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EMC Test Report

Application for Grant of Equipment Authorization

Industry Canada RSS-Gen Issue 4 / RSS 210 Issue 8
FCC Part 15, Subpart E

Model: 260-E255040

FCC ID:	PGR5G4360M
APPLICANT:	Pace Americas Inc. 310 Providence Mine Road Nevada City, CA 95959
TEST SITE(S):	National Technical Systems - Silicon Valley 41039 Boyce Road. Fremont, CA. 94538-2435
IC SITE REGISTRATION #:	2845B-3; 2845B-4, 2845B-5, 2845B-7
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Testing Cert #0214.26

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REVISION HISTORY

Rev#	Date	Comments	Modified By
-	March 8, 2016	First release	
1	March 15, 2016	Corrected typographical error on page 6, repeated band edge and spurious emissions tests for results on pages 76, 77, 80, 81, 82, 88, 90 and 120	

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SCOPE

An electromagnetic emissions test has been performed on the Pace Americas Inc. model 260-E255040, pursuant to the following rules:

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 - Silicon Valley test procedures:

ANSI C63.10-2013
FCC General UNII Test Procedures KDB789033

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

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

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

OBJECTIVE

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

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

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

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

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

STATEMENT OF COMPLIANCE

The tested sample of Pace Americas Inc. model 260-E255040 complied with the requirements of the following regulations:

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 Pace Americas Inc. model 260-E255040 and therefore apply only to the tested sample. The sample was selected and prepared by Mark Rieger of Pace Americas Inc.

DEVIATIONS FROM THE STANDARDS

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

TEST RESULTS SUMMARY

UNII / LELAN DEVICES

OPERATION IN THE 5.15 – 5.25 GHZ BAND – MOBILE AND PORTABLE CLIENT DEVICE

FCC Rule Part		Description	Measured Value / Comments	Limit / Requirement	Result
15.407 (a) (1) (iv)		Output Power	802.11a: 0.162 W n20: 0.081 W n40: 0.126 W ac80: 0.037 W (Max eirp: 0.771 W)	24 dBm (250 mW) 22.1 dBm (162 mW)[1] 22.1 dBm (162 mW)[1] 22.1 dBm (162 mW)[1] EIRP <= 1 W	Complies
15.407 (a) (1) (iv)		Power Spectral Density	802.11a: 12.6 mW/MHz n20: 7.8 mW/MHz n40: 6.9 mW/MHz ac80: 1.0 mW/MHz	11 dBm/MHz 9.1 dBm/MHz[1] 9.1 dBm/MHz[1] 9.1 dBm/MHz[1]	Complies
15.407(b) (1) / 15.209		Spurious Emissions above 1GHz	53.9 dBµV/m @ 5380.9 MHz (-0.1 dB)	Refer to the limits section (p19) for restricted bands, all others -27 dBm/MHz EIRP	Complies
Note 1 – The limit was reduced as the effective antenna gain exceeded 6 dBi					

OPERATION IN THE 5.725 – 5.85 GHZ BAND

FCC Rule Part		Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.407(e)		6dB Bandwidth	6 dB BW is > 500 kHz	>= 500 kHz	Complies
15.407(a) (3)		Output Power (multipoint systems)	802.11a: 0.166 W n20: 0.480 W n40: 0.173 W ac80: 0.090 W (Max eirp: 3.299 W)	30 dBm (1 W) 27.6 dBm (575 mW)[1] 27.6 dBm (575 mW)[1] 27.6 dBm (575 mW)[1] EIRP <= 4W	Complies
15.407(a) (3)		Power Spectral Density	802.11a: 12.9 mW/MHz n20: 15.7 dBm/MHz n40: 7.5 dBm/MHz ac80: 2.0 dBm/MHz	30 dBm / 500 kHz 27.6 dBm / 500 kHz[1] 27.6 dBm / 500 kHz[1] 27.6 dBm / 500 kHz[1]	Complies
15.407(b) (4) / 15.209		Spurious Emissions above 1GHz	53.8 dBµV/m @ 11569.7 MHz (-0.2 dB	Refer to the limits section (p19) for restricted bands, all others -17 dBm/MHz EIRP bandedge and -27 dBm/MHz EIRP	Complies
Note 1 – The limit was reduced as the effective antenna gain exceeded 6 dBi					

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	OFDM Digital Modulation is used	Digital modulation is required	Complies
15.407(b) (6) / 15.209		Spurious Emissions below 1GHz	33.7 dBµV/m @ 30.27 MHz (-6.3 dB)	Refer to page 20	Complies
15.31 (m)		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)		Operation in the absence of information to transmit	Operation is discontinued in the absence of information (refer to Operational Description)	Device shall automatically discontinue operation in the absence of information to transmit	Complies
15.407 (g)		Frequency Stability	Frequency stability is better than 10 ppm.	Signal shall remain within the allocated band	Complies
15.407 (h1)		Transmit Power Control	Device does not operate in either 5470 – 5725 or 5250 – 5350 MHz bands.		N/A
15.407 (h2)		Dynamic frequency Selection (device with radar detection)			

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part		Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203		RF Connector	u.fl connector used	Unique or integral antenna required	Complies
15.407 (b) (6)		AC Conducted Emissions	39.4 dBµV @ 0.474 MHz (-7.0 dB)	Refer to page 19	Complies
15.247 (i) 15.407 (f)		RF Exposure Requirements	Refer to MPE calculations in separate exhibit and User Manual statements.	Refer to OET 65, FCC Part 1 and RSS 102	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 Pace Americas Inc. model 260-E255040 is an 802.11anac radio module that used 20, 40 and 80 MHz nominal bandwidths.

The sample was received on January 6, 2016 and tested on January 4, 6, 7, 8, 11, 28 and 29, February 1, 2, 4, 5, 10 and 16, and March 11, 2016. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
Pace Americas	260-E255040	Wi-Fi module	F56154520246	PGR5G4360M

OTHER EUT DETAILS

The following EUT details should be noted: The EUT operates only on 1 chain in legacy mode and only with all 3 chains in MIMO modes. The EUT was tested stand-alone on the interface board that will be used in a final product.

ANTENNA SYSTEM

The antenna system consists of three PCB antennas with attached coaxial cables for connection to the module. The Pace N319 5 GHz antennas were used for the testing.

ENCLOSURE

The EUT has no enclosure. The PCB measures 7 cm by 7 cm. It is designed to be installed within the enclosure of a host.

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
Delta	ADP-66DR A	Power Adapter	HUGD5B9005J	-
Pace	-	Interface board	-	-

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

Company	Model	Description	Serial Number	FCC ID
Dell	Latitude D610	Laptop	6XYYQ91	-

EUT INTERFACE PORTS

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

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Antenna port (x3)	Antenna	Coax	Shielded	Varies, Integral to antenna

The module connects to the interface board via PCI-E connector.

The cabling configuration of the support equipment used during testing was as follows:

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Interface board serial	Remote Laptop	Adapter to Dsub and standard serial	Unshielded Shielded	10
Interface board Ethernet	Remote Laptop	Cat 5	Unshielded	10

EUT OPERATION

During testing, the EUT was configured to transmit continuously on the selected channel, in the selected mode at the maximum power.

TEST SITE

GENERAL INFORMATION

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

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

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. 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. 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.

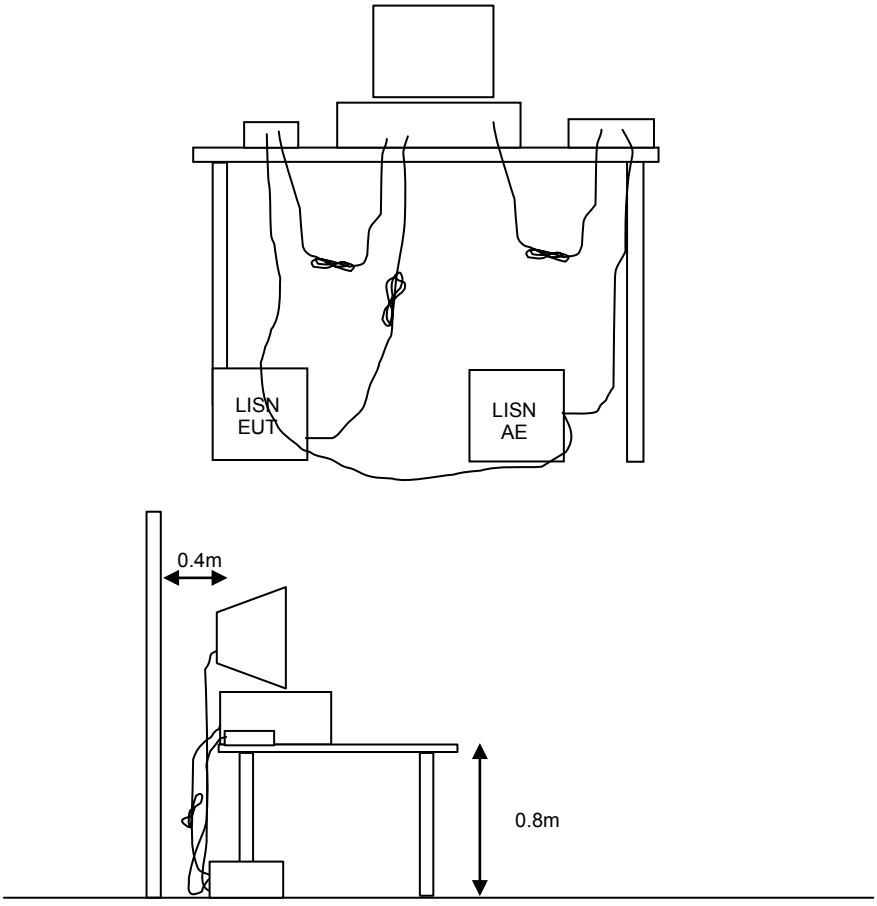


Figure 1 Typical Conducted Emissions Test Configuration

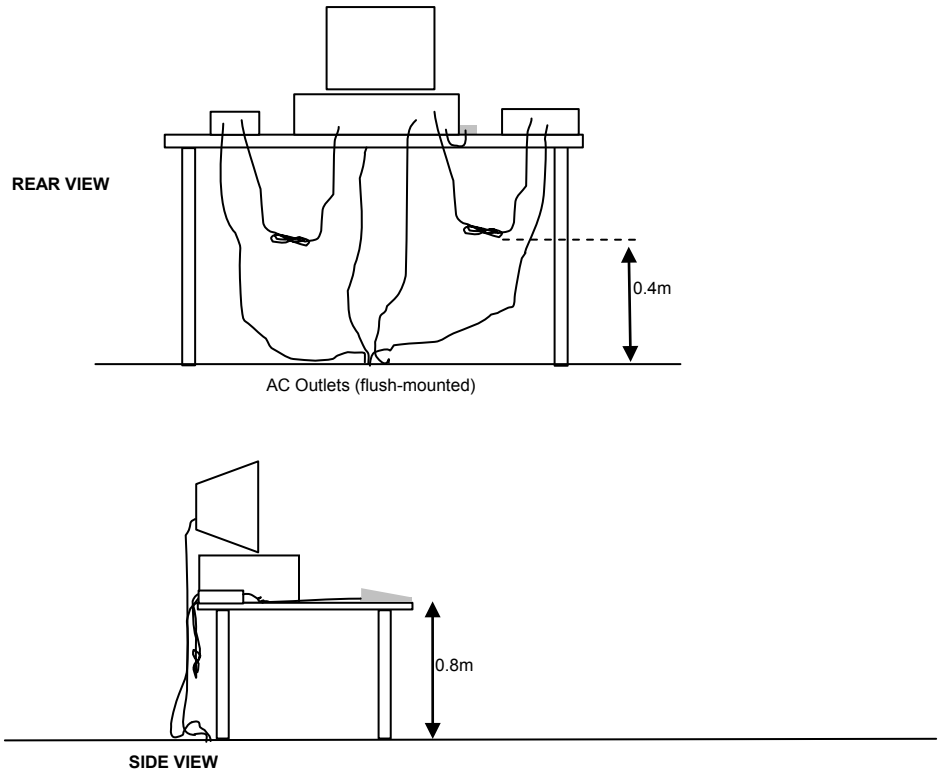
RADIATED EMISSIONS

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.

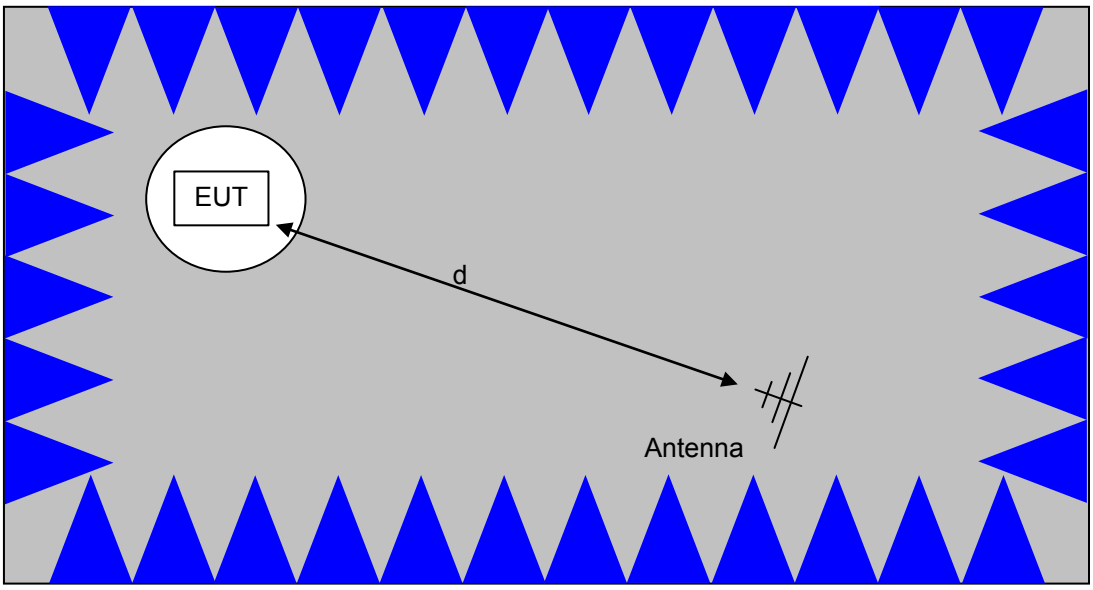
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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.

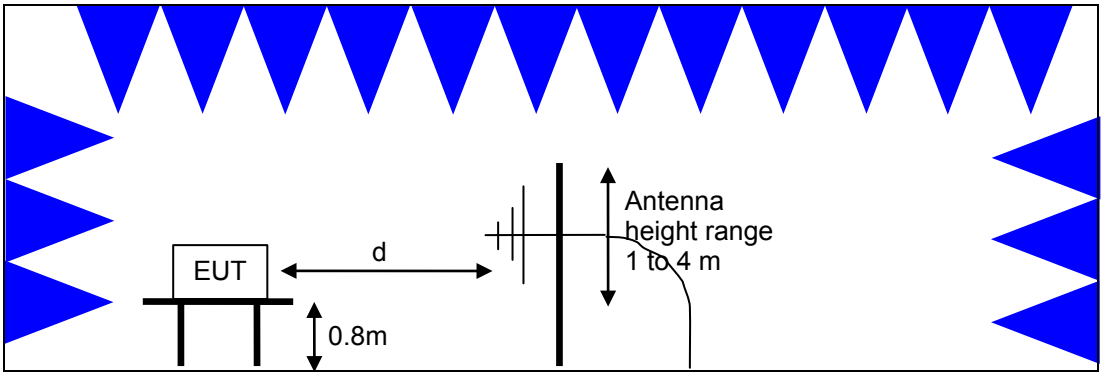


Typical Test Configuration for Radiated Field Strength Measurements



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.

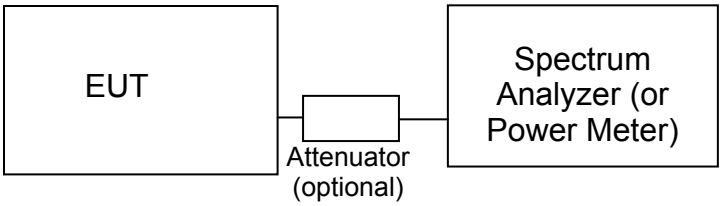
Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.



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] (with the exception of transmitters operating under FCC Part 15 Subpart D and RSS 210 Annex 9), the limits for all emissions from a low power device operating under the general rules of RSS 310 (tables 3 and 4), RSS 210 (table 2) and FCC Part 15 Subpart C section 15.209.

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

RECEIVER RADIATED SPURIOUS EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from receivers as detailed in FCC Part 15.109, RSS 210 Table 2, RSS GEN Table 1 and RSS 310 Table 3. Note that receivers operating outside of the frequency range 30 MHz – 960 MHz are exempt from the requirements of 15.109.

Frequency Range (MHz)	Limit (uV/m @ 3m)	Limit (dBuV/m @ 3m)
30 to 88	100	40
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

[1] The restricted bands are detailed in FCC 15.203, RSS 210 Table 1 and RSS 310 Table 2

GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from transmitters that fall in restricted bands[2].

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

RECEIVER RADIATED SPURIOUS EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from receivers as detailed in FCC Part 15.109 and RSS GEN Table 2. Note that receivers operating outside of the frequency range 30 MHz – 960 MHz are exempt from the requirements of 15.109 and receivers that are not stand-alone are exempt from the ISED Canada requirements per RSS-GEN.

Frequency Range (MHz)	Limit (uV/m @ 3m)	Limit (dBuV/m @ 3m)
30 to 88	100	40
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

[2] The restricted bands are detailed in FCC 15.205 and RSS-Gen Table 6

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)[3] 1W (30dBm) eirp	11 dBm/MHz
5725 – 5825	1 Watt (30 dBm) 4W eirp	30 dBm/500kHz

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

SPURIOUS EMISSIONS LIMITS –UNII and LELAN DEVICES

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

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

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

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

$$R_r - S = M$$

where:
R_r = Receiver Reading in dBuV
S = Specification Limit in dBuV
M = Margin to Specification in +/- dB

SAMPLE CALCULATIONS - RADIATED EMISSIONS

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

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

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

where:
F_d = Distance Factor in dB
D_m = Measurement Distance in meters
D_s = Specification Distance in meters

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

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

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

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

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:
R_r = Receiver Reading in dBuV/m
F_d = Distance Factor in dB
R_c = Corrected Reading in dBuV/m
L_s = Specification Limit in dBuV/m
M = Margin in dB Relative to Spec

SAMPLE CALCULATIONS - FIELD STRENGTH TO EIRP CONVERSION

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

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

where P is the eirp (Watts)

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

Appendix A Test Equipment Calibration Data

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
Radiated Emissions, 1000 - 6,000 MHz, 04, 06-Jan-16					
EMCO	Antenna, Horn, 1-18GHz	3115	868	6/26/2014	6/26/2016
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	12/19/2015	12/19/2016
Radiated Emissions, 1000 - 18,000 MHz, 07-Jan-16					
EMCO	Antenna, Horn, 1-18GHz	3115	868	6/26/2014	6/26/2016
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	2/20/2015	2/20/2016
Hewlett Packard	Spectrum Analyzer (SA40) Red 30 Hz -40 GHz	8564E (84125C)	1148	10/17/2015	10/17/2016
Hewlett Packard	High Pass filter, 8.2 GHz	P/N 84300-80039	1156	6/2/2015	6/2/2016
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	12/19/2015	12/19/2016
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	1729	7/8/2015	7/8/2016
Radiated Emissions, 1000 - 40,000 MHz, 08-Jan-16					
EMCO	Antenna, Horn, 1-18GHz	3115	868	6/26/2014	6/26/2016
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	2/20/2015	2/20/2016
HP / Miteq	SA40 Head (Red)	TTA1840-45-5P-HG-S	1145	7/17/2015	7/17/2016
Hewlett Packard	Spectrum Analyzer (SA40) Red 30 Hz -40 GHz	8564E (84125C)	1148	10/17/2015	10/17/2016
Hewlett Packard	High Pass filter, 8.2 GHz	P/N 84300-80039	1156	6/2/2015	6/2/2016
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	12/19/2015	12/19/2016
A. H. Systems	Purple System Horn, 18-40GHz	SAS-574, p/n: 2581	2160	8/28/2014	8/28/2017
Micro-Tronics	Band Reject Filter, 5725-5875 MHz	BRC50705-02	2241	9/16/2015	9/16/2016
Radiated Emissions, 30 - 1,000 MHz, 11-Jan-16					
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	12/19/2015	12/19/2016
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1549	6/2/2015	6/2/2017
Hewlett Packard	9KHz-1300MHz pre-amp	8447F	2777	3/4/2015	3/5/2016
Radiated Emissions, 1000 - 6,000 MHz, 28, 29-Jan-16					
EMCO	Antenna, Horn, 1-18GHz	3115	868	6/26/2014	6/26/2016
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	6/20/2015	6/20/2016
Radiated Emissions, 1000 - 6,000 MHz, 01-Feb-16					
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/27/2014	6/27/2016
Rohde & Schwarz	EMI Test Receiver, 20 Hz-40 GHz	ESIB40 (1088.7490.40)	2493	1/23/2015	2/23/2016
Radiated Emissions, 1000 - 40,000 MHz, 02-Feb-16					
EMCO	Antenna, Horn, 1-18GHz	3115	868	6/26/2014	6/26/2016

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	1/21/2016	1/21/2017
HP / Miteq	SA40 Head (Red)	TTA1840-45-5P-HG-S	1145	7/17/2015	7/17/2016
Hewlett Packard	Spectrum Analyzer (SA40) Red 30 Hz -40 GHz	8564E (84125C)	1148	10/17/2015	10/17/2016
Hewlett Packard	High Pass filter, 8.2 GHz	P/N 84300-80039	1156	6/2/2015	6/2/2016
A. H. Systems	Purple System Horn, 18-40GHz	SAS-574, p/n: 2581	2160	8/28/2014	8/28/2017
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	2251	9/16/2015	9/16/2016
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	12/19/2015	12/19/2016
Radiated Emissions, 1000 - 40,000 MHz, 03, 04-Feb-16					
EMCO	Antenna, Horn, 1-18GHz	3115	868	6/26/2014	6/26/2016
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	1/21/2016	1/21/2017
HP / Miteq	SA40 Head (Red)	TTA1840-45-5P-HG-S	1145	7/17/2015	7/17/2016
Hewlett Packard	Spectrum Analyzer (SA40) Red 30 Hz -40 GHz	8564E (84125C)	1148	10/17/2015	10/17/2016
Hewlett Packard	High Pass filter, 8.2 GHz	P/N 84300-80039	1156	6/2/2015	6/2/2016
A. H. Systems	Purple System Horn, 18-40GHz	SAS-574, p/n: 2581	2160	8/28/2014	8/28/2017
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	2251	9/16/2015	9/16/2016
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	12/19/2015	12/19/2016
Micro-Tronics	Band Reject Filter, 5725-5875 MHz	BRC50705-02	2241	9/16/2015	9/16/2016
Radiated Emissions, 1000 - 40,000 MHz, 05-Feb-16					
Hewlett Packard	High Pass filter, 8.2 GHz	P/N 84300-80039	1156	6/2/2015	6/2/2016
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	12/19/2015	12/19/2016
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/27/2014	6/27/2016
HP / Miteq	SA40 Head (Purple)	TTA1840-45-5P-HG-S	1772	12/21/2015	12/21/2016
A. H. Systems	Spare System Horn, 18-40GHz	SAS-574, p/n: 2581	2162	7/29/2015	7/29/2017
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	2199	10/9/2015	10/9/2016
Micro-Tronics	Band Reject Filter, 5725-5875 MHz	BRC50705-02	2241	9/16/2015	9/16/2016
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	2251	9/16/2015	9/16/2016
Hewlett Packard	Spectrum Analyzer (SA40) Purple 9 kHz - 40 GHz,	8564E (84125C)	2415	3/7/2015	3/7/2016
Radio Antenna Port (Power and Spurious Emissions), 10-Feb-16					
Rohde & Schwarz	Signal Analyzer 20 Hz - 26.5 GHz	FSQ26	2327	5/6/2015	5/6/2016

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
Rohde & Schwarz	Open Switch and Control Unit, p/s	OSP120 with B157	3000	6/8/2015	6/8/2016
Radio Antenna Port (Power and Spurious Emissions), 16-Feb-16					
Rohde & Schwarz	Signal Analyzer 20 Hz - 26.5 GHz	FSQ26	2327	5/6/2015	5/6/2016
Rohde & Schwarz	Open Switch and Control Unit, p/s	OSP120 with B157	3000	6/8/2015	6/8/2016
Radiated Emissions, 1000 - 18,000 MHz, 11-Mar-16					
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	10/12/2015	10/12/2016
Hewlett Packard	High Pass filter, 8.2 GHz	P/N 84300-80039	1156	6/2/2015	6/2/2016
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1630	7/6/2015	7/6/2016
Micro-Tronics	Band Reject Filter, 5725-5875 MHz	BRC50705-02	1682	7/8/2015	7/8/2016
EMCO	Antenna, Horn, 1-18 GHz	3115	2733	11/18/2014	11/18/2016
Hewlett Packard	Spectrum Analyzer (SA40) Blue 9 kHz - 40 GHz	8564E (84125C)	3810	3/1/2016	3/12017

Appendix B Test Data

T100356 Pages 29 – 151

Client:	Pace Americas, Inc.	Job Number:	JD100297
Product	Wi-Fi Module 5 GHz	T-Log Number:	T100356
System Configuration:		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	
Emissions Standard(s):	FCC Part 15.407	Class:	B
Immunity Standard(s):		Environment:	Radio

EMC Test Data

For The

Pace Americas, Inc.

Product

Wi-Fi Module 5 GHz

Date of Last Test: 3/11/2016

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Power vs. Data Rate

In normal operating modes the card uses power settings stored on EEPROM to set the output power. For a given nominal output power the actual transmit power normally is reduced as the data rate increases, therefore testing was performed at the data rate in the mode with highest power to determine compliance with the requirements.
The following power measurements were made using a **GATED** average power meter and with the device configured in a continuous transmit mode on Chain 1 at the various data rates in each mode to verify the highest power mode:

Sample Notes

Sample S/N: F56154520246
Driver: 7.14.89.21.571.206

Date of Test: 1/6/2016
Test Engineer: Mehran Birgani
Test Location: Fremont Chamber #7

Mode	Data Rate	Power (dBm)	Power setting
802.11a	6	**18.6**	20.0
	9	18.6	
	12	18.6	
	18	18.6	
	24	18.5	
	36	18.5	
	48	18.5	
	54	18.5	

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Mode	Data Rate	Power (dBm)	Power setting	
802.11n/ac 20MHz	6.5	12.0		
	13.0	12.2		
	19.5	12.4		
	26.0	12.6		
	39.0	12.9		
	52.0	13.3		
	58.5	13.4		
	65.0	13.5		
	78.0	**13.7**		<<-11ac mode only
802.11n/ac 40MHz	13.5	12.6		
	27.0	12.9		
	40.5	13.3		
	54.0	13.6		
	81.0	14.0		
	108.0	14.3		
	121.5	14.4		
	135.0	14.6		
	162.0	14.9		<<-11ac mode only
	180.0	**15.1**		<<-11ac mode only
802.11ac 80MHz	29.3	12.3		
	58.5	13.0		
	87.8	13.4		
	117.0	13.6		
	175.5	14.2		
	234.0	14.5		
	266.3	14.7		
	292.5	14.9		
	351.0	15.1		
	390.0	**15.2**		

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

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Duty Cycle

Date of Test: 1/4/16 & 1/29/2016
Test Engineer: David Bare & Joseph Cadigal
Test Location: Fremont Chamber #7 & EMC Lab #4A

Duty cycle measurements performed on the worse case data rate for power.

Notes: Measurements taken with maximum RBW/VBW settings allowed.

Non-beamforming

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	98.0%	Yes	1.302	0	0	10
n20	VHT8	99.1%	Yes	1.935	0	0	10
n40	VHT9	98.1%	Yes	0.952	0	0	10
ac80	VHT9	93.7%	Yes	0.448	0.3	0.6	2232

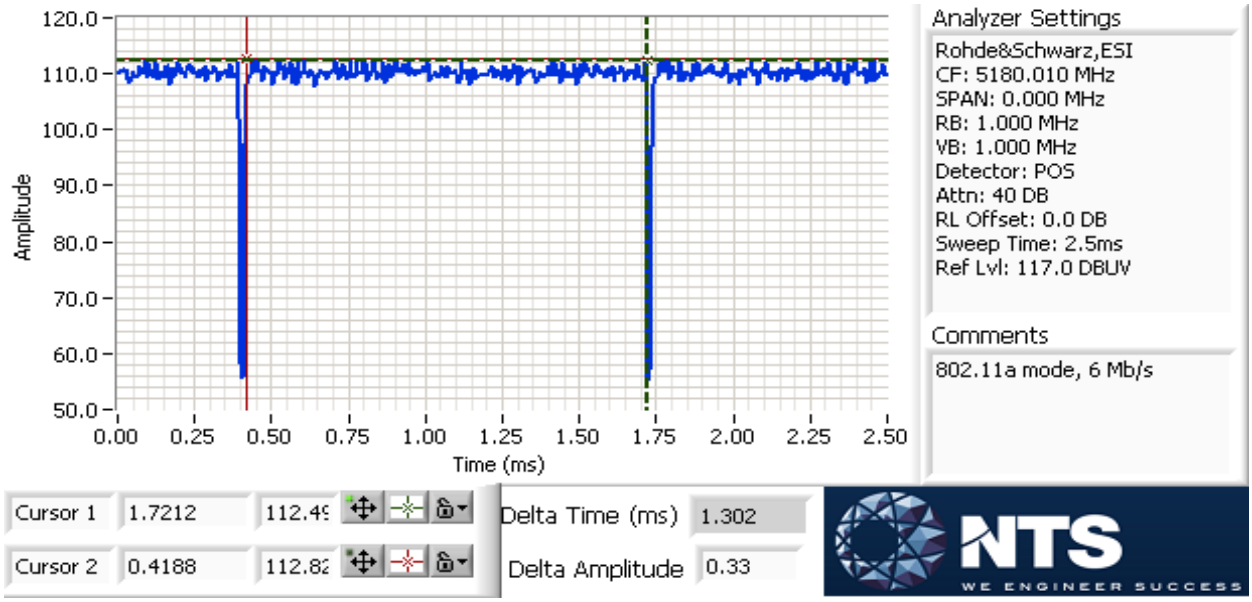
Beamforming

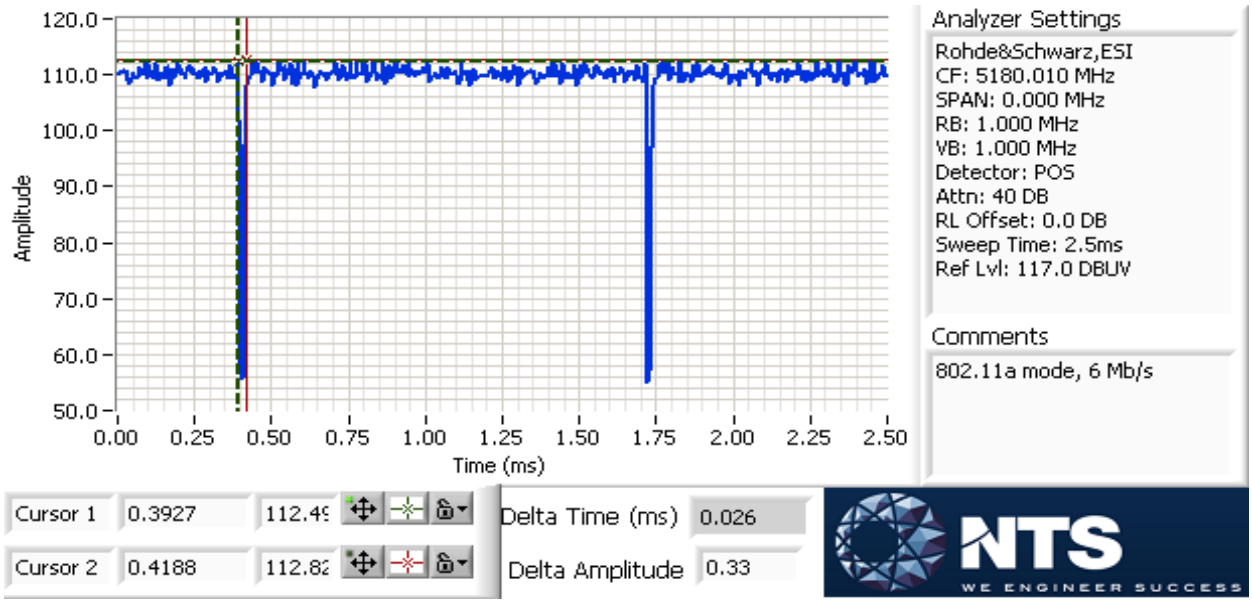
Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)	
n20	VHT8	92.6%	No	1.935	0.3	0.7	517	1k
n40	VHT9	95.2%	No	0.952	0.2	0.4	1050	3k
ac80	VHT9	75.5%	Yes	2.023	1.2	2.4	494	1k

* Correction factor when using RMS/Power averaging - 10*log(1/x)
** Correction factor when using linear voltage average - 20*log(1/x)
T = Minimum transmission duration

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

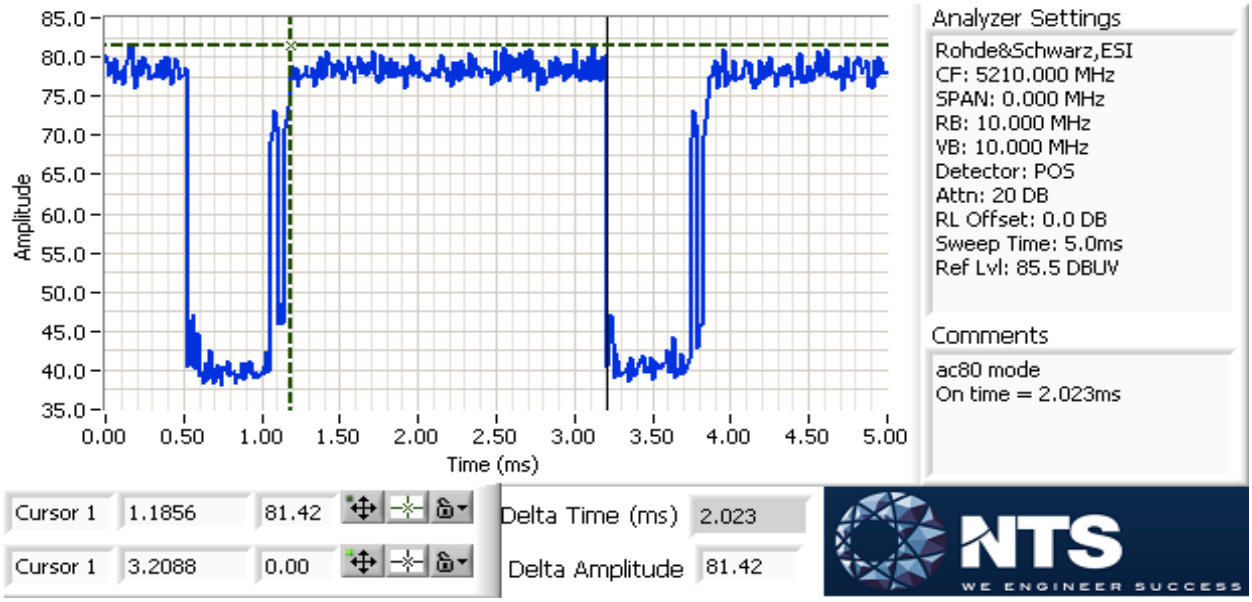
Non-Beamforming

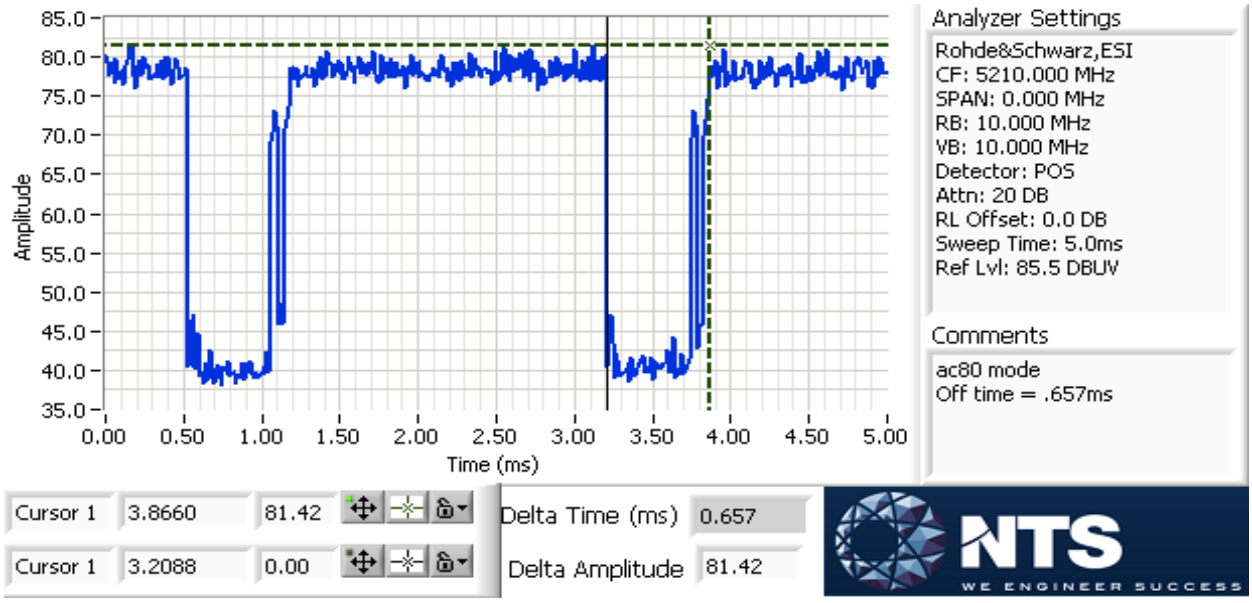




Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Beamforming





Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

RSS-247 (LELAN) and FCC 15.407(UNII)
Antenna Port Measurements
Power, PSD, Bandwidth and Spurious Emissions

Test Specific Details

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

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Power, 5150 - 5250MHz	15.407(a) (1), (2), (3) RSS-247 6.2	Pass	a: 162 mW n20: 81.4 mW n40: 126 mW ac80: 37 mW
1	PSD, 5150 - 5250MHz	15.407(a) (1), (2), (3) RSS-247 6.2	Pass	a: 12.6 mW/MHz n20: 7.8 mW/MHz n40: 6.9 mW/MHz ac80: 1 mW/MHz
2	99% Bandwidth	RSS-247 (Information only)	N/A	a: 17.0 MHz n20: 17.9 MHz n40: 36.9 MHz ac80: 76.1 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.

Ambient Conditions:

Temperature:	22.1 °C
Rel. Humidity:	34 %

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:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

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	0.98	Yes	1.302	0	0	10
11n20	VHT8	0.99	Yes	1.935	0	0	10
11n40	VHT9	0.98	Yes	0.952	0	0	10
ac80	VHT9	0.94	Yes	0.448	0.28	0.56	2232

Sample Notes

Sample S/N: F56154520246
Driver: 7.14.89.21.571.206

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

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

Date of Test: 2/10/2016 8:00 Config. Used: 1
Test Engineer: John Caizzi / R. Varelas Config Change: None
Test Location: Lab 4B EUT Voltage: 120V / 60Hz

Note 1:	Duty Cycle ≥ 98% for a, n20 and n40 modes. Output power measured using a spectrum analyzer (see plots below). RBW=1MHz, VB=3 MHz, Span > OBW, # of points in sweep ≥ 2*span/RBW, auto sweep, RMS detector, power averaging on (transmitted signal was continuous, duty cycle ≥ 98%) and power integration over the OBW (method SA-1 of ANSI
Note 2:	Constant Duty Cycle < 98% for ac80 mode. 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, power averaging on and power integration over the OBW. Tthe measurements were adjusted by adding .28 dB. This is based on 10log(1/x), where x is the duty cycle. (method SA-2 of ANSI C63.10)
Note 3:	Measured using the same analyzer settings used for output power.
Note 4:	For RSS-247 the limit for the 5150 - 5250 MHz band accounts for the antenna gain as the maximum eirp allowed is 10dBm/MHz. The limits are also corrected for instances where the highest measured value of the PSD exceeds the average PSD (calculated from the measured power divided by the measured 99% bandwidth) by more than 3dB by the amount that the measured value exceeds the average by more than 3dB.
Note 5:	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 6:	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.

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Antenna Gain Information

Freq	Antenna Gain (dBi) / Chain				BF	MultiChain Legacy	CDD	Sectorized / Xpol	Dir G (PWR)	Dir G (PSD)
	1	2	3	4						
5150-5250	2.5	4.1	2.6		Yes	No	Yes, n mode only	No	7.9	7.9

For devices that support CDD modes

Min # of spatial streams: 3

Max # of spatial streams: 3

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 of the following options: Option 1: Delays are optimized for beamforming, rather than being selected from cyclic delay table of 802.11; Array gains calculated based on beamforming criteria.

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

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

MIMO Device - 5150-5250 MHz Band - FCC

Mode: **11a** SISO only with diversity (worst chain selected) Max EIRP (mW): 416.9182

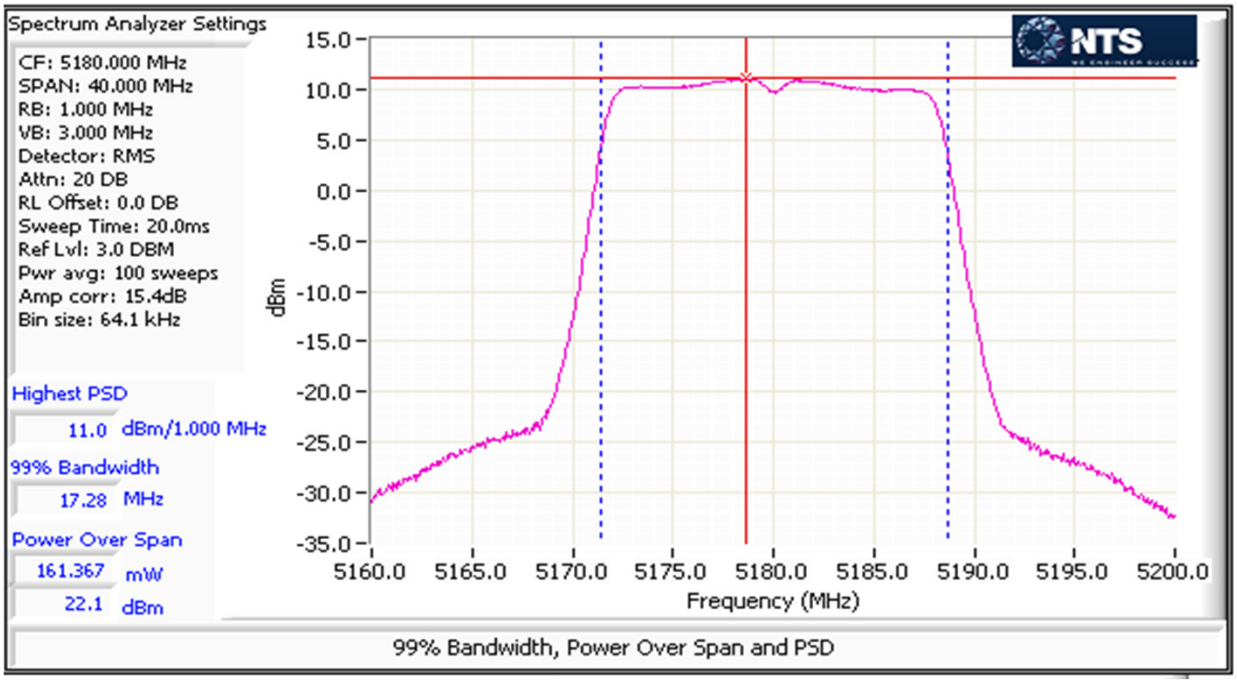
Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power mW	Total Power dBm	FCC Limit dBm	Max Power (W)	Result
5180	1	21		98		162.2	22.1	24.0	0.162	Pass
	3									
	4									
	2				22.1					
5200	1	18.5		98		85.1	19.3	24.0		Pass
	3									
	4									
	2				19.3					
5240	1	19		98		107.2	20.3	24.0		Pass
	3									
	4									
	2				20.3					

5150-5250 PSD - FCC

Mode: **11a** SISO only with diversity (worst chain selected)

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[3] mW/MHz	Total PSD[3] dBm/MHz	FCC Limit dBm/MHz	Result
5180	1	21		98		12.6	11.0	11.0	Pass
	3								
	4								
	2				11.0				
5200	1	18.5		98		6.9	8.4	11.0	Pass
	3								
	4								
	2				8.4				
5240	1	19		98		8.7	9.4	11.0	Pass
	3								
	4								
	2				9.4				

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

MIMO Device - 5150-5250 MHz Band - FCC

Mode: n20 Max EIRP (mW): 498.37093

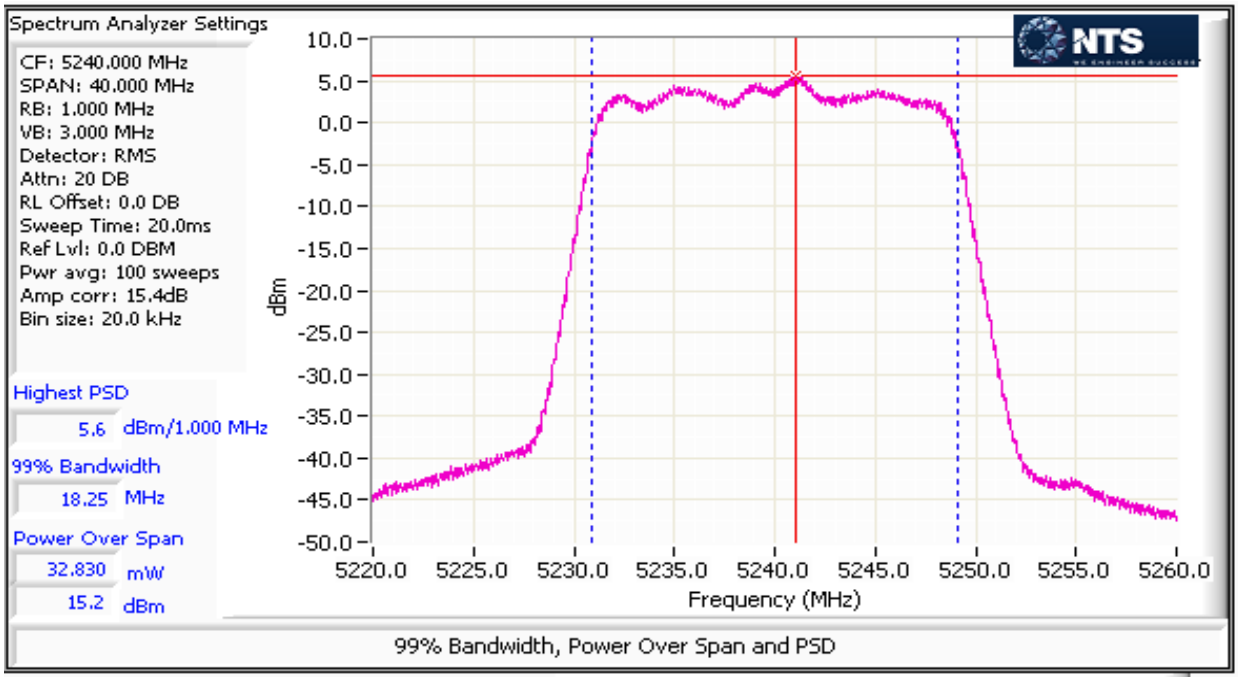
Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power mW	Total Power dBm	FCC Limit dBm	Max Power (W)	Result
5180	1	14.5		99	13.5	81.4	19.1	22.1	0.081	Pass
	3				14.7					
	4									
	2				14.7					
5200	1	14.5		99	13.6	80.7	19.1	22.1		Pass
	3				14.8					
	4									
	2				14.4					
5240	1	14.5		99	13.2	79.7	19.0	22.1		Pass
	3				15.2					
	4									
	2				14.1					

5150-5250 PSD - FCC

Mode: n20

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[3] mW/MHz	Total PSD[3] dBm/MHz	FCC Limit dBm/MHz	Result
5180	1	14.5		99	2.4	7.7	8.9	9.1	Pass
	3				5.1				
	4								
	2				4.3				
5200	1	14.5		99	2.7	7.7	8.9	9.1	Pass
	3				5.2				
	4								
	2				4.1				
5240	1	14.5		99	2.1	7.8	8.9	9.1	Pass
	3				5.6				
	4								
	2				4.1				

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

MIMO Device - 5150-5250 MHz Band - FCC

Mode: n40 Max EIRP (mW): 771.43412

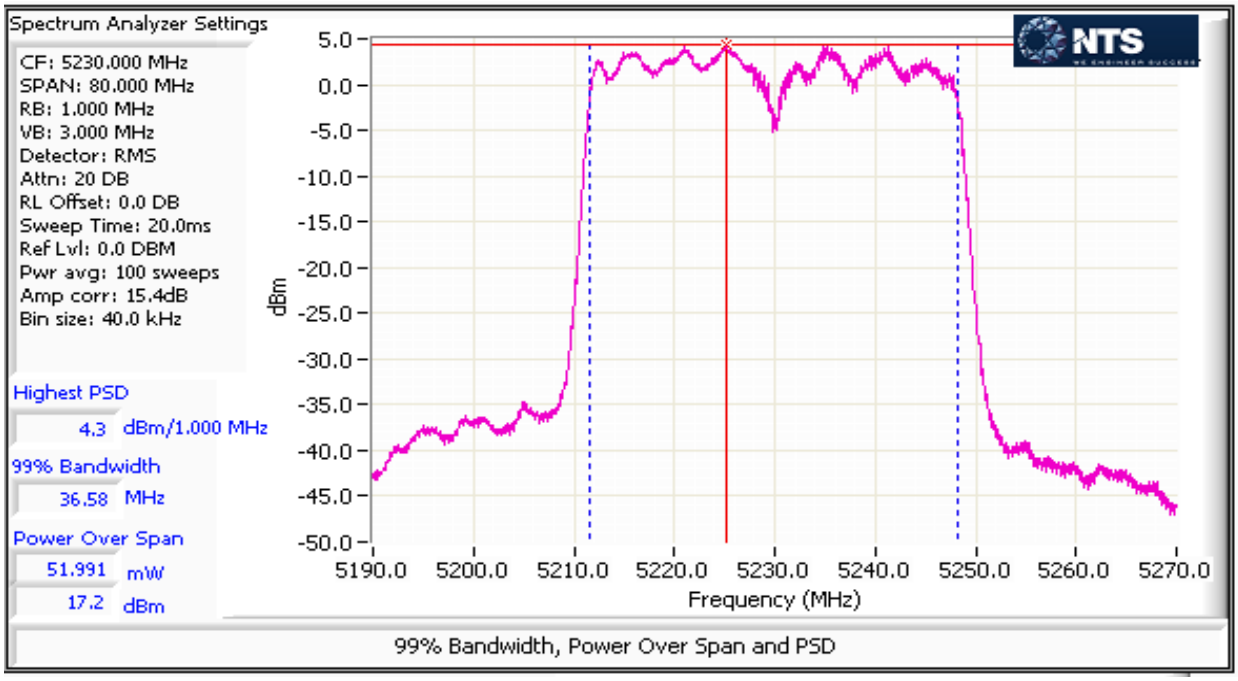
Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5190	1	11.5		98	10.2	37.6	15.8	22.1	0.126	Pass
	3				11.7					
	4									
	2				10.9					
5230	1	16.5		98	15.5	126.0	21.0	22.1		Pass
	3				17.2					
	4									
	2				15.8					

5150-5250 PSD - FCC

Mode: n40

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[3] mW/MHz	Total PSD[3] dBm/MHz	FCC Limit dBm/MHz	Result
5190	1	11.5		98	-3.4	1.9	2.8	9.1	Pass
	3				-1.4				
	4								
	2				-1.4				
5230	1	16.5		98	2.1	6.9	8.4	9.1	Pass
	3				4.3				
	4								
	2				4.1				

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

MIMO Device - 5150-5250 MHz Band - FCC

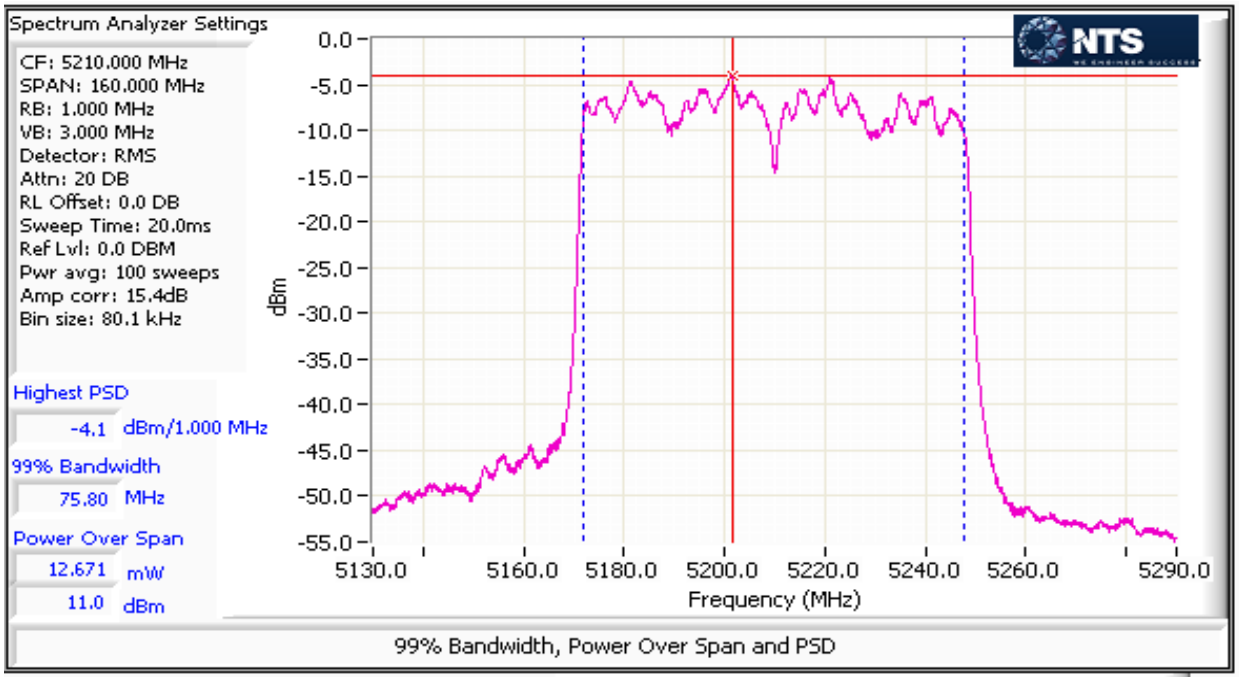
Mode: **ac80** Max EIRP (mW): 228.36899

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power dBm	Total Power[2] mW	Total Power[2] dBm	FCC Limit dBm	Max Power (W)	Result
5210	1	11		94	10.1	37.3	15.7	22.1	0.037	Pass
	3				11.3					
	4									
	2				10.6					

5150-5250 PSD - FCC

Mode: **ac80**

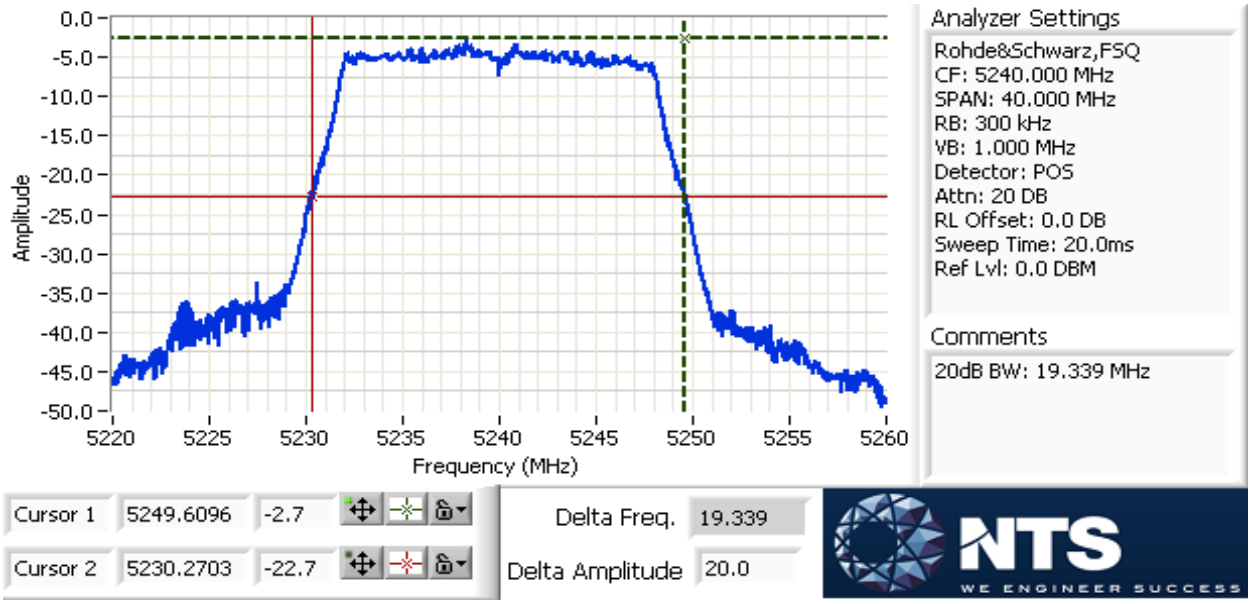
Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[3] mW/MHz	Total PSD[3] dBm/MHz	FCC Limit dBm/MHz	Result
5210	1	11		94	-6.5	1.0	0.0	9.1	Pass
	3				-4.1				
	4								
	2				-4.6				



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #2: 20 dB Bandwidth
Mode: 11a

Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (MHz)	
		20dB	99%	20dB	99%
19	5240	19.3		0.3	

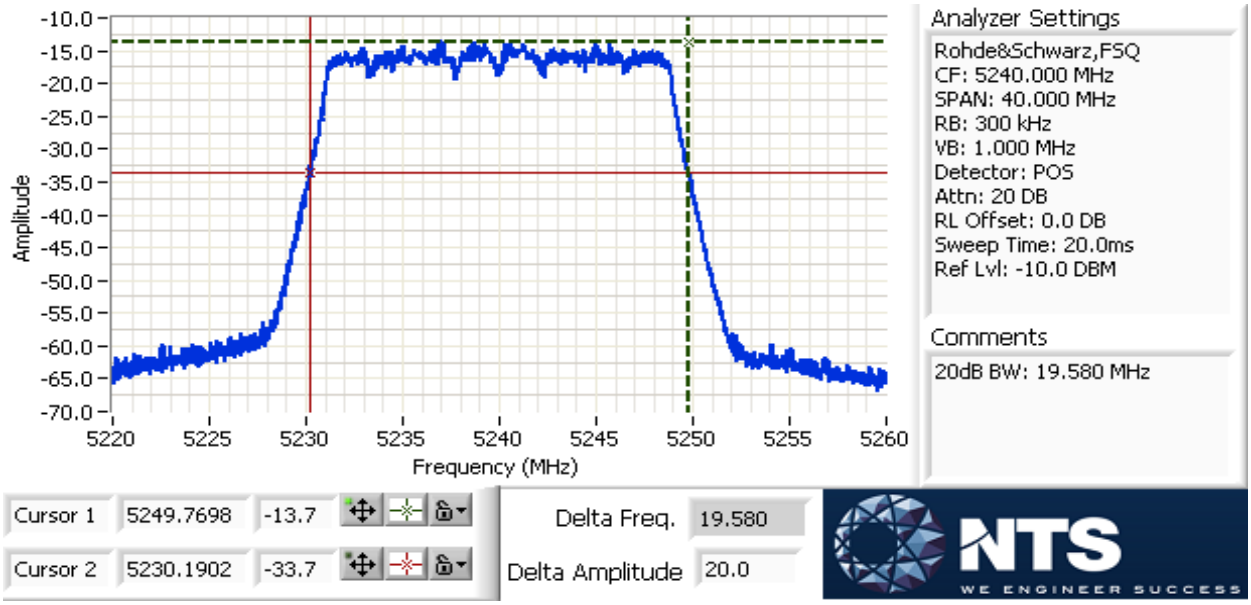


Note 1	Measurements performed on chain 2.
Note 2	-20 dB BW wholly contained in UNII 1 band.
Note 3	20dB BW: RBW=1-5% of 20dB BW, VBW ≥ 3*RBW, peak detector, max hold, auto sweep time. Span 1.5-5 times 20dB BW.

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Mode: **n20**

Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (MHz)	
		20dB	99%	20dB	99%
8.5	5240	19.6		0.3	

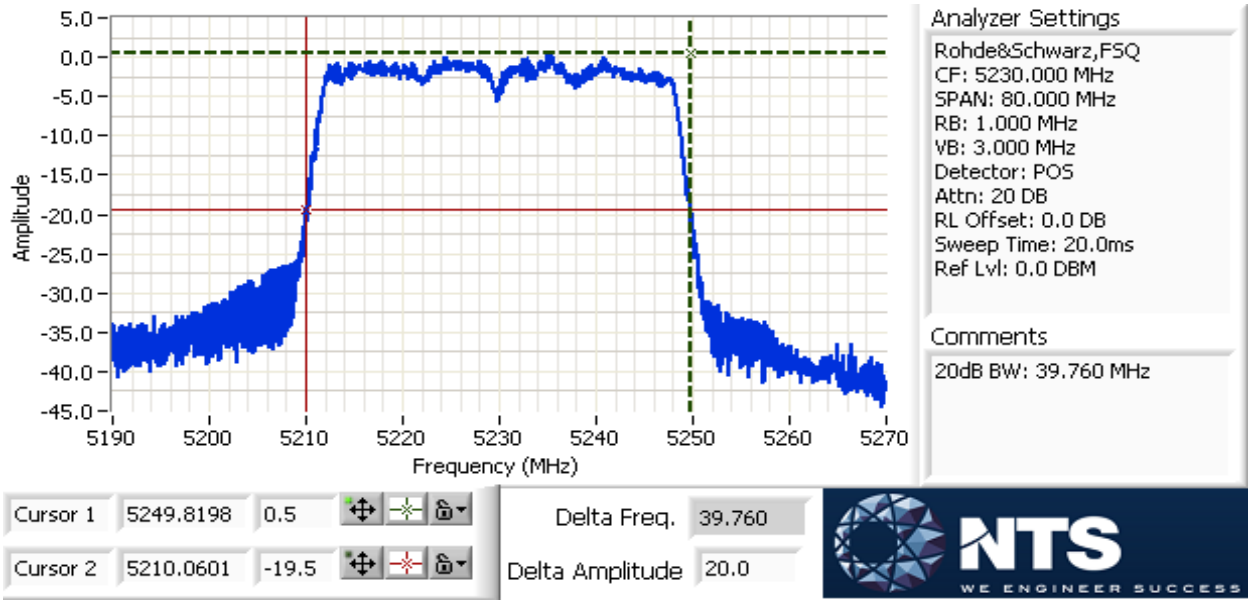


Note 1	Measurements performed on chain 3.
Note 2	-20 dB BW wholly contained in UNII 1 band.
Note 3	20dB BW: RBW=1-5% of 20dB BW, VBW ≥ 3*RBW, peak detector, max hold, auto sweep time. Span 1.5-5 times 20dB BW.

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Mode: **n40**

Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (MHz)	
		20dB	99%	20dB	99%
11.5	5230	39.76		1	

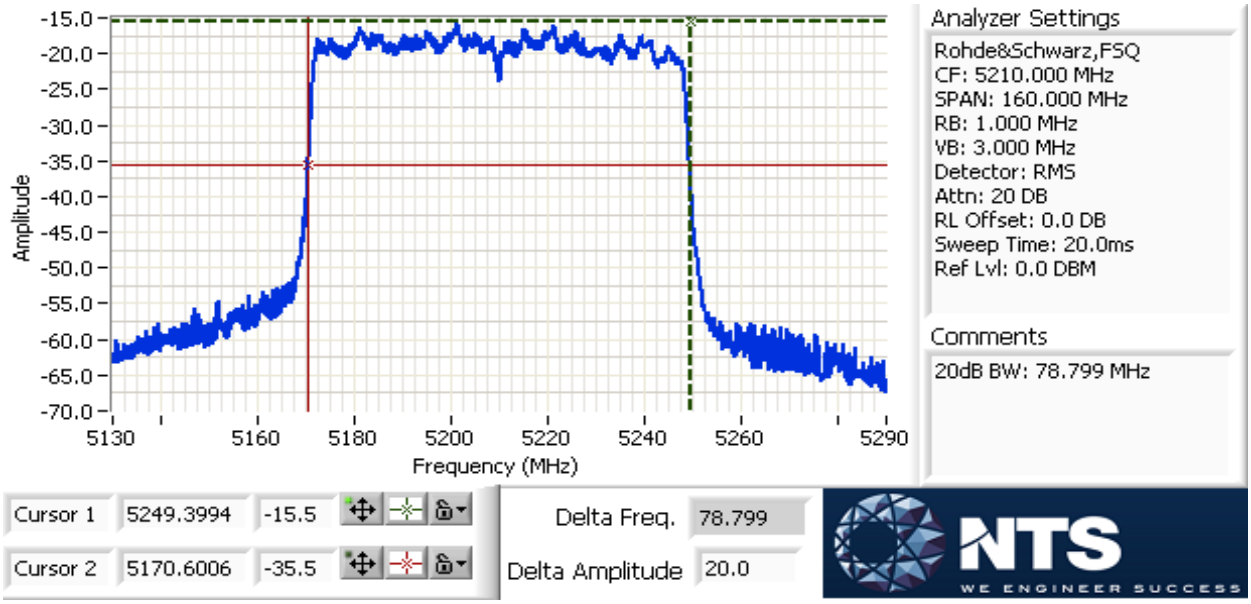


Note 1	Measurements performed on chain 3.
Note 2	-20 dB BW wholly contained in UNII 1 band.
Note 3	20dB BW: RBW=1-5% of 20dB BW, VBW ≥ 3*RBW, peak detector, max hold, auto sweep time. Span 1.5-5 times 20dB BW.

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Mode: **ac80**

Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (MHz)	
		20dB	99%	20dB	99%
11	5210	78.8		1	



Note 1	Measurements performed on chain 3.
Note 2	-20 dB BW wholly contained in UNII 1 band.
Note 3	20dB BW: RBW=1-5% of 20dB BW, VBW ≥ 3*RBW, peak detector, max hold, auto sweep time. Span 1.5-5 times 20dB BW.

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

RSS-247 (LELAN) and FCC 15.407(UNII)
Antenna Port Measurements
Power, PSD, Bandwidth and Spurious Emissions

Test Specific Details

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

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Power, 5725 - 5850MHz	15.407(a) (1), (2), (3) RSS-247 6.2	Pass	a: 166 mW n20: 480 mW n40: 173 mW ac80: 90.0 mW
1	PSD, 5725 - 5850MHz	15.407(a) (1), (2), (3) RSS-247 6.2	Pass	a: 12.9 mW/MHz n20: 15.7 mW/MHz n40: 7.5 mW/MHz ac80: 2.0 mW/MHz
1	99% Bandwidth	RSS-GEN (Information only)	N/A	a: 17.4 MHz n20: 17.5 MHz n40: 36.9 MHz ac80: 76.1 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.

Ambient Conditions:

Temperature:	22.3 °C
Rel. Humidity:	35 %

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:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

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	0.98	Yes	1.302	0	0	10
11n20	VHT8	0.99	Yes	1.935	0	0	10
11n40	VHT9	0.98	Yes	0.952	0	0	10
ac80	VHT9	0.94	Yes	0.448	0.28	0.56	2232

Sample Notes

Sample S/N: F56154520246

Driver: 7.14.89.21.571.206

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

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

Date of Test: 2/16/2016 0:00 Config. Used: 1
Test Engineer: Rafael Varelas Config Change: None
Test Location: FT Lab #4B EUT Voltage: 120V/60Hz

Note 1:	Duty Cycle ≥ 98% for a, n20 and n40 modes. Output power measured using a spectrum analyzer (see plots below). RBW=1MHz, VB=3 MHz, Span > OBW, # of points in sweep ≥ 2*span/RBW, auto sweep, RMS detector, power averaging on (transmitted signal was continuous, duty cycle ≥ 98%) and power integration over the OBW (method SA-1 of ANSI C63.10).
Note 2:	Constant Duty Cycle < 98% for ac80 mode. 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, power averaging on and power integration over the OBW. Tthe measurements were adjusted by adding .28 dB. This is based on 10log(1/x), where x is the duty cycle. (method SA-2 of ANSI C63.10)
Note 3:	Measured using the same analyzer settings used for output power.
Note 4:	99% Bandwidth measured in accordance with C63.10 - RB between 1-5 % of OBW and VB ≥ 3*RB, Span between 1.5 and 5 times OBW.
Note 5:	For MIMO systems the total output power and total PSD are calculated from the sum of the powers of the individual chains (in linear terms). The antenna gain used to determine the EIRP and limits for PSD/Output power depends on the operating mode of the MIMO device. If the signals on the non-coherent between the transmit chains then the gain used to determine the limits is the highest gain of the individual chains and the EIRP is the sum of the products of gain and power on each chain. If the signals are coherent then the effective antenna gain is the sum (in linear terms) of the gains for each chain and the EIRP is the product of the effective gain and total power.

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Antenna Gain Information

Freq	Antenna Gain (dBi) / Chain				BF	MultiChain Legacy	CDD	Sectorized / Xpol	Dir G (PWR)	Dir G (PSD)
	1	2	3	4						
5150-5250	2.5	4.1	2.6		Yes	No	Yes	No		
5250-5350	2.8	4.3	2.3		Yes	No	Yes	No		
5470-5725	3.1	3.5	3		Yes	No	Yes	No		
5725-5825	3.6	3.7	3.5		Yes	No	Yes	No	8.4	8.4

For devices that support CDD modes

Min # of spatial streams: 3
Max # of spatial streams: 3

Notes:	BF = beamforming mode supported, Multichain Legacy = 802.11 legacy data rates supported for multichain transmissions, CDD = Cyclic Delay Diversity (or Cyclic Shift Diversity) modes supported, Sectorized / Xpol = antennas are sectorized or cross polarized.
Notes:	Dir G (PWR) = total gain (Gant + Array Gain) for power calculations; GA (PSD) = total gain for PSD calculations based on FCC KDB 662911. Depending on the modes supported, the Array Gain value for power could be different from the PSD value.
Notes:	Array gain for power/psd calculated per KDB 662911 D01.
Notes:	For systems with Beamforming and CDD, choose one the following options: Option 1: Delays are optimized for beamforming, rather than being selected from cyclic delay table of 802.11; Array gains calculated based on beamforming criteria.

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

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

Mode: 11a SISO only with diversity (worst chain selected) Max EIRP (mW): 389.1

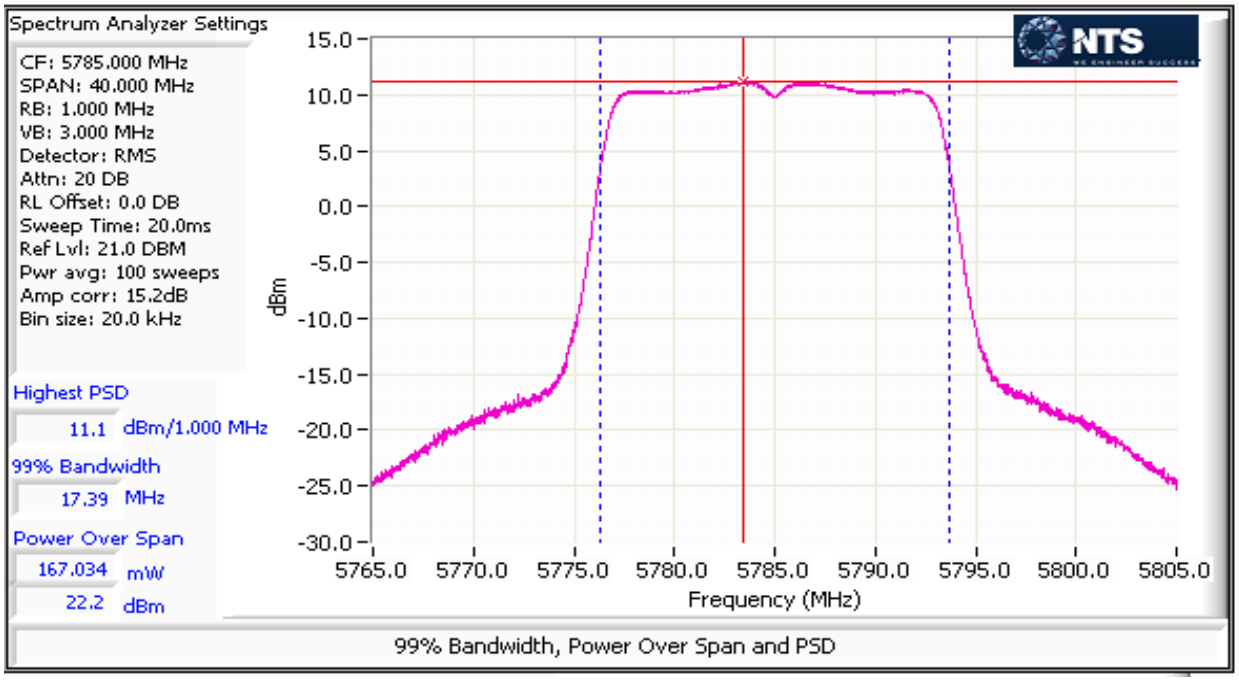
Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	Limit dBm	Max Power (W)	Result
5745	1	19.5	17.3	98		87.1	19.4	30.0	0.166	Pass
	3									
	4									
	2				19.4					
5785	1	23	17.4	98		166.0	22.2	30.0		Pass
	3									
	4									
	2				22.2					
5825	1	22.5	17.3	98		128.8	21.1	30.0		Pass
	3									
	4									
	2				21.1					

5725-5850 PSD - FCC/IC

Mode: 11a SISO only with diversity (worst chain selected)

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/500kHz	IC Limit dBm/500kHz	Result
5745	1	19.5		98		6.9	8.4	30.0	30.0	Pass
	3									
	4									
	2				8.4					
5785	1	23		98		12.9	11.1	30.0	30.0	Pass
	3									
	4									
	2				11.1					
5825	1	22.5		98		10.2	10.1	30.0	30.0	Pass
	3									
	4									
	2				10.1					

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A



Note:	It is clear from the above 99% bandwidth that the 6 dB bandwidth is >> 500 kHz.

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

Mode: n20 Max EIRP (mW): 3298.5

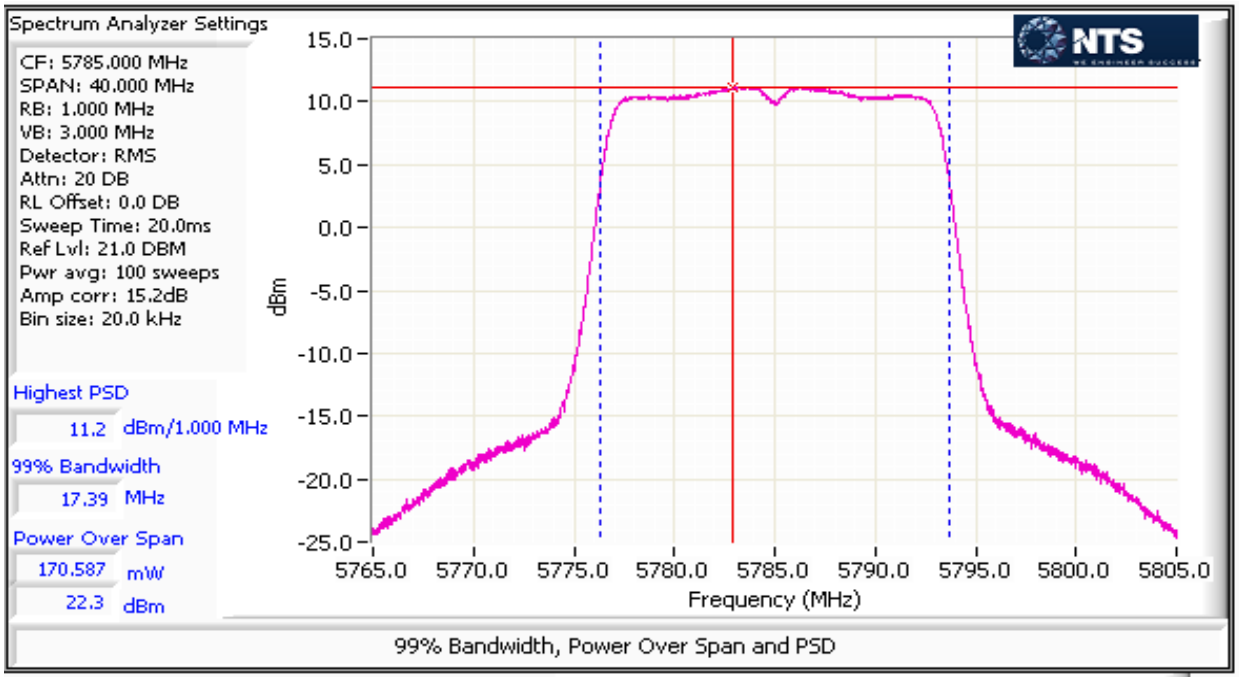
Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5745	1	19.5	17.3	99	18.4	228.2	23.6	27.6	0.480	Pass
	3				18.8					
	4									
	2				19.2					
5785	1	23	17.5	99	21.7	479.9	26.8	27.6		Pass
	3				22.1					
	4									
	2				22.3					
5825	1	20	17.3	99	18.5	237.2	23.8	27.6		Pass
	3				19.1					
	4									
	2				19.3					

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

5250-5350 PSD - FCC/IC

Mode: n20

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	IC Limit dBm/MHz	Result
5745	1	19.5		99	7.3	17.7	12.5	27.6	27.6	Pass
	3				7.7					
	4									
	2				8.1					
5785	1	23		99	10.7	37.5	15.7	27.6	27.6	Pass
	3				11.0					
	4									
	2				11.2					
5825	1	20		99	7.4	18.6	12.7	27.6	27.6	Pass
	3				8.0					
	4									
	2				8.3					



Note:	It is clear from the above 99% bandwidth that the 6 dB bandwidth is >> 500 kHz.

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

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

Mode: **n40** Max EIRP (mW): 1191.8

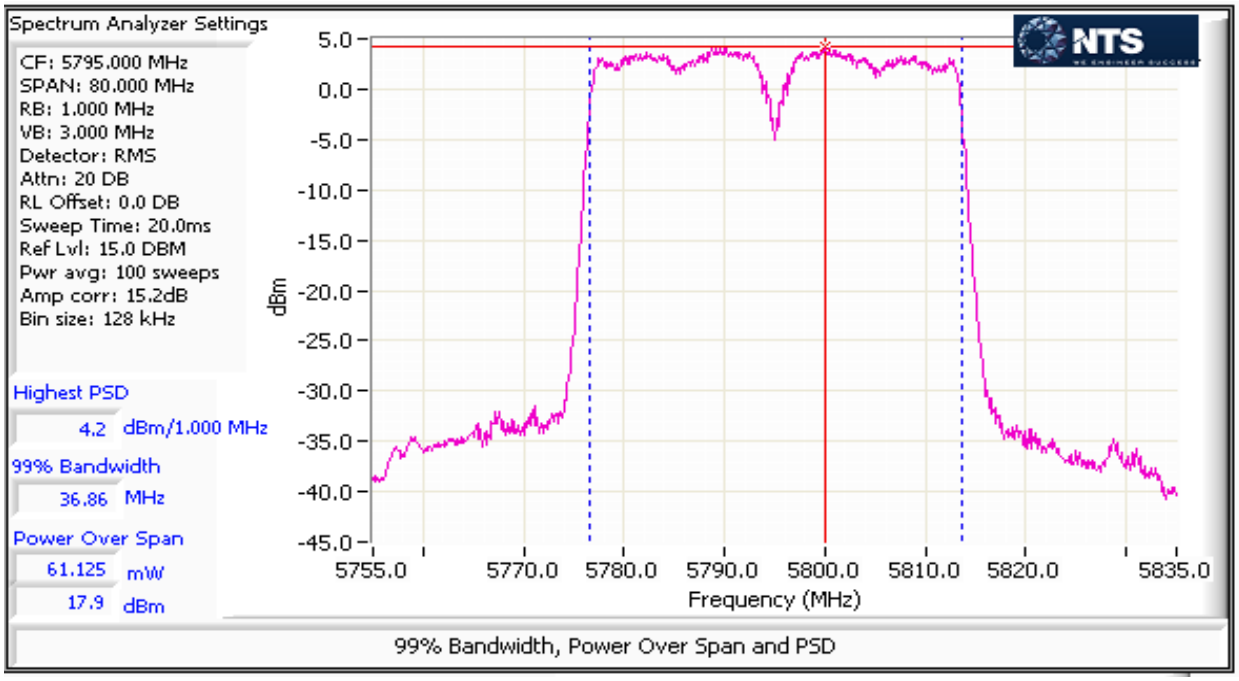
Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5755	1	15.5	36.6	98	13.8	85.8	19.3	27.6	0.173	Pass
	3				14.9					
	4									
	2				14.9					
5795	1	19.5	36.9	98	17.0	173.4	22.4	27.6		Pass
	3				17.9					
	4									
	2				17.9					

MIMO Device 5250-5350 PSD - FCC/IC

Mode: **n40**

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	IC Limit dBm/MHz	Result
5755	1	15.5		98	0.0	3.5	5.4	27.6	27.6	Pass
	3				1.0					
	4									
	2				1.0					
5795	1	19.5		98	3.3	7.5	8.8	27.6	27.6	Pass
	3				4.4					
	4									
	2				4.2					

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A



Note:	It is clear from the above 99% bandwidth that the 6 dB bandwidth is >> 500 kHz.

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

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

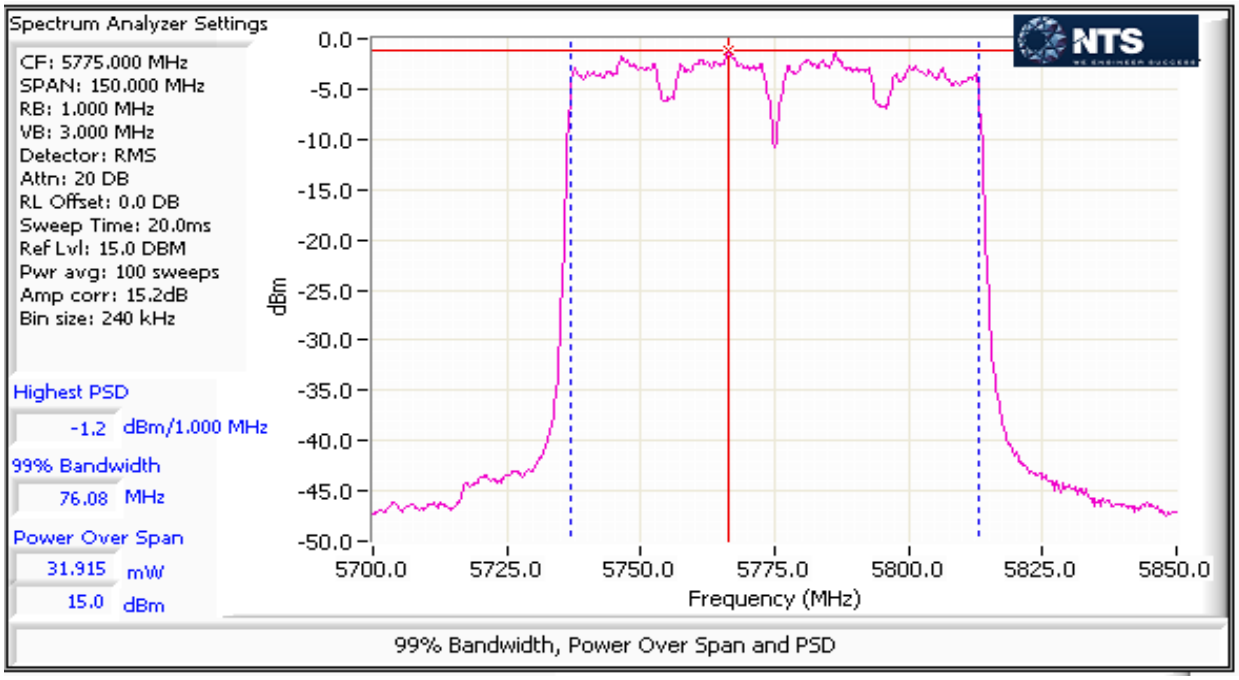
Mode: **ac80** Max EIRP (mW): 659.8

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5775	1	16.5	76.1	94	14.0	96.0	19.8	27.6	0.096	Pass
	3				15.3					
	4									
	2				15.0					

MIMO Device 5250-5350 PSD - FCC/IC

Mode: **ac80**

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	IC Limit dBm/MHz	Result
5775	1	16.5		94	-2.9	2.2	3.4	27.6	27.6	Pass
	3				-0.9					
	4									
	2				-1.5					



Note:	It is clear from the above 99% bandwidth that the 6 dB bandwidth is >> 500 kHz.

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 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: 22-25 °C
Rel. Humidity: 30-35 %

Summary of Results

Run #	Mode	Channel	Target Power	Passing Power	Test Performed	Limit	Result / Margin
20MHz Bandwith Modes							
1	a	36 - 5180MHz	23.0	21.5	Restricted Band Edge at 5150 MHz	15.209	53.1 dBµV/m @ 5150.0 MHz (-0.9 dB)
	a	48 - 5240MHz	23.0	19.0	Restricted Band Edge at 5350 MHz	15.209	53.5 dBµV/m @ 5360.8 MHz (-0.5 dB)
	a	44 - 5220MHz	23.0	18.0	Restricted Band Edge at 5350 MHz	15.209	53.9 dBµV/m @ 5380.9 MHz (-0.1 dB)
	a	40 - 5200MHz	23.0	18.5	Restricted Band Edge at 5350 MHz	15.209	53.5 dBµV/m @ 5360.9 MHz (-0.5 dB)
	a	36 - 5180MHz	23.0	21.5	Restricted Band Edge at 5350 MHz	15.209	53.1 dBµV/m @ 5422.2 MHz (-0.9 dB)
2	a	149 - 5745MHz	23.0	19.5	Band Edge 5725MHz	15E	77.7 dBµV/m @ 5725.0 MHz (-0.6 dB)
					Band Edge 5715MHz		66.1 dBµV/m @ 5714.0 MHz (-2.2 dB)
	a	153 - 5765MHz	23.0	23.0	Band Edge 5725MHz	15E	69.9 dBµV/m @ 5717.4 MHz (-8.4 dB)
					Band Edge 5715MHz		68.1 dBµV/m @ 5686.4 MHz (-0.2 dB)

Continued on the Next Page -->

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

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Summary of Results (continued)

Run #	Mode	Channel	Target Power	Passing Power	Test Performed	Limit	Result / Margin
20MHz Bandwith Modes (continued)							
3	a	165 - 5825MHz	23.0	22.5	Band Edge 5850MHz	15E	76.8 dBµV/m @ 5853.1 MHz (-1.5 dB)
					Band Edge 5860MHz		52.3 dBµV/m @ 5863.8 MHz (-1.7 dB)
4	n20	36 - 5180MHz	23.0	21.5	Restricted Band Edge at 5150 MHz	15.209	52.5 dBµV/m @ 5150.0 MHz (-1.5 dB)
	n20	48 - 5240MHz	23.0	23.0	Restricted Band Edge at 5350 MHz	15.209	53.3 dBµV/m @ 5355.0 MHz (-0.7 dB)
5	n20	149 - 5745MHz	23.0	19.5	Band Edge 5725MHz	15E	75.2 dBµV/m @ 5724.5 MHz (-3.1 dB)
					Band Edge 5715MHz		61.7 dBµV/m @ 5711.5 MHz (-6.6 dB)
	n20	153 - 5765MHz	23.0	23.0	Band Edge 5725MHz	15E	62.2 dBµV/m @ 5723.0 MHz (-16.1 dB)
					Band Edge 5715MHz		64.1 dBµV/m @ 5686.2 MHz (-4.2 dB)
6	n20	165 - 5825MHz	23.0	20.0	Band Edge 5850MHz	15E	75.8 dBµV/m @ 5850.2 MHz (-2.5 dB)
					Band Edge 5860MHz		66.9 dBµV/m @ 5860.0 MHz (-1.4 dB)
40MHz Bandwith Modes							
7	n40	38 - 5190MHz	23	17	Restricted Band Edge at 5150 MHz	15.209	53.7 dBµV/m @ 5149.9 MHz (-0.3 dB)
	n40	46 - 5230MHz	23	23	Restricted Band Edge at 5350 MHz	15.209	50.9 dBµV/m @ 5353.8 MHz (-3.1 dB)
8	n40	151 - 5755MHz	23.0	16.5	Band Edge 5725MHz	15E	73.2 dBµV/m @ 5724.6 MHz (-5.1 dB)
					Band Edge 5715MHz		66.6 dBµV/m @ 5714.3 MHz (-1.7 dB)
9	n40	159 - 5795MHz	23.0	19.5	Band Edge 5850MHz	15E	63.4 dBµV/m @ 5850.5 MHz (-14.9 dB)
					Band Edge 5860MHz		66.8 dBµV/m @ 5853.5 MHz (-11.5 dB)

Continued on the Next Page -->

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

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80MHz Bandwith Modes

10	ac80	42 - 5210MHz	23	16	Restricted Band Edge at 5150 MHz	15.209	53.7 dBµV/m @ 5142.7 MHz (-0.3 dB)
	ac80	42 - 5210MHz	23	16	Restricted Band Edge at 5350 MHz	15.209	48.8 dBµV/m @ 5353.8 MHz (-5.2 dB)
11	ac80	155 - 5775MHz	23	16.5	Band Edge 5725MHz	15E	68.5 dBµV/m @ 5722.7 MHz (-9.8 dB)
					Band Edge 5715MHz		66.4 dBµV/m @ 5713.0 MHz (-1.9 dB)
12	ac80	155 - 5775MHz	23	16.5	Band Edge 5850MHz	15E	60.3 dBµV/m @ 5850.6 MHz (-18.0 dB)
					Band Edge 5860MHz		59.5 dBµV/m @ 5860.0 MHz (-8.8 dB)

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Procedure Comments:

Measurements performed in accordance with FCC KDB 789033
Peak measurements performed with: RBW=1MHz, VBW=3MHz, peak detector, max hold, auto sweep time
Unless otherwise stated/noted, emission has duty cycle ≥ 98% and was measured using RBW=1MHz, VBW=10Hz, peak detector, linear average mode, auto sweep time, max hold 50 traces. (method VB of KDB 789033)

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
11a	6 Mbps	98.0%	Yes	1.302	0	0	10
n20	VHT8	99.1%	Yes	1.935	0	0	10
n40	VHT9	98.1%	Yes	0.952	0	0	10
ac80	VHT9	93.7%	Yes	0.448	0.3	0.6	2232

3k

Sample Notes

Sample S/N: F56154520246
Driver: 7.14.89.21.571.206
Antenna: 3x3 Non-Beamforming

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.

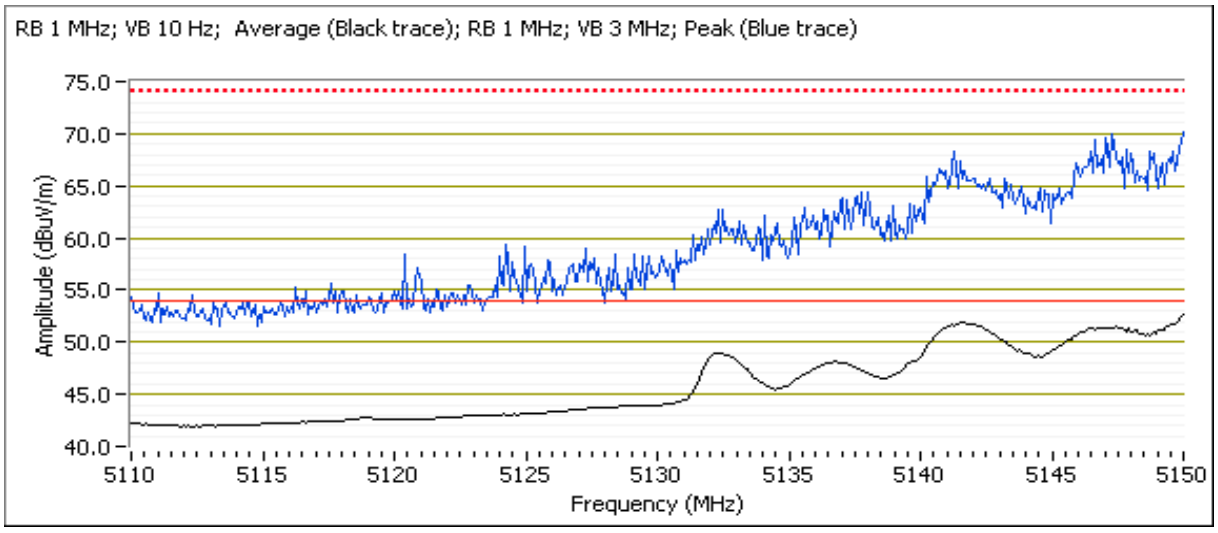
Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

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

Date of Test: 01/06/16 Test Location: Chamber #7
Test Engineer: Mehran Birgani EUT Voltage: 120V/ 60Hz
Channel: 36 - 5180 MHz Mode: a Setting: 21.5
Tx Chain: 3Tx Data Rate: 6Mbps

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5150.000	**53.1**	H	54.0	**-0.9**	AVG	1	1.9	POS; RB 1 MHz; VB: 10 Hz
5149.960	51.1	V	54.0	-2.9	AVG	287	2.8	POS; RB 1 MHz; VB: 10 Hz
5148.470	71.0	H	74.0	-3.0	PK	1	1.9	POS; RB 1 MHz; VB: 3 MHz
5149.920	69.2	V	74.0	-4.8	PK	287	2.8	POS; RB 1 MHz; VB: 3 MHz

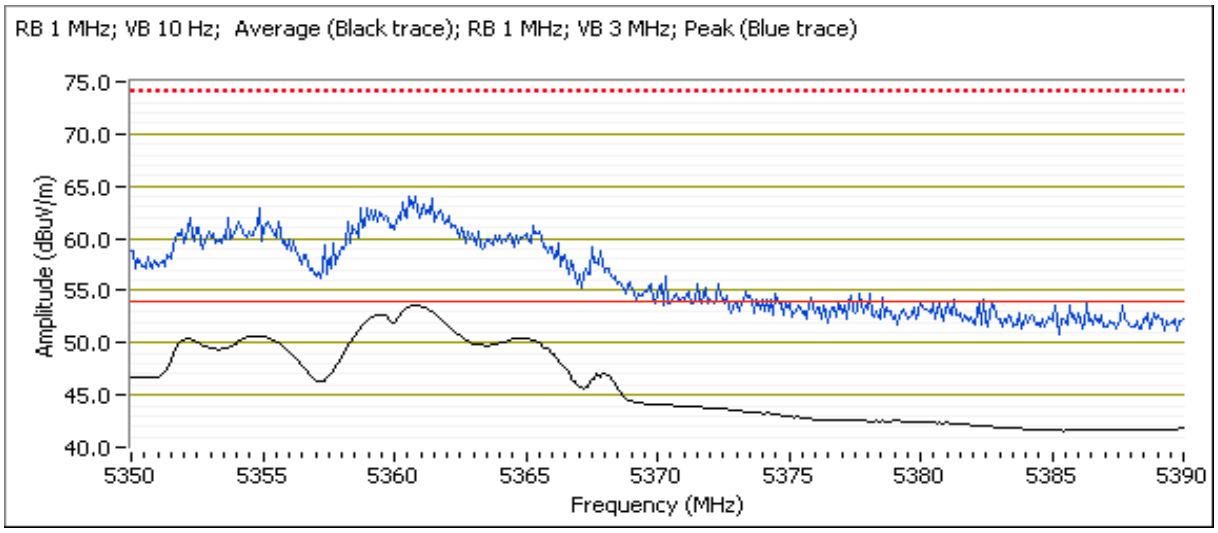


Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Date of Test: 01/06/16 Test Location: Chamber #7
Test Engineer: Rafael Varelas EUT Voltage: 120V/ 60Hz
Channel: 48 - 5240 MHz Mode: a Setting: 19.0
Tx Chain: 3Tx Data Rate: 6Mbps

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	
5360.820	53.5	H	54.0	-0.5	AVG	188	1.6	POS; RB 1 MHz; VB: 10 Hz
5360.500	64.4	H	74.0	-9.6	PK	188	1.6	POS; RB 1 MHz; VB: 3 MHz
5363.270	50.6	V	54.0	-3.4	AVG	202	1.8	POS; RB 1 MHz; VB: 10 Hz
5361.820	61.6	V	74.0	-12.4	PK	202	1.8	POS; RB 1 MHz; VB: 3 MHz

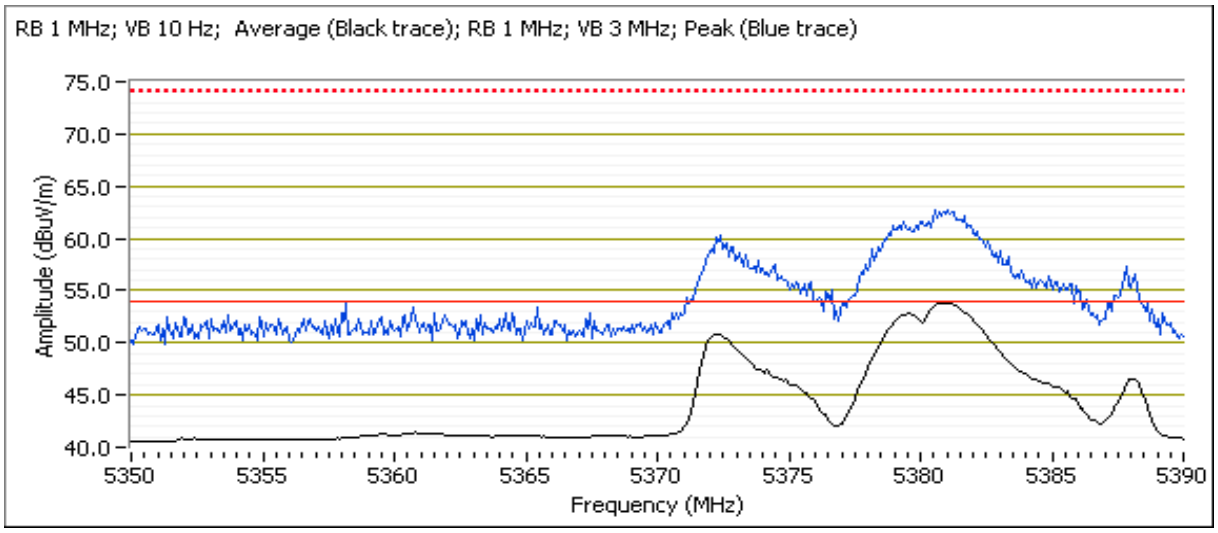


Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Date of Test: 01/06/16 Test Location: Chamber #7
Test Engineer: Rafael Varelas EUT Voltage: 120V/ 60Hz
Channel: 44 - 5220 MHz Mode: a Setting: 18.0
Tx Chain: 3Tx Data Rate: 6Mbps

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	
5380.860	53.9	H	54.0	-0.1	AVG	176	1.3	POS; RB 1 MHz; VB: 10 Hz
5380.580	63.6	H	74.0	-10.4	PK	176	1.3	POS; RB 1 MHz; VB: 3 MHz
5383.230	50.6	V	54.0	-3.4	AVG	202	1.0	POS; RB 1 MHz; VB: 10 Hz
5383.230	60.2	V	74.0	-13.8	PK	202	1.0	POS; RB 1 MHz; VB: 3 MHz

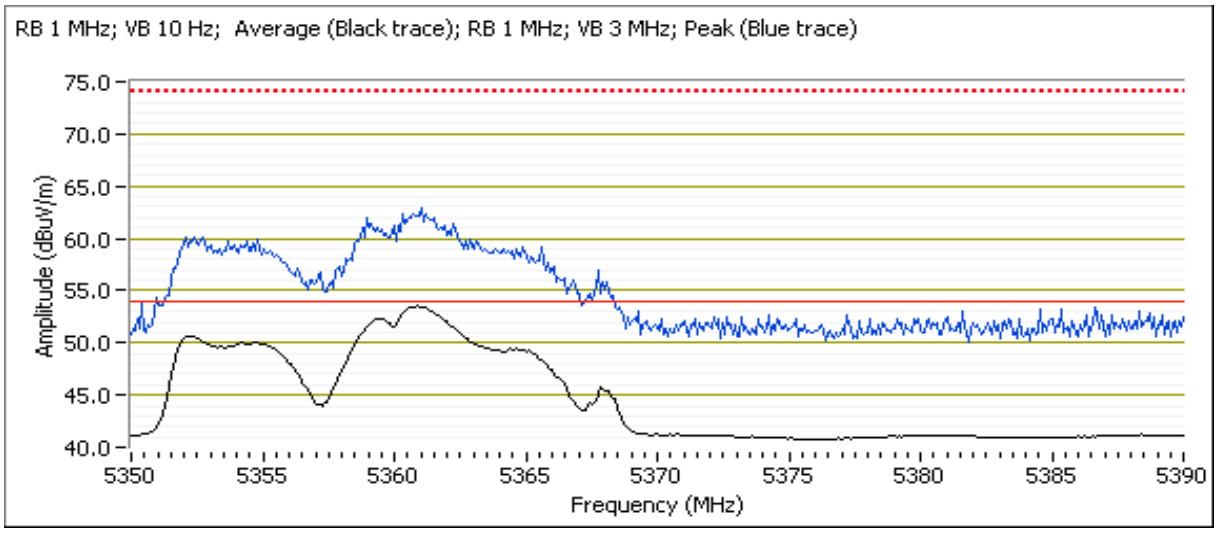


Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Date of Test: 01/06/16 Test Location: Chamber #7
Test Engineer: Rafael Varelas EUT Voltage: 120V/ 60Hz
Channel: 40 - 5200 MHz Mode: a Setting: 18.5
Tx Chain: 3Tx Data Rate: 6Mbps

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	
5360.880	53.5	H	54.0	-0.5	AVG	184	1.3	POS; RB 1 MHz; VB: 10 Hz
5361.320	62.3	H	74.0	-11.7	PK	184	1.3	POS; RB 1 MHz; VB: 3 MHz
5356.570	50.4	V	54.0	-3.6	AVG	204	1.7	POS; RB 1 MHz; VB: 10 Hz
5356.530	60.8	V	74.0	-13.2	PK	204	1.7	POS; RB 1 MHz; VB: 3 MHz

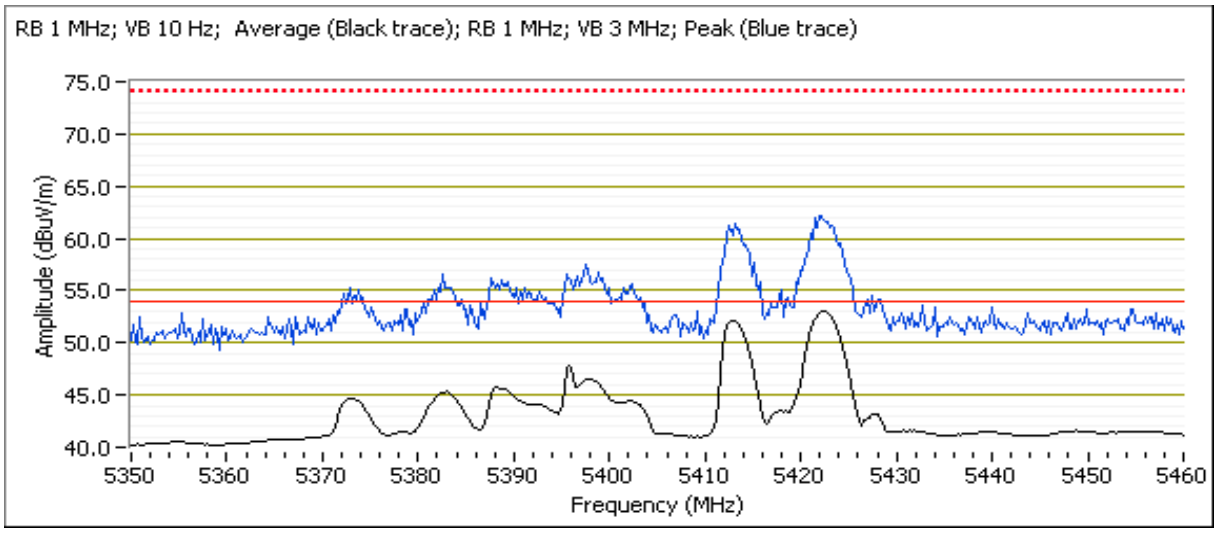


Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Date of Test: 01/06/16 Test Location: Chamber #7
Test Engineer: Rafael Varelas EUT Voltage: 120V/ 60Hz
Channel: 36 - 5180 MHz Mode: a Setting: 21.5
Tx Chain: 3Tx Data Rate: 6Mbps

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	
5422.240	53.1	H	54.0	-0.9	AVG	0	1.0	POS; RB 1 MHz; VB: 10 Hz
5422.120	62.2	H	74.0	-11.8	PK	0	1.0	POS; RB 1 MHz; VB: 3 MHz
5422.240	49.2	V	54.0	-4.8	AVG	47	1.0	POS; RB 1 MHz; VB: 10 Hz
5422.480	59.3	V	74.0	-14.7	PK	47	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #2: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 01/07/16 Test Location: FT Chamber #7

Test Engineer: Eddie Mariscal EUT Voltage: 120V/60Hz

Channel: 149 - 5745MHz Mode: a Setting: 19.5

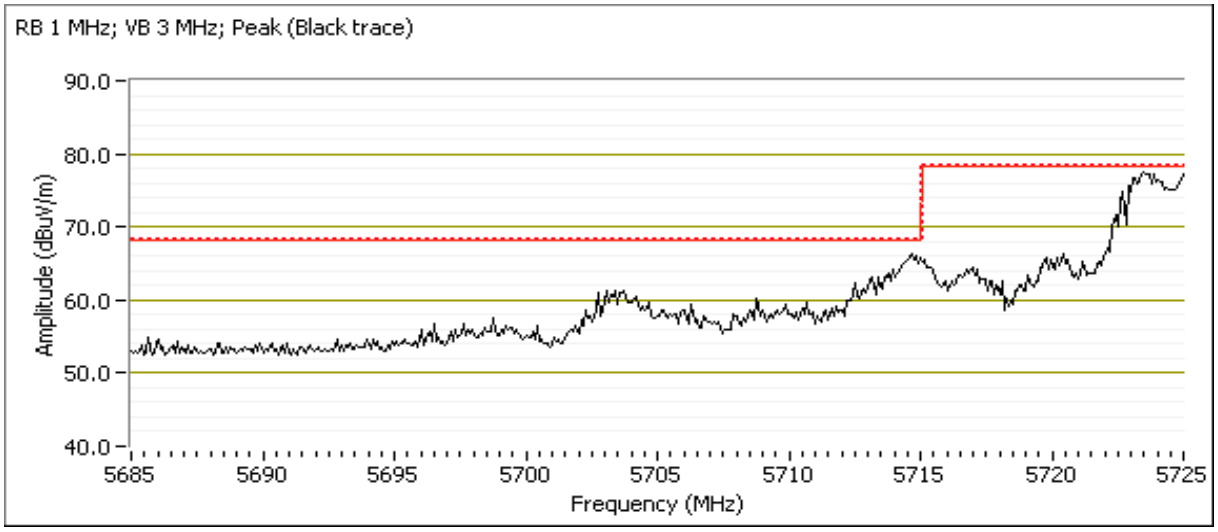
Tx Chain: 3Tx Data Rate: 6Mbps

5725 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	
5724.990	77.7	H	78.3	-0.6	PK	182	1.0	POS; RB 1 MHz; VB: 3 MHz

5715 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	
5714.040	66.1	H	68.3	-2.2	PK	182	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #3: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 01/07/16 Test Location: FT Chamber #7

Test Engineer: Eddie Mariscal EUT Voltage: 120V/60Hz

Channel: 153 - 5765MHz Mode: a Setting: 23

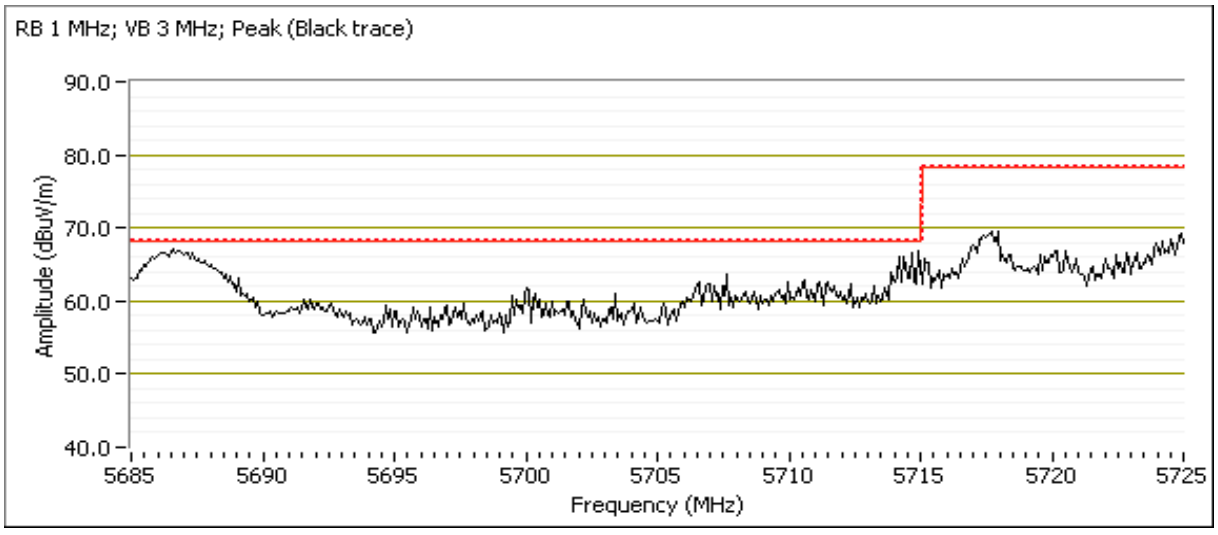
Tx Chain: 3Tx Data Rate: 6Mbps

5725 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	
5720.750	66.9	V	78.3	-11.4	PK	76	1.0	POS; RB 1 MHz; VB: 3 MHz
5717.400	69.9	H	78.3	-8.4	PK	356	1.1	POS; RB 1 MHz; VB: 3 MHz

5715 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	
5685.960	62.6	V	68.3	-5.7	PK	76	1.0	POS; RB 1 MHz; VB: 3 MHz
5686.360	68.1	H	68.3	-0.2	PK	356	1.1	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #3: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 01/07/16 Test Location: FT Chamber #7
Test Engineer: Eddie Mariscal EUT Voltage: 120V/60Hz
Channel: 165 - 5825MHz Mode: a Setting: 22.5
Tx Chain: 3Tx Data Rate: 6Mbps

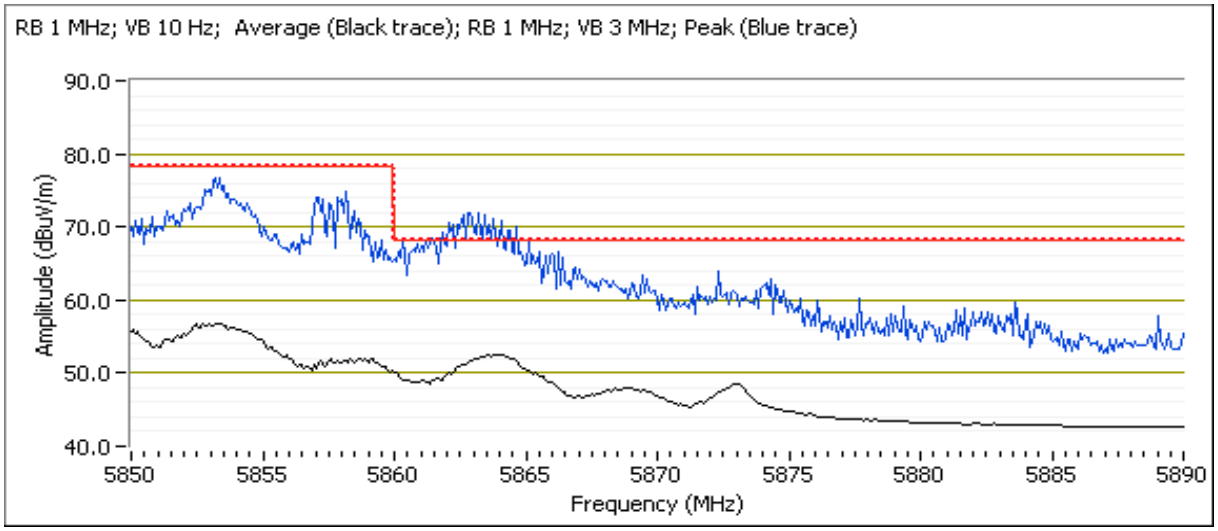
5850 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5851.580	76.2	V	78.3	-2.1	PK	342	1.0	POS; RB 1 MHz; VB: 3 MHz
5853.050	76.8	H	78.3	-1.5	PK	191	1.2	POS; RB 1 MHz; VB: 3 MHz

5860 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	
5861.320	53.1	V	54.0	-0.9	AVG	342	1.0	POS; RB 1 MHz; VB: 10 Hz
5862.340	72.5	V	74.0	-1.5	PK	342	1.0	POS; RB 1 MHz; VB: 3 MHz
5863.790	52.3	H	54.0	-1.7	AVG	191	1.2	POS; RB 1 MHz; VB: 10 Hz
5860.180	72.1	H	74.0	-1.9	PK	191	1.2	POS; RB 1 MHz; VB: 3 MHz

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. Plot only shows 15.407(b) limit.



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

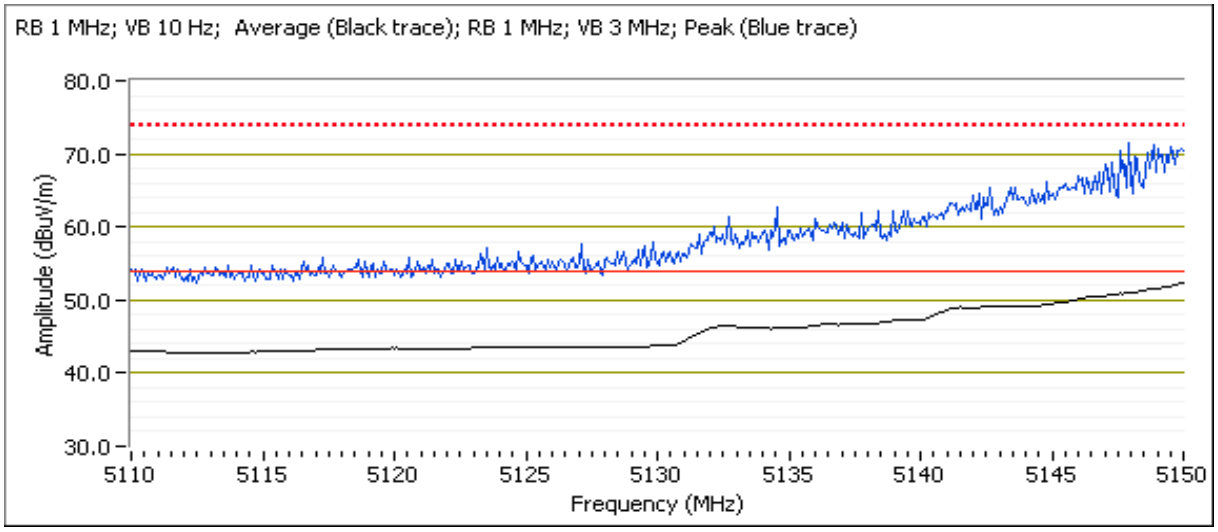
Run #4: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 01/07/16 Test Location: FT Chamber #7
Test Engineer: Eddie Mariscal EUT Voltage: 120V/60Hz

Channel: 36 - 5180 MHz Mode: n20 Setting: 21.5
Tx Chain: 3Tx Data Rate: VHT8

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.980	49.8	V	54.0	-4.2	AVG	124	1.2	POS; RB 1 MHz; VB: 10 Hz
5149.640	66.5	V	74.0	-7.5	PK	124	1.2	POS; RB 1 MHz; VB: 3 MHz
5149.990	**52.5**	H	54.0	**-1.5**	AVG	1	1.3	POS; RB 1 MHz; VB: 10 Hz
5149.930	71.4	H	74.0	-2.6	PK	1	1.3	POS; RB 1 MHz; VB: 3 MHz

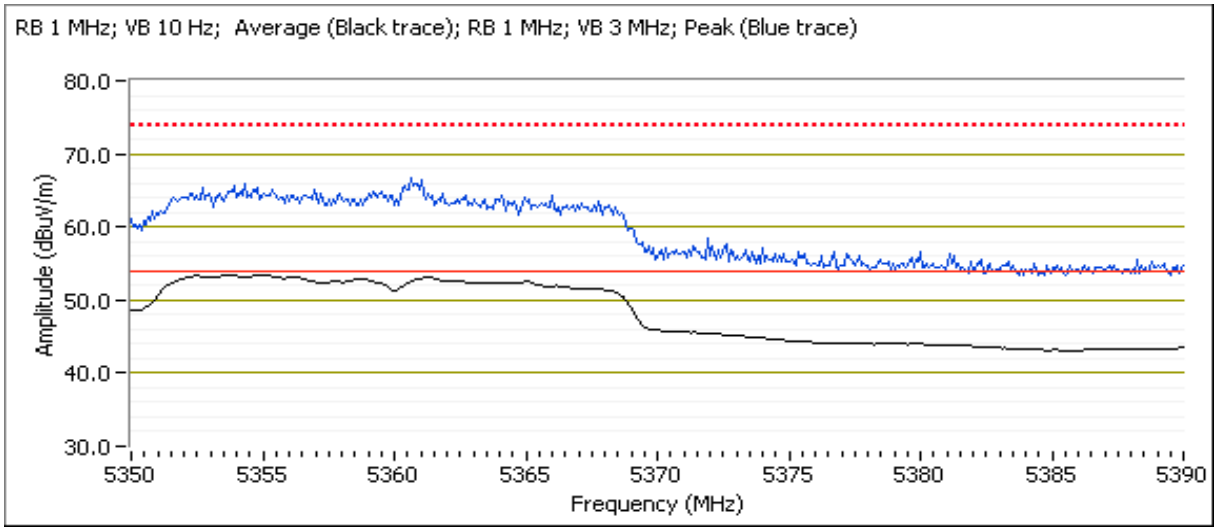


Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Channel: 48 - 5240 MHz Mode: n20 Setting: 23
Tx Chain: 3Tx Data Rate: VHT8

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	
5353.730	49.0	V	54.0	-5.0	AVG	203	1.4	POS; RB 1 MHz; VB: 10 Hz
5362.540	64.1	V	74.0	-9.9	PK	203	1.4	POS; RB 1 MHz; VB: 3 MHz
5355.010	53.3	H	54.0	-0.7	AVG	186	1.7	POS; RB 1 MHz; VB: 10 Hz
5354.290	65.7	H	74.0	-8.3	PK	186	1.7	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #5: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 1/7/2016 0:00 Config. Used: 1
Test Engineer: Eddie Mariscal Config Change: None
Test Location: FT Chamber #7 EUT Voltage: 120V/60Hz

Channel: 149 - 5745MHz Mode: n20 Setting: 19.5
Tx Chain: 3Tx Data Rate: VHT8

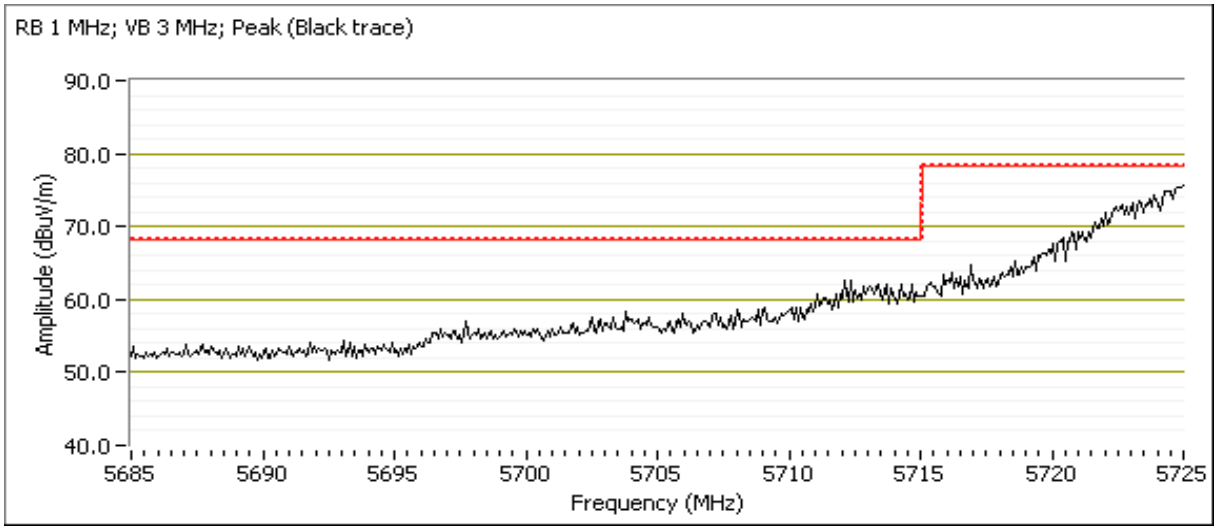
5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5724.490	75.2	H	78.3	-3.1	PK	188	1.0	POS; RB 1 MHz; VB: 3 MHz

5715 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	
5711.510	61.7	H	68.3	-6.6	PK	188	1.0	POS; RB 1 MHz; VB: 3 MHz

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. Plot only shows 15.407(b) limit.



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Date of Test: 01/07/16
Test Engineer: Mehran Birgani
Test Location: FT Chamber #7

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

Channel: 153 - 5765MHz
Tx Chain: 3Tx

Mode: n20
Data Rate: VHT8

Setting: 23

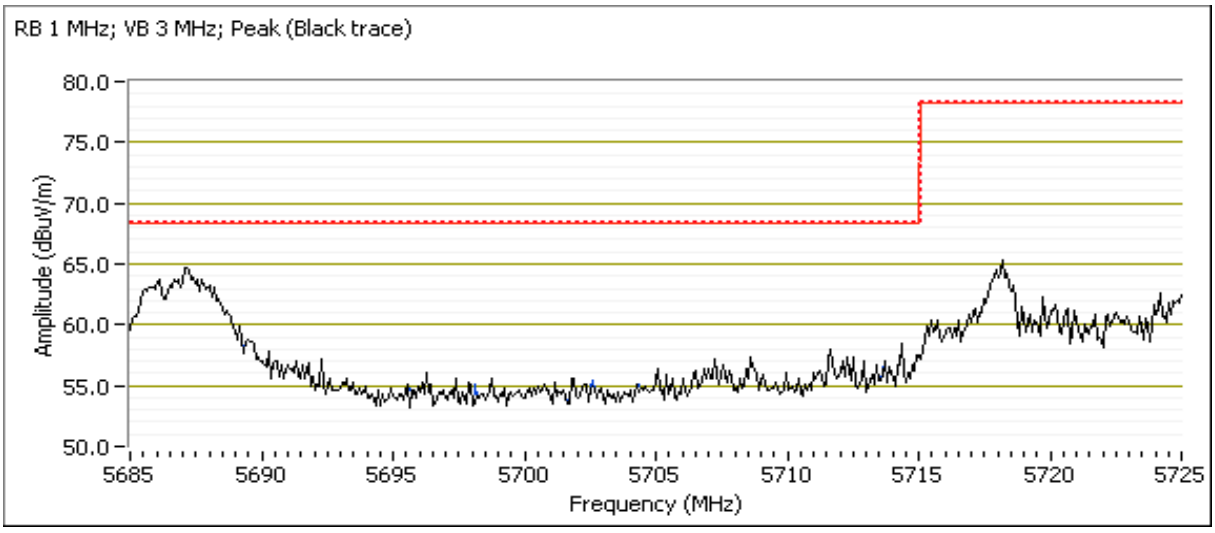
5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5723.000	62.2	V	78.3	-16.1	PK	104	1.3	POS; RB 1 MHz; VB: 3 MHz

5715 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	
5686.220	64.1	H	68.3	-4.2	PK	0	1.0	POS; RB 1 MHz; VB: 3 MHz

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. Plot only shows 15.407(b) limit.



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #6: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 2/4/2016 and 3/11/16 Config. Used: 1
Test Engineer: Joseph Cadigal & Rafael Valeras Config Change: none
Test Location: FT Chamber#4 EUT Voltage: 120V/60Hz

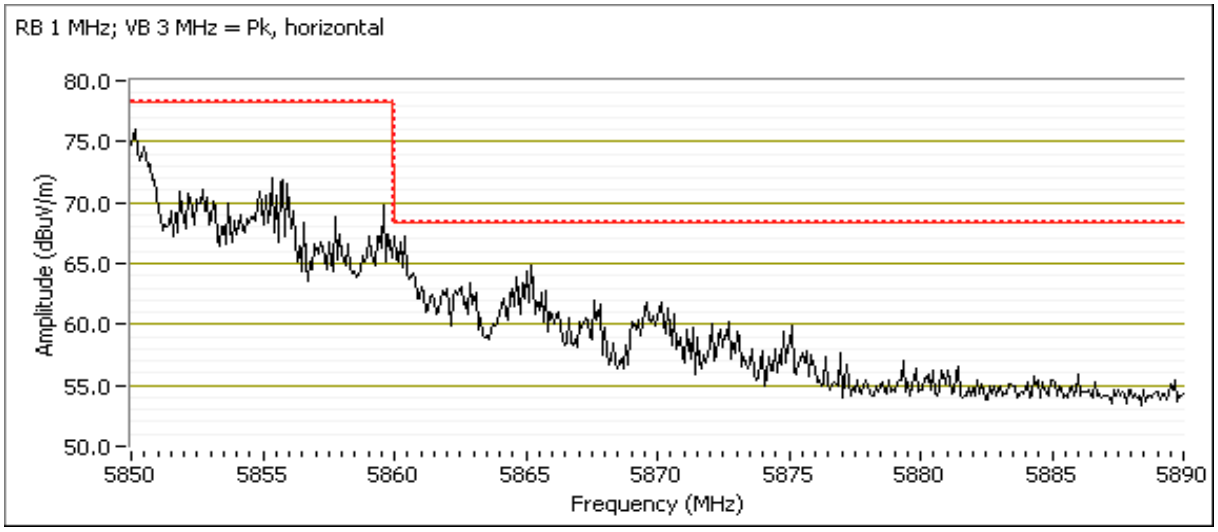
Channel: 165 - 5825MHz Setting: 20
Tx Chain: 3x3
Mode: n20
Data Rate: VHT8

5850 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5850.080	73.6	V	78.3	-4.7	Pk	97	0.9	POS; RB 1 MHz; VB: 3 MHz
5850.240	75.8	H	78.3	-2.5	Pk	175	1.0	POS; RB 1 MHz; VB: 3 MHz

5860 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	
5860.000	64.8	V	78.3	-13.5	Pk	97	0.9	POS; RB 1 MHz; VB: 3 MHz
5860.000	66.9	H	68.3	-1.4	Pk	175	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

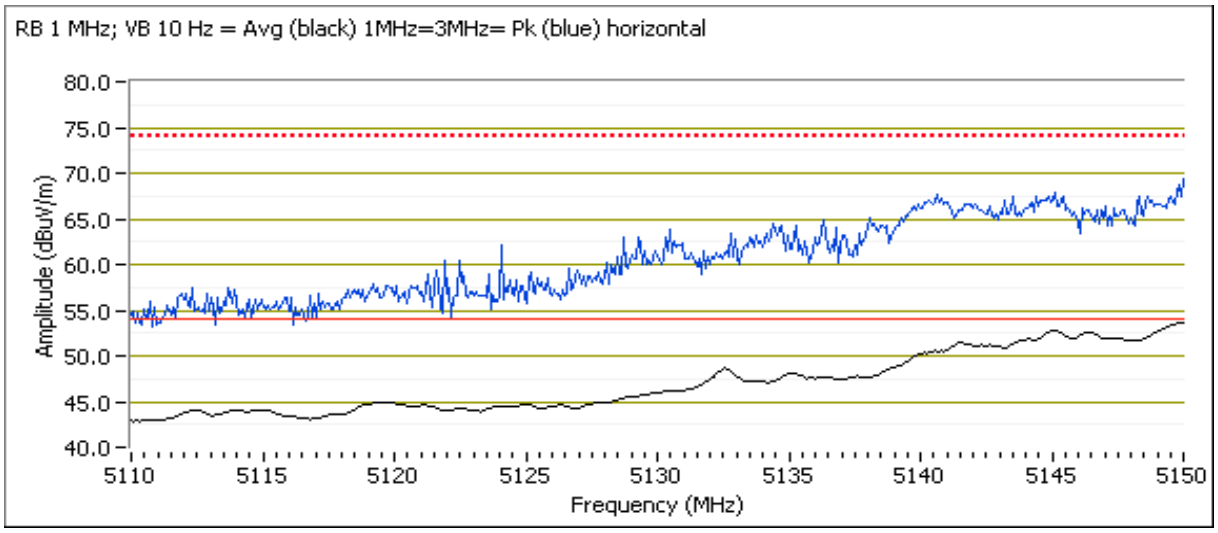
Run #7: Radiated Bandedge Measurements, 5150-5250MHz

Date of Test: 2/4/2016 and 3/11/16 Config. Used: 1
Test Engineer: Joseph Cadigal & Rafael Valeras Config Change: none
Test Location: FT Chamber#4 EUT Voltage: 120V/60Hz

Channel: 38 - 5190MHz Setting: 17
Tx Chain: 3x3
Mode: n40
Data Rate: VHT9

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.920	53.7	H	54.0	-0.3	AVG	299	1.1	POS; RB 1 MHz; VB: 10 Hz
5139.740	69.4	H	74.0	-4.6	PK	299	1.1	POS; RB 1 MHz; VB: 3 MHz
5146.870	48.7	V	54.0	-5.3	AVG	61	1.0	POS; RB 1 MHz; VB: 10 Hz
5144.870	62.3	V	74.0	-11.7	PK	61	1.0	POS; RB 1 MHz; VB: 3 MHz

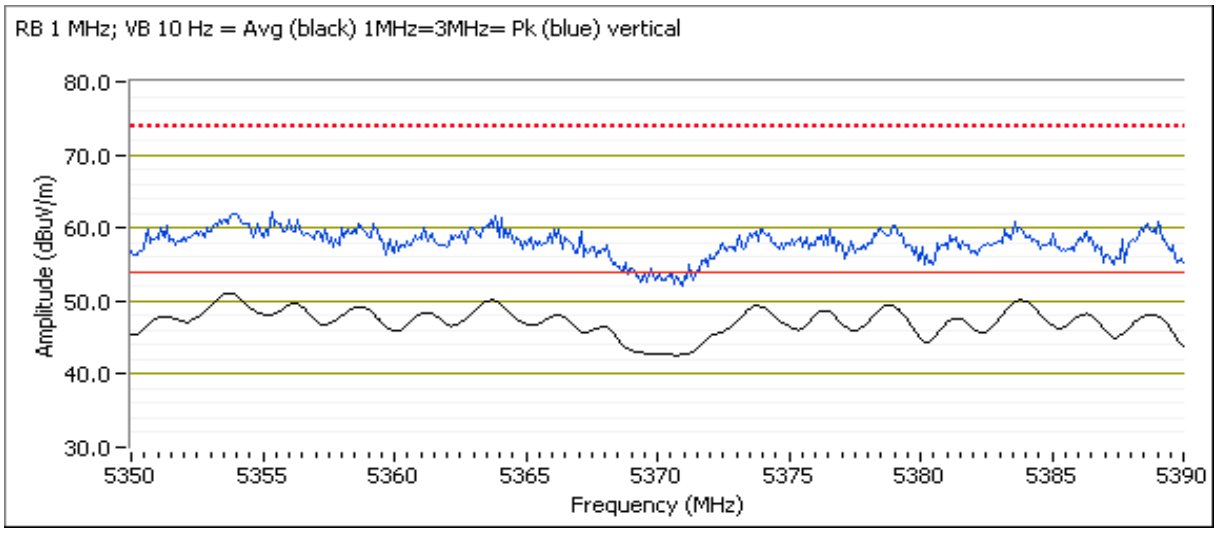


Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Channel: 46 - 5230 MHz setting = 23
Tx Chain: 3x3
Mode: n40
Data Rate: VHT9

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	
5353.770	50.9	V	54.0	-3.1	AVG	92	1.0	POS; RB 1 MHz; VB: 10 Hz
5358.820	61.2	V	74.0	-12.8	PK	92	1.0	POS; RB 1 MHz; VB: 3 MHz
5353.690	50.6	H	54.0	-3.4	AVG	300	1.0	POS; RB 1 MHz; VB: 10 Hz
5354.730	60.6	H	74.0	-13.4	PK	300	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

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

Date of Test: 2/4/2016 0:00
Test Engineer: Joseph Cadigal
Test Location: FT Chamber#4

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

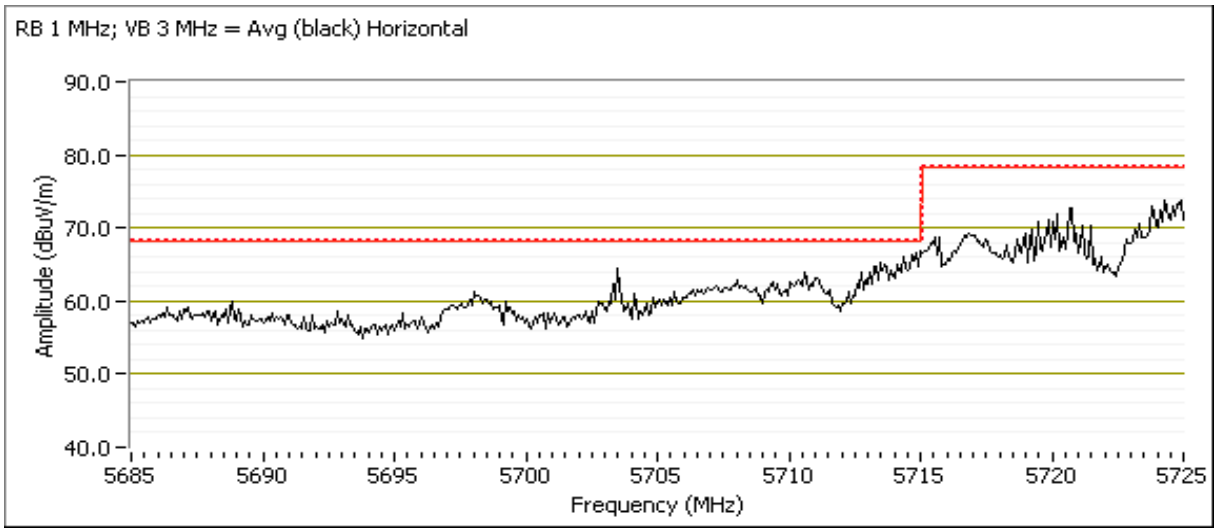
Channel: 151 - 5755MHz setting = 16.5
Tx Chain: 3x3
Mode: n40
Data Rate: VHT9

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	
5724.600	73.2	H	78.3	-5.1	Pk	359	1.2	POS; RB 1 MHz; VB: 3 MHz

5715 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	
5714.340	66.6	H	68.3	-1.7	Pk	359	1.2	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #9: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 2/4/2016 and 3/11/16 Config. Used: 1
Test Engineer: Joseph Cadigal & Rafael Valeras Config Change: none
Test Location: FT Chamber#4 EUT Voltage: 120V/60Hz

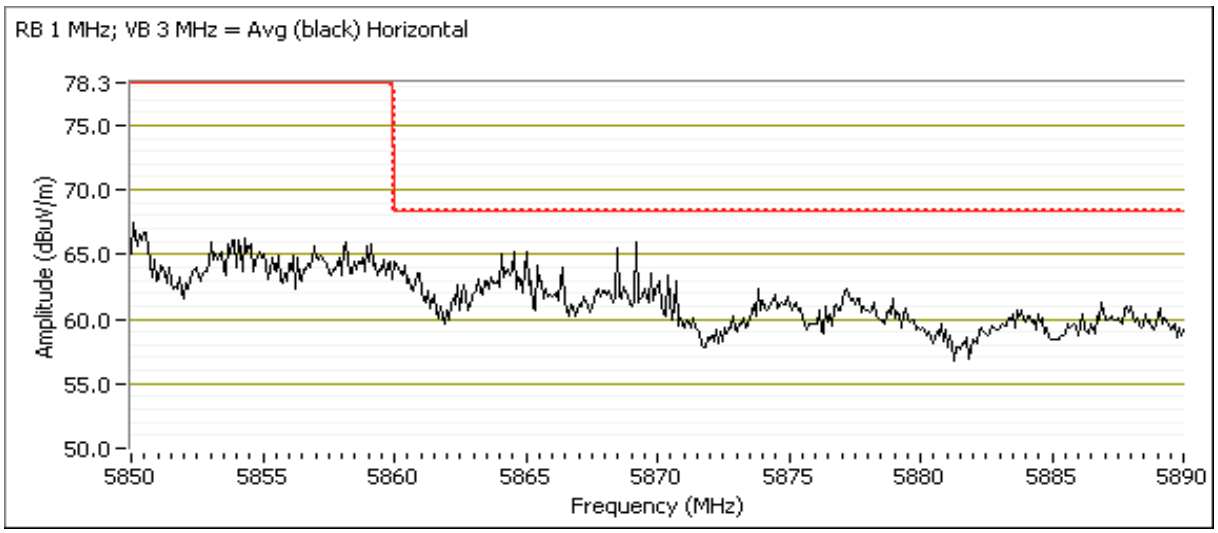
Channel: 159 - 5795MHz setting = 19.5
Tx Chain: 3x3
Mode: n40
Data Rate: VHT9

5850 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5850.480	63.4	H	78.3	-14.9	Pk	359	1.3	POS; RB 1 MHz; VB: 3 MHz

5860 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	
5853.530	66.8	H	78.3	-11.5	Pk	359	1.3	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #10: Radiated Bandedge Measurements, 5150-5250MHz

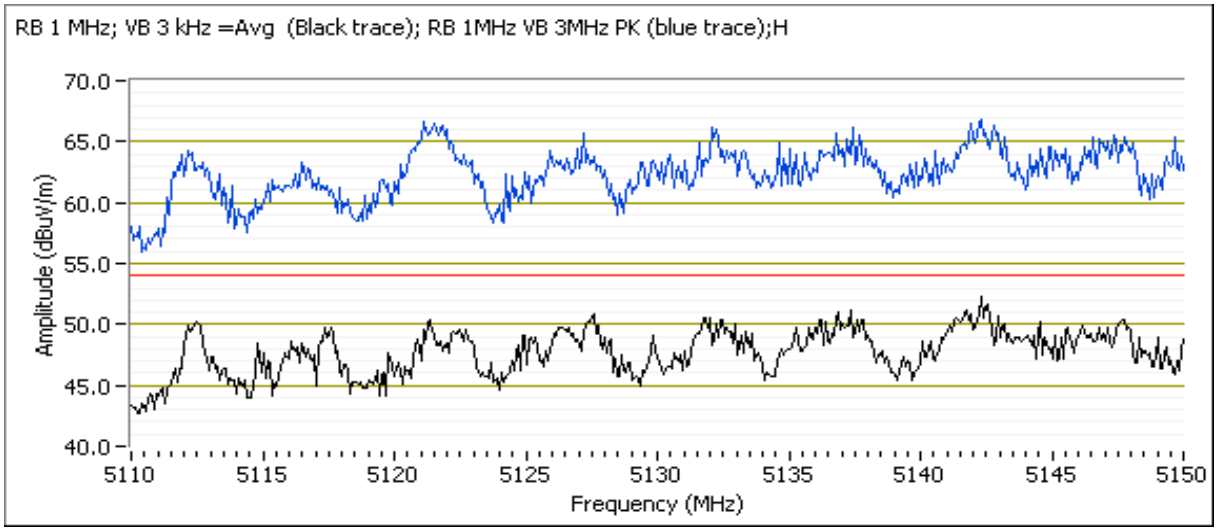
Date of Test: 3/11/2016 0:00
Test Engineer: Rafael Varelas
Test Location: FT Chamber#4

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

Channel: 42 - 5210MHz setting = 16
Tx Chain: 3x3
Mode: ac80
Data Rate: VHT9

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5142.710	53.7	V	54.0	-0.3	Avg	281	1.0	Note 3,POS Vavg:100; RB 1 MHz; VB
5121.220	67.3	V	74.0	-6.7	PK	281	1.0	POS; RB 1 MHz; VB: 3 MHz



Date of Test: 3/11/2016 0:00
Test Engineer: Rafael Varelas
Test Location: FT Chamber#4

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

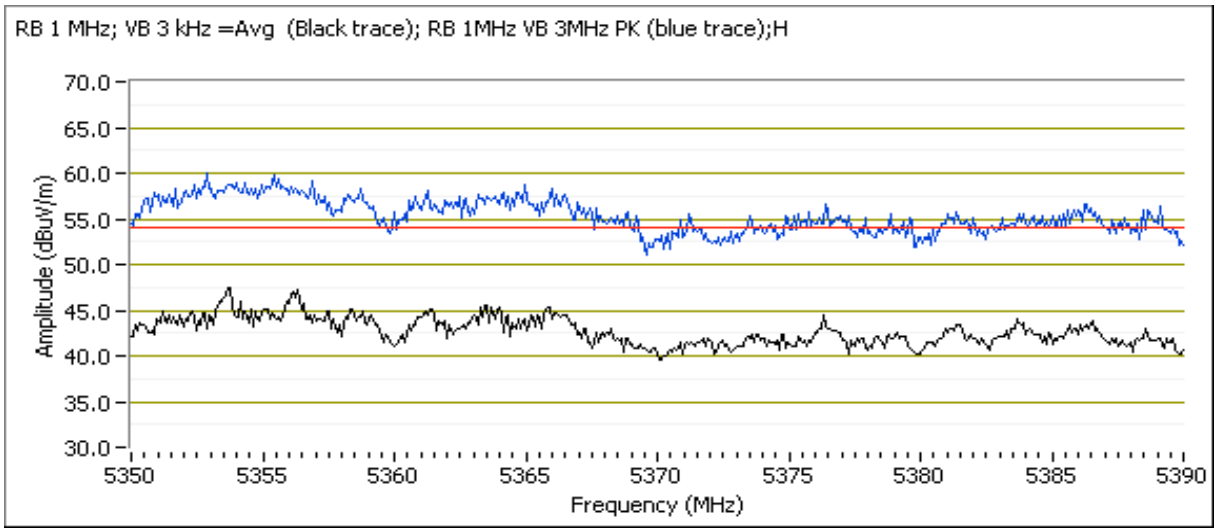
Channel: 42 - 5210MHz Setting = 16

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Tx Chain: 3x3
Mode: ac80
Data Rate: VHT9

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	
5353.770	48.8	H	54.0	-5.2	Avg	187	1.0	Note 3,POS Vavg:100; RB 1 MHz; VB
5355.130	59.6	H	74.0	-14.4	PK	187	1.0	POS; RB 1 MHz; VB: 3 MHz
5358.980	45.9	V	54.0	-8.1	Avg	260	1.1	Note 3,POS Vavg:100; RB 1 MHz; VB
5366.510	57.0	V	74.0	-17.0	PK	260	1.1	POS; RB 1 MHz; VB: 3 MHz



Run #11: Radiated Bandedge Measurements, 5745-5850MHz

Date of Test: 2/5/2016 0:00
Test Engineer: Rafael Varelas
Test Location: FT Chamber#7

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

Channel: 155 - 5775MHz Setting = 16.5

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

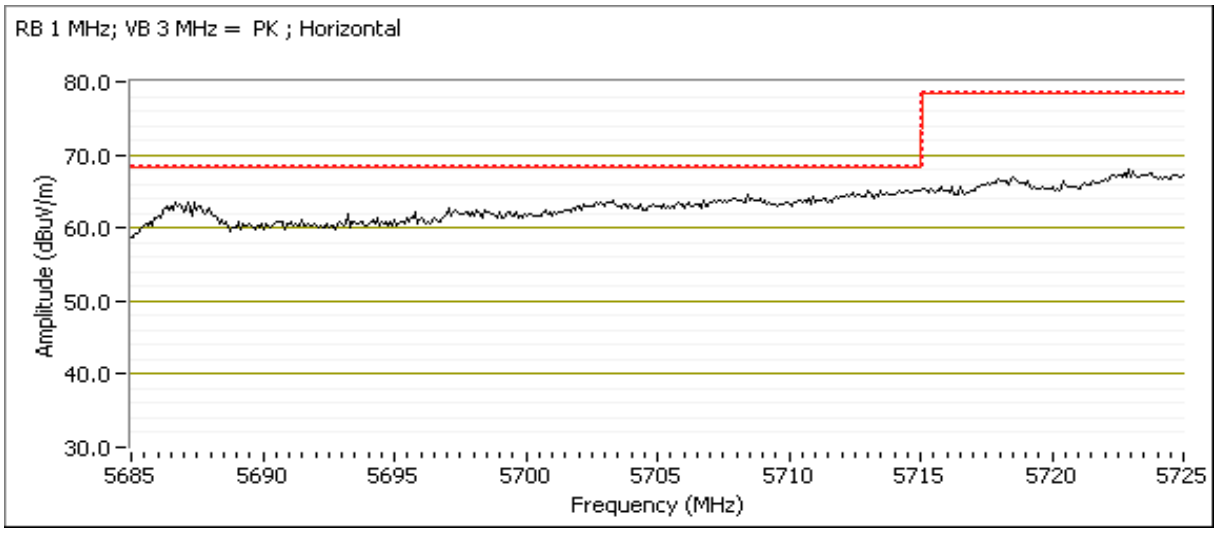
Tx Chain: 3x3
Mode: ac80
Data Rate: VHT9

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5722.660	68.5	H	78.3	-9.8	PK	4	1.2	POS; RB 1 MHz; VB: 3 MHz
5722.680	64.9	V	78.3	-13.4	PK	113	1.0	POS; RB 1 MHz; VB: 3 MHz

5715 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	
5713.020	66.4	H	68.3	-1.9	PK	4	1.2	POS; RB 1 MHz; VB: 3 MHz
5707.540	63.0	V	68.3	-5.3	PK	113	1.0	POS; RB 1 MHz; VB: 3 MHz



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

Date of Test: 2/5/2016 0:00
Test Engineer: Rafael Varelas
Test Location: FT Chamber#7

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

Channel: 155 - 5775MHz Setting = 16.5

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

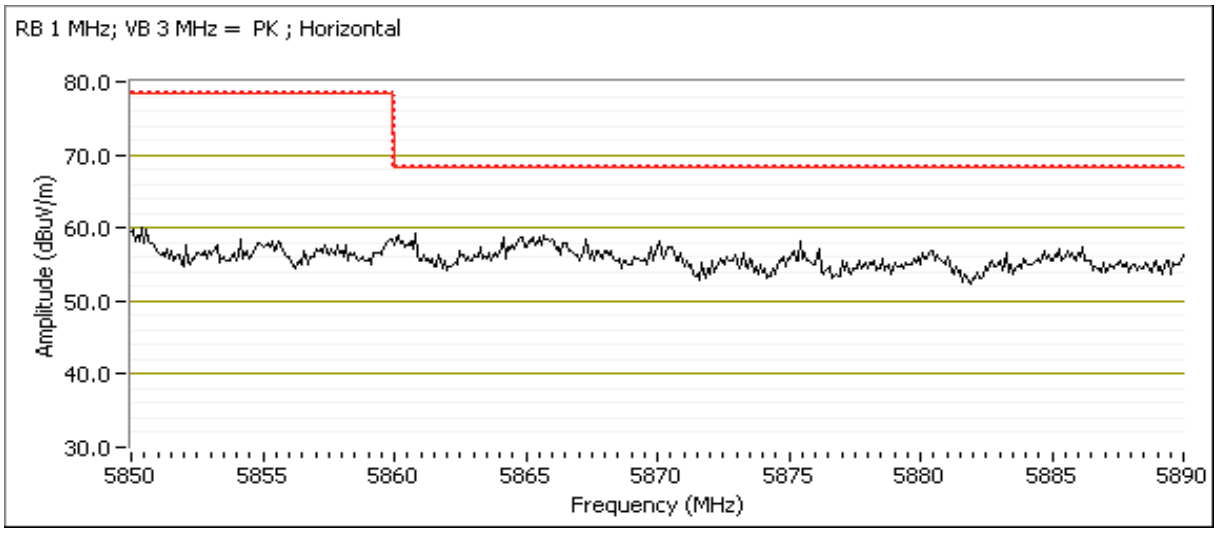
Tx Chain: 3x3
Mode: ac80
Data Rate: VHT9

5850 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5850.620	60.3	H	78.3	-18.0	PK	192	1.0	POS; RB 1 MHz; VB: 3 MHz
5851.380	59.5	V	78.3	-18.8	PK	71	1.0	POS; RB 1 MHz; VB: 3 MHz

5860 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	
5860.000	59.5	H	68.3	-8.8	PK	192	1.0	POS; RB 1 MHz; VB: 3 MHz
5860.660	58.2	V	68.3	-10.1	PK	71	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 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: 22-25 °C
Rel. Humidity: 30-35 %

Summary of Results

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
20MHz Bandwith Modes							
3	n20	36 - 5180MHz	18.5	18.5	Restricted Band Edge at 5150 MHz	15.209	53.6 dBµV/m @ 5149.5 MHz (-0.4 dB)
	n20	48 - 5240MHz	23.0	23.0	Restricted Band Edge at 5350 MHz	15.209	50.6 dBµV/m @ 5353.9 MHz (-3.4 dB)
4	n20	149 - 5745MHz	19.5	19.5	Band Edge 5725MHz	15E	78.1 dBµV/m @ 5723.2 MHz (-0.2 dB)
					Band Edge 5715MHz		65.8 dBµV/m @ 5715.0 MHz (-2.5 dB)
	n20	165 - 5825MHz	20.0	20.0	Band Edge 5850MHz	15E	76.3 dBµV/m @ 5851.1 MHz (-2.0 dB)
					Band Edge 5860MHz		67.4 dBµV/m @ 5864.7 MHz (-0.9 dB)
40MHz Bandwith Modes							
5	n40	38 - 5190MHz	11.5	11.5	Restricted Band Edge at 5150 MHz	15.209	52.7 dBµV/m @ 5148.2 MHz (-1.3 dB)
	n40	46 - 5230MHz	19.5	19.5	Restricted Band Edge at 5350 MHz	15.209	53.6 dBµV/m @ 5384.7 MHz (-0.4 dB)

Continued on the Next Page -->

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

<-- Continued from the Last Page

6	n40	151 - 5755MHz	15.5	15.5	Band Edge 5725MHz	15E	73.6 dBµV/m @ 5718.5 MHz (-4.7 dB)
					Band Edge 5715MHz		65.6 dBµV/m @ 5713.0 MHz (-2.7 dB)
7	n40	159 - 5795MHz	20.0	20	Band Edge 5850MHz	15E	73.2 dBµV/m @ 5851.0 MHz (-5.1 dB)
					Band Edge 5860MHz		67.4 dBµV/m @ 5860.7 MHz (-0.9 dB)
80MHz Bandwith Modes							
10	ac80	42 - 5210MHz	11.0	11.0	Restricted Band Edge at 5150 MHz	15.209	53.1 dBµV/m @ 5149.7 MHz (-0.9 dB)
	ac80	42 - 5210MHz	11.0	11.0	Restricted Band Edge at 5350 MHz	15.209	44.2 dBµV/m @ 5356.4 MHz (-9.8 dB)
11	ac80	155 - 5775MHz	16.5	16.5	Band Edge 5725MHz	15E	69.2 dBµV/m @ 5717.3 MHz (-9.1 dB)
					Band Edge 5715MHz		67.2 dBµV/m @ 5708.5 MHz (-1.1 dB)
12	ac80	155 - 5775MHz	16.5	16.5	Band Edge 5850MHz	15E	64.6 dBµV/m @ 5852.3 MHz (-13.7 dB)
					Band Edge 5860MHz		63.5 dBµV/m @ 5863.9 MHz (-4.8 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:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 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)	
n20	VHT8	92.6%	No	1.935	0.3	0.7	517	1k
n40	VHT9	95.2%	No	0.952	0.2	0.4	1050	3k
ac80	VHT9	75.5%	Yes	2.023	1.2	2.4	494	1k

Sample Notes

Sample S/N: F56154520246
Driver: 7.14.89.21.571.206
Antenna: 3x3 Beamforming

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.
Note 6:	Emission has non constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW> 1/T, peak detector, linear average mode, sweep time auto, max hold. Max hold for 50*(1/DC) traces

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #3: Radiated Bandedge Measurements, 5150-5250MHz

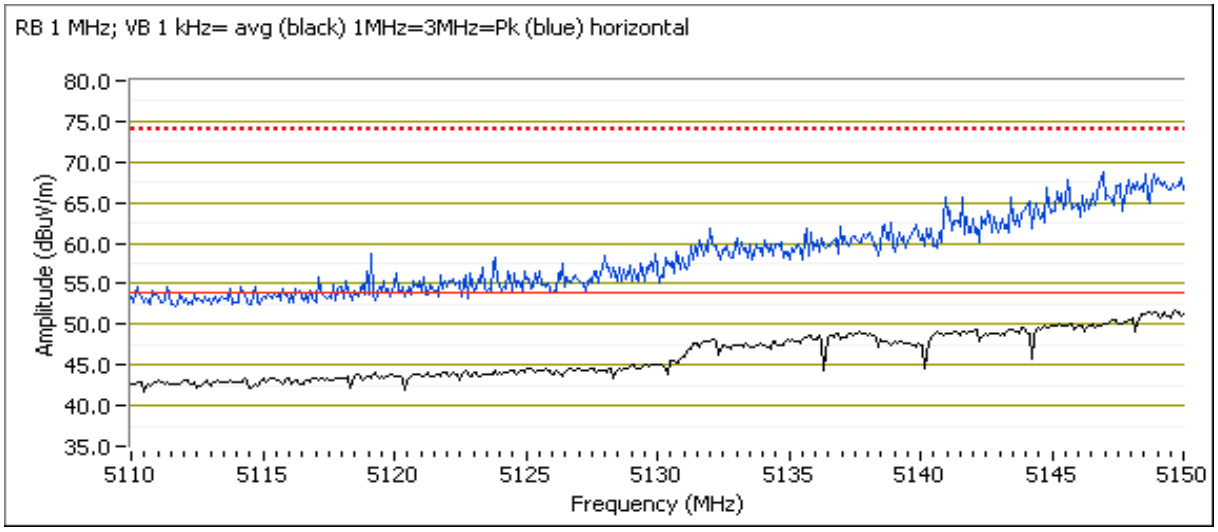
Date of Test: 1/28/2016 & 3/11/2016
Test Engineer: Joseph Cadigal & Rafael Varelas
Test Location: FT Chamber#3

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

Channel: 36 - 5180 MHz
Tx Chain: 3x3
Mode: n20
Data Rate: VHT8

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.520	53.6	H	54.0	-0.4	Avg	349	1.1	POS; RB 1 MHz; VB: 1 kHz, note 6
5148.880	68.7	H	74.0	-5.3	PK	349	1.1	POS; RB 1 MHz; VB: 3 MHz
5148.560	47.9	V	54.0	-6.1	Avg	57	1.0	POS; RB 1 MHz; VB: 1 kHz
5145.430	60.1	V	74.0	-13.9	PK	57	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #3: Radiated Bandedge Measurements, 5150-5250MHz

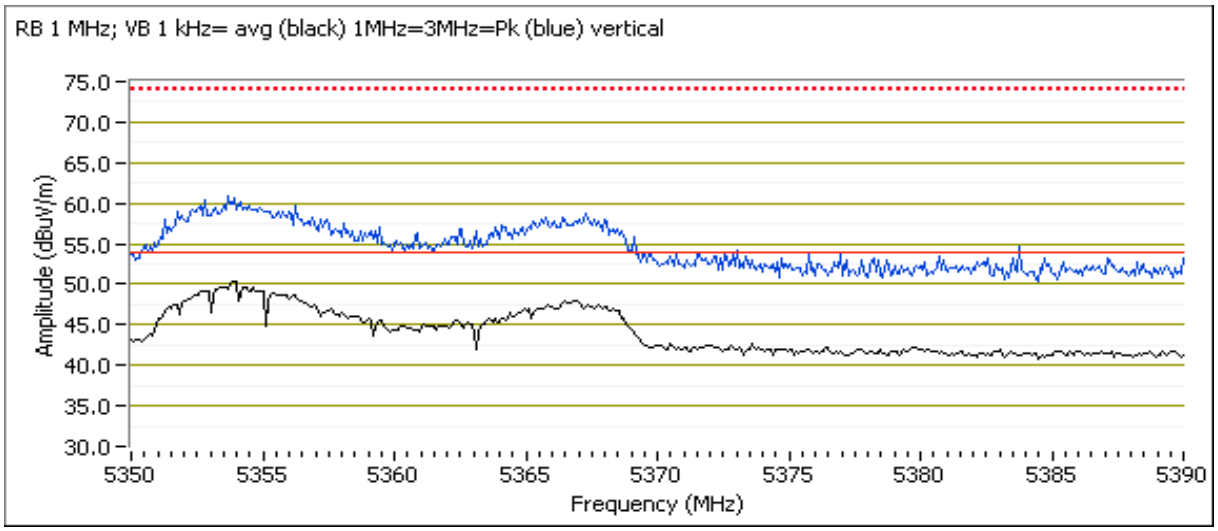
Date of Test: 1/28/2016 0:00
Test Engineer: Joseph Cadigal
Test Location: FT Chamber#3

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

Channel: 48 - 5240MHz
Tx Chain: 3x3
Mode: n20
Data Rate: VHT8

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	
5353.930	50.6	V	54.0	-3.4	Avg	302	1.0	POS; RB 1 MHz; VB: 1 kHz, note 6
5353.050	60.4	V	74.0	-13.6	PK	302	1.0	POS; RB 1 MHz; VB: 3 MHz
5364.030	46.8	H	54.0	-7.2	Avg	360	1.0	POS; RB 1 MHz; VB: 1 kHz, Note 6
5362.500	57.3	H	74.0	-16.7	PK	360	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

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

Date of Test: 1/28/2016 & 3/11/2016
Test Engineer: Joseph Cadigal & Rafael Varelas
Test Location: FT Chamber#3

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

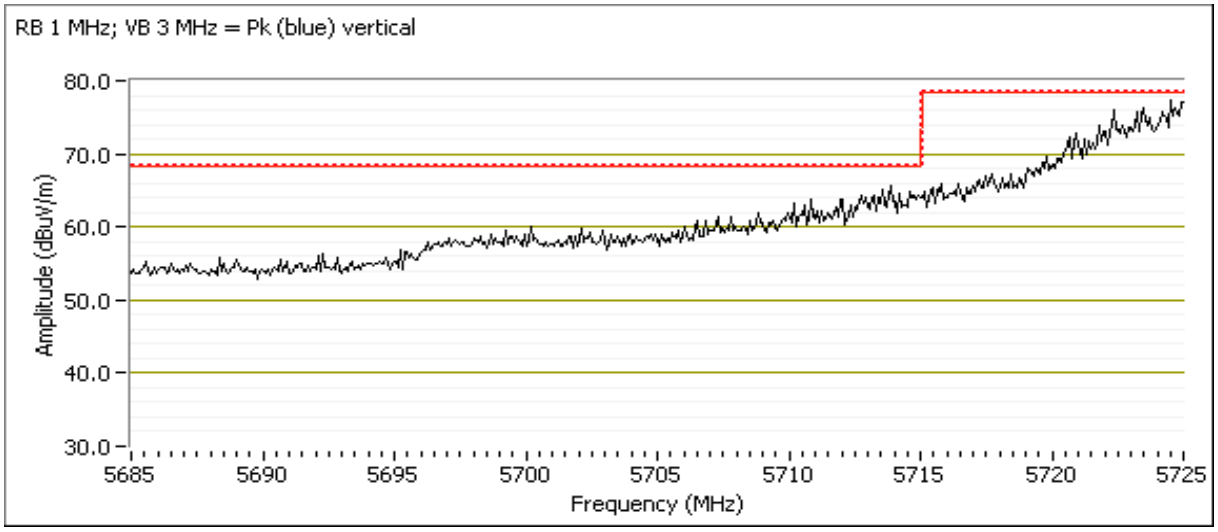
Channel: 149 - 5745MHz
Tx Chain: 3x3
Mode: n20
Data Rate: VHT8

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5723.240	78.1	V	78.3	-0.2	PK	62	1.0	POS; RB 1 MHz; VB: 3 MHz
5718.670	53.3	H	78.3	-25.0	PK	343	1.0	POS; RB 1 MHz; VB: 3 MHz

5715 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	
5715.000	65.8	V	68.3	-2.5	PK	60	1.0	POS; RB 1 MHz; VB: 3 MHz
5713.800	60.5	H	68.3	-7.8	PK	344	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Date of Test: 2/1/2016 0:00
Test Engineer: Rafael Varelas
Test Location: FT Chamber #5

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

Channel: 165 - 5825MHz
Tx Chain: 3x3
Mode: n20
Data Rate: VHT8

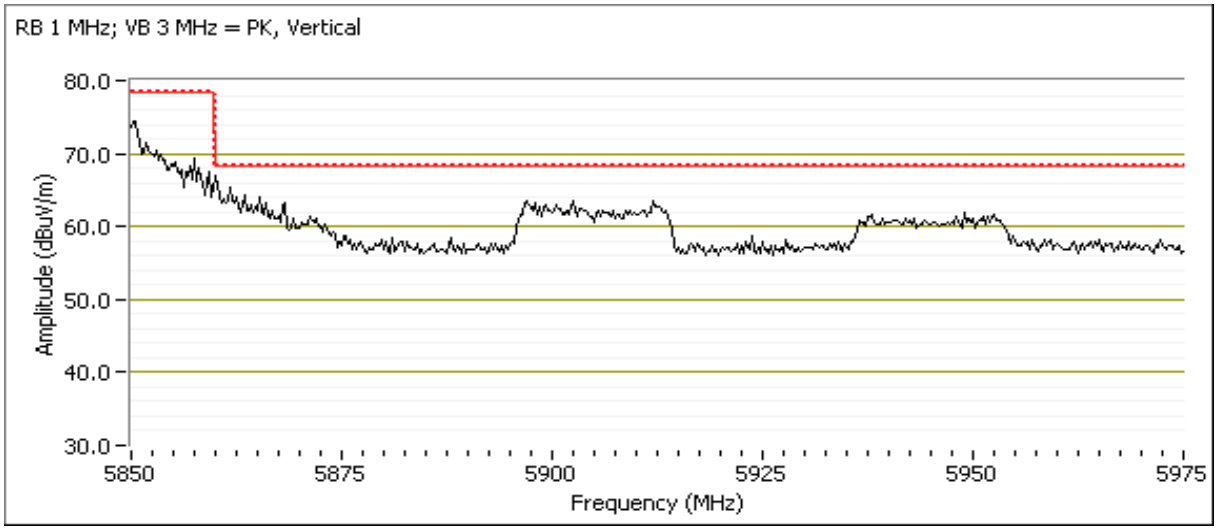
5850 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5851.080	76.3	V	78.3	-2.0	PK	58	1.0	POS; RB 1 MHz; VB: 3 MHz
5850.480	75.3	H	78.3	-3.0	PK	352	1.0	POS; RB 1 MHz; VB: 3 MHz

5860 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	
5864.710	67.4	V	68.3	-0.9	PK	58	1.0	POS; RB 1 MHz; VB: 3 MHz
5860.780	67.0	H	68.3	-1.3	PK	352	1.0	POS; RB 1 MHz; VB: 3 MHz

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. Only the 15.407(b) limit on the plot.



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

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

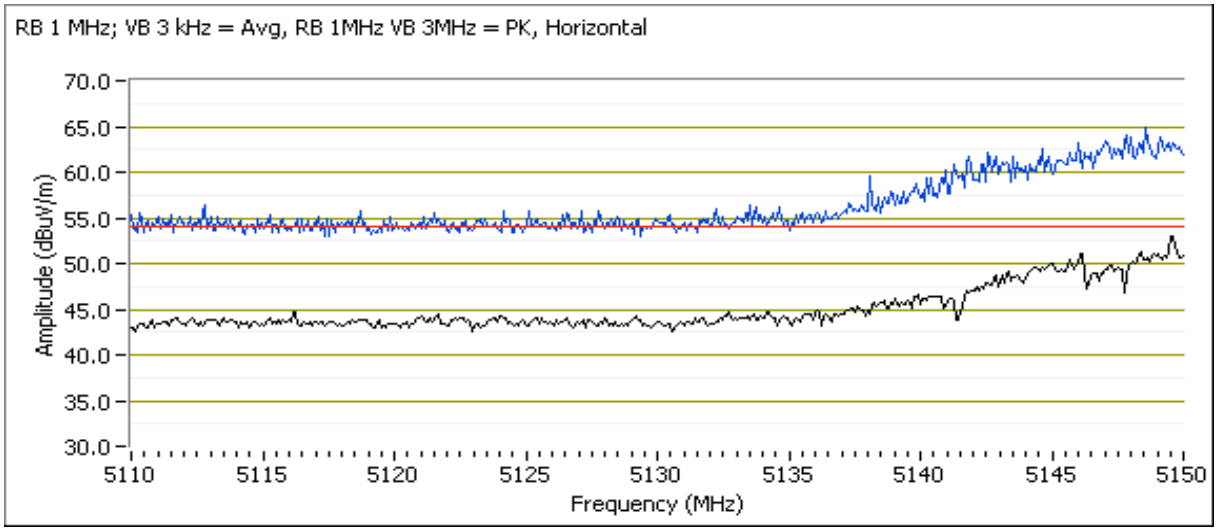
Date of Test: 2/1/2016 0:00
Test Engineer: Rafael Varelas
Test Location: FT Chamber #5

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

Channel: 38 - 5190 MHz
Tx Chain: 3x3
Mode: n40
Data Rate: VHT9

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	
5148.240	52.7	H	54.0	-1.3	Avg	333	2.3	POS; RB 1 MHz; VB: 3 kHz, note 6
5148.560	63.8	H	74.0	-10.2	PK	333	2.3	POS; RB 1 MHz; VB: 3 MHz
5149.600	48.7	V	54.0	-5.3	Avg	287	1.5	POS; RB 1 MHz; VB: 3 kHz, note 6
5148.800	59.4	V	74.0	-14.6	PK	287	1.5	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #5: Radiated Bandedge Measurements, 5250-5350MHz

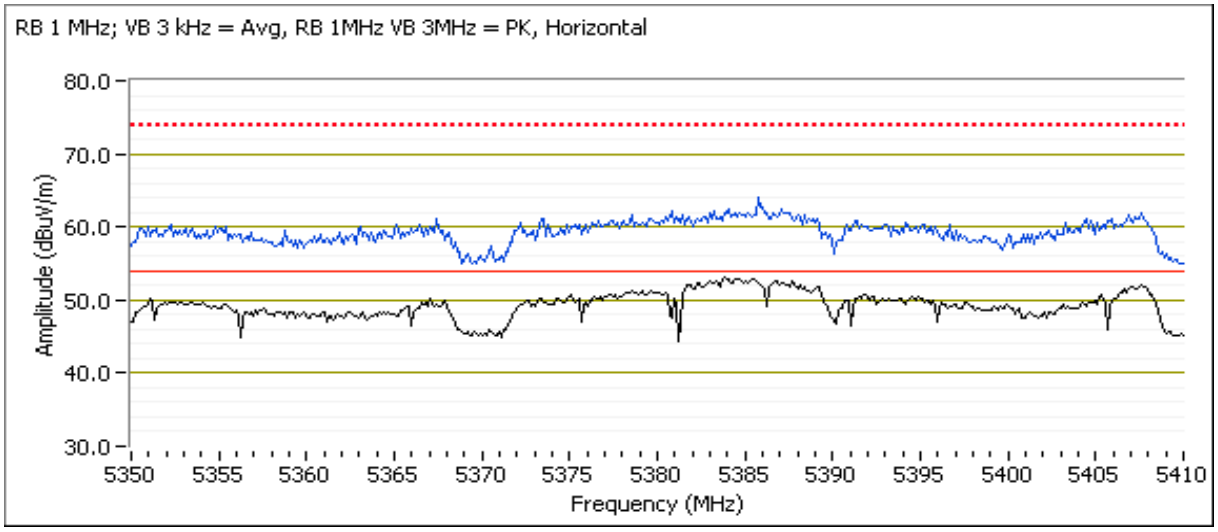
Date of Test: 2/1/2016 0:00
Test Engineer: Rafael Varelas
Test Location: FT Chamber #5

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

Channel: 46 - 5230MHz
Tx Chain: 3x3
Mode: n40
Data Rate: VHT9

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	
5384.650	53.6	H	54.0	-0.4	Avg	177	1.1	POS; RB 1 MHz; VB: 3 kHz, note 6
5388.240	62.2	H	74.0	-11.8	PK	177	1.1	POS; RB 1 MHz; VB: 3 MHz
5406.990	51.3	V	54.0	-2.7	Avg	98	1.0	POS; RB 1 MHz; VB: 3 kHz, note 6
5406.270	60.1	V	74.0	-13.9	PK	98	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #9: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 2/1/2016 0:00
Test Engineer: Rafael Varelas
Test Location: FT Chamber #5

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

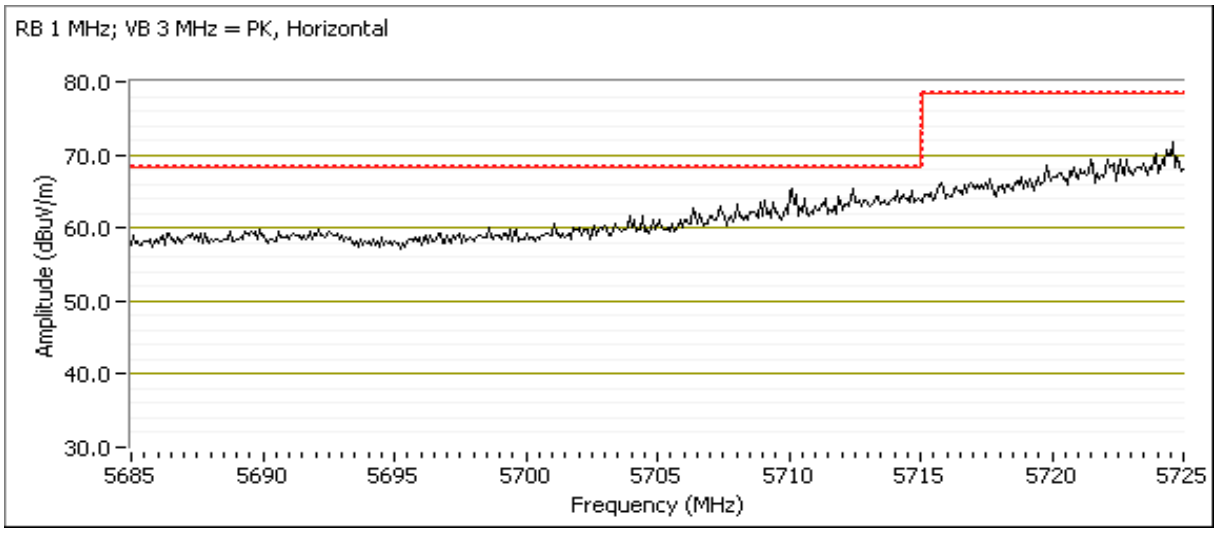
Channel: 151 - 5755MHz
Tx Chain: 3x3
Mode: n40
Data Rate: VHT9

5725 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	
5718.510	73.6	H	78.3	-4.7	PK	0	1.1	POS; RB 1 MHz; VB: 3 MHz
5723.160	72.1	V	78.3	-6.2	PK	42	1.0	POS; RB 1 MHz; VB: 3 MHz

5715 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	
5712.990	65.6	H	68.3	-2.7	PK	0	1.1	POS; RB 1 MHz; VB: 3 MHz
5713.380	65.0	V	68.3	-3.3	PK	42	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

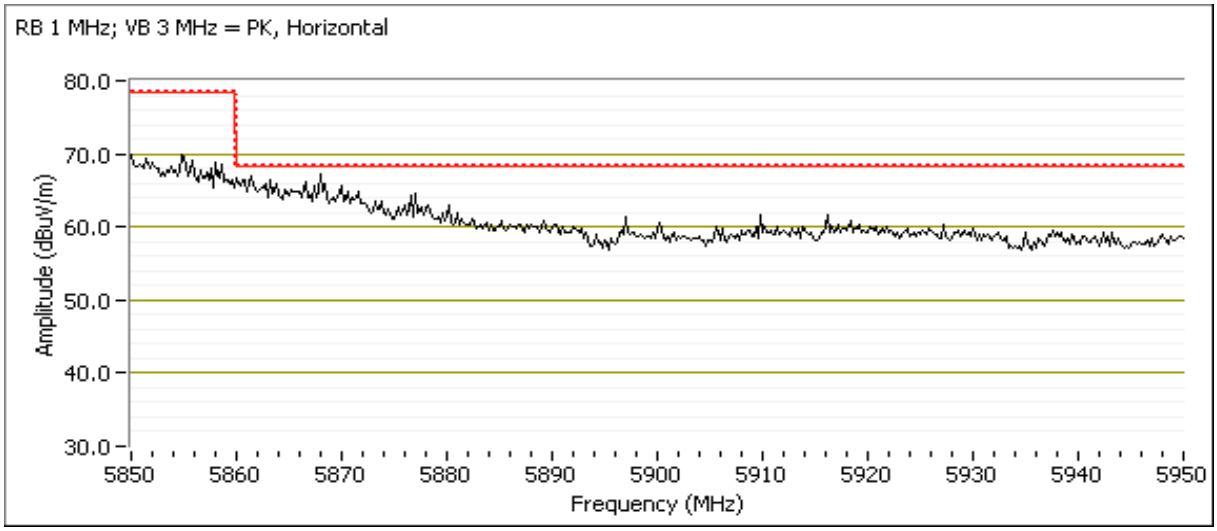
Channel: 159 - 5795MHz
Tx Chain: 3x3
Mode: n40
Data Rate: VHT9

5850 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5851.000	73.2	H	78.3	-5.1	PK	0	1.0	POS; RB 1 MHz; VB: 3 MHz
5852.710	69.2	V	78.3	-9.1	PK	45	1.0	POS; RB 1 MHz; VB: 3 MHz

5860 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	
5860.660	67.4	H	68.3	-0.9	PK	0	1.0	POS; RB 1 MHz; VB: 3 MHz
5860.420	65.8	V	68.3	-2.5	PK	45	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #10: Radiated Bandedge Measurements, 5150-5250MHz

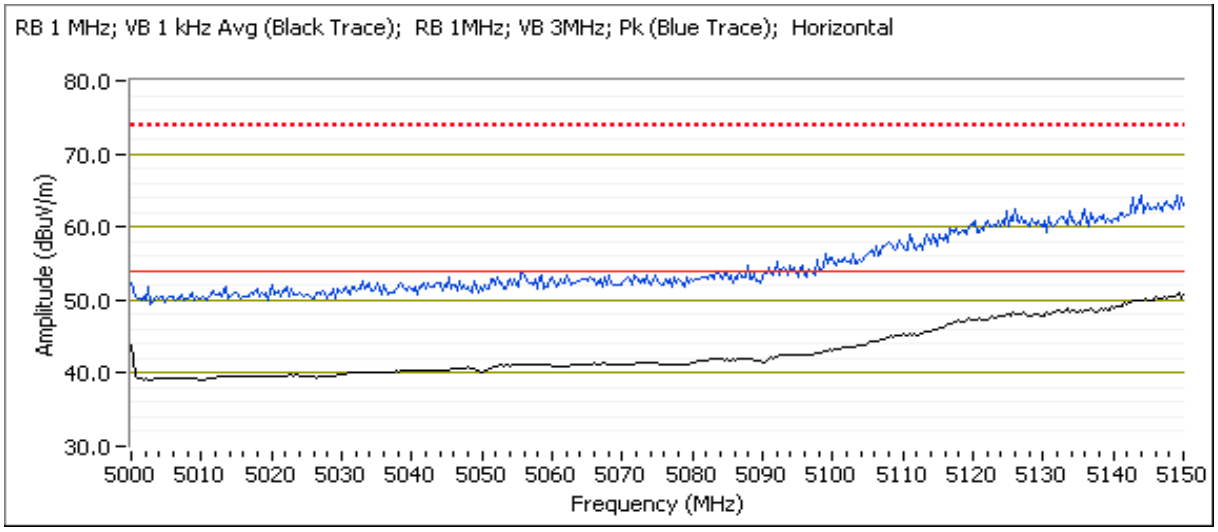
Date of Test: 2/2/2016 0:00
Test Engineer: Rafael Varelas
Test Location: FT Chamber #7

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

Channel: 42 - 5210MHz
Tx Chain: 3x3
Mode: ac80
Data Rate: VHT9

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.680	53.1	H	54.0	-0.9	Avg	346	1.0	Note 3,POS; RB 1 MHz; VB: 1 kHz
5149.100	62.7	H	74.0	-11.3	PK	346	1.0	POS; RB 1 MHz; VB: 3 MHz
5147.820	50.8	V	54.0	-3.2	Avg	304	1.0	Note 3,POS; RB 1 MHz; VB: 1 kHz
5149.200	61.9	V	74.0	-12.1	PK	304	1.0	POS; RB 1 MHz; VB: 3 MHz

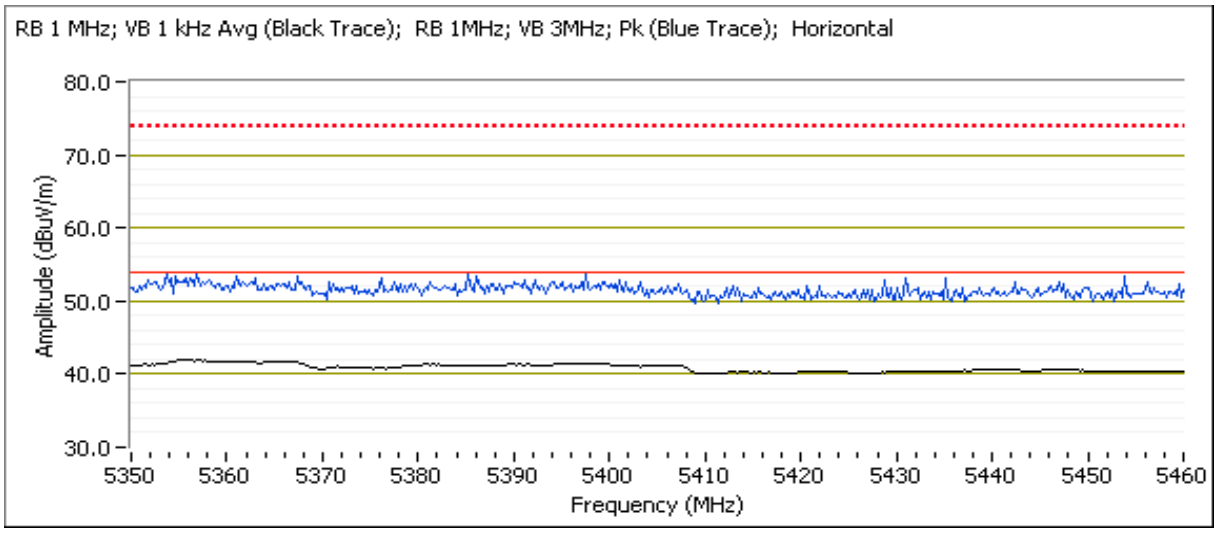


Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Channel: 42 - 5210MHz
Tx Chain: 3x3
Mode: ac80
Data Rate: VHT9

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	
5356.410	44.2	H	54.0	-9.8	Avg	210	1.5	Note 3,POS; RB 1 MHz; VB: 1 kHz
5355.450	54.6	H	74.0	-19.4	PK	210	1.5	POS; RB 1 MHz; VB: 3 MHz
5355.950	42.7	V	54.0	-11.3	Avg	87	1.0	Note 3,POS; RB 1 MHz; VB: 1 kHz
5356.650	52.6	V	74.0	-21.4	PK	87	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #11: Radiated Bandedge Measurements, 5725-5850MHz

Date of Test: 2/2/2016 0:00
Test Engineer: Rafael Varelas
Test Location: FT Chamber #7

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

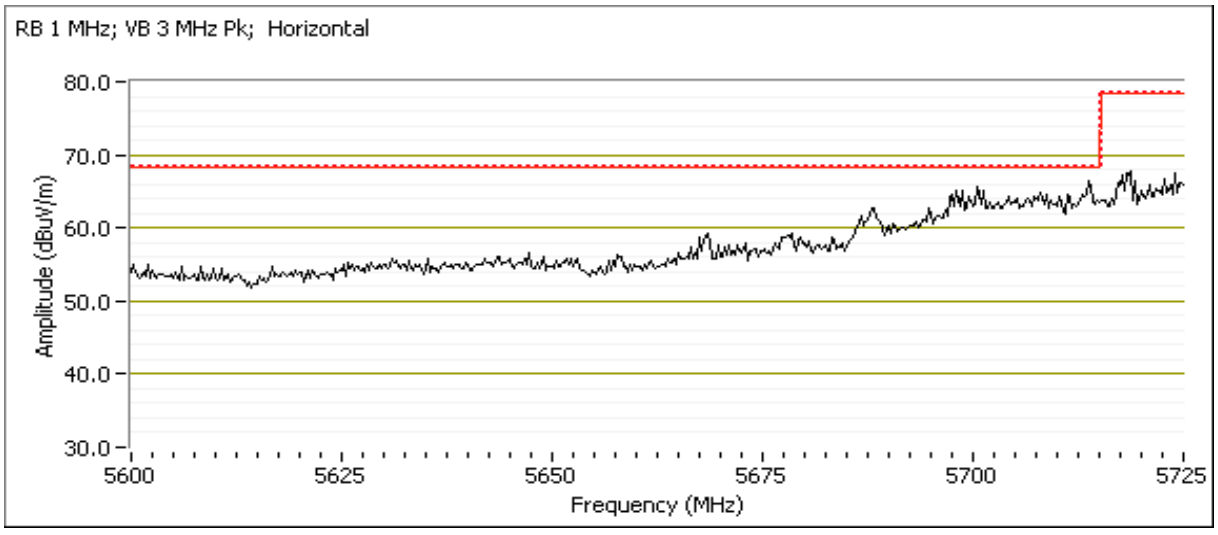
Channel: 155 - 5775MHz
Tx Chain: 3x3
Mode: ac80
Data Rate: VHT9

5725 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	
5717.280	69.2	H	78.3	-9.1	PK	360	1.0	POS; RB 1 MHz; VB: 3 MHz
5723.860	67.9	V	78.3	-10.4	PK	68	1.0	POS; RB 1 MHz; VB: 3 MHz

5715 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	
5708.450	67.2	H	68.3	-1.1	PK	360	1.0	POS; RB 1 MHz; VB: 3 MHz
5708.510	65.5	V	68.3	-2.8	PK	68	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

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

Date of Test: 2/2/2016 0:00
Test Engineer: Rafael Varelas
Test Location: FT Chamber #7

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

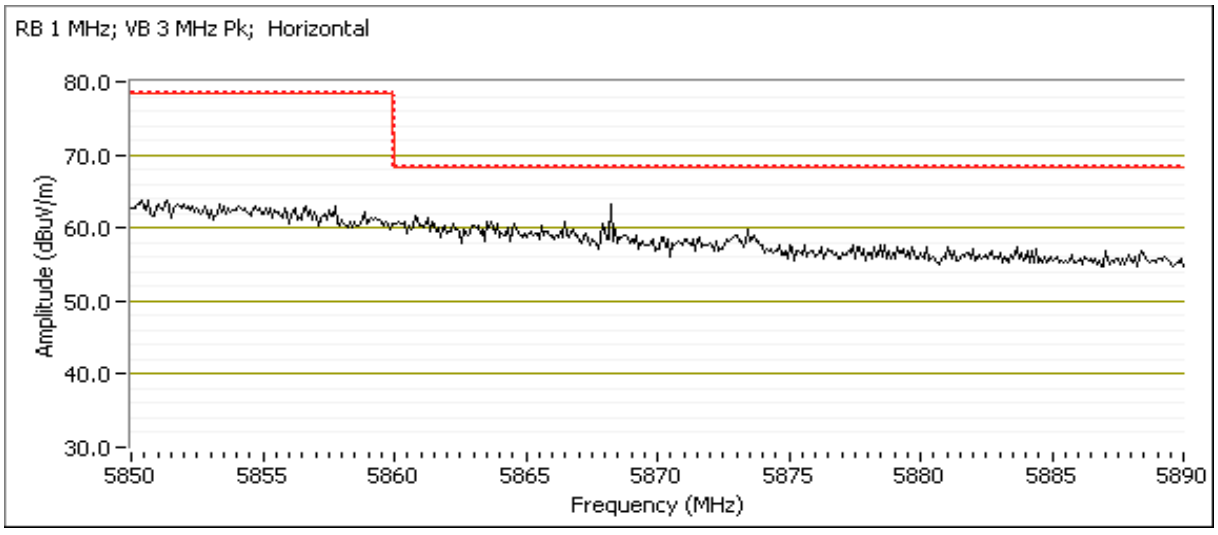
Channel: 155 - 5775MHz
Tx Chain: 3x3
Mode: ac80
Data Rate: VHT9

5850 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	
5852.340	64.6	H	78.3	-13.7	PK	354	2.2	POS; RB 1 MHz; VB: 3 MHz
5852.520	62.2	V	78.3	-16.1	PK	360	1.0	POS; RB 1 MHz; VB: 3 MHz

5860 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	
5863.910	63.5	H	68.3	-4.8	PK	354	2.2	POS; RB 1 MHz; VB: 3 MHz
5862.220	58.1	V	68.3	-10.2	PK	360	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 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: 18-20 °C
Rel. Humidity: 35-40 %

Summary of Results

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
Scans on "center" channel in all four OFDM modes to determine the worst case mode.							
1 UNII-1	a	40 - 5200MHz	23.0	23.0	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.5 dBµV/m @ 5042.2 MHz (-0.5 dB)
	n20	40 - 5200MHz	23.0	23.0	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	47.0 dBµV/m @ 5041.4 MHz (-7.0 dB)
	n40	38 - 5190MHz	23.0	23.0	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	48.0 dBµV/m @ 5042.6 MHz (-6.0 dB)
	ac80	42 - 5210MHz	23.0	23.0	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	51.2 dBµV/m @ 5043.9 MHz (-2.8 dB)
Measurements on low and high channels in worst-case OFDM mode.							
2	a	36 - 5180MHz	21.0	21.0	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.2 dBµV/m @ 5021.9 MHz (-0.8 dB)
	a	48 - 5240MHz	23.0	23.0	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	68.2 dBµV/m @ 5473.4 MHz (-0.1 dB)
Scans on "center" channel for all OFDM modes to determine the worst case mode.							
3 UNII-3	a	157 - 5785MHz	23.0	23.0	Radiated Emissions 1 - 40 GHz	FCC 15.209 / 15 E	53.8 dBµV/m @ 11569.7 MHz (-0.2 dB)
	n20	157 - 5785MHz	23.0	23.0	Radiated Emissions 1 - 40 GHz	FCC 15.209 / 15 E	53.3 dBµV/m @ 11569.5 MHz (-0.7 dB)
	n40	151 - 5755MHz	23.0	23.0	Radiated Emissions 1 - 40 GHz	FCC 15.209 / 15 E	66.4 dBµV/m @ 5990.7 MHz (-1.9 dB)
	ac80	155 - 5775MHz	23.0	22.0	Radiated Emissions 1 - 40 GHz	FCC 15.209 / 15 E	67.0 dBµV/m @ 5606.4 MHz (-1.3 dB)

Continued on the Next Page -->

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

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Measurements on low and high channels in worst-case OFDM mode.

4 UNII-3	a	149 - 5745MHz	23.0	23.0	Radiated Emissions 1 - 40 GHz	FCC 15.209 / 15 E	52.1 dBµV/m @ 11489.4 MHz (-1.9 dB)
	a	165 - 5825MHz	23.0	23.0	Radiated Emissions 1 - 40 GHz	FCC 15.209 / 15 E	53.8 dBµV/m @ 11650.1 MHz (-0.2 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.

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)
11a	6 Mb/s	98.0%	Yes	1.302	0	0	10
n20	VHT8	99.1%	Yes	1.935	0	0	10
n40	VHT9	98.1%	Yes	0.952	0	0	10
ac80	VHT9	93.7%	Yes	0.448	0.3	0.6	2232

3k

Sample Notes

Sample S/N: F56154520246
Driver: 7.14.89.21.571.206
Antenna: 3x3 Non-Beamforming

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)

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

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

Run #1a: Center Channel

Date of Test: 01/07/16 Test Location: Chamber #7

Test Engineer: Mehran Birgani / R. Varelas EUT Voltage: 120V/ 60Hz

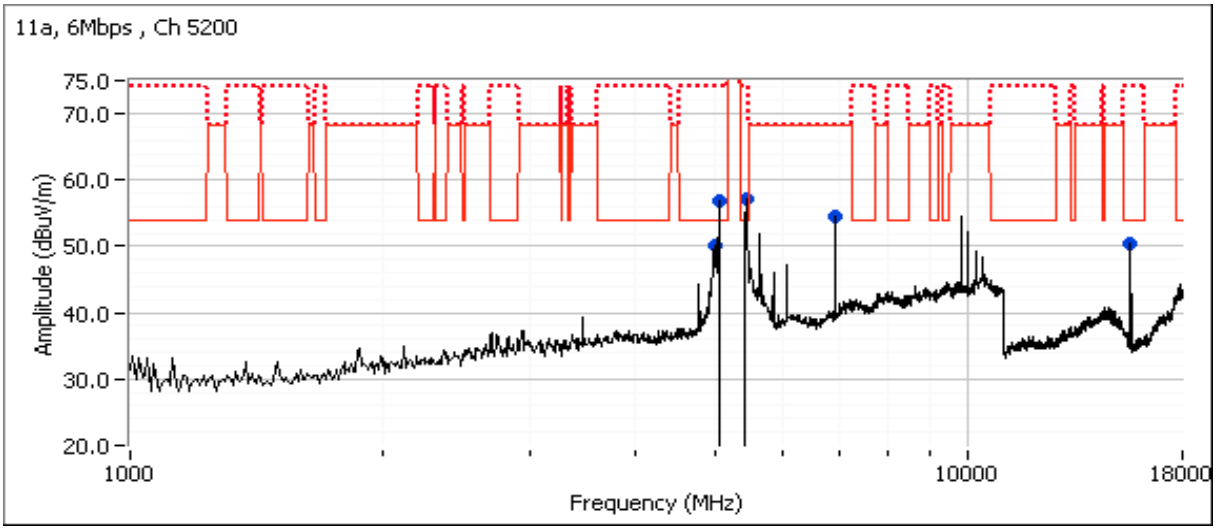
Channel: 40 - 5200MHz Mode: a Setting: 23.0

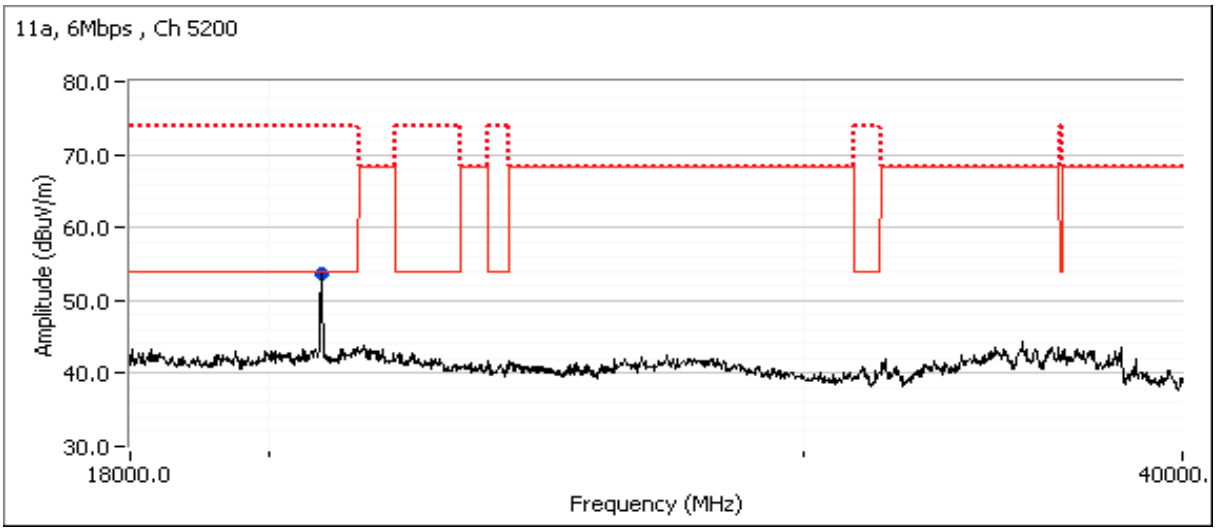
Tx Chain: 3Tx Data Rate: 6 Mbps

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5042.210	53.5	H	54.0	-0.5	AVG	1	1.0	POS; RB 1 MHz; VB: 10 Hz
5442.340	53.5	H	54.0	-0.5	AVG	1	1.0	POS; RB 1 MHz; VB: 10 Hz
4982.560	46.5	H	54.0	-7.5	AVG	194	1.6	POS; RB 1 MHz; VB: 10 Hz
5443.210	63.8	H	74.0	-10.2	PK	1	1.0	POS; RB 1 MHz; VB: 3 MHz
5042.150	63.6	H	74.0	-10.4	PK	1	1.0	POS; RB 1 MHz; VB: 3 MHz
6933.420	57.1	H	68.3	-11.2	PK	14	1.1	RB 1 MHz;VB 3 MHz;Peak
4982.120	57.3	H	74.0	-16.7	PK	194	1.6	POS; RB 1 MHz; VB: 3 MHz
15601.220	50.5	V	54.0	-3.5	AVG	318	2.0	RB 1 MHz;VB 10 Hz;Peak
15602.420	67.9	V	74.0	-6.1	PK	318	2.0	RB 1 MHz;VB 3 MHz;Peak
20799.620	50.3	V	54.0	-3.7	AVG	326	1.1	RB 1 MHz;VB 10 Hz;Peak
20799.590	64.3	V	74.0	-9.7	PK	326	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). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A





Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #1b: Center Channel

Date of Test: 01/07/16 Test Location: Chamber #7

Test Engineer: Mehran Birgani / R. Varelas EUT Voltage: 120V/ 60Hz

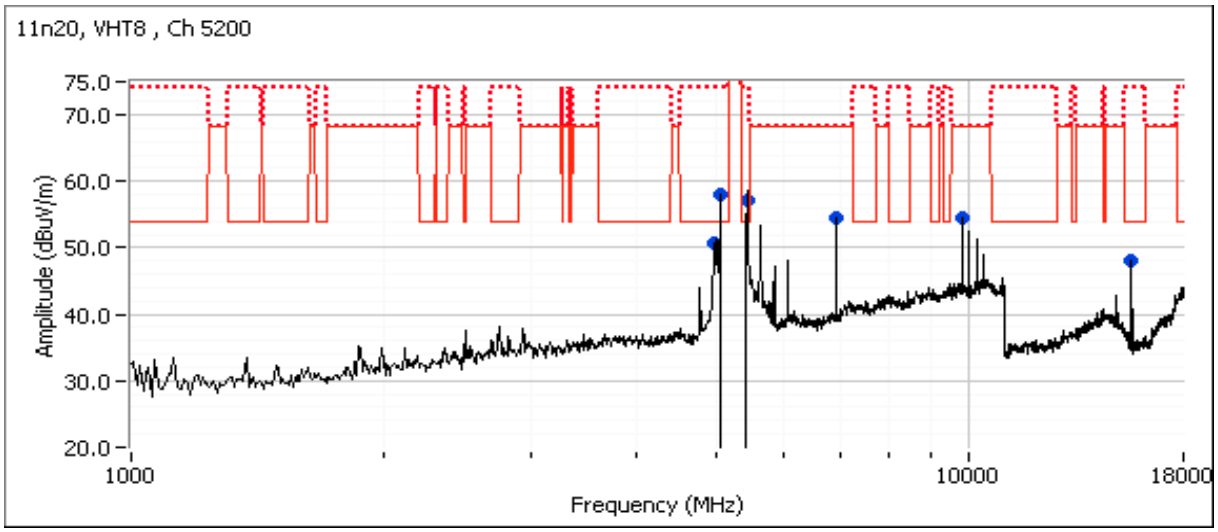
Channel: 40 - 5200MHz Mode: 11n20 Setting: 23.0

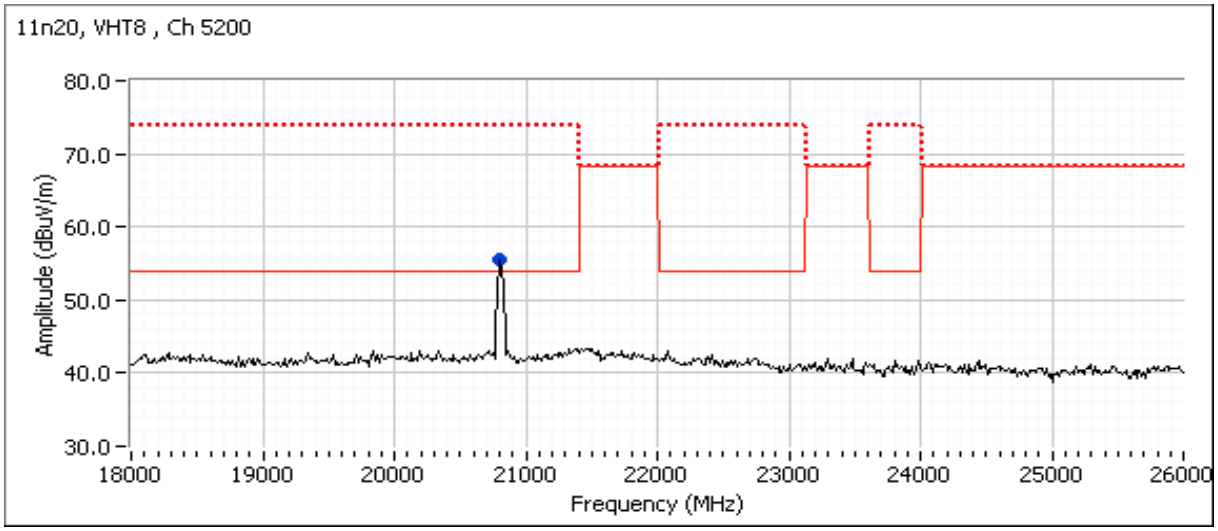
Tx Chain: 3Tx Data Rate: VHT8

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5041.360	47.0	H	54.0	-7.0	AVG	354	1.0	POS; RB 1 MHz; VB: 10 Hz
5438.760	46.1	H	54.0	-7.9	AVG	162	1.3	POS; RB 1 MHz; VB: 10 Hz
9800.010	58.7	V	68.3	-9.6	PK	345	2.2	RB 1 MHz;VB 3 MHz;Peak
5042.340	62.8	H	74.0	-11.2	PK	354	1.0	POS; RB 1 MHz; VB: 3 MHz
6933.430	56.7	H	68.3	-11.6	PK	154	1.9	RB 1 MHz;VB 3 MHz;Peak
5439.280	60.8	H	74.0	-13.2	PK	162	1.3	POS; RB 1 MHz; VB: 3 MHz
4962.490	40.3	H	54.0	-13.7	AVG	308	1.6	POS; RB 1 MHz; VB: 10 Hz
4961.050	55.9	H	74.0	-18.1	PK	308	1.6	POS; RB 1 MHz; VB: 3 MHz
15597.760	43.5	V	54.0	-10.5	AVG	273	1.0	RB 1 MHz;VB 10 Hz;Peak
15589.710	57.3	V	74.0	-16.7	PK	273	1.0	RB 1 MHz;VB 3 MHz;Peak
20799.630	50.5	V	54.0	-3.5	AVG	326	1.1	RB 1 MHz;VB 10 Hz;Peak
20793.900	64.4	V	74.0	-9.6	PK	326	1.1	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 26 - 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).

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A





Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #1c: Center Channel

Date of Test: 01/07/16 Test Location: Chamber #7

Test Engineer: Mehran Birgani / R. Varelas EUT Voltage: 120V/ 60Hz

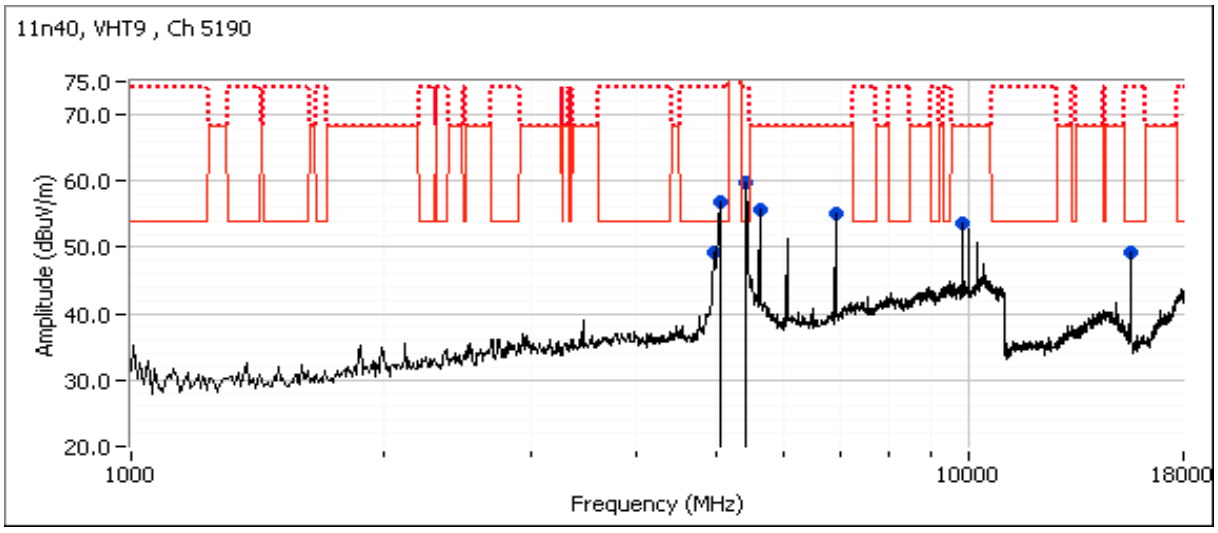
Channel: 38 - 5190MHz Mode: 11n40 Setting: 23.0

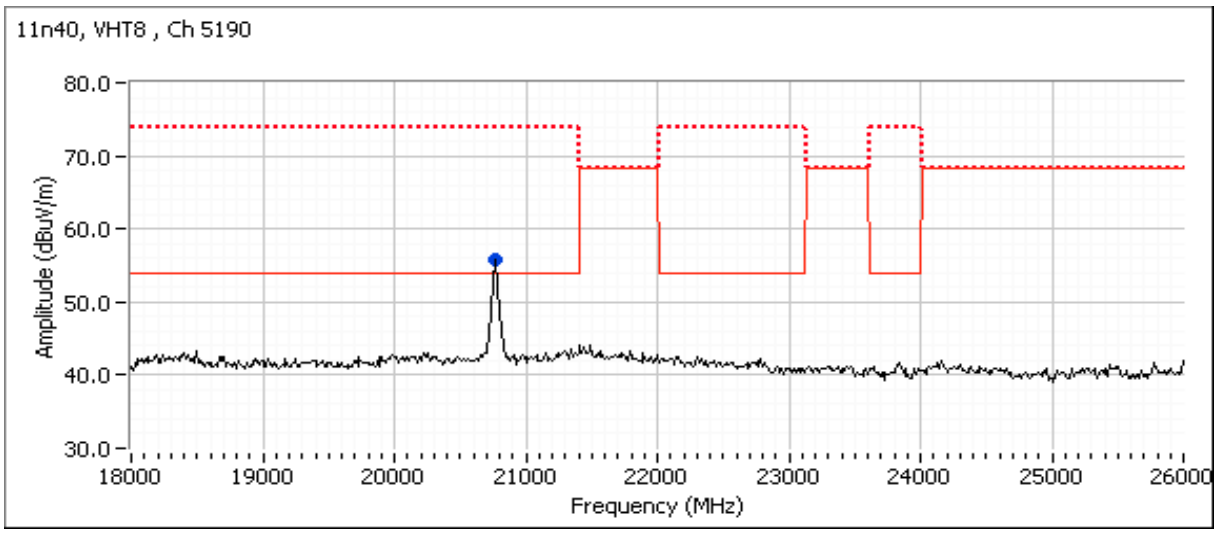
Tx Chain: 3Tx Data Rate: VHT9

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5042.570	48.0	H	54.0	-6.0	AVG	0	1.2	POS; RB 1 MHz; VB: 10 Hz
5042.310	61.6	H	74.0	-12.4	PK	0	1.2	POS; RB 1 MHz; VB: 3 MHz
4963.900	41.4	H	54.0	-12.6	AVG	302	1.2	POS; RB 1 MHz; VB: 10 Hz
4959.650	54.7	H	74.0	-19.3	PK	302	1.2	POS; RB 1 MHz; VB: 3 MHz
5415.000	46.9	H	54.0	-7.1	AVG	190	1.5	POS; RB 1 MHz; VB: 10 Hz
5412.880	59.1	H	74.0	-14.9	PK	190	1.5	POS; RB 1 MHz; VB: 3 MHz
6919.980	57.1	H	68.3	-11.2	PK	166	1.7	RB 1 MHz;VB 3 MHz;Peak
9799.870	57.6	V	68.3	-10.7	PK	338	1.0	RB 1 MHz;VB 3 MHz;Peak
5622.450	59.1	H	68.3	-9.2	PK	355	2.3	RB 1 MHz;VB 3 MHz;Peak
15568.950	44.5	V	54.0	-9.5	AVG	94	1.9	RB 1 MHz;VB 10 Hz;Peak
15568.230	58.3	V	74.0	-15.7	PK	94	1.9	RB 1 MHz;VB 3 MHz;Peak
20764.870	49.1	V	54.0	-4.9	AVG	326	1.2	RB 1 MHz;VB 10 Hz;Peak
20769.840	61.2	V	74.0	-12.8	PK	326	1.2	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 26 - 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).

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A





Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #1d: Center Channel

Date of Test: 01/07/16 Test Location: Chamber #7

Test Engineer: Rafael Varelas EUT Voltage: 120V/ 60Hz

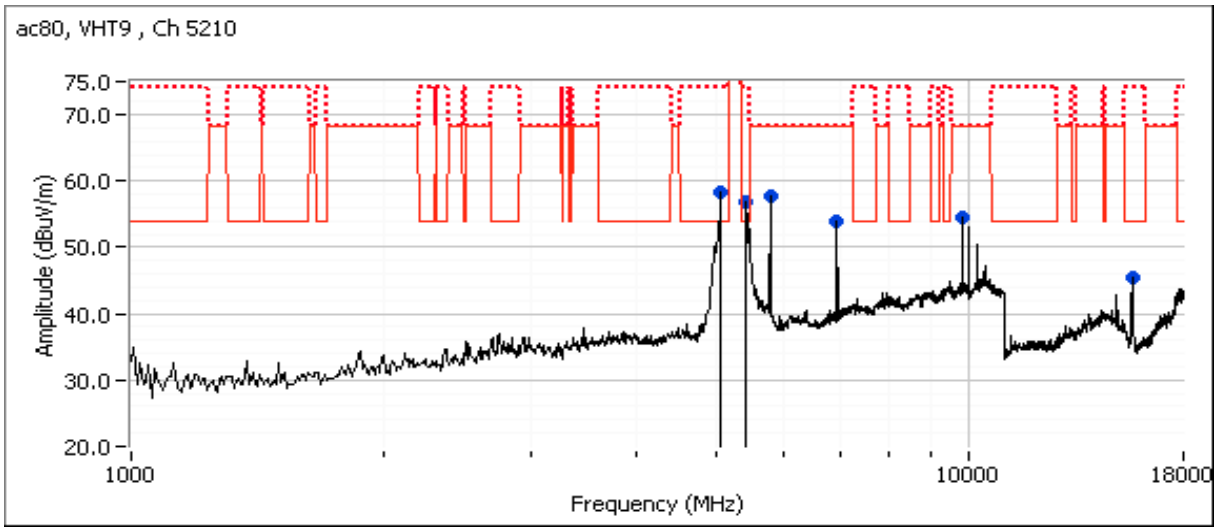
Channel: 42 - 5210MHz Mode: 11ac80 Setting: 23.0

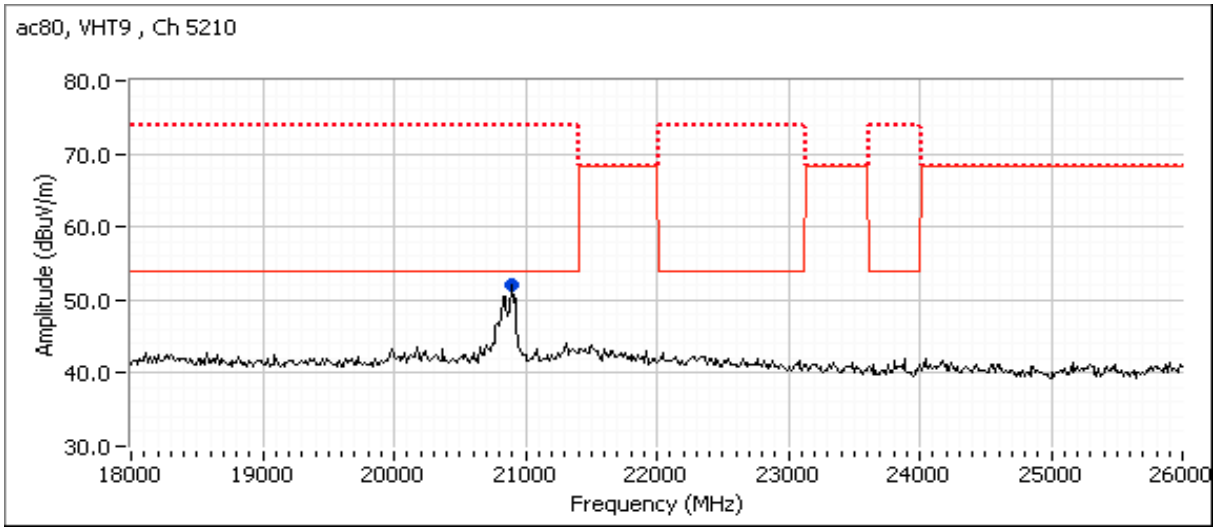
Tx Chain: 3Tx Data Rate: VHT9

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5043.880	51.2	H	54.0	-2.8	Avg	193	1.9	AVG; RB 1 MHz; VB: 3 kHz
5045.770	64.7	H	74.0	-9.3	PK	193	1.9	POS; RB 1 MHz; VB: 3 MHz
5788.990	59.7	H	68.3	-8.6	PK	27	2.3	RB 1 MHz;VB 3 MHz;Peak
6946.600	52.6	H	68.3	-15.7	PK	196	1.0	RB 1 MHz;VB 3 MHz;Peak
9799.910	57.5	V	68.3	-10.8	PK	340	1.0	RB 1 MHz;VB 3 MHz;Peak
5414.980	48.8	H	54.0	-5.2	Avg	233	1.7	AVG; RB 1 MHz; VB: 3 kHz
5415.190	60.4	H	74.0	-13.6	PK	233	1.7	POS; RB 1 MHz; VB: 3 MHz
15670.990	43.6	V	54.0	-10.4	Avg	324	1.8	RB 1 MHz;VB 3 kHz;Peak
15670.620	57.6	V	74.0	-16.4	PK	324	1.8	RB 1 MHz;VB 3 MHz;Peak
20890.000	44.1	V	54.0	-9.9	AVG	326	1.1	RB 1 MHz;VB 10 Hz;Peak
20900.040	56.7	V	74.0	-17.3	PK	326	1.1	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 26 - 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).

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A





Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

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

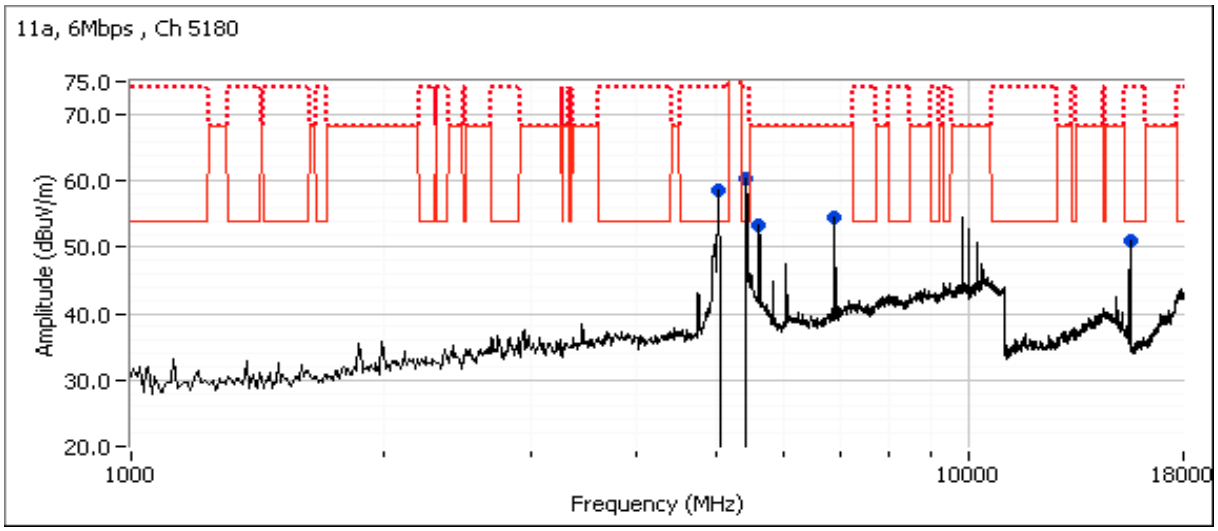
Date of Test: 1/8/2016 0:00 Config. Used: 1
Test Engineer: Eddie Mariscal / R. Varelas Config Change: None
Test Location: FT Chamber #7 EUT Voltage: 120V/60Hz

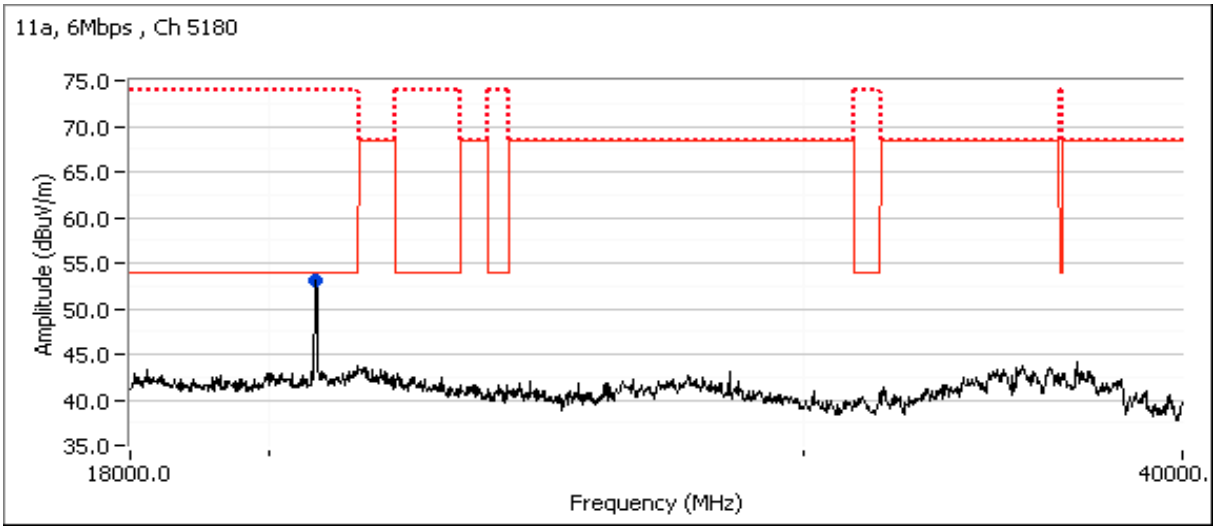
Run #2a: Low Channel

Channel: 36 - 5180MHz Mode: a
Tx Chain: 3Tx Data Rate: 6Mbps

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5021.900	53.2	H	54.0	-0.8	AVG	353	1.0	POS; RB 1 MHz; VB: 10 Hz
5022.540	63.3	H	74.0	-10.7	PK	353	1.0	POS; RB 1 MHz; VB: 3 MHz
5423.090	52.2	H	54.0	-1.8	AVG	229	1.6	POS; RB 1 MHz; VB: 10 Hz
5422.910	62.1	H	74.0	-11.9	PK	229	1.6	POS; RB 1 MHz; VB: 3 MHz
5604.840	53.2	H	68.3	-15.1	AVG	342	1.0	RB 1 MHz;VB 10 Hz;Peak
5605.440	63.3	H	68.3	-5.0	PK	342	1.0	RB 1 MHz;VB 3 MHz;Peak
6906.730	55.5	H	68.3	-12.8	AVG	174	1.7	RB 1 MHz;VB 10 Hz;Peak
6906.740	58.4	H	68.3	-9.9	PK	174	1.7	RB 1 MHz;VB 3 MHz;Peak
15541.770	51.8	V	54.0	-2.2	AVG	293	2.0	RB 1 MHz;VB 10 Hz;Peak
15541.750	69.5	V	74.0	-4.5	PK	293	2.0	RB 1 MHz;VB 3 MHz;Peak
20717.800	49.9	V	54.0	-4.1	AVG	42	2.0	RB 1 MHz;VB 10 Hz;Peak
20728.930	62.6	V	74.0	-11.4	PK	42	2.0	RB 1 MHz;VB 3 MHz;Peak

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A



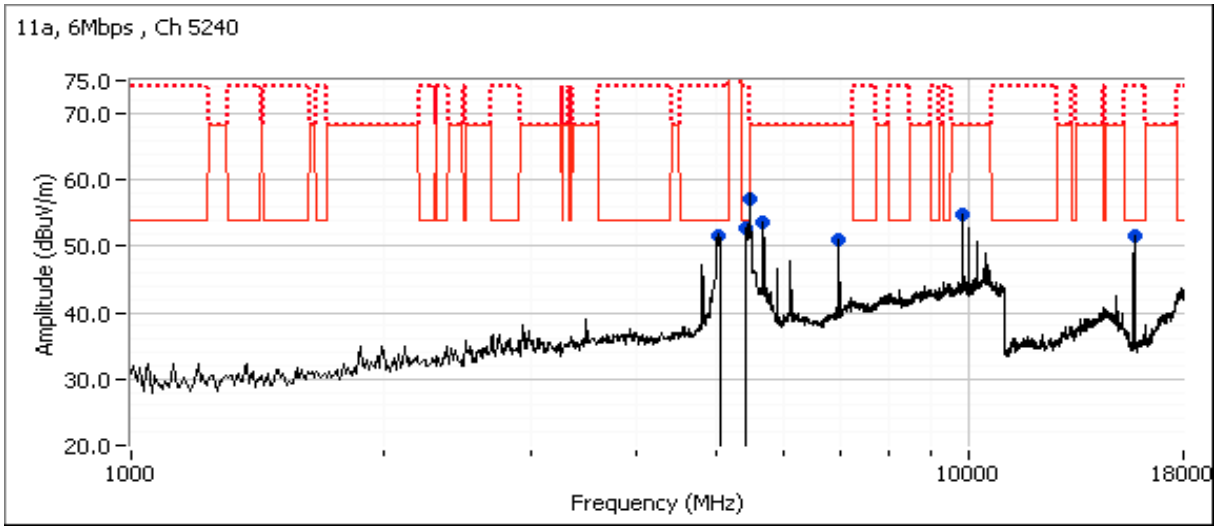


Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

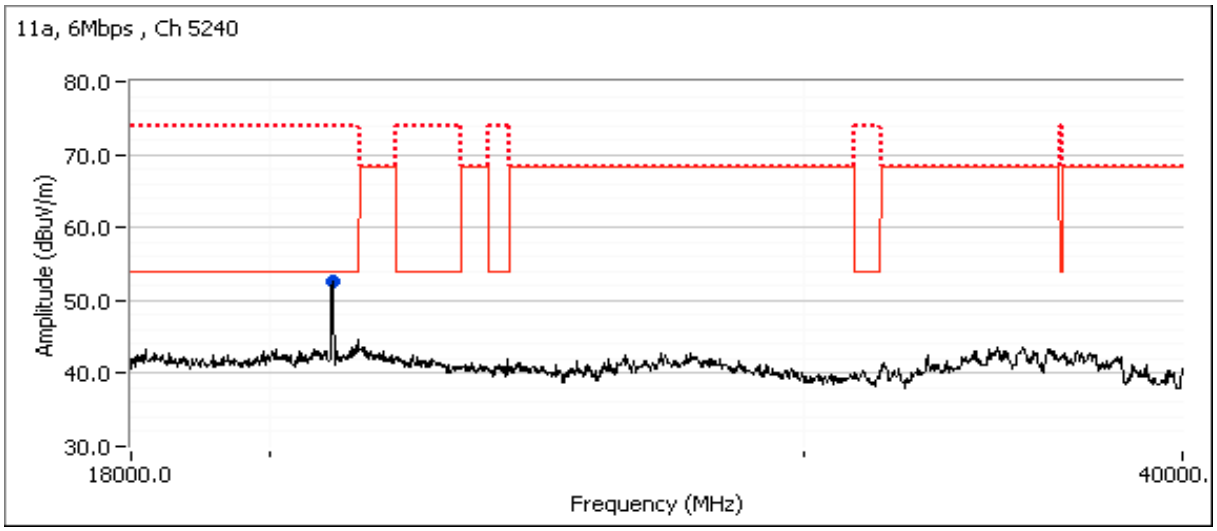
Run #2b: High Channel

Channel: 48 - 5240MHz Mode: a
Tx Chain: 3Tx Data Rate: 6Mbps

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5019.790	51.5	H	54.0	-2.5	AVG	195	1.8	RB 1 MHz;VB 10 Hz;Peak
5019.280	62.6	H	74.0	-11.4	PK	195	1.8	RB 1 MHz;VB 3 MHz;Peak
5441.210	53.1	H	54.0	-0.9	AVG	183	1.5	RB 1 MHz;VB 10 Hz;Peak
5441.380	63.9	H	74.0	-10.1	PK	183	1.5	RB 1 MHz;VB 3 MHz;Peak
5472.880	58.7	H	68.3	-9.6	AVG	360	1.0	RB 1 MHz;VB 10 Hz;Peak
5473.410	68.2	H	68.3	-0.1	PK	360	1.0	RB 1 MHz;VB 3 MHz;Peak
5679.570	51.8	H	68.3	-16.5	AVG	356	1.2	RB 1 MHz;VB 10 Hz;Peak
5679.640	62.8	H	68.3	-5.5	PK	356	1.2	RB 1 MHz;VB 3 MHz;Peak
6986.690	51.4	H	68.3	-16.9	AVG	2	1.2	RB 1 MHz;VB 10 Hz;Peak
6986.680	55.8	H	68.3	-12.5	PK	2	1.2	RB 1 MHz;VB 3 MHz;Peak
9799.940	54.2	V	68.3	-14.1	AVG	348	2.2	RB 1 MHz;VB 10 Hz;Peak
9799.960	58.6	V	68.3	-9.7	PK	348	2.2	RB 1 MHz;VB 3 MHz;Peak
15720.720	53.9	V	54.0	-0.1	AVG	318	1.9	RB 1 MHz;VB 10 Hz;Peak
15720.780	71.4	V	74.0	-2.6	PK	318	1.9	RB 1 MHz;VB 3 MHz;Peak
20958.520	48.7	V	54.0	-5.3	AVG	358	1.1	RB 1 MHz;VB 10 Hz;Peak
20959.420	62.6	V	74.0	-11.4	PK	358	1.1	RB 1 MHz;VB 3 MHz;Peak



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #3, Radiated Spurious Emissions, 1,000 - 40,000 MHz. Operation in the 5725-5850 MHz Band

Date of Test: 1/8/2016 0:00 Config. Used: 1
Test Engineer: Eddie Mariscal Config Change: None
Test Location: FT Chamber #7 EUT Voltage: 120V/60Hz

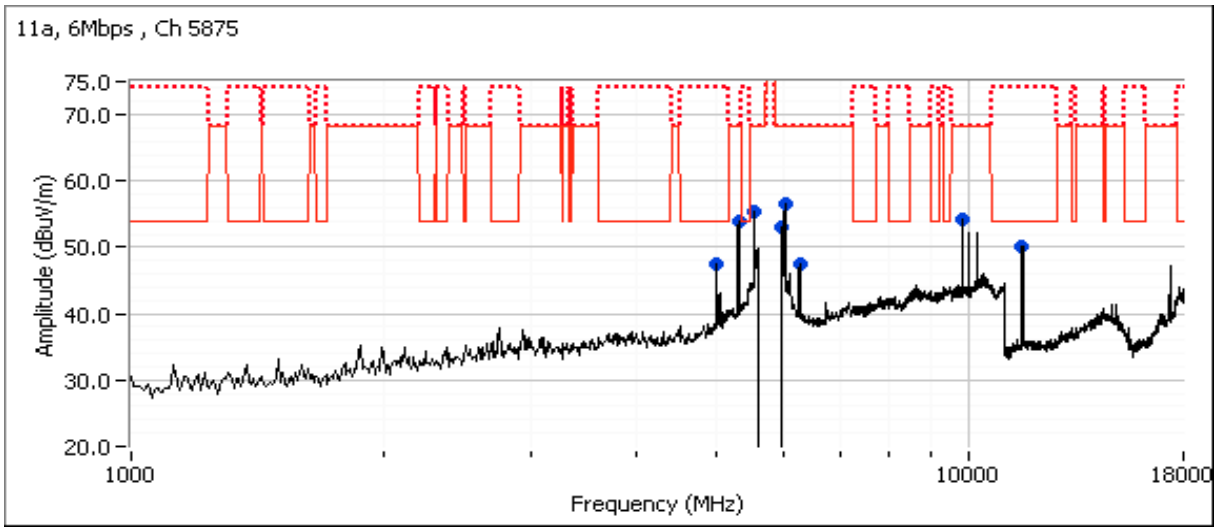
Run #3a: Center Channel

Channel: 157 Mode: a
Tx Chain: 3Tx 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	
5546.340	55.4	H	68.3	-12.9	AVG	360	1.0	RB 1 MHz;VB 10 Hz;Peak
5546.140	66.0	H	68.3	-2.3	PK	360	1.0	RB 1 MHz;VB 3 MHz;Peak
9799.950	54.3	V	68.3	-14.0	AVG	351	2.2	RB 1 MHz;VB 10 Hz;Peak
9799.900	58.4	V	68.3	-9.9	PK	351	2.2	RB 1 MHz;VB 3 MHz;Peak
5000.000	46.5	H	54.0	-7.5	AVG	343	2.5	RB 1 MHz;VB 10 Hz;Peak
5000.010	51.8	H	74.0	-22.2	PK	343	2.5	RB 1 MHz;VB 3 MHz;Peak
6022.340	54.3	H	68.3	-14.0	AVG	252	2.0	RB 1 MHz;VB 10 Hz;Peak
6021.740	64.6	H	68.3	-3.7	PK	252	2.0	RB 1 MHz;VB 3 MHz;Peak
5307.600	53.6	H	68.3	-14.7	AVG	249	2.2	RB 1 MHz;VB 10 Hz;Peak
5307.570	63.0	H	68.3	-5.3	PK	249	2.2	RB 1 MHz;VB 3 MHz;Peak
6260.690	44.7	H	68.3	-23.6	AVG	8	1.1	RB 1 MHz;VB 10 Hz;Peak
6260.870	56.0	H	68.3	-12.3	PK	8	1.1	RB 1 MHz;VB 3 MHz;Peak
5988.720	52.4	H	68.3	-15.9	AVG	1	1.1	RB 1 MHz;VB 10 Hz;Peak
5989.290	63.4	H	68.3	-4.9	PK	1	1.1	RB 1 MHz;VB 3 MHz;Peak
11569.730	**53.8**	V	54.0	**-0.2**	AVG	345	2.2	RB 1 MHz;VB 10 Hz;Peak
11569.070	66.6	V	74.0	-7.4	PK	345	2.2	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).

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

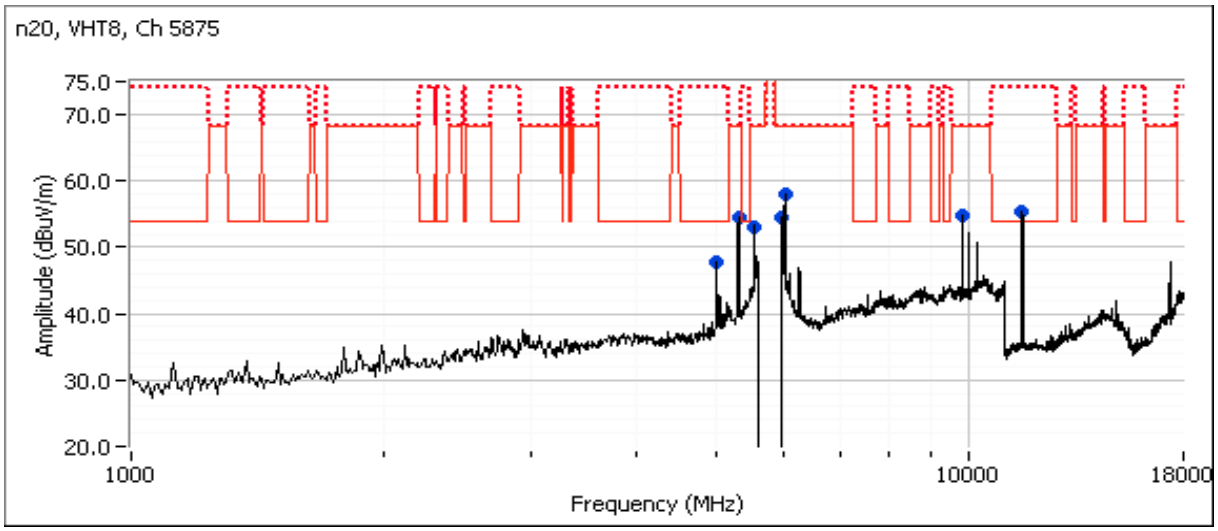
Run #3b: Center Channel

Channel: 157 Mode: 11n20
Tx Chain: 3Tx Data Rate: VHT8

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5546.430	46.9	H	68.3	-21.4	AVG	5	1.0	RB 1 MHz;VB 10 Hz;Peak
5546.290	64.2	H	68.3	-4.1	PK	5	1.0	RB 1 MHz;VB 3 MHz;Peak
6026.140	53.9	H	68.3	-14.4	AVG	0	1.1	RB 1 MHz;VB 10 Hz;Peak
6027.390	65.1	H	68.3	-3.2	PK	0	1.1	RB 1 MHz;VB 3 MHz;Peak
6022.630	51.0	H	68.3	-17.3	AVG	249	2.2	RB 1 MHz;VB 10 Hz;Peak
6020.810	63.2	H	68.3	-5.1	PK	249	2.2	RB 1 MHz;VB 3 MHz;Peak
5303.100	50.4	H	68.3	-17.9	AVG	244	2.0	RB 1 MHz;VB 10 Hz;Peak
5297.600	61.3	H	68.3	-7.0	PK	244	2.0	RB 1 MHz;VB 3 MHz;Peak
5000.030	48.2	H	54.0	-5.8	AVG	345	2.5	RB 1 MHz;VB 10 Hz;Peak
4999.900	52.9	H	74.0	-21.1	PK	345	2.5	RB 1 MHz;VB 3 MHz;Peak
9800.080	54.8	V	68.3	-13.5	PK	352	2.2	RB 1 MHz;VB 3 MHz;Peak
11569.480	**53.3**	V	54.0	**-0.7**	AVG	345	2.1	RB 1 MHz;VB 10 Hz;Peak
11569.920	66.5	V	74.0	-7.5	PK	345	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).

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

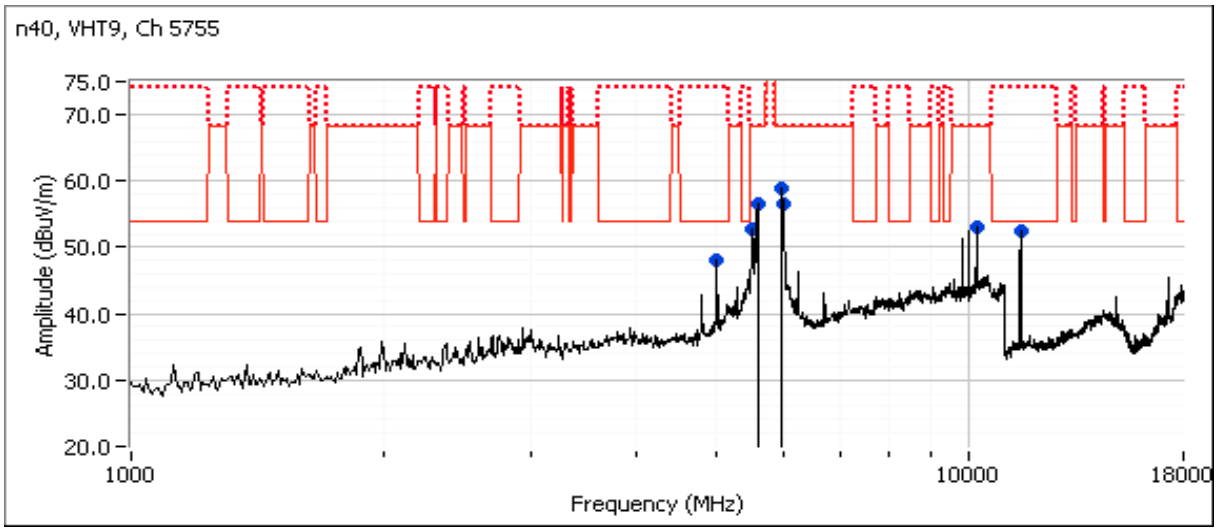
Run #3c: Center Channel

Channel: 151 Mode: 11n40
Tx Chain: 3Tx Data Rate: VHT9

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5000.020	46.0	H	54.0	-8.0	AVG	346	2.2	RB 1 MHz;VB 10 Hz;Peak
4999.960	52.1	H	74.0	-21.9	PK	346	2.2	RB 1 MHz;VB 3 MHz;Peak
5510.300	49.7	H	68.3	-18.6	AVG	186	1.7	RB 1 MHz;VB 10 Hz;Peak
5510.630	62.0	H	68.3	-6.3	PK	186	1.7	RB 1 MHz;VB 3 MHz;Peak
5577.830	52.5	H	68.3	-15.8	AVG	344	1.1	RB 1 MHz;VB 10 Hz;Peak
5577.850	64.3	H	68.3	-4.0	PK	344	1.1	RB 1 MHz;VB 3 MHz;Peak
5990.530	54.4	H	68.3	-13.9	AVG	199	1.6	RB 1 MHz;VB 10 Hz;Peak
5990.650	66.4	H	68.3	-1.9	PK	199	1.6	RB 1 MHz;VB 3 MHz;Peak
6000.240	52.7	H	68.3	-15.6	AVG	197	1.6	RB 1 MHz;VB 10 Hz;Peak
6000.810	64.8	H	68.3	-3.5	PK	197	1.6	RB 1 MHz;VB 3 MHz;Peak
10200.000	53.0	V	68.3	-15.3	AVG	356	2.2	RB 1 MHz;VB 10 Hz;Peak
10199.850	57.8	V	68.3	-10.5	PK	356	2.2	RB 1 MHz;VB 3 MHz;Peak
11509.530	49.4	V	54.0	-4.6	AVG	347	2.1	RB 1 MHz;VB 10 Hz;Peak
11509.680	61.4	V	74.0	-12.6	PK	347	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).

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #3d: Center Channel

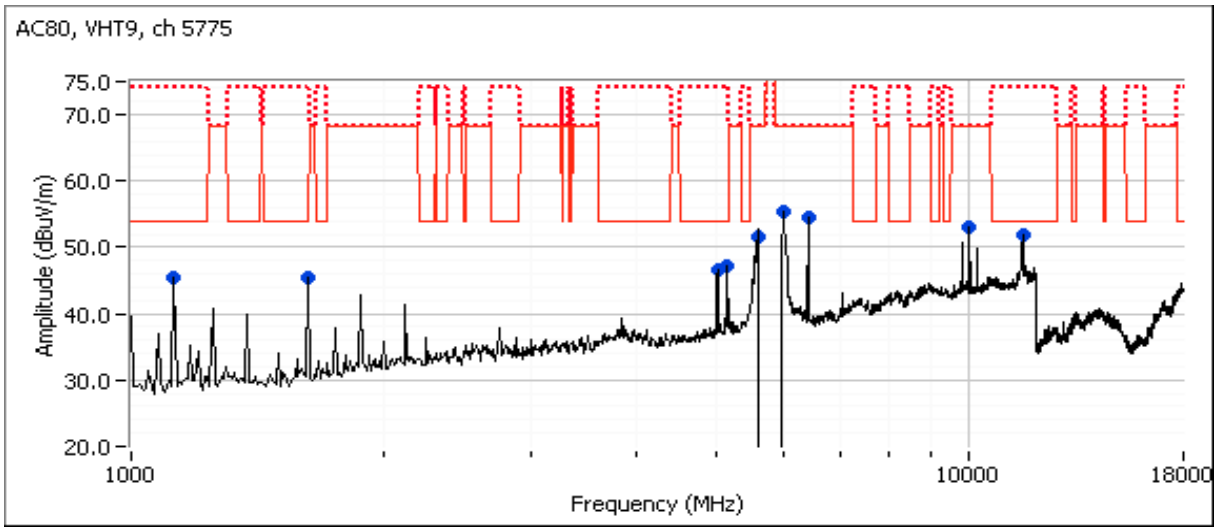
Date of Test: 3/11/2016 0:00 Config. Used: 1
Test Engineer: Rafael Varelas Config Change: None
Test Location: FT Chamber #4 EUT Voltage: 120V/60Hz

Channel: 155 Mode: 11ac80
Tx Chain: 3Tx Data Rate: VHT9

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5606.440	67.0	V	68.3	-1.3	PK	50	1.0	RB 1 MHz;VB 3 MHz;Peak
6416.480	57.0	H	68.3	-11.3	PK	350	1.0	RB 1 MHz;VB 3 MHz;Peak
11563.800	44.2	V	54.0	-9.8	Avg	299	1.9	Note 3,RB 1 MHz;VB 3 kHz;Peak VA
11581.000	54.9	V	74.0	-19.1	PK	299	1.9	RB 1 MHz;VB 3 MHz;Peak
5133.810	33.7	V	54.0	-20.3	Avg	261	1.0	Note 3,RB 1 MHz;VB 3 kHz;Peak VA
5133.190	50.9	V	74.0	-23.1	PK	261	1.0	RB 1 MHz;VB 3 MHz;Peak
4999.940	45.3	V	54.0	-8.7	Avg	245	1.9	Note 3,RB 1 MHz;VB 3 kHz;Peak VA
4999.830	50.0	V	74.0	-24.0	PK	245	1.9	RB 1 MHz;VB 3 MHz;Peak
5988.180	62.0	H	68.3	-6.3	PK	174	1.4	RB 1 MHz;VB 3 MHz;Peak
1624.980	44.3	V	54.0	-9.7	Avg	155	2.0	Note 3,RB 1 MHz;VB 3 kHz;Peak VA
1625.020	47.3	V	74.0	-26.7	PK	155	2.0	RB 1 MHz;VB 3 MHz;Peak
1125.010	45.5	H	54.0	-8.5	Avg	129	1.0	Note 3,RB 1 MHz;VB 3 kHz;Peak VA
1124.980	47.8	H	74.0	-26.2	PK	129	1.0	RB 1 MHz;VB 3 MHz;Peak
9999.980	56.9	V	68.3	-11.4	PK	9	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). Per KDB 789033 2) c) (i), compliance can be demonstrated by meeting the average and peak limits of 15.209, as an alternative.

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #4: Radiated Spurious Emissions, 1,000 - 40000 MHz. Operating Mode: Worse case from Run #3

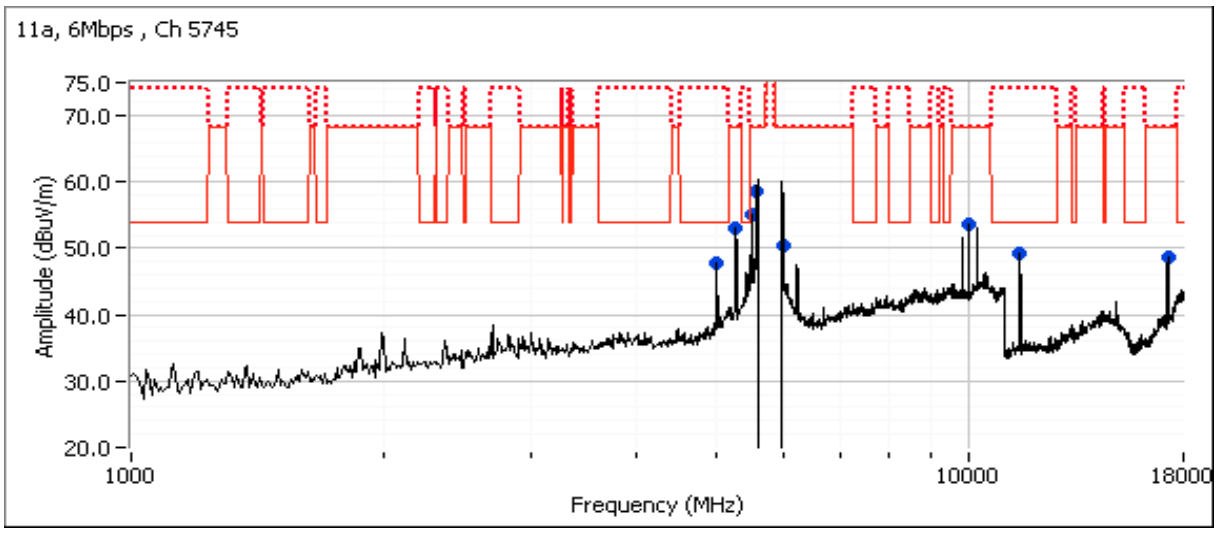
Date of Test: 1/8/2016 0:00 Config. Used: 1
Test Engineer: Rafael Varelas Config Change: None
Test Location: FT Chamber #7 EUT Voltage: 120V/60Hz

Run #4a: Low Channel

Channel: 149 Mode: a
Tx Chain: 3Tx Data Rate: 6 Mb/s

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11489.410	52.1	V	54.0	**-1.9**	AVG	335	2.5	RB 1 MHz;VB 10 Hz;Peak
11489.270	65.4	V	74.0	-8.6	PK	335	2.5	RB 1 MHz;VB 3 MHz;Peak
5587.280	65.4	H	68.3	-2.9	PK	350	1.2	POS; RB 1 MHz; VB: 3 MHz
5982.820	62.4	H	68.3	-5.9	PK	177	1.3	POS; RB 1 MHz; VB: 3 MHz
5508.030	62.6	H	68.3	-5.7	PK	5	1.0	POS; RB 1 MHz; VB: 3 MHz
4999.980	46.2	H	54.0	-7.8	AVG	272	1.4	RB 1 MHz;VB 10 Hz;Peak
5000.100	51.4	H	74.0	-22.6	PK	272	1.4	RB 1 MHz;VB 3 MHz;Peak
5266.600	60.1	H	68.3	-8.2	PK	248	1.7	RB 1 MHz;VB 3 MHz;Peak
9999.880	57.0	V	68.3	-11.3	PK	19	2.3	RB 1 MHz;VB 3 MHz;Peak
17236.810	62.4	H	68.3	-5.9	PK	314	1.4	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



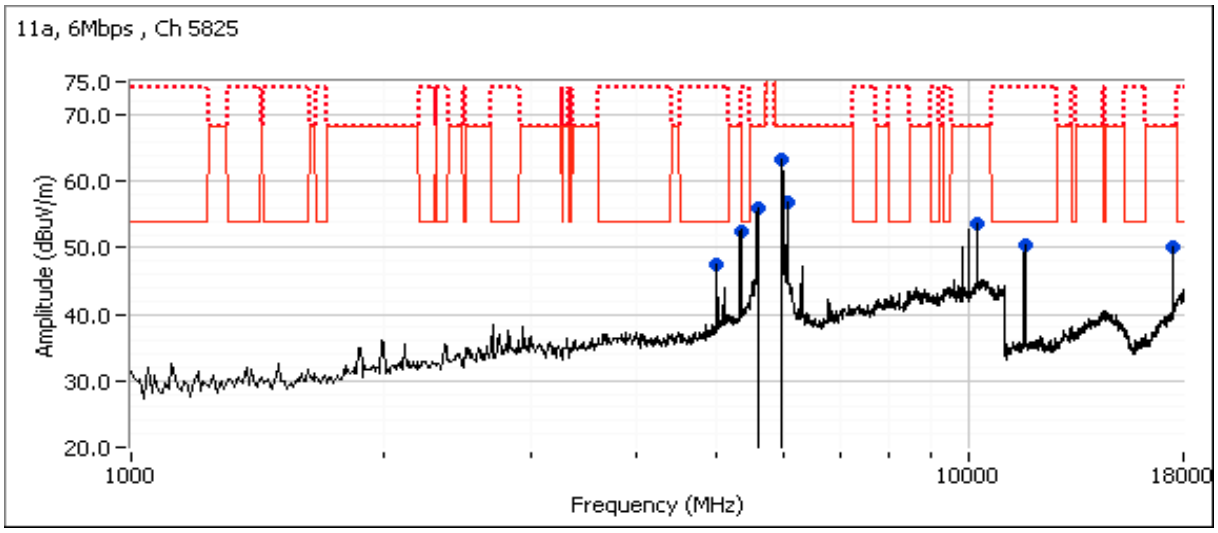
Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #4b: High Channel

Channel: 165 Mode: a
Tx Chain: 3Tx Data Rate: 6 Mb/s

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11650.070	53.8	V	54.0	-0.2	AVG	342	2.1	RB 1 MHz;VB 10 Hz;Peak
11649.300	65.9	V	74.0	-8.1	PK	342	2.1	RB 1 MHz;VB 3 MHz;Peak
10200.120	57.4	V	68.3	-10.9	PK	350	2.1	RB 1 MHz;VB 3 MHz;Peak
5992.190	63.7	H	68.3	-4.6	PK	258	1.3	POS; RB 1 MHz; VB: 3 MHz
5333.740	60.5	H	68.3	-7.8	PK	243	2.0	POS; RB 1 MHz; VB: 3 MHz
5586.750	61.8	H	68.3	-6.5	PK	339	1.0	POS; RB 1 MHz; VB: 3 MHz
6068.650	66.1	H	68.3	-2.2	PK	358	1.2	RB 1 MHz;VB 3 MHz;Peak
5000.010	46.8	H	54.0	-7.2	AVG	343	2.3	RB 1 MHz;VB 10 Hz;Peak
4999.940	52.2	H	74.0	-21.8	PK	343	2.3	RB 1 MHz;VB 3 MHz;Peak
17472.510	67.3	H	68.3	-1.0	PK	308	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



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 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: 21.4 °C
Rel. Humidity: 35 %

Summary of Results

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
Scans on "center" channel in all four OFDM modes to determine the worst case mode.							
1 UNII-1	n20	40 - 5200MHz	23.0	23.0	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	50.9 dBµV/m @ 20798.2 MHz (-3.1 dB)
	n40	38 - 5190MHz	23.0	23.0	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.1 dBµV/m @ 5432.8 MHz (-0.9 dB)
	ac80	42 - 5210MHz	20.5	20.5	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.7 dBµV/m @ 5049.5 MHz (-1.3 dB)
Measurements on low and high channels in worst-case OFDM mode.							
2	n20	36 - 5180MHz	23.0	23.0	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.7 dBµV/m @ 5027.7 MHz (-0.3 dB)
	n40	46 - 5230MHz	23.0	23	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.4 dBµV/m @ 15686.9 MHz (-1.6 dB)
Scans on "center" channel for all OFDM modes to determine the worst case mode.							
3 UNII-3	n20	157 - 5785MHz	23.0	23	Radiated Emissions 1 - 40 GHz	FCC 15.209 / 15 E	52.7 dBµV/m @ 11569.3 MHz (-1.3 dB)
	n40	151 - 5755MHz	23.0	23	Radiated Emissions 1 - 40 GHz	FCC 15.209 / 15 E	48.5 dBµV/m @ 11532.5 MHz (-5.5 dB)
	ac80	155 - 5775MHz	23.0	23	Radiated Emissions 1 - 40 GHz	FCC 15.209 / 15 E	63.9 dBµV/m @ 5578.5 MHz (-4.4 dB)
Measurements on low and high channels in worst-case OFDM mode.							
4 UNII-3	n20	149 - 5745MHz	23.0	23	Radiated Emissions 1 - 40 GHz	FCC 15.209 / 15 E	67.1 dBµV/m @ 5579.2 MHz (-1.2 dB)
	n20	165 - 5825MHz	23.0	23	Radiated Emissions 1 - 40 GHz	FCC 15.209 / 15 E	62.4 dBµV/m @ 17472.3 MHz (-5.9 dB)

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Procedure Comments:

Measurements performed in accordance with FCC KDB 789033
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)	
n20	VHT8	92.6%	No	1.935	0.34	0.67	517	1k
n40	VHT9	95.2%	No	0.952	0.21	0.43	1050	3k
ac80	VHT9	75.5%	Yes	2.023	1.2	2.4	494	1k

Sample Notes

Sample S/N: F56154520246
Driver: 7.14.89.21.571.206
Antenna: 3x3 Beamforming

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:	Emission has non constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW> 1/T, peak detector, linear average mode, sweep time auto, max hold. Max hold for 50*(1/DC) traces

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

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

Date of Test: 2/2/2016 0:00 Config. Used: 1
Test Engineer: Rafael Varelas Config Change: None
Test Location: FT Chamber #7 EUT Voltage: 120V/60Hz

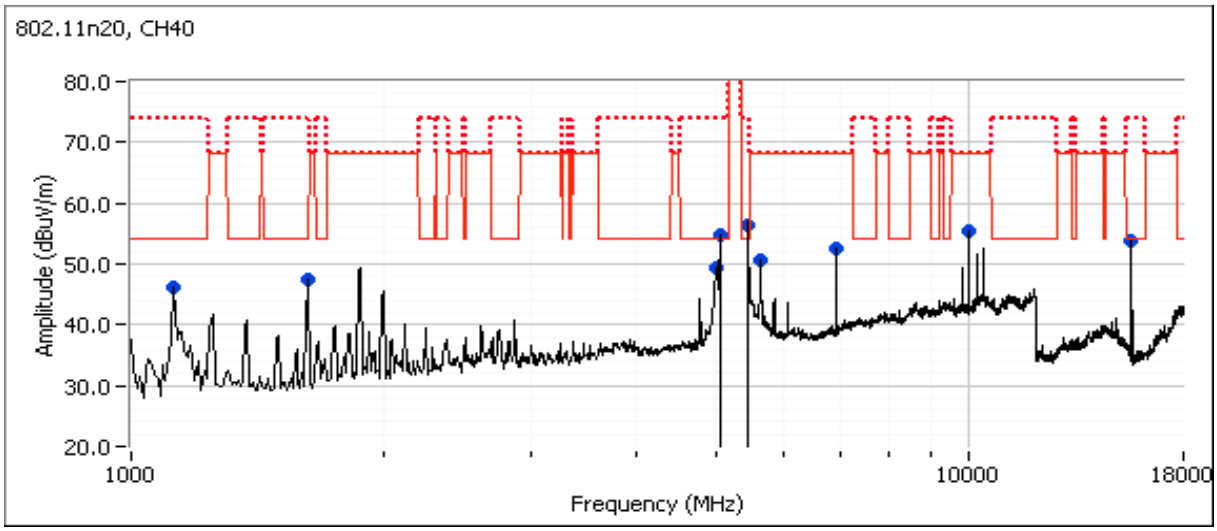
Run #1b: Center Channel

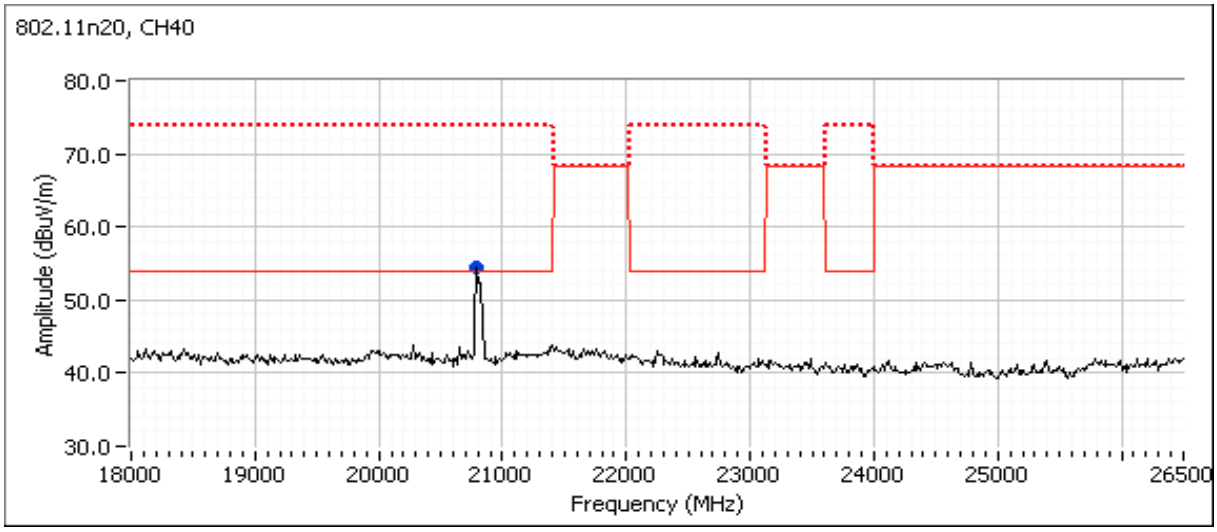
Channel: 40 Mode: 11n20
Tx Chain: 3x3 Data Rate: VHT8

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
20798.240	50.9	V	54.0	-3.1	Avg	36	1.9	Note 5,RB 1 MHz;VB 1 kHz;Peak
20796.070	65.5	V	74.0	-8.5	PK	36	1.9	RB 1 MHz;VB 3 MHz;Peak
5632.120	60.7	H	68.3	-7.6	PK	260	1.7	RB 1 MHz;VB 3 MHz;Peak
1125.070	43.9	V	54.0	-10.1	Avg	252	1.9	Note 5,RB 1 MHz;VB 1 kHz;Peak
1125.180	47.3	V	74.0	-26.7	PK	252	1.9	RB 1 MHz;VB 3 MHz;Peak
1624.990	47.1	V	54.0	-6.9	Avg	212	2.0	Note 5,RB 1 MHz;VB 1 kHz;Peak
1625.180	49.2	V	74.0	-24.8	PK	211	2.0	RB 1 MHz;VB 3 MHz;Peak
6933.310	55.6	V	68.3	-12.7	PK	183	1.1	RB 1 MHz;VB 3 MHz;Peak
9999.880	58.7	V	68.3	-9.6	PK	18	2.1	RB 1 MHz;VB 3 MHz;Peak
5045.110	49.4	H	54.0	-4.6	Avg	175	1.5	Note 5,POS; RB 1 MHz; VB: 1 kHz
5045.270	65.6	H	74.0	-8.4	PK	175	1.5	POS; RB 1 MHz; VB: 3 MHz
4983.380	46.2	H	54.0	-7.8	Avg	190	2.1	Note 5,POS; RB 1 MHz; VB: 1 kHz
4983.440	56.9	H	74.0	-17.1	PK	190	2.1	POS; RB 1 MHz; VB: 3 MHz
5442.020	48.9	H	54.0	-5.1	Avg	338	1.1	Note 5,POS; RB 1 MHz; VB: 1 kHz
5441.310	60.2	H	74.0	-13.8	PK	338	1.1	POS; RB 1 MHz; VB: 3 MHz
15600.510	46.5	V	54.0	-7.5	Avg	326	1.8	Note 5,RB 1 MHz;VB 1 kHz;Peak
15592.910	60.8	V	74.0	-13.2	PK	326	1.8	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 26.5 - 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).

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A





Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

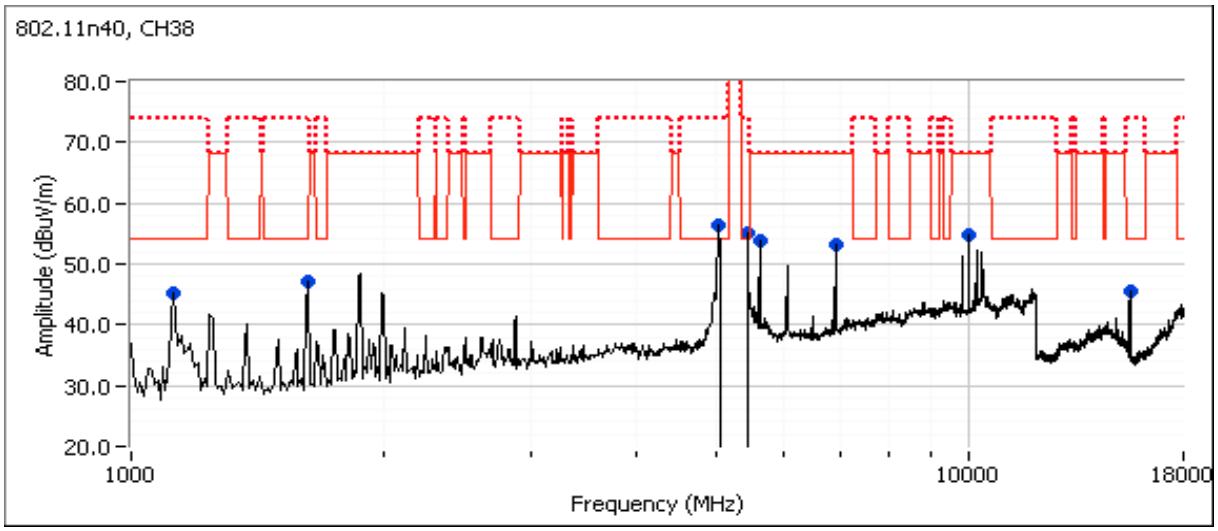
Run #1c: Center Channel

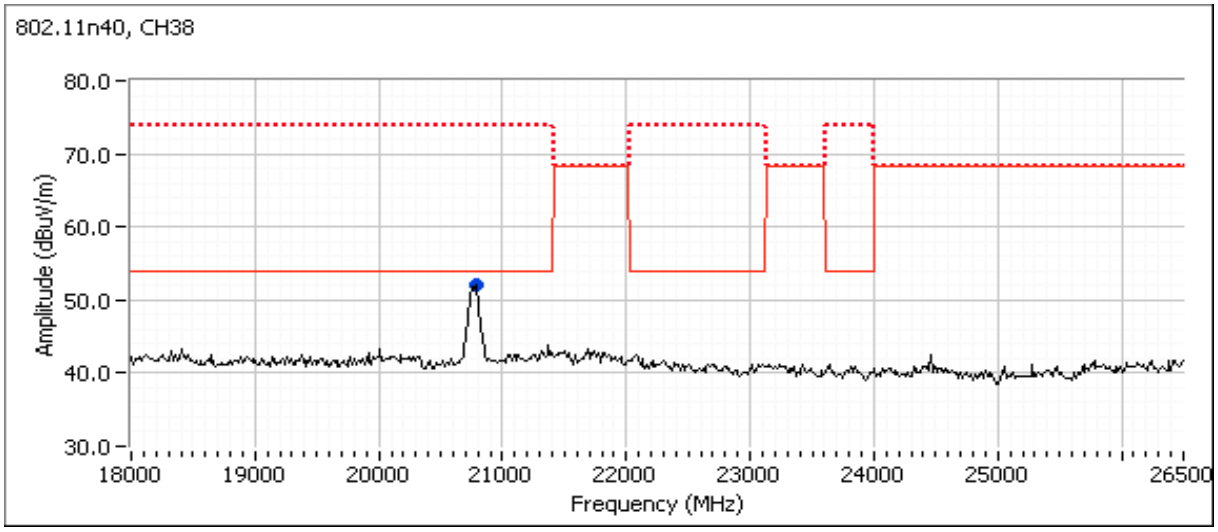
Channel: 38 Mode: 11n40
Tx Chain: 3x3 Data Rate: VHT9

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5432.800	53.1	H	54.0	-0.9	Avg	183	1.5	Note 5,RB 1 MHz;VB 3 kHz;Peak
5433.650	63.3	H	74.0	-10.7	PK	183	1.5	POS; RB 1 MHz; VB: 3 MHz
5622.430	57.0	H	68.3	-11.3	PK	356	2.1	RB 1 MHz;VB 3 MHz;Peak
1125.040	46.0	V	54.0	-8.0	Avg	231	2.0	Note 5,RB 1 MHz;VB 3 kHz;Peak
1125.060	47.9	V	74.0	-26.1	PK	231	2.0	RB 1 MHz;VB 3 MHz;Peak
1625.070	46.7	V	54.0	-7.3	Avg	214	1.9	Note 5,RB 1 MHz;VB 3 kHz;Peak
1625.010	48.5	V	74.0	-25.5	PK	214	1.9	RB 1 MHz;VB 3 MHz;Peak
6920.010	56.9	H	68.3	-11.4	PK	170	1.5	RB 1 MHz;VB 3 MHz;Peak
9999.950	56.7	V	68.3	-11.6	PK	22	1.0	RB 1 MHz;VB 3 MHz;Peak
5025.170	49.7	H	54.0	-4.3	Avg	206	1.3	Note 5,RB 1 MHz;VB 3 kHz;Peak
5026.210	60.2	H	74.0	-13.8	PK	206	1.3	POS; RB 1 MHz; VB: 3 MHz
20754.830	50.8	V	54.0	-3.2	Avg	326	1.1	Note 5,RB 1 MHz;VB 3 kHz;Peak
20760.700	62.7	V	74.0	-11.3	PK	326	1.1	RB 1 MHz;VB 3 MHz;Peak
15568.110	45.6	H	54.0	-8.4	Avg	18	1.8	Note 5,RB 1 MHz;VB 3 kHz;Peak
15580.780	56.3	H	74.0	-17.7	PK	18	1.8	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 26.5 - 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).

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A





Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

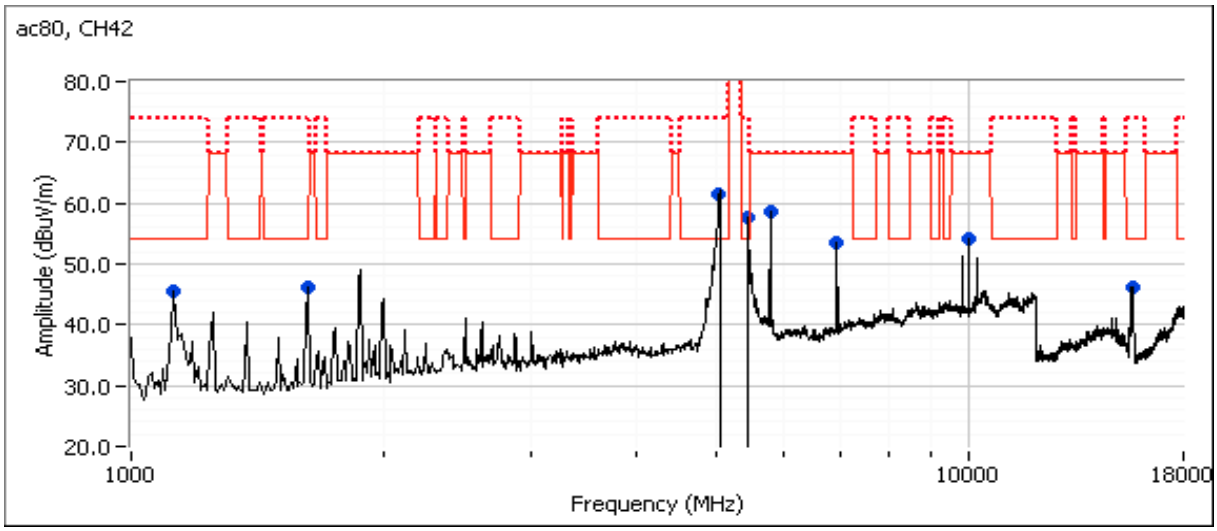
Run #1d: Center Channel

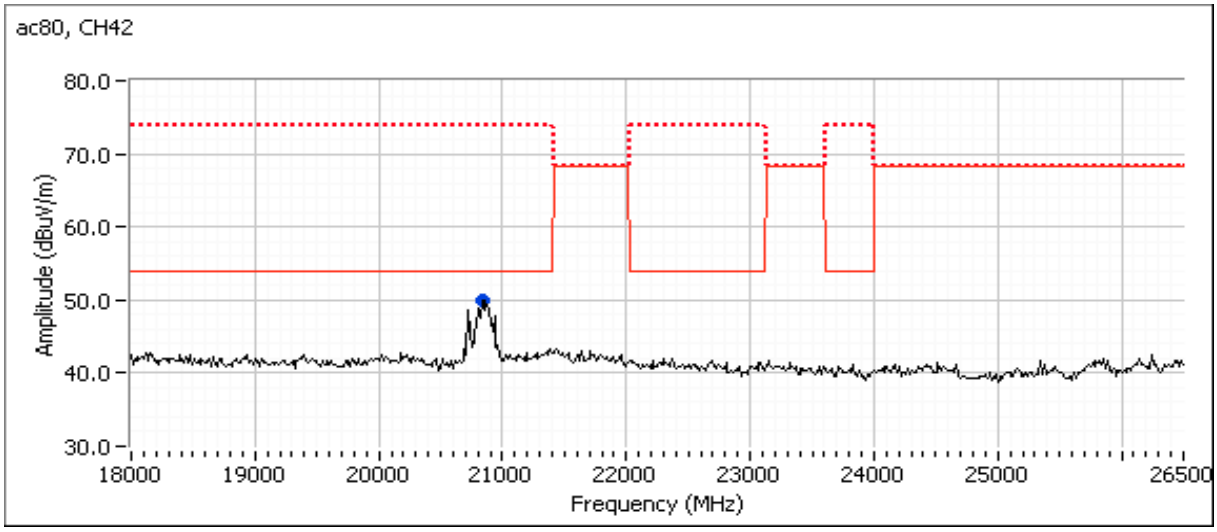
Channel: 42 Mode: ac80
Tx Chain: 3x3 Data Rate: VHT9

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5049.480	52.7	H	54.0	-1.3	Avg	298	1.2	Note 3,POS Vavg:100; RB 1 MHz; VB
5049.320	66.5	H	74.0	-7.5	PK	298	1.2	POS; RB 1 MHz; VB: 3 MHz
9999.860	57.7	V	68.3	-10.6	PK	22	2.1	RB 1 MHz;VB 3 MHz;Peak
1125.110	45.8	V	54.0	-8.2	Avg	22	2.5	Note 3,POS Vavg:100; RB 1 MHz; VB
1124.940	47.3	V	74.0	-26.7	PK	22	2.5	RB 1 MHz;VB 3 MHz;Peak
5789.000	60.1	V	68.3	-8.2	PK	108	1.2	RB 1 MHz;VB 3 MHz;Peak
6946.710	55.4	H	68.3	-12.9	PK	158	1.6	RB 1 MHz;VB 3 MHz;Peak
1625.060	47.9	V	54.0	-6.1	Avg	211	2.0	Note 3,POS Vavg:100; RB 1 MHz; VB
1625.020	48.4	V	74.0	-25.6	PK	211	2.0	RB 1 MHz;VB 3 MHz;Peak
5432.300	49.4	H	54.0	-4.6	Avg	194	1.1	Note 3,POS Vavg:100; RB 1 MHz; VB
5430.690	64.8	H	74.0	-9.2	PK	194	1.1	POS; RB 1 MHz; VB: 3 MHz
20853.220	49.0	V	54.0	-5.0	Avg	31	1.9	Note 3,RB 1 MHz;VB 1 kHz;Peak VA
20838.350	60.4	V	74.0	-13.6	PK	31	1.9	RB 1 MHz;VB 3 MHz;Peak
15656.160	48.6	V	54.0	-5.4	Avg	311	1.8	Note 3,RB 1 MHz;VB 1 kHz;Peak VA
15668.960	59.5	V	74.0	-14.5	PK	311	1.8	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 26.5 - 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).

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A





Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

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

Date of Test: 2/2 & 2/5/16 Config. Used: 1
Test Engineer: Rafael Varelas Config Change: None
Test Location: FT Chamber #7 EUT Voltage: 120V/60Hz

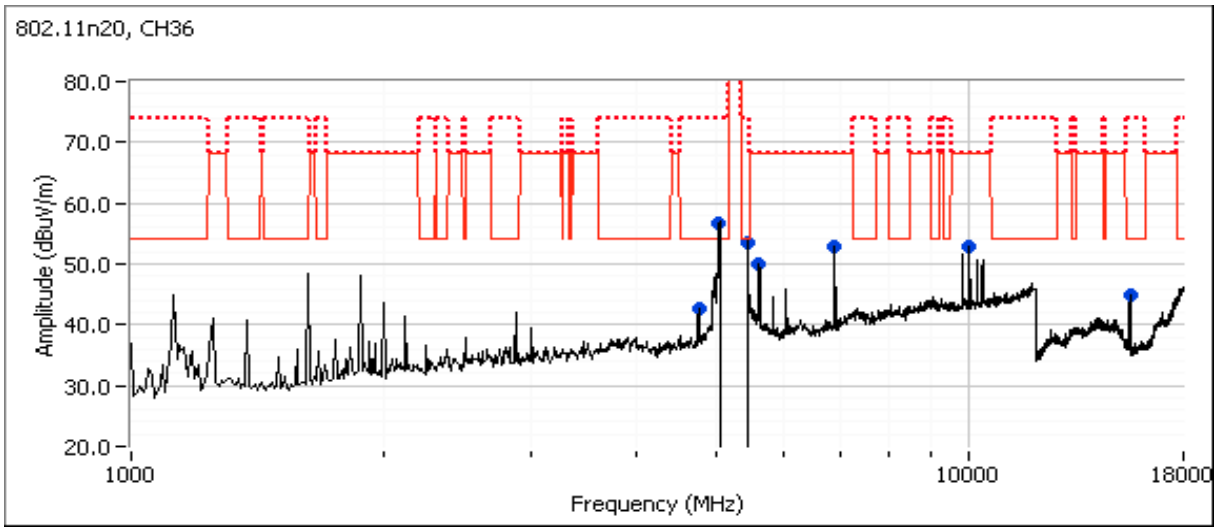
Run #2a: Low Channel

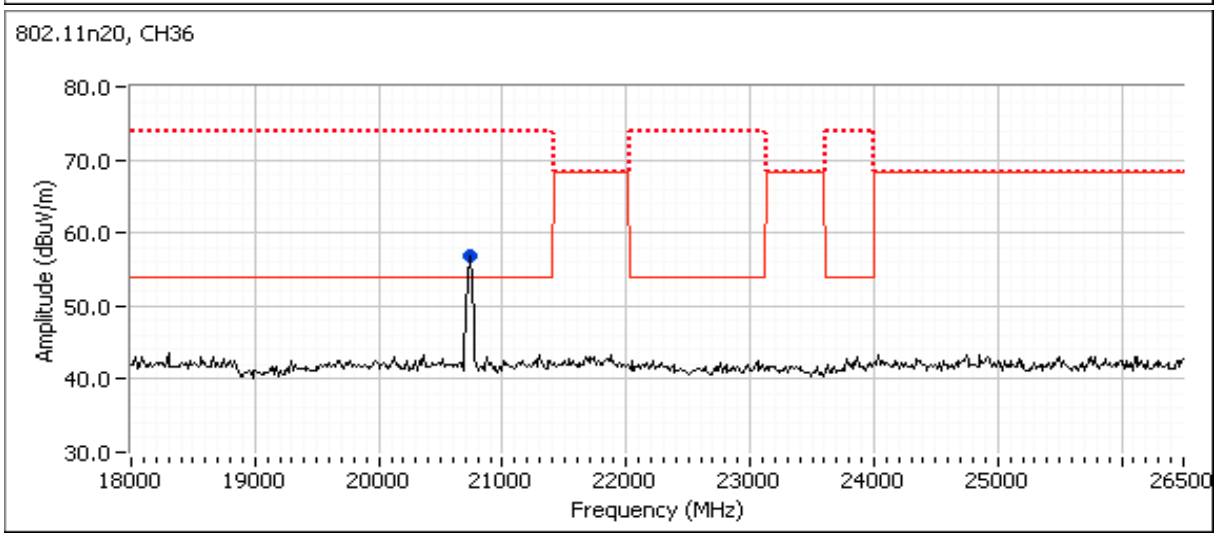
Channel: 36 Mode: 11n20
Tx Chain: 3x3 Data Rate: VHT8

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5027.730	53.7	H	54.0	-0.3	Avg	0	2.1	Note 5,RB 1 MHz;VB 1 kHz;Peak
5024.890	64.6	H	74.0	-9.4	PK	0	2.1	POS; RB 1 MHz; VB: 3 MHz
9999.770	56.2	V	68.3	-12.1	PK	24	2.2	RB 1 MHz;VB 3 MHz;Peak
6906.800	56.0	H	68.3	-12.3	PK	176	1.5	RB 1 MHz;VB 3 MHz;Peak
5614.230	57.1	H	68.3	-11.2	PK	269	1.7	RB 1 MHz;VB 3 MHz;Peak
4747.280	40.6	H	54.0	-13.4	Avg	317	1.4	Note 5,RB 1 MHz;VB 1 kHz;Peak
4746.810	51.6	H	74.0	-22.4	PK	317	1.4	RB 1 MHz;VB 3 MHz;Peak
5428.510	49.8	H	54.0	-4.2	Avg	360	1.0	Note 5,RB 1 MHz;VB 1 kHz;Peak
5427.320	60.5	H	74.0	-13.5	PK	360	1.0	POS; RB 1 MHz; VB: 3 MHz
15540.350	46.4	V	54.0	-7.6	Avg	321	1.7	Note 5,RB 1 MHz;VB 1 kHz;Peak
15538.820	63.5	V	74.0	-10.5	PK	321	1.7	RB 1 MHz;VB 3 MHz;Peak
20726.710	51.3	V	54.0	-2.7	Avg	329	1.9	Note 5,RB 1 MHz;VB 1 kHz;Peak
20726.220	64.7	V	74.0	-9.3	PK	329	1.9	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 26.5 - 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

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A





Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

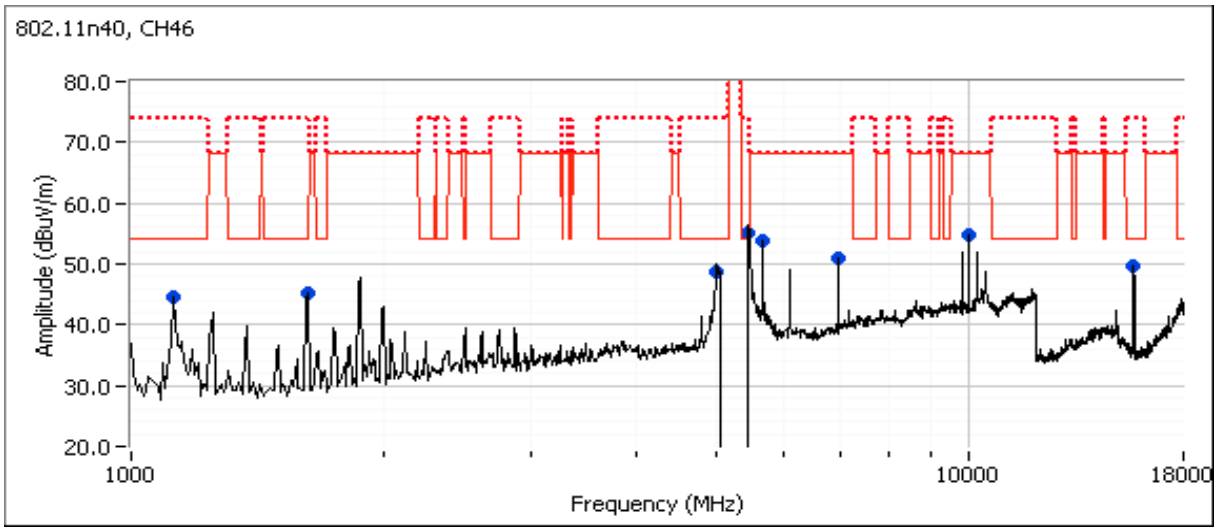
Run #2b: High Channel

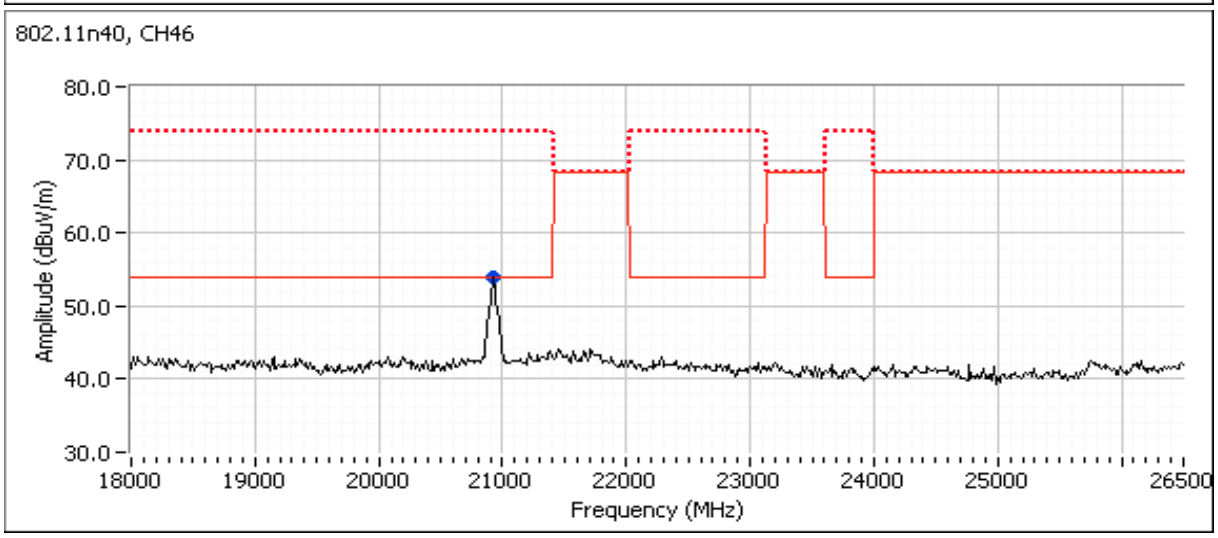
Channel: 46 Mode: 11n40
Tx Chain: 3x3 Data Rate: VHT9

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
15686.930	52.4	V	54.0	-1.6	Avg	310	1.8	Note 5,RB 1 MHz;VB 3 kHz;Peak
15698.510	65.6	V	74.0	-8.4	PK	310	1.8	RB 1 MHz;VB 3 MHz;Peak
1125.110	45.3	V	54.0	-8.7	Avg	228	2.0	Note 5,RB 1 MHz;VB 3 kHz;Peak
1125.040	47.5	V	74.0	-26.5	PK	228	2.0	RB 1 MHz;VB 3 MHz;Peak
1625.050	45.3	V	54.0	-8.7	Avg	220	1.6	Note 5,RB 1 MHz;VB 3 kHz;Peak
1624.930	47.5	V	74.0	-26.5	PK	220	1.6	RB 1 MHz;VB 3 MHz;Peak
5665.770	57.6	V	68.3	-10.7	PK	114	1.0	RB 1 MHz;VB 3 MHz;Peak
9999.930	58.7	V	68.3	-9.6	PK	19	2.2	RB 1 MHz;VB 3 MHz;Peak
6973.400	55.6	H	68.3	-12.7	PK	17	1.0	RB 1 MHz;VB 3 MHz;Peak
4999.880	44.1	H	54.0	-9.9	Avg	184	1.7	Note 5,RB 1 MHz;VB 3 kHz;Peak
5000.700	54.7	H	74.0	-19.3	PK	184	1.7	POS; RB 1 MHz; VB: 3 MHz
5423.650	44.9	H	54.0	-9.1	Avg	178	1.5	Note 5,RB 1 MHz;VB 3 kHz;Peak
5424.890	56.7	H	74.0	-17.3	PK	178	1.5	POS; RB 1 MHz; VB: 3 MHz
20926.810	50.0	V	54.0	-4.0	Avg	22	1.9	Note 5,RB 1 MHz;VB 3 kHz;Peak
20942.920	64.0	V	74.0	-10.0	PK	22	1.9	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 26.5 - 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

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A





Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #3, Radiated Spurious Emissions, 1,000 - 40,000 MHz. Operation in the 5725-5850 MHz Band

Date of Test: 2/3/2016 0:00 Config. Used: 1
Test Engineer: Rafael Varelas Config Change: None
Test Location: FT Chamber #7 EUT Voltage: 120V/60Hz

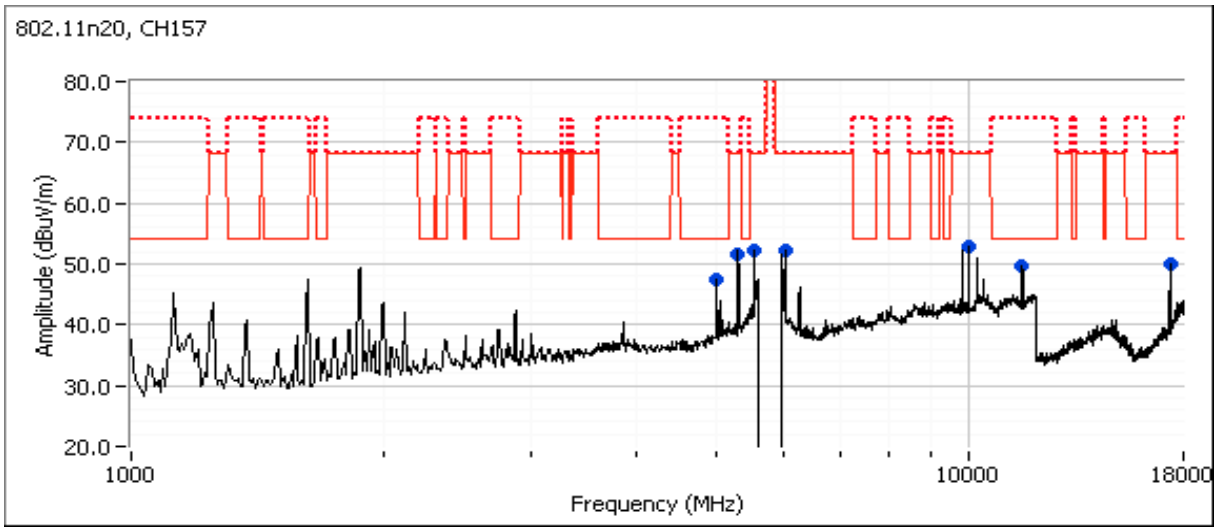
Run #3a: Center Channel

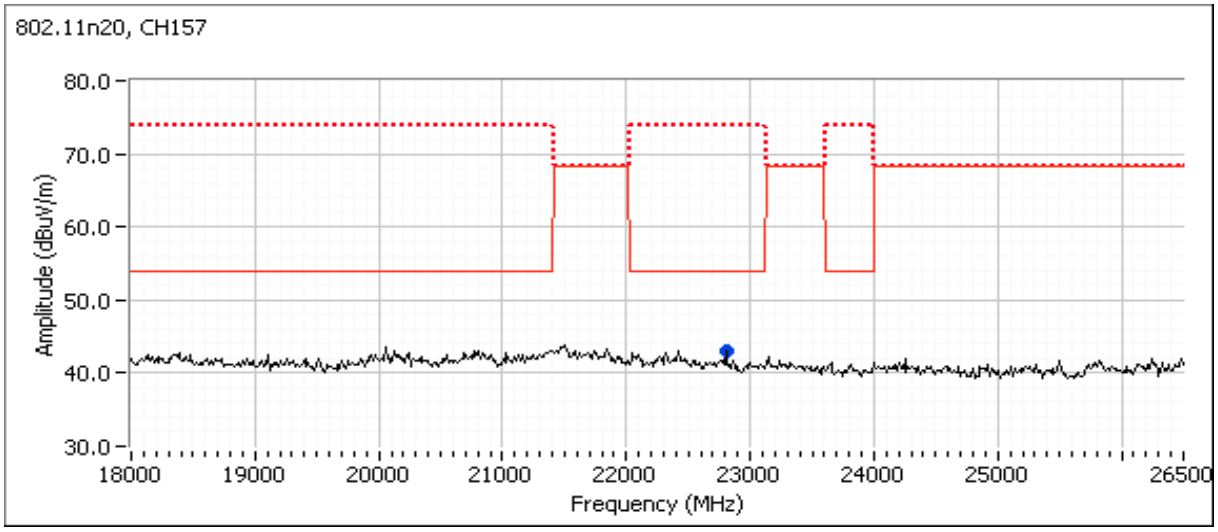
Channel: 157 Mode: 11n20
Tx Chain: 3x3 Data Rate: VHT8

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11569.300	52.7	V	54.0	-1.3	Avg	334	1.0	Note 5,RB 1 MHz;VB 1 kHz;Peak
11564.080	63.3	V	74.0	-10.7	PK	334	1.0	RB 1 MHz;VB 3 MHz;Peak
9999.990	57.7	V	68.3	-10.6	PK	7	2.1	RB 1 MHz;VB 3 MHz;Peak
4999.980	45.2	H	54.0	-8.8	Avg	328	2.2	Note 5,RB 1 MHz;VB 1 kHz;Peak
5000.020	50.7	H	74.0	-23.3	PK	328	2.2	RB 1 MHz;VB 3 MHz;Peak
5543.530	61.0	H	68.3	-7.3	PK	344	1.0	POS; RB 1 MHz; VB: 3 MHz
5296.410	59.0	H	68.3	-9.3	PK	190	1.3	POS; RB 1 MHz; VB: 3 MHz
22802.500	43.1	V	54.0	-10.9	Peak	106	1.0	
17353.130	60.9	H	68.3	-7.4	PK	246	1.0	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 26.5 - 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).

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A





Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

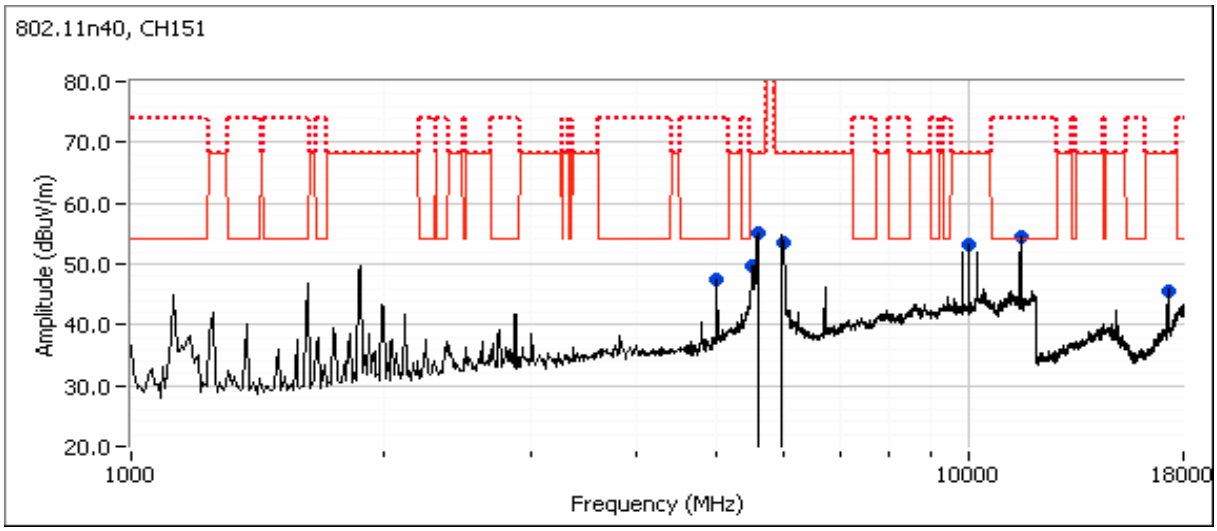
Run #3b: Center Channel

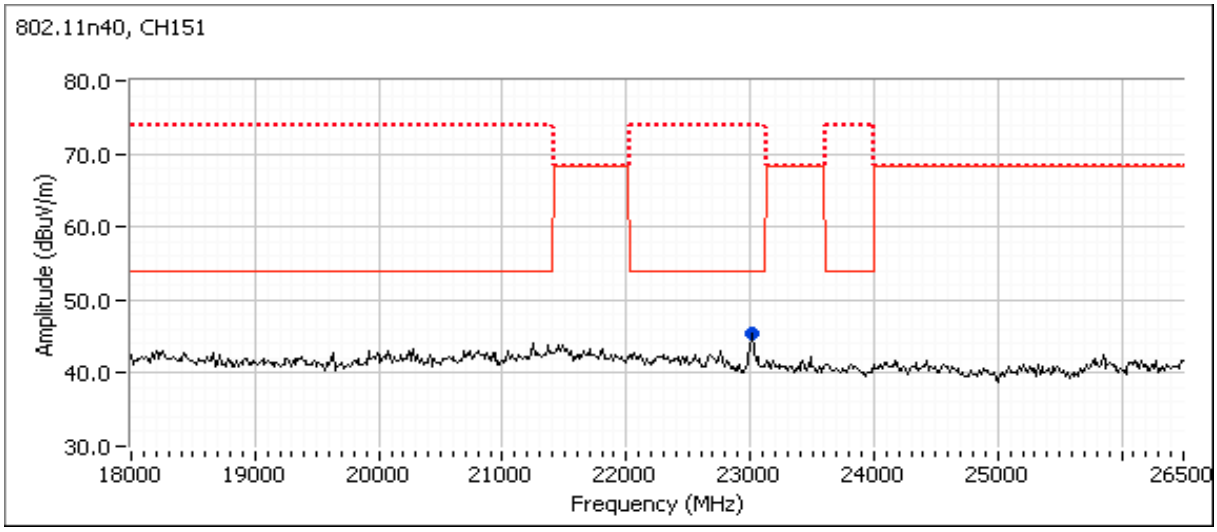
Channel: 151 Mode: 11n40
Tx Chain: 3x3 Data Rate: VHT9

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11532.530	48.5	V	54.0	-5.5	Avg	330	1.0	Note 5,RB 1 MHz;VB 3 kHz;Peak
11531.270	62.4	V	74.0	-11.6	PK	330	1.0	RB 1 MHz;VB 3 MHz;Peak
5000.050	46.6	V	54.0	-7.4	Avg	256	1.8	Note 5,RB 1 MHz;VB 3 kHz;Peak
5000.000	50.7	V	74.0	-23.3	PK	256	1.8	RB 1 MHz;VB 3 MHz;Peak
9999.790	57.0	V	68.3	-11.3	PK	8	2.2	RB 1 MHz;VB 3 MHz;Peak
5529.440	58.3	H	68.3	-10.0	PK	360	1.0	POS; RB 1 MHz; VB: 3 MHz
5601.110	60.6	H	68.3	-7.7	PK	350	1.0	POS; RB 1 MHz; VB: 3 MHz
5985.690	57.8	H	68.3	-10.5	PK	198	1.1	POS; RB 1 MHz; VB: 3 MHz
23007.860	40.5	V	54.0	-13.5	Avg	32	1.8	Note 5,RB 1 MHz;VB 3 kHz;Peak
23020.670	53.7	V	74.0	-20.3	PK	32	1.8	RB 1 MHz;VB 3 MHz;Peak
17263.870	59.4	H	68.3	-8.9	PK	218	1.6	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 26.5 - 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).

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A





Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

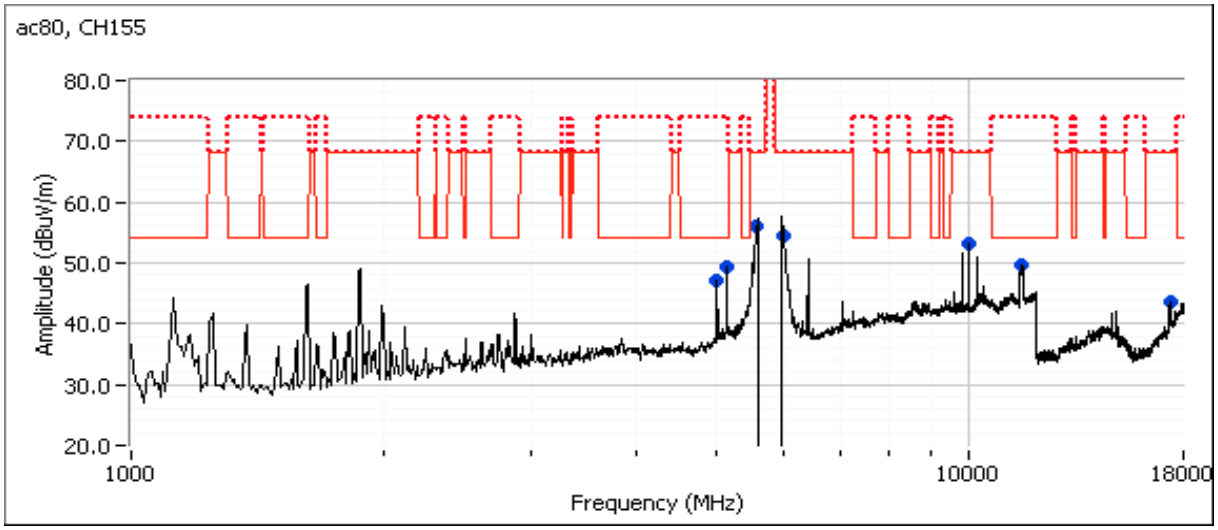
Run #3c: Center Channel

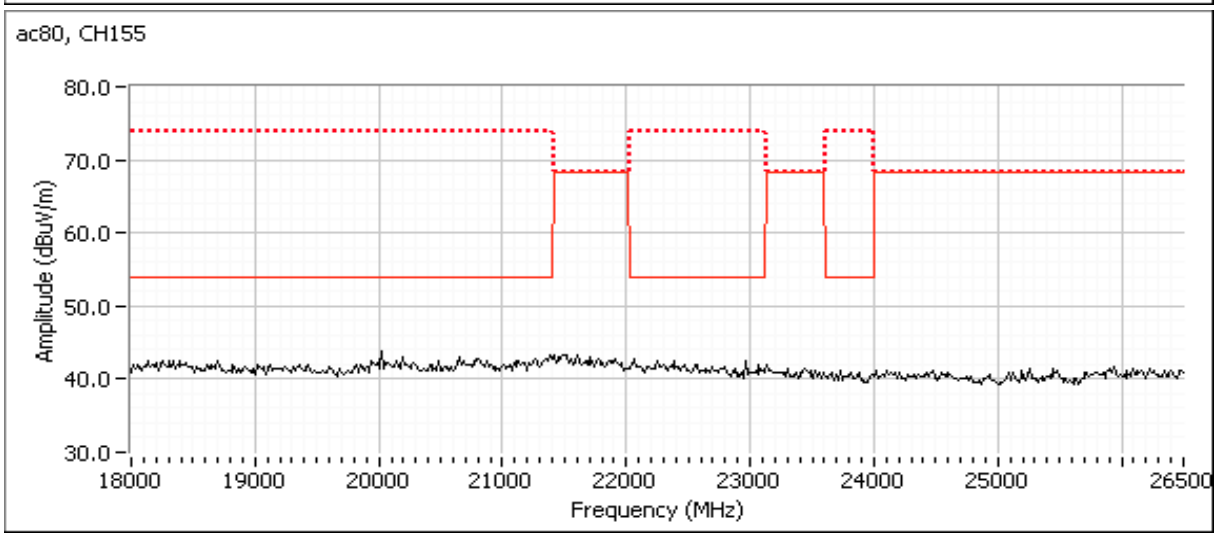
Channel: 155 Mode: ac80
Tx Chain: 3x3 Data Rate: VHT9

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5578.450	63.9	H	68.3	-4.4	PK	354	1.0	POS; RB 1 MHz; VB: 3 MHz
10000.050	57.4	V	68.3	-10.9	PK	6	2.1	RB 1 MHz;VB 3 MHz;Peak
5133.350	48.8	H	54.0	-5.2	Avg	206	1.2	Note3,RB 1 MHz;VB 1 kHz;Peak VA
5133.250	51.7	H	74.0	-22.3	PK	206	1.2	RB 1 MHz;VB 3 MHz;Peak
5000.010	48.7	V	54.0	-5.3	Avg	253	1.7	Note3,RB 1 MHz;VB 1 kHz;Peak VA
5000.230	51.1	V	74.0	-22.9	PK	253	1.7	RB 1 MHz;VB 3 MHz;Peak
11546.320	42.2	V	54.0	-11.8	Avg	332	2.3	Note3,RB 1 MHz;VB 1 kHz;Peak VA
11545.760	52.6	V	74.0	-21.4	PK	332	2.3	RB 1 MHz;VB 3 MHz;Peak
5989.190	60.9	H	68.3	-7.4	PK	340	1.0	POS; RB 1 MHz; VB: 3 MHz
17371.460	59.3	H	68.3	-9.0	PK	358	1.9	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 26.5 - 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).

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A





Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #4: Radiated Spurious Emissions, 1,000 - 40000 MHz. Operating Mode: Worse case from Run #3

Date of Test: 2/3/2016 0:00 Config. Used: 1
Test Engineer: Rafael Varelas Config Change: None
Test Location: FT Chamber #7 EUT Voltage: 120V/60Hz

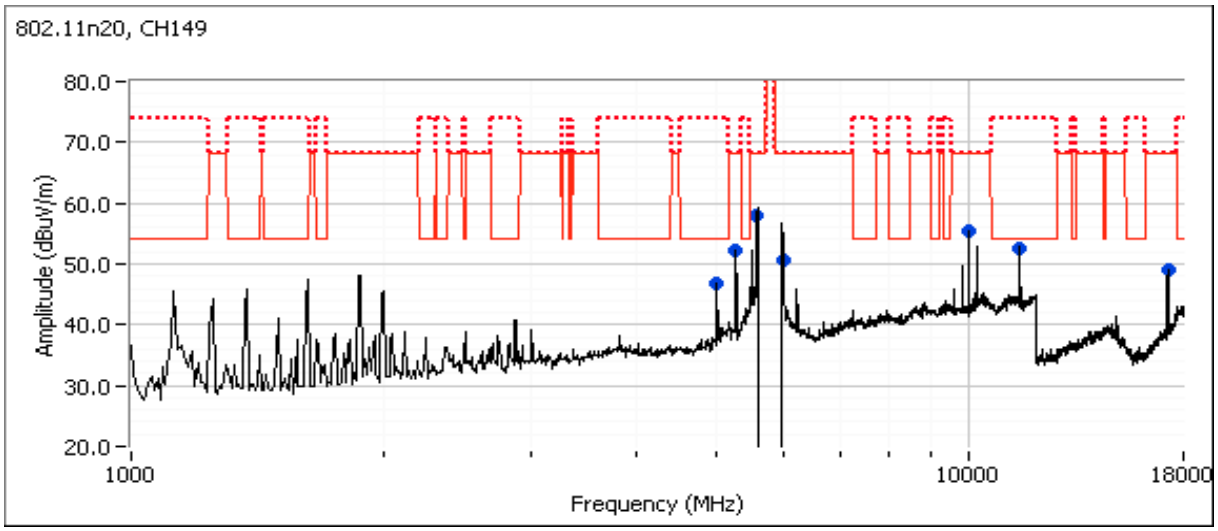
Run #4a: Low Channel

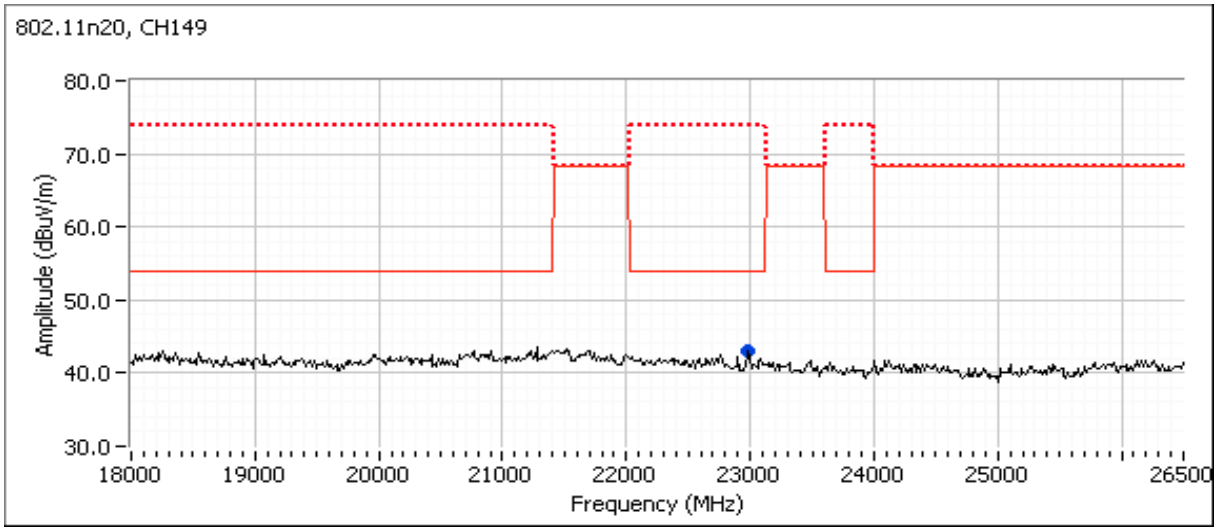
Channel: 149 Mode: 11n20
Tx Chain: 3x3 Data Rate: VHT8

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5579.170	67.1	H	68.3	-1.2	PK	353	1.0	RB 1 MHz;VB 3 MHz;Peak
17242.200	66.5	V	68.3	-1.8	PK	300	1.7	RB 1 MHz;VB 3 MHz;Peak
11489.430	51.2	V	54.0	-2.8	Avg	331	1.0	Note 5,RB 1 MHz;VB 1 kHz;Peak
11484.230	64.2	V	74.0	-9.8	PK	331	1.0	RB 1 MHz;VB 3 MHz;Peak
5000.020	46.3	V	54.0	-7.7	Avg	253	1.6	Note 5,RB 1 MHz;VB 1 kHz;Peak
5000.150	51.0	V	74.0	-23.0	PK	253	1.6	RB 1 MHz;VB 3 MHz;Peak
5258.900	59.4	H	68.3	-8.9	PK	199	1.4	RB 1 MHz;VB 3 MHz;Peak
9999.900	59.1	V	68.3	-9.2	PK	0	2.2	RB 1 MHz;VB 3 MHz;Peak
22986.670	42.9	V	54.0	-11.1	PK	12	1.9	
5984.490	62.3	H	68.3	-6.0	PK	201	2.2	RB 1 MHz;VB 3 MHz;Peak

Note: Scans made between 26.5 - 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

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A





Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

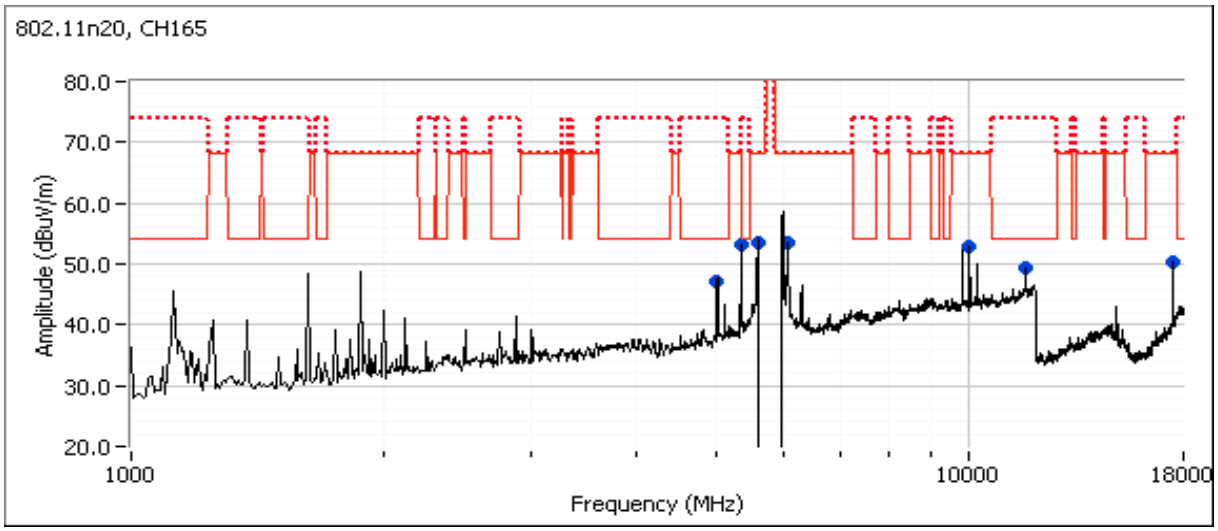
Run #4b: High Channel

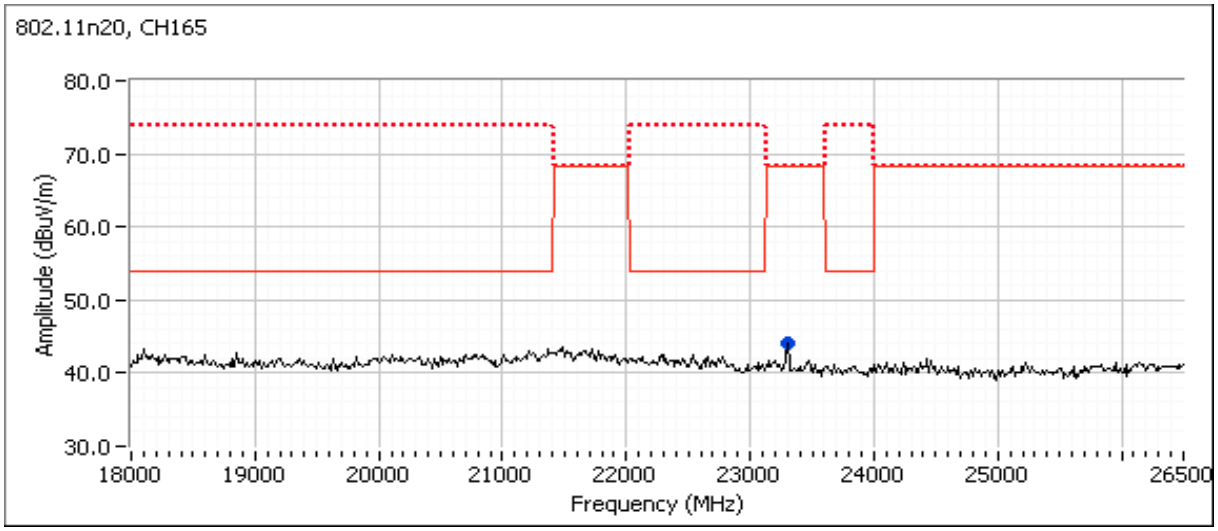
Channel: 165 Mode: 11n20
Tx Chain: 3x3 Data Rate: VHT8

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
17472.330	62.4	H	68.3	-5.9	PK	296	1.2	RB 1 MHz;VB 3 MHz;Peak
11657.990	46.8	V	54.0	-7.2	Avg	327	1.1	Note 5,RB 1 MHz;VB 1 kHz;Peak
11656.420	57.7	V	74.0	-16.3	PK	327	1.1	RB 1 MHz;VB 3 MHz;Peak
4999.910	46.1	H	54.0	-7.9	Avg	297	1.2	Note 5,RB 1 MHz;VB 1 kHz;Peak
4999.790	51.1	H	74.0	-22.9	PK	297	1.2	RB 1 MHz;VB 3 MHz;Peak
5341.880	57.3	H	68.3	-11.0	PK	192	1.2	RB 1 MHz;VB 3 MHz;Peak
5604.520	56.0	H	68.3	-12.3	PK	185	1.2	RB 1 MHz;VB 3 MHz;Peak
6066.070	61.6	H	68.3	-6.7	PK	188	1.0	RB 1 MHz;VB 3 MHz;Peak
9999.730	56.9	V	68.3	-11.4	PK	24	2.2	RB 1 MHz;VB 3 MHz;Peak
23298.330	44.2	V	68.3	-24.1	PK	8	1.9	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 26.5 - 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

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A





Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 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: 15-17 °C
Rel. Humidity: 35-40 %

Summary of Results

Run #	Mode	Channel	Target Power	Power Setting	Test Performed	Limit	Result / Margin
1	a	36 - 5180MHz	23.0	23.0	Radiated Emissions, 30 - 1,000 MHz	FCC Part 15.209 / 15.247(c)	35.4 dBµV/m @ 874.99 MHz (-10.6 dB)
2	n20	149 - 5745MHz	23.0	23.0	Radiated Emissions, 30 - 1,000 MHz	FCC Part 15.209 / 15.247(c)	33.7 dBµV/m @ 30.27 MHz (-6.3 dB)

If no difference between modes and channels, then no additional modes or channels need be tested.

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: F56154520246
Driver: 7.14.89.21.571.206

Procedure Comments:

Measurements performed in accordance with KDB 789033

Measurement Specific Notes:

Note 1:	Emission in non-restricted band, but limit of 15.209 used.
Note 2:	Emission in non-restricted band, the limit was set 30dB below the level of the fundamental and measured in 100kHz.

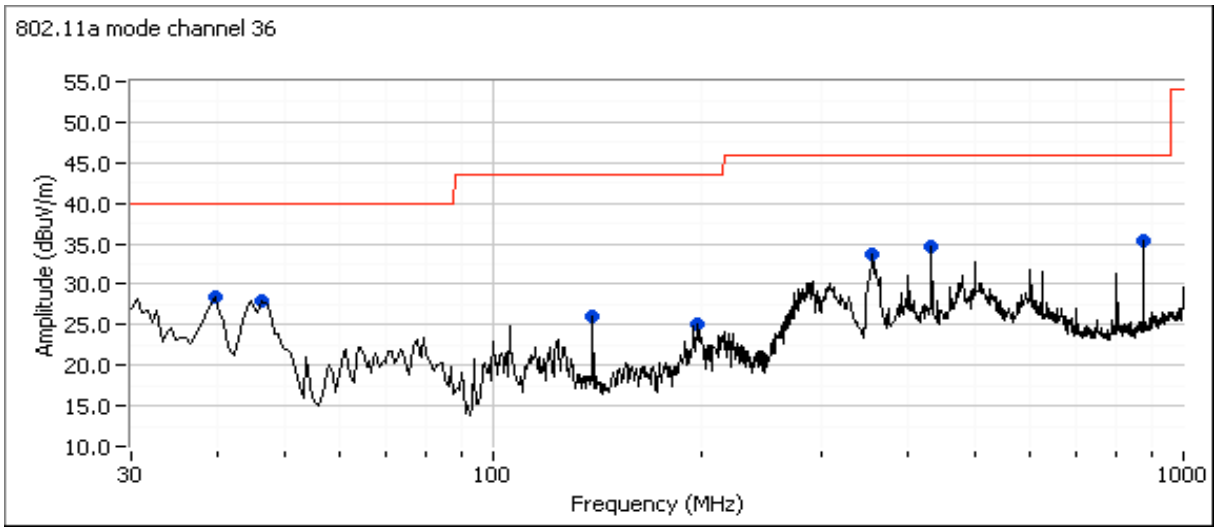
Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #1: Radiated Spurious Emissions, 30 - 1,000 MHz

Date of Test: 01/11/16 Config. Used: 1
Test Engineer: Mehran Birgani Config Change: -
Test Location: Chamber #7 EUT Voltage: 120V/60Hz

Channel: 36 Mode: a Setting: 23.0
Tx Chain: 3Tx Data Rate: VHT 8

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
874.990	**35.4**	H	46.0	**-10.6**	QP	81	1.0	QP (1.00s)
432.007	34.5	H	46.0	-11.5	QP	308	2.5	QP (1.00s)
46.683	27.2	V	40.0	-12.8	QP	7	1.0	QP (1.00s)
40.450	22.9	V	40.0	-17.1	QP	287	1.5	QP (1.00s)
356.653	28.4	H	46.0	-17.6	QP	247	1.5	QP (1.00s)
196.878	23.2	H	43.5	-20.3	QP	254	1.5	QP (1.00s)
138.707	13.7	H	43.5	-29.8	QP	22	1.0	QP (1.00s)



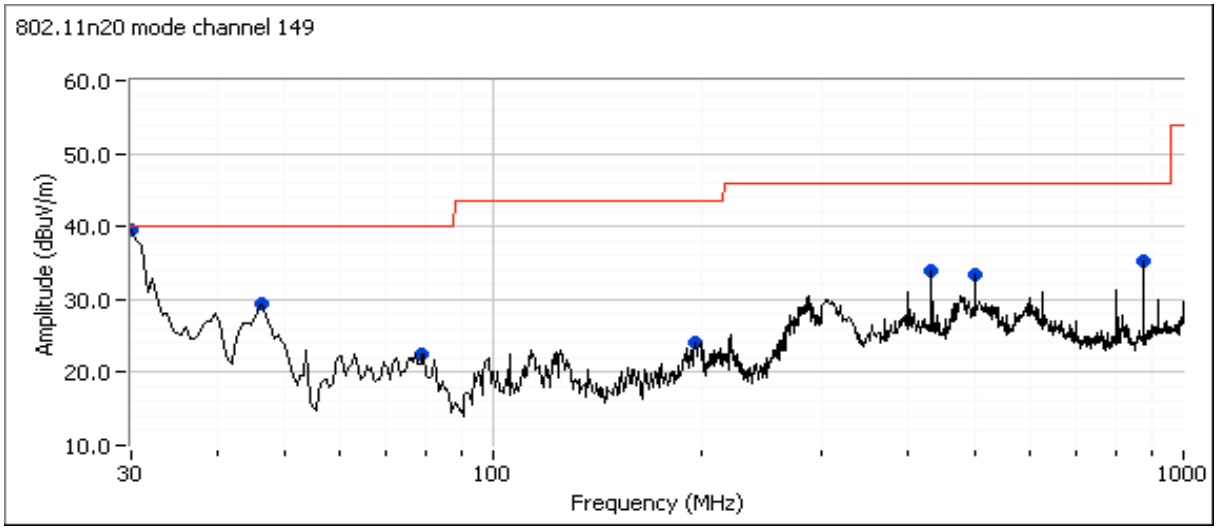
Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run 2: Radiated Spurious Emissions, 30 - 1,000 MHz

Date of Test: 01/11/16 Config. Used: 1
Test Engineer: Mehran Birgani Config Change: -
Test Location: Chamber #7 EUT Voltage: 120V/60Hz

Channel: 149 Mode: n20 Setting: 23.0
Tx Chain: 3Tx Data Rate: VHT 9

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
30.269	**33.7**	H	40.0	**-6.3**	QP	219	1.5	QP (1.00s)
875.007	35.2	H	46.0	-10.8	QP	85	1.0	QP (1.00s)
432.007	34.2	H	46.0	-11.8	QP	319	2.0	QP (1.00s)
46.722	27.4	V	40.0	-12.6	QP	292	1.0	QP (1.00s)
499.998	33.4	H	46.0	-12.6	QP	314	2.0	QP (1.00s)
77.793	19.1	V	40.0	-20.9	QP	219	1.0	QP (1.00s)
196.652	20.9	H	43.5	-22.6	QP	231	2.0	QP (1.00s)



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	B

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: 1/11/2016
Test Engineer: Mehran Birgani
Test Location: Chamber #7

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

General Test Configuration

The EUT and power source were located on a wooden table inside the semi-anechoic chamber, 40 cm from a vertical coupling plane and 80cm from the LISN. Remote support equipment was located outside of the semi-anechoic chamber. Any cables running to remote support equipment where routed through metal conduit and when possible passed through a ferrite clamp upon exiting the chamber.

Ambient Conditions:

Temperature: 17-19 °C
Rel. Humidity: 35-40 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power,120V/60Hz	FCC 15.207	PASS	39.4 dBµV @ 0.474 MHz (-7.0 dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

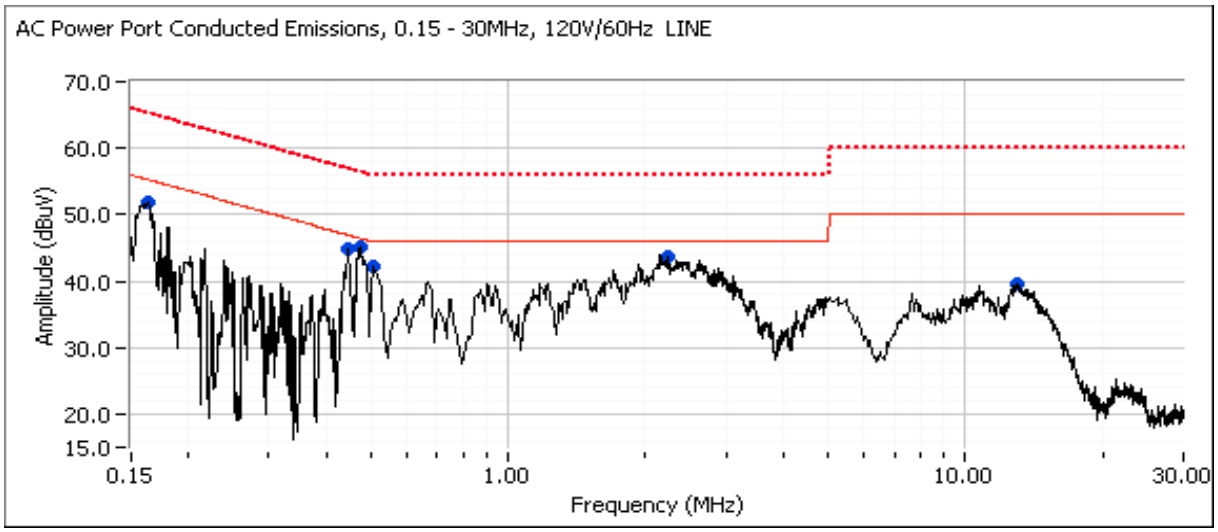
No deviations were made from the requirements of the standard.

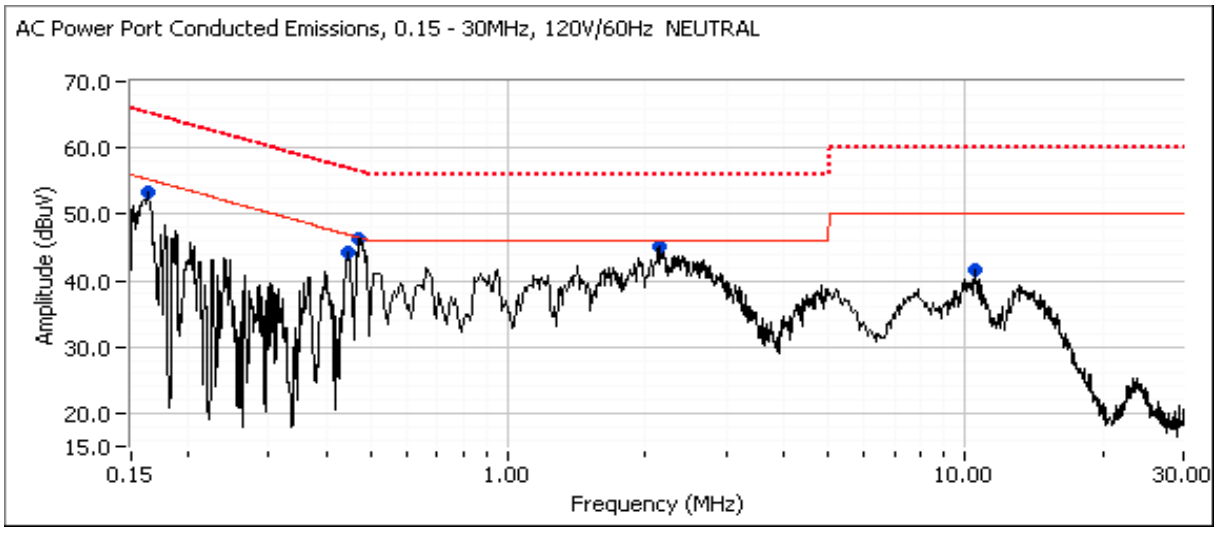
Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	B

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz

Mode: 802.11n 20MHz (VHT 9) **Power Setting:** 23.0

Channel: 40 (5200 MHz)





Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	B

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz

Mode: 802.11n 20MHz (VHT 9) **Power Setting: 23.0**

Channel: 40 (5200 MHz)

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

Frequency	Level	AC	FCC 15.207		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.472	46.4	Neutral	46.5	-0.1	Peak	
2.124	45.1	Neutral	46.0	-0.9	Peak	
0.474	45.1	Line	46.4	-1.3	Peak	
0.162	53.3	Neutral	55.3	-2.0	Peak	
0.447	44.7	Line	46.9	-2.2	Peak	
2.227	43.8	Line	46.0	-2.2	Peak	
0.447	44.4	Neutral	47.0	-2.6	Peak	
0.163	51.8	Line	55.3	-3.5	Peak	
0.513	42.2	Line	46.0	-3.8	Peak	
10.451	41.6	Neutral	50.0	-8.4	Peak	
12.953	39.6	Line	50.0	-10.4	Peak	

Final quasi-peak and average readings

Frequency	Level	AC	FCC 15.207		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.474	**39.4**	Line	46.4	**-7.0**	AVG	AVG (0.10s)
0.472	38.6	Neutral	46.5	-7.9	AVG	AVG (0.10s)
0.162	45.9	Neutral	55.4	-9.5	AVG	AVG (0.10s)
2.124	36.2	Neutral	46.0	-9.8	AVG	AVG (0.10s)
0.472	46.3	Neutral	56.5	-10.2	QP	QP (1.00s)
0.513	35.5	Line	46.0	-10.5	AVG	AVG (0.10s)
0.163	44.7	Line	55.3	-10.6	AVG	AVG (0.10s)
0.474	45.0	Line	56.4	-11.4	QP	QP (1.00s)
0.447	35.3	Neutral	46.9	-11.6	AVG	AVG (0.10s)
2.227	34.3	Line	46.0	-11.7	AVG	AVG (0.10s)
0.447	35.0	Line	46.9	-11.9	AVG	AVG (0.10s)
0.447	43.4	Neutral	56.9	-13.5	QP	QP (1.00s)
0.447	43.2	Line	56.9	-13.7	QP	QP (1.00s)
0.513	42.1	Line	56.0	-13.9	QP	QP (1.00s)
2.124	41.9	Neutral	56.0	-14.1	QP	QP (1.00s)
0.162	50.6	Neutral	65.4	-14.8	QP	QP (1.00s)
0.163	49.9	Line	65.3	-15.4	QP	QP (1.00s)
2.227	40.2	Line	56.0	-15.8	QP	QP (1.00s)

End of Report

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