

Test of Polycom Spectralink 8400 Series Wi-Fi  
handset with Bluetooth

To: FCC 47 CFR Part 15, Collocation [FCC  
15.31(h)]

Test Report Serial No.: POLY06-X2 Rev A



## TEST REPORT

From



**Test of:** Polycom Spectralink 8400 Series Wi-Fi handset with Bluetooth

**To:** FCC 47 CFR Part 15, Collocation [FCC 15.31(h)]

**Test Report Serial No.:** POLY06-X2 Rev A

**Reference Test Report(s):** POLY06-U12, POLY06-U13, POLY06-U7, POLY06-U8

This report supersedes: None

**Applicant:** Polycom  
4750 Willow Road  
Pleasanton, CA 94588-2708  
USA

**Product Function:** Wi-Fi handset with Bluetooth

**Copy No:** pdf    **Issue Date:** 6th April 2011

**This Test Report is Issued Under the Authority of:**

**MiCOM Labs, Inc.**

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TESTING CERTIFICATE #2381.01

**MiCOM Labs is an ISO 17025 Accredited Testing Laboratory**



**Title:** Polycom Spectralink 8440/8450 Wi-Fi  
handset with Bluetooth Collocation Report  
**To:** FCC 47 CFR Part 15, Collocation  
**Serial #:** POLY06-X2 Rev A  
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## 1 ACCREDITATION, LISTINGS & RECOGNITION

### 1.1 TESTING ACCREDITATION

MiCOM Labs, Inc. is an accredited Electrical testing laboratory per the international standard EN ISO/IEC 17025. The company is accredited by the American Association for Laboratory Accreditation (A2LA) [www.a2la.org](http://www.a2la.org) test laboratory number 2381.01. MiCOM Labs test schedule is available at the following URL; <http://www.a2la.org/scopepdf/2381-01.pdf>



The American Association for Laboratory Accreditation

World Class Accreditation

## Accredited Laboratory

A2LA has accredited

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*Pleasanton, CA*

for technical competence in the field of

**Electrical Testing**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).

Presented this 14<sup>th</sup> day of April 2010.



President & CEO  
For the Accreditation Council  
Certificate Number 2381.01  
Valid to November 30, 2011

*For the tests or types of tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.*

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## 1.2 RECOGNITION

MiCOM Labs, Inc has widely recognized Electrical testing capabilities. Our international recognition includes Conformity Assessment Body designation by APEC MRA\*\* countries. Our test reports are widely accepted for global type approvals.

| Country   | Recognition Body                                                                              | Status | Phase      | Identification No. |
|-----------|-----------------------------------------------------------------------------------------------|--------|------------|--------------------|
| USA       | Federal Communications Commission (FCC)                                                       | TCB    | -          | Listing #: 102167  |
| Canada    | Industry Canada (IC)                                                                          | FCB    | APEC MRA 2 | Listing #: 4143A   |
| Japan     | VCCI                                                                                          | -      | -          | No. 2959           |
| Europe    | European Commission                                                                           | NB     | EU MRA     | NB 2280            |
| Australia | Australian Communications and Media Authority (ACMA)                                          | CAB    | APEC MRA 1 | US0159             |
| Hong Kong | Office of the Telecommunication Authority (OFTA)                                              | CAB    | APEC MRA 1 |                    |
| Korea     | Ministry of Information and Communication Radio Research Laboratory (RRL)                     | CAB    | APEC MRA 1 |                    |
| Singapore | Infocomm Development Authority (IDA)                                                          | CAB    | APEC MRA 1 |                    |
| Taiwan    | National Communications Commission (NCC) Bureau of Standards, Metrology and Inspection (BSMI) | CAB    | APEC MRA 1 |                    |
| Vietnam   | Ministry of Communication (MIC)                                                               | CAB    | APEC MRA 1 |                    |

\*\*APEC MRA – Asia Pacific Economic Community Mutual Recognition Agreement.

Is a recognition agreement under which test lab is accredited to regulatory standards of the APEC member countries.

Phase I - recognition for product testing

Phase II – recognition for both product testing and certification

N/A – Not Applicable

\*\*EU MRA – European Union Mutual Recognition Agreement.

Is a recognition agreement under which test lab is accredited to regulatory standards of the EU member countries.

\*\*NB – Notified Body

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### 1.3 PRODUCT CERTIFICATION

MiCOM Labs, Inc. is an accredited Product Certification Body per the international standard EN ISO/IEC Guide 65. The company is accredited by the American Association for Laboratory Accreditation (A2LA) [www.a2la.org](http://www.a2la.org) test laboratory number 2381.02. MiCOM Labs test schedule is available at the following URL; <http://www.a2la.org/scopepdf/2381-02.pdf>



The American Association for Laboratory Accreditation

World Class Accreditation

## Accredited Product Certification Body

A2LA has accredited

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for technical competence as a

**Product Certification Body**

This product certification body is accredited in accordance with the recognized International Standard ISO/IEC Guide 65:1996 *General requirements for bodies operating product certification systems*. This accreditation demonstrates technical competence for a defined scope and the operation of a quality management system for a Telecommunications Certification Body (TCB) meeting FCC (U.S.), and IC (Canada) requirements.



Presented this 24<sup>th</sup> day of June 2010.

President & CEO  
For the Accreditation Council  
Certificate Number 2381.02  
Valid to November 30, 2011

*For the product certification schemes to which this accreditation applies, please refer to the organization's Product Certification Scope of Accreditation.*

### **United States of America – Telecommunication Certification Body**

TCB Identifier – US0159

### **Industry Canada – Certification Body**

CAB Identifier – US0159

### **Europe – Notified Body**

Notified Body Identifier - 2280

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## 2 DOCUMENT HISTORY

| Document History |                            |                 |
|------------------|----------------------------|-----------------|
| Revision         | Date                       | Comments        |
| Draft            |                            |                 |
| Rev A            | 6 <sup>th</sup> April 2011 | Initial Release |
|                  |                            |                 |
|                  |                            |                 |

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### 3 TEST RESULT CERTIFICATE

|                 |                                                                              |            |                                                                                            |
|-----------------|------------------------------------------------------------------------------|------------|--------------------------------------------------------------------------------------------|
| Applicant:      | Polycom<br>4750 Willow Road<br>Pleasanton<br>California ,<br>94588-2708, USA | Tested By: | MiCOM Labs, Inc.<br>440 Boulder Court<br>Suite 200<br>Pleasanton<br>California, 94566, USA |
| Product:        | Spectralink 8400 series Wi-Fi handsets                                       | Telephone: | +1 925 462 0304                                                                            |
| Model No.:      | Spectralink 8450<br>Spectralink 8440                                         | Fax:       | +1 925 462 0306                                                                            |
| S/No's:         | 600826769                                                                    |            |                                                                                            |
| Date(s) Tested: | March 7th, 2011                                                              | Website:   | www.micomlabs.com                                                                          |

| STANDARD(S)                                            | TEST RESULTS       |
|--------------------------------------------------------|--------------------|
| FCC 47 CFR Part 15, SubPart C 15.247 & RSS-210 Annex 8 | EQUIPMENT COMPLIES |

MiCOM Labs, Inc. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report.

**Notes:**

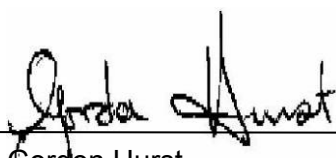
1. This document reports conditions under which testing was conducted and the results of testing performed.
2. Details of test methods used have been recorded and kept on file by the laboratory.
3. Test results apply only to the item(s) tested.



**Approved & Released for MiCOM Labs, Inc. by:**

TESTING CERTIFICATE #2381.01

  
\_\_\_\_\_  
Graeme Grieve  
Quality Manager MiCOM Labs, Inc.

  
\_\_\_\_\_  
Gordon Hurst  
President & CEO MiCOM Labs, Inc.

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## 4 REFERENCES AND MEASUREMENT UNCERTAINTY

### 4.1 Normative References

| Ref.  | Publication               | Year                 | Title                                                                                                                                                                |
|-------|---------------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| i.    | FCC 47 CFR Part 15,       | 2010                 | Title 47: Telecommunication PART 15—RADIO FREQUENCY DEVICES Subpart C—Intentional Radiators                                                                          |
| ii.   | RSS-210 Annex 8           | 2010                 | Radio Standards Specification 210, Issue 8, Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment,                         |
| iii.  | RSS-GEN                   | 2010                 | Radio Standards Specification-Gen, Issue 3, General Requirements and Information for the Certification of Radiocommunication Equipment,                              |
| iv.   | 47 CFR Part 15, SubPart B | 2010                 | 47 CFR Part 15, SubPart B; Unintentional Radiators                                                                                                                   |
| v.    | ICES-003                  | 2004                 | Spectrum Management and Telecommunications Policy Interference-Causing Equipment Standard Digital Apparatus; Issue 4                                                 |
| vi.   | ANSI C63.4                | 2009                 | American National Standards for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz |
| vii.  | CISPR 22/ EN 55022        | 2008<br>2006+A1:2007 | Limits and Methods of Measurements of Radio Disturbance Characteristics of Information Technology Equipment                                                          |
| viii. | M 3003                    | Edition 1 Dec. 1997  | Expression of Uncertainty and Confidence in Measurements                                                                                                             |
| ix.   | LAB34                     | Edition 1 Aug 2002   | The expression of uncertainty in EMC Testing                                                                                                                         |
| x.    | ETSI TR 100 028           | 2001                 | Parts 1 and 2<br>Electromagnetic compatibility and Radio Spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics          |
| xi.   | A2LA                      | 9th June 2010        | Reference to A2LA Accreditation Status – A2LA Advertising Policy                                                                                                     |

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## **4.2 Test and Uncertainty Procedures**

Conducted and radiated emission measurements were conducted in accordance with American National Standards Institute ANSI C63.4, listed in the Normative References section of this report.

Measurement uncertainty figures are calculated in accordance with ETSI TR 100 028 Parts 1 and 2.

Measurement uncertainties stated are based on a standard uncertainty multiplied by a coverage factor  $k = 2$ , providing a level of confidence of approximately 95 % in accordance with UKAS document M 3003 listed in the Normative References section of this report.



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## 5 TEST SUMMARY

**List of Measurements:** The following table represents the list of measurements required under FCC 47 CFR Part 15, SubPart C 15.247 & Industry Canada RSS-210 Annex 8.

| Standard Section(s)             | Test Description                        | Condition | Result | Notes      | Test Report Section |
|---------------------------------|-----------------------------------------|-----------|--------|------------|---------------------|
| 15.31 (h),<br>15.205,<br>15.209 | Transmitter Radiated Spurious Emissions | Radiated  | PASS   | Note 1,2,3 | 7.1                 |

Note 1: Test results reported in this document relate only to the items tested

Note 2: The required tests demonstrated compliance as per client declaration of test configuration, monitoring methodology and associated pass/fail criteria

Note 3: Section 6.11 Equipment Modifications highlights the equipment modifications that were required to bring the product into compliance with the above test matrix

Note 4: Radio's included within the Spectralink 8400 Series wireless handsets are identical. Unit and model with highest output power was utilized for testing.



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## 6 PRODUCT DETAILS AND TEST CONFIGURATIONS

### 6.1 Test Program Scope

The scope of the test program was to test the WiFi transmitter (802.11a/b/g/n) and Bluetooth transmitter (802.15.1) utilized in the Polycom Spectralink 8400 Series Wi-Fi handset with Bluetooth for compliance against multiple collocated transmitter requirements of FCC 47 CFR Part 15.

**APPLICANT:** Polycom **PRODUCT:** Spectralink 8450 handset Front



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**APPLICANT:** Polycom **PRODUCT:** Spectralink 8450 handset Back



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**APPLICANT:** Polycom **PRODUCT:** Spectralink 8440 handset Front



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**APPLICANT:** Polycom **PRODUCT:** Spectralink 8440 handset Back



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## 6.2 EUT Details

| Detail                              | Description                                                                                                                                                                                                                                                                          |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Purpose:                            | The scope of the test program was to test the WiFi transmitter (802.11a/b/g/n) and Bluetooth transmitter (802.15.1) utilized in the Polycom Spectralink 8450 Wi-Fi handset with Bluetooth for compliance against multiple collocated transmitter requirements of FCC 47 CFR Part 15. |
| Applicant:                          | Polycom<br>4750 Willow Road<br>Pleasanton, CA 94588-2708<br>USA                                                                                                                                                                                                                      |
| Manufacturer:                       | Same as Applicant                                                                                                                                                                                                                                                                    |
| Test Laboratory:                    | MiCOM Labs, Inc.<br>440 Boulder Court, Suite 200<br>Pleasanton, California 94566 USA                                                                                                                                                                                                 |
| Test report reference number:       | POLY06-X2 Rev A                                                                                                                                                                                                                                                                      |
| Date EUT received:                  | 11/11/2010                                                                                                                                                                                                                                                                           |
| Dates of test (from - to):          | 03/07/2011                                                                                                                                                                                                                                                                           |
| No of Units Tested:                 | S/N: 600826769                                                                                                                                                                                                                                                                       |
| Product Name:                       | Spectralink 8400 series Wi-Fi handsets                                                                                                                                                                                                                                               |
| Manufacturers Trade Name:           | Polycom Spectralink 8400 series Wi-Fi handsets                                                                                                                                                                                                                                       |
| Model No.:                          | Spectralink 8440<br>Spectralink 8450                                                                                                                                                                                                                                                 |
| Equipment Primary Function:         | Wi-Fi handset with Bluetooth                                                                                                                                                                                                                                                         |
| Equipment Secondary Function(s):    | Bar code reader (8450 only)                                                                                                                                                                                                                                                          |
| Type of Technology:                 | 802.11a/b/g/n; 802.15.1 2.1+EDR                                                                                                                                                                                                                                                      |
| Installation type:                  | Portable                                                                                                                                                                                                                                                                             |
| Construction/Location for Use:      | Indoor/Outdoor                                                                                                                                                                                                                                                                       |
| Software/Firmware Release:          | fcc-1.8 (test software)                                                                                                                                                                                                                                                              |
| Test Software Release:              | fcc-1.8 (test software)                                                                                                                                                                                                                                                              |
| Rated Input Voltage and Current DC: | Nominal:3.8V; Battery: 3.5V - 4.2V,<br>Charger (USB or Base) supply: 5V +/- 10%                                                                                                                                                                                                      |
| Operating Temperature Range °C:     | Min: 0 °C      Max: 40 °C                                                                                                                                                                                                                                                            |
| Equipment Dimensions:               | 5.75" x 2.125" x 0.9"                                                                                                                                                                                                                                                                |
| Weight:                             | 8 oz                                                                                                                                                                                                                                                                                 |
| Long Term Frequency Stability:      | 20 p.p.m.                                                                                                                                                                                                                                                                            |
| Transmit/Receive Operation:         | Full Duplex                                                                                                                                                                                                                                                                          |
| Output Power Type                   | Fixed                                                                                                                                                                                                                                                                                |

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### 6.3 External A.C. / D.C. Power Adaptor

| Model     | Description                                                                                             |
|-----------|---------------------------------------------------------------------------------------------------------|
| SA106B-05 | GCI Technologies switching adaptor:<br>Input: 100 - 240V AC; 50-60 Hz; 0.25 Amp<br>Output: 5V DC; 1 Amp |

### 6.4 Operational Power Range

| Declared O/P Power Range |           |           |
|--------------------------|-----------|-----------|
|                          | Max       | Min       |
| Bluetooth Mode           | 7.42 dBm  | 4.33 dBm  |
| 802.11 Mode (2.4 GHz)    | 16.49 dBm | 14.65 dBm |
| 802.11 Mode (5 GHz)      | 17.32 dBm | 14.71 dBm |

### 6.5 Types of Modulation Supported

| Modulation / Mode | Modulation Type |
|-------------------|-----------------|
| 802.11b           | DSSS            |
| 802.11g           | OFDM            |
| 802.11a           | OFDM            |
| 802.11n HT-20     | OFDM            |
| 802.15.1 1Mbps    | GFSK            |
| 802.15.1 2Mbps    | $\pi/4$ -DPSK   |
| 802.15.1 3Mbps    | 8DPSK           |

### 6.6 Antenna Details

The following is a description of the EUT antennas.

| Antenna Type          | Manufacturer | Model | Gain     | Frequency Range   |
|-----------------------|--------------|-------|----------|-------------------|
| Plated antenna on PCB | Polycom      | N/A   | 2.5 dBi  | 2400 - 2483.5 MHz |
| Plated antenna on PCB | Polycom      | N/A   | 5.51 dBi | 5150 - 5850 MHz   |

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## 6.7 Cabling and I/O Ports

The following is a description of the cable and input, output ports available on the EUT.

| Type of I/O Ports       | Description                                                          | Screened (Y/N) | Length     | Qty | Tested (Y/N) |
|-------------------------|----------------------------------------------------------------------|----------------|------------|-----|--------------|
| Enclosure               | EUT Enclosure                                                        | N/A            | N/A        | 1   | Y            |
| Battery terminal        | Battery connections for removable battery                            | N              | N/A        | 1   | N            |
| 1/8th" Stereo connector | Connection to hands free headset                                     | Y              | < 3 meters | 1   | N            |
| AC-DC Adapter/Charger   | Power connector - mini USB for charging using power supply SA106B-05 | Y              | < 3 meters | 1   | N            |
| Charging terminals      | Charging terminal for charging EUT with docking options              | N              | N/A        | 1   | N            |

## 6.8 EUT Channel plan and spacing

### 802.11 Operation

| Band (GHz) | Mode           | Freq Band (MHz) | Freq Range (MHz) | Low Ch | Mid Ch | High Ch | # Ch | Ch Spacing (MHz) |
|------------|----------------|-----------------|------------------|--------|--------|---------|------|------------------|
| 2.4        | 802.11 b       | 2400 - 2483.5   | 2412 - 2472      | 2412   | 2442   | 2472    | 13   | 20               |
| 2.4        | 802.11 g       | 2400 - 2483.5   | 2412 - 2472      | 2412   | 2442   | 2472    | 13   | 20               |
| 2.4        | 802.11 n HT-20 | 2400 - 2483.5   | 2412 - 2472      | 2412   | 2442   | 2472    | 13   | 20               |

| Band (GHz) | Mode           | Freq Band (MHz) | Freq Range (MHz) | Low Ch | High Ch | # Ch | Ch Spacing (MHz) |
|------------|----------------|-----------------|------------------|--------|---------|------|------------------|
| 5.2        | 802.11 a       | 5150-5350       | 5180-5320        | 5180   | 5320    | 8    | 20               |
| 5.2        | 802.11 a       | 5470-5725       | 5500-5700        | 5500   | 5700    | 11   | 20               |
| 5.5        | 802.11 n HT-20 | 5150-5350       | 5180-5320        | 5180   | 5320    | 8    | 20               |
| 5.5        | 802.11 n HT-20 | 5470-5725       | 5500-5700        | 5500   | 5700    | 11   | 20               |

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### 802.15.1 Operation

| Band (GHz) | Mode      | Freq Band (MHz) | Freq. Range (MHz) | Low Ch. | Mid Ch. | High Ch. | # Ch. | Ch. Spacing (MHz) |
|------------|-----------|-----------------|-------------------|---------|---------|----------|-------|-------------------|
| 2.4        | Bluetooth | 2400 - 2483.5   | 2402- 2480        | 2402    | 2441    | 2480     | 79    | 1 MHz             |

## 6.9 Equipment Details

The following is a description of supporting equipment used during the test program.

| Equipment             | Equipment Description | Manufacturer     | Model No.     | Serial No (s). | Tested |
|-----------------------|-----------------------|------------------|---------------|----------------|--------|
| Battery               | Alpha SAMPLE          | Polycom          | ESB-RS657+002 | AC10103200B7   | Y      |
| Battery               | Alpha SAMPLE          | Polycom          | ESB-RS658+002 | AD101032019C   | N      |
| AC-DC Adapter/Charger | Switching Adapter     | GCI technologies | SA106B-05     | N/A            | N      |

## 6.10 Test Configurations

Testing was performed on a sample of frequency combinations possible with Bluetooth and WLAN operation. Testing was performed in the highest power density mode available on the device [WLAN - 802.11b 1Mbps; BT = 802.15.1 1 Mbps]

WLAN-2412MHz/ BT-2480MHz - TX: WLAN-Ch.1; BT-Ch. 78  
WLAN-5280MHz/ BT-2441MHz - TX: WLAN-Ch.56; BT-Ch. 39  
WLAN-5500MHz/ BT-2402MHz - TX: WLAN-Ch.100; BT-Ch. 0  
WLAN-5825MHz/ BT-2441MHz - TX: WLAN-Ch.165; BT-Ch. 39

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### **6.11 Equipment Modifications**

The following modifications were required to bring the equipment into compliance:

1. NONE

### **6.12 Deviations from the Test Standard**

The following deviations from the test standard were required in order to complete the test program:

1. NONE



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## **7 TEST RESULTS**

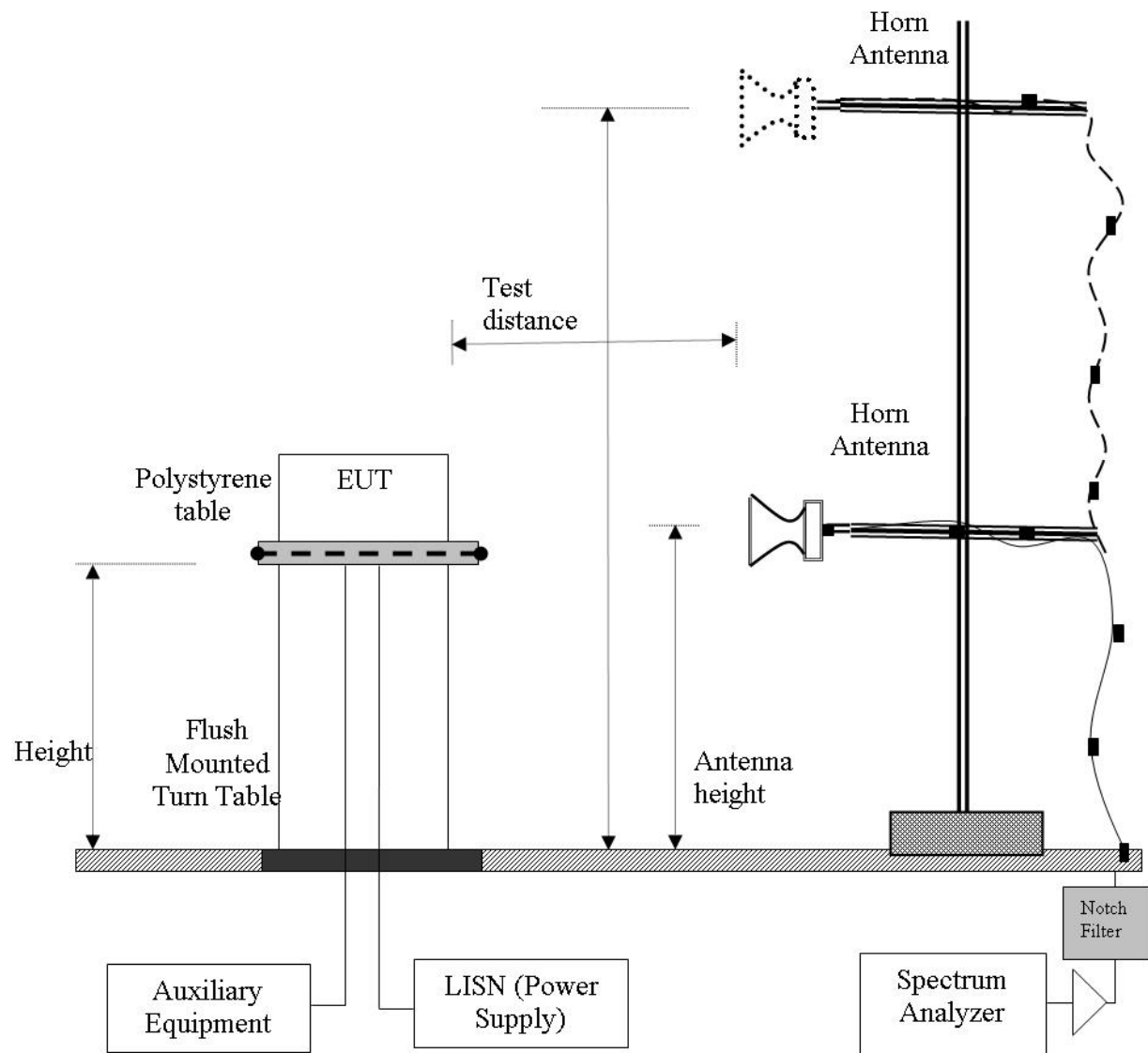
### **7.1 Radiated Spurious Emissions**

#### **Test Procedure**

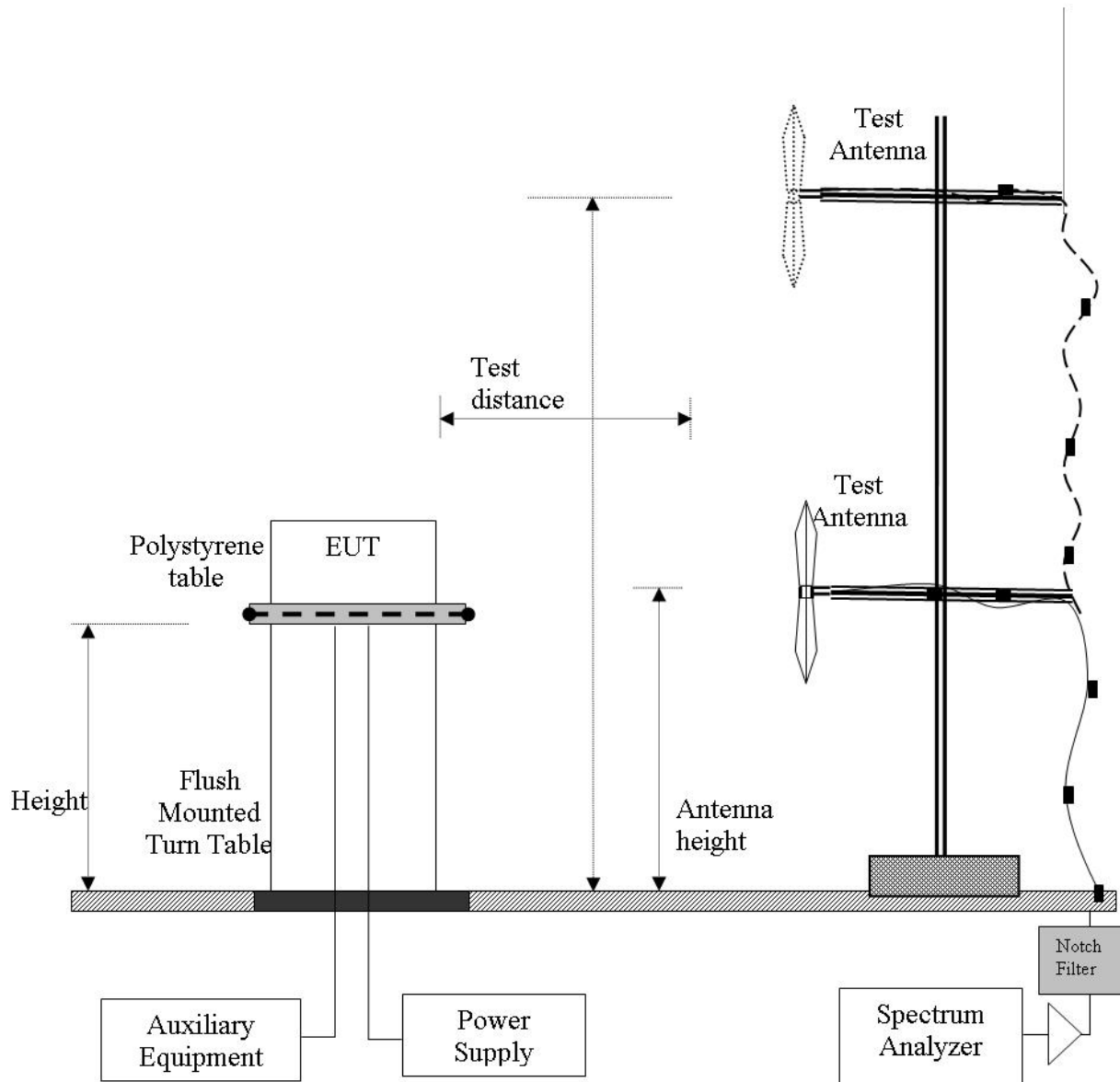
Testing was performed in a 3-meter anechoic chamber. Preliminary radiated emissions were measured on every azimuth and with the receiving antenna in both horizontal and vertical polarizations. Preliminary emissions were recorded with in Spectrum Analyzer mode, using a maximum peak detector while in peak hold mode.

Emissions nearest the limits were chosen for maximization and formal measurement using a CISPR Compliant receiver. Emissions above 1000 MHz are measured utilizing a CISPR compliant average detector with a tuned receiver, using a bandwidth of 1 MHz. Emissions from 30 MHz – 1000 MHz are measured utilizing a CISPR compliant quasi-peak detector with a tuned receiver, using a bandwidth of 120 kHz. Only the highest emissions relative to the limit are listed.

### Radiated Emission Measurement Setup – Above 1 GHz



## Radiated Emission Measurement Setup – Below 1 GHz



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## Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Loss, and subtracting Amplifier Gain from the measured reading. All factors are included in the reported data.

$$FS = R + AF + CORR - FO$$

FS = Field Strength

R = Measured Spectrum analyzer Input Amplitude

AF = Antenna Factor

$$CORR = \text{Correction Factor} = CL - AG + NFL$$

CL = Cable Loss

AG = Amplifier Gain

FO = Distance Falloff Factor

NFL = Notch Filter Loss or Waveguide Loss

### Field Strength Calculation Example:

Given receiver input reading of 51.5 dB $\mu$ V; Antenna Factor of 8.5 dB; Cable Loss of 1.3 dB; Falloff Factor of 0 dB, an Amplifier Gain of 26 dB and Notch Filter Loss of 1 dB. The Field Strength of the measured emission is:

$$FS = 51.5 + 8.5 + 1.3 - 26.0 + 1 = 36.3 \text{ dB}\mu\text{V/m}$$

Conversion between dB $\mu$ V/m (or dB $\mu$ V) and  $\mu$ V/m (or  $\mu$ V) are done as:

$$\text{Level (dB}\mu\text{V/m)} = 20 * \text{Log (level (}\mu\text{V/m))}$$

$$40 \text{ dB}\mu\text{V/m} = 100 \mu\text{V/m}$$

$$48 \text{ dB}\mu\text{V/m} = 250 \mu\text{V/m}$$



## Specification for FCC Part 15 Radiated Spurious Emissions

**FCC §15.247(d)** In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section §15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(a)).

### **§15.407 (b)(2)**

All emissions outside of the 5,150-5,350MHz band shall not exceed an EIRP of -27dBm/MHz.

**FCC §15.205 (a)** Except as shown in paragraph (d) of 15.205 (a), only spurious emissions are permitted in any of the frequency bands listed.

**FCC §15.205 (a)** Except as shown in paragraphs (d) and (e) of this section, the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

**FCC §15.209 (a)** Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table.

**Table 1: FCC 15.209 Spurious Emissions Limits**

| Frequency (MHz) | Field Strength (µV/m) | Field Strength (dBµV/m) | Measurement Distance (meters) |
|-----------------|-----------------------|-------------------------|-------------------------------|
| 30-88           | 100                   | 40.0                    | 3                             |
| 88-216          | 150                   | 43.5                    | 3                             |
| 216-960         | 200                   | 46.0                    | 3                             |
| Above 960       | 500                   | 54.0                    | 3                             |



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## Specification for FCC 47 CFR Part 15 - Collocation

### **FCC §15.31 (h)**

For a composite system that incorporates devices contained either in a single enclosure or in separate enclosures connected by wire or cable, testing for compliance with the standards in this part shall be performed with all of the devices in the system functioning. If an intentional radiator incorporates more than one antenna or other radiating source and these radiating sources are designed to emit at the same time, measurements of conducted and radiated emissions shall be performed with all radiating sources that are to be employed emitting. A device which incorporates a carrier current system shall be tested as if the carrier current system were incorporated in a separate device; that is, the device shall be tested for compliance with whatever rules would apply to the device were the carrier current system not incorporated, and the carrier current system shall be tested for compliance with the rules applicable to carrier current systems.

## Specification for Industry Canada RSS-210 Radiated Spurious Emissions

### **RSS-210 §2.1 RSS-Gen Compliance**

In addition to RSS-210, the requirements in RSS-Gen, General Requirements and Information for the Certification of Radio Apparatus, must be met.

### **RSS-210 §2.2 Emissions Falling Within Restricted Frequency Bands**

Category I license-exempt equipment is required to comply with the provisions in RSS-Gen with respect to emissions falling within restricted frequency bands. These restricted frequency bands are listed in RSS-Gen.

### **RSS-210 §2.3 Receivers**

Category I equipment receivers for use with transmitters subject to RSS-210 must comply with the applicable requirements set out in RSS-Gen and be certified under RSS-210. Category II equipment receivers for use with transmitters subject to RSS-210 are exempt from certification, but are subject to compliance with RSS-Gen and RSS-310.

### **RSS-210 §2.5 General Field Strength Limits**

RSS-Gen includes the general field strength limits of unwanted emissions, where applicable, for transmitters and receivers operating in accordance with the provisions specified in this standard.

Unwanted emissions of transmitters and receivers are permitted to fall within the restricted bands listed in RSS-Gen, and including the TV bands, but fundamental emissions are prohibited in the restricted bands.



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## Specification for Industry Canada RSS-Gen Radiated Transmitter Spurious Emissions

### **RSS-Gen §7.2.5 Transmitter Spurious Emissions Limits**

Spurious emissions from license-exempt transmitters shall comply with the field strength limits shown below. Additionally, the level of any transmitter spurious emission shall not exceed the level of the transmitter's fundamental emission.

**Table 1: RSS-Gen §7.2.5 Radiated Transmitter Spurious Emissions Limits**

| Frequency (MHz) | Field Strength (µV/m) | Field Strength (dBµV/m) | Measurement Distance (meters) |
|-----------------|-----------------------|-------------------------|-------------------------------|
| 30-88           | 100                   | 40.0                    | 3                             |
| 88-216          | 150                   | 43.5                    | 3                             |
| 216-960         | 200                   | 46.0                    | 3                             |
| Above 960       | 500                   | 54.0                    | 3                             |

## Specification for Industry Canada RSS-Gen Radiated Receiver Spurious Emissions

### **RSS-Gen §6.1 Receiver Spurious Emissions Limits**

Radiated spurious emission measurements shall be performed with the receiver antenna connected to the receiver antenna terminals.

Spurious emissions from receivers shall not exceed the radiated limits shown in the table below.

**Table 1: RSS-Gen §6.1 Radiated Receiver Spurious Emissions Limits**

| Frequency (MHz) | Field Strength (µV/m) | Field Strength (dBµV/m) | Measurement Distance (meters) |
|-----------------|-----------------------|-------------------------|-------------------------------|
| 30-88           | 100                   | 40.0                    | 3                             |
| 88-216          | 150                   | 43.5                    | 3                             |
| 216-960         | 200                   | 46.0                    | 3                             |
| Above 960       | 500                   | 54.0                    | 3                             |

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#### Laboratory Measurement Uncertainty for Spectrum Measurement

|                                |               |
|--------------------------------|---------------|
| <b>Measurement Uncertainty</b> | +5.6/ -4.5 dB |
|--------------------------------|---------------|

#### Traceability:

| Method                 | Test Equipment Used                                  |
|------------------------|------------------------------------------------------|
| Work instruction WI-03 | 0287, 0193, 0342, 0158, 0303, 0304, 0134, 0310, 0312 |

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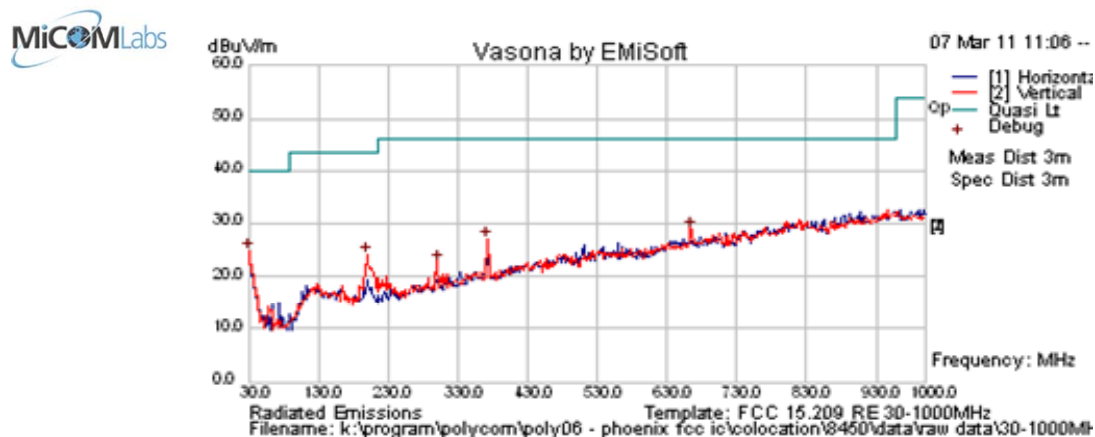


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### 7.1.1 Collocation - 30MHz - 1000 MHz

No radio emissions were present below 1GHz. The following plots represent the worst case conditions with both 802.11 (WiFi) and 802.15.1 (Bluetooth) transmitters operating at the same time.

|                      |                                                              |                       |      |
|----------------------|--------------------------------------------------------------|-----------------------|------|
| <b>Test Freq.</b>    | WLAN-2412MHz/ BT-2480MHz                                     | <b>Engineer</b>       | EVF  |
| <b>Variant</b>       | Collocation                                                  | <b>Temp (°C)</b>      | 18.5 |
| <b>Freq. Range</b>   | 30 MHz - 1000 MHz                                            | <b>Rel. Hum.(%)</b>   | 44   |
| <b>Power Setting</b> | 18 in test utility                                           | <b>Press. (mBars)</b> | 1004 |
| <b>Antenna</b>       | integral                                                     |                       |      |
| <b>Test Notes 1</b>  | Handset (Spectralink Model: 8450) with fully charged battery |                       |      |
| <b>Test Notes 2</b>  | TX: WLAN-Ch.1; BT-Ch. 78                                     |                       |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|----------|
| 30.113        | 30.7     | 3.4        | -9.3  | 24.8         | Peak [Scan]      | V   | 98     | 360     | 40.0         | -15.2     | Pass       |          |
| 200.425       | 37.2     | 4.8        | -17.9 | 24.1         | Peak [Scan]      | V   | 98     | 360     | 43.5         | -19.4     | Pass       |          |
| 300.694       | 34.0     | 5.2        | -16.9 | 22.4         | Peak [Scan]      | V   | 98     | 360     | 46.0         | -23.6     | Pass       |          |
| 372.244       | 36.7     | 5.6        | -15.3 | 27.0         | Peak [Scan]      | V   | 98     | 360     | 46.0         | -19.0     | Pass       |          |
| 663.871       | 32.6     | 6.6        | -10.3 | 28.8         | Peak [Scan]      | V   | 98     | 360     | 46.0         | -17.2     | Pass       |          |

**Legend:** DIG = Digital Device Emission; TX = Transmitter Emission; FUND = Fundamental Frequency  
 NRB = Non-Restricted Band, Limit is 20 dB below Fundamental; RB = Restricted Band

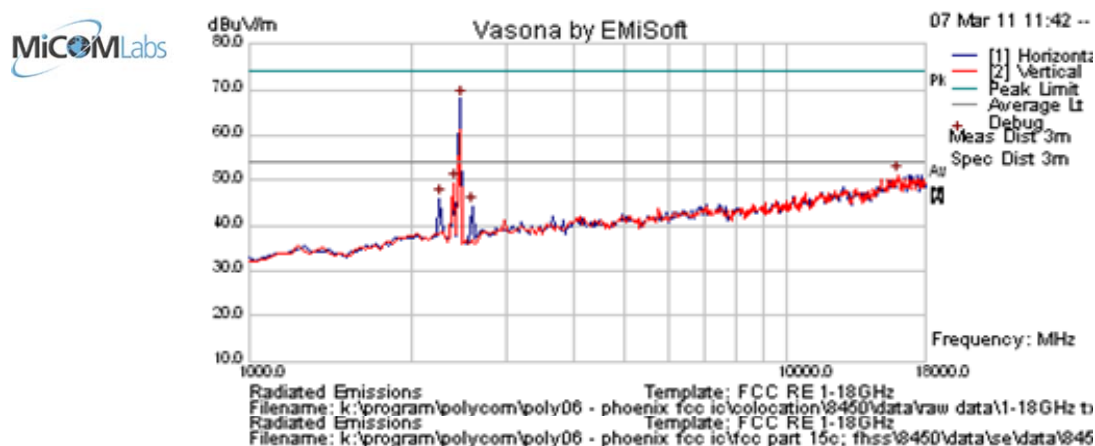
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### 7.1.2 Collocation - WLAN-2412MHz/ BT-2480MHz

|                      |                                                              |                       |      |
|----------------------|--------------------------------------------------------------|-----------------------|------|
| <b>Test Freq.</b>    | WLAN-2412MHz/ BT-2480MHz                                     | <b>Engineer</b>       | EVF  |
| <b>Variant</b>       | Collocation                                                  | <b>Temp (°C)</b>      | 18.5 |
| <b>Freq. Range</b>   | 1-18 GHz                                                     | <b>Rel. Hum.(%)</b>   | 44   |
| <b>Power Setting</b> | 18 in test utility                                           | <b>Press. (mBars)</b> | 1004 |
| <b>Antenna</b>       | integral                                                     |                       |      |
| <b>Test Notes 1</b>  | Handset (Spectralink Model: 8450) with fully charged battery |                       |      |
| <b>Test Notes 2</b>  | TX: WLAN-Ch.1; BT-Ch. 78                                     |                       |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments    |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|-------------|
| 2480.190      | 76.0     | 3.0        | -11.0 | 67.9         | Peak [Scan]      | H   | --     | --      | --           | --        | n/a        | FUNDBT      |
| 16058.116     | 41.4     | 9.0        | 0.8   | 51.2         | Peak [Scan]      | H   | 200    | 0       | 54.0         | -2.8      | Pass       | noise floor |
| 2412.906      | 57.3     | 3.0        | -10.9 | 49.4         | Peak [Scan]      | V   | --     | --      | --           | --        | n/a        | FUNDWLAN    |
| 2260.521      | 54.4     | 2.9        | -11.3 | 46.0         | Peak [Scan]      | H   | 200    | 0       | 54.0         | -8.0      | Pass       | New         |
| 2601.202      | 52.5     | 3.1        | -11.3 | 44.3         | Peak [Scan]      | H   | 200    | 0       | 54.0         | -9.7      | Pass       | New         |

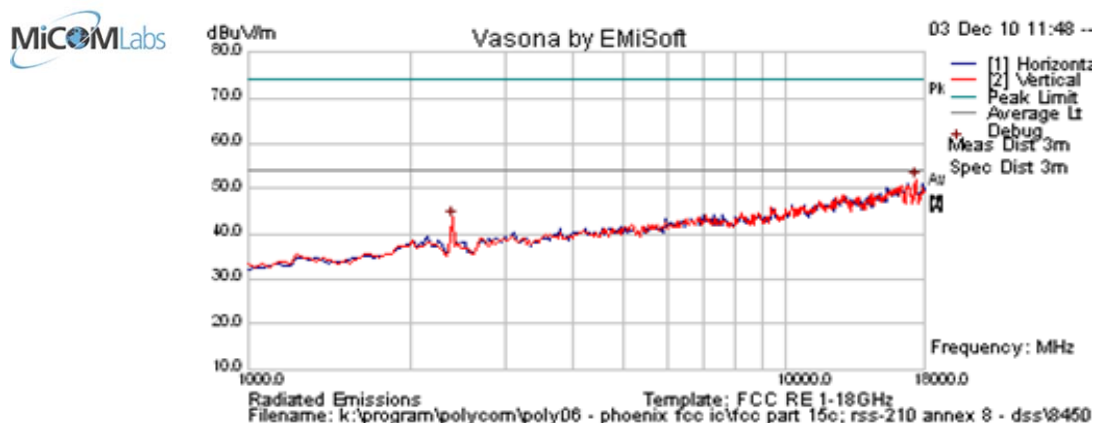
**Legend:** TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 NRB = Non-Restricted Band. RB = Restricted Band.

All emissions that were not present during stand-alone transmitter emissions testing are indicated as "New". Peak values of these emissions are all less than 6dB below the average limit. Please see plots below for stand-alone transmitter emissions results.



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|                      |                                                                                                                                                |                       |      |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------|
| <b>Test Freq.</b>    | 2412 MHz                                                                                                                                       | <b>Engineer</b>       | EVF  |
| <b>Variant</b>       | 802.11b; 1 Mbs                                                                                                                                 | <b>Temp (°C)</b>      | 21.4 |
| <b>Freq. Range</b>   | 1000 MHz - 18000 MHz                                                                                                                           | <b>Rel. Hum.(%)</b>   | 33   |
| <b>Power Setting</b> | 24 in test utility (maximum)                                                                                                                   | <b>Press. (mBars)</b> | 1010 |
| <b>Antenna</b>       | Integral                                                                                                                                       | <b>Duty Cycle (%)</b> | 10   |
| <b>Test Notes 1</b>  | Fundamental attenuated by band-stop filter. Handset (Mdel: 8450) with battery (SN: AC101032008E) , also connected to charger (Mdel: SA106B-05) |                       |      |
| <b>Test Notes 2</b>  | Mdel: WLAN Channel 01 Transmit; WLAN=1, BT=0, BC=0, DK=0                                                                                       |                       |      |



#### Formally measured emission peaks

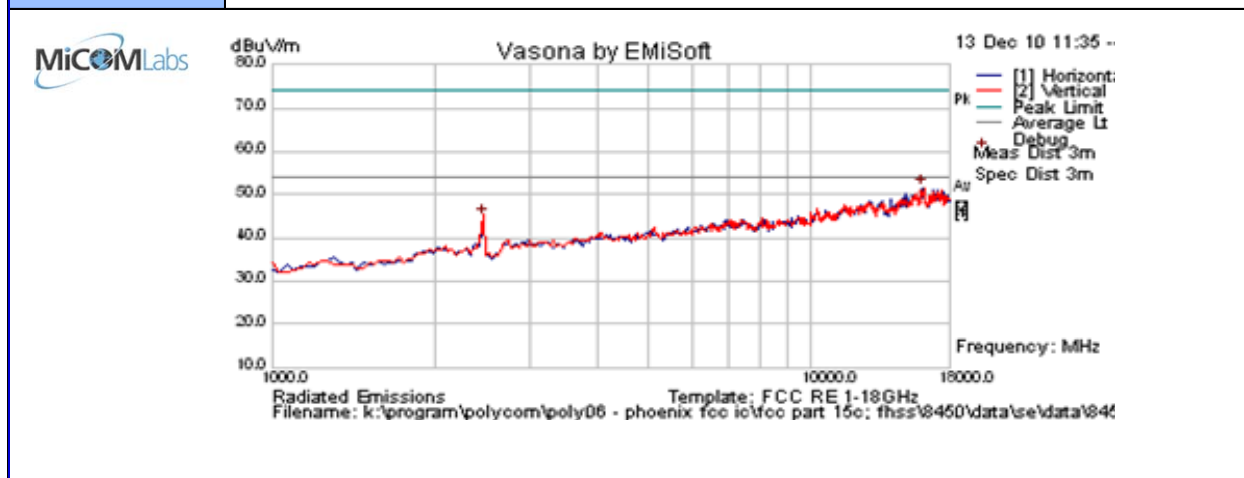
| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments    |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|-------------|
| 17352.705                                                                                               | 41.1     | 8.7        | 2     | 51.9         | Peak [Scan]      | V   | 150    | 0       | 54           | -2.1      | Pass       | noise floor |
| 2399.787                                                                                                | 51.1     | 3          | -11.1 | 43           | Peak [Scan]      | V   | 98     | 0       | 54           | -11       | Pass       | FUND        |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission |          |            |       |              |                  |     |        |         |              |           |            |             |
| NRB = Non-Restricted Band. RB = Restricted Band.                                                        |          |            |       |              |                  |     |        |         |              |           |            |             |

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|                      |                                                                                                                                                  |                       |      |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------|
| <b>Test Freq.</b>    | 2480 MHz                                                                                                                                         | <b>Engineer</b>       | EVF  |
| <b>Variant</b>       | Bluetooth - CW Mode                                                                                                                              | <b>Temp (°C)</b>      | 21.4 |
| <b>Freq. Range</b>   | 1000 - 18000 MHz                                                                                                                                 | <b>Rel. Hum.(%)</b>   | 33   |
| <b>Power Setting</b> | Maximum                                                                                                                                          | <b>Press. (mBars)</b> | 1010 |
| <b>Antenna</b>       | integral                                                                                                                                         | <b>Duty Cycle (%)</b> | 0    |
| <b>Test Notes 1</b>  | Fundamental attenuated by band-stop filter. Handset (Model: 8450) with battery (SN: AC101032008E) , also connected to charger (Model: SA106B-05) |                       |      |
| <b>Test Notes 2</b>  | Mode: BT Channel 78 Transmit; rate: CW; WLAN=0, BT=1, BC=0, DK=0                                                                                 |                       |      |



#### Formally measured emission peaks

| Frequency MHz                                                                                                                                               | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|-------------|
| 16058.116                                                                                                                                                   | 41.9     | 9.0        | 0.8   | 51.6         | Peak [Scan]      | H   | 100    | 0       | 54.0         | -2.4      | Pass       | noise floor |
| 2464.451                                                                                                                                                    | 53.1     | 3.0        | -11.1 | 44.9         | Peak [Scan]      | V   | 98     | 360     | 54.0         | -9.1      | Pass       | FUND        |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission<br>NRB = Non-Restricted Band. RB = Restricted Band. |          |            |       |              |                  |     |        |         |              |           |            |             |

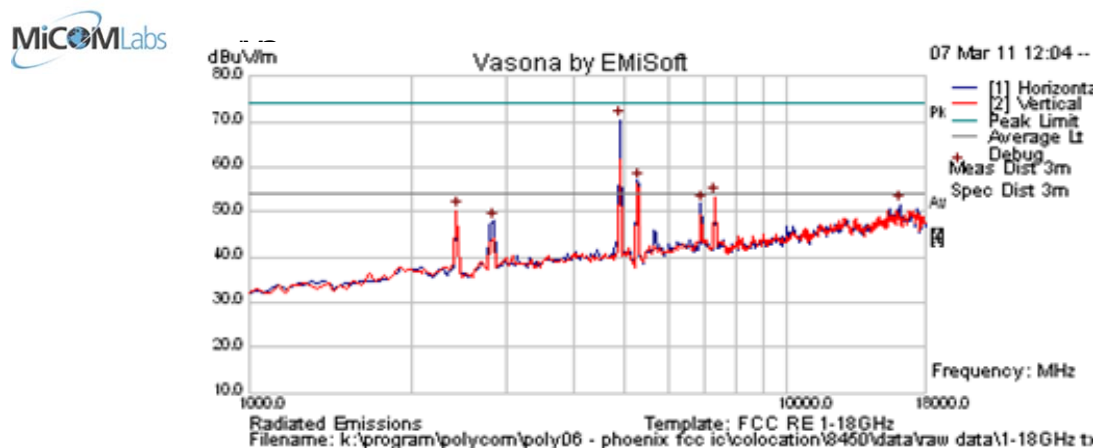
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### 7.1.3 Collocation - WLAN-5280MHz/ BT-2441MHz

|                      |                                                              |                       |      |
|----------------------|--------------------------------------------------------------|-----------------------|------|
| <b>Test Freq.</b>    | WLAN-5280MHz/ BT-2441MHz                                     | <b>Engineer</b>       | EVF  |
| <b>Variant</b>       | Collocation                                                  | <b>Temp (°C)</b>      | 21   |
| <b>Freq. Range</b>   | 1-18GHz                                                      | <b>Rel. Hum.(%)</b>   | 39   |
| <b>Power Setting</b> | 16 in test utility                                           | <b>Press. (mBars)</b> | 1005 |
| <b>Antenna</b>       | integral                                                     |                       |      |
| <b>Test Notes 1</b>  | Handset (Spectralink Model: 8450) with fully charged battery |                       |      |
| <b>Test Notes 2</b>  | TX: WLAN-Ch.56; BT-Ch. 39                                    |                       |      |



#### Formally measured emission peaks

| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments    |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|-------------|
| 4881.733                                                                                                | 72.8     | 4.5        | -9.3  | 68.0         | Peak Max         | H   | 175    | 191     | 74.0         | -6.1      | Pass       | New         |
| 7322.806                                                                                                | 53.1     | 5.5        | -5.1  | 53.5         | Peak Max         | V   | 188    | 85      | 74.0         | -20.5     | Pass       | New         |
| 4881.733                                                                                                | 50.9     | 4.5        | -9.3  | 46.1         | Average Max      | H   | 175    | 191     | 54.0         | -7.9      | Pass       | New         |
| 7322.806                                                                                                | 35.2     | 5.5        | -5.1  | 35.5         | Average Max      | V   | 188    | 85      | 54.0         | -18.5     | Pass       | New         |
| 5273.186                                                                                                | 62.0     | 4.6        | -9.8  | 56.9         | Peak [Scan]      | H   | --     | --      | --           | --        | n/a        | FUNDWLAN    |
| 6920.401                                                                                                | 51.9     | 5.3        | -5.5  | 51.7         | Peak [Scan]      | H   | 100    | 0       | 54.0         | -2.3      | Pass       | WLAN        |
| 16126.253                                                                                               | 41.5     | 9.0        | 1.0   | 51.5         | Peak [Scan]      | H   | 200    | 0       | 54.0         | -2.6      | Pass       | noise floor |
| 2441.145                                                                                                | 58.3     | 3.0        | -11.0 | 50.3         | Peak [Scan]      | V   | --     | --      | --           | --        | n/a        | FUNDBT      |
| 2840.521                                                                                                | 56.0     | 3.3        | -11.4 | 47.9         | Peak [Scan]      | H   | 200    | 0       | 54.0         | -6.1      | Pass       |             |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission |          |            |       |              |                  |     |        |         |              |           |            |             |
| NRB = Non-Restricted Band. RB = Restricted Band.                                                        |          |            |       |              |                  |     |        |         |              |           |            |             |

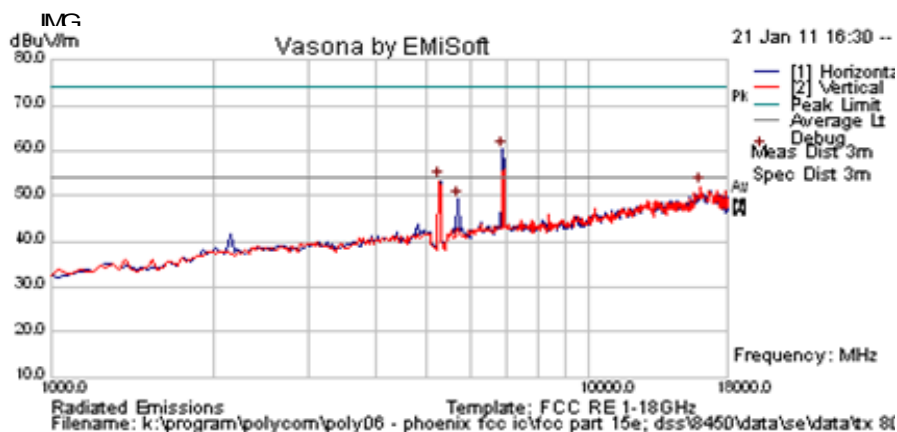
All emissions that were not present during stand-alone transmitter emissions testing are indicated as "New". Peak values of these emissions are all less than 6dB below the average limit. Please see plots below for stand-alone transmitter emissions results.

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|                      |                                                              |                       |      |
|----------------------|--------------------------------------------------------------|-----------------------|------|
| <b>Test Freq.</b>    | 5280 MHz                                                     | <b>Engineer</b>       | EVF  |
| <b>Variant</b>       | Collocation                                                  | <b>Temp (°C)</b>      | 21   |
| <b>Freq. Range</b>   | 1-18GHz                                                      | <b>Rel. Hum.(%)</b>   | 39   |
| <b>Power Setting</b> | 16 in test utility                                           | <b>Press. (mBars)</b> | 1005 |
| <b>Antenna</b>       | integral                                                     | <b>Duty Cycle (%)</b> | 0    |
| <b>Test Notes 1</b>  | Handset (Spectralink Model: 8450) with fully charged battery |                       |      |
| <b>Test Notes 2</b>  | Mode: WLAN Channel 56 Transmit; WLAN=1, BT=0, BC=0, DK=0     |                       |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments    |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|-------------|
| 6919.760      | 60.4     | 5.3        | -5.6  | 60.2         | Peak [Scan]      | H   | 100    | 0       | 68.2         | -8.0      | Pass       | NRB         |
| 5280.802      | 58.3     | 4.6        | -9.7  | 53.3         | Peak [Scan]      | V   | --     | --      | --           | --        | n/a        | FUND        |
| 16058.116     | 42.3     | 9.0        | 0.8   | 52.0         | Peak [Scan]      | V   | 100    | 0       | 54           | -2.0      | Pass       | noise floor |
| 5720.120      | 52.9     | 4.7        | -8.4  | 49.2         | Peak [Scan]      | H   | 100    | 0       | 68.2         | -19.0     | Pass       | NRB         |

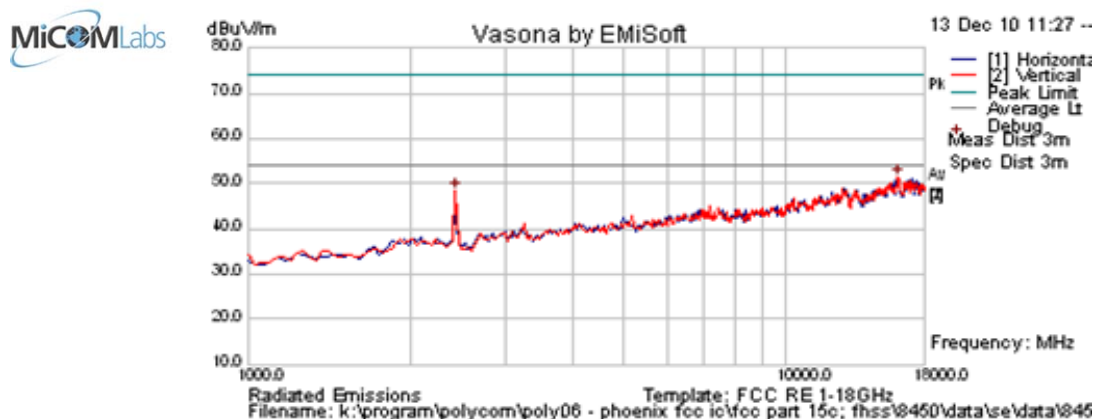
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
NRB = Non-Restricted Band. RB = Restricted Band.

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|                      |                                                                                                                                                |                       |      |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------|
| <b>Test Freq.</b>    | 2441 MHz                                                                                                                                       | <b>Engineer</b>       | EVF  |
| <b>Variant</b>       | Bluetooth - CW/Mbde                                                                                                                            | <b>Temp (°C)</b>      | 21   |
| <b>Freq. Range</b>   | 1000 - 18000 MHz                                                                                                                               | <b>Rel. Hum.(%)</b>   | 39   |
| <b>Power Setting</b> | Maximum                                                                                                                                        | <b>Press. (mBars)</b> | 1005 |
| <b>Antenna</b>       | Integral                                                                                                                                       | <b>Duty Cycle (%)</b> | 0    |
| <b>Test Notes 1</b>  | Fundamental attenuated by band-stop filter. Handset (Mdel: 8450) with battery (SN: AC101032008E) , also connected to charger (Mdel: SA106B-05) |                       |      |
| <b>Test Notes 2</b>  | Mdb: BT Channel 39 Transmit; rate: CW; WLAN=0, BT=1, BC=0, DK=0                                                                                |                       |      |



#### Formally measured emission peaks

| Frequency MHz                                                                                                                                               | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|-------------|
| 16092.184                                                                                                                                                   | 41.5     | 9.0        | 0.8   | 51.2         | Peak [Scan]      | V   | 150    | 0       | 54.0         | -2.8      | Pass       | noise floor |
| 2430.86172                                                                                                                                                  | 56.4     | 3.0        | -11.1 | 48.2         | Peak [Scan]      | V   | 100    | 0       | 54.0         | -5.8      | Pass       | FUND        |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission<br>NRB = Non-Restricted Band. RB = Restricted Band. |          |            |       |              |                  |     |        |         |              |           |            |             |

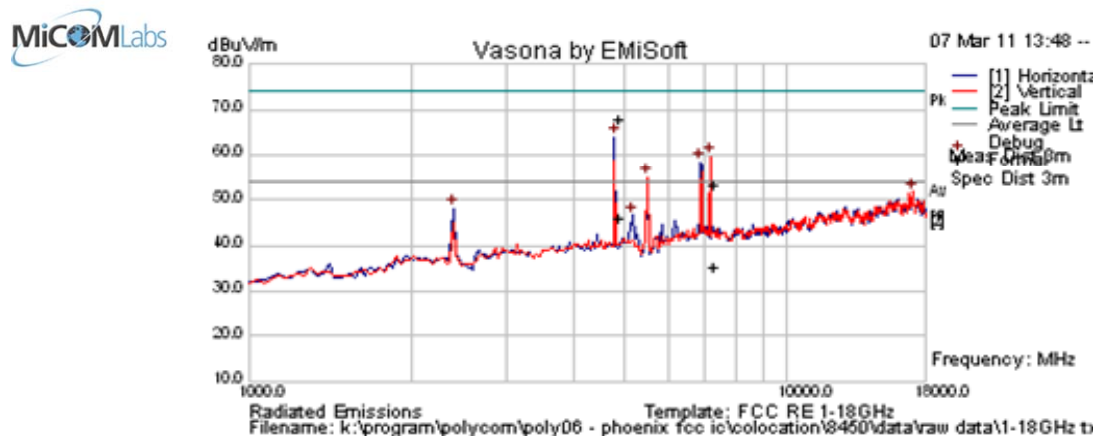
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#### 7.1.4 Collocation - WLAN-5500MHz/ BT-2402MHz

|                      |                                                              |                       |      |
|----------------------|--------------------------------------------------------------|-----------------------|------|
| <b>Test Freq.</b>    | WLAN-5500MHz/ BT-2402MHz                                     | <b>Engineer</b>       | EVF  |
| <b>Variant</b>       | Collocation                                                  | <b>Temp (°C)</b>      | 18.5 |
| <b>Freq. Range</b>   | 1-18 GHz                                                     | <b>Rel. Hum.(%)</b>   | 44   |
| <b>Power Setting</b> | 16 in test utility                                           | <b>Press. (mBars)</b> | 1004 |
| <b>Antenna</b>       | integral                                                     |                       |      |
| <b>Test Notes 1</b>  | Handset (Spectralink Model: 8450) with fully charged battery |                       |      |
| <b>Test Notes 2</b>  | TX: WLAN-Ch.100; BT-Ch. 0                                    |                       |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments    |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|-------------|
| 4804.358      | 63.7     | 4.5        | -9.3  | 58.8         | Peak Max         | H   | 201    | 212     | 74.0         | -15.2     | Pass       | New         |
| 7205.571      | 60.6     | 5.4        | -5.3  | 60.8         | Peak Max         | V   | 142    | 303     | 74.0         | -13.2     | Pass       | New         |
| 4804.358      | 42.0     | 4.5        | -9.3  | 37.1         | Average Max      | H   | 201    | 212     | 54.0         | -16.9     | Pass       | New         |
| 7205.571      | 38.9     | 5.4        | -5.3  | 39.0         | Average Max      | V   | 142    | 303     | 54.0         | -15.0     | Pass       | New         |
| 6916.313      | 58.6     | 5.3        | -5.6  | 58.3         | Peak [Scan]      | H   | 200    | 0       | 68.2         | -9.9      | Pass       | WLAN        |
| 5492.505      | 59.2     | 4.6        | -8.8  | 55.1         | Peak [Scan]      | V   | --     | --      | --           | --        | n/a        | FUNDWLAN    |
| 17114.228     | 42.6     | 8.5        | 0.8   | 51.9         | Peak [Scan]      | V   | 100    | 0       | 54.0         | -2.1      | Pass       | noise floor |
| 2402.004      | 56.2     | 3.0        | -11.1 | 48.1         | Peak [Scan]      | H   | --     | --      | --           | --        | n/a        | FUNDBT      |
| 5156.292      | 51.1     | 4.6        | -9.0  | 46.7         | Peak [Scan]      | H   | 100    | 0       | 54.0         | -7.3      | Pass       | WLAN        |

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
 NRB = Non-Restricted Band. RB = Restricted Band.

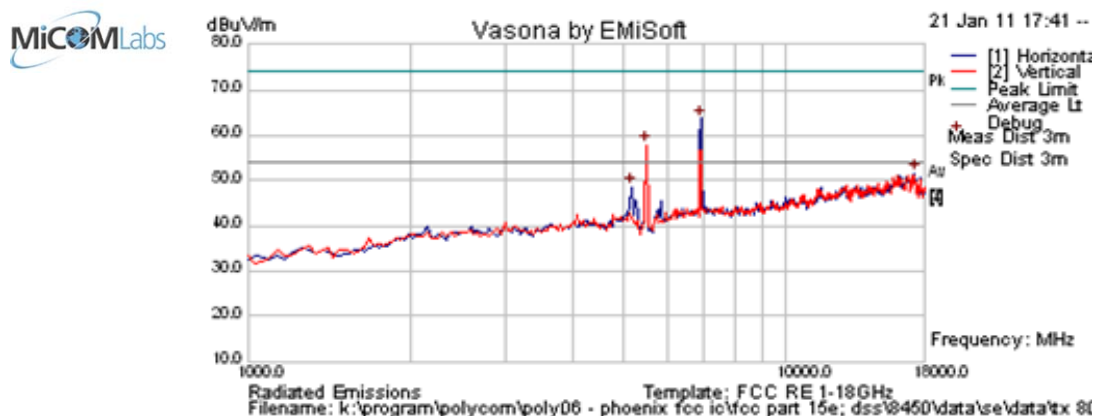
All emissions that were not present during stand-alone transmitter emissions testing are indicated as "New". Peak values of these emissions are all less than 6dB below the average limit. Please see plots below for stand-alone transmitter emissions results.

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|                      |                                                                                                                                                |                       |      |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------|
| <b>Test Freq.</b>    | 5500 MHz                                                                                                                                       | <b>Engineer</b>       | EVF  |
| <b>Variant</b>       | 802.11a; 6 Mbs                                                                                                                                 | <b>Temp (°C)</b>      | 20   |
| <b>Freq. Range</b>   | 1000 MHz - 18000 MHz                                                                                                                           | <b>Rel. Hum.(%)</b>   | 38   |
| <b>Power Setting</b> | 16 in test utility                                                                                                                             | <b>Press. (mBars)</b> | 1005 |
| <b>Antenna</b>       | integral                                                                                                                                       | <b>Duty Cycle (%)</b> | 10   |
| <b>Test Notes 1</b>  | Fundamental attenuated by band-stop filter. Handset (Mdel: 8450) with battery (SN: AC1010320232) , also connected to charger (Mdel: SA106B-05) |                       |      |
| <b>Test Notes 2</b>  | Mdel: WLAN Channel 100 Transmit; WLAN=1, BT=0, BC=0, DK=0                                                                                      |                       |      |



#### Formally measured emission peaks

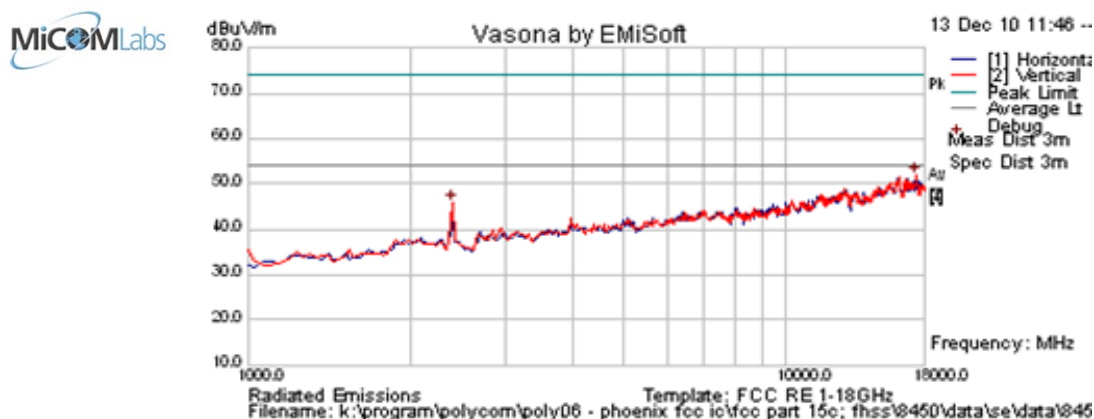
| Frequency MHz                                                                                                                                                      | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|-------------|
| 6920.321                                                                                                                                                           | 63.9     | 5.3        | -5.5  | 63.7         | Peak [Scan]      | H   | 100    | 0       | 68.2         | -4.5      | Pass       | NRB         |
| 5498.236                                                                                                                                                           | 62.1     | 4.6        | -8.7  | 58.0         | Peak [Scan]      | H   | --     | --      | --           | --        | n/a        | FUND        |
| 17284.569                                                                                                                                                          | 41.3     | 8.6        | 1.6   | 51.5         | Peak [Scan]      | H   | 200    | 0       | 54           | -2.5      | Pass       | noise floor |
| 5156.152                                                                                                                                                           | 52.9     | 4.6        | -9.0  | 48.6         | Peak [Scan]      | H   | 100    | 0       | 68.2         | -19.7     | Pass       | NRB         |
| <b>Legend:</b> TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission<br>NRB = Non-Restricted Band. RB = Restricted Band. |          |            |       |              |                  |     |        |         |              |           |            |             |

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|                      |                                                                                                                                                |                       |      |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------|
| <b>Test Freq.</b>    | 2402 MHz                                                                                                                                       | <b>Engineer</b>       | EVF  |
| <b>Variant</b>       | Bluetooth - CW/Mbde                                                                                                                            | <b>Temp (°C)</b>      | 20   |
| <b>Freq. Range</b>   | 1000 - 18000 MHz                                                                                                                               | <b>Rel. Hum.(%)</b>   | 47   |
| <b>Power Setting</b> | Maximum                                                                                                                                        | <b>Press. (mBars)</b> | 1007 |
| <b>Antenna</b>       | Integral                                                                                                                                       | <b>Duty Cycle (%)</b> | 10   |
| <b>Test Notes 1</b>  | Fundamental attenuated by band-stop filter. Handset (Mdel: 8450) with battery (SN: AC101032008E) , also connected to charger (Mdel: SA106B-05) |                       |      |
| <b>Test Notes 2</b>  | Mbde: BT Channel 0 Transmit; rate: CW; WLAN=0, BT=1, BC=0, DK=0                                                                                |                       |      |



#### Formally measured emission peaks

| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments    |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|-------------|
| 17420.842                                                                                               | 41.2     | 8.7        | 1.9   | 51.9         | Peak [Scan]      | V   | 100    | 0       | 54.0         | -2.1      | Pass       | noise floor |
| 2397.347                                                                                                | 53.9     | 3.0        | -11.1 | 45.7         | Peak [Scan]      | V   | 98     | 360     | 54.0         | -8.3      | Pass       | FUND        |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission |          |            |       |              |                  |     |        |         |              |           |            |             |
| NRB = Non-Restricted Band. RB = Restricted Band.                                                        |          |            |       |              |                  |     |        |         |              |           |            |             |

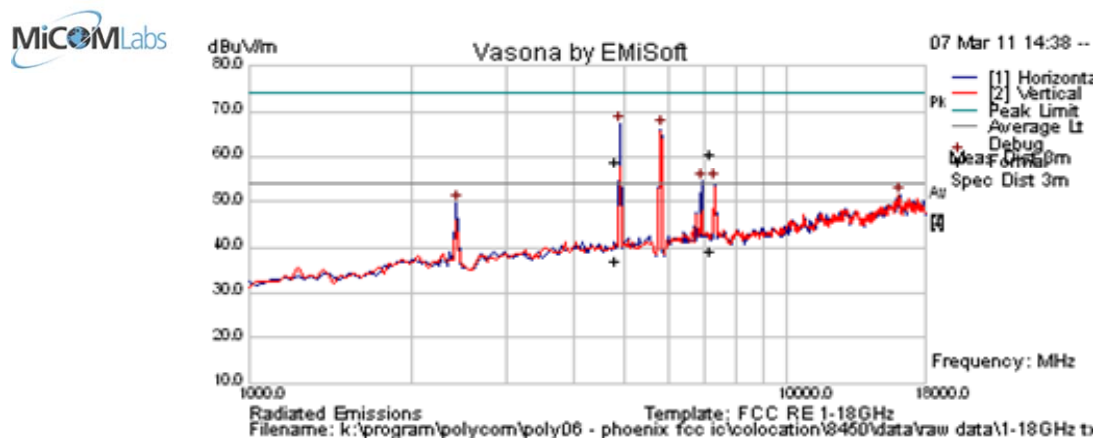
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### 7.1.5 Collocation - WLAN-5825MHz/ BT-2441MHz

|                      |                                                              |                       |      |
|----------------------|--------------------------------------------------------------|-----------------------|------|
| <b>Test Freq.</b>    | WLAN-5825MHz/ BT-2441MHz                                     | <b>Engineer</b>       | EVF  |
| <b>Variant</b>       | Collocation                                                  | <b>Temp (°C)</b>      | 22   |
| <b>Freq. Range</b>   | 1-18GHz                                                      | <b>Rel. Hum.(%)</b>   | 33   |
| <b>Power Setting</b> | 16 in test utility                                           | <b>Press. (mBars)</b> | 1000 |
| <b>Antenna</b>       | integral                                                     |                       |      |
| <b>Test Notes 1</b>  | Handset (Spectralink Model: 8450) with fully charged battery |                       |      |
| <b>Test Notes 2</b>  | TX: WLAN-Ch.165; BT-Ch. 39                                   |                       |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments    |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|-------------|
| 4881.703      | 70.5     | 4.5        | -9.3  | 65.7         | Peak Max         | H   | 98     | 147     | 74.0         | -8.3      | Pass       | New         |
| 7322.485      | 51.5     | 5.5        | -5.1  | 51.9         | Peak Max         | H   | 187    | 3       | 74.0         | -22.2     | Pass       | New         |
| 4881.703      | 48.2     | 4.5        | -9.3  | 43.4         | Average Max      | H   | 98     | 147     | 54.0         | -10.6     | Pass       | New         |
| 7322.485      | 33.7     | 5.5        | -5.1  | 34.0         | Average Max      | H   | 187    | 3       | 54.0         | -20.0     | Pass       | New         |
| 5821.323      | 69.5     | 4.8        | -8.3  | 66.1         | Peak [Scan]      | H   | --     | --      | --           | --        | n/a        | FUNDWLAN    |
| 6925.21       | 54.4     | 5.3        | -5.5  | 54.2         | Peak [Scan]      | H   | 100    | 0       | 74.0         | -19.8     | Pass       | WLAN        |
| 16160.321     | 41.5     | 9.0        | 1.0   | 51.4         | Peak [Scan]      | H   | 100    | 0       | 54           | -2.6      | Pass       | noise floor |
| 2441.022      | 57.6     | 3.0        | -11.0 | 49.5         | Peak [Scan]      | H   | --     | --      | --           | --        | n/a        | FUNDBT      |

**Legend:** TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
NRB = Non-Restricted Band. RB = Restricted Band.

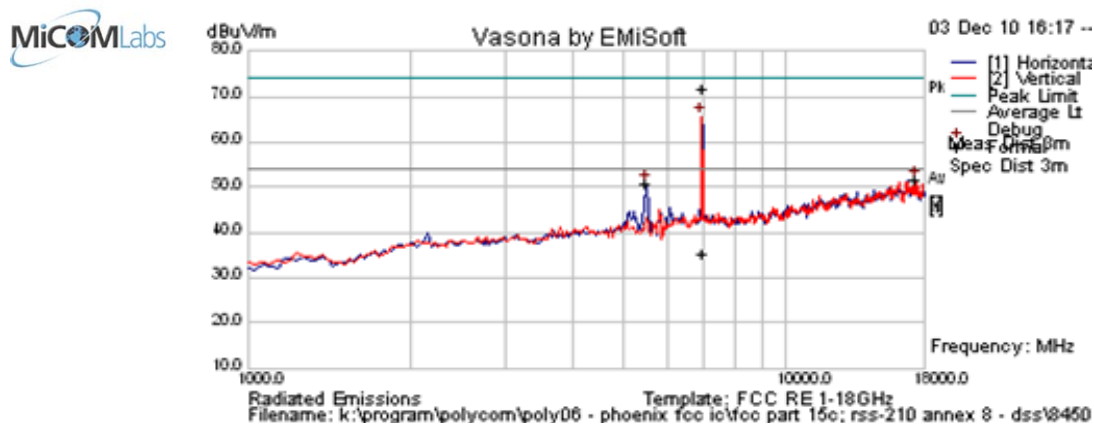
All emissions that were not present during stand-alone transmitter emissions testing are indicated as "New". Peak values of these emissions are all less than 6dB below the average limit. Please see plots below for stand-alone transmitter emissions results.

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|                      |                                                              |                       |      |
|----------------------|--------------------------------------------------------------|-----------------------|------|
| <b>Test Freq.</b>    | 5825 MHz                                                     | <b>Engineer</b>       | EVF  |
| <b>Variant</b>       | Colocation                                                   | <b>Temp (°C)</b>      | 22   |
| <b>Freq. Range</b>   | 1-18GHz                                                      | <b>Rel. Hum.(%)</b>   | 33   |
| <b>Power Setting</b> | 16 in test utility                                           | <b>Press. (mBars)</b> | 1000 |
| <b>Antenna</b>       | integral                                                     | <b>Duty Cycle (%)</b> | 0    |
| <b>Test Notes 1</b>  | Handset (Spectralink Model: 8450) with fully charged battery |                       |      |
| <b>Test Notes 2</b>  | Mode: WLAN Channel 165 Transmit; WLAN=1, BT=0, BC=0, DK=0    |                       |      |



#### Formally measured emission peaks

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments         |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|------------------|
| 6971.703      | 71.4     | 5.4        | -5.2  | 71.6         | Peak Max         | V   | 178    | 181     | 74.0         | -2.4      | Pass       | NRB              |
| 6971.703      | 35.2     | 5.4        | -5.2  | 35.4         | Average Max      | V   | 178    | 181     | 54.0         | -18.6     | Pass       | NRB              |
| 17284.569     | 41.3     | 8.6        | 1.6   | 51.5         | Peak [Scan]      | V   | 150    | 0       | 54           | -2.5      | Pass       | noise floor      |
| 5496.994      | 54.7     | 4.6        | -8.7  | 50.6         | Peak [Scan]      | H   | 200    | 0       | 54           | -3.4      | Pass       | RB see band edge |

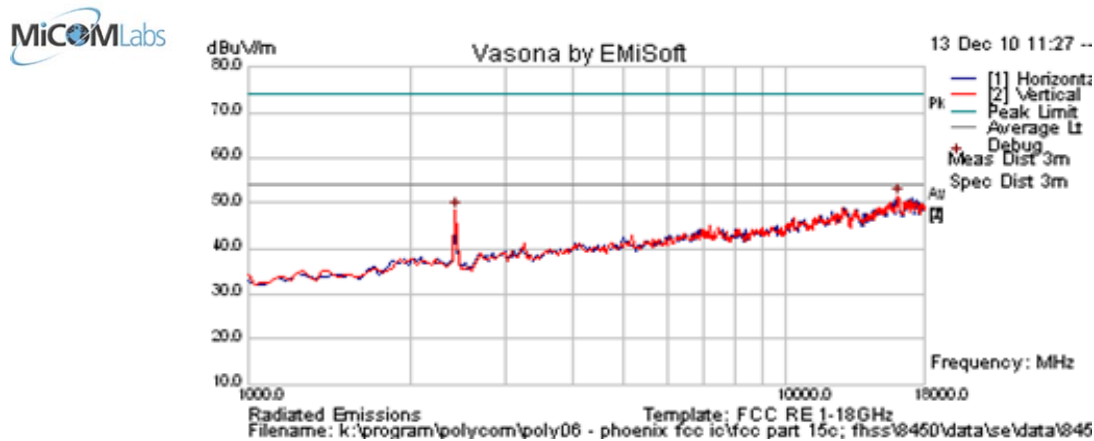
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission

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|                      |                                                                                                                                                |                       |      |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------|
| <b>Test Freq.</b>    | 2441 MHz                                                                                                                                       | <b>Engineer</b>       | EVF  |
| <b>Variant</b>       | Bluetooth - CW/Mbde                                                                                                                            | <b>Temp (°C)</b>      | 22   |
| <b>Freq. Range</b>   | 1000 - 18000 MHz                                                                                                                               | <b>Rel. Hum.(%)</b>   | 33   |
| <b>Power Setting</b> | Maximum                                                                                                                                        | <b>Press. (mBars)</b> | 1000 |
| <b>Antenna</b>       | integral                                                                                                                                       | <b>Duty Cycle (%)</b> | 0    |
| <b>Test Notes 1</b>  | Fundamental attenuated by band-stop filter. Handset (Mdel: 8450) with battery (SN: AC101032008E) , also connected to charger (Mdel: SA106B-05) |                       |      |
| <b>Test Notes 2</b>  | Mdb: BT Channel 78 Transmit; rate: CW; WLAN=0, BT=1, BC=0, DK=0                                                                                |                       |      |



#### Formally measured emission peaks

| Frequency MHz                                                                                           | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail | Comments    |
|---------------------------------------------------------------------------------------------------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|-------------|
| 16092.184                                                                                               | 41.5     | 9.0        | 0.8   | 51.2         | Peak [Scan]      | V   | 150    | 0       | 54.0         | -2.8      | Pass       | noise floor |
| 2430.86172                                                                                              | 56.4     | 3.0        | -11.1 | 48.2         | Peak [Scan]      | V   | 100    | 0       | 54.0         | -5.8      | Pass       | FUND        |
| Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission |          |            |       |              |                  |     |        |         |              |           |            |             |
| NRB = Non-Restricted Band. RB = Restricted Band.                                                        |          |            |       |              |                  |     |        |         |              |           |            |             |

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## 8 Photographs

### 8.1 Transmitter Radiated Spurious Emission above 1 GHz



## 8.2 Transmitter Radiated Spurious Emission below 1 GHz





**Title:** Polycom Spectralink 8440/8450 Wi-Fi handset with Bluetooth Collocation Report  
**To:** FCC 47 CFR Part 15, Collocation  
**Serial #:** POLY06-X2 Rev A  
**Issue Date:** 6th April, 2011  
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## 9 TEST EQUIPMENT DETAILS

| Asset # | Instrument             | Manufacturer     | Part #                | Serial #    |
|---------|------------------------|------------------|-----------------------|-------------|
| 0134    | Amplifier              | Com Power        | PA 122                | 181910      |
| 0158    | Barometer /Thermometer | Control Co.      | 4196                  | E2846       |
| 0287    | EMI Receiver           | Rhode & Schwartz | ESIB 40               | 100201      |
| 0193    | EMI Receiver           | Rhode & Schwartz | ESIB 7                | 838496/007  |
| 0252    | SMA Cable              | Megaphase        | Sucoflex 104          | None        |
| 0310    | 2m SMA Cable           | Micro-Coax       | UFA210A-0-0787-3G03G0 | 209089-001  |
| 0312    | 3m SMA Cable           | Micro-Coax       | UFA210A-1-1181-3G0300 | 209092-001  |
| 0313    | Coupler                | Hewlett Packard  | 86205A                | 3140A01285  |
| 0314    | 30dB N-Type Attenuator | ARRA             | N9444-30              | 1623        |
| 0070    | Power Meter            | Hewlett Packard  | 437B                  | 3125U11552  |
| 0116    | Power Sensor           | Hewlett Packard  | 8485A                 | 3318A19694  |
| 0117    | Power Sensor           | Hewlett Packard  | 8487D                 | 3318A00371  |
| 0184    | Pulse Limiter          | Rhode & Schwartz | ESH3Z2                | 357.8810.52 |
| 0190    | LISN                   | Rhode & Schwartz | ESH3Z5                | 836679/006  |
| 0293    | BNC Cable              | Megaphase        | 1689 1GVT4            | 15F50B001   |
| 0301    | 5.6 GHz Notch Filter   | Micro-Tronics    | RBC50704              | 001         |
| 0302    | 5.25 GHz Notch Filter  | Micro-Tronics    | BRC50703              | 002         |
| 0303    | 5.8 GHz Notch Filter   | Micro-Tronics    | BRC50705              | 003         |
| 0304    | 2.4GHzHz Notch Filter  | Micro-Tronics    | --                    | 001         |
| 0307    | BNC Cable              | Megaphase        | 1689 1GVT4            | 15F50B002   |
| 0335    | 1-18GHz Horn Antenna   | ETS- Lindgren    | 3117                  | 00066580    |
| 0337    | Amplifier              | MiCOM Labs       | --                    | --          |
| 0338    | Antenna                | Sunol Sciences   | JB-3                  | A052907     |
| 0342    | 2.4 GHz Notch Filter   | EWT              | EWT-14-0203           | H1          |

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