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EMC Test Report

Application for Grant of Equipment Authorization

Industry Canada RSS-Gen Issue 4 / RSS 247 Issue 1
FCC Part 15, Subpart E

Model: APINM210

IC CERTIFICATION #:	4675A-APINM210
FCC ID:	Q9DAPINM210
APPLICANT:	Ericsson Canada 349 Terry Fox Drive Kanata, ON K2K 2V6
TEST SITE(S):	National Technical Systems - Silicon Valley 41039 Boyce Road. Fremont, CA. 94538-2435
IC SITE REGISTRATION #:	2845B-4, 2845B-5, 2845B-7
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Testing Cert #0214.26

REVISION HISTORY

Rev#	Date	Comments	Modified By
-	January 22, 2016	First release	
1.0	February 29, 2016	Updated model number	MEH

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SCOPE

An electromagnetic emissions test has been performed on the Ericsson Canada model APINM210, pursuant to the following rules:

Industry Canada RSS-Gen Issue 4
RSS 247 Issue 1 "Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices"
FCC Part 15, Subpart E requirements for UNII Devices

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

Testing was performed only on model APINM210.

This test report covers 5150 - 5250 MHz and 5725 – 5850 MHz bands of operation.

STATEMENT OF COMPLIANCE

The tested sample of Ericsson Canada model APINM210 complied with the requirements of the following regulations:

RSS 247 Issue 1 "Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices"
FCC Part 15, Subpart E requirements for UNII Devices

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

The test results recorded herein are based on a single type test of Ericsson Canada model APINM210 and therefore apply only to the tested sample. The sample was selected and prepared by Nancy Langford of Ericsson Canada.

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
FCC 15.407

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
	RSS 247 6.2.1	Indoor operation only	Refer to user's manual	N/A	Complies
15.407 (a) (1) (iv)	-	Output Power	a: 26.6dBm (455 mW) n20: 26.4dBm (437 mW) n40: 24.4dBm (275mW) ac80 20.3dBm (107mW)	24 dBm	
	RSS 247 6.2.1 (1)		a: 15.6dBm (36 mW) n20: 16.1dBm (41mW) n40: 19.0dBm (79mW) ac80:20.3dBm (107mW) (Max eirp: 21.8 dBm)	22.3 dBm eirp	Complies
15.407 (a) (1)	-	Power Spectral Density	a: 14.5dBm/MHz n20: 14.0dBm/MHz n40: 9.2dBm/MHz ac80: 2.0dBm/MHz	17 dBm/MHz	Complies
-	RSS 247 6.2.1 (1)		a: 3.8dBm/MHz n20: 3.8dBm/MHz n40: 3.6dBm/MHz ac80: 2.0dBm/MHz	4 dBm/MHz	Complies

MIMO TxBF

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
-	RSS 247 6.2.1	Indoor operation only	Refer to user's manual	N/A	Complies
-	RSS-247 6.2.1	Output Power	n20: 16.1dBm (41mW) n40: 16.8dBm (48mW) ac80: 16.6dBm (46mW) (Max eirp: 22.8 dBm)	17 dBm	Complies
-	RSS-247 A9.5 (2)	Power Spectral Density	n20: 3.8dBm/MHz n40: 1.8dBm/MHz ac80: -1.5dBm/MHz	4 dBm/MHz	Complies

Operation in the 5.725 – 5.850 GHz Band

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.407 (e)	RSS 247 6.2.4 (1)	6 dB Bandwidth	a: 16.4 MHz n20: 17.6 MHz n40: 36.3 MHz ac80: 75.9 MHz	≥ 500 kHz	Complies
15.407(a) (3)	RSS 247 6.2.4 (1)	Output Power	a: 22.6dBm (184mW) n20: 23.5dBm (223mW) n40: 20.9dBm (124mW) ac80:20.2dBm (104mW)	30 dBm (1 W) (eirp < 36 dBm)	Complies
15.407(a) (3)	RSS 247 6.2.4 (1)	Power Spectral Density	a: 10.8dBm/MHz n20: 11.4dBm/MHz n40: 5.9dBm/MHz ac80: 2.0dBm/MHz	30 dBm/ 500 kHz	Complies

Requirements for all U-NII/LELAN bands

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.407	RSS 247 6.1	Modulation	Digital Modulation is used	Digital modulation is required	Complies
15.407(b) / 15.209	RSS 247 6.0	Spurious Emissions	53.0 dBµV/m @ 5037.6 MHz (-1.0 dB)	Refer to page 20	Complies
-	RSS 247 6.4 (1)	Channel Selection	Spurious emissions tested at outermost channels in each band	Device was tested on the top, bottom and center channels in each band	N/A
15	-		Measurements on three channels in each band		Complies
15.407 (c)	RSS 247 6.4 (2)	Operation in the absence of information to transmit	Operation is discontinued in the absence of information	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 (i)	RSS 247 6.4 (4)	Device Security	Refer to Software Security Exhibit	Prevents modifications by unauthorized parties	Complies
-	RSS 247 6.4 (5) and (6)	User manual information	Refer to manual for details	Warning regarding interference from Satellite Systems	Complies

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	Uses integral antennas	Unique or integral antenna required	Complies
15.207	RSS GEN Table 3	AC Conducted Emissions	35.6 dBµV @ 0.207 MHz	Refer to page 18	Complies (-17.7 dB)
15.247 (b) (5) 15.407 (f)	RSS 102	RF Exposure Requirements	Refer to MPE calculations in separate exhibit, RSS 102 declaration and User Manual statements.	Refer to OET 65, FCC Part 1 and RSS 102	Complies
-	RSS GEN 8.3	User Manual	-	Statement for products with detachable antenna	Complies
-	RSP 100 RSS GEN 6.6	Occupied Bandwidth	a: 16.9 MHz n20: 18.0 MHz n40: 36.4 MHz ac80: 75.6 MHz	Information only	N/A

MEASUREMENT UNCERTAINTIES

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

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

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The Ericsson Canada model APINM210 is an IEEE 802.11 a/b/g/n wireless module that operates in both the 2.4 GHz and 5 GHz bands. The module supports n20, n40 and ac80 modes.
This test report covers 5150 - 5250 MHz and 5725 – 5850 MHz bands of operation.

The sample was received on November 19, 2015 and tested on November 19, 23, 25 and 30 and December 1, 3, 4, 7, 8, 9, 14, 17, 18 and 23, 2015. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
Aruba	APINM210	Radio Module	-	Q9DAPINM210

OTHER EUT DETAILS

The radiated emission tests were performed with the host unit.

ANTENNA SYSTEM

PCB trace, integral antennas (3 chains)

ENCLOSURE

The EUT has no enclosure. It is designed to be installed within the enclosure of a host unit.

MODIFICATIONS

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

SUPPORT EQUIPMENT

No local support equipment was used during testing.
The following equipment was used as remote support equipment for emissions testing:

Company	Model	Description	Serial Number	FCC ID
Dell	LATITUDE E5440	Laptop Computer	HMPNP12	-
Dell	LA65NM130	AC Adaptor	CN-0JNKWD-72438	-

EUT INTERFACE PORTS

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

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Ethernet	Laptop Computer	Cat5e Ethernet	Unshielded	10
DC Power	AC Adaptor	Two-wire	Unshielded	1
AC Adaptor	AC Mains	Three-wire	Unshielded	1

EUT OPERATION

During testing, the EUT was configured to continuously transmit at maximum output power and noted data rate on the channel indicated.

TEST SITE

GENERAL INFORMATION

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

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

ANSI C63.4 recommends that ambient noise at the test site be at least 6 dB below the allowable limits. Ambient levels are below this requirement. The test site(s) contain separate areas for radiated and conducted emissions testing. 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 20 Hz, 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

The receivers utilize either a Rohde & Schwarz EZM Spectrum Monitor/Controller or contain an internal Spectrum Monitor/Controller to view and convert the 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)

The Spectrum Monitor provides a visual display of the signal being measured. In addition, the controller or a personal computer run automated data collection programs which control the receivers. This provides added accuracy since all site correction factors, such as cable loss and antenna factors are added automatically.

LINE IMPEDANCE STABILIZATION NETWORK (LISN)

Line conducted measurements utilize a 50 µH Line Impedance Stabilization Network as the monitoring point. The LISN used also contains a 250 µH 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.
ANSI C63.10 specifies that the test height above ground for table mounted devices shall be 0.8 meters for below 1 GHz measurements and 1.5 meters for above 1 GHz measurements.
During radiated measurements, the EUT is positioned on a motorized turntable in conformance with this requirement.

INSTRUMENT CALIBRATION

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

TEST PROCEDURES

EUT AND CABLE PLACEMENT

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

CONDUCTED EMISSIONS

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

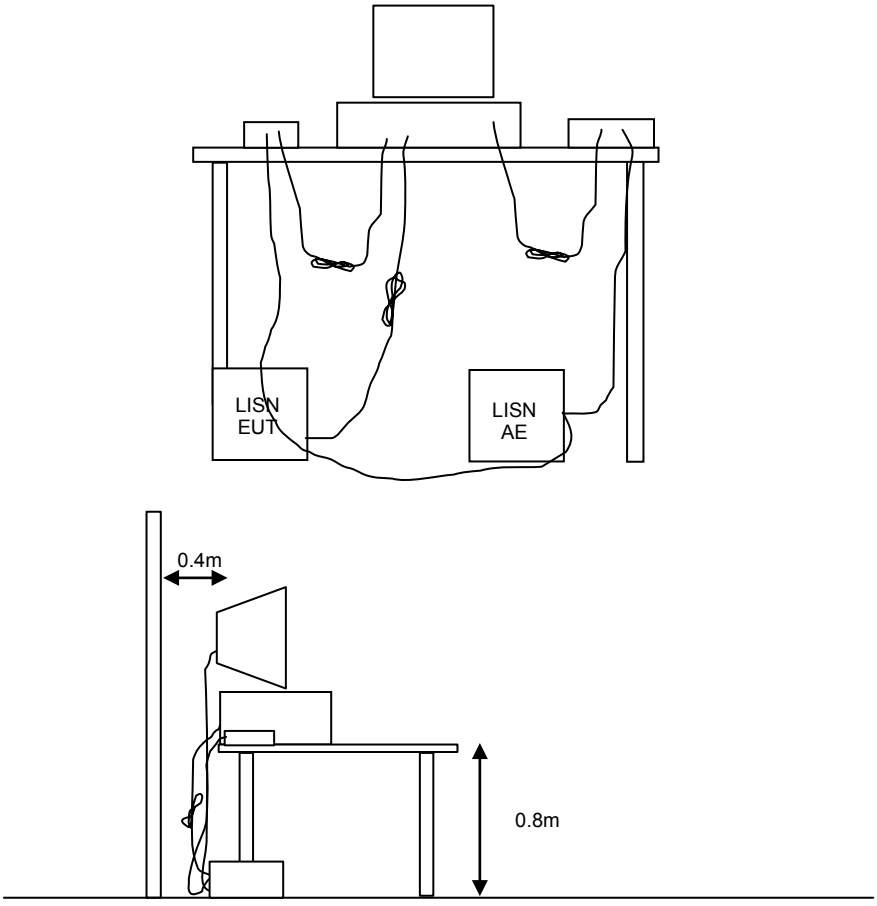


Figure 1 Typical Conducted Emissions Test Configuration

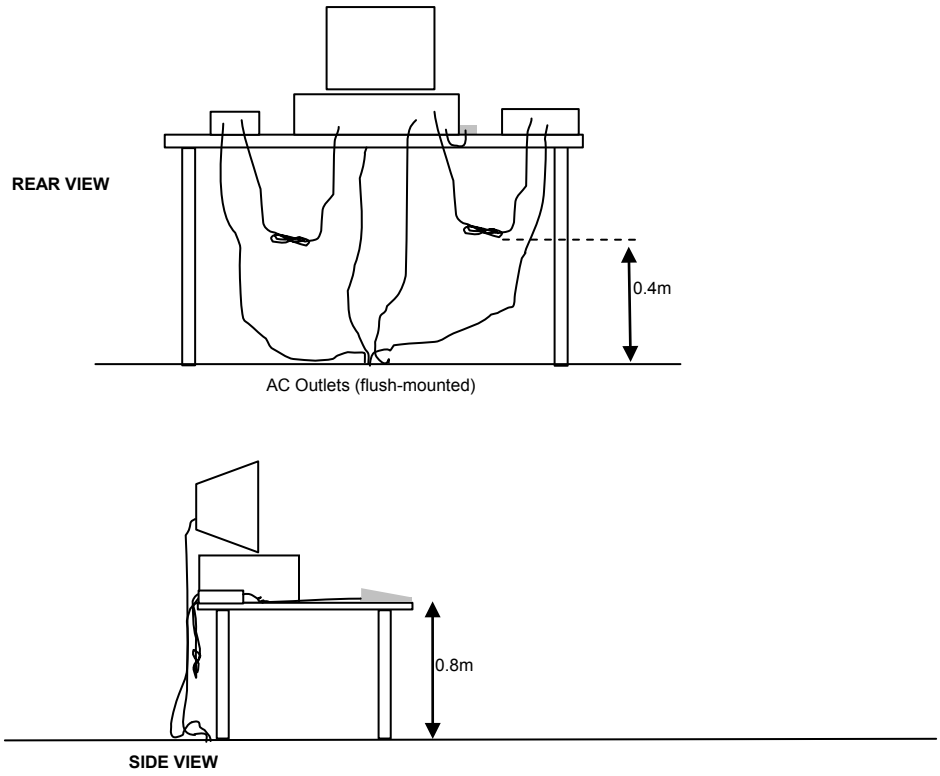
RADIATED EMISSIONS

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

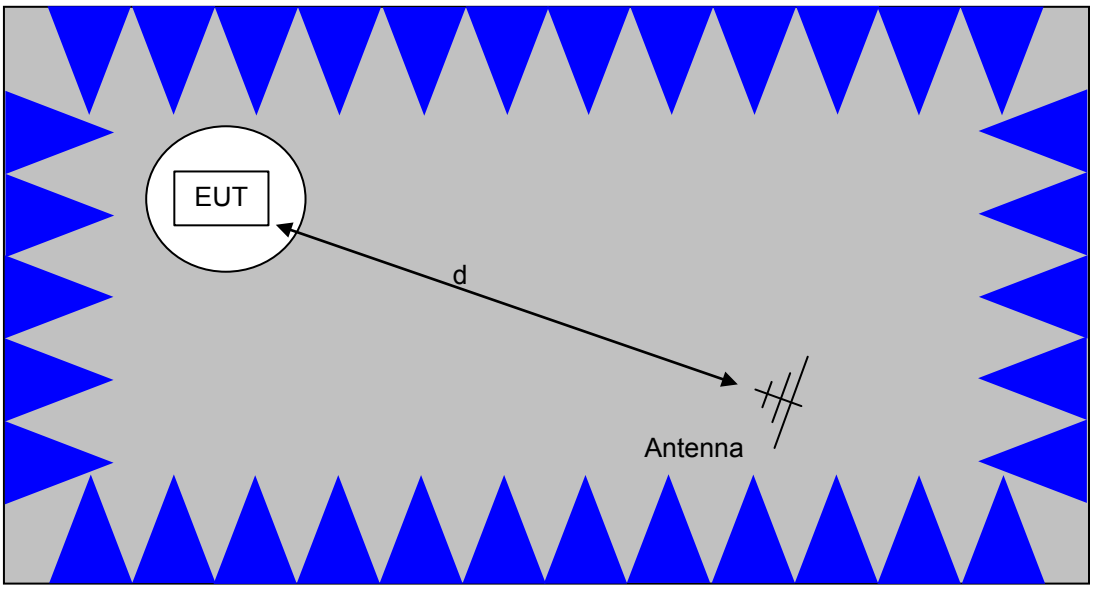
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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

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

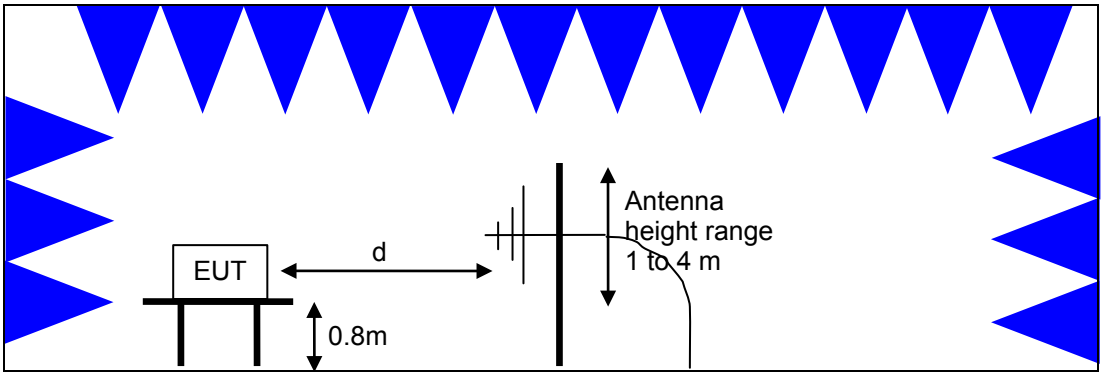


Typical Test Configuration for Radiated Field Strength Measurements



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

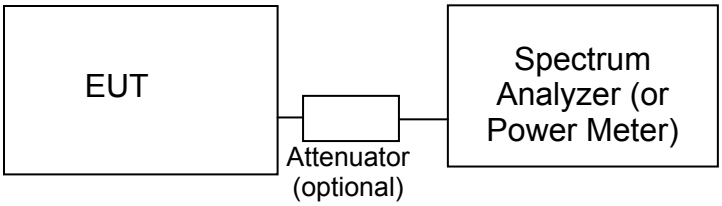
Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.



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

CONDUCTED EMISSIONS FROM ANTENNA PORT

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



Test Configuration for Antenna Port Measurements

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

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

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

BANDWIDTH MEASUREMENTS

The 6 dB, 20 dB, 26 dB 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 (dBµV). For radiated emissions, the measured data is converted to the field strength at the antenna in dB microvolts per meter (dBµV/m). The results are then converted to the linear forms of µV and µV/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 (dBµV)	Quasi Peak Limit (dBµV)
0.150 to 0.500	Linear decrease on logarithmic frequency axis between 56.0 and 46.0	Linear decrease on logarithmic frequency axis between 66.0 and 56.0
0.500 to 5.000	46.0	56.0
5.000 to 30.000	50.0	60.0

GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from transmitters that fall in restricted bands[1]

Frequency Range (MHz)	Limit (µV/m)	Limit (dBµV/m @ 3m)
0.009-0.490	$2400/F_{KHz}$ @ 300m	$67.6-20*\log_{10}(F_{KHz})$ @ 300m
0.490-1.705	$24000/F_{KHz}$ @ 30m	$87.6-20*\log_{10}(F_{KHz})$ @ 30m
1.705 to 30	30 @ 30m	29.5 @ 30m
30 to 88	100 @ 3m	40 @ 3m
88 to 216	150 @ 3m	43.5 @ 3m
216 to 960	200 @ 3m	46.0 @ 3m
Above 960	500 @ 3m	54.0 @ 3m

FCC 15.407 (a) OUTPUT POWER LIMITS

The table below shows the limits for output power and output power density. 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	1 Watts (30 dBm)	17 dBm/MHz
5250 – 5350	250 mW (24 dBm)	11 dBm/MHz
5745 – 5725	250 mW (24 dBm)	11 dBm/MHz
5725 – 5850	1 Watts (30 dBm)	30 dBm/500 kHz

For system using antennas with gains exceeding 6 dBi, the output power and power spectral density limits are reduced by 1dB for every dB the antenna gain exceeds 6 dBi.

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[1] The restricted bands are detailed in FCC 15.205, RSS-GEN Table 3

OUTPUT POWER LIMITS –LELAN DEVICES

The table below shows the limits for output power and output power density defined by RSS 210. 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	200 mW (23 dBm) eirp	10 dBm/MHz eirp
5250 – 5350	250 mW (24 dBm)2 1W (30 dBm) eirp	11 dBm/MHz
5470 – 5725	250 mW (24 dBm)2 1W (30 dBm) eirp	11 dBm/MHz
5725 – 5825	1 Watts (30 dBm) 4 Watts eirp	30 dBm/ 500KHz

In addition, the power spectral density limit shall be reduced by 1dB for every dB the highest power spectral density exceeds the "average" power spectral density) by more than 3dB. The "average" power spectral density is determined by dividing the output power by 10*log(EBW) where EBW is the 99% power bandwidth.

SPURIOUS EMISSIONS LIMITS –UNII and LELAN DEVICES

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

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

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

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

$$R_r - S = M$$

where:

R_r = Receiver Reading in dBµV

S = Specification Limit in dBµV

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 30 MHz, 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 30 MHz 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 dBµV/m

F_d = Distance Factor in dB

R_c = Corrected Reading in dBµV/m

L_s = Specification Limit in dBµV/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 (dBµV/m) to an eirp power (dBm) is -95.3 dB.

Appendix A Test Equipment Calibration Data

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
Radiated Emissions, 1000 - 6,000 MHz, 19-Nov-15					
EMCO	Antenna, Horn, 1-18GHz	3115	868	6/26/2014	6/26/2016
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	12/20/2014	12/20/2015
Radiated Emissions, 1000 - 6,000 MHz, 23-Nov-15					
EMCO	Antenna, Horn, 1-18GHz	3115	868	6/26/2014	6/26/2016
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	12/20/2014	12/20/2015
Radiated Spurious Emissions, 1000 - 6,500 MHz, 25-Nov-15					
EMCO	Antenna, Horn, 1-18GHz	3115	868	6/26/2014	6/26/2016
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	12/20/2014	12/20/2015
Radiated Emissions, 1000 - 18,000 MHz, 25-Nov-15					
EMCO	Antenna, Horn, 1-18GHz	3115	868	6/26/2014	6/26/2016
Hewlett Packard	High Pass filter, 3.5 GHz	P/N 84300-80038	1157	7/10/2015	7/10/2016
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1683	7/13/2015	7/13/2016
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	2199	10/9/2015	10/9/2016
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), 30-Nov-15					
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 Spurious Emissions), 01-Dec-15					
Agilent Technologies	PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX,	E4446A	2139	6/22/2015	6/22/2016
Radiated Emissions, 1000 - 25,000 MHz, 03-Dec-15					
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	2/20/2015	2/20/2016
Hewlett Packard	SA40 Head (Red)	Miteq	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
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/27/2014	6/27/2016
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	1729	7/8/2015	7/8/2016
A. H. Systems	Purple System Horn, 18-40GHz	SAS-574, p/n: 2581	2160	8/28/2014	8/28/2017
Radiated Emissions, 1000 - 12,000 MHz, 04-Dec-15					
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
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/27/2014	6/27/2016

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
Micro-Tronics	Band Reject Filter, 5725-5875 MHz	BRC50705-02	1682	7/8/2015	7/8/2016
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	1729	7/8/2015	7/8/2016
Micro-Tronics	Band Reject Filter, 5470-5725 MHz	BRC50704-02	1730	7/10/2015	7/10/2016
Radiated Emissions, 1,000 - 12,000 MHz, 07-Dec-15					
EMCO	Antenna, Horn, 1-18GHz	3115	868	6/26/2014	6/26/2016
Micro-Tronics	Band Reject Filter, 5725-5875 MHz	BRC50705-02	1682	7/8/2015	7/8/2016
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	2199	10/9/2015	10/9/2016
Radiated Emissions, 30 - 1,000 MHz, 08-Dec-15					
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1630	7/6/2015	7/6/2016
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	2237	8/29/2014	8/29/2016
Com-Power	Preamplifier, 1-1000 MHz	PAM-103	2885	10/13/2015	10/13/2016
Radiated Emissions, 1000 - 40,000 MHz, 08-Dec-15					
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
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/27/2014	6/27/2016
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	2239	9/16/2015	9/16/2016
Hewlett Packard	SA40 Head (Red)	Miteq	1145	7/17/2015	7/17/2016
A. H. Systems	Purple System Horn, 18-40GHz	SAS-574, p/n: 2581	2160	8/28/2014	8/28/2017
Conducted Emissions - AC Power Ports, 9-Dec-15					
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	1401	5/14/2015	5/14/2016
Rohde & Schwarz	EMI Test Receiver, 20 Hz-40 GHz	ESIB40 (1088.7490.40)	2493	1/23/2015	1/23/2016
Com-Power	9KHz-30MHz, 50uH, 15Aac, 10Adc, max	LI-215A	2672	6/26/2015	6/26/2016
Radiated Emissions, 1000 - 40,000 MHz, 14-Dec-15					
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	2/20/2015	2/20/2016
Hewlett Packard	SA40 Head (Red)	Miteq	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	1152	7/10/2015	7/10/2016
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/27/2014	6/27/2016
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	1729	7/8/2015	7/8/2016
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, 2400-2500 MHz	BRM50702-02	2238	9/16/2015	9/16/2016

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
Antenna port measurements, 17-Dec-15					
Agilent Technologies	PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX,	E4446A	2139	6/22/2015	6/22/2016
Frequency Stability (U-NII), 18-Dec-15					
Fluke	Fluke Multimeter, True RMS	175	1447	7/23/2015	7/23/2016
Watlow	Temp Chamber (w/ F4 watlow Controller)	96A0	2171	7/14/2015	7/14/2016
Agilent Technologies	3Hz -44GHz PSA Spectrum Analyzer	E4446A	2796	3/31/2015	3/31/2016
Radiated Emissions, 1,000 - 40,000 MHz, 23-Dec-15					
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
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/27/2014	6/27/2016
Micro-Tronics	Band Reject Filter, 5470-5725 MHz	BRC50704-02	1730	7/10/2015	7/10/2016
Hewlett Packard	High Pass filter, 8.2 GHz (Purple System)	P/N 84300-80039	1767	11/3/2015	11/3/2016
Com-Power	Comb Generator, 1-10 GHz, 100 MHz Step	CGO-5100	2096	5/22/2015	5/22/2016
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, 2400-2500 MHz	BRM50702-02	2249	9/16/2015	9/16/2016
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	2251	9/16/2015	9/16/2016

Appendix B Test Data

T99885 Pages 27 – 142

Client:	Ericsson Canada	Job Number:	JD99841
Product	APINM210	T-Log Number:	T99885
System Configuration:	-	Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Emissions Standard(s):	FCC 15.247/15.E, RSS-247	Class:	-
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

Ericsson Canada

Product

APINM210

Date of Last Test: 2/17/2016

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	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: -
Driver: -

Date of Test: 11/5/2012
Test Engineer: Mark Hill
Test Location: Lab #4

Mode	Data Rate	Power (dBm)	Power setting
802.11b	1	16.0	q66
	2	16.5	
	5.5	**16.7**	
	11	16.6	
802.11g	6	**16.6**	q69
	9	16.4	
	12	16.5	
	18	16.5	
	24	16.3	
	36	16.4	
	48	16.2	
	54	16.4	

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Mode	Data Rate	Power (dBm)	Power setting	
802.11n 20MHz	**6.5**	**16.6**	q69	
	13	16.6		
	19.5	16.5		
	26	16.5		
	39	16.5		
	52	16.5		
	58.5	16.5		
	65	16.5		
	78	16.5		<<-11ac mode only
802.11n/ac 40MHz	**13.5**	**16.9**	q70	
	27	16.8		
	40.5	16.8		
	54	16.8		
	81	16.8		
	108	16.9		
	121.5	16.9		
	135	16.8		
	162	16.6		<<-11ac mode only
	180	16.7		<<-11ac mode only
802.11ac 80MHz	**29.3**	**17.7**	q74	
	58.5	17.7		
	87.8	17.7		
	117	17.6		
	175.5	17.7		
	234	17.1		
	266.3	16.7		
	292.5	16.8		
	351	16.3		
	390	15.8		

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

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Duty Cycle

Date of Test: 11/5/2012
Test Engineer: Mark Hill
Test Location: Lab #4

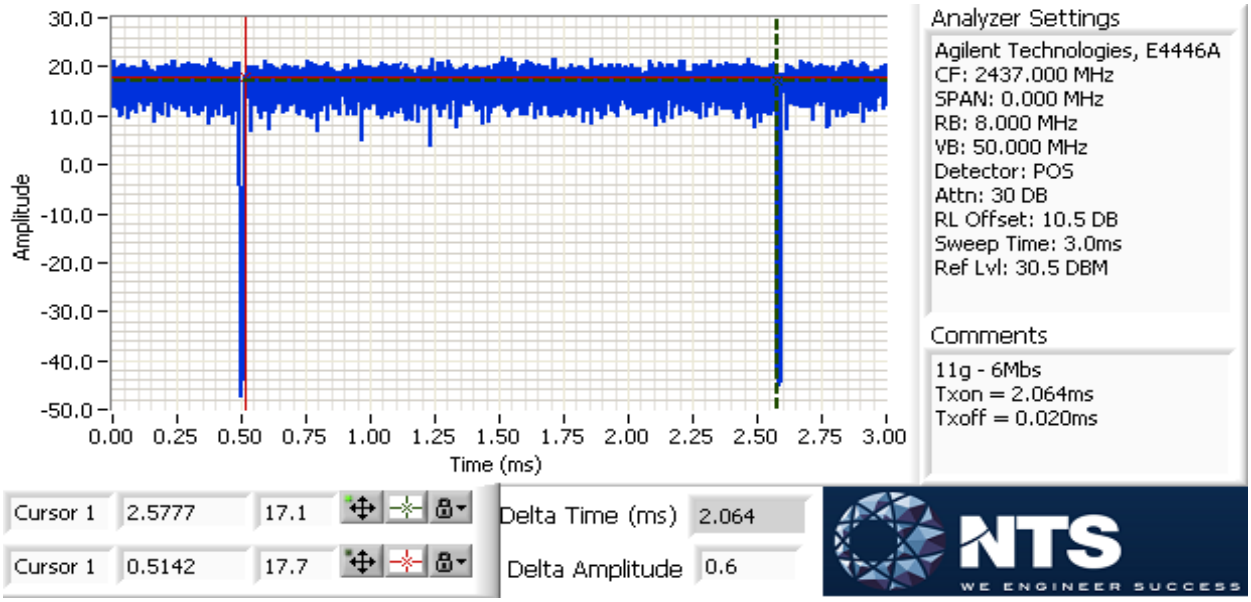
Duty cycle measurements performed on the worse case data rate for power.

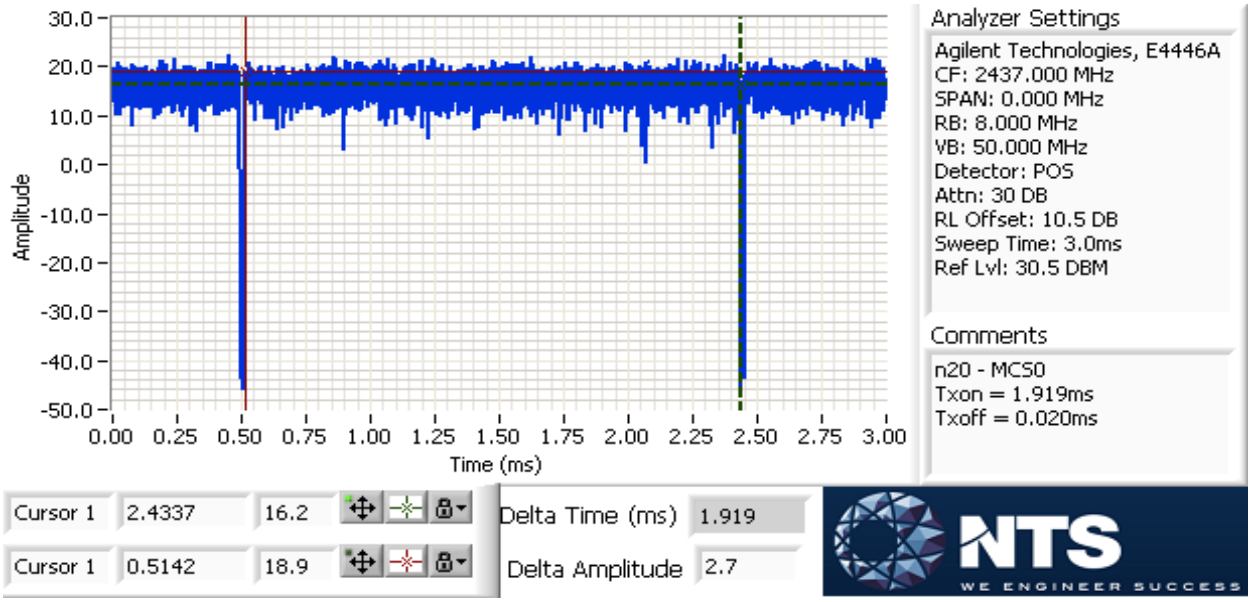
Notes: Measurements taken with maximum RBW/VBW settings allowed.

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
11b	5.5	99.4%	Yes	2.32	0	0	10
11g	6	99.0%	Yes	2.06	0	0	10
n20	MCS0	99.0%	Yes	1.92	0	0	10
n40	MCS0	98.0%	Yes	0.94	0	0	10
ac80	VHT0	77.6%	Yes	0.21	1.1	2.2	4739

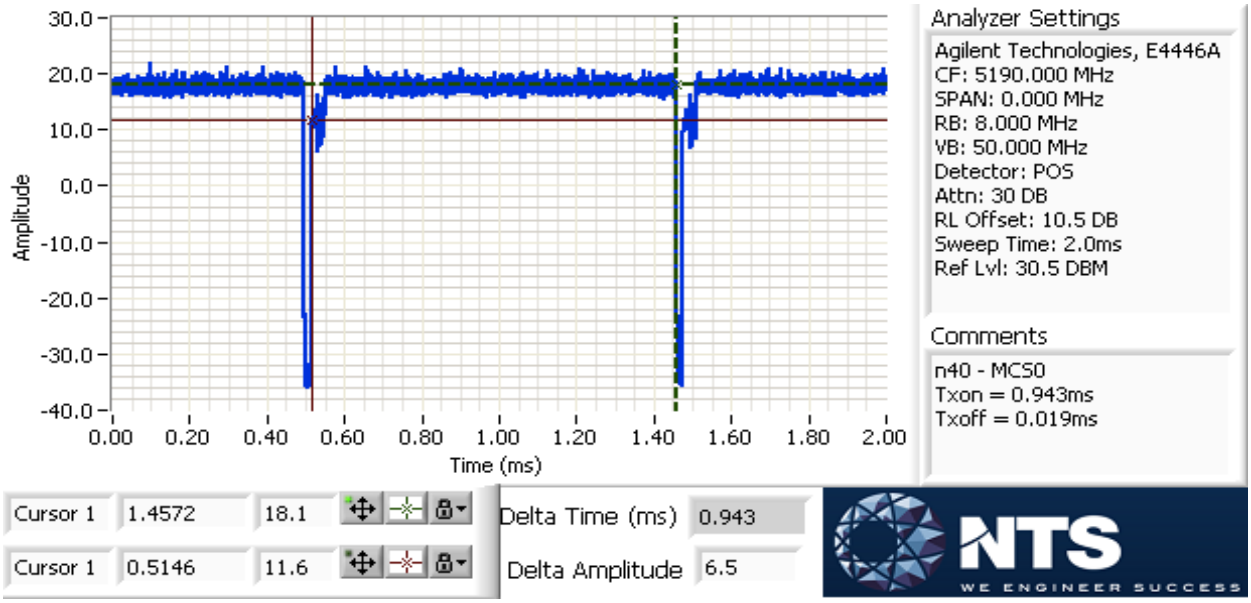
* Correction factor when using RMS/Power averaging - 10*log(1/x)
** Correction factor when using linear voltage average - 20*log(1/x)
T = Minimum transmission duration

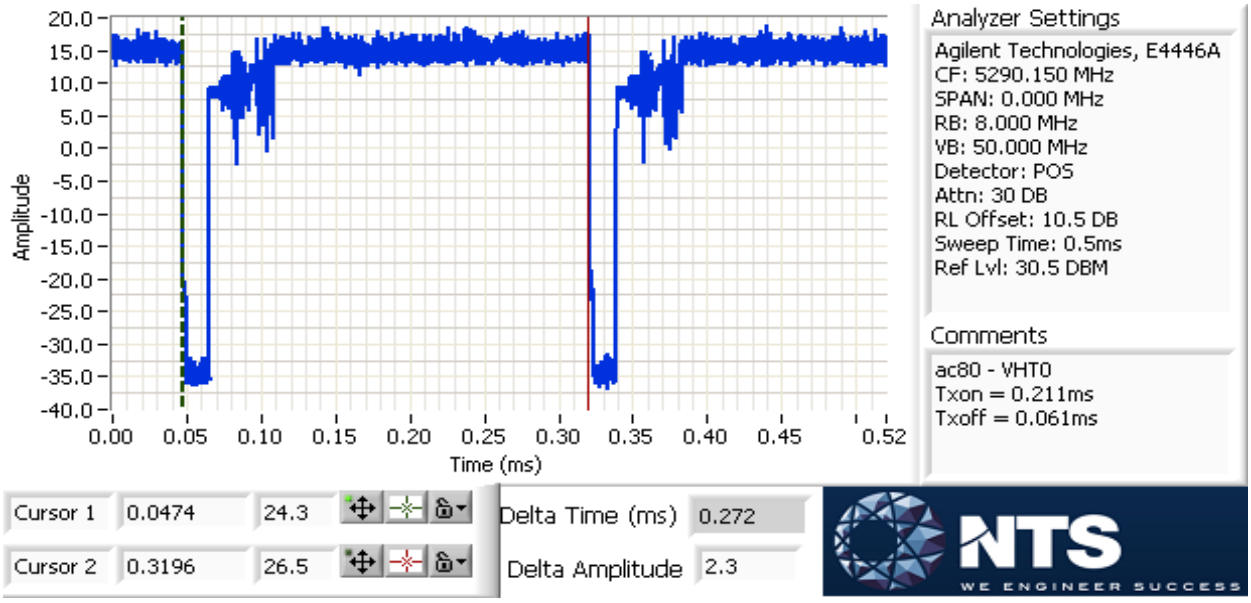
Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A





Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A





Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	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) (ii)	Pass	a: 26.6dBm (455 mW) n20: 26.4dBm (437 mW) n40: 24.4dBm (275mW) ac80 20.3dBm (107mW)
1	Power, 5150 - 5250MHz	RSS-247 6.2	Pass	a: 15.6dBm (36 mW) n20: 16.1dBm (41mW) n40: 19.0dBm (79mW) ac80: 20.3dBm (107mW)
1	PSD, 5150 - 5250MHz	15.407(a) (1) (ii)	Pass	a: 14.5dBm/MHz n20: 14.0dBm/MHz n40: 9.2dBm/MHz ac80: 2.0dBm/MHz
1	PSD, 5150 - 5250MHz	RSS-247 6.2	Pass	a: 3.8dBm/MHz n20: 3.8dBm/MHz n40: 3.6dBm/MHz ac80: 2.0dBm/MHz
1	99% Bandwidth	RSS-247 (Information only)	N/A	a: 16.9 MHz n20: 18 MHz n40: 36.4 MHz ac80: 75.6 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.

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Ambient Conditions:

Temperature: 22.3 °C
Rel. Humidity: 35 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

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	99.0%	Yes	2.06	0	0	10
n20	MCS0	99.0%	Yes	1.92	0	0	10
n40	MCS0	98.0%	Yes	0.94	0	0	10
ac80	VHT0	77.6%	Yes	0.21	1.1	2.2	4739

Sample Notes

Sample S/N: Prototype
Driver:

Notes

Beamforming is supported for n20/n40/ac80. For FCC, the conducted power remains the same for both non-beamforming and beamforming modes. For IC beamforming power, refer to UNII-1 Ant (MIMO_TxBF) results

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

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

Date of Test: 12/1/2015 0:00 Config. Used: 1
Test Engineer: Rafael Varelas Config Change: None
Test Location: FT Lab #4A EUT Voltage: 120V/60Hz

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

Antenna Gain Information - Non-Beamforming

Freq	Antenna Gain (dBi) / Chain				BF	MultiChain Legacy	CDD	Sectorized / Xpol	Dir G (PWR)	Dir G (PSD)
	1	2	3	4						
5150-5250	5.5	4.79	4.17		No	Yes	Yes	No	1.50	6.00
5250-5350	5.5	4.79	4.17		No	Yes	Yes	No	1.50	6.00
5470-5725	5.23	5.15	5.16		No	Yes	Yes	No	1.10	5.80
5725-5825	5.79	3.92	5.1		No	Yes	Yes	No	0.60	5.20

For devices that support CDD modes

Min # of spatial streams: 1
Max # of spatial streams: 3

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Notes:	BF = beamforming mode supported, Multichain Legacy = 802.11 legacy data rates supported for multichain transmissions, CDD = Cyclic Delay Diversity (or Cyclic Shift Diversity) modes supported, Sectorized / Xpol = antennas are sectorized or cross polarized.
Notes:	Dir G (PWR) = total gain (Gant + Array Gain) for power calculations; GA (PSD) = total gain for PSD calculations based on FCC KDB 662911. Depending on the modes supported, the Array Gain value for power could be different from the PSD value.
Notes:	Array gain for power/psd calculated per KDB 662911 D01.
Notes:	For systems with Beamforming and CDD, choose one the following options: Option 1: Delays are optimized for beamforming, rather than being selected from cyclic delay table of 802.11; Array gains calculated based on beamforming criteria. Option 2: Antennas are paired for beamforming, and the pairs are configured to use the cyclic delay diversity of 802.11; the array gain associated with beamforming with 2 antennas (3dB), and the array gain associated with CDD with two antennas (3dB for PSD and 0 dB for power)

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:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

MIMO Device - 5150-5250 MHz Band - FCC

Mode: **11a** Max EIRP (mW): 642.6

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	q74		99	17.7	187.0	22.7	30.0	0.455	Pass
	3				17.7					
	4									
	2				18.4					
5200	1	q83		99	19.8	307.4	24.9	30.0		Pass
	3				20.2					
	4									
	2				20.3					
5240	1	q92		99	21.3	454.9	26.6	30.0		Pass
	3				21.4					
	4									
	2				22.6					

MIMO Device - 5150-5250 MHz Band - Industry Canada

Mode: **11a** Max EIRP (mW): 51.3

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power dBm	Total Power dBm (eirp)	IC limit dBm (eirp)	Max Power (W)	Result
5180	1	q43	16.8	99	11.5	15.5	17.0	22.3	0.036	**Pass**
	3				10.0					
	4									
	2				10.5					
5200	1	q43	16.8	99	11.6	15.5	17.0	22.3		Pass
	3				10.1					
	4									
	2				10.3					
5240	1	q44	16.8	99	11.8	15.6	17.1	22.3		Pass
	3				9.9					
	4									
	2				10.5					

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

5150-5250 PSD - FCC

Mode: 11a

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	Result
5180	1	q74		99	5.5	12.1	10.8	17.0	Pass
	3				5.6				
	4								
	2				6.9				
5200	1	q83		99	7.5	19.5	12.9	17.0	Pass
	3				8.0				
	4								
	2				8.8				
5240	1	q92		99	9.4	28.5	14.5	17.0	Pass
	3				9.2				
	4								
	2				10.6				

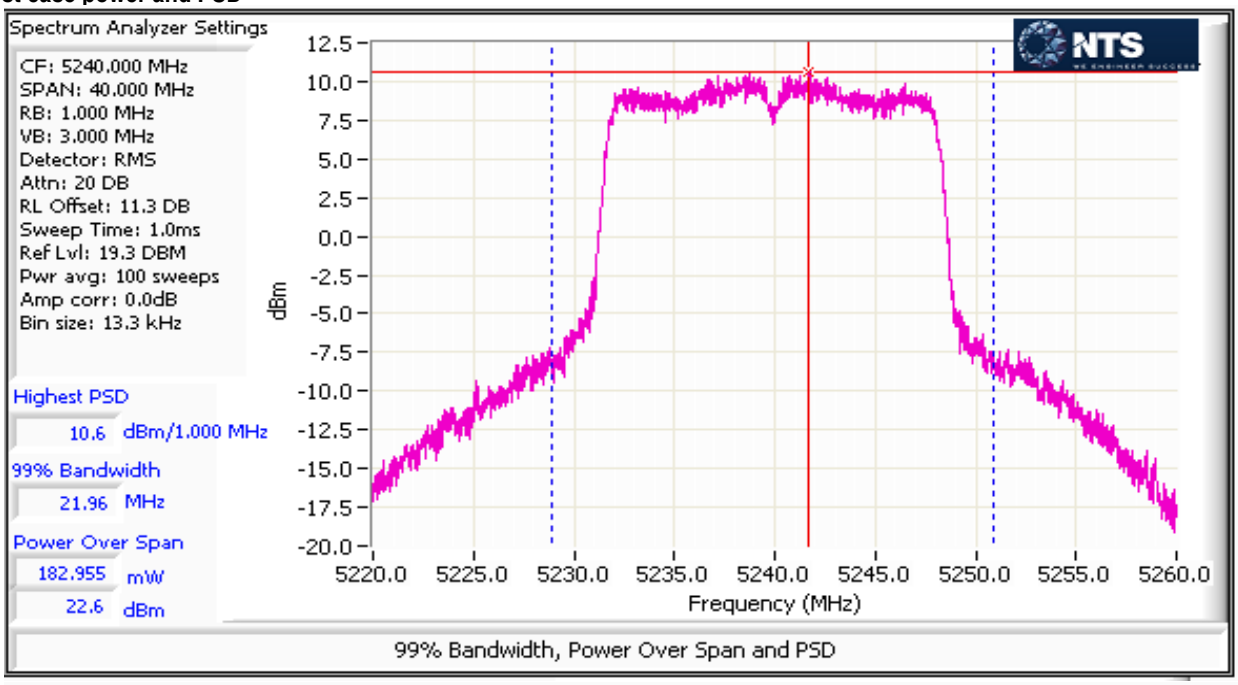
5150-5250 PSD - IC

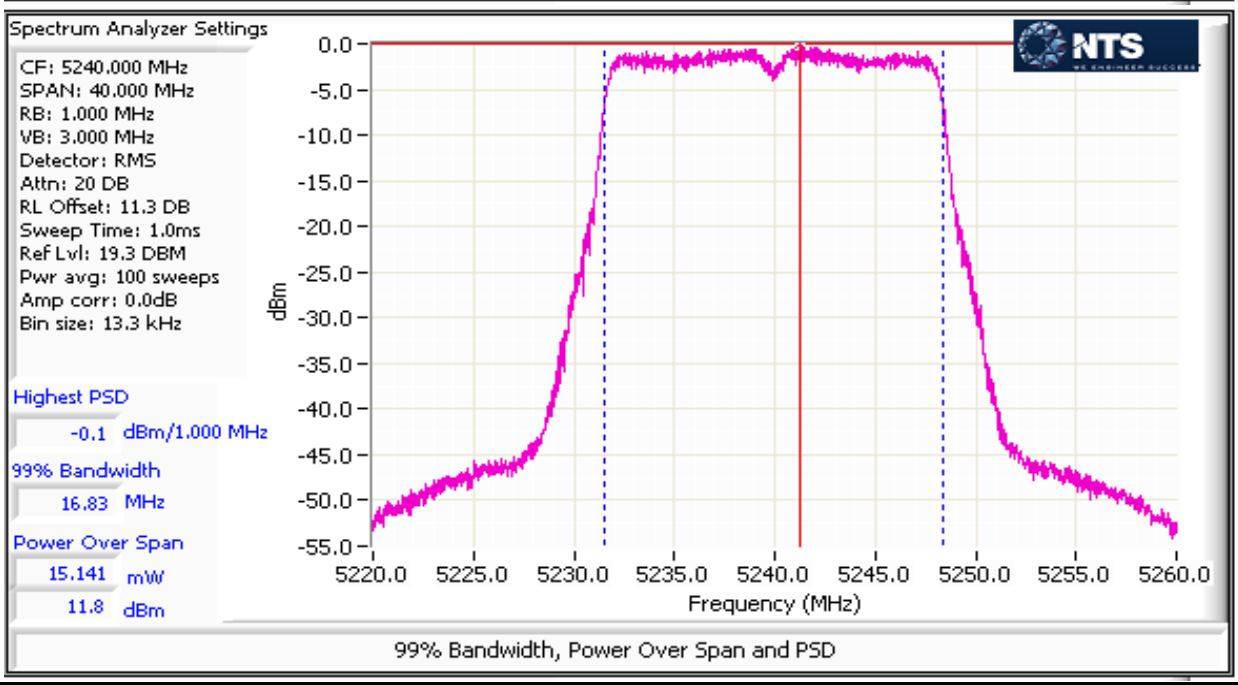
Mode: 11a

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	IC Limit dBm/MHz	Result
5180	1	q43		99	-0.7	2.3	3.6	4.0	Pass
	3				-2.0				
	4								
	2				-0.9				
5200	1	q43		99	-0.6	2.3	3.6	4.0	Pass
	3				-1.9				
	4								
	2				-0.9				
5240	1	q44		99	-0.1	2.4	3.8	4.0	Pass
	3				-1.7				
	4								
	2				-1.0				

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Worst case power and PSD





Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

MIMO Device - 5150-5250 MHz Band - FCC

Max EIRP (mW) beamforming: 1738.5

Mode: n20 Max EIRP (mW): 616.9

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	q72		99	17.3	164.9	22.2	30.0	0.437	Pass
	3				17.4					
	4									
	2				17.5					
5200	1	q77		99	18.2	213.1	23.3	30.0		Pass
	3				18.3					
	4									
	2				19.0					
5240	1	q92		99	21.0	436.7	26.4	30.0		Pass
	3				21.1					
	4									
	2				22.6					

MIMO Device - 5150-5250 MHz Band - Industry Canada

Mode: n20 Max EIRP (mW): 57.5

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power dBm	Total Power dBm (eirp)	IC limit dBm (eirp)	Max Power (W)	Result
5180	1	q46	18	99	11.6	15.9	17.4	22.6	0.041	Pass
	3				10.7					
	4									
	2				10.9					
5200	1	q47	18	99	11.8	16.1	17.6	22.6		Pass
	3				10.8					
	4									
	2				11.4					
5240	1	q47	18	99	11.9	16.0	17.5	22.6		Pass
	3				10.5					
	4									
	2				11.2					

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

5150-5250 PSD - FCC

Mode: n20

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	Result
5180	1	q72		99	5.2	9.7	9.9	17.0	Pass
	3				5.1				
	4								
	2				5.0				
5200	1	q77		99	5.9	12.2	10.9	17.0	Pass
	3				5.7				
	4								
	2				6.6				
5240	1	q92		99	8.5	25.4	14.0	17.0	Pass
	3				8.8				
	4								
	2				10.3				

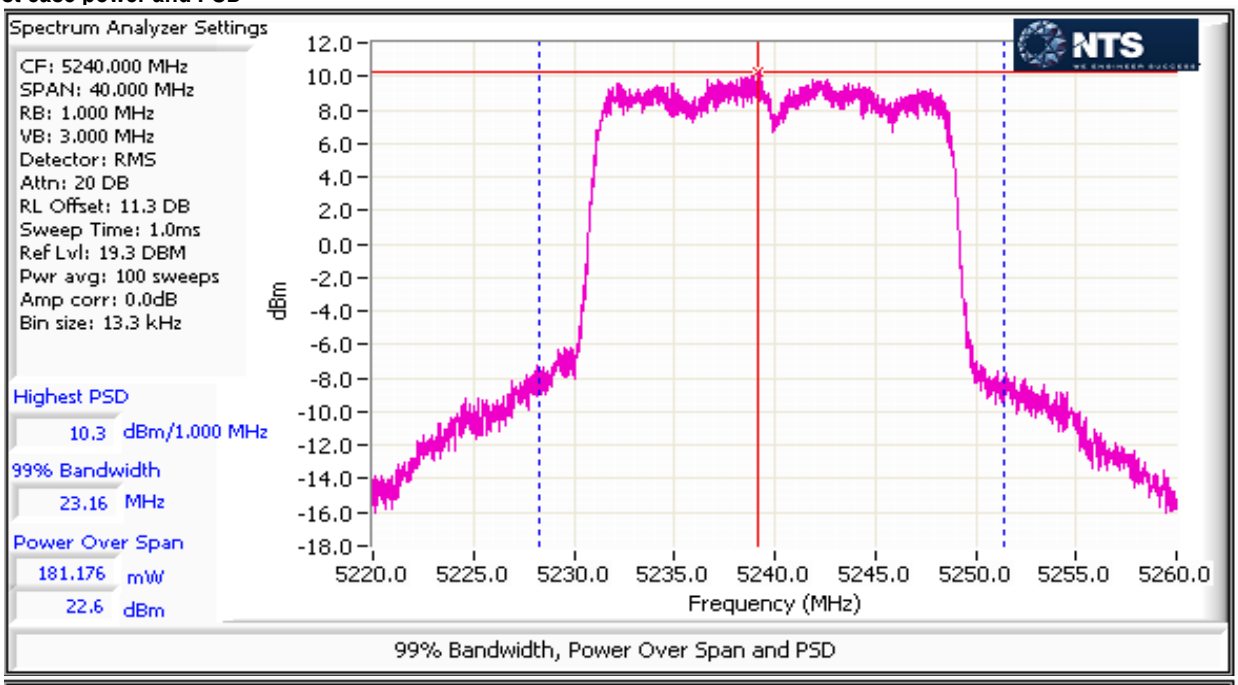
5150-5250 PSD - IC

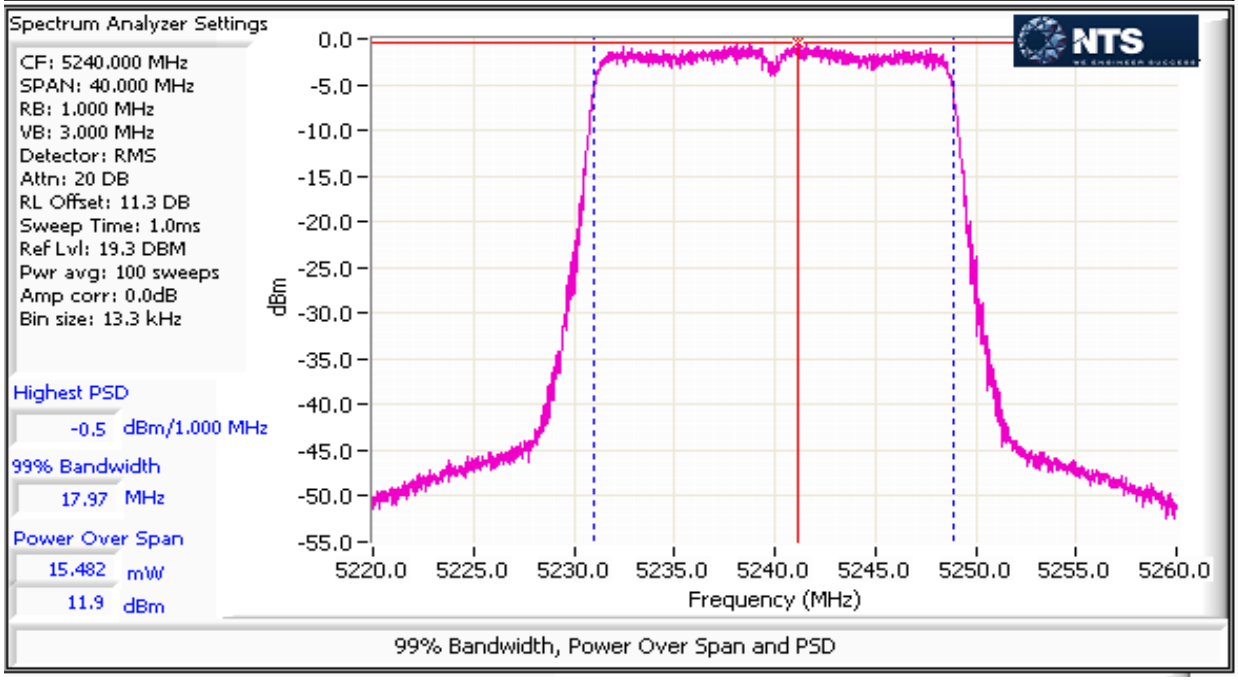
Mode: n20

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	IC Limit dBm/MHz	Result
5180	1	q46		99	-0.7	2.3	3.6	4.0	Pass
	3				-1.6				
	4								
	2				-1.4				
5200	1	q47		99	-0.6	2.4	3.8	4.0	Pass
	3				-1.4				
	4								
	2				-1.0				
5240	1	q47		99	-0.5	2.4	3.8	4.0	Pass
	3				-1.8				
	4								
	2				-0.8				

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Worst case power and PSD





Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

MIMO Device - 5150-5250 MHz Band - FCC

Max EIRP (mW) beamforming: 1095.2

Mode: n40 Max EIRP (mW): 388.6

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5190	1	q62		98	15.2	92.9	19.7	30.0	0.275	Pass
	3				14.5					
	4									
	2				15.0					
5230	1	q82		98	19.1	275.1	24.4	30.0		Pass
	3				19.5					
	4									
	2				20.2					

MIMO Device - 5150-5250 MHz Band - Industry Canada

Mode: n40 Max EIRP (mW): 112.2

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power dBm	Total Power dBm (eirp)	IC limit dBm (eirp)	Max Power (W)	Result
5190	1	q59	36.4	98	14.5	19.0	20.5	23.0	0.079	Pass
	3				13.8					
	4									
	2				14.3					
5230	1	q59	36.4	98	14.3	18.8	20.3	23.0		Pass
	3				13.5					
	4									
	2				14.2					

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

5150-5250 PSD - FCC

Mode: n40

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	Result
5190	1	q62		98	-0.2	2.7	4.3	17.0	Pass
	3				-0.9				
	4								
	2				-0.1				
5230	1	q82		98	3.5	8.3	9.2	17.0	Pass
	3				4.2				
	4								
	2				5.4				

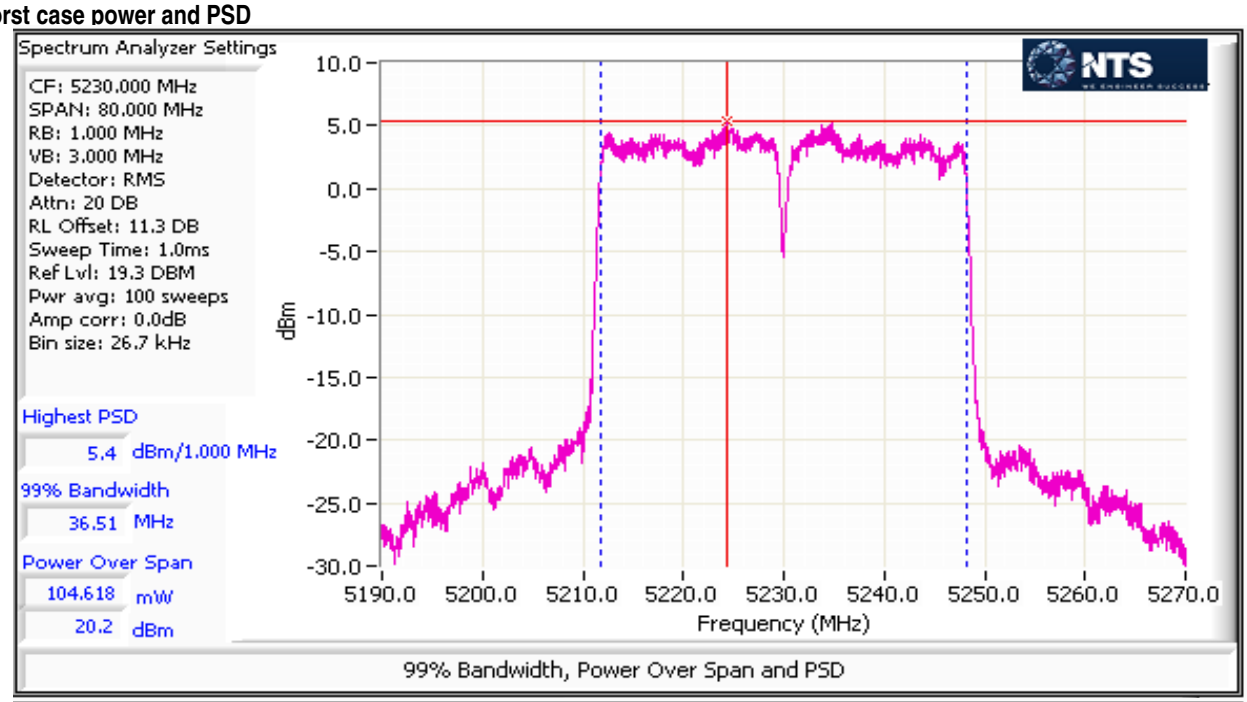
5150-5250 PSD - IC

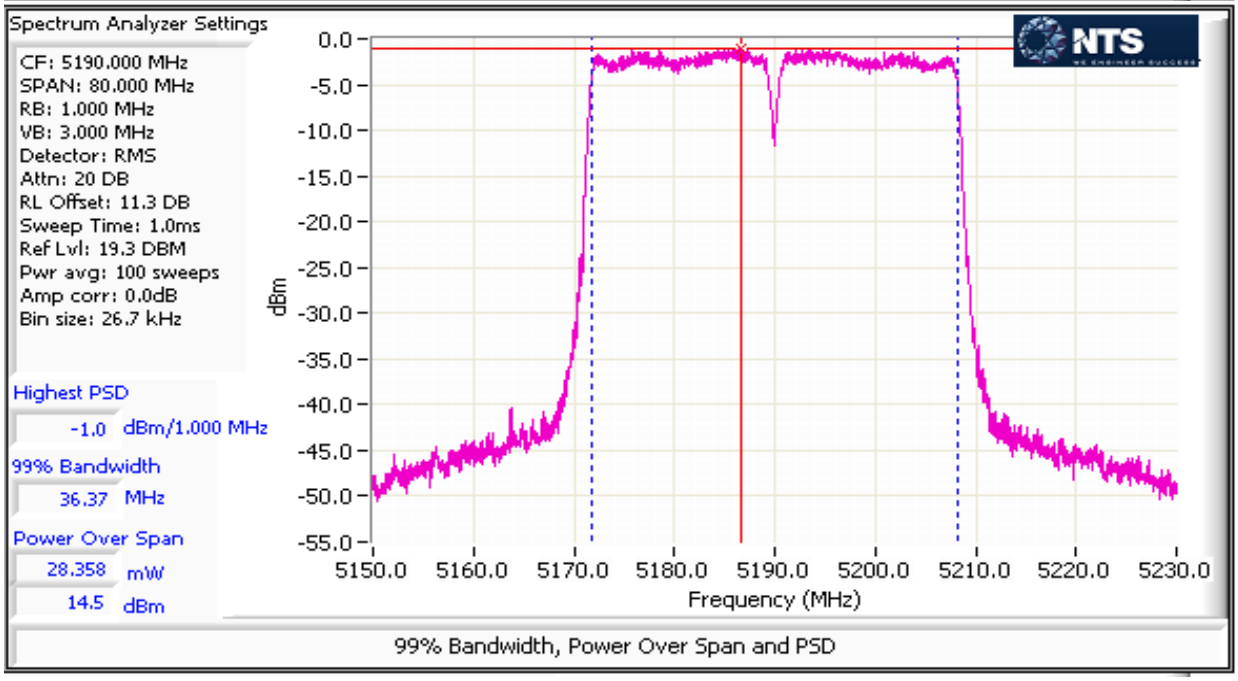
Mode: n40

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	IC Limit dBm/MHz	Result
5190	1	q59		98	-1.0	2.3	3.6	4.0	Pass
	3				-1.4				
	4								
	2				-0.9				
5230	1	q59		98	-1.1	2.3	3.6	4.0	Pass
	3				-1.9				
	4								
	2				-0.8				

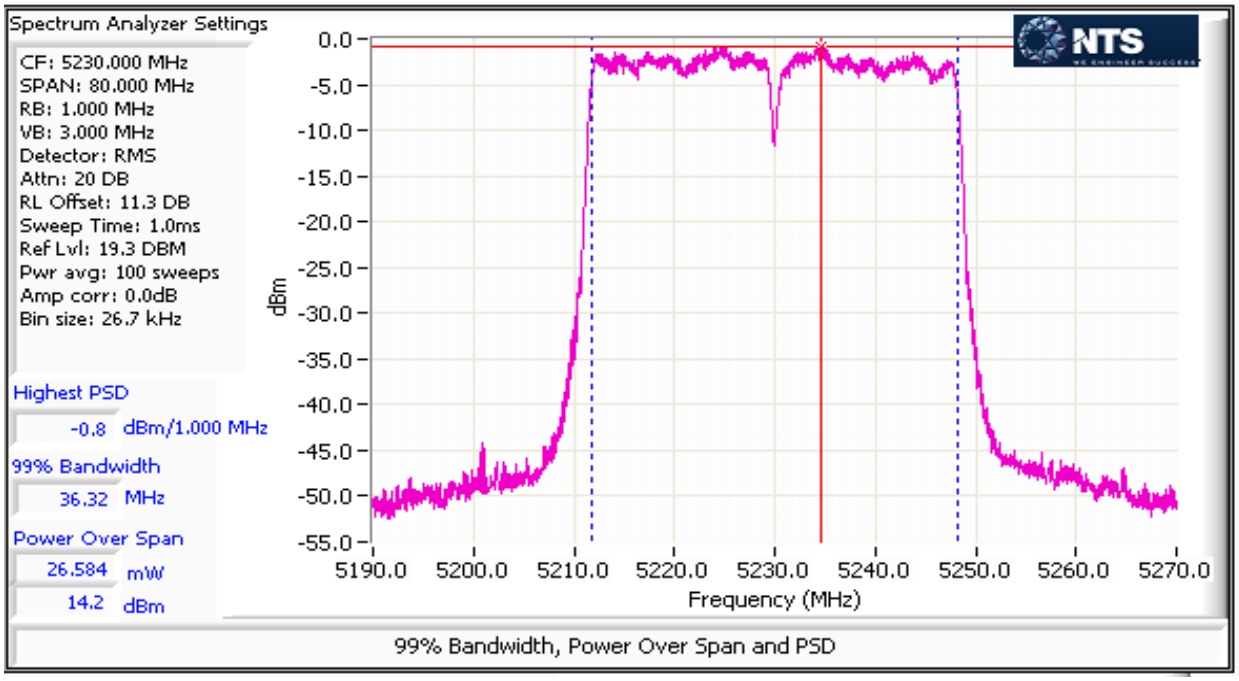
Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Worst case power and PSD





Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

MIMO Device - 5150-5250 MHz Band - FCC

Max EIRP (mW): 424.8

Mode: ac80 Max EIRP (mW): 150.7

Frequency (MHz)	Chain	Software Setting	26dB BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5210	1	q61		77.6	14.3	106.7	20.3	30.0	0.107	Pass
	3				14.1					
	4									
	2				14.8					

MIMO Device - 5150-5250 MHz Band - Industry Canada

Mode: ac80 Max EIRP (mW): 151.4

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power dBm	Total Power dBm (eirp)	IC limit dBm (eirp)	Max Power (W)	Result
5210	1	q61	75.6	77.6	14.3	20.3	21.8	23.0	0.107	Pass
	3				14.1					
	4									
	2				14.8					

5150-5250 PSD - FCC

Mode: ac80

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	Result
5210	1	q61		77.6	-3.9	1.6	2.0	17.0	Pass
	3				-4.0				
	4								
	2				-3.5				

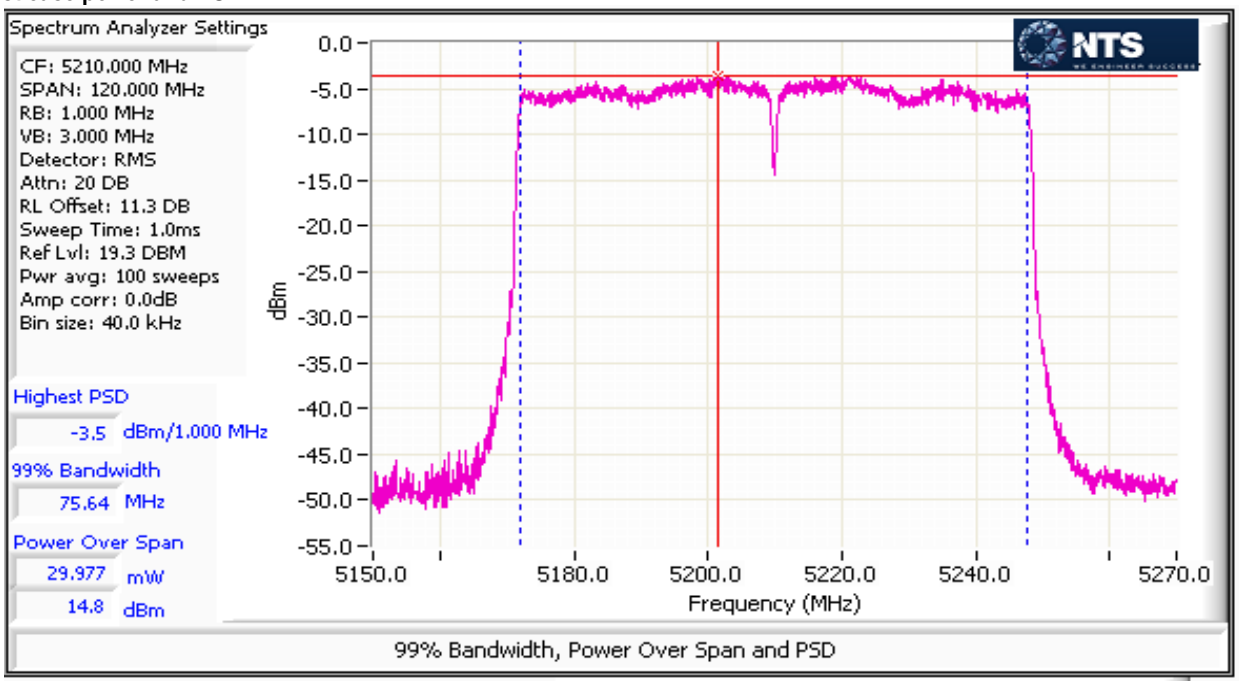
5150-5250 PSD - IC

Mode: ac80

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	IC Limit dBm/MHz	Result
5210	1	q61		77.6	-3.9	1.6	2.0	4.0	Pass
	3				-4.0				
	4								
	2				-3.5				

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Worst case power and PSD



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

RSS-247 (LELAN)
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	RSS-247 6.2	Pass	n20: 16.1dBm (41mW) n40: 16.8dBm (48mW) ac80: 16.6dBm (46mW)
1	PSD, 5150 - 5250MHz	RSS-247 6.2	Pass	n20: 3.8dBm/MHz n40: 1.8dBm/MHz ac80: -1.5dBm/MHz
1	99% Bandwidth	RSS-247 (Information only)	N/A	n20: 18 MHz n40: 36.4 MHz ac80: 75.6 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: 22.4 °C
Rel. Humidity: 36 %

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Procedure Comments:

Measurements performed in accordance with FCC KDB 789033 D01

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
11a	6	99.0%	Yes	2.06	0	0	10
n20	MCS0	99.0%	Yes	1.92	0	0	10
n40	MCS0	98.0%	Yes	0.94	0	0	10
ac80	VHT0	77.6%	Yes	0.21	1.1	2.2	4739

Sample Notes

Sample S/N: Prototype
Driver:

Notes

Beamforming is supported for n20/n40/ac80. For IC beamforming power, refer to UNII-1 Ant (MIMO_TxBF) results

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
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Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

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

Date of Test: 12/2/2015 0:00 Config. Used: 1
Test Engineer: Rafael Varelas Config Change: None
Test Location: FT Lab #4A EUT Voltage: 120V/60Hz

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

Antenna Gain Information - Beamforming

Freq	Antenna Gain (dBi) / Chain				BF	MultiChain Legacy	CDD	Sectorized / Xpol	Dir G (PWR)	Dir G (PSD)
	1	2	3	4						
5150-5250	5.5	4.79	4.17		No	Yes	Yes	No	6.00	6.00
5250-5350	5.5	4.79	4.17		No	Yes	Yes	No	6.00	6.00
5470-5725	5.23	5.15	5.16		No	Yes	Yes	No	5.80	5.80
5725-5825	5.79	3.92	5.1		No	Yes	Yes	No	5.20	5.20

For devices that support CDD modes

Min # of spatial streams: 1
Max # of spatial streams: 3

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
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Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Notes:	BF = beamforming mode supported, Multichain Legacy = 802.11 legacy data rates supported for multichain transmissions, CDD = Cyclic Delay Diversity (or Cyclic Shift Diversity) modes supported, Sectorized / Xpol = antennas are sectorized or cross polarized.
Notes:	Dir G (PWR) = total gain (Gant + Array Gain) for power calculations; GA (PSD) = total gain for PSD calculations based on FCC KDB 662911. Depending on the modes supported, the Array Gain value for power could be different from the PSD value.
Notes:	Array gain for power/psd calculated per KDB 662911 D01.
Notes:	For systems with Beamforming and CDD, choose one the following options: Option 1: Delays are optimized for beamforming, rather than being selected from cyclic delay table of 802.11; Array gains calculated based on beamforming criteria. Option 2: Antennas are paired for beamforming, and the pairs are configured to use the cyclic delay diversity of 802.11; the array gain associated with beamforming with 2 antennas (3dB), and the array gain associated with CDD with two antennas (3dB for PSD and 0 dB for power)

MIMO Device - 5150-5250 MHz Band - Industry Canada

Mode: n20 Max EIRP (mW): 162.2

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power dBm	Total Power dBm (eirp)	IC limit dBm (eirp)	Max Power (W)	Result
5180	1	q46	18	99	11.6	15.9	21.9	22.6	0.041	Pass
	3				10.7					
	4									
	2				10.9					
5200	1	q47	18	99	11.8	16.1	22.1	22.6		Pass
	3				10.8					
	4									
	2				11.4					
5240	1	q47	18	99	11.9	16.0	22	22.6		Pass
	3				10.5					
	4									
	2				11.2					

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
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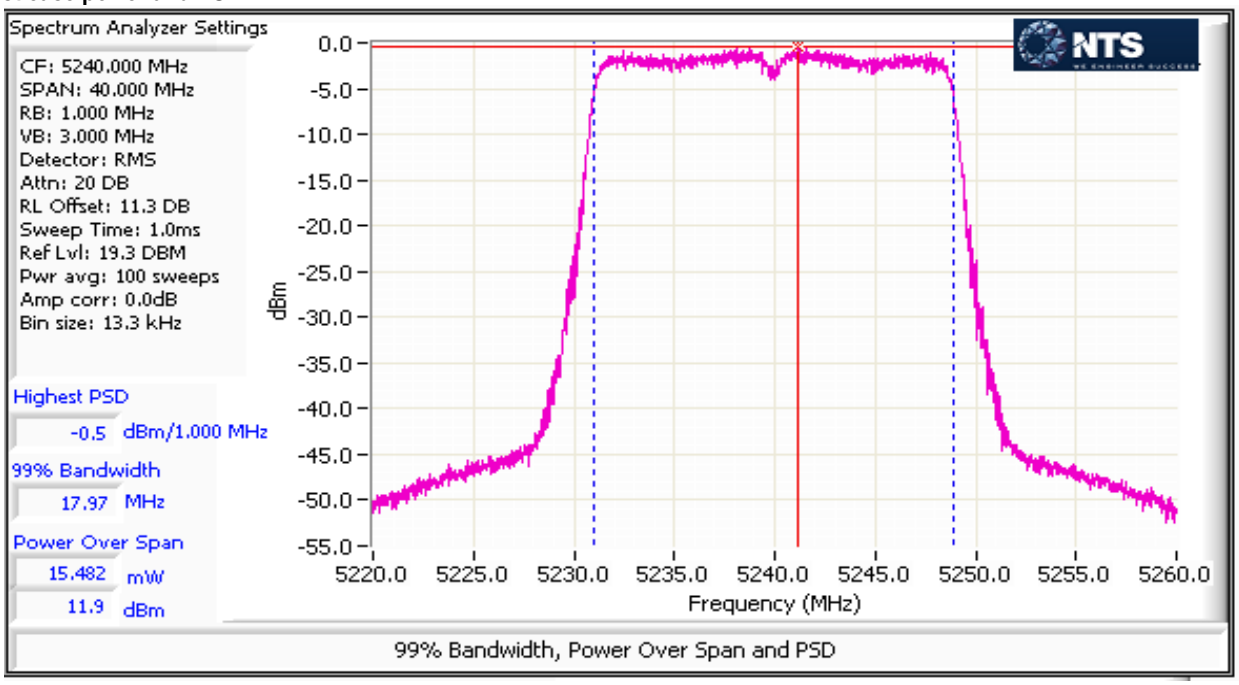
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

5150-5250 PSD - IC

Mode: n20

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	IC Limit dBm/MHz	Result
5180	1	q46		99	-0.7	2.3	3.6	4.0	Pass
	3				-1.6				
	4								
	2				-1.4				
5200	1	q47		99	-0.6	2.4	3.8	4.0	Pass
	3				-1.4				
	4								
	2				-1.0				
5240	1	q47		99	-0.5	2.4	3.8	4.0	Pass
	3				-1.8				
	4								
	2				-0.8				

Worst case power and PSD



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Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

MIMO Device - 5150-5250 MHz Band - Industry Canada

Mode: n40 Max EIRP (mW): 190.5

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power dBm	Total Power dBm (eirp)	IC limit dBm (eirp)	Max Power (W)	Result
5190	1	q49	36.4	98	12.4	16.8	22.8	23.0	0.048	Pass
	3				11.6					
	4									
	2				12.1					
5230	1	q49	36.4	98	12.6	16.8	22.8	23.0		Pass
	3				11.4					
	4									
	2				12.1					

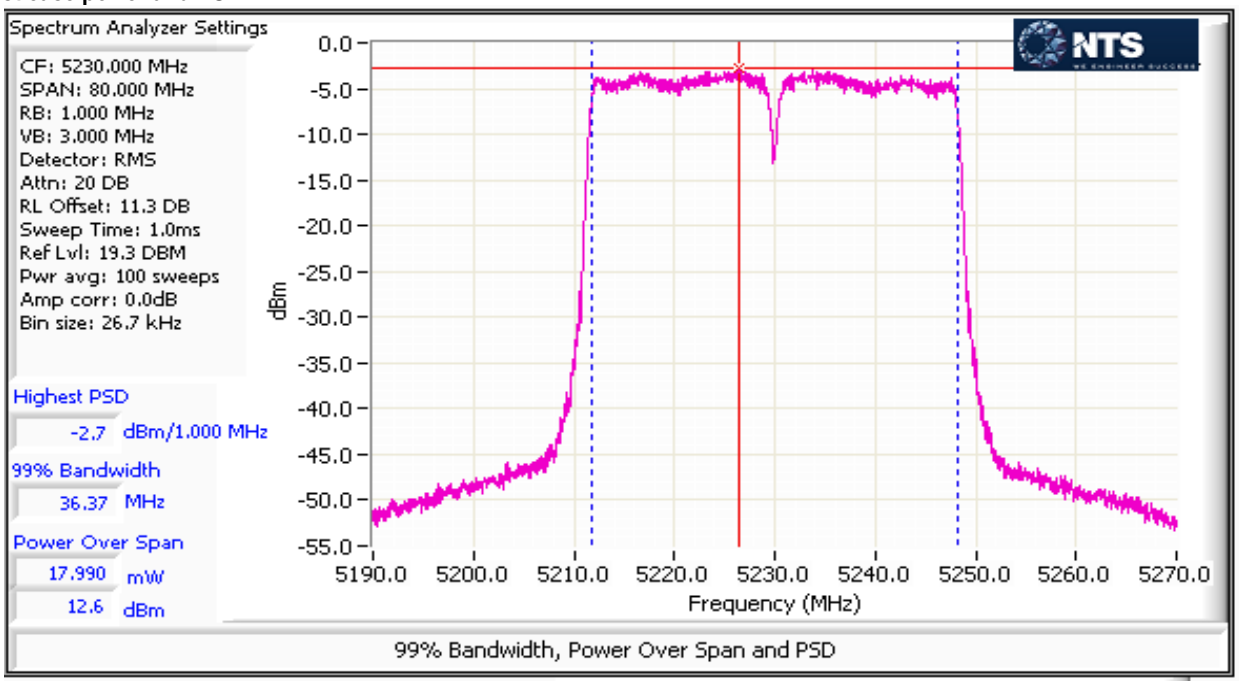
5150-5250 PSD - IC

Mode: n40

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	IC Limit dBm/MHz	Result
5190	1	q49		98	-3.0	1.4	1.5	4.0	Pass
	3				-3.6				
	4								
	2				-3.0				
5230	1	q49		98	-2.7	1.5	1.8	4.0	Pass
	3				-4.0				
	4								
	2				-2.8				

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Worst case power and PSD



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

MIMO Device - 5150-5250 MHz Band - Industry Canada

Mode: ac80 Max EIRP (mW): 182.0

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power[1] dBm	Total Power dBm	Total Power dBm (eirp)	IC limit dBm (eirp)	Max Power (W)	Result
5210	1	q45	75.6	77.6	10.9	16.6	22.6	23.0	0.0457	Pass
	3				10.4					
	4									
	2				11.0					

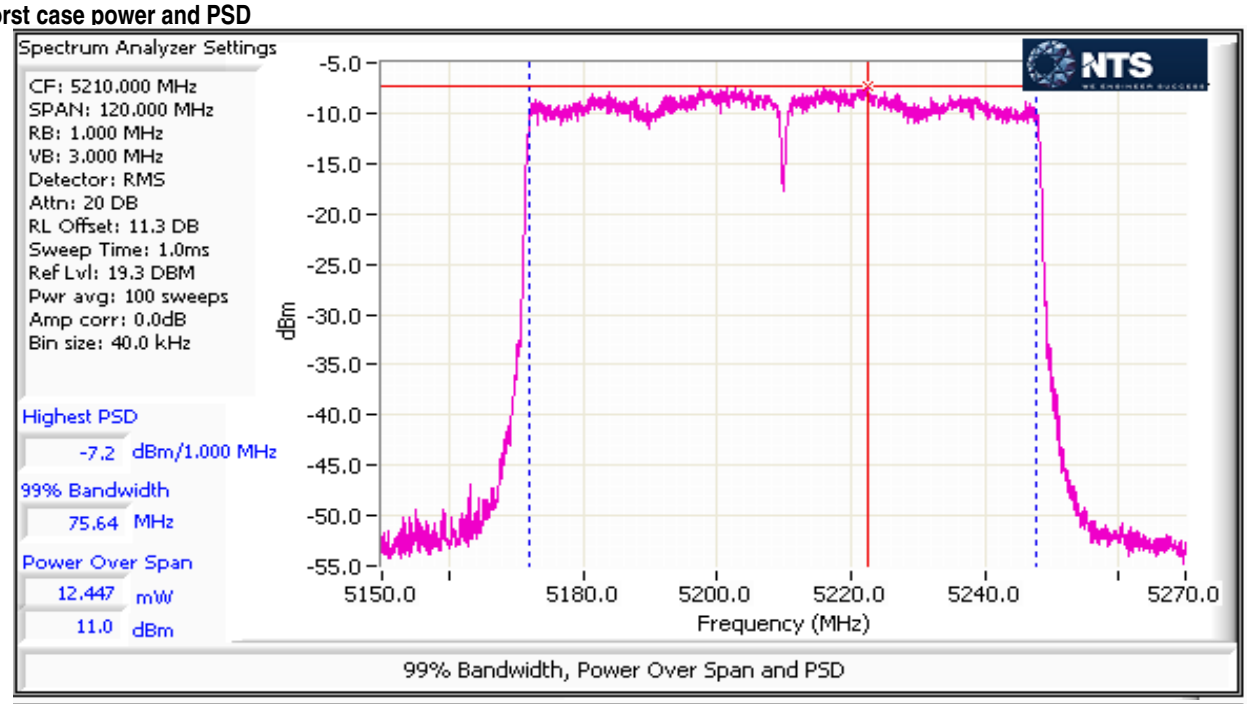
5150-5250 PSD - IC

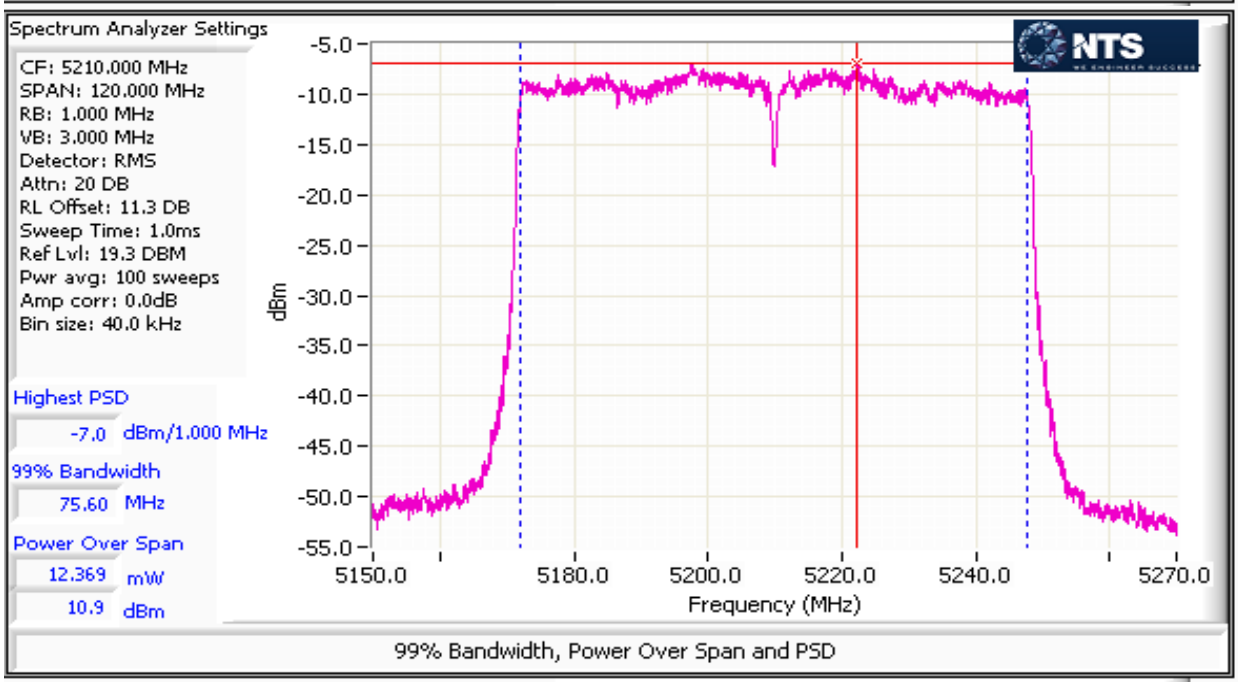
Mode: ac80

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	IC Limit dBm/MHz	Result
5210	1	q45		77.6	-7.0	0.7	-1.5	4.0	Pass
	3				-7.6				
	4								
	2				-7.2				

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Worst case power and PSD





Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	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: 22.6dBm (184mW) n20: 23.5dBm (223mW) n40: 20.9dBm (124mW) ac80: 20.2dBm (104mW)
1	PSD, 5725 - 5850MHz	15.407(a) (1), (2), (3) RSS-247 6.2	Pass	a: 10.8dBm/MHz n20: 11.4dBm/MHz n40: 5.9dBm/MHz ac80: 2.0dBm/MHz
2	99% Bandwidth	RSS-GEN (Information only)	N/A	a: 16.9 MHz n20: 18.5 MHz n40: 36.4 MHz ac80: 75.7 MHz
2	6 dB Bandwidth	≥ 500 kHz	Pass	a: 16.4 MHz n20: 17.6 MHz n40: 36.3 MHz ac80: 75.9 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: 22.4 °C
Rel. Humidity: 36 %

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Procedure Comments:

Measurements performed in accordance with FCC KDB 789033 D01

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
11a	6	99.0%	Yes	2.06	0	0	10
n20	MCS0	99.0%	Yes	1.92	0	0	10
n40	MCS0	98.0%	Yes	0.94	0	0	10
ac80	VHT0	77.6%	Yes	0.21	1.1	2.2	4739

Sample Notes

Sample S/N: Prototype
Driver:

Notes

Beamforming is supported for n20/n40/ac80. For FCC/IC, the conducted power remains the same for both non-beamforming and

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

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

Date of Test: 12/1 & 12/2/2015 12:00:00 AM
Test Engineer: Rafael Varelas
Test Location: FT Lab #4A

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

Note 1:	Duty Cycle ≥ 98%. Output power measured using a spectrum analyzer (see plots below). RBW=1MHz, VB=3 MHz, Span > OBW, # of points in sweep ≥ 2*span/RBW, auto sweep, **RMS sample** 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:	Measured using the same analyzer settings used for output power.
Note 3:	99% Bandwidth measured in accordance with C63.10 - RB between 1-5 % of OBW and VB ≥ 3*RB, Span between 1.5 and 5 times OBW.
Note 4:	For MIMO systems the total output power and total PSD are calculated from the sum of the powers of the individual chains (in linear terms). The antenna gain used to determine the EIRP and limits for PSD/Output power depends on the operating mode of the MIMO device. If the signals on the non-coherent between the transmit chains then the gain used to determine the limits is the highest gain of the individual chains and the EIRP is the sum of the products of gain and power on each chain. If the signals are coherent then the effective antenna gain is the sum (in linear terms) of the gains for each chain and the EIRP is the product of the effective gain and total power.

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	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	5.5	4.79	4.17		No	Yes	Yes	No	1.50	6.00
5250-5350	5.5	4.79	4.17		No	Yes	Yes	No	1.50	6.00
5470-5725	5.23	5.15	5.16		No	Yes	Yes	No	1.10	5.80
5725-5825	5.79	3.92	5.1		No	Yes	Yes	No	0.60	5.20

For devices that support CDD modes

Min # of spatial streams: 1

Max # of spatial streams: 3

Notes:	BF = beamforming mode supported, Multichain Legacy = 802.11 legacy data rates supported for multichain transmissions, CDD = Cyclic Delay Diversity (or Cyclic Shift Diversity) modes supported, Sectorized / Xpol = antennas are sectorized or cross polarized.
Notes:	Dir G (PWR) = total gain (Gant + Array Gain) for power calculations; GA (PSD) = total gain for PSD calculations based on FCC KDB 662911. Depending on the modes supported, the Array Gain value for power could be different from the PSD value.
Notes:	Array gain for power/psd calculated per KDB 662911 D01.
Notes:	For systems with Beamforming and CDD, choose one the following options: Option 1: Delays are optimized for beamforming, rather than being selected from cyclic delay table of 802.11; Array gains calculated based on beamforming criteria. Option 2: Antennas are paired for beamforming, and the pairs are configured to use the cyclic delay diversity of 802.11; the array gain associated with beamforming with 2 antennas (3dB), and the array gain associated with CDD with two antennas (3dB for PSD and 0 dB for power)

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

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

Mode: **11a** Max EIRP (mW): 210.8

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	Limit dBm	Max Power (W)	Result
5745	1	q59	16.8	99	15.0	83.7	19.2	30.0	0.184	Pass
	3				14.3					
	4									
	2				14.0					
5785	1	q72	16.9	99	18.0	183.6	22.6	30.0		Pass
	3				17.9					
	4									
	2				17.7					
5825	1	q69	16.9	99	17.2	142.9	21.6	30.0		Pass
	3				16.7					
	4									
	2				16.4					

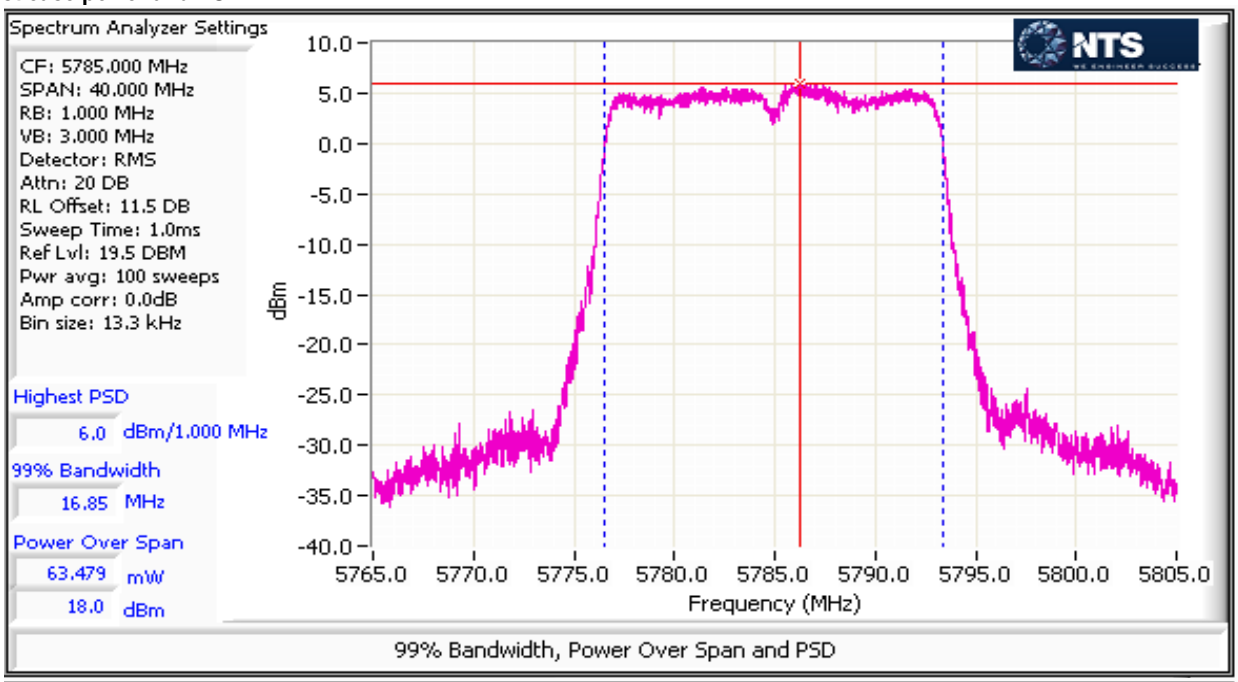
5725-5850 PSD - FCC/IC

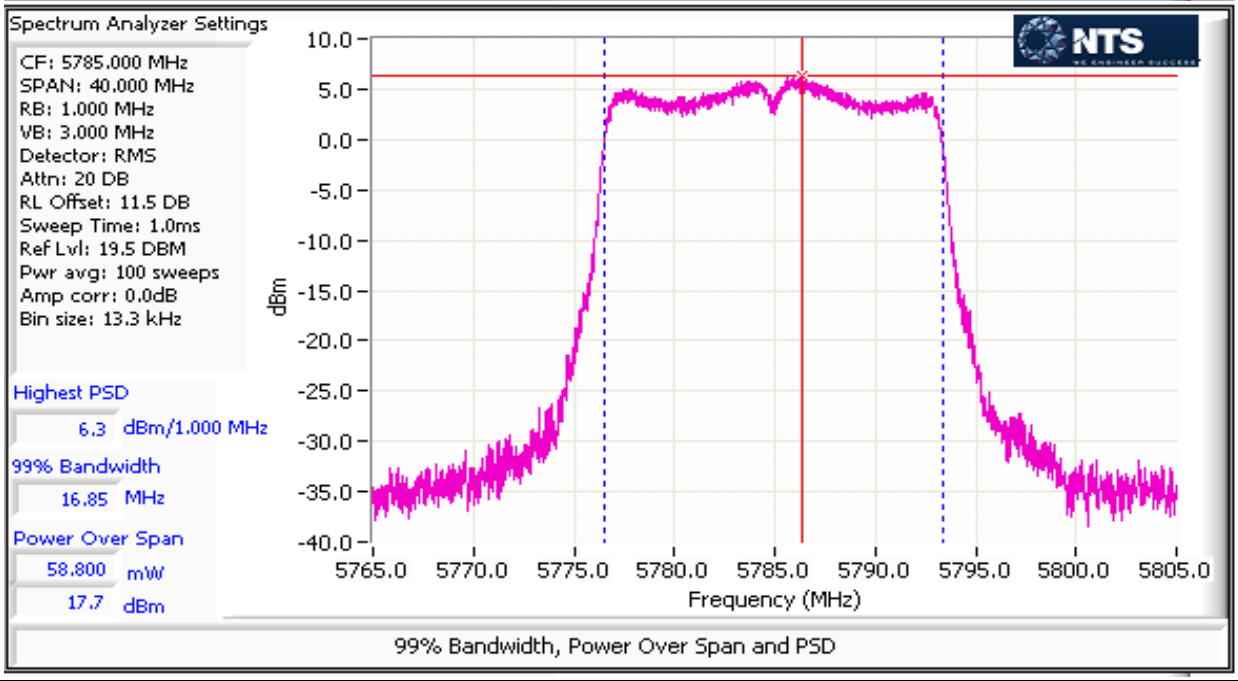
Mode: **11a**

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/500kHz	IC Limit dBm/500kHz	Result
5745	1	q59		99	2.9	5.3	7.2	30.0	30.0	Pass
	3				2.4					
	4									
	2				2.0					
5785	1	q72		99	6.0	12.1	10.8	30.0	30.0	Pass
	3				5.9					
	4									
	2				6.3					
5825	1	q69		99	5.2	9.4	9.7	30.0	30.0	Pass
	3				4.6					
	4									
	2				5.1					

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Worst case power and PSD





Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

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

Max EIRP (mW) Beamforming: 737.4

Mode: n20 Max EIRP (mW): 255.7

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5745	1	q55	18	99	14.4	68.4	18.4	30.0	0.223	Pass
	3				13.3					
	4									
	2				12.9					
5785	1	q75	18.5	99	18.8	222.7	23.5	30.0		Pass
	3				18.9					
	4									
	2				18.4					
5825	1	q58	18	99	14.7	74.8	18.7	30.0		Pass
	3				13.6					
	4									
	2				13.5					

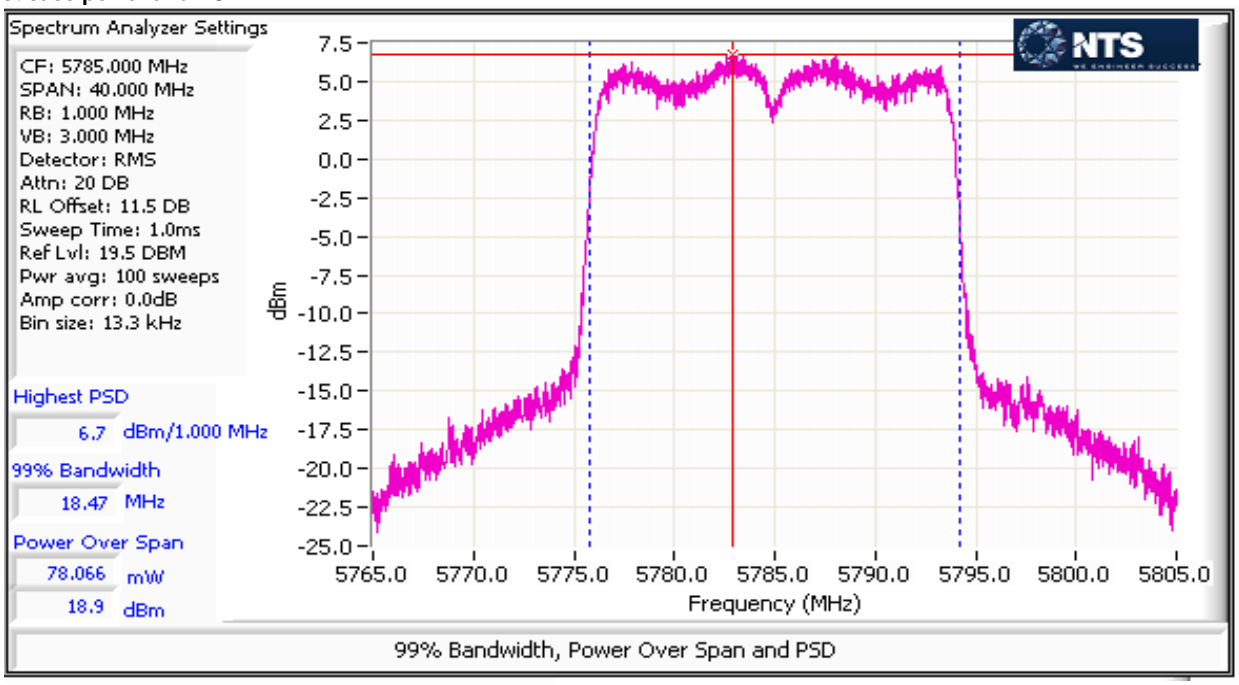
5725-5850 PSD - FCC/IC

Mode: n20

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	IC Limit dBm/MHz	Result
5745	1	q55		99	2.2	4.4	6.4	30.0	30.0	Pass
	3				1.0					
	4									
	2				1.6					
5785	1	q75		99	6.4	13.7	11.4	30.0	30.0	Pass
	3				6.7					
	4									
	2				6.7					
5825	1	q58		99	2.5	4.7	6.7	30.0	30.0	Pass
	3				1.7					
	4									
	2				1.5					

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Worst case power and PSD



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

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

Max EIRP (mW) Beamforming: 408.9

Mode: n40 Max EIRP (mW): 141.8

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5755	1	q52	36.4	98	12.5	55.1	17.4	30.0	0.124	Pass
	3				12.5					
	4									
	2				12.9					
5795	1	q65	36.4	98	16.6	123.5	20.9	30.0		Pass
	3				15.8					
	4									
	2				16.0					

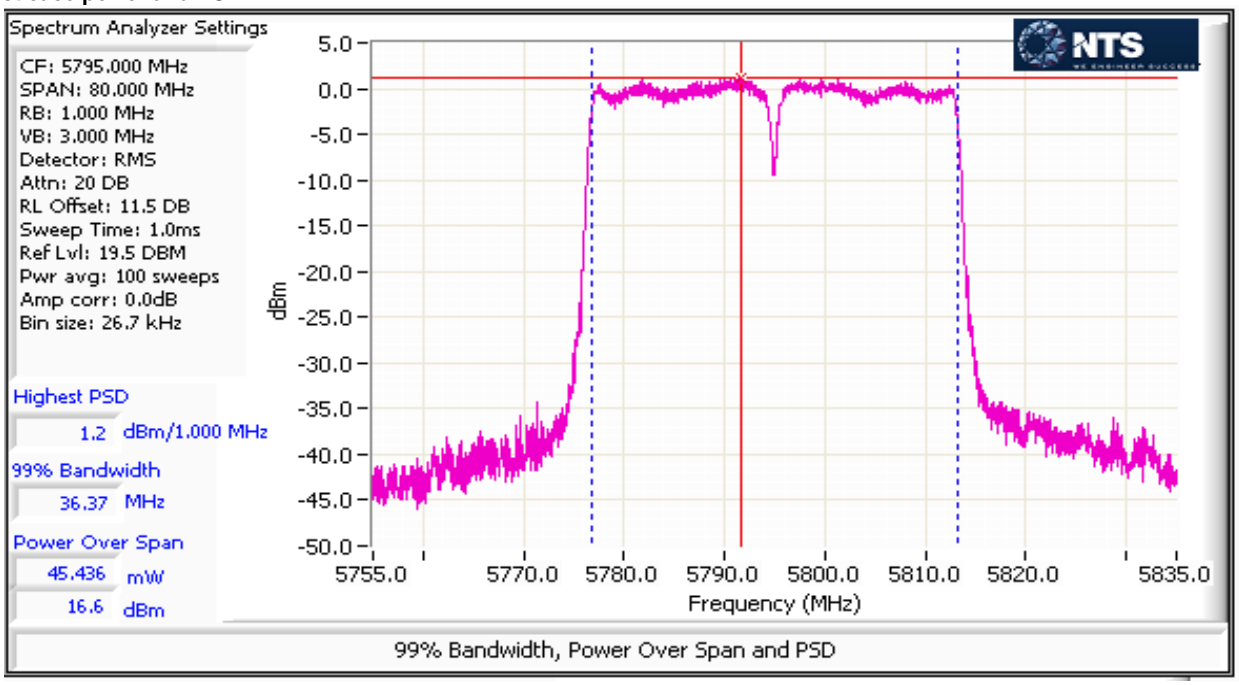
MIMO Device 5725-5850 PSD - FCC/IC

Mode: n40

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	IC Limit dBm/MHz	Result
5755	1	q52		98	-1.9	1.8	2.6	30.0	30.0	Pass
	3				-2.8					
	4									
	2				-2.0					
5795	1	q65		98	1.2	3.9	5.9	30.0	30.0	Pass
	3				0.7					
	4									
	2				1.6					

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Worst case power and PSD



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

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

Max EIRP (mW) Beamforming: 345.4

Mode: ac80 Max EIRP (mW): 119.8

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	Power dBm	Total Power[1] mW	Total Power[1] dBm	FCC Limit dBm	Max Power (W)	Result
5775	1	q59	75.7	78	14.7	104.3	20.2	30.0	0.104	Pass
	3				14.3					
	4									
	2				13.9					

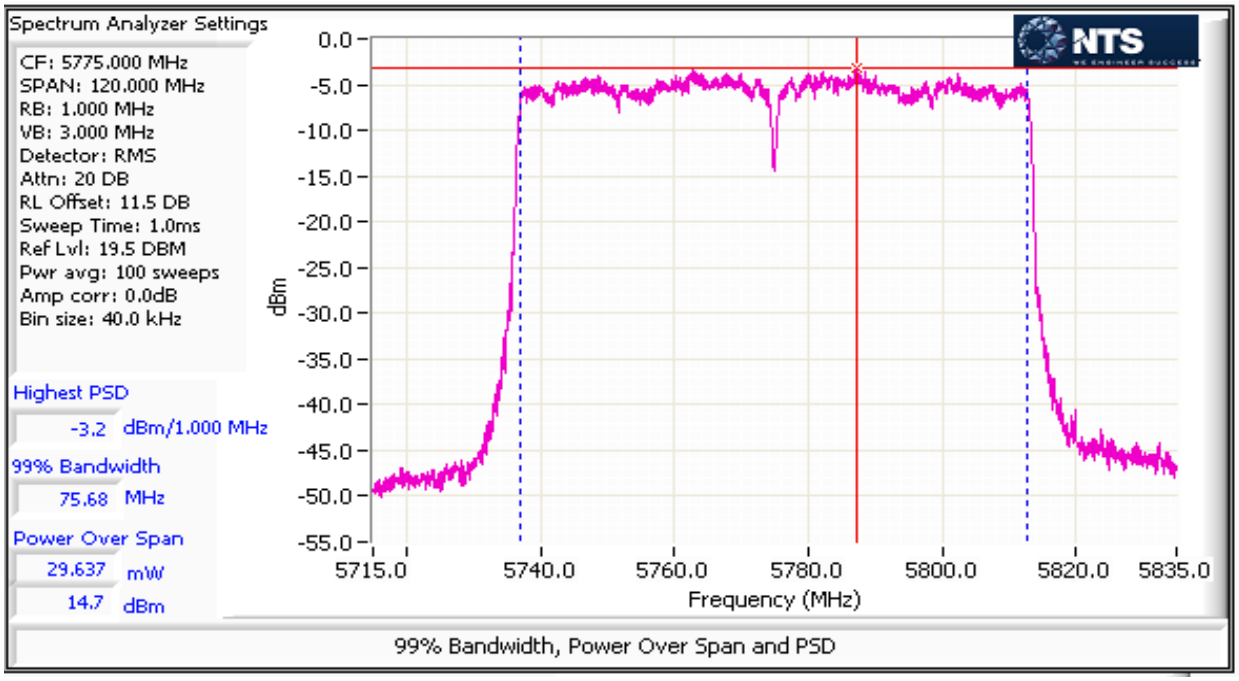
MIMO Device 5725-5850 PSD - FCC/IC

Mode: ac80

Frequency (MHz)	Chain	Software Setting	99% BW (MHz)	Duty Cycle %	PSD dBm/MHz	Total PSD[1] mW/MHz	Total PSD[1] dBm/MHz	FCC Limit dBm/MHz	IC Limit dBm/MHz	Result
5775	1	q59		77.6	-3.2	1.6	2.0	30.0	30.0	Pass
	3				-3.7					
	4									
	2				-4.3					

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Worst case power and PSD



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Run #2: Bandwidth Measurements

Date of Test: 12/02/15 Config. Used: 1

Test Engineer: Rafael Varelas Config Change: None

Test Location: FT Lab #4A EUT Voltage: 120V/60Hz

Mode: 11a

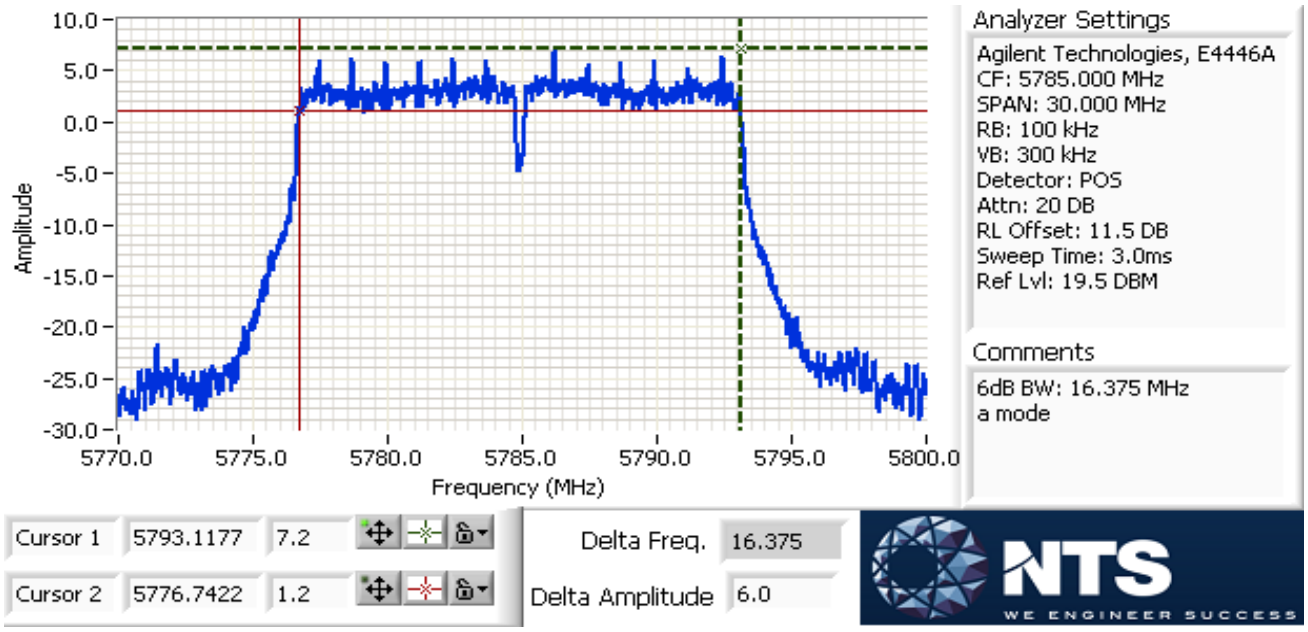
5725-5850MHz band (UNII3)

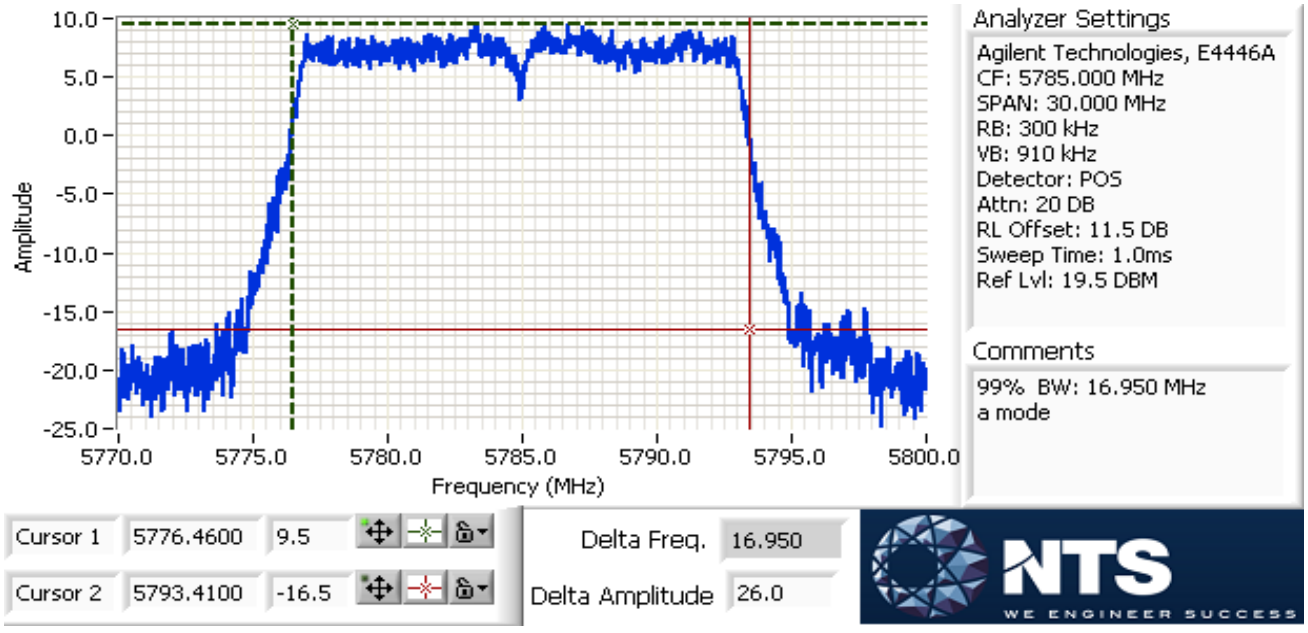
Testing performed on port: 2

Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (MHz)	
		6dB	99%	6dB	99%
q59	5745	16.4	16.8	0.1	0.3
q75	5785	16.4	17.0	0.1	0.3
q69	5825	16.4	16.9	0.1	0.3

Note 1:	6dB BW: RBW=100kHz, VBW ≥ 3*RBW, peak detector, max hold, auto sweep time. 99% BW: RBW=1-5% of of 99%BW, VBW ≥ 3*RBW, peak detector, max hold, auto sweep time.

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A





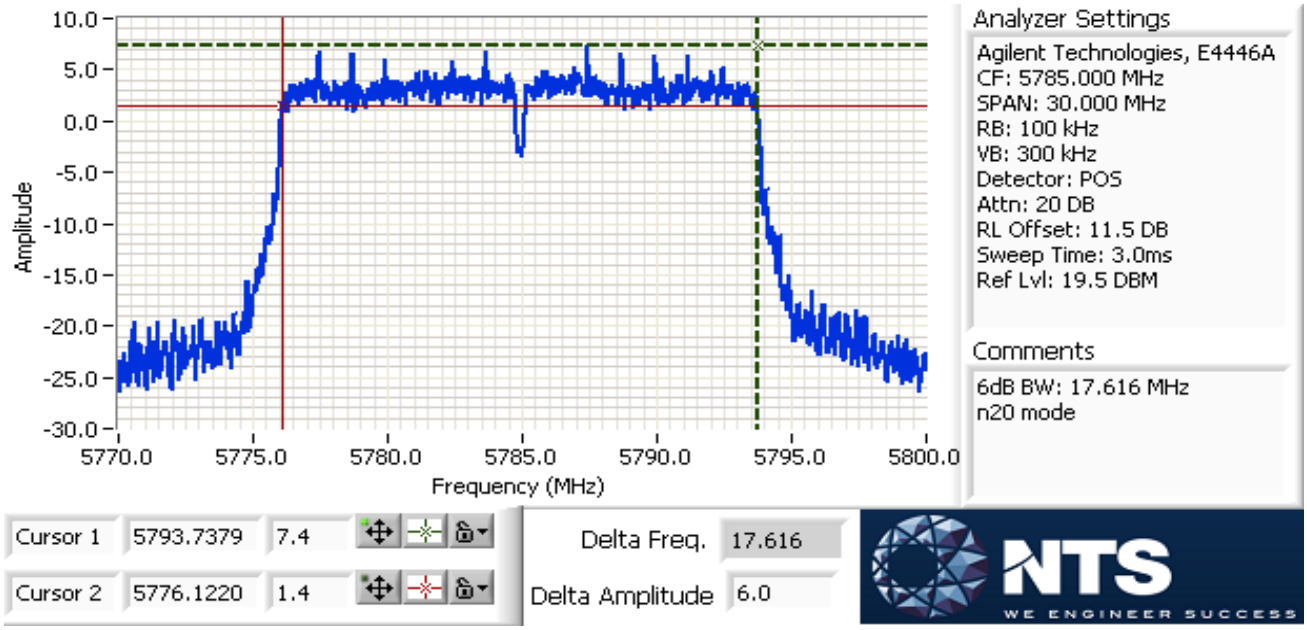
Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

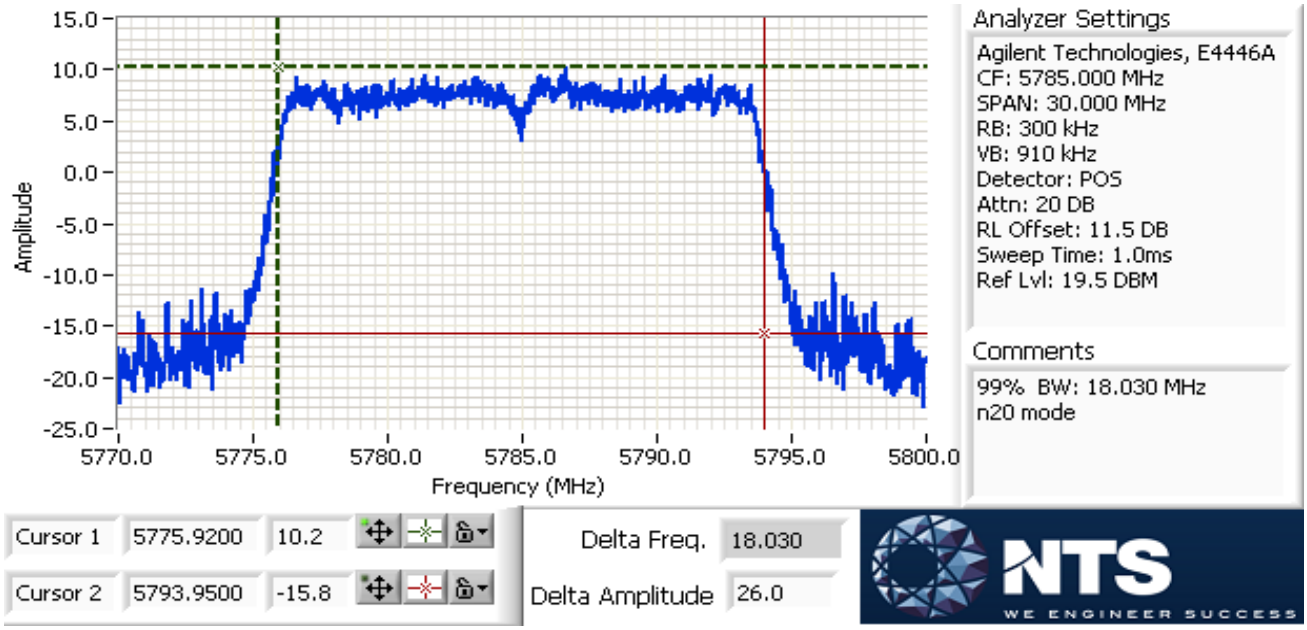
Mode: **HT20**
5725-5850MHz band (UNII3)
Testing performed on port: 2

Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (MHz)	
		6dB	99%	6dB	99%
q55	5745	17.6	17.9	0.1	0.3
q75	5785	17.6	18.0	0.1	0.3
q58	5825	17.6	17.9	0.1	0.3

Note 1:	6dB BW: RBW=100kHz, VBW ≥ 3*RBW, peak detector, max hold, auto sweep time. 99% BW: RBW=1-5% of of 99%BW, VBW ≥ 3*RBW, peak detector, max hold, auto sweep time.

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A





Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Mode: **HT40**

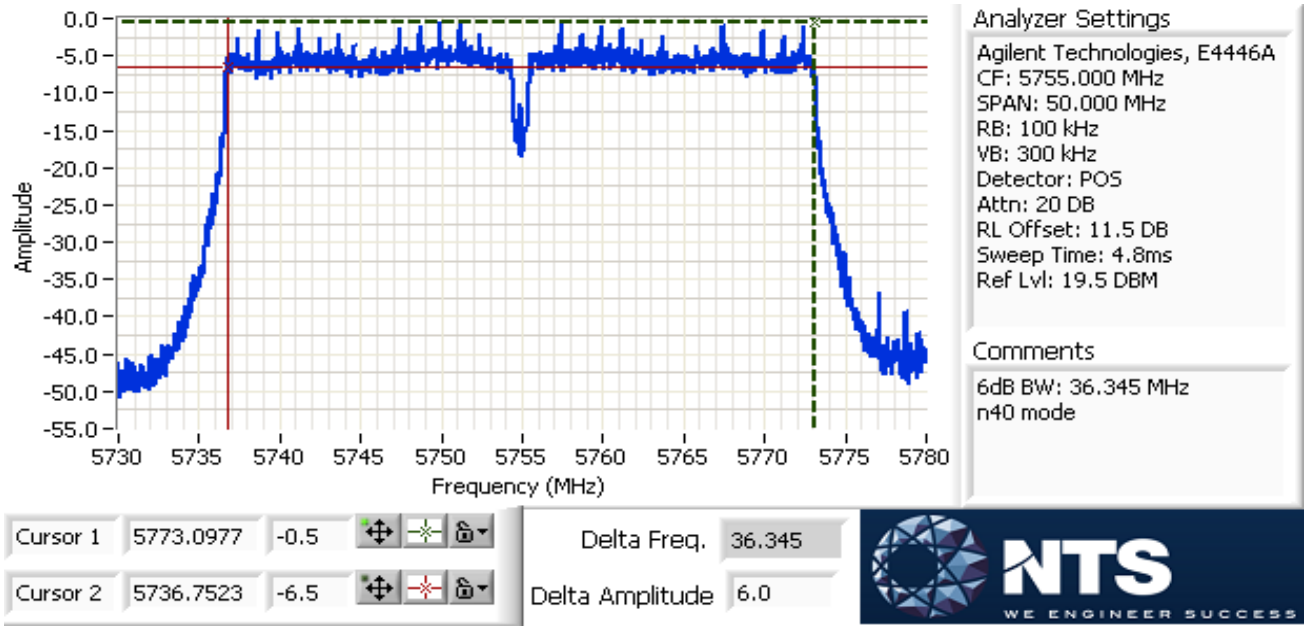
5725-5850MHz band (UNII3)

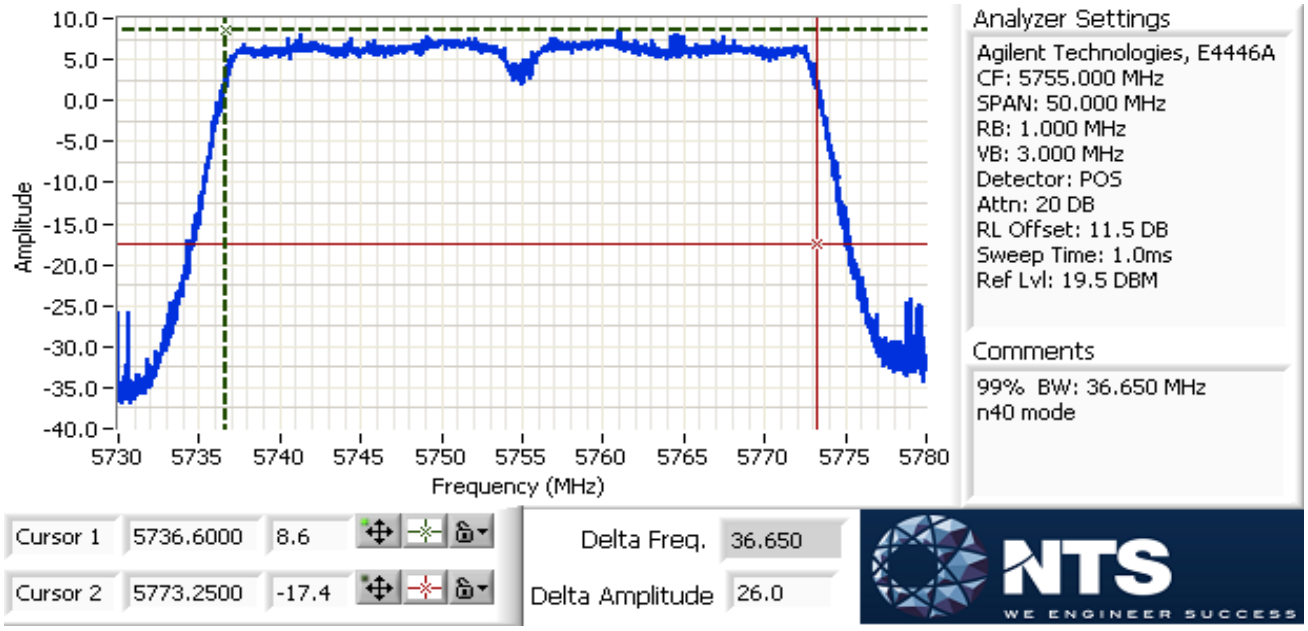
Testing performed on port: 2

Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (MHz)	
		6dB	99%	6dB	99%
q52	5755	36.3	36.7	0.1	1
q65	5795	36.4	36.6	0.1	1

Note 1:
6dB BW: RBW=100kHz, VBW ≥ 3*RBW, peak detector, max hold, auto sweep time.
99% BW: RBW=1-5% of of 99%BW, VBW ≥ 3*RBW, peak detector, max hold, auto sweep time.

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A





Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Mode: **AC80**

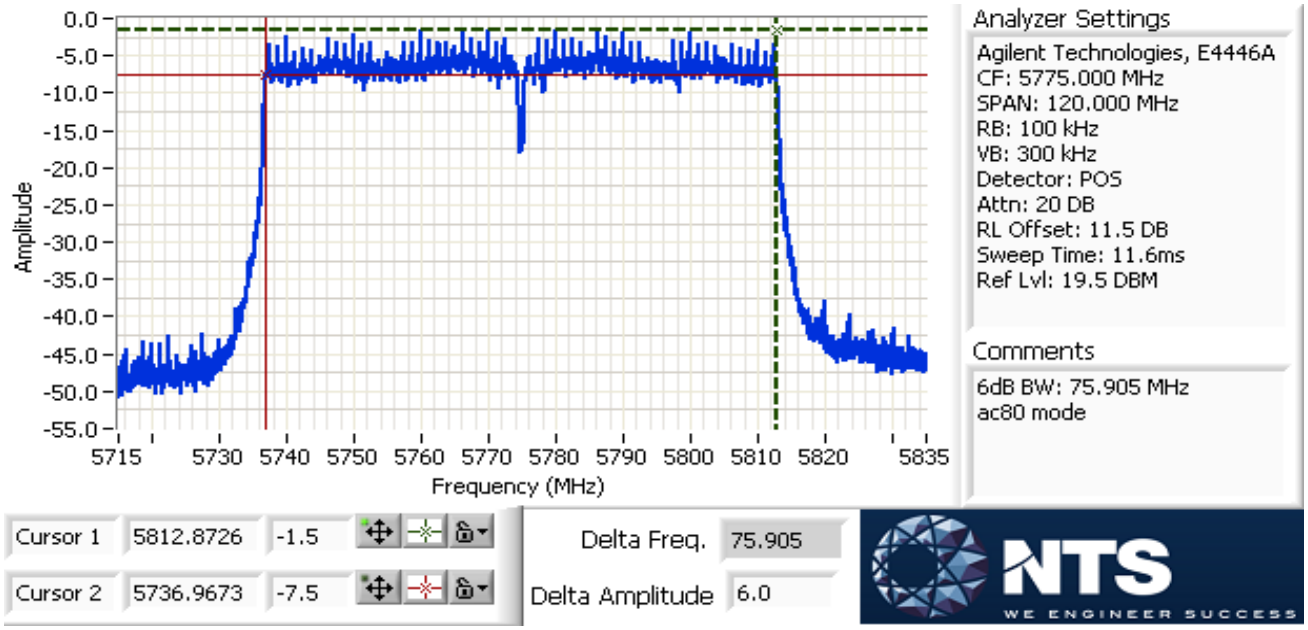
5725-5850MHz band (UNII3)

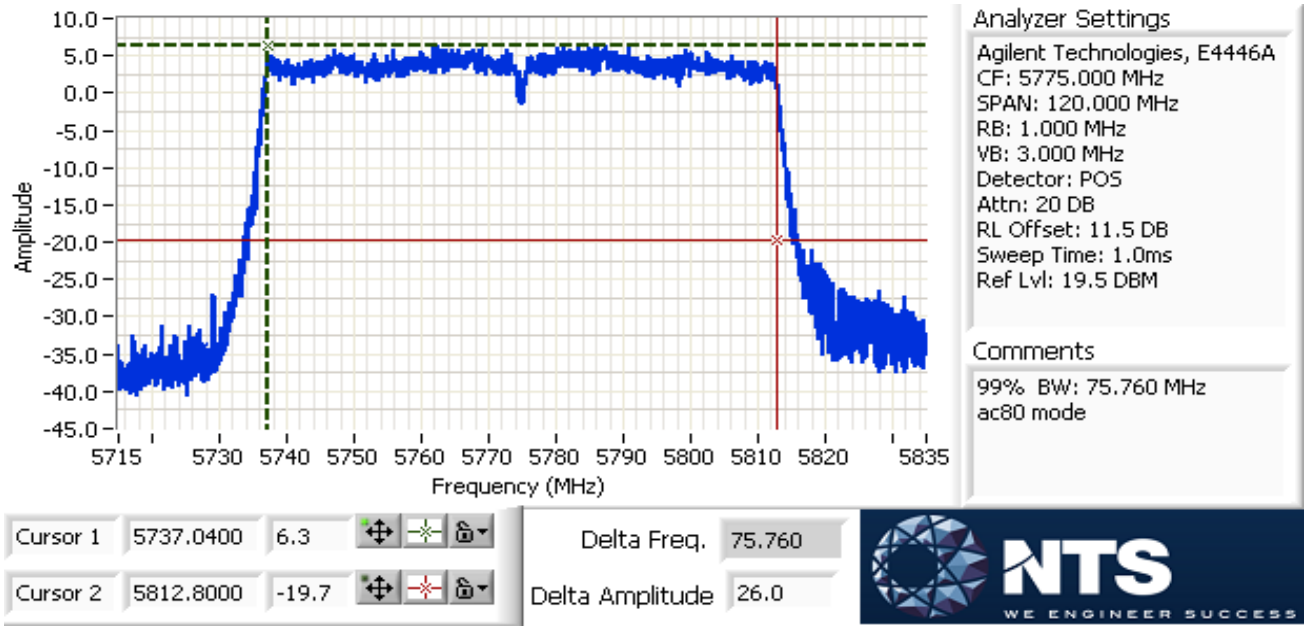
Testing performed on port: 2

Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (MHz)	
		6dB	99%	6dB	99%
q59	5775	75.9	75.7	0.1	1

Note 1:	6dB BW: RBW=100kHz, VBW ≥ 3*RBW, peak detector, max hold, auto sweep time. 99% BW: RBW=1-5% of of 99%BW, VBW ≥ 3*RBW, peak detector, max hold, auto sweep time.

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A





Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

RSS-247 and FCC 15.407 (UNII) Radiated Spurious Emissions

Test Specific Details

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

General Test Configuration

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

Ambient Conditions:

Temperature: 21.6 °C
Rel. Humidity: 35 %

Summary of Results

Run #	Mode	Channel	Target Power	Passing Power Setting	Test Performed	Limit	Result / Margin
20MHz Bandwith Modes							
1 UNII-1	a	36 - 5180MHz	-	q74	Restricted Band Edge at 5150 MHz	15.209	52.4 dBµV/m @ 5148.2 MHz (-1.6 dB)
		40 - 5200MHz		q83	Restricted Band Edge at 5150 MHz	15.209	53.0 dBµV/m @ 5037.6 MHz (-1.0 dB)
4 UNII-3		149 - 5745MHz	-	q59	Band Edge 5715 MHz	15E	67.1 dBµV/m @ 5713.8 MHz (-1.2 dB)
				q59	Band Edge 5715 - 5725 MHz	15E	73.7 dBµV/m @ 5724.3 MHz (-4.6 dB)

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Summary of Results

Run #	Mode	Channel	Target Power	Passing Power Setting	Test Performed	Limit	Result / Margin
4 UNII-3	a	153 - 5765MHz	-	q74	Band Edge 5715 MHz	15E	66.3 dBµV/m @ 5714.1 MHz (-2.0 dB)
				q74	Band Edge 5715 - 5725 MHz		70.9 dBµV/m @ 5724.2 MHz (-7.4 dB)
		165 - 5825MHz		q69	Band Edge 5850 MHz		76.7 dBµV/m @ 5851.3 MHz (-1.6 dB)
				q69	Band Edge 5860 MHz		67.2 dBµV/m @ 5869.7 MHz (-1.1 dB)
		161 - 5805MHz		q80	Band Edge 5850 MHz		72.9 dBµV/m @ 5851.4 MHz (-5.4 dB)
				q80	Band Edge 5860 MHz		65.9 dBµV/m @ 5865.0 MHz (-2.4 dB)
		157 - 5785MHz		q72	Band Edge 5850 MHz		62.8 dBµV/m @ 5858.0 MHz (-15.5 dB)
				q72	Band Edge 5860 MHz		66.7 dBµV/m @ 5862.9 MHz (-1.6 dB)
5 UNII-1	n20	36 - 5180MHz	-	q72	Restricted Band Edge at 5150 MHz	15.209	52.4 dBµV/m @ 5149.6 MHz (-1.6 dB)
		40 - 5200MHz		q77	Restricted Band Edge at 5150 MHz	15.209	52.6 dBµV/m @ 5122.1 MHz (-1.4 dB)
		44 - 5220MHz		q74	Restricted Band Edge at 5150 MHz	15.209	52.8 dBµV/m @ 5142.7 MHz (-1.2 dB)

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Summary of Results

Run #	Mode	Channel	Target Power	Passing Power Setting	Test Performed	Limit	Result / Margin
8 UNII-3	n20	149 - 5745MHz	-	q55	Band Edge 5715 MHz	15E	66.5 dBµV/m @ 5712.1 MHz (-1.8 dB)
				q55	Band Edge 5715 - 5725 MHz		73.2 dBµV/m @ 5722.9 MHz (-5.1 dB)
		153 - 5765MHz		q72	Band Edge 5715 MHz		67.0 dBµV/m @ 5714.9 MHz (-1.3 dB)
				q72	Band Edge 5715 - 5725 MHz		72.1 dBµV/m @ 5720.0 MHz (-6.2 dB)
		157 - 5785MHz		q75	Band Edge 5715 MHz		67.1 dBµV/m @ 5707.4 MHz (-1.2 dB)
				q75	Band Edge 5715 - 5725 MHz		66.5 dBµV/m @ 5724.2 MHz (-11.8 dB)
		165 - 5825MHz		q58	Band Edge 5850 MHz		73.1 dBµV/m @ 5852.2 MHz (-5.2 dB)
				q58	Band Edge 5860 MHz		66.9 dBµV/m @ 5865.0 MHz (-1.4 dB)
		161 - 5805MHz		q74	Band Edge 5850 MHz		70.3 dBµV/m @ 5852.8 MHz (-8.0 dB)
				q74	Band Edge 5860 MHz		67.0 dBµV/m @ 5889.9 MHz (-1.3 dB)
		157 - 5785MHz		q75	Band Edge 5850 MHz		65.1 dBµV/m @ 5857.4 MHz (-13.2 dB)
				q75	Band Edge 5860 MHz		66.4 dBµV/m @ 5869.5 MHz (-1.9 dB)

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Summary of Results

Run #	Mode	Channel	Target Power	Passing Power Setting	Test Performed	Limit	Result / Margin
40MHz Bandwith Modes							
9 UNII-1	n40	38 - 5190MHz	-	q62	Restricted Band Edge at 5150 MHz	15.209	72.3 dBµV/m @ 5146.3 MHz (-1.7 dB)
		46 - 5230MHz		q82	Restricted Band Edge at 5150 MHz	15.209	53.0 dBµV/m @ 5147.0 MHz (-1.0 dB)
12 UNII-3		151 - 5755MHz	-	q52	Band Edge 5715 MHz	15E	48.8 dBµV/m @ 5714.9 MHz (-5.2 dB)
				q52	Band Edge 5715 - 5725 MHz		72.5 dBµV/m @ 5723.6 MHz (-1.5 dB)
		159 - 5795MHz		q65	Band Edge 5850 MHz		71.6 dBµV/m @ 5855.3 MHz (-6.7 dB)
					Band Edge 5860 MHz		52.7 dBµV/m @ 5862.3 MHz (-1.3 dB)

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Summary of Results

Run #	Mode	Channel	Target Power	Passing Power Setting	Test Performed	Limit	Result / Margin
80MHz Bandwith Modes							
13 UNII-1	ac80	42 - 5210MHz	-	q61	Restricted Band Edge at 5150 MHz	15.209	53.0 dBµV/m @ 5149.1 MHz (-1.0 dB)
16 UNII-3		155 - 5785MHz	-	q59	Band Edge 5715 MHz	15E	66.9 dBµV/m @ 5702.9 MHz (-1.4 dB)
					Band Edge 5715 - 5725 MHz		68.8 dBµV/m @ 5722.8 MHz (-9.5 dB)
					Band Edge 5850 MHz		65.2 dBµV/m @ 5857.1 MHz (-13.1 dB)
					Band Edge 5860 MHz		66.8 dBµV/m @ 5866.1 MHz (-1.5 dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	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	99.0%	Yes	2.06	0	0	10
n20	MCS0	99.0%	Yes	1.92	0	0	10
n40	MCS0	98.0%	Yes	0.94	0	0	10
ac80	VHT0	77.6%	Yes	0.21	1.1	2.2	4739

Sample Notes

Sample S/N: prototype
Driver: -
Antenna: Internal

Measurement Specific Notes:

Note 1:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector). Per KDB 789033 2) c) (i), compliance can be demonstrated by meeting the average and peak limits of 15.209, as an alternative.
Note 3:	Emission has constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW>1/T but not less than 10Hz, peak detector, linear averaging, auto sweep,max hold 50*1/DC traces (method VB of KDB 789033)
Note 5:	Plots of the average and peak bandedge do not account for any duty cycle correction. Refer to the tabular results for final measurements.

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

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

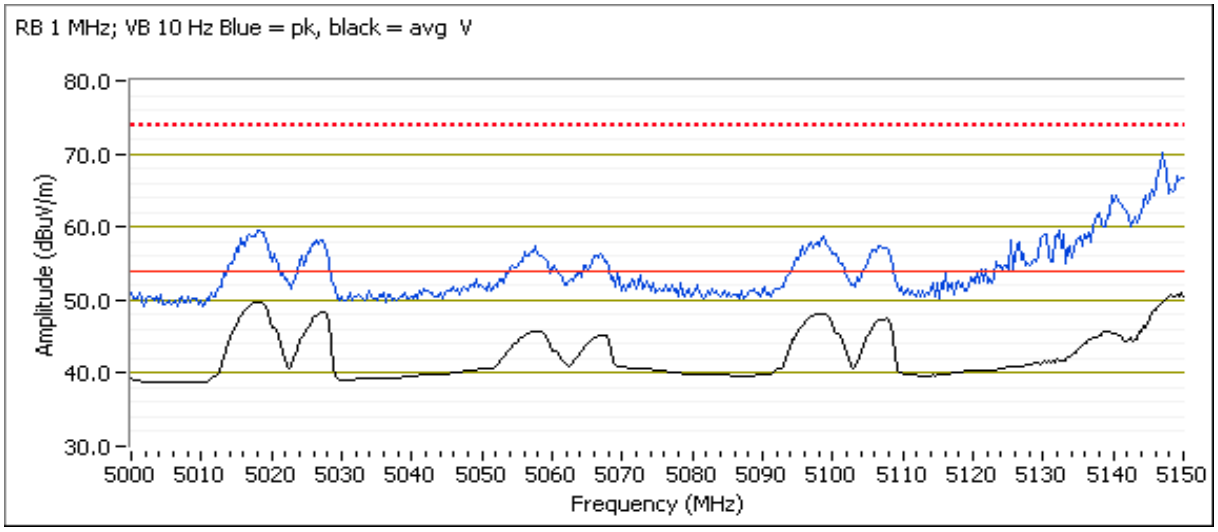
Date of Test: 11/23/2015 0:00
Test Engineer: Rafael Varelas
Test Location: FT Chamber #7

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

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

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5148.160	52.4	V	54.0	-1.6	AVG	238	1.7	POS; RB 1 MHz; VB: 10 Hz
5146.550	70.7	V	74.0	-3.3	PK	238	1.7	POS; RB 1 MHz; VB: 3 MHz
5149.680	48.9	H	54.0	-5.1	AVG	246	1.2	POS; RB 1 MHz; VB: 10 Hz
5146.230	65.1	H	74.0	-8.9	PK	246	1.2	POS; RB 1 MHz; VB: 3 MHz

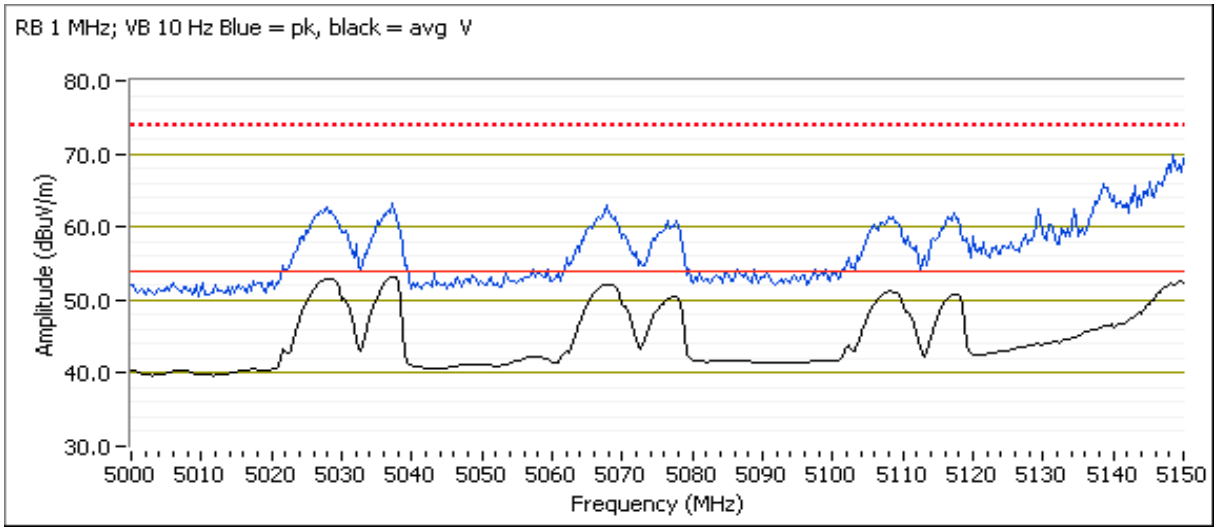


Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Channel: 40 - 5200 MHz
Tx Chain: 3Tx
Mode: a
Data Rate: 6

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	
5037.580	**53.0**	V	54.0	**-1.0**	AVG	238	2.0	POS; RB 1 MHz; VB: 10 Hz
5028.960	69.7	V	74.0	-4.3	PK	238	2.0	POS; RB 1 MHz; VB: 3 MHz
5149.120	52.6	V	54.0	-1.4	AVG	238	2.0	POS; RB 1 MHz; VB: 10 Hz
5148.560	70.2	V	74.0	-3.8	PK	238	2.0	POS; RB 1 MHz; VB: 3 MHz
5149.920	51.2	H	54.0	-2.8	AVG	307	1.7	POS; RB 1 MHz; VB: 10 Hz
5148.160	67.5	H	74.0	-6.5	PK	307	1.7	POS; RB 1 MHz; VB: 3 MHz
5030.860	51.8	H	54.0	-2.2	AVG	307	1.7	POS; RB 1 MHz; VB: 10 Hz
5031.260	60.2	H	74.0	-13.8	PK	307	1.7	POS; RB 1 MHz; VB: 3 MHz



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

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

Date of Test: 11/23/2015 0:00
Test Engineer: Rafael Varelas
Test Location: FT Chamber #7

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

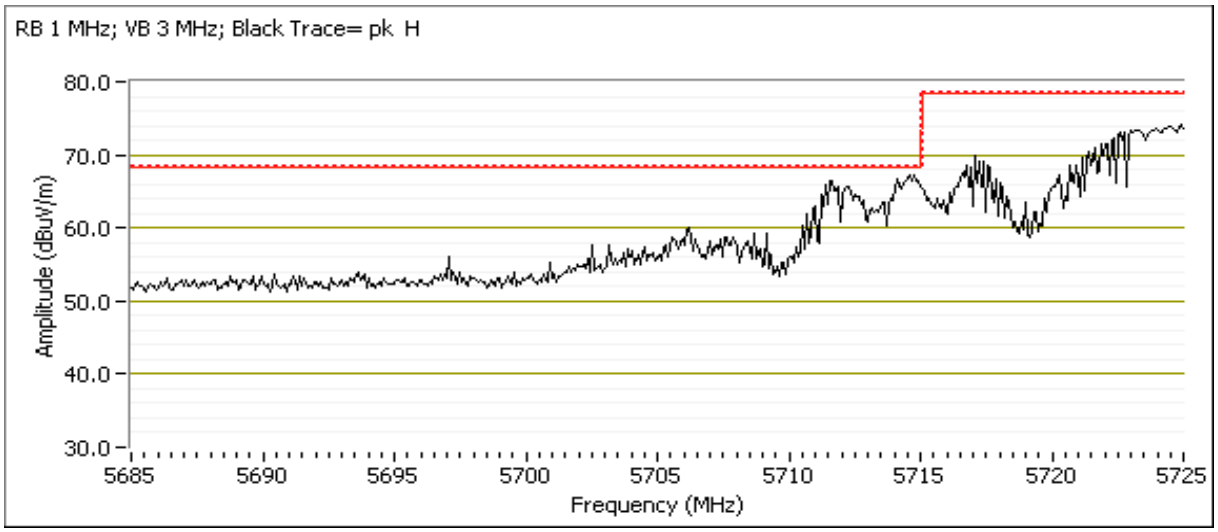
Channel: 149 - 5745MHz
Tx Chain: 3Tx
Mode: a
Data Rate: 6

5715 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5713.800	67.1	H	68.3	-1.2	PK	296	1.5	POS; RB 1 MHz; VB: 3 MHz
5714.820	64.5	V	68.3	-3.8	PK	262	2.0	POS; RB 1 MHz; VB: 3 MHz

5715-5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5724.340	73.7	H	78.3	-4.6	PK	296	1.5	POS; RB 1 MHz; VB: 3 MHz
5724.840	71.2	V	78.3	-7.1	PK	262	2.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

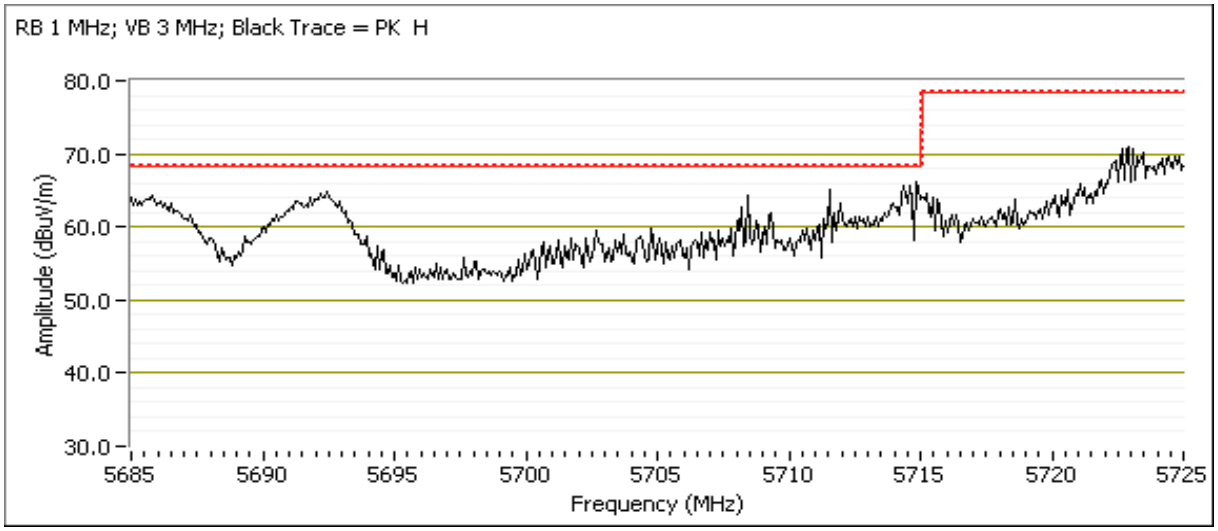
Channel: 153 - 5765MHz
Tx Chain: 3Tx
Mode: a
Data Rate: 6

5715 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5714.100	66.3	H	68.3	-2.0	PK	291	1.9	POS; RB 1 MHz; VB: 3 MHz
5714.160	65.8	V	68.3	-2.5	PK	263	1.8	POS; RB 1 MHz; VB: 3 MHz

5715-5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5724.220	70.9	H	78.3	-7.4	PK	291	1.9	POS; RB 1 MHz; VB: 3 MHz
5724.600	68.7	V	78.3	-9.6	PK	263	1.8	POS; RB 1 MHz; VB: 3 MHz



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

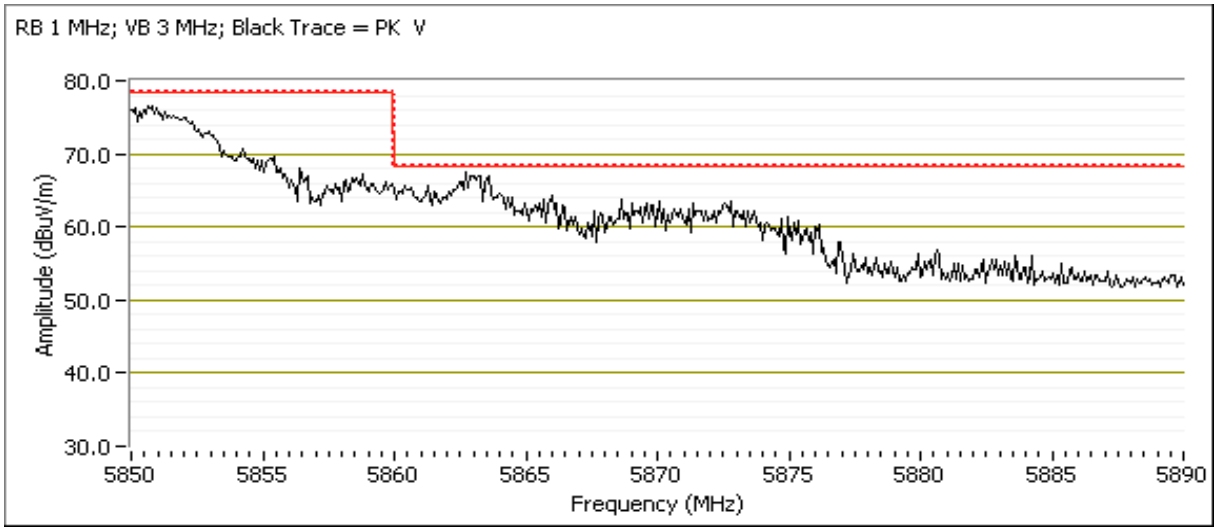
Channel: 165 - 5825MHz
Tx Chain: 3Tx
Mode: a
Data Rate: 6

5850-5860MHz MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5851.300	76.7	V	78.3	-1.6	PK	229	2.2	POS; RB 1 MHz; VB: 3 MHz
5850.220	76.2	H	78.3	-2.1	PK	276	1.0	POS; RB 1 MHz; VB: 3 MHz

5860 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5869.680	67.2	V	68.3	-1.1	PK	229	2.2	POS; RB 1 MHz; VB: 3 MHz
5861.320	66.9	H	68.3	-1.4	PK	276	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

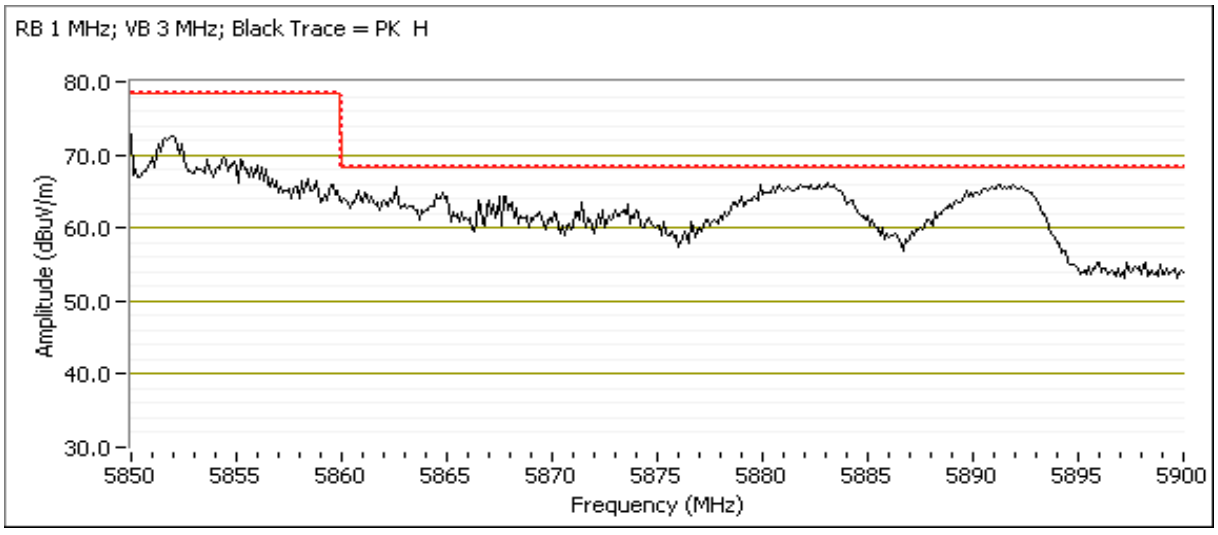
Channel: 161 - 5805MHz
Tx Chain: 3Tx
Mode: a
Data Rate: 6

5850-5860MHz MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5851.440	72.9	H	78.3	-5.4	PK	272	1.5	POS; RB 1 MHz; VB: 3 MHz
5853.430	71.7	V	78.3	-6.6	PK	225	2.2	POS; RB 1 MHz; VB: 3 MHz

5860 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5864.950	65.9	H	68.3	-2.4	PK	272	1.5	POS; RB 1 MHz; VB: 3 MHz
5862.420	64.8	V	68.3	-3.5	PK	225	2.2	POS; RB 1 MHz; VB: 3 MHz



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

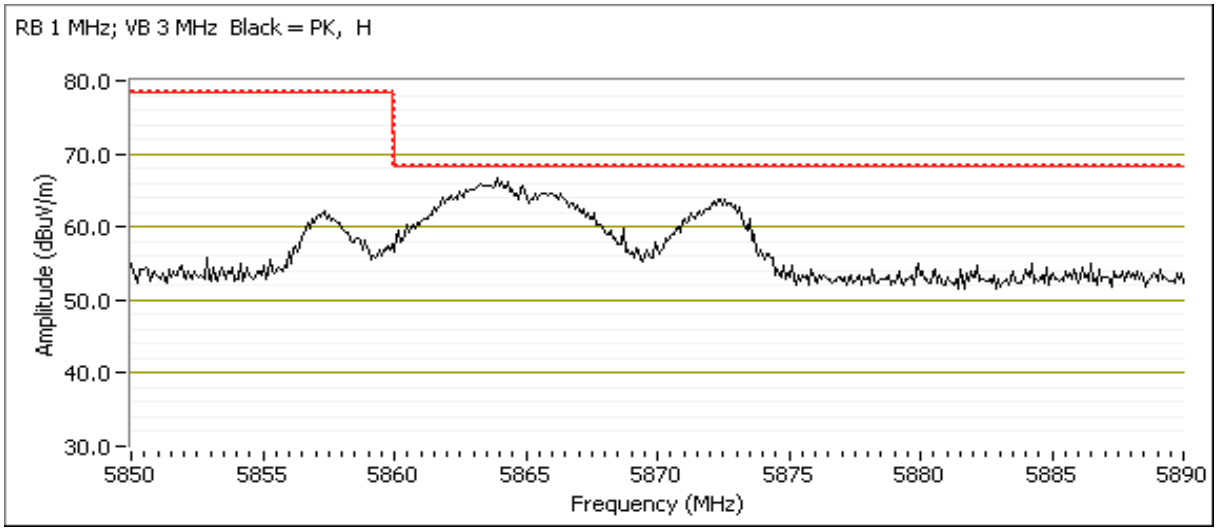
Channel: 157 - 5785MHz
Tx Chain: 3Tx
Mode: a
Data Rate: 6

5850-5860MHz 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	
5857.960	62.8	H	78.3	-15.5	PK	285	1.4	POS; RB 1 MHz; VB: 3 MHz
5860.000	60.2	V	78.3	-18.1	PK	242	1.7	POS; RB 1 MHz; VB: 3 MHz

5860 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5862.890	66.7	H	68.3	-1.6	PK	285	1.4	POS; RB 1 MHz; VB: 3 MHz
5862.830	64.7	V	68.3	-3.6	PK	242	1.7	POS; RB 1 MHz; VB: 3 MHz



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

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

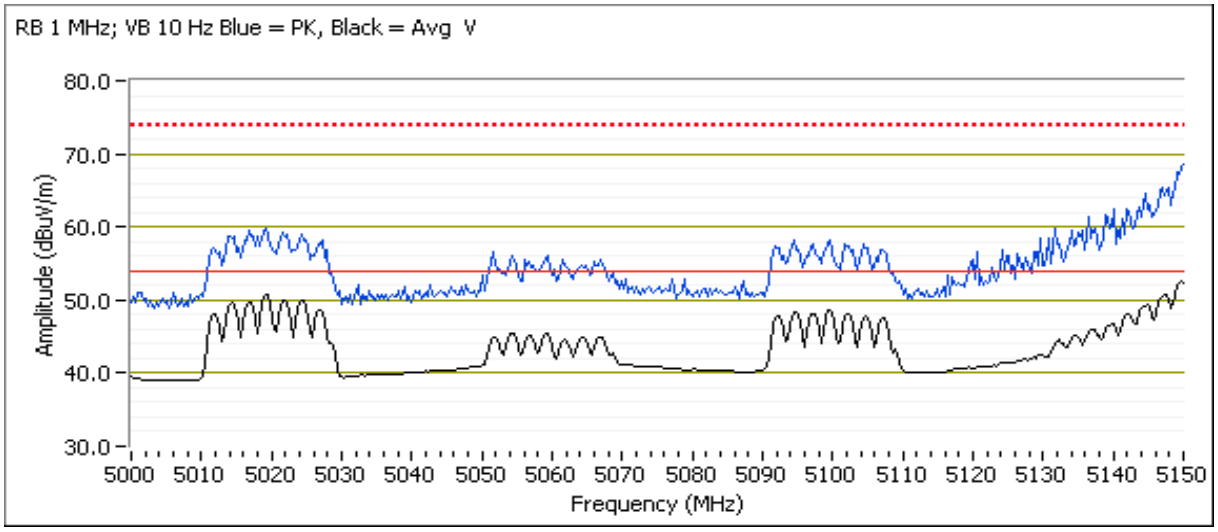
Date of Test: 11/23/2015 0:00
Test Engineer: Rafael Varelas
Test Location: FT Chamber #7

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

Channel: 36 - 5180 MHz
Tx Chain: 3Tx
Mode: n20
Data Rate: MCS0

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.600	52.4	V	54.0	-1.6	AVG	240	2.2	POS; RB 1 MHz; VB: 10 Hz
5148.960	69.1	V	74.0	-4.9	PK	240	2.2	POS; RB 1 MHz; VB: 3 MHz
5149.920	49.9	H	54.0	-4.1	AVG	230	1.0	POS; RB 1 MHz; VB: 10 Hz
5147.520	66.7	H	74.0	-7.3	PK	230	1.0	POS; RB 1 MHz; VB: 3 MHz

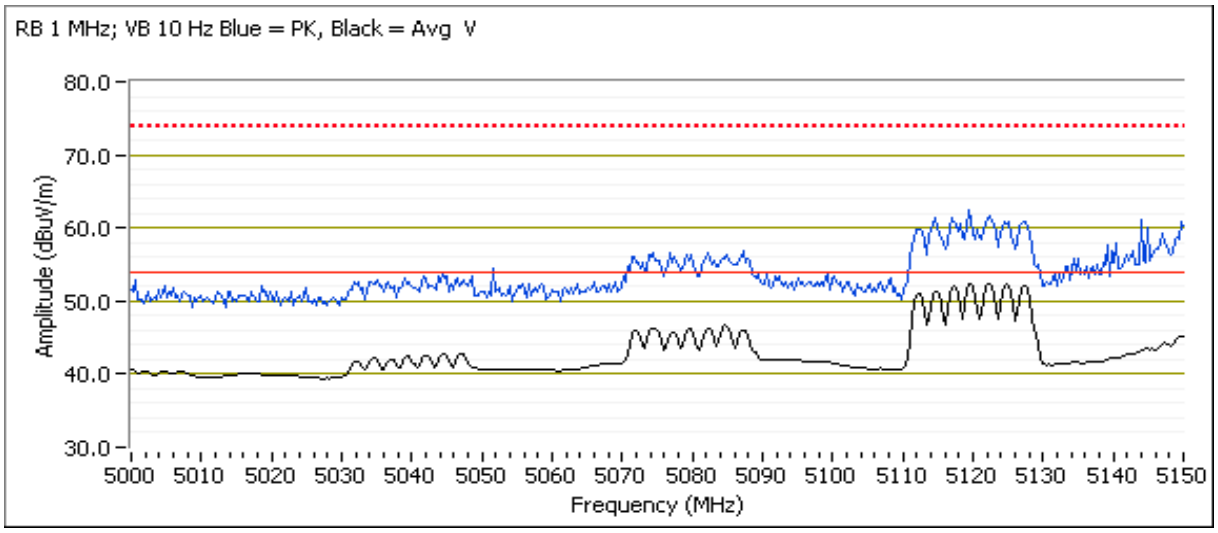


Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Channel: 40 - 5200 MHz
Tx Chain: 3Tx
Mode: n20
Data Rate: MCS0

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	
5122.100	52.6	V	54.0	-1.4	AVG	248	2.0	POS; RB 1 MHz; VB: 10 Hz
5117.210	61.4	V	74.0	-12.6	PK	248	2.0	POS; RB 1 MHz; VB: 3 MHz
5118.180	49.6	H	54.0	-4.4	AVG	249	1.0	POS; RB 1 MHz; VB: 10 Hz
5125.390	59.0	H	74.0	-15.0	PK	249	1.0	POS; RB 1 MHz; VB: 3 MHz

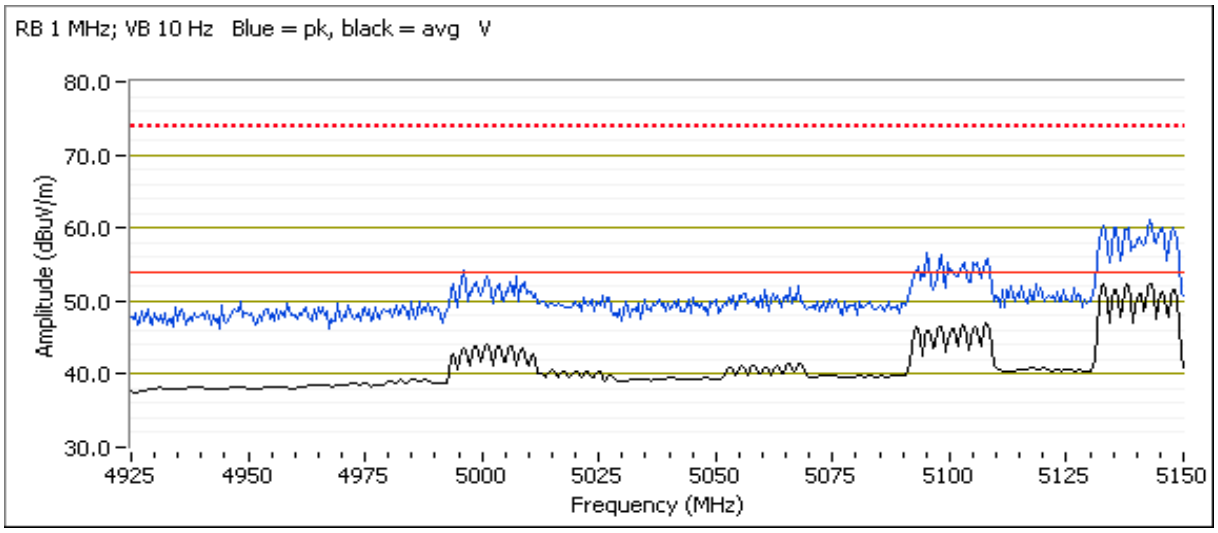


Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Channel: 44 - 5220 MHz
Tx Chain: 3Tx
Mode: n20
Data Rate: MCS0

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5142.690	52.8	V	54.0	**-1.2**	AVG	262	2.50	POS; RB 1 MHz; VB: 10 Hz
5142.690	61.7	V	74.0	-12.3	PK	262	2.50	POS; RB 1 MHz; VB: 3 MHz
5142.130	50.4	H	54.0	-3.6	AVG	281	1.64	POS; RB 1 MHz; VB: 10 Hz
5144.990	59.9	H	74.0	-14.1	PK	281	1.64	POS; RB 1 MHz; VB: 3 MHz



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

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

Date of Test: 11/24/2015 0:00
Test Engineer: Rafael Varelas
Test Location: FT Chamber #7

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

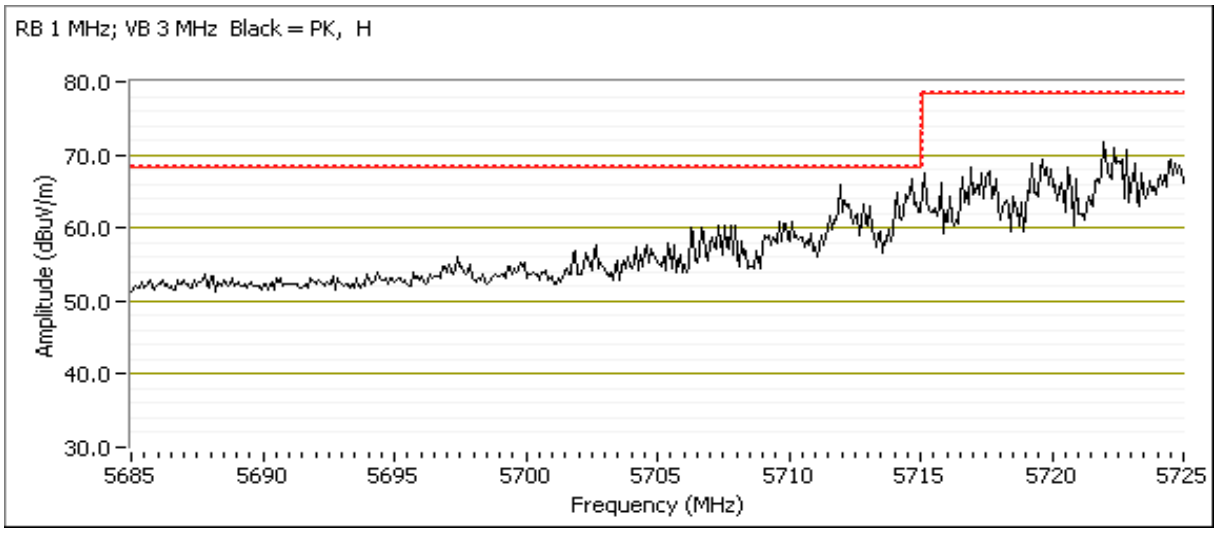
Channel: 149 - 5745MHz
Tx Chain: 3Tx
Mode: n20
Data Rate: MCS0

5715 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	
5712.110	66.5	H	68.3	-1.8	PK	284	1.6	POS; RB 1 MHz; VB: 3 MHz
5712.720	64.4	V	68.3	-3.9	PK	247	1.8	POS; RB 1 MHz; VB: 3 MHz

5715-5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5722.920	73.2	H	78.3	-5.1	PK	284	1.6	POS; RB 1 MHz; VB: 3 MHz
5724.420	70.2	V	78.3	-8.1	PK	247	1.8	POS; RB 1 MHz; VB: 3 MHz



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

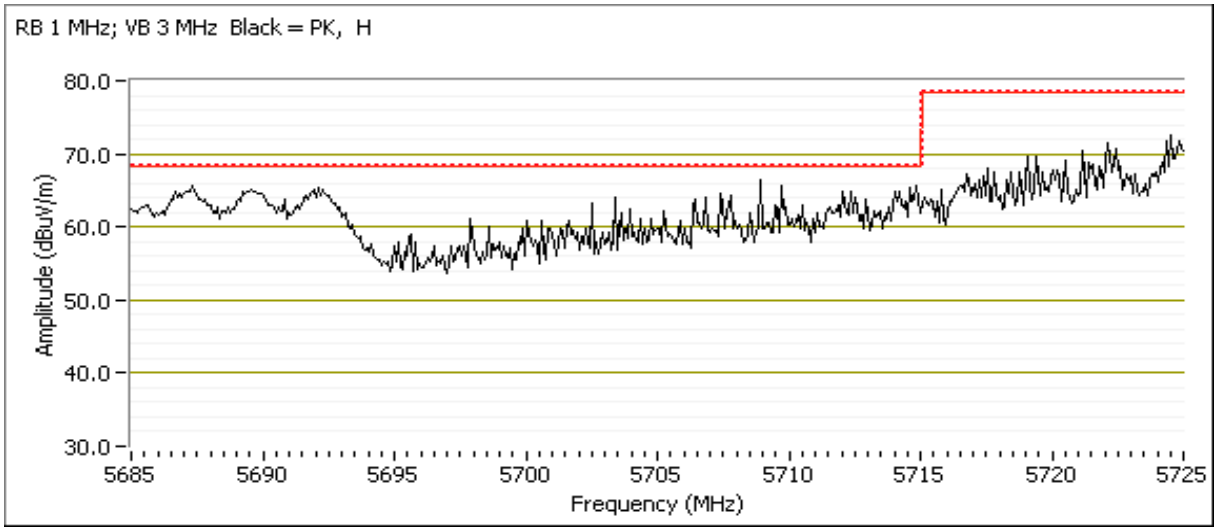
Channel: 153 - 5765MHz
Tx Chain: 3Tx
Mode: n20
Data Rate: MCS0

5715 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	
5714.880	67.0	H	68.3	-1.3	PK	279	1.5	POS; RB 1 MHz; VB: 3 MHz
5710.970	64.1	V	68.3	-4.2	PK	218	1.9	POS; RB 1 MHz; VB: 3 MHz

5715-5725 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	
5719.950	72.1	H	78.3	-6.2	PK	279	1.5	POS; RB 1 MHz; VB: 3 MHz
5724.620	69.7	V	78.3	-8.6	PK	218	1.9	POS; RB 1 MHz; VB: 3 MHz



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

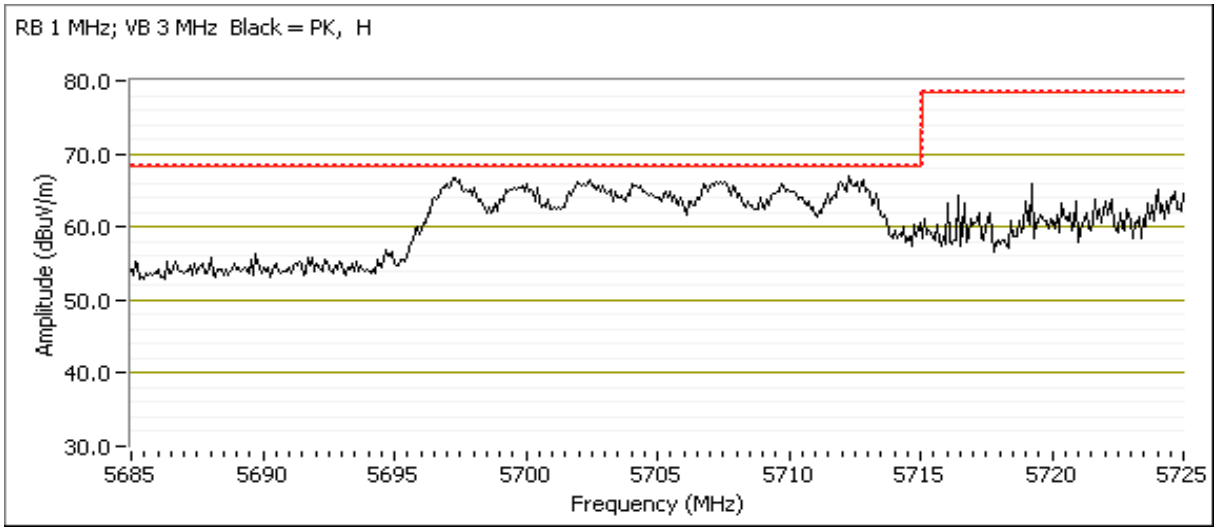
Channel: 157 - 5785MHz
Tx Chain: 3Tx
Mode: n20
Data Rate: MCS0

5715 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	
5707.360	67.1	H	68.3	-1.2	PK	287	1.5	POS; RB 1 MHz; VB: 3 MHz
5704.160	66.0	V	68.3	-2.3	PK	220	2.2	POS; RB 1 MHz; VB: 3 MHz

5715-5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5724.160	66.5	H	78.3	-11.8	PK	287	1.5	POS; RB 1 MHz; VB: 3 MHz
5722.780	64.7	V	78.3	-13.6	PK	220	2.2	POS; RB 1 MHz; VB: 3 MHz



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

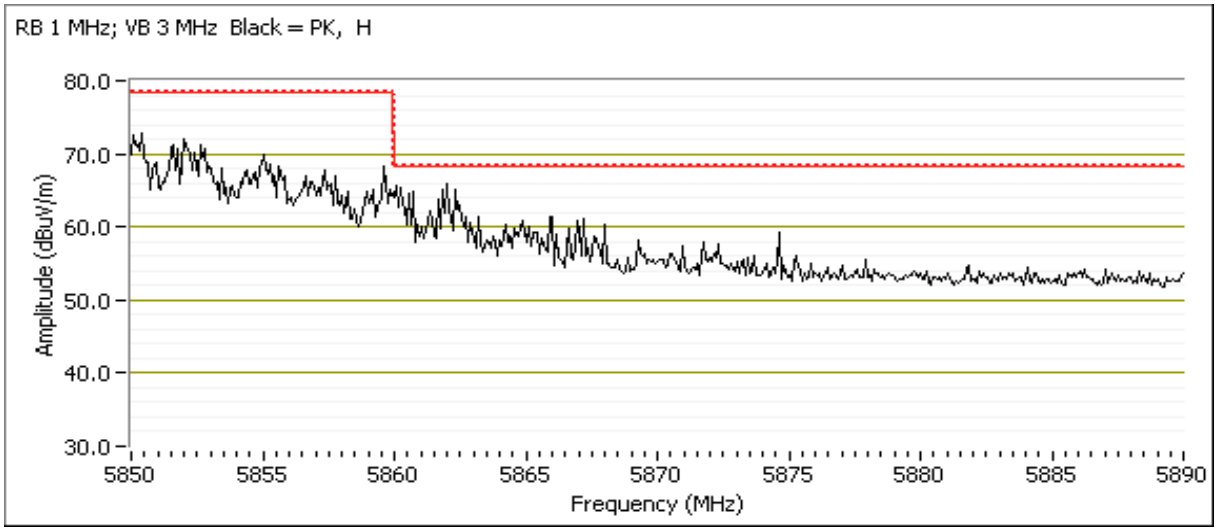
Channel: 165 - 5825MHz
Tx Chain: 3Tx
Mode: n20
Data Rate: MCS0

5850-5860MHz 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	
5852.200	73.1	H	78.3	-5.2	PK	285	1.4	POS; RB 1 MHz; VB: 3 MHz
5855.510	70.7	V	78.3	-7.6	PK	246	1.6	POS; RB 1 MHz; VB: 3 MHz

5860 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5864.990	66.9	H	68.3	-1.4	PK	285	1.4	POS; RB 1 MHz; VB: 3 MHz
5861.980	60.9	V	68.3	-7.4	PK	246	1.6	POS; RB 1 MHz; VB: 3 MHz



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

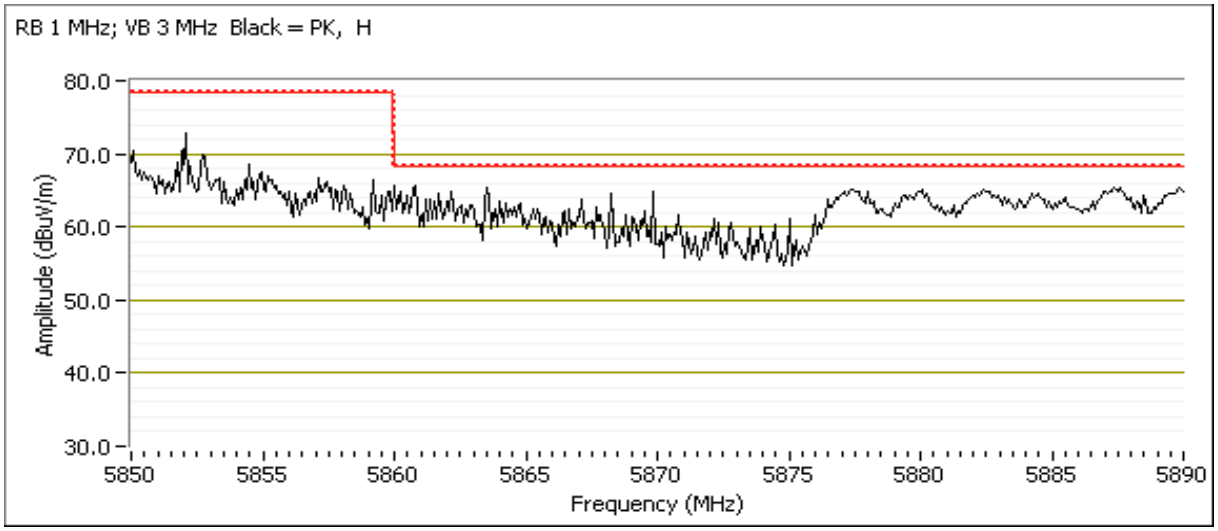
Channel: 161 - 5805MHz
Tx Chain: 3Tx
Mode: n20
Data Rate: MCS0

5850-5860MHz 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	
5852.770	70.3	H	78.3	-8.0	PK	286	1.3	POS; RB 1 MHz; VB: 3 MHz
5850.020	69.1	V	78.3	-9.2	PK	248	1.8	POS; RB 1 MHz; VB: 3 MHz

5860 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5889.940	67.0	H	68.3	-1.3	PK	286	1.3	POS; RB 1 MHz; VB: 3 MHz
5887.110	65.1	V	68.3	-3.2	PK	248	1.8	POS; RB 1 MHz; VB: 3 MHz



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

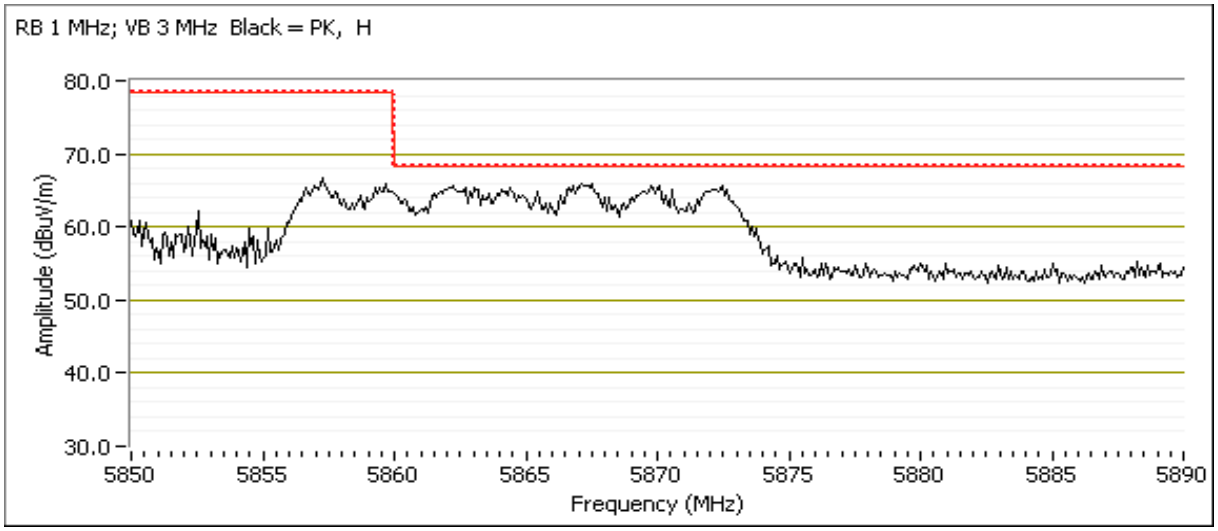
Channel: 157 - 5785MHz
Tx Chain: 3Tx
Mode: n20
Data Rate: MCS0

5850-5860MHz 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	
5857.440	65.1	H	78.3	-13.2	PK	281	1.5	POS; RB 1 MHz; VB: 3 MHz
5857.480	65.0	V	78.3	-13.3	PK	242	1.6	POS; RB 1 MHz; VB: 3 MHz

5860 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5869.480	66.4	H	68.3	-1.9	PK	281	1.5	POS; RB 1 MHz; VB: 3 MHz
5862.520	64.5	V	68.3	-3.8	PK	242	1.6	POS; RB 1 MHz; VB: 3 MHz



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

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

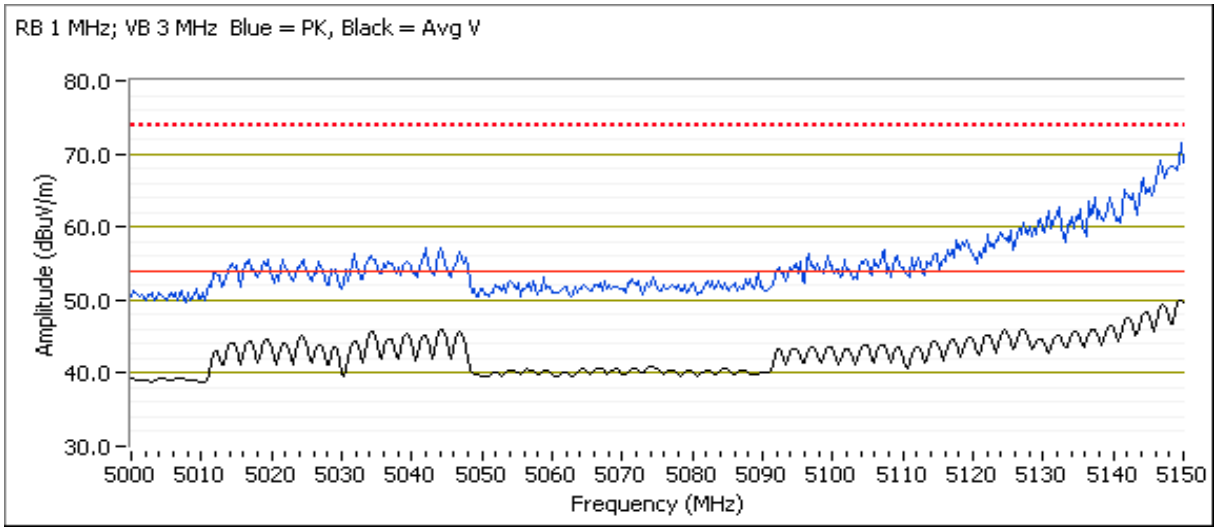
Date of Test: 11/24/2015 0:00
Test Engineer: Rafael Varelas
Test Location: FT Chamber #7

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

Channel: 38 - 5190 MHz
Tx Chain: 3Tx
Mode: n40
Data Rate: MCS0

5150 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5146.310	72.3	V	74.0	-1.7	PK	223	2.2	POS; RB 1 MHz; VB: 3 MHz
5149.520	50.3	V	54.0	-3.7	AVG	223	2.2	POS; RB 1 MHz; VB: 10 Hz
5147.840	69.6	H	74.0	-4.4	PK	292	1.2	POS; RB 1 MHz; VB: 3 MHz
5150.000	49.1	H	54.0	-4.9	AVG	292	1.2	POS; RB 1 MHz; VB: 10 Hz

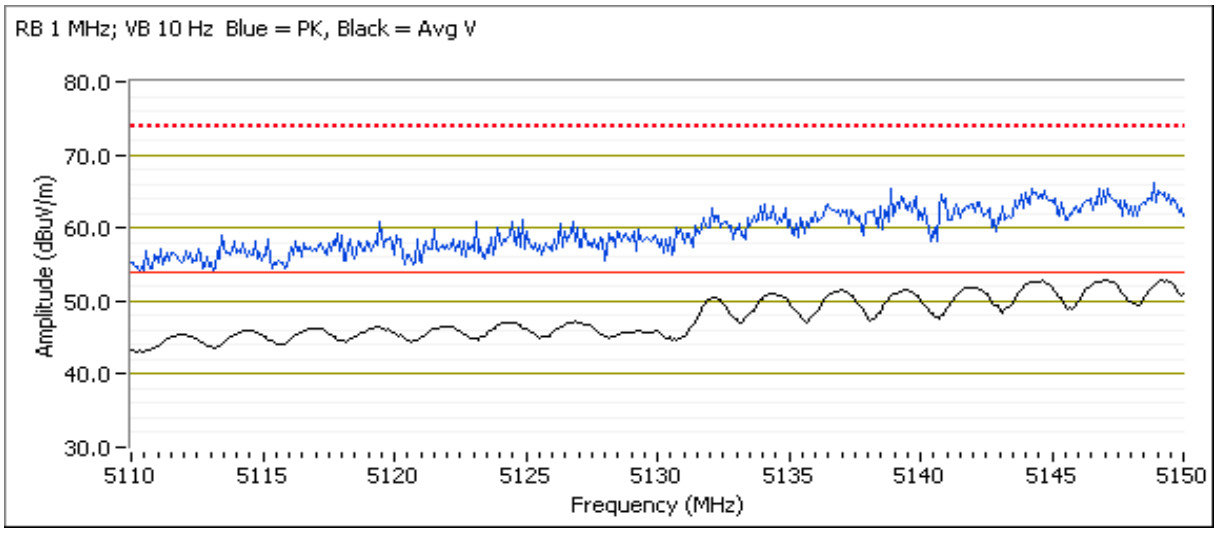


Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Channel: 46 - 5230 MHz
Tx Chain: 3Tx
Mode: n40
Data Rate: MCS0

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	
5147.030	53.0	V	54.0	-1.0	AVG	224	2.1	POS; RB 1 MHz; VB: 10 Hz
5143.990	66.9	V	74.0	-7.1	PK	224	2.1	POS; RB 1 MHz; VB: 3 MHz
5148.560	52.4	H	54.0	-1.6	AVG	240	1.6	POS; RB 1 MHz; VB: 10 Hz
5143.750	66.0	H	74.0	-8.0	PK	240	1.6	POS; RB 1 MHz; VB: 3 MHz



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

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

Date of Test: 11/24/2015 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: MCS0

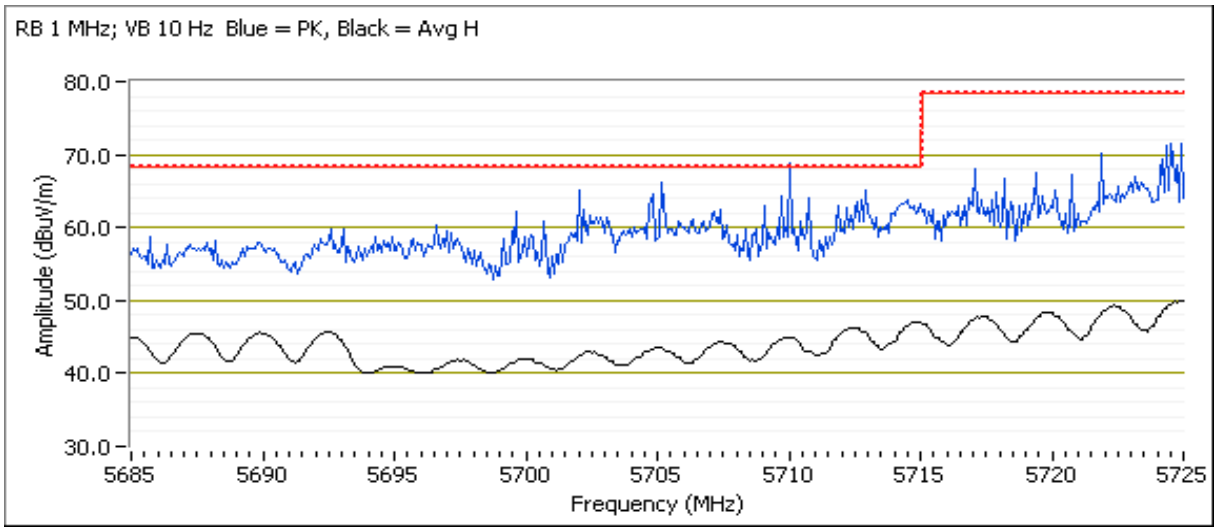
5715 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5714.880	48.8	H	54.0	-5.2	AVG	288	1.0	POS; RB 1 MHz; VB: 3 MHz, note 1
5712.960	68.1	H	74.0	-5.9	PK	288	1.0	POS; RB 1 MHz; VB: 10 Hz, note 1
5714.100	47.9	V	54.0	-6.1	AVG	219	2.0	POS; RB 1 MHz; VB: 3 MHz, note 1
5713.560	67.8	V	74.0	-6.2	PK	219	2.0	POS; RB 1 MHz; VB: 10 Hz, note 1

5715-5725 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5723.560	72.5	H	74.0	-1.5	PK	288	1.0	POS; RB 1 MHz; VB: 3 MHz, note 1
5724.800	51.8	H	54.0	-2.2	AVG	288	1.0	POS; RB 1 MHz; VB: 10 Hz, note 1
5724.180	51.1	V	54.0	-2.9	AVG	219	2.0	POS; RB 1 MHz; VB: 3 MHz, note 1
5723.680	72.2	V	74.0	-1.8	PK	219	2.0	POS; RB 1 MHz; VB: 10 Hz, note 1

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Date of Test: 11/25/2015 0:00
Test Engineer: John Caizzi
Test Location: FT Chamber #7

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

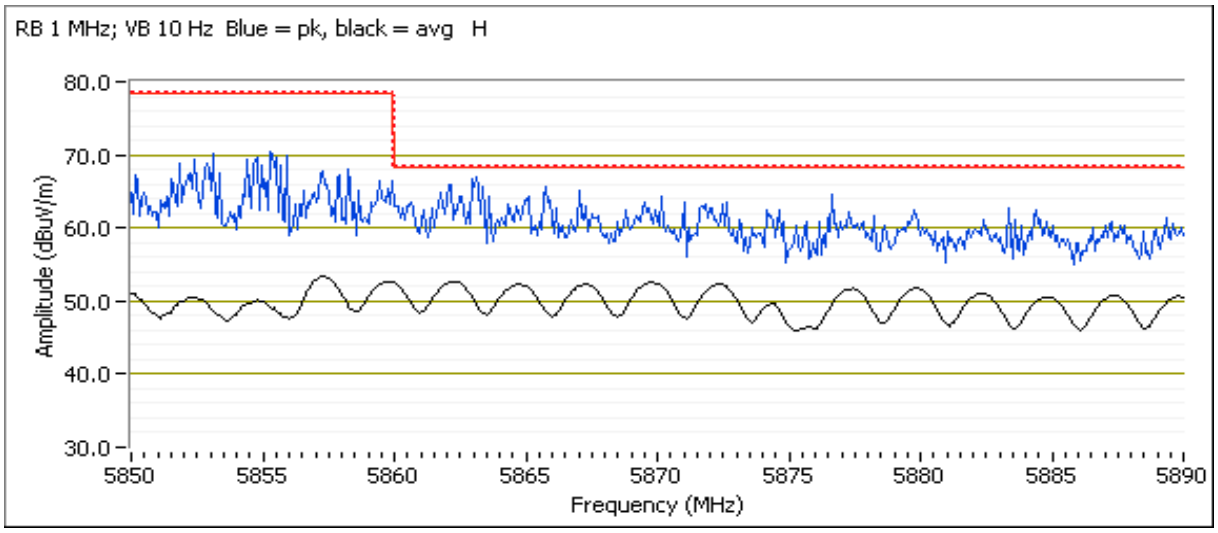
Channel: 159 - 5795MHz
Tx Chain: 3Tx
Mode: n40
Data Rate: MCS0

5850-5860MHz 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	
5855.330	71.6	H	78.3	**-6.7**	PK	281	1.50	POS; RB 1 MHz; VB: 10 Hz, note 1
5852.950	68.8	V	78.3	-9.5	PK	230	1.89	POS; RB 1 MHz; VB: 10 Hz, note 1

5860 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5862.280	52.7	H	54.0	**-1.3**	AVG	281	1.50	POS; RB 1 MHz; VB: 3 MHz, note 1
5862.830	68.7	H	74.0	-5.3	PK	281	1.50	POS; RB 1 MHz; VB: 10 Hz, note 1
5861.860	51.5	V	54.0	-2.5	AVG	230	1.89	POS; RB 1 MHz; VB: 3 MHz, note 1
5870.460	66.9	V	74.0	-7.1	PK	230	1.89	POS; RB 1 MHz; VB: 10 Hz, note 1



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

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

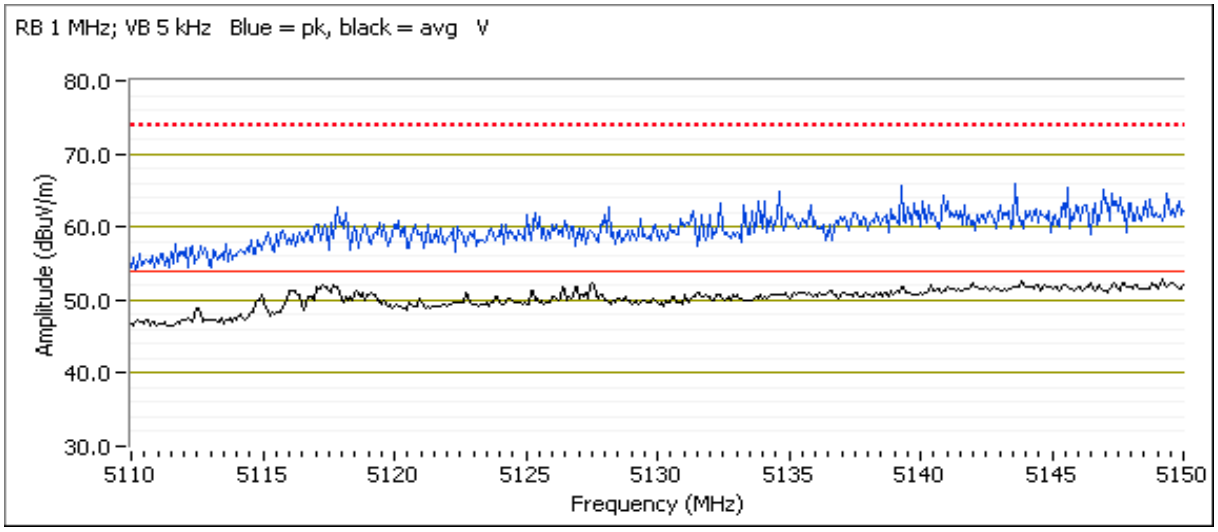
Date of Test: 11/25/2015 0:00
Test Engineer: John Caizzi
Test Location: FT Chamber #7

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

Channel: 42 - 5210MHz
Tx Chain: 3Tx
Mode: ac80
Data Rate: VHT0

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	
5149.040	52.1	H	54.0	-1.9	Avg	279	1.76	RB 1 MHz; VB: 5 kHz. Note 3
5149.520	65.7	H	74.0	-8.3	PK	279	1.76	POS; RB 1 MHz; VB: 3 MHz
5149.120	53.0	V	54.0	**-1.0**	Avg	231	2.50	RB 1 MHz; VB: 5 kHz. Note 3
5145.350	66.2	V	74.0	-7.8	PK	231	2.50	POS; RB 1 MHz; VB: 3 MHz



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

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

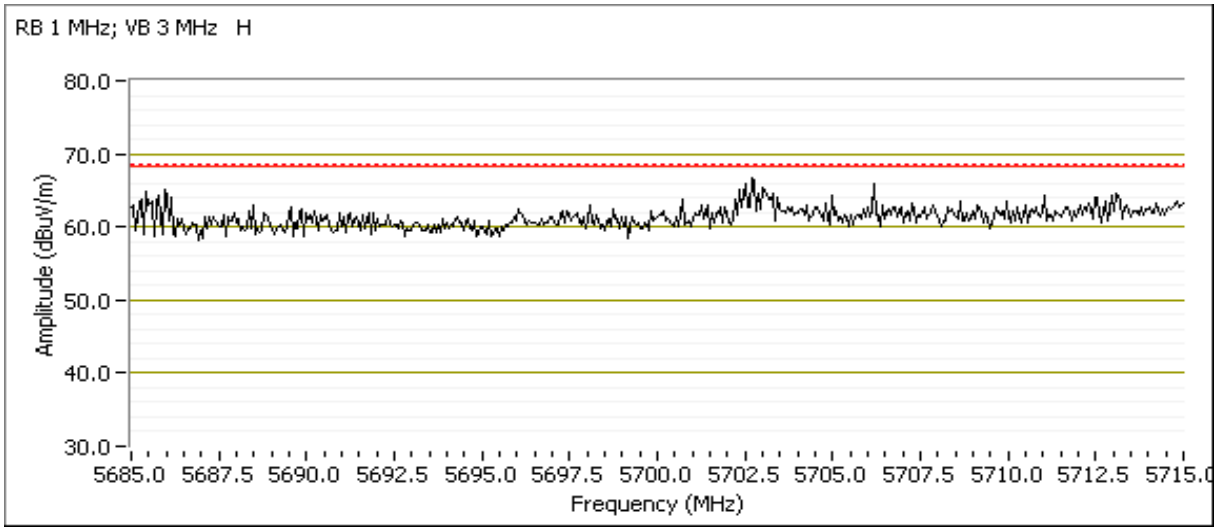
Date of Test: 11/25/2015 0:00
Test Engineer: John Caizzi
Test Location: FT Chamber #7

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

Channel: 155 - 5775MHz
Tx Chain: 3Tx
Mode: ac80
Data Rate: VHT0

5715 MHz Band Edge Signal Radiated Field Strength

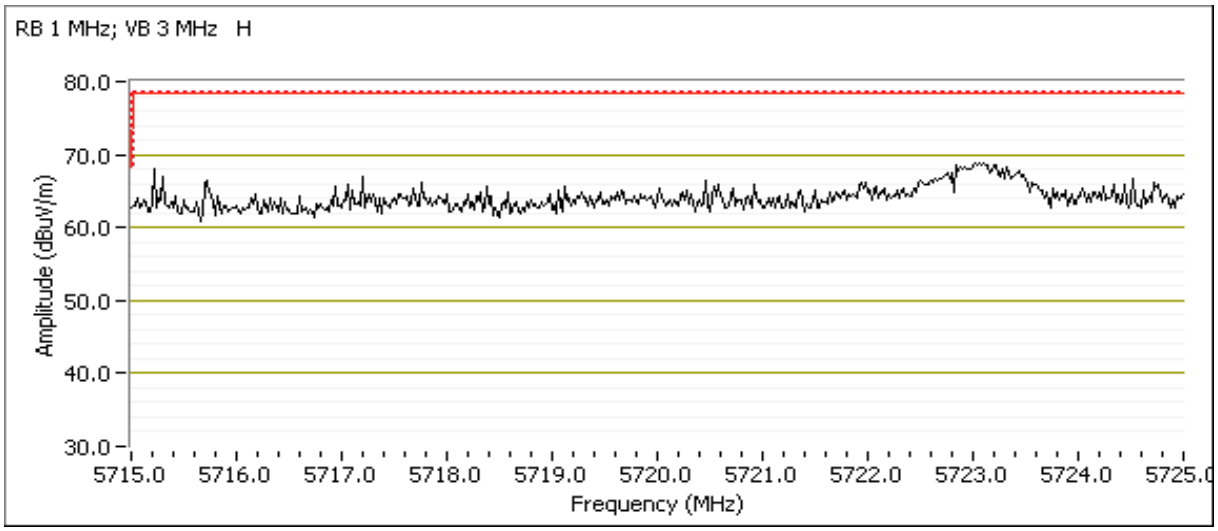
Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5702.920	66.9	H	68.3	**-1.4**	PK	282	1.55	POS; RB 1 MHz; VB: 3 MHz
5702.920	65.3	V	68.3	-3.0	PK	244	1.90	POS; RB 1 MHz; VB: 3 MHz



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

5715-5725 MHz Band Edge Signal Radiated Field Strength

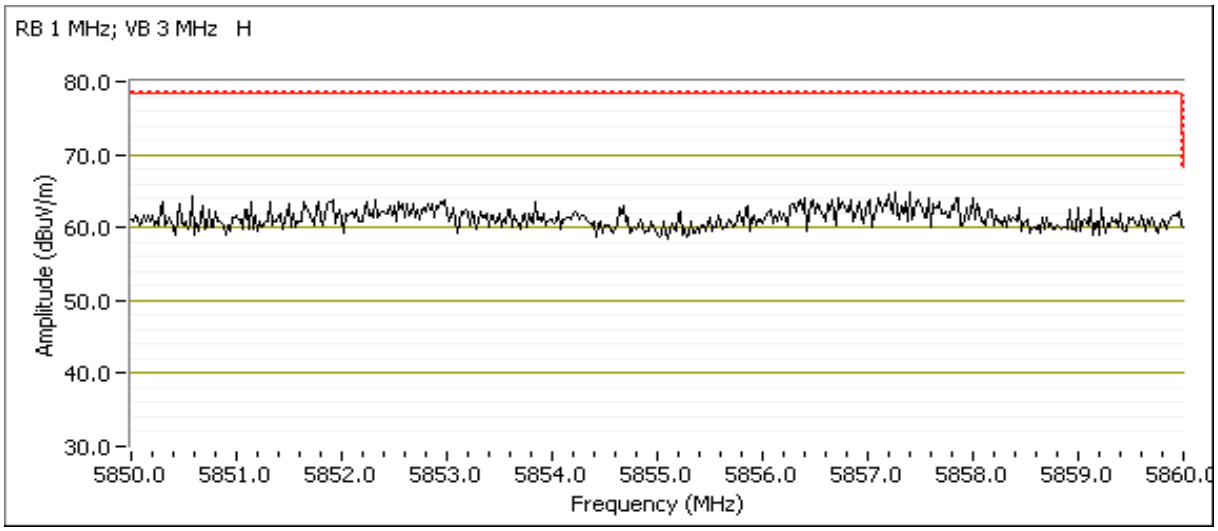
Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5722.820	68.8	H	78.3	**-9.5**	PK	283	1.35	POS; RB 1 MHz; VB: 3 MHz
5723.160	67.5	V	78.3	-10.8	PK	248	2.15	POS; RB 1 MHz; VB: 3 MHz



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

5850-5860MHz MHz Band Edge Signal Radiated Field Strength

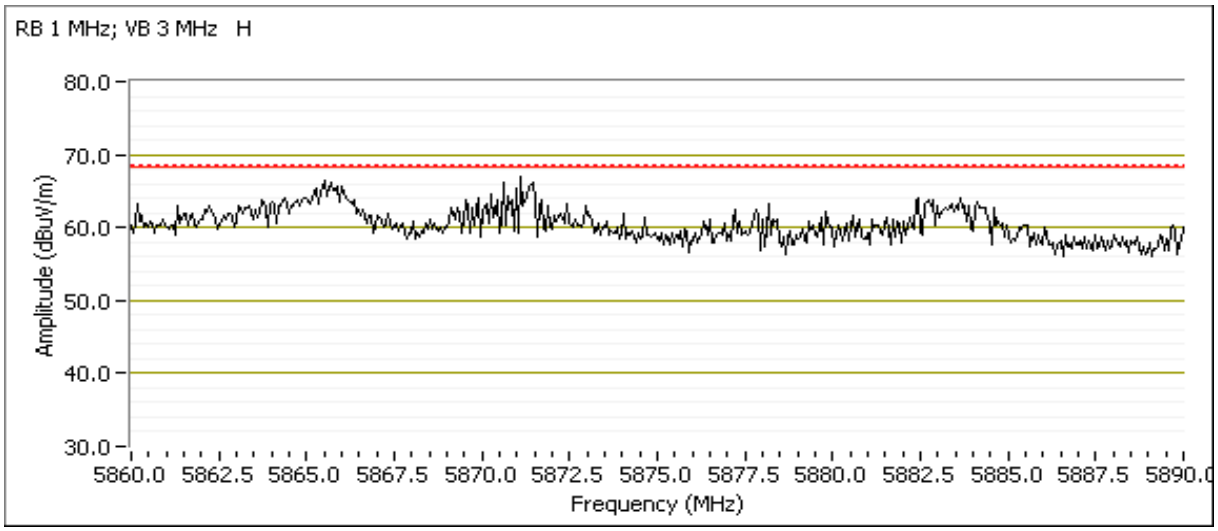
Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5857.130	65.2	H	78.3	**-13.1**	PK	280	1.42	POS; RB 1 MHz; VB: 3 MHz
5851.420	64.3	V	78.3	-14.0	PK	242	2.07	POS; RB 1 MHz; VB: 3 MHz



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

5860 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	15.E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5866.070	66.8	H	68.3	**-1.5**	PK	276	1.41	POS; RB 1 MHz; VB: 3 MHz
5870.820	65.7	V	68.3	-2.6	PK	224	2.28	POS; RB 1 MHz; VB: 3 MHz



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	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: 22.1 °C
Rel. Humidity: 36 %

Summary of Results

Run #	Mode	Channel	Target Power	Passing Power Setting	Test Performed	Limit	Result / Margin
Scans on "center" channel in all four OFDM modes to determine the worst case mode.							
1	a	40 - 5200MHz	-	q92	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	49.6 dBµV/m @ 5441.2 MHz (-4.4 dB)
	n20	40 - 5200MHz	-	q92	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	48.4 dBµV/m @ 5445.3 MHz (-5.6 dB)
	n40	38 - 5190MHz	-	q78	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.8 dBµV/m @ 5015.4 MHz (-1.2 dB)
	ac80	42 - 5210MHz	-	q81	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.4 dBµV/m @ 5046.0 MHz (-1.6 dB)
Measurements on low and high channels in worst-case OFDM mode.							
2	n40	46 - 5230MHz	-	q92	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	48.9 dBµV/m @ 5037.7 MHz (-5.1 dB)
Scans on "center" channel in all four OFDM modes to determine the worst case mode.							
7	a	157 - 5785MHz	-	q92	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	65.7 dBµV/m @ 5295.7 MHz (-2.6 dB)
	n20	157 - 5785MHz	-	q92	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	63.3 dBµV/m @ 5295.8 MHz (-5.0 dB)
	n40	151 - 5755MHz	-	q92	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	60.1 dBµV/m @ 5999.3 MHz (-8.2 dB)
	ac80	155 - 5775MHz	-	q92	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	55.5 dBµV/m @ 6416.6 MHz (-12.8 dB)

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Summary of Results

Run #	Mode	Channel	Target Power	Passing Power Setting	Test Performed	Limit	Result / Margin
Measurements on low and high channels in worst-case OFDM mode.							
8	a	149 - 5745MHz	-	q92	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	63.6 dBµV/m @ 5268.1 MHz (-4.7 dB)
	a	165 - 5825MHz	-	q92	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	62.4 dBµV/m @ 5342.2 MHz (-5.9 dB)

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	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	99.0%	Yes	2.06	0	0	10
n20	MCS0	99.0%	Yes	1.92	0	0	10
n40	MCS0	98.0%	Yes	0.94	0	0	10
ac80	VHT0	77.6%	Yes	0.21	1.1	2.2	4739

Sample Notes

Sample S/N: prototype
Driver: -
Antenna: Internal

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:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

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

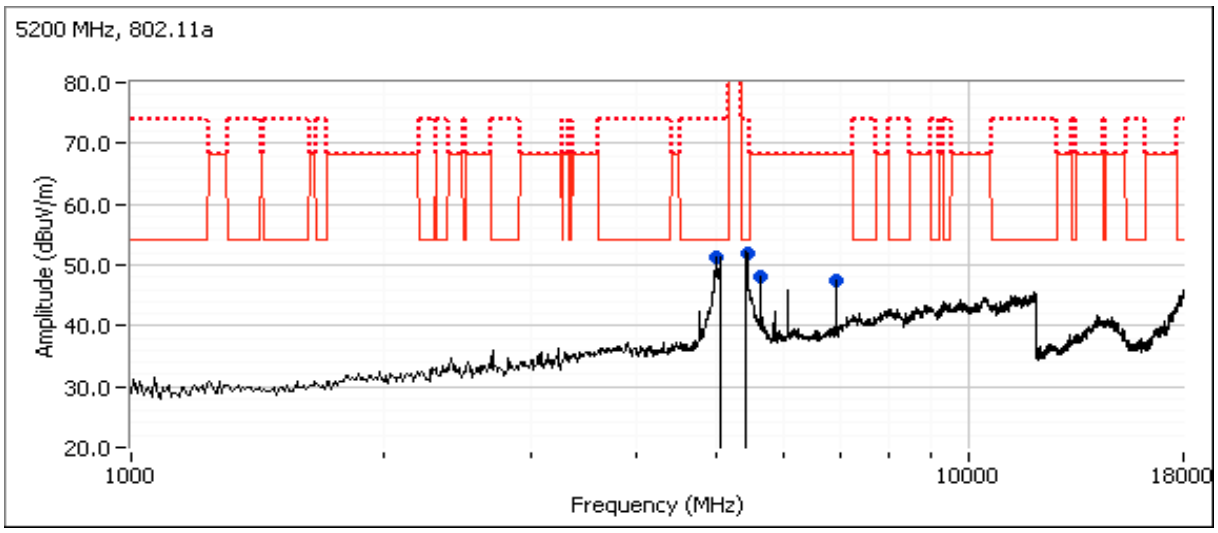
Date of Test: 12/3/2015 0:00 Config. Used: 1
Test Engineer: Rafael Varelas Config Change: None
Test Location: FT Chamber #7 EUT Voltage: 120V/60Hz

Run #1a: Center Channel

Channel: 40 Mode: a
Tx Chain: 3Tx Data Rate: 6

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5441.180	49.6	H	54.0	-4.4	AVG	244	1.7	RB 1 MHz;VB 10 Hz;Peak
5441.150	60.9	H	74.0	-13.1	PK	244	1.7	RB 1 MHz;VB 3 MHz;Peak
4989.210	47.9	H	54.0	-6.1	AVG	235	1.7	RB 1 MHz;VB 10 Hz;Peak
4986.930	60.0	H	74.0	-14.0	PK	235	1.7	RB 1 MHz;VB 3 MHz;Peak
6933.500	52.1	H	68.3	-16.2	PK	273	1.7	RB 1 MHz;VB 3 MHz;Peak
5633.310	46.5	H	68.3	-21.8	AVG	244	1.4	RB 1 MHz;VB 10 Hz;Peak
5633.100	54.9	H	68.3	-13.4	PK	244	1.4	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 18 - 40 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range
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).



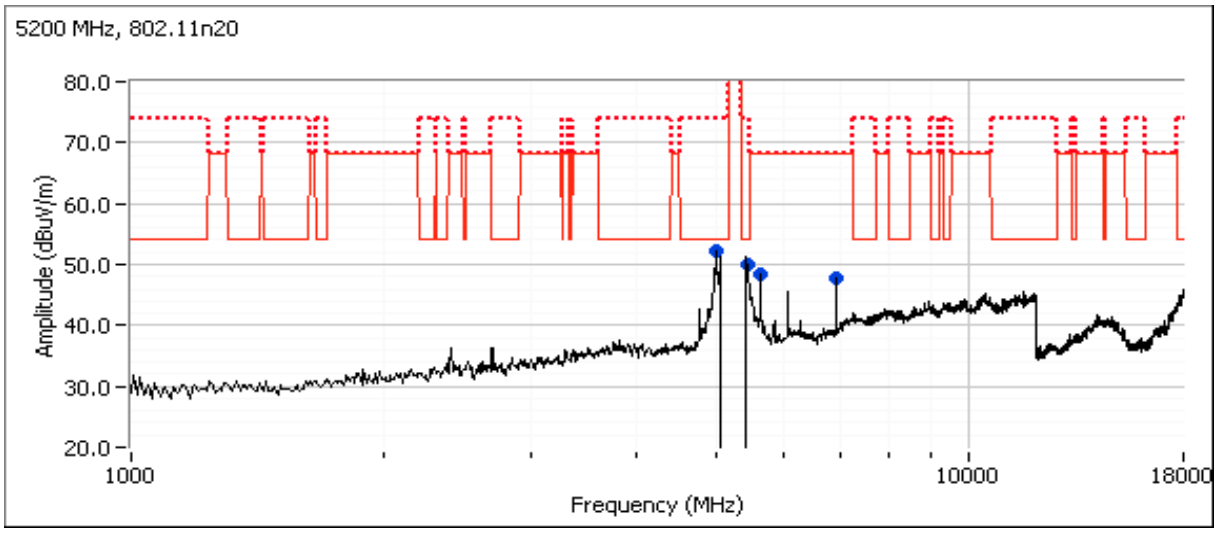
Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Run #1b: Center Channel

Channel: 40 Mode: 11n20
Tx Chain: 3Tx Data Rate: MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5445.290	48.4	H	54.0	-5.6	AVG	236	1.7	RB 1 MHz;VB 10 Hz;Peak
5440.520	59.0	H	74.0	-15.0	PK	236	1.7	RB 1 MHz;VB 3 MHz;Peak
6933.340	52.0	H	68.3	-16.3	PK	274	1.5	RB 1 MHz;VB 3 MHz;Peak
4979.760	47.7	H	54.0	-6.3	AVG	232	1.6	RB 1 MHz;VB 10 Hz;Peak
4981.950	58.7	H	74.0	-15.3	PK	232	1.6	RB 1 MHz;VB 3 MHz;Peak
5633.370	45.3	H	68.3	-23.0	AVG	218	1.5	RB 1 MHz;VB 10 Hz;Peak
5633.500	54.2	H	68.3	-14.1	PK	218	1.5	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 18 - 40 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range
Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).



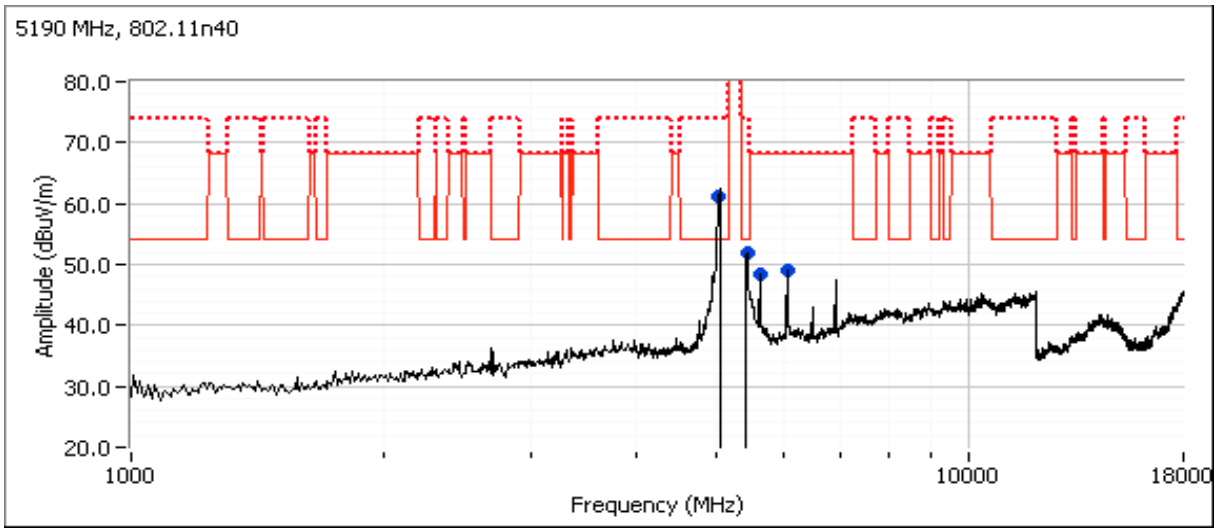
Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Run #1c: Center Channel

Channel: 38 Mode: 11n40
Tx Chain: 3Tx Data Rate: MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5015.400	52.8	H	54.0	-1.2	AVG	242	1.8	RB 1 MHz;VB 10 Hz;Peak
5015.100	62.5	H	74.0	-11.5	PK	242	1.8	RB 1 MHz;VB 3 MHz;Peak
5622.520	55.3	V	68.3	-13.0	PK	263	1.9	RB 1 MHz;VB 3 MHz;Peak
6054.900	52.8	H	68.3	-15.5	PK	266	1.9	RB 1 MHz;VB 3 MHz;Peak
5415.300	48.5	H	54.0	-5.5	AVG	222	1.8	RB 1 MHz;VB 10 Hz;Peak
5415.270	58.8	H	74.0	-15.2	PK	222	1.8	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 18 - 40 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range
Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).



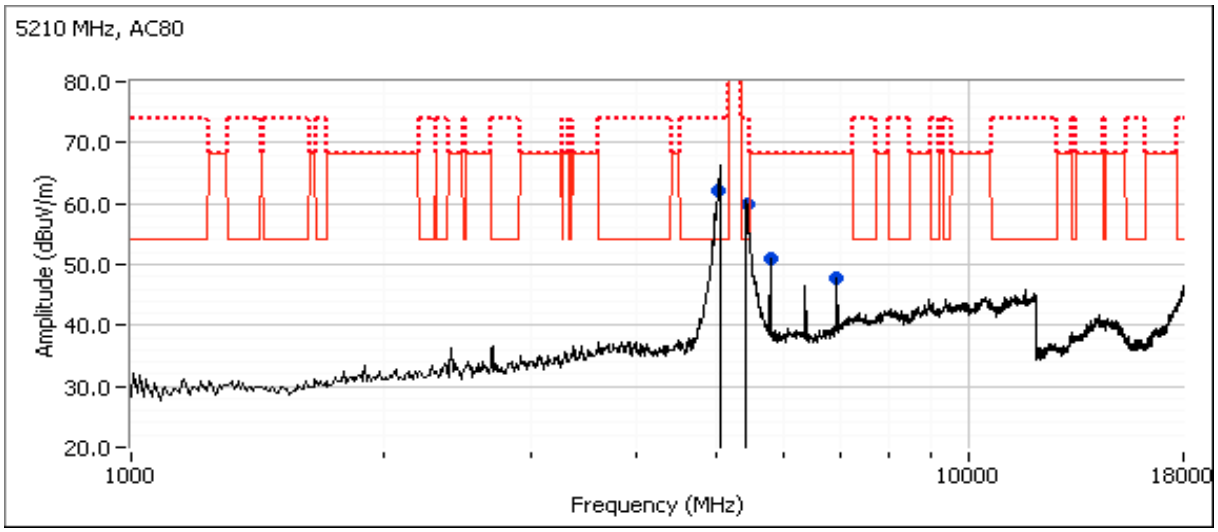
Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Run #1d: Center Channel

Channel: 42 Mode: ac80
Tx Chain: 3Tx Data Rate: VHT0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5046.000	52.4	H	54.0	-1.6	Avg	244	1.4	RB 1 MHz;VB 10 kHz;Peak
5040.300	65.3	H	74.0	-8.7	PK	244	1.4	RB 1 MHz;VB 3 MHz;Peak
5427.150	45.9	H	54.0	-8.1	AVG	248	1.7	RB 1 MHz;VB 10 kHz;Peak
5427.080	58.6	H	74.0	-15.4	PK	248	1.7	RB 1 MHz;VB 3 MHz;Peak
5788.980	56.2	V	68.3	-12.1	PK	294	1.7	RB 1 MHz;VB 10 kHz;Peak
6946.420	51.9	H	68.3	-16.4	PK	274	1.7	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 18 - 40 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range
Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

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

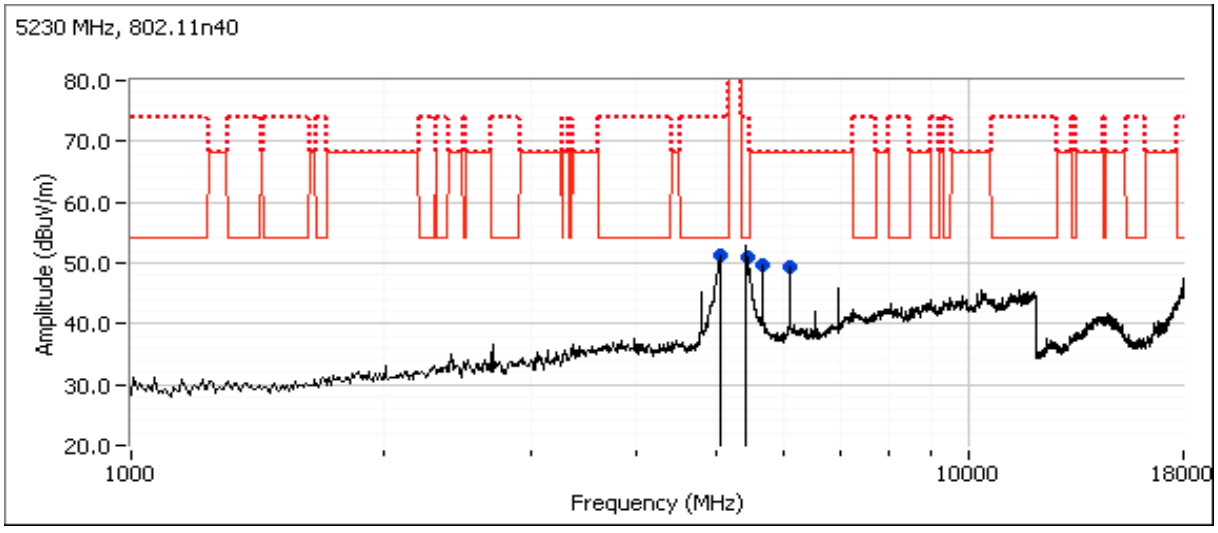
Date of Test: 12/3/2015 0:00 Config. Used: 1
Test Engineer: Rafael Varelas Config Change: None
Test Location: FT Chamber #7 EUT Voltage: 120V/60Hz

Run #2b: High Channel

Channel: 46 Mode: 11n40
Tx Chain: 3Tx Data Rate: MCS0

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5037.670	48.9	H	54.0	-5.1	AVG	254	2.0	RB 1 MHz;VB 10 Hz;Peak
5041.270	60.7	H	74.0	-13.3	PK	254	2.0	RB 1 MHz;VB 3 MHz;Peak
5665.980	53.7	V	68.3	-14.6	PK	280	2.0	RB 1 MHz;VB 3 MHz;Peak
6101.270	53.5	H	68.3	-14.8	PK	270	1.9	RB 1 MHz;VB 3 MHz;Peak
5420.210	44.8	H	54.0	-9.2	AVG	211	1.0	RB 1 MHz;VB 10 Hz;Peak
5420.850	56.2	H	74.0	-17.8	PK	211	1.0	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 18 - 40 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Run #7, Radiated Spurious Emissions, 1,000 - 40,000 MHz. Operation in the 5725-5850 MHz Band

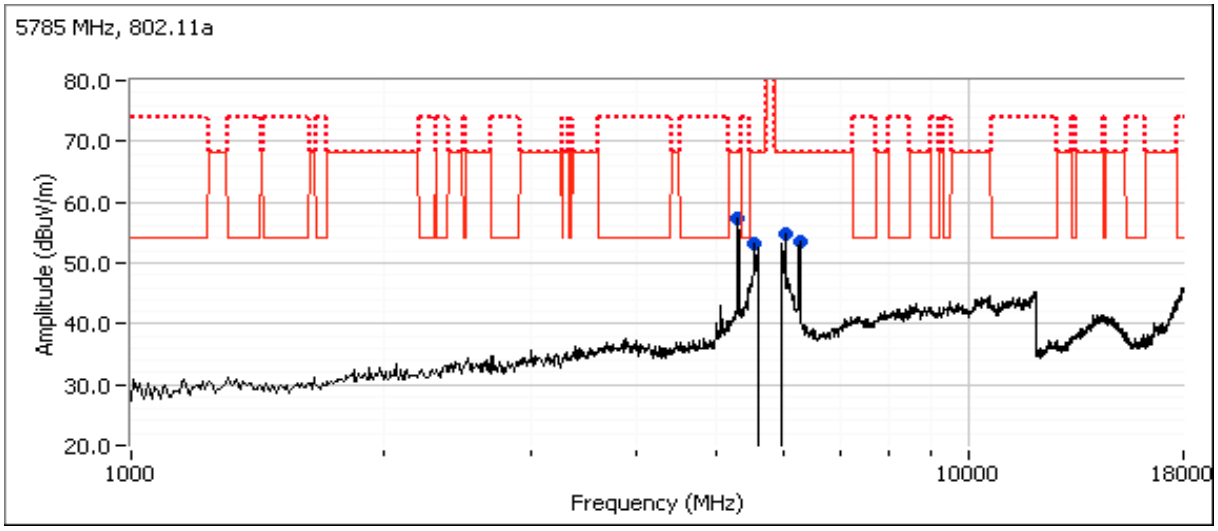
Date of Test: 12/4/2015 0:00 Config. Used: 1
Test Engineer: Rafael Varelas Config Change: None
Test Location: FT Chamber #7 EUT Voltage: 120V/60Hz

Run #7a: Center Channel

Channel: 157 Mode: a
Tx Chain: 3Tx Data Rate: 6

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5295.670	65.7	H	68.3	-2.6	PK	240	1.8	RB 1 MHz;VB 3 MHz;Peak
6267.650	62.6	H	68.3	-5.7	PK	288	1.7	RB 1 MHz;VB 3 MHz;Peak
6025.350	61.4	V	68.3	-6.9	PK	283	2.1	RB 1 MHz;VB 3 MHz;Peak
5537.440	62.2	H	68.3	-6.1	PK	237	1.9	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 18 - 40 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range
Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).



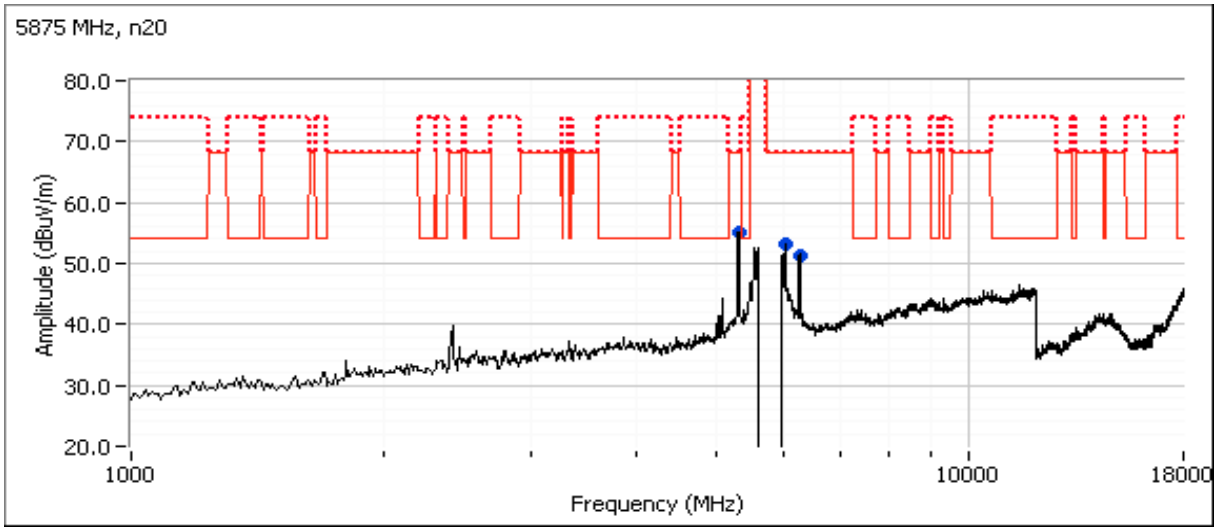
Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Run #7b: Center Channel

Channel: 157 Mode: 11n20
Tx Chain: 3Tx Data Rate: MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5295.820	63.3	H	68.3	-5.0	PK	213	1.8	RB 1 MHz;VB 3 MHz;Peak
6031.870	60.4	V	68.3	-7.9	PK	268	1.7	RB 1 MHz;VB 3 MHz;Peak
6258.800	59.5	V	68.3	-8.8	PK	269	1.8	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 18 - 40 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range
Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).



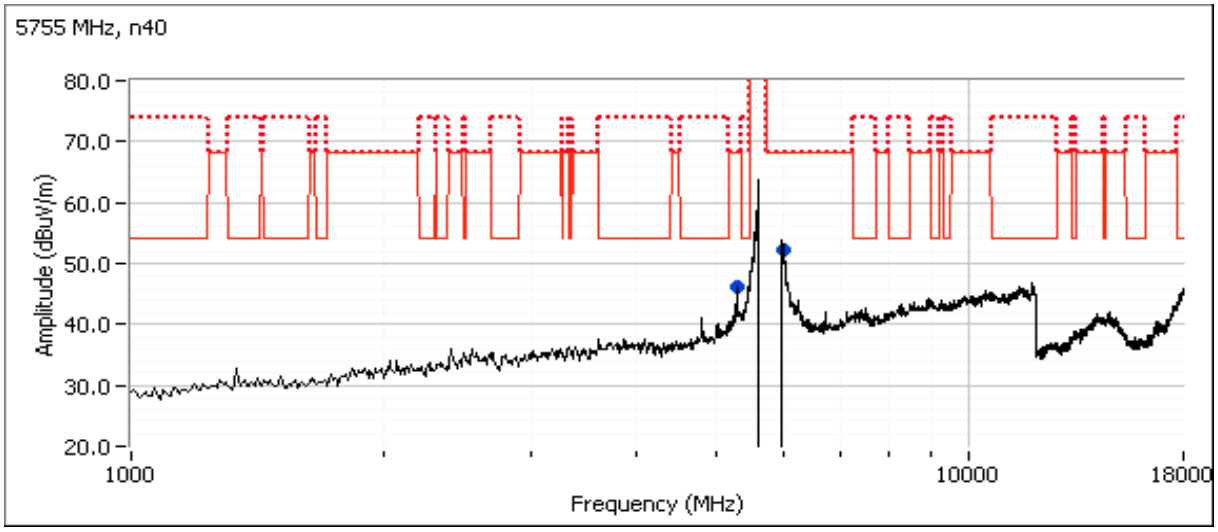
Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Run #7c: Center Channel

Channel: 151 Mode: 11n40
Tx Chain: 3Tx Data Rate: MCS0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5999.320	60.1	H	68.3	-8.2	PK	255	1.5	RB 1 MHz;VB 3 MHz;Peak
5275.460	53.7	H	68.3	-14.6	PK	224	1.8	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 18 - 40 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range
Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).



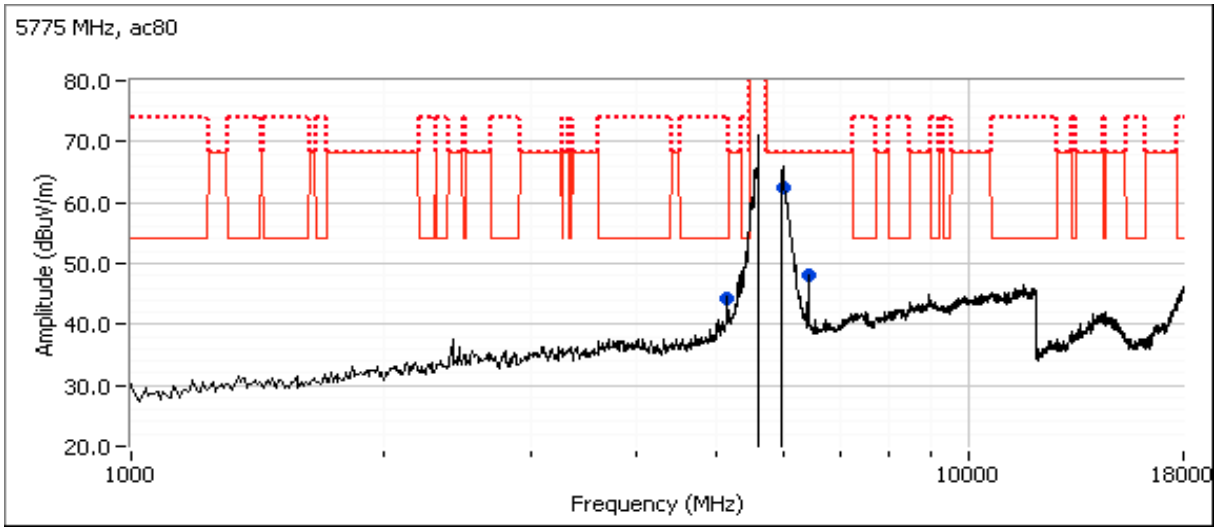
Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Run #7d: Center Channel

Channel: 155 Mode: ac80
Tx Chain: 3Tx Data Rate: VHT0

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
6416.610	55.5	V	68.3	-12.8	PK	287	1.6	RB 1 MHz;VB 3 MHz;Peak
5133.360	51.9	H	74.0	-22.1	PK	212	2.0	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 18 - 40 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range
Note 1:	For emissions in restricted bands, the limit of 15.209 was used which requires average and peak measurements.
Note 2:	For emissions outside of the restricted bands the limit is -27dBm/MHz eirp (68.3dBuV/m). The measurement method required is a peak measurement (RB=1MHz, VB≥3MHz, peak detector).



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Run #8: Radiated Spurious Emissions, 1,000 - 40000 MHz. Operating Mode: Worse case from Run #7

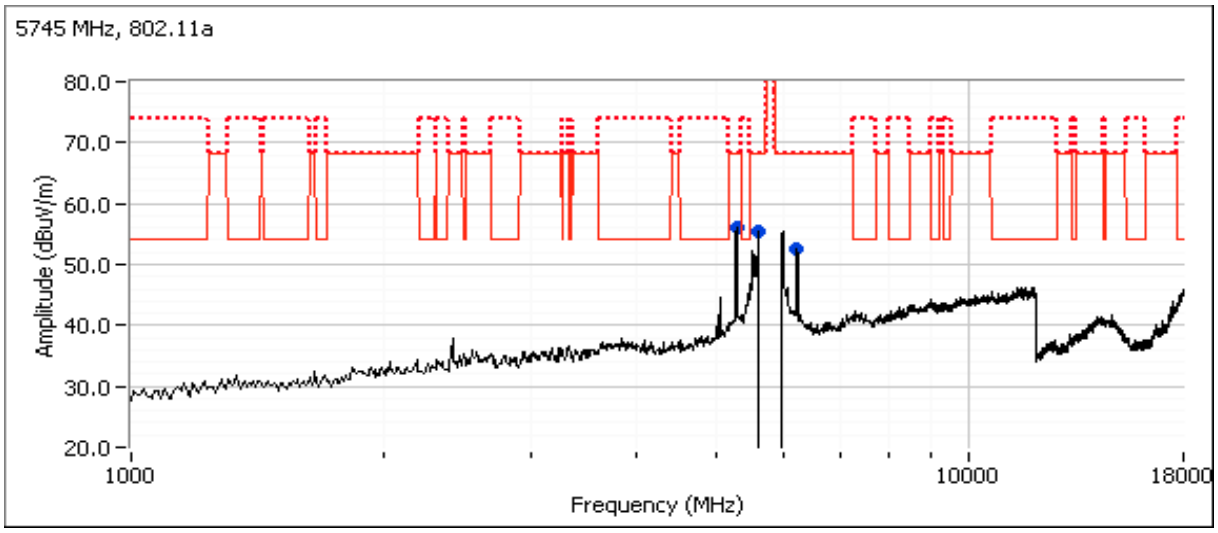
Date of Test: 12/7/2015 0:00 Config. Used: 1
Test Engineer: Rafael Varelas Config Change: None
Test Location: FT Chamber #7 EUT Voltage: 120V/60Hz

Run #8a: Low Channel

Channel: 149 Mode: a
Tx Chain: 3Tx Data Rate: 6

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5268.070	63.6	H	68.3	-4.7	PK	214	1.9	RB 1 MHz;VB 3 MHz;Peak
5586.910	61.3	H	68.3	-7.0	PK	214	1.8	RB 1 MHz;VB 3 MHz;Peak
6222.390	59.9	V	68.3	-8.4	PK	283	1.8	RB 1 MHz;VB 3 MHz;Peak

Note: Scans made between 18 - 40 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range



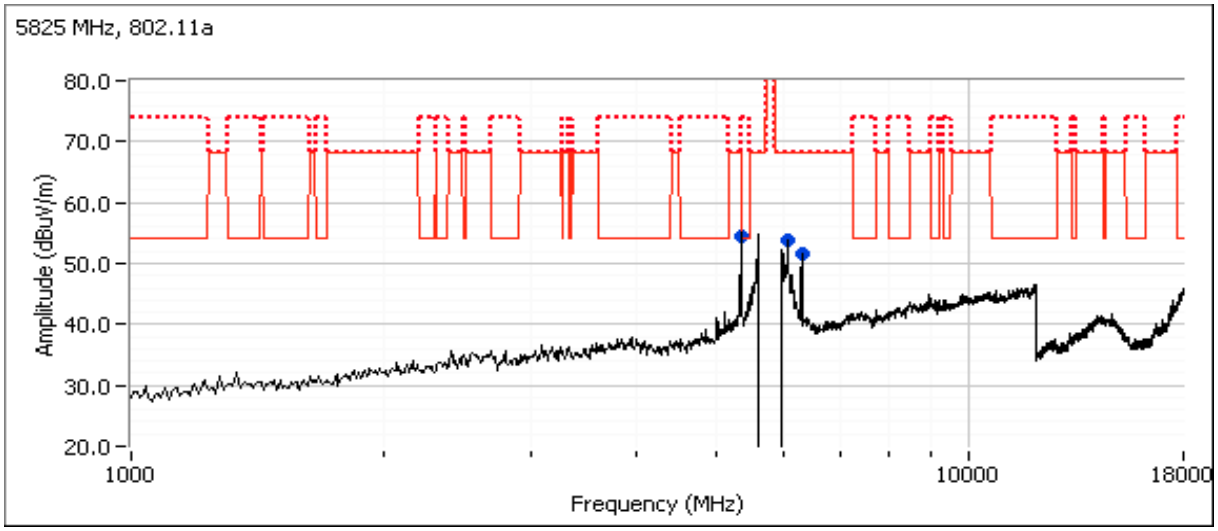
Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Run #8b: High Channel

Channel: 165 Mode: a
Tx Chain: 3Tx Data Rate: 6

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5342.170	62.4	H	68.3	-5.9	PK	219	1.9	RB 1 MHz;VB 3 MHz;Peak
6311.050	59.2	H	68.3	-9.1	PK	261	1.8	RB 1 MHz;VB 3 MHz;Peak
6067.560	58.1	V	68.3	-10.2	PK	271	1.9	RB 1 MHz;VB 3 MHz;Peak

Note:	Scans made between 18 - 40 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

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

Test Specific Details

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

General Test Configuration

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

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

Ambient Conditions:

Temperature: 22.4 °C
Rel. Humidity: 37 %

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

Run #	Mode	Channel	Target Power	Passing Power Setting	Test Performed	Limit	Result / Margin
1	b	6 - 2437MHz	23	q92	Radiated Emissions, 30 - 1000 MHz	FCC Part 15.209 / 15.247(c)	31.0 dBµV/m @ 46.56 MHz (-9.0 dB)
2	a	157 - 5785MHz	23	q92	Radiated Emissions, 30 - 1000 MHz	FCC Part 15.209 / 15.247(c)	29.9 dBµV/m @ 40.05 MHz (-10.1 dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Sample Notes

Sample S/N: prototype
Driver: -
Antenna: Internal

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Procedure Comments:

Measurements performed in accordance with FCC KDB 558074
Peak measurements performed with: RBW=1MHz, VBW=3MHz, peak detector, max hold, auto sweep time
Unless otherwise stated/noted, emission has duty cycle ≥ 98% and was measured using RBW=1MHz, VBW=10Hz, peak detector, linear average mode, auto sweep time, max hold.
2.4GHz band reject filter used

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
11b	5.5	99.4%	Yes	2.32	0	0	10
11a	6	99.0%	Yes	2.06	0	0	10

Measurement Specific Notes:

Note 1:	Emission in non-restricted band, but limit of 15.209 used.
Note 2:	Emission in non-restricted band, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 3:	Emission has a duty cycle ≥ 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100 traces
Note 4:	Emission has constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW>1/T but not less than 10Hz, peak detector, linear averaging, auto sweep, trace average 100 traces, measurement corrected by Linear voltage correction factor
Note 5:	Emission has constatnt duty cycle < 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100 traces, measurement corrected by Pwr correction factor
Note 6:	Emission has non constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW> 1/T, peak detector, linear average mode, sweep time auto, max hold. Max hold for 50*(1/DC) traces
Note 7:	Emission has non constant duty cycle < 98%, average measurement performed: RBW=1MHz, VBW> 1/T, RMS detector, sweep time auto, max hold. Max hold for 50*(1/DC) traces

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Run #1: Radiated Spurious Emissions, 30 - 1000 MHz. Operating Mode: 802.11b

Date of Test: 12/09/15 Test Location: FT Chamber #5

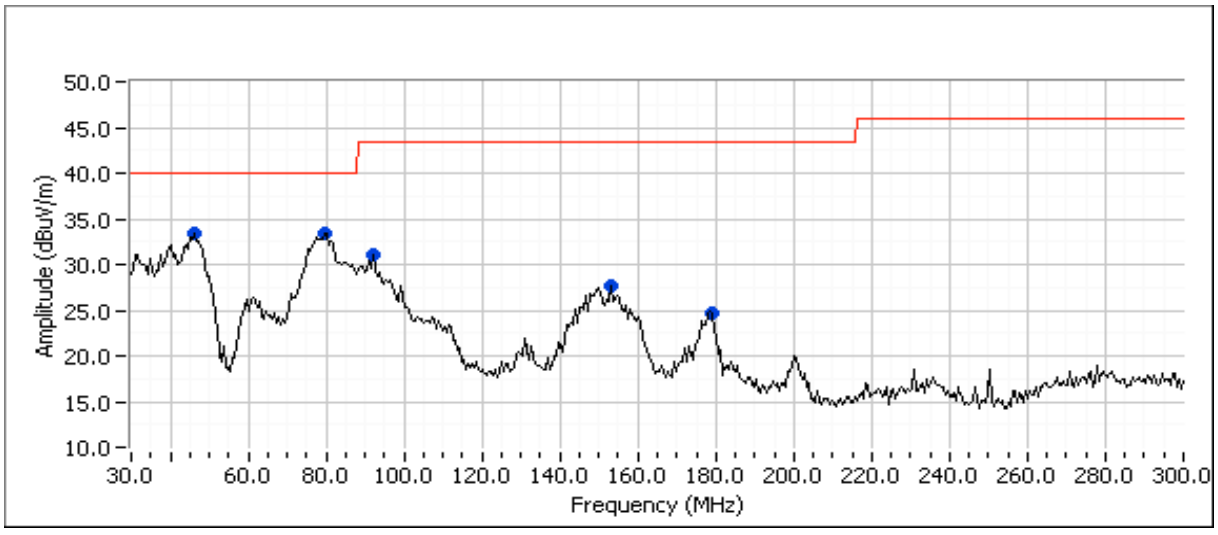
Test Engineer: Rafael Varelas EUT Voltage: 120V/60Hz

Run #1b: Center Channel

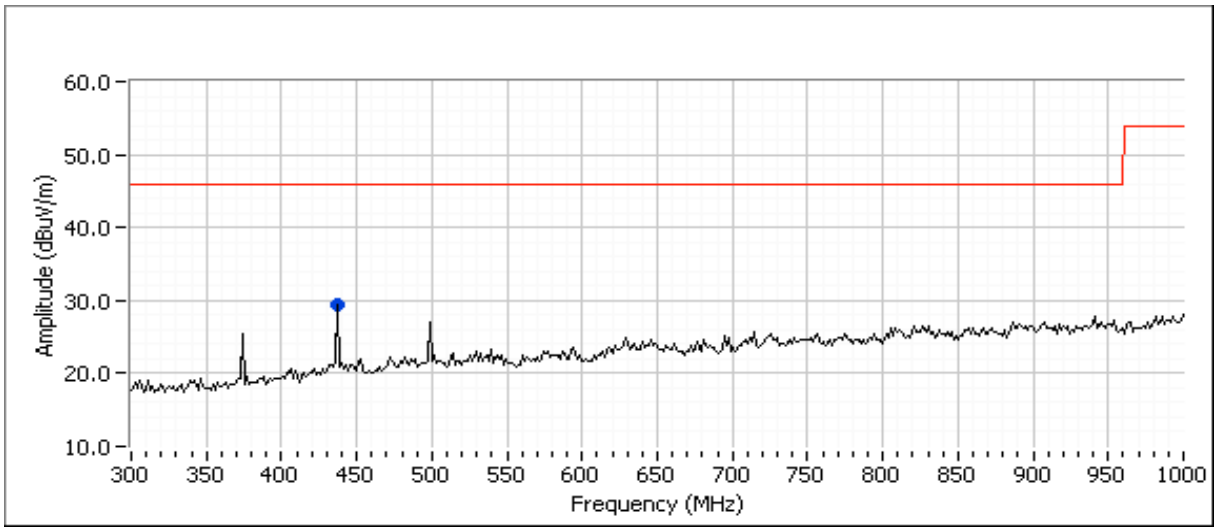
Channel: 6 Mode: b

Tx Chain: 3Tx Data Rate: 5.5

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
46.560	**31.0**	V	40.0	**-9.0**	QP	0	1.0	QP (1.00s)
78.303	30.2	V	40.0	-9.8	QP	189	1.1	QP (1.00s)
91.123	29.1	V	43.5	-14.4	QP	308	1.0	QP (1.00s)
437.500	29.5	V	46.0	-16.5	QP	360	1.0	QP (1.00s)
153.201	24.3	V	43.5	-19.2	QP	179	1.0	QP (1.00s)
178.827	21.0	V	43.5	-22.5	QP	224	1.0	QP (1.00s)



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Run #2: Radiated Spurious Emissions, 30-1000MHz. Operating Mode: 802.11a

Date of Test: 12/09/15 Test Location: FT Chamber #5

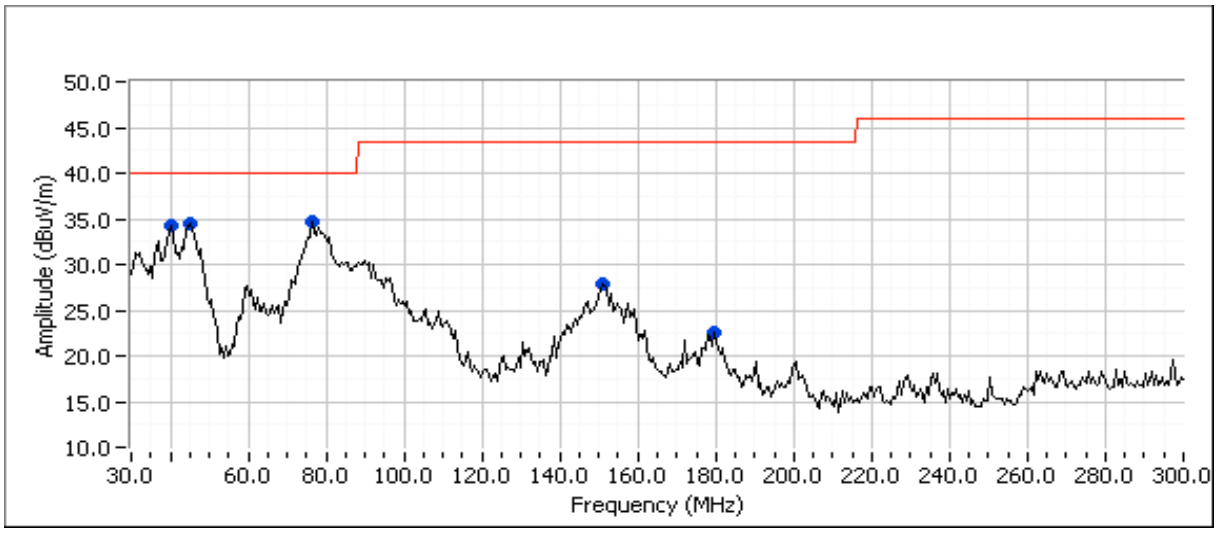
Test Engineer: Rafael Varelas EUT Voltage: 120V/60Hz

Run #2a: Center Channel

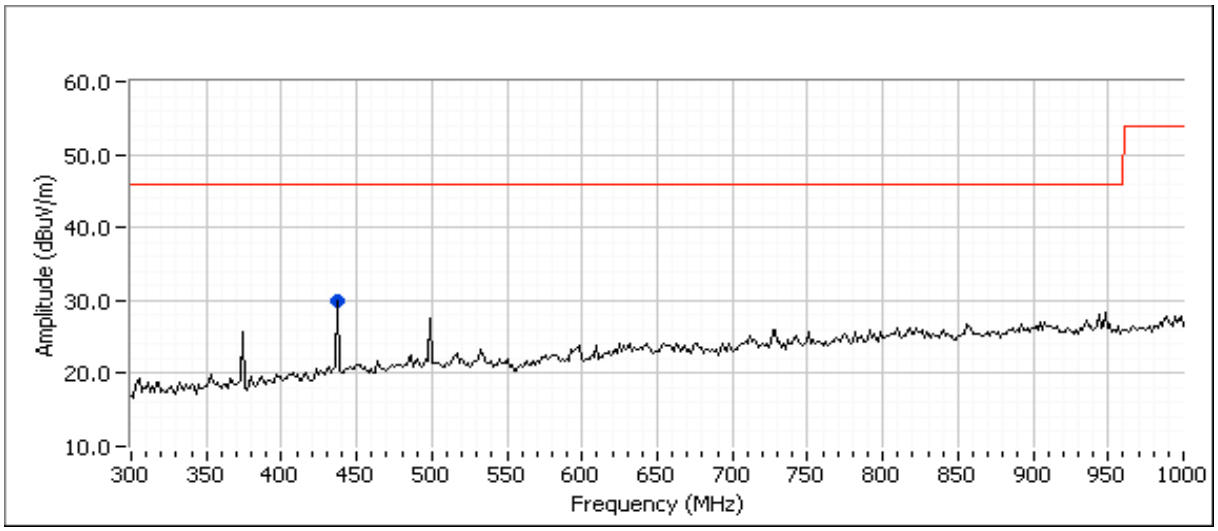
Channel: 157 Mode: a

Tx Chain: 3Tx Data Rate: 6

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
40.050	**29.9**	V	40.0	**-10.1**	QP	353	1.0	QP (1.00s)
44.413	29.3	V	40.0	-10.7	QP	15	1.0	QP (1.00s)
75.764	28.9	V	40.0	-11.1	QP	267	1.0	QP (1.00s)
437.500	29.2	V	46.0	-16.8	QP	326	1.0	QP (1.00s)
150.757	24.3	V	43.5	-19.2	QP	145	1.0	QP (1.00s)
179.232	21.3	V	43.5	-22.2	QP	202	1.0	QP (1.00s)



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A



Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

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

Test Specific Details

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

General Test Configuration

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

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

Ambient Conditions:

Temperature: 22.4 °C
Rel. Humidity: 36 %

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

Run #	Mode	Channel	Target Power	Power Setting	Test Performed	Limit	Result / Margin
1	b	2412MHz	q92	q92	Radiated Emissions, 1 - 40 GHz	FCC Part 15.209 / 15.247(c) / 15.407	50.0 dBµV/m @ 4818.7 MHz (-4.0 dB)
	a	5180MHz	q74	q74			
	b	2462MHz	q92	q92	Radiated Emissions, 1 - 40 GHz	FCC Part 15.209 / 15.247(c) / 15.407	67.1 dBµV/m @ 5480.7 MHz (-1.2 dB)
	a	5320MHz	q72	q60			
	b	2437MHz	q92	q92	Radiated Emissions, 1 - 40 GHz	FCC Part 15.209 / 15.247(c) / 15.407	66.2 dBµV/m @ 5266.3 MHz (-2.1 dB)
	a	5500MHz	q73	q73			

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Sample Notes

Sample S/N: prototype
Driver: -
Antenna: Internal

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Procedure Comments:

Measurements performed in accordance with FCC KDB 558074
Peak measurements performed with: RBW=1MHz, VBW=3MHz, peak detector, max hold, auto sweep time
Unless otherwise stated/noted, emission has duty cycle ≥ 98% and was measured using RBW=1MHz, VBW=10Hz, peak detector, linear average mode, auto sweep time, max hold.
2.4GHz and 5GHz band reject filters were used

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
11b	5.5	99.4%	Yes	2.32	0	0	10
11a	6	99.0%	Yes	2.06	0	0	10

Measurement Specific Notes:

Note 1:	Emission in non-restricted band, but limit of 15.209 used.
Note 2:	Emission in non-restricted band, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 3:	Emission has a duty cycle ≥ 98%, average measurement performed: RBW=1MHz, VBW=3MHz, RMS, Power averaging, auto sweep, trace average 100 traces

Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Run #1: Radiated Spurious Emissions, 1,000 - 40000 MHz

Date of Test: 12/23/2015 Config. Used: 1
Test Engineer: Deniz Demirci Config Change: None
Test Location: FT Chamber #5 EUT Voltage: 120V/60Hz

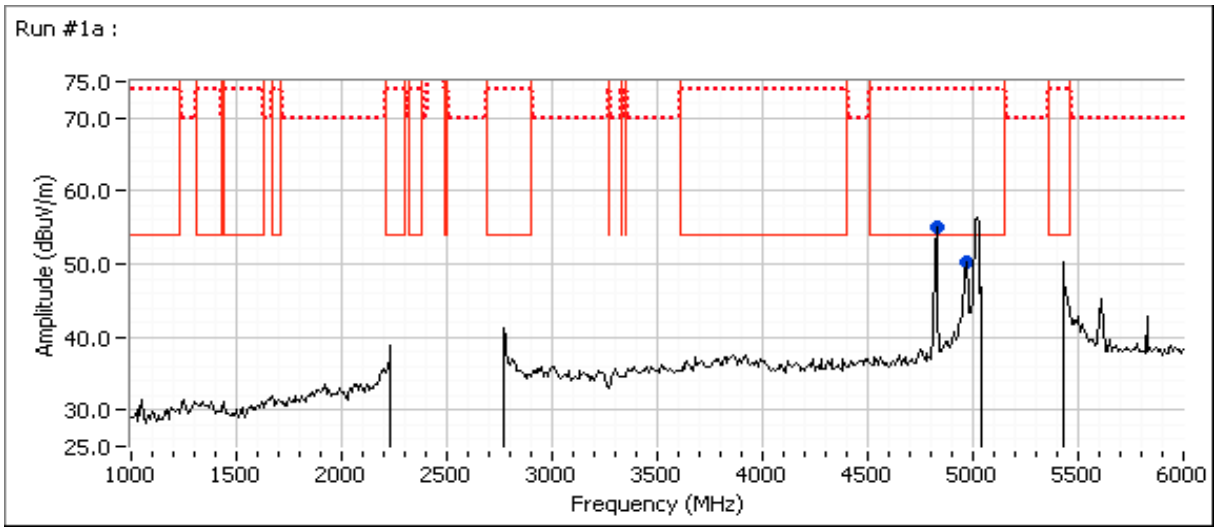
Run #1a:

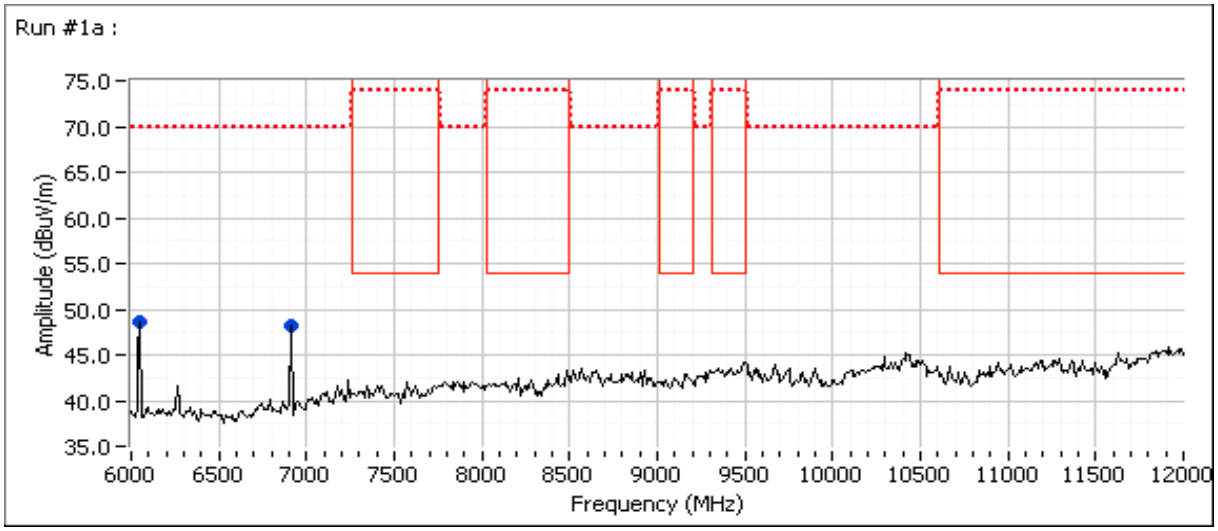
Channel: 1 Mode: b
Tx Chain: 3Tx Data Rate: 5.5

Channel: 36 Mode: a
Tx Chain: 3Tx Data Rate: 6

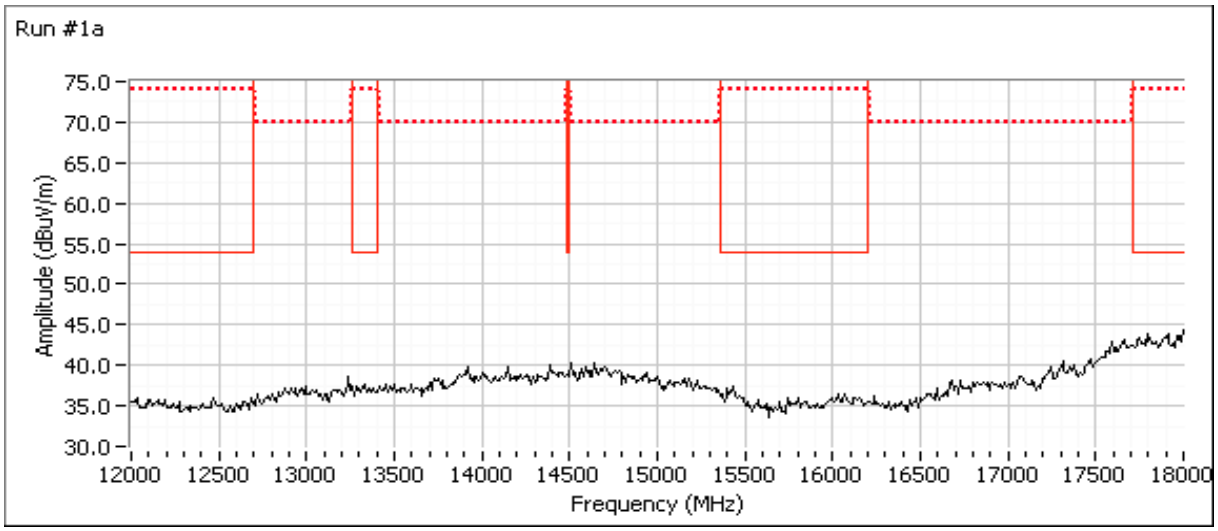
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4818.700	50.0	V	54.0	-4.0	AVG	33	2.0	RB 1 MHz;VB 10 Hz;Peak
4818.510	56.2	V	74.0	-17.8	PK	33	2.0	RB 1 MHz;VB 3 MHz;Peak
4960.870	48.7	H	54.0	-5.3	AVG	224	1.6	RB 1 MHz;VB 10 Hz;Peak
4971.000	59.4	H	74.0	-14.6	PK	224	1.6	RB 1 MHz;VB 3 MHz;Peak
6043.330	53.6	H	68.3	-14.7	PK	240	1.8	RB 1 MHz;VB 3 MHz;Peak
6906.790	53.6	H	68.3	-14.7	PK	253	1.4	RB 1 MHz;VB 3 MHz;Peak

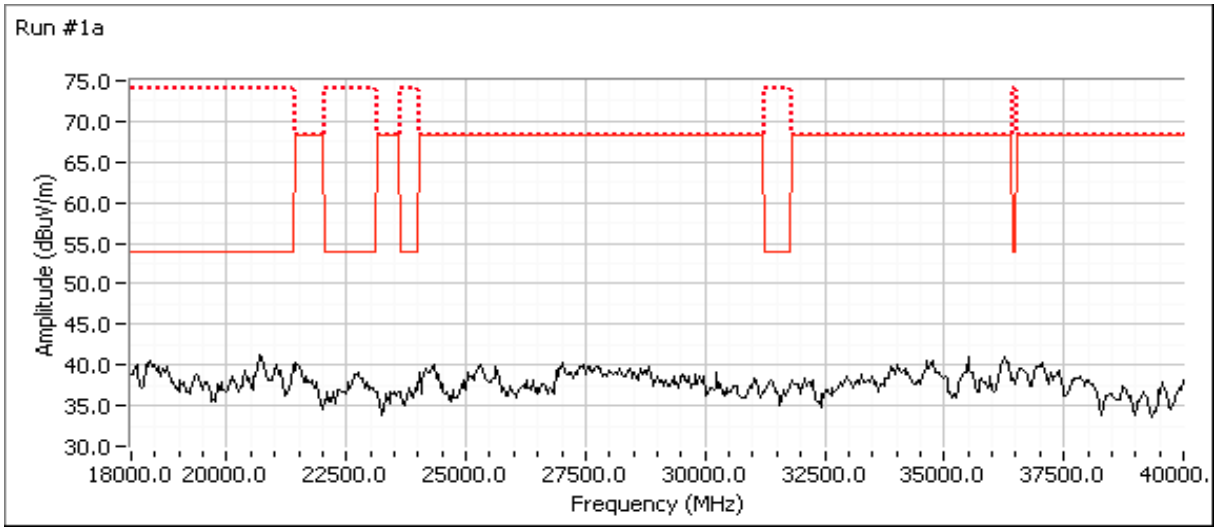
Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A





Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A





Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

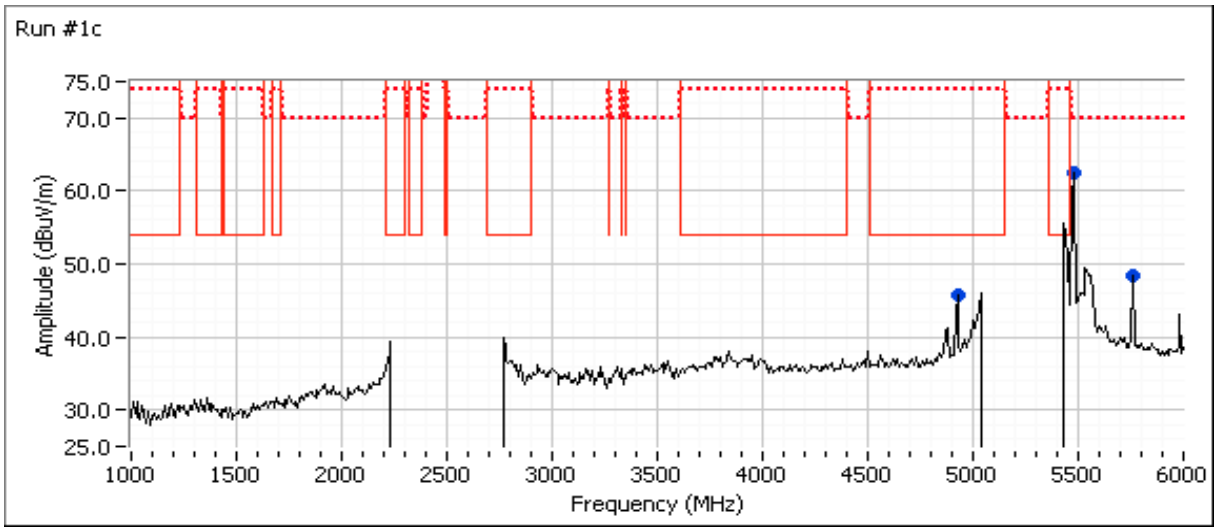
Run #1c:

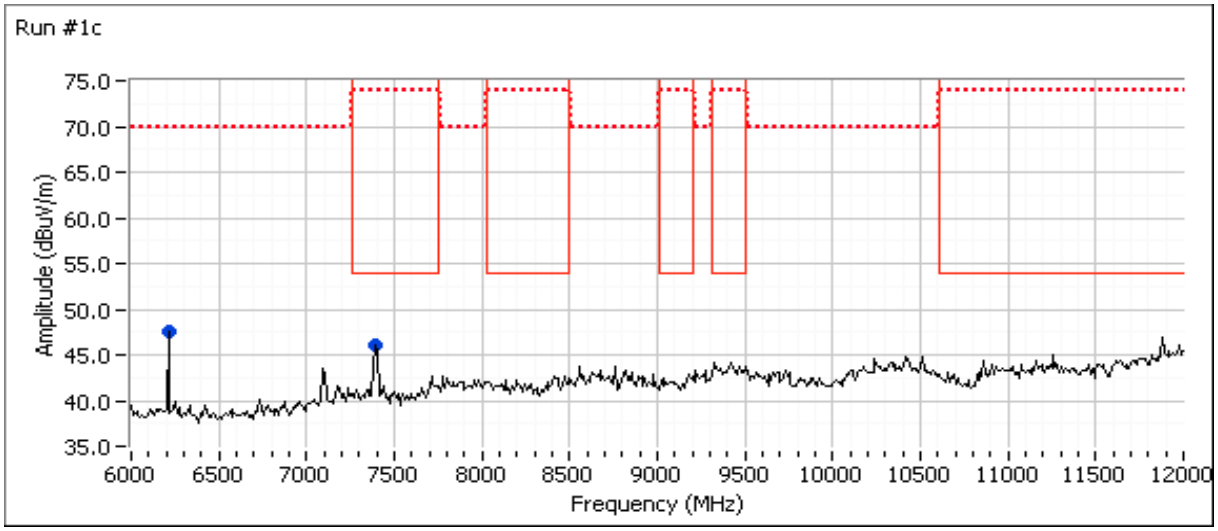
Channel: 11 Mode: b
Tx Chain: 3Tx Data Rate: 5.5

Channel: 64 Mode: a
Tx Chain: 3Tx Data Rate: 6

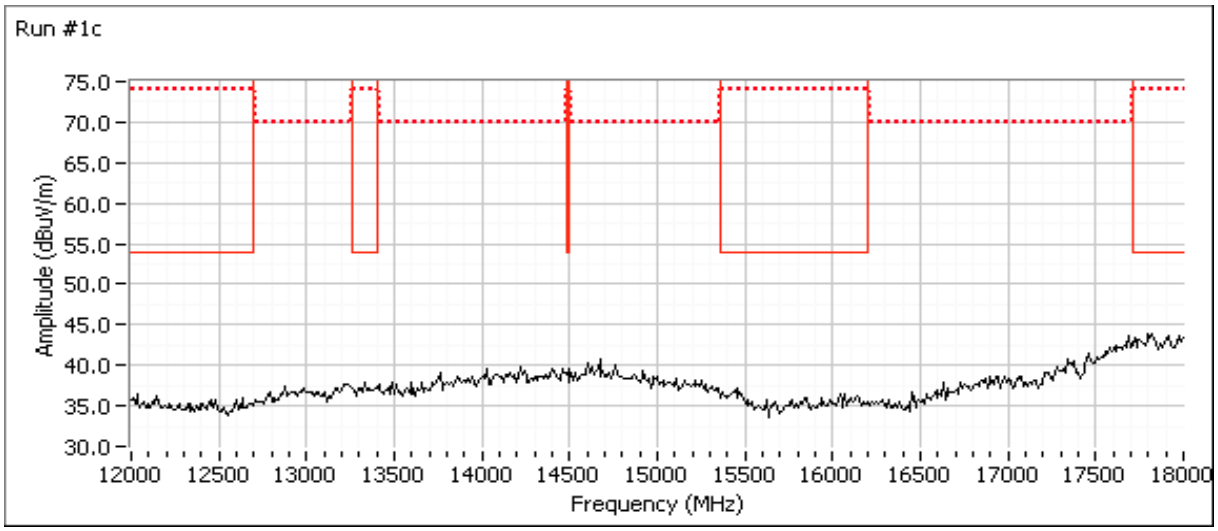
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4929.300	42.3	H	54.0	-11.7	AVG	117	1.4	RB 1 MHz;VB 10 Hz;Peak
4924.170	51.8	H	74.0	-22.2	PK	117	1.4	RB 1 MHz;VB 3 MHz;Peak
5763.550	52.5	H	68.3	-15.8	PK	215	1.9	RB 1 MHz;VB 3 MHz;Peak
5480.700	67.1	H	68.3	-1.2	PK	226	1.6	RB 1 MHz;VB 3 MHz;Peak
6206.600	53.1	H	68.3	-15.2	PK	236	1.9	RB 1 MHz;VB 3 MHz;Peak
7393.520	44.2	V	54.0	-9.8	AVG	61	1.0	RB 1 MHz;VB 10 Hz;Peak
7393.570	53.7	V	74.0	-20.3	PK	61	1.0	RB 1 MHz;VB 3 MHz;Peak

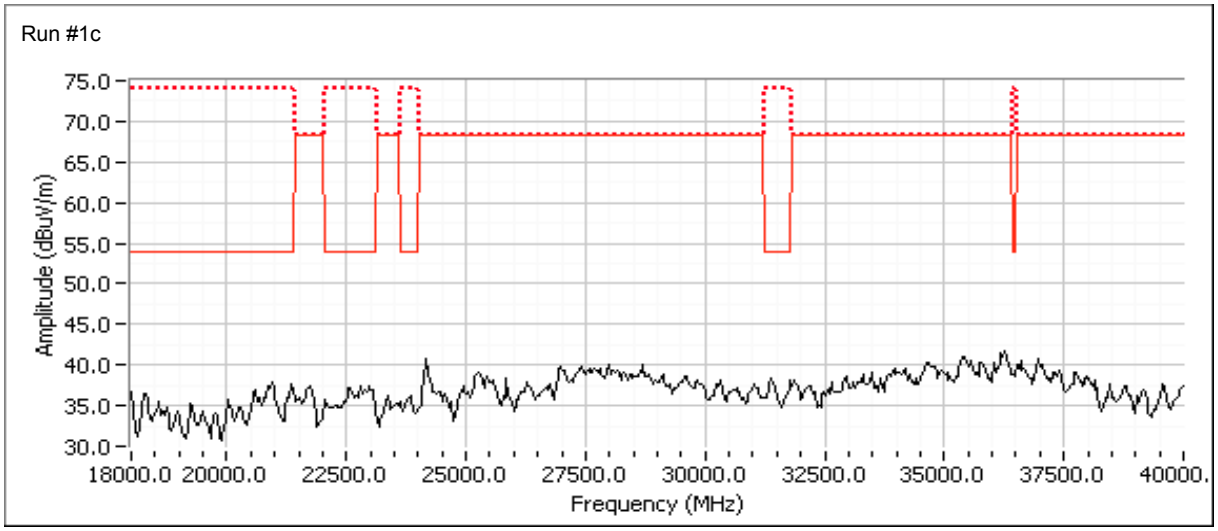
Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A





Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A





Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

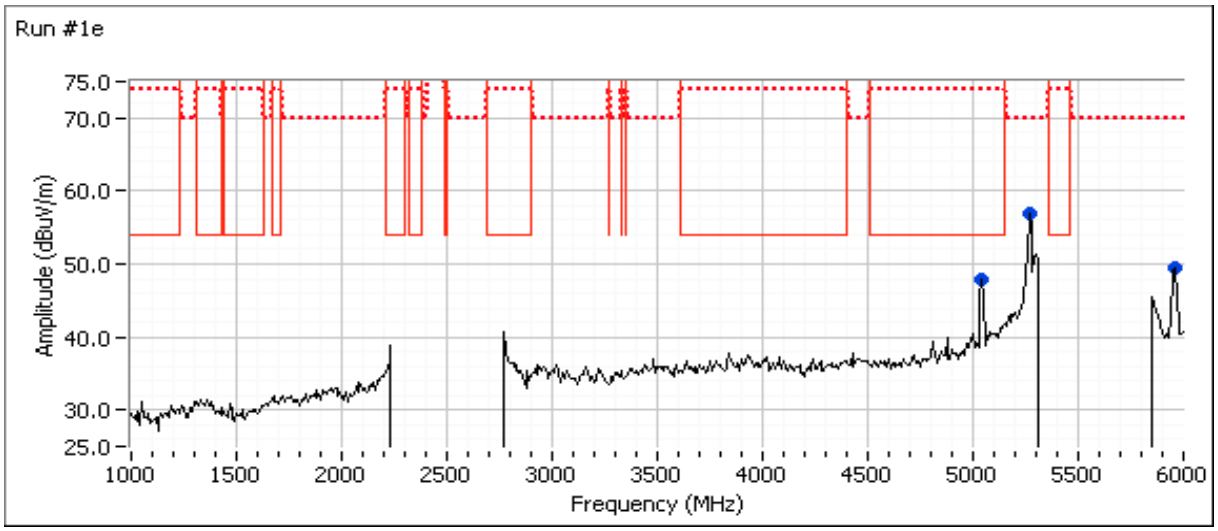
Run #1e:

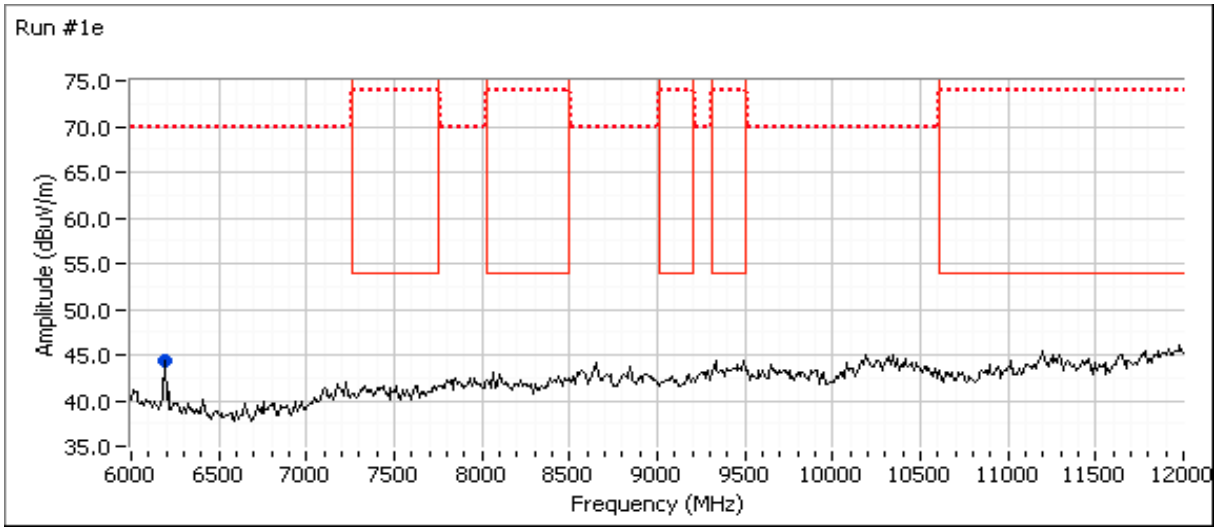
Channel: 6 Mode: b
Tx Chain: 3Tx Data Rate: 5.5

Channel: 100 Mode: a
Tx Chain: 3Tx Data Rate: 6

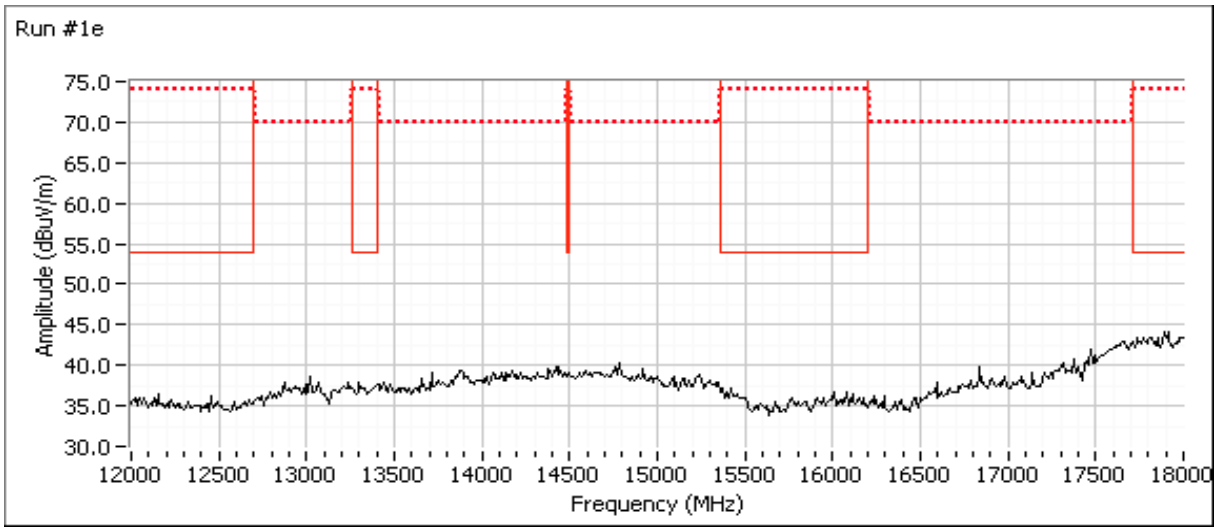
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5266.330	**66.2**	H	68.3	**-2.1**	PK	228	1.5	RB 1 MHz;VB 3 MHz;Peak
5042.370	48.1	H	54.0	-5.9	AVG	213	1.9	RB 1 MHz;VB 10 Hz;Peak
5960.520	56.7	H	68.3	-11.6	PK	202	1.8	RB 1 MHz;VB 3 MHz;Peak
5041.510	59.2	H	74.0	-14.8	PK	213	1.9	RB 1 MHz;VB 3 MHz;Peak
6187.230	52.2	V	68.3	-16.1	PK	269	1.8	RB 1 MHz;VB 3 MHz;Peak

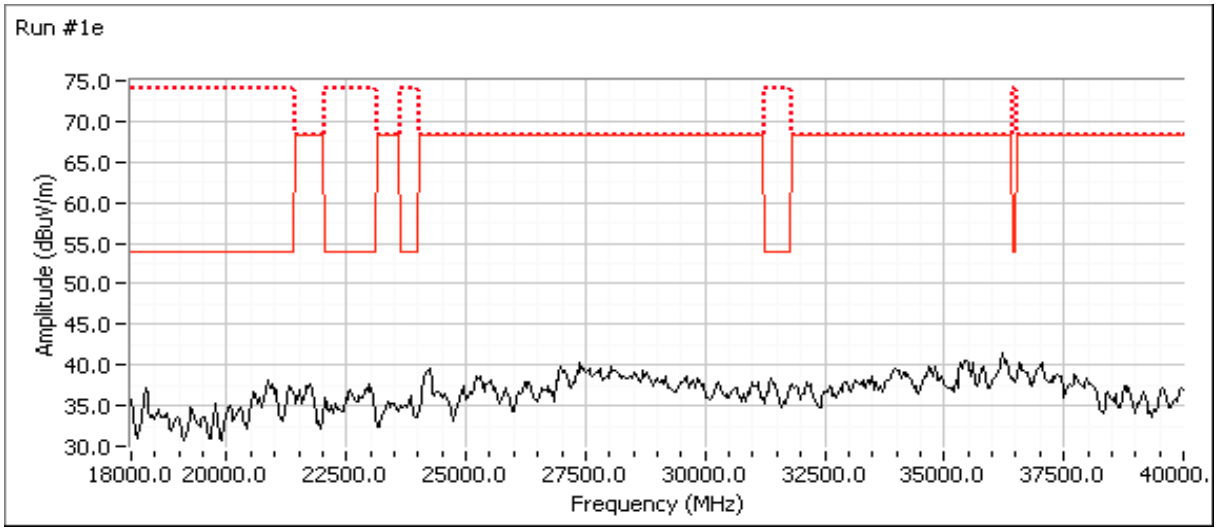
Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A





Client:	Ericsson Canada	Job Number:	JD99841
Model:	APINM210	T-Log Number:	T99885
		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A





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Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

FCC Part 15
Frequency Stability

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

All measurements are made with the EUT's rf port connected to the measurement instrument via an attenuator. All amplitude measurements are adjusted to account for the attenuation between EUT and measuring instrument. For frequency stability measurements the EUT was placed inside an environmental chamber.

Ambient Conditions:

Temperature: 20-22 °C
Rel. Humidity: 30-35 %

Run #			Test Performed	Limit	Pass / Fail	
1			Frequency Stability	Stays in band	Pass	12.7 ppm

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.

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		Project Manager:	Christine Krebill
Contact:	Nancy Langford	Project Coordinator:	-
Standard:	FCC 15.247/15.E, RSS-247	Class:	N/A

Run #1: Frequency Stability

Date of Test: 12/18/2015
Test Engineer: Deniz Demirci
Test Location: FT Lab #4b

Config. Used: 1
Config Change: None
EUT Voltage: 5 Vdc

Nominal Frequency: 5240.0000 MHz

Frequency Stability Over Temperature

The EUT was soaked at each temperature for a minimum of 30 minutes prior to starting the transmitter and making the measurements to ensure the EUT and chamber had stabilized at that temperature.

Measurement performed on a modulated carrier. Center determined from the -10dBc frequency points, captured using RBW=1MHz, VBW=10kHz, RMS detector, trace averaging.

Temperature	Frequency Measured	Drift	
(Celsius)	(MHz)	(Hz)	(ppm)
-30	5240.033300	33300	6.4
-20	5240.033300	33300	6.4
-10	5240.033300	33300	6.4
0	5240.033300	33300	6.4
10	5240.000000	0	0.0
20	5239.966700	-33300	-6.4
30	5239.950000	-50000	-9.5
40	5239.933300	-66700	-12.7
50	5239.933300	-66700	-12.7
Worst case:		-66700	-12.7

Frequency Stability Over Input Voltage

Nominal Voltage is 5Vdc.

Voltage	Frequency Measured	Drift	
(DC)	(MHz)	(Hz)	(ppm)
4.50	5239.966700	-33300	-6.4
5.50	5239.966700	-33300	-6.4
Worst case:		-33300	-6.4

End of Report

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