7.0 | | 92.3 | -4.0 | 3.6 | 5.6 | 26.7 | 26.7 | Pass |
| | 1 | | | | -4.0 | | | | | |
| | 2 | | | | -4.4 | | | | | |
| | 3 | | | | -4.5 | | | | | |
| | 4 | | | | -3.9 | | | | | |
| | 5 | | | | -3.2 | | | | | |
| | 6 | | | | -2.3 | | | | | |
| | 7 | | | | -4.4 | | | | | |



# EMC Test Data

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

MIMO Device - 5470-5725 MHz Band - FCC

Mode: ax20 Max EIRP (mW): 45.2

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power dBm | Total Power mW | Total Power dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5500 | 0 | 7.5 | 22.917 | 96.2 | 7.2 | 40.3 | 16.1 | 24.0 | 0.040 | Pass |
| | 1 | | | | 6.8 | | | | | |
| | 2 | | | | 6.9 | | | | | |
| | 3 | | | | 7.1 | | | | | |
| | 4 | | | | 7.2 | | | | | |
| | 5 | | | | 6.6 | | | | | |
| | 6 | | | | 6.6 | | | | | |
| | 7 | | | | 6.4 | | | | | |
| 5580 | 0 | 7.5 | 22.837 | 96.2 | 6.8 | 36.9 | 15.7 | 24.0 | | Pass |
| | 1 | | | | 6.2 | | | | | |
| | 2 | | | | 6.4 | | | | | |
| | 3 | | | | 6.3 | | | | | |
| | 4 | | | | 6.6 | | | | | |
| | 5 | | | | 6.7 | | | | | |
| | 6 | | | | 6.7 | | | | | |
| | 7 | | | | 6.0 | | | | | |
| 5700 | 0 | 7.5 | 22.917 | 96.2 | 6.9 | 39.3 | 15.9 | 24.0 | | Pass |
| | 1 | | | | 6.5 | | | | | |
| | 2 | | | | 6.2 | | | | | |
| | 3 | | | | 6.4 | | | | | |
| | 4 | | | | 6.4 | | | | | |
| | 5 | | | | 7.1 | | | | | |
| | 6 | | | | 7.5 | | | | | |
| | 7 | | | | 6.8 | | | | | |
| 5720 | 0 | 7.5 | 22.756 | 96.2 | 7.1 | 40.0 | 16.0 | 24.0 | | Pass |
| | 1 | | | | 6.7 | | | | | |
| | 2 | | | | 6.9 | | | | | |
| | 3 | | | | 6.6 | | | | | |
| | 4 | | | | 6.9 | | | | | |
| | 5 | | | | 7.0 | | | | | |
| | 6 | | | | 6.9 | | | | | |
| | 7 | | | | 6.4 | | | | | |

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

Portion within 5725-5850 MHz band (UNII-3)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 5720 | 0 | 7.5 | | 96.2 | 0.8 | 10.9 | 10.4 | 30.0 | 0.0109 | Pass |
| | 1 | | | | 0.3 | | | | | |
| | 2 | | | | 0.4 | | | | | |
| | 3 | | | | 0.7 | | | | | |
| | 4 | | | | 1.5 | | | | | |
| | 5 | | | | 1.3 | | | | | |
| | 6 | | | | 0.3 | | | | | |
| | 7 | | | | 3.3 | | | | | |

# EMC Test Data

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

MIMO Device - 5470-5725 MHz Band - ISEDC

Mode: ax20 Max EIRP (mW): 45.2

| Frequency (MHz) | Chain | Software Setting | 99% BW (MHz) | Duty Cycle % | Power[1] dBm | Total Power mW | Total Power dBm | IC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5500 | 0 | 7.5 | 19.36 | 96.2 | 7.2 | 40.3 | 16.1 | 23.9 | 0.040 | Pass |
| | 1 | | | | 6.8 | | | | | |
| | 2 | | | | 6.9 | | | | | |
| | 3 | | | | 7.1 | | | | | |
| | 4 | | | | 7.2 | | | | | |
| | 5 | | | | 6.6 | | | | | |
| | 6 | | | | 6.6 | | | | | |
| | 7 | | | | 6.4 | | | | | |
| 5580 | 0 | 7.5 | 19.44 | 96.2 | 6.8 | 36.9 | 15.7 | 23.9 | | Pass |
| | 1 | | | | 6.2 | | | | | |
| | 2 | | | | 6.4 | | | | | |
| | 3 | | | | 6.3 | | | | | |
| | 4 | | | | 6.6 | | | | | |
| | 5 | | | | 6.7 | | | | | |
| | 6 | | | | 6.7 | | | | | |
| | 7 | | | | 6.0 | | | | | |
| 5700 | 0 | 7.5 | 19.52 | 96.2 | 6.9 | 39.3 | 15.9 | 23.9 | | Pass |
| | 1 | | | | 6.5 | | | | | |
| | 2 | | | | 6.2 | | | | | |
| | 3 | | | | 6.4 | | | | | |
| | 4 | | | | 6.4 | | | | | |
| | 5 | | | | 7.1 | | | | | |
| | 6 | | | | 7.5 | | | | | |
| | 7 | | | | 6.8 | | | | | |
| 5720 | 0 | 7.5 | 19.52 | 96.2 | 7.1 | 40.0 | 16.0 | 23.9 | | Pass |
| | 1 | | | | 6.7 | | | | | |
| | 2 | | | | 6.9 | | | | | |
| | 3 | | | | 6.6 | | | | | |
| | 4 | | | | 6.9 | | | | | |
| | 5 | | | | 7.0 | | | | | |
| | 6 | | | | 6.9 | | | | | |
| | 7 | | | | 6.4 | | | | | |

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

Portion within 5725-5850 MHz band (UNII-3)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 5720 | 0 | 7.5 | | 96.2 | 0.8 | 10.9 | 10.4 | 30.0 | 0.0109 | Pass |
| | 1 | | | | 0.3 | | | | | |
| | 2 | | | | 0.4 | | | | | |
| | 3 | | | | 0.7 | | | | | |
| | 4 | | | | 1.5 | | | | | |
| | 5 | | | | 1.3 | | | | | |
| | 6 | | | | 0.3 | | | | | |
| | 7 | | | | 3.3 | | | | | |

# EMC Test Data

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

5470-5725 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 5500 | 0 | 7.5 | | 96.2 | -3.7 | 3.5 | 5.4 | 7.7 | 11.0 | Pass |
| | 1 | | | | -4.2 | | | | | |
| | 2 | | | | -3.9 | | | | | |
| | 3 | | | | -3.7 | | | | | |
| | 4 | | | | -3.4 | | | | | |
| | 5 | | | | -3.5 | | | | | |
| | 6 | | | | -3.7 | | | | | |
| | 7 | | | | -4.3 | | | | | |
| 5580 | 0 | 7.5 | | 96.2 | -3.6 | 3.5 | 5.4 | 7.7 | 11.0 | Pass |
| | 1 | | | | -4.0 | | | | | |
| | 2 | | | | -4.3 | | | | | |
| | 3 | | | | -4.3 | | | | | |
| | 4 | | | | -3.2 | | | | | |
| | 5 | | | | -3.2 | | | | | |
| | 6 | | | | -2.8 | | | | | |
| | 7 | | | | -4.6 | | | | | |
| 5700 | 0 | 7.5 | | 96.2 | -3.8 | 3.6 | 5.6 | 7.7 | 11.0 | Pass |
| | 1 | | | | -4.0 | | | | | |
| | 2 | | | | -4.2 | | | | | |
| | 3 | | | | -4.2 | | | | | |
| | 4 | | | | -3.7 | | | | | |
| | 5 | | | | -3.2 | | | | | |
| | 6 | | | | -2.6 | | | | | |
| | 7 | | | | -3.6 | | | | | |
| 5720 | 0 | 7.5 | | 96.2 | -3.4 | 3.5 | 5.4 | 7.7 | 11.0 | Pass |
| | 1 | | | | -4.3 | | | | | |
| | 2 | | | | -4.0 | | | | | |
| | 3 | | | | -4.4 | | | | | |
| | 4 | | | | -3.5 | | | | | |
| | 5 | | | | -3.5 | | | | | |
| | 6 | | | | -3.1 | | | | | |
| | 7 | | | | -4.4 | | | | | |

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

Portion within 5725-5850 MHz band (UNII-3)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 5720 | 0 | 7.5 | | 96.2 | -3.6 | 4.0 | 6.0 | 26.7 | 26.7 | Pass |
| | 1 | | | | -3.6 | | | | | |
| | 2 | | | | -3.3 | | | | | |
| | 3 | | | | -3.5 | | | | | |
| | 4 | | | | -2.7 | | | | | |
| | 5 | | | | -2.7 | | | | | |
| | 6 | | | | -2.3 | | | | | |
| | 7 | | | | -3.9 | | | | | |

# EMC Test Data

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

MIMO Device - 5470-5725 MHz Band - FCC

Mode: ax40 Max EIRP (mW): 100

| Frequency (MHz) | Chain | Software Setting | 26dB BW (MHz) | Duty Cycle % | Power dBm | Total Power mW | Total Power dBm | FCC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5510 | 0 | 11.5 | 42.949 | 95.5 | 10.1 | 81.0 | 19.1 | 24.0 | 0.089 | Pass |
| | 1 | | | | 9.8 | | | | | |
| | 2 | | | | 9.9 | | | | | |
| | 3 | | | | 9.8 | | | | | |
| | 4 | | | | 10.1 | | | | | |
| | 5 | | | | 9.6 | | | | | |
| | 6 | | | | 9.5 | | | | | |
| | 7 | | | | 10.0 | | | | | |
| 5550 | 0 | 11.5 | 42.949 | 95.5 | 10.0 | 82.2 | 19.1 | 24.0 | | Pass |
| | 1 | | | | 9.9 | | | | | |
| | 2 | | | | 9.8 | | | | | |
| | 3 | | | | 10.0 | | | | | |
| | 4 | | | | 10.3 | | | | | |
| | 5 | | | | 9.9 | | | | | |
| | 6 | | | | 9.8 | | | | | |
| | 7 | | | | 9.6 | | | | | |
| 5670 | 0 | 11.5 | 42.564 | 95.5 | 10.2 | 89.1 | 19.5 | 24.0 | | Pass |
| | 1 | | | | 10.2 | | | | | |
| | 2 | | | | 10.0 | | | | | |
| | 3 | | | | 10.0 | | | | | |
| | 4 | | | | 10.1 | | | | | |
| | 5 | | | | 10.4 | | | | | |
| | 6 | | | | 10.8 | | | | | |
| | 7 | | | | 10.4 | | | | | |
| 5710 | 0 | 11.0 | 56.282 | 95.5 | 9.2 | 68.0 | 18.3 | 24.0 | | Pass |
| | 1 | | | | 8.7 | | | | | |
| | 2 | | | | 9.0 | | | | | |
| | 3 | | | | 8.8 | | | | | |
| | 4 | | | | 9.2 | | | | | |
| | 5 | | | | 9.4 | | | | | |
| | 6 | | | | 9.3 | | | | | |
| | 7 | | | | 9.1 | | | | | |

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

Portion within 5725-5850 MHz band (UNII-3)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 5710 | 0 | 11.0 | | 95.5 | 4.3 | 22.8 | 13.6 | 30.0 | 0.0228 | Pass |
| | 1 | | | | 4.5 | | | | | |
| | 2 | | | | 4.4 | | | | | |
| | 3 | | | | 3.9 | | | | | |
| | 4 | | | | 4.6 | | | | | |
| | 5 | | | | 4.1 | | | | | |
| | 6 | | | | 4.5 | | | | | |
| | 7 | | | | 4.4 | | | | | |

# EMC Test Data

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

MIMO Device - 5470-5725 MHz Band - ISEDC

Mode: ax40 Max EIRP (mW): 100

| Frequency (MHz) | Chain | Software Setting | 99% BW (MHz) | Duty Cycle % | Power[1] dBm | Total Power mW | Total Power dBm | IC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5510 | 0 | 11.5 | 38.528 | 95.5 | 10.1 | 81.0 | 19.1 | 24.0 | 0.089 | Pass |
| | 1 | | | | 9.8 | | | | | |
| | 2 | | | | 9.9 | | | | | |
| | 3 | | | | 9.8 | | | | | |
| | 4 | | | | 10.1 | | | | | |
| | 5 | | | | 9.6 | | | | | |
| | 6 | | | | 9.5 | | | | | |
| | 7 | | | | 10.0 | | | | | |
| 5550 | 0 | 11.5 | 38.528 | 95.5 | 10.0 | 82.2 | 19.1 | 24.0 | | Pass |
| | 1 | | | | 9.9 | | | | | |
| | 2 | | | | 9.8 | | | | | |
| | 3 | | | | 10.0 | | | | | |
| | 4 | | | | 10.3 | | | | | |
| | 5 | | | | 9.9 | | | | | |
| | 6 | | | | 9.8 | | | | | |
| | 7 | | | | 9.6 | | | | | |
| 5670 | 0 | 11.5 | 38.4 | 95.5 | 10.2 | 89.1 | 19.5 | 24.0 | | Pass |
| | 1 | | | | 10.2 | | | | | |
| | 2 | | | | 10.0 | | | | | |
| | 3 | | | | 10.0 | | | | | |
| | 4 | | | | 10.1 | | | | | |
| | 5 | | | | 10.4 | | | | | |
| | 6 | | | | 10.8 | | | | | |
| | 7 | | | | 10.4 | | | | | |
| 5710 | 0 | 11.0 | 38.912 | 95.5 | 9.2 | 68.0 | 18.3 | 24.0 | | Pass |
| | 1 | | | | 8.7 | | | | | |
| | 2 | | | | 9.0 | | | | | |
| | 3 | | | | 8.8 | | | | | |
| | 4 | | | | 9.2 | | | | | |
| | 5 | | | | 9.4 | | | | | |
| | 6 | | | | 9.3 | | | | | |
| | 7 | | | | 9.1 | | | | | |

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

Portion within 5725-5850 MHz band (UNII-3)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 5710 | 0 | 11 | | 95.5 | 4.3 | 22.8 | 13.6 | 30.0 | 0.0228 | Pass |
| | 1 | | | | 4.5 | | | | | |
| | 2 | | | | 4.4 | | | | | |
| | 3 | | | | 3.9 | | | | | |
| | 4 | | | | 4.6 | | | | | |
| | 5 | | | | 4.1 | | | | | |
| | 6 | | | | 4.5 | | | | | |
| | 7 | | | | 4.4 | | | | | |

# EMC Test Data

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

MIMO Device 5470-5725 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 5510 | 0 | 11.5 | | 95.5 | -3.7 | 3.6 | 5.6 | 7.7 | 11.0 | Pass |
| | 1 | | | | -3.6 | | | | | |
| | 2 | | | | -4.0 | | | | | |
| | 3 | | | | -3.9 | | | | | |
| | 4 | | | | -3.2 | | | | | |
| | 5 | | | | -3.7 | | | | | |
| | 6 | | | | -3.4 | | | | | |
| | 7 | | | | -3.9 | | | | | |
| 5550 | 0 | 11.5 | | 95.5 | -3.8 | 3.6 | 5.6 | 7.7 | 11.0 | Pass |
| | 1 | | | | -4.0 | | | | | |
| | 2 | | | | -3.9 | | | | | |
| | 3 | | | | -4.0 | | | | | |
| | 4 | | | | -3.1 | | | | | |
| | 5 | | | | -3.3 | | | | | |
| | 6 | | | | -3.4 | | | | | |
| | 7 | | | | -4.1 | | | | | |
| 5670 | 0 | 11.5 | | 95.5 | -3.7 | 3.7 | 5.7 | 7.7 | 11.0 | Pass |
| | 1 | | | | -3.8 | | | | | |
| | 2 | | | | -4.2 | | | | | |
| | 3 | | | | -4.1 | | | | | |
| | 4 | | | | -3.7 | | | | | |
| | 5 | | | | -3.3 | | | | | |
| | 6 | | | | -2.2 | | | | | |
| | 7 | | | | -3.6 | | | | | |
| 5710 | 0 | 11 | | 95.5 | -4.0 | 3.6 | 5.6 | 7.7 | 11.0 | Pass |
| | 1 | | | | -4.2 | | | | | |
| | 2 | | | | -4.0 | | | | | |
| | 3 | | | | -4.3 | | | | | |
| | 4 | | | | -3.4 | | | | | |
| | 5 | | | | -3.0 | | | | | |
| | 6 | | | | -2.8 | | | | | |
| | 7 | | | | -4.0 | | | | | |

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

Portion within 5725-5850 MHz band (UNII-3)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 5710 | 0 | 11 | | 95.5 | -5.7 | 2.3 | 3.6 | 26.7 | 26.7 | Pass |
| | 1 | | | | -5.6 | | | | | |
| | 2 | | | | -5.9 | | | | | |
| | 3 | | | | -6.2 | | | | | |
| | 4 | | | | -5.6 | | | | | |
| | 5 | | | | -5.6 | | | | | |
| | 6 | | | | -4.7 | | | | | |
| | 7 | | | | -5.7 | | | | | |

# EMC Test Data

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

MIMO Device - 5470-5725 MHz Band - FCC

Mode: ax80 Max EIRP (mW): 177.5

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 5530 | 0 | 13.5 | 90 | 95.9 | 12.5 | 158.2 | 22.0 | 24.0 | 0.158 | Pass |
| | 1 | | | | 13.1 | | | | | |
| | 2 | | | | 12.8 | | | | | |
| | 3 | | | | 12.8 | | | | | |
| | 4 | | | | 12.6 | | | | | |
| | 5 | | | | 12.6 | | | | | |
| | 6 | | | | 12.9 | | | | | |
| | 7 | | | | 12.9 | | | | | |
| 5610 | 0 | 14 | 92.051 | 95.9 | 13.0 | 158.0 | 22.0 | 24.0 | | Pass |
| | 1 | | | | 12.7 | | | | | |
| | 2 | | | | 12.4 | | | | | |
| | 3 | | | | 12.5 | | | | | |
| | 4 | | | | 12.4 | | | | | |
| | 5 | | | | 12.8 | | | | | |
| | 6 | | | | 13.4 | | | | | |
| | 7 | | | | 12.9 | | | | | |
| 5690 | 0 | 14 | 93.59 | 95.9 | 12.9 | 162.8 | 22.1 | 24.0 | | Pass |
| | 1 | | | | 12.6 | | | | | |
| | 2 | | | | 12.6 | | | | | |
| | 3 | | | | 12.5 | | | | | |
| | 4 | | | | 12.8 | | | | | |
| | 5 | | | | 13.2 | | | | | |
| | 6 | | | | 13.7 | | | | | |
| | 7 | | | | 12.8 | | | | | |

Portion within 5725-5850 MHz band (UNII-3)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 5690 | 0 | 14 | | 95.9 | -1.3 | 7.8 | 8.9 | 30.0 | 0.0078 | Pass |
| | 1 | | | | -1.1 | | | | | |
| | 2 | | | | -0.3 | | | | | |
| | 3 | | | | -0.7 | | | | | |
| | 4 | | | | -0.4 | | | | | |
| | 5 | | | | 0.5 | | | | | |
| | 6 | | | | 0.7 | | | | | |
| | 7 | | | | -0.2 | | | | | |

# EMC Test Data

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

MIMO Device - 5470-5725 MHz Band - ISEDC

Mode: ax80 Max EIRP (mW): 182.7

| Frequency (MHz) | Chain | Software Setting | 99% BW (MHz) | Duty Cycle % | Power[1] dBm | Total Power mW | Total Power dBm | IC Limit dBm | Max Power (W) | Result |
|---|---|---|---|---|---|---|---|---|---|---|
| 5530 | 0 | 13.5 | 78.336 | 95.9 | 12.5 | 158.2 | 22.0 | 24.0 | 0.163 | Pass |
| | 1 | | | | 13.1 | | | | | |
| | 2 | | | | 12.8 | | | | | |
| | 3 | | | | 12.8 | | | | | |
| | 4 | | | | 12.6 | | | | | |
| | 5 | | | | 12.6 | | | | | |
| | 6 | | | | 12.9 | | | | | |
| | 7 | | | | 12.9 | | | | | |
| 5690 | 0 | 14 | 78.336 | 95.9 | 12.9 | 162.8 | 22.1 | 24.0 | | Pass |
| | 1 | | | | 12.6 | | | | | |
| | 2 | | | | 12.6 | | | | | |
| | 3 | | | | 12.5 | | | | | |
| | 4 | | | | 12.8 | | | | | |
| | 5 | | | | 13.2 | | | | | |
| | 6 | | | | 13.7 | | | | | |
| | 7 | | | | 12.8 | | | | | |

Portion within 5725-5850 MHz band (UNII-3)

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 5690 | 0 | 14 | | 95.9 | -1.3 | 7.8 | 8.9 | 30.0 | 0.0078 | Pass |
| | 1 | | | | -1.1 | | | | | |
| | 2 | | | | -0.3 | | | | | |
| | 3 | | | | -0.7 | | | | | |
| | 4 | | | | -0.4 | | | | | |
| | 5 | | | | 0.5 | | | | | |
| | 6 | | | | 0.7 | | | | | |
| | 7 | | | | -0.2 | | | | | |

# EMC Test Data

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

5470-5725 PSD - FCC/ISEDC Note: 5610 MHz channel not used for Canada

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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 5530 | 0 | 13.5 | | 95.9 | -4.1 | 3.1 | 4.9 | 7.7 | 11.0 | Pass |
| | 1 | | | | -4.4 | | | | | |
| | 2 | | | | -4.8 | | | | | |
| | 3 | | | | -4.6 | | | | | |
| | 4 | | | | -4.4 | | | | | |
| | 5 | | | | -3.7 | | | | | |
| | 6 | | | | -4.4 | | | | | |
| | 7 | | | | -4.1 | | | | | |
| 5610 | 0 | 14 | | 95.9 | -3.8 | 3.4 | 5.3 | 7.7 | - | Pass |
| | 1 | | | | -4.1 | | | | | |
| | 2 | | | | -4.5 | | | | | |
| | 3 | | | | -4.6 | | | | | |
| | 4 | | | | -4.2 | | | | | |
| | 5 | | | | -3.5 | | | | | |
| | 6 | | | | -2.5 | | | | | |
| | 7 | | | | -4.2 | | | | | |
| 5690 | 0 | 14 | | 95.9 | -3.7 | 3.7 | 5.7 | 7.7 | 11.0 | Pass |
| | 1 | | | | -4.1 | | | | | |
| | 2 | | | | -4.3 | | | | | |
| | 3 | | | | -4.2 | | | | | |
| | 4 | | | | -3.5 | | | | | |
| | 5 | | | | -3.3 | | | | | |
| | 6 | | | | -2.2 | | | | | |
| | 7 | | | | -3.8 | | | | | |
| Portion within 5725-5850 MHz band (UNII-3) | | | | | | | | | | |
| 5690 | 0 | 14 | | 95.9 | -6.2 | 2.0 | 3.0 | 26.7 | 26.7 | Pass |
| | 1 | | | | -6.3 | | | | | |
| | 2 | | | | -6.7 | | | | | |
| | 3 | | | | -6.9 | | | | | |
| | 4 | | | | -6.3 | | | | | |
| | 5 | | | | -5.7 | | | | | |
| | 6 | | | | -5.0 | | | | | |
| | 7 | | | | -6.4 | | | | | |

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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: 24.8 °C
Rel. Humidity: 39 %

## Summary of Results

| Run # | Mode | Channel | Target Power | Power Setting | Test Performed | Limit | Result / Margin |
|---|---|---|---|---|---|---|---|
| 20MHz Bandwith Modes | | | | | | | |
| 2 | a, BLE | 64 5320 MHz | 9.0 | 14.0 | Restricted Band Edge at 5350 MHz | 15.209 | 52.9 dBµV/m @ 5350.2 MHz (-1.1 dB) |
| 3 | | 100 5500 MHz | 9.0 | 16.0 | Restricted Band Edge at 5460 MHz | | 52.1 dBµV/m @ 5460.0 MHz (-1.9 dB) |
| | | | | 12.0 | Band Edge 5460 - 5470 MHz | 15E | 67.8 dBµV/m @ 5468.9 MHz (-0.5 dB) |
| | | 140 5700 MHz | 9.0 | 11.0 | Band Edge 5725MHz | | 67.5 dBµV/m @ 5725.3 MHz (-0.8 dB) |
| 6 | ax20, BLE | ax20 64 - 5320MHz | 14.0 | 14.0 | Restricted Band Edge at 5350 MHz | 15.209 | 53.3 dBµV/m @ 5350.5 MHz (-0.7 dB) |
| 7 | ax20, BLE | 100 - 5500MHz | 14.0 | 13.5 | Restricted Band Edge at 5460 MHz | 15.209 | 47.8 dBµV/m @ 5460.0 MHz (-6.2 dB) |
| | | | 14.0 | 13.5 | Band Edge 5460 - 5470 MHz | 15E | 67.2 dBµV/m @ 5469.9 MHz (-1.1 dB) |
| | | 140 - 5700MHz | 14.0 | 12.5 | Band Edge 5725MHz | | 67.8 dBµV/m @ 5729.1 MHz (-0.5 dB) |

# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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 | Target Power | Power Setting | Test Performed | Limit | Result / Margin |
|---|---|---|---|---|---|---|---|
| 40MHz Bandwith Modes | | | | | | | |
| 10 | ax40, BLE | 62 - 5310MHz | 14.5 | 15.0 | Restricted Band Edge at 5350 MHz | 15.209 | 53.5 dBµV/m @ 5350.2 MHz (-0.5 dB) |
| 11 | | 102 - 5510MHz | 14.5 | 14.5 | Restricted Band Edge at 5460 MHz | | 51.2 dBµV/m @ 5459.3 MHz (-2.8 dB) |
| | | 102 - 5510MHz | 14.5 | 14.5 | Band Edge 5460 - 5470 MHz | 15E | 68.2 dBµV/m @ 5469.6 MHz (-0.1 dB) |
| | | 134 - 5670MHz | 14.5 | 14.5 | Band Edge 5725MHz | | 67.6 dBµV/m @ 5727.3 MHz (-0.7 dB) |
| 80MHz Bandwith Modes | | | | | | | |
| 14 | ax80, BLE | 58 - 5290MHz | 14.5 | 14.5 | Restricted Band Edge at 5350 MHz | 15.209 | 53.6 dBµV/m @ 5350.1 MHz (-0.4 dB) |
| 15 | | 106 - 5530MHz | 14.5 | 13.5 | Restricted Band Edge at 5460 MHz | | 51.5 dBµV/m @ 5451.6 MHz (-2.5 dB) |
| | | 106 - 5530MHz | 14.5 | 13.5 | Band Edge 5460 - 5470 MHz | 15E | 67.5 dBµV/m @ 5462.1 MHz (-0.8 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.

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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
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) | |
|---|---|---|---|---|---|---|---|---|
| BLE | 1 Mb/s | 0.65 | Yes | 0.424 | 1.9 | 3.8 | 2358 | |
| ZigBee | - | 0.43 | Yes | 0.858 | 3.7 | 7.4 | 1166 | 2 kHz |
| 11a | 6 MB/s | 0.92 | Yes | 1.437 | 0.3 | 0.7 | 696 | 1 kHz |
| ac20 | MCS0 | 0.95 | Yes | 5.474 | 0.2 | 0.5 | 183 | 200 Hz |
| ax20 | MCS0 | 0.96 | Yes | 5.452 | 0.2 | 0.4 | 183 | 200 Hz |
| ax40 | MCS0 | 0.96 | Yes | 5.297 | 0.2 | 0.4 | 189 | 200 Hz |
| ax80 | MCS0 | 0.96 | Yes | 5.401 | 0.2 | 0.4 | 185 | 200 Hz |
| ax80+80 | MCS0 | 0.95 | Yes | 5.401 | 0.2 | 0.4 | 185 | 200 Hz |

## Sample Notes

Sample S/N: CNGFK9Y02N (BLE)
Driver: P4 V0.4.5
Antenna: Internal 8 antennas for 5 GHz radio and 4 antennas for 2.4 GHz radio (5GHz radio may also use 4 antennas but with 3 dB higher power and can operate in both lower and upper 5 GHz bands simutaneously). Tests performed with 8 antennas at the 4 antenna 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). 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 4: | Emission has a duty cycle < 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100*1/DC traces, measurement corrected by Pwr correction factor (method AD 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. |

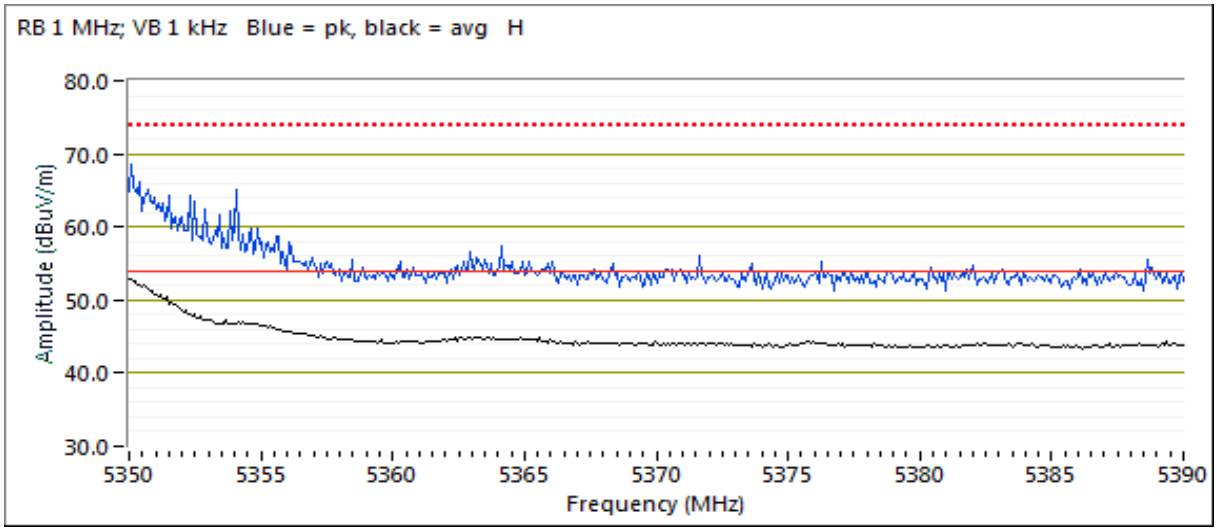
| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-RA-FCC |
| | | Project Manager: | Christine Krebill |
| Contact: | Mark Hill | Project Coordinator: | David Bare |
| Standard: | FCC §15.247 &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

Run #2: Radiated Bandedge Measurements, 5250-5350MHz

Channel: 64 - 5320 MHz at setting 9, BLE at 2440 MHz, 8 dBm, V primary antenna.
Tx Chain: 8
Mode: a

*5350 MHz Band Edge Signal Radiated Field Strength*

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| 5350.240 | 52.9 | H | 54.0 | -1.1 | Avg | 49 | 2.0 | VB 1 kHz, note 3 |
| 5353.210 | 68.5 | H | 74.0 | -5.5 | PK | 49 | 2.0 | |



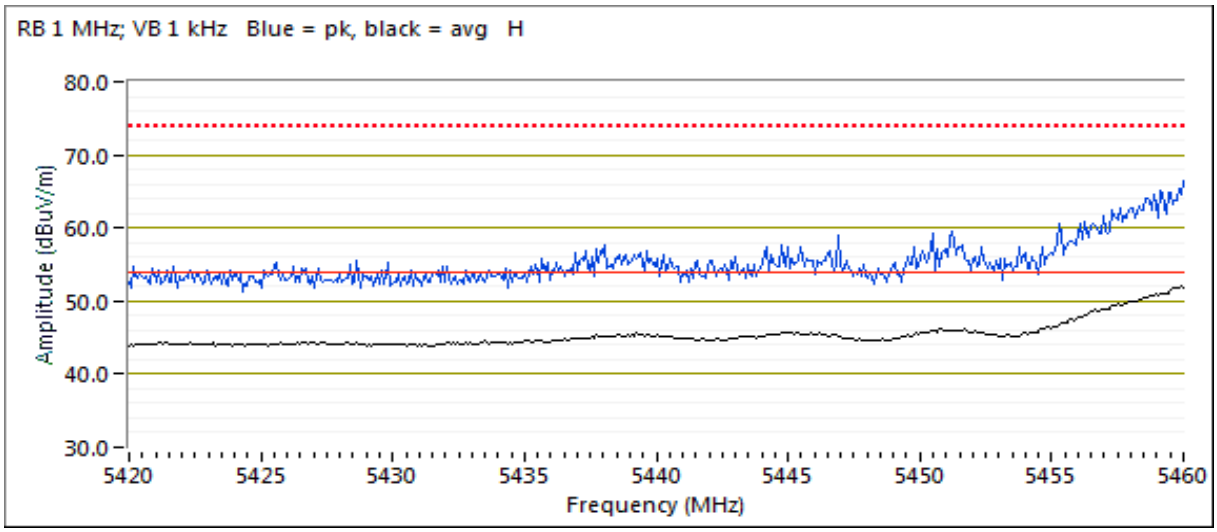
| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-RA-FCC |
| | | Project Manager: | Christine Krebill |
| Contact: | Mark Hill | Project Coordinator: | David Bare |
| Standard: | FCC §15.247 &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

Run #3: Radiated Bandedge Measurements, 5470-5725MHz

Channel: 100 - 5500 MHz at setting 15, BLE at 2440 MHz, 8 dBm, V primary antenna.
Tx Chain: 8
Mode: a

*5460 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 | |
| 5460.000 | 52.1 | H | 54.0 | -1.9 | Avg | 301 | 1.82 | VB 1 kHz, note 3 |
| 5459.760 | 68.2 | H | 74.0 | -5.8 | PK | 301 | 1.82 | |

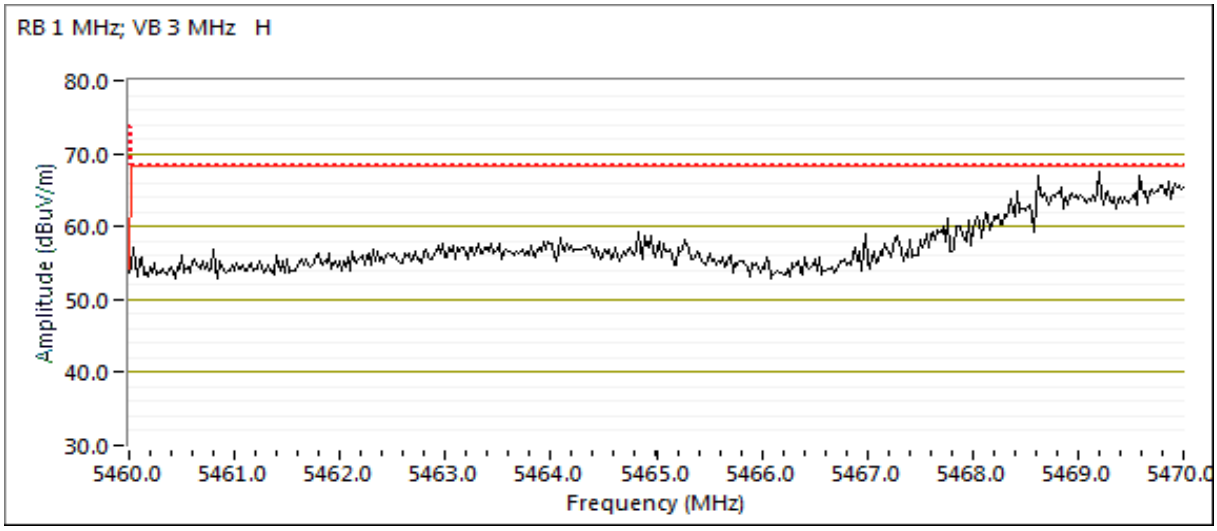


# EMC Test Data

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

*5470 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 | |
| 5468.920 | 67.8 | H | 68.3 | -0.5 | PK | 43 | 1.53 | |
| 5469.800 | 50.9 | H | 54.0 | -3.1 | Avg | 43 | 1.53 | VB 1 kHz, note 3 |
| 5468.920 | 67.8 | H | 74.0 | -6.2 | PK | 43 | 1.53 | |



# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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: 10/22/2018
Test Engineer: John Caizzi
Test Location: Fremont Chamber #7

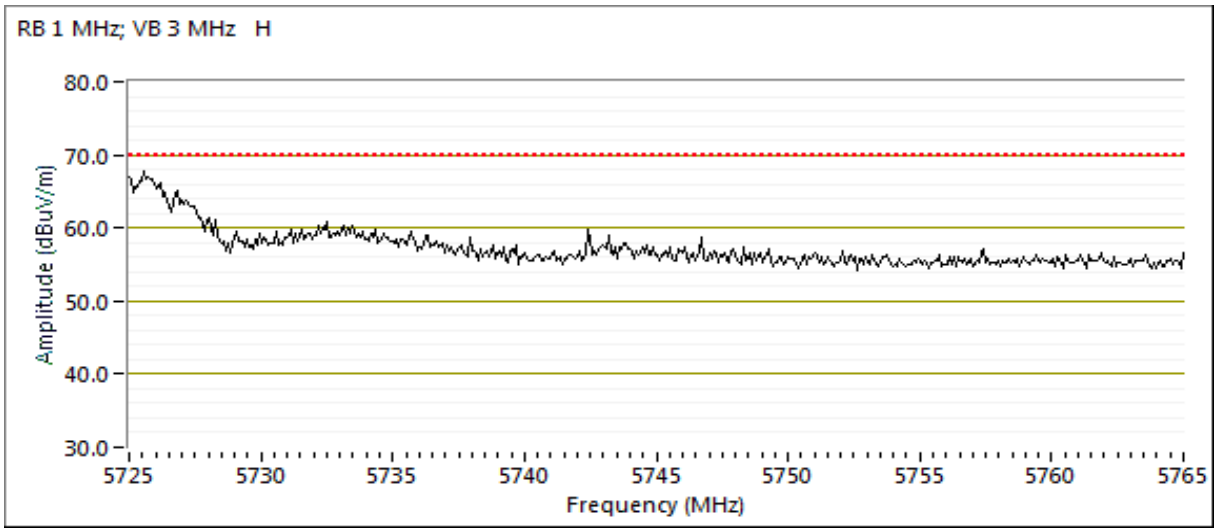
Config. Used: 1
Config Change: none
EUT Voltage: PoE & 120V/60Hz

Channel: 140 - 5700 MHz at setting 11
Tx Chain: 8
Mode: a

Mode: BLE at 8 dBm
Ch.Freq.: 2440 MHz
V primary antenna

*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 | |
| 5725.320 | 67.5 | H | 68.3 | -0.8 | PK | 62 | 1.51 | |



# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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 Bandedge Measurements, 5250-5350 MHz

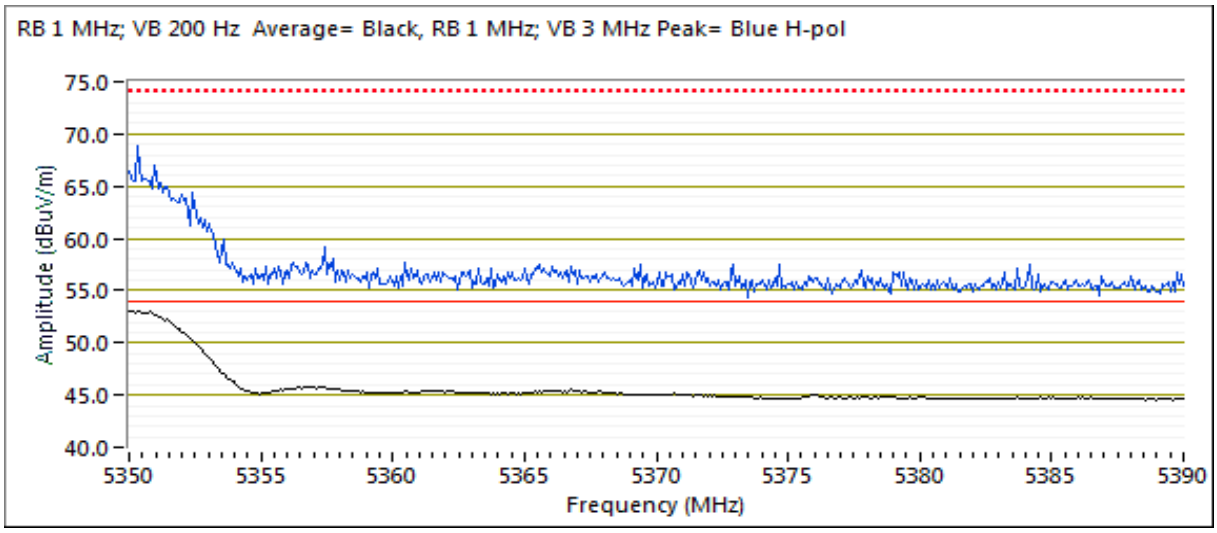
Date of Test: 10/16/2018
Test Engineer: Deniz Demirci
Test Location: Fremont Chamber #7

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

Channel: 64 - 5320 MHz
Tx Chain: 8x8
Mode: ax20, BLE

*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 | |
| 5350.500 | 53.3 | H | 54.0 | -0.7 | Avg | 300 | 1.4 | Note 3 - POS; RB 1 MHz; VB: 200 Hz |
| 5350.530 | 69.7 | H | 74.0 | -4.3 | PK | 300 | 1.4 | POS; RB 1 MHz; VB: 3 MHz |
| 5350.190 | 51.6 | V | 54.0 | -2.4 | Avg | 272 | 1.9 | Note 3 - POS; RB 1 MHz; VB: 200 Hz |
| 5351.520 | 67.2 | V | 74.0 | -6.8 | PK | 272 | 1.9 | POS; RB 1 MHz; VB: 3 MHz |



# EMC Test Data

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

Run #7: Radiated Bandedge Measurements, 5470-5725MHz

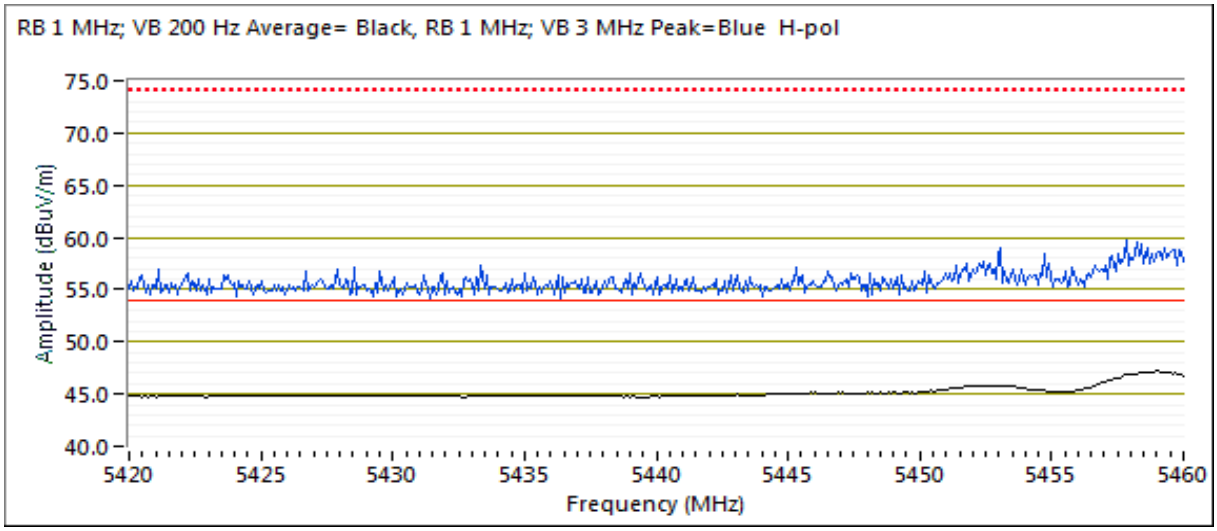
Date of Test: 10/16/2018
Test Engineer: Deniz Demirci
Test Location: Fremont Chamber #7

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

Channel: 100 - 5500 MHz
Tx Chain: 8x8
Mode: ax20, BLE

*5460 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 | |
| 5460.000 | 47.8 | V | 54.0 | -6.2 | Avg | 295 | 1.5 | Note 3 - POS; RB 1 MHz; VB: 200 Hz |
| 5458.990 | 47.2 | H | 54.0 | -6.8 | Avg | 298 | 1.5 | Note 3 - POS; RB 1 MHz; VB: 200 Hz |
| 5459.920 | 63.8 | V | 74.0 | -10.2 | PK | 295 | 1.5 | POS; RB 1 MHz; VB: 3 MHz |
| 5459.900 | 61.1 | H | 74.0 | -12.9 | PK | 298 | 1.5 | POS; RB 1 MHz; VB: 3 MHz |

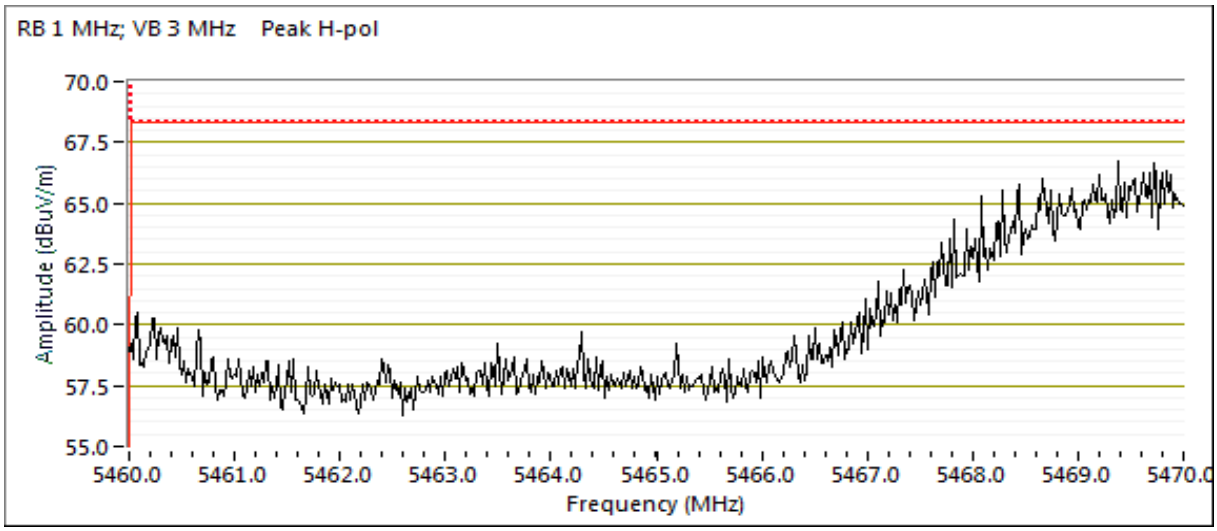


# EMC Test Data

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

*5470 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 | |
| 5469.930 | 67.2 | H | 68.3 | -1.1 | PK | 300 | 1.4 | POS; RB 1 MHz; VB: 3 MHz |
| 5469.000 | 61.4 | V | 68.3 | -6.9 | PK | 289 | 1.6 | POS; RB 1 MHz; VB: 3 MHz |



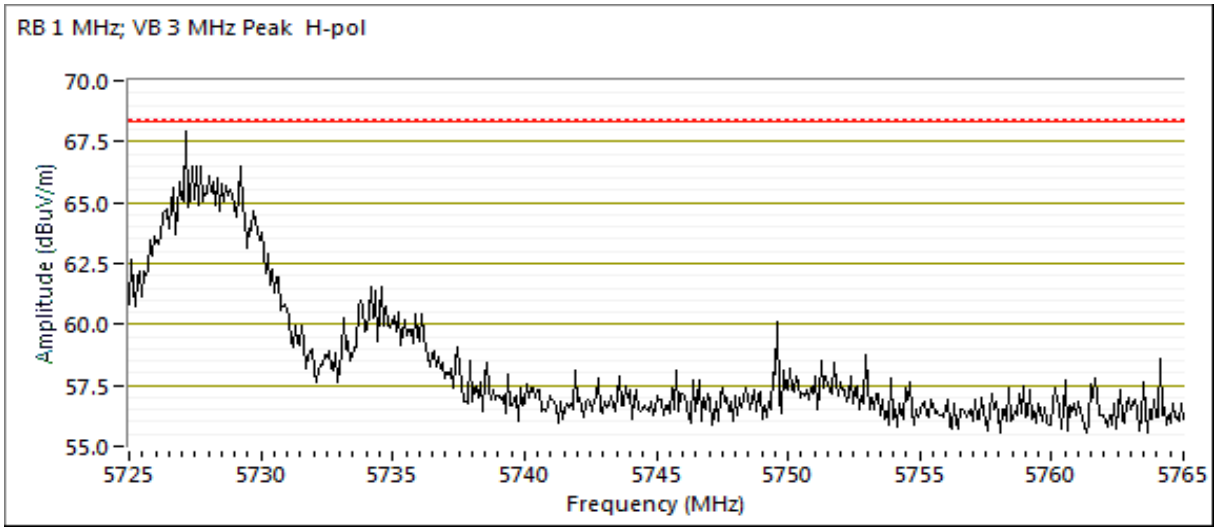
# EMC Test Data

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

Channel: 140 - 5700MHz
Tx Chain:
Mode: ax20, BLE

*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 | |
| 5729.070 | 67.8 | H | 68.3 | -0.5 | PK | 288 | 1.6 | POS; RB 1 MHz; VB: 3 MHz |
| 5726.890 | 63.4 | V | 68.3 | -4.9 | PK | 293 | 2.0 | POS; RB 1 MHz; VB: 3 MHz |



# EMC Test Data

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

Run #10: Radiated Bandedge Measurements, 5250-5350 MHz

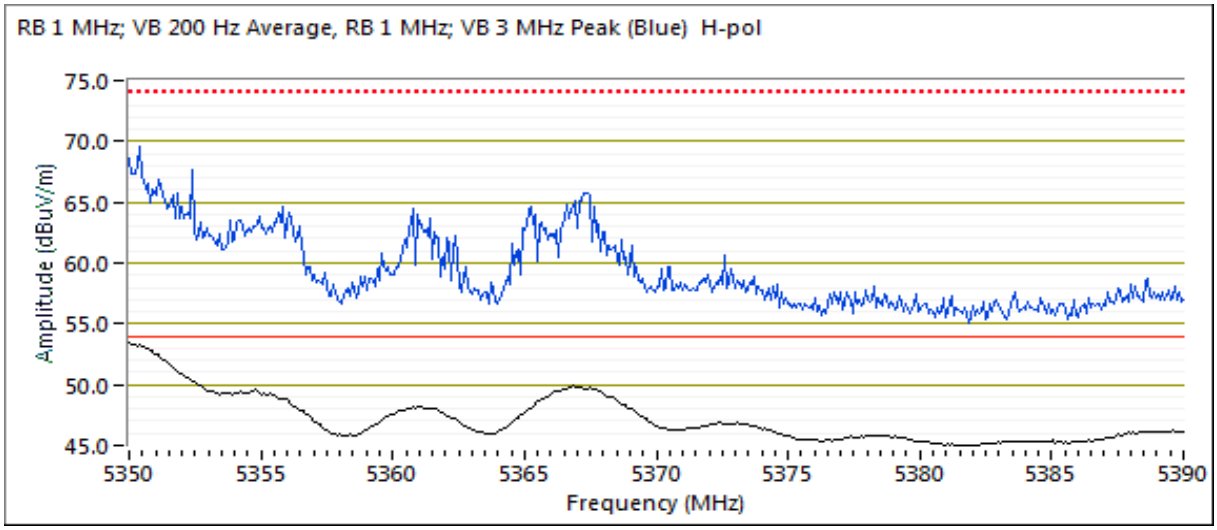
Date of Test: 10/16/2018
Test Engineer: Deniz Demirci
Test Location: Fremont Chamber #7

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

Channel: 62 - 5310 MHz
Tx Chain: 8x8
Mode: ax40

*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 | |
| 5350.160 | 53.5 | H | 54.0 | -0.5 | Avg | 290 | 1.4 | Note 3 - POS; RB 1 MHz; VB: 200 Hz |
| 5350.230 | 69.4 | H | 74.0 | -4.6 | PK | 290 | 1.4 | POS; RB 1 MHz; VB: 3 MHz |
| 5353.470 | 50.3 | V | 54.0 | -3.7 | Avg | 283 | 1.9 | Note 3 - POS; RB 1 MHz; VB: 200 Hz |
| 5352.600 | 65.0 | V | 74.0 | -9.0 | PK | 283 | 1.9 | POS; RB 1 MHz; VB: 3 MHz |



# EMC Test Data

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

Run #11: Radiated Bandedge Measurements, 5470-5725 MHz

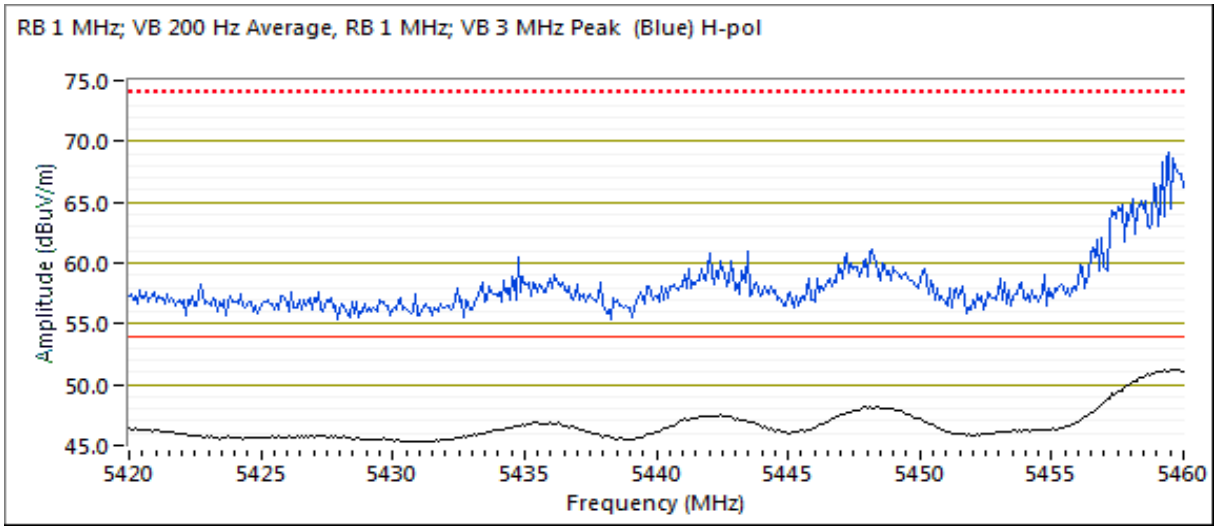
Date of Test: 10/16/2018
Test Engineer: Deniz Demirci
Test Location: Fremont Chamber #7

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

Channel: 102 - 5510 MHz
Tx Chain: 8x8
Mode: ax40

*5460 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 | |
| 5459.250 | 51.2 | H | 54.0 | -2.8 | Avg | 294 | 2.0 | Note 3 - POS; RB 1 MHz; VB: 200 Hz |
| 5459.420 | 69.4 | H | 74.0 | -4.6 | PK | 294 | 2.0 | POS; RB 1 MHz; VB: 3 MHz |
| 5459.930 | 51.0 | V | 54.0 | -3.0 | Avg | 284 | 1.6 | Note 3 - POS; RB 1 MHz; VB: 200 Hz |
| 5459.620 | 68.8 | V | 74.0 | -5.2 | PK | 284 | 1.6 | POS; RB 1 MHz; VB: 3 MHz |

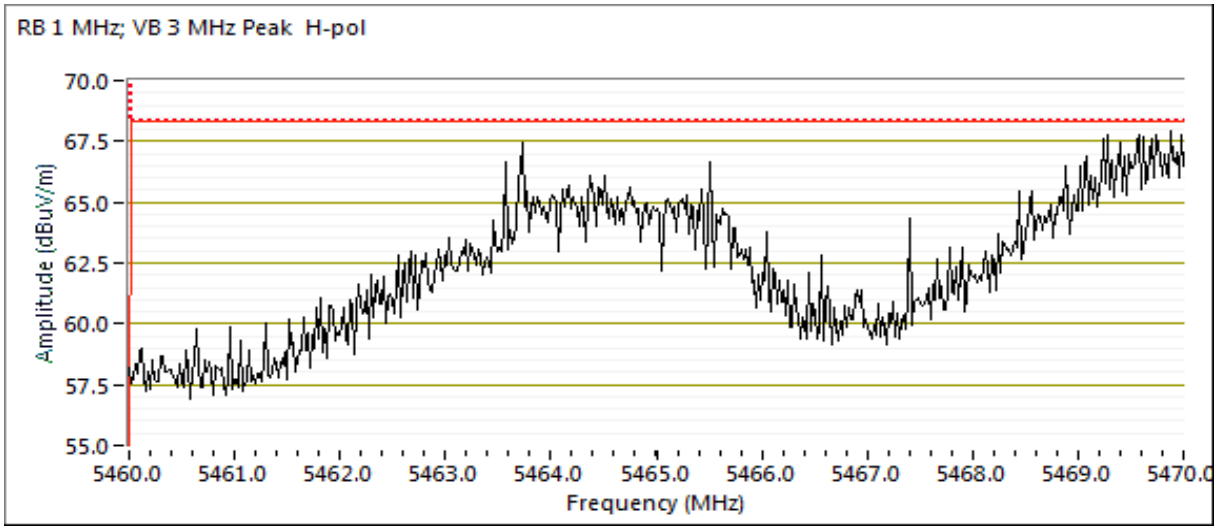


# EMC Test Data

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

*5470 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 | |
| 5469.570 | 68.2 | H | 68.3 | -0.1 | PK | 294 | 1.5 | POS; RB 1 MHz; VB: 3 MHz |
| 5467.820 | 66.0 | V | 68.3 | -2.3 | PK | 290 | 1.5 | POS; RB 1 MHz; VB: 3 MHz |



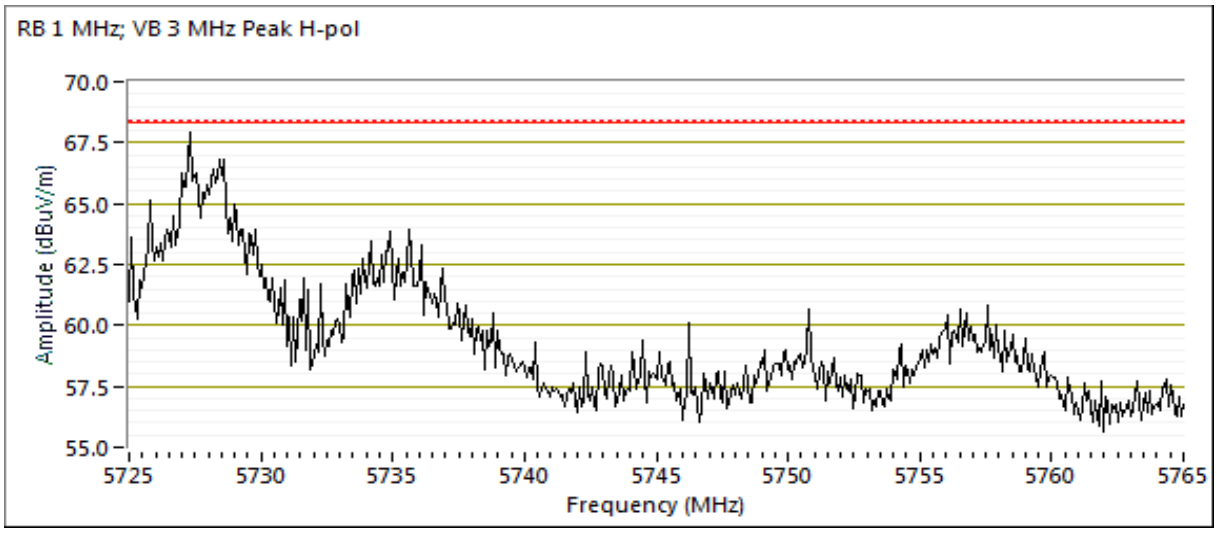
# EMC Test Data

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

Channel: 134 - 5670 MHz
Tx Chain: 8x8
Mode: ax40

*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 | |
| 5727.280 | 67.6 | H | 68.3 | -0.7 | PK | 296 | 2.0 | POS; RB 1 MHz; VB: 3 MHz |
| 5733.000 | 64.9 | V | 68.3 | -3.4 | PK | 292 | 2.1 | POS; RB 1 MHz; VB: 3 MHz |



# EMC Test Data

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

Run #14: Radiated Bandedge Measurements, 5250-5350 MHz

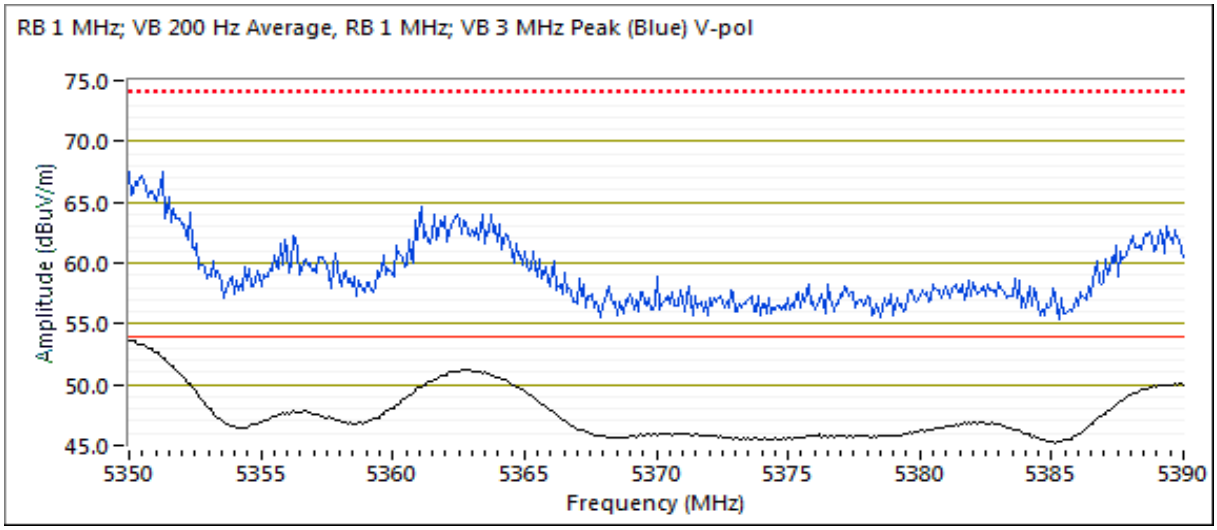
Date of Test: 10/16/2018
Test Engineer: Deniz Demirci
Test Location: Fremont Chamber #7

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

Channel: 58 - 5290 MHz
Tx Chain: 8x8
Mode: ax80

*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 | |
| 5350.090 | 53.6 | V | 54.0 | -0.4 | Avg | 293 | 1.8 | Note 3 - POS; RB 1 MHz; VB: 200 Hz |
| 5353.100 | 52.9 | H | 54.0 | -1.1 | Avg | 293 | 1.6 | Note 3 - POS; RB 1 MHz; VB: 200 Hz |
| 5350.570 | 69.5 | V | 74.0 | -4.5 | PK | 293 | 1.8 | POS; RB 1 MHz; VB: 3 MHz |
| 5354.130 | 68.3 | H | 74.0 | -5.7 | PK | 293 | 1.6 | POS; RB 1 MHz; VB: 3 MHz |



# EMC Test Data

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

Run #15: Radiated Bandedge Measurements, 5470-5725 MHz

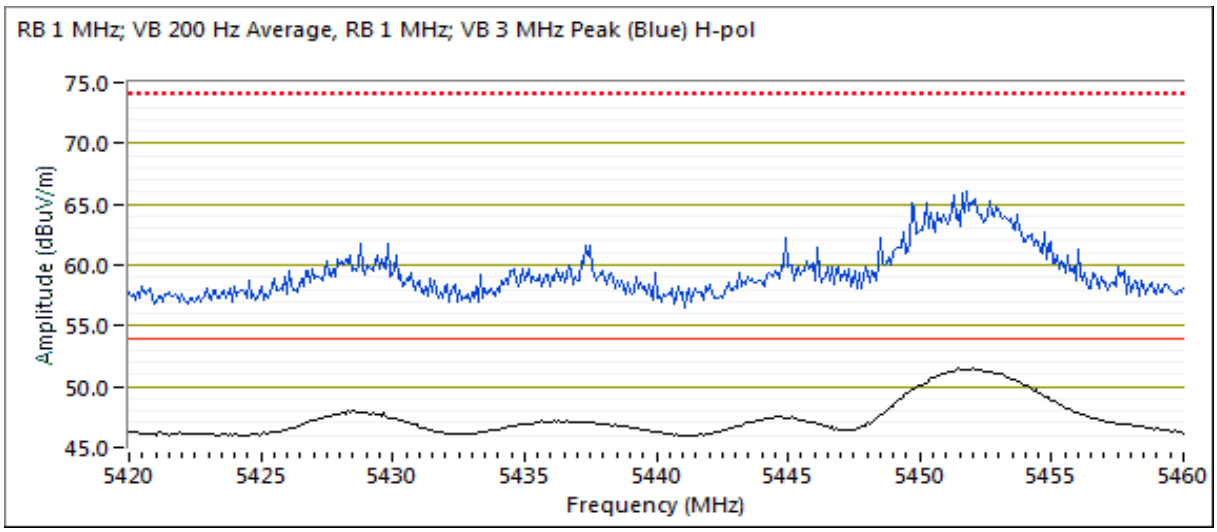
Date of Test: 10/16/2018
Test Engineer: Deniz Demirci
Test Location: Fremont Chamber #7

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

Channel: 106 - 5530 MHz
Tx Chain: 8x8
Mode: ax80

*5460 MHz Band Edge Signal Radiated Field Strength*

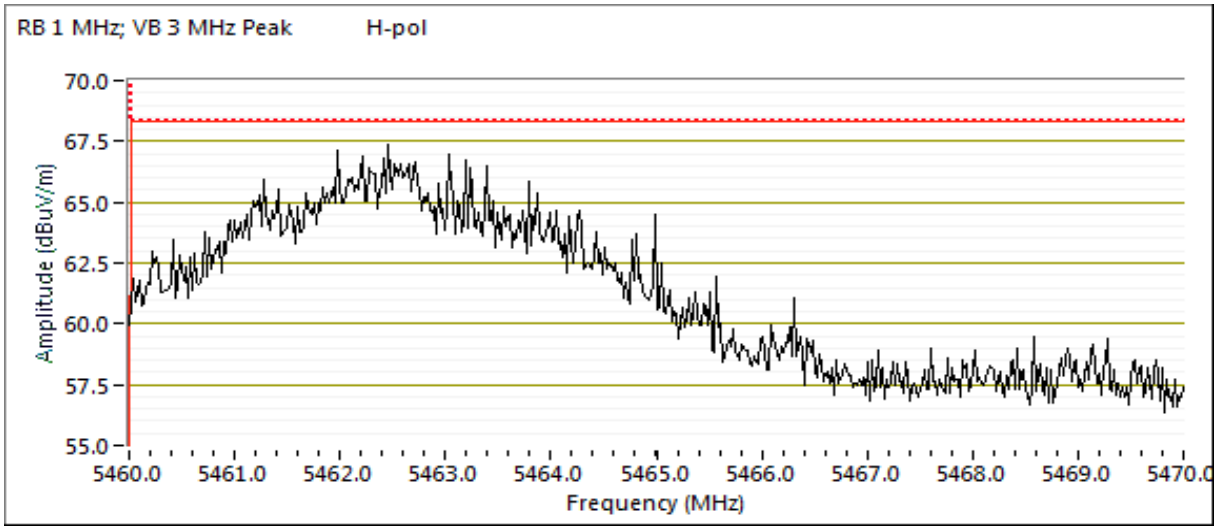
| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5451.560 | 51.5 | H | 54.0 | -2.5 | Avg | 282 | 2.3 | Note 3 - POS; RB 1 MHz; VB: 200 Hz |
| 5453.440 | 66.9 | H | 74.0 | -7.1 | PK | 282 | 2.3 | POS; RB 1 MHz; VB: 3 MHz |
| 5454.640 | 49.6 | V | 54.0 | -4.4 | Avg | 282 | 1.4 | Note 3 - POS; RB 1 MHz; VB: 200 Hz |
| 5455.480 | 65.1 | V | 74.0 | -8.9 | PK | 282 | 1.4 | POS; RB 1 MHz; VB: 3 MHz |



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

*5470 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 | |
| 5462.050 | 67.5 | H | 68.3 | -0.8 | PK | 276 | 1.7 | POS; RB 1 MHz; VB: 3 MHz |
| 5461.250 | 66.1 | V | 68.3 | -2.2 | PK | 287 | 1.1 | POS; RB 1 MHz; VB: 3 MHz |



# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-RA-FCC |
| | | 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: 35-45 %

### Modifications Made During Testing

No modifications were made to the EUT during testing

### Deviations From The Standard

No deviations were made from the requirements of the standard.

### Summary of Results

| Run # | Mode | Channel | Target Powers | Power Settings | Test Performed | Limit | Result / Margin |
|---|---|---|---|---|---|---|---|
| Scans on "center" channel in all five OFDM modes determined the worst case modes were a and b. | | | | | | | |
| 2 | a / b, ZigBee | 6, 116 Wi-Fi 18 - ZB | 15 / 20 / 8 | 15 / 20 / 8 | Radiated Emissions, 1 - 40 GHz | FCC 15.209/ 15.247 / 15 E | 39.1 dBµV/m @ 22319.7MHz (-14.9dB) |
| | a / b, ZigBee | 6, 60 Wi-Fi 26 - ZigBee | 15 / 20 / 8 | 15 / 20 / 8 | | | 47.2 dBµV/m @ 10599.9 MHz (-6.8 dB) |
| | a / b, BLE | 6, 116 Wi-Fi 17 - BLE | 15 / 20 / 8 | 15 / 20 / 8 | | | 49.4 dBµV/m @ 7319.3 MHz (-4.6 dB) |
| | a / b, BLE | 6, 60 Wi-Fi 39 - BLE | 15 / 20 / 8 | 15 / 20 / 8 | | | 49.4 dBµV/m @ 7439.3 MHz (-4.6 dB) |

# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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 | Target Powers | Power Settings | Test Performed | Limit | Result / Margin |
|---|---|---|---|---|---|---|---|
| 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). | | | | | | | |
| 4 | a / g | 1 & 60 | 14 / 20 | 20 / 20 | Radiated Emissions, 1 - 40 GHz | FCC 15.209/ 15.247 / 15 E | 46.2 dBµV/m @ 2195.7 MHz (-7.8 dB) |
| | ax20 | 1 & 60 | 14.0 / 20 | 20 / 20 | | | 44.2 dBµV/m @ 10600.0 MHz (-9.8 dB) |
| | ax40 | 1 & 54 | 14.5 / 20 | 20 / 20 | | | 33.9 dBµV/m @ 21076.6MHz (-20.1dB) |
| | ax80 / b | 1 & 58 | 14.5 / 20 | 20 / 20 | | | 51.9 dBµV/m @ 10580.0MHz (-16.4dB) |
| Measurements on low and high channels in worst-case OFDM mode. | | | | | | | |
| 5 | g /a | 1 & 52 | 20 / 20 | 20 / 20 | Radiated Emissions, 1 - 12 GHz | FCC 15.209/ 15.247 / 15 E | 43.8 dBµV/m @ 1034.9 MHz (-10.2 dB) |
| | | 11 & 64 | 20 / 20 | | | | 46.4 dBµV/m @ 21275.0 MHz (-7.6 dB) |
| 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). ac160 mode performed in Run 1. | | | | | | | |
| 6 | g /a | 6 & 116 | 20 / 12 | 20 / 20 | Radiated Emissions, 1 - 40 GHz | FCC 15.209/ 15.247 / 15 E | 44.1 dBµV/m @ 22320.7 MHz (-9.9 dB) |
| | ax20 | 6 & 116 | 20 / 14.5 | 20 / 20 | | | 42.8dBµV/m @ 22321.4MHz (-11.2dB) |
| | ax40 | 6 & 110 | 20 / 14.5 | 20 / 20 | | | 50.1 dBµV/m @ 11100.0 MHz (-3.9 dB) |
| | ax80 / b | 6 & 122 | 20 / 14.5 | 20 / 20 | | | 44.4 dBµV/m @ 11220.0 MHz (-9.6 dB) |
| Measurements on low and high channels in worst-case OFDM mode. | | | | | | | |
| 7 | ax40 | 3 & 102 | 20 / 20 | 20 / 20 | Radiated Emissions, 1 - 12 GHz | FCC 15.209/ 15.247 / 15 E | 48.6dBµV/m @ 11019.9MHz (-5.4dB) |
| | | 9 & 142 | 20 / 20 | | | | 43.1dBµV/m @ 22835.7MHz (-10.9dB) |

# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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
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) | |
|---|---|---|---|---|---|---|---|---|
| BLE | 1 Mb/s | 0.65 | Yes | 0.424 | 1.9 | 3.8 | 2358 | 3 kHz |
| ZigBee | - | 0.43 | Yes | 0.858 | 3.7 | 7.4 | 1166 | 2 kHz |
| 11b | 1 Mb/s | 0.78 | Yes | 0.667 | 1.1 | 2.2 | 1499 | 2 kHz |
| 11g | 6 Mb/s | 0.92 | Yes | 1.437 | 0.4 | 0.7 | 696 | 1 kHz |
| 11a | 6 Mb/s | 0.92 | Yes | 1.437 | 0.3 | 0.7 | 696 | 1 kHz |
| ax20 | MCS0 | 0.96 | Yes | 5.485 | 0.2 | 0.3 | 182 | 200 Hz |
| ax40 | MCS0 | 0.96 | Yes | 5.401 | 0.2 | 0.4 | 185 | 200 Hz |
| ax80 | MCS0 | 0.96 | Yes | 5.401 | 0.2 | 0.4 | 185 | 200 Hz |

## Sample Notes

Sample S/N: CNGFK9Y02N (BLE) & CNGFK9Y005 (Zigbee)
Driver: P4 V0.4.5
Antenna: Internal 8 antennas for 5 GHz radio and 4 antennas for 2.4 GHz radio (5GHz radio may also use 4 antennas but with 3 dB higher power and can operate in both lower and upper 5 GHz bands simutaneously). Tests performed with 8 antennas at the 4 antenna 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 2 | Emission in non-restricted band, but limit of 15.209 used. |
| Note 3: | Emission has constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW>1/T but not less than 10Hz, peak detector, linear averaging, auto sweep,max hold 50*1/DC traces (method VB of KDB 789033) |
| Note 4: | Emission has constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW>1/T but not less than 10Hz, peak detector, linear averaging, auto sweep, trace average 100 traces, measurement corrected by linear voltage correction factor |
| Note 5: | -20 dB correction factor was used for ZigBee as 10% operational duty cycle |
| Note 6: | Digital device emission, class A limit extrapolated to 3m applied, peak reading vs peak or average limit. |

# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-RA-FCC |
| | | 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: Rafael Varelas
Test Location: Ft Chamber #5

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

Run #2b: Center Channel

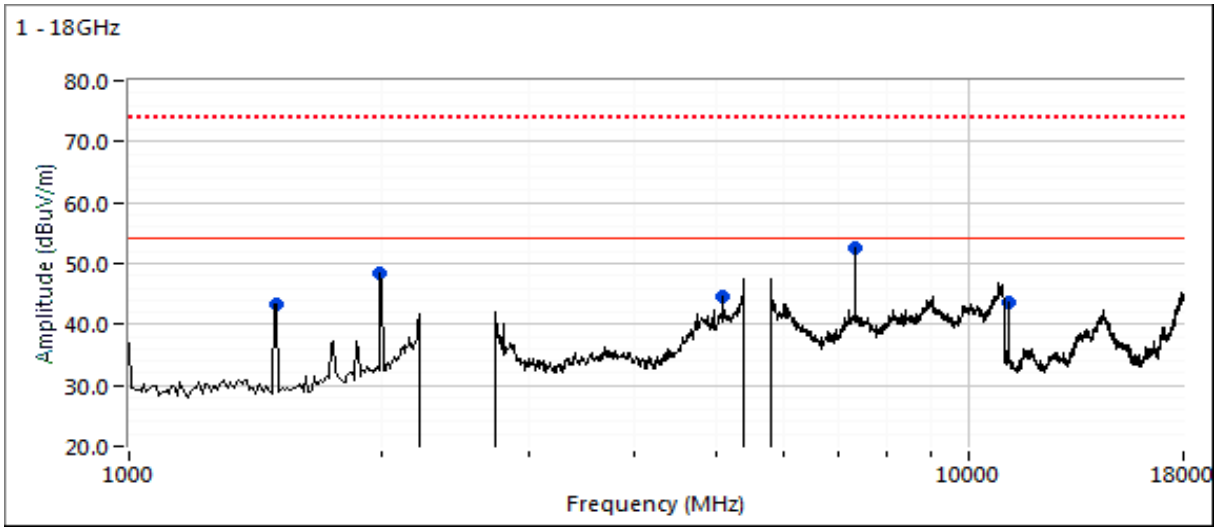
Channel: 6, 116 Wi-Fi, 18 - ZigBee
Tx Chain: 8 (5GHz), 4 (2.4 GHz)

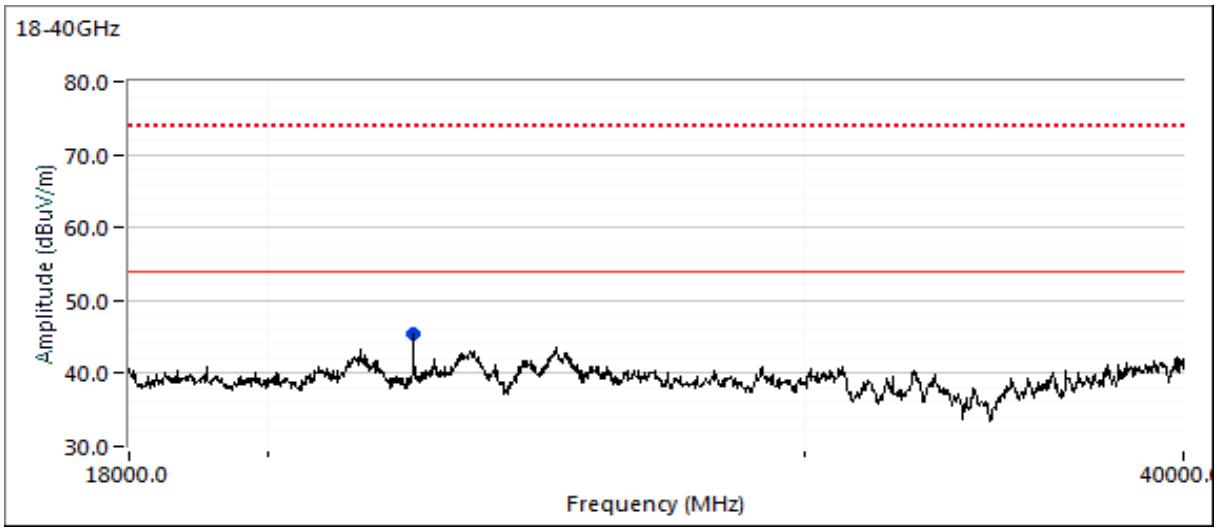
Mode: a, b
Data Rate: 6Mbps, 1

| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBμV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 1500.000 | 43.3 | H | 60.0 | -16.7 | Peak | 129 | 1.0 | Note 6 |
| 2000.000 | 48.3 | H | 60.0 | -11.7 | Peak | 61 | 1.0 | Note 6 |
| 11151.670 | 43.6 | V | 54.0 | -10.4 | Peak | 209 | 1.0 | |
| 22319.690 | 39.1 | V | 54.0 | -14.9 | Vavg | 220 | 1.6 | RB 1 MHz;VB 1 kHz; VAVG 100 |
| 22320.070 | 51.8 | V | 74.0 | -22.2 | PK | 220 | 1.6 | RB 1 MHz;VB 3 MHz;Peak |
| 7321.330 | 37.3 | V | 54.0 | -16.7 | Avg | 187 | 2.0 | Note 5 |
| 7321.530 | 57.3 | V | 74.0 | -16.7 | PK | 187 | 2.0 | RB 1 MHz;VB 3 MHz;Peak |
| 5084.750 | 37.2 | V | 54.0 | -16.8 | Vavg | 250 | 2.0 | RB 1 MHz;VB 1 kHz; VAVG 100 |
| 5085.320 | 49.7 | V | 74.0 | -24.3 | PK | 250 | 2.0 | RB 1 MHz;VB 3 MHz;Peak |

| | |
|---|---|
| Note 1: | For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements. |
| Note 2: | For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m) for emissions related to UNII operation. The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector). |

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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: a, b

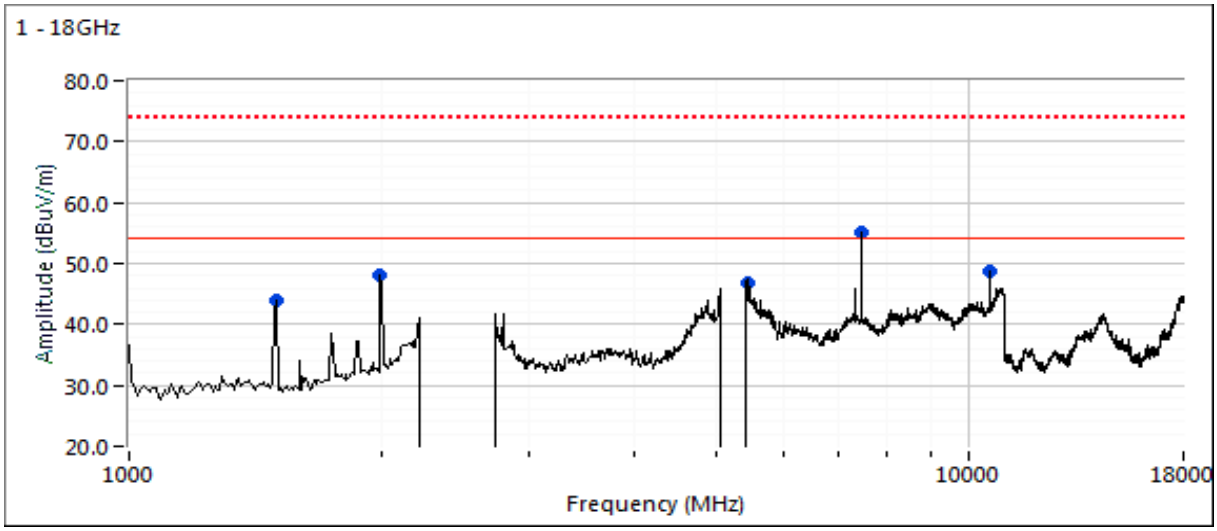
Tx Chain: 8 (5GHz), 4 (2.4 GHz)  Data Rate: 6Mbps, 1

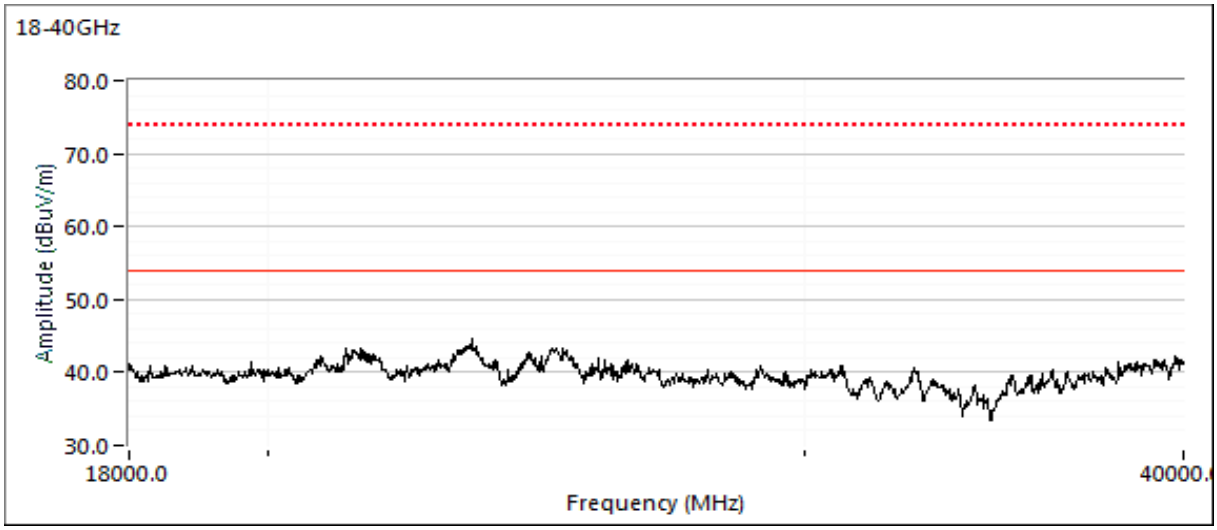
| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBμV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 1500.000 | 43.9 | H | 54.0 | -10.1 | Peak | 120 | 1.0 | |
| 2000.000 | 48.2 | H | 60.0 | -11.8 | Peak | 62 | 2.2 | Note 6 |
| 7438.690 | 38.2 | V | 54.0 | -15.8 | Avg | 222 | 1.0 | Note 5 |
| 7441.490 | 58.2 | V | 74.0 | -15.8 | PK | 222 | 1.0 | RB 1 MHz;VB 3 MHz;Peak |
| 10599.870 | 47.2 | V | 54.0 | -6.8 | Vavg | 191 | 1.0 | RB 1 MHz;VB 1 kHz; VAVG 100 |
| 10599.810 | 55.3 | V | 74.0 | -18.7 | PK | 191 | 1.0 | RB 1 MHz;VB 3 MHz;Peak |
| 5454.860 | 40.9 | H | 54.0 | -13.1 | Avg | 130 | 1.7 | RB 1 MHz;VB 1 kHz; VAVG 100 |
| 5455.100 | 52.3 | H | 74.0 | -21.7 | PK | 130 | 1.7 | RB 1 MHz;VB 3 MHz;Peak |

| | |
|---|---|
| Note 1: | For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements. |
| Note 2: | For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m) for emissions related to UNII operation. The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector). |

# EMC Test Data

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

Run #2e: Center Channel

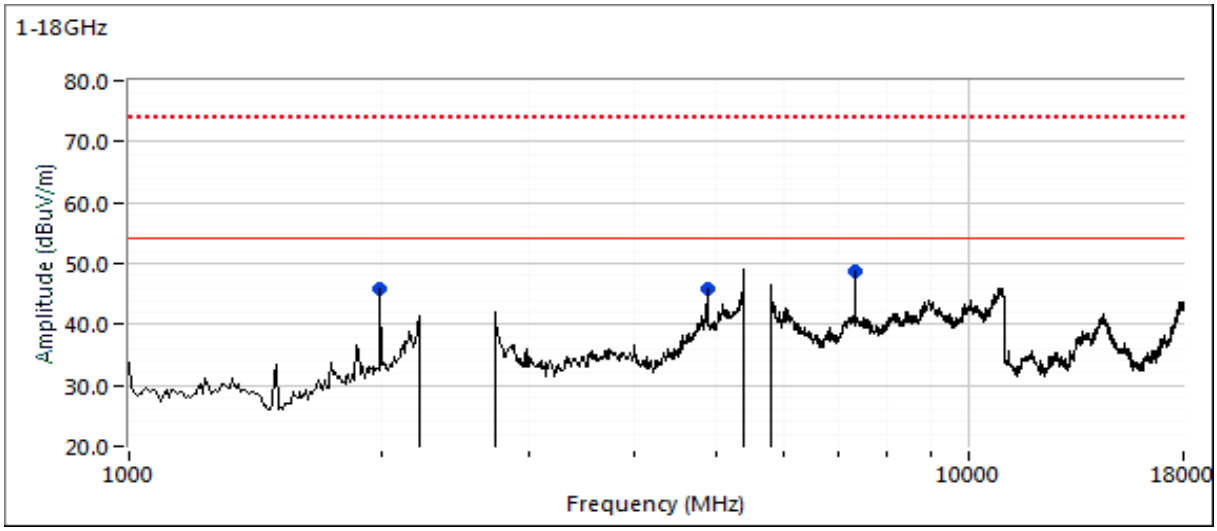
Channel: 6, 116 Wi-Fi, 17 - BLE  Mode: a, b

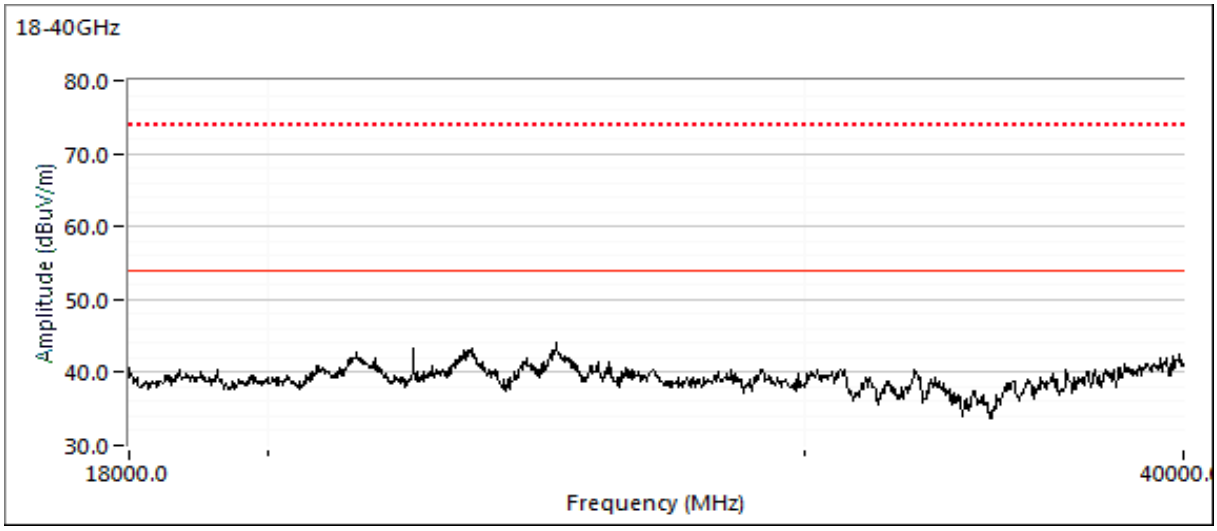
Tx Chain: 8 (5GHz), 4 (2.4 GHz)  Data Rate: 6Mbps, 1

| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBμV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 2000.000 | 46.0 | V | 60.0 | -14.0 | Peak | 184 | 1.0 | Note 6 |
| 7319.270 | 49.4 | V | 54.0 | -4.6 | Vavg | 220 | 1.3 | VB 3 kHz;Peak VAVG 100 |
| 7320.750 | 55.5 | V | 74.0 | -18.5 | PK | 220 | 1.3 | RB 1 MHz;VB 3 MHz;Peak |
| 4879.790 | 46.1 | V | 54.0 | -7.9 | Vavg | 210 | 1.1 | VB 3 kHz;Peak VAVG 100 |
| 4879.380 | 51.0 | V | 74.0 | -23.0 | PK | 210 | 1.1 | RB 1 MHz;VB 3 MHz;Peak |

| | |
|---|---|
| Note 1: | For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements. |
| Note 2: | For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m) for emissions related to UNII operation. The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector). |

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

Run #2f: Center Channel

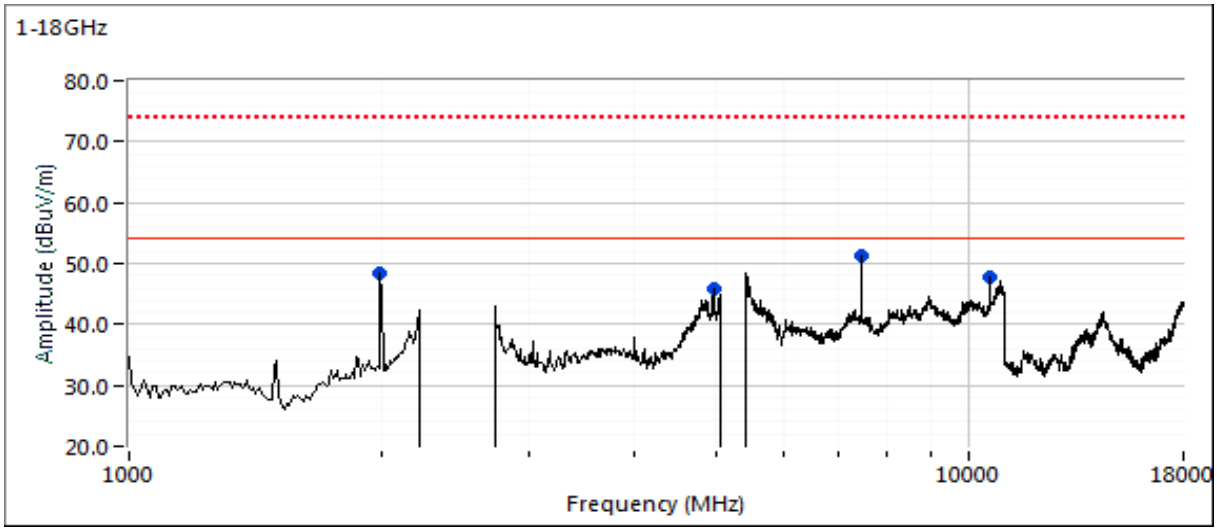
Channel: 6, 60 Wi-Fi, 39 - BLE  Mode: a, b

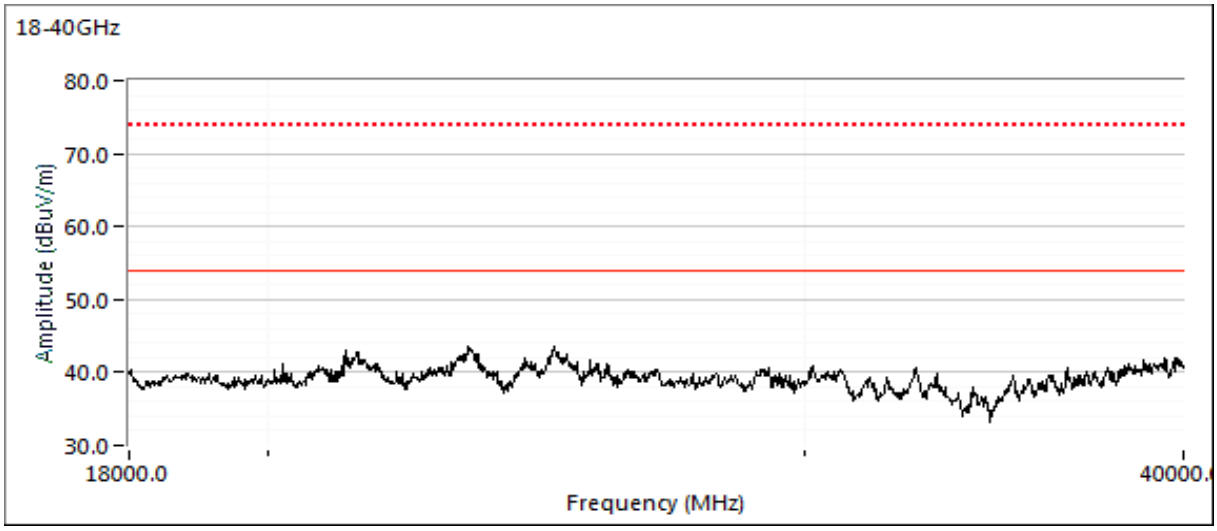
Tx Chain: 8 (5GHz), 4 (2.4 GHz)  Data Rate: 6Mbps, 1

| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBμV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 2000.000 | 48.5 | H | 60.0 | -11.5 | Peak | 95 | 2.2 | Note 6 |
| 7439.330 | 49.4 | V | 54.0 | -4.6 | Vavg | 218 | 1.3 | VB 3 kHz;Peak VAVG 100 |
| 7440.520 | 56.1 | V | 74.0 | -17.9 | PK | 218 | 1.3 | RB 1 MHz;VB 3 MHz;Peak |
| 10599.930 | 47.3 | V | 54.0 | -6.7 | Vavg | 180 | 1.4 | VB 1 kHz;Peak VAVG 100 |
| 10599.970 | 55.4 | V | 74.0 | -18.6 | PK | 180 | 1.4 | RB 1 MHz;VB 3 MHz;Peak |
| 4954.130 | 40.2 | V | 54.0 | -13.8 | Vavg | 118 | 1.6 | VB 1 kHz;Peak VAVG 100 |
| 4955.520 | 49.0 | V | 74.0 | -25.0 | PK | 118 | 1.6 | RB 1 MHz;VB 3 MHz;Peak |

| | |
|---|---|
| Note 1: | For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements. |
| Note 2: | For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m) for emissions related to UNII operation. The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector). |

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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

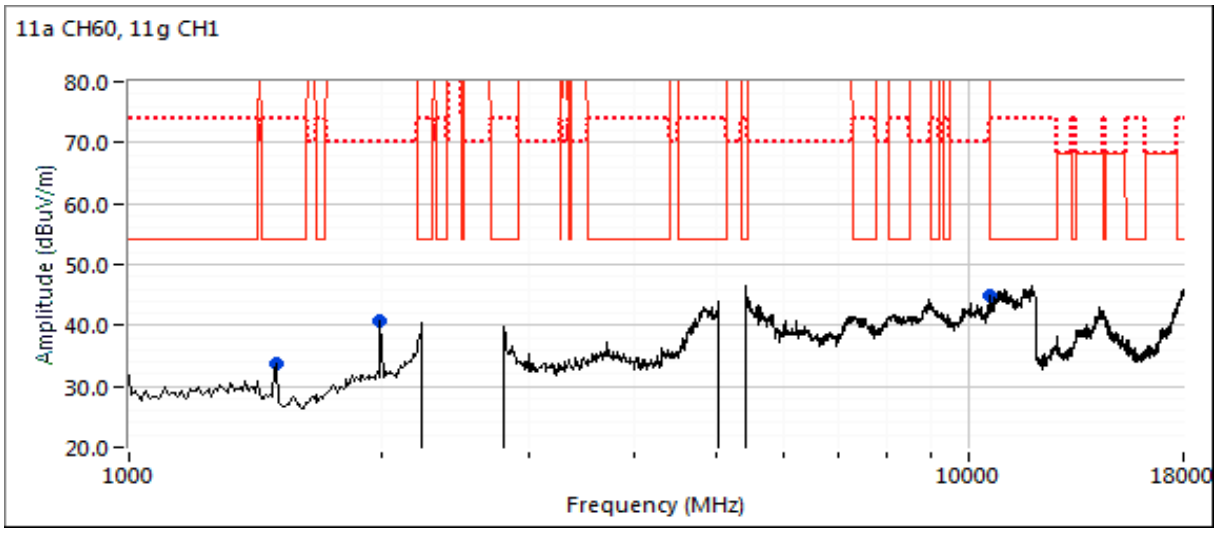
Date of Test: 10/26/18 — Config. Used: 1
Test Engineer: John Caizzi — Config. Used: none
Test Location: Chamber 4 — EUT Voltage: PoE & 120V / 60Hz

Run #4a: Center Channel

Channel: 1 & 60 Wi-Fi — Mode: a, g — Power: 20/20
Tx Chain: 8 (5GHz), 4 (2.4 GHz) — Data Rate: 6 Mb/s

| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBμV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 21195.680 | 46.2 | V | 54.0 | -7.8 | Avg | 25 | 1.1 | VB 1 kHz, note 3 |
| 21195.700 | 55.3 | V | 74.0 | -18.7 | PK | 25 | 1.1 | RB 1 MHz;VB 3 MHz;Peak |
| 10599.980 | 44.6 | V | 54.0 | -9.4 | Avg | 357 | 2.02 | VB 1 kHz, note 3 |
| 10599.980 | 52.6 | V | 74.0 | -21.4 | PK | 357 | 2.02 | RB 1 MHz;VB 3 MHz;Peak |
| 1500.000 | 33.8 | V | 60.0 | -26.2 | Peak | 161 | 2.0 | Note 6 |
| 2000.000 | 40.9 | V | 60.0 | -19.1 | Peak | 262 | 1.5 | Note 6 |

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



# EMC Test Data

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

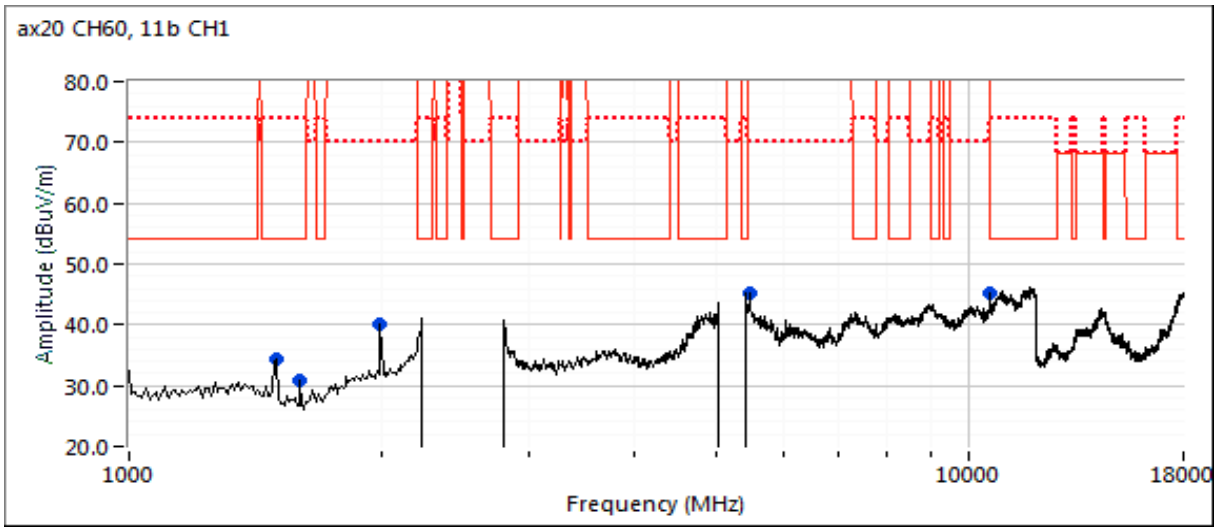
Run #4b: Center Channel

Channel: 1 & 60 Wi-Fi  Mode: ax20, b

Tx Chain: 8 (5GHz), 4 (2.4 GHz)  Data Rate: MCS0 & 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 | 34.3 | V | 60.0 | -25.7 | Peak | 142 | 1.5 | Note 6 |
| 2000.000 | 40.0 | V | 60.0 | -20.0 | Peak | 193 | 1.5 | Note 6 |
| 5472.220 | 51.0 | H | | | PK | 297 | 1.61 | See bandedge measurements |
| 10599.880 | 52.9 | V | 74.0 | -21.1 | PK | 358 | 2.02 | RB 1 MHz;VB 3 MHz;Peak |
| 10599.980 | 44.2 | V | 54.0 | -9.8 | Avg | 358 | 2.02 | VB 300 Hz, note 3 |
| 21203.990 | 58.4 | V | 74.0 | -15.6 | PK | 25 | 1.05 | RB 1 MHz;VB 3 MHz;Peak |
| 21204.370 | 43.6 | V | 54.0 | -10.4 | AVG | 25 | 1.05 | RB 1 MHz;VB 300 Hz; note 3 |

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



# EMC Test Data

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

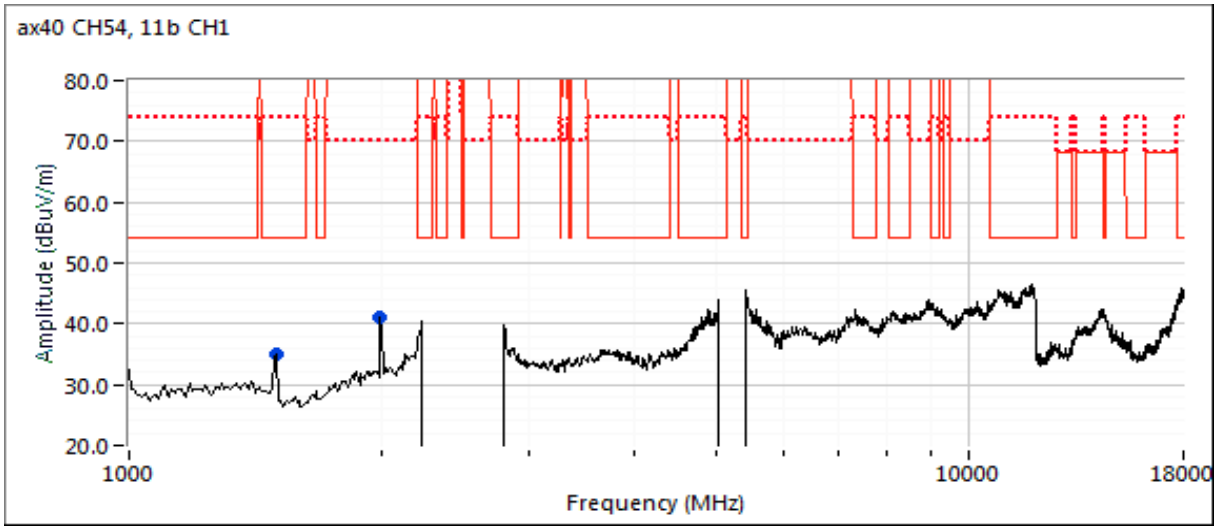
Run #4c: Center Channel

Channel: 1 & 54 Wi-Fi  Mode: ax40, b  Power: 20/20

Tx Chain: 8 (5GHz), 4 (2.4 GHz)  Data Rate: MCS0 & 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 | |
| 21076.630 | 33.9 | V | 54.0 | -20.1 | VAVG | 16 | 1.0 | RB 1 MHz;VB 1 kHz; note 3 |
| 21078.830 | 46.6 | V | 74.0 | -27.4 | PK | 16 | 1.0 | RB 1 MHz;VB 3 MHz;Peak |
| 1500.000 | 35.0 | V | 60.0 | -25.0 | Peak | 34 | 1.5 | Note 6 |

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



# EMC Test Data

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

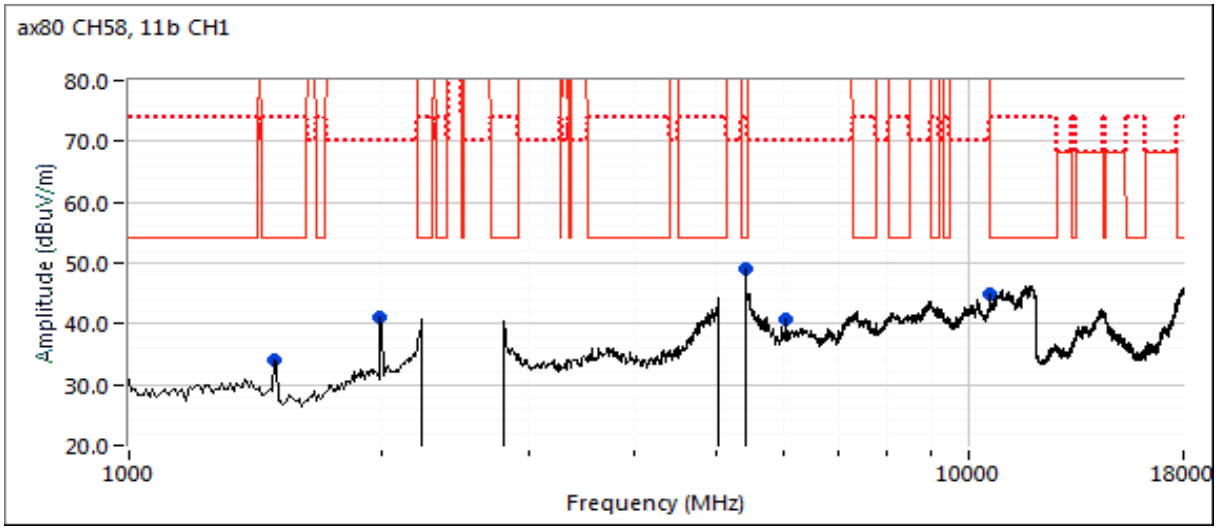
Run #4d: Center Channel

Channel: 1 & 58 Wi-Fi  Mode: ax80 / b  Power: 20/20

Tx Chain: 8 (5GHz), 4 (2.4 GHz)  Data Rate: MCS0 & 1 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 | 34.0 | V | 54.0 | -20.0 | Peak | 32 | 1.5 | Note 6 |
| 2000.000 | 41.0 | V | 70.0 | -29.0 | Peak | 259 | 1.5 | Note 6 |
| 5416.670 | 49.0 | V | | | Peak | 296 | 1.0 | See bandedge measurements. |
| 10579.950 | 51.9 | V | 68.3 | -16.4 | PK | 357 | 2.0 | RB 1 MHz;VB 3 MHz;Peak |
| 6048.280 | 45.8 | H | 68.3 | -22.5 | PK | 293 | 1.4 | RB 1 MHz;VB 3 MHz;Peak |
| 21055.380 | 33.7 | V | 54.0 | -20.3 | VAVG | 16 | 1.0 | RB 1 MHz;VB 1 kHz; note 3 |
| 21056.100 | 46.2 | V | 68.3 | -22.1 | PK | 16 | 1.0 | RB 1 MHz;VB 3 MHz;Peak |

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



# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-RA-FCC |
| | | 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 Run #4

Date of Test: 10/31/18 — Config. Used: 1

Test Engineer: M. Birgani — Config Change: -

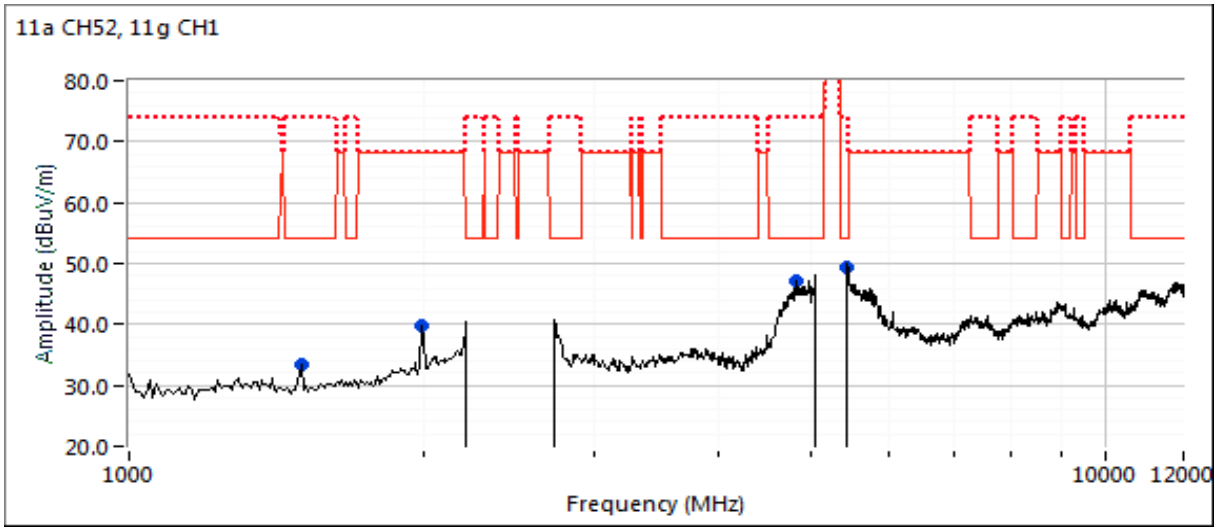
Test Location: Chamber 7 — EUT Voltage: PoE & 120/60Hz

Run #5a: Low Channel

Channel/Mode/Rate/Chains/Power: 1/g/6Mbps/4/20 — Channel/Mode/Rate/Chains/Power: 52/a/6Mbps/8/20

| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBμV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 1500.000 | 33.5 | V | 60.0 | -26.5 | Peak | 291 | 1.5 | Note 6 |
| 2000.000 | 39.8 | V | 60.0 | -20.2 | Peak | 306 | 1.0 | Note 6 |
| 4830.230 | 43.0 | H | 54.0 | -11.0 | Avg | 303 | 1.72 | VB 1 kHz, note 3 |
| 4822.870 | 55.6 | H | 74.0 | -18.4 | PK | 303 | 1.72 | RB 1 MHz;VB 3 MHz;Peak |
| 5433.330 | 49.3 | H | | | Peak | 306 | 1.5 | See bandedge measurement. |
| 21034.940 | 43.8 | V | 54.0 | -10.2 | VAVG | 340 | 1.1 | RB 1 MHz;VB 1 kHz |
| 21036.030 | 58.3 | V | 74.0 | -15.7 | PK | 340 | 1.1 | RB 1 MHz;VB 3 MHz;Peak |

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



# EMC Test Data

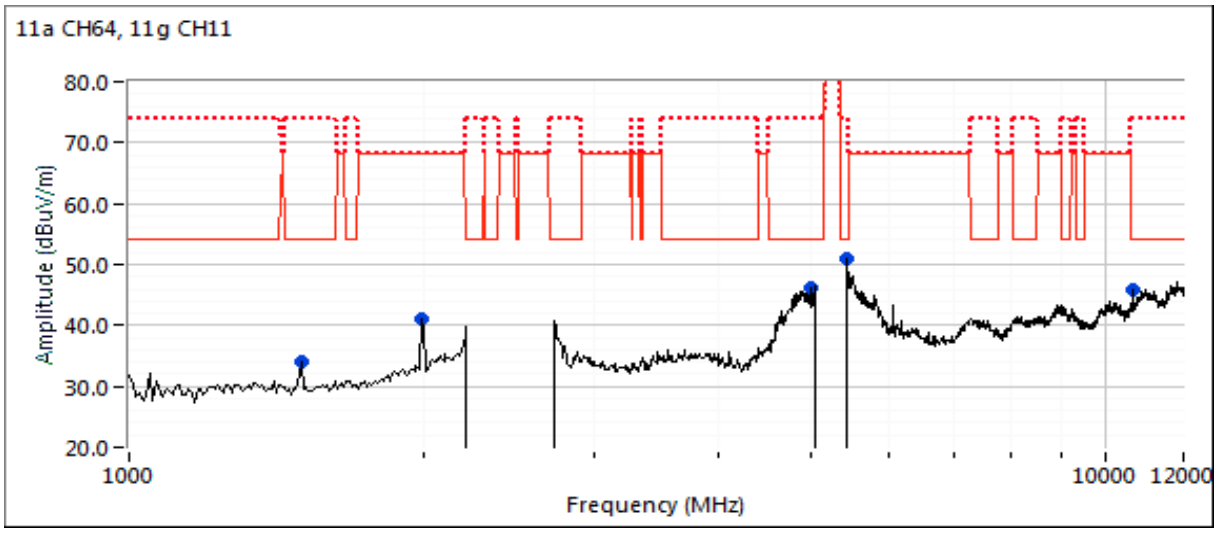
| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-RA-FCC |
| | | Project Manager: | Christine Krebill |
| Contact: | Mark Hill | Project Coordinator: | David Bare |
| Standard: | FCC §15.247 &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

Run #5b: High Channel

Channel/Mode/Rate/Chains/Power: 11/g/6Mbps/4/20 Channel/Mode/Rate/Chains/Power: 64/a/6Mbps/8/20

| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 1500.000 | 34.0 | V | 60.0 | -26.0 | Peak | 326 | 1.0 | Note 6 |
| 2000.000 | 41.1 | V | 60.0 | -18.9 | Peak | 336 | 1.0 | Note 6 |
| 4961.470 | 42.1 | H | 54.0 | -11.9 | Avg | 299 | 1.73 | VB 1 kHz, note 3 |
| 4957.400 | 55.1 | H | 74.0 | -18.9 | PK | 299 | 1.73 | RB 1 MHz;VB 3 MHz;Peak |
| 5425.000 | 50.8 | H | | | Peak | 294 | 2.0 | See bandedge measurement. |
| 10640.000 | 44.3 | V | 54.0 | -9.7 | Avg | 8 | 2.04 | VB 1 kHz, note 3 |
| 10639.820 | 51.6 | V | 74.0 | -22.4 | PK | 8 | 2.04 | |
| 21275.030 | 46.4 | V | 54.0 | -7.6 | VAVG | 340 | 1.1 | RB 1 MHz;VB 1 kHz |
| 21275.720 | 59.3 | V | 74.0 | -14.7 | PK | 340 | 1.1 | RB 1 MHz;VB 3 MHz;Peak |

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



# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-RA-FCC |
| | | 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: 10/29/18
Test Engineer: John Caizzi
Test Location: Chamber 4

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

Run #6a: Center Channel

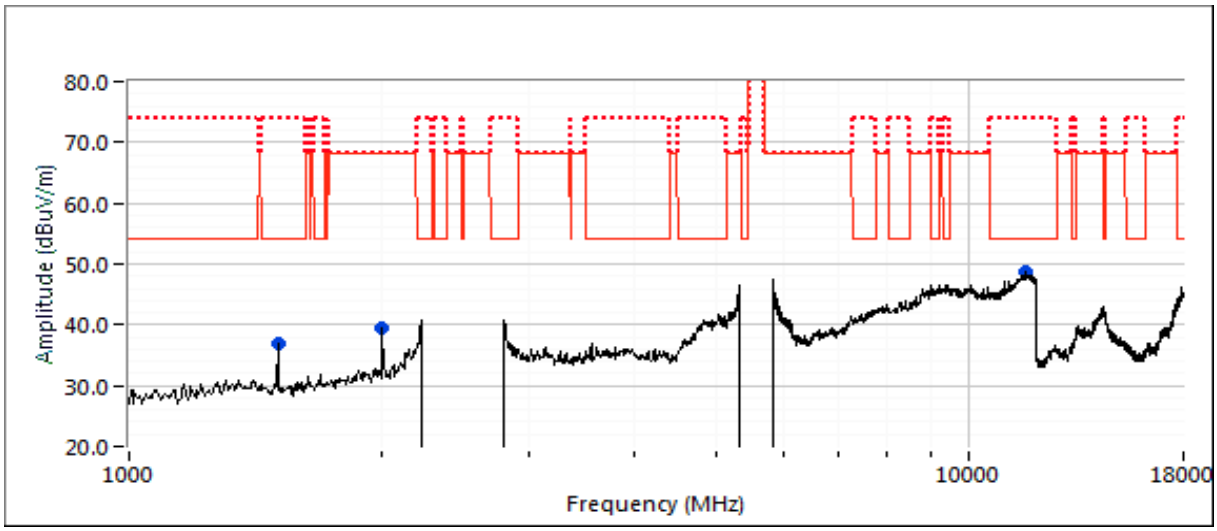
Channel: 6 & 116 Wi-Fi
Tx Chain: 8 (5GHz), 4 (2.4 GHz)

Mode: g, a
Data Rate:

Power: 20 / 12

| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 11694.250 | 42.3 | V | 54.0 | -11.7 | Avg | 88 | 2.5 | VB 1 kHz, note 3 |
| 11696.480 | 53.3 | V | 74.0 | -20.7 | PK | 88 | 2.5 | RB 1 MHz;VB 3 MHz;Peak |
| 22320.720 | 44.1 | V | 54.0 | -9.9 | AVG | 28 | 1.0 | RB 1 MHz;VB 1 kHz; note 3 |
| 22321.060 | 57.4 | V | 74.0 | -16.6 | PK | 28 | 1.0 | RB 1 MHz;VB 3 MHz;Peak |
| 1500.000 | 36.9 | V | 60.0 | -23.1 | Peak | 63 | 1.0 | Note 6 |
| 2000.000 | 39.4 | V | 60.0 | -20.6 | Peak | 345 | 1.0 | Note 6 |

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



# EMC Test Data

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

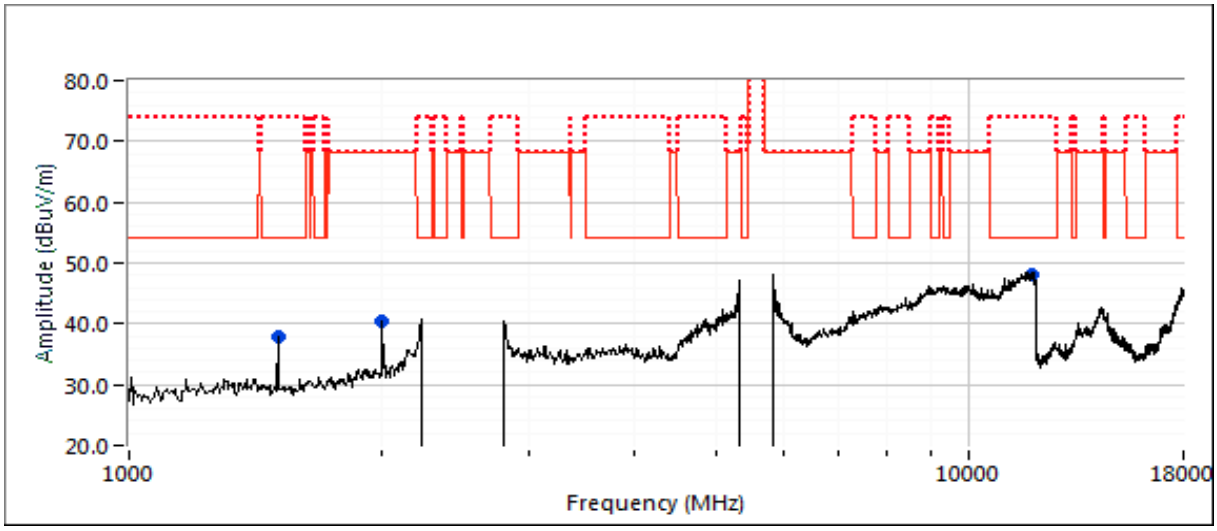
Run #6b: Center Channel

Channel: 6 & 116 Wi-Fi  Mode: ax20 / ax20  Power: 20 /20

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 | |
| 11890.500 | 41.9 | H | 54.0 | -12.1 | Avg | 316 | 2.0 | VB 300 Hz, note 3. |
| 11889.990 | 53.3 | H | 74.0 | -20.7 | PK | 316 | 2.0 | RB 1 MHz;VB 3 MHz;Peak |
| 22321.440 | 42.8 | V | 54.0 | -11.2 | VAVG | 28 | 1.2 | RB 1 MHz;VB 300 Hz; note 3 |
| 22321.160 | 57.4 | V | 74.0 | -16.6 | PK | 28 | 1.2 | RB 1 MHz;VB 3 MHz;Peak |
| 1500.000 | 37.8 | V | 60.0 | -22.2 | Peak | 165 | 1.0 | Note 6 |
| 2000.000 | 40.3 | V | 60.0 | -19.7 | Peak | 175 | 1.5 | Note 6 |

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



# EMC Test Data

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

Run #6c: Center Channel

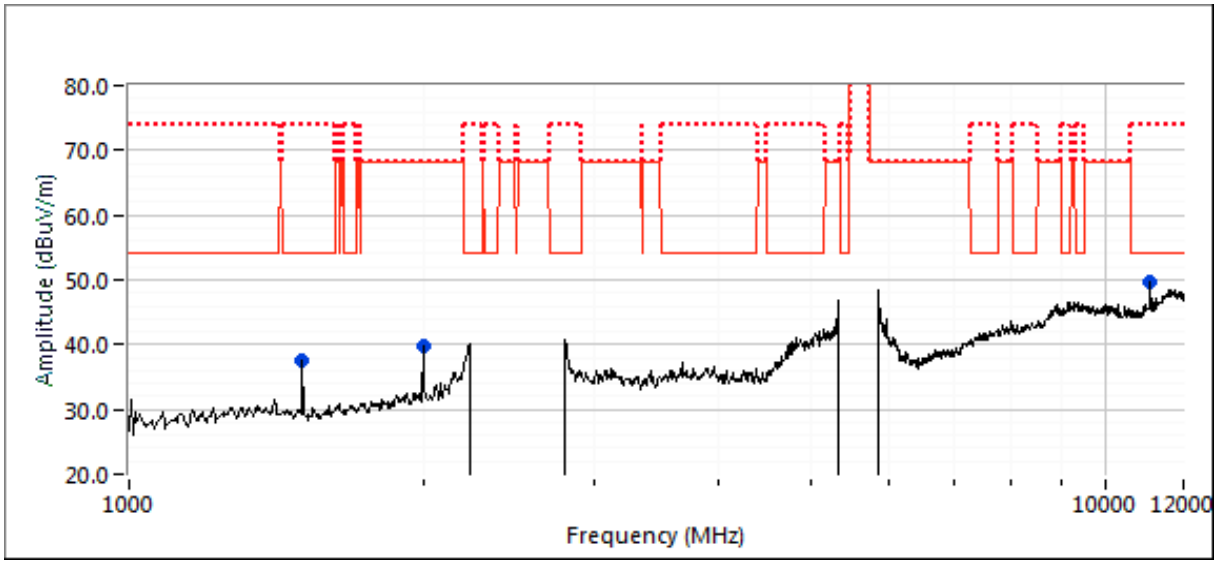
Channel: 6 & 110 Wi-Fi  Mode: 11ax40, b

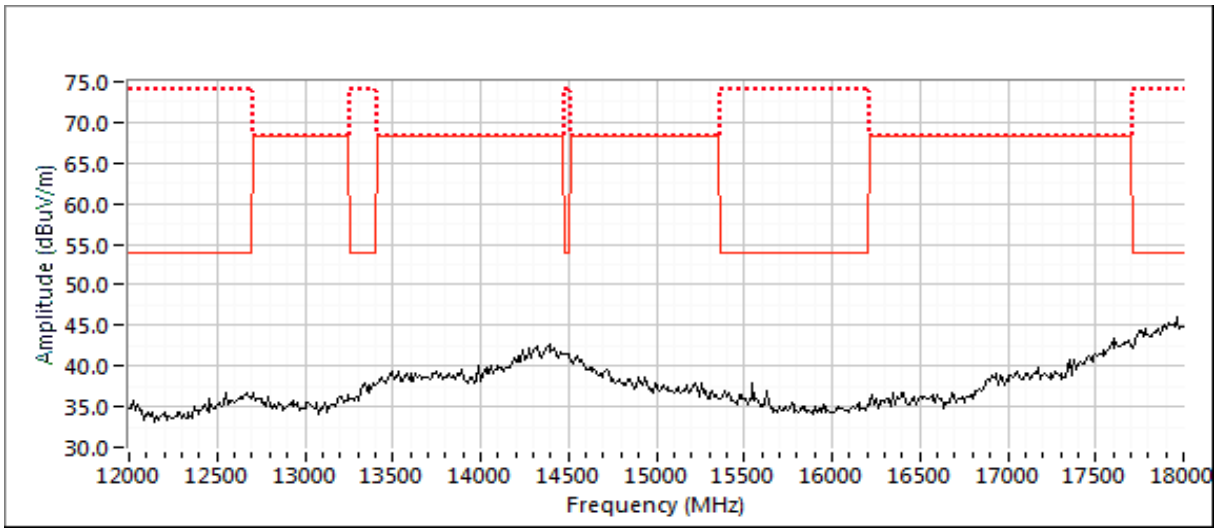
Tx Chain: 8 (5GHz), 4 (2.4 GHz)  Data Rate: 1 Mb/s & MCS0

| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBμV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 11099.950 | 50.1 | V | 54.0 | -3.9 | Avg | 29 | 1.9 | VB 300 Hz, note 3. |
| 11099.780 | 55.8 | V | 74.0 | -18.2 | PK | 29 | 1.9 | RB 1 MHz;VB 3 MHz;Peak |
| 22192.400 | 37.4 | V | 54.0 | -16.6 | Avg | 32 | 1.0 | VB 300 Hz, note 3. |
| 22193.500 | 50.8 | V | 74.0 | -23.2 | PK | 32 | 1.0 | RB 1 MHz;VB 3 MHz;Peak |
| 1500.000 | 37.5 | V | 60.0 | -22.5 | Peak | 78 | 1.0 | Note 6 |
| 2000.000 | 39.9 | V | 60.0 | -20.1 | Peak | 145 | 1.5 | Note 6 |

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

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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

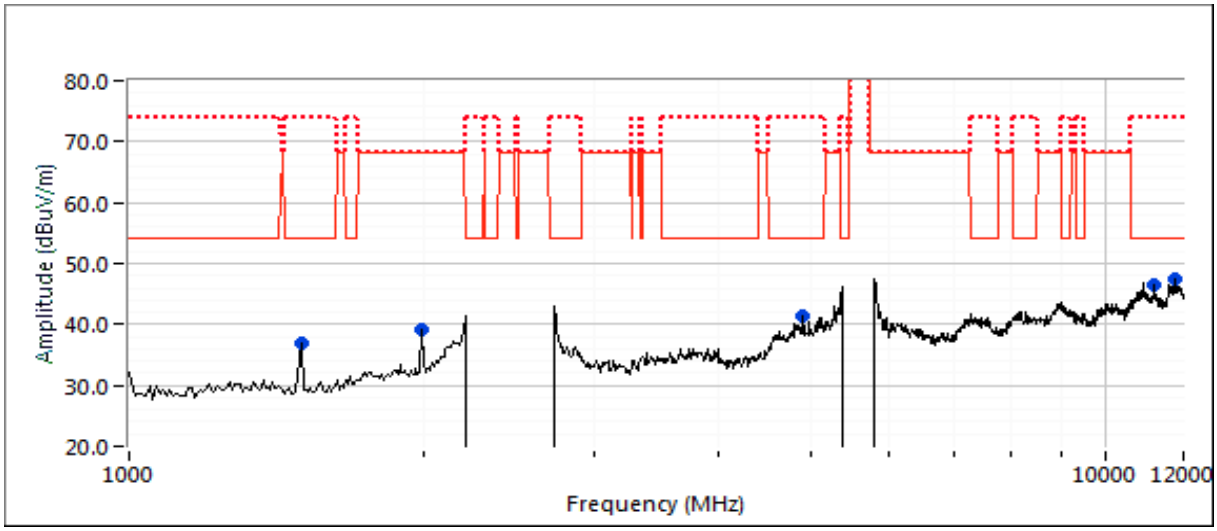
Channel: 6 & 122 Wi-Fi  Mode: ax80 / b  Note: Channel 122 not used in Canada

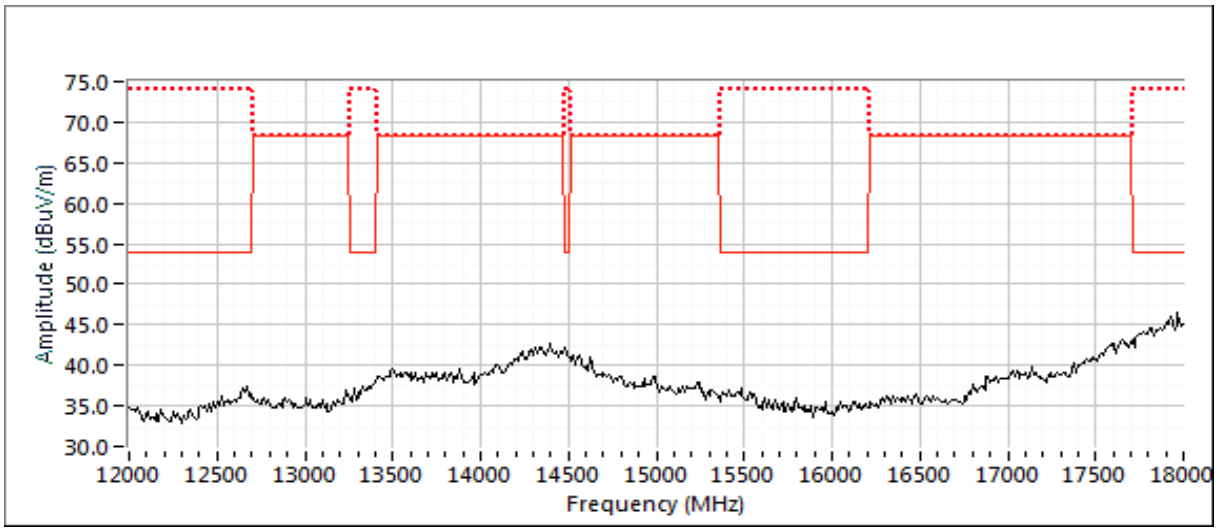
Tx Chain: 8 (5GHz), 4 (2.4 GHz)  Data Rate: 1 Mb/s & MCS0

| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBμV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 1500.000 | 36.8 | H | 60.0 | -23.2 | Peak | 205 | 2.0 | Note 6 |
| 2000.000 | 39.1 | V | 60.0 | -20.9 | Peak | 150 | 1.5 | Note 6 |
| 4895.950 | 37.4 | H | 54.0 | -16.6 | Avg | 30 | 2.0 | VB 3 kHz, note 3 |
| 4896.070 | 46.8 | H | 74.0 | -27.2 | PK | 30 | 2.0 | RB 1 MHz;VB 3 MHz;Peak |
| 11219.980 | 44.4 | V | 54.0 | -9.6 | Avg | 146 | 1.5 | VB 3 kHz, note 3 |
| 11219.900 | 52.4 | V | 74.0 | -21.6 | PK | 146 | 1.5 | RB 1 MHz;VB 3 MHz;Peak |
| 22439.970 | 37.8 | V | 54.0 | -16.2 | Avg | 3 | 1.0 | VB 3 kHz, note 3 |
| 22439.970 | 51.2 | V | 74.0 | -22.8 | PK | 3 | 1.0 | RB 1 MHz;VB 3 MHz;Peak |

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

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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 Run #6

Date of Test: 10/31/18 — Config. Used: 1

Test Engineer: M. Birgani — Config Change: -

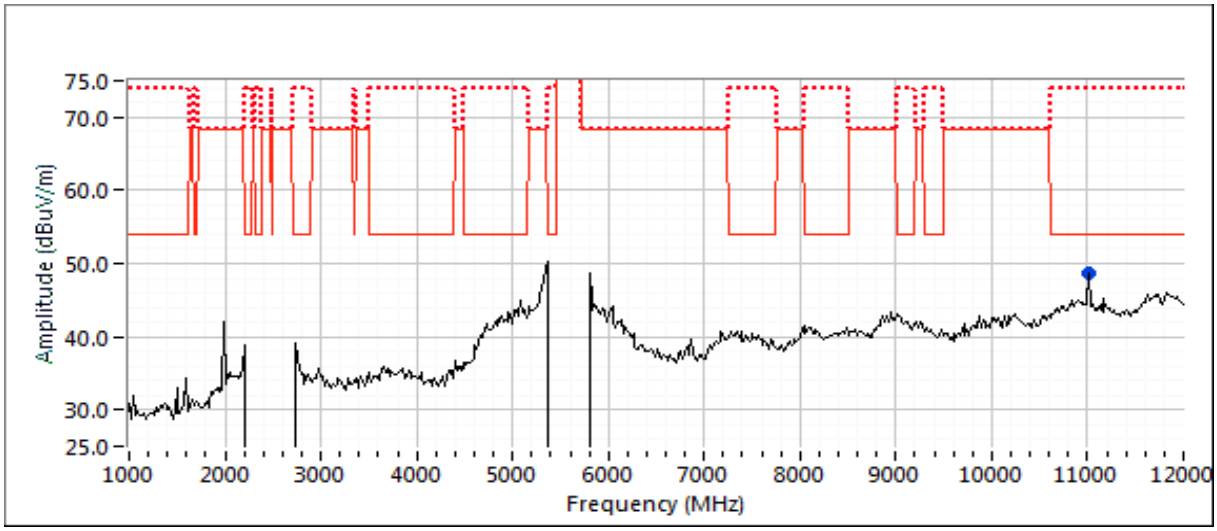
Test Location: Chamber 7 — EUT Voltage: PoE & 120/60Hz

Run #7a: Low Channel

Channel/Mode/Rate/Chains/Power: 3/ax40/MCS0/4/20 — Channel/Mode/Rate/Chains/Power: 102/ax40/MCS0/8/20

| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBμV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 11019.890 | 48.6 | V | 54.0 | -5.4 | VAVG | 26 | 1.0 | RB 1 MHz;VB 300 Hz |
| 22038.260 | 41.8 | V | 54.0 | -12.2 | VAVG | 24 | 1.1 | RB 1 MHz;VB 300 Hz |
| 22038.660 | 56.1 | V | 74.0 | -17.9 | PK | 24 | 1.1 | RB 1 MHz;VB 3 MHz;Peak |
| 11019.950 | 55.2 | V | 74.0 | -18.8 | PK | 26 | 1.0 | RB 1 MHz;VB 3 MHz;Peak |

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



# EMC Test Data

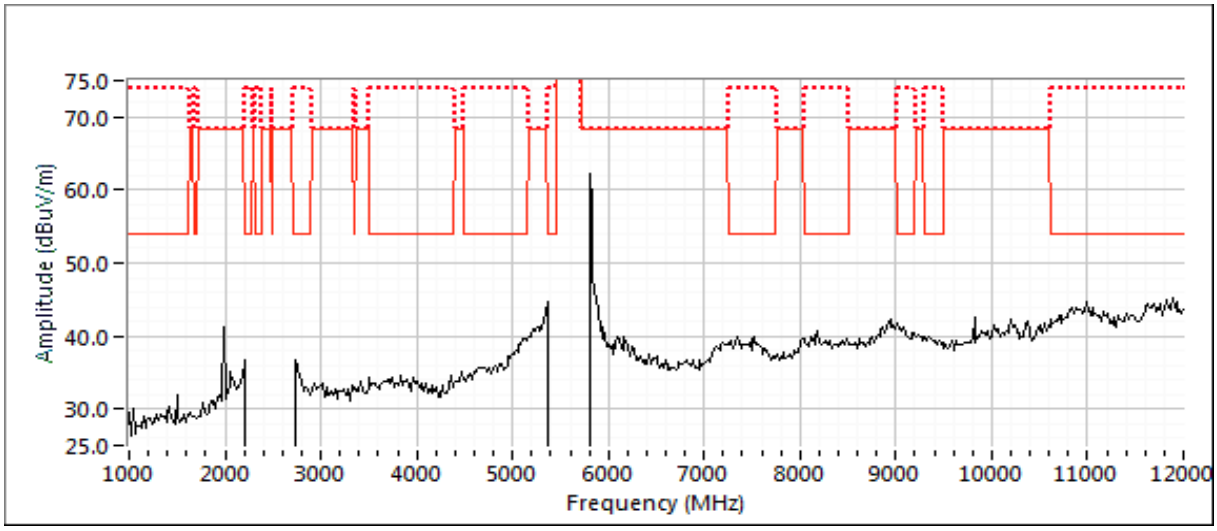
| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-RA-FCC |
| | | Project Manager: | Christine Krebill |
| Contact: | Mark Hill | Project Coordinator: | David Bare |
| Standard: | FCC §15.247 &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

Run #7b: High Channel

Channel/Mode/Rate/Chains/Power: 9/ax40/MCS0/4/20 Channel/Mode/Rate/Chains/Power: 142/ax40/MCS0/8/20

| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 22835.730 | 43.1 | V | 54.0 | -10.9 | Avg | 332 | 1.92 | VB 300 Hz, note 3. |
| 22835.450 | 57.1 | V | 74.0 | -16.9 | PK | 332 | 1.92 | RB 1 MHz;VB 3 MHz;Peak |

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



# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-RA-FCC |
| | | 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: 17-21 °C
Rel. Humidity: 38-45 %

### Modifications Made During Testing

No modifications were made to the EUT during testing

### Deviations From The Standard

No deviations were made from the requirements of the standard.

### Summary of Results

| Run # | Mode | Channel | Target Power | Power Setting | Test Performed | Limit | Result / Margin |
|---|---|---|---|---|---|---|---|
| 20MHz Bandwith Modes | | | | | | | |
| 2 | a | 1, 64 & 100 Wi-Fi 37 - BLE | 20 / 14 / 16 / 8 | 20 / 14 16 / 8 | Restricted Band Edge at 5350 MHz | 15.209 | 45.1 dBµV/m @ 5350.1 MHz (-8.9 dB) |
| 3 | a | 1, 64 & 100 Wi-Fi 37 - BLE | 20 / 14 / 16 / 8 | 20 / 14 / 16 / 8 | Restricted Band Edge at 5460 MHz | 15.209 | 50.1 dBµV/m @ 5460.0 MHz (-3.9 dB) |
| | a | 1, 64 & 100 Wi-Fi 37 - BLE | 20 / 14 / 16 / 8 | 20 / 14 / 16 / 8 | Band Edge 5460 - 5470 MHz | 15E | 65.0 dBµV/m @ 5469.5 MHz (-3.3 dB) |
| | a | 1, 64 & 140 Wi-Fi 37 - BLE | 20 / 14 / 16 / 8 | 20 / 14 / 13 / 8 | Band Edge 5725MHz | 15E | 67.8 dBµV/m @ 5729.7 MHz (-0.5 dB) |

# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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 | Target Power | Power Setting | Test Performed | Limit | Result / Margin |
|---|---|---|---|---|---|---|---|
| 20MHz Bandwith Modes | | | | | | | |
| 5 | ax20 | 1, 36 & 100 Wi-Fi 37 - BLE | 20 / 14.5 / 13.5 / 8 | 20 / 14.5 / 13.5 / 8 | Restricted Band Edge at 5150 MHz | 15.209 | 52.8 dBµV/m @ 5148.7 MHz (-1.2 dB) |
| 6 | ax20 | 1, 64 & 100 Wi-Fi 37 - BLE | 20 / 14 / 13.5 / 8 | 20 / 14 / 13.5 / 8 | Restricted Band Edge at 5350 MHz | 15.209 | 48.7 dBµV/m @ 5350.0 MHz (-5.3 dB) |
| 7 | ax20 | 1, 64 & 100 Wi-Fi 37 - BLE | 20 / 14 / 13.5 / 8 | 20 / 14 / 13.5 / 8 | Restricted Band Edge at 5460 MHz | 15.209 | 43.6 dBµV/m @ 5459.8 MHz (-10.4 dB) |
| | ax20 | 1, 64 & 100 Wi-Fi 37 - BLE | 20 / 14 / 13.5 / 8 | 20 / 14 / 13.5 / 8 | Band Edge 5460 - 5470 MHz | 15E | 56.5 dBµV/m @ 5463.0 MHz (-11.8 dB) |
| | ax20 | 1, 64 & 140 Wi-Fi 37 - BLE | 20 / 14 / 16 / 8 | 20 / 14 / 16 / 8 | Band Edge 5725MHz | 15E | 55.5 dBµV/m @ 5732.6 MHz (-12.8 dB) |
| 40MHz Bandwith Modes | | | | | | | |
| 10 | ax40 | 1, 62 & 102 Wi-Fi 37 - BLE | 20 / 15 / 14.5 / 8 | 20 / 13 / 14.5 / 8 | Restricted Band Edge at 5350 MHz | 15.209 | 52.7 dBµV/m @ 5350.1 MHz (-1.3 dB) |
| 11 | ax40 | 1, 62 & 102 Wi-Fi 37 - BLE | 20 / 15 / 14.5 / 8 | 20 / 13 / 14.5 / 8 | Restricted Band Edge at 5460 MHz | 15.209 | 52.7 dBµV/m @ 5350.1 MHz (-1.3 dB) |
| | ax40 | 1, 62 & 102 Wi-Fi 37 - BLE | 20 / 15 / 14.5 / 8 | 20 / 13 / 14.5 / 8 | Band Edge 5460 - 5470 MHz | 15E | 58.1 dBµV/m @ 5470.0 MHz (-10.2 dB) |
| | ax40 | 1, 62 & 134 Wi-Fi 37 - BLE | 20 / 15 / 14.5 / 8 | 20 / 13 / 14.5 / 8 | Band Edge 5725MHz | 15E | 66.6 dBµV/m @ 5761.0 MHz (-1.7 dB) |
| 80MHz Bandwith Modes | | | | | | | |
| 14 | ax80 | 1, 58 & 106 Wi-Fi 37 - BLE | 20 / 14.5 / 13.5 / 8 | 20/11.5/ 13.5/8 | Restricted Band Edge at 5350 MHz | 15.209 | 53.5 dBµV/m @ 5350.1 MHz (-0.5 dB) |
| 15 | ax80 | 1, 58 & 106 Wi-Fi 37 - BLE | 20 / 14.5 / 13.5 / 8 | 20/11.5/ 13.5/8 | Restricted Band Edge at 5460 MHz | 15.209 | 45.8 dBµV/m @ 5460.0 MHz (-8.2 dB) |
| | ax80 | 1, 58 & 106 Wi-Fi 37 - BLE | 20 / 14.5 / 13.5 / 8 | 20/11.5/ 13.5/8 | Band Edge 5460 - 5470 MHz | 15E | 61.6 dBµV/m @ 5469.0 MHz (-6.7 dB) |

# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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
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) | |
|---|---|---|---|---|---|---|---|---|
| BLE | 1 Mb/s | 0.65 | Yes | 0.424 | 1.9 | 3.8 | 2358 | |
| 11b | 1 Mb/s | 0.78 | Yes | 0.667 | 1.1 | 2.2 | 1499 | 2 kHz |
| 11a | 6 MB/s | 0.92 | Yes | 1.437 | 0.3 | 0.7 | 696 | 1 kHz |
| ax20 | MCS0 | 0.96 | Yes | 5.452 | 0.2 | 0.4 | 183 | 200 Hz |
| ax40 | MCS0 | 0.96 | Yes | 5.297 | 0.2 | 0.4 | 189 | 200 Hz |
| ax80 | MCS0 | 0.96 | Yes | 5.401 | 0.2 | 0.4 | 185 | 200 Hz |

## Sample Notes

Sample S/N: CNGXK9Y07
Driver: P5
Antenna: Integral

## 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 2: | Emission has a duty cycle ≥ 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100 traces (method AD of KDB 789033) |
| Note 3: | Emission has constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW>1/T but not less than 10Hz, peak detector, linear averaging, auto sweep,max hold 50*1/DC traces (method VB of KDB 789033) |
| Note 4: | Emission has a duty cycle < 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100*1/DC traces, measurement corrected by Pwr correction factor (method AD 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: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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 Bandedge Measurements, 5350 MHz

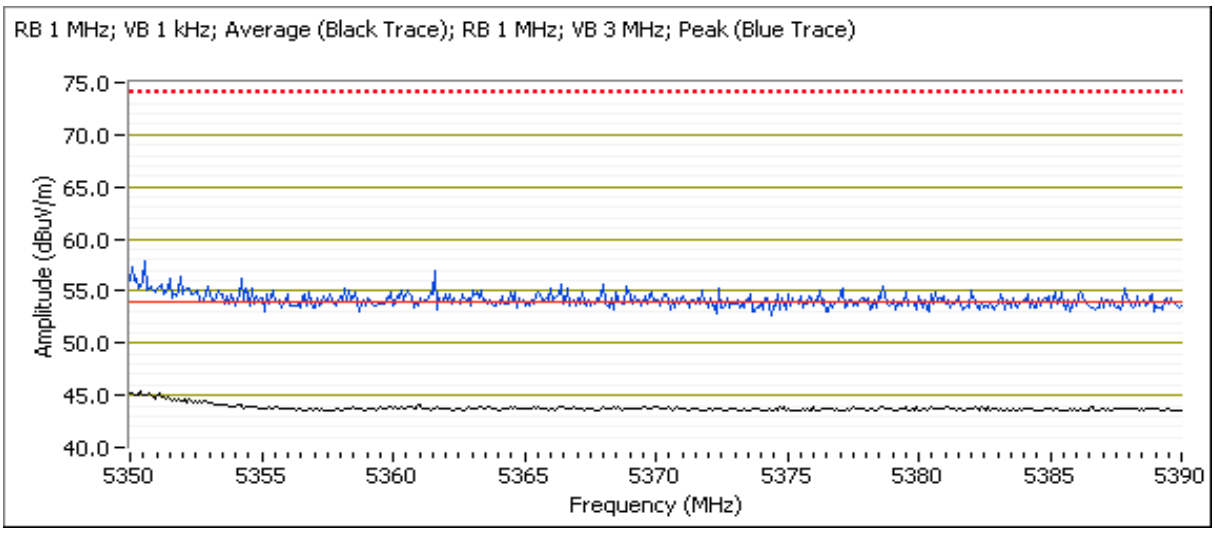
Date of Test: 02/14/19
Test Engineer: Mehran Birgani
Test Location: Frement Chamber #7

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

Mode,Channel, Chains, Data Rate,Power: b,1,4x4,1Mbps,20
Mode,Channel, Chains, Data Rate,Power: a,36,4x4,6Mbps,14.0
Mode,Channel, Chains, Data Rate,Power: a,100,4x4,6Mbps,16.0
Mode,Channel, Chains, Data Rate,Power: BLE,37,1x1,1Mbps,8

*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 | |
| 5350.110 | 45.1 | V | 54.0 | -8.9 | AVG | 275 | 1.4 | RB 1 MHz; VB: 1 kHz; Note 3 |
| 5350.090 | 42.4 | H | 54.0 | -11.6 | AVG | 67 | 1.0 | RB 1 MHz; VB: 1 kHz; Note 3 |
| 5350.790 | 57.9 | V | 74.0 | -16.1 | PK | 275 | 1.4 | RB 1 MHz; VB: 3 MHz |
| 5353.030 | 57.0 | H | 74.0 | -17.0 | PK | 67 | 1.0 | RB 1 MHz; VB: 3 MHz |



# EMC Test Data

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

Run #3: Radiated Bandedge Measurements, 5470-5725MHz

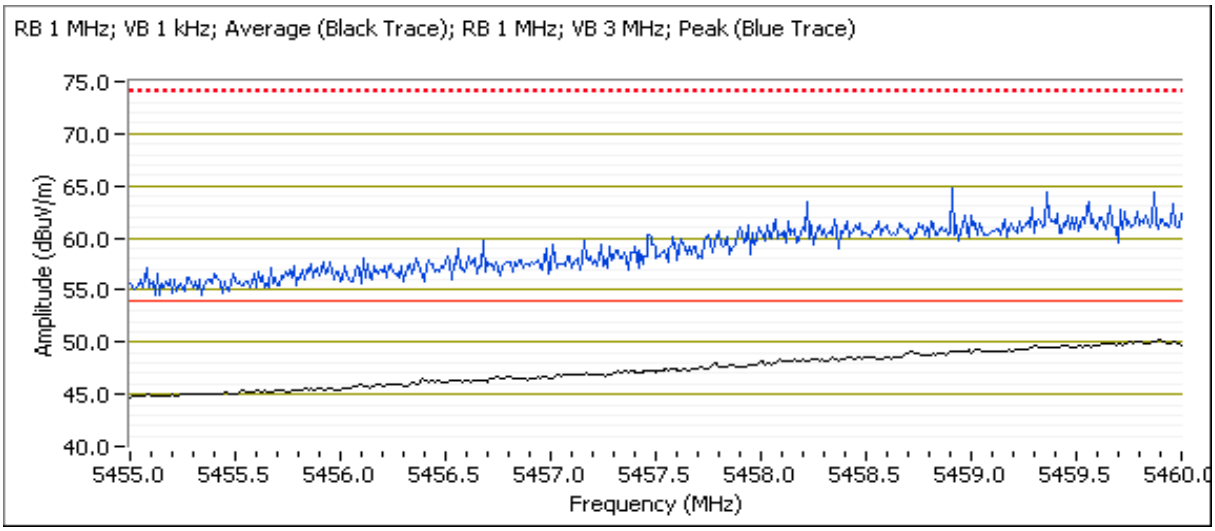
Date of Test: 02/14/19
Test Engineer: Mehran Birgani
Test Location: Frement Chamber #7

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

Mode,Channel, Chains, Data Rate,Power: b,1,4x4,1Mbps,20
Mode,Channel, Chains, Data Rate,Power: a,36,4x4,6Mbps,14.0
Mode,Channel, Chains, Data Rate,Power: a,100,4x4,6Mbps,16.0
Mode,Channel, Chains, Data Rate,Power: BLE,37,1x1,1Mbps,8

*5460 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 | |
| 5460.000 | 50.1 | H | 54.0 | -3.9 | AVG | 302 | 2.1 | RB 1 MHz; VB: 1 kHz; Note 3 |
| 5459.650 | 65.8 | H | 74.0 | -8.2 | PK | 302 | 2.1 | RB 1 MHz; VB: 3 MHz |



# EMC Test Data

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

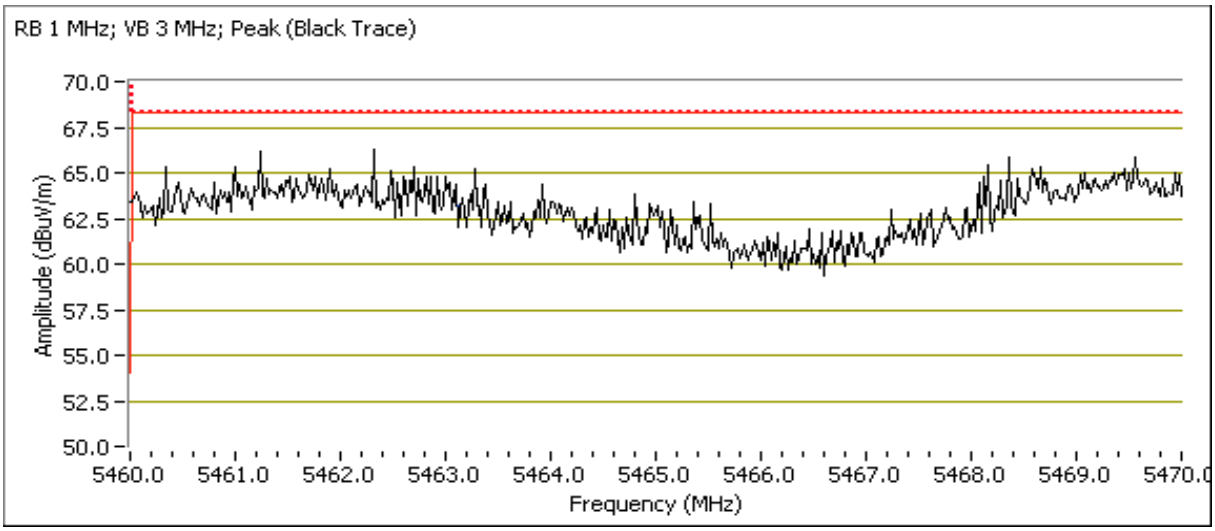
Date of Test: 02/14/19
Test Engineer: Mehran Birgani
Test Location: Frement Chamber #7

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

Mode,Channel, Chains, Data Rate,Power: b,1,4x4,1Mbps,20
Mode,Channel, Chains, Data Rate,Power: a,36,4x4,6Mbps,14.0
Mode,Channel, Chains, Data Rate,Power: a,100,4x4,6Mbps,16.0
Mode,Channel, Chains, Data Rate,Power: BLE,37,1x1,1Mbps,8

*5470 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 | |
| 5469.520 | 65.0 | H | 68.3 | -3.3 | PK | 302 | 2.1 | RB 1 MHz; VB: 3 MHz |



# EMC Test Data

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

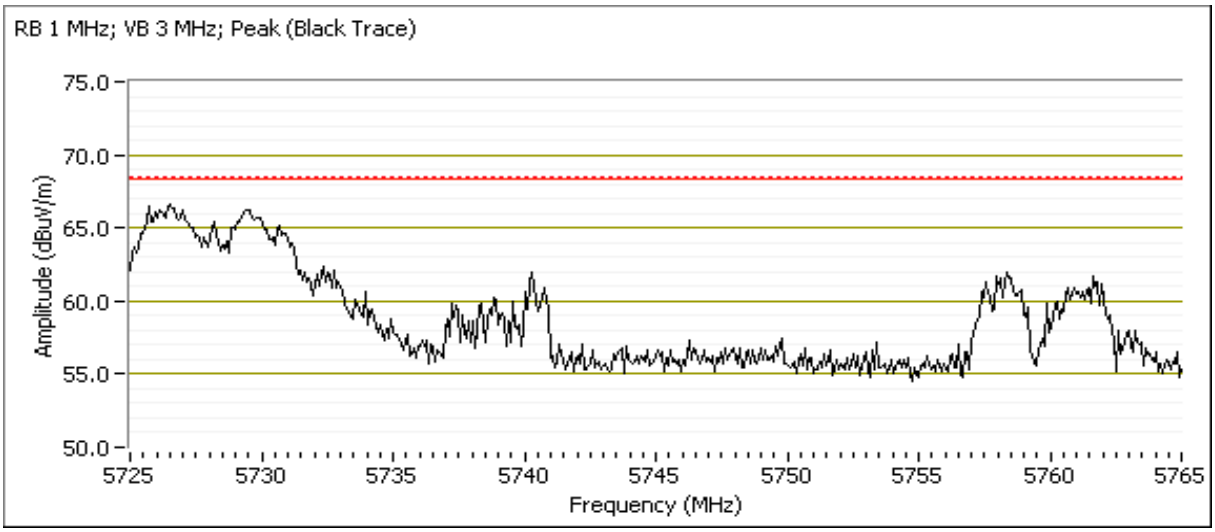
Date of Test: 02/14/19
Test Engineer: Deniz Demirci
Test Location: Frement Chamber #7

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

Mode,Channel, Chains, Data Rate,Power: b,1,4x4,1Mbps,20
Mode,Channel, Chains, Data Rate,Power: a,64,4x4,6Mbps,14.0
Mode,Channel, Chains, Data Rate,Power: a,140,4x4,6Mbps,13.0
Mode,Channel, Chains, Data Rate,Power: BLE,37,1x1,1Mbps,8

*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 | |
| 5729.670 | 67.8 | H | 68.3 | -0.5 | PK | 268 | 1.4 | POS; RB 1 MHz; VB: 3 MHz |



# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-RA-FCC |
| | | 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 MHz

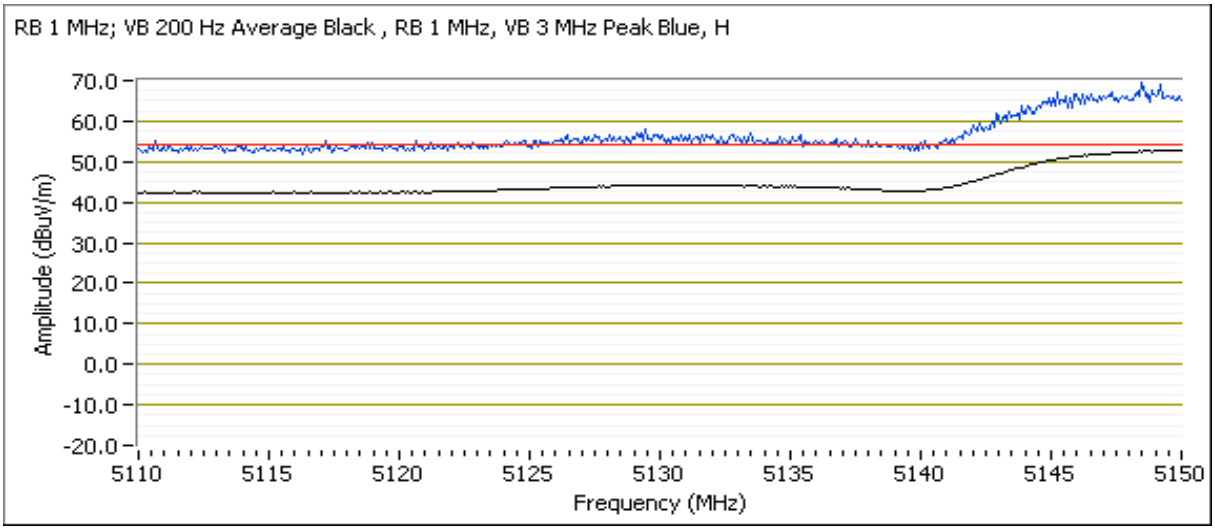
Date of Test: 02/14/19
Test Engineer: David Bare
Test Location: Frement Chamber #7

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

Mode,Channel, Chains, Data Rate,Power: b,1,4x4,1Mbps,20
Mode,Channel, Chains, Data Rate,Power: ax20,36,4x4,MCS0,14.5
Mode,Channel, Chains, Data Rate,Power: ax20,100,4x4,MCS0,13.5
Mode,Channel, Chains, Data Rate,Power: BLE,37,1x1,1Mbps,8

*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 | |
| 5148.680 | 52.8 | H | 54.0 | -1.2 | Avg | 74 | 1.8 | RB 1 MHz; VB: 200 Hz, Note 3 |
| 5149.340 | 69.3 | H | 74.0 | -4.7 | PK | 74 | 1.8 | RB 1 MHz; VB: 3 MHz |



# EMC Test Data

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

Run #6: Radiated Bandedge Measurements, 5350 MHz

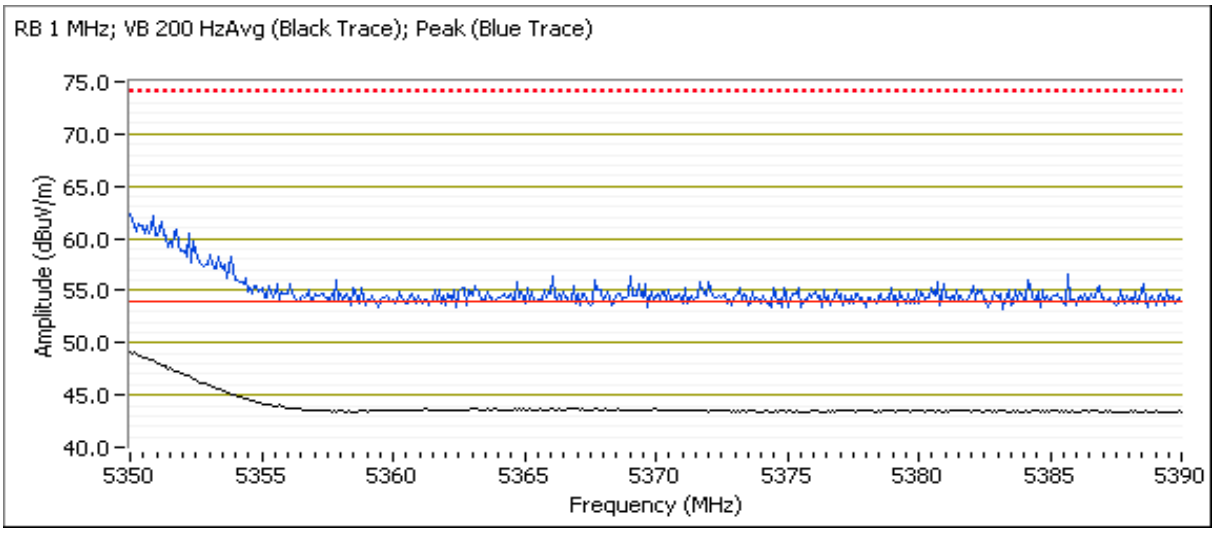
Date of Test: 2/15/2019 0:00
Test Engineer: Roy Zheng
Test Location: Frement Chamber #7

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

Channel: 1, 64, 100, BLE
Tx Chain: 4 and 4
Mode: b, ax20, BLE
Data Rate: 1 Mb/s, MCS0, 1 Mb/s

*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 | |
| 5350.000 | 48.7 | H | 54.0 | -5.3 | Avg | 272 | 1.0 | RB 1 MHz; VB: 200 Hz, Note 3 |
| 5350.400 | 60.5 | H | 74.0 | -13.5 | PK | 272 | 1.0 | RB 1 MHz; VB: 3 MHz |
| 5350.000 | 47.8 | V | 54.0 | -6.2 | Avg | 258 | 2.1 | RB 1 MHz; VB: 200 Hz, Note 3 |
| 5350.400 | 58.6 | V | 74.0 | -15.4 | PK | 258 | 2.1 | RB 1 MHz; VB: 3 MHz |



# EMC Test Data

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

Run #7: Radiated Bandedge Measurements, 5470-5725MHz

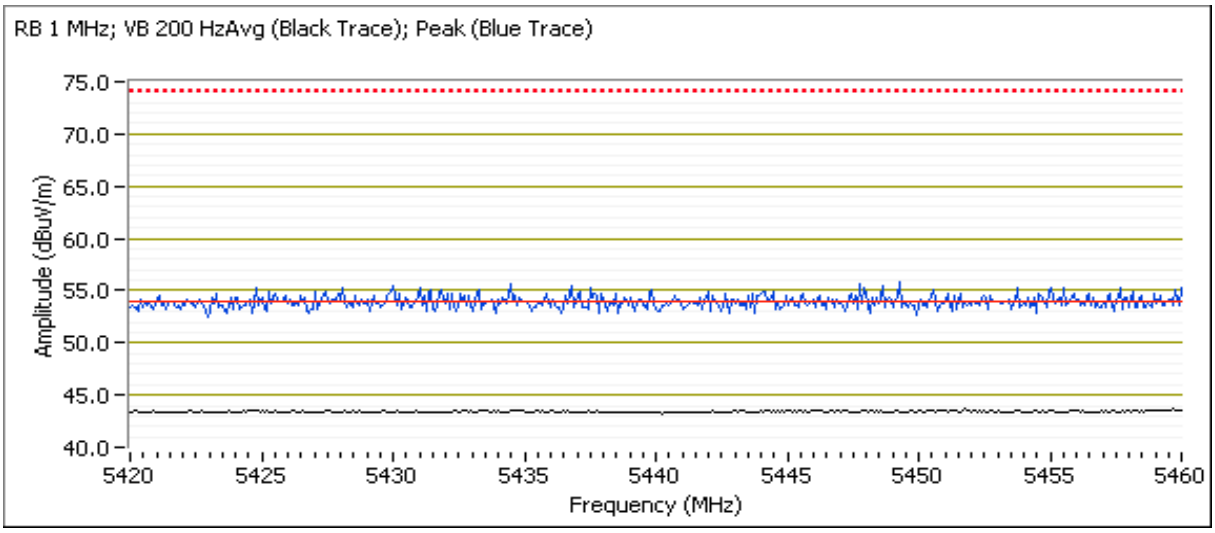
Date of Test: 2/15/2019 0:00
Test Engineer: Roy Zheng
Test Location: Frement Chamber #7

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

Channel: 1, 64, 100, BLE
Tx Chain: 4 and 4
Mode: b, ax20, BLE
Data Rate: 1 Mb/s, MCS0, 1 Mb/s

*5460 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 | |
| 5459.760 | 43.6 | H | 54.0 | -10.4 | Avg | 148 | 3.0 | RB 1 MHz; VB: 200 Hz, Note 3 |
| 5452.300 | 55.5 | H | 74.0 | -18.5 | PK | 148 | 3.0 | RB 1 MHz; VB: 3 MHz |

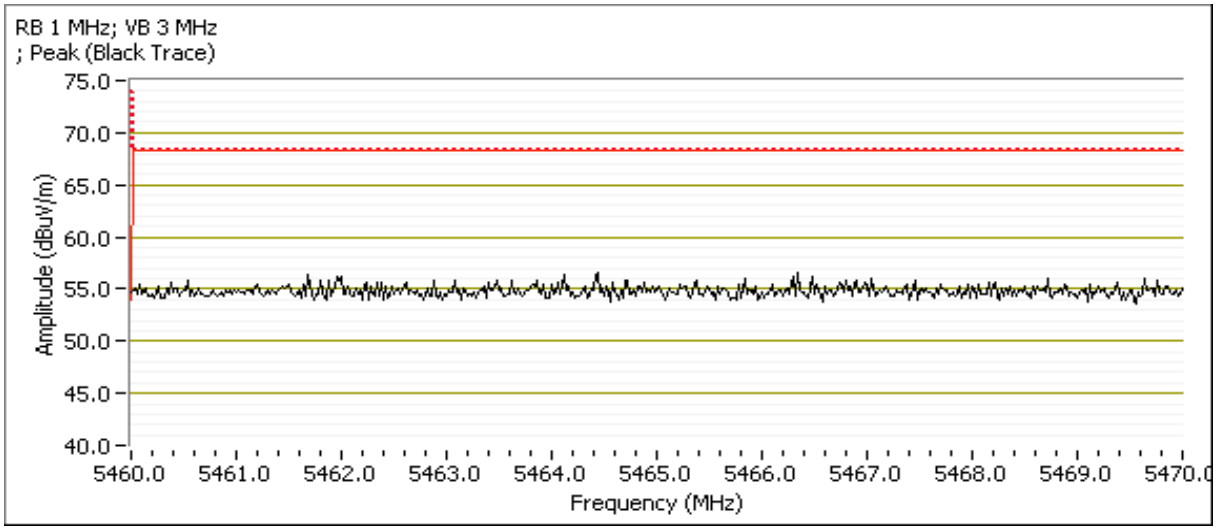


# EMC Test Data

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

*5470 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 | |
| 5463.030 | 56.5 | H | 68.3 | -11.8 | PK | 148 | 3.0 | POS; RB 1 MHz; VB: 3 MHz |



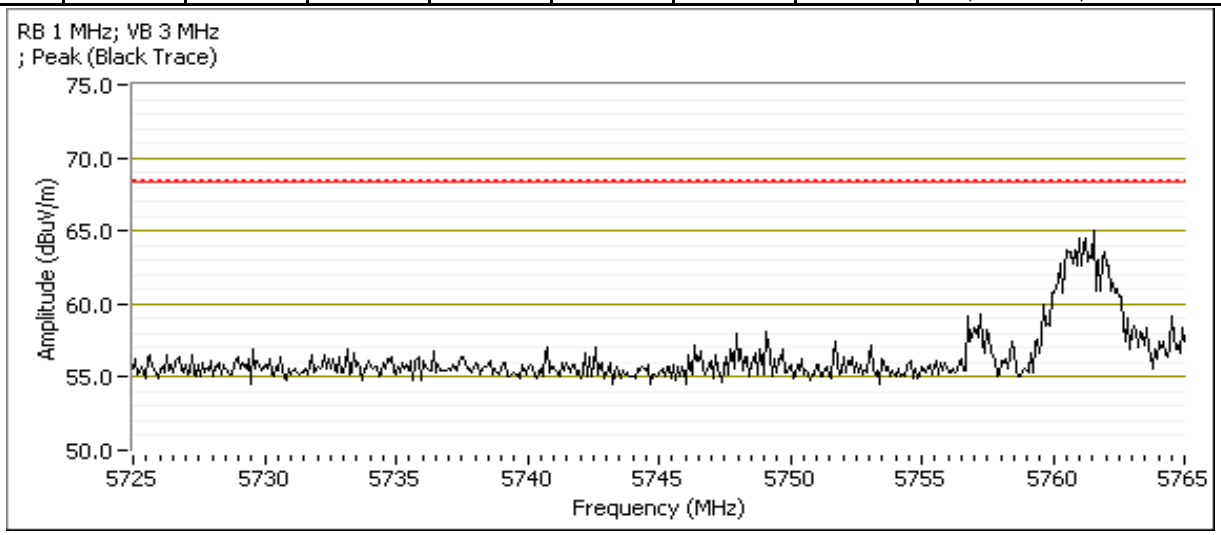
# EMC Test Data

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

Channel: 1, 64, 140, BLE
Tx Chain: 4 and 4
Mode: b, ax20, BLE
Data Rate: 1 Mb/s, MCS0, 1 Mb/s

*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 | |
| 5732.620 | 55.5 | V | 68.3 | -12.8 | PK | 317 | 1.1 | POS; RB 1 MHz; VB: 3 MHz |



# EMC Test Data

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

Run #10: Radiated Bandedge Measurements, 5350 MHz

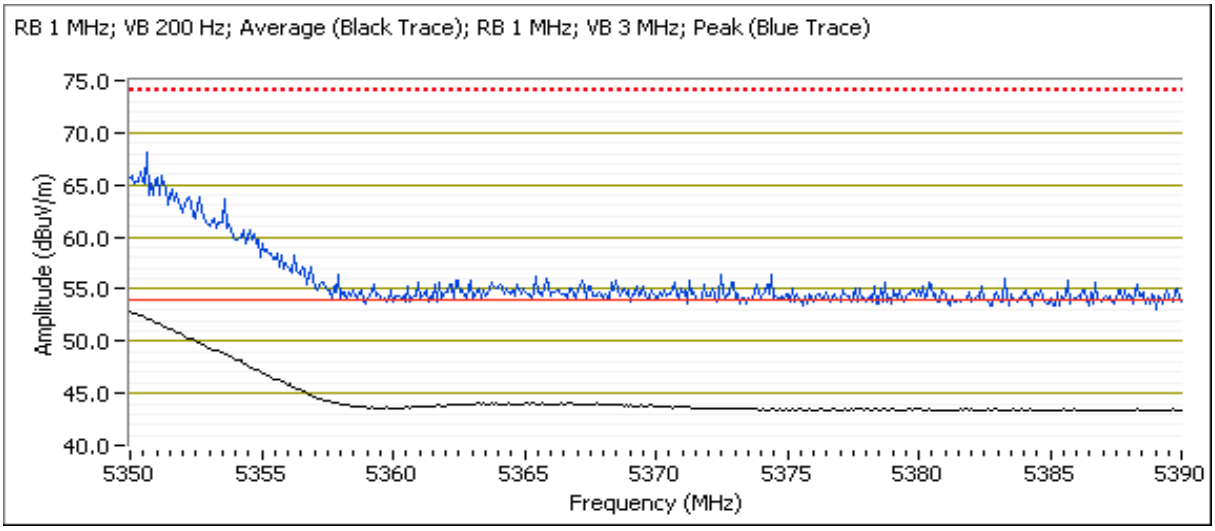
Date of Test: 01/15/19
Test Engineer: Mehran Birgani
Test Location: Chamber #7

Config. Used: 1
Config Change: -
EUT Voltage: PoE and 120V/60Hz

Mode,Channel, Chains, Data Rate,Power: b,1,4x4,1Mbps,20
Mode,Channel, Chains, Data Rate,Power: ax40,62,4x4,MCS0,13
Mode,Channel, Chains, Data Rate,Power: ax40,102,4x4,MCS0,14.5
Mode,Channel, Chains, Data Rate,Power: BLE,37,1x1,1Mbps,8

*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 | |
| 5350.070 | 52.7 | H | 54.0 | -1.3 | AVG | 272 | 1.0 | RB 1 MHz; VB: 200 Hz, Note 3 |
| 5355.170 | 49.6 | V | 54.0 | -4.4 | AVG | 268 | 1.0 | RB 1 MHz; VB: 200 Hz, Note 3 |
| 5351.450 | 68.8 | H | 74.0 | -5.2 | PK | 272 | 1.0 | RB 1 MHz; VB: 3 MHz |
| 5353.910 | 62.9 | V | 74.0 | -11.1 | PK | 268 | 1.0 | RB 1 MHz; VB: 3 MHz |



# EMC Test Data

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

Run #11: Radiated Bandedge Measurements, 5470-5725MHz

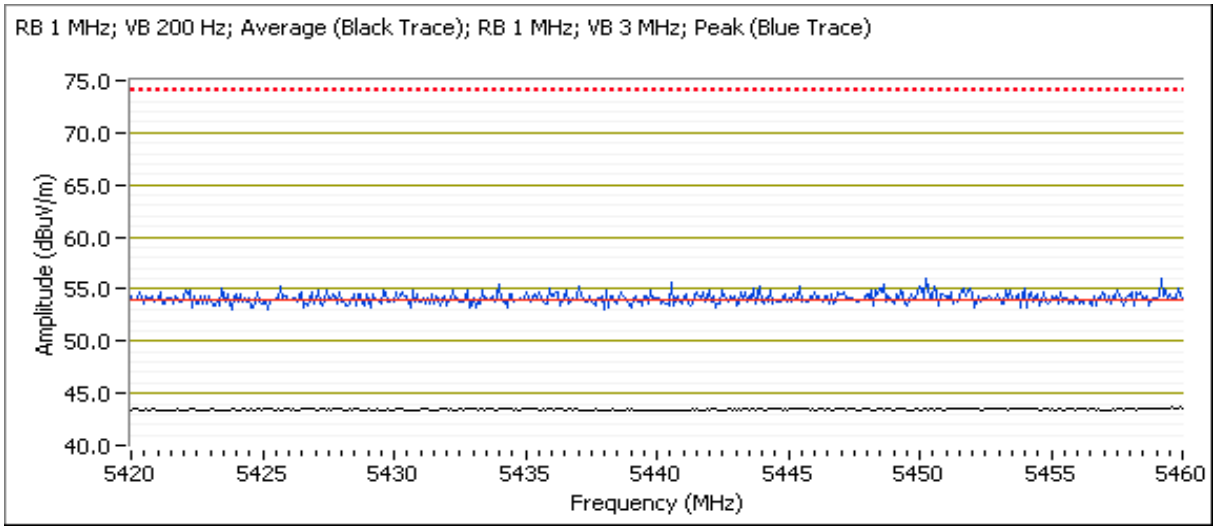
Date of Test: 01/15/19
Test Engineer: Mehran Birgani
Test Location: Chamber #7

Config. Used: 1
Config Change: -
EUT Voltage: PoE and 120V/60Hz

Mode,Channel, Chains, Data Rate,Power: b,1,4x4,1Mbps,20
Mode,Channel, Chains, Data Rate,Power: ax40,62,4x4,MCS0,13
Mode,Channel, Chains, Data Rate,Power: ax40,102,4x4,MCS0,14.5
Mode,Channel, Chains, Data Rate,Power: BLE,37,1x1,1Mbps,8

*5460 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 | |
| 5350.070 | 52.7 | H | 54.0 | -1.3 | AVG | 272 | 1.0 | POS; RB 1 MHz; VB: 200 Hz |
| 5351.450 | 68.8 | H | 74.0 | -5.2 | PK | 272 | 1.0 | POS; RB 1 MHz; VB: 3 MHz |
| 5459.760 | 44.2 | V | 54.0 | -9.8 | AVG | 298 | 1.0 | POS; RB 1 MHz; VB: 200 Hz |
| 5446.370 | 56.5 | V | 74.0 | -17.5 | PK | 298 | 1.0 | POS; RB 1 MHz; VB: 3 MHz |



# EMC Test Data

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

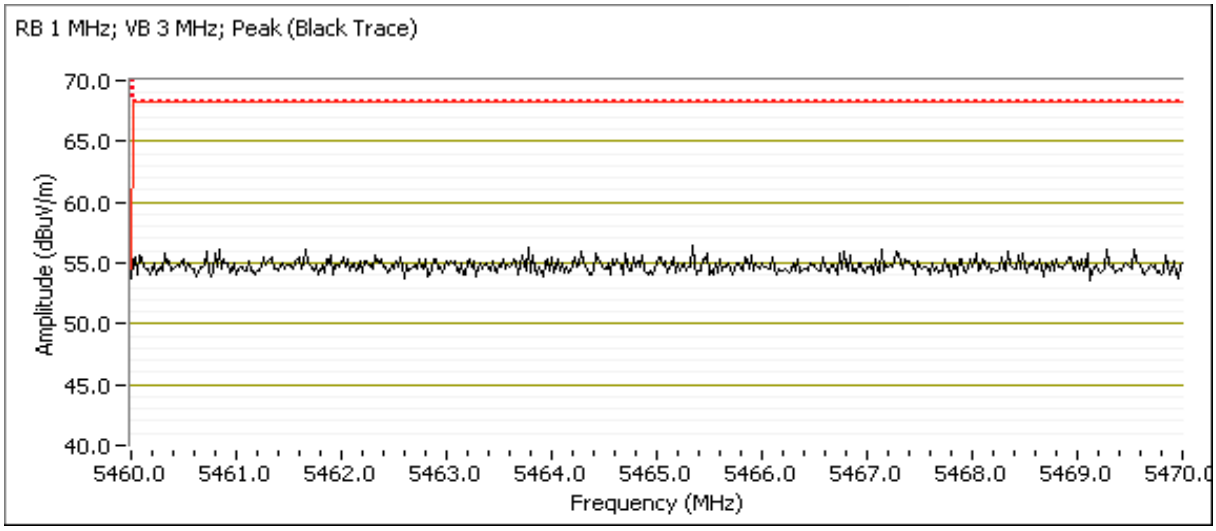
Date of Test: 01/15/19
Test Engineer: Mehran Birgani
Test Location: Chamber #7

Config. Used: 1
Config Change: -
EUT Voltage: PoE and 120V/60Hz

Mode,Channel, Chains, Data Rate,Power: b,1,4x4,1Mbps,20
Mode,Channel, Chains, Data Rate,Power: ax40,62,4x4,MCS0,13
Mode,Channel, Chains, Data Rate,Power: ax40,102,4x4,MCS0,14.5
Mode,Channel, Chains, Data Rate,Power: BLE,37,1x1,1Mbps,8

*5470 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 | |
| 5470.000 | 58.1 | V | 68.3 | -10.2 | PK | 298 | 1.0 | POS; RB 1 MHz; VB: 3 MHz |
| 5462.500 | 56.3 | H | 68.3 | -12.0 | PK | 20 | 1.0 | POS; RB 1 MHz; VB: 3 MHz |



# EMC Test Data

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

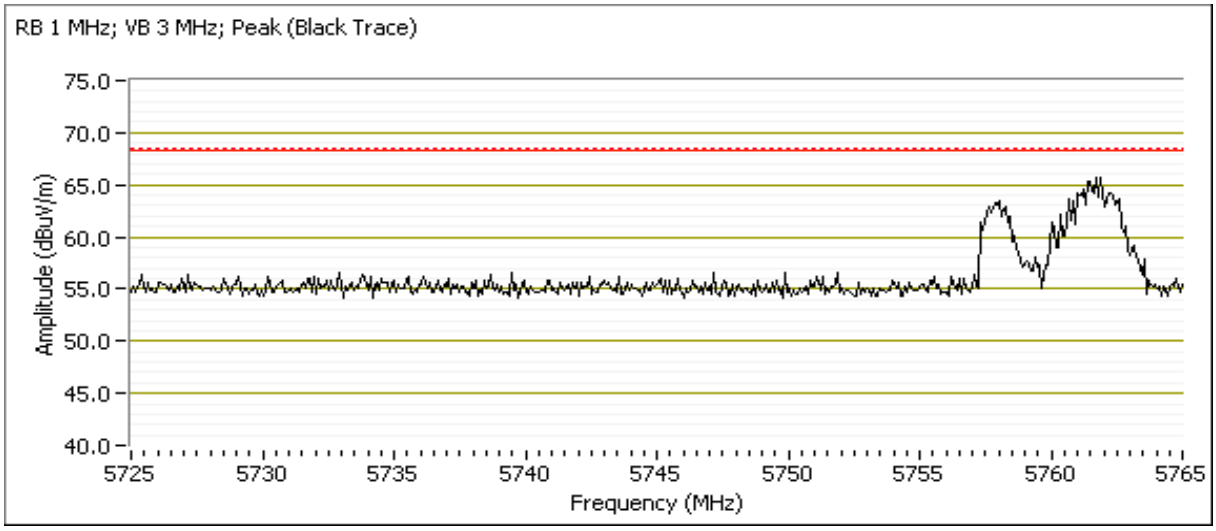
Date of Test: 01/15/19
Test Engineer: Mehran Birgani
Test Location: Chamber #7

Config. Used: 1
Config Change: -
EUT Voltage: PoE and 120V/60Hz

Mode,Channel, Chains, Data Rate,Power: b,1,4x4,1Mbps,20
Mode,Channel, Chains, Data Rate,Power: ax40,62,4x4,MCS0,13
Mode,Channel, Chains, Data Rate,Power: ax40,134,4x4,MCS0,14.5
Mode,Channel, Chains, Data Rate,Power: BLE,37,1x1,1Mbps,8

*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 | |
| 5761.010 | 66.6 | H | 68.3 | -1.7 | PK | 212 | 1.6 | POS; RB 1 MHz; VB: 3 MHz |
| 5763.100 | 65.6 | V | 68.3 | -2.7 | PK | 258 | 2.5 | RB 1 MHz; VB: 3 MHz |



# EMC Test Data

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

Run #14: Radiated Bandedge Measurements, 5250-5350MHz

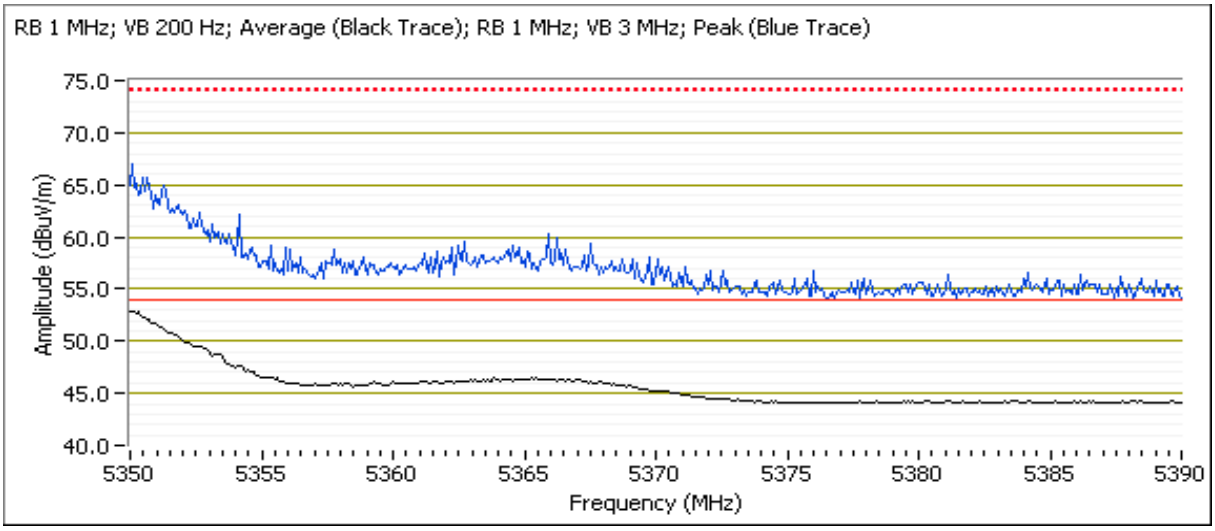
Date of Test: 01/15/19
Test Engineer: Mehran Birgani
Test Location: Chamber #7

Config. Used: 1
Config Change: -
EUT Voltage: PoE and 120V/60Hz

Mode,Channel, Chains, Data Rate,Power: b,1,4x4,1Mbps,20
Mode,Channel, Chains, Data Rate,Power: ax80,58,4x4,MCS0,11.5
Mode,Channel, Chains, Data Rate,Power: ax80,106,4x4,MCS0,13.5
Mode,Channel, Chains, Data Rate,Power: BLE,37,1x1,1Mbps,8

*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 | |
| 5350.050 | 53.5 | H | 54.0 | -0.5 | AVG | 52 | 1.4 | RB 1 MHz; VB: 200 Hz, Note 3 |
| 5350.350 | 67.6 | H | 74.0 | -6.4 | PK | 52 | 1.4 | RB 1 MHz; VB: 3 MHz |
| 5350.090 | 47.5 | V | 54.0 | -6.5 | AVG | 318 | 1.3 | RB 1 MHz; VB: 200 Hz, Note 3 |
| 5350.710 | 61.8 | V | 74.0 | -12.2 | PK | 318 | 1.3 | RB 1 MHz; VB: 3 MHz |



# EMC Test Data

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

Run #15: Radiated Bandedge Measurements, 5470-5725MHz

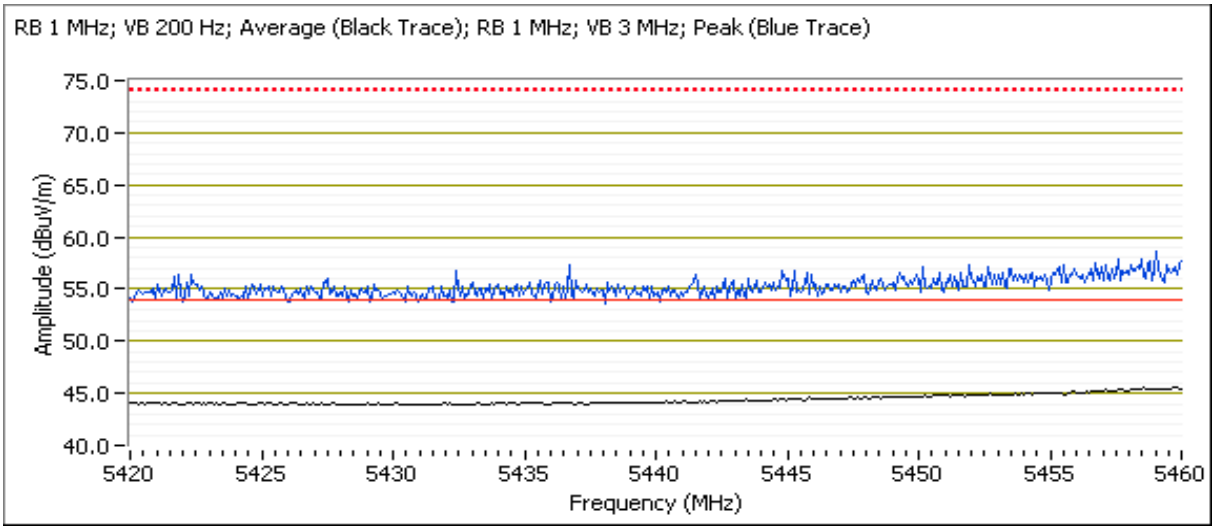
Date of Test: 01/15/19
Test Engineer: Mehran Birgani
Test Location: Chamber #7

Config. Used: 1
Config Change: -
EUT Voltage: PoE and 120V/60Hz

Mode,Channel, Chains, Data Rate,Power: b,1,4x4,1Mbps,20
Mode,Channel, Chains, Data Rate,Power: ax80,58,4x4,MCS0,11.5
Mode,Channel, Chains, Data Rate,Power: ax80,106,4x4,MCS0,13.5
Mode,Channel, Chains, Data Rate,Power: BLE,37,1x1,1Mbps,8

*5460 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 | |
| 5459.980 | 45.8 | V | 54.0 | -8.2 | AVG | 318 | 1.3 | RB 1 MHz; VB: 200 Hz, Note 3 |
| 5459.080 | 45.6 | H | 54.0 | -8.4 | AVG | 57 | 1.3 | RB 1 MHz; VB: 200 Hz, Note 3 |
| 5458.930 | 61.0 | V | 74.0 | -13.0 | PK | 318 | 1.3 | RB 1 MHz; VB: 3 MHz |
| 5458.010 | 59.4 | H | 74.0 | -14.6 | PK | 57 | 1.3 | RB 1 MHz; VB: 3 MHz |



# EMC Test Data

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

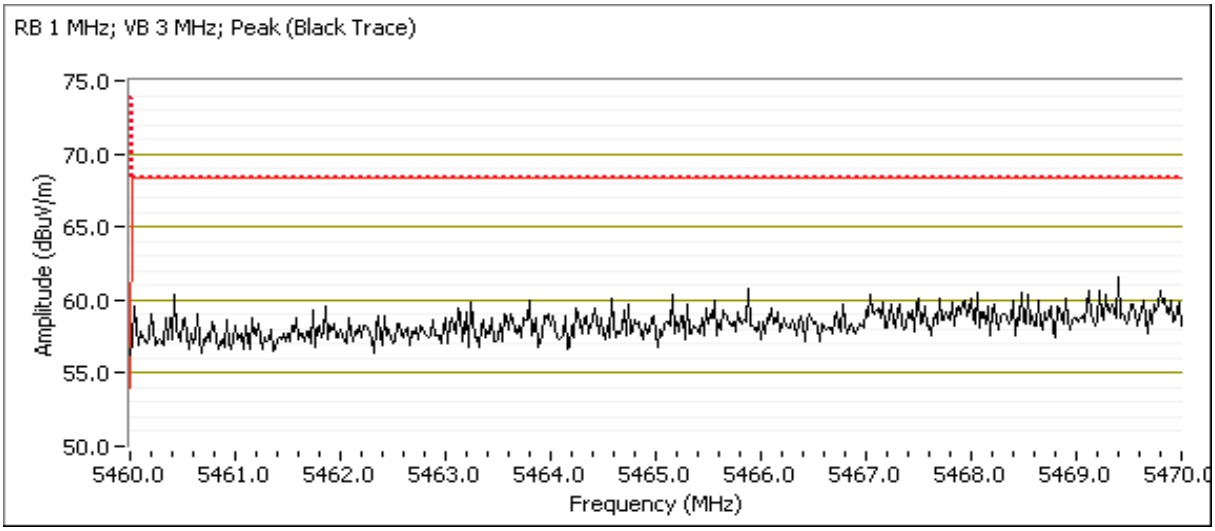
Date of Test: 01/15/19
Test Engineer: Mehran Birgani
Test Location: Chamber #7

Config. Used: 1
Config Change: -
EUT Voltage: PoE and 120V/60Hz

Mode,Channel, Chains, Data Rate,Power: b,1,4x4,1Mbps,20
Mode,Channel, Chains, Data Rate,Power: ax80,58,4x4,MCS0,11.5
Mode,Channel, Chains, Data Rate,Power: ax80,106,4x4,MCS0,13.5
Mode,Channel, Chains, Data Rate,Power: BLE,37,1x1,1Mbps,8

*5470 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 | |
| 5469.000 | 61.6 | V | 68.3 | -6.7 | PK | 318 | 1.3 | RB 1 MHz; VB: 3 MHz |
| 5464.630 | 60.8 | H | 68.3 | -7.5 | PK | 57 | 1.3 | POS; RB 1 MHz; VB: 3 MHz |



| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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: 18-22 °C
Rel. Humidity: 38-43 %

## Modifications Made During Testing

No modifications were made to the EUT during testing

## Deviations From The Standard

No deviations were made from the requirements of the standard.

# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-RA-FCC |
| | | 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 | | Test Performed | Limit | Result / Margin |
|---|---|---|---|---|---|---|---|
| Scans on closest 5 GHz channels in all four OFDM modes to determine the worst case mode (4x4 in lower 5 GHz bands, 4x4 in upper 5GHz bands and 4x4 in 2.4 GHz band) | | | | | | | |
| 1 | b , a BLE | 1, 64 & 100 Wi-Fi 37 - BLE | 20, 20, 8 | | Radiated Emissions, 1 - 40 GHz | FCC 15.209/ 15.247 / 15 E | 42.5 dBµV/m @ 7207.0 MHz (-11.5 dB) |
| | b, ax20, BLE | 1, 64 & 100 Wi-Fi 37 - BLE | 20, 20, 8 | | Radiated Emissions, 1 - 40 GHz | FCC 15.209/ 15.247 / 15 E | 43.4 dBµV/m @ 7205.1 MHz (-10.6 dB) |
| | b, ax40, BLE | 1, 62 & 102 Wi-Fi 37 - BLE | 20, 20, 8 | | Radiated Emissions, 1 - 40 GHz | FCC 15.209/ 15.247 / 15 E | 42.2 dBµV/m @ 4804.0 MHz (-11.8 dB) |
| | b, ax80, BLE | 1, 58 & 114 Wi-Fi 37 - BLE | 20, 20, 8 | | Radiated Emissions, 1 - 40 GHz | FCC 15.209/ 15.247 / 15 E | 42.8 dBµV/m @ 7205.3 MHz (-11.2 dB) |
| Measurements on low, mid and high channels in worst-case OFDM mode | | | | | | | |
| 2 | b, ax20, BLE | 1, 52 & 144 Wi-Fi 37 - BLE | 20, 20, 20, 8 | | Radiated Emissions, 1 - 40 GHz | FCC 15.209/ 15.247 / 15 E | 47.7 dBµV/m @ 7205.9 MHz (-6.3 dB) |
| | | 1, 60 & 116 Wi-Fi 37 - BLE | 20, 20, 20, 8 | | | | 47.6 dBµV/m @ 7205.4 MHz (-6.4 dB) |

# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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
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) | |
|---|---|---|---|---|---|---|---|---|
| BLE | 1 Mb/s | 0.65 | Yes | 0.424 | 1.9 | 3.8 | 2358 | |
| 11b | 1 Mb/s | 0.78 | Yes | 0.667 | 1.1 | 2.2 | 1499 | 2 kHz |
| 11a | 6 MB/s | 0.92 | Yes | 1.437 | 0.3 | 0.7 | 696 | 1 kHz |
| ax20 | MCS0 | 0.96 | Yes | 5.452 | 0.2 | 0.4 | 183 | 200 Hz |
| ax40 | MCS0 | 0.96 | Yes | 5.297 | 0.2 | 0.4 | 189 | 200 Hz |
| ax80 | MCS0 | 0.96 | Yes | 5.401 | 0.2 | 0.4 | 185 | 200 Hz |

## Sample Notes

Sample S/N: CNGXK9Y07
Driver: P5
Antenna: Integral

## 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: | Digital device emission, class A limit extrapolated to 3m applied, peak reading vs peak or average limit. |

# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-RA-FCC |
| | | 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 5150-5350 MHz Bands

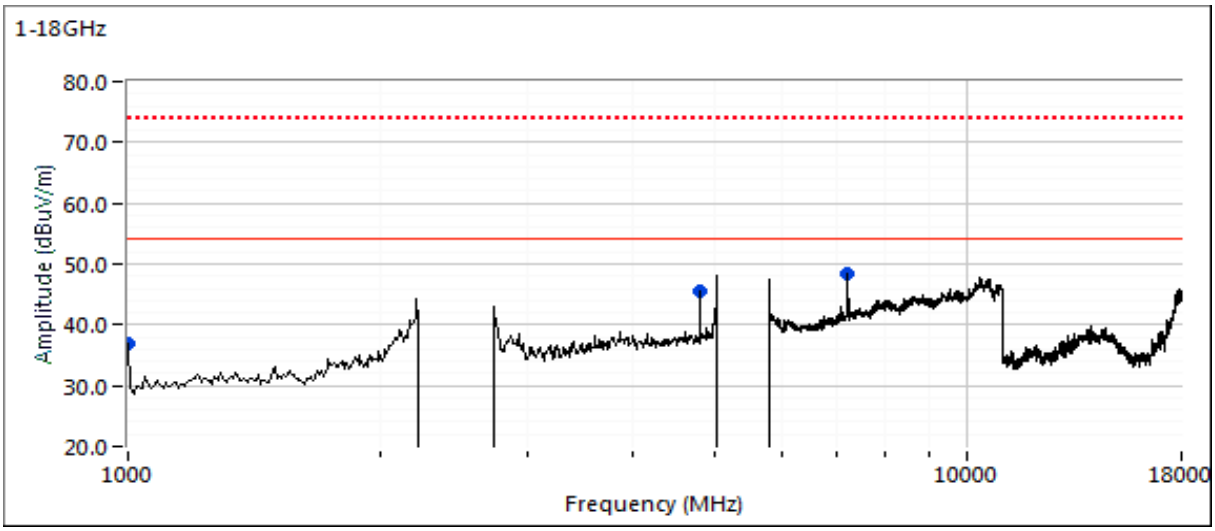
Date of Test: 02/19/19
Test Engineer: Roy Zheng
Test Location: Fremont Chamber #5

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

Run #1a: Low and High Channels

Mode,Channel, Chains, Data Rate,Power: b,1,4x4,1Mbps,20
Mode,Channel, Chains, Data Rate,Power: a,64,4x4,6Mbps,20
Mode,Channel, Chains, Data Rate,Power: a,100,4x4,6Mbps,20
Mode,Channel, Chains, Data Rate,Power: BLE,37,1x1,1Mbps,8

| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBμV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 7206.960 | 42.5 | H | 54.0 | -11.5 | PK | 116 | 2.1 | RB 1 MHz;VB 1 kHz; Note 3 |
| 4804.000 | 39.6 | H | 54.0 | -14.4 | AVG | 197 | 2.1 | RB 1 MHz;VB 1 kHz; Note 3 |
| 1000.000 | 36.9 | V | 54.0 | -17.1 | Peak | 158 | 1.0 | |
| 7207.000 | 53.5 | H | 74.0 | -20.5 | PK | 116 | 2.1 | RB 1 MHz;VB 3 MHz;Peak |
| 4803.450 | 48.5 | H | 74.0 | -25.5 | PK | 197 | 2.1 | RB 1 MHz;VB 3 MHz;Peak |




| | |
|---|---|
| Note: | Scans made between 18 - 40 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 |
| 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). |

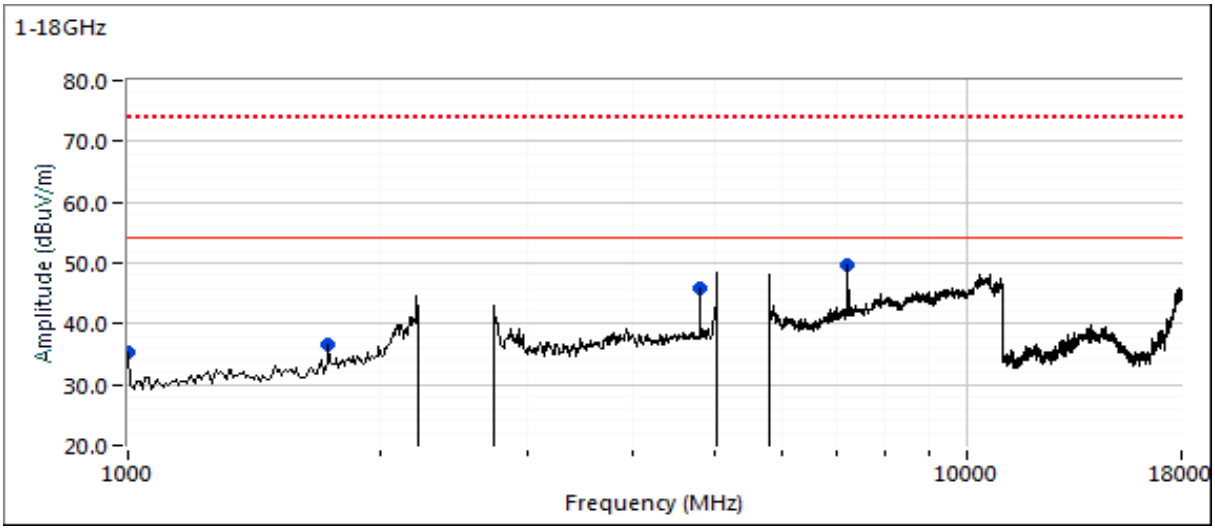
# EMC Test Data

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

Run #1b: Low and High Channels

Mode,Channel, Chains, Data Rate,Power: b,1,4x4,1Mbps,20
Mode,Channel, Chains, Data Rate,Power: ax20,64,4x4,MCS0,20
Mode,Channel, Chains, Data Rate,Power: ax20,100,4x4,MCS0,20
Mode,Channel, Chains, Data Rate,Power: BLE,37,1x1,1Mbps,8

| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 7205.100 | 43.4 | H | 54.0 | -10.6 | PK | 121 | 2.1 | RB 1 MHz;VB 300 Hz; Note 3 |
| 4803.970 | 41.4 | H | 54.0 | -12.6 | AVG | 217 | 2.1 | RB 1 MHz;VB 300 Hz; Note 3 |
| 1000.000 | 35.3 | V | 54.0 | -18.7 | Peak | 119 | 1.0 | |
| 7205.110 | 54.1 | H | 74.0 | -19.9 | PK | 121 | 2.1 | RB 1 MHz;VB 3 MHz;Peak |
| 4803.950 | 50.8 | H | 74.0 | -23.2 | PK | 217 | 2.1 | RB 1 MHz;VB 3 MHz;Peak |
| 1733.330 | 36.6 | V | 68.3 | -31.7 | Peak | 314 | 1.0 | |




| | |
|---|---|
| Note: | Scans made between 18 - 40 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 |
| 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). |

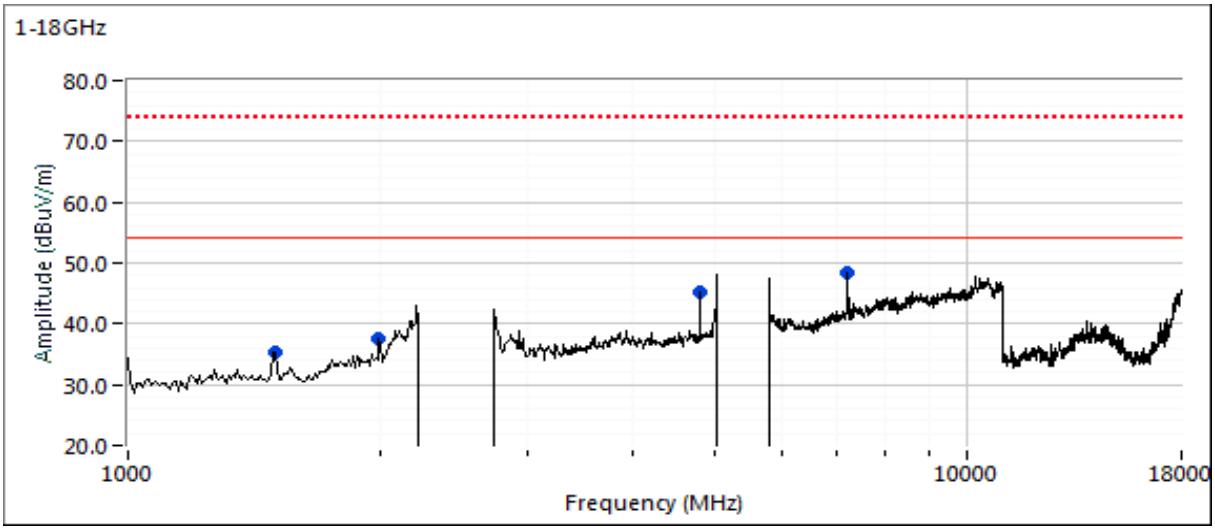
# EMC Test Data

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

Run #1c: Low and High Channels

Mode,Channel, Chains, Data Rate,Power: b,1,4x4,1Mbps,20
Mode,Channel, Chains, Data Rate,Power: ax40,62,4x4,MCS0,20
Mode,Channel, Chains, Data Rate,Power: ax40,102,4x4,MCS0,20
Mode,Channel, Chains, Data Rate,Power: BLE,37,1x1,1Mbps,8

| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 4803.980 | 42.2 | H | 54.0 | -11.8 | AVG | 224 | 2.2 | RB 1 MHz;VB 300 Hz; Note 3 |
| 7208.280 | 41.0 | H | 54.0 | -13.0 | AVG | 224 | 2.2 | RB 1 MHz;VB 300 Hz; Note 3 |
| 2000.000 | 37.5 | V | 60.0 | -22.5 | Peak | 91 | 1.0 | Note 6 |
| 4803.340 | 51.4 | H | 74.0 | -22.6 | PK | 224 | 2.2 | RB 1 MHz;VB 3 MHz;Peak |
| 7208.330 | 50.0 | H | 74.0 | -24.0 | PK | 242 | 2.2 | RB 1 MHz;VB 3 MHz;Peak |
| 1500.000 | 35.3 | V | 60.0 | -24.7 | Peak | 235 | 1.0 | Note 6 |




| | |
|---|---|
| Note: | Scans made between 18 - 40 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 |
| 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). |

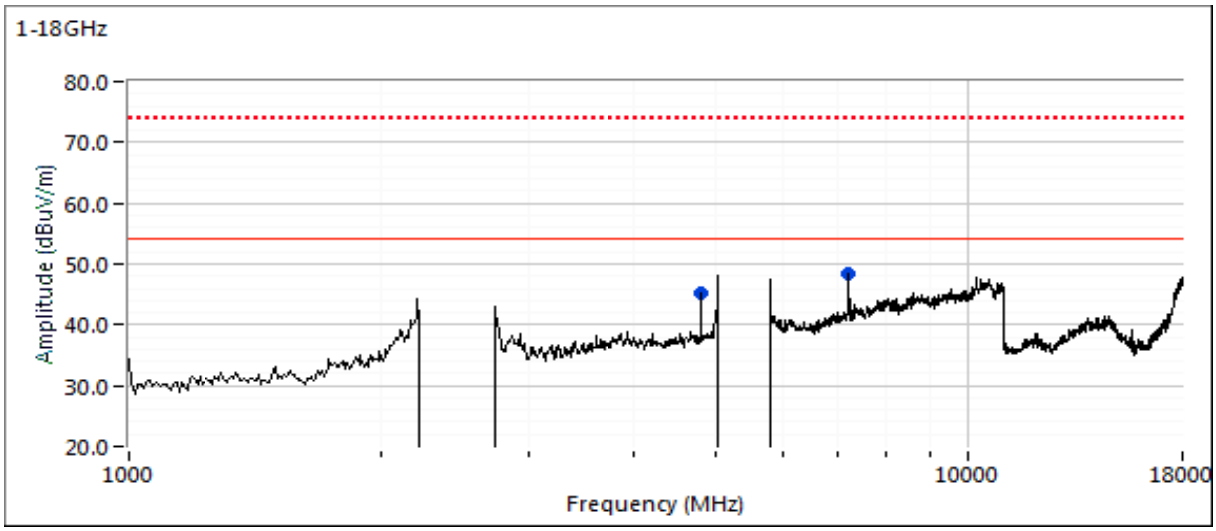
# EMC Test Data

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

Run #1d: Low and High Channels

Mode,Channel, Chains, Data Rate,Power: b,1,4x4,1Mbps,20
Mode,Channel, Chains, Data Rate,Power: ax80,58,4x4,MCS0,20
Mode,Channel, Chains, Data Rate,Power: ax80,114,4x4,MCS0,20
Mode,Channel, Chains, Data Rate,Power: BLE,37,1x1,1Mbps,8

| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBµV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 7205.270 | 42.8 | H | 54.0 | -11.2 | AVG | 230 | 2.1 | RB 1 MHz;VB 300 Hz; Note 3 |
| 4804.010 | 42.3 | H | 54.0 | -11.7 | AVG | 230 | 2.1 | RB 1 MHz;VB 300 Hz; Note 3 |
| 7205.310 | 54.8 | H | 74.0 | -19.2 | PK | 165 | 1.5 | RB 1 MHz;VB 3 MHz;Peak |
| 4804.120 | 51.4 | H | 74.0 | -22.6 | PK | 230 | 2.1 | RB 1 MHz;VB 3 MHz;Peak |




| | |
|---|---|
| Note: | Scans made between 18 - 40 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 |
| 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). |

# EMC Test Data

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

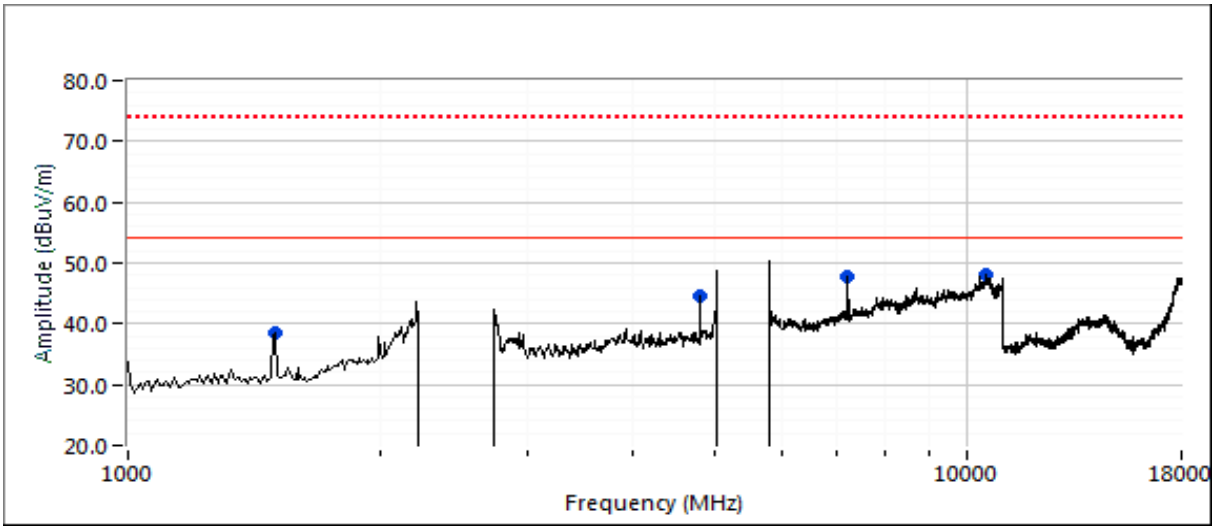
Run #2: Radiated Spurious Emissions, 1,000 - 40000 MHz. Operating Mode: Worse case from Run #1

Date of Test: 2/19/2019 — Config. Used: 1
Test Engineer: Deniz Demirci — Config Change: None
Test Location: Fremont Chamber #5 — EUT Voltage: POE & 120 V, 60 Hz

Run #2a: High and Low Channels

Mode,Channel, Chains, Data Rate,Power: b,1,4x4,1Mbps,20
Mode,Channel, Chains, Data Rate,Power: ax20,52,4x4,MCS0,20
Mode,Channel, Chains, Data Rate,Power: ax20,144,4x4,MCS0,20
Mode,Channel, Chains, Data Rate,Power: BLE,37,1x1,1Mbps,8

| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|---|---|---|---|---|---|---|---|
| MHz | dBμV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 1499.990 | 39.1 | V | 54.0 | -14.9 | AVG | 284 | 1.1 | RB 1 MHz;VB 10 Hz;Peak - CW clock |
| 1499.870 | 44.6 | V | 74.0 | -29.4 | PK | 284 | 1.1 | RB 1 MHz;VB 3 MHz;Peak - CW cloc |
| 4804.040 | 46.0 | H | 54.0 | -8.0 | AVG | 242 | 2.2 | RB 1 MHz;VB 3 kHz;Peak VAVG 100 |
| 4804.030 | 52.3 | H | 74.0 | -21.7 | PK | 242 | 2.2 | RB 1 MHz;VB 3 MHz;Peak |
| 7205.430 | 47.6 | H | 54.0 | -6.4 | AVG | 124 | 2.4 | RB 1 MHz;VB 3 kHz;Peak VAVG 100 |
| 7205.110 | 55.2 | H | 74.0 | -18.8 | PK | 124 | 2.4 | RB 1 MHz;VB 3 MHz;Peak |
| 10518.430 | 42.4 | H | 54.0 | -11.6 | AVG | 159 | 1.9 | RB 1 MHz;VB 300 Hz;Peak VAVG 10 |
| 10518.360 | 56.0 | H | 74.0 | -18.0 | PK | 159 | 1.9 | 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). |

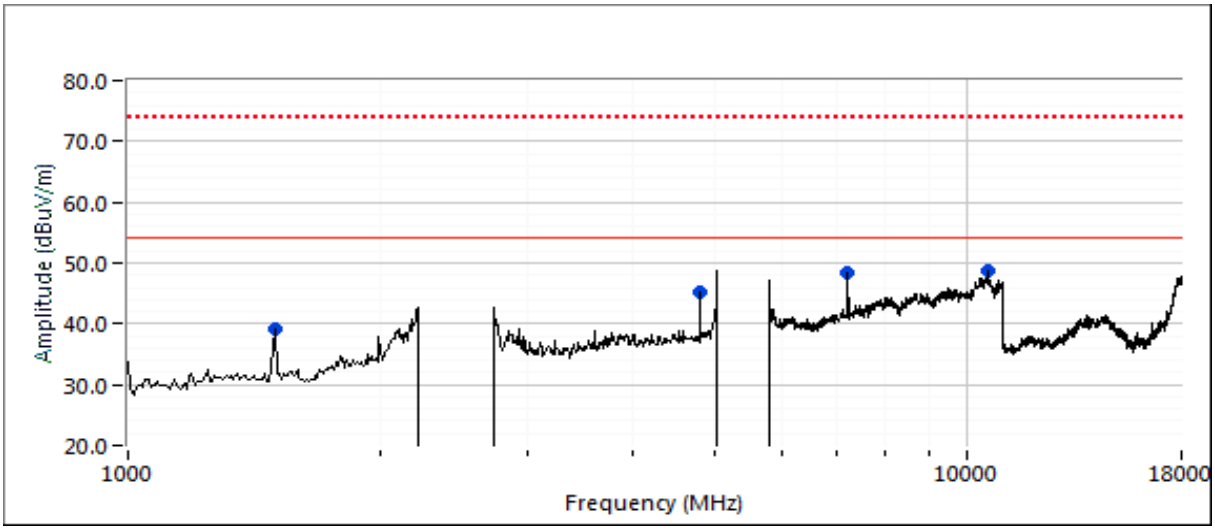
# EMC Test Data

| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | Job Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-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 Channels

Mode,Channel, Chains, Data Rate,Power: b,1,4x4,1Mbps,20
Mode,Channel, Chains, Data Rate,Power: ax20,60,4x4,MCS0,20
Mode,Channel, Chains, Data Rate,Power: ax20,116,4x4,MCS0,20
Mode,Channel, Chains, Data Rate,Power: BLE,37,1x1,1Mbps,8

| 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 | 54.0 | -14.8 | AVG | 276 | 1.1 | RB 1 MHz;VB 10 Hz;Peak - CW clock |
| 1499.980 | 44.6 | V | 74.0 | -29.4 | PK | 276 | 1.1 | RB 1 MHz;VB 3 MHz;Peak - CW cloc |
| 4803.940 | 46.1 | H | 54.0 | -7.9 | AVG | 232 | 2.2 | RB 1 MHz;VB 3 kHz;Peak VAVG 100 |
| 4803.530 | 51.5 | H | 74.0 | -22.5 | PK | 232 | 2.2 | RB 1 MHz;VB 3 MHz;Peak |
| 7205.910 | 47.7 | H | 54.0 | -6.3 | AVG | 149 | 1.1 | RB 1 MHz;VB 3 kHz;Peak VAVG 100 |
| 7205.390 | 55.5 | H | 74.0 | -18.5 | PK | 149 | 1.1 | RB 1 MHz;VB 3 MHz;Peak |
| 10605.240 | 44.8 | V | 54.0 | -9.2 | AVG | 206 | 1.9 | RB 1 MHz;VB 300 Hz;Peak VAVG 10 |
| 10604.670 | 57.9 | V | 74.0 | -16.1 | PK | 206 | 1.9 | 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). |

# EMC Test Data

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

## Radiated Emissions

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

### Test Specific Details

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

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

Config. Used: 1
Config Change: None
EUT Voltage: PoE & 110 V / 60Hz

### General Test Configuration

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

### Ambient Conditions:

Temperature: 24 °C
Rel. Humidity: 40 %

### Summary of Results

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

### Modifications Made During Testing

No modifications were made to the EUT during testing

### Deviations From The Standard

No deviations were made from the requirements of the standard.

# EMC Test Data

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

## Sample Notes

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

Run #1a, Radiated Spurious Emissions, 30 - 1000 MHz, Wi-Fi
Channel, Mode, Chain, Level: 6, g, 4, 20
Channel, Mode, Chain, Level: 40, a, 8, 20

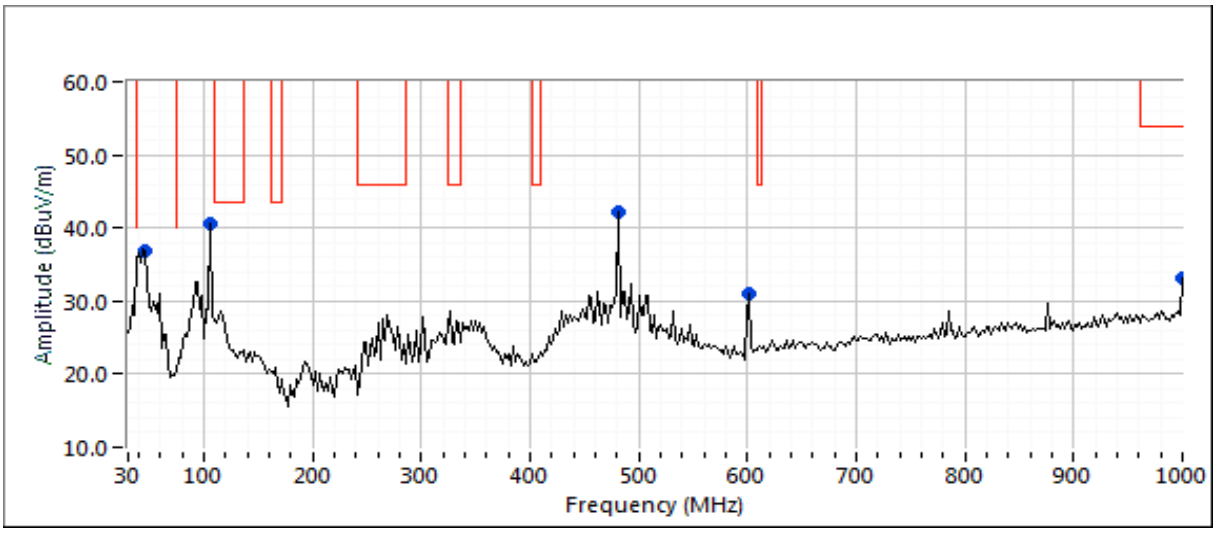
Preliminary peak readings captured during pre-scan (peak readings vs. QP limit)

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

Final QP readings

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

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



# EMC Test Data

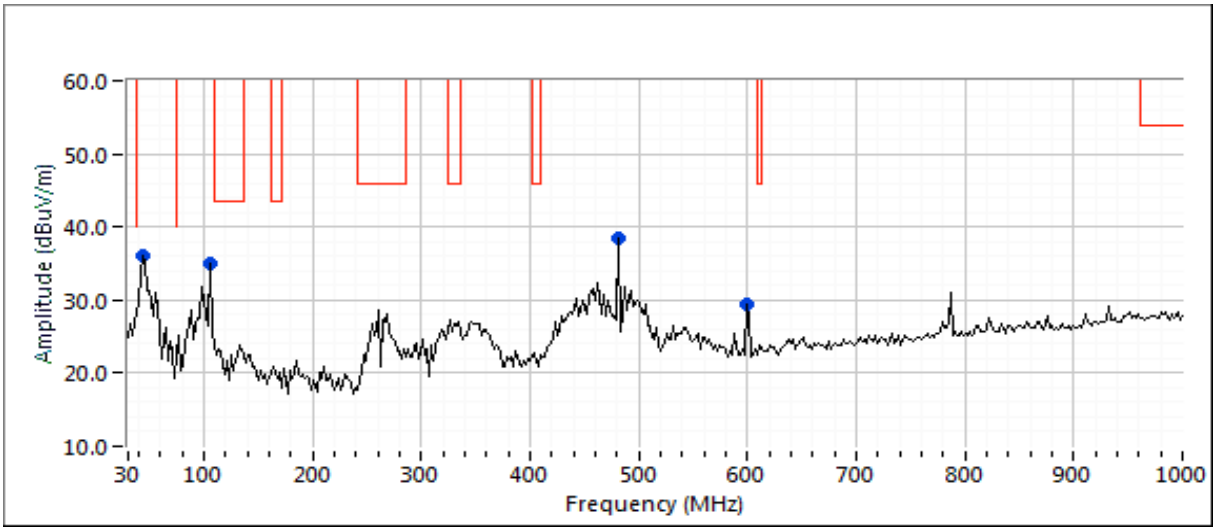
| | | | |
|---|---|---|---|
| Client: | Aruba, a Hewlett Packard Enterprise company | PR Number: | PR075848 |
| Model: | APIN0555 | T-Log Number: | TL075848-RA-FCC |
| | | Project Manager: | Christine Krebill |
| Contact: | Mark Hill | Project Engineer: | David Bare |
| Standard: | FCC §15.247 & §15.407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

Run #1b, Radiated Spurious Emissions, 30 - 1000 MHz, Wi-Fi
Channel, Mode, Chain, Level: 11, b, 4, 20
Channel, Mode, Chain, Level: 165, ax20, 8, 20

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

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

| | |
|---|---|
| Note 1 | Emission in non-restricted band, but limit of 15.209 used. |
| Note 2 | Emissions were the same as run 1a, though the channels and modes were different. Therefore, it is likely that none of these emissions are radio signals. Testing on other channels in other modes was not done, since the emissions would not change. |



# EMC Test Data

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

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

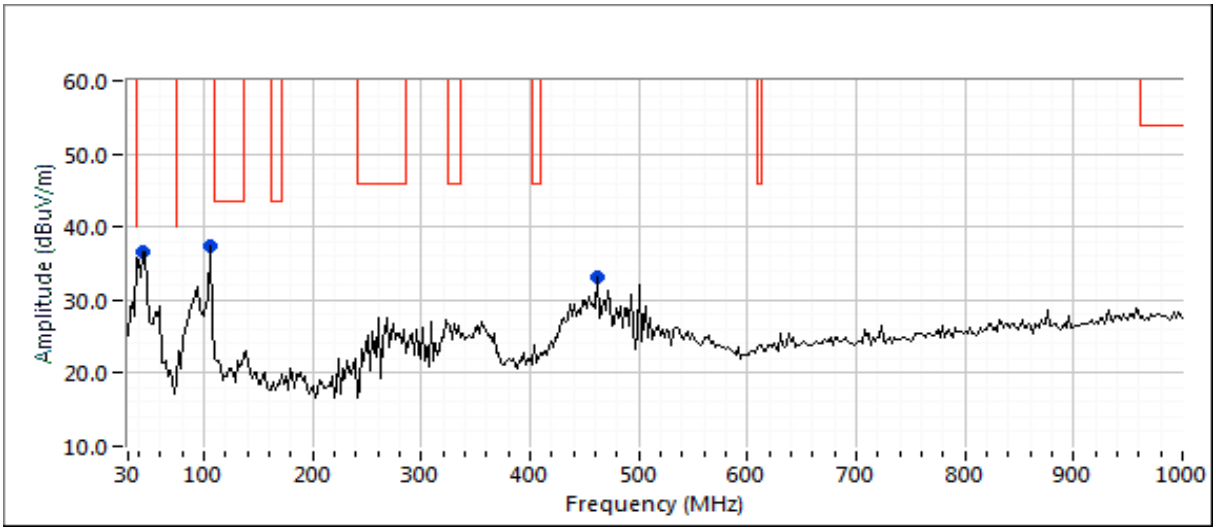
Preliminary peak readings captured during pre-scan (peak readings vs. QP limit)

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

Final QP readings

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

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



# EMC Test Data

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

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

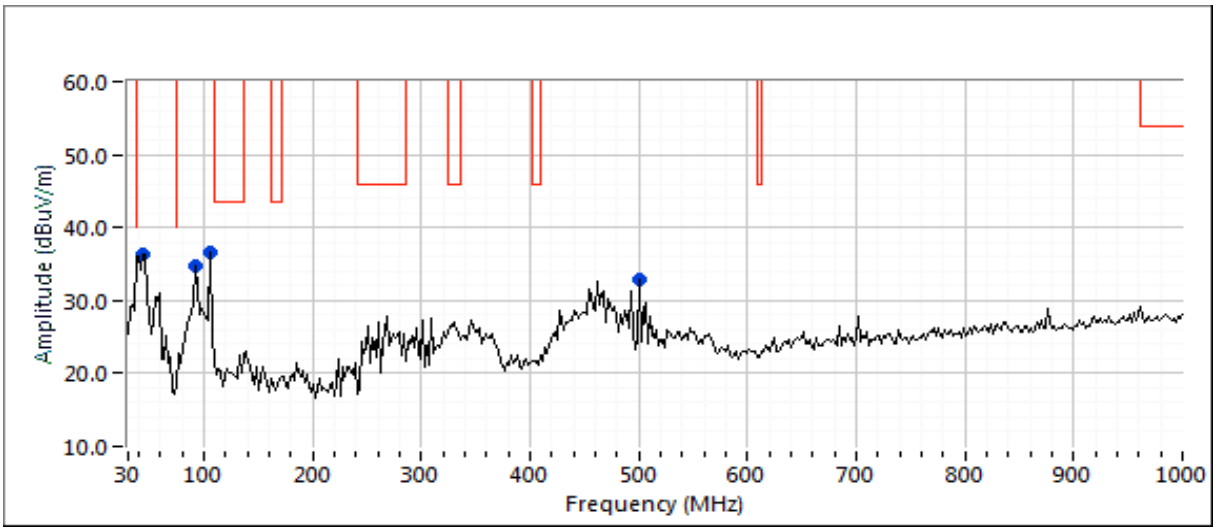
Preliminary peak readings captured during pre-scan (peak readings vs. QP limit)

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

Final QP readings

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

| | |
|---|---|
| Note 1 | Emission in non-restricted band, but limit of 15.209 used. |
| Note 2 | Emissions were the same as run 2a, though the channel was different. Therefore, it is likely that none of these emissions are radio signals. Testing on the middle channel was not done, since the emissions would not change. |



# EMC Test Data

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

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

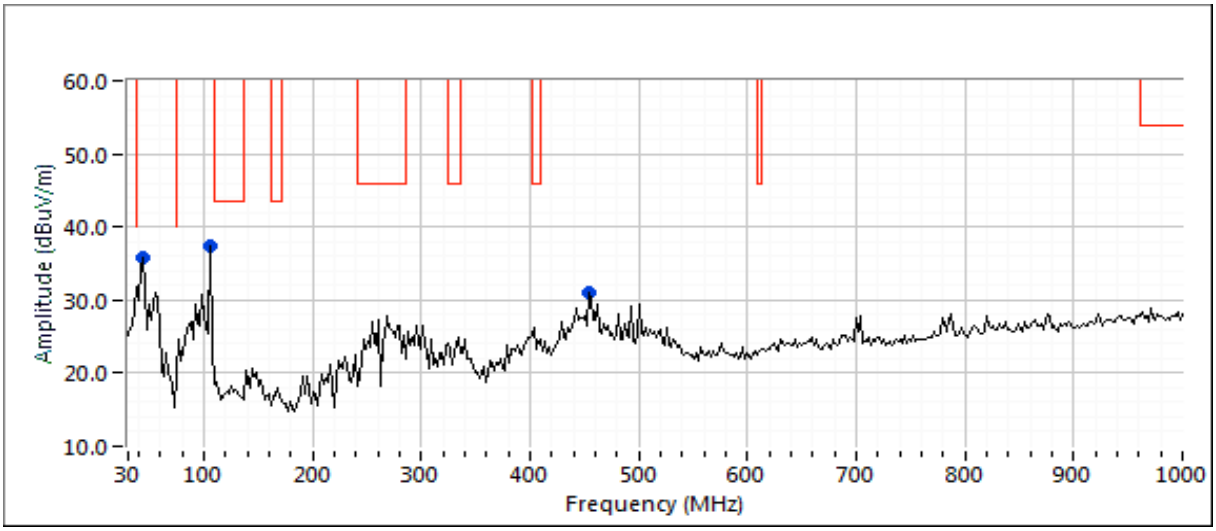
Preliminary peak readings captured during pre-scan (peak readings vs. QP limit)

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

Final QP readings

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

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



# EMC Test Data

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

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

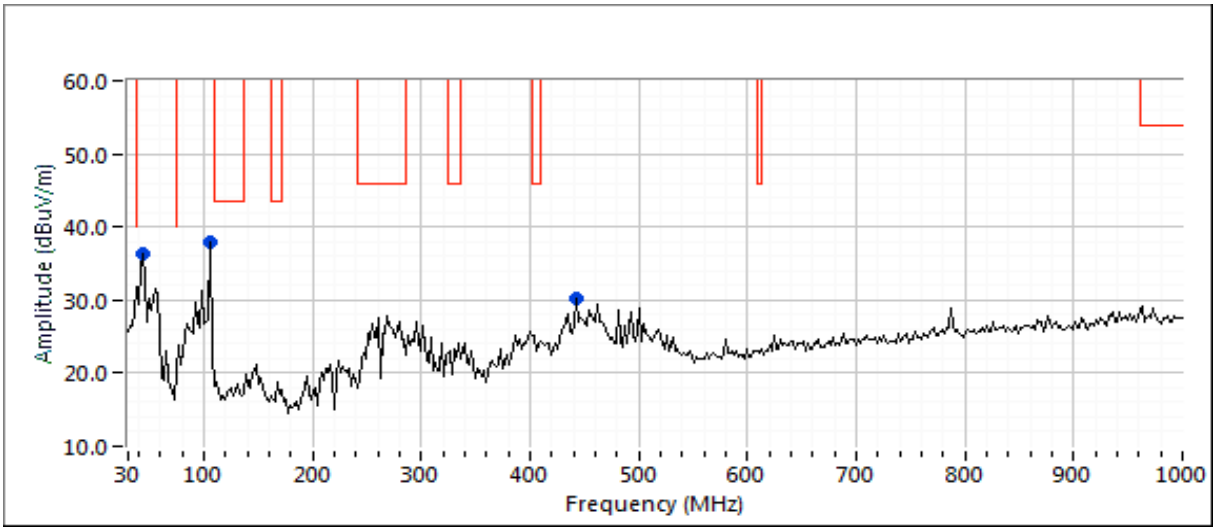
Preliminary peak readings captured during pre-scan (peak readings vs. QP limit)

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

Final QP readings

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

| | |
|---|---|
| Note 1 | Emission in non-restricted band, but limit of 15.209 used. |
| Note 2 | Emissions were the same as run 3a, though the channel was different. Therefore, it is likely that none of these emissions are radio signals. Testing on the middle channel was not done, since the emissions would not change. |



# EMC Test Data

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

## Conducted Emissions

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

### Test Specific Details

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

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

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

### General Test Configuration

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

### Ambient Conditions:

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

### Summary of Results

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

### Modifications Made During Testing

No modifications were made to the EUT during testing

### Deviations From The Standard

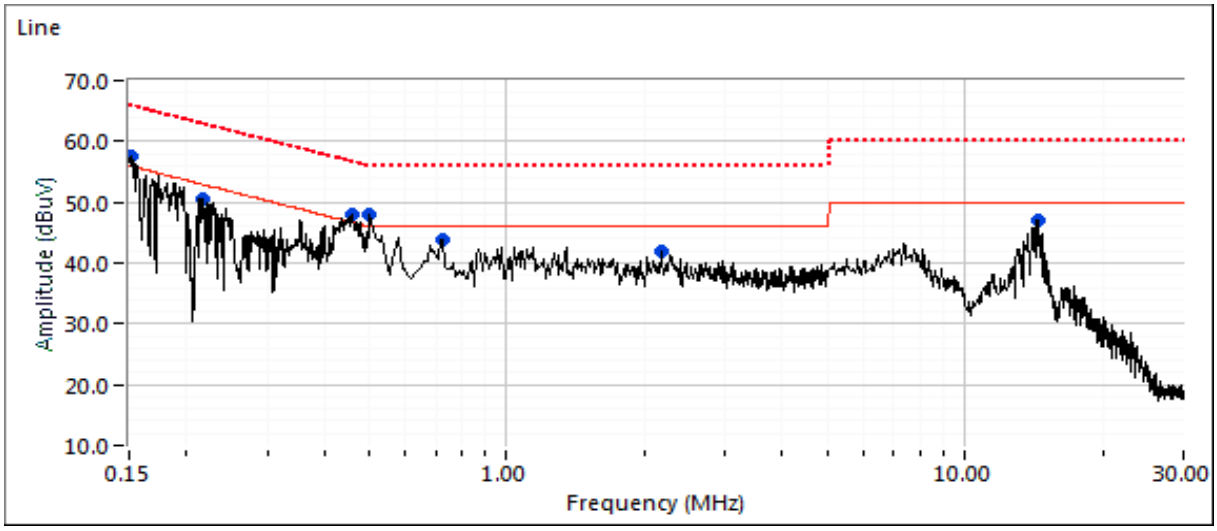
No deviations were made from the requirements of the standard.

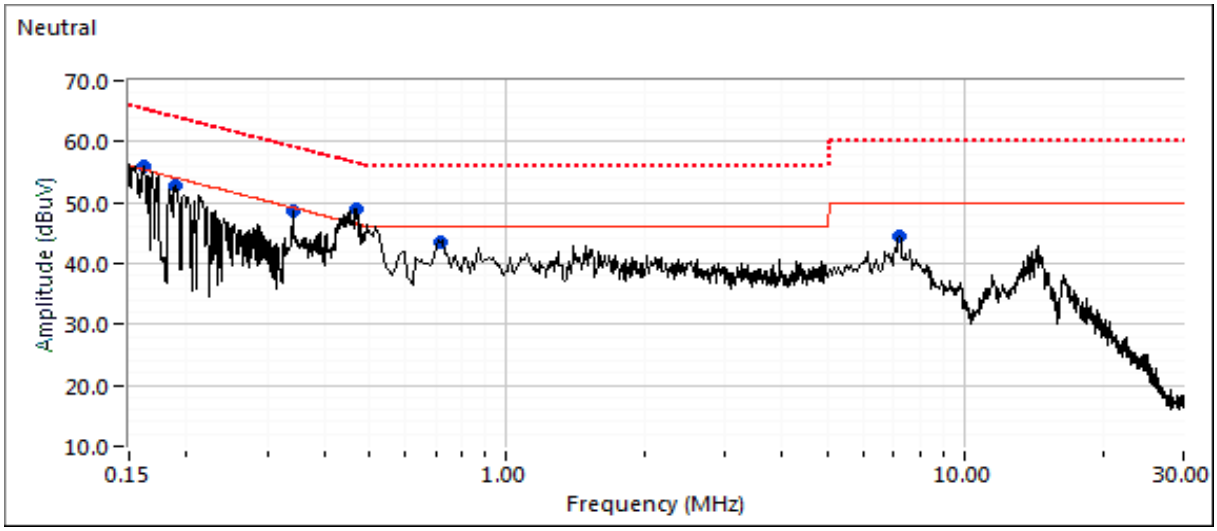
Note: The unit was transmitting at 2412MHz in 802.11b mode and 5180MHz in 802.11a mode.

# EMC Test Data

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

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



# EMC Test Data

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

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

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

# EMC Test Data

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

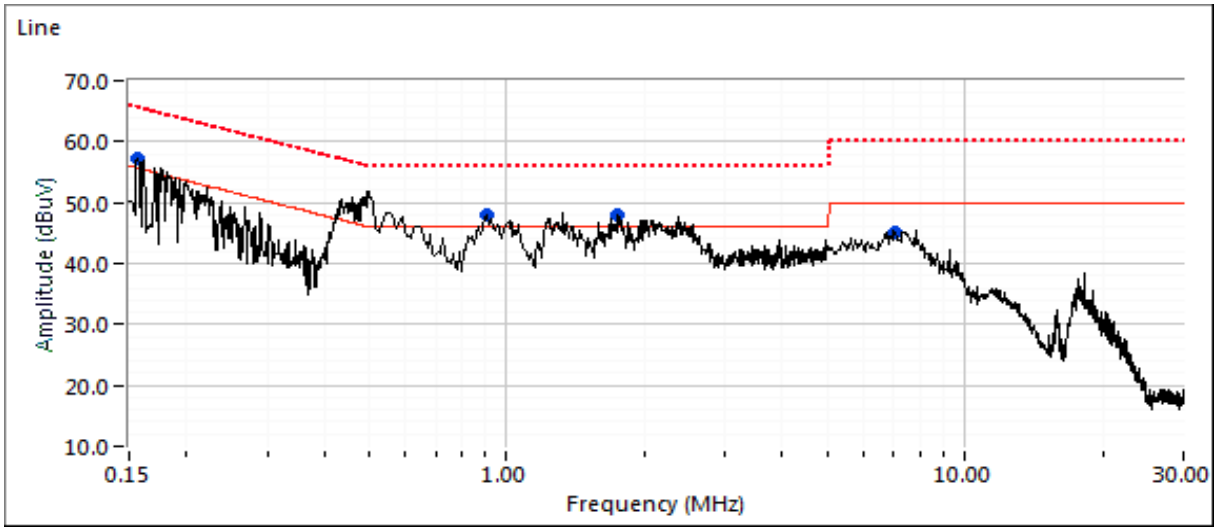
Final quasi-peak and average readings

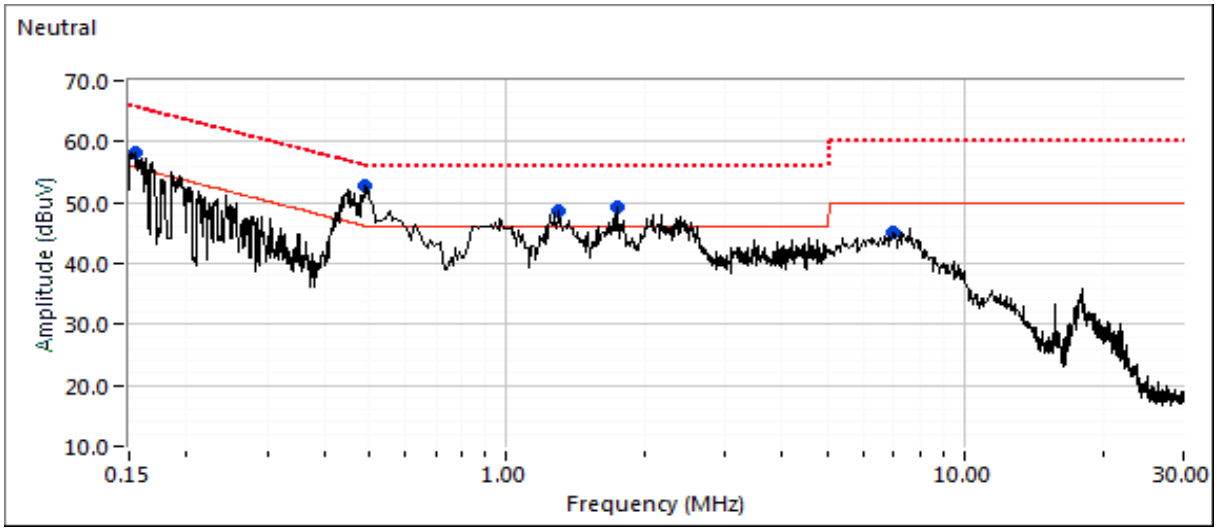
| Frequency MHz | Level dBμV | AC Line | Class B Limit | Margin | Detector QP/Ave | Comments |
|---|---|---|---|---|---|---|
| 0.455 | 38.5 | Line | 46.8 | -8.3 | AVG | |
| 0.154 | 33.5 | Line | 55.8 | -22.3 | AVG | |
| 0.154 | 49.7 | Line | 65.8 | -16.1 | QP | |
| 0.214 | 20.8 | Line | 53.1 | -32.3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

| | |
|---|---|
| Note 1: | |
| Note 2: | |

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

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



# EMC Test Data

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

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

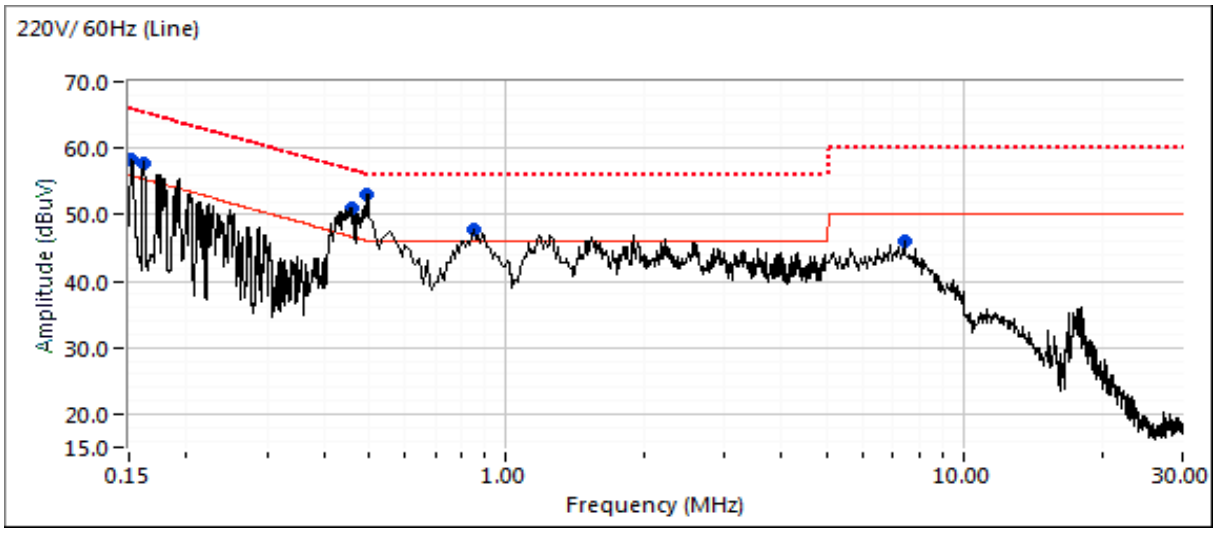
| Frequency MHz | Level dBμV | AC Line | Class B Limit | Margin | Detector QP/Ave | Comments |
|---|---|---|---|---|---|---|
| 0.150 | 57.3 | Line | 55.6 | 1.7 | Peak | |
| 0.497 | 51.9 | Line | 46.0 | 5.9 | Peak | |
| 0.904 | 48.0 | Line | 46.0 | 2.0 | Peak | |
| 1.680 | 47.9 | Line | 46.0 | 1.9 | Peak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

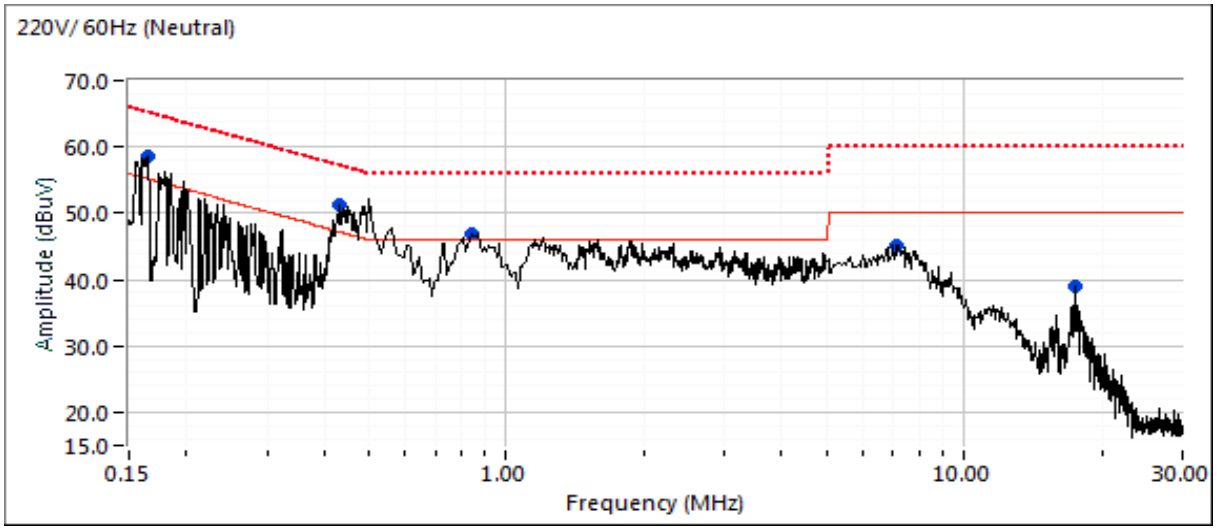
Final quasi-peak and average readings

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

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

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



# EMC Test Data

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

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

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

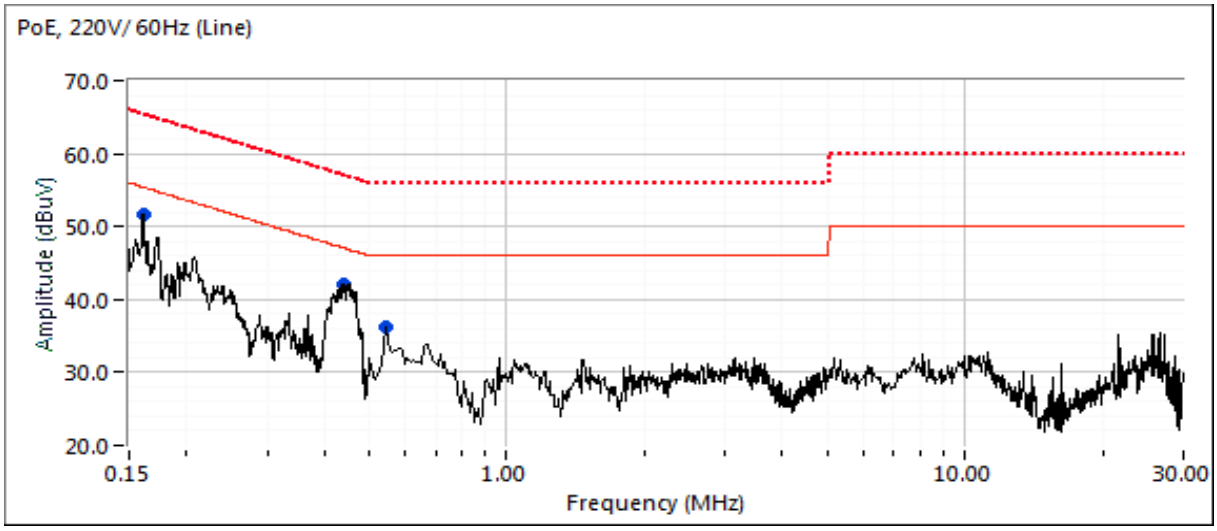
| Frequency MHz | Level dBμV | AC Line | Class B Limit | Class B Margin | Detector QP/Ave | Comments |
|---|---|---|---|---|---|---|
| 0.498 | 53.1 | Line | 46.0 | 7.1 | Peak | |
| 0.500 | 51.6 | Neutral | 46.0 | 5.6 | Peak | |
| 0.457 | 51.0 | Line | 46.7 | 4.3 | Peak | |
| 0.432 | 51.4 | Neutral |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

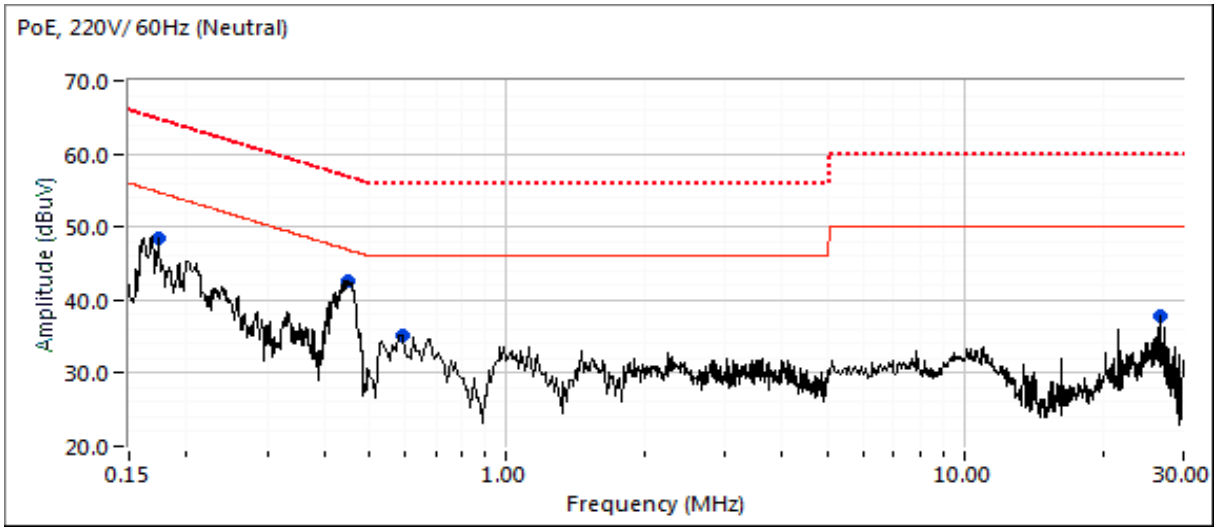
Final quasi-peak and average readings

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

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

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



# EMC Test Data

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

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

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

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

Final quasi-peak and average readings

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

***End of Report***

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