

EMC Test Report

Application for Grant of Equipment Authorization

*Industry Canada RSS-Gen Issue 3 / RSS 210 Issue 8
FCC Part 15, Subpart E*

CELF-RS225CU

IC CERTIFICATION #: 9298A-CRS225CU
FCC ID: YETCELF-RS225CU

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TEST SITE(S): Elliott Laboratories
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IC SITE REGISTRATION #: 2845B-3; 2845B-4, 2845B-5, 2845B-7

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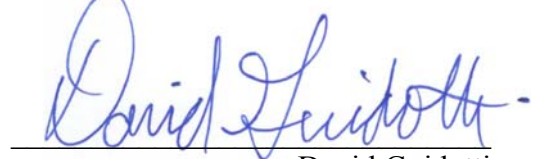
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SCOPE

An electromagnetic emissions test has been performed on the Nextivity Inc. CELFI-RS225CU, pursuant to the following rules:

Industry Canada RSS-Gen Issue 3

RSS 210 Issue 8 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"

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 Elliott Laboratories test procedures:

ANSI C63.4:2003

FCC UNII test procedure KDB789033

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

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

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

OBJECTIVE

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

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

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

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

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

STATEMENT OF COMPLIANCE

The tested sample of Nextivity Inc. CELFI-RS225CU complied with the requirements of the following regulations:

RSS 210 Issue 8 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"
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 Nextivity Inc. CELFI-RS225CU and therefore apply only to the tested sample. The sample was selected and prepared by Steve Van Skike of Nextivity Inc..

DEVIATIONS FROM THE STANDARDS

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

TEST RESULTS SUMMARY**UNII / LELAN DEVICES****Operation in the 5.47-5.60 and 5.65-5.725 GHz Bands**

| FCC Rule Part | RSS Rule Part | Description | Measured Value / Comments | Limit / Requirement | Result (margin) |
|---------------|---------------|---|---|--------------------------------------|-----------------|
| 15.407(a)(2) | - | 26dB Bandwidth | 36.6 MHz | N/A – limits output power if < 20MHz | N/A |
| - | A9.2(1) | 99% Bandwidth | 36.6 MHz | N/A – limits output power if < 20MHz | N/A |
| 15.407(a)(2) | A9.2(3) | Output Power | 114.8mW | 24 dBm / 250mW (eirp < 30dBm) | Complies |
| 15.407(a)(2) | | Power Spectral Density | 8.1dBm/1MHz | 11 dBm/MHz | Complies |
| | A9.2(3) | Power Spectral Density | | 11 dBm / MHz ¹ | Complies |
| KDB 443999 | A9.2(3) | Non-operation in 5600 – 5650 MHz sub band | Device cannot operate in the 5600 – 5650 MHz band –refer to Operational Description | | Complies |

Requirements for all U-NII/LELAN bands

| FCC Rule Part | RSS Rule Part | Description | Measured Value / Comments | Limit / Requirement | Result |
|-----------------------|---------------|---|--|---|----------|
| 15.407 | A9.4(1) | Modulation | OFDM Digital Modulation is used | Digital modulation is required | Complies |
| 15.407(b)(5) / 15.209 | A9.2 | Spurious Emissions | 51.5dBμV/m @ 5455.2MHz (-2.5dB) | Refer to page 21 | Complies |
| 15.407(a)(6) | - | Peak Excursion Ratio | 11.8dB | < 13dB | Complies |
| - | A9.4(3) | 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 | | N/A |
| 15.407 (c) | A9.4(4) | Operation in the absence of information to transmit | Operation never stops as information from cell tower is always present | Device shall automatically discontinue operation in the absence of information to transmit | Complies |
| 15.407 (g) | - | Frequency Stability | Frequency stability is better than 10ppm | Signal shall remain within the allocated band | Complies |
| 15.407 (h1) | A9.3 | Transmit Power Control | TPC is not required as the device operates at below 500mW eirp | The U-NII device shall have the capability to operate with a mean EIRP value lower than 24dBm (250mW) | Complies |

¹ Reduced from 11dBm because highest value exceeded the average value by more than 3dB

| FCC Rule Part | RSS Rule Part | Description | Measured Value / Comments | Limit / Requirement | Result |
|---------------|---------------|---|---|---|----------|
| 15.407 (h2) | A9.3 | Dynamic frequency Selection (device with radar detection) | Refer to separate test report, reference R87008 | Threshold -62dBm (-64dBm if eirp > 200mW) Channel Availability Check > 60s Channel closing transmission time < 260ms Channel move time < 10s Non occupancy period > 30minutes | Complies |
| | A9.4(5) | User Manual information | Refer to User Manual Statements | Warning regarding interference from Satellite Systems | Complies |
| - | A9.4(6) | User Manual | Refer to User Manual statements | Indoor use and antenna gain | Complies |
| - | A9.4(7) | User Manual | Refer to User Manual statements | Advice about high power radar interference | 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 | | Unique or integral antenna required | Complies |
| 15.207 | RSS GEN Table 2 | AC Conducted Emissions | 44.0 dBμV @ 0.179 MHz (-20.5 dB) | Refer to page 18 | Complies |
| 15.247 (b) (5) 15.407 (f) | RSS 102 | RF Exposure Requirements | Refer to MPE calculations in Exhibit 11, RSS 102 declaration and User Manual statements. | Refer to OET 65, FCC Part 1 and RSS 102 | Complies |
| - | RSP 100 RSS GEN 7.1.5 | User Manual | Refer to User Manual statements | Statement required regarding non-interference | Complies |
| - | RSP 100 RSS GEN 7.1.5 | User Manual | Device does not use detachable antennas | Statement for products with detachable antenna | Complies |
| - | RSP 100 RSS GEN 4.4.1 | 99% Bandwidth | 26.7 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) | dB μ V/m | 25 to 1000 MHz | ± 3.6 dB |
| | | 1000 to 40000 MHz | ± 6.0 dB |
| Conducted Emissions (AC Power) | dB μ V | 0.15 to 30 MHz | ± 2.4 dB |

EQUIPMENT UNDER TEST (EUT) DETAILS**GENERAL**

The Nextivity Inc. model CELFI-RS225CU is half of a smart repeater system that receives a cell signal from a cell site, converts it to a signal in the 5 GHz ISM band & transmits that to another close by transceiver inside a building, which receives & converts it back to a cell signal. That cell signal is then transmitted to any cell phones in the building. The uplink from cell phones is this process in reverse. The EUT was treated as table-top equipment during testing to most closely simulate the end-user environment. The electrical rating of the EUT is 100-240 Volts, 50-60 Hz, 0.7 Amps.

The sample was received on March 13, 2012 and tested on March 20 and April 6, 2012. The EUT consisted of the following component(s):

| Company | Model | Description | Serial Number | FCC ID |
|---------------|------------------|-----------------------------|---------------|---------------------|
| Nextivity Inc | CELF- RS225CU | Smart cell band repeater | 150206000097 | YETCELF- RS225CU |

ANTENNA SYSTEM

The antenna is integral to the device.

ENCLOSURE

The CU is primarily constructed of plastic. It measures approximately 157mm H x 145mm W x 58mm D.

MODIFICATIONS

No modifications were made to the EUT during the time the product was at Elliott.

SUPPORT EQUIPMENT

No support equipment was used during testing.

EUT INTERFACE PORTS

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

| Port | Connected To | Description | Cable(s) | Length(m) |
|------------------------|-------------------------|----------------|------------------------|-----------|
| | | | Shielded or Unshielded | |
| DC Power | External pwr supply out | 2 wire | Unshielded | 2 |
| External pwr supply in | AC Mains | Direct plug-in | NA | NA |

Note: The custom USB port was not connected during testing. Nextivity stated that this is for setup purposes and therefore would not normally be connected. The external antenna port was not connected during Tx testing.

EUT OPERATION

During emissions testing the EUT was transmitting at full power on the channel called out in the specific test, or receiving on the channel called out in the specific test.

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 | Registration Numbers | | Location |
|-----------|----------------------|---------|---|
| | FCC | Canada | |
| Chamber 5 | 211948 | 2845B-5 | 41039 Boyce Road Fremont, CA 94538-2435 |
| Chamber 4 | 211948 | 2845B-4 | |

ANSI C63.4:2003 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 C63.4:2003.

CONDUCTED EMISSIONS CONSIDERATIONS

Conducted emissions testing is performed in conformance with ANSI C63.4:2003. 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 C63.4:2003 guidelines and meet the Normalized Site Attenuation (NSA) requirements of ANSI C63.4:2003.

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

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 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 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 C63.4:2003 specifies that the test height above ground for table mounted devices shall be 80 centimeters. Floor mounted equipment shall be placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material from 3 to 12 mm if the device is normally used on a non-conductive floor. 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 C63.4:2003, 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.

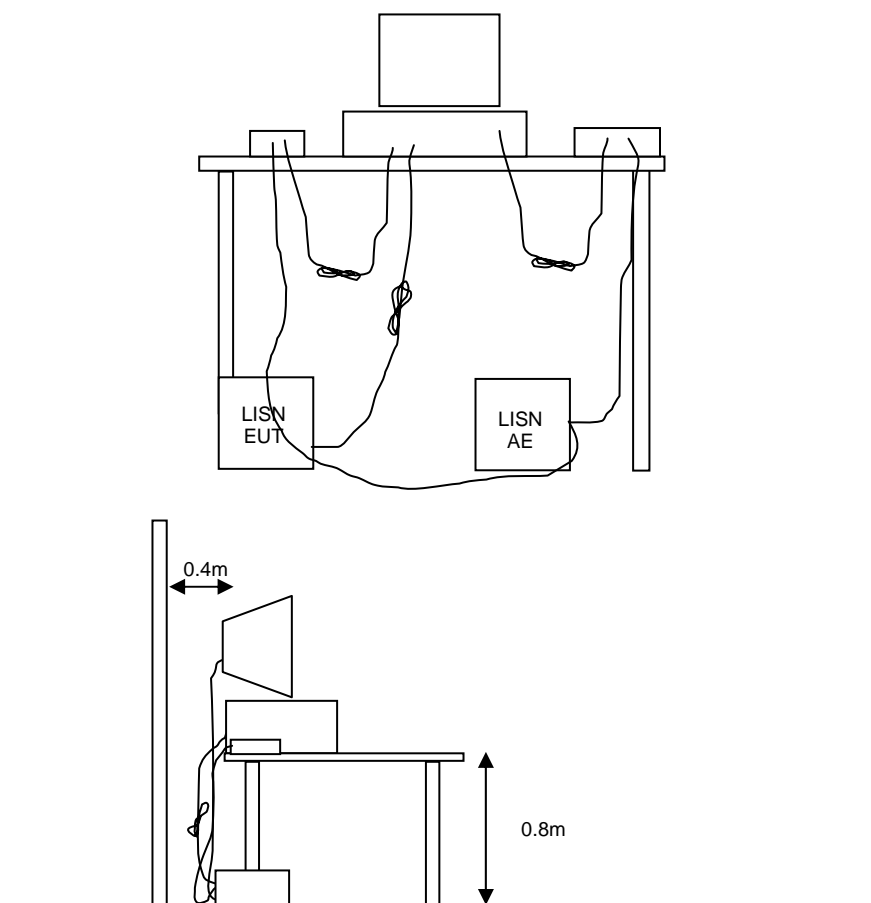


Figure 1 Typical Conducted Emissions Test Configuration

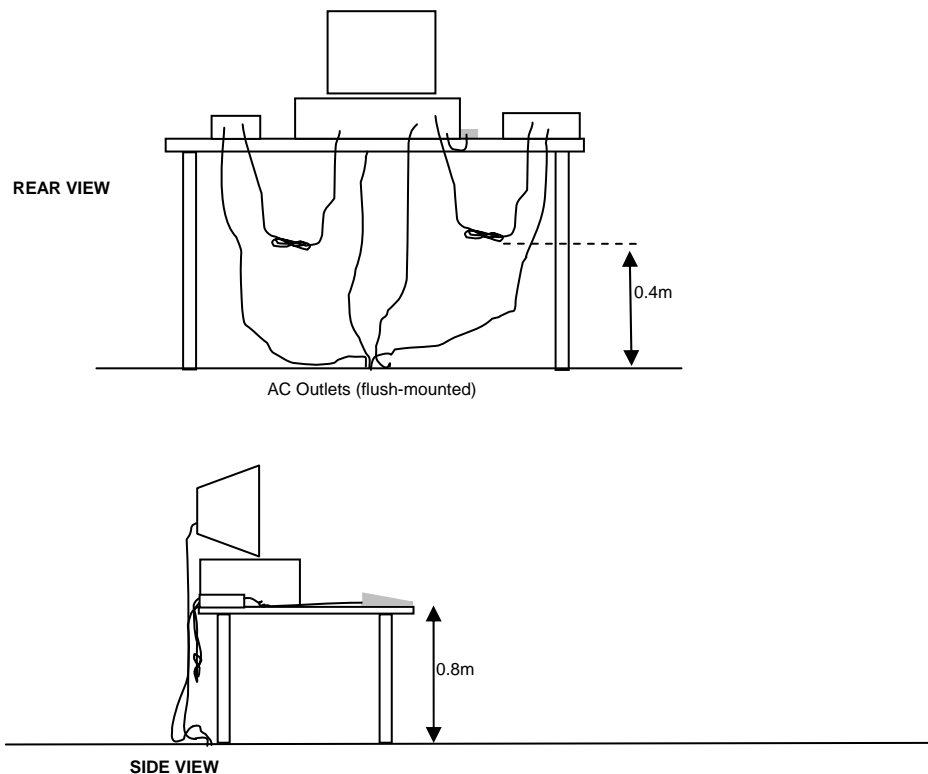
RADIATED EMISSIONS

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.

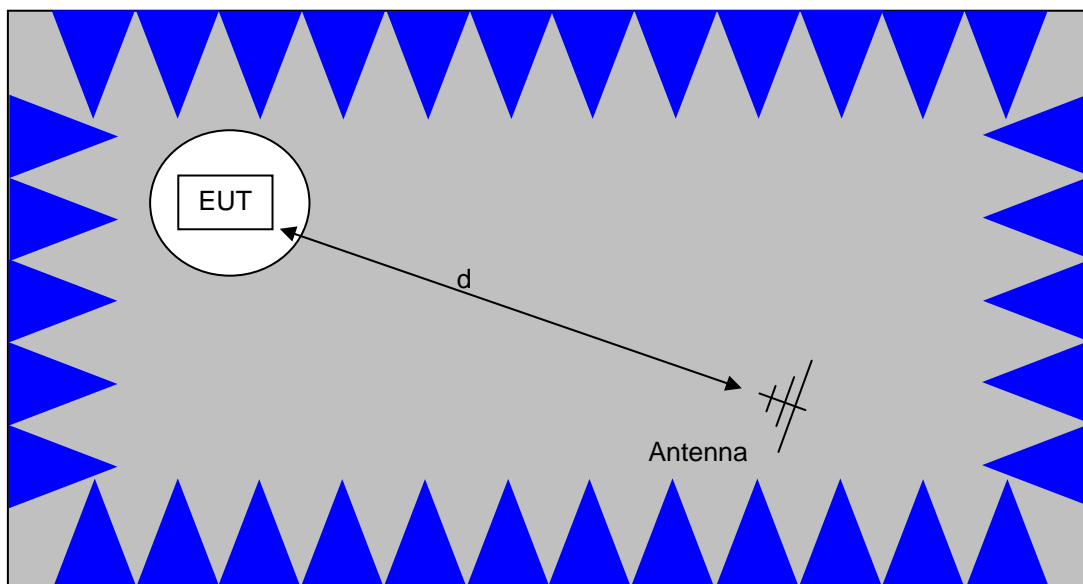
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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.

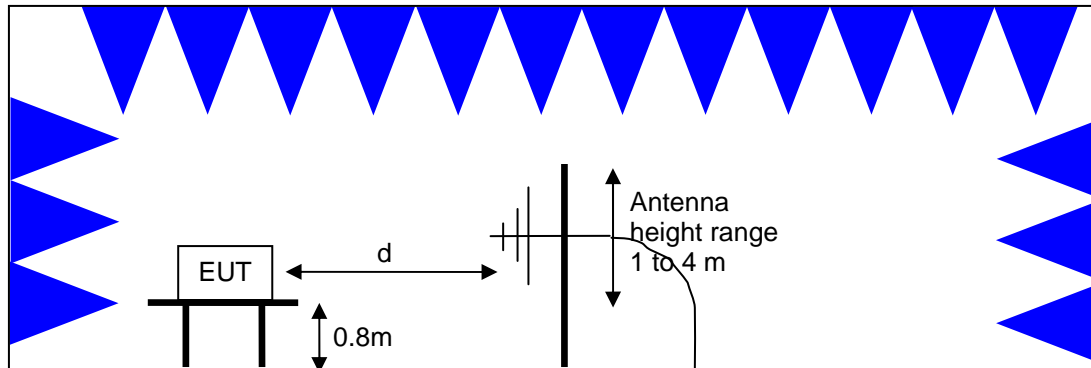


Typical Test Configuration for Radiated Field Strength Measurements



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.

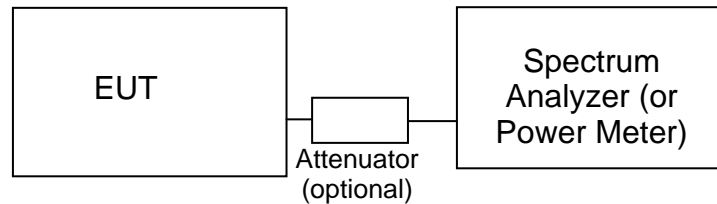
Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.



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 Elliott'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 and/or 26dB signal bandwidth is measured in using the bandwidths recommended by ANSI C63.4. When required, the 99% bandwidth is measured using the methods detailed in 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 bands² (with the exception of transmitters operating under FCC Part 15 Subpart D and RSS 210 Annex 9), the limits for all emissions from a low power device operating under the general rules of RSS 310 (tables 3 and 4), RSS 210 (table 2) and FCC Part 15 Subpart C section 15.209.

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

RECEIVER RADIATED SPURIOUS EMISSIONS SPECIFICATION LIMITS

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

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

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

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 | 50mW (17 dBm) | 4 dBm/MHz |
| 5250 – 5350 | 250 mW (24 dBm) | 11 dBm/MHz |
| 5725 – 5825 | 1 Watts (30 dBm) | 17 dBm/MHz |

For system using antennas with gains exceeding 6dBi, the output power and power spectral density limits are reduced by 1dB for every dB the antenna gain exceeds 6dBi. Fixed point-to-point applications using the 5725 – 5825 MHz band may use antennas with gains of up to 23dBi without this limitation. If the gain exceeds 23dBi then the output power limit of 1 Watt is reduced by 1dB for every dB the gain exceeds 23dBi.

The peak excursion envelope is limited to 13dB.

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 | 200mW (23 dBm) eirp | 10 dBm/MHz eirp |
| 5250 – 5350 | 250 mW (24 dBm) ³ 1W (30dBm) eirp | 11 dBm/MHz |
| 5470 – 5725 | 250 mW (24 dBm) ⁴ 1W (30dBm) eirp | 11 dBm/MHz |
| 5725 – 5825 | 1 Watts (30 dBm) 4W eirp | 17 dBm/MHz |

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 $10\log(\text{EBW})$ where EBW is the 99% power bandwidth.

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

³ If EIRP exceeds 500mW the device must employ TPC

⁴ If EIRP exceeds 500mW the device must employ TPC

SPURIOUS EMISSIONS LIMITS –UNII and LELAN DEVICES

The spurious emissions limits for signals below 1GHz are the FCC/RSS-GEN general limits. For emissions above 1GHz, signals in restricted bands are subject to the FCC/RSS GEN general limits. All other signals have a limit of –27dBm/MHz, which is a field strength of 68.3dBuV/m/MHz at a distance of 3m. This is an average limit so the peak value of the emission may not exceed –7dBm/MHz (88.3dBuV/m/MHz at a distance of 3m). For devices operating in the 5725-5850Mhz bands under the LELAN/UNII rules, the limit within 10Mhz of the allocated band is increased to –17dBm/MHz.

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:

$$R_r = \text{Receiver Reading in dBuV/m}$$

$$F_d = \text{Distance Factor in dB}$$

$$R_c = \text{Corrected Reading in dBuV/m}$$

$$L_s = \text{Specification Limit in dBuV/m}$$

$$M = \text{Margin in dB Relative to Spec}$$

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**Conducted Emissions - AC Power Ports, 20-Mar-12**

| <u>Manufacturer</u> | <u>Description</u> | <u>Model</u> | <u>Asset #</u> | <u>Cal Due</u> |
|---------------------|-------------------------------------|-----------------------|----------------|----------------|
| Rohde & Schwarz | Pulse Limiter | ESH3 Z2 | 1401 | 4/21/2012 |
| Fischer Custom Comm | LISN, 25A, 150kHz to 30MHz, 25 Amp, | FCC-LISN-50-25-2-09 | 2000 | 10/18/2012 |
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-40 GHz | ESIB40 (1088.7490.40) | 2493 | 12/9/2012 |

Radiated Emissions, 1000 - 18,000 MHz, 06-Apr-12

| <u>Manufacturer</u> | <u>Description</u> | <u>Model</u> | <u>Asset #</u> | <u>Cal Due</u> |
|---------------------|--------------------------------------|----------------|----------------|----------------|
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-7 GHz | ESIB7 | 1538 | 12/6/2012 |
| EMCO | Antenna, Horn, 1-18 GHz | 3115 | 1561 | 6/22/2012 |
| Micro-Tronics | Band Reject Filter, 5470-5725 MHz | BRC50704-02 | 1730 | 8/5/2012 |
| Hewlett Packard | Microwave Preamplifier, 1-26.5GHz | 8449B | 2199 | 2/23/2013 |
| Hewlett Packard | SpecAn 9 kHz - 40 GHz, (SA40) Purple | 8564E (84125C) | 2415 | 7/28/2012 |

Radiated Power, 06-Apr-12

| <u>Manufacturer</u> | <u>Description</u> | <u>Model #</u> | <u>Asset #</u> | <u>Cal Due</u> |
|---------------------|--------------------------------|----------------|----------------|----------------|
| Rohde & Schwarz | EMI Test Receiver, 20 Hz-7 GHz | ESIB7 | 1538 | 06-Dec-12 |
| EMCO | Antenna, Horn, 1-18 GHz | 3115 | 1561 | 22-Jun-12 |

Appendix B Test Data

T86797 Pages 25 –44



EMC Test Data

| | | | |
|------------------------|-------------------------------|------------------|---------------------|
| Client: | Nextivity Inc | Job Number: | J86441 |
| Model: | CELF1-RS225CU & CELFI-RS225WU | T-Log Number: | T86797 |
| | | Account Manager: | Sheareen Washington |
| Contact: | Steve van Skike | | - |
| Emissions Standard(s): | FCC 15B & 15E, RSS-210 | Class: | - |
| Immunity Standard(s): | - | Environment: | - |

EMC Test Data

For The

Nextivity Inc

Model

CELF1-RS225CU & CELFI-RS225WU

Date of Last Test: 4/11/2012

| | | | |
|-----------|------------------------------|------------------|---------------------|
| Client: | Nextivity Inc | Job Number: | J86441 |
| Model: | CELF-RS225CU & CELFI-RS225WU | T-Log Number: | T86797 |
| Contact: | Steve van Skike | Account Manager: | Sheareen Washington |
| Standard: | FCC 15B & 15E, RSS-210 | Class: | N/A |

RSS-210 (LELAN) and FCC 15.407(UNII) Power, PSD, Peak Excursion and Bandwidth

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: 4/6/2012
Test Engineer: Rafael Varelas
Test Location: FT Chamber #4

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

Summary of Results

| Run # | Test Performed | Limit | Pass / Fail | Result / Margin |
|-------|-------------------------|-----------------------|-------------|-----------------|
| 1 | Power, 5460 - 5725 MHz | 15.407(a) (1), (2) | Pass | 114.8mW |
| 1 | PSD, 5460 - 5725 MHz | 15.407(a) (1), (2) | Pass | 8.1dBm/1MHz |
| 1 | 26dB Bandwidth | 15.407 | - | 36.6 MHz |
| 1 | 99% Bandwidth | RSS 210 | N/A | 26.7 MHz |
| 2 | Peak Excursion Envelope | 15.407(a) (6) 13dB | Pass | 11.8dB |

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.
The EUT was radiating through its internal antenna. The emission was maximized, & EIRP was measured as described in the notes below.
For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

Ambient Conditions:

Temperature: 20.3 °C
Rel. Humidity: 35 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

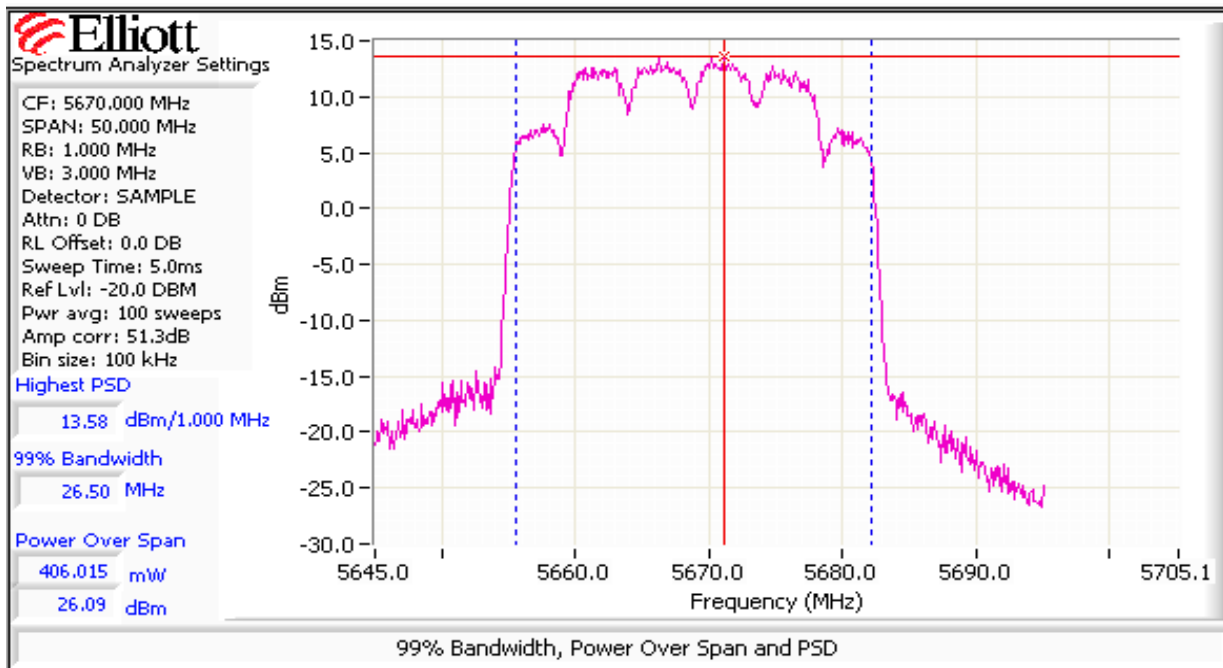
| | | | |
|-----------|------------------------------|------------------|---------------------|
| Client: | Nextivity Inc | Job Number: | J86441 |
| Model: | CELF-IR225CU & CELFI-RS225WU | T-Log Number: | T86797 |
| Contact: | Steve van Skike | Account Manager: | Sheareen Washington |
| Standard: | FCC 15B & 15E, RSS-210 | Class: | N/A |

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

| | |
|---------|--|
| Note 1: | Output power measured using a spectrum analyzer (see plots below). RBW=1MHz, VB=3 MHz, # of points in sweep $\geq 2 \times \text{span}/\text{RBW}$, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50MHz (method SA-1 of KDB 789033). |
| Note 2: | Measured using the same analyzer settings used for output power. |
| Note 3: | For RSS-210 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 RSS GEN - RB > 1% of span and VB $\geq 3 \times \text{RB}$ |

Single Chain Operation, 5470- 5725 MHz Band

| Antenna Gain (dBi): 5.5 | | | | EIRP: 406.0 mW | | 26.1 dBm | | | | |
|-------------------------|------------------|-----------|------------------|-------------------------------|-------|---------------|--------------------------|-----------|------------------------|--------|
| Frequency (MHz) | Software Setting | Bandwidth | | Output Power ¹ dBm | | Power (Watts) | PSD ² dBm/MHz | | | Result |
| | | 26dB | 99% ⁴ | Measured | Limit | | Measured | FCC Limit | RSS Limit ³ | |
| 5525 | Max | 36.4 | 26.7 | 17.9 | 24.0 | 0.062 | 4.7 | 11.0 | 11.0 | Pass |
| 5580 | Max | 30.6 | 26.3 | 19.4 | 24.0 | 0.087 | 6.7 | 11.0 | 11.0 | Pass |
| 5670 | Max | 36.6 | 26.5 | 20.6 | 24.0 | 0.114 | 8.1 | 11.0 | 11.0 | Pass |



| | |
|--------------------------------------|--------------------------------------|
| Client: Nextivity Inc | Job Number: J86441 |
| Model: CELFI-RS225CU & CELFI-RS225WU | T-Log Number: T86797 |
| Contact: Steve van Skike | Account Manager: Sheareen Washington |
| Standard: FCC 15B & 15E, RSS-210 | Class: N/A |

Run #2: Peak Excursion Measurement

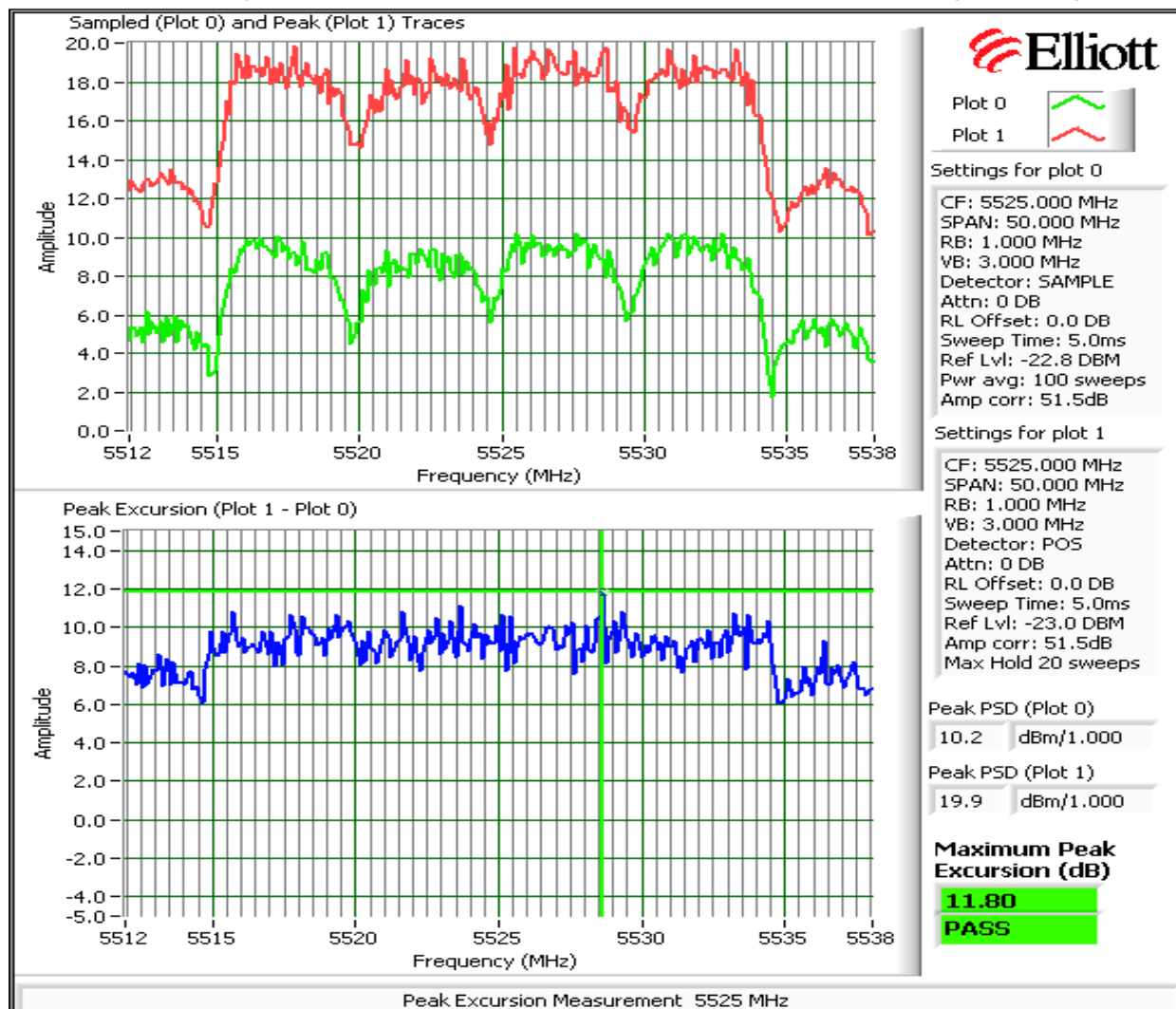
20MHz: Device meets the requirement for the peak excursion

| Freq | Peak Excursion(dB) | | Freq | Peak Excursion(dB) | | Freq | Peak Excursion(dB) | |
|-------|--------------------|-------|-------|--------------------|-------|-------|--------------------|-------|
| (MHz) | Value | Limit | (MHz) | Value | Limit | (MHz) | Value | Limit |
| 5525 | 11.8 | 13.0 | 5580 | 11.6 | 13.0 | 5670 | 11.3 | 13.0 |

Plots Showing Peak Excursion

Trace A: RBW = 1MHz, VBW = 3MHz, Peak hold

Trace B: Same settings as used for power/PSD measurements (RBW = 1 MHz, VBW = 3MHz, Integrated average power)



| | | | |
|-----------|-------------------------------|------------------|---------------------|
| Client: | Nextivity Inc | Job Number: | J86441 |
| Model: | CELF- RS225CU & CELF- RS225WU | T-Log Number: | T86797 |
| Contact: | Steve van Skike | Account Manager: | Sheareen Washington |
| Standard: | FCC 15B & 15E, RSS-210 | Class: | N/A |

RSS 210 and FCC 15.407 (UNII) Radiated Spurious Emissions

Test Specific Details

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

Date of Test: 4/6/2012 0:00
Test Engineer: Rafael Varelas
Test Location: Fremont Chamber #4

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

General Test Configuration

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

For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

Ambient Conditions:

Temperature: 20.6 °C
Rel. Humidity: 33 %

Summary of Results

| Run # | Mode | Channel | Power Setting | Measured Power | Test Performed | Limit | Result / Margin |
|----------------|-------------|--------------------|---------------|----------------|-------------------------------------|-------------------|------------------------------------|
| 1 5470-5725 | Proprietary | Low 5525 MHz | Max | - | Restricted Band Edge at 5460 MHz | 15.209 | 51.5dBµV/m @ 5455.2MHz (-2.5dB) |
| | | | | - | Band Edge 5460 - 5470 MHz | 15E | 65.1 dBµV/m @ 5469.7 MHz (-3.2 dB) |
| | | | | - | Radiated Emissions, 30 MHz - 40 GHz | FCC 15.209 / 15 E | No significant emissions observed |
| | | Center 5580 MHz | | - | Radiated Emissions, 1 - 40 GHz | FCC 15.209 / 15 E | 46.1dBµV/m @ 11160.5MHz (-7.9dB) |
| | | High 5670 MHz | | - | Band Edge 5725MHz | 15E | 64.9 dBµV/m @ 5725.0 MHz (-3.4 dB) |
| | | | | - | Radiated Emissions, 1 - 40 GHz | FCC 15.209 / 15 E | 50.6dBµV/m @ 11338.6MHz (-3.4dB) |

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: | Nextivity Inc | Job Number: | J86441 |
| Model: | CELF- RS225CU & CELF- RS225WU | T-Log Number: | T86797 |
| | | Account Manager: | Sheareen Washington |
| Contact: | Steve van Skike | | |
| Standard: | FCC 15B & 15E, RSS-210 | Class: | N/A |

Test Procedure Comments:

Unless otherwise noted, average measurements above 1GHz were performed as documented in FCC KDB 789033 G) 6) d) Method VB

Antenna: connected.
 Duty Cycle: 100%

| | | | |
|-----------|---------------------------------|------------------|---------------------|
| Client: | Nextivity Inc | Job Number: | J86441 |
| Model: | CELF-1-RS225CU & CELF-1-RS225WU | T-Log Number: | T86797 |
| Contact: | Steve van Skike | Account Manager: | Sheareen Washington |
| Standard: | FCC 15B & 15E, RSS-210 | Class: | N/A |

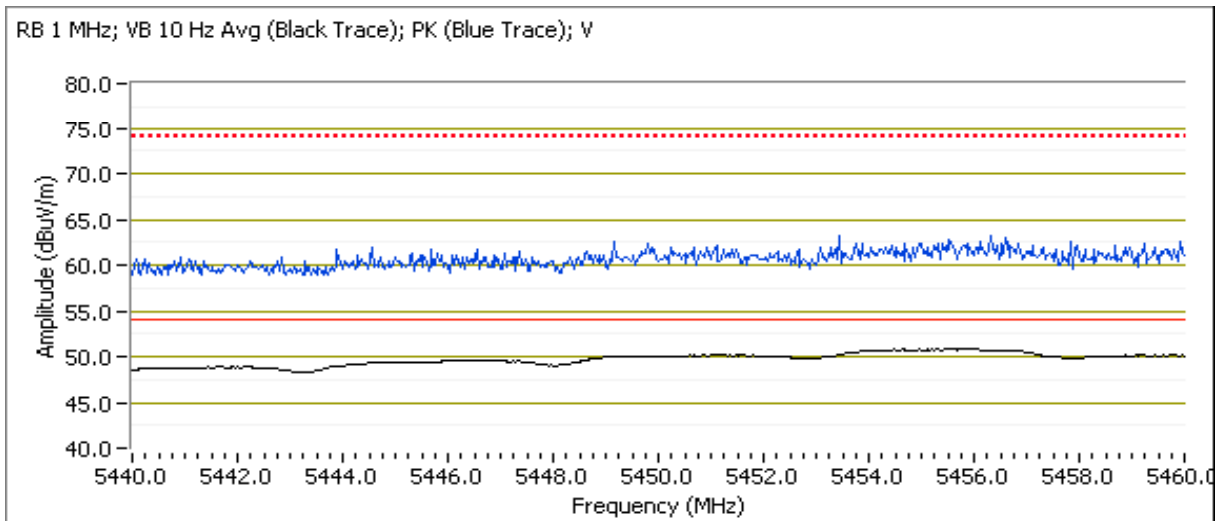
Run #1, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5470-5725 MHz Band

Date of Test: 4/6/2012
Test Engineer: Rafael Varelas
Test Location: FT4

Run #1a: Low Channel @ 5525 MHz

5350-5460 MHz Restricted Band Edge Signal Radiated Field Strength

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|-----------|--------------|-----|------------|--------|-----------|---------|--------|----------------------|
| MHz | dB μ V/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 5455.200 | 51.5 | V | 54.0 | -2.5 | AVG | 55 | 1.0 | RB 1 MHz;VB 10 Hz;Pk |
| 5454.730 | 62.6 | V | 74.0 | -11.4 | PK | 55 | 1.0 | RB 1 MHz;VB 3 MHz;Pk |
| 5456.200 | 46.8 | H | 54.0 | -7.2 | AVG | 200 | 1.1 | RB 1 MHz;VB 10 Hz;Pk |
| 5450.870 | 57.8 | H | 74.0 | -16.2 | PK | 200 | 1.1 | RB 1 MHz;VB 3 MHz;Pk |

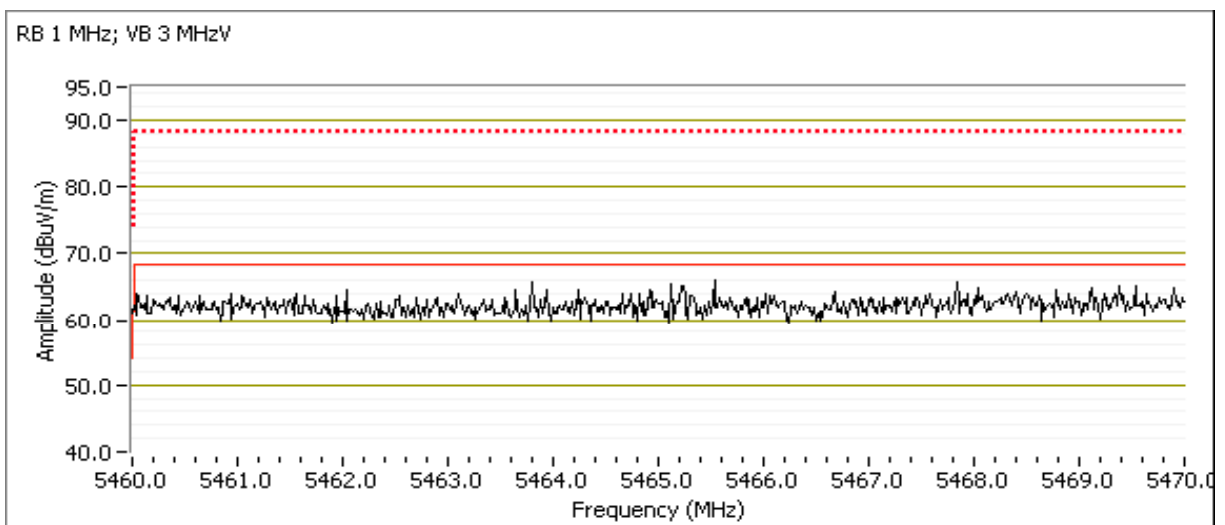


| | | | |
|-----------|-------------------------------|------------------|---------------------|
| Client: | Nextivity Inc | Job Number: | J86441 |
| Model: | CELFI-RS225CU & CELFI-RS225WU | T-Log Number: | T86797 |
| Contact: | Steve van Skike | Account Manager: | Sheareen Washington |
| Standard: | FCC 15B & 15E, RSS-210 | Class: | N/A |

Date of Test: 4/11/2012
Test Engineer: John Caizzi
Test Location: FT3

5460-5470 MHz Restricted Band Edge Radiated Field Strength

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|-----------|--------------|-----|------------|--------|-----------|---------|--------|----------|
| MHz | dB μ V/m | v/h | Limit | Margin | PK/QP/Avg | degrees | meters | |
| 5469.680 | 65.1 | V | 68.3 | -3.2 | PK | 333 | 1.30 | |
| 5468.820 | 58.2 | H | 68.3 | -10.1 | PK | 205 | 1.32 | |

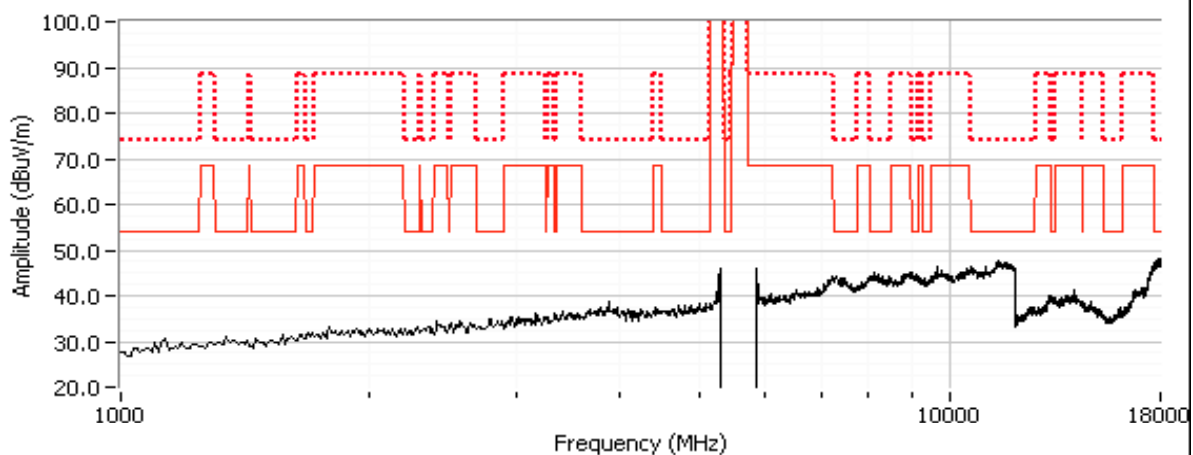


| | | | |
|-----------|-------------------------------|------------------|---------------------|
| Client: | Nextivity Inc | Job Number: | J86441 |
| Model: | CELFI-RS225CU & CELFI-RS225WU | T-Log Number: | T86797 |
| Contact: | Steve van Skike | Account Manager: | Sheareen Washington |
| Standard: | FCC 15B & 15E, RSS-210 | Class: | N/A |

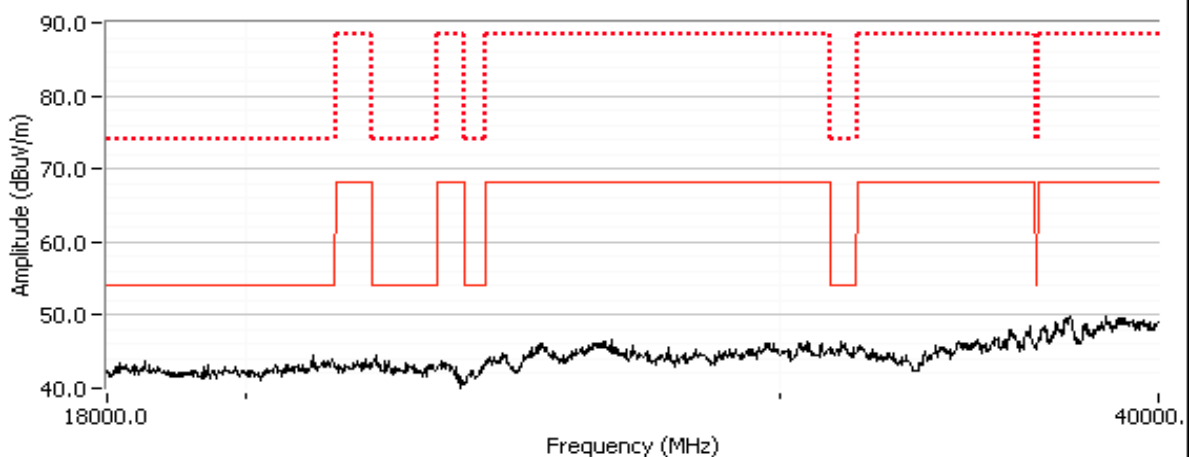
Spurious Radiated Emissions:

| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|---|--------------|-----|--------------|--------|-----------|---------|--------|----------|
| MHz | dB μ V/m | v/h | Limit | Margin | PK/QP/Avg | degrees | meters | |
| No emissions observed above the noise floor | | | | | | | | |

Low Channel, 5525 MHz



Low channel



| | | | |
|-----------|---------------------------------|------------------|---------------------|
| Client: | Nextivity Inc | Job Number: | J86441 |
| Model: | CELF-1-RS225CU & CELF-1-RS225WU | T-Log Number: | T86797 |
| Contact: | Steve van Skike | Account Manager: | Sheareen Washington |
| Standard: | FCC 15B & 15E, RSS-210 | Class: | N/A |

Date of Test: 4/25/2012
Test Engineer: Conrad Chu
Test Location: FT7

Preliminary readings

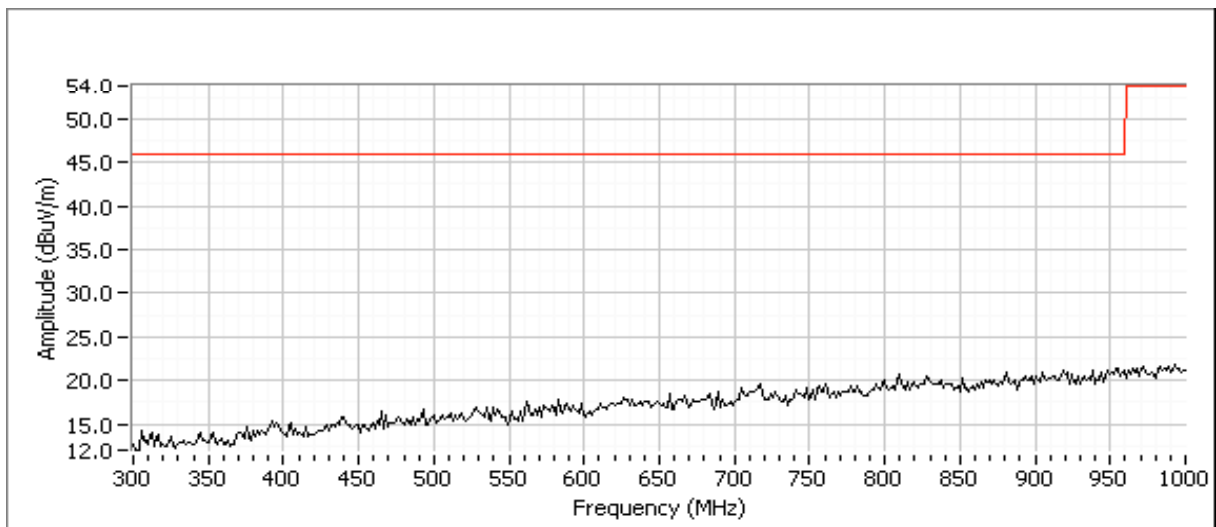
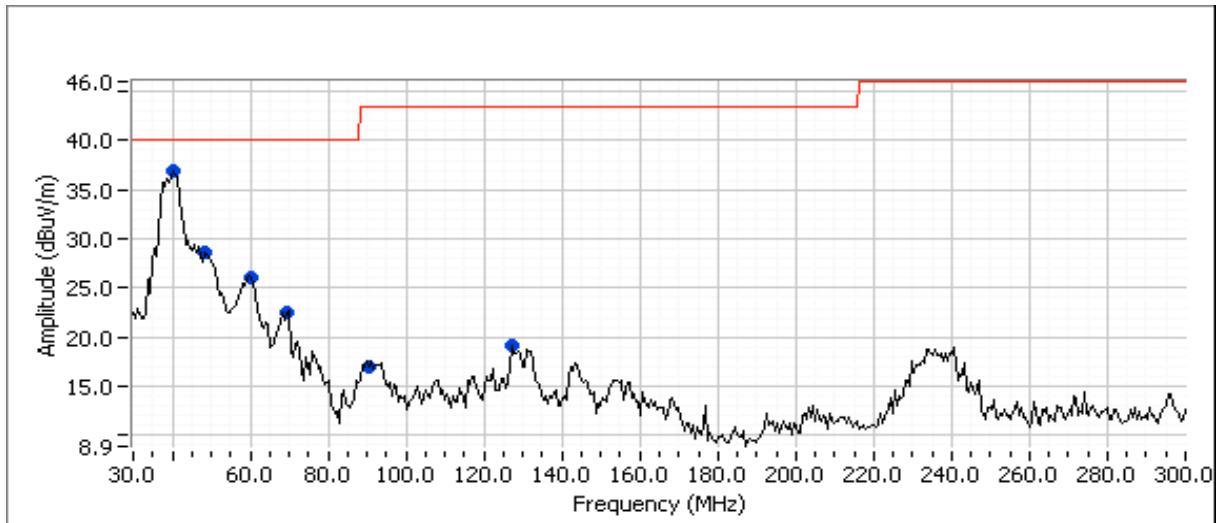
| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|-----------|--------|-----|------------|--------|-----------|---------|--------|------------|
| MHz | dBμV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 48.628 | 26.2 | V | 40.0 | -13.8 | QP | 23 | 1.0 | QP (1.00s) |
| 127.695 | 16.3 | H | 43.5 | -27.2 | QP | 52 | 2.3 | QP (1.00s) |
| 90.511 | 15.0 | H | 43.5 | -28.5 | QP | 82 | 2.5 | QP (1.00s) |
| 60.438 | 21.5 | V | 40.0 | -18.5 | QP | 111 | 1.4 | QP (1.00s) |
| 69.461 | 21.0 | V | 40.0 | -19.0 | QP | 189 | 1.0 | QP (1.00s) |
| 40.721 | 33.6 | V | 40.0 | -6.4 | QP | 313 | 1.1 | QP (1.00s) |

Maximized readings

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|-----------|--------|-----|------------|--------|-----------|---------|--------|------------|
| MHz | dBμV/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 40.721 | 33.7 | V | 40.0 | -6.3 | QP | 305 | 1.0 | QP (1.00s) |
| 48.628 | 27.8 | V | 40.0 | -12.2 | QP | 23 | 1.0 | QP (1.00s) |
| 60.438 | 21.5 | V | 40.0 | -18.5 | QP | 111 | 1.4 | QP (1.00s) |
| 69.461 | 21.0 | V | 40.0 | -19.0 | QP | 189 | 1.0 | QP (1.00s) |
| 127.695 | 16.9 | H | 43.5 | -26.6 | QP | 64 | 2.5 | QP (1.00s) |
| 90.511 | 15.0 | H | 43.5 | -28.5 | QP | 82 | 2.5 | QP (1.00s) |

Note 1: No emissions related to the transmitter were observed between 30 and 1000 MHz.

| | | | |
|-----------|--------------------------------|------------------|---------------------|
| Client: | Nextivity Inc | Job Number: | J86441 |
| Model: | CELF-1-RS225CU & CELFI-RS225WU | T-Log Number: | T86797 |
| Contact: | Steve van Skike | Account Manager: | Sheareen Washington |
| Standard: | FCC 15B & 15E, RSS-210 | Class: | N/A |



| | | | |
|-----------|-------------------------------|------------------|---------------------|
| Client: | Nextivity Inc | Job Number: | J86441 |
| Model: | CELFI-RS225CU & CELFI-RS225WU | T-Log Number: | T86797 |
| Contact: | Steve van Skike | Account Manager: | Sheareen Washington |
| Standard: | FCC 15B & 15E, RSS-210 | Class: | N/A |

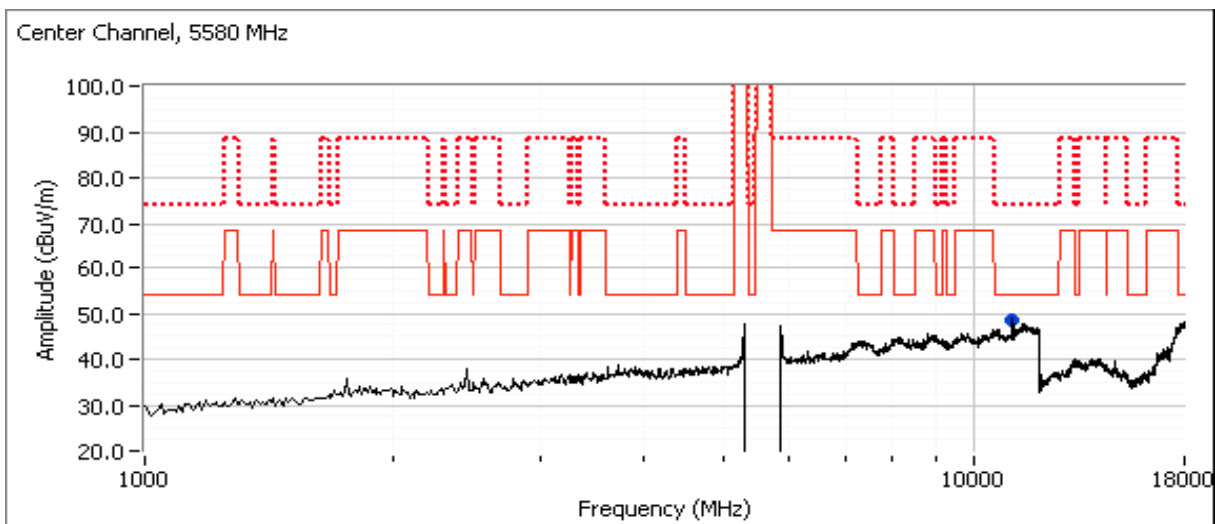
Run #1b: Center Channel @ 5580 MHz

Spurious Radiated Emissions:

| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|-----------|--------------|-----|--------------|--------|-----------|---------|--------|----------------------|
| MHz | dB μ V/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 11160.490 | 46.1 | V | 54.0 | -7.9 | AVG | 181 | 1.1 | RB 1 MHz;VB 10 Hz;Pk |
| 11160.890 | 57.8 | V | 74.0 | -16.2 | PK | 181 | 1.1 | RB 1 MHz;VB 3 MHz;Pk |

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 (68.3dB μ V/m). The measurement method required is a peak measurement (RB=1MHz, VB \geq 3MHz, peak detector).



| | | | |
|-----------|---------------------------------|------------------|---------------------|
| Client: | Nextivity Inc | Job Number: | J86441 |
| Model: | CELF-1-RS225CU & CELF-1-RS225WU | T-Log Number: | T86797 |
| Contact: | Steve van Skike | Account Manager: | Sheareen Washington |
| Standard: | FCC 15B & 15E, RSS-210 | Class: | N/A |

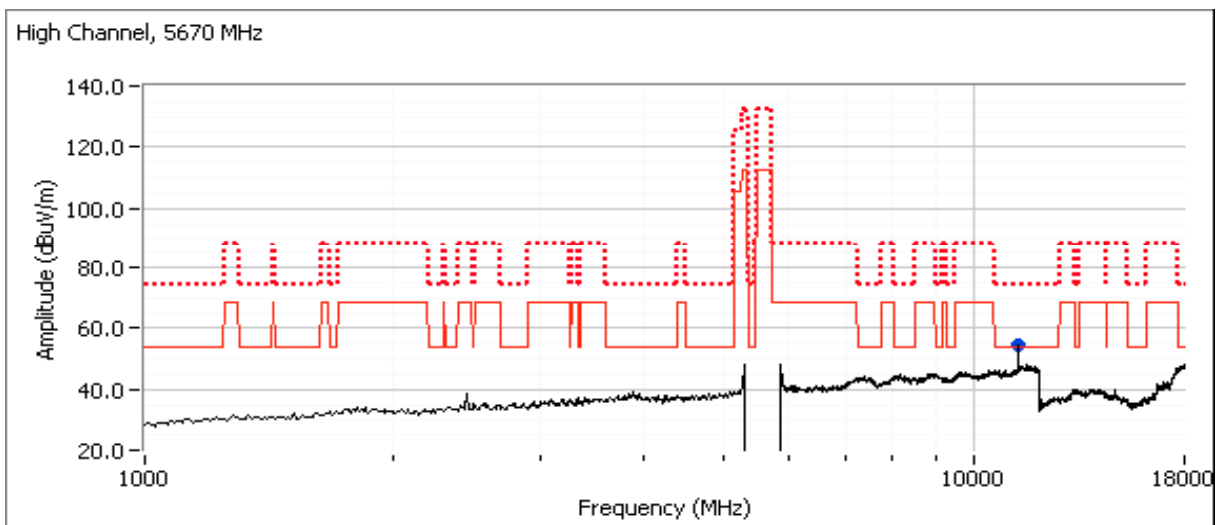
Run #1c: High Channel

Spurious Radiated Emissions:

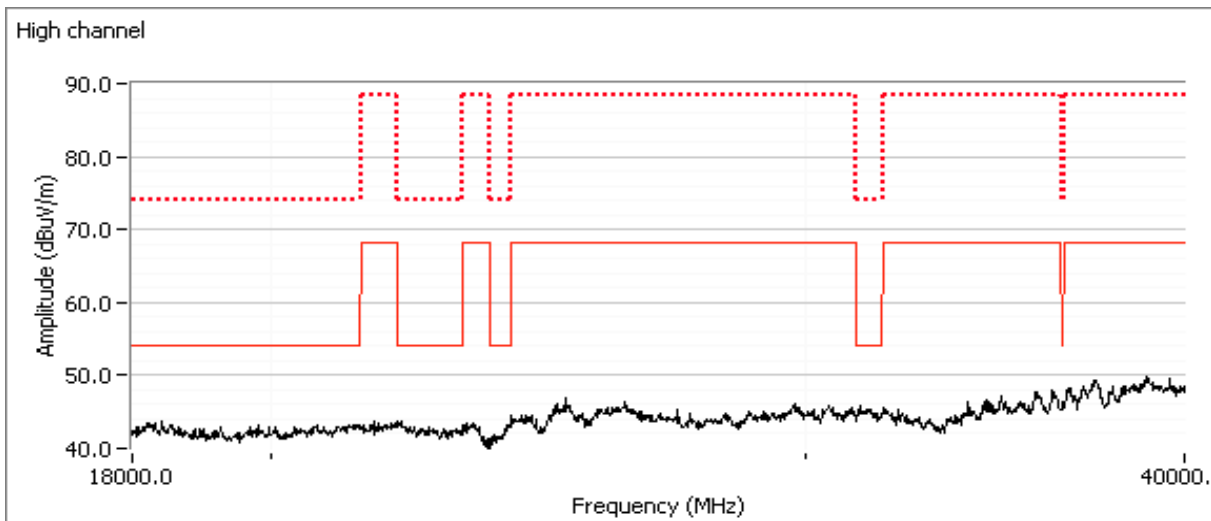
| Frequency | Level | Pol | 15.209 / 15E | | Detector | Azimuth | Height | Comments |
|-----------|--------------|-----|--------------|--------|-----------|---------|--------|----------------------|
| MHz | dB μ V/m | v/h | Limit | Margin | Pk/QP/Avg | degrees | meters | |
| 11338.550 | 50.6 | V | 54.0 | -3.4 | AVG | 257 | 1.2 | RB 1 MHz;VB 10 Hz;Pk |
| 11338.550 | 62.5 | V | 74.0 | -11.5 | PK | 257 | 1.2 | RB 1 MHz;VB 3 MHz;Pk |

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 (68.3dB μ V/m). The measurement method required is a peak measurement (RB=1MHz, VB \geq 3MHz, peak detector).



| | | | |
|-----------|--------------------------------|------------------|---------------------|
| Client: | Nextivity Inc | Job Number: | J86441 |
| Model: | CELF-1-RS225CU & CELFI-RS225WU | T-Log Number: | T86797 |
| Contact: | Steve van Skike | Account Manager: | Sheareen Washington |
| Standard: | FCC 15B & 15E, RSS-210 | Class: | N/A |

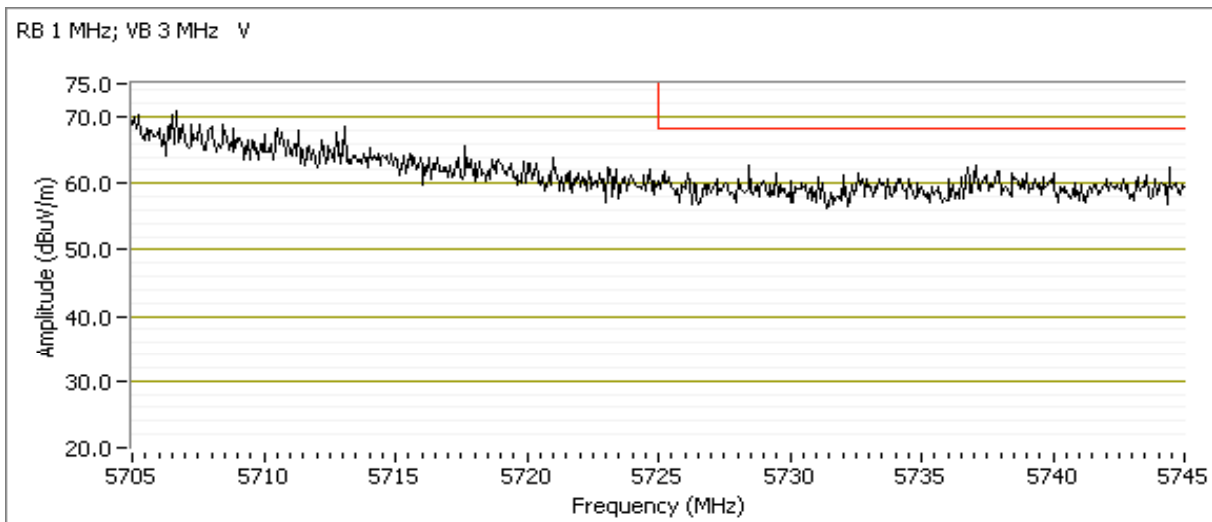


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| Model: | CELF-RS225CU & CELFI-RS225WU | T-Log Number: | T86797 |
| Contact: | Steve van Skike | Account Manager: | Sheareen Washington |
| Standard: | FCC 15B & 15E, RSS-210 | Class: | N/A |

Date of Test: 4/11/2012
Test Engineer: John Caizzi
Test Location: FT3

5725 MHz Restricted Band Edge Radiated Field Strength

| Frequency | Level | Pol | FCC 15.209 | | Detector | Azimuth | Height | Comments |
|-----------|--------------|-----|------------|--------|-----------|---------|--------|----------|
| MHz | dB μ V/m | v/h | Limit | Margin | PK/QP/Avg | degrees | meters | |
| 5725.000 | 64.9 | V | 68.3 | -3.4 | PK | 203 | 1.34 | |



| | | | |
|-----------|-----------------------------|------------------|---------------------|
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| Standard: | FCC 15B & 15E, RSS-210 | Class: | - |

Conducted Emissions

(Elliott Laboratories 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: 3/20/2012
Test Engineer: Peter Sales
Test Location: Fremont Chamber #5

Config. Used: 1
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 were routed through metal conduit and when possible passed through a ferrite clamp upon exiting the chamber.

Ambient Conditions:
Temperature: 21 °C
Rel. Humidity: 32 %

Summary of Results

| Run # | Test Performed | Limit | Result | Margin |
|-------|--|---------|--------|----------------------------------|
| 1 | CE, AC Power, 120V/60Hz, Coverage Unit | Class B | Pass | 44.0 dBμV @ 0.179 MHz (-20.5 dB) |
| 2 | CE, AC Power, 120V/60Hz, Window Unit | Class B | Pass | 50.1 dBμV @ 0.153 MHz (-15.7 dB) |

Modifications Made During Testing

No modifications were made to the EUT during testing

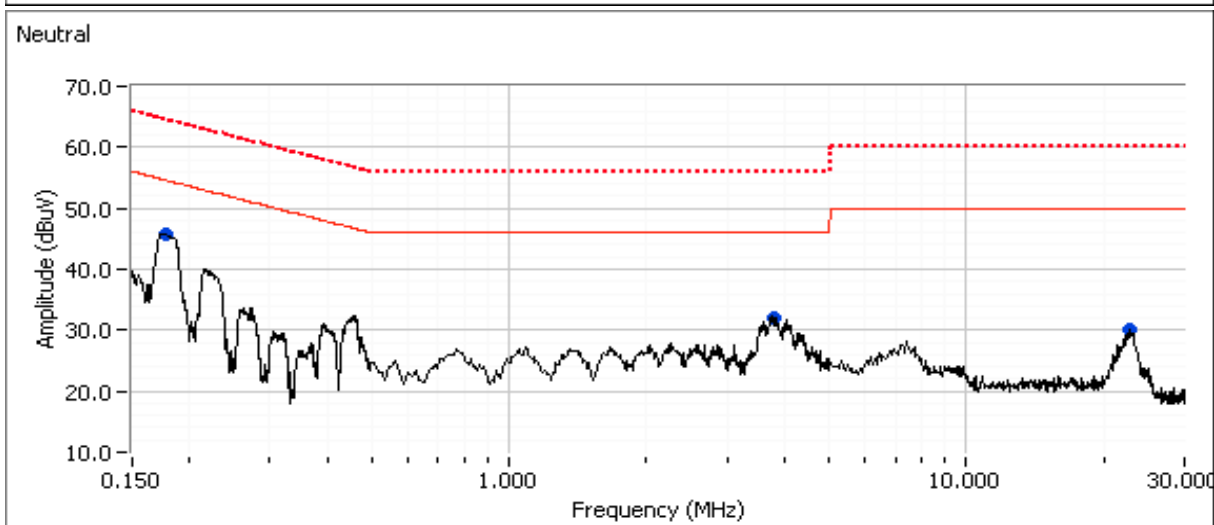
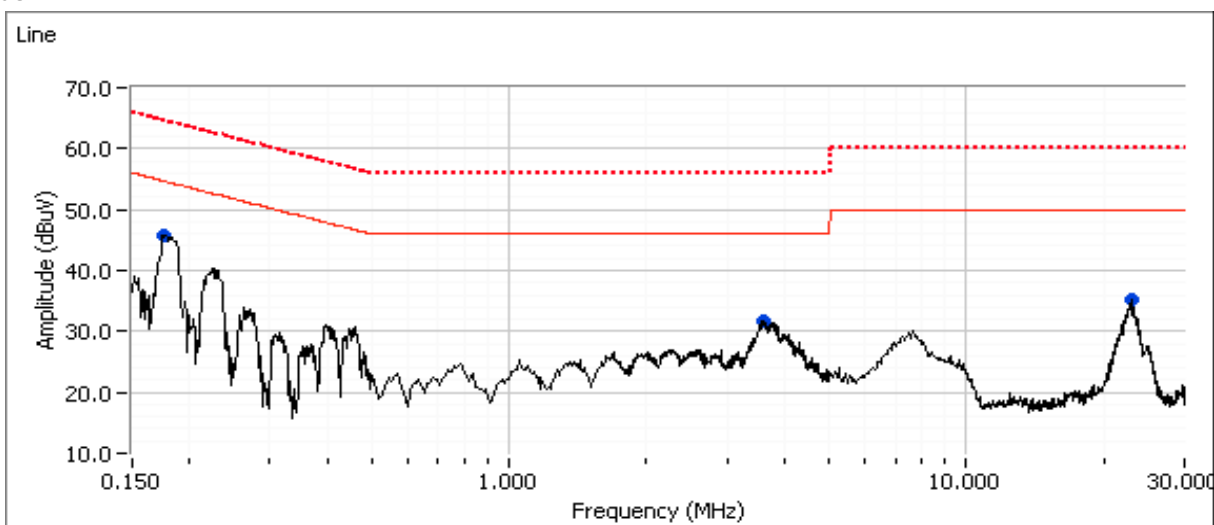
Deviations From The Standard

No deviations were made from the requirements of the standard.

| | | | |
|-----------|--------------------------------|------------------|---------------------|
| Client: | Nextivity Inc | Job Number: | J86441 |
| Model: | CELF-1-RS225CU & CELFI-RS225WU | T-Log Number: | T86797 |
| Contact: | Steve van Skike | Account Manager: | Sheareen Washington |
| Standard: | FCC 15B & 15E, RSS-210 | Class: | - |

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 230V/50Hz

CU



Continue Run #1 next page...

| | | | |
|-----------|------------------------------|------------------|---------------------|
| Client: | Nextivity Inc | Job Number: | J86441 |
| Model: | CELF-IR225CU & CELFI-RS225WU | T-Log Number: | T86797 |
| Contact: | Steve van Skike | Account Manager: | Sheareen Washington |
| Standard: | FCC 15B & 15E, RSS-210 | Class: | - |

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 230V/50Hz (continue)

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

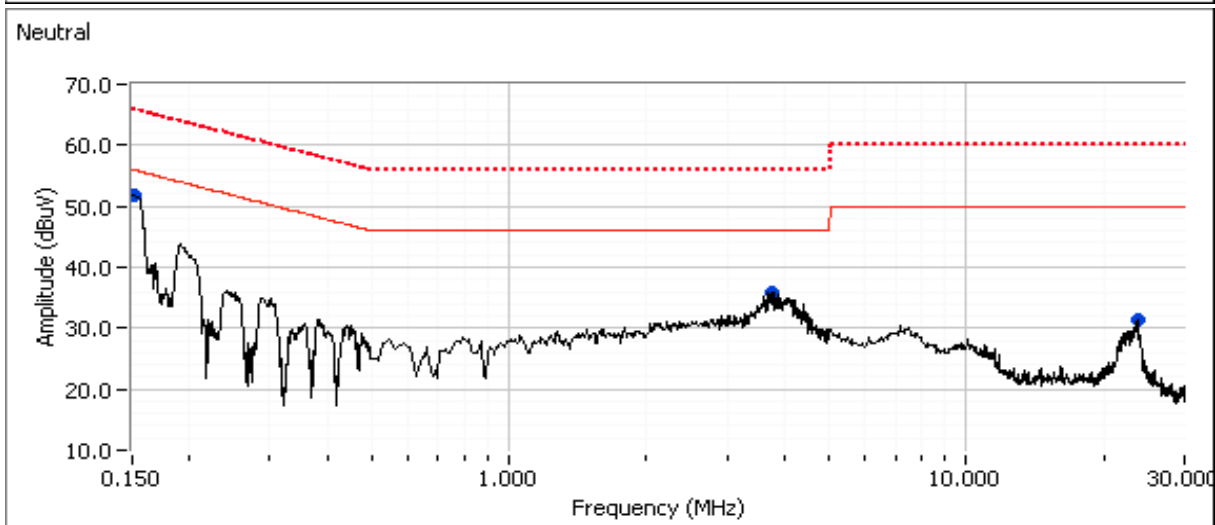
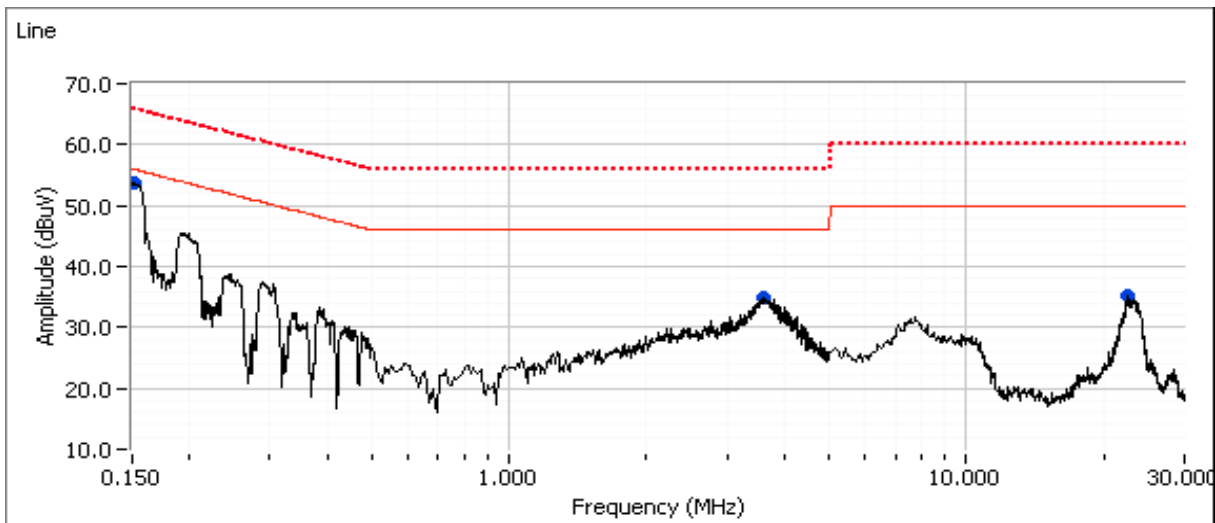
| Frequency MHz | Level dB μ V | AC Line | Class B | | Detector QP/Ave | Comments |
|------------------|---------------------|------------|---------|--------|--------------------|----------|
| | | | Limit | Margin | | |
| 0.179 | 45.8 | Neutral | 54.6 | -8.8 | Peak | |
| 0.177 | 45.7 | Line 1 | 54.7 | -9.0 | Peak | |
| 3.784 | 31.9 | Neutral | 46.0 | -14.1 | Peak | |
| 3.597 | 31.7 | Line 1 | 46.0 | -14.3 | Peak | |
| 23.154 | 35.3 | Line 1 | 50.0 | -14.7 | Peak | |
| 22.721 | 30.0 | Neutral | 50.0 | -20.0 | Peak | |

Final quasi-peak and average readings

| Frequency MHz | Level dB μ V | AC Line | Class B | | Detector QP/Ave | Comments |
|------------------|---------------------|------------|---------|--------|--------------------|-------------|
| | | | Limit | Margin | | |
| 0.179 | 44.0 | Neutral | 64.5 | -20.5 | QP | QP (1.00s) |
| 0.177 | 43.6 | Line 1 | 64.6 | -21.0 | QP | QP (1.00s) |
| 0.179 | 32.6 | Neutral | 54.5 | -21.9 | AVG | AVG (0.10s) |
| 3.597 | 20.9 | Line 1 | 46.0 | -25.1 | AVG | AVG (0.10s) |
| 0.177 | 29.0 | Line 1 | 54.6 | -25.6 | AVG | AVG (0.10s) |
| 3.784 | 20.3 | Neutral | 46.0 | -25.7 | AVG | AVG (0.10s) |
| 23.154 | 22.7 | Line 1 | 50.0 | -27.3 | AVG | AVG (0.10s) |
| 3.784 | 26.6 | Neutral | 56.0 | -29.4 | QP | QP (1.00s) |
| 3.597 | 26.4 | Line 1 | 56.0 | -29.6 | QP | QP (1.00s) |
| 23.154 | 28.4 | Line 1 | 60.0 | -31.6 | QP | QP (1.00s) |
| 22.721 | 16.5 | Neutral | 50.0 | -33.5 | AVG | AVG (0.10s) |
| 22.721 | 23.2 | Neutral | 60.0 | -36.8 | QP | QP (1.00s) |

| | | | |
|-----------|------------------------------|------------------|---------------------|
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| Contact: | Steve van Skike | Account Manager: | Sheareen Washington |
| Standard: | FCC 15B & 15E, RSS-210 | Class: | - |

Run #2: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz
WU



Continue Run #2 next page...

| | | | |
|-----------|---------------------------------|------------------|---------------------|
| Client: | Nextivity Inc | Job Number: | J86441 |
| Model: | CELF-1-RS225CU & CELF-1-RS225WU | T-Log Number: | T86797 |
| Contact: | Steve van Skike | Account Manager: | Sheareen Washington |
| Standard: | FCC 15B & 15E, RSS-210 | Class: | - |

Run #2: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz (continue)

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

| Frequency MHz | Level dB μ V | AC Line | Class B | | Detector QP/Ave | Comments |
|------------------|---------------------|------------|---------|--------|--------------------|----------|
| | | | Limit | Margin | | |
| 0.153 | 53.6 | Line 1 | 55.9 | -2.3 | Peak | |
| 0.153 | 51.9 | Neutral | 55.9 | -4.0 | Peak | |
| 3.784 | 35.8 | Neutral | 46.0 | -10.2 | Peak | |
| 3.588 | 34.8 | Line 1 | 46.0 | -11.2 | Peak | |
| 22.404 | 35.3 | Line 1 | 50.0 | -14.7 | Peak | |
| 23.702 | 31.3 | Neutral | 50.0 | -18.7 | Peak | |

Final quasi-peak and average readings

| Frequency MHz | Level dB μ V | AC Line | Class B | | Detector QP/Ave | Comments |
|------------------|---------------------|------------|---------|--------|--------------------|-------------|
| | | | Limit | Margin | | |
| 0.153 | 50.1 | Line 1 | 65.8 | -15.7 | QP | QP (1.00s) |
| 0.153 | 49.0 | Neutral | 65.8 | -16.8 | QP | QP (1.00s) |
| 0.153 | 34.1 | Neutral | 55.8 | -21.7 | AVG | AVG (0.10s) |
| 3.588 | 23.3 | Line 1 | 46.0 | -22.7 | AVG | AVG (0.10s) |
| 0.153 | 32.9 | Line 1 | 55.8 | -22.9 | AVG | AVG (0.10s) |
| 3.588 | 32.2 | Line 1 | 56.0 | -23.8 | QP | QP (1.00s) |
| 3.784 | 21.6 | Neutral | 46.0 | -24.4 | AVG | AVG (0.10s) |
| 3.784 | 30.9 | Neutral | 56.0 | -25.1 | QP | QP (1.00s) |
| 22.404 | 22.4 | Line 1 | 50.0 | -27.6 | AVG | AVG (0.10s) |
| 22.404 | 28.5 | Line 1 | 60.0 | -31.5 | QP | QP (1.00s) |
| 23.702 | 15.5 | Neutral | 50.0 | -34.5 | AVG | AVG (0.10s) |
| 23.702 | 23.3 | Neutral | 60.0 | -36.7 | QP | QP (1.00s) |

End of Report

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