Company: Zebra Technologies Corporation

Test of: WhereTag IV GT

To: FCC CFR 47 Part 15 Subpart C (--) 15.247 (DTS)

Test Report Serial No.: ZEBA05-U2 Rev A

TEST REPORT

FROM

MiCOM Labs
opening wireless markets

Test of: Zebra Technologies Corporation, WhereTag IV GT

to

To: FCC CFR 47 Part 15 Subpart C15.247 (DTS), IC RSS-210

Test Report Serial No.: ZEBA05-U2 Rev A

This report supersedes: None

Applicant:	Zebra Technologies Corporation 333 Corporate Woods Parkway Vernon Hills Illinois 60061, United States
Product Function:	Remote Telemetry Module
Issue Date:	19th Jun 2014

This Test Report is Issued Under the Authority of:

MiCOM Labs, Inc.
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A2LA ACCREDITED
TESTING CERT #2381.01

MiCOM Labs is an ISO 17025 Accredited Testing Laboratory

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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 test laboratory number 2381.01. MiCOM Labs test schedule is available at the following URL; http://www.a2la.org/scopepdf/2381-01.pdf


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-IAF Communiqué dated 8 January 2009*).

Presented this 28th day of February 2014.

President & CEO
For the Accreditation Council
Certificate Number 2381.01
Valid to November 30, 2015

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

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	-	US0159 Listing #: 102167
Canada	Industry Canada (IC)	FCB	APEC MRA 2	US0159 Listing #: 4143A-2 4143A-3
Japan	MIC (Ministry of Internal Affairs and Communication)	CAB	APEC MRA 2	RCB 210
	VCCI	--	--	A-0012
Europe	European Commission	NB	EU MRA	NB 2280
Australia	Australian Communications and Media Authority (ACMA)	CAB	APEC MRA 1	US0159
Hong Kong	Office of the Telecommunication Authority (OFTA)	CAB	APEC MRA 1	
Korea	Ministry of Information and Communication Radio Research Laboratory (RRL)	CAB	APEC MRA 1	
Singapore	Infocomm Development Authority (IDA)	CAB	APEC MRA 1	
Taiwan	National Communications Commission (NCC) Bureau of Standards, Metrology and Inspection (BSMI)	CAB	APEC MRA 1	
Vietnam	Ministry of Communication (MIC)	CAB	APEC MRA 1	

**APEC MRA – Asia Pacific Economic Community Mutual Recognition Agreement.
Is a recognition agreement under which test lab is accredited to regulatory standards of the APEC member countries.

Phase I - recognition for product testing
Phase II – recognition for both product testing and certification

N/A – Not Applicable

**EU MRA – European Union Mutual Recognition Agreement.
Is a recognition agreement under which test lab is accredited to regulatory standards of the EU member countries.

**NB – Notified Body

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 test laboratory number 2381.02. MiCOM Labs test schedule is available at the following URL; http://www.a2la.org/scopepdf/2381-02.pdf


American Association for Laboratory Accreditation

Accredited Product Certification Body

A2LA has accredited

MICOM LABS

Pleasanton, CA

for technical competence as a

Product Certification Body

This product certification body is accredited in accordance with the recognized International Standard ISO/IEC 17065:2012 - *Requirements for bodies certifying products, processes and services*. This accreditation demonstrates technical competence for a defined scope and the operation of a quality management system.

Presented this 28th day of February 2014.

President & CEO
For the Accreditation Council
Certificate Number 2381.02
Valid to November 30, 2015

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)-TCB Identifier US0159

Industry Canada – Certification Body - CAB Identifier – US0159

Europe – Notified Body - Notified Body Identifier – 2280

Japan – Recognized Certification Body (RCB) - RCB Identifier - 210

2. DOCUMENT HISTORY

Document History		
Revision	Date	Comments
Draft	19th Jun 2014	
Rev A	27th June 2014	Initial Release

3. TEST RESULT CERTIFICATE

Manufacturer:	Zebra Technologies Corporation 333 Corporate Woods Parkway Vernon Hills Illinois 60061, United States	**Tested By:**	MiCOM Labs, Inc. 575 Boulder Court Pleasanton California, 94566, USA
EUT:	WhereTag IV GT	**Telephone:**	+1 925 462 0304
Model:	TFF-3110	**Fax:**	+1 925 462 0306
S/N's:	044047034		
Test Date(s):	From 19th to 20th May 2014	**Website:**	www.micomlabs.com

STANDARD(S)	TEST RESULTS
FCC CFR 47 Part 15 Subpart C (--) 15.247 (DTS)	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.

A2LA ACCREDITED
TESTING CERT #2381.01

Approved & Released for MiCOM Labs, Inc. by:

Graeme Grieve
Quality Manager MiCOM Labs,

Gordon Hurst
President & CEO MiCOM Labs, Inc.

4. REFERENCES AND MEASUREMENT UNCERTAINTY

4.1. Normative References

REF.	PUBLICATION	YEAR	TITLE
i.	FCC 47 CFR Part 15, Subpart C	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 License-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment
iii.	FCC OET KDB 662911	4th April 2011	Emissions Testing of Transmitters with Multiple Outputs in the Same Band
iv.	DA 00-705	2000	FCC DA 00-705 “Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems” released March 30, 2000
v.	RSS-GEN	2010	Radio Standards Specification-Gen, Issue 3, General Requirements and Information for the Certification of Radiocommunication Equipment
vi.	FCC 47 CFR Part 15, Subpart B	2010	47 CFR Part 15, SubPart B; Unintentional Radiators
vii.	ICES-003	2004	Spectrum Management and Telecommunications Policy Interference-Causing Equipment Standard Digital Apparatus; Issue 4
viii.	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

ix.	CISPR 22/ EN 55022	2008 2006+A1:2007	Limits and Methods of Measurements of Radio Disturbance Characteristics of Information Technology Equipment
x.	M 3003	Edition 1 Dec. 1997	Expression of Uncertainty and Confidence in Measurements
xi.	LAB34	Edition 1 Aug 2002	The expression of uncertainty in EMC Testing
xii.	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
xiii.	A2LA	July 2012	Reference to A2LA Accreditation Status – A2LA Advertising Policy

4.2. Test and Uncertainty Procedure

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.

5. PRODUCT DETAILS AND TEST CONFIGURATIONS

5.1. Technical Details

Details	Description
Purpose:	Test of the WhereTag IV GT to FCC CFR 47 Part 15 Subpart C (--) 15.247 (DTS) and IC RSS-210
Applicant:	Zebra Technologies Corporation 333 Corporate Woods Parkway Vernon Hills Illinois 60061, USA
Manufacturer:	As Applicant
Laboratory performing the tests:	MiCOM Labs, Inc. 575 Boulder Court, Pleasanton, California 94566 USA
Test report reference number:	ZEBA05 - 2.4GHz Vehicular FCC IC EU
Date EUT received:	19th May 2014
Standard(s) applied:	FCC CFR 47 Part 15 Subpart C (--) 15.247 (DTS)
Dates of test (from - to):	19th to 23rd May 2014
No of Units Tested:	1
Type of Equipment:	Remote Telemetry Module
Manufacturers Trade Name:	WhereTag IV GT
Model(s):	TFF-3110
Location for use:	Outdoor
Declared Frequency Range(s):	2400 - 2483.5 MHz;
Hardware Rev:	02
Software Rev:	TEST V1.1.0 (1)
EUT Modes of Operation:	802.11b; 802.11g; DSSS, OOK
Type of Modulation:	CCK, OFDM, DSSS, OOK
Declared Nominal OP Power (Peak):	802.11b; +21 dBm 802.11g; +21 dBm DSSS; +21 dBm OOK; +4.0 dBm
Transmit/Receive Operation:	Transceiver - Simplex
System Beam Forming:	This device has no beam-forming capability
Rated Input Voltage and Current:	DC only (Battery operated/external supply) 3.6V battery/ Ext. 12-28VDC @ 40mA typical
Operating Temperature Range:	Declared Range -40C to +70C
ITU Emission Designator:	802.11b 27M8G1D 802.11g 27M5D1D ISO 24730 DSSS: 43M5W7D ISO 24730 OOK: 10M7W7D
Equipment Dimensions:	16 cm x 10 cm x 4.5 cm
Weight:	< 0.5 kg
Primary function of equipment:	Remote Telemetry Module
Secondary function of equipment:	No secondary function provided

5.2. Scope Of Test Program

Zebra Technologies Corporation WhereTag IV GT

The scope of the test program was to test the WhereTag IV GT, TFF-3110 configurations in the frequency ranges 2400 - 2483.5 MHz; for compliance against FCC CFR 47 Part 15 Subpart C 15.247 (DTS) and IC RSS-210 specifications.

FCC OET KDB Implementation

This test program implements the following FCC KDB – 662911 4/4/2011;
Emissions Testing of Transmitters with Multiple Outputs in the Same Band

The KDB document provides guidance for measurements of conducted output emissions of devices that employ a single transmitter with multiple outputs in the same band, with the outputs occupying the same or overlapping frequency ranges. It applies to EMC compliance measurements on devices that transmit on multiple antennas simultaneously in the same or overlapping frequency ranges through a coordinated process. Examples include, but are not limited to, devices employing beam forming or multiple-input and multiple-output (MIMO.) This guidance applies to both licensed and unlicensed devices wherever the FCC rules call for conducted output measurements. Guidance is provided for in-band, out-of-band and spurious emission measurements.

5.3. Device Photos

EUT Front

EUT Rear

5.4. Equipment Model(s) and Serial Number(s)

Model / Description	Serial no.	Hardware ver.	Software Version
TFF-3110	044047034	Unknown	TEST V1.1.0 (1)

Model No / Description	Power Source Type	AC VOLTAGE					DC VOLTAGE			
		Nom	Min	Max	Amp	Freq	Nom	Min	Max	Amp
	DC only						15	12	25	1

5.5. Antenna Details

Test Candidate	Type	Manufacturer	Model	Family	Gain (dBi)	Beamforming Gain	Dir BeamWidth	Frequency Band (MHz)
Y		Zebra	Inverted F	PCB	-1.0	-	360	2400 - 2483.5

5.6. Cabling and I/O Ports

Number and type of I/O ports

Port Type	Max Cable Length	# Of Ports	Screened	Conn Type	Data Type
Ethernet	>3m	1	N	RJ-45	Packet

5.7. Test Configurations

Testing was performed to determine the highest power level versus bit rate. The variant with the highest power was used to exercise the product.

2400 - 2483.5 MHz

Operational Mode(s) (802.11a/b/g/n/ac)	Data Rate with Highest Power MBit/s	Frequencies (MHz)		
		Low	Mid	High
802.11b	1	2,412.00	2,437.00	2,462.00
802.11g	6	2,412.00	2,437.00	2,462.00
DSSS	N/A	--	2441.75	--
OOK	N/A	--	2446.519	--

Results for the above configurations are provided in this report

5.8. Equipment Modifications

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

1. None

5.9. Deviations from the Test Standard

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

1. None

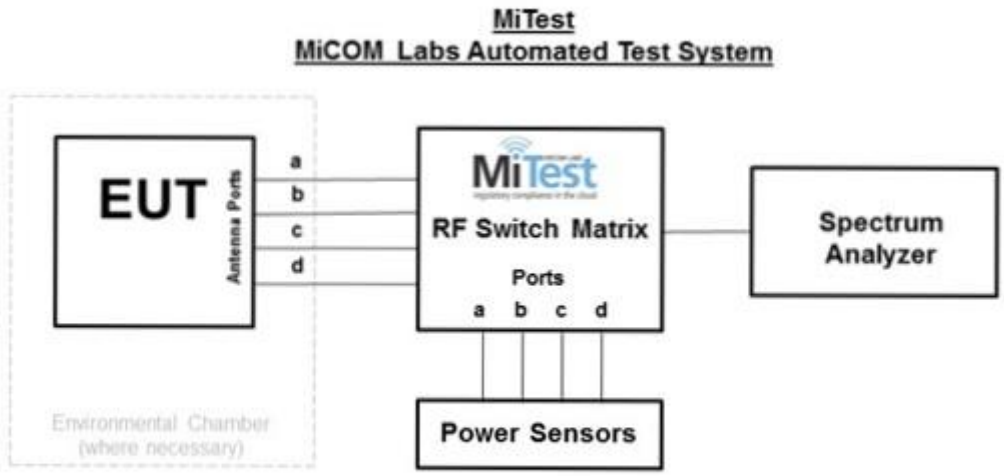
6. TEST EQUIPMENT CONFIGURATION(S)

6.1. Conducted RF Emission Test Set-up

The following tests were performed using the conducted test set-up shown in the diagram below.

Conducted Test Set-Up Pictorial Representation

1. Section 6.1.1.1. 6 dB and 99% Bandwidth
2. Section 6.1.1.2. Peak Output Power
3. Section 6.1.1.3. Power Spectral Density
4. Section 6.1.1.4. Conducted Spurious Emissions



Conducted Test Measurement Setup

Measurement and Presentation of Test Data

The measurement and graphical data presented in this test report was generated automatically using state-of-the-art technology creating an easy to read report structure. Numerical measurement data is separated from supporting graphical data (plots) through hyperlinks. Numerical measurement data can be reviewed without scrolling through numerous graphical pages to arrive at the next data matrix.

Plots have been relegated into the Appendix 'Graphical Data'.

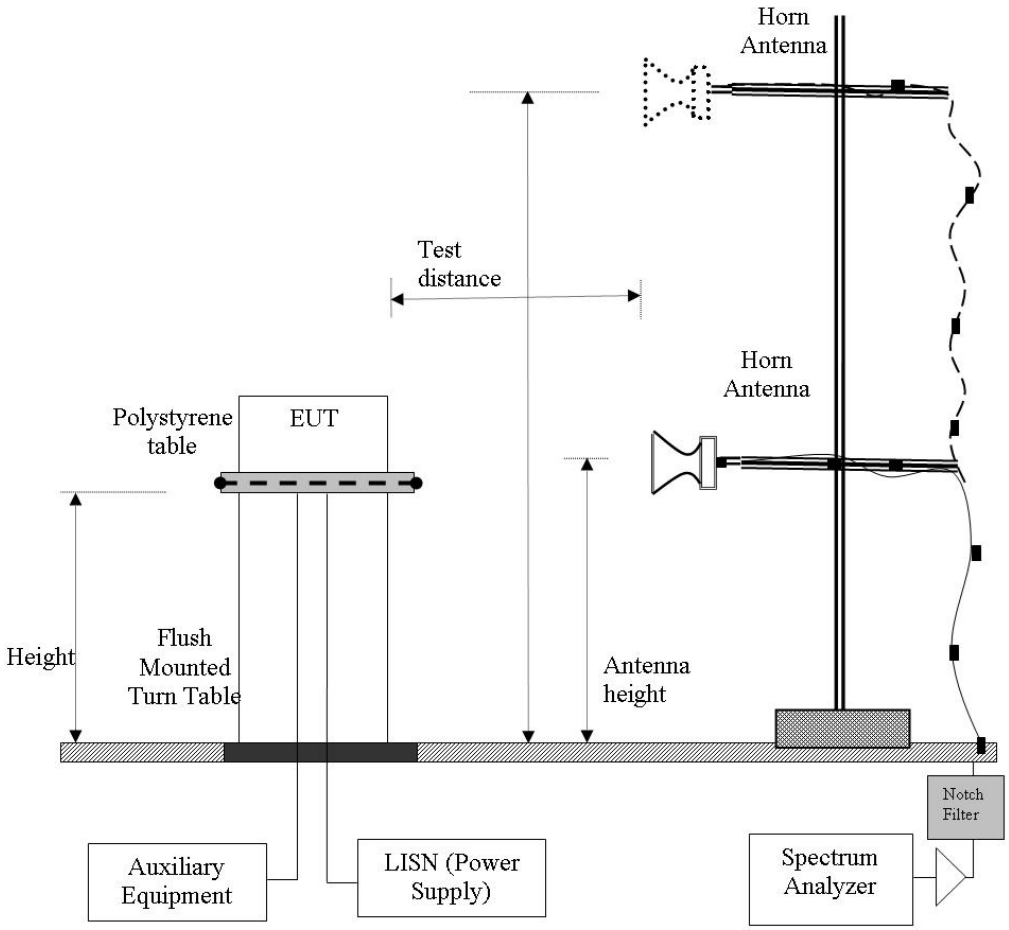
Test and report automation was performed by MiTest. MiTest is an automated test system developed by MiCOM Labs. MiTest is the first cloud based modular test system enabling end-to-end automation of regulatory compliance testing for conducted RF testing.

The MiCOM Labs "***MiTest***" Automated Test System" (Patent Pending)

6.2. Radiated Spurious Emission Test Set-up > 1 GHz

The following tests were performed using the conducted test set-up shown in the diagram below.

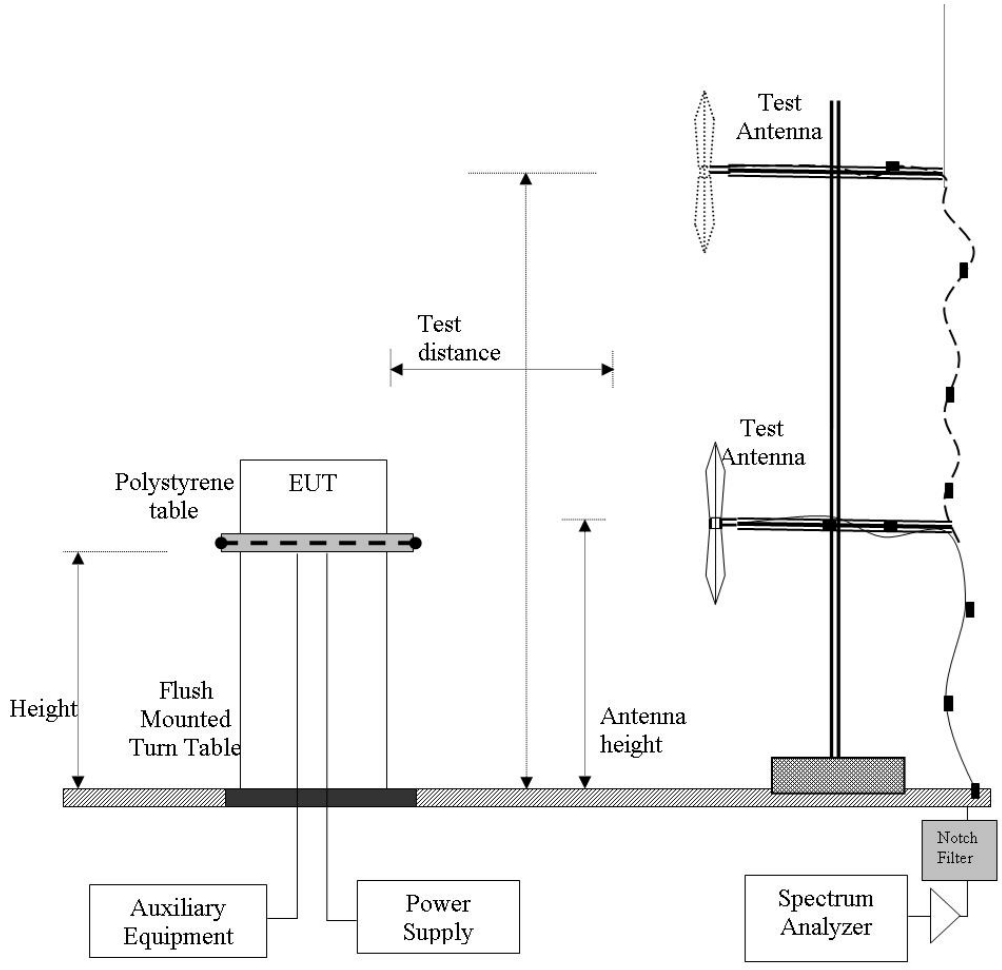
Radiated Emission Measurement Setup – Above 1 GHz



6.3. Digital Emissions Test Set-up (0.03 – 1 GHz)

The following tests were performed using the conducted test set-up shown in the diagram below.

Digital Emission Measurement Setup – Below 1 GHz

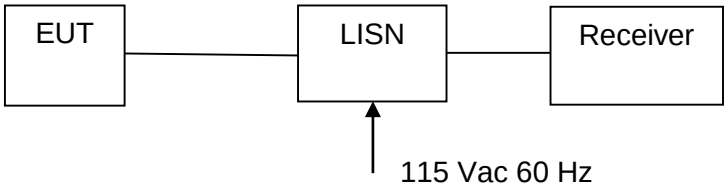


6.4. ac Wireline Emission Test Set-up

The following tests were performed using the conducted test set-up shown in the diagram below.

1. ac Wireline Conducted Emissions

Conducted Test Set-Up Pictorial Representation



7. TEST SUMMARY

List of Measurements

The following table represents the list of measurements required under the FCC CFR47 Part 15.247.

Section(s)	Test Items	Description	Condition	Result	Test Report Section
15.247(a)(2)	6 dB and 99 % Bandwidths	≥500 kHz	Conducted	Complies	5.1.1.1
15.247(b)(3) 15.31(e)	Peak Output Power	Shall not exceed 1W	Conducted	Complies	5.1.1.2
15.247(e)	Peak Power Spectral Density	Shall not be greater than +8 dBm in any 3 kHz band	Conducted	Complies	5.1.1.3
15.247(d) 15.205 / 15.209	Spurious Emissions (30MHz -26 GHz b/g and 30 MHz – 40 GHz a)	The radiated emission in any 100 kHz of out-band shall be at least 20 dB below the highest in-band spectral density	Conducted	Complies	5.1.1.4
15.247(d) 15.205 / 15.209	Radiated Emissions	Restricted Bands	Radiated	Complies	5.1.2
	Transmitter Radiated Spurious Emissions	Emissions above 1 GHz		Complies	
	Radiated Band Edge	Band-edge results Peak Emissions		Complies	
15.205 / 15.209	Radiated Spurious Emissions	Emissions <1 GHz (30M-1 GHz)	Radiated	Complies	5.1.2.4
15.207	AC Wireline Conducted Emissions 150 kHz–30 MHz	Conducted Emissions	Conducted	N/A EUT is dc powered	5.1.3

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 5.8 Equipment Modifications highlights the equipment modifications that were required to bring the product into compliance with the above test matrix

8. TEST RESULTS

8.1. 6 dB & 99% Bandwidth

Equipment Configuration for 6 dB & 99% Bandwidth			
Variant:	802.11b	**Duty Cycle (%):**	99
Data Rate:	1 MBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	CCK	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 6 dB Bandwidth (MHz) Port(s)				6 dB Bandwidth (MHz)		Limit	Lowest Margin
MHz	a	b	c	d	Highest	Lowest	KHz	MHz
2412.0	11.142	--	--	--	11.142	11.142	≥500.0	-10.64
2437.0	10.261	--	--	--	10.261	10.261	≥500.0	-9.76
2462.0	12.265	--	--	--	12.265	12.265	≥500.0	-11.77

Test Frequency	Measured 99% Bandwidth (MHz) Port(s)				Maximum 99% Bandwidth (MHz)		
MHz	a	b	c	d			
2412.0	22.204	--	--	--	22.204		
2437.0	25.090	--	--	--	25.090		
2462.0	27.816	--	--	--	27.816		

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for 6 dB & 99% Bandwidth			
Variant:	802.11g	**Duty Cycle (%):**	99
Data Rate:	6 MBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 6 dB Bandwidth (MHz) Port(s)				6 dB Bandwidth (MHz)		Limit	Lowest Margin
MHz	a	b	c	d	Highest	Lowest	KHz	MHz
2412.0	16.433	--	--	--	16.433	16.433	≥500.0	-15.93
2437.0	15.952	--	--	--	15.952	15.952	≥500.0	-15.45
2462.0	15.952	--	--	--	15.952	15.952	≥500.0	-15.45

Test Frequency	Measured 99% Bandwidth (MHz) Port(s)				Maximum 99% Bandwidth (MHz)		
MHz	a	b	c	d			
2412.0	27.495	--	--	--	27.495		
2437.0	17.475	--	--	--	17.475		
2462.0	17.876	--	--	--	17.876		

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for 6 dB & 99% Bandwidth			
Variant:	DSSS	**Duty Cycle (%):**	99
Data Rate:	59.7 kbps	**Antenna Gain (dBi):**	Not Applicable
Modulation:	DSSS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 6 dB Bandwidth (MHz) Port(s)				6 dB Bandwidth (MHz)		Limit	Lowest Margin
MHz	a	b	c	d	Highest	Lowest	KHz	MHz
2441.75	22.846	--	--	--	22.846	22.846	≥500.0	-22.35

Test Frequency	Measured 99% Bandwidth (MHz) Port(s)				Maximum 99% Bandwidth (MHz)		
MHz	a	b	c	d			
2441.75	43.527	--	--	--	43.527		

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for 6 dB & 99% Bandwidth			
Variant:	OOK	**Duty Cycle (%):**	99
Data Rate:	19.83 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OOK	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 6 dB Bandwidth (MHz) Port(s)				6 dB Bandwidth (MHz)		Limit	Lowest Margin
MHz	a	b	c	d	Highest	Lowest	KHz	MHz
2446.519	1.242	--	--	--	1.242	1.242	≥500.0	-0.74

Test Frequency	Measured 99% Bandwidth (MHz) Port(s)				Maximum 99% Bandwidth (MHz)		
MHz	a	b	c	d			
2446.519	10.701	--	--	--	10.701		

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

8.2. Conducted Output Power

Equipment Configuration for Peak Output Power

Variant:	802.11b	**Duty Cycle (%):**	99
Data Rate:	1 MBit/s	**Antenna Gain (dBi):**	-1.00
Modulation:	CCK	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm) Port(s)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
MHz	a	b	c	d	dBm	dBm	dBm	
2412.0	20.28	--	--	--	20.28	30.00	-9.72	15.00
2437.0	20.32	--	--	--	20.32	30.00	-9.68	15.00
2462.0	20.91	--	--	--	20.91	30.00	-9.09	15.00

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Measurement Uncertainty:	±1.33 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Peak Output Power			
Variant:	802.11g	**Duty Cycle (%):**	99
Data Rate:	6 MBit/s	**Antenna Gain (dBi):**	-1.00
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm) Port(s)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
MHz	a	b	c	d	dBm	dBm	dBm	
2412.0	21.06	--	--	--	21.06	30.00	-8.94	11.00
2437.0	21.21	--	--	--	21.21	30.00	-8.79	11.00
2462.0	21.77	--	--	--	21.77	30.00	-8.23	11.00

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Measurement Uncertainty:	±1.33 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Peak Output Power			
Variant:	DSSS	**Duty Cycle (%):**	99
Data Rate:	59.7 kbps	**Antenna Gain (dBi):**	-1.00
Modulation:	DSSS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm) Port(s)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
MHz	a	b	c	d	dBm	dBm	dBm	
2441.75	21.23	--	--	--	21.23	30.00	-8.77	15.00

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Measurement Uncertainty:	±1.33 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Peak Output Power			
Variant:	OOK	**Duty Cycle (%):**	99
Data Rate:	19.83 KBit/s	**Antenna Gain (dBi):**	-1.00
Modulation:	OOK	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm) Port(s)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
MHz	a	b	c	d	dBm	dBm	dBm	
2446.519	3.54	--	--	--	3.54	30.00	-26.46	1.00

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Measurement Uncertainty:	±1.33 dB

Note: click the links in the above matrix to view the graphical image (plot).

8.3. Spurious Emissions

8.3.1. Conducted Emissions

8.3.1.1. Conducted Spurious Emissions

Equipment Configuration for Transmitter Conducted Spurious Emissions			
Variant:	802.11b	**Duty Cycle (%):**	99
Data Rate:	1 MBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	CCK	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Frequency Range	Transmitter Conducted Spurious Emissions (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	SE	Limit	SE	Limit	SE	Limit	SE	Limit
2412.0	30 - 26000	-33.497	-13.29	--	--	--	--	--	--
2437.0	30 - 26000	-33.603	-13.06	--	--	--	--	--	--
2462.0	30 - 26000	-33.551	-12.74	--	--	--	--	--	--

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Transmitter Conducted Spurious Emissions

Variant:	802.11g	**Duty Cycle (%):**	99
Data Rate:	6 MBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Frequency Range	Transmitter Conducted Spurious Emissions (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	SE	Limit	SE	Limit	SE	Limit	SE	Limit
2412.0	30 - 26000	-45.329	-18.25	--	--	--	--	--	--
2437.0	30 - 26000	-44.994	-16.69	--	--	--	--	--	--
2462.0	30 - 26000	-45.156	-19.09	--	--	--	--	--	--

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Transmitter Conducted Spurious Emissions			
Variant:	DSSS	**Duty Cycle (%):**	99
Data Rate:	59.7 kbps	**Antenna Gain (dBi):**	Not Applicable
Modulation:	DSSS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Frequency Range	Transmitter Conducted Spurious Emissions (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	SE	Limit	SE	Limit	SE	Limit	SE	Limit
2441.75	30.0 - 260000.0	-51.591	-18.03	--	--	--	--	--	--

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Transmitter Conducted Spurious Emissions			
Variant:	OOK	**Duty Cycle (%):**	99
Data Rate:	19.83 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OOK	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Frequency Range	Transmitter Conducted Spurious Emissions (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	SE	Limit	SE	Limit	SE	Limit	SE	Limit
2446.519	30.0 - 26000.0	-46.139	-23.35	--	--	--	--	--	--

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

8.3.1.2. Conducted Band-Edge Emissions

Equipment Configuration for Conducted Low Band-Edge Emissions - Peak

Variant:	802.11b	**Duty Cycle (%):**	99
Data Rate:	1 MBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	CCK	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	2412.0 MHz					
Band-Edge Frequency:	2400.0 MHz					
Test Frequency Range:	2350.0 - 2422.0 MHz					
Port(s)	**Band-Edge Markers and Limit**			**Amended Limit**		**Margin**
	M1 Amplitude (dBm)	**Plot Limit (dBm)**	**M2 Frequency (MHz)**	**Amplitude (dBm)**	**M2A Frequency (MHz)**	**(MHz)**
a	-21.92	-11.62	2402.80	--	--	-2.800

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted Low Band-Edge Emissions - Peak			
Variant:	802.11g	**Duty Cycle (%):**	99
Data Rate:	6 MBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	2412.0 MHz
Band-Edge Frequency:	2400.0 MHz
Test Frequency Range:	2350.0 - 2422.0 MHz

Port(s)	Band-Edge Markers and Limit			Amended Limit		Margin
	M1 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a	-20.75	-16.66	2401.90	--	--	-1.900

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted Low Band-Edge Emissions - Peak			
Variant:	DSSS	**Duty Cycle (%):**	99
Data Rate:	59.7 kbps	**Antenna Gain (dBi):**	Not Applicable
Modulation:	DSSS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	2441.75 MHz
Band-Edge Frequency:	2400.0 MHz
Test Frequency Range:	2350.0 - 2442.0 MHz

Port(s)	Band-Edge Markers and Limit			Amended Limit		Margin
	M1 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a	-31.99	-17.99	2419.10			-19.100

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted Low Band-Edge Emissions - Peak			
Variant:	OOK	**Duty Cycle (%):**	99
Data Rate:	19.83 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OOK	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	2446.519 MHz					
Band-Edge Frequency:	2400.0 MHz					
Test Frequency Range:	2350.0 - 2446.0 MHz					
Port(s)	**Band-Edge Markers and Limit**			**Amended Limit**		**Margin**
	M1 Amplitude (dBm)	**Plot Limit (dBm)**	**M2 Frequency (MHz)**	**Amplitude (dBm)**	**M2A Frequency (MHz)**	**(MHz)**
a	-48.94	-26.88	2443.30			-43.300

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted High Band-Edge Emissions - Peak			
Variant:	802.11b	**Duty Cycle (%):**	99
Data Rate:	1 MBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	CCK	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	2462.0 MHz					
Band-Edge Frequency:	2483.5 MHz					
Test Frequency Range:	2452.0 - 2524.0 MHz					
Port(s)	**Band-Edge Markers and Limit**			**Amended Limit**		**Margin**
	M3 Amplitude (dBm)	**Plot Limit (dBm)**	**M2 Frequency (MHz)**	**Amplitude (dBm)**	**M2A Frequency (MHz)**	**(MHz)**
a	-39.91	-12.12	2477.70	--	--	-5.800

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted High Band-Edge Emissions - Peak			
Variant:	802.11g	**Duty Cycle (%):**	99
Data Rate:	6 MBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	2462.0 MHz
Band-Edge Frequency:	2483.5 MHz
Test Frequency Range:	2452.0 - 2524.0 MHz

Port(s)	Band-Edge Markers and Limit			Amended Limit		Margin
	M3 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a	-29.93	-15.37	2471.20	--	--	-12.300

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted High Band-Edge Emissions - Peak			
Variant:	DSSS	**Duty Cycle (%):**	99
Data Rate:	59.7 kbps	**Antenna Gain (dBi):**	Not Applicable
Modulation:	DSSS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	2441.75 MHz
Band-Edge Frequency:	2483.5 MHz
Test Frequency Range:	2452.0 - 2524.0 MHz

Port(s)	Band-Edge Markers and Limit			Amended Limit		Margin
	M3 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a	-33.66	-22.96	2466.00			-17.500

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Conducted High Band-Edge Emissions - Peak			
Variant:	802.11g	**Duty Cycle (%):**	99
Data Rate:	19.83 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OOK	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Channel Frequency:	2446.519 MHz
Band-Edge Frequency:	2483.5 MHz
Test Frequency Range:	2446.0 - 2524.0 MHz

Port(s)	Band-Edge Markers and Limit			Amended Limit		Margin
	M3 Amplitude (dBm)	Plot Limit (dBm)	M2 Frequency (MHz)	Amplitude (dBm)	M2A Frequency (MHz)	(MHz)
a	-46.31	-23.22	2448.80			-34.700

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ±2.37 dB, > 40 GHz ±4.6 dB

Note: click the links in the above matrix to view the graphical image (plot).

8.3.2. Radiated Emissions

Transmitter Radiated Spurious Emissions (above 1 GHz); Peak Field Strength Measurements; and Radiated Band Edge Measurements – Restricted Bands

FCC, Part 15 Subpart C §15.247(d) 15.205; 15.209
Industry Canada RSS-210 §A8.5, §2.2, §2.6
Industry Canada RSS-Gen §4.7

Test Procedure

Radiated emissions above 1 GHz are measured in the anechoic chamber at a 3-meter distance on every azimuth in both horizontal and vertical polarities. The emissions are recorded and maximized as a function of azimuth by rotation through 360° with a spectrum analyzer in peak hold mode. Depending on the frequency band spanned a notch filter and waveguide filter was used to remove the fundamental frequency. The highest emissions relative to the limit are listed for each frequency spanned.

All measurements on any frequency or frequencies over 1 MHz are based on the use of measurement instrumentation employing an average detector function. All measurements above 1 GHz were performed using a minimum resolution bandwidth of 1 MHz.

Operational Modes

Operational mode(s) tested for spurious emissions were limited to the modes that delivered maximum spectral density.

Field Strength Calculation

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

FS = R + AF + CORR - FO

where: FS = Field Strength
R = Measured Spectrum analyzer Input Amplitude
AF = Antenna Factor
CORR = Correction Factor = CL – AG + NFL
CL = Cable Loss
AG = Amplifier Gain
FO = Distance Falloff Factor
NFL = Notch Filter Loss or Waveguide Loss

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

FS = 51.5 + 8.5 + 1.3 - 26.0 +1 = 36.3 dBμV/m

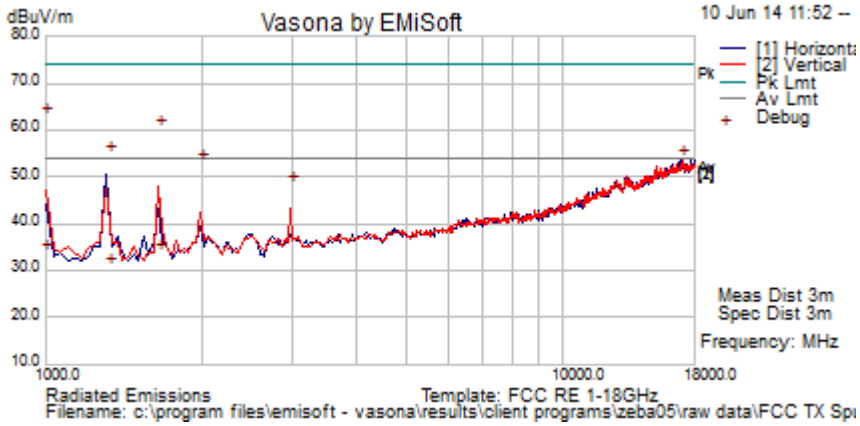
Conversion between dBμV/m (or dBμV) and μV/m (or μV) are done as:

Level (dBμV/m) = 20 * Log (level (μV/m))

40 dBμV/m = 100 μV/m
48 dBμV/m = 250 μV/m

NOTE: KDB 662911 was implemented for Out-of-Band measurements. Where necessary Option (2) Measure and add 10 log (N) dB was implemented

Test Freq.	2412 MHz CH 1	**Engineer**	JMH
Variant	802.11b; 1 Mbit/s	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	36%
Power Setting	10	**Press. (mBars)**	993
Antenna	Integral	**Duty Cycle (%)**	100
Test Notes 1	DC Power 13V		
Test Notes 2			

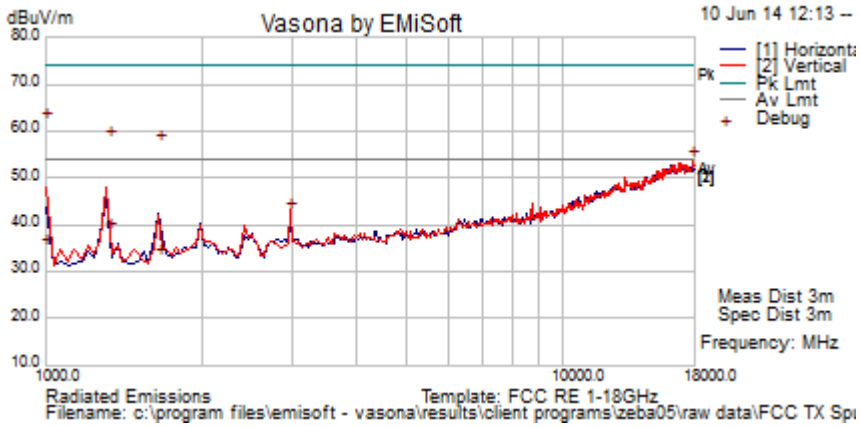


Formally measured emission peaks

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
1000.150	69.5	2.5	-9.3	62.7	Peak Max	V	116	204	74	-11.32	Pass	RB
1000.15	40.3	2.5	-9.3	33.5	Average Max	V	116	204	54	-20.51	Pass	RB
1331.513	59.4	2.9	-7.7	54.6	Peak Max	H	193	210	74	-19.44	Pass	RB
1331.513	35.5	2.9	-7.7	30.7	Average Max	H	193	210	54	-23.29	Pass	RB
1665.281	38.8	3.2	-8.6	33.5	Average Max	V	167	262	54	-20.5	Pass	RB
1665.281	65.5	3.2	-8.6	60.2	Peak Max	V	167	262	74	-13.9	Pass	RB
1997.698	55.7	3.6	-6.2	53.1	Peak [Scan]							NRB
2996.317	48.3	4.4	-4.6	48.1	Peak [Scan]							NRB
17046.092	31.3	12.4	10.2	53.9	Peak [Scan]	H	200	0	54	-0.2	Pass	Noise

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	2437 MHz CH 6	**Engineer**	JMH
Variant	802.11b; 1 Mbit/s	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	36%
Power Setting	9	**Press. (mBars)**	993
Antenna	Integral	**Duty Cycle (%)**	100
Test Notes 1	DC Power 13V		
Test Notes 2			

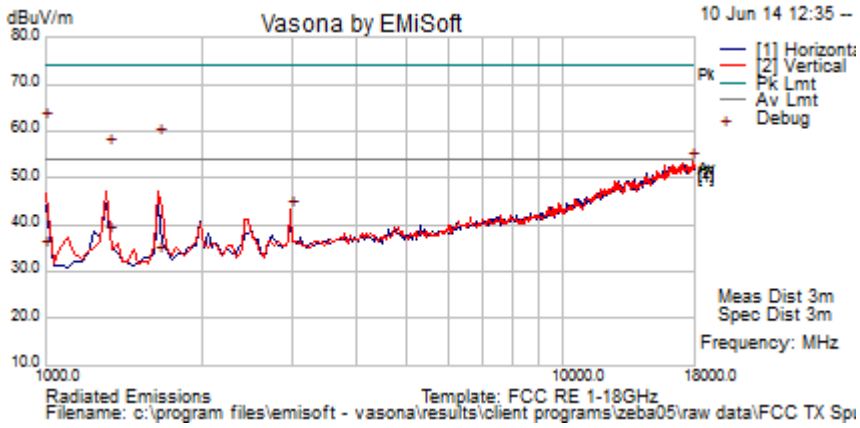


Formally measured emission peaks

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
1000.150	41.8	2.5	-9.3	35.0	Average Max	V	100	185	54	-18.97	Pass	RB
1000.150	68.9	2.5	-9.3	62.2	Peak Max	V	100	185	74	-11.84	Pass	RB
1331.746	63.0	2.9	-7.7	58.2	Peak Max	V	99	65	74	-15.77	Pass	RB
1331.746	43.0	2.9	-7.7	38.2	Average Max	V	99	65	54	-15.84	Pass	RB
1664.560	38.2	3.2	-8.6	32.8	Average Max	V	156	345	54	-21.2	Pass	RB
1664.560	62.5	3.2	-8.6	57.1	Peak Max	V	156	345	74	-16.89	Pass	RB
17829.659	30.2	13.0	10.6	53.8	Peak [Scan]	V						Noise
2973.293	42.9	4.4	-4.7	42.7	Peak [Scan]	V						NRB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	2462 MHz CH 11	**Engineer**	JMH
Variant	802.11b; 1 Mbit/s	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	36%
Power Setting	9	**Press. (mBars)**	993
Antenna	Integral	**Duty Cycle (%)**	100
Test Notes 1	DC Power 13V		
Test Notes 2			



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
1000.150	41.2	2.5	-9.3	34.4	Average Max	V	151	196	54	-19.6	Pass	
1000.150	68.8	2.5	-9.3	62.0	Peak Max	V	151	196	74	-11.96	Pass	
1331.587	42.3	2.9	-7.7	37.5	Average Max	V	102	62	54	-16.55	Pass	
1331.587	61.4	2.9	-7.7	56.6	Peak Max	V	102	62	74	-17.42	Pass	
1664.416	38.8	3.2	-8.6	33.4	Average Max	V	103	244	54	-20.59	Pass	
1664.416	63.7	3.2	-8.6	58.3	Peak Max	V	103	244	74	-15.69	Pass	
17829.659	29.9	13.0	10.6	53.4	Peak [Scan]	V						Noise
2977.144	43.2	4.4	-4.7	42.9	Peak [Scan]	V						RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

8.3.2.1. Restricted Band Emissions

Band-Edge Antenna Integral

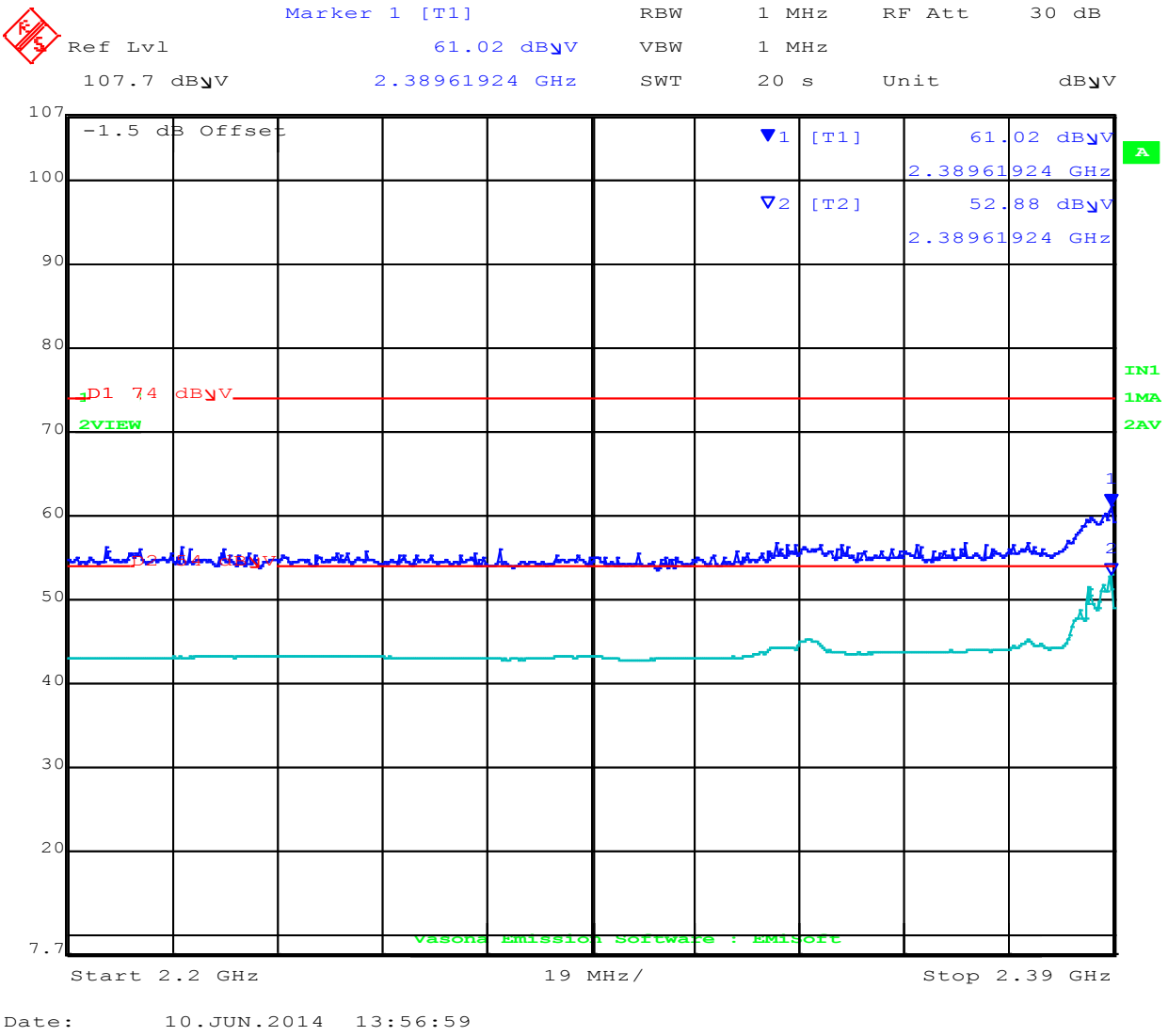
Peak Limit 74.0 dBµV/m, Average Limit 54.0 dBµV/m

2.4 GHz Frequency Band

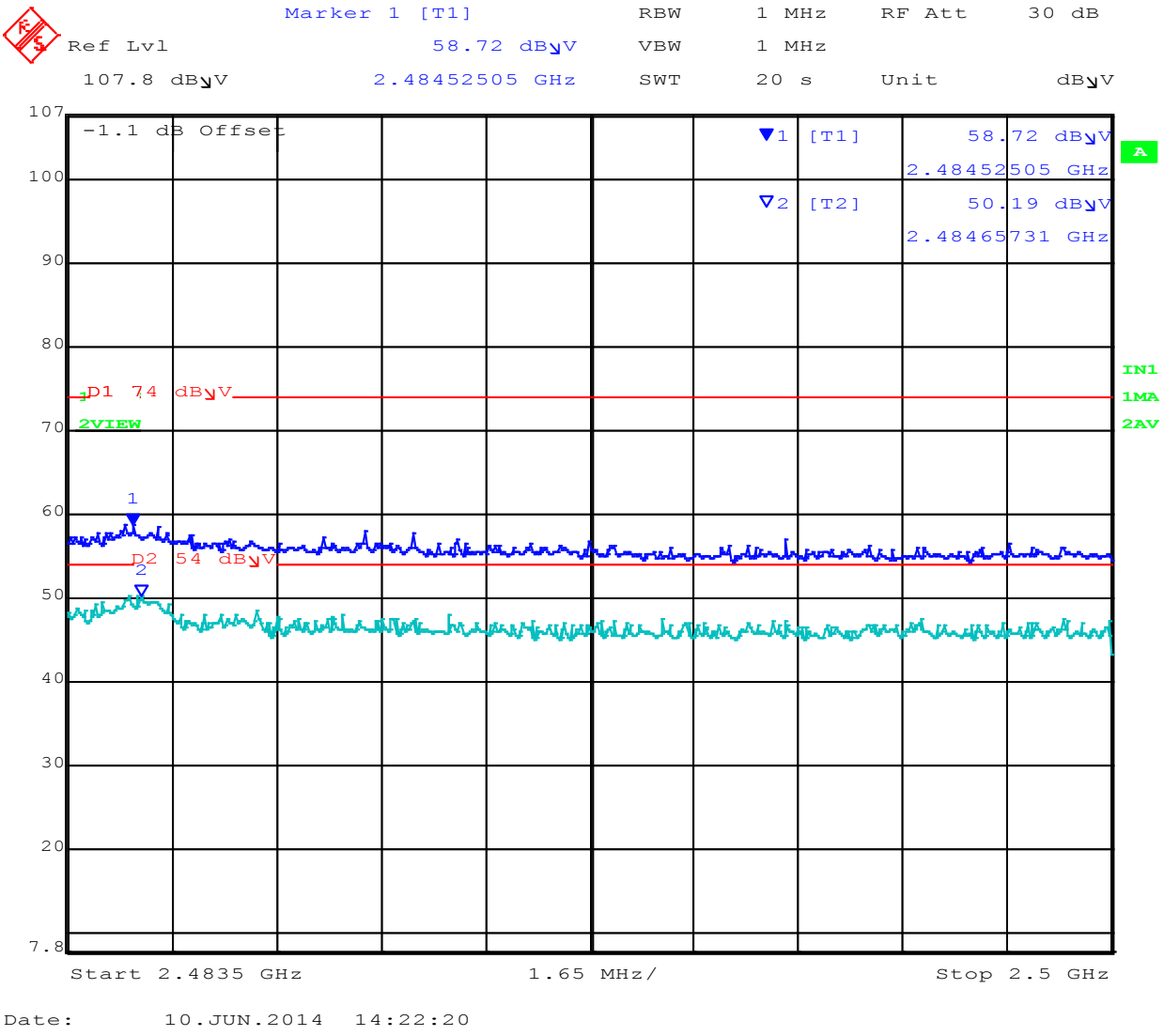
	Restricted Band 2390 MHz			Restricted Band 2483.5 MHz		
	dBµV/m		Power Setting	dBµV/m		Power Setting
Operational Mode	Peak	Average		Peak	Average	
b	61.02	52.88	10	58.72	50.19	9
g	68.69	52.05	6	70.92	52.66	6
DSSS	48.73	38.50	12	46.42	32.79	12
OOK	46.36	33.78	Max	45.88	32.79	Max

Radiated Band-Edge Plots

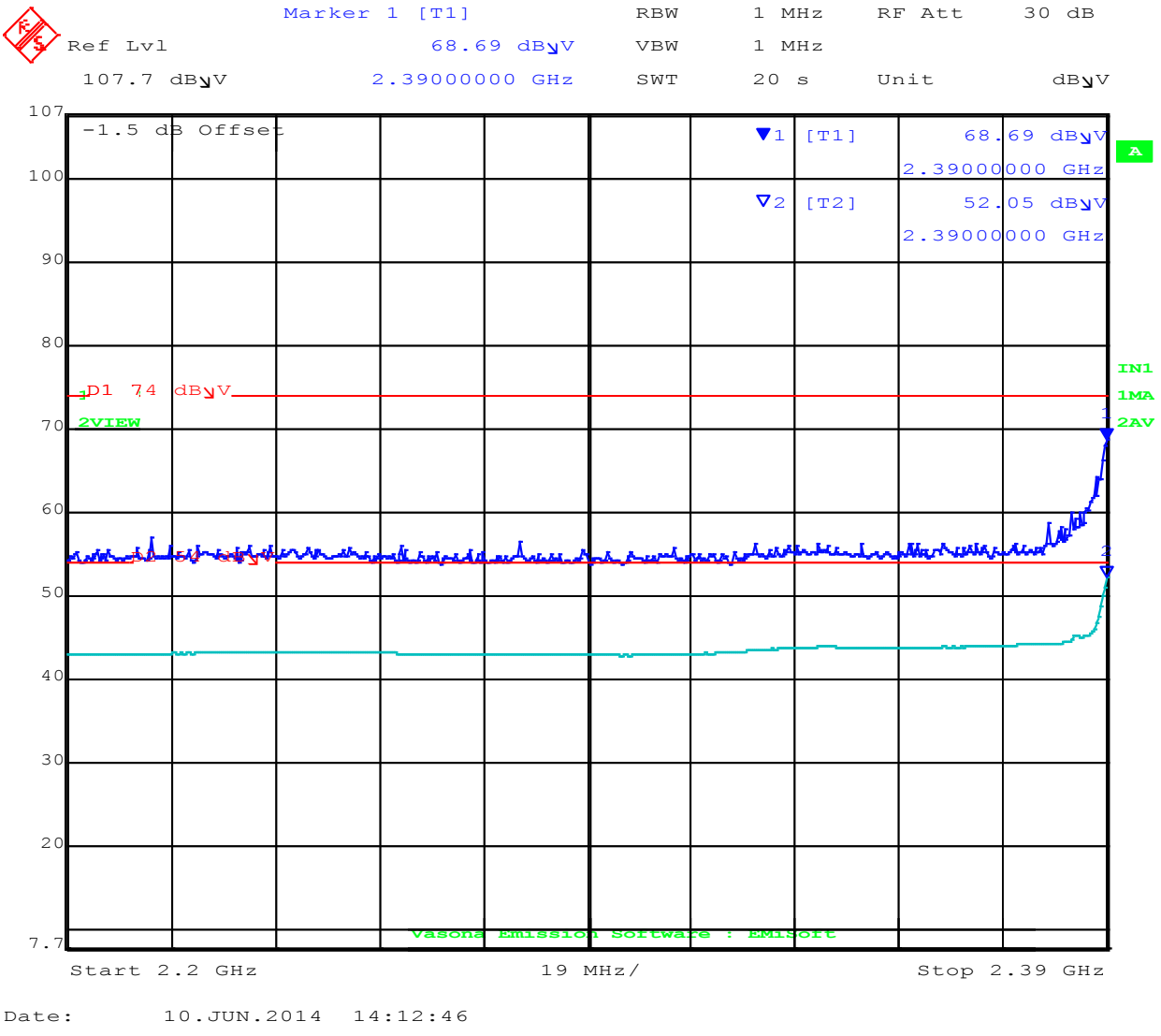
802.11b Lower Restricted Band-Edge Emissions



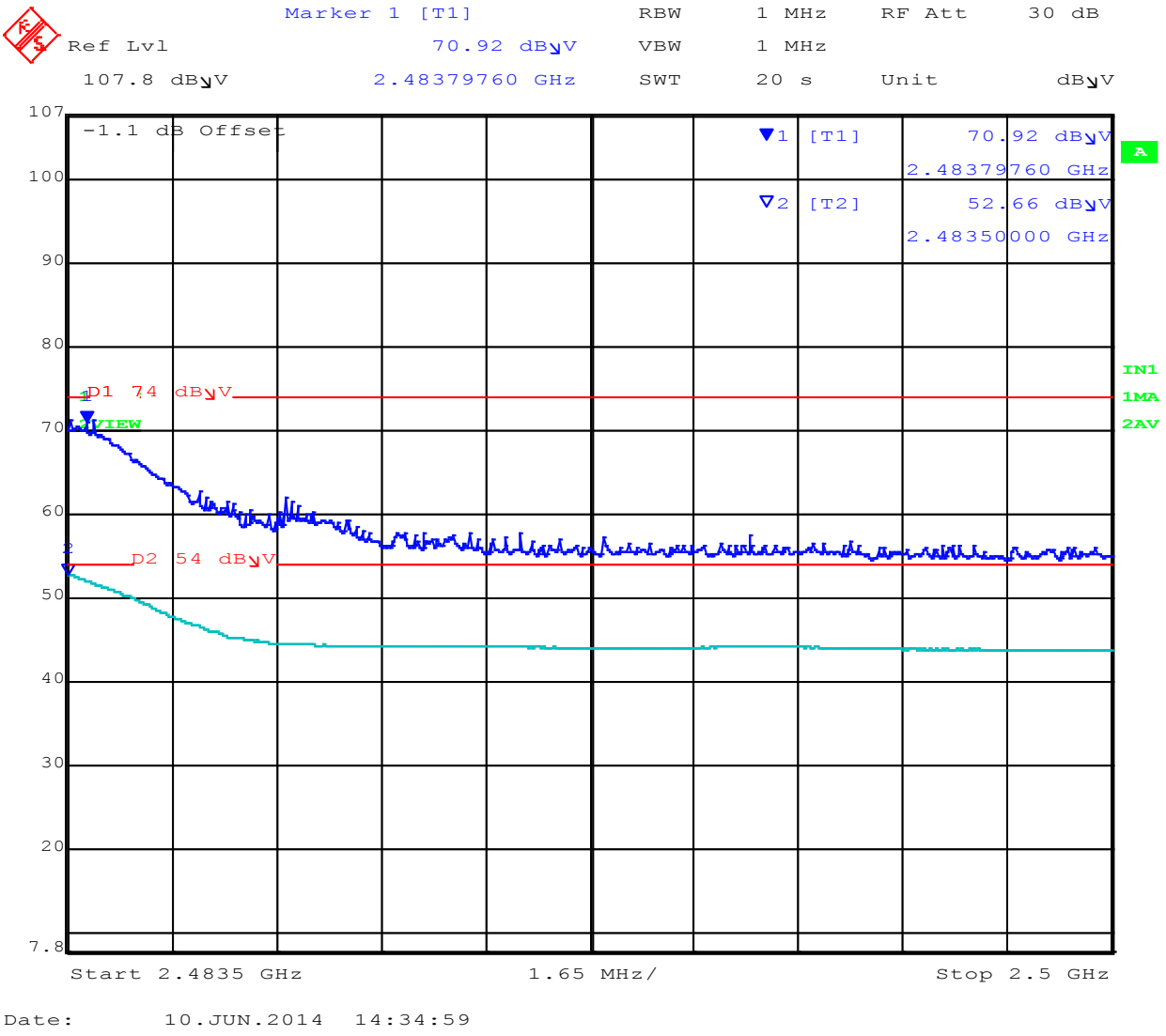
802.11b Upper Restricted Band-Edge Emissions



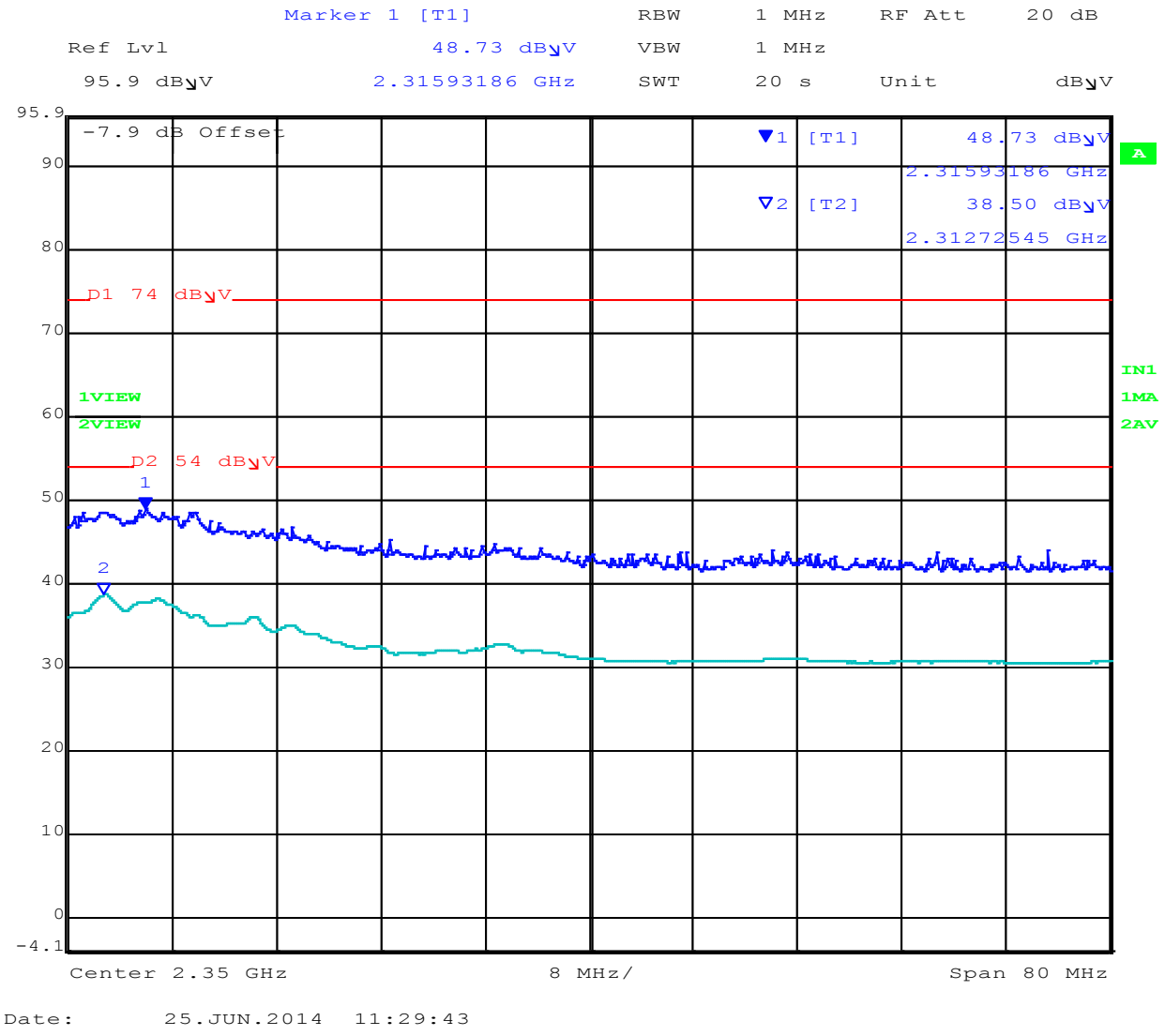
802.11g Lower Restricted Band-Edge Emissions



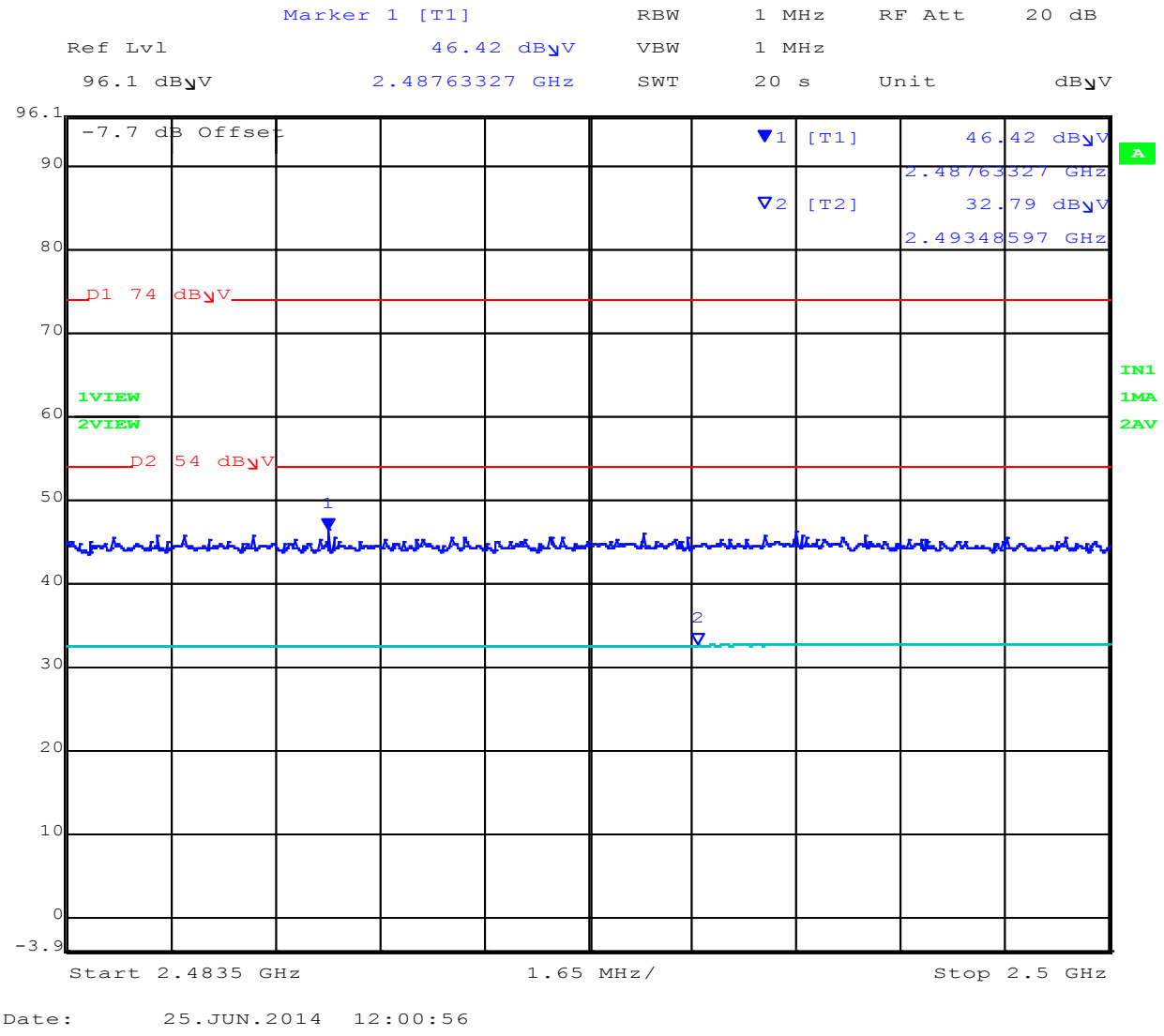
802.11g Upper Restricted Band-Edge Emissions



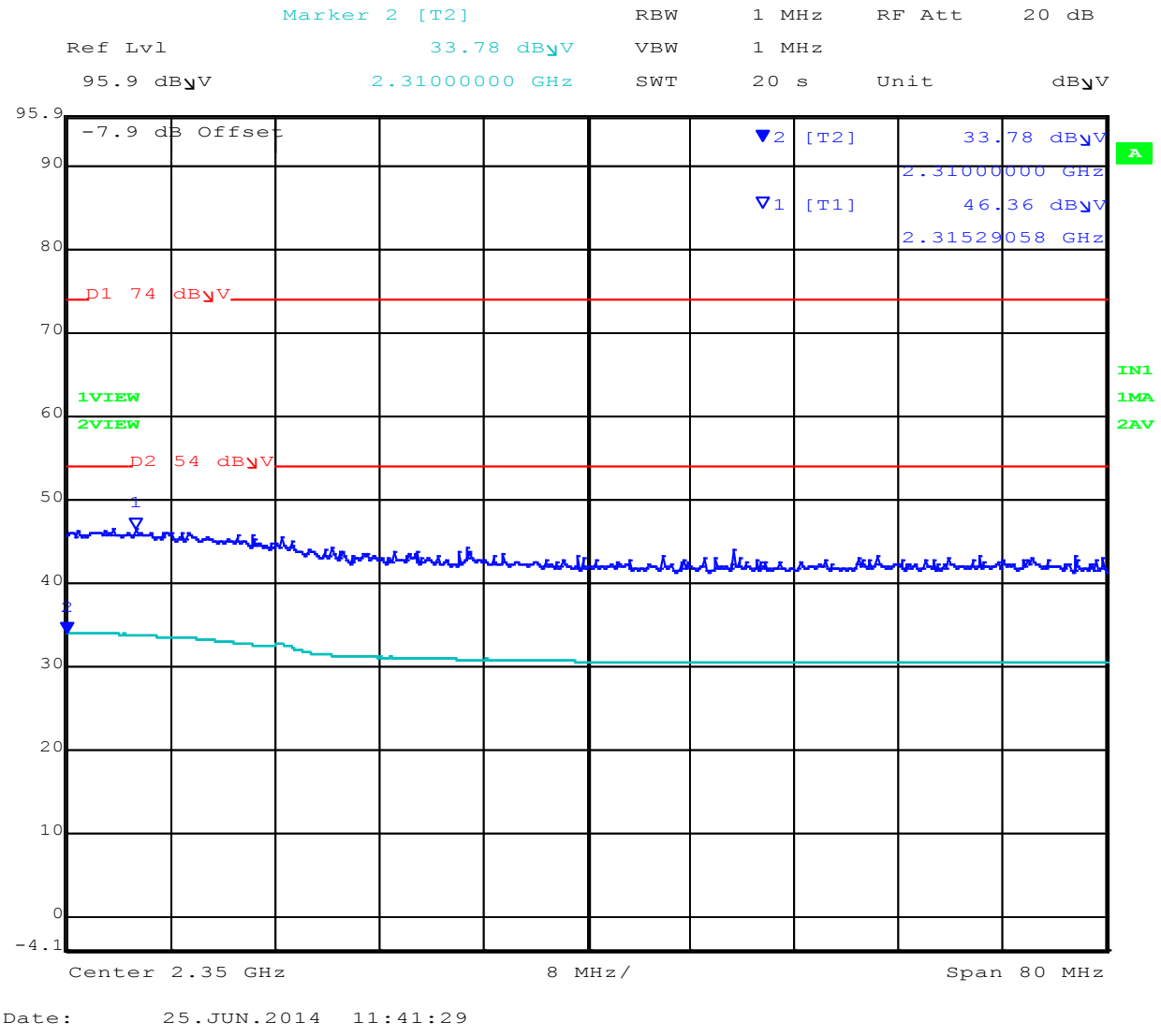
DSSS Lower Restricted Band-Edge Emissions



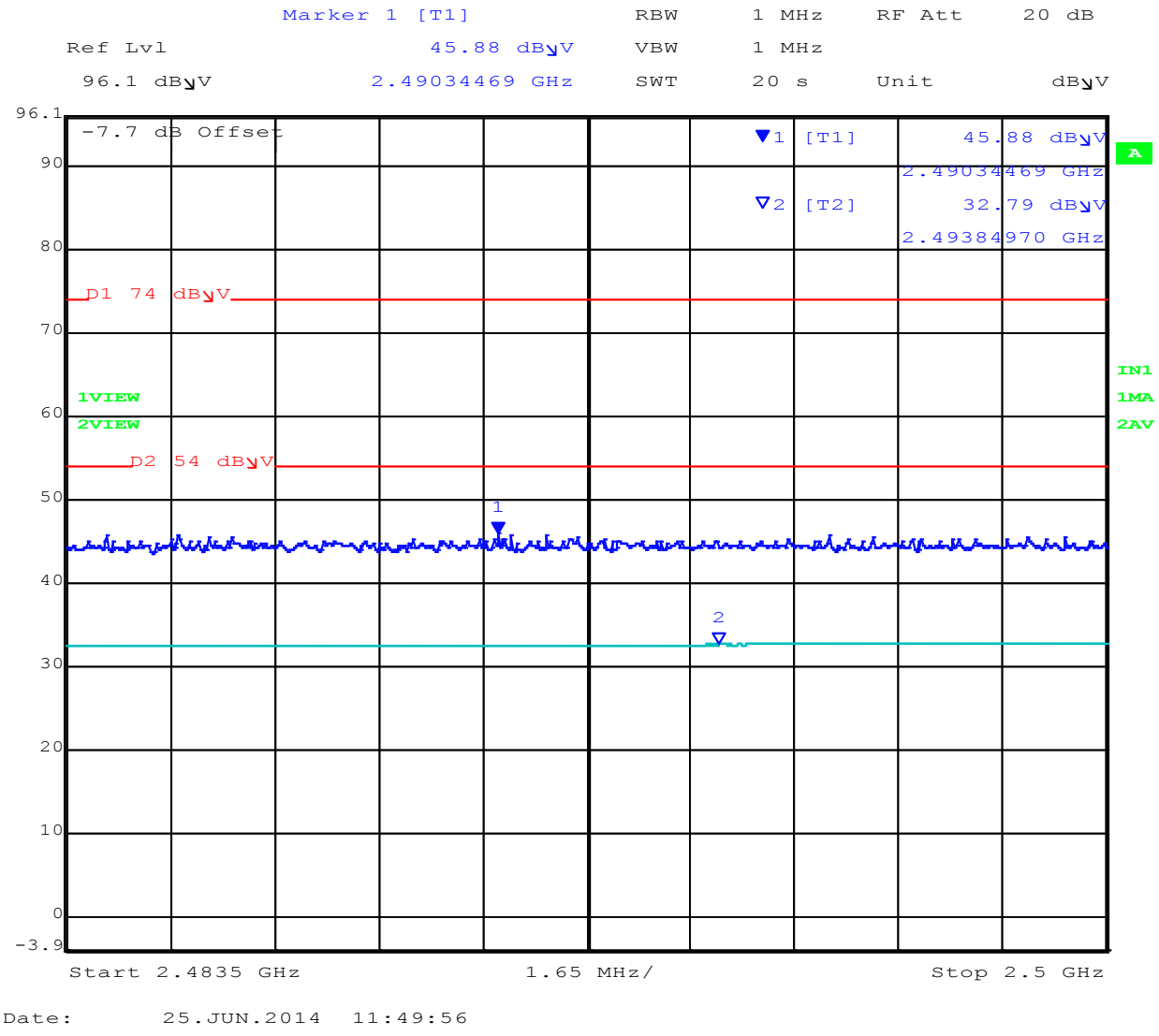
DSSS Upper Restricted Band-Edge Emissions



OOK Lower Restricted Band-Edge Emissions

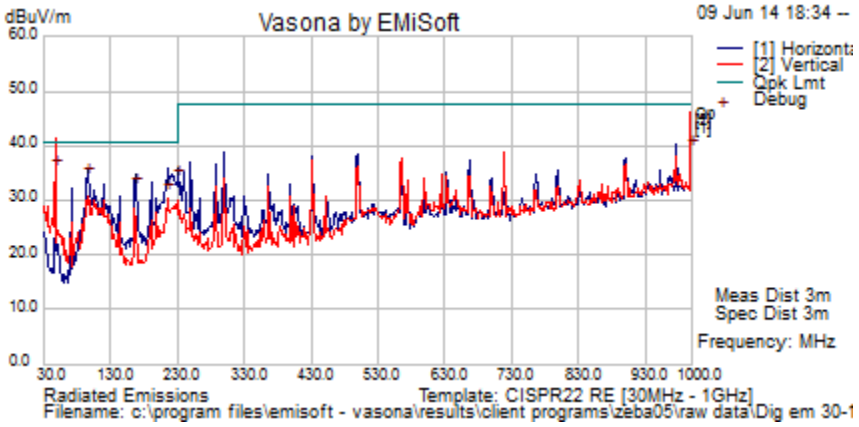


OOK Upper Restricted Band-Edge Emissions



8.3.3. Digital Emissions (0.03 - 1 GHz)

Test Freq.	NA	**Engineer**	JMH
Variant	Digital Emissions	**Temp (ºC)**	32
Freq. Range	30 MHz - 1000 MHz	**Rel. Hum.(%)**	24
Power Setting	NA	**Press. (mBars)**	989
Antenna	NA		
Test Notes 1			
Test Notes 2			



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
48.035	53.8	3.7	-22.0	35.5	Quasi Max	V	99	99	40.5	-5.0	Pass	
95.999	52.0	4.1	-22.0	34.1	Quasi Max	H	199	221	40.5	-6.4	Pass	
999.148	37.8	7.4	-5.8	39.4	Quasi Max	V	234	235	47.5	-8.1	Pass	
168.016	46.7	4.5	-18.9	32.3	Quasi Max	H	238	189	40.5	-8.2	Pass	
215.949	46.3	4.7	-19.7	31.4	Quasi Max	H	161	107	40.5	-9.1	Pass	
229.104	48.1	4.8	-19.2	33.7	Peak [Scan]	H	99	99	40.5	-6.8	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

8.3.4. AC Wireline Emissions

No requirement to test as the device is dc powered

8.4. Power Spectral Density

Equipment Configuration for Power Spectral Density - Peak

Variant:	802.11b	**Duty Cycle (%):**	99.0
Data Rate:	1 MBit/s	**Antenna Gain (dBi):**	-1.00
Modulation:	CCK	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density Port(s) (dBm/3KHz)				Amplitude Summation	Limit	Margin
MHz	a	b	c	d	dBm/3KHz	dBm/3KHz	dB
2412.0	-9.132	--	--	--	-9.132	8.0	-17.1
2437.0	-8.524	--	--	--	-8.524	8.0	-16.5
2462.0	-8.959	--	--	--	-8.959	8.0	-17.0

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Power Spectral Density - Peak			
Variant:	802.11g	**Duty Cycle (%):**	99.0
Data Rate:	6 MBit/s	**Antenna Gain (dBi):**	-1.00
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density Port(s) (dBm/3KHz)				Amplitude Summation	Limit	Margin
MHz	a	b	c	d	dBm/3KHz	dBm/3KHz	dB
2412.0	-10.733	--	--	--	-10.733	8.0	-18.7
2437.0	-10.538	--	--	--	-10.538	8.0	-18.5
2462.0	-10.786	--	--	--	-10.786	8.0	-18.8

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Power Spectral Density - Peak			
Variant:	DSSS	**Duty Cycle (%):**	99.0
Data Rate:	59.7 kbps	**Antenna Gain (dBi):**	-1.00
Modulation:	DSSS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density Port(s) (dBm/3KHz)				Amplitude Summation	Limit	Margin
MHz	a	b	c	d	dBm/3KHz	dBm/3KHz	dB
2441.75	-3.275	--	--	--	-3.275	8.0	-11.3

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

Note: click the links in the above matrix to view the graphical image (plot).

Equipment Configuration for Power Spectral Density - Peak			
Variant:	OOK	**Duty Cycle (%):**	99.0
Data Rate:	19.83 KBit/s	**Antenna Gain (dBi):**	-1.00
Modulation:	OOK	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	CC
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density Port(s) (dBm/3KHz)				Amplitude Summation	Limit	Margin
MHz	a	b	c	d	dBm/3KHz	dBm/3KHz	dB
2446.519	-3.902	--	--	--	-3.902	8.0	-11.9

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

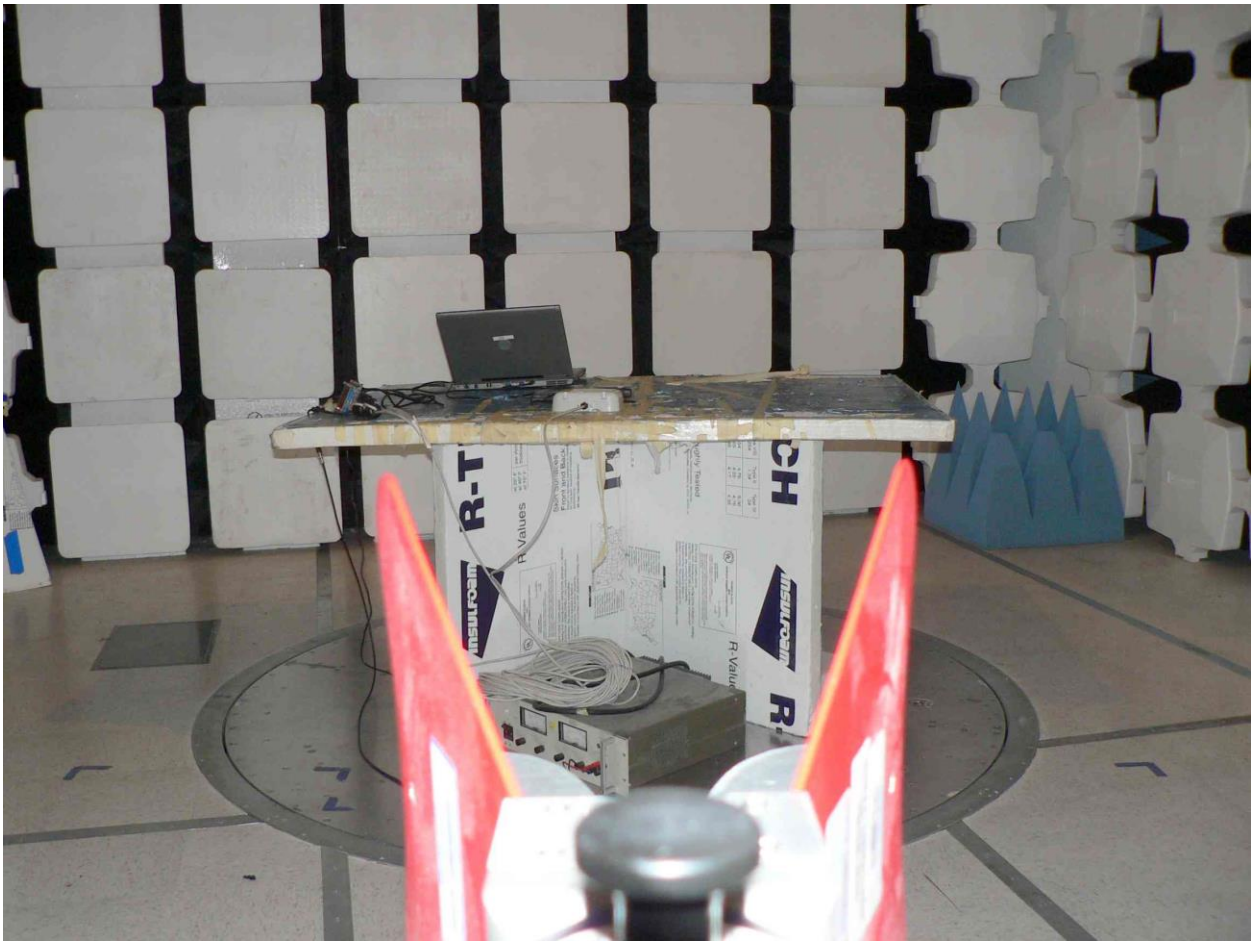
Note: click the links in the above matrix to view the graphical image (plot).

9. PHOTOGRAPHS

9.1. Conducted Test Set-up

9.2. Radiated Emissions below 1 GHz

9.3. Radiated Emissions above 1 GHz



10. TEST EQUIPMENT

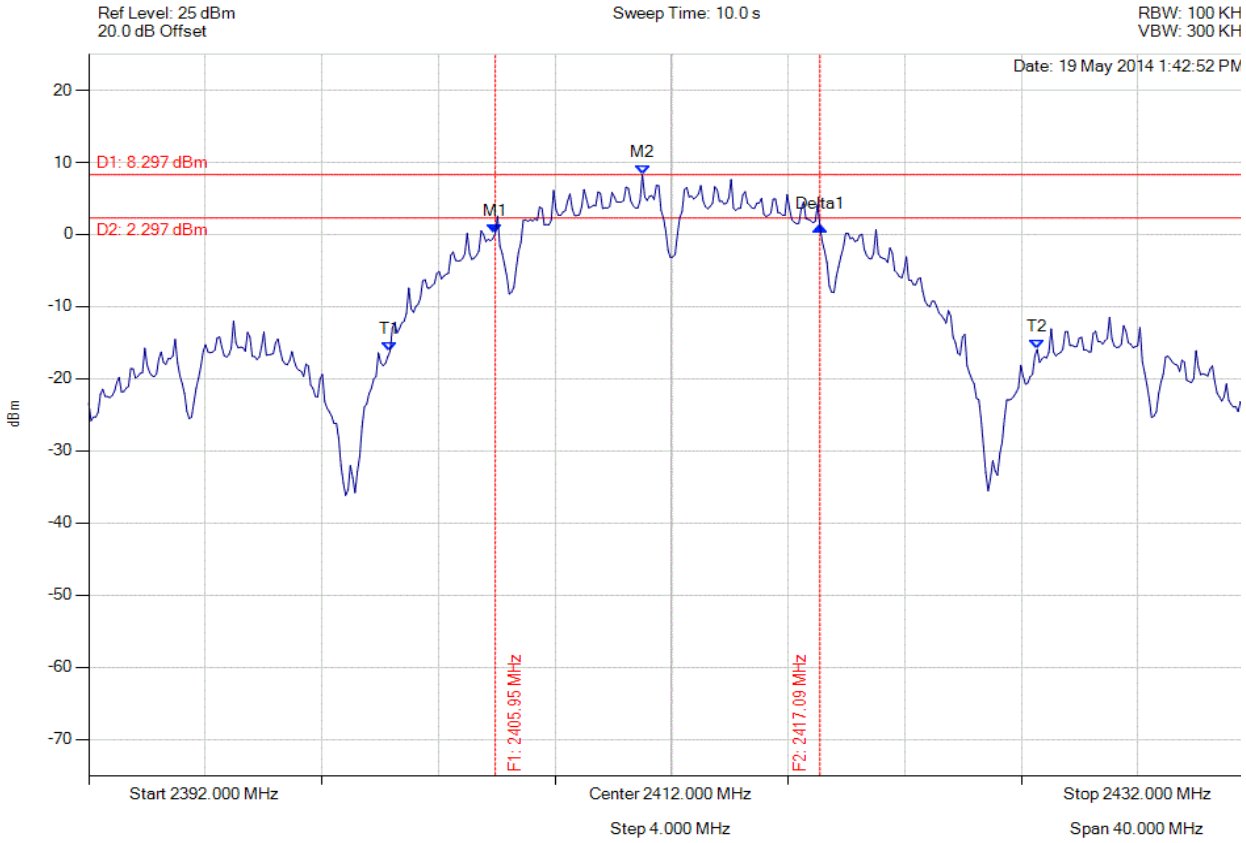
Asset #	Instrument	Manufacturer	Part #	Serial #	Calibration Due Date
0070	Power Meter	Hewlett Packard	437B	3125U11552	28th Nov 14
0117	Power Sensor	Hewlett Packard	8487D	3318A00371	15th Nov 14
0223	Power Meter	Hewlett Packard	EPM-442A	US37480256	15th Nov 14
0374	Power Sensor	Hewlett Packard	8485A	3318A19694	29th Nov 14
0158	Barometer /Thermometer	Control Co.	4196	E2846	8th Dec 14
0193	EMI Receiver	Rhode & Schwartz	ESI 7	838496/007	2nd Dec 14
0287	EMI Receiver	Rhode & Schwartz	ESIB40	100201	16th Nov 14
0338	30 - 3000 MHz Antenna	Sunol	JB3	A052907	8th Nov 14
0335	1-18 GHz Horn Antenna	EMCO	3117	00066580	7th Nov 14
0252	SMA Cable	Megaphase	Sucoflex 104	None	N/A
0293	BNC Cable	Megaphase	1689 1GVT4	15F50B001	N/A
0307	BNC Cable	Megaphase	1689 1GVT4	15F50B002	N/A
0310	2m SMA Cable	Micro-Coax	UFA210A-0-0787-3G03G0	209089-001	N/A
0312	3m SMA Cable	Micro-Coax	UFA210A-1-1181-3G0300	209092-001	N/A
0314	30dB N-Type Attenuator	ARRA	N9444-30	1623	N/A
	EMC Test Software	EMISoft	Vasona	5.0051	N/A
	RF Conducted Test Software	National Instruments	Labview	Version 8.2	N/A
	RF Conducted Test Software	MiCOM Labs ATS		Version 1.5	N/A

11. APPENDIX

11.1. 6 dB & 99% Bandwidth

6 dB & 99% BANDWIDTH

Variant: 802.11b, Channel: 2412.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc

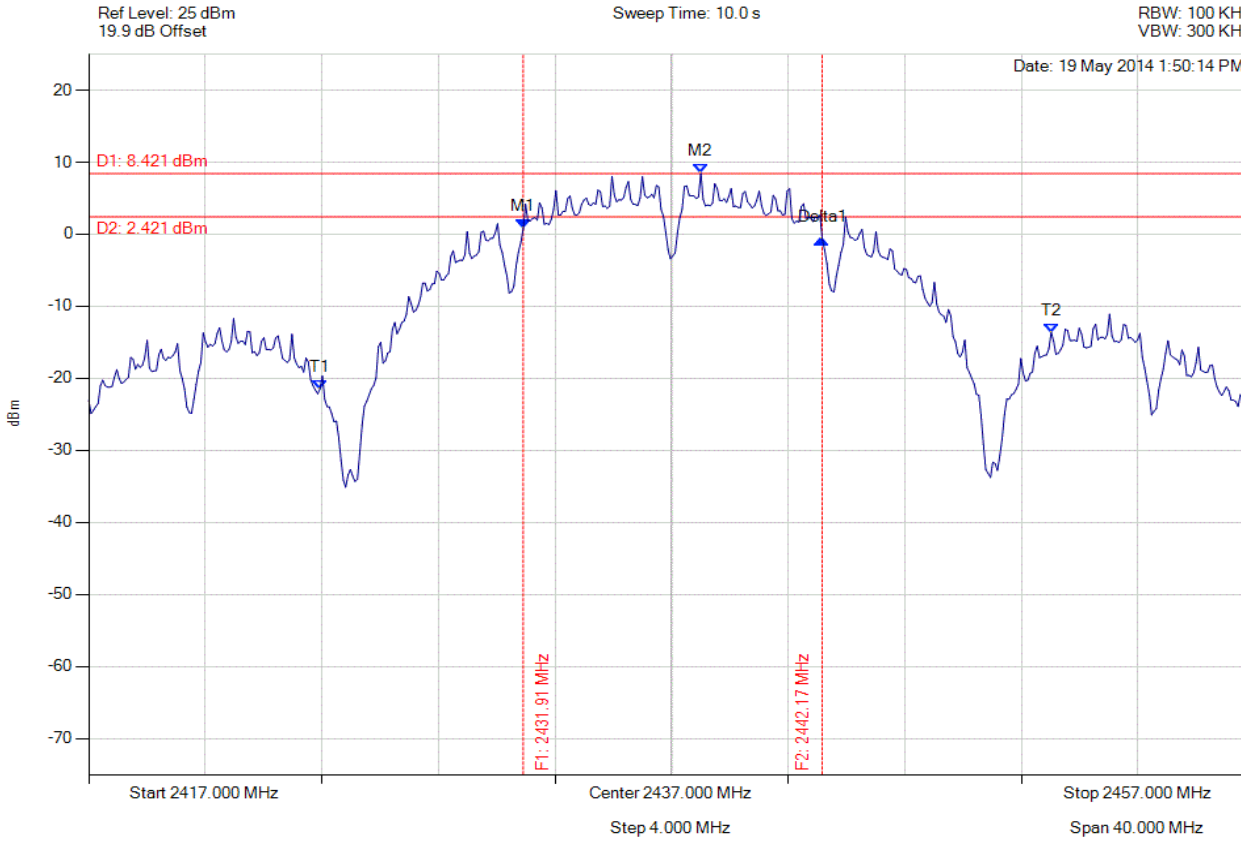


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2405.948 MHz : 0.158 dBm M2 : 2410.998 MHz : 8.297 dBm Delta1 : 11.142 MHz : 0.929 dB T1 : 2402.341 MHz : -16.177 dBm T2 : 2424.545 MHz : -15.927 dBm OBW : 22.204 MHz	Measured 6 dB Bandwidth: 11.142 MHz Limit: ≥500.0 kHz Margin: -10.64 MHz

Back to the Matrix

6 dB & 99% BANDWIDTH

Variant: 802.11b, Channel: 2437.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc

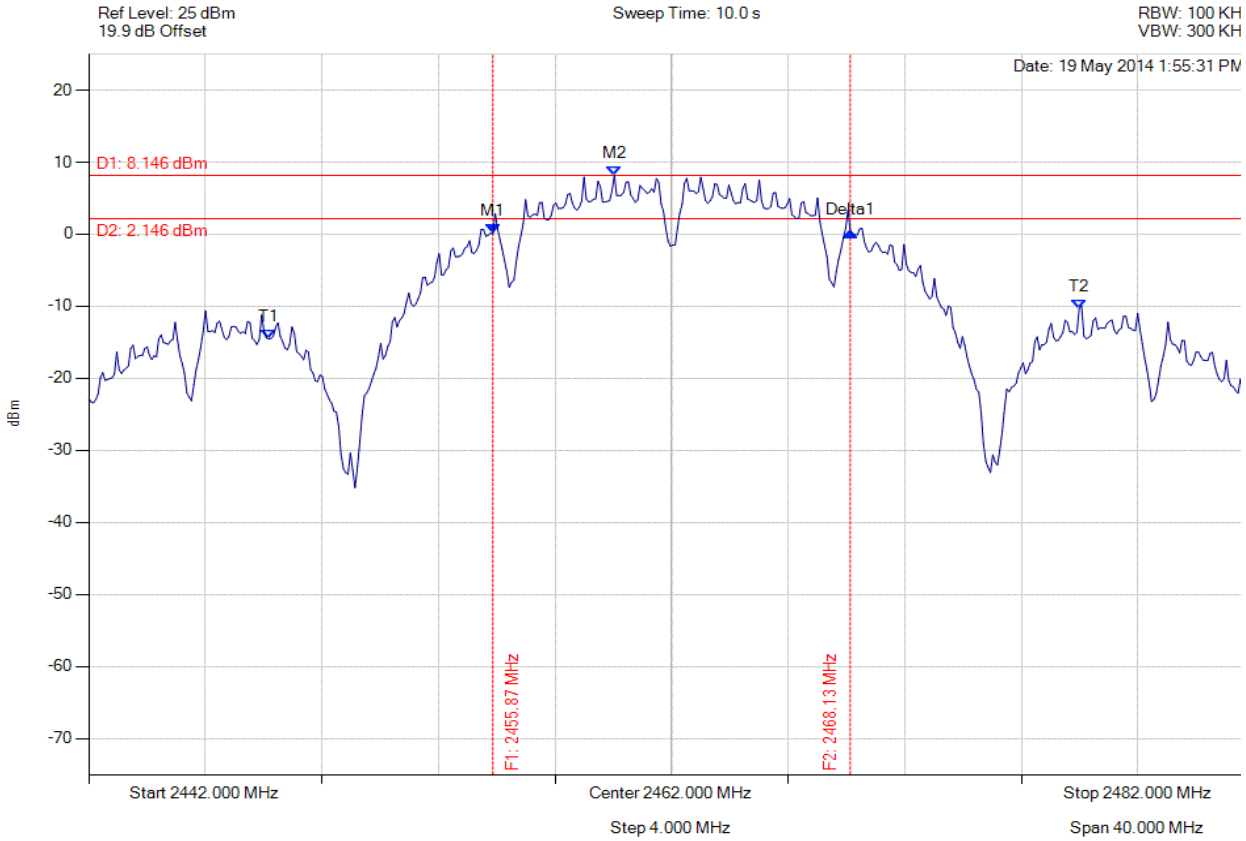


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2431.910 MHz : 0.758 dBm M2 : 2438.002 MHz : 8.421 dBm Delta1 : 10.261 MHz : -1.440 dB T1 : 2424.936 MHz : -21.498 dBm T2 : 2450.026 MHz : -13.647 dBm OBW : 25.090 MHz	Measured 6 dB Bandwidth: 10.261 MHz Limit: ≥500.0 kHz Margin: -9.76 MHz

Back to the Matrix

6 dB & 99% BANDWIDTH

Variant: 802.11b, Channel: 2462.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc

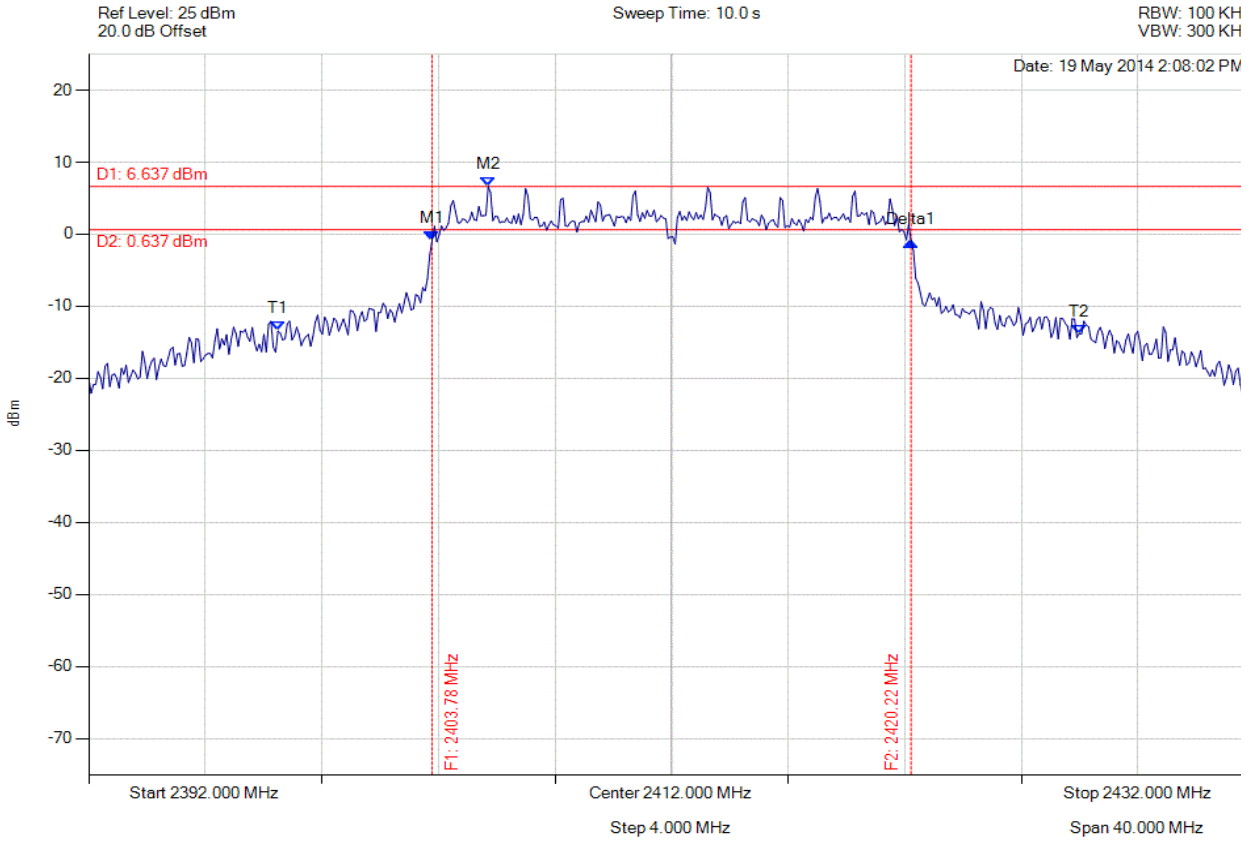


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2455.868 MHz : 0.091 dBm M2 : 2460.036 MHz : 8.146 dBm Delta1 : 12.265 MHz : 0.218 dB T1 : 2448.172 MHz : -14.544 dBm T2 : 2475.988 MHz : -10.312 dBm OBW : 27.816 MHz	Measured 6 dB Bandwidth: 12.265 MHz Limit: ≥500.0 kHz Margin: -11.77 MHz

Back to the Matrix

6 dB & 99% BANDWIDTH

Variant: 802.11g, Channel: 2412.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc

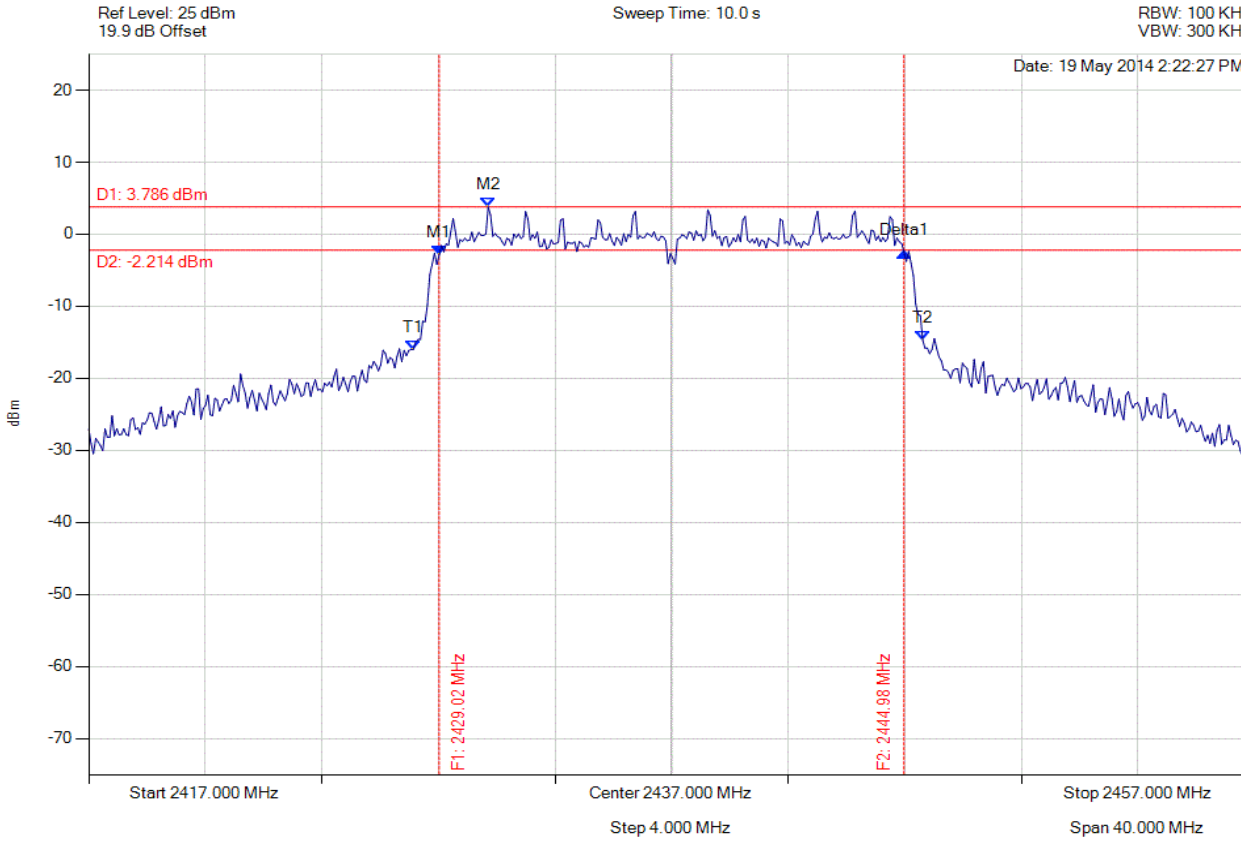


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2403.784 MHz : -0.867 dBm M2 : 2405.707 MHz : 6.637 dBm Delta1 : 16.433 MHz : -0.226 dB T1 : 2398.493 MHz : -13.438 dBm T2 : 2425.988 MHz : -13.822 dBm OBW : 27.495 MHz	Measured 6 dB Bandwidth: 16.433 MHz Limit: ≥500.0 kHz Margin: -15.93 MHz

Back to the Matrix

6 dB & 99% BANDWIDTH

Variant: 802.11g, Channel: 2437.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc

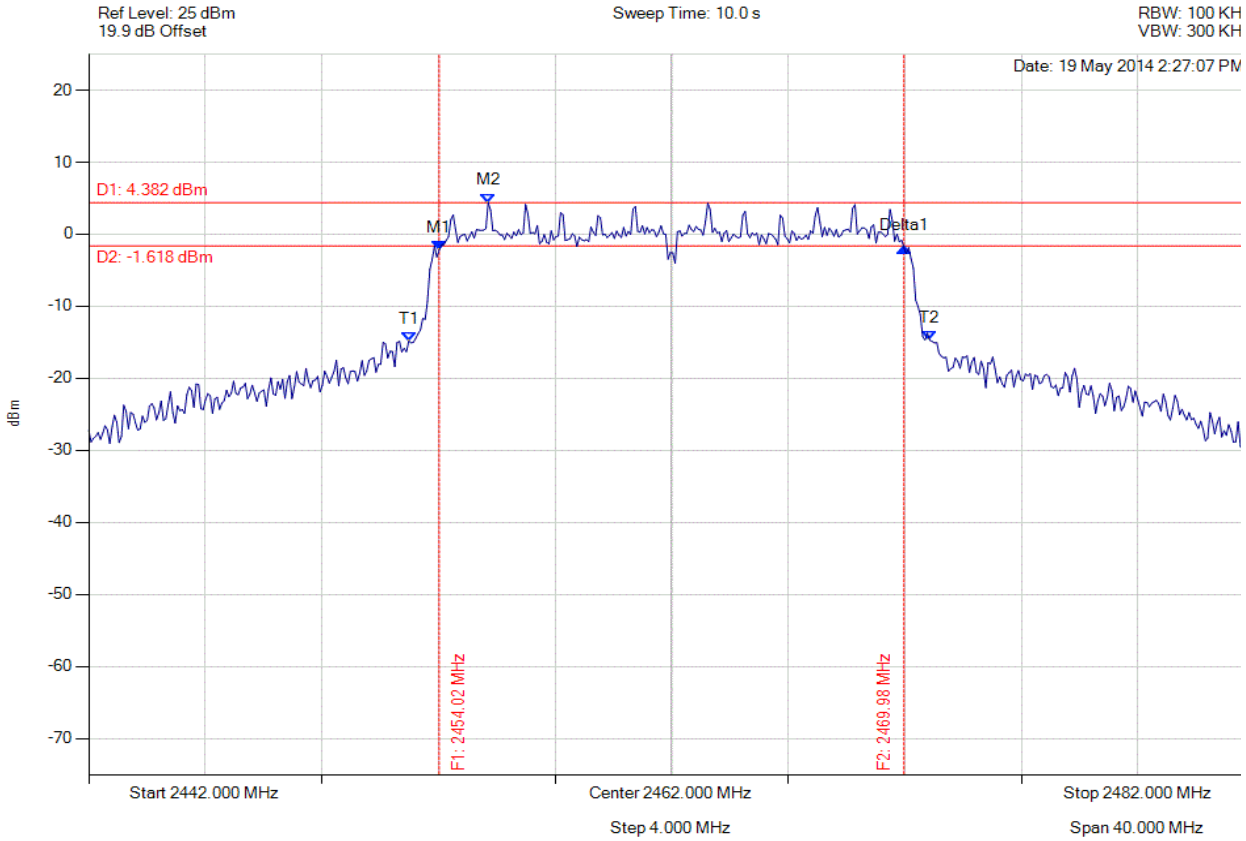


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2429.024 MHz : -2.897 dBm M2 : 2430.707 MHz : 3.786 dBm Delta1 : 15.952 MHz : 0.393 dB T1 : 2428.142 MHz : -16.025 dBm T2 : 2445.617 MHz : -14.754 dBm OBW : 17.475 MHz	Measured 6 dB Bandwidth: 15.952 MHz Limit: ≥500.0 kHz Margin: -15.45 MHz

Back to the Matrix

6 dB & 99% BANDWIDTH

Variant: 802.11g, Channel: 2462.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc

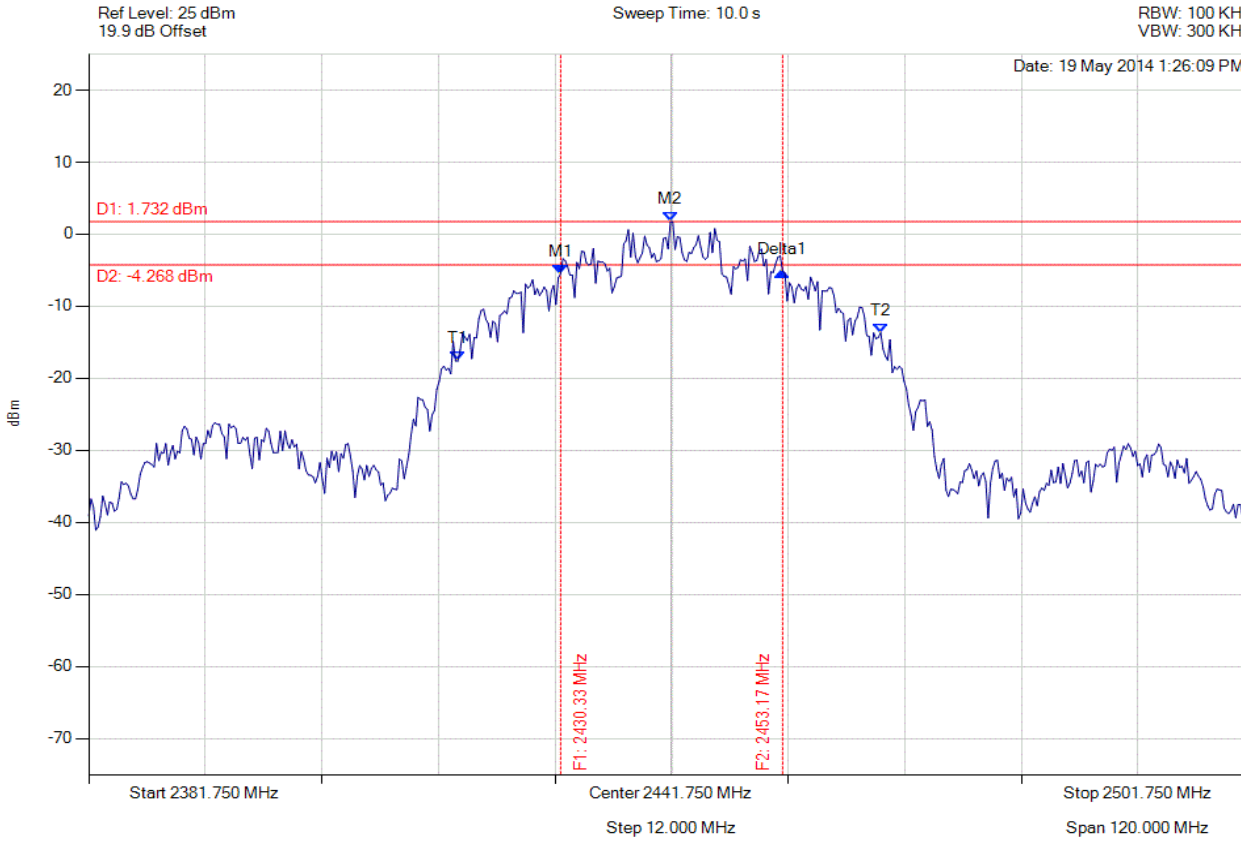


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2454.024 MHz : -2.228 dBm M2 : 2455.707 MHz : 4.382 dBm Delta1 : 15.952 MHz : 0.407 dB T1 : 2452.982 MHz : -14.821 dBm T2 : 2470.858 MHz : -14.711 dBm OBW : 17.876 MHz	Measured 6 dB Bandwidth: 15.952 MHz Limit: ≥500.0 kHz Margin: -15.45 MHz

Back to the Matrix

6 dB & 99% BANDWIDTH

Variant: DSSS, Channel: 2441.75 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc

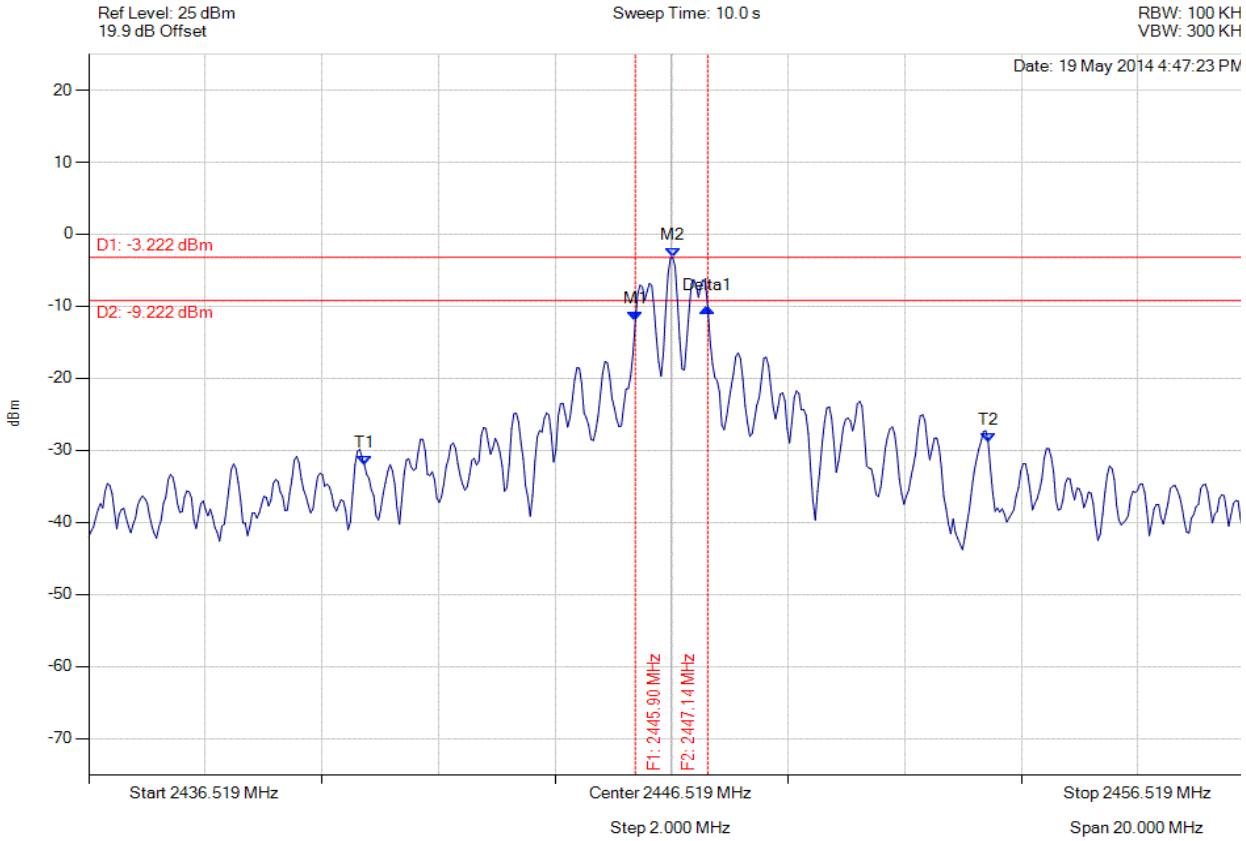


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2430.327 MHz : -5.500 dBm M2 : 2441.630 MHz : 1.732 dBm Delta1 : 22.846 MHz : 0.338 dB T1 : 2419.746 MHz : -17.617 dBm T2 : 2463.273 MHz : -13.686 dBm OBW : 43.527 MHz	Measured 6 dB Bandwidth: 22.846 MHz Limit: ≥500.0 kHz Margin: -22.35 MHz

Back to the Matrix

6 dB & 99% BANDWIDTH

Variant: OOK, Channel: 2446.52 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2445.898 MHz : -12.024 dBm M2 : 2446.539 MHz : -3.222 dBm Delta1 : 1.242 MHz : 1.851 dB T1 : 2441.248 MHz : -32.034 dBm T2 : 2451.950 MHz : -28.819 dBm OBW : 10.701 MHz	Measured 6 dB Bandwidth: 1.242 MHz Limit: ≥500.0 kHz Margin: -0.74 MHz

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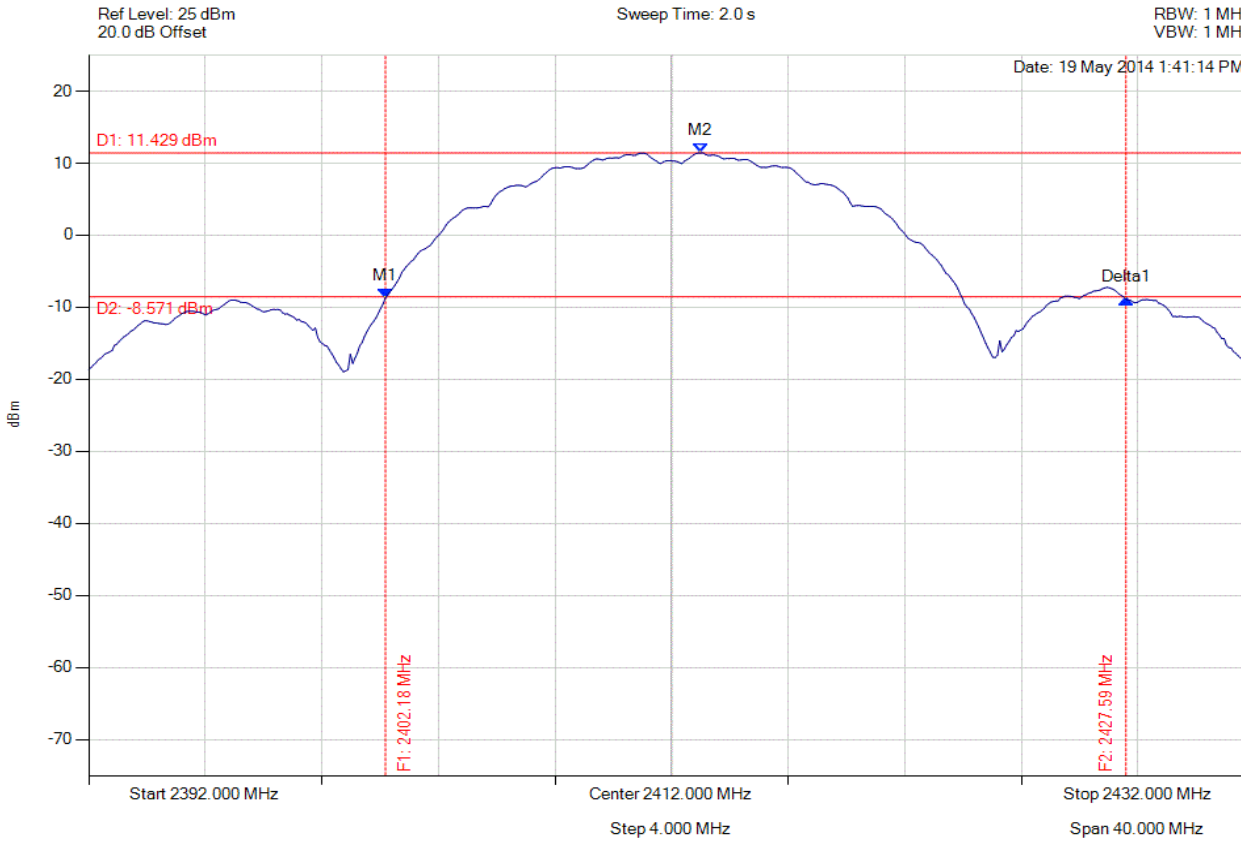
11.2. Conducted Output Power

PEAK OUTPUT POWER

Variant: 802.11b, Channel: 2412.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc

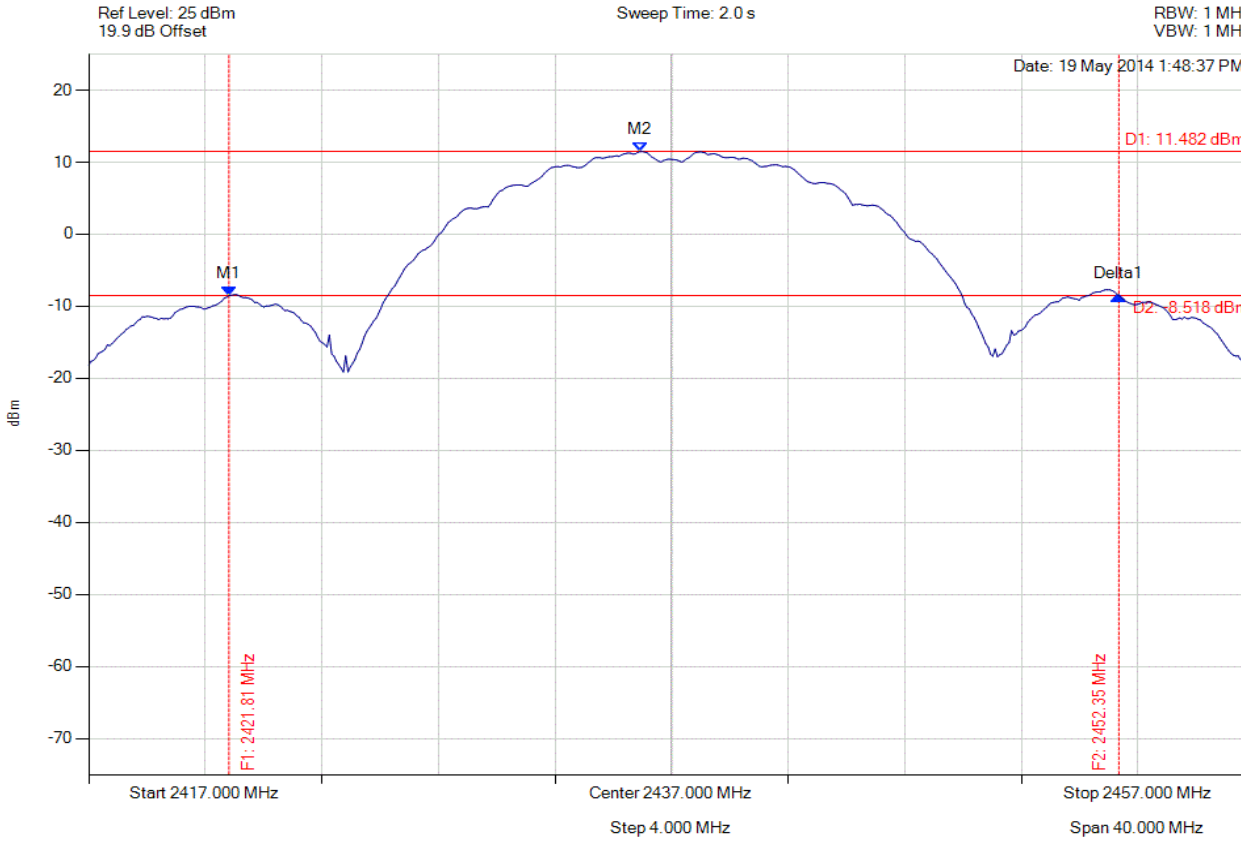


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2402.180 MHz : -8.709 dBm M2 : 2413.002 MHz : 11.429 dBm Delta1 : 25.411 MHz : -0.175 dB	Channel Power: 20.28 dBm Limit: 30.00 dBm Margin: -9.72 dB

Back to the Matrix

PEAK OUTPUT POWER

Variant: 802.11b, Channel: 2437.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc

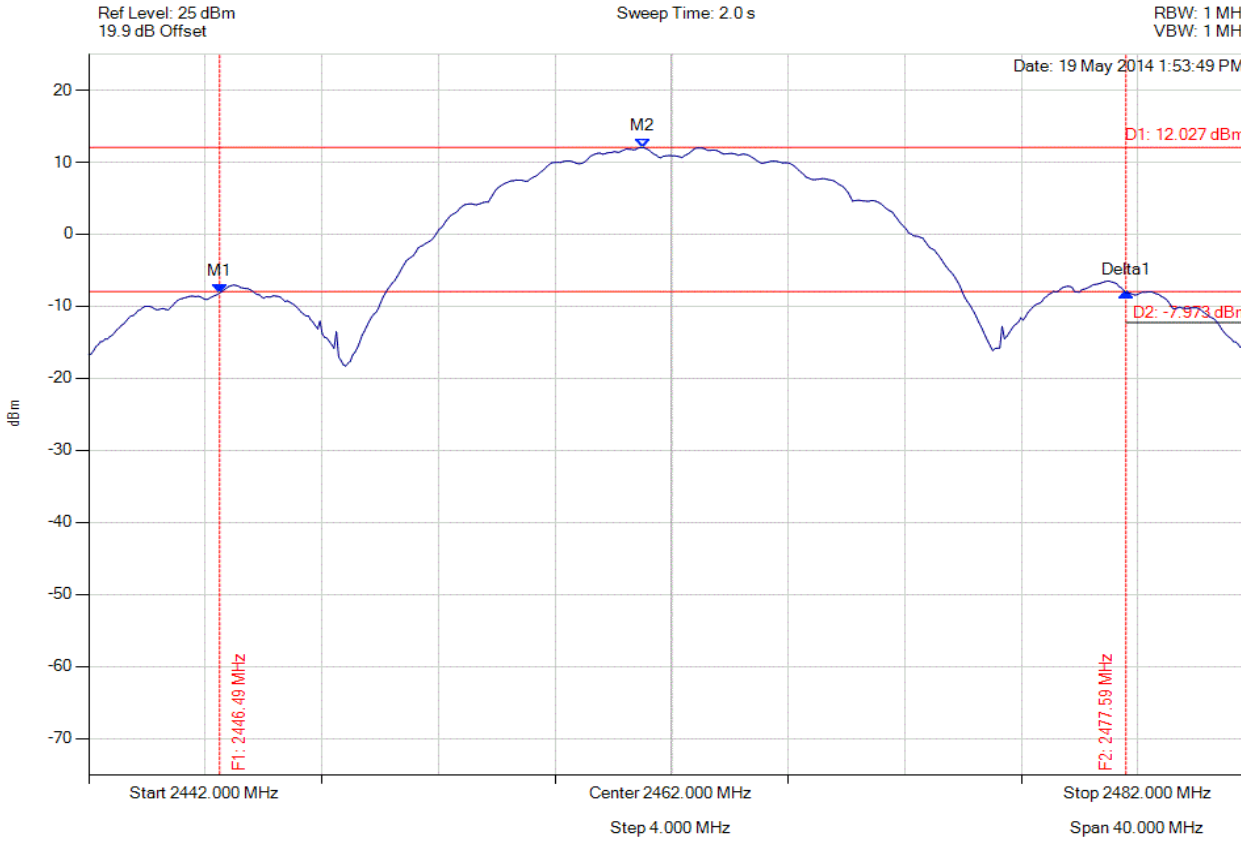


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2421.810 MHz : -8.541 dBm M2 : 2435.918 MHz : 11.482 dBm Delta1 : 30.541 MHz : -0.002 dB	Channel Power: 20.32 dBm Limit: 30.00 dBm Margin: -9.68 dB

Back to the Matrix

PEAK OUTPUT POWER

Variant: 802.11b, Channel: 2462.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2446.489 MHz : -8.174 dBm M2 : 2460.998 MHz : 12.027 dBm Delta1 : 31.102 MHz : 0.102 dB	Channel Power: 20.91 dBm Limit: 30.00 dBm Margin: -9.09 dB

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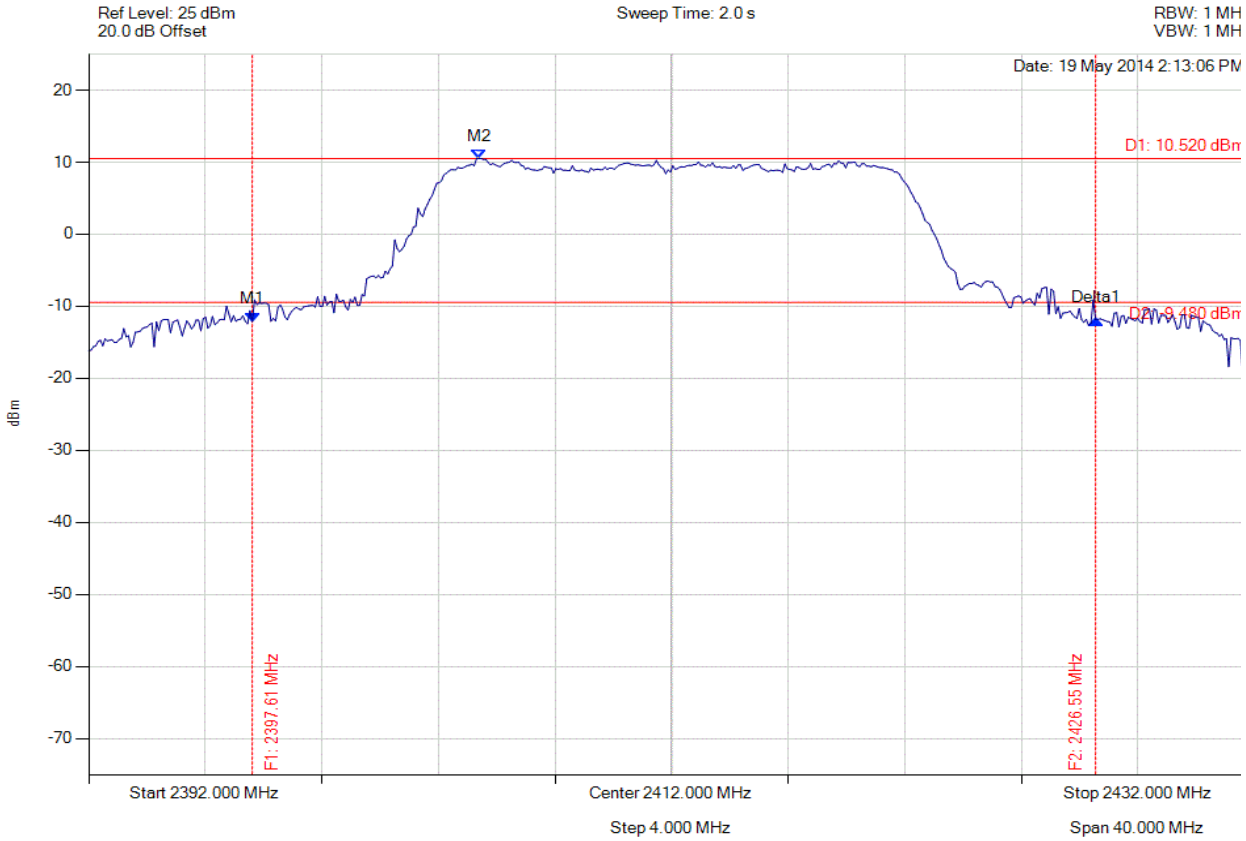
PEAK OUTPUT POWER

Variant: 802.11g, Channel: 2412.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc

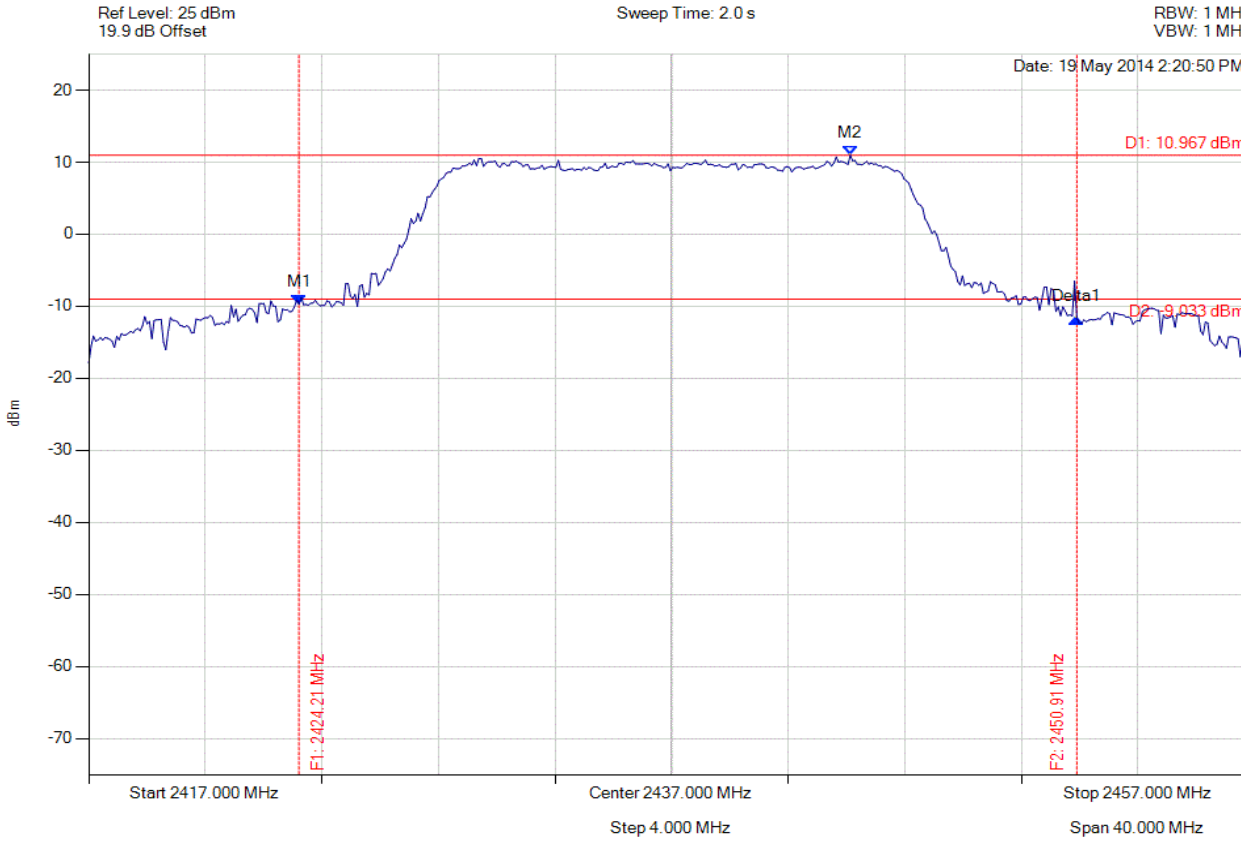


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2397.611 MHz : -12.124 dBm M2 : 2405.387 MHz : 10.520 dBm Delta1 : 28.938 MHz : 0.236 dB	Channel Power: 21.06 dBm Limit: 30.00 dBm Margin: -8.94 dB

Back to the Matrix

PEAK OUTPUT POWER

Variant: 802.11g, Channel: 2437.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2424.214 MHz : -9.749 dBm M2 : 2443.132 MHz : 10.967 dBm Delta1 : 26.693 MHz : -1.952 dB	Channel Power: 21.21 dBm Limit: 30.00 dBm Margin: -8.79 dB

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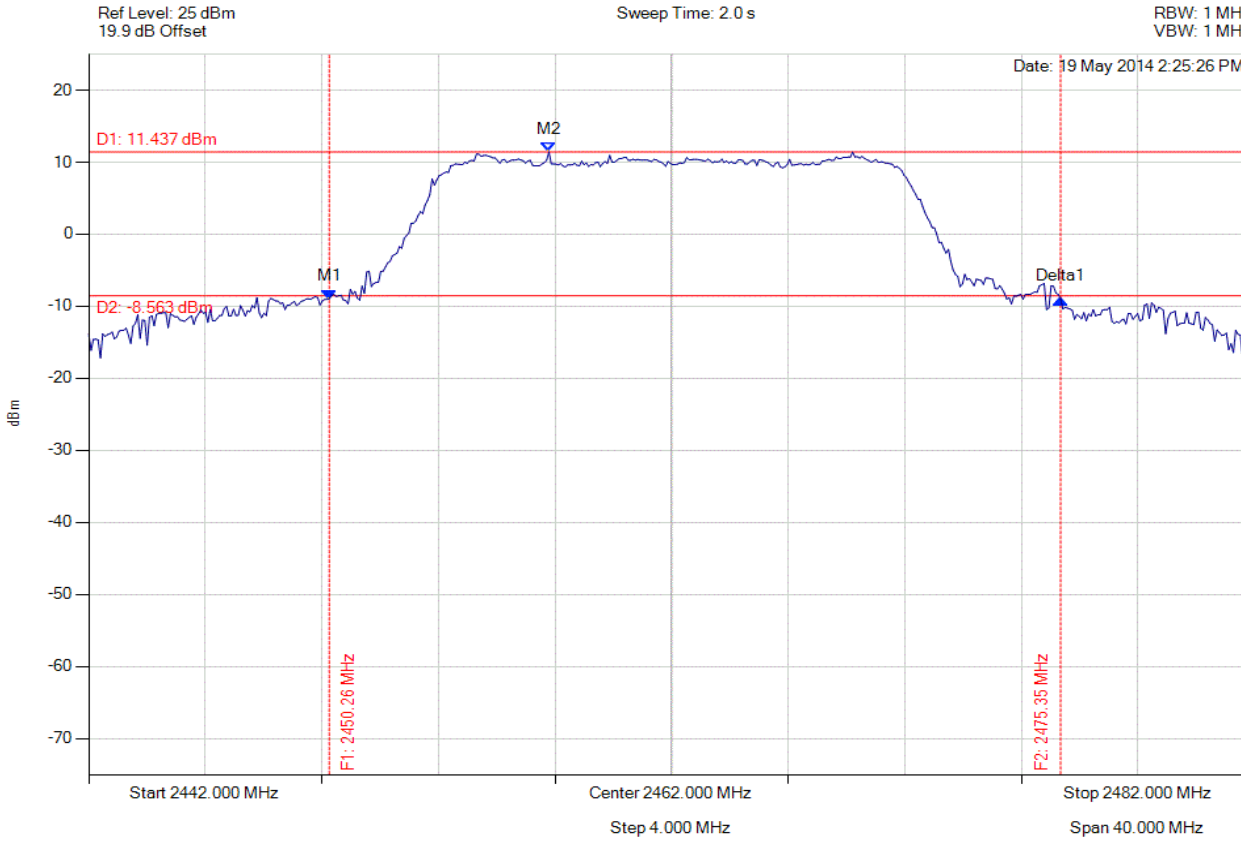
PEAK OUTPUT POWER

Variant: 802.11g, Channel: 2462.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc

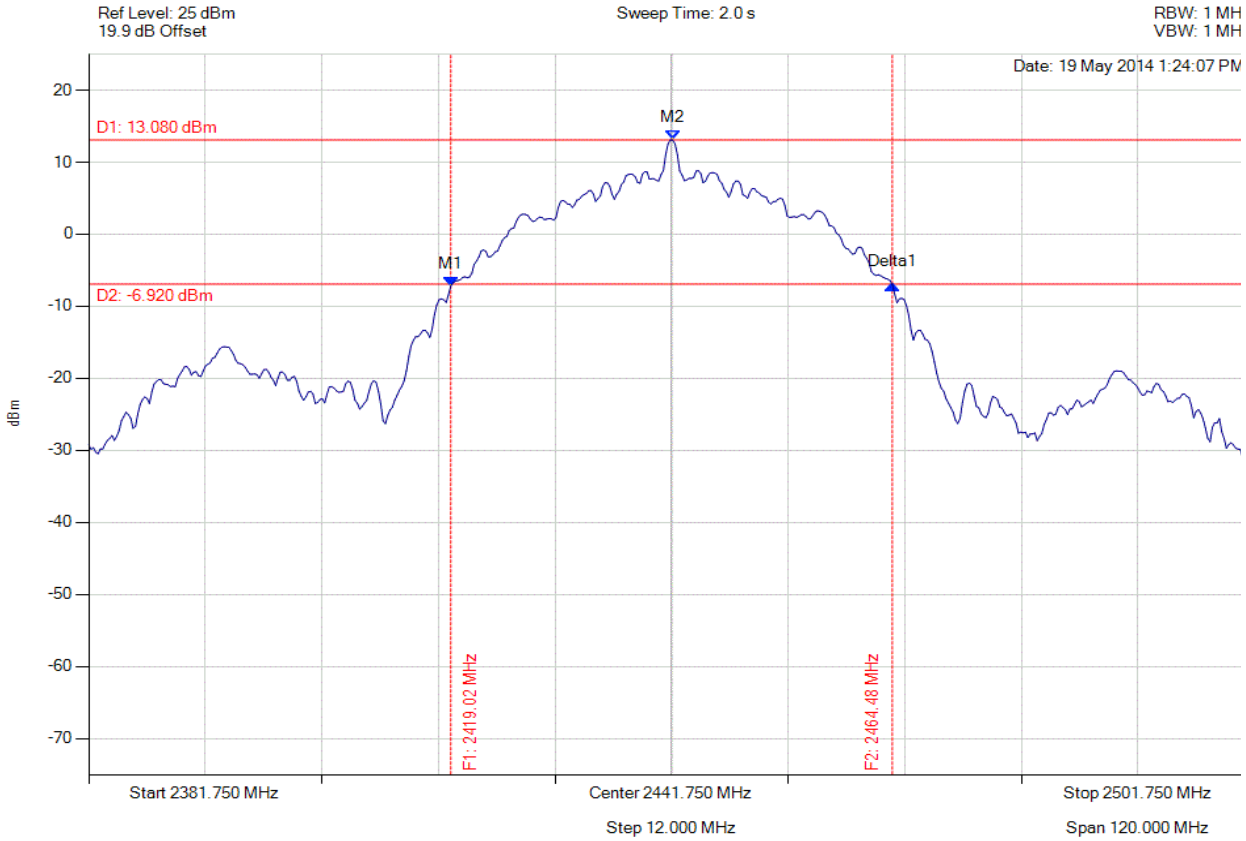


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2450.257 MHz : -8.962 dBm M2 : 2457.792 MHz : 11.437 dBm Delta1 : 25.090 MHz : 0.010 dB	Channel Power: 21.77 dBm Limit: 30.00 dBm Margin: -8.23 dB

Back to the Matrix

PEAK OUTPUT POWER

Variant: DSSS, Channel: 2441.75 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2419.025 MHz : -7.131 dBm M2 : 2441.870 MHz : 13.080 dBm Delta1 : 45.451 MHz : 0.169 dB	Channel Power: 21.23 dBm Limit: 30.00 dBm Margin: -8.77 dB

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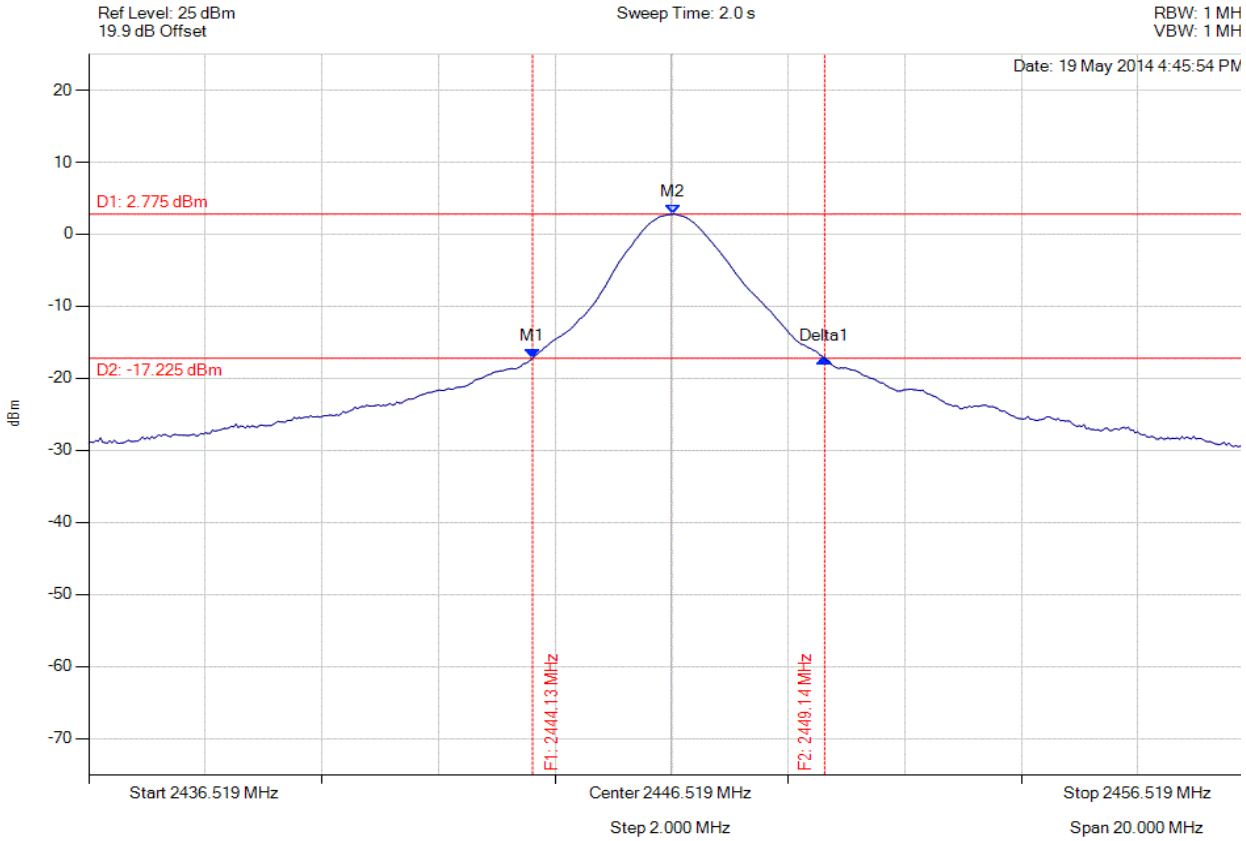
PEAK OUTPUT POWER

Variant: OOK, Channel: 2446.52 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2444.134 MHz : -17.241 dBm M2 : 2446.539 MHz : 2.775 dBm Delta1 : 5.010 MHz : 0.008 dB	Channel Power: 3.54 dBm Limit: 30.00 dBm Margin: -26.46 dB

Back to the Matrix

11.3. Emissions

header_chart_796040b8-4283-4a69-86f9-5abc34d3a536

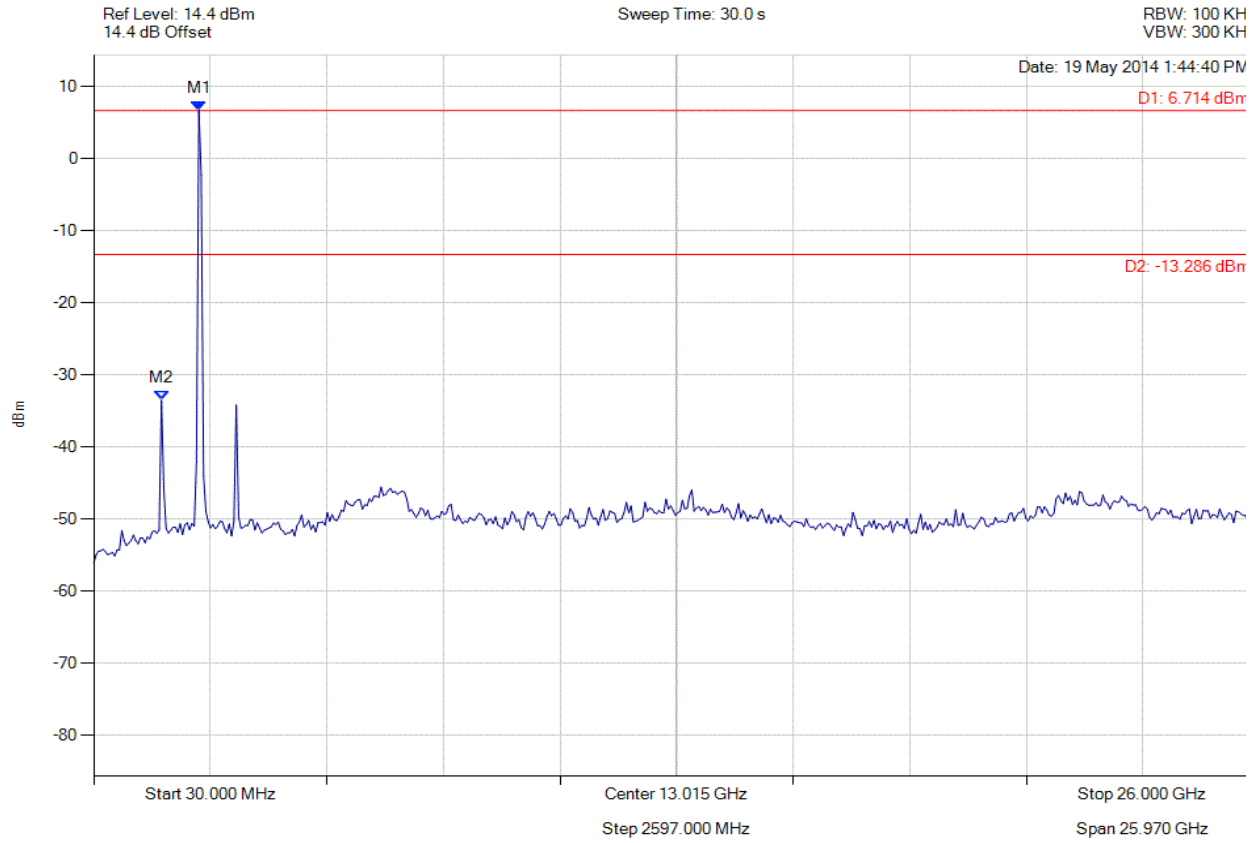
11.3.1. Conducted Emissions

header_chart_ebb67062-6343-425f-b0c8-dd21e66e27bf

11.3.1.1. Conducted Spurious Emissions

CONDUCTED SPURIOUS EMISSIONS - PEAK

Variant: 802.11b, Channel: 2412.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc

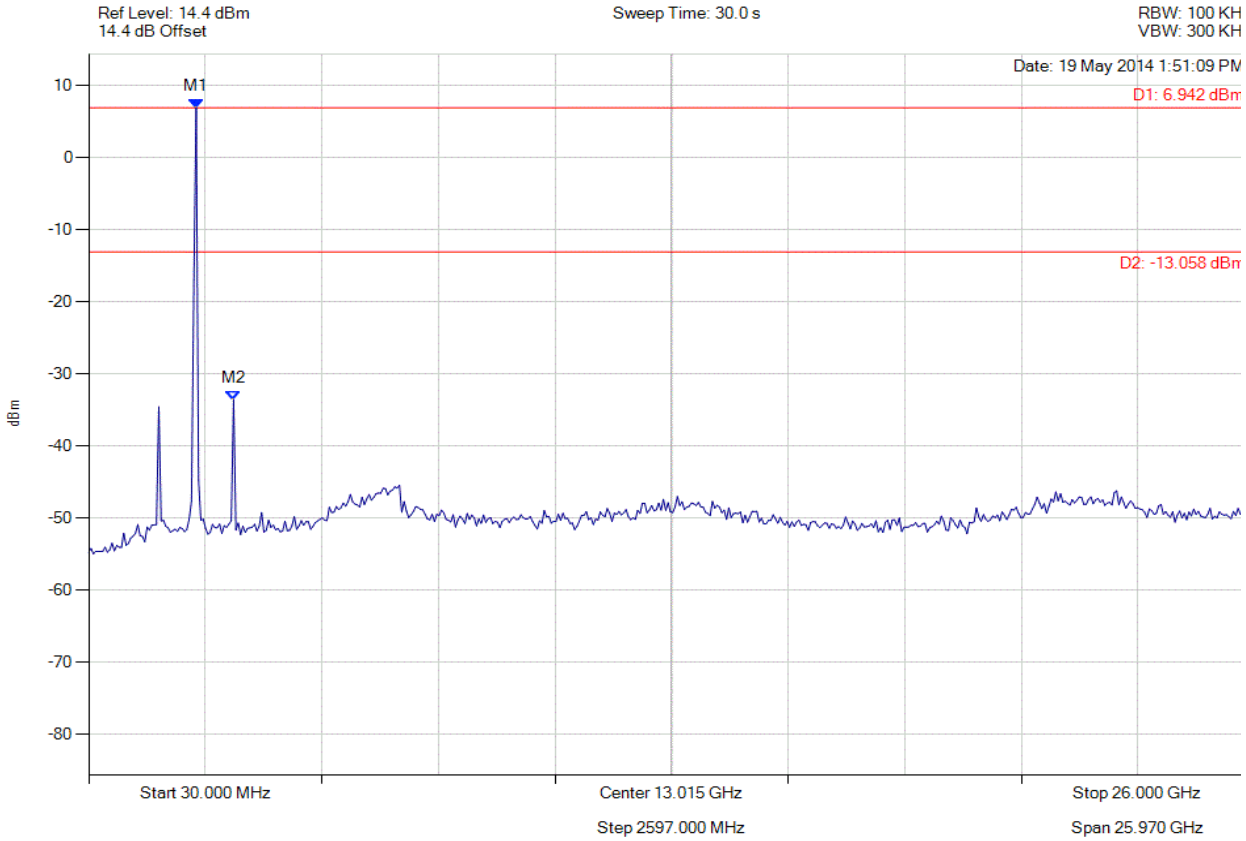


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2371.984 MHz : 6.714 dBm M2 : 1539.279 MHz : -33.497 dBm	Limit: -13.29 dBm Margin: -20.21 dB

Back to the Matrix

CONDUCTED SPURIOUS EMISSIONS - PEAK

Variant: 802.11b, Channel: 2437.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2424.028 MHz : 6.942 dBm M2 : 3256.733 MHz : -33.603 dBm	Limit: -13.06 dBm Margin: -20.54 dB

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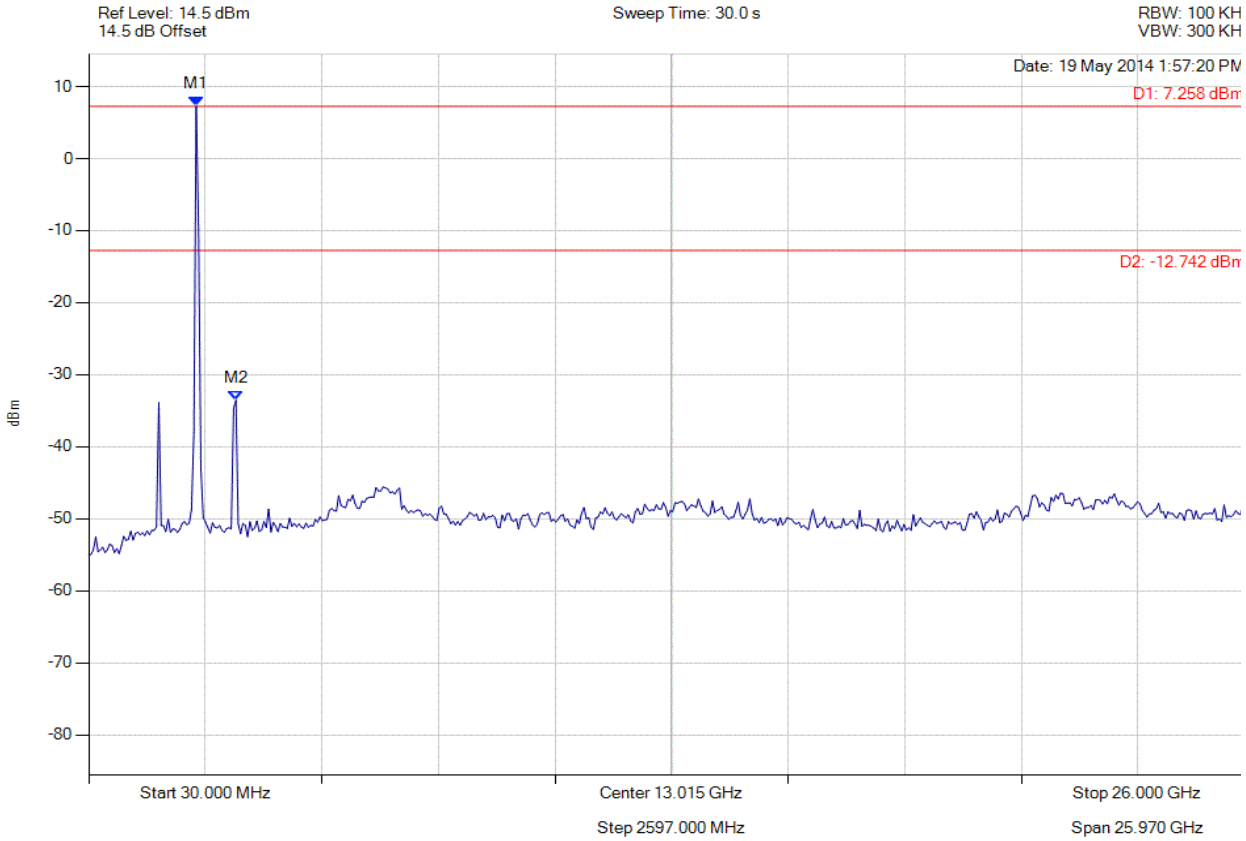
CONDUCTED SPURIOUS EMISSIONS - PEAK

Variant: 802.11b, Channel: 2462.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc

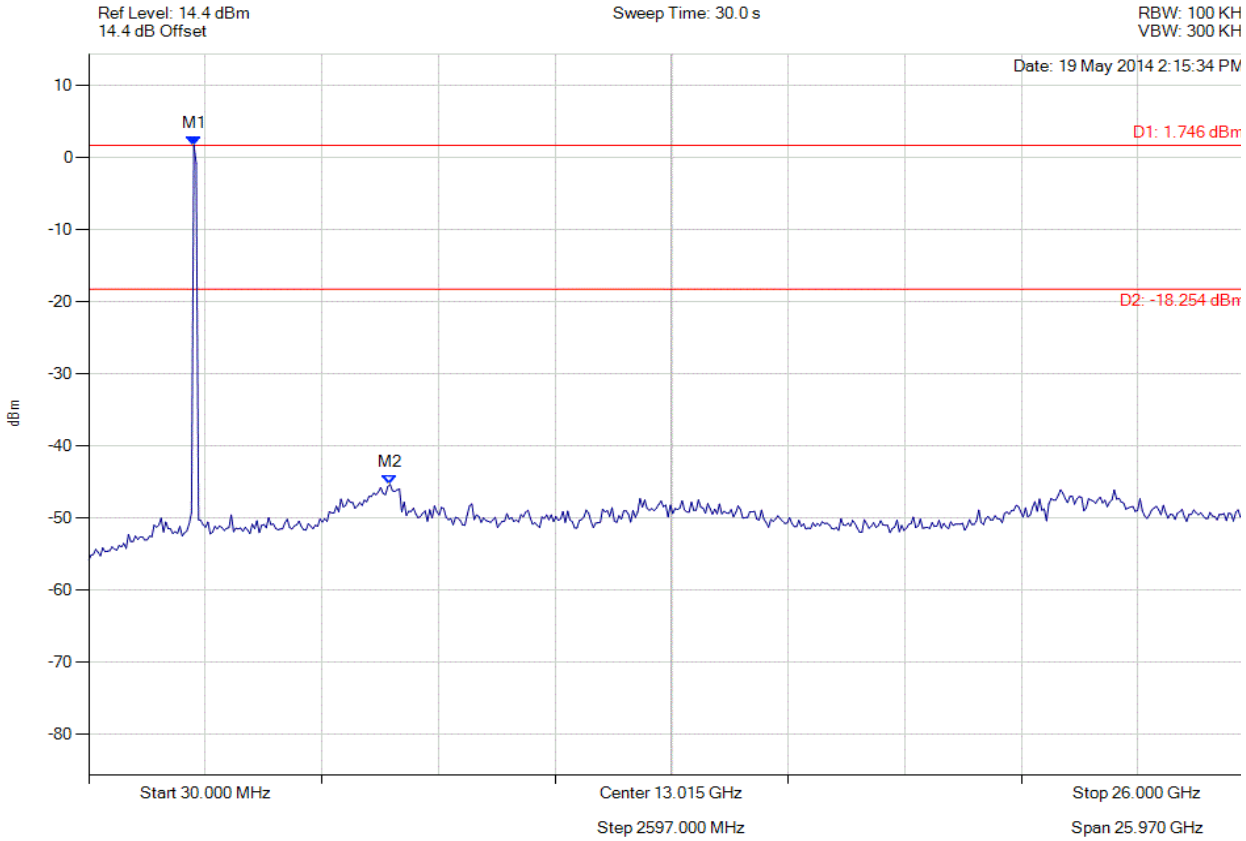


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2424.028 MHz : 7.258 dBm M2 : 3308.778 MHz : -33.551 dBm	Limit: -12.74 dBm Margin: -20.81 dB

Back to the Matrix

CONDUCTED SPURIOUS EMISSIONS - PEAK

Variant: 802.11g, Channel: 2412.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2371.984 MHz : 1.746 dBm M2 : 6743.687 MHz : -45.329 dBm	Limit: -18.25 dBm Margin: -27.08 dB

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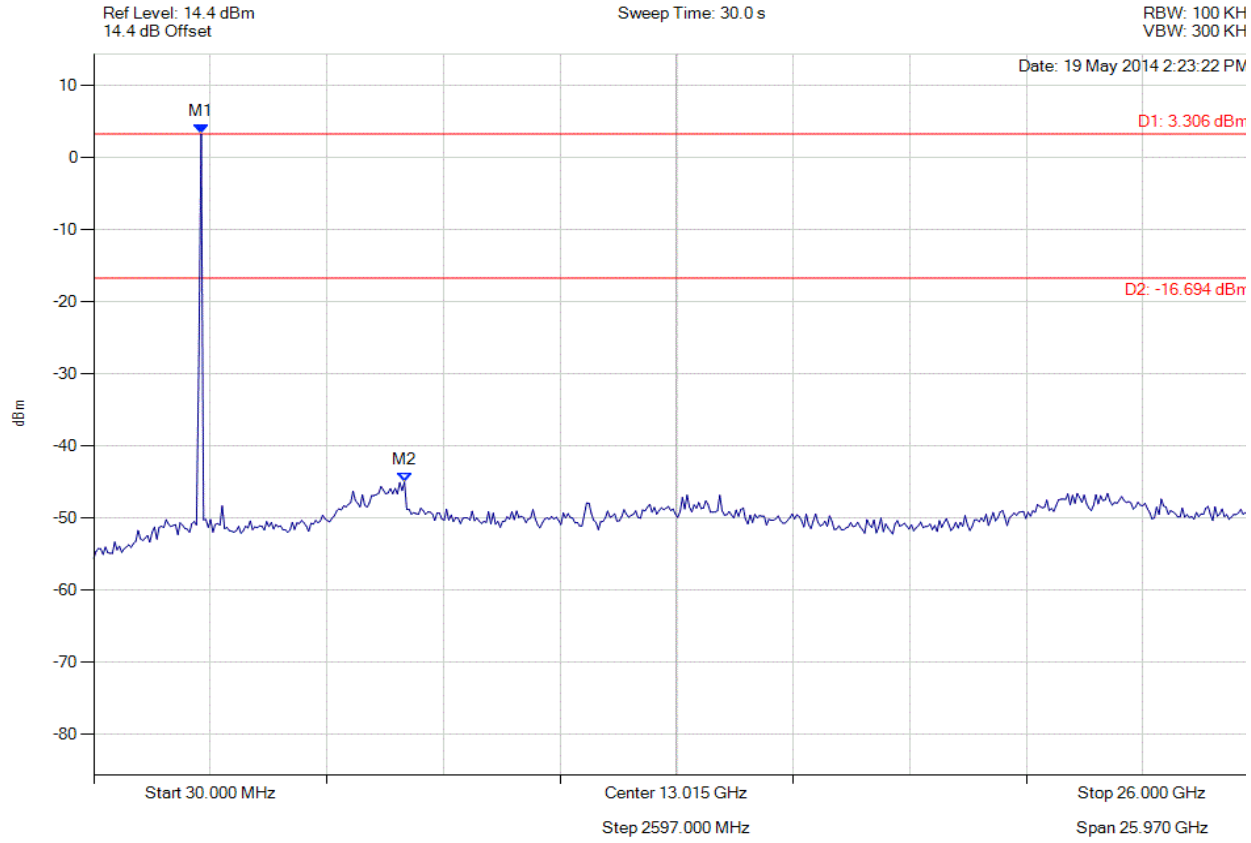
CONDUCTED SPURIOUS EMISSIONS - PEAK

Variant: 802.11g, Channel: 2437.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2424.028 MHz : 3.306 dBm M2 : 6951.864 MHz : -44.994 dBm	Limit: -16.69 dBm Margin: -28.30 dB

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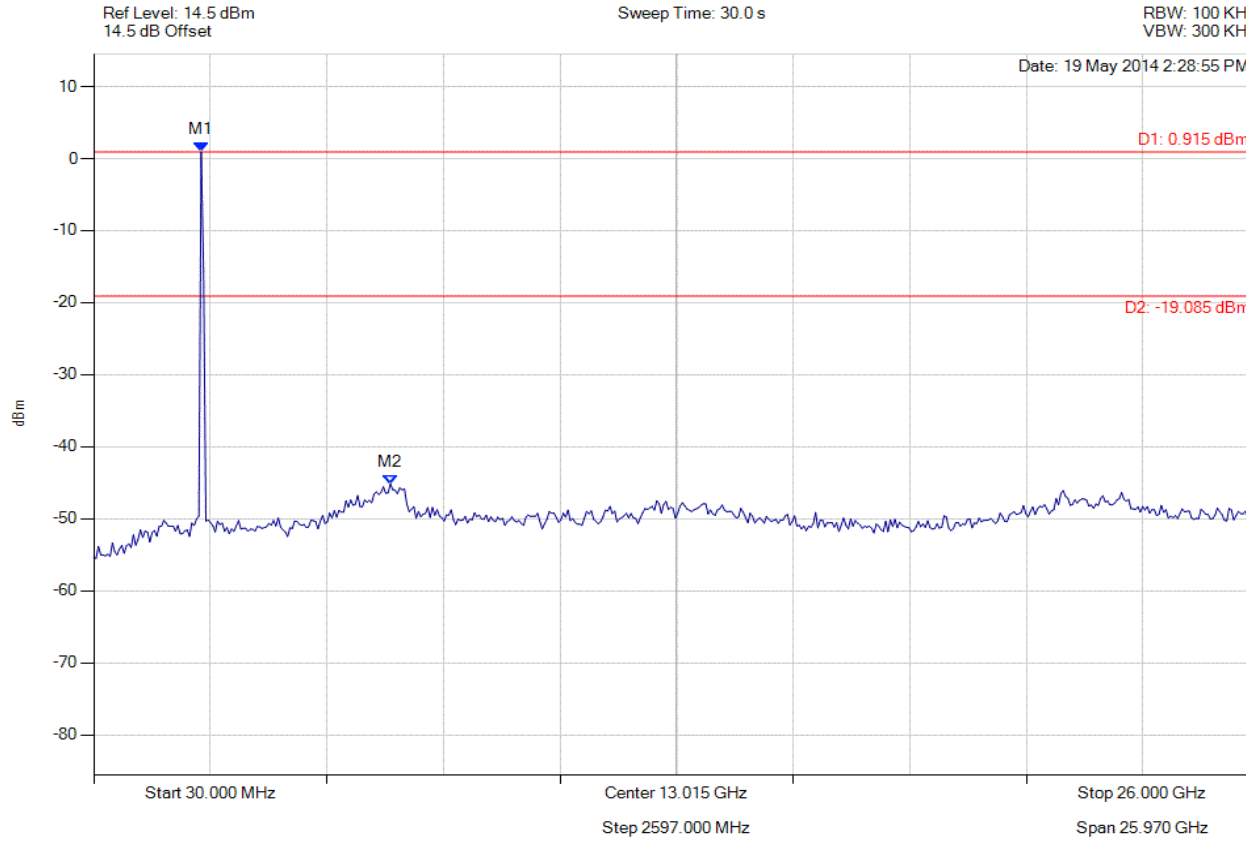
CONDUCTED SPURIOUS EMISSIONS - PEAK

Variant: 802.11g, Channel: 2462.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2424.028 MHz : 0.915 dBm M2 : 6639.599 MHz : -45.156 dBm	Limit: -19.09 dBm Margin: -26.07 dB

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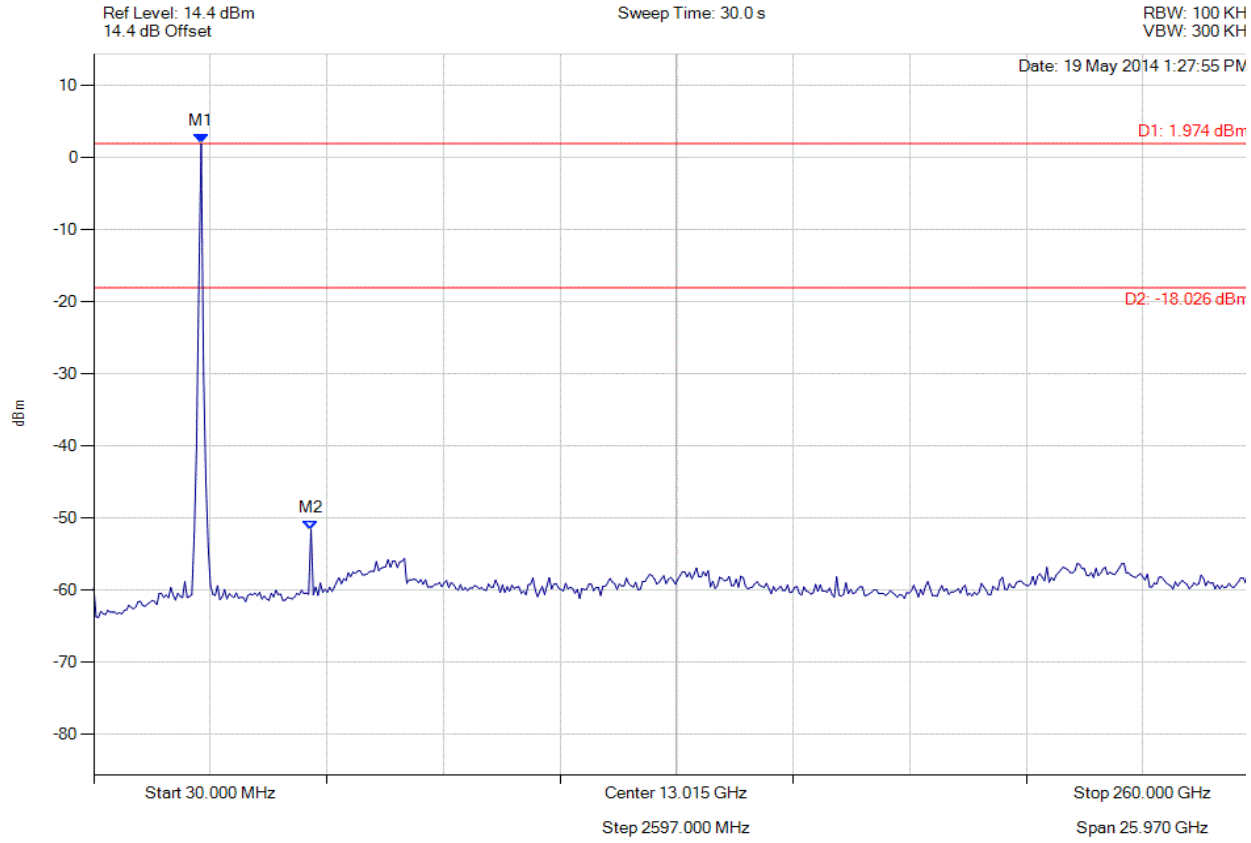
CONDUCTED SPURIOUS EMISSIONS - PEAK

Variant: DSSS, Channel: 2441.75 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2424.028 MHz : 1.974 dBm M2 : 4870.100 MHz : -51.591 dBm	Limit: -18.03 dBm Margin: -33.56 dB

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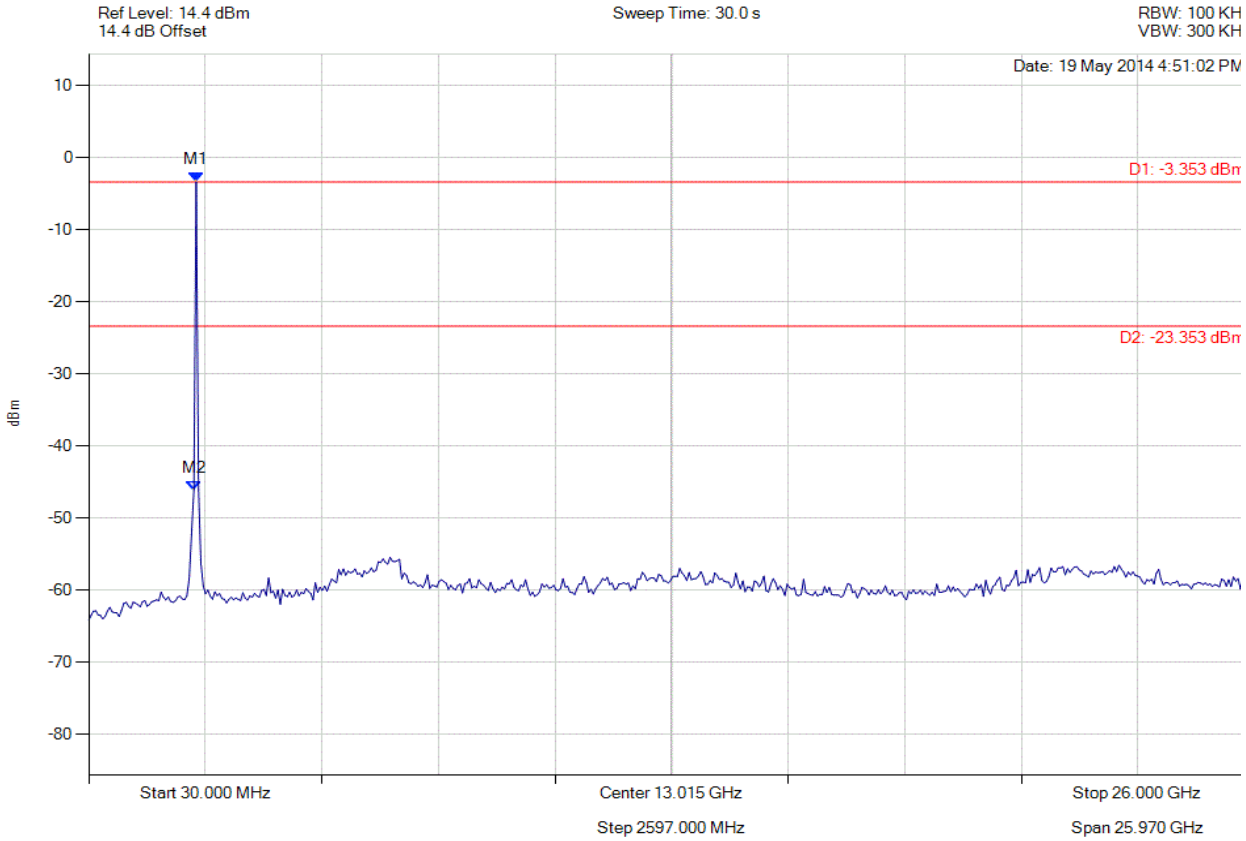
CONDUCTED SPURIOUS EMISSIONS - PEAK

Variant: OOK, Channel: 2446.52 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 2424.028 MHz : -3.353 dBm M2 : 2371.984 MHz : -46.139 dBm	Limit: -23.35 dBm Margin: -22.79 dB

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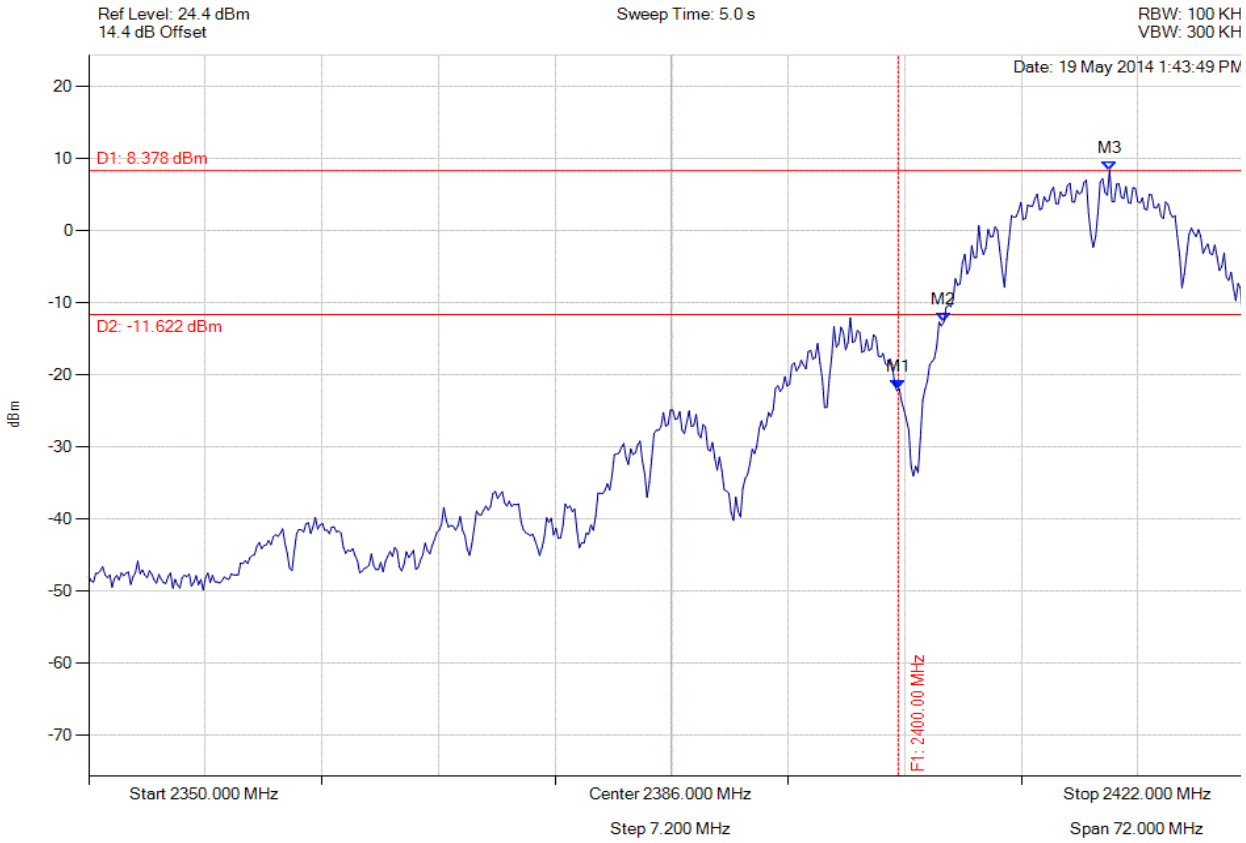
11.3.1.2. Conducted Band-Edge Emissions

CONDUCTED LOW BAND-EDGE EMISSION - PEAK

Variant: 802.11b, Channel: 2412.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2400.000 MHz : -21.923 dBm M2 : 2402.810 MHz : -12.649 dBm M3 : 2413.054 MHz : 8.378 dBm	Channel Frequency: 2412.00 MHz

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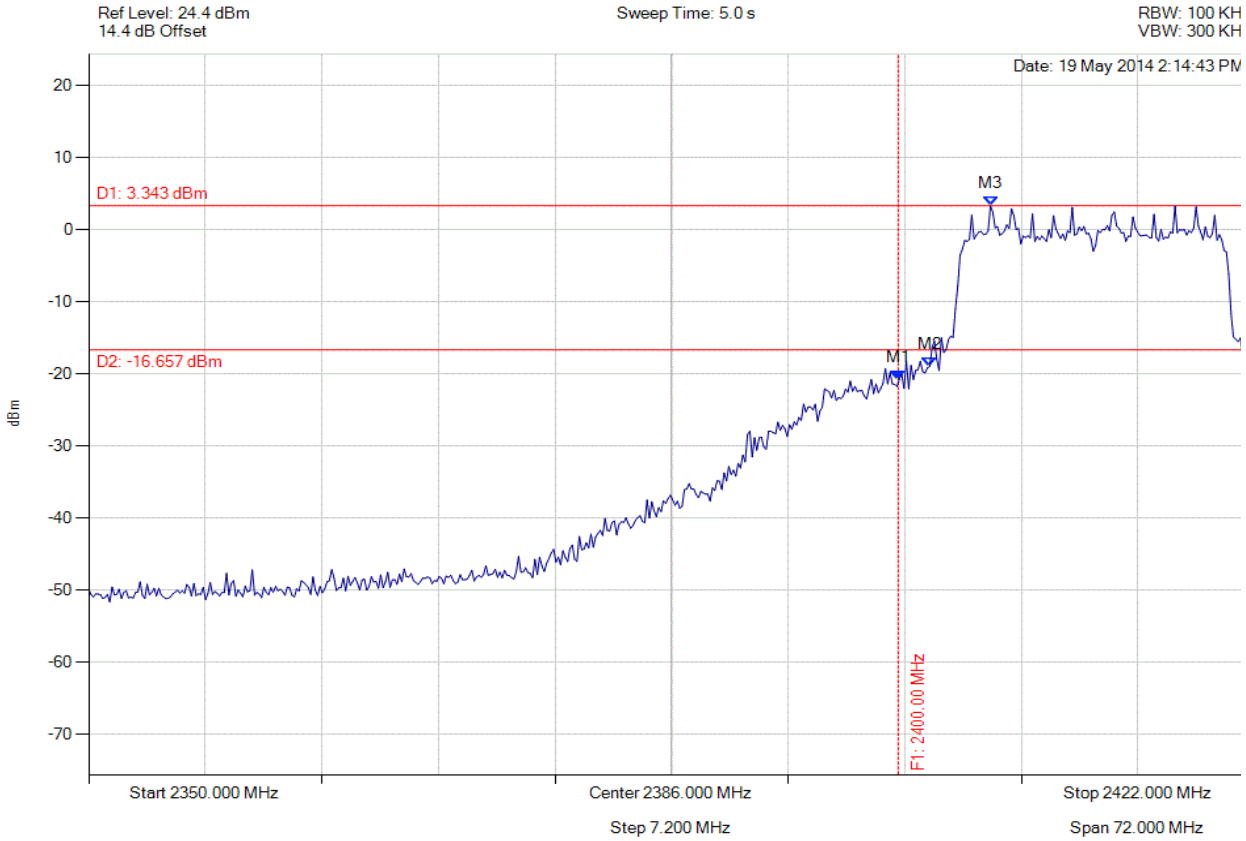
CONDUCTED LOW BAND-EDGE EMISSION - PEAK

Variant: 802.11g, Channel: 2412.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2400.000 MHz : -20.745 dBm M2 : 2401.944 MHz : -18.982 dBm M3 : 2405.695 MHz : 3.343 dBm	Channel Frequency: 2412.00 MHz

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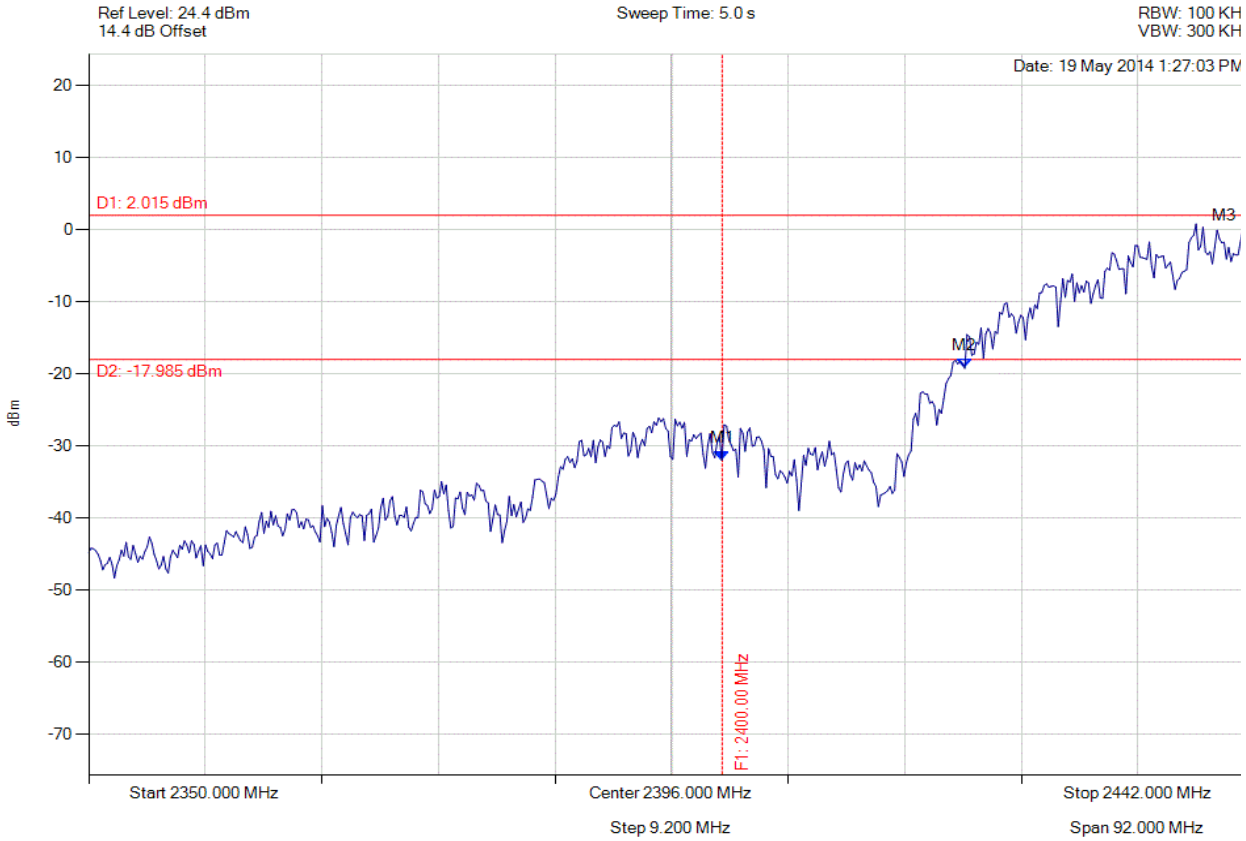
CONDUCTED LOW BAND-EDGE EMISSION - PEAK

Variant: 802.11b, Channel: 2441.75 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2400.000 MHz : -31.988 dBm M2 : 2419.138 MHz : -19.220 dBm M3 : 2441.816 MHz : 2.015 dBm	Channel Frequency: 2441.75 MHz

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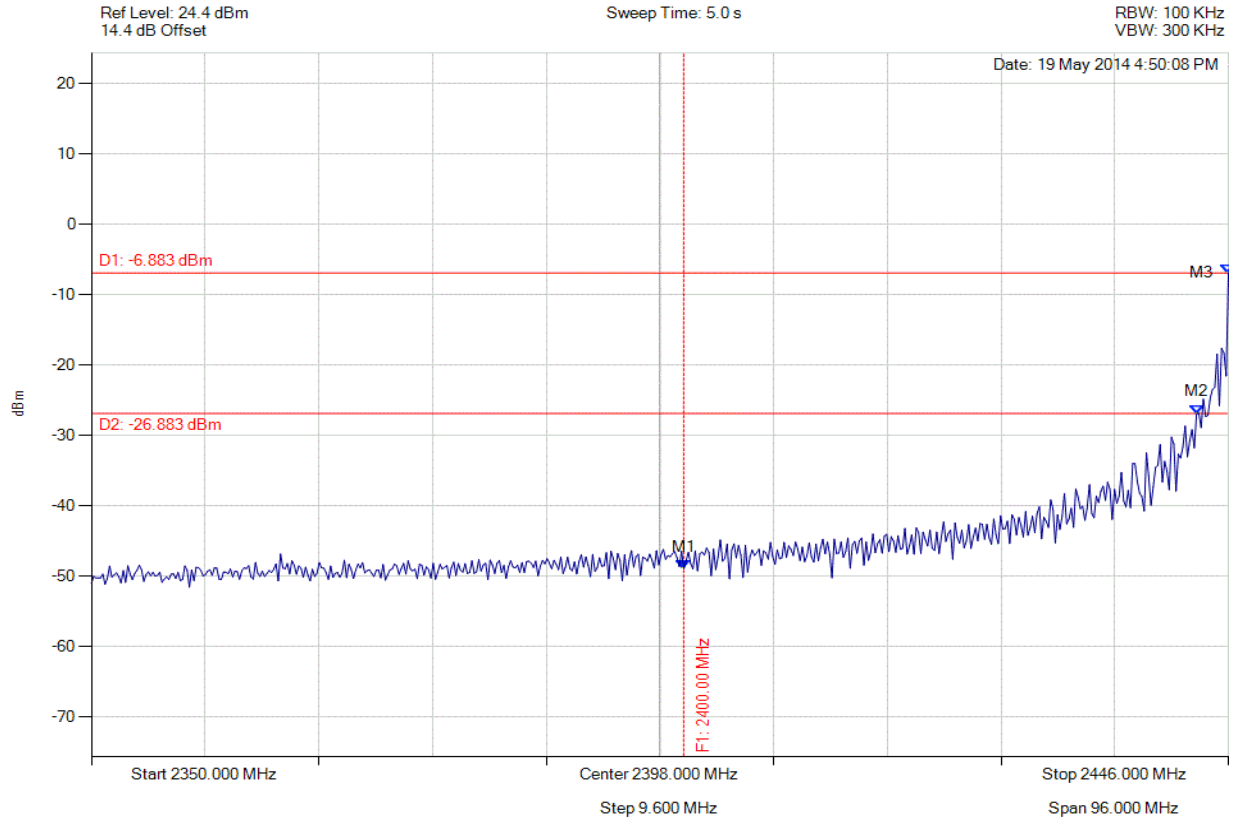
CONDUCTED LOW BAND-EDGE EMISSION - PEAK

Variant: 802.11g, Channel: 2446.52 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2400.000 MHz : -48.943 dBm M2 : 2443.307 MHz : -26.905 dBm M3 : 2446.000 MHz : -6.883 dBm	Channel Frequency: 2446.52 MHz

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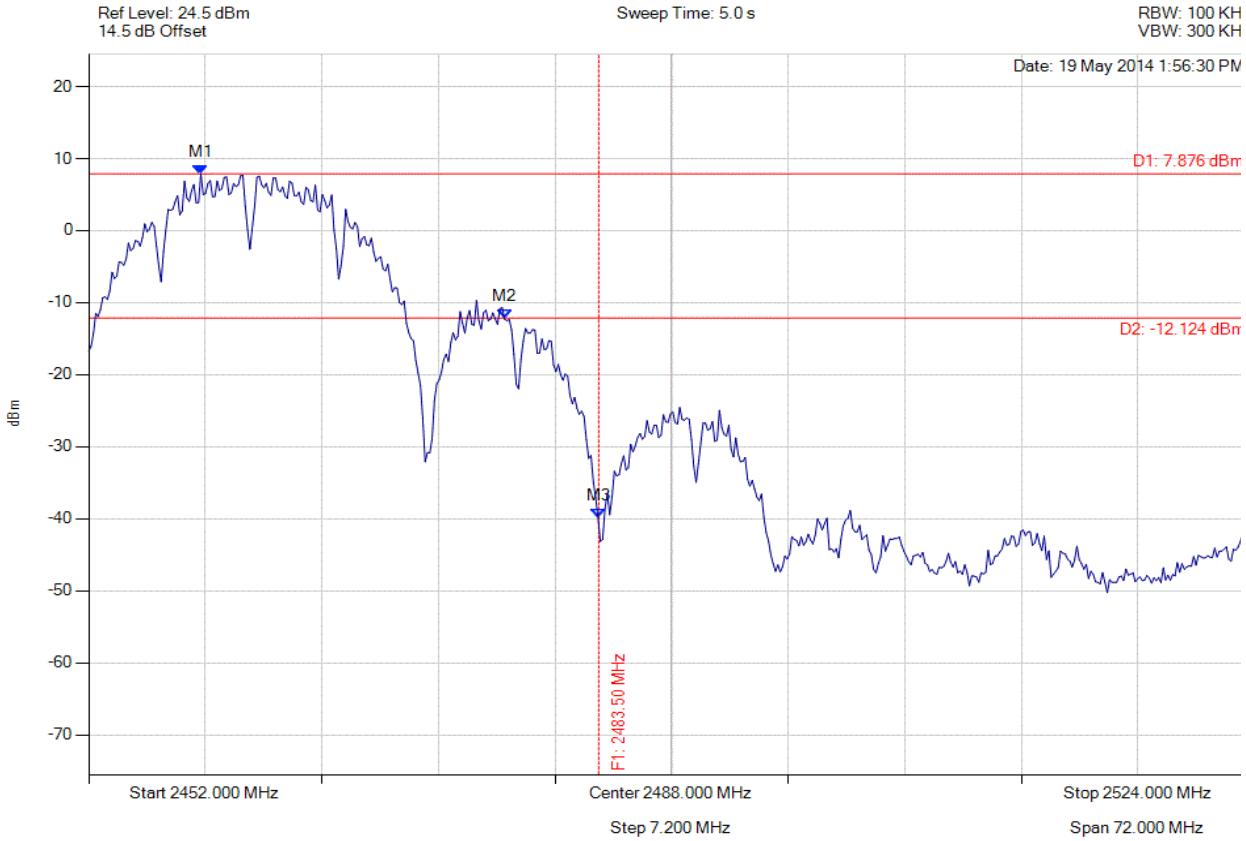
CONDUCTED HIGH BAND-EDGE EMISSION - PEAK

Variant: 802.11b, Channel: 2462.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2458.926 MHz : 7.876 dBm M2 : 2477.683 MHz : -12.282 dBm M3 : 2483.500 MHz : -39.905 dBm	Channel Frequency: 2462.00 MHz

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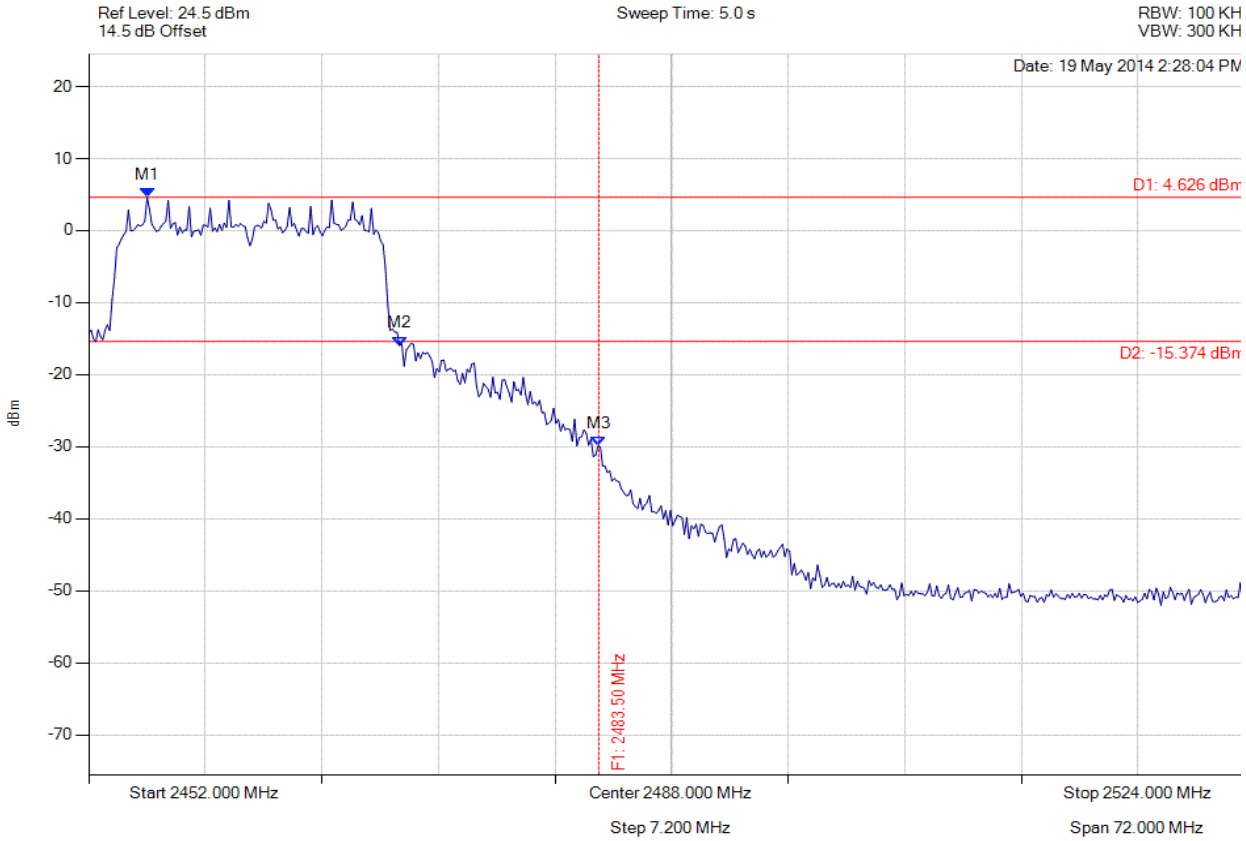
CONDUCTED HIGH BAND-EDGE EMISSION - PEAK

Variant: 802.11g, Channel: 2462.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2455.607 MHz : 4.626 dBm M2 : 2471.190 MHz : -15.955 dBm M3 : 2483.500 MHz : -29.925 dBm	Channel Frequency: 2462.00 MHz

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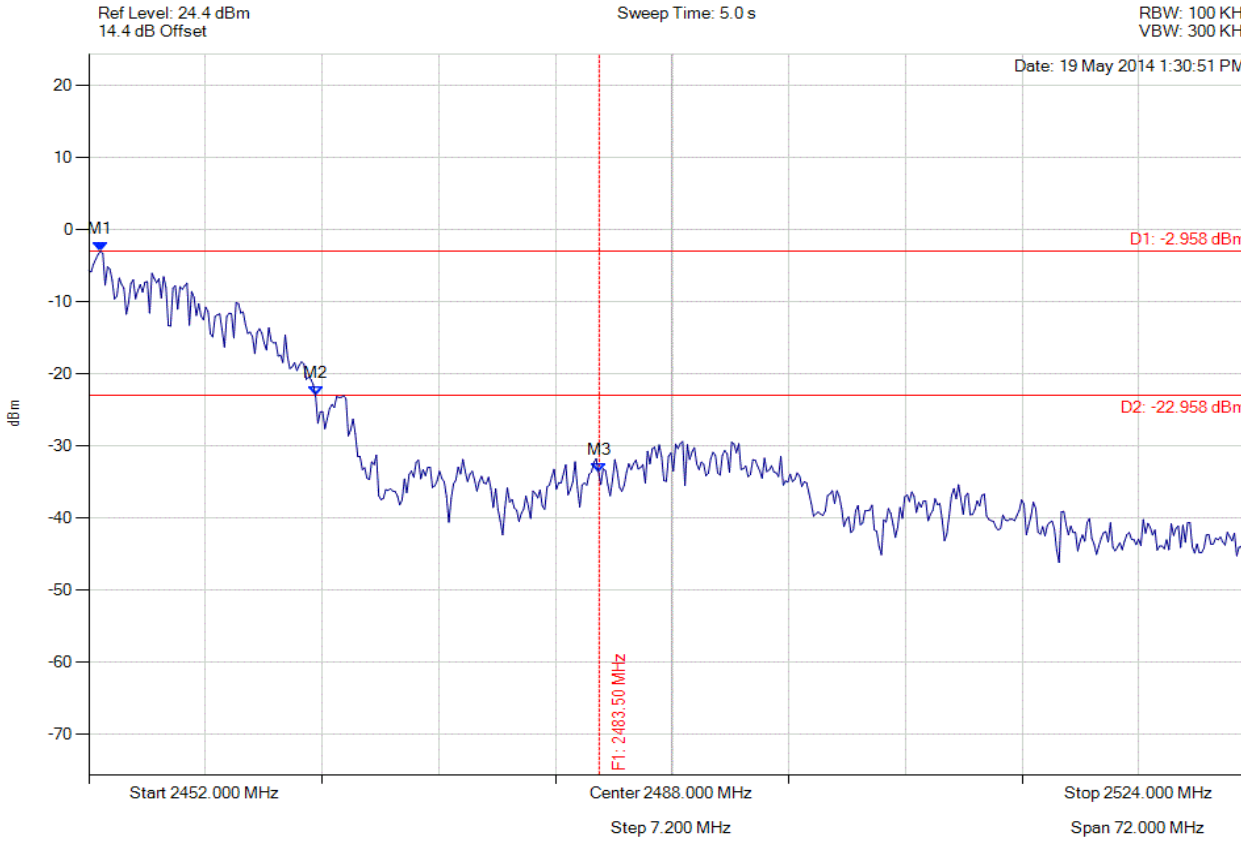
CONDUCTED HIGH BAND-EDGE EMISSION - PEAK

Variant: 802.11b, Channel: 2441.75 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2452.721 MHz : -2.958 dBm M2 : 2465.996 MHz : -23.029 dBm M3 : 2483.500 MHz : -33.655 dBm	Channel Frequency: 2441.75 MHz

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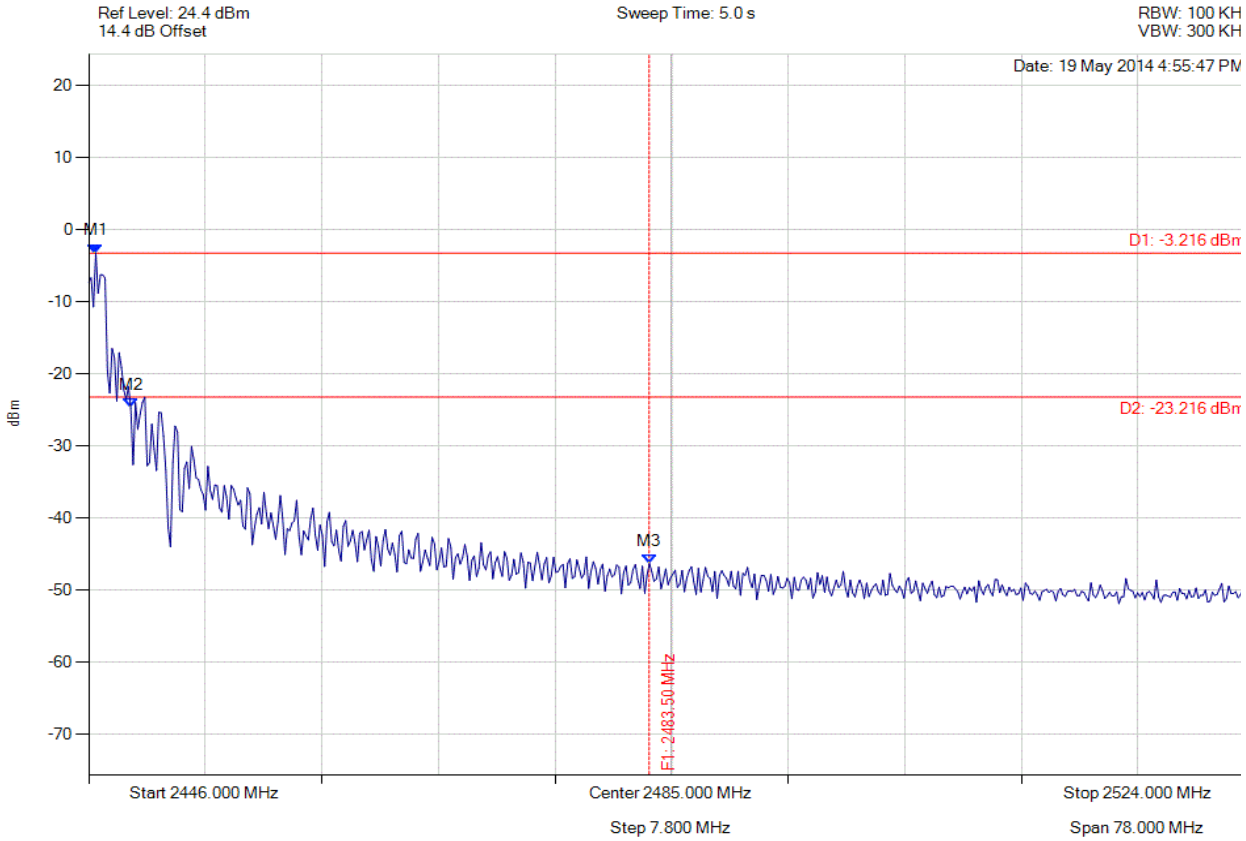
CONDUCTED HIGH BAND-EDGE EMISSION - PEAK

Variant: 802.11g, Channel: 2446.52 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2446.469 MHz : -3.216 dBm M2 : 2448.814 MHz : -24.725 dBm M3 : 2483.500 MHz : -46.305 dBm	Channel Frequency: 2446.52 MHz

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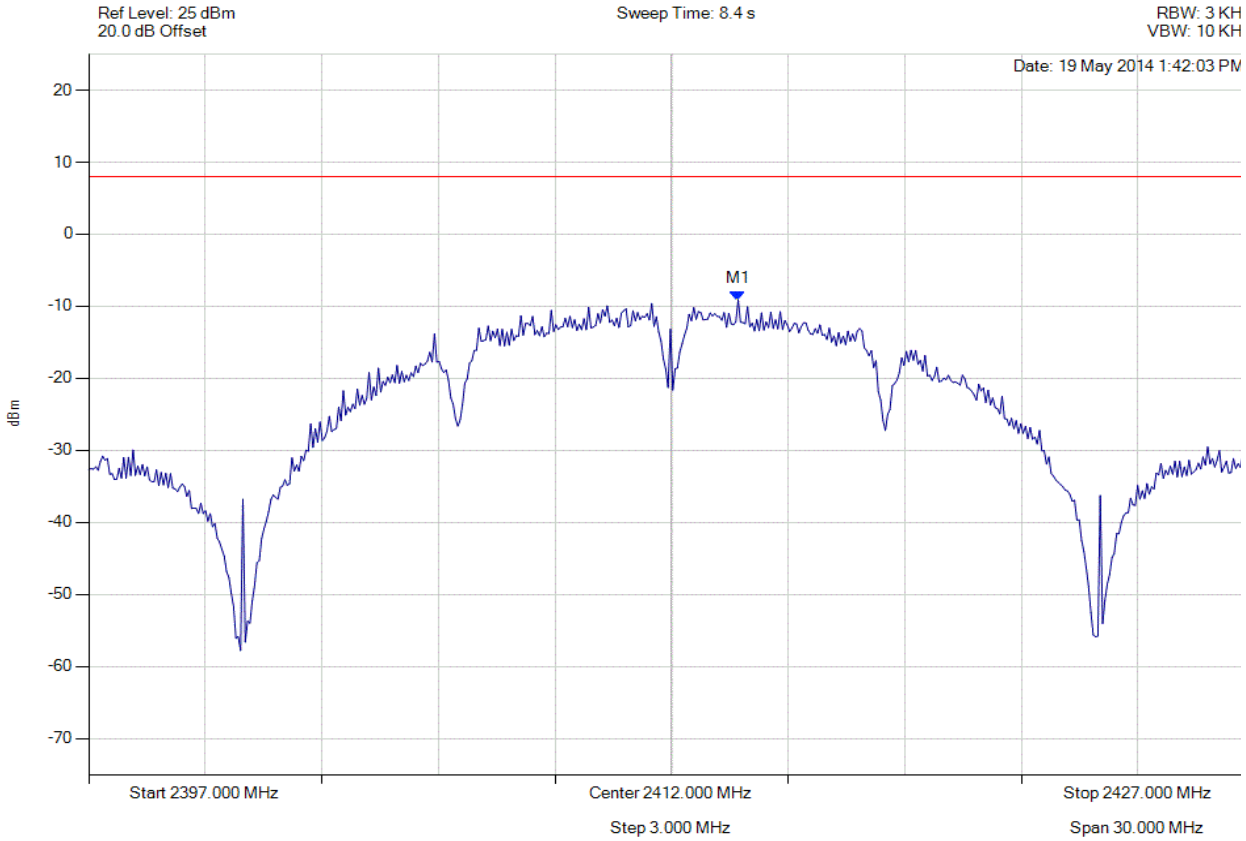
11.4. Power Spectral Density

POWER SPECTRAL DENSITY - PEAK

Variant: 802.11b, Channel: 2412.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2413.713 MHz : -9.132 dBm	Limit: ≤ 8.000 dBm Margin: 17.13 dB

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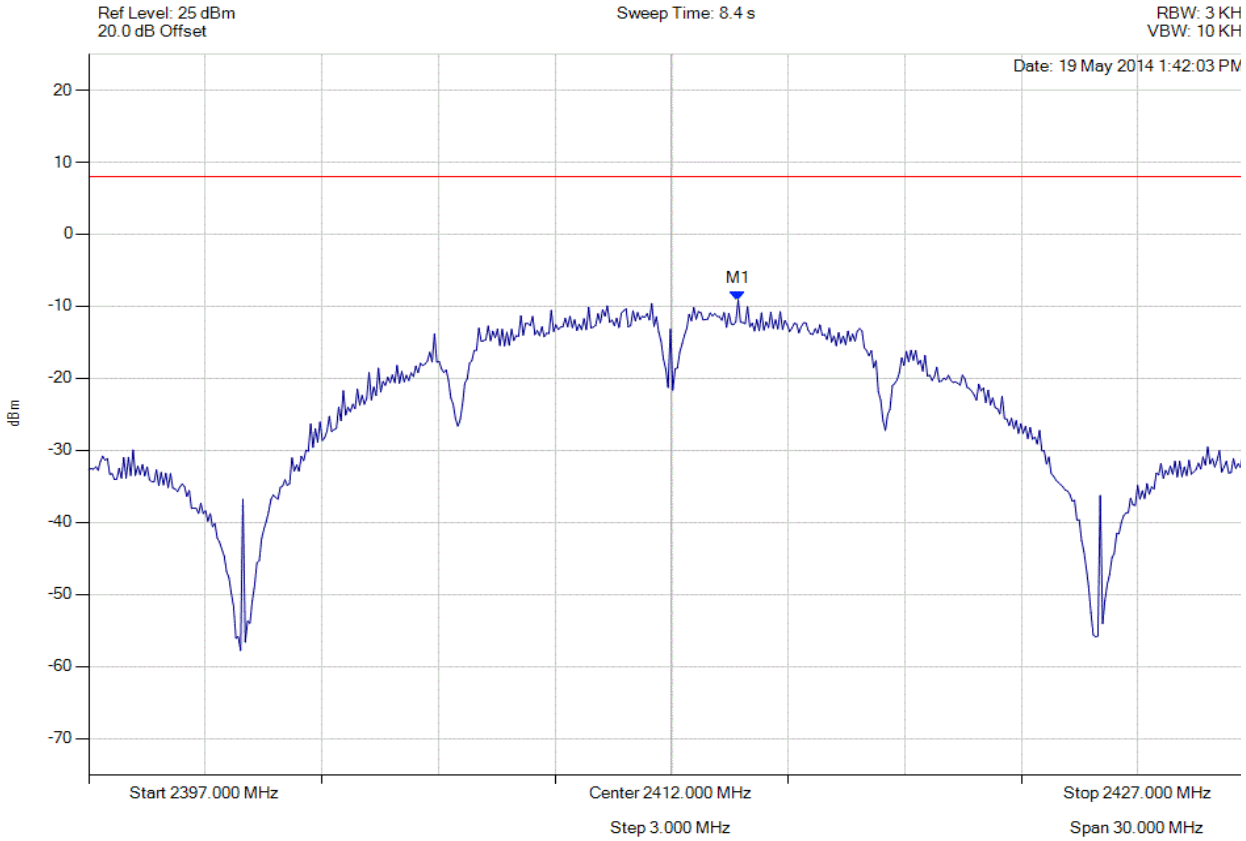
POWER SPECTRAL DENSITY - PEAK

Variant: 802.11b, Channel: 2412.00 MHz, SUM, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2413.713 MHz : -9.132 dBm	Limit: ≤ 8.0 dBm Margin: -17.1 dB

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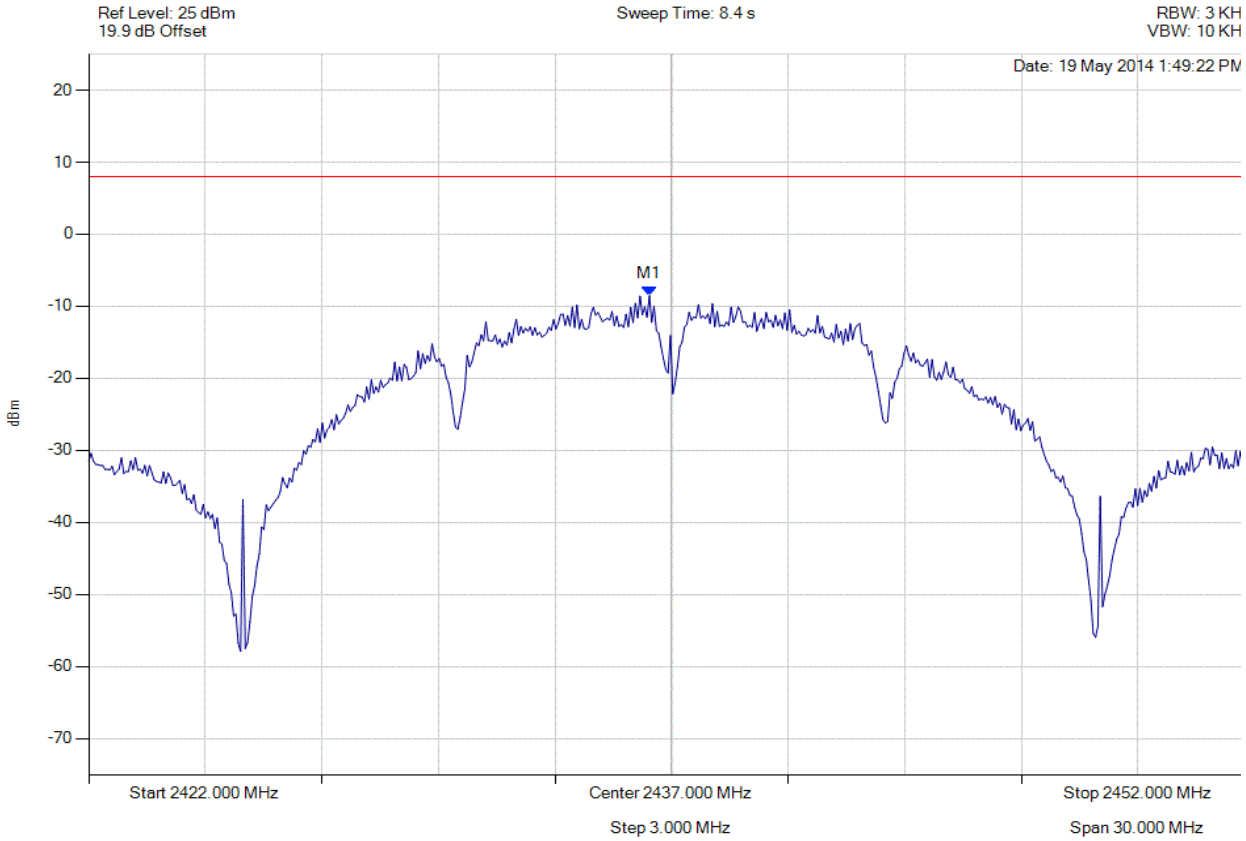
POWER SPECTRAL DENSITY - PEAK

Variant: 802.11b, Channel: 2437.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2436.429 MHz : -8.524 dBm	Limit: ≤ 8.000 dBm Margin: 16.52 dB

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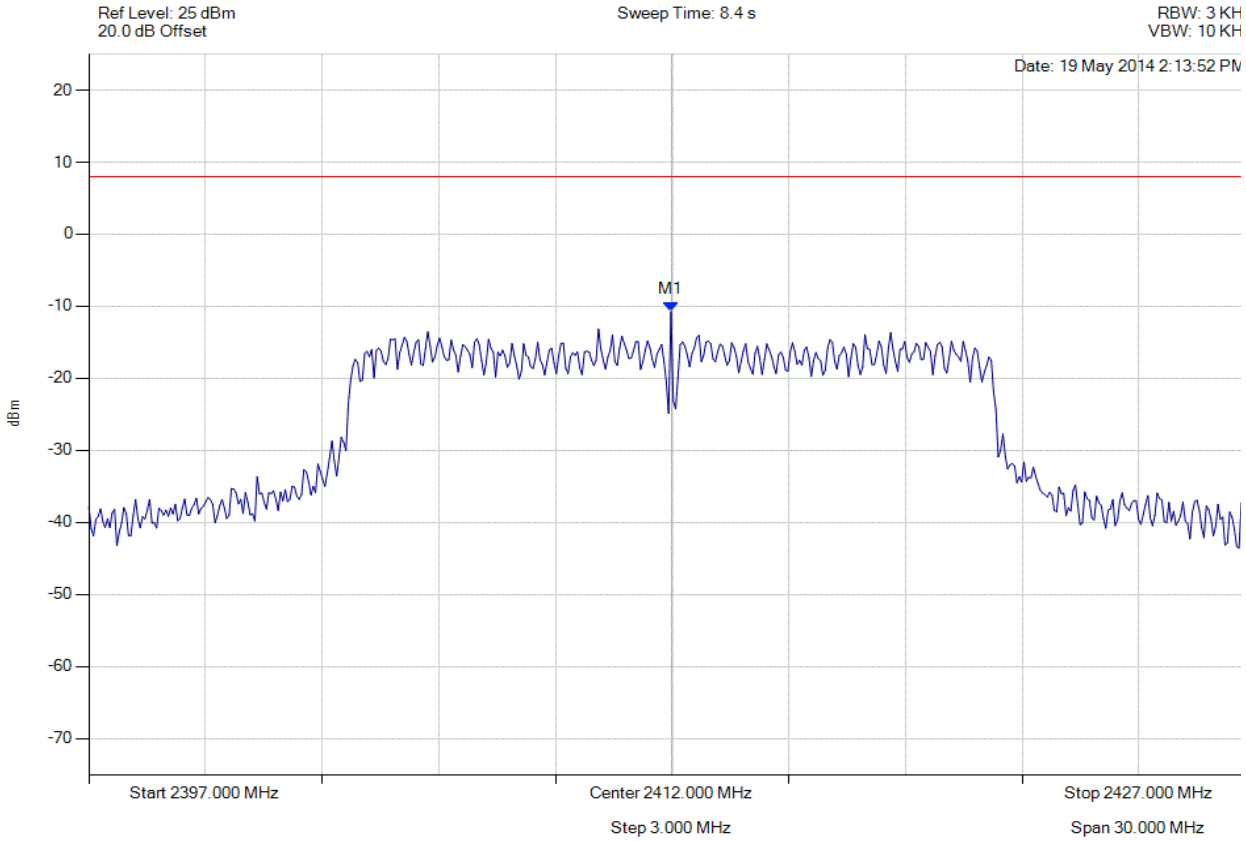
POWER SPECTRAL DENSITY - PEAK

Variant: 802.11g, Channel: 2412.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2411.970 MHz : -10.733 dBm	Limit: ≤ 8.000 dBm Margin: 18.73 dB

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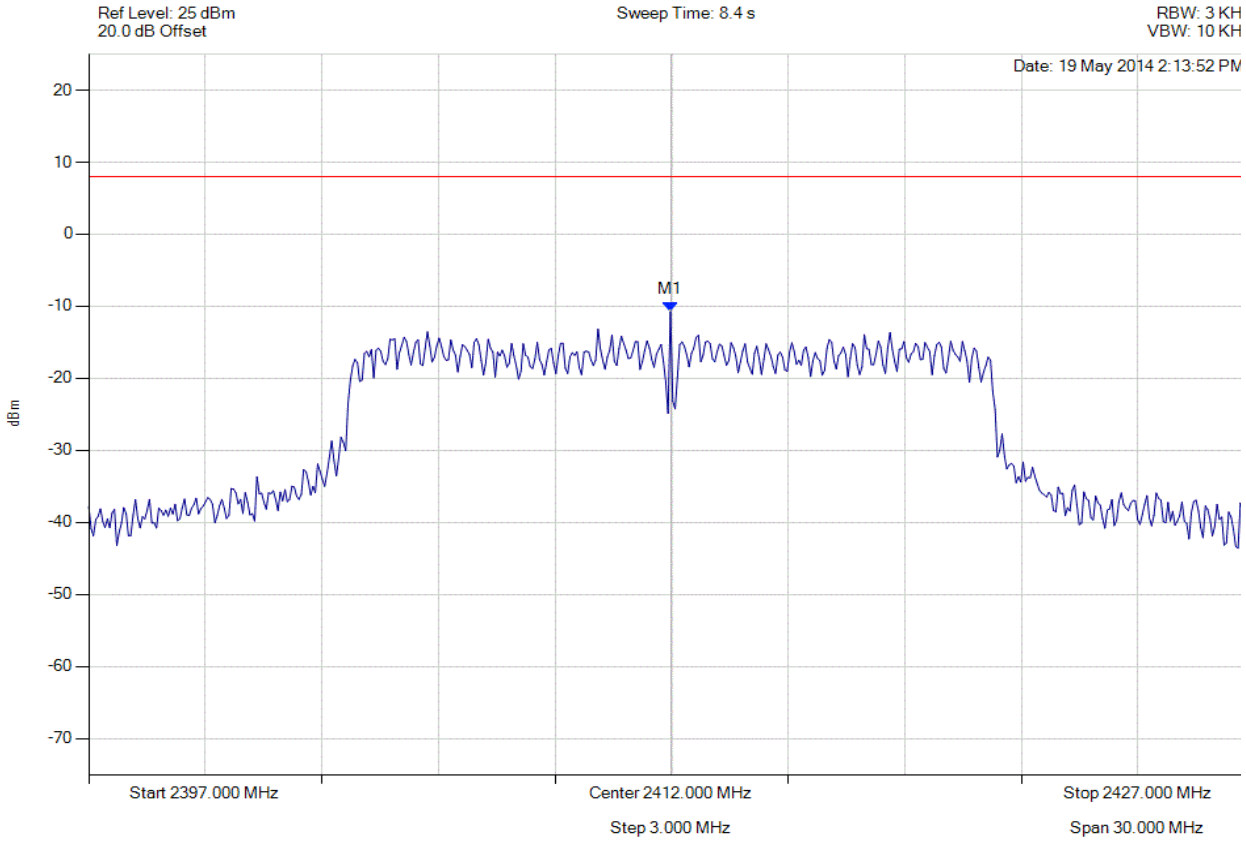
POWER SPECTRAL DENSITY - PEAK

Variant: 802.11g, Channel: 2412.00 MHz, SUM, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2411.970 MHz : -10.733 dBm	Limit: ≤ 8.0 dBm Margin: -18.7 dB

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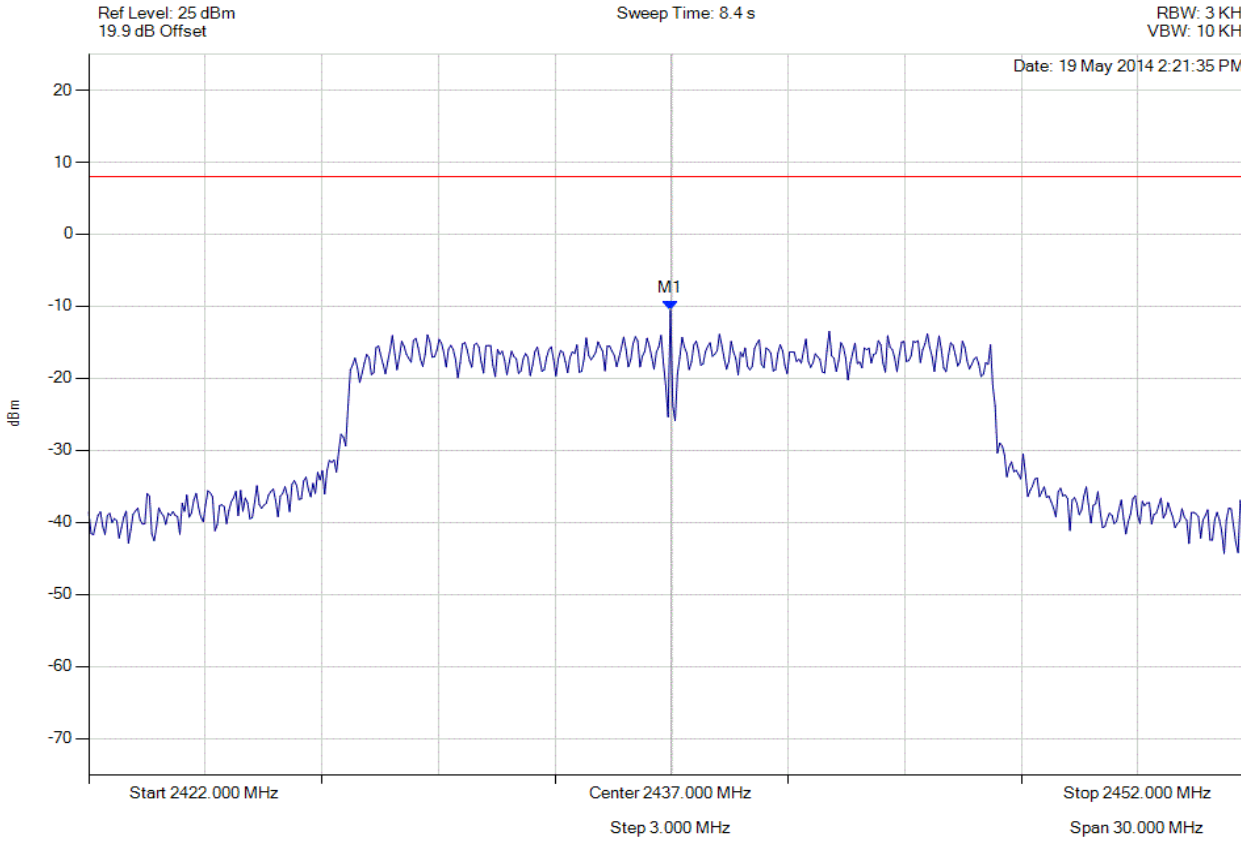
POWER SPECTRAL DENSITY - PEAK

Variant: 802.11g, Channel: 2437.00 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2436.970 MHz : -10.538 dBm	Limit: ≤ 8.000 dBm Margin: 18.54 dB

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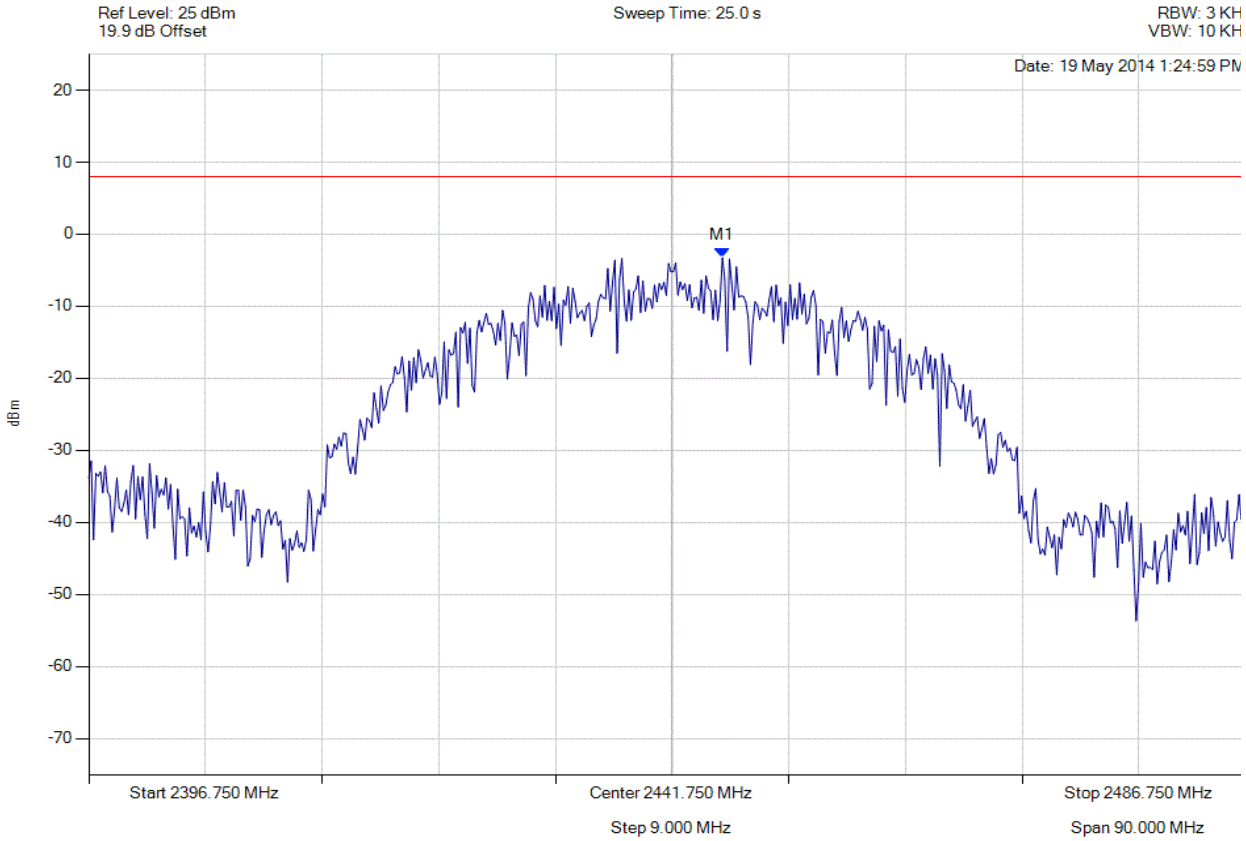
POWER SPECTRAL DENSITY - PEAK

Variant: DSSS, Channel: 2441.75 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2445.628 MHz : -3.275 dBm	Limit: ≤ 8.000 dBm Margin: 11.28 dB

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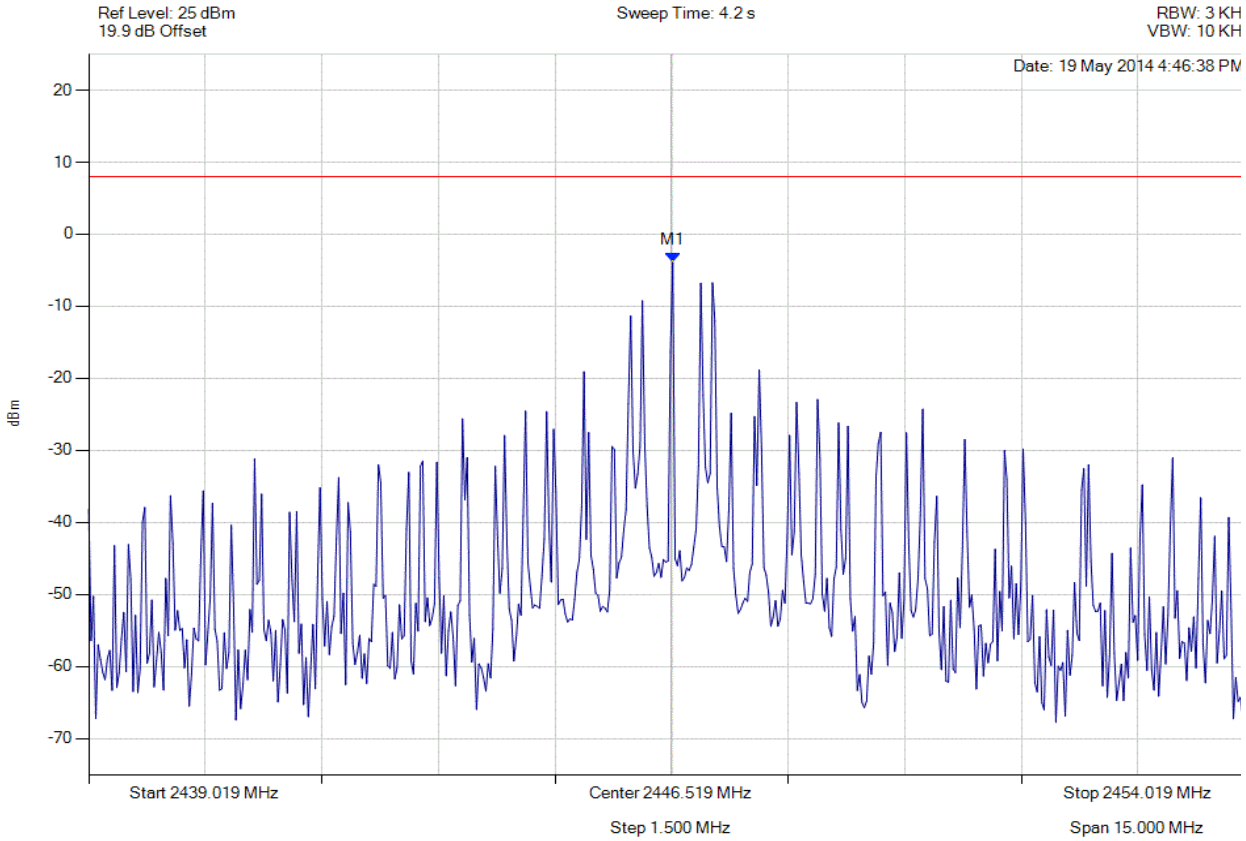
POWER SPECTRAL DENSITY - PEAK

Variant: OOK, Channel: 2446.52 MHz, Chain a, Temp: Ambient, Voltage: 12 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 2446.534 MHz : -3.902 dBm	Limit: ≤ 8.000 dBm Margin: 11.90 dB

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