

VivaLnk, Inc.

TEST REPORT FOR

Fever Scout Charger (Relay) Model: VV-200

Tested To The Following Standard:

FCC Part 15 Subpart C Section

15.247
(DTS 2400-2483.5 MHz)

Report No.: 98267-7

Date of issue: April 29, 2016



This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of EMC testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

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Santa Clara, CA 95054

REPORT PREPARED BY:

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CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

REPRESENTATIVE: George Wang

Project Number: 98267

DATE OF EQUIPMENT RECEIPT:

April 12, 2016

DATE(S) OF TESTING:

April 12-21, 2016

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the sample equipment tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.



Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information



Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
1120 Fulton Place
Fremont, CA 94539

Software Versions

| CKC Laboratories Proprietary Software | Version |
|---------------------------------------|---------|
| EMITest Emissions | 5.03.02 |

Site Registration & Accreditation Information

| Location | CB # | TAIWAN | CANADA | FCC | JAPAN |
|----------|--------|----------------|---------|--------|--------|
| Fremont | US0082 | SL2-IN-E-1148R | 3082B-1 | 958979 | A-0149 |

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart C - 15.247 (DTS)

| Test Procedure | Description | Modifications | Results |
|----------------|------------------------------------|---------------|---------|
| 15.247(a)(2) | 6dB Bandwidth | NA | Pass |
| 15.247(b)(3) | Output Power | NA | Pass |
| 15.247(e) | Power Spectral Density | NA | Pass |
| 15.247(d) | RF Conducted Emissions & Band Edge | NA | NA2 |
| 15.247(d) | Radiated Emissions & Band Edge | NA | Pass |
| 15.207 | AC Conducted Emissions | NA | NA1 |

NA = Not Applicable

NA1 = Not applicable because the EUT is operated by 3.0VDC batteries.

NA2 = Not applicable because the EUT has an integral antenna.

Modifications During Testing

This list is a summary of the modifications made to the equipment during testing.

Summary of Conditions

No modifications were made during testing.

Modifications listed above must be incorporated into all production units.

Conditions During Testing

This list is a summary of the conditions noted to the equipment during testing.

Summary of Conditions

None

EQUIPMENT UNDER TEST (EUT)

During testing numerous configurations may have been utilized. The configurations listed below support compliance to the standard(s) listed in the Summary of Results section.

Configuration 2

Equipment Tested:

| Device | Manufacturer | Model # | S/N |
|-----------------------------|---------------|---------|-----|
| Fever Scout Charger (Relay) | VivaLnk, Inc. | VV-200 | F5 |

Support Equipment:

| Device | Manufacturer | Model # | S/N |
|--------|--------------|---------|-----|
| None | | | |

General Product Information:

| Product Information | Manufacturer-Provided Details |
|----------------------------|-------------------------------|
| Equipment Type: | Stand-Alone Equipment |
| Type of Wideband System: | BLE 4.0 |
| Operating Frequency Range: | 2400MHz to 2483.5MHz |
| Modulation Type(s): | GFSK |
| Maximum Duty Cycle: | 25% |
| Number of TX Chains: | 40 |
| Antenna Type(s) and Gain: | 3.3dBi |
| Beamforming Type: | NA |
| Antenna Connection Type: | Integral |
| Nominal Input Voltage: | 3.0VDC |
| Software used for Test: | VBLET version 2.5.3 |

FCC Part 15 Subpart C

15.247(a)(2) 6dB Bandwidth

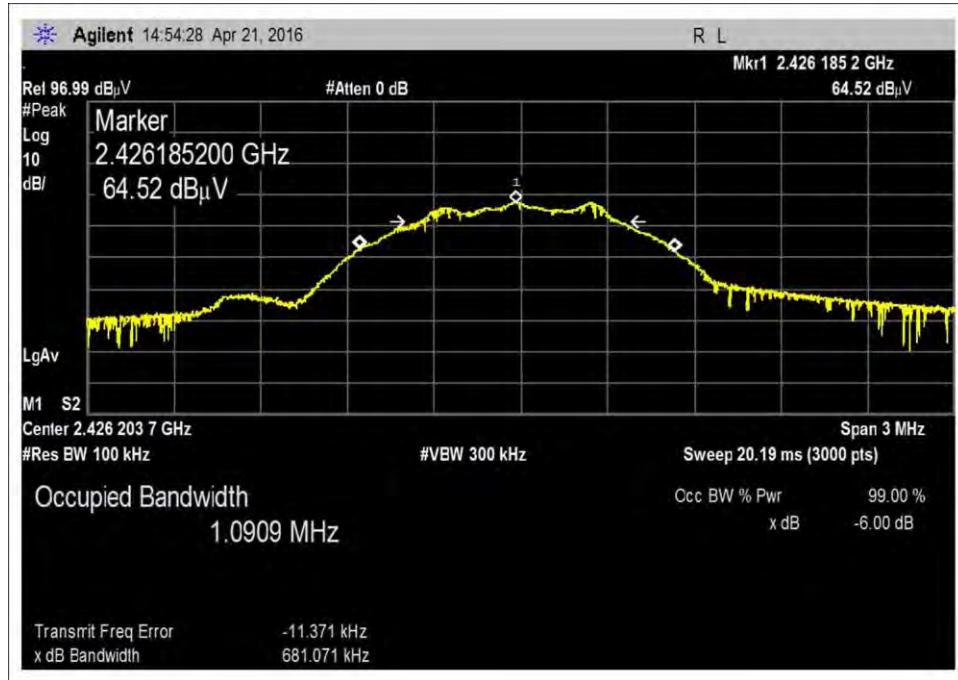
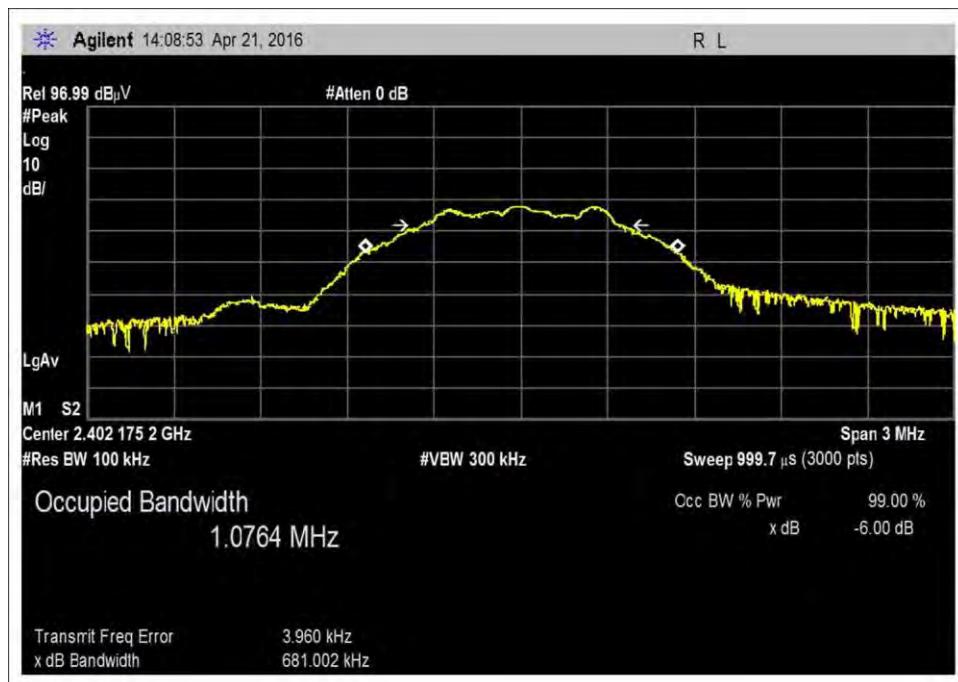
| Test Setup/Conditions | | | |
|-----------------------|---|----------------|----------------------|
| Test Location: | Fremont Lab C3 | Test Engineer: | Hieu Song Nguyenpham |
| Test Method: | ANSI C63.10 (2013), KDB 558074 v03r05 Section 8.1 | Test Date(s): | 4/21/2016 |
| Configuration: | 2 | | |
| Test Setup: | The EUT is placed on a non-conducted table. The device is operated by an internal battery at 3.0VDC. The EUT is set in continuously transmitting as intended. RBW=100kHz VBW=300kHz | | |

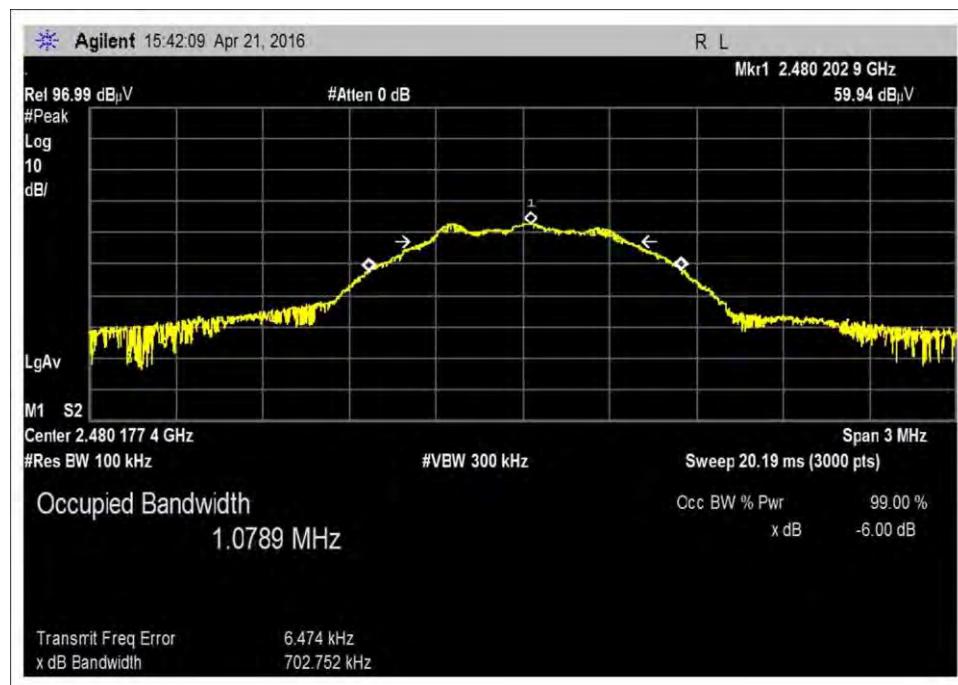
| Environmental Conditions | | | |
|--------------------------|------|------------------------|----|
| Temperature (°C) | 21.3 | Relative Humidity (%): | 42 |

| Test Equipment | | | | | |
|----------------|-------------------|------------------|--------------------------|-----------|-----------|
| Asset# | Description | Manufacturer | Model | Cal Date | Cal Due |
| 02113 | Horn Antenna | EMC Test Systems | 3115 | 2/3/2015 | 2/3/2017 |
| P01210 | Cable | Andrews | FSJ1P-50A-4A | 1/15/2015 | 1/15/2017 |
| 03302 | Cable | Astrolab | 32026-29094K-29094K-72TC | 1/29/2016 | 1/29/2018 |
| 03471 | Spectrum Analyzer | Agilent | E4440A | 1/4/2016 | 1/4/2018 |

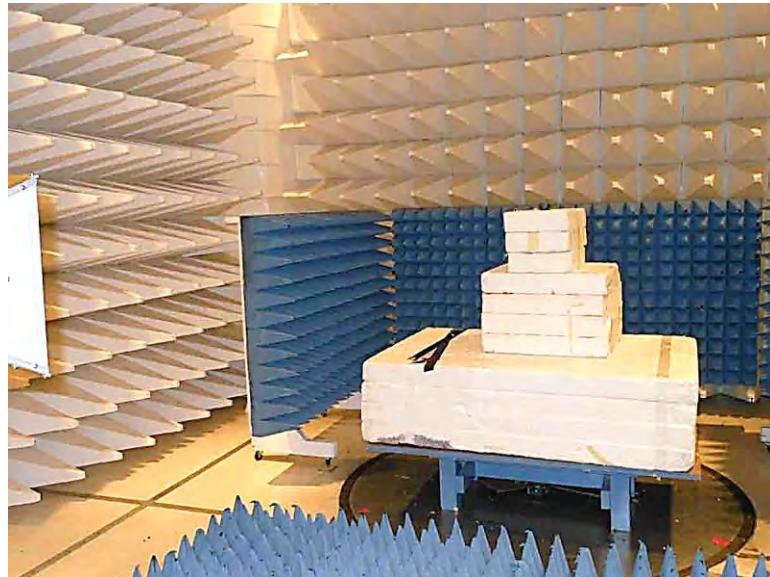
| Test Data Summary | | | | | |
|-------------------|--------------|------------|----------------|-------------|---------|
| Frequency (MHz) | Antenna Port | Modulation | Measured (kHz) | Limit (kHz) | Results |
| 2402 | 1 | GFSK | 681.002 | ≥500 | Pass |
| 2426 | 1 | GFSK | 681.071 | ≥500 | Pass |
| 2480 | 1 | GFSK | 702.725 | ≥500 | Pass |

Plots





Test Setup Photos



15.247(b)(3) Output Power

Test Data Summary - Voltage Variations

This equipment is battery powered. Power output tests were performed using a fresh battery.

| Power Output Test Data Summary - Radiated Measurement | | | | | | |
|---|------------|------------------------|-----------------------------|------------------|-------------|---------|
| Measurement Option: RBW > DTS Bandwidth | | | | | | |
| Frequency (MHz) | Modulation | Ant. Type / Gain (dBi) | Field Strength (dBuV/m @3m) | Calculated (dBm) | Limit (dBm) | Results |
| 2402 Horizontal | GFSK | 3.3 | 95.4 | -3.129 | ≤ 30 | Pass |
| 2402 Vertical | GFSK | 3.3 | 88.3 | -10.229 | ≤ 30 | Pass |
| 2426 Horizontal | GFSK | 3.3 | 94.8 | -3.729 | ≤ 30 | Pass |
| 2426 Vertical | GFSK | 3.3 | 86.7 | -11.829 | ≤ 30 | Pass |
| 2480 Horizontal | GFSK | 3.3 | 90.2 | -8.329 | ≤ 30 | Pass |
| 2480 Vertical | GFSK | 3.3 | 83.0 | -15.529 | ≤ 30 | Pass |

For fixed point-to-point antennas, the limit is calculated in accordance with 15.247(c)(1): $Limit = 30 - Roundup\left(\frac{G-6}{3}\right)$

For directional beamforming antennas, the limit is calculated in accordance with 15.247(c)(2) and KDB 662911.

Conducted RF output power calculated in accordance with ANSI C63.10.

$$P(W) = \frac{(E \cdot d)^2}{30 G}$$

Or equivalently, in logarithmic form:

$$P(dBm) = E(dBuV/m) + 20LOG(d) - G - 104.77$$

Test Setup / Conditions / Data

Test Location: CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
 Customer: **VivaLnk, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **98267** Date: 4/21/2016
 Test Type: **Radiated Scan** Time: 15:35:05
 Tested By: Hieu Song Nguyenpham Sequence#: 48
 Software: EMITest 5.03.02

Equipment Tested:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 2 | | | |

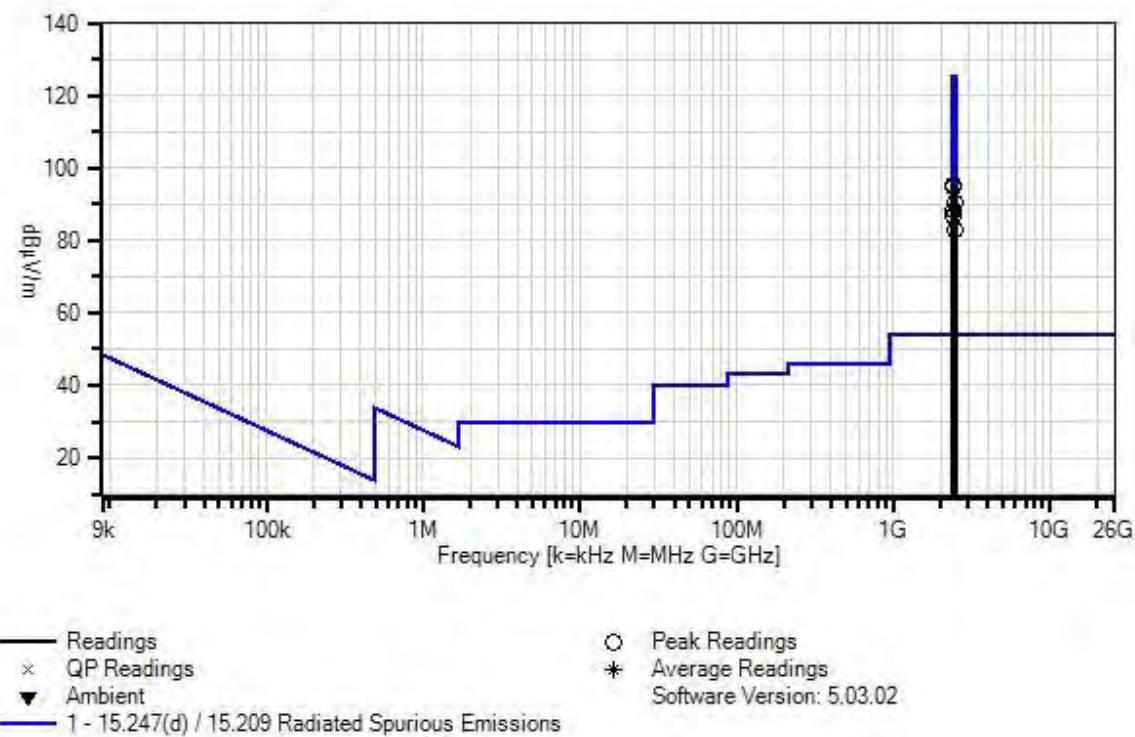
Support Equipment:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 2 | | | |

Test Conditions / Notes:

| |
|---|
| Fundamental |
| Application: VBLET version 2.5.3 |
| Temperature: 21.3° C |
| Humidity: 42 % |
| Atmospheric Pressure: 101.9 kPa |
| Highest Generating Frequency: 2.48GHz |
| Method: ANSI C 63.10 2013 and KDB 558074 v03r05 section 9.1.1 |
| Transmitting Frequencies: 2402, 2426 and 2480MHz |
| RBW=3MHz |
| VBW=8MHz |
| The EUT is placed on a non-conducted table. The device is operated by an internal battery at 3.0VDC. The EUT is set in continuously transmitting as intended. |

Vivalnk, Inc WO#: 98267 Sequence#: 48 Date: 4/21/2016
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters



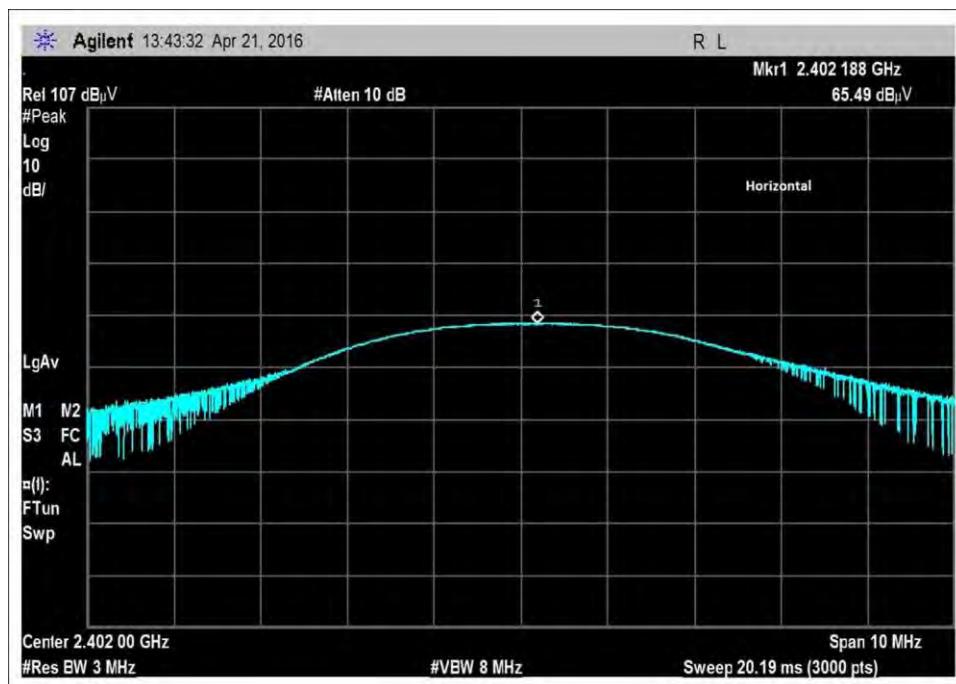
Test Equipment:

| ID | Asset # | Description | Model | Calibration Date | Cal Due Date |
|----|----------|-------------------|------------------------------|------------------|--------------|
| T1 | AN02113 | Horn Antenna | 3115 | 2/3/2015 | 2/3/2017 |
| T2 | AN03302 | Cable | 32026-29094K- 29094K-72TC | 1/29/2016 | 1/29/2018 |
| T3 | ANP01210 | Cable | FSJ1P-50A-4A | 1/15/2015 | 1/15/2017 |
| | AN03471 | Spectrum Analyzer | E4440A | 1/4/2016 | 1/4/2018 |

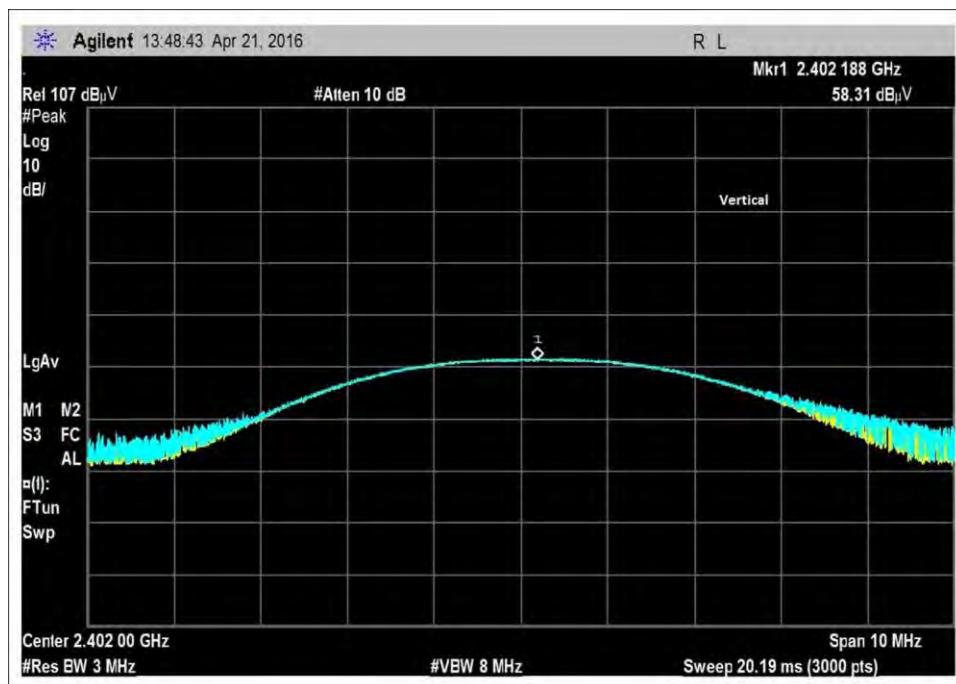
Measurement Data: Reading listed by margin. Test Distance: 3 Meters

| # | Freq MHz | Rdng dB μ V | T1 dB | T2 dB | T3 dB | dB | Dist Table | Corr dB μ V/m | Spec dB μ V/m | Margin dB | Polar Ant |
|---|-------------|--------------------|----------|----------|----------|----|---------------|----------------------|----------------------|--------------|--------------|
| 1 | 2402.188M | 65.5 | +26.0 | +1.3 | +2.6 | | +0.0 | 95.4 | 125.2 | -29.8 | Horiz |
| 2 | 2426.169M | 64.8 | +26.1 | +1.3 | +2.6 | | +0.0 | 94.8 | 125.2 | -30.4 | Horiz |
| 3 | 2480.068M | 60.0 | +26.3 | +1.3 | +2.6 | | +0.0 | 90.2 | 125.2 | -35.0 | Horiz |
| 4 | 2402.188M | 58.4 | +26.0 | +1.3 | +2.6 | | +0.0 | 88.3 | 125.2 | -36.9 | Vert |
| 5 | 2426.169M | 56.7 | +26.1 | +1.3 | +2.6 | | +0.0 | 86.7 | 125.2 | -38.5 | Vert |
| 6 | 2480.068M | 52.8 | +26.3 | +1.3 | +2.6 | | +0.0 | 83.0 | 125.2 | -42.2 | Vert |

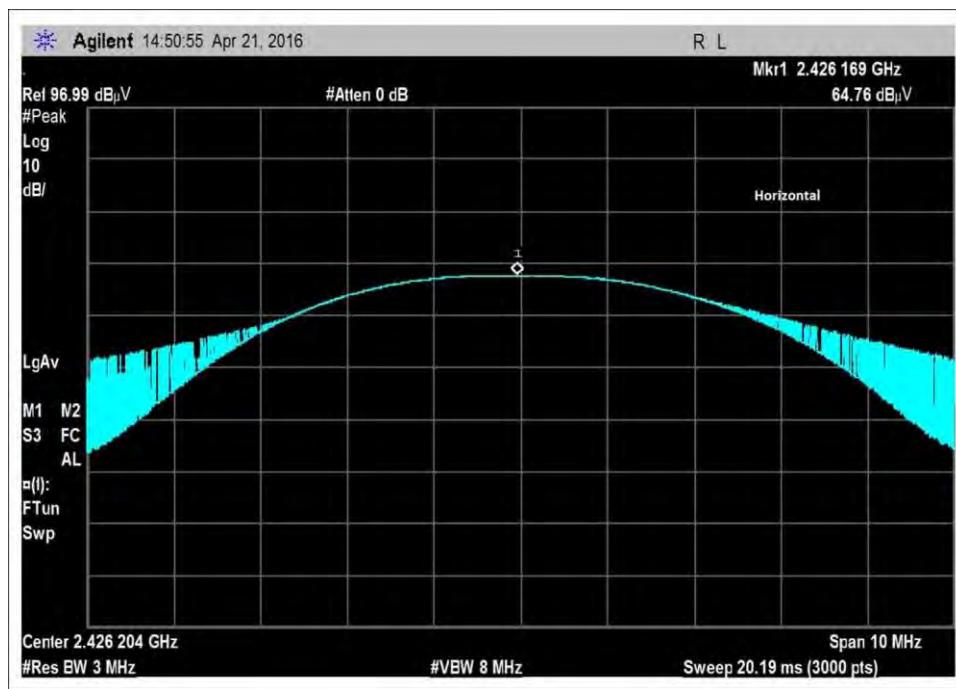
Plots



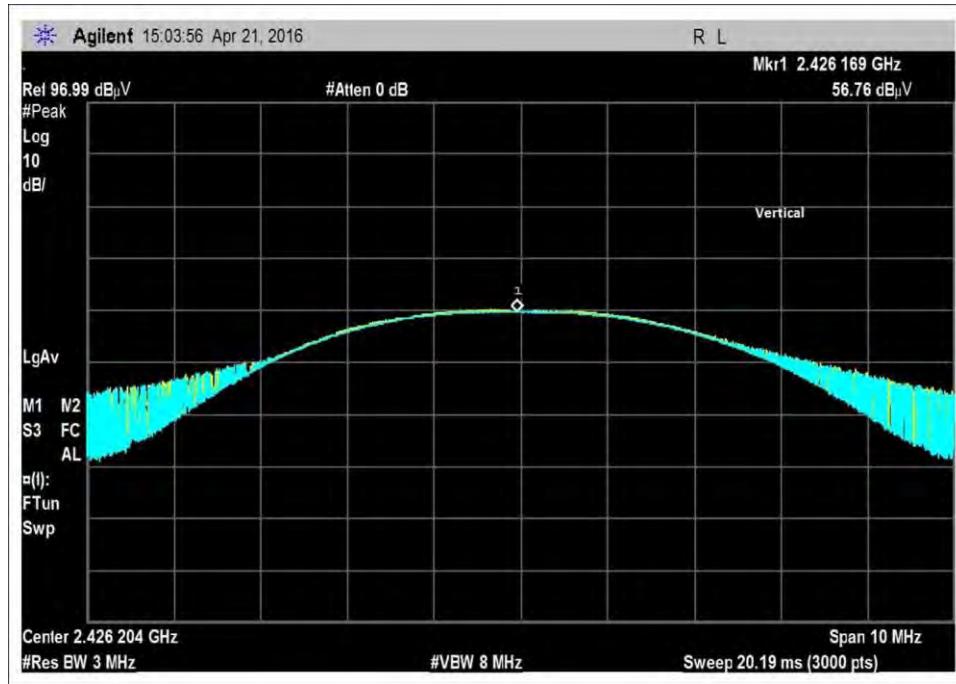
Low Channel, Horizontal Polarity



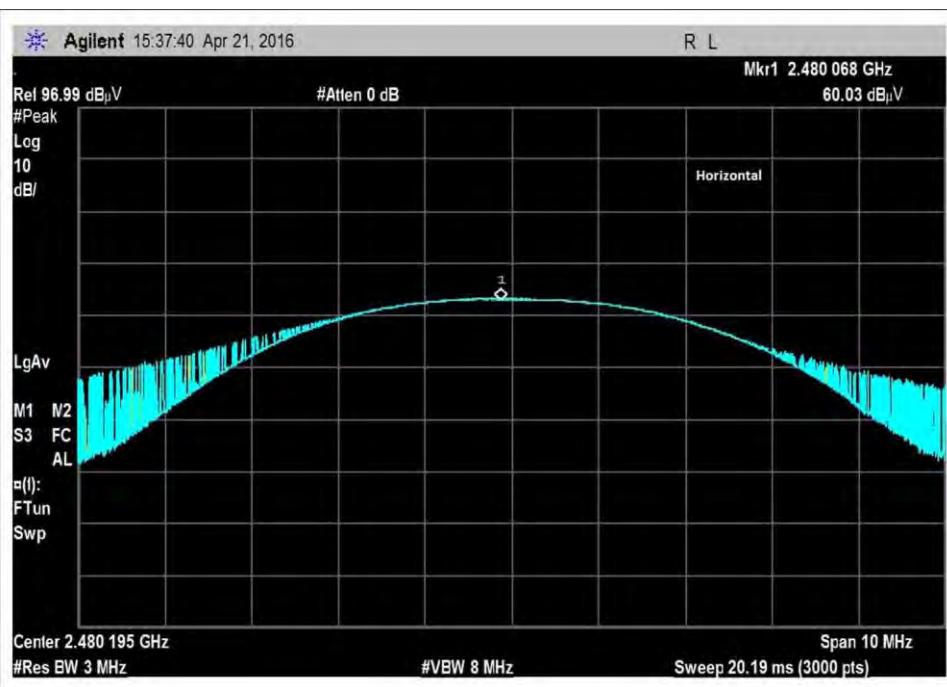
Low Channel, Vertical Polarity



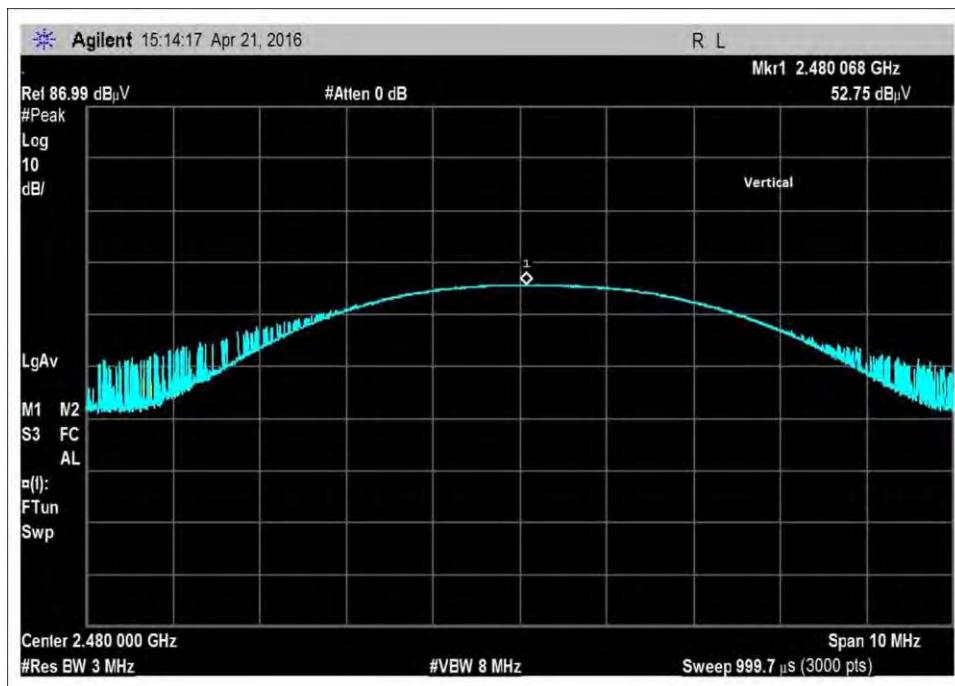
Middle Channel, Horizontal Polarity



Middle Channel, Vertical Polarity

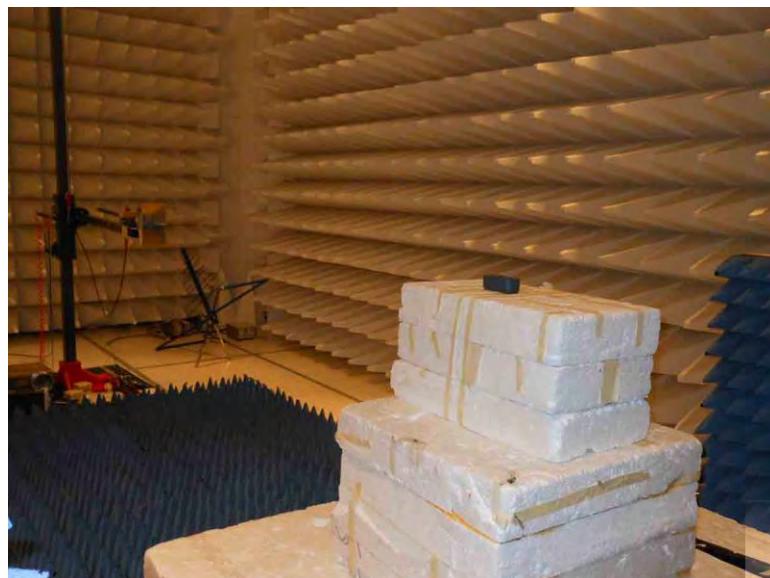
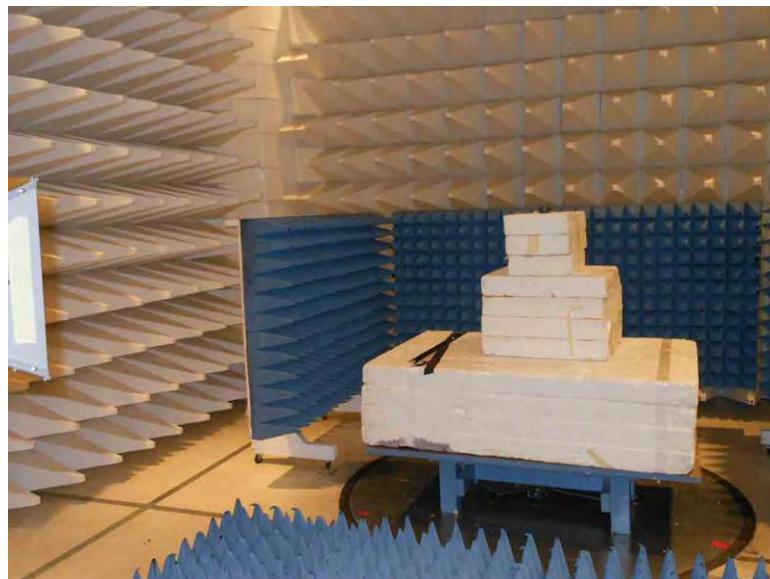


High Channel, Horizontal Polarity



High Channel, Vertical Polarity

Test Setup Photos



15.247(e) Power Spectral Density

| PSD Test Data Summary - Radiated Measurement | | | | | | |
|--|------------|------------------------|-----------------------------|-----------------------|------------------|---------|
| Measurement Method: PKPSD | | | | | | |
| Frequency (MHz) | Modulation | Ant. Type / Gain (dBi) | Field Strength (dBuV/m @3m) | Calculated (dBm/3kHz) | Limit (dBm/3kHz) | Results |
| 2402 Horizontal | GFSK | 3.3 | 80.9 | -17.629 | ≤8 | Pass |
| 2402 Vertical | GFSK | 3.3 | 73.4 | -25.129 | ≤8 | Pass |
| 2426 Horizontal | GFSK | 3.3 | 80.7 | -17.829 | ≤8 | Pass |
| 2426 Vertical | GFSK | 3.3 | 72.6 | -25.929 | ≤8 | Pass |
| 2480 Horizontal | GFSK | 3.3 | 75.5 | -23.029 | ≤8 | Pass |
| 2480 Vertical | GFSK | 3.3 | 67.7 | -30.829 | ≤8 | Pass |

Conducted RF output power calculated in accordance with ANSI C63.10.

$$P(W) = \frac{(E \cdot d)^2}{30 G}$$

Or equivalently, in logarithmic form:

$$P(dBm) = E(dBuV/m) + 20LOG(d) - G - 104.77$$

Test Setup / Conditions / Data

Test Location: CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
 Customer: **VivaLnk, Inc.**
 Specification: **15.247(e) Peak Power Spectral Density (2400-2483.5 MHz DTS)**
 Work Order #: **98267** Date: 4/21/2016
 Test Type: **Radiated Scan** Time: 15:33:03
 Tested By: Hieu Song Nguyenpham Sequence#: 49
 Software: EMITest 5.03.02

Equipment Tested:

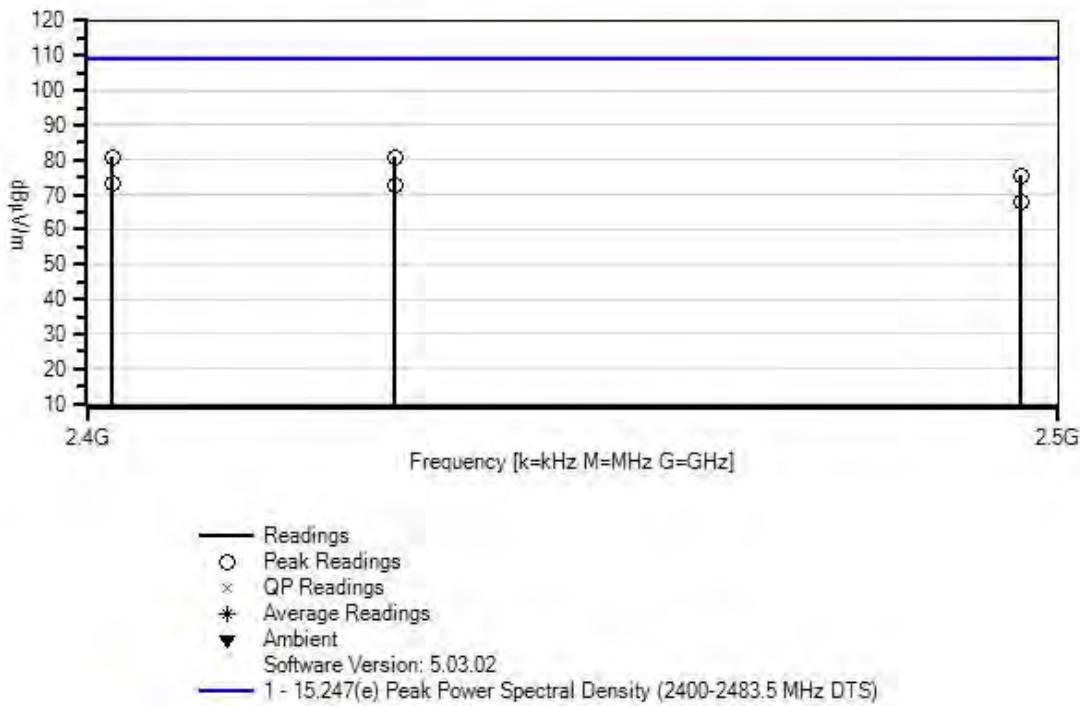
| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 2 | | | |

Support Equipment:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 2 | | | |

Test Conditions / Notes:

| |
|---|
| Application: VBLET version 2.5.3 |
| Temperature: 21.3°C |
| Humidity: 42 % |
| Atmospheric Pressure: 101.9 kPa |
| Highest Generating Frequency: 2.48GHz |
| Method: ANSI C 63.10 2013 and KDB 558074 v03r05 section 10.2 |
| Transmitting Frequencies: 2402, 2426 and 2480MHz |
| RBW=3kHz |
| VBW=10kHz |
| The EUT is placed on a non-conducted table. The device is operated by an internal battery at 3.0VDC. The EUT is set in continuously transmitting as intended. |

Vivalink, Inc WO#: 98267 Sequence#: 49 Date: 4/21/2016
 15.247(e) Peak Power Spectral Density (2400-2483.5 MHz DTS) Test Distance: 3 Meters

Test Equipment:

| ID | Asset #/Serial # | Description | Model | Calibration Date | Cal Due Date |
|----|------------------|-------------------|--------------------------|------------------|--------------|
| T1 | AN02113 | Horn Antenna | 3115 | 2/3/2015 | 2/3/2017 |
| T2 | AN03302 | Cable | 32026-29094K-29094K-72TC | 1/29/2016 | 1/29/2018 |
| T3 | ANP01210 | Cable | FSJ1P-50A-4A | 1/15/2015 | 1/15/2017 |
| | AN03471 | Spectrum Analyzer | E4440A | 1/4/2016 | 1/4/2018 |

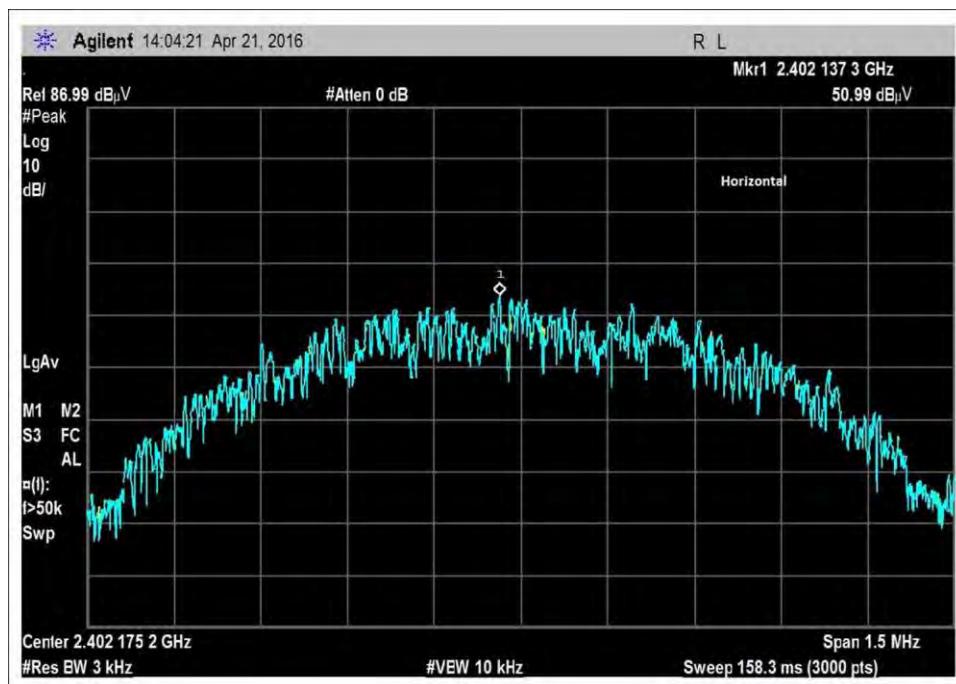
Measurement Data:

Reading listed by margin.

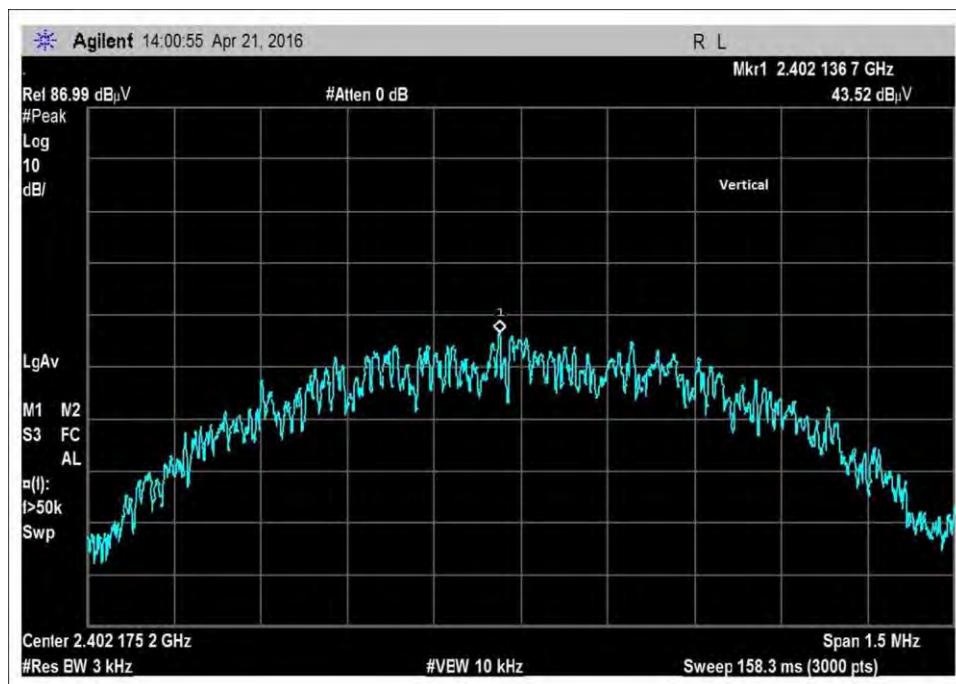
Test Distance: 3 Meters

| # | Freq MHz | Rdng dB μ V | T1 dB | T2 dB | T3 dB | Dist Table | Corr dB μ V/m | Spec dB μ V/m | Margin dB | Polar Ant |
|---|-------------|--------------------|----------|----------|----------|---------------|----------------------|----------------------|--------------|--------------|
| 1 | 2402.137M | 51.0 | +26.0 | +1.3 | +2.6 | +0.0 | 80.9 | 109.2 | -28.3 | Horiz |
| 2 | 2426.138M | 50.7 | +26.1 | +1.3 | +2.6 | +0.0 | 80.7 | 109.2 | -28.5 | Horiz |
| 3 | 2480.195M | 45.3 | +26.3 | +1.3 | +2.6 | +0.0 | 75.5 | 109.2 | -33.7 | Horiz |
| 4 | 2402.137M | 43.5 | +26.0 | +1.3 | +2.6 | +0.0 | 73.4 | 109.2 | -35.8 | Vert |
| 5 | 2426.138M | 42.6 | +26.1 | +1.3 | +2.6 | +0.0 | 72.6 | 109.2 | -36.6 | Vert |
| 6 | 2480.195M | 37.5 | +26.3 | +1.3 | +2.6 | +0.0 | 67.7 | 109.2 | -41.5 | Vert |

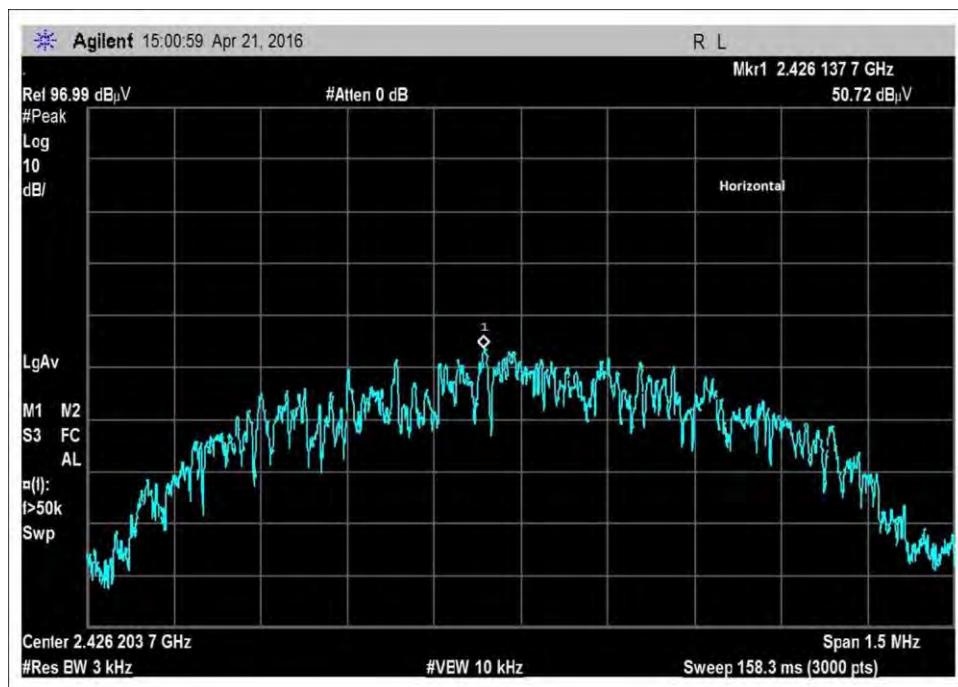
Plots



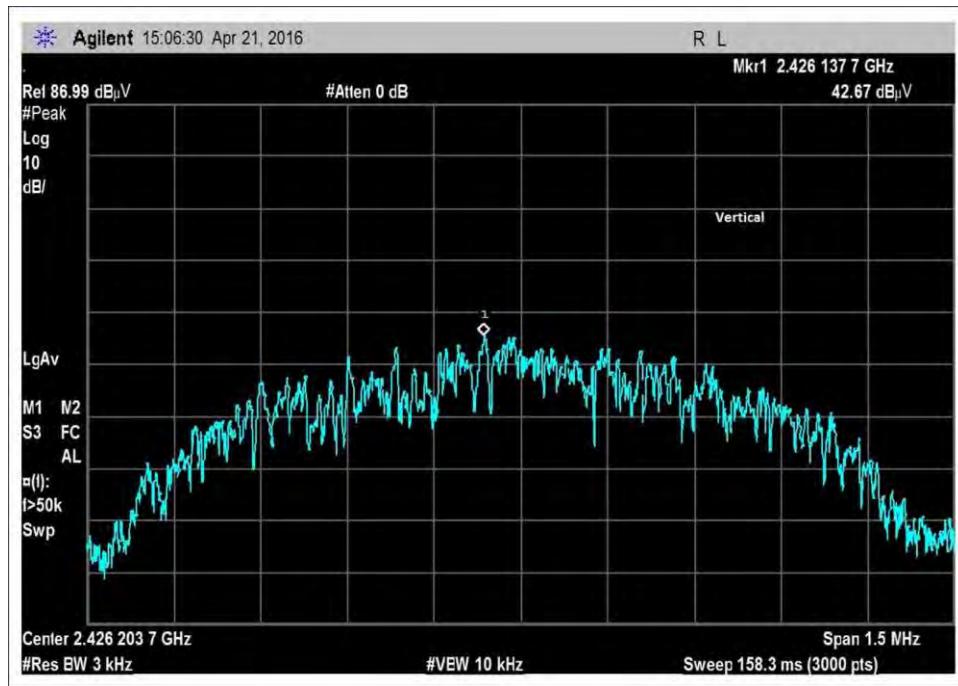
Low Channel, Horizontal Polarity



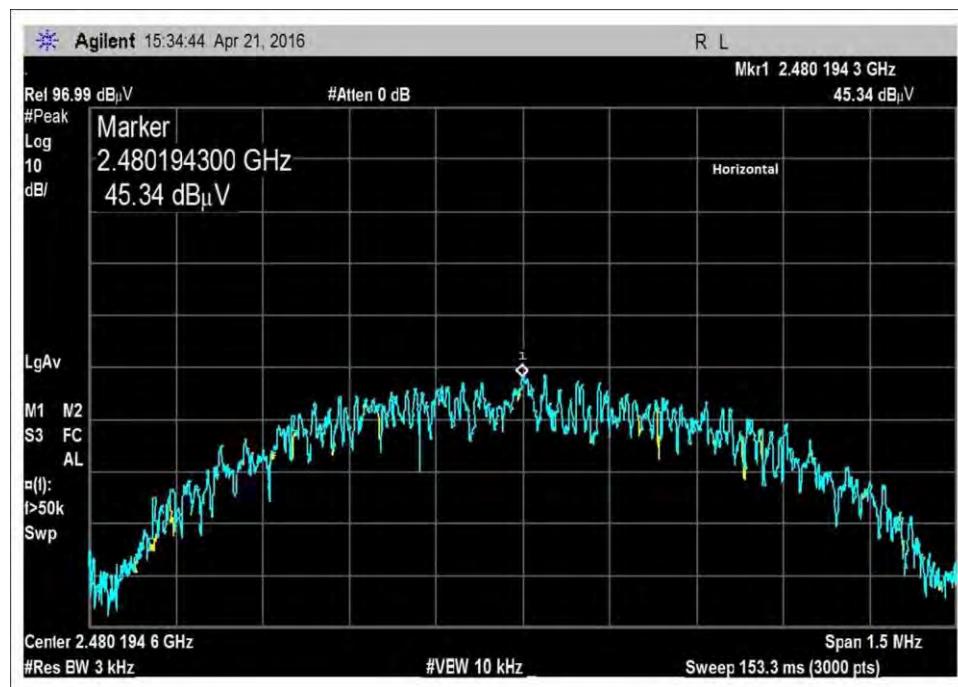
Low Channel, Vertical Polarity



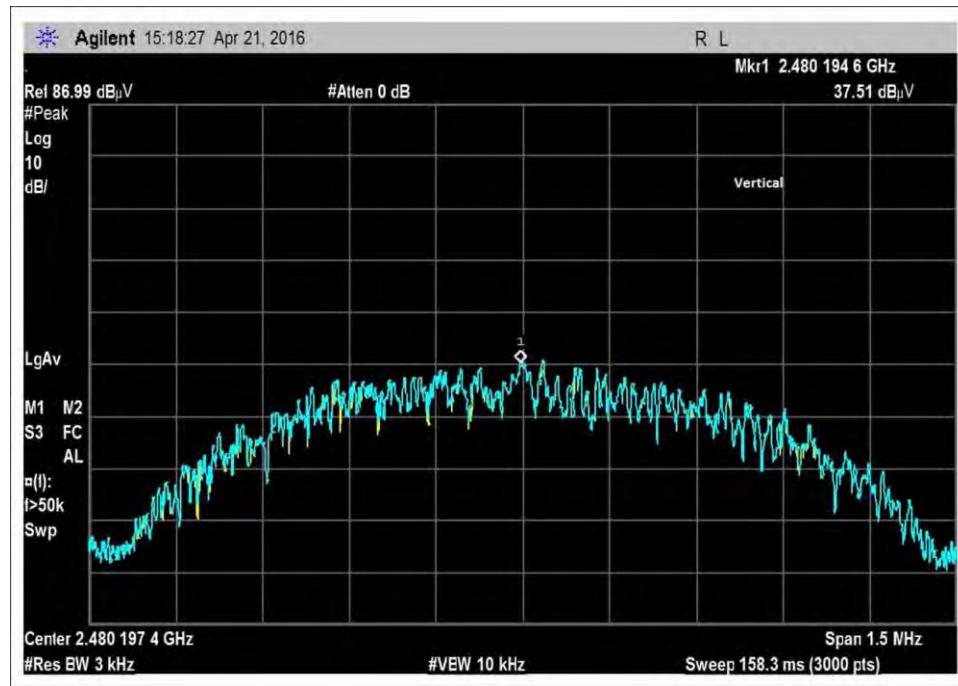
Middle Channel, Horizontal Polarity



Middle Channel, Vertical Polarity

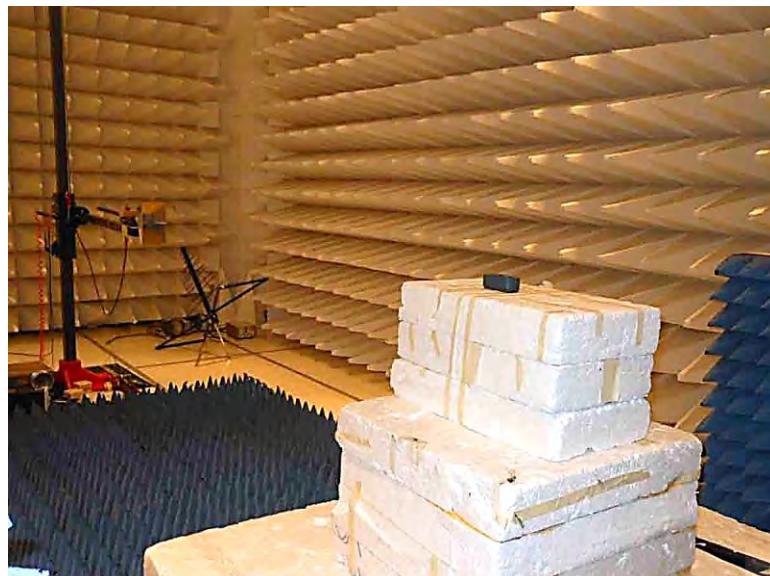
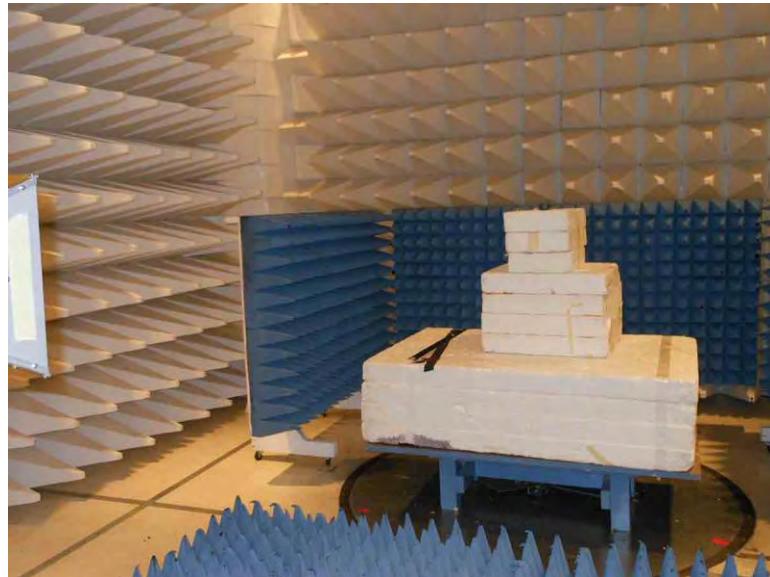


High Channel, Horizontal Polarity



High Channel, Vertical Polarity

Test Setup Photos



15.247(d) Radiated Emissions & Band Edge

Test Data

Test Location: CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
 Customer: **VivaLnk, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **98267** Date: 4/12/2016
 Test Type: **Radiated Scan** Time: 19:21:52
 Tested By: Hieu Song Nguyenpham Sequence#: 41
 Software: EMITest 5.03.02

Equipment Tested:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 2 | | | |

Support Equipment:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 2 | | | |

Test Conditions / Notes:

Radiated Spurious Emission
 Frequency Range: 9kHz to 1000MHz

Application: VBLET version 2.5.3

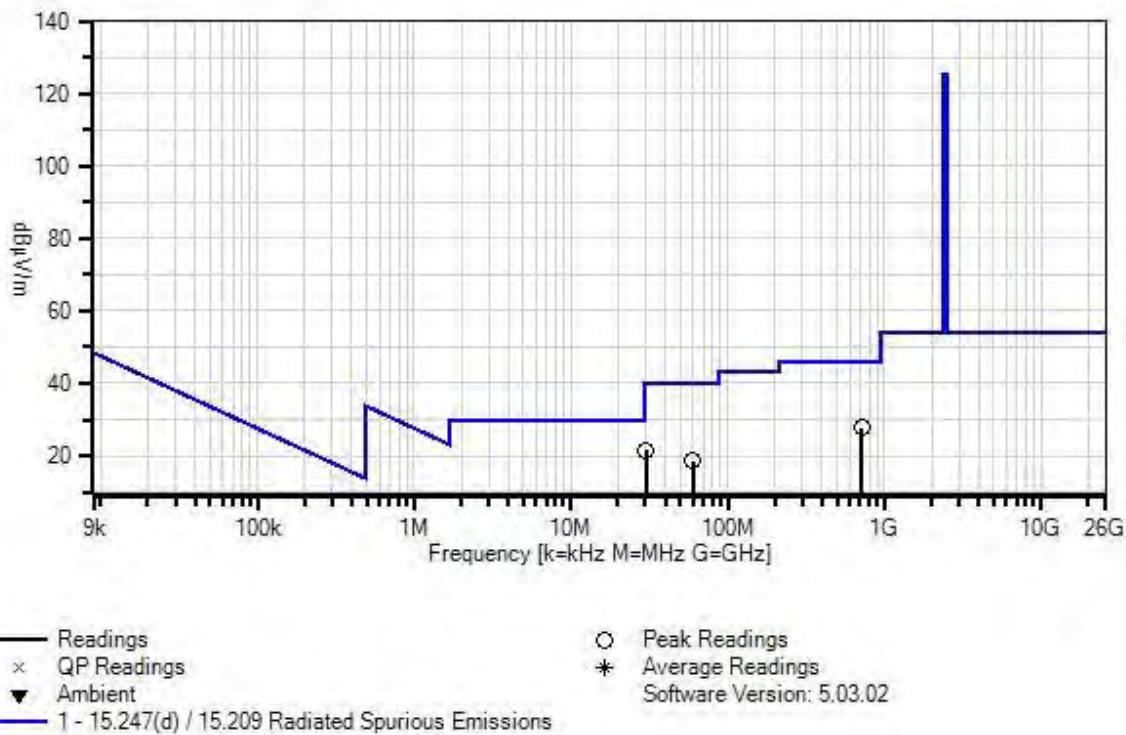
Temperature: 20.3° C
 Humidity: 45 %
 Atmospheric Pressure: 101.9 kPa

Highest Generating Frequency: 2.48GHz
 Method: ANSI C 63.10 2013
 Transmitting Frequencies: 2402, 2426 and 2480MHz

9 kHz -150 kHz; RBW=200 Hz,VBW=200 Hz
 150 kHz-30 MHz; RBW=9 kHz,VBW=9 kHz
 30 MHz-1000 MHz; RBW=120 kHz,VBW=120 kHz
 1000 MHz-25000MHz; RBW=1 MHz,VBW=1 MHz

The EUT is placed on a non-conducted table. The device is operated by an internal battery at 3.0VDC. The EUT is set in continuously transmitting as intended.

Low Channel

Vivalnk, Inc WO#: 98267 Sequence#: 41 Date: 4/12/2016
 15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters

Test Equipment:

| ID | Asset # | Description | Model | Calibration Date | Cal Due Date |
|----|----------|-------------------|------------|------------------|--------------|
| T1 | AN00852 | Biconilog Antenna | CBL 6111C | 11/24/2014 | 11/24/2016 |
| T2 | AN00971A | Preamp | 8447D | 2/5/2016 | 2/5/2018 |
| | AN00432 | Loop Antenna | 6502 | 5/8/2015 | 5/8/2017 |
| T3 | ANP00880 | Cable | RG214U | 6/13/2014 | 6/13/2016 |
| T4 | ANP01187 | Cable | CNT-195 | 12/30/2014 | 12/30/2016 |
| T5 | ANP06691 | Cable | PE3062-180 | 8/8/2014 | 8/8/2016 |
| | AN02660 | Spectrum Analyzer | E4446A | 7/9/2015 | 7/9/2017 |

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

| # | Freq | Rdng | T1 | T2 | T3 | T4 | Dist | Corr | Spec | Margin | Polar |
|---|----------|------|-------|-------|------|------|-------|--------|--------|--------|-------|
| | | | T5 | | | | Table | dBµV/m | dBµV/m | | |
| | | | MHz | dB | dB | dB | | | | | Ant |
| 1 | 718.598M | 30.2 | +20.8 | -28.2 | +2.9 | +0.7 | +0.0 | 27.6 | 46.0 | -18.4 | Horiz |
| | | | +1.2 | | | | | | | | |
| 2 | 30.337M | 30.0 | +18.7 | -28.0 | +0.4 | +0.1 | +0.0 | 21.4 | 40.0 | -18.6 | Horiz |
| | | | +0.2 | | | | | | | | |
| 3 | 59.921M | 39.5 | +6.2 | -27.9 | +0.6 | +0.1 | +0.0 | 18.7 | 40.0 | -21.3 | Vert |
| | | | +0.2 | | | | | | | | |

Test Location: CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
 Customer: **VivaLnk, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **98267** Date: 4/12/2016
 Test Type: **Radiated Scan** Time: 10:07:03
 Tested By: Hieu Song Nguyenpham Sequence#: 14
 Software: EMITest 5.03.02

Equipment Tested:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 2 | | | |

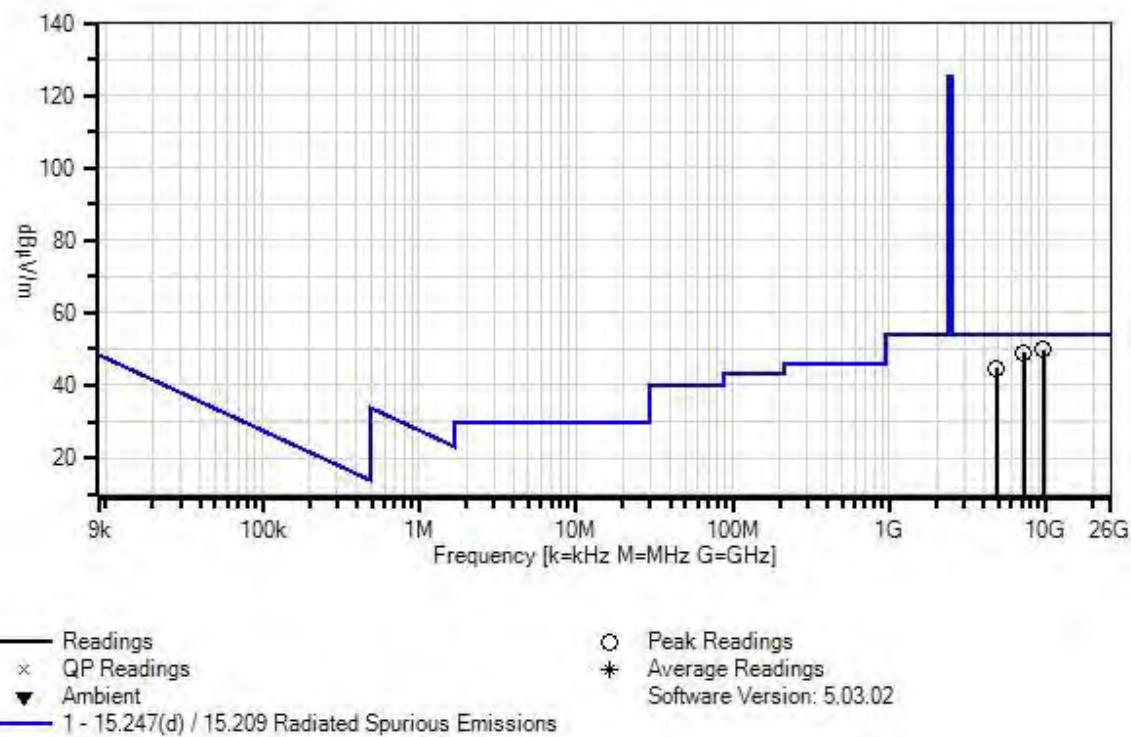
Support Equipment:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 2 | | | |

Test Conditions / Notes:

| |
|---|
| Radiated Spurious Emission Frequency Range: 1000MHz to 25000MHz |
| Application: VBLET version 2.5.3 |
| Temperature: 20.3° C |
| Humidity: 45 % |
| Atmospheric Pressure: 101.9 kPa |
| Highest Generating Frequency: 2.48GHz |
| Method: ANSI C 63.10 2013 |
| Transmitting Frequencies: 2402, 2426 and 2480MHz |
| 9 kHz -150 kHz; RBW=200 Hz,VBW=200 Hz |
| 150 kHz-30 MHz; RBW=9 kHz,VBW=9 kHz |
| 30 MHz-1000 MHz; RBW=120 kHz,VBW=120 kHz |
| 1000 MHz-25000MHz; RBW=1 MHz,VBW=1 MHz |
| The EUT is placed on a non-conducted table. The device is operated by an internal battery at 3.0VDC. The EUT is set in continuously transmitting as intended. |
| Low Channel |

Vivalnk, Inc WO#: 98267 Sequence#: 14 Date: 4/12/2016
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters



Test Equipment:

| ID | Asset # | Description | Model | Calibration Date | Cal Due Date |
|----|----------|-----------------------------------|---------------------------|------------------|--------------|
| T1 | AN02113 | Horn Antenna | 3115 | 2/3/2015 | 2/3/2017 |
| T2 | AN03302 | Cable | 32026-29094K-29094K-72TC | 1/29/2016 | 1/29/2018 |
| T3 | ANP01210 | Cable | FSJ1P-50A-4A | 1/15/2015 | 1/15/2017 |
| | AN02660 | Spectrum Analyzer | E4446A | 7/9/2015 | 7/9/2017 |
| T4 | AN03114 | Preamp | AMF-7D-00101800-30-10P | 4/22/2015 | 4/22/2017 |
| | AN02694 | Horn Antenna-ANSI C63.5 3m | AMFW-5F-18002650-20-10P | 5/7/2015 | 5/7/2017 |
| | ANP00928 | Cable | various | 1/25/2016 | 1/25/2018 |
| | ANP00929 | Cable | various | 1/25/2016 | 1/25/2018 |
| | ANP06126 | Cable | 32022-29094K-29094K-168TC | 3/18/2015 | 3/18/2017 |
| | ANP06138 | Cable | 32022-29094K-29094K-72TC | 3/18/2015 | 3/18/2017 |
| T5 | ANP06900 | Cable | 32022-29094K-29094K-36TC | 12/30/2015 | 12/30/2017 |
| T6 | AN03309 | High Pass Filter | 11SH10-3000/T10000-O/O | 1/18/2016 | 1/18/2018 |
| | AN02693 | Active Horn Antenna-ANSI C63.5 3m | AMFW-5F-12001800-20-10P | 5/6/2015 | 5/6/2017 |

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

| # | Freq | Rdng | T1 | T2 | T3 | T4 | Dist | Corr | Spec | Margin | Polar |
|---|-----------|------------|---------------|--------------|------|-------|-------|--------------|--------------|--------|-------|
| | | | T5 | T6 | | | Table | dB μ V/m | dB μ V/m | | |
| | MHz | dB μ V | dB | dB | dB | dB | | | | | Ant |
| 1 | 9609.603M | 62.8 | +34.8 +1.1 | +2.6 +0.3 | +5.4 | -57.2 | +0.0 | 49.8 | 54.0 | -4.2 | Vert |
| 2 | 7207.203M | 64.8 | +34.1 +1.0 | +2.2 +0.3 | +5.0 | -58.3 | +0.0 | 49.1 | 54.0 | -4.9 | Vert |
| 3 | 4803.802M | 65.1 | +30.8 +0.8 | +1.8 +0.3 | +3.8 | -57.8 | +0.0 | 44.8 | 54.0 | -9.2 | Horiz |

Test Location: CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
 Customer: **VivaLnk, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **98267** Date: 4/12/2016
 Test Type: **Radiated Scan** Time: 19:41:14
 Tested By: Hieu Song Nguyenpham Sequence#: 44
 Software: EMITest 5.03.02

Equipment Tested:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 2 | | | |

Support Equipment:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 2 | | | |

Test Conditions / Notes:

Radiated Spurious Emission
 Frequency Range: 9kHz to 1000MHz

Application: VBLET version 2.5.3

Temperature: 20.3°C
 Humidity: 45 %
 Atmospheric Pressure: 101.9 kPa

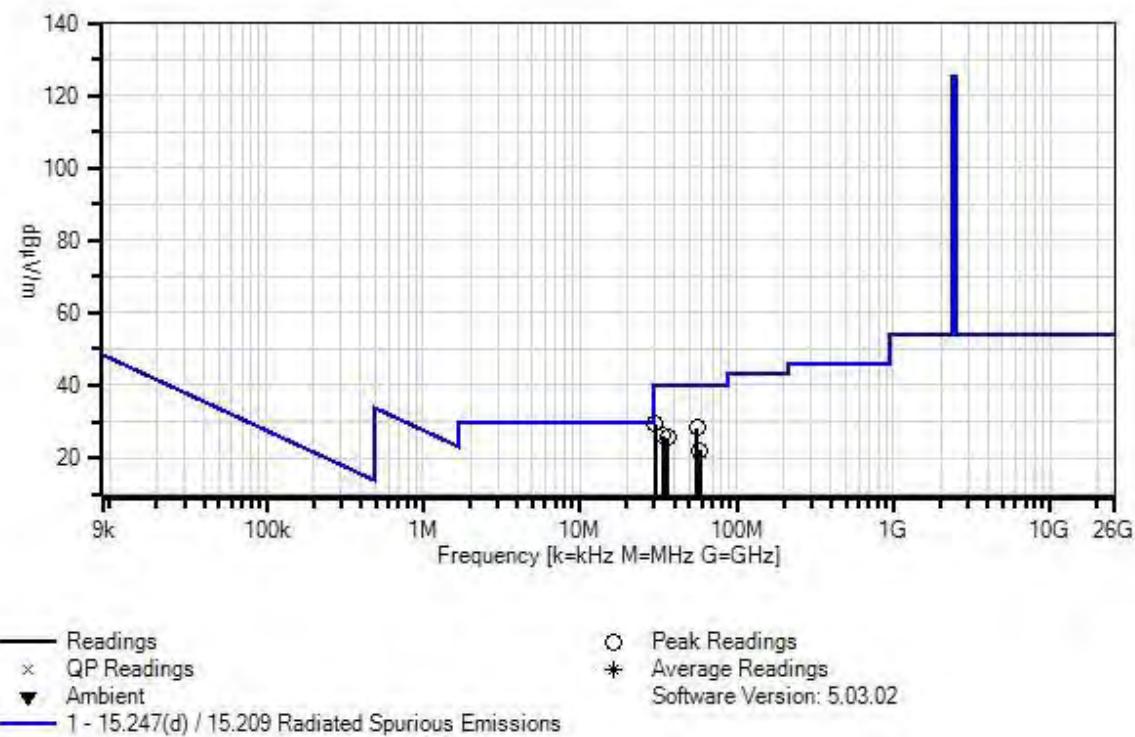
Highest Generating Frequency: 2.48GHz
 Method: ANSI C 63.10 2013
 Transmitting Frequencies: 2402, 2426 and 2480MHz

9 kHz -150 kHz; RBW=200 Hz,VBW=200 Hz
 150 kHz-30 MHz; RBW=9 kHz,VBW=9 kHz
 30 MHz-1000 MHz; RBW=120 kHz,VBW=120 kHz
 1000 MHz-25000MHz; RBW=1 MHz,VBW=1 MHz

The EUT is placed on a non-conducted table. The device is operated by an internal battery at 3.0VDC. The EUT is set in continuously transmitting as intended.

Middle Channel

Vivalnk, Inc WO#: 98267 Sequence#: 44 Date: 4/12/2016
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters



Test Equipment:

| ID | Asset # | Description | Model | Calibration Date | Cal Due Date |
|----|----------|-------------------|------------|------------------|--------------|
| T1 | AN00852 | Biconilog Antenna | CBL 6111C | 11/24/2014 | 11/24/2016 |
| T2 | AN00971A | Preamp | 8447D | 2/5/2016 | 2/5/2018 |
| | AN00432 | Loop Antenna | 6502 | 5/8/2015 | 5/8/2017 |
| T3 | ANP00880 | Cable | RG214U | 6/13/2014 | 6/13/2016 |
| T4 | ANP01187 | Cable | CNT-195 | 12/30/2014 | 12/30/2016 |
| T5 | ANP06691 | Cable | PE3062-180 | 8/8/2014 | 8/8/2016 |
| | AN02660 | Spectrum Analyzer | E4446A | 7/9/2015 | 7/9/2017 |

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

| # | Freq | Rdng | T1 | T2 | T3 | T4 | Dist | Corr | Spec | Margin | Polar |
|---|---------|------------|---------------|-------|------|------|-------|--------------|--------------|--------|-------|
| | | | T5 | | | | Table | dB μ V/m | dB μ V/m | | |
| | MHz | dB μ V | dB | dB | dB | dB | | | | dB | Ant |
| 1 | 30.253M | 37.9 | +18.8 +0.2 | -28.0 | +0.4 | +0.1 | +0.0 | 29.4 | 40.0 | -10.6 | Horiz |
| 2 | 55.760M | 47.9 | +7.4 +0.2 | -27.9 | +0.6 | +0.1 | +0.0 | 28.3 | 40.0 | -11.7 | Horiz |
| 3 | 33.788M | 36.2 | +17.0 +0.2 | -28.0 | +0.5 | +0.1 | +0.0 | 26.0 | 40.0 | -14.0 | Horiz |
| 4 | 36.271M | 36.9 | +15.8 +0.2 | -28.0 | +0.5 | +0.1 | +0.0 | 25.5 | 40.0 | -14.5 | Horiz |
| 5 | 58.460M | 42.5 | +6.6 +0.2 | -27.9 | +0.6 | +0.1 | +0.0 | 22.1 | 40.0 | -17.9 | Horiz |

Test Location: CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
 Customer: **VivaLnk, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **98267** Date: 4/12/2016
 Test Type: **Radiated Scan** Time: 10:28:15
 Tested By: Hieu Song Nguyenpham Sequence#: 17
 Software: EMITest 5.03.02

Equipment Tested:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 2 | | | |

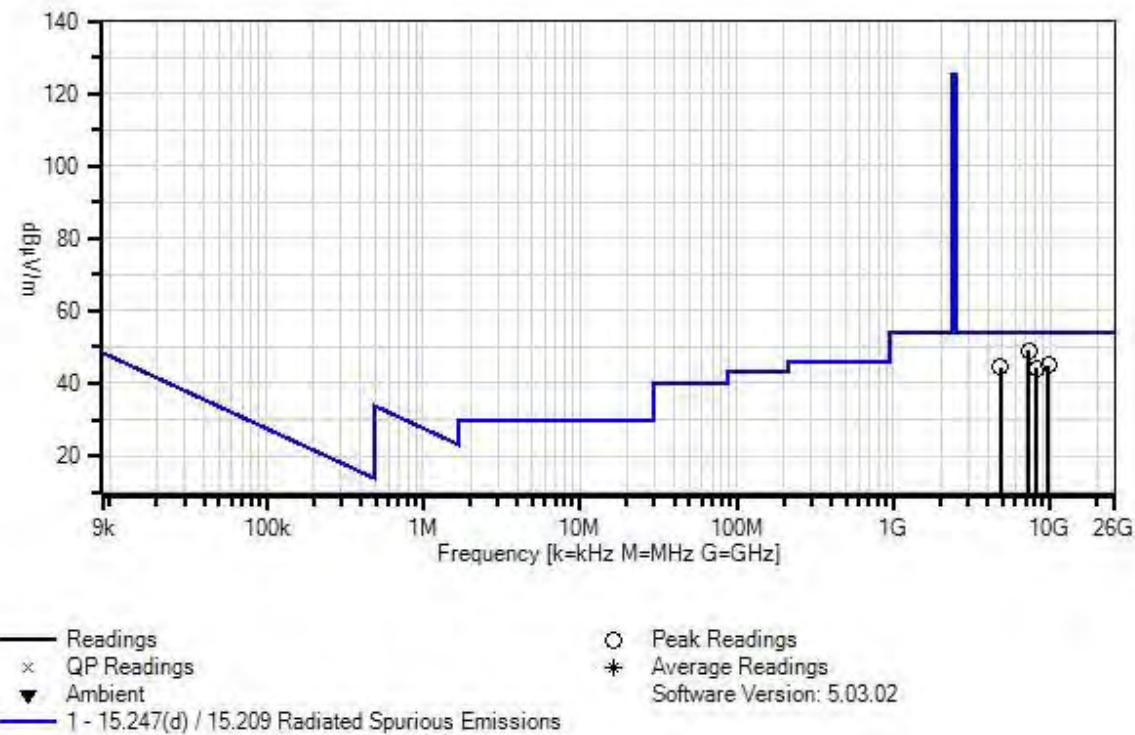
Support Equipment:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 2 | | | |

Test Conditions / Notes:

| |
|---|
| Radiated Spurious Emission Frequency Range: 1000MHz to 25000MHz |
| Application: VBLET version 2.5.3 |
| Temperature: 20.3° C |
| Humidity: 45 % |
| Atmospheric Pressure: 101.9 kPa |
| Highest Generating Frequency: 2.48GHz |
| Method: ANSI C 63.10 2013 |
| Transmitting Frequencies: 2402, 2426 and 2480MHz |
| 9 kHz -150 kHz; RBW=200 Hz,VBW=200 Hz |
| 150 kHz-30 MHz; RBW=9 kHz,VBW=9 kHz |
| 30 MHz-1000 MHz; RBW=120 kHz,VBW=120 kHz |
| 1000 MHz-25000MHz; RBW=1 MHz,VBW=1 MHz |
| The EUT is placed on a non-conducted table. The device is operated by an internal battery at 3.0VDC. The EUT is set in continuously transmitting as intended. |
| Middle Channel |

Vivalnk, Inc WO#: 98267 Sequence#: 17 Date: 4/12/2016
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters



Test Equipment:

| ID | Asset # | Description | Model | Calibration Date | Cal Due Date |
|----|----------|-----------------------------------|---------------------------|------------------|--------------|
| T1 | AN02113 | Horn Antenna | 3115 | 2/3/2015 | 2/3/2017 |
| T2 | AN03302 | Cable | 32026-29094K-29094K-72TC | 1/29/2016 | 1/29/2018 |
| T3 | ANP01210 | Cable | FSJ1P-50A-4A | 1/15/2015 | 1/15/2017 |
| | AN02660 | Spectrum Analyzer | E4446A | 7/9/2015 | 7/9/2017 |
| T4 | AN03114 | Preamp | AMF-7D-00101800-30-10P | 4/22/2015 | 4/22/2017 |
| | AN02694 | Horn Antenna-ANSI C63.5 3m | AMFW-5F-18002650-20-10P | 5/7/2015 | 5/7/2017 |
| | ANP00928 | Cable | various | 1/25/2016 | 1/25/2018 |
| | ANP00929 | Cable | various | 1/25/2016 | 1/25/2018 |
| | ANP06126 | Cable | 32022-29094K-29094K-168TC | 3/18/2015 | 3/18/2017 |
| | ANP06138 | Cable | 32022-29094K-29094K-72TC | 3/18/2015 | 3/18/2017 |
| T5 | ANP06900 | Cable | 32022-29094K-29094K-36TC | 12/30/2015 | 12/30/2017 |
| T6 | AN03309 | High Pass Filter | 11SH10-3000/T10000-O/O | 1/18/2016 | 1/18/2018 |
| | AN02693 | Active Horn Antenna-ANSI C63.5 3m | AMFW-5F-12001800-20-10P | 5/6/2015 | 5/6/2017 |

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

| # | Freq | Rdng | T1 | T2 | T3 | T4 | Dist | Corr | Spec | Margin | Polar |
|---|-----------|------------|---------------|--------------|------|-------|-------|--------------|--------------|--------|-------|
| | | | T5 | T6 | | | Table | dB μ V/m | dB μ V/m | | |
| | MHz | dB μ V | dB | dB | dB | dB | | | | | Ant |
| 1 | 7277.435M | 64.6 | +34.2 +1.0 | +2.3 +0.3 | +5.0 | -58.3 | +0.0 | 49.1 | 54.0 | -4.9 | Horiz |
| 2 | 9704.889M | 58.2 | +34.9 +1.1 | +2.6 +0.3 | +5.5 | -57.5 | +0.0 | 45.1 | 54.0 | -8.9 | Vert |
| 3 | 4852.444M | 64.6 | +30.9 +0.8 | +1.8 +0.3 | +3.8 | -57.7 | +0.0 | 44.5 | 54.0 | -9.5 | Horiz |
| 4 | 8204.445M | 56.4 | +35.7 +1.0 | +2.4 +0.3 | +5.2 | -56.8 | +0.0 | 44.2 | 54.0 | -9.8 | Vert |

Test Location: CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
 Customer: **VivaLnk, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **98267** Date: 4/12/2016
 Test Type: **Radiated Scan** Time: 20:08:27
 Tested By: Hieu Song Nguyenpham Sequence#: 47
 Software: EMITest 5.03.02

Equipment Tested:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 2 | | | |

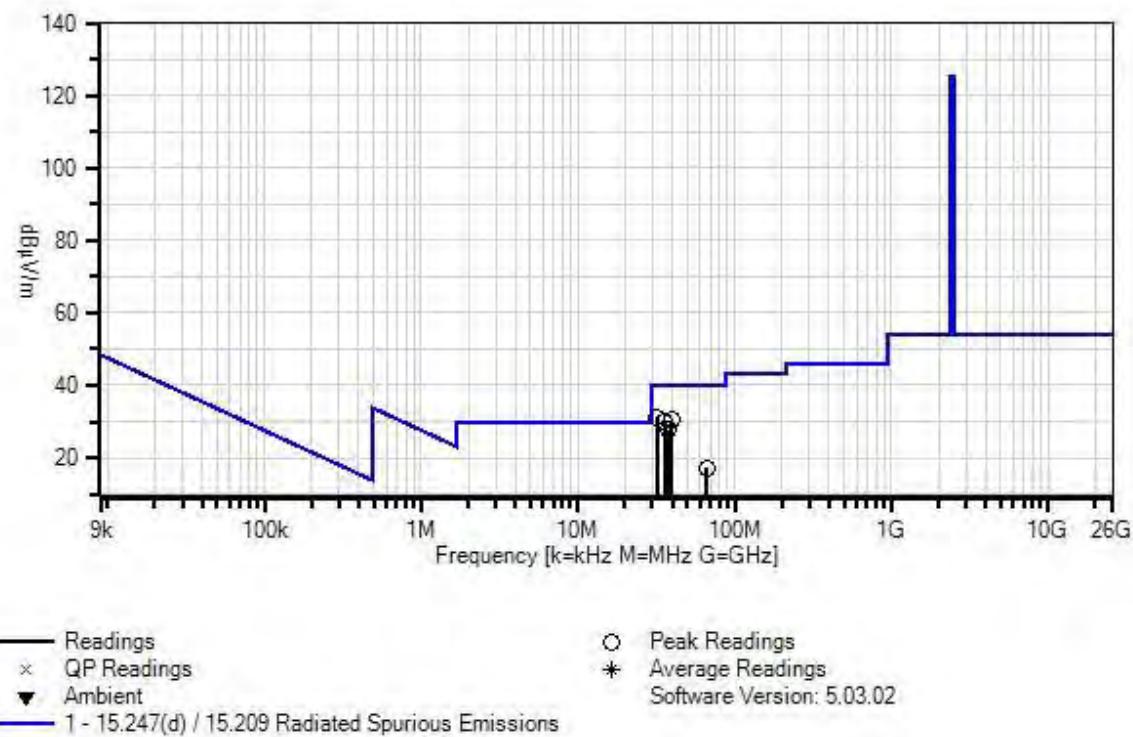
Support Equipment:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 2 | | | |

Test Conditions / Notes:

| |
|--|
| Radiated Spurious Emission Frequency Range: 9kHz to 1000MHz Application: VBLET version 2.5.3 Temperature: 20.3° C Humidity: 45 % Atmospheric Pressure: 101.9 kPa Highest Generating Frequency: 2.48GHz Method: ANSI C 63.10 2013 Transmitting Frequencies: 2402, 2426 and 2480MHz 9 kHz -150 kHz; RBW=200 Hz,VBW=200 Hz 150 kHz-30 MHz; RBW=9 kHz,VBW=9 kHz 30 MHz-1000 MHz; RBW=120 kHz,VBW=120 kHz 1000 MHz-25000MHz; RBW=1 MHz,VBW=1 MHz The EUT is placed on a non-conducted table. The device is operated by an internal battery at 3.0VDC. The EUT is set in continuously transmitting as intended. |
| High Channel |

Vivalnk, Inc WO#: 98267 Sequence#: 47 Date: 4/12/2016
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters



Test Equipment:

| ID | Asset # | Description | Model | Calibration Date | Cal Due Date |
|----|----------|-------------------|------------|------------------|--------------|
| T1 | AN00852 | Biconilog Antenna | CBL 6111C | 11/24/2014 | 11/24/2016 |
| T2 | AN00971A | Preamp | 8447D | 2/5/2016 | 2/5/2018 |
| | AN00432 | Loop Antenna | 6502 | 5/8/2015 | 5/8/2017 |
| T3 | ANP00880 | Cable | RG214U | 6/13/2014 | 6/13/2016 |
| T4 | ANP01187 | Cable | CNT-195 | 12/30/2014 | 12/30/2016 |
| T5 | ANP06691 | Cable | PE3062-180 | 8/8/2014 | 8/8/2016 |
| | AN02660 | Spectrum Analyzer | E4446A | 7/9/2015 | 7/9/2017 |

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

| # | Freq | Rdng | T1 | T2 | T3 | T4 | Dist | Corr | Spec | Margin | Polar |
|---|---------|------------|---------------|-------|------|------|-------|--------------|--------------|--------|-------|
| | | | T5 | | | | Table | dB μ V/m | dB μ V/m | | |
| | MHz | dB μ V | dB | dB | dB | dB | | | | | Ant |
| 1 | 31.810M | 40.4 | +18.0 +0.2 | -28.0 | +0.5 | +0.1 | +0.0 | 31.2 | 40.0 | -8.8 | Horiz |
| 2 | 39.950M | 43.8 | +13.7 +0.2 | -28.0 | +0.5 | +0.1 | +0.0 | 30.3 | 40.0 | -9.7 | Horiz |
| 3 | 35.723M | 41.2 | +16.1 +0.2 | -28.0 | +0.5 | +0.1 | +0.0 | 30.1 | 40.0 | -9.9 | Horiz |
| 4 | 37.575M | 40.0 | +15.0 +0.2 | -28.0 | +0.5 | +0.1 | +0.0 | 27.8 | 40.0 | -12.2 | Horiz |
| 5 | 66.150M | 38.0 | +6.2 +0.2 | -27.9 | +0.7 | +0.1 | +0.0 | 17.3 | 40.0 | -22.7 | Horiz |

Test Location: CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
 Customer: **VivaLnk, Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **98267** Date: 4/12/2016
 Test Type: **Radiated Scan** Time: 10:45:10
 Tested By: Hieu Song Nguyenpham Sequence#: 20
 Software: EMITest 5.03.02

Equipment Tested:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 2 | | | |

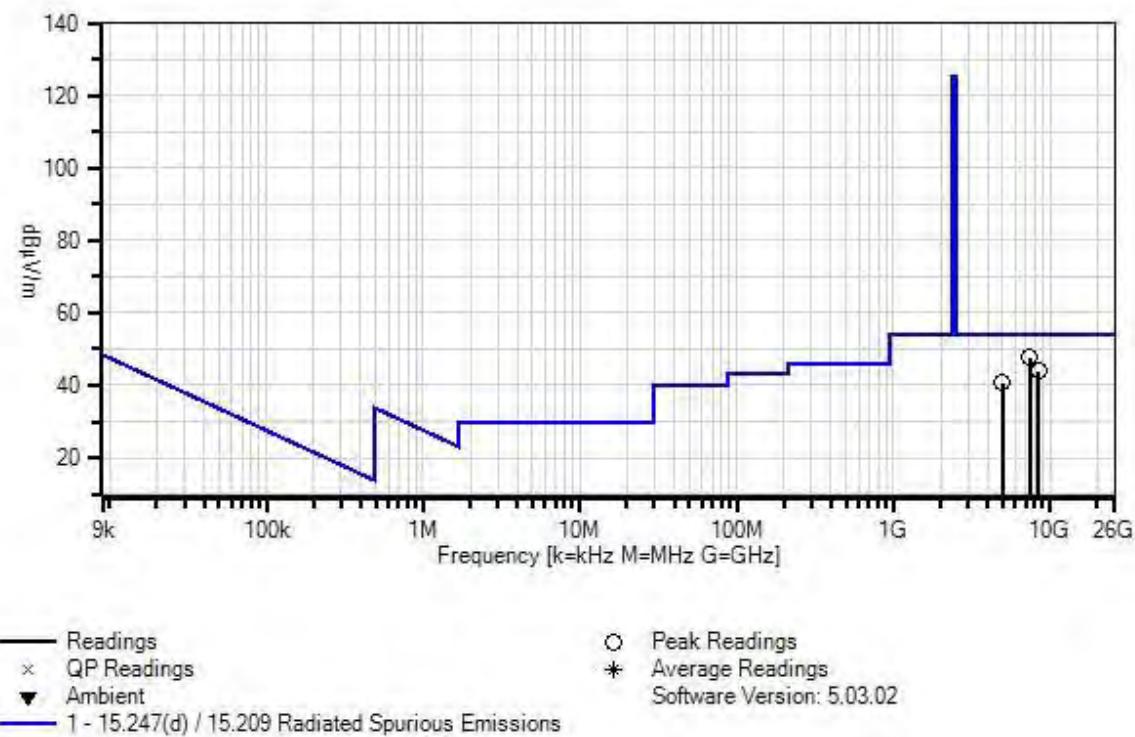
Support Equipment:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 2 | | | |

Test Conditions / Notes:

| |
|---|
| Radiated Spurious Emission Frequency Range: 1000MHz to 25000MHz |
| Application: VBLET version 2.5.3 |
| Temperature: 20.3° C |
| Humidity: 45 % |
| Atmospheric Pressure: 101.9 kPa |
| Highest Generating Frequency: 2.48GHz |
| Method: ANSI C 63.10 2013 |
| Transmitting Frequencies: 2402, 2426 and 2480MHz |
| 9 kHz -150 kHz; RBW=200 Hz,VBW=200 Hz |
| 150 kHz-30 MHz; RBW=9 kHz,VBW=9 kHz |
| 30 MHz-1000 MHz; RBW=120 kHz,VBW=120 kHz |
| 1000 MHz-25000MHz; RBW=1 MHz,VBW=1 MHz |
| The EUT is placed on a non-conducted table. The device is operated by an internal battery at 3.0VDC. The EUT is set in continuously transmitting as intended. |
| High Channel |

Vivalnk, Inc WO#: 98267 Sequence#: 20 Date: 4/12/2016
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters



Test Equipment:

| ID | Asset # | Description | Model | Calibration Date | Cal Due Date |
|----|----------|-----------------------------------|---------------------------|------------------|--------------|
| T1 | AN02113 | Horn Antenna | 3115 | 2/3/2015 | 2/3/2017 |
| T2 | AN03302 | Cable | 32026-29094K-29094K-72TC | 1/29/2016 | 1/29/2018 |
| T3 | ANP01210 | Cable | FSJ1P-50A-4A | 1/15/2015 | 1/15/2017 |
| | AN02660 | Spectrum Analyzer | E4446A | 7/9/2015 | 7/9/2017 |
| T4 | AN03114 | Preamp | AMF-7D-00101800-30-10P | 4/22/2015 | 4/22/2017 |
| | AN02694 | Horn Antenna-ANSI C63.5 3m | AMFW-5F-18002650-20-10P | 5/7/2015 | 5/7/2017 |
| | ANP00928 | Cable | various | 1/25/2016 | 1/25/2018 |
| | ANP00929 | Cable | various | 1/25/2016 | 1/25/2018 |
| | ANP06126 | Cable | 32022-29094K-29094K-168TC | 3/18/2015 | 3/18/2017 |
| | ANP06138 | Cable | 32022-29094K-29094K-72TC | 3/18/2015 | 3/18/2017 |
| T5 | ANP06900 | Cable | 32022-29094K-29094K-36TC | 12/30/2015 | 12/30/2017 |
| T6 | AN03309 | High Pass Filter | 11SH10-3000/T10000-O/O | 1/18/2016 | 1/18/2018 |
| | AN02693 | Active Horn Antenna-ANSI C63.5 3m | AMFW-5F-12001800-20-10P | 5/6/2015 | 5/6/2017 |

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

| # | Freq | Rdng | T1 | T2 | T3 | T4 | Dist | Corr | Spec | Margin | Polar |
|---|-----------|------------|---------------|--------------|------|-------|-------|--------------|--------------|--------|-------|
| | | | T5 | T6 | | | Table | dB μ V/m | dB μ V/m | | |
| | MHz | dB μ V | dB | dB | dB | dB | | | | | Ant |
| 1 | 7441.463M | 62.8 | +34.4 +1.0 | +2.3 +0.3 | +5.1 | -58.2 | +0.0 | 47.7 | 54.0 | -6.3 | Vert |
| 2 | 8488.796M | 55.2 | +36.1 +1.0 | +2.4 +0.3 | +5.2 | -56.3 | +0.0 | 43.9 | 54.0 | -10.1 | Vert |
| 3 | 4960.491M | 60.2 | +31.1 +0.8 | +1.8 +0.3 | +3.8 | -57.3 | +0.0 | 40.7 | 54.0 | -13.3 | Horiz |

Band Edge

Band Edge Summary

| Frequency (MHz) | Modulation | Ant. Type | Field Strength (dBuV/m @3m) | Limit (dBuV/m @3m) | Results |
|-----------------|------------|-----------|-----------------------------|--------------------|---------|
| 2390.0 | GFSK | 3.3 | 43.1 | <54 | Pass |
| 2483.5 | GFSK | 3.3 | 43.9 | <54 | Pass |

Band Edge Test Setup / Conditions / Data

Test Location: CKC Laboratories, Inc. • 1120 Fulton Place • Fremont, CA 94539 • (510) 249-1170
 Customer: **VivaLnk Inc.**
 Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
 Work Order #: **98267** Date: 4/21/2016
 Test Type: **Radiated Scan** Time: 15:35:05
 Tested By: Hieu Song Nguyenpham Sequence#: 48
 Software: EMITest 5.03.02

Equipment Tested:

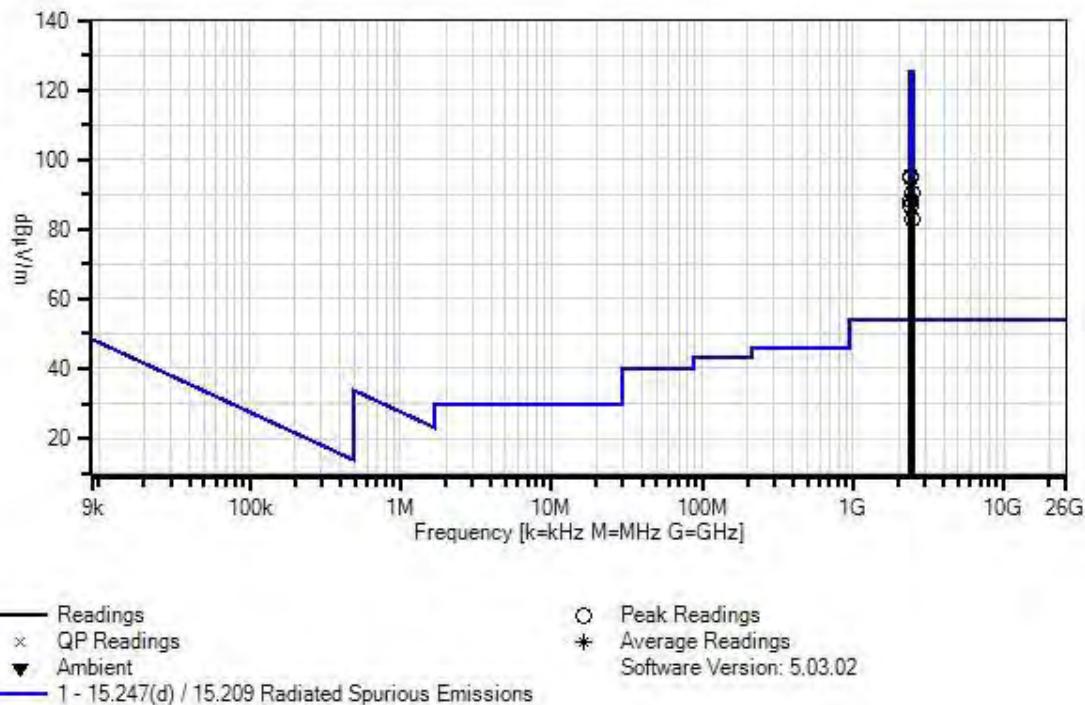
| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 2 | | | |

Support Equipment:

| Device | Manufacturer | Model # | S/N |
|-----------------|--------------|---------|-----|
| Configuration 2 | | | |

Test Conditions / Notes:

| |
|---|
| Band Edge |
| Application: VBLET version 2.5.3 |
| Temperature: 21.3° C |
| Humidity: 42 % |
| Atmospheric Pressure: 101.9 kPa |
| Highest Generating Frequency: 2.48GHz |
| Method: ANSI C 63.10 2013 |
| Transmitting Frequencies: 2402, 2426 and 2480MHz |
| The EUT is placed on a non-conducted table. The device is operated by an internal battery at 3.0VDC. The EUT is set in continuously transmitting as intended. |

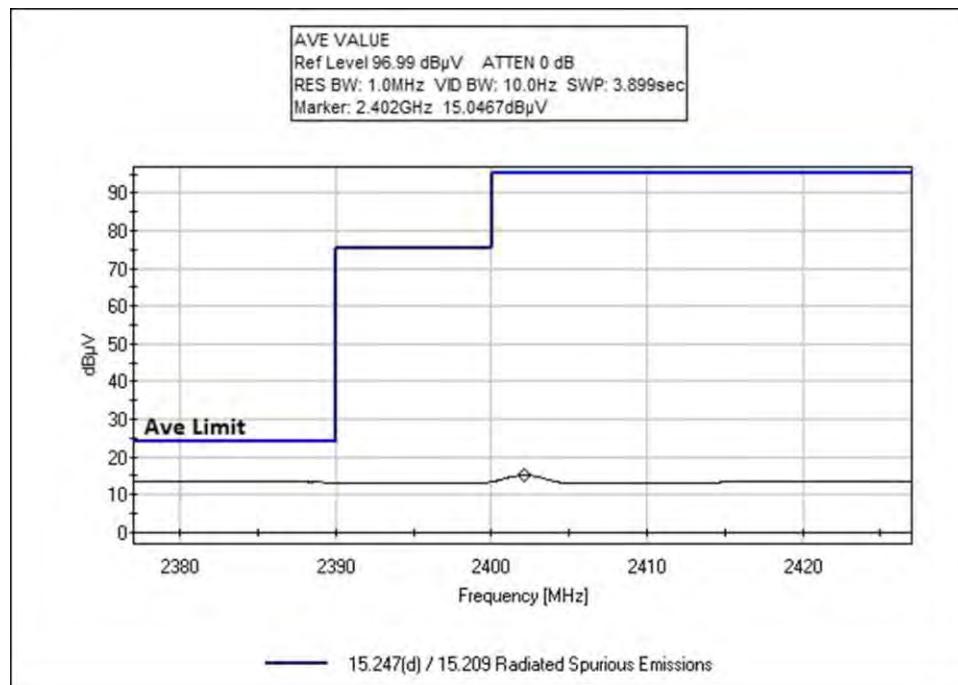
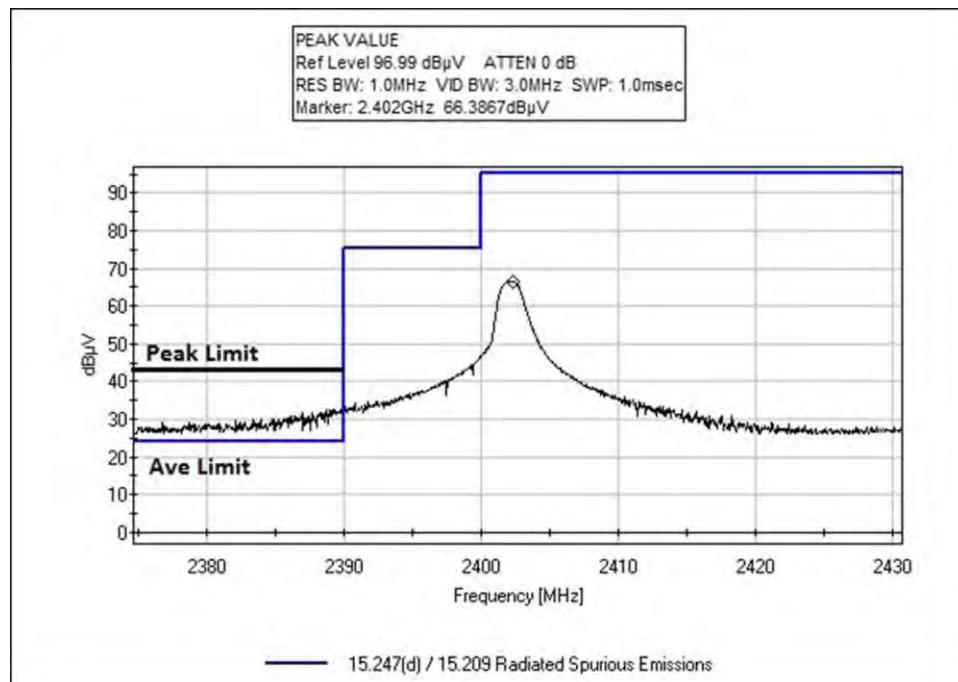
Vivalink WO#: 98267 Sequence#: 48 Date: 4/21/2016
 15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters

Test Equipment:

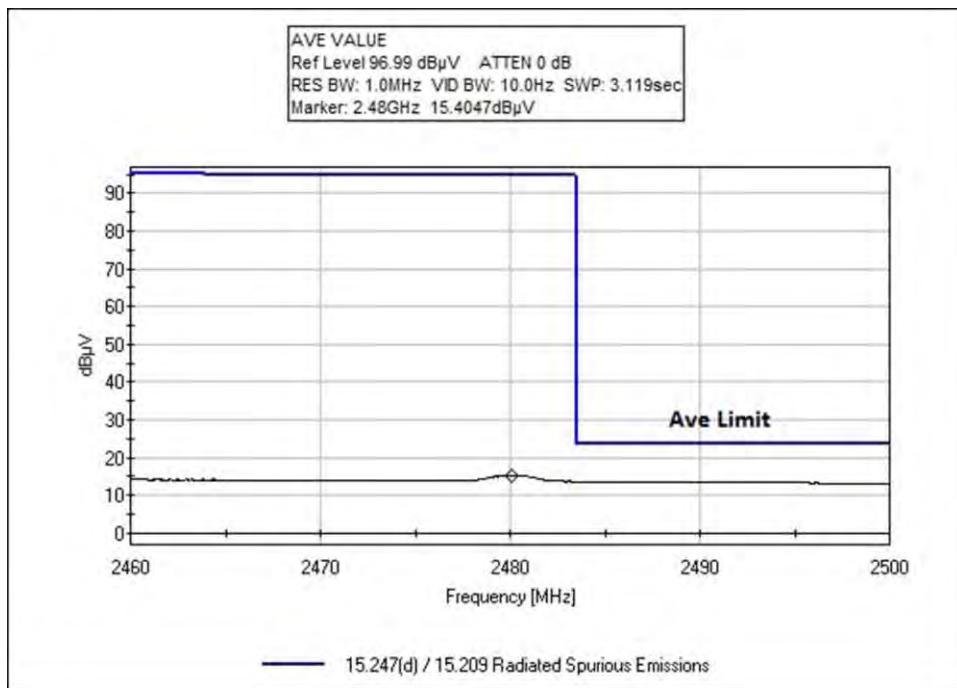
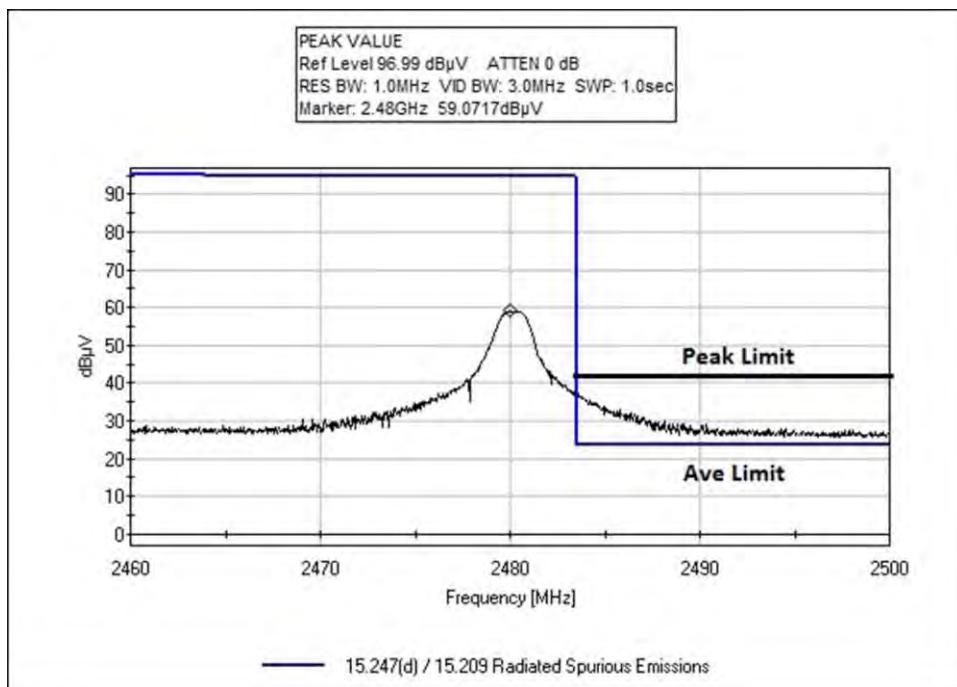
| ID | Asset # | Description | Model | Calibration Date | Cal Due Date |
|----|----------|-------------------|--------------------------|------------------|--------------|
| T1 | AN02113 | Horn Antenna | 3115 | 2/3/2015 | 2/3/2017 |
| T2 | AN03302 | Cable | 32026-29094K-29094K-72TC | 1/29/2016 | 1/29/2018 |
| T3 | ANP01210 | Cable | FSJ1P-50A-4A | 1/15/2015 | 1/15/2017 |
| | AN03471 | Spectrum Analyzer | E4440A | 1/4/2016 | 1/4/2018 |

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

| # | Freq MHz | Rdng dB μ V | T1 dB | T2 dB | T3 dB | dB | Dist Table | Corr dB μ V/m | Spec dB μ V/m | Margin dB | Polar Ant |
|---|-------------|--------------------|----------|----------|----------|----|---------------|----------------------|----------------------|--------------|--------------|
| 1 | 2402.188M | 65.5 | +26.0 | +1.3 | +2.6 | | +0.0 | 95.4 | 125.2 | -29.8 | Horiz |
| 2 | 2426.169M | 64.8 | +26.1 | +1.3 | +2.6 | | +0.0 | 94.8 | 125.2 | -30.4 | Horiz |
| 3 | 2480.068M | 60.0 | +26.3 | +1.3 | +2.6 | | +0.0 | 90.2 | 125.2 | -35.0 | Horiz |
| 4 | 2402.188M | 58.4 | +26.0 | +1.3 | +2.6 | | +0.0 | 88.3 | 125.2 | -36.9 | Vert |
| 5 | 2426.169M | 56.7 | +26.1 | +1.3 | +2.6 | | +0.0 | 86.7 | 125.2 | -38.5 | Vert |
| 6 | 2480.068M | 52.8 | +26.3 | +1.3 | +2.6 | | +0.0 | 83.0 | 125.2 | -42.2 | Vert |

Band Edge Plots





Test Setup Photos



9kHz – 30MHz



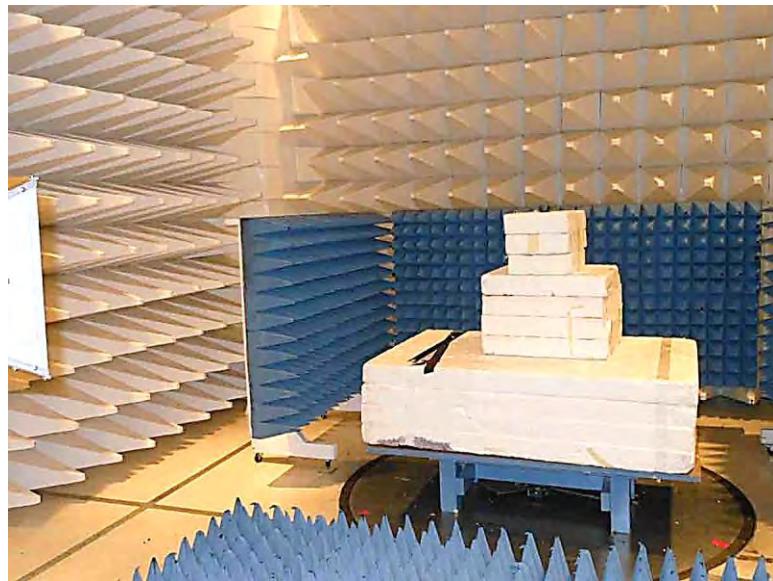
9kHz – 30MHz



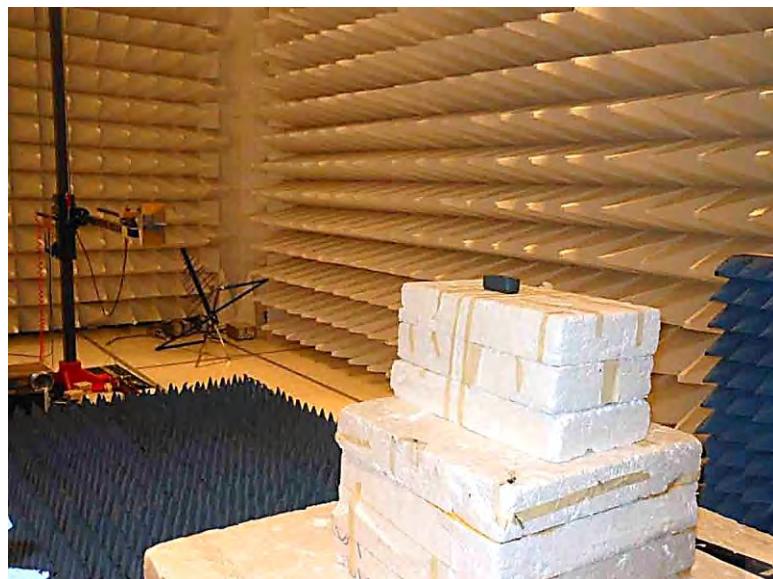
30MHz -1GHz



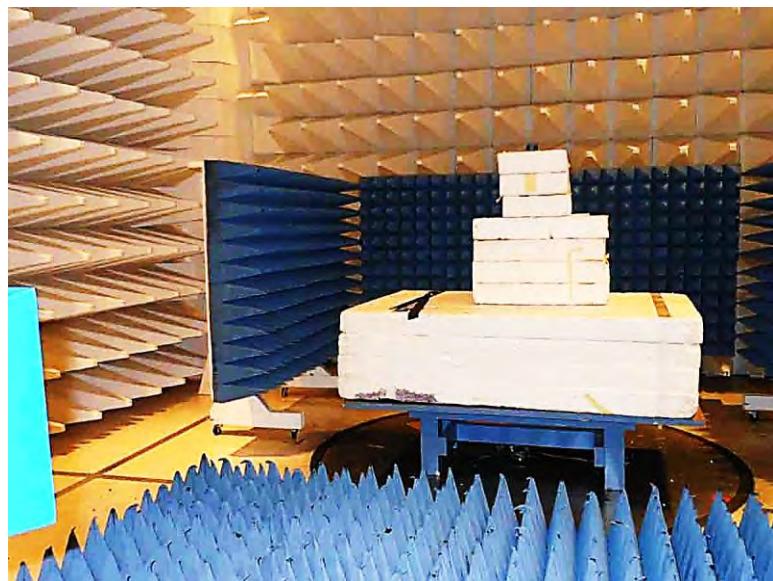
30MHz – 1GHz



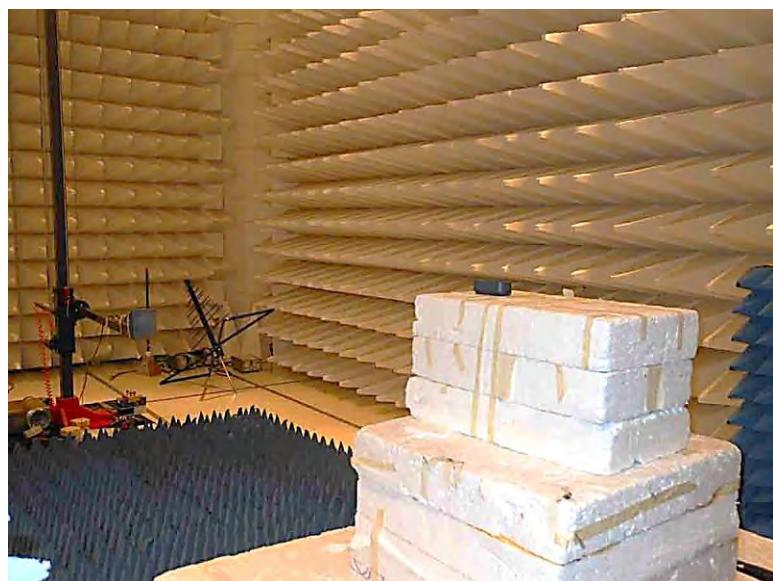
1 – 12GHz



1 – 12GHz



12 – 25GHz



12 – 25GHz

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

| Uncertainty Value | Parameter |
|-------------------|---------------------------|
| 4.73 dB | Radiated Emissions |
| 3.34 dB | Mains Conducted Emissions |
| 3.30 dB | Disturbance Power |

Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k=2$. Compliance is deemed to occur provided measurements are below the specified limits.

Emissions Test Details

TESTING PARAMETERS

Unless otherwise indicated, the following configuration parameters are used for equipment setup: The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in $\text{dB}\mu\text{V}/\text{m}$, the spectrum analyzer reading in $\text{dB}\mu\text{V}$ was corrected by using the following formula. This reading was then compared to the applicable specification limit. Individual measurements were compared with the displayed limit value in the margin column. The margin was calculated based on the limit value subtracting the corrected measured value; a negative margin represents a measurement less than the limit while a positive margin represents a measurement exceeding the limit.

| SAMPLE CALCULATIONS | |
|-----------------------|-------------------------------------|
| Meter reading | ($\text{dB}\mu\text{V}$) |
| + Antenna Factor | (dB/m) |
| + Cable Loss | (dB) |
| - Distance Correction | (dB) |
| - Preamplifier Gain | (dB) |
| = Corrected Reading | ($\text{dB}\mu\text{V}/\text{m}$) |

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. Unless otherwise specified, the following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used.

| MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE | | | |
|--|---------------------|------------------|-------------------|
| TEST | BEGINNING FREQUENCY | ENDING FREQUENCY | BANDWIDTH SETTING |
| CONDUCTED EMISSIONS | 150 kHz | 30 MHz | 9 kHz |
| RADIATED EMISSIONS | 9 kHz | 150 kHz | 200 Hz |
| RADIATED EMISSIONS | 150 kHz | 30 MHz | 9 kHz |
| RADIATED EMISSIONS | 30 MHz | 1000 MHz | 120 kHz |
| RADIATED EMISSIONS | 1000 MHz | >1 GHz | 1 MHz |

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "positive peak" detector mode. Whenever a "quasi-peak" or "average" reading was recorded, the measurement was annotated with a "QP" or an "Ave" on the appropriate rows of the data sheets. In cases where quasi-peak or average limits were employed and data exists for multiple measurement types for the same frequency then the peak measurement was retained in the report for reference, however the numbering for the affected row was removed and an arrow or caret ("^") was placed in the far left-hand column indicating that the row above takes precedence for comparison to the limit. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the spectrum analyzer or receiver recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature called "peak hold," the measurement device had the ability to measure intermittent or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

Quasi-peak measurements were taken using the quasi-peak detector when the true peak values exceeded or were within 2 dB of a quasi-peak specification limit. Additional QP measurements may have been taken at the discretion of the operator.

Average

Average measurements were taken using the average detector when the true peak values exceeded or were within 2 dB of an average specification limit. Additional average measurements may have been taken at the discretion of the operator. If the specification or test procedure requires trace averaging, then the averaging was performed using 100 samples or as required by the specification. All other average measurements are performed using video bandwidth averaging. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point the measuring device is set into the linear mode and the scan time is reduced.