Test of Aruba AP-92/93 802.11a/b/g/n Wireless AP

To: FCC 47 CFR Part 15.247 & IC RSS-210

Test Report Serial No.: ARUB51-U1 Rev A

TEST REPORT

FROM

Test of: Aruba Networks, Inc AP-92/93 802.11a/b/g/n Wireless AP

To: FCC 47 CFR Part 15.247 & IC RSS 210

Test Report Serial No.: ARUB51-U1 Rev A

Note: this report contains data with regard to the 2400 to 2483.5 MHz and 5725 to 5850 MHz bands for the Aruba Networks, Inc AP-92 & AP-93 Wireless Access Point. 5,150 to 5,250 MHz test data are reported in MiCOM Labs test report ARUB51-U2.

This report supersedes: NONE

Applicant: Aruba Networks, Inc
1322 Crossman Avenue
Sunnyvale , CA 94089
USA

Product Function: Wireless Access Point

Copy No: pdf **Issue Date:** 18th May 2010

This Test Report is Issued Under the Authority of;

MiCOM Labs, Inc.
440 Boulder Court, Suite 200
Pleasanton, CA 94566 USA
Phone: +1 (925) 462-0304
Fax: +1 (925) 462-0306
www.micomlabs.com

CERTIFICATE #2381.01

MiCOM Labs is an ISO 17025 Accredited Testing Laboratory

TABLE OF CONTENTS

1 ACCREDITATION, LISTINGS & RECOGNITION

1.1 ACCREDITATION

MiCOM Labs, Inc. an accredited laboratory complies with 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

ilac-MRA

The American Association for Laboratory Accreditation

World Class 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 14th 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.

1.2 LISTINGS

MiCOM Labs test facilities are listed by the following organizations;

North America

United States of America
Federal Communications Commission (FCC) Listing #: 102167

Canada

Industry Canada (IC) Listing #: 4143A

Japan Registration

VCCI Membership Number: 2959

- Radiated 3 meter site; Registration No. R-2881
- Line Conducted, Registration Nos. C-3181 & T-1470
- Emissions; Registration Nos. C-3180 & T-1469

1.3 RECOGNITION

APEC MRA (Asia-Pacific Economic Community Mutual Recognition Agreement)

Conformity Assessment Body (CAB) – MiCOM Labs

Test data generated by MiCOM Labs is accepted in the following countries under the APEC MRA.

Country	Recognition Body	Phase	CAB Identification No.
Australia	Australian Communications and Media Authority (ACMA)	I	US0159
Hong Kong	Office of the Telecommunication Authority (OFTA)	I	
Korea	Ministry of Information and Communication Radio Research Laboratory (RRL)	I	
Singapore	Infocomm Development Authority (IDA)	I	
Taiwan	National Communications Commission (NCC) Bureau of Standards, Metrology and Inspection (BSMI)	I I	
Vietnam	Ministry of Information and Communications	I	

2 DOCUMENT HISTORY

Document History		
Revision	**Date**	**Comments**
Draft		
Rev A	18th May 2010	Initial Release

3 TEST RESULT CERTIFICATE

Applicant:	Aruba Networks, Inc 1344 Crossman Avenue Sunnyvale California , 94089, USA	Tested By:	MiCOM Labs, Inc. 440 Boulder Court Suite 200 Pleasanton California, 94566, USA
EUT	802.11a/b/g/n Wireless Access Point	Tel:	+1 925 462 0304
Model	AP-92 & AP-93	Fax:	+1 925 462 0306
S/No's:	AP-92 AN0000305 (Conducted) AP-92 AN0000307 (Radiated) AP-93 AN0000330 (Radiated)		
Test Date(s)	3rd to 28th April 2010	Website:	www.micomlabs.com

STANDARD(S)	TEST RESULTS
FCC 47 CFR Part 15, SubPart 15.247	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.

ACCREDITED
CERTIFICATE #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.	47 CFR Part 15, SubPart 15.247	2009	For Digitally Modulated Intentional Radiators
ii.	Industry Canada RSS-210	Issue 7 June 2007	Low Power License-Exempt Radiocommunication Devices (All Frequency Bands): Category 1 Equipment
iii.	Industry Canada RSS-Gen	Issue 2 June 2007	General Requirements and Information for the Certification of Radiocommunication Equipment
iv.	ANSI C63.4	2003	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
v.	CISPR 22/ EN 55022	2005	Limits and Methods of Measurements of Radio Disturbance Characteristics of Information Technology Equipment
vi.	M 3003	Edition 1 Dec. 1997	Expression of Uncertainty and Confidence in Measurements
vii.	LAB34	Edition 1 Aug 2002	The expression of uncertainty in EMC Testing
viii.	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
ix.	A2LA	14th September 2005	Reference to A2LA Accreditation Status – A2LA Advertising Policy

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.

5 TEST SUMMARY

List of Measurements: The following table represents the list of measurements required under **FCC 47 CFR Part 15,** SubPart 15.247

Standard Section(s)	Test Description	Condition	Result	Test Report Section
(a)(2)	6 dB Occupied Bandwidth	Conducted	Compliant	7.1
(b)(3), (b)(4)	Peak Output Power	Conducted	Compliant	7.2
(e)	Peak Power Spectral Density	Conducted	Compliant	7.3
(i)	Maximum Permissible Exposure	Calculation	Compliant	7.4
(d)	Spurious Emissions	Conducted	Compliant	7.5
(d), 15.205, 15.209	Transmitter Radiated Spurious Emissions	Radiated	Compliant	7.6
(d), 15.205, 15.209	Radiated Band-Edge	Radiated	Compliant	7.6
15.205, 15.210	Radiated (Digital) Emissions	Radiated	Compliant	7.6
15.207	AC Wireline Emissions 0.15 – 30 MHz	Conducted	Compliant	7.7

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

6 PRODUCT DETAILS AND TEST CONFIGURATIONS

6.1 EUT Details

Detail	Description
Purpose:	Test of the Aruba Networks, Inc AP-92 / AP-93 802.11a/b/g/n Wireless Access Point for compliance against FCC 47 CFR Part 15, SubPart 15.247 and Industry Canada RSS-210 regulations.
Applicant:	Aruba Networks, Inc 1322 Crossman Avenue Sunnyvale , CA 94089 USA
Manufacturer:	As manufacturer
Test Laboratory:	MiCOM Labs, Inc. 440 Boulder Court, Suite 200 Pleasanton, California 94566 USA
Test report reference number:	ARUB51-U1 Rev A
Date EUT received:	3rd April 2010
Dates of test (from - to):	3rd to 28th April 2010
No of Units Tested:	3
Product Name:	AP-92 (External antenna), AP-93 (Integral antenna)
Manufacturers Trade Name:	Aruba Networks, Inc
Equipment Primary Function:	802.11a/b/g/n Wireless Access Point, 2x2 Spatial Multiplexing MIMO configuration
Type of Technology:	802.11
Installation type:	Fixed
Construction/Location for Use:	Indoor only
Software/Firmware Release:	5.0.1.0 ART v0_9-b16ALL
Transmit/Receive Operation:	TDD (Time Div Duplex)
Output Power Type	Stepped _
Rated Input Voltage and Current DC:	DC: Nominal: 12V DC Current: 1.25 A ENET: Nominal: 48 V DC Current: 0.350 A
Operating Temperature Range:	Nominal: 20 ºC Max: 50 ºC Min: 0 ºC
ITU Emission Designator(s):	2400 – 2483.5 MHz 802.11b 15M8G1D 2400 – 2483.5 MHz 802.11g 17M7D1D 2400 – 2483.5 MHz 802.11n – HT-20 18M7D1D 2400 – 2483.5 MHz 802.11n – HT-40 36M6D1D 5725 – 5850 MHz 802.11a 17M8D1D 5725 – 5850 MHz 802.11n – HT-20 18M4D1D 5725 – 5850 MHz 802.11n – HT-40 36M6D1D
Long Term Frequency Stability:	±20 ppm
Equipment Dimensions:	12.0 cm x 12.7 cm x 3.2 cm
Weight:	375 grams
Primary function of equipment:	Wireless Access Point for transmitting data and voice

6.2 Scope of Test Program

RF Testing

The scope of the compliance program was to test the Aruba AP-92 and AP-93 wireless Access Point, 2x2 Spatial Multiplexing MIMO configurations in the frequency ranges 5150 - 5250 MHz for compliance against FCC 47 CFR Part 15.407 and Industry Canada RSS-210 specifications.

The Aruba Networks, Inc AP-92 has external reverse SMA connectors which utilize external antennas while the AP-93 has integral antenna(s). The antennas used with the AP-92 and AP-93 are detailed in section 3.4 “Antenna Details”.

Aruba AP-92, AP-93 Access Point

The AP-92 and AP-93 are high-speed, affordable, and reliable 802.11n access points for indoor environments. Designed for both ceiling and wall mounting, the compact AP-92 and AP-93 deliver wire-like performance at data rates up to 300Mbps. The AP-92 and AP-93 are built to deliver years of trouble-free operation and are backed by Aruba’s limited lifetime warranty program.

Working in conjunction with Aruba’s line of centralized Mobility Controllers, the AP-92 and AP-93 deliver high-speed, secure network services that let users finally move to a “wireless where possible, wired where necessary” network access model. The network can then be rightsized, with unnecessary ports eliminated to lower operating costs. The key to rightsizing is Aruba’s unique Adaptive Radio Management technology, which manages channel, power, and wireless client behavior to deliver wire-like performance and reliability. By rightsizing network infrastructure, organizations significantly enhance user mobility and efficiency while lowering total cost of ownership.

The multifunction AP-92 and AP-93 can be configured through the controller to provide wireless LAN access, air monitoring, remote networking, secure enterprise mesh, and wireless intrusion detection and prevention over the 2.4GHz and 5GHz RF spectrum. The AP-92 and AP-93 feature a 100/1000Base-T Ethernet interface and operate from either standard 802.3af Power over Ethernet (PoE) sources or a 12VDC power supply.

6.3 Equipment Model(s) and Serial Number(s)

Type (EUT/ Support)	Equipment Description (Including Brand Name)	Mfr	Model No.	Serial No.
EUT	802.11a/b/g/n Wireless Access Point	Aruba Networks, Inc	AP-92 AP-92 AP-93	AN0000305 (Conducted Testing) AN0000307 (Radiated Testing) AN0000330 (Radiated Testing)
Support	Laptop PC	IBM	Thinkpad	None

6.4 Antenna Details

Antenna Type:	Manufacturer	Model	Gain (dBi)	Frequency Range (MHz)
Integral	Aruba Networks, Inc	PIFA	2.13	2400 - 2500
Integral	Aruba Networks, Inc	PIFA	5.8	4900 - 5875
External	Aruba Networks, Inc	AP-ANT-2	6	2400 - 2500
External	Aruba Networks, Inc	AP-ANT-7	12	2400 - 2500
External	Aruba Networks, Inc	AP-ANT-10	6	4900 - 5875
External	Aruba Networks, Inc	AP-ANT-12	14	4900 - 5875
External	Aruba Networks, Inc	AP-ANT-13B	3.3	4900 - 5875
External	Aruba Networks, Inc	AP-ANT-1B	2.5	2400 - 2500

6.5 Cabling and I/O Ports

Number and type of I/O ports

Description	Type	Length	Additional Information
ENET	RJ-45 Ethernet Port	Greater than 10m	Ethernet connection; Only non-shielded CAT-5 cable was used during testing. Port not connected to public utility/telecommunication network.
CONSOLE	RJ-45 Serial Port	Greater than 10m	For EUT setup only, not connected during typical EUT operation; Only non-shielded CAT-5 cable was used during testing.
DC Power	DC Power Port	Less than 3m	AC adaptor with attached DC cable supplied with EUT
AC Power	AC Adaptor	Less than 3m	AC adaptor and mains cable supplied with EUT

6.6 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.

Operational Mode(s) (802.11a/b/g/n)	Variant	Data Rate with Highest Power	Frequencies (MHz)
b	Legacy	1 MBit/s	2,412 2,437 2,462
g	Legacy	6 MBit/s	
n	HT-20	6.5 MCS	
	HT-40	13.5 MCS	2,422 2,437 2,452
a	Legacy	6 MBit/s	5,745 5,785 5,825
n	HT-20	6.5 MCS	
	HT-40	13.5 MCS	5,755 5,785 5,815

Legacy – data rates for 802.11abg products

Results for the above configurations are provided in this report

Antenna Test Configurations for Radiated Emissions

Spurious Emission and Band-Edge Test Strategy

When testing radiated spurious emissions and band-edge two identical antennae were connected to the EUT at all times. Transmission during this test process simulated a typical installation. Results for the following configurations are provided in this report.

2,400 – 2483.5 MHz

15.247	
	Integral
802.11b	b SE 2412
	b SE 2437
	b SE 2462
	BE b 2390
	b Pk 2412
	b Pk 2437
	b Pk 2462
	BE b 2483.5
802.11g	g SE 2412
	g SE 2437
	g SE 2462
	BE g 2390
	g Pk 2412
	g Pk 2437
	g Pk 2462
	BE g 2483.5
HT-20 n	g SE 2412
	g SE 2437
	g SE 2462
	BE g 2390
	PK g 2412
	PK g 2437
	PK g 2462
	BE g 2483.5
HT-40 n	g SE 2422
	g SE 2437
	g SE 2452
	BE g 2390
	PK g 2422
	PK g 2437
	PK g 2452
	BE g 2483.5

KEY;-

SE – Spurious Emission
BE – Band-Edge
PK - Peak Emission

5,725 – 5850 MHz

15.247	
	Integral
Legacy	
802.11a	a SE 5745
	a SE 5785
	a SE 5825
	Pk a 5745
	Pk a 5785
	Pk a 5825
	BE a 5460
HT-20	a SE 5745
	a SE 5785
	a SE 5825
	Pk a 5745
	Pk a 5785
	Pk a 5825
	BE a 5460
HT-40	a SE 5755
	a SE 5785
	a SE 5815
	Pk a 5755
	Pk a 5785
	Pk a 5815
	BE a 5460

KEY;-

SE – Spurious Emission
BE – Band-Edge
PK - Peak Emission

6.7 Equipment Modifications

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

EUT Software Power Settings - Radiated Testing

1. Reduction in output power to meet band-edge and emission requirements was required in certain circumstances. The following matrix was generated identifying the reduction in power required bringing the EUT into compliance.

2400 - 2483.5 MHz Integral Antenna

	Channel Freq (MHz)	Nominal ART Power	Passing ART Power	Measured Pwr (dBm)
11b	2412	20	12	13.17
	2437	20	12	12.53
	2462	20	10.5	9.84
11g	2412	20	14.5	14.79
	2437	20	18	18.65
	2462	20	14.5	14.63
HT-20	2412	20	14	15.11
	2437	20	18	18.67
	2462	20	14	14.62
HT-40	2422	20	12	12.39
	2437	20	18	18.39
	2452	20	12.5	12.53

5725 – 5850 MHz

	Channel Freq (MHz)	Nominal ART Power	Passing ART Power	Aggregate Measured Pwr (dBm)
11a	5745	20	18	17.53
	5785	20	13.5	13.99
	5825	20	14	14.62
HT-20	5745	20	14	14.61
	5785	20	14	15
	5825	20	13.5	13.8
HT-40	5755	20	13.5	13.25
	5785	20	13.5	13.58
	5815	20	14	14.44

2400 - 2483.5 MHz AP-ANT-2

	Channel Freq (MHz)	Nominal ART Power	Passing ART Power	Measured Pwr (dBm)
11b	2412	20	6	7.23
	2437	20	7.5	7.7
	2462	20	7	7.11
11g	2412	20	13	14.13
	2437	20	13	13.71
	2462	20	13	13.5
HT-20	2412	20	13	14.24
	2437	20	18	18.67
	2462	20	13.5	13.49
HT-40	2422	20	11	11.13
	2437	20	18	18.39
	2452	20	10	10.98

2400 - 2483.5 MHz AP-ANT-7

	Channel Freq (MHz)	Nominal ART Power	Passing ART Power	Measured Pwr (dBm)
11b	2412	20	6	7.23
	2437	20	6.5	4.7
	2462	20	7	7.11
11g	2412	20	11	12.43
	2437	20	13	13.71
	2462	20	12	12.43
HT-20	2412	20	10	11.38
	2437	20	16	16.58
	2462	20	12	12.43
HT-40	2422	20	6.5	6.61
	2437	20	18	18.39
	2452	20	6	7.29

5725 – 5850 MHz AP-ANT-10

	Channel Freq (MHz)	Nominal ART Power	Passing ART Power	Aggregate Measured Pwr (dBm)
11a	5745	20	18.0	17.35
	5785	20	13.5	13.99
	5825	20	10.5	10.00
HT-20	5745	20	9.5	8.14
	5785	20	9.0	8.50
	5825	20	9.0	8.78
HT-40	5755	20	10.5	9.83
	5785	20	10.5	9.54
	5815	20	9.5	8.21

5725 – 5850 MHz AP-ANT-12

	Channel Freq (MHz)	Nominal ART Power	Passing ART Power	Aggregate Measured Pwr (dBm)
11a	5745	20	7	6.23
	5785	20	6.5	5.07
	5825	20	6.5	4.84
HT-20	5745	20	7	5.74
	5785	20	6.5	4.76
	5825	20	6.5	5.61
HT-40	5755	20	6	4.38
	5785	20	6.5	4.85
	5815	20	6.5	4.63

6.8 Deviations from the Test Standard

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

1. None

6.9 Subcontracted Testing or Third Party Data

1. NONE

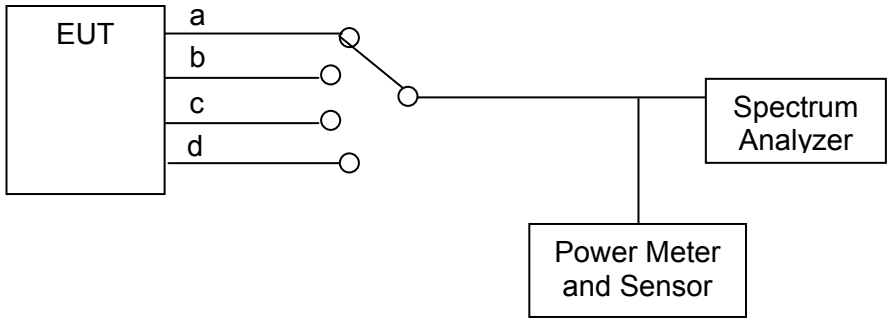
7 TEST RESULTS

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



Test configuration for 6 dB & 99% Bandwidth

Specification

Limits

§15.247 (a)(2) 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

7.1.1 6 dB and 99% Bandwidth Results: 802.11b

Test Conditions:	15.247 (a)(2)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11b		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain (Y):	N/A	dB	**Antenna Gain:**	6	dBi
Applied Voltage:	12.0	Vdc			
Notes 1:					
Notes 2:					

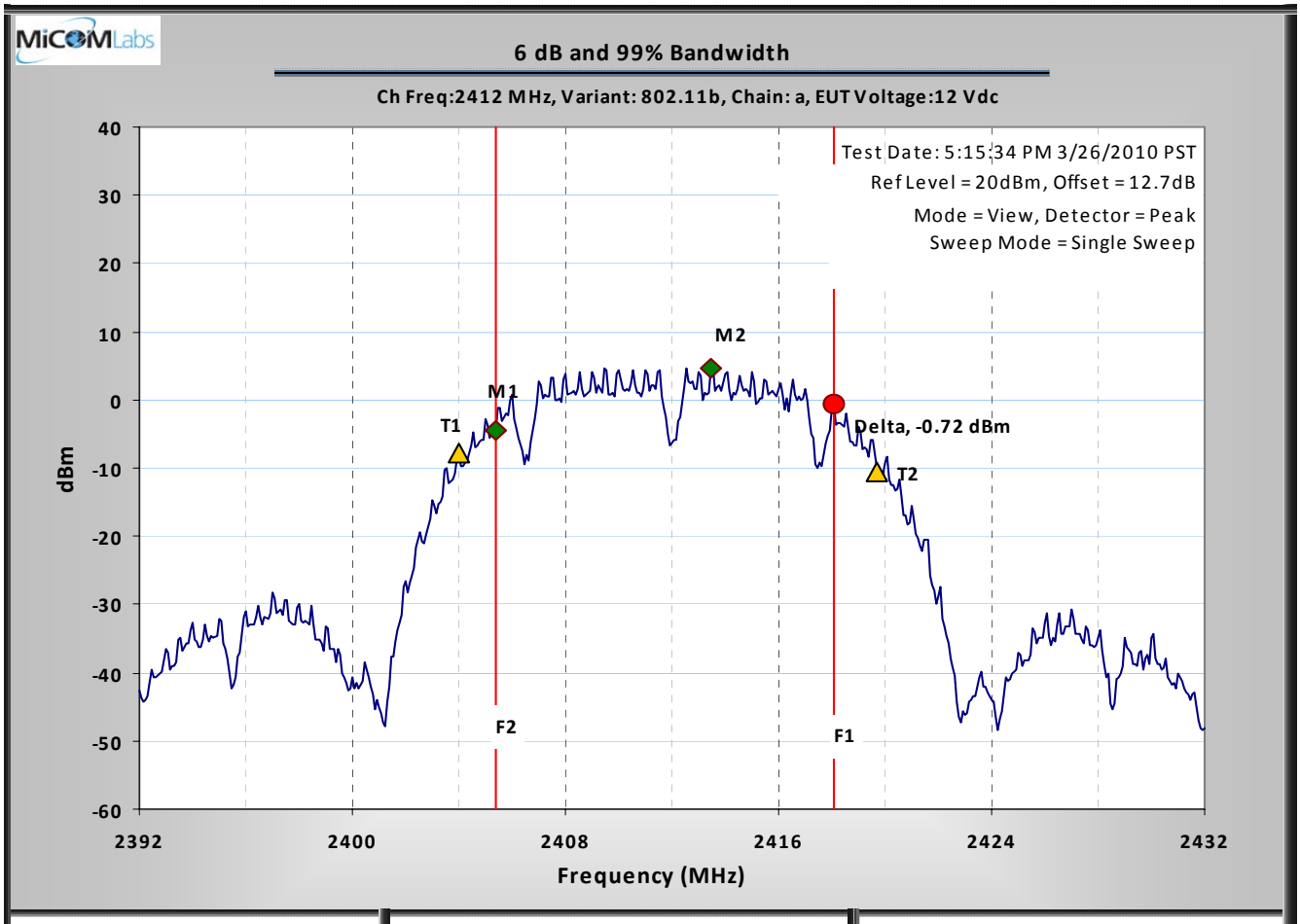
6 dB Bandwidth

Test Frequency	6 dB Bandwidth MHz				Minimum 6dB Bandwidth Limit		Margin
MHz	a	b	c	d	kHz	MHz	MHz
2412	12.665000	12.585000			500	0.5	-12.085000
2437	12.104000	12.184000					-11.604000
2462	13.066000	12.184000					-11.684000

99% Bandwidth

Test Frequency	99 % Bandwidth MHz						
MHz	a	b	c	d			
2412	15.711000	15.551000					
2437	15.631000	15.551000					
2462	15.631000	15.711000					

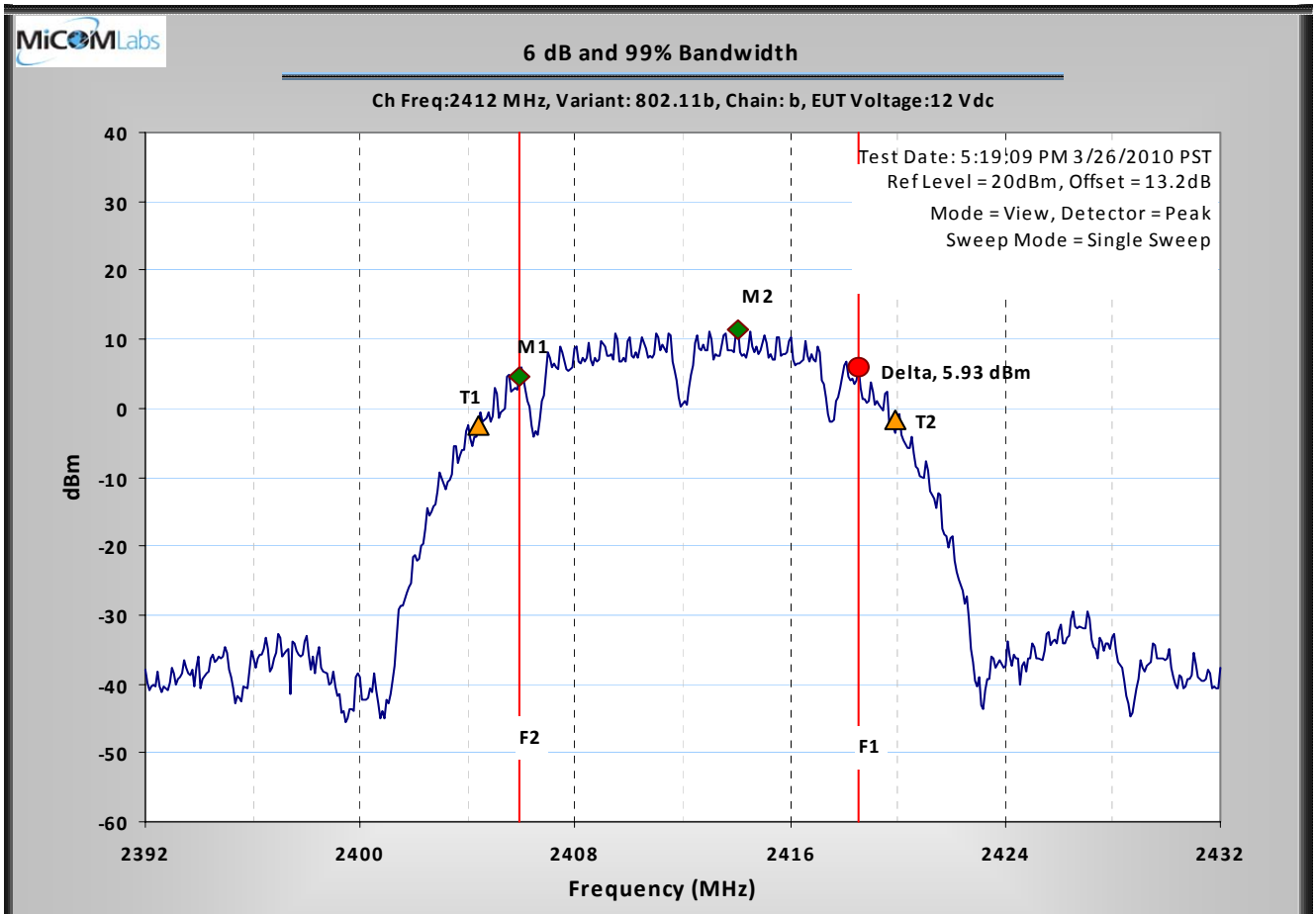
Measurement uncertainty:	±2.81 dB



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	2405.386774MHz	-4.523dBm
M2	2413.482966MHz	4.615dBm
Delta	2418.052104MHz	-.718dBm
T1	2404.024048MHz	-7.661dBm
T2	2419.655311MHz	-10.433dBm

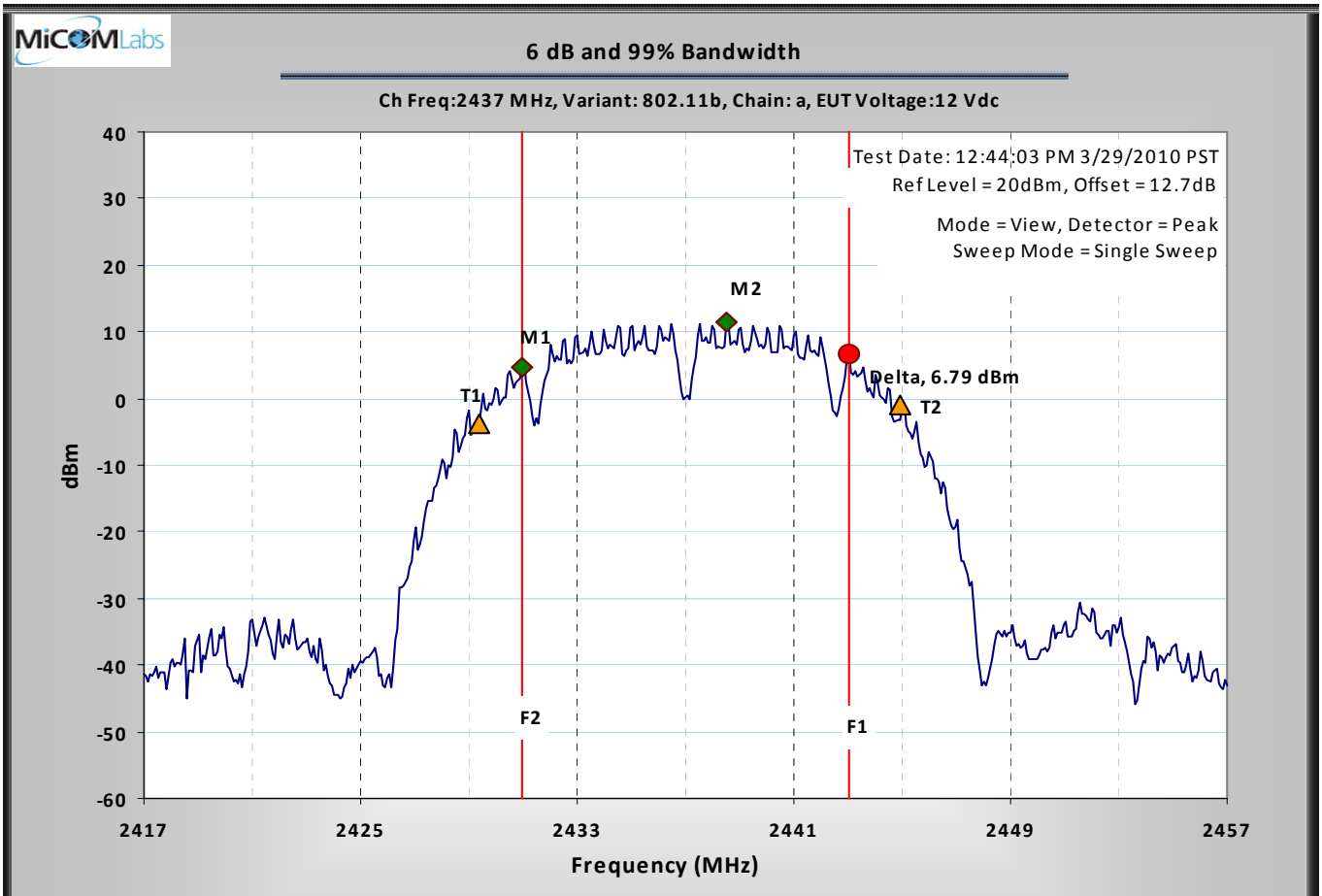
Test Results
Center frequency = 2412MHz
6dB BW (Delta -M1) = 12.665331MHz
99% OBW (T2-T1) = 15.711423MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	2405.947896MHz	4.480dBm
M2	2414.044088MHz	11.458dBm
Delta	2418.533066MHz	5.926dBm
T1	2404.424850MHz	-2.509dBm
T2	2419.895792MHz	-1.722dBm

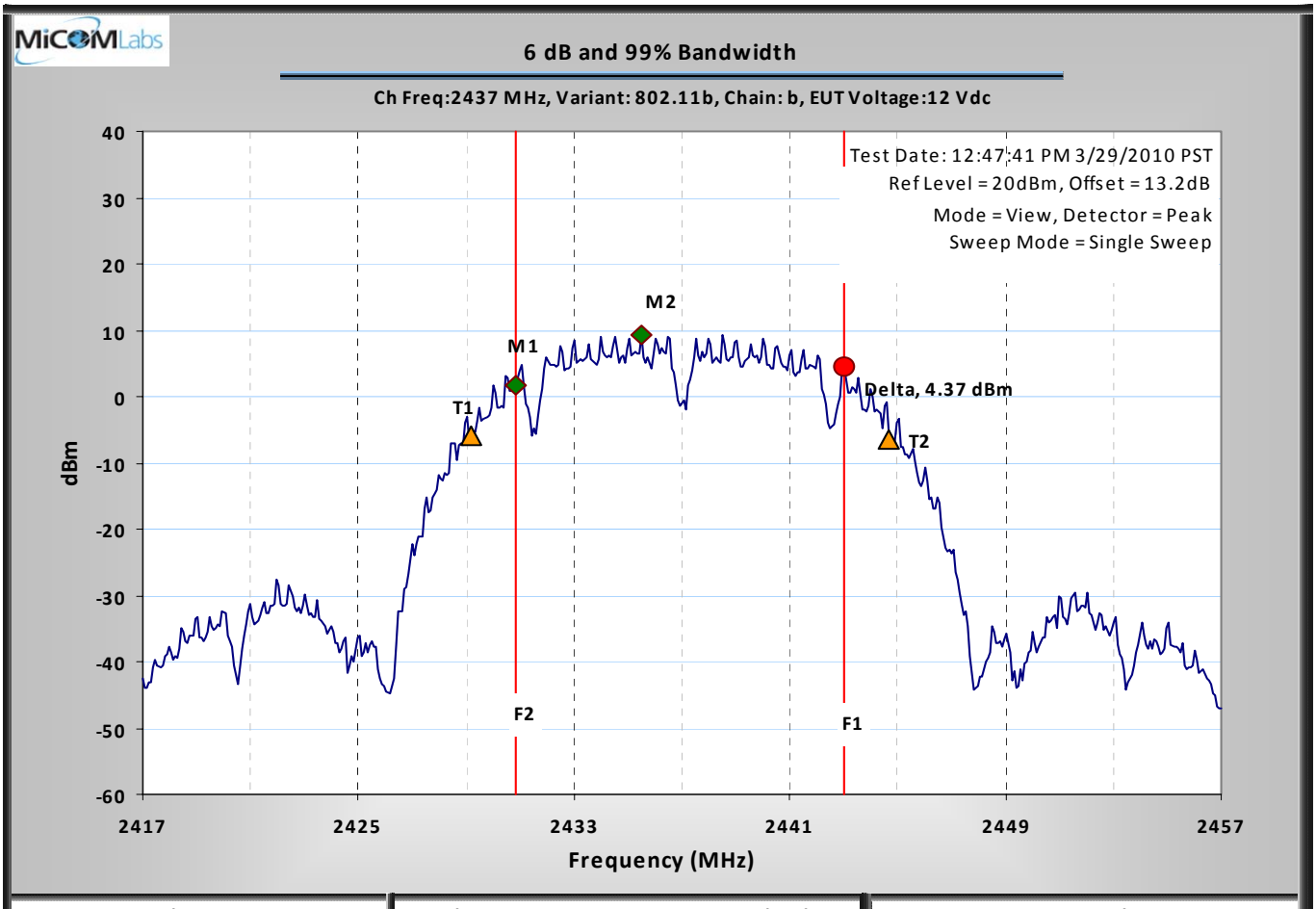
Test Results
Center frequency = 2412MHz
6dB BW (Delta -M1) = 12.585170MHz
99% OBW (T2-T1) = 15.551102MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	2430.947896MHz	4.814dBm
M2	2438.482966MHz	11.336dBm
Delta	2443.052104MHz	6.791dBm
T1	2429.344689MHz	-3.919dBm
T2	2444.895792MHz	-0.982dBm

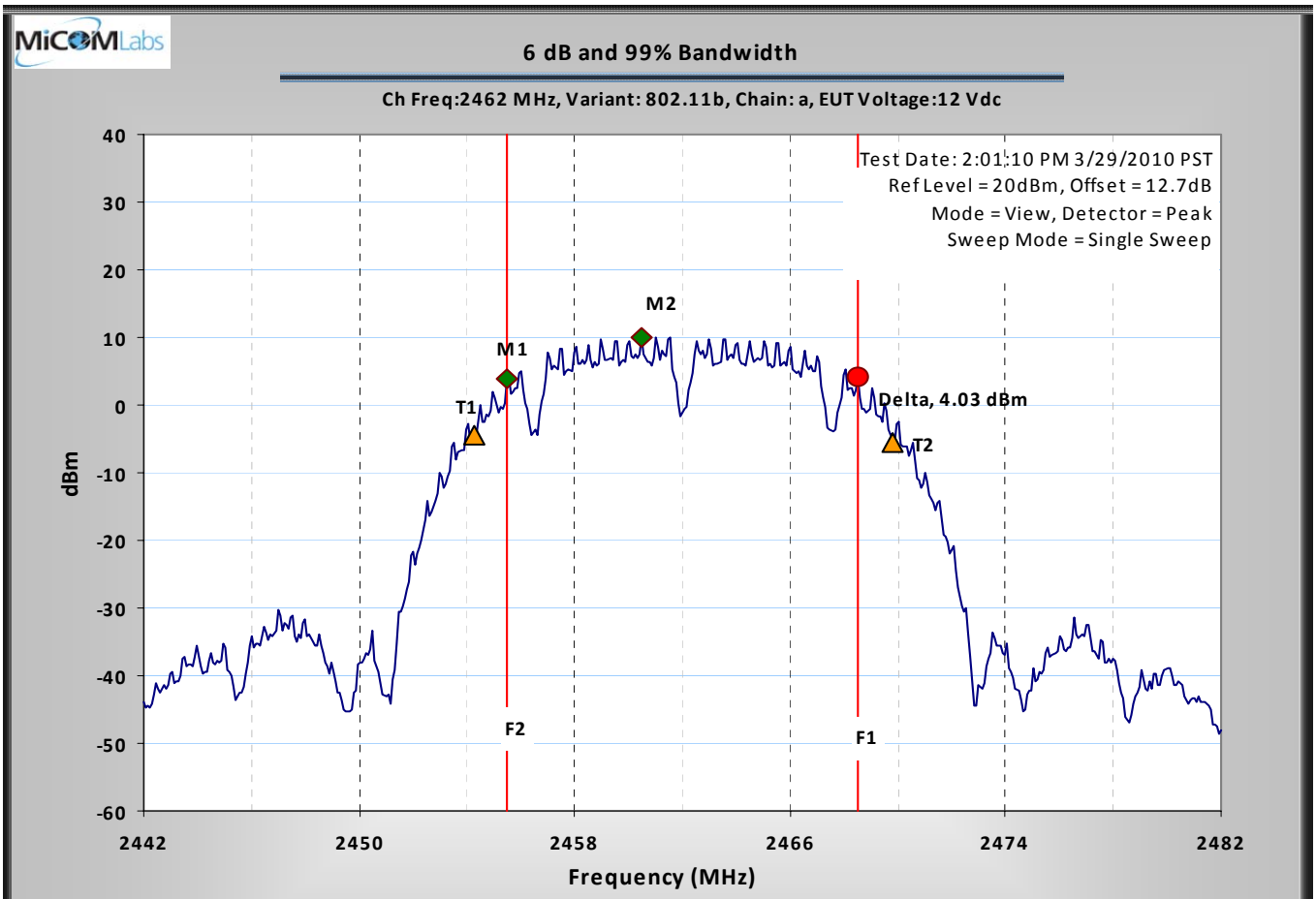
Test Results
Center frequency = 2437MHz
6dB BW (Delta -M1) = 12.104208MHz
99% OBW (T2-T1) = 15.631263MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	2430.867735MHz	1.690dBm
M2	2435.517034MHz	9.303dBm
Delta	2443.052104MHz	4.375dBm
T1	2429.184369MHz	-6.022dBm
T2	2444.655311MHz	-6.569dBm

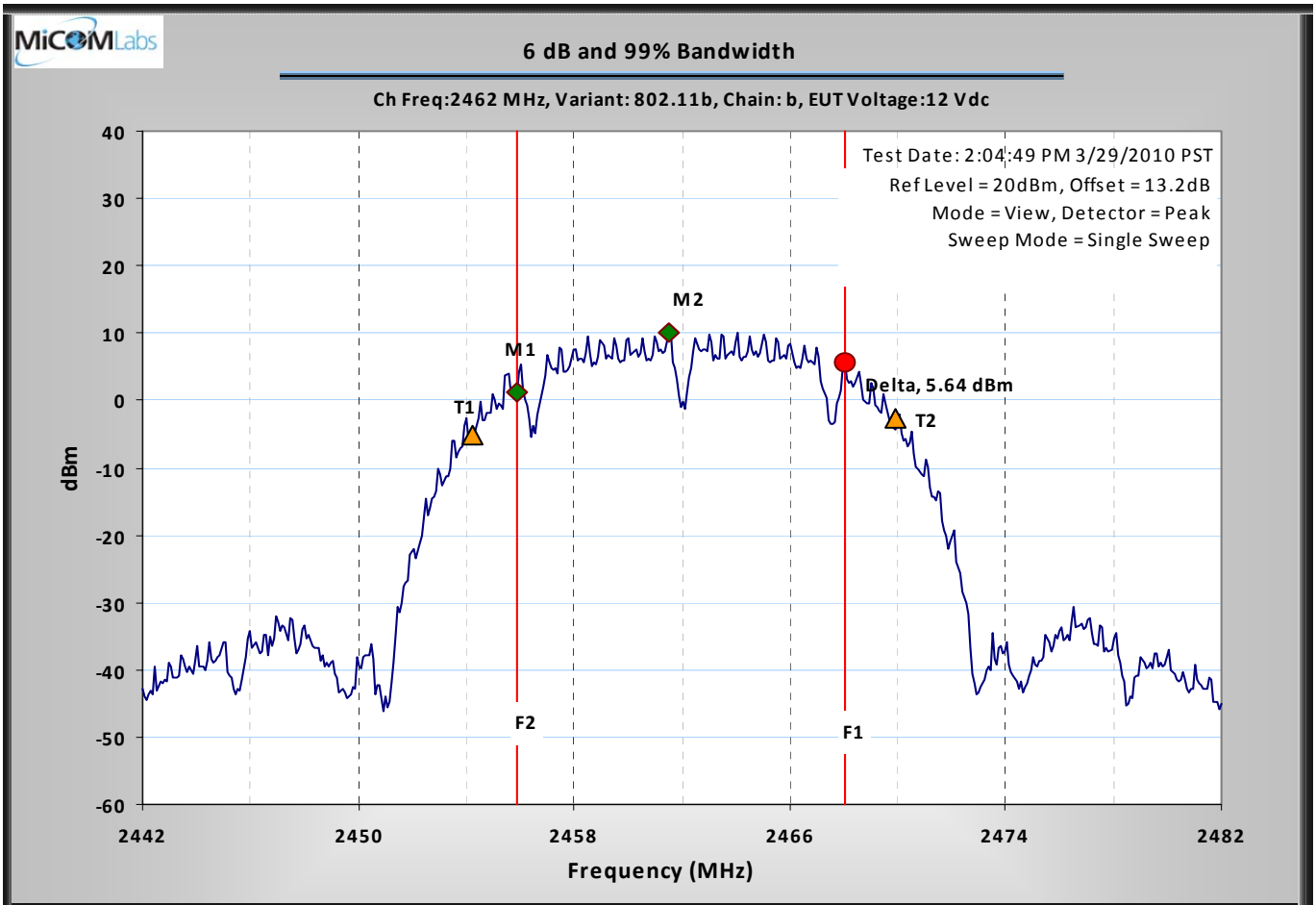
Test Results
Center frequency = 2437MHz
6dB BW (Delta -M1) = 12.184369MHz
99% OBW (T2-T1) = 15.551102MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	2455.466934MHz	3.779dBm
M2	2460.517034MHz	10.012dBm
Delta	2468.533066MHz	4.029dBm
T1	2454.264529MHz	-4.529dBm
T2	2469.815631MHz	-5.66dBm

Test Results
Center frequency = 2462MHz
6dB BW (Delta -M1) = 13.066132MHz
99% OBW (T2-T1) = 15.631263MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	2455.867735MHz	1.139dBm
M2	2461.478958MHz	10.181dBm
Delta	2468.052104MHz	5.644dBm
T1	2454.264529MHz	-5.135dBm
T2	2469.895792MHz	-2.668dBm

Test Results
Center frequency = 2462MHz
6dB BW (Delta -M1) = 12.184369MHz
99% OBW (T2-T1) = 15.711423MHz

7.1.2 6 dB and 99% Bandwidth Results: 802.11g

Test Conditions:	15.247 (a)(2)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11g		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain	N/A	dB	**Antenna Gain:**	6	dBi
Applied Voltage:	12.0	Vdc			
Notes 1:					
Notes 2:					

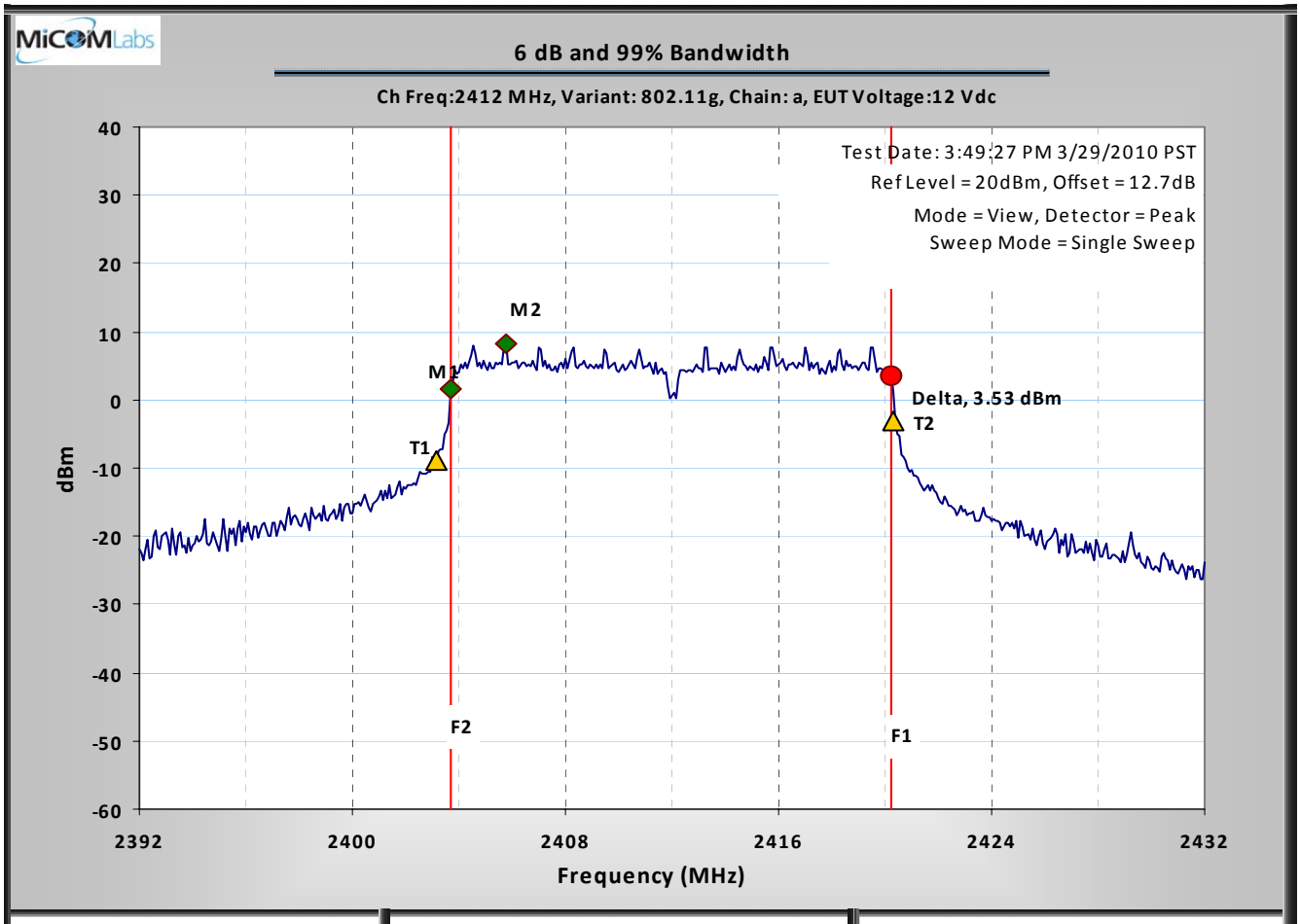
6 dB Bandwidth

Test Frequency	6 dB Bandwidth MHz				Minimum 6dB Bandwidth Limit		Margin
MHz	**a**	**b**	**c**	**d**	**kHz**	**MHz**	**MHz**
2412	16.513000	16.433000			500	0.5	-15.933000
2437	16.433000	16.513000					-15.933000
2462	16.433000	16.433000					-15.933000

99% Bandwidth

Test Frequency	99 % Bandwidth MHz						
MHz	**a**	**b**	**c**	**d**			
2412	17.234000	17.635000					
2437	17.635000	17.555000					
2462	16.914000	16.834000					

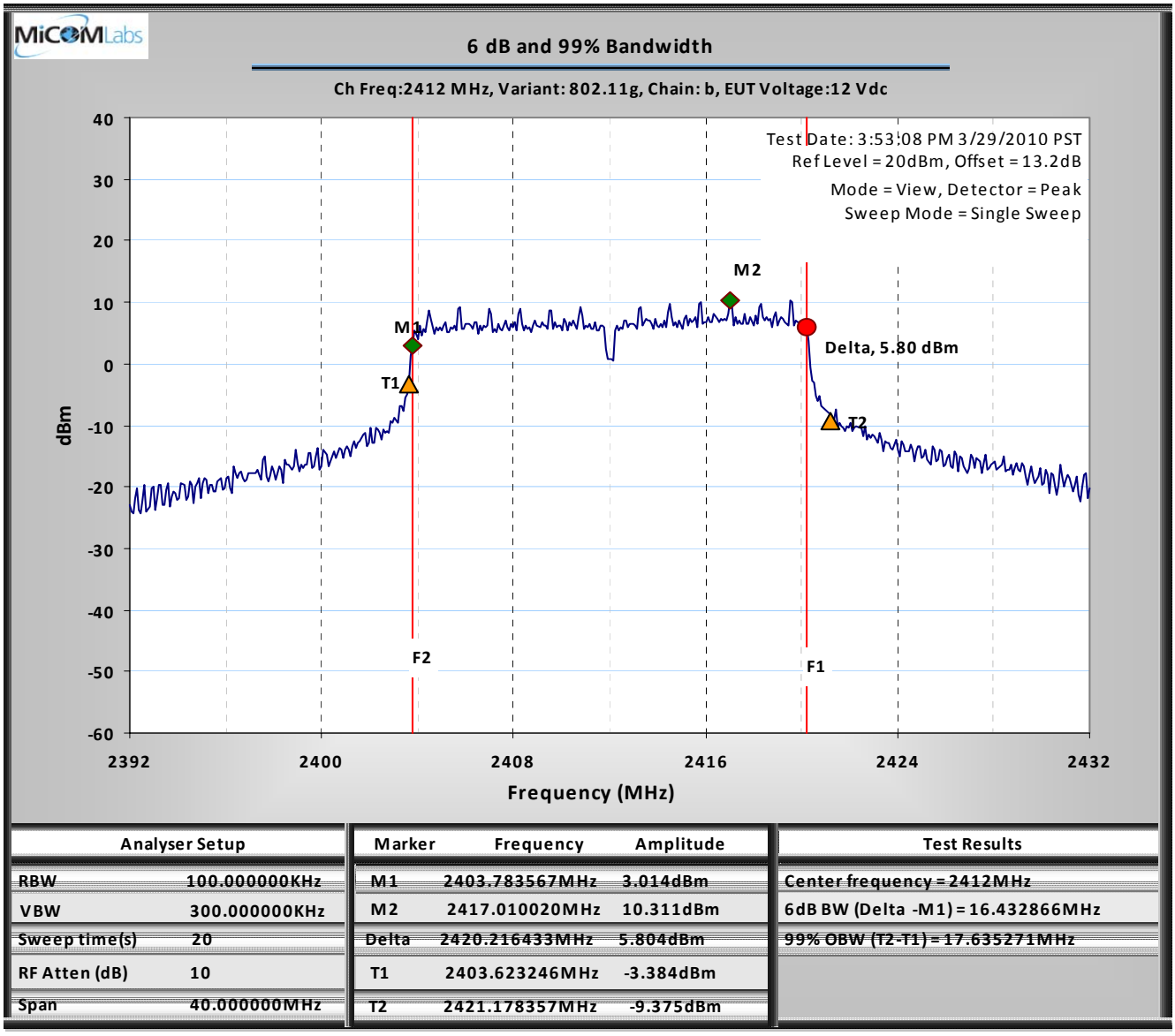
Measurement uncertainty:	±2.81 dB



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	2403.703407MHz	1.607dBm
M2	2405.787575MHz	8.369dBm
Delta	2420.216433MHz	3.531dBm
T1	2403.142285MHz	-9.032dBm
T2	2420.296593MHz	-3.089dBm

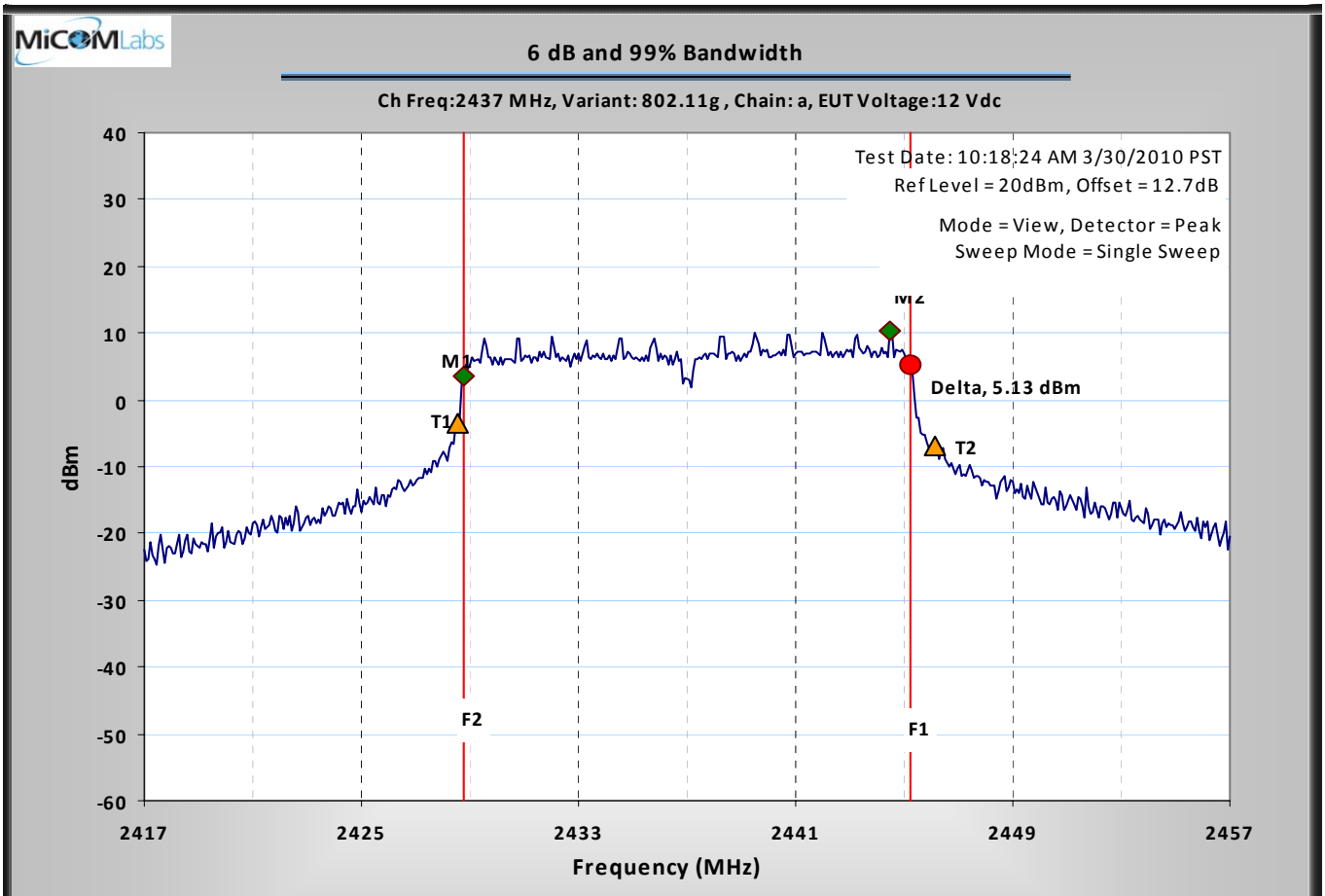
Test Results
Center frequency = 2412MHz
6dB BW (Delta -M1) = 16.513026MHz
99% OBW (T2-T1) = 17.234469MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	2403.783567MHz	3.014dBm
M2	2417.010020MHz	10.311dBm
Delta	2420.216433MHz	5.804dBm
T1	2403.623246MHz	-3.384dBm
T2	2421.178357MHz	-9.375dBm

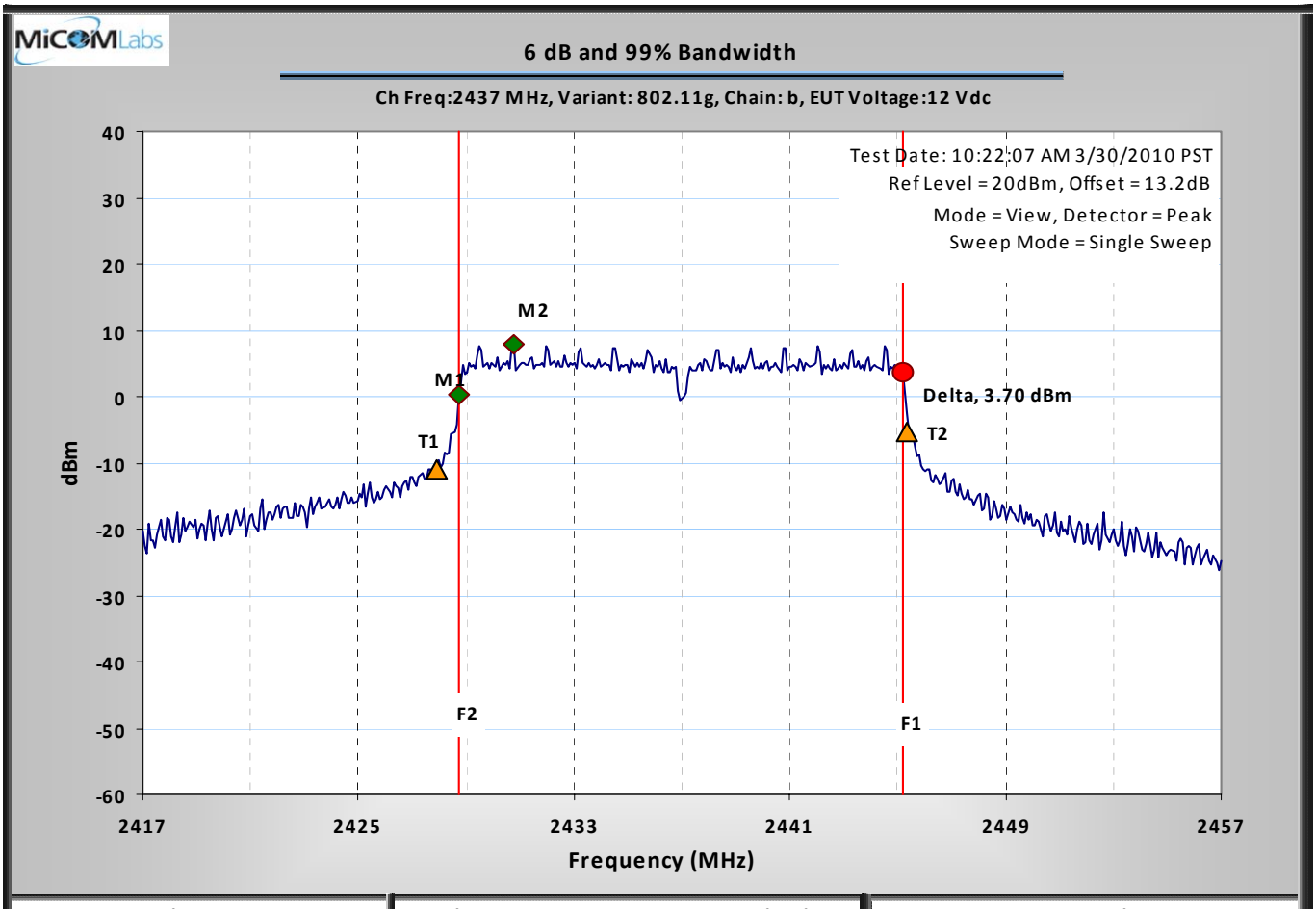
Test Results
Center frequency = 2412MHz
6dB BW (Delta -M1) = 16.432866MHz
99% OBW (T2-T1) = 17.635271MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	2428.783567MHz	3.673dBm
M2	2444.494990MHz	10.295dBm
Delta	2445.216433MHz	5.129dBm
T1	2428.543086MHz	-3.598dBm
T2	2446.098196MHz	-6.982dBm

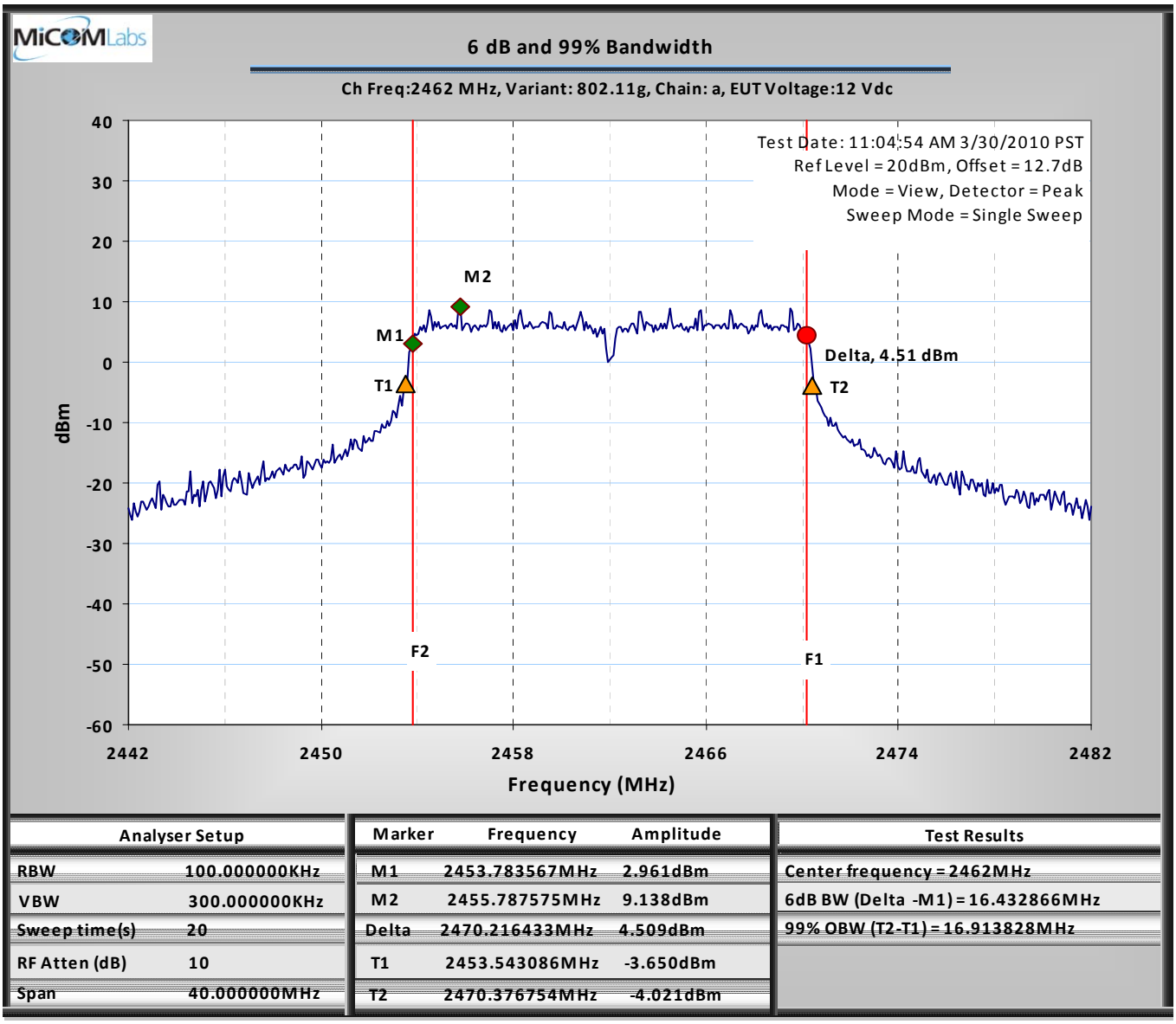
Test Results
Center frequency = 2437MHz
6dB BW (Delta -M1) = 16.432866MHz
99% OBW (T2-T1) = 17.635271MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	2428.703407MHz	.295dBm
M2	2430.787575MHz	7.913dBm
Delta	2445.216433MHz	3.700dBm
T1	2427.901804MHz	-11.070dBm
T2	2445.376754MHz	-5.284dBm

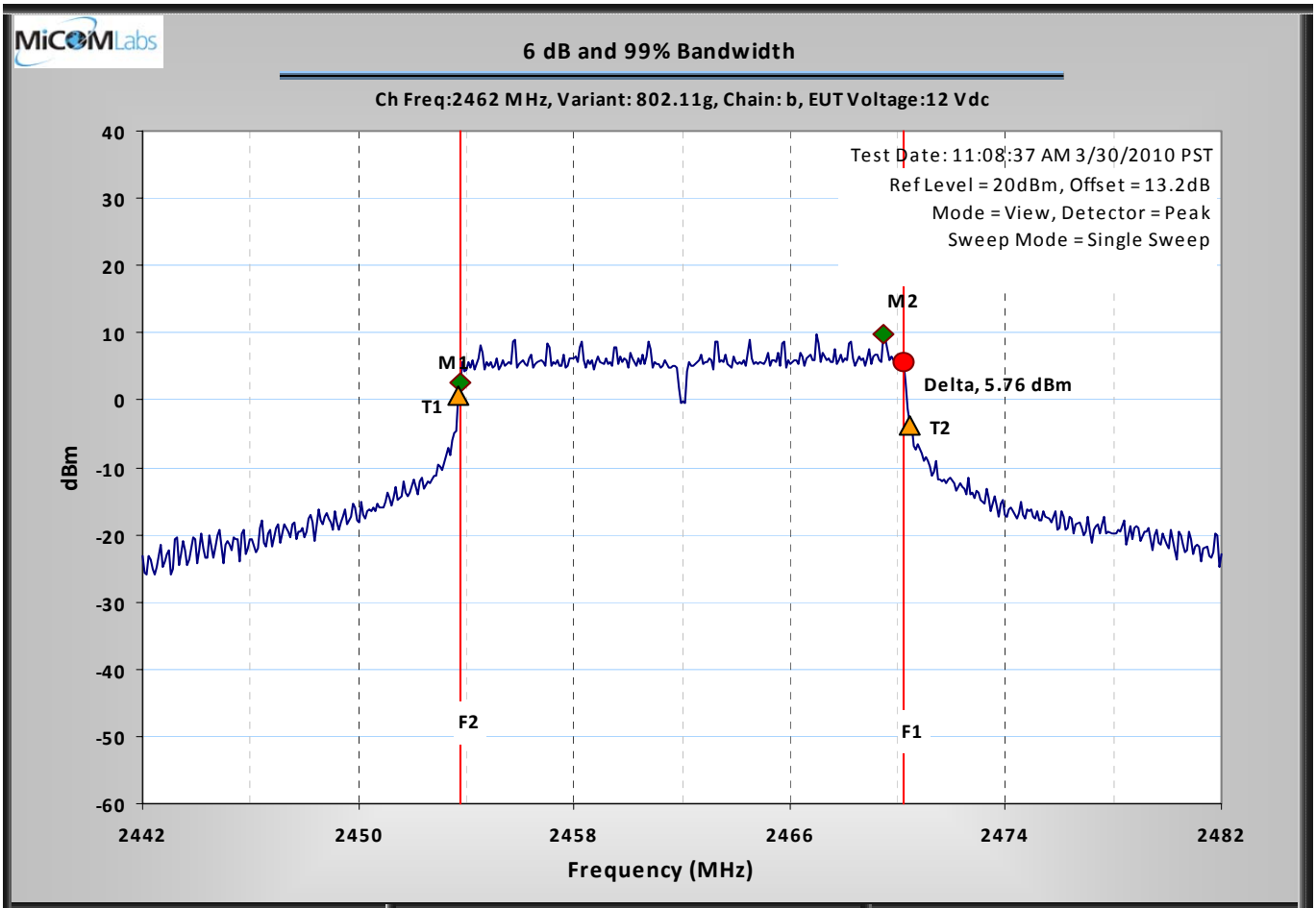
Test Results
Center frequency = 2437MHz
6dB BW (Delta -M1) = 16.513026MHz
99% OBW (T2-T1) = 17.555110MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	2453.783567MHz	2.961dBm
M2	2455.787575MHz	9.138dBm
Delta	2470.216433MHz	4.509dBm
T1	2453.543086MHz	-3.650dBm
T2	2470.376754MHz	-4.021dBm

Test Results
Center frequency = 2462MHz
6dB BW (Delta -M1) = 16.432866MHz
99% OBW (T2-T1) = 16.913828MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	2453.783567MHz	2.516dBm
M2	2469.494990MHz	9.685dBm
Delta	2470.216433MHz	5.758dBm
T1	2453.703407MHz	.728dBm
T2	2470.456914MHz	-3.905dBm

Test Results
Center frequency = 2462MHz
6dB BW (Delta -M1) = 16.432866MHz
99% OBW (T2-T1) = 16.833667MHz

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

Test Conditions:	15.247 (a)(2)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11n HT-20		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain	N/A	dB	**Antenna Gain:**	6	dBi
Applied Voltage:	12.0	Vdc			
Notes 1:					
Notes 2:					

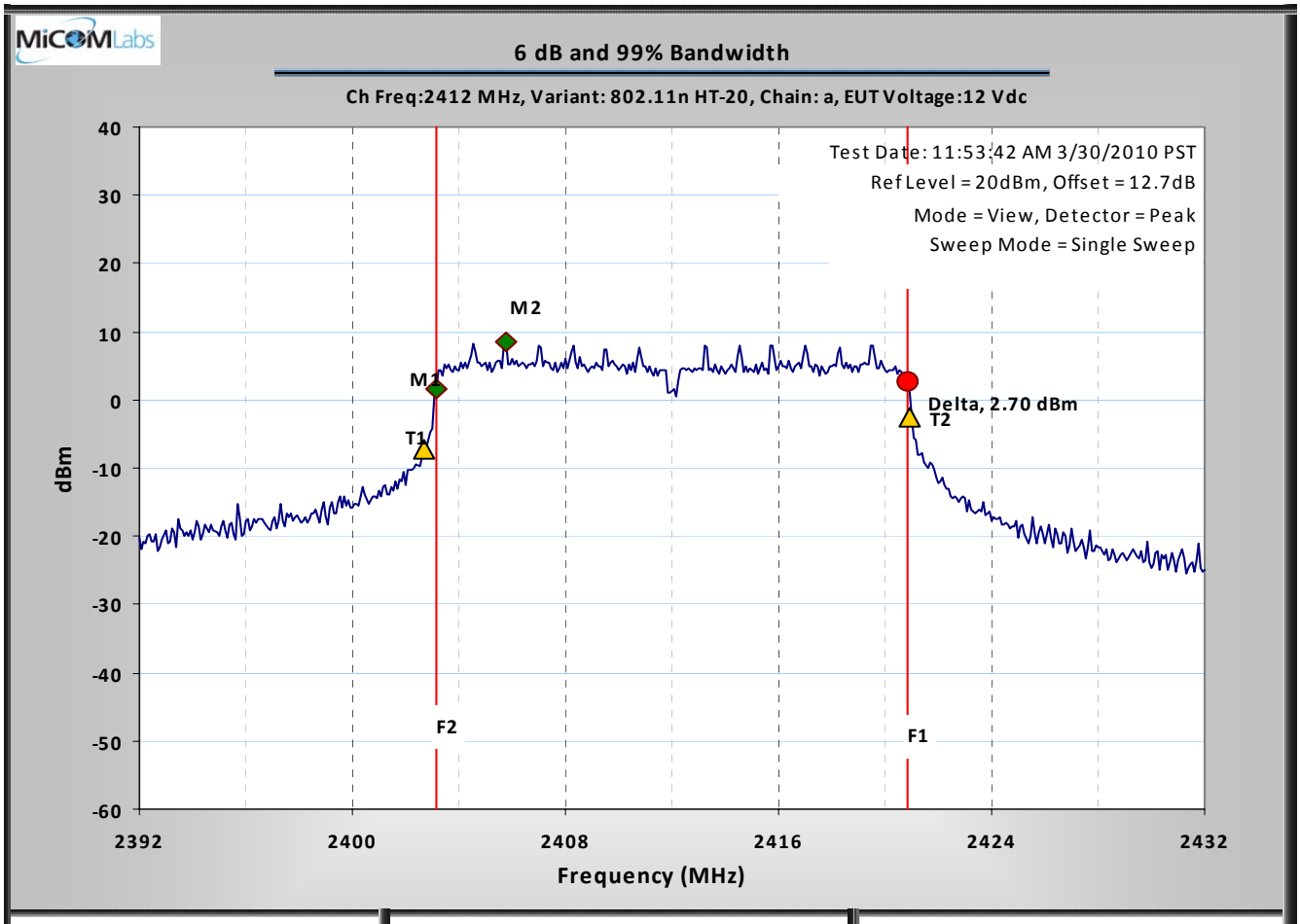
6 dB Bandwidth

Test Frequency	6 dB Bandwidth MHz				Minimum 6dB Bandwidth Limit		Margin
MHz	**a**	**b**	**c**	**d**	**kHz**	**MHz**	**MHz**
2412	17.715000	17.715000			500	0.5	-17.215000
2437	17.635000	17.635000					-17.135000
2462	17.635000	17.715000					-17.135000

99% Bandwidth

Test Frequency	99 % Bandwidth MHz						
MHz	**a**	**b**	**c**	**d**			
2412	18.357000	18.677000					
2437	18.597000	18.437000					
2462	18.036000	18.036000					

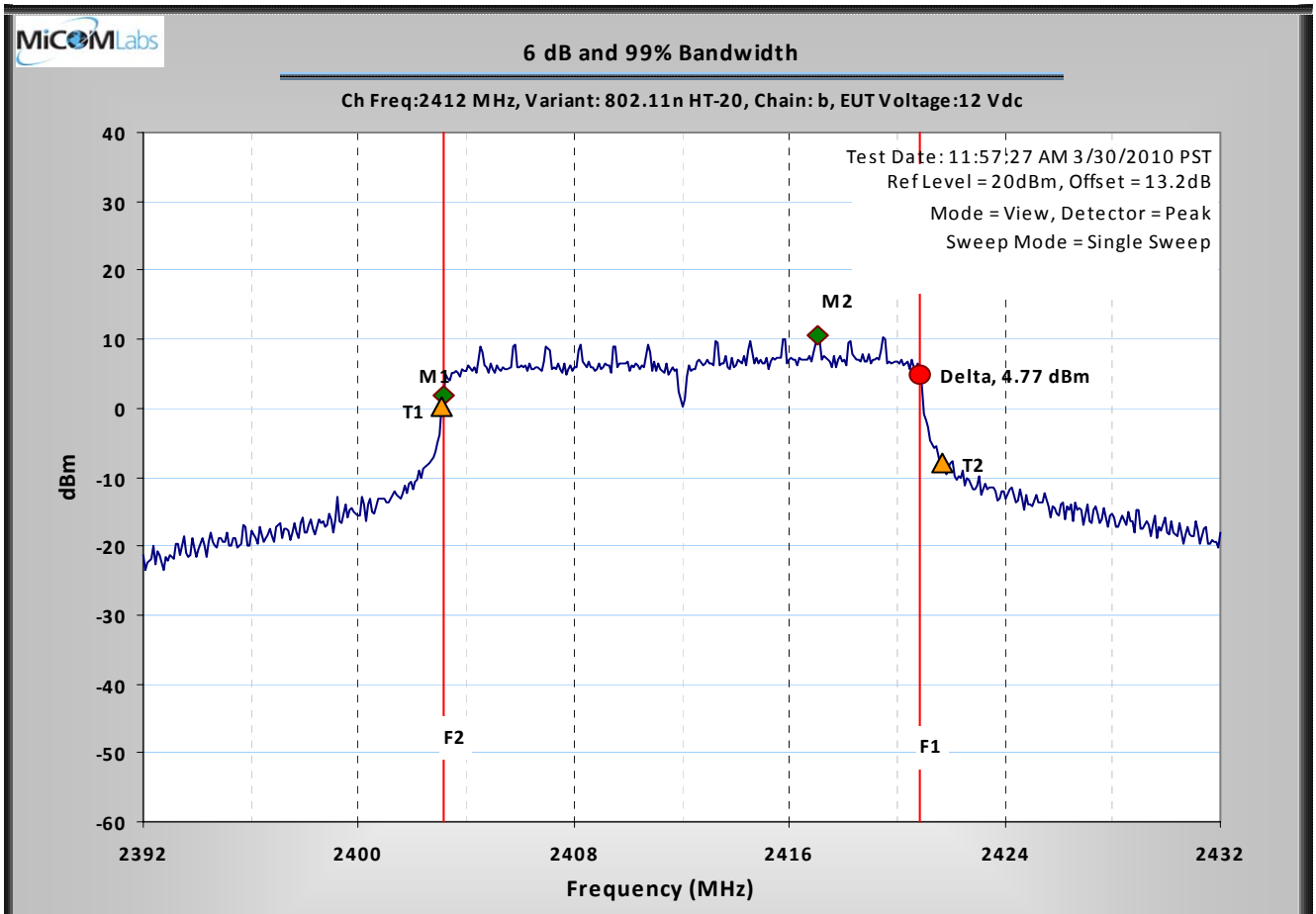
Measurement uncertainty:	±2.81 dB



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	2403.142285MHz	1.558dBm
M2	2405.787575MHz	8.550dBm
Delta	2420.857715MHz	2.697dBm
T1	2402.661323MHz	-7.258dBm
T2	2420.937876MHz	-2.573dBm

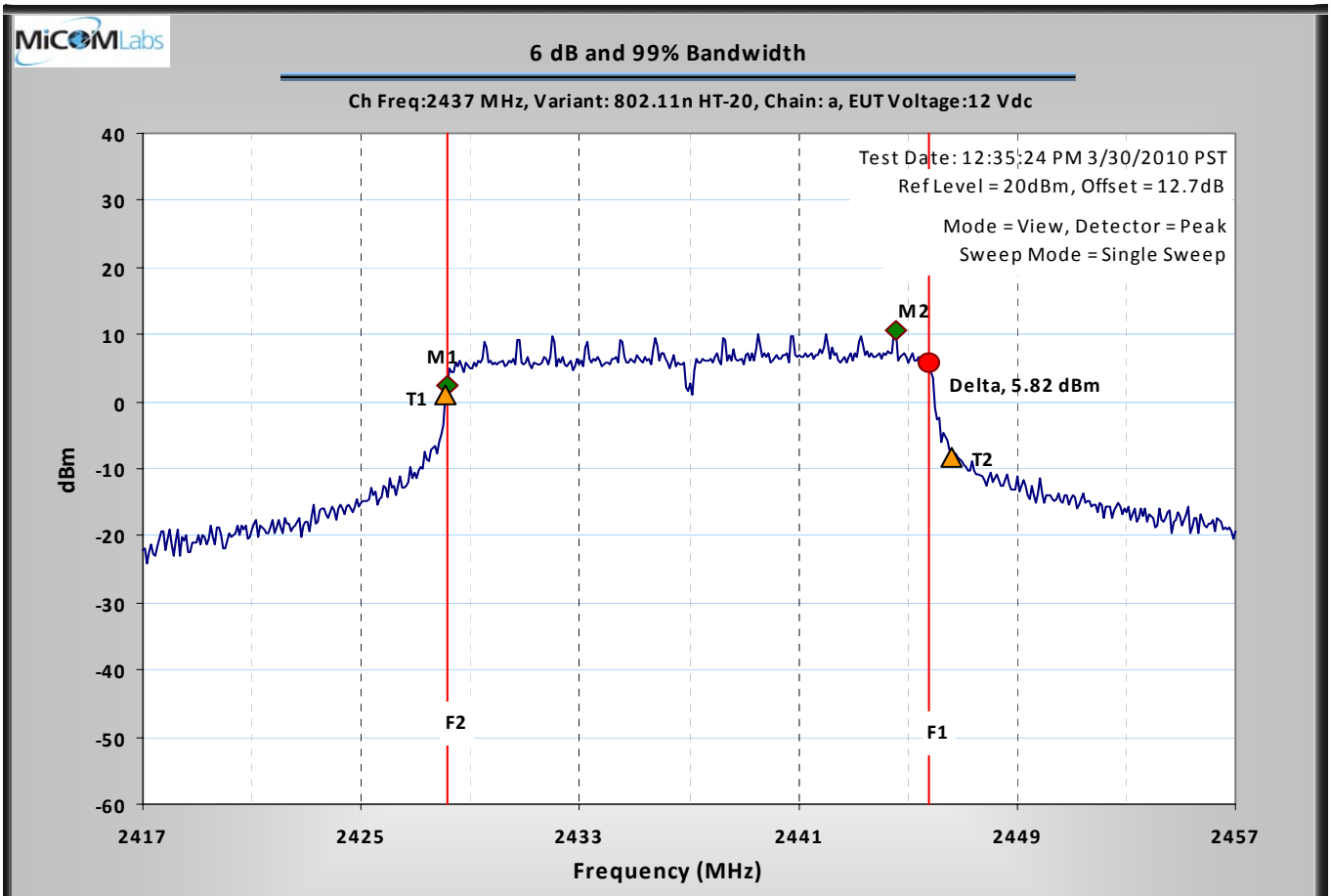
Test Results
Center frequency = 2412MHz
6dB BW (Delta -M1) = 17.715431MHz
99% OBW (T2-T1) = 18.356713MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	2403.142285MHz	1.763dBm
M2	2417.010020MHz	10.521dBm
Delta	2420.857715MHz	4.767dBm
T1	2403.062124MHz	.258dBm
T2	2421.659319MHz	-7.905dBm

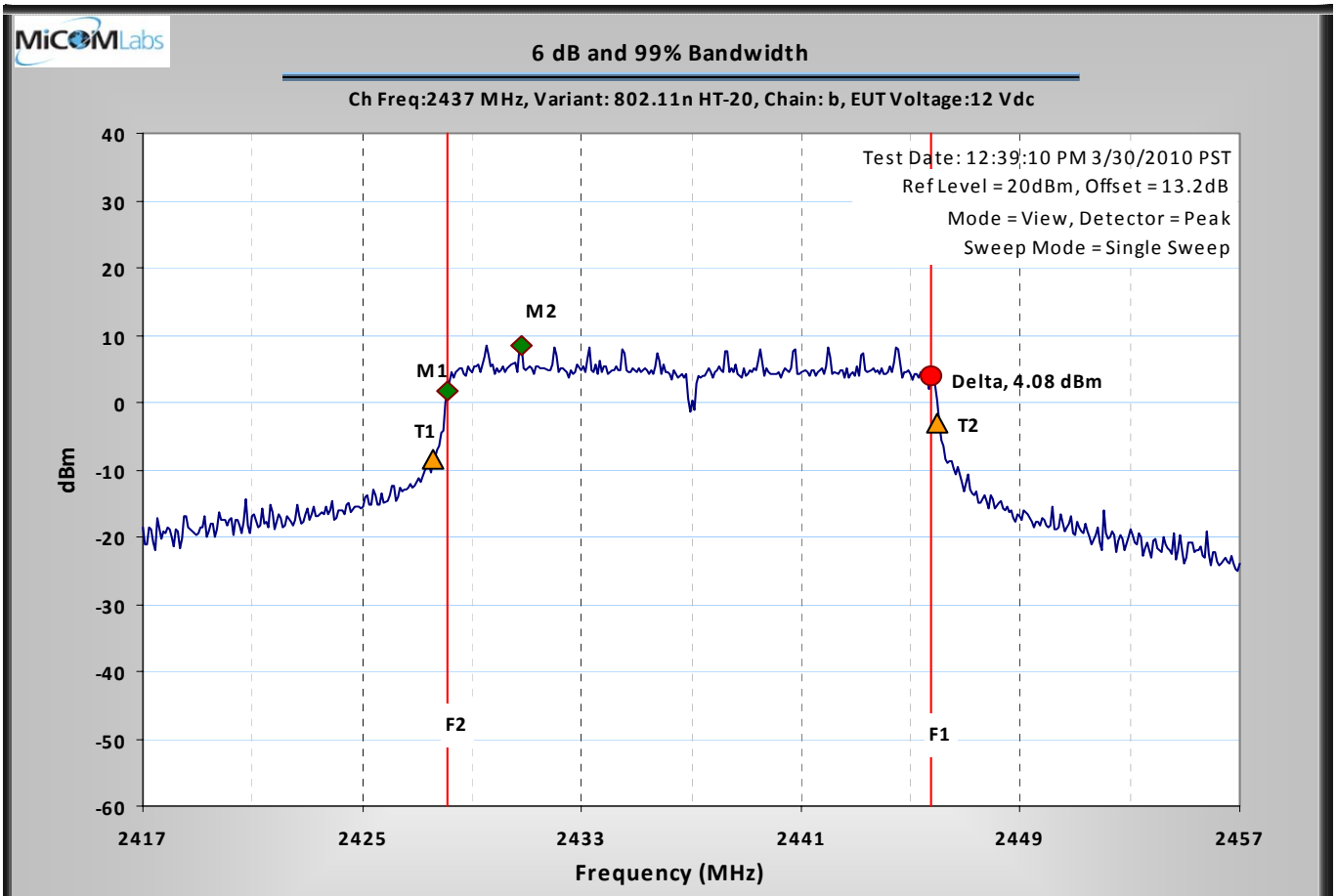
Test Results
Center frequency = 2412MHz
6dB BW (Delta -M1) = 17.715431MHz
99% OBW (T2-T1) = 18.677355MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	2428.142285MHz	2.443dBm
M2	2444.575150MHz	10.661dBm
Delta	2445.777555MHz	5.825dBm
T1	2428.062124MHz	.995dBm
T2	2446.579158MHz	-8.247dBm

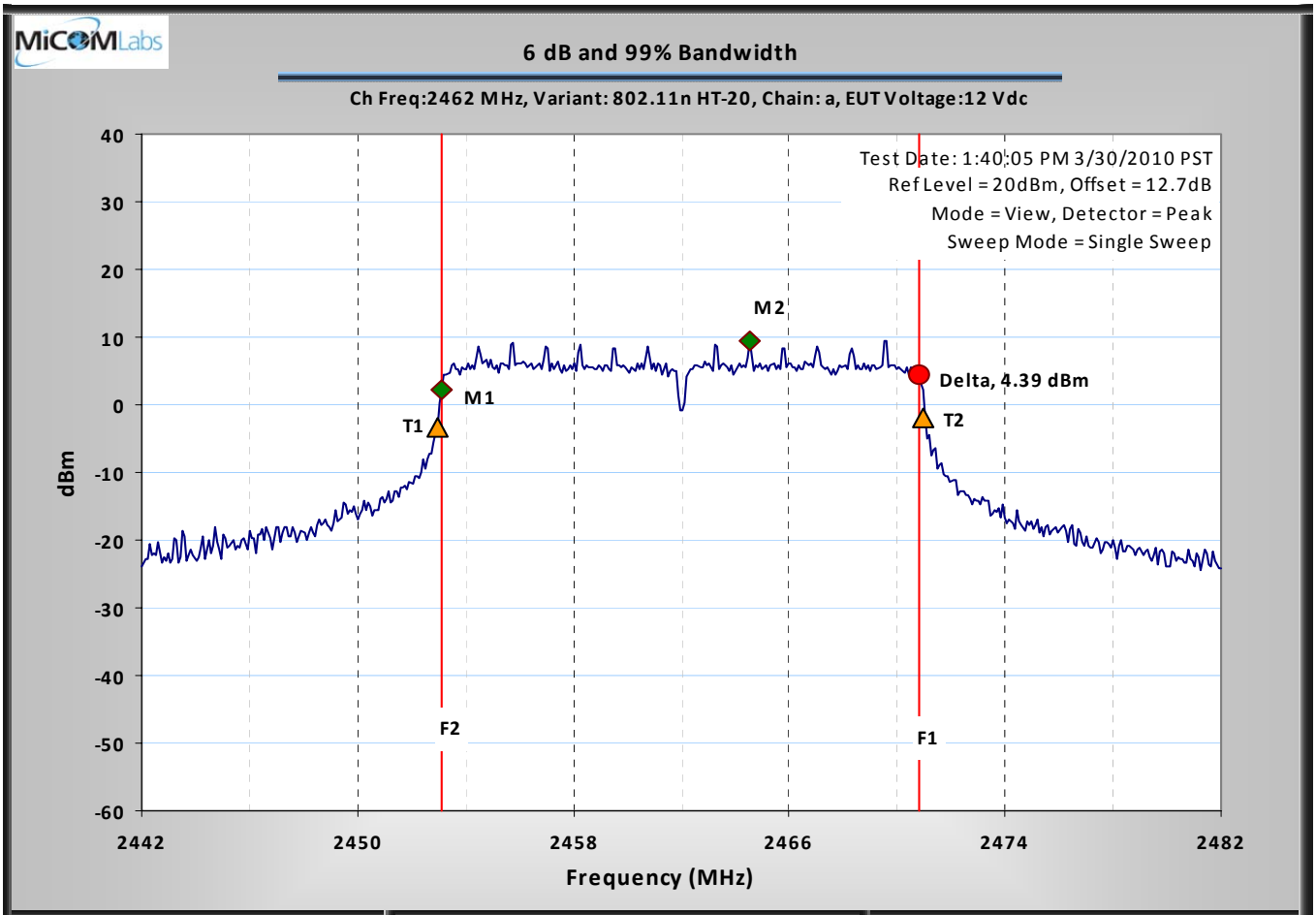
Test Results
Center frequency = 2437MHz
6dB BW (Delta -M1) = 17.635271MHz
99% OBW (T2-T1) = 18.597194MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	2428.142285MHz	1.641dBm
M2	2430.787575MHz	8.487dBm
Delta	2445.777555MHz	4.084dBm
T1	2427.581162MHz	-8.340dBm
T2	2445.937876MHz	-3.217dBm

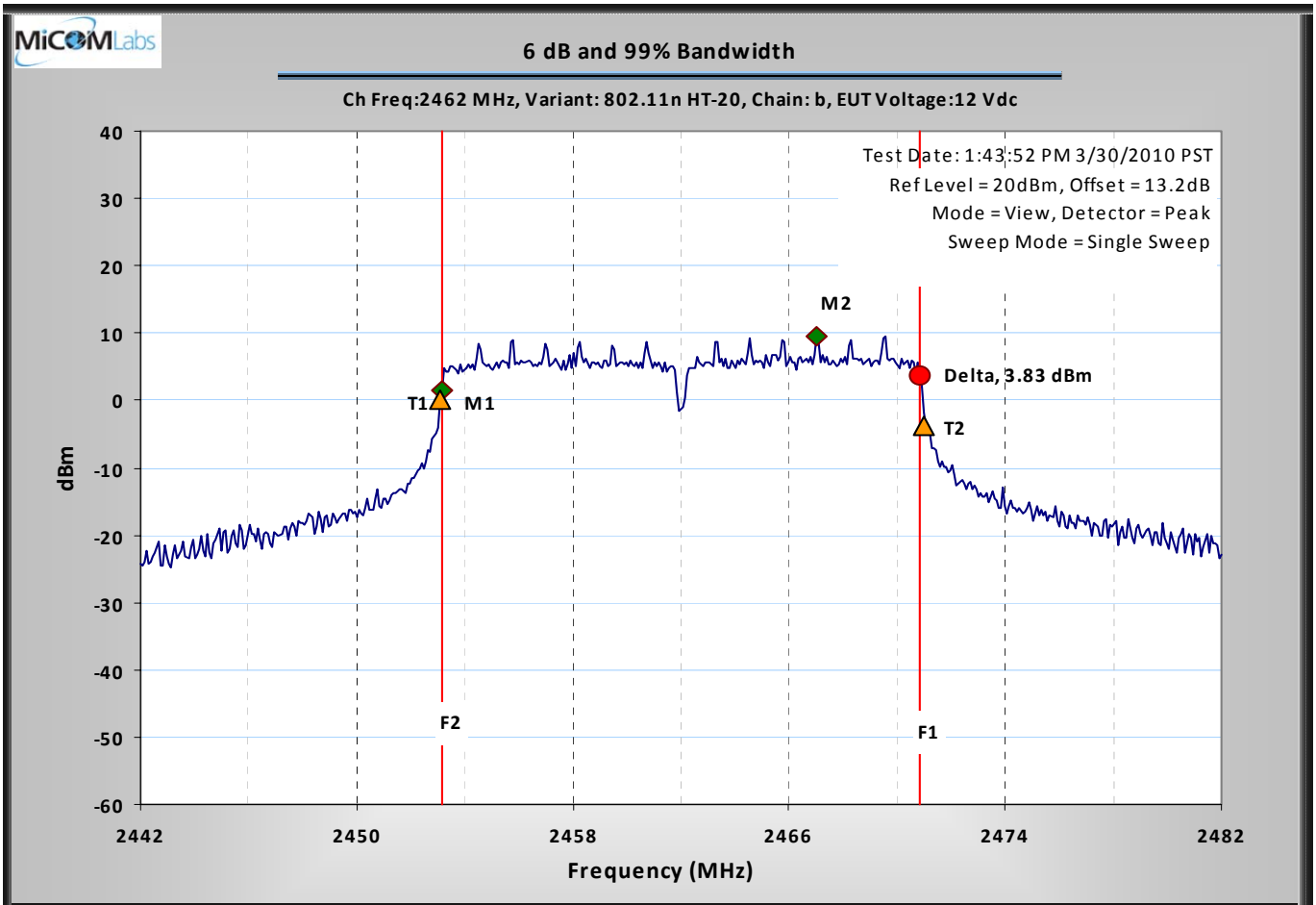
Test Results
Center frequency = 2437MHz
6dB BW (Delta -M1) = 17.635271MHz
99% OBW (T2-T1) = 18.436874MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	2453.142285MHz	2.140dBm
M2	2464.525050MHz	9.333dBm
Delta	2470.777555MHz	4.391dBm
T1	2452.981964MHz	-3.292dBm
T2	2470.937876MHz	-1.946dBm

Test Results
Center frequency = 2462MHz
6dB BW (Delta -M1) = 17.635271MHz
99% OBW (T2-T1) = 18.036072MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	2453.142285MHz	1.556dBm
M2	2467.010020MHz	9.644dBm
Delta	2470.857715MHz	3.834dBm
T1	2453.062124MHz	.165dBm
T2	2471.018036MHz	-3.809dBm

Test Results
Center frequency = 2462MHz
6dB BW (Delta -M1) = 17.715431MHz
99% OBW (T2-T1) = 18.036072MHz

7.1.4 6 dB and 99% Bandwidth Results: 802.11n HT-40

Test Conditions:	15.247 (a)(2)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11n HT-40		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain	N/A	dB	**Antenna Gain:**	6	dBi
Applied Voltage:	12.0	Vdc			
Notes 1:					
Notes 2:					

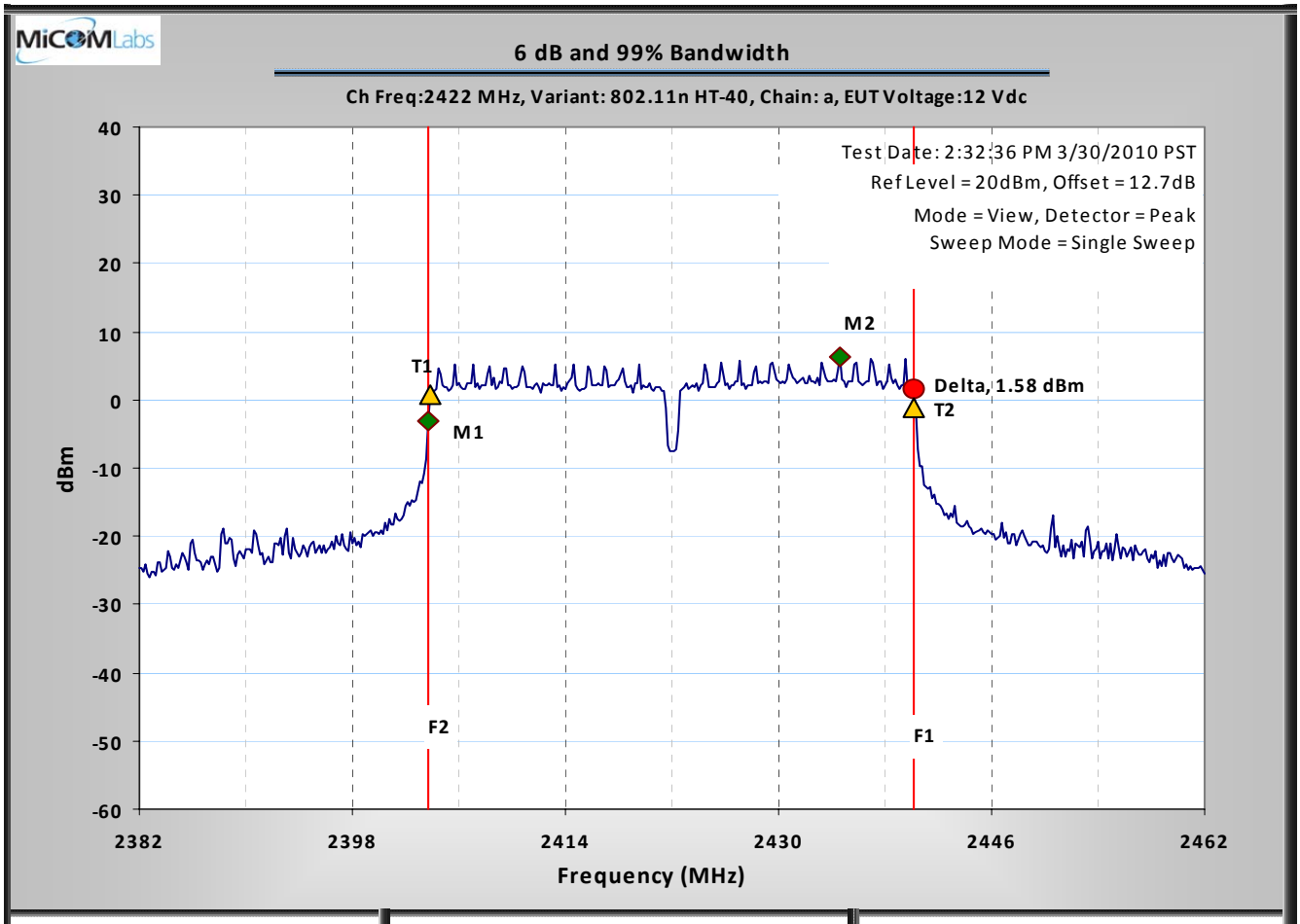
6 dB Bandwidth

Test Frequency	6 dB Bandwidth MHz				Minimum 6dB Bandwidth Limit		Margin
MHz	a	b	c	d	kHz	MHz	MHz
2422	36.553000	35.912000			500	0.5	-35.412000
2437	35.912000	36.553000					-35.412000
2452	36.553000	36.553000					-36.053000

99% Bandwidth

Test Frequency	99 % Bandwidth MHz						
MHz	a	b	c	d			
2422	36.553000	36.553000					
2437	36.553000	36.553000					
2452	36.553000	36.553000					

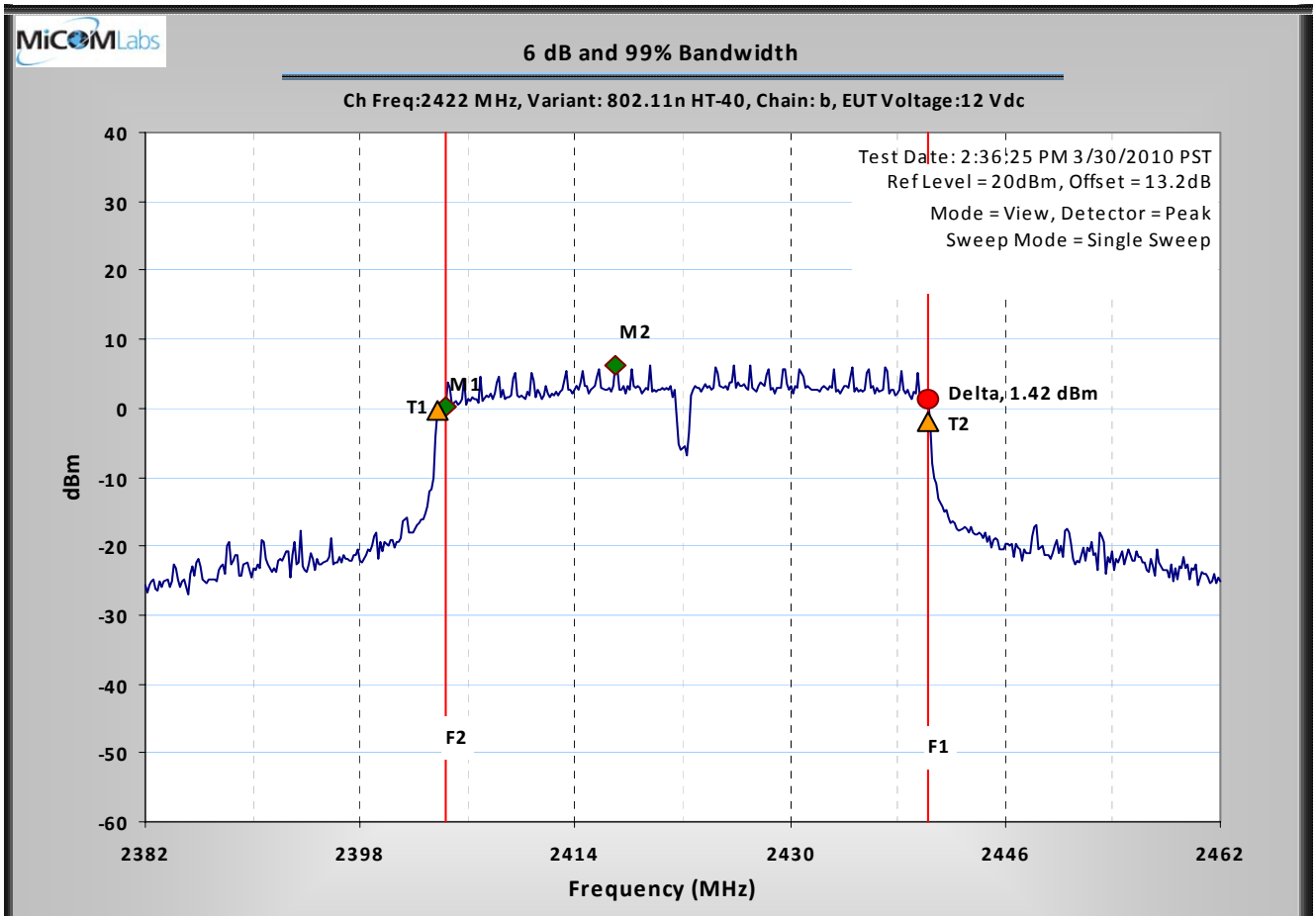
Measurement uncertainty:	±2.81 dB



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	80.000000MHz

Marker	Frequency	Amplitude
M1	2403.643287MHz	-3.175dBm
M2	2434.585170MHz	6.341dBm
Delta	2440.196393MHz	1.578dBm
T1	2403.803607MHz	.669dBm
T2	2440.196393MHz	-1.125dBm

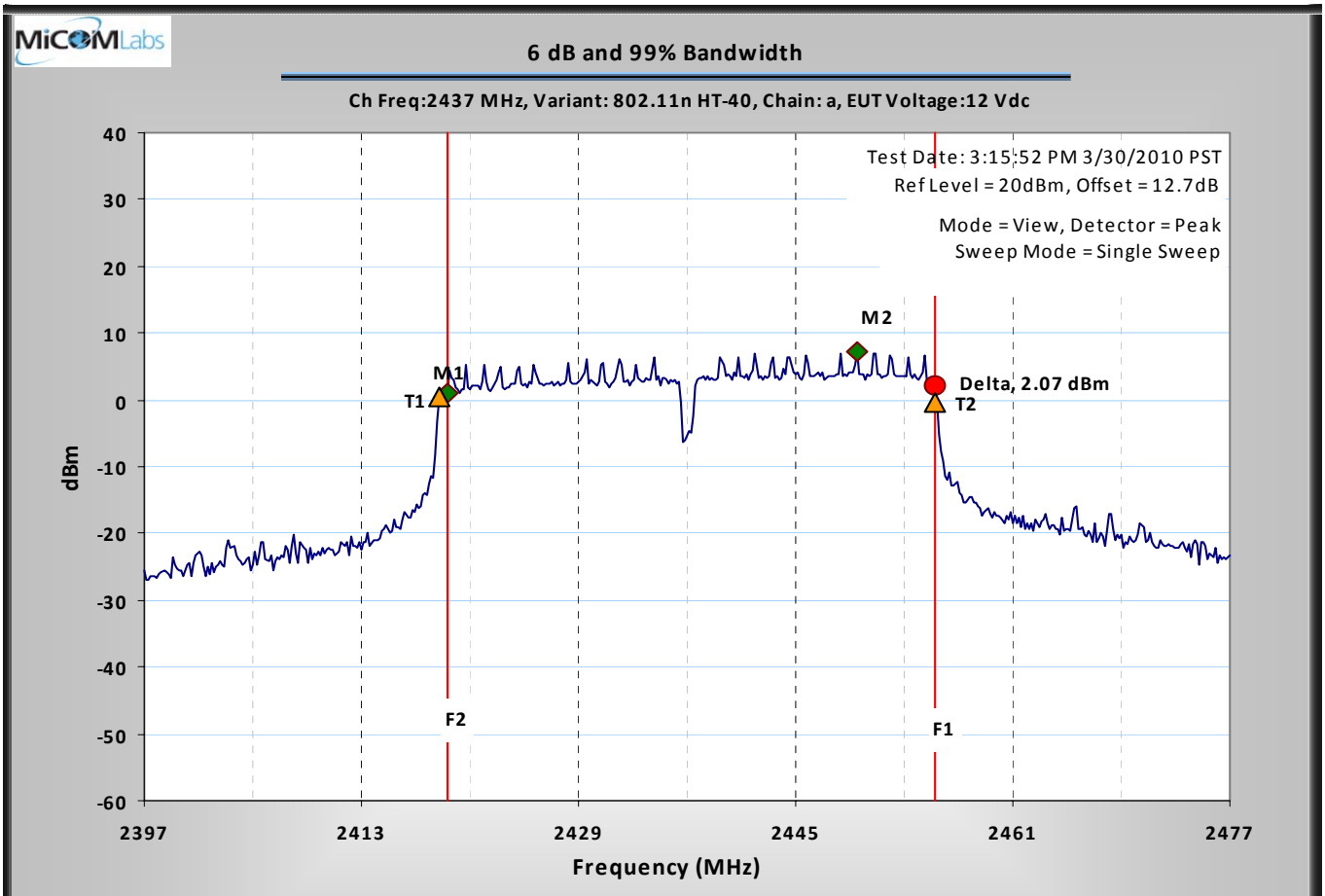
Test Results
Center frequency = 2422MHz
6dB BW (Delta -M1) = 36.553106MHz
99% OBW (T2-T1) = 36.553106MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	80.000000MHz

Marker	Frequency	Amplitude
M1	2404.284569MHz	.236dBm
M2	2416.949900MHz	6.325dBm
Delta	2440.196393MHz	1.416dBm
T1	2403.803607MHz	-.370dBm
T2	2440.196393MHz	-2.078dBm

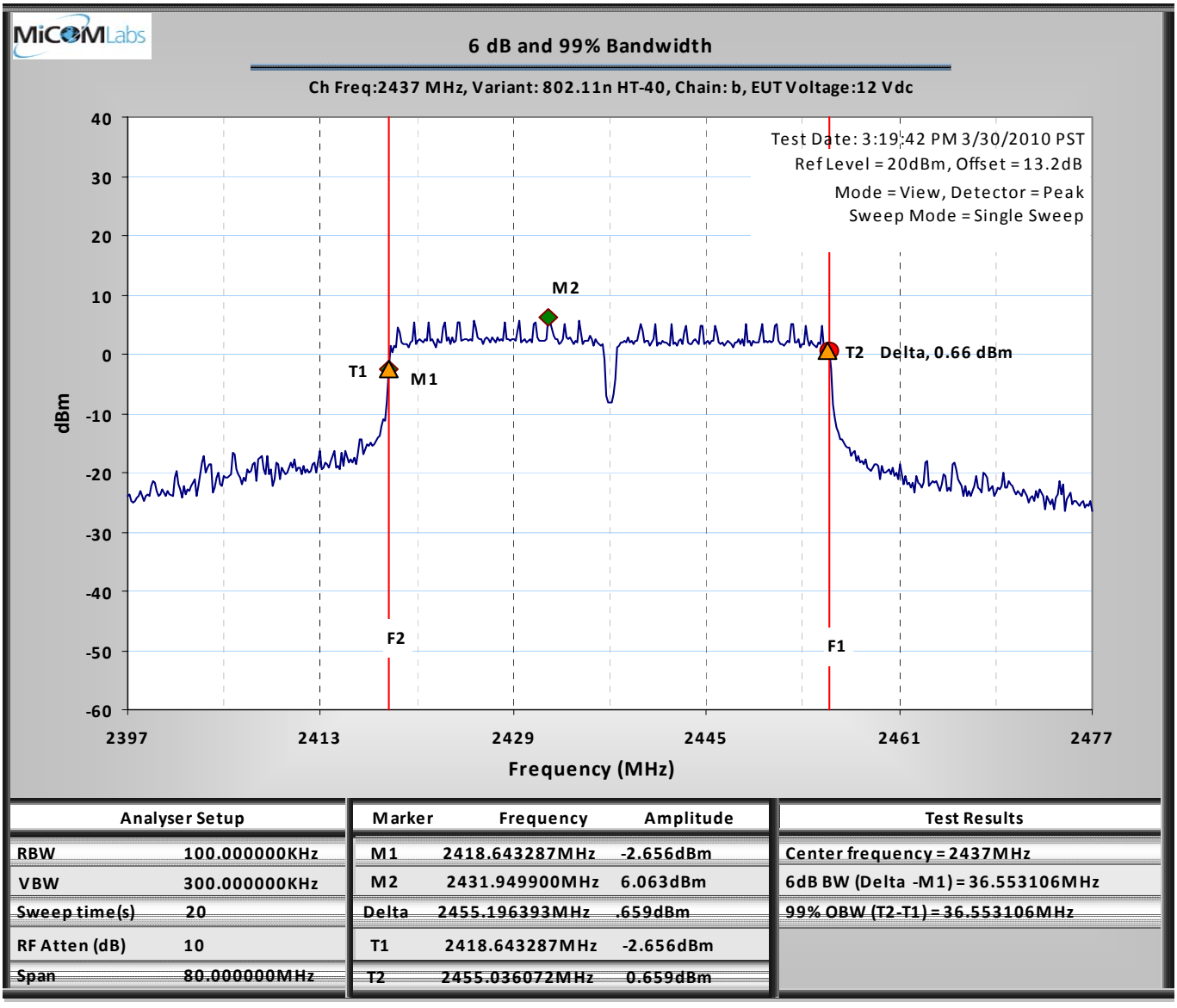
Test Results
Center frequency = 2422MHz
6dB BW (Delta -M1) = 35.911824MHz
99% OBW (T2-T1) = 36.553106MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	80.000000MHz

Marker	Frequency	Amplitude
M1	2419.284569MHz	1.131dBm
M2	2449.585170MHz	7.153dBm
Delta	2455.196393MHz	2.070dBm
T1	2418.803607MHz	.321dBm
T2	2455.196393MHz	-0.506dBm

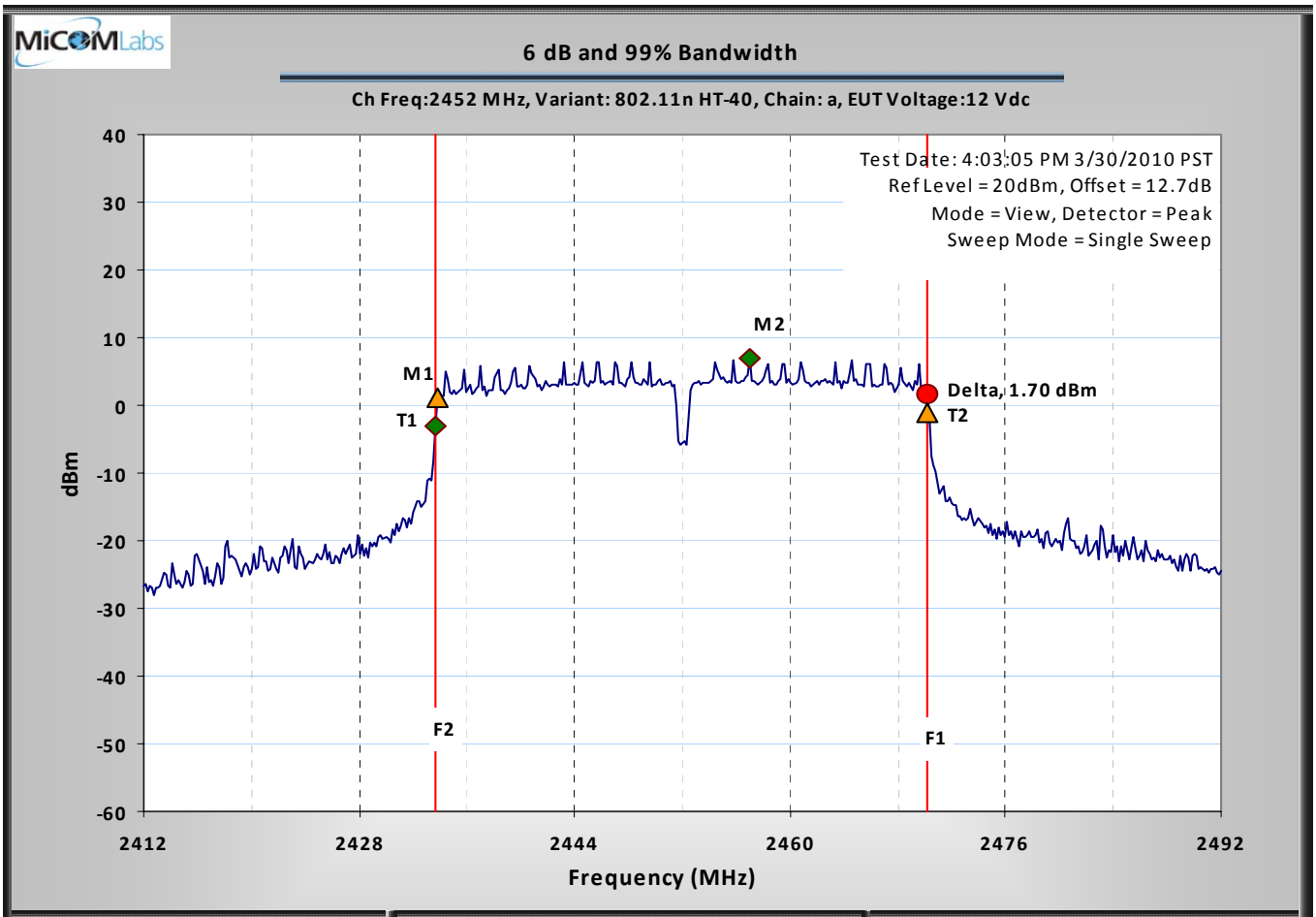
Test Results
Center frequency = 2437MHz
6dB BW (Delta -M1) = 35.911824MHz
99% OBW (T2-T1) = 36.553106MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	80.000000MHz

Marker	Frequency	Amplitude
M1	2418.643287MHz	-2.656dBm
M2	2431.949900MHz	6.063dBm
Delta	2455.196393MHz	.659dBm
T1	2418.643287MHz	-2.656dBm
T2	2455.036072MHz	0.659dBm

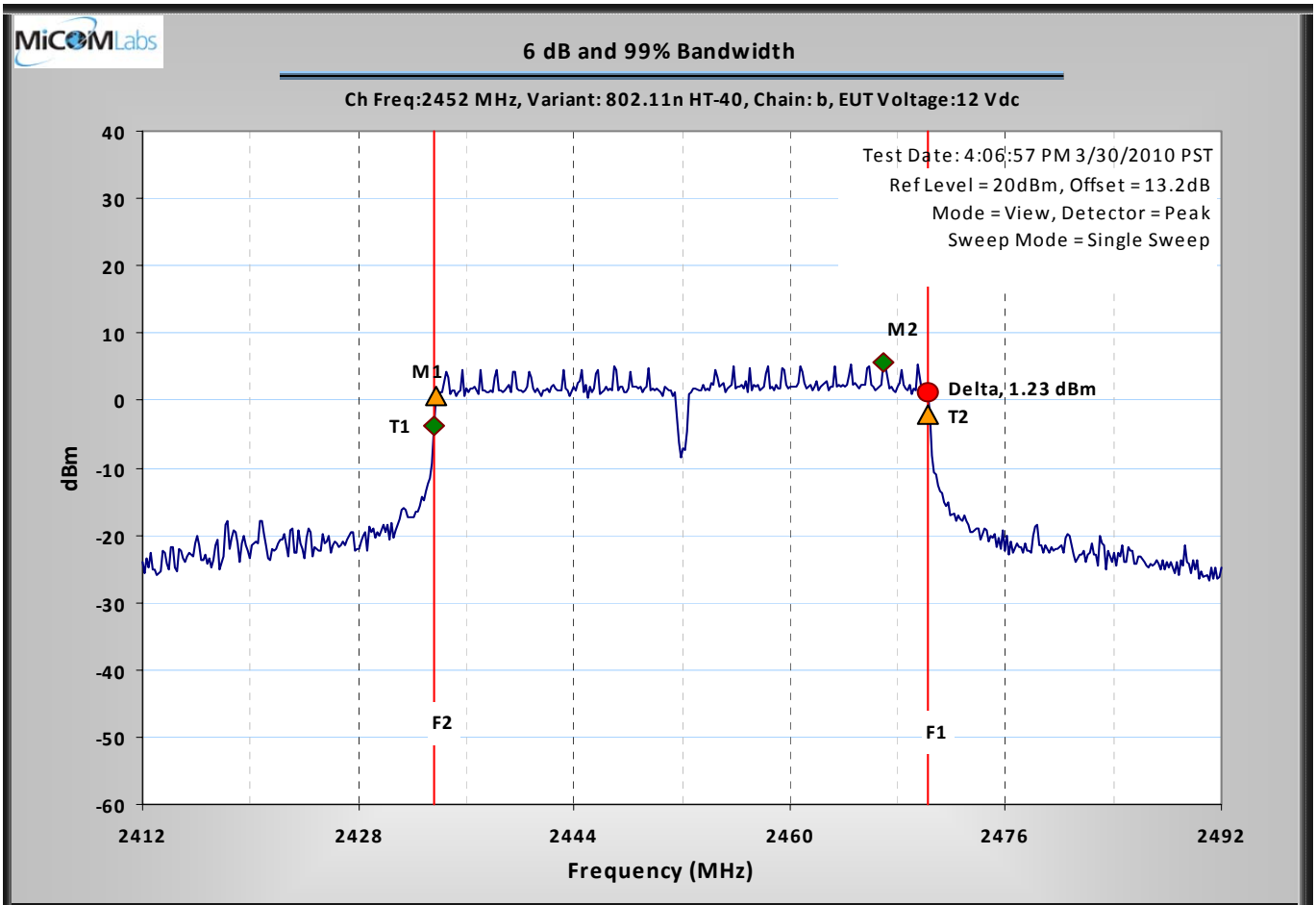
Test Results
Center frequency = 2437MHz
6dB BW (Delta -M1) = 36.553106MHz
99% OBW (T2-T1) = 36.553106MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	80.000000MHz

Marker	Frequency	Amplitude
M1	2433.643287MHz	-3.158dBm
M2	2457.050100MHz	6.825dBm
Delta	2470.196393MHz	1.698dBm
T1	2433.803607MHz	1.013dBm
T2	2470.196393MHz	-1.023dBm

Test Results
Center frequency = 2452MHz
6dB BW (Delta -M1) = 36.553106MHz
99% OBW (T2-T1) = 36.553106MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	80.000000MHz

Marker	Frequency	Amplitude
M1	2433.643287MHz	-3.848dBm
M2	2466.989980MHz	5.750dBm
Delta	2470.196393MHz	1.235dBm
T1	2433.803607MHz	.566dBm
T2	2470.196393MHz	-2.04dBm

Test Results
Center frequency = 2452MHz
6dB BW (Delta -M1) = 36.553106MHz
99% OBW (T2-T1) = 36.553106MHz

7.1.5 6 dB and 99% Bandwidth Results: 802.11a

Test Conditions:	15.247 (a)(2)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11a		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain	N/A	dB	**Antenna Gain:**	6	dBi
Applied Voltage:	12.0	Vdc			
Notes 1:					
Notes 2:					

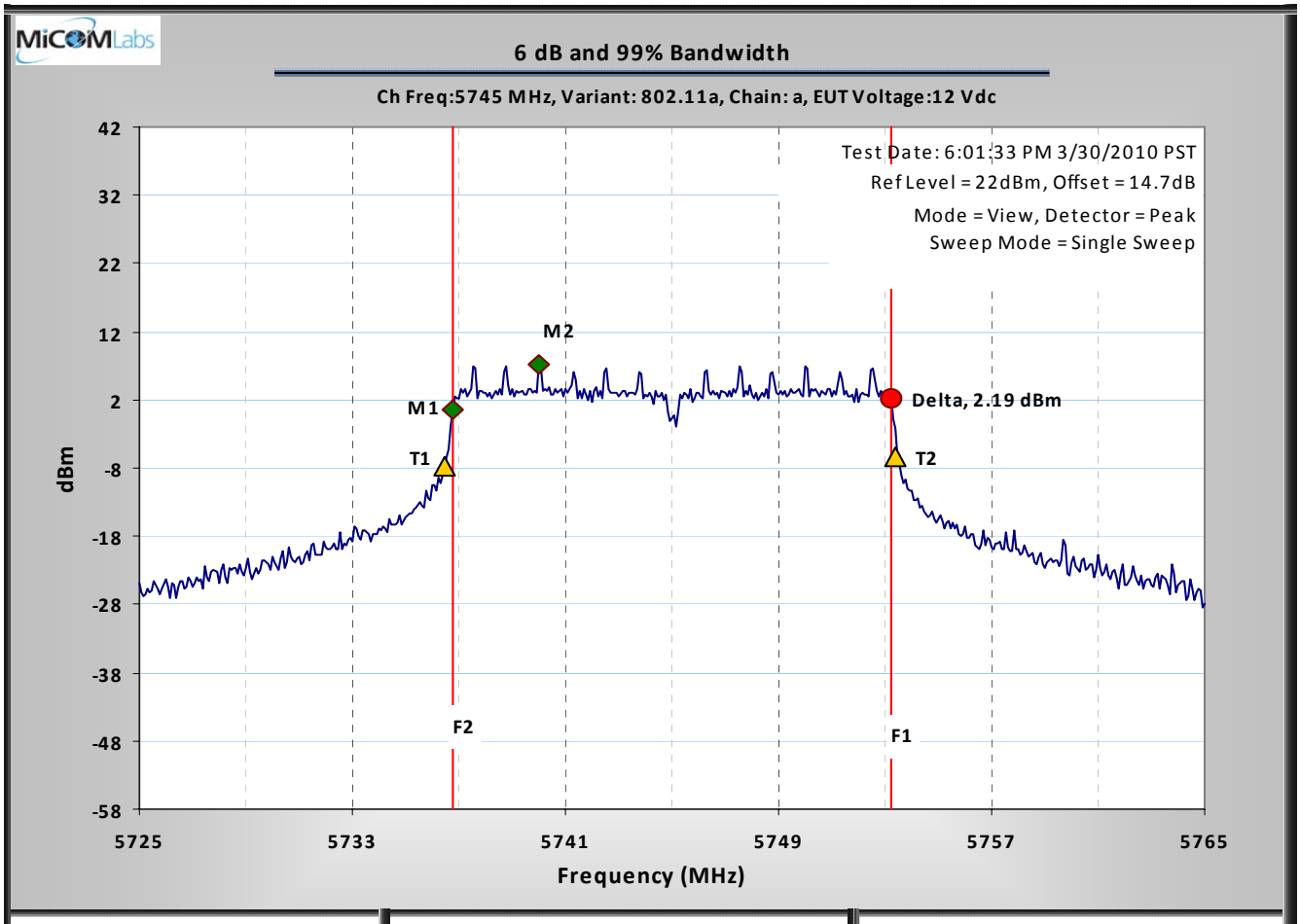
6 dB Bandwidth

Test Frequency	6 dB Bandwidth MHz				Minimum 6dB Bandwidth Limit		Margin
MHz	**a**	**b**	**c**	**d**	**kHz**	**MHz**	**MHz**
5745	16.433000	16.433000			500	0.5	-15.933000
5785	16.433000	16.433000					-15.933000
5825	16.433000	16.433000					-15.933000

99% Bandwidth

Test Frequency	99 % Bandwidth MHz						
MHz	**a**	**b**	**c**	**d**			
5745	16.994000	17.796000					
5785	16.754000	16.754000					
5825	16.673000	16.673000					

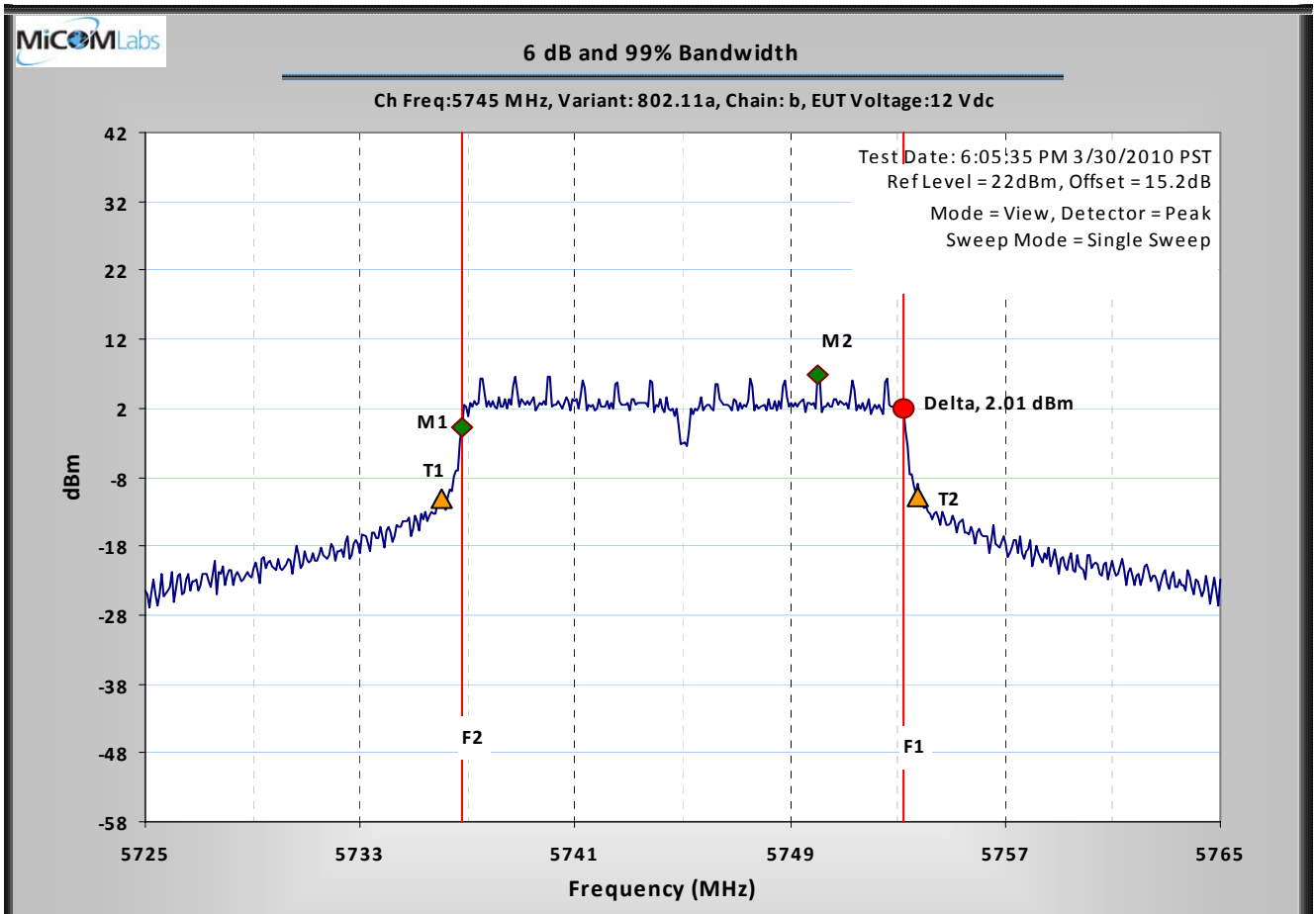
Measurement uncertainty:	±2.81 dB



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	5736.783567MHz	.471dBm
M2	5739.989980MHz	7.082dBm
Delta	5753.216433MHz	2.187dBm
T1	5736.462926MHz	-7.794dBm
T2	5753.376754MHz	-6.426dBm

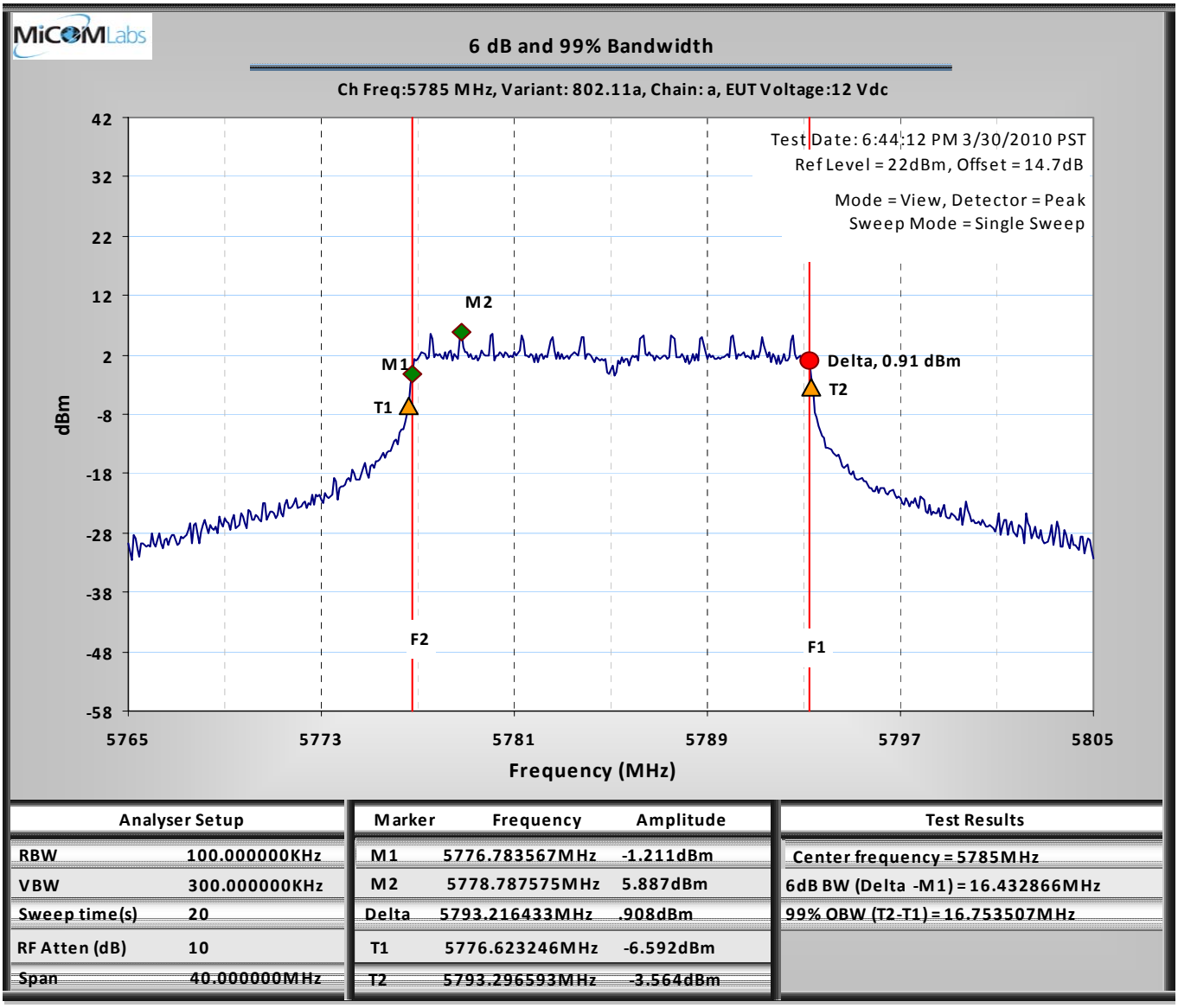
Test Results
Center frequency = 5745MHz
6dB BW (Delta -M1) = 16.432866MHz
99% OBW (T2-T1) = 16.993988MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	5736.783567MHz	-.662dBm
M2	5750.010020MHz	6.745dBm
Delta	5753.216433MHz	2.012dBm
T1	5736.062124MHz	-11.030dBm
T2	5753.777555MHz	-10.869dBm

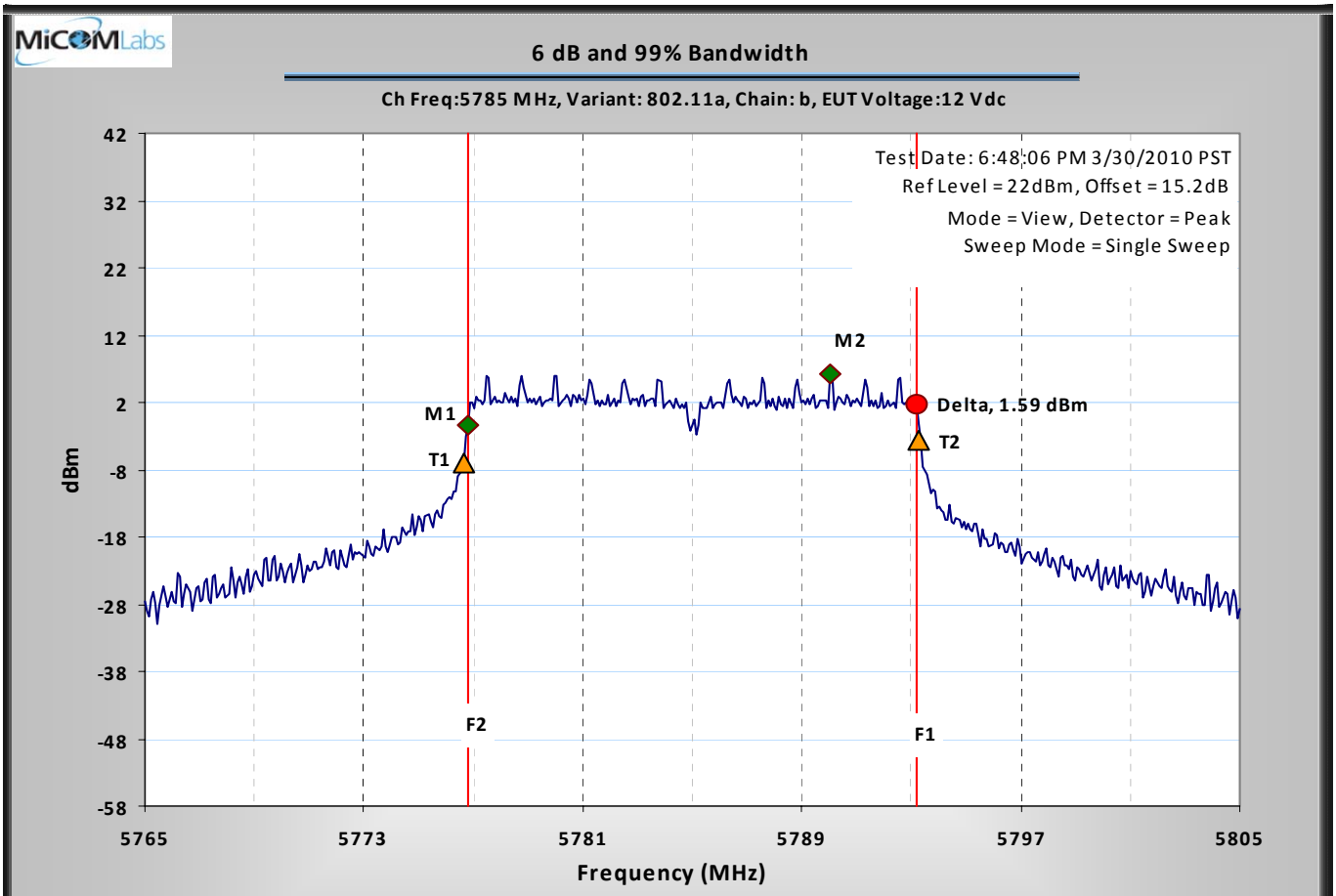
Test Results
Center frequency = 5745MHz
6dB BW (Delta -M1) = 16.432866MHz
99% OBW (T2-T1) = 17.795591MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	5776.783567MHz	-1.211dBm
M2	5778.787575MHz	5.887dBm
Delta	5793.216433MHz	.908dBm
T1	5776.623246MHz	-6.592dBm
T2	5793.296593MHz	-3.564dBm

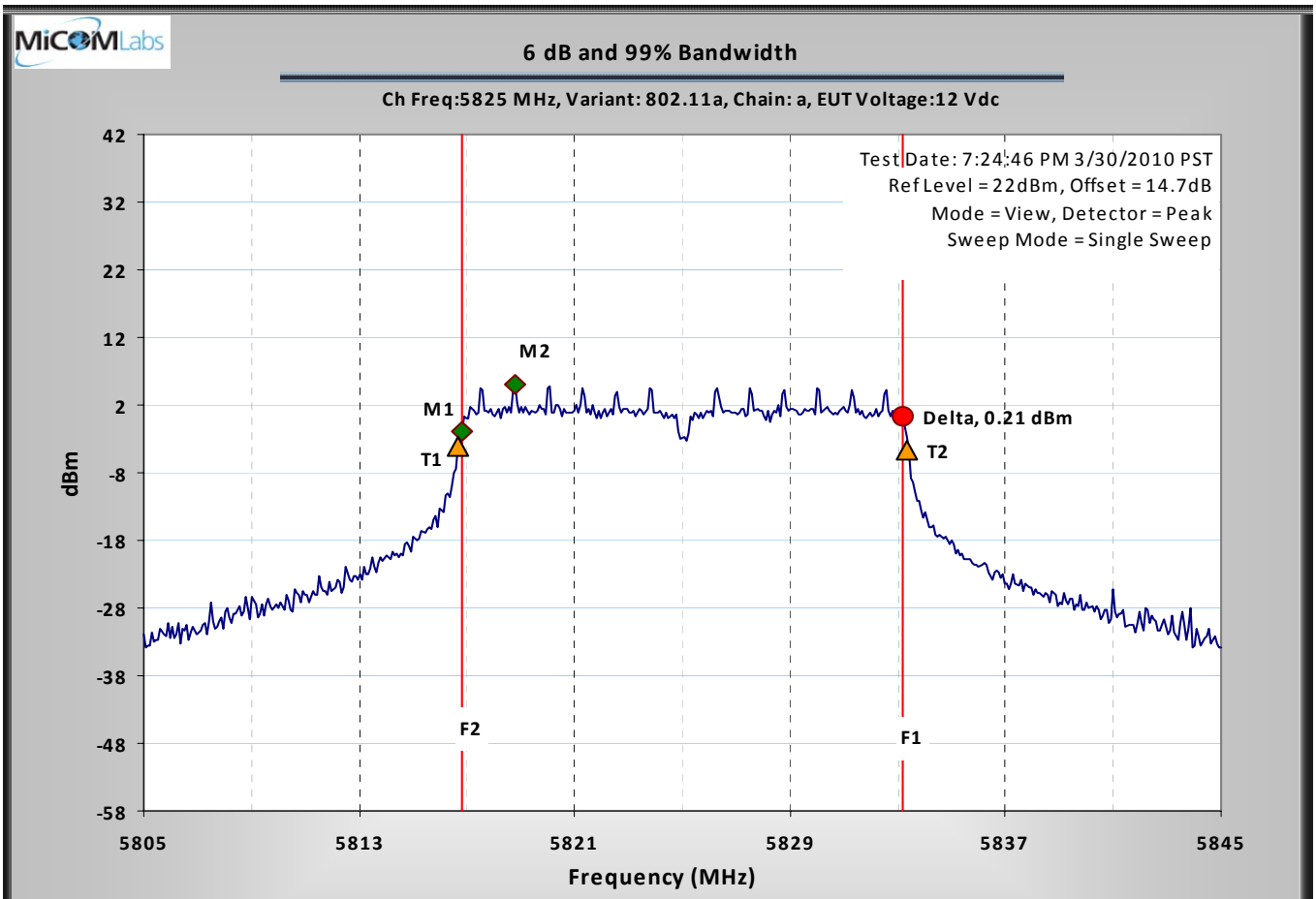
Test Results
Center frequency = 5785MHz
6dB BW (Delta -M1) = 16.432866MHz
99% OBW (T2-T1) = 16.753507MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	5776.783567MHz	-1.250dBm
M2	5790.010020MHz	6.228dBm
Delta	5793.216433MHz	1.587dBm
T1	5776.623246MHz	-6.944dBm
T2	5793.296593MHz	-3.599dBm

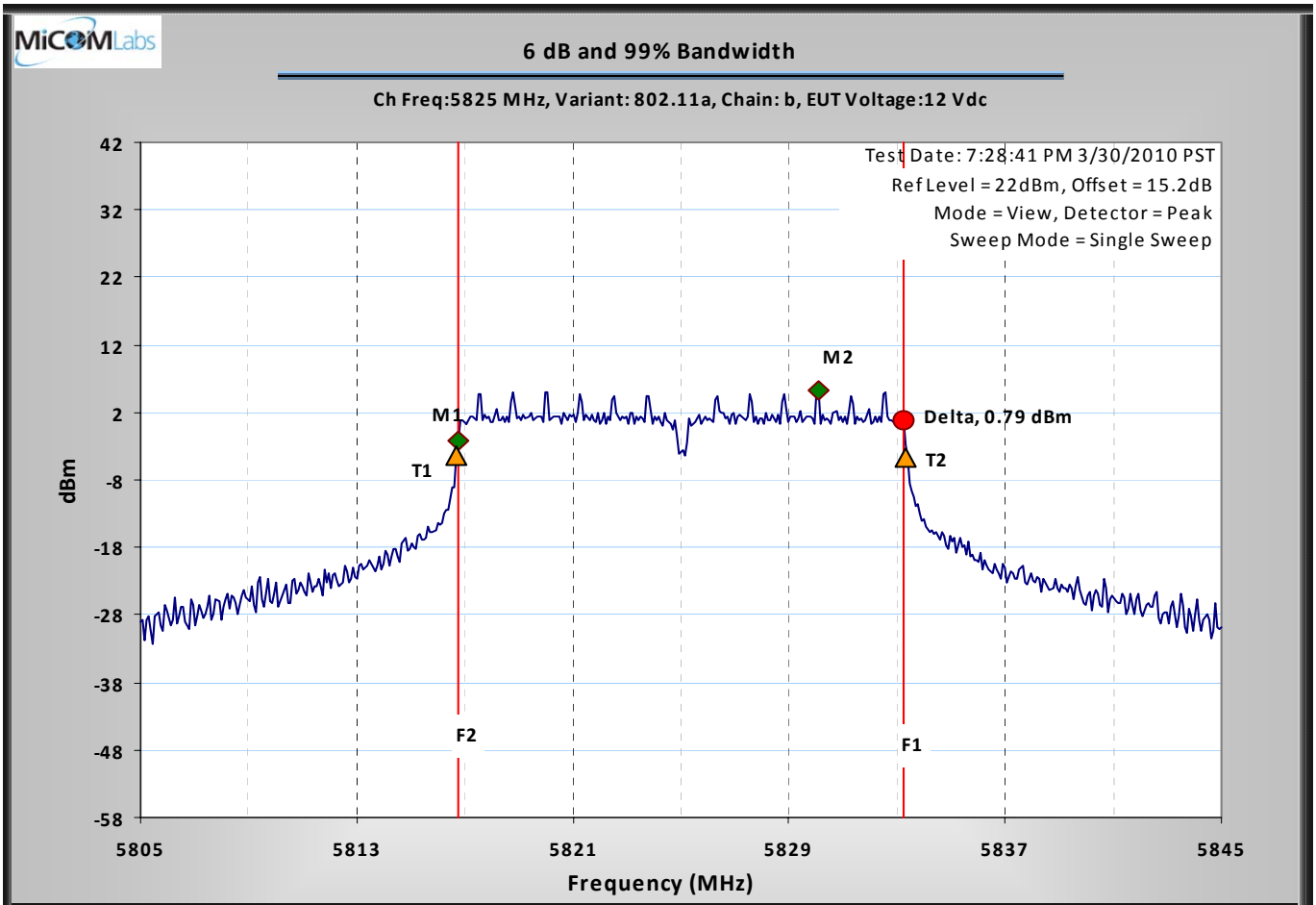
Test Results
Center frequency = 5785MHz
6dB BW (Delta -M1) = 16.432866MHz
99% OBW (T2-T1) = 16.753507MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	5816.783567MHz	-1.848dBm
M2	5818.787575MHz	5.108dBm
Delta	5833.216433MHz	.212dBm
T1	5816.703407MHz	-4.138dBm
T2	5833.296593MHz	-4.681dBm

Test Results
Center frequency = 5825MHz
6dB BW (Delta -M1) = 16.432866MHz
99% OBW (T2-T1) = 16.673347MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	5816.783567MHz	-2.179dBm
M2	5830.090180MHz	5.268dBm
Delta	5833.216433MHz	.788dBm
T1	5816.703407MHz	-4.471dBm
T2	5833.296593MHz	-4.614dBm

Test Results
Center frequency = 5825MHz
6dB BW (Delta -M1) = 16.432866MHz
99% OBW (T2-T1) = 16.673347MHz

7.1.6 6 dB and 99% Bandwidth Results: 802.11n HT20

Test Conditions:	15.247 (a)(2)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11n HT-20		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain (Y):	N/A	dB	**Antenna Gain:**	6	dBi
Applied Voltage:	12.0	Vdc			
Notes 1:					
Notes 2:					

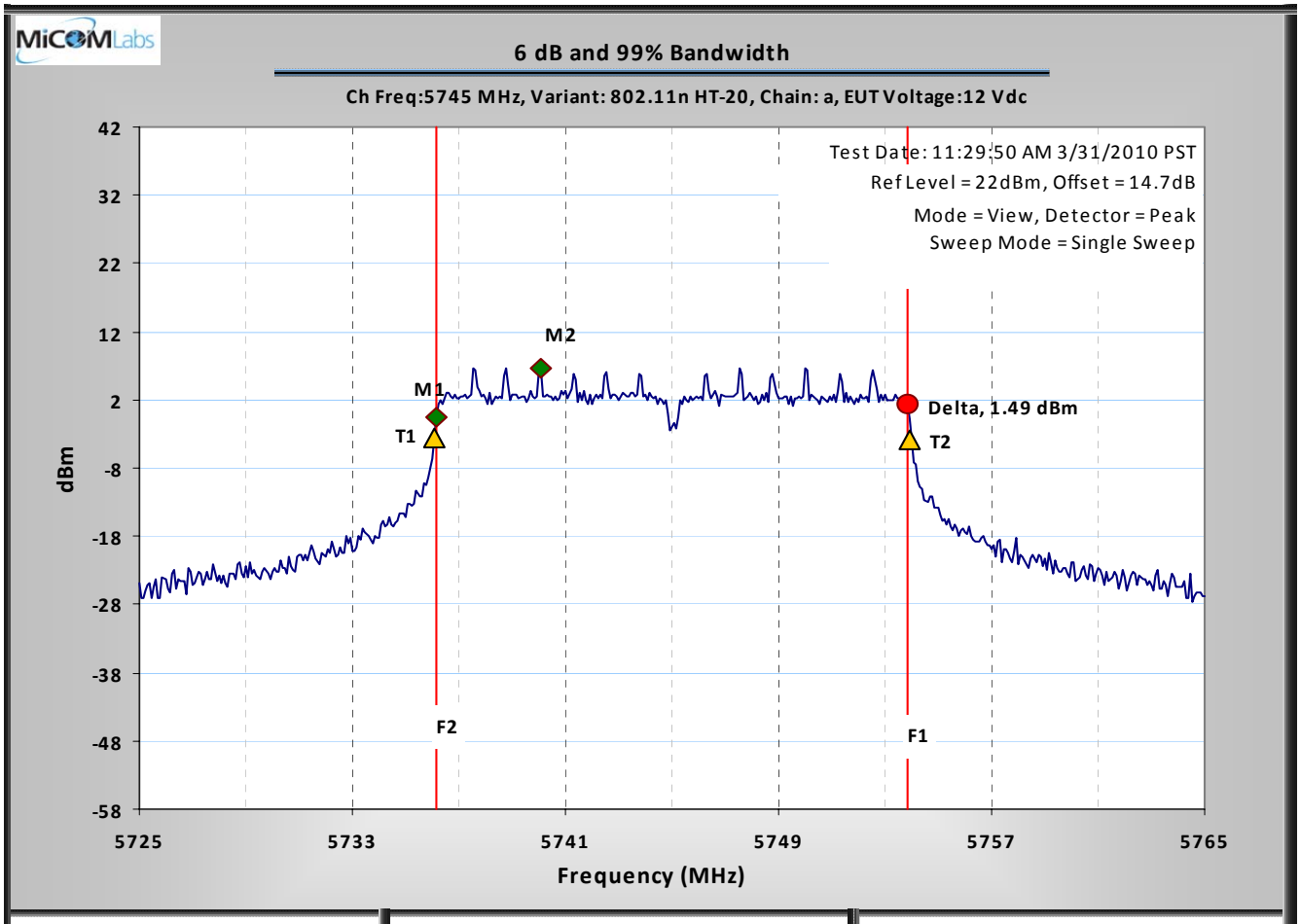
6 dB Bandwidth

Test Frequency	6 dB Bandwidth MHz				Minimum 6dB Bandwidth Limit		Margin
MHz	**a**	**b**	**c**	**d**	**kHz**	**MHz**	**MHz**
5745	17.715000	17.715000			500	0.5	-17.215000
5785	17.635000	17.715000					-17.135000
5825	17.635000	17.715000					-17.135000

99% Bandwidth

Test Frequency	99 % Bandwidth MHz						
MHz	**a**	**b**	**c**	**d**			
5745	17.956000	18.357000					
5785	17.876000	17.956000					
5825	17.796000	17.956000					

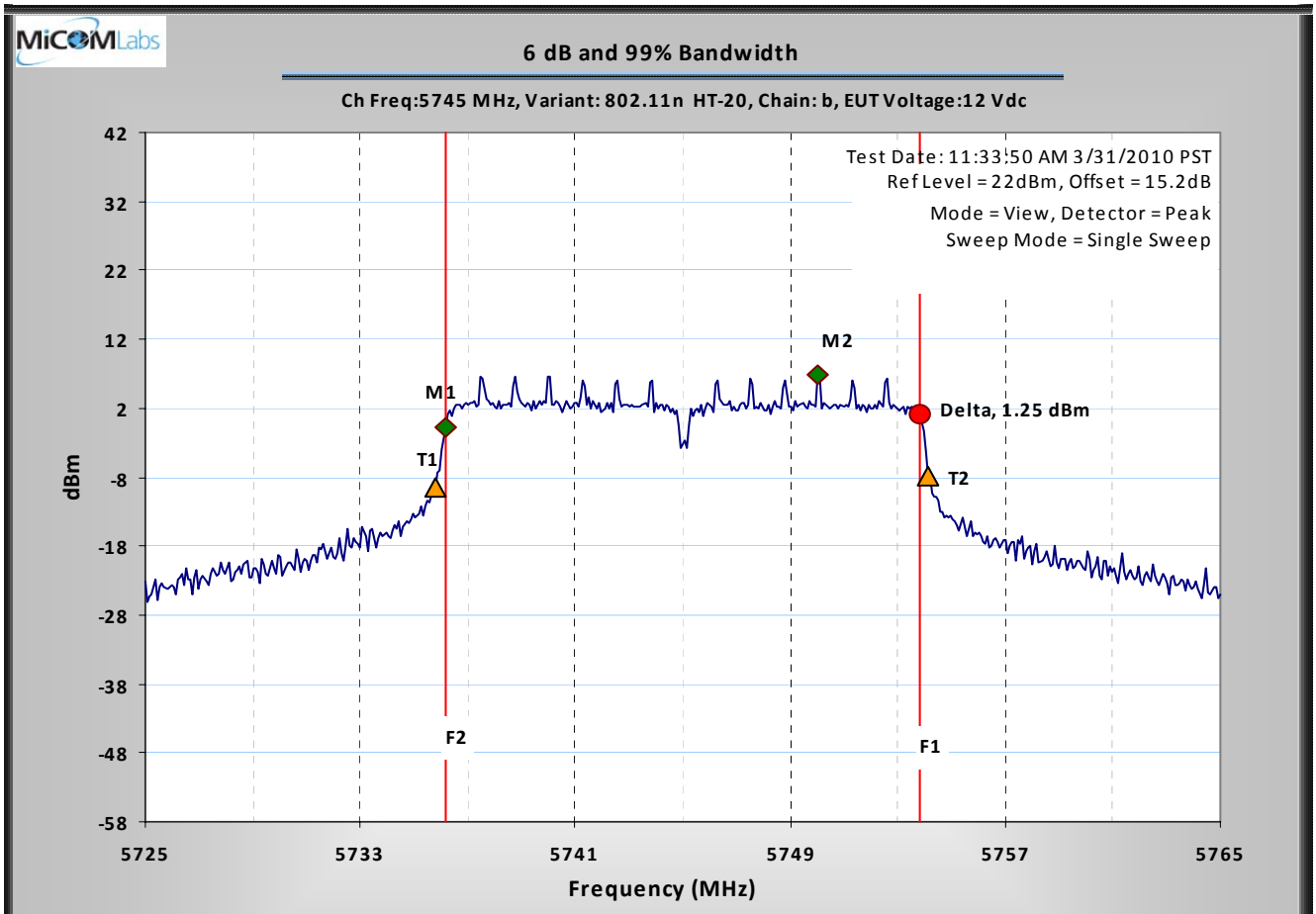
Measurement uncertainty:	±2.81 dB



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	5736.142285MHz	-.636dBm
M2	5740.070140MHz	6.714dBm
Delta	5753.857715MHz	1.486dBm
T1	5736.062124MHz	-3.599dBm
T2	5753.937876MHz	-3.735dBm

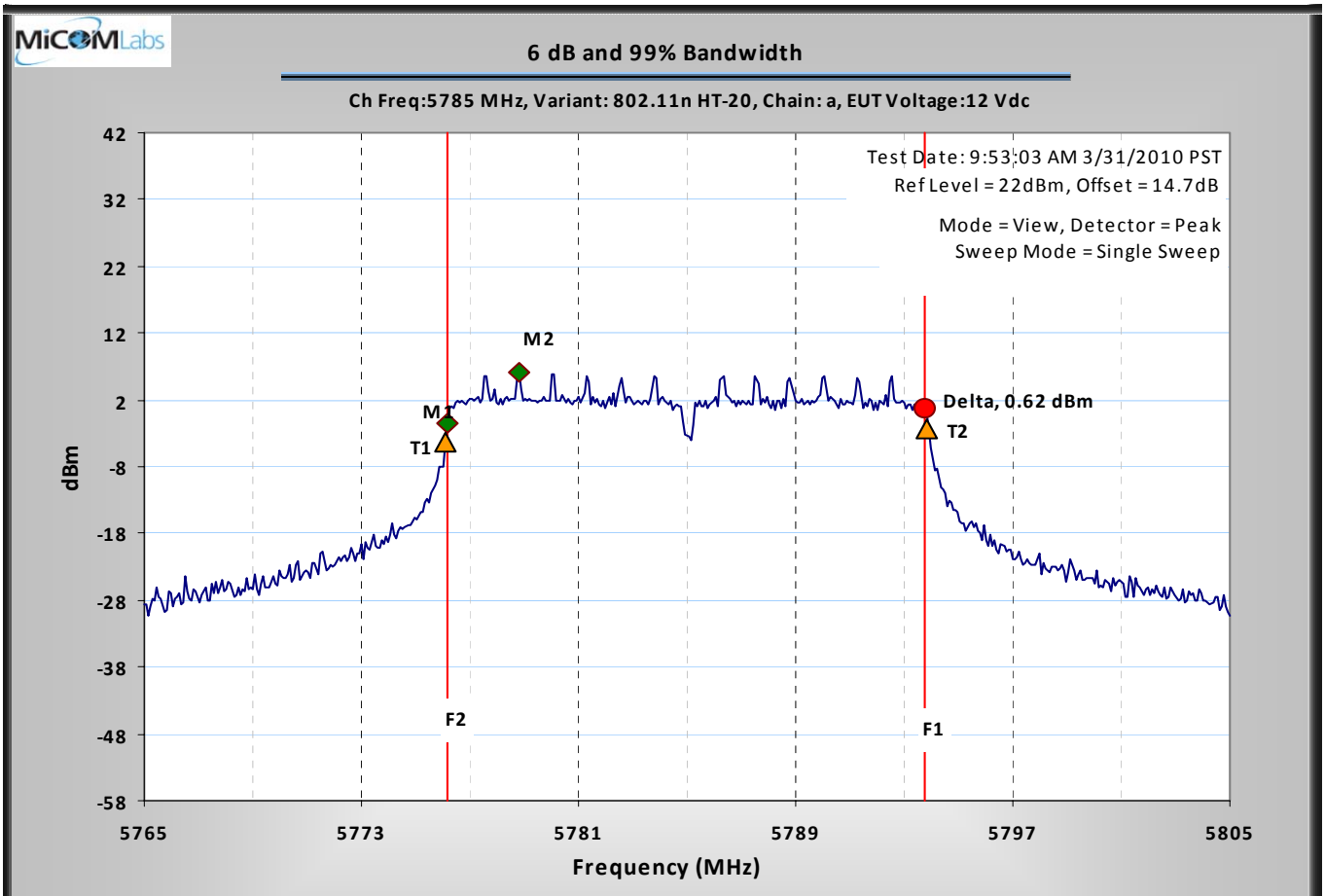
Test Results
Center frequency = 5745MHz
6dB BW (Delta -M1) = 17.715431MHz
99% OBW (T2-T1) = 17.955912MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	5736.142285MHz	-.772dBm
M2	5750.010020MHz	6.749dBm
Delta	5753.857715MHz	1.254dBm
T1	5735.821643MHz	-9.535dBm
T2	5754.098196MHz	-7.811dBm

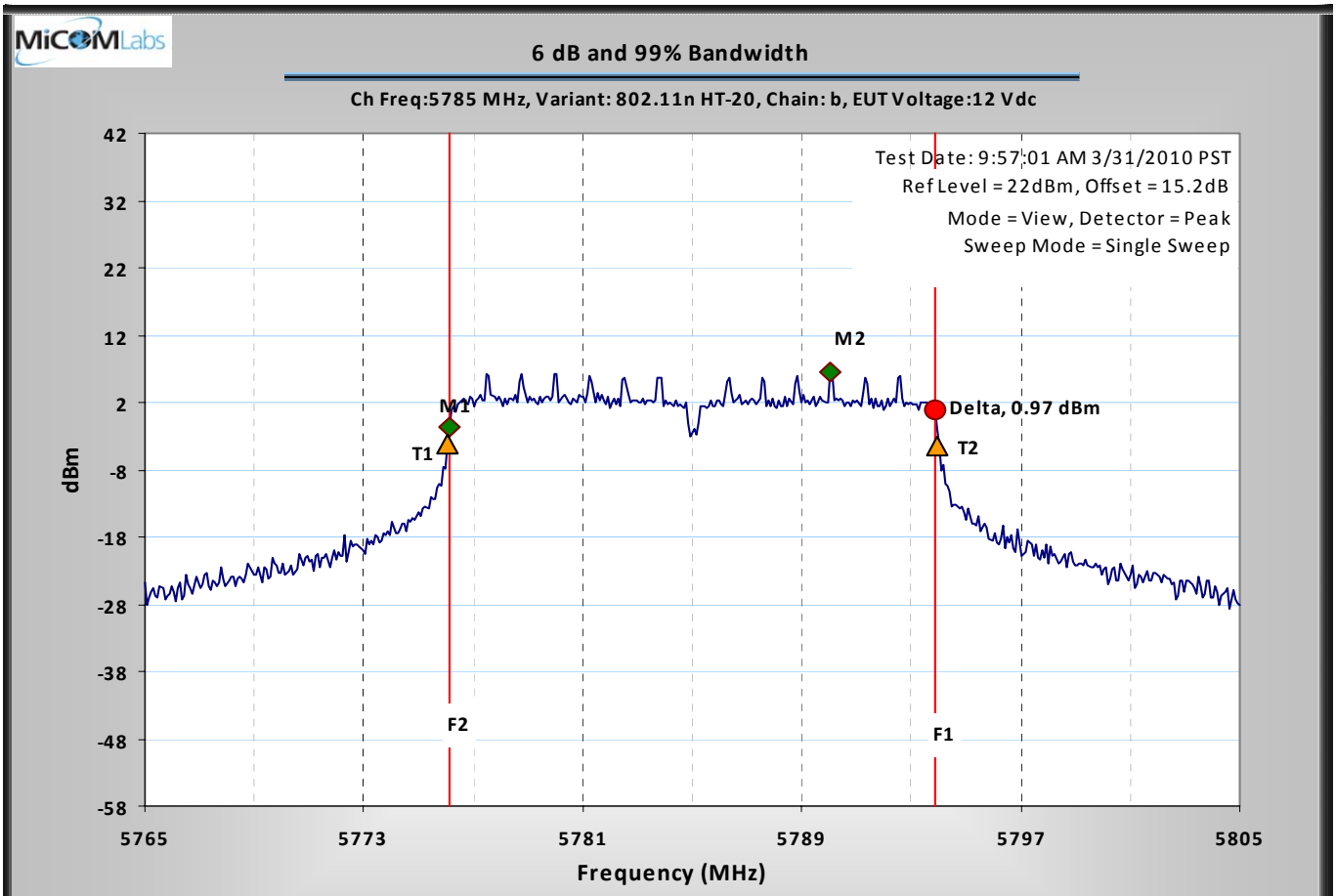
Test Results
Center frequency = 5745MHz
6dB BW (Delta -M1) = 17.715431MHz
99% OBW (T2-T1) = 18.356713MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	5776.142285MHz	-1.593dBm
M2	5778.787575MHz	6.208dBm
Delta	5793.777555MHz	.619dBm
T1	5776.062124MHz	-4.353dBm
T2	5793.857715MHz	-2.252dBm

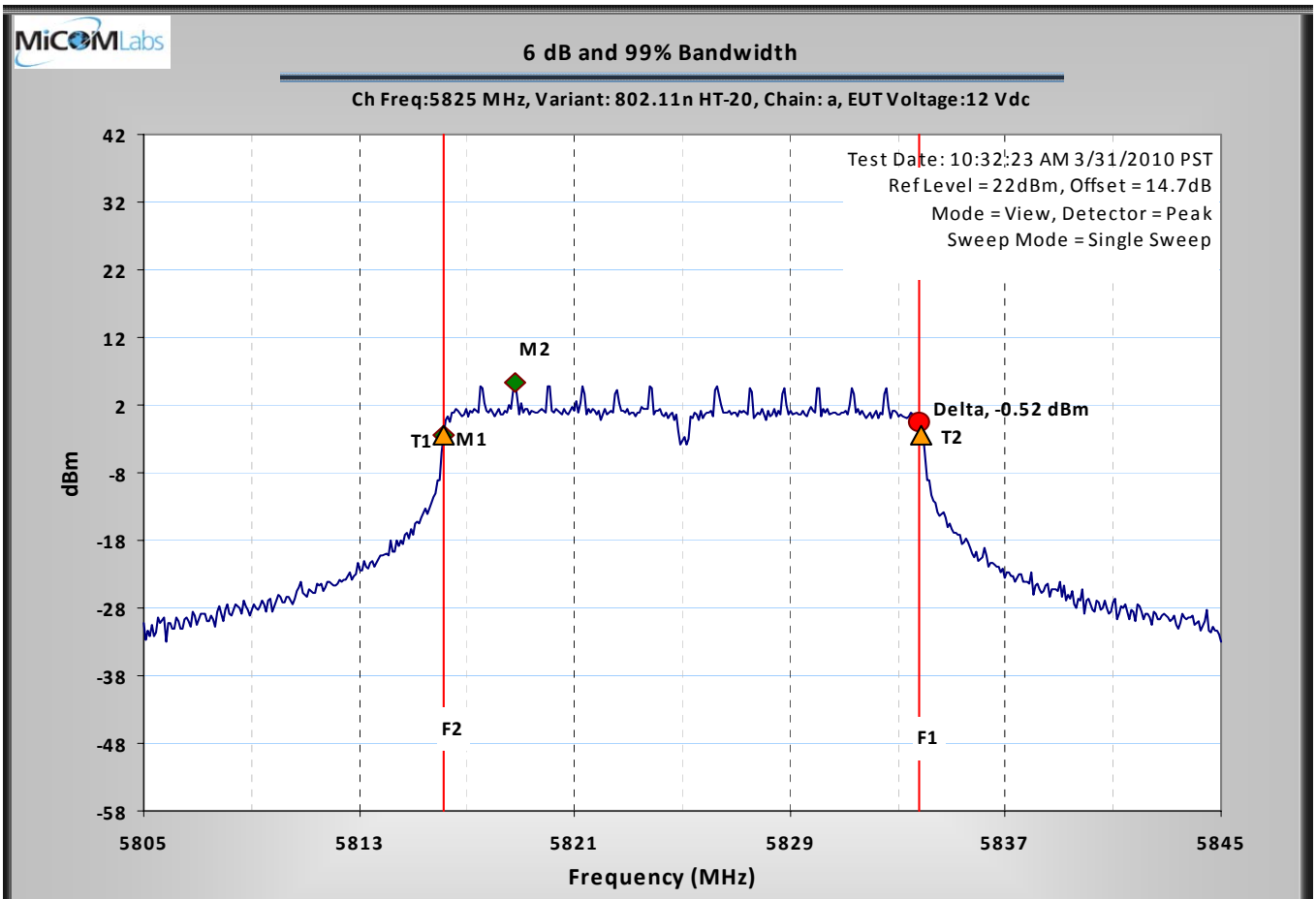
Test Results
Center frequency = 5785MHz
6dB BW (Delta -M1) = 17.635271MHz
99% OBW (T2-T1) = 17.875752MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	5776.142285MHz	-1.539dBm
M2	5790.010020MHz	6.511dBm
Delta	5793.857715MHz	.967dBm
T1	5776.062124MHz	-4.331dBm
T2	5793.937876MHz	-4.603dBm

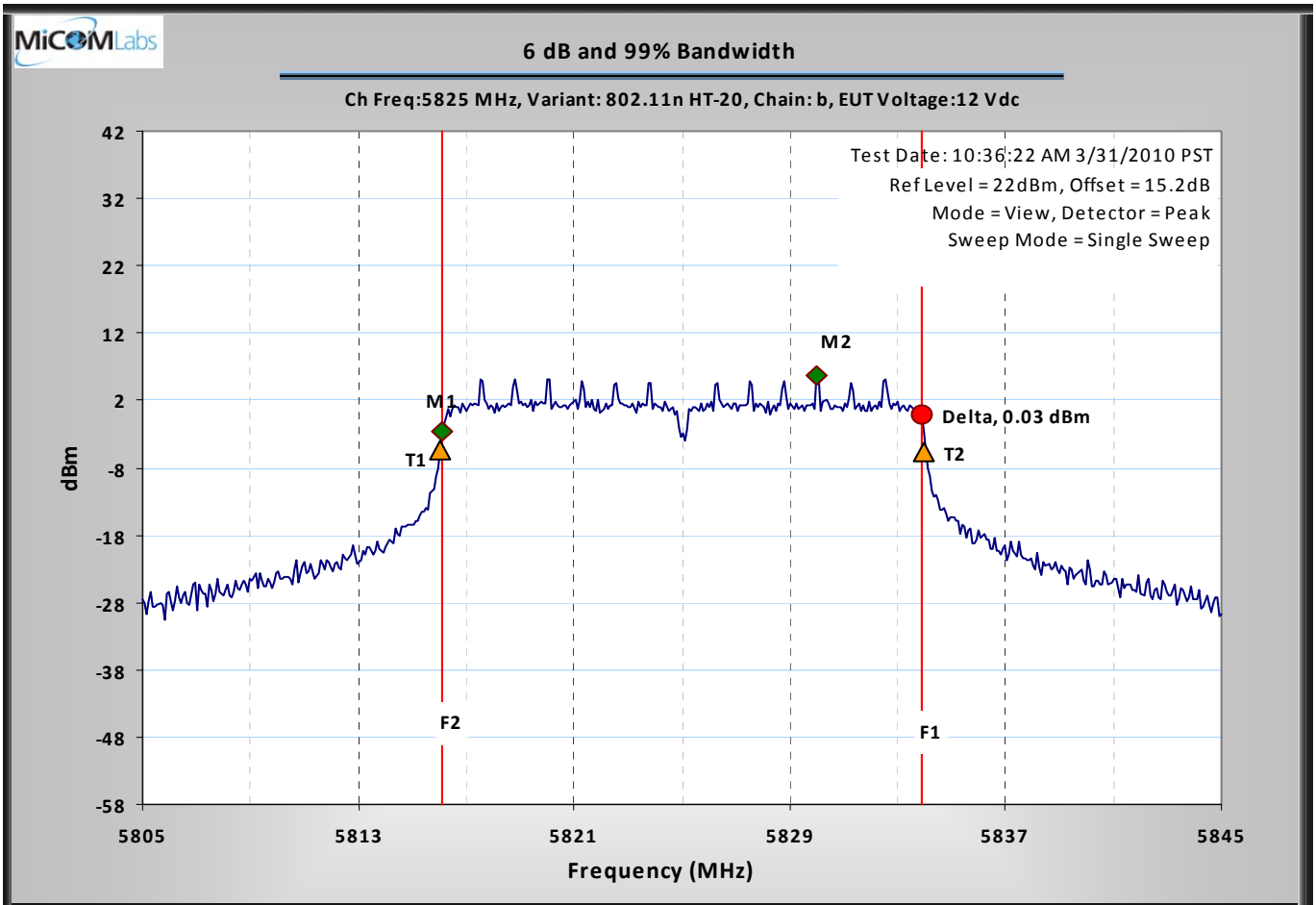
Test Results
Center frequency = 5785MHz
6dB BW (Delta -M1) = 17.715431MHz
99% OBW (T2-T1) = 17.955912MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	5816.142285MHz	-2.435dBm
M2	5818.787575MHz	5.331dBm
Delta	5833.777555MHz	-.516dBm
T1	5816.142285MHz	-2.435dBm
T2	5833.857715MHz	-2.547dBm

Test Results
Center frequency = 5825MHz
6dB BW (Delta -M1) = 17.635271MHz
99% OBW (T2-T1) = 17.795591MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	40.000000MHz

Marker	Frequency	Amplitude
M1	5816.142285MHz	-2.531dBm
M2	5830.010020MHz	5.616dBm
Delta	5833.857715MHz	.031dBm
T1	5816.062124MHz	-5.419dBm
T2	5833.937876MHz	-5.726dBm

Test Results
Center frequency = 5825MHz
6dB BW (Delta -M1) = 17.715431MHz
99% OBW (T2-T1) = 17.955912MHz

7.1.7 6 dB and 99% Bandwidth Results: 802.11n HT-40

Test Conditions:	15.247 (a)(2)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11n HT-40		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain	N/A	dB	**Antenna Gain:**	6	dBi
Applied Voltage:	12.0	Vdc			
Notes 1:					
Notes 2:					

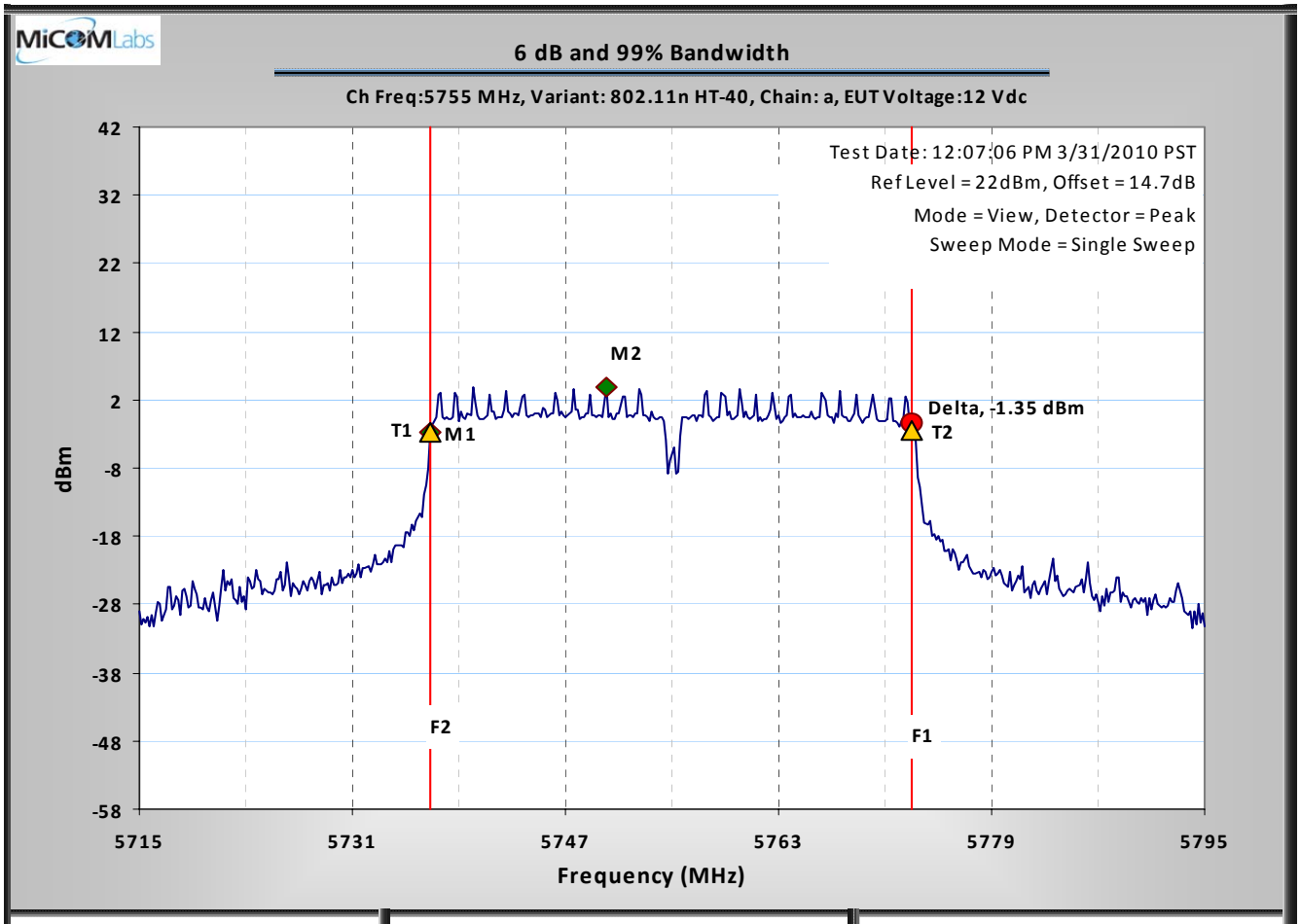
6 dB Bandwidth

Test Frequency	6 dB Bandwidth MHz				Minimum 6dB Bandwidth Limit		Margin
MHz	**a**	**b**	**c**	**d**	**kHz**	**MHz**	**MHz**
5755	36.232000	36.393000			500	0.5	-35.732000
5785	36.393000	36.232000					-35.732000
5815	36.393000	36.393000					-35.893000

99% Bandwidth

Test Frequency	99 % Bandwidth MHz						
MHz	**a**	**b**	**c**	**d**			
5755	36.393000	36.553000					
5785	36.393000	36.393000					
5815	36.393000	36.393000					

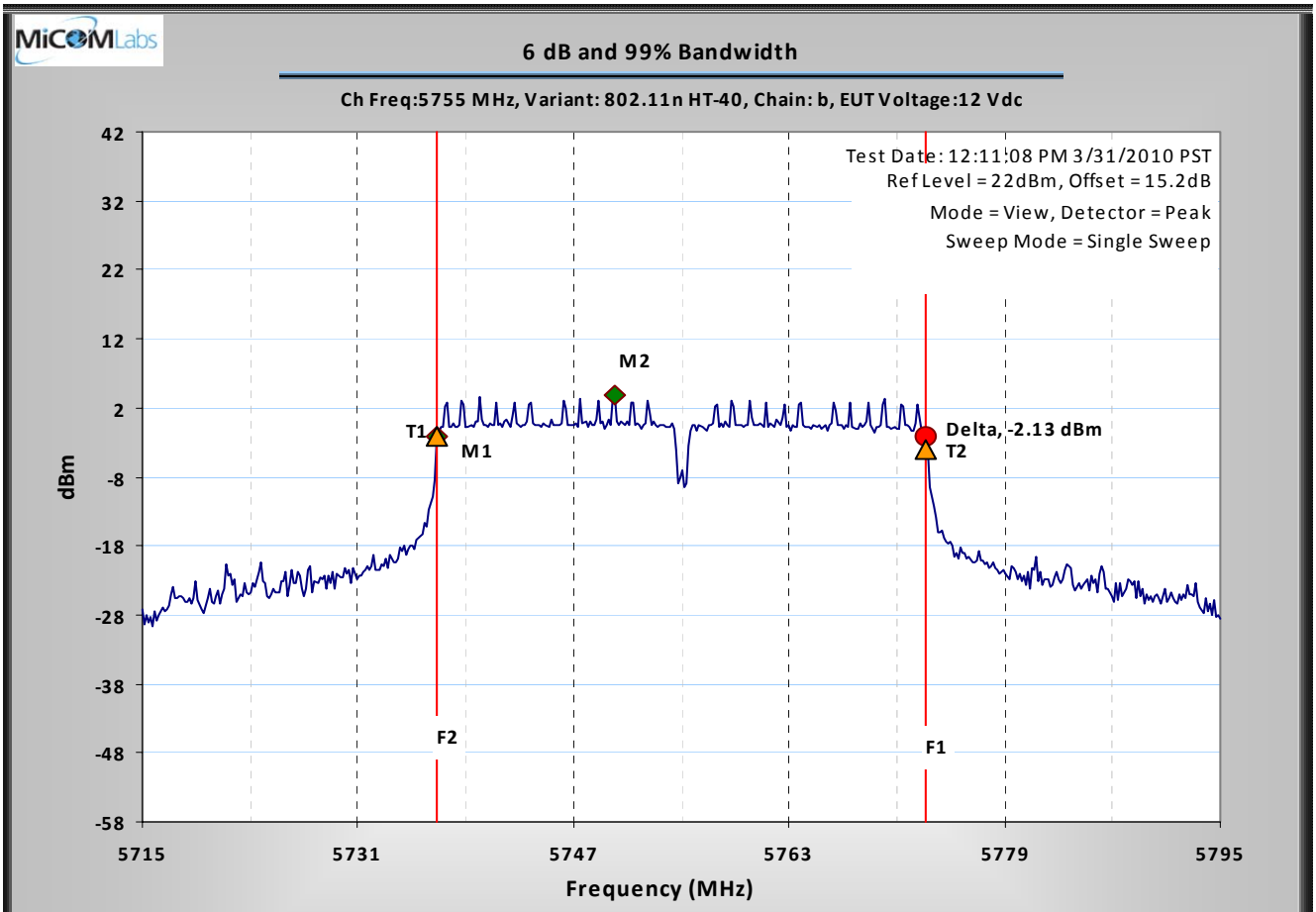
Measurement uncertainty:	±2.81 dB



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	80.000000MHz

Marker	Frequency	Amplitude
M1	5736.803607MHz	-2.747dBm
M2	5750.110220MHz	3.774dBm
Delta	5773.036072MHz	-1.351dBm
T1	5736.803607MHz	-2.747dBm
T2	5773.036072MHz	-2.574dBm

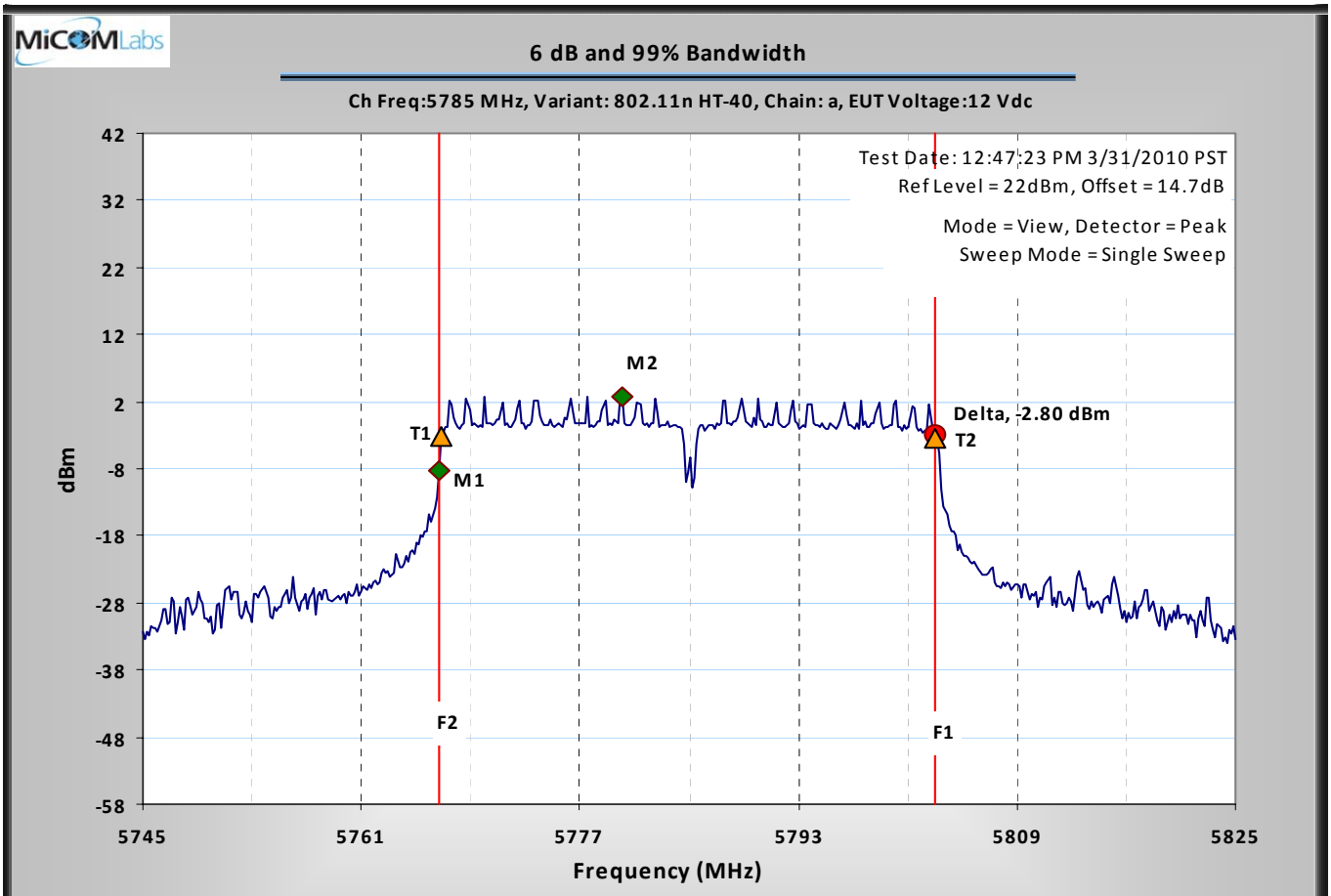
Test Results
Center frequency = 5755MHz
6dB BW (Delta -M1) = 36.232465MHz
99% OBW (T2-T1) = 36.392786MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	80.000000MHz

Marker	Frequency	Amplitude
M1	5736.803607MHz	-2.232dBm
M2	5750.110220MHz	3.835dBm
Delta	5773.196393MHz	-2.128dBm
T1	5736.803607MHz	-2.232dBm
T2	5773.196393MHz	-4.03dBm

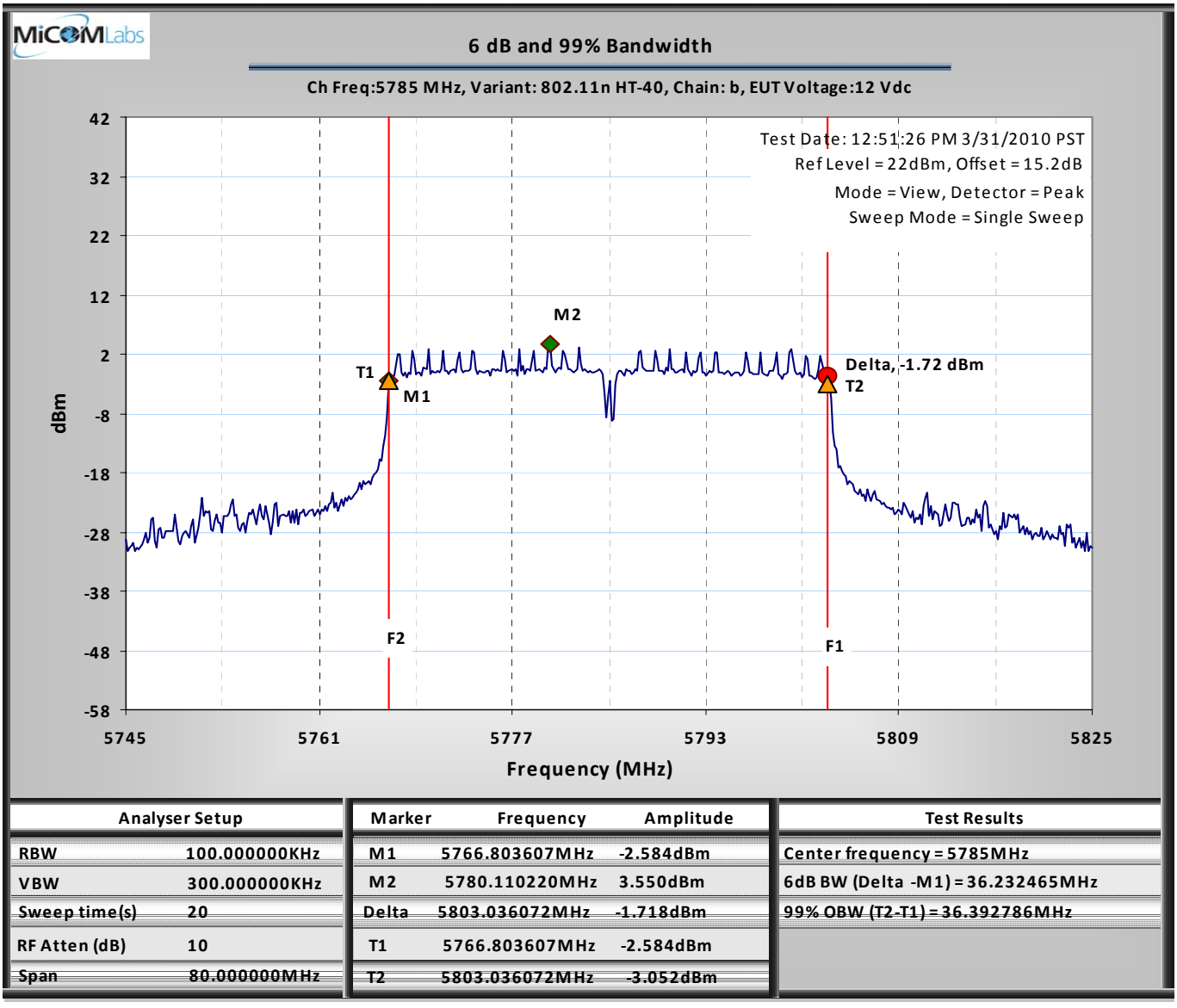
Test Results
Center frequency = 5755MHz
6dB BW (Delta -M1) = 36.392786MHz
99% OBW (T2-T1) = 36.553106MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	80.000000MHz

Marker	Frequency	Amplitude
M1	5766.643287MHz	-8.258dBm
M2	5780.110220MHz	2.759dBm
Delta	5803.036072MHz	-2.797dBm
T1	5766.803607MHz	-3.058dBm
T2	5803.036072MHz	-3.454dBm

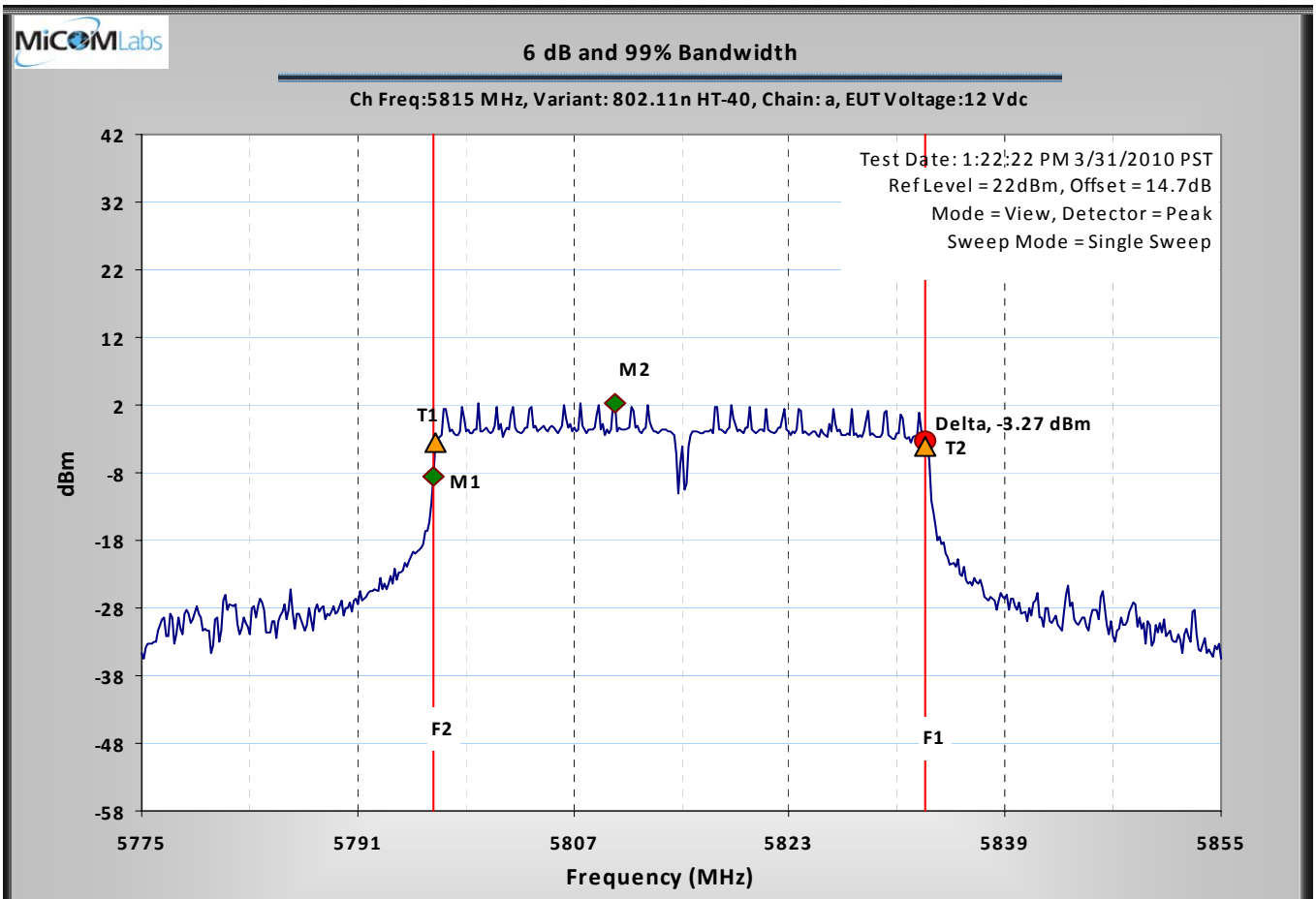
Test Results
Center frequency = 5785MHz
6dB BW (Delta -M1) = 36.392786MHz
99% OBW (T2-T1) = 36.392786MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	80.000000MHz

Marker	Frequency	Amplitude
M1	5766.803607MHz	-2.584dBm
M2	5780.110220MHz	3.550dBm
Delta	5803.036072MHz	-1.718dBm
T1	5766.803607MHz	-2.584dBm
T2	5803.036072MHz	-3.052dBm

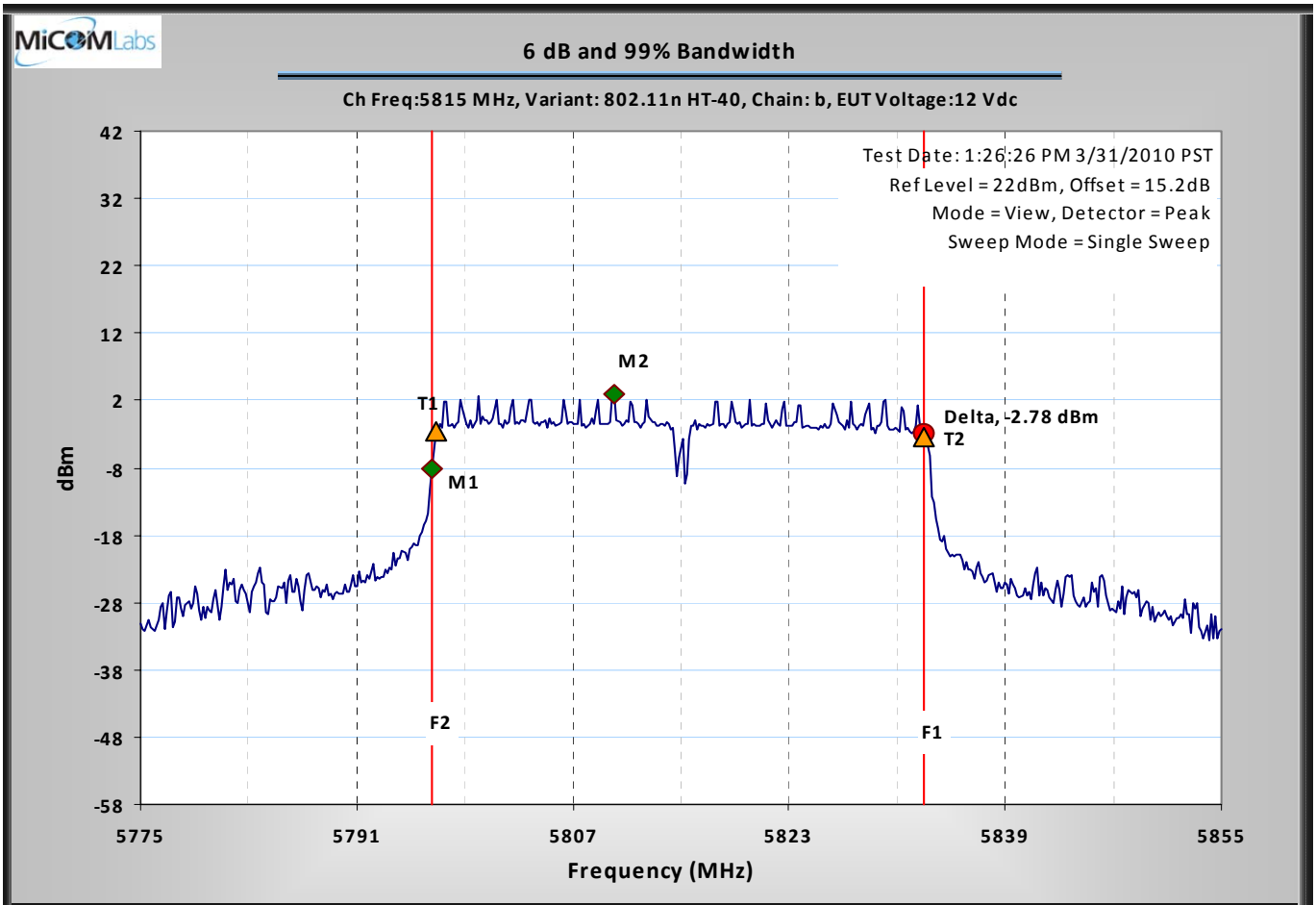
Test Results
Center frequency = 5785MHz
6dB BW (Delta -M1) = 36.232465MHz
99% OBW (T2-T1) = 36.392786MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	80.000000MHz

Marker	Frequency	Amplitude
M1	5796.643287MHz	-8.435dBm
M2	5810.110220MHz	2.254dBm
Delta	5833.036072MHz	-3.265dBm
T1	5796.803607MHz	-3.509dBm
T2	5833.036072MHz	-4.067dBm

Test Results
Center frequency = 5815MHz
6dB BW (Delta -M1) = 36.392786MHz
99% OBW (T2-T1) = 36.392786MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	80.000000MHz

Marker	Frequency	Amplitude
M1	5796.643287MHz	-8.258dBm
M2	5810.110220MHz	2.826dBm
Delta	5833.036072MHz	-2.783dBm
T1	5796.803607MHz	-2.643dBm
T2	5833.036072MHz	-3.509dBm

Test Results
Center frequency = 5815MHz
6dB BW (Delta -M1) = 36.392786MHz
99% OBW (T2-T1) = 36.392786MHz

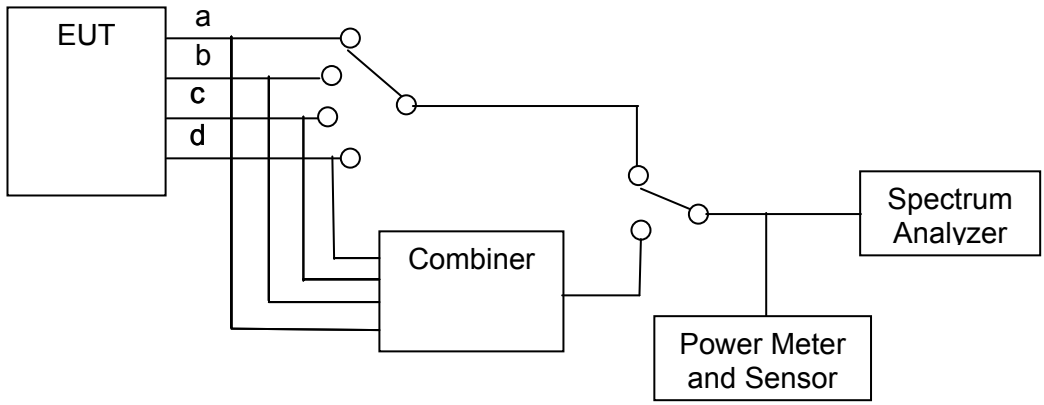
7.2 Peak Output Power

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 set-up for Peak Output Power

Total Power = A + G + Y + 10 log (1/x) dBm

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

Specification

Limits

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

§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.

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.

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.

§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.

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

7.2.1 Measurement Results for 802.11b

Test Conditions:	15.247 (b)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11b		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain (Y):	N/A	dB	**Antenna Gain:**	6	dBi
Applied Voltage:	12.0	Vdc			
Notes 1:					
Notes 2:					

Test Frequency	Measured Peak Power RF Port (dBm)				Total Power (dBm)		Limit	Margin
MHz	**a**	**b**	**c**	**d**	**Combined**	**Calculated**	**dBm**	**dB**
2412	19.30	21.52	--	--	22.42	23.56	30.00	-7.58
2437	21.36	19.32	--	--	22.08	23.47	30.00	-7.92
2462	19.86	20.11	--	--	22.40	23.00	30.00	-7.60

Measurement uncertainty:	±1.33 dB

7.2.2 Measurement Results for 802.11g

Test Conditions:	15.247 (b)	**Rel. Humidity (%):**	35 to 42
Variant:	802.11g	**Ambient Temp. (ºC):**	19 to 22
TPC:	HIGH	**Pressure (mBars):**	998 to 1003
Modulation:	ON	**Duty Cycle (%):**	100
Beam Forming Gain (Y):	N/A dB	**Antenna Gain:**	6 dBi
Applied Voltage:	12.0 Vdc		
Notes 1:			
Notes 2:			

Test Frequency	Measured Peak Power RF Port (dBm)				Total Power (dBm)		Limit	Margin
MHz	a	b	c	d	Combined	Calculated	dBm	dB
2412	19.52	21.31	--	--	24.01	23.52	30.00	-5.99
2437	21.23	19.62	--	--	21.95	23.51	30.00	-8.05
2462	20.37	20.58	--	--	22.56	23.49	30.00	-7.44

Measurement uncertainty:	±1.33 dB

7.2.3 Measurement Results for 802.11n HT-20

Test Conditions:	15.247 (b)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11n HT-20		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain (Y):	N/A	dB	**Antenna Gain:**	6	dBi
Applied Voltage:	12.0	Vdc			
Notes 1:					
Notes 2:					

Test Frequency	Measured Peak Power RF Port (dBm)				Total Power (dBm)		Limit	Margin
MHz	a	b	c	d	Combined	Calculated	dBm	dB
2412	19.63	21.36	--	--	23.95	23.59	30.00	-6.05
2437	21.17	19.60	--	--	21.91	23.47	30.00	-8.09
2462	20.46	20.57	--	--	22.46	23.53	30.00	-7.54

Measurement uncertainty:	±1.33 dB

7.2.4 Measurement Results for 802.11n HT-40

Test Conditions:	15.247 (b)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11n HT-40		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain	N/A	dB	**Antenna Gain:**	6	dBi
Applied Voltage:	12.0	Vdc			
Notes 1:					
Notes 2:					

Test Frequency	Measured Peak Power RF Port (dBm)				Total Power (dBm)		Limit	Margin
MHz	a	b	c	d	Combined	Calculated	dBm	dB
2422	19.89	20.59	--	--	23.03	23.26	30.00	-6.97
2437	20.79	20.08	--	--	22.41	23.46	30.00	-7.59
2452	20.90	19.70	--	--	22.00	23.35	30.00	-8.00

Measurement uncertainty:	±1.33 dB

7.2.5 Measurement Results for 802.11a

Test Conditions:	15.247 (b)	**Rel. Humidity (%):**	35 to 42
Variant:	802.11a	**Ambient Temp. (ºC):**	19 to 22
TPC:	HIGH	**Pressure (mBars):**	998 to 1003
Modulation:	ON	**Duty Cycle (%):**	100
Beam Forming Gain (Y):	N/A dB	**Antenna Gain:**	6 dBi
Applied Voltage:	12.0 Vdc		
Notes 1:			
Notes 2:			

Test Frequency	Measured Peak Power RF Port (dBm)				Total Power (dBm)		Limit	Margin
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5745	16.61	16.78	--	--	19.13	19.71	30.00	-10.87
5785	16.30	16.82	--	--	19.50	19.58	30.00	-10.50
5825	15.67	15.96	--	--	18.61	18.83	30.00	-11.39

Measurement uncertainty:	±1.33 dB

7.2.6 Measurement Results for 802.11n HT-20

Test Conditions:	15.247 (b)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11n HT-20		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain	N/A	dB	**Antenna Gain:**	6	dBi
Applied Voltage:	12.0	Vdc			
Notes 1:					
Notes 2:					

Test Frequency	Measured Peak Power RF Port (dBm)				Total Power (dBm)		Limit	Margin
MHz	**a**	**b**	**c**	**d**	**Combined**	**Calculated**	**dBm**	**dB**
5745	16.84	16.97	--	--	19.15	19.92	30.00	-10.85
5785	16.49	16.97	--	--	19.49	19.75	30.00	-10.51
5825	15.84	16.10	--	--	18.82	18.98	30.00	-11.18

Measurement uncertainty:	±1.33 dB

7.2.7 Measurement Results for 802.11n HT-40

Test Conditions:	15.247 (b)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11n HT-40		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming Gain	N/A	dB	**Antenna Gain:**	6	dBi
Applied Voltage:	12.0	Vdc			
Notes 1:					
Notes 2:					

Test Frequency	Measured Peak Power RF Port (dBm)				Total Power (dBm)		Limit	Margin
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5755	16.39	16.61	--	--	19.11	19.51	30.00	-10.89
5785	16.10	16.59	--	--	19.28	19.36	30.00	-10.72
5815	15.61	15.93	--	--	18.55	18.78	30.00	-11.45

Measurement uncertainty:	±1.33 dB

7.3 Peak Power Spectral Density

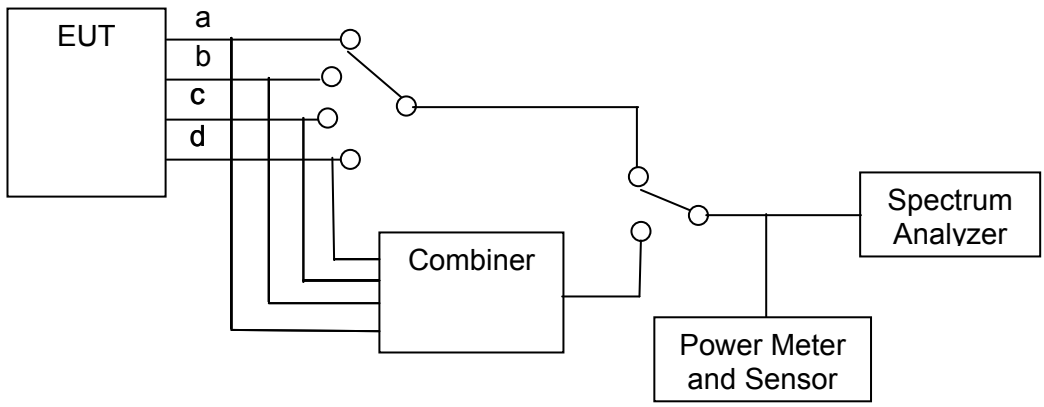
Test Procedure

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 set-up for Peak Power Spectral Density

Specification

Peak Power Spectral Density Limits

§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

Traceability

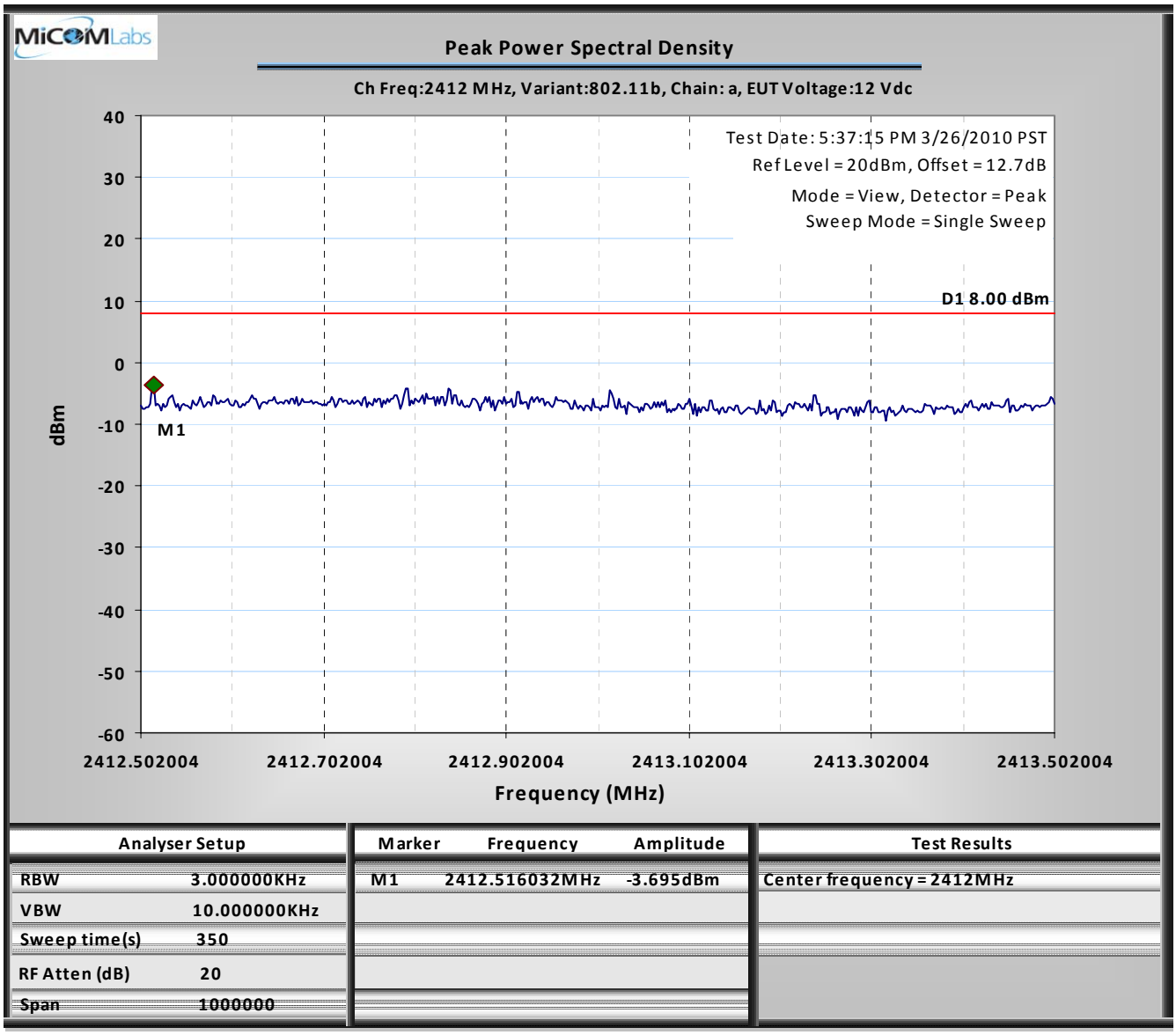
Method	Test Equipment Used
Measurements were made per work instruction WI-01 'Measuring RF Output Power'	0158, 0252, 0313, 0314, 0223, 0116, 0117, 0287, 0363

7.3.1 Measurement results for 802.11b

Test Conditions:	15.247 (e)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11b		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming	N/A	dB	**Antenna Gain:**	6	dBi
Applied Voltage:	12.0	Vdc			
Notes 1:					
Notes 2:					

Test Frequency	Measured Power Density RF Port (dBm)				Total Peak Power Spectral Density (dBm)		Limit	Margin
MHz	**a**	**b**	**c**	**d**	**Combined**	**Calculated**	**dBm**	**dB**
2412	-3.70	-1.26	--	--	3.17	0.70	8.00	-4.84
2437	-1.38	-3.59	--	--	1.62	0.67	8.00	-6.38
2462	-2.93	-2.62	--	--	2.23	0.24	8.00	-5.77

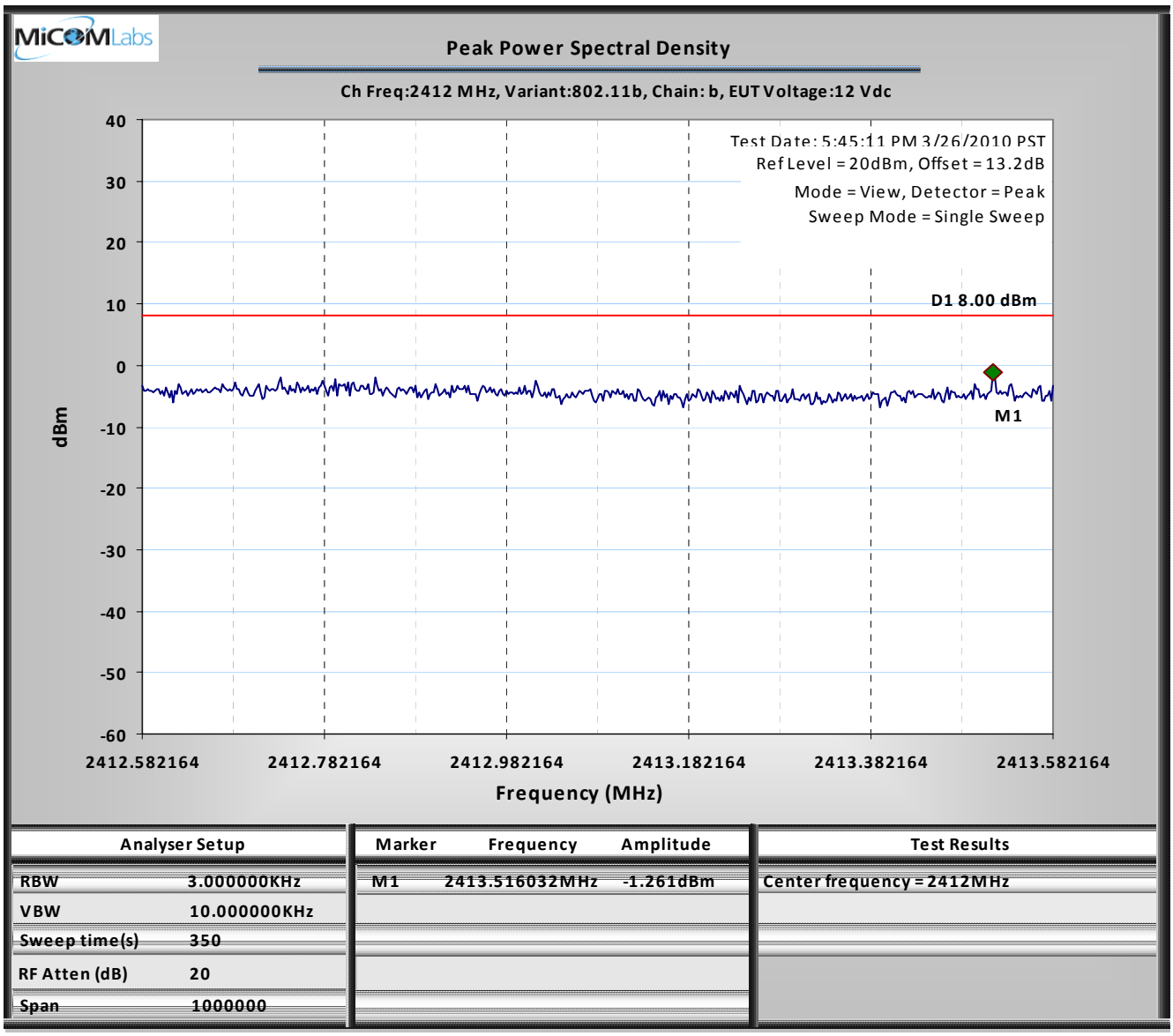
Measurement uncertainty:	± 1.33 dB



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2412.516032MHz	-3.695dBm

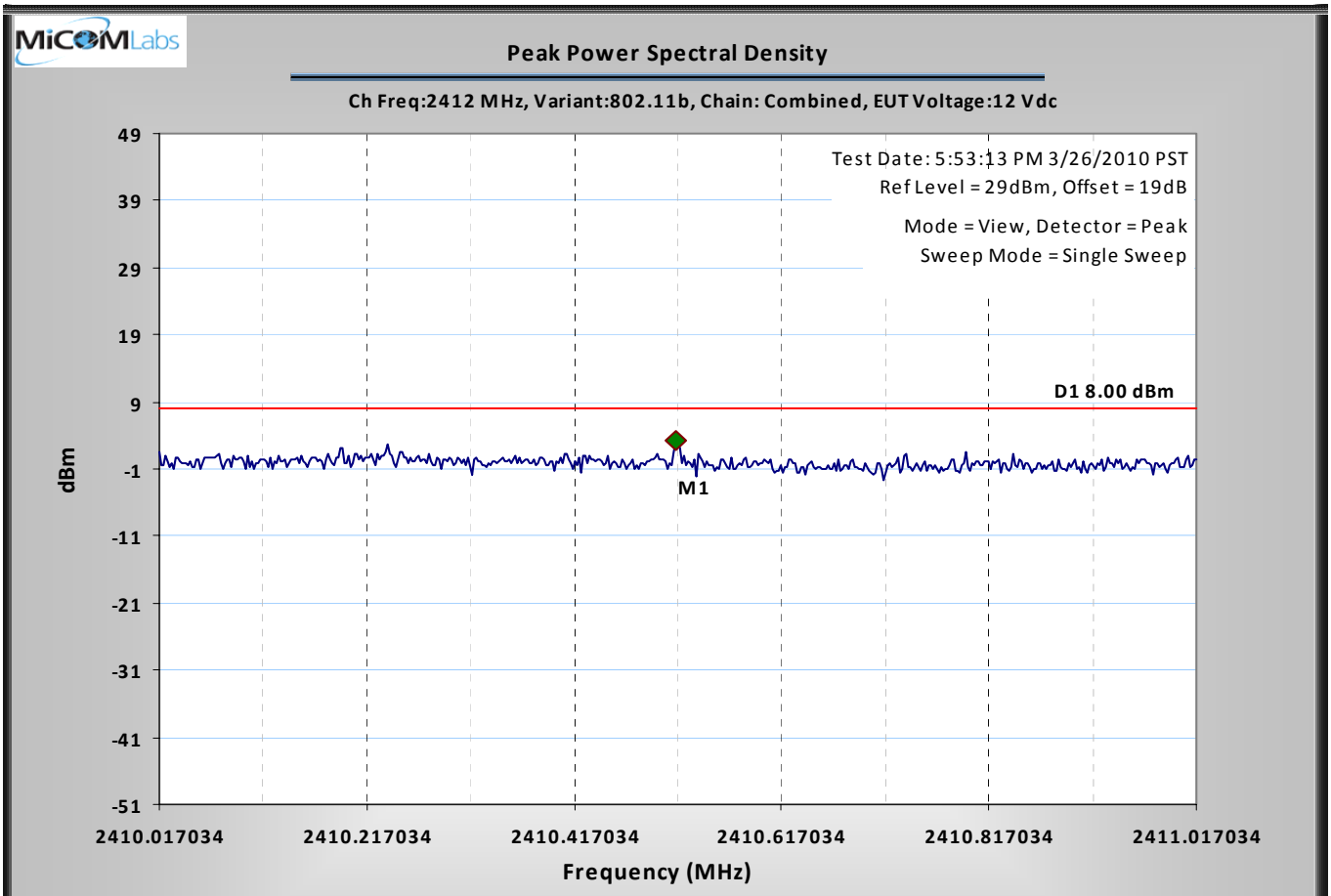
Test Results
Center frequency = 2412MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2413.516032MHz	-1.261dBm

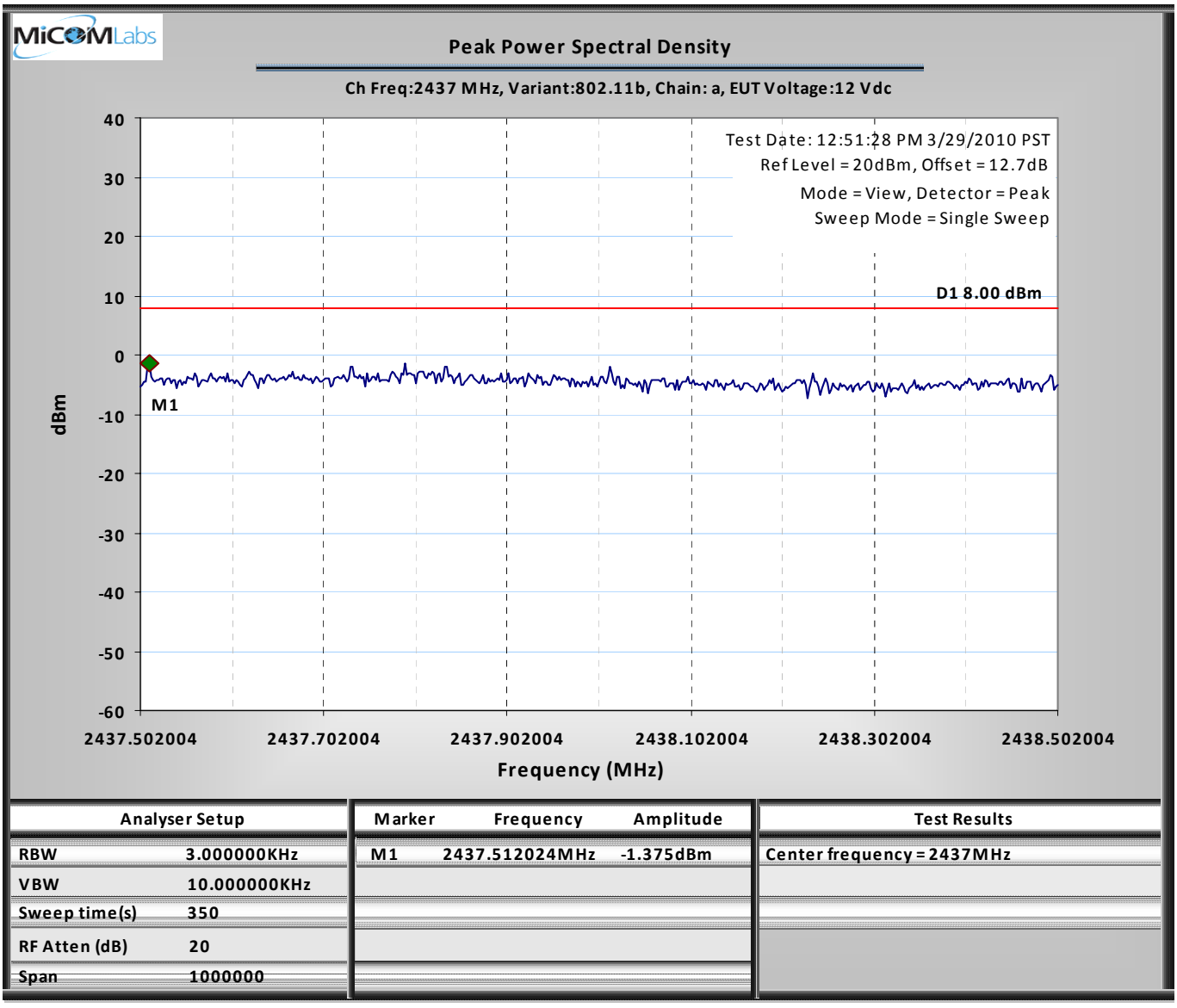
Test Results
Center frequency = 2412MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2410.516032MHz	3.165dBm

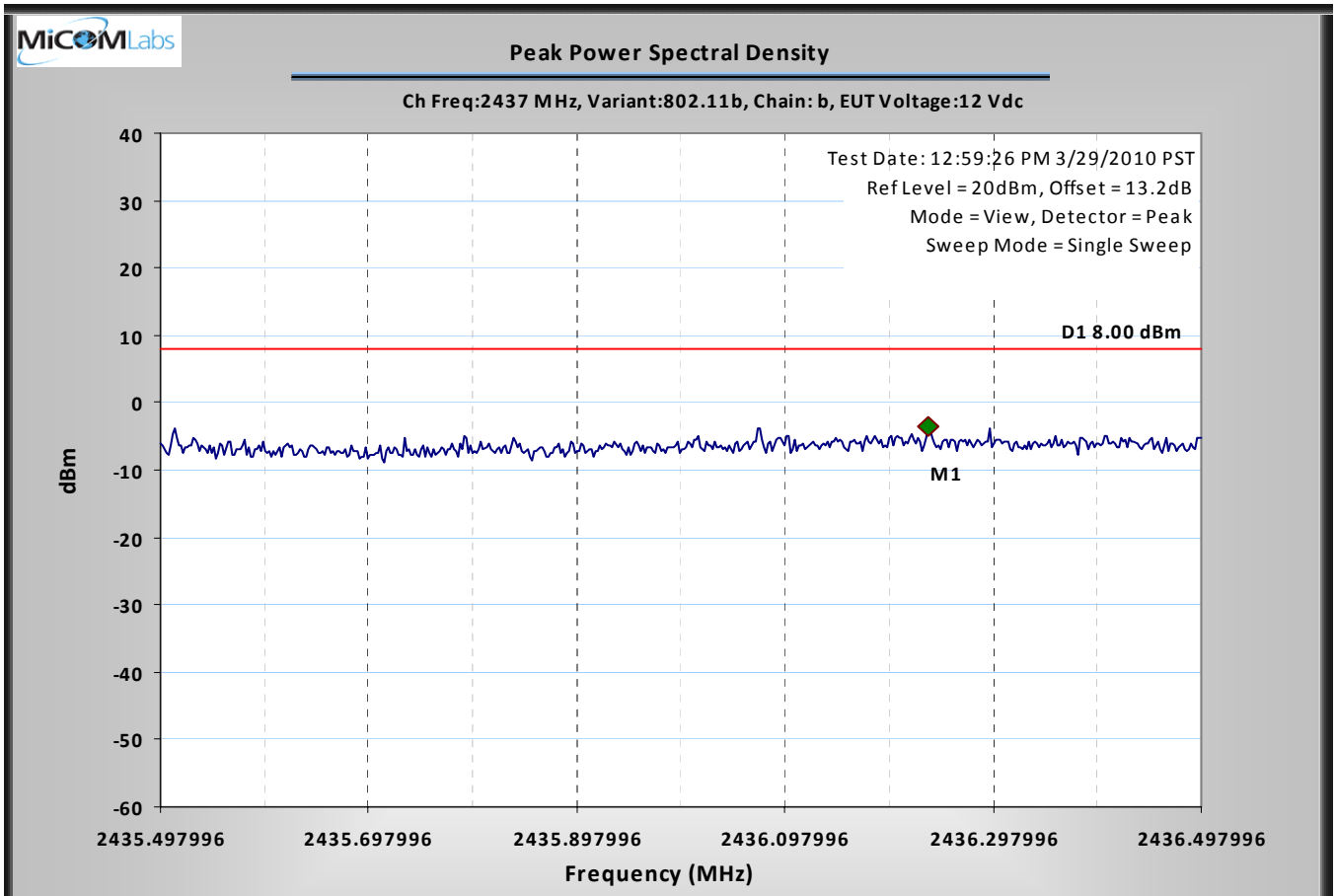
Test Results
Center frequency = 2412MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2437.512024MHz	-1.375dBm

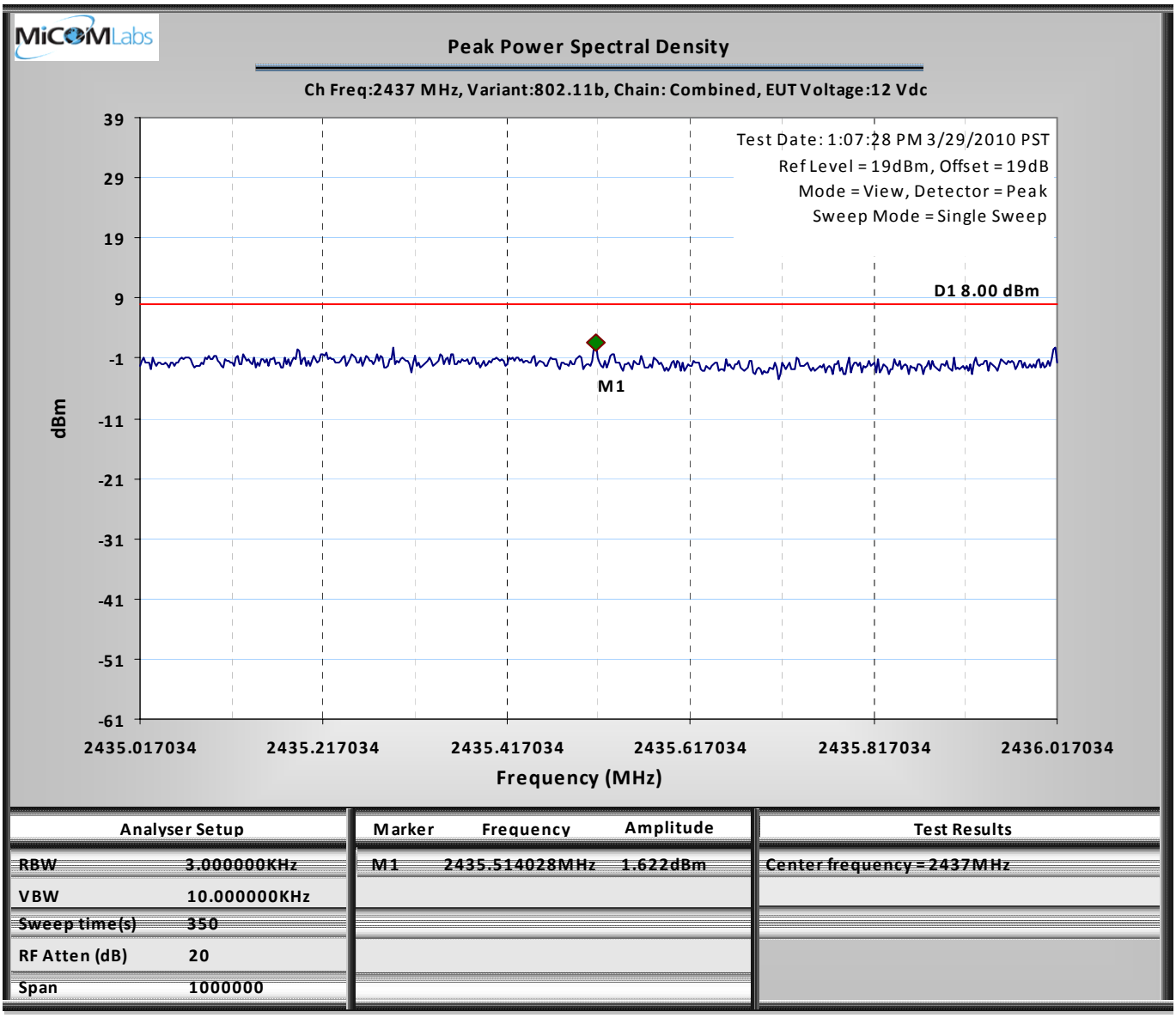
Test Results
Center frequency = 2437MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2436.235471MHz	-3.585dBm

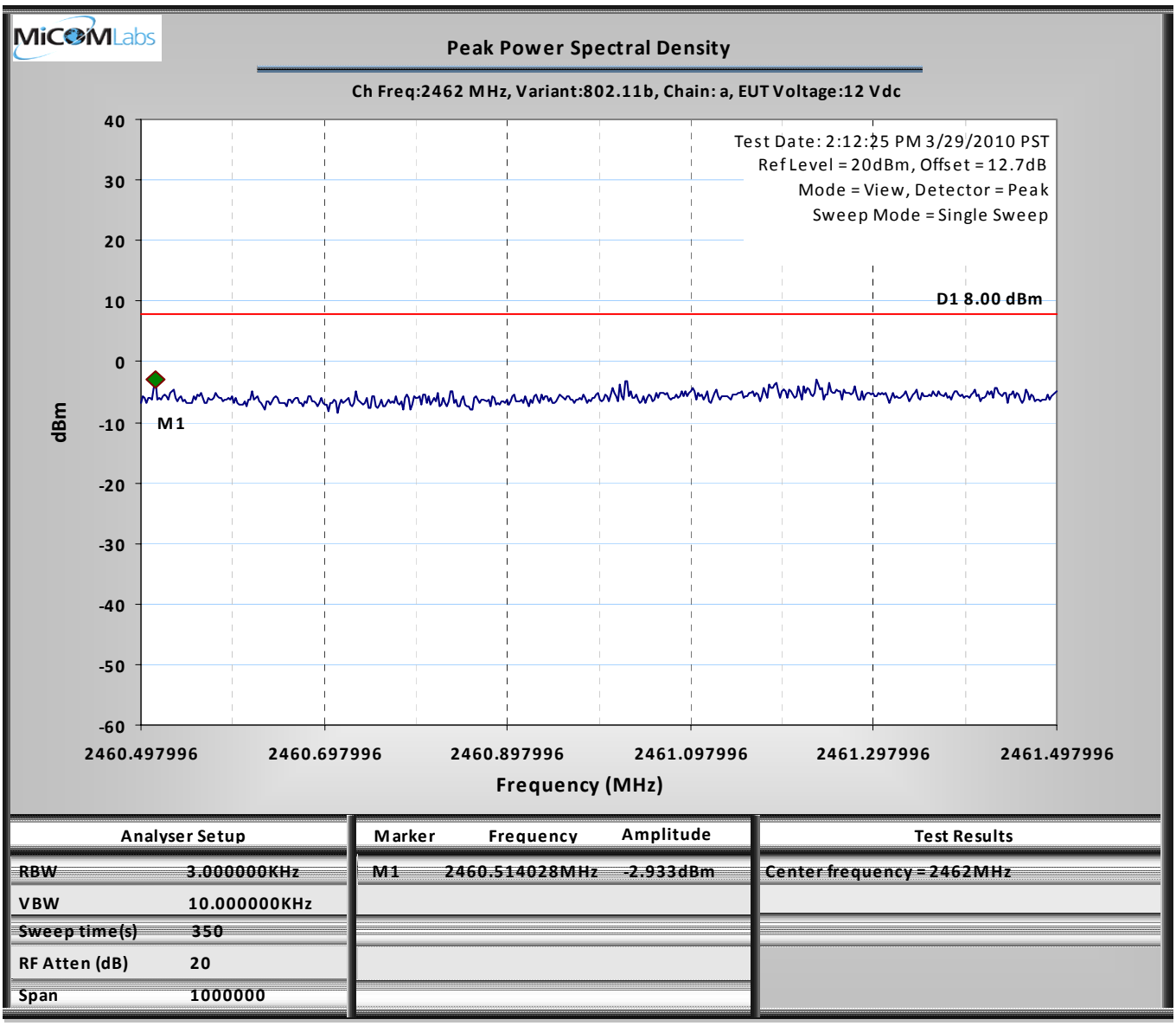
Test Results
Center frequency = 2437MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2435.514028MHz	1.622dBm

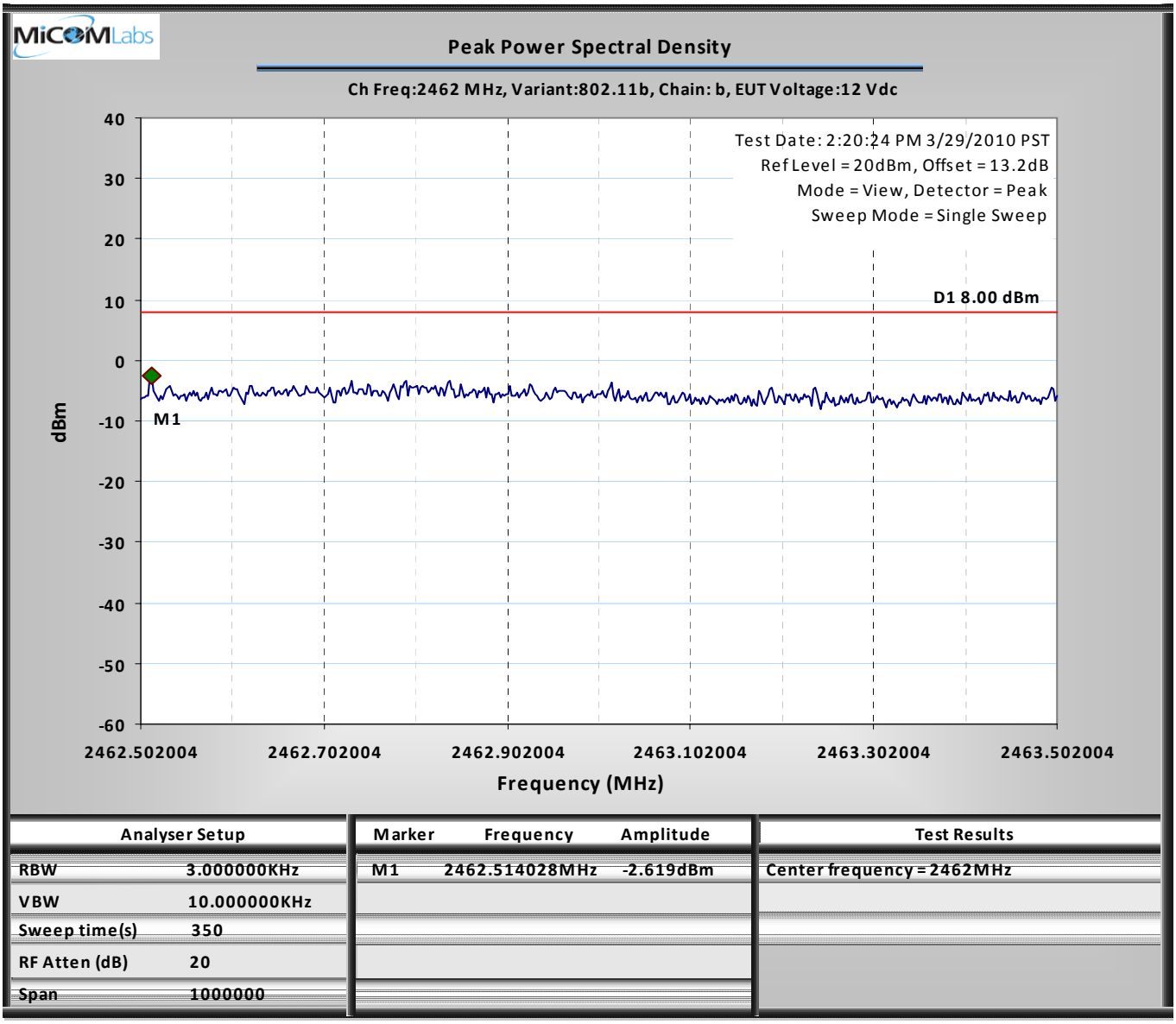
Test Results
Center frequency = 2437MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2460.514028MHz	-2.933dBm

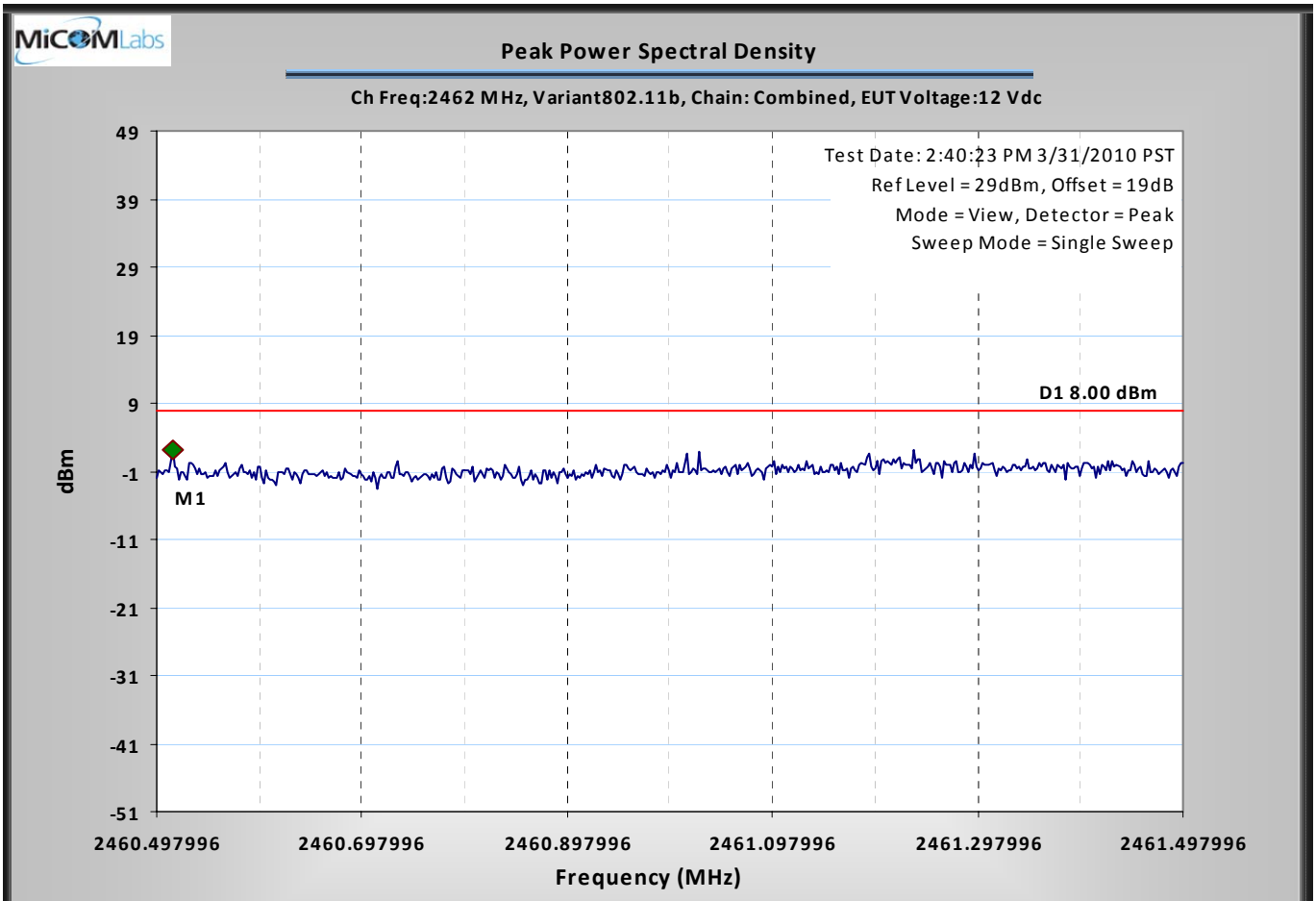
Test Results
Center frequency = 2462MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2462.514028MHz	-2.619dBm

Test Results
Center frequency = 2462MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2460.514028MHz	2.228dBm

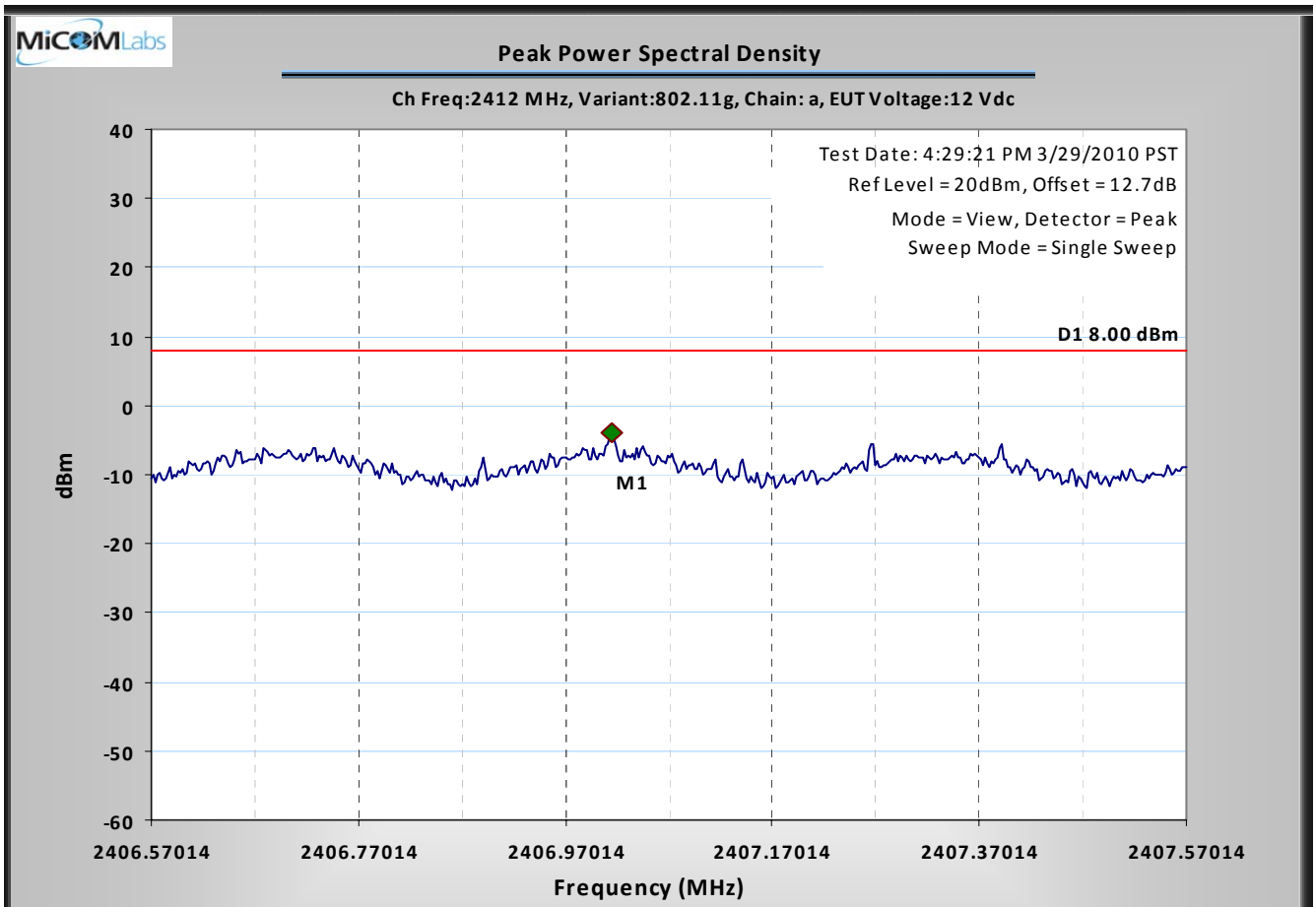
Test Results
Center frequency = 2462MHz

7.3.2 Measurement results for 802.11g

Test Conditions:	15.247 (e)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11g		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming	N/A	dB	**Antenna Gain:**	6	dBi
Applied Voltage:	12.0	Vdc			
Notes 1:					
Notes 2:					

Test Frequency	Measured Power Density RF Port (dBm)				Total Peak Power Spectral Density (dBm)		Limit	Margin
MHz	a	b	c	d	Combined	Calculated	dBm	dB
2412	-4.05	-3.03	--	--	1.30	-0.50	8.00	-6.70
2437	-2.57	-4.81	--	--	0.89	-0.54	8.00	-7.11
2462	-3.65	-4.63	--	--	0.56	-1.10	8.00	-7.44

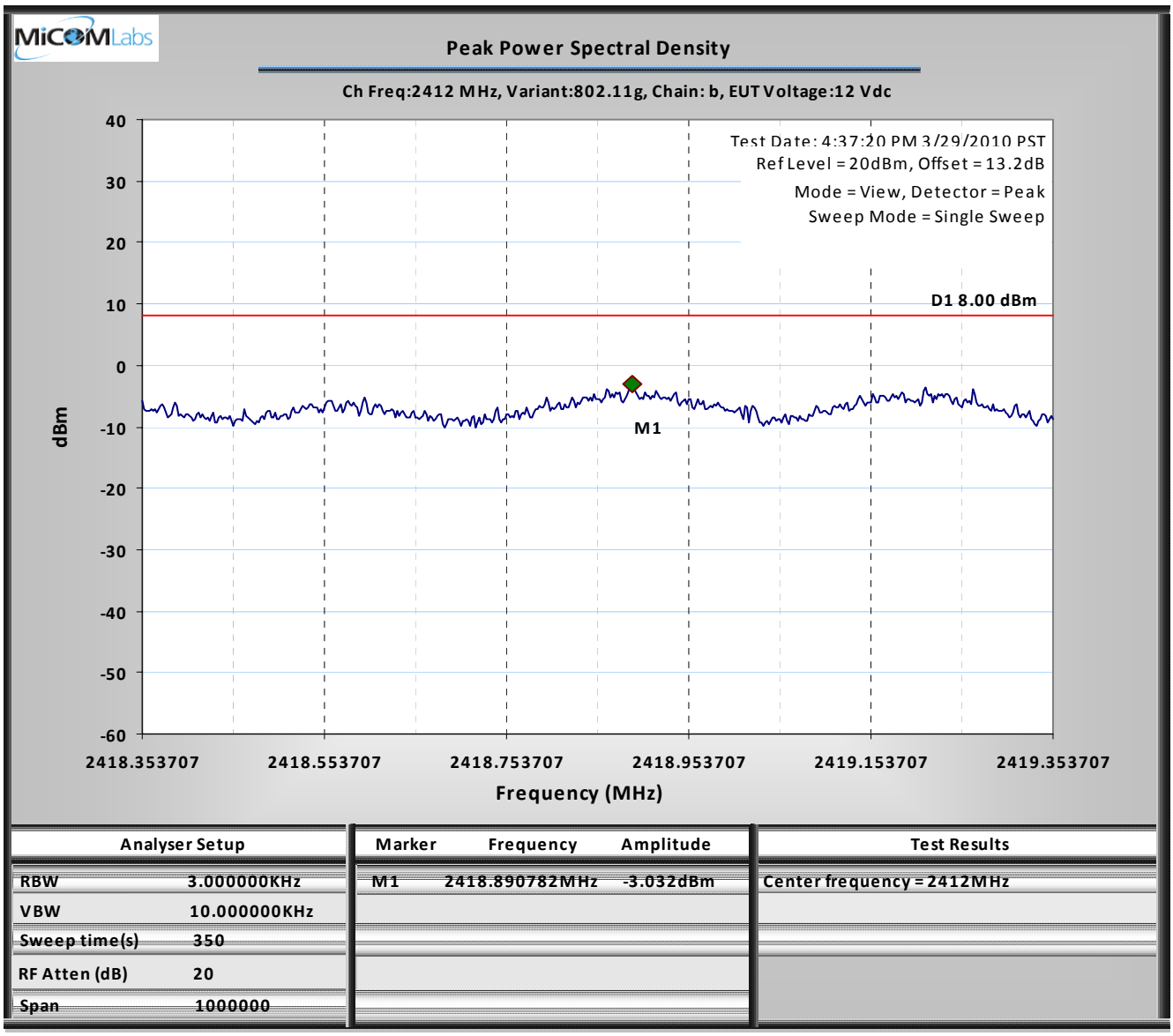
Measurement uncertainty:	± 1.33 dB



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2407.015030MHz	-4.047dBm

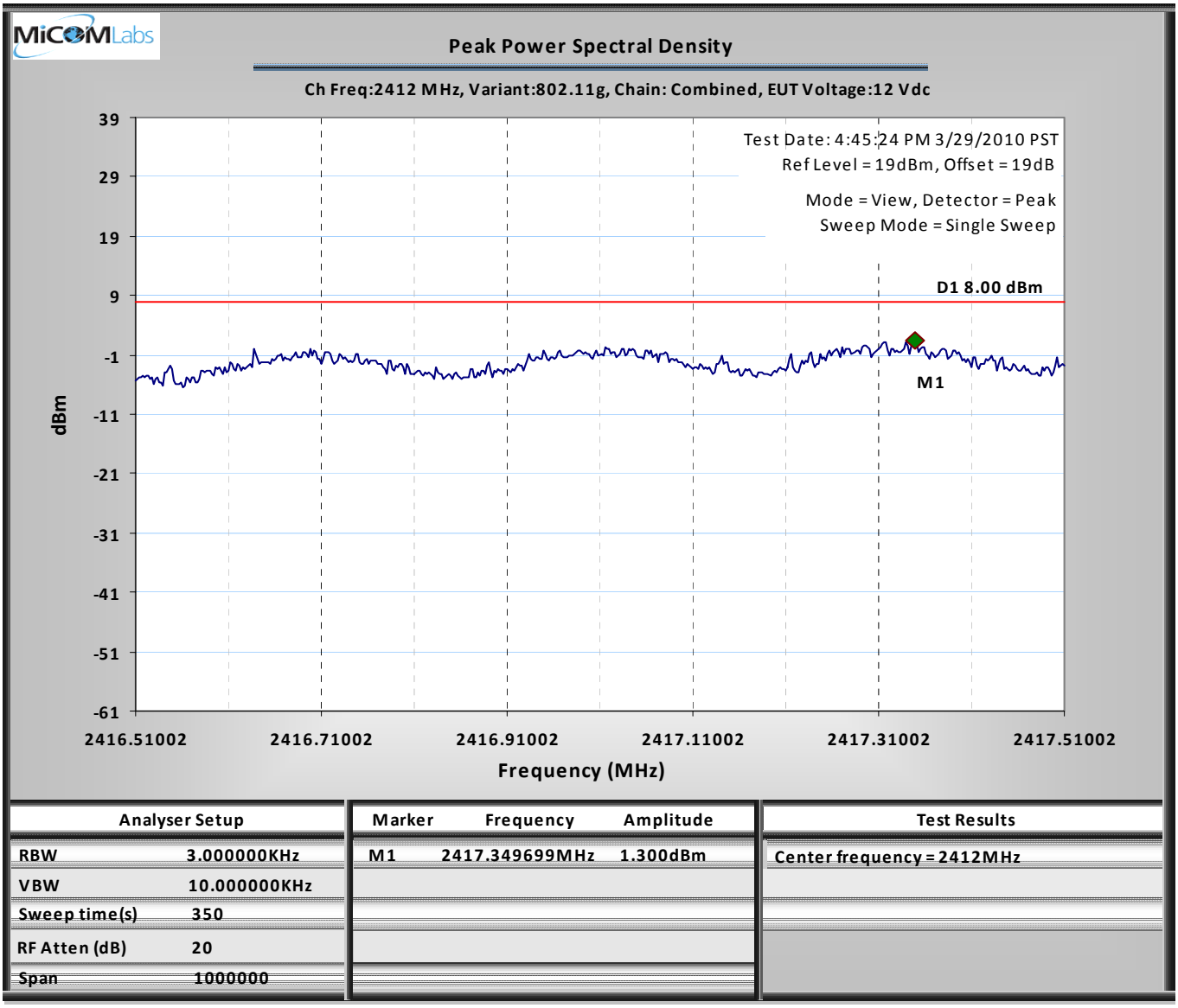
Test Results
Center frequency = 2412MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2418.890782MHz	-3.032dBm

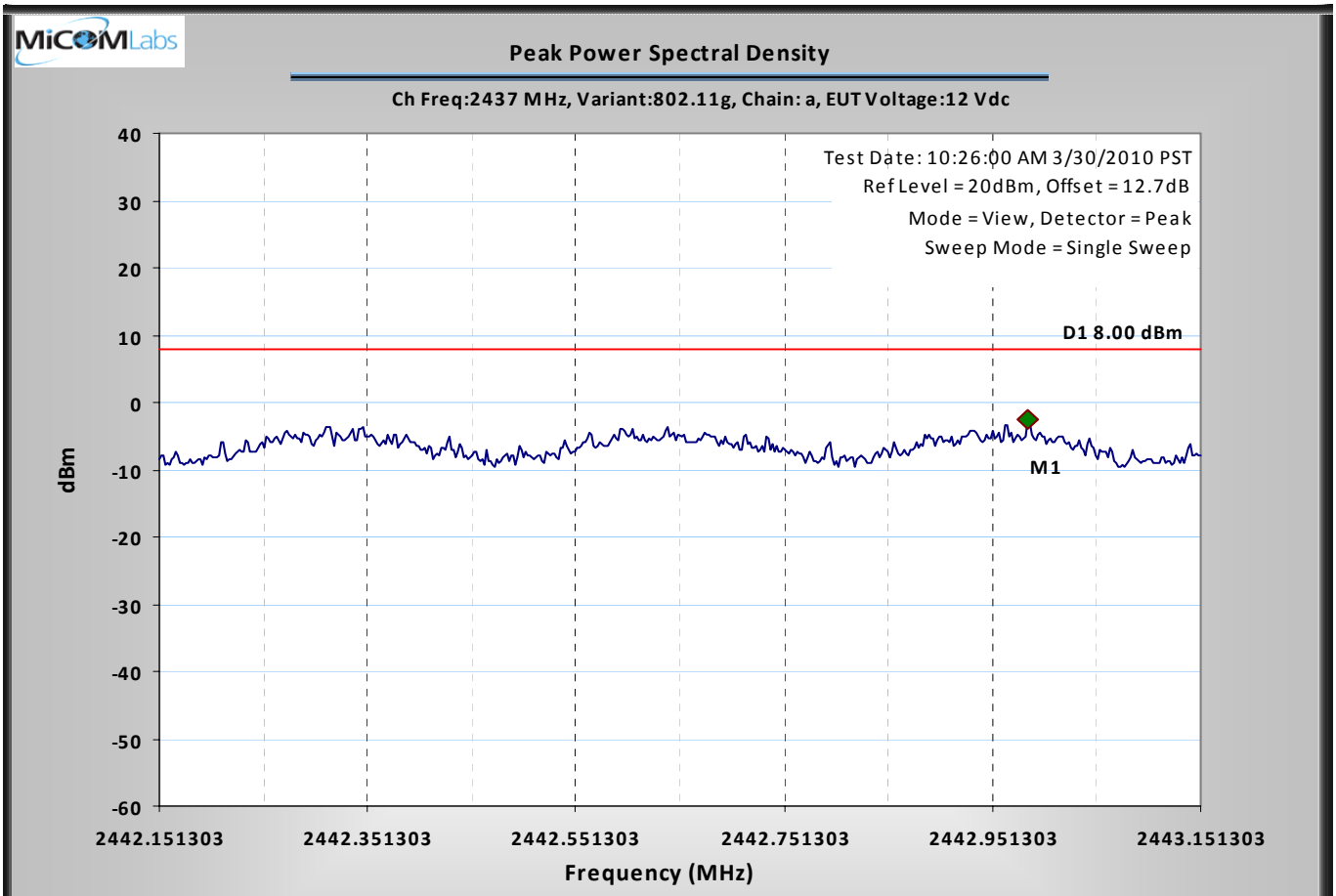
Test Results
Center frequency = 2412MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2417.349699MHz	1.300dBm

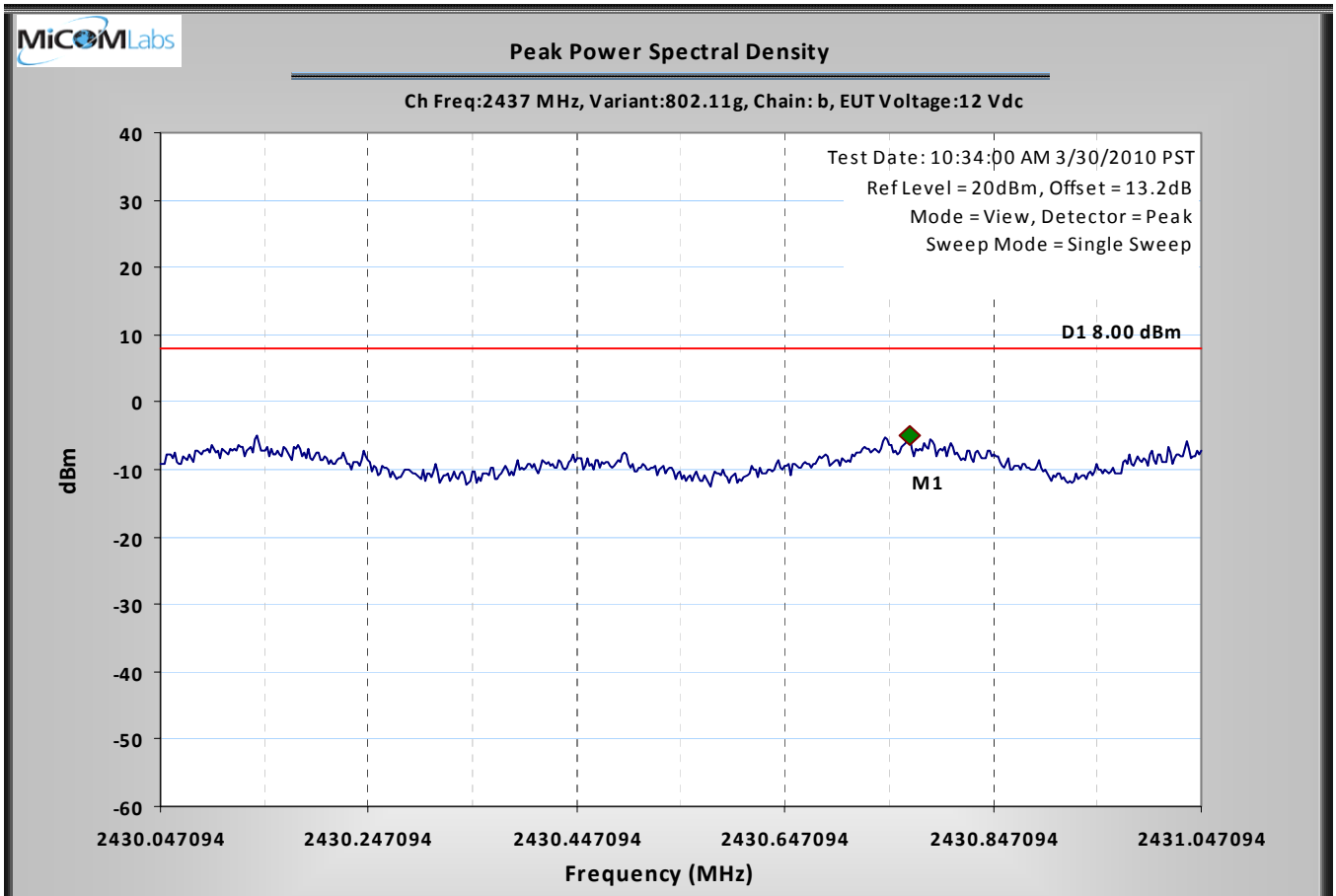
Test Results
Center frequency = 2412MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2442.984970MHz	-2.573dBm

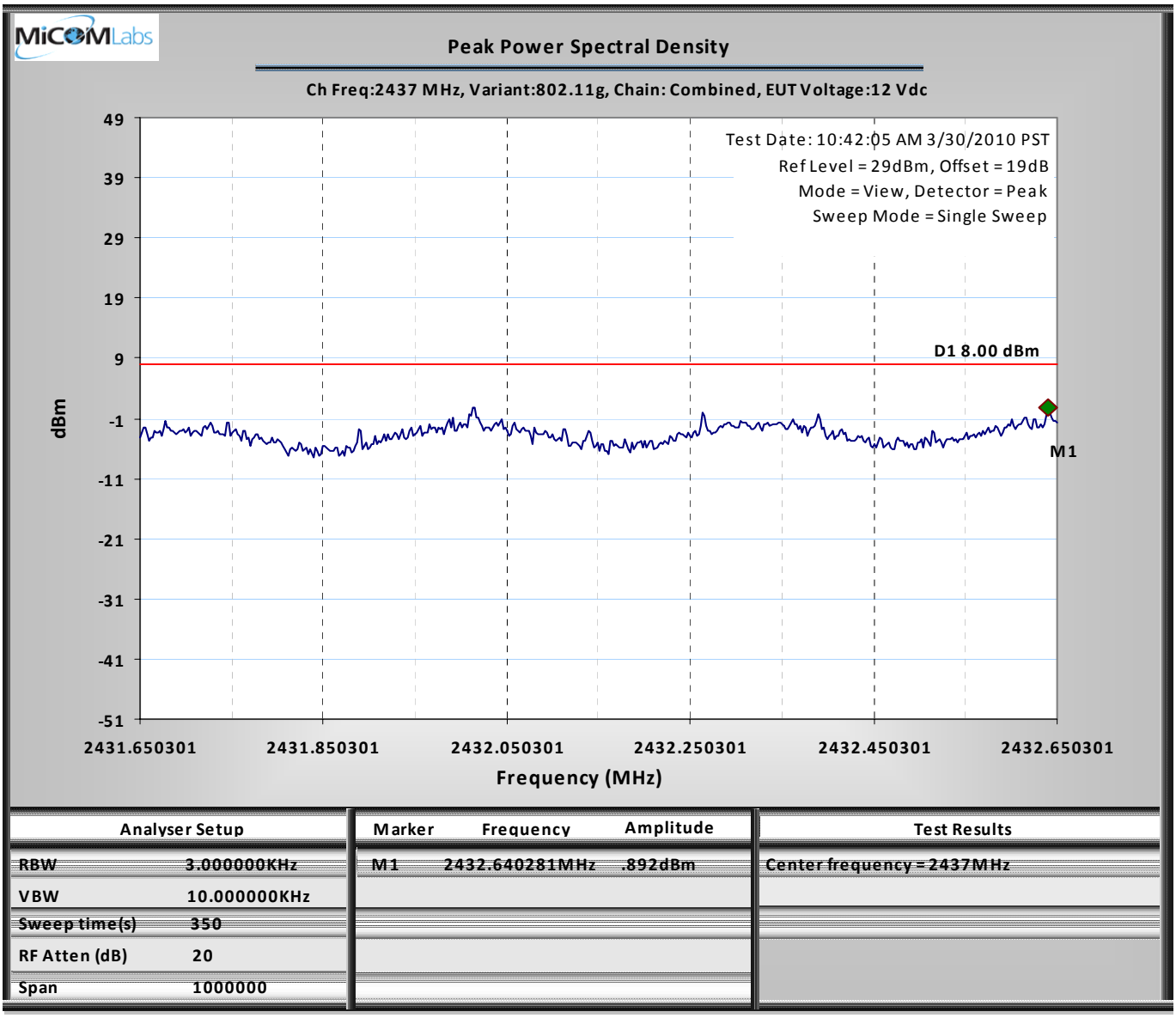
Test Results
Center frequency = 2437MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2430.766533MHz	-4.808dBm

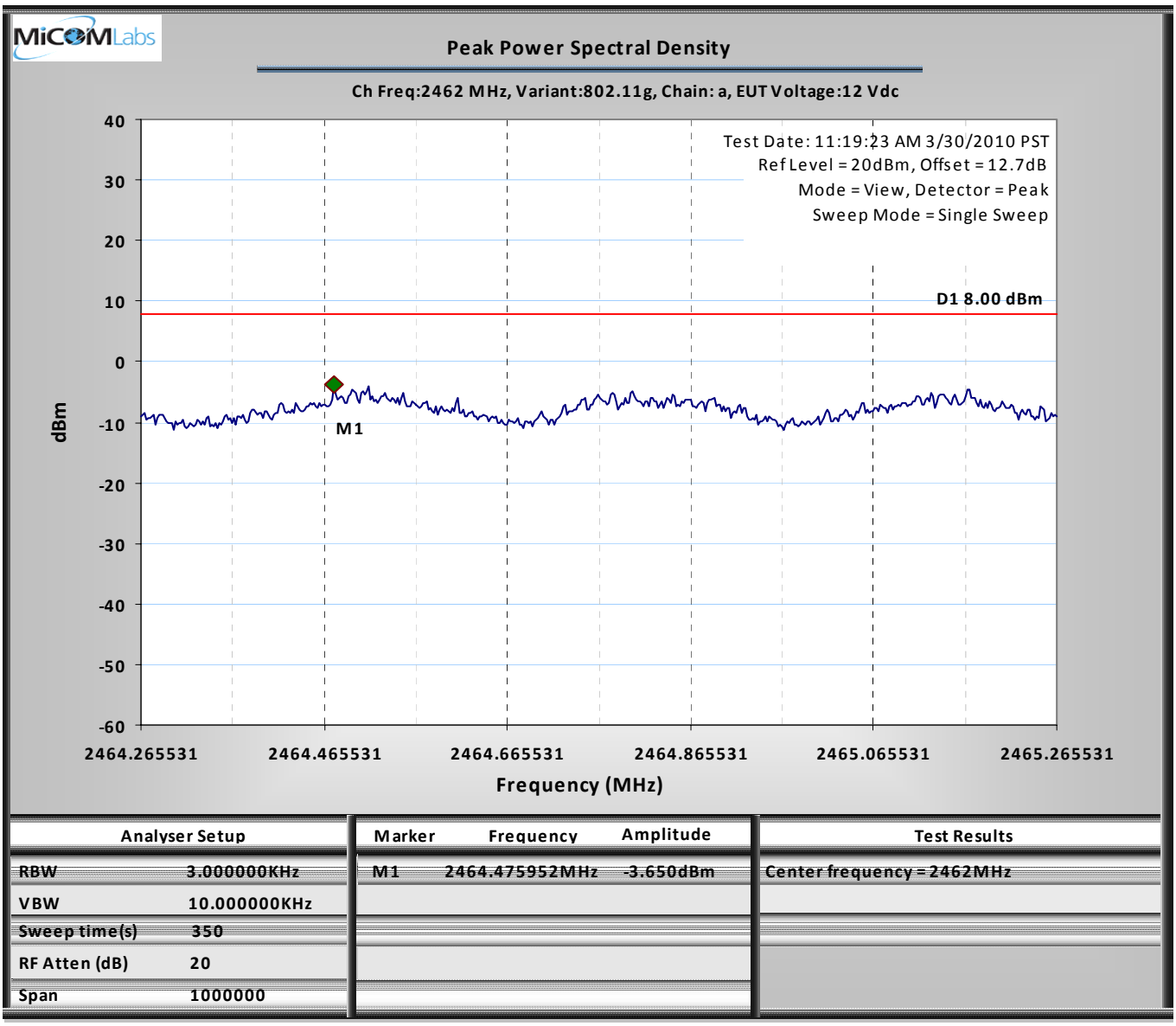
Test Results
Center frequency = 2437MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2432.640281MHz	.892dBm

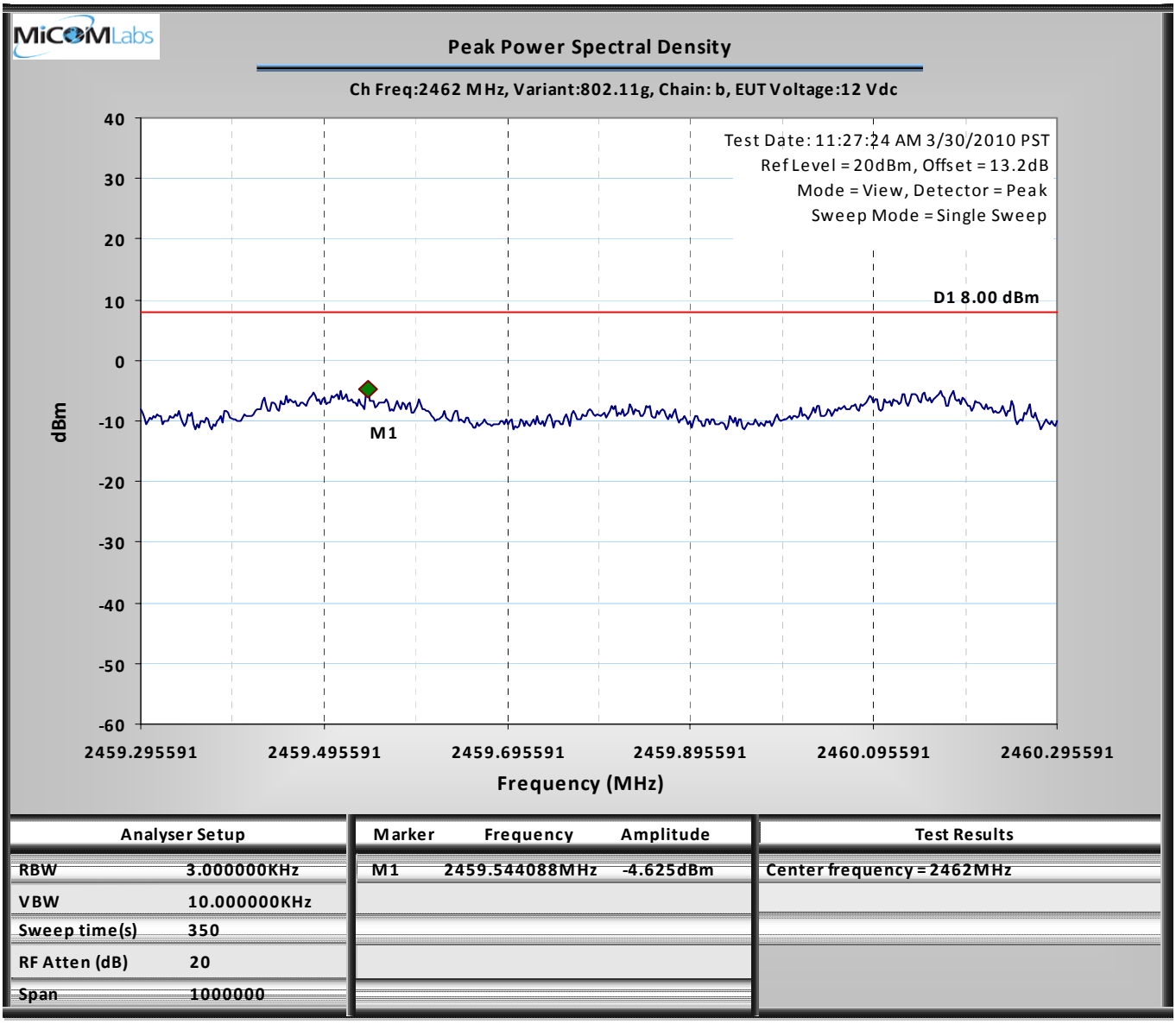
Test Results
Center frequency = 2437MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2464.475952MHz	-3.650dBm

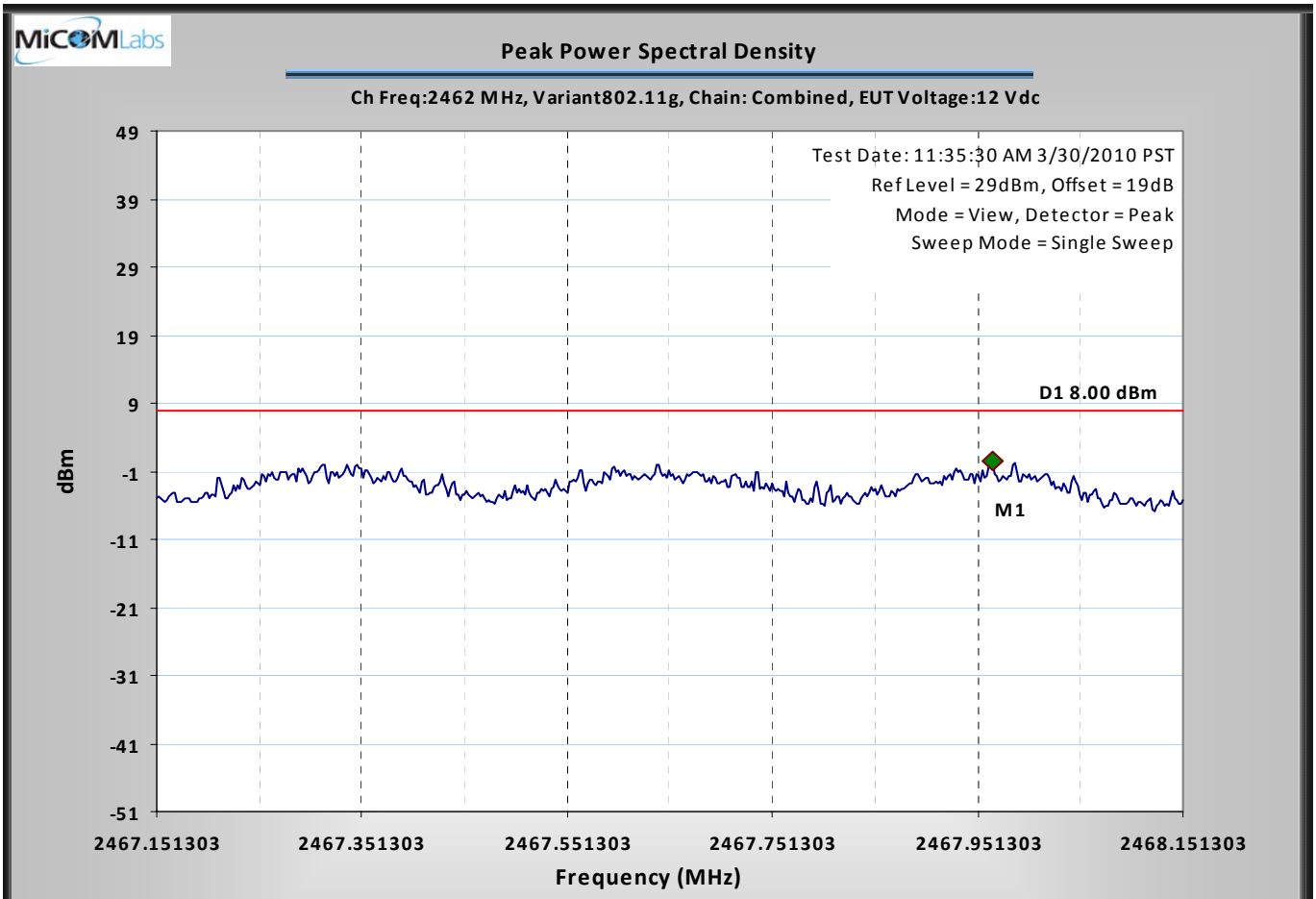
Test Results
Center frequency = 2462MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2459.544088MHz	-4.625dBm

Test Results
Center frequency = 2462MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2467.964930MHz	.560dBm

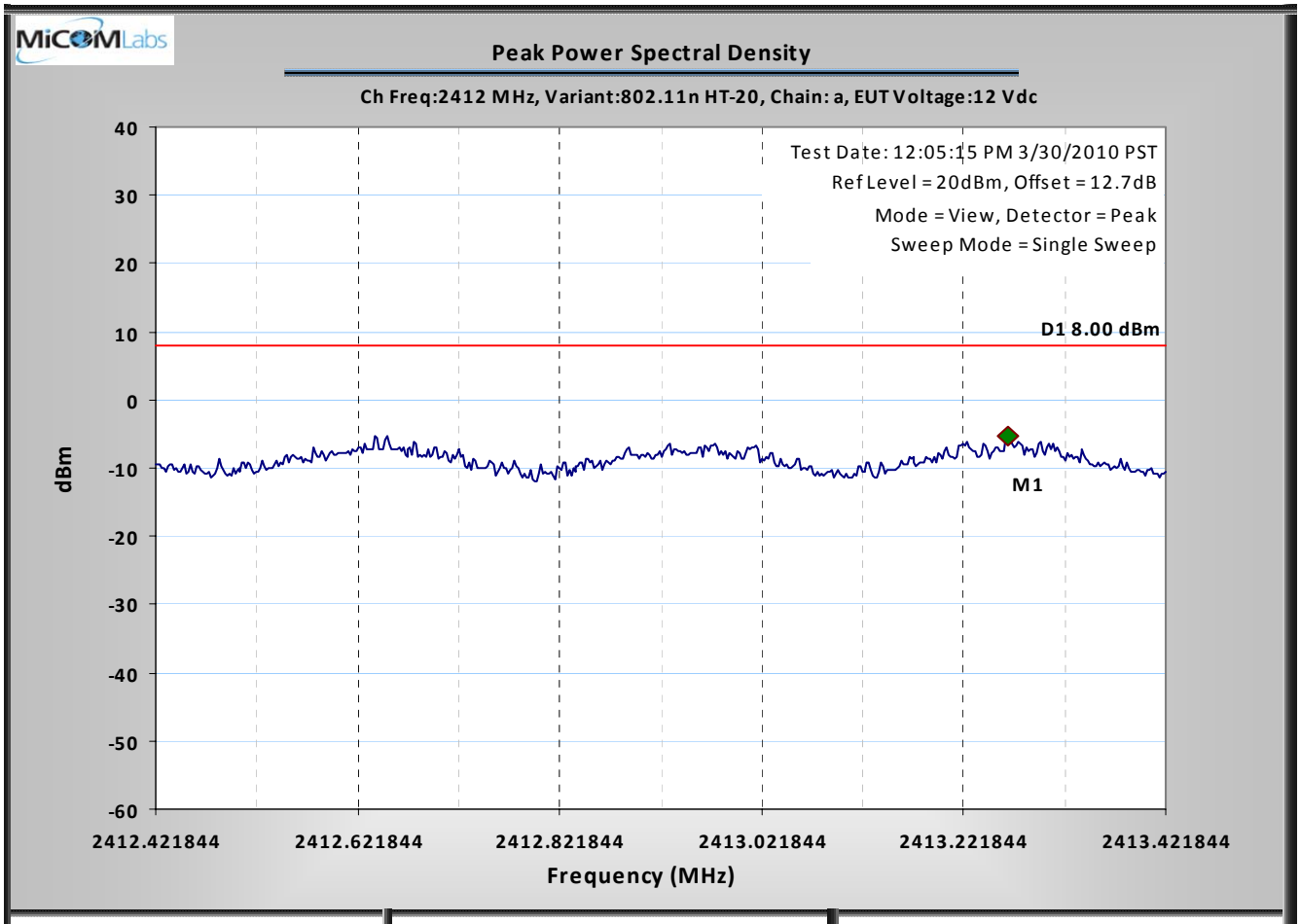
Test Results
Center frequency = 2462MHz

7.3.3 Measurement results for 802.11n HT-20

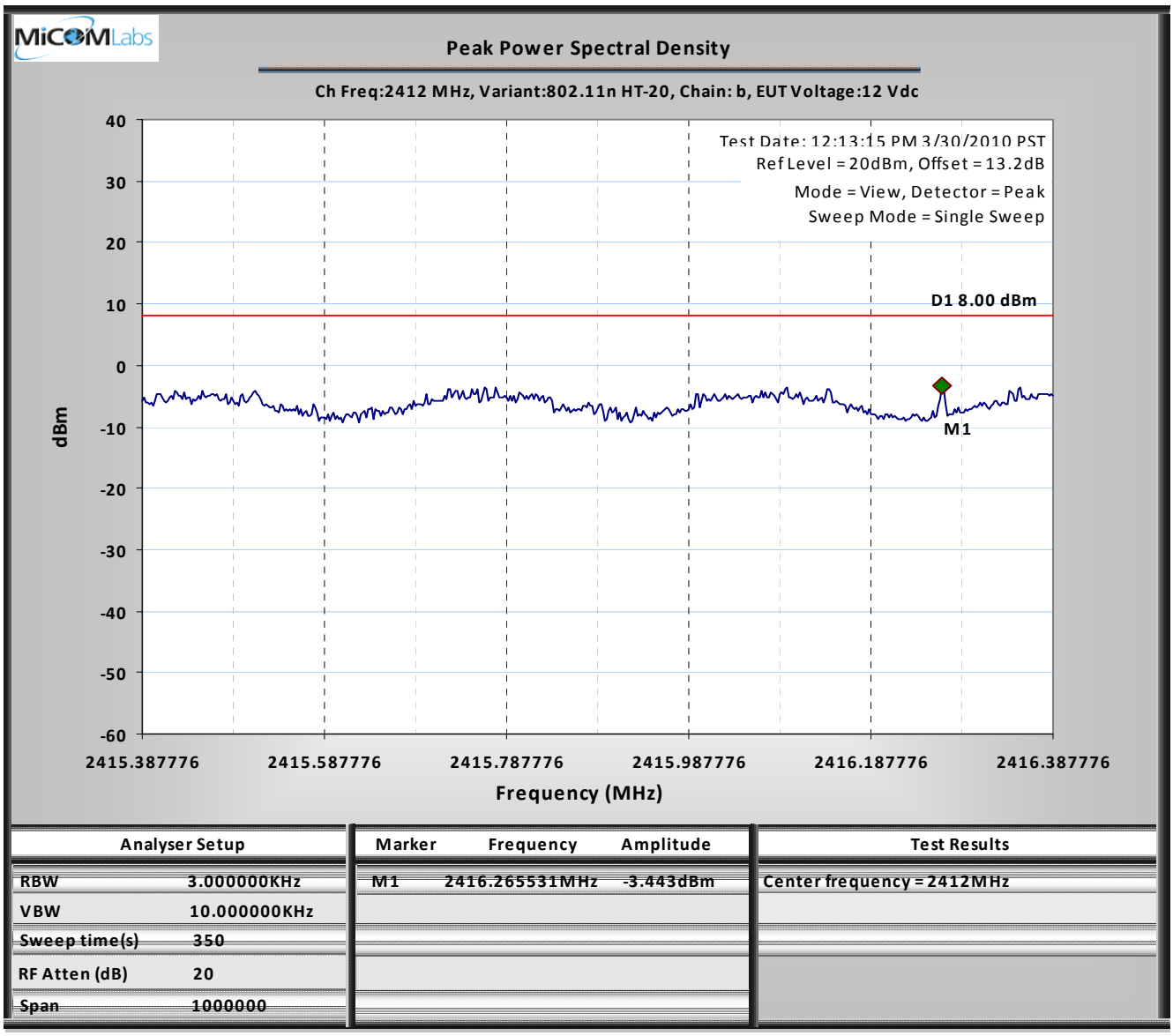
Test Conditions:	15.247 (e)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11n HT-20		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming	N/A	dB	**Antenna Gain:**	6	dBi
Applied Voltage:	12.0	Vdc			
Notes 1:					
Notes 2:					

Test Frequency	Measured Power Density RF Port (dBm)				Total Peak Power Spectral Density (dBm)		Limit	Margin
MHz	**a**	**b**	**c**	**d**	**Combined**	**Calculated**	**dBm**	**dB**
2412	-5.18	-3.44	--	--	1.45	-1.21	8.00	-6.55
2437	-3.02	-5.43	--	--	-0.55	-1.05	8.00	-8.55
2462	-4.60	-4.01	--	--	0.54	-1.28	8.00	-7.46

Measurement uncertainty:	± 1.33 dB



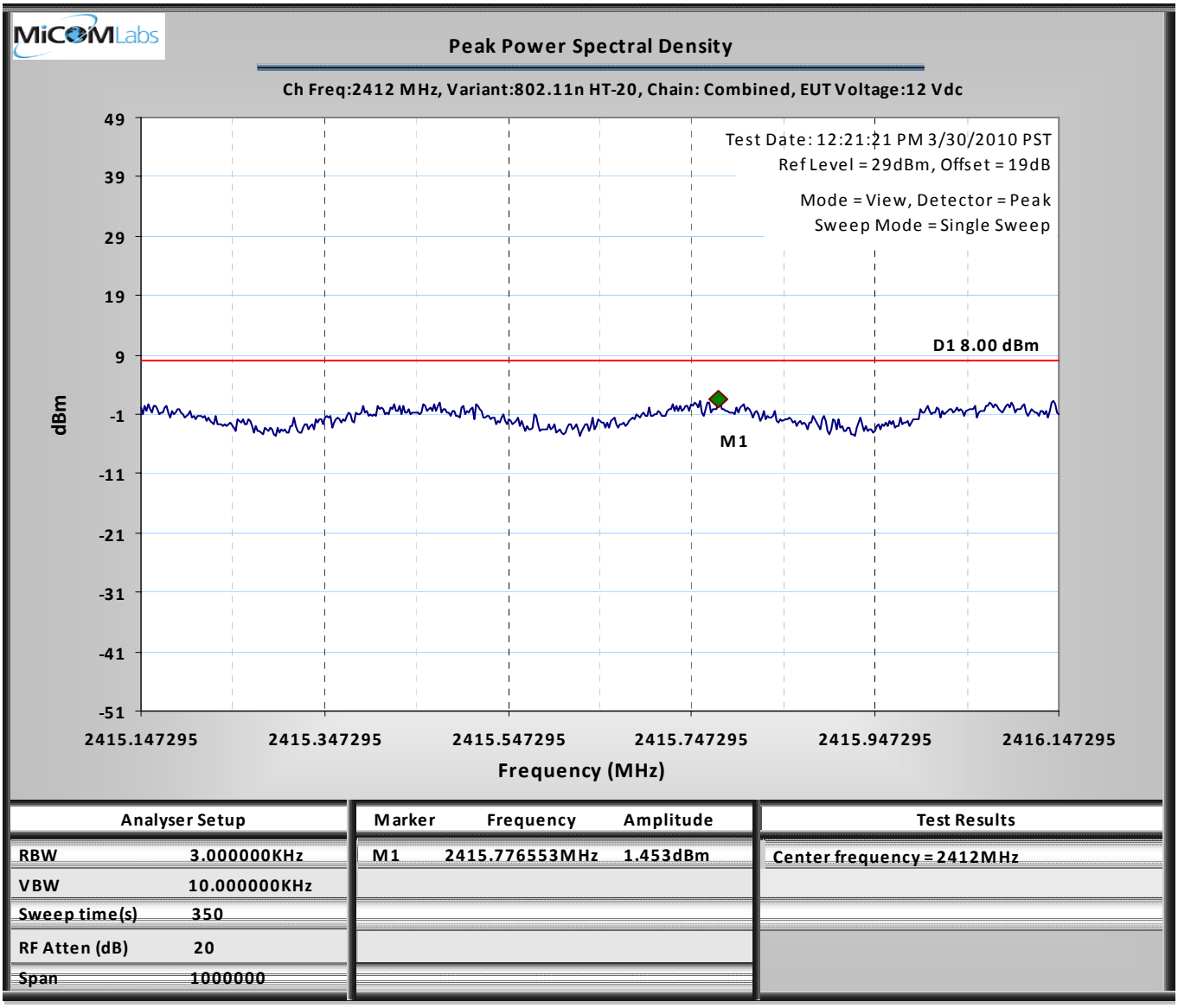
Analyser Setup		Marker	Frequency	Amplitude	Test Results
RBW	3.000000KHz	M1	2413.265531MHz	-5.180dBm	Center frequency = 2412MHz
VBW	10.000000KHz				
Sweep time(s)	350				
RF Atten (dB)	20				
Span	1000000				



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2416.265531MHz	-3.443dBm

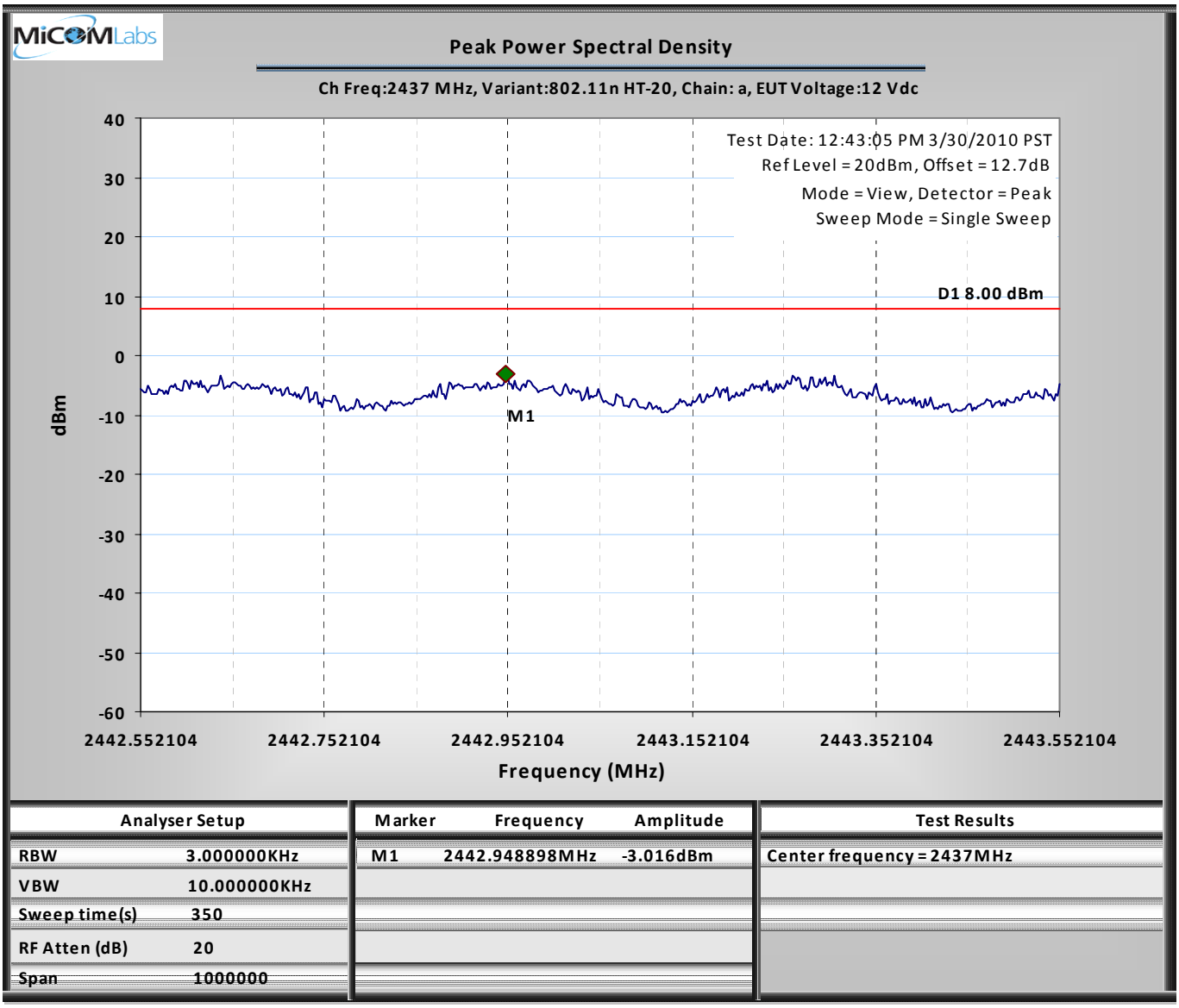
Test Results
Center frequency = 2412MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2415.776553MHz	1.453dBm

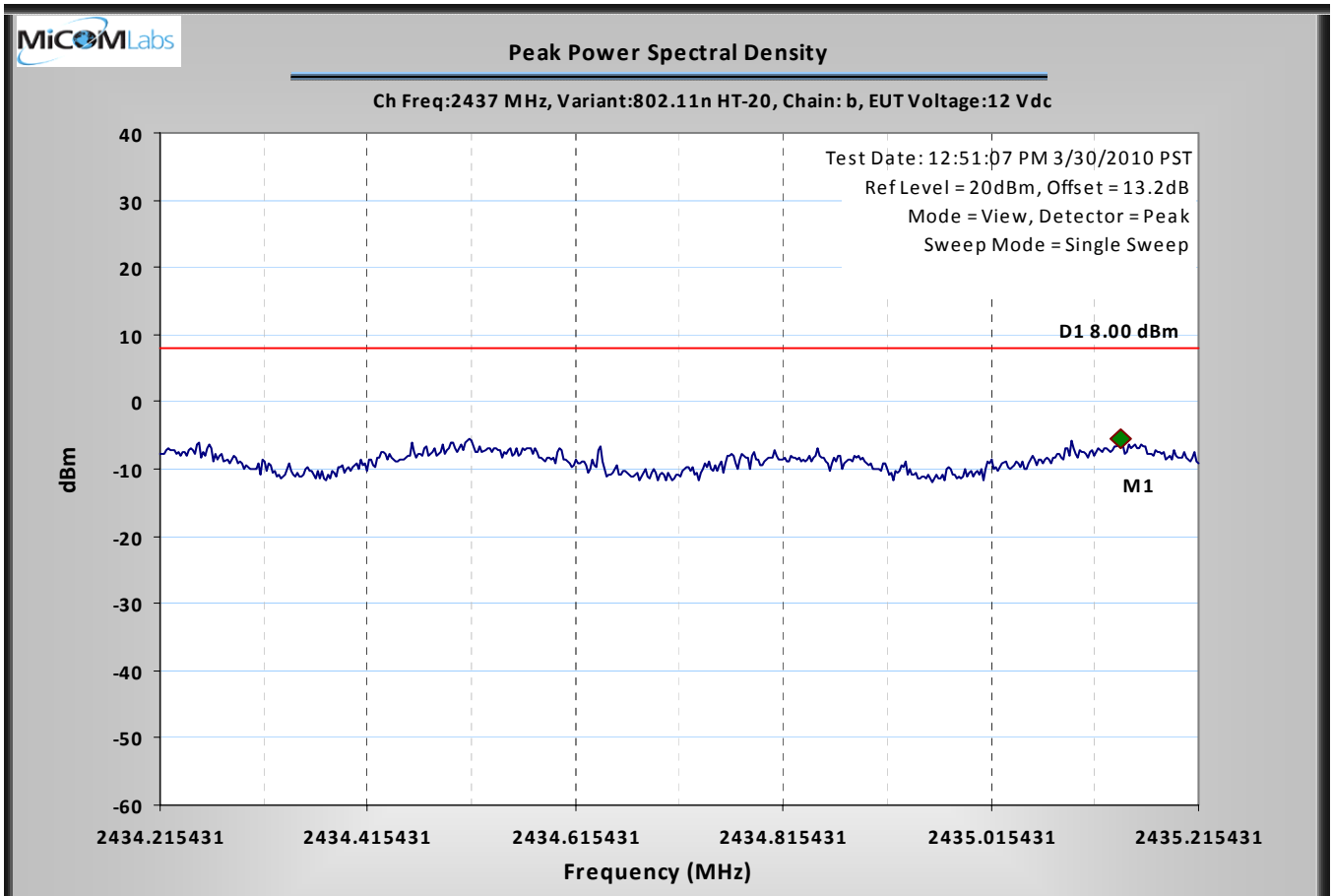
Test Results
Center frequency = 2412MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2442.948898MHz	-3.016dBm

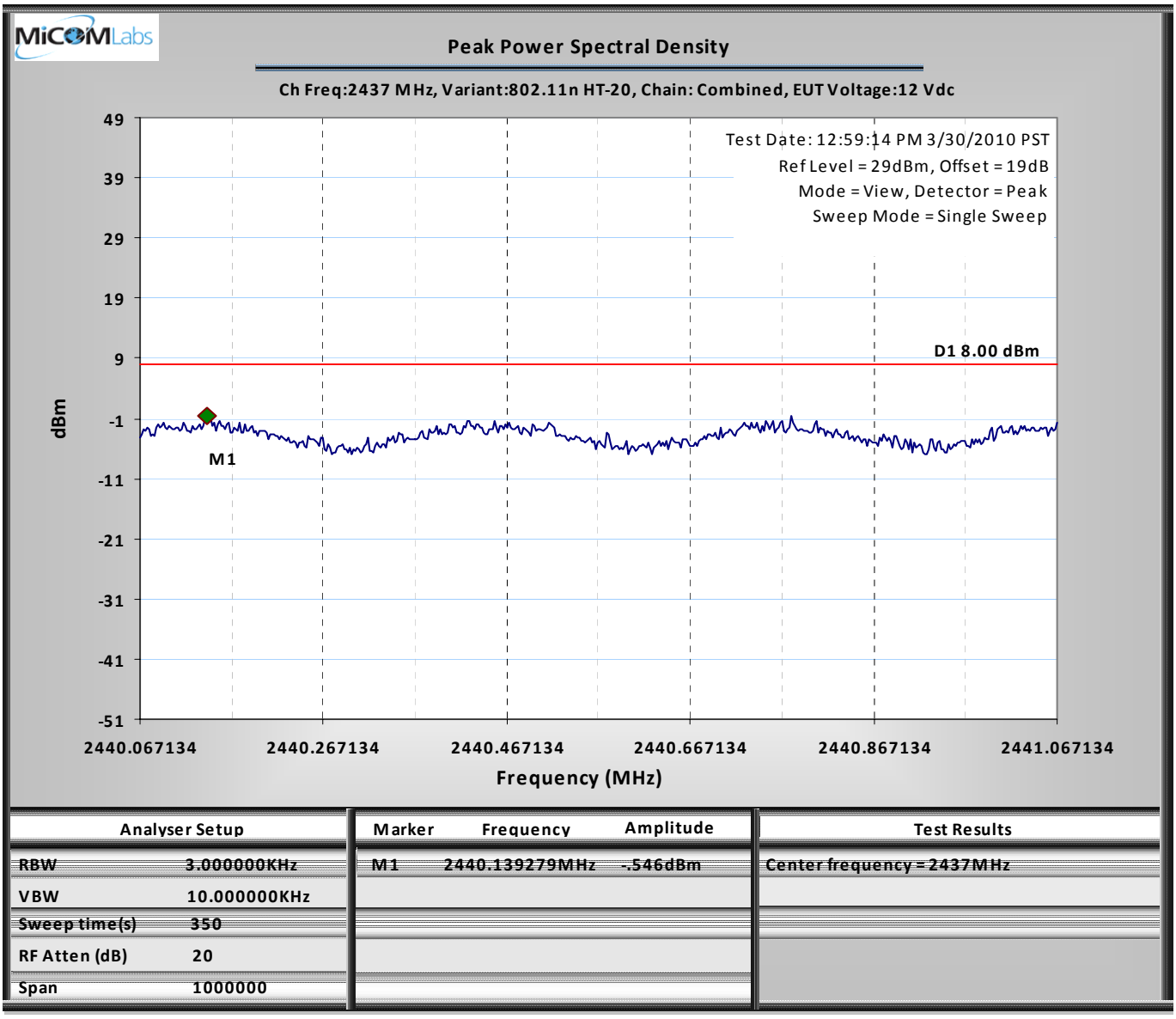
Test Results
Center frequency = 2437MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2435.141283MHz	-5.426dBm

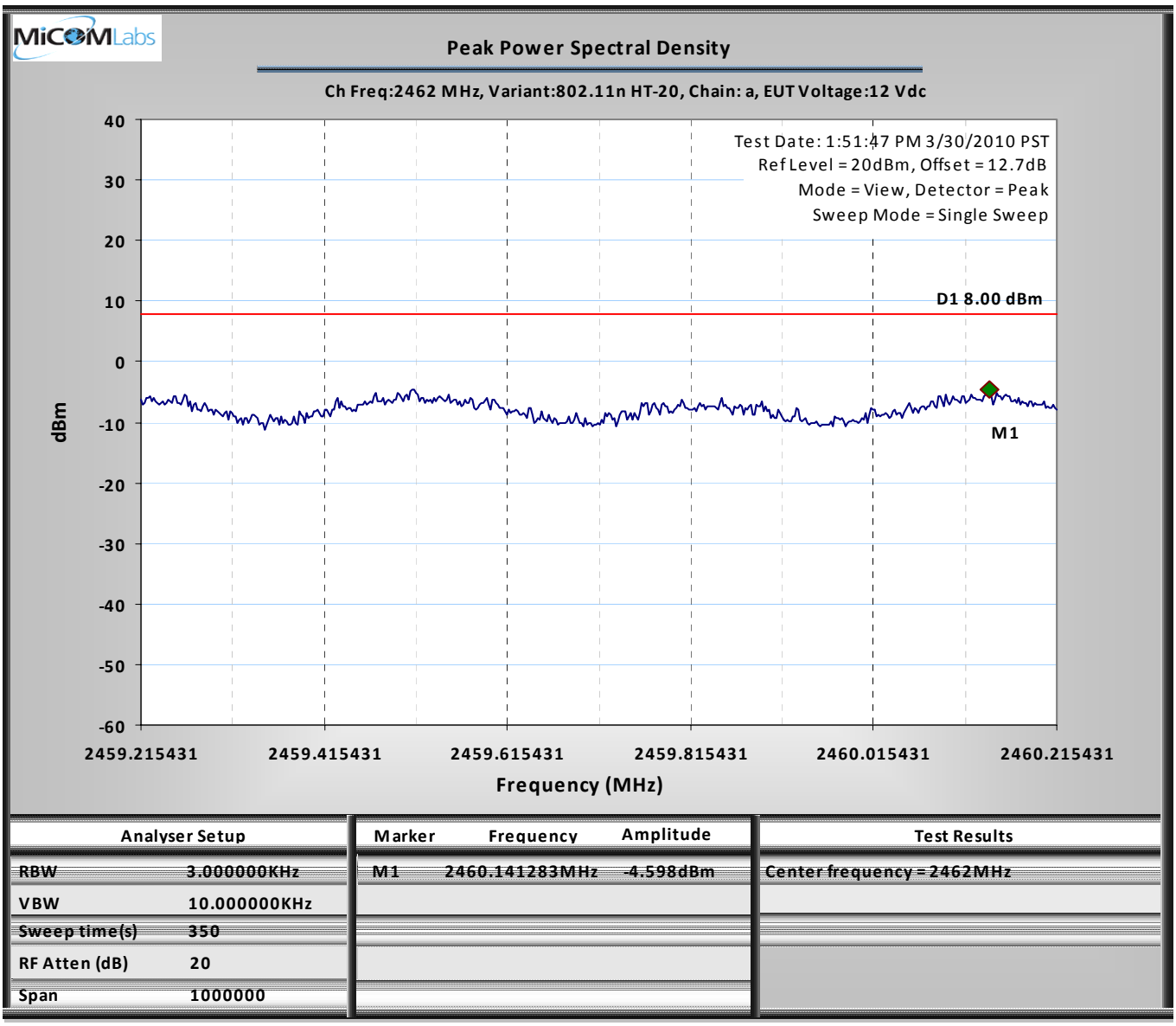
Test Results
Center frequency = 2437MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2440.139279MHz	-.546dBm

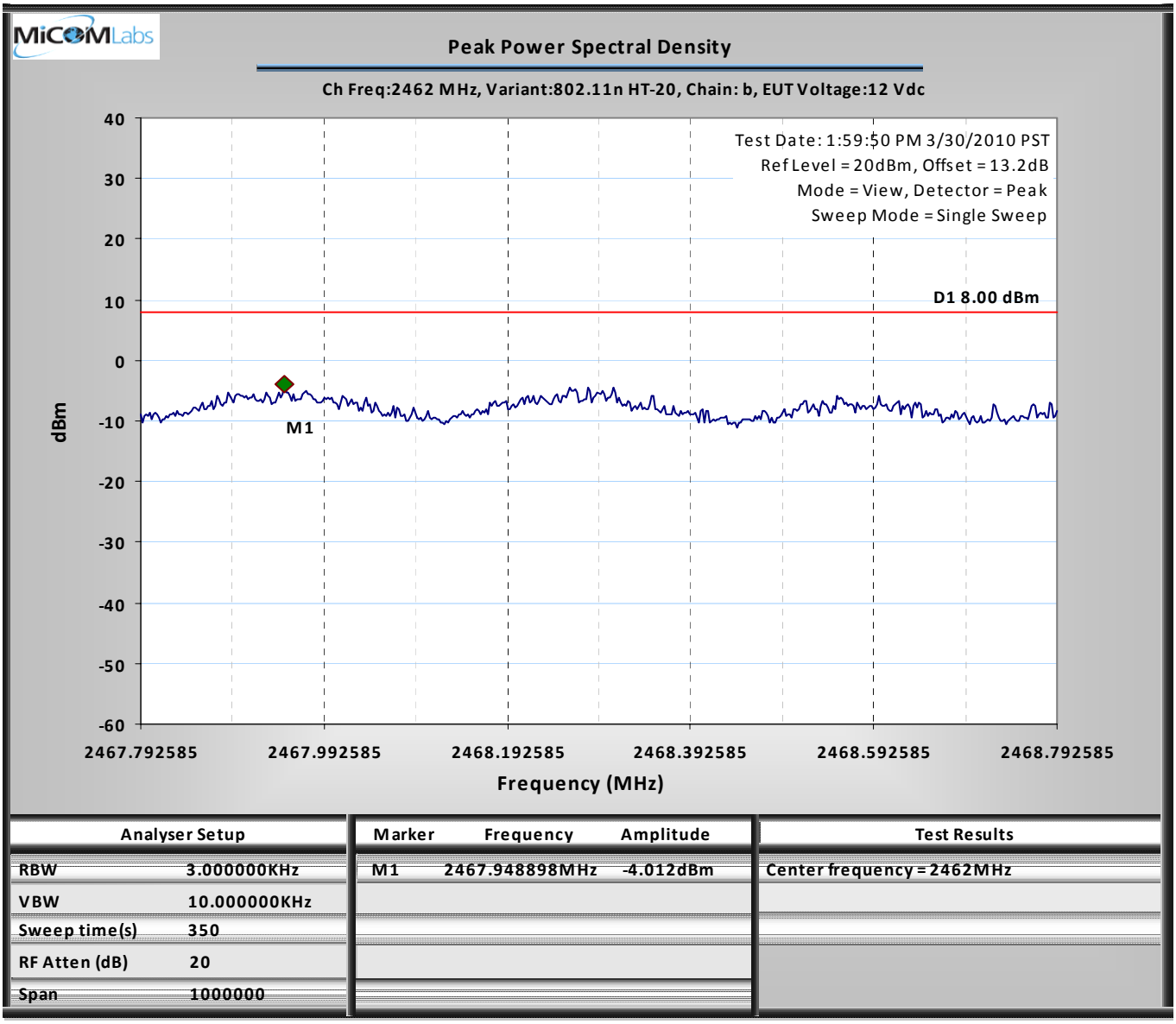
Test Results
Center frequency = 2437MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2460.141283MHz	-4.598dBm

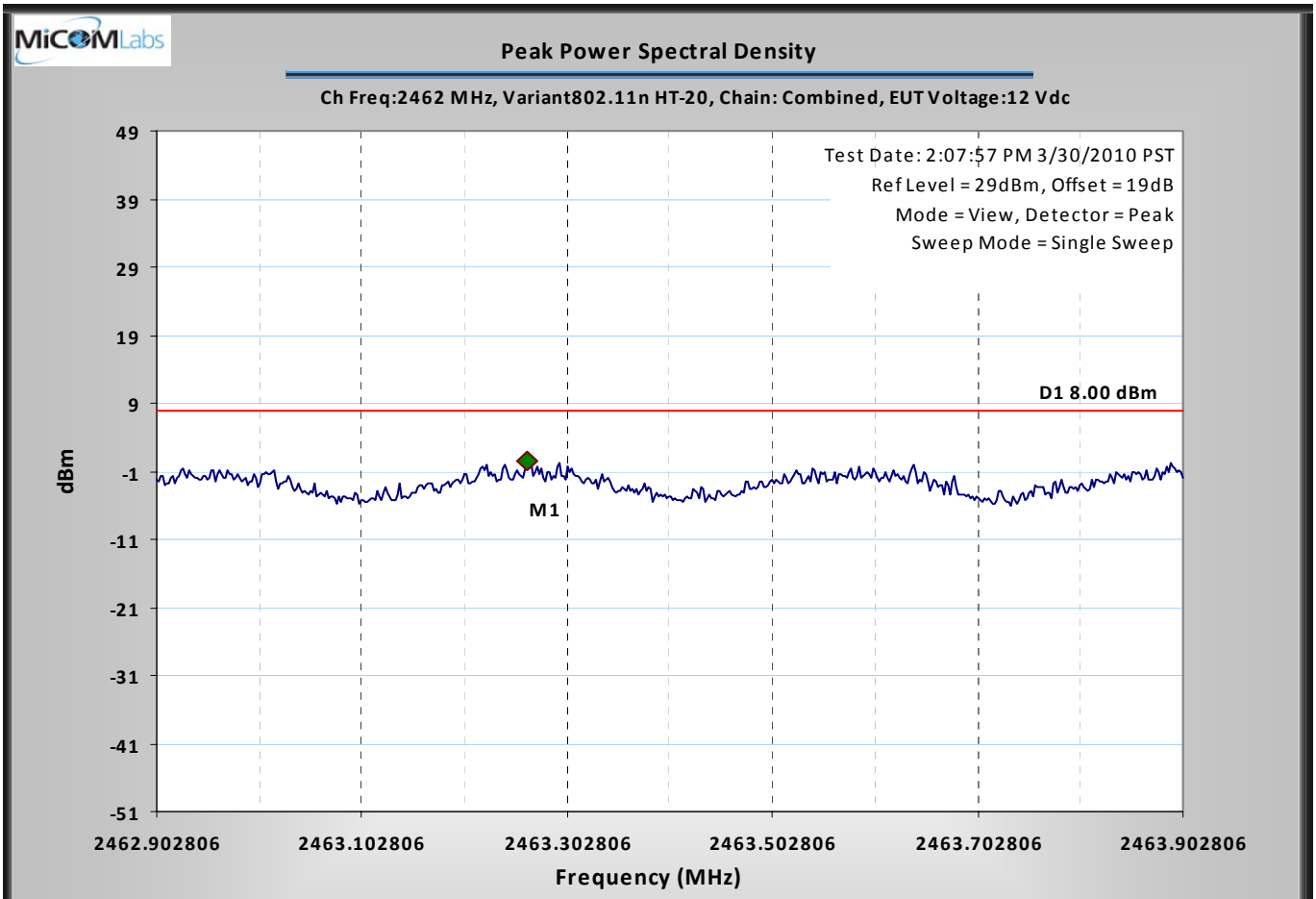
Test Results
Center frequency = 2462MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2467.948898MHz	-4.012dBm

Test Results
Center frequency = 2462MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2463.263527MHz	.542dBm

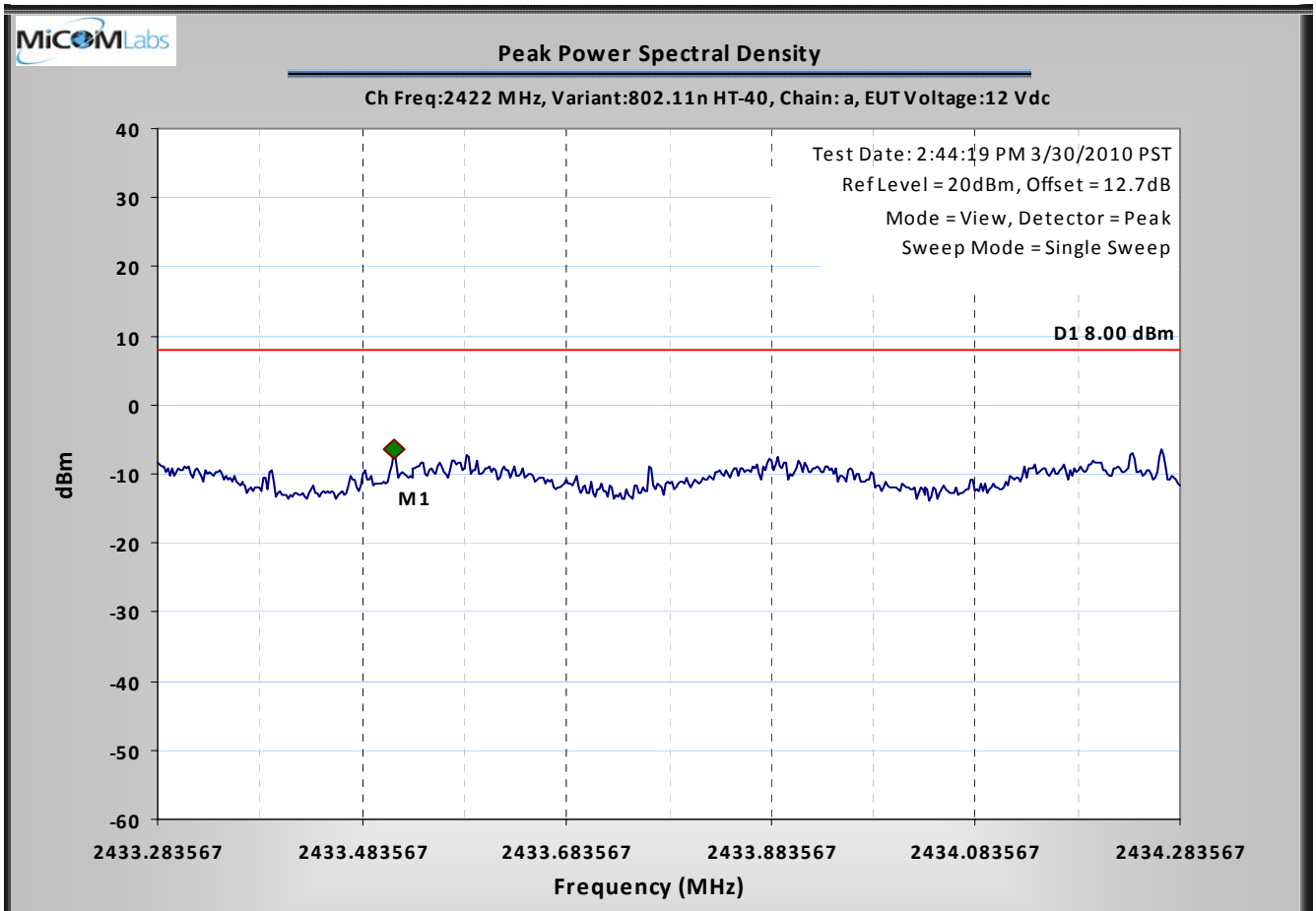
Test Results
Center frequency = 2462MHz

7.3.4 Measurement results for 802.11n HT-40

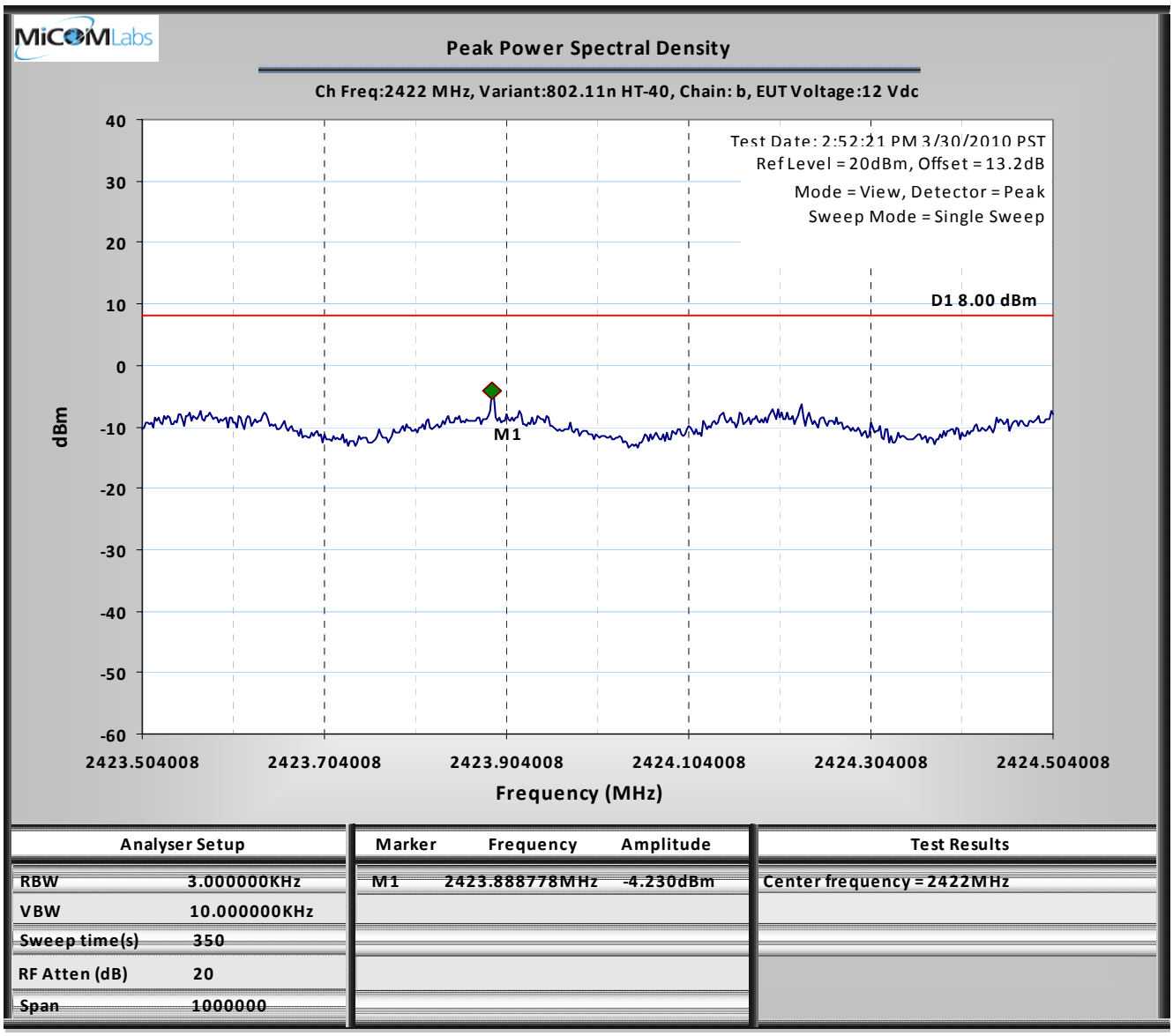
Test Conditions:	15.247 (e)		**Rel. Humidity (%):**	35	to	42
Variant:	802.11n HT-40		**Ambient Temp. (ºC):**	19	to	22
TPC:	HIGH		**Pressure (mBars):**	998	to	1003
Modulation:	ON		**Duty Cycle (%):**	100		
Beam Forming Gain	N/A	dB	**Antenna Gain:**	6	dBi	
Applied Voltage:	12.0	Vdc				
Notes 1:						
Notes 2:						

Test Frequency	Measured Power Density RF Port (dBm)				Total Peak Power Spectral Density		Limit	Margin
MHz	a	b	c	d	Combined	Calculated	dBm	dB
2422	-6.32	-4.23	--	--	0.07	-2.14	8.00	-7.93
2437	-5.34	-6.68	--	--	-2.22	-2.95	8.00	-10.22
2452	-5.72	-8.37	--	--	-1.33	-3.84	8.00	-9.33

Measurement uncertainty:	± 1.33 dB



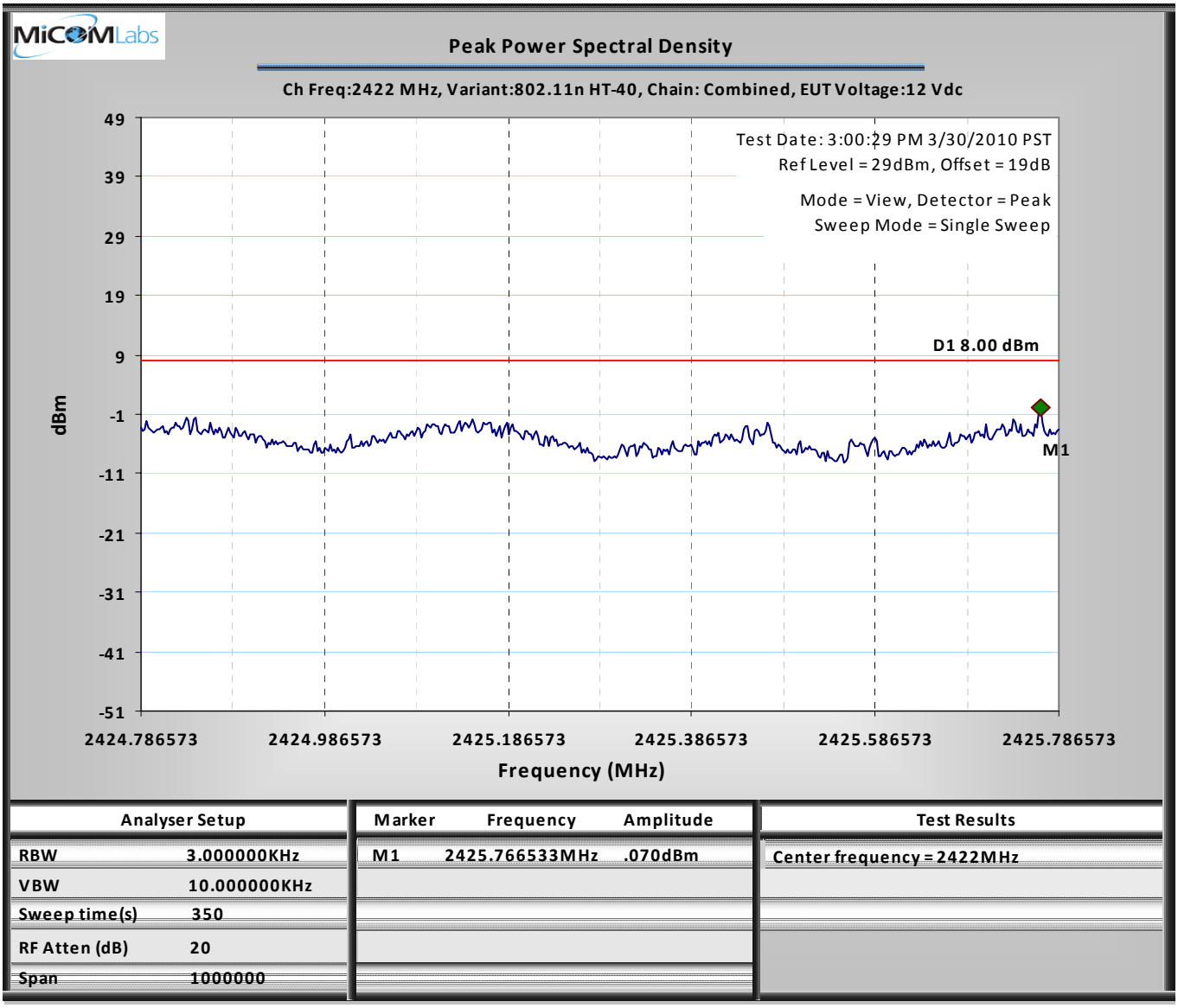
Analyser Setup		Marker	Frequency	Amplitude	Test Results
RBW	3.000000KHz	M1	2433.514028MHz	-6.321dBm	Center frequency = 2422MHz
VBW	10.000000KHz				
Sweep time(s)	350				
RF Atten (dB)	20				
Span	1000000				



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2423.888778MHz	-4.230dBm

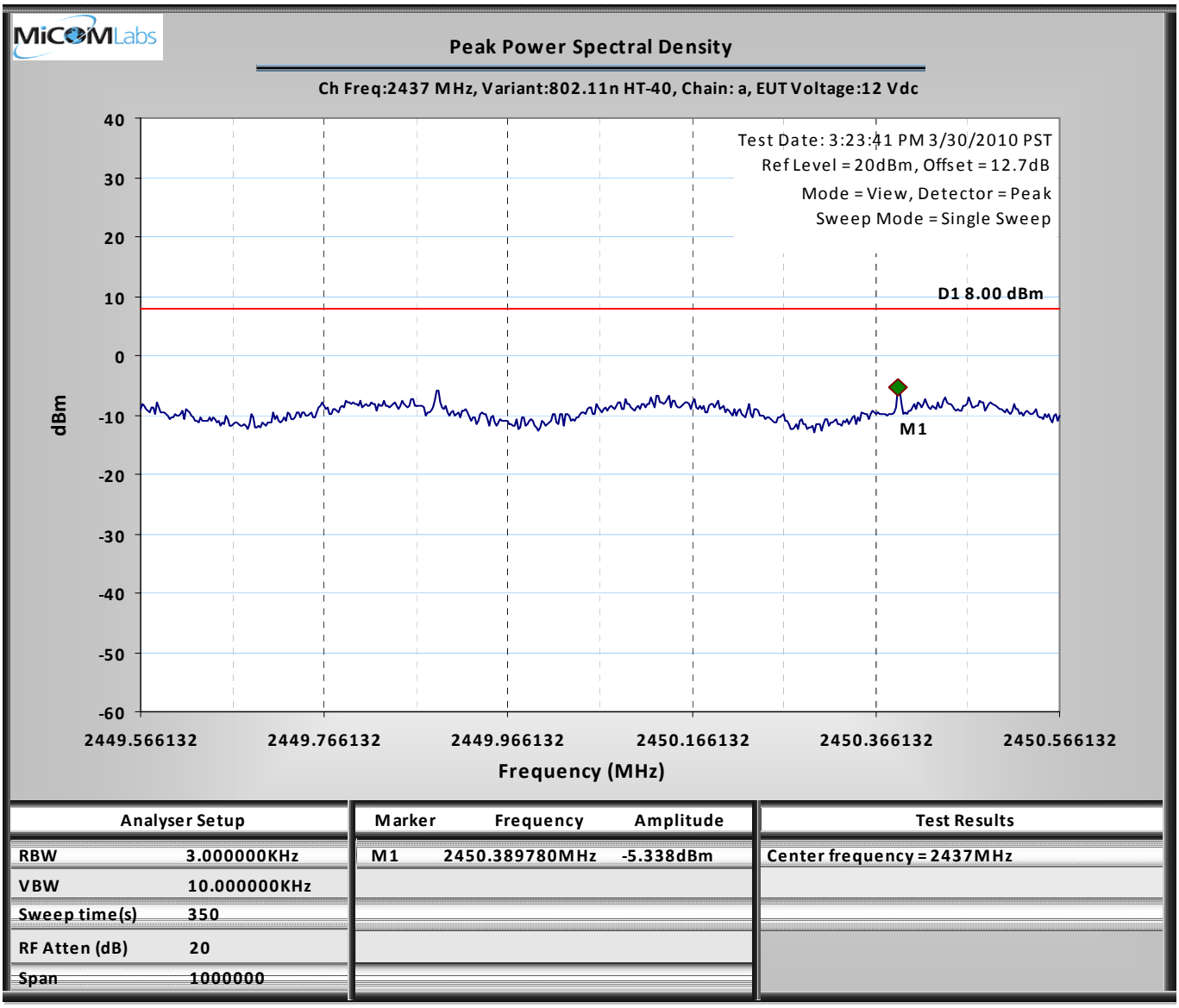
Test Results
Center frequency = 2422MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2425.766533MHz	.070dBm

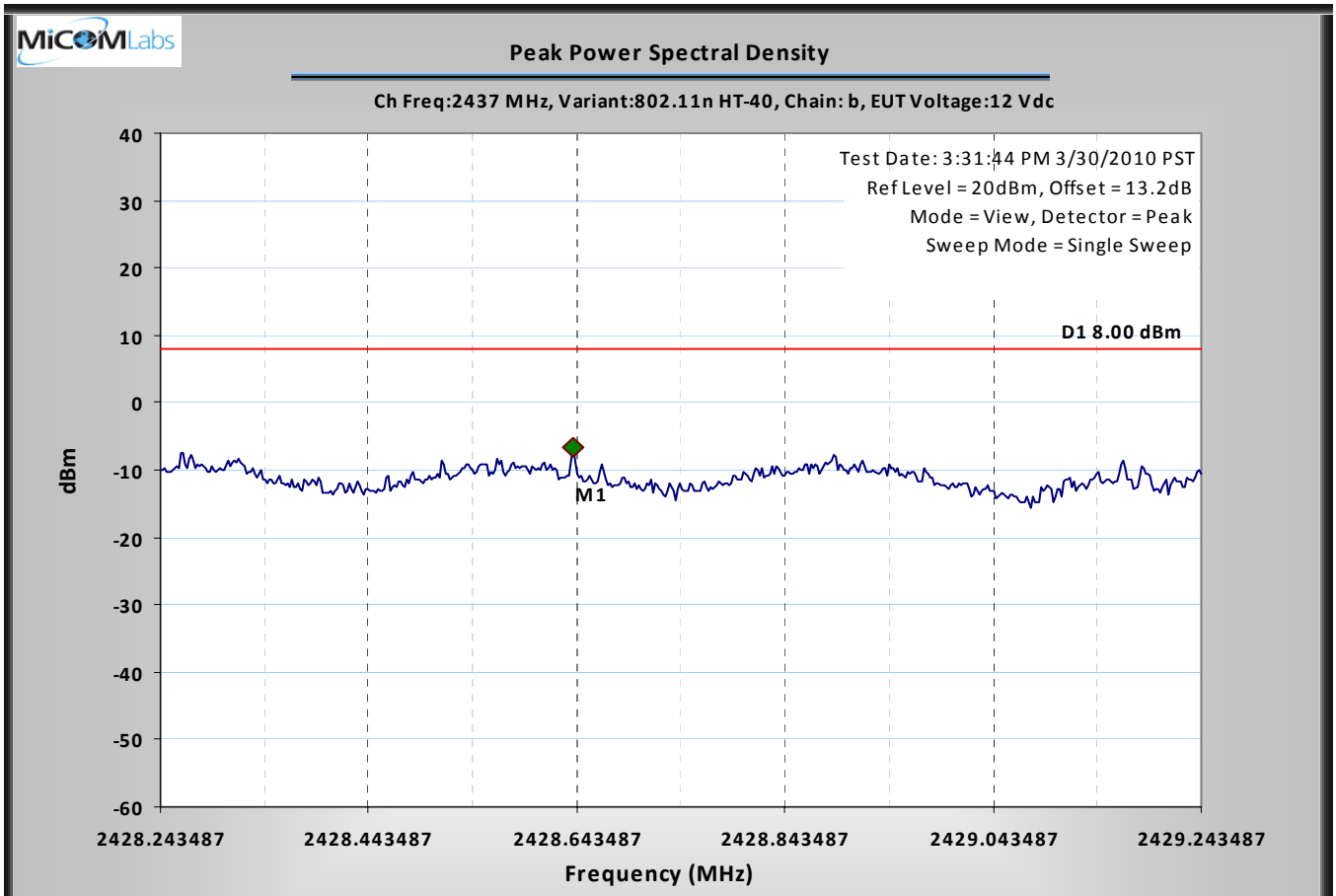
Test Results
Center frequency = 2422MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2450.389780MHz	-5.338dBm

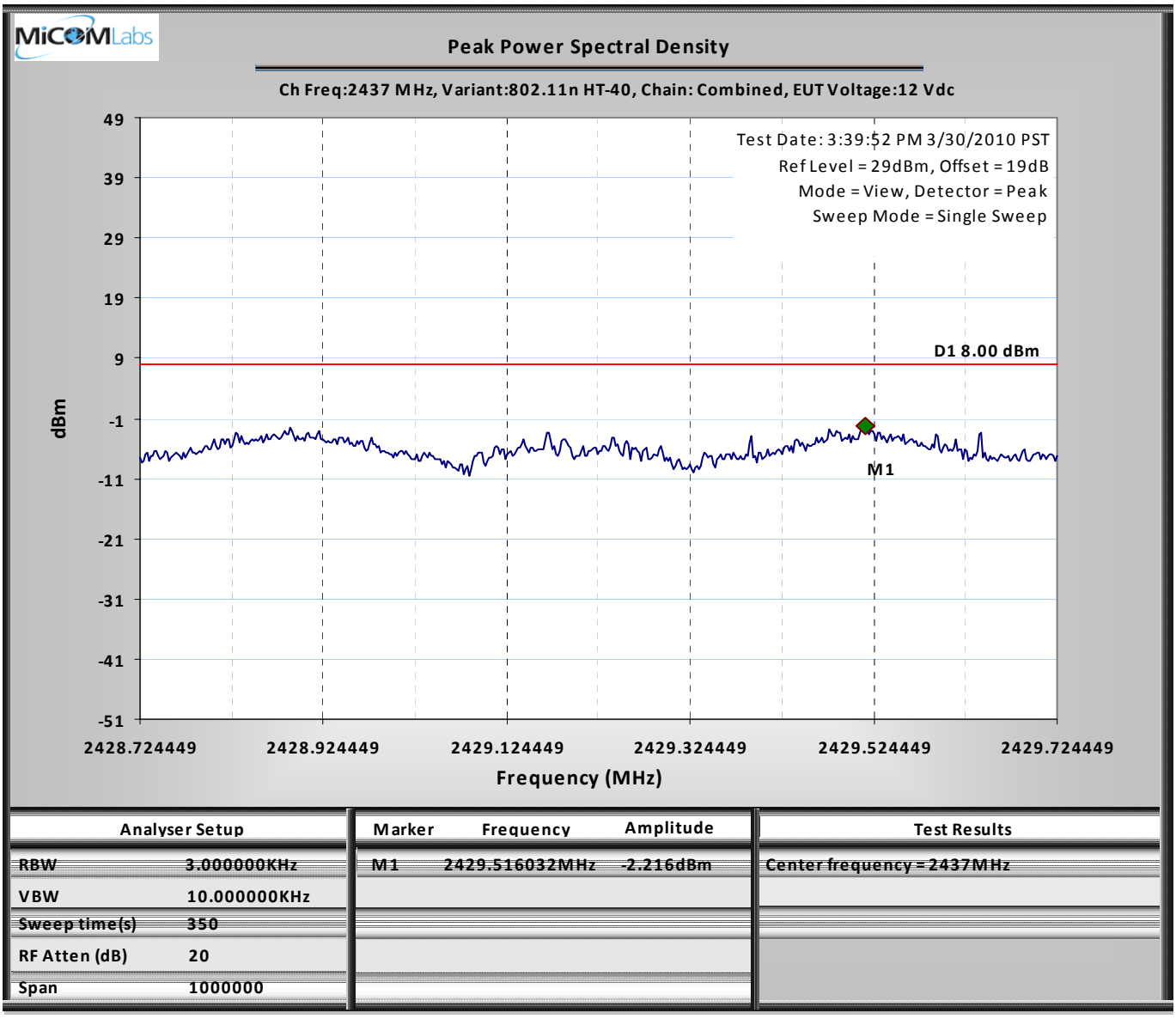
Test Results
Center frequency = 2437MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2428.640281MHz	-6.683dBm

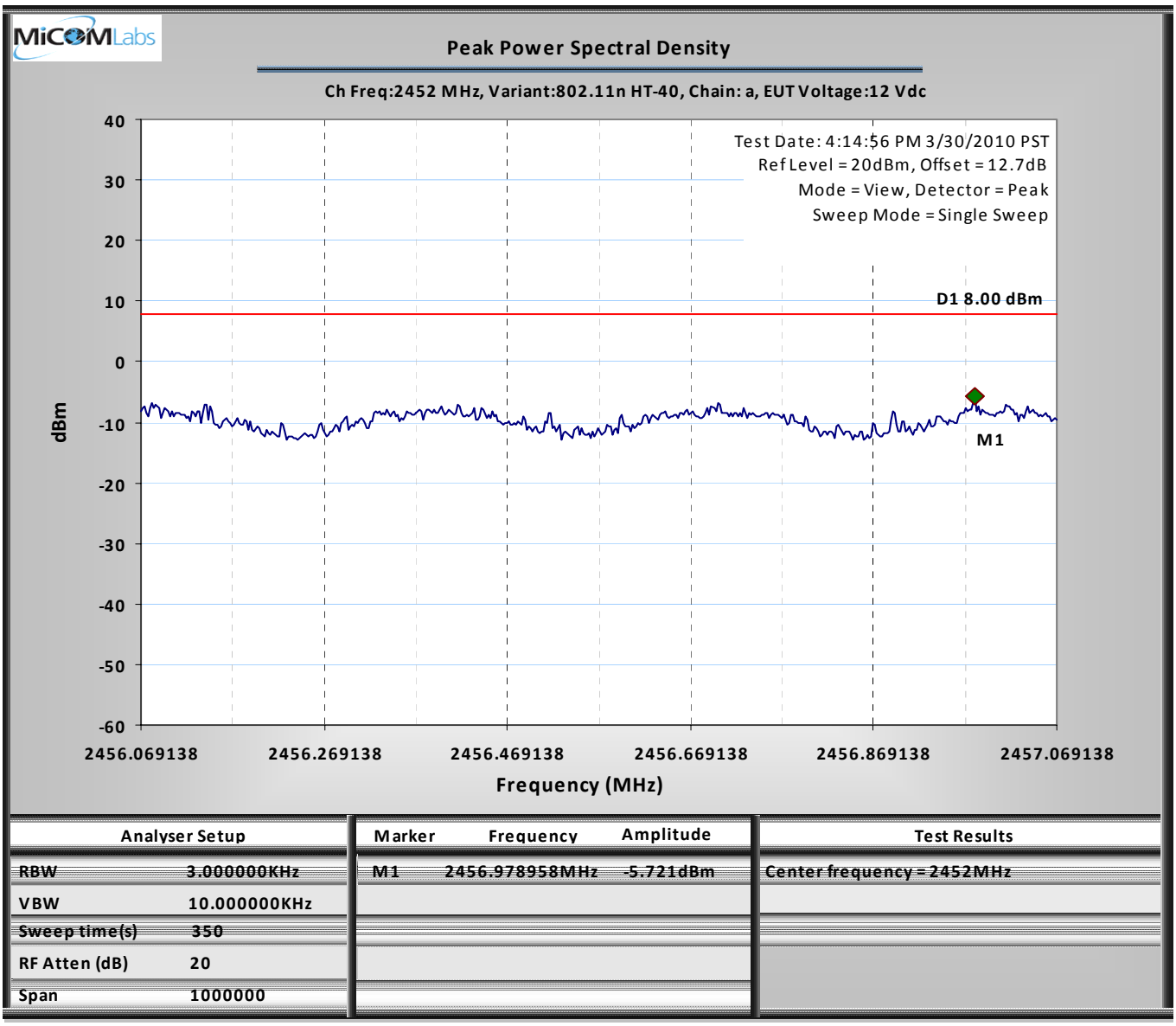
Test Results
Center frequency = 2437MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2429.516032MHz	-2.216dBm

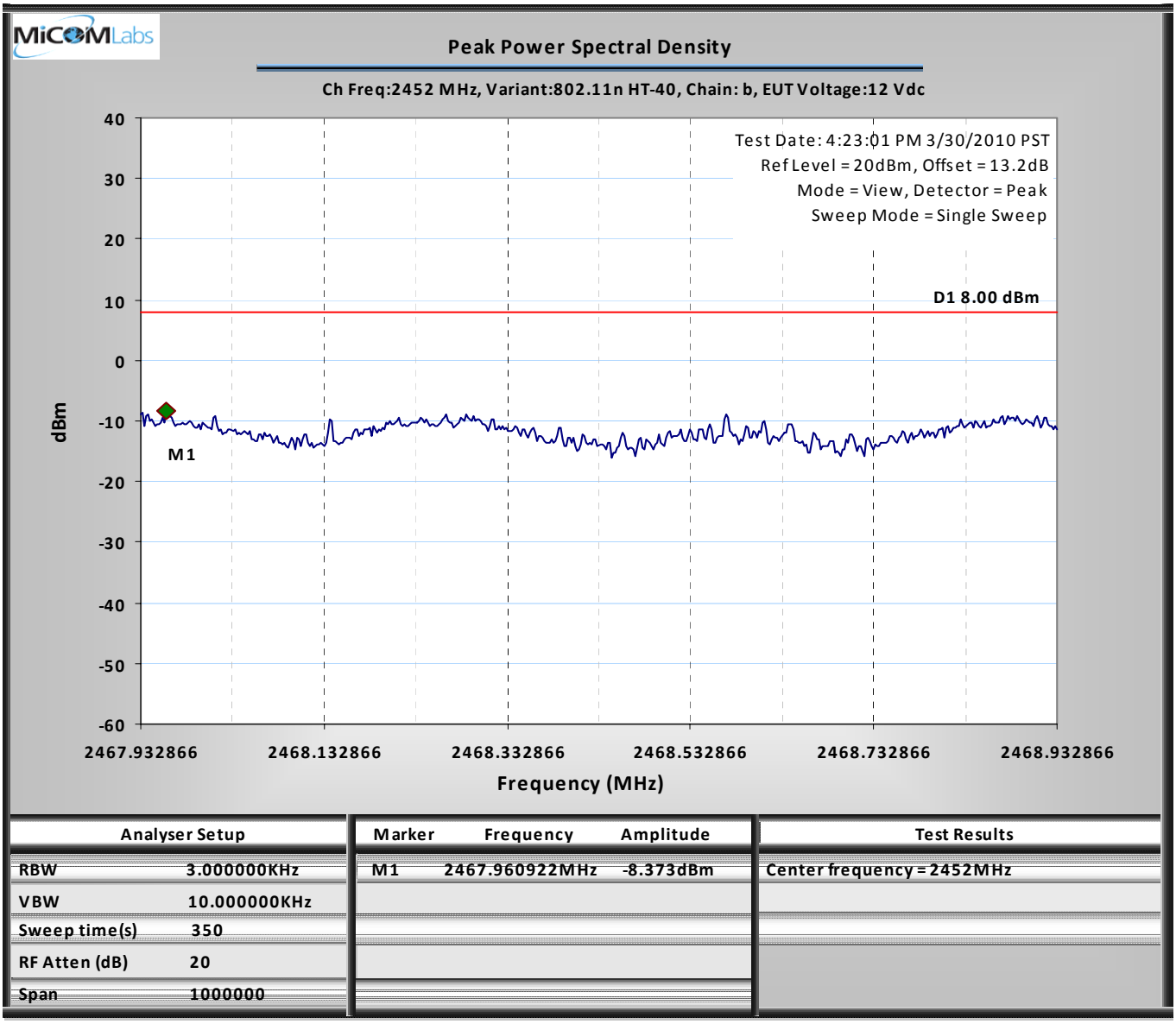
Test Results
Center frequency = 2437MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2456.978958MHz	-5.721dBm

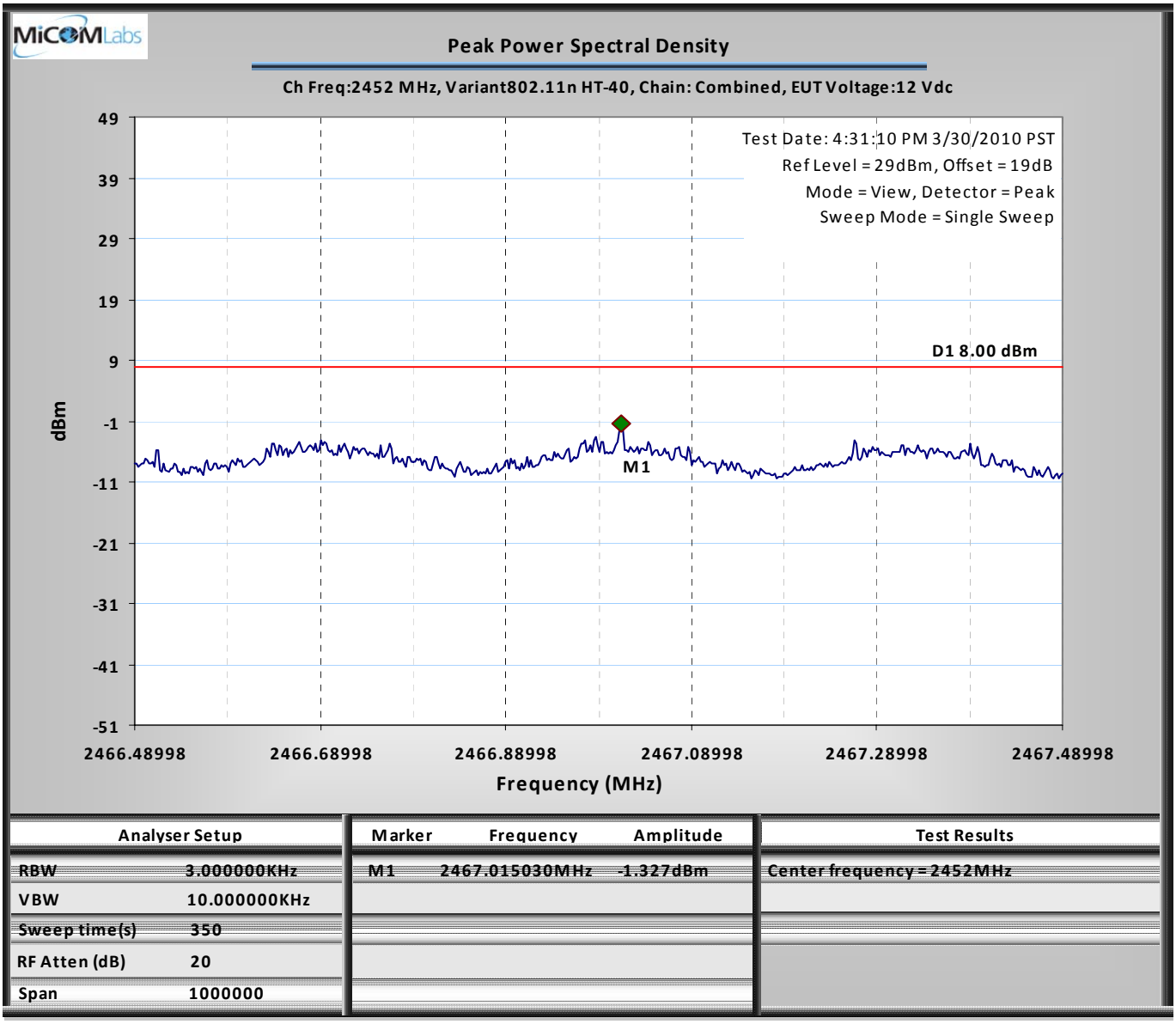
Test Results
Center frequency = 2452MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2467.960922MHz	-8.373dBm

Test Results
Center frequency = 2452MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	2467.015030MHz	-1.327dBm

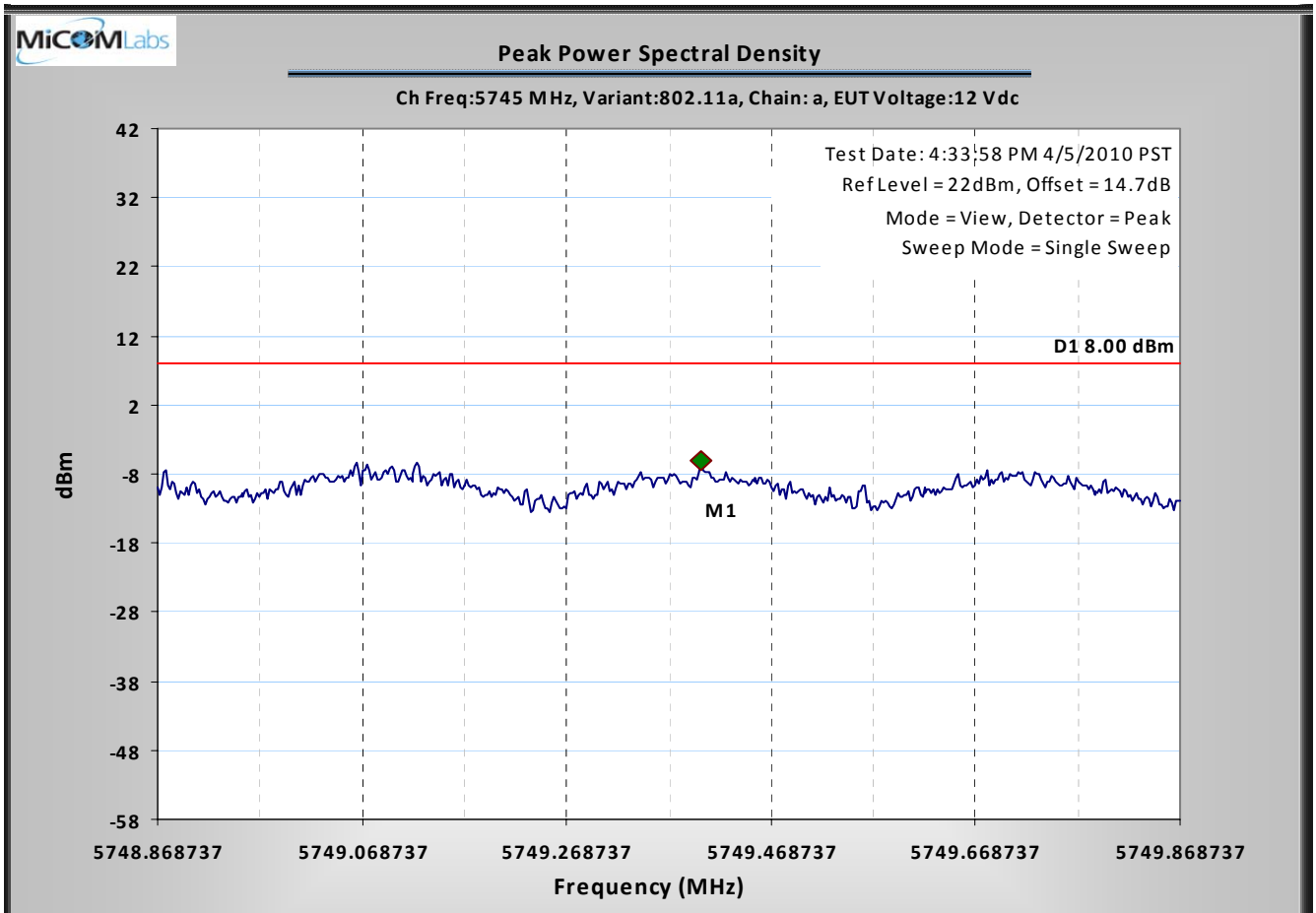
Test Results
Center frequency = 2452MHz

7.3.5 Measurement results for 802.11a

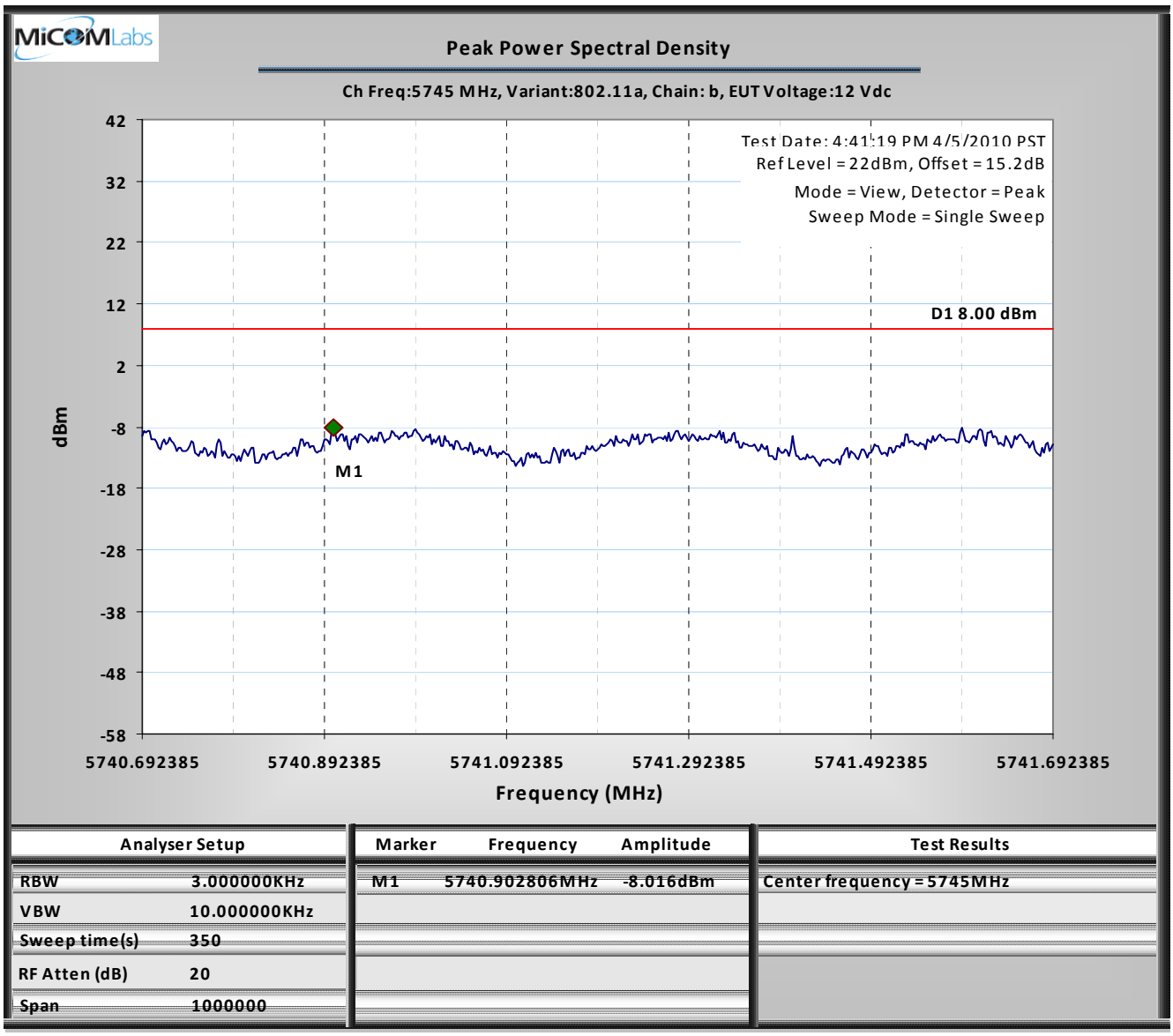
Test Conditions:	15.247 (e)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11a		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming	N/A	dB	**Antenna Gain:**	6	dBi
Applied Voltage:	12.0	Vdc			
Notes 1:					
Notes 2:					

Test Frequency	Measured Power Density RF Port (dBm)				Total Peak Power Spectral Density (dBm)		Limit	Margin
MHz	**a**	**b**	**c**	**d**	**Combined**	**Calculated**	**dBm**	**dB**
5745	-5.94	-8.02	--	--	-2.66	-3.84	8.00	-10.66
5785	-8.40	-8.31	--	--	-2.84	-5.35	8.00	-10.84
5825	-9.01	-7.66	--	--	-3.29	-5.27	8.00	-11.29

Measurement uncertainty:	± 1.33 dB



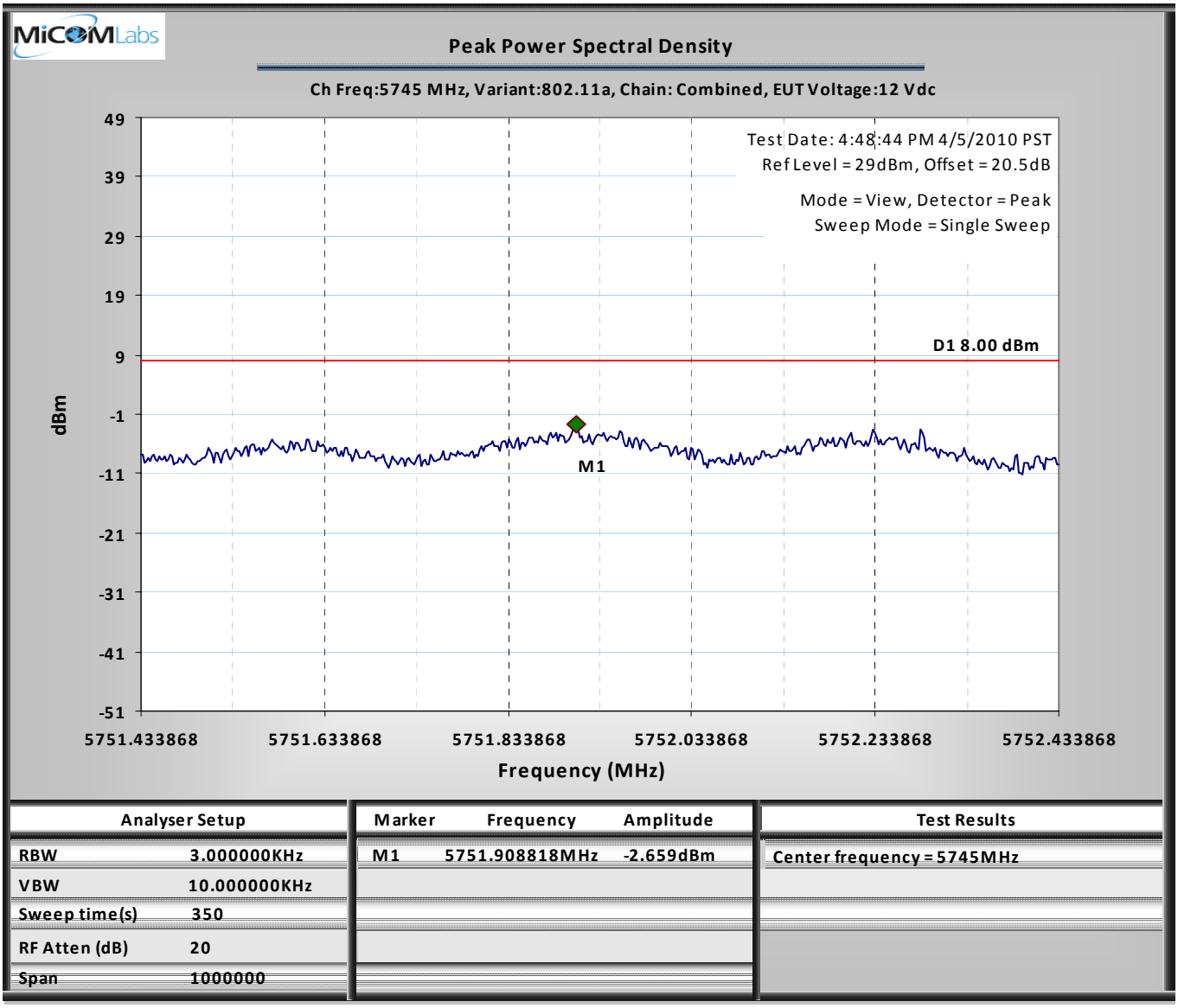
Analyser Setup		Marker	Frequency	Amplitude	Test Results
RBW	3.000000KHz	M1	5749.399800MHz	-5.940dBm	Center frequency = 5745MHz
VBW	10.000000KHz				
Sweep time(s)	350				
RF Atten (dB)	20				
Span	1000000				



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	5740.902806MHz	-8.016dBm

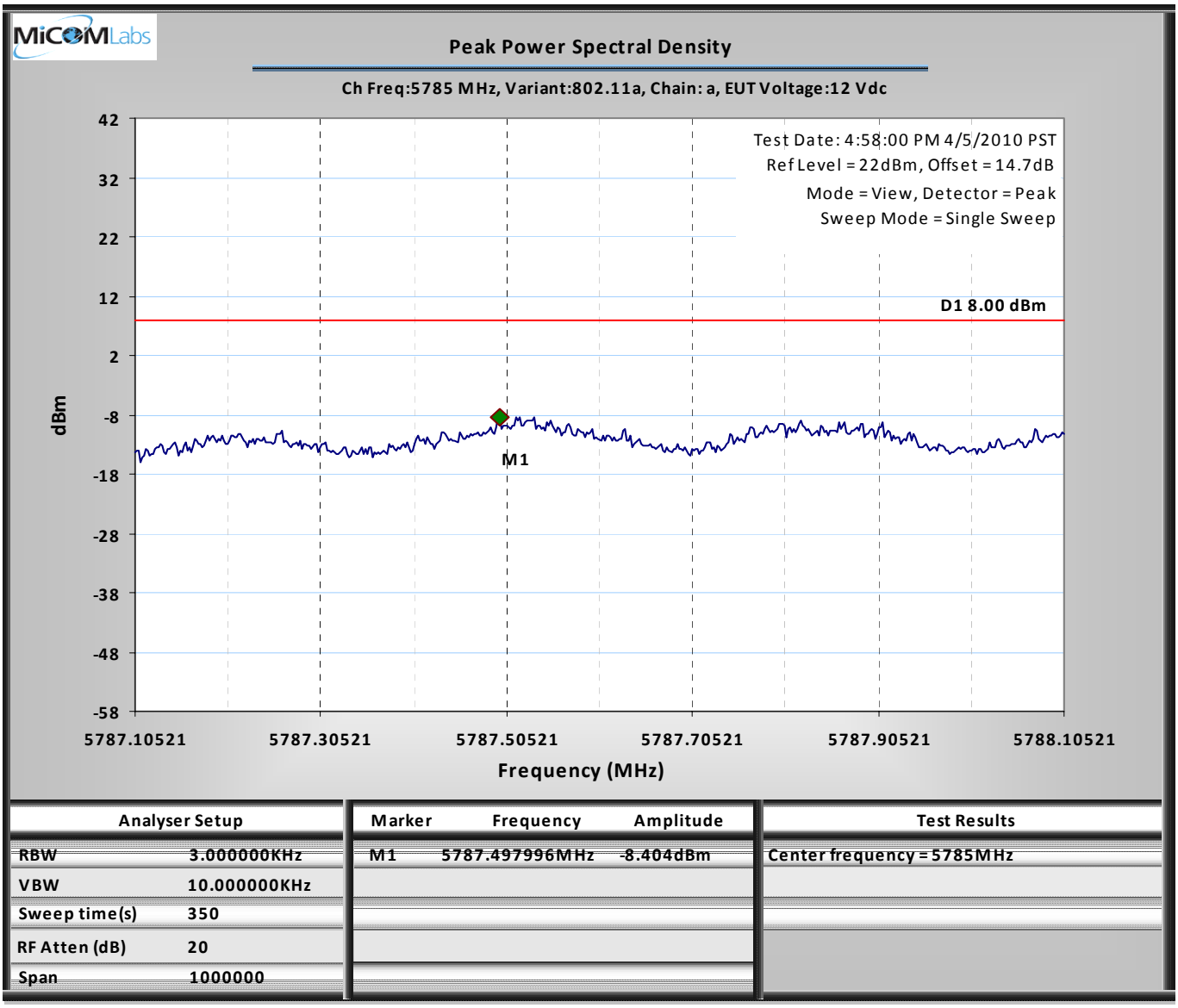
Test Results
Center frequency = 5745MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	5751.908818MHz	-2.659dBm

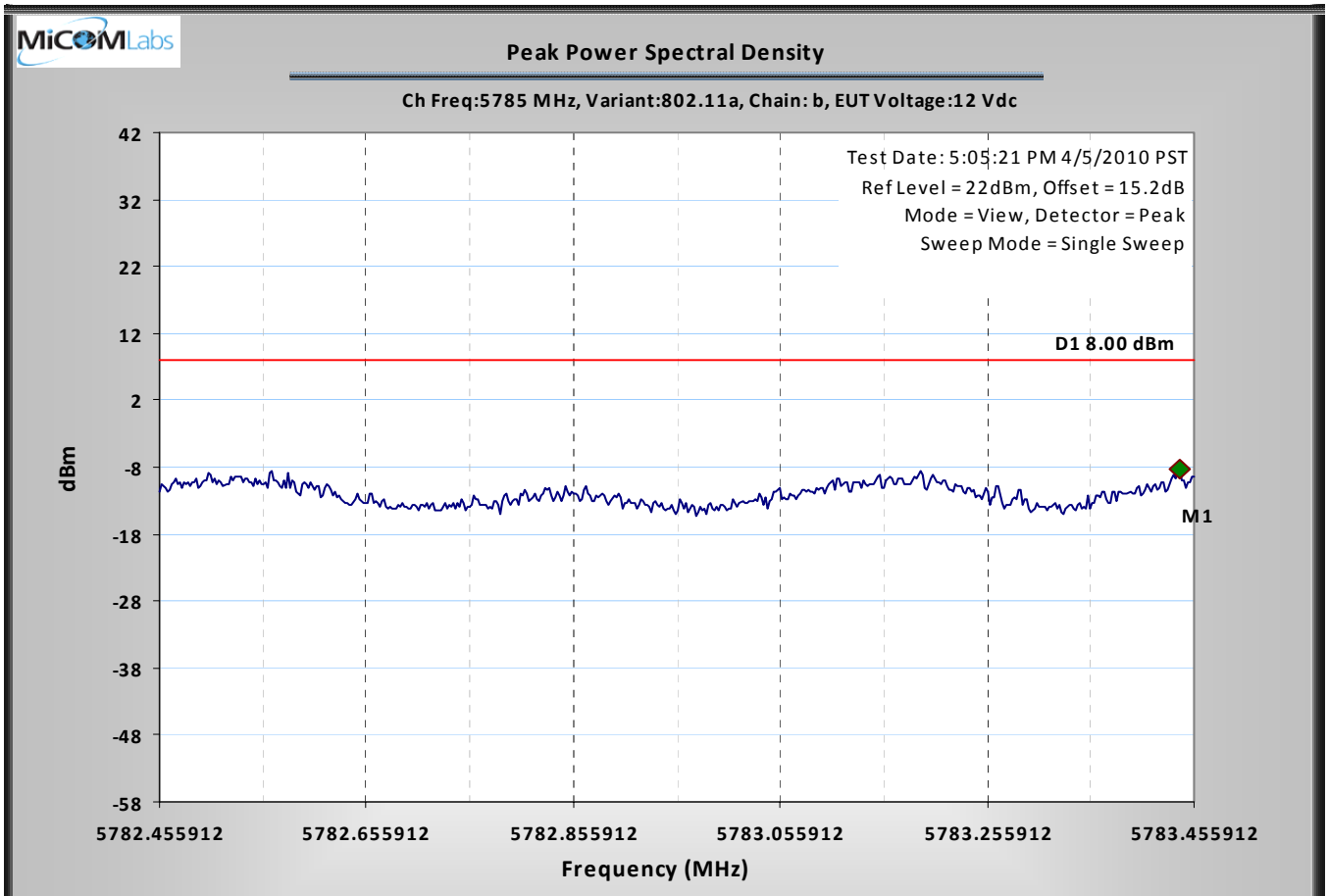
Test Results
Center frequency = 5745MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	5787.497996MHz	-8.404dBm

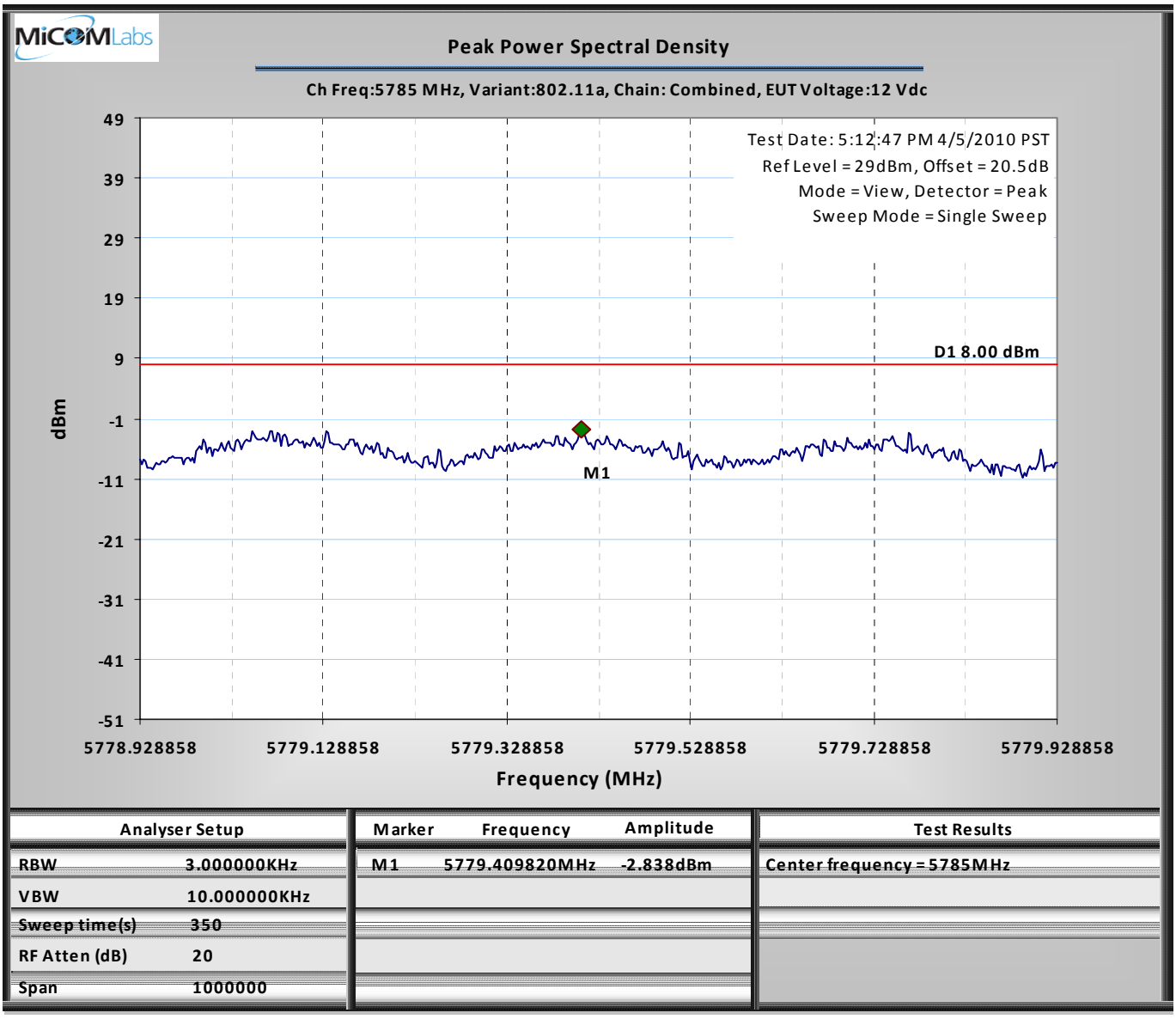
Test Results
Center frequency = 5785MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	5783.441884MHz	-8.311dBm

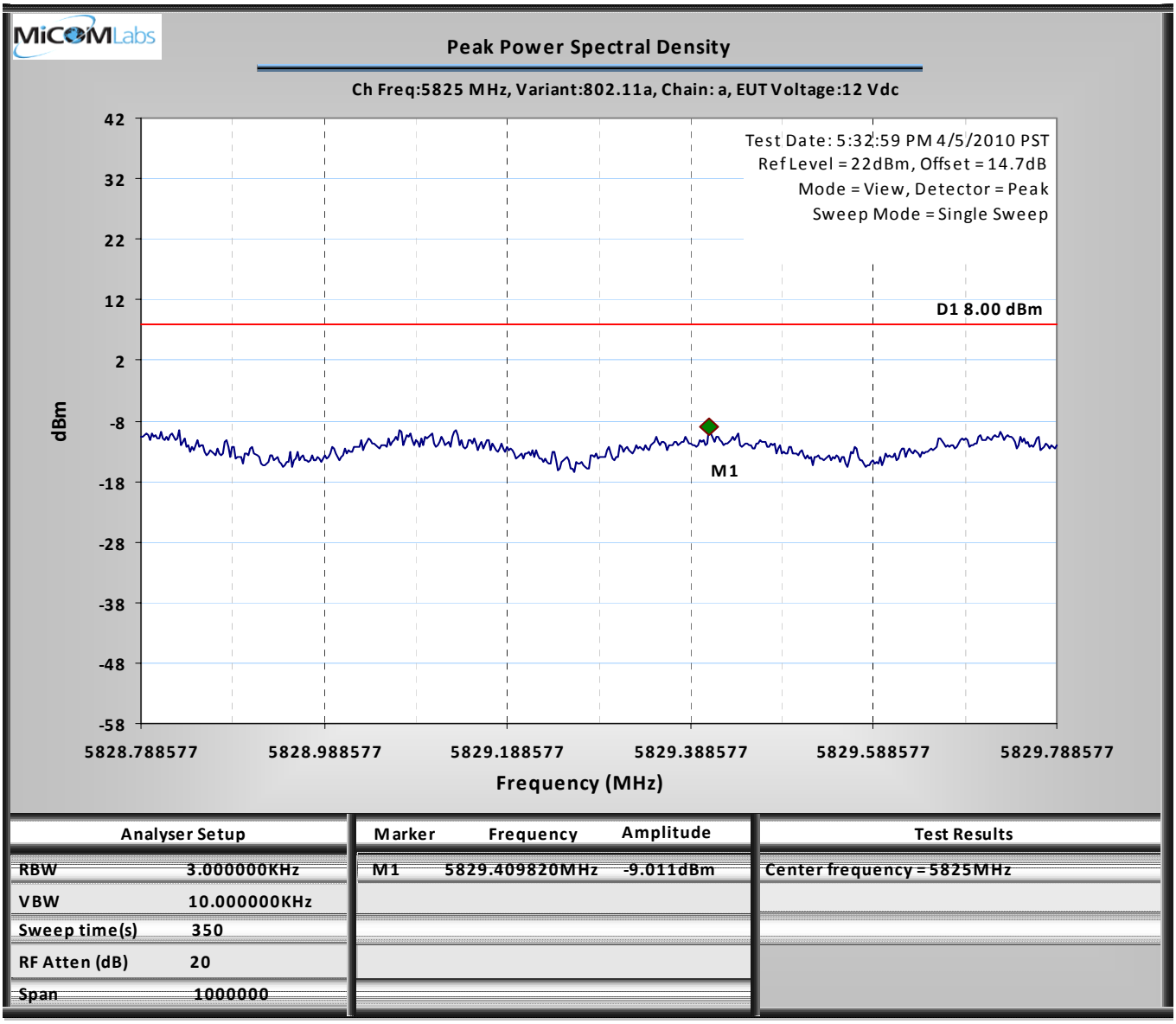
Test Results
Center frequency = 5785MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	5779.409820MHz	-2.838dBm

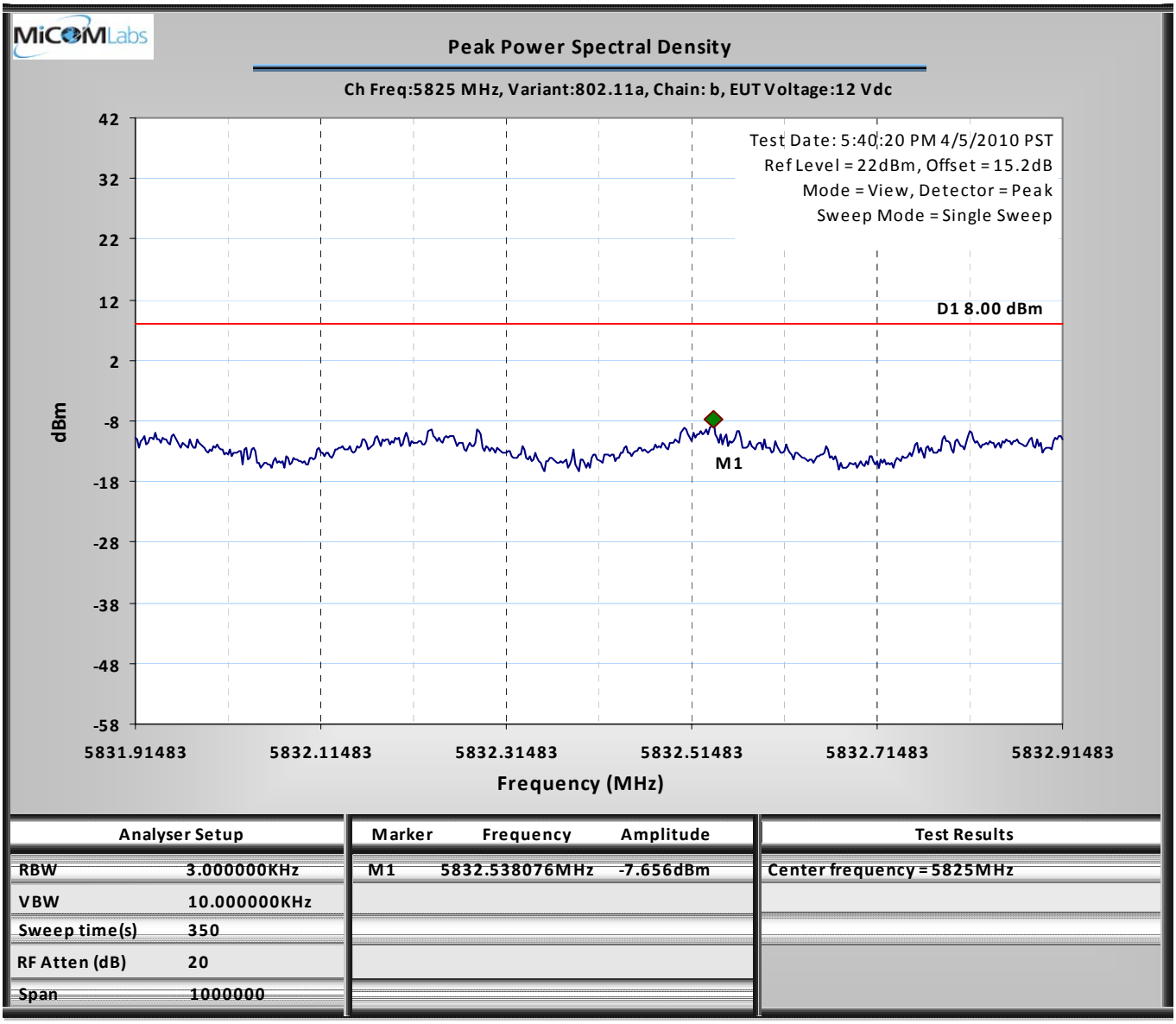
Test Results
Center frequency = 5785MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	5829.409820MHz	-9.011dBm

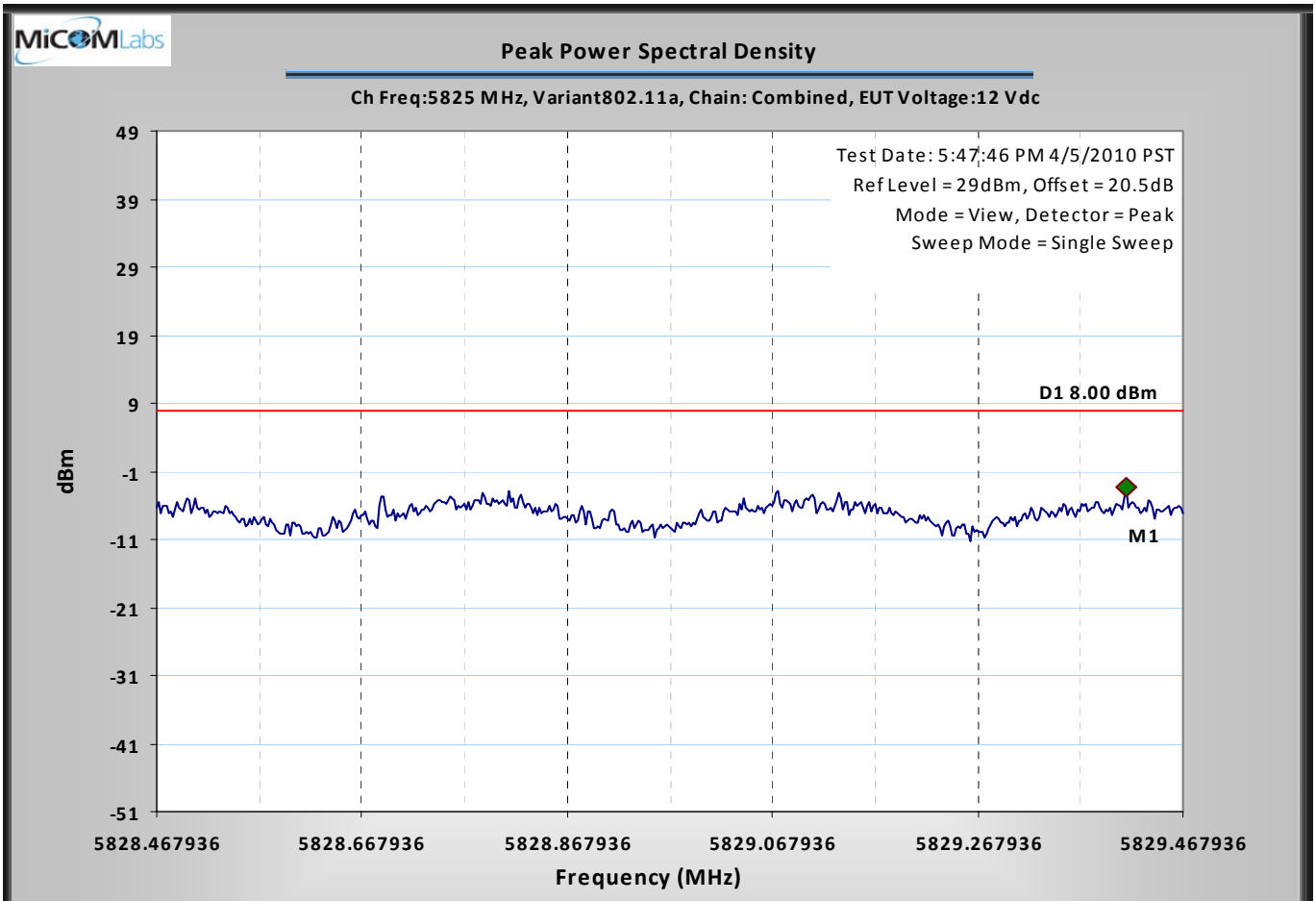
Test Results
Center frequency = 5825MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	5832.538076MHz	-7.656dBm

Test Results
Center frequency = 5825MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	5829.411824MHz	-3.290dBm

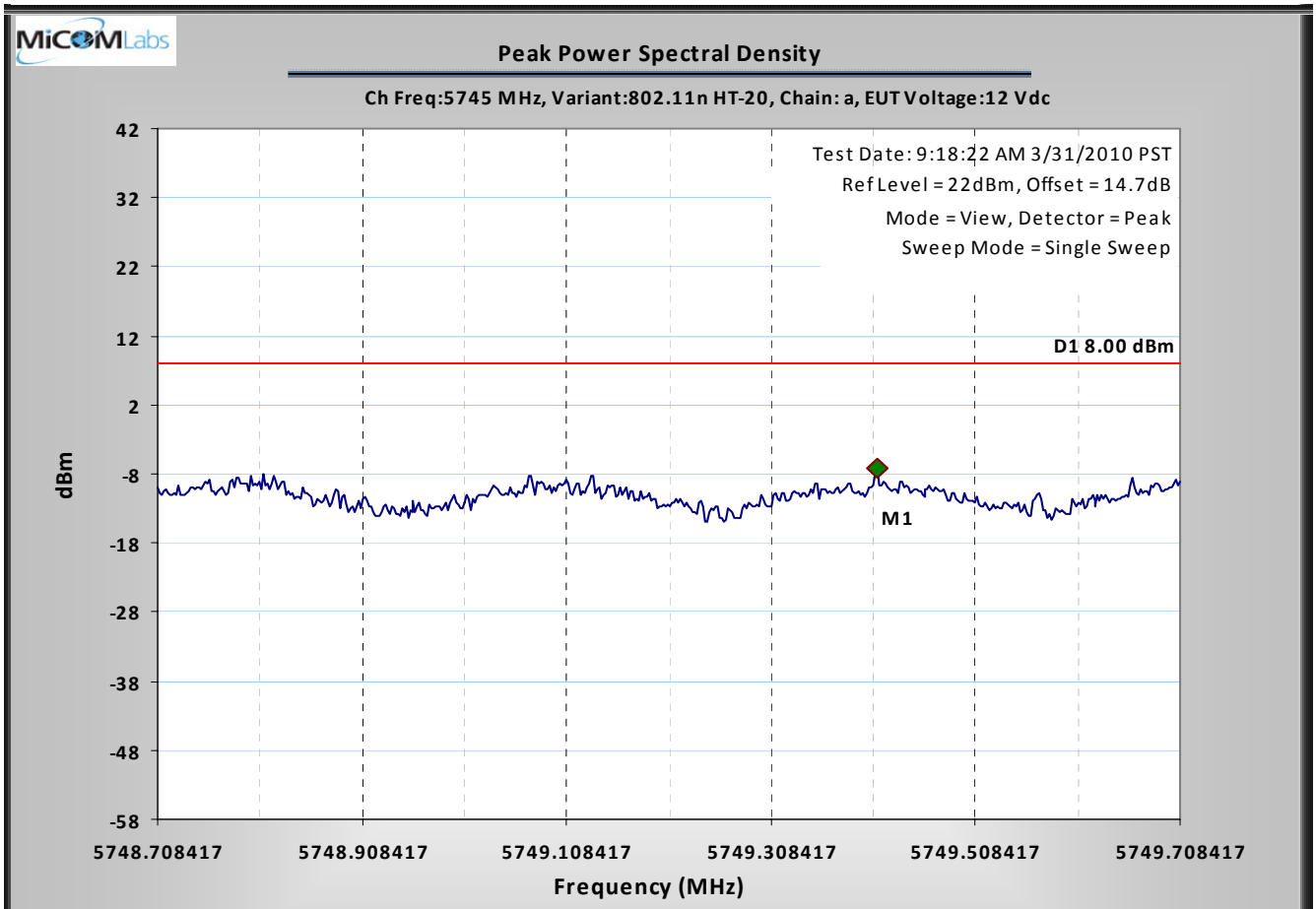
Test Results
Center frequency = 5825MHz

7.3.6 Measurement results for 802.11n HT-20

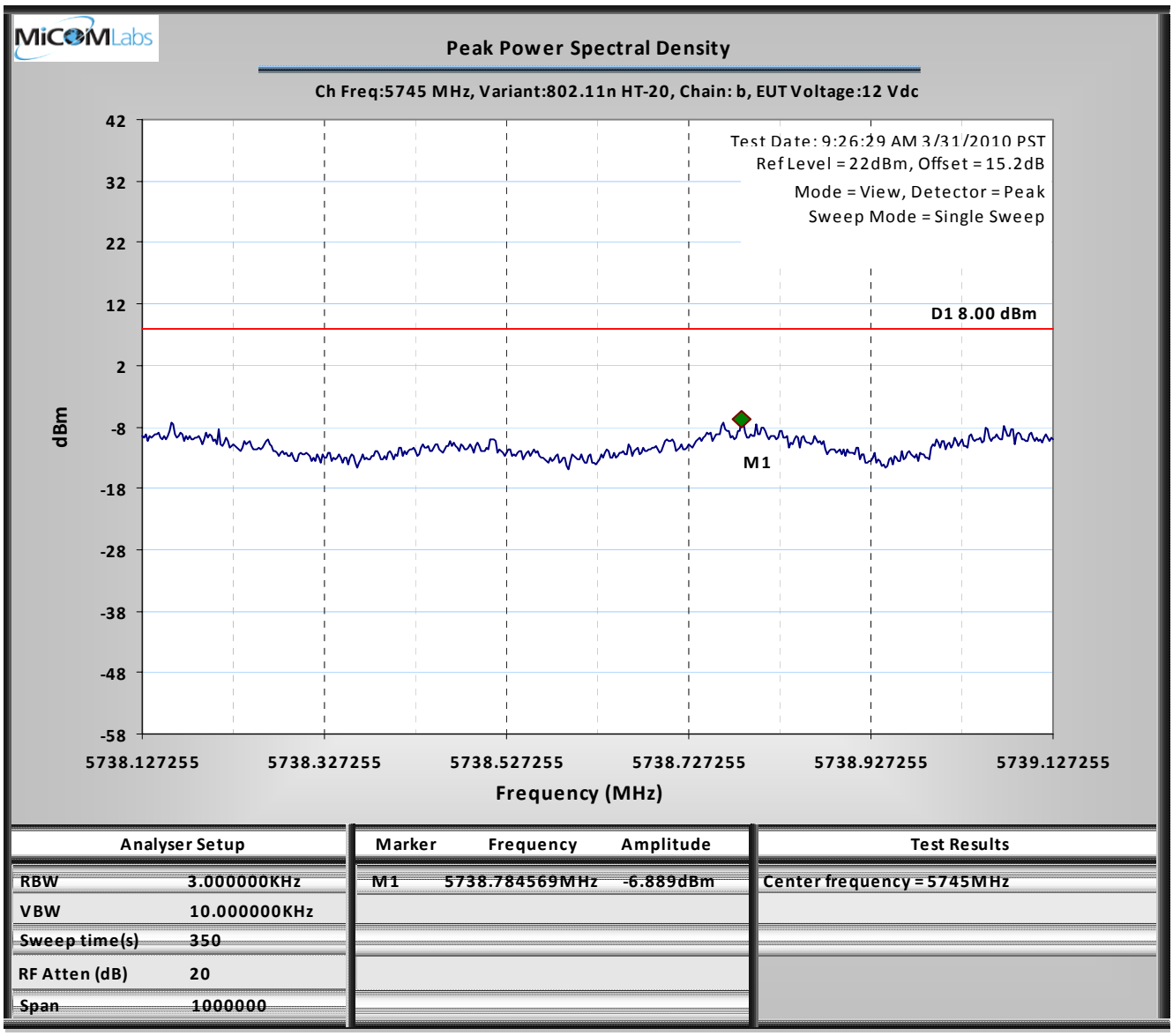
Test Conditions:	15.247 (e)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11n HT-20		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming	N/A	dB	**Antenna Gain:**	6	dBi
Applied Voltage:	12.0	Vdc			
Notes 1:					
Notes 2:					

Test Frequency	Measured Power Density RF Port (dBm)				Total Peak Power Spectral Density (dBm)		Limit	Margin
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5745	-7.13	-6.89			-1.83	-3.99509718	8.00	-9.83
5785	-8.54	-7.52			-2.06	-4.99049858	8.00	-10.06
5825	-9.32	-9.09			-3.13	-6.19323012	8.00	-11.13

Measurement uncertainty:	± 1.33 dB



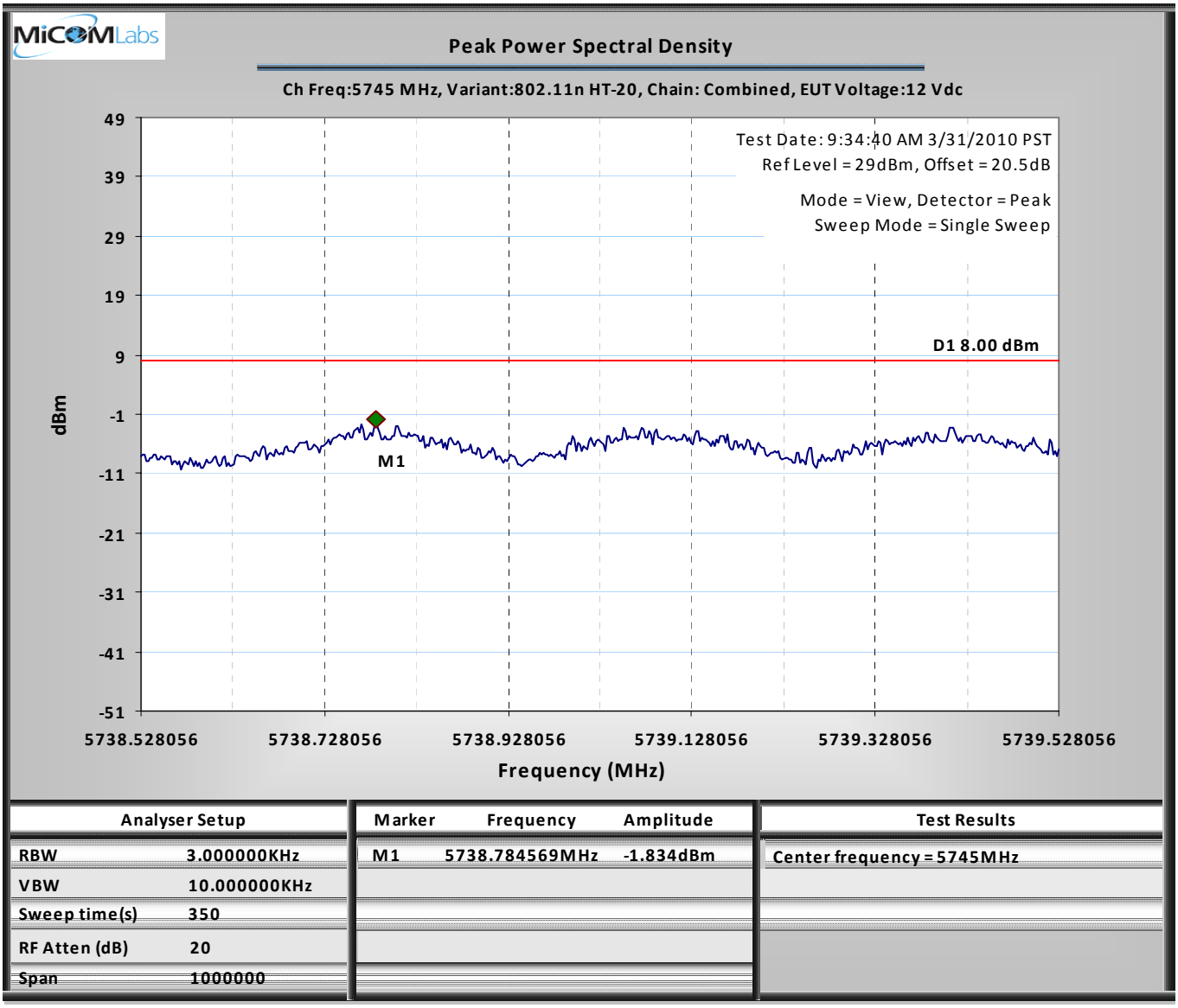
Analyser Setup		Marker	Frequency	Amplitude	Test Results
RBW	3.000000KHz	M1	5749.411824MHz	-7.125dBm	Center frequency = 5745MHz
VBW	10.000000KHz				
Sweep time(s)	350				
RF Atten (dB)	20				
Span	1000000				



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	5738.784569MHz	-6.889dBm

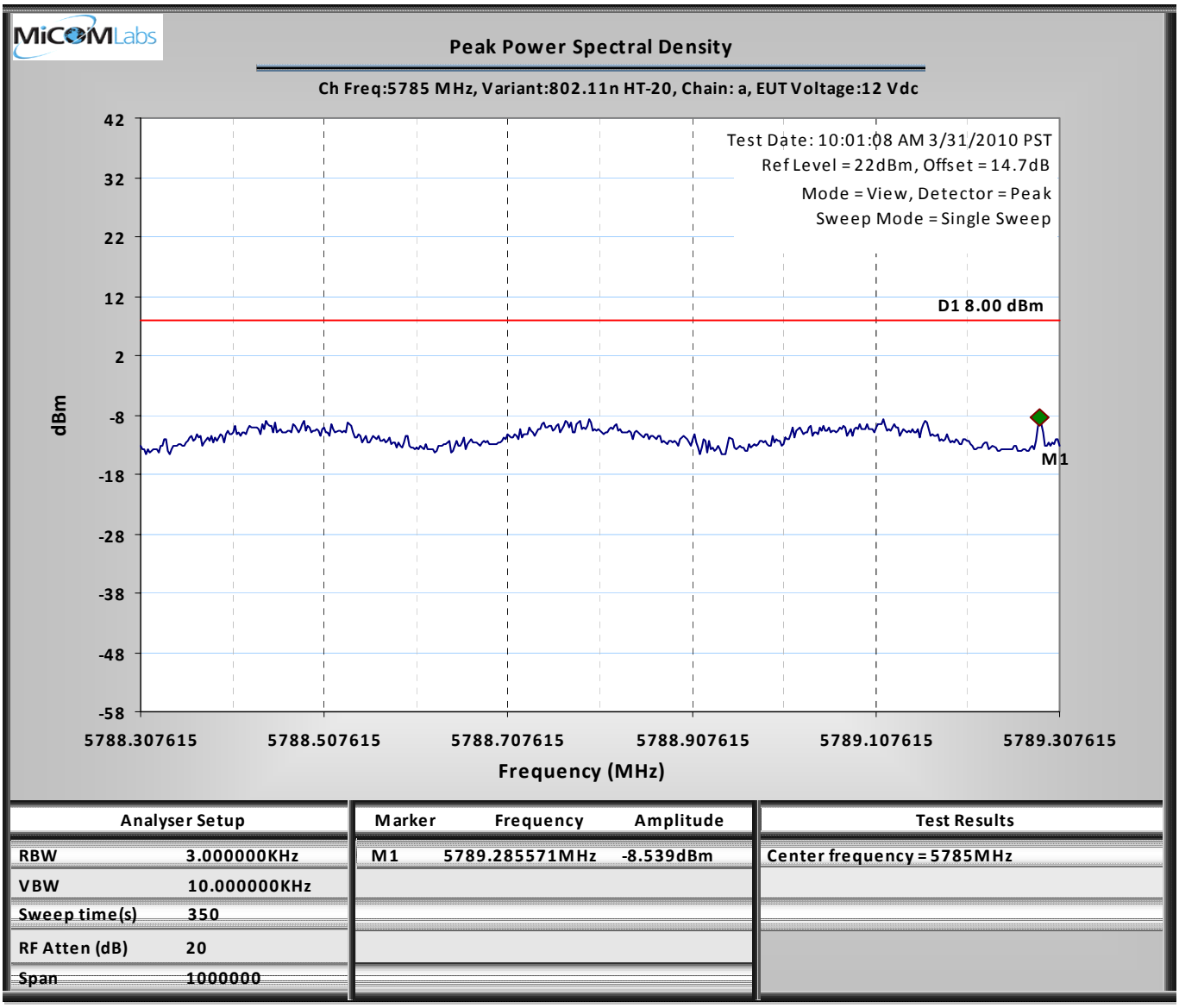
Test Results
Center frequency = 5745MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	5738.784569MHz	-1.834dBm

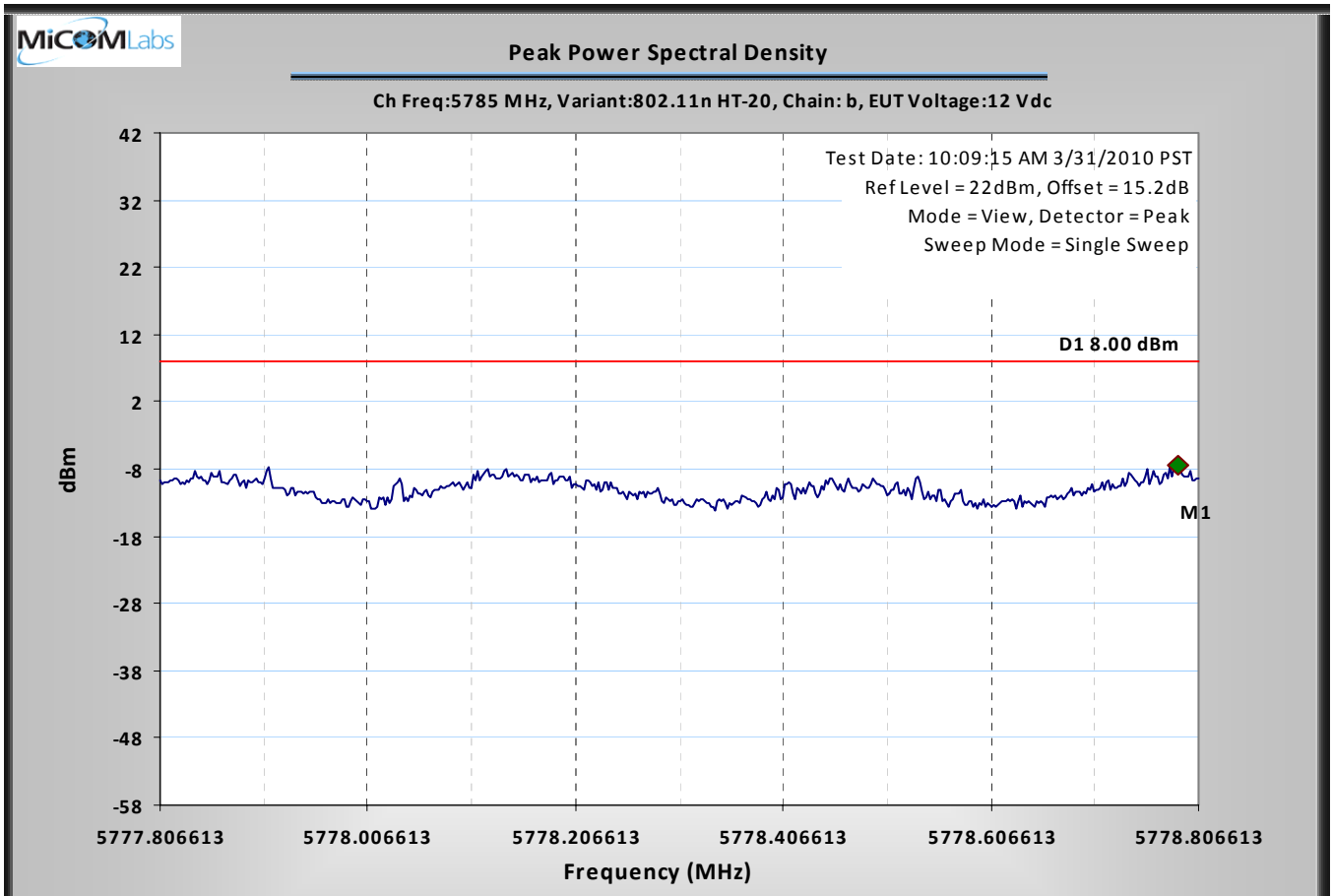
Test Results
Center frequency = 5745MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	5789.285571MHz	-8.539dBm

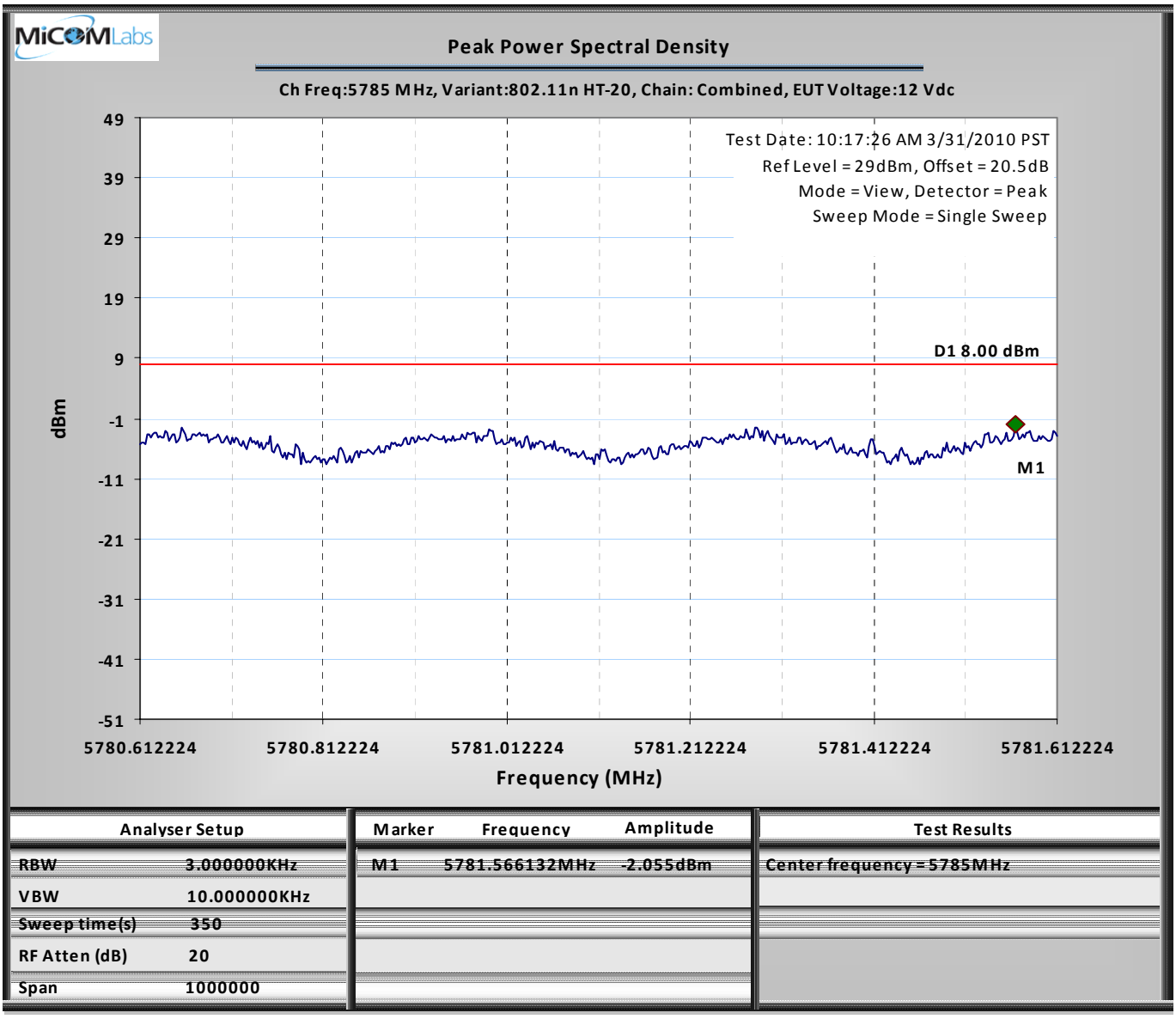
Test Results
Center frequency = 5785MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	5778.786573MHz	-7.522dBm

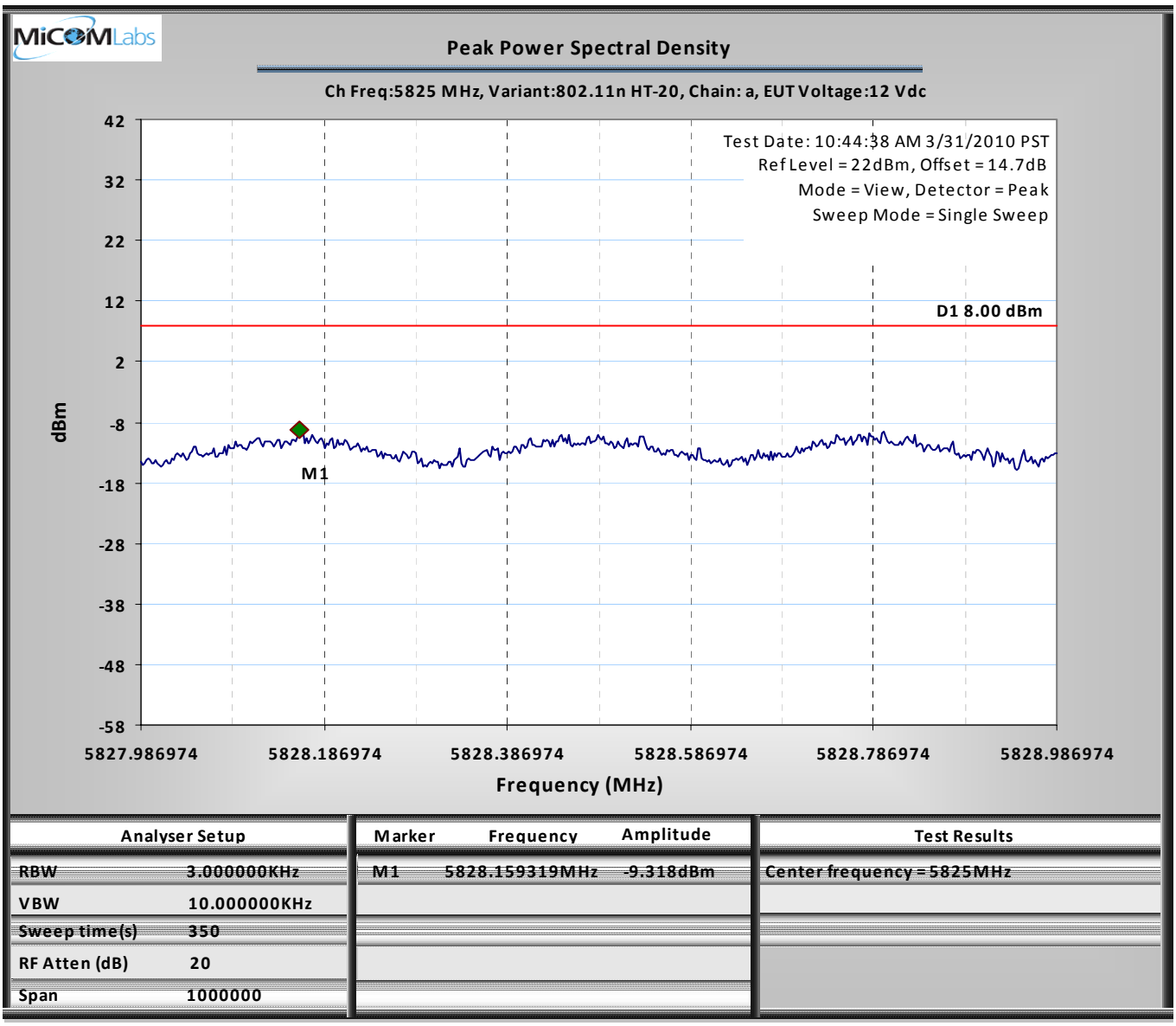
Test Results
Center frequency = 5785MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	5781.566132MHz	-2.055dBm

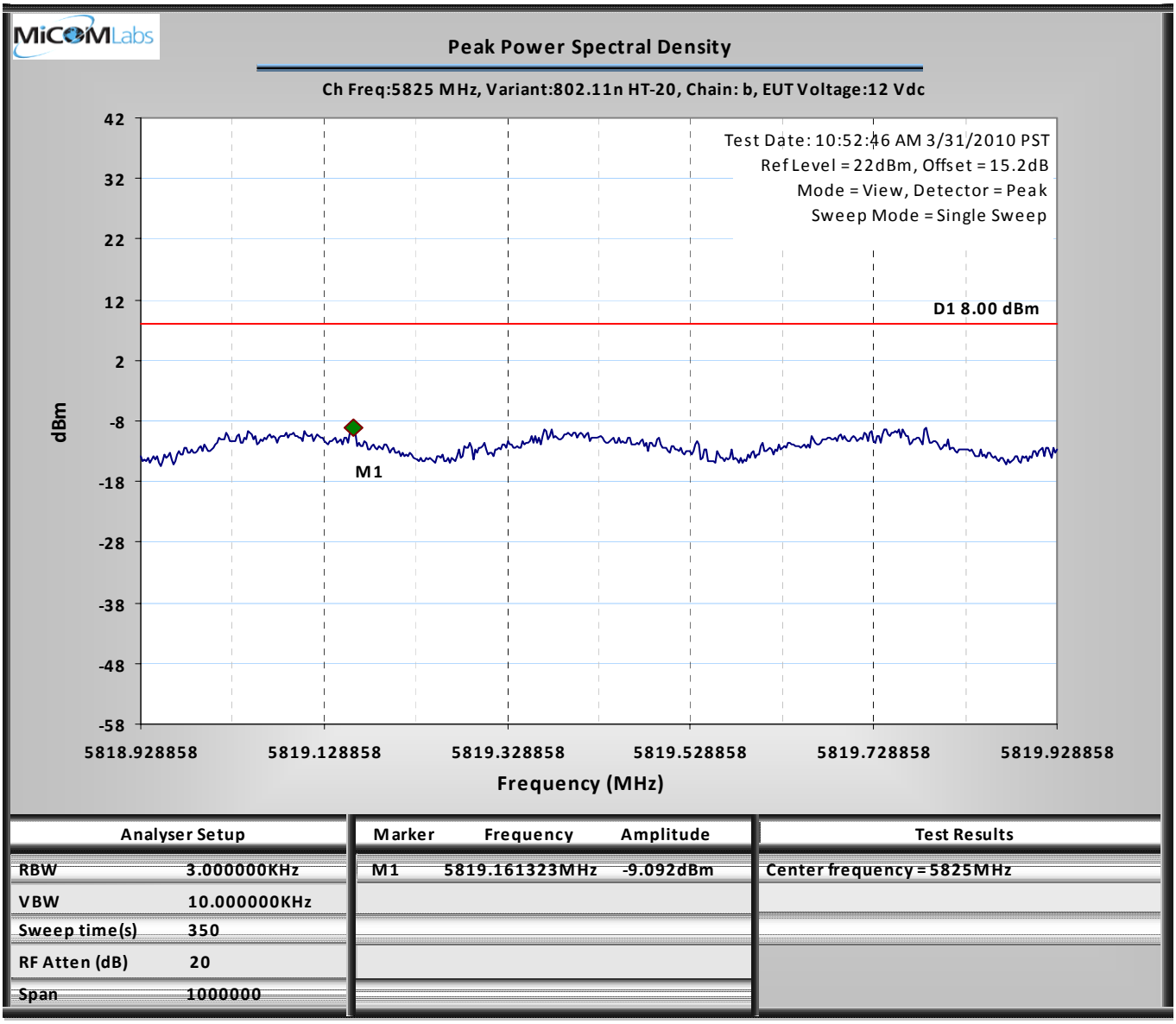
Test Results
Center frequency = 5785MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	5828.159319MHz	-9.318dBm

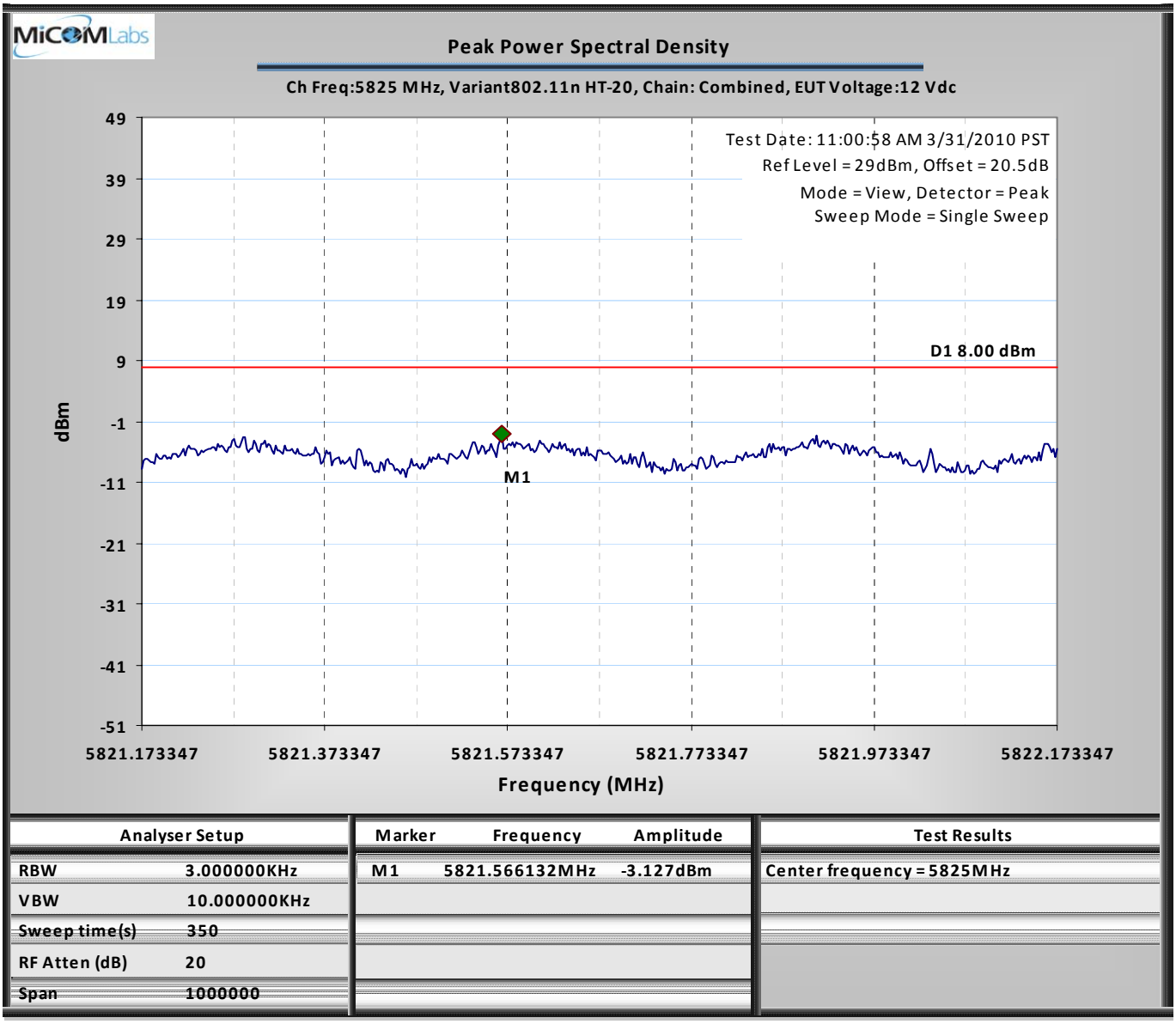
Test Results
Center frequency = 5825MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	5819.161323MHz	-9.092dBm

Test Results
Center frequency = 5825MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	5821.566132MHz	-3.127dBm

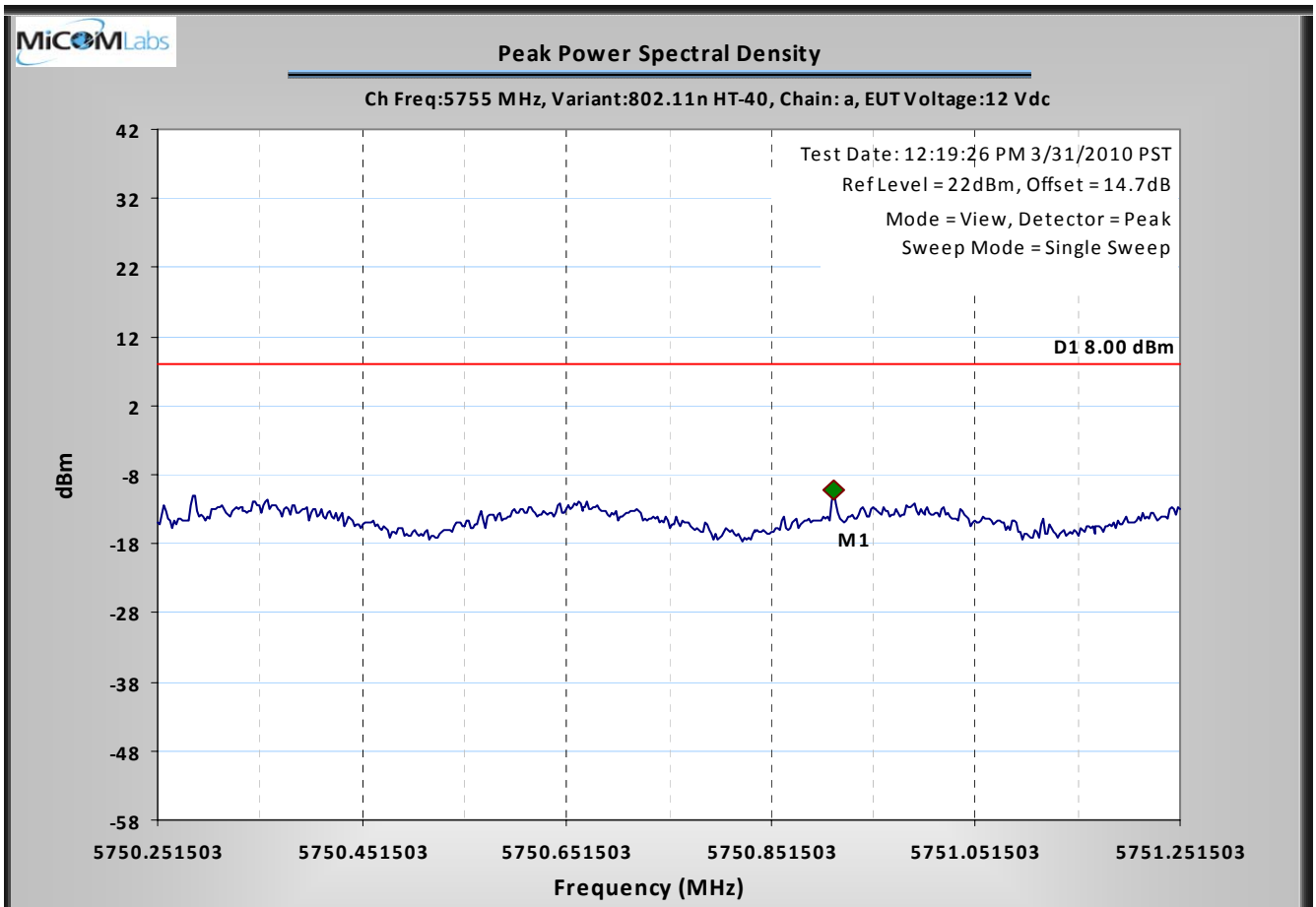
Test Results
Center frequency = 5825MHz

7.3.7 Measurement results for 802.11n HT-40

Test Conditions:	15.247 (e)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11n HT-40		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming	N/A	dB	**Antenna Gain:**	6	dBi
Applied Voltage:	12.0	Vdc			
Notes 1:					
Notes 2:					

Test Frequency	Measured Power Density RF Port (dBm)				Total Peak Power Spectral Density (dBm)		Limit	Margin
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5755	-10.33	-9.74	--	--	-4.38	-7.01	8.00	-12.38
5785	-10.33	-10.15	--	--	-4.49	-7.23	8.00	-12.49
5815	-10.59	-9.70	--	--	-5.47	-7.11	8.00	-13.47

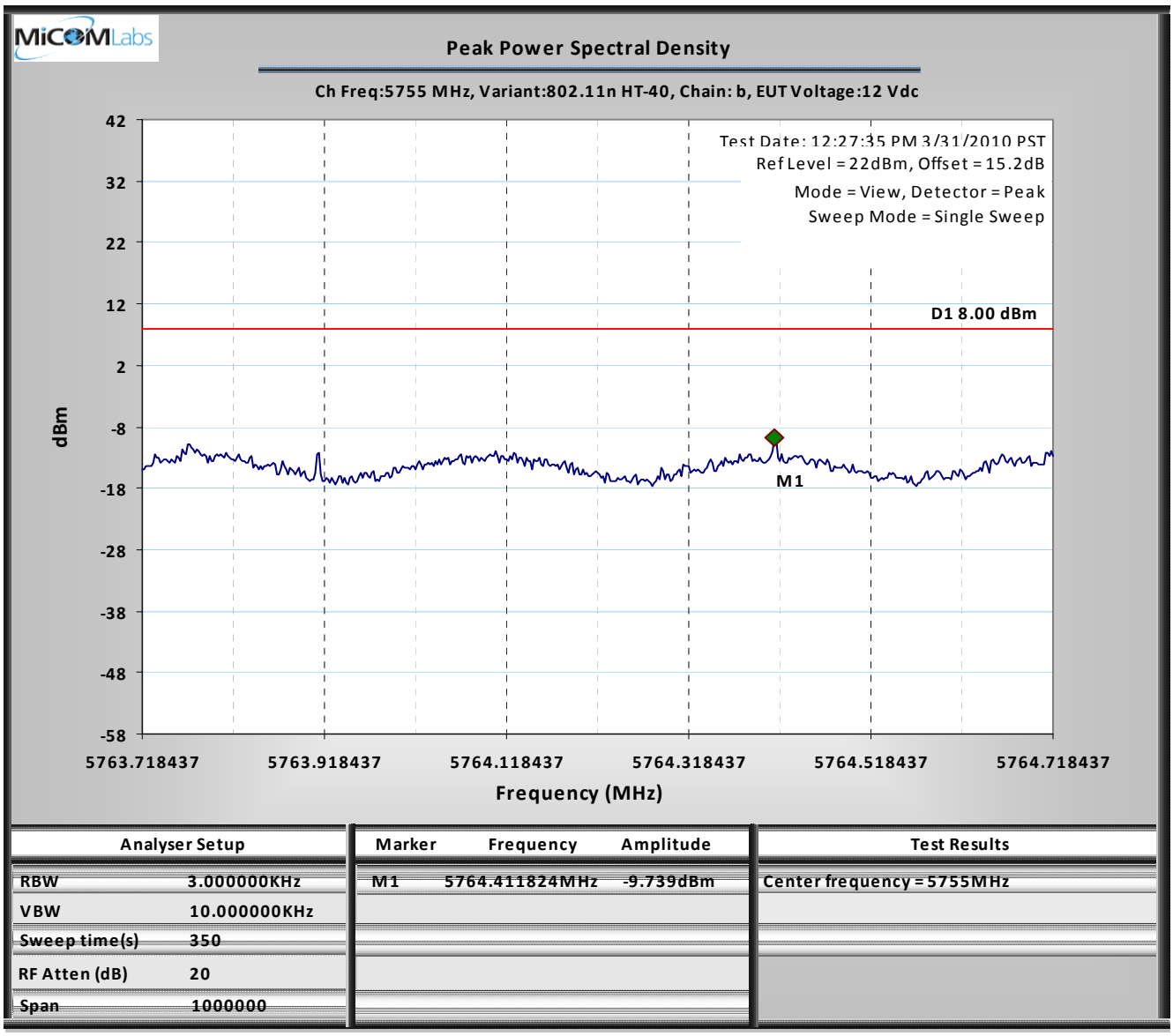
Measurement uncertainty:	± 1.33 dB



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	5750.912826MHz	-10.328dBm

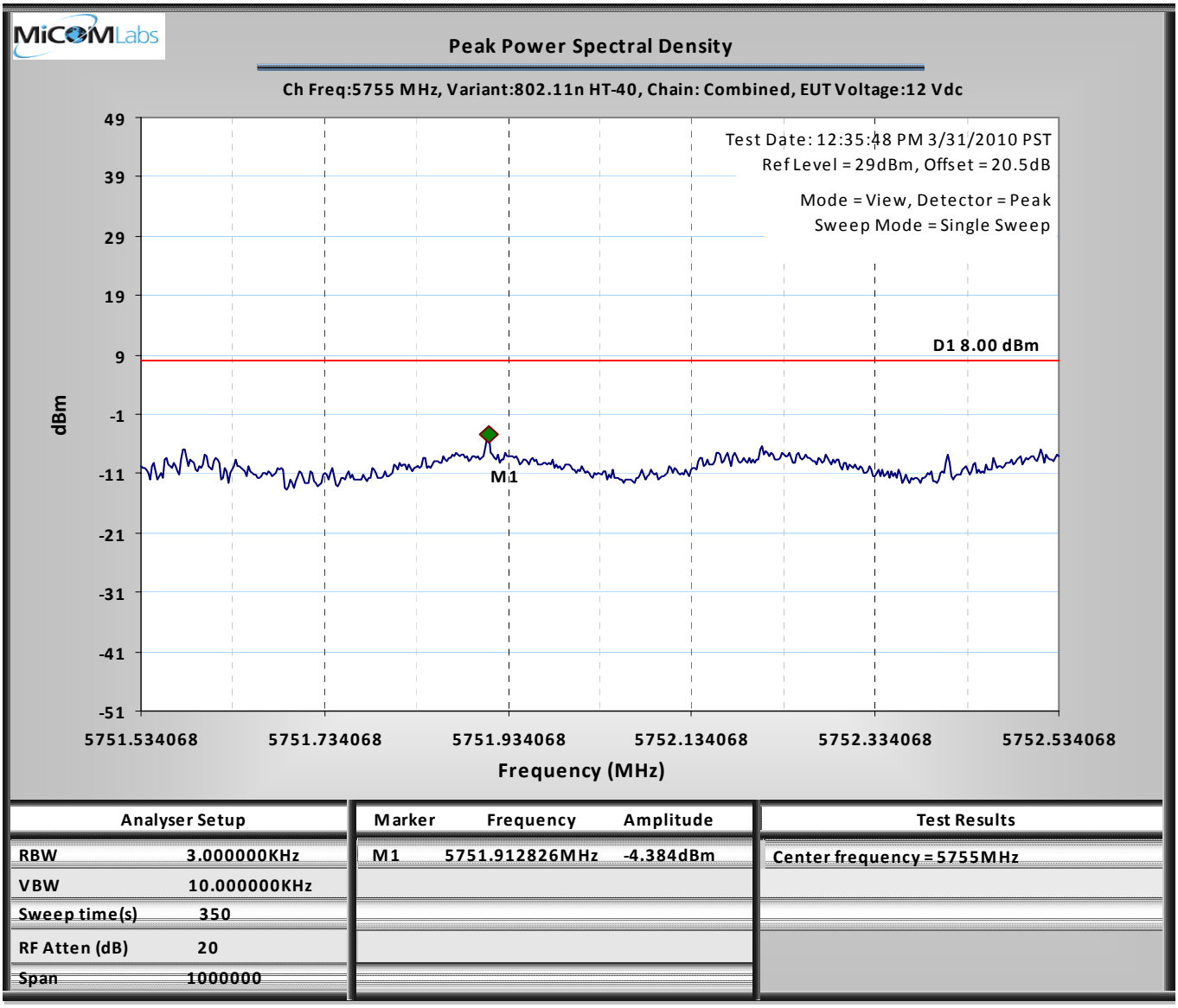
Test Results
Center frequency = 5755MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	5764.411824MHz	-9.739dBm

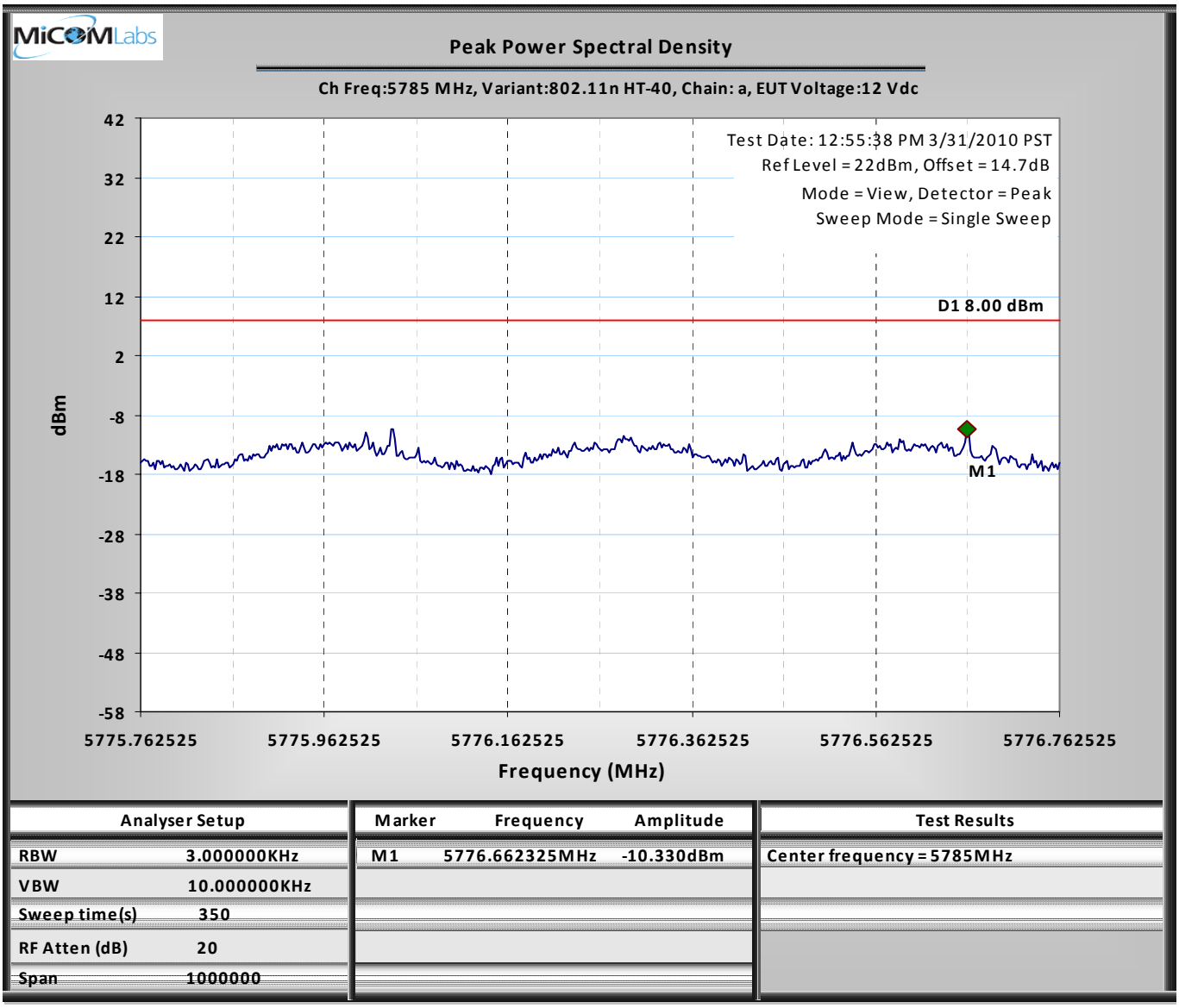
Test Results
Center frequency = 5755MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	5751.912826MHz	-4.384dBm

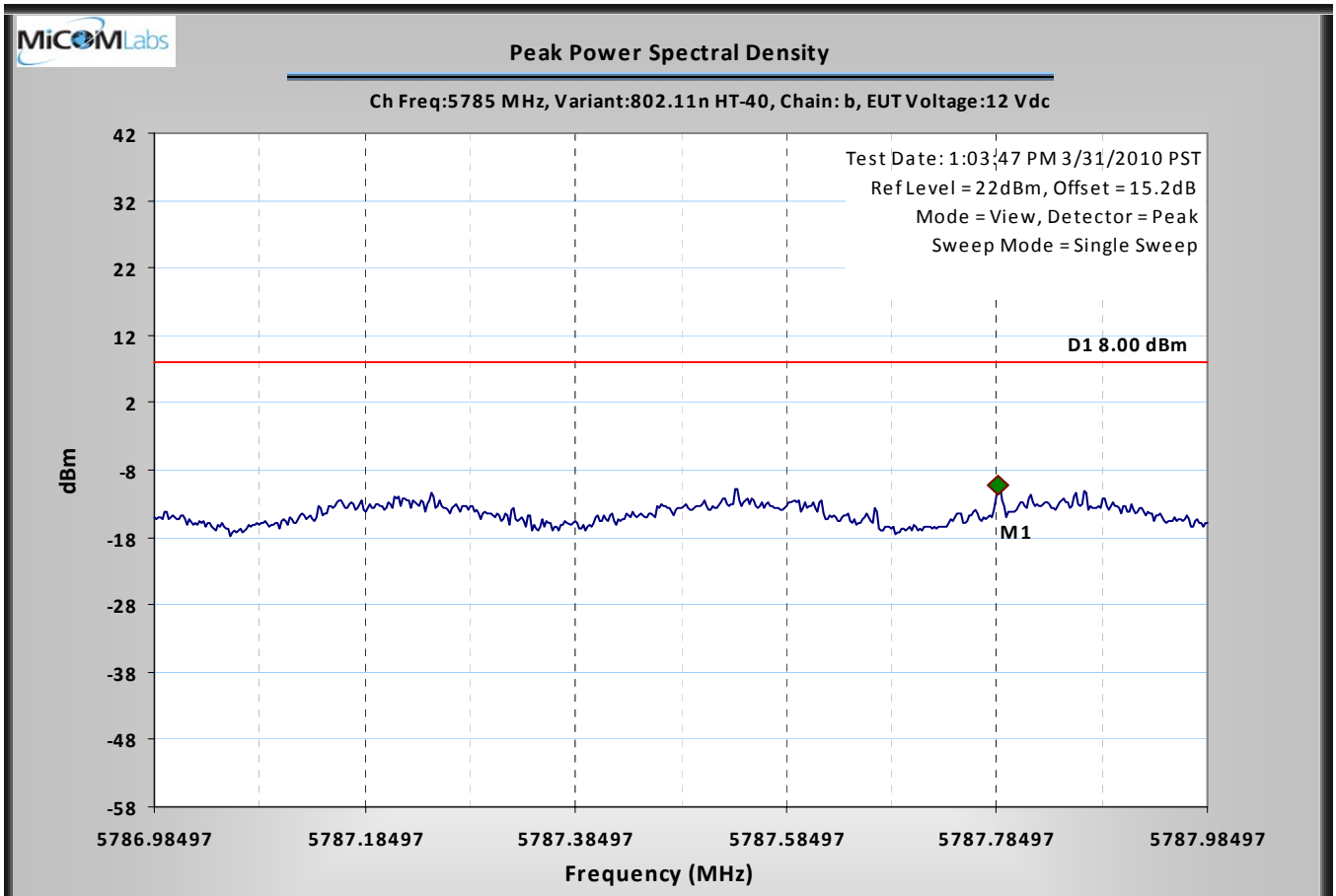
Test Results
Center frequency = 5755MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	5776.662325MHz	-10.330dBm

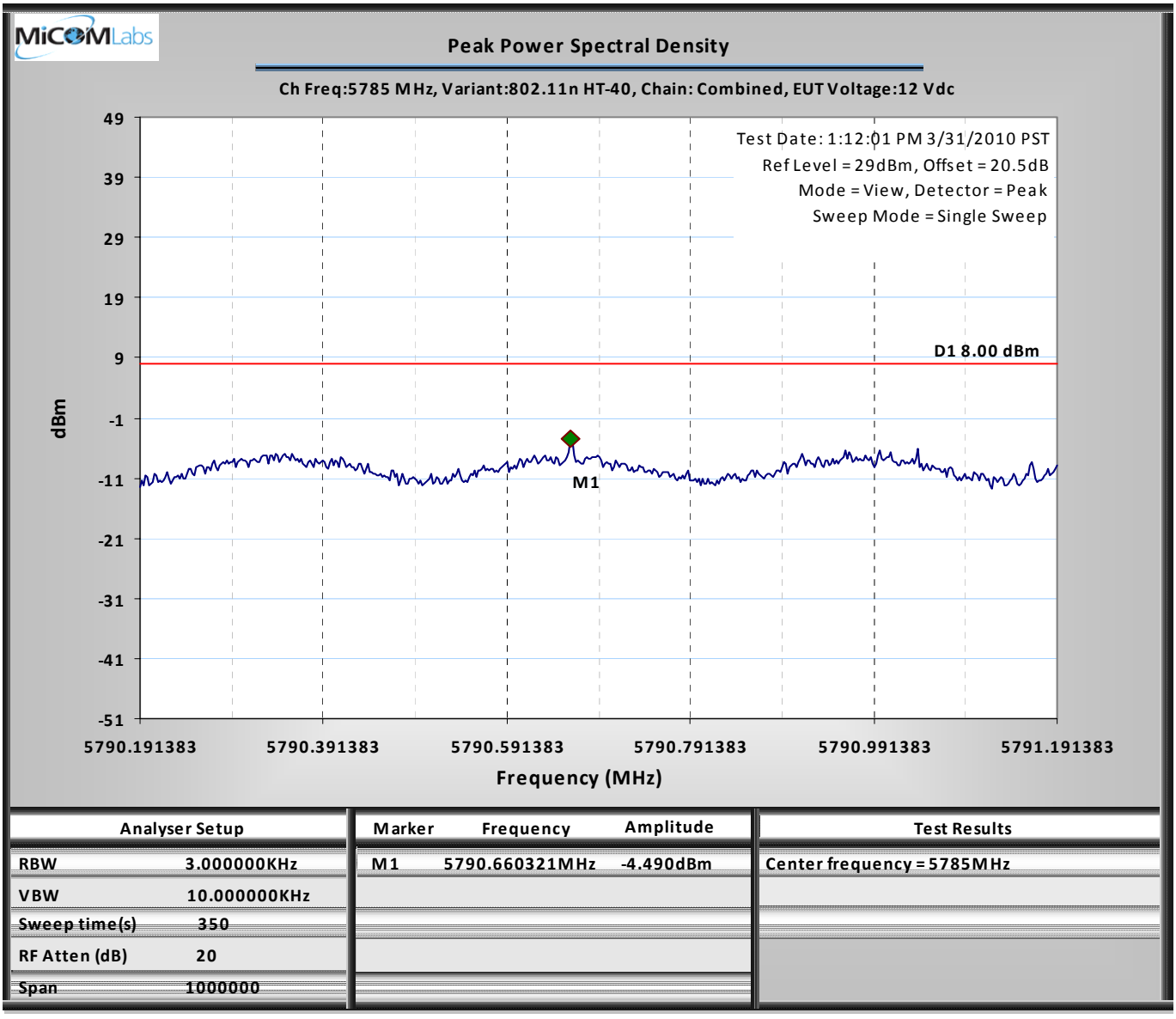
Test Results
Center frequency = 5785MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	5787.786573MHz	-10.145dBm

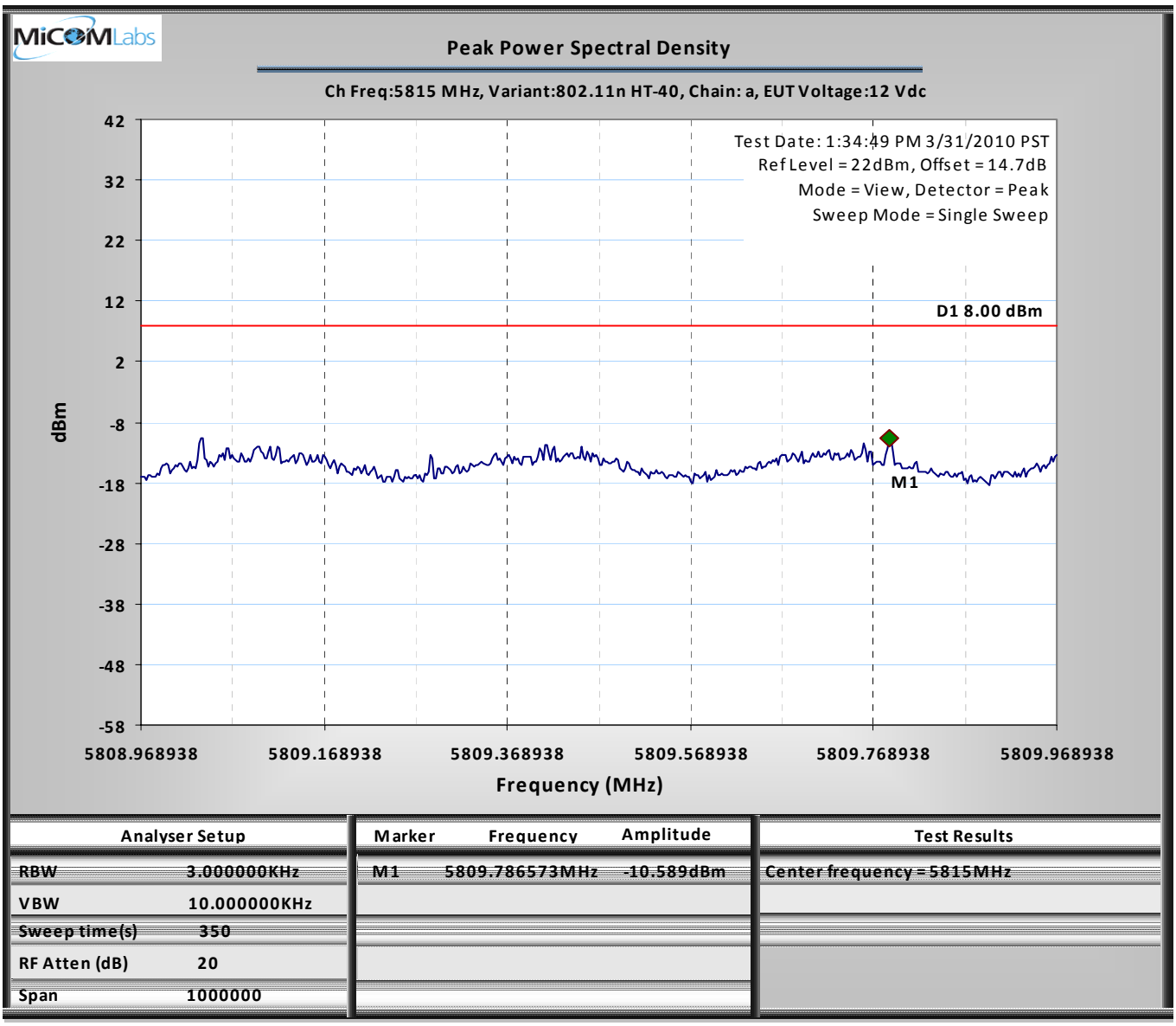
Test Results
Center frequency = 5785MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	5790.660321MHz	-4.490dBm

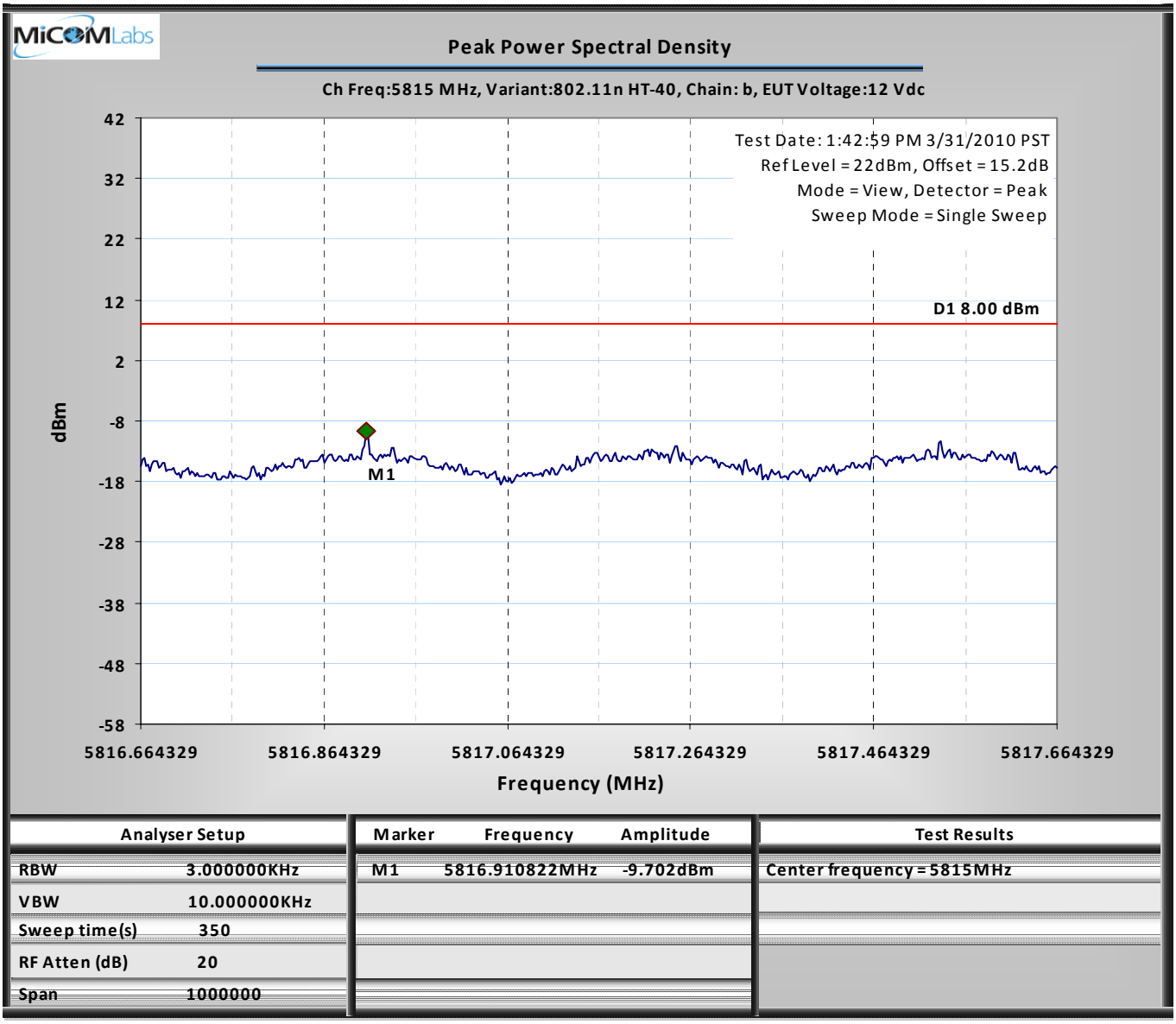
Test Results
Center frequency = 5785MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	5809.786573MHz	-10.589dBm

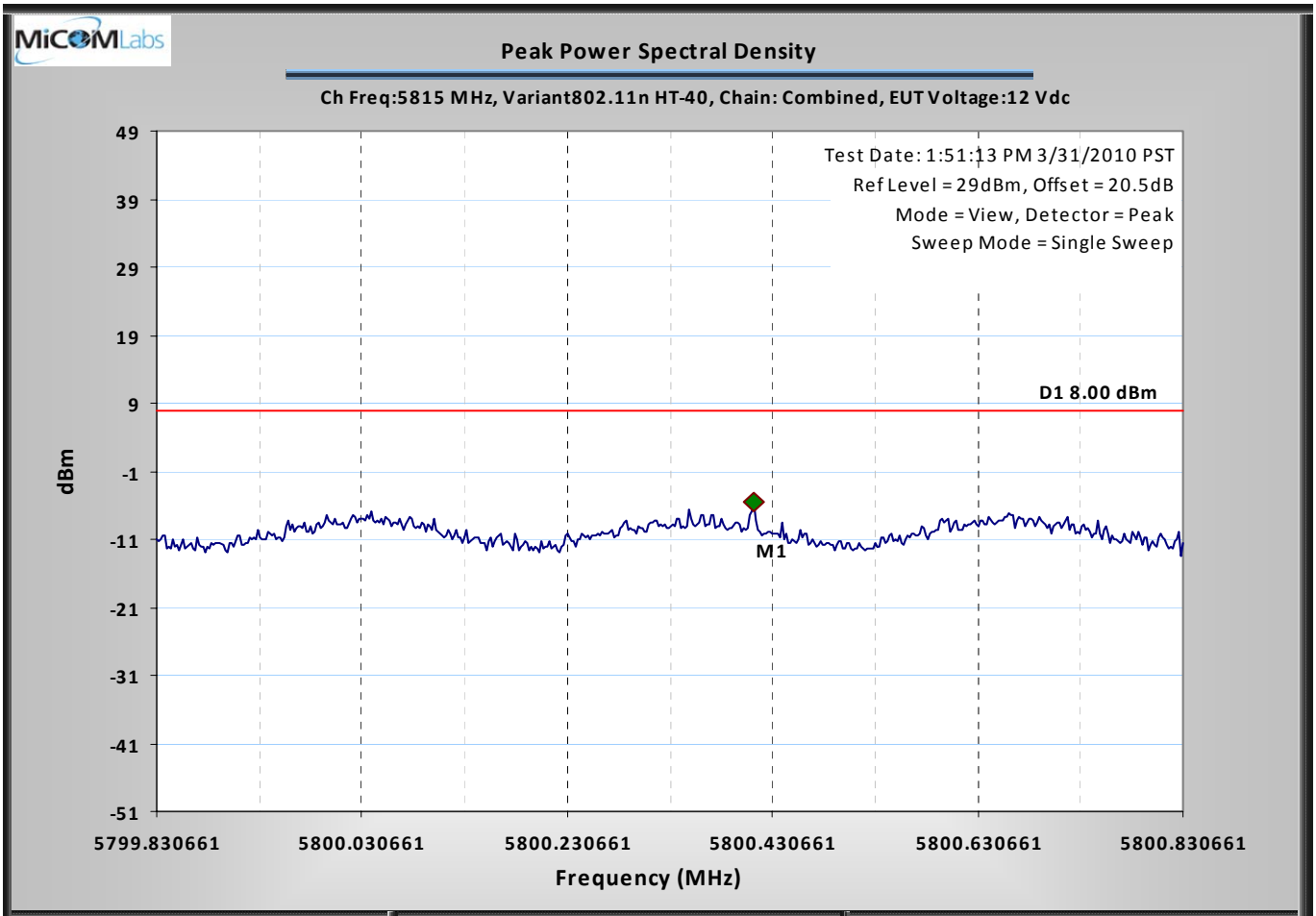
Test Results
Center frequency = 5815MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	5816.910822MHz	-9.702dBm

Test Results
Center frequency = 5815MHz



Analyser Setup	
RBW	3.000000KHz
VBW	10.000000KHz
Sweep time(s)	350
RF Atten (dB)	20
Span	1000000

Marker	Frequency	Amplitude
M1	5800.411824MHz	-5.466dBm

Test Results
Center frequency = 5815MHz

7.4 Maximum Permissible Exposure

FCC, Part 15 Subpart C §15.407(f)
Industry Canada RSS-Gen §5.5

Calculations for Maximum Permissible Exposure Levels

Power Density = Pd (mW/cm^2) = EIRP/(4πd^2)
EIRP = P * G * 2
P = Peak output power (mW)
G = Antenna numeric gain (numeric)
d = Separation distance (cm)
Numeric Gain = 10 ^ (G (dBi)/10)

The Aruba AP-92 / AP-93 has two transmitters. The peak power in the table below is calculated by assuming a worst case scenario where the two transmitters are operating simultaneously in the same band. The Peak Power in mW is calculated by taking the maximum conducted power measured in each band and multiplying by 2.

Because the EUT belongs to the General Population/Uncontrolled Exposure the limit of power density is 1.0 mW/cm^2

Freq. Band (MHz)	Antenna Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power x 2 (mW)	Calculated Safe Distance @ 1mW/cm^2 Limit(cm)	Minimum Separation Distance (cm)
2400 – 2500	12.0	15.84	+18.67	2328.1	13.61	20.00
5725 - 5850	14.0	25.1	+17.53	2837.9	15.03	20.00

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^2 from 1.310 Table 1

RSS-Gen §5.5 Before equipment certification is granted, the application requirements of RSS-102 shall be met.

Laboratory Measurement Uncertainty for Power Measurements

Measurement uncertainty	±1.33 dB

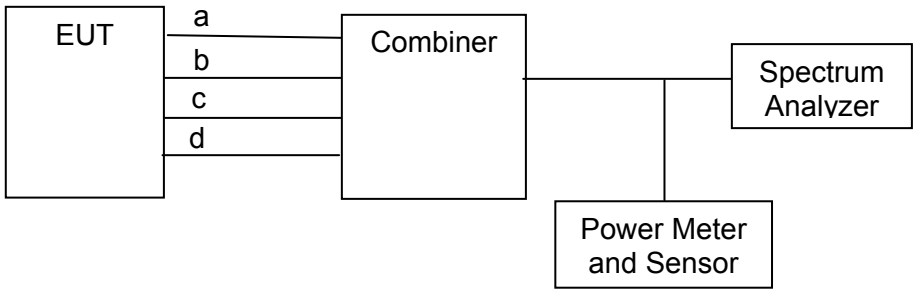
7.5 Conducted Spurious Emissions

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 Measurement Set up



Conducted Spurious Emission measurement test configuration

Specification

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	

§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.

§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)).

Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-05 'Measurement of Spurious Emissions'	0158, 0252, 0313, 0314, 0223, 0116, 0117, 0287, 0363.

7.5.1 Measurement results for 802.11b

Test Conditions:	15.247 (a)(2)		**Rel. Humidity (%):**	35	to	42
Variant:	802.11b		**Ambient Temp. (ºC):**	19	to	22
TPC:	HIGH		**Pressure (mBars):**	998	to	1003
Modulation:	ON		**Duty Cycle (%):**	100		
Beam Forming	N/A	dB	**Antenna Gain:**	N/A	dBi	
Applied Voltage:	12.0	Vdc				
Notes 1:						
Notes 2:						

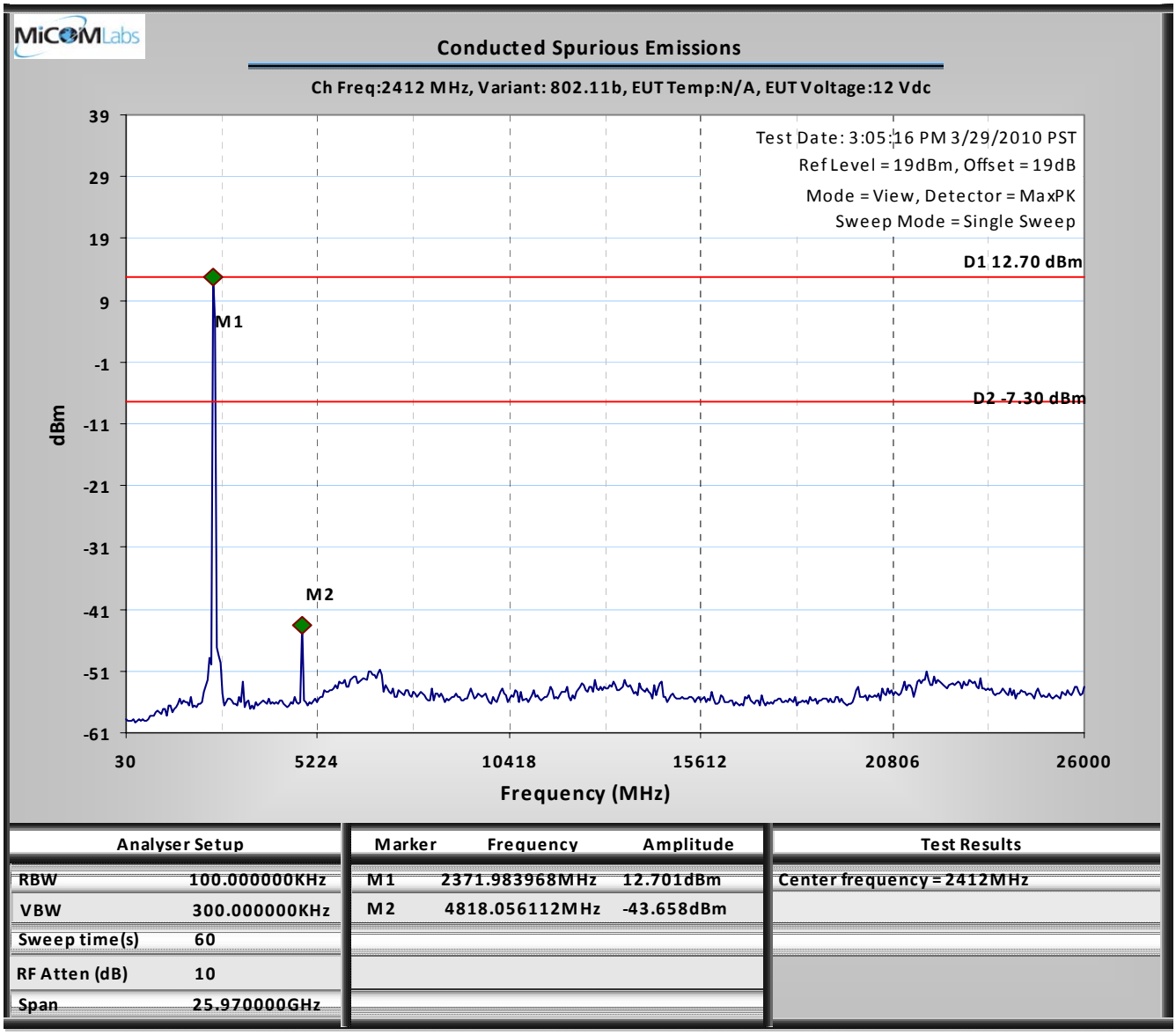
Conducted Spurious Measurment

Test Frequency	Start Frequency	Stop Frequency	Maximum Observed Emission	Limit (20 dB below peak of fundamental)
MHz	MHz	MHz	dBm	dBm
2412.00	30.00	26000.00	-43.66	-7.30
2437.00	30.00	26000.00	-40.77	-6.04
2462.00	30.00	26000.00	-39.73	-6.17

Band-edge Measurment

Test Frequency	Band-edge Frequency	Emission Amplitude @ Band-edge	Limit (20 dB below peak of fundamental)	Margin
MHz	MHz	dBm	dBm	dB
2412.00	2400.00	-35.16	-3.77	-31.40
2462.00	2483.50	-36.70	-5.41	-31.29

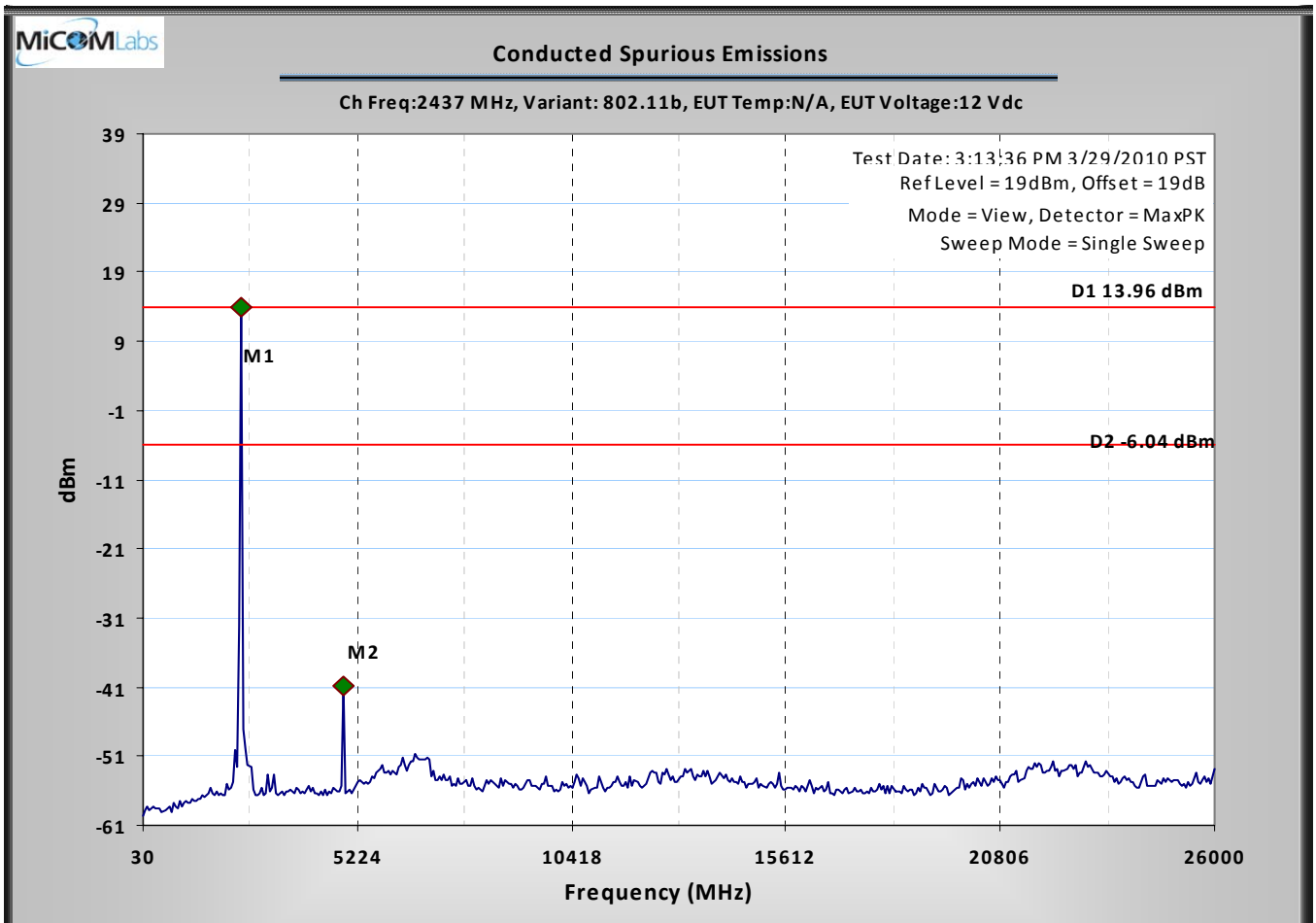
Measurement uncertainty:	±2.81 dB



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	60
RF Atten (dB)	10
Span	25.970000GHz

Marker	Frequency	Amplitude
M1	2371.983968MHz	12.701dBm
M2	4818.056112MHz	-43.658dBm

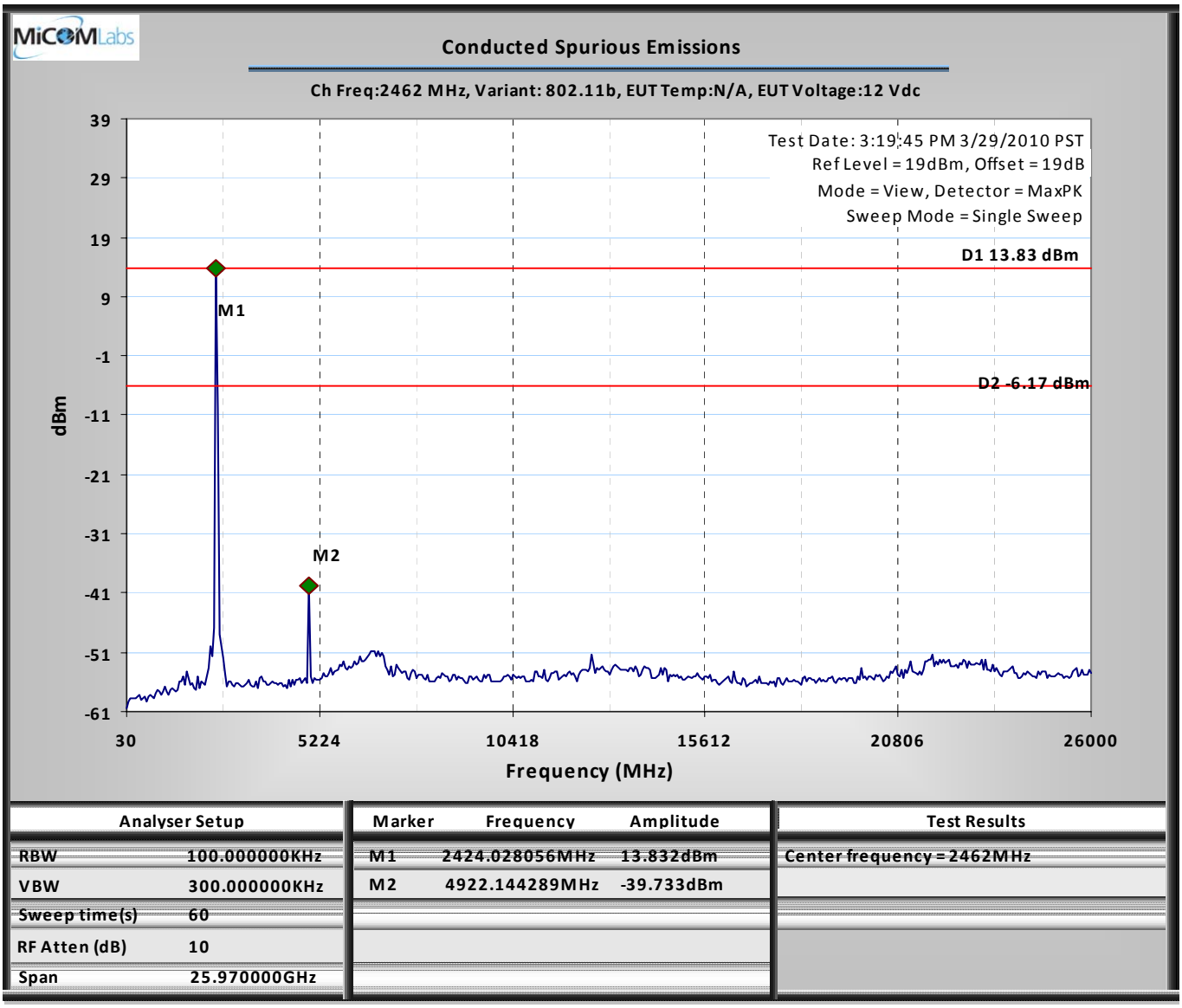
Test Results
Center frequency = 2412MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	60
RF Atten (dB)	10
Span	25.970000GHz

Marker	Frequency	Amplitude
M1	2424.028056MHz	13.964dBm
M2	4870.100200MHz	-40.770dBm

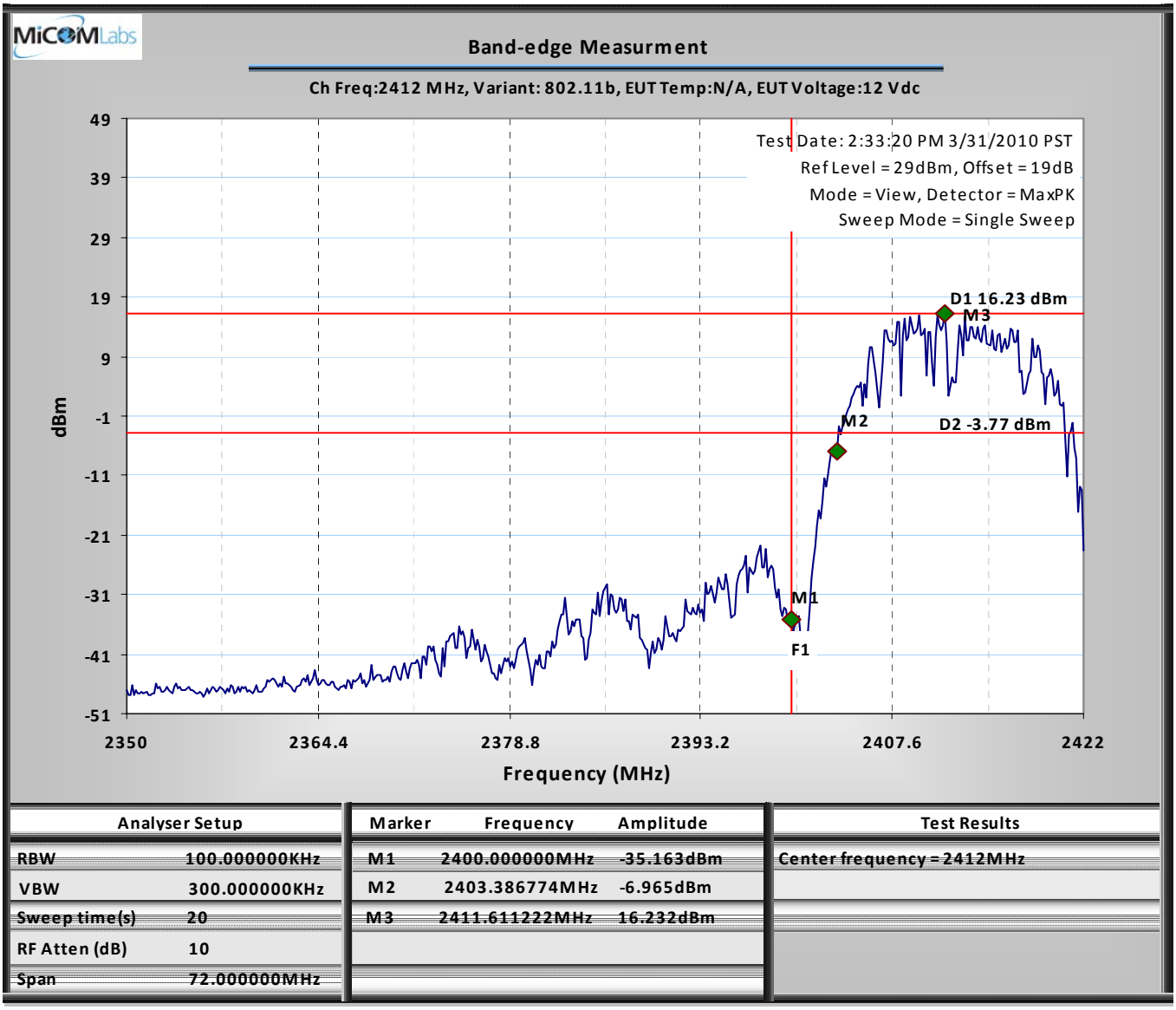
Test Results
Center frequency = 2437MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	60
RF Atten (dB)	10
Span	25.970000GHz

Marker	Frequency	Amplitude
M1	2424.028056MHz	13.832dBm
M2	4922.144289MHz	-39.733dBm

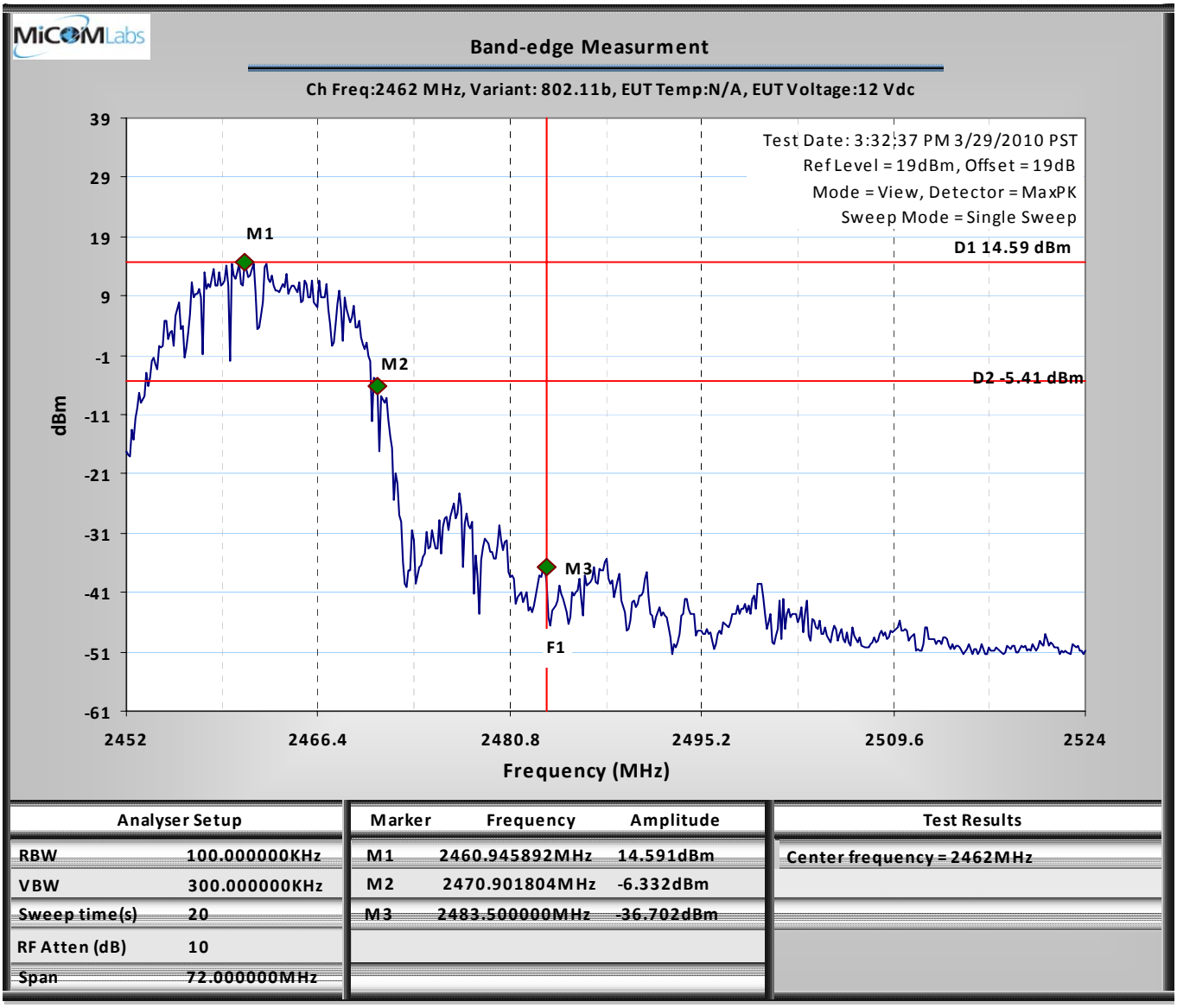
Test Results
Center frequency = 2462MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	72.000000MHz

Marker	Frequency	Amplitude
M1	2400.000000MHz	-35.163dBm
M2	2403.386774MHz	-6.965dBm
M3	2411.611222MHz	16.232dBm

Test Results
Center frequency = 2412MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	72.000000MHz

Marker	Frequency	Amplitude
M1	2460.945892MHz	14.591dBm
M2	2470.901804MHz	-6.332dBm
M3	2483.500000MHz	-36.702dBm

Test Results
Center frequency = 2462MHz

7.5.2 Measurement Results: 802.11g

Test Conditions:	15.247 (a)(2)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11g		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming	N/A	dB	**Antenna Gain:**	N/A	dBi
Applied Voltage:	12.0	Vdc			
Notes 1:					
Notes 2:					

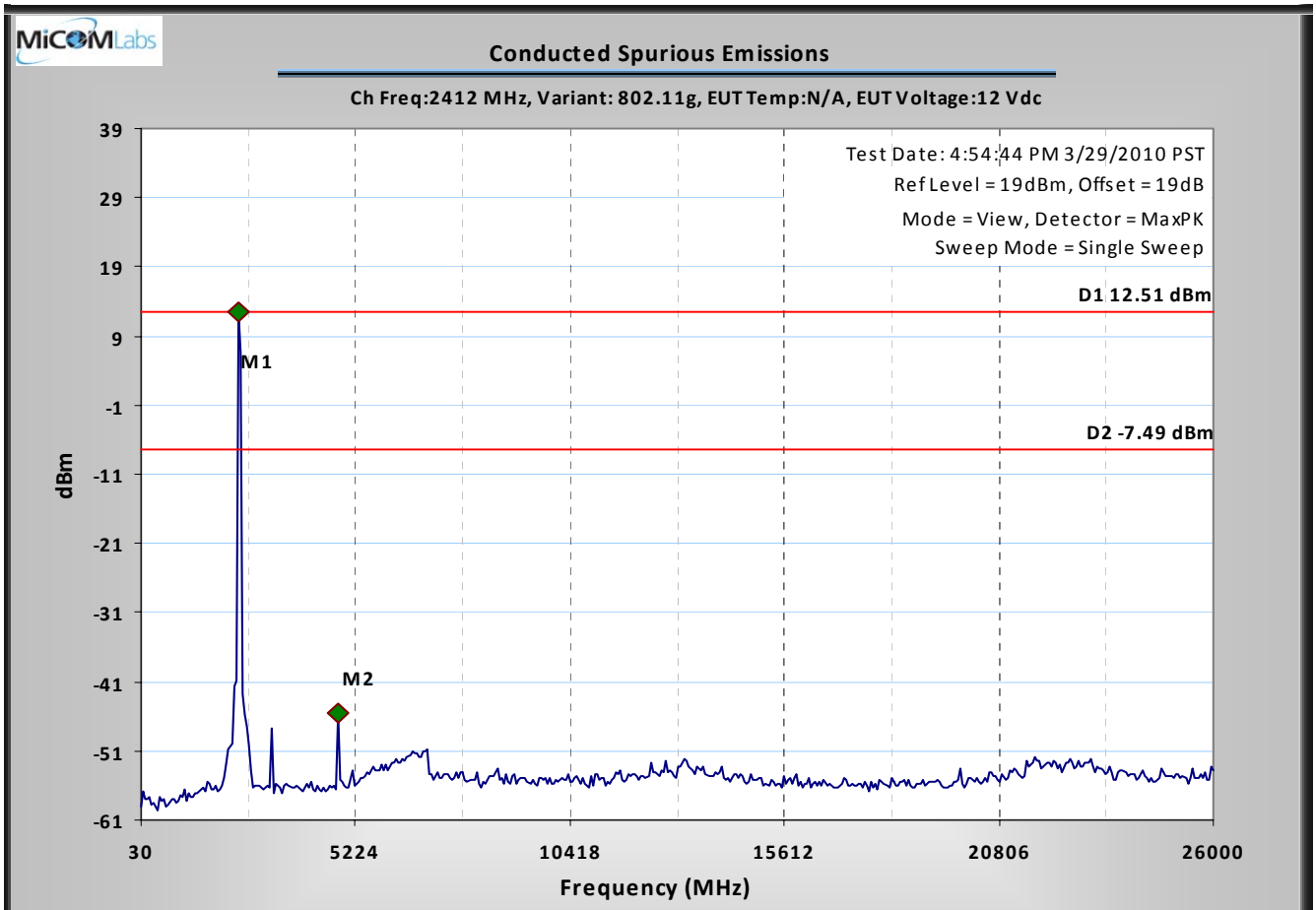
Conducted Spurious Measurment

Test Frequency	Start Frequency	Stop Frequency	Maximum Observed Emission	Limit (20 dB below peak of fundamental)
MHz	MHz	MHz	dBm	dBm
2412.00	30.00	26000.00	-45.44	-7.49
2437.00	30.00	26000.00	-40.64	-9.32
2462.00	30.00	26000.00	-40.92	-7.20

Band-edge Measurment

Test Frequency	Band-edge Frequency	Emission Amplitude @ Band-edge	Limit (20 dB below peak of fundamental)	Margin
MHz	MHz	dBm	dBm	dB
2412.00	2400.00	-11.13	-4.93	-6.21
2462.00	2483.50	-23.12	-5.88	-17.23

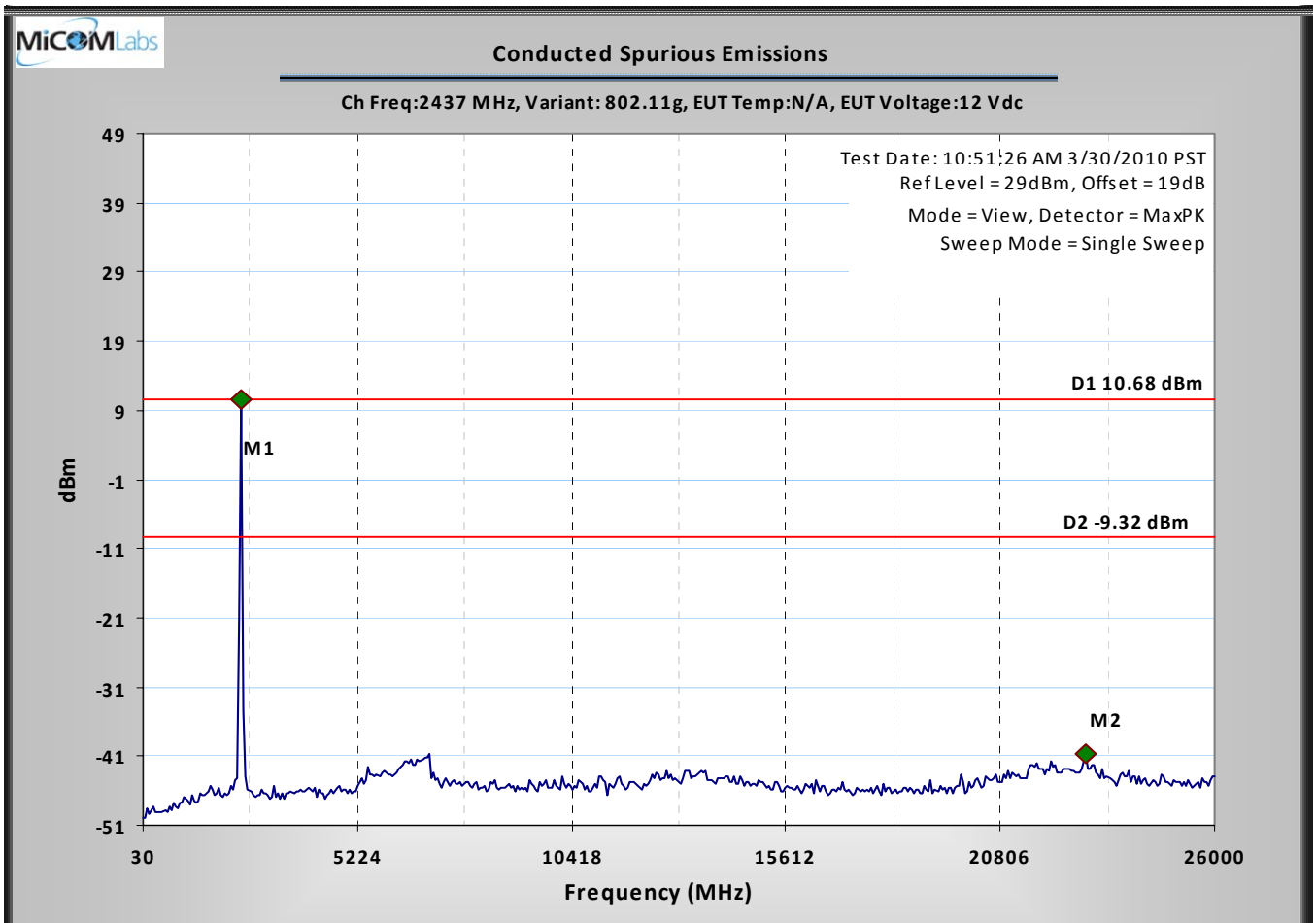
Measurement uncertainty:	±2.81 dB



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	60
RF Atten (dB)	10
Span	25.970000GHz

Marker	Frequency	Amplitude
M1	2371.983968MHz	12.514dBm
M2	4818.056112MHz	-45.435dBm

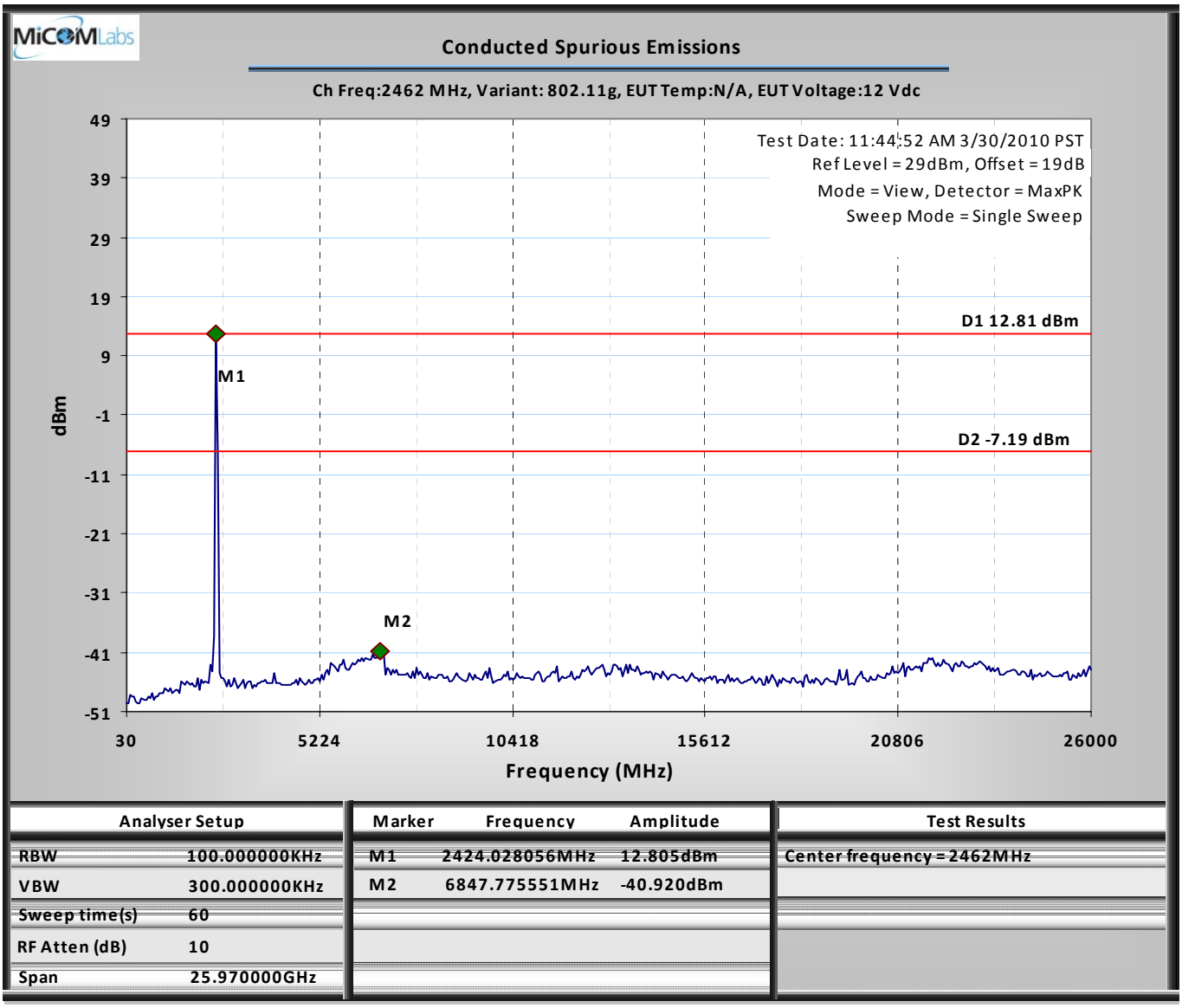
Test Results
Center frequency = 2412MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	60
RF Atten (dB)	10
Span	25.970000GHz

Marker	Frequency	Amplitude
M1	2424.028056MHz	10.684dBm
M2	22877.354709MHz	-40.637dBm

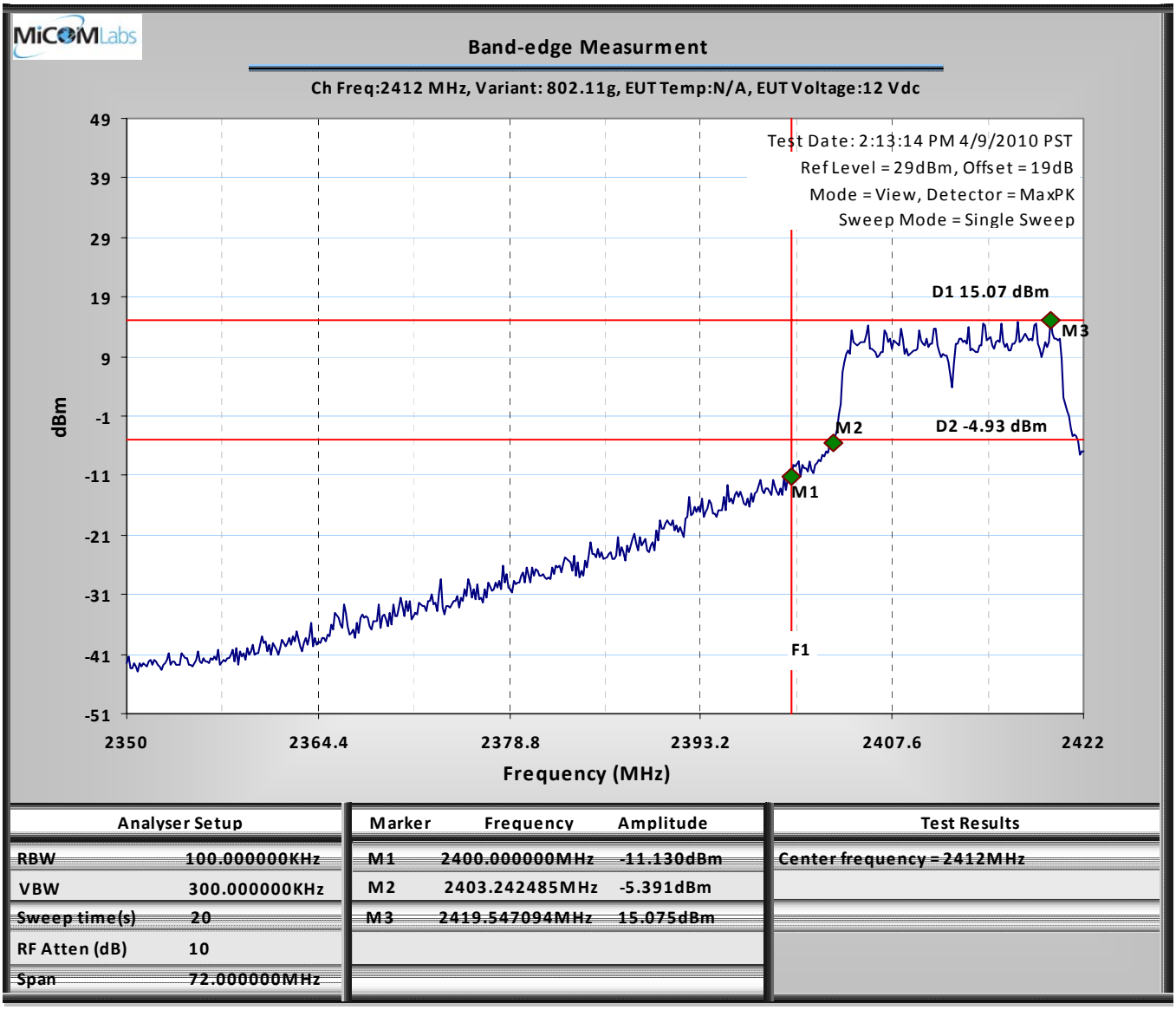
Test Results
Center frequency = 2437MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	60
RF Atten (dB)	10
Span	25.970000GHz

Marker	Frequency	Amplitude
M1	2424.028056MHz	12.805dBm
M2	6847.775551MHz	-40.920dBm

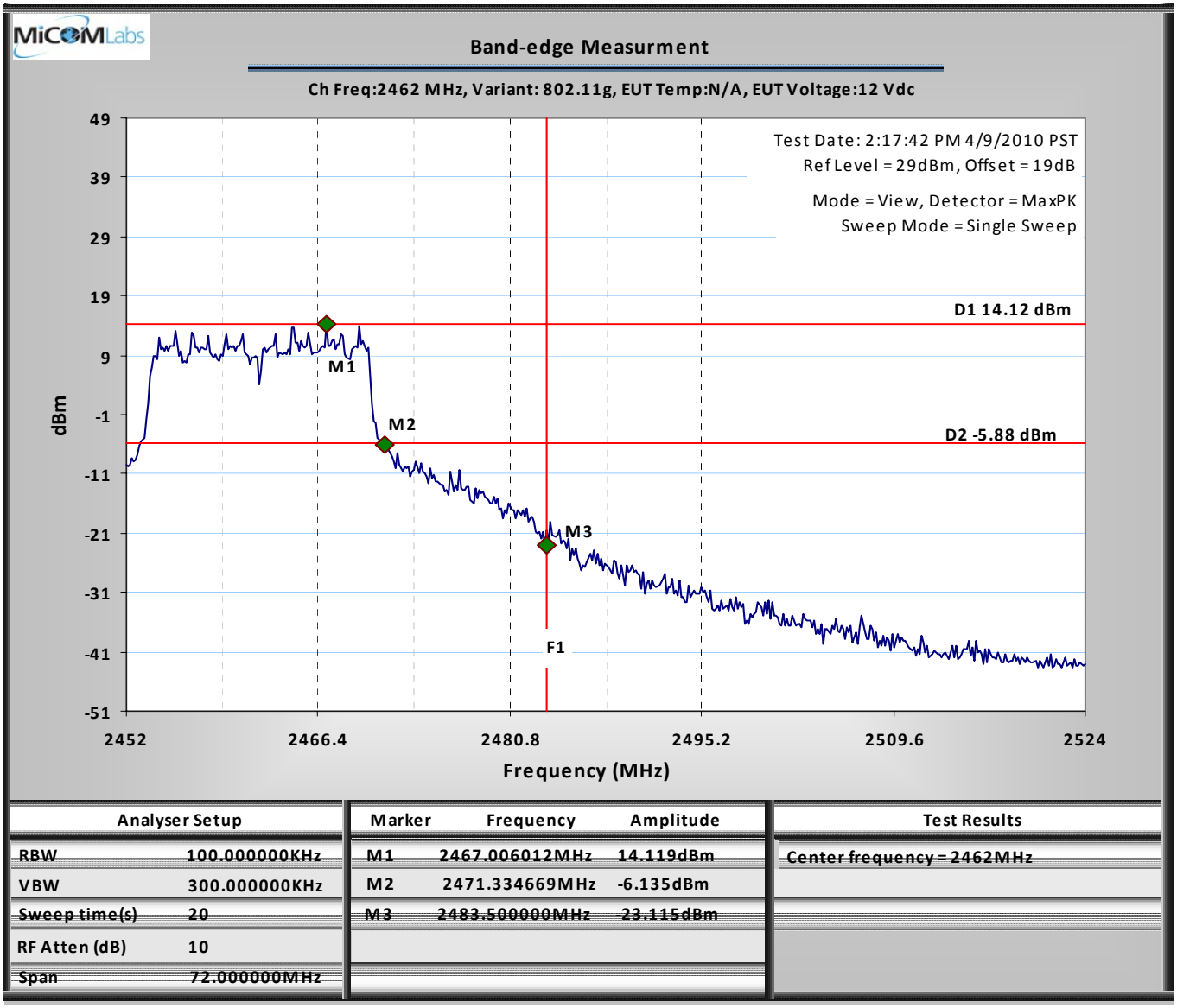
Test Results
Center frequency = 2462MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	72.000000MHz

Marker	Frequency	Amplitude
M1	2400.000000MHz	-11.130dBm
M2	2403.242485MHz	-5.391dBm
M3	2419.547094MHz	15.075dBm

Test Results
Center frequency = 2412MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	72.000000MHz

Marker	Frequency	Amplitude
M1	2467.006012MHz	14.119dBm
M2	2471.334669MHz	-6.135dBm
M3	2483.500000MHz	-23.115dBm

Test Results
Center frequency = 2462MHz

7.5.3 Measurement Results for 802,11n HT-20

Test Conditions:	15.247 (a)(2)		**Rel. Humidity (%):**	35	to	42
Variant:	802.11n HT-20		**Ambient Temp. (ºC):**	19	to	22
TPC:	HIGH		**Pressure (mBars):**	998	to	1003
Modulation:	ON		**Duty Cycle (%):**	100		
Beam Forming	N/A	dB	**Antenna Gain:**	N/A	dBi	
Applied Voltage:	12.0	Vdc				
Notes 1:						
Notes 2:						

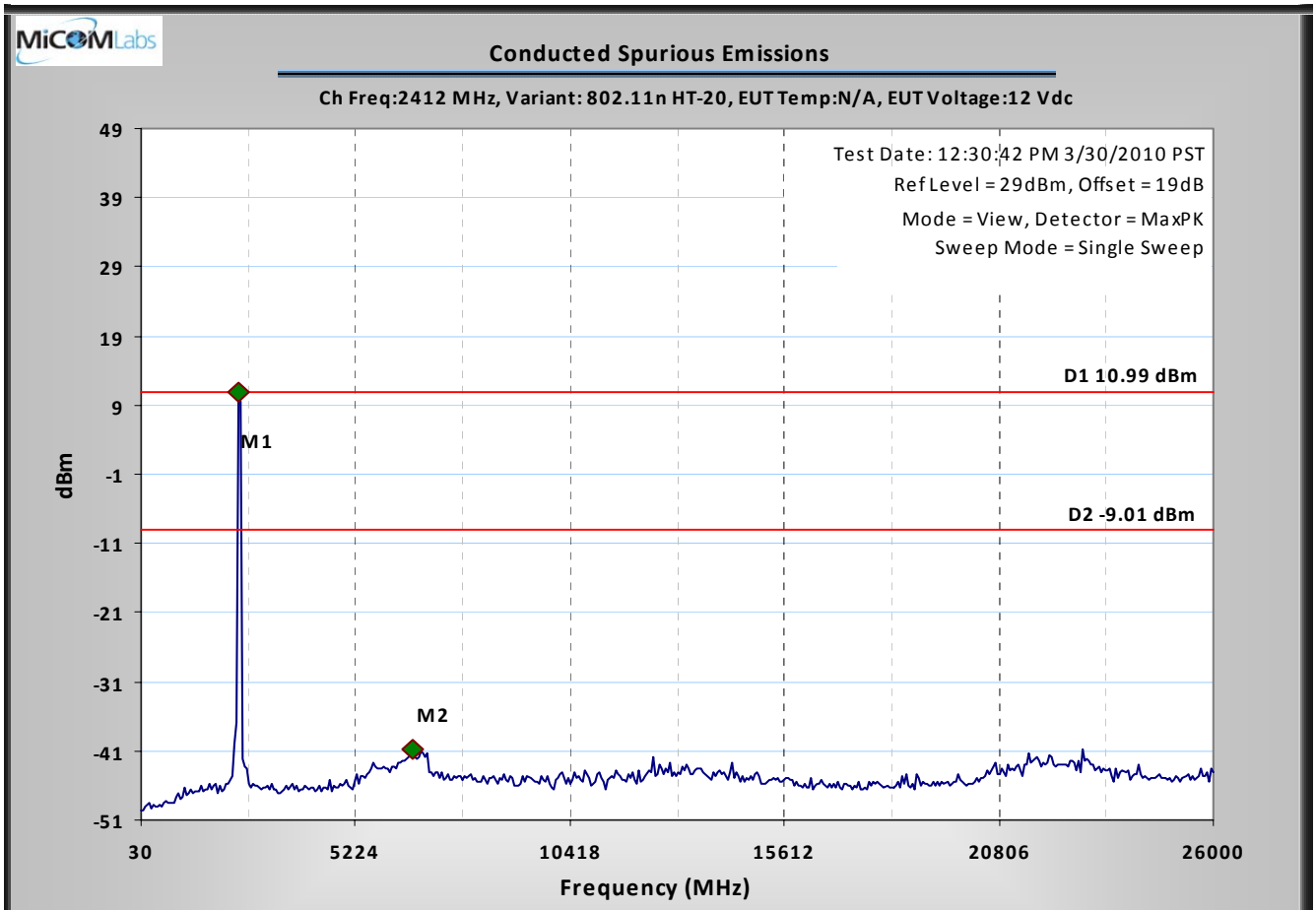
Conducted Spurious Measurment

Test Frequency	Start Frequency	Stop Frequency	Maximum Observed Emission	Limit (20 dB below peak of fundamental)
MHz	**MHz**	**MHz**	**dBm**	**dBm**
2412.00	30.00	26000.00	-40.70	-9.01
2437.00	30.00	26000.00	-40.93	-8.39
2462.00	30.00	26000.00	-40.90	-10.56

Band-edge Measurment

Test Frequency	Band-edge Frequency	Emission Amplitude @ Band-edge	Limit (20 dB below peak of fundamental)	Margin
MHz	**MHz**	**dBm**	**dBm**	**dB**
2412.00	2400.00	-12.03	-4.79	-7.25
2462.00	2483.50	-18.62	-5.81	-12.81

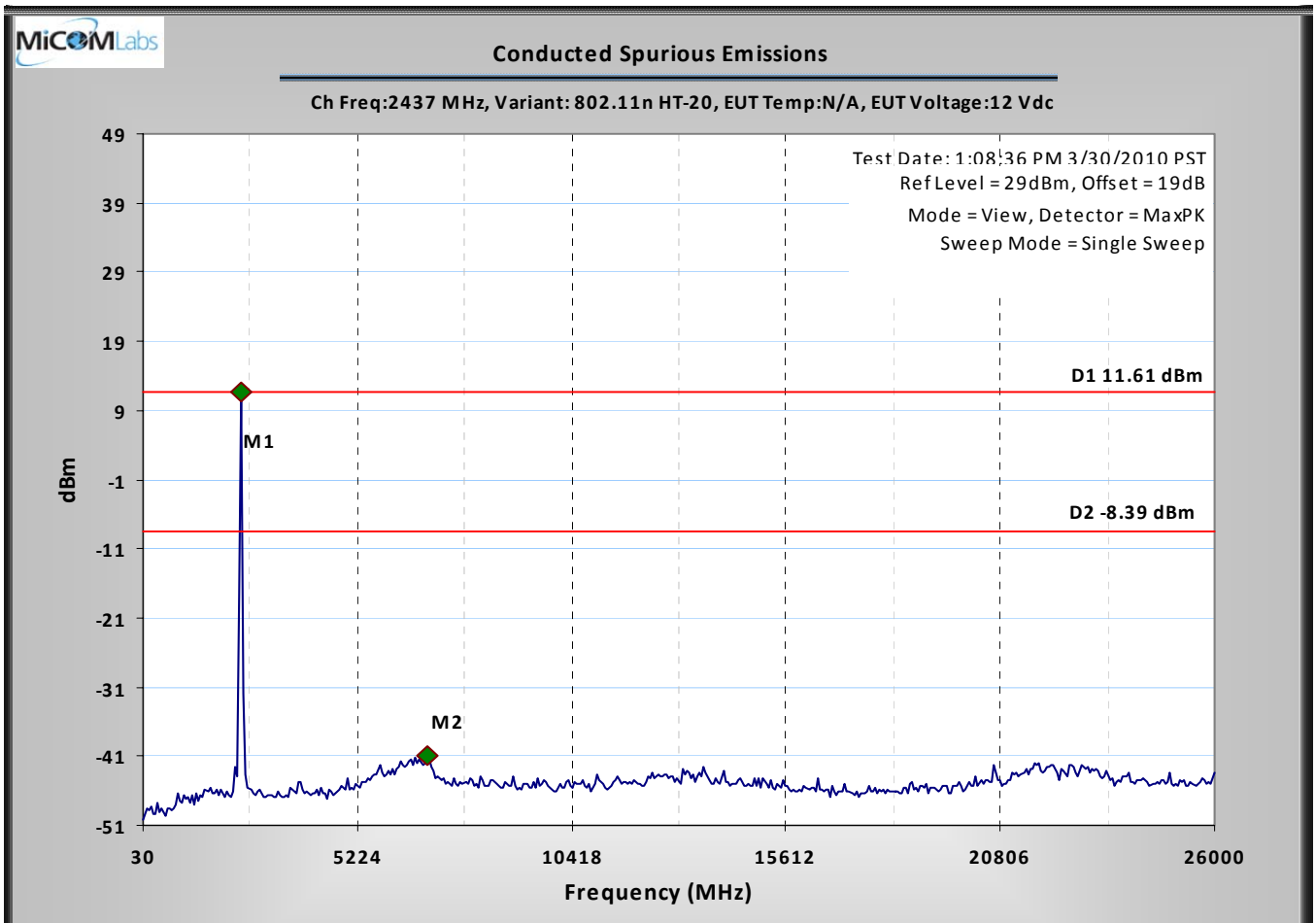
Measurement uncertainty:	±2.81 dB



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	60
RF Atten (dB)	10
Span	25.970000GHz

Marker	Frequency	Amplitude
M1	2371.983968MHz	10.991dBm
M2	6587.555110MHz	-40.699dBm

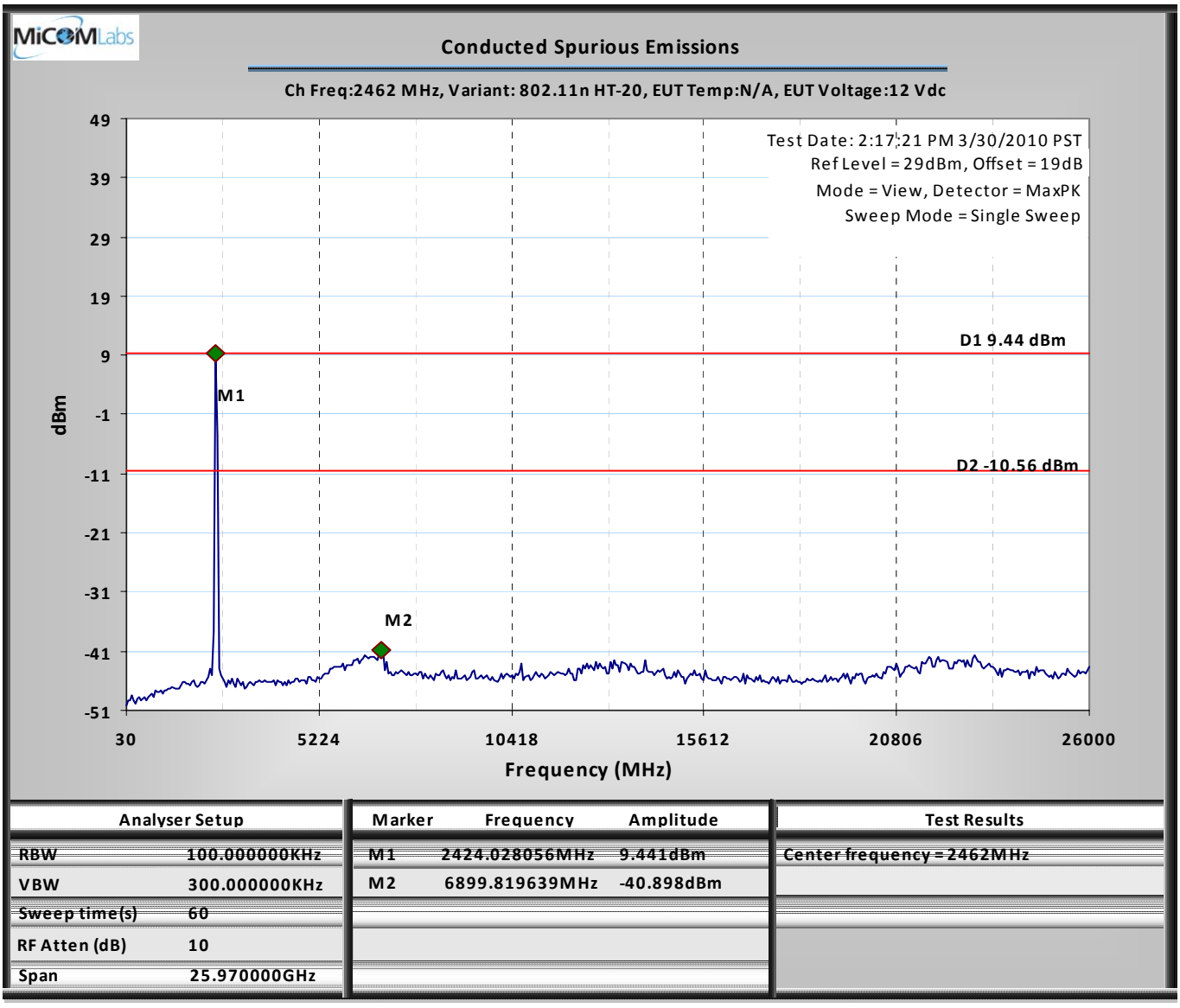
Test Results
Center frequency = 2412MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	60
RF Atten (dB)	10
Span	25.970000GHz

Marker	Frequency	Amplitude
M1	2424.028056MHz	11.607dBm
M2	6899.819639MHz	-40.932dBm

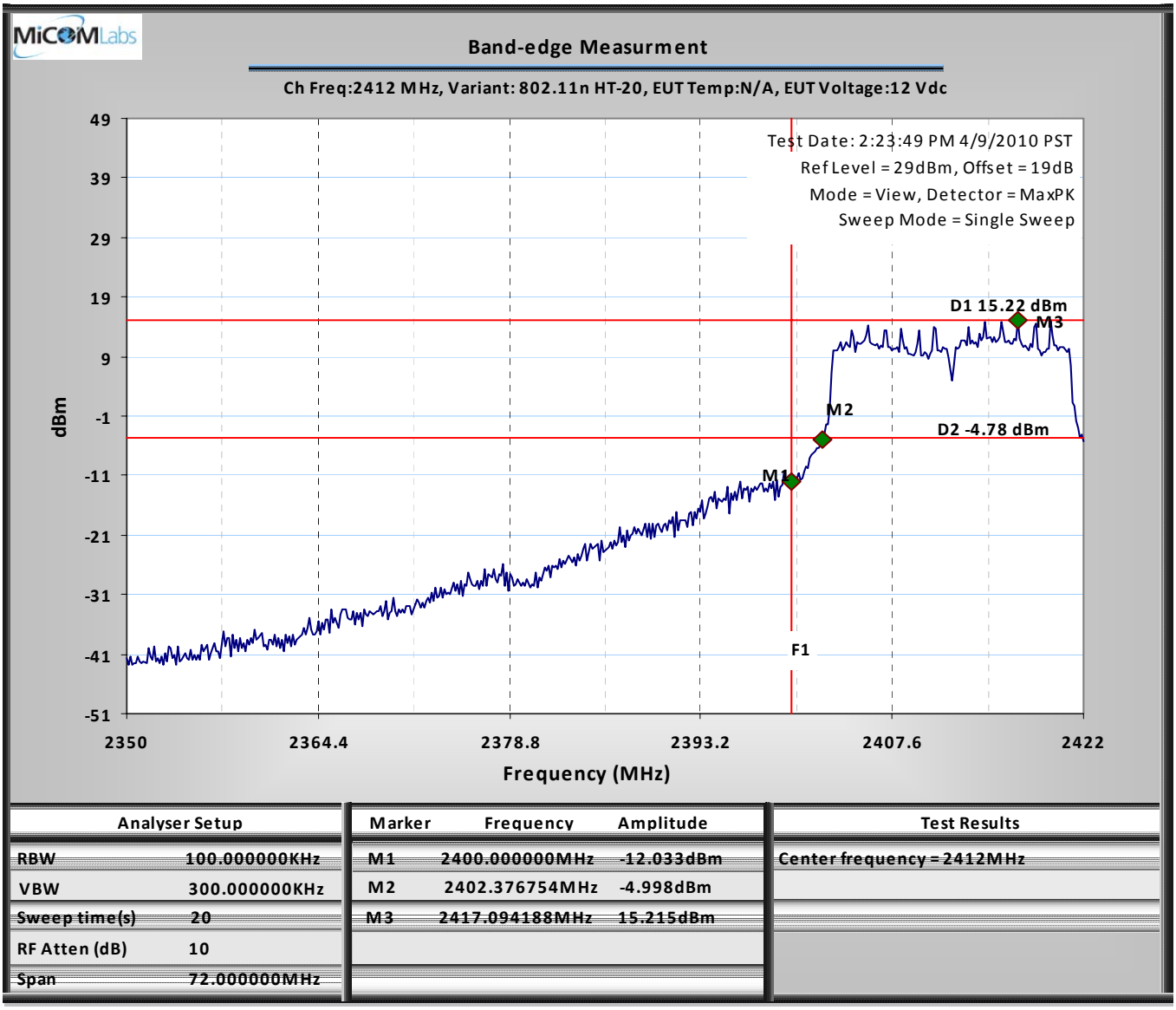
Test Results
Center frequency = 2437MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	60
RF Atten (dB)	10
Span	25.970000GHz

Marker	Frequency	Amplitude
M1	2424.028056MHz	9.441dBm
M2	6899.819639MHz	-40.898dBm

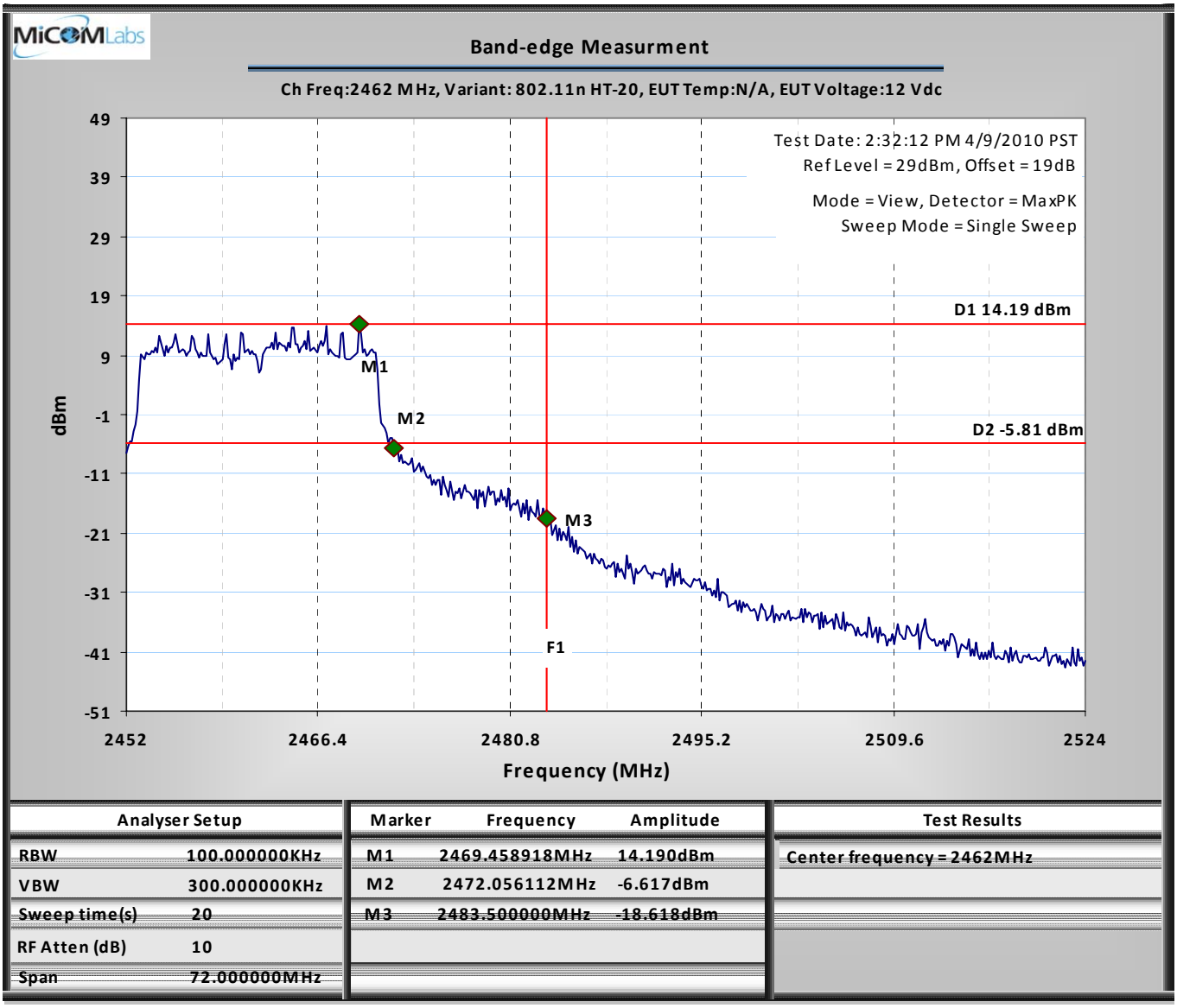
Test Results
Center frequency = 2462MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	72.000000MHz

Marker	Frequency	Amplitude
M1	2400.000000MHz	-12.033dBm
M2	2402.376754MHz	-4.998dBm
M3	2417.094188MHz	15.215dBm

Test Results
Center frequency = 2412MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	72.000000MHz

Marker	Frequency	Amplitude
M1	2469.458918MHz	14.190dBm
M2	2472.056112MHz	-6.617dBm
M3	2483.500000MHz	-18.618dBm

Test Results
Center frequency = 2462MHz

7.5.4 Measurement Results for 802,11n HT-40

Test Conditions:	15.247 (a)(2)		**Rel. Humidity (%):**	35 to 42	
Variant:	802.11n HT-40		**Ambient Temp. (ºC):**	19 to 22	
TPC:	HIGH		**Pressure (mBars):**	998 to 1003	
Modulation:	ON		**Duty Cycle (%):**	100	
Beam Forming	N/A	dB	**Antenna Gain:**	N/A	dBi
Applied Voltage:	12.0	Vdc			
Notes 1:					
Notes 2:					

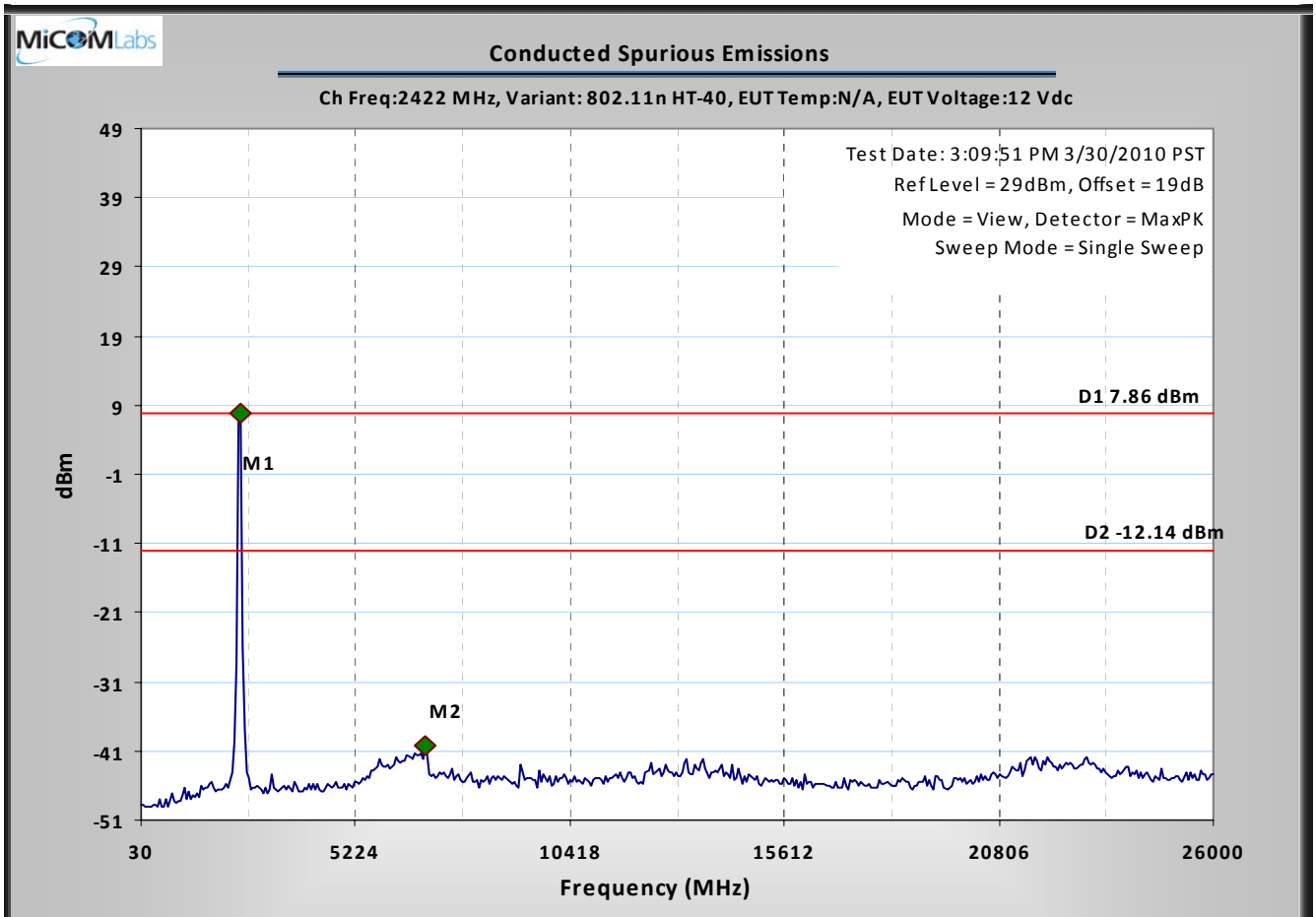
Conducted Spurious Measurment

Test Frequency	Start Frequency	Stop Frequency	Maximum Observed Emission	Limit (20 dB below peak of fundamental)
MHz	MHz	MHz	dBm	dBm
2422.00	30.00	26000.00	-40.36	-12.14
2437.00	30.00	26000.00	-39.28	-11.00
2452.00	30.00	26000.00	-40.88	-10.55

Band-edge Measurment

Test Frequency	Band-edge Frequency	Emission Amplitude @ Band-edge	Limit (20 dB below peak of fundamental)	Margin
MHz	MHz	dBm	dBm	dB
2422.00	2400.00	-14.03	-8.43	-5.61
2452.00	2483.50	-17.98	-9.37	-8.62

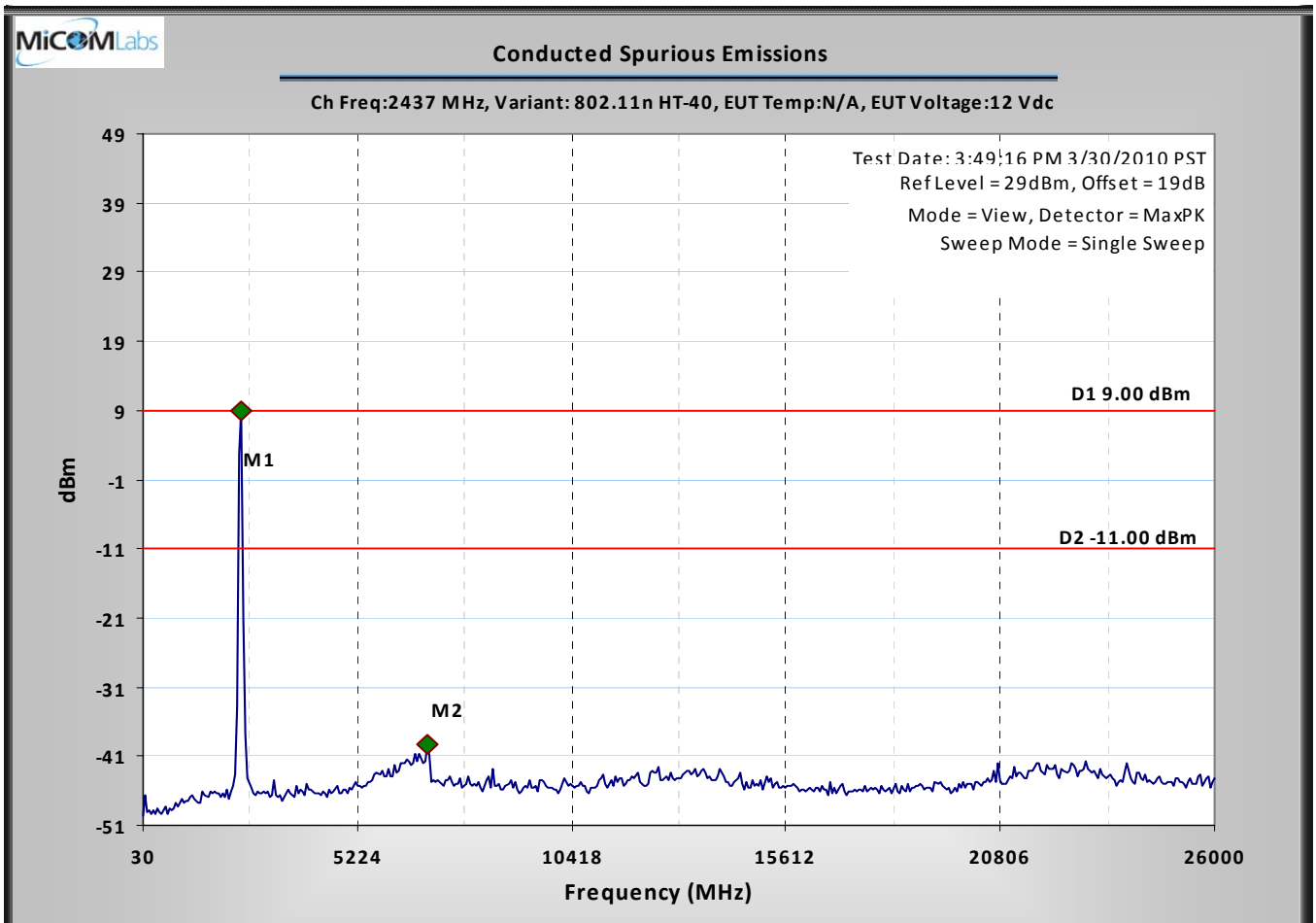
Measurement uncertainty:	±2.81 dB



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	60
RF Atten (dB)	10
Span	25.970000GHz

Marker	Frequency	Amplitude
M1	2424.028056MHz	7.857dBm
M2	6899.819639MHz	-40.355dBm

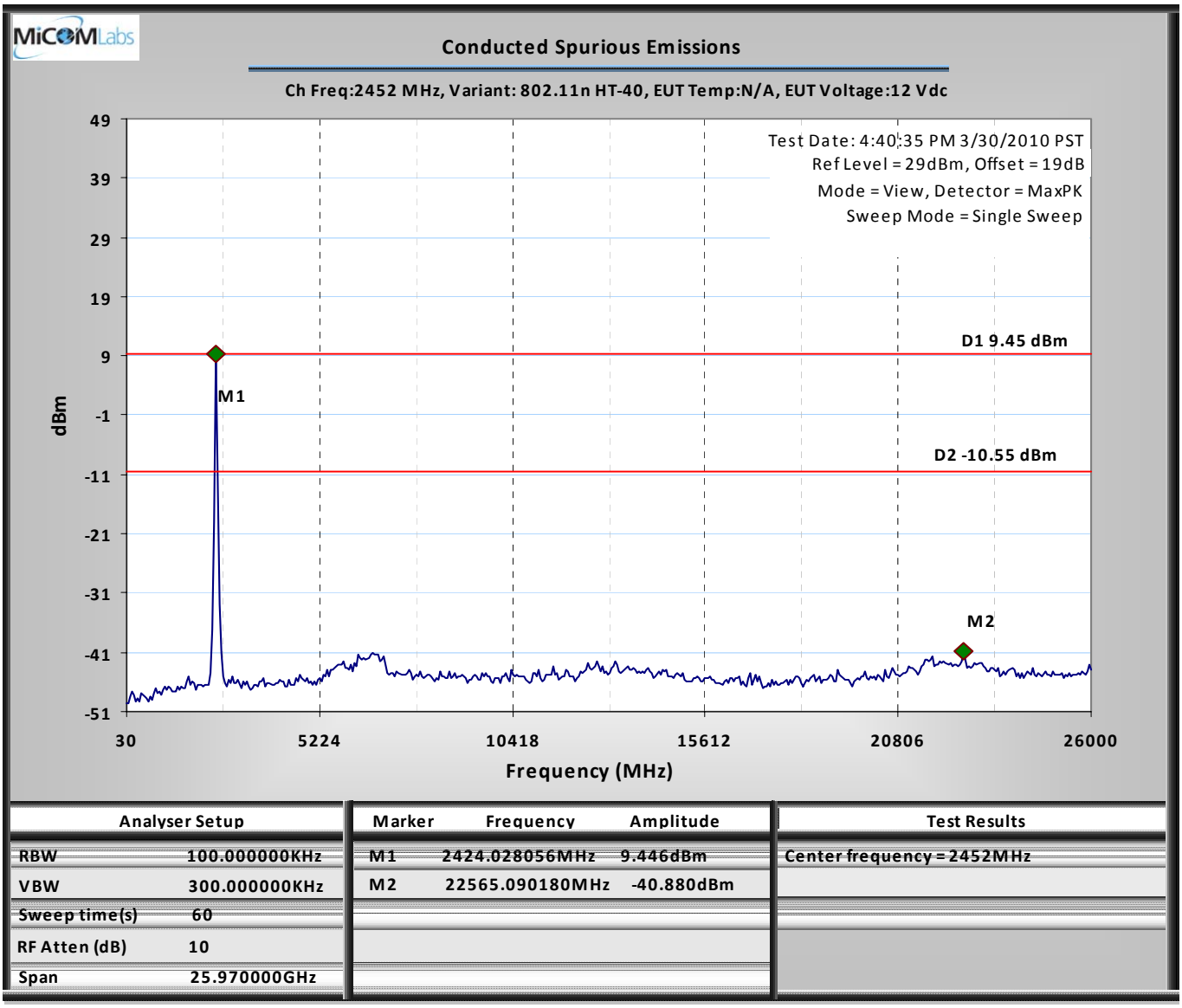
Test Results
Center frequency = 2422MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	60
RF Atten (dB)	10
Span	25.970000GHz

Marker	Frequency	Amplitude
M1	2424.028056MHz	8.996dBm
M2	6899.819639MHz	-39.279dBm

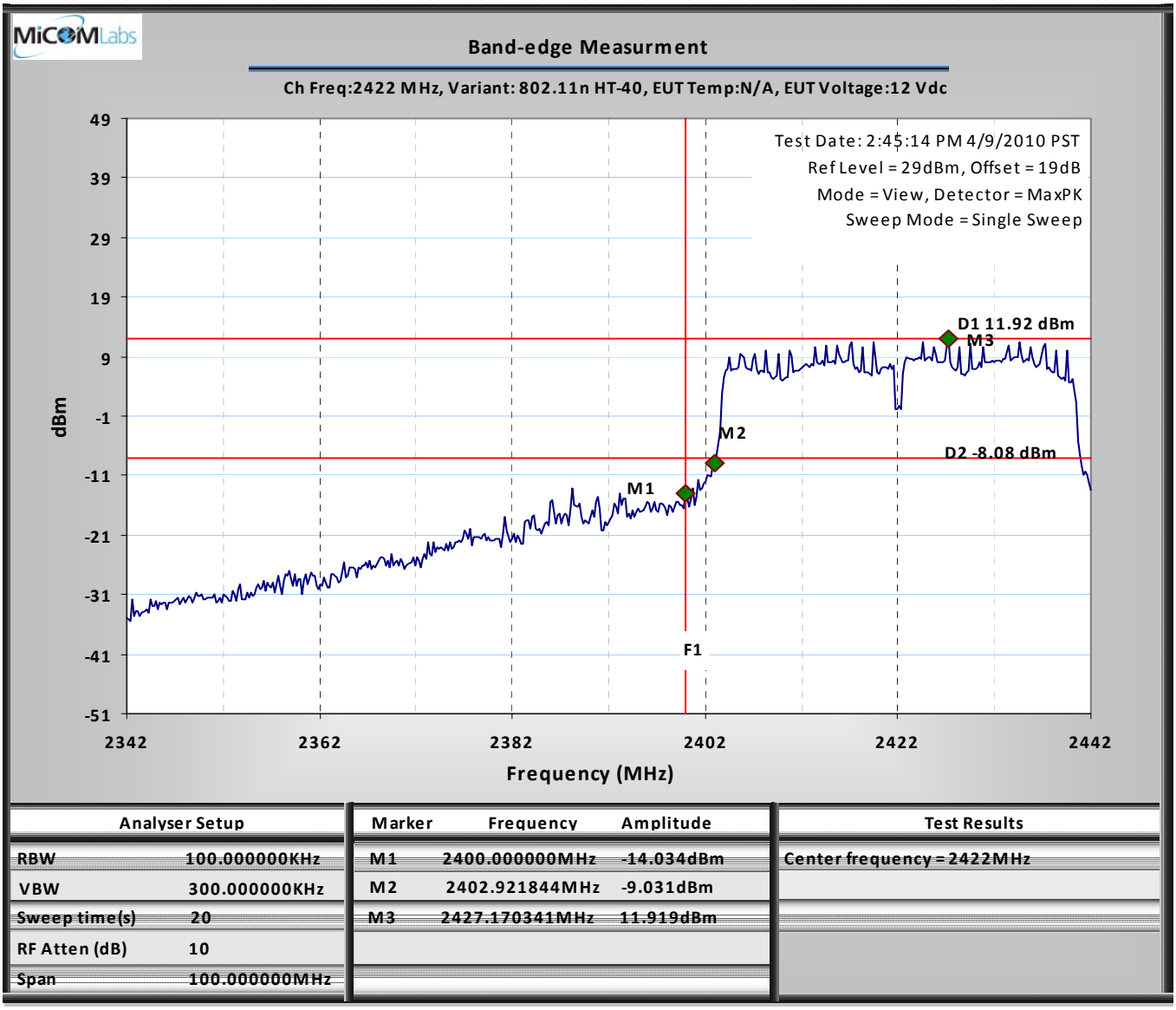
Test Results
Center frequency = 2437MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	60
RF Atten (dB)	10
Span	25.970000GHz

Marker	Frequency	Amplitude
M1	2424.028056MHz	9.446dBm
M2	22565.090180MHz	-40.880dBm

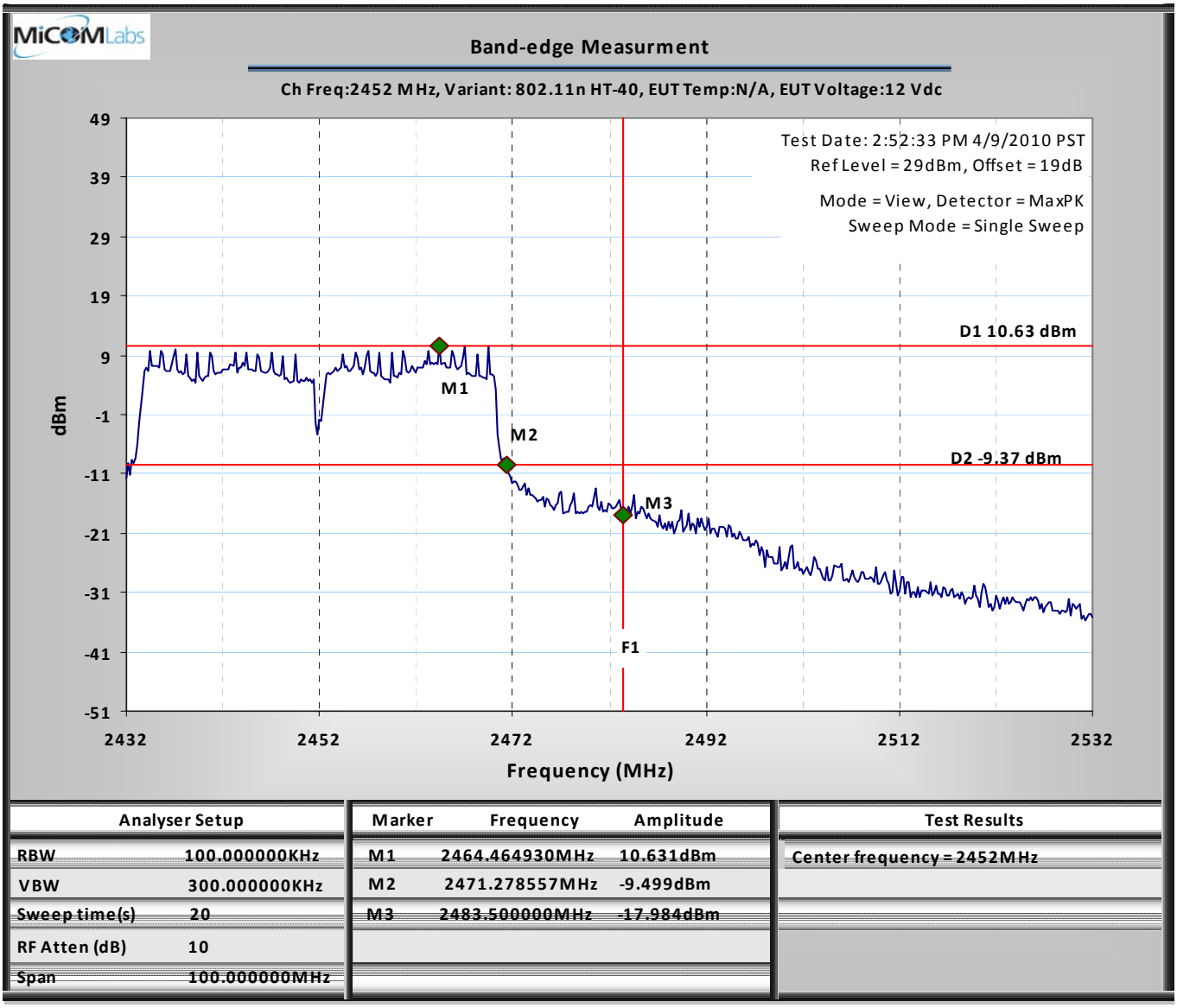
Test Results
Center frequency = 2452MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	100.000000MHz

Marker	Frequency	Amplitude
M1	2400.000000MHz	-14.034dBm
M2	2402.921844MHz	-9.031dBm
M3	2427.170341MHz	11.919dBm

Test Results
Center frequency = 2422MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	100.000000MHz

Marker	Frequency	Amplitude
M1	2464.464930MHz	10.631dBm
M2	2471.278557MHz	-9.499dBm
M3	2483.500000MHz	-17.984dBm

Test Results
Center frequency = 2452MHz

7.5.5 Measurement results for 802.11a

Test Conditions:	15.247 (a)(2)		**Rel. Humidity (%):**	35	to	42
Variant:	802.11a		**Ambient Temp. (ºC):**	19	to	22
TPC:	HIGH		**Pressure (mBars):**	998	to	1003
Modulation:	ON		**Duty Cycle (%):**	100		
Beam Forming	N/A	dB	**Antenna Gain:**	N/A	dBi	
Applied Voltage:	12.00	Vdc				
Notes 1:						
Notes 2:						

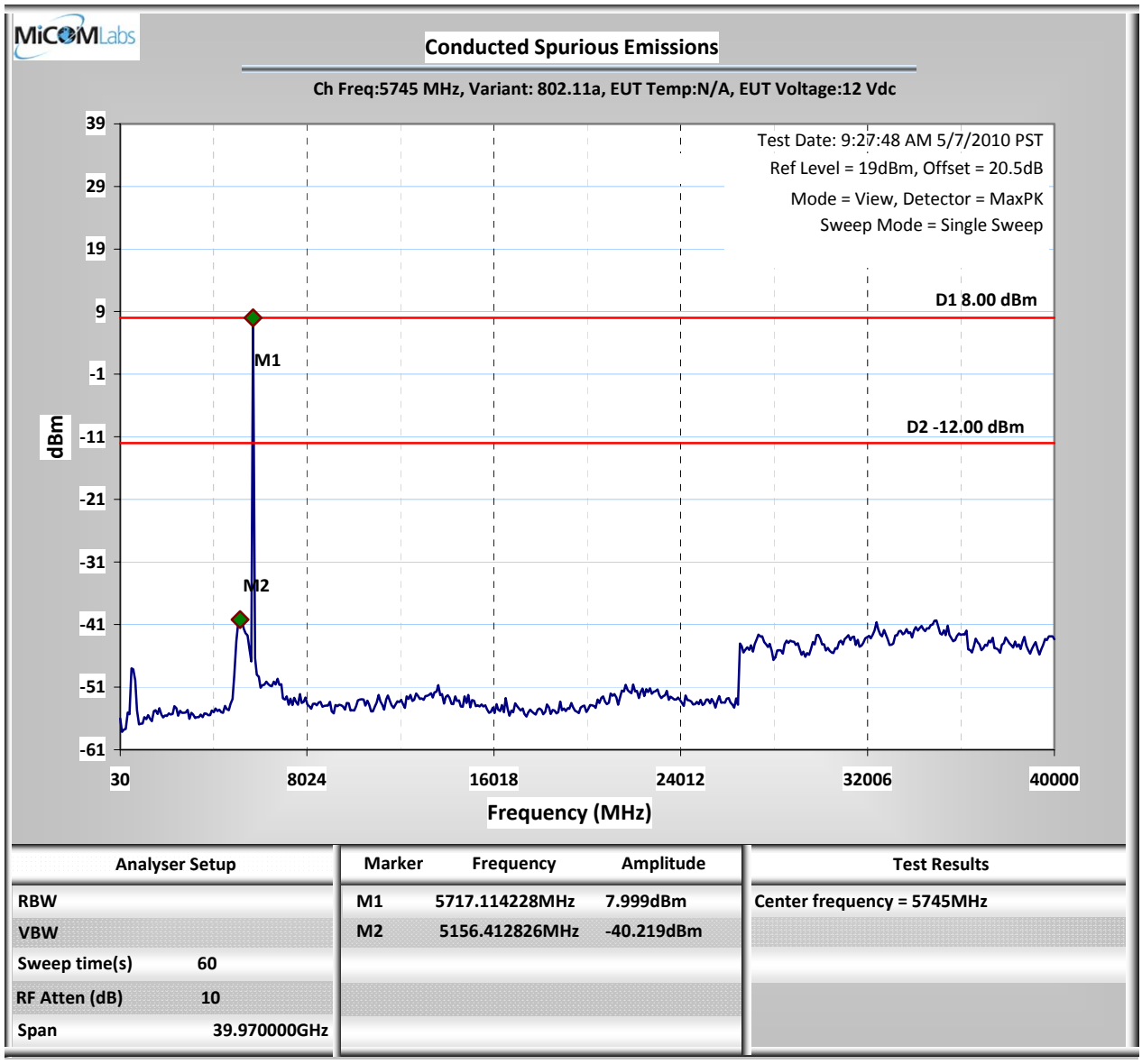
Conducted Spurious Measurment

Test Frequency	Start Frequency	Stop Frequency	Maximum Observed Emission	Limit (20 dB below peak of fundamental)
MHz	**MHz**	**MHz**	**dBm**	**dBm**
5745	30.00	40000.00	-40.22	-12.00
5785	30.00	40000.00	-39.57	-13.55
5825	30.00	40000.00	-39.87	-11.78

Band-edge Measurment

Test Frequency	Band-edge Frequency	Emission Amplitude @ Band-edge	Limit (20 dB below peak of fundamental)	Margin
MHz	**MHz**	**dBm**	**dBm**	**dB**
5745.00	5725.00	-25.51	-8.86	-16.65
5825.00	5850.00	-37.18	-10.35	-26.84

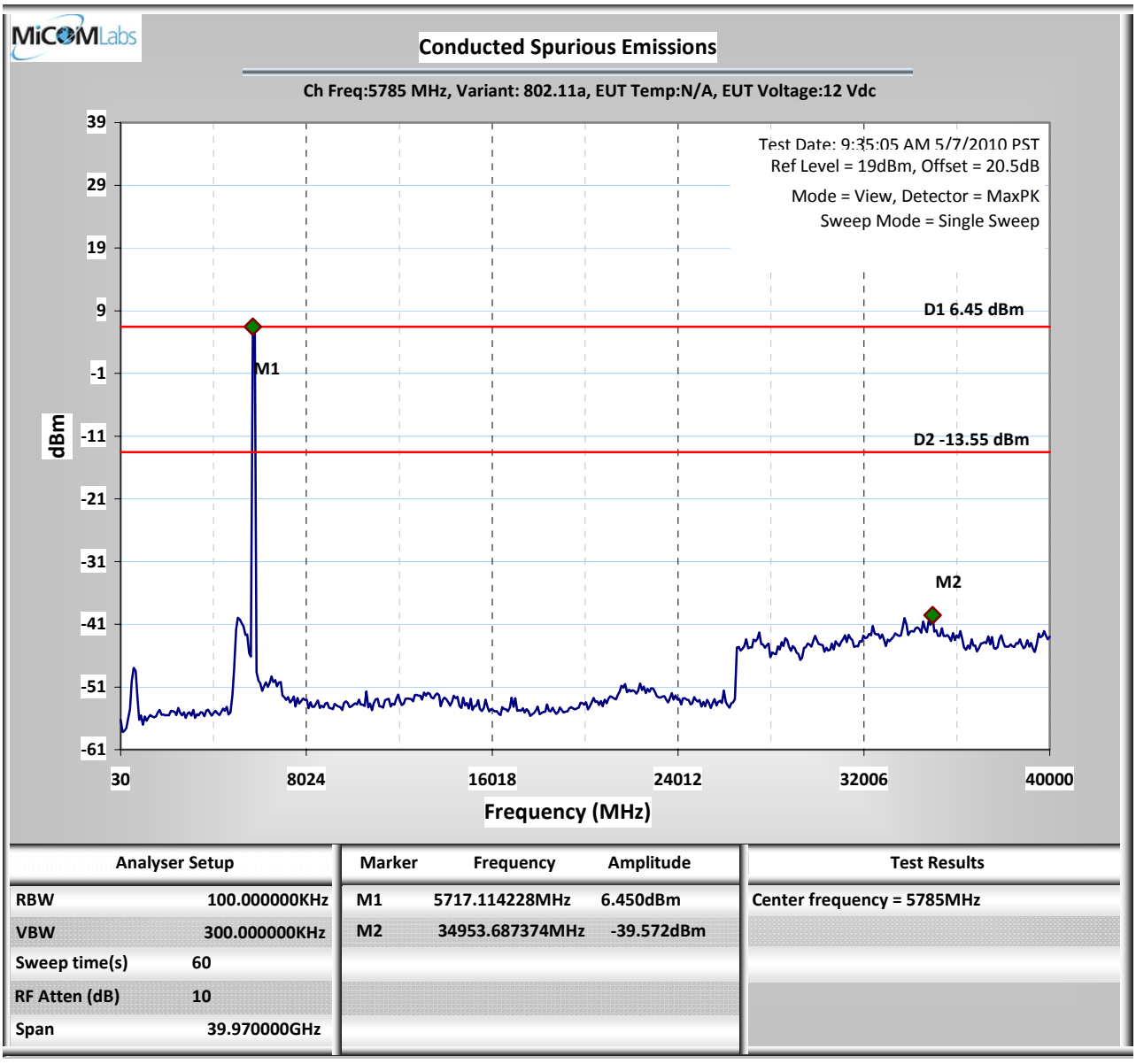
Measurement uncertainty:	±2.81 dB



Analyser Setup	
RBW	
VBW	
Sweep time(s)	60
RF Atten (dB)	10
Span	39.970000GHz

Marker	Frequency	Amplitude
M1	5717.114228MHz	7.999dBm
M2	5156.412826MHz	-40.219dBm

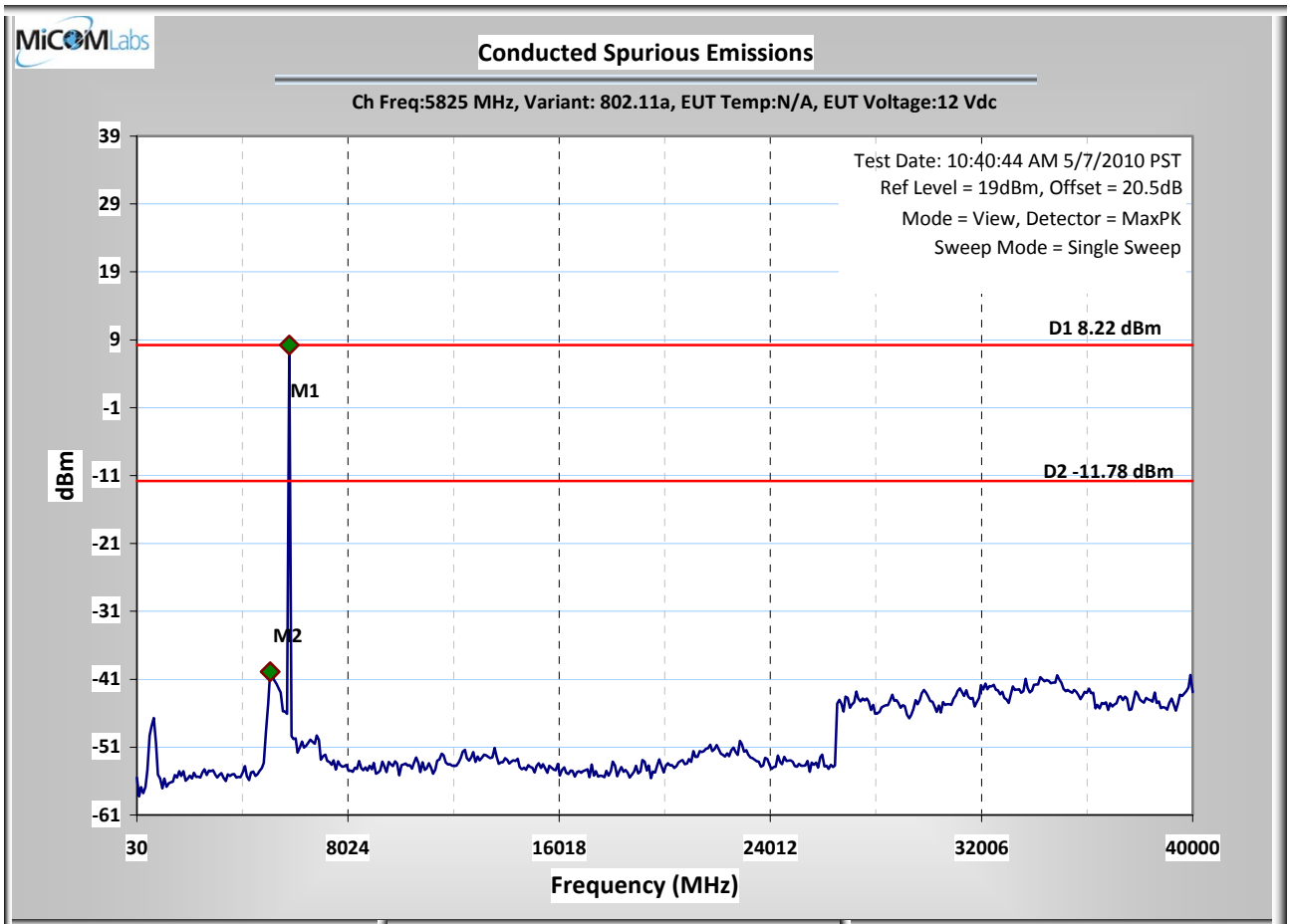
Test Results
Center frequency = 5745MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	60
RF Atten (dB)	10
Span	39.970000GHz

Marker	Frequency	Amplitude
M1	5717.114228MHz	6.450dBm
M2	34953.687374MHz	-39.572dBm

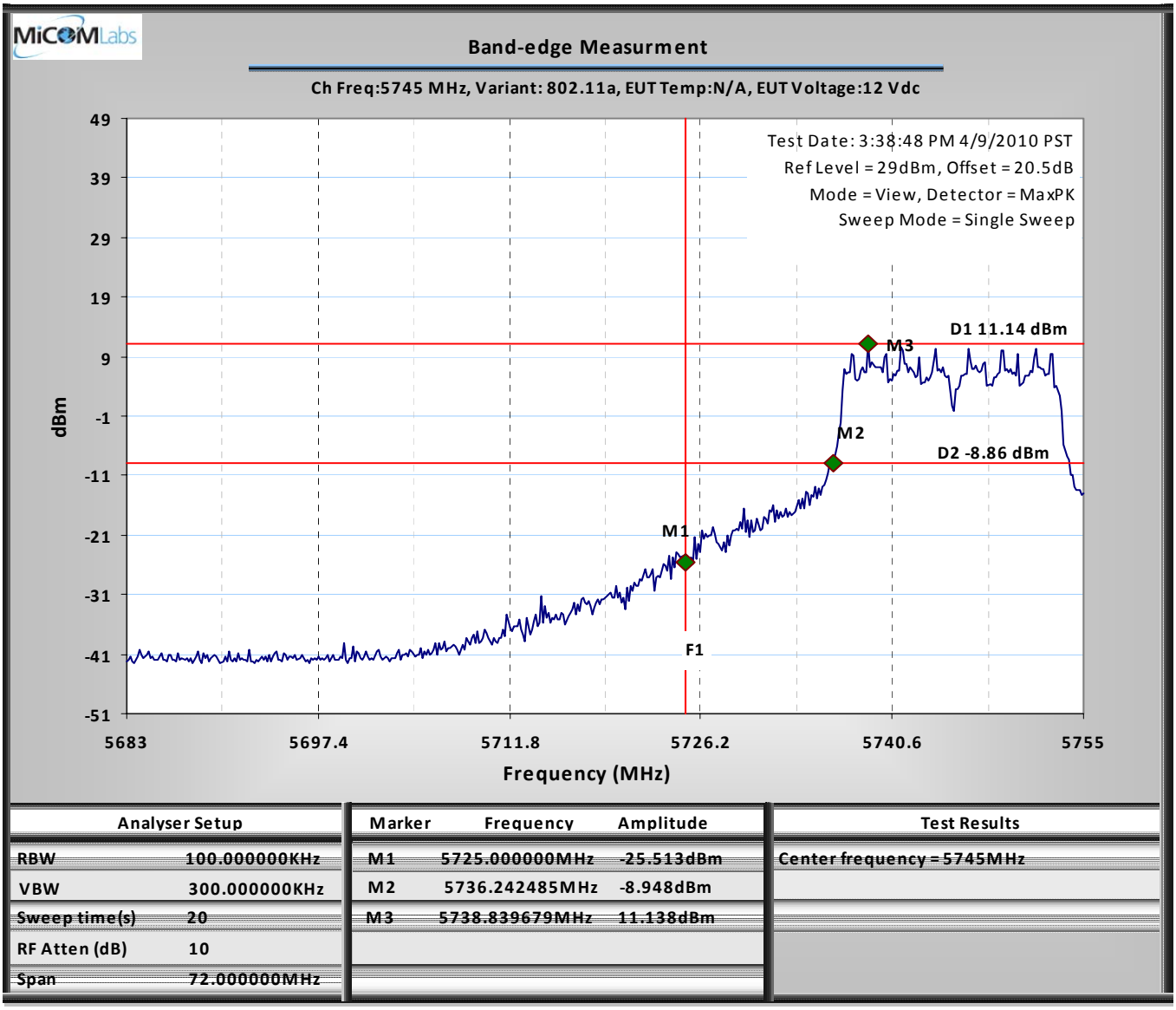
Test Results
Center frequency = 5785MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	60
RF Atten (dB)	10
Span	39.970000GHz

Marker	Frequency	Amplitude
M1	5797.214429MHz	8.219dBm
M2	5076.312625MHz	-39.871dBm

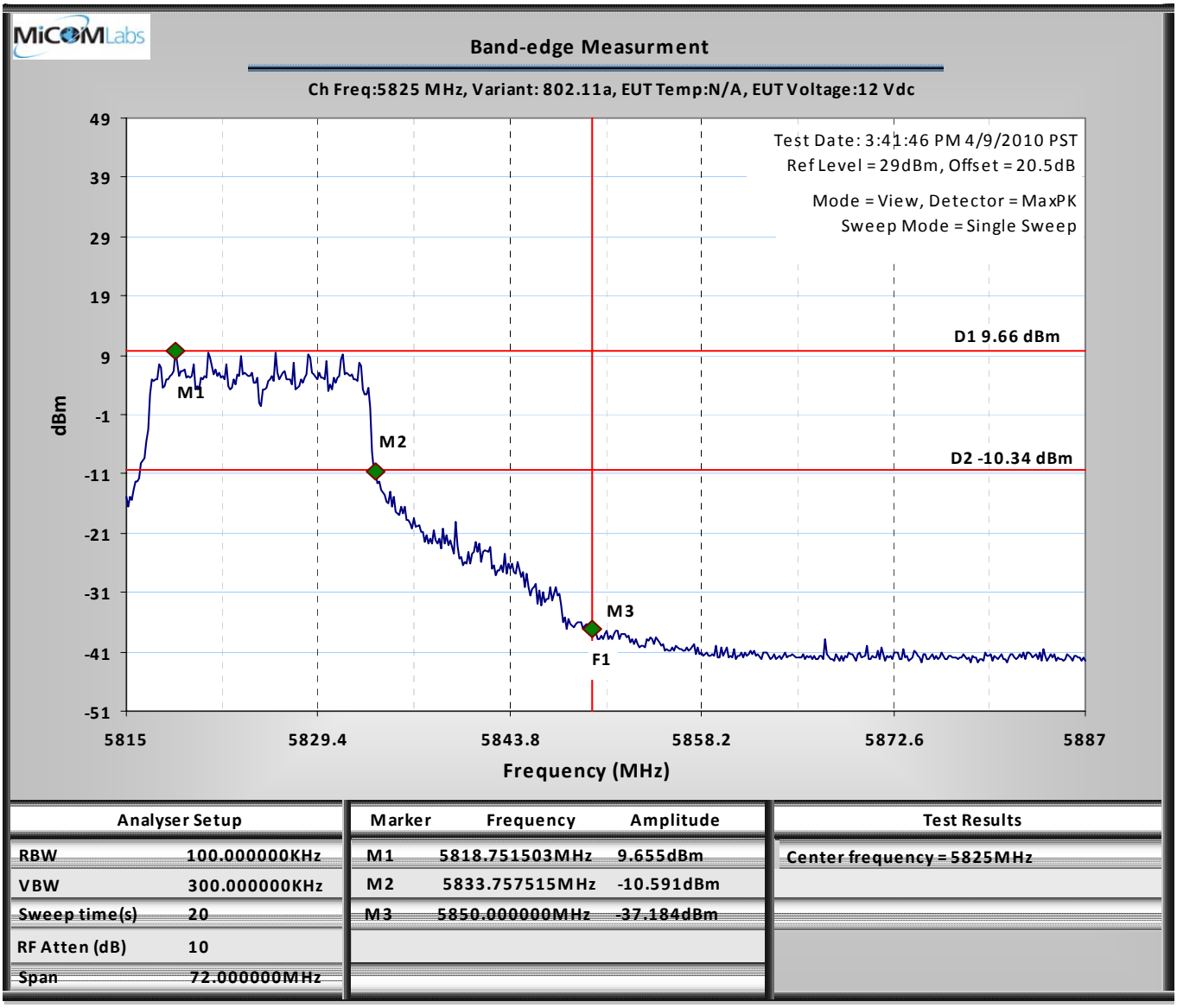
Test Results
Center frequency = 5825MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	72.000000MHz

Marker	Frequency	Amplitude
M1	5725.000000MHz	-25.513dBm
M2	5736.242485MHz	-8.948dBm
M3	5738.839679MHz	11.138dBm

Test Results
Center frequency = 5745MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	72.000000MHz

Marker	Frequency	Amplitude
M1	5818.751503MHz	9.655dBm
M2	5833.757515MHz	-10.591dBm
M3	5850.000000MHz	-37.184dBm

Test Results
Center frequency = 5825MHz

7.5.6 Measurement Results for 802,11n HT-20

Test Conditions:	15.247 (a)(2)		**Rel. Humidity (%):**	35	to	42
Variant:	802.11n HT-20		**Ambient Temp. (ºC):**	19	to	22
TPC:	HIGH		**Pressure (mBars):**	998	to	1003
Modulation:	ON		**Duty Cycle (%):**	100		
Beam Forming Gain	N/A	dB	**Antenna Gain:**	N/A	dBi	
Applied Voltage:	12.00	Vdc				
Notes 1:						
Notes 2:						

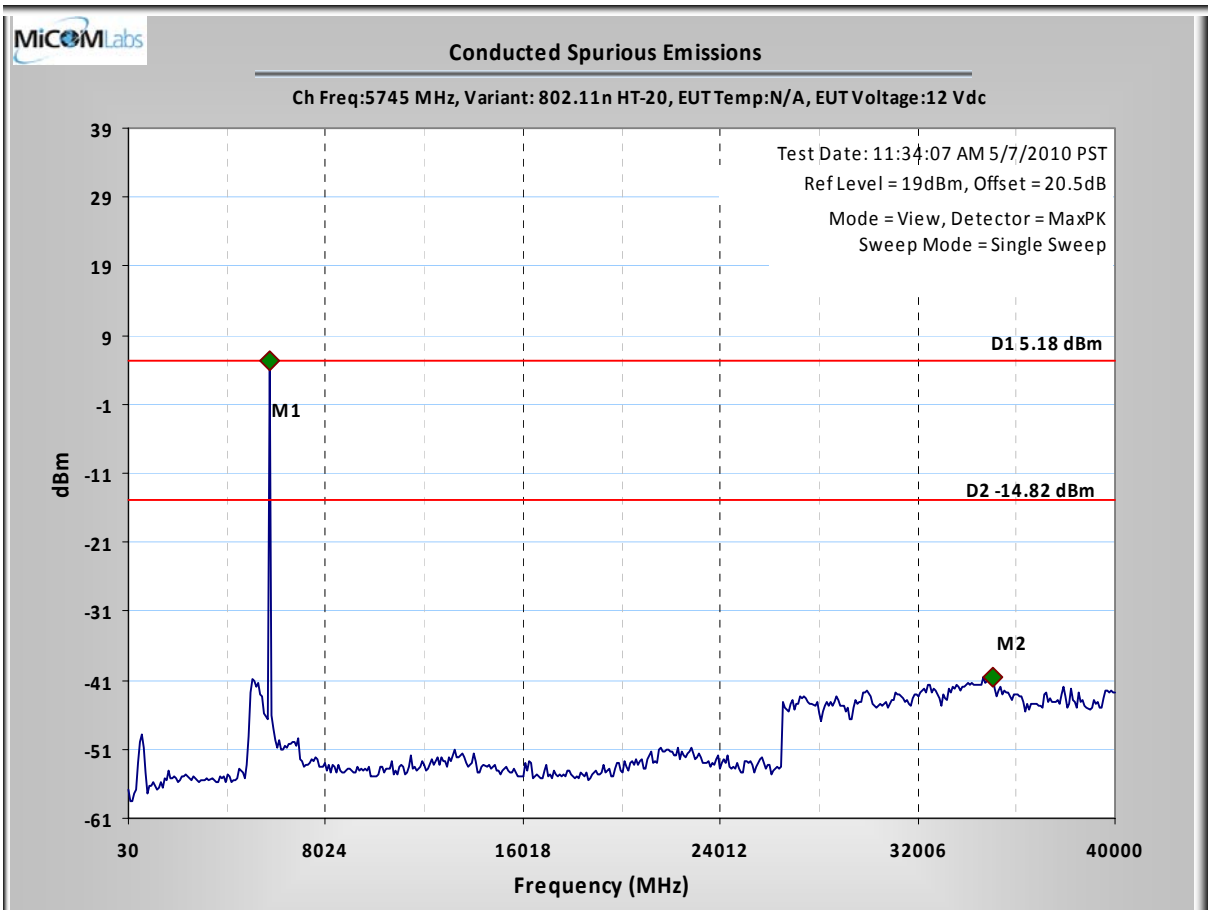
Conducted Spurious Measurment

Test Frequency	Start Frequency	Stop Frequency	Maximum Observed Emission	Limit (20 dB below peak of fundamental)
MHz	**MHz**	**MHz**	**dBm**	**dBm**
5745	30.00	40000.00	-40.47	-14.82
5785	30.00	40000.00	-40.55	-10.37
5825	30.00	40000.00	-39.63	-14.65

Band-edge Measurment

Test Frequency	Band-edge Frequency	Emission Amplitude @ Band-edge	Limit (20 dB below peak of fundamental)	Margin
MHz	**MHz**	**dBm**	**dBm**	**dB**
5745.00	5725.00	-24.27	-8.86	-15.42
5825.00	5850.00	-36.44	-10.05	-26.39

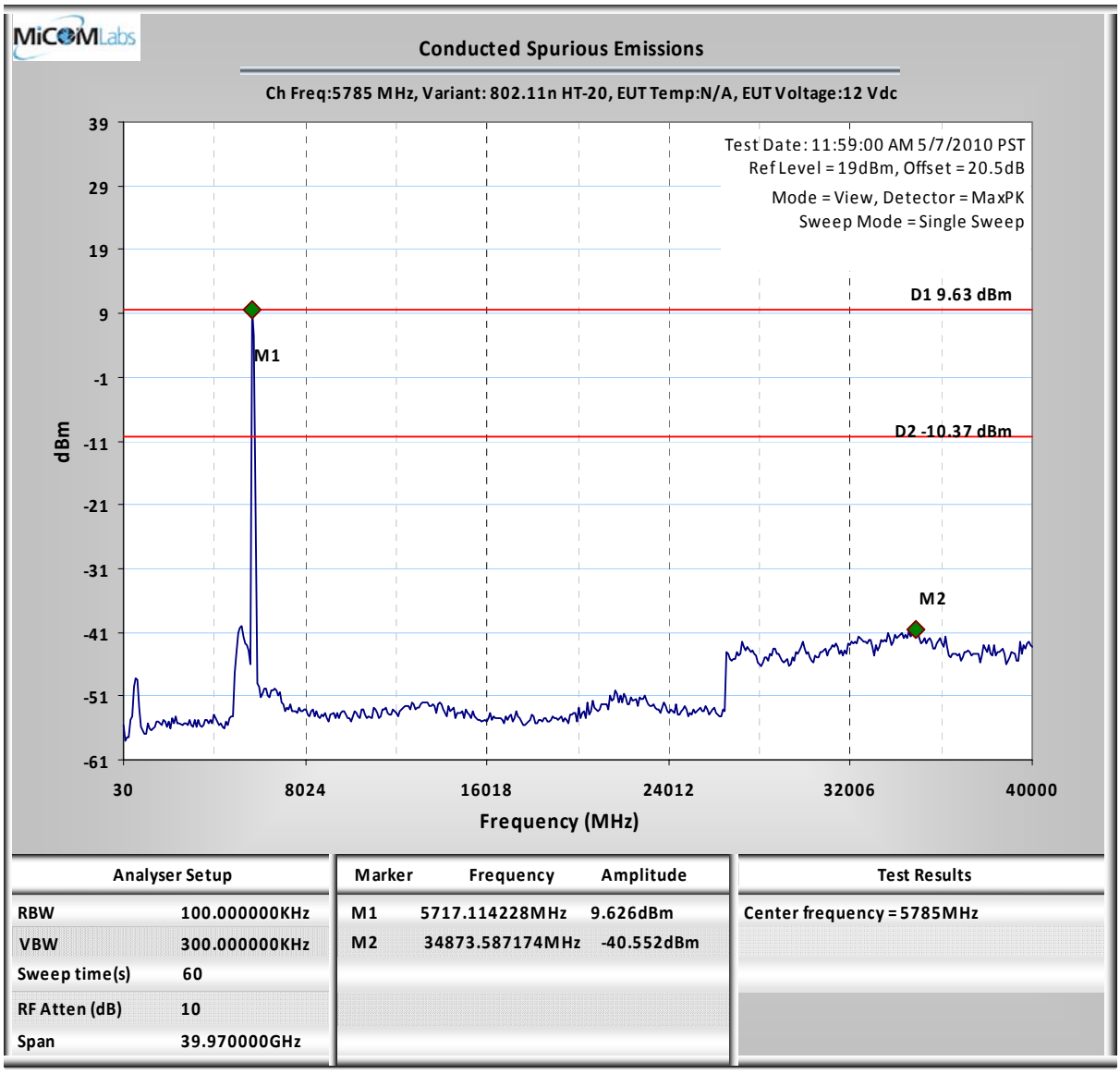
Measurement uncertainty:	±2.81 dB



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	60
RF Atten (dB)	10
Span	39.970000GHz

Marker	Frequency	Amplitude
M1	5717.114228MHz	5.185dBm
M2	35033.787575MHz	-40.471dBm

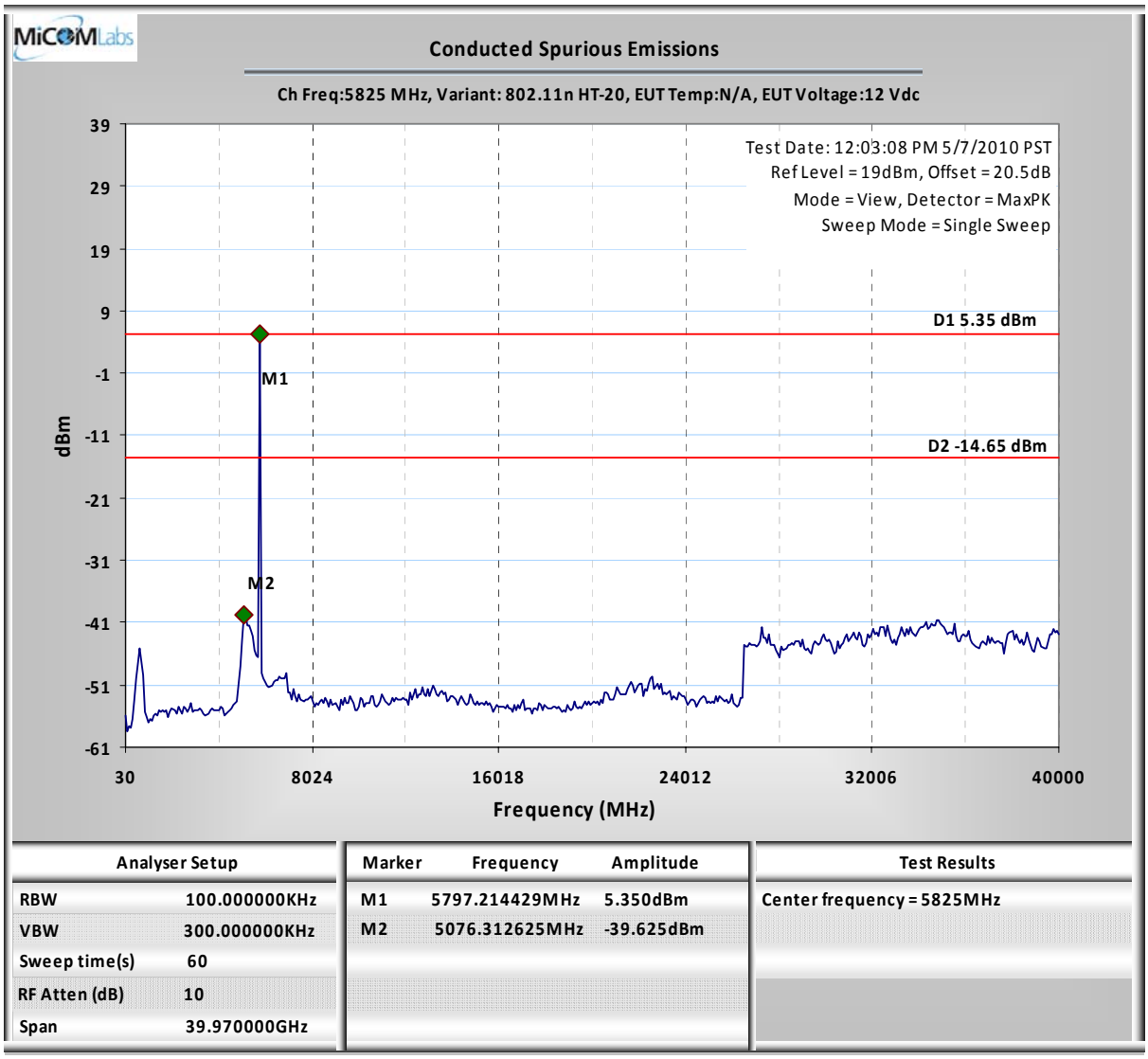
Test Results
Center frequency = 5745MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	60
RF Atten (dB)	10
Span	39.970000GHz

Marker	Frequency	Amplitude
M1	5717.114228MHz	9.626dBm
M2	34873.587174MHz	-40.552dBm

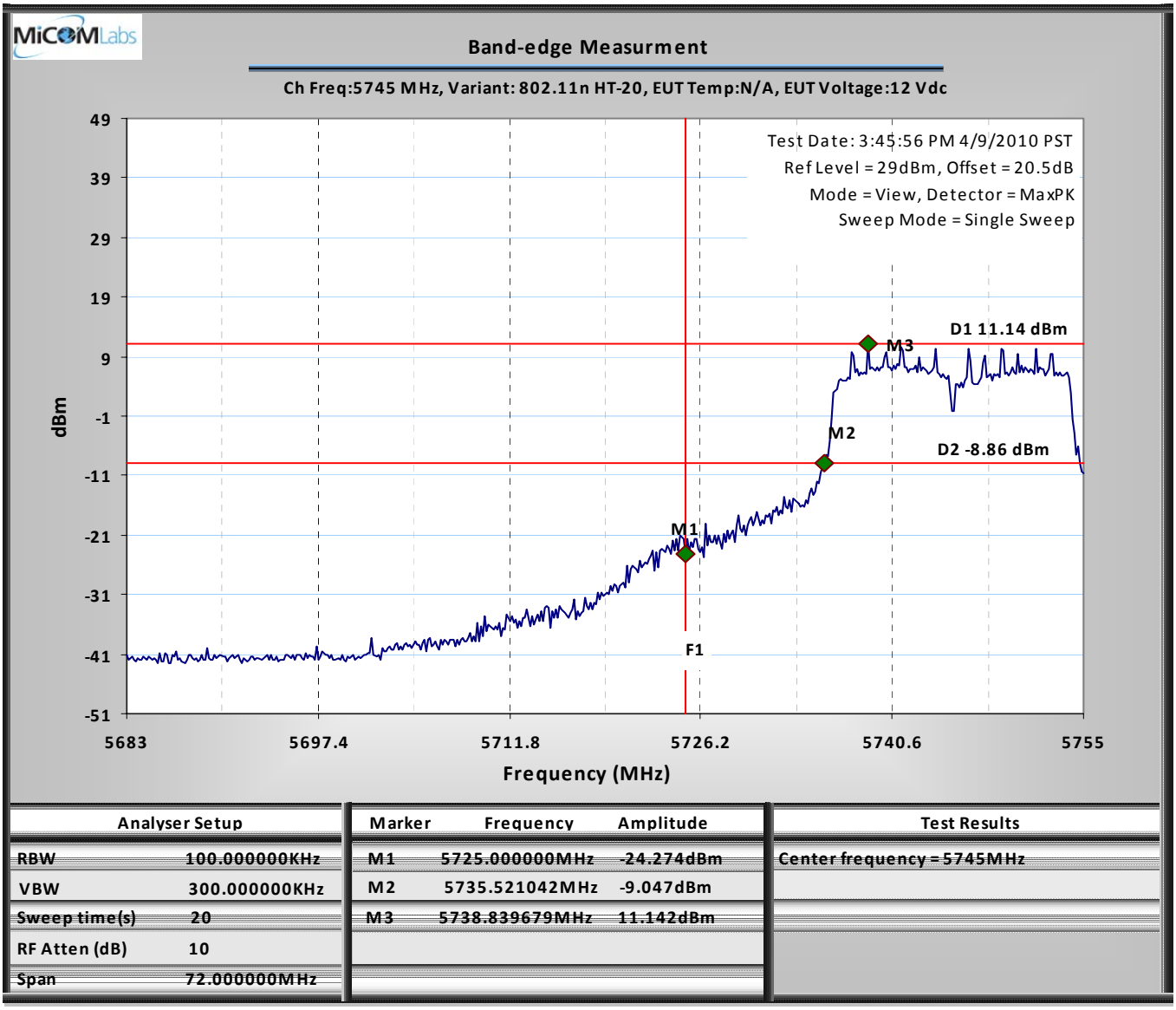
Test Results
Center frequency = 5785MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	60
RF Atten (dB)	10
Span	39.970000GHz

Marker	Frequency	Amplitude
M1	5797.214429MHz	5.350dBm
M2	5076.312625MHz	-39.625dBm

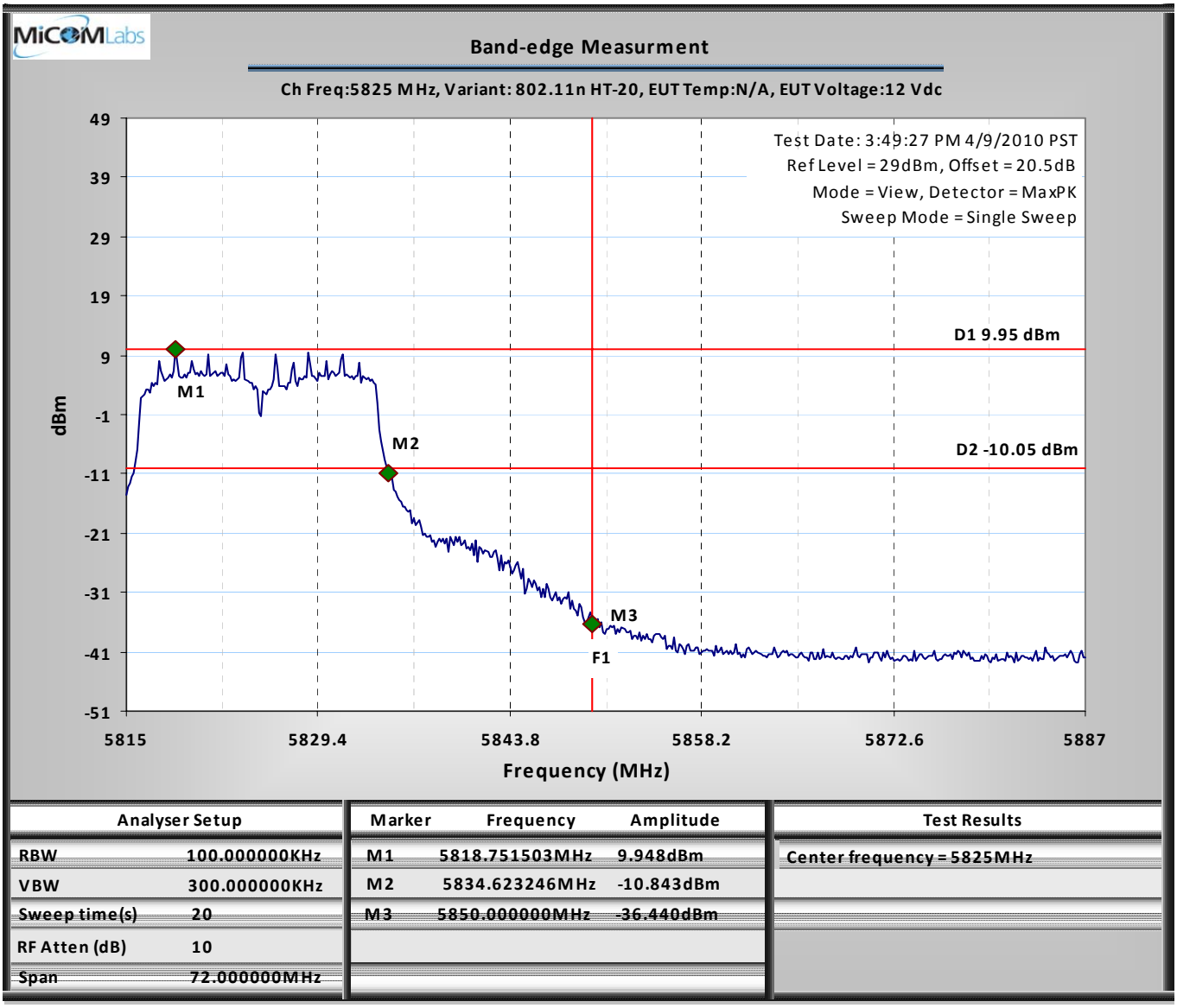
Test Results
Center frequency = 5825MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	72.000000MHz

Marker	Frequency	Amplitude
M1	5725.000000MHz	-24.274dBm
M2	5735.521042MHz	-9.047dBm
M3	5738.839679MHz	11.142dBm

Test Results
Center frequency = 5745MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	72.000000MHz

Marker	Frequency	Amplitude
M1	5818.751503MHz	9.948dBm
M2	5834.623246MHz	-10.843dBm
M3	5850.000000MHz	-36.440dBm

Test Results
Center frequency = 5825MHz

7.5.7 Measurement Results for 802,11n HT-40

Test Conditions:	15.247 (a)(2)	**Rel. Humidity (%):**	35	to	42
Variant:	802.11n HT-40	**Ambient Temp. (ºC):**	19	to	22
TPC:	HIGH	**Pressure (mBars):**	998	to	1003
Modulation:	ON	**Duty Cycle (%):**	100		
Beam Forming Gain	N/A dB	**Antenna Gain:**	N/A	dBi	
Applied Voltage:	12.00 Vdc				
Notes 1:					
Notes 2:					

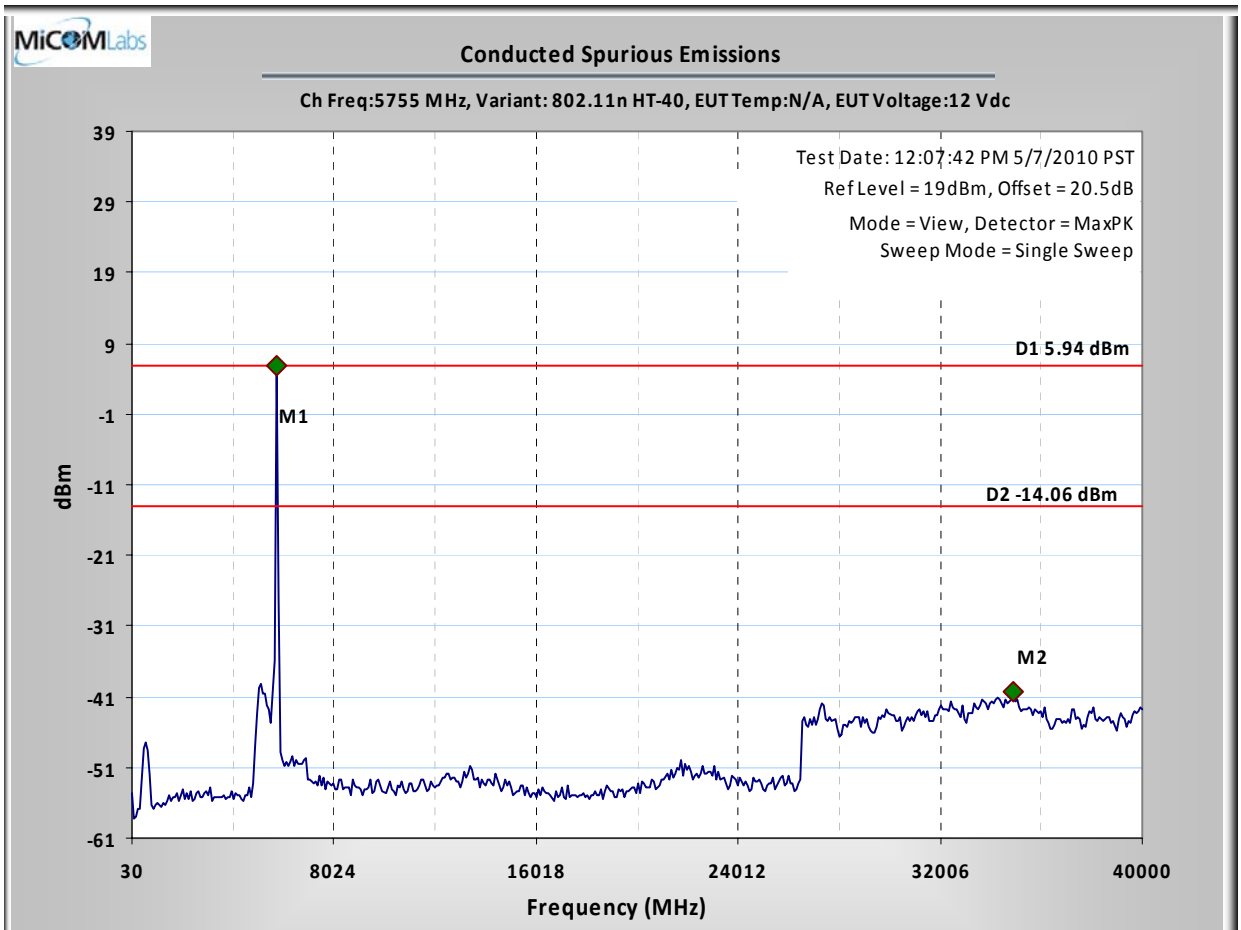
Conducted Spurious Measurment

Test Frequency	Start Frequency	Stop Frequency	Maximum Observed Emission	Limit (20 dB below peak of fundamental)
MHz	**MHz**	**MHz**	**dBm**	**dBm**
5755	30.00	40000.00	-40.38	-14.06
5785	30.00	40000.00	-39.43	-14.68
5815	30.00	40000.00	-39.20	-15.73

Band-edge Measurment

Test Frequency	Band-edge Frequency	Emission Amplitude @ Band-edge	Limit (20 dB below peak of	Margin
MHz	**MHz**	**dBm**	**dBm**	**dB**
5755.00	5725.00	-22.05	-11.97	-10.08
5815.00	5850.00	-27.53	-12.57	-14.96

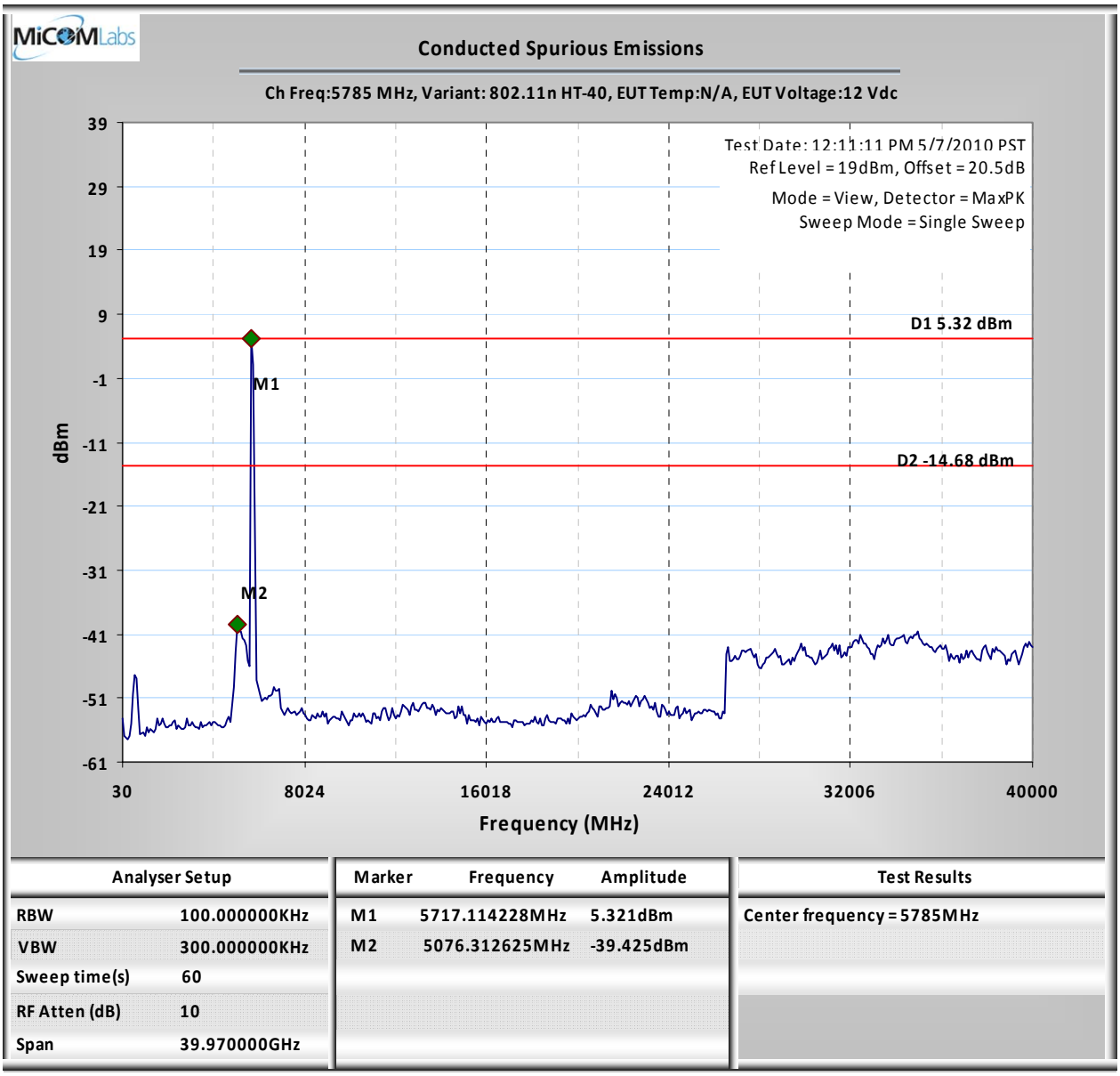
Measurement uncertainty:	±2.81 dB



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	60
RF Atten (dB)	10
Span	39.970000GHz

Marker	Frequency	Amplitude
M1	5717.114228MHz	5.939dBm
M2	34873.587174MHz	-40.375dBm

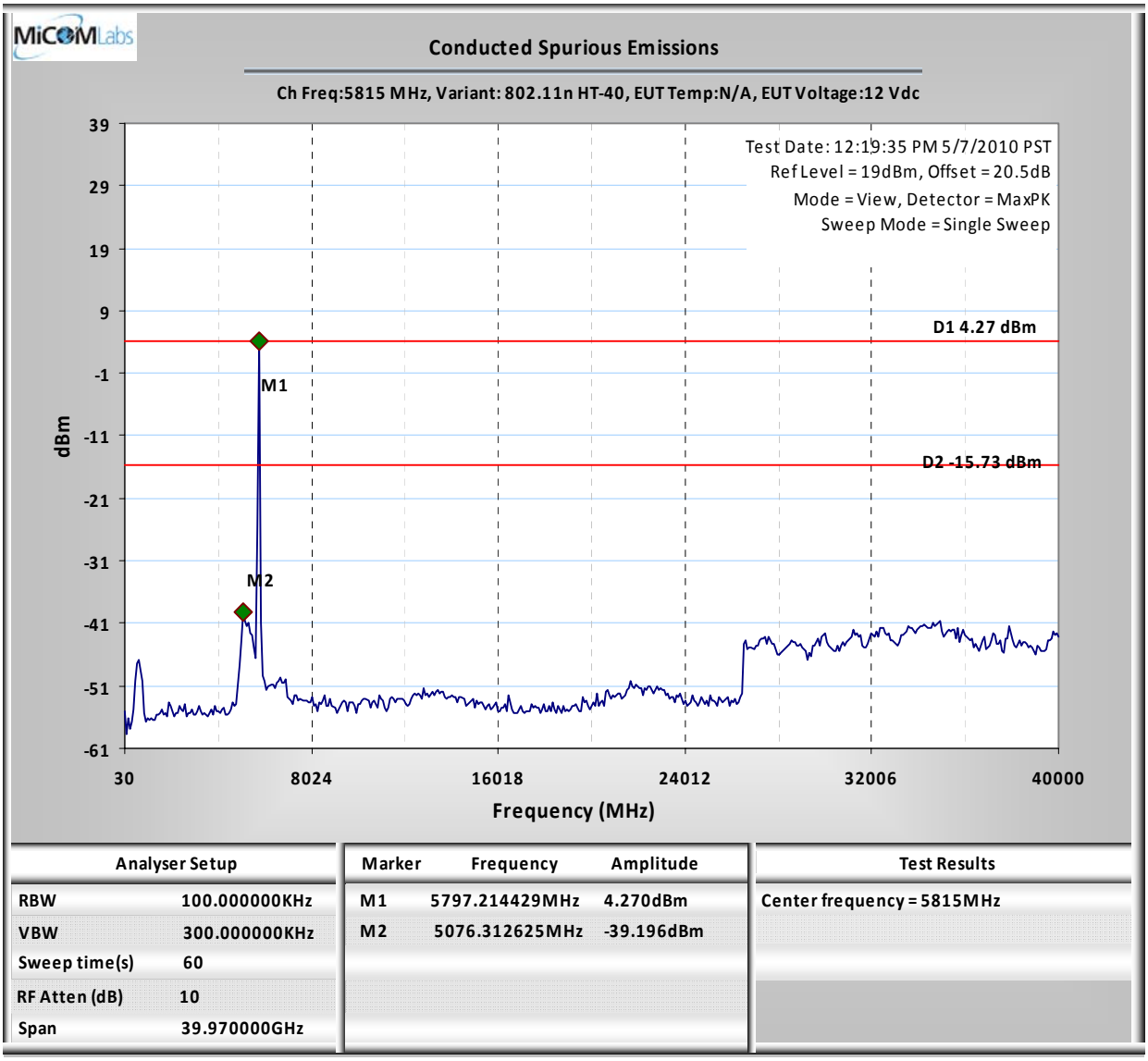
Test Results
Center frequency = 5755MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	60
RF Atten (dB)	10
Span	39.970000GHz

Marker	Frequency	Amplitude
M1	5717.114228MHz	5.321dBm
M2	5076.312625MHz	-39.425dBm

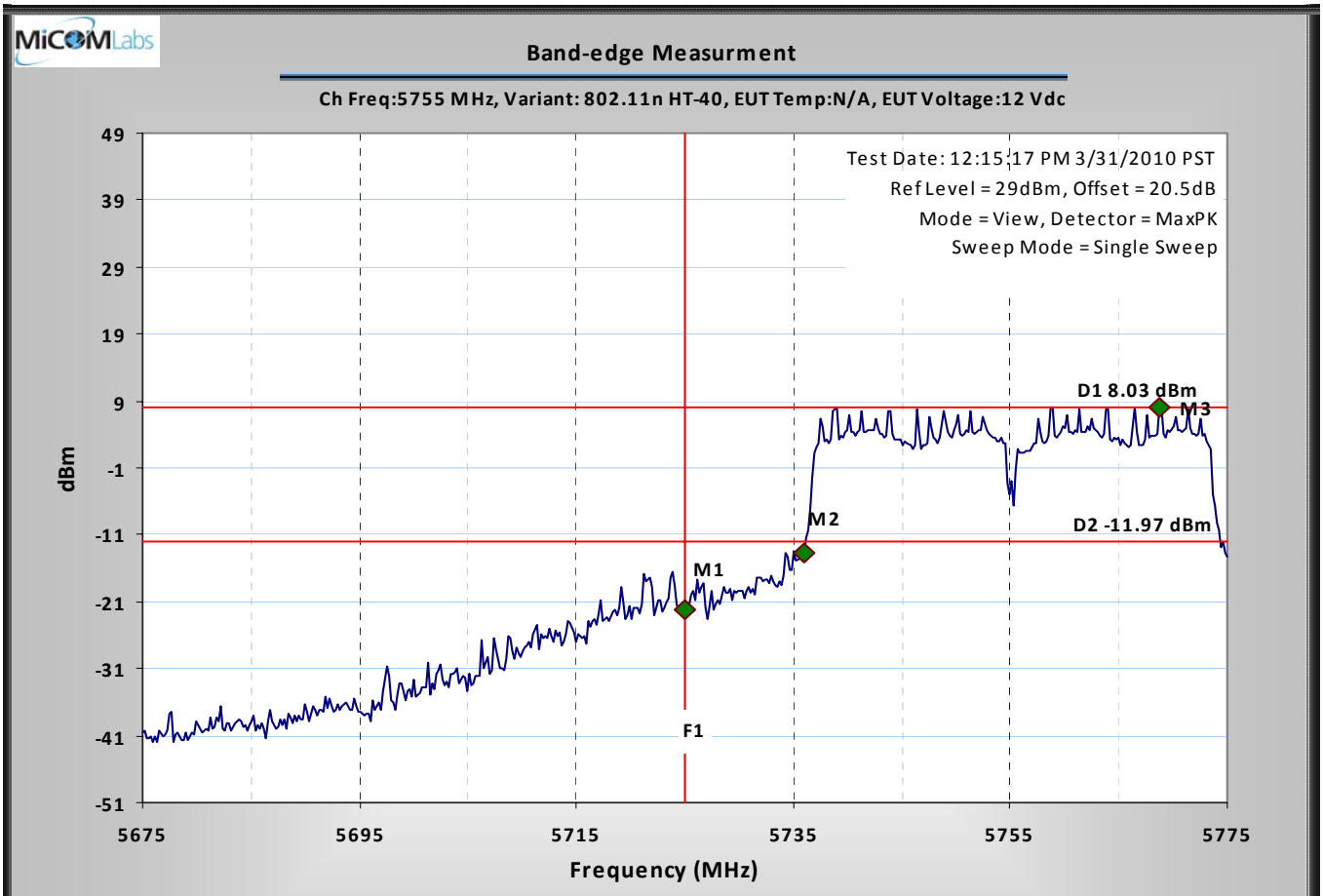
Test Results
Center frequency = 5785MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	60
RF Atten (dB)	10
Span	39.970000GHz

Marker	Frequency	Amplitude
M1	5797.214429MHz	4.270dBm
M2	5076.312625MHz	-39.196dBm

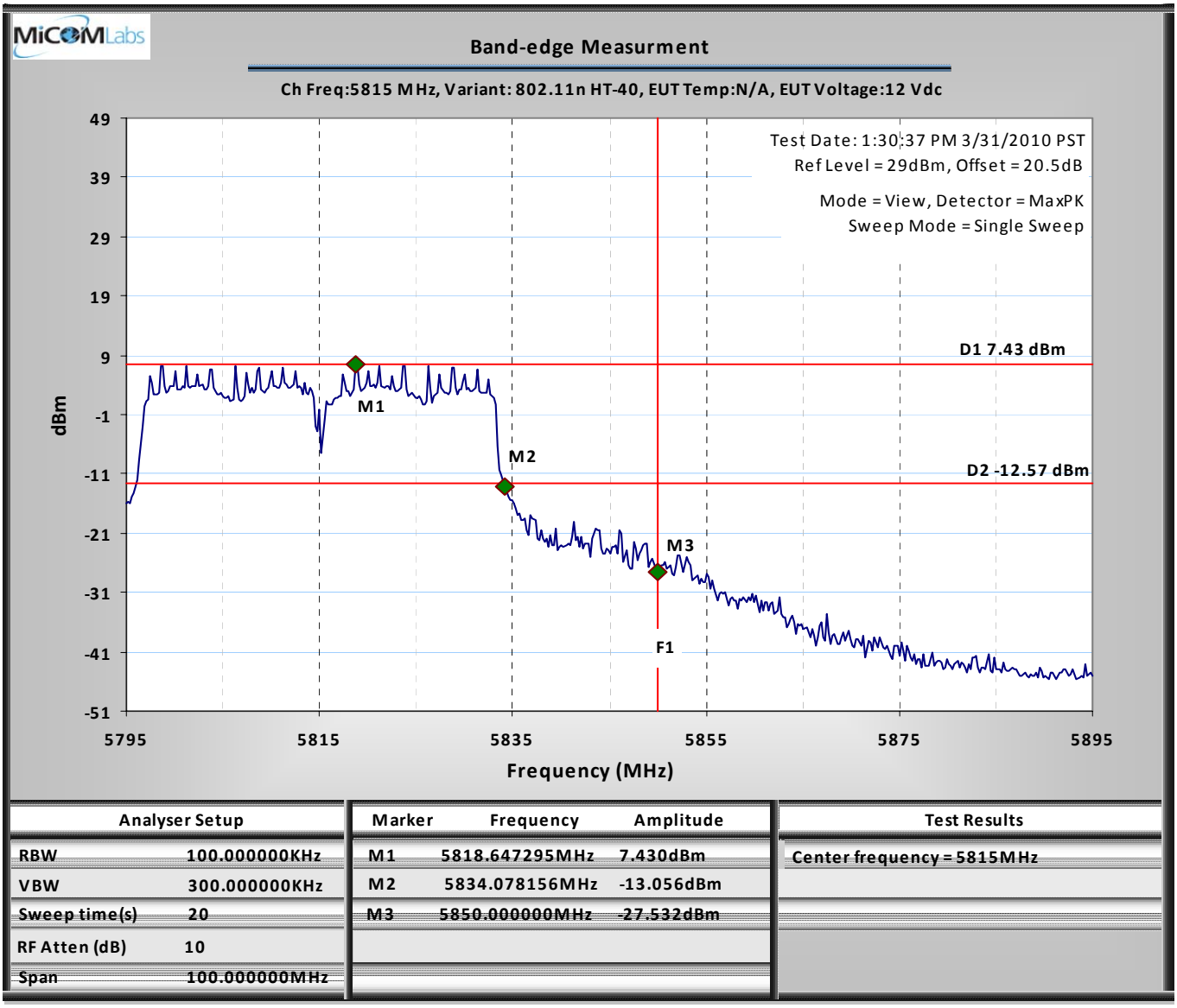
Test Results
Center frequency = 5815MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	100.000000MHz

Marker	Frequency	Amplitude
M1	5725.000000MHz	-22.049dBm
M2	5735.921844MHz	-13.743dBm
M3	5768.787575MHz	8.032dBm

Test Results
Center frequency = 5755MHz



Analyser Setup	
RBW	100.000000KHz
VBW	300.000000KHz
Sweep time(s)	20
RF Atten (dB)	10
Span	100.000000MHz

Marker	Frequency	Amplitude
M1	5818.647295MHz	7.430dBm
M2	5834.078156MHz	-13.056dBm
M3	5850.000000MHz	-27.532dBm

Test Results
Center frequency = 5815MHz