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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
REPORT DATE:	March 8, 2016
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A2LA ACCREDITED
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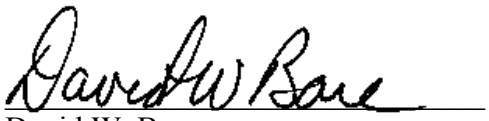
VALIDATING SIGNATORIES

PROGRAM MGR



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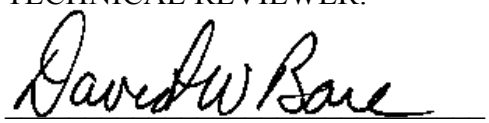

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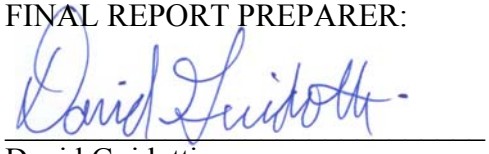

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REVISION HISTORY

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	
2	April 28, 2017	Revised to add new data for operation in UNII-1, UNII-2 and UNII-3 bands	David Guidotti
3	May 5, 2017	Revised to correct various tabular data, add notes about spurious emissions in the 5150-5250 and 5725-5850 MHz bands and spurious emissions below 1 GHz	David Bare

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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 – INDOOR ACCESS POINTS

FCC Rule Part		Description	Measured Value / Comments	Limit / Requirement	Result
15.407 (a) (1) (i) or (ii)		Output Power	802.11a: 0.162 W n20: 0.392 W n40: 0.259 W ac80: 0.037 W (Max eirp: 0.162 W))	30 dBm EIRP <= 4W	Complies
15.407 (a) (1) (i), (ii) or (iii)		Power Spectral Density	802.11a: 12.6 mW/MHz n20: 30.7 mW/MHz n40: 10.9 mW/MHz ac80: 1.0 mW/MHz	17 dBm/MHz	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 (p21) for restricted bands, all others -27 dBm/MHz EIRP	Complies
Note: The original results for radiated spurious emissions for the 5150-5250 MHz band were obtained at power levels that exceed the new powers for these bands thus no spurious emissions tests were performed for this permissive change.					

OPERATION IN THE 5.25 – 5.35 GHZ BAND

FCC Rule Part		Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.407(a) (2)		26dB Bandwidth	> 20MHz for all modes	N/A – limits output power if < 20MHz	N/A
15.407(a) (2)		Output Power	802.11a: 0.068 W n20: 0.095 W n40: 0.160 W ac80: 0.085 W (Max eirp: 0.996 W)	24 dBm (250 mW) EIRP <= 1W	Complies
15.407(a) (2)		Power Spectral Density	802.11a: 5.8 mW/MHz n20: 7.9 mW/MHz n40: 7.1 mW/MHz ac80: 2.4 mW/MHz	11 dBm/MHz	Complies
15.407(b) (2) / 15.209		Spurious Emissions above 1GHz	53.9 dBµV/m @ 5350.6 MHz (-0.1 dB)	Refer to the limits section (p21) for restricted bands, all others -27 dBm/MHz EIRP	Complies
Note: Previous results for emissions below 1 GHz showed that there was no discernible difference in the emissions when changing the EUT frequency. Therefore no additional tests below 1 GHz were performed for this permissive change to add this frequency band.					

OPERATION IN THE 5.47 – 5.725 GHZ BAND

FCC Rule Part		Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.407(a) (2)		26dB Bandwidth	> 20MHz for all modes	N/A – limits output power if < 20MHz	N/A
15.407(a) (2)		Output Power	a: 0.074 W n20: 0.093 W n40: 0.160 W ac80: 0.159 W (Max eirp: 1.005 W)	24 dBm (250 mW) EIRP <= 1W	Complies
15.407(a) (2)		Power Spectral Density	a: 7.6 mW/MHz n20: 7.7 mW/MHz n40: 7.4 mW/MHz ac80: 4.1 mW/MHz	11 dBm/MHz	Complies
15.407(b) (3) / 15.209		Spurious Emissions above 1GHz	53.3 dBµV/m @ 5725.3 MHz (-0.7 dB)	Refer to the limits section (p21) for restricted bands, all others -27 dBm/MHz EIRP	Complies
Note: Previous results for emissions below 1 GHz showed that there was no discernible difference in the emissions when changing the EUT frequency. Therefore no additional tests below 1 GHz were performed for this permissive change to add this frequency band.					

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: 0.479 W n40: 0.501 W ac80: 0.284 W (Max eirp: 3.445 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	a: 13.8 mW/MHz n20: 39.3 mW/MHz n40: 21.1 mW/MHz ac80: 7.6 mW/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 (p21) 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 Note 2 - The original results for radiated spurious emissions for the 5725-5850 MHz band were obtained at power levels that exceed the new powers for this band thus no spurious emissions tests were performed for this permissive change.					

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 22	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	TCP mechanism is discussed in the Operational Description	The U-NII device shall have the capability to operate with a mean EIRP value lower than 24dBm (250mW)	Complies
15.407 (h2)		Dynamic frequency Selection (device with radar detection)	Refer to separate test report, reference R102779	Threshold -62dBm (-64dBm if eirp > 200mW) Channel Availability Check > 60s Channel closing transmission time < 260ms Channel move time < 10s Non occupancy period > 30minutes	Complies

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 21	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 uses 20, 40 and 80 MHz nominal bandwidths.

The sample was received on January 4, 2016 and tested on January 4, 6, 7, 8, 11, 28 and 29, February 1, 2, 4, 5, 10 and 16, March 2, 4, May 13, 17, 19, 25 and June 1, 2, 6, 17, 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.

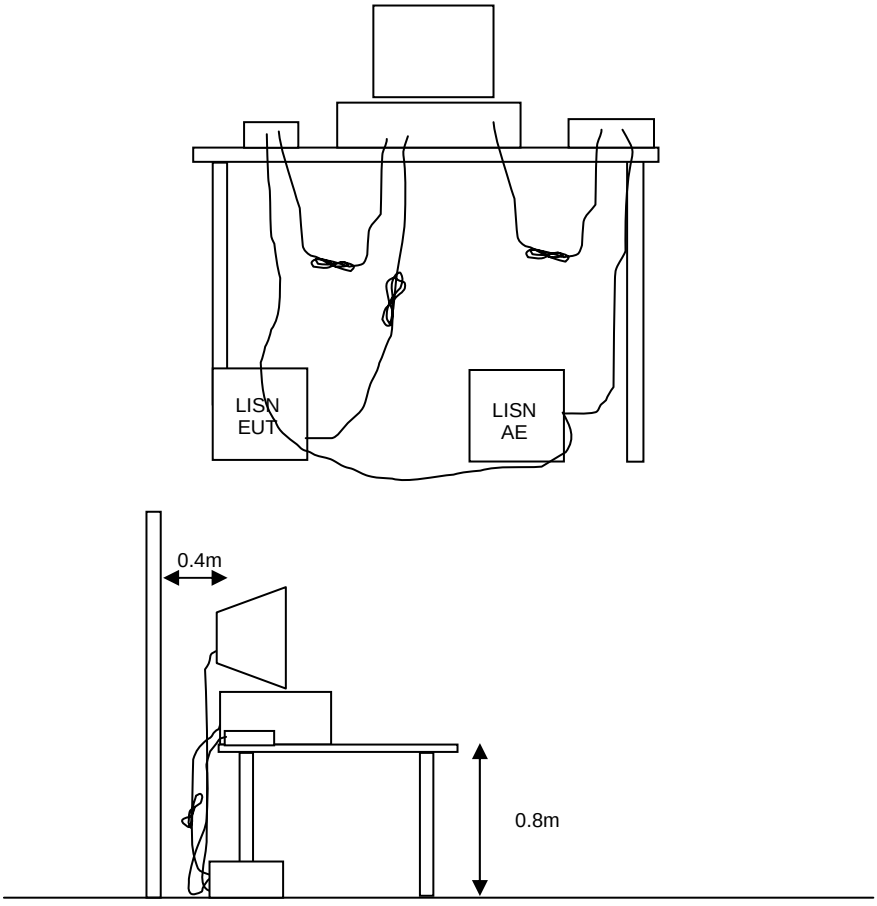


Figure 1 Typical Conducted Emissions Test Configuration

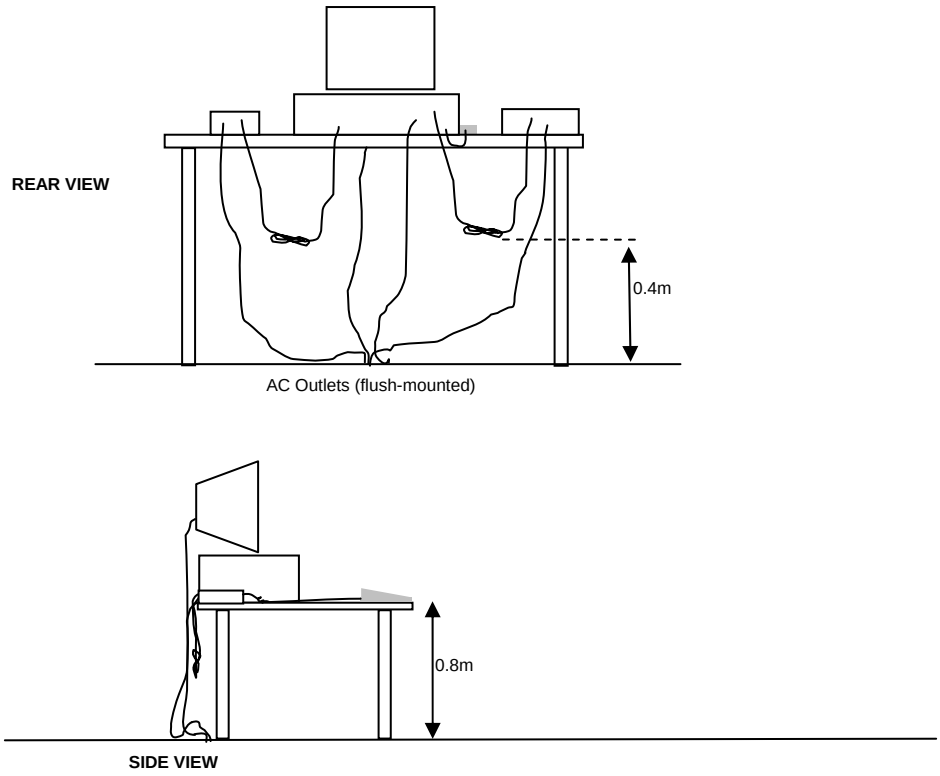
RADIATED EMISSIONS

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.

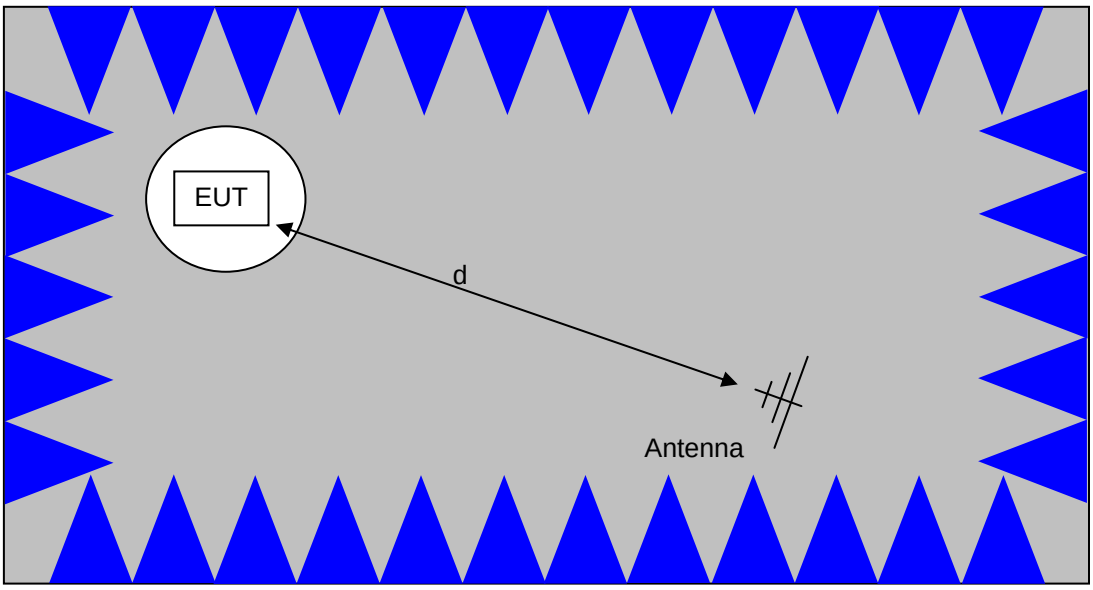
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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.

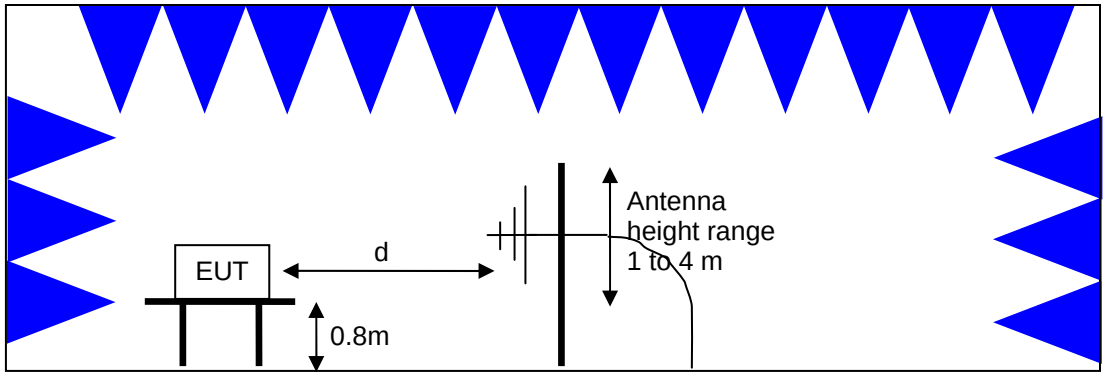


Typical Test Configuration for Radiated Field Strength Measurements



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.

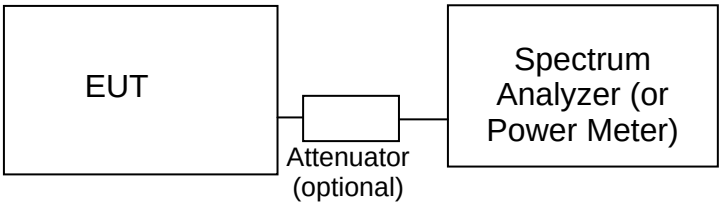
Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.



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
Radiated Emissions, 1000 - 6,000 MHz, 02-Mar-16					
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1630	7/6/2015	7/6/2016
EMCO	Antenna, Horn, 1-18 GHz	3115	2733	11/18/2014	11/18/2016
Radiated Emissions, 1000 - 18,000 MHz, 04-Mar-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
Hewlett Packard	Spectrum Analyzer (SA40) Red 30 Hz -40 GHz	8564E (84125C)	1148	10/17/2015	10/17/2016
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	2251	9/16/2015	9/16/2016
Radiated Emissions, BE, 1,000 - 6,500 MHz, 13, 17-May-16					
EMCO	Antenna, Horn, 1-18 GHz	3115	487	7/29/2014	7/29/2016
Rohde & Schwarz	EMI Test Receiver, 20 Hz-40 GHz	ESIB40 (1088.7490.40)	2493	2/20/2016	2/20/2017
Radiated Emissions, 1000 - 40,000 MHz, 19, 25-May-16					
EMCO	Antenna, Horn, 1-18GHz	3115	868	6/26/2014	6/26/2016
Hewlett Packard	High Pass filter, 8.2 GHz	P/N 84300-80039	1152	7/10/2015	7/10/2016
Micro-Tronics	Band Reject Filter, 5470-5725 MHz	BRC50704-02	1730	7/10/2015	7/10/2016
HP / Miteq	SA40 Head (Purple)	TTA1840-45-5P-HG-S	1772	12/21/2015	12/21/2016
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	1780	10/9/2015	10/9/2016
Hewlett Packard	Spectrum Analyzer (SA40) Purple 9 kHz - 40 GHz,	8564E (84125C)	2415	3/19/2016	3/19/2017
A. H. Systems	Spare System Horn, 18-40GHz	SAS-574, p/n: 2581	2162	7/29/2015	7/29/2017

Radiated Emissions, 1000 - 40,000 MHz, 25-May-16

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
EMCO	Antenna, Horn, 1-18GHz	3115	868	6/26/2014	6/26/2016
Hewlett Packard	High Pass filter, 8.2 GHz	P/N 84300-80039	1152	7/10/2015	7/10/2016
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	5/11/2016	5/11/2017
Micro-Tronics	Band Reject Filter, 5470-5725 MHz	BRC50704-02	1730	7/10/2015	7/10/2016
HP / Miteq	SA40 Head (Purple)	TTA1840-45-5P-HG-S	1772	12/21/2015	12/21/2016
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	1780	10/9/2015	10/9/2016
A. H. Systems	Spare System Horn, 18-40GHz	SAS-574, p/n: 2581	2162	7/29/2015	7/29/2017
Hewlett Packard	Spectrum Analyzer (SA40) Purple 9 kHz - 40 GHz,	8564E (84125C)	2415	3/19/2016	3/19/2017

Radiated Emissions, 1000 - 6,000 MHz, 01-Jun-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

Conducted Emissions - Antenna Ports, 01, 02-Jun-16

Agilent Technologies	PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX,	E4446A	2139	6/22/2015	6/22/2016

Conducted Emissions - Antenna Ports, 06-Jun-16

Agilent Technologies	PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX,	E4446A	2139	6/22/2015	6/22/2016

Radio Antenna Port (Power and PSD), 17-Jun-16

Agilent Technologies	PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX,	E4446A	2139	6/22/2015	6/22/2016

Appendix B Test Data

T100356 Pages 32 – 160

Client:	Pace Americas, Inc.	Job Number:	JD100297
Product	Wi-Fi Module 5 GHz (260-E255040)	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 (260-E255040)

Date of Last Test: 5/17/2017

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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 (260-E255040)	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 (260-E255040)	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

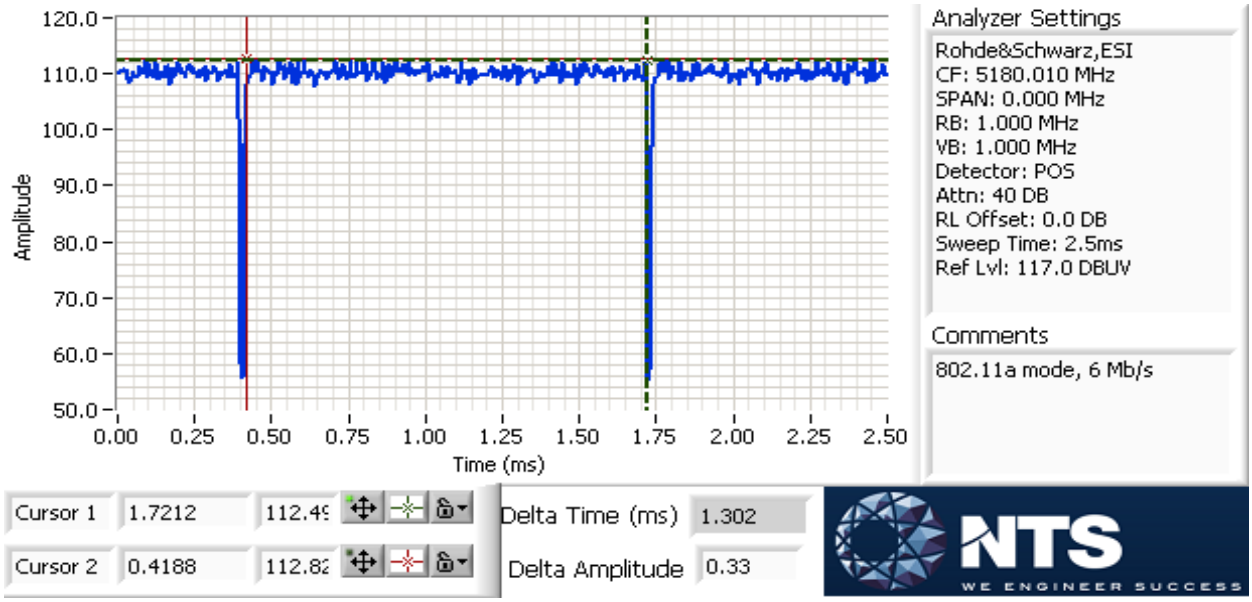
Beamforming

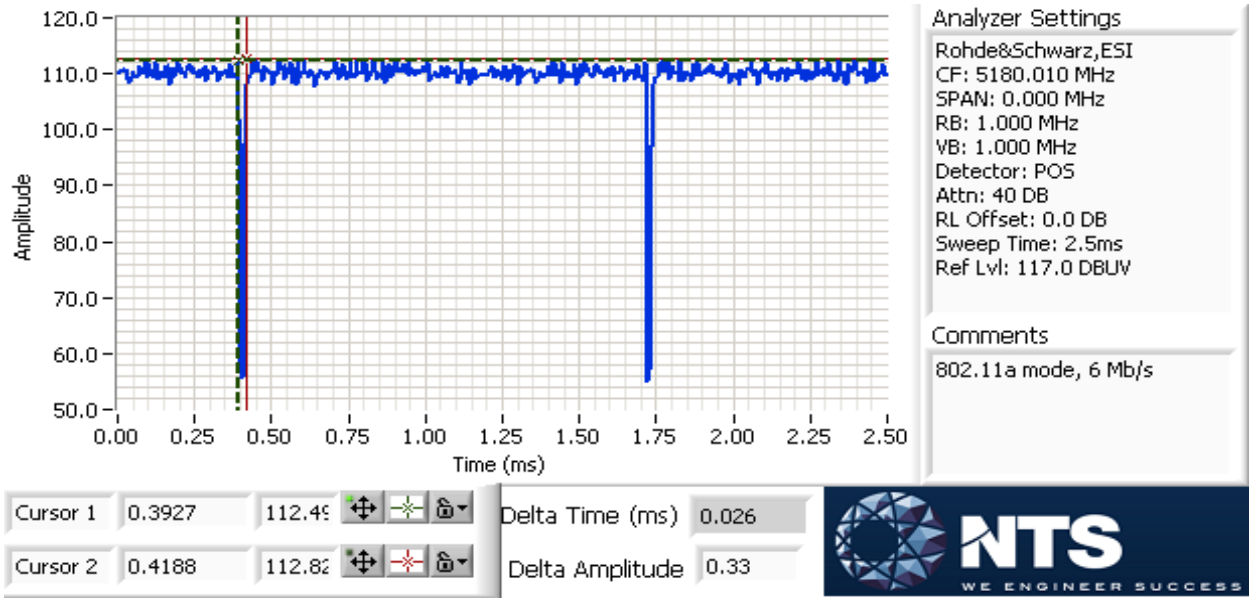
Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)	
n20	VHT8	92.6%	No	1.935	0.3	0.7	517	1k
n40	VHT9	95.2%	No	0.952	0.2	0.4	1050	3k
ac80	VHT9	75.5%	Yes	2.023	1.2	2.4	494	1k

* 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 (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

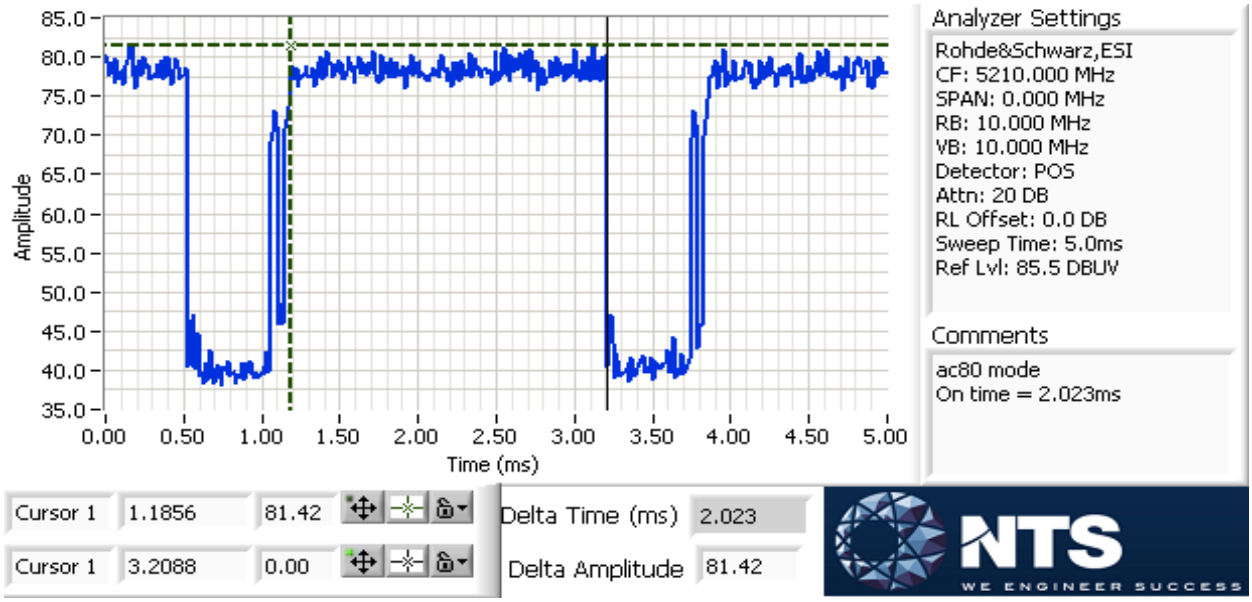
Non-Beamforming

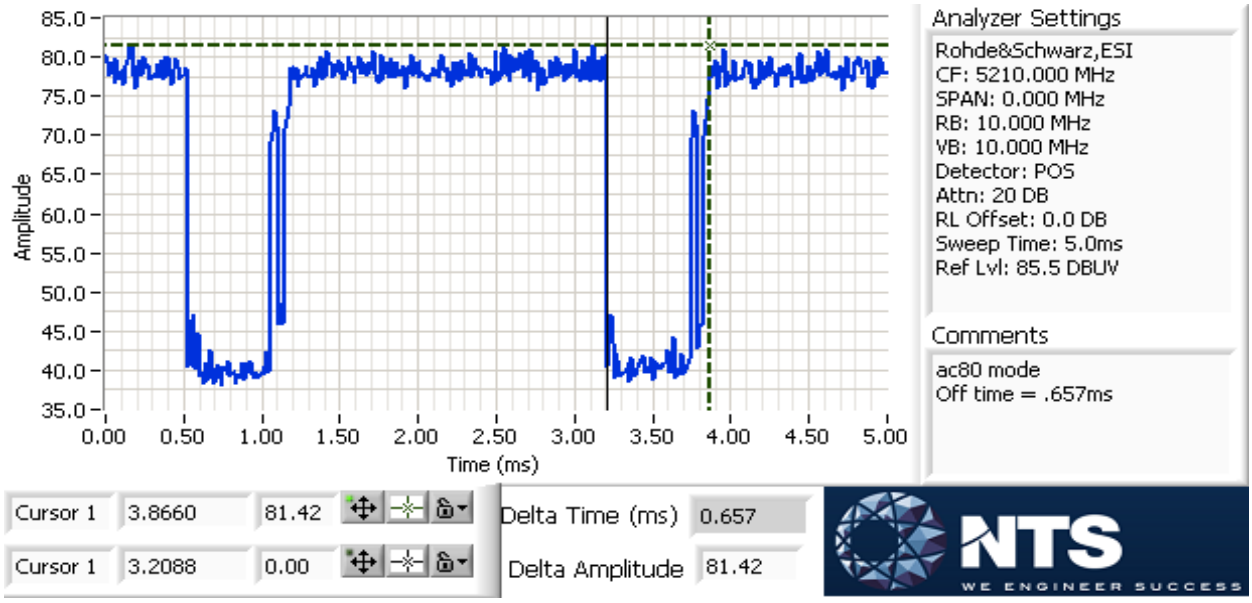




Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Beamforming





Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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, 5250 - 5350MHz	15.407(a) (1), (2), (3) RSS-247 6.2	Pass	a: 67.6 mW n20: 95.3 mW n40: 159.8 mW ac80: 85.4 mW
1	PSD, 5250 - 5350MHz	15.407(a) (1), (2), (3) RSS-247 6.2	Pass	a: 5.8 mW/MHz n20: 7.9 mW/MHz n40: 7.1 mW/MHz ac80: 2.4 mW/MHz
1	Max EIRP 5250 - 5350MHz	TPC required if EIRP≥ 500mW (27dBm)	Pass	EIRP = 996 mW (30 dBm)
1	26dB Bandwidth	15.407 (Information only)	-	> 20MHz for all modes

General Test Configuration

When measuring the EUT's antenna port, it 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: 20-25 °C
Rel. Humidity: 38-43 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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	6MB/s	0.98	Yes	1.302	0	0	768
11n20	VHT8	0.99	Yes	1.935	0	0	517
11n40	VHT9	0.98	Yes	0.952	0	0	1050
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

Antenna Gain Information

Freq	Antenna Gain (dBi) / Chain				BF	MultiChain Legacy	CDD	Sectorized / Xpol	Dir G (PWR)	Dir G (PSD)
	1	2	3	4						
5250-5350	2.8	4.3	2.3		Yes	No	Yes	No	7.9	7.9

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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: 6/1/2016 0:00
Test Engineer: Rafael Varelas
Test Location: Lab 4B

Config. Used: 1
Config Change: none
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:	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 are non-coherent among 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.

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, 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 (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

MIMO Device - 5250-5350 MHz Band - FCC

Mode: 11a SISO only with diversity (worst chain selected) Max EIRP (mW): 421.3

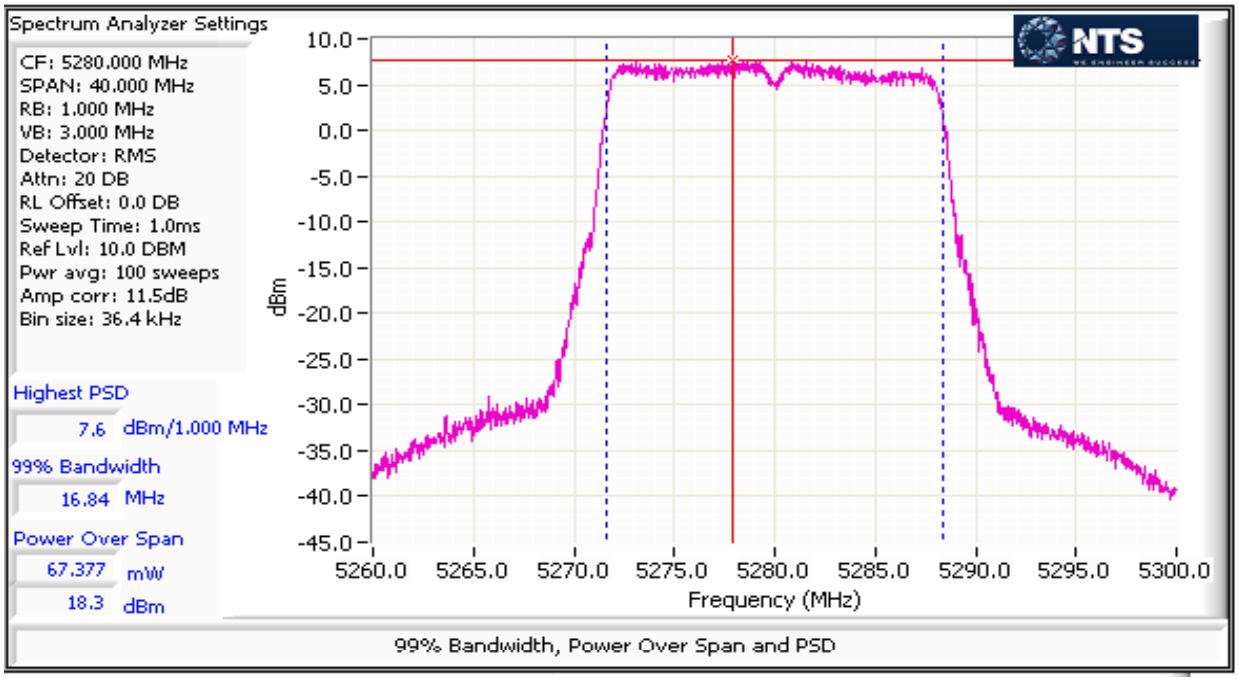
Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power mW	Total Power dBm	FCC Limit dBm	Max Power (W)	Result
5260	1	16	20.0	98		33.9	15.3	22.1	0.068	Pass
	3				15.3					
	4									
	2									
5280	1	20.5	20.4	98		67.6	18.3	22.1		Pass
	3				18.3					
	4									
	2									
5320	1	18.5	20.2	98		52.5	17.2	22.1		Pass
	3				17.2					
	4									
	2									

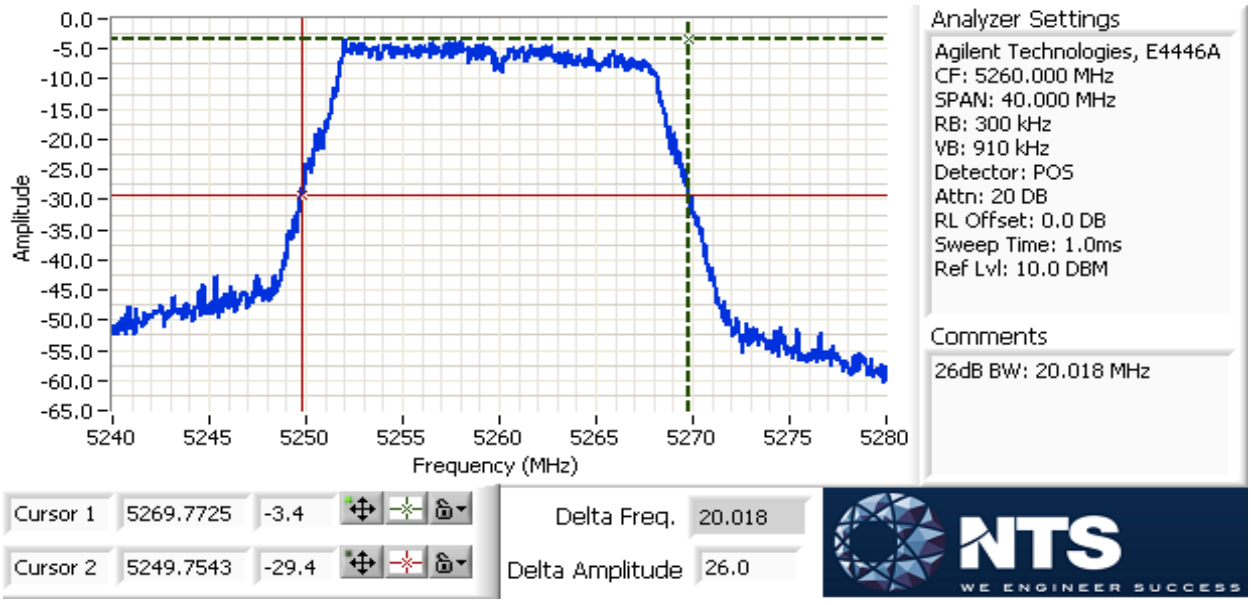
5250-5350 PSD - FCC

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

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD[3] dBm/MHz	Total PSD mW/MHz	Total PSD dBm/MHz	FCC Limit dBm/MHz	IC Limit dBm/MHz	Result
5260	1	16		98		3.2	5.1	9.1	11.0	Pass
	3				5.0					
	4									
	2									
5280	1	20.5		98		5.8	7.6	9.1	11.0	Pass
	3				7.6					
	4									
	2									
5320	1	18.5		98		4.5	6.5	9.1	11.0	Pass
	3				6.5					
	4									
	2									

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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 (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

MIMO Device - 5250-5350 MHz Band - FCC

Mode: n20 Max EIRP (mW): 594

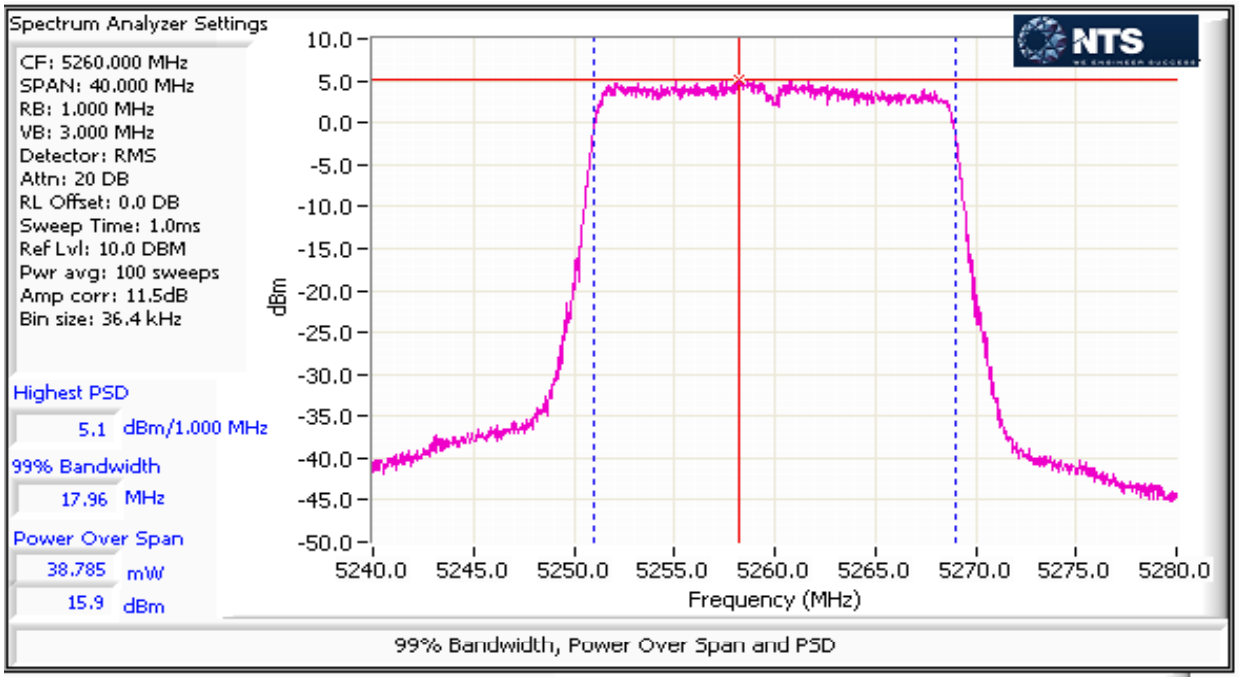
Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power mW	Total Power dBm	FCC Limit dBm	Max Power (W)	Result
5260	1	16	20.3	99	14.3	95.3	19.8	22.1	0.095	Pass
	3				15.9					
	4									
	2				14.7					
5300	1	15.5	20.5	99	14.2	88.2	19.5	22.1		Pass
	3				15.1					
	4									
	2				14.7					
5320	1	15.5	20.5	99	14.4	95.3	19.8	22.1		Pass
	3				15.2					
	4									
	2				15.4					

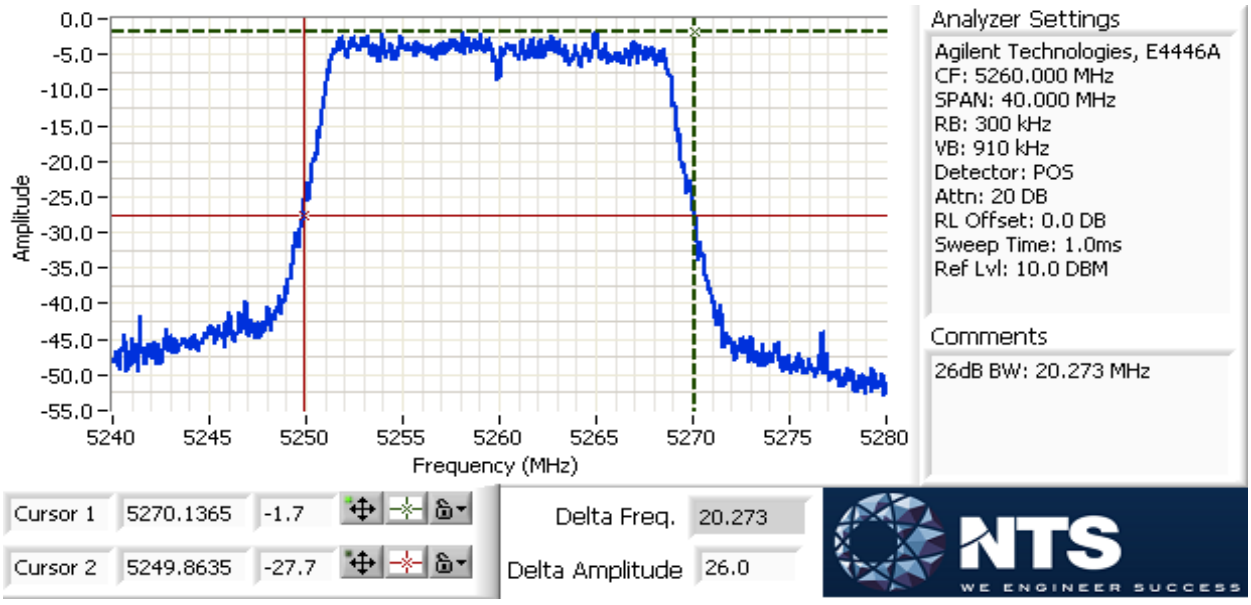
5250-5350 PSD - FCC/IC

Mode: n20

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD[3] dBm/MHz	Total PSD mW/MHz	Total PSD dBm/MHz	FCC Limit dBm/MHz	IC Limit dBm/MHz	Result
5260	1	16		99	3.4	7.8	8.9	9.1	11.0	Pass
	3				5.1					
	4									
	2				3.8					
5300	1	15.5		99	3.1	7.2	8.6	9.1	11.0	Pass
	3				4.4					
	4									
	2				3.8					
5320	1	15.5		99	3.6	7.9	9.0	9.1	11.0	Pass
	3				4.3					
	4									
	2				4.6					

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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 (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

MIMO Device - 5250-5350 MHz Band - FCC

Mode: n40 Max EIRP (mW): 996.0

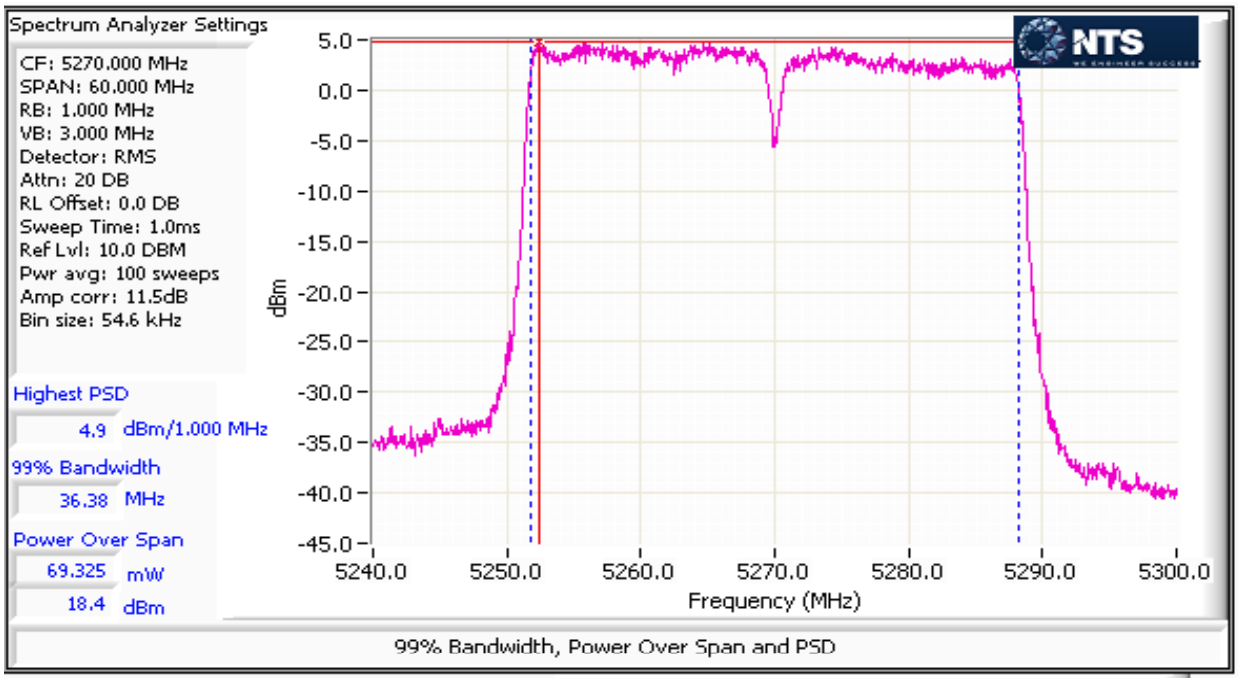
Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power mW	Total Power dBm	FCC Limit dBm	Max Power (W)	Result
5270	1	17.5	39.5	98	18.4	159.8	22.0	22.1	0.160	Pass
	3				16.2					
	4									
	2				16.9					
5310	1	15.5	40.0	98	15.2	94.4	19.7	22.1		Pass
	3				14.5					
	4									
	2				15.2					

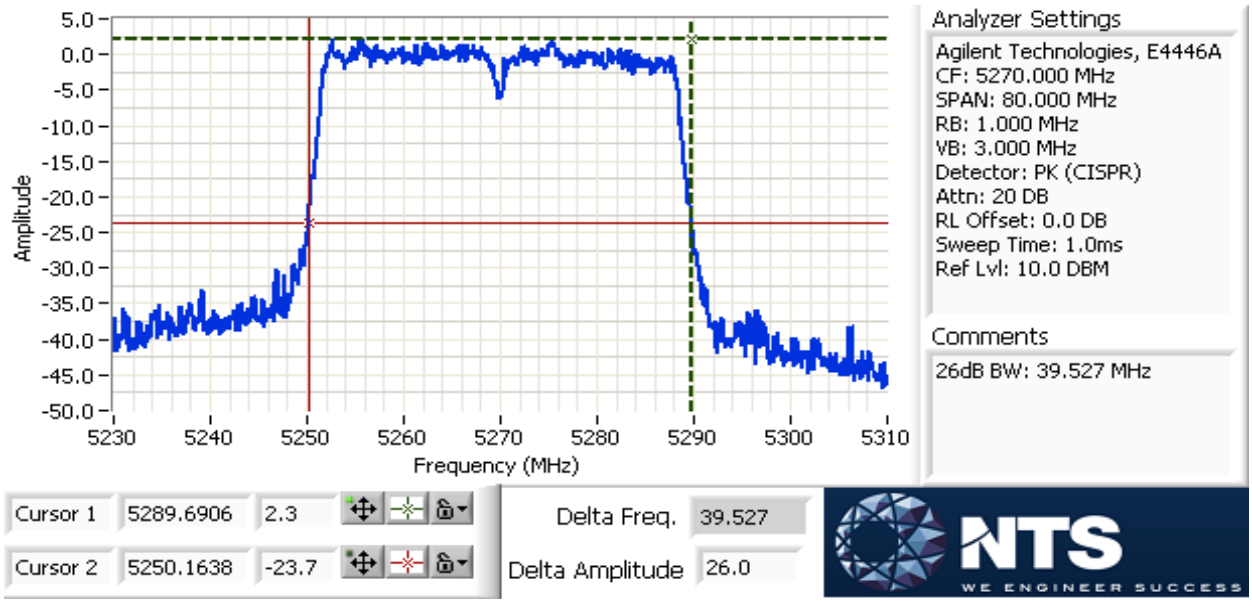
MIMO Device 5250-5350 PSD - FCC

Mode: n40

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD[3] dBm/MHz	Total PSD mW/MHz	Total PSD dBm/MHz	FCC Limit dBm/MHz	IC Limit dBm/MHz	Result
5270	1	17.5		98	4.9	7.1	8.5	9.1	11.0	Pass
	3				2.7					
	4									
	2				3.4					
5310	1	15.5		98	1.6	4.2	6.2	9.1	11.0	Pass
	3				1.1					
	4									
	2				1.8					

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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 (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

MIMO Device - 5250-5350 MHz Band - FCC

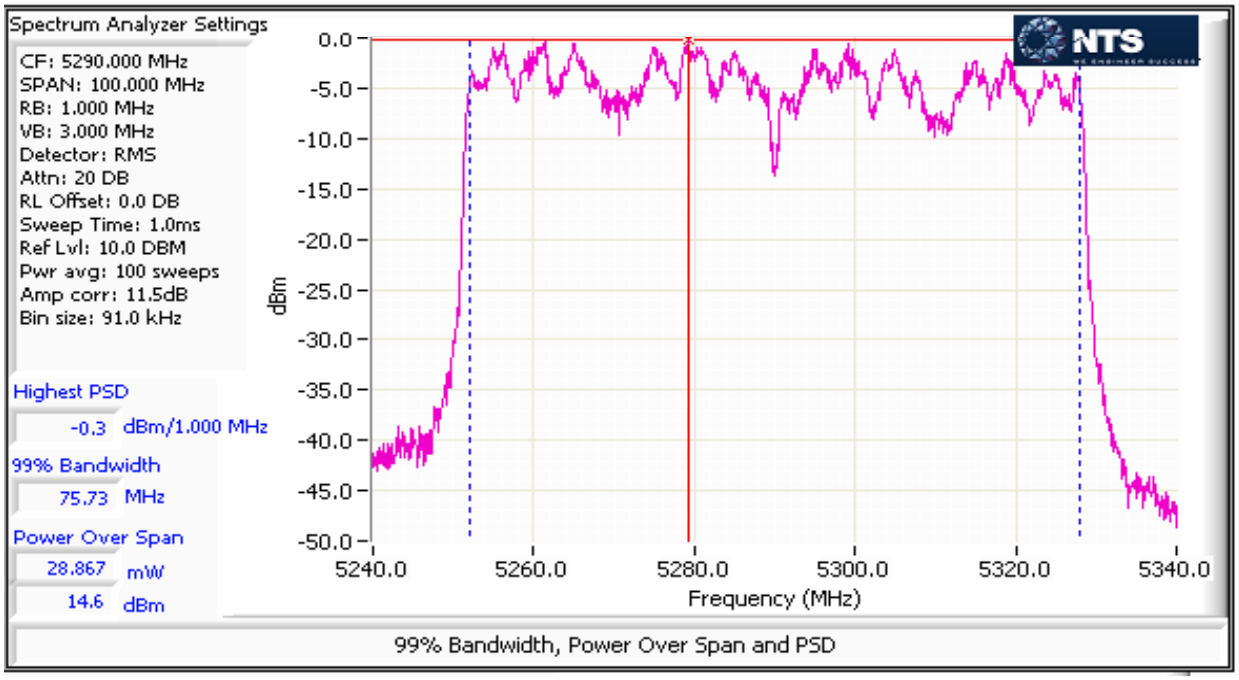
Mode: ac80 Max EIRP (mW): 532.3

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power[2] dBm	Total Power mW	Total Power dBm	FCC Limit dBm	Max Power (W)	Result
5290	1	16.5	81.1	94	14.9	85.4	19.3	22.1	0.085	Pass
	3				14.2					
	4									
	2				13.7					

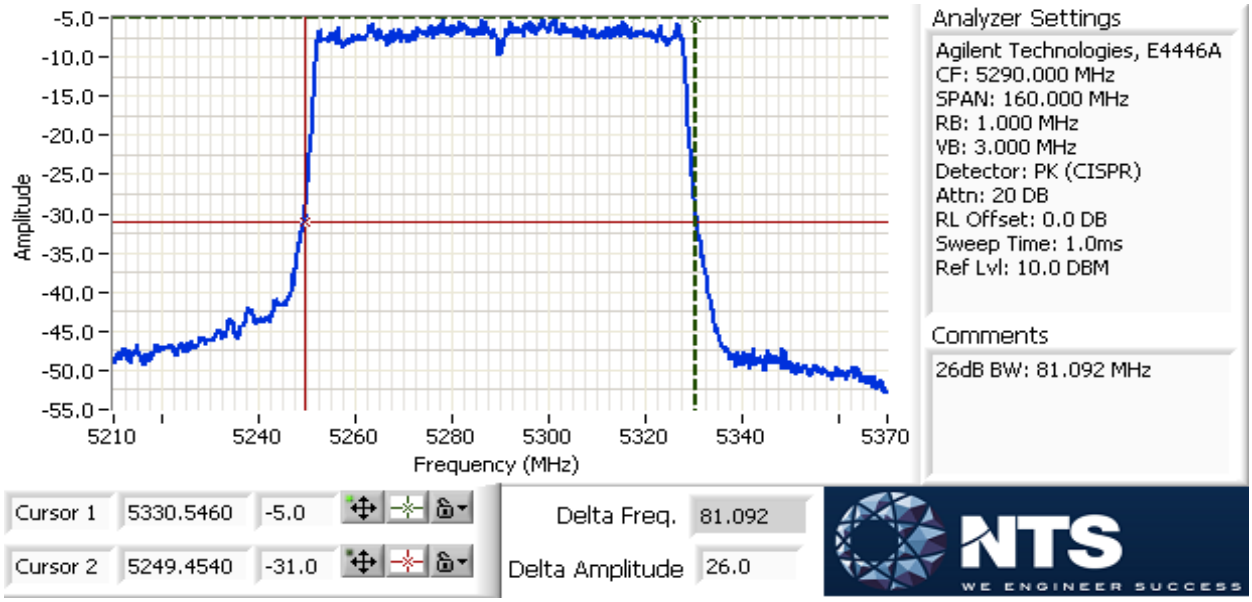
MIMO Device 5250-5350 PSD - FCC/IC

Mode: ac80

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD[3] dBm/MHz	Total PSD mW/MHz	Total PSD dBm/MHz	FCC Limit dBm/MHz	IC Limit dBm/MHz	Result
5290	1	16.5		94	-0.3	2.4	3.8	9.1	11.0	Pass
	3				-2.2					
	4									
	2				-1.4					



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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 (260-E255040)	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, 5470 - 5725MHz	15.407(a) (1), (2), (3) RSS-247 6.2	Pass	a: 74.1 mW n20: 92.8 mW n40: 160.3 mW ac80: 158.9 mW
1	PSD, 5470 - 5725MHz	15.407(a) (1), (2), (3) RSS-247 6.2	Pass	a: 7.6 mW/MHz n20: 7.7 mW/MHz n40: 7.4 mW/MHz ac80: 4.1 mW/MHz
1	Max EIRP 5470 - 5725MHz	TPC required if EIRP≥ 500mW (27dBm). EIRP ≥ 200mW (23dBm)	Pass	EIRP = 1005 mW (30 dBm)
1	26dB Bandwidth	15.407 (Information only)	-	> 20MHz for all modes

General Test Configuration

When measuring the EUT's antenna port, it 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:	20-25 °C
Rel. Humidity:	38-43 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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	6MB/s	0.98	Yes	1.302	0	0	768
11n20	VHT8	0.99	Yes	1.935	0	0	517
11n40	VHT9	0.98	Yes	0.952	0	0	1050
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

Antenna Gain Information

Freq	Antenna Gain (dBi) / Chain				BF	MultiChain Legacy	CDD	Sectorized / Xpol	Dir G (PWR)	Dir G (PSD)
	1	2	3	4						
5470-5725	3.1	3.5	3		Yes	No	Yes	No	8.0	8.0

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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: 6/2/2016, 6/6/2016
Test Engineer: John Caizzi / Yew-Kwong Soo
Test Location: Lab 4B

Config. Used: 1
Config Change: none
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:	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.

For devices that support CDD modes
Min # of spatial streams:
Max # of spatial streams:

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, 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 (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

MIMO Device - 5470-5725 MHz Band - FCC

Mode: 11a SISO only with diversity (worst chain selected) Max EIRP (mW): 464.7

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
5500	1	19.5	21.1	98		70.8	18.5	22.0	0.074	Pass
	3									
	4									
	2				18.5					
5580	1	19.5	24.3	98		74.1	18.7	22.0		Pass
	3									
	4									
	2				18.7					
5700	1	19.5	24	98		72.4	18.6	22.0		Pass
	3									
	4									
	2				18.6					
5720	1	20.5	20.4	98		70.8	18.5	22.0		Pass
	3									
	4									
	2				18.5					

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

5720	1	20.5		98		17.0	12.3	28.0	0.017	Pass
	3									
	4									
	2				12.3					

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

5470-5700 PSD - FCC

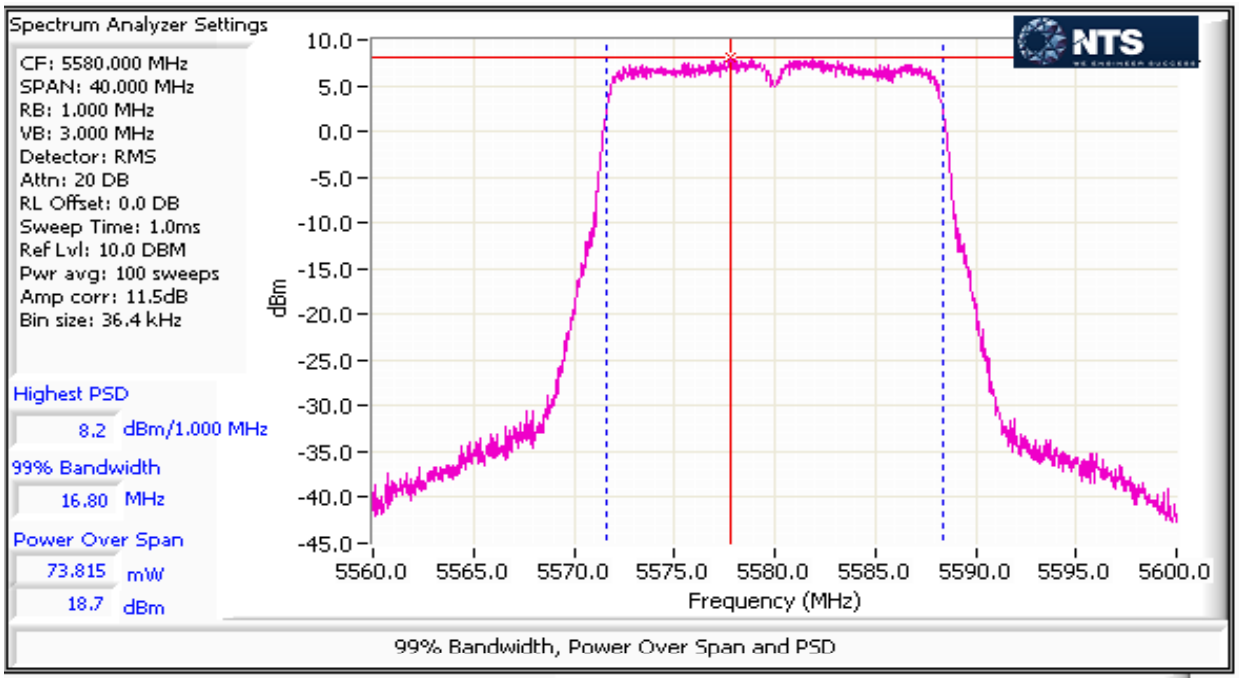
Mode: 11a SISO only with diversity (worst chain selected)

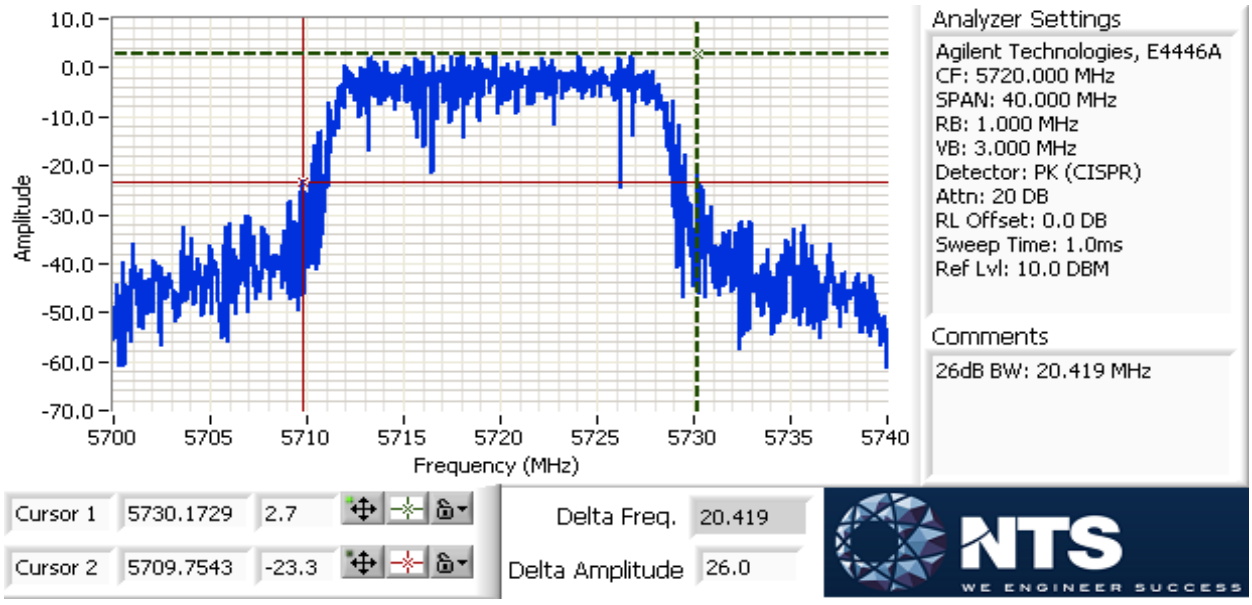
Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD[3] dBm/MHz	Total PSD mW/MHz	Total PSD dBm/MHz	FCC Limit dBm/MHz	IC limit dBm/MHz	Result
5500	1	19.5		98		6.2	7.9	9.0	11.0	Pass
	3									
	4									
	2				7.9					
5580	1	19.5		98		6.6	8.2	9.0	11.0	Pass
	3									
	4									
	2				8.2					
5700	1	19.5		98		6.2	7.9	9.0	11.0	Pass
	3									
	4									
	2				7.9					
5720	1	20.5		98		7.6	8.8	9.0	11.0	Pass
	3									
	4									
	2				8.8					

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

5720	1	20.5		98		6.8	8.3	28.0	28.0	Pass
	3									
	4									
	2				8.3					

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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 (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

MIMO Device - 5470-5725 MHz Band - FCC

Mode: n20 Max EIRP (mW): 582

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
5500	1	15	21.1	99	14.8	92.8	19.7	22.0	0.093	Pass
	3				14.2					
	4									
	2				15.6					
5580	1	15	23.8	99	14.9	90.3	19.6	22.0		Pass
	3				14.2					
	4									
	2				15.2					
5700	1	15.5	21.3	99	14.1	87.5	19.4	22.0		Pass
	3				15.0					
	4									
	2				14.8					
5720	1	15.5	20.3	99	14.1	69.0	18.4	22.0		Pass
	3				13.2					
	4									
	2				13.5					
Portion within 5725-5850 MHz band (UNII-3)										
5720	1	15.5		99	8.4	18.7	12.7	28.0	0.0187	Pass
	3				7.6					
	4									
	2				7.8					

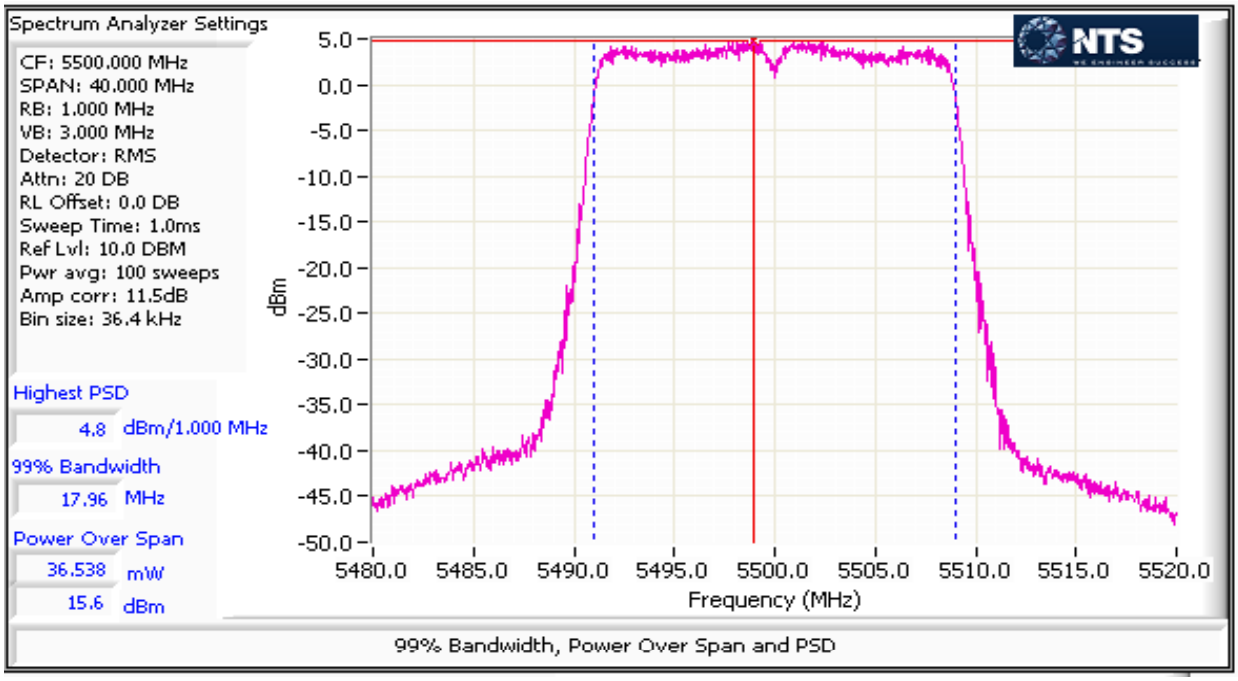
Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

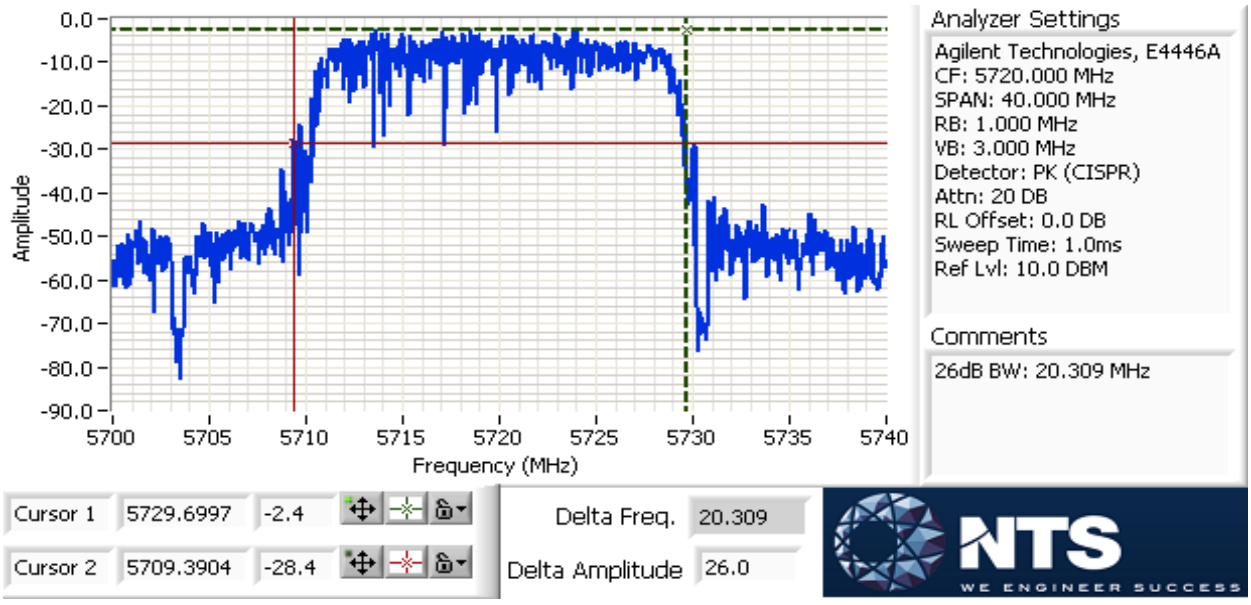
5470-5725 PSD - FCC

Mode: n20

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD[3] dBm/MHz	Total PSD mW/MHz	Total PSD dBm/MHz	FCC Limit dBm/MHz	IC limit dBm/MHz	Result
5500	1	15		99	4.0	7.7	8.9	9.0	11.0	Pass
	3				3.4					
	4									
	2				4.8					
5580	1	15		99	3.9	7.4	8.7	9.0	11.0	Pass
	3				3.2					
	4									
	2				4.6					
5700	1	15.5		99	3.2	7.1	8.5	9.0	11.0	Pass
	3				4.1					
	4									
	2				3.9					
5720	1	15.5		99	4.3	7.5	8.8	9.0	11.0	Pass
	3				3.7					
	4									
	2				4.0					
Portion within 5725-5850 MHz band (UNII-3)										
5720	1	15.5		99	3.8	6.4	8.1	28.0	28.0	Pass
	3				3.0					
	4									
	2				3.1					

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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 (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

MIMO Device - 5470-5725 MHz Band - FCC

Mode: n40 Max EIRP (mW): 1005.4

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
5510	1	16.5	39.4	98	15.5	122.1	20.9	22.0	0.160	Pass
	3				16.0					
	4									
	2				16.7					
5550	1	17.5	39.7	98	16.1	142.3	21.5	22.0		Pass
	3				16.8					
	4									
	2				17.3					
5670	1	17.5	39.8	98	17.5	155.3	21.9	22.0		Pass
	3				17.0					
	4									
	2				16.9					
5710	1	18.5	40.2	98	17.7	160.3	22.0	22.0		Pass
	3				16.9					
	4									
	2				17.2					

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

5710	1	18.5		98	7.3	14.8	11.7	28.0	0.0148	Pass
	3				6.8					
	4									
	2				6.7					

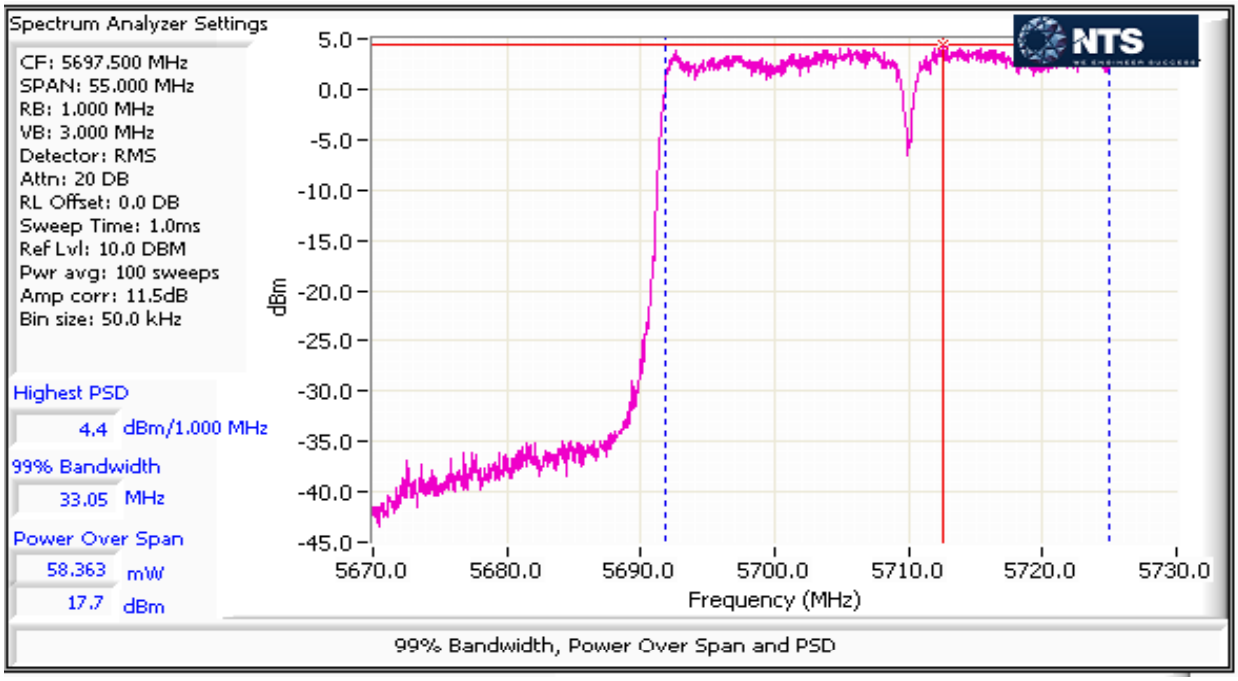
Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

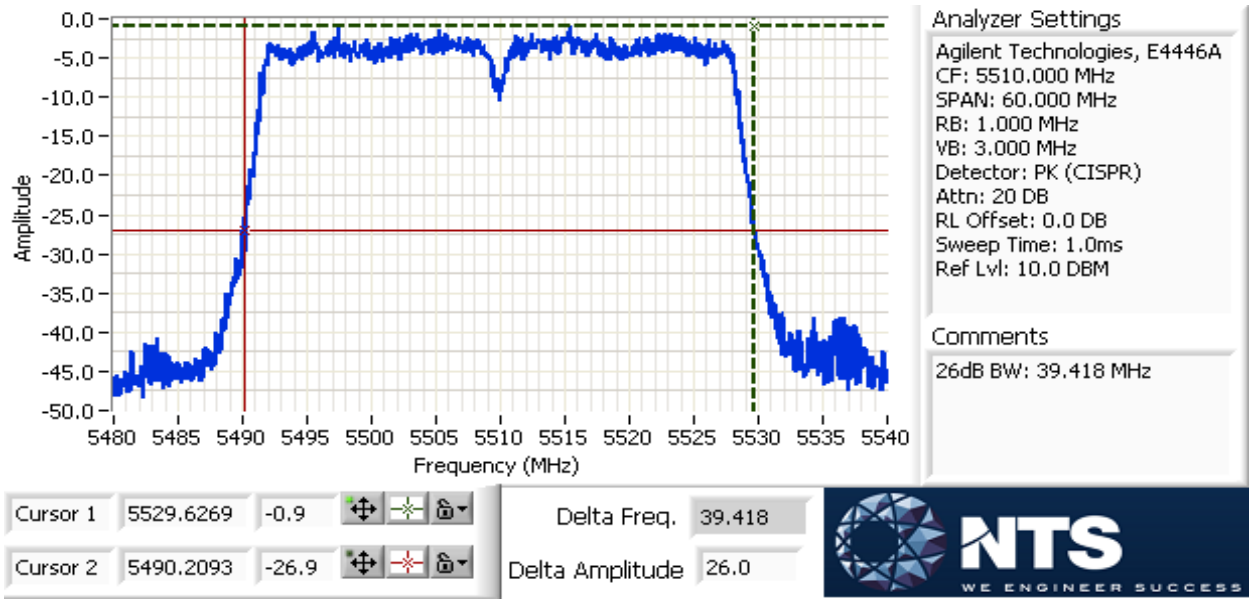
MIMO Device 5470-5725 PSD - FCC

Mode: n40

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD[3] dBm/MHz	Total PSD mW/MHz	Total PSD dBm/MHz	FCC Limit dBm/MHz	IC limit dBm/MHz	Result
5510	1	16.5		98	2.0	5.2	7.2	9.0	11.0	Pass
	3				2.1					
	4									
	2				3.0					
5550	1	17.5		98	2.3	6.1	7.9	9.0	11.0	Pass
	3				3.1					
	4									
	2				3.7					
5670	1	17.5		98		4.3	6.3	9.0	11.0	Pass
	3				3.4					
	4									
	2				3.2					
5710	1	18.5		98	4.4	7.4	8.7	9.0	11.0	Pass
	3				3.4					
	4									
	2				3.9					
Portion within 5725-5850 MHz band (UNII-3)										
5710	1	18.5		98	3.6	6.2	7.9	28.0	28.0	Pass
	3				2.8					
	4									
	2				3.0					

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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 (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

MIMO Device - 5470-5725 MHz Band - FCC

Mode: ac80 Max EIRP (mW): 996.6

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power[2] dBm	Total Power mW	Total Power dBm	FCC Limit dBm	Max Power (W)	Result
5530	1	16.5	80.2	94	15.1	98.0	19.9	22.0	0.159	Pass
	3				14.2					
	4									
	2				15.3					
5610	1	18.5	80.5	94	17.3	158.9	22.0	22.0		Pass
	3				16.3					
	4									
	2				17.3					
5690	1	18.5	81.7	94	16.9	137.4	21.4	22.0		Pass
	3				15.7					
	4									
	2				16.4					

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

5690	1	18.5		94	3.3	6.1	7.9	28.0	0.0061	Pass
	3				2.3					
	4									
	2				2.8					

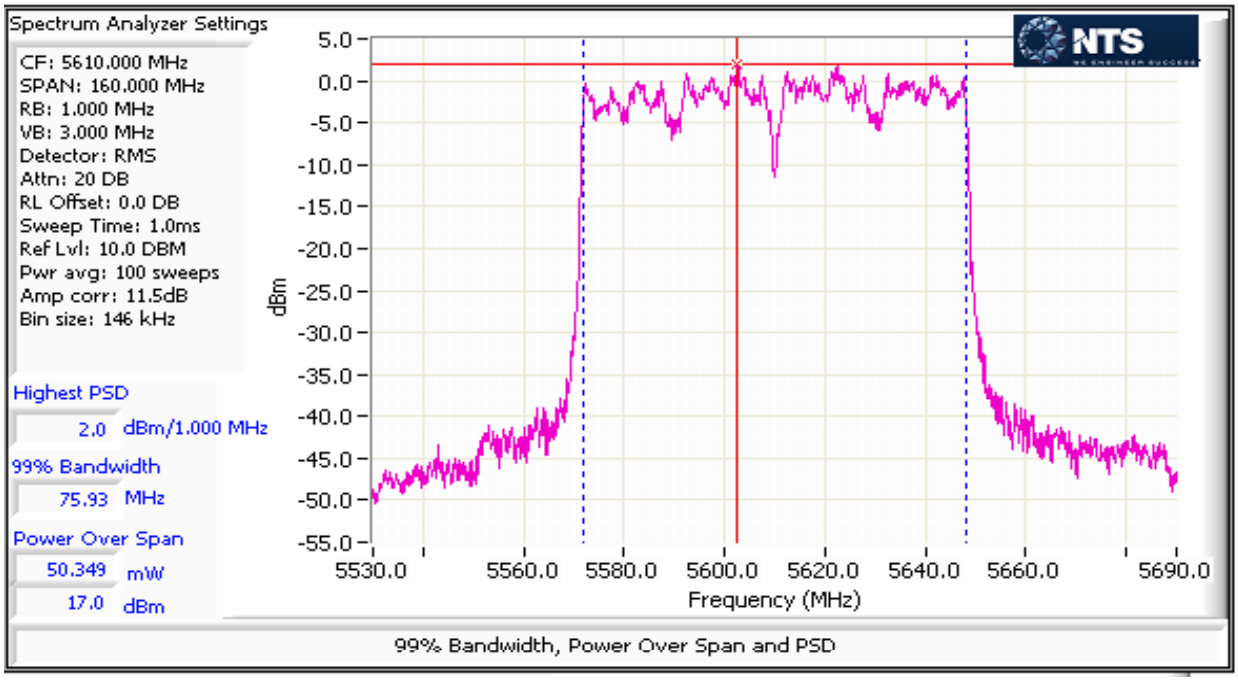
Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

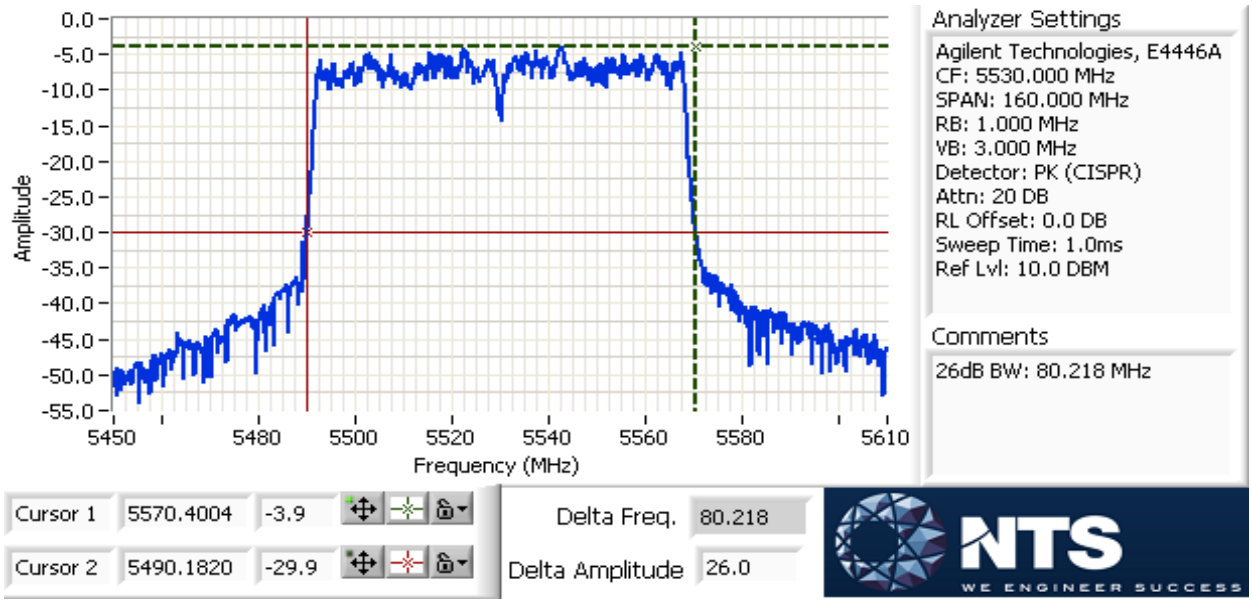
5470-5725 PSD - FCC/IC Note: 5610 MHz channel not used for Canada

Mode: ac80

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD[3] dBm/MHz	Total PSD mW/MHz	Total PSD dBm/MHz	FCC Limit dBm/MHz	IC limit dBm/MHz	Result
5530	1	16.5		94	0.8	2.8	4.5	9.0	11.0	Pass
	3				-2.6					
	4									
	2				-0.6					
5610	1	18.5		94	2.0	4.1	6.1	9.0	-	Pass
	3				-0.4					
	4									
	2				1.3					
5690	1	18.5		94	1.3	3.5	5.4	9.0	11.0	Pass
	3				-0.4					
	4									
	2				0.0					
Portion within 5725-5850 MHz band (UNII-3)										
5690	1	18.5		94	-0.3	2.6	4.1	28.0	28.0	Pass
	3				-1.4					
	4									
	2				-1.0					

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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 (260-E255040)	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: 22.4 °C
Rel. Humidity: 35 %

Summary of Results

Run #	Mode	Channel	Target Power	Passing Power	Test Performed	Limit	Result / Margin
20MHz Bandwith Modes							
1	a	52 - 5260MHz	21.5	18.5	RestrictedBand Edge 5150MHz	15E	53.1 dBµV/m @ 5141.2 MHz (-0.9 dB)
	a	56 - 5280MHz	21.5	20.5	RestrictedBand Edge 5150MHz	15E	53.4 dBµV/m @ 5121.9 MHz (-0.6 dB)
	a	64 - 5320MHz	21.5	18.5	Restricted Band Edge at 5350 MHz	15.209	53.4 dBµV/m @ 5432.3 MHz (-0.6 dB)
	a	60 - 5300MHz	21.5	19.5	Restricted Band Edge at 5350 MHz	15.209	53.8 dBµV/m @ 5422.3 MHz (-0.2 dB)
2	a	100 - 5500MHz	21.5	21.5	Restricted Band Edge at 5460 MHz	15.209	50.5 dBµV/m @ 5377.7 MHz (-3.5 dB)
	a	100 - 5500MHz	21.5	21.5	Band Edge 5460 - 5470 MHz	15E	51.9 dBµV/m @ 5467.6 MHz (-2.1 dB)
	a	140 - 5700MHz	21.5	21.5	Band Edge 5725MHz	15E	53.3 dBµV/m @ 5725.3 MHz (-0.7 dB)
3	n20	52 - 5260MHz	21.5	21.5	RestrictedBand Edge 5150MHz	15E	52.7 dBµV/m @ 5141.8 MHz (-1.3 dB)
	n20	64 - 5320MHz	21.5	20.5	Restricted Band Edge at 5350 MHz	15.209	53.2 dBµV/m @ 5350.0 MHz (-0.8 dB)

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #	Mode	Channel	Target Power	Passing Power	Test Performed	Limit	Result / Margin
4	n20	100 - 5500MHz	21.5	19.5	Restricted Band Edge at 5460 MHz	15.209	48.3 dBµV/m @ 5459.2 MHz (-5.7 dB)
	n20	100 - 5500MHz	21.5	19.5	Band Edge 5460 - 5470 MHz	15E	63.4 dBµV/m @ 5468.5 MHz (-4.9 dB)
	n20	140 - 5700MHz	21.5	19.5	Band Edge 5725MHz	15E	66.2 dBµV/m @ 5763.6 MHz (-2.1 dB)
40MHz Bandwith Modes							
5	n40	54 - 5270MHz	21.5	21.5	Restricted Band Edge at 5150 MHz	15.209	50.8 dBµV/m @ 5146.4 MHz (-3.2 dB)
	n40	62 - 5310MHz	21.5	15.5	Restricted Band Edge at 5350 MHz	15.209	53.9 dBµV/m @ 5350.6 MHz (-0.1 dB)
6	n40	102 - 5510MHz	21.5	16.5	Restricted Band Edge at 5460 MHz	15.209	48.1 dBµV/m @ 5459.8 MHz (-5.9 dB)
	n40	102 - 5510MHz	21.5	16.5	Band Edge 5460 - 5470 MHz	15E	66.2 dBµV/m @ 5469.8 MHz (-2.1 dB)
	n40	110 - 5550MHz	21.5	21.5	Restricted Band Edge at 5460 MHz	15.209	48.7 dBµV/m @ 5457.5 MHz (-5.3 dB)
	n40	110 - 5550MHz	21.5	21.5	Band Edge 5460 - 5470 MHz	15E	64.1 dBµV/m @ 5465.1 MHz (-4.2 dB)
	n40	134 - 5670MHz	21.5	21.5	Band Edge 5725MHz	15E	64.3 dBµV/m @ 5743.1 MHz (-4.0 dB)
80MHz Bandwith Modes							
7	ac80	58 - 5290MHz	21.5	21.5	Restricted Band Edge at 5150 MHz	15.209	52.5 dBµV/m @ 5149.9 MHz (-1.5 dB)
	ac80	58 - 5290MHz	21.5	16.5	Restricted Band Edge at 5350 MHz	15.209	53.3 dBµV/m @ 5351.3 MHz (-0.7 dB)
8	ac80	106 - 5530MHz	21.5	16.5	Restricted Band Edge at 5460 MHz	15.209	52.4 dBµV/m @ 5457.1 MHz (-1.6 dB)
	ac80	106 - 5530MHz	21.5	16.5	Band Edge 5460 - 5470 MHz	15E	66.8 dBµV/m @ 5464.5 MHz (-1.5 dB)
	ac80	122 - 5610MHz	21.5	21.5	Restricted Band Edge at 5460 MHz	15.209	50.7 dBµV/m @ 5458.2 MHz (-3.3 dB)
	ac80	122 - 5610MHz	21.5	21.5	Band Edge 5460 - 5470 MHz	15E	65.9 dBµV/m @ 5462.7 MHz (-2.4 dB)
	ac80	122 - 5610MHz	21.5	21.5	Band Edge 5725MHz	15E	65.1 dBµV/m @ 5741.6 MHz (-3.2 dB)

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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	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: Internal 3x3 Beamforming (802.11a mode does not do 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 (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

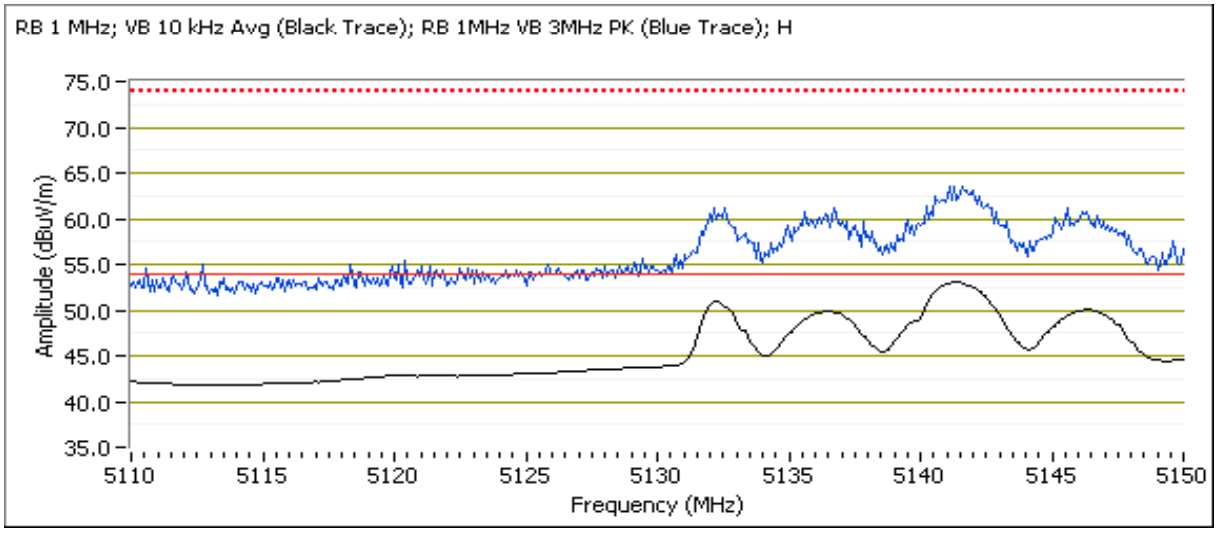
Run #1: Radiated Bandedge Measurements, 5250-5350MHz

Date of Test: 03/02/16
Test Engineer: Rafael Varelas
Test Location: FT Chamber #4
EUT Voltage: 120V/60Hz

Channel: 52 - 5260MHz
Tx Chain: 3Tx
Mode: a
Data Rate: 6 Mbps

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	
5141.220	53.1	H	54.0	-0.9	AVG	334	1.0	POS; RB 1 MHz; VB: 10 Hz
5141.060	62.4	H	74.0	-11.6	PK	334	1.0	POS; RB 1 MHz; VB: 3 MHz
5141.420	49.0	V	54.0	-5.0	AVG	297	1.3	POS; RB 1 MHz; VB: 10 Hz
5140.380	58.7	V	74.0	-15.3	PK	297	1.3	POS; RB 1 MHz; VB: 3 MHz

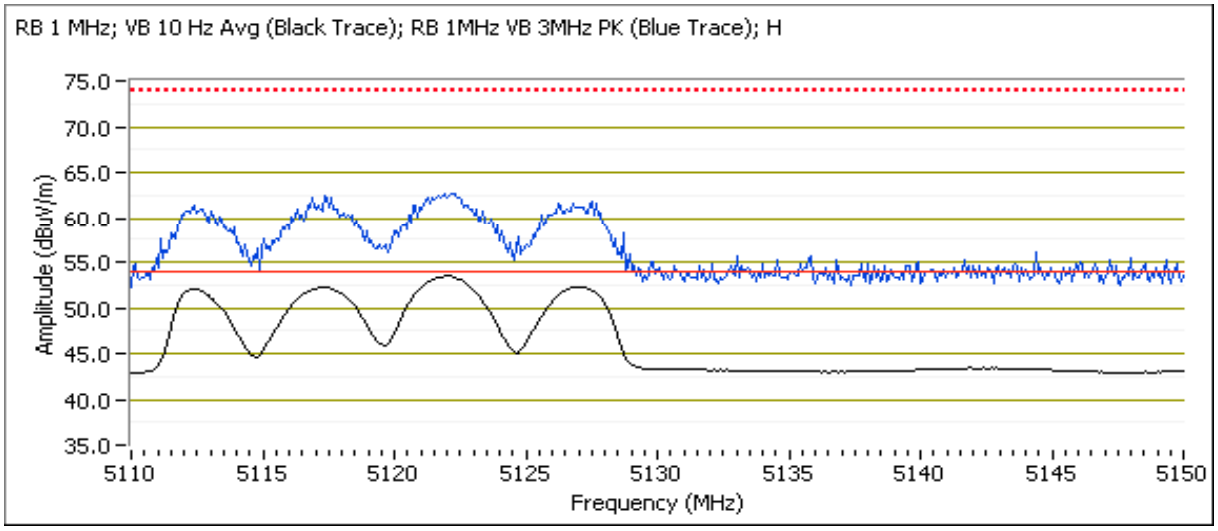


Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Channel: 56 - 5280MHz
Tx Chain: 3Tx
Mode: a
Data Rate: 6 Mbps

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	
5121.940	53.4	H	54.0	-0.6	AVG	336	1.0	POS; RB 1 MHz; VB: 10 Hz
5121.340	63.1	H	74.0	-10.9	PK	336	1.0	POS; RB 1 MHz; VB: 3 MHz
5121.940	50.7	V	54.0	-3.3	AVG	294	1.4	POS; RB 1 MHz; VB: 10 Hz
5121.140	60.1	V	74.0	-13.9	PK	294	1.4	POS; RB 1 MHz; VB: 3 MHz

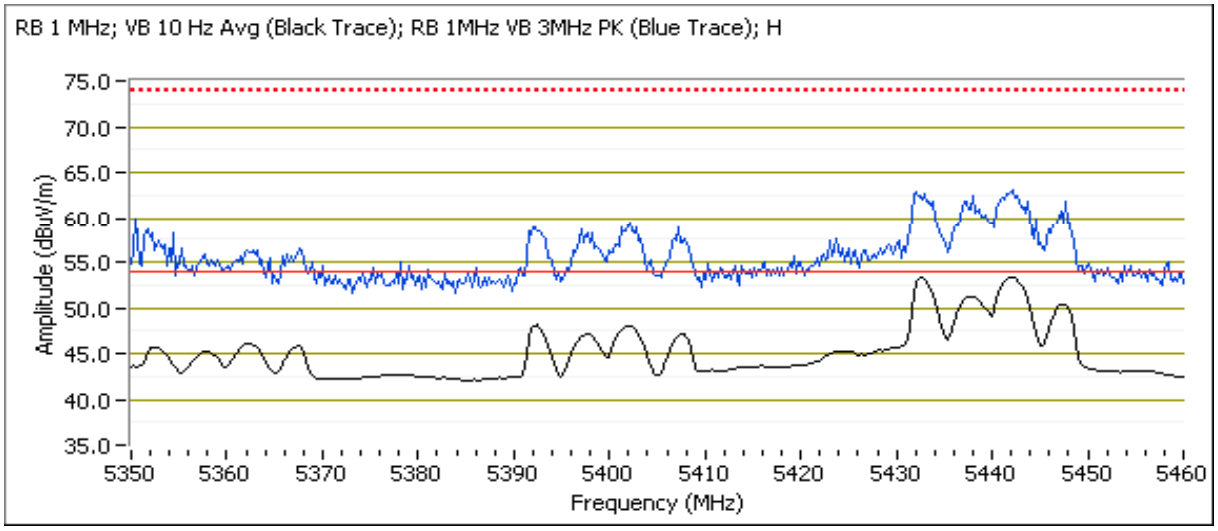


Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Channel: 64 - 5320MHz
Tx Chain: 3Tx
Mode: a
Data Rate: 6 Mbps

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	
5432.340	53.4	H	54.0	-0.6	AVG	359	1.0	POS; RB 1 MHz; VB: 10 Hz
5441.720	62.9	H	74.0	-11.1	PK	359	1.0	POS; RB 1 MHz; VB: 3 MHz
5438.300	49.9	V	54.0	-4.1	AVG	87	1.2	POS; RB 1 MHz; VB: 10 Hz
5438.060	59.2	V	74.0	-14.8	PK	87	1.2	POS; RB 1 MHz; VB: 3 MHz

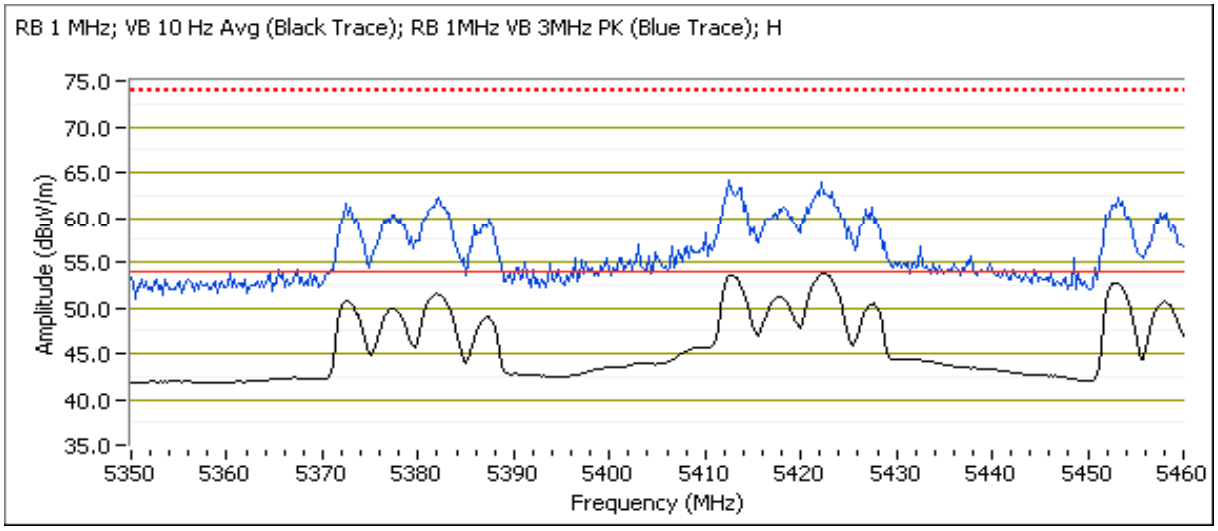


Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Channel: 60 - 5300MHz
Tx Chain: 3Tx
Mode: a
Data Rate: 6 Mbps

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	
5422.260	53.8	H	54.0	-0.2	AVG	6	1.0	POS; RB 1 MHz; VB: 10 Hz
5413.450	63.9	H	74.0	-10.1	PK	6	1.0	POS; RB 1 MHz; VB: 3 MHz
5459.050	50.8	V	54.0	-3.2	AVG	71	1.0	POS; RB 1 MHz; VB: 10 Hz
5459.200	59.8	V	74.0	-14.2	PK	71	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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, 5470-5725MHz

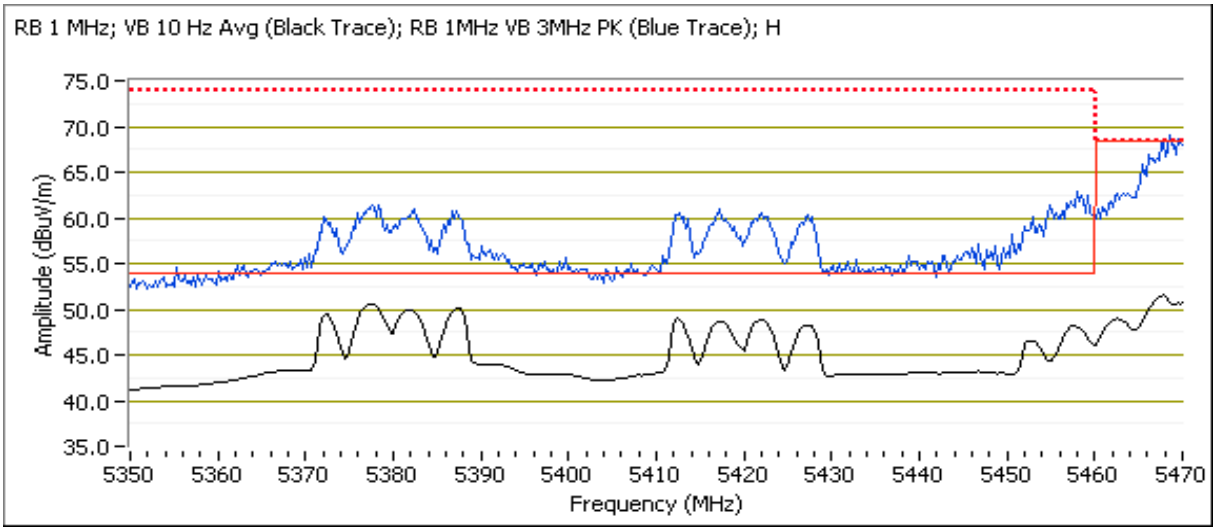
Date of Test: 03/02/16
Test Engineer: Rafael Varelas
Test Location: FT Chamber #4
EUT Voltage: 120V/60Hz
Channel: 100 - 5500MHz
Tx Chain: 3Tx
Mode: a
Data Rate: 6 Mbps

5460 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5377.660	50.5	H	54.0	-3.5	AVG	4	1.0	POS; RB 1 MHz; VB: 10 Hz
5382.220	60.4	H	74.0	-13.6	PK	4	1.0	POS; RB 1 MHz; VB: 3 MHz
5377.980	48.6	V	54.0	-5.4	AVG	81	1.2	POS; RB 1 MHz; VB: 10 Hz
5383.990	59.0	V	74.0	-15.0	PK	81	1.2	POS; RB 1 MHz; VB: 3 MHz

5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5467.560	51.9	H	54.0	-2.1	AVG	4	1.0	POS; RB 1 MHz; VB: 10 Hz
5469.200	69.6	H	74.0	-4.4	PK	4	1.0	POS; RB 1 MHz; VB: 3 MHz
5467.860	46.8	V	54.0	-7.2	AVG	81	1.2	POS; RB 1 MHz; VB: 10 Hz
5467.640	61.8	V	74.0	-12.2	PK	81	1.2	POS; RB 1 MHz; VB: 3 MHz

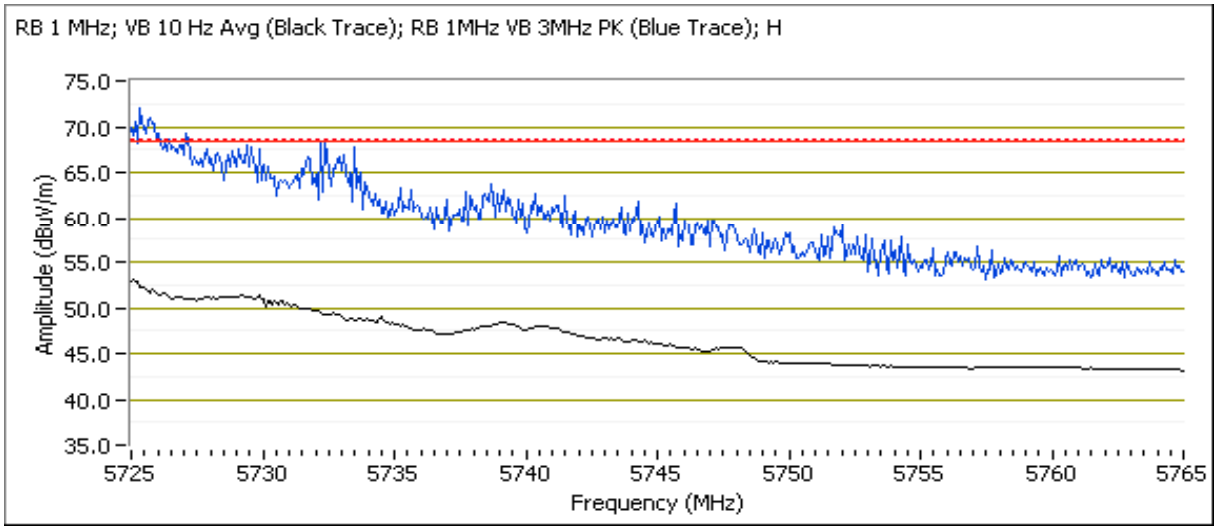


Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Channel: 140 - 5700MHz
Tx Chain: 3Tx
Mode: a
Data Rate: 6 Mbps

5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5725.300	53.3	H	54.0	-0.7	AVG	149	1.0	POS; RB 1 MHz; VB: 10 Hz
5725.340	72.3	H	74.0	-1.7	PK	149	1.0	POS; RB 1 MHz; VB: 3 MHz
5725.030	53.2	V	54.0	-0.8	AVG	120	1.0	POS; RB 1 MHz; VB: 10 Hz
5726.800	70.9	V	74.0	-3.1	PK	120	1.0	POS; RB 1 MHz; VB: 3 MHz

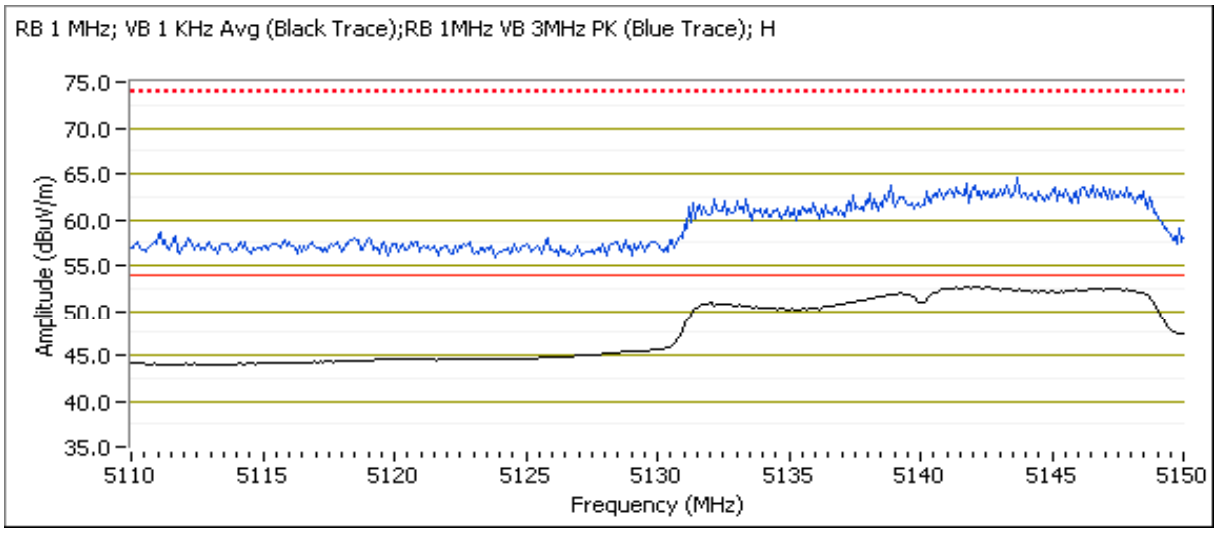


Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #3: Radiated Bandedge Measurements, 5250-5350MHz

Date of Test: 05/13/16
Test Engineer: Joseph Cadigal
Test Location: FT Chamber#4
EUT Voltage: 120V/60Hz

Channel: 52 - 5260MHz
Tx Chain: 3x3
Mode: n20
Data Rate: VHT8



5150 MHz Band Edge Signal Radiated Field Strength

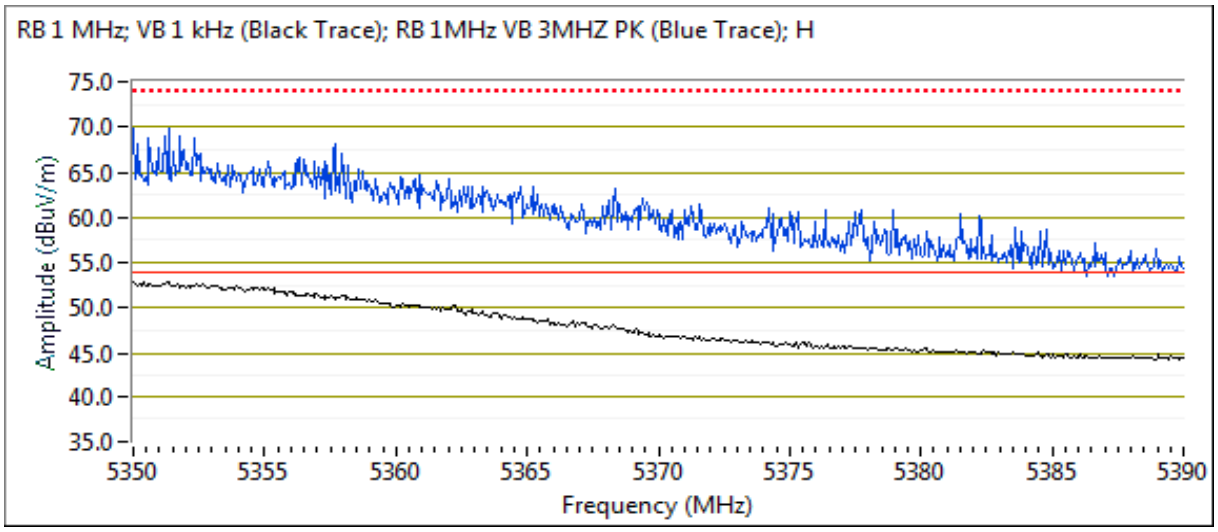
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5141.820	52.7	H	54.0	-1.3	AVG	330	1.2	POS; RB 1 MHz; VB: 1 kHz
5148.640	64.9	H	74.0	-9.1	PK	330	1.2	POS; RB 1 MHz; VB: 3 MHz
5141.740	47.1	V	54.0	-6.9	AVG	240	1.0	POS; RB 1 MHz; VB: 1 kHz
5143.030	58.1	V	74.0	-15.9	PK	240	1.0	POS; RB 1 MHz; VB: 3 MHz

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Date of Test: 05/17/17
Test Engineer: David Bare

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

Channel: 64 - 5320MHz
Tx Chain: 3x3
Mode: n20
Data Rate: VHT8



5350 MHz Band Edge Signal Radiated Field Strength

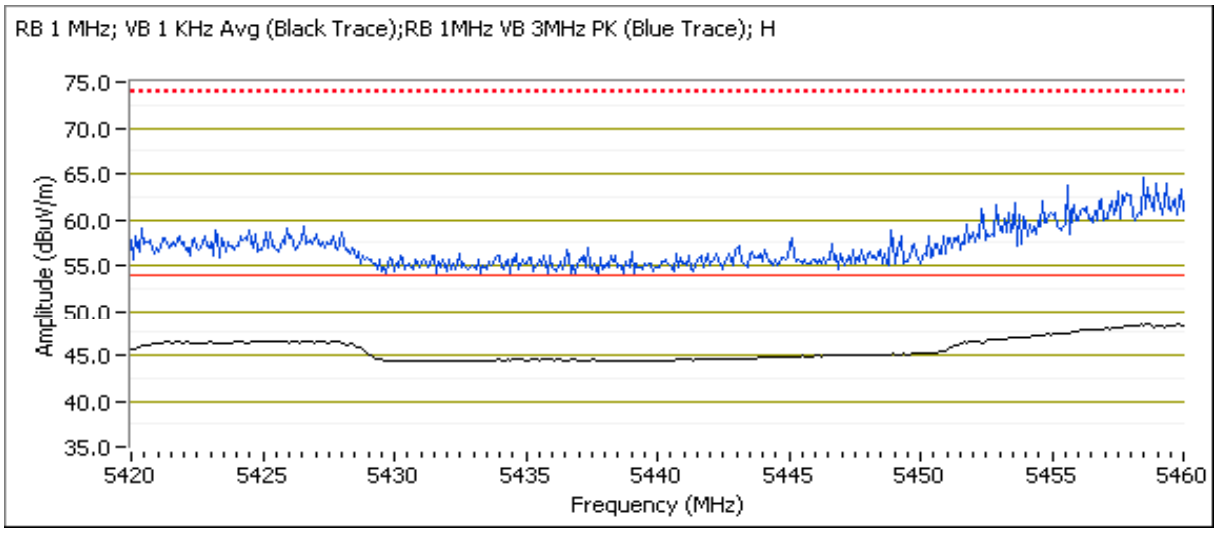
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.000	53.2	H	54.0	-0.8	AVG	353	1.3	RB 1 MHz;VB 1 kHz;Peak
5350.060	70.4	H	74.0	-3.6	PK	353	1.3	RB 1 MHz;VB 3 MHz;Peak
5350.730	52.4	V	54.0	-1.6	AVG	358	1.3	RB 1 MHz;VB 1 kHz;Peak
5351.330	69.3	V	74.0	-4.7	PK	358	1.3	RB 1 MHz;VB 3 MHz;Peak

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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, 5470-5725MHz

Date of Test: 05/17/16
Test Engineer: Joseph Cadigal
Test Location: FT Chamber#4
EUT Voltage: 120V/60Hz

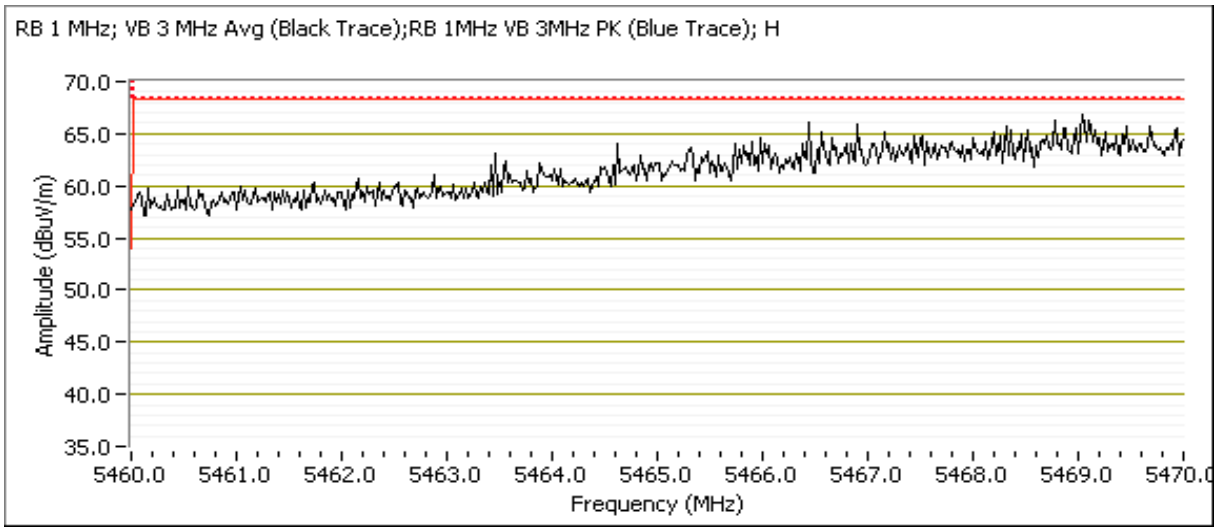
Channel: 100 - 5500MHz
Tx Chain: 3x3
Mode: n20
Data Rate: VHT8



5460 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5459.200	48.3	H	54.0	-5.7	AVG	342	2.2	Setting = 19.5
5459.040	64.8	H	74.0	-9.2	PK	342	2.2	Setting = 19.5
5458.560	47.0	V	54.0	-7.0	AVG	95	1.0	Setting = 19.5
5425.450	57.9	V	74.0	-16.1	PK	95	1.0	Setting = 19.5

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

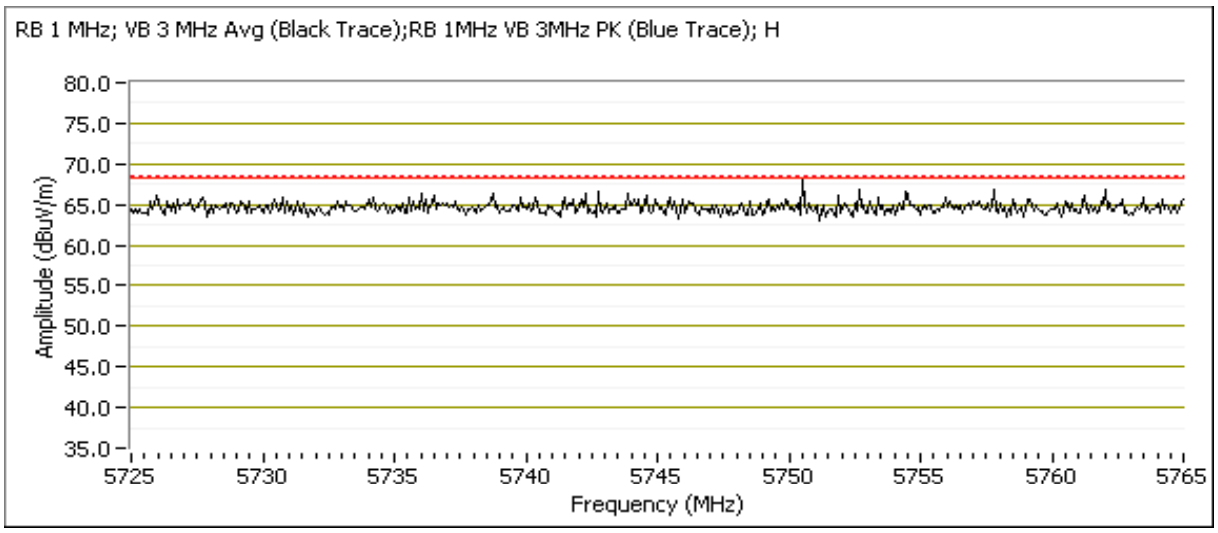


5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5466.490	67.1	V	68.3	-1.2	PK	95	1.0	Setting = 19.5
5468.500	63.4	H	68.3	-4.9	PK	342	2.2	Setting = 19.5

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Channel: 140 - 5700MHz
Tx Chain: 3x3
Mode: n20
Data Rate: VHT8



5725 MHz Band Edge Signal Radiated Field Strength

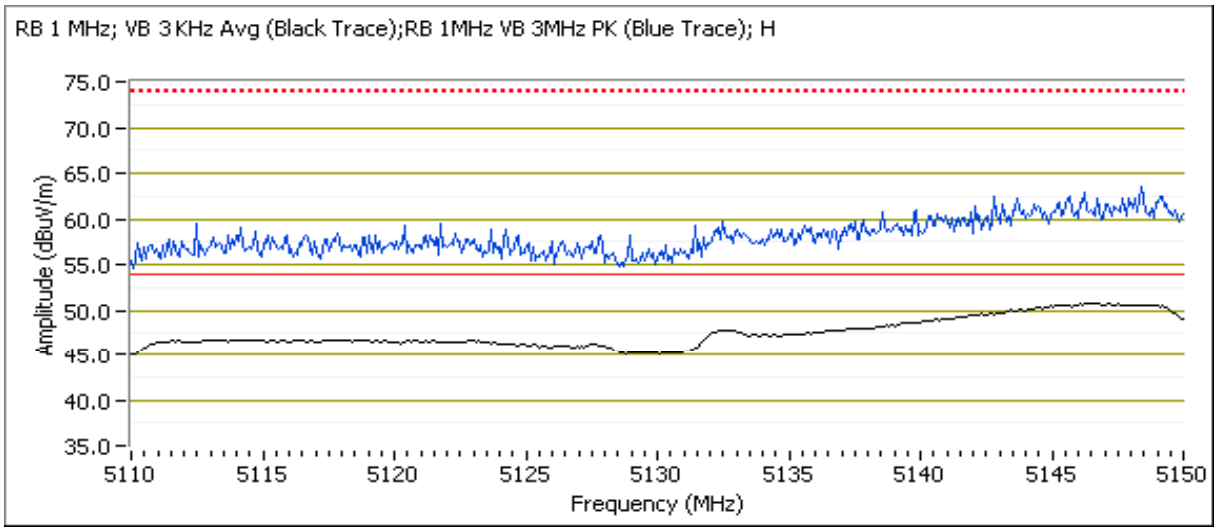
Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5752.580	68.1	V	68.3	-0.2	PK	159	1.0	POS; RB 1 MHz; VB: 3 MHz
5763.560	66.2	H	68.3	-2.1	PK	51	1.1	POS; RB 1 MHz; VB: 3 MHz

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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: 05/17/16
Test Engineer: Joseph Cadigal
Test Location: FT Chamber#4
EUT Voltage: 120V/60Hz

Channel: 54 - 5270MHz
Tx Chain: 3x3
Mode: n40
Data Rate: VHT9

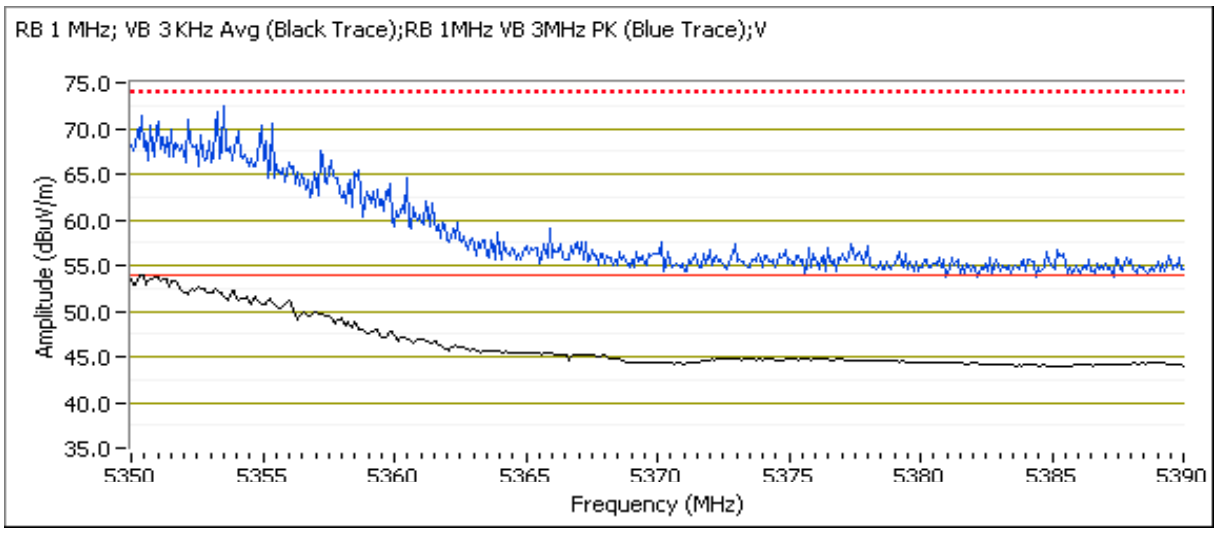


5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5146.390	50.8	H	54.0	-3.2	AVG	285	1.0	POS; RB 1 MHz; VB: 3 kHz
5147.270	61.6	H	74.0	-12.4	PK	285	1.0	POS; RB 1 MHz; VB: 3 MHz
5144.630	47.8	V	54.0	-6.2	AVG	262	1.4	POS; RB 1 MHz; VB: 3 kHz
5140.700	59.0	V	74.0	-15.0	PK	262	1.4	POS; RB 1 MHz; VB: 3 MHz

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Channel: 62 - 5310MHz
Tx Chain: 3x3
Mode: n40
Data Rate: VHT9



5350 MHz Band Edge Signal Radiated Field Strength

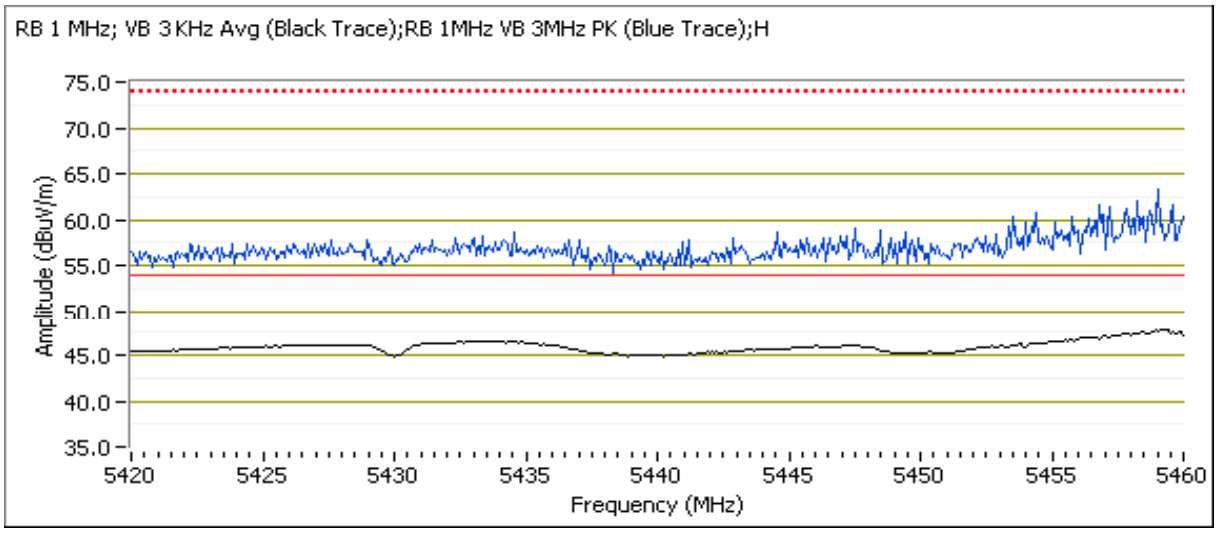
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.640	53.9	V	54.0	-0.1	AVG	261	1.0	Setting = 15.5
5353.930	72.5	V	74.0	-1.5	PK	261	1.0	Setting = 15.5
5350.320	53.2	H	54.0	-0.8	AVG	182	1.4	Setting = 15.5
5352.730	67.9	H	74.0	-6.1	PK	182	1.4	Setting = 15.5

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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, 5470-5725MHz

Date of Test: 05/17/16
Test Engineer: Joseph Cadigal
Test Location: FT Chamber#4
EUT Voltage: 120V/60Hz

Channel: 102 - 5510MHz
Tx Chain: 3x3
Mode: n40
Data Rate: VHT9



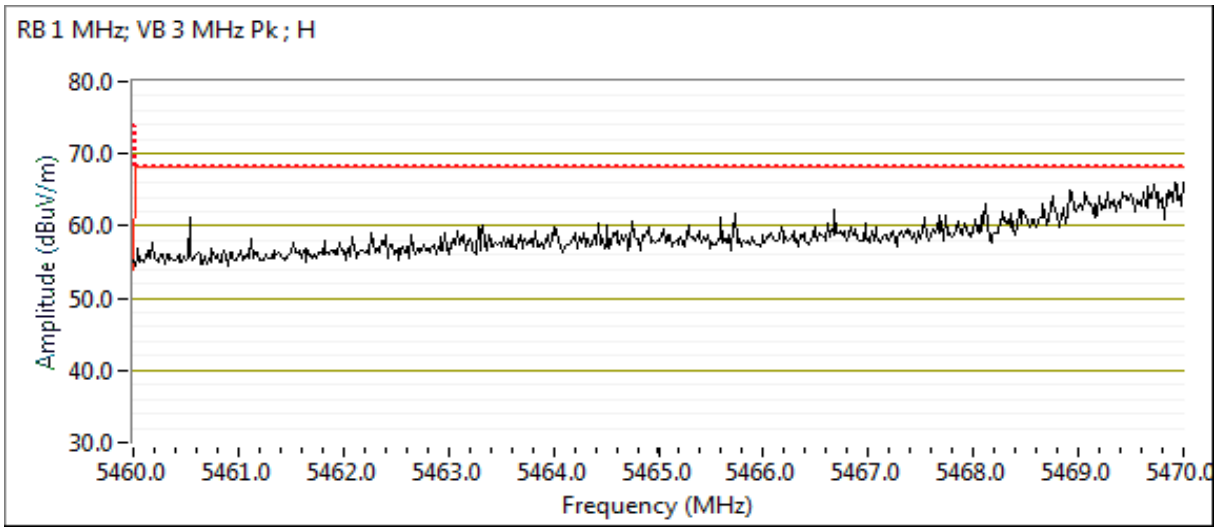
5460 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5459.760	48.1	H	54.0	-5.9	AVG	351	1.0	POS; RB 1 MHz; VB: 3 kHz
5457.920	61.5	H	74.0	-12.5	PK	351	1.0	POS; RB 1 MHz; VB: 3 MHz
5459.840	46.4	V	54.0	-7.6	AVG	79	1.3	POS; RB 1 MHz; VB: 3 kHz
5459.440	57.9	V	74.0	-16.1	PK	79	1.3	POS; RB 1 MHz; VB: 3 MHz

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Date of Test: 05/17/17
Test Engineer: David Bare

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

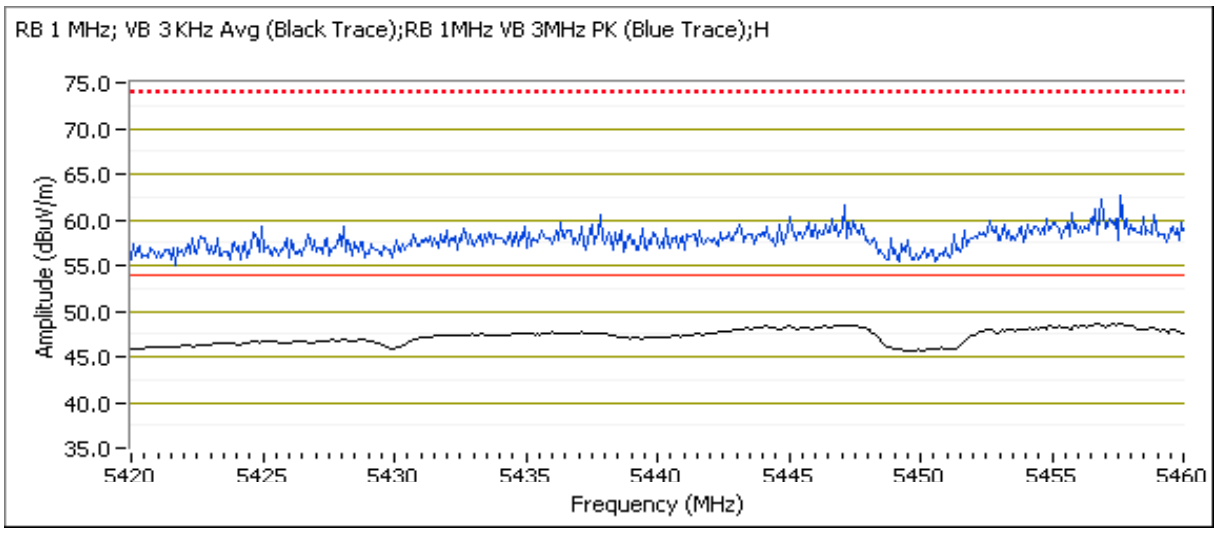


5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5469.840	66.2	H	68.3	-2.1	PK	351	1.0	Setting = 16.5
5469.210	66.1	V	68.3	-2.2	PK	356	1.0	Setting = 16.5

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

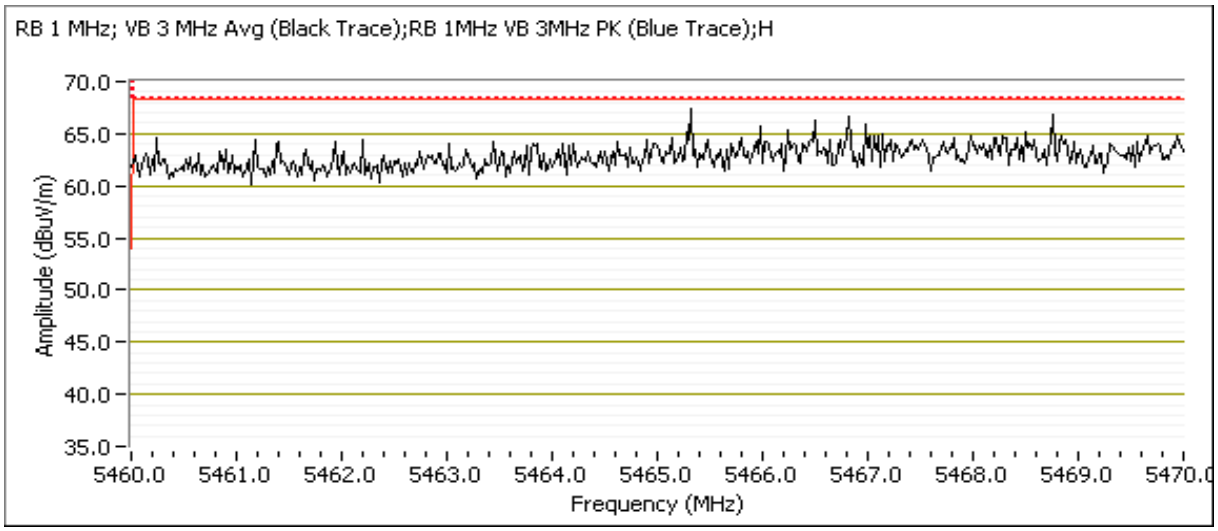
Channel: 110 - 5550MHz
Tx Chain: 3x3
Mode: n40
Data Rate: VHT9



5460 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5457.520	48.7	H	54.0	-5.3	AVG	352	1.0	POS; RB 1 MHz; VB: 3 kHz
5459.680	62.1	H	74.0	-11.9	PK	352	1.0	POS; RB 1 MHz; VB: 3 MHz
5424.650	46.5	V	54.0	-7.5	AVG	85	1.3	POS; RB 1 MHz; VB: 3 kHz
5435.470	57.6	V	74.0	-16.4	PK	85	1.3	POS; RB 1 MHz; VB: 3 MHz

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

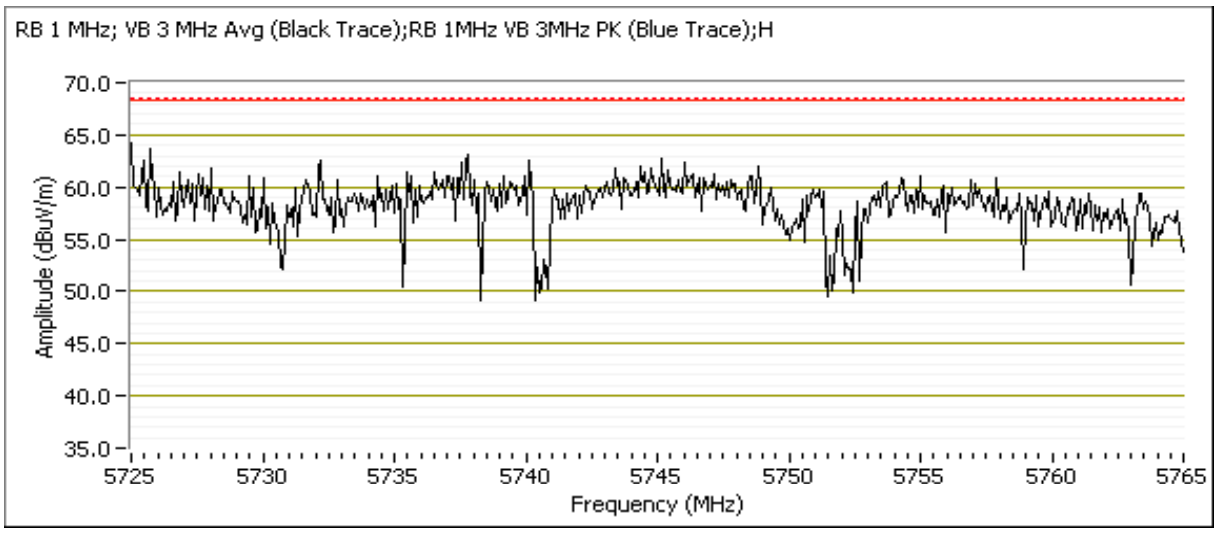


5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5465.050	67.7	H	68.3	-0.6	Pk	352	1.0	POS; RB 1 MHz; VB: 3 MHz
5467.800	67.6	V	68.3	-0.7	Pk	78	1.0	POS; RB 1 MHz; VB: 3 MHz

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Channel: 134 - 5670MHz
Tx Chain: 3x3
Mode: n40
Data Rate: VHT9



5725 MHz Band Edge Signal Radiated Field Strength

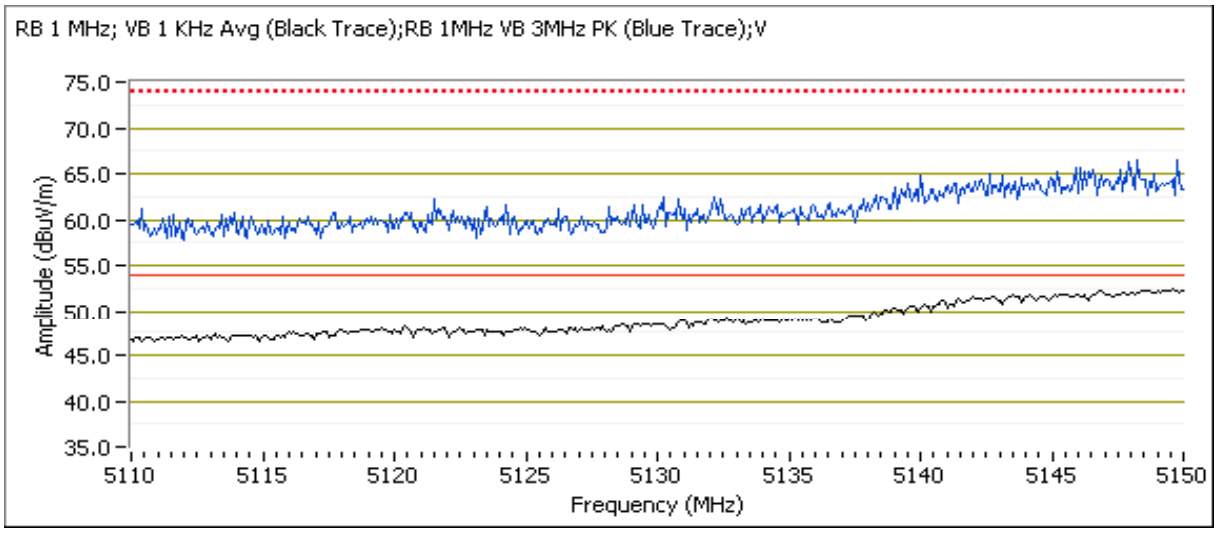
Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5743.120	64.3	H	68.3	-4.0	Pk	183	1.4	POS; RB 1 MHz; VB: 3 MHz
5728.850	63.3	V	68.3	-5.0	Pk	65	1.0	POS; RB 1 MHz; VB: 3 MHz

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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, 5250-5350MHz

Date of Test: 05/17/16
Test Engineer: Joseph Cadigal
Test Location: FT Chamber#4
EUT Voltage: 120V/60Hz

Channel: 58 - 5290MHz
Tx Chain: 3x3
Mode: ac80
Data Rate: VHT9

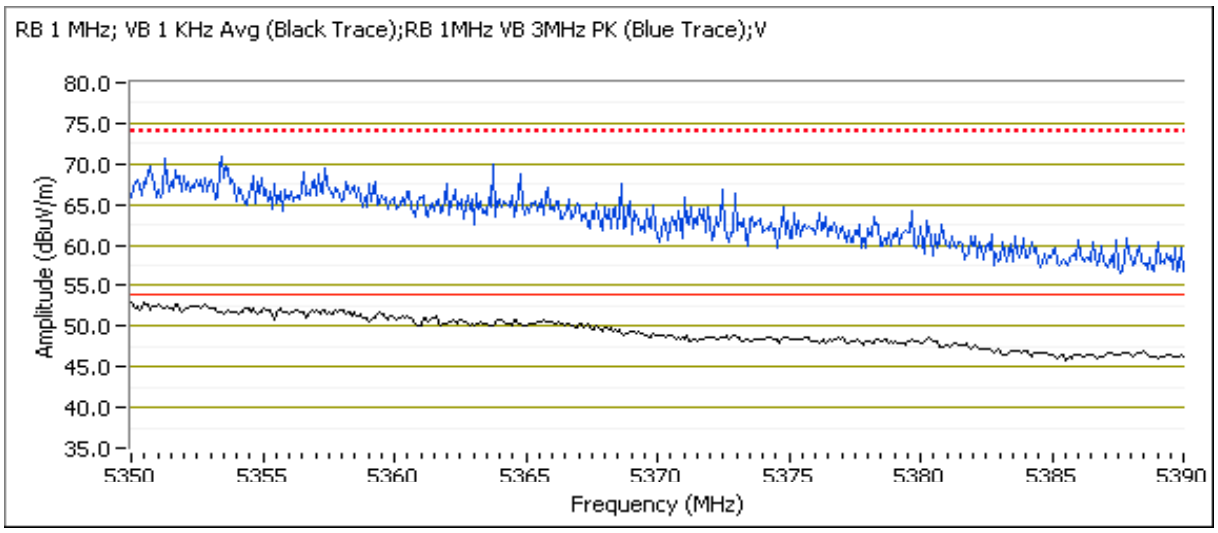


5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.920	52.5	V	54.0	-1.5	AVG	264	1.4	POS; RB 1 MHz; VB: 3 kHz
5147.030	66.2	V	74.0	-7.8	PK	264	1.4	POS; RB 1 MHz; VB: 3 MHz
5146.790	51.8	H	54.0	-2.2	AVG	183	1.5	POS; RB 1 MHz; VB: 3 kHz
5149.520	63.8	H	74.0	-10.2	PK	183	1.5	POS; RB 1 MHz; VB: 3 MHz

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Channel: 58 - 5290MHz
Tx Chain: 3x3
Mode: ac80
Data Rate: VHT9



5350 MHz Band Edge Signal Radiated Field Strength

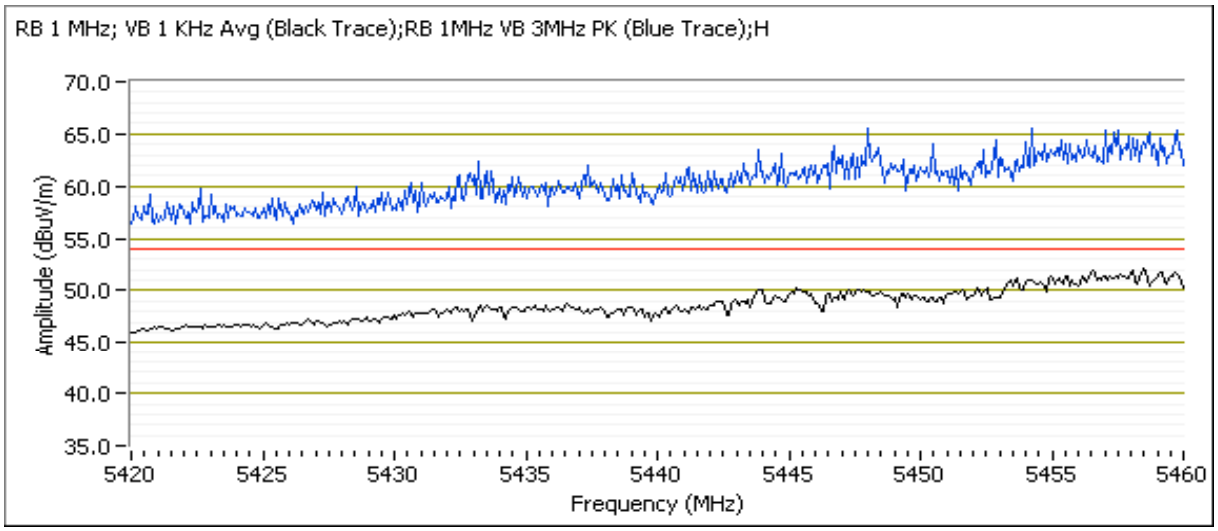
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5351.280	53.3	V	54.0	-0.7	AVG	264	1.4	Setting = 16.5
5369.560	70.3	V	74.0	-3.7	PK	264	1.4	Setting = 16.5
5351.360	52.1	H	54.0	-1.9	AVG	183	1.5	Setting = 16.5
5359.140	69.2	H	74.0	-4.8	PK	183	1.5	Setting = 16.5

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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, 5470-5725MHz

Date of Test: 05/17/16
Test Engineer: Joseph Cadigal
Test Location: FT Chamber#4
EUT Voltage: 120V/60Hz

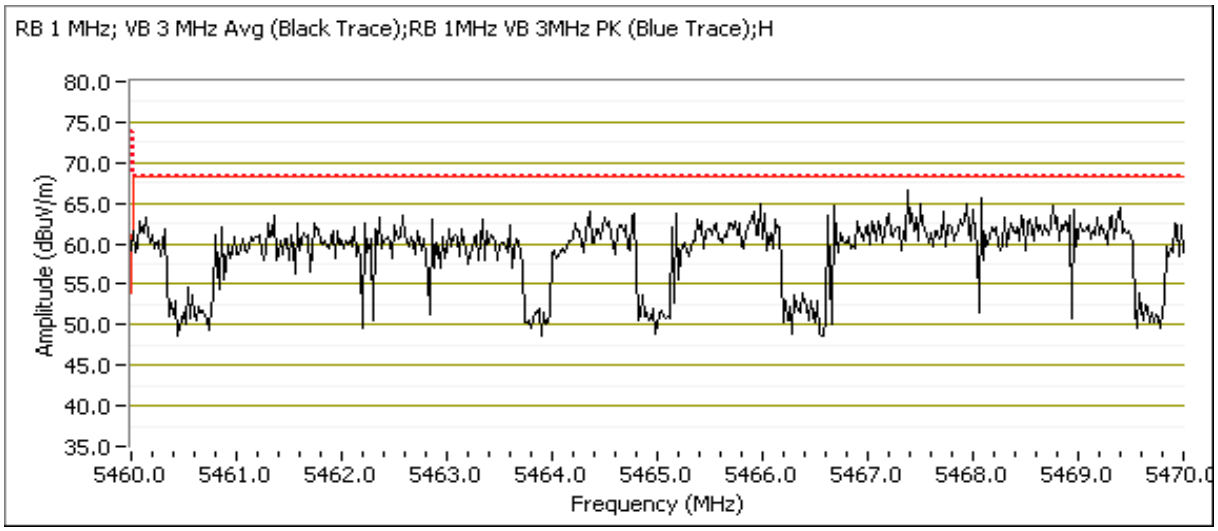
Channel: 106 - 5530MHz
Tx Chain: 3x3
Mode: ac80
Data Rate: VHT9



5460 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5457.110	52.4	H	54.0	-1.6	AVG	0	1.0	Setting = 16.5
5458.000	65.1	H	74.0	-8.9	PK	0	1.0	Setting = 16.5
5458.000	45.4	V	54.0	-8.6	AVG	359	1.0	Setting = 16.5
5420.080	56.6	V	74.0	-17.4	PK	359	1.0	Setting = 16.5

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

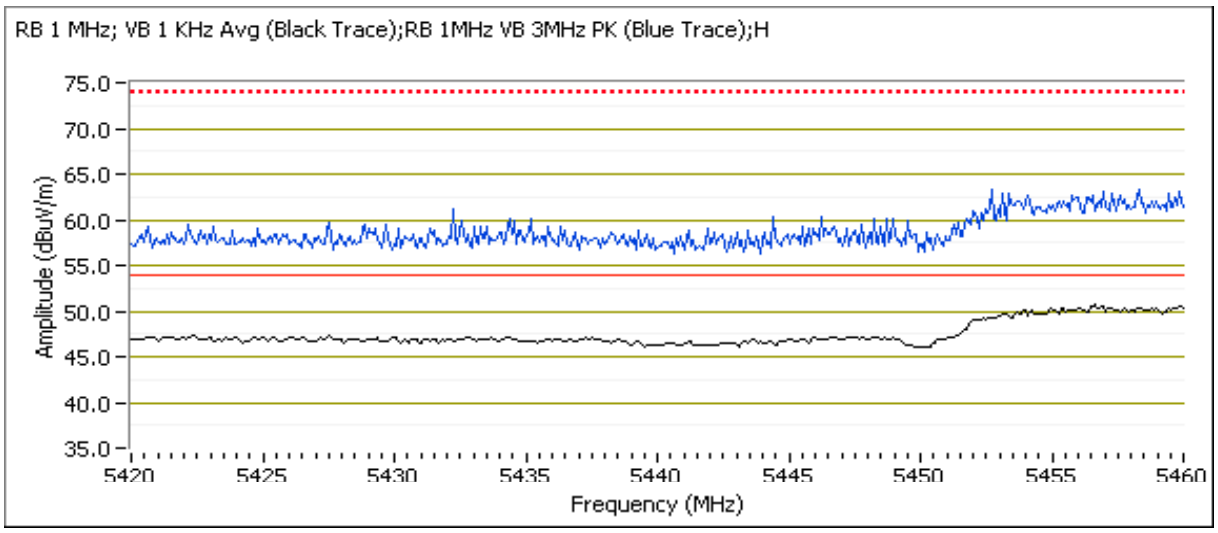


5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5464.4700	66.8	H	68.3	-1.5	Pk	0	1.0	Setting = 16.5
5468.080	57.4	V	68.3	-10.9	PK	360	1.0	Setting = 16.5

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

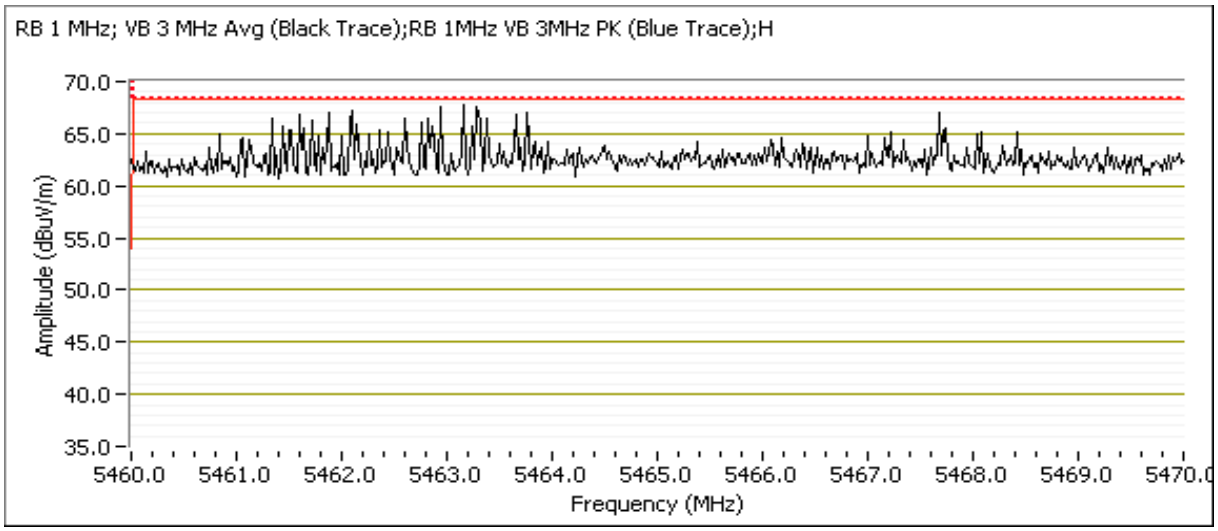
Channel: 122 - 5610MHz
Tx Chain: 3x3
Mode: ac80
Data Rate: VHT9



5460 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5458.240	50.7	H	54.0	-3.3	AVG	358	1.0	POS; RB 1 MHz; VB: 3 kHz
5456.390	62.8	H	74.0	-11.2	PK	358	1.0	POS; RB 1 MHz; VB: 3 MHz
5459.120	48.7	V	54.0	-5.3	AVG	64	1.0	POS; RB 1 MHz; VB: 3 kHz
5456.630	59.7	V	74.0	-14.3	PK	64	1.0	POS; RB 1 MHz; VB: 3 MHz

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

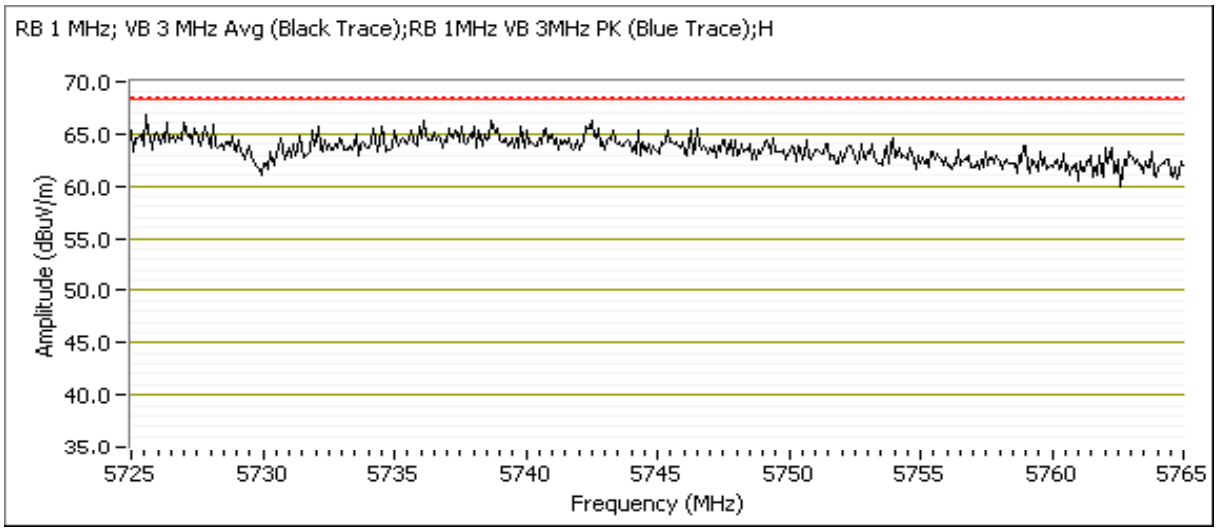


5470 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5462.670	68.0	H	68.3	-0.3	Pk	358	1.0	POS; RB 1 MHz; VB: 3 MHz
5460.440	60.0	V	68.3	-8.3	Pk	63	1.0	POS; RB 1 MHz; VB: 3 MHz

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Channel: 122 - 5610MHz
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	
5741.590	67.1	H	68.3	-1.2	Pk	0	1.0	POS; RB 1 MHz; VB: 3 MHz
5752.580	66.9	V	68.3	-1.4	Pk	346	1.0	POS; RB 1 MHz; VB: 3 MHz

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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: 20-23 °C
Rel. Humidity: 35-40 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Summary of Results

Run #	Mode	Channel	Target Power	Passing Power	Test Performed	Limit	Result / Margin
Scans on "center" channel in all four OFDM modes to determine the worst case mode.							
3	a	60 - 5300MHz	21.5	21.5	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.3 dBµV/m @ 5454.1 MHz (-0.7 dB)
	ac20	60 - 5300MHz	21.5	19.5	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.0 dBµV/m @ 5418.6 MHz (-1.0 dB)
	ac40	54 - 5270MHz	21.5	19.5	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.8 dBµV/m @ 5359.6 MHz (-1.2 dB)
	ac80	58 - 5290MHz	21.5	17.5	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.5 dBµV/m @ 5372.4 MHz (-1.5 dB)
Measurements on low and high channels in worst-case OFDM mode.							
4	ac20	52 - 5260MHz	21.5	16.0	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.5 dBµV/m @ 5426.3 MHz (-0.5 dB)
	ac20	64 - 5320MHz	21.5	18.5	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	53.1 dBµV/m @ 5433.6 MHz (-0.9 dB)
Scans on "center" channel in all four OFDM modes to determine the worst case mode.							
5	a	116 - 5580MHz	21.5	21.5	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	50.5 dBµV/m @ 5114.2 MHz (-3.5 dB)
	n20	116 - 5580MHz	21.5	21.5	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.5 dBµV/m @ 5113.1 MHz (-1.5 dB)
	n40	110 - 5550MHz	21.5	21.5	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	61.6 dBµV/m @ 5323.9 MHz (-6.7 dB)
	ac80	106 - 5530MHz	21.5	21.5	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	62.7 dBµV/m @ 5322.1 MHz (-5.6 dB)
Measurements on low and high channels in worst-case OFDM mode.							
6	n20	100 - 5500MHz	21.5	21.5	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	51.5 dBµV/m @ 5039.9 MHz (-2.5 dB)
	n20	144- 5720MHz	21.5	18.0	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	67.7 dBµV/m @ 5885.5 MHz (-0.6 dB)

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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)	
11a	6 Mb/s	98.0%	Yes	1.302	0	0	10	
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: Internal 3x3 Beamforming (802.11a mode does not do 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)

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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 5250-5350 MHz Band

Date of Test: 3/4/2016 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

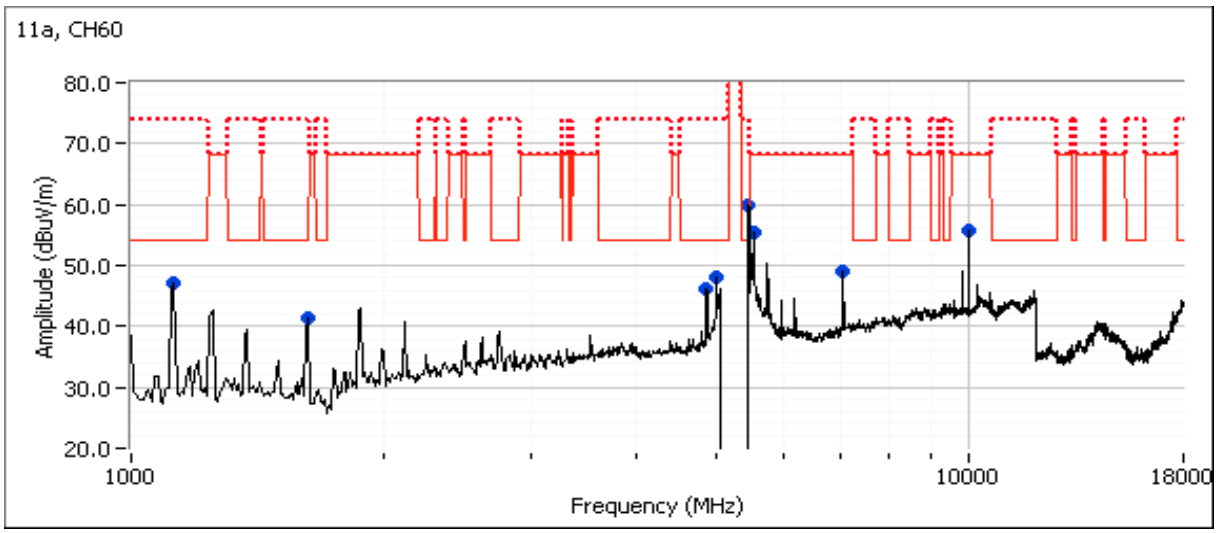
Channel: 60 Mode: a

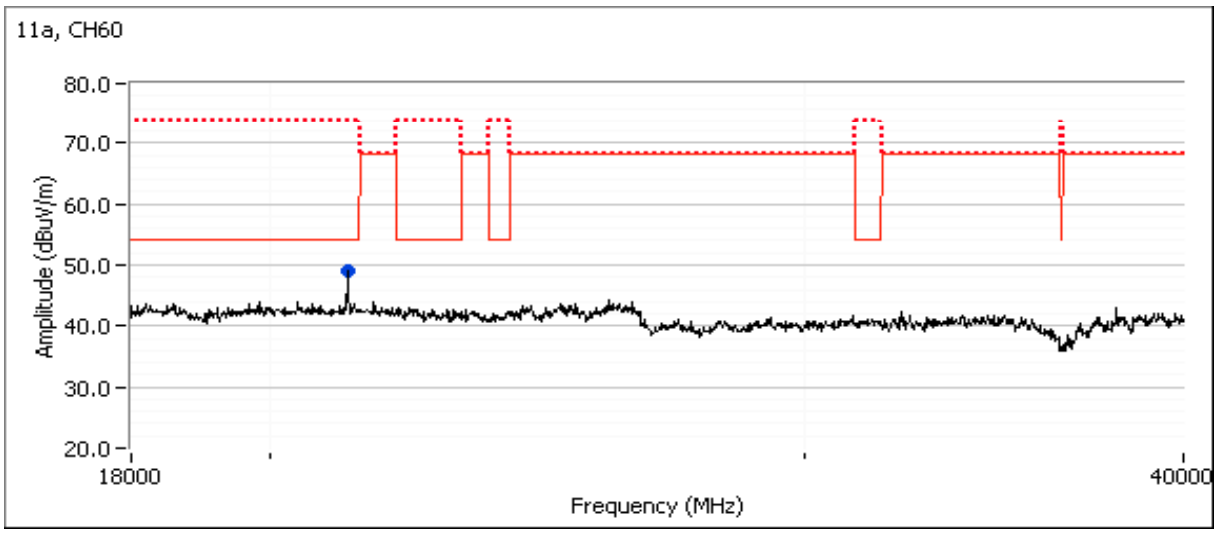
Tx Chain: 3x3 Data Rate: 6 Mb/s

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5454.080	53.3	H	54.0	-0.7	AVG	173	1.0	POS; RB 1 MHz; VB: 10 Hz
5453.690	62.3	H	74.0	-11.7	PK	173	1.0	POS; RB 1 MHz; VB: 3 MHz
1125.040	46.8	H	54.0	-7.2	AVG	115	1.3	RB 1 MHz;VB 10 Hz;Peak
1125.050	49.0	H	74.0	-25.0	PK	115	1.3	RB 1 MHz;VB 3 MHz;Peak
1625.060	40.6	V	54.0	-13.4	AVG	138	1.7	RB 1 MHz;VB 10 Hz;Peak
1625.110	43.7	V	74.0	-30.3	PK	138	1.7	RB 1 MHz;VB 3 MHz;Peak
7066.410	53.6	H	68.3	-14.7	PK	149	1.5	RB 1 MHz;VB 3 MHz;Peak
4999.960	46.8	V	54.0	-7.2	AVG	259	1.8	RB 1 MHz;VB 10 Hz;Peak
4999.850	51.6	V	74.0	-22.4	PK	259	1.8	RB 1 MHz;VB 3 MHz;Peak
4858.240	46.7	H	54.0	-7.3	AVG	323	1.0	RB 1 MHz;VB 10 Hz;Peak
4857.240	56.6	H	74.0	-17.4	PK	323	1.0	RB 1 MHz;VB 3 MHz;Peak
21203.970	42.7	V	54.0	-11.3	AVG	331	1.8	RB 1 MHz;VB 10 Hz;Peak
21194.970	56.6	V	74.0	-17.4	PK	331	1.8	RB 1 MHz;VB 3 MHz;Peak
9999.990	59.1	V	68.3	-9.2	PK	324	2.1	RB 1 MHz;VB 3 MHz;Peak
5542.180	64.3	H	68.3	-4.0	PK	334	1.0	RB 1 MHz;VB 3 MHz;Peak

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). 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 (260-E255040)	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 (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

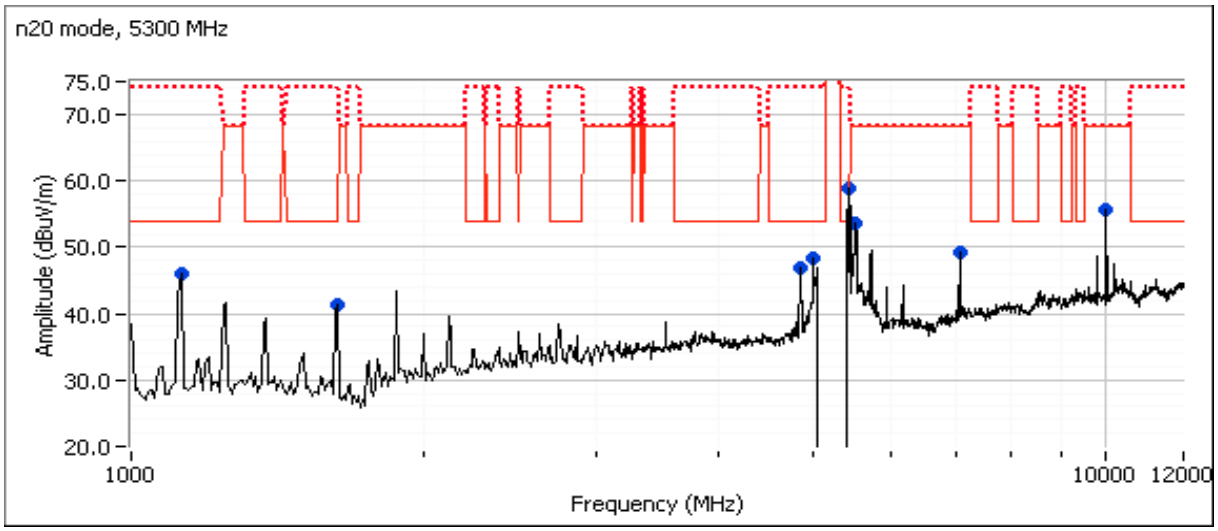
Run #3b: Center Channel

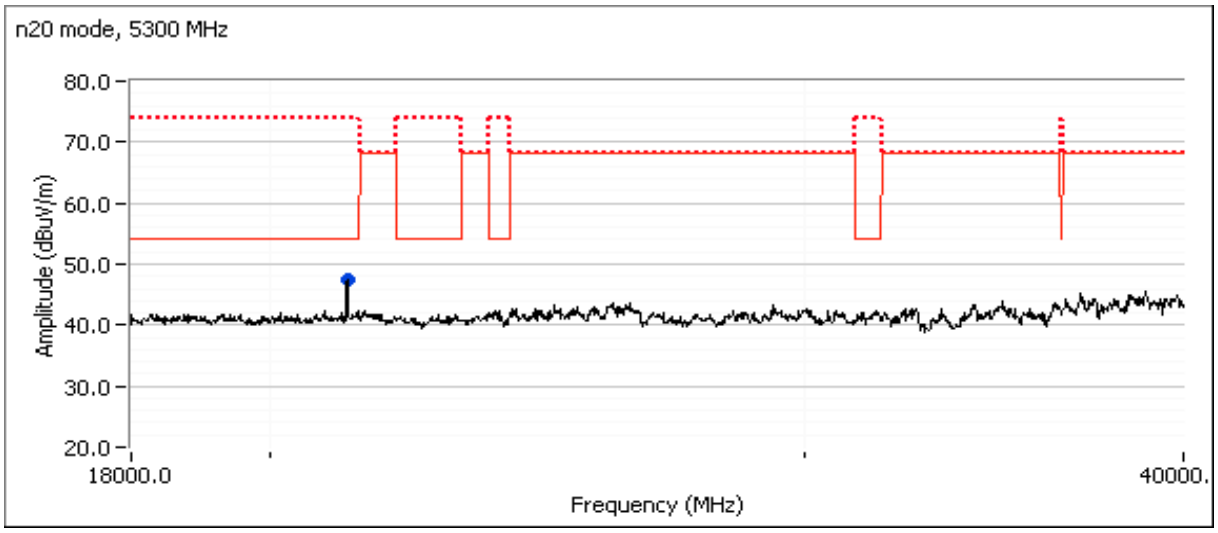
Channel: 60 Mode: 11n20
Tx Chain: 3x3 Data Rate: VHT8

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5418.580	53.0	H	54.0	-1.0	AVG	185	1.4	RB 1 MHz;VB 1 kHz;Peak
5411.840	64.3	H	74.0	-9.7	PK	185	1.4	RB 1 MHz;VB 3 MHz;Peak
5453.700	53.0	H	54.0	-1.0	AVG	357	1.2	RB 1 MHz;VB 1 kHz;Peak
5453.500	63.3	H	74.0	-10.7	PK	357	1.2	RB 1 MHz;VB 3 MHz;Peak
4854.420	45.8	H	54.0	-8.2	AVG	346	1.0	RB 1 MHz;VB 1 kHz;Peak
4854.200	56.1	H	74.0	-17.9	PK	346	1.0	RB 1 MHz;VB 3 MHz;Peak
9999.780	58.5	V	68.3	-9.8	PK	322	2.0	RB 1 MHz;VB 3 MHz;Peak
4999.980	46.6	V	54.0	-7.4	AVG	259	1.9	RB 1 MHz;VB 1 kHz;Peak
4999.860	52.5	V	74.0	-21.5	PK	259	1.9	RB 1 MHz;VB 3 MHz;Peak
5535.150	62.8	H	68.3	-5.5	PK	152	1.0	RB 1 MHz;VB 3 MHz;Peak
7066.620	53.1	H	68.3	-15.2	PK	145	1.7	RB 1 MHz;VB 3 MHz;Peak
1625.080	39.5	V	54.0	-14.5	AVG	172	1.3	RB 1 MHz;VB 1 kHz;Peak
1625.160	42.4	V	74.0	-31.6	PK	172	1.3	RB 1 MHz;VB 3 MHz;Peak
1125.050	46.7	H	54.0	-7.3	AVG	116	1.3	RB 1 MHz;VB 1 kHz;Peak
1125.080	48.4	H	74.0	-25.6	PK	116	1.3	RB 1 MHz;VB 3 MHz;Peak
21202.540	39.0	V	54.0	-15.0	AVG	281	1.0	RB 1 MHz;VB 1 kHz;Peak
21188.140	51.0	V	74.0	-23.0	PK	281	1.0	RB 1 MHz;VB 3 MHz;Peak

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). 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 (260-E255040)	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 (260-E255040)	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

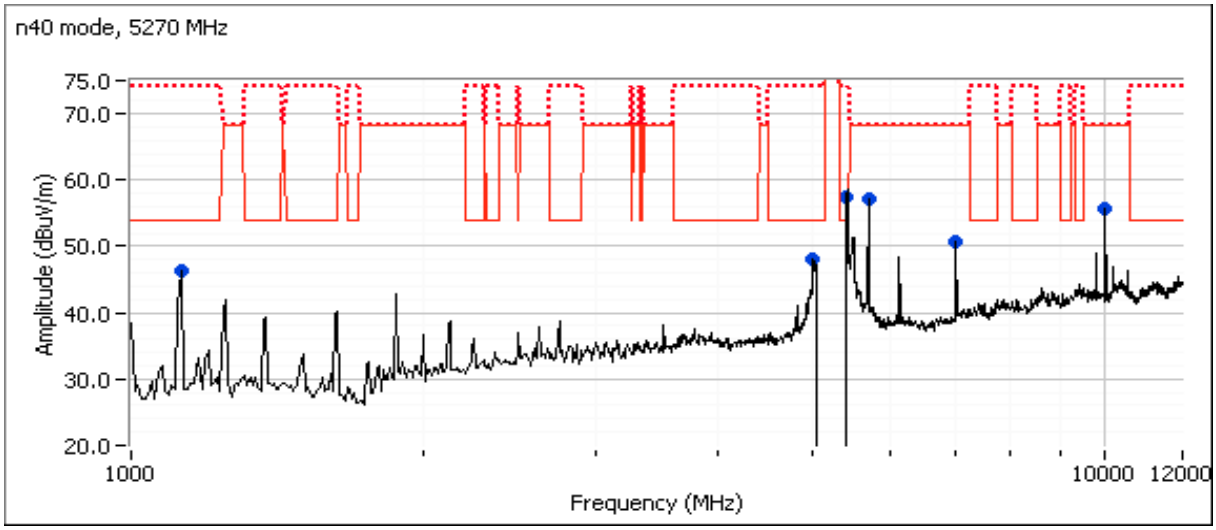
Channel: 54 Mode: 11ac40

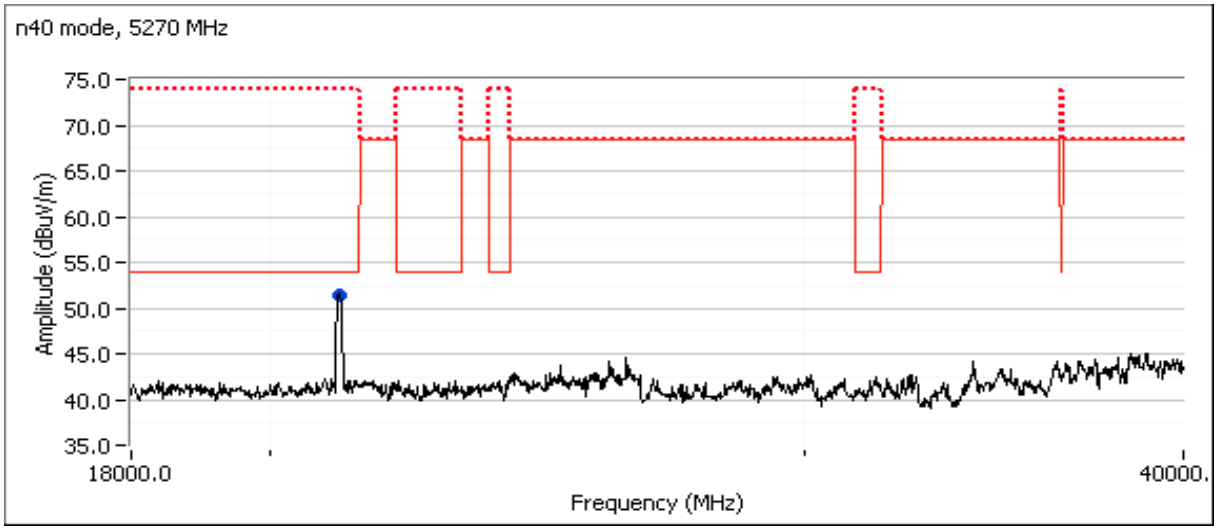
Tx Chain: 3x3 Data Rate: VHT9

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5444.010	52.7	H	54.0	-1.3	AVG	168	1.2	RB 1 MHz;VB 3 kHz;Peak
5442.700	63.3	H	74.0	-10.7	PK	168	1.2	RB 1 MHz;VB 3 MHz;Peak
5359.620	52.8	H	54.0	-1.2	AVG	169	1.8	POS; RB 1 MHz; VB: 3 kHz
5433.680	51.3	H	54.0	-2.7	AVG	172	1.3	POS; RB 1 MHz; VB: 3 kHz
4999.980	47.2	V	54.0	-6.8	AVG	252	2.0	RB 1 MHz;VB 3 kHz;Peak
5709.150	60.0	H	68.3	-8.3	PK	332	2.2	RB 1 MHz;VB 3 MHz;Peak
9999.840	59.7	V	68.3	-8.6	PK	329	2.1	RB 1 MHz;VB 3 MHz;Peak
5358.980	65.1	H	74.0	-8.9	PK	169	1.8	POS; RB 1 MHz; VB: 3 MHz
1125.040	44.1	V	54.0	-9.9	AVG	327	2.5	RB 1 MHz;VB 3 kHz;Peak
5434.130	61.1	H	74.0	-12.9	PK	172	1.3	POS; RB 1 MHz; VB: 3 MHz
7026.570	54.5	H	68.3	-13.8	PK	149	1.6	RB 1 MHz;VB 3 MHz;Peak
21088.000	39.4	V	54.0	-14.6	AVG	287	1.9	RB 1 MHz;VB 3 kHz;Peak
5000.040	52.5	V	74.0	-21.5	PK	252	2.0	RB 1 MHz;VB 3 MHz;Peak
21087.110	52.3	V	74.0	-21.7	PK	287	1.9	RB 1 MHz;VB 3 MHz;Peak
1125.060	47.6	V	74.0	-26.4	PK	327	2.5	RB 1 MHz;VB 3 MHz;Peak

Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). 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 (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A





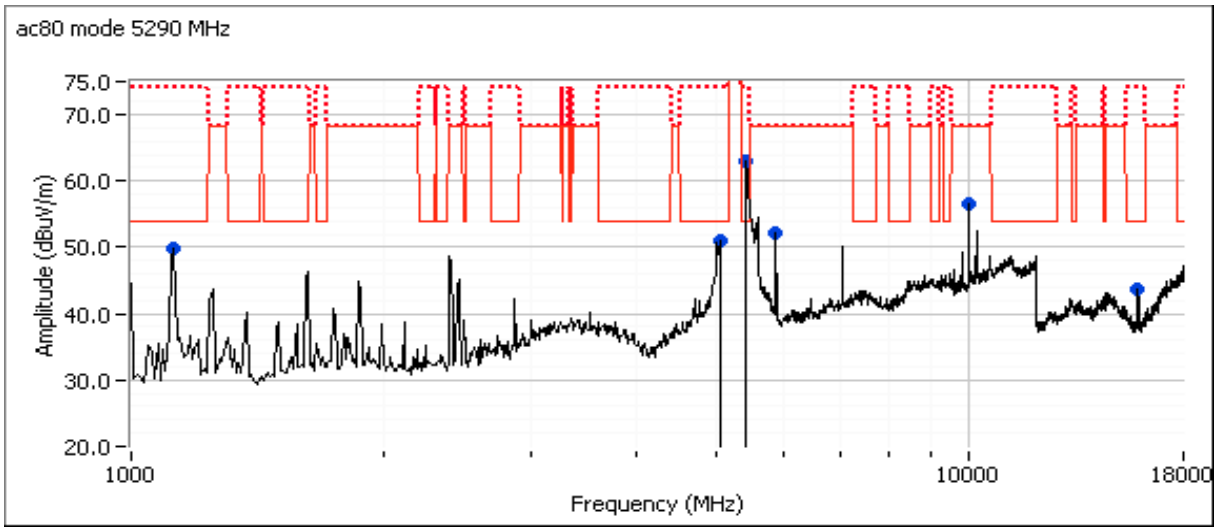
Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

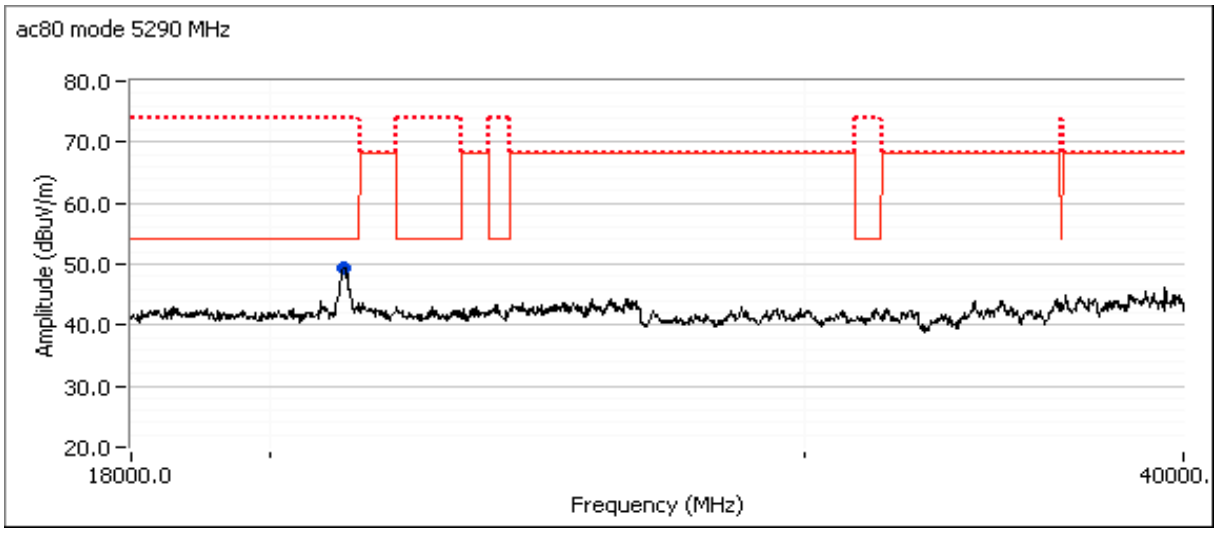
Run #3d: Center Channel
Channel: 58 Mode: ac80
Tx Chain: 3x3 Data Rate: VHT9

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5372.370	52.5	H	54.0	-1.5	AVG	348	1.3	RB 1 MHz;VB 3 kHz;Peak
5365.880	67.2	H	74.0	-6.8	PK	348	1.3	RB 1 MHz;VB 3 MHz;Peak
5412.010	71.2	H	74.0	-2.8	PK	0	1.0	RB 1 MHz;VB 3 MHz;Peak
5411.340	50.8	H	54.0	-3.2	Avg	0	1.0	RB 1 MHz;VB 3 kHz;Peak
5877.780	50.8	H	68.3	-17.5	Avg	134	1.3	RB 1 MHz;VB 3 kHz;Peak
5877.770	53.9	H	68.3	-14.4	PK	134	1.3	RB 1 MHz;VB 3 MHz;Peak
1124.980	49.0	V	54.0	-5.0	Avg	211	2.5	RB 1 MHz;VB 3 kHz;Peak
1124.920	50.3	V	74.0	-23.7	PK	211	2.5	RB 1 MHz;VB 3 MHz;Peak
5028.940	47.2	H	54.0	-6.8	Avg	330	1.0	RB 1 MHz;VB 3 kHz;Peak
5027.180	57.3	H	74.0	-16.7	PK	330	1.0	RB 1 MHz;VB 3 MHz;Peak
15880.650	48.6	V	54.0	-5.4	Avg	272	1.9	RB 1 MHz;VB 3 kHz;Peak
15881.520	58.3	V	74.0	-15.7	PK	272	1.9	RB 1 MHz;VB 3 MHz;Peak
21167.480	48.6	V	74.0	-25.4	PK	300	1.0	RB 1 MHz;VB 3 MHz;Peak
21167.050	37.8	V	54.0	-16.2	AVG	309	1.0	RB 1 MHz;VB 3 kHz;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 (260-E255040)	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 (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

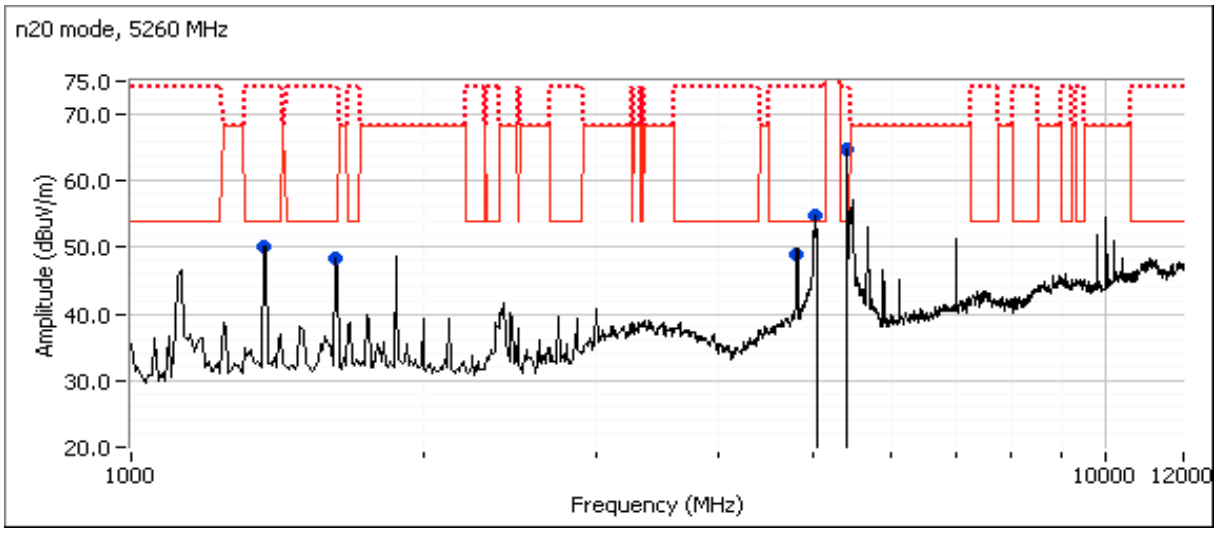
Run #4: Radiated Spurious Emissions, 1,000 - 40000 MHz. Operating Mode: Worse case from Run #3

Date of Test: 05/19/16 Config. Used: 1
Test Engineer: M. Birgani, Joseph Cadigal Config Change: -
Test Location: Chamber 5 EUT Voltage: 120V/ 60Hz

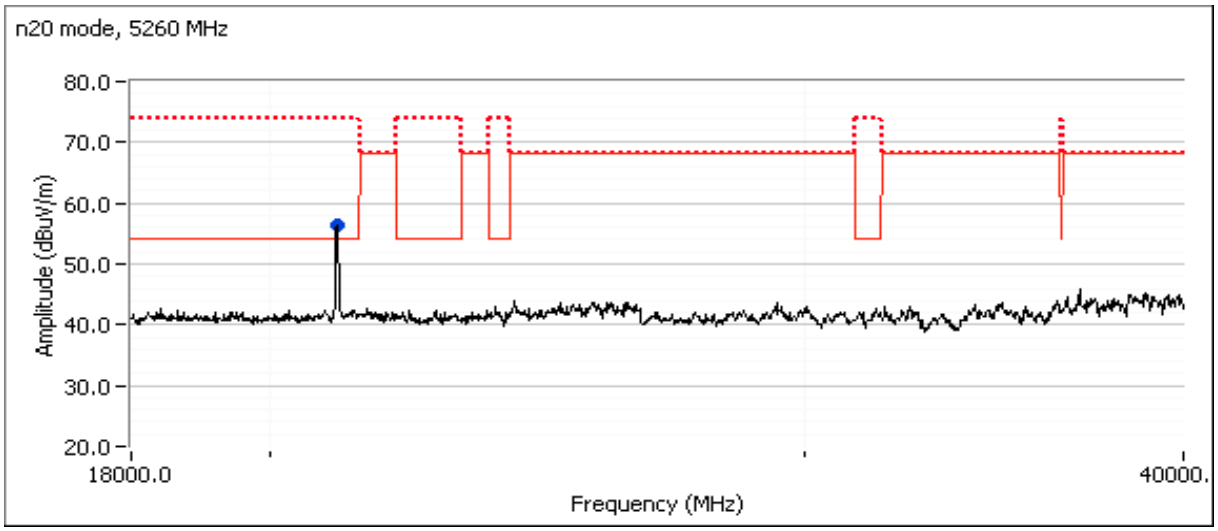
Run #4a: Low Channel

Channel: 52 Mode: ac20
Tx Chain: 3x3 Data Rate: V8

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
21043.770	49.1	V	54.0	-4.9	AVG	6	1.9	RB 1 MHz;VB 1 kHz;Peak
21038.100	61.9	V	74.0	-12.1	PK	6	1.9	RB 1 MHz;VB 3 MHz;Peak
5425.830	51.0	V	54.0	-3.0	AVG	180	1.0	RB 1 MHz;VB 1 kHz;Peak
5424.730	61.5	V	74.0	-12.5	PK	180	1.0	RB 1 MHz;VB 3 MHz;Peak
5426.270	53.5	H	54.0	-0.5	AVG	185	1.4	RB 1 MHz;VB 1 kHz;Peak
5424.950	64.4	H	74.0	-9.6	PK	185	1.4	RB 1 MHz;VB 3 MHz;Peak



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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 (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

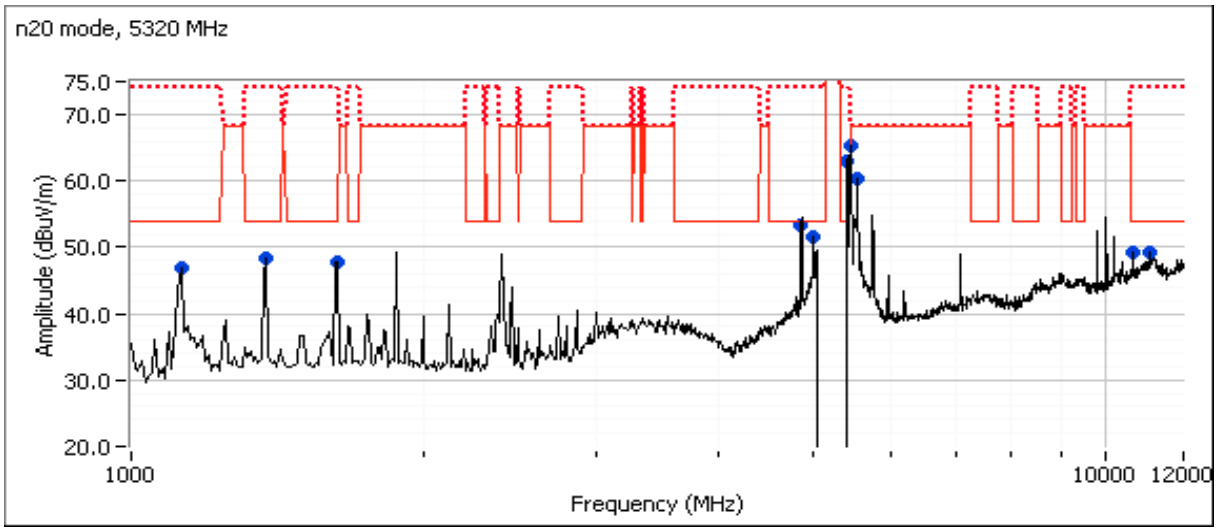
Run #4b: High Channel

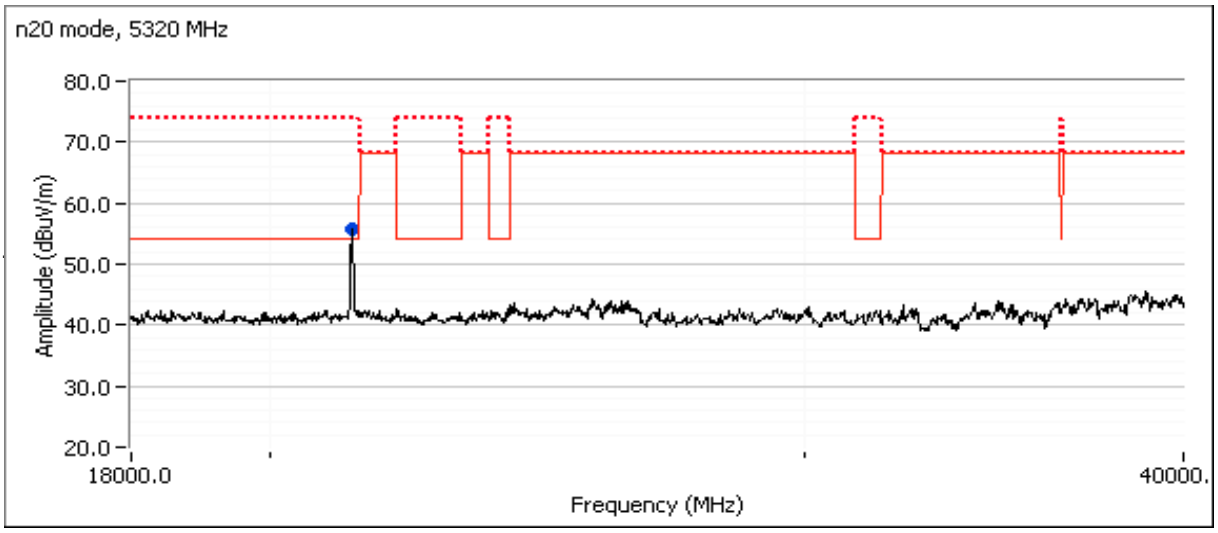
Channel: 64 Mode: ac20

Tx Chain: 3x3 Data Rate: V8

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11083.020	42.5	V	54.0	-11.5	AVG	93	1.6	RB 1 MHz;VB 1 kHz;Peak
11082.230	54.0	V	74.0	-20.0	PK	93	1.6	RB 1 MHz;VB 3 MHz;Peak
1625.050	44.4	V	54.0	-9.6	AVG	138	2.5	RB 1 MHz;VB 1 kHz;Peak
1624.990	47.7	V	74.0	-26.3	PK	138	2.5	RB 1 MHz;VB 3 MHz;Peak
5481.760	66.5	H	68.3	-1.8	PK	173	1.9	RB 1 MHz;VB 3 MHz;Peak
1375.010	41.4	V	54.0	-12.6	AVG	165	1.9	RB 1 MHz;VB 1 kHz;Peak
1375.110	47.0	V	74.0	-27.0	PK	165	1.9	RB 1 MHz;VB 3 MHz;Peak
4999.930	47.0	V	54.0	-7.0	AVG	242	2.2	RB 1 MHz;VB 1 kHz;Peak
4999.870	53.6	V	74.0	-20.4	PK	242	2.2	RB 1 MHz;VB 3 MHz;Peak
1125.060	44.1	V	54.0	-9.9	AVG	327	1.6	RB 1 MHz;VB 1 kHz;Peak
1124.960	48.5	V	74.0	-25.5	PK	327	1.6	RB 1 MHz;VB 3 MHz;Peak
4868.170	48.0	H	54.0	-6.0	AVG	348	1.6	RB 1 MHz;VB 1 kHz;Peak
4869.120	57.3	H	74.0	-16.7	PK	348	1.6	RB 1 MHz;VB 3 MHz;Peak
10642.600	44.4	V	54.0	-9.6	AVG	353	2.2	RB 1 MHz;VB 1 kHz;Peak
10642.660	55.5	V	74.0	-18.5	PK	353	2.2	RB 1 MHz;VB 3 MHz;Peak
5433.610	53.1	H	54.0	-0.9	AVG	169	1.8	RB 1 MHz;VB 1 kHz;Peak
5431.920	65.2	H	74.0	-8.8	PK	169	1.8	RB 1 MHz;VB 3 MHz;Peak
21111.100	36.5	V	54.0	-17.5	AVG	296	1.9	RB 1 MHz;VB 1 kHz;Peak
21113.200	49.7	V	74.0	-24.3	PK	296	1.9	RB 1 MHz;VB 3 MHz;Peak
5561.020	52.8	H	54.0	-1.2	AVG	155	1.6	RB 1 MHz;VB 1 kHz;Peak
5563.270	62.2	H	74.0	-11.8	PK	155	1.6	RB 1 MHz;VB 3 MHz;Peak

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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 (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #5, Radiated Spurious Emissions, 1,000 - 40,000 MHz. Operation in the 5470-5725 MHz Band

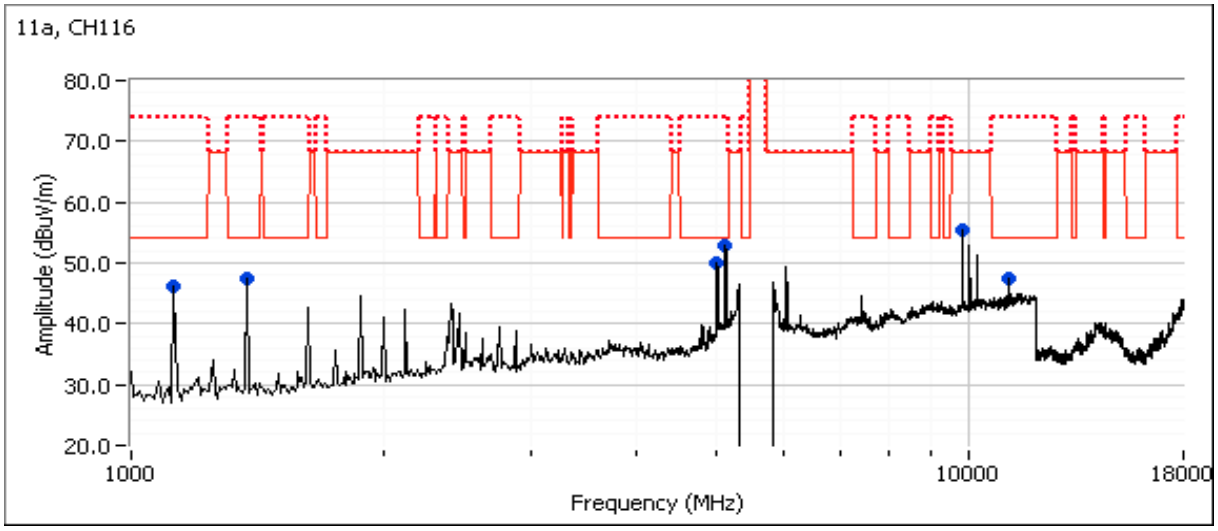
Date of Test: 05/25/16 Config. Used: 1
Test Engineer: Rafael Varelas Config Change: -
Test Location: FT Chamber #7 EUT Voltage: 120V/ 60Hz

Run #5a: Center Channel

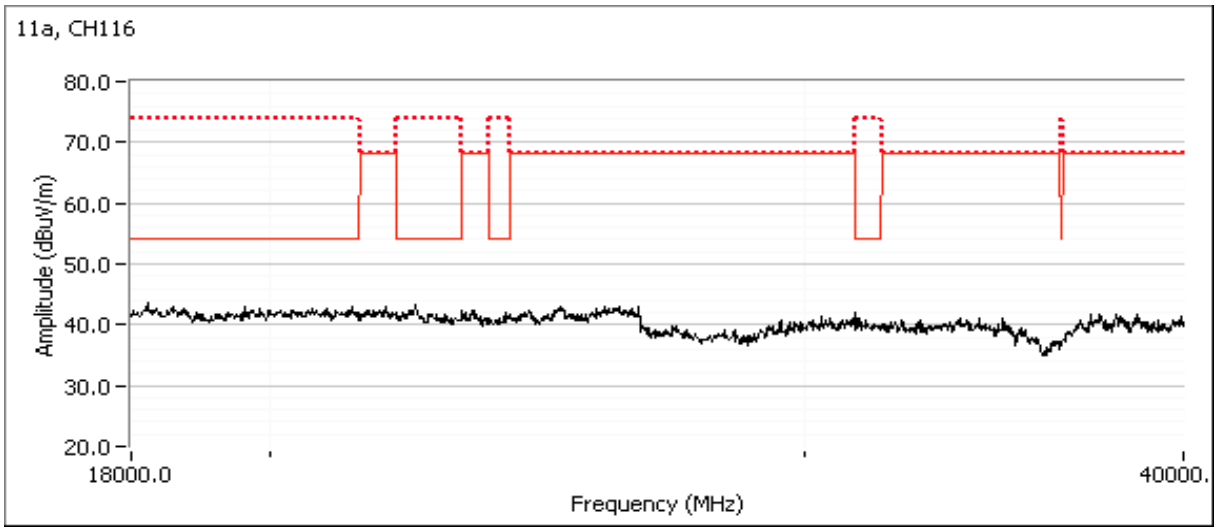
Channel: 116 Mode: 11a
Tx Chain: 3x3 Data Rate: 6 Mb/s

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5114.210	50.5	H	54.0	-3.5	AVG	300	1.3	RB 1 MHz;VB 10 Hz;Peak
5113.750	59.2	H	74.0	-14.8	PK	300	1.3	RB 1 MHz;VB 3 MHz;Peak
11159.930	42.6	V	54.0	-11.4	AVG	349	1.0	RB 1 MHz;VB 10 Hz;Peak
11160.330	54.7	V	74.0	-19.3	PK	349	1.0	RB 1 MHz;VB 3 MHz;Peak
1125.000	*46.1*	*H*	*54.0*	*-7.9*	*Peak*	*166*	*1.5*	*Not related to Radio*
1375.000	*47.4*	*V*	*54.0*	*-6.6*	*Peak*	*66*	*2.0*	*Not related to Radio*
5000.000	*50.0*	*V*	*54.0*	*-4.0*	*Peak*	*269*	*2.0*	*Not related to Radio*
9810.000	*55.3*	*V*	*68.3*	*-13.0*	*Peak*	*352*	*2.0*	*Not related to Radio*

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 (260-E255040)	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 (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

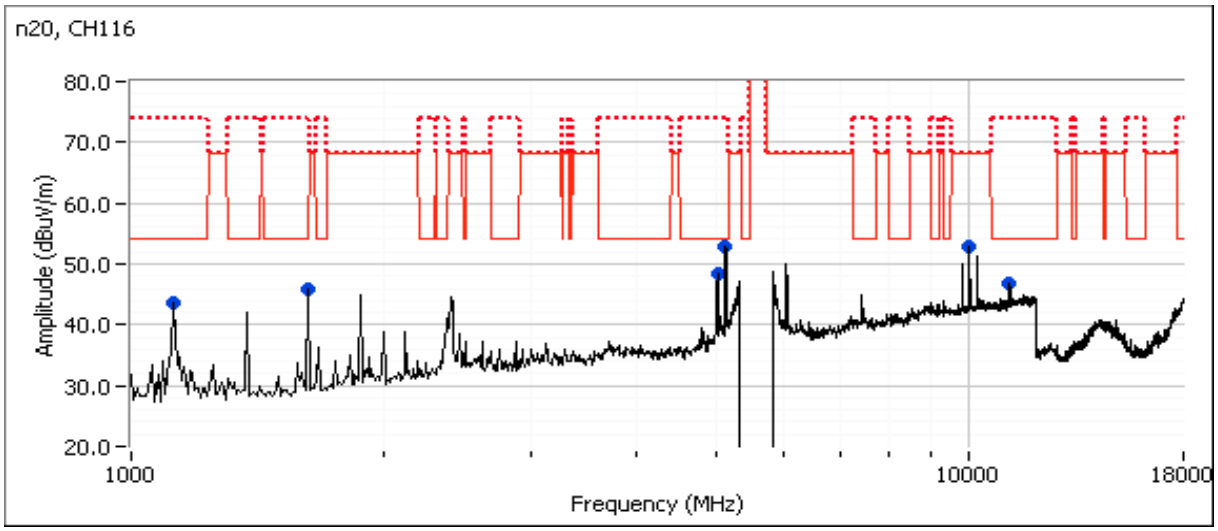
Run #5b: Center Channel

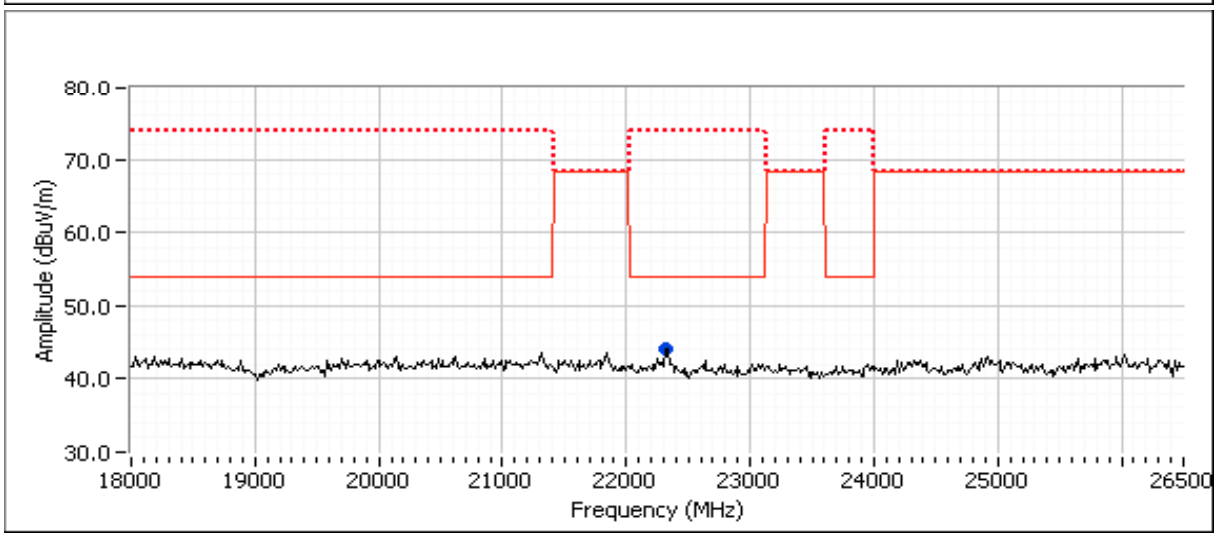
Channel: 116 Mode: 11n20
Tx Chain: 3x3 Data Rate: VHT8

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5113.070	52.5	H	54.0	-1.5	AVG	354	1.9	RB 1 MHz;VB 1 kHz;Peak
5112.650	61.9	H	74.0	-12.1	PK	354	1.9	RB 1 MHz;VB 3 MHz;Peak
4999.970	46.4	V	54.0	-7.6	AVG	244	1.9	RB 1 MHz;VB 1 kHz;Peak
4999.720	51.5	V	74.0	-22.5	PK	244	1.9	RB 1 MHz;VB 3 MHz;Peak
1624.990	44.5	V	54.0	-9.5	AVG	202	1.5	RB 1 MHz;VB 1 kHz;Peak
1625.060	48.6	V	74.0	-25.4	PK	202	1.5	RB 1 MHz;VB 3 MHz;Peak
1125.080	38.7	V	54.0	-15.3	AVG	203	1.8	RB 1 MHz;VB 1 kHz;Peak
1125.070	44.5	V	74.0	-29.5	PK	203	1.8	RB 1 MHz;VB 3 MHz;Peak
9999.610	57.0	V	68.3	-11.3	PK	40	2.0	RB 1 MHz;VB 3 MHz;Peak
11160.330	42.8	H	54.0	-11.2	AVG	20	1.0	RB 1 MHz;VB 1 kHz;Peak
11169.400	54.9	H	74.0	-19.1	PK	20	1.0	RB 1 MHz;VB 3 MHz;Peak
22323.820	42.3	V	54.0	-11.7	AVG	64	2.0	RB 1 MHz;VB 1 kHz;Peak
22330.480	55.2	V	74.0	-18.8	PK	64	2.0	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 (260-E255040)	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 (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

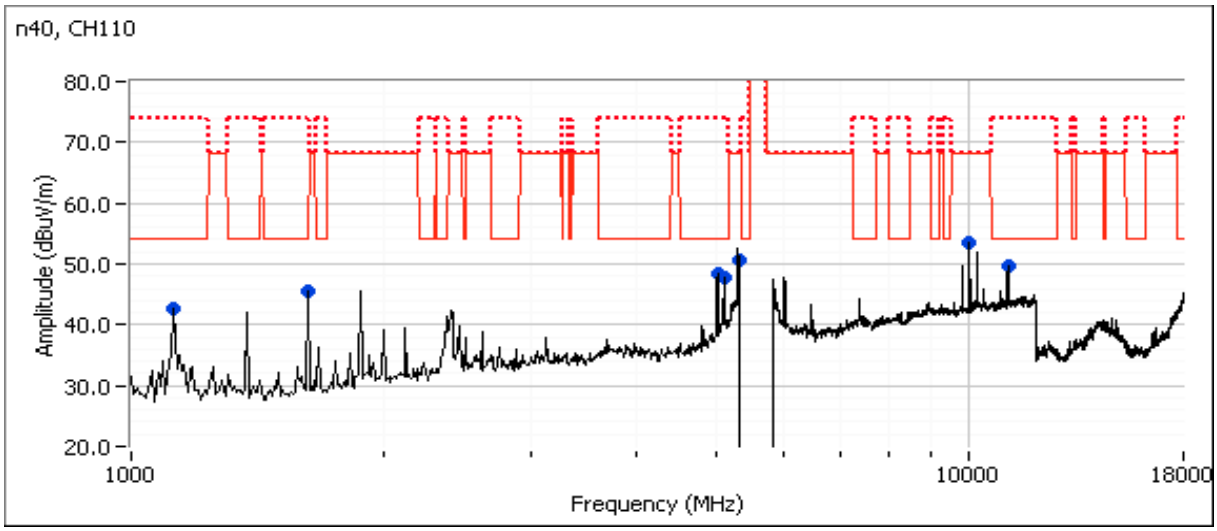
Run #5c: Center Channel

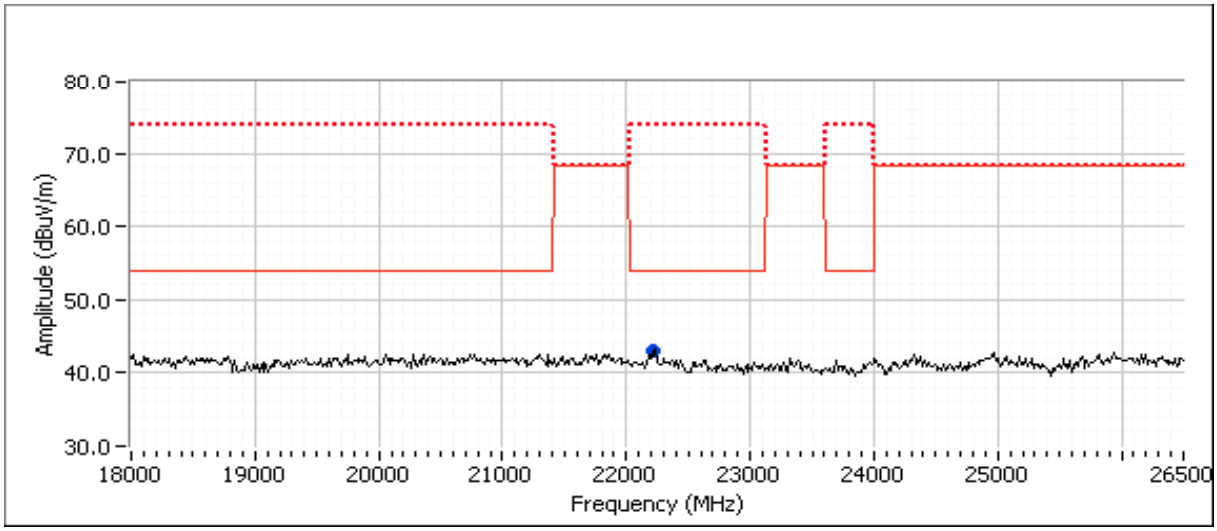
Channel: 110 Mode: 11n40
Tx Chain: 3x3 Data Rate: VHT9

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5323.910	61.6	H	68.3	-6.7	PK	351	1.9	RB 1 MHz;VB 3 MHz;Peak
9999.950	57.8	V	68.3	-10.5	PK	39	2.5	RB 1 MHz;VB 3 MHz;Peak
11099.970	41.6	H	54.0	-12.4	AVG	20	1.0	RB 1 MHz;VB 3 kHz;Peak
11104.430	52.8	H	74.0	-21.2	PK	20	1.0	RB 1 MHz;VB 3 MHz;Peak
1125.010	39.9	H	54.0	-14.1	AVG	131	2.0	RB 1 MHz;VB 3 kHz;Peak
1125.000	44.7	H	74.0	-29.3	PK	131	2.0	RB 1 MHz;VB 3 MHz;Peak
1625.060	44.7	V	54.0	-9.3	AVG	202	1.4	RB 1 MHz;VB 3 kHz;Peak
1625.030	48.6	V	74.0	-25.4	PK	202	1.4	RB 1 MHz;VB 3 MHz;Peak
5087.540	47.3	H	54.0	-6.7	AVG	191	1.0	RB 1 MHz;VB 3 kHz;Peak
5087.560	52.4	H	74.0	-21.6	PK	191	1.0	RB 1 MHz;VB 3 MHz;Peak
5000.010	43.0	V	54.0	-11.0	AVG	210	1.4	RB 1 MHz;VB 3 kHz;Peak
5000.110	48.6	V	74.0	-25.4	PK	210	1.4	RB 1 MHz;VB 3 MHz;Peak
22203.710	39.5	V	54.0	-14.5	AVG	64	1.9	RB 1 MHz;VB 3 kHz;Peak
22217.710	54.0	V	74.0	-20.0	PK	64	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 (260-E255040)	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 (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

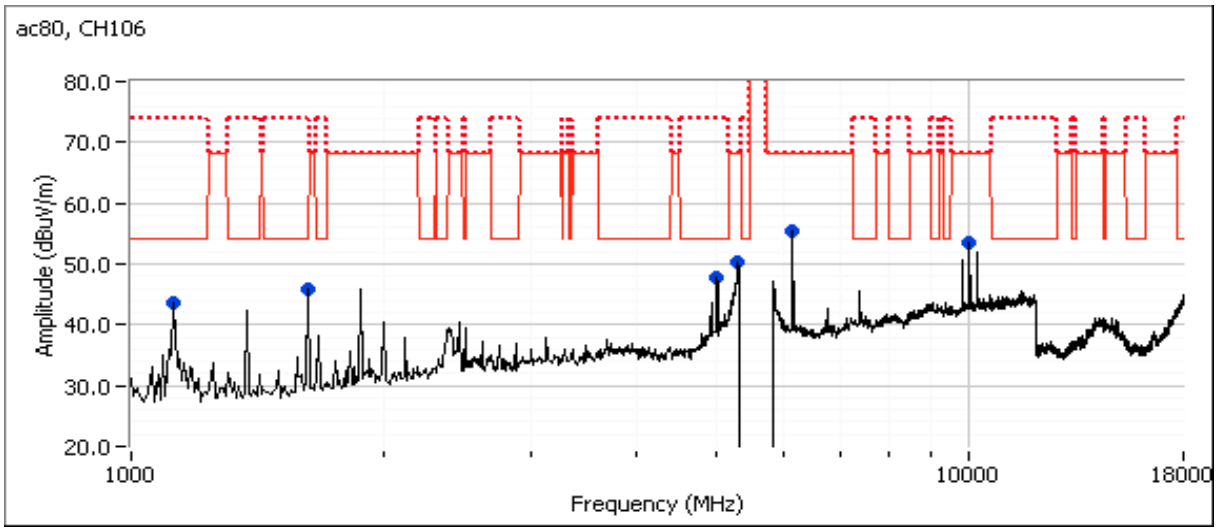
Run #5d: Center Channel

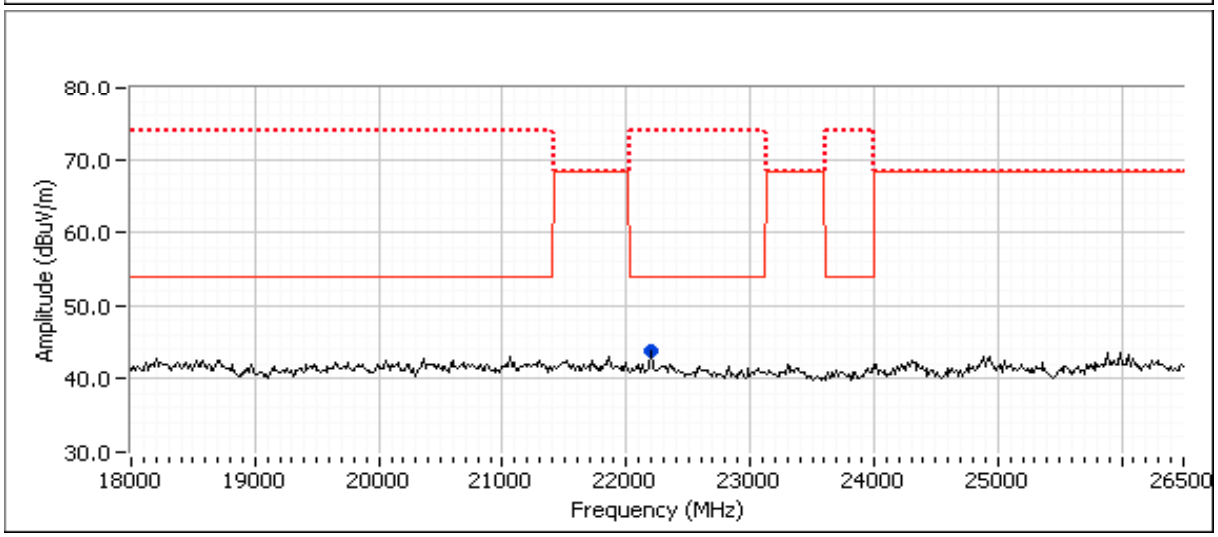
Channel: 106 Mode: ac80
Tx Chain: 3x3 Data Rate: VHT9

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5322.130	62.7	H	68.3	-5.6	PK	343	1.7	RB 1 MHz;VB 3 MHz;Peak
1125.150	42.7	V	54.0	-11.3	Avg	337	1.5	RB 1 MHz;VB 3 kHz;Peak
1124.920	45.7	V	74.0	-28.3	PK	337	1.5	RB 1 MHz;VB 3 MHz;Peak
4999.990	41.3	V	54.0	-12.7	Avg	227	1.0	RB 1 MHz;VB 3 kHz;Peak
5000.060	48.1	V	74.0	-25.9	PK	227	1.0	RB 1 MHz;VB 3 MHz;Peak
6144.520	58.2	H	68.3	-10.1	PK	202	2.0	RB 1 MHz;VB 3 MHz;Peak
1625.010	45.3	V	54.0	-8.7	Avg	202	1.4	RB 1 MHz;VB 3 kHz;Peak
1625.030	48.4	V	74.0	-25.6	PK	202	1.4	RB 1 MHz;VB 3 MHz;Peak
9999.850	57.5	V	68.3	-10.8	PK	39	2.4	RB 1 MHz;VB 3 MHz;Peak
22130.890	37.3	V	54.0	-16.7	Avg	36	1.0	RB 1 MHz;VB 3 kHz;Peak
22169.830	47.9	V	74.0	-26.1	PK	36	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 (260-E255040)	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 (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

Run #6: Radiated Spurious Emissions, 1,000 - 40000 MHz. Operating Mode: Worse case from Run #5

Date of Test: 05/25/16 Config. Used: 1
Test Engineer: Rafael Varelas Config Change: -
Test Location: FT Chamber #7 EUT Voltage: 120V/ 60Hz

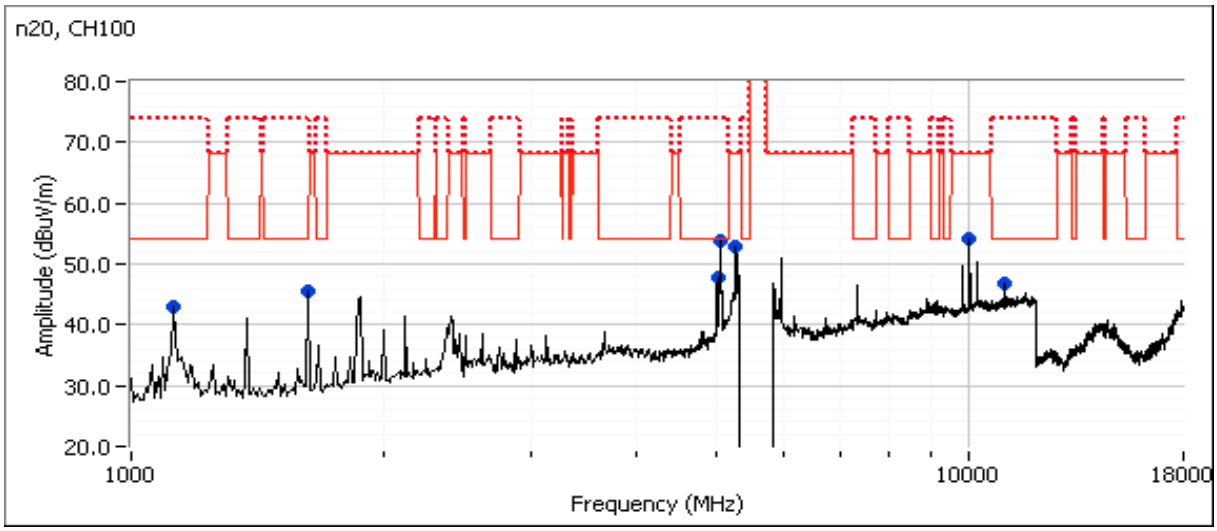
Run #6a: Low Channel

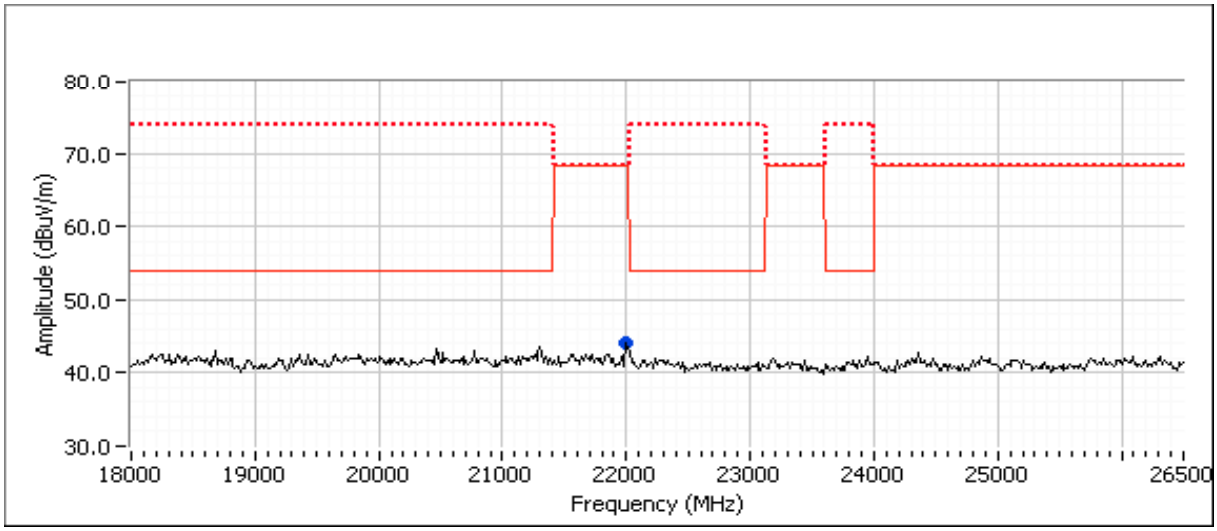
Channel: 100 Mode: 11n20
Tx Chain: 3x3 Data Rate: VHT8

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5039.930	51.5	H	54.0	-2.5	AVG	199	2.0	RB 1 MHz;VB 1 kHz;Peak
5037.170	62.0	H	74.0	-12.0	PK	199	2.0	RB 1 MHz;VB 3 MHz;Peak
10997.380	42.7	V	54.0	-11.3	AVG	264	2.0	RB 1 MHz;VB 1 kHz;Peak
10994.520	54.5	V	74.0	-19.5	PK	264	2.0	RB 1 MHz;VB 3 MHz;Peak
5268.380	58.0	H	68.3	-10.3	PK	344	1.9	RB 1 MHz;VB 3 MHz;Peak
21991.110	39.6	V	54.0	-14.4	AVG	355	1.0	RB 1 MHz;VB 1 kHz;Peak
21997.980	53.9	V	74.0	-20.1	PK	355	1.0	RB 1 MHz;VB 3 MHz;Peak
1125.000	*43.0*	*V*	*54.0*	*-11.0*	*Peak*	*329*	*1.5*	*Not related to radio*
1625.000	*45.5*	*V*	*54.0*	*-8.5*	*Peak*	*169*	*1.5*	*Not related to radio*
4999.980	47.9	V	54.0	*-6.1*	Peak	252	2.0	Not related to radio
10010.000	*54.2*	*V*	*68.3*	*-14.1*	*Peak*	*32*	*2.5*	*Not related to radio*

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 (260-E255040)	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 (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

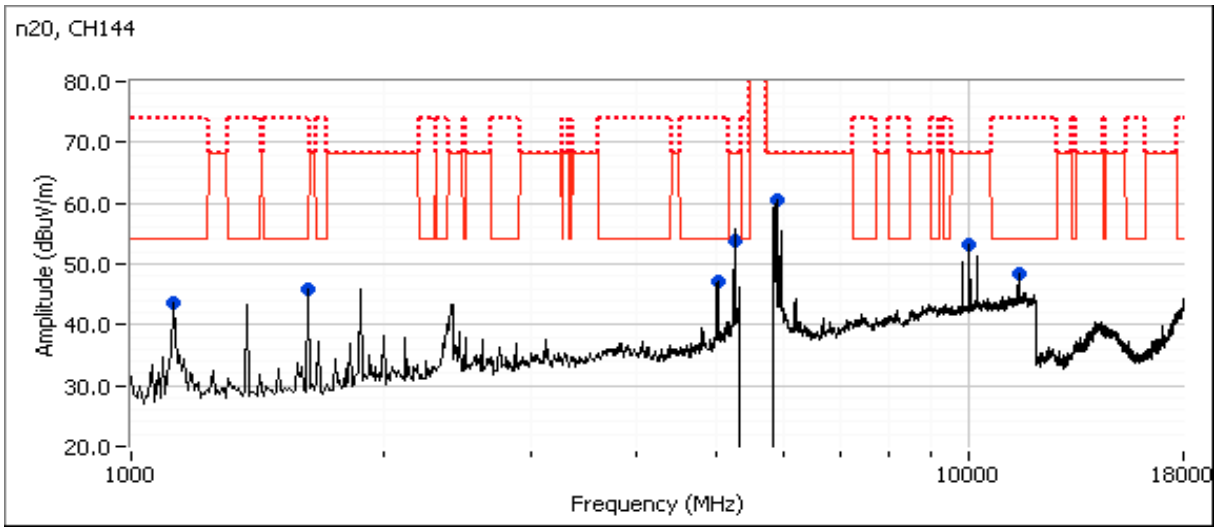
Run #6b: High Channel

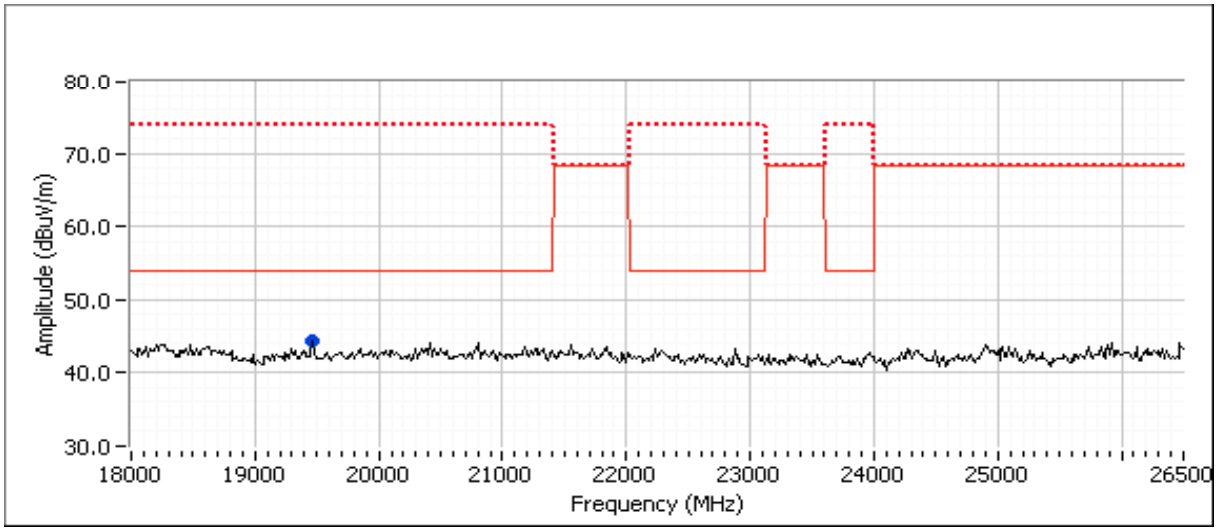
Channel: 144 Mode: 11n20
Tx Chain: 3x3 Data Rate: VHT8

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5249.690	63.2	H	68.3	-5.1	PK	358	1.5	RB 1 MHz;VB 3 MHz;Peak
5885.480	67.7	H	68.3	-0.6	PK	199	1.3	RB 1 MHz;VB 3 MHz;Peak
11439.230	44.3	V	54.0	-9.7	AVG	26	1.1	RB 1 MHz;VB 1 kHz;Peak
11439.370	56.2	V	74.0	-17.8	PK	26	1.1	RB 1 MHz;VB 3 MHz;Peak
19460.060	36.0	V	54.0	-18.0	AVG	196	2.0	RB 1 MHz;VB 1 kHz;Peak
19455.510	47.6	V	74.0	-26.4	PK	196	2.0	RB 1 MHz;VB 3 MHz;Peak
1125.000	*43.6*	*V*	*54.0*	*-10.4*	*Peak*	*352*	*2.0*	*Not related to radio*
1625.000	*46.0*	*V*	*54.0*	*-8.0*	*Peak*	*156*	*2.0*	*Not related to radio*
5008.330	*47.0*	*V*	*54.0*	*-7.0*	*Peak*	*32*	*2.0*	Not related to radio
10010.000	*53.2*	*V*	*68.3*	*-15.1*	*Peak*	*34*	*2.5*	*Not related to radio*

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 (260-E255040)	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 (260-E255040)	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: 392 mW n40: 259 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: 30.7 mW/MHz n40: 10.9 mW/MHz ac80: 1.0 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 (260-E255040)	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
n20	VHT8	92.6%	No	1.935	0.3	0.7	517
n40	VHT9	95.2%	No	0.952	0.2	0.4	1050
ac80	VHT9	75.5%	Yes	2.023	1.2	2.4	494

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 (260-E255040)	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 and 6/17/2016
Test Engineer: John Caizzi / R. Varelas / D. Bare
Test Location: Lab 4B

Config. Used: 1
Config Change: None
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 (260-E255040)	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
X	Indoor AP	30	17
	Station (e.g. Client)	24	11
	Outdoor AP (>30° Elv.)	21	-

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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	30.0	0.162	Pass
	3									
	4									
	2				22.1					
5200	1	18.5		98		85.1	19.3	30.0		Pass
	3									
	4									
	2				19.3					
5240	1	19		98		107.2	20.3	30.0		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	17.0	Pass
	3								
	4								
	2				11.0				
5200	1	18.5		98		6.9	8.4	17.0	Pass
	3								
	4								
	2				8.4				
5240	1	19		98		8.7	9.4	17.0	Pass
	3								
	4								
	2				9.4				

Client:	Pace Americas, Inc.	Job Number:	JD100297
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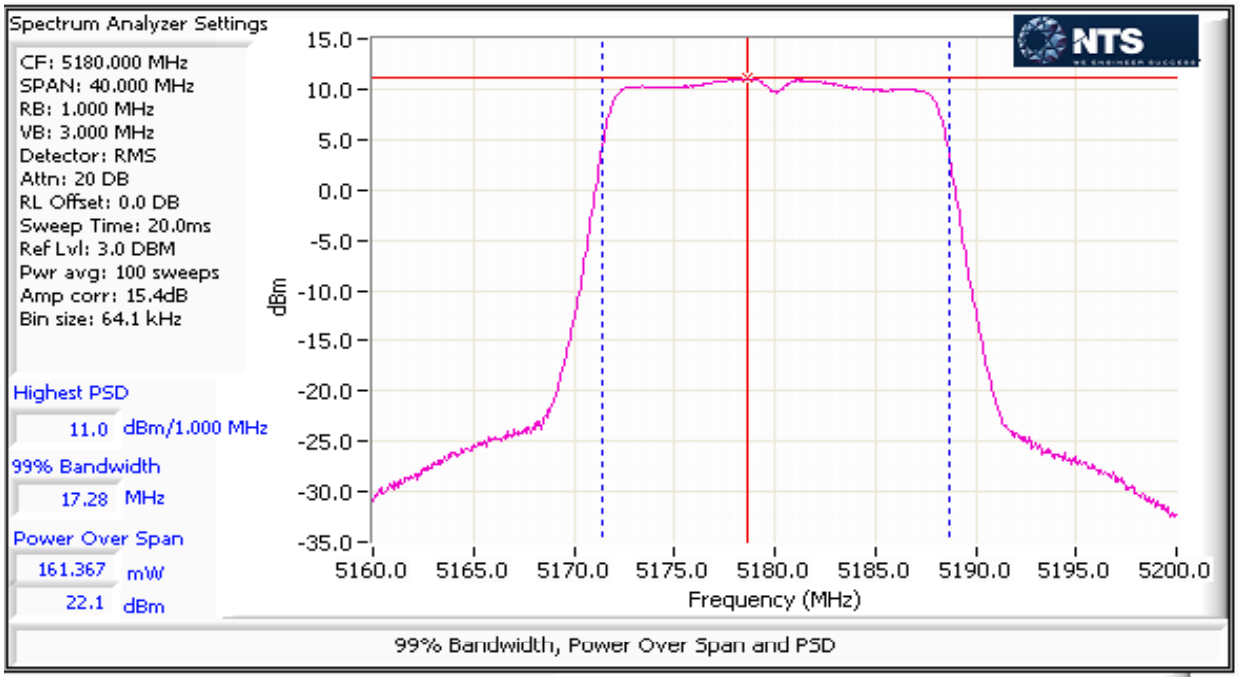
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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): 2399.405

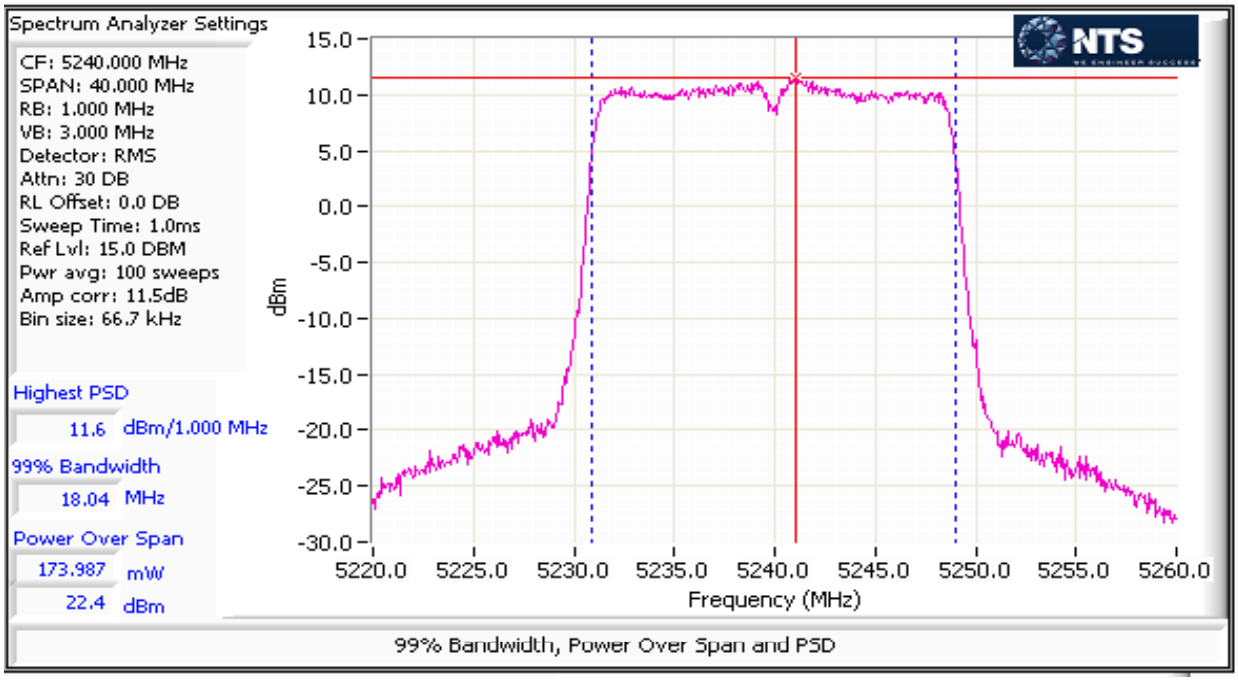
Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power mW	Total Power dBm	FCC Limit dBm	Max Power (W)	Result
5180	1	18.5		99	17.5	200.6	23.0	28.1	0.392	Pass
	3				19.1					
	4									
	2				18.0					
5200	1	22		99	20.5	391.9	25.9	28.1		Pass
	3				22.1					
	4									
	2				20.7					
5240	1	22		99	20.3	383.3	25.8	28.1		Pass
	3				22.4					
	4									
	2				20.1					

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	18.5		99	6.3	16.0	12.0	15.1	Pass
	3				8.2				
	4								
	2				7.1				
5200	1	22		99	9.3	30.4	14.8	15.1	Pass
	3				11.0				
	4								
	2				9.7				
5240	1	22		99	9.1	30.7	14.9	15.1	Pass
	3				11.6				
	4								
	2				9.1				

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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 (260-E255040)	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): 1588.1747

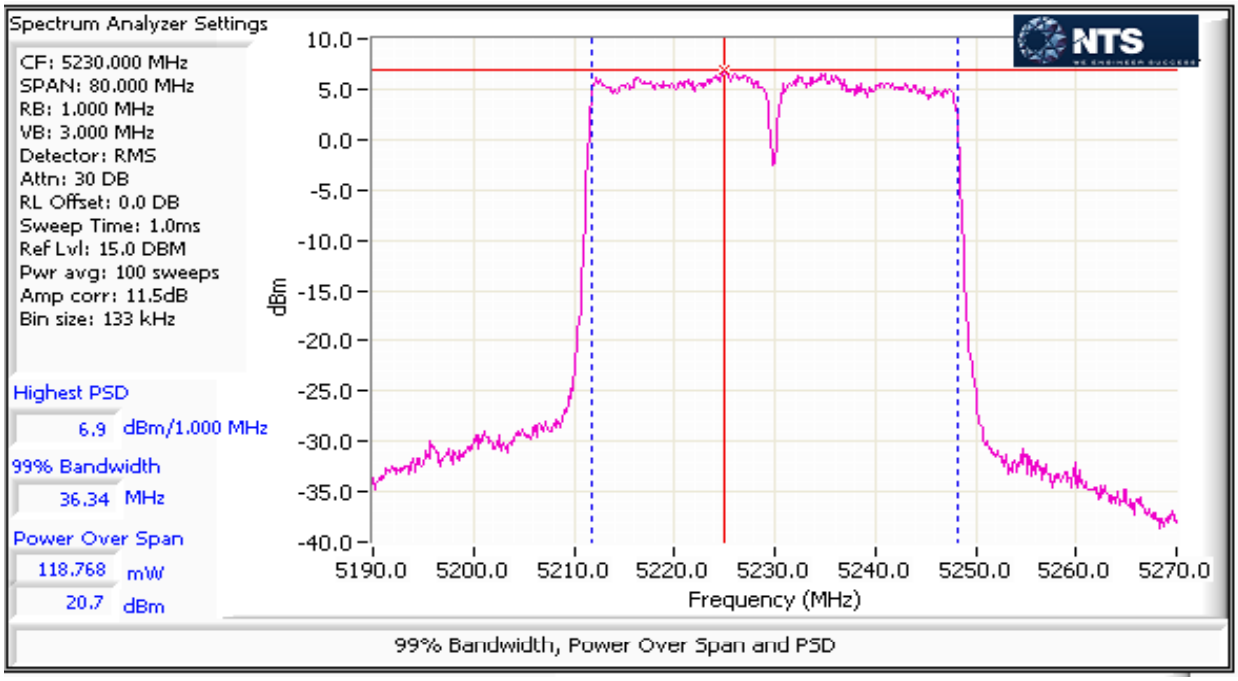
Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5190	1	11.5		98	10.2	37.6	15.8	28.1	0.259	Pass
	3				11.7					
	4									
	2				10.9					
5230	1	19.5		98	18.8	259.4	24.1	28.1		Pass
	3				20.7					
	4									
	2				18.2					

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	15.1	Pass
	3				-1.4				
	4								
	2				-1.4				
5230	1	19.5		98	5.0	10.9	10.4	15.1	Pass
	3				6.9				
	4								
	2				4.5				

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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 (260-E255040)	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

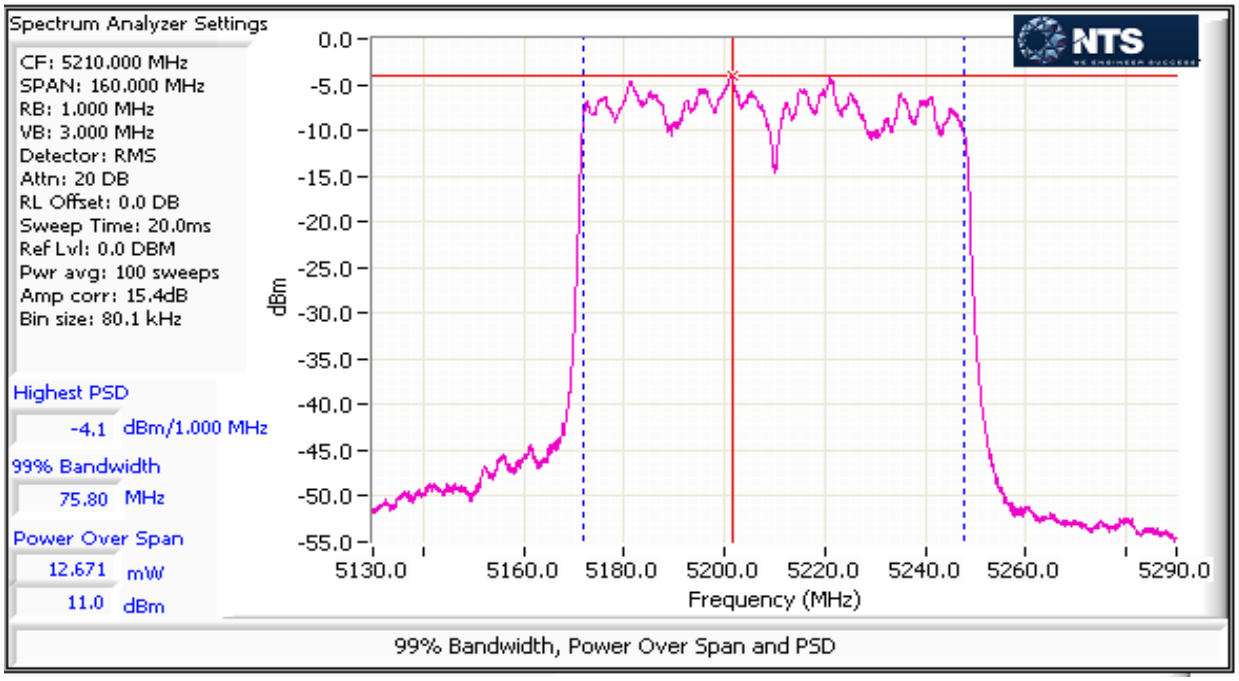
Mode: ac80 Max EIRP (mW): 228.36899

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	28.1	0.037	Pass
	3				11.3					
	4									
	2				10.6					

5150-5250 PSD - FCC

Mode: ac80

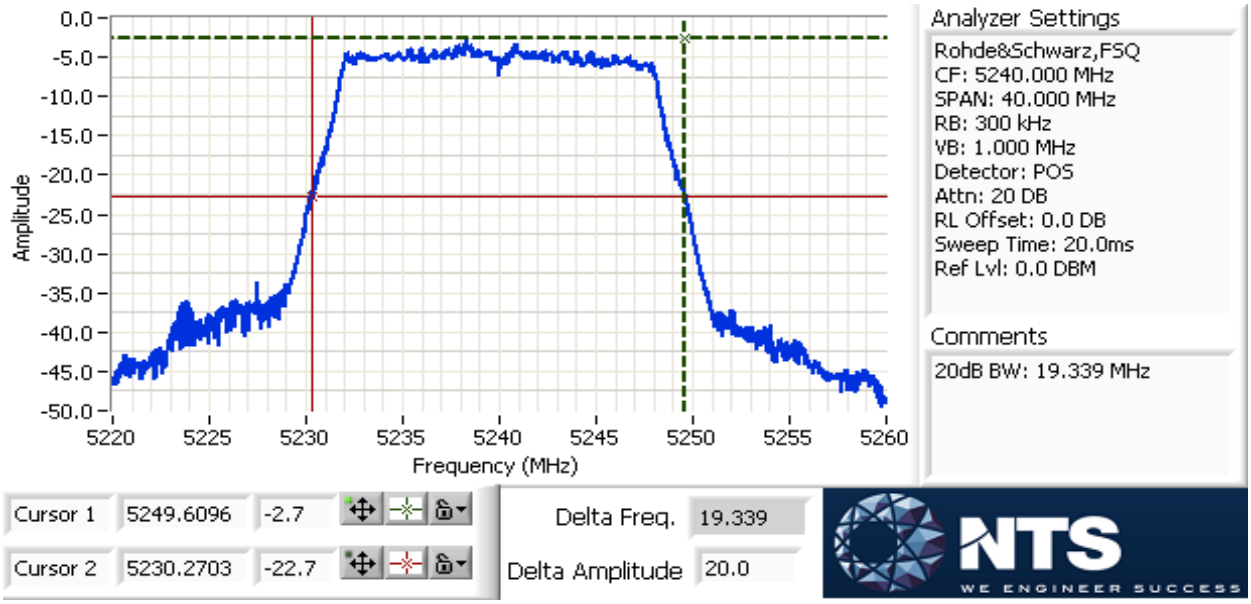
Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[3] mW/MHz	Total PSD[3] dBm/MHz	FCC Limit dBm/MHz	Result
5210	1	11		94	-6.5	1.0	0.0	15.1	Pass
	3				-4.1				
	4								
	2				-4.6				



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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	

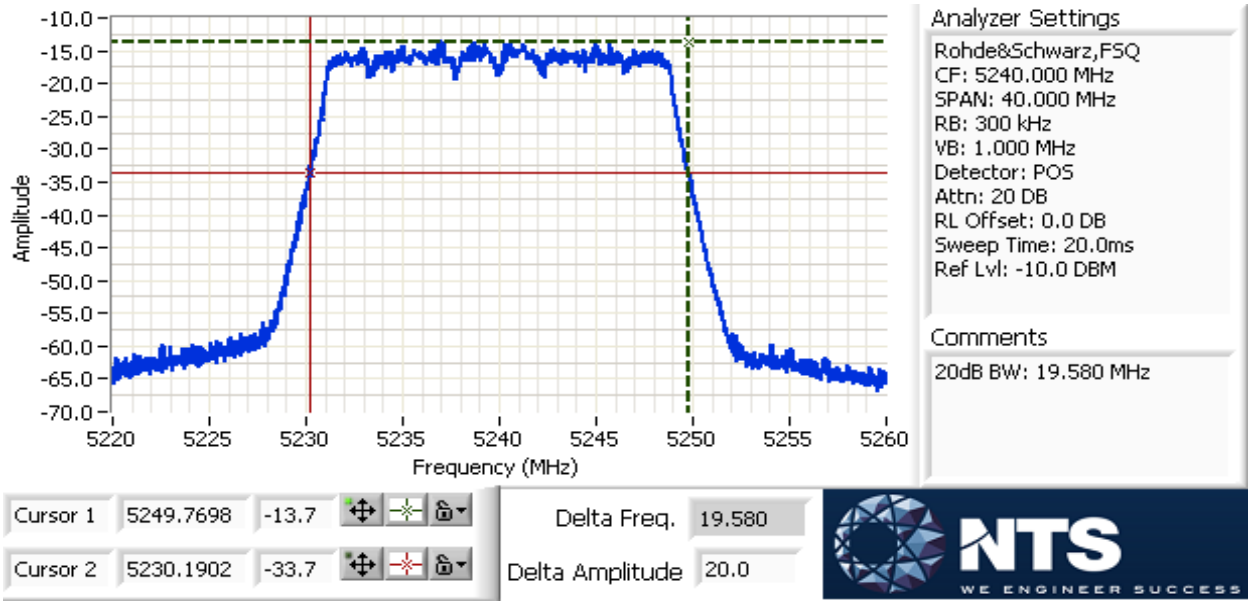


Note 1	Measurements performed on chain 2.
Note 2	-20 dB BW wholly contained in UNII 1 band.
Note 3	20dB BW: RBW=1-5% of 20dB BW, VBW ≥ 3*RBW, peak detector, max hold, auto sweep time. Span 1.5-5 times 20dB BW.

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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	

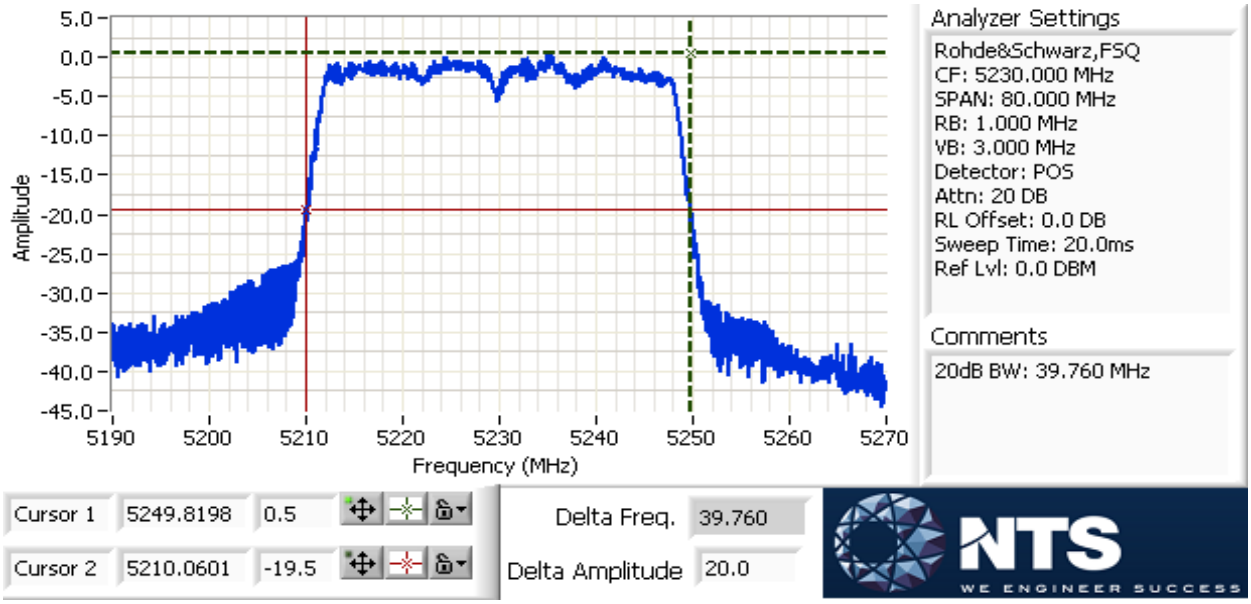


Note 1	Measurements performed on chain 3.
Note 2	-20 dB BW wholly contained in UNII 1 band.
Note 3	20dB BW: RBW=1-5% of 20dB BW, VBW ≥ 3*RBW, peak detector, max hold, auto sweep time. Span 1.5-5 times 20dB BW.

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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) 20dB	Bandwidth (MHz) 99%	RBW Setting (MHz) 20dB	RBW Setting (MHz) 99%
11.5	5230	39.76		1	

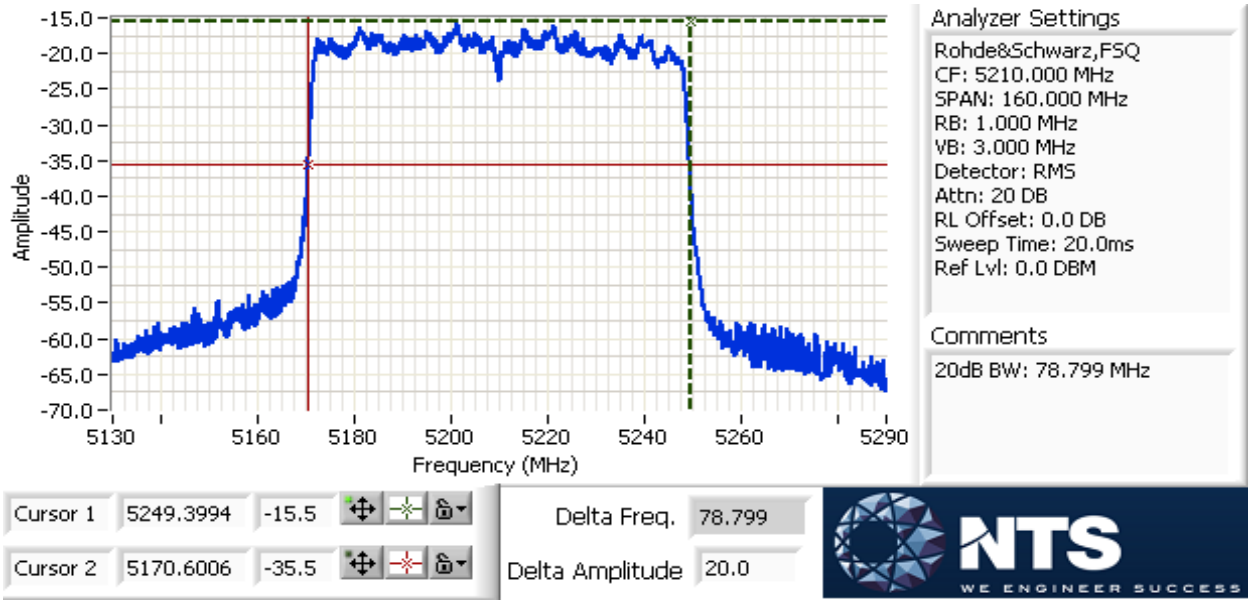


Note 1	Measurements performed on chain 3.
Note 2	-20 dB BW wholly contained in UNII 1 band.
Note 3	20dB BW: RBW=1-5% of 20dB BW, VBW ≥ 3*RBW, peak detector, max hold, auto sweep time. Span 1.5-5 times 20dB BW.

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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 (260-E255040)	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: 479 mW n40: 501 mW ac80: 284 mW
1	PSD, 5725 - 5850MHz	15.407(a) (1), (2), (3) RSS-247 6.2	Pass	a: 13.8 mW/MHz n20: 39.3 mW/MHz n40: 21.1 mW/MHz ac80: 7.6 mW/MHz
1	99% Bandwidth	RSS-GEN (Information only)	N/A	a: 17.4 MHz n20: 18.2 MHz n40: 36.7 MHz ac80: 75.8 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:	20-25 °C
Rel. Humidity:	38-43 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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
n20	VHT8	92.6%	No	1.935	0.3	0.7	517
n40	VHT9	95.2%	No	0.952	0.2	0.4	1050
ac80	VHT9	75.5%	Yes	2.023	1.2	2.4	494

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 (260-E255040)	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: 6/6/2016 9:00 Config. Used: 1

Test Engineer: Yew-Kwong Soo 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 (260-E255040)	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, 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 (260-E255040)	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[1] dBm	Total Power mW	Total Power dBm	Limit dBm	Max Power (W)	Result
5745	1	23	17.0	98		151.4	21.8	30.0	0.166	Pass
	3									
	4									
	2				21.8					
5785	1	23	17.4	98		166.0	22.2	30.0		Pass
	3									
	4									
	2				22.2					
5825	1	23	17.0	98		138.0	21.4	30.0		Pass
	3									
	4									
	2				21.4					

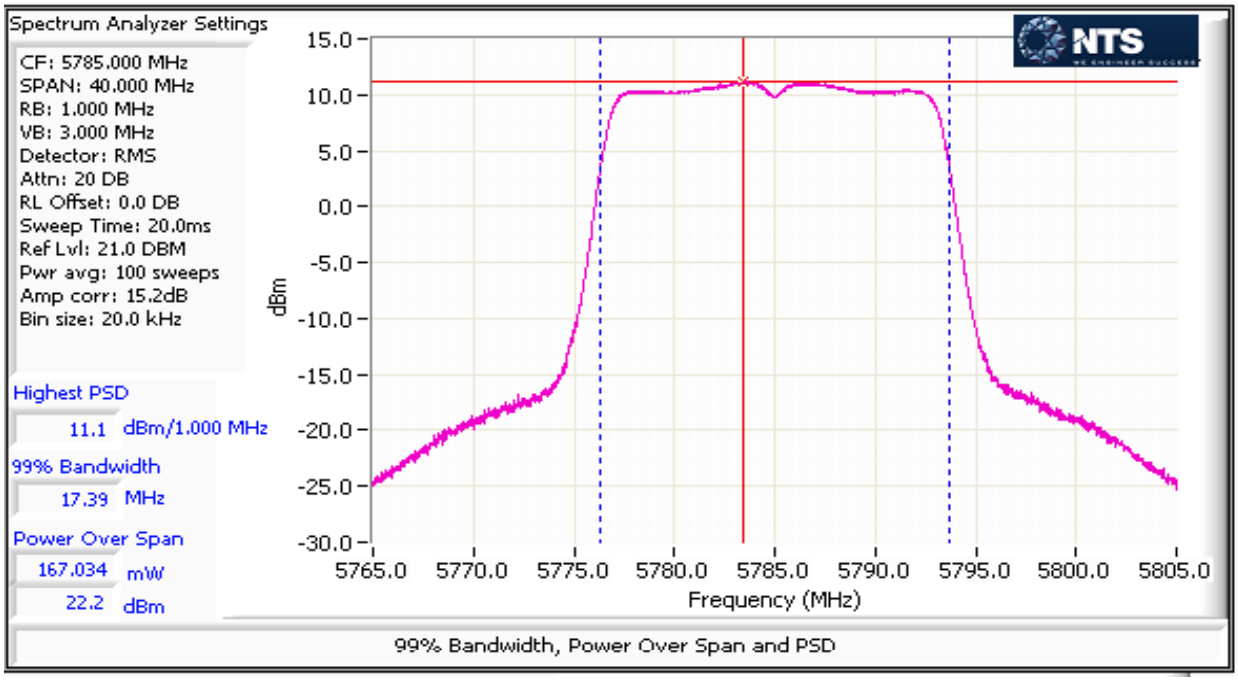
5725-5850 PSD - FCC/IC

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

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD[3] dBm/MHz	Total PSD mW/MHz	Total PSD dBm/MHz	FCC Limit dBm/500kHz	IC Limit dBm/500kHz	Result
5745	1	23		98		13.8	11.4	30.0	30.0	Pass
	3									
	4									
	2				11.4					
5785	1	23		98		12.9	11.1	30.0	30.0	Pass
	3									
	4									
	2				11.1					
5825	1	23		98		12.3	10.9	30.0	30.0	Pass
	3									
	4									
	2				10.9					

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 (260-E255040)	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 (260-E255040)	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: n20 Max EIRP (mW): 3298.5

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power mW	Total Power dBm	FCC Limit dBm	Max Power (W)	Result
5745	1	23	18.1	99	22.6	477.9	26.8	27.6	0.480	Pass
	3				21.6					
	4									
	2				21.8					
5785	1	23	17.5	99	21.7	479.9	26.8	27.6		Pass
	3				22.1					
	4									
	2				22.3					
5825	1	23	18.2	99	22.2	432.7	26.4	27.6		Pass
	3				21.3					
	4									
	2				21.2					

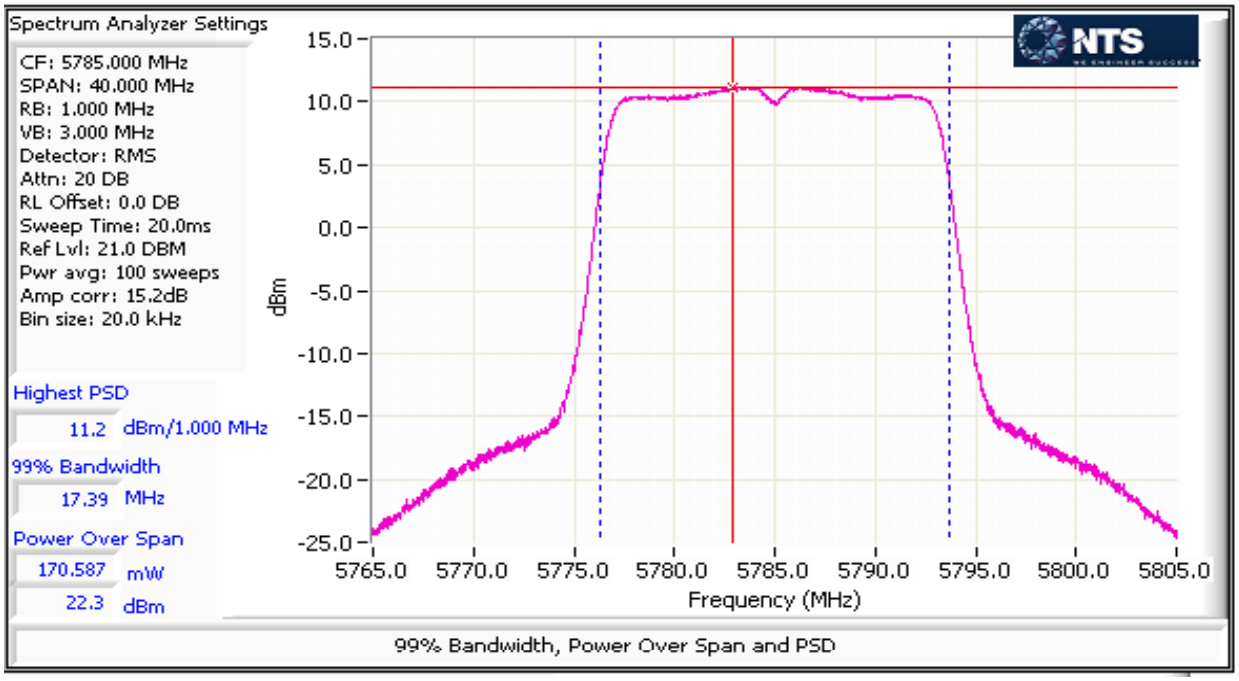
5250-5350 PSD - FCC/IC

Mode: n20

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD[3] dBm/MHz	Total PSD mW/MHz	Total PSD dBm/MHz	FCC Limit dBm/MHz	IC Limit dBm/MHz	Result
5745	1	23		99	11.6	39.3	15.9	27.6	27.6	Pass
	3				10.9					
	4									
	2				11.0					
5785	1	23		99	10.7	37.5	15.7	27.6	27.6	Pass
	3				11.0					
	4									
	2				11.2					
5825	1	23		99	11.1	34.3	15.4	27.6	27.6	Pass
	3				10.1					
	4									
	2				10.5					

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 (260-E255040)	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 (260-E255040)	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): 3444.9

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power mW	Total Power dBm	FCC Limit dBm	Max Power (W)	Result
5755	1	23	36.6	98	22.9	501.2	27.0	27.6	0.501	Pass
	3				21.8					
	4									
	2				21.9					
5795	1	23	36.7	98	22.8	496.8	27.0	27.6		Pass
	3				21.9					
	4									
	2				21.8					

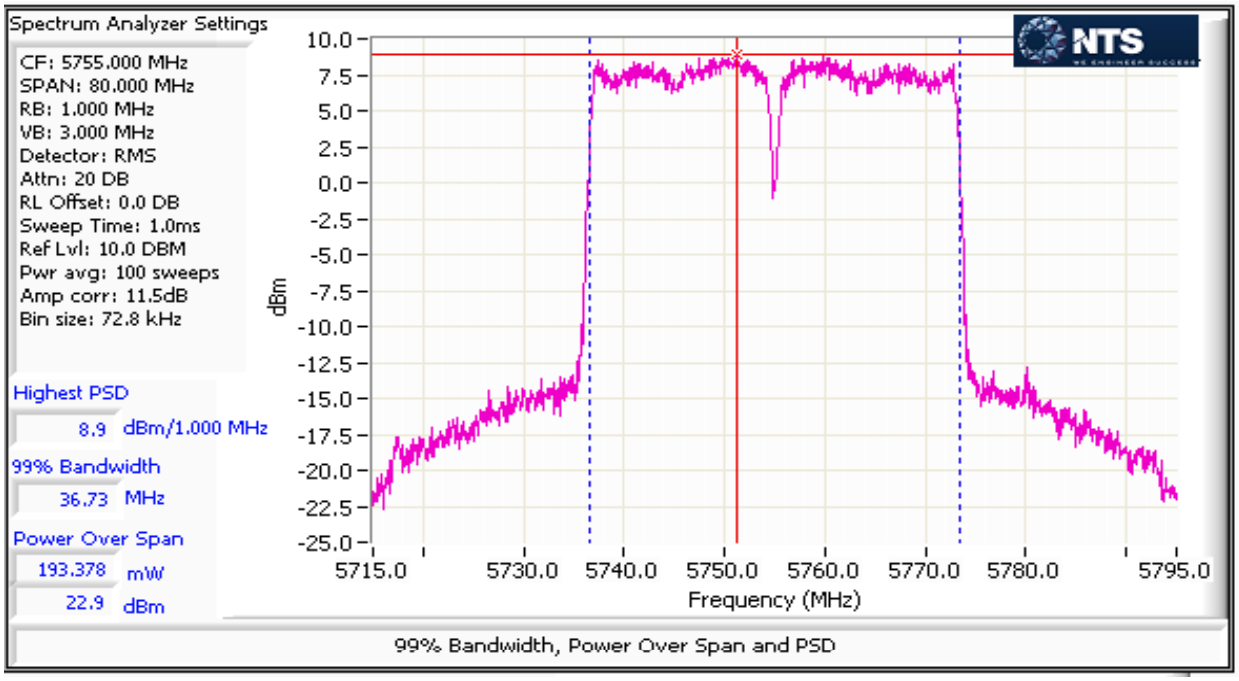
MIMO Device 5250-5350 PSD - FCC/IC

Mode: n40

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD[3] dBm/MHz	Total PSD mW/MHz	Total PSD dBm/MHz	FCC Limit dBm/MHz	IC Limit dBm/MHz	Result
5755	1	23		98	8.9	21.1	13.2	27.6	27.6	Pass
	3				8.1					
	4									
	2				8.4					
5795	1	23		98	9.0	20.6	13.1	27.6	27.6	Pass
	3				7.9					
	4									
	2				8.1					

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 (260-E255040)	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 (260-E255040)	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): 1951.3

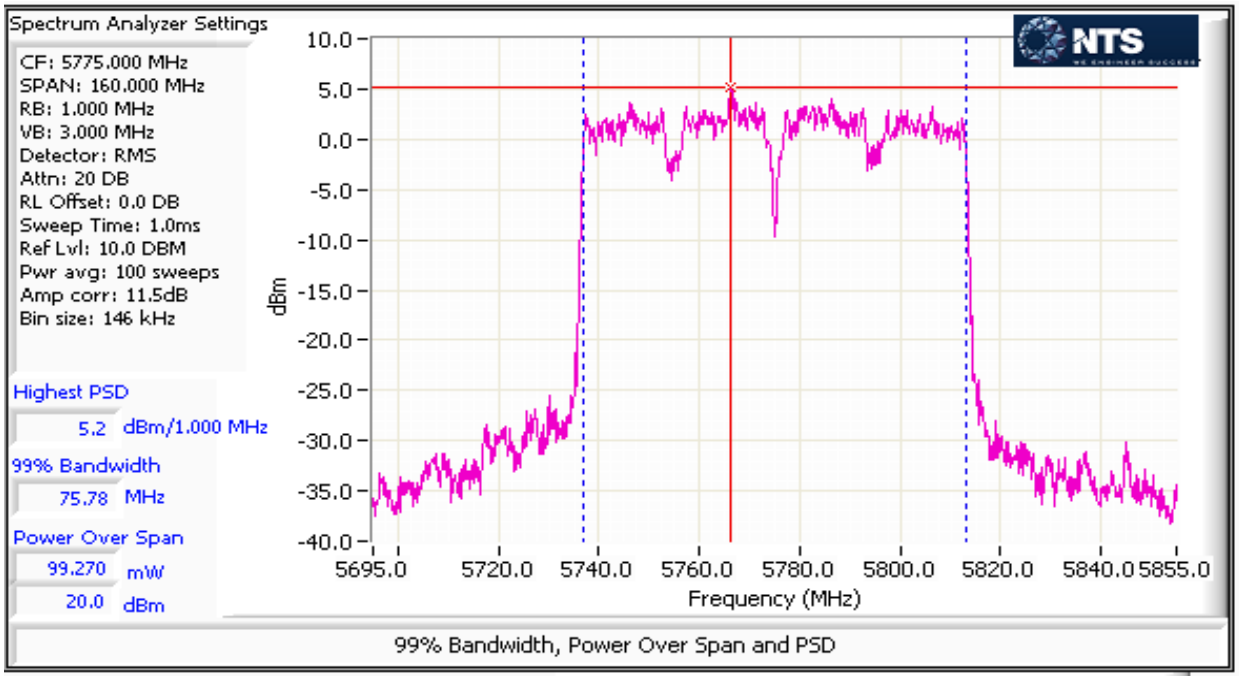
Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[2] dBm	Total Power mW	Total Power dBm	FCC Limit dBm	Max Power (W)	Result
5775	1	21.5	75.8	94	20.3	283.9	24.5	27.6	0.284	Pass
	3				18.8					
	4									
	2				19.3					

MIMO Device 5250-5350 PSD - FCC/IC

Mode: ac80

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD[3] dBm/MHz	Total PSD mW/MHz	Total PSD dBm/MHz	FCC Limit dBm/MHz	IC Limit dBm/MHz	Result
5775	1	21.5		94	5.2	7.6	8.8	27.6	27.6	Pass
	3				2.6					
	4									
	2				3.0					

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 (260-E255040)	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.

Date of Test: 6/1/2016 18:00
Test Engineer: Rafael Varelas
Test Location: Fremont Chamber #7

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

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: 22.8 °C
Rel. Humidity: 35 %

Summary of Results

Run #	Mode	Channel	Power Setting		Test Performed	Limit	Result / Margin
20MHz Bandwith Modes							
1	a	149 - 5745MHz	23.0		Bandedge at 5725MHz	15.407(4)(i)	66.2 dBµV/m @ 5627.3 MHz (-2.1 dB)
	a	165 - 5825MHz	23.0		Bandedge at 5850MHz	15.407(4)(i)	67.4 dBµV/m @ 5987.2 MHz (-0.9 dB)
2	n20	149 - 5745MHz	23.0		Bandedge at 5725MHz	15.407(4)(i)	66.2 dBµV/m @ 5617.9 MHz (-2.1 dB)
	n20	165 - 5825MHz	23.0		Bandedge at 5850MHz	15.407(4)(i)	67.4 dBµV/m @ 5981.6 MHz (-0.9 dB)
40MHz Bandwith Modes							
3	n40	151 - 5755MHz	23.0		Bandedge at 5725MHz	15.407(4)(i)	66.3 dBµV/m @ 5638.7 MHz (-2.0 dB)
	n40	159 - 5795MHz	23.0		Bandedge at 5850MHz	15.407(4)(i)	65.9 dBµV/m @ 5943.0 MHz (-2.4 dB)
80MHz Bandwith Modes							
4	ac80	155 - 5775MHz	21.5		Bandedge at 5745MHz	15.407(4)(i)	67.3 dBµV/m @ 5645.1 MHz (-1.0 dB)
	ac80	155 - 5775MHz	21.5		Bandedge at 5850MHz	15.407(4)(i)	66.7 dBµV/m @ 5928.1 MHz (-1.6 dB)

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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	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: Internal 3x3 Beamforming (802.11a mode does not do 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 (260-E255040)	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, 5725-5850MHz

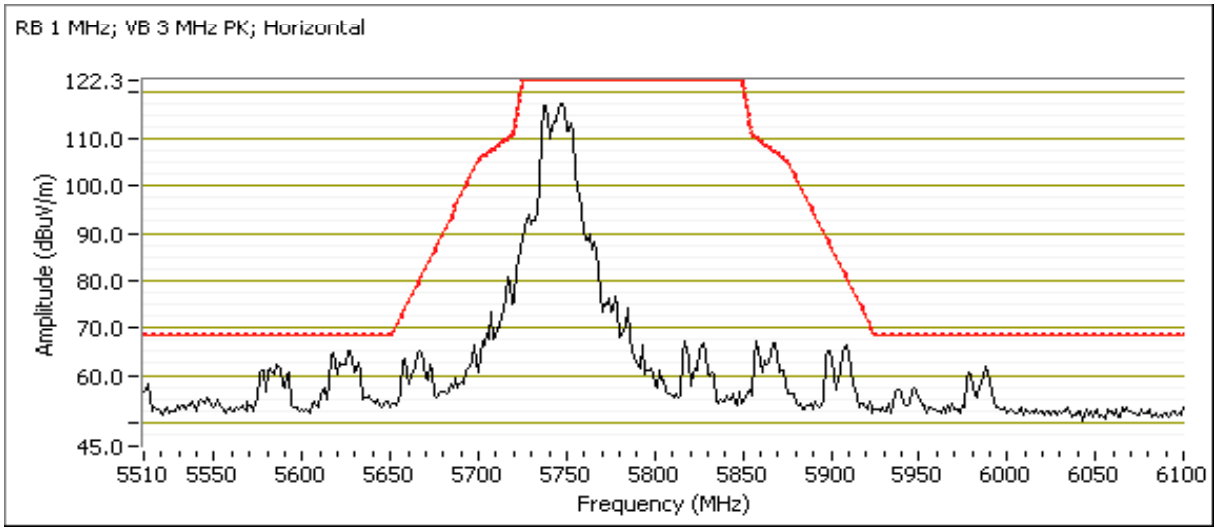
Date of Test: 6/1/2016 0:00
Test Engineer: Rafael Varelas
Test Location: Chamber #7

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

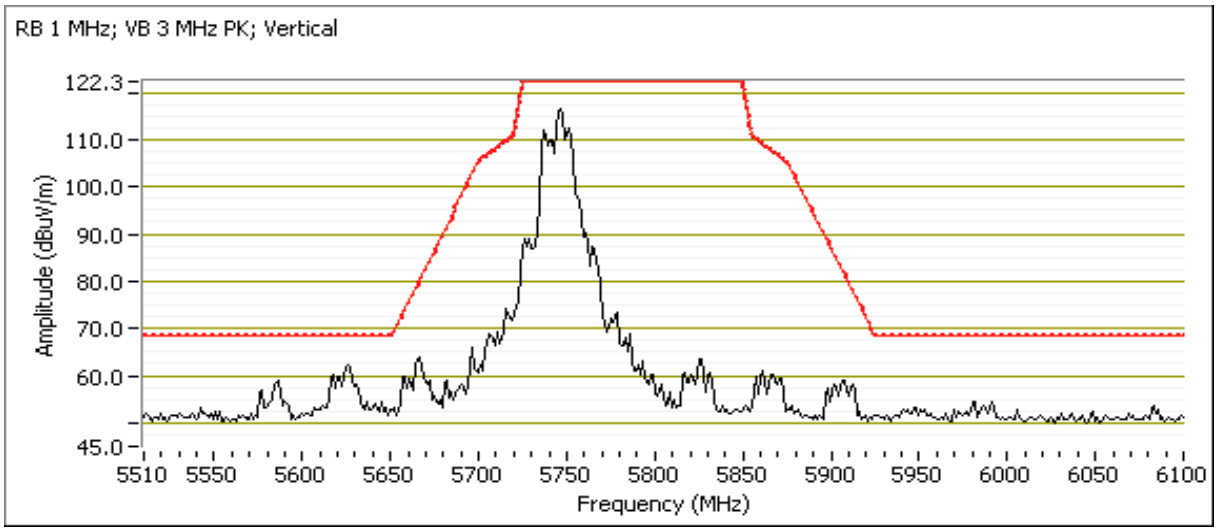
Channel: 149 - 5745MHz
Tx Chain: 3Tx
Mode: a
Data Rate: 6 Mbps

Band Edge Signal Radiated Field Strength - Using mask of 15.407(4)(i)

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5627.250	66.2	H	68.3	-2.1	PK	360	1.1	POS; RB 1 MHz; VB: 3 MHz
5626.050	63.7	V	68.3	-4.6	PK	318	1.5	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

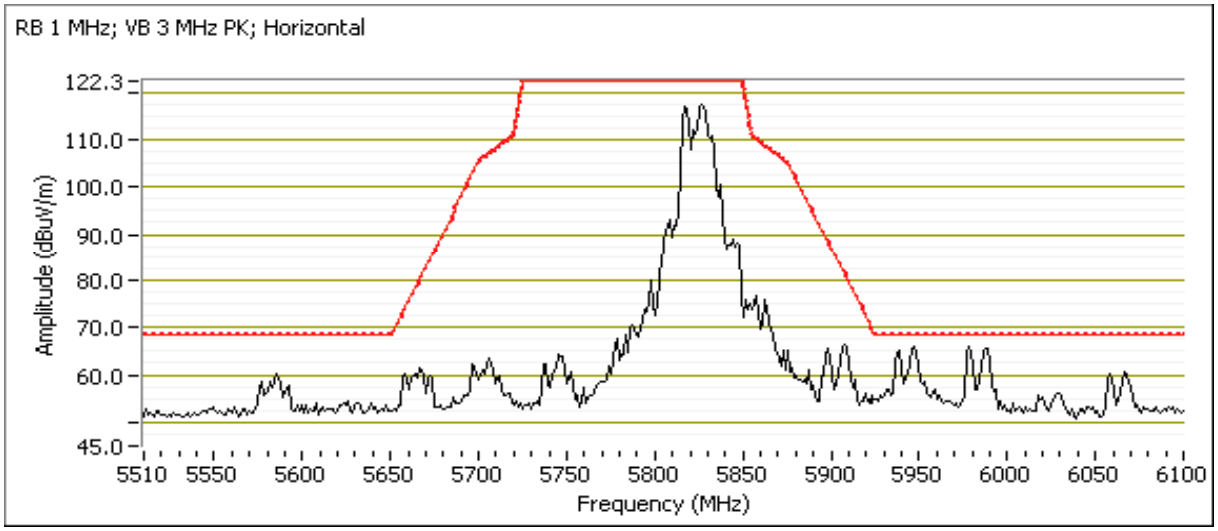


Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

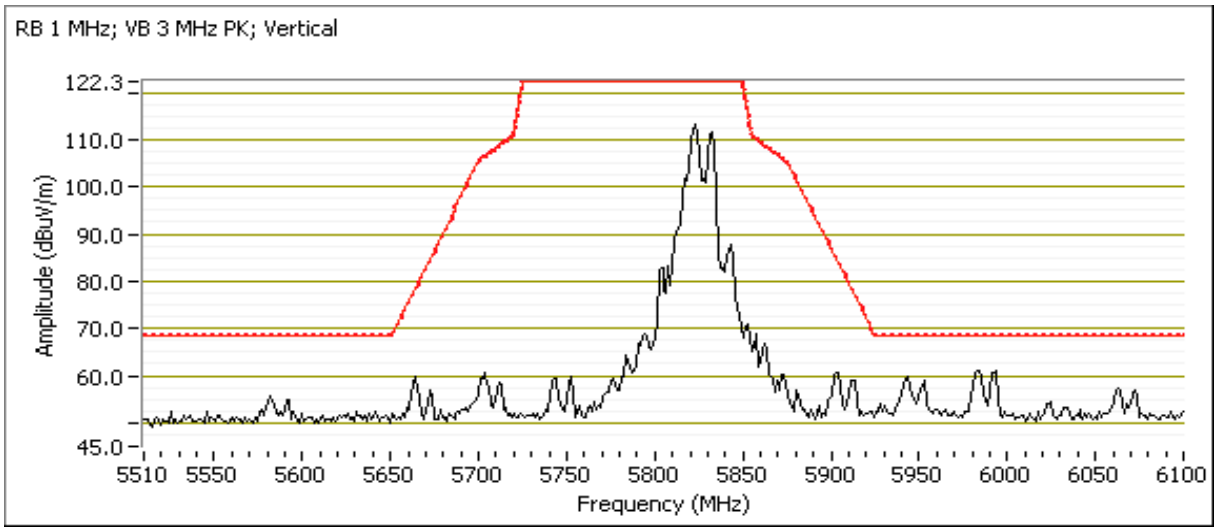
Channel: 165 - 5825MHz
Tx Chain: 3Tx
Mode: a
Data Rate: 6 Mbps

Band Edge Signal Radiated Field Strength - Using mask of 15.407(4)(i)

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5987.220	67.4	H	68.3	-0.9	PK	0	1.0	POS; RB 1 MHz; VB: 3 MHz
5983.170	63.5	V	68.3	-4.8	PK	111	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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 (260-E255040)	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

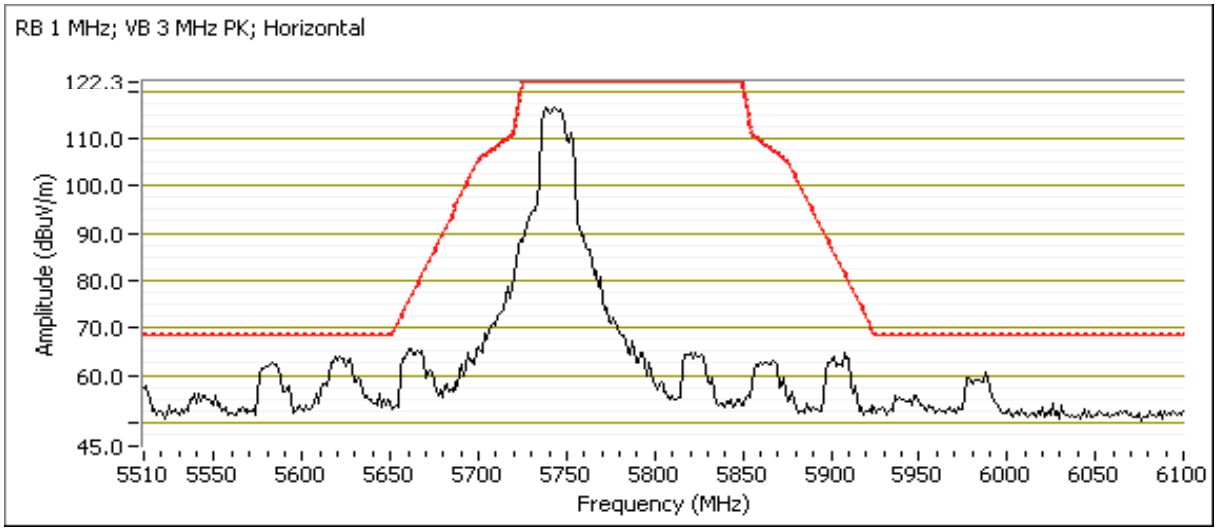
Date of Test: 6/1/2016 0:00
Test Engineer: Rafael Varelas
Test Location: FT Chamber #7

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

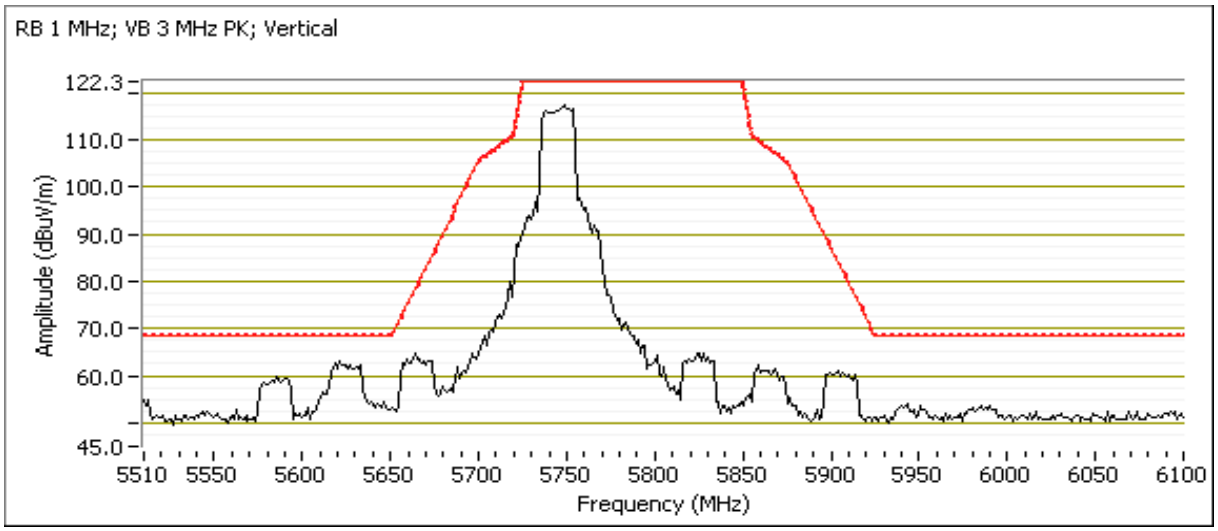
Channel: 149 -5745MHz
Tx Chain: 3Tx
Mode: n20
Data Rate: VHT8

Band Edge Signal Radiated Field Strength - Using mask of 15.407(4)(i)

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5617.940	66.2	H	68.3	-2.1	PK	3	1.2	POS; RB 1 MHz; VB: 3 MHz
5626.350	64.3	V	68.3	-4.0	PK	315	1.7	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

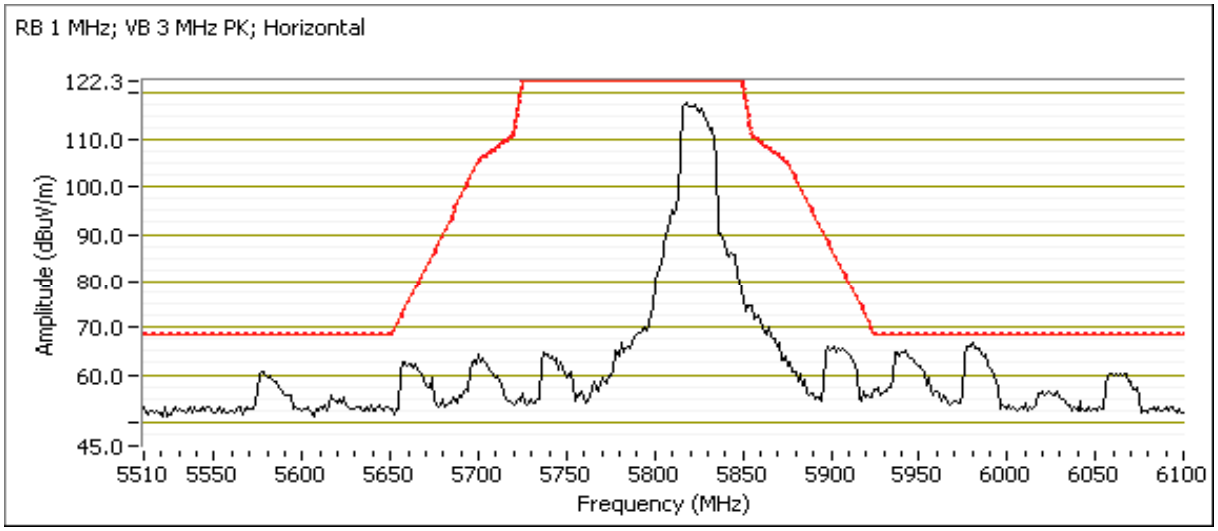


Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

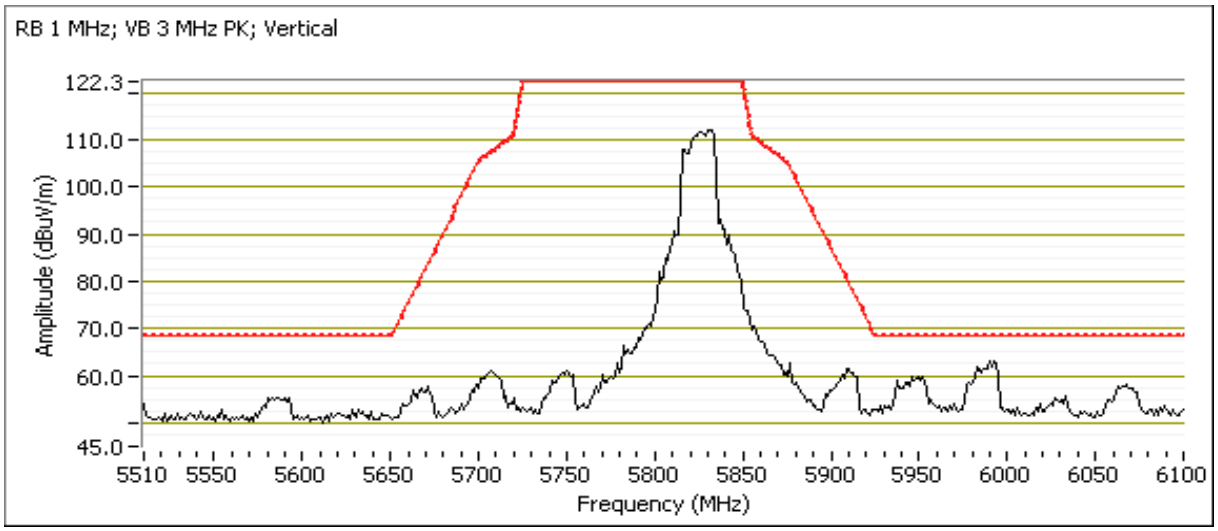
Channel: 165 - 5825MHz
Tx Chain: 3Tx
Mode: n20
Data Rate: VHT8

Band Edge Signal Radiated Field Strength - Using mask of 15.407(4)(i)

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5981.560	67.4	H	68.3	-0.9	PK	2	1.0	POS; RB 1 MHz; VB: 3 MHz
5990.880	63.2	V	68.3	-5.1	PK	112	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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 (260-E255040)	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

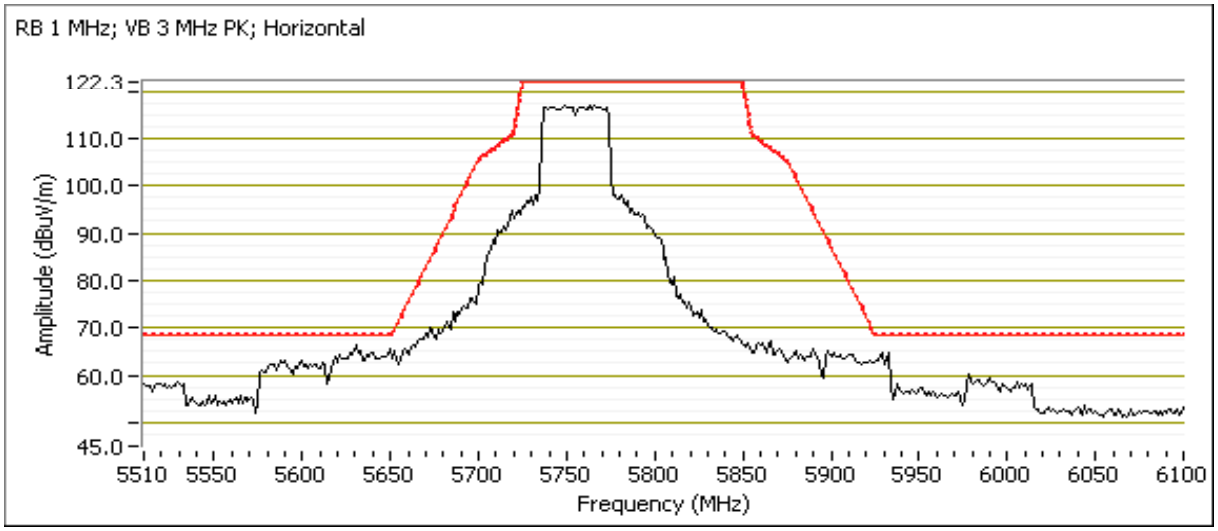
Date of Test: 6/1/2016 0:00
Test Engineer: Rafael Varelas
Test Location: FT Chamber #7

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

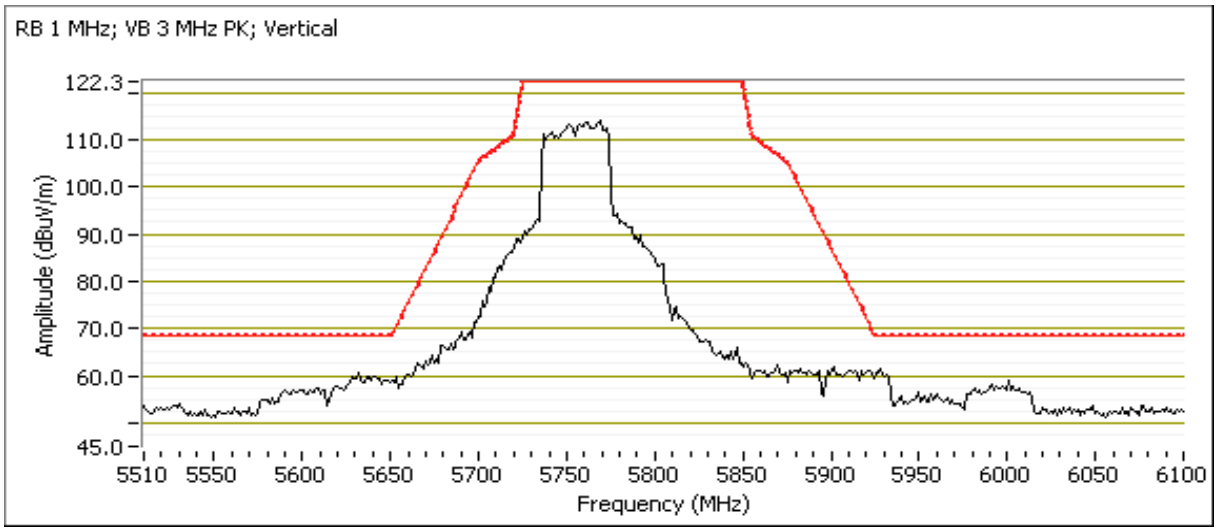
Channel: 151 -5755MHz
Tx Chain: 3Tx
Mode: n40
Data Rate: VHT8

Band Edge Signal Radiated Field Strength - Using mask of 15.407(4)(i)

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5638.680	66.3	H	68.3	-2.0	PK	354	1.2	POS; RB 1 MHz; VB: 3 MHz
5639.280	60.6	V	68.3	-7.7	PK	70	1.1	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

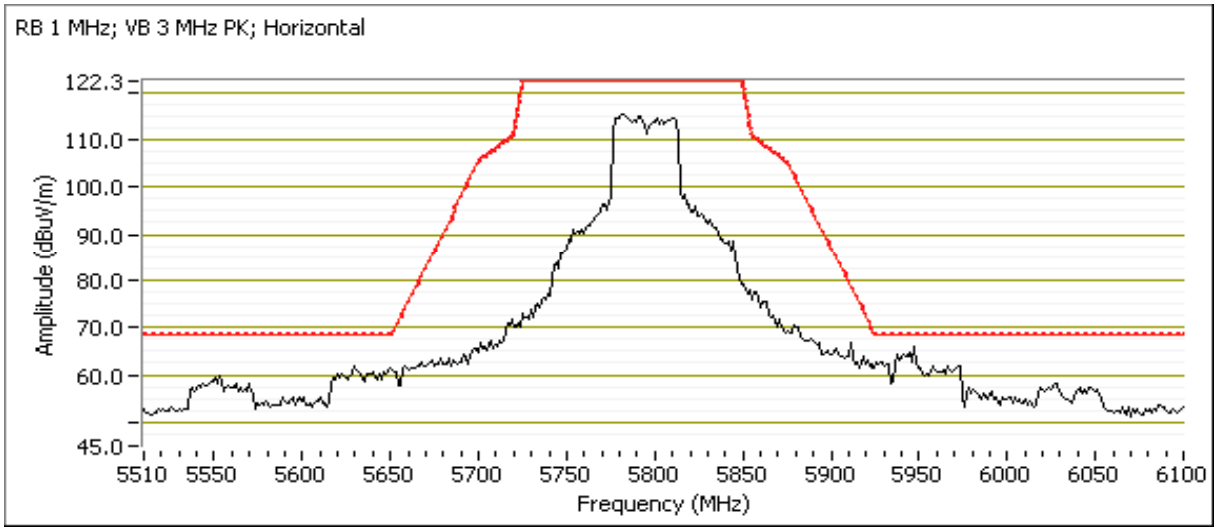


Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A

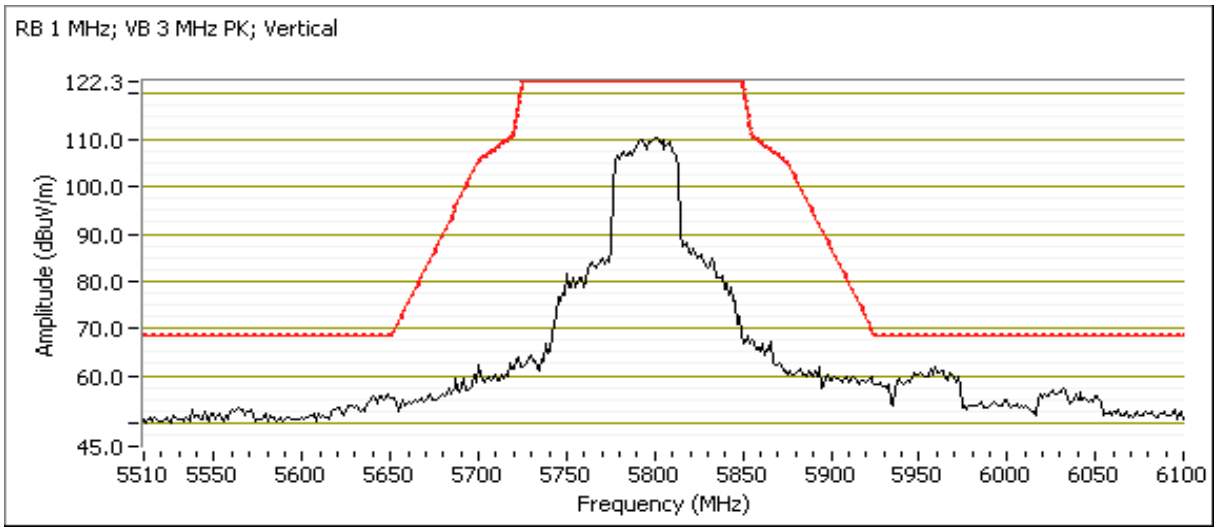
Channel: 159 - 5795MHz
Tx Chain: 3Tx
Mode: n40
Data Rate: VHT8

Band Edge Signal Radiated Field Strength - Using mask of 15.407(4)(i)

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5943.030	65.9	H	68.3	-2.4	PK	360	1.0	POS; RB 1 MHz; VB: 3 MHz
5960.420	62.8	V	68.3	-5.5	PK	17	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	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 (260-E255040)	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: 6/1/2016 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: 3Tx
Mode: ac80
Data Rate: VHT9

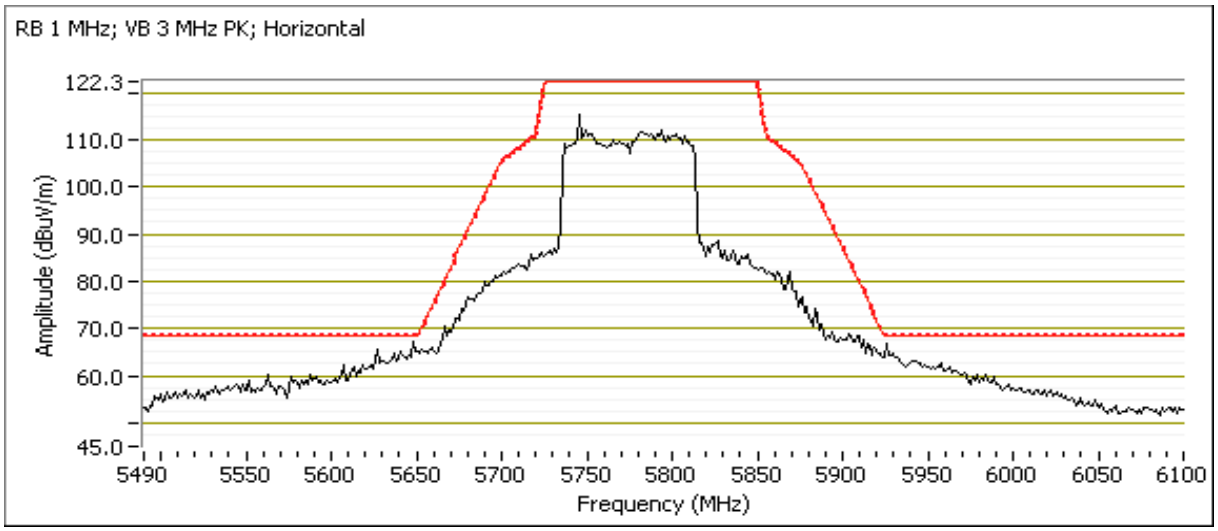
Band Edge Signal Radiated Field Strength - Using mask of 15.407(4)(i) - At the low side of the band

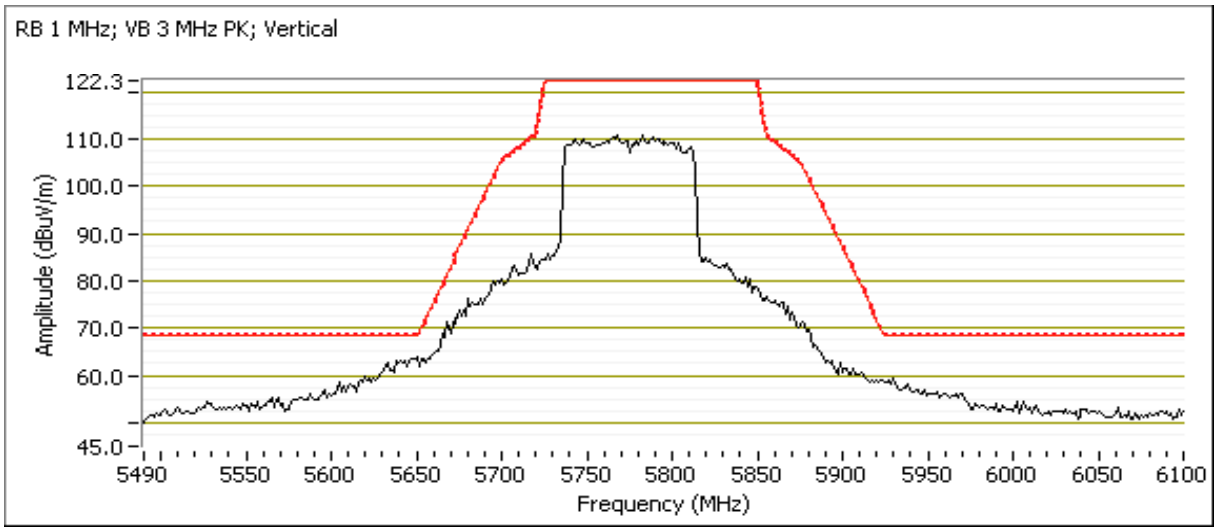
Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5645.090	67.3	H	68.3	-1.0	PK	349	1.1	POS; RB 1 MHz; VB: 3 MHz
5647.110	64.5	V	68.3	-3.8	PK	321	1.4	POS; RB 1 MHz; VB: 3 MHz

Band Edge Signal Radiated Field Strength - Using mask of 15.407(4)(i) - At the high side of the band

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5928.110	66.7	H	68.3	-1.6	PK	360	1.0	POS; RB 1 MHz; VB: 3 MHz
5928.310	60.3	V	68.3	-8.0	PK	321	1.4	POS; RB 1 MHz; VB: 3 MHz

Client:	Pace Americas, Inc.	Job Number:	JD100297
Model:	Wi-Fi Module 5 GHz (260-E255040)	T-Log Number:	T100356
		Project Manager:	Irene Radamacher
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC Part 15.407	Class:	N/A





End of Report

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