

Test of Polycom Spectralink 8450 Wi-Fi handset with  
Bluetooth

To: FCC 47 CFR Part 15, SubPart C 15.247 & RSS-  
210 Annex 8

Test Report Serial No.: POLY06-U8a Rev A



# TEST REPORT

From



**Test of:** Polycom Spectralink 8450 Wi-Fi handset with Bluetooth

**To:** FCC 47 CFR Part 15, SubPart C 15.247 & RSS-210 Annex 8

**Test Report Serial No.:** POLY06-U8a Rev A

**Reference Test Report:** POLY06-U21, POLY06-U8b

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:** 21st January 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 8450 Wi-Fi handset with Bluetooth  
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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

*Accredited Laboratory*

A2LA has accredited

**MICOM LABS**

*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-LAF 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
Australia	Australian Communications and Media Authority (ACMA)	CAB	APEC MRA 1	
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

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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.

  
\_\_\_\_\_  
Peter Olynyk  
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

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## 2 DOCUMENT HISTORY

Document History		
Revision	Date	Comments
Draft		
Rev A	21 <sup>st</sup> January 2011	Initial Release

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### 3 TEST RESULT CERTIFICATE

Applicant:	Polycom 4750 Willow Road Pleasanton California , 94588-2708, USA	Tested By:	MiCOM Labs, Inc. 440 Boulder Court Suite 200 Pleasanton California, 94566, USA
Product:	Spectralink 8400 series Wi-Fi handsets	Telephone:	+1 925 462 0304
Model No.:	Spectralink 8450 handset	Fax:	+1 925 462 0306
S/No's:	600826769 (radiated) 600826501 (conducted)		
Date(s) Tested:	Nov 19th - Dec 9th, 2010	Website:	<a href="http://www.micomlabs.com">www.micomlabs.com</a>

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:**

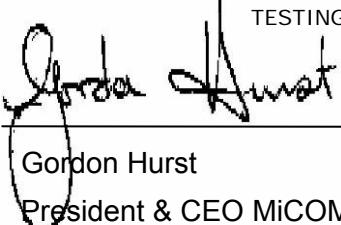
1. This document reports conditions under which testing was conducted and the results of testing performed.
2. Details of test methods used have been recorded and kept on file by the laboratory.
3. Test results apply only to the item(s) tested.

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, SubPart C 15.247	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 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 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
15.247 (a)(2)	6 dB Occupied Bandwidth	Conducted	PASS	Note 1,2,3,5	7.1
15.247 (i)	Maximum Permissible Exposure	Calculation	PASS	Note 1,2,3,5	7.2
15.247 (b)(3), 15.247 (b)(4)	Peak Output Power	Conducted	PASS	Note 1,2,3,5	7.3
15.247 (e)	Peak Power Spectral Density	Conducted	PASS	Note 1,2,3,5	7.4
15.247 (d)	Spurious Emissions	Conducted	PASS	Note 1,2,3,5	7.5
15.247 (d), 15.205, 15.209	Transmitter Radiated Spurious Emissions	Radiated	PASS	Note 1,2,3	7.6.1
15.247 (d), 15.205, 15.209	Radiated Band-Edge	Radiated	PASS	Note 1,2,3	7.6.2
RSS-GEN	Radiated Peak Emissions	Radiated	PASS	Note 1,2,3	7.6.3
RSS-GEN	Radiated Receiver Emissions	Radiated	PASS	Note 1,2,3	7.6.4
15.207	AC Wireline Emissions 0.15 – 30 MHz	Conducted	PASS	Note 1,2,3,4	7.7
15.109	Radiated (Digital) Emissions	Radiated	PASS	Note 1,2,3,4	N/A

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: Test results are presented in MiCOM Labs test report POLY06-U21.

Note 5: Radio's included within the Spectralink 8400 Series wireless handsets are declared identical by the manufacturer. EUT's were tested for RF output power. Unit and model (Model: Spectralink 8450 S/N: 600826501) 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) utilized in the Polycom Spectralink 8450 Wi-Fi handset with Bluetooth for compliance against FCC 47 CFR Part 15, SubPart C 15.247 & RSS-210 Annex 8.

**APPLICANT:** Polycom **PRODUCT:** Spectralink 8450 Wi-Fi handset Front



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**APPLICANT:** Polycom **PRODUCT:** Spectralink 8450 Wi-Fi handset Back



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**APPLICANT:** Polycom **PRODUCT:** AC-DC Adapter/ Charger Model SA106B-05 for Spectralink 8400 series handsets



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## 6.2 EUT Details

Detail	Description
Purpose:	Test of the Polycom Spectralink 8450 Wi-Fi handset with Bluetooth for compliance against FCC 47 CFR Part 15, SubPart C 15.247 & RSS-210 Annex 8
Applicant:	Polycom 4750 Willow Road Pleasanton, CA 94588-2708 USA
Manufacturer:	Same as Applicant
Test Laboratory:	MiCOM Labs, Inc. 440 Boulder Court, Suite 200 Pleasanton, California 94566 USA
Test report reference number:	POLY06-U8a
Date EUT received:	11/11/2010
Dates of test (from - to):	11/19/2010 – 12/09/2010
No of Units Tested:	S/N: 600826769 (radiated) S/N: 600826501 (conducted)
Product Name:	Spectralink 8400 series Wi-Fi handsets
Manufacturers Trade Name:	Polycom Spectralink 8400 series Wi-Fi handsets
Model No.:	Spectralink 8450 handset with Bluetooth
Equipment Primary Function:	Wi-Fi handset with Bluetooth
Equipment Secondary Function(s):	Bar code reader
Type of Technology:	802.11a/b/g/n with Bluetooth
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, 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: Input: 100 - 240V AC; 50-60 Hz; 0.25 Amp Output: 5V DC; 1 Amp

### 6.4 Operational Power Range

Fundamental Frequency (MHz)	Utility Setting Used During Tests	Measured Output Power (dBm)	TX SPR: Utility Setting Used During Test	Band Edge: Utility Setting Used During Test	Compliant Test Utility Setting	Compliant Output Power (dBm)
<b>802.11b</b>	Conducted RF Emissions			Radiated RF Emissions		
2412	24	16.72	24	24	24	16.72
2437	24	17.70	24		24	17.70
2462	24	17.50	24	24	24	17.50

<b>802.11g</b>	Conducted RF Emissions			Radiated RF Emissions		
2412	24	16.22	24	24	24	16.22
2437	24	17.34	24		24	17.34
2462	24	17.20	24	15	15	16.00

<b>802.11n HT-20</b>	Conducted RF Emissions			Radiated RF Emissions		
2412	24	16.21	24	24	24	16.21
2437	24	17.16	24		24	17.16
2462	24	17.00	24	16	16	16.70
5745	24	19.11	24	24	24	19.11
5785	24	19.00	24		24	19.00
5825	24	18.68	24		24	18.68

<b>802.11a</b>	Conducted RF Emissions			Radiated RF Emissions		
5745	24	19.11	24	24	24	19.11
5785	24	19.16	24		24	19.16
5825	24	18.84	24		24	18.84

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## 6.5 Types of Modulation Supported

Modulation / Mode	BW 1
802.11b	DSSS/CCK
802.11g	DSSS
802.11n HT-20 (2.4GHz)	OFDM
802.11a	OFDM
802.11n HT-20 (5.8GHz)	OFDM

## 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 5150 - 5850 MHz

## 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)
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	Y
AC-DC Adapter/ Charger	Power connector - mini USB for charging using power supply SA106B-05	Y	< 3 meters	1	Y
Charging terminals	Charging terminal for charging EUT with docking options	N	N/A	1	Y

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## 6.8 EUT Configurations

### Frequency Bands:

Test Mode	Start Freq. (MHz)	Stop Freq. (MHz)	Rated Output Power (Watts)	Frequency Tolerance (p.p.m.)	20dB BW (KHz)	Emission Designator	Microprocessor
802.11b	2412	2462	0.059	20	13900	13M9G1D	--
802.11g	2412	2462	0.054	20	16500	16M5D1D	--
802.11n HT-20	2412	2462	0.052	20	17600	17M6D1D	--
802.11a	5725	5850	0.082	20	16600	16M6D1D	--
802.11n HT-20	5725	5850	0.081	20	17700	17M7D1D	--

### Channel plan and spacing

Band (GHz)	Mode	Freq Band (MHz)	Freq Range (MHz)	Low Ch	Mid Ch	High Ch	# Ch	Ch Spacing (MHz)
2.4	802.11b	2400 - 2483.5	2412 - 2462	2412	2437	2462	11	5
2.4	802.11g	2400 - 2483.5	2412 - 2462	2412	2437	2462	11	5
2.4	802.11n HT-20	2400 - 2483.5	2412 - 2462	2412	2437	2462	11	5
5.8	802.11a	5725 - 5850	5745 - 5825	5745	5785	5825	5	20
5.8	802.11n HT-20	5725 - 5850	5745 - 5825	5745	5785	5825	5	20

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## 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-RS657+002	AC1010320232	Y
Battery	Alpha SAMPLE	Polycom	ESB-RS657+002	AC101032008E	Y
Battery	Alpha SAMPLE	Polycom	ESB-RS658+002	AD101032019C	N
Charging Dock	Alpha SAMPLE	Polycom	ESB-DCA39+001	AlphaB391741033	N
AC-DC Adapter	I.T.E. Power Supply	HON-KWANG	HK-U-120A050-CP	N/A	N
AC-DC Adapter/Charger	Switching Adapter	GCi technologies	SA106B-05	N/A	Y
Speaker Dock	10uF @ U8 Pin4 to Ground Dock PCB Revision X4	Polycom	N/A	N/A	N
AC-DC Adapter	I.T.E. Power Supply	HON-KWANG	HK-AX-120A200-CP	N/A	N
Headset	Encore Headset	Plantronics	P/N: 29951-12	0E0723 K7	N

## 6.10 Test Configurations

Operational Mode(s)	Data Rate Tested	Duty Cycle
b	1 MBit/s	10 %
g	6 MBit/s	10 %
a	6 MBit/s	10 %
n HT-20	6.5 MCS	10 %

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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

## 7 TEST RESULTS

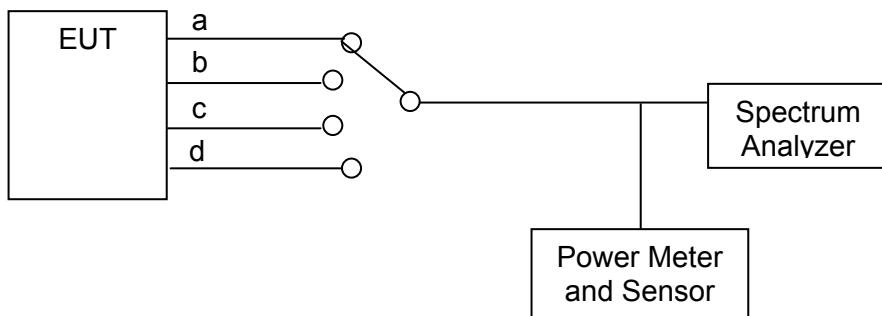
### 7.1 6 dB and 99% Bandwidth

#### Test Procedure

The test methodology and conditions utilized for each measurement is referenced in the following test results matrix. 6 dB and 99% bandwidth were measured per the Test Configuration identified below.

Testing was restricted to a single port.

#### Test Configuration



Measurement setup for 6 dB & 99% Bandwidth



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## Specification Limits

### FCC §15.247 (a)(2)

The minimum 6 dB bandwidth shall be at least 500 kHz.

### Industry Canada RSS-210 §A8.2 (a)

These include systems that employ digital modulation techniques resulting in spectral characteristics similar to direct sequence systems. The following applies to all three bands:

(a) The minimum -6 dB bandwidth shall be at least 500 kHz.

## Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-03 'Measurement of RF Spectrum Mask'	0158, 0252, 0313, 0314, 0116, 0117, 0287, 0363

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### 7.1.1 6 dB and 99% Bandwidth Results: 802.11b

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11 b	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	10
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	2.5 dBi
<b>Applied Voltage:</b>	4.20 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

#### 6 dB Bandwidth

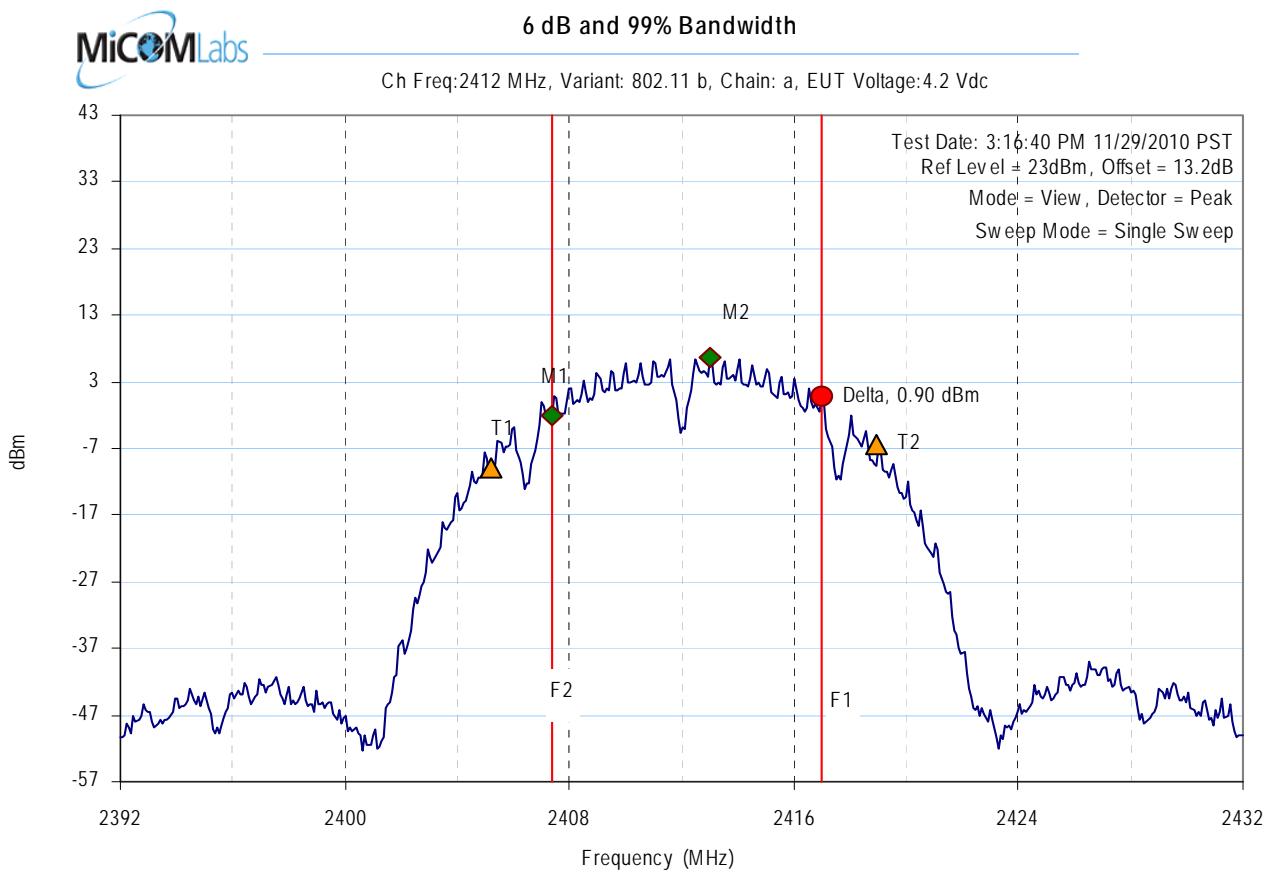
<b>Test Frequency</b>	<b>6 dB Bandwidth</b>				<b>Minimum 6dB Bandwidth Limit</b>		<b>Margin</b>
	<b>MHz</b>						
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>kHz</b>	<b>MHz</b>	<b>MHz</b>
2412.000	9.619000	--	--	--	500	0.5	-9.119000
2437.000	9.138000	--	--	--			-8.638000
2462.000	9.138000	--	--	--			-8.638000

#### 99% Bandwidth

<b>Test Frequency</b>	<b>99 % Bandwidth</b>						
	<b>MHz</b>						
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>			
2412.000	13.788000	--	--	--			
2437.000	13.948000	--	--	--			
2462.000	13.948000	--	--	--			

<b>Measurement uncertainty:</b>	±2.81 dB
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**Analyser Setup**

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 20  
 RF Atten (dB) = 10  
 Span = 40.00MHz

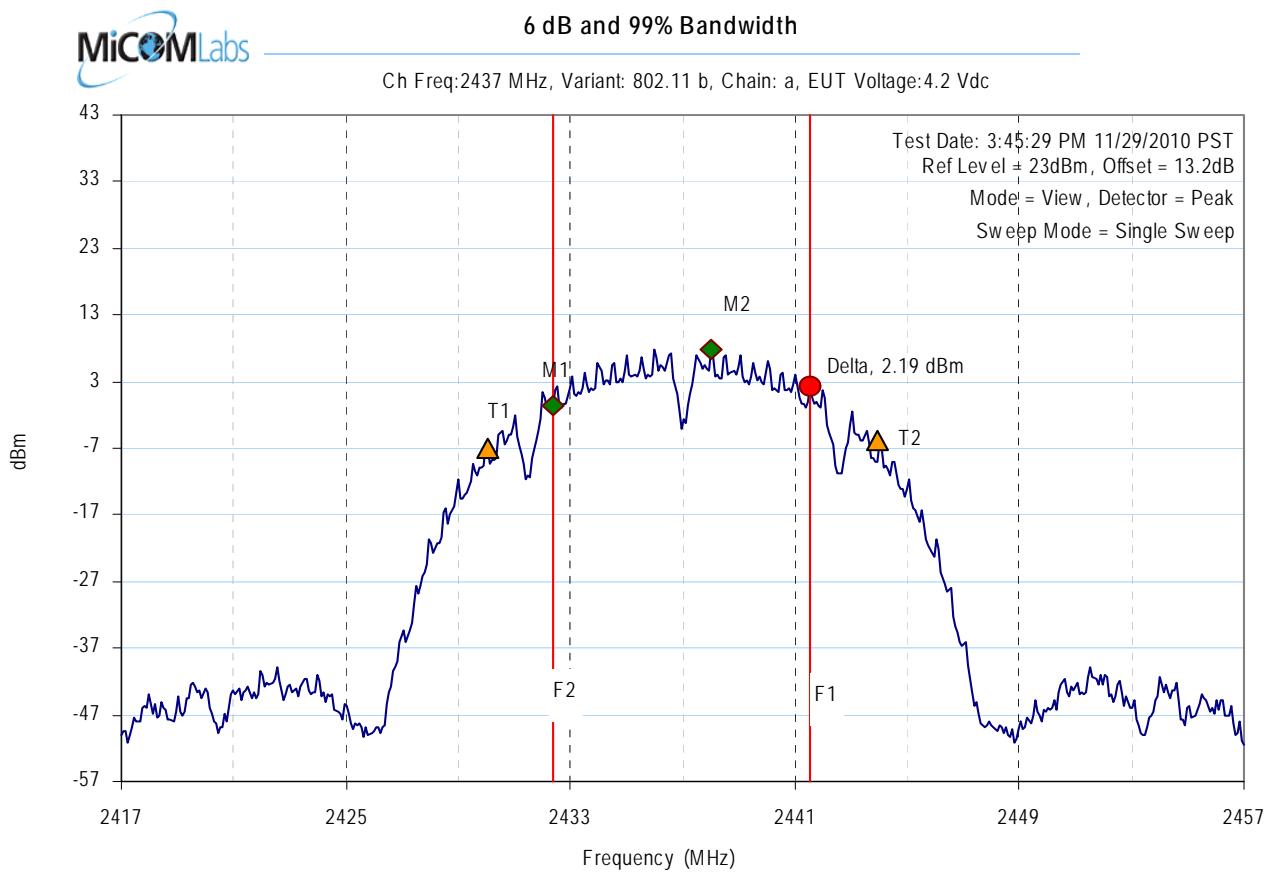
**Marker : Frequency : Amplitude**

M1 : 2407.390782MHz : -1.948dBm  
 M2 : 2413.002004MHz : 6.657dBm  
 Delta : 2417.010020MHz : .895dBm  
 T1 : 2405.226453MHz : -9.949dBm  
 T2 : 2418.933868MHz : -6.471dBm

**Test Results**

Center frequency = 2412MHz  
 6dB BW(Delta-M1) = 9.619238MHz  
 99% OBW(T2-T1) = 13.787575MHz

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**Analyser Setup**

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 20  
 RF Alten (dB) = 10  
 Span = 40.00MHz

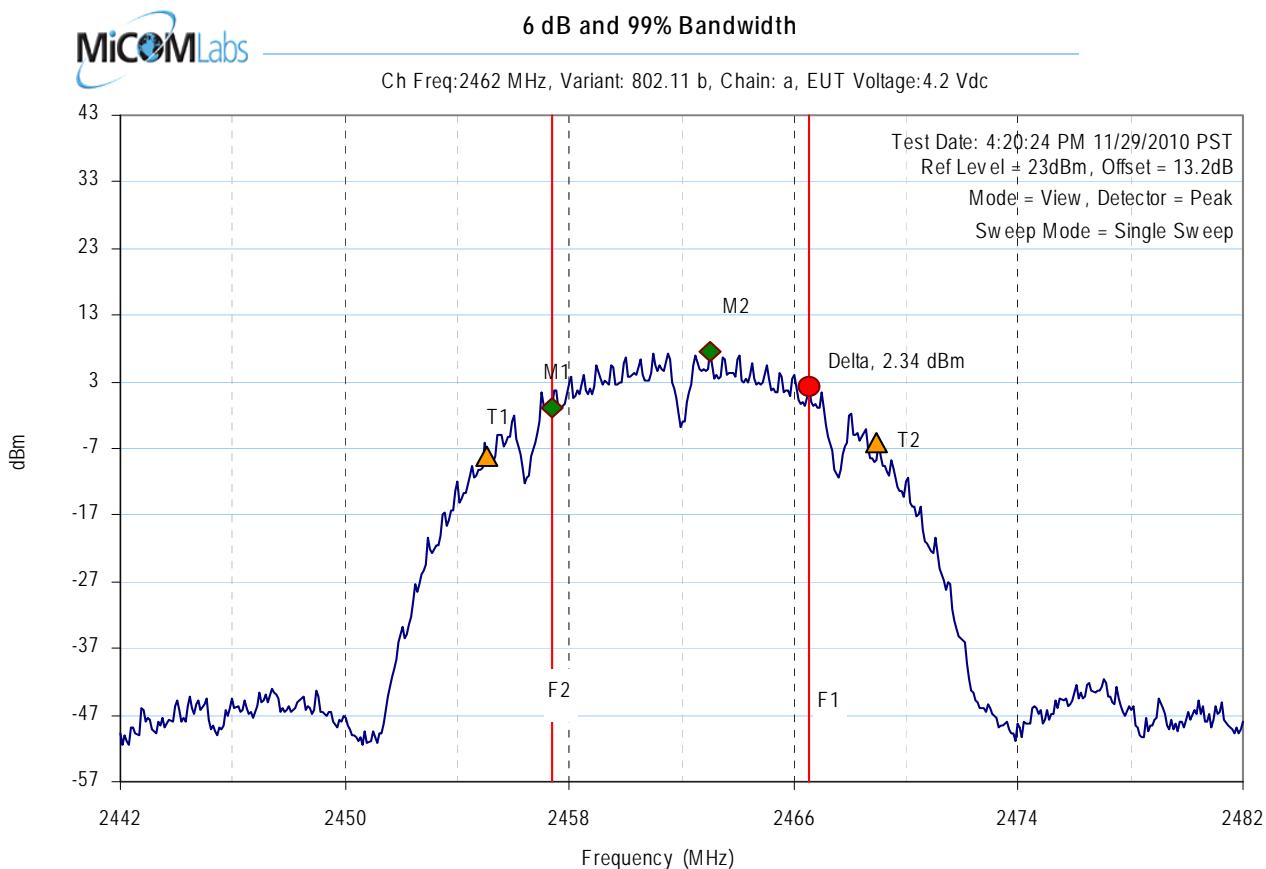
**Marker : Frequency : Amplitude**

M1 : 2432.390782MHz : -.730dBm  
 M2 : 2438.002004MHz : 7.777dBm  
 Delta : 2441.529058MHz : 2.187dBm  
 T1 : 2430.066132MHz : -6.914dBm  
 T2 : 2443.933868MHz : -5.771dBm

**Test Results**

Center frequency = 2437MHz  
 6dB BW(Delta-M1) = 9.138277MHz  
 99% OBW(T2-T1) = 13.947896MHz

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**Analyser Setup**

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 20  
 RF Atten (dB) = 10  
 Span = 40.00MHz

**Marker : Frequency : Amplitude**

M1 : 2457.390782MHz : -0.876dBm  
 M2 : 2463.002004MHz : 7.521dBm  
 Delta : 2466.529058MHz : 2.335dBm  
 T1 : 2455.066132MHz : -8.259dBm  
 T2 : 2468.933868MHz : -6.052dBm

**Test Results**

Center frequency = 2462MHz  
 6dB BW(Delta-M1) = 9.138277MHz  
 99% OBW(T2-T1) = 13.947896MHz

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### 7.1.2 6 dB and 99% Bandwidth Results: 802.11g

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11g	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	10		
<b>Beam Forming Gain (Y):</b>	N/A	<b>Antenna Gain:</b>	2.5	dB	
<b>Applied Voltage:</b>	4.20	Vdc			
<b>Notes 1:</b>					
<b>Notes 2:</b>					

#### 6 dB Bandwidth

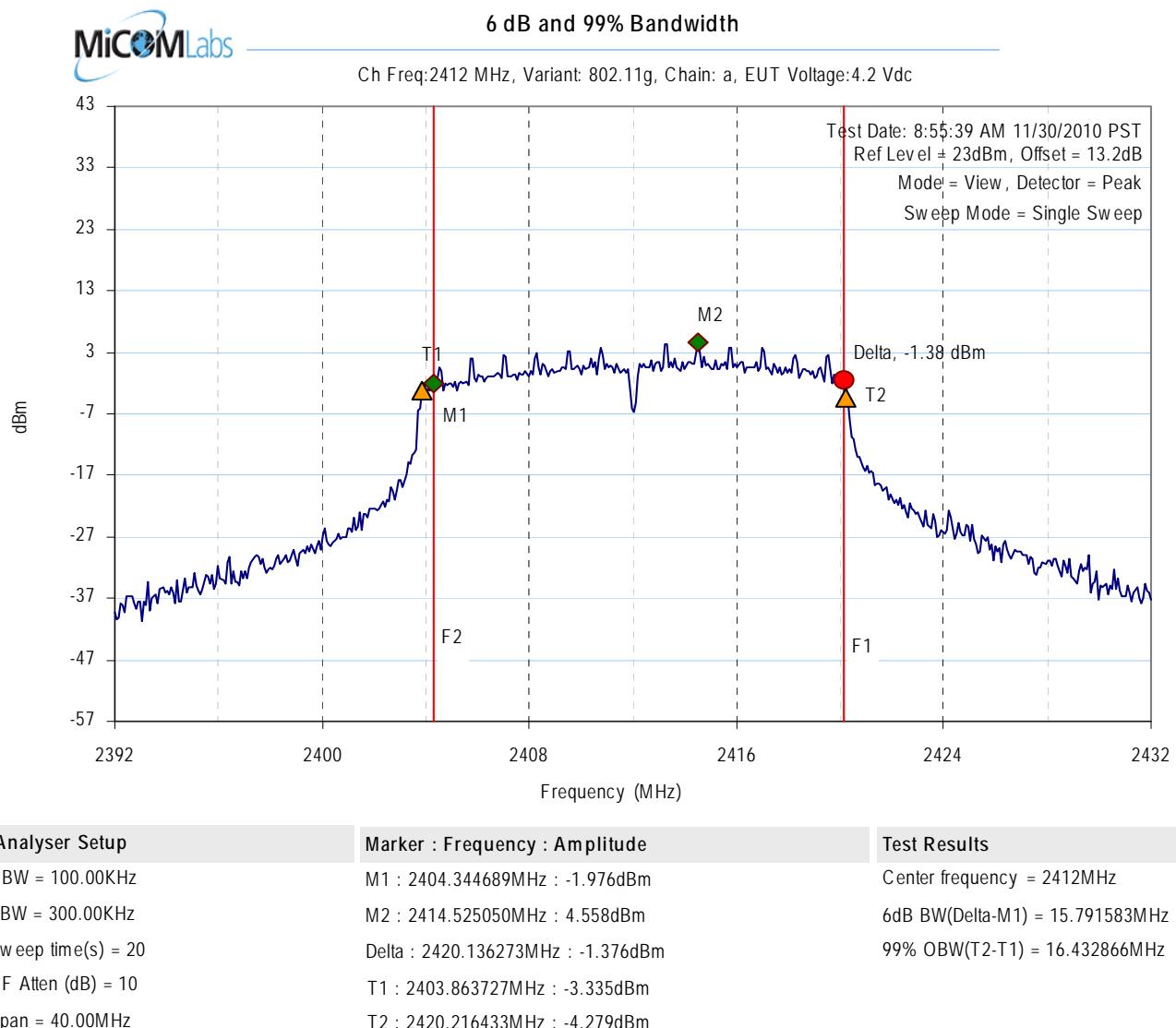
<b>Test Frequency</b>	<b>6 dB Bandwidth</b>				<b>Minimum 6dB Bandwidth Limit</b>		<b>Margin</b>
	<b>MHz</b>						
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>kHz</b>	<b>MHz</b>	<b>MHz</b>
2412.000	15.792000	--	--	--	500	0.5	-15.292000
2437.000	15.551000	--	--	--			-15.051000
2462.000	15.711000	--	--	--			-15.211000

#### 99% Bandwidth

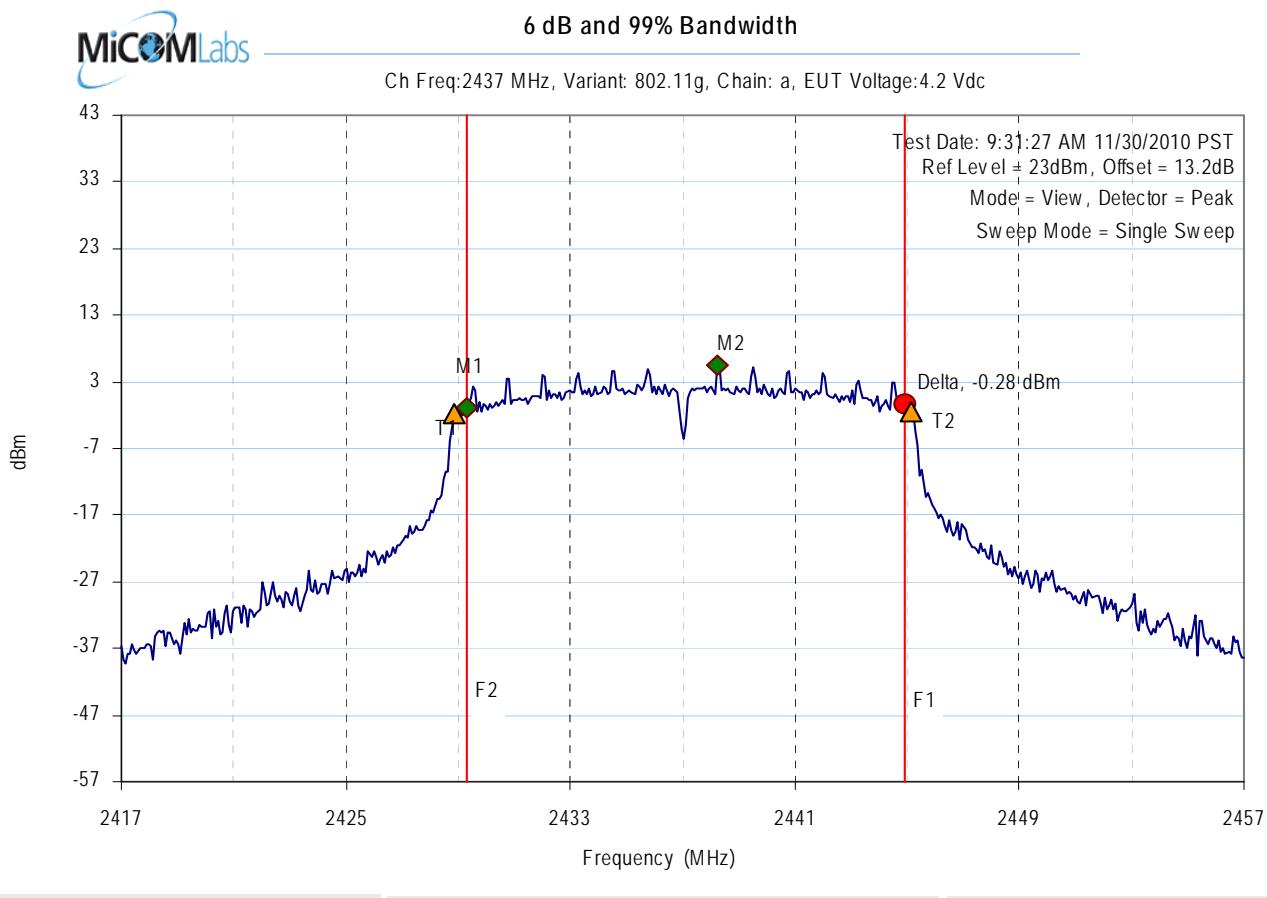
<b>Test Frequency</b>	<b>99 % Bandwidth</b>						
	<b>MHz</b>						
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>			
2412.000	16.433000	--	--	--			
2437.000	16.353000	--	--	--			
2462.000	16.513000	--	--	--			

<b>Measurement uncertainty:</b>	<b>±2.81 dB</b>
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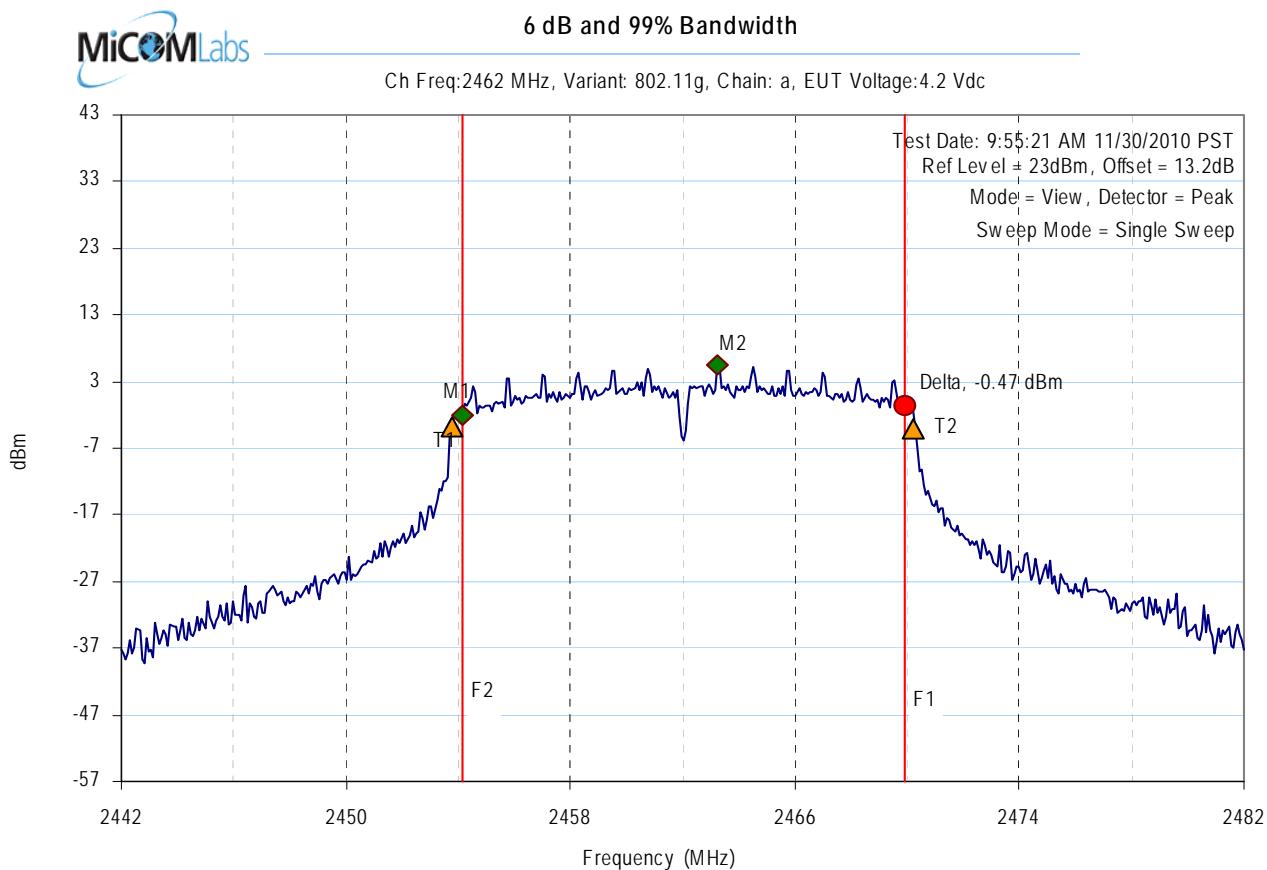


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Analyser Setup	Marker : Frequency : Amplitude	Test Results
RBW = 100.00KHz	M1 : 2429.344689MHz : -1.031dBm	Center frequency = 2437MHz
VBW = 300.00KHz	M2 : 2438.242485MHz : 5.374dBm	6dB BW(Delta-M1) = 15.551102MHz
Sweep time(s) = 20	Delta : 2444.895792MHz : -.282dBm	99% OBW(T2-T1) = 16.352705MHz
RF Atten (dB) = 10	T1 : 2428.863727MHz : -1.901dBm	
Span = 40.00MHz	T2 : 2445.136273MHz : -1.56dBm	

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**Analyser Setup**

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 20  
 RF Atten (dB) = 10  
 Span = 40.00MHz

**Marker : Frequency : Amplitude**

M1 : 2454.184369MHz : -1.954dBm  
 M2 : 2463.242485MHz : 5.367dBm  
 Delta : 2469.895792MHz : -.465dBm  
 T1 : 2453.783567MHz : -3.868dBm  
 T2 : 2470.216433MHz : -3.967dBm

**Test Results**

Center frequency = 2462MHz  
 6dB BW(Delta-M1) = 15.711423MHz  
 99% OBW(T2-T1) = 16.513026MHz

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### 7.1.3 6 dB and 99% Bandwidth Results: 802.11n HT-20

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11n HT-20	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	10		
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	2.5	dB	
<b>Applied Voltage:</b>	4.20 Vdc				
<b>Notes 1:</b>					
<b>Notes 2:</b>					

#### 6 dB Bandwidth

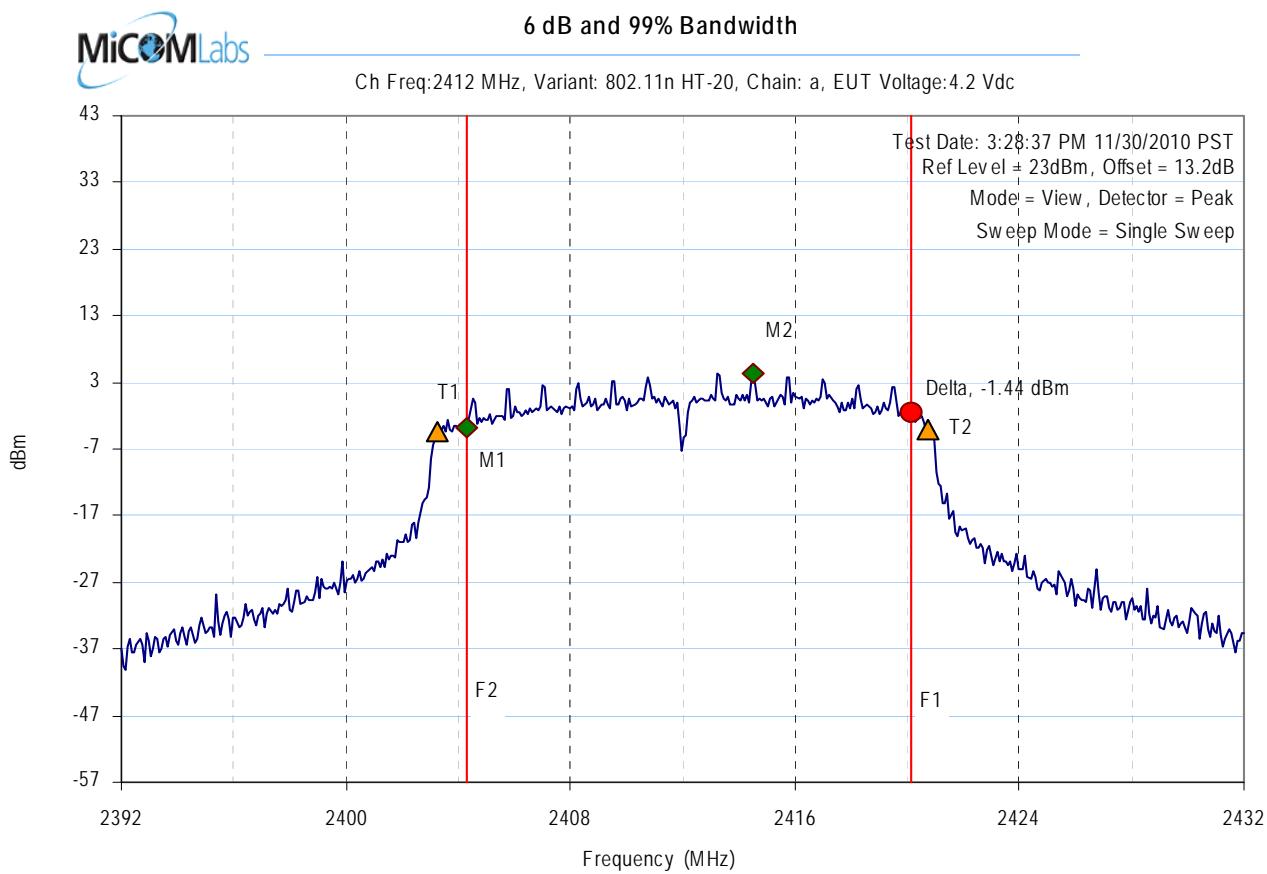
<b>Test Frequency</b>	<b>6 dB Bandwidth</b>				<b>Minimum 6dB Bandwidth Limit</b>	<b>Margin</b>
	<b>MHz</b>					
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>kHz</b>	<b>MHz</b>
2412.000	15.792000	--	--	--	500	-15.292000
2437.000	15.551000	--	--	--		
2462.000	15.391000	--	--	--		

#### 99% Bandwidth

<b>Test Frequency</b>	<b>99 % Bandwidth</b>					
	<b>MHz</b>					
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>		
2412.000	17.635000	--	--	--		
2437.000	17.635000	--	--	--		
2462.000	17.635000	--	--	--		

<b>Measurement uncertainty:</b>	±2.81 dB
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**Analyser Setup**

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 20  
 RF Atten (dB) = 10  
 Span = 40.00MHz

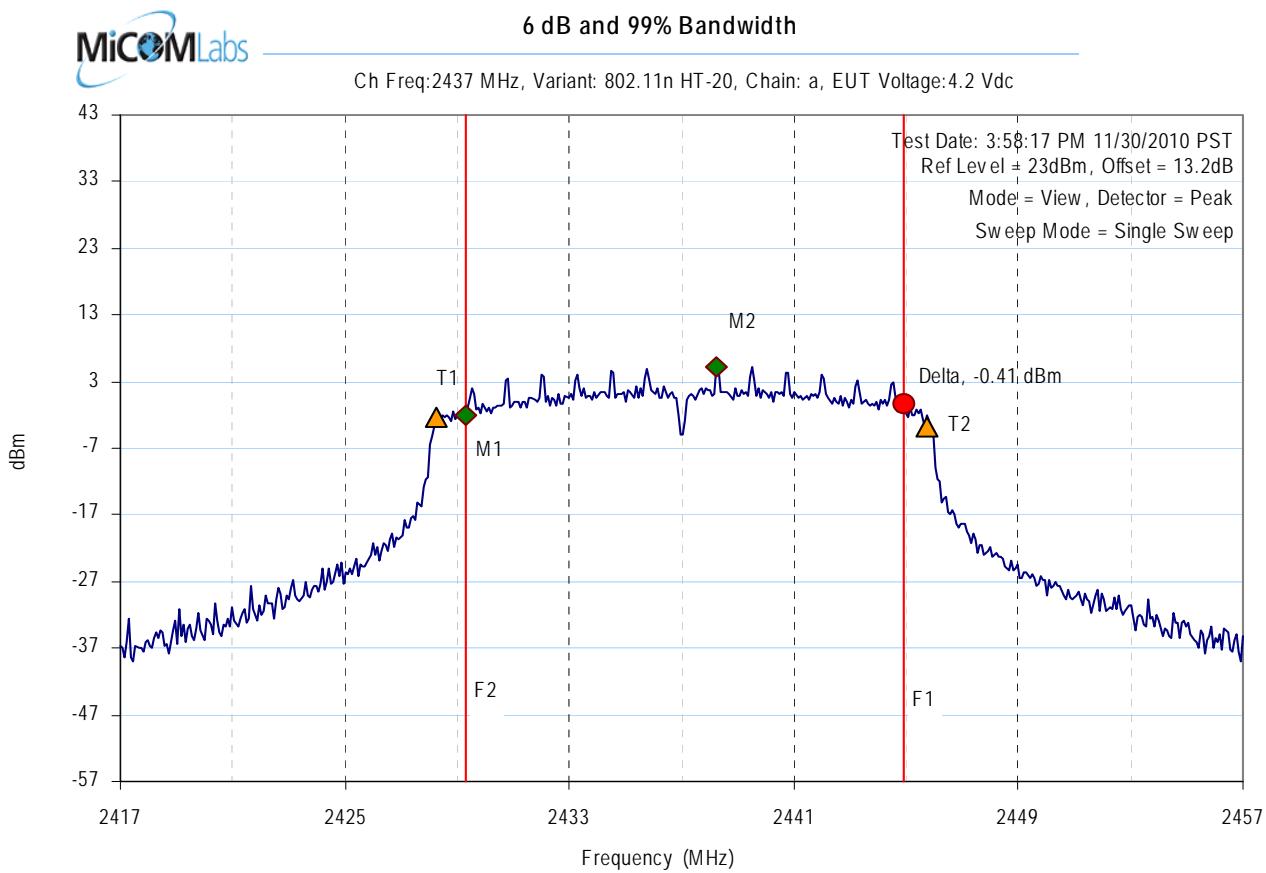
**Marker : Frequency : Amplitude**

M1 : 2404.344689MHz : -3.744dBm  
 M2 : 2414.525050MHz : 4.405dBm  
 Delta : 2420.136273MHz : -1.442dBm  
 T1 : 2403.222445MHz : -4.490dBm  
 T2 : 2420.777555MHz : -4.13dBm

**Test Results**

Center frequency = 2412MHz  
 6dB BW(Delta-M1) = 15.791583MHz  
 99% OBW(T2-T1) = 17.635271MHz

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**Analyser Setup**

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 20  
 RF Alten (dB) = 10  
 Span = 40.00MHz

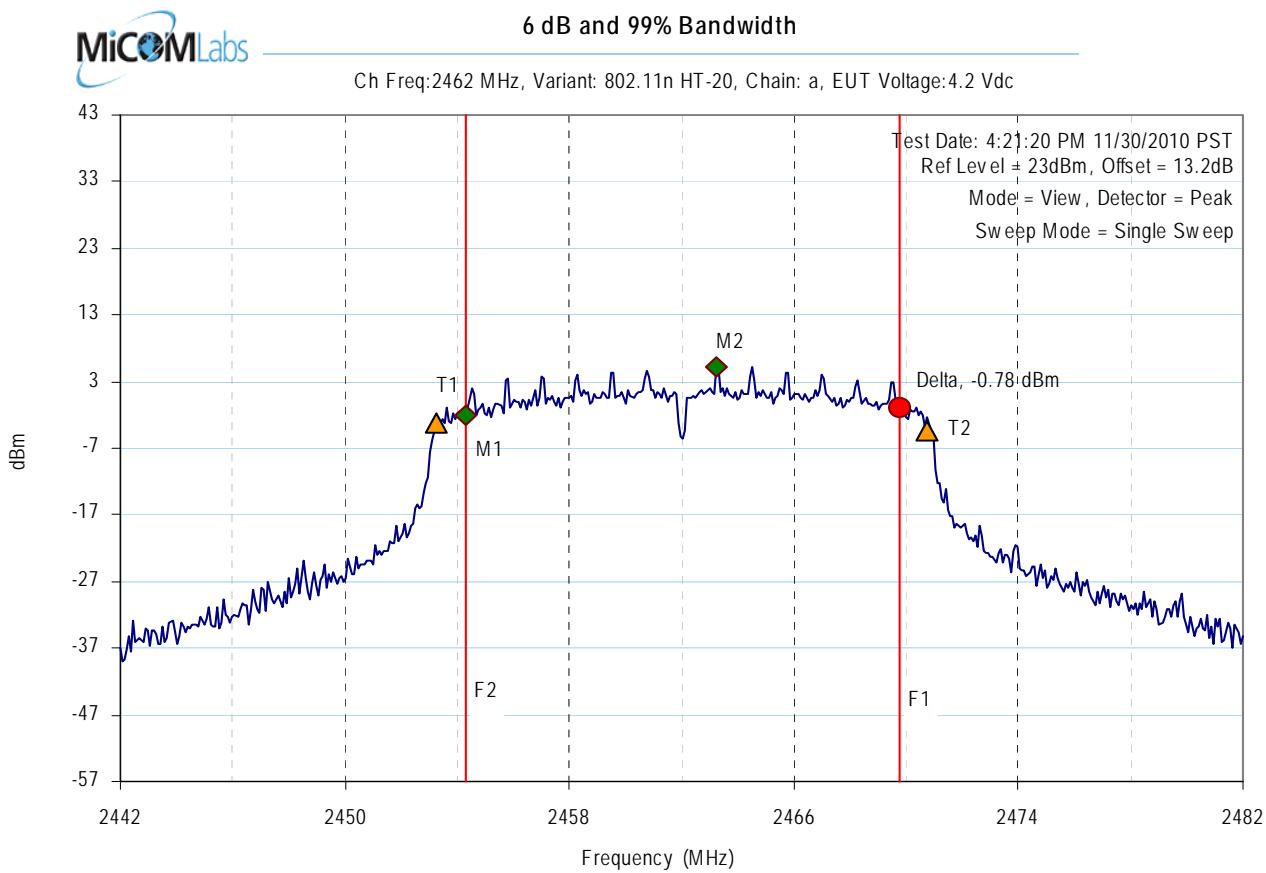
**Marker : Frequency : Amplitude**

M1 : 2429.344689MHz : -2.009dBm  
 M2 : 2438.242485MHz : 5.188dBm  
 Delta : 2444.895792MHz : -.415dBm  
 T1 : 2428.222445MHz : -2.456dBm  
 T2 : 2445.777555MHz : -3.833dBm

**Test Results**

Center frequency = 2437MHz  
 6dB BW(Delta-M1) = 15.551102MHz  
 99% OBW(T2-T1) = 17.635271MHz

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**Analyser Setup**

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 20  
 RF Alten (dB) = 10  
 Span = 40.00MHz

**Marker : Frequency : Amplitude**

M1 : 2454.344689MHz : -2.164dBm  
 M2 : 2463.242485MHz : 5.156dBm  
 Delta : 2469.735471MHz : -.777dBm  
 T1 : 2453.222445MHz : -3.136dBm  
 T2 : 2470.777555MHz : -4.364dBm

**Test Results**

Center frequency = 2462MHz  
 6dB BW(Delta-M1) = 15.390782MHz  
 99% OBW(T2-T1) = 17.635271MHz

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#### 7.1.4 6 dB and 99% Bandwidth Results: 802.11a

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11a	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	10
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	2.5 dBi
<b>Applied Voltage:</b>	4.20 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

##### 6 dB Bandwidth

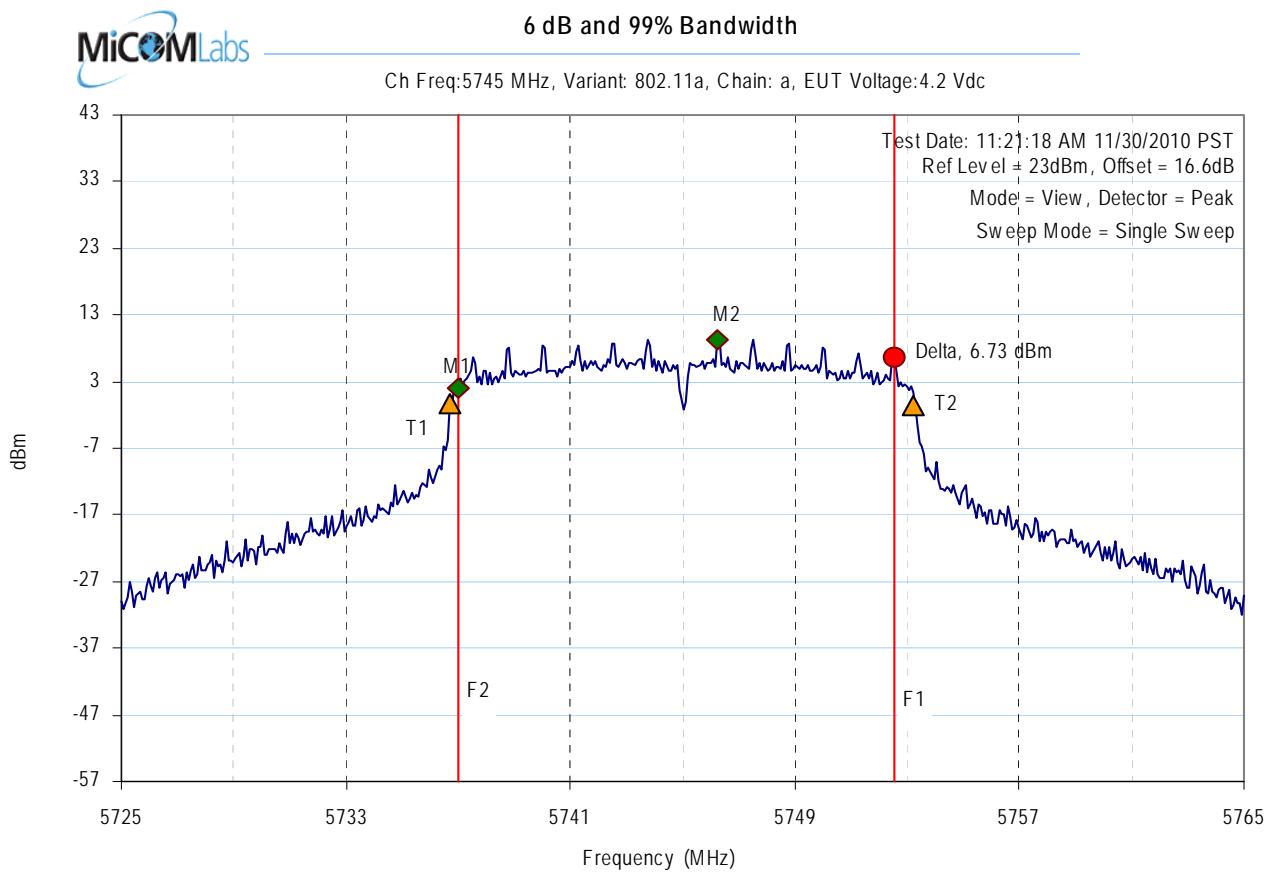
<b>Test Frequency</b>	<b>6 dB Bandwidth</b>				<b>Minimum 6dB Bandwidth Limit</b>		<b>Margin</b>
	<b>MHz</b>						
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>kHz</b>	<b>MHz</b>	<b>MHz</b>
5745.000	15.551000	--	--	--	500	0.5	-15.051000
5785.000	15.551000	--	--	--			-15.051000
5825.000	15.230000	--	--	--			-14.730000

##### 99% Bandwidth

<b>Test Frequency</b>	<b>99 % Bandwidth</b>						
	<b>MHz</b>						
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>			
5745.000	16.593000	--	--	--			
5785.000	16.593000	--	--	--			
5825.000	16.593000	--	--	--			

<b>Measurement uncertainty:</b>	±2.81 dB
---------------------------------	----------

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**Analyser Setup**

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 20  
 RF Alten (dB) = 10  
 Span = 40.00MHz

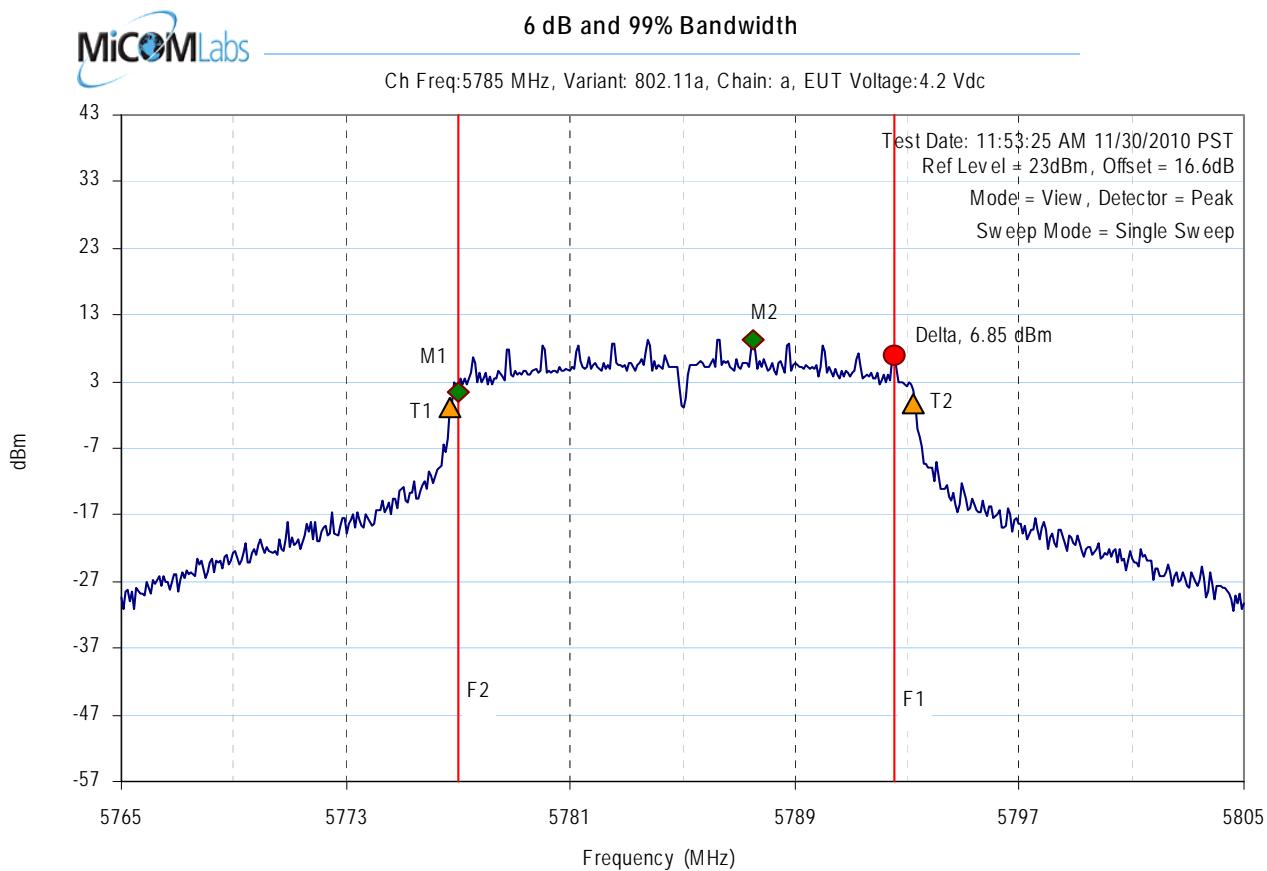
**Marker : Frequency : Amplitude**

M1 : 5737.024048MHz : 1.869dBm  
 M2 : 5746.242485MHz : 9.356dBm  
 Delta : 5752.575150MHz : 6.730dBm  
 T1 : 5736.703407MHz : -.382dBm  
 T2 : 5753.216433MHz : -.608dBm

**Test Results**

Center frequency = 5745MHz  
 6dB BW(Delta-M1) = 15.551102MHz  
 99% OBW(T2-T1) = 16.593186MHz

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**Analyser Setup**

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 20  
 RF Alten (dB) = 10  
 Span = 40.00MHz

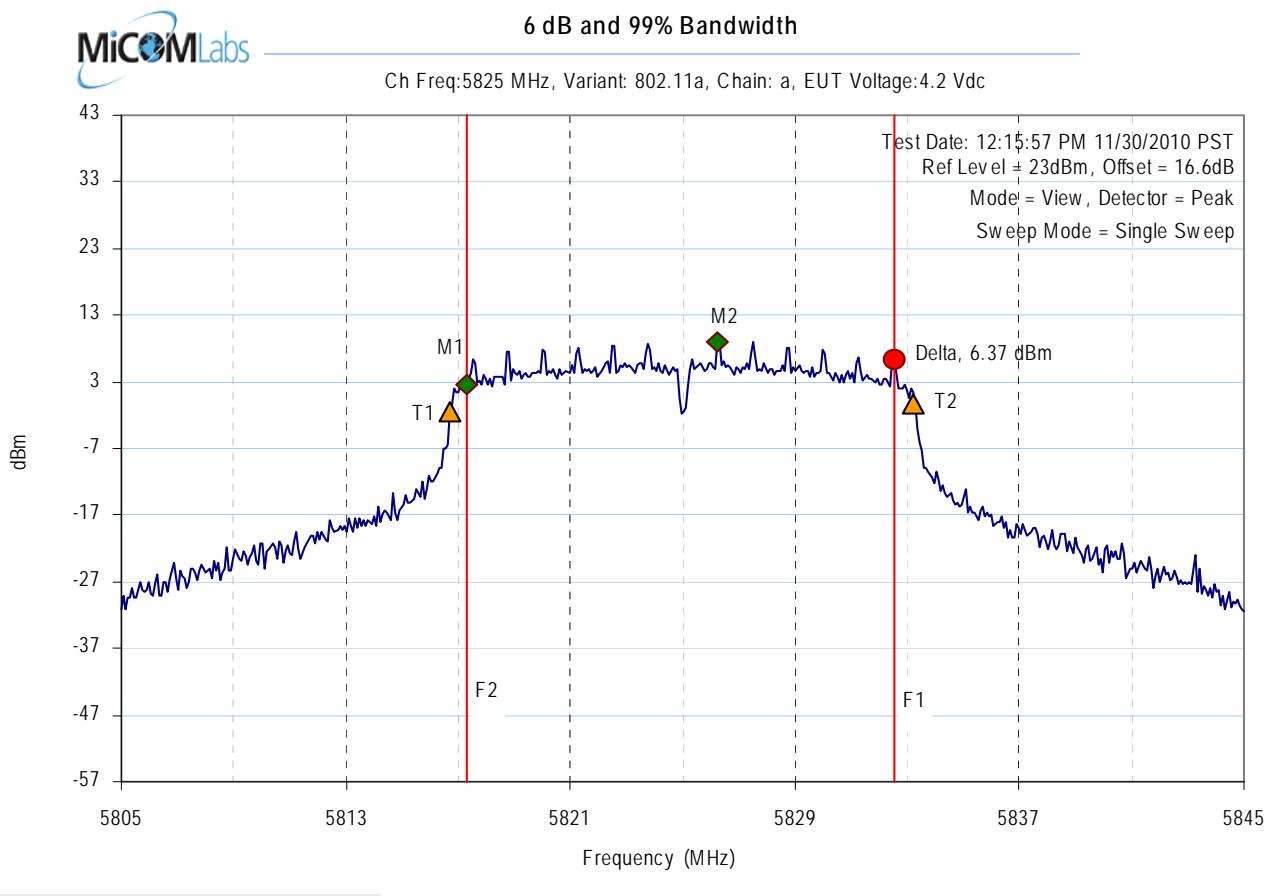
**Marker : Frequency : Amplitude**

M1 : 5777.024048MHz : 1.562dBm  
 M2 : 5787.525050MHz : 9.356dBm  
 Delta : 5792.575150MHz : 6.850dBm  
 T1 : 5776.703407MHz : -.758dBm  
 T2 : 5793.216433MHz : -.229dBm

**Test Results**

Center frequency = 5785MHz  
 6dB BW(Delta-M1) = 15.551102MHz  
 99% OBW(T2-T1) = 16.593186MHz

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Analyser Setup	Marker : Frequency : Amplitude	Test Results
RBW = 100.00KHz	M1 : 5817.344689MHz : 2.632dBm	Center frequency = 5825MHz
VBW = 300.00KHz	M2 : 5826.242485MHz : 8.977dBm	6dB BW(Delta-M1) = 15.230461MHz
Sweep time(s) = 20	Delta : 5832.575150MHz : 6.368dBm	99% OBW(T2-T1) = 16.593186MHz
RF Atten (dB) = 10	T1 : 5816.703407MHz : -1.440dBm	
Span = 40.00MHz	T2 : 5833.216433MHz : -0.39dBm	

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### 7.1.5 6 dB and 99% Bandwidth Results: 802.11n HT-20

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11n HT-20	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	10
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	2.5 dBi
<b>Applied Voltage:</b>	4.20 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

#### 6 dB Bandwidth

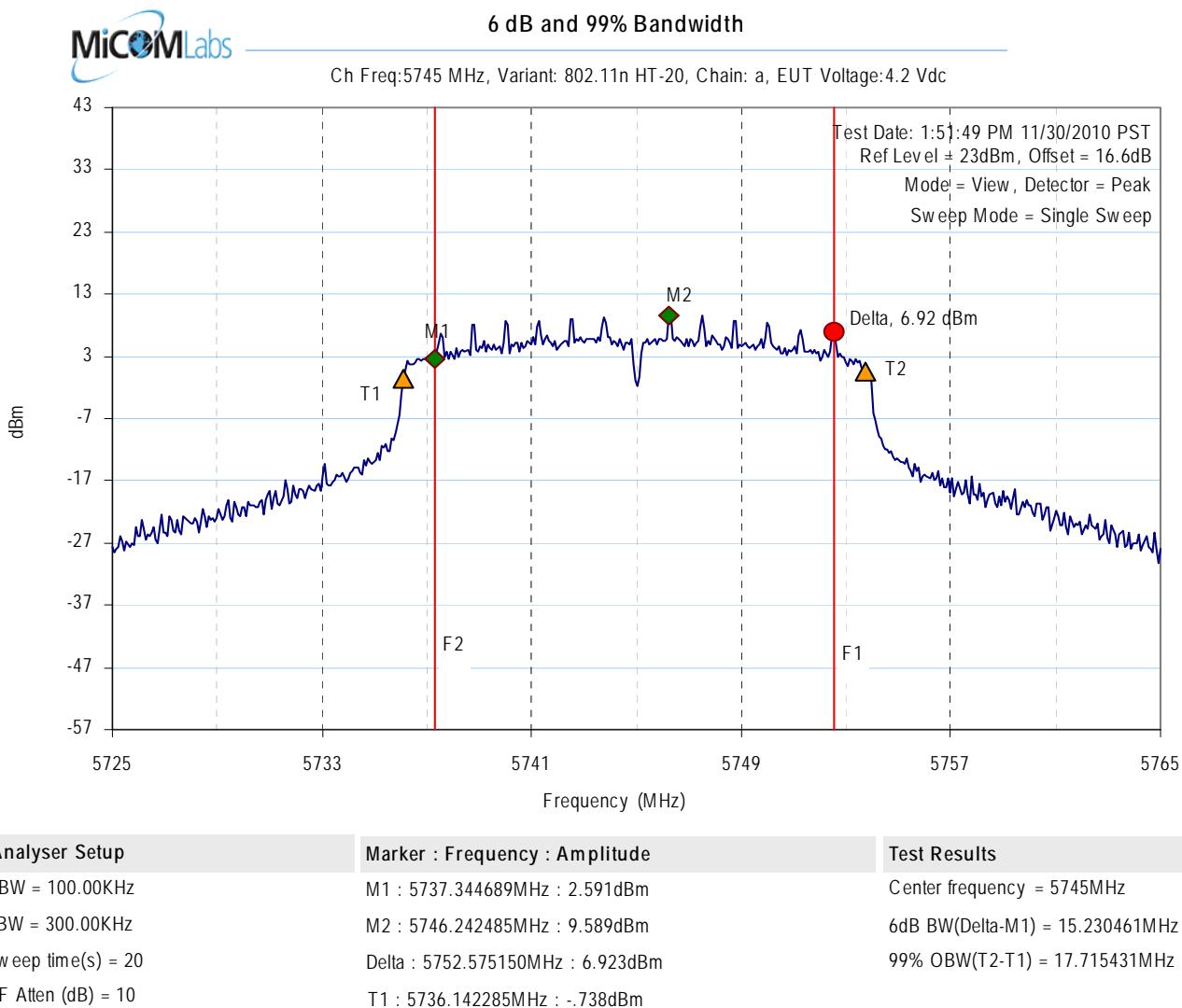
<b>Test Frequency</b>	<b>6 dB Bandwidth</b>				<b>Minimum 6dB Bandwidth Limit</b>		<b>Margin</b>
	<b>MHz</b>				<b>kHz</b>	<b>MHz</b>	
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>			
5745.000	15.230000	--	--	--	500	0.5	-14.730000
5785.000	15.230000	--	--	--			-14.730000
5825.000	16.032000	--	--	--			-15.532000

#### 99% Bandwidth

<b>Test Frequency</b>	<b>99 % Bandwidth</b>						
	<b>MHz</b>						
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>			
5745.000	17.715000	--	--	--			
5785.000	17.715000	--	--	--			
5825.000	17.715000	--	--	--			

<b>Measurement uncertainty:</b>	±2.81 dB
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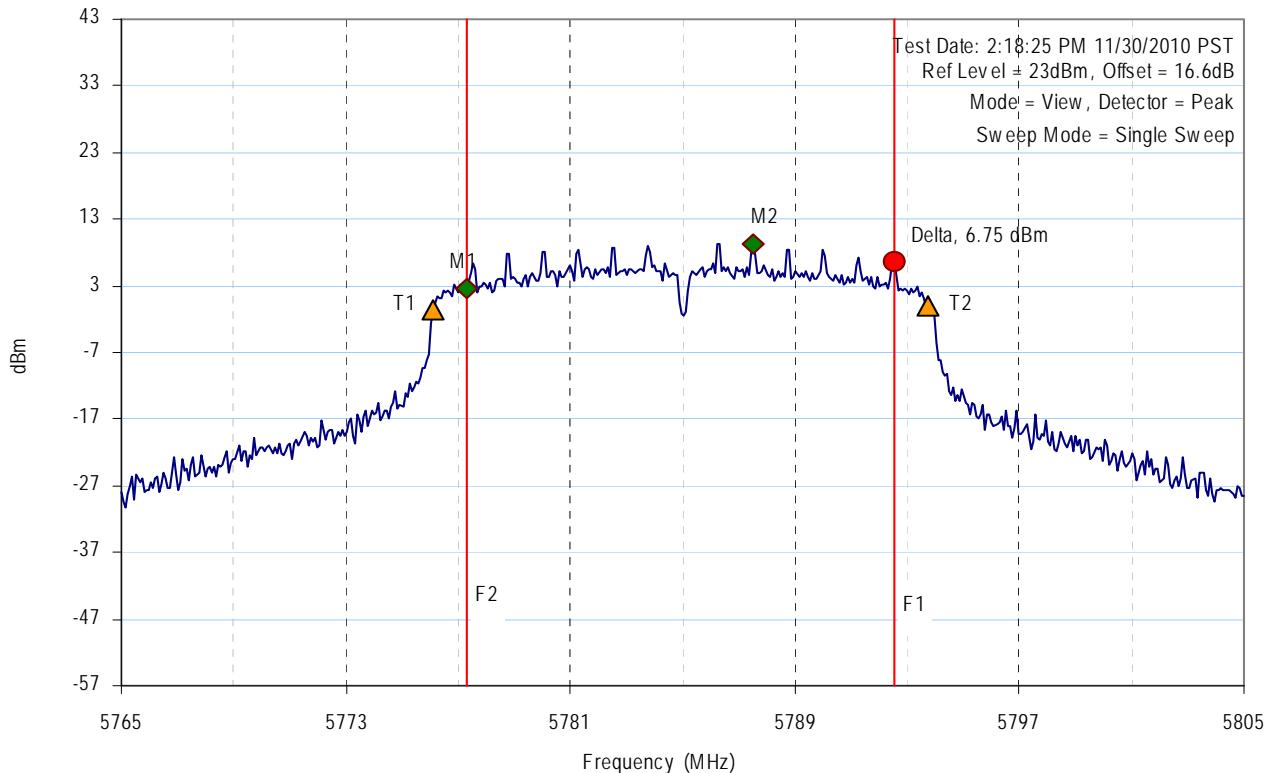
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### 6 dB and 99% Bandwidth

Ch Freq:5785 MHz, Variant: 802.11n HT-20, Chain: a, EUT Voltage:4.2 Vdc



#### Analyser Setup

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 20  
 RF Atten (dB) = 10  
 Span = 40.00MHz

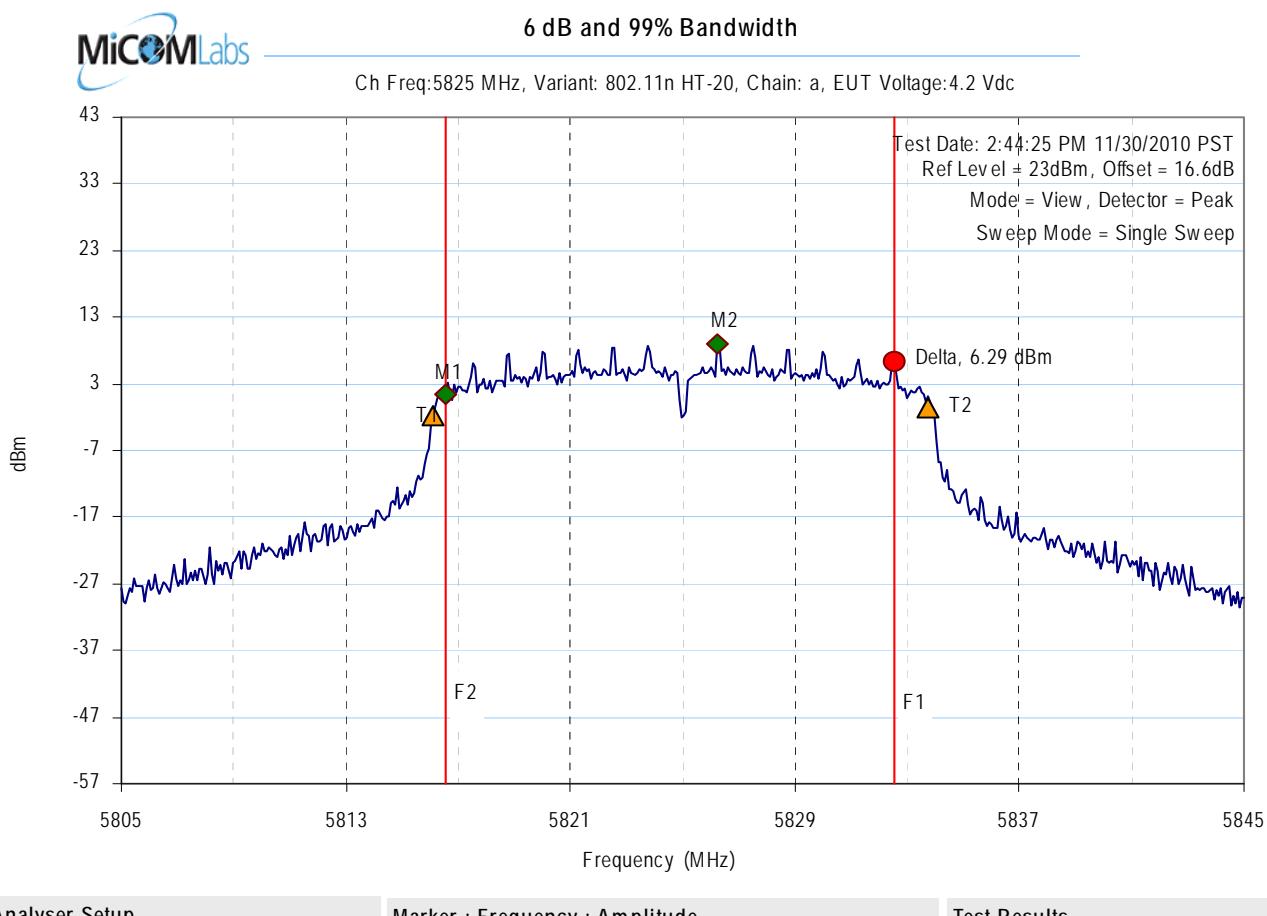
#### Marker : Frequency : Amplitude

M1 : 5777.344689MHz : 2.691dBm  
 M2 : 5787.525050MHz : 9.303dBm  
 Delta : 5792.575150MHz : 6.750dBm  
 T1 : 5776.142285MHz : -.585dBm  
 T2 : 5793.777555MHz : -0.055dBm

#### Test Results

Center frequency = 5785MHz  
 6dB BW(Delta-M1) = 15.230461MHz  
 99% OBW(T2-T1) = 17.715431MHz

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**Analyser Setup**

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 20  
 RF Atten (dB) = 10  
 Span = 40.00MHz

**Marker : Frequency : Amplitude**

M1 : 5816.543086MHz : 1.304dBm  
 M2 : 5826.242485MHz : 8.935dBm  
 Delta : 5832.575150MHz : 6.287dBm  
 T1 : 5816.142285MHz : -1.897dBm  
 T2 : 5833.777555MHz : -0.545dBm

**Test Results**

Center frequency = 5825MHz  
 6dB BW(Delta-M1) = 16.032064MHz  
 99% OBW(T2-T1) = 17.715431MHz

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## 7.2 Maximum Permissible Exposure

### Calculations for Maximum Permissible Exposure Levels

$$\text{Power Density} = P_d \text{ (mW/cm}^2\text{)} = \text{EIRP}/(4\pi d^2)$$

$$\text{EIRP} = P * G$$

P = Peak output power (mW)

G = Antenna numeric gain (numeric)

d = Separation distance (cm)

$$\text{Numeric Gain} = 10 ^ {(G \text{ (dBi)})/10}$$

The Peak Power in mW is the highest transmitter power measured and summed across all transmitters. Because the EUT belongs to the General Population/Uncontrolled Exposure the limit of power density is 1.0 mW/cm<sup>2</sup>

Freq. Band (MHz)	Antenna Gain (dBi)	Peak Output Power (dBm)	Antenna Gain (numeric)	EIRP (mW)	Distance @ 1mW/cm <sup>2</sup> Limit(cm)	Minimum Separation Distance (cm)
2.4 - 4.835	2.5	17.7	1.7782794	104.71	2.89	20
4.9 - 5.8	2.5	19.16	1.7782794	146.55	3.42	20

Note: for mobile or fixed location transmitters the minimum separation distance is 20cm, even if calculations indicate the MPE distance to be less.

### Specification

#### Maximum Permissible Exposure Limits

##### FCC §1.1310

Limit = 1mW / cm<sup>2</sup> from 1.310 Table 1

##### RSS-Gen §5.6

Exposure of Humans to RF Fields: Category I and Category II equipment shall comply with the applicable requirements of RSS-102.

#### Laboratory Measurement Uncertainty for Power Measurements

Measurement uncertainty	±1.33 dB
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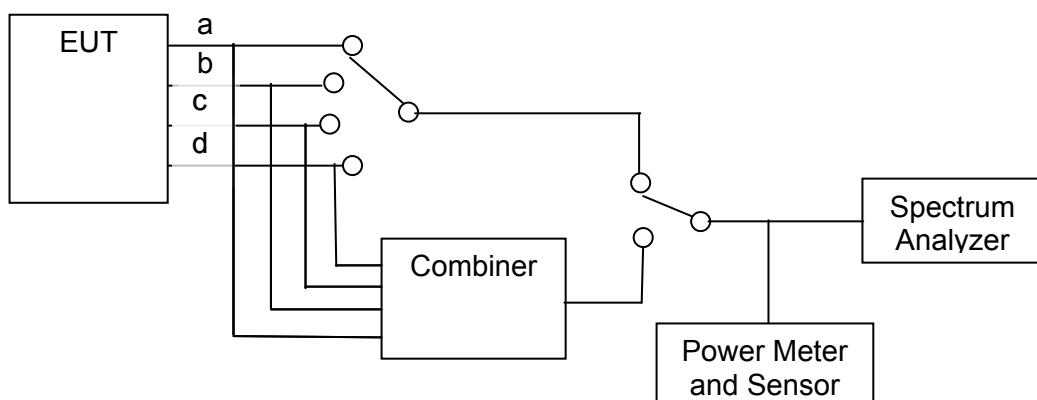
### 7.3 Peak Output Power

#### Test Procedure

The test methodology and conditions utilized for each measurement is referenced in the test results matrix. The average output power was measured per the test configuration identified below.

Per the standard measurements were taken at ambient conditions, nominal voltage.

#### Test Configuration



Measurement setup for Peak Output Power

$$\text{Total Power} = A + G + Y + 10 \log (1/x) \text{ dBm}$$

$A = \text{Total Power} [10 \log_{10} (10^{a/10} + 10^{b/10} + 10^{c/10} + 10^{d/10})]$ ,  $G = \text{Antenna Gain}$ ,  
 $Y = \text{Beam Forming Gain}$ ,  $x = \text{Duty Cycle}$



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## Specification Limits

**FCC §15.247 (b)** The maximum peak output power of the intentional radiator shall not exceed the following:

**FCC §15.247 (b) (3)** For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands: 1.0 watt.

**FCC 15.247 (b) (4)** The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

**FCC 15.247 (c)** Operation with directional antenna gains greater than 6 dBi.

(1) Fixed point-to-point operation:

(i) Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

(ii) Systems operating in the 5725–5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted output power.

**FCC §15.31 (e)** For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

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#### Industry Canada RSS-210 §A8.4 (4)

(4) For systems employing digital modulation techniques operating in the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz, the maximum peak conducted output power shall not exceed 1 W. Except as provided in Section A8.4 (5), the e.i.r.p. shall not exceed 4 W.

As an alternative to a peak power measurement, compliance can be based on a measurement of the maximum conducted output power. The maximum conducted output power is the total transmit power delivered to all antennas and antenna elements, averaged across all symbols in the signalling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or transmitting at a reduced power level. If multiple modes of operation are implemented, the maximum conducted output power is the highest total transmit power occurring in any mode.

(5) Point-to-point systems in the bands 2400-2483.5 MHz and 5725-5850 MHz are permitted to have an e.i.r.p. higher than 4 W provided that the higher e.i.r.p. is achieved by employing higher gain directional antennas and not higher transmitter output powers. Point-to-multipoint systems, omnidirectional applications and multiple co-located transmitters transmitting the same information are prohibited from exceeding 4 W e.i.r.p. However, remote stations of point-to-multipoint systems shall be allowed to operate at greater than 4 W e.i.r.p. under the same conditions as for point-to-point systems.

Note: "Fixed point-to-point operation" excludes point-to-multipoint systems, omnidirectional applications and multiple co-located transmitters transmitting the same information.

#### Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-01 'Measuring RF Output Power'	0158, 0252, 0313, 0314, 0223, 0116, 0117, 0287, 0363

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### 7.3.1 Measurement results for 802.11b

<b>Test Conditions:</b>	15.247 (b)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11 b	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	10		
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	2.5	dBi	
<b>Applied Voltage:</b>	4.20 Vdc				
<b>Notes 1:</b>					
<b>Notes 2:</b>					

<b>Test Frequency</b>	<b>Measured Peak Power</b>				<b>Total Power (dBm)</b>		<b>Limit</b>	<b>Margin</b>
	<b>RF Port (dBm)</b>							
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Combined</b>	<b>Calculated</b>	<b>dBm</b>	<b>dB</b>
2412	16.72	--	--	--	--	16.72	30.00	-13.28
2437	17.70	--	--	--	--	17.70	30.00	-12.30
2462	17.50	--	--	--	--	17.50	30.00	-12.50

<b>Measurement uncertainty:</b>	±1.33 dB
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### 7.3.2 Measurement results for 802.11g

<b>Test Conditions:</b>	15.247 (b)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11g	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	10		
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	2.5	dB	
<b>Applied Voltage:</b>	4.20 Vdc				
<b>Notes 1:</b>					
<b>Notes 2:</b>					

<b>Test Frequency</b>	<b>Measured Peak Power</b>				<b>Total Power (dBm)</b>		<b>Limit</b>	<b>Margin</b>
	<b>RF Port (dBm)</b>							
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Combined</b>	<b>Calculated</b>	<b>dBm</b>	<b>dB</b>
2412	16.22	--	--	--	--	16.22	30.00	-13.78
2437	17.34	--	--	--	--	17.34	30.00	-12.66
2462	17.20	--	--	--	--	17.20	30.00	-12.80

<b>Measurement uncertainty:</b>	±1.33 dB
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### 7.3.3 Measurement results for 802.11n HT-20

<b>Test Conditions:</b>	15.247 (b)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11n HT-20	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	10		
<b>Beam Forming Gain (Y):</b>	N/A	<b>Antenna Gain:</b>	2.5	dBi	
<b>Applied Voltage:</b>	4.20	Vdc			
<b>Notes 1:</b>					
<b>Notes 2:</b>					

<b>Test Frequency</b>	<b>Measured Peak Power</b>				<b>Total Power (dBm)</b>		<b>Limit</b>	<b>Margin</b>
	<b>RF Port (dBm)</b>				<b>Combined</b>	<b>Calculated</b>		
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>				
2412	16.21	--	--	--	--	16.21	30.00	-13.79
2437	17.16	--	--	--	--	17.16	30.00	-12.84
2462	17.00	--	--	--	--	17.00	30.00	-13.00

<b>Measurement uncertainty:</b>	±1.33 dB
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#### 7.3.4 Measurement results for 802.11a

<b>Test Conditions:</b>	15.247 (b)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11a	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	10		
<b>Beam Forming Gain (Y):</b>	N/A	<b>Antenna Gain:</b>	2.5	dB	
<b>Applied Voltage:</b>	4.20	Vdc			
<b>Notes 1:</b>					
<b>Notes 2:</b>					

<b>Test Frequency</b>	<b>Measured Peak Power</b>				<b>Total Power (dBm)</b>		<b>Limit</b>	<b>Margin</b>
	<b>RF Port (dBm)</b>							
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Combined</b>	<b>Calculated</b>	<b>dBm</b>	<b>dB</b>
5745	19.11	--	--	--	--	19.11	30.00	-10.89
5785	19.16	--	--	--	--	19.16	30.00	-10.84
5825	18.84	--	--	--	--	18.84	30.00	-11.16

<b>Measurement uncertainty:</b>	±1.33 dB
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### 7.3.5 Measurement results for 802.11n HT-20

<b>Test Conditions:</b>	15.247 (b)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11n HT-20	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	10		
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	2.5	dB	
<b>Applied Voltage:</b>	4.20 Vdc				
<b>Notes 1:</b>					
<b>Notes 2:</b>					

<b>Test Frequency</b>	<b>Measured Peak Power</b>				<b>Total Power (dBm)</b>		<b>Limit</b>	<b>Margin</b>
	<b>RF Port (dBm)</b>							
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Combined</b>	<b>Calculated</b>	<b>dBm</b>	<b>dB</b>
5745	19.11	--	--	--	--	19.11	30.00	-10.89
5785	19.00	--	--	--	--	19.00	30.00	-11.00
5825	18.68	--	--	--	--	18.68	30.00	-11.32

<b>Measurement uncertainty:</b>	±1.33 dB
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## 7.4 Peak Power Spectral Density

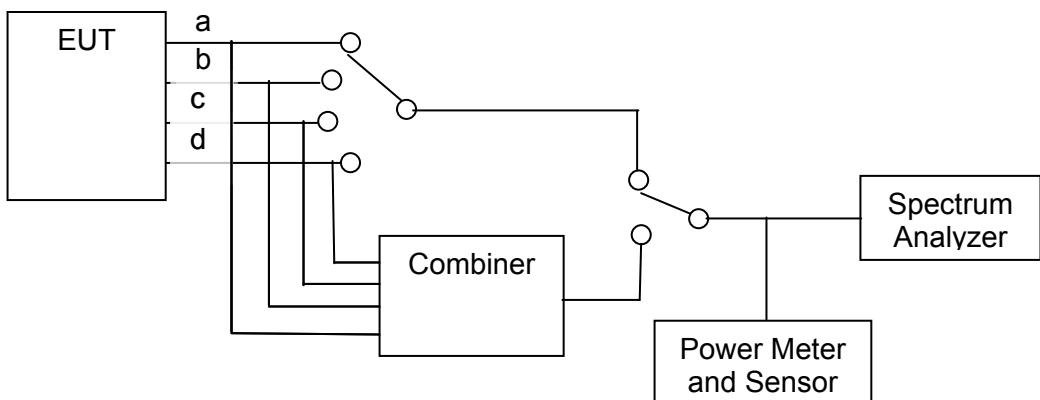
### Test Procedure

The test methodology and conditions utilized for each measurement is referenced in the following test results matrix. RF output power, transmit power control and power density were measured per the Test Configuration identified below.

Testing was performed on the highest and lowest power settings of the equipment.

Per the standard measurements were taken at ambient and extreme temperature conditions at nominal and extreme voltage levels.

### Test Configuration



Measurement setup for Peak Power Spectral Density



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## Specification for Peak Power Spectral Density Limits

### FCC §15.247 (e)

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than +8 dBm in any 3 kHz band during any time interval of continuous transmission

### Industry Canada RSS-210 §A8.2 (b)

These include systems that employ digital modulation techniques resulting in spectral characteristics similar to direct sequence systems. The following applies to all three bands:

(a) The minimum -6 dB bandwidth shall be at least 500 kHz.

(b) The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of Section A8.4 (4), (i.e. the power spectral density shall be determined using the same method as is used to determine the conducted output power).

## Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-01 'Measuring RF Output Power'	0158, 0252, 0313, 0314, 0223, 0116, 0117, 0287, 0363

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#### 7.4.1 Measurement results for 802.11b

<b>Test Conditions:</b>	15.247 (e)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11 b	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	10		
<b>Beam Forming Gain</b>	N/A dB	<b>Antenna Gain:</b>	2.5	dBi	
<b>Applied Voltage:</b>	4.20 Vdc				
<b>Notes 1:</b>					
<b>Notes 2:</b>					

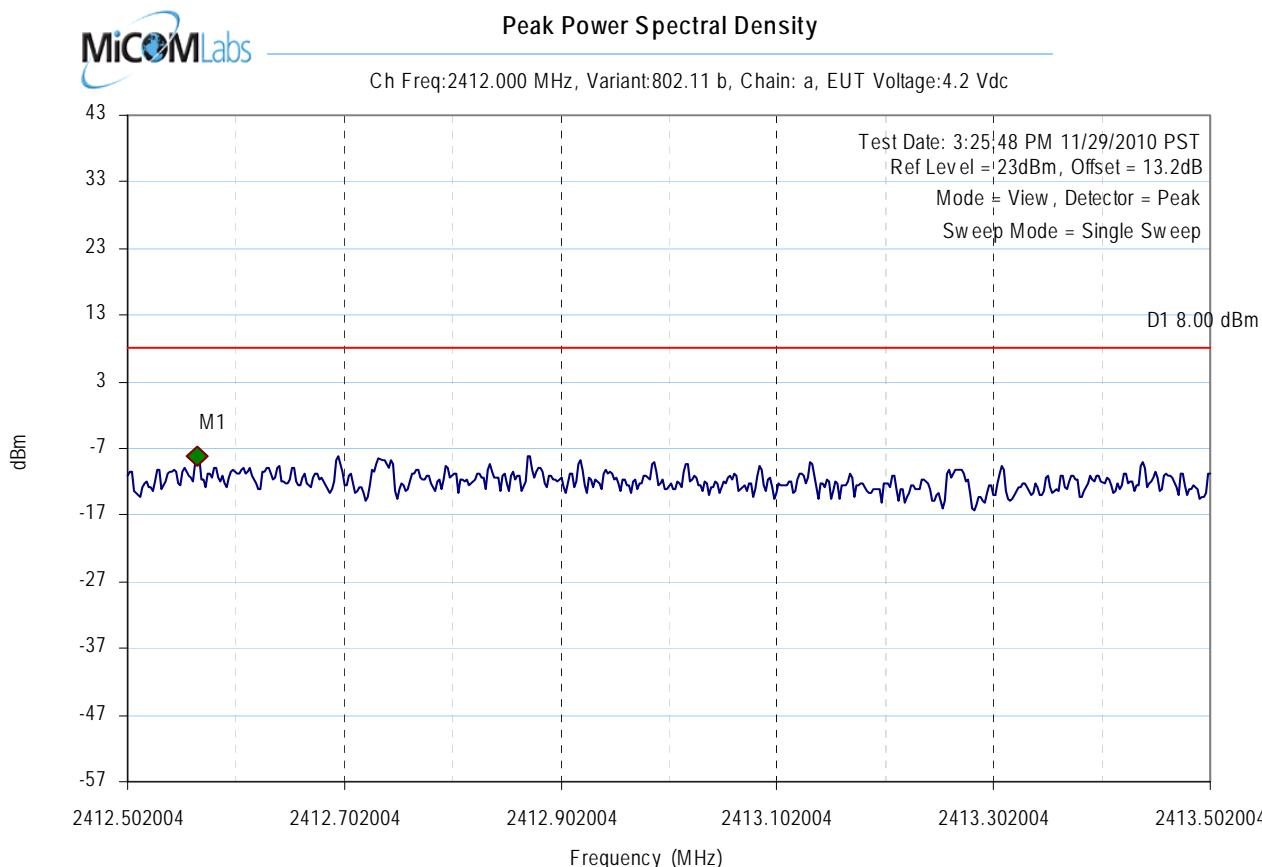
<b>Test Frequency</b>	<b>Measured Power Density</b>				<b>Total Peak Power Spectral Density (dBm)</b>		<b>Limit</b>	<b>Margin</b>
	<b>RF Port (dBm)</b>							
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Combined</b>	<b>Calculated</b>	<b>dBm</b>	<b>dB</b>
2412.000	-8.06	--	--	--	--	-8.06	8.00	-16.06
2437.000	-7.08	--	--	--	--	-7.08	8.00	-15.08
2462.000	-7.25	--	--	--	--	-7.25	8.00	-15.25

<b>Measurement uncertainty:</b>	± 1.33 dB
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**Analyser Setup**

RBW = 3.00KHz  
VBW = 10.00KHz  
Sweep time(s) = 350  
RF Atten (dB) = 20  
Span = 1.00MHz

**Marker : Frequency : Amplitude**

M1 : 2412.566132MHz : -8.061dBm

**Test Results**

Center frequency = 2412MHz

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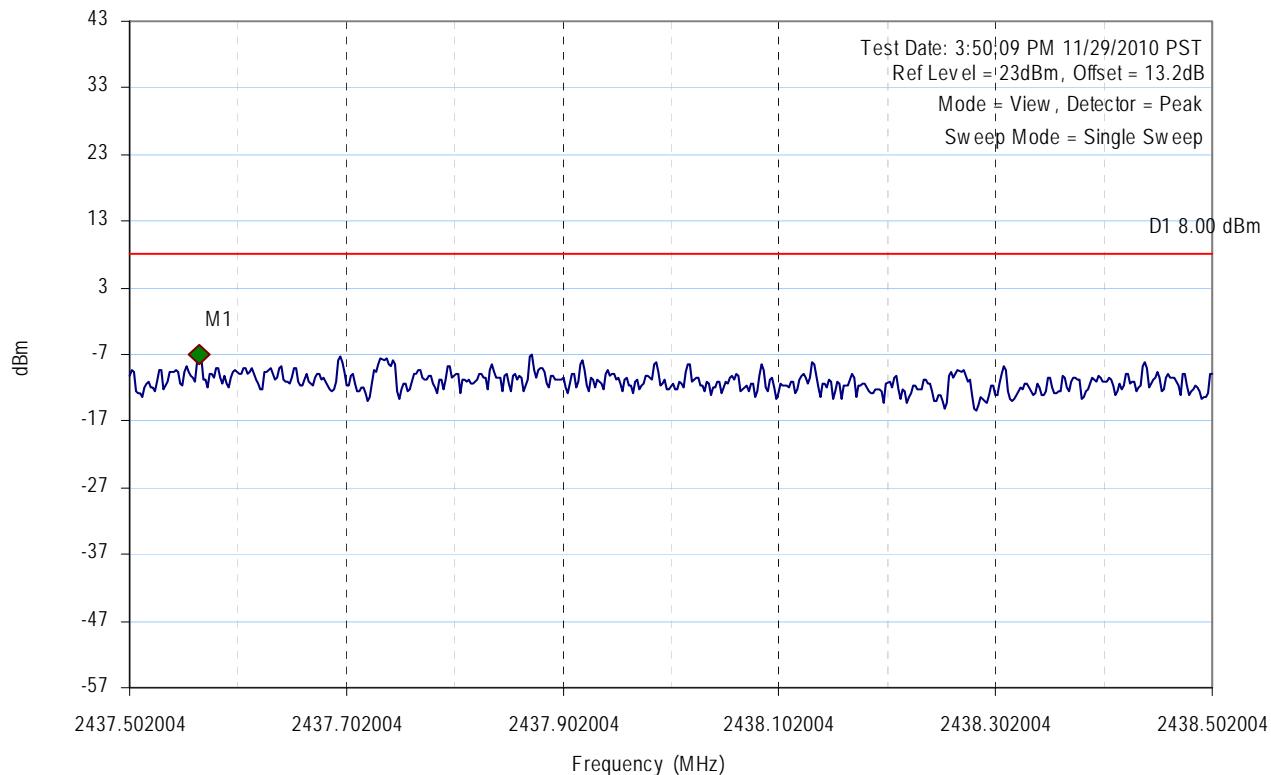


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### Peak Power Spectral Density

Ch Freq:2437.000 MHz, Variant:802.11 b, Chain: a, EUT Voltage:4.2 Vdc



#### Analyser Setup

RBW = 3.00KHz  
VBW = 10.00KHz  
Sweep time(s) = 350  
RF Atten (dB) = 20  
Span = 1.00MHz

#### Marker : Frequency : Amplitude

M1 : 2437.566132MHz : -7.079dBm

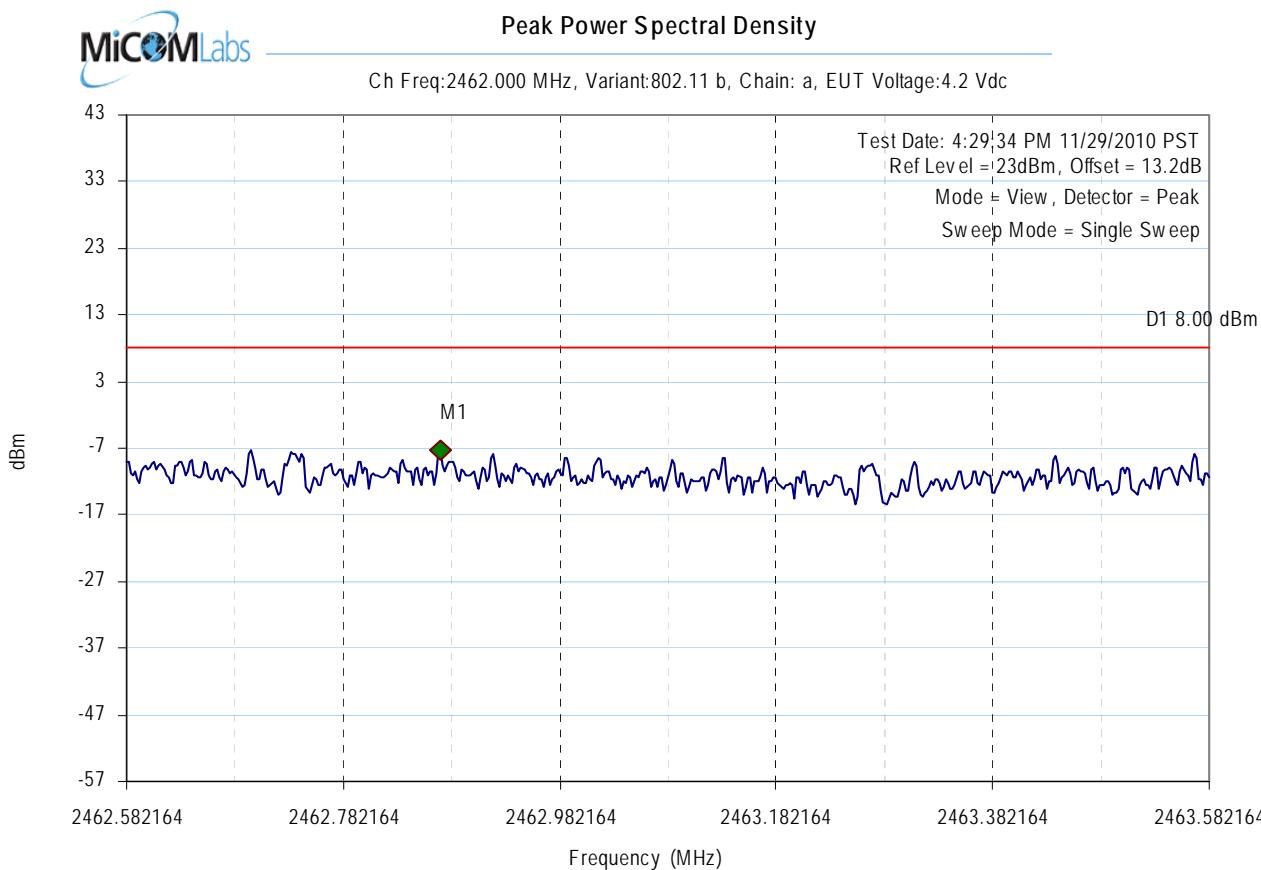
#### Test Results

Center frequency = 2437MHz

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**Analyser Setup**

RBW = 3.00KHz  
VBW = 10.00KHz  
Sweep time(s) = 350  
RF Atten (dB) = 20  
Span = 1.00MHz

**Marker : Frequency : Amplitude**

M1 : 2462.872745MHz : -7.250dBm

**Test Results**

Center frequency = 2462MHz

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#### 7.4.2 Measurement results for 802.11g

<b>Test Conditions:</b>	15.247 (e)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11g	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	10		
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	2.5	dB	
<b>Applied Voltage:</b>	4.20 Vdc				
<b>Notes 1:</b>					
<b>Notes 2:</b>					

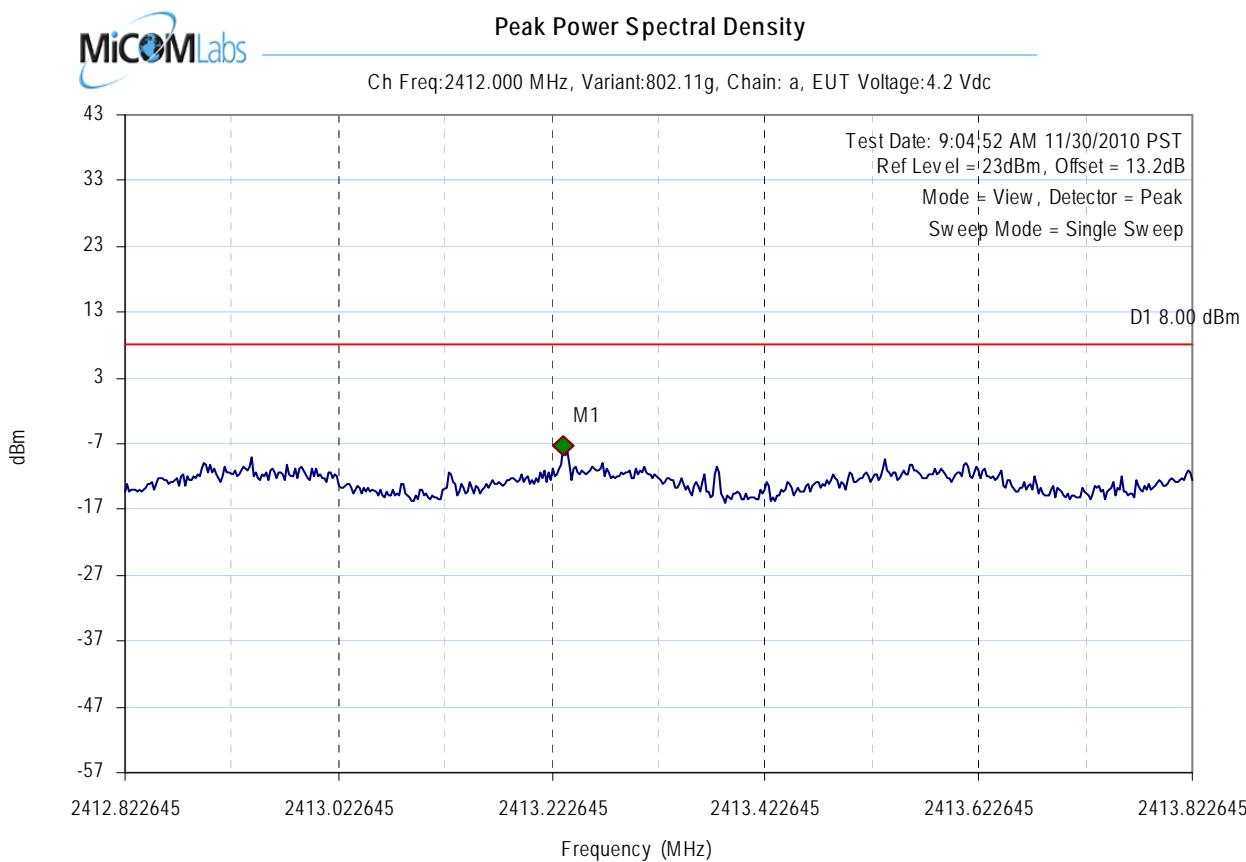
<b>Test Frequency</b>	<b>Measured Power Density</b>				<b>Total Peak Power Spectral Density (dBm)</b>		<b>Limit</b>	<b>Margin</b>
	<b>RF Port (dBm)</b>				<b>Combined</b>	<b>Calculated</b>		
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>			<b>dBm</b>	<b>dB</b>
2412.000	-7.30	--	--	--	--	-7.30	8.00	-15.30
2437.000	-6.41	--	--	--	--	-6.41	8.00	-14.41
2462.000	-8.33	--	--	--	--	-8.33	8.00	-16.33

<b>Measurement uncertainty:</b>	± 1.33 dB
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**Analyser Setup**

RBW = 3.00KHz

VBW = 10.00KHz

Sweep time(s) = 350

RF Atten (dB) = 20

Span = 1.00MHz

**Marker : Frequency : Amplitude**

M1 : 2413.233467MHz : -7.303dBm

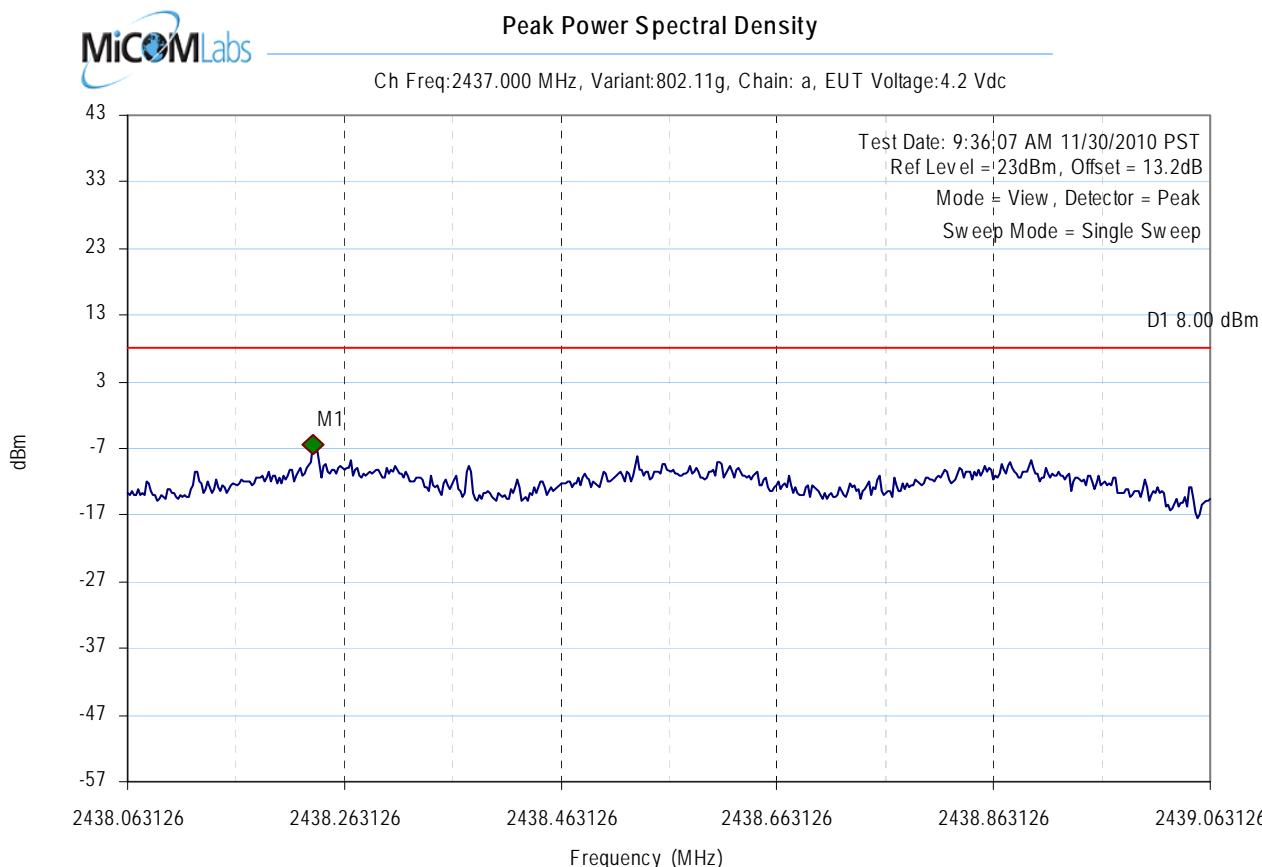
**Test Results**

Center frequency = 2412MHz

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**Analyser Setup**

RBW = 3.00KHz

VBW = 10.00KHz

Sweep time(s) = 350

RF Atten (dB) = 20

Span = 1.00MHz

**Marker : Frequency : Amplitude**

M1 : 2438.233467MHz : -6.412dBm

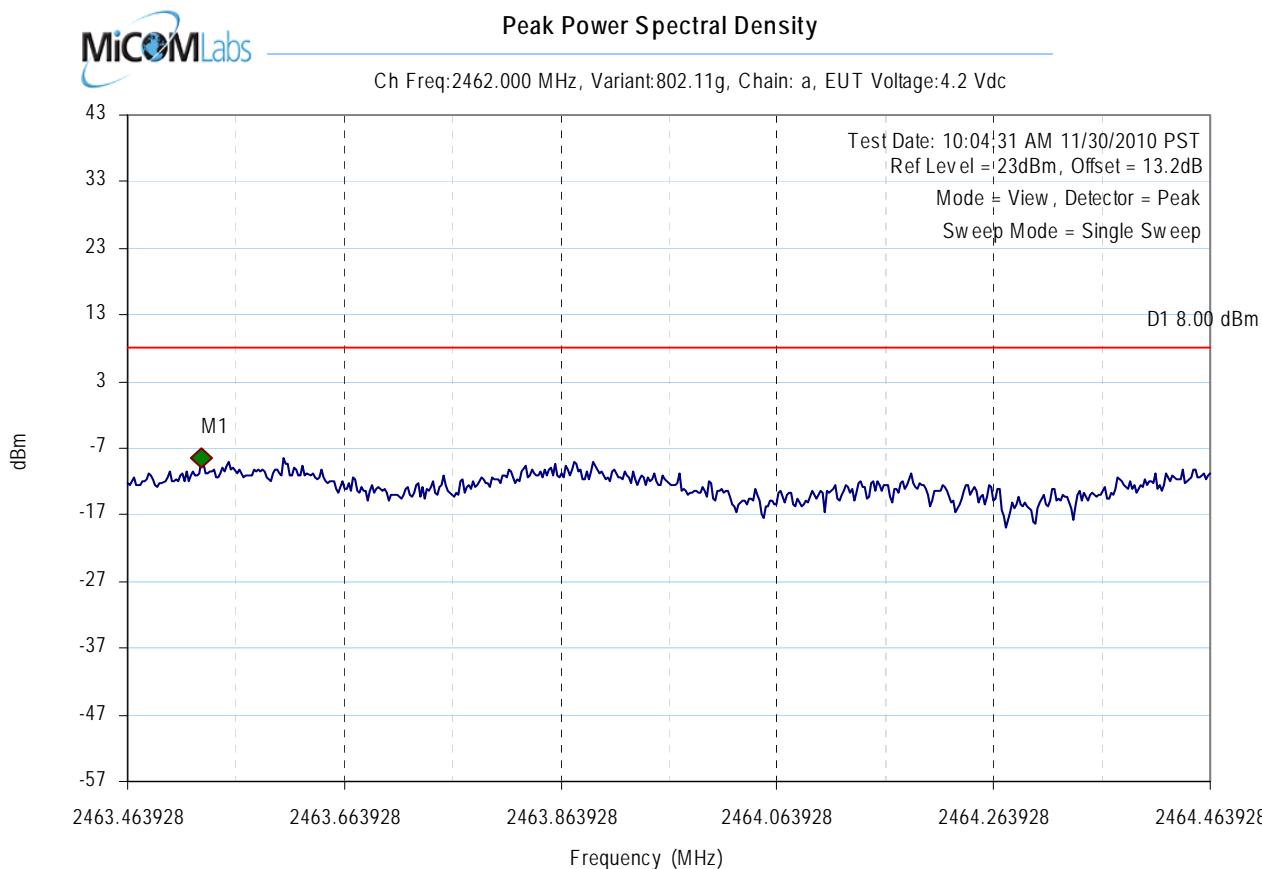
**Test Results**

Center frequency = 2437MHz

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**Analyser Setup**

RBW = 3.00KHz  
VBW = 10.00KHz  
Sweep time(s) = 350  
RF Atten (dB) = 20  
Span = 1.00MHz

**Marker : Frequency : Amplitude**

M1 : 2463.532064MHz : -8.328dBm

**Test Results**

Center frequency = 2462MHz

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#### 7.4.3 Measurement results for 802.11n HT-20

<b>Test Conditions:</b>	15.247 (e)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11n HT-20	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	10		
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	2.5	dBi	
<b>Applied Voltage:</b>	4.20 Vdc				
<b>Notes 1:</b>					
<b>Notes 2:</b>					

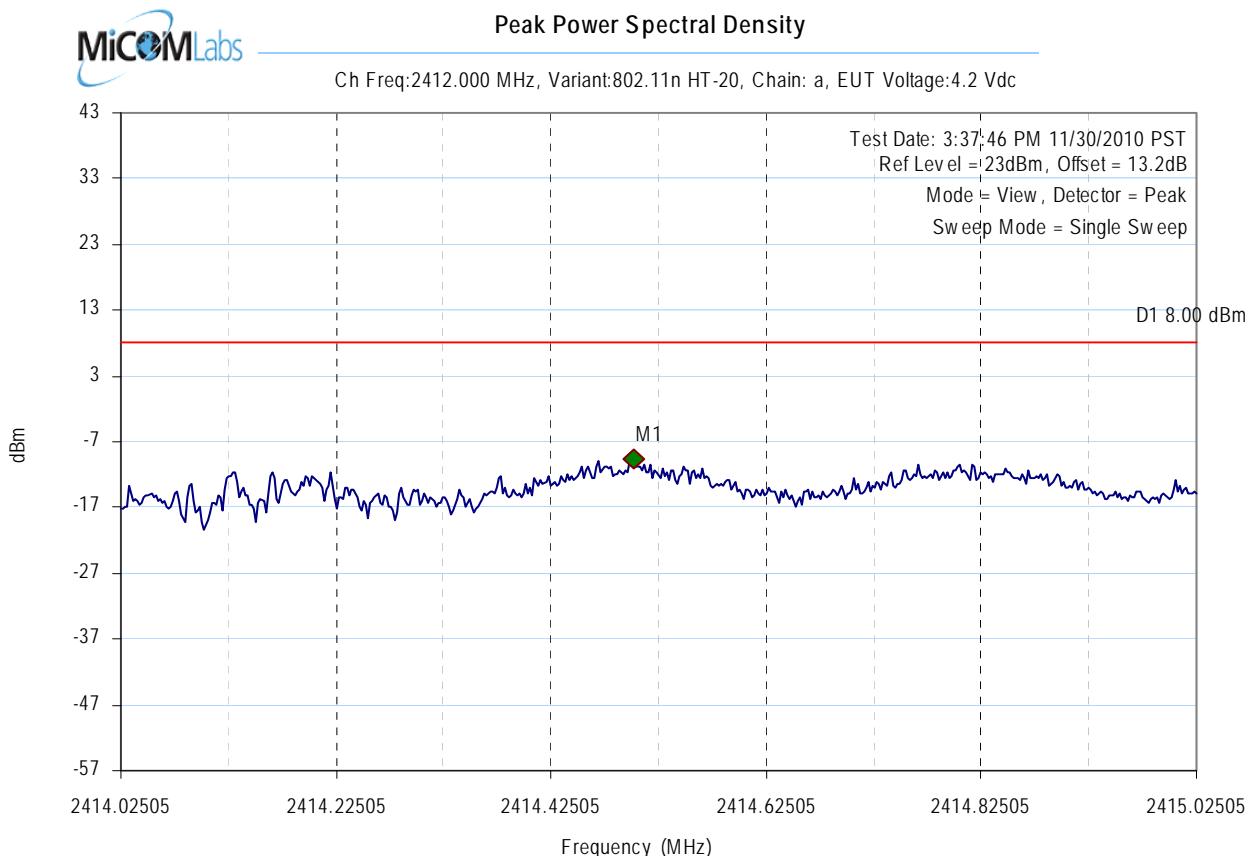
<b>Test Frequency</b>	<b>Measured Power Density</b>				<b>Total Peak Power Spectral Density (dBm)</b>		<b>Limit</b>	<b>Margin</b>
	<b>RF Port (dBm)</b>				<b>Combined</b>	<b>Calculated</b>		
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>			<b>dBm</b>	<b>dB</b>
2412.000	-9.51	--	--	--	--	-9.51	8.00	-17.51
2437.000	-8.26	--	--	--	--	-8.26	8.00	-16.26
2462.000	-8.23	--	--	--	--	-8.23	8.00	-16.23

<b>Measurement uncertainty:</b>	± 1.33 dB
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**Analyser Setup**

RBW = 3.00KHz

VBW = 10.00KHz

Sweep time(s) = 350

RF Atten (dB) = 20

Span = 1.00MHz

**Marker : Frequency : Amplitude**

M1 : 2414.502004MHz : -9.505dBm

**Test Results**

Center frequency = 2412MHz

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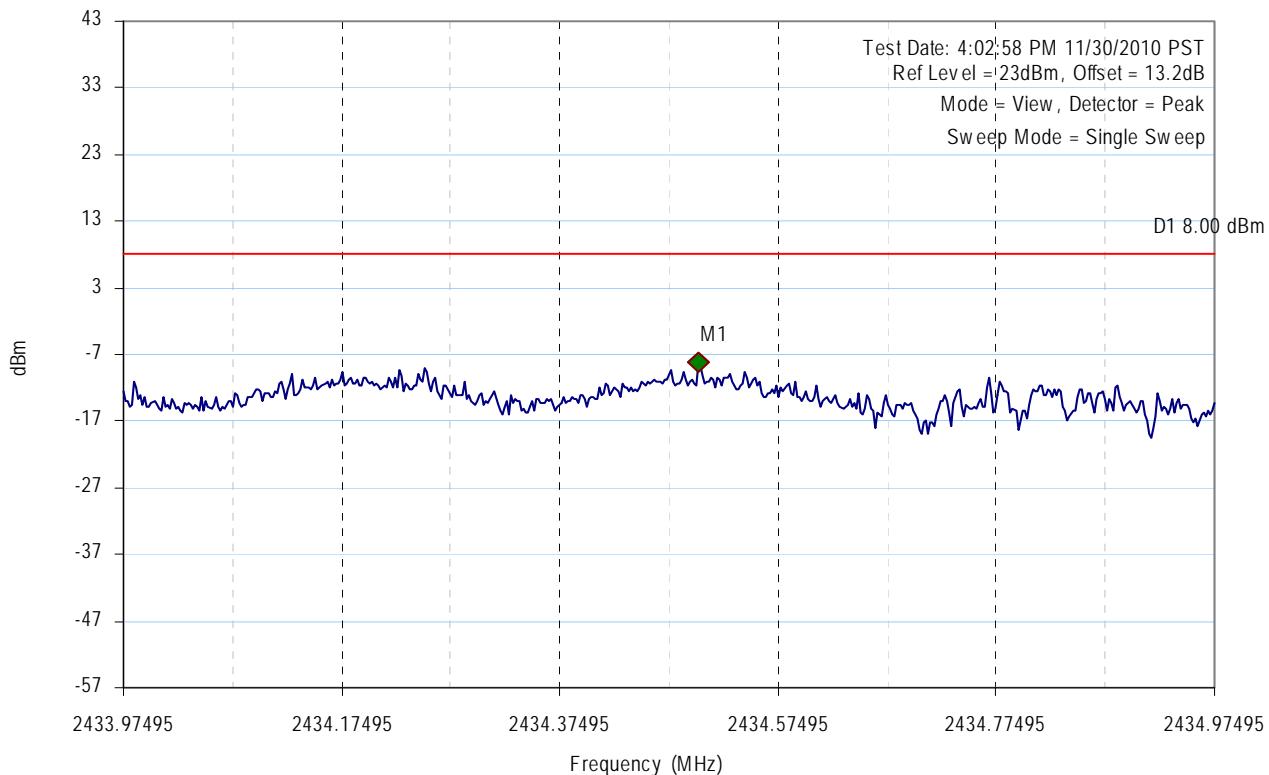


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### Peak Power Spectral Density

Ch Freq:2437.000 MHz, Variant:802.11n HT-20, Chain: a, EUT Voltage:4.2 Vdc



#### Analyser Setup

RBW = 3.00KHz  
VBW = 10.00KHz  
Sweep time(s) = 350  
RF Atten (dB) = 20  
Span = 1.00MHz

#### Marker : Frequency : Amplitude

M1 : 2434.502004MHz : -8.257dBm

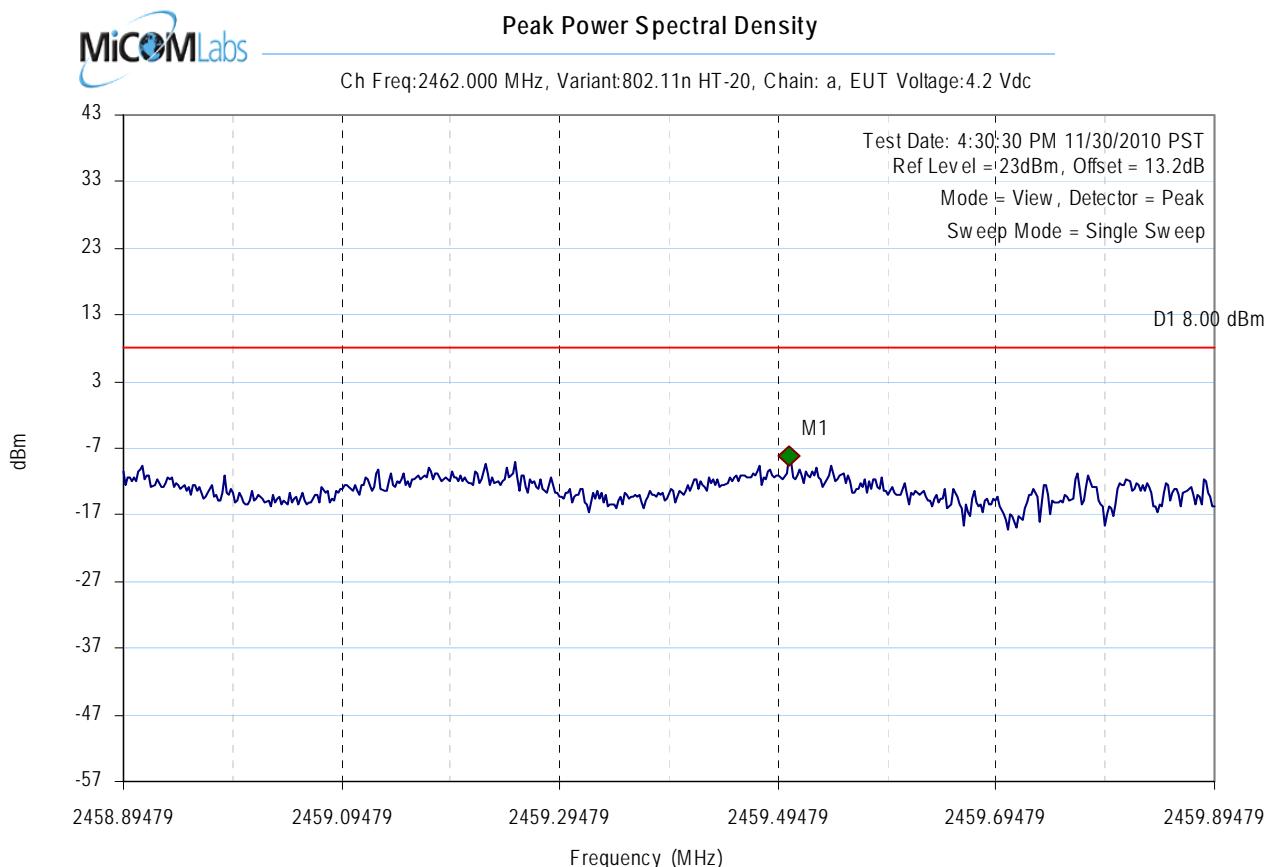
#### Test Results

Center frequency = 2437MHz

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#### 7.4.4 Measurement results for 802.11a

<b>Test Conditions:</b>	15.247 (e)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11a	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	10		
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	2.5	dB	
<b>Applied Voltage:</b>	4.20 Vdc				
<b>Notes 1:</b>					
<b>Notes 2:</b>					

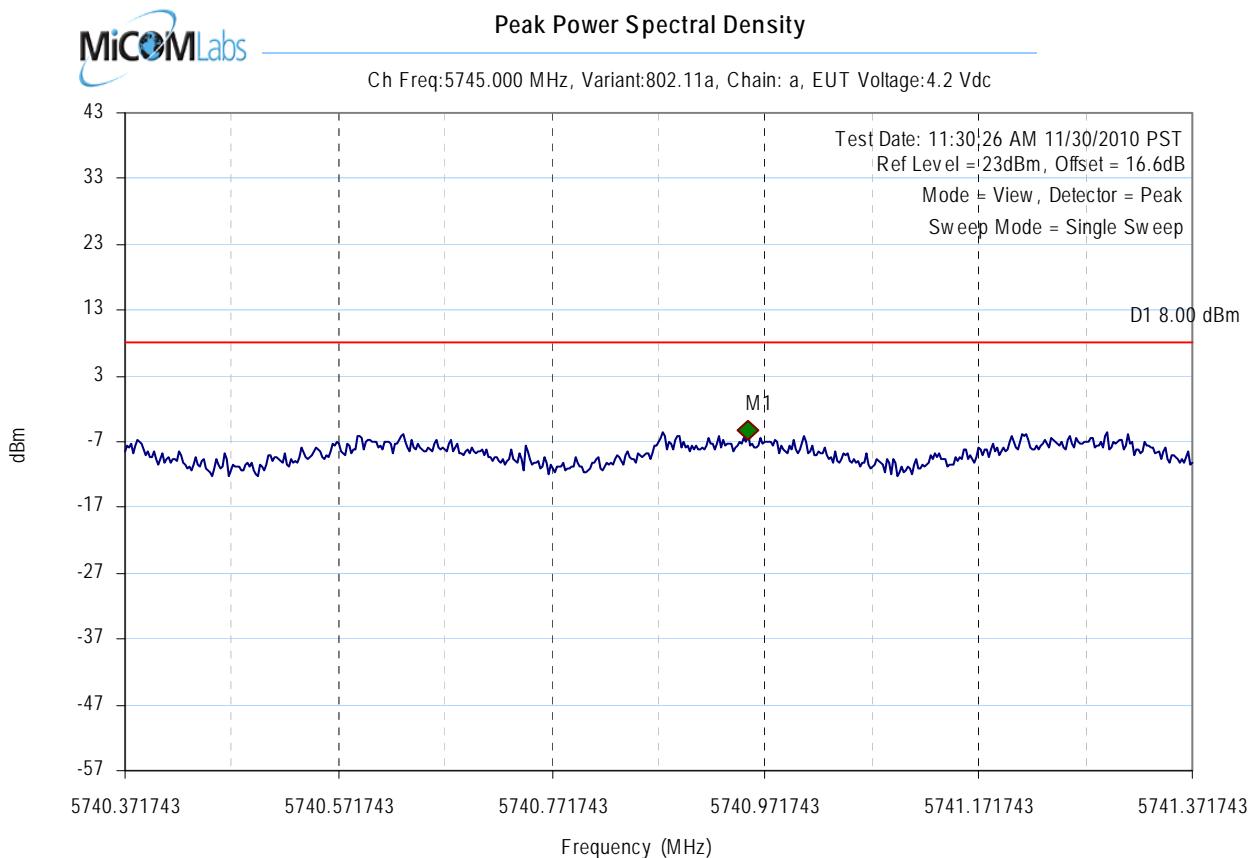
<b>Test Frequency</b>	<b>Measured Power Density</b>				<b>Total Peak Power Spectral Density (dBm)</b>		<b>Limit</b>	<b>Margin</b>
	<b>RF Port (dBm)</b>				<b>Combined</b>	<b>Calculated</b>		
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>			<b>dBm</b>	<b>dB</b>
5745.000	-5.35	--	--	--	--	-5.35	8.00	-13.35
5785.000	-4.25	--	--	--	--	-4.25	8.00	-12.25
5825.000	-3.14	--	--	--	--	-3.14	8.00	-11.14

<b>Measurement uncertainty:</b>	± 1.33 dB
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**Analyser Setup**

RBW = 3.00KHz

VBW = 10.00KHz

Sweep time(s) = 350

RF Atten (dB) = 20

Span = 1.00MHz

**Marker : Frequency : Amplitude**

M1 : 5740.954910MHz : -5.352dBm

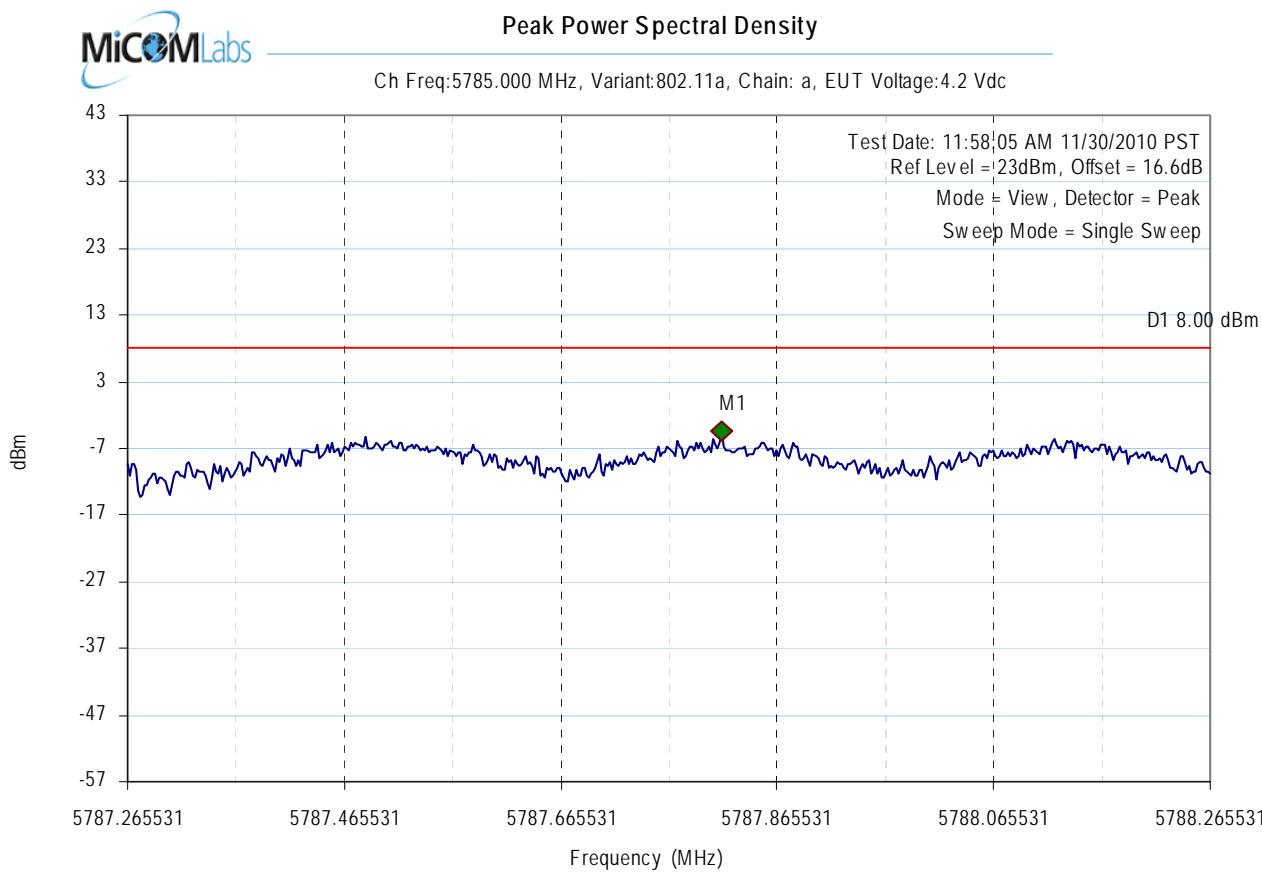
**Test Results**

Center frequency = 5745MHz

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**Analyser Setup**

RBW = 3.00KHz  
VBW = 10.00KHz  
Sweep time(s) = 350  
RF Atten (dB) = 20  
Span = 1.00MHz

**Marker : Frequency : Amplitude**

M1 : 5787.814629MHz : -4.248dBm

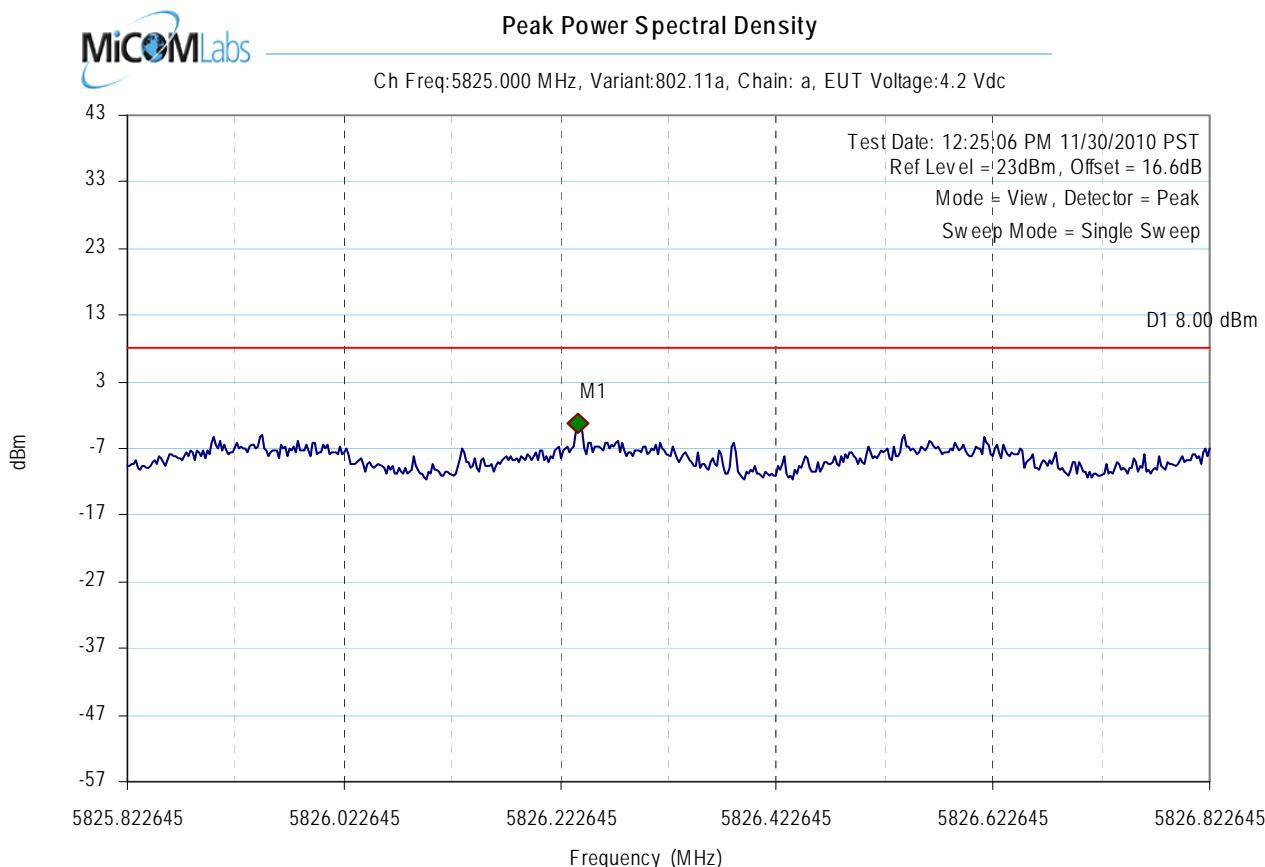
**Test Results**

Center frequency = 5785MHz

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**Analyser Setup**

RBW = 3.00KHz

VBW = 10.00KHz

Sweep time(s) = 350

RF Atten (dB) = 20

Span = 1.00MHz

**Marker : Frequency : Amplitude**

M1 : 5826.239479MHz : -3.136dBm

**Test Results**

Center frequency = 5825MHz

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#### **7.4.5 Measurement results for 802.11n HT-20**

<b>Test Conditions:</b>	15.247 (e)	<b>Rel. Humidity (%):</b>	35	to	42	
<b>Variant:</b>	802.11n HT-20		<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH		<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON		<b>Duty Cycle (%):</b>	10		
<b>Beam Forming Gain (Y):</b>	N/A dB		<b>Antenna Gain:</b>	2.5	dB	
<b>Applied Voltage:</b>	4.20 Vdc					
<b>Notes 1:</b>						
<b>Notes 2:</b>						

<b>Test Frequency</b>	<b>Measured Power Density</b>				<b>Total Peak Power Spectral Density (dBm)</b>		<b>Limit</b>	<b>Margin</b>
	<b>RF Port (dBm)</b>							
<b>MHz</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>Combined</b>	<b>Calculated</b>	<b>dBm</b>	<b>dB</b>
5745.000	-3.94	--	--	--	--	-3.94	8.00	-11.94
5785.000	-4.07	--	--	--	--	-4.07	8.00	-12.07
5825.000	-4.02	--	--	--	--	-4.02	8.00	-12.02

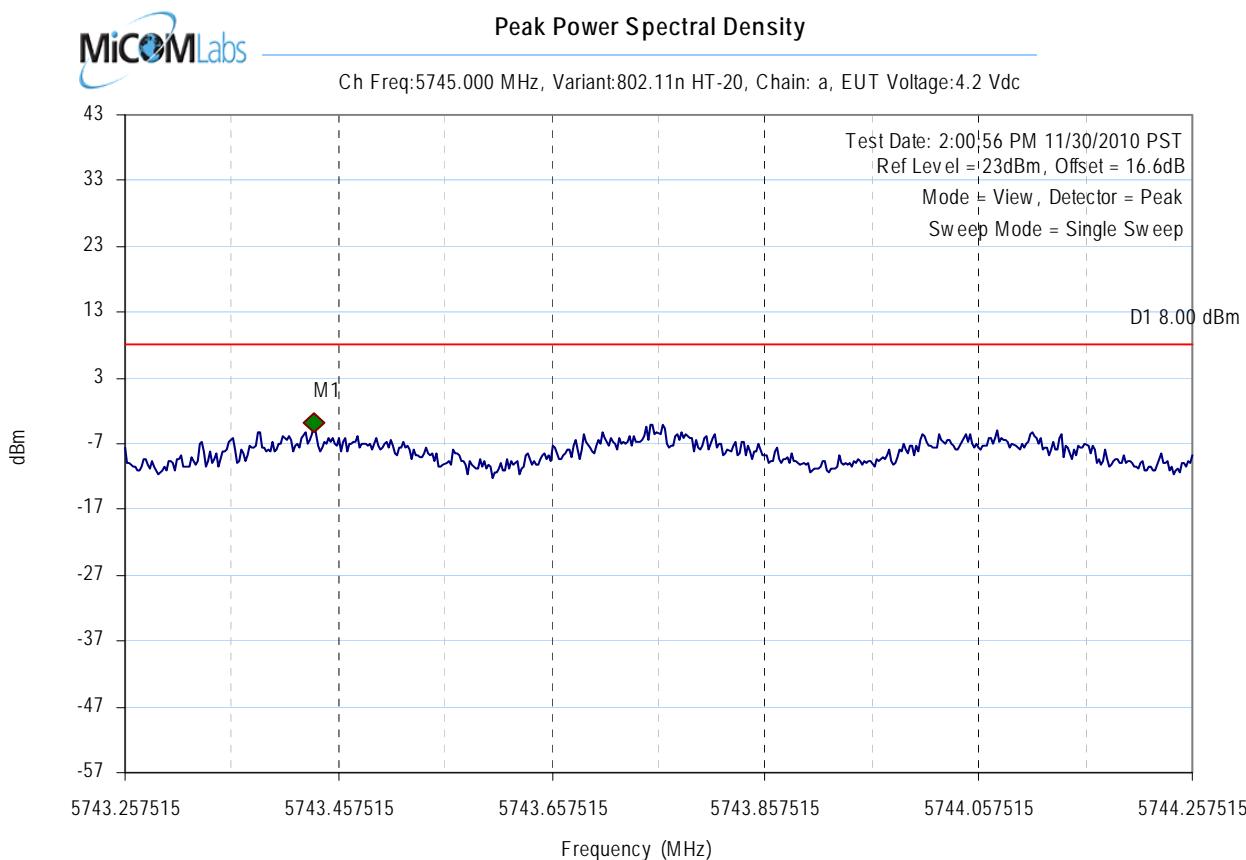
  

<b>Measurement uncertainty:</b>	± 1.33 dB
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**Analyser Setup**

RBW = 3.00KHz

VBW = 10.00KHz

Sweep time(s) = 350

RF Atten (dB) = 20

Span = 1.00MHz

**Marker : Frequency : Amplitude**

M1 : 5743.433868MHz : -3.937dBm

**Test Results**

Center frequency = 5745MHz

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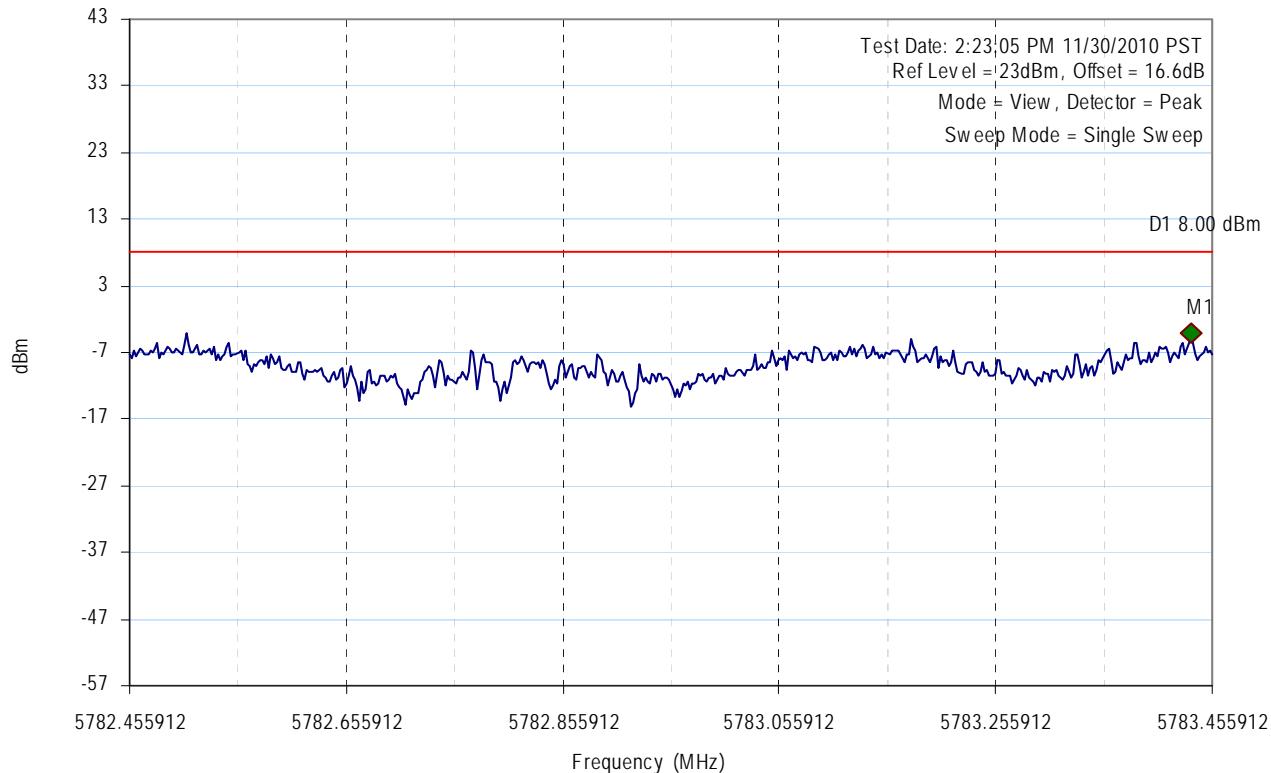


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### Peak Power Spectral Density

Ch Freq:5785.000 MHz, Variant:802.11n HT-20, Chain: a, EUT Voltage:4.2 Vdc



#### Analyser Setup

RBW = 3.00KHz  
VBW = 10.00KHz  
Sweep time(s) = 350  
RF Atten (dB) = 20  
Span = 1.00MHz

#### Marker : Frequency : Amplitude

M1 : 5783.435872MHz : -4.065dBm

#### Test Results

Center frequency = 5785MHz

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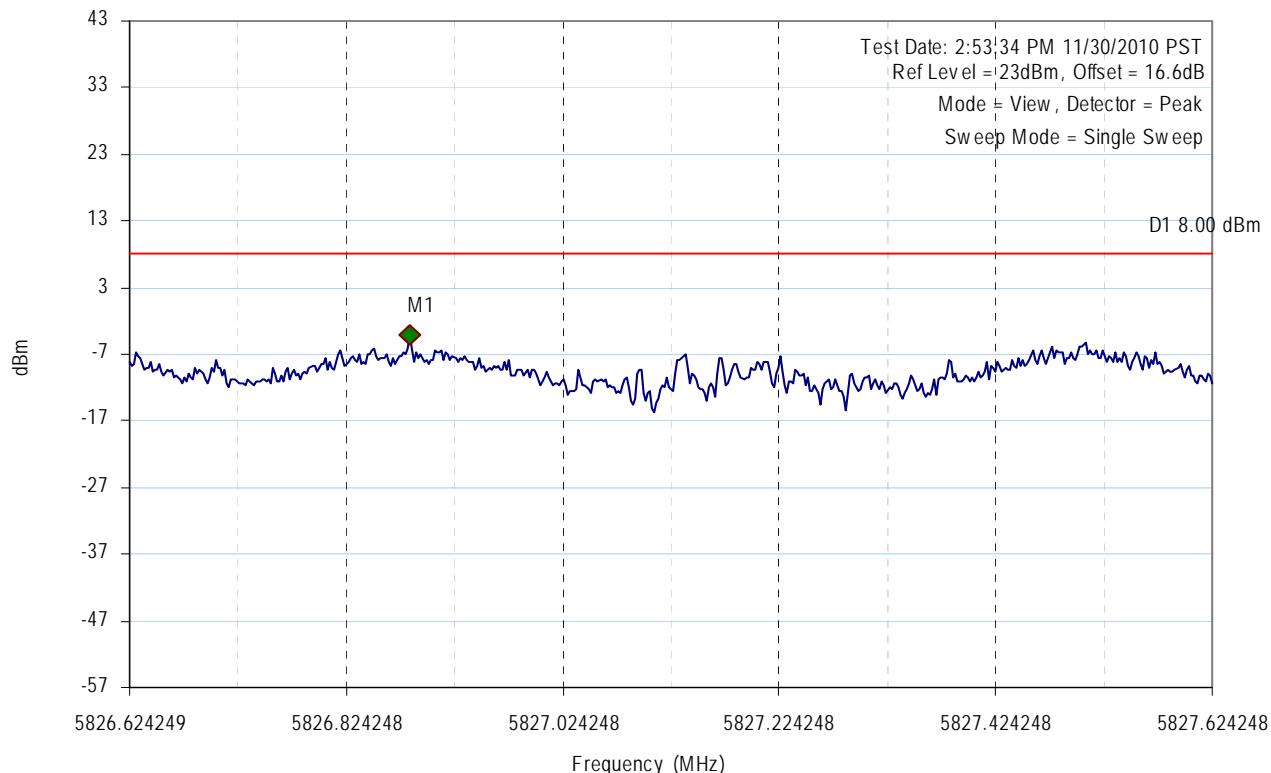


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### Peak Power Spectral Density

Ch Freq:5825.000 MHz, Variant:802.11n HT-20, Chain: a, EUT Voltage:4.2 Vdc



#### Analyser Setup

RBW = 3.00KHz  
VBW = 10.00KHz  
Sweep time(s) = 350  
RF Atten (dB) = 20  
Span = 1.00MHz

#### Marker : Frequency : Amplitude

M1 : 5826.882766MHz : -4.016dBm

#### Test Results

Center frequency = 5825MHz

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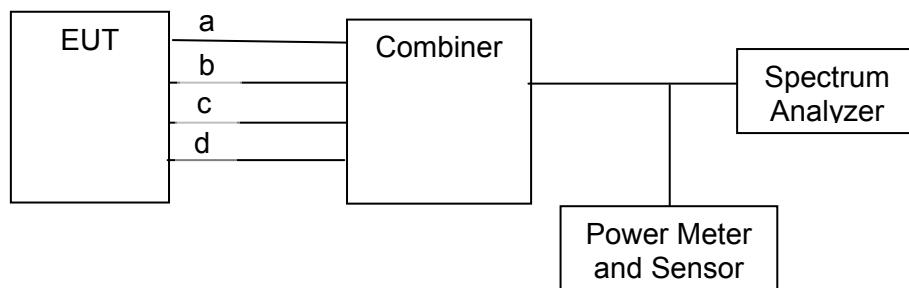
## 7.5 Conducted Spurious Emissions

### Test Procedure

Conducted emissions were measured at a limit of 20 dB below the highest in-band spectral density measured with a spectrum analyzer connected to the antenna terminal. Emissions at the band edge were measured and recorded. Measurements were made while EUT was operating in transmit mode of operation at the appropriate center frequency.

Measurements were made using a combiner with the transmitter tuned to the channel closest to the band-edge being measured. All emissions were maximized during measurement. Limits which were derived from the peak emission.

### Test Configuration



Measurement setup for Conducted Spurious Emission



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## Specification for Band Edge Limits

### 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.

### FCC §15.247(d)

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)).

### Limits Band-Edge

Lower Limit Band-edge	Upper Limit Band-edge	Limit below highest level of desired power
2,400 MHz	2,483.5 MHz	≥ 20 dB
5725 MHz	5850 MHz	

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### Industry Canada RSS-210 §A8.5

**Out-of-band Emissions:** In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section A8.4 (4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

### RSS-GEN 6.2

If the receiver has a detachable antenna of known impedance, antenna conducted spurious emissions measurement is permitted as an alternative to radiated measurement. However, the radiated method of Section 6.1 is recommended:

The antenna conducted test shall be performed with the antenna disconnected and the receiver antenna terminals connected to a measuring instrument having equal impedance to that specified for the antenna

The receiver spurious emissions measured at the antenna terminals by the antenna conducted method shall then comply with the following limits:

Receiver spurious emissions at any discrete frequency shall not exceed 2 nanowatts in the band 30-1000 MHz, and 5 nanowatts above 1000 MHz.

### Traceability

Method	Test Equipment Used
WI-05	0158, 0252, 0313, 0314, 0223, 0116, 0117, 0287, 0363.

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### 7.5.1 Measurement Results for 802.11b

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35	to	42
<b>Variant:</b>	802.11 b	<b>Ambient Temp. (°C):</b>	19	to	22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998	to	1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	10		
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	N/A	dBi	
<b>Applied Voltage:</b>	4.20 Vdc				
<b>Notes 1:</b>					
<b>Notes 2:</b>					

#### Conducted Spurious Measurement

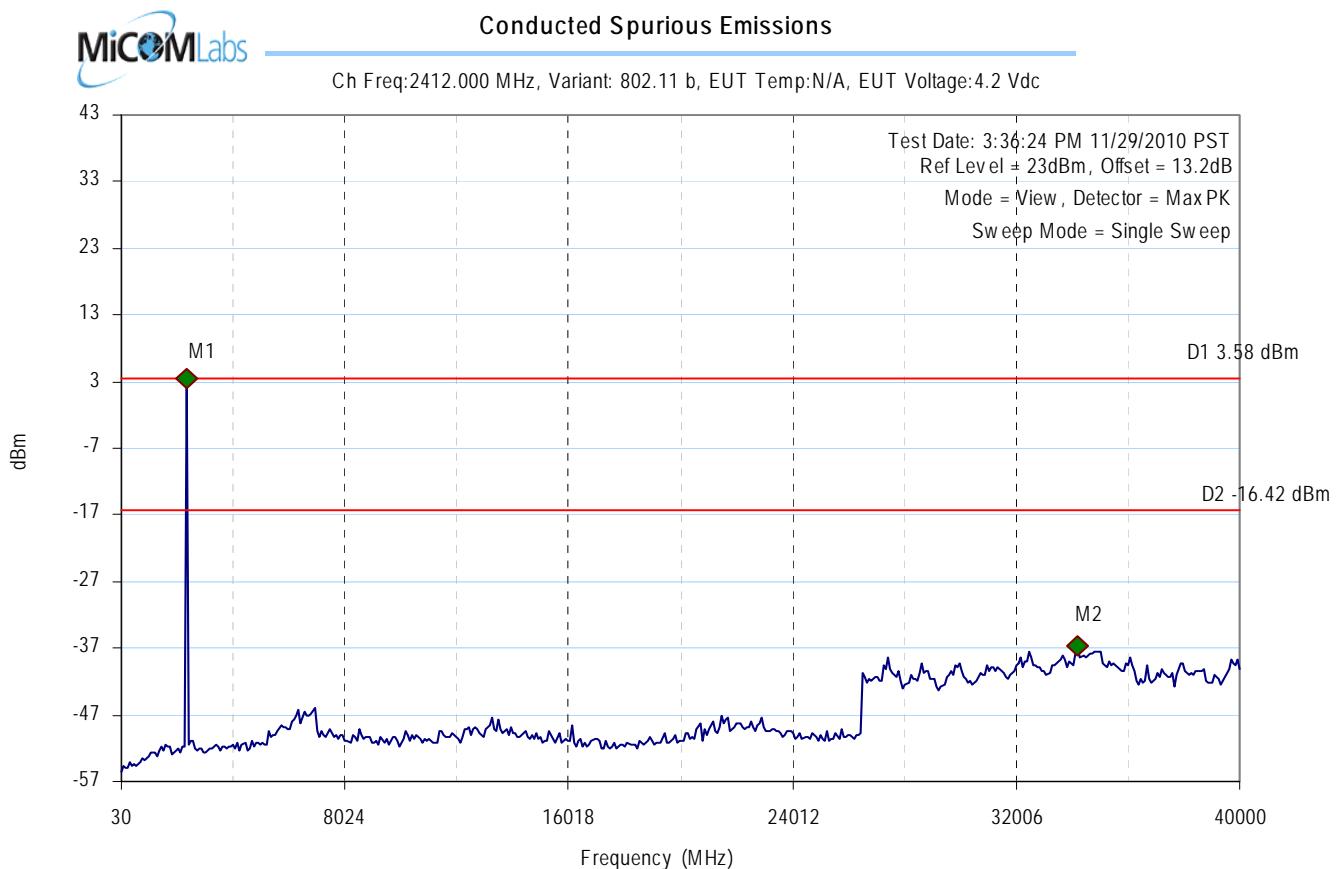
<b>Test Frequency</b>	<b>Start Frequency</b>	<b>Stop Frequency</b>	<b>Maximum Observed Emission</b>	<b>Limit (20 dB below peak of fundamental)</b>
<b>MHz</b>	<b>MHz</b>	<b>MHz</b>	<b>dBm</b>	<b>dBm</b>
2412.000	30.00	40000.00	-36.74	-16.42
2437.000	30.00	40000.00	-37.36	-22.94
2462.000	30.00	40000.00	-37.50	-25.02

#### Band-edge Measurement

<b>Test Frequency</b>	<b>Band-edge Frequency</b>	<b>Emission Amplitude @ Band-edge</b>	<b>Limit (20 dB below peak of fundamental)</b>	<b>Margin</b>
<b>MHz</b>	<b>MHz</b>	<b>dBm</b>	<b>dBm</b>	<b>dB</b>
2412.000	2400.00	-45.96	-13.97	-31.99
2462.000	2483.50	-50.71	-12.33	-38.37

<b>Measurement uncertainty:</b>	±2.81 dB
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**Analyser Setup**

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 60  
 RF Atten (dB) = 10  
 Span = 39.97GHz

**Marker : Frequency : Amplitude**

M1 : 2352.905812MHz : 3.576dBm  
 M2 : 34232.785571MHz : -36.741dBm

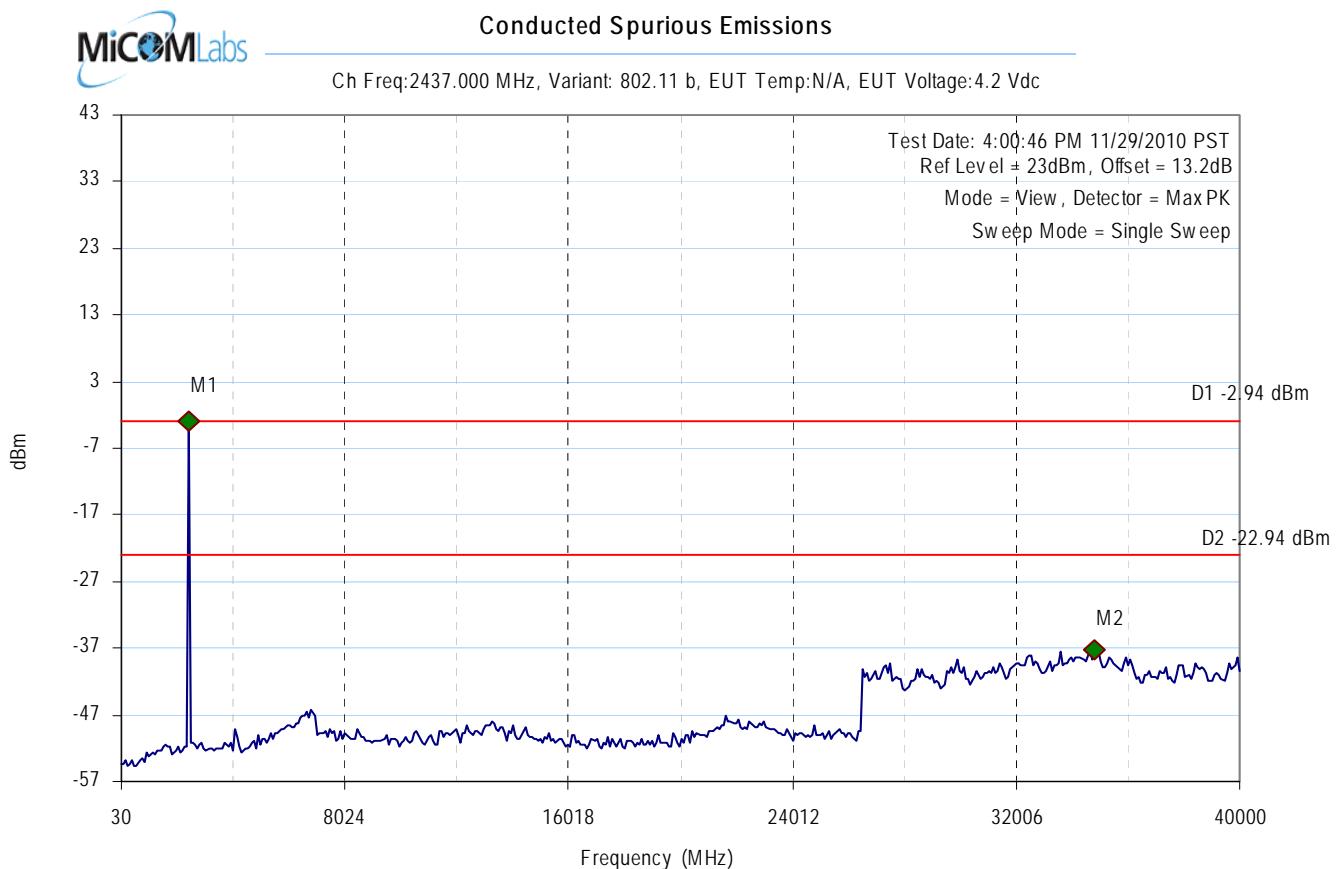
**Test Results**

Center frequency = 2412MHz

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**Analyser Setup**

RBW = 100.00KHz  
VBW = 300.00KHz  
Sweep time(s) = 60  
RF Alten (dB) = 10  
Span = 39.97GHz

**Marker : Frequency : Amplitude**

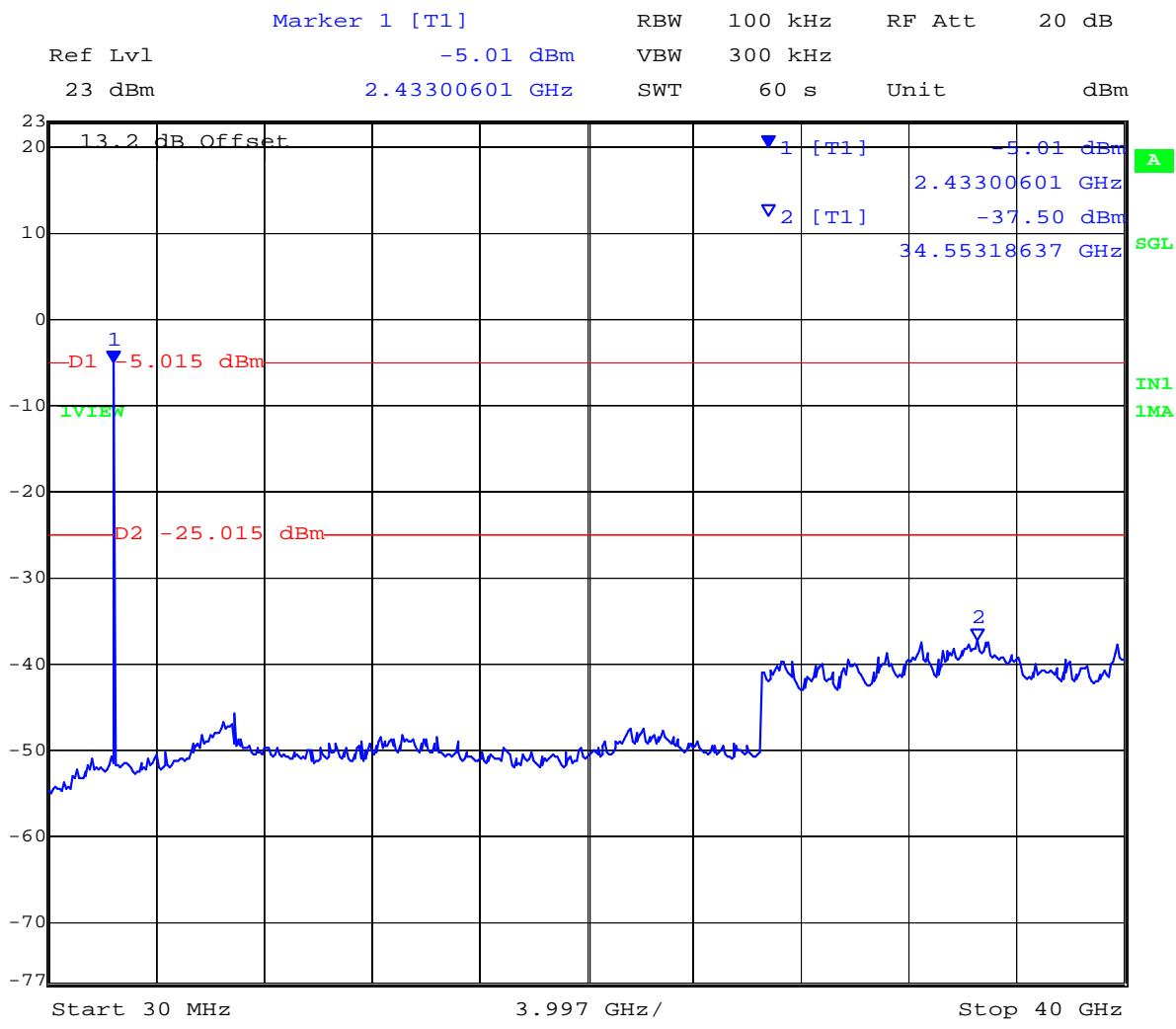
M1 : 2433.006012MHz : -2.944dBm  
M2 : 34793.486973MHz : -37.355dBm

**Test Results**

Center frequency = 2437MHz

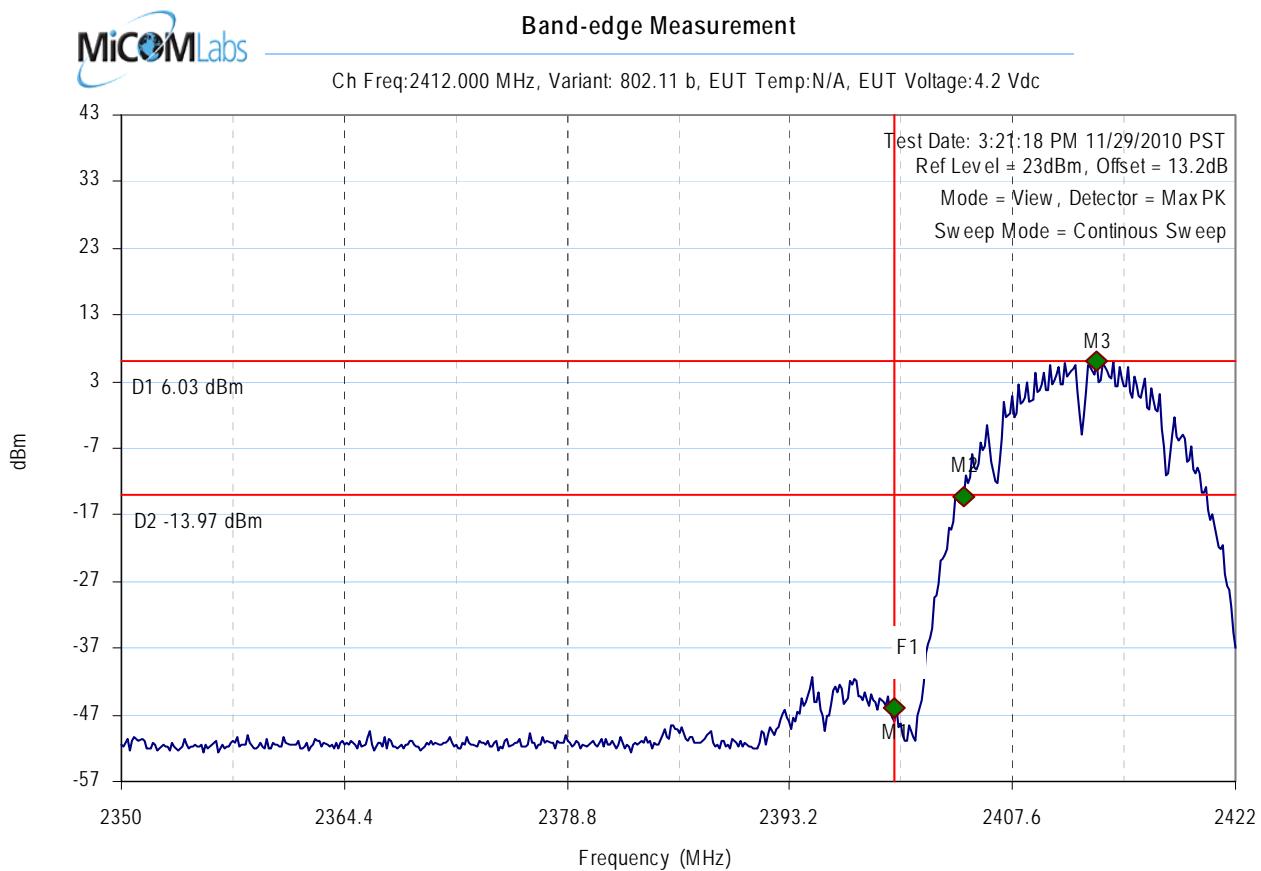
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802.11b TX SPR Ambient 2462MHz 4.20V 0.03-40GHz



Date: 29.NOV.2010 16:43:51

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**Analyser Setup**

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 20  
 RF Atten (dB) = 10  
 Span = 72.00MHz

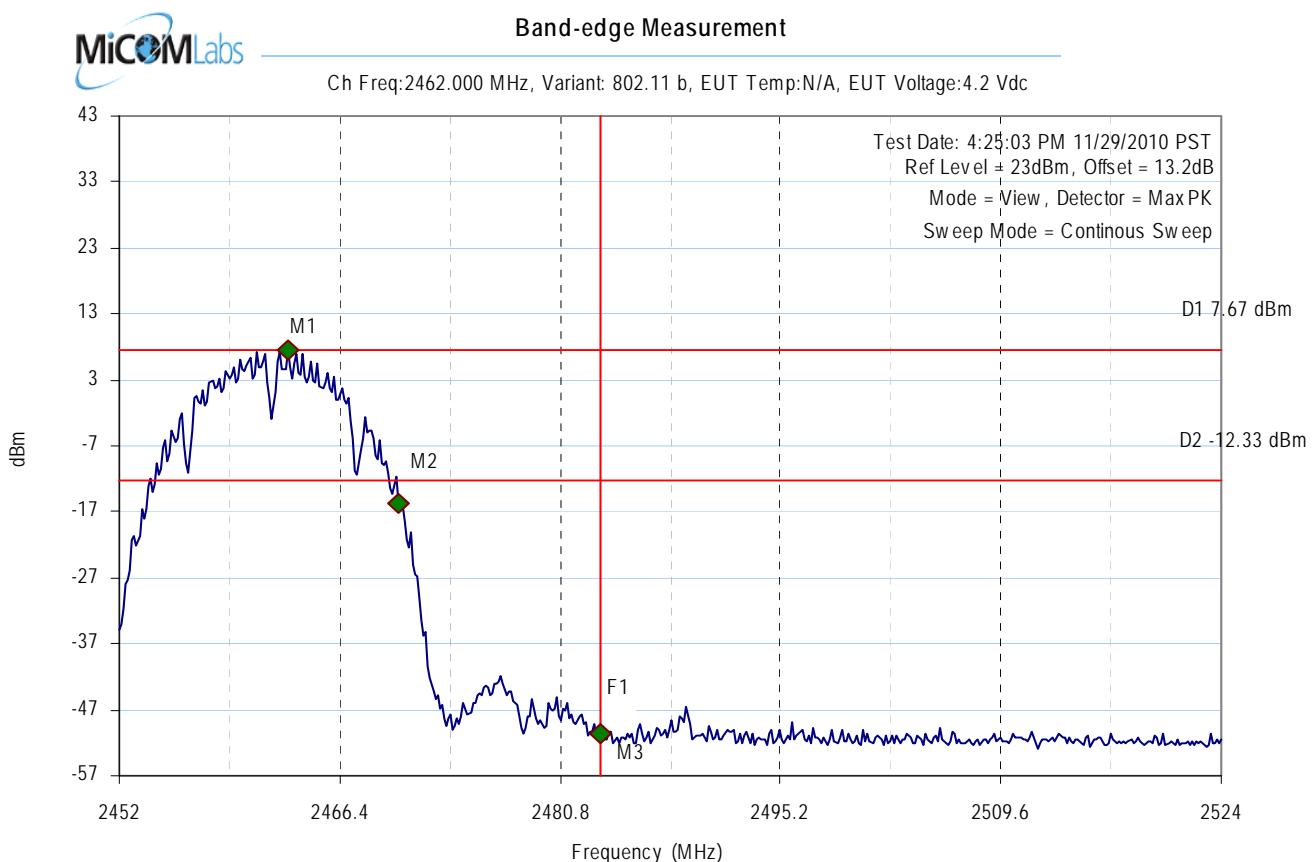
**Marker : Frequency : Amplitude**

M1 : 2400.000000MHz : -45.956dBm  
 M2 : 2404.396794MHz : -14.364dBm  
 M3 : 2413.054108MHz : 6.032dBm

**Test Results**

Center frequency = 2412MHz

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**Analyser Setup**

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 20  
 RF Atten (dB) = 10  
 Span = 72.00MHz

**Marker : Frequency : Amplitude**

M1 : 2462.965932MHz : 7.666dBm  
 M2 : 2470.180361MHz : -15.639dBm  
 M3 : 2483.500000MHz : -50.705dBm

**Test Results**

Center frequency = 2462MHz

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### 7.5.2 Measurement Results for 802.11g

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11g	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	10
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	N/A dBi
<b>Applied Voltage:</b>	4.20 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

#### Conducted Spurious Measurement

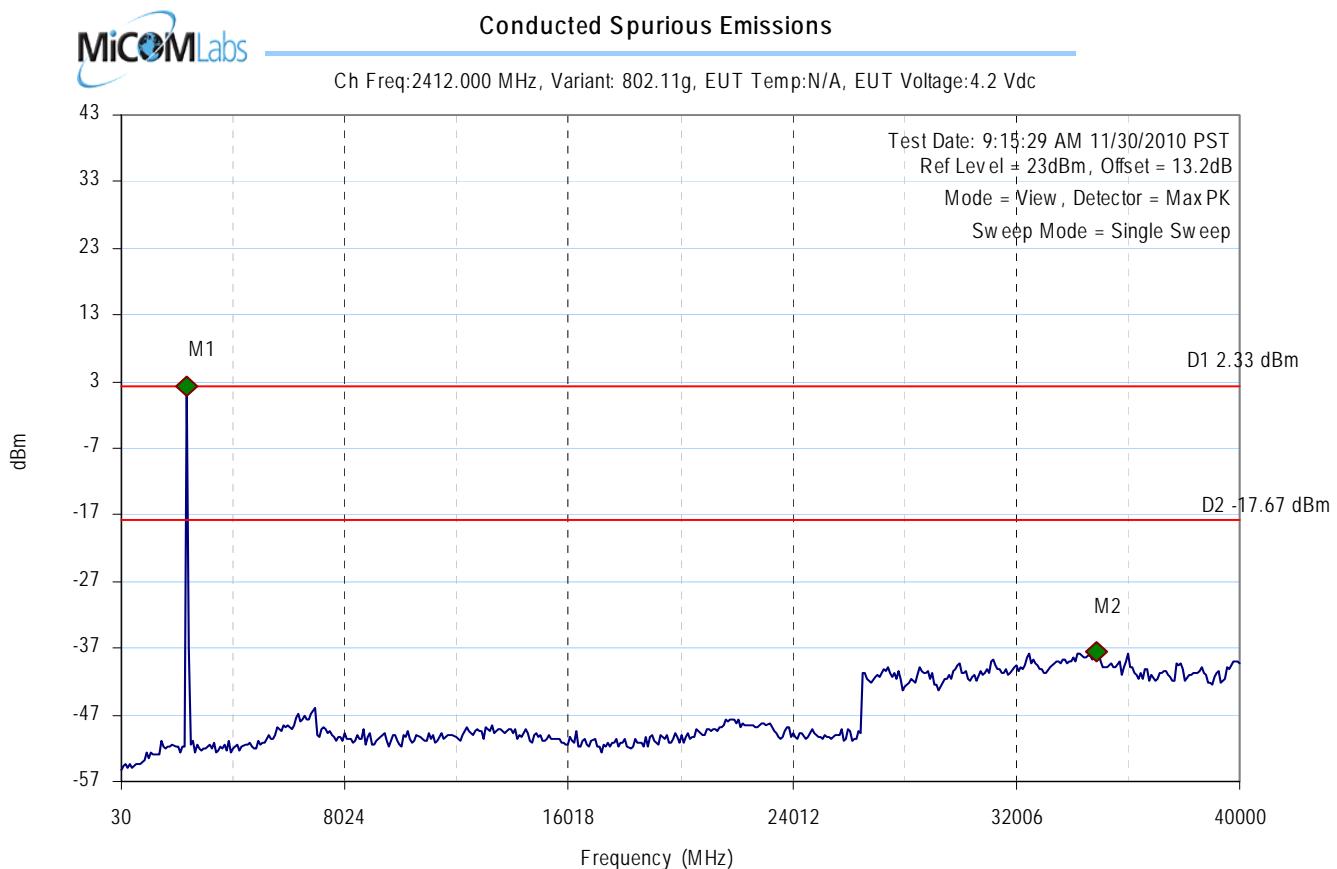
<b>Test Frequency</b>	<b>Start Frequency</b>	<b>Stop Frequency</b>	<b>Maximum Observed Emission</b>	<b>Limit (20 dB below peak of fundamental)</b>
<b>MHz</b>	<b>MHz</b>	<b>MHz</b>	<b>dBm</b>	<b>dBm</b>
2412.000	30.00	40000.00	-37.61	-17.67
2437.000	30.00	40000.00	-36.25	-18.12
2462.000	30.00	40000.00	-37.62	-16.00

#### Band-edge Measurement

<b>Test Frequency</b>	<b>Band-edge Frequency</b>	<b>Emission Amplitude @ Band-edge</b>	<b>Limit (20 dB below peak of fundamental)</b>	<b>Margin</b>
<b>MHz</b>	<b>MHz</b>	<b>dBm</b>	<b>dBm</b>	<b>dB</b>
2412.000	2400.00	-28.42	-15.55	-12.88
2462.000	2483.50	-39.37	-14.67	-24.70

<b>Measurement uncertainty:</b>	±2.81 dB
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**Analyser Setup**

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 60  
 RF Alten (dB) = 10  
 Span = 39.97GHz

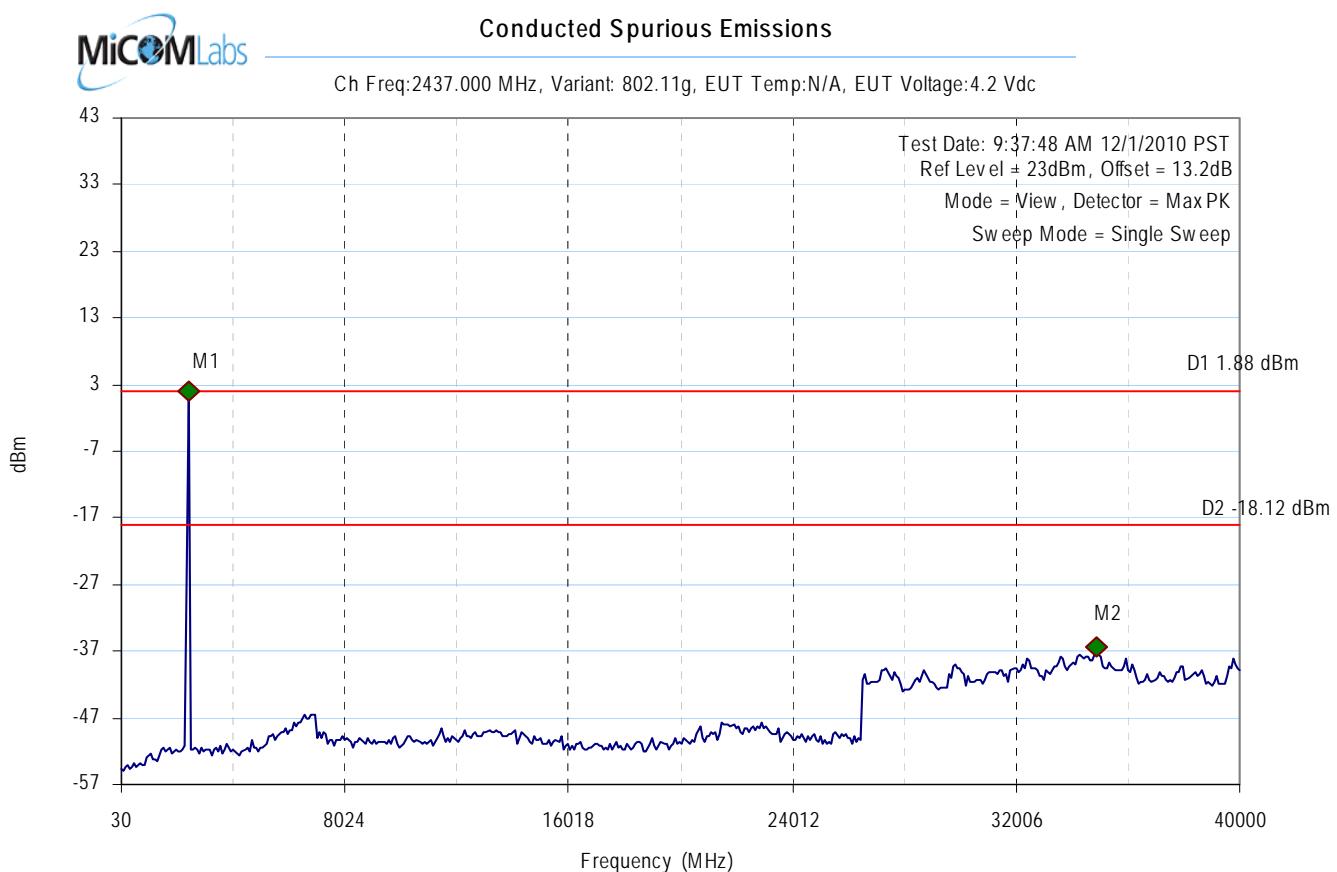
**Marker : Frequency : Amplitude**

M1 : 2352.905812MHz : 2.331dBm  
 M2 : 34873.587174MHz : -37.612dBm

**Test Results**

Center frequency = 2412MHz

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**Analyser Setup**

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 60  
 RF Alten (dB) = 10  
 Span = 39.97GHz

**Marker : Frequency : Amplitude**

M1 : 2433.006012MHz : 1.880dBm  
 M2 : 34873.587174MHz : -36.245dBm

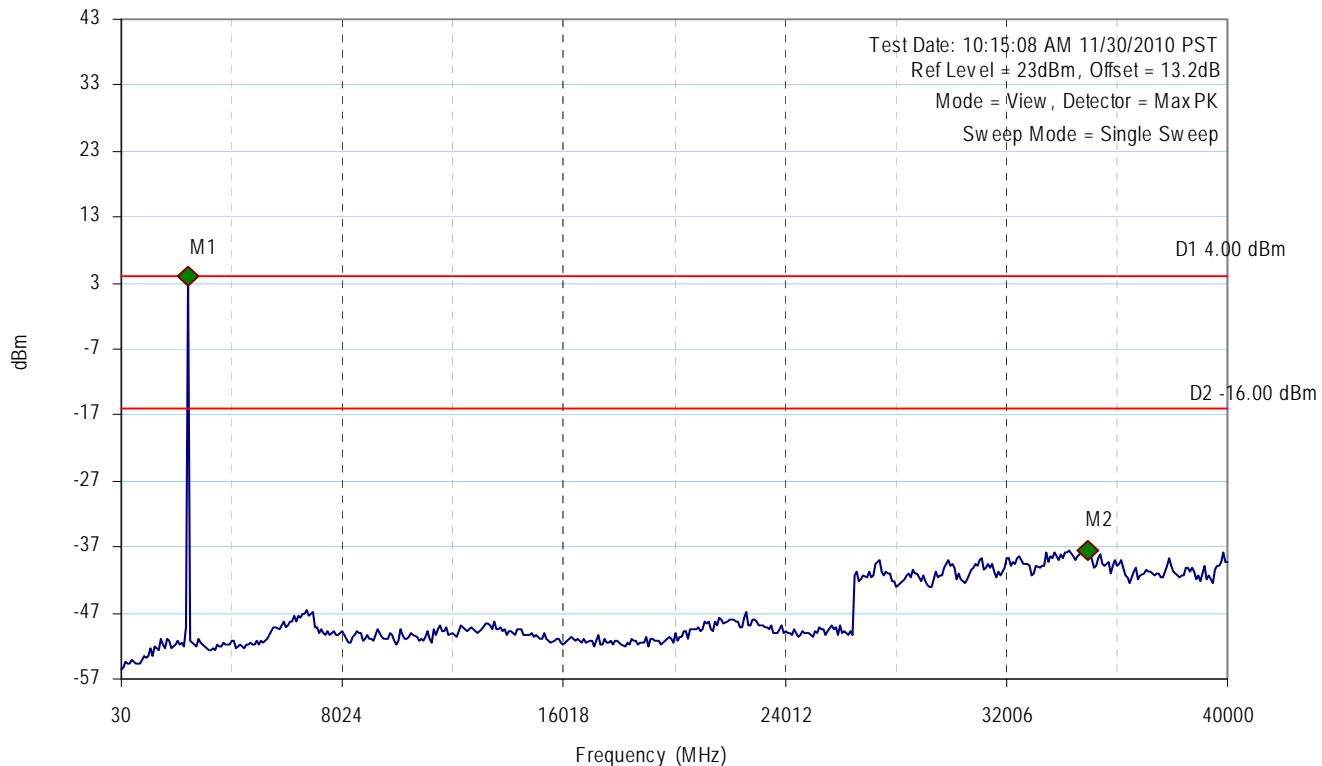
**Test Results**

Center frequency = 2437MHz

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### Conducted Spurious Emissions

Ch Freq:2462.000 MHz, Variant: 802.11g, EUT Temp:N/A, EUT Voltage:4.2 Vdc



#### Analyser Setup

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 60  
 RF Atten (dB) = 10  
 Span = 39.97GHz

#### Marker : Frequency : Amplitude

M1 : 2433.006012MHz : 3.999dBm  
 M2 : 34953.687374MHz : -37.620dBm

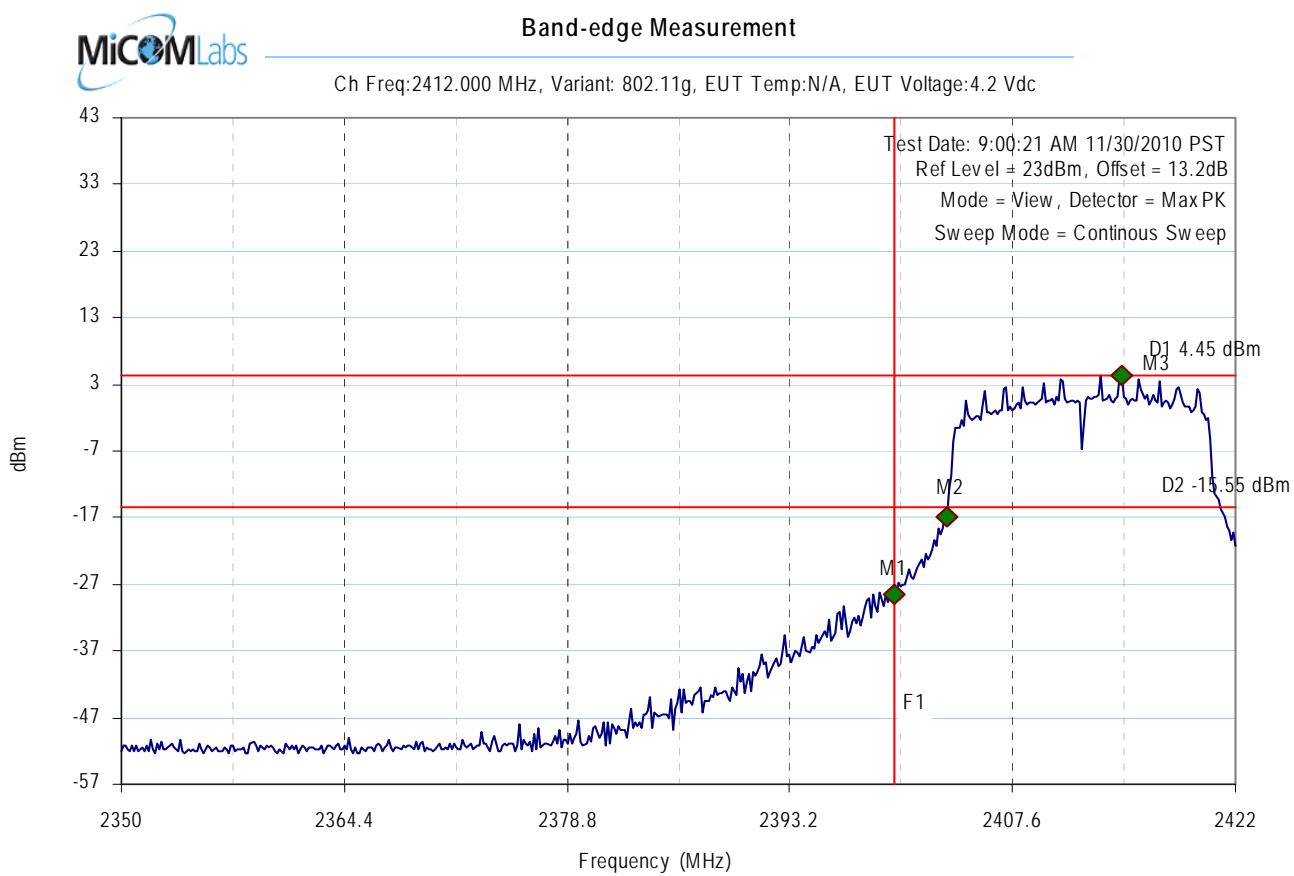
#### Test Results

Center frequency = 2462MHz

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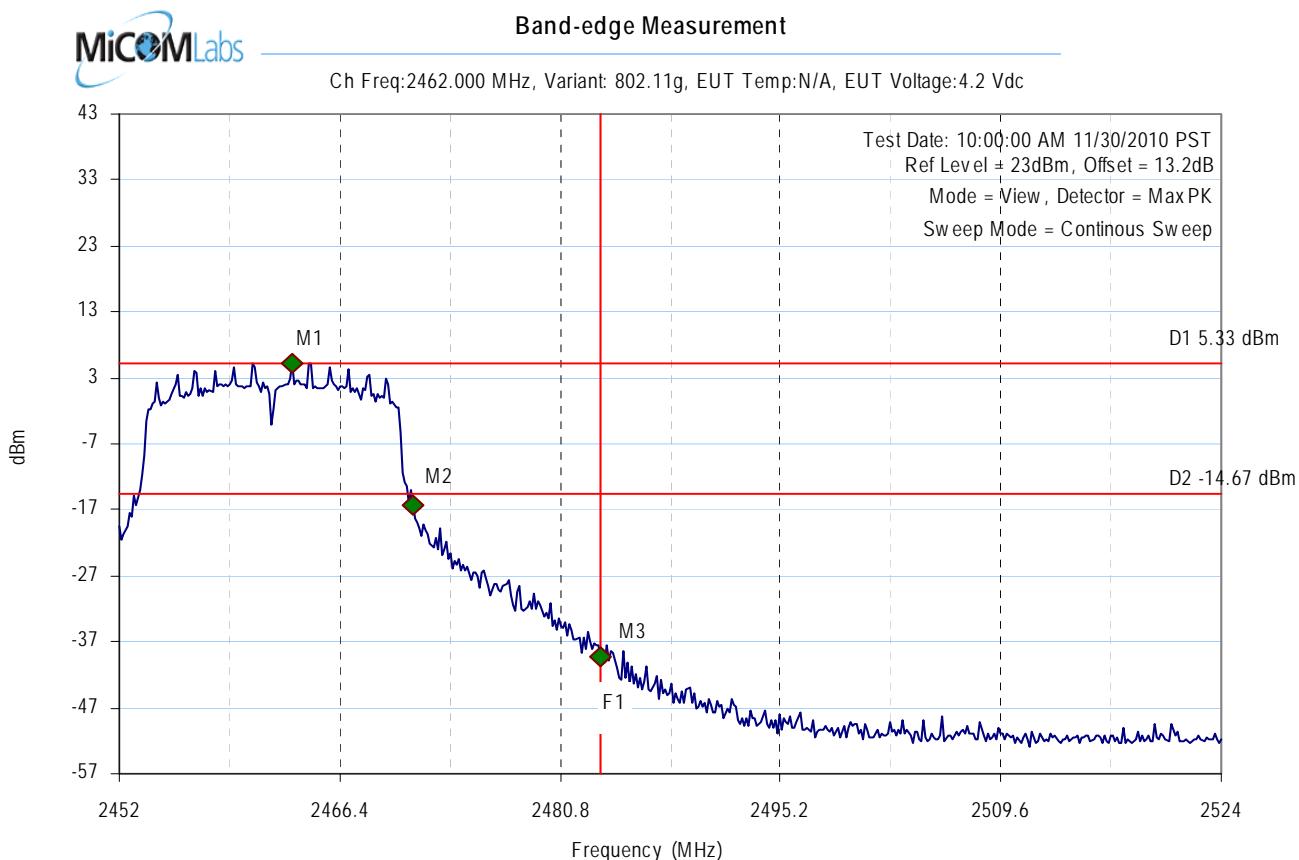


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Analyser Setup	Marker : Frequency : Amplitude	Test Results
RBW = 100.00KHz	M1 : 2400.00000MHz : -28.421dBm	Center frequency = 2412MHz
VBW = 300.00KHz	M2 : 2403.386774MHz : -16.750dBm	
Sweep time(s) = 20	M3 : 2414.641283MHz : 4.454dBm	
RF Atten (dB) = 10		
Span = 72.00MHz		

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**Analyser Setup**

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 20  
 RF Atten (dB) = 10  
 Span = 72.00MHz

**Marker : Frequency : Amplitude**

M1 : 2463.254509MHz : 5.333dBm  
 M2 : 2471.190381MHz : -16.388dBm  
 M3 : 2483.500000MHz : -39.371dBm

**Test Results**

Center frequency = 2462MHz

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### 7.5.3 Measurement Results for 802.11n HT-20

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11n HT-20	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	10
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	N/A dBi
<b>Applied Voltage:</b>	4.20 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

#### *Conducted Spurious Measurement*

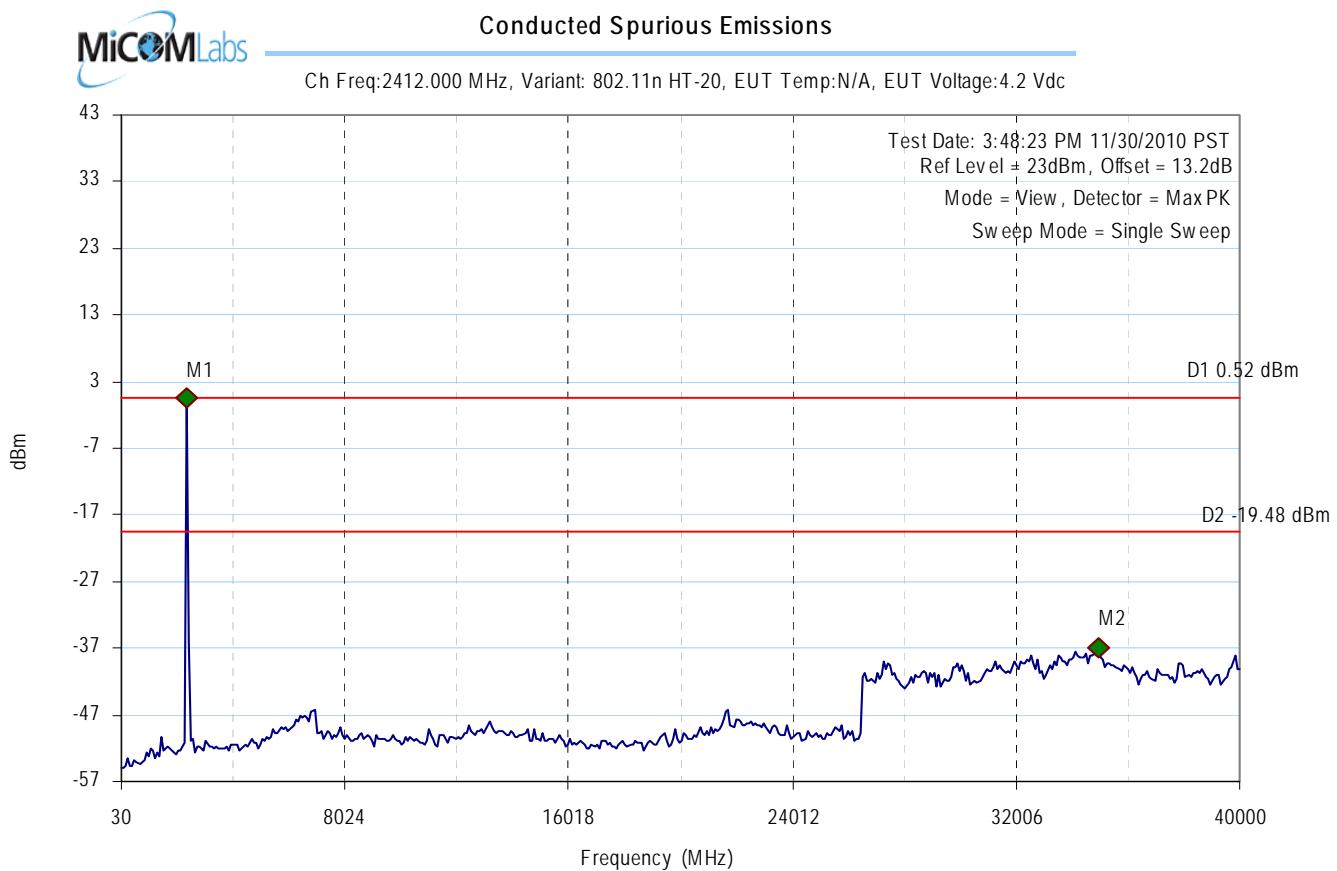
<b>Test Frequency</b>	<b>Start Frequency</b>	<b>Stop Frequency</b>	<b>Maximum Observed</b>	<b>Limit (20 dB below</b>
<b>MHz</b>	<b>MHz</b>	<b>MHz</b>	<b>dBm</b>	<b>dBm</b>
2412.000	30.00	40000.00	-37.02	-19.48
2437.000	30.00	40000.00	-36.57	-15.82
2462.000	30.00	40000.00	-37.37	-20.08

#### *Band-edge Measurement*

<b>Test Frequency</b>	<b>Band-edge Frequency</b>	<b>Emission Amplitude @ Band-edge</b>	<b>Limit (20 dB below peak of fundamental)</b>	<b>Margin</b>
<b>MHz</b>	<b>MHz</b>	<b>dBm</b>	<b>dBm</b>	<b>dB</b>
2412.000	2400.00	-27.77	-15.62	-12.15
2462.000	2483.50	-38.39	-14.86	-23.53

<b>Measurement uncertainty:</b>	±2.81 dB
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**Analyser Setup**

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 60  
 RF Alten (dB) = 10  
 Span = 39.97GHz

**Marker : Frequency : Amplitude**

M1 : 2352.905812MHz : .521dBm  
 M2 : 34953.687374MHz : -37.024dBm

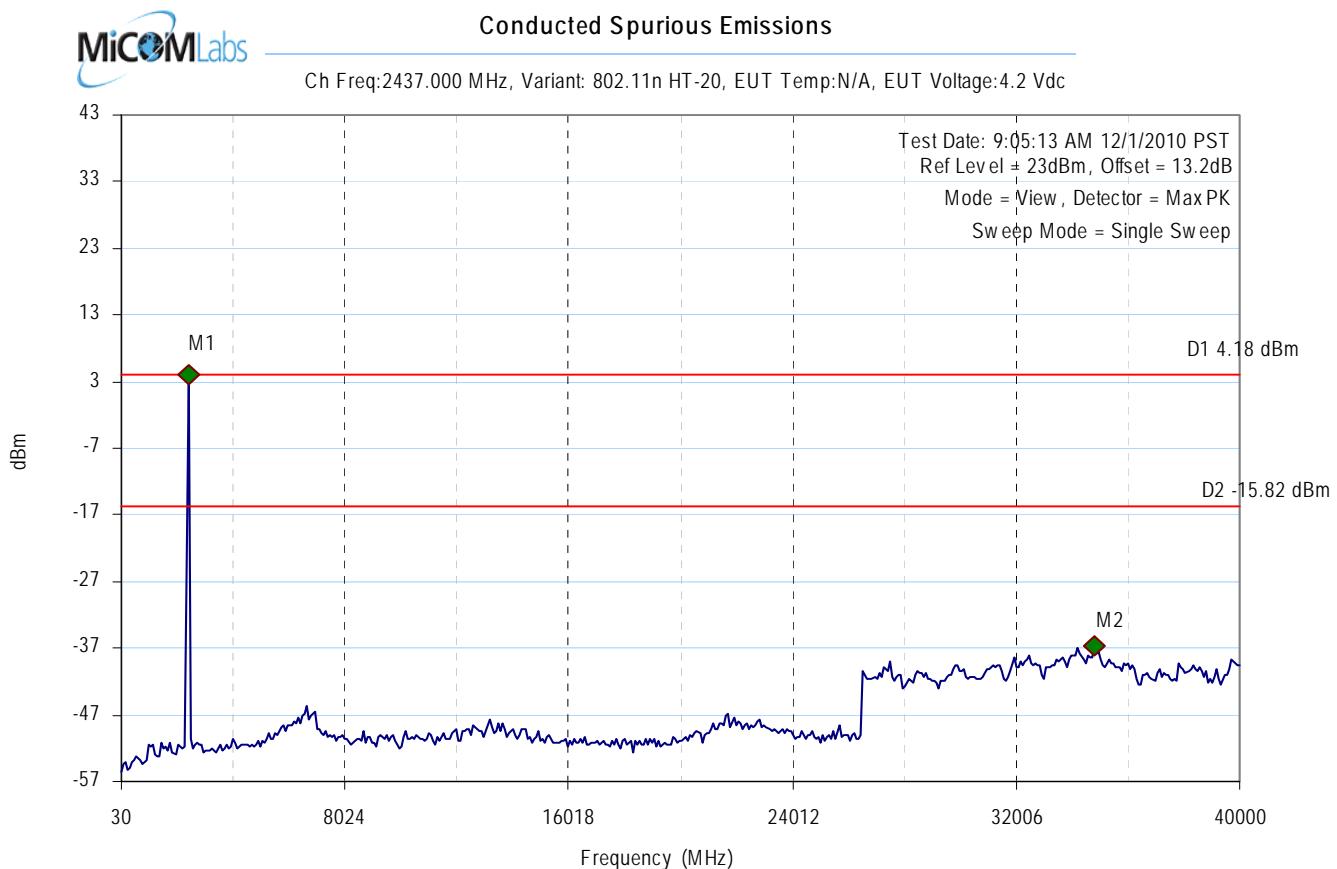
**Test Results**

Center frequency = 2412MHz

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Analyser Setup	Marker : Frequency : Amplitude	Test Results
RBW = 100.00KHz	M1 : 2433.006012MHz : 4.178dBm	Center frequency = 2437MHz
VBW = 300.00KHz	M2 : 34793.486973MHz : -36.570dBm	
Sweep time(s) = 60		
RF Atten (dB) = 10		
Span = 39.97GHz		

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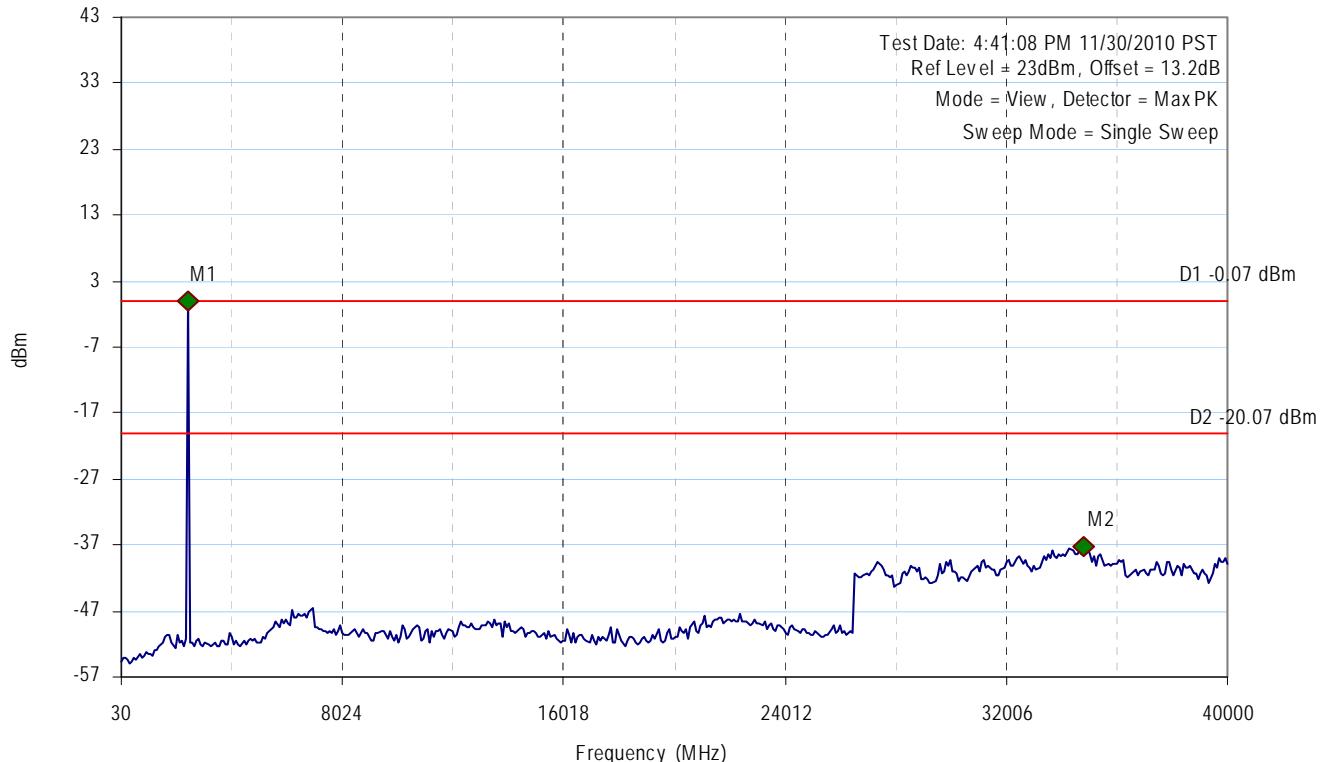


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### Conducted Spurious Emissions

Ch Freq:2462.000 MHz, Variant: 802.11n HT-20, EUT Temp:N/A, EUT Voltage:4.2 Vdc



#### Analyser Setup

RBW = 100.00KHz  
VBW = 300.00KHz  
Sweep time(s) = 60  
RF Atten (dB) = 10  
Span = 39.97GHz

#### Marker : Frequency : Amplitude

M1 : 2433.006012MHz : -0.075dBm  
M2 : 34793.486973MHz : -37.368dBm

#### Test Results

Center frequency = 2462MHz

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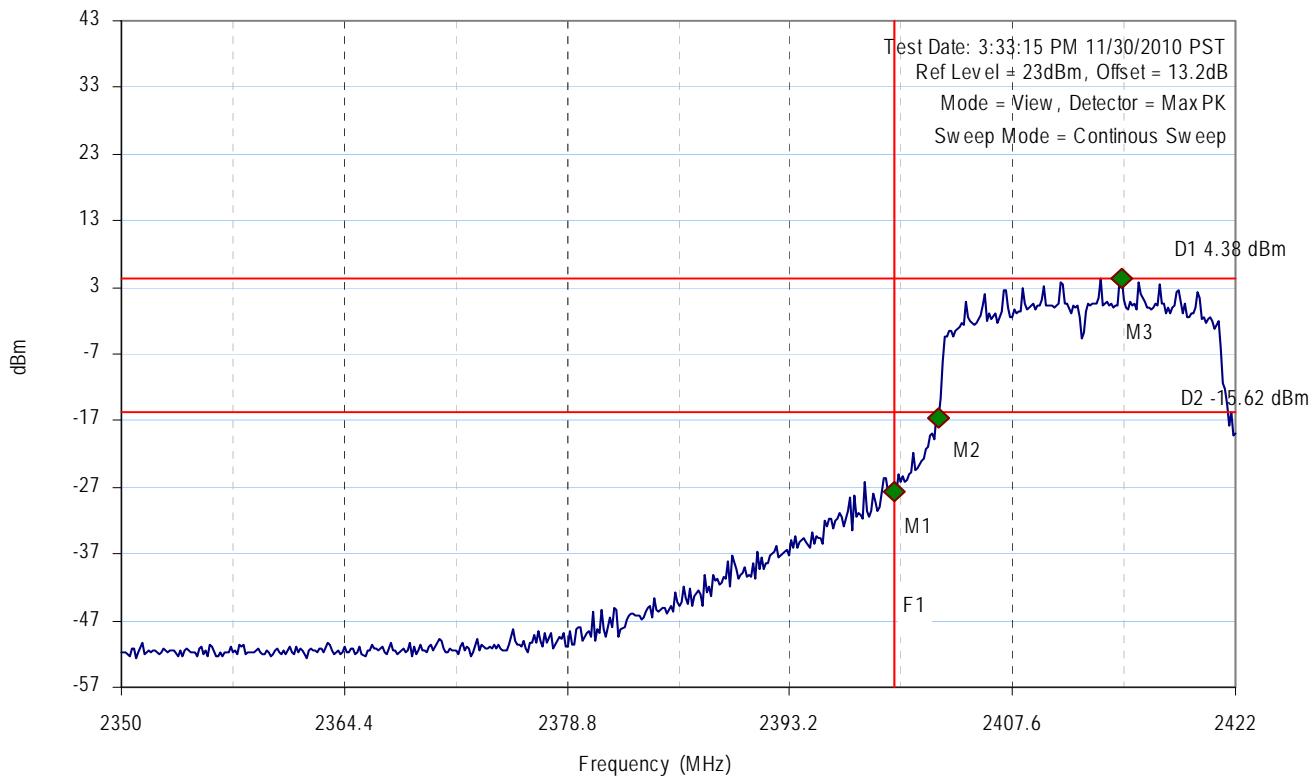


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## Band-edge Measurement

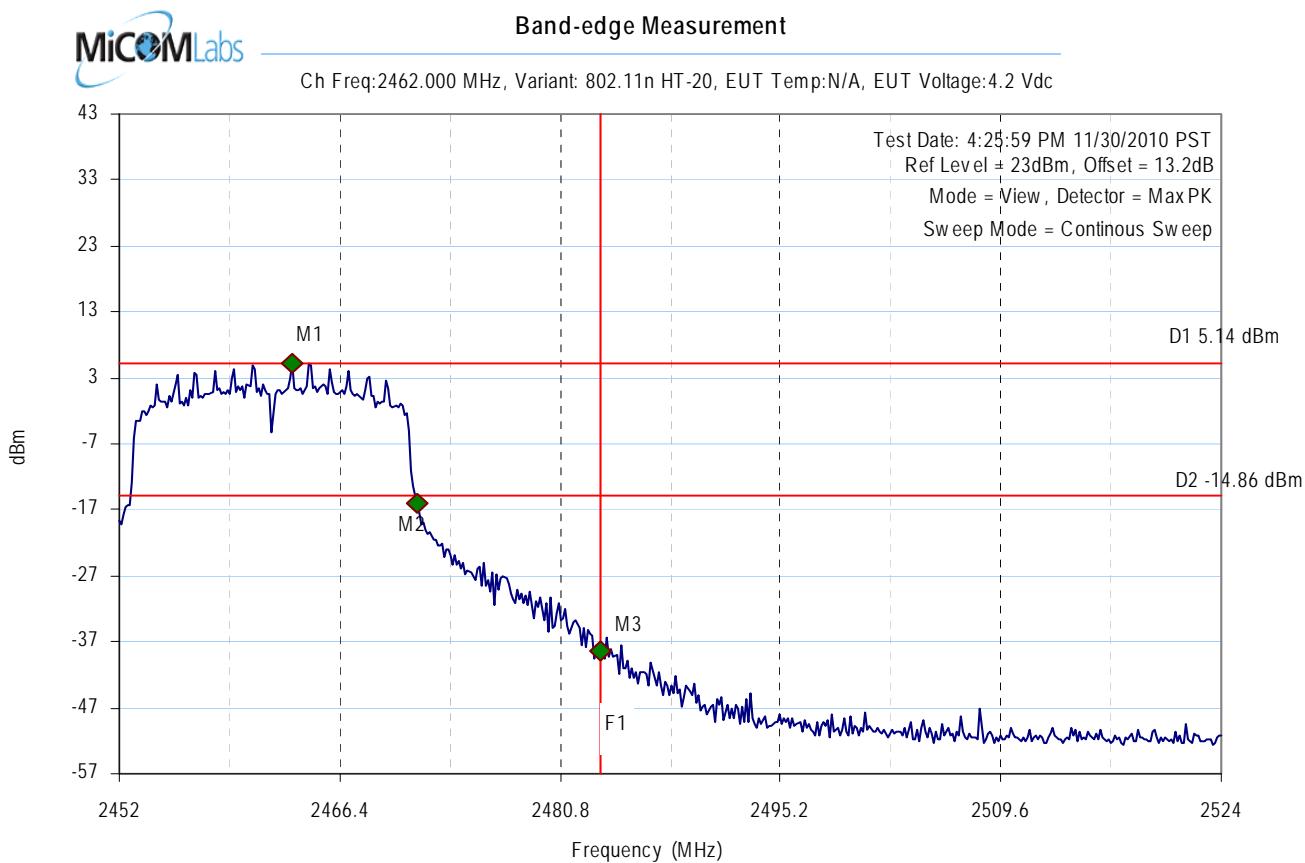
MiCOM Labs

Ch Freq:2412.000 MHz, Variant: 802.11n HT-20, EUT Temp:N/A, EUT Voltage:4.2 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
RBW = 100.00KHz	M1 : 2400.000000MHz : -27.766dBm	Center frequency = 2412MHz
VBW = 300.00KHz	M2 : 2402.809619MHz : -16.693dBm	
Sweep time(s) = 20	M3 : 2414.641283MHz : 4.379dBm	
RF Atten (dB) = 10		
Span = 72.00MHz		

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**Analyser Setup**

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 20  
 RF Atten (dB) = 10  
 Span = 72.00MHz

**Marker : Frequency : Amplitude**

M1 : 2463.254509MHz : 5.142dBm  
 M2 : 2471.478958MHz : -16.111dBm  
 M3 : 2483.500000MHz : -38.389dBm

**Test Results**

Center frequency = 2462MHz

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#### 7.5.4 Measurement Results for 802.11a

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11a	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	10
<b>Beam Forming</b>	N/A dB	<b>Antenna Gain:</b>	N/A dBi
<b>Applied Voltage:</b>	4.20 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

##### *Conducted Spurious Measurement*

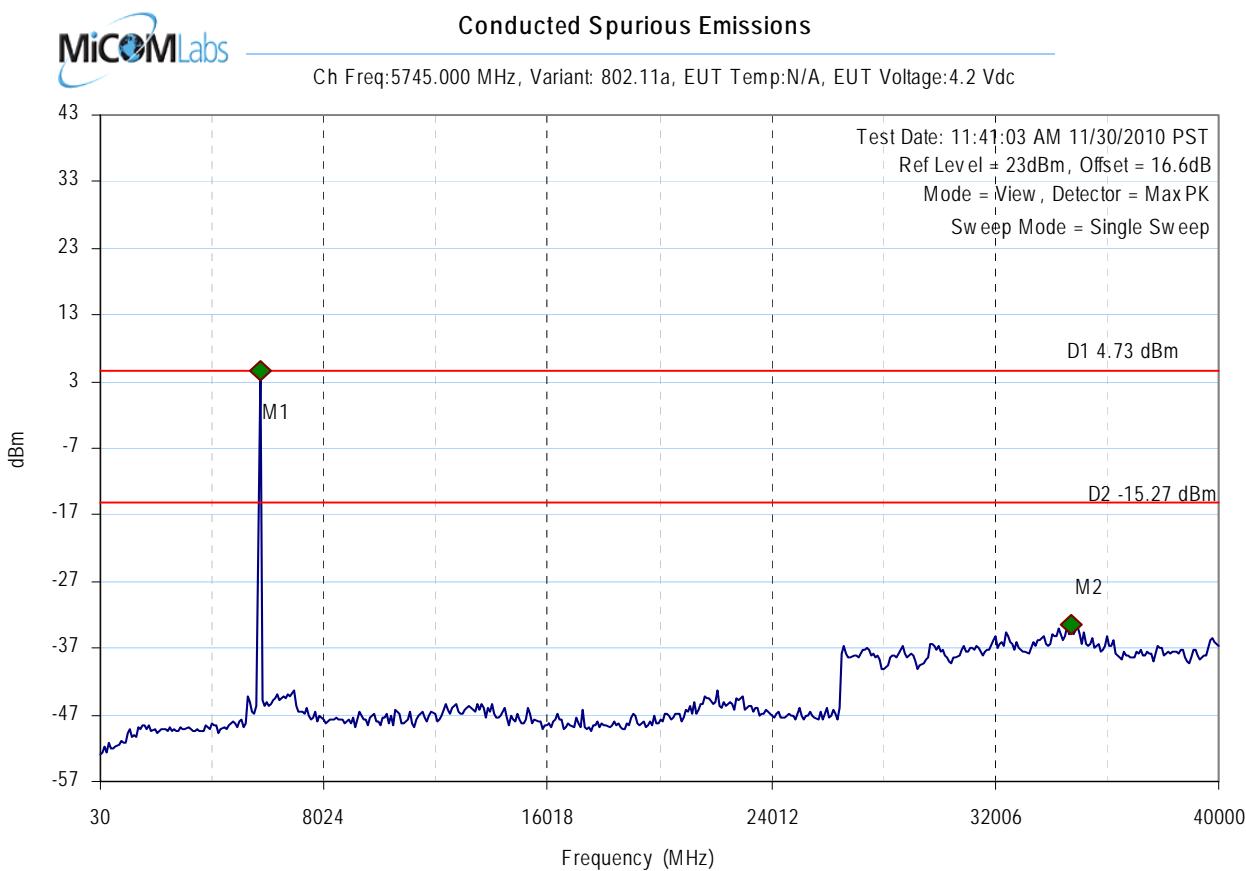
Test Frequency	Start Frequency	Stop Frequency	Maximum Observed Emission	Limit (20 dB below peak of fundamental)
MHz	MHz	MHz	dBm	dBm
5745.000	30.00	40000.00	-33.39	-15.27
5785.000	30.00	40000.00	-34.00	-12.28
5825.000	30.00	40000.00	-34.01	-15.69

##### *Band-edge Measurement*

Test Frequency	Band-edge Frequency	Emission Amplitude @ Band-edge	Limit (20 dB below peak of fundamental)	Margin
MHz	MHz	dBm	dBm	dB
5745.000	5725.00	-29.79	-10.52	-19.26
5825.000	5850.00	-38.15	-11.04	-27.11

Measurement uncertainty:	±2.81 dB
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**Analyser Setup**

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 60  
 RF Atten (dB) = 10  
 Span = 39.97GHz

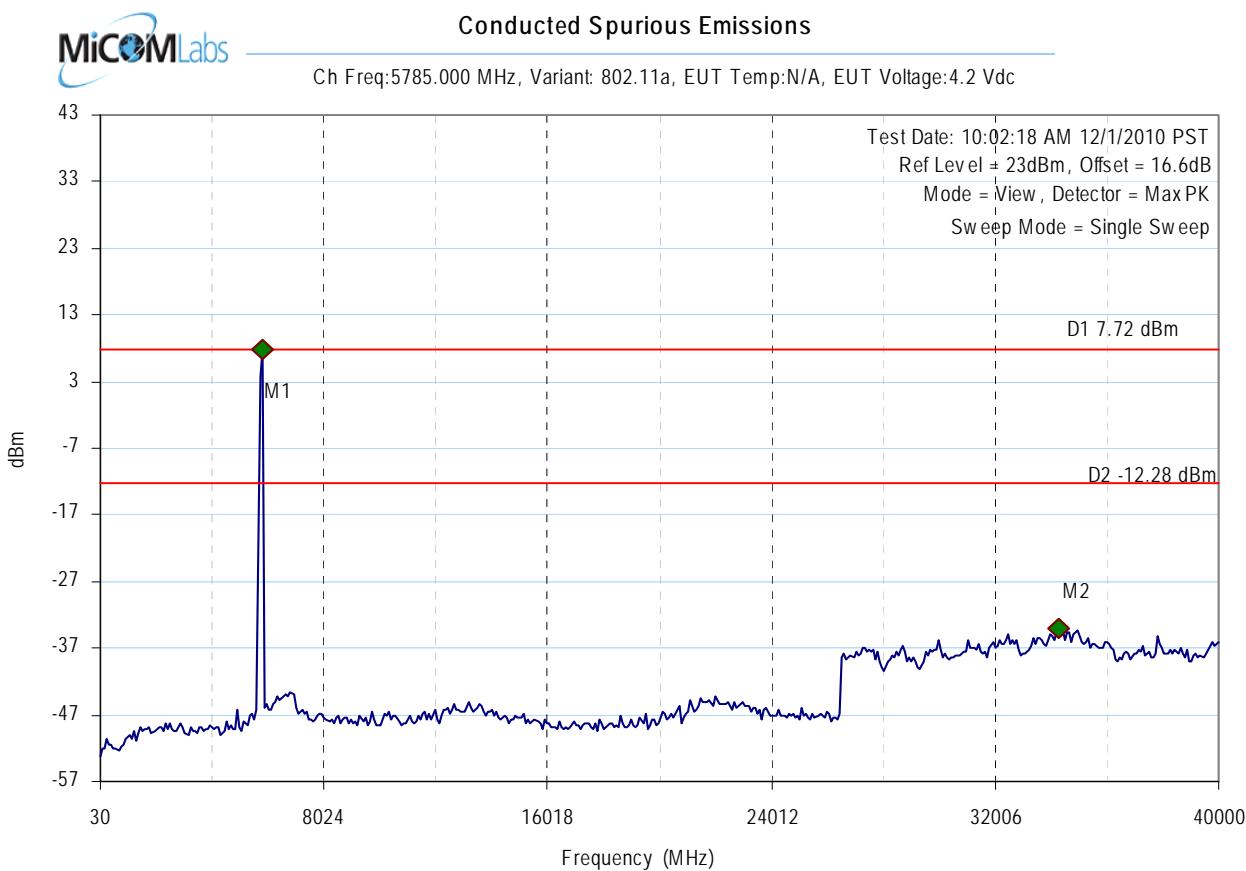
**Marker : Frequency : Amplitude**

M1 : 5717.114228MHz : 4.735dBm  
 M2 : 34713.386773MHz : -33.390dBm

**Test Results**

Center frequency = 5745MHz

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**Analyser Setup**

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 60  
 RF Atten (dB) = 10  
 Span = 39.97GHz

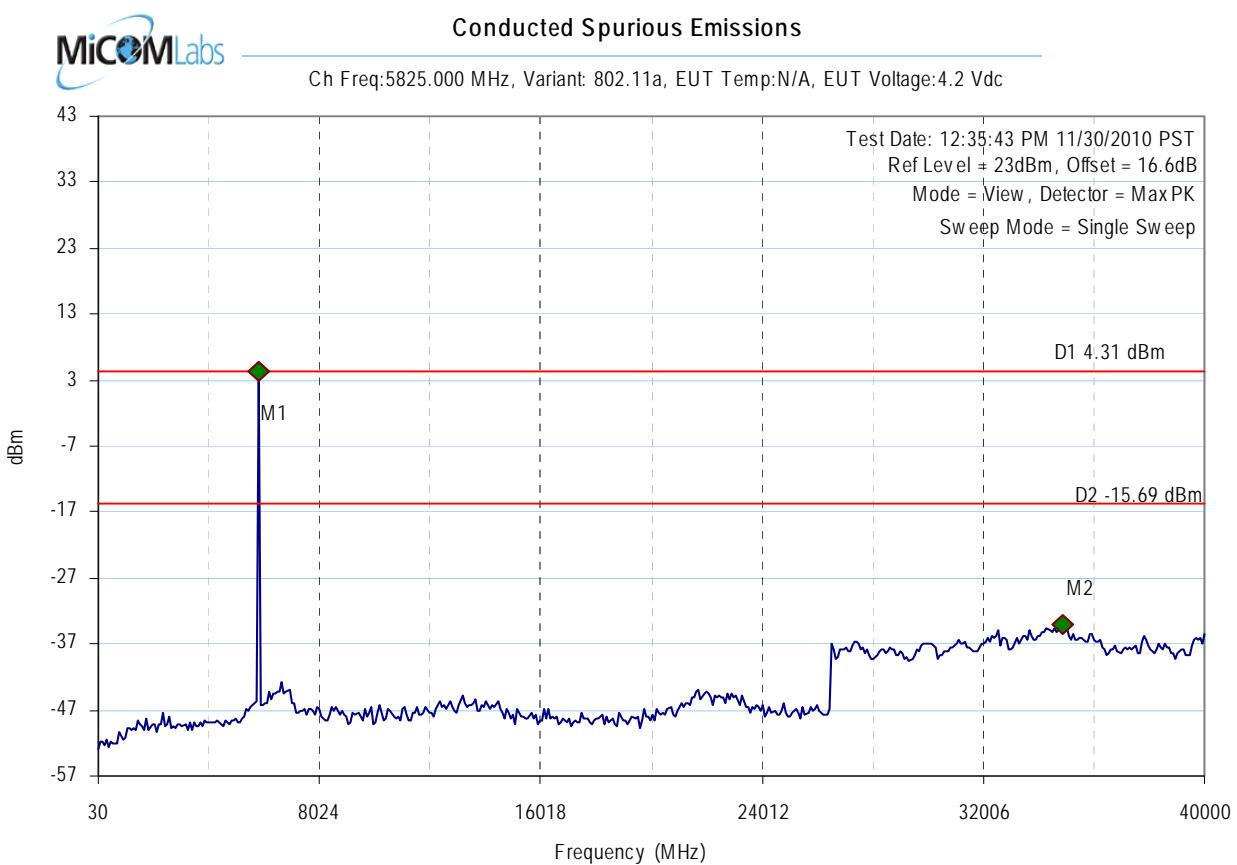
**Marker : Frequency : Amplitude**

M1 : 5797.214429MHz : 7.720dBm  
 M2 : 34312.885771MHz : -33.998dBm

**Test Results**

Center frequency = 5785MHz

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**Analyser Setup**

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 60  
 RF Atten (dB) = 10  
 Span = 39.97GHz

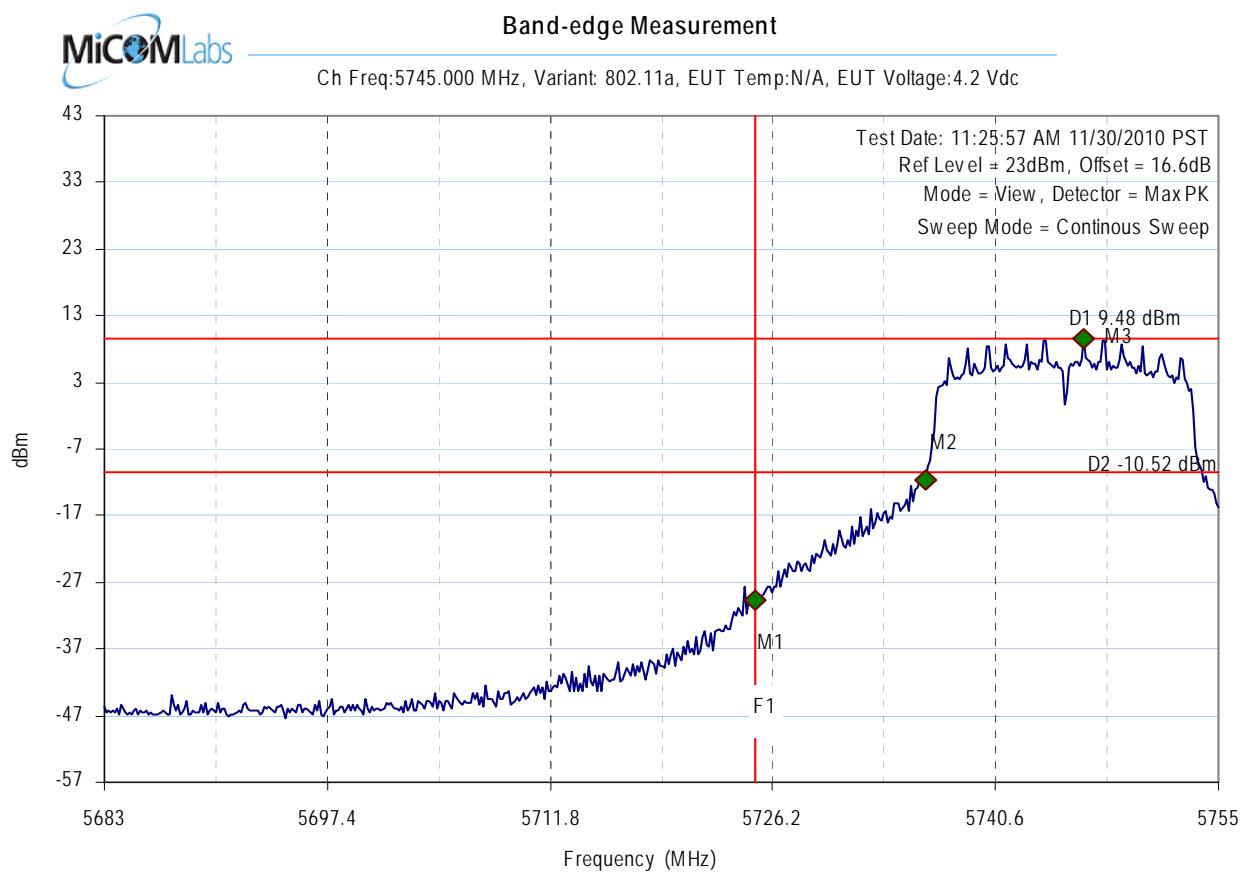
**Marker : Frequency : Amplitude**

M1 : 5797.214429MHz : 4.312dBm  
 M2 : 34873.587174MHz : -34.014dBm

**Test Results**

Center frequency = 5825MHz

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**Analyser Setup**

RBW = 100.000KHz  
 VBW = 300.000KHz  
 Sweep time(s) = 20  
 RF Atten (dB) = 10  
 Span = 72.00MHz

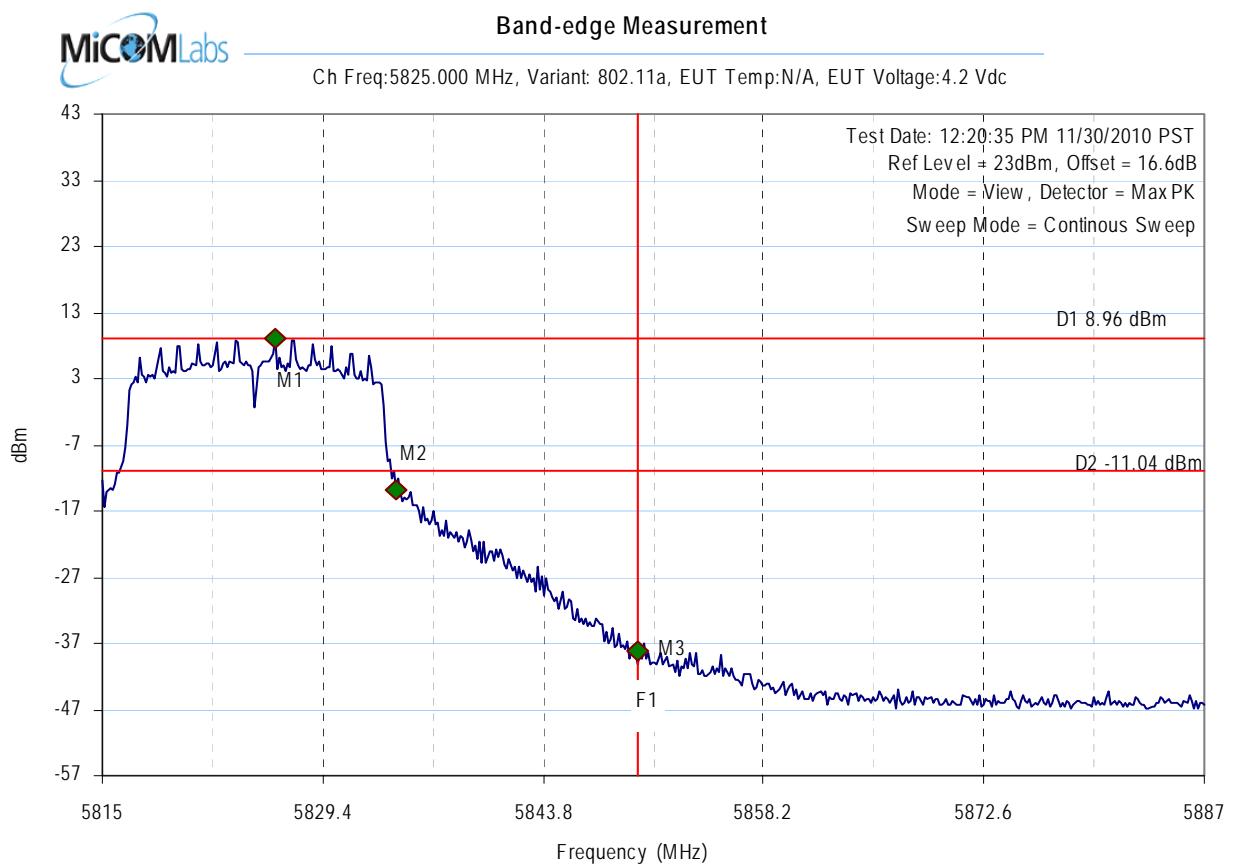
**Marker : Frequency : Amplitude**

M1 : 5725.000000MHz : -29.786dBm  
 M2 : 5736.098196MHz : -11.787dBm  
 M3 : 5746.342685MHz : 9.478dBm

**Test Results**

Center frequency = 5745MHz

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**Analyser Setup**

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 20  
 RF Atten (dB) = 10  
 Span = 72.00MHz

**Marker : Frequency : Amplitude**

M1 : 5826.254509MHz : 8.961dBm  
 M2 : 5834.190381MHz : -13.876dBm  
 M3 : 5850.000000MHz : -38.153dBm

**Test Results**

Center frequency = 5825MHz

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### 7.5.5 Measurement Results for 802.11n HT-20

<b>Test Conditions:</b>	15.247 (a)(2)	<b>Rel. Humidity (%):</b>	35 to 42
<b>Variant:</b>	802.11n HT-20	<b>Ambient Temp. (°C):</b>	19 to 22
<b>TPC:</b>	HIGH	<b>Pressure (mBars):</b>	998 to 1003
<b>Modulation:</b>	ON	<b>Duty Cycle (%):</b>	10
<b>Beam Forming Gain (Y):</b>	N/A dB	<b>Antenna Gain:</b>	N/A dBi
<b>Applied Voltage:</b>	4.20 Vdc		
<b>Notes 1:</b>			
<b>Notes 2:</b>			

#### *Conducted Spurious Measurement*

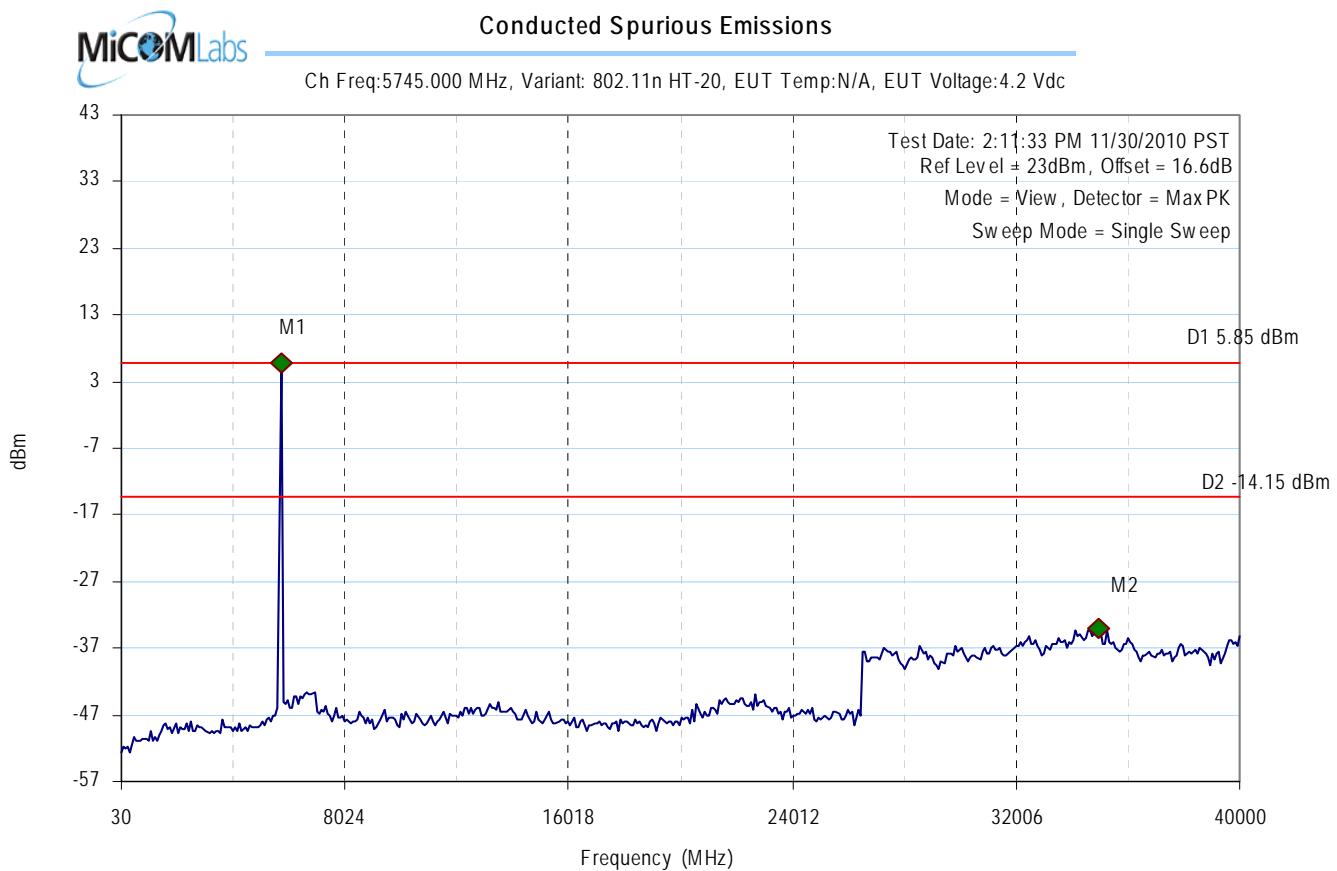
<b>Test Frequency</b>	<b>Start Frequency</b>	<b>Stop Frequency</b>	<b>Maximum Observed Emission</b>	<b>Limit (20 dB below peak of fundamental)</b>
<b>MHz</b>	<b>MHz</b>	<b>MHz</b>	<b>dBm</b>	<b>dBm</b>
5745.000	30.00	40000.00	-34.00	-14.15
5785.000	30.00	40000.00	-34.17	-13.97
5825.000	30.00	40000.00	-33.35	-15.06

#### *Band-edge Measurement*

<b>Test Frequency</b>	<b>Band-edge Frequency</b>	<b>Emission Amplitude @ Band-edge</b>	<b>Limit (20 dB below peak of fundamental)</b>	<b>Margin</b>
<b>MHz</b>	<b>MHz</b>	<b>dBm</b>	<b>dBm</b>	<b>dB</b>
5745.000	5725.00	-28.16	-10.41	-17.76
5825.000	5850.00	-36.72	-11.19	-25.53

<b>Measurement uncertainty:</b>	±2.81 dB
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**Analyser Setup**

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 60  
 RF Atten (dB) = 10  
 Span = 39.97GHz

**Marker : Frequency : Amplitude**

M1 : 5717.114228MHz : 5.853dBm  
 M2 : 34953.687374MHz : -34.000dBm

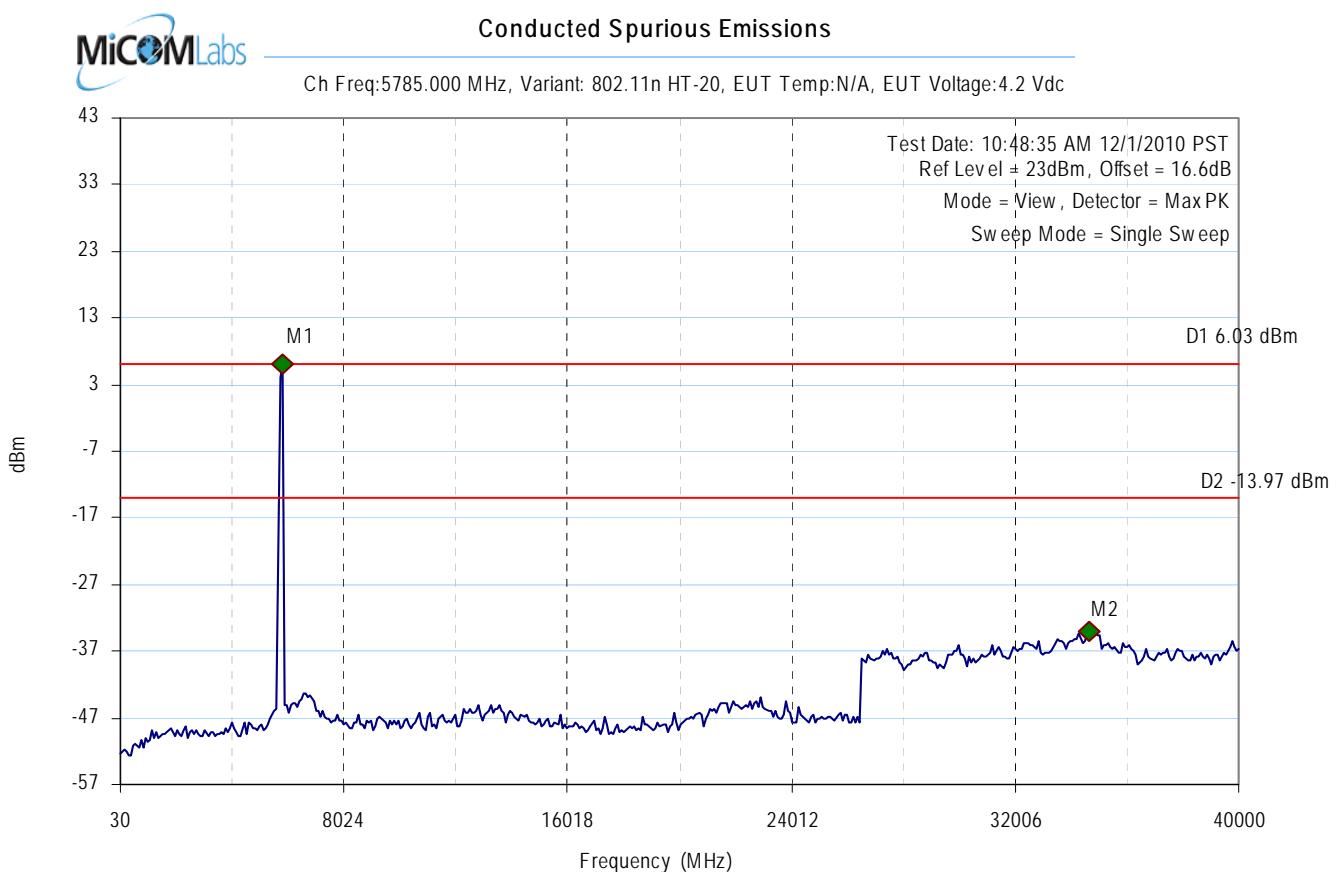
**Test Results**

Center frequency = 5745MHz

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**Analyser Setup**

RBW = 100.00KHz  
VBW = 300.00KHz  
Sweep time(s) = 60  
RF Alten (dB) = 10  
Span = 39.97GHz

**Marker : Frequency : Amplitude**

M1 : 5797.214429MHz : 6.030dBm  
M2 : 34633.286573MHz : -34.173dBm

**Test Results**

Center frequency = 5785MHz

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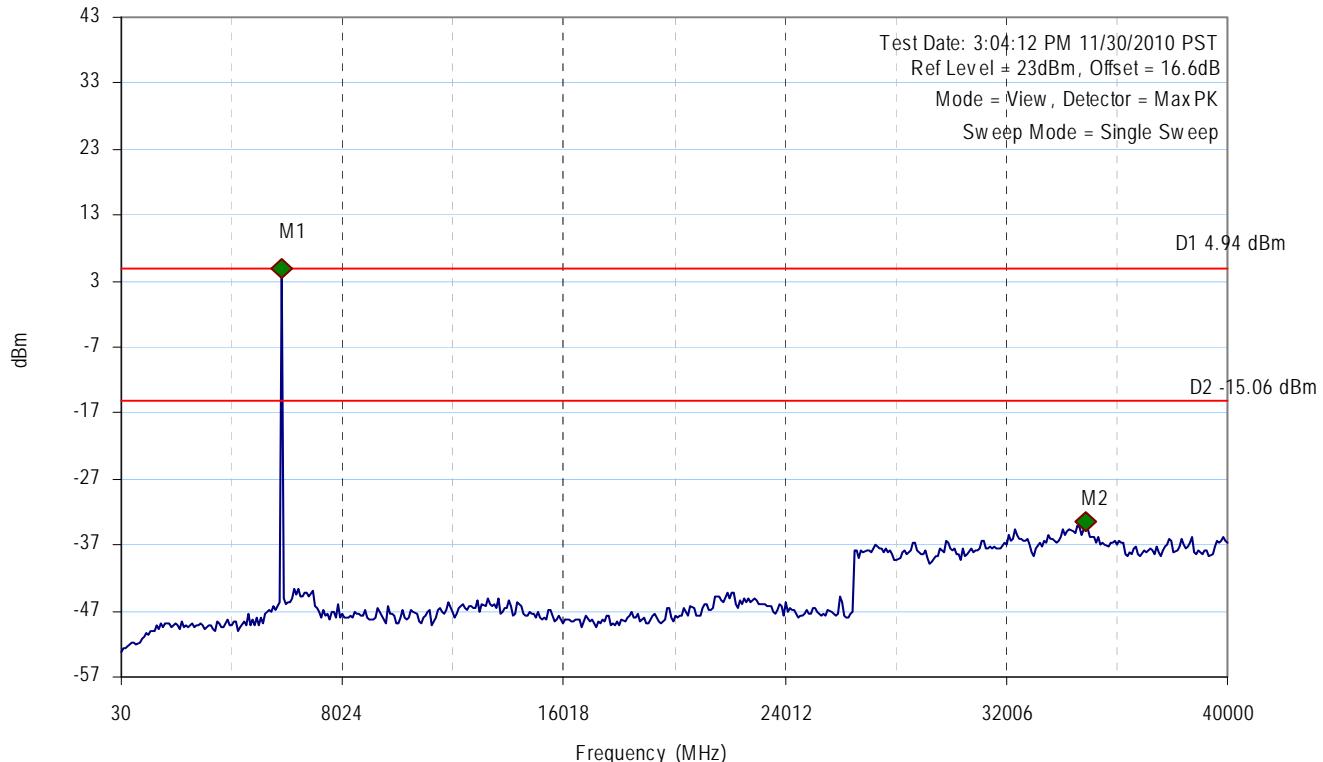


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### Conducted Spurious Emissions

Ch Freq:5825.000 MHz, Variant: 802.11n HT-20, EUT Temp:N/A, EUT Voltage:4.2 Vdc



#### Analyser Setup

RBW = 100.00KHz  
VBW = 300.00KHz  
Sweep time(s) = 60  
RF Atten (dB) = 10  
Span = 39.97GHz

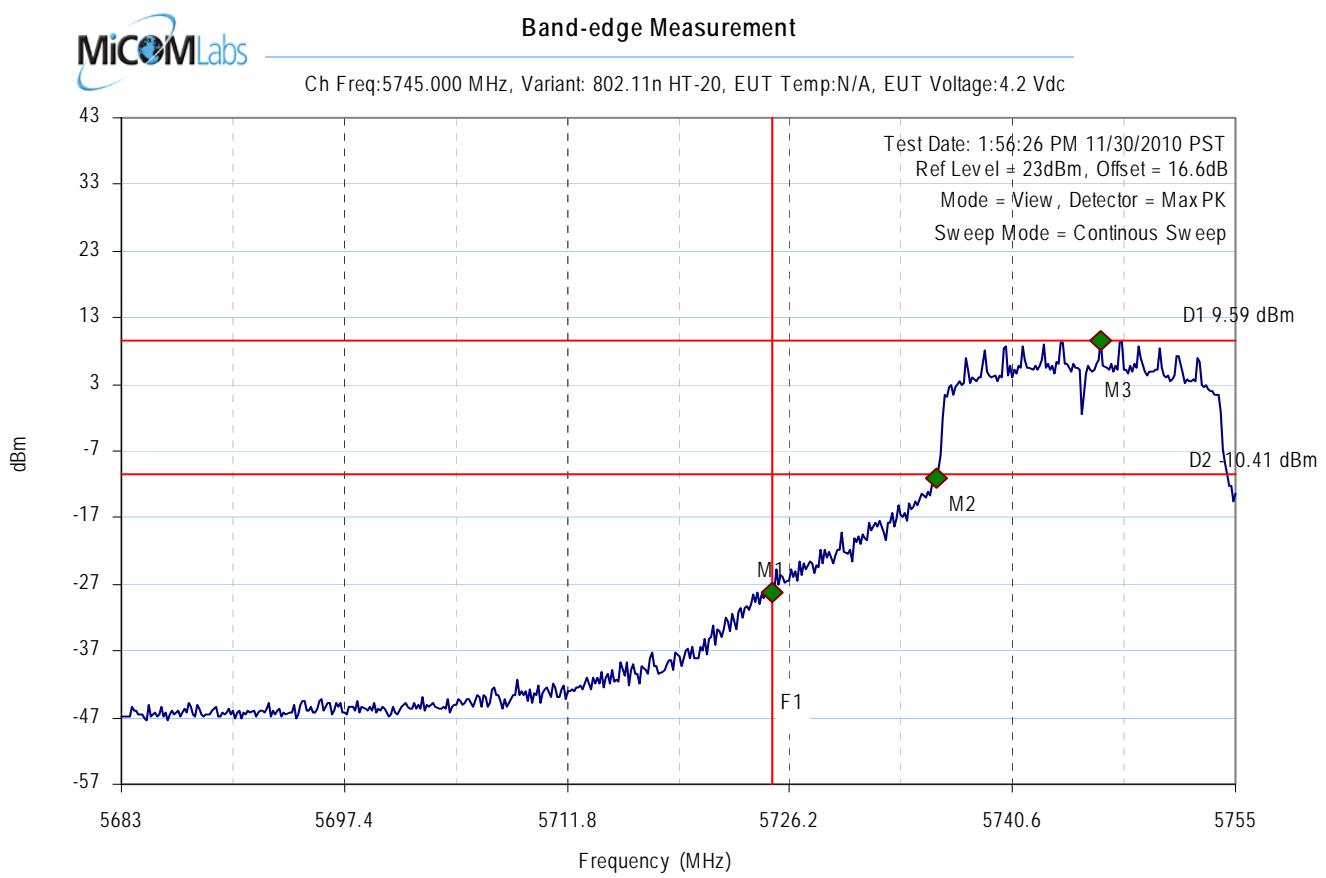
#### Marker : Frequency : Amplitude

M1 : 5797.214429MHz : 4.938dBm  
M2 : 34873.587174MHz : -33.347dBm

#### Test Results

Center frequency = 5825MHz

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**Analyser Setup**

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 20  
 RF Atten (dB) = 10  
 Span = 72.00MHz

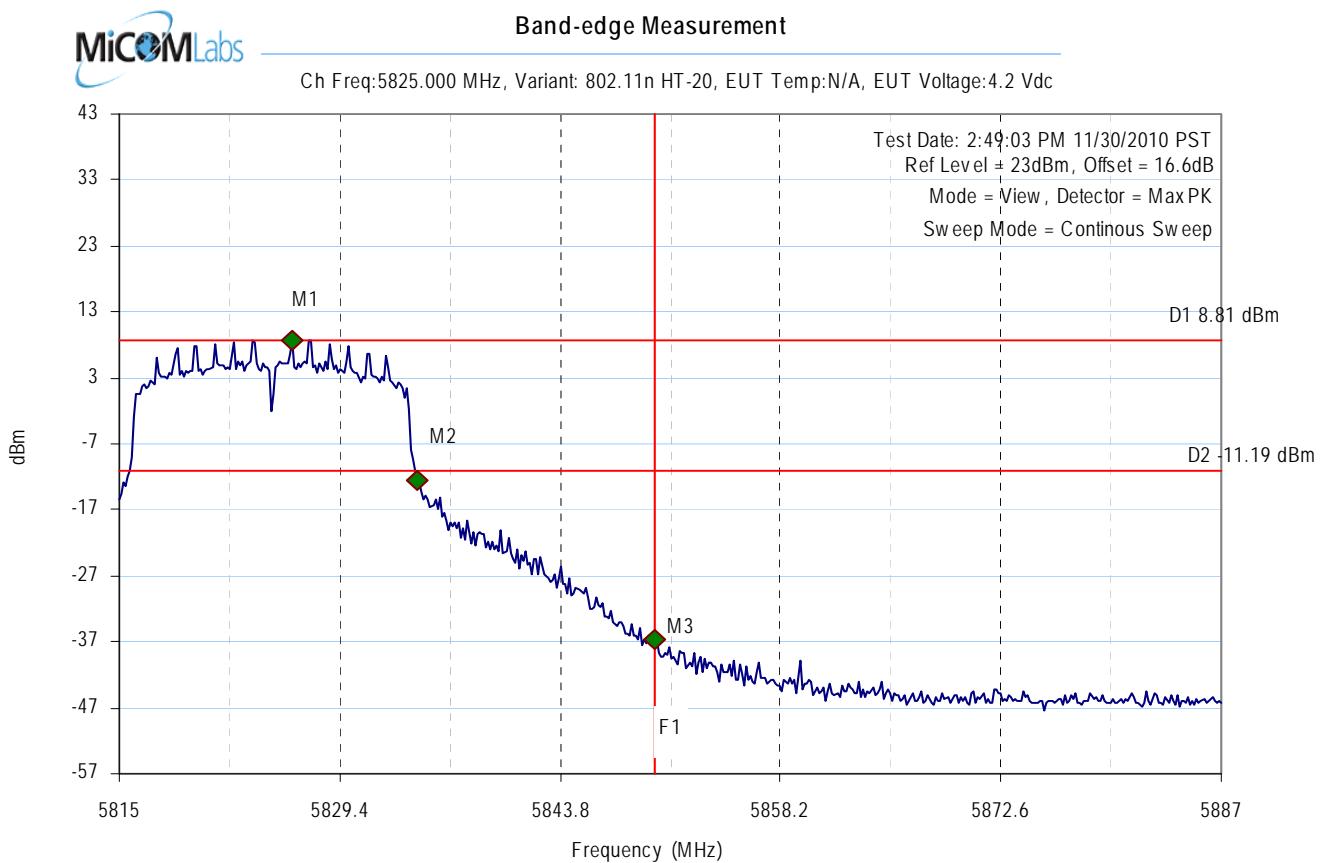
**Marker : Frequency : Amplitude**

M1 : 5725.000000MHz : -28.161dBm  
 M2 : 5735.665331MHz : -11.037dBm  
 M3 : 5746.342685MHz : 9.594dBm

**Test Results**

Center frequency = 5745MHz

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**Analyser Setup**

RBW = 100.00KHz  
 VBW = 300.00KHz  
 Sweep time(s) = 20  
 RF Atten (dB) = 10  
 Span = 72.00MHz

**Marker : Frequency : Amplitude**

M1 : 5826.254509MHz : 8.813dBm  
 M2 : 5834.478958MHz : -12.538dBm  
 M3 : 5850.000000MHz : -36.715dBm

**Test Results**

Center frequency = 5825MHz

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## 7.6 Radiated Spurious Emissions

### Test Procedure

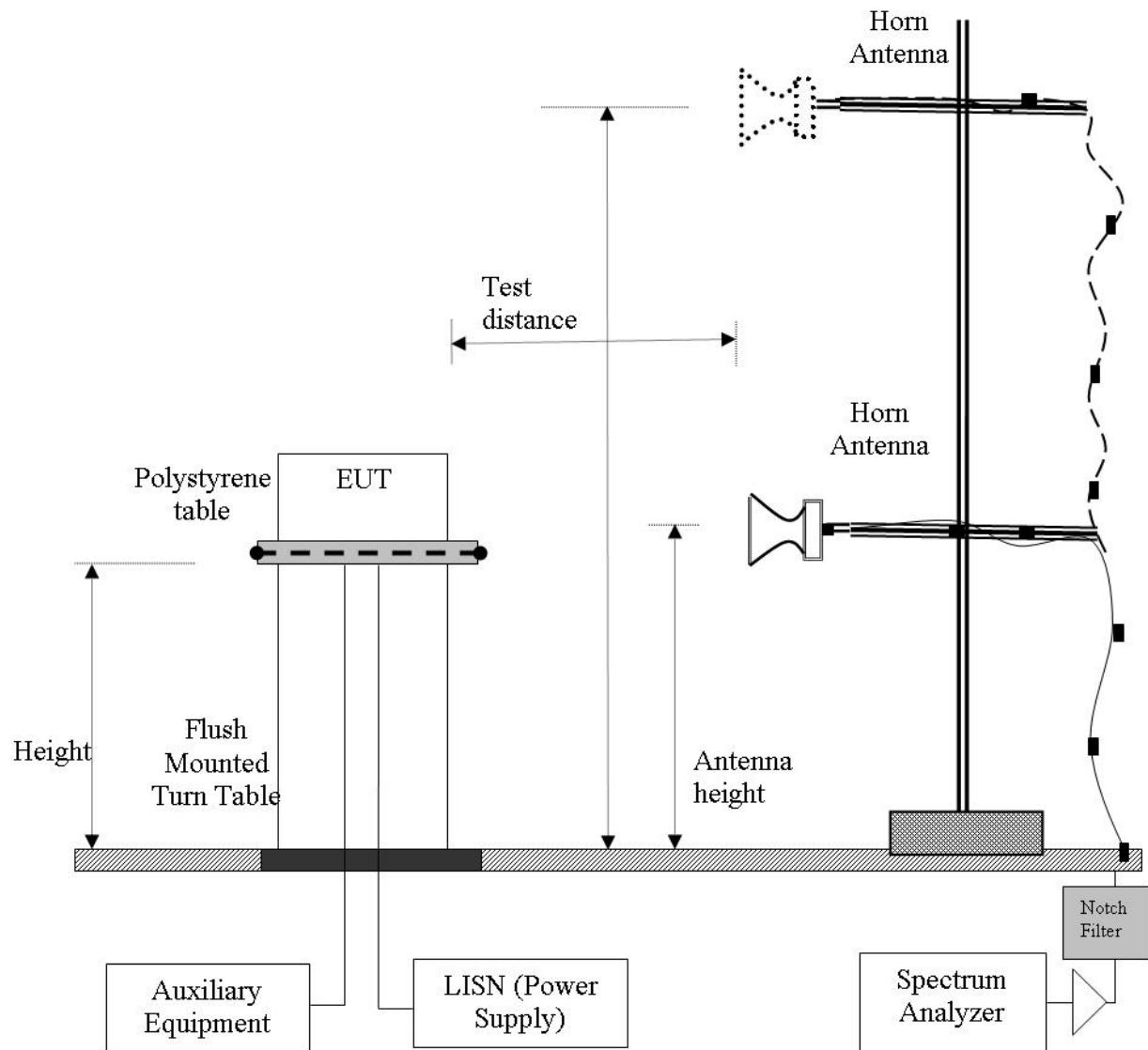
Testing was performed in a 3-meter anechoic chamber. Preliminary radiated emissions were measured on every azimuth and with the receiving antenna in both horizontal and vertical polarizations. Preliminary emissions were recorded with in Spectrum Analyzer mode, using a maximum peak detector while in peak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

---

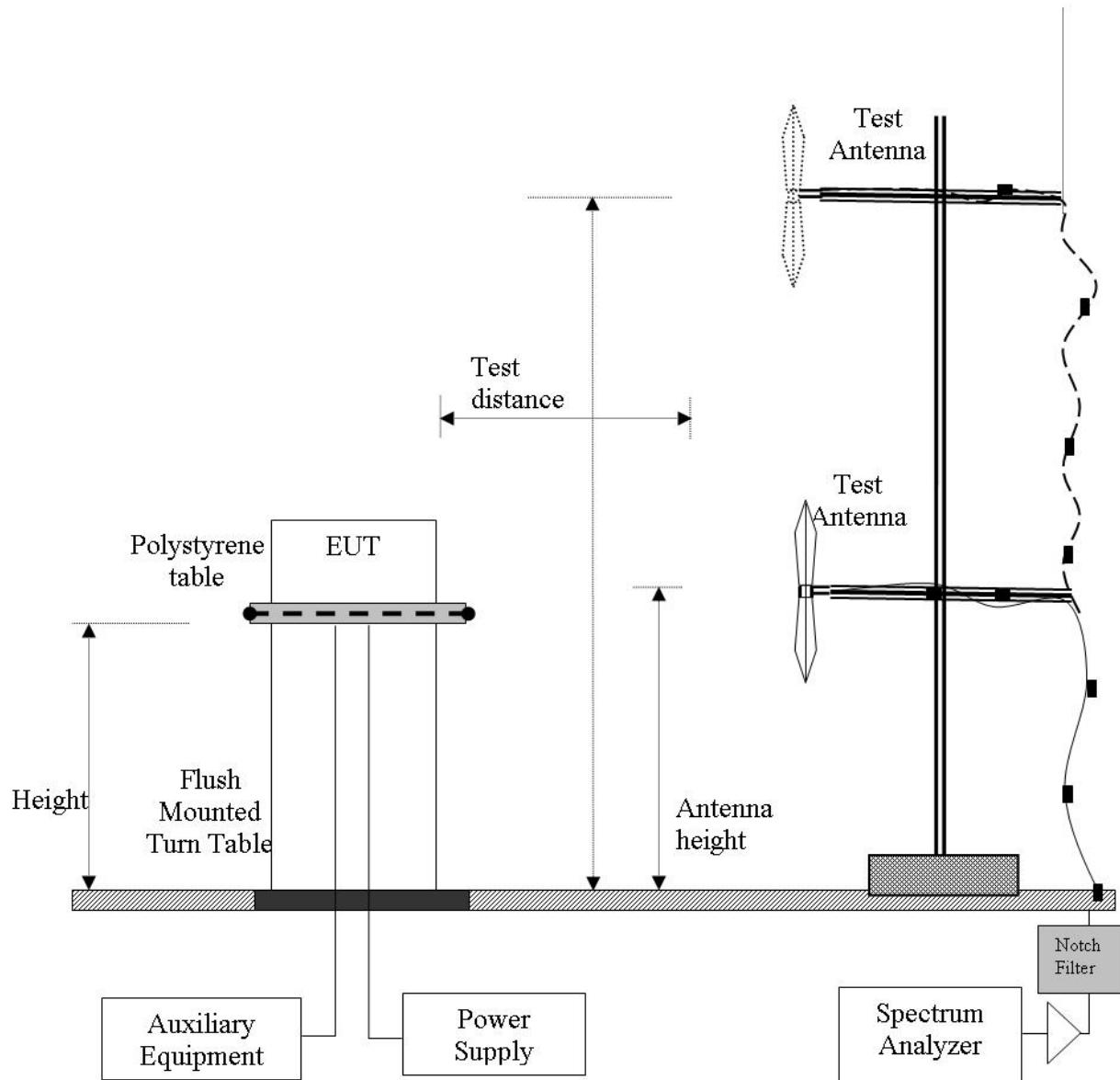
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### Radiated Emission Measurement Setup – Above 1 GHz



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### 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.

$$\mathbf{FS = R + AF + CORR - FO}$$

FS = Field Strength

R = Measured Spectrum analyzer Input Amplitude

AF = Antenna Factor

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

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:

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

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

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

$$40\ dB\mu V/m = 100\ \mu V/m$$

$$48\ dB\mu V/m = 250\ \mu V/m$$

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## 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)).

**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 ( $\mu\text{V/m}$ )	Field Strength ( $\text{dB}\mu\text{V/m}$ )	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 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
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### Traceability:

<b>Method</b>	<b>Test Equipment Used</b>
Work instruction WI-03	0287, 0193, 0342, 0158, 0303, 0304, 0134, 0310, 0312

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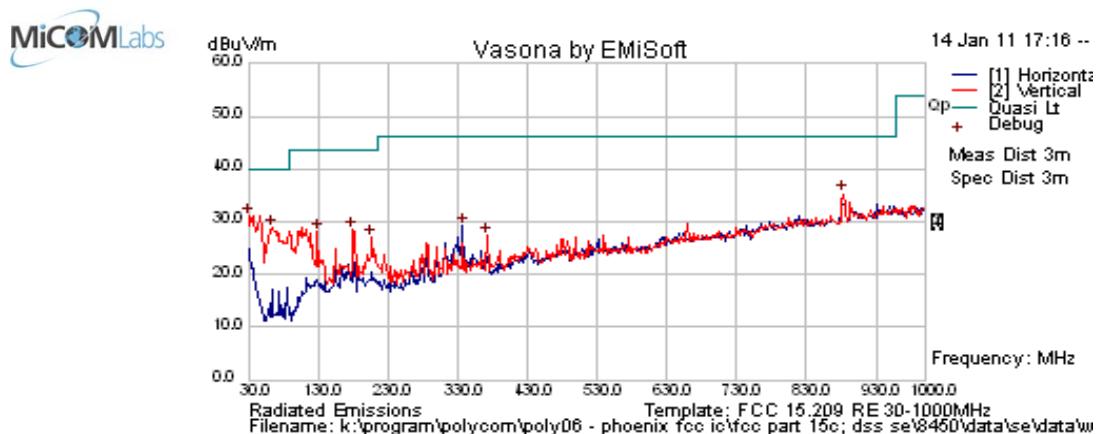


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### 7.6.1 Transmitter Radiated Spurious Emissions

All frequencies and modes were checked per 15.247 for radio emissions below 1GHz.

Test Freq.	N/A	Engineer	EVF
Variant	WLAN: 802.11a, b, g, n HT-20	Temp (°C)	21
Freq. Range	30 - 1000 MHz	Rel. Hum. (%)	44
Power Setting	Utility Setting 24 - Maximum	Press. (mBars)	1013
Antenna	Integral	Duty Cycle (%)	10
Test Notes 1	Fundamental attenuated by band-stop filter. Handset (Model: 8450) with battery (SN: AC1010320232) , also connected to charger (Model: SA106B-05)		
Test Notes 2	Mode: WLAN Tx; 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
30.000	36.9	3.4	-9.2	31.1	Peak [Scan]	V	100	0	40.0	-8.9	Pass	DIG
883.366733	35.2	7.3	-7.3	35.2	Peak [Scan]	V	400	0	46.0	-10.8	Pass	AMB
63.653	48.3	3.9	-23.3	28.9	Peak [Scan]	V	100	0	40	-11.1	Pass	DIG
179.997	43.5	4.7	-19.7	28.4	Peak [Scan]	V	100	0	43.5	-15.1	Pass	DIG
130.000	40.9	4.4	-17.2	28.1	Peak [Scan]	V	100	0	43.5	-15.5	Pass	DIG
208.004	41.7	4.8	-19.6	27.0	Peak [Scan]	V	100	0	43.5	-16.5	Pass	DIG
337.992	40.0	5.4	-16.2	29.2	Peak [Scan]	H	100	0	46	-16.8	Pass	DIG
372.266	37.1	5.6	-15.3	27.4	Peak [Scan]	V	300	0	46	-18.6	Pass	DIG

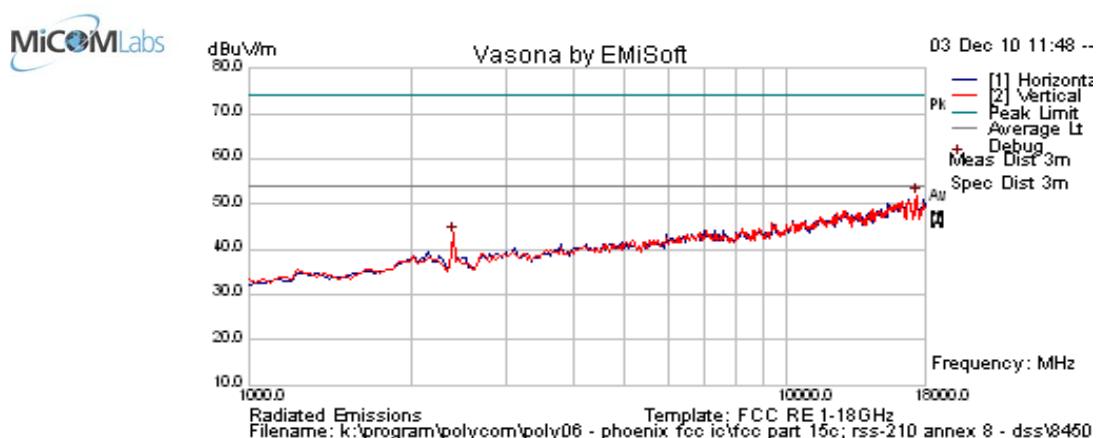
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; AMB=Ambient Emission  
NRB = Non-Restricted Band. RB = Restricted Band.

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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 (Model: 8450) with battery (SN: AC101032008E), also connected to charger (Model: SA106B-05)		
<b>Test Notes 2</b>	Mode: WLAN Channel 01 Transmit; WLAN=1, BT=0, BC=0, DK=0		



#### Formally measured emission peaks

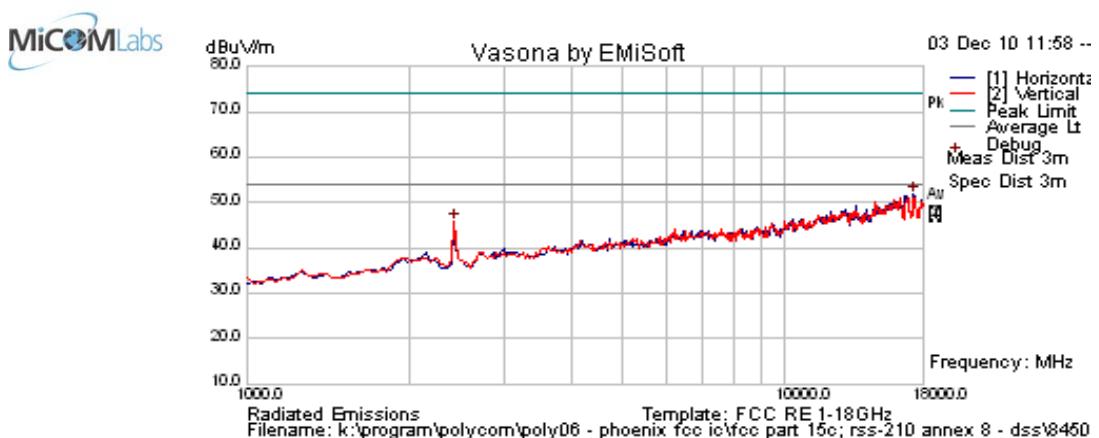
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
No radio emissions within 6dB of limit.												
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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<b>Test Freq.</b>	2437 MHz	<b>Engineer</b>	EVF
<b>Variant</b>	802.11b; 1 Mbps	<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 (Model: 8450) with battery (SN: AC101032008E), also connected to charger (Model: SA106B-05)		
<b>Test Notes 2</b>	Mode: WLAN Channel 06 Transmit; WLAN=1, BT=0, BC=0, DK=0		



#### Formally measured emission peaks

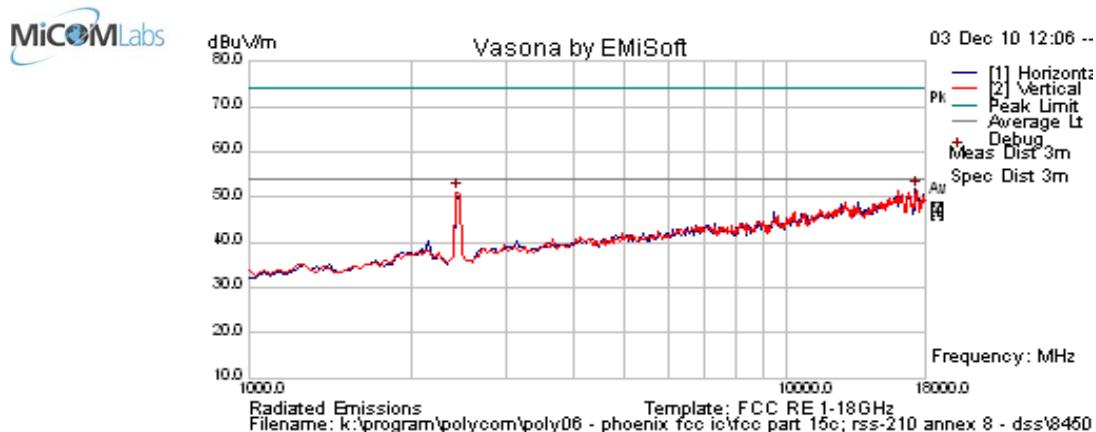
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
No radio emissions within 6dB of limit.												
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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<b>Test Freq.</b>	2462 MHz	<b>Engineer</b>	EVF
<b>Variant</b>	802.11b; 1 Mbps	<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 (Model: 8450) with battery (SN: AC101032008E), also connected to charger (Model: SA106B-05)		
<b>Test Notes 2</b>	Mode: WLAN Channel 11 Transmit; WLAN=1, BT=0, BC=0, DK=0		



#### Formally measured emission peaks

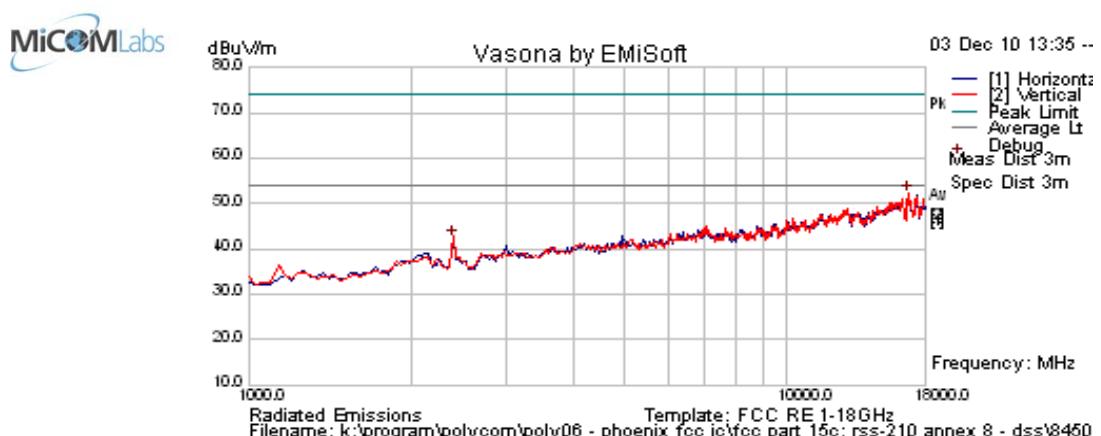
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
No radio emissions within 6dB of limit.												
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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<b>Test Freq.</b>	2412 MHz	<b>Engineer</b>	EVF
<b>Variant</b>	802.11g; 6 Mbs	<b>Temp (°C)</b>	21
<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 (Model: 8450) with battery (SN: AC101032008E), also connected to charger (Model: SA106B-05)		
<b>Test Notes 2</b>	Mode: WLAN Channel 01 Transmit; WLAN=1, BT=0, BC=0, DK=0		



#### Formally measured emission peaks

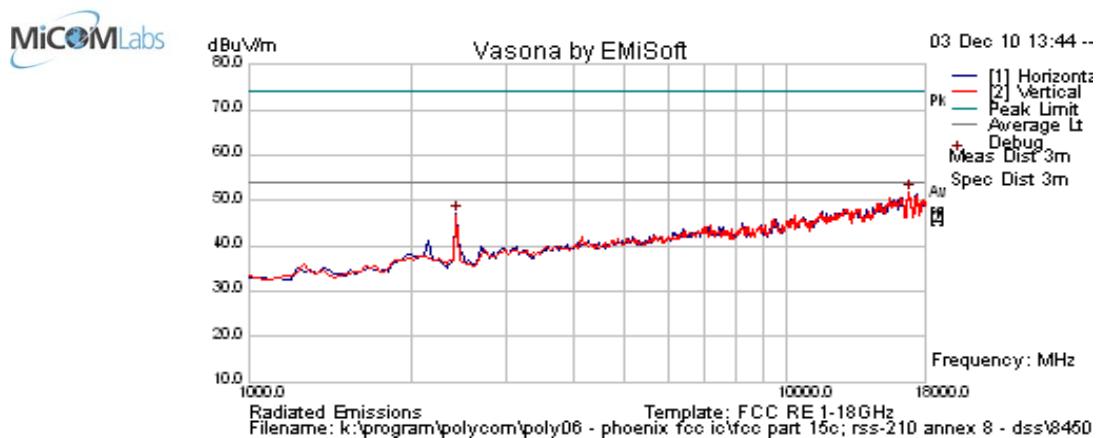
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
No radio emissions within 6dB of limit.												
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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<b>Test Freq.</b>	2437 MHz	<b>Engineer</b>	EVF
<b>Variant</b>	802.11g; 6 Mbs	<b>Temp (°C)</b>	21
<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 (Model: 8450) with battery (SN: AC101032008E), also connected to charger (Model: SA106B-05)		
<b>Test Notes 2</b>	Mode: WLAN Channel 06 Transmit; WLAN=1, BT=0, BC=0, DK=0		



#### Formally measured emission peaks

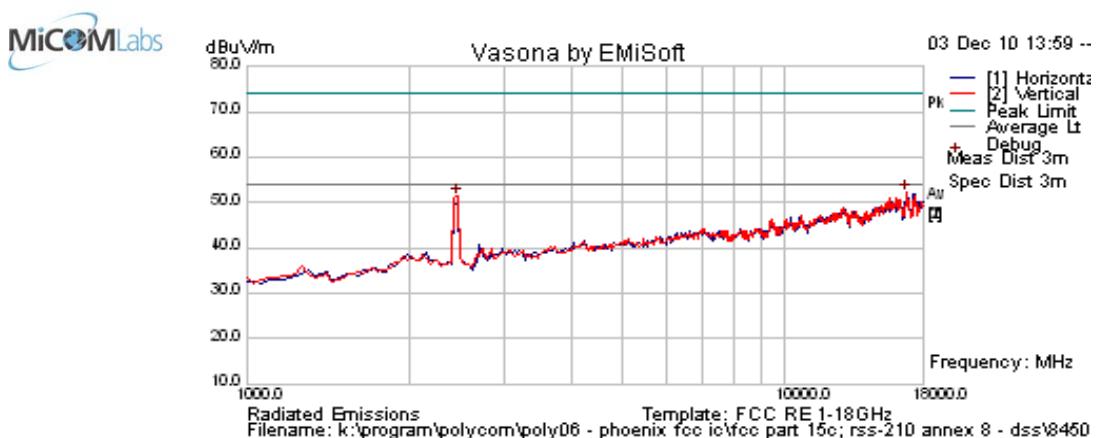
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
No radio emissions within 6dB of limit.												
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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**Title:** Polycom Spectralink 8450 Wi-Fi handset with Bluetooth  
**To:** FCC 47 CFR 15.247 & RSS-210 A8  
**Serial #:** POLY06-U8a Rev A  
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<b>Test Freq.</b>	2462 MHz	<b>Engineer</b>	EVF
<b>Variant</b>	802.11g; 6 Mbs	<b>Temp (°C)</b>	21
<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 (Model: 8450) with battery (SN: AC101032008E), also connected to charger (Model: SA106B-05)		
<b>Test Notes 2</b>	Mode: WLAN Channel 11 Transmit; WLAN=1, BT=0, BC=0, DK=0		



#### Formally measured emission peaks

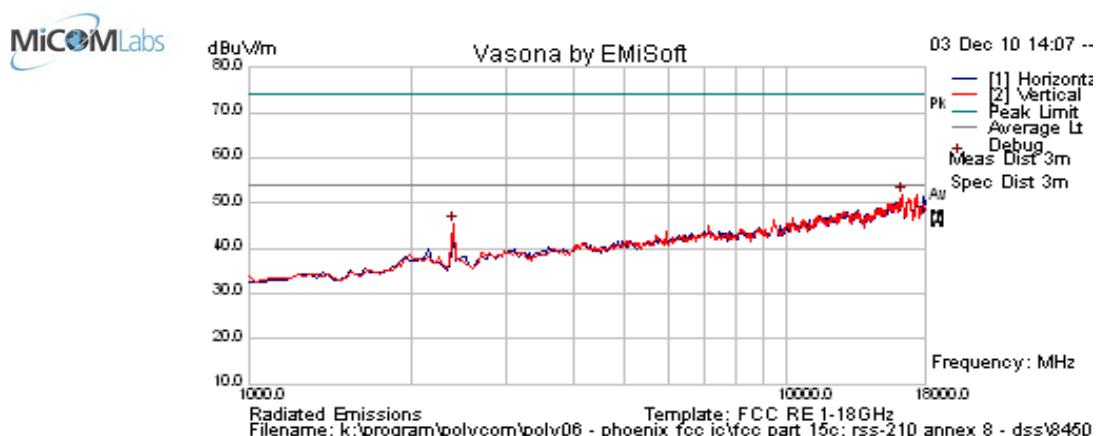
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
No radio emissions within 6dB of limit.												
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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**To:** FCC 47 CFR 15.247 & RSS-210 A8  
**Serial #:** POLY06-U8a Rev A  
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<b>Test Freq.</b>	2412 MHz	<b>Engineer</b>	EVF
<b>Variant</b>	802.11n; HT-20; 6.5 MCS	<b>Temp (°C)</b>	21
<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 (Model: 8450) with battery (SN: AC101032008E), also connected to charger (Model: SA106B-05)		
<b>Test Notes 2</b>	Mode: WLAN Channel 01 Transmit; WLAN=1, BT=0, BC=0, DK=0		



#### Formally measured emission peaks

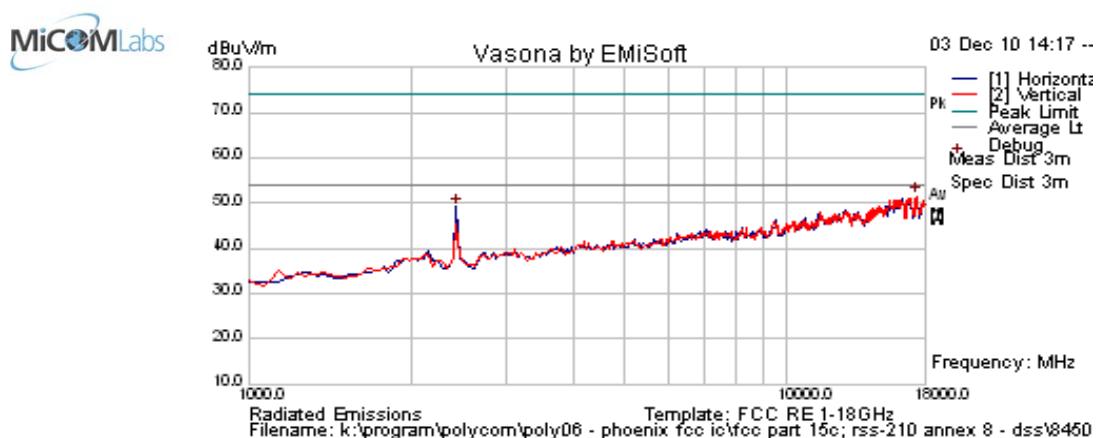
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
No radio emissions within 6dB of limit.												
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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**To:** FCC 47 CFR 15.247 & RSS-210 A8  
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<b>Test Freq.</b>	2437 MHz	<b>Engineer</b>	EVF
<b>Variant</b>	802.11n; HT-20; 6.5 MCS	<b>Temp (°C)</b>	21
<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 (Model: 8450) with battery (SN: AC101032008E), also connected to charger (Model: SA106B-05)		
<b>Test Notes 2</b>	Mode: WLAN Channel 06 Transmit; WLAN=1, BT=0, BC=0, DK=0		



#### Formally measured emission peaks

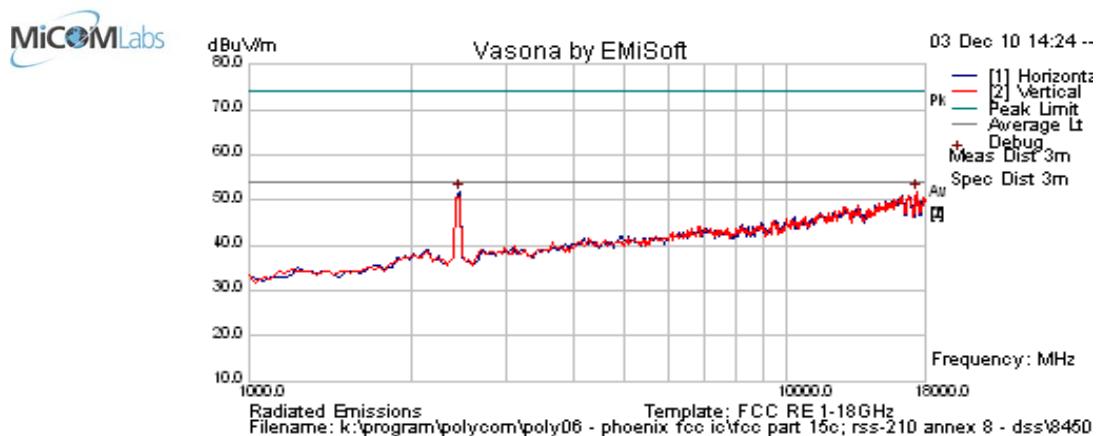
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
No radio emissions within 6dB of limit.												
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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<b>Test Freq.</b>	2462 MHz	<b>Engineer</b>	EVF
<b>Variant</b>	802.11n; HT-20; 6.5 MCS	<b>Temp (°C)</b>	21
<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 (Model: 8450) with battery (SN: AC101032008E), also connected to charger (Model: SA106B-05)		
<b>Test Notes 2</b>	Mode: WLAN Channel 11 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
No radio emissions within 6dB of limit.												
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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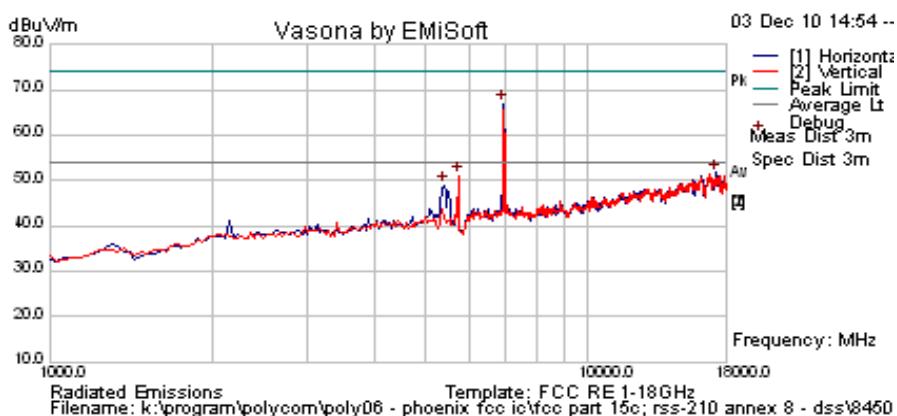


**Title:** Polycom Spectralink 8450 Wi-Fi handset with Bluetooth  
**To:** FCC 47 CFR 15.247 & RSS-210 A8  
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<b>Test Freq.</b>	5745 MHz	<b>Engineer</b>	EVF
<b>Variant</b>	802.11a; 6 Mbs	<b>Temp (°C)</b>	21.4
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<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 (Model: 8450) with battery (SN: AC101032008E), also connected to charger (Model: SA106B-05)		
<b>Test Notes 2</b>	Mode: WLAN Channel 149 Transmit; WLAN=1, BT=0, BC=0, DK=0		



IMG



#### 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
6971.022	57.7	5.4	-5.2	57.8	Peak Max	H	98	165	74	-16.2	Pass	NRB
6971.022	35.1	5.4	-5.2	35.3	Average Max	H	98	165	54	-18.7	Pass	NRB
17250.501	41.4	8.6	1.6	51.7	Peak [Scan]	H	100	0	54	-2.3	Pass	noise floor
5735.471	54.7	4.8	-8.2	51.2	Peak [Scan]	H	150	0	54	-2.8	Pass	FUND
5394.790	53.7	4.6	-9.3	49.1	Peak [Scan]	H	100	0	54	-4.9	Pass	RB see band edge

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

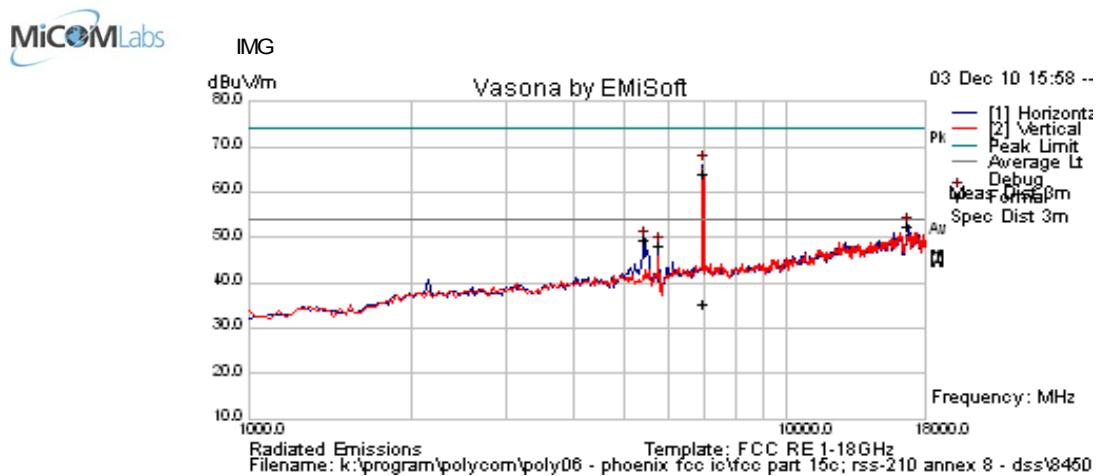
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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**To:** FCC 47 CFR 15.247 & RSS-210 A8  
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<b>Test Freq.</b>	5785 MHz	<b>Engineer</b>	EVF
<b>Variant</b>	802.11a; 6 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 (Model: 8450) with battery (SN: AC101032008E), also connected to charger (Model: SA106B-05)		
<b>Test Notes 2</b>	Mode: WLAN Channel 157 Transmit; WLAN=1, BT=0, BC=0, DK=0		



#### Formally measured emission peaks

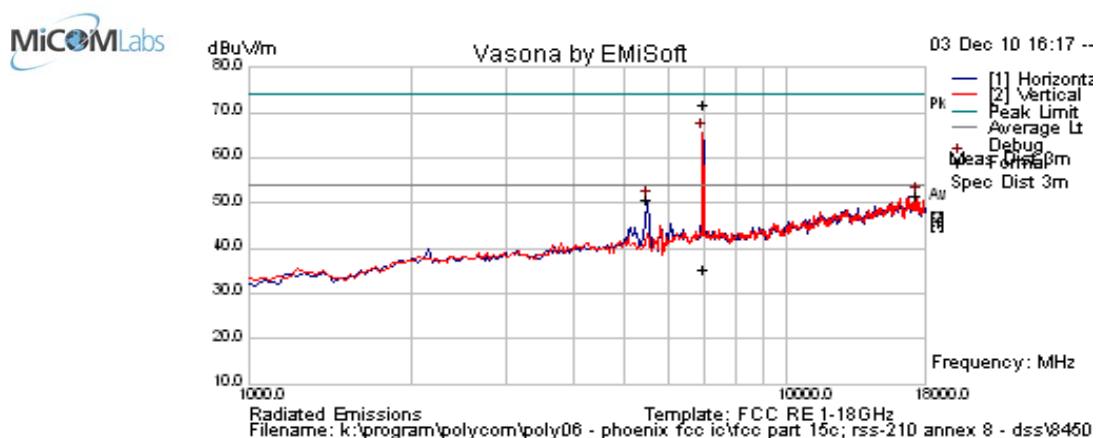
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
6971.543	64.1	5.4	-5.2	64.3	Peak Max	H	165	0	74.0	-9.8	Pass	NRB
6971.543	35.1	5.4	-5.2	35.3	Average Max	H	165	0	54.0	-18.7	Pass	NRB
16807.615	42.4	8.6	1.6	52.6	Peak [Scan]	H	100	0	54	-1.4	Pass	noise floor
5428.858	54.2	4.6	-9.2	49.6	Peak [Scan]	H	100	0	54	-4.4	Pass	RB see band edge
5769.539	51.6	4.8	-8.3	48.1	Peak [Scan]	H	200	0	54	-5.9	Pass	FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak												

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<b>Test Freq.</b>	5825 MHz	<b>Engineer</b>	EVF
<b>Variant</b>	802.11a; 6 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 (Model: 8450) with battery (SN: AC101032008E), also connected to charger (Model: SA106B-05)		
<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

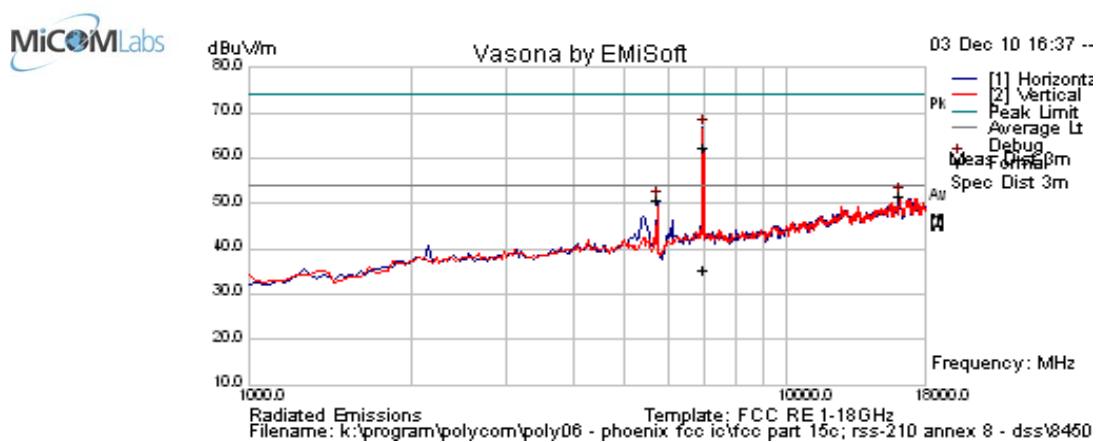
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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<b>Test Freq.</b>	5745 MHz	<b>Engineer</b>	EVF
<b>Variant</b>	802.11n; HT-20; 6.5 MCS	<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 (Model: 8450) with battery (SN: AC101032008E), also connected to charger (Model: SA106B-05)		
<b>Test Notes 2</b>	Mode: WLAN Channel 149 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
6972.826	62.02	5.37	-5.13	62.25	Peak Max	H	125	40	74	-11.75	Pass	NRB
6972.826	35.1	5.37	-5.13	35.34	Average Max	H	125	40	54	-18.66	Pass	NRB
16194.389	41.4	8.9	1.3	51.6	Peak [Scan]	V	150	0	54	-2.4	Pass	noise floor
5735.471	54.2	4.8	-8.2	50.7	Peak [Scan]	H	100	0	54	-3.3	Pass	FUND

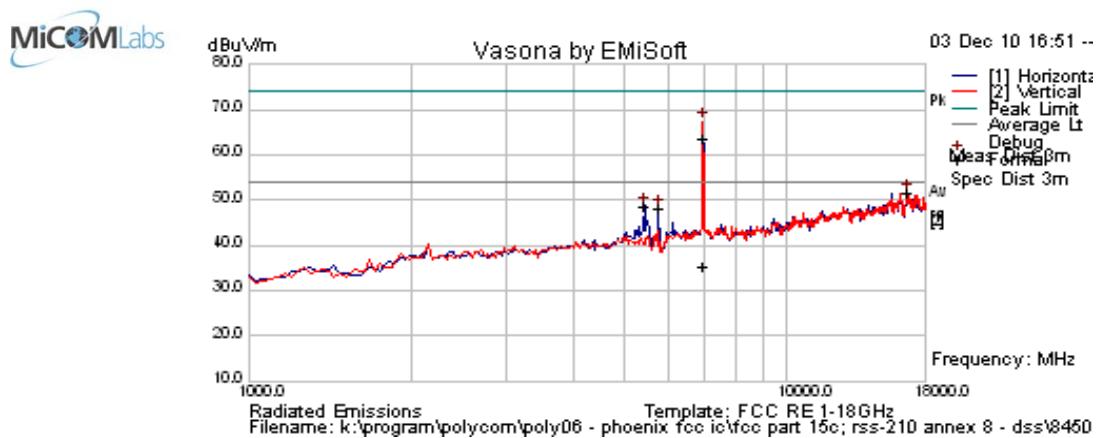
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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<b>Test Freq.</b>	5785 MHz	<b>Engineer</b>	EVF
<b>Variant</b>	802.11n; HT-20; 6.5 MCS	<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 (Model: 8450) with battery (SN: AC101032008E), also connected to charger (Model: SA106B-05)		
<b>Test Notes 2</b>	Mode: WLAN Channel 157 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
6971.002	63.7	5.4	-5.2	63.8	Peak Max	V	194	310	74.0	-10.2	Pass	NRB
6971.00167	35.1	5.4	-5.2	35.3	Average Max	V	194	310	54.0	-18.7	Pass	NRB
16807.615	41.2	8.6	1.6	51.5	Peak [Scan]	V	150	0	54	-2.6	Pass	noise floor
5428.858	53.2	4.6	-9.2	48.6	Peak [Scan]	H	100	0	54	-5.4	Pass	RB see band edge
5769.539	51.9	4.8	-8.3	48.4	Peak [Scan]	H	100	0	54	-5.6	Pass	FUND

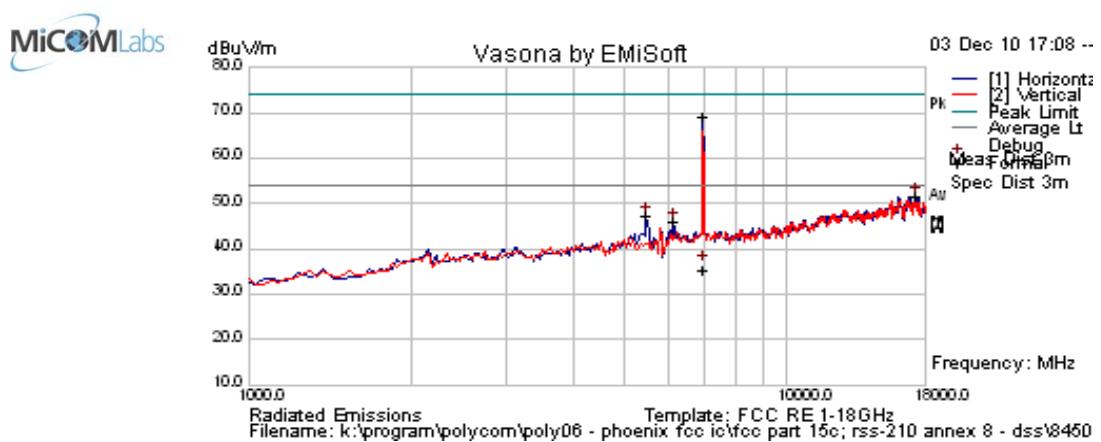
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission  
RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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<b>Test Freq.</b>	5825 MHz	<b>Engineer</b>	EVF
<b>Variant</b>	802.11n; HT-20; 6.5 MCS	<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 (Model: 8450) with battery (SN: AC101032008E), also connected to charger (Model: SA106B-05)		
<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
6971.944	69.0	5.4	-5.2	69.2	Peak Max	V	99	274	74.0	-4.8	Pass	NRB
6971.944	35.1	5.4	-5.2	35.3	Average Max	V	99	274	54.0	-18.7	Pass	NRB
17318.637	41.2	8.7	1.7	51.6	Peak [Scan]	H	100	0	54	-2.4	Pass	noise floor
5469.869	51.8	4.6	-9.1	47.4	Peak [Scan]	V	99	274	54	-6.6	Pass	NRB
6153.002	48.4	5.0	-7.3	46.1	Peak [Scan]	V	99	274	54	-7.9	Pass	NRB

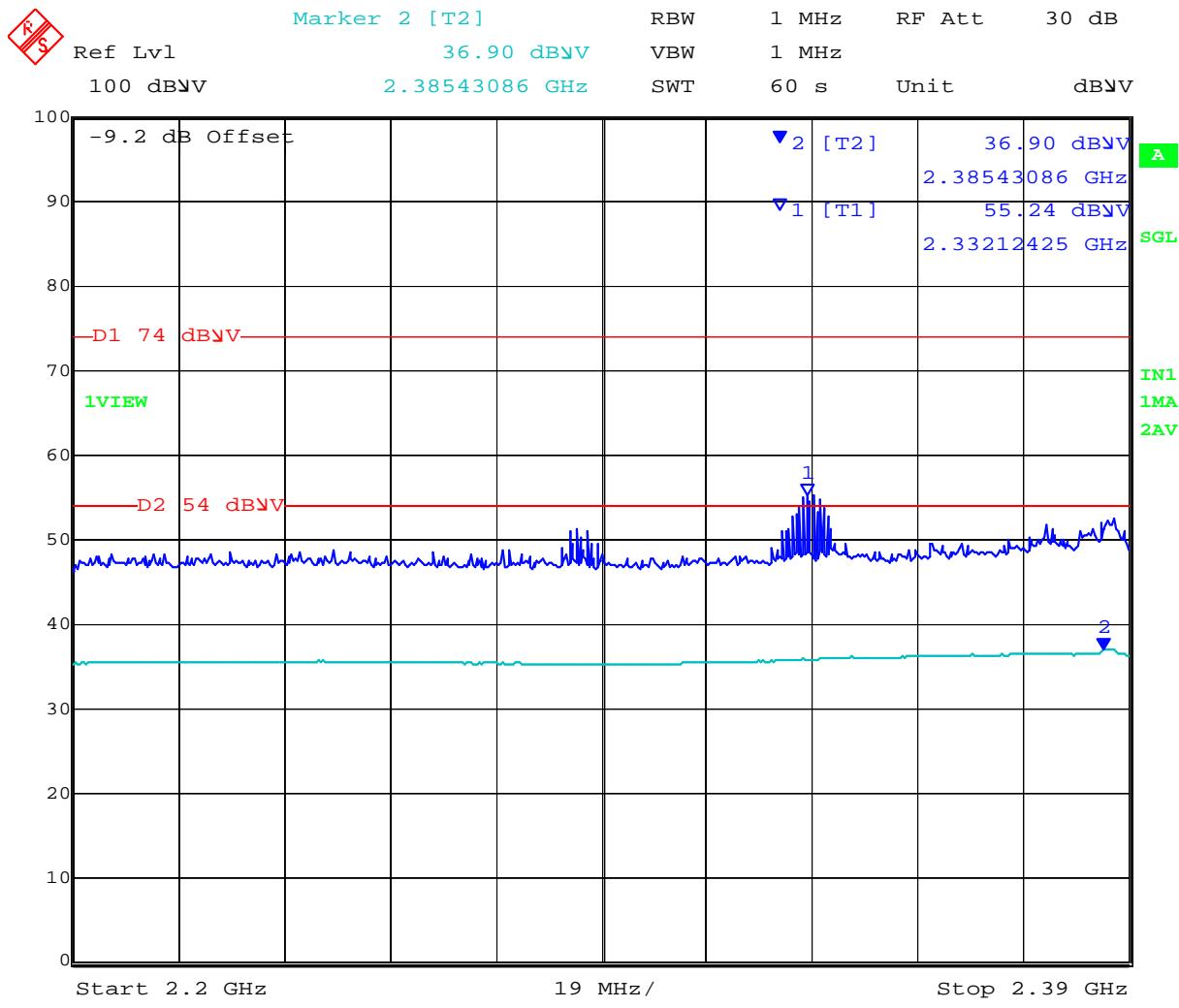
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission

RB = Restricted Band (15.209 Limits); NRB = Non Restricted Band, Limit is 20dB below fundamental peak

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### 7.6.2 Band Edge Measurements

POLY06 Band Edge 2412MHz 802.11b 2200-2390 MHz Pwr=24 Vert. Hg=108 Ang=131



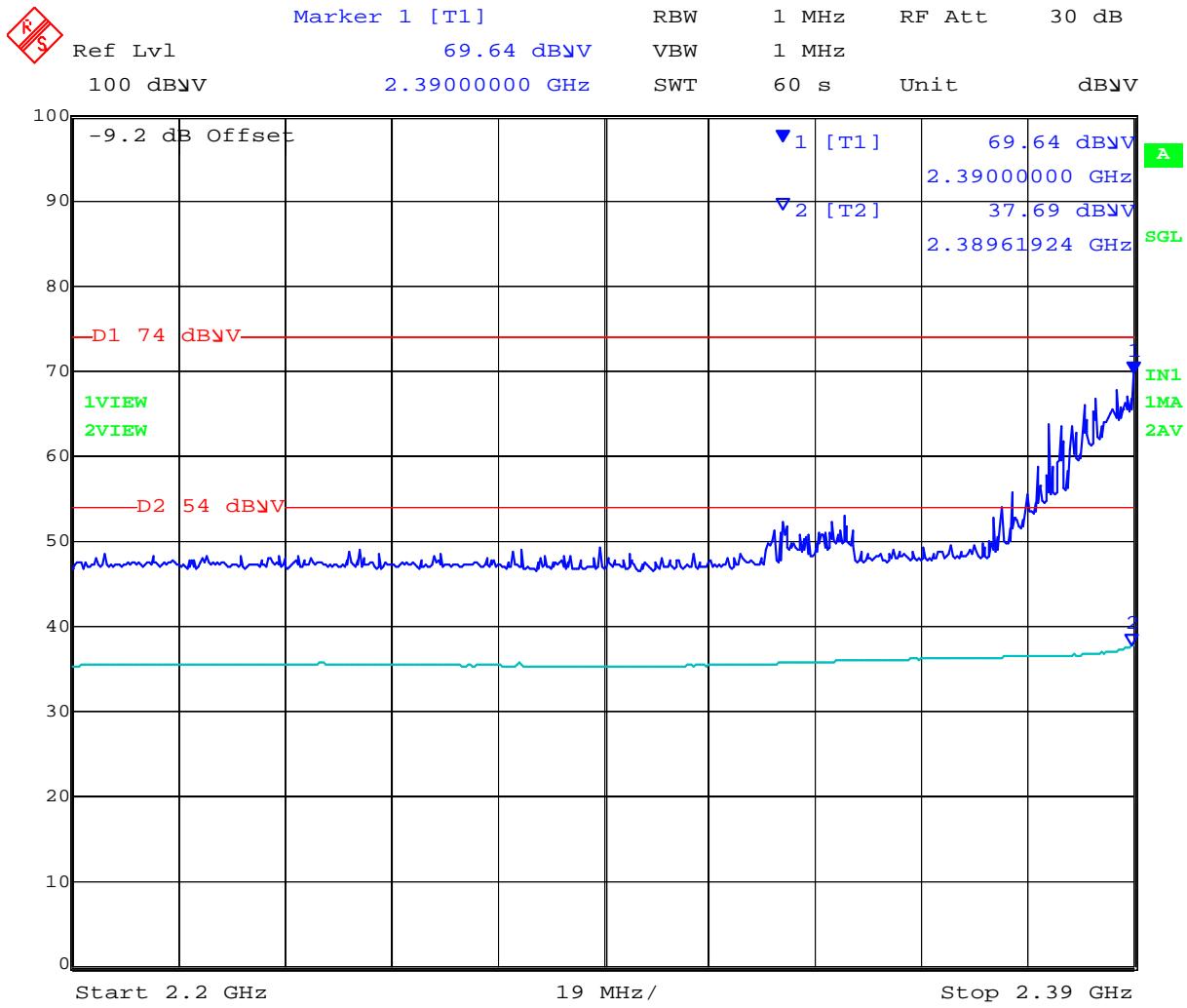
Date: 6.DEC.2010 16:37:31

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POLY06 Band Edge 2412MHz 802.11g 2200-2390 MHz Pwr=24 Vert. Hg=98 Ang=140



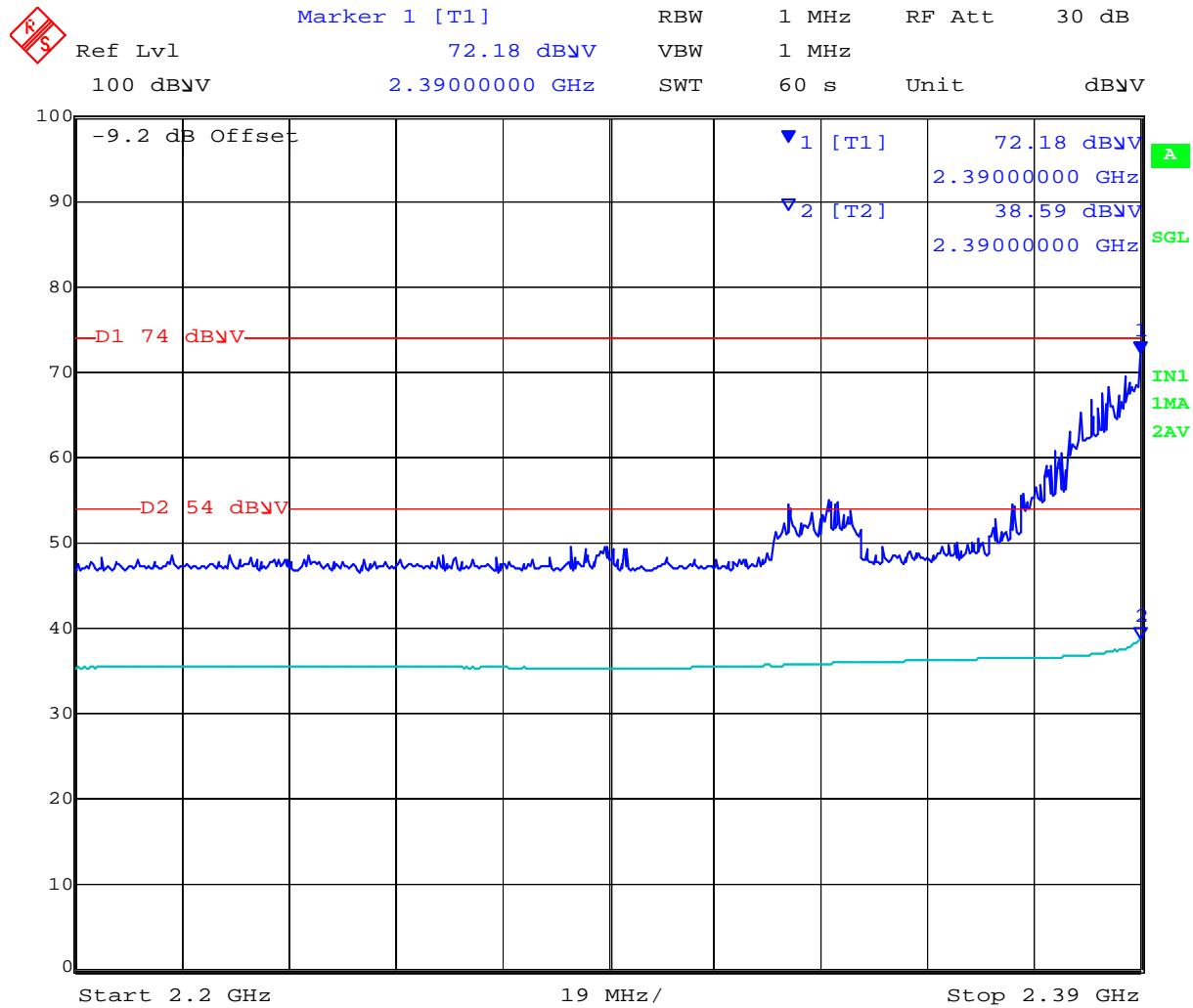
Date: 6.DEC.2010 17:02:20

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POLY06 Band Edge 2412MHz 802.11n HT20 2200-2390 MHz Pwr=24 Vert. Hg=98 Ang=121



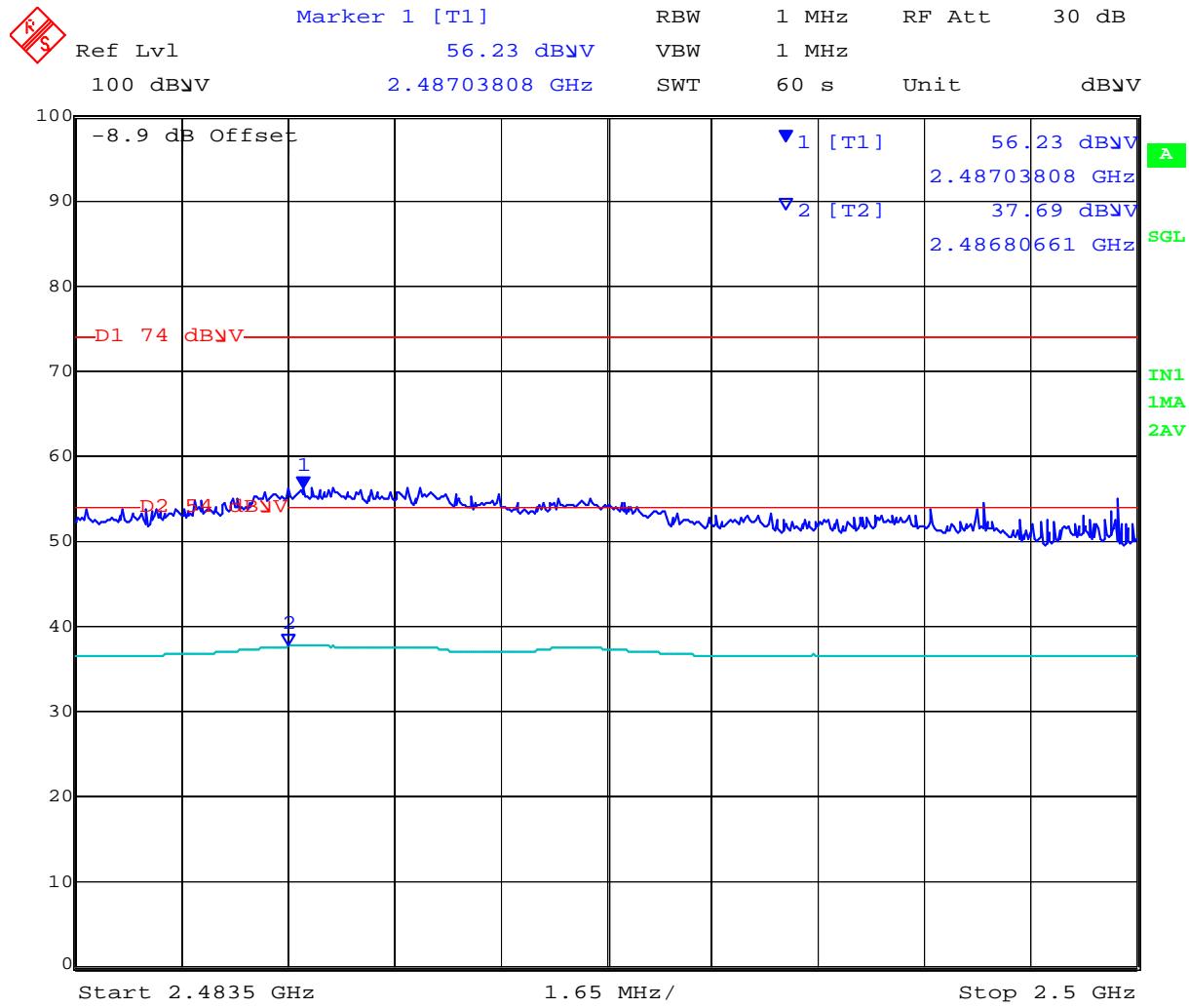
Date: 6.DEC.2010 17:18:18

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**Title:** Polycom Spectralink 8450 Wi-Fi handset with Bluetooth  
**To:** FCC 47 CFR 15.247 & RSS-210 A8  
**Serial #:** POLY06-U8a Rev A  
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POLY06 Band Edge 2462MHz 802.11b 2483.5-2500 MHz Pwr=24 Vert. Hg=98 Ang=100



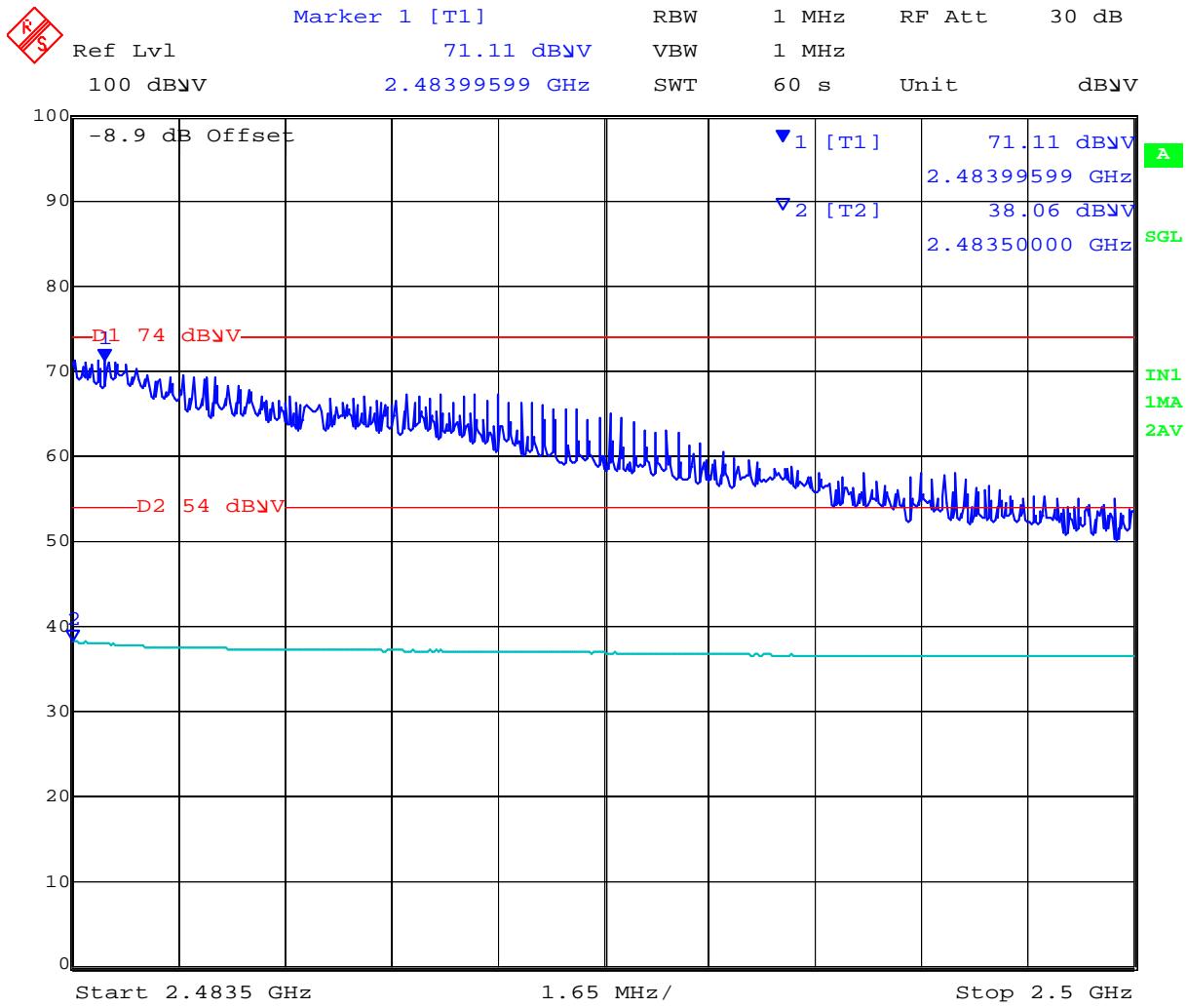
Date: 9.DEC.2010 12:25:56

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**To:** FCC 47 CFR 15.247 & RSS-210 A8  
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POLY06 Band Edge 2462MHz 802.11g 2483.5-2500 MHz Pwr=15 Vert. Hg=98 Ang=104



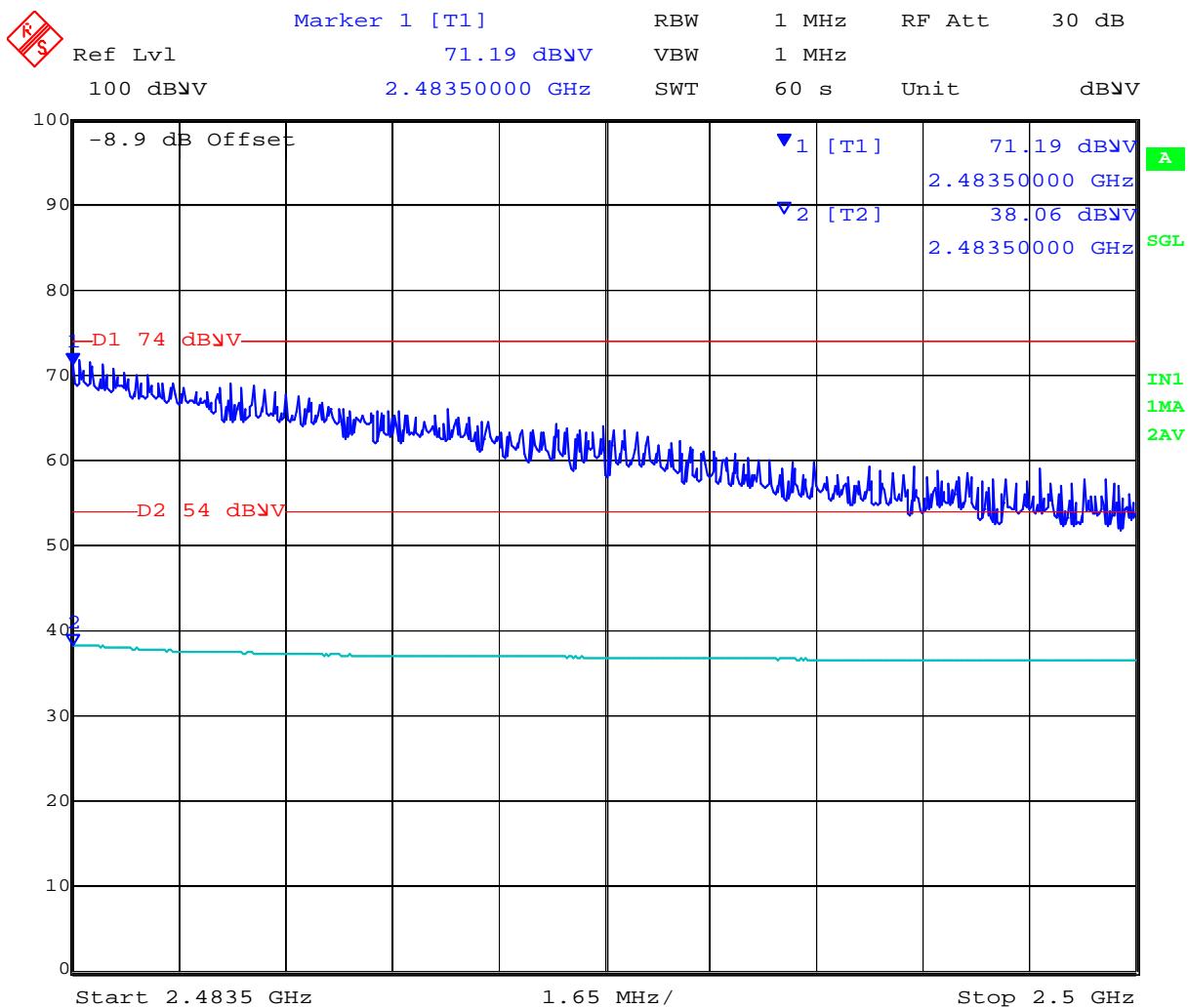
Date: 9.DEC.2010 13:03:47

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**To:** FCC 47 CFR 15.247 & RSS-210 A8  
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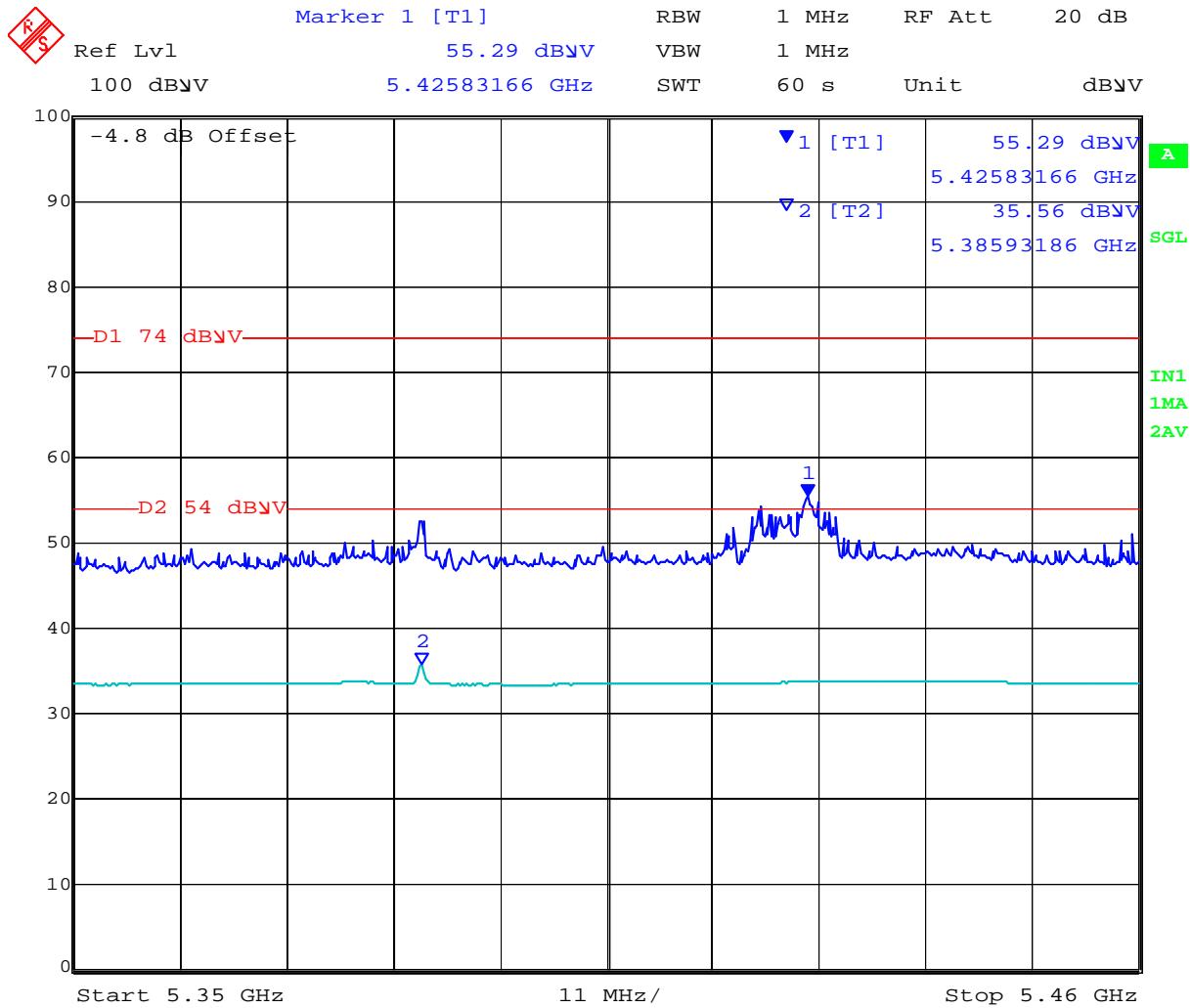
POLY06 Band Edge 2462MHz 802.11n HT20 2483.5-2500 MHz Pwr=15 Vert. Hg=98  
Ang=115



Date: 9.DEC.2010 13:20:11

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POLY06 Band Edge 5745MHz 802.11a 5350-5460 MHz Pwr=24 Hor. Hg=106 Ang=351



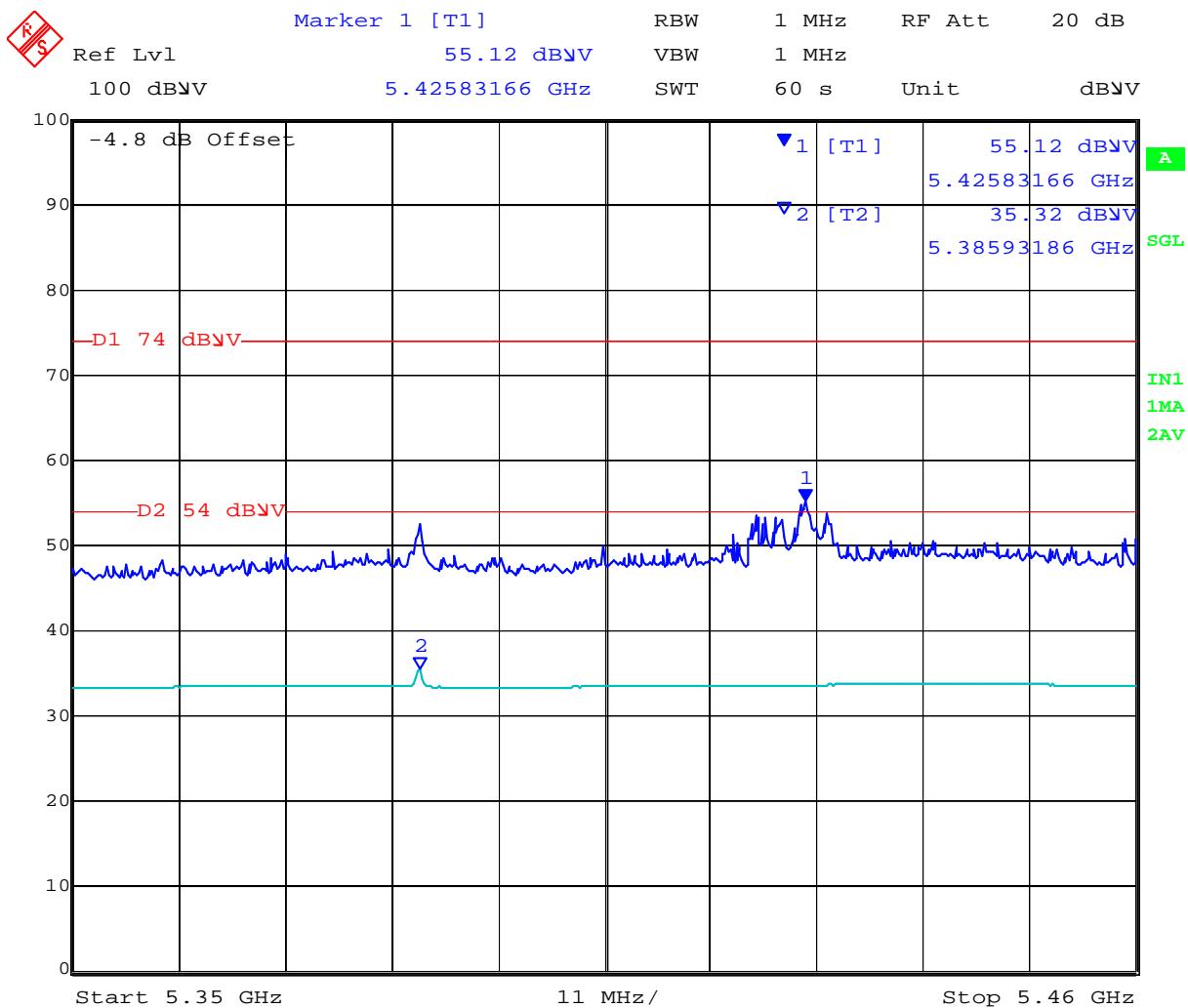
Date: 9.DEC.2010 14:27:54

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POLY06 Band Edge 5745MHz 802.11n HT-20 5350-5460 MHz Pwr=24 Hor. Hg=104  
Ang=348

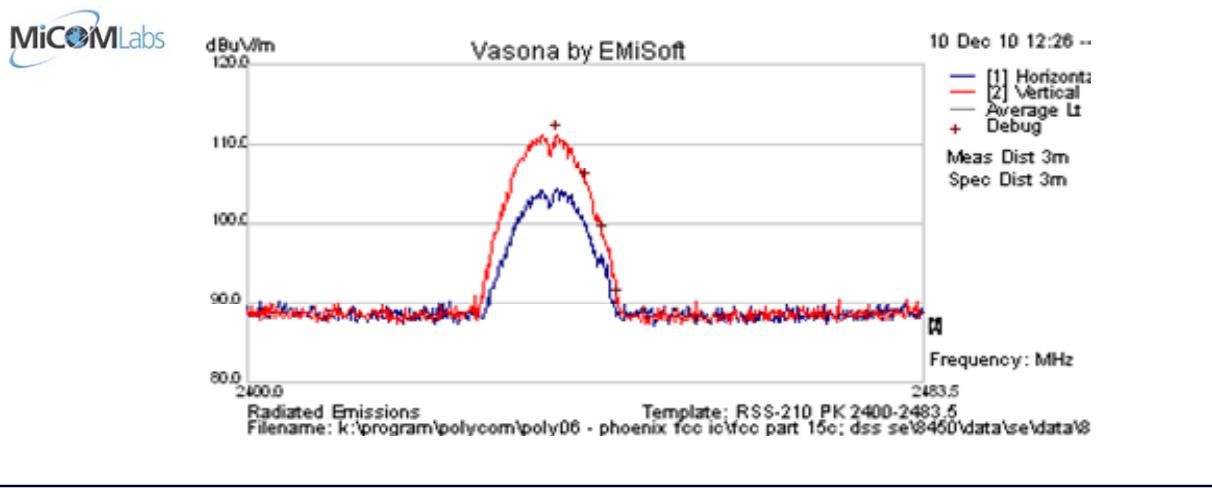


Date: 9.DEC.2010 14:35:49

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### 7.6.3 Peak Emissions

<b>Test Freq.</b>	2437 MHz	<b>Engineer</b>	EVF
<b>Variant</b>	802.11b; 1 Mbs	<b>Temp (°C)</b>	23
<b>Freq. Range</b>	2400 - 2483.5 MHz	<b>Rel. Hum. (%)</b>	48
<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>	Handset (Model: 8450) with battery (SN: AC101032008E), also connected to charger (Model: SA106B-05)		
<b>Test Notes 2</b>	Mode: WLAN Channel 06 Transmit; WLAN=1, BT=0, BC=0, DK=0		



#### Formally measured emission peaks

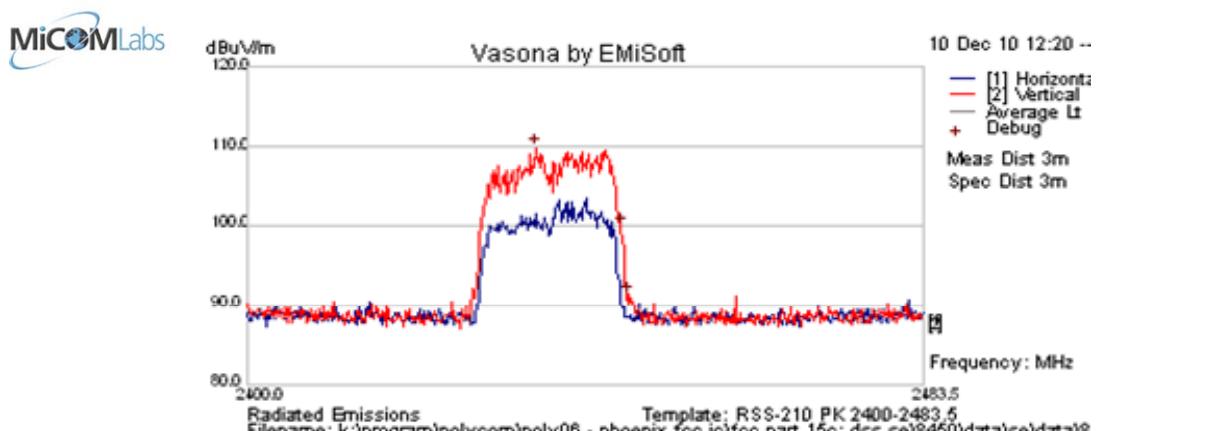
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2437.985	66.1	13.0	32.2	111.3	Peak [Scan]	V						FUND
Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission											

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<b>Test Freq.</b>	2437 MHz	<b>Engineer</b>	EVF
<b>Variant</b>	802.11g; 6 Mbs	<b>Temp (°C)</b>	23
<b>Freq. Range</b>	2400 - 2483.5 MHz	<b>Rel. Hum.(%)</b>	48
<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>	Handset (Model: 8450) with battery (SN: AC101032008E), also connected to charger (Model: SA106B-05)		
<b>Test Notes 2</b>	Mode: WLAN Channel 06 Transmit; WLAN=1, BT=0, BC=0, DK=0		



#### Formally measured emission peaks

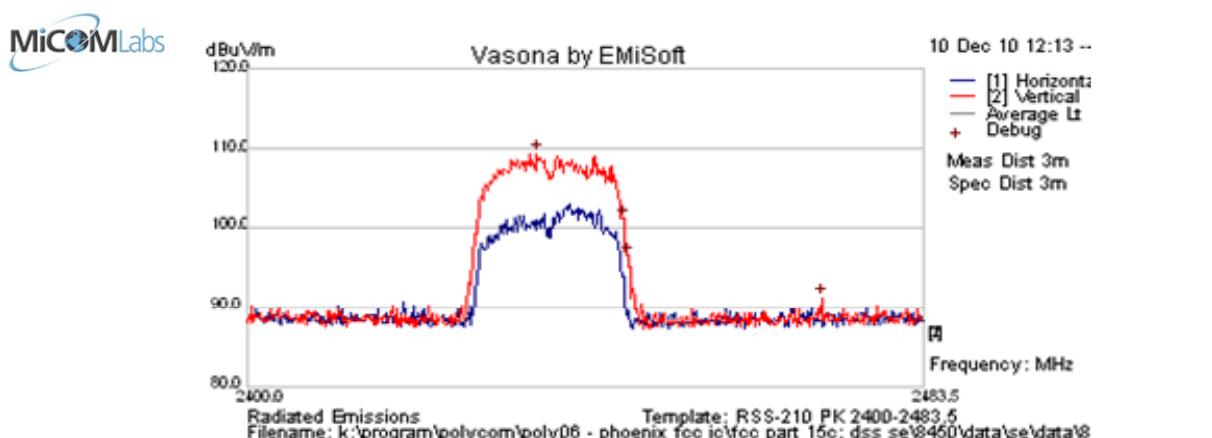
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2435.308	64.6	13.0	32.2	109.8	Peak [Scan]	V						FUND
Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission											

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<b>Test Freq.</b>	2437 MHz	<b>Engineer</b>	EVF
<b>Variant</b>	802.11n HT-20; 6.5 MCS	<b>Temp (°C)</b>	23
<b>Freq. Range</b>	2400 - 2483.5 MHz	<b>Rel. Hum.(%)</b>	48
<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>	Handset (Model: 8450) with battery (SN: AC101032008E), also connected to charger (Model: SA106B-05)		
<b>Test Notes 2</b>	Mode: WLAN Channel 06 Transmit; WLAN=1, BT=0, BC=0, DK=0		



#### Formally measured emission peaks

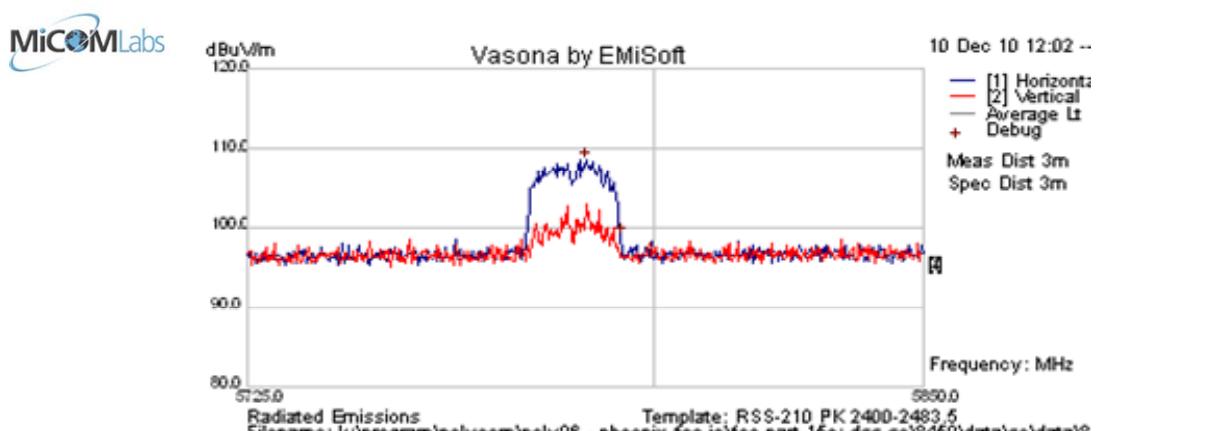
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
2435.475	64.1	13.0	32.2	109.3	Peak [Scan]	V						FUND
Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission											

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<b>Test Freq.</b>	5785 MHz	<b>Engineer</b>	EVF
<b>Variant</b>	802.11a; 6 Mbs	<b>Temp (°C)</b>	23
<b>Freq. Range</b>	5725-5850 MHz	<b>Rel. Hum.(%)</b>	48
<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>	Handset (Model: 8450) with battery (SN: AC101032008E), also connected to charger (Model: SA106B-05)		
<b>Test Notes 2</b>	Mode: WLAN Channel 157 Transmit; WLAN=1, BT=0, BC=0, DK=0		



#### Formally measured emission peaks

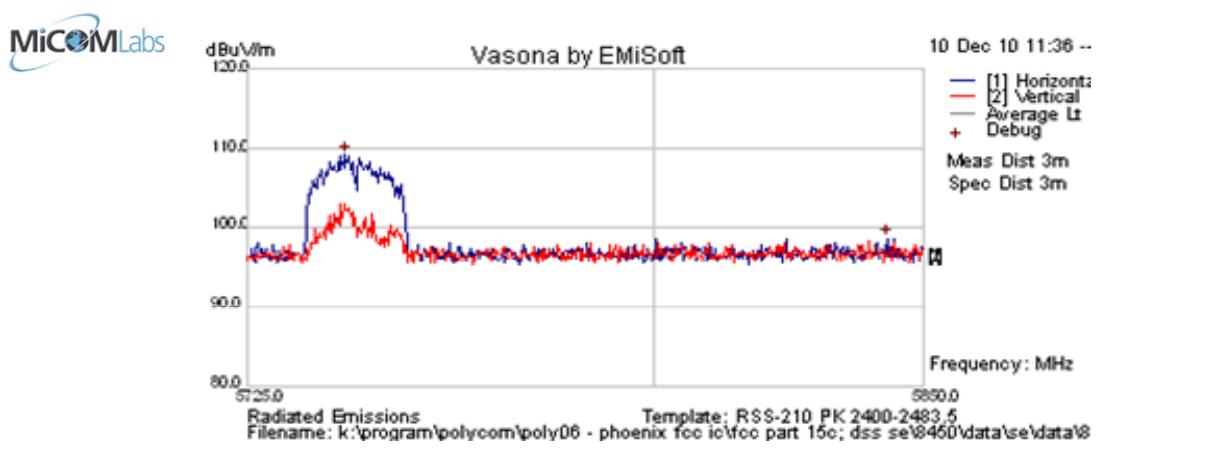
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5787.375	58.8	14.8	35.0	108.6	Peak [Scan]	H						FUND
Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission											

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<b>Test Freq.</b>	5745 MHz	<b>Engineer</b>	EVF
<b>Variant</b>	802.11n HT-20; 6.5 MCS	<b>Temp (°C)</b>	23
<b>Freq. Range</b>	5725-5850 MHz	<b>Rel. Hum.(%)</b>	48
<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>	Handset (Model: 8450) with battery (SN: AC101032008E), also connected to charger (Model: SA106B-05)		
<b>Test Notes 2</b>	Mode: WLAN Channel 149 Transmit; WLAN=1, BT=0, BC=0, DK=0		



#### Formally measured emission peaks

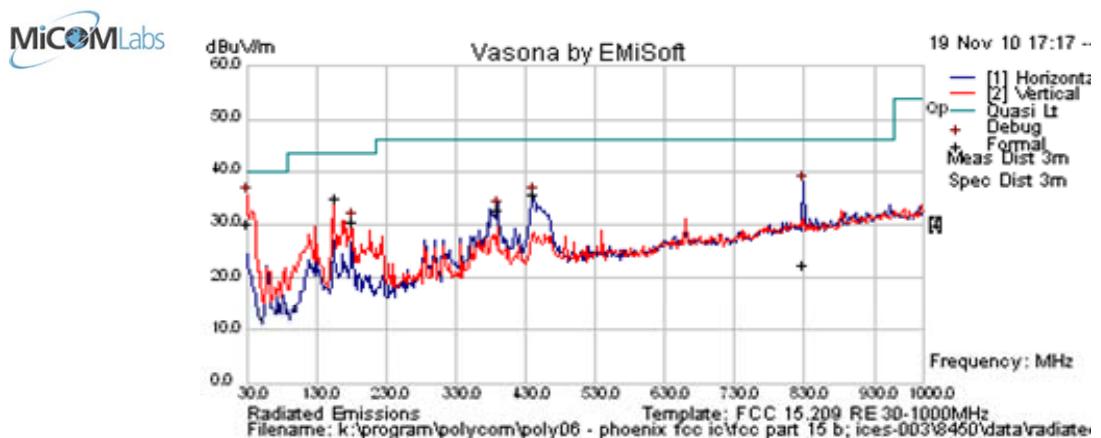
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5743.036	59.6	14.8	35.0	109.3	Peak [Scan]	H						FUND
Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission											

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#### 7.6.4 Receiver Radiated Emissions

##### Stand alone Charger (SA106B-05) - Measurement Results for Radiated Spurious Emissions – Receiver

<b>Test Freq.</b>	N/A	<b>Engineer</b>	EVF
<b>Variant</b>	Digital Emissions	<b>Temp (°C)</b>	22.5
<b>Freq. Range</b>	30 MHz - 1000 MHz	<b>Rel. Hum. (%)</b>	34
<b>Power Setting</b>	Charger: 120VAC/ 60Hz	<b>Press. (mBars)</b>	99.7
<b>Antenna</b>	Integral		
<b>Test Notes 1</b>	Cordless telephone (Model:8450) with discharged battery (SN: AC1010320232), headset connected, also connected to charger (Model: SA106B-05)/ Mode: BT Channel 39 Receive; WLAN Channel 06 Receive; WLAN=1, BT=1, BC=1, DK=1		
<b>Test Notes 2</b>	Preliminary testing performed. EUT tested in horizontal position		



##### Formally measured emission peaks

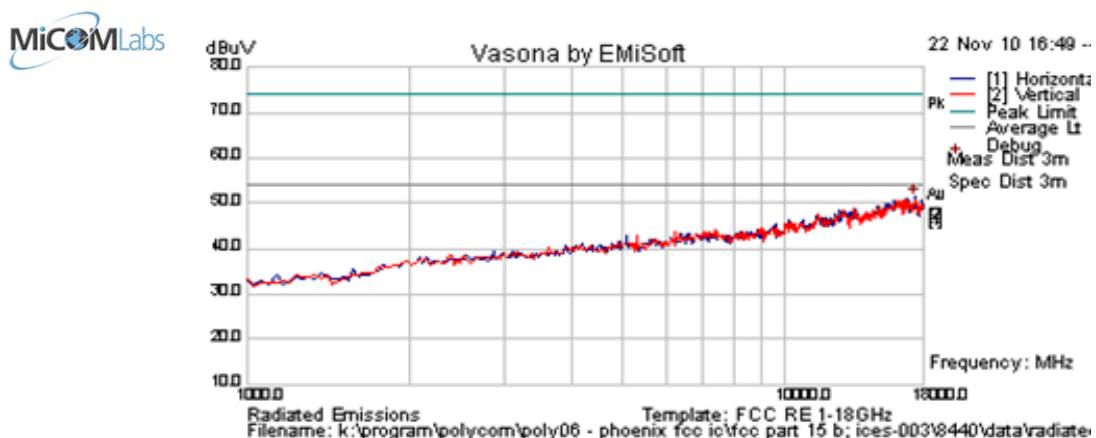
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
30.297	36.0	3.4	-9.4	30.0	Quasi Max	V	151	90	40	-10.0	Pass	
155.996	48.7	4.5	-18.4	34.9	Quasi Max	V	98	87	43.5	-8.7	Pass	
829.047	23.3	7.2	-7.9	22.6	Quasi Max	H	332	173	46	-23.4	Pass	
179.994	45.6	4.7	-19.7	30.5	Peak [Scan]	V	98	360	43.5	-13.0	Pass	
389.992	42.1	5.6	-14.9	32.8	Peak [Scan]	H	98	360	46	-13.2	Pass	
441.988	43.5	5.8	-13.8	35.5	Peak [Scan]	H	98	360	46	-10.5	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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<b>Test Freq.</b>	N/A	<b>Engineer</b>	EVF
<b>Variant</b>	Digital Emissions	<b>Temp (°C)</b>	21.5
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum. (%)</b>	34
<b>Power Setting</b>	Charger: 120VAC/ 60Hz	<b>Press. (mBars)</b>	1007
<b>Antenna</b>	Integral		
<b>Test Notes 1</b>	Cordless telephone (Model:8450) with discharged battery (S/N: AC10103200B7) , headset connected, also connected to charger (Model: SA106B-05)/ Mode: BT Channel 39 Receive; WLAN Channel 06 Receive; WLAN=1, BT=1, BC=1, DK=1		
<b>Test Notes 2</b>			



#### Formally measured emission peaks

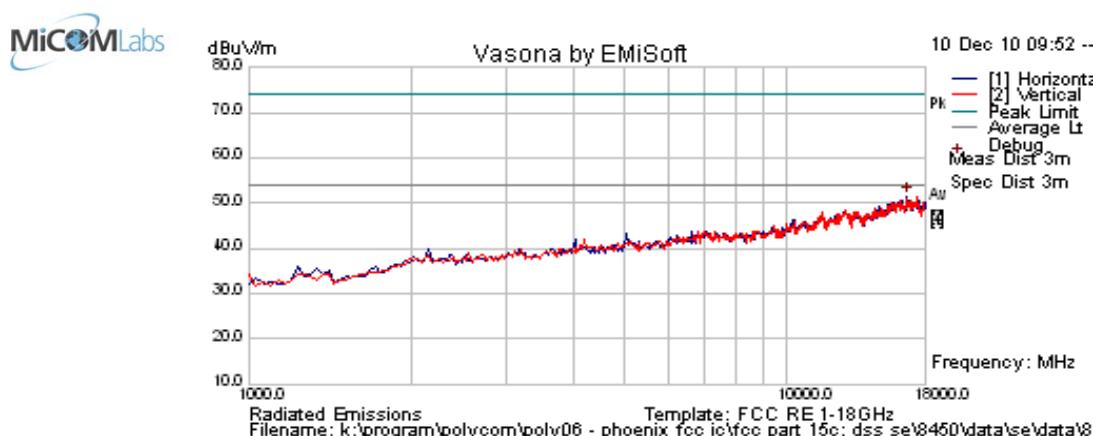
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
No emissions above 1GHz.												
Legend:	DIG = Digital Device Emission; TX = Transmitter Emission; FUND = Fundamental Frequency NRB = Non-Restricted Band, Limit is 20 dB below Fundamental; RB = Restricted Band											

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<b>Test Freq.</b>	5785 MHz	<b>Engineer</b>	CSB
<b>Variant</b>	Receive in Test Utility	<b>Temp (°C)</b>	23
<b>Freq. Range</b>	1000 MHz - 18000 MHz	<b>Rel. Hum.(%)</b>	32
<b>Power Setting</b>	Not Applicable in Receive Mode	<b>Press. (mBars)</b>	999
<b>Antenna</b>	Integral Antenna's connected during testing		
<b>Test Notes 1</b>	Handset (Model: 8450) with battery (SN: AC101032008E) , also connected to charger (Model: SA106B-05)		
<b>Test Notes 2</b>	Mode: WLAN Channel 157 Receive; 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
No Receiver Emissions within 6dB of limit.												
Legend: TRANS = Transient Emission; RB = Restricted Band; NRB = Non-Restricted Band; BE = Emission in Restricted Band Nearest Transmission Band Edge; FUND = Fundamental Freq.												

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## 7.7 Conducted Disturbance at Mains Terminal (150 kHz – 30 MHz)

### Test Procedure

The EUT is configured in accordance with ANSI C63.4. The conducted emissions are measured in a shielded room with a spectrum analyzer in peak hold in the first instance. Emissions closest to the limit are measured in the quasi-peak mode (QP) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation. The highest emissions relative to the limit are listed.

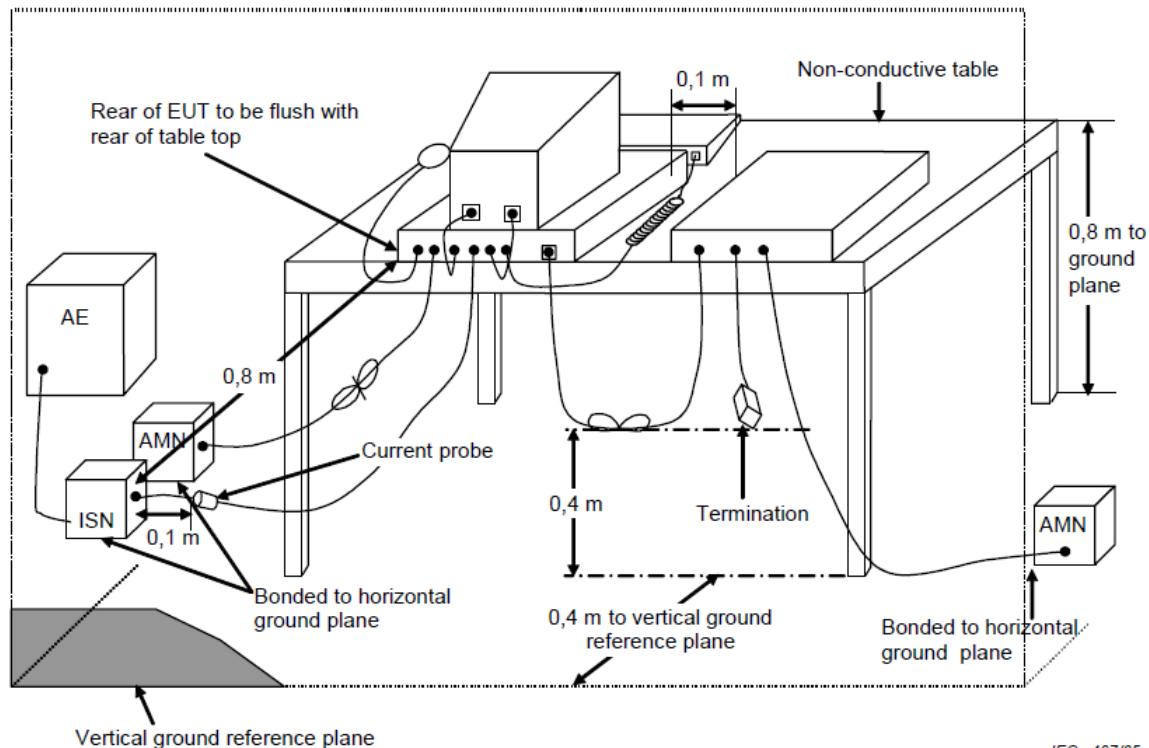
If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

If the reading of the measuring receiver shows fluctuations close to the limit, the reading shall be observed for at least 15 s at each measurement frequency; the higher reading shall be recorded with the exception of any brief isolated high reading which shall be ignored.

---

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## Test Measurement Setup



Measurement setup for Conducted Disturbance at Mains Terminals

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## Specification for Conducted Disturbance at Mains Terminal – Digital Apparatus

### FCC §15.207 (a)

Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu\Omega$  line impedance stabilization network (LISN), see §15.207 (a) matrix below. Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

### RSS-GEN §7.2.4

AC Power Line Conducted Emissions Limits: Except when the requirements applicable to a given device state otherwise, for any radio apparatus equipped to operate from the public utility AC power supply, either directly or indirectly (such as with a battery charger), the radio frequency voltage of emissions conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in the table below. The more stringent limit applies at the frequency range boundaries.

The conducted emissions shall be measured with a 50 ohm/50 microhenry line impedance stabilization network (LISN).

### Limits

Frequency of Emission (MHz)	Conducted Limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\* Decreases with the logarithm of the frequency

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### Traceability

#### Laboratory Measurement Uncertainty for Conducted Emissions

<b>Measurement uncertainty</b>	±2.64 dB
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### Traceability

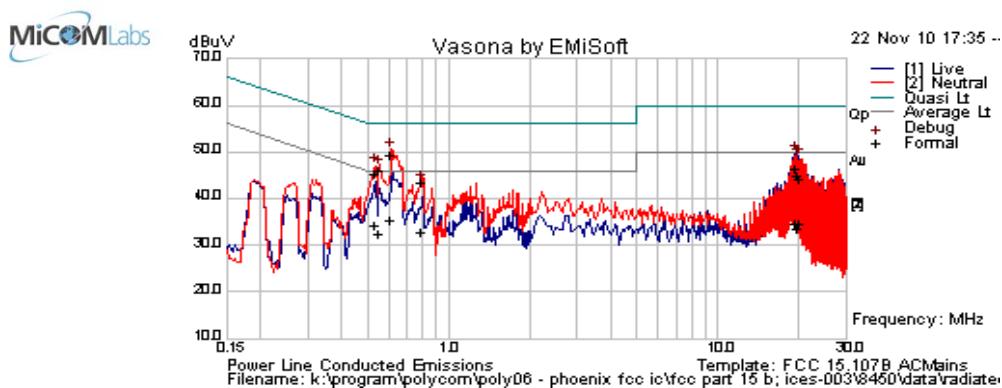
<b>Method</b>	<b>Test Equipment Used</b>
Work instruction WI-EMC-01	0158, 0184, 0193, 0190, 0293, 0307

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### 7.7.1 Stand Alone Charger - Conducted Disturbance at Mains Terminal (150 kHz – 30 MHz)

<b>Test Freq.</b>	N/A	<b>Engineer</b>	EVF
<b>Variant</b>	AC Line Emissions	<b>Temp (°C)</b>	21.5
<b>Freq. Range</b>	0.150 MHz - 30 MHz	<b>Rel. Hum. (%)</b>	34
<b>Power Setting</b>	Charger: 120VAC/60Hz	<b>Press. (mBars)</b>	1007
<b>Antenna</b>	Intergal		
<b>Test Notes 1</b>	Handset (Model: 8450) with discharged battery (S/N: AC10103200B7), headset connected, also connected to charger (Model: SA106B-05)		
<b>Test Notes 2</b>	Mode: BT Channel 39 Receive; WLAN Channel 06 Receive; WLAN=1, BT=1, BC=1, DK=1		



#### Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement Type	Line	Limit dBuV	Margin dB	Pass /Fail	Comments
0.535	35.2	9.9	0.1	45.2	Quasi Peak	Neutral	56	-10.8	Pass	
0.535	24.4	9.9	0.1	34.5	Average	Neutral	46	-11.5	Pass	
0.553	36.1	9.9	0.1	46.1	Quasi Peak	Neutral	56	-9.9	Pass	
0.553	22.3	9.9	0.1	32.3	Average	Neutral	46	-13.7	Pass	
0.615	25.3	10.0	0.1	35.3	Average	Neutral	46	-10.7	Pass	
0.615	39.3	10.0	0.1	49.3	Quasi Peak	Neutral	56	-6.7	Pass	
0.800	33.5	10.0	0.1	43.5	Quasi Peak	Neutral	56	-12.5	Pass	
0.800	22.7	10.0	0.1	32.7	Average	Neutral	46	-13.3	Pass	
19.462	35.1	10.5	0.7	46.3	Quasi Peak	Live	60	-13.7	Pass	
19.462	23.4	10.5	0.7	34.6	Average	Live	50	-15.4	Pass	
19.727	33.5	10.5	0.7	44.8	Quasi Peak	Neutral	60	-15.2	Pass	
19.727	22.3	10.5	0.7	33.6	Average	Neutral	50	-16.4	Pass	
20.070	32.9	10.5	0.7	44.2	Quasi Peak	Live	60	-15.8	Pass	
20.070	23.3	10.5	0.7	34.5	Average	Live	50	-15.5	Pass	

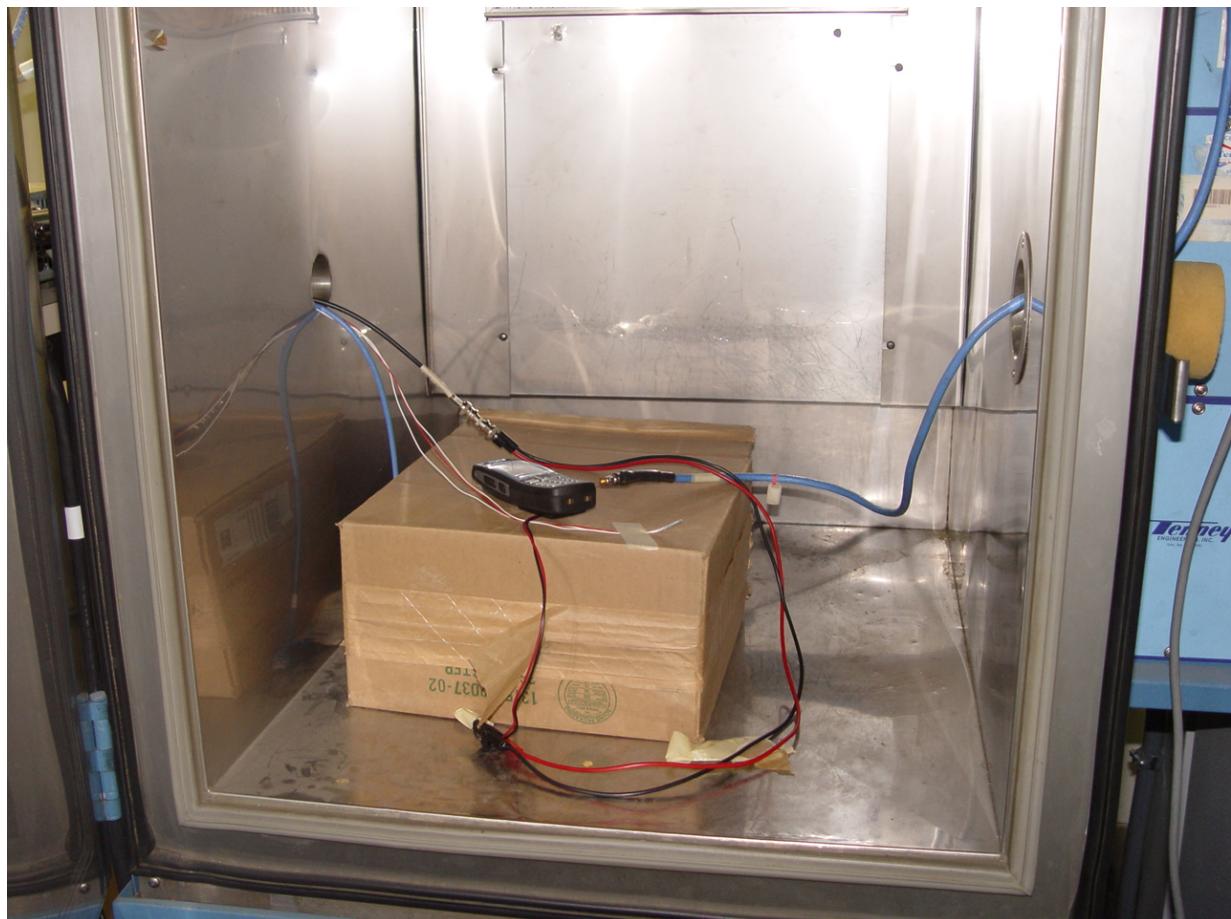
Legend: DIG = Digital Device Emission; TX = Transmitter Emission; FUND = Fundamental Frequency

NRB = Non-Restricted Band, Limit is 20 dB below Fundamental; RB = Restricted Band

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## 8 Photographs

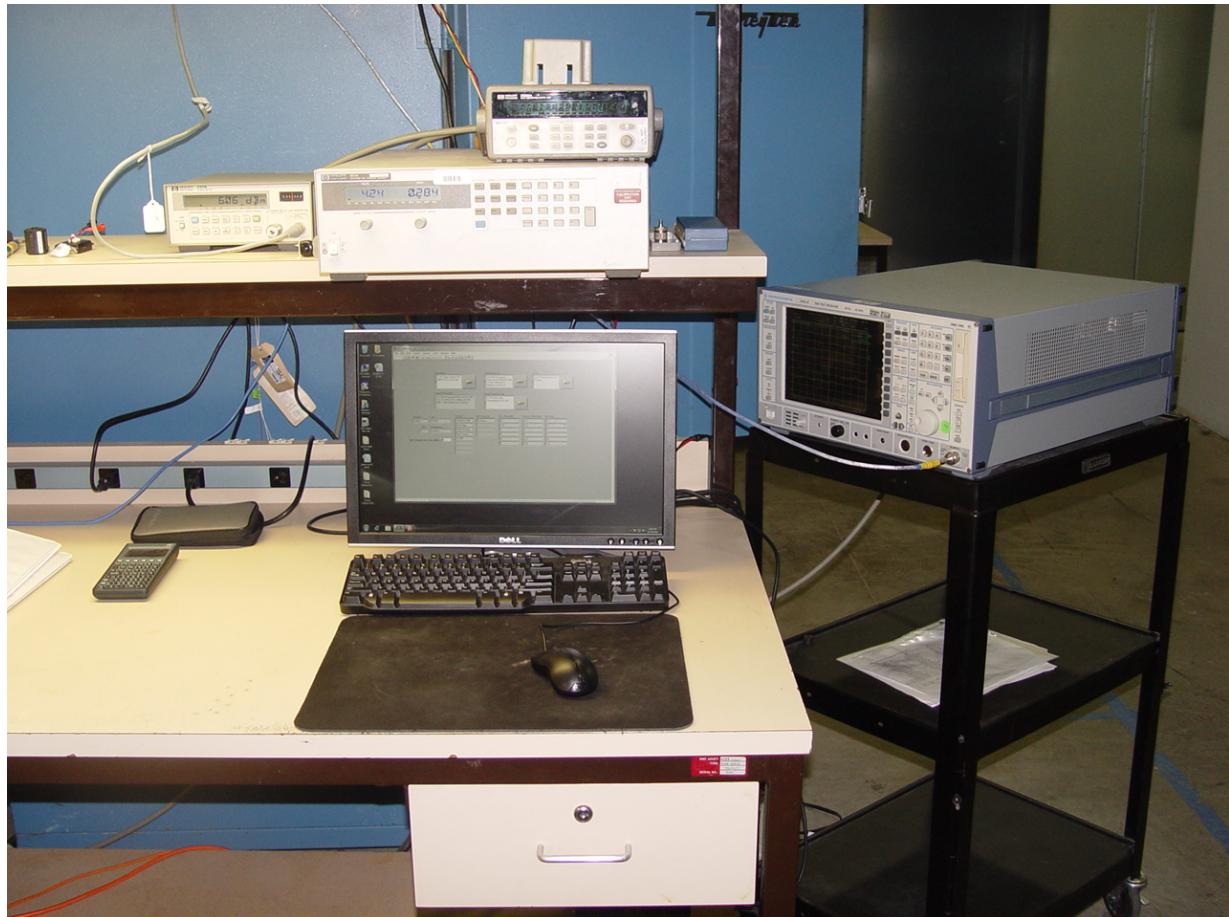
### 8.1 Conducted RF Emissions - EUT



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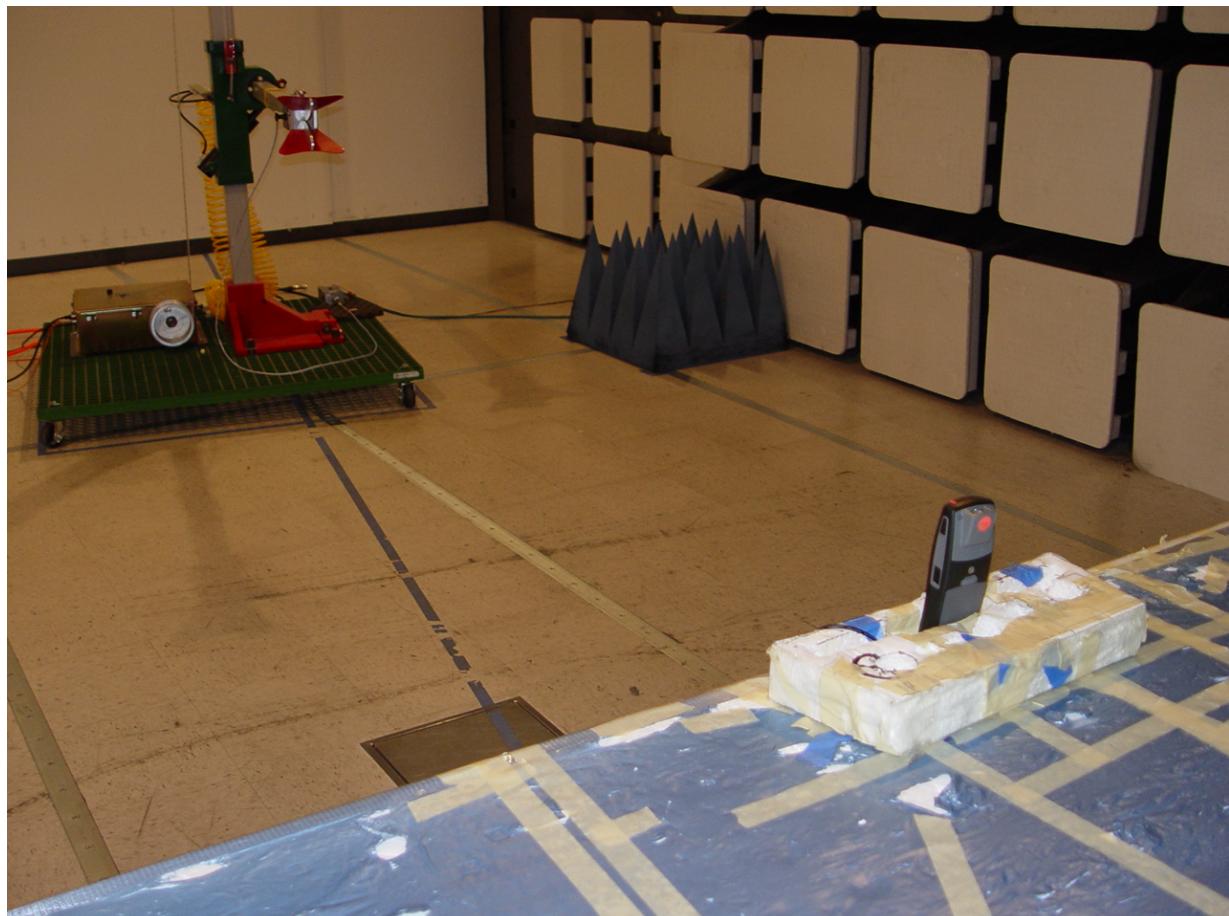
## 8.2 Conducted RF Emissions - Test Equipment



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### 8.3 Transmitter Radiated Spurious Emission above 1 GHz with Charger



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#### 8.4 Receiver Radiated Emissions below 1 GHz with Charger



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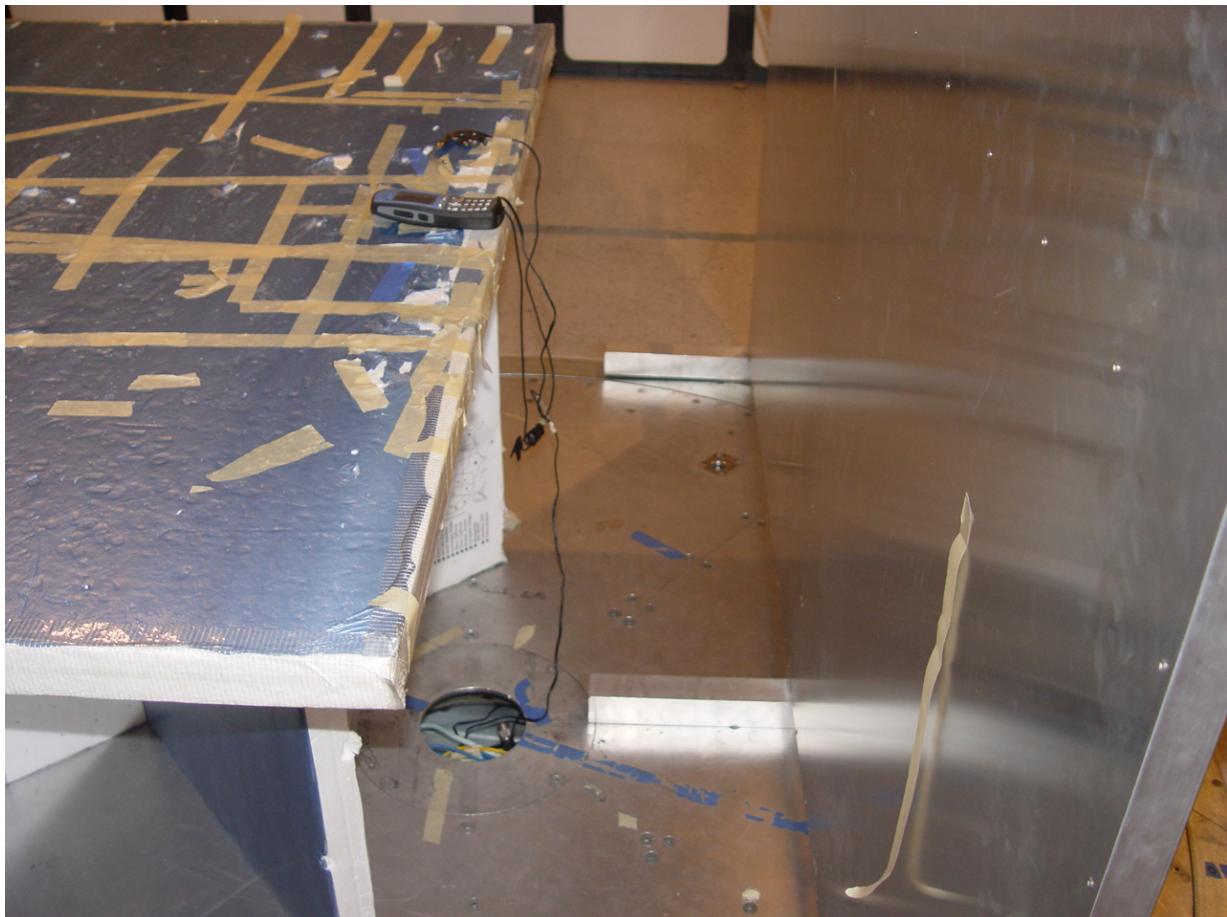
## 8.5 Receiver Radiated Emissions above 1 GHz with Charger



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## 8.6 AC Mains Conducted Emissions with Charger



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**Title:** Polycom Spectralink 8450 Wi-Fi handset with Bluetooth  
**To:** FCC 47 CFR 15.247 & RSS-210 A8  
**Serial #:** POLY06-U8a Rev A  
**Issue Date:** 21st January, 2011  
**Page:** Page 159 of 160

## 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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