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EMC Test Report

Application for FCC Grant of Equipment Authorization

FCC Part 15 Subpart C

Model: C61W-700 Wireless RVU Client

FCC ID:	PGRC61W
APPLICANT:	ARRIS 310 Providence Mine Road Nevada City, CA 95959
TEST SITE(S):	National Technical Systems - Silicon Valley 41039 Boyce Road. Fremont, CA. 94538-2435
IC SITE REGISTRATION #:	2845B-4, 2845B-7
REPORT DATE:	March 27, 2017
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FINAL TEST DATES:	January 30, February 6, March 8, 2017
TOTAL NUMBER OF PAGES:	65

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VALIDATING SIGNATORIES

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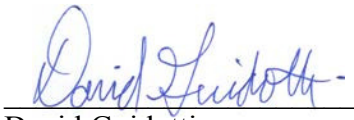

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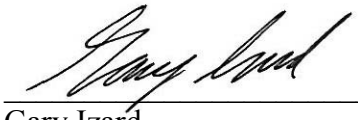

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REVISION HISTORY

Rev#	Date	Comments	Modified By
-	March 27, 2017	First release	
1.0	May 8, 2017	Clarified the VBW for the duty cycle for the radiated measurements. Added 15.B data to demonstrate compliance with spurious emissions limits below 1GHz	MEH
2.0	May 10, 2017	Clarified the VBW for the duty cycle for the radiated measurements	MEH

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SCOPE

An electromagnetic emissions test has been performed on the ARRIS model C61W-700 Wireless RVU Client, pursuant to the following rules:

FCC Part 15 Subpart C

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 DTS Measurement Guidance KDB558074

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.

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

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

STATEMENT OF COMPLIANCE

The tested sample of ARRIS model C61W-700 Wireless RVU Client complied with the requirements of the following regulations:

FCC Part 15 Subpart C

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 ARRIS model C61W-700 Wireless RVU Client and therefore apply only to the tested sample. The sample was selected and prepared by Mark Rieger of ARRIS.

DEVIATIONS FROM THE STANDARDS

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

TEST RESULTS SUMMARY

DIGITAL TRANSMISSION SYSTEMS (2400 – 2483.5MHz)

FCC Rule Part	-	Description	Measured Value / Comments	Limit / Requirement	Result
15.247(a)	-	Digital Modulation	Systems uses DSSS techniques	System must utilize a digital transmission technology	Complies
15.247 (a) (2)	-	6dB Bandwidth	1.6MHz minimum	>500kHz	Complies
15.247 (b) (3)	-	Output Power (multipoint systems)	5.9 dBm (3.9 mW) EIRP = 8mW Note 1	1Watt, EIRP limited to 4 Watts.	Complies
15.247(e)	-	Power Spectral Density	-8.9 dBm / 3kHz	8dBm/3kHz	Complies
15.247(d) / 15.209	-	Radiated Spurious Emissions 30MHz – 25 GHz	45.4 dBµV/m @ 2484.0 MHz (-8.6 dB)	Refer to the limits section (p19) for restricted bands, all others < -20dBc	Complies
Note 1: EIRP calculated using antenna gains of 3.27 dBi for the highest EIRP system.					

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	-	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	Antenna is integral	Unique or integral antenna required	Complies
15.407 (b) (6)	-	AC Conducted Emissions	46.3 dBµV @ 0.532 MHz (-9.7 dB)	Refer to page 18	Complies
15.247 (i) 15.407 (f)	-	RF Exposure Requirements	Refer to MPE calculations in separate exhibit	Refer to OET 65, FCC Part 1 and RSS 102	Complies

MEASUREMENT UNCERTAINTIES

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

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

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The ARRIS model C61W-700 Wireless RVU Client is a high definition set top box, with RF4CE and 5GHz 802.11an/ac. Since the EUT would be placed on a tabletop during operation, the EUT was treated as tabletop equipment during testing to simulate the end-user environment. The electrical rating of the EUT is 100-120 Volts, 60 Hz, 0.5 Amps.

The sample was received on January 25, 2017 and tested on January 30, February 6, March 8, 2017. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
ARRIS	C61W-700	DirecTV Home Client	Refer to test results	PGAC61W
DirecTV	ESP10R4-15	AC/DC Power Supply	CL10G160R4900	-

ANTENNA SYSTEM

The EUT uses two pcb trace antennas, 3.27dBi gain, configured for transmit diversity.

ENCLOSURE

The EUT enclosure is primarily constructed of plastic. It measures approximately 18 cm wide by 12 cm deep by 3 cm high.

MODIFICATIONS

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

SUPPORT EQUIPMENT

The following equipment was used as support equipment for testing:

Configuration #1

Company	Model	Description	Serial Number	FCC ID
JVC	EM39FT	TV	TA1SEI042503850	-

Configuration #2 (AC Conducted Emissions)

Company	Model	Description	Serial Number	FCC ID
Toshiba	24SL415U	TV	B46193T06429C1	-

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

Configuration #1

Company	Model	Description	Serial Number	FCC ID
Dell	M4600	Precision laptop	F9N0MQ1	

Configuration #2

Company	Model	Description	Serial Number	FCC ID
Dell	Latitude	Precision laptop	E6540	

EUT INTERFACE PORTS

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

EUT

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Serial*	USB	Serial	Shielded	5
A/V	TV input	RCA	Shielded	1
HDMI	TV Input	HDMI	Shielded	1
Digital Audio (SPDIF)	75 Ohm Terminated	RCA	Shielded	1
USB	USB Stick	USB	Shielded	1
DC power Input	AC/DC power Output	2Wire	Unshielded	1
AC/DC Adapter	AC Mains	2Wire	Unshielded	0.8

Additional on Support Equipment

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
DC to RF Adapter Input	AC/DC Output	2Wire	Unshielded	1
Laptop DC Input	AC/DC Output	2Wire	Unshielded	1
AC/DC Adapter (x2)	AC Mains	2Wire	Unshielded	1
TV AC input	AC Mains	2Wire	Unshielded	1.5

* - temporary internal connection to allow for configuration of radios

EUT OPERATION

The EUT was configured to transmit continuously at the maximum output power. For AC conducted emissions, the RF4CE radio was configured for transmit at 2450MHz, while the 802.11 radio was configured for transmit at 5200MHz, 20MHz, MCS0.

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 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 20Hz, peak measurements are made in lieu of Quasi-Peak measurements.

For measurements above the frequency range of the receivers, a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis. Average measurements above 1000MHz are performed on the spectrum analyzer using the linear-average method with a resolution bandwidth of 1 MHz and a video bandwidth of 10 Hz, unless the signal is pulsed in which case the average (or video) bandwidth of the measuring instrument is reduced to onset of pulse desensitization and then increased.

INSTRUMENT CONTROL COMPUTER

Software is used to view and convert receiver measurements to the field strength at an antenna or voltage developed at the LISN measurement port, which is then compared directly with the appropriate specification limit. This provides faster, more accurate readings by performing the conversions described under Sample Calculations within the Test Procedures section of this report. Results are printed in a graphic and/or tabular format, as appropriate. A personal computer is used to record all measurements made with the receivers. The software used for radiated and conducted emissions measurements is NTS EMI Test Software (rev 2.10)

LINE IMPEDANCE STABILIZATION NETWORK (LISN)

Line conducted measurements utilize a fifty microhenry Line Impedance Stabilization Network as the monitoring point. The LISN used also contains a 250 uH CISPR adapter. This network provides for calibrated radio frequency noise measurements by the design of the internal low pass and high pass filters on the EUT and measurement ports, respectively.

FILTERS/ATTENUATORS

External filters and precision attenuators are often connected between the receiving antenna or LISN and the receiver. This eliminates saturation effects and non-linear operation due to high amplitude transient events.

ANTENNAS

A loop antenna is used below 30 MHz. For the measurement range 30 MHz to 1000 MHz either a combination of a biconical antenna and a log periodic or a bi-log antenna is used. Above 1000 MHz, horn antennas are used. The antenna calibration factors to convert the received voltage to an electric field strength are included with appropriate cable loss and amplifier gain factors to determine an overall site factor, which is then programmed into the test receivers or incorporated into the test software.

ANTENNA MAST AND EQUIPMENT TURNTABLE

The antennas used to measure the radiated electric field strength are mounted on a non-conductive antenna mast equipped with a motor-drive to vary the antenna height. Measurements below 30 MHz are made with the loop antenna at a fixed height of 1m above the ground plane.

ANSI C63.10 specifies that the test height above ground for table mounted devices shall be 80 centimeters for measurements below 1GHz, and 1.5m for measurements above 1GHz. Floor mounted equipment shall be placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material from 3 to 12 mm if the device is normally used on a non-conductive floor as specified in ANSI C63.4. During radiated measurements, the EUT is positioned on a motorized turntable in conformance with this requirement.

INSTRUMENT CALIBRATION

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

TEST PROCEDURES

EUT AND CABLE PLACEMENT

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

CONDUCTED EMISSIONS

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

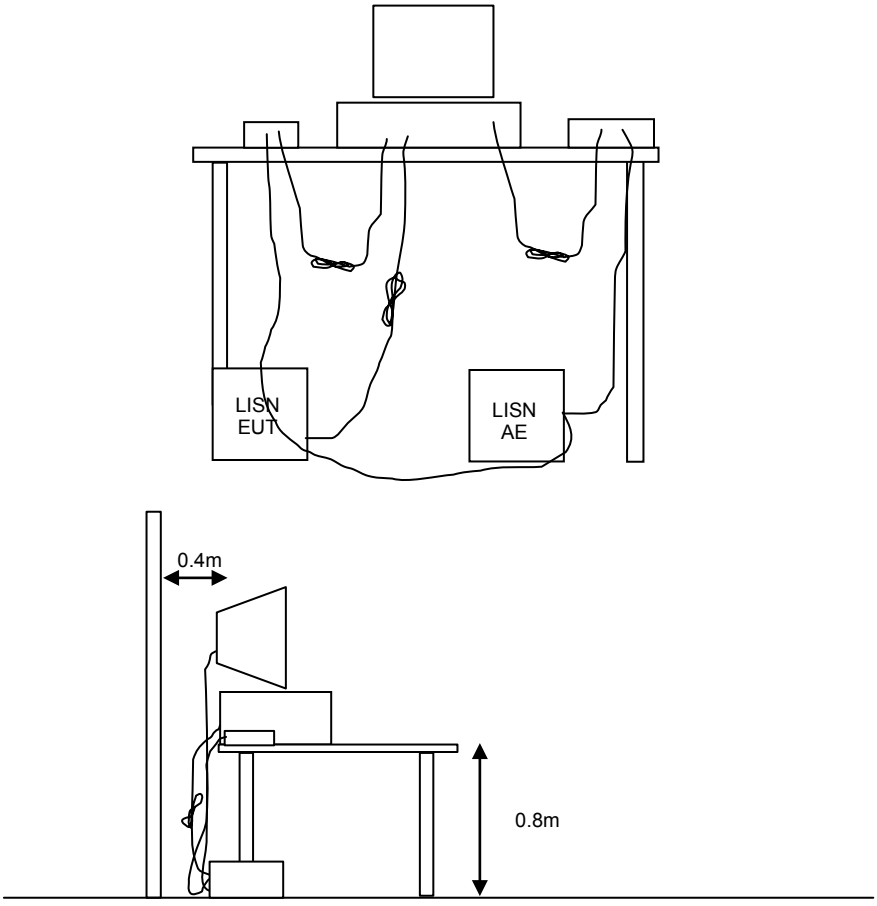


Figure 1 Typical Conducted Emissions Test Configuration

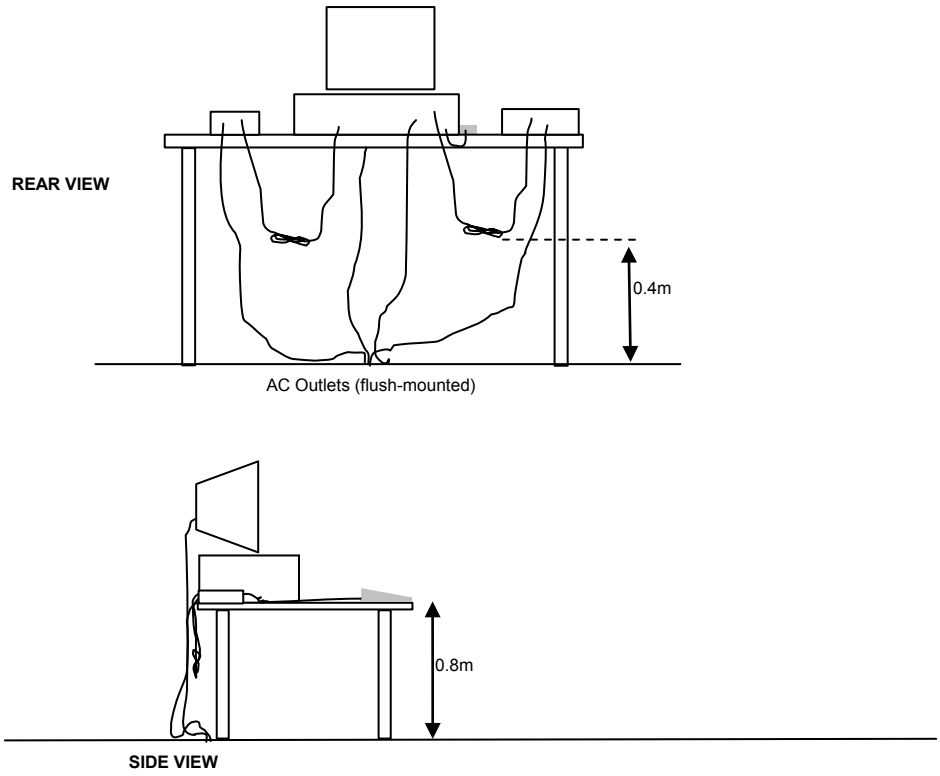
RADIATED EMISSIONS

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

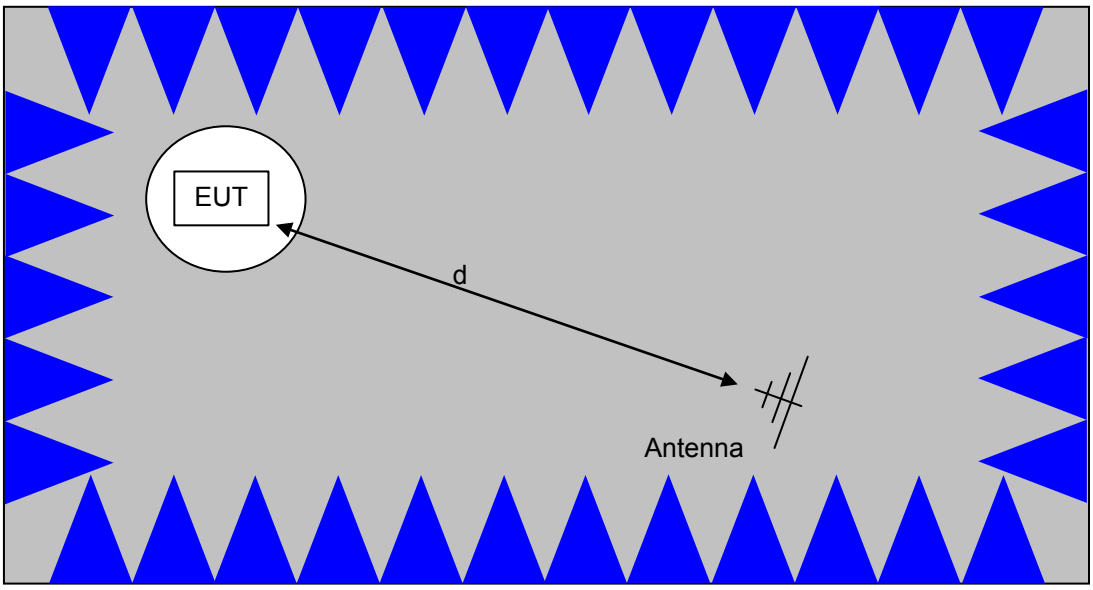
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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

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

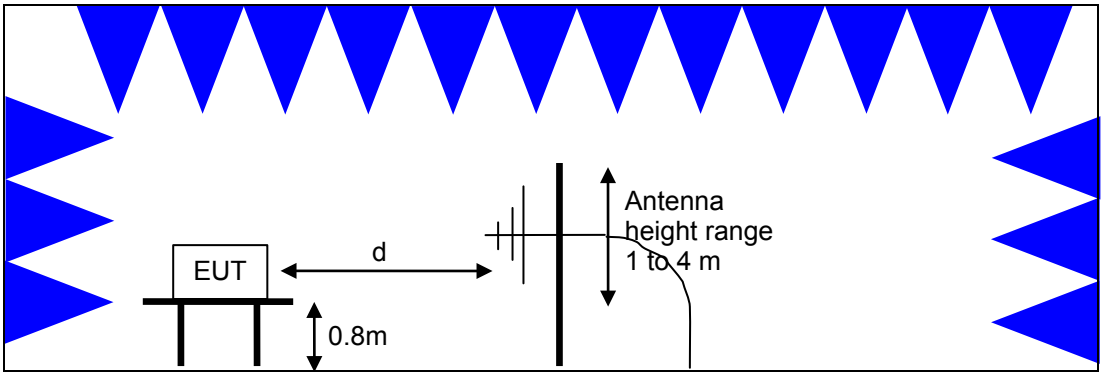


Typical Test Configuration for Radiated Field Strength Measurements



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

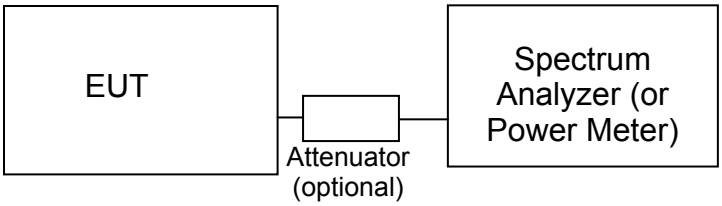
Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.



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

CONDUCTED EMISSIONS FROM ANTENNA PORT

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



Test Configuration for Antenna Port Measurements

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

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

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

BANDWIDTH MEASUREMENTS

The 6dB, 20dB, 26dB and/or 99% signal bandwidth are measured using the bandwidths recommended by ANSI C63.10 and RSS GEN.

SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

The limits for conducted emissions are given in units of microvolts, and the limits for radiated emissions are given in units of microvolts per meter at a specified test distance. Data is measured in the logarithmic form of decibels relative to one microvolt, or dB microvolts (dBuV). For radiated emissions, the measured data is converted to the field strength at the antenna in dB microvolts per meter (dBuV/m). The results are then converted to the linear forms of uV and uV/m for comparison to published specifications.

For reference, converting the specification limits from linear to decibel form is accomplished by taking the base ten logarithm, then multiplying by 20. These limits in both linear and logarithmic form are as follows:

CONDUCTED EMISSIONS SPECIFICATION LIMITS: FCC 15.207; FCC 15.107(a), RSS GEN

The table below shows the limits for the emissions on the AC power line from an intentional radiator and a receiver.

Frequency (MHz)	Average Limit (dBuV)	Quasi Peak Limit (dBuV)
0.150 to 0.500	Linear decrease on logarithmic frequency axis between 56.0 and 46.0	Linear decrease on logarithmic frequency axis between 66.0 and 56.0
0.500 to 5.000	46.0	56.0
5.000 to 30.000	50.0	60.0

GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

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

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

OUTPUT POWER LIMITS – DIGITAL TRANSMISSION SYSTEMS

The table below shows the limits for output power and output power density.

Operating Frequency (MHz)	Output Power	Power Spectral Density
2400 – 2483.5	1 Watt (30 dBm)	8 dBm/3kHz

The maximum permitted output power is reduced by 1dB for every dB the antenna gain exceeds 6dBi.

TRANSMIT MODE SPURIOUS RADIATED EMISSIONS LIMITS – FHSS and DTS SYSTEMS

The limits for unwanted (spurious) emissions from the transmitter falling in the restricted bands are those specified in the general limits sections of FCC Part 15. All other unwanted (spurious) emissions shall be at least 20dB below the level of the highest in-band signal level (30dB if the power is measured using the sample detector/power averaging method).

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

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

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

$$R_r - S = M$$

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

SAMPLE CALCULATIONS - RADIATED EMISSIONS

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

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

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

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

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

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

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

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

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

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

SAMPLE CALCULATIONS - FIELD STRENGTH TO EIRP CONVERSION

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

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

where P is the eirp (Watts)

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

Appendix A Test Equipment Calibration Data

Manufacturer	Description	Model	Asset #	Calibrated	Cal Due
Radiated Emissions, 1000 - 25,000 MHz, 30-Jan-17					
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	9/29/2016	9/29/2018
HP / Miteq	SA40 Head (Red)	TTA1840-45-5P-HG-S	1145	8/24/2016	8/24/2017
Hewlett Packard	Spectrum Analyzer (SA40) Red 30 Hz -40 GHz	8564E (84125C)	1148	10/31/2016	11/1/2017
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	1780	9/30/2016	9/30/2017
Micro-Tronics	Band Reject Filter, 2400-2500 MHz 18GHz	BRM50702-02	2238	10/14/2016	10/14/2017
Rohde & Schwarz	EMI Test Receiver, 20 Hz-40 GHz	ESIB40 (1088.7490.40)	2493	2/20/2016	2/20/2017
Conducted Emissions - AC Power Ports, 06-Feb-17					
NTS	NTS EMI Software (rev 2.10)	N/A	0		N/A
EMCO	LISN, 10 kHz-100 MHz	3825/2	1292	8/1/2016	8/1/2017
EMCO	LISN, 10 kHz-100 MHz	3825/2	1293	6/7/2016	6/7/2017
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	1401	2/3/2017	2/3/2018
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	9482	10/28/2016	10/28/2017
Radiated Emissions, 30 - 1,000 MHz, 08-Mar-17					
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1549	6/2/2015	6/2/2017
Com-Power	Preamplifier, 30-1000 MHz	PA-103	1632	3/8/2017	3/8/2018
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB 7	9482	10/28/2016	10/28/2017
Radiated Emissions, 1000 - 40,000 MHz, 08-Mar-17					
HP / Miteq	SA40 R Head HF preAmplifier, 18-40 GHz (w/1148)	TTA1840-45-5P-HG-S	1145	8/24/2016	8/24/2017
Hewlett Packard	Spectrum Analyzer (SA40) Red 30 Hz -40 GHz	8564E (84125C)	1148	10/31/2016	11/1/2017
Micro-Tronics	Band Reject Filter, 5725-5875 MHz 12GHz	BRC50705-02	1682	5/9/2016	5/9/2017
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	1780	9/30/2016	9/30/2017
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 18GHz	BRM50702-02	2238	10/14/2016	10/14/2017
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	2251	9/19/2016	9/19/2017
Micro-Tronics	High Pass Filter 6400 MHz - 18000 MHz	HPM50112	2739	10/7/2016	10/7/2017
EMCO	Antenna, Horn, 1-18 GHz	3115	2870	8/31/2015	8/31/2017

Appendix B Test Data

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Client:	ARRIS	Job Number:	JD102669
Product	C61W	T-Log Number:	T103891
System Configuration:	-	Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Emissions Standard(s):	FCC 15.B / FCC 15.247 / 15.E	Class:	B
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

ARRIS

Product

C61W

Date of Last Test: 3/15/2017

Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	B

Conducted Emissions

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

Test Specific Details

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

Date of Test: 2/6/2017
Test Engineer: Joseph Cadigal
Test Location: Fremont Chamber #4

Config. Used: 2
Config Change: none
EUT Voltage: 120V/60Hz

General Test Configuration

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

Ambient Conditions:

Temperature: 25 °C
Rel. Humidity: 30 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power,120V/60Hz	Class B	Pass	46.3 dBµV @ 0.532 MHz (-9.7 dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

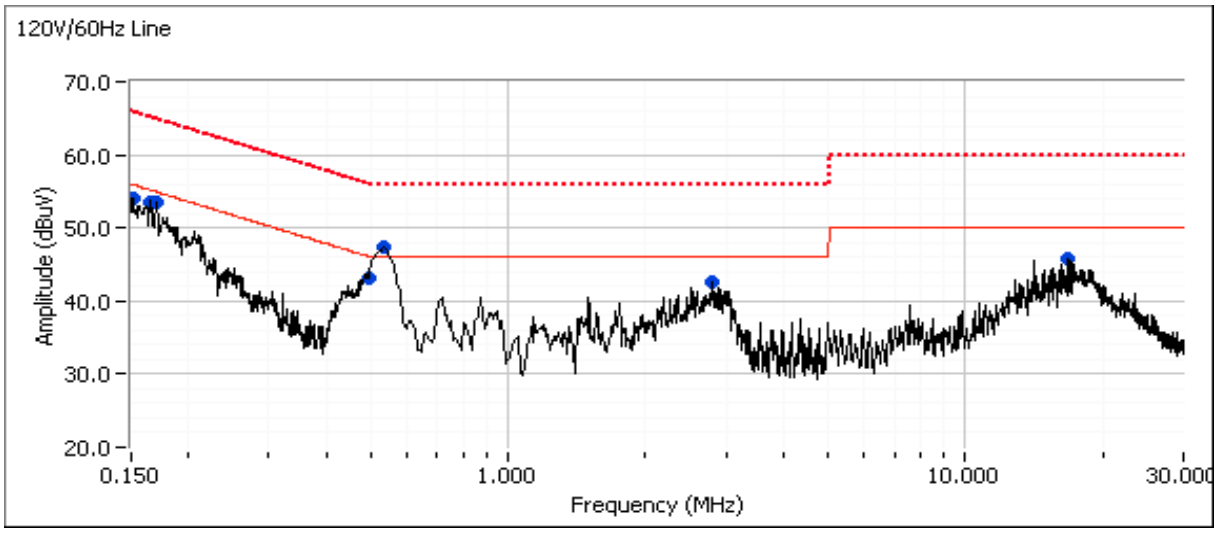
Deviations From The Standard

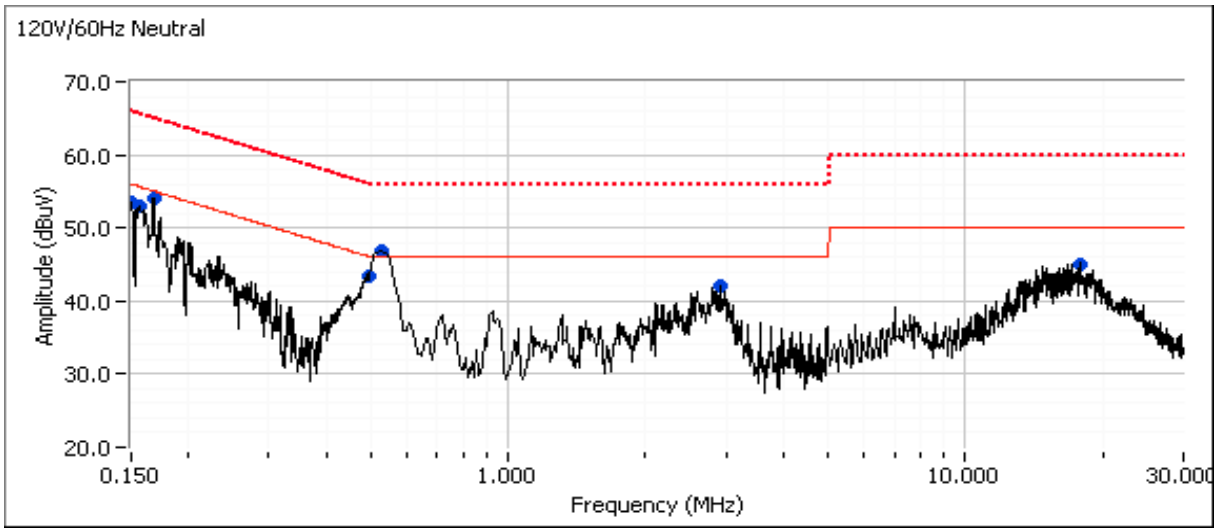
No deviations were made from the requirements of the standard.

Sample S/N: G62DATB200100
Driver: 20161214_c61w-bcm_v1.24.1.5
Antenna: Internal

Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	B

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





Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	B

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

Frequency	Level	AC	Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.171	53.5	Line 1	54.9	-1.4	Peak	
0.165	53.6	Line 1	55.2	-1.6	Peak	
0.151	54.0	Line 1	55.9	-1.9	Peak	
0.494	43.2	Line 1	46.1	-2.9	Peak	
2.806	42.6	Line 1	46.0	-3.4	Peak	
0.532	47.4	Line 1	46.0	1.4	Peak	
16.810	45.8	Line 1	50.0	-4.2	Peak	
0.168	54.0	Neutral	55.0	-1.0	Peak	
0.151	53.4	Neutral	56.0	-2.6	Peak	
0.157	53.0	Neutral	55.7	-2.7	Peak	
0.494	43.5	Neutral	46.1	-2.6	Peak	
2.917	42.0	Neutral	46.0	-4.0	Peak	
0.525	46.8	Neutral	46.0	0.8	Peak	
17.772	44.9	Neutral	50.0	-5.1	Peak	

Final quasi-peak and average readings

Frequency	Level	AC	Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.532	**46.3**	Line 1	56.0	**-9.7**	QP	QP (1.00s)
0.525	45.7	Neutral	56.0	-10.3	QP	QP (1.00s)
0.532	35.3	Line 1	46.0	-10.7	AVG	AVG (0.10s)
0.525	33.7	Neutral	46.0	-12.3	AVG	AVG (0.10s)
0.494	42.3	Line 1	56.1	-13.8	QP	QP (1.00s)
0.494	42.0	Neutral	56.1	-14.1	QP	QP (1.00s)
0.494	31.1	Neutral	46.1	-15.0	AVG	AVG (0.10s)
0.494	30.7	Line 1	46.1	-15.4	AVG	AVG (0.10s)
0.165	48.3	Line 1	65.2	-16.9	QP	QP (1.00s)
0.168	47.8	Neutral	65.1	-17.3	QP	QP (1.00s)
0.171	47.1	Line 1	64.9	-17.8	QP	QP (1.00s)
2.806	38.1	Line 1	56.0	-17.9	QP	QP (1.00s)
0.157	47.1	Neutral	65.6	-18.5	QP	QP (1.00s)
0.151	46.8	Neutral	65.9	-19.1	QP	QP (1.00s)
0.151	46.6	Line 1	65.9	-19.3	QP	QP (1.00s)
2.917	36.7	Neutral	56.0	-19.3	QP	QP (1.00s)
2.806	25.5	Line 1	46.0	-20.5	AVG	AVG (0.10s)
17.772	38.8	Neutral	60.0	-21.2	QP	QP (1.00s)
16.810	28.7	Line 1	50.0	-21.3	AVG	AVG (0.10s)
16.810	38.7	Line 1	60.0	-21.3	QP	QP (1.00s)
17.772	28.4	Neutral	50.0	-21.6	AVG	AVG (0.10s)

Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	B

Radiated Emissions

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

Test Specific Details

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

Date of Test: 2/6/2017
Test Engineer: Joseph Cadigal
Test Location: Fremont Chamber #4
Config. Used: 2
Config Change: none
EUT Voltage: 120V/60Hz

General Test Configuration

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

Radiated emissions tests above 1 GHz to FCC Part 15 were performed with floor absorbers in place in accordance with the test methods of ANSI C63.4 and CISPR 16-1-4.

The test distance and extrapolation factor (if applicable) are detailed under each run description.

Note, preliminary testing indicates that the emissions were maximized by orientation of the EUT and elevation of the measurement antenna. Maximized testing indicated that the emissions were maximized by orientation of the EUT, elevation of the measurement antenna, and manipulation of the EUT's interface cables.

Ambient Conditions:

Temperature: 25 °C
Rel. Humidity: 30 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	Radiated Emissions 30 - 1000 MHz, Preliminary	Class B	Eval	Refer to individual runs
2	Radiated Emissions 30 - 1000 MHz, Maximized	Class B	Pass	38.0 dBµV/m @ 30.39 MHz (-2.0 dB)
3b	Radiated Emissions 1 GHz - 12 GHz Maximized	FCC Class B	Pass	50.6 dBµV/m @ 7373.4 MHz (-3.4 dB)

Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	B

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.

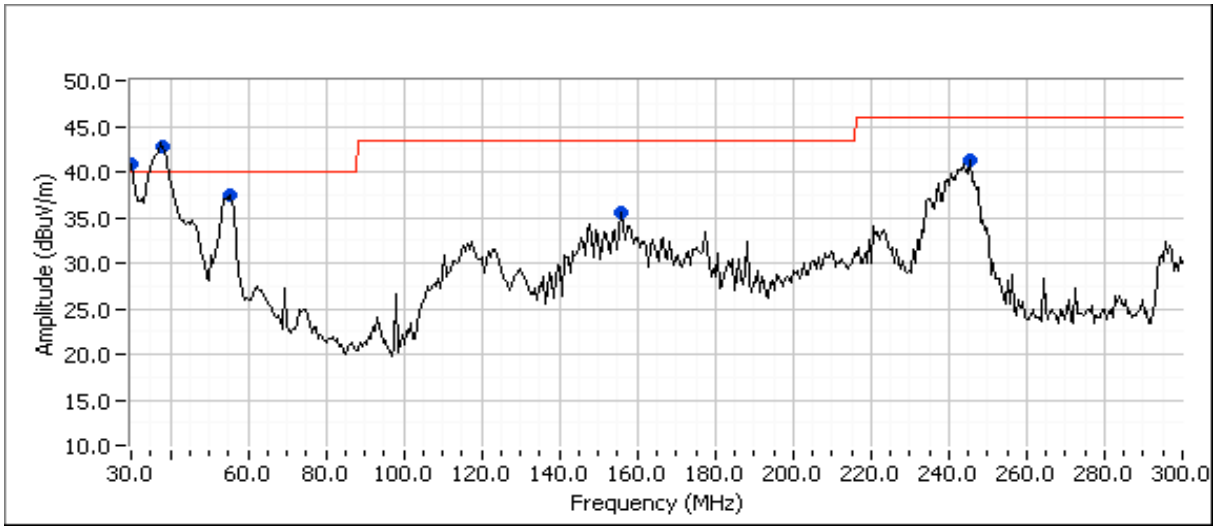
Sample Notes

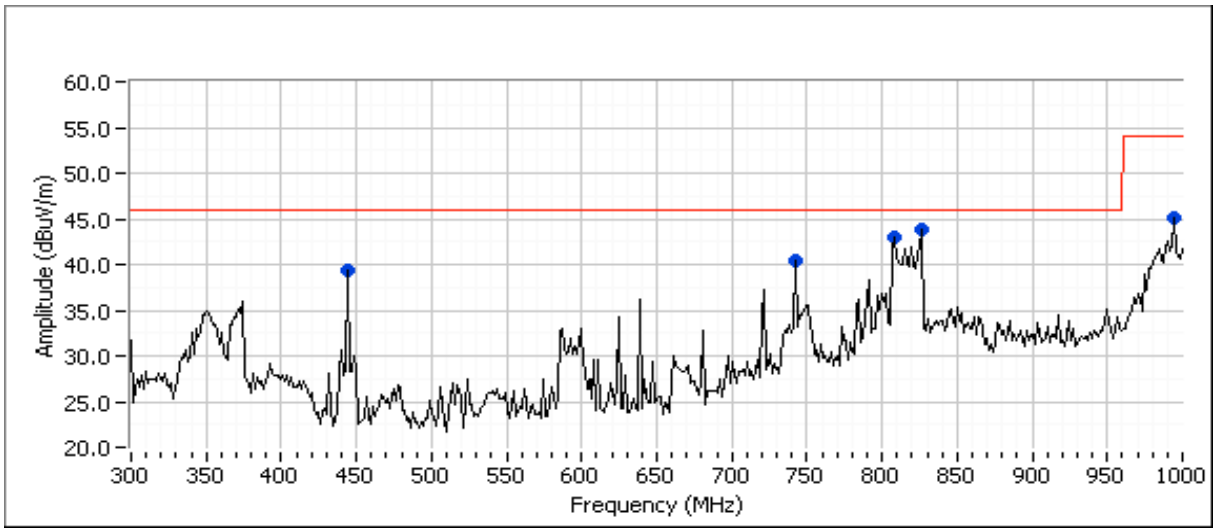
Sample S/N: G62DATB200100
Driver: 20161214_c61w-bcm_v1.24.1.5
Antenna: Internal

Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	B

Run #1: Preliminary Radiated Emissions, 30 - 1000 MHz

Test Parameters for Preliminary Scan(s)			
Frequency Range (MHz)	Prescan Distance (meters)	Limit Distance (meters)	Extrapolation Factor (dB, applied to data)
30 - 1000	3	3	0.0





Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	B

Preliminary peak readings captured during pre-scan

Frequency	Level	Pol	Class B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
55.019	37.5	V	40.0	-2.5	Peak	114	1.0	
245.569	41.2	H	46.0	-4.8	Peak	198	1.0	
37.968	42.7	V	40.0	2.7	Peak	270	1.0	signal from TV
30.392	40.9	V	40.0	0.9	Peak	273	1.0	
155.772	35.6	H	43.5	-7.9	Peak	349	2.0	
825.151	43.9	V	46.0	-2.1	Peak	191	1.0	
806.668	43.0	V	46.0	-3.0	Peak	217	1.0	
993.909	45.1	H	54.0	-8.9	Peak	193	1.0	
741.769	40.5	H	46.0	-5.5	Peak	243	2.0	
445.053	39.4	H	46.0	-6.6	Peak	153	1.5	

Preliminary quasi-peak readings (no manipulation of EUT interface cables)

Frequency	Level	Pol	Class B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
55.019	35.3	V	40.0	-4.7	QP	114	1.0	QP (1.00s)
245.569	39.1	H	46.0	-6.9	QP	198	1.0	QP (1.00s)
37.968	41.8	V	40.0	1.8	QP	270	1.0	Signal from TV on
37.968	37.7	V	40.0	-2.3	QP	270	1.0	Signal from TV off
30.392	37.4	V	40.0	-2.6	QP	272	1.0	QP (1.00s)
155.772	27.8	H	43.5	-15.7	QP	349	2.0	QP (1.00s)
825.151	38.8	V	46.0	-7.2	QP	191	1.0	QP (1.00s)
806.668	38.0	V	46.0	-8.0	QP	217	1.0	QP (1.00s)
993.909	37.6	H	54.0	-16.4	QP	192	1.0	QP (1.00s)
741.769	34.3	H	46.0	-11.7	QP	242	2.0	QP (1.00s)
445.053	38.3	H	46.0	-7.7	QP	153	1.4	QP (1.00s)

Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	B

Run #2: Maximized Readings From Run #1

Test Parameters for Maximized Reading(s)			
Frequency Range (MHz)	Test Distance (meters)	Limit Distance (meters)	Extrapolation Factor (dB, applied to data)
30 - 1000	3	3	0.0

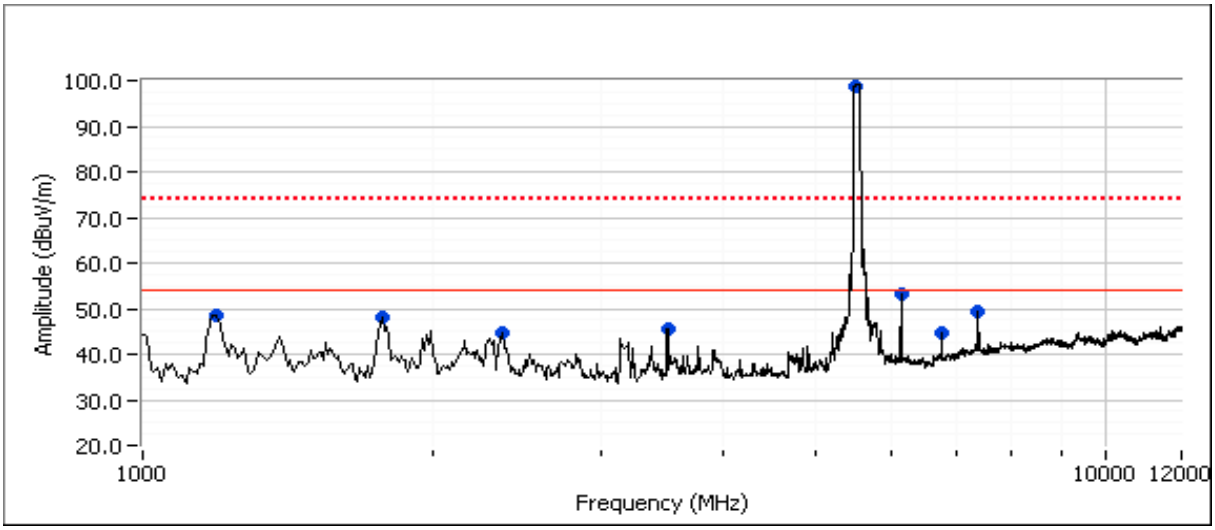
Maximized quasi-peak readings (includes manipulation of EUT interface cables)

Frequency	Level	Pol	Class B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
30.392	**38.0**	V	40.0	**-2.0**	QP	273	1.0	QP (1.00s)
55.019	35.3	V	40.0	-4.7	QP	113	1.0	QP (1.00s)
245.569	39.1	H	46.0	-6.9	QP	198	1.0	QP (1.00s)
825.151	38.8	V	46.0	-7.2	QP	191	1.0	QP (1.00s)
445.053	38.3	H	46.0	-7.7	QP	153	1.4	QP (1.00s)
806.668	38.0	V	46.0	-8.0	QP	217	1.0	QP (1.00s)

Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	B

Run #3: Maximized Readings, 1000 - 12000 MHz
Single pre-scan covering both EN 55022 and FCC Part 15 requirements
Antenna height scan performed during pre-scan to satisfy FCC requirements
2.4GHz radio in receive mode and 5GHz radio in transmit mode

Test Parameters for Preliminary Scan(s)			
Frequency Range (MHz)	Prescan Distance (meters)	Limit Distance (meters)	Extrapolation Factor (dB, applied to data)
1000 - 12000	3	3	0.0



Preliminary peak readings captured during pre-scan (peak readings vs. average limit)
EN 55022 limit used for pre-scan (i.e. worst case of EN 55022 and FCC)

Frequency	Level	Pol	EN 55022 Class B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5510.000	98.8	V	-	-	Peak	207	1.0	5GHz radio fundamental
6141.230	53.4	V	54.0	-0.6	Peak	340	1.6	
1766.610	48.0	H	54.0	-6.0	Peak	177	1.3	
1200.070	48.3	H	54.0	-5.7	Peak	221	1.6	
3519.510	45.6	V	54.0	-8.4	Peak	172	1.3	
2372.540	44.8	V	54.0	-9.2	Peak	217	1.6	
7382.750	49.3	H	54.0	-4.7	Peak	182	1.3	
6761.100	44.8	H	54.0	-9.2	Peak	190	1.3	

Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	B

Final peak and average readings (vs. FCC limits)

All final readings collected at 3 meters test distance, unless otherwise noted

**FCC Class B limit (when applicable) is by default a 3m limit*

Frequency	Level	Pol	FCC Class B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7373.390	**50.6**	V	54.0	**-3.4**	AVG	182	1.3	RB 1 MHz;VB 10 Hz;Peak
6144.760	50.0	V	54.0	-4.0	AVG	339	1.6	RB 1 MHz;VB 10 Hz;Peak
6144.860	49.9	V	54.0	-4.1	AVG	206	1.3	RB 1 MHz;VB 10 Hz;Peak
6758.980	41.2	V	54.0	-12.8	AVG	32	2.5	RB 1 MHz;VB 10 Hz;Peak
1199.350	40.2	H	54.0	-13.8	AVG	221	1.6	RB 1 MHz;VB 10 Hz;Peak
6759.680	38.3	H	54.0	-15.7	AVG	190	1.3	RB 1 MHz;VB 10 Hz;Peak
1768.090	38.1	H	54.0	-15.9	AVG	176	1.2	RB 1 MHz;VB 10 Hz;Peak
1200.360	57.7	H	74.0	-16.3	PK	221	1.6	RB 1 MHz;VB 3 MHz;Peak
2371.410	37.6	V	54.0	-16.4	AVG	217	1.6	RB 1 MHz;VB 10 Hz;Peak
2371.670	56.4	V	74.0	-17.6	PK	217	1.6	RB 1 MHz;VB 3 MHz;Peak
1766.570	55.7	H	74.0	-18.3	PK	176	1.2	RB 1 MHz;VB 3 MHz;Peak
3519.970	33.9	V	54.0	-20.1	AVG	172	1.2	RB 1 MHz;VB 10 Hz;Peak
7373.750	50.8	H	74.0	-23.2	PK	182	1.3	RB 1 MHz;VB 3 MHz;Peak
6759.720	48.6	V	74.0	-25.4	PK	32	2.5	RB 1 MHz;VB 3 MHz;Peak
6147.190	47.3	V	74.0	-26.7	PK	206	1.3	RB 1 MHz;VB 3 MHz;Peak
6143.400	47.0	V	74.0	-27.0	PK	339	1.6	RB 1 MHz;VB 3 MHz;Peak
3519.730	46.8	V	74.0	-27.2	PK	172	1.2	RB 1 MHz;VB 3 MHz;Peak

Note 1:	For FCC testing above 1 GHz, the limit is based on an average measurement. In addition, the peak reading of any emission above 1 GHz can not exceed the average limit by more than 20 dB.

Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	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: 20.1 °C
Rel. Humidity: 40 %

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	RF4CE	2425MHz	3	3	Restricted Band Edge (2390 MHz)	FCC Part 15.209 / 15.247(c)	32.4 dBµV/m @ 2361.5 MHz (-21.6 dB)
	RF4CE	2475MHz	3	3	Restricted Band Edge (2483.5 MHz)	FCC Part 15.209 / 15.247(c)	45.4 dBµV/m @ 2484.0 MHz (-8.6 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: G62DA6TB200126
Driver: -
Antenna: PCB trace

Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	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 a duty cycle ≥ 98% and was measured using RBW=1MHz, VBW=10Hz, peak detector, linear average mode, auto sweep time, max hold.

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
RF4CE	-	1.00	Yes	1	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

Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	N/A

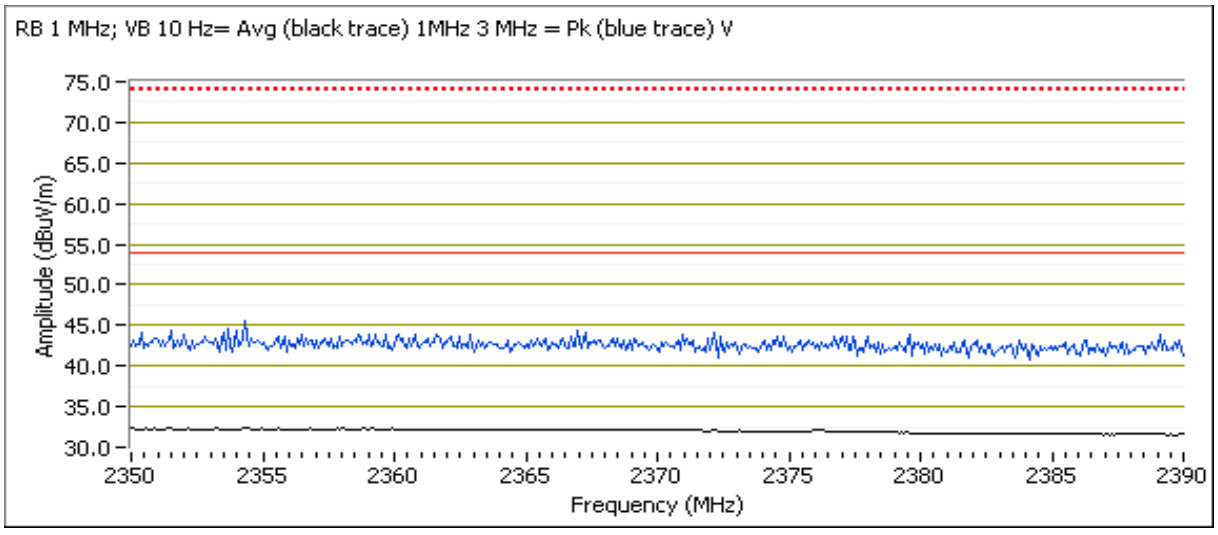
Run #1: Radiated Bandedge Measurements

Date of Test: 1/30/2017 0:00 Config. Used: 1
Test Engineer: Joseph Cadigal Config Change: none
Test Location: FT Chamber#7 EUT Voltage: 120V/60Hz

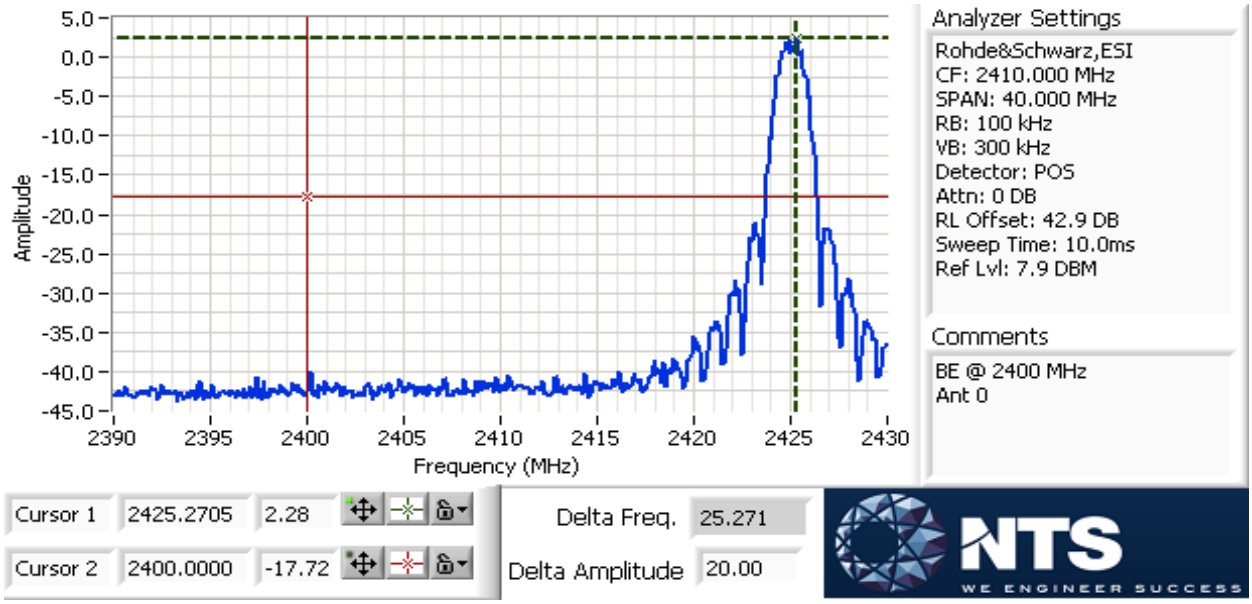
Channel: 2425MHz Mode: RF4CE
Tx Chain: Ant 0 Data Rate: -

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2353.930	**32.3**	V	54.0	**-21.7**	AVG	333	1.0	POS; RB 1 MHz; VB: 10 Hz
2371.880	44.4	V	74.0	-29.6	PK	333	1.0	POS; RB 1 MHz; VB: 3 MHz
2352.570	32.3	H	54.0	-21.7	AVG	314	1.0	POS; RB 1 MHz; VB: 10 Hz
2352.080	44.1	H	74.0	-29.9	PK	314	1.0	POS; RB 1 MHz; VB: 3 MHz



Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	N/A

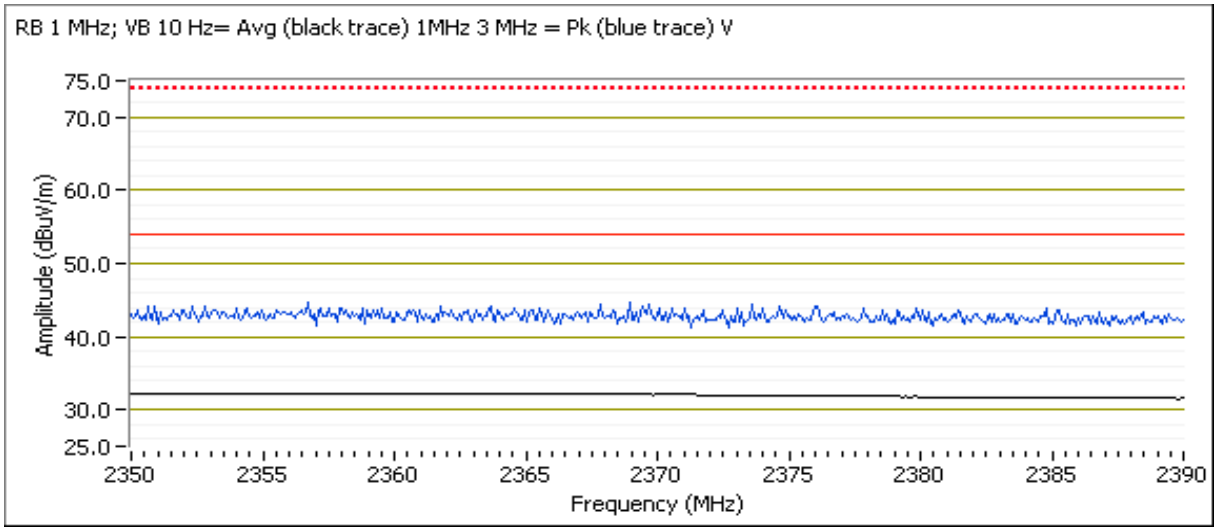


Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	N/A

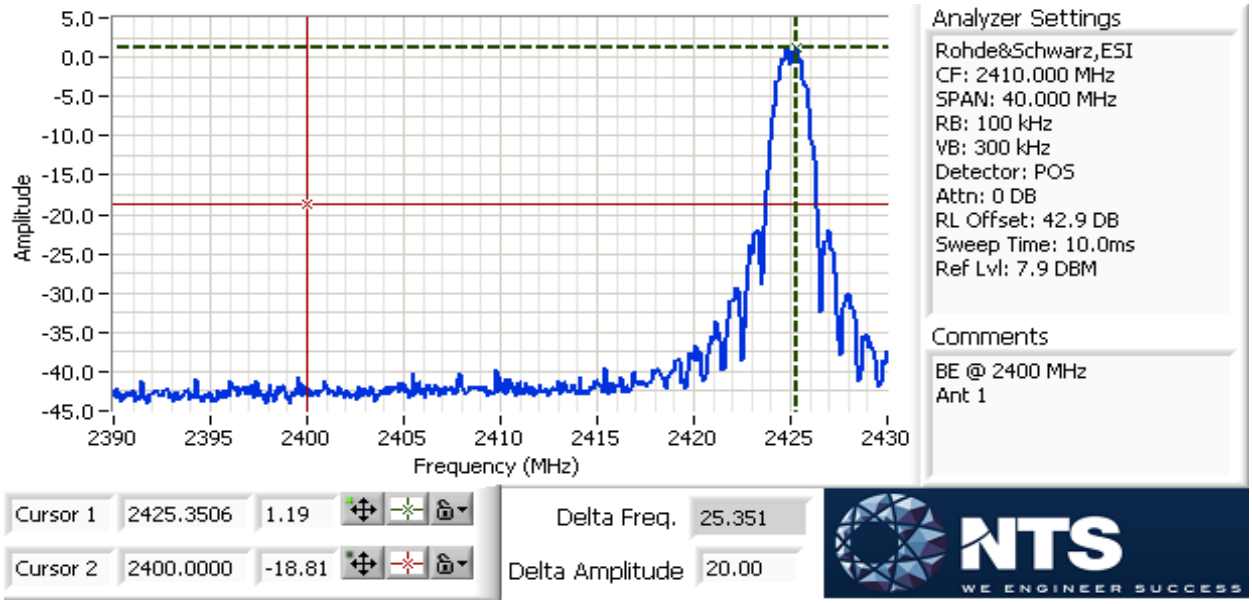
Channel: 2425MHz Mode: RF4CE
Tx Chain: Ant 1 Data Rate: -

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2361.540	**32.4**	V	54.0	**-21.6**	AVG	14	1.0	POS; RB 1 MHz; VB: 10 Hz
2359.540	43.9	V	74.0	-30.1	PK	14	1.0	POS; RB 1 MHz; VB: 3 MHz
2351.760	32.3	H	54.0	-21.7	AVG	307	2.5	POS; RB 1 MHz; VB: 10 Hz
2350.080	44.6	H	74.0	-29.4	PK	307	2.5	POS; RB 1 MHz; VB: 3 MHz



Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	N/A

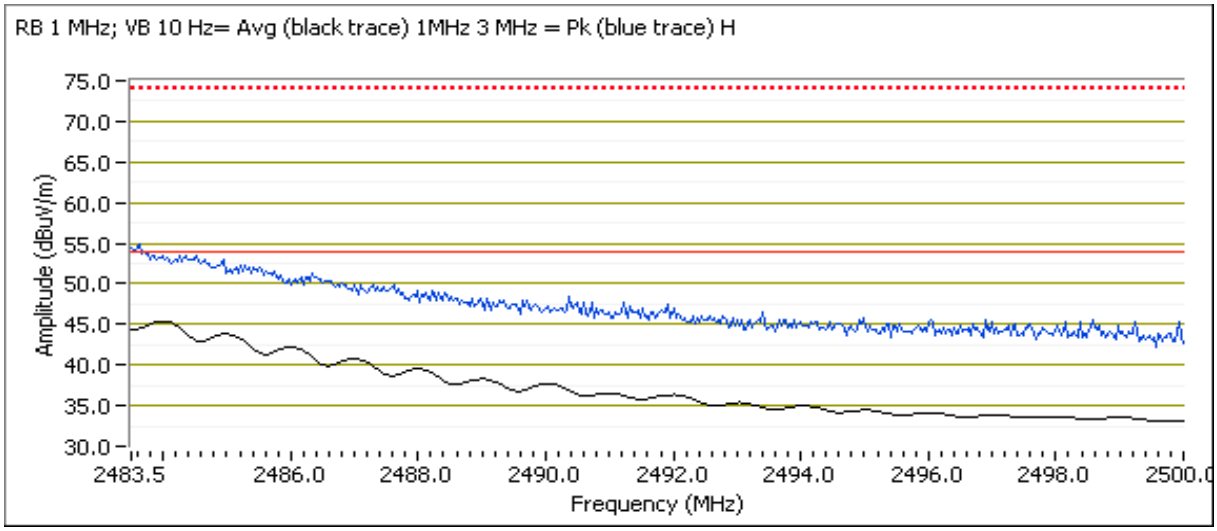


Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	N/A

Channel: 2475MHz Mode: RF4CE
Tx Chain: Ant 0 Data Rate: -

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2484.000	**45.4**	H	54.0	**-8.6**	AVG	158	1.0	POS; RB 1 MHz; VB: 10 Hz
2483.530	54.0	H	74.0	-20.0	PK	158	1.0	POS; RB 1 MHz; VB: 3 MHz
2484.000	40.7	V	54.0	-13.3	AVG	174	1.3	POS; RB 1 MHz; VB: 10 Hz
2483.530	49.9	V	74.0	-24.1	PK	174	1.3	POS; RB 1 MHz; VB: 3 MHz

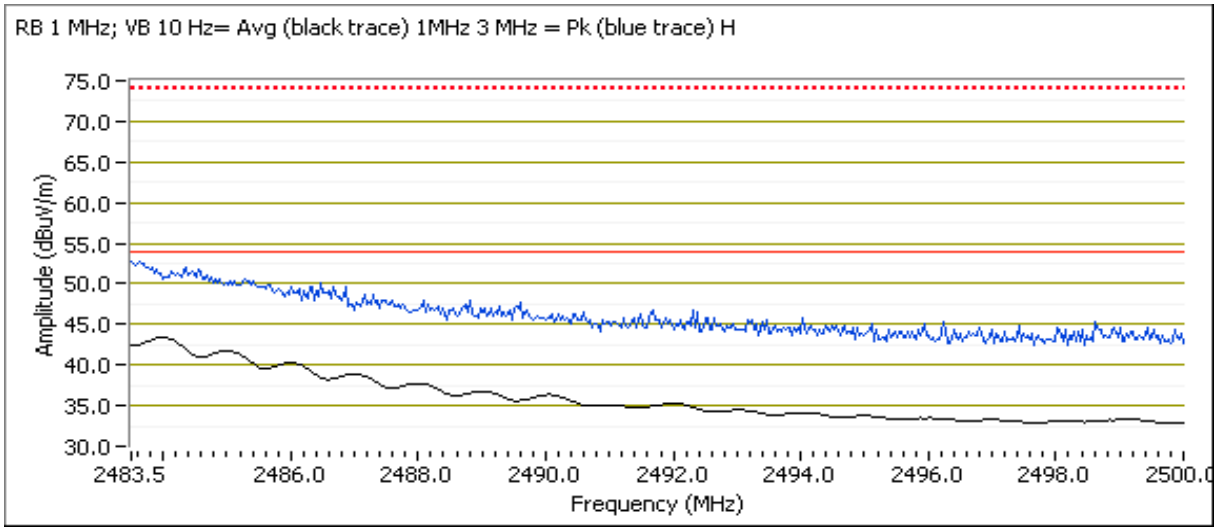


Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	N/A

Channel: 2475MHz Mode: RF4CE
Tx Chain: Ant 1 Data Rate: -

Band Edge Signal Field Strength - Direct measurement of field strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2484.000	**43.4**	H	54.0	**-10.6**	AVG	26	1.1	POS; RB 1 MHz; VB: 10 Hz
2483.670	52.2	H	74.0	-21.8	PK	26	1.1	POS; RB 1 MHz; VB: 3 MHz
2484.030	34.8	V	54.0	-19.2	AVG	360	1.3	POS; RB 1 MHz; VB: 10 Hz
2492.100	44.6	V	74.0	-29.4	PK	360	1.3	POS; RB 1 MHz; VB: 3 MHz



Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	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: 20.1 °C
Rel. Humidity: 40 %

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	RF4CE	2425MHz	3	3	Radiated Emissions, 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	40.0 dBµV/m @ 4851.0 MHz (-14.0 dB)
	RF4CE	2450MHz	3	3	Radiated Emissions, 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	39.3 dBµV/m @ 4901.0 MHz (-14.7 dB)
	RF4CE	2475MHz	3	3	Radiated Emissions, 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	35.1 dBµV/m @ 4949.0 MHz (-18.9 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: G62DA6TB200126
Driver: -
Antenna: PCB trace

Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	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)
RF4CE	-	1.00	Yes	1	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:	Average value calculated from peak measurement and duty cycle correction for actual operation (0.5ms per every 100ms, 20log(0.5/100) = -46dB (FCC maximum value of 20dB used). Refer to operational description for more details.

Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	N/A

Run #1: Radiated Spurious Emissions, 1,000 - 25000 MHz.

Date of Test: 1/30/2017 0:00 Config. Used: 1
Test Engineer: Joseph Cadigal / R. Varelas Config Change: none
Test Location: FT Chamber#7 EUT Voltage: 120V/60Hz

Run #1a: Low Channel - Ant 0

Channel: 2425MHz Mode: RF4CE
Tx Chain: Ant 0 Data Rate: -

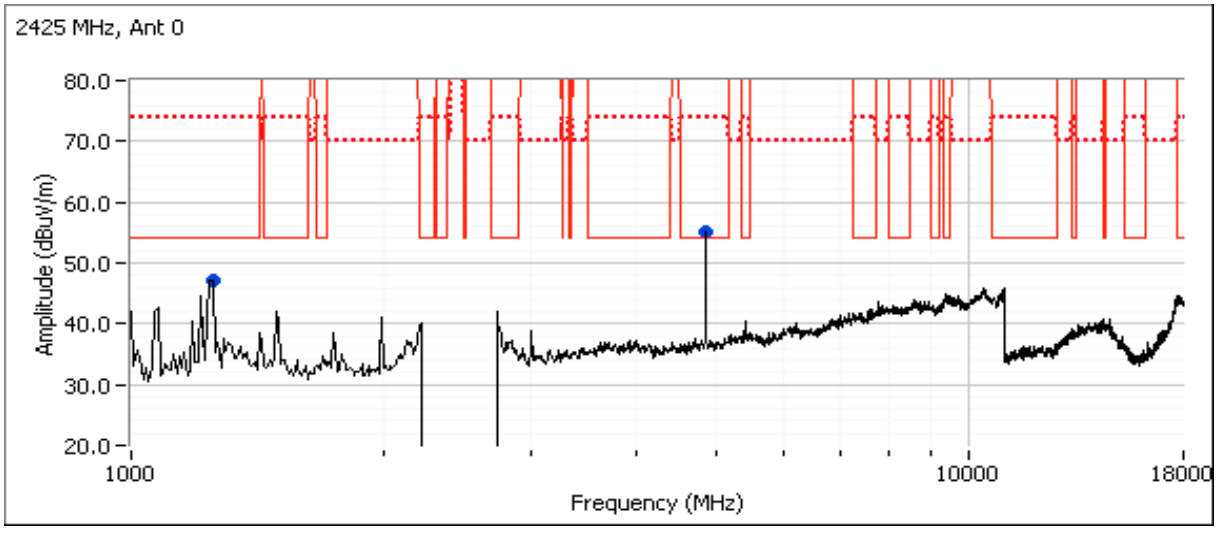
Fundamental Signal Field Strength: peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2424.770	90.7	V	-	-	Pk	221	1.0	POS; RB 100 kHz; VB: 300 kHz
2424.890	94.7	H	-	-	Pk	160	1.0	POS; RB 100 kHz; VB: 300 kHz

Fundamental emission level @ 3m in **100kHz RBW**:	94.7 dBµV/m	
Limit for emissions outside of restricted bands:	74.7 dBµV/m	Limit is -20dBc (Peak power measurement)
Limit for emissions outside of restricted bands:	64.7 dBµV/m	Limit is -30dBc (UNII power measurement)

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4850.980	40.0	V	54.0	-14.0	AVG	236	1.9	Note 3
4849.020	60.0	V	74.0	-14.0	PK	236	1.9	RB 1 MHz;VB 3 MHz;Peak
1248.840	47.1	H	54.0	-6.9	Peak	201	2.0	Not related to radio



Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	N/A

Run #1b: Center Channel

Channel: 2450MHz Mode: RF4CE
Tx Chain: Ant 0 Data Rate: -

Fundamental Signal Field Strength: peak value measured in 100kHz

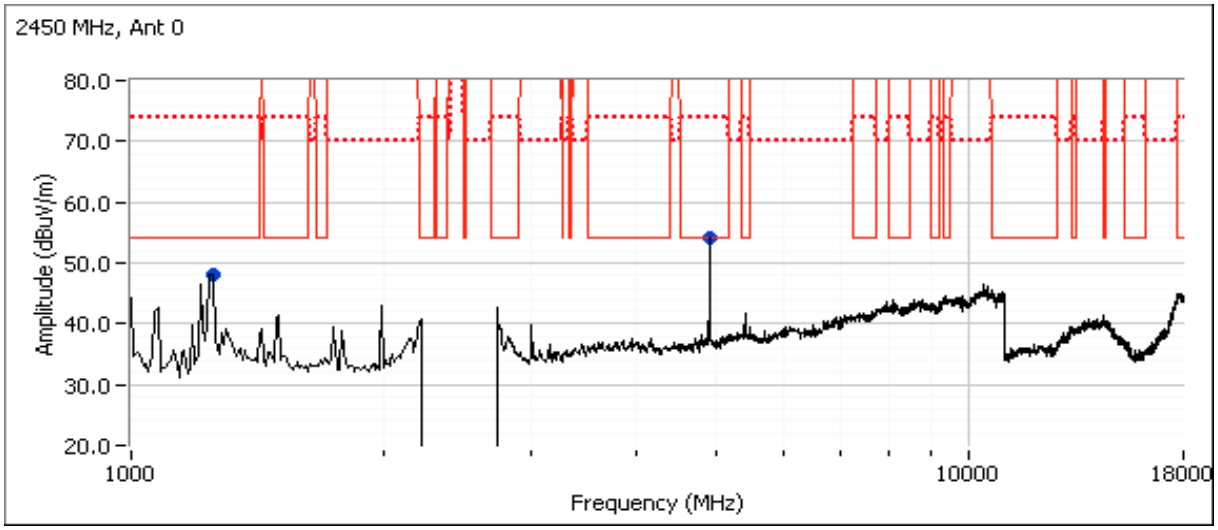
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2450.210	89.1	V	-	-	Pk	172	1.3	POS; RB 100 kHz; VB: 300 kHz
2449.730	95.8	H	-	-	Pk	161	1.0	POS; RB 100 kHz; VB: 300 kHz

Fundamental emission level @ 3m in **100kHz RBW**:	95.8 dBµV/m	
Limit for emissions outside of restricted bands:	75.8 dBµV/m	Limit is -20dBc (Peak power measurement)
Limit for emissions outside of restricted bands:	65.8 dBµV/m	Limit is -30dBc (UNII power measurement)

Spurious Emissions - Ant 0

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4900.950	39.3	V	54.0	-14.7	AVG	234	2.0	Note 3
4901.080	59.3	V	74.0	-14.7	PK	234	2.0	RB 1 MHz;VB 3 MHz;Peak
1249.220	48.1	H	54.0	-5.9	Peak	227	2.5	Not related to radio

Note:	Scans made between 18 - 25 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range

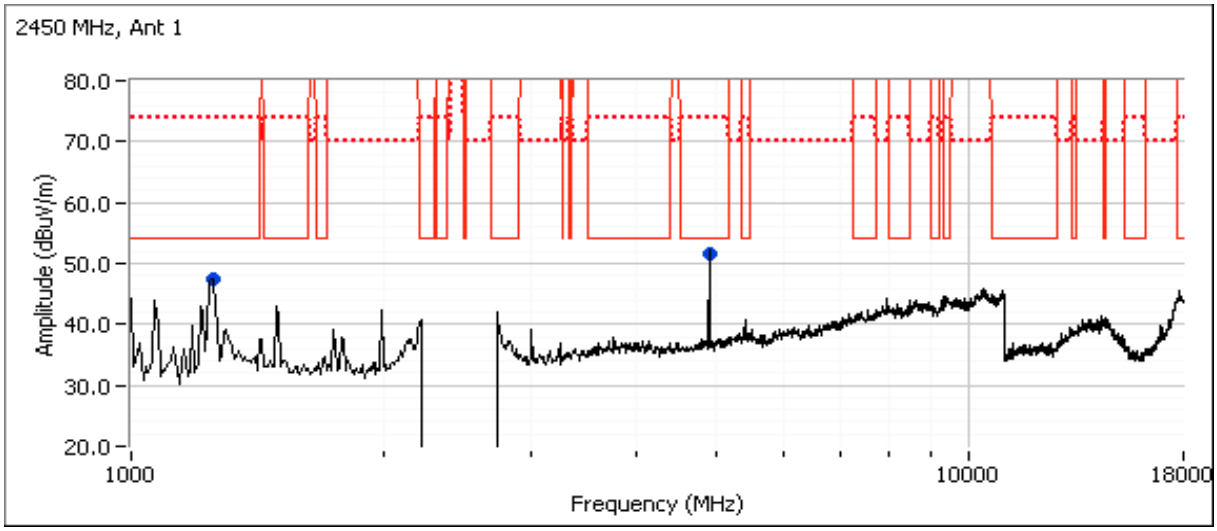


Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	N/A

Spurious Emissions - Ant 1

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4899.140	37.0	V	54.0	-17.0	AVG	302	1.5	Note 3
4899.060	57.0	V	74.0	-17.0	PK	302	1.5	RB 1 MHz;VB 3 MHz;Peak
1248.640	47.6	H	54.0	-6.4	Peak	194	2.0	Not related to radio

Note:	Scans made between 18 - 25 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range



Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	N/A

Run #1c: High Channel - Ant 0

Channel: 2475MHz Mode: RF4CE
Tx Chain: Ant 0 Data Rate: -

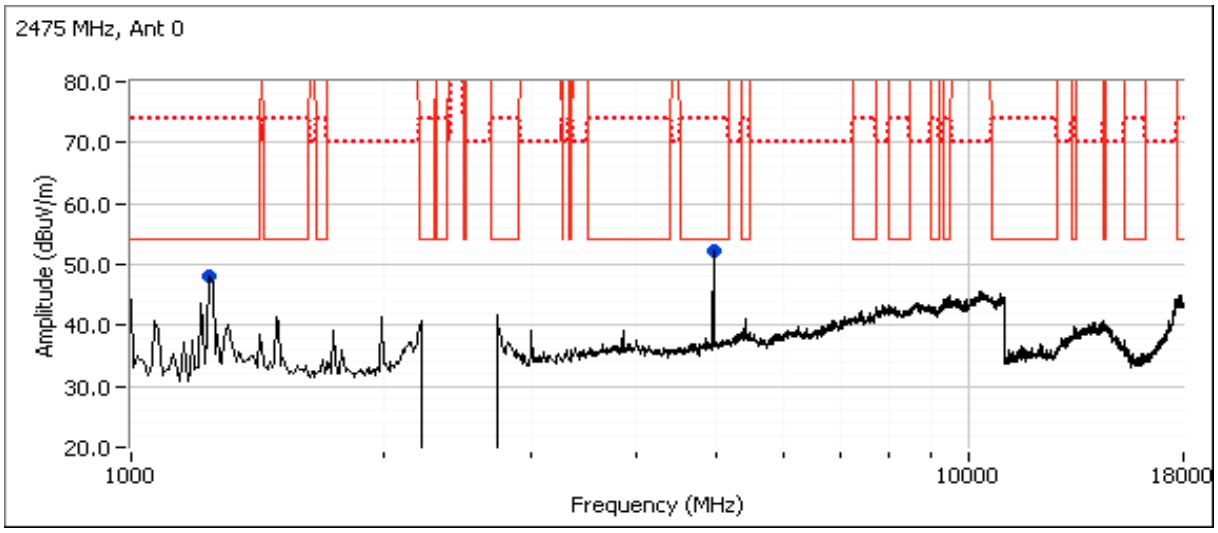
Fundamental Signal Field Strength: peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2474.740	91.9	V	-	-	Pk	170	1.2	POS; RB 100 kHz; VB: 300 kHz
2474.890	98.0	H	-	-	Pk	160	1.0	POS; RB 100 kHz; VB: 300 kHz

Fundamental emission level @ 3m in **100kHz RBW**:	98 dBµV/m	
Limit for emissions outside of restricted bands:	78 dBµV/m	Limit is -20dBc (Peak power measurement)
Limit for emissions outside of restricted bands:	68 dBµV/m	Limit is -30dBc (UNII power measurement)

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4949.020	35.1	V	54.0	-18.9	AVG	197	1.6	Note 3
4949.050	55.1	V	74.0	-18.9	PK	197	1.6	RB 1 MHz;VB 3 MHz;Peak
1248.850	48.1	H	54.0	-5.9	Peak	191	2.0	Not related to radio



Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	N/A

FCC 15.247 (DTS) 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.

Date of Test: 1/30/2017
Test Engineer: Rafael Varelas
Test Location: FT Chamber #7

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

General Test Configuration

The EUT does not provide an RF connector. All measurements performed radiated. For power and PSD measurements, the field strength was maximized at a distance of 3m.

All measurements have been corrected to allow for the external attenuators used.

Ambient Conditions:

Temperature: 20.1 °C
Rel. Humidity: 40 %

Summary of Results

Run #	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
1	3	-	Output Power	15.247(b)	Pass	5.9 dBm
2	3	-	Power spectral Density (PSD)	15.247(d)	Pass	-8.9 dBm/3kHz
3	3	-	Minimum 6dB Bandwidth	15.247(a)	Pass	1.6 MHz
3	3	-	99% Bandwidth	RSS GEN	-	2.4 MHz

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:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	N/A

Procedure Comments:

Measurements performed in accordance with FCC KDB 558074

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
RF4CE	-	1.00	Yes	1	0	0	10

Sample Notes

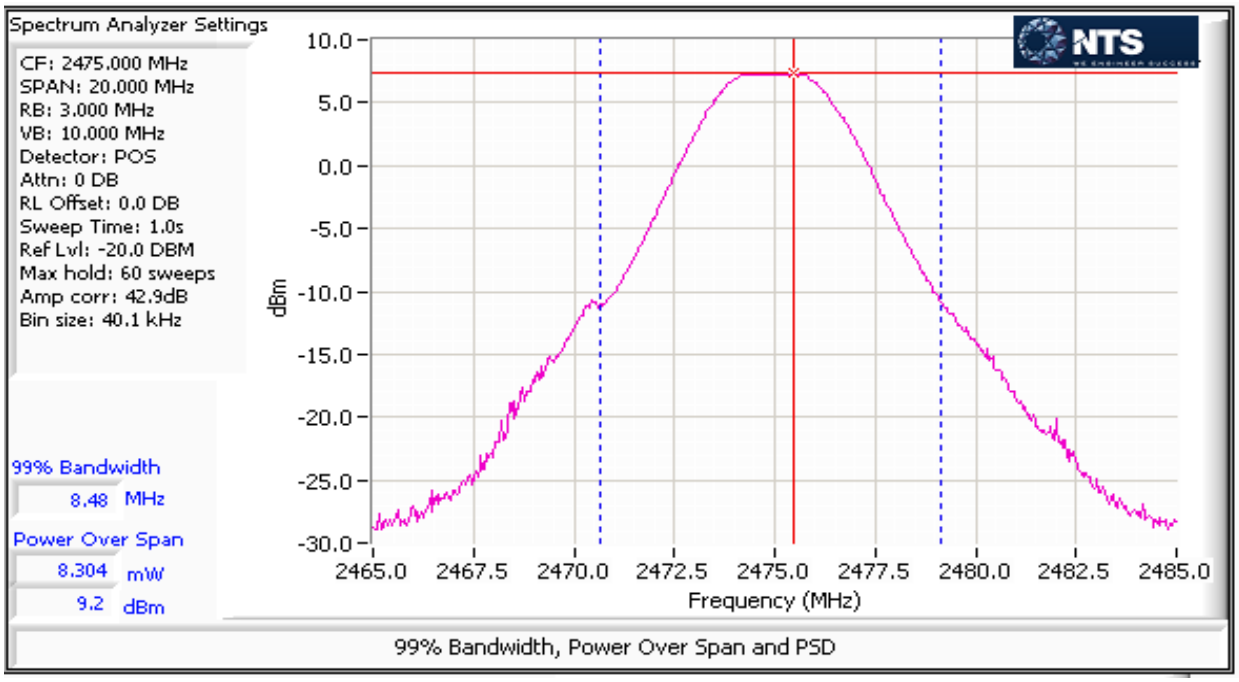
Sample S/N: G62DA6TB200126
Driver: -

Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	N/A

Run #1: Output Power

Power Setting[2]	Frequency (MHz)	EIRP [1] dBm	EIRP [1] W	Antenna Gain (dBi)	Output Power (dBm) [1]	Output Power mW	Result	
3	2425	8.4	0.007	3.27	5.1	3.3	Pass	Ant 0
3	2450	8.6	0.007	3.27	5.3	3.4	Pass	Ant 0
3	2450	7.1	0.005	3.27	3.8	2.4	Pass	Ant 1
3	2475	9.2	0.008	3.27	5.9	3.9	Pass	Ant 0

Note 1:	Output power measured using RBW > OBW, VBW=3xRBW, peak detector, max hold
Note 2:	Power setting - the software power setting used during testing, included for reference only.
Note 3:	Power measurement performed at the worse case orientation and measurement antenna polarity **(Horizontal).** Refer to the fundamental field strength measurements in the spurious emissions results.
Note 4:	As the device operates using Tx diversity, the power for each output was measured at the center channel. Measurements on the low and high channels were performed on the port with the highest EIRP.

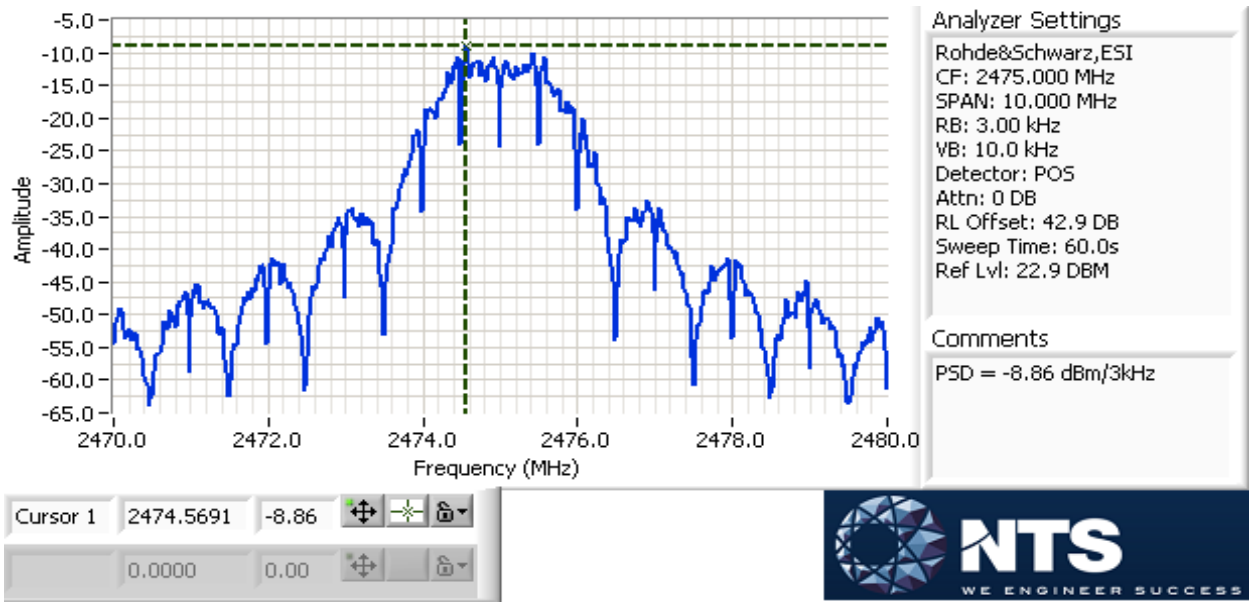


Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD (eirp) (dBm/3kHz) Note 1	Antenna Gain (dBi)	PSD (dBm/3kHz) Note 1	Limit dBm/3kHz	Result
3	2425	-10.8	3.27	-14.0	8.0	Pass
3	2450	-10.3	3.27	-13.5	8.0	Pass
3	2475	-8.9	3.27	-12.1	8.0	Pass

Note 1:	Power spectral density measured radiated. Test performed per method PKSPD, in KDB 558074. Power spectral density measured using: 3kHz ≤ RBW ≤ 100kHz, VBW=3*RBW, peak detector, span = 1.5*DTS BW, auto sweep time, max hold.
Note 2:	PSD performed radiated using Ant 0 (highest output power). Measurement performed at the worse case orientation and measurement antenna polarity (horizontal).



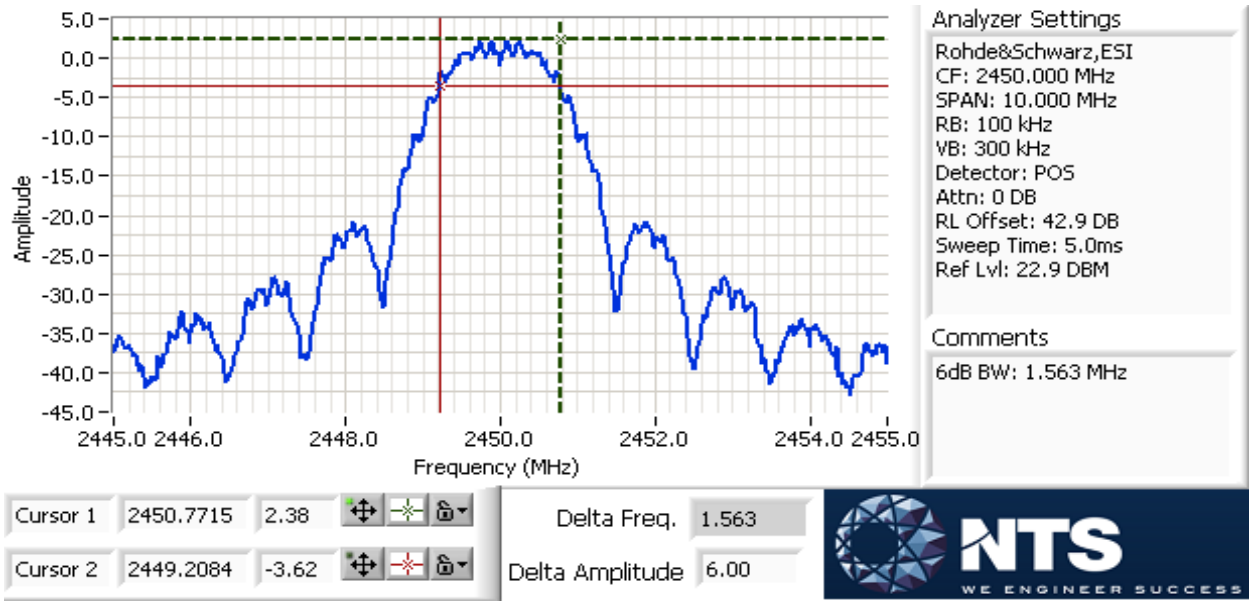
Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	N/A

Run #3: Signal Bandwidth

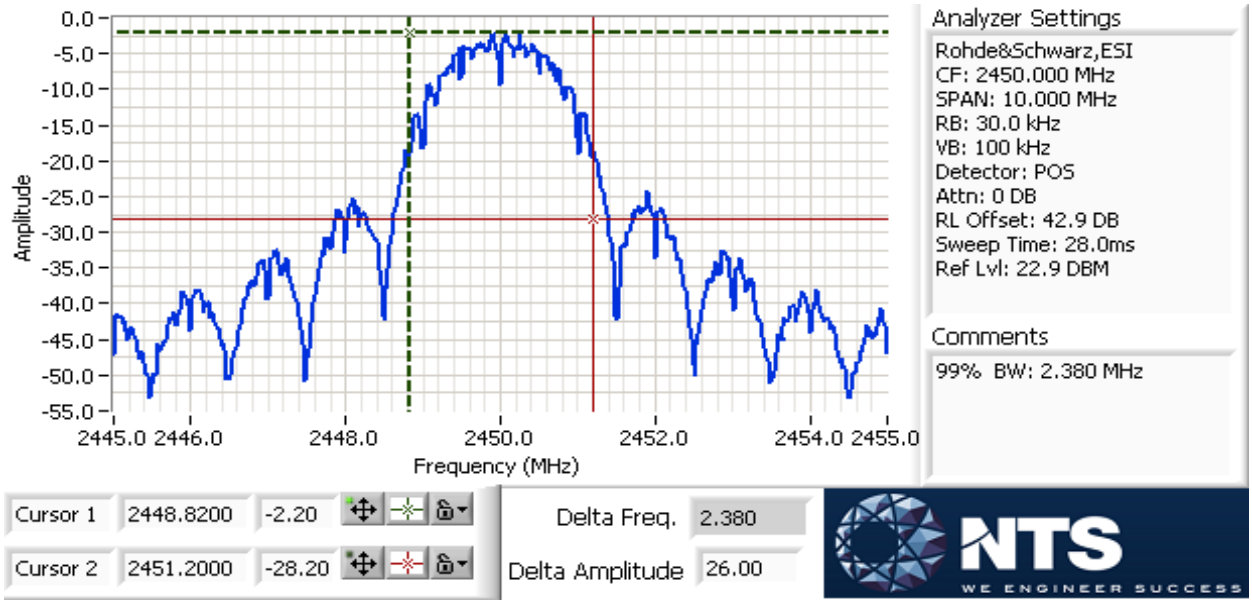
Mode: **RF4CE**

Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (kHz)	
		6dB	99%	6dB	99%
3	2425	1.6	2.4	100	30
3	2450	1.6	2.4	100	30
3	2475	1.6	2.4	100	30

Note 1:	DTS BW: RBW=100kHz, VBW ≥ 3*RBW, peak detector, max hold, auto sweep time, Span 2-5 times measured BW. 99% BW: RBW=1-5% of 99%BW, VBW ≥ 3*RBW, peak detector, max hold, auto sweep time. Span 1.5-5 times OBW.
Note 2:	Bandwidth measurements performed radiated using Ant 0 (highest output power). Measurement performed at the worse case orientation and measurement antenna polarity (horizontal).



Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	N/A



Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	N/A

RSS-247, FCC 15.247, FCC 15.407 Radiated Spurious Emissions

Test Specific Details

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

General Test Configuration

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

Ambient Conditions:

Temperature: 22.4 °C
Rel. Humidity: 41 %

Summary of Results

Run #	Mode	Channel	Target Power	Passing Power Setting	Test Performed	Limit	Result / Margin
Simultaneous Tx operation							
1	RF4CE a	2425MHz 40	3 90	3 90	Radiated Emissions, 30 - 1000MHz	FCC 15.209 / 15.247 / 15 E	42.5 dBµV/m @ 152.47 MHz (-1.0 dB)
	RF4CE a	2425MHz 40	3 90	3 86	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15.247 / 15 E	67.5 dBµV/m @ 10399.0 MHz (-0.8 dB)
2	RF4CE a	2475MHz 157	3 90	3 90	Radiated Emissions, 30 - 1000MHz	FCC 15.209 / 15.247 / 15 E	42.0 dBµV/m @ 152.47 MHz (-1.5 dB)
	RF4CE a	2475MHz 157	3 90	3 90	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15.247 / 15 E	52.7 dBµV/m @ 11567.8 MHz (-1.3 dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	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.

	Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
	RF4CE	-	1.00	Yes	1	0	0	10
1SS	11a	6MB/s	0.99	Yes	1.952	0	0	10

Sample Notes

Sample S/N: G62DA7BU20005B
Driver: -
Antenna: Internal 4x4

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 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)

Notes:

Serial cable connected directly to the motherboard to configure the radio operation. Responsible for non-radio reltated emissions observed below 1GHz. Would not be present during normal use.

Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	N/A

Run #1: Radiated Spurious Emissions

Date of Test: 3/8/2017 0:00 Config. Used: 1
Test Engineer: Joseph Cadigal/R. Varelas Config Change: none
Test Location: FT Chamber#7 EUT Voltage: 120V/60Hz

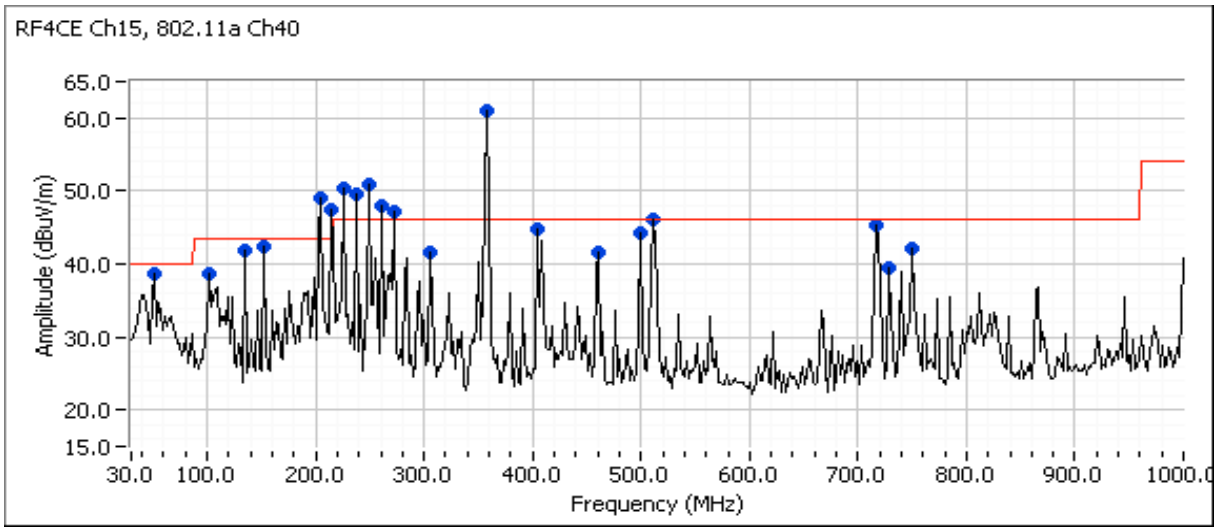
Channel: 2425MHz Mode: RF4CE
Tx Chain: Ant 0 Data Rate: -

Channel: 40 Mode: 11a
Tx Chain: 4Tx Data Rate: 6MB/s

Run #1a: 30-1000MHz

Frequency	Level	Pol	15.209 / 15.247 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
152.465	42.5	V	43.5	-1.0	Peak	324	1.0	
51.383	38.7	V	40.0	-1.3	Peak	136	1.0	
101.924	38.6	V	43.5	-4.9	Peak	274	1.0	
134.970	41.9	V	43.5	-1.6	Peak	234	1.0	
204.950	49.1	V	-	-	Peak	0	1.5	Not related to Radio
214.669	47.5	V	-	-	Peak	76	1.0	Not related to Radio
226.333	50.5	H	-	-	Peak	126	2.5	Not related to Radio
237.996	49.5	H	-	-	Peak	155	1.0	Not related to Radio
249.659	51.0	H	-	-	Peak	71	1.5	Not related to Radio
261.323	48.0	H	-	-	Peak	224	3.0	Not related to Radio
272.986	47.3	V	-	-	Peak	210	1.0	Not related to Radio
306.032	41.6	H	46.0	-4.4	Peak	338	1.5	
358.517	61.0	H	-	-	Peak	244	2.0	Not related to Radio
405.170	44.8	V	46.0	-1.2	Peak	225	1.0	
461.543	41.6	V	46.0	-4.4	Peak	309	1.0	
500.421	44.2	H	46.0	-1.8	Peak	220	1.5	
512.084	46.0	H	-	-	Peak	269	1.5	Not related to Radio
716.192	45.2	H	-	-	Peak	229	1.0	Not related to Radio
727.856	39.6	H	46.0	-6.4	Peak	230	1.5	
749.238	42.2	V	46.0	-3.8	Peak	269	1.0	

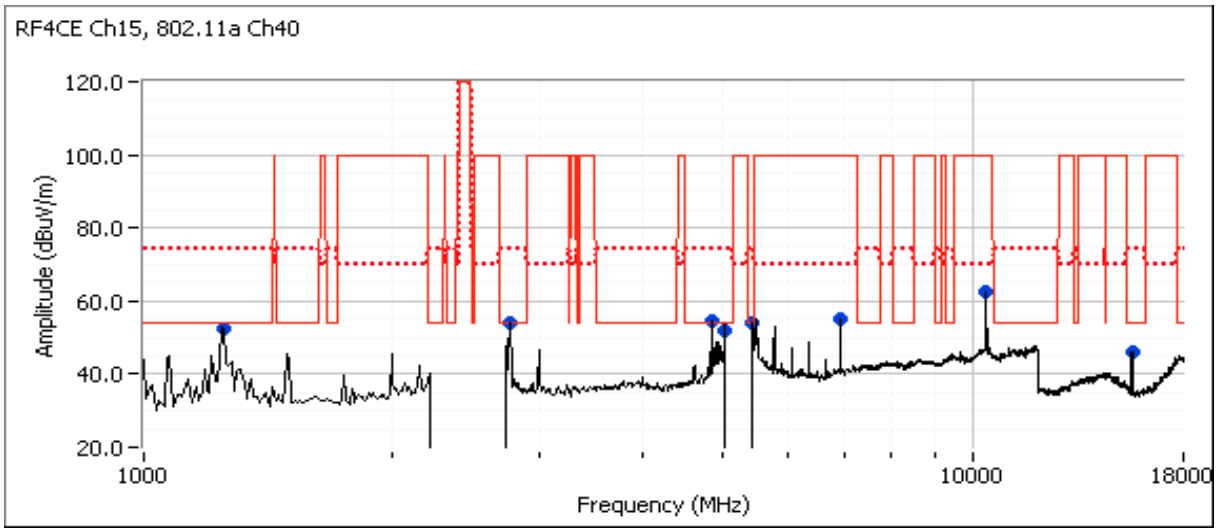
Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	N/A



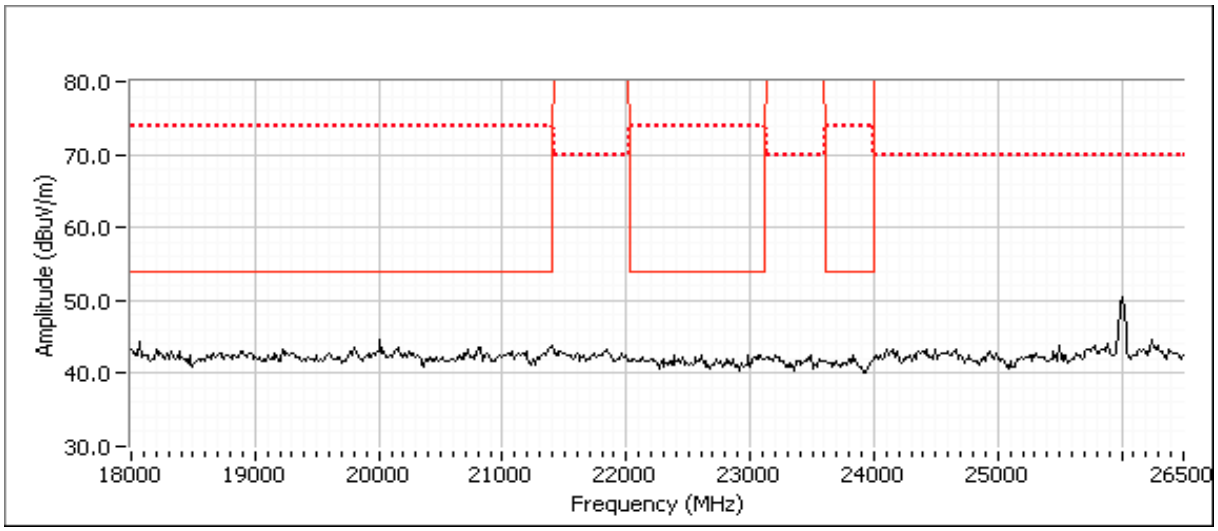
Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	N/A

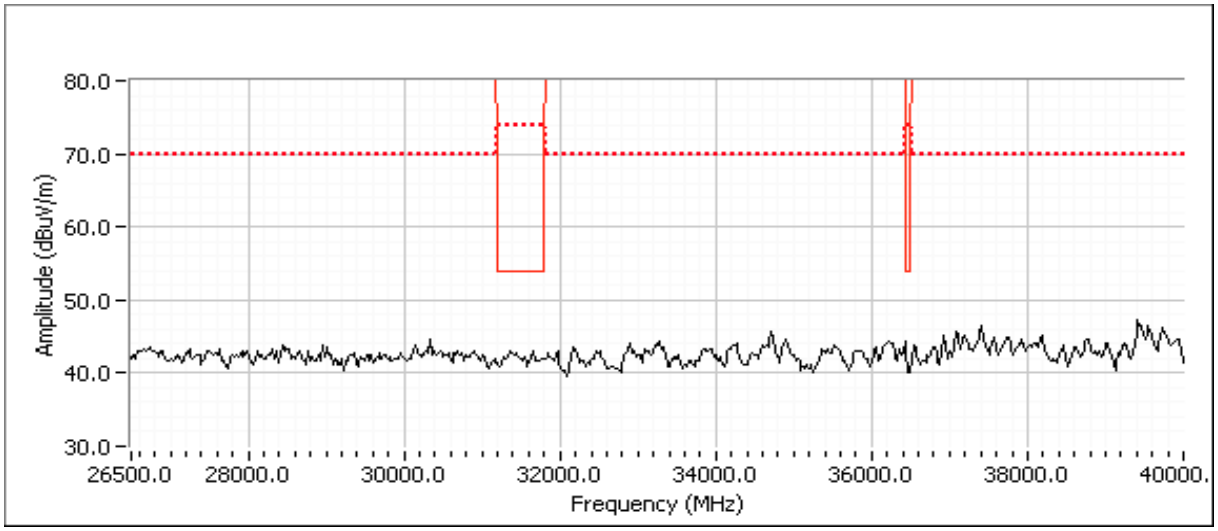
Run #1b: 1000-40000MHz

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
q90								
2772.430	51.3	H	54.0	-2.7	AVG	92	1.0	RB 1 MHz;VB 10 Hz;Peak
2772.100	60.9	H	74.0	-13.1	PK	92	1.0	RB 1 MHz;VB 3 MHz;Peak
1248.700	41.0	H	54.0	-13.0	AVG	186	2.4	RB 1 MHz;VB 10 Hz;Peak
1249.160	67.6	H	74.0	-6.4	PK	186	2.4	RB 1 MHz;VB 3 MHz;Peak
4850.960	51.1	V	54.0	-2.9	AVG	227	2.0	RB 1 MHz;VB 10 Hz;Peak
4851.180	58.5	V	74.0	-15.5	PK	227	2.0	RB 1 MHz;VB 3 MHz;Peak
5036.410	51.2	V	54.0	-2.8	AVG	254	1.5	RB 1 MHz;VB 10 Hz;Peak
5035.470	62.2	V	74.0	-11.8	PK	254	1.5	RB 1 MHz;VB 3 MHz;Peak
6933.300	58.1	V	68.3	-10.2	PK	336	1.0	RB 1 MHz;VB 3 MHz;Peak
5445.680	47.8	V	54.0	-6.2	AVG	342	1.0	RB 1 MHz;VB 10 Hz;Peak
5445.130	59.2	V	74.0	-14.8	PK	342	1.0	RB 1 MHz;VB 3 MHz;Peak
15592.560	48.5	V	54.0	-5.5	AVG	10	1.1	RB 1 MHz;VB 10 Hz;Peak
15589.160	60.4	V	74.0	-13.6	PK	10	1.1	RB 1 MHz;VB 3 MHz;Peak
10399.030	67.5	V	68.3	**-0.8**	PK	44	1.0	RB 1 MHz;VB 3 MHz;Peak



Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	N/A





Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	N/A

Run #2: Radiated Spurious Emissions

Date of Test: 3/8/2017 0:00 Config. Used: 1
Test Engineer: Rafael Varelas Config Change: none
Test Location: FT Chamber#7 EUT Voltage: 120V/60Hz

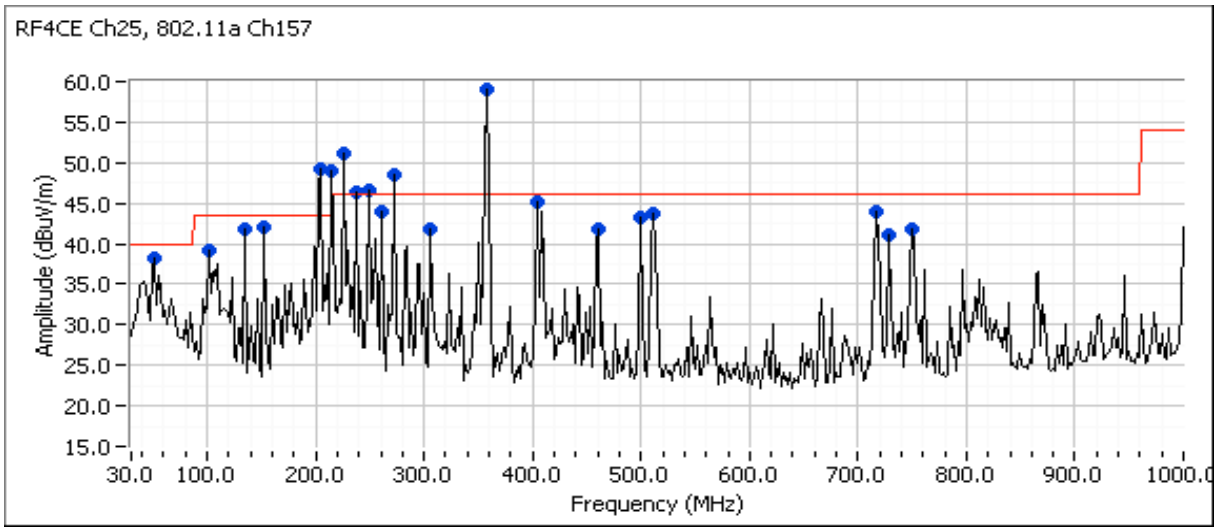
Channel: 2475MHz Mode: RF4CE
Tx Chain: Ant 0 Data Rate: -

Channel: 157 Mode: 11a
Tx Chain: 4Tx Data Rate: 6MB/s

Run #1a: 30-1000MHz

Frequency	Level	Pol	15.209 / 15.247 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
152.465	42.0	V	43.5	-1.5	Peak	299	1.0	
51.383	38.2	V	40.0	-1.8	Peak	126	1.0	
101.924	39.1	V	43.5	-4.4	Peak	348	1.0	
134.970	41.7	V	43.5	-1.8	Peak	259	1.0	
204.950	49.2	V	-	-	Peak	185	1.0	Not related to Radio
214.669	49.1	V	-	-	Peak	27	1.0	Not related to Radio
226.333	51.1	H	-	-	Peak	121	1.5	Not related to Radio
237.996	46.3	H	-	-	Peak	111	2.5	Not related to Radio
249.659	46.7	H	-	-	Peak	334	3.5	Not related to Radio
261.323	43.9	H	46.0	-2.1	Peak	313	2.0	
272.986	48.5	H	-	-	Peak	120	1.0	Not related to Radio
306.032	41.7	V	46.0	-4.3	Peak	224	1.5	
358.517	59.0	H	-	-	Peak	224	3.0	Not related to Radio
405.170	45.1	V	-	-	Peak	210	1.0	Not related to Radio
461.543	41.7	V	46.0	-4.3	Peak	289	1.0	
500.421	43.2	H	46.0	-2.8	Peak	215	1.5	
512.084	43.8	V	46.0	-2.2	Peak	304	1.0	
716.192	44.0	H	46.0	-2.0	Peak	254	1.0	
727.856	41.0	V	46.0	-5.0	Peak	353	1.0	
749.238	41.7	H	46.0	-4.3	Peak	224	1.0	

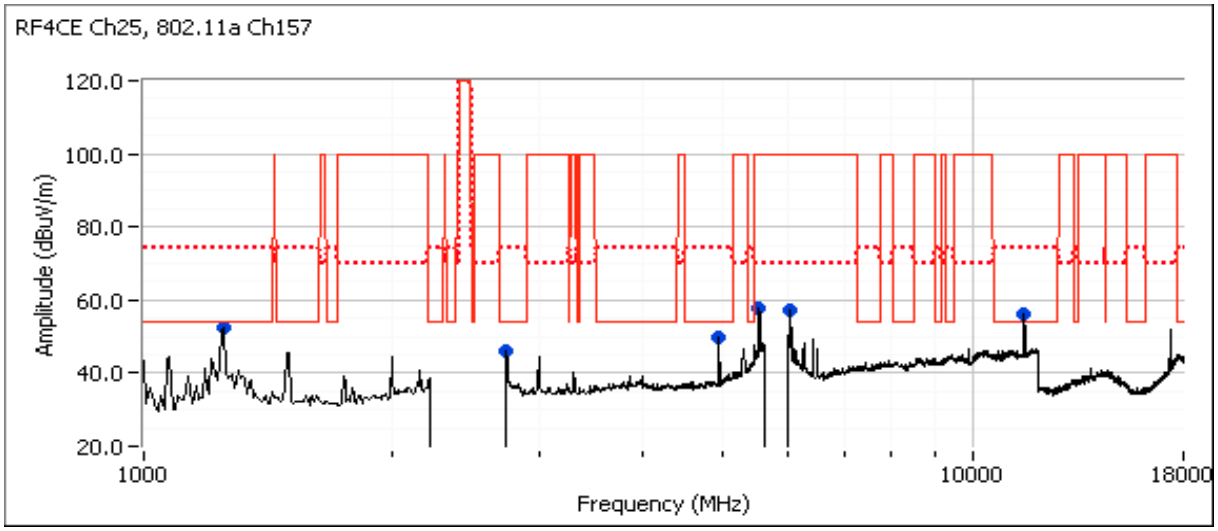
Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	N/A



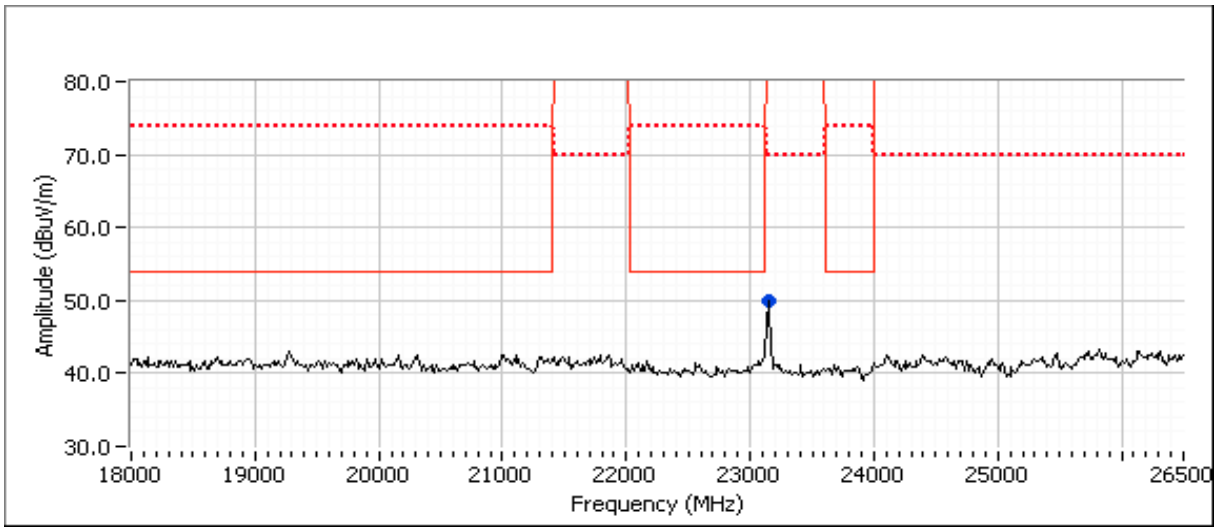
Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	N/A

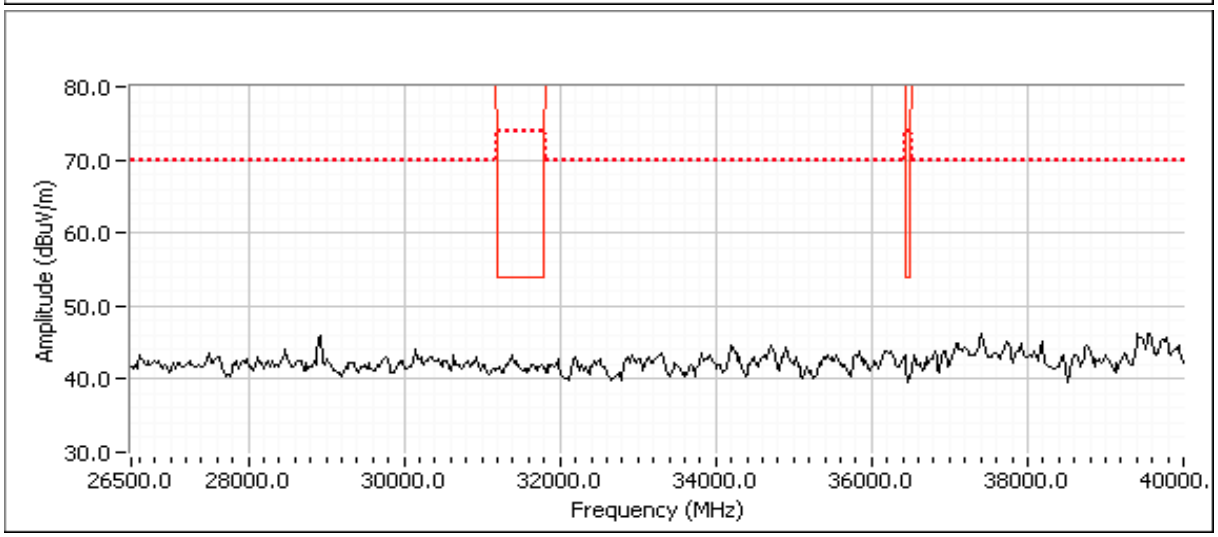
Run #1b: 1000-40000MHz

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11567.750	52.7	V	54.0	**-1.3**	AVG	356	1.0	RB 1 MHz;VB 10 Hz;Peak
11568.850	66.2	V	74.0	-7.8	PK	356	1.0	RB 1 MHz;VB 3 MHz;Peak
4949.060	47.7	V	54.0	-6.3	AVG	228	1.7	RB 1 MHz;VB 10 Hz;Peak
4948.930	55.2	V	74.0	-18.8	PK	228	1.7	RB 1 MHz;VB 3 MHz;Peak
2722.240	39.6	H	54.0	-14.4	AVG	185	1.0	RB 1 MHz;VB 10 Hz;Peak
2722.510	51.7	H	74.0	-22.3	PK	185	1.0	RB 1 MHz;VB 3 MHz;Peak
1248.780	41.7	H	54.0	-12.3	AVG	169	1.6	RB 1 MHz;VB 10 Hz;Peak
1248.840	66.0	H	74.0	-8.0	PK	169	1.6	RB 1 MHz;VB 3 MHz;Peak
6032.760	66.3	V	68.3	-2.0	PK	162	1.6	RB 1 MHz;VB 3 MHz;Peak
5549.810	65.8	V	68.3	-2.5	PK	96	1.2	RB 1 MHz;VB 3 MHz;Peak
23142.260	62.6	V	68.3	-5.7	PK	4	1.8	RB 1 MHz;VB 3 MHz;Peak



Client:	ARRIS	Job Number:	JD102669
Model:	C61W	T-Log Number:	T103891
		Project Manager:	Christine Krebill
Contact:	Mark Rieger	Project Coordinator:	-
Standard:	FCC 15.B / FCC 15.247 / 15.E	Class:	N/A





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