

Test of Miltope Corporation nMAP

To: FCC 47 CFR Part 15.407 & IC RSS-210

Test Report Serial No.: MLTP04-U2 Rev A





Test of Miltope Corporation, Inc nMAP 11a/b/g/n Wireless AP
to

To: FCC 47 CFR Part 15.407 & IC RSS-210

Test Report Serial No.: MLTP04-U2 Rev A

Note: this report contains data with regard to the 5,150 to 5,250 MHz, 5250 -5350 MHz and 5470 – 5725 MHz bands for the Miltope Corporation nMAP Wireless Access Point. 2.4 and 5.8 GHz test data are reported in MiCOM Labs test report MLTP04-U1.

This report supersedes None

Applicant: Miltope Corporation, Inc
3800 Richardson Road South
Hope Hull
AL 36043, USA

Product Function: Wireless Access Point

Copy No: pdf Issue Date: 17th December 2010

This Test Report is Issued Under the Authority of:

MiCOM Labs, Inc.
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TESTING CERTIFICATE #2381.01

MiCOM Labs is an ISO 17025 Accredited Testing Laboratory



Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 3 of 465

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 4 of 465

TABLE OF CONTENTS

1. ACCREDITATION, LISTINGS & RECOGNITION	6
TESTING ACCREDITATION	6
RECOGNITION	7
2. DOCUMENT HISTORY	9
3. TEST RESULT CERTIFICATE	10
4. REFERENCES AND MEASUREMENT UNCERTAINTY	11
Normative References	11
Test and Uncertainty Procedures	12
5. PRODUCT DETAILS AND TEST CONFIGURATIONS	13
5.1. Scope of Test Program	13
6.1. EUT Details	17
6.2. External A.C/D.C Power Adaptor	19
6.3. Operational Power Range	19
6.4. Types of Modulation Supported	19
6.5. Antenna Details	20
6.6. Cabling and I/O Ports	20
6.7. EUT Configurations	21
6.8. Equipment Details	22
6.9. Test Configurations	22
6.10. Equipment Modifications	22
6.11. Deviations from the Test Standard	23
6. TEST SUMMARY	24
7. TEST RESULTS	27
7.1. Device Characteristics	27
7.1.1. 26 dB and 99 % Bandwidth	27
7.1.2. Transmit Output Power	117
7.1.3. Peak Power Spectral Density	127
7.1.4. Peak Excursion Ratio	242
7.1.5. Frequency Stability	332
7.1.6. Maximum Permissible Exposure	333
7.1.7. Radiated Emissions	334
7.1.8. Receiver Radiated Spurious Emissions (above 1 GHz)	400
7.1.9. Radiated Spurious Emissions – Digital Apparatus	404
7.1.10. AC Wireline Conducted Emissions (150 kHz – 30 MHz)	414
8. Dynamic Frequency Selection (DFS)	416
8.1. Test Procedure and Setup	416
8.1.1. Interference Threshold values, Master or Client incorporating In-Service Monitoring	416
8.1.2. DFS Response requirement values	416
8.1.3. Radar Test Waveforms	417
8.1.4. Frequency Hopping Radar Test Waveform	420
8.1.5. Radar Waveform Calibration	420

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 5 of 465

8.1.6.	Test Set Up:.....	421
8.2.	Dynamic Frequency Selection (DFS) Test Results	423
8.2.1.	UNII Detection Bandwidth:	423
8.2.2.	Initial Channel Availability Check Time.....	427
8.2.3.	Radar Burst at the Beginning of the Channel Availability Check Time:	430
8.2.4.	Radar Burst at the End of the Channel Availability Check Time:	433
8.2.5.	In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period	436
8.2.6.	Verification of Non-Operation in the weather radar band 5600 – 5650 MHz	451
8.2.7.	Statistical Performance Check	455
9.	PHOTOGRAPHS.....	459
9.1.	RF Conducted Test Set-up	459
9.2.	Test Instrumentation	460
9.3.	Radiated Emission Testing	461
9.4.	Dynamic Frequency Selection Test Set-Up	462
10.	TEST EQUIPMENT DETAILS.....	464

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 6 of 465

1. ACCREDITATION, LISTINGS & RECOGNITION

TESTING ACCREDITATION

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



The American Association for Laboratory Accreditation

Accredited Laboratory

A2LA has accredited

MICOM LABS

Pleasanton, CA

for technical competence in the field of

Electrical Testing

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



Presented this 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.

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 7 of 465

RECOGNITION

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

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

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

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

Phase I - recognition for product testing

Phase II – recognition for both product testing and certification

N/A – Not Applicable

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 8 of 465

PRODUCT CERTIFICATION

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



The American Association for Laboratory Accreditation

World Class Accreditation

Accredited Product Certification Body

A2LA has accredited

MICOM LABS

Pleasanton, CA

for technical competence as a

Product Certification Body

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



Presented this 24th day of June 2010.

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

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

United States of America – Telecommunication Certification Body

TCB Identifier – US0159

Industry Canada – Certification Body

CAB Identifier – US0159

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 9 of 465

2. DOCUMENT HISTORY

Document History		
Revision	Date	Comments
Draft		
Rev A	17 th December 2010	Initial release.

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 10 of 465

3. TEST RESULT CERTIFICATE

Applicant:	Miltope Corporation, Inc 3800 Richardson Road South Hope Hull AL 36043, USA	Tested By:	MiCOM Labs, Inc. 440 Boulder Court Suite 200 Pleasanton California, 94566, USA
EUT:	nMAP	Tel:	+1 925 462 0304
Model:	920693-1	Fax:	+1 925 462 0306
S/N:	Conducted: nMAP-00014 Radiated: nMAP-00012		
Test Date(s):	12th Oct to 2nd Dec 2010	Website:	www.micomlabs.com

STANDARD(S)	TEST RESULTS
FCC 47 CFR Part 15.407 & IC RSS-210 The nMAP will not operate in the weather radar band 5600 – 5650 MHz.	EQUIPMENT COMPLIES

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

Notes:

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

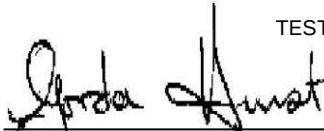
Approved & Released for MiCOM Labs, Inc. by:



TESTING CERTIFICATE #2381.01



Graeme Grieve
Quality Manager MiCOM Labs,



Gordon Hurst
President & CEO MiCOM Labs, Inc.

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4. REFERENCES AND MEASUREMENT UNCERTAINTY

Normative References

Ref.	Publication	Year	Title
(i)	FCC 47 CFR Part 15.407	2009	Code of Federal Regulations
(ii)	FCC 06-96	June 2006	Memorandum Opinion and Order
(iii)	Industry Canada RSS-210	Issue 7 June 2007	Low Power License-Exempt Radiocommunication Devices (All Frequency Bands): Category 1 Equipment
(iv)	Industry Canada RSS-Gen	Issue 2 June 2007	General Requirements and Information for the Certification of Radiocommunication Equipment
(v)	ANSI C63.4	2009	American National Standards for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
(vi)	CISPR 22/ EN 55022	2008 2006+A1:2007 1998	Limits and Methods of Measurements of Radio Disturbance Characteristics of Information Technology Equipment
(vii)	M 3003	Edition 1 Dec. 1997	Expression of Uncertainty and Confidence in Measurements
(viii)	LAB34	Edition 1 Aug 2002	The expression of uncertainty in EMC Testing
(ix)	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
(x)	A2LA	9 th June 2010	Reference to A2LA Accreditation Status – A2LA Advertising Policy
(xi)	FCC Public Notice – DA 02-2138	2002	Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices



Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 12 of 465

Test and Uncertainty Procedures

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

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

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

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 13 of 465

5. PRODUCT DETAILS AND TEST CONFIGURATIONS

5.1. Scope of Test Program

The scope of the test program was to test the Miltope Corporation nMAP 802.11 access point for compliance against FCC 47 CFR Part 15.407 & IC RSS-210. The nMap contains two 802.11a/b/g/n MIMO devices operating in the 2.4 GHz and 5 GHz frequency bands. Although both wireless modules are exactly the same (DMNA-83) they are configured differently. The wireless devices are configured as follows;

- 1).. 1st wireless module - 802.11a/b/g/n 3x3 Spatial Multiplexing MIMO.
- 2).. 2nd wireless module 802.11a/b/g legacy device (does not operate in 5250 – 5350 MHz and 5470 – 5725 MHz bands)

The manufacturer declared that both wireless modules will never transmit on the same frequency at any given time.

The EUT will not operate in the weather radar band 5600 – 5650 MHz.

Collocation of Antenna

The manufacturer declared that the antenna spacing will be greater than 20cm therefore collocation testing is not required.

The nMap operates in the 2.4 GHz and 5 GHz frequency bands. Only the 5.15-5.35 GHz and 5.47 – 5.725 GHz results are reported in this test report (MLTP04-U2). 2.4 GHz and 5.8 GHz measurements are reported MiCOM Labs test report MLTP04-U1.



Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 14 of 465

Applicant: VT Miltope Corporation

Product: nMAP



This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 15 of 465

Applicant: VT Miltope Corporation

Product: nMAP



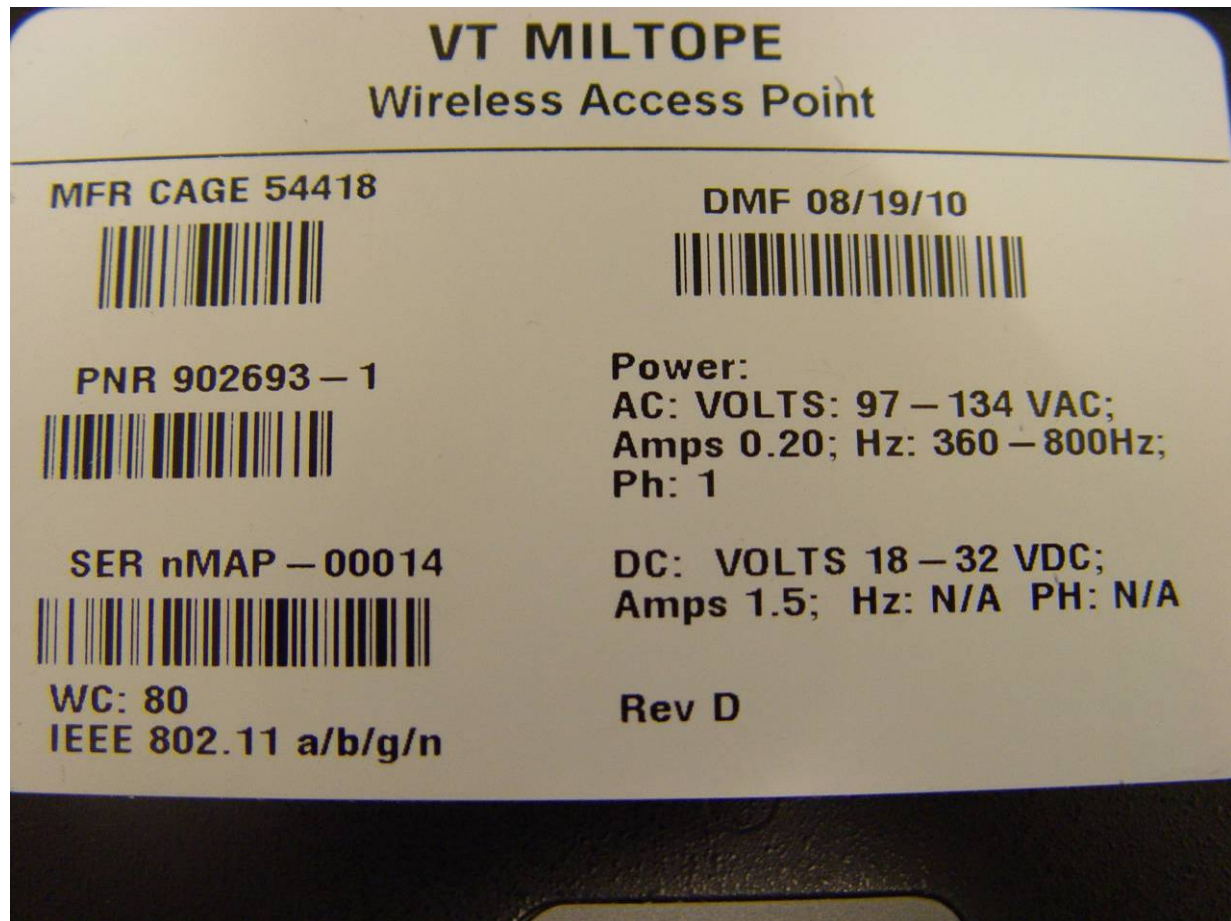
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 16 of 465

Applicant: VT Miltope Corporation

Product: nMAP - Label



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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 17 of 465

6.1. EUT Details

Detail	Description
Purpose:	Test of the Miltope Corp nMAP 802.11a/b/g/n access point for compliance against FCC 47 CFR Part 15.407 & IC RSS-210.
Applicant:	Miltope Corp 3800 Richardson Road South Hope Hull, AL 36043 USA
Manufacturer:	As Applicant
Test Laboratory:	MiCOM Labs, Inc. 440 Boulder Court, Suite 200 Pleasanton, California 94566 USA
Test report reference number:	MLTP04-E2
Date EUT received:	7 th October 2010
Dates of test (from - to):	12th Oct to 2nd Dec 2010
No of Units Tested:	2 Devices Conducted nMAP-00014, Radiated nMAP-00012
Product Name:	nMAP
Manufacturers Trade Name:	VT Miltope
Model No.:	902693-1
Equipment Primary Function:	Data and voice transmission. The nMAP will not operate in the weather radar band 5600 – 5650 MHz
Equipment Secondary Function(s):	Aircraft In-Flight Entertainment (IFE) System
Type of Technology:	802.11 a/b/g/n, 3x3 Spatial Multiplexing MIMO 802.11a/b/g
Installation type:	Fixed
Construction/Location for Use:	Indoor only (aircraft)
Software/Firmware Release:	999175 A1
Hardware Release:	902693-1 Rev D
Test Software Release:	M_dfap128-DRAGONFLY-DRAGON FLY_AP_128_11N_ART_Manfu-B7177-ALL-OEM.com
Transmit/Receive Operation:	Simplex
Output Power Type	Fixed
Automatic Transmit Power Control Available:	N/A
Remote Frequency Control Available:	N/A

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 18 of 465

ITU Emission Designator(s):	5150 – 5250 MHz 802.11a	16M8D1D
	5150 – 5250 MHz 802.11n HT-20	18M0D1D
	5150 – 5250 MHz 802.11n HT-40	36M5D1D
	5250 – 5350 MHz 802.11a	17M0D1D
	5250 – 5350 MHz 802.11n HT-20	18M0D1D
	5250 – 5350 MHz 802.11n HT-40	36M5D1D
	5470 – 5725 MHz 802.11a	16M9D1D
	5470 – 5725 MHz 802.11n HT-20	18M0D1D
	5470 – 5725 MHz 802.11n HT-40	36M5D1D
Long Term Frequency Stability:	20 ppm	
Equipment Dimensions:	11.50 x 7.49 x 2.40	
Weight:	5lbs	

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6.2. External A.C/D.C Power Adaptor

No ac/dc power adapter

Detail	Description

6.3. Operational Power Range

Declared O/P Power Range	Mode 1 3x3 MIMO		Mode 2 Legacy abg		Mode 3		Mode 4		Mode 5	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
802.11a	16.0		16.0							
802.11n HT-20	16.0		16.0							
802.11n HT-40	16.0		16.0							

6.4. Types of Modulation Supported

Modulation / Mode	Modulation Type
802.11b	CCK, BPSK, QPSK, DSSS
802.11g	OFDM
802.11a	OFDM
802.11n HT-20	OFDM
802.11n HT-40	OFDM



Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 20 of 465

6.5. Antenna Details

The following is a description of the EUT antennas.

Antenna Type:	Manufacturer	Model	Gain (dBi)	Frequency Range
Dipole	VT Miltope	901167-2	0.0 dBi Peak	5.0 GHz
Dipole	VT Miltope	901167-2	+1.2 dBi Peak	5.25 GHz
Dipole	VT Miltope	901167-2	+1.2 dBi Peak	5.8 GHz
Leaky Coaxial	Gore	GSC-10-84156-90	-10 dBi	5.0 – 5.8 GHz

6.6. Cabling and I/O Ports

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

Type of I/O Ports	Description	Screened (y/n)	Description	Qty	Tested
Mil-Rnd	Ethernet LAN	Y	> 1m	1	Y
Mil-Rnd	Input Power	Y	> 1m	1	Y
TNC	RF Output	Y	> 1m	4	Y

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6.7. EUT Configurations

LEGACY

Band (GHz)	Mode	Freq Band (MHz)	Freq Range (MHz)	Low ch	Mid ch	High ch	# Ch	Ch Spacing (MHz)	Ch BW (MHz)
5.6 (DFS incl)	802.11 n HT-40	5470 - 5725	5510 - 5690	5510	5550	5690	5	40	40

MIMO

Band (GHz)	Mode	Freq Band (MHz)	Freq Range (MHz)	Low ch	Mid ch	High ch	# Ch	Ch Spacing (MHz)	Ch BW (MHz)
5.15	802.11 a	5150 - 5250	5180 - 5240	5180	5200	5240	4	20	20
5.25 (DFS incl)	802.11 a	5250 - 5350	5260 - 5320	5260	5300	5320	4	20	20
5.6 (DFS incl)	802.11 a	5470 - 5725	5500 - 5700	5500	5600	5700	11	20	20
5.8	802.11 a	5725 - 5825	5745 - 5805	5745	5785	5805	4	20	20
5.15	802.11 n HT-20	5150 - 5250	5180 - 5240	5180	5200	5240	4	20	20
5.25 (DFS incl)	802.11 n HT-20	5250 - 5350	5260 - 5320	5260	5300	5320	4	20	20
5.6 (DFS incl)	802.11 n HT-20	5470 - 5725	5500 - 5700	5500	5600	5700	11	20	20
5.8	802.11 n HT-20	5725 - 5825	5745 - 5805	5745	5785	5805	4	20	20
5.15	802.11 n HT-40	5150 - 5250	5190 - 5230	5190		5230	2	40	40
5.25 (DFS incl)	802.11 n HT-40	5250 - 5350	5270 - 5310	5270	--	5310	2	40	40
5.6 (DFS incl)	802.11 n HT-40	5470 - 5725	5510 - 5690	5510	5590	5690	5	40	40
5.8	802.11 n HT-40	5725 - 5825	5755 - 5795	5755	--	5795	2	40	40



Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 22 of 465

6.8. Equipment Details

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

Type (EUT/Support)	Equipment Description	Manufacturer	Model No.	Serial No (s).
EUT (Conducted)	2.4 and 5 GHz nMap MIMO Device	Miltope	902693-1	nMAP-00014
EUT (Radiated)	2.4 and 5 GHz nMap MIMO Device	Miltope	902693-1	nMAP-00012
Support	Test Box	Miltope	n/a	002

6.9. Test Configurations

Operational Mode(s)	Data Rate Tested	Duty Cycle
a	6 MBit/s	100
HT-20	6.5 MBit/s	100
HT-40	13.5 MBit/s	100

6.10. Equipment Modifications

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

No modifications were required to bring the device into compliance.

No.	Test	Problem	Modification Required

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 23 of 465

6.11. Deviations from the Test Standard

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

No test deviations were required during the test program

No.	Test / Standard	Deviation	Rationale

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 24 of 465

6. TEST SUMMARY

List of Measurements

The following table represents the list of measurements required under the **FCC CFR47 Part 15.407** and **Industry Canada RSS-210** and **Industry Canada RSS-Gen**.

Section(s)	Test Items	Description	Condition	Result	Test Report Section
15.407(a) A9.2(2) 4.4	26dB and 99% Emission BW	Emission bandwidth measurement	Conducted	Complies	7.1.1
15.407(a) A9.2(2) 4.6	Transmit Output Power	Power Measurement	Conducted	Complies	7.1.2
15.407(a) A9.2(2)	Peak Power Spectral Density	PPSD	Conducted	Complies	7.1.3
15.407(a)(6)	Peak Excursion Ratio	<13dB in any 1MHz bandwidth	Conducted	Complies	7.1.4
15.407(g) 15.31 2.1 4.5	Frequency Stability	Limits: contained within band of operation at all times.	Applicant declaration	Complies	7.1.5
15.407(f) 5.5	Radio Frequency Radiation Exposure	Exposure to radio frequency energy levels, Maximum Permissible Exposure (MPE)	Conducted	Complies	7.1.6

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 25 of 465

List of Measurements (continued)

The following table represents the list of measurements required under the **FCC CFR47 Part 15.407** and **Industry Canada RSS-210** and **Industry Canada RSS-Gen**.

Section(s)	Test Items	Description	Condition	Result	Test Report Section
15.407(b)(2) 15.205(a) 15.209(a) 2.2 2.6 A9.3(2) 4.7	Radiated Emissions		Radiated		7.1.7
	Transmitter Radiated Spurious Emissions	Emissions above 1 GHz		Complies	
	Radiated Band Edge	Band edge results		Complies	
Industry Canada only RSS-Gen §4.10, §6	Receiver Radiated Spurious Emissions	Emissions above 1 GHz		Complies	7.1.8
15.407(b)(6) 15.105(a) 15.109(a) 2.2	Radiated Spurious Emissions - Digital	Emissions <1 GHz (30M-1 GHz)		Complies	7.1.9
15.407(b)(6) 15.207 7.2.2	AC Wireline Conducted Emissions 150 kHz–30 MHz	Conducted Emissions	Conducted	Complies	7.1.10

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List of Measurements (cont'd)

Dynamic Frequency Selection (DFS)

The following table represents the list of measurements required under the **FCC CFR47 Part 15.407(h)(2)** and **FCC Memorandum Opinion and Order FCC 06-96 (Compliance Measurement procedures for Unlicensed National Information Infrastructure devices operating in the 5250-5350 MHz and 5470-5725 MHz bands incorporating dynamic frequency selection)**.

Tests performed on Master Device

Section	Test Items	Description	Condition	Result	Test Report Section
7.8.1	Detection Bandwidth	UNII Detection Bandwidth	Conducted	Complies	8.2.1
7.8.2.1	Performance Requirements Check	Initial Channel Availability Check Time	Conducted	Complies	8.2.2
7.8.2.2		Radar Burst at the Beginning of the Channel Availability Check Time	Conducted	Complies	8.2.3
7.8.2.3		Radar Burst at the End of the Channel Availability Check Time	Conducted	Complies	8.2.4
7.8.3	In-Service Monitoring	In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period	Conducted	Complies	8.2.5
7.8.4	Radar Detection	Statistical Performance Check	Conducted	Complies	8.2.6

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

7. TEST RESULTS

7.1. Device Characteristics

7.1.1. 26 dB and 99 % Bandwidth

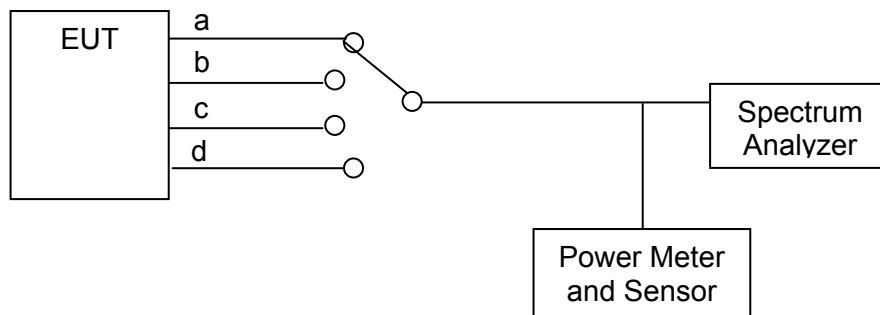
FCC, Part 15 Subpart C §15.407(a)
Industry Canada RSS-210 § A9.2(2)
Industry Canada RSS-Gen 4.4

Test Procedure

The bandwidth at 26 dB and 99 % is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

Testing was restricted to a single port.

Test Configuration



Measurement set up for 26 dB and 99 % bandwidth test

Radio Parameters

Duty Cycle: 100%

Output: Modulated Carrier

Power: Maximum Default Power



Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 28 of 465

Measurement Results for 26 dB and 99 % Operational Bandwidth(s)

Ambient conditions.

Temperature: 17 to 23 °C Relative humidity: 31 to 57 % Pressure: 999 to 1012 mbar

TABLE OF RESULTS – 802.11a Legacy - MIMO radio

Test Conditions:	15.247 (a)(2)	Rel. Humidity (%):	35 to 42
Variant:	802.11 a	Ambient Temp. (°C):	19 to 22
TPC:	HIGH	Pressure (mBars):	998 to 1003
Modulation:	ON	Duty Cycle (x):	100
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2 dBi
Applied Voltage:	28.0 Vdc		
Notes 1:			
Notes 2:			

26 dB Bandwidth

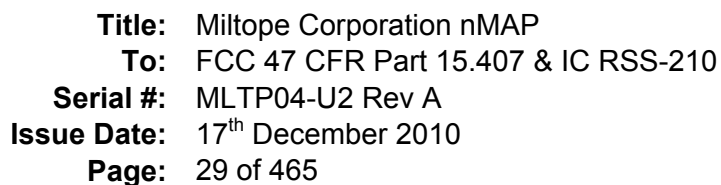
26 dB Bandwidth							
Test Frequency	26 dB Bandwidth				Minimum 6dB Bandwidth Limit		Margin
	MHz						
MHz	a	b	c	d	kHz	MHz	MHz
5180	22.645000	22.044000	22.244000		500	0.5	-21.544000
5200	23.146000	23.146000	23.547000				-22.646000
5240	23.246000	22.244000	22.645000				-21.744000

99% Bandwidth

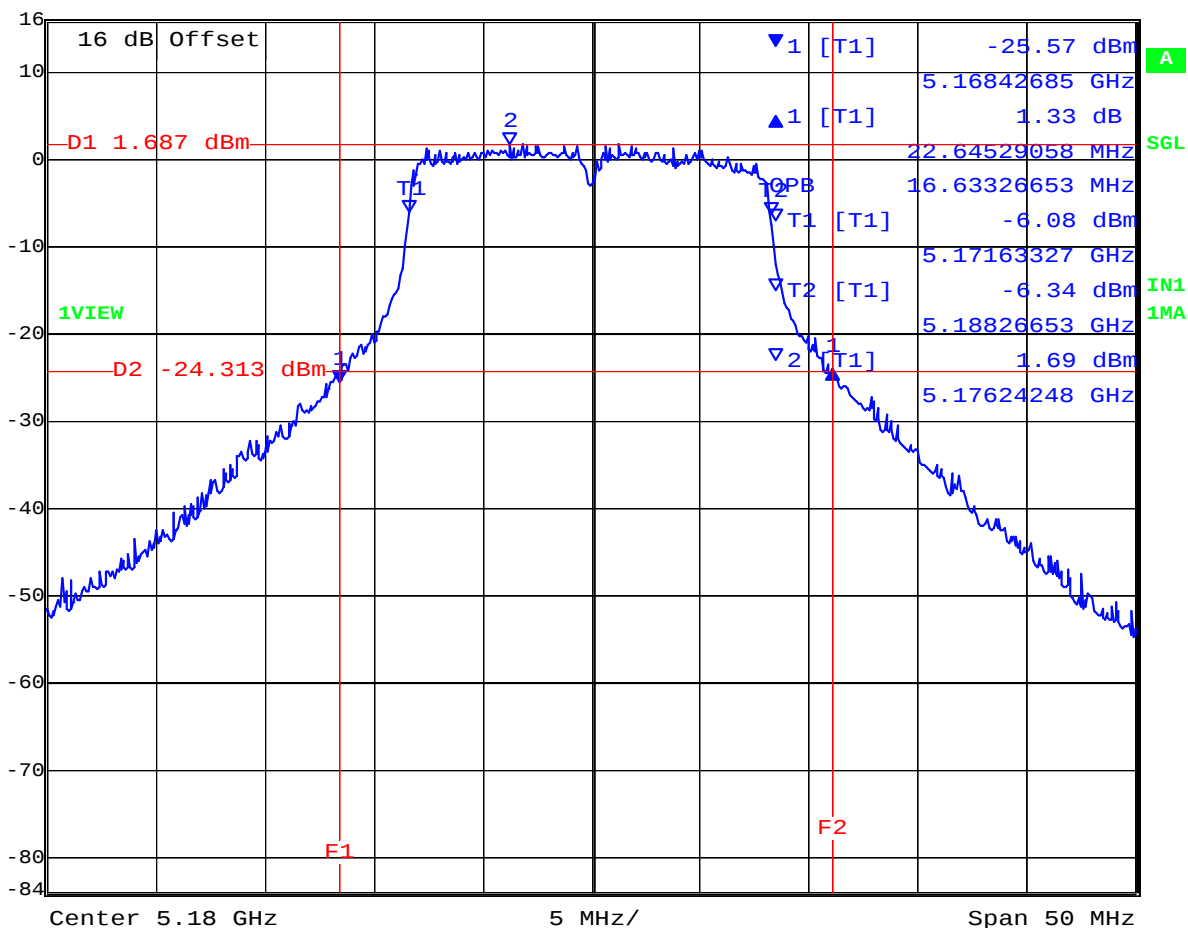
99 % Bandwidth							
Test Frequency	MHz						
	MHz	a	b	c	d		
5180	16.633000	16.633000	16.733000				
5200	16.633000	16.633000	16.733000				
5240	16.733000	16.733000	16.733000				

Measurement uncertainty:	±2.81 dB
---------------------------------	----------

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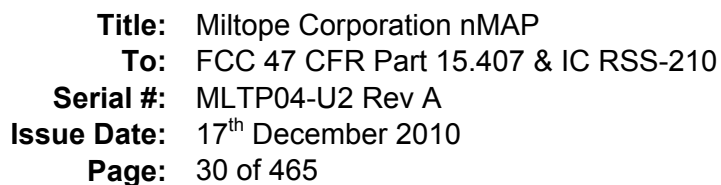


	Delta 1 [T1]	RBW	200 kHz	RF Att	10 dB
Ref Lvl	1.33 dB	VBW	300 kHz		
16 dBm	22.64529058 MHz	SWT	20 s	Unit	dBm



Date: 18.OCT.2010 12:07:13

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[illegible]

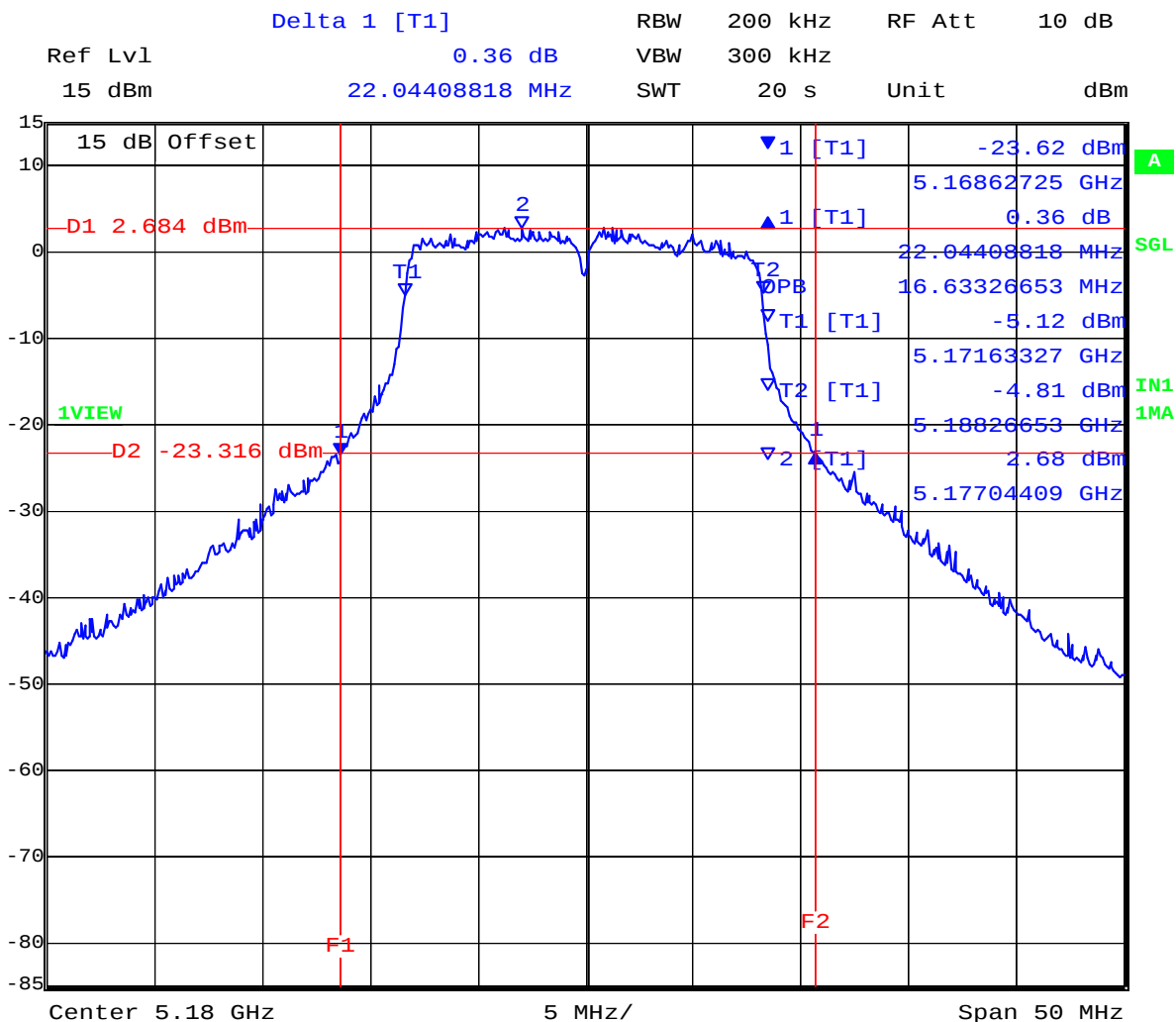
Date: 18.OCT.2010 12:16:02

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 31 of 465

5,180 MHz 802.11a Legacy - MIMO radio Chain c 26 dB and 99 % Bandwidth



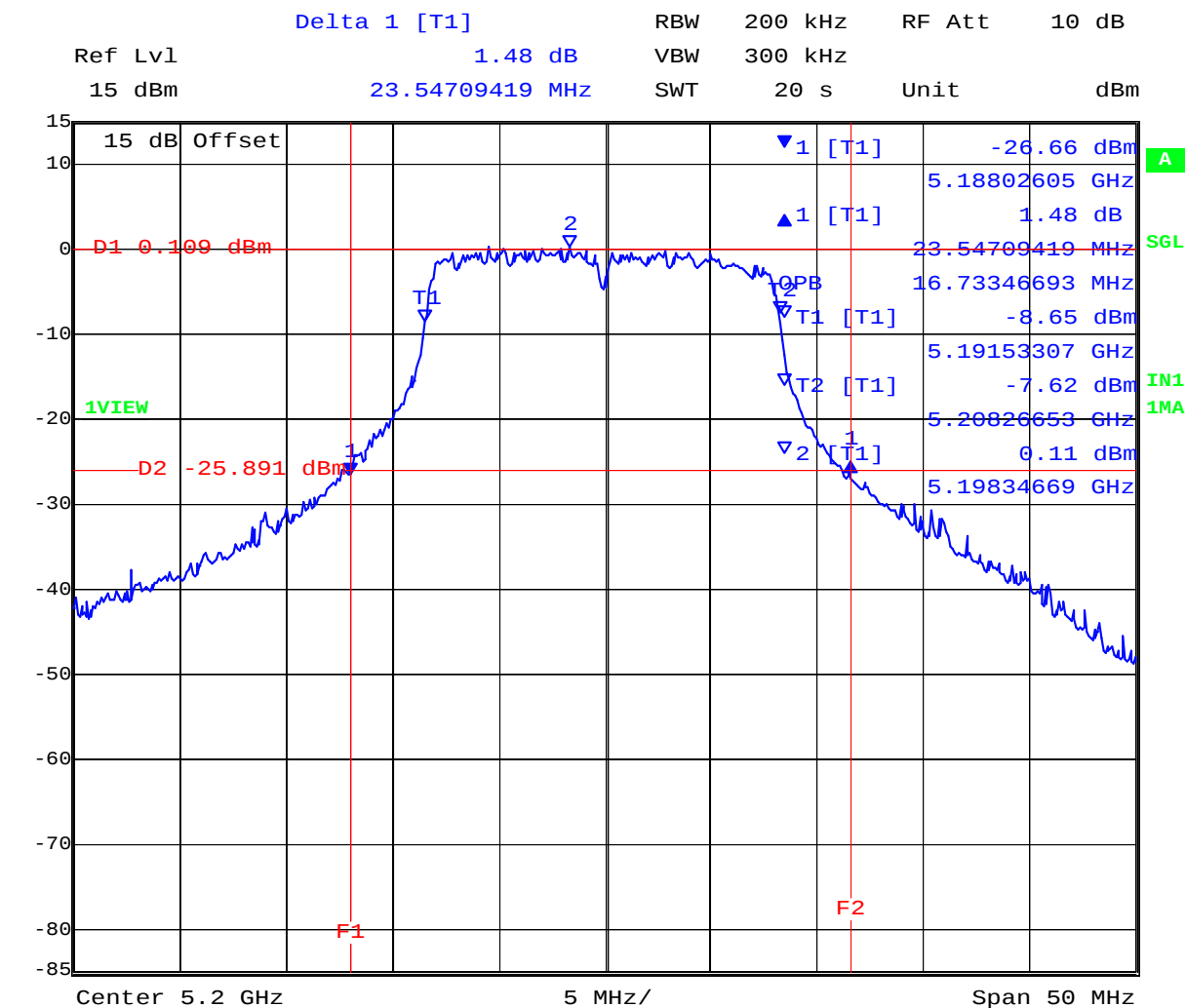
Date: 18.OCT.2010 12:11:36

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Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 32 of 465

5,200 MHz 802.11a Legacy Chain a 26 dB and 99 % Bandwidth



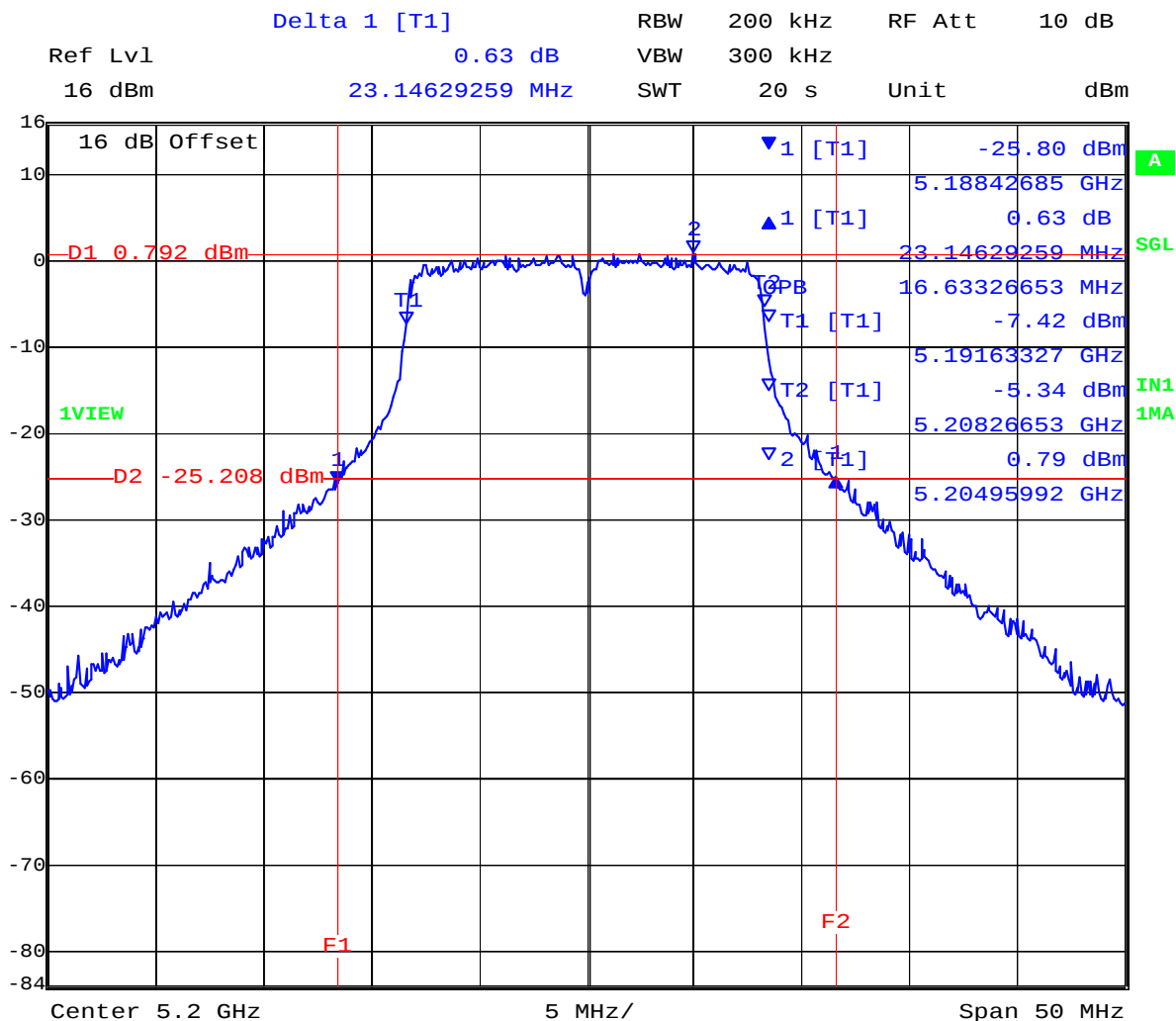
Date: 18.OCT.2010 12:50:25

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 33 of 465

5,200 MHz 802.11a Legacy - MIMO radio Chain b 26 dB and 99 % Bandwidth

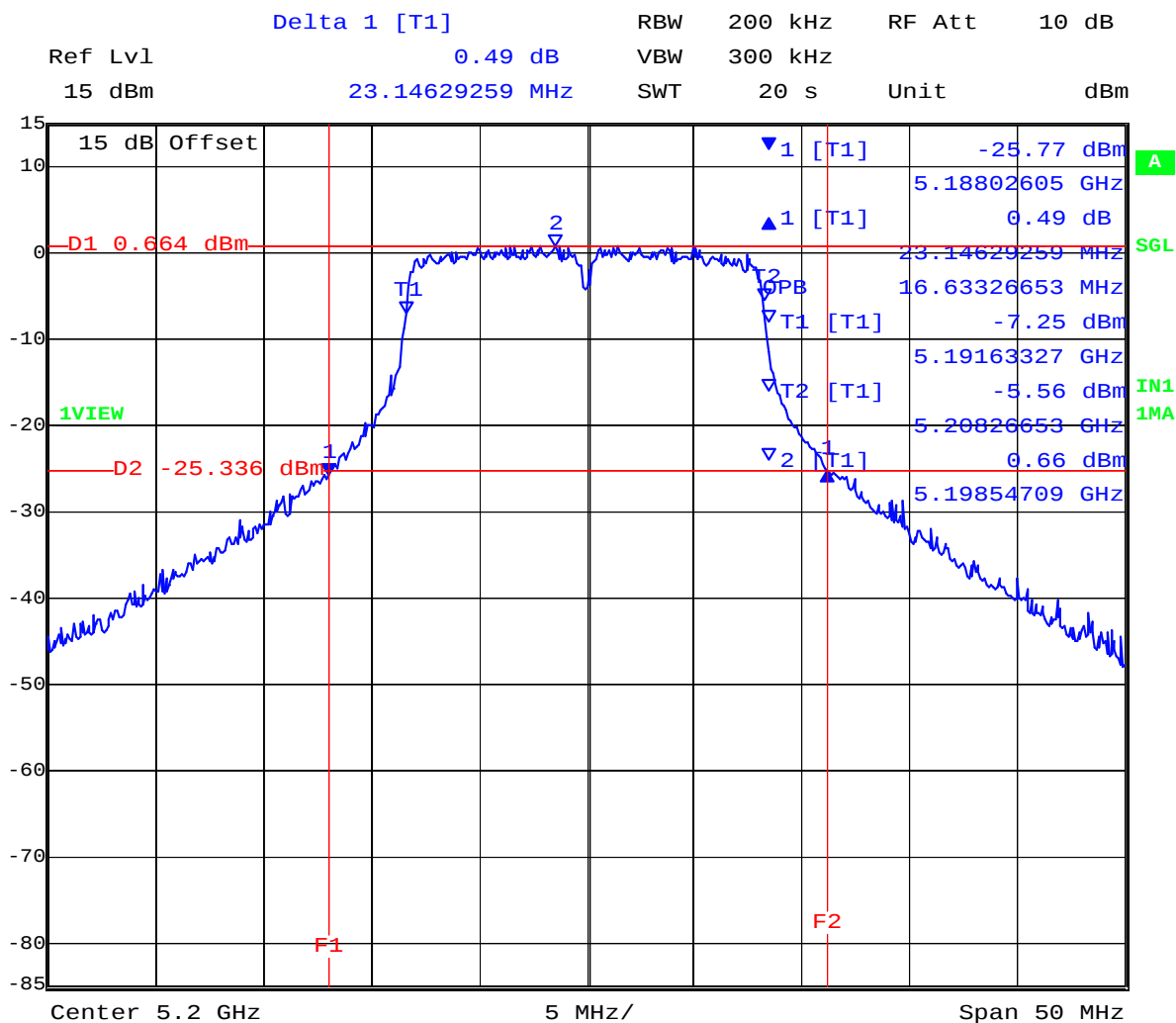


Date: 18.OCT.2010 12:41:34

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5,200 MHz 802.11a Legacy - MIMO radio Chain c 26 dB and 99 % Bandwidth



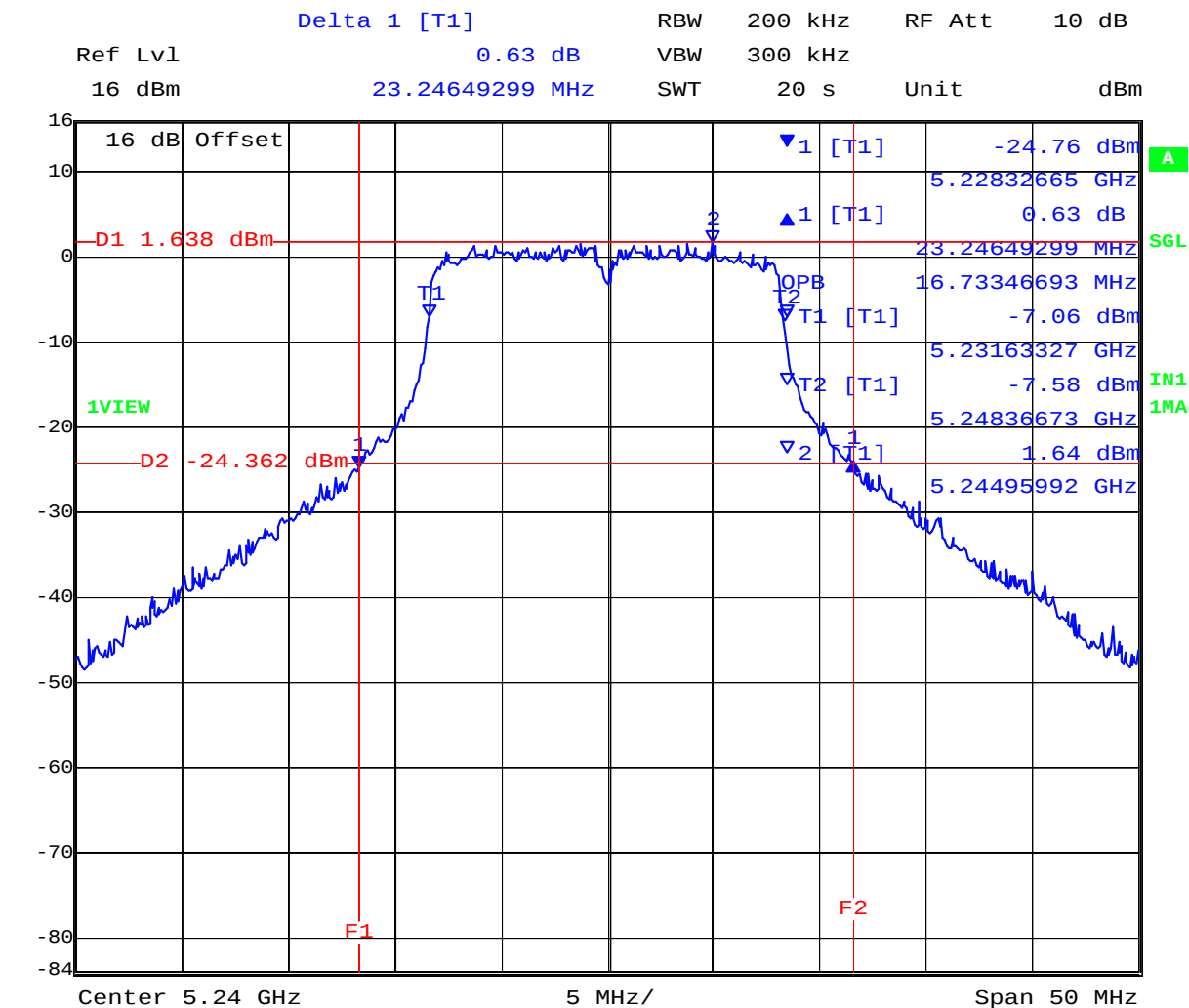
Date: 18.OCT.2010 12:45:59

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 35 of 465

5,240 MHz 802.11a Legacy - MIMO radio Chain a 26 dB and 99 % Bandwidth



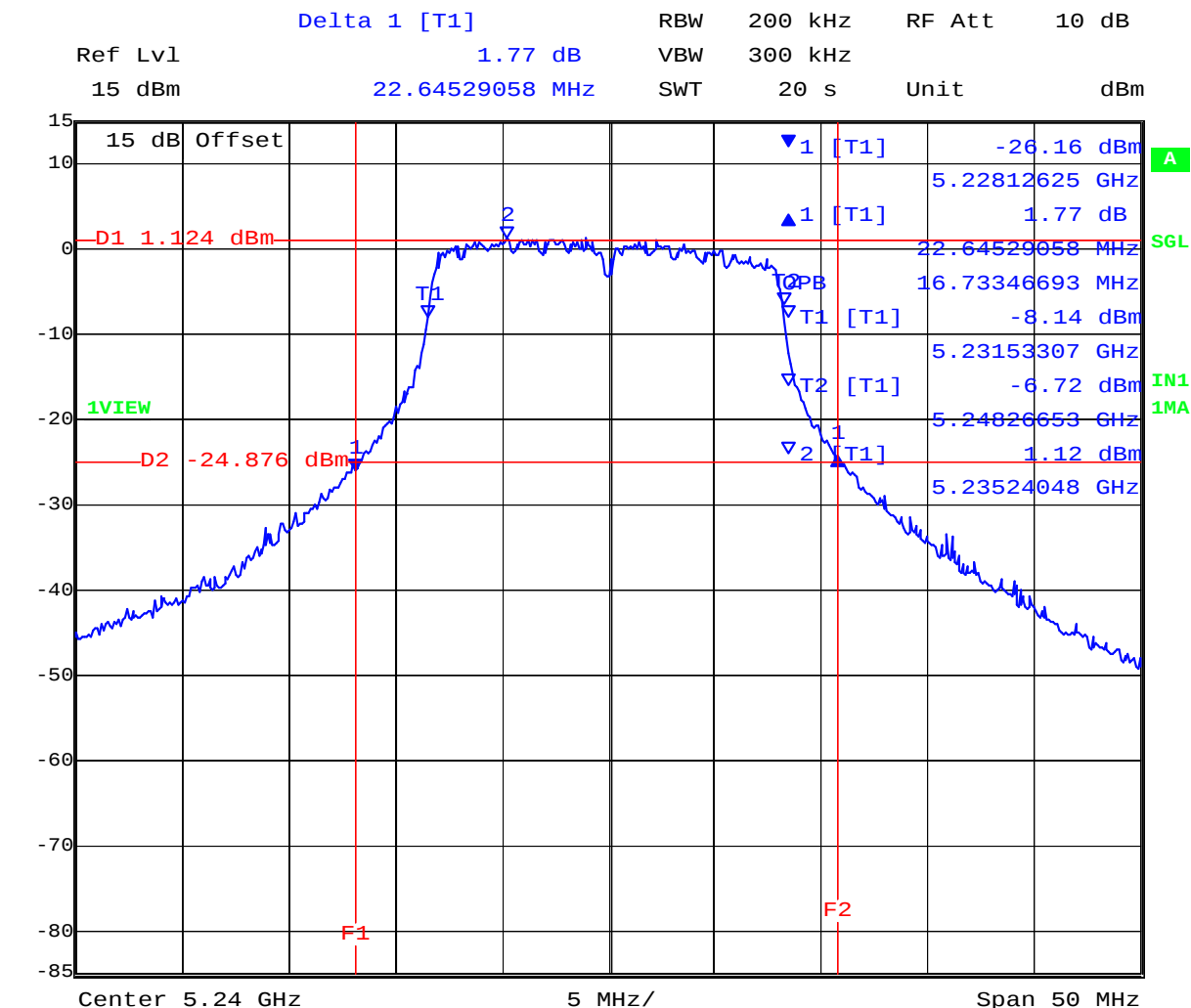
Date: 18.OCT.2010 13:15:28

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 36 of 465

5,240 MHz 802.11a Legacy - MIMO radio Chain b 26 dB and 99 % Bandwidth



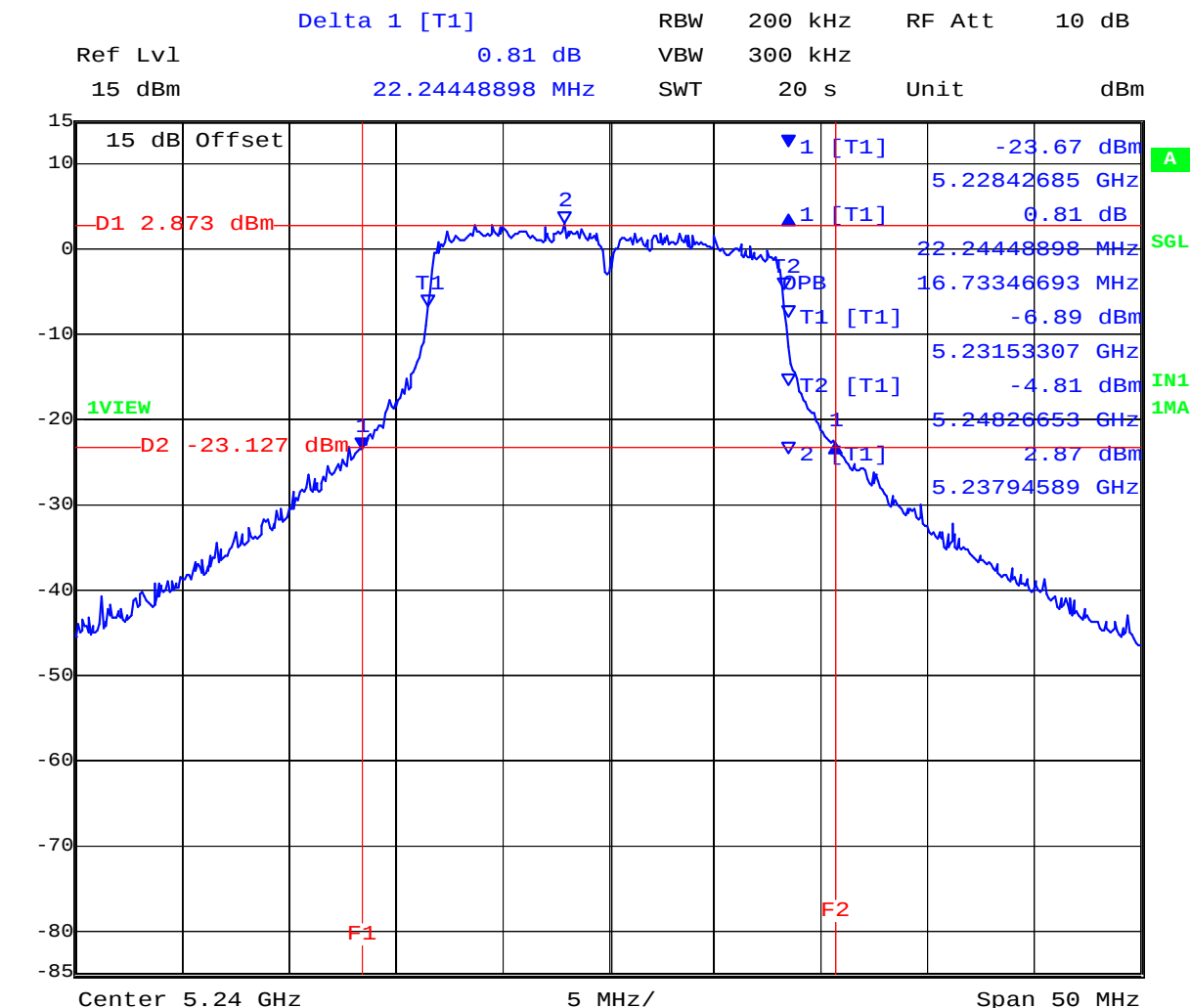
Date: 18.OCT.2010 13:24:25

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 37 of 465

5,240 MHz 802.11a Legacy - MIMO radio Chain c 26 dB and 99 % Bandwidth



Date: 18.OCT.2010 13:19:57

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 38 of 465

TABLE OF RESULTS – 802.11a Legacy - MIMO radio

Test Conditions:	15.247 (a)(2)	Rel. Humidity (%):	35 to 42
Variant:	802.11 a	Ambient Temp. (°C):	19 to 22
TPC:	HIGH	Pressure (mBars):	998 to 1003
Modulation:	ON	Duty Cycle (x):	100
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2 dBi
Applied Voltage:	28.0 Vdc		
Notes 1:			
Notes 2:			

26 dB Bandwidth

Test Frequency	26 dB Bandwidth				Minimum 6dB Bandwidth Limit		Margin
	MHz						
MHz	a	b	c	d	kHz	MHz	MHz
5260	23.547000	24.148000	23.046000		500	0.5	-22.546000
5300	23.447000	23.146000	23.347000				-22.646000
5320	23.046000	27.655000	22.044000				-21.544000

99% Bandwidth

Test Frequency	99 % Bandwidth						
	MHz						
MHz	a	b	c	d			
5260	16.733000	16.733000	16.834000				
5300	16.733000	16.633000	16.733000				
5320	16.633000	16.934000	16.633000				

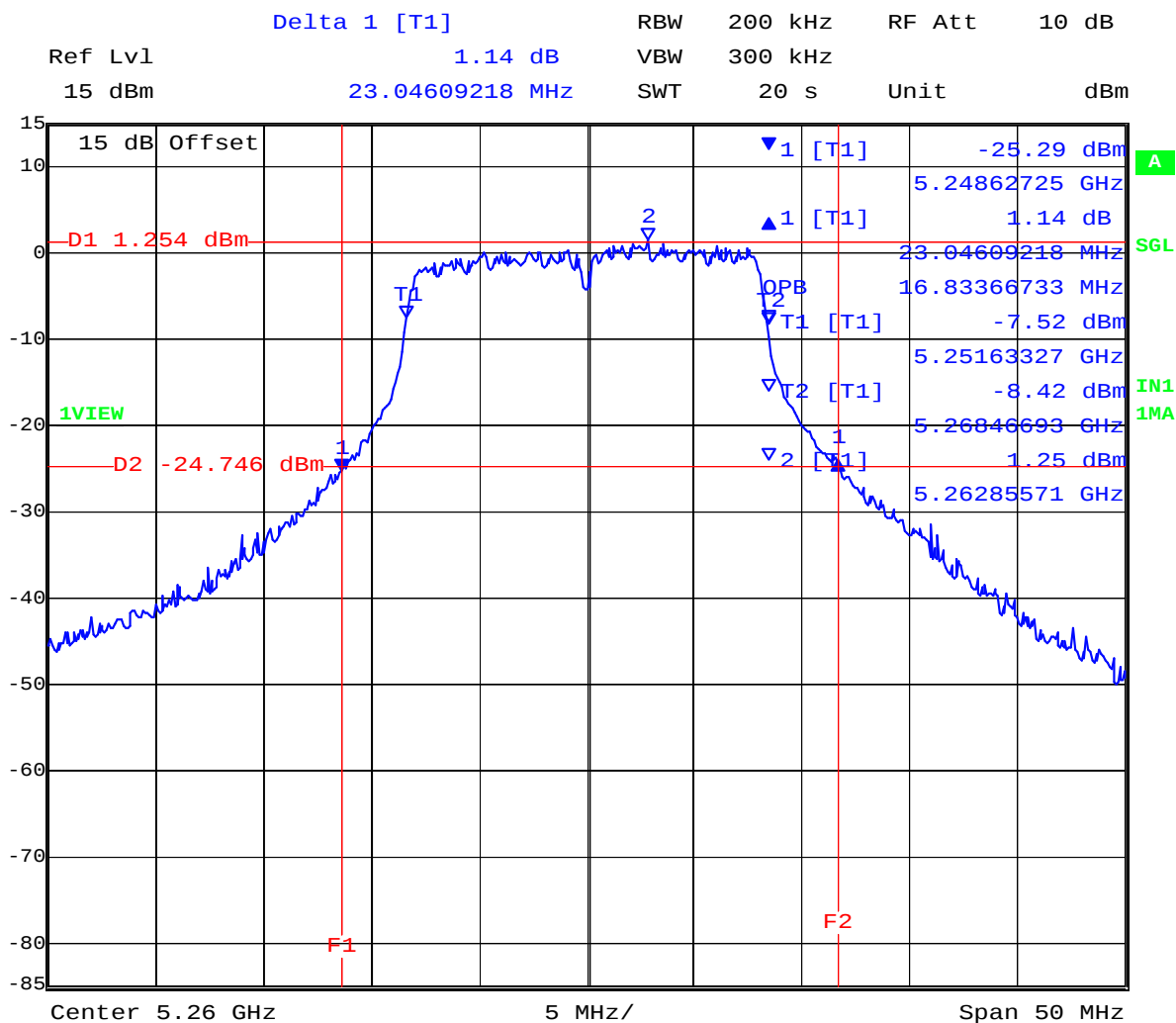
Measurement uncertainty:	±2.81 dB
---------------------------------	----------

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 39 of 465

5,260 MHz 802.11a Legacy - MIMO radio Chain a 26 dB and 99 % Bandwidth



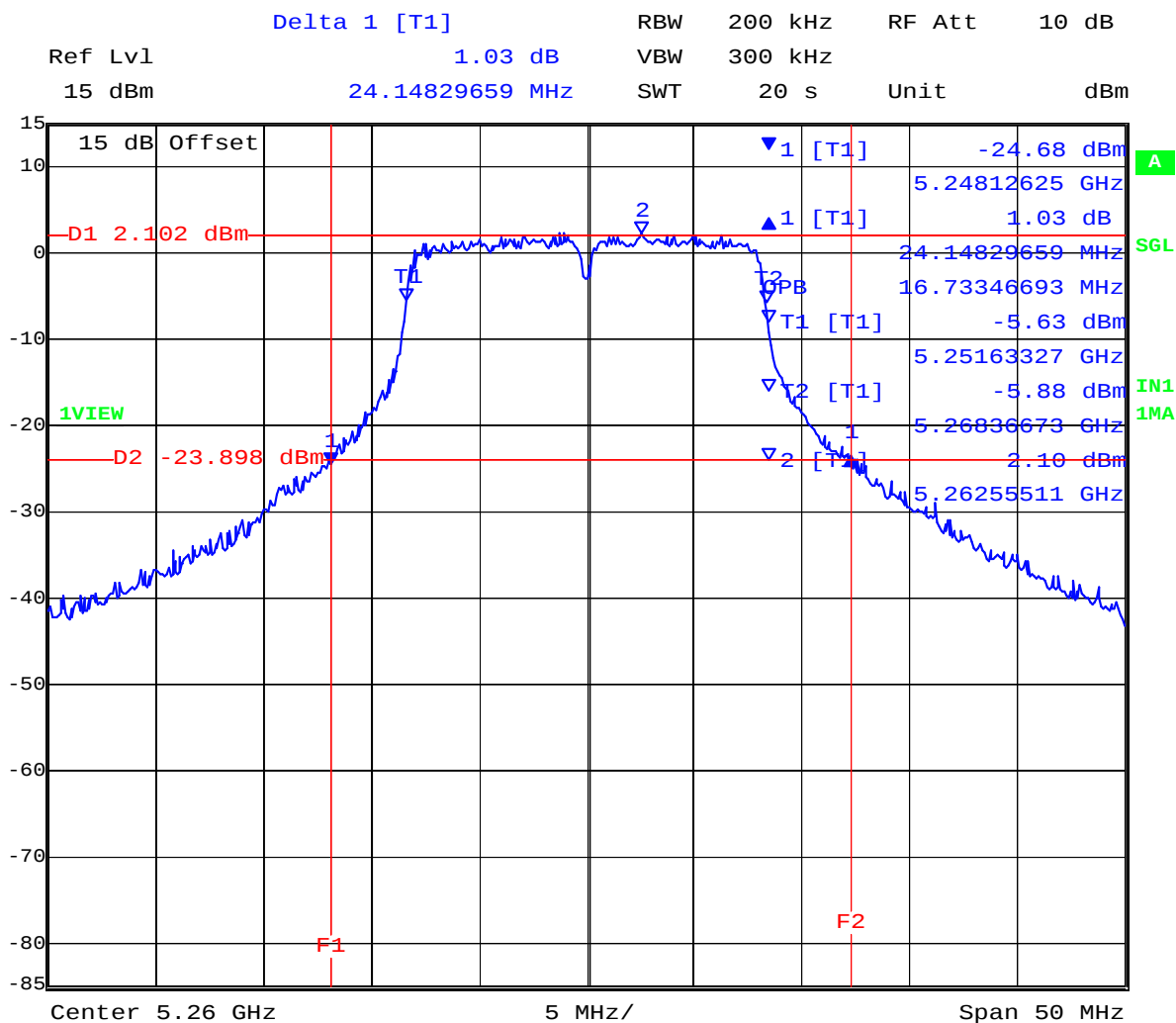
Date: 19.OCT.2010 08:41:56

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 40 of 465

5,260 MHz 802.11a Legacy - MIMO radio Chain b 26 dB and 99 % Bandwidth



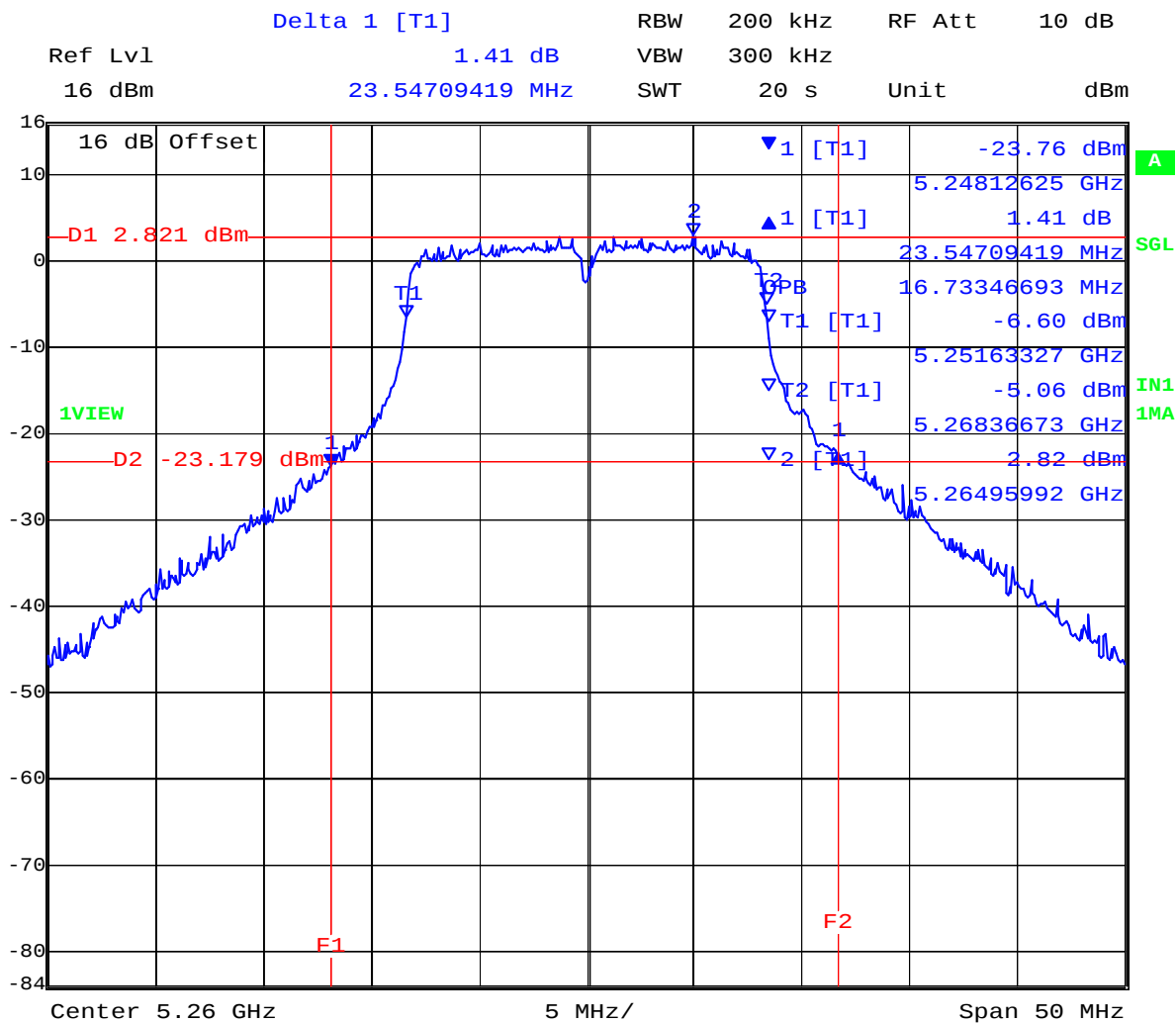
Date: 19.OCT.2010 08:37:11

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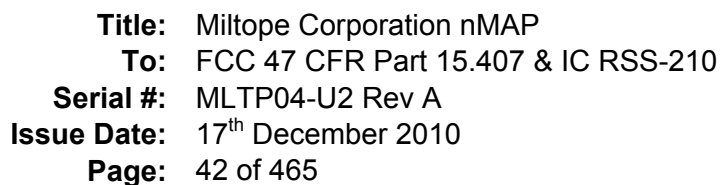
Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 41 of 465

5,260 MHz 802.11a Legacy - MIMO radio Chain c 26 dB and 99 % Bandwidth



Date: 20.OCT.2010 08:32:30

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Ref Lvl 15 dBm Delta 1 [T1] 0.45 dB RBW 200 kHz RF Att 10 dB

15 dBm 23.34669339 MHz SWT 20 s Unit dBm

15 dB Offset

▼1 [T1] -25.47 dBm

▲1 [T1] 0.45 dB

2 23.34669339 MHz

QPB 16.73346693 MHz

▽T1 [T1] -7.75 dBm

▽T2 [T1] -7.27 dBm

▽1 [T1] 5.30836673 GHz

▽2 [T1] 5.30165331 GHz

D1 0.845 dBm

D2 -25.155 dBm

1VIEW

F1 F2

Center 5.3 GHz 5 MHz/ Span 50 MHz

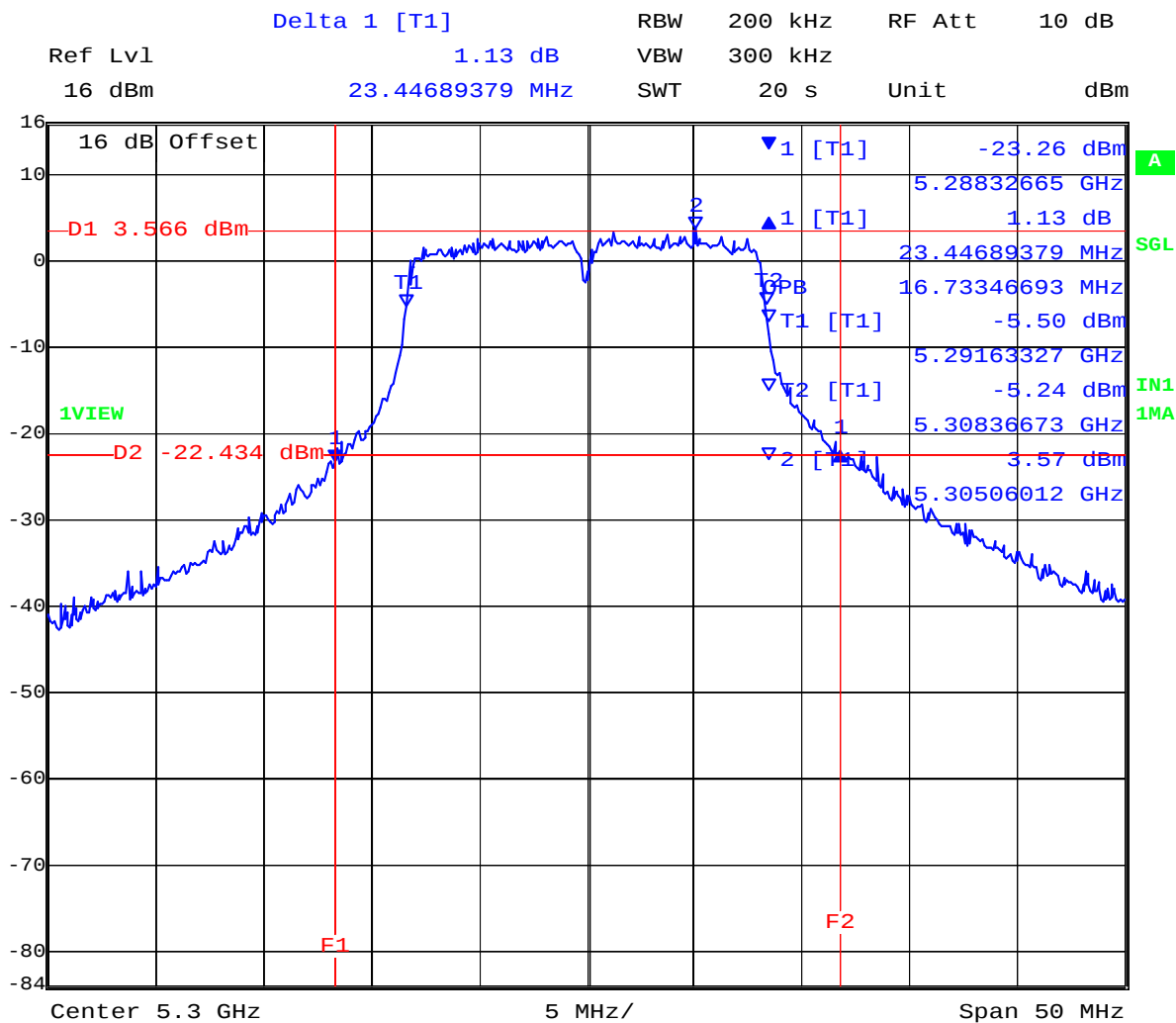
Date: 19.OCT.2010 09:15:30

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 43 of 465

5,300 MHz 802.11a Legacy - MIMO radio Chain b 26 dB and 99 % Bandwidth



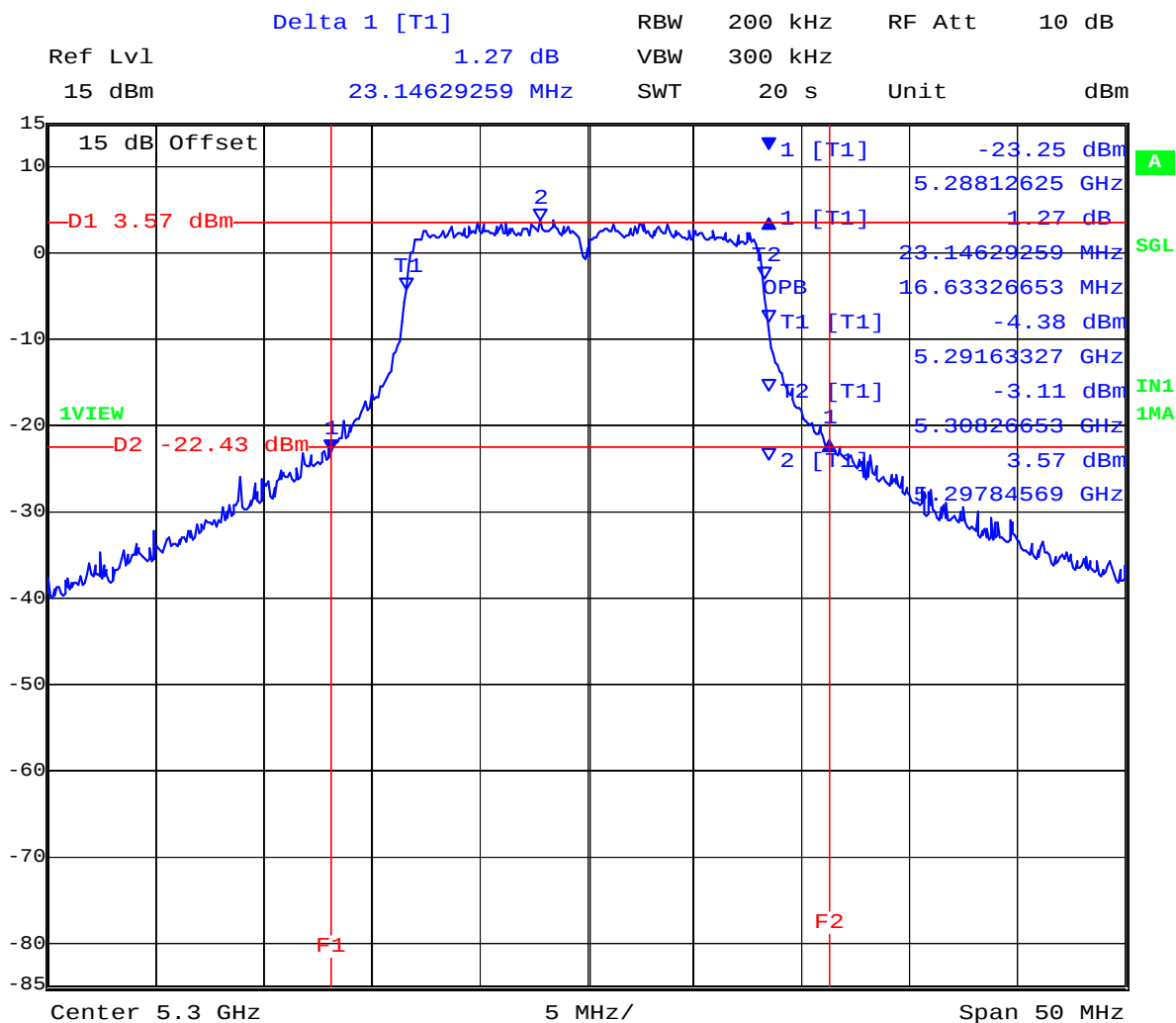
Date: 19.OCT.2010 09:06:25

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 44 of 465

5,300 MHz 802.11a Legacy - MIMO radio Chain c 26 dB and 99 % Bandwidth



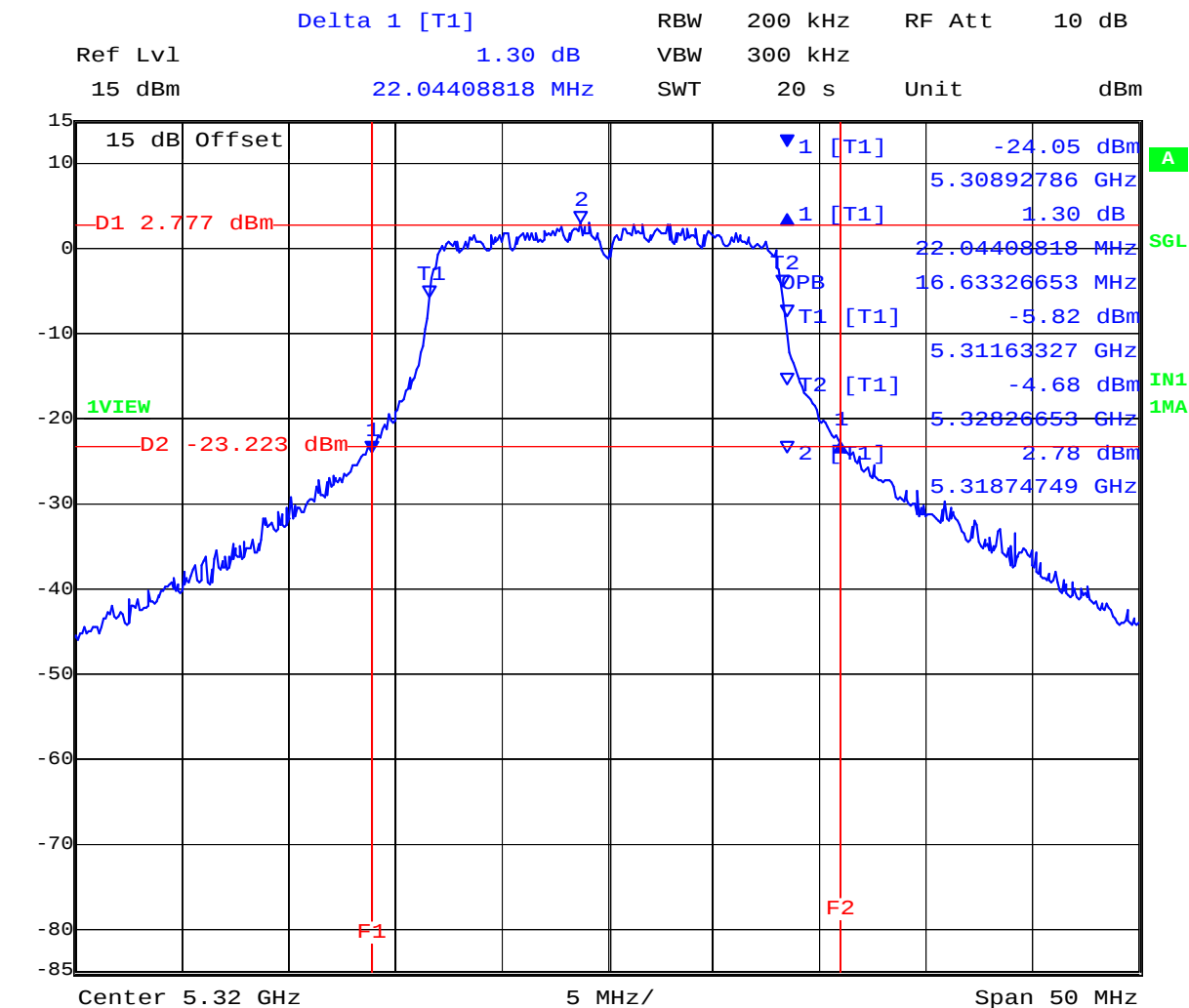
Date: 19.OCT.2010 09:10:58

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 45 of 465

5,320 MHz 802.11a Legacy - MIMO radio Chain a 26 dB and 99 % Bandwidth



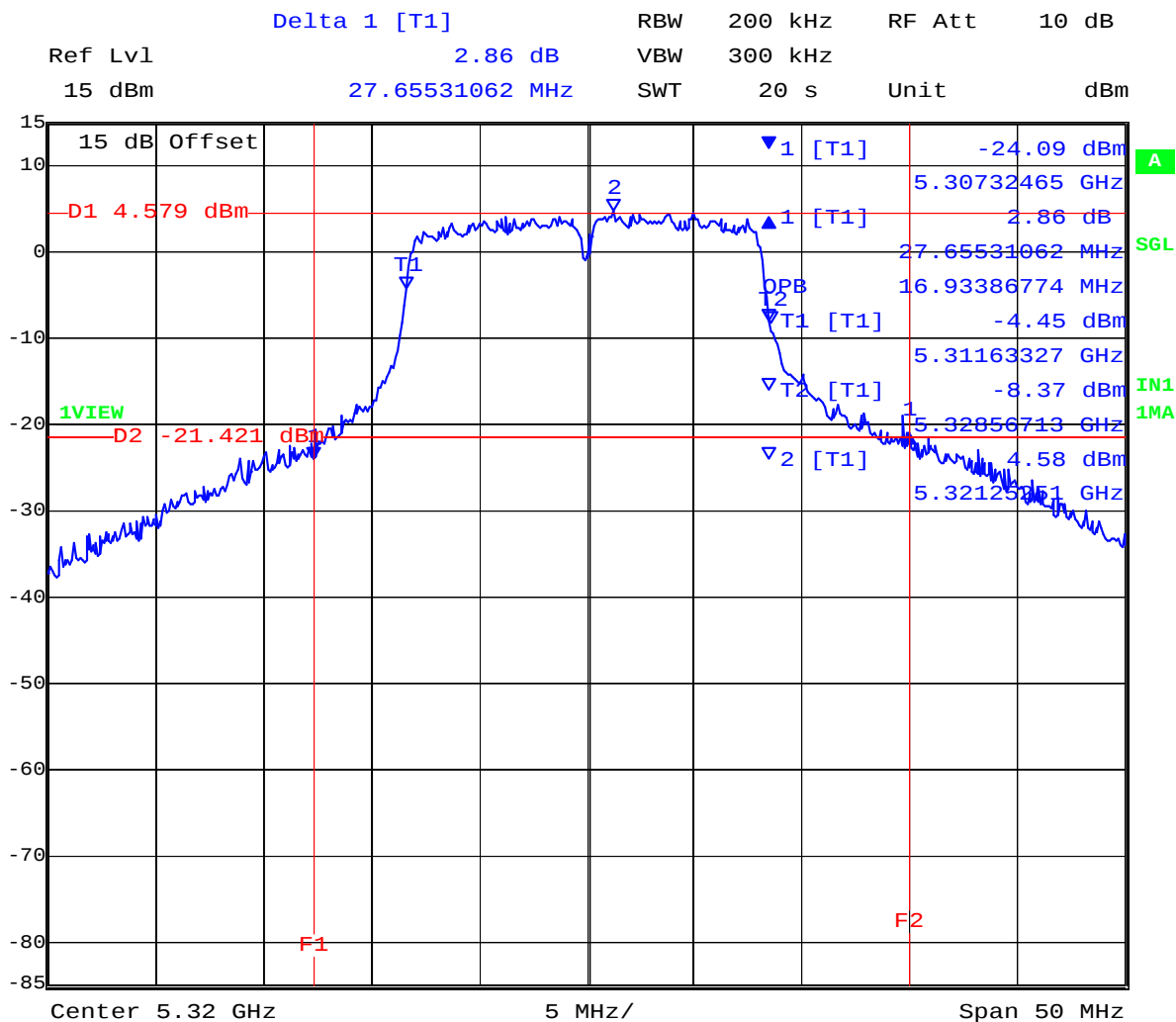
Date: 19.OCT.2010 09:53:39

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 46 of 465

5,320 MHz 802.11a Legacy - MIMO radio Chain b 26 dB and 99 % Bandwidth



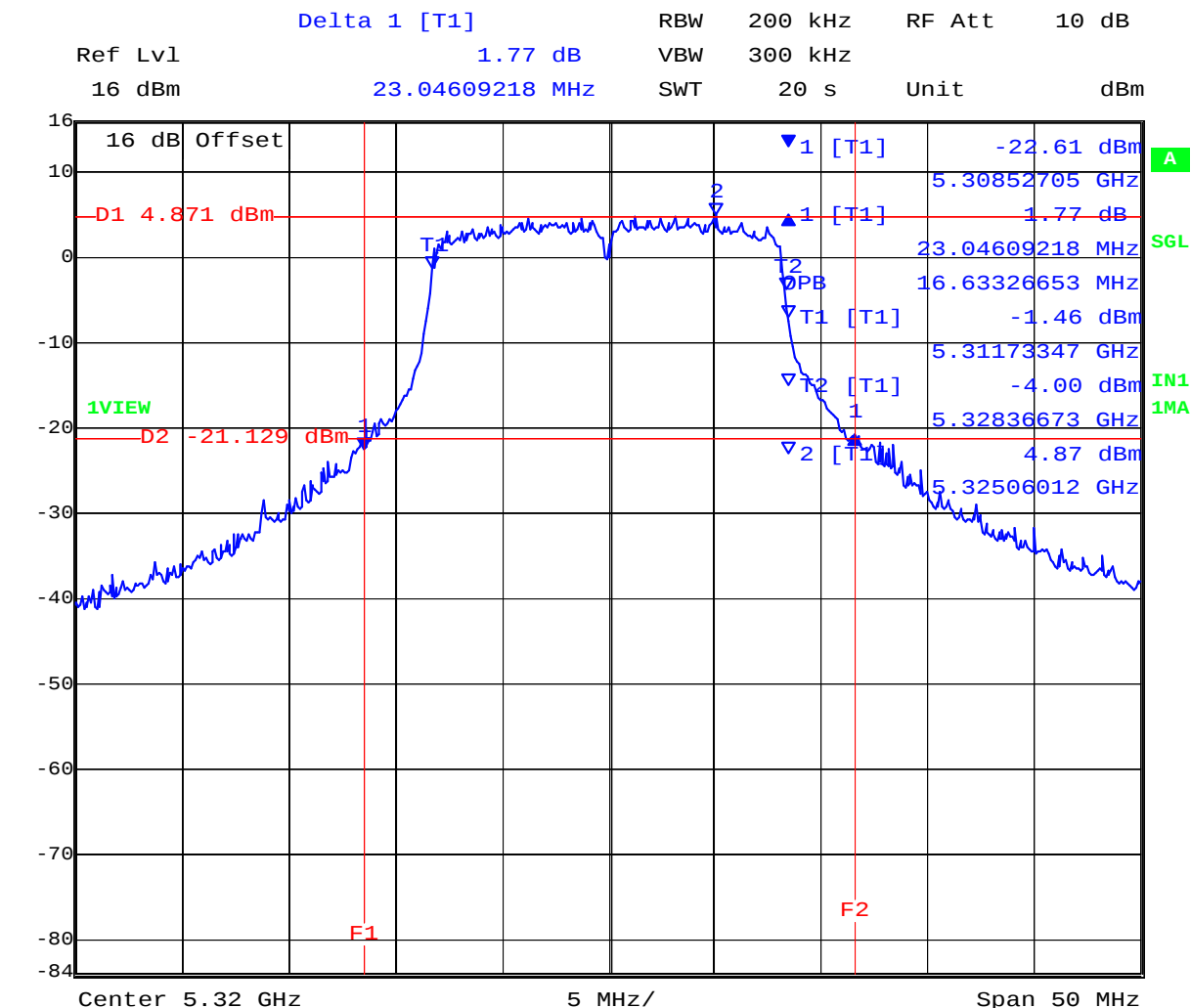
Date: 19.OCT.2010 09:49:06

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 47 of 465

5,320 MHz 802.11a Legacy - MIMO radio Chain c 26 dB and 99 % Bandwidth



Date: 19.OCT.2010 09:44:37

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 48 of 465

TABLE OF RESULTS – 802.11a Legacy - MIMO radio

Test Conditions:	15.247 (a)(2)	Rel. Humidity (%):	35 to 42
Variant:	802.11 a	Ambient Temp. (°C):	19 to 22
TPC:	HIGH	Pressure (mBars):	998 to 1003
Modulation:	ON	Duty Cycle (x):	100
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2 dBi
Applied Voltage:	28.0 Vdc		
Notes 1:			
Notes 2:			

26 dB Bandwidth

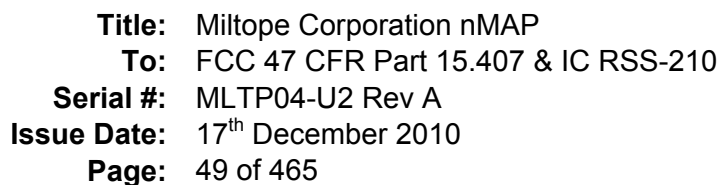
26 dB Bandwidth							
Test Frequency	26 dB Bandwidth				Minimum 6dB Bandwidth Limit		Margin
	MHz						
MHz	a	b	c	d	kHz	MHz	MHz
5500	24.248000	23.347000	27.555000		500	0.5	-22.847000
5560	23.046000	22.144000	24.349000				-21.644000
5700	22.745000	27.655000	21.743000				-21.243000

99% Bandwidth

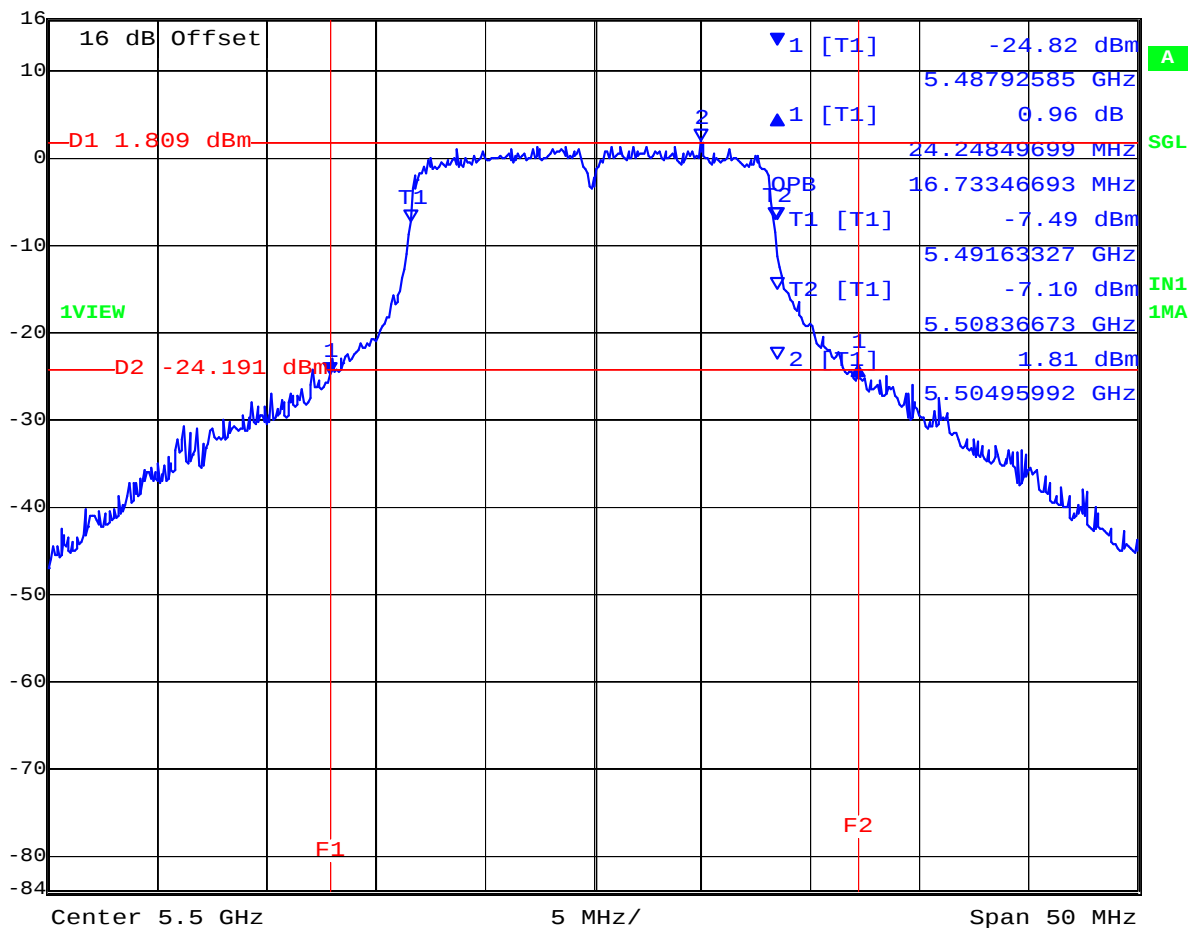
99 % Bandwidth							
Test Frequency	MHz						
MHz	a	b	c	d			
5500	16.733000	16.733000	16.834000				
5560	16.633000	16.633000	16.733000				
5700	16.733000	16.834000	16.633000				

Measurement uncertainty:	±2.81 dB
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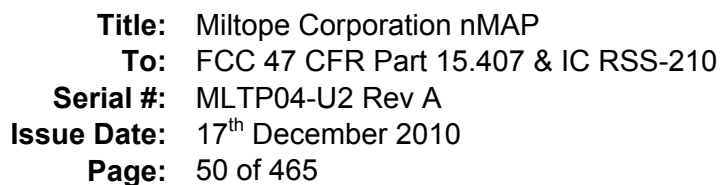


	Delta 1 [T1]	RBW	200 kHz	RF Att	10 dB
Ref Lvl	0.96 dB	VBW	300 kHz		
16 dBm	24.24849699 MHz	SWT	20 s	Unit	dBm



Date: 19.OCT.2010 14:17:16

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Delta 1 [T1] 0.59 dB

Ref Lvl 15 dBm

23.34669339 MHz

RBW 200 kHz

VBW 300 kHz

SWT 20 s

RF Att 10 dB

Unit dBm

15 dB Offset

D1 1.246 dBm

D2 -24.754 dBm

T1

T2

F1

F2

1 [T1] -25.25 dBm

2 5.48832665 GHz

1 0.59 dB

2 23.34669339 MHz

1 16.73346693 MHz

1 [T1] -8.39 dBm

2 5.49153307 GHz

1 [T1] -5.68 dBm

2 5.50826653 GHz

1 [T1] 1.25 dBm

2 5.49794589 GHz

1VIEW

IN1

1MA

Center 5.5 GHz

5 MHz/

Span 50 MHz

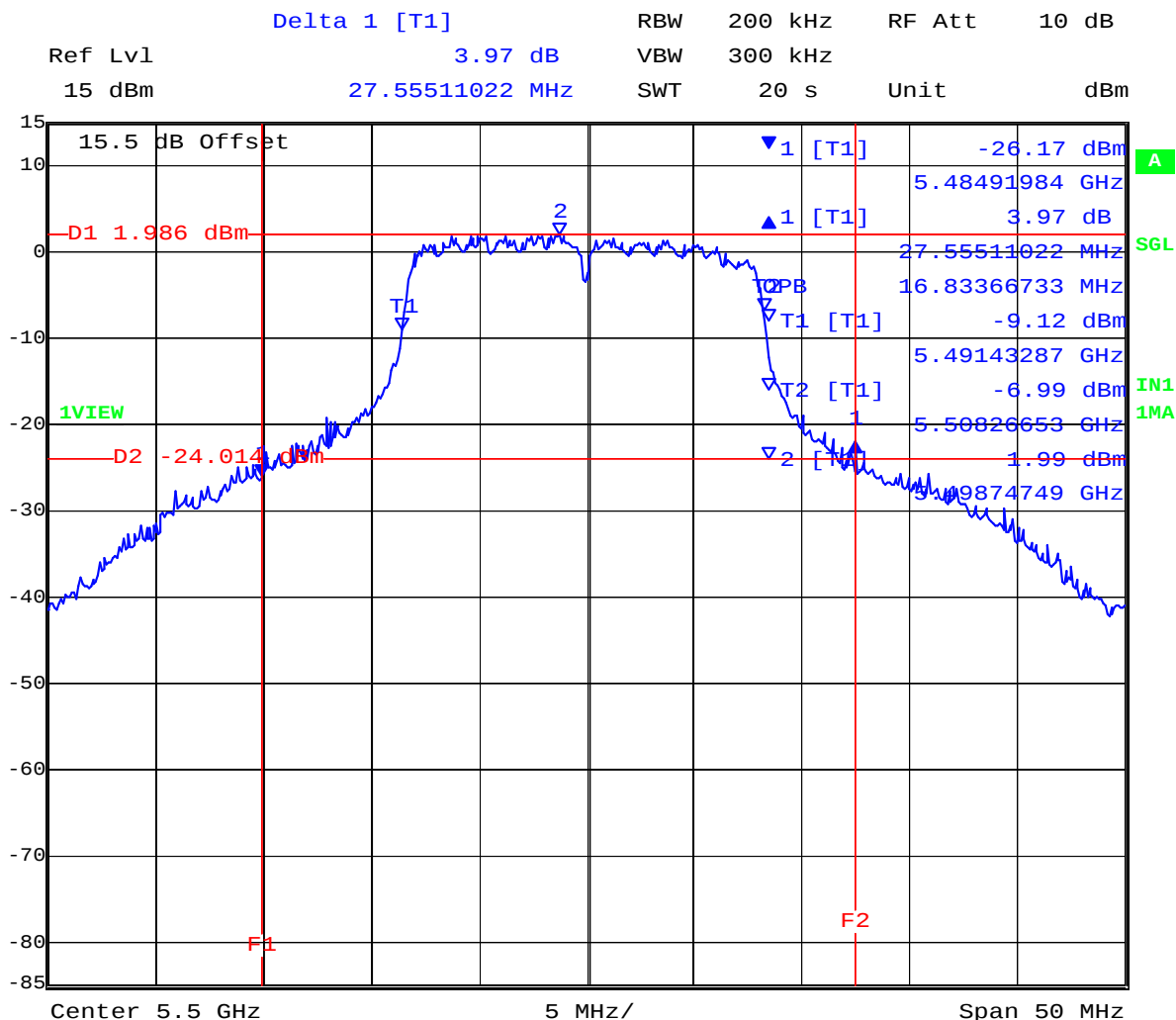
Date: 19.OCT.2010 14:21:53

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 51 of 465

5,500 MHz 802.11a Legacy - MIMO radio Chain c 26 dB and 99 % Bandwidth



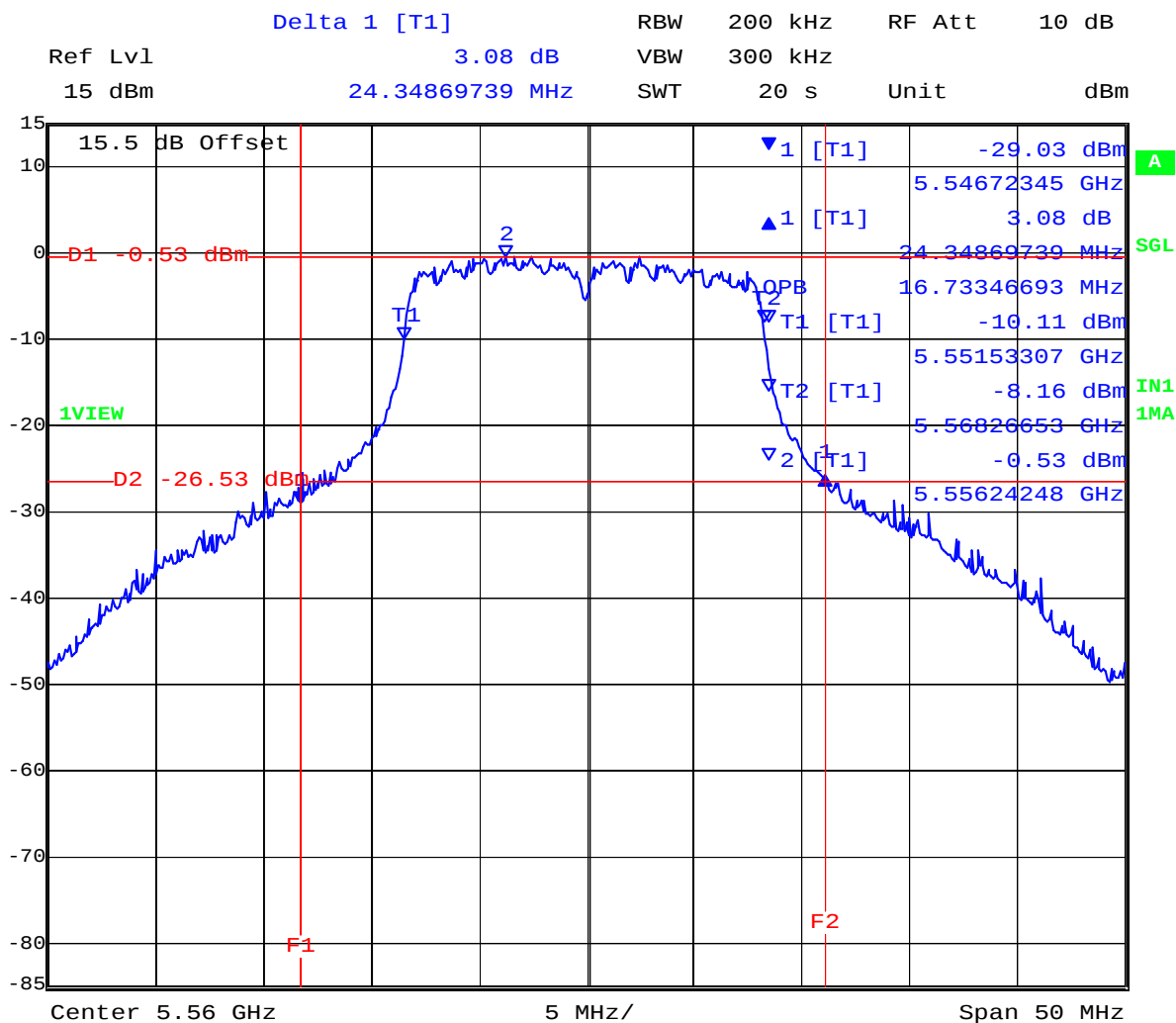
Date: 19.OCT.2010 14:26:28

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 52 of 465

5,560 MHz 802.11a Legacy - MIMO radio Chain a 26 dB and 99 % Bandwidth



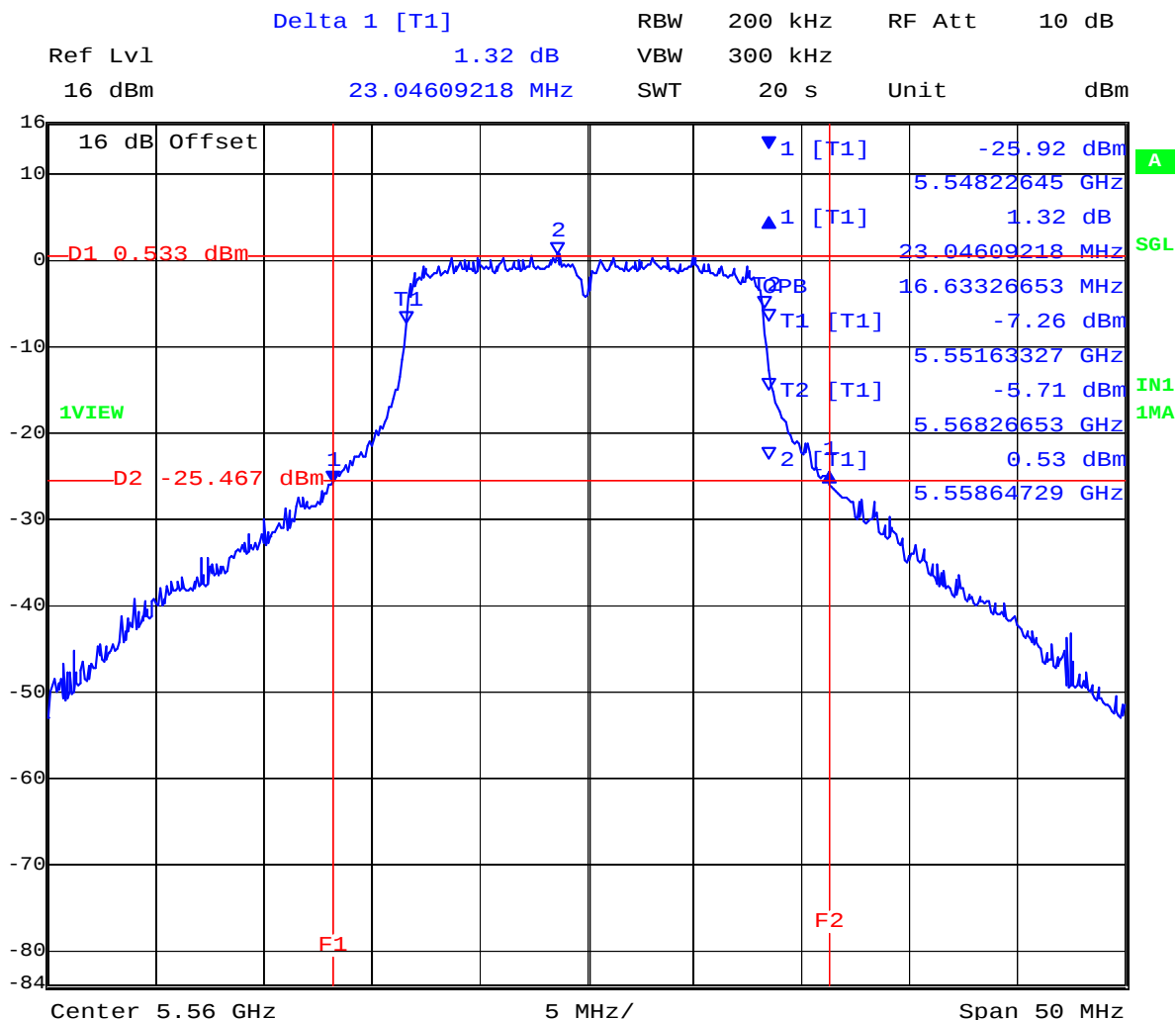
Date: 19.OCT.2010 14:57:13

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 53 of 465

5,560 MHz 802.11a Legacy - MIMO radio Chain b 26 dB and 99 % Bandwidth



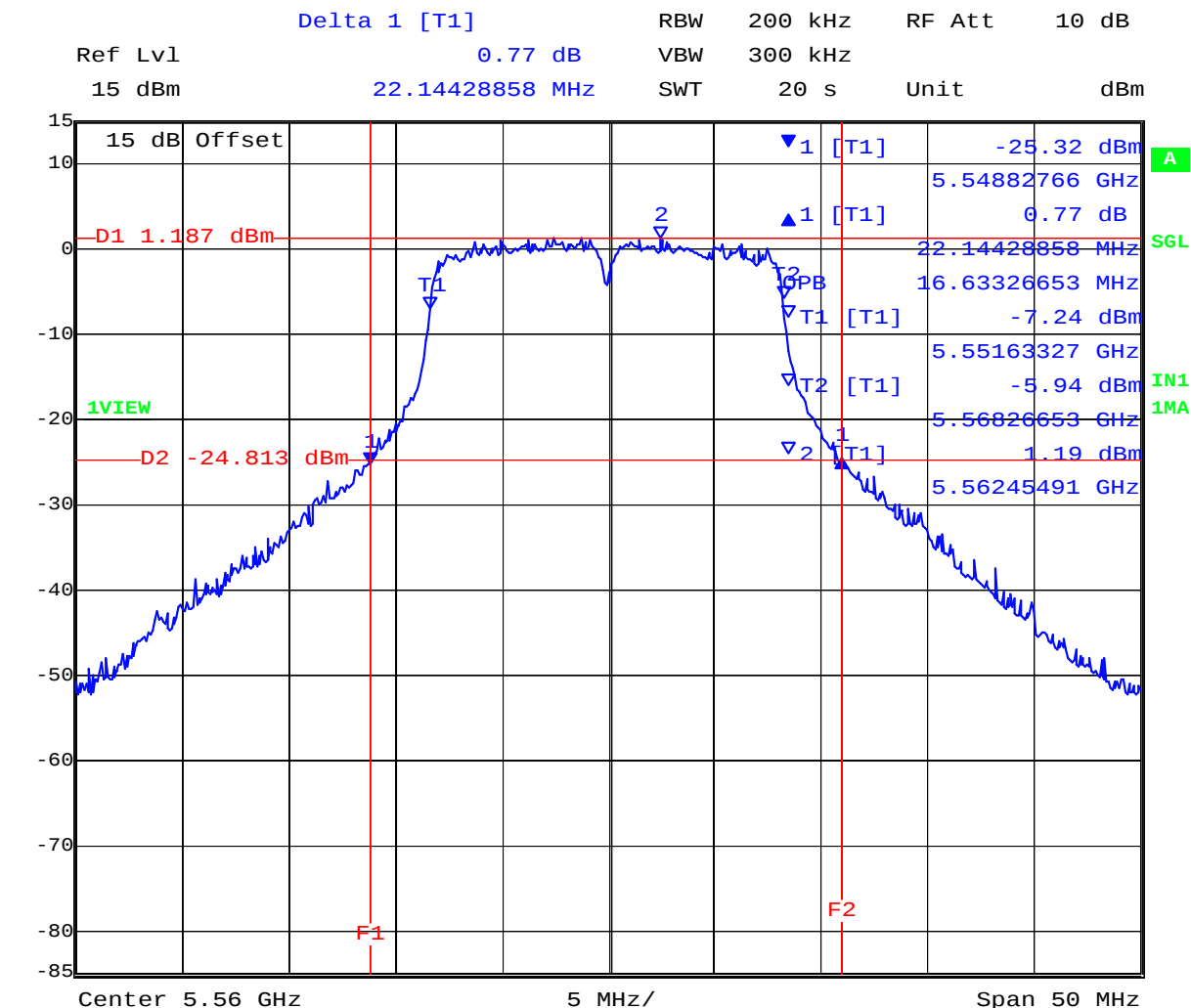
Date: 19.OCT.2010 14:47:58

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 54 of 465

5,560 MHz 802.11a Legacy - MIMO radio Chain c 26 dB and 99 % Bandwidth



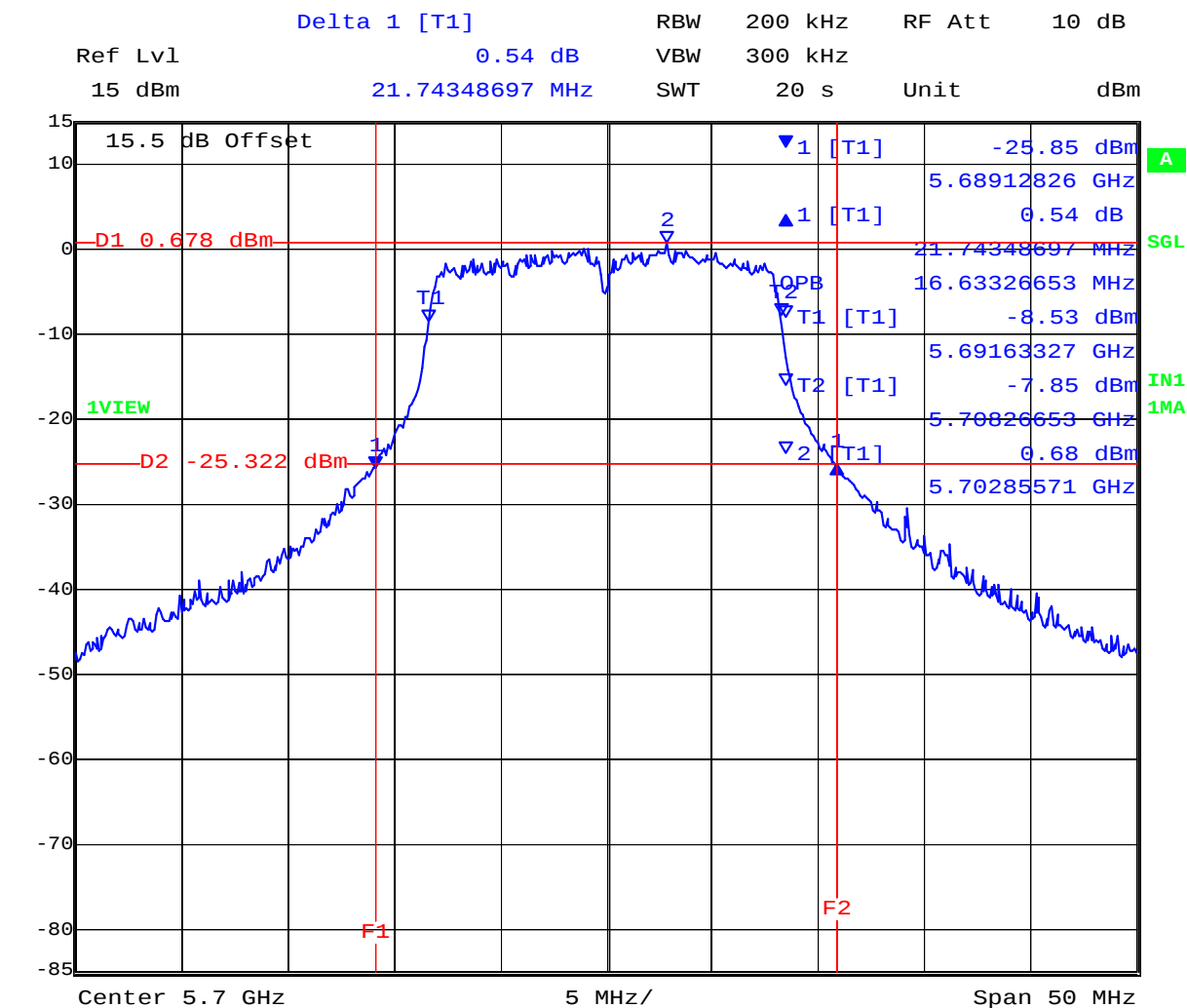
Date: 19.OCT.2010 14:52:35

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 55 of 465

5,700 MHz 802.11a Legacy - MIMO radio Chain a 26 dB and 99 % Bandwidth



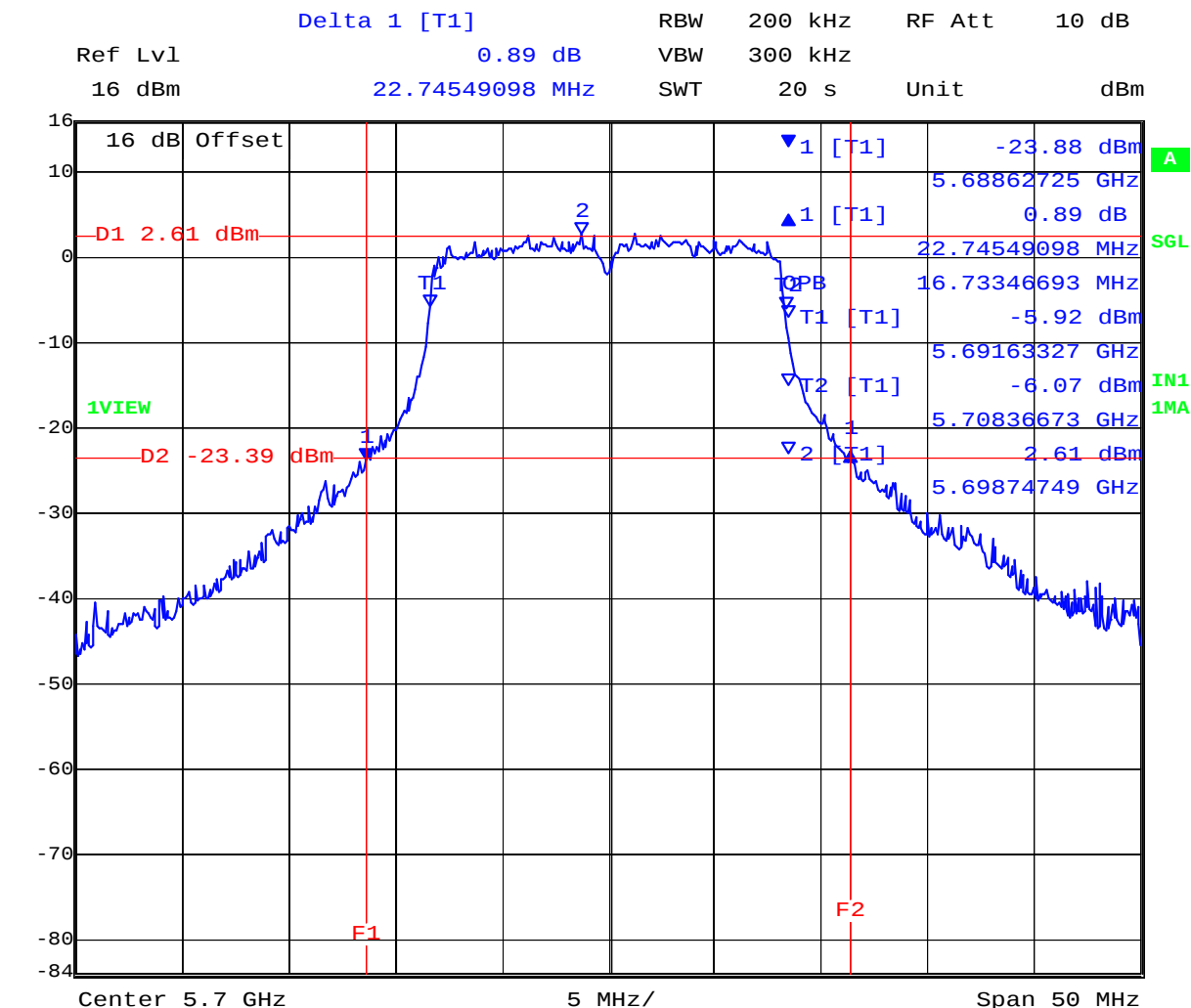
Date: 19.OCT.2010 15:29:39

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 56 of 465

5,700 MHz 802.11a Legacy - MIMO radio Chain b 26 dB and 99 % Bandwidth



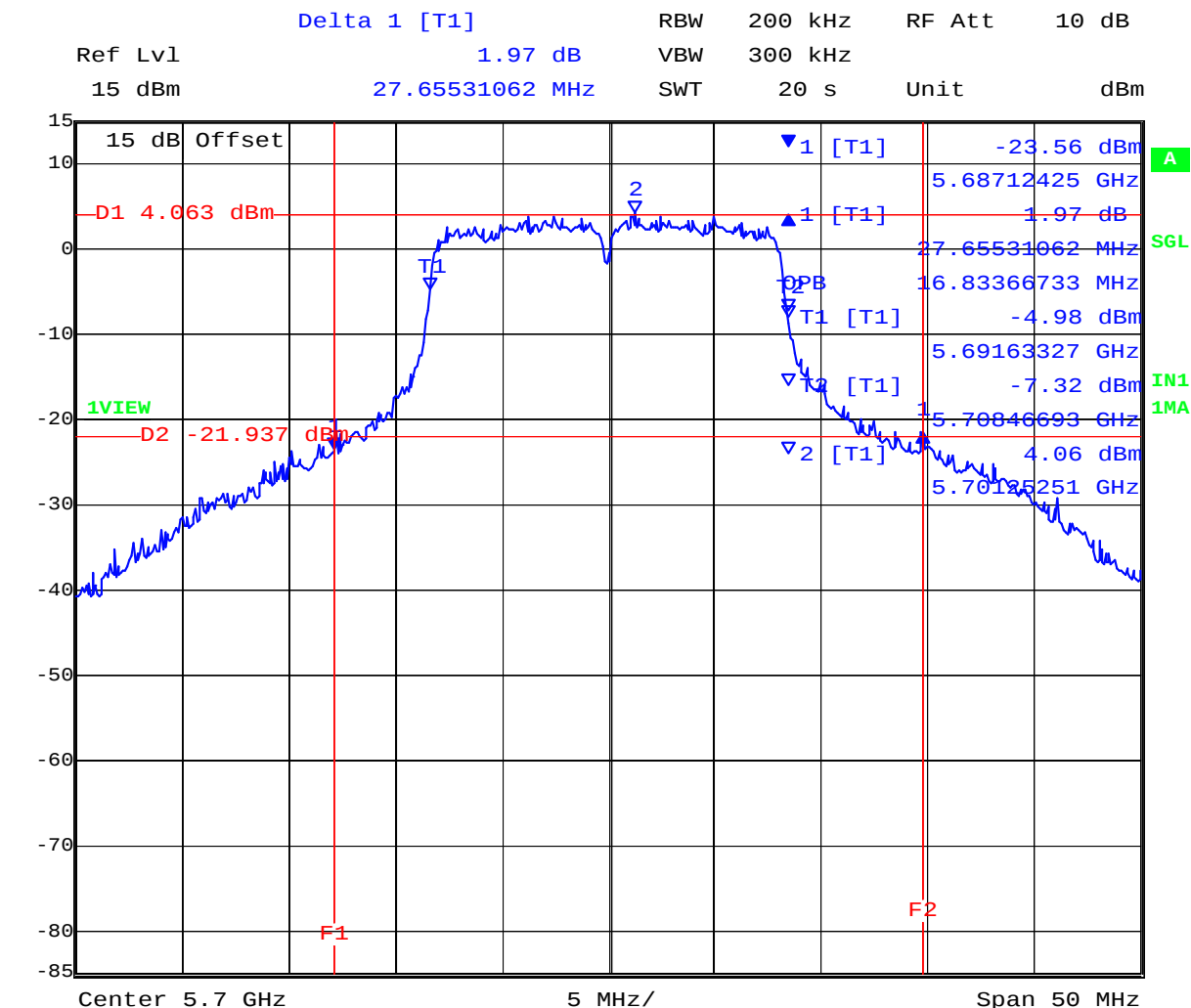
Date: 19.OCT.2010 15:20:24

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 57 of 465

5,700 MHz 802.11a Legacy - MIMO radio Chain c 26 dB and 99 % Bandwidth



Date: 19.OCT.2010 15:25:01

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 58 of 465

Measurement Results for 26 dB and 99 % Operational Bandwidth(s) -Continued

TABLE OF RESULTS – 802.11n HT20 - MIMO RADIO

Test Conditions:	15.247 (a)(2)	Rel. Humidity (%):	35 to 42
Variant:	802.11 n HT-20	Ambient Temp. (°C):	19 to 22
TPC:	HIGH	Pressure (mBars):	998 to 1003
Modulation:	ON	Duty Cycle (x):	100
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2 dBi
Applied Voltage:	28.0 Vdc		
Notes 1:			
Notes 2:			

26 dB Bandwidth

Test Frequency	26 dB Bandwidth				Minimum 6dB Bandwidth Limit		Margin
	MHz						
MHz	a	b	c	d	kHz	MHz	MHz
5180	23.347000	23.146000	23.547000		500	0.5	-22.646000
5200	23.547000	24.649000	24.048000				-23.047000
5240	23.647000	23.347000	23.747000				-22.847000

99% Bandwidth

Test Frequency	99 % Bandwidth						
	MHz						
MHz	a	b	c	d			
5180	17.836000	17.836000	17.836000				
5200	17.836000	17.836000	17.936000				
5240	17.836000	17.836000	17.836000				

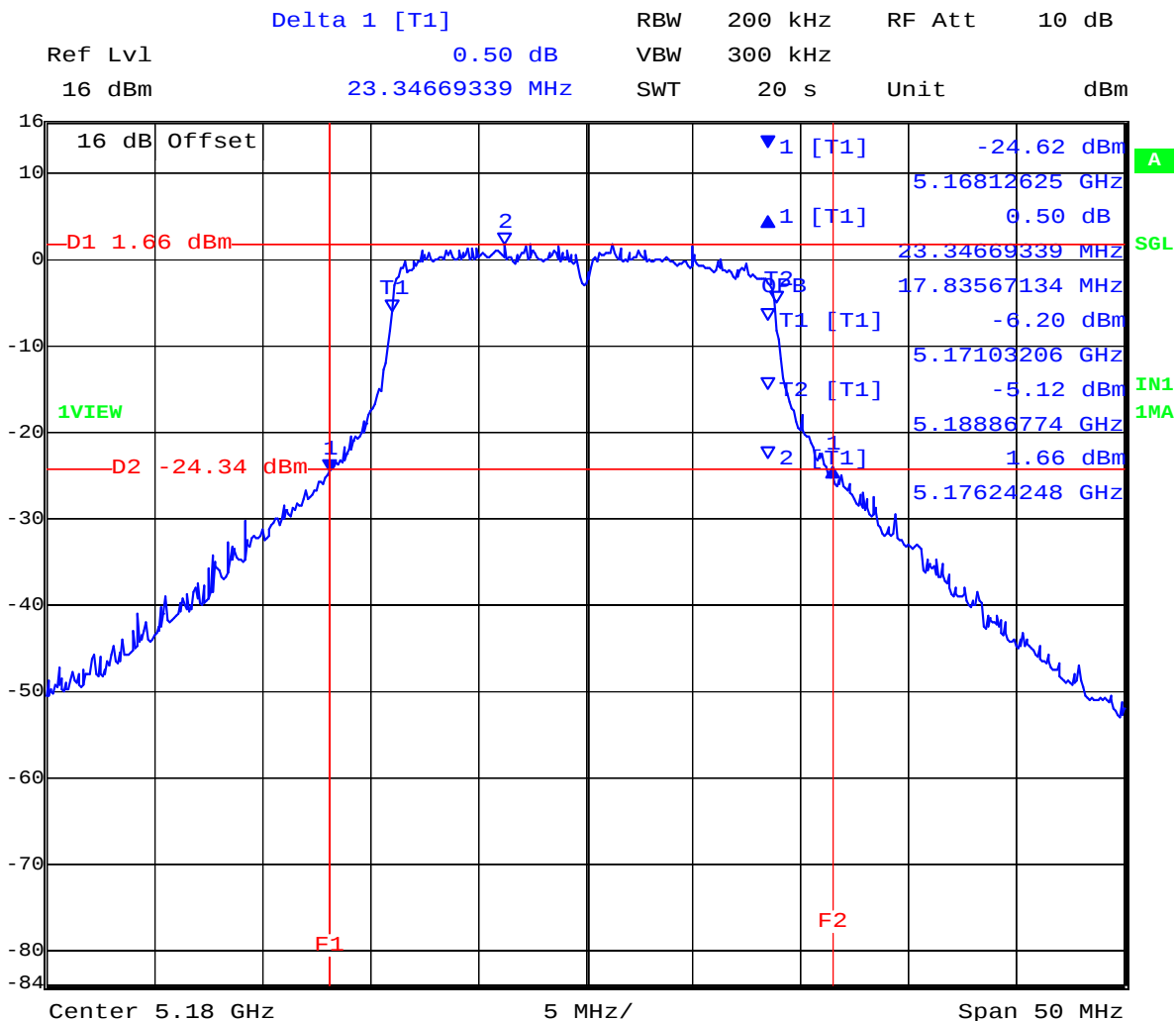
Measurement uncertainty:	±2.81 dB
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 59 of 465

5,180 MHz 802.11n HT20 - MIMO RADIO Chain a 26 dB and 99 % Bandwidth



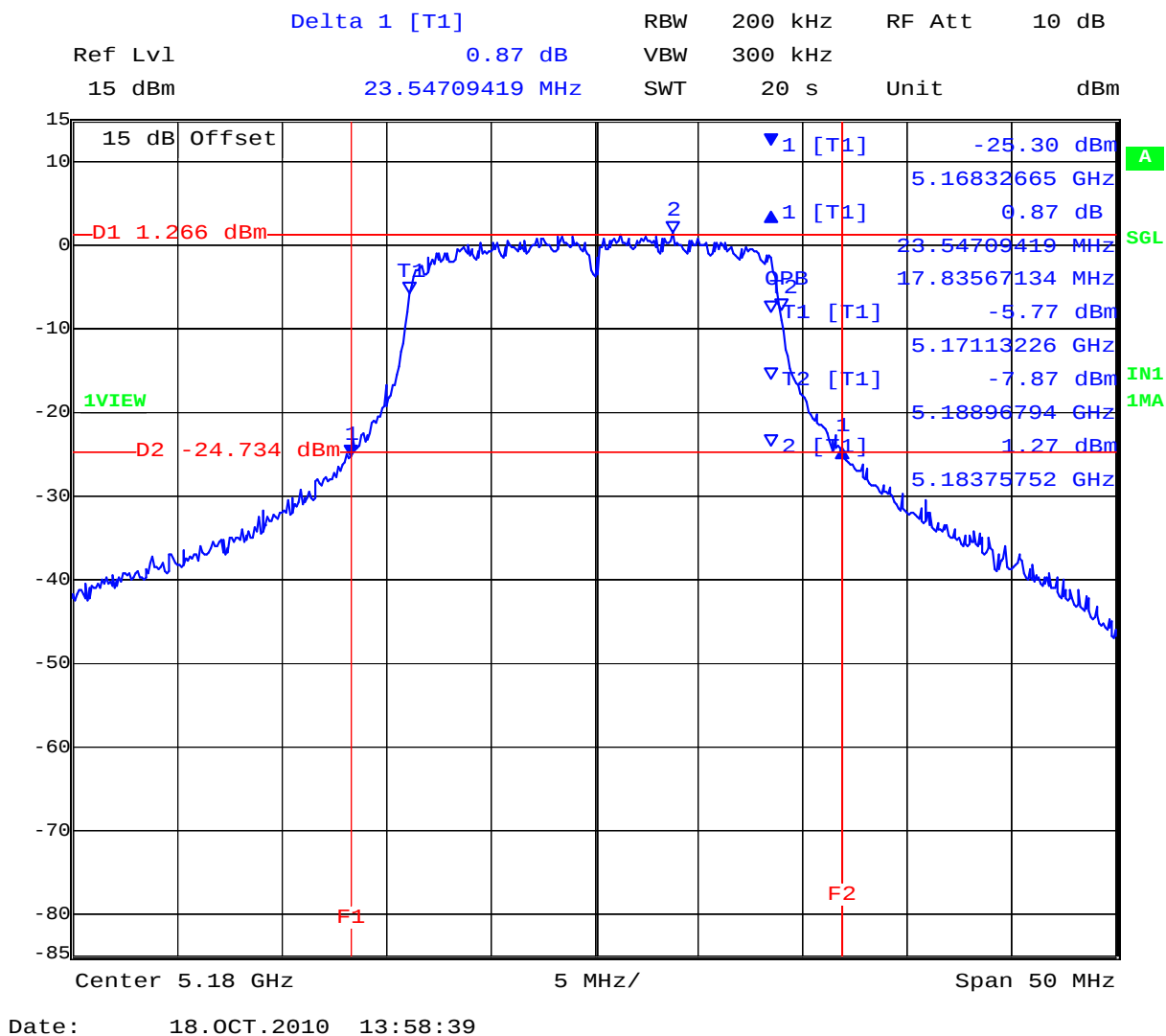
Date: 18.OCT.2010 13:49:42

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 60 of 465

5,180 MHz 802.11n HT20 - MIMO RADIO Chain b 26 dB and 99 % Bandwidth

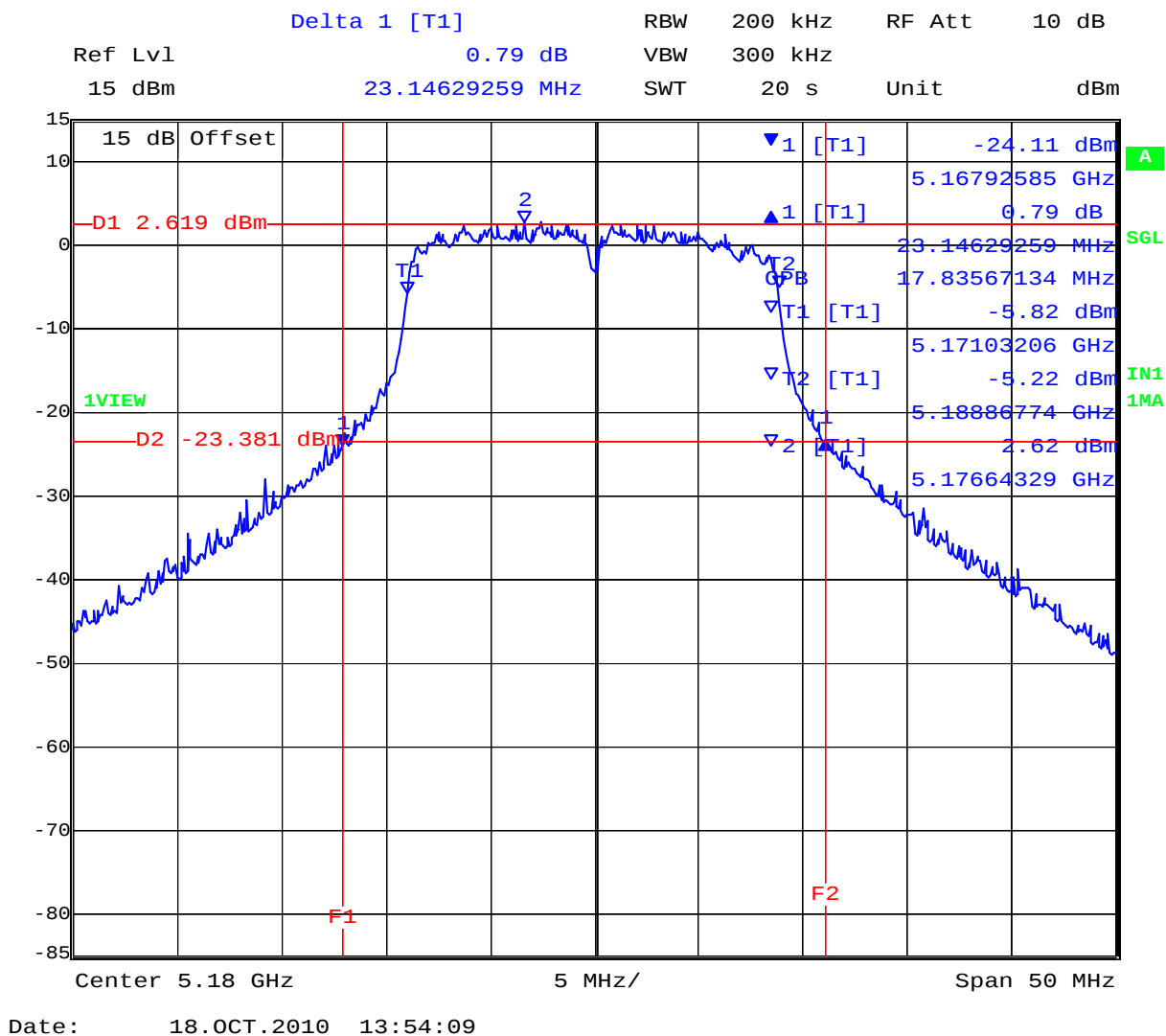


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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 61 of 465

5,180 MHz 802.11n HT20 - MIMO RADIO Chain c 26 dB and 99 % Bandwidth

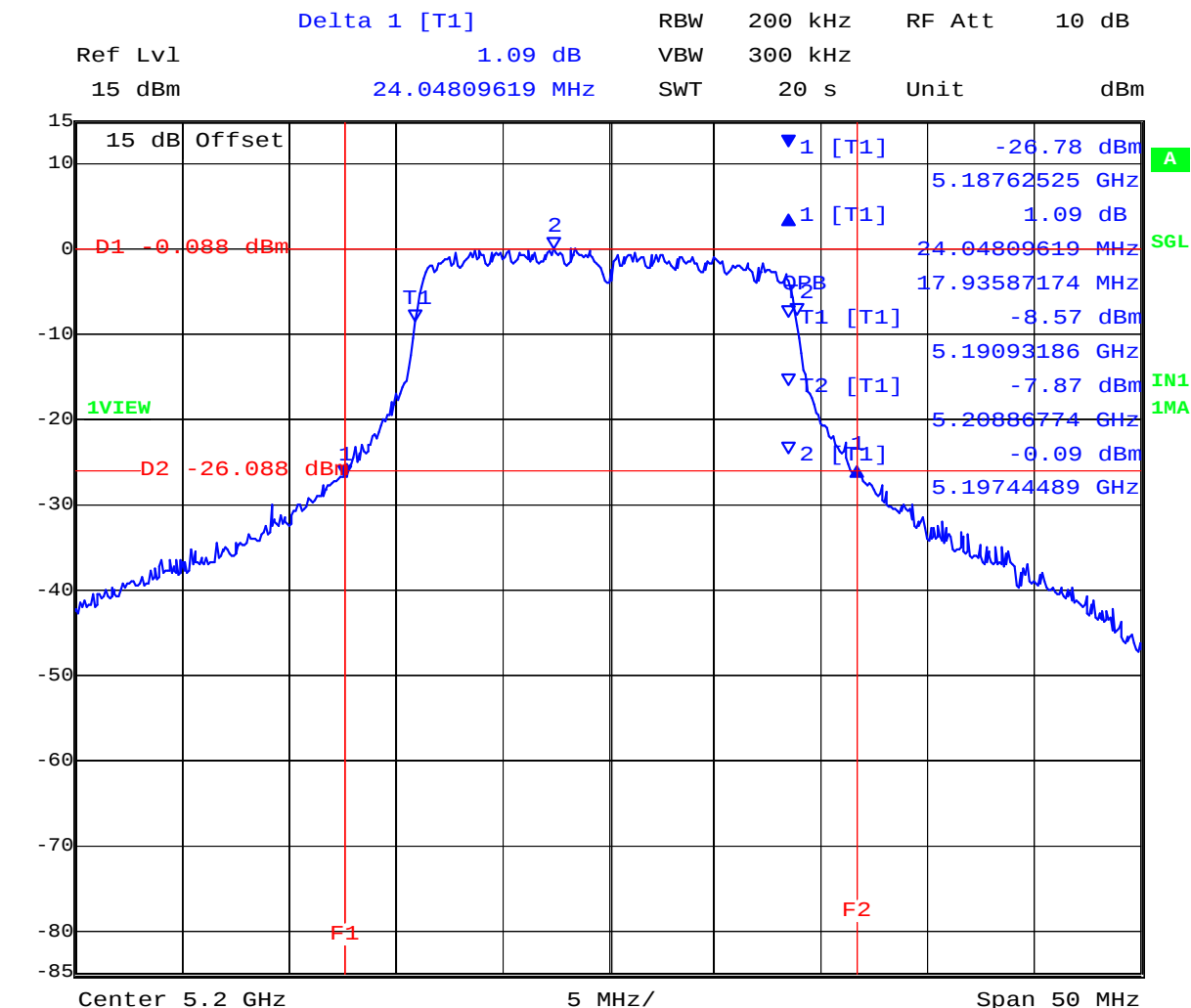


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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 62 of 465

5,200 MHz 802.11n HT20 - MIMO RADIO Chain a 26 dB and 99 % Bandwidth



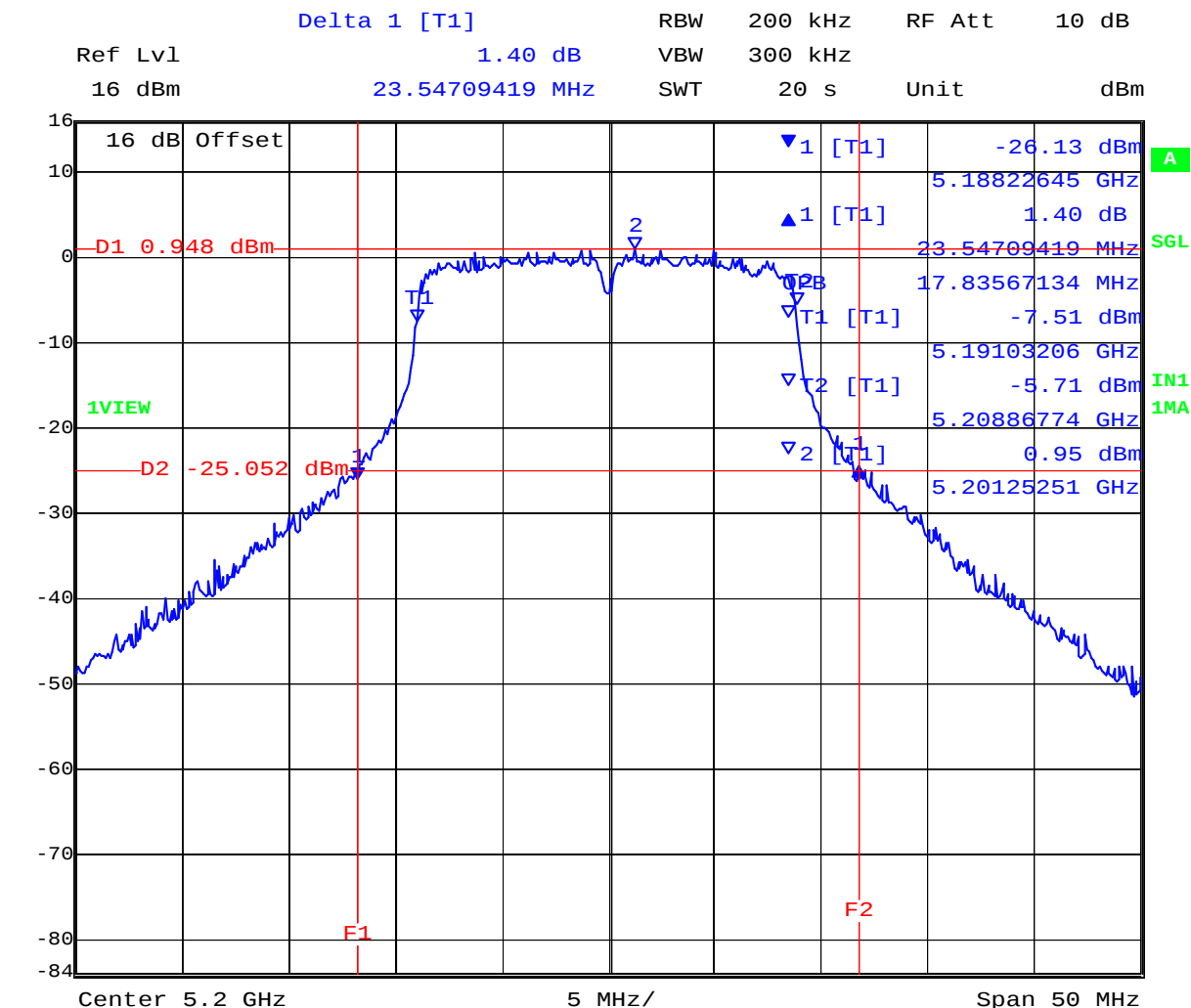
Date: 18.OCT.2010 14:28:39

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 63 of 465

5,200 MHz 802.11n HT20 - MIMO RADIO Chain b 26 dB and 99 % Bandwidth



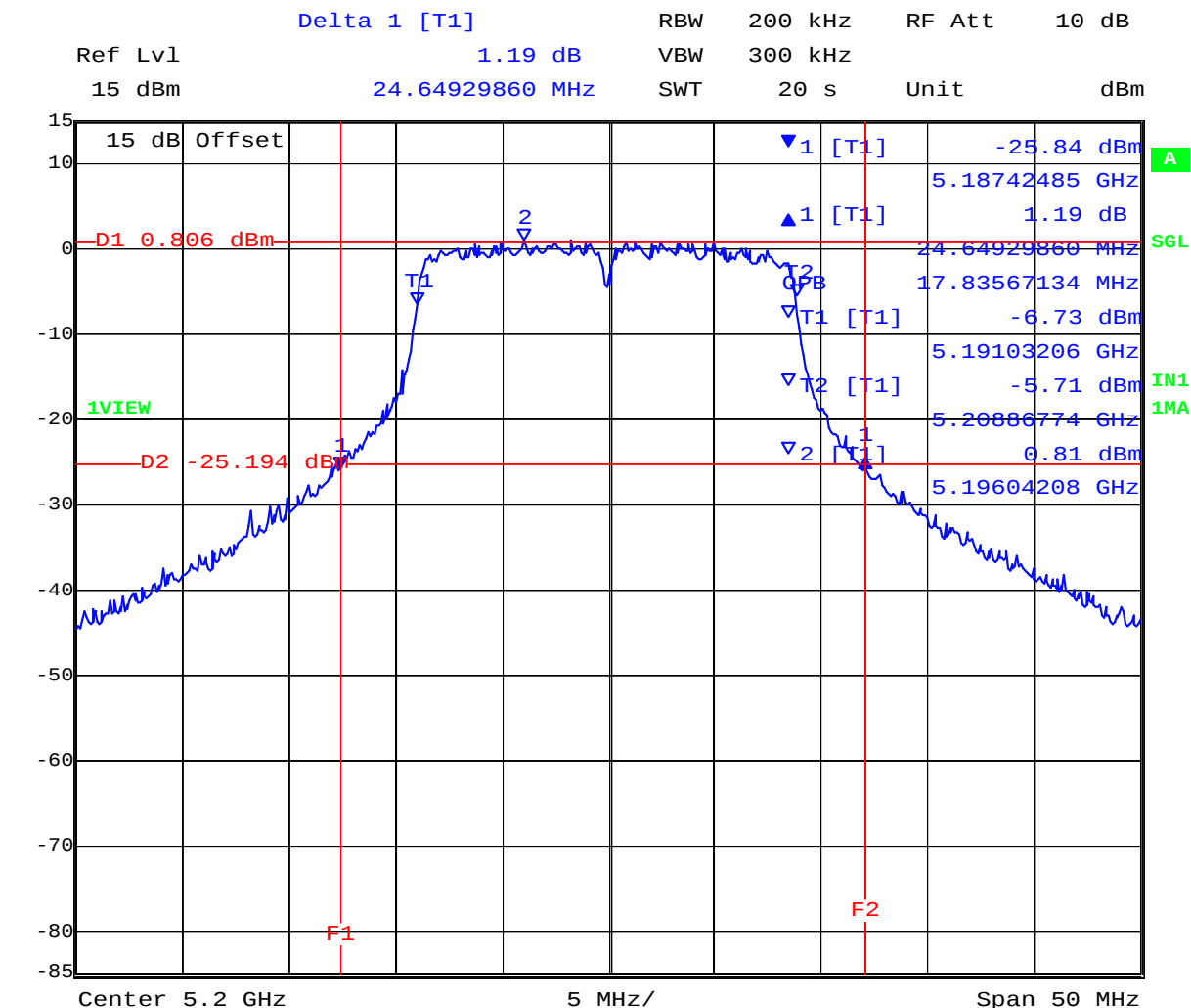
Date: 18.OCT.2010 14:19:38

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 64 of 465

5,200 MHz 802.11n HT20 - MIMO RADIO Chain c 26 dB and 99 % Bandwidth



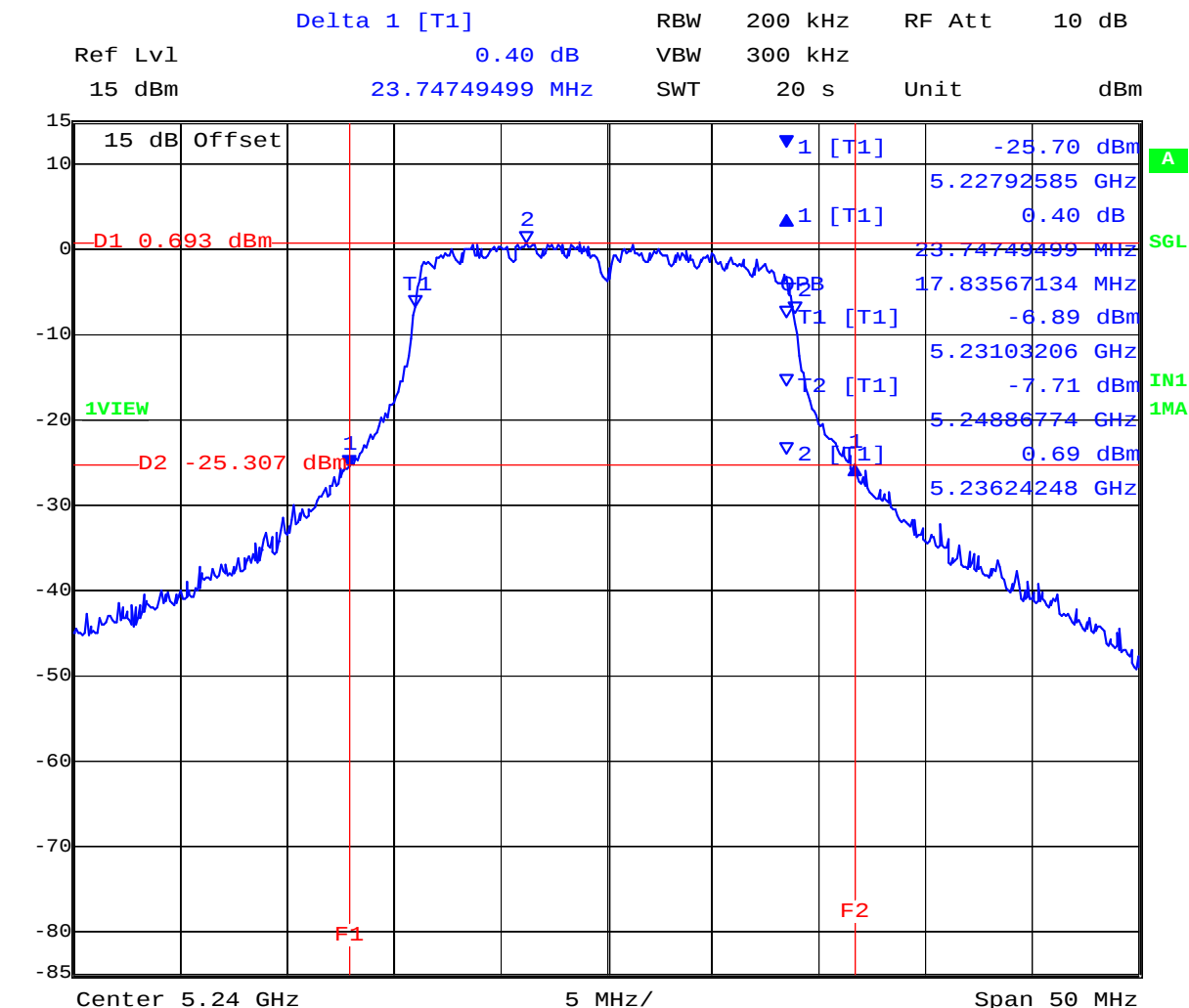
Date: 18.OCT.2010 14:24:09

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 65 of 465

5,240 MHz 802.11n HT20 - MIMO RADIO Chain a 26 dB and 99 % Bandwidth



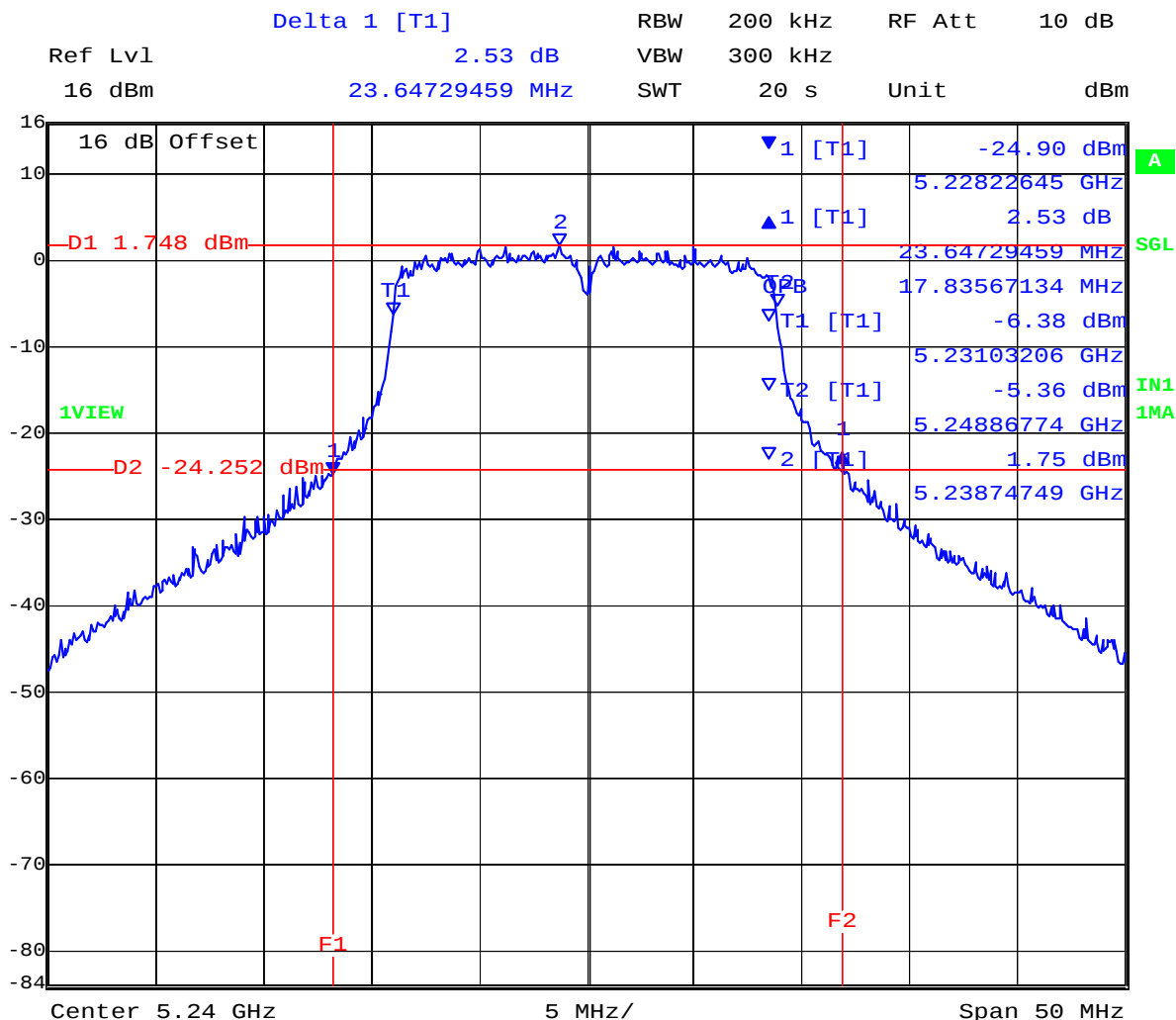
Date: 18.OCT.2010 14:59:18

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 66 of 465

5,240 MHz 802.11n HT20 - MIMO RADIO Chain b 26 dB and 99 % Bandwidth



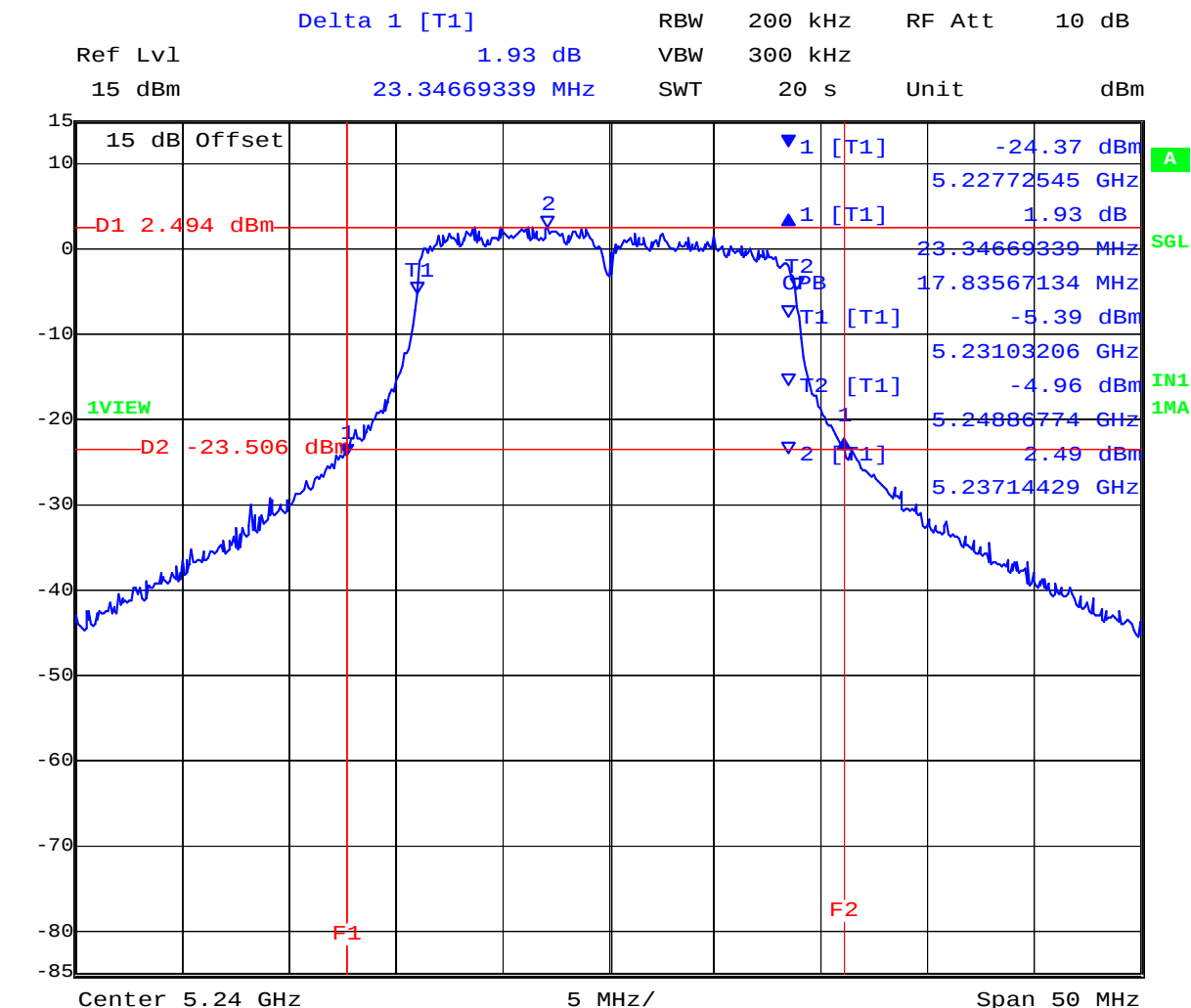
Date: 18.OCT.2010 14:50:19

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 67 of 465

5,240 MHz 802.11n HT20 - MIMO RADIO Chain c 26 dB and 99 % Bandwidth



Date: 18.OCT.2010 14:54:49

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 68 of 465

TABLE OF RESULTS – 802.11n HT20 - MIMO RADIO

Test Conditions:	15.247 (a)(2)	Rel. Humidity (%):	35 to 42
Variant:	802.11 n HT-20	Ambient Temp. (°C):	19 to 22
TPC:	HIGH	Pressure (mBars):	998 to 1003
Modulation:	ON	Duty Cycle (x):	100
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2 dBi
Applied Voltage:	28.0 Vdc		
Notes 1:			
Notes 2:			

26 dB Bandwidth

26 dB Bandwidth							
Test Frequency	26 dB Bandwidth				Minimum 6dB Bandwidth Limit		Margin
	MHz						
MHz	a	b	c	d	kHz	MHz	MHz
5260	23.547000	25.251000	23.547000		500	0.5	-23.047000
5300	24.449000	25.651000	23.848000				-23.348000
5320	23.246000	28.557000	23.347000				-22.746000

99% Bandwidth

Test Frequency	99 % Bandwidth						
	MHz						
MHz	a	b	c	d			
5260	17.735000	17.936000	17.836000				
5300	17.836000	17.836000	17.936000				
5320	17.735000	18.036000	17.735000				

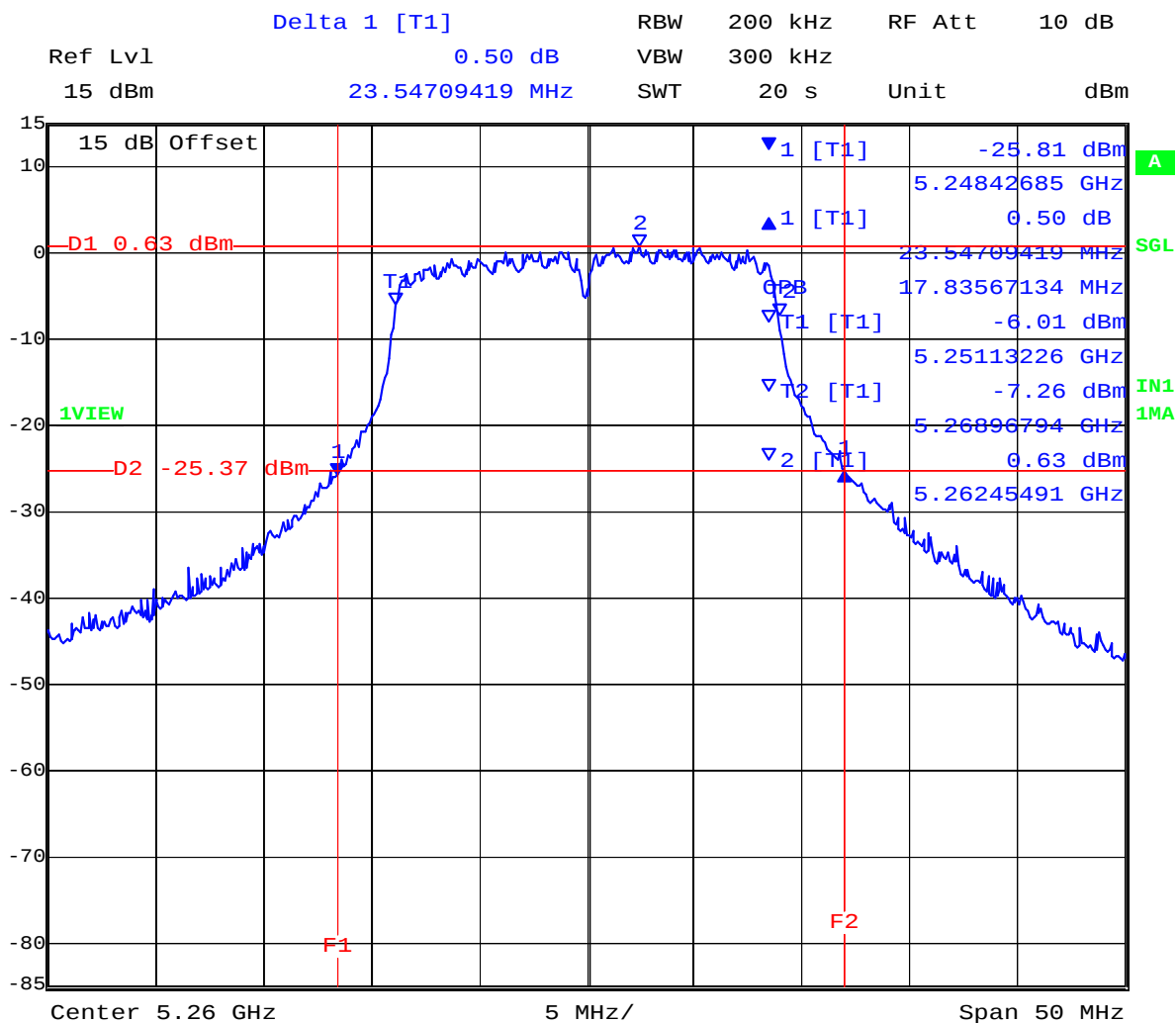
Measurement uncertainty:	±2.81 dB
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 69 of 465

5,260 MHz 802.11n HT20 - MIMO RADIO Chain a 26 dB and 99 % Bandwidth



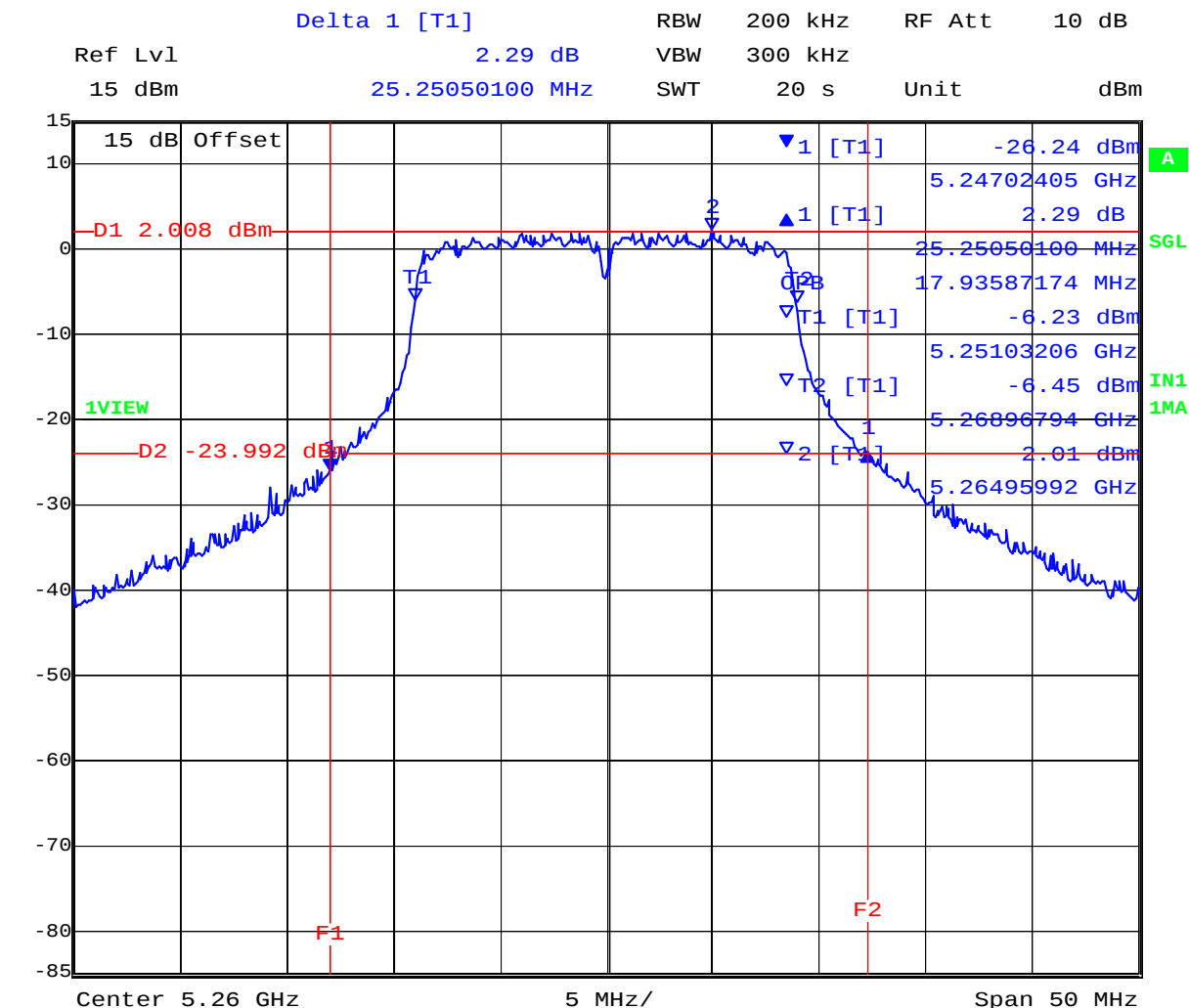
Date: 19.OCT.2010 10:24:29

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 70 of 465

5,260 MHz 802.11n HT20 - MIMO RADIO Chain b 26 dB and 99 % Bandwidth



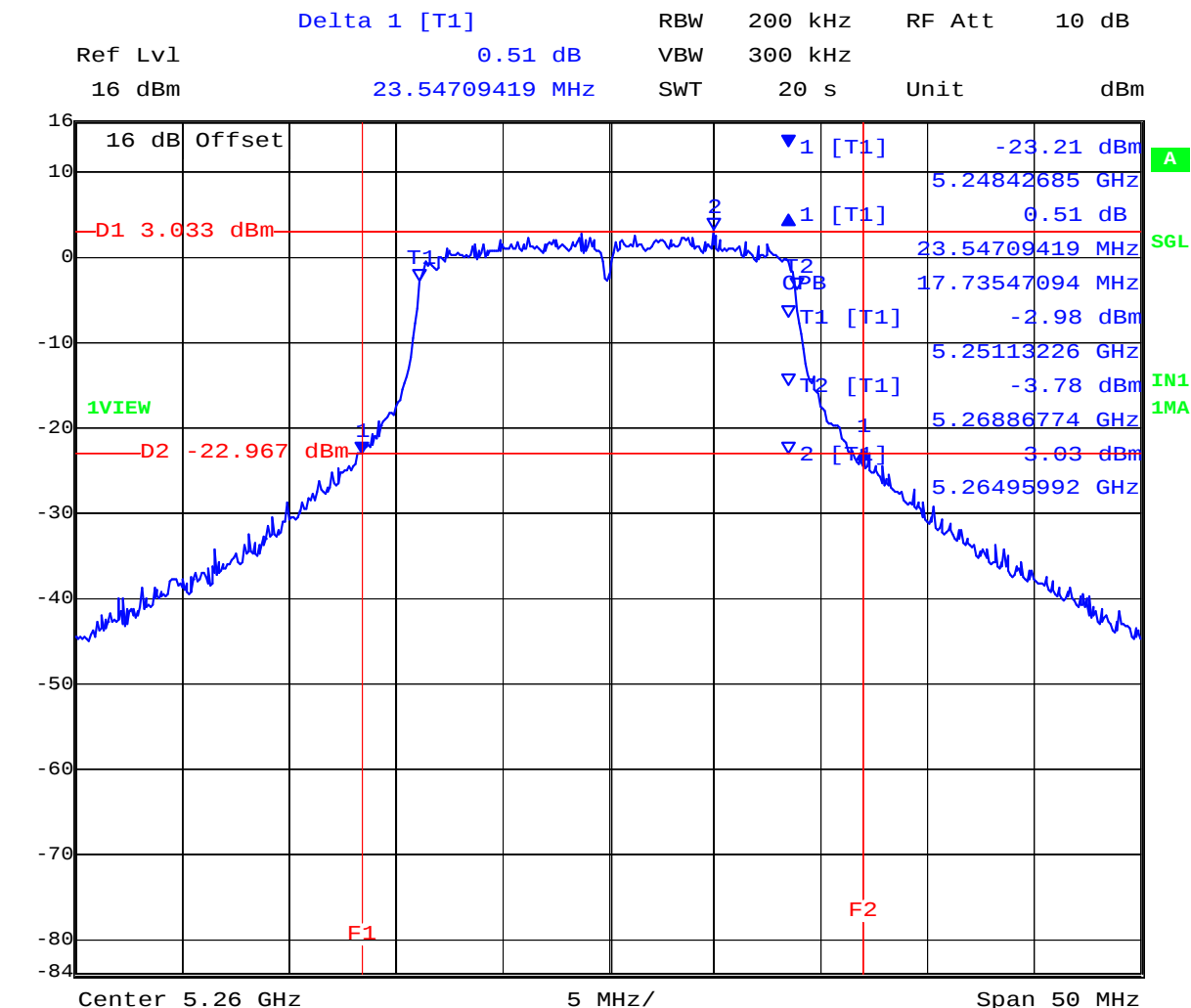
Date: 19.OCT.2010 10:19:57

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 71 of 465

5,260 MHz 802.11n HT20 - MIMO RADIO Chain c 26 dB and 99 % Bandwidth



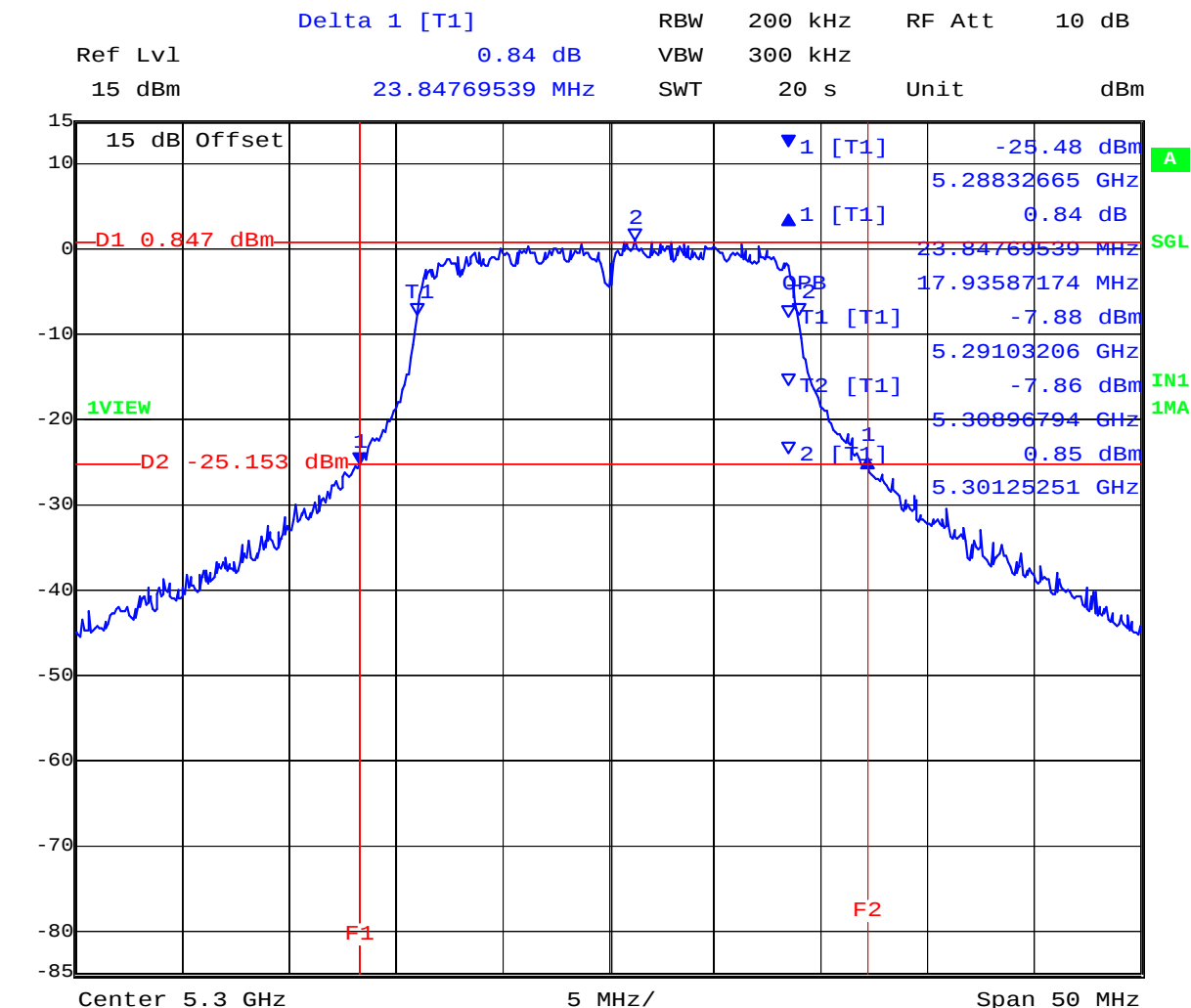
Date: 19.OCT.2010 10:15:29

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 72 of 465

5,300 MHz 802.11n HT20 - MIMO RADIO Chain a 26 dB and 99 % Bandwidth



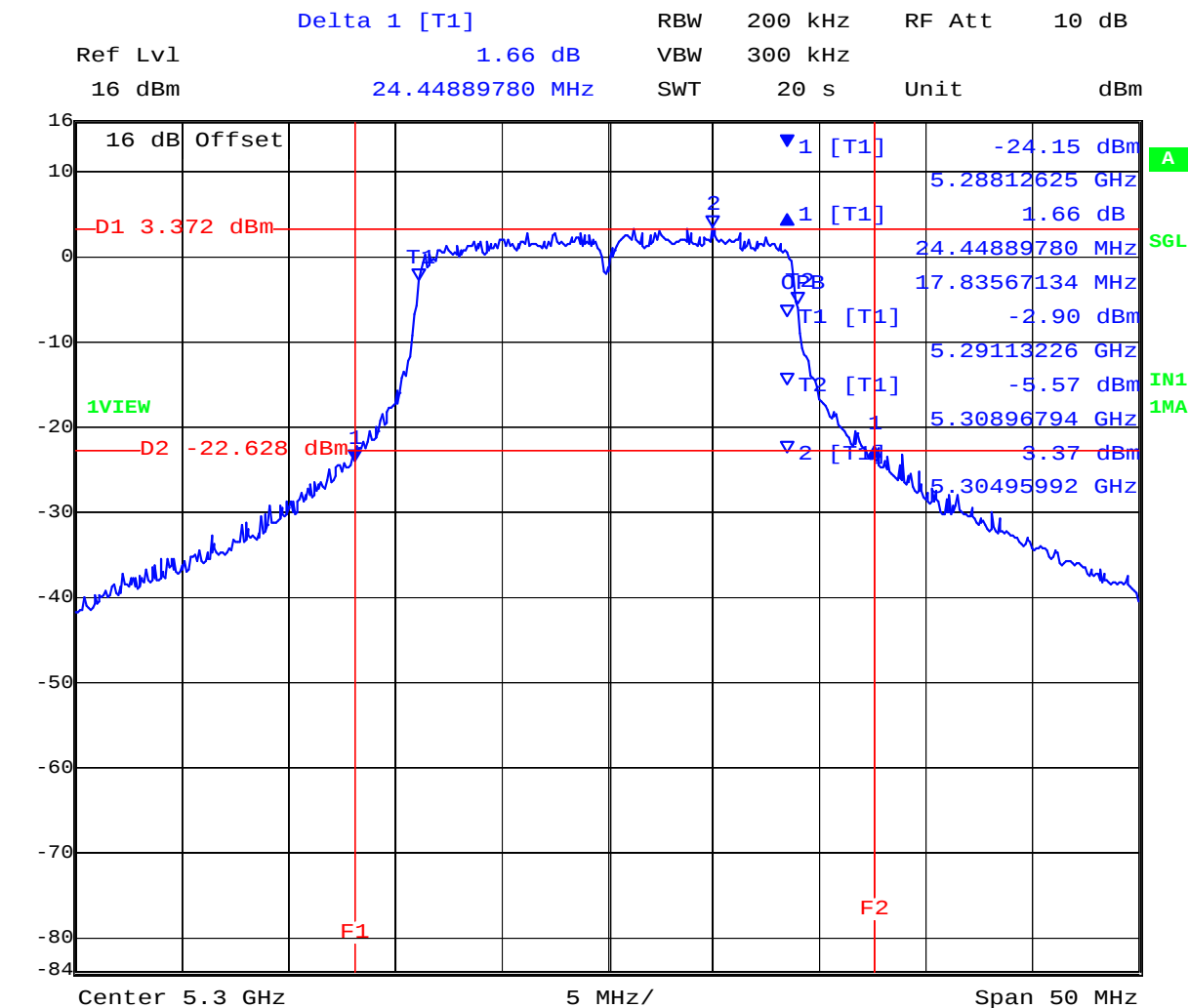
Date: 19.OCT.2010 11:10:01

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 73 of 465

5,300 MHz 802.11n HT20 - MIMO RADIO Chain b 26 dB and 99 % Bandwidth



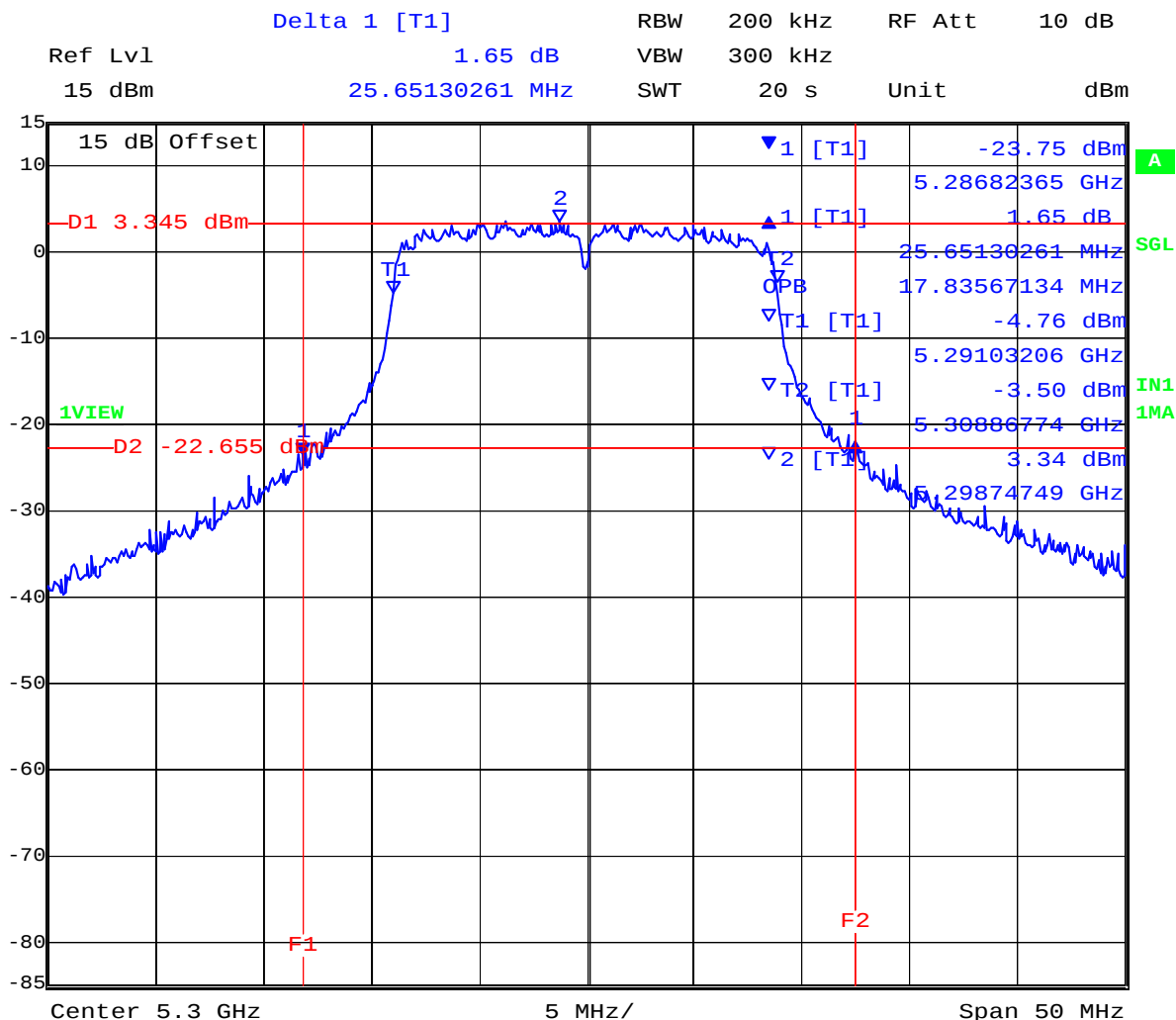
Date: 19.OCT.2010 11:00:53

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Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 74 of 465

5,300 MHz 802.11n HT20 - MIMO RADIO Chain c 26 dB and 99 % Bandwidth



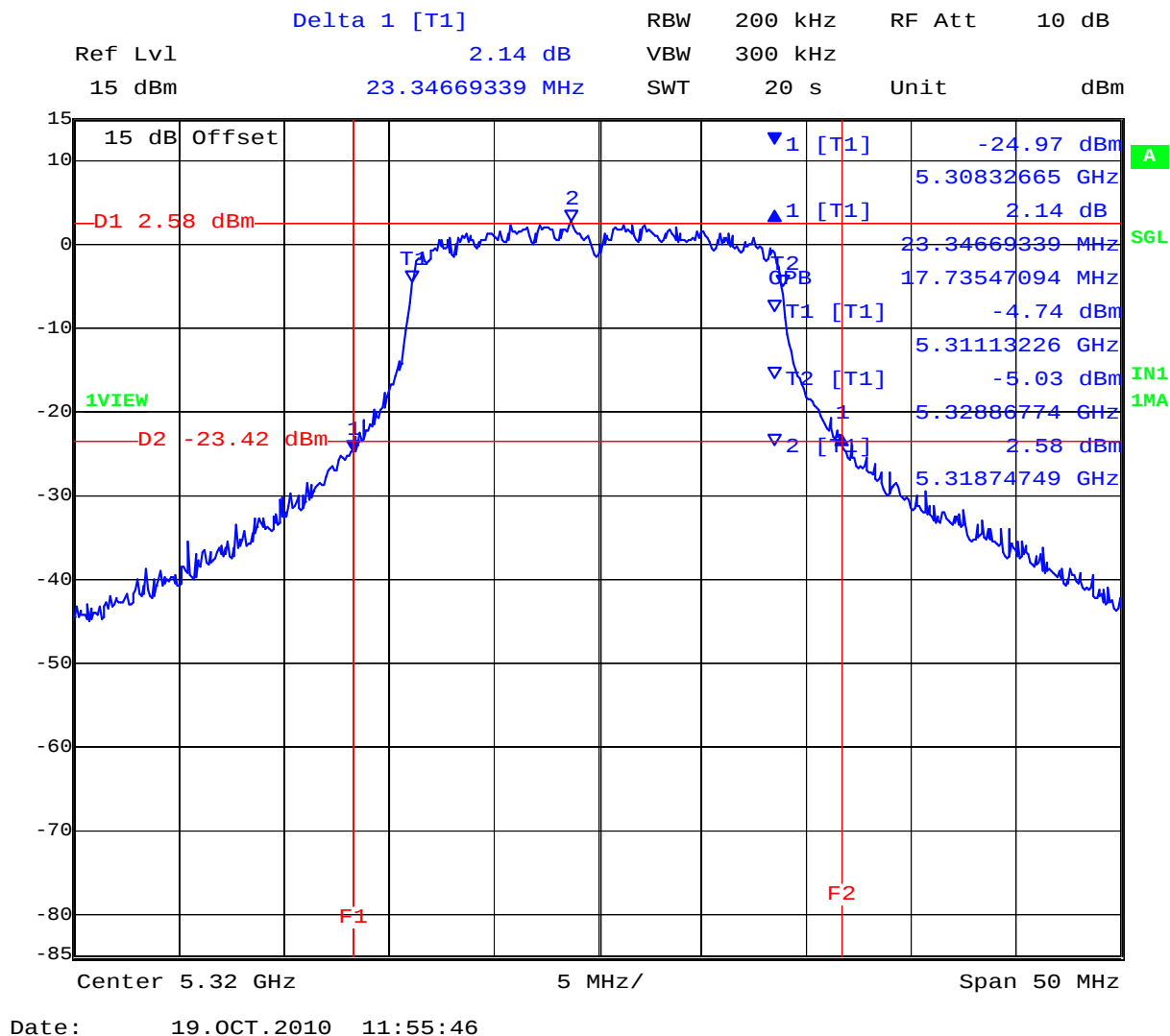
Date: 19.OCT.2010 11:05:28

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 75 of 465

5,320 MHz 802.11n HT20 - MIMO RADIO Chain a 26 dB and 99 % Bandwidth

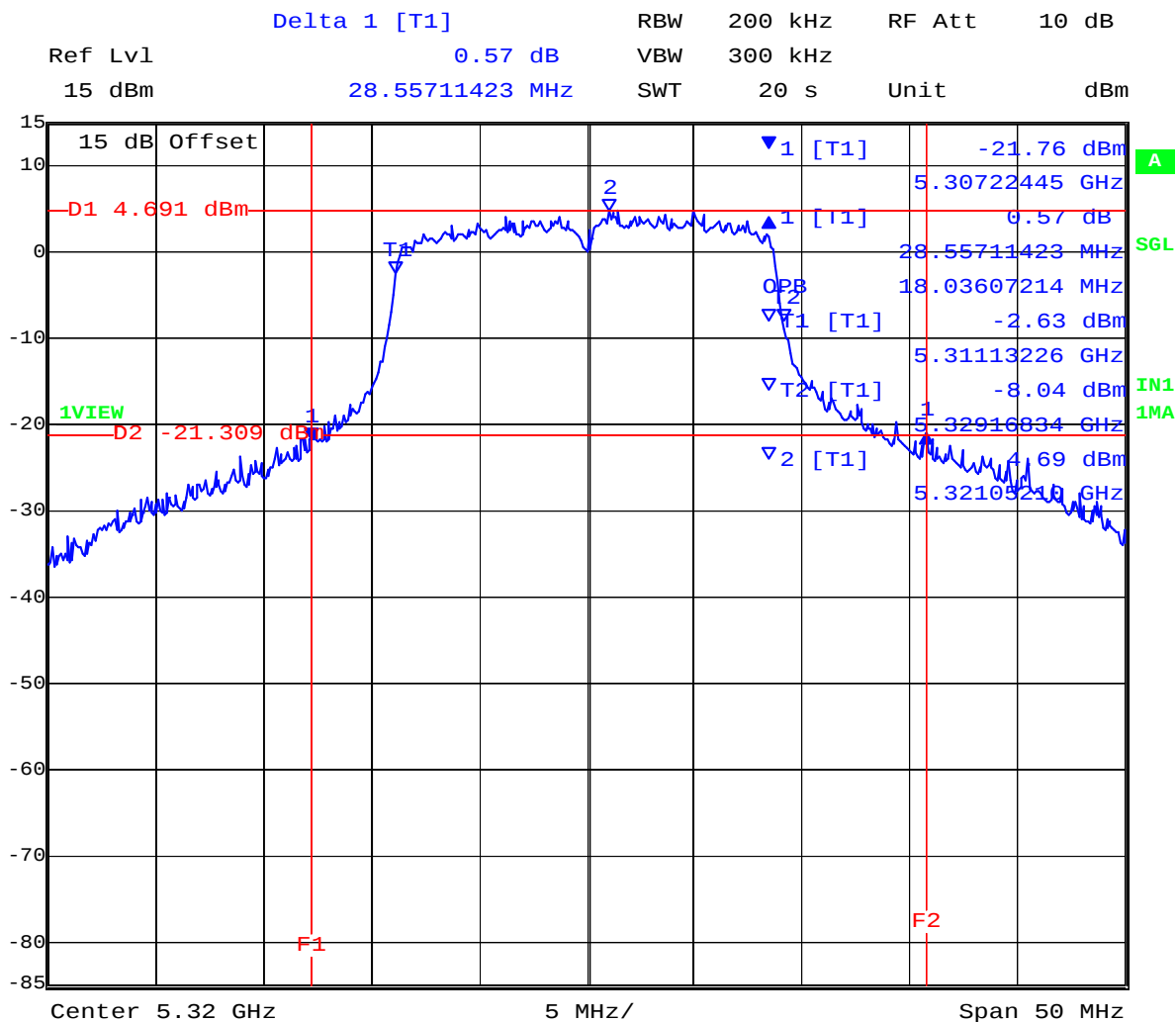


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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 76 of 465

5,320 MHz 802.11n HT20 - MIMO RADIO Chain b 26 dB and 99 % Bandwidth



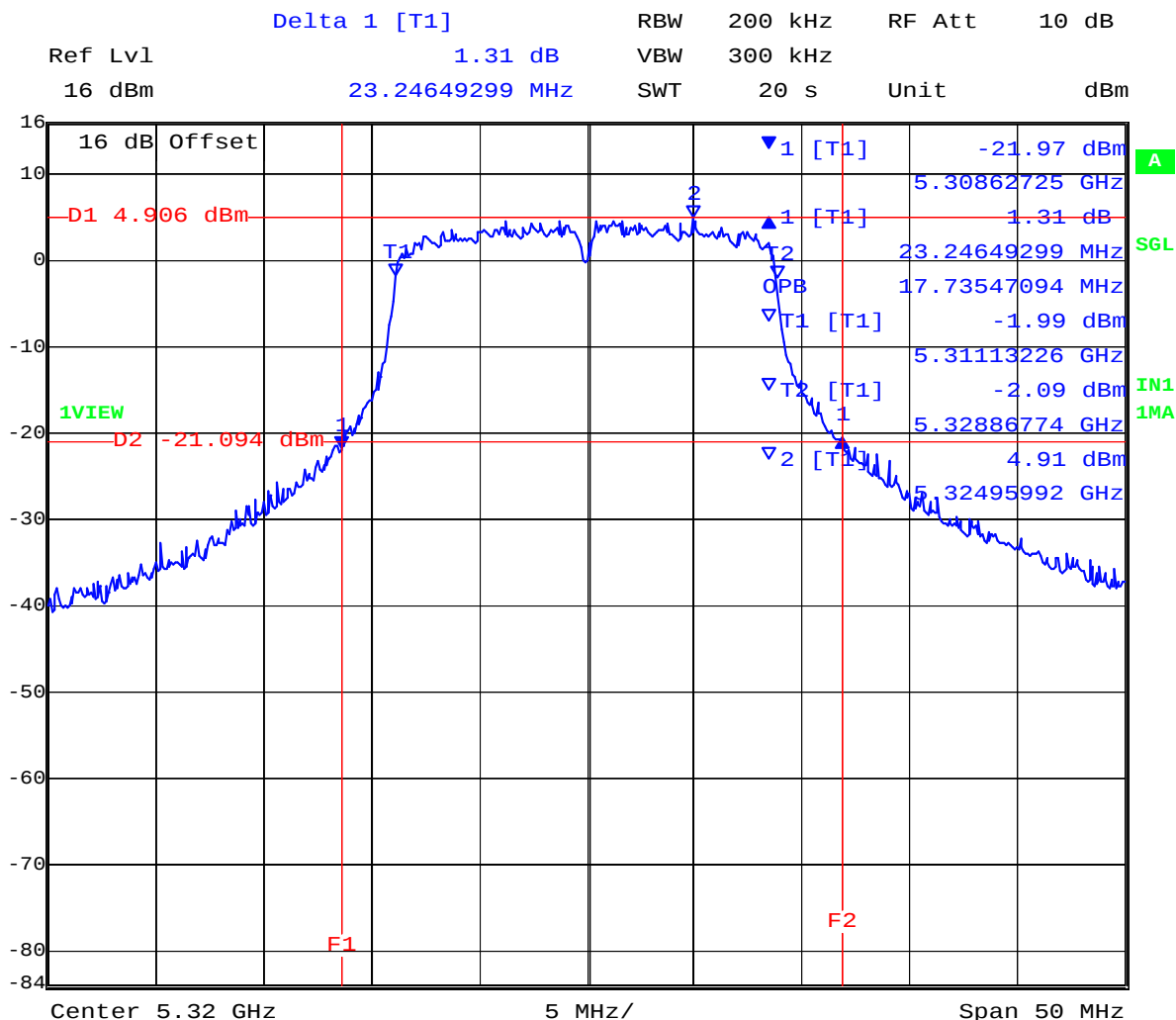
Date: 19.OCT.2010 11:51:08

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 77 of 465

5,320 MHz 802.11n HT20 - MIMO RADIO Chain c 26 dB and 99 % Bandwidth



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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 78 of 465

TABLE OF RESULTS – 802.11n HT20 - MIMO RADIO

Test Conditions:	15.247 (a)(2)	Rel. Humidity (%):	35 to 42
Variant:	802.11 n HT-20	Ambient Temp. (°C):	19 to 22
TPC:	HIGH	Pressure (mBars):	998 to 1003
Modulation:	ON	Duty Cycle (x):	100
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2 dBi
Applied Voltage:	28.0 Vdc		
Notes 1:			
Notes 2:			

26 dB Bandwidth

26 dB Bandwidth							
Test Frequency	26 dB Bandwidth				Minimum 6dB Bandwidth Limit		Margin
	MHz						
MHz	a	b	c	d	kHz	MHz	MHz
5500	24.048000	25.551000	26.954000		500	0.5	-23.548000
5560	23.948000	22.846000	24.248000				-22.346000
5700	23.347000	25.752000	23.246000				-22.746000

99% Bandwidth

99 % Bandwidth							
Test Frequency	MHz						
MHz	a	b	c	d			
5500	17.936000	17.836000	18.036000				
5560	17.836000	17.735000	17.936000				
5700	17.735000	17.836000	17.735000				

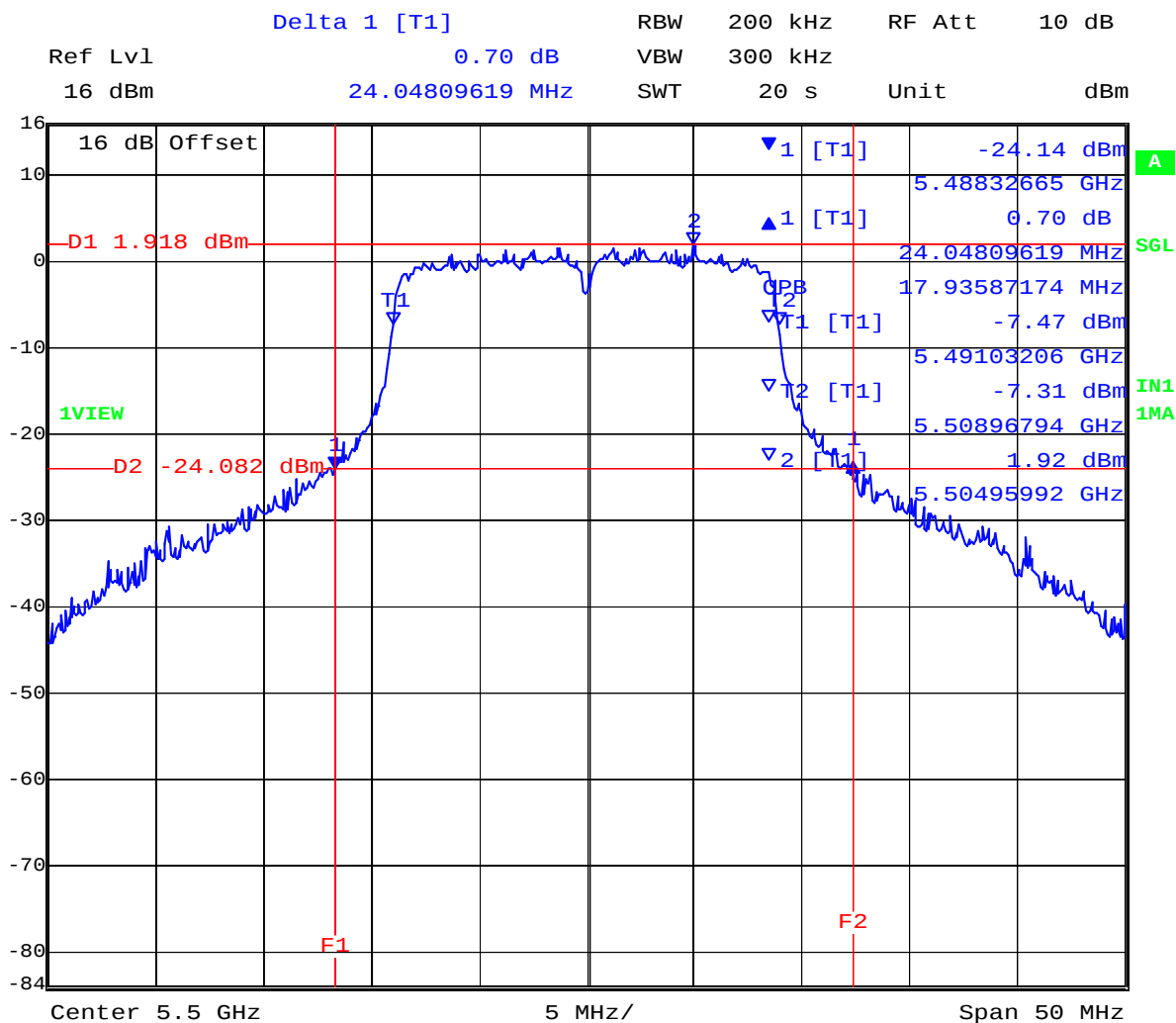
Measurement uncertainty:	±2.81 dB
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 79 of 465

5,500 MHz 802.11n HT20 - MIMO RADIO Chain a 26 dB and 99 % Bandwidth



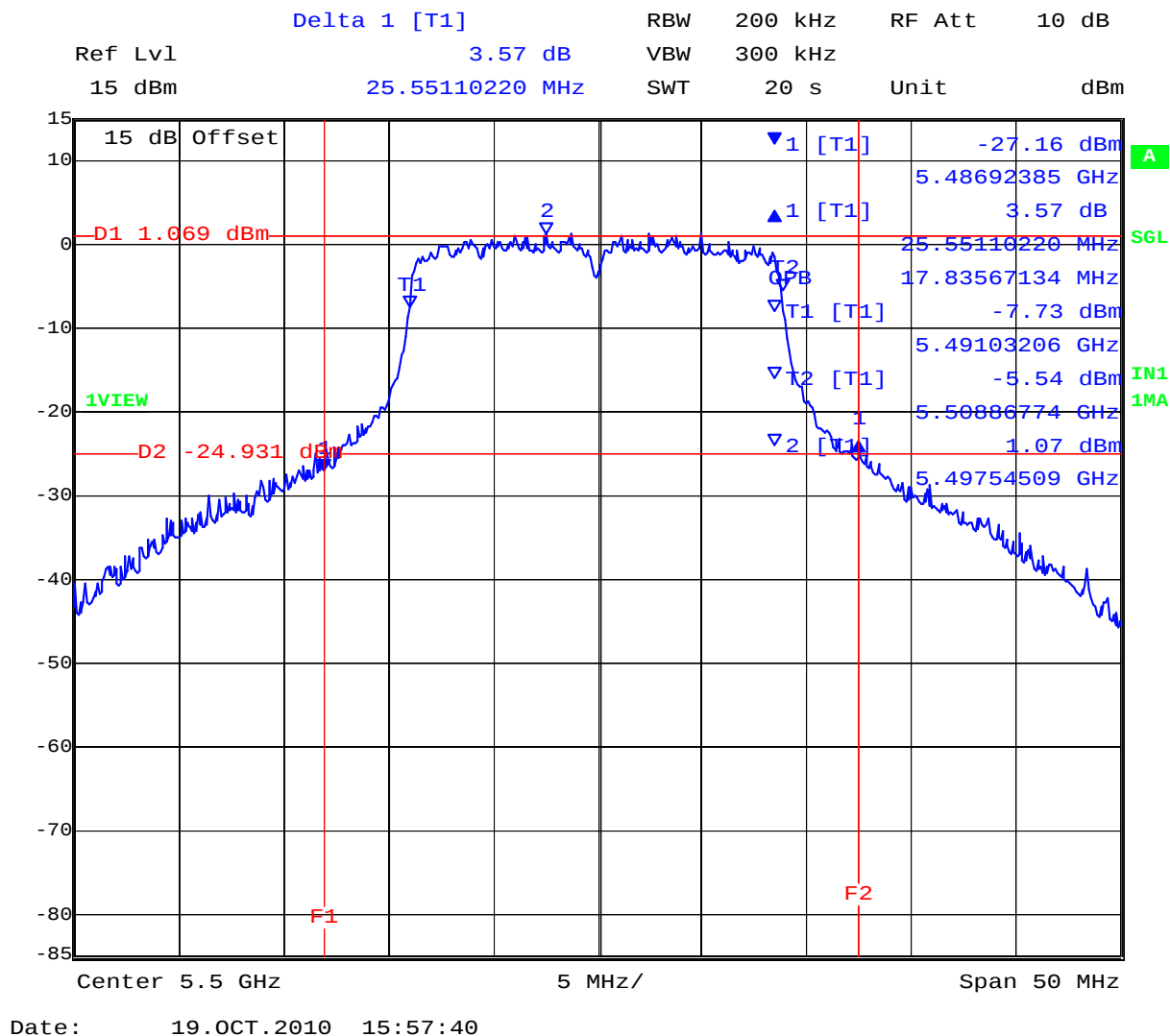
Date: 19.OCT.2010 15:53:03

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 80 of 465

5,500 MHz 802.11n HT20 - MIMO RADIO Chain b 26 dB and 99 % Bandwidth

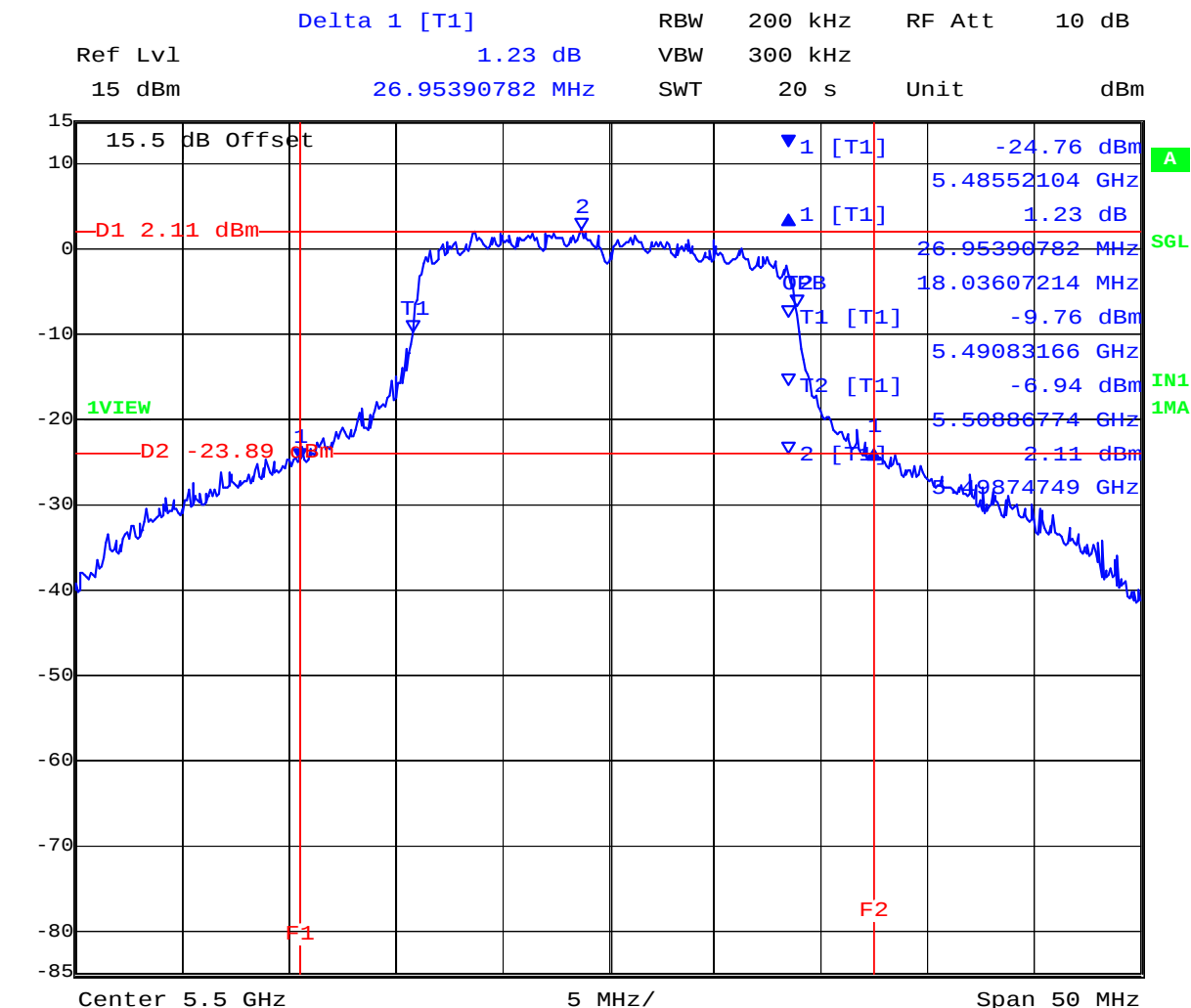


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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 81 of 465

5,500 MHz 802.11n HT20 - MIMO RADIO Chain c 26 dB and 99 % Bandwidth



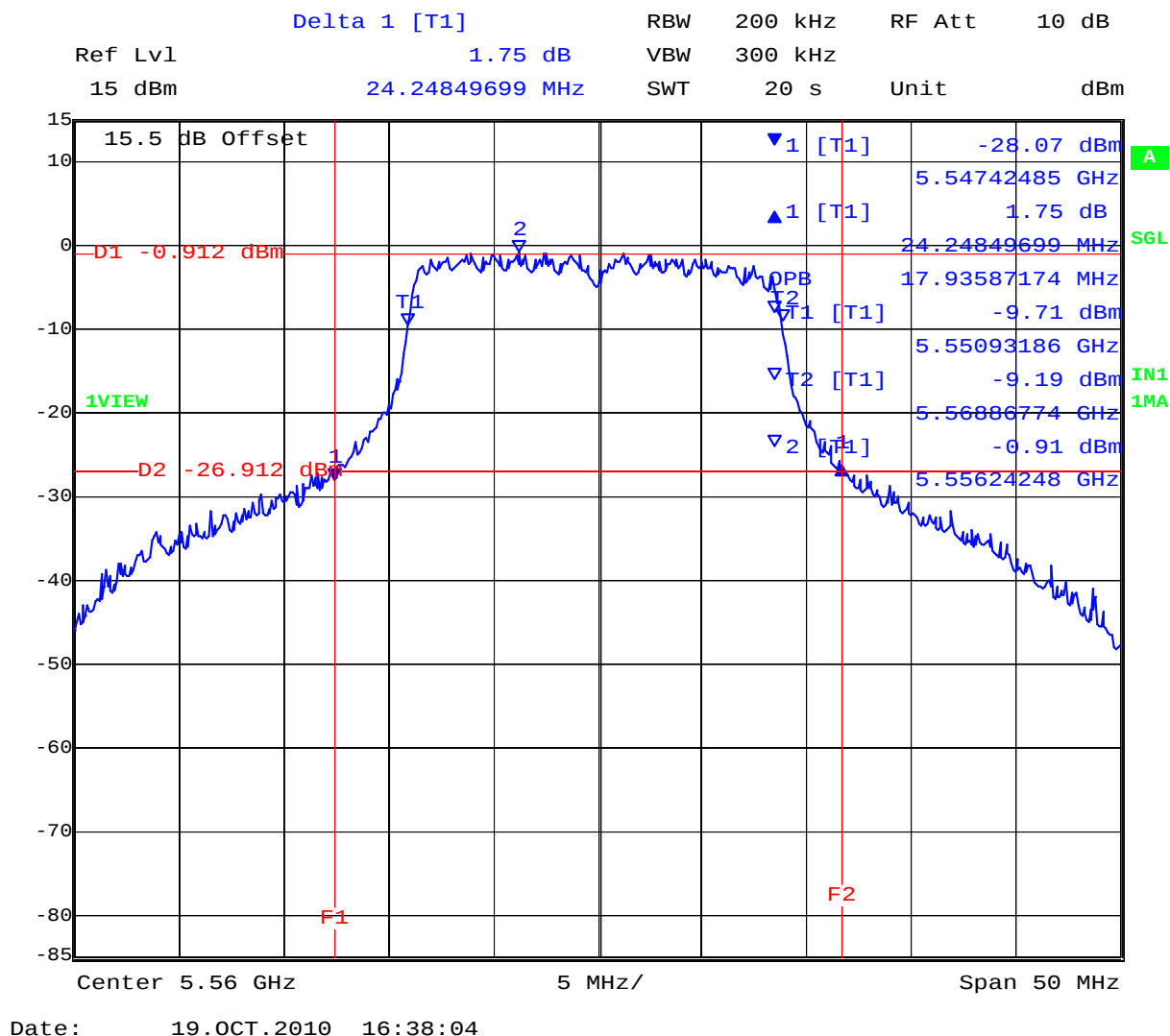
Date: 19.OCT.2010 16:02:19

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 82 of 465

5,560 MHz 802.11n HT20 - MIMO RADIO Chain a 26 dB and 99 % Bandwidth

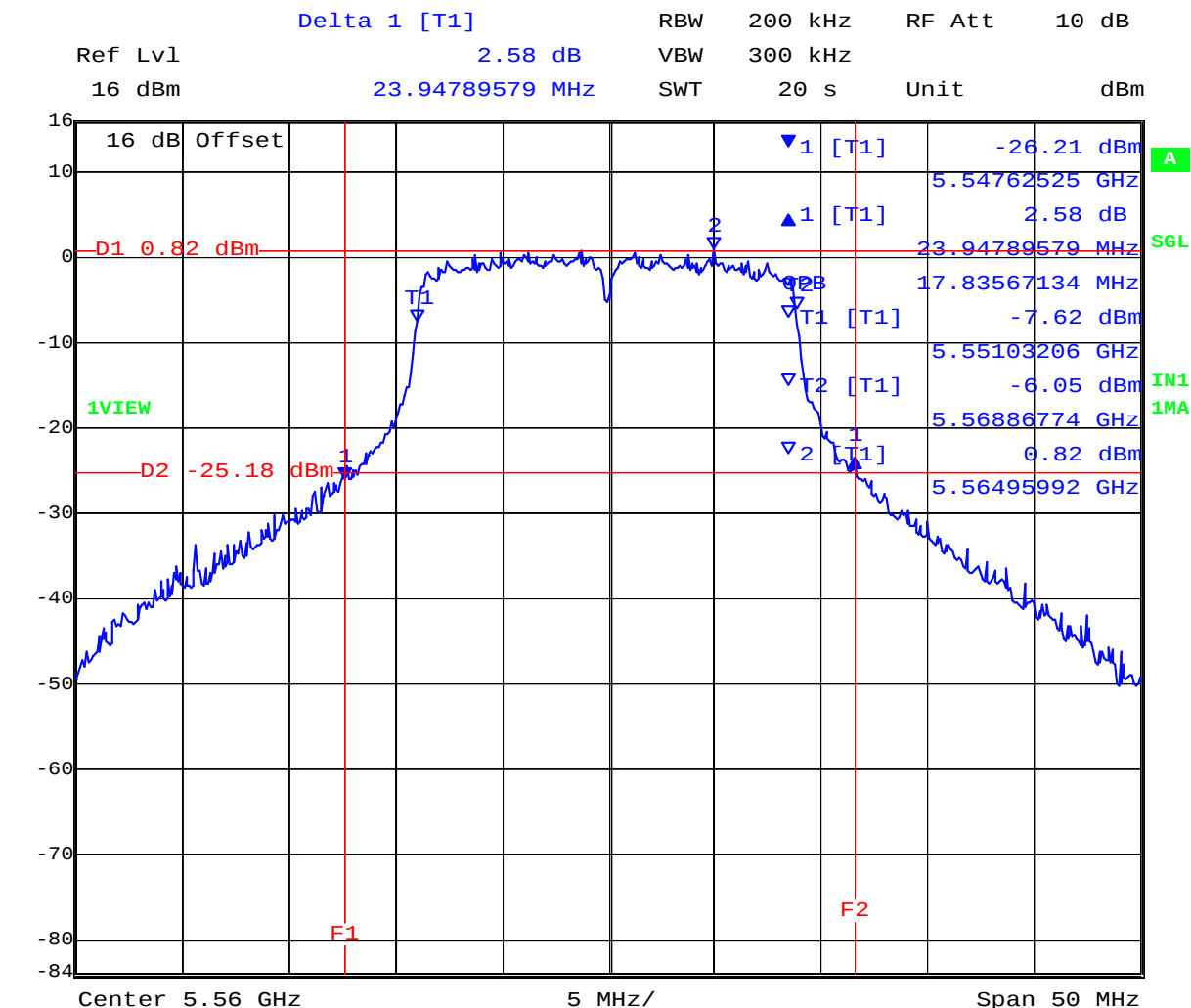


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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 83 of 465

5,560 MHz 802.11n HT20 - MIMO RADIO Chain b 26 dB and 99 % Bandwidth



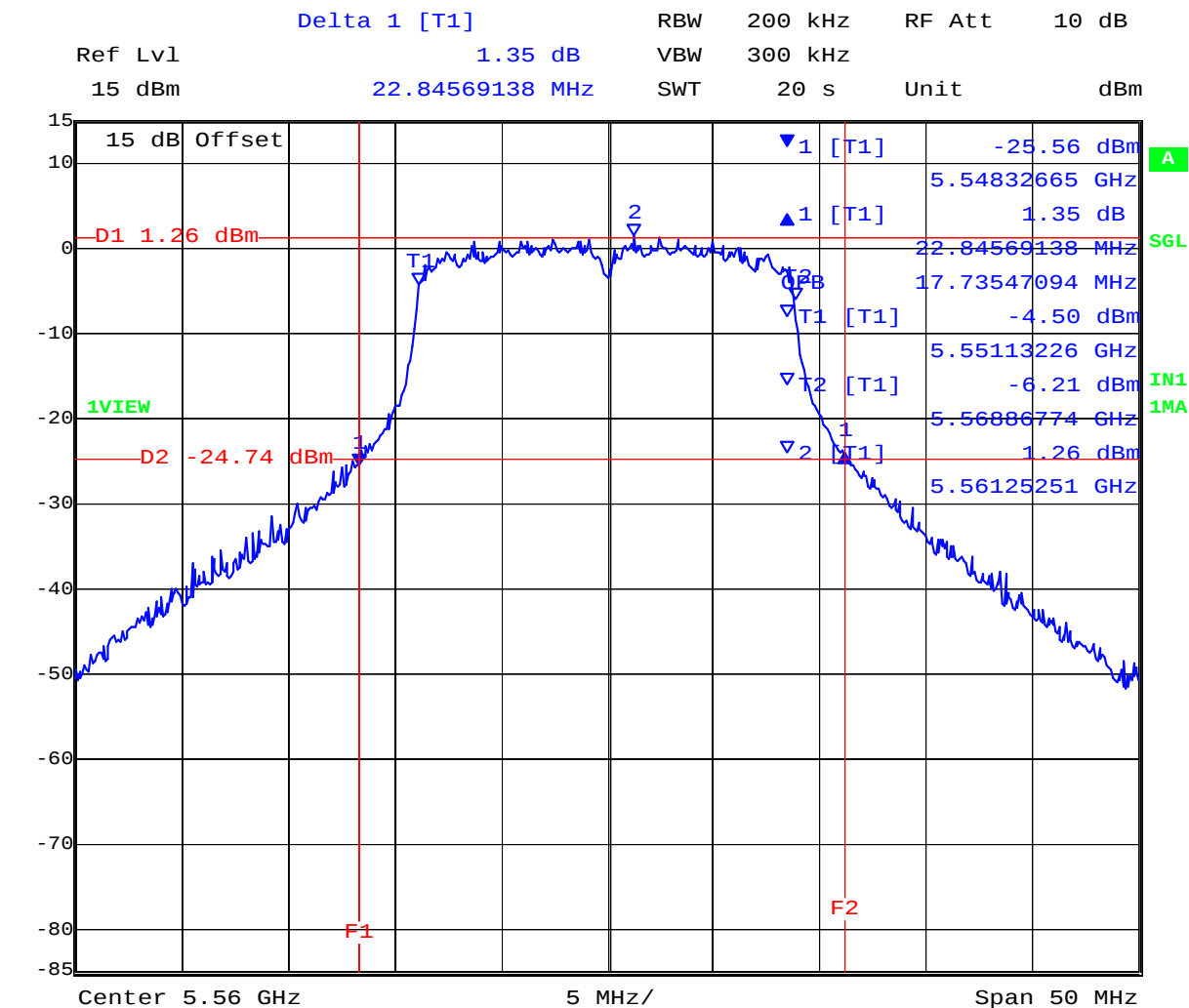
Date: 19.OCT.2010 16:28:48

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 84 of 465

5,560 MHz 802.11n HT20 - MIMO RADIO Chain c 26 dB and 99 % Bandwidth



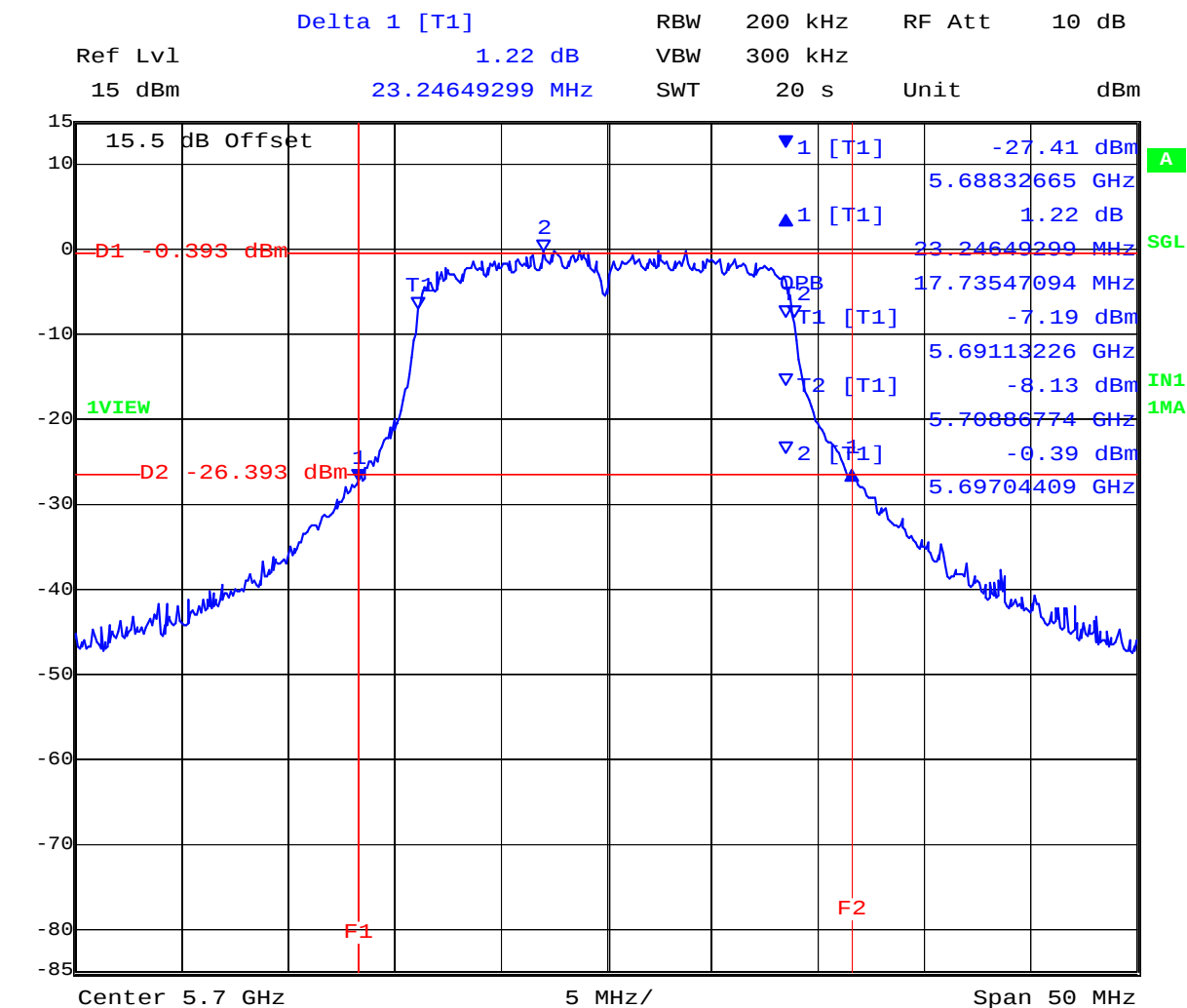
Date: 19.OCT.2010 16:33:25

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 85 of 465

5,700 MHz 802.11n HT20 - MIMO RADIO Chain a 26 dB and 99 % Bandwidth



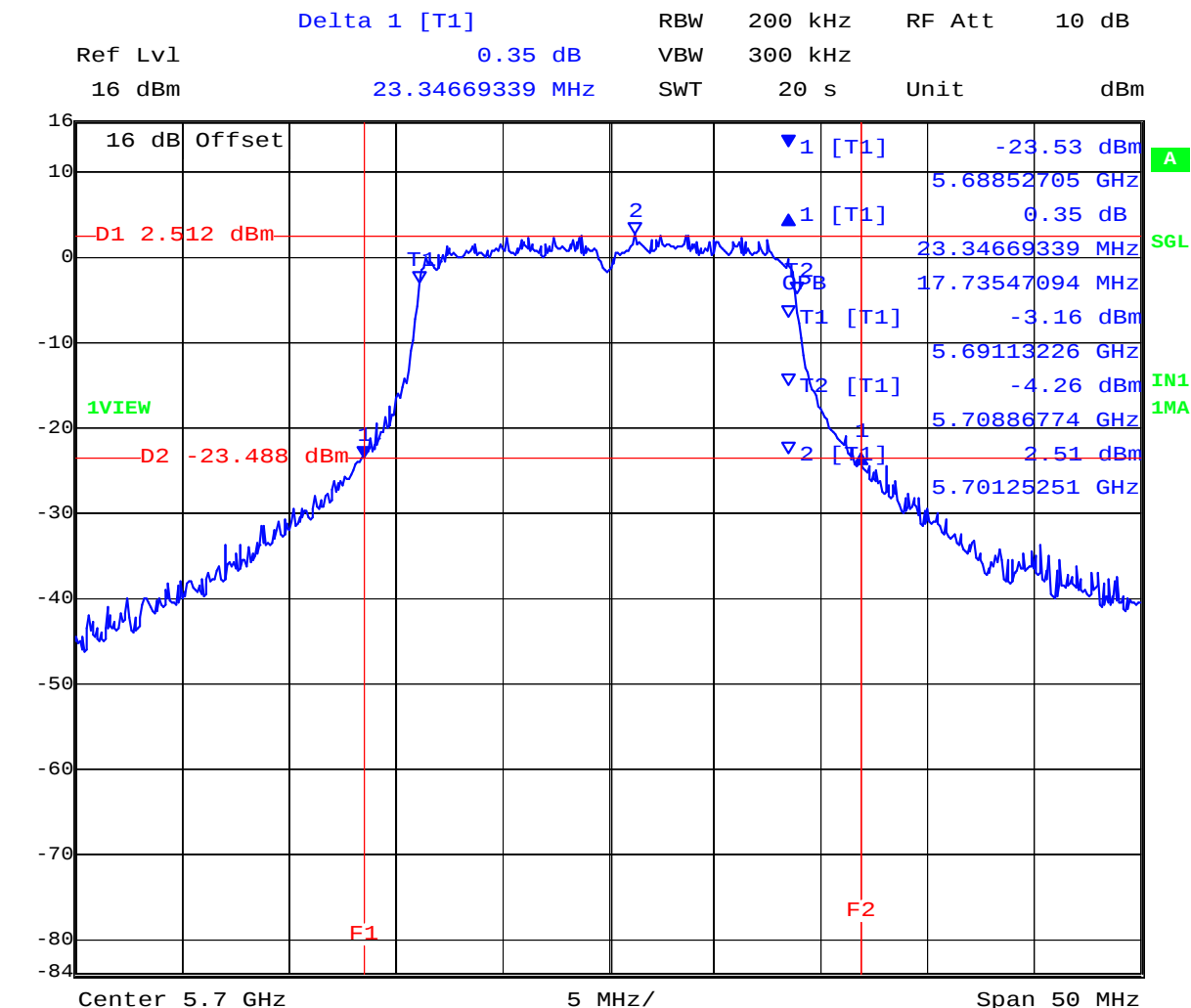
Date: 19.OCT.2010 17:11:09

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 86 of 465

5,700 MHz 802.11n HT20 - MIMO RADIO Chain b 26 dB and 99 % Bandwidth



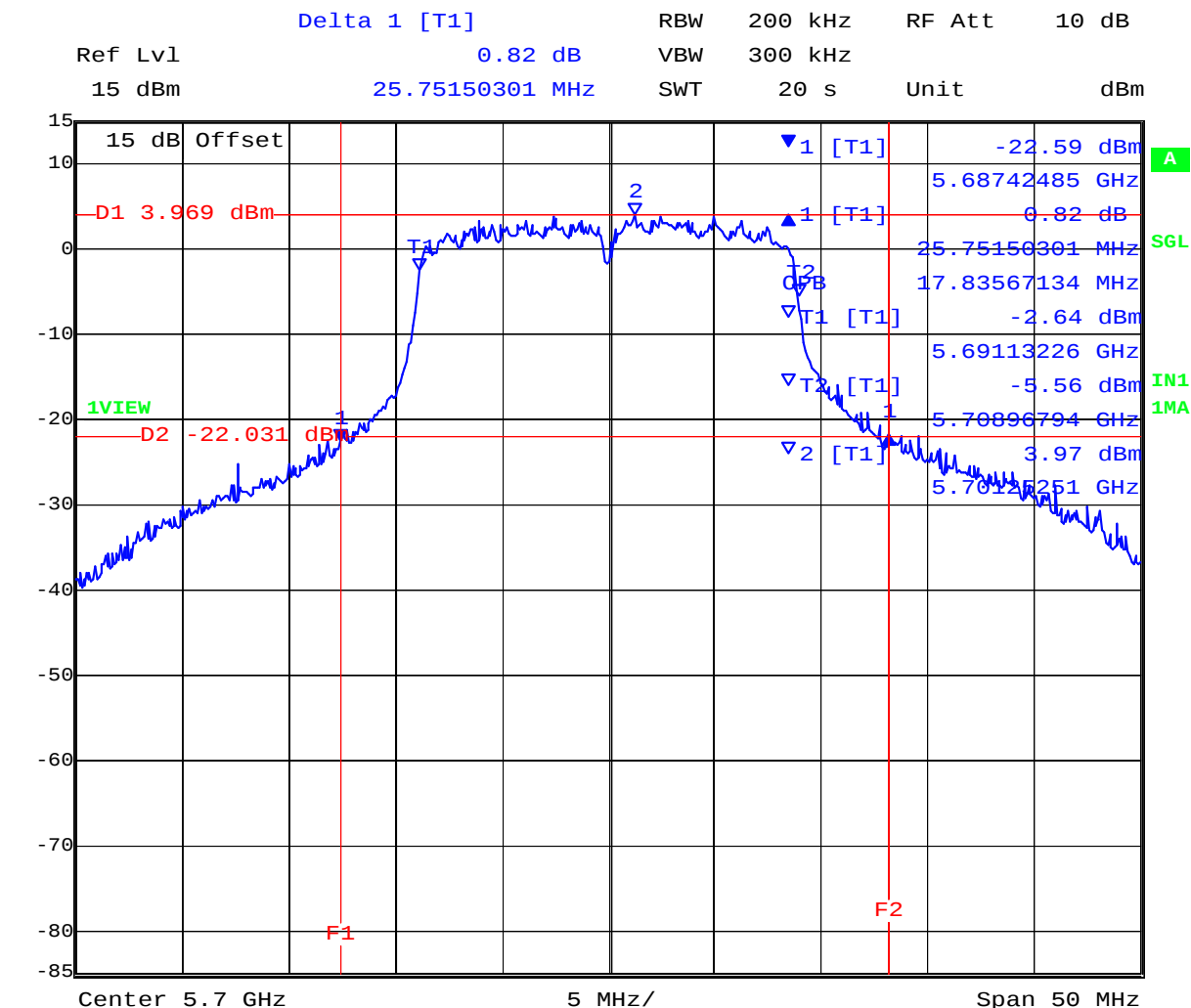
Date: 19.OCT.2010 17:01:50

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 87 of 465

5,700 MHz 802.11n HT20 - MIMO RADIO Chain c 26 dB and 99 % Bandwidth



Date: 19.OCT.2010 17:06:30

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 88 of 465

Measurement Results for 26 dB and 99 % Operational Bandwidth(s) -Continued

TABLE OF RESULTS – 802.11n HT40 - MIMO RADIO

Test Conditions:	15.247 (a)(2)	Rel. Humidity (%):	35 to 42
Variant:	HT-40	Ambient Temp. (°C):	19 to 22
TPC:	HIGH	Pressure (mBars):	998 to 1003
Modulation:	ON	Duty Cycle (x):	100
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2 dBi
Applied Voltage:	28.0 Vdc		
Notes 1:			
Notes 2:			

26 dB Bandwidth

26 dB Bandwidth							
Test Frequency	26 dB Bandwidth				Minimum 6dB Bandwidth Limit		Margin
	MHz						
MHz	a	b	c	d	kHz	MHz	MHz
5190	43.487000	43.687000	43.888000		500	0.5	-42.987000
5230	42.084000	42.285000	42.886000				-41.584000

99% Bandwidth

99 % Bandwidth							
Test Frequency	MHz						
MHz	a	b	c	d			
5190	36.473000	36.473000	36.273000				
5230	36.273000	36.273000	36.273000				

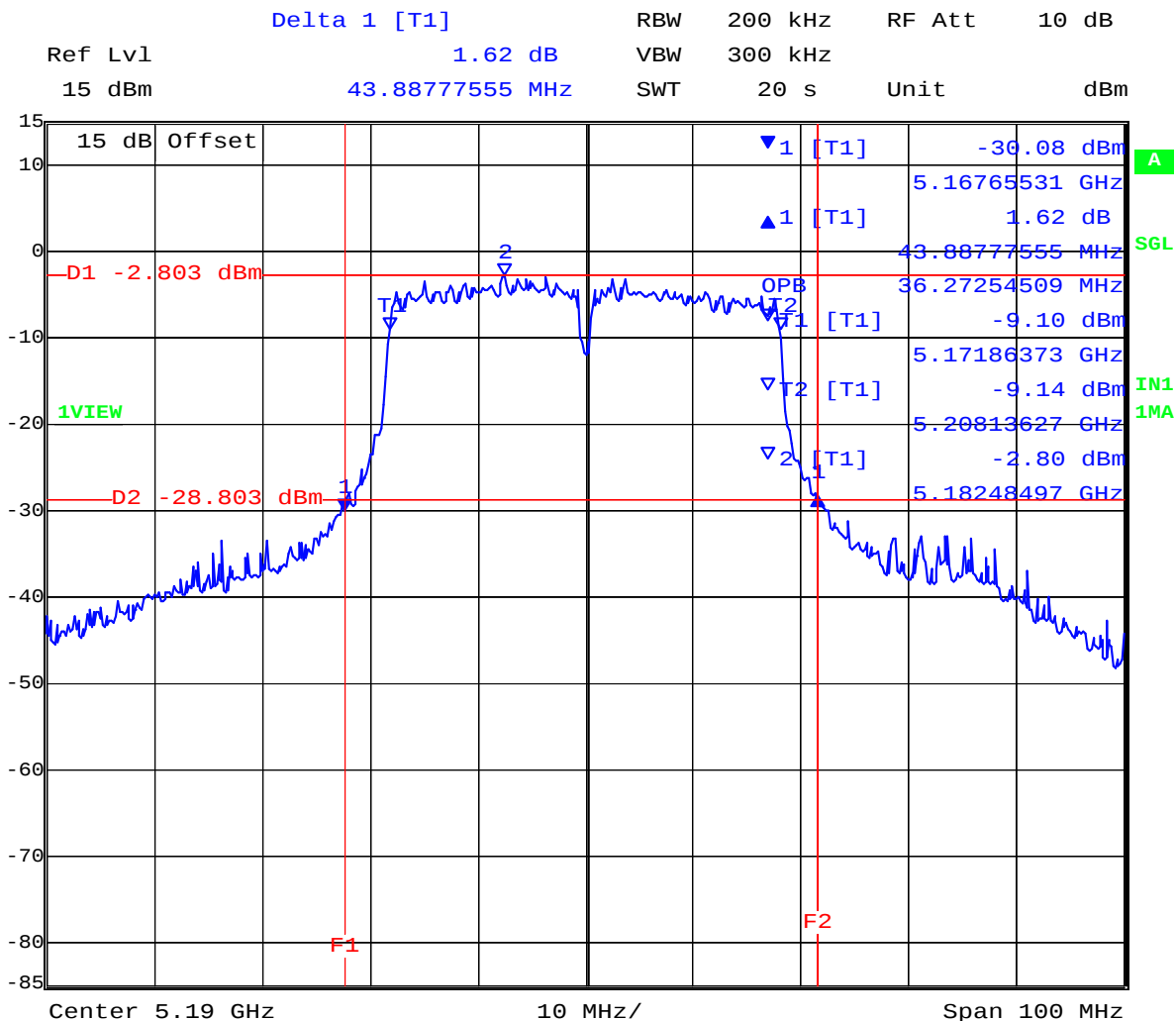
Measurement uncertainty:	±2.81 dB
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 89 of 465

5,190 MHz 802.11n HT40 - MIMO RADIO Chain a 26 dB and 99 % Bandwidth



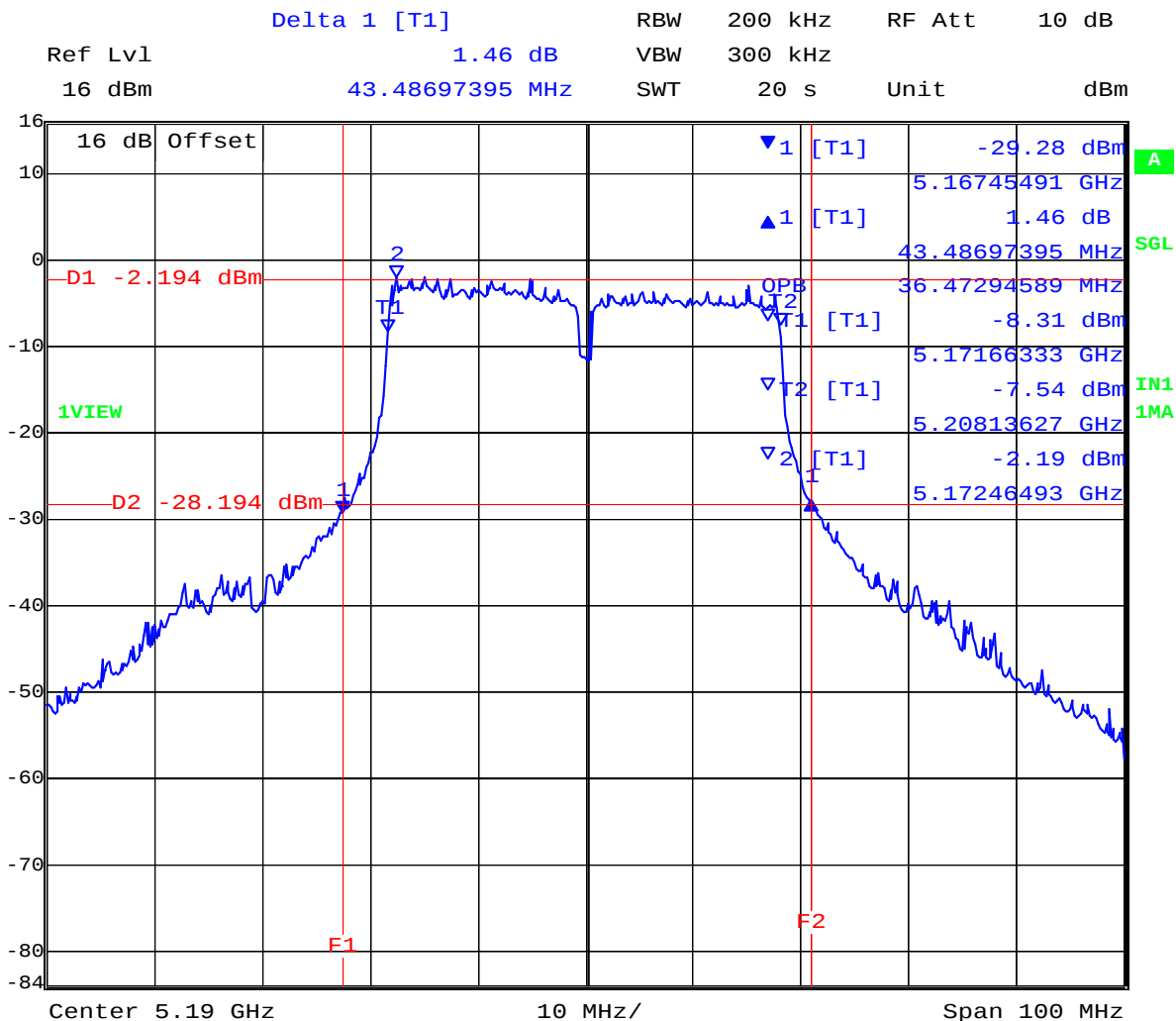
Date: 18.OCT.2010 15:33:30

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 90 of 465

5,190 MHz 802.11n HT40 - MIMO RADIO Chain b 26 dB and 99 % Bandwidth



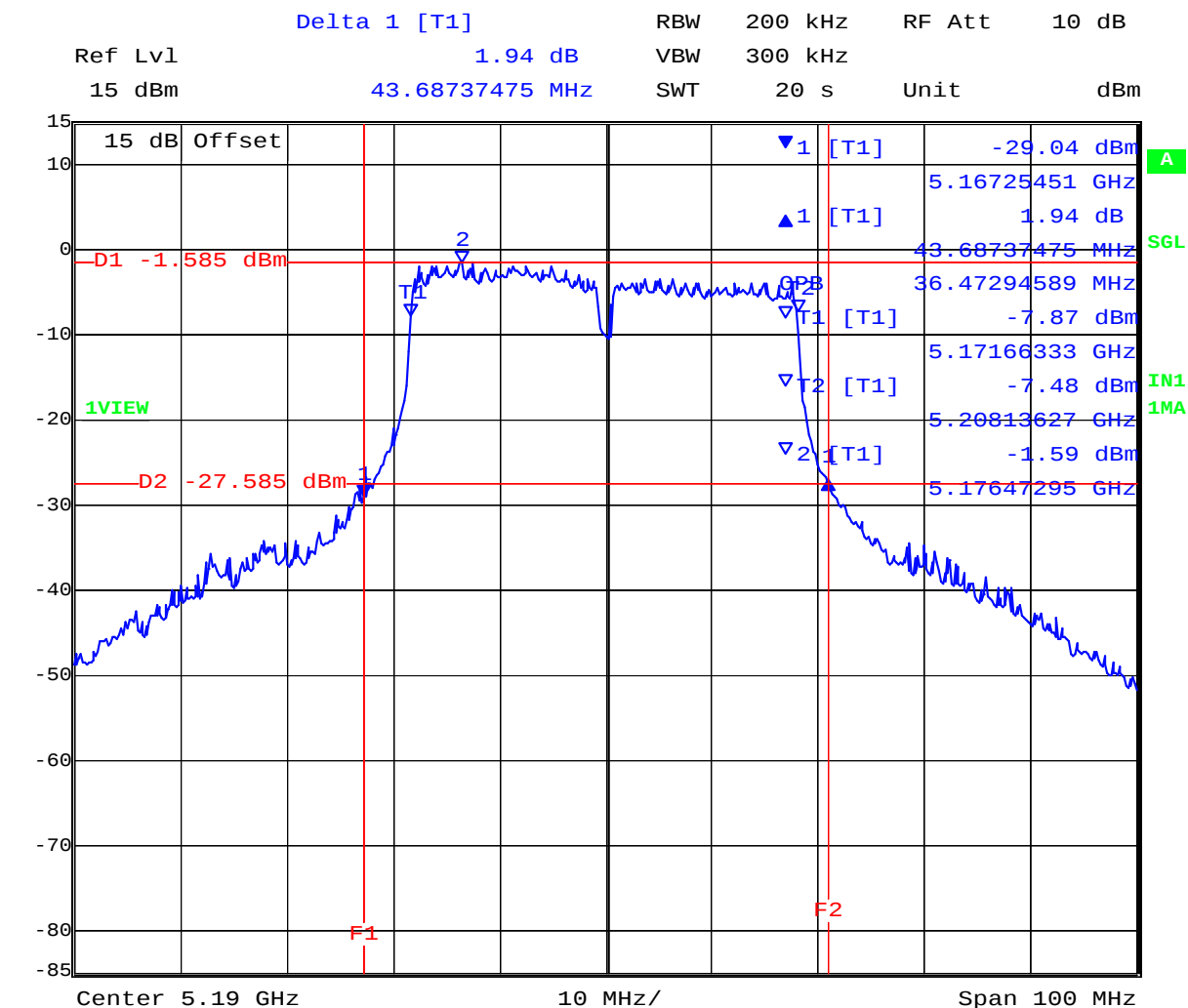
Date: 18.OCT.2010 15:24:33

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 91 of 465

5,190 MHz 802.11n HT40 - MIMO RADIO Chain c 26 dB and 99 % Bandwidth



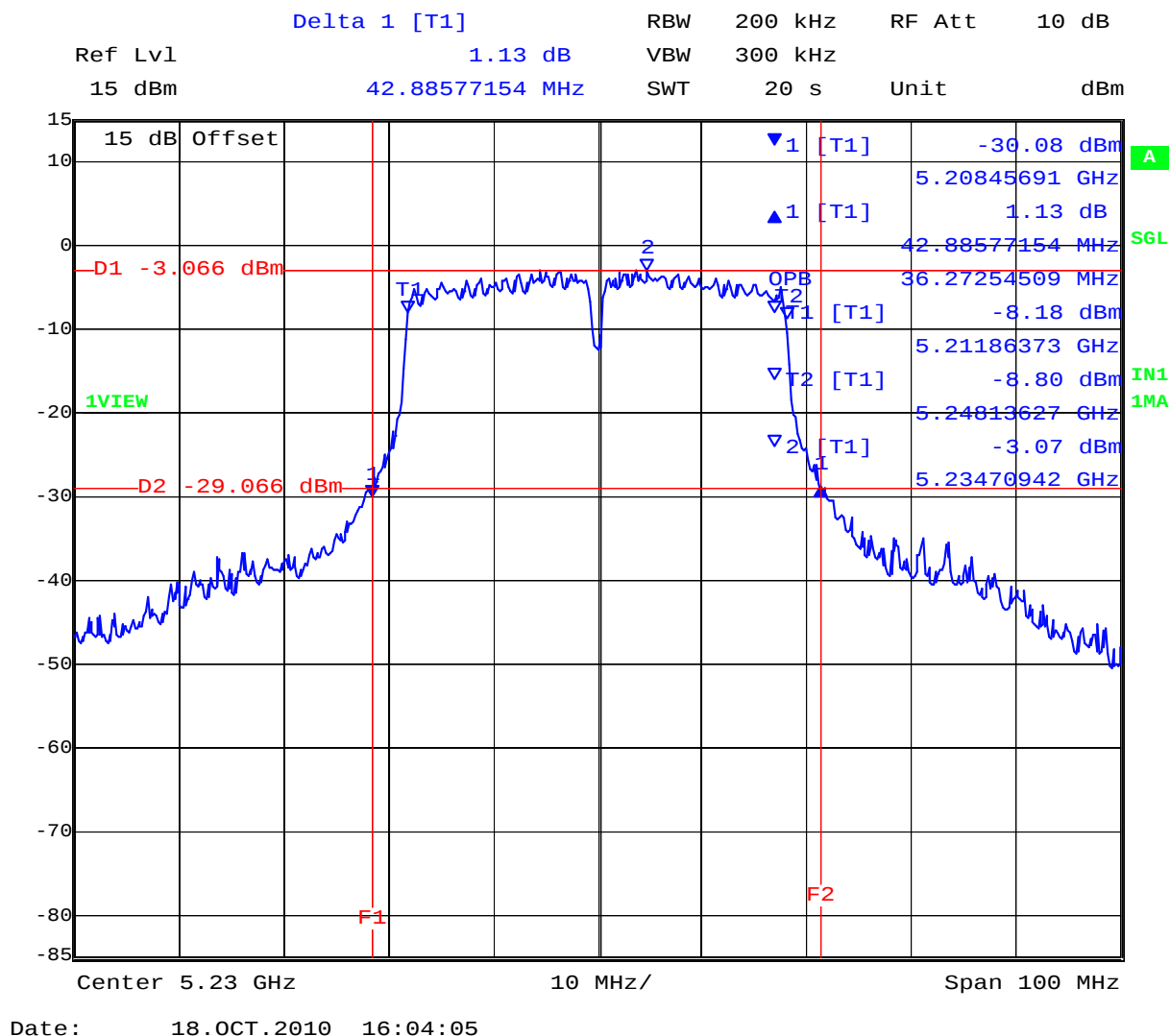
Date: 18.OCT.2010 15:29:00

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 92 of 465

5,230 MHz 802.11n HT40 - MIMO RADIO Chain a 26 dB and 99 % Bandwidth

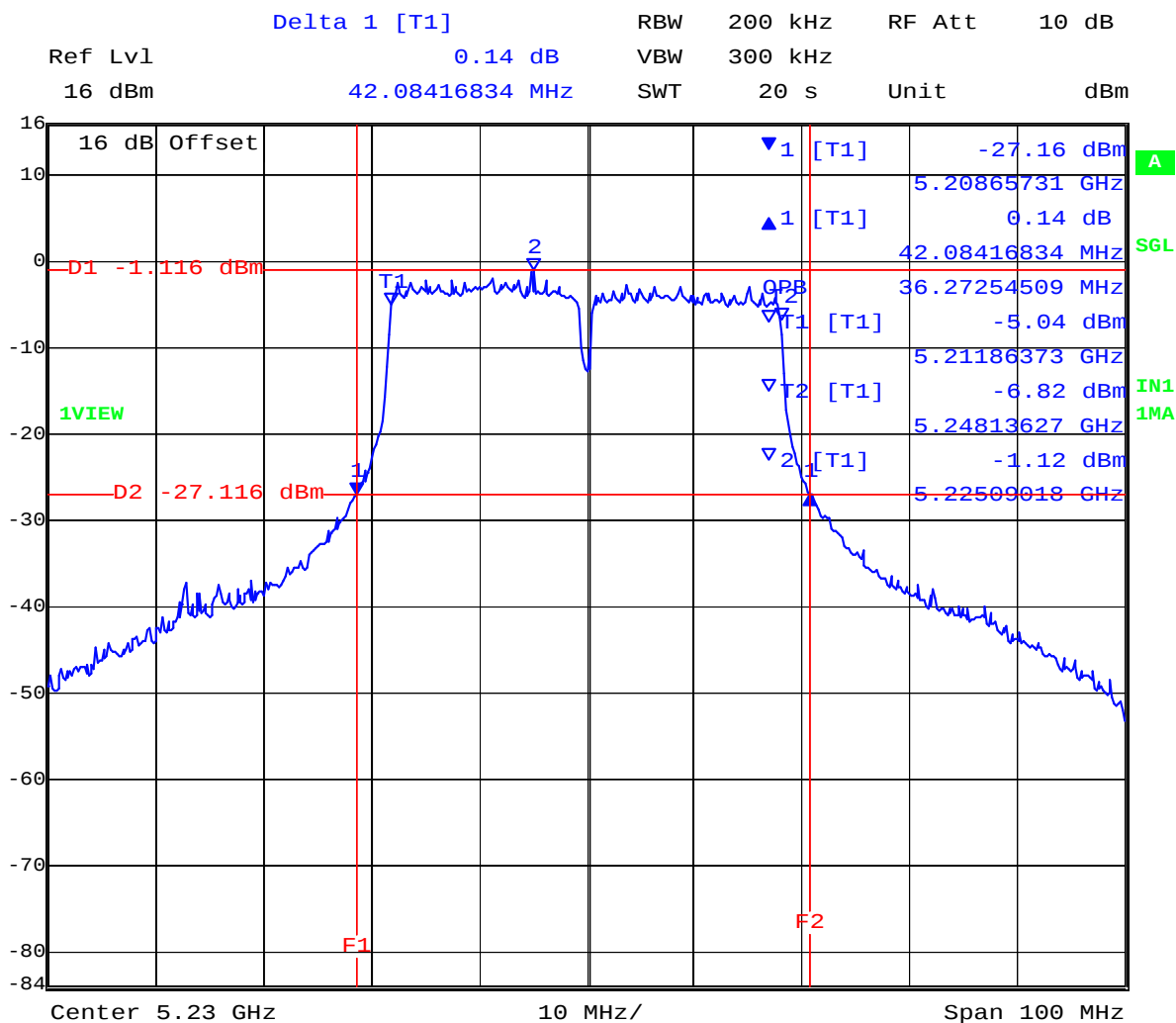


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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 93 of 465

5,230 MHz 802.11n HT40 - MIMO RADIO Chain b 26 dB and 99 % Bandwidth



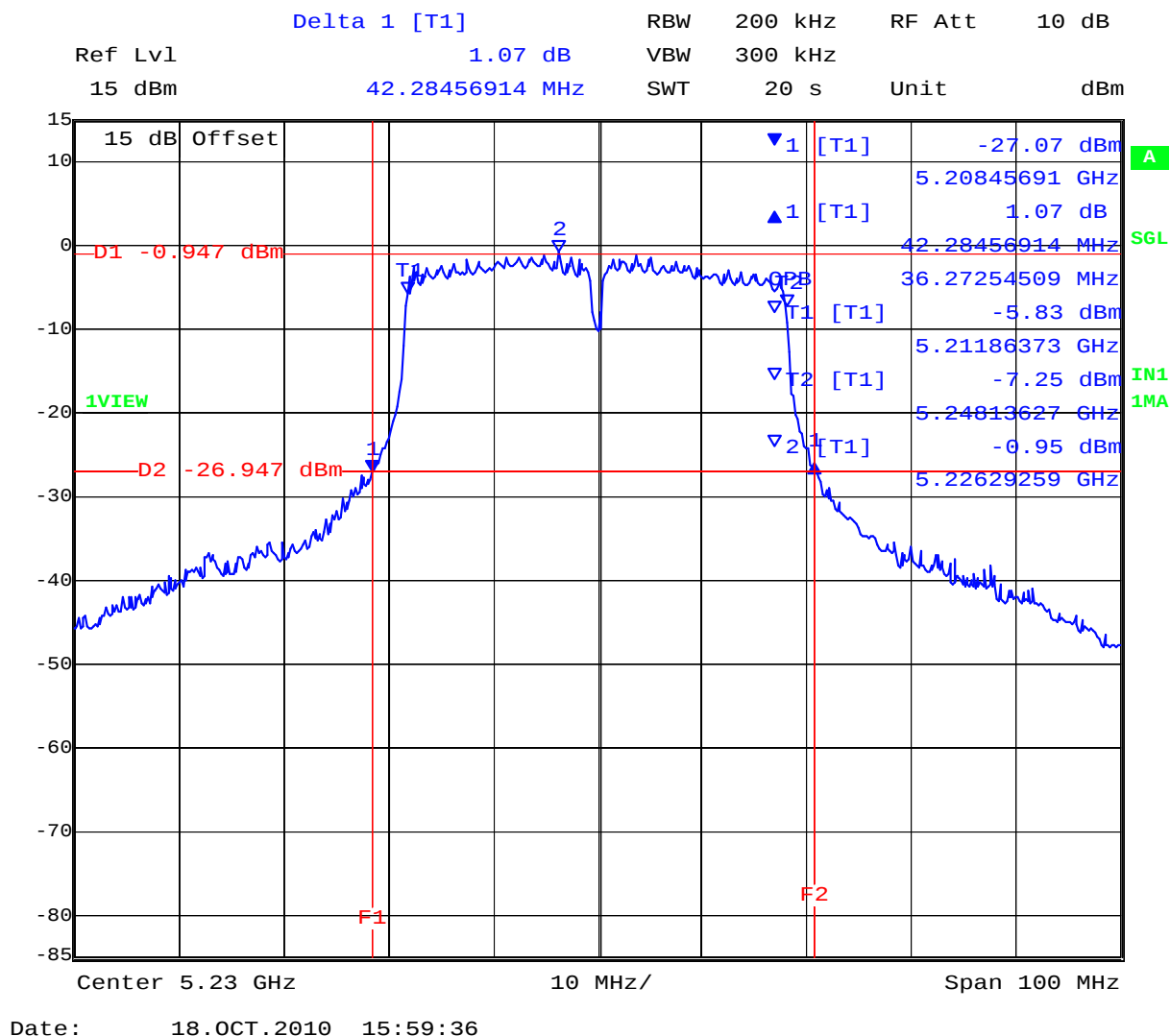
Date: 18.OCT.2010 15:55:05

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 94 of 465

5,230 MHz 802.11n HT40 - MIMO RADIO Chain c 26 dB and 99 % Bandwidth



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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 95 of 465

TABLE OF RESULTS – 802.11n HT40 - MIMO RADIO

Test Conditions:	15.247 (a)(2)	Rel. Humidity (%):	35 to 42
Variant:	802.11 n HT-40	Ambient Temp. (°C):	19 to 22
TPC:	HIGH	Pressure (mBars):	998 to 1003
Modulation:	ON	Duty Cycle (x):	100
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2 dBi
Applied Voltage:	28.0 Vdc		
Notes 1:			
Notes 2:			

26 dB Bandwidth

Test Frequency	26 dB Bandwidth				Minimum 6dB Bandwidth Limit		Margin
	MHz						
MHz	a	b	c	d	kHz	MHz	MHz
5270	42.886000	45.291000	42.685000		500	0.5	-42.185000
5310	43.086000	53.707000	43.487000				-42.586000

99% Bandwidth

Test Frequency	99 % Bandwidth						
	MHz						
MHz	a	b	c	d			
5270	36.273000	36.273000	36.273000				
5310	36.473000	36.473000	36.273000				

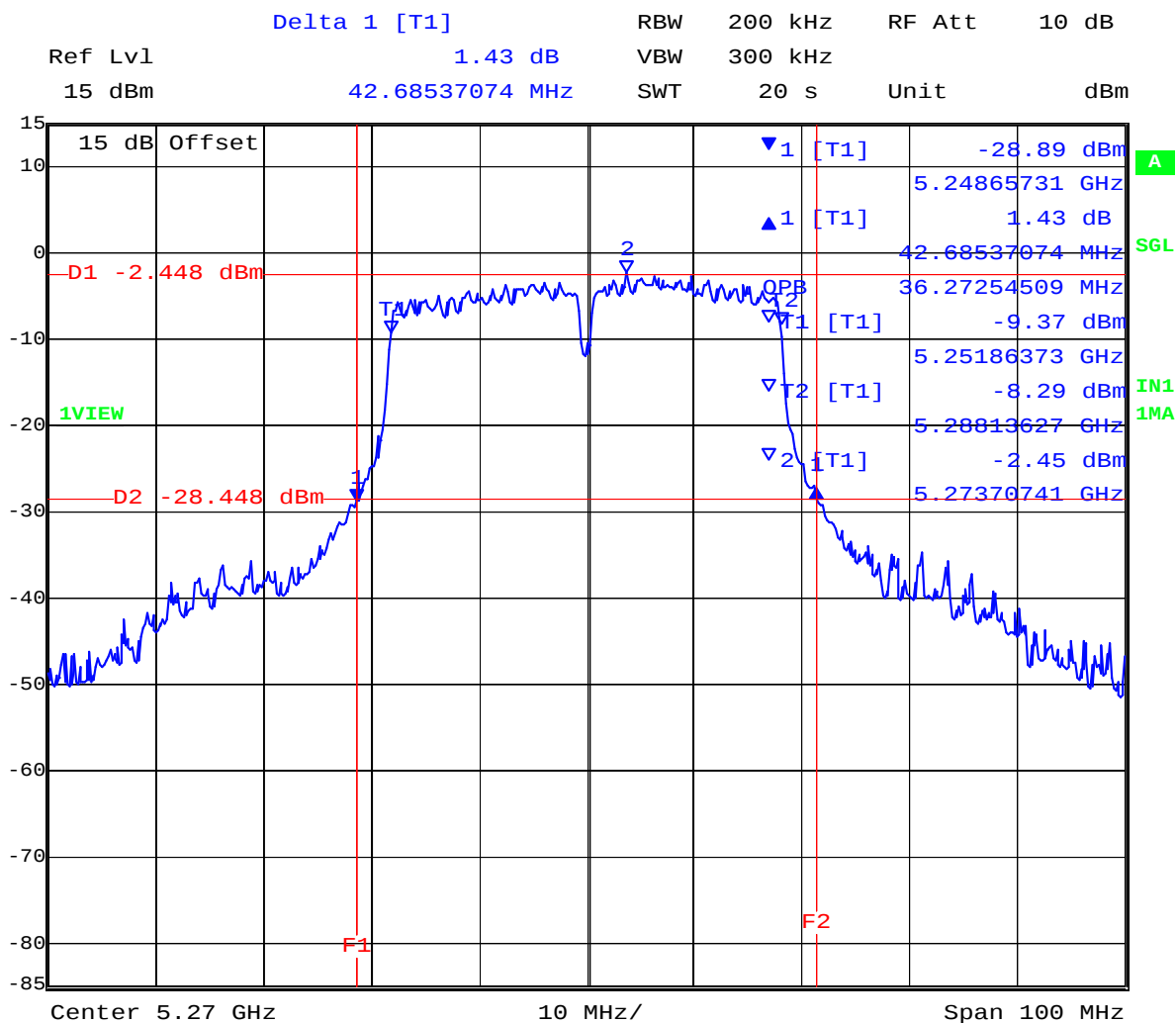
Measurement uncertainty:	±2.81 dB
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 96 of 465

5,270 MHz 802.11n HT40 - MIMO RADIO Chain a 26 dB and 99 % Bandwidth



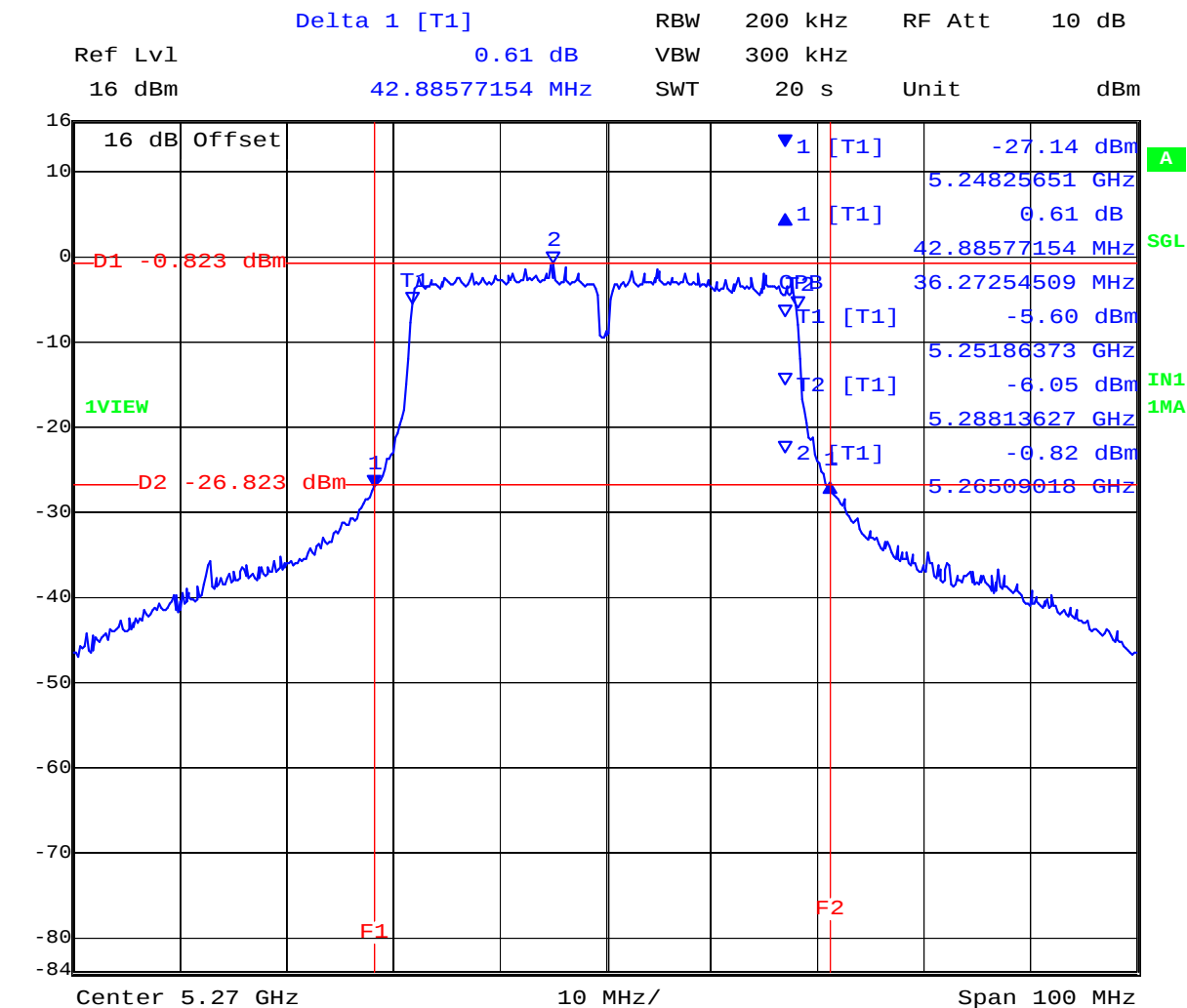
Date: 19.OCT.2010 12:27:11

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 97 of 465

5,270 MHz 802.11n HT40 - MIMO RADIO Chain b 26 dB and 99 % Bandwidth



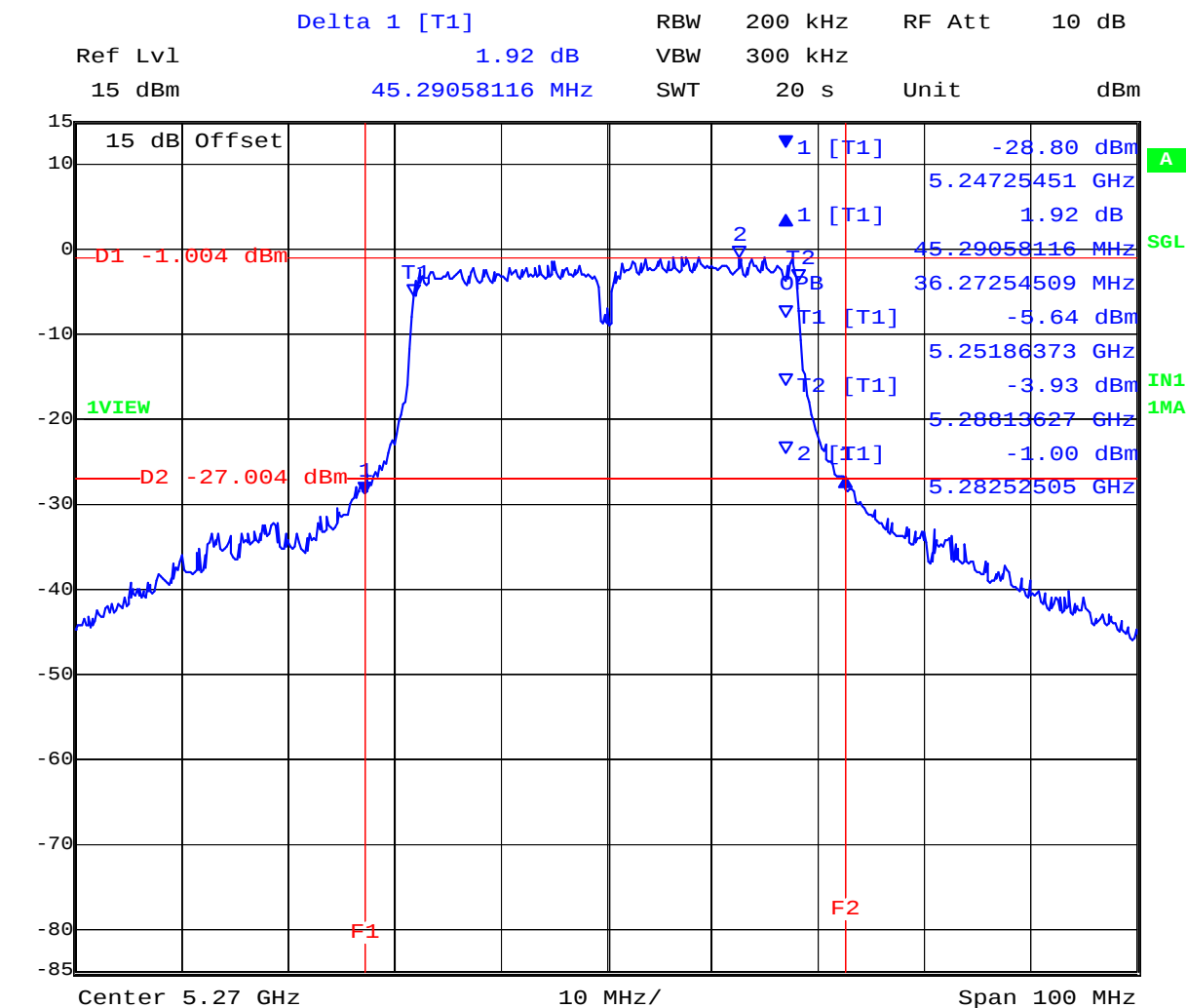
Date: 19.OCT.2010 12:18:10

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 98 of 465

5,270 MHz 802.11n HT40 - MIMO RADIO Chain c 26 dB and 99 % Bandwidth



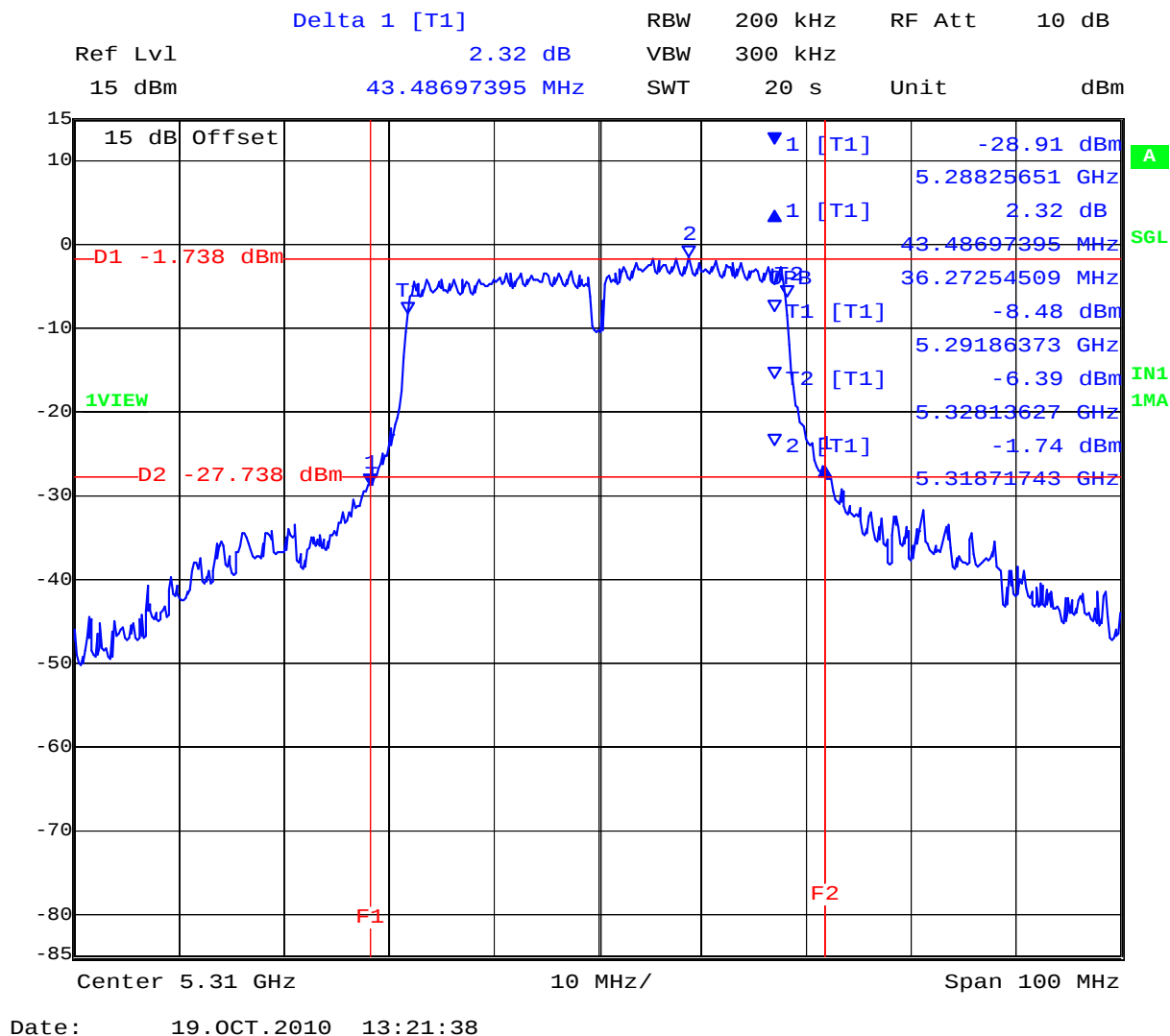
Date: 19.OCT.2010 12:22:40

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 99 of 465

5,310 MHz 802.11n HT40 - MIMO RADIO Chain a 26 dB and 99 % Bandwidth

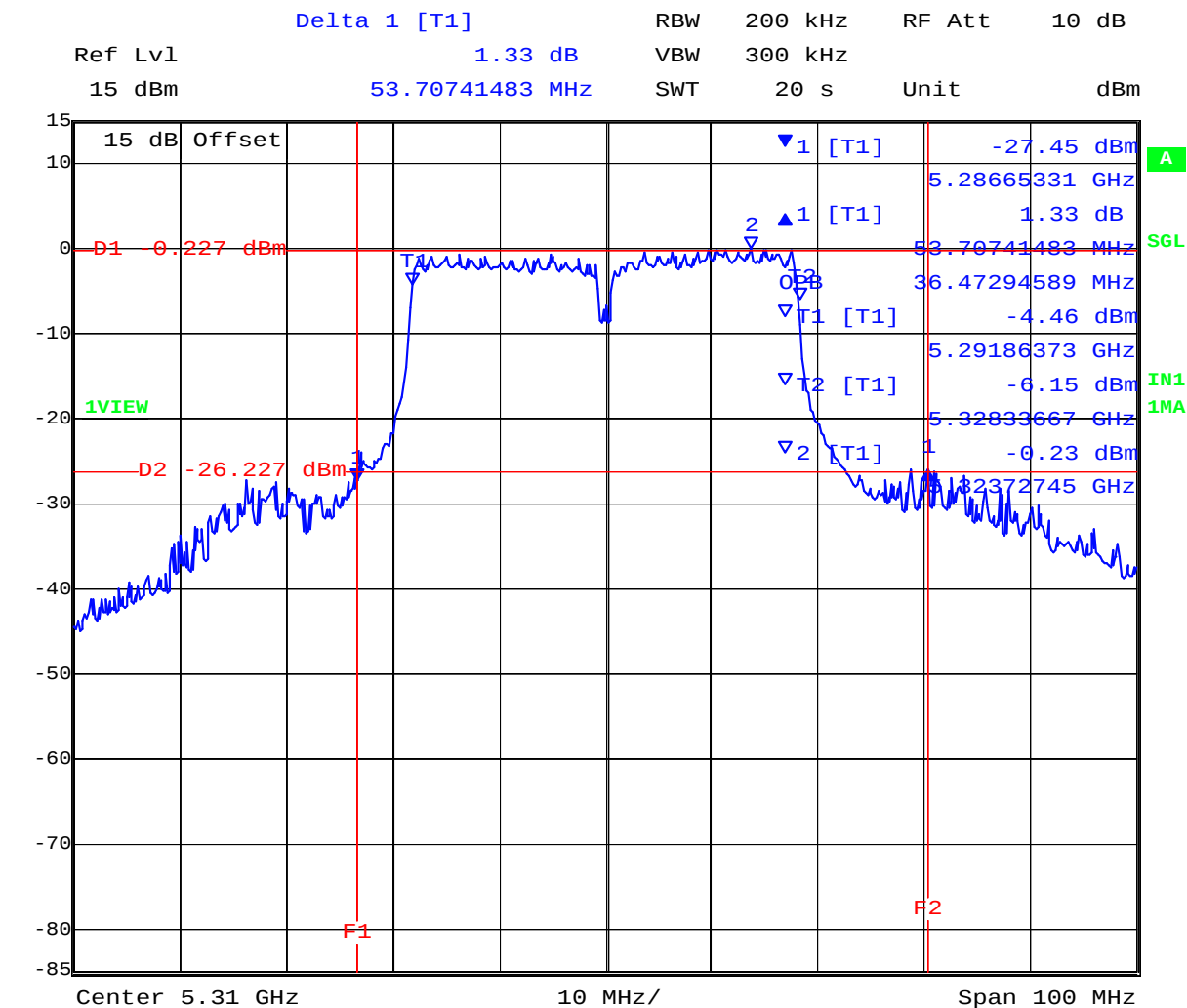


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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 100 of 465

5,310 MHz 802.11n HT40 - MIMO RADIO Chain b 26 dB and 99 % Bandwidth



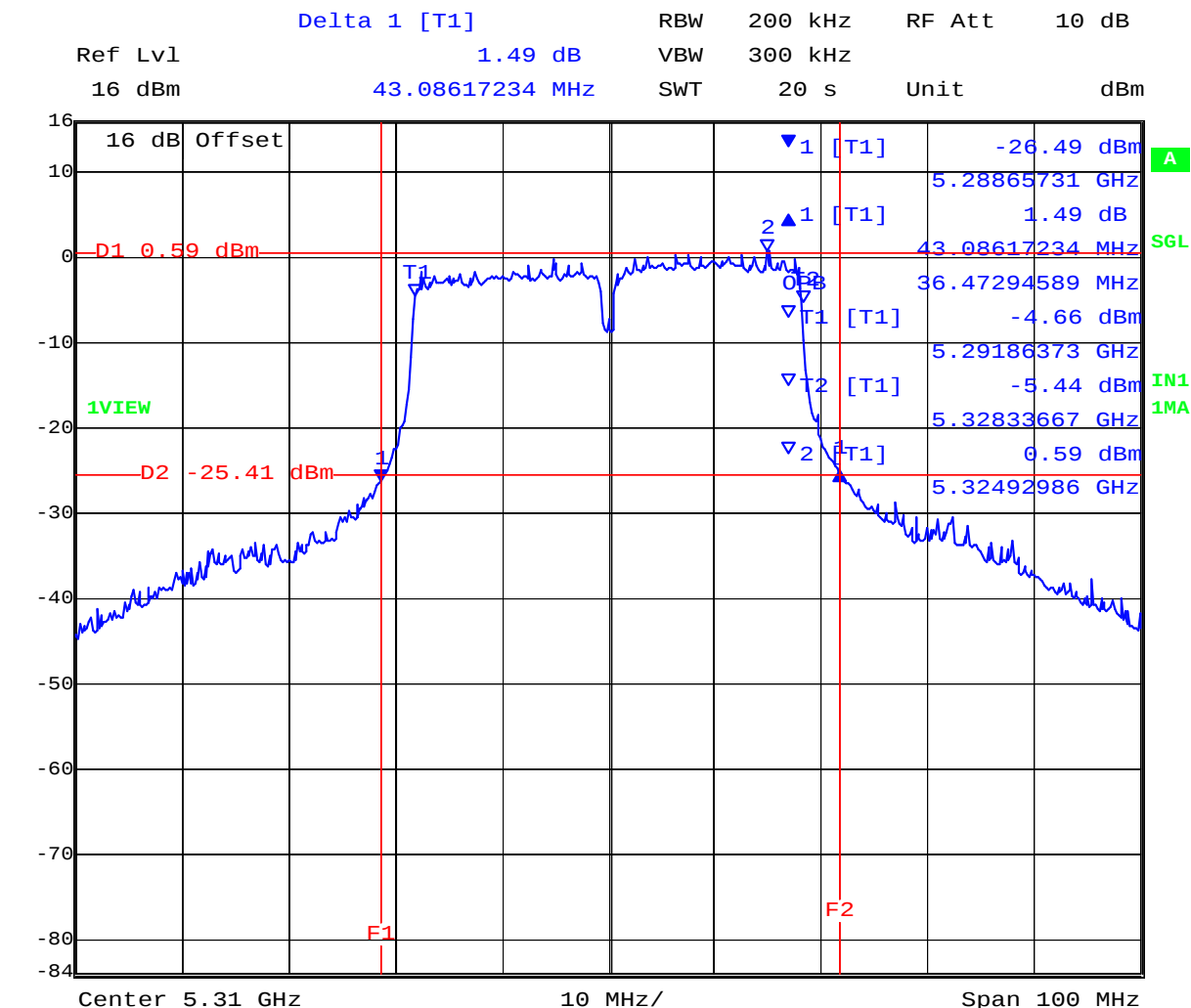
Date: 19.OCT.2010 13:17:04

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 101 of 465

5,310 MHz 802.11n HT40 - MIMO RADIO Chain c 26 dB and 99 % Bandwidth



Date: 19.OCT.2010 13:12:31

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 102 of 465

TABLE OF RESULTS – 802.11n HT40 - MIMO RADIO

Test Conditions:	15.407 (a)(2)	Rel. Humidity (%):	35 to 42
Variant:	802.11 n HT-40	Ambient Temp. (°C):	19 to 22
TPC:	HIGH	Pressure (mBars):	998 to 1003
Modulation:	ON	Duty Cycle (x):	100
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2 dBi
Applied Voltage:	28.0 Vdc		
Notes 1:			
Notes 2:			

26 dB Bandwidth

Test Frequency	26 dB Bandwidth				Minimum 6dB Bandwidth Limit		Margin
	MHz						
MHz	a	b	c	d	kHz	MHz	MHz
5510	55.311000	44.489000	53.507000		500	0.5	-43.989000
5550	43.086000	44.890000	43.487000				-42.586000
5690	43.086000	53.507000	43.487000				-42.586000

99% Bandwidth

Test Frequency	99 % Bandwidth						
	MHz						
MHz	a	b	c	d			
5510	36.273000	36.273000	36.473000				
5550	36.473000	36.473000	36.473000				
5690	36.273000	36.473000	36.273000				

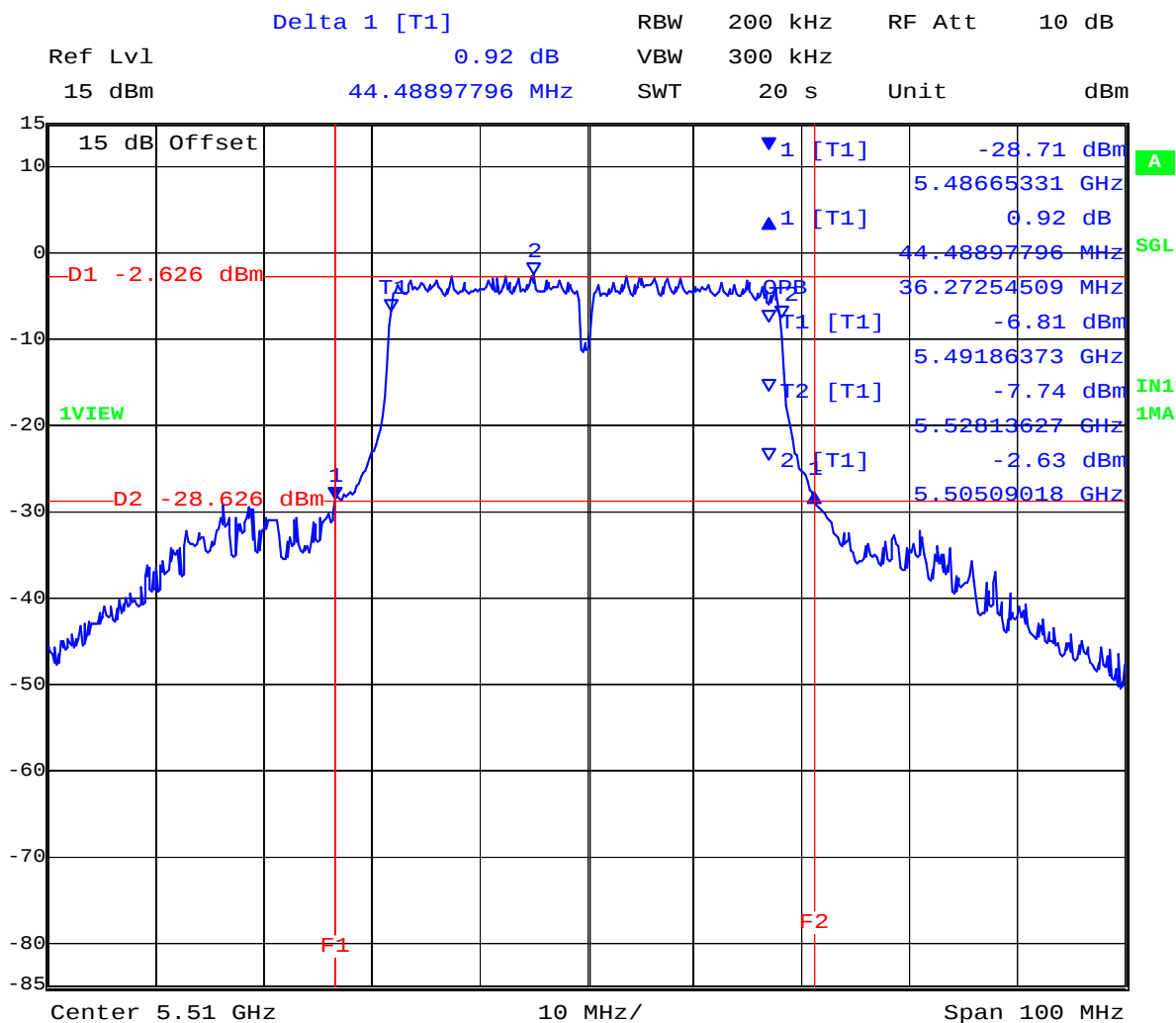
Measurement uncertainty:	±2.81 dB
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 103 of 465

5,510 MHz 802.11n HT40 - MIMO RADIO Chain a 26 dB and 99 % Bandwidth



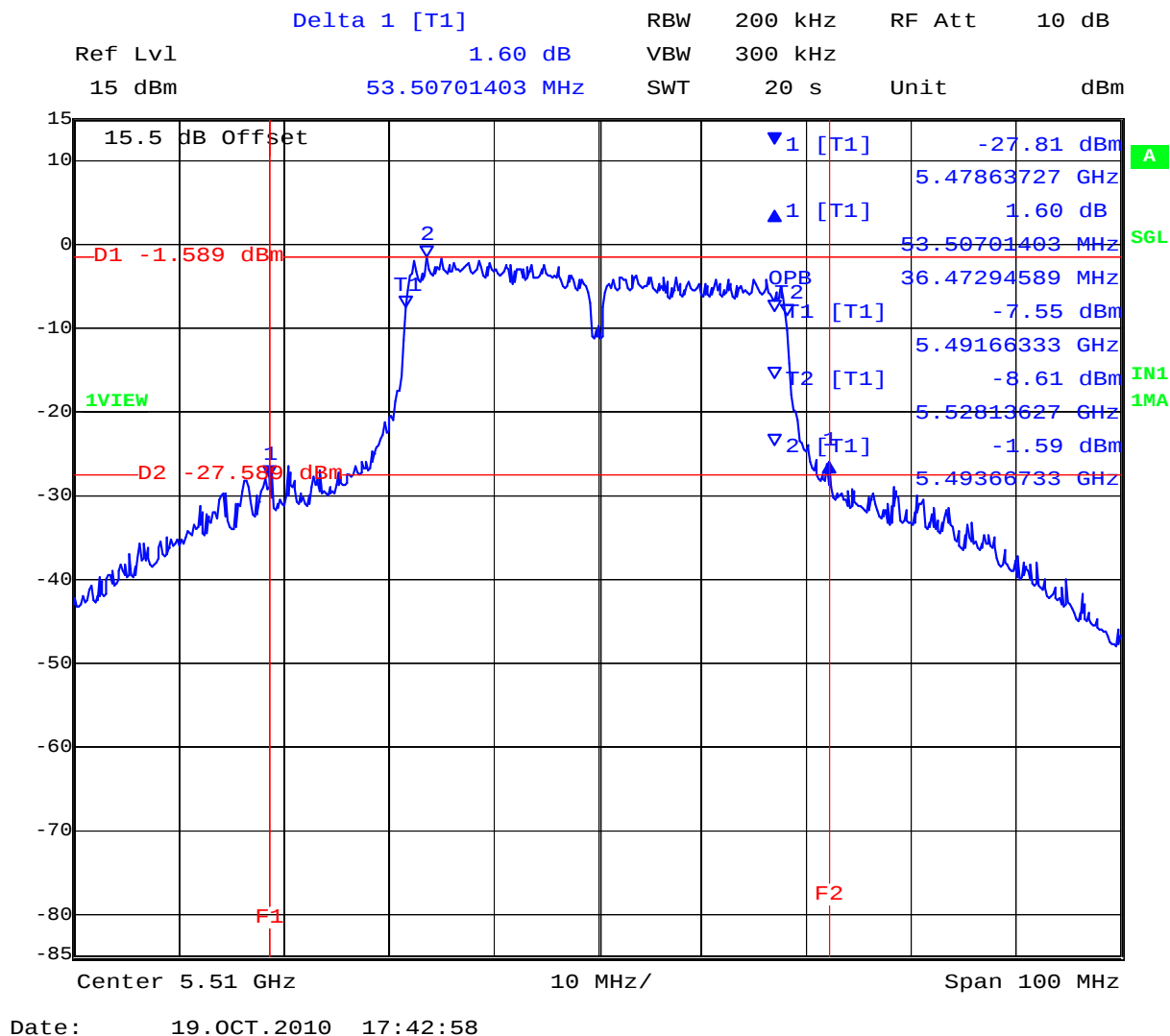
Date: 19.OCT.2010 17:38:19

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 104 of 465

5,510 MHz 802.11n HT40 - MIMO RADIO Chain b 26 dB and 99 % Bandwidth

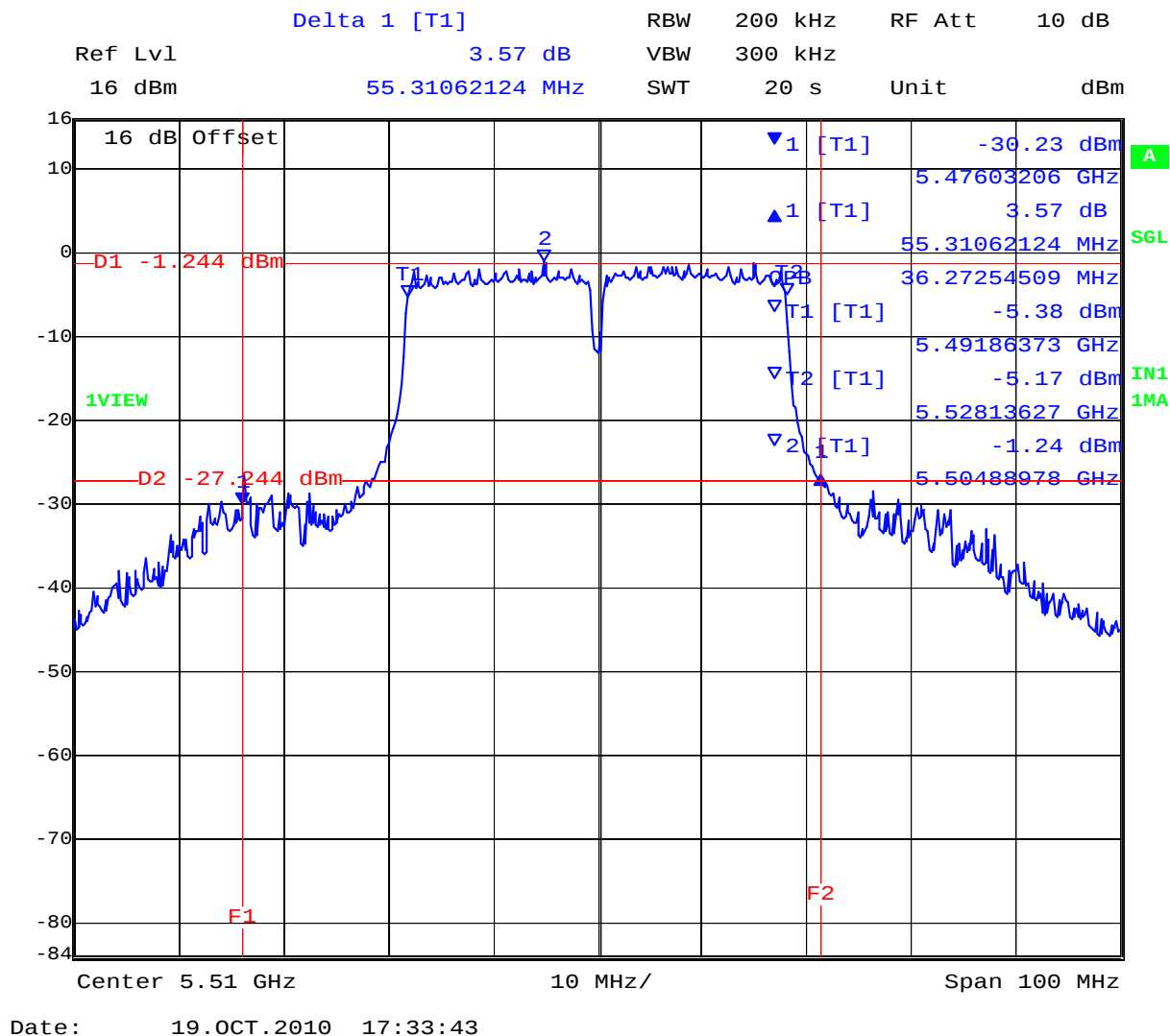


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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 105 of 465

5,510 MHz 802.11n HT40 - MIMO RADIO Chain c 26 dB and 99 % Bandwidth

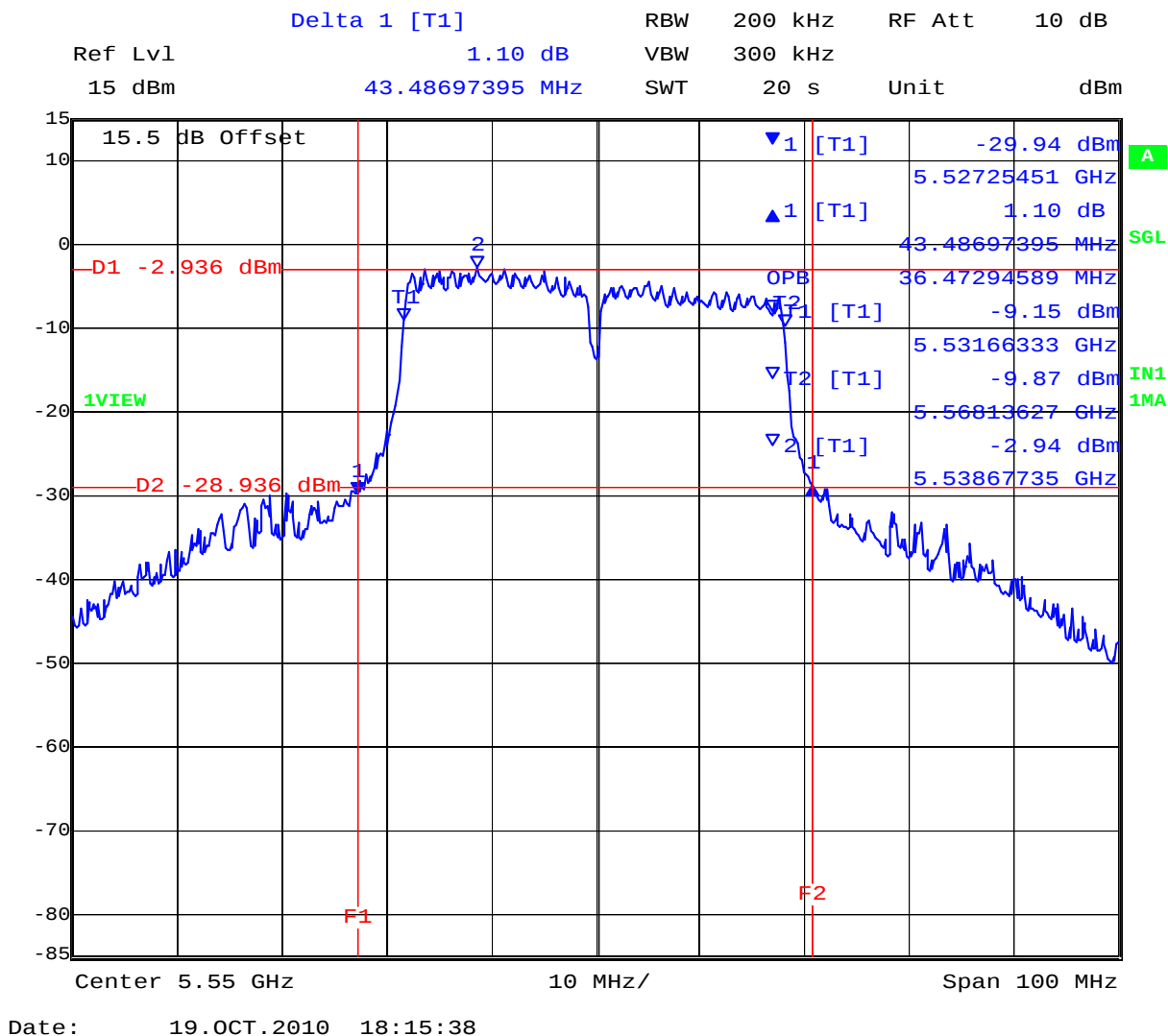


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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 106 of 465

5,550 MHz 802.11n HT40 - MIMO RADIO Chain a 26 dB and 99 % Bandwidth

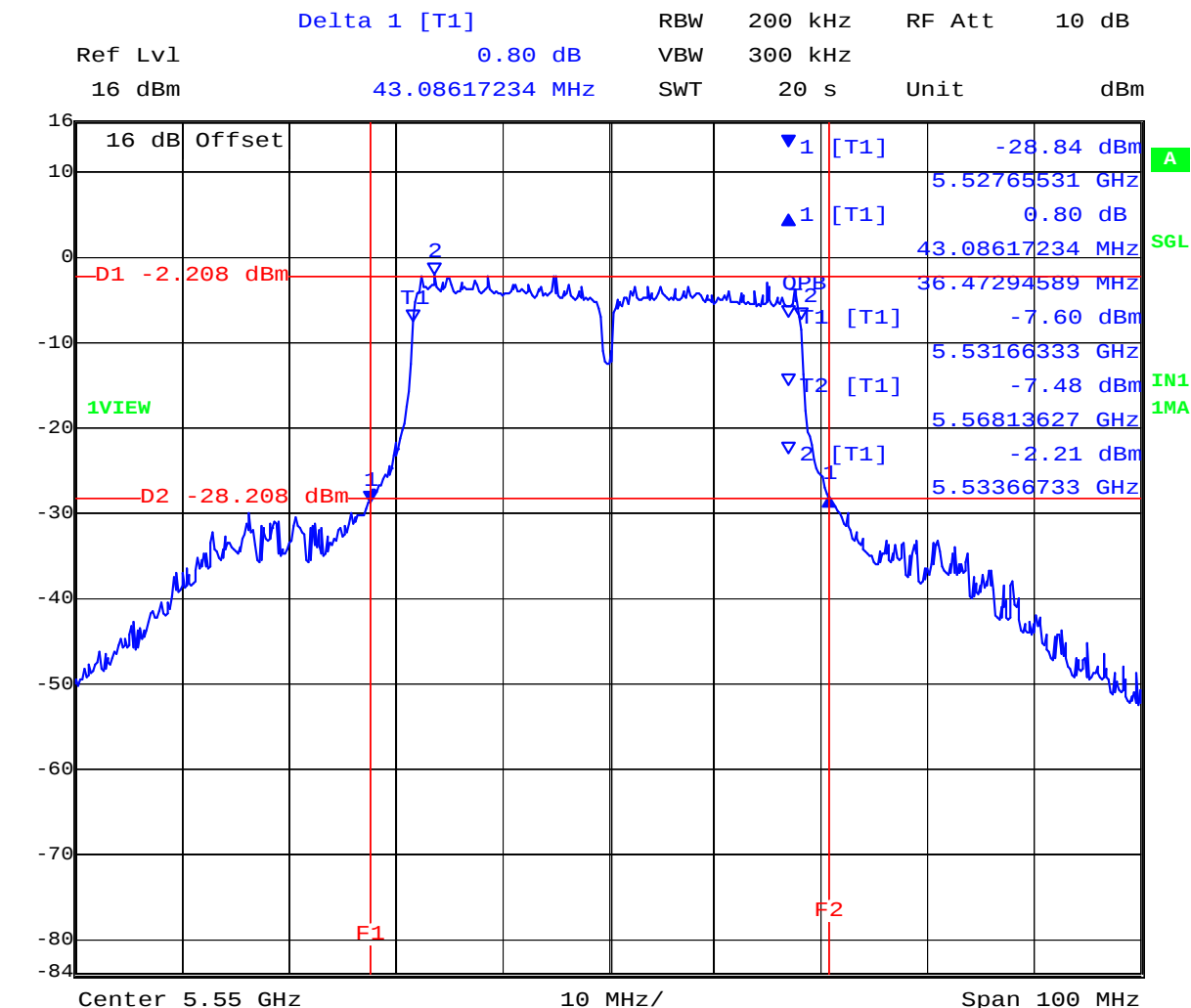


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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 107 of 465

5,550 MHz 802.11n HT40 - MIMO RADIO Chain b 26 dB and 99 % Bandwidth



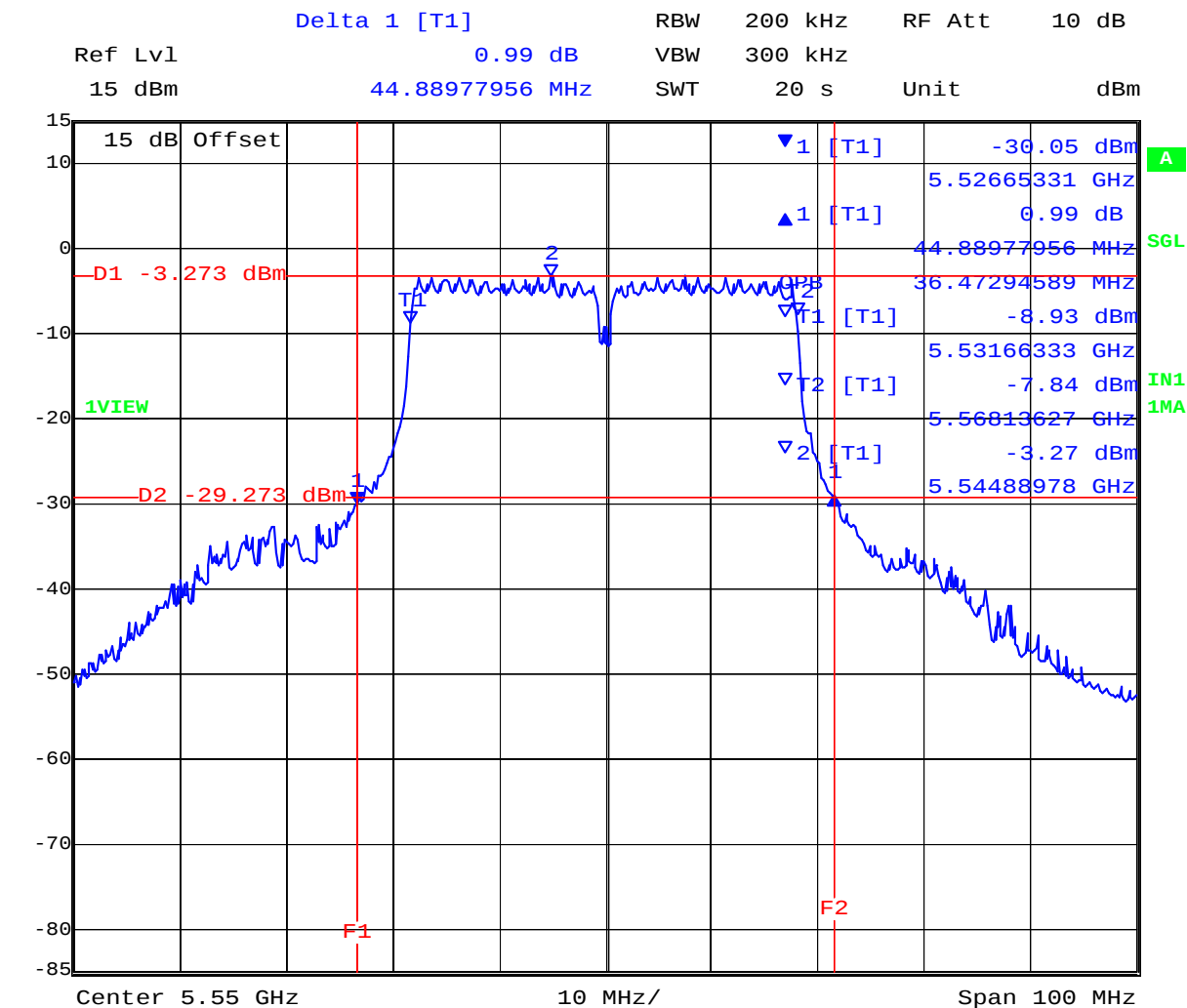
Date: 19.OCT.2010 18:06:17

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 108 of 465

5,550 MHz 802.11n HT40 - MIMO RADIO Chain c 26 dB and 99 % Bandwidth



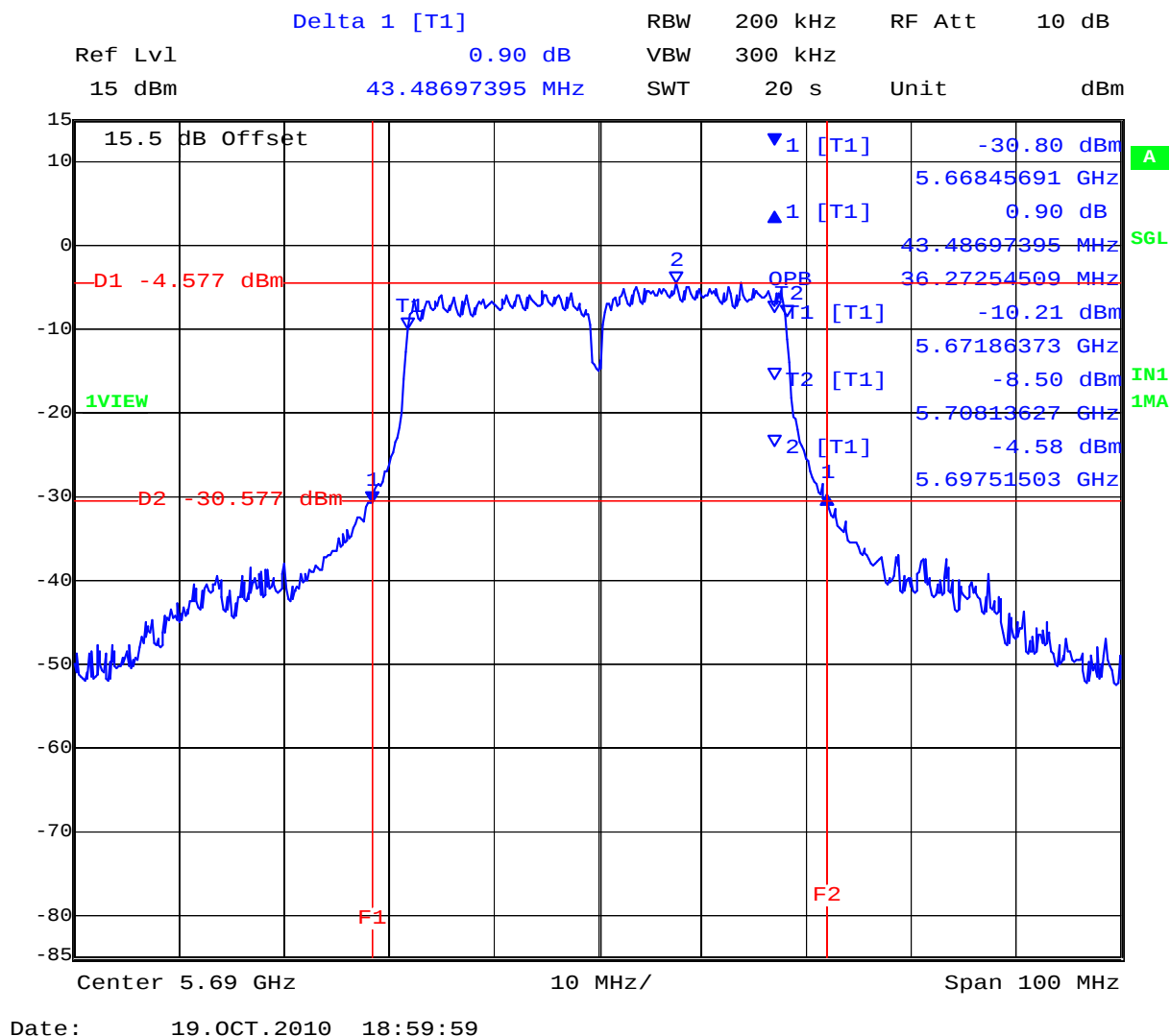
Date: 19.OCT.2010 18:10:56

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 109 of 465

5,690 MHz 802.11n HT40 - MIMO RADIO Chain a 26 dB and 99 % Bandwidth

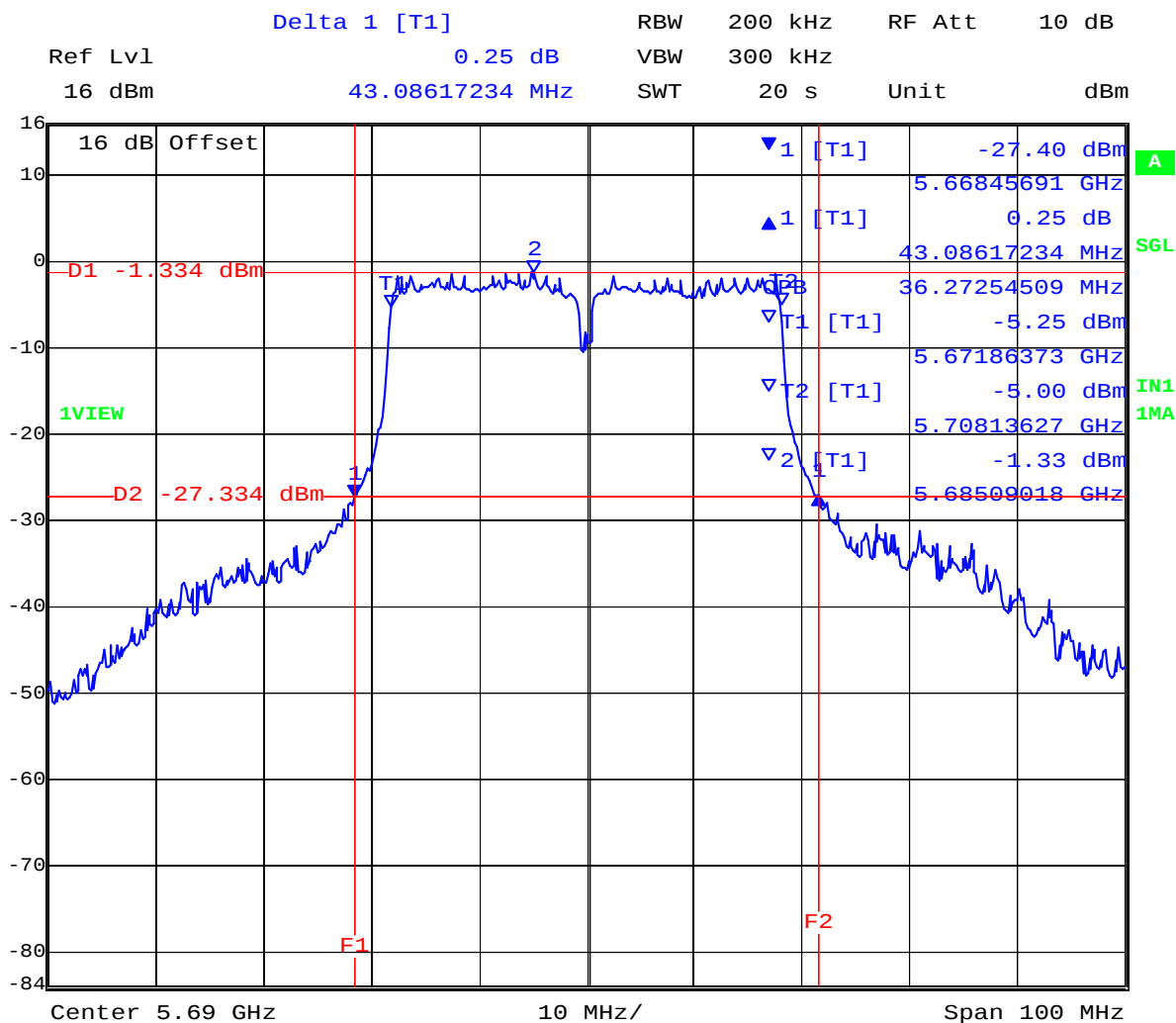


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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 110 of 465

5,690 MHz 802.11n HT40 - MIMO RADIO Chain b 26 dB and 99 % Bandwidth



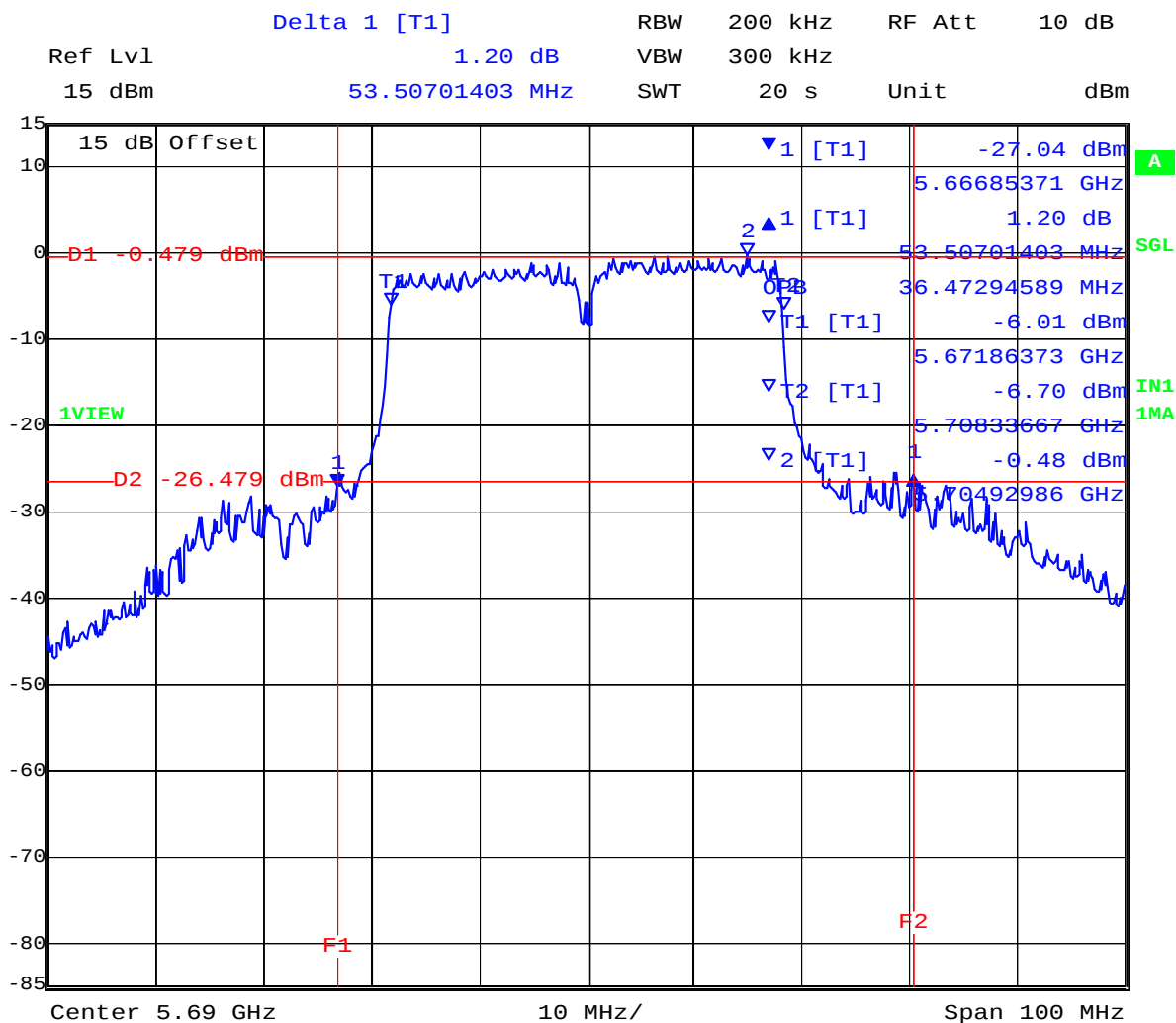
Date: 19.OCT.2010 18:50:36

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 111 of 465

5,690 MHz 802.11n HT40 - MIMO RADIO Chain c 26 dB and 99 % Bandwidth



Date: 19.OCT.2010 18:55:15

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 112 of 465

802.11a Legacy only radio 26 dB and 99 % Bandwidth(s) Results

Test Conditions:	15.247 (a)(2)	Rel. Humidity (%):	35 to 42
Variant:	802.11 a	Ambient Temp. (°C):	19 to 22
TPC:	HIGH	Pressure (mBars):	998 to 1003
Modulation:	ON	Duty Cycle (x):	100
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2 dBi
Applied Voltage:	28.0 Vdc		
Notes 1:			
Notes 2:			

26 dB Bandwidth

26 dB Bandwidth							
Test Frequency	26 dB Bandwidth				Minimum 6dB Bandwidth Limit		Margin
	MHz						
MHz	a	b	c	d	kHz	MHz	MHz
5180	23.647000				500	0.5	-23.147000
5200	24.950000						-24.450000
5240	24.048000						-23.548000

99% Bandwidth

Test Frequency	99 % Bandwidth						
	MHz						
MHz	a	b	c	d			
5180	17.034000						
5200	17.134000						
5240	16.934000						

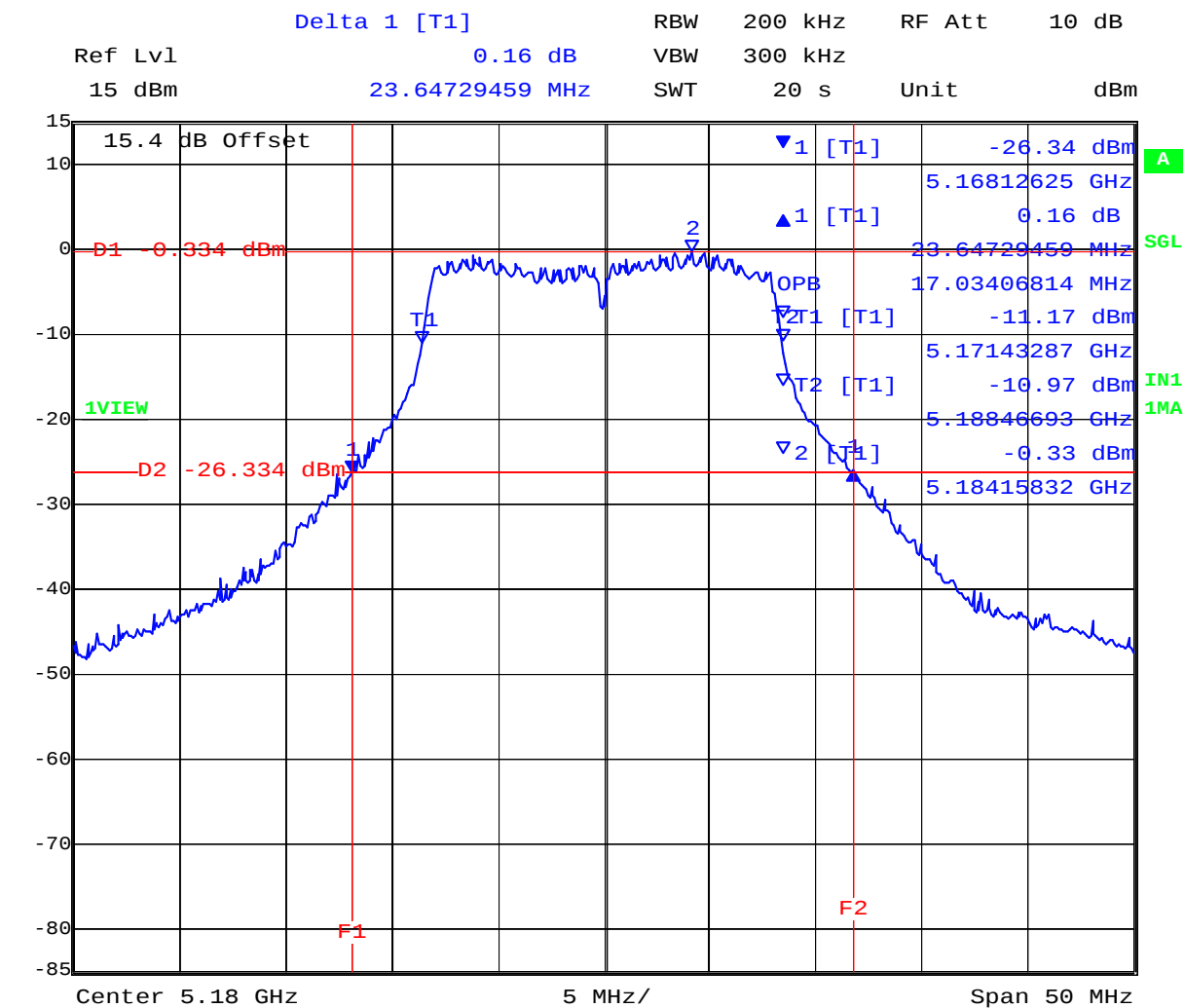
Measurement uncertainty:	±2.81 dB
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 113 of 465

5180 MHz 802.11a, 26 dB and 99% Bandwidth



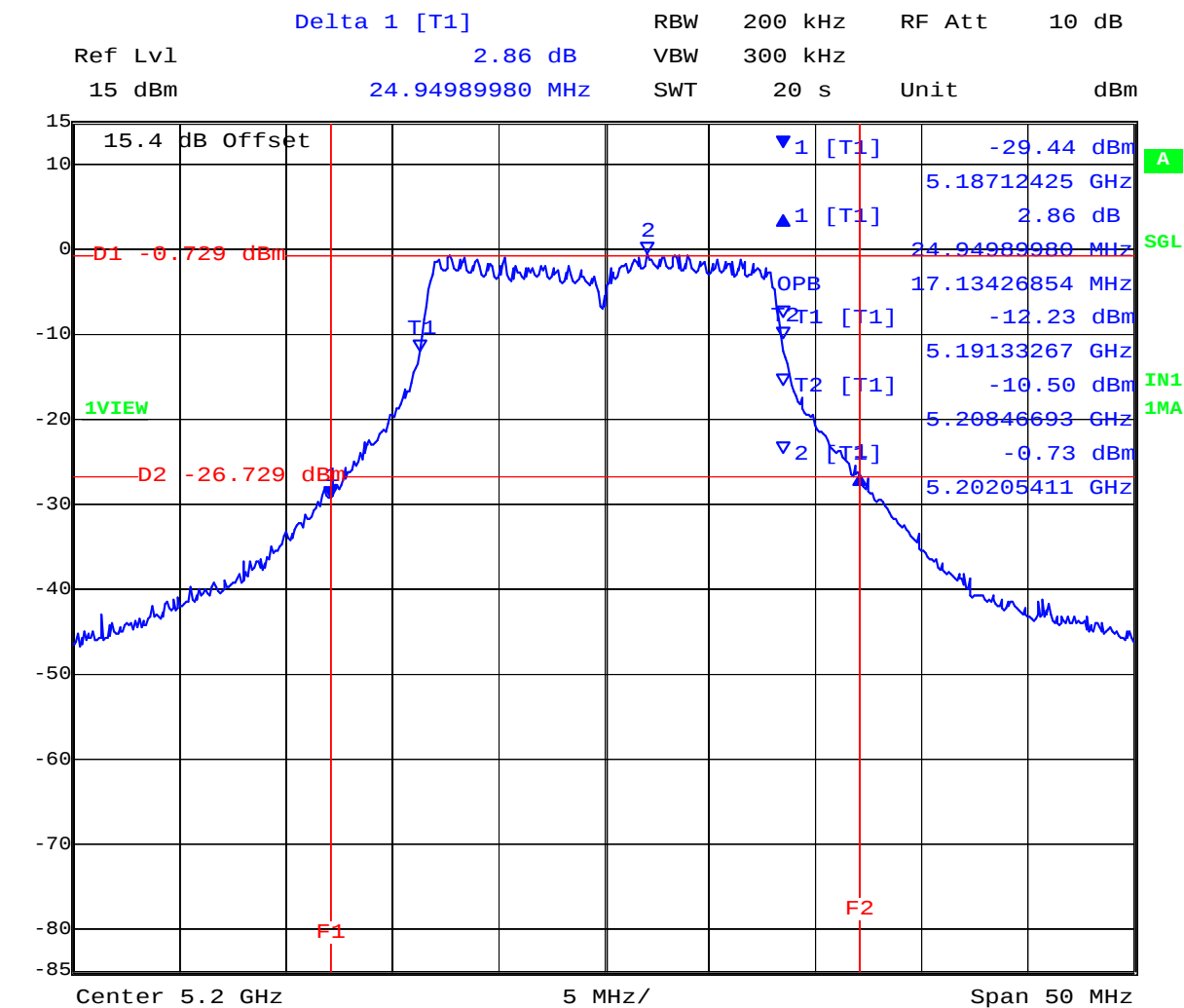
Date: 18.NOV.2010 17:55:37

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 114 of 465

5200 MHz 802.11a, 26 dB and 99% Bandwidth



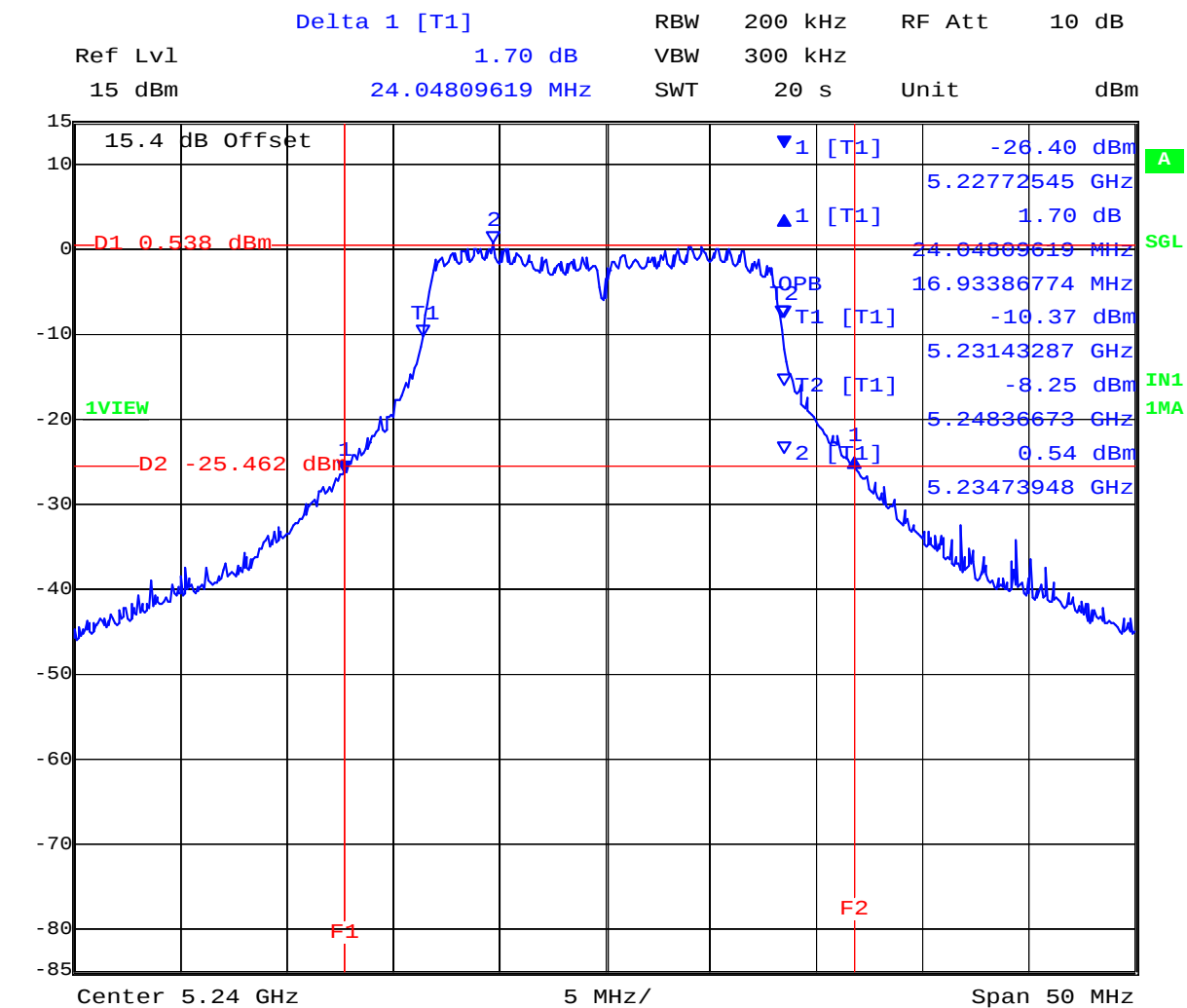
Date: 18.NOV.2010 18:53:59

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 115 of 465

5240 MHz 802.11a, 26 dB and 99% Bandwidth



Date: 18.NOV.2010 19:49:13

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 116 of 465

Specification

Limits

FCC, Part 15 §15.407 (a)(1), (a)(2) and Industry Canada RSS-210 § A9.2(2)

(a)(1) For the band 5.15-5.25 GHz the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $+4 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed +4 dBm in any 1 megahertz band.

(a)(2) For the 5.25-5.35 GHz band the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or $+11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed +11 dBm in any 1 megahertz band.

Industry Canada RSS-210 §A9.2(2)

For the band 5150-5250 MHz, the maximum equivalent isotropically radiated power (e.i.r.p.) shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

For the band 5250-5350 MHz and 5470-5725 MHz, the maximum conducted output power shall not exceed 250 mW or $11 + 10 \log_{10} B$, dBm, whichever power is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

Industry Canada RSS-Gen 4.4

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.

Laboratory Measurement Uncertainty for Spectrum Measurement

Measurement uncertainty	$\pm 2.81 \text{ dB}$
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Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-03 'Measurement of RF Spectrum Mask'	0158, 0287, 0252, 0313, 0314, 0070, 0116, 0117

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7.1.2. Transmit Output Power

FCC, Part 15 Subpart C §15.407(a)

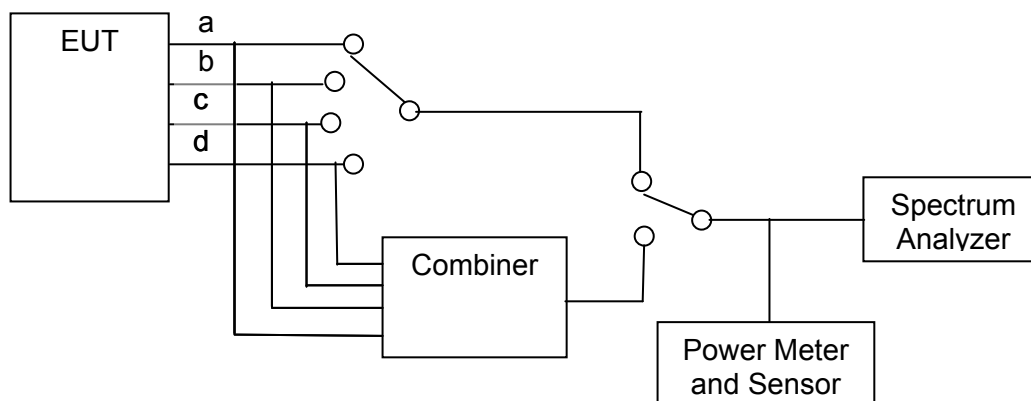
Industry Canada RSS-210 §9.9(2)

Industry Canada RSS-Gen 4.6

Test Procedure

The transmitter terminal of EUT was connected to the input of an average power meter. Measurements were made while EUT was operating in a continuous transmission mode i.e. 100 % duty cycle at the appropriate center frequency. All cable losses and offsets were taken into consideration in the measured result.

Test Measurement Set up



Measurement set up for Transmitter Output Power



Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 118 of 465

Antenna Gain - Maximum Permissible Peak Transmit Power

If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The maximum allowable peak power in the 5150 – 5250 MHz frequency band is +17 dBm.

The maximum allowable peak power in the 5250 – 5350 MHz, and 5470 – 5725 MHz frequency band is + 24 dBm.

Maximum Transmit Power, **FCC Limits**

Limit 5150 – 5250 MHz: Lesser of 50 mW (+17dBm) or $4 + 10 \log(B)$ dBm

Frequency Range (MHz)	Maximum 26 dB Bandwidth (MHz)	$4 + 10 \log(B)$ (dBm)	Limit (dBm)
5150 – 5250	43.888	20.42	17.00

Limit 5250 – 5350 and 5470 – 5725; Lesser of 250 mW (+24dBm) or $11 + 10 \log(B)$ dBm

Frequency Range (MHz)	Maximum 26 dB Bandwidth (MHz)	$11 + 10 \log(B)$ (dBm)	Limit (dBm)
5250 - 5350	53.707	28.30	24.00
5470 - 5725	55.311	28.43	24.00

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 119 of 465

Maximum Transmit Power Industry Canada Limits

Limit 5150 – 5250 MHz: Lesser of 200 mW (+23 dBm) or $10 + 10 \log(B)$ dBm

Frequency Range (MHz)	Maximum 99% Bandwidth (MHz)	$10 + 10 \log(B)$ (dBm)	Limit (dBm)
5150 – 5250	36.473	25.62	23.00

Limit 5250 – 5350 and 5470 – 5725; Lesser of 250 mW (+24dBm) or $11 + 10 \log(B)$ dBm

Frequency Range (MHz)	Maximum 99% Bandwidth (MHz)	$11 + 10 \log(B)$ (dBm)	Limit (dBm)
5250 - 5350	36.473	26.62	24.00
5470 - 5725	36.473	26.62	24.00

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 120 of 465

Measurement Results for Transmit Output Power

MIMO Radio 5150 – 5250 11a

Test Conditions:	15.407 (a)(1)	Rel. Humidity (%):	35	to	42
Variant:	802.11 a	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (x):	100		
Beam Forming Gain (Y):	N/A	Antenna Gain:	1.2		dBi
Applied Voltage:	28.0				Vdc
Notes 1:					
Notes 2:					

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5180	10.54	11.12	10.72		14.49		17.00	-2.51
5200	10.01	10.08	9.48		14.11		17.00	-2.89
5240	10.42	11.14	10.33		13.96		17.00	-3.04

Measurement uncertainty:	±1.33 dB
---------------------------------	----------

MIMO Radio 5150 – 5250 11n HT-20

Test Conditions:	15.407 (a)(1)	Rel. Humidity (%):	35	to	42
Variant:	802.11 n HT-20	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (x):	100		
Beam Forming Gain (Y):	N/A	Antenna Gain:	1.2		dBi
Applied Voltage:	28.0				Vdc
Notes 1:					
Notes 2:					

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5180	10.58	10.99	10.77		14.48		17.00	-2.52
5200	9.93	10.18	9.27		14.07		17.00	-2.93
5240	10.32	11.16	10.12		13.91		17.00	-3.09

Measurement uncertainty:	±1.33 dB
---------------------------------	----------

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 121 of 465

MIMO Radio 5150 – 5250 11n HT-40

Test Conditions:	15.407 (a)(1)	Rel. Humidity (%):	35	to	42
Variant:	802.11n HT-40	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (x):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2 dBi		
Applied Voltage:	28.0 Vdc				
Notes 1:					
Notes 2:					

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)				Combined	Calculated	dBm	dB
MHz	a	b	c	d				
5190	9.27	9.45	8.82		13.08		17.00	-3.92
5230	9.61	10.25	9.01		13.43		17.00	-3.57

Measurement uncertainty:	±1.33 dB
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MIMO Radio 5250 – 5350 11a

Test Conditions:	15.407 (a)(1)	Rel. Humidity (%):	35	to	42
Variant:	802.11 a	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (x):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2 dBi		
Applied Voltage:	28.0 Vdc				
Notes 1:					
Notes 2:					

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)				Combined	Calculated	dBm	dB
MHz	a	b	c	d				
5260	11.52	11.26	9.76		15.29		24.00	-8.71
5300	12.26	12.71	10.53		15.54		24.00	-8.46
5320	13.58	13.23	11.64		17.65		24.00	-6.35

Measurement uncertainty:	±1.33 dB
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 122 of 465

MIMO Radio 5250 – 5350 11n HT-20

Test Conditions:	15.407 (a)(1)	Rel. Humidity (%):	35	to	42
Variant:	802.11 n HT-20	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (x):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2 dBi		
Applied Voltage:	28.0 Vdc				
Notes 1:					
Notes 2:					

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5260	11.53	11.13	9.64		15.13		24.00	-8.87
5300	12.25	12.72	10.21		15.39		24.00	-8.61
5320	13.62	13.03	11.41		17.52		24.00	-6.48

Measurement uncertainty:	±1.33 dB
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MIMO Radio 5250 – 5350 11n HT-40

Test Conditions:	15.407 (a)(1)	Rel. Humidity (%):	35	to	42
Variant:	802.11 n HT-40	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (x):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2 dBi		
Applied Voltage:	28.0 Vdc				
Notes 1:					
Notes 2:					

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5270	10.48	10.83	8.98		14.26		24.00	-9.74
5310	11.82	11.68	9.79		15.57		24.00	-8.43

Measurement uncertainty:	±1.33 dB
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 123 of 465

MIMO Radio 5470 – 5725 11a

Test Conditions:	15.407 (a)(1)	Rel. Humidity (%):	35	to	42
Variant:	802.11 a	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (x):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2 dBi		
Applied Voltage:	28.0 Vdc				
Notes 1:					
Notes 2:					

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5500	9.61	9.67	10.71		14.46		24.00	-9.54
5560	8.95	9.83	8.24		12.73		24.00	-11.27
5700	10.31	12.43	8.46		15.61		24.00	-8.39

Measurement uncertainty:	±1.33 dB
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MIMO Radio 5470 – 5725 11n HT-20

Test Conditions:	15.407 (a)(1)	Rel. Humidity (%):	35	to	42
Variant:	802.11 n HT-20	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (x):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2 dBi		
Applied Voltage:	28.0 Vdc				
Notes 1:					
Notes 2:					

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5500	9.53	9.64	10.73		14.38		24.00	-9.62
5560	8.79	9.65	8.15		12.72		24.00	-11.28
5700	10.19	12.27	8.35		15.56		24.00	-8.44

Measurement uncertainty:	±1.33 dB
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 124 of 465

MIMO Radio 5470 – 5725 11n HT-40

Test Conditions:	15.407 (a)(1)	Rel. Humidity (%):	35	to	42
Variant:	802.11 n HT-40	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (x):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2 dBi		
Applied Voltage:	28.0 Vdc				
Notes 1:					
Notes 2:					

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5510	9.50	9.00	9.31		13.70		24.00	-10.30
5550	8.25	8.54	8.22		12.91		24.00	-11.09
5690	8.95	10.67	6.73		14.09		24.00	-9.91

Measurement uncertainty:	±1.33 dB
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 125 of 465

802.11a Legacy only radio Transmit Output Power Results

Test Conditions:	15.407 (a)(1)	Rel. Humidity (%):	35	to	42
Variant:	802.11 a	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (x):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2		dBi
Applied Voltage:	28.0 Vdc				
Notes 1:					
Notes 2:					

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5180				14.32			17.00	-2.68
5200				13.36			17.00	-3.64
5240				14.89			17.00	-2.11

Measurement uncertainty:	±1.33 dB
---------------------------------	----------

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 126 of 465

Specification

Limits

FCC, Part 15 §15.407 (a)(1), (a)(2) and Industry Canada RSS-210 § A9.2(2)

(a)(1) For the band 5.15-5.25 GHz the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $+4 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed +4 dBm in any 1 megahertz band.

(a)(2) For the 5.25-5.35 and 5470-5725 MHz GHz band the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or $+11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed +11 dBm in any 1 megahertz band.

Industry Canada RSS-210 §A9.2(2)

For the band 5150-5250 MHz, the maximum equivalent isotropically radiated power (e.i.r.p.) shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

For the band 5250-5350 MHz and 5470-5725 MHz, the maximum conducted output power shall not exceed 250 mW or $11 + 10 \log_{10} B$, dBm, whichever power is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

Industry Canada RSS-Gen 4.4

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.

Laboratory Measurement Uncertainty for Power Measurements

Measurement uncertainty	$\pm 1.33 \text{ dB}$
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Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-01 'Measuring RF Output Power'	0158, 0287, 0252, 0313, 0314, 0070, 0116, 0117

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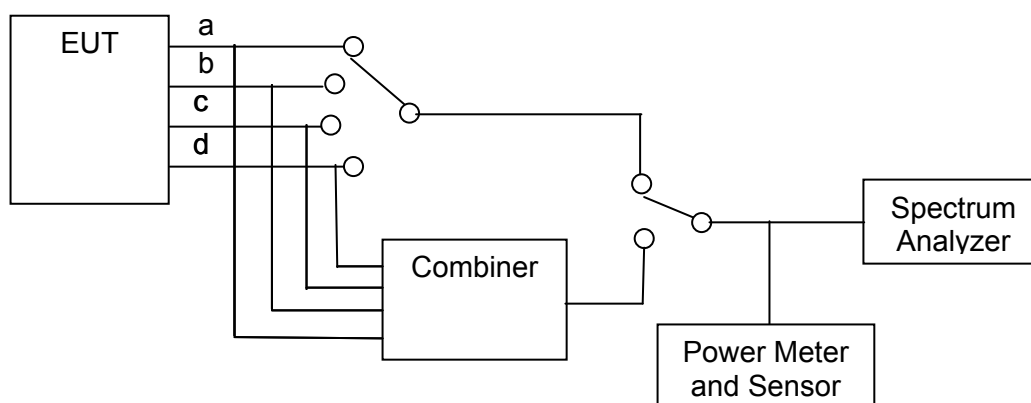
7.1.3. Peak Power Spectral Density

FCC, Part 15 Subpart C §15.407(a)
Industry Canada RSS-210 § A9.2(2)

Test Procedure

The transmitter output was connected to a spectrum analyzer and the peak power spectral density measured. Method 2 Sample Detection and power averaging, specified in FCC document DA 02-2138 (Normative Reference (ix) Section 2.1 “Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices”) was used to determine the peak power spectral density of the emission. The Peak Power Spectral Density is the highest level found across the emission in a 1 MHz resolution bandwidth.

Test Measurement Set up



Measurement set-up for Peak Power Spectral Density

Measurement Results for Peak Power Spectral Density

Ambient conditions.

Temperature: 17 to 23 °C Relative humidity: 31 to 57 % Pressure: 999 to 1012 mbar

Radio Parameters

Duty Cycle: 100%

Output: Modulated Carrier

Power: Maximum Default Power



Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 128 of 465

TABLE OF RESULTS – 802.11a Legacy - MIMO radio

5150 - 5250 MHZ

Test Conditions:	15.407 (a)	Rel. Humidity (%):	35	to	42
Variant:	802.11 a	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2 dBi		
Applied Voltage:	28.0 Vdc				
Notes 1:					
Notes 2:					

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)				Combined	Calculated		
MHz	a	b	c	d			dBm	dB
5180	-1.49	-1.15	-1.66		0.60		4.00	-3.41
5200	-2.22	-2.25	-2.27		0.50		4.00	-3.50
5240	-1.69	-0.87	-1.54		1.10		4.00	-2.90

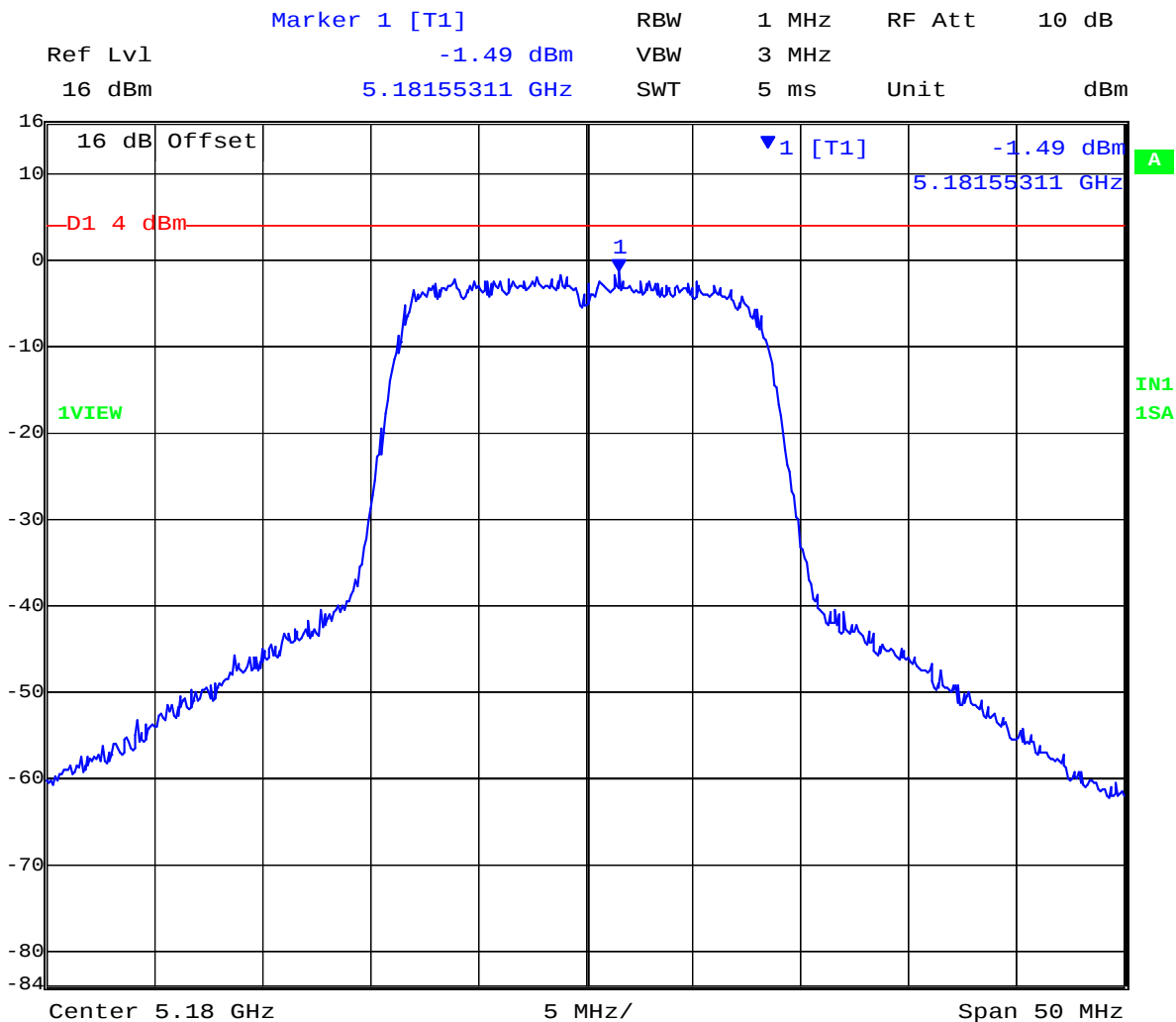
Measurement uncertainty:	±1.33 dB
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 129 of 465

5,180 MHz 802.11a Legacy - MIMO radio Chain a Peak Power Spectral Density



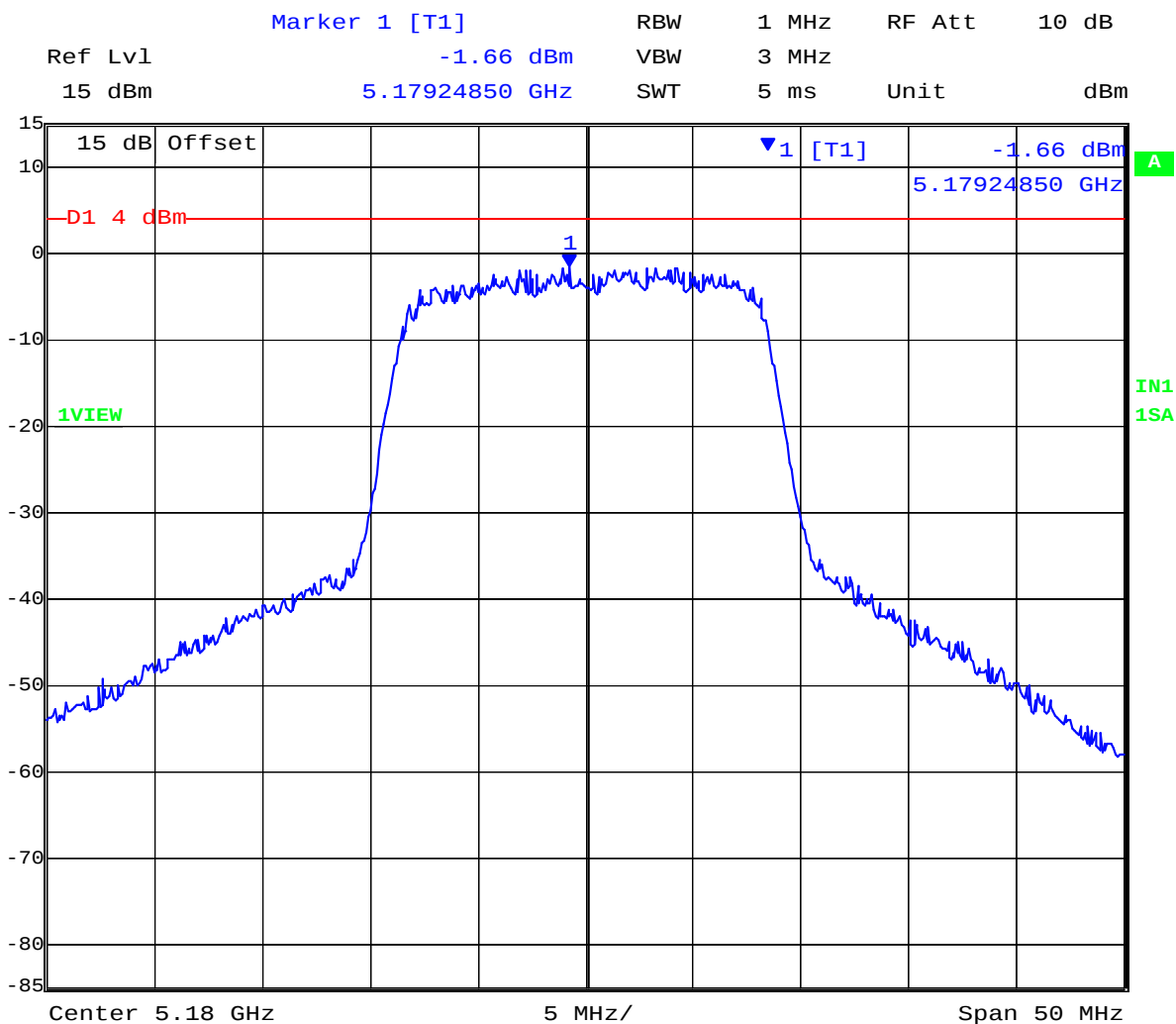
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 130 of 465

5,180 MHz 802.11a Legacy - MIMO radio Chain b Peak Power Spectral Density



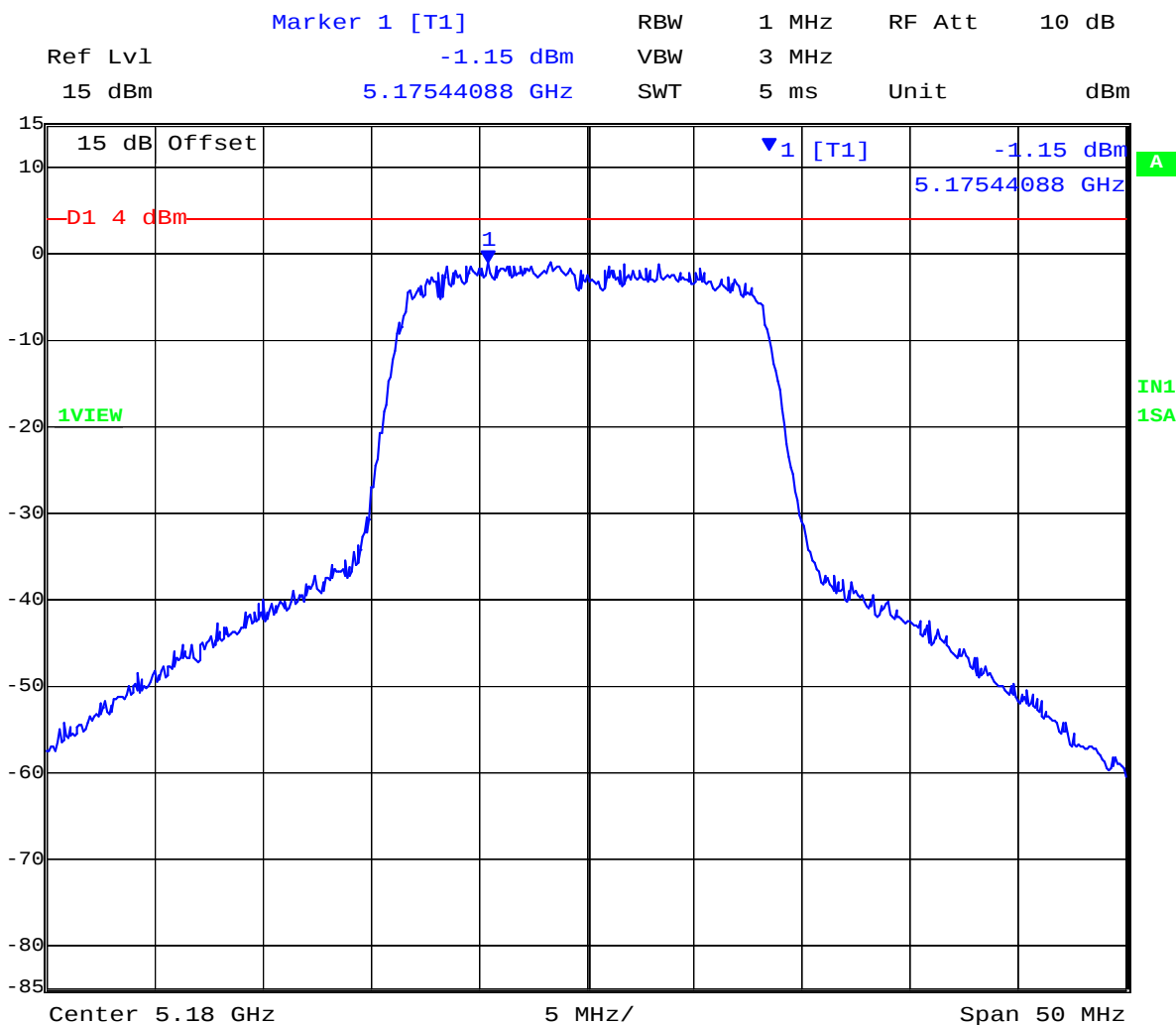
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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 131 of 465

5,180 MHz 802.11a Legacy - MIMO radio Chain c Peak Power Spectral Density



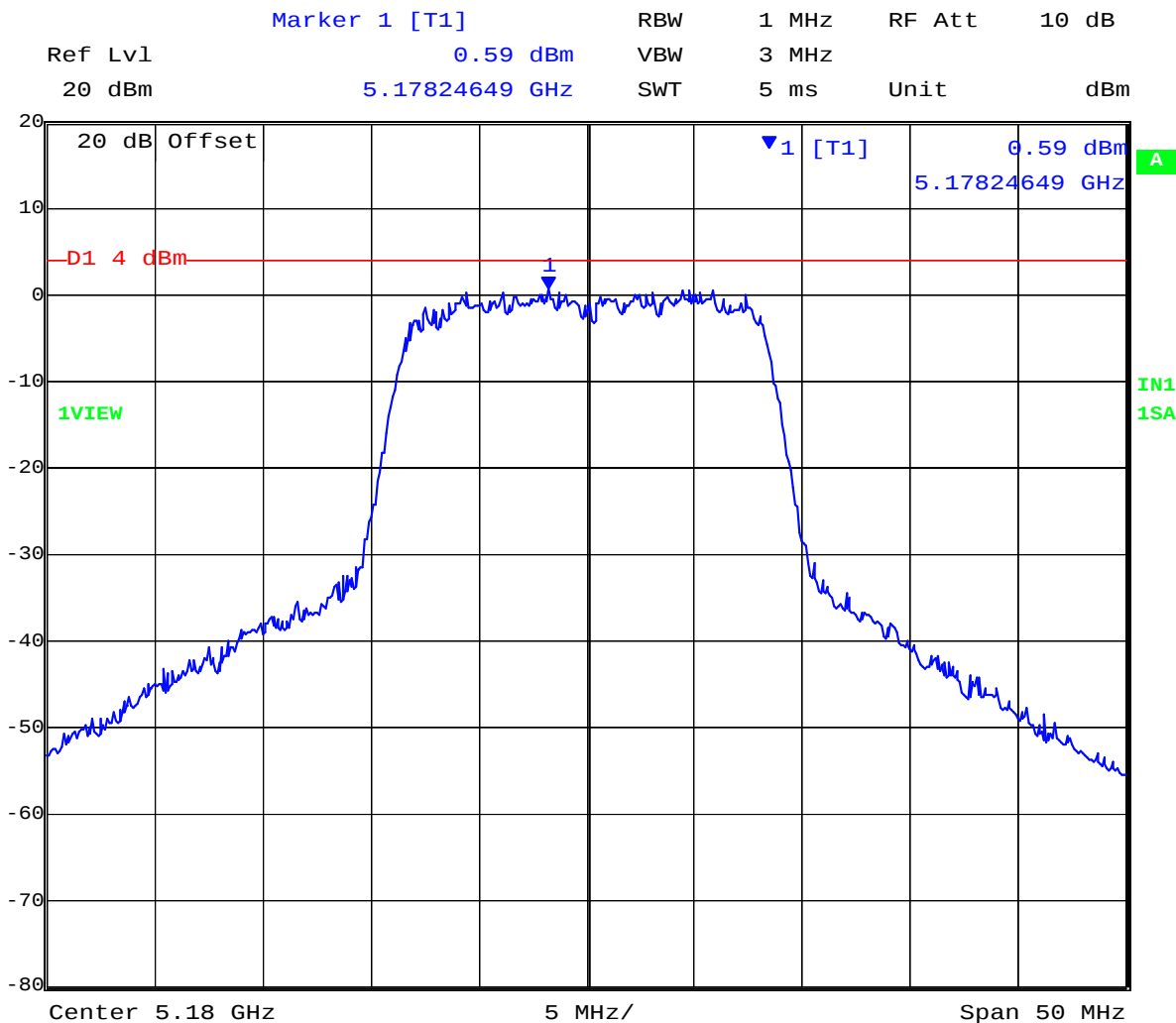
Date: 18.OCT.2010 12:20:47

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 132 of 465

5,180 MHz 802.11a Legacy - MIMO radio Combined Peak Power Spectral Density



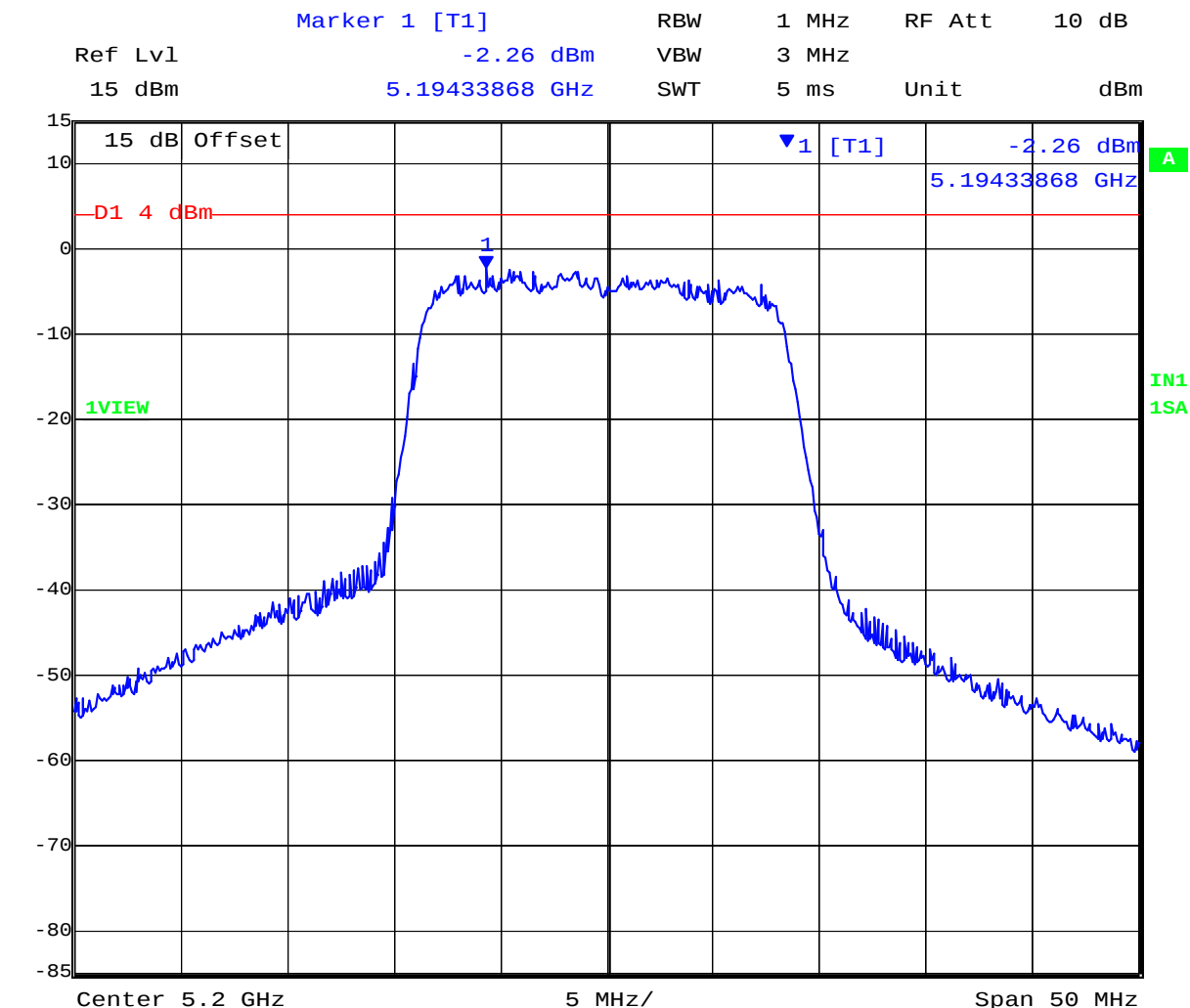
Date: 18.OCT.2010 12:25:31

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 133 of 465

5,200 MHz 802.11a Legacy - MIMO radio Chain a Peak Power Spectral Density



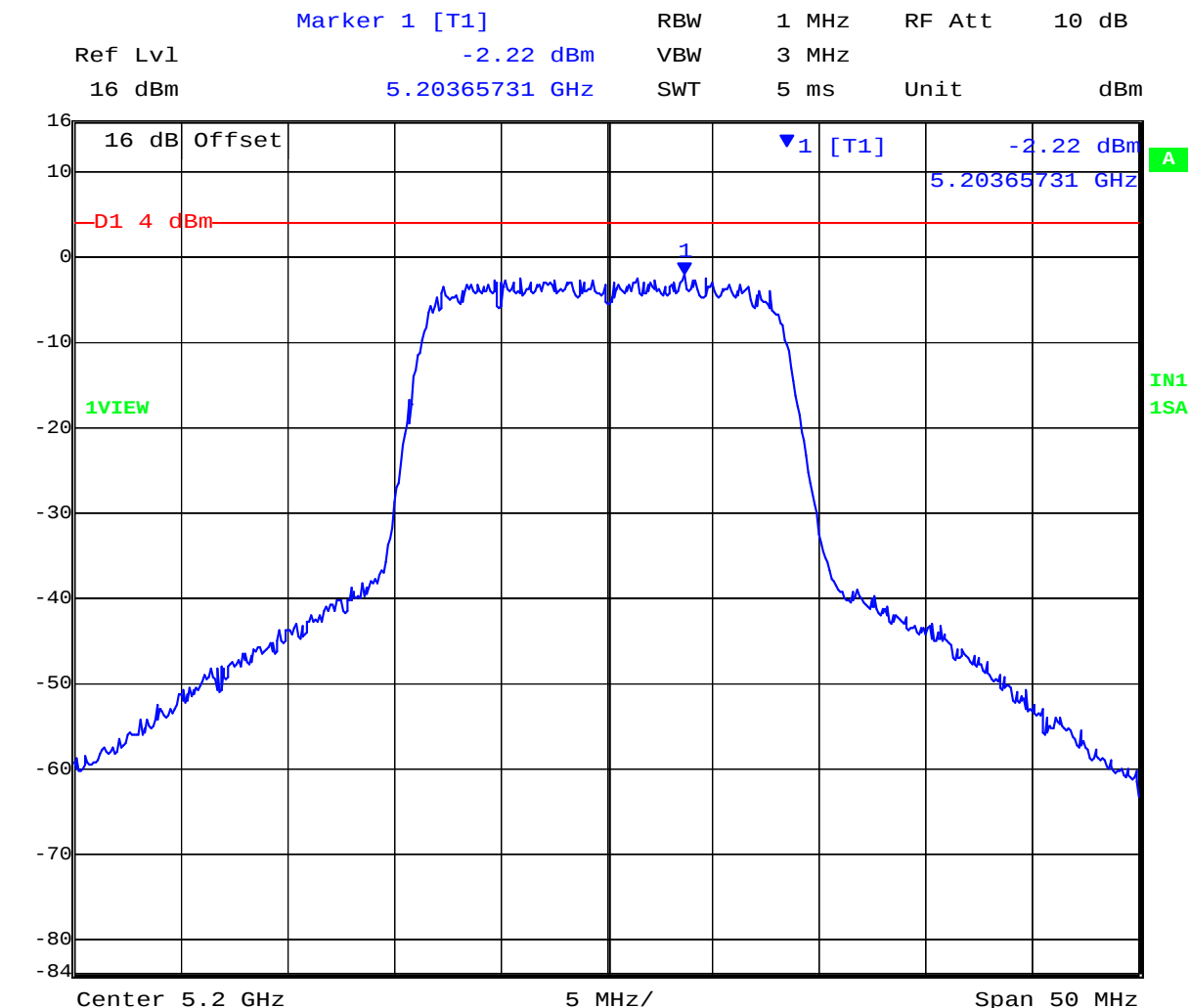
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 134 of 465

5,200 MHz 802.11a Legacy - MIMO radio Chain b Peak Power Spectral Density



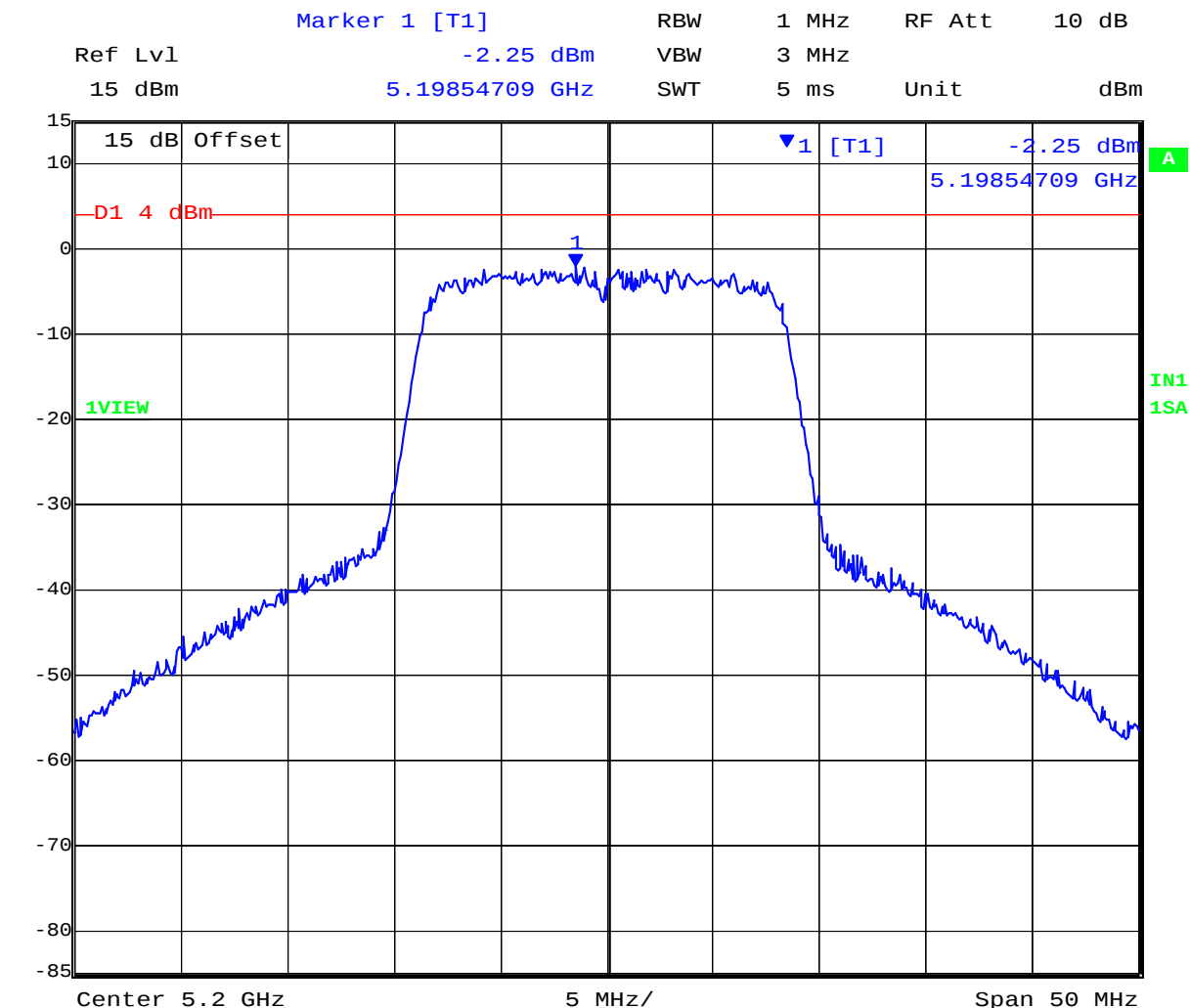
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 135 of 465

5,200 MHz 802.11a Legacy - MIMO radio Chain c Peak Power Spectral Density



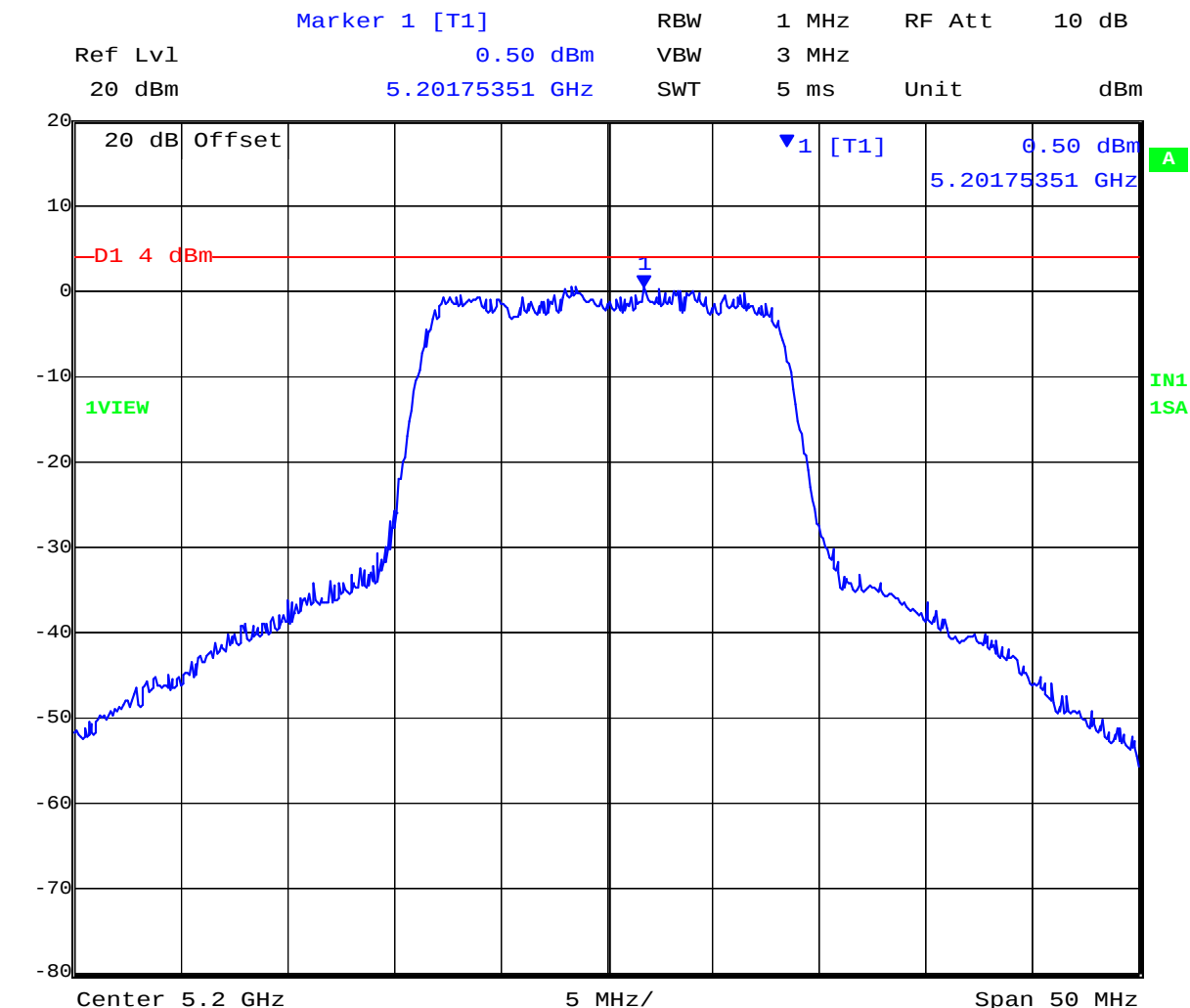
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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 136 of 465

5,200 MHz 802.11a Legacy - MIMO radio Combined Peak Power Spectral Density



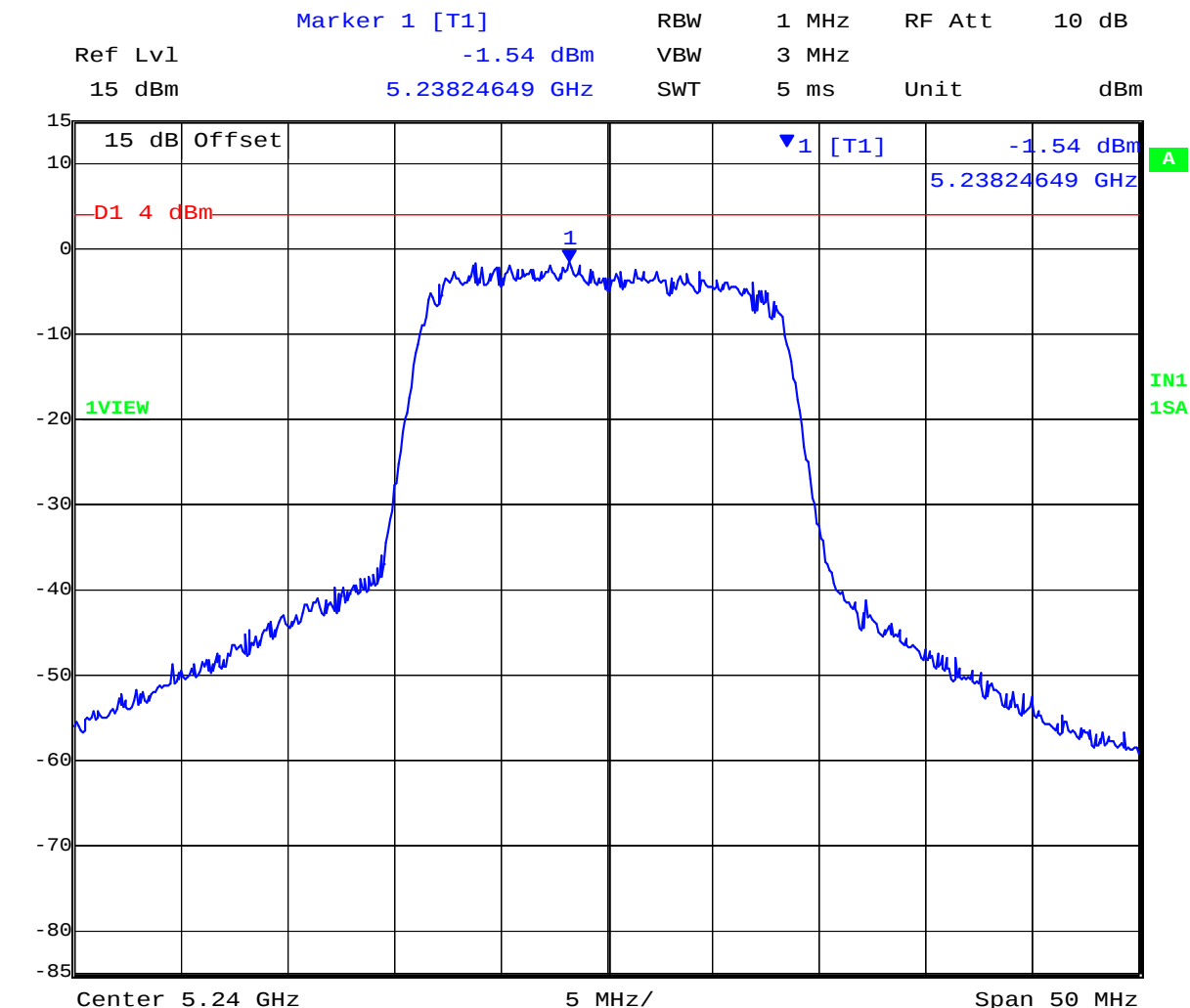
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 137 of 465

5,240 MHz 802.11a Legacy - MIMO radio Chain a Peak Power Spectral Density



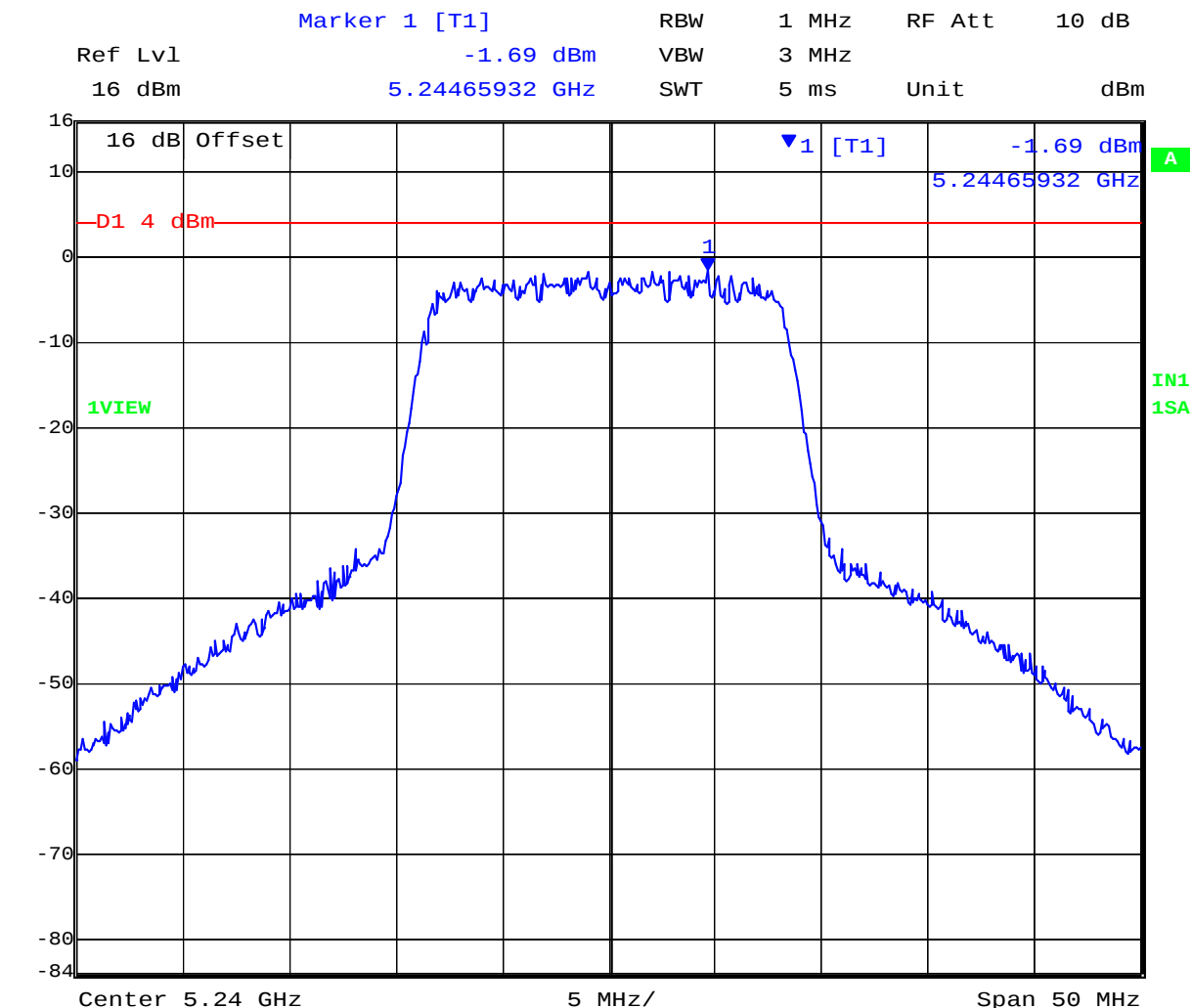
Date: 18.OCT.2010 13:31:33

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 138 of 465

5,240 MHz 802.11a Legacy - MIMO radio Chain b Peak Power Spectral Density



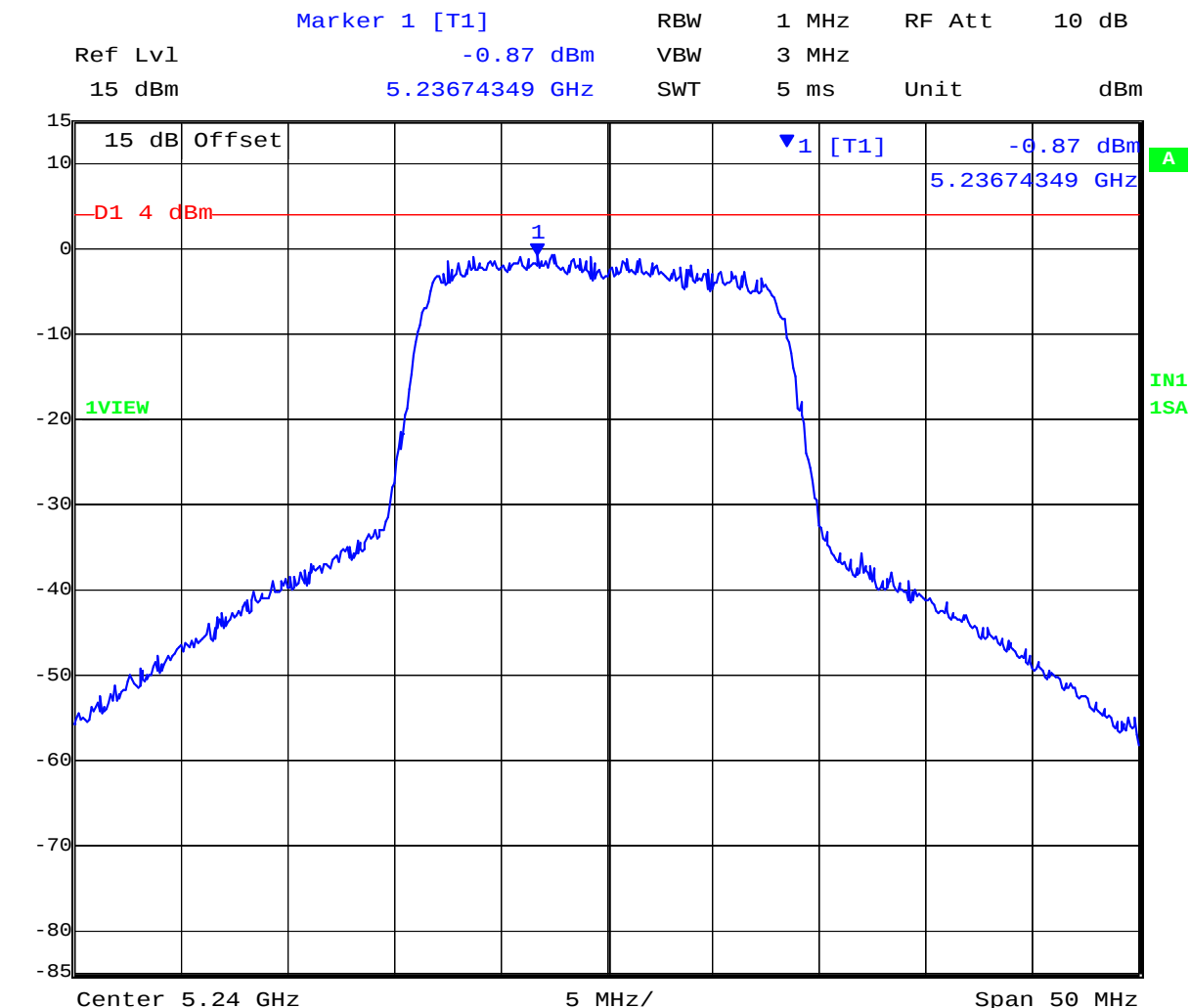
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 139 of 465

5,240 MHz 802.11a Legacy - MIMO radio Chain c Peak Power Spectral Density



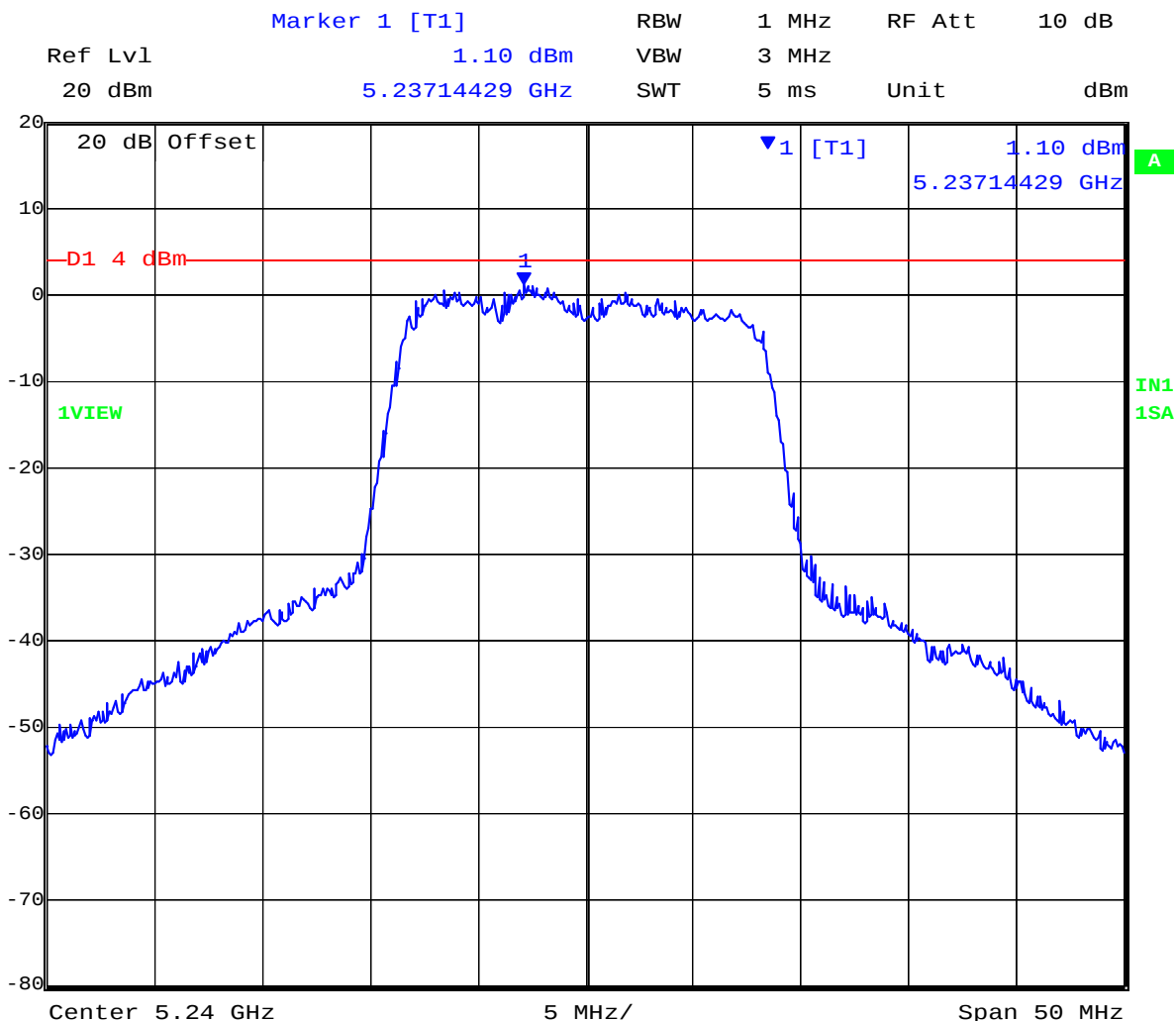
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 140 of 465

5,240 MHz 802.11a Legacy - MIMO radio Combined Peak Power Spectral Density



Date: 18.OCT.2010 13:33:58

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 141 of 465

TABLE OF RESULTS – 802.11a Legacy - MIMO radio
5250 -5350 MHz

Test Conditions:	15.407 (a)	Rel. Humidity (%):	35	to	42
Variant:	802.11 a	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2 dBi		
Applied Voltage:	28.0 Vdc				
Notes 1:					
Notes 2:					

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5260	-0.46	-0.58	-2.57		2.13		11.00	-8.87
5300	0.31	0.73	-1.82		1.98		11.00	-9.02
5320	1.13	1.49	-0.69		4.49		11.00	-6.51

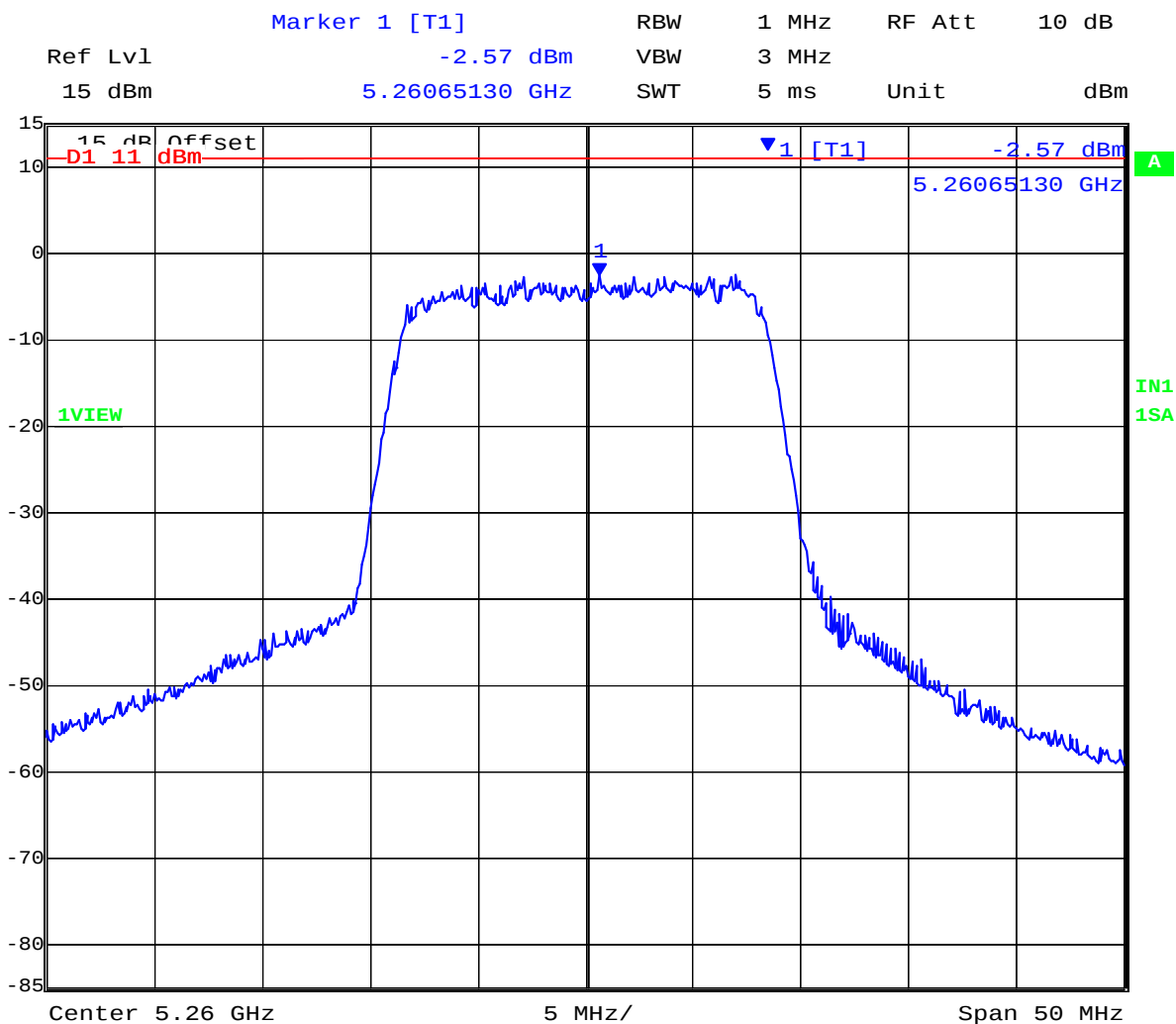
Measurement uncertainty:	±1.33 dB
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 142 of 465

5,260 MHz 802.11a Legacy - MIMO radio Chain a Peak Power Spectral Density



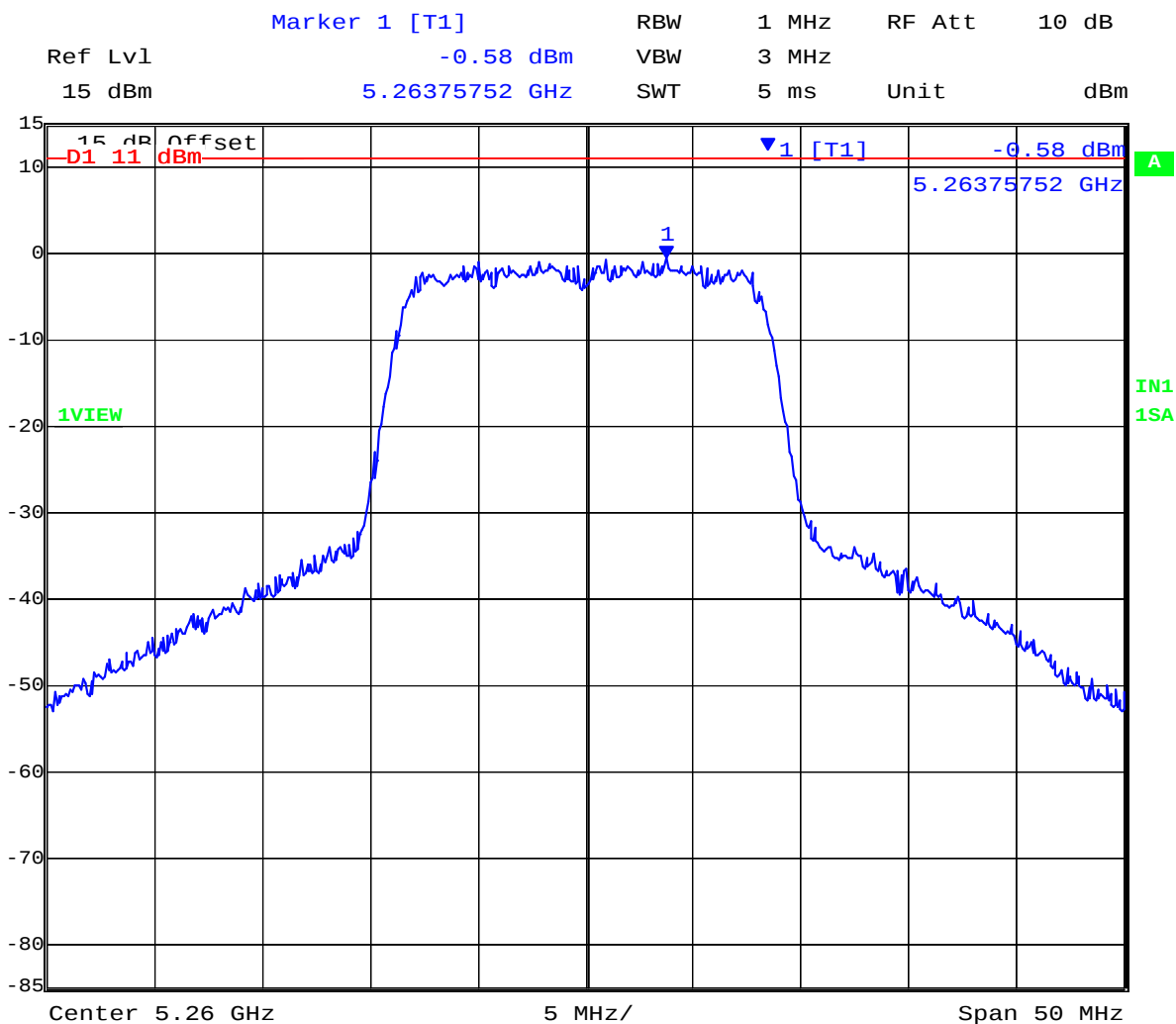
Date: 19.OCT.2010 08:49:16

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 143 of 465

5,260 MHz 802.11a Legacy - MIMO radio Chain b Peak Power Spectral Density



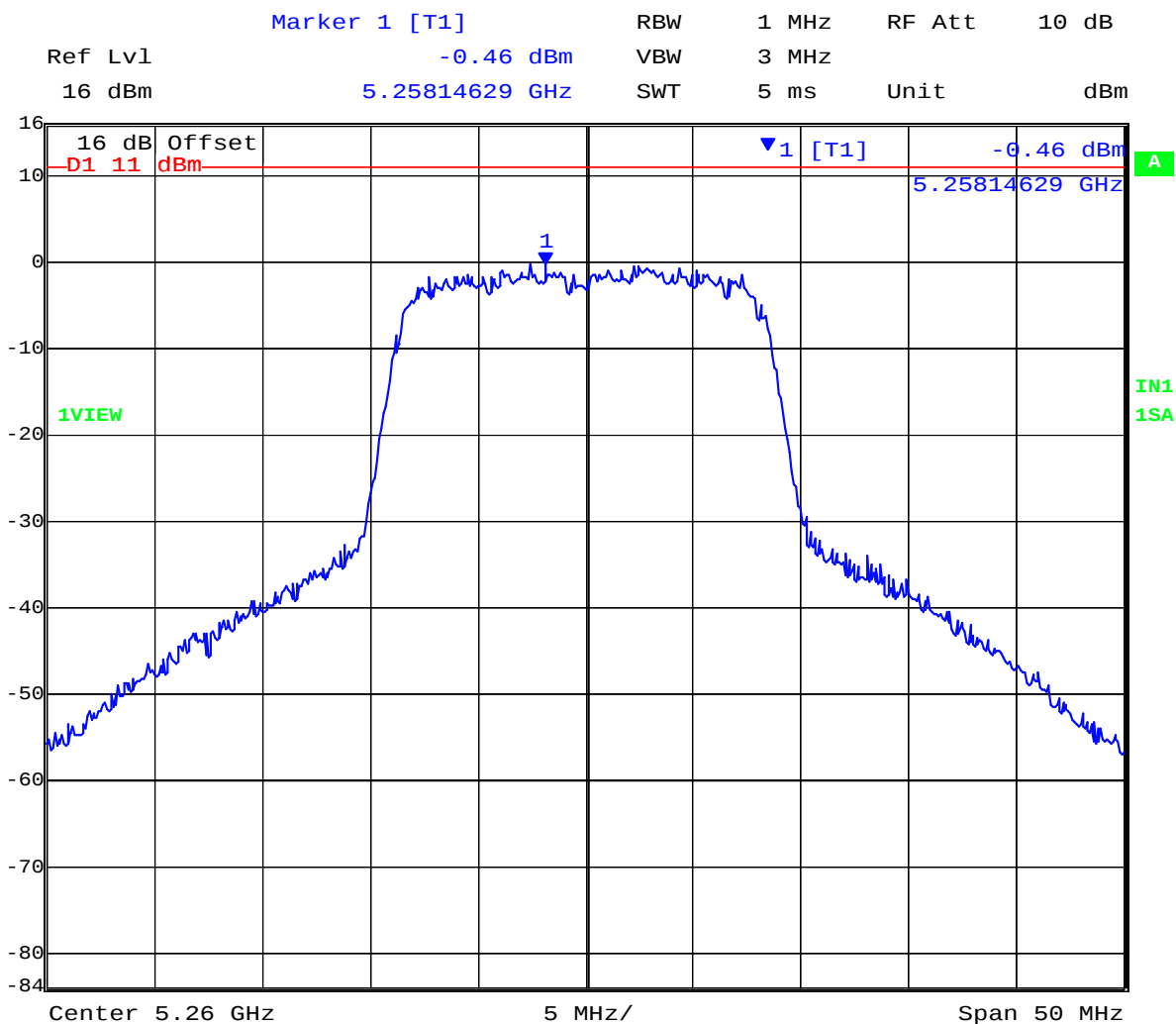
Date: 19.OCT.2010 08:46:52

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 144 of 465

5,260 MHz 802.11a Legacy - MIMO radio Chain c Peak Power Spectral Density



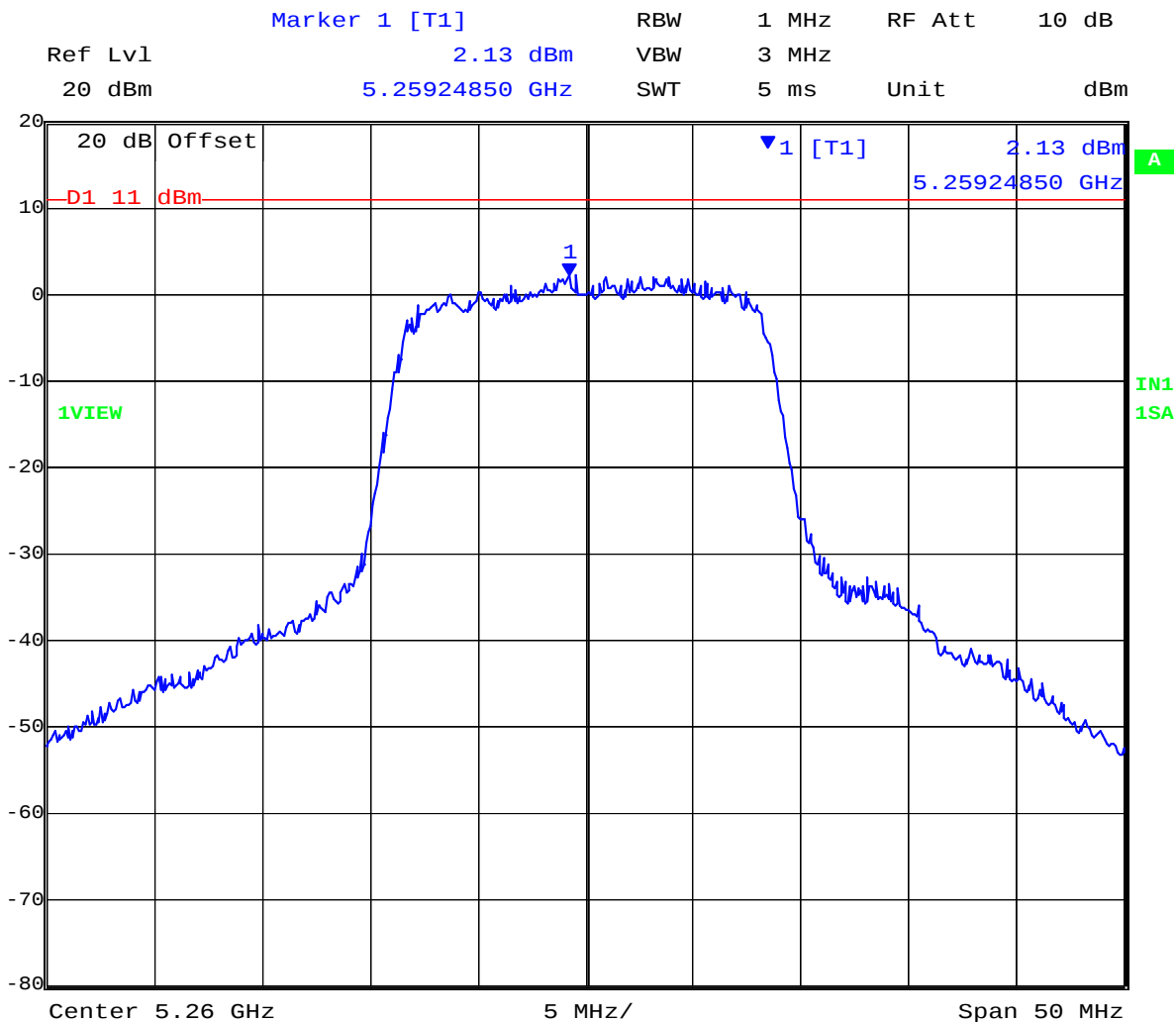
Date: 19.OCT.2010 08:44:27

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 145 of 465

5,260 MHz 802.11a Legacy - MIMO radio Combined Peak Power Spectral Density



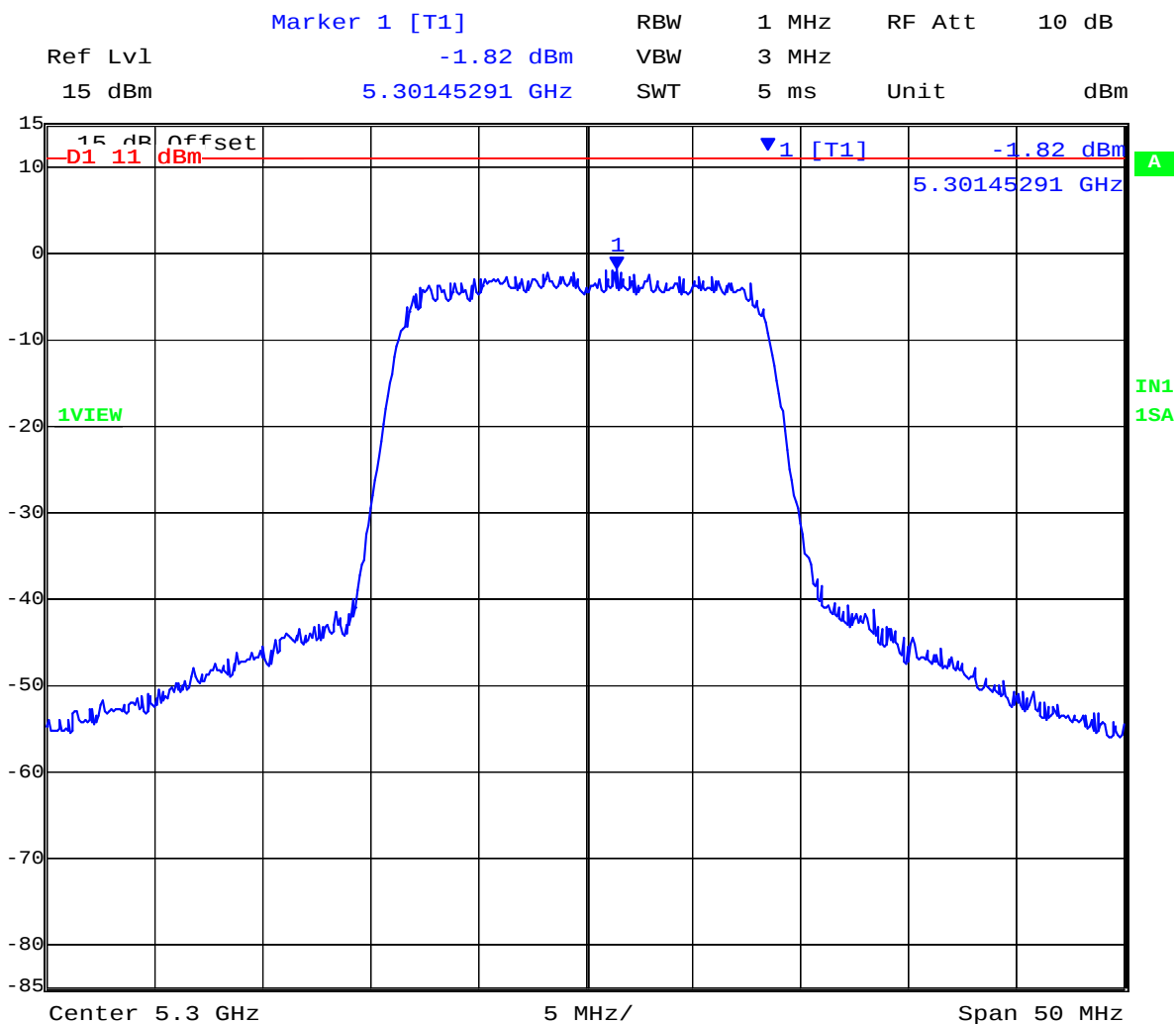
Date: 19.OCT.2010 08:51:46

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 146 of 465

5,300 MHz 802.11a Legacy - MIMO radio Chain a Peak Power Spectral Density



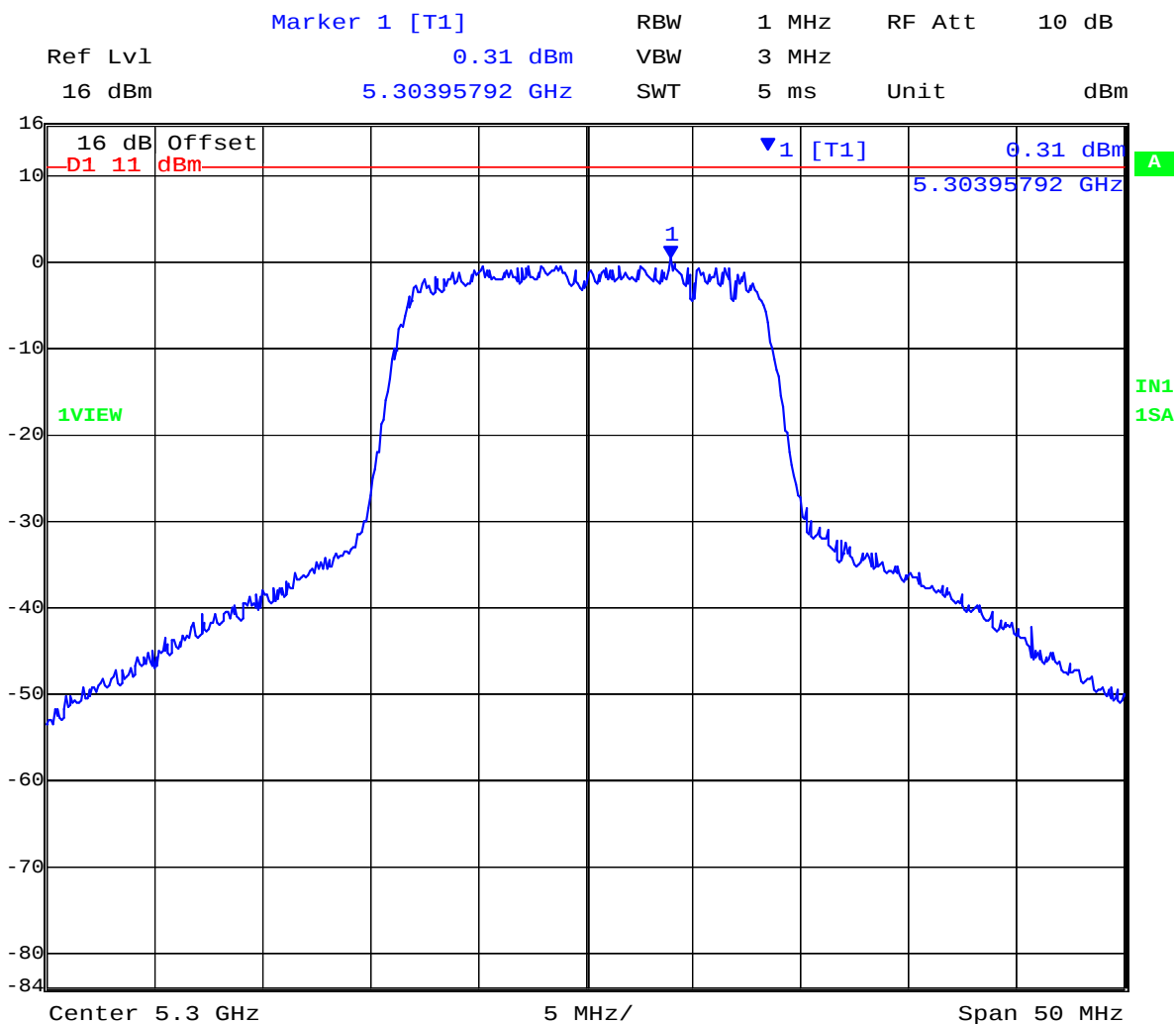
Date: 19.OCT.2010 09:22:38

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 147 of 465

5,300 MHz 802.11a Legacy - MIMO radio Chain b Peak Power Spectral Density



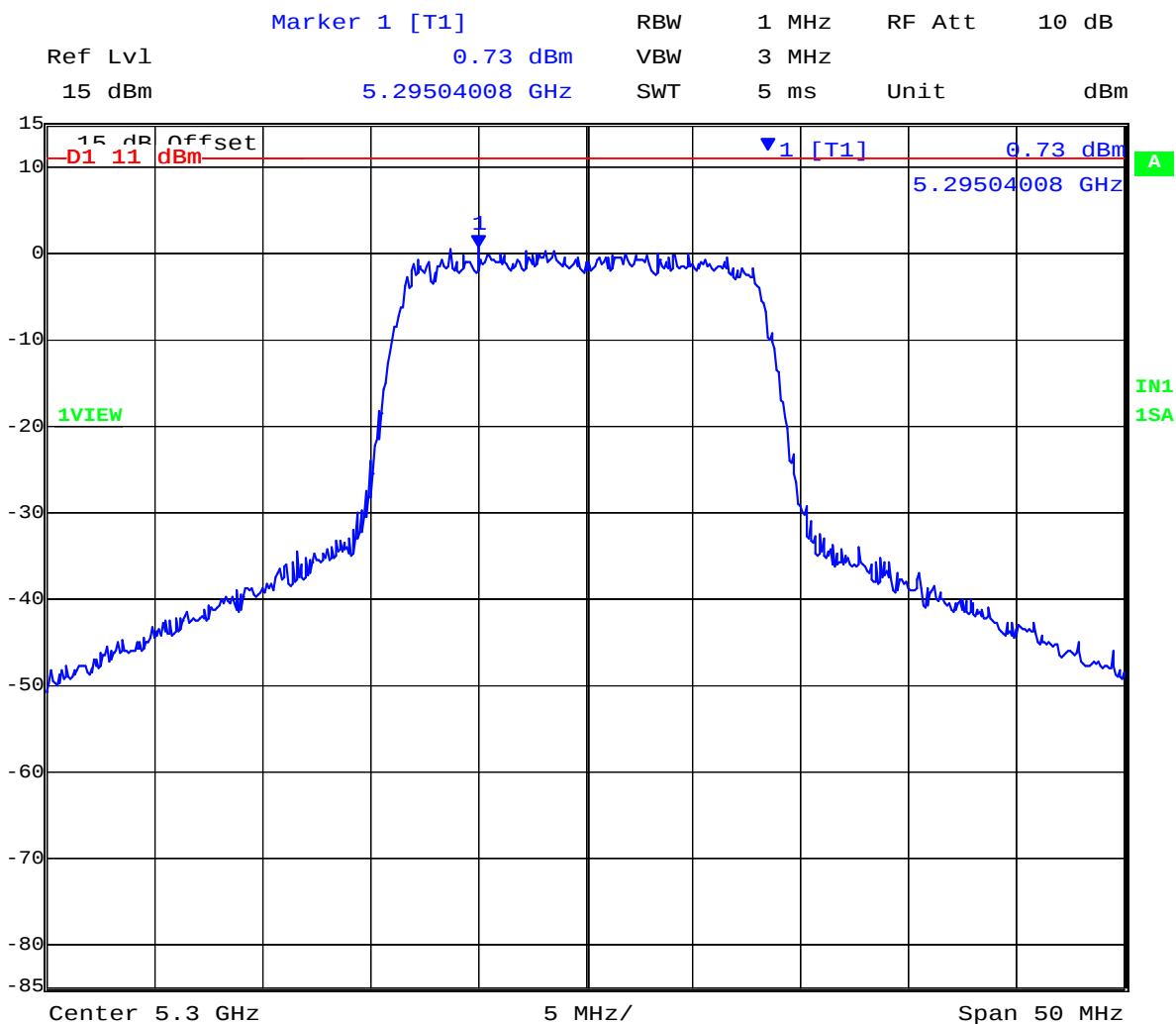
Date: 19.OCT.2010 09:17:55

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 148 of 465

5,300 MHz 802.11a Legacy - MIMO radio Chain c Peak Power Spectral Density



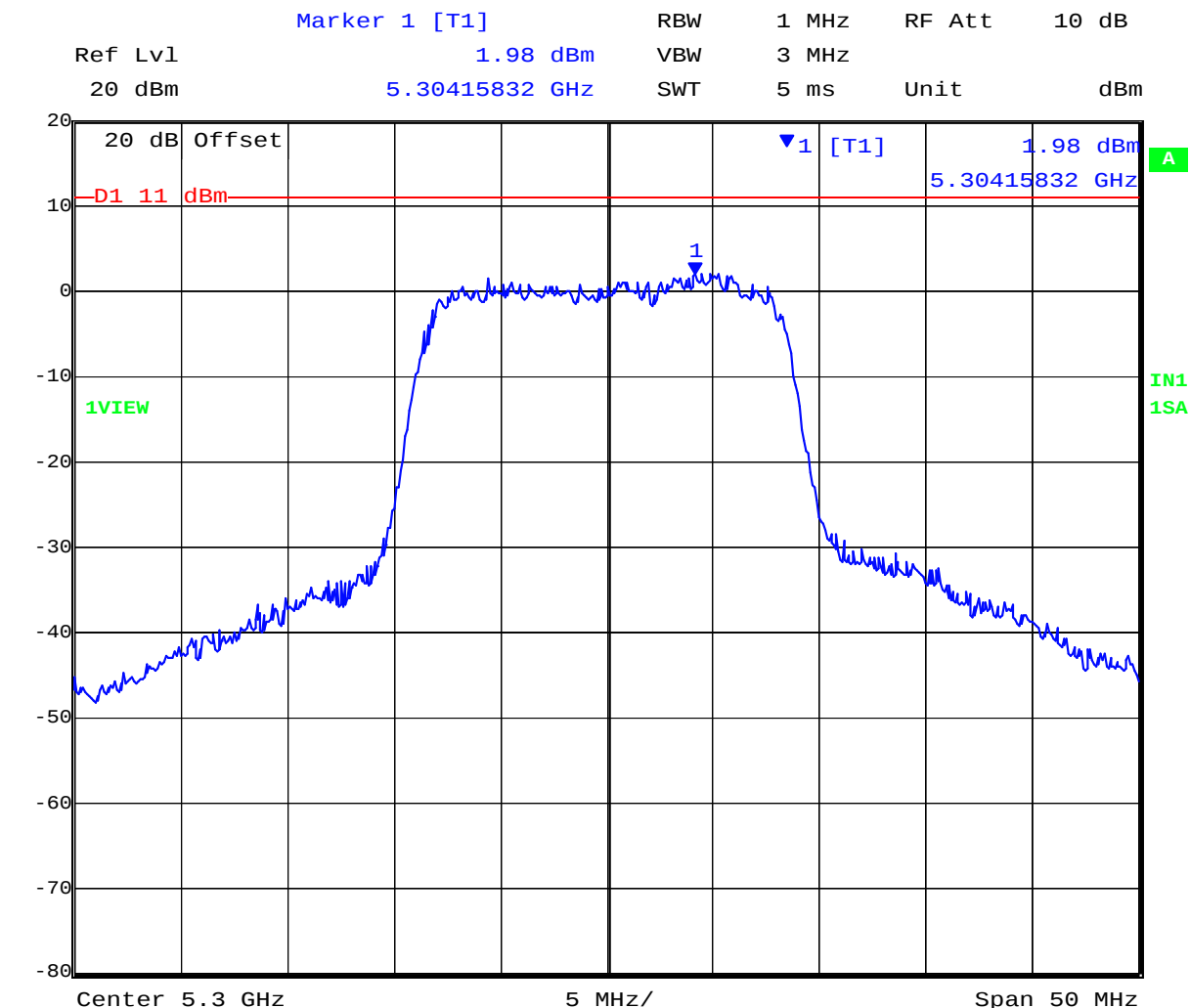
Date: 19.OCT.2010 09:20:16

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 149 of 465

5,300 MHz 802.11a Legacy - MIMO radio Combined Peak Power Spectral Density



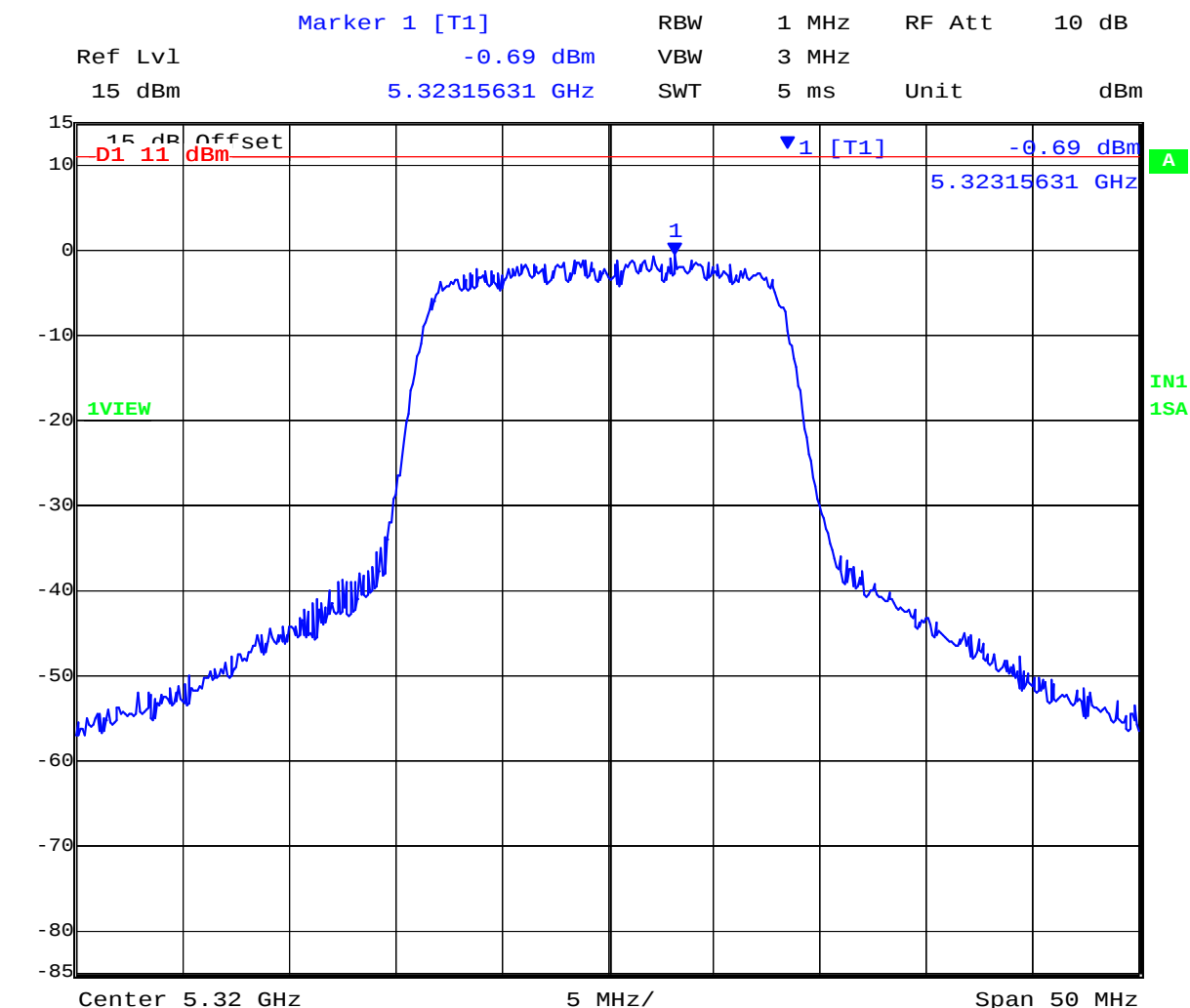
Date: 19.OCT.2010 09:25:02

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Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 150 of 465

5,320 MHz 802.11a Legacy - MIMO radio Chain a Peak Power Spectral Density



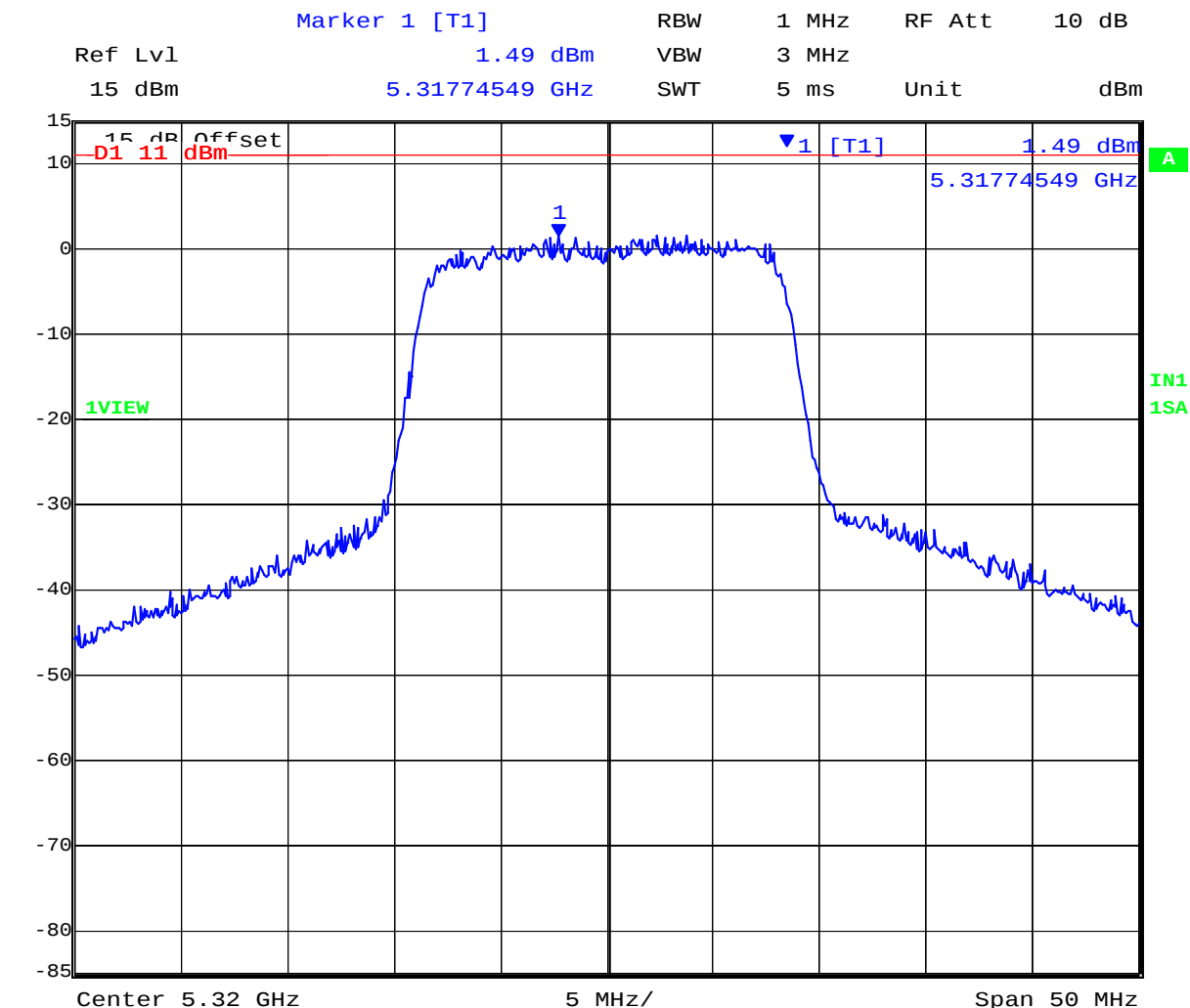
Date: 19.OCT.2010 10:00:48

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 151 of 465

5,320 MHz 802.11a Legacy - MIMO radio Chain b Peak Power Spectral Density



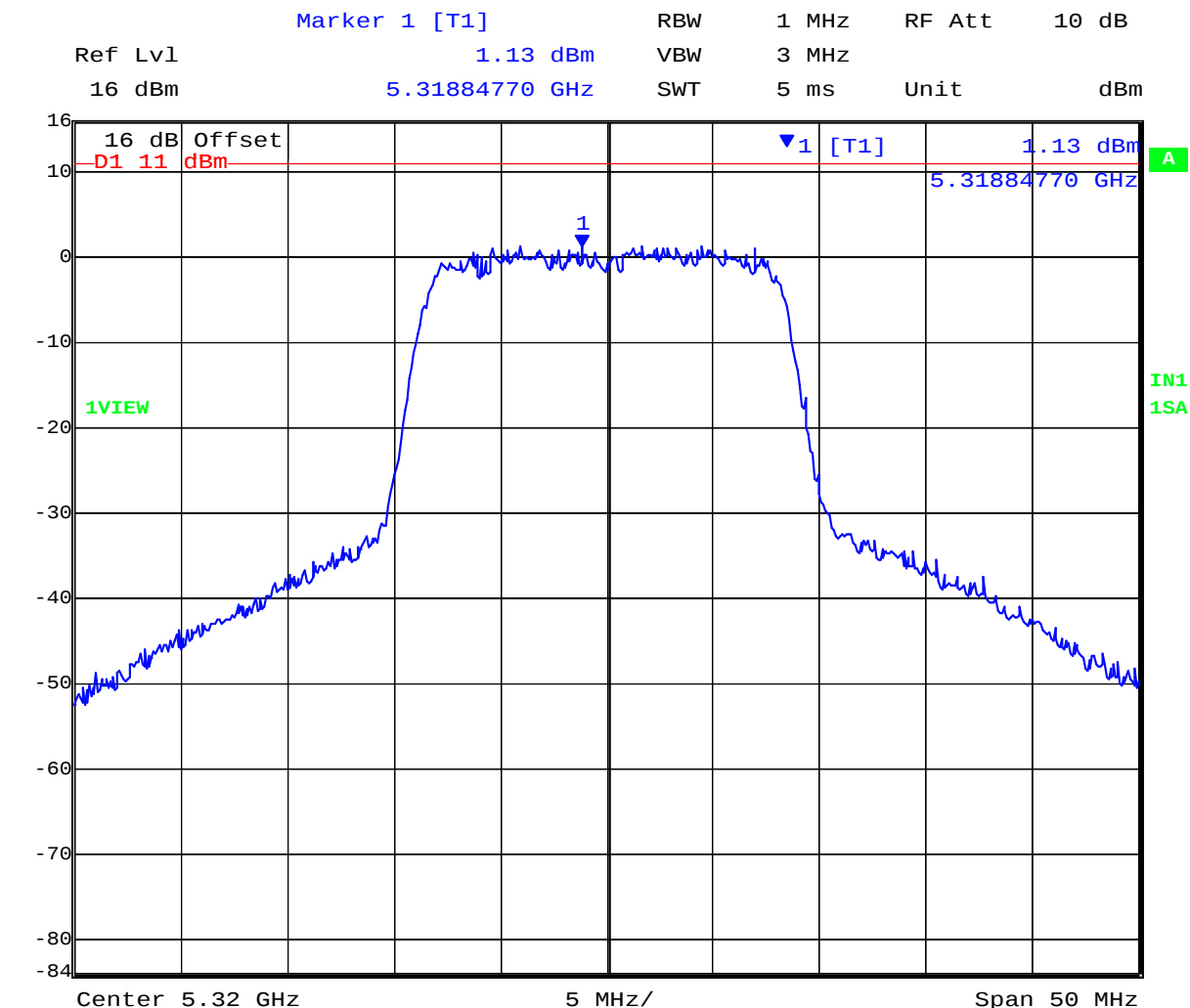
Date: 19.OCT.2010 09:58:25

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 152 of 465

5,320 MHz 802.11a Legacy - MIMO radio Chain c Peak Power Spectral Density



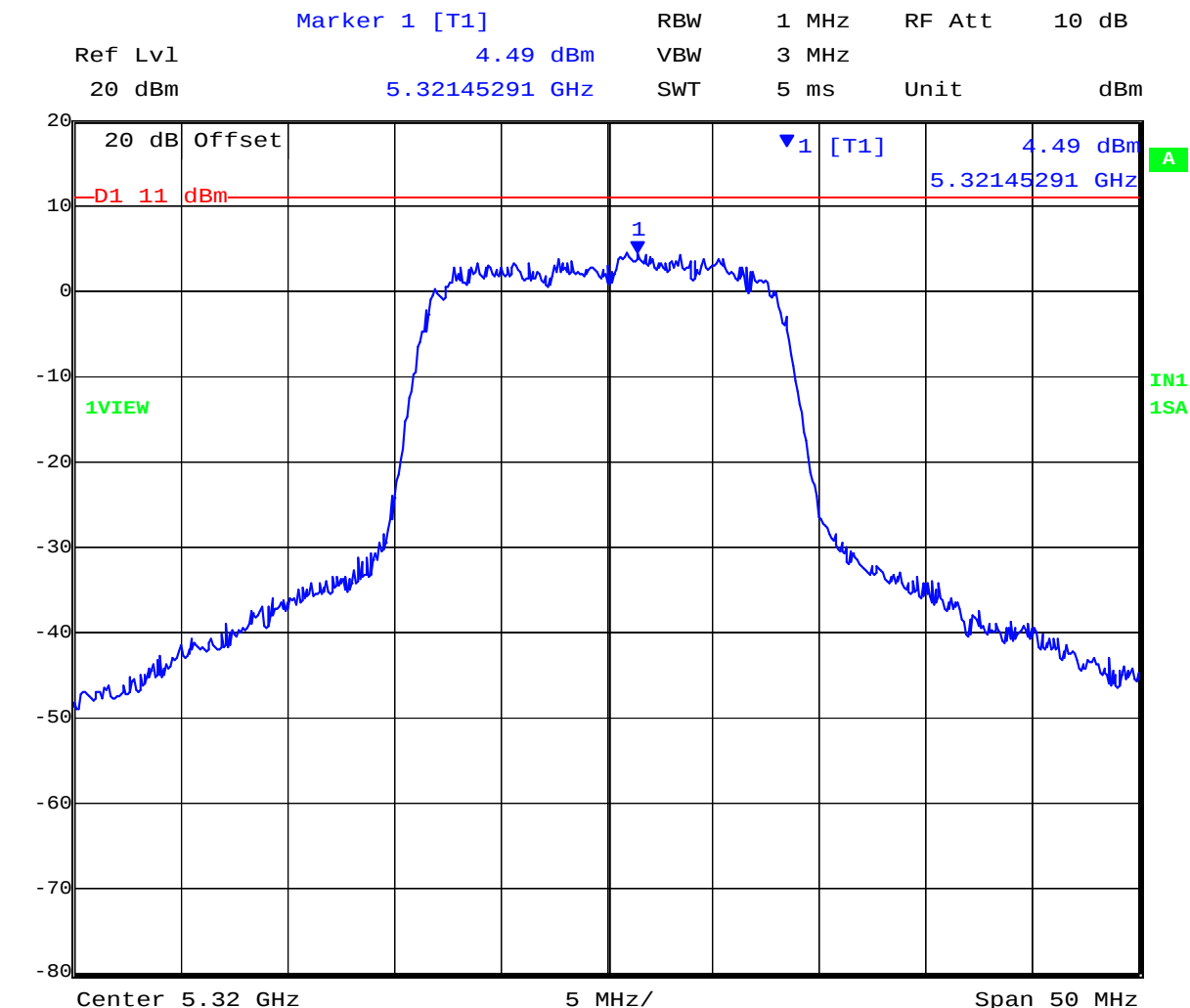
Date: 19.OCT.2010 09:56:05

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 153 of 465

5,320 MHz 802.11a Legacy - MIMO radio Combined Peak Power Spectral Density



Date: 19.OCT.2010 10:03:14

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 154 of 465

TABLE OF RESULTS – 802.11a Legacy - MIMO radio
5470 -5725 MHZ

Test Conditions:	15.407 (a)	Rel. Humidity (%):	35	to	42
Variant:	802.11 a	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2 dBi		
Applied Voltage:	28.0 Vdc				
Notes 1:					
Notes 2:					

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5500	-1.48	-2.33	-0.71		1.53		11.00	-9.47
5560	-2.49	-2.07	-4.34		0.69		11.00	-10.31
5700	-0.99	0.64	-3.89		2.23		11.00	-8.77

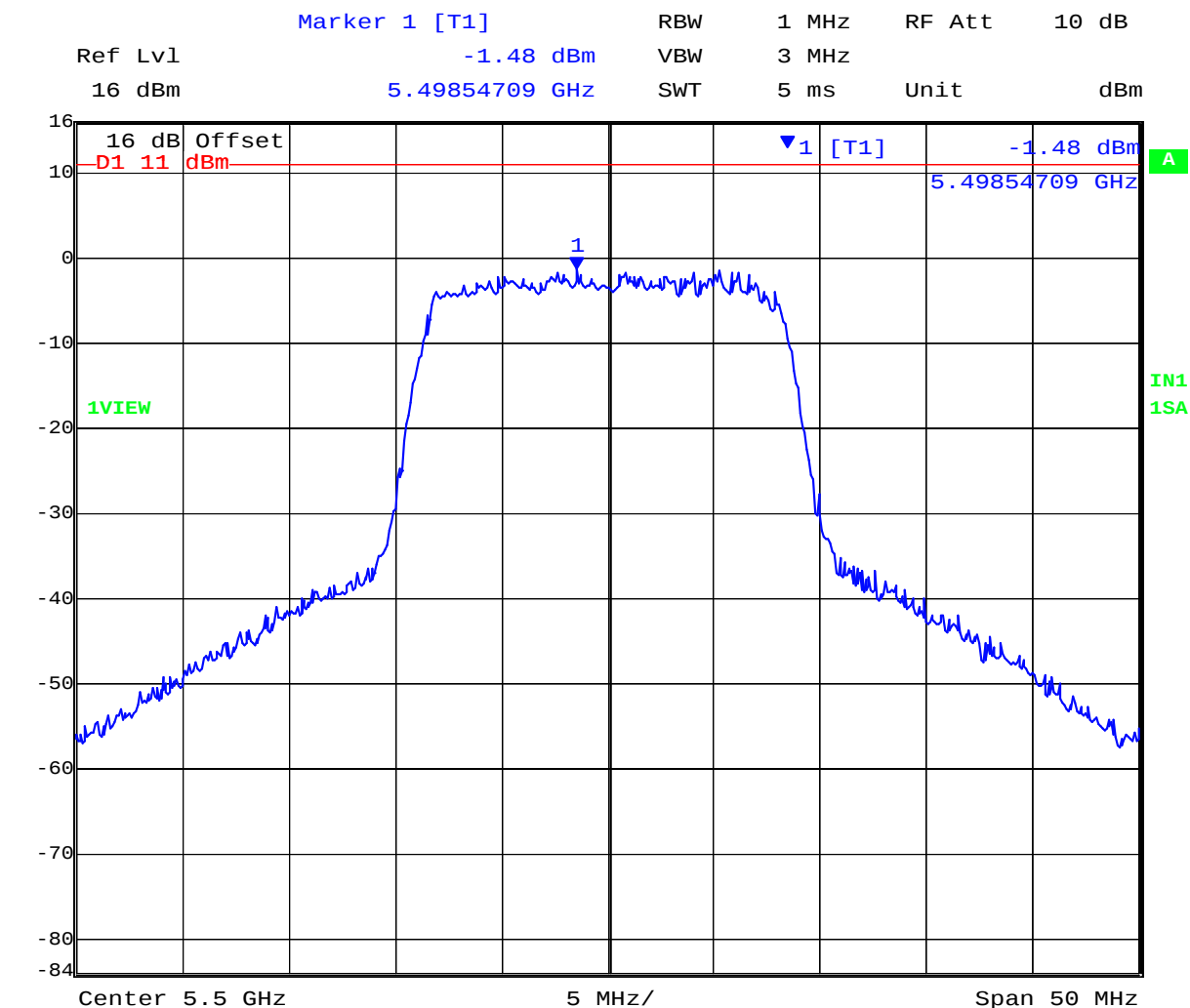
Measurement uncertainty:	±1.33 dB
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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 155 of 465

5,500 MHz 802.11a Legacy - MIMO radio Chain a Peak Power Spectral Density



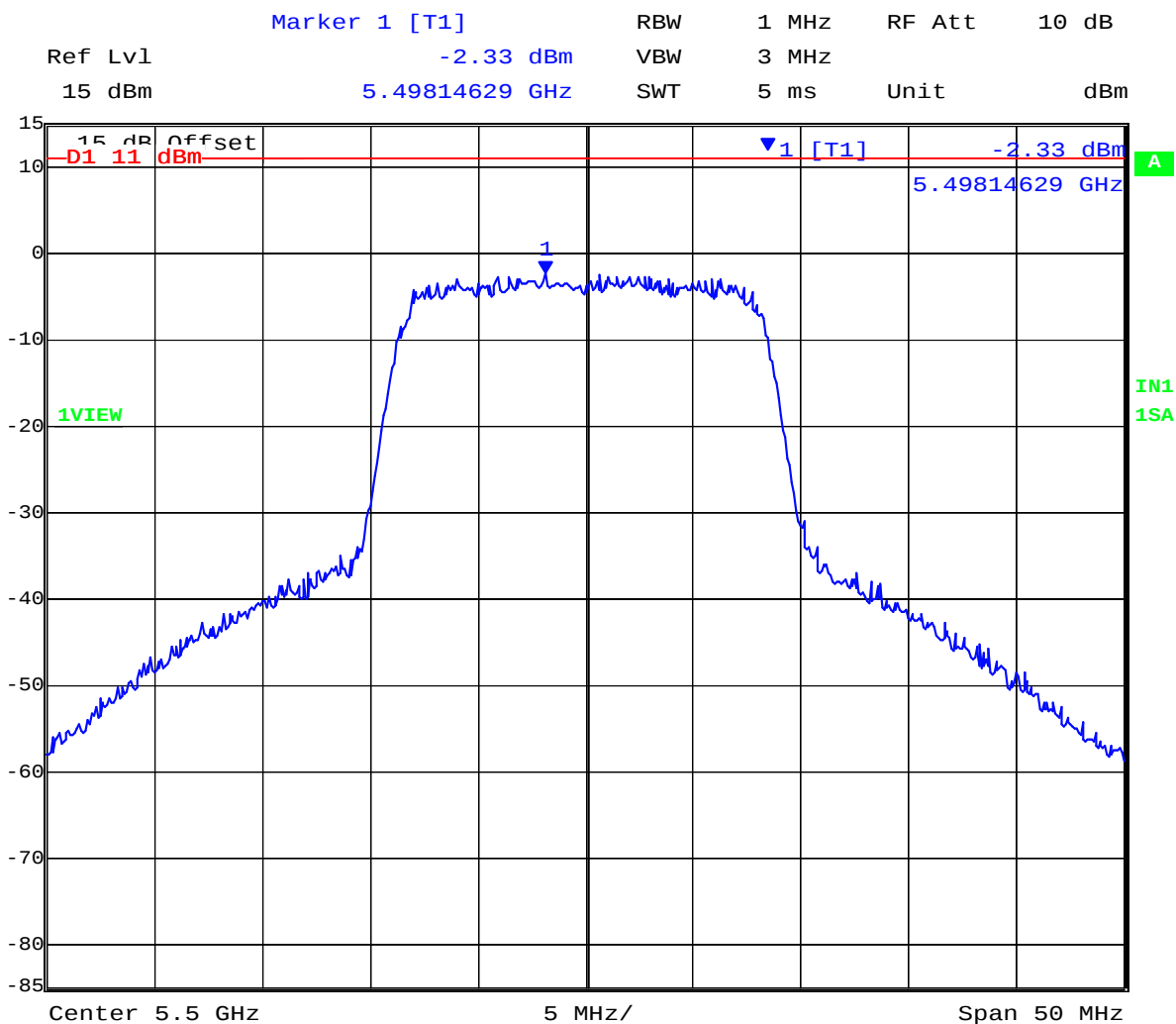
Date: 19.OCT.2010 14:28:55

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 156 of 465

5,500 MHz 802.11a Legacy - MIMO radio Chain b Peak Power Spectral Density



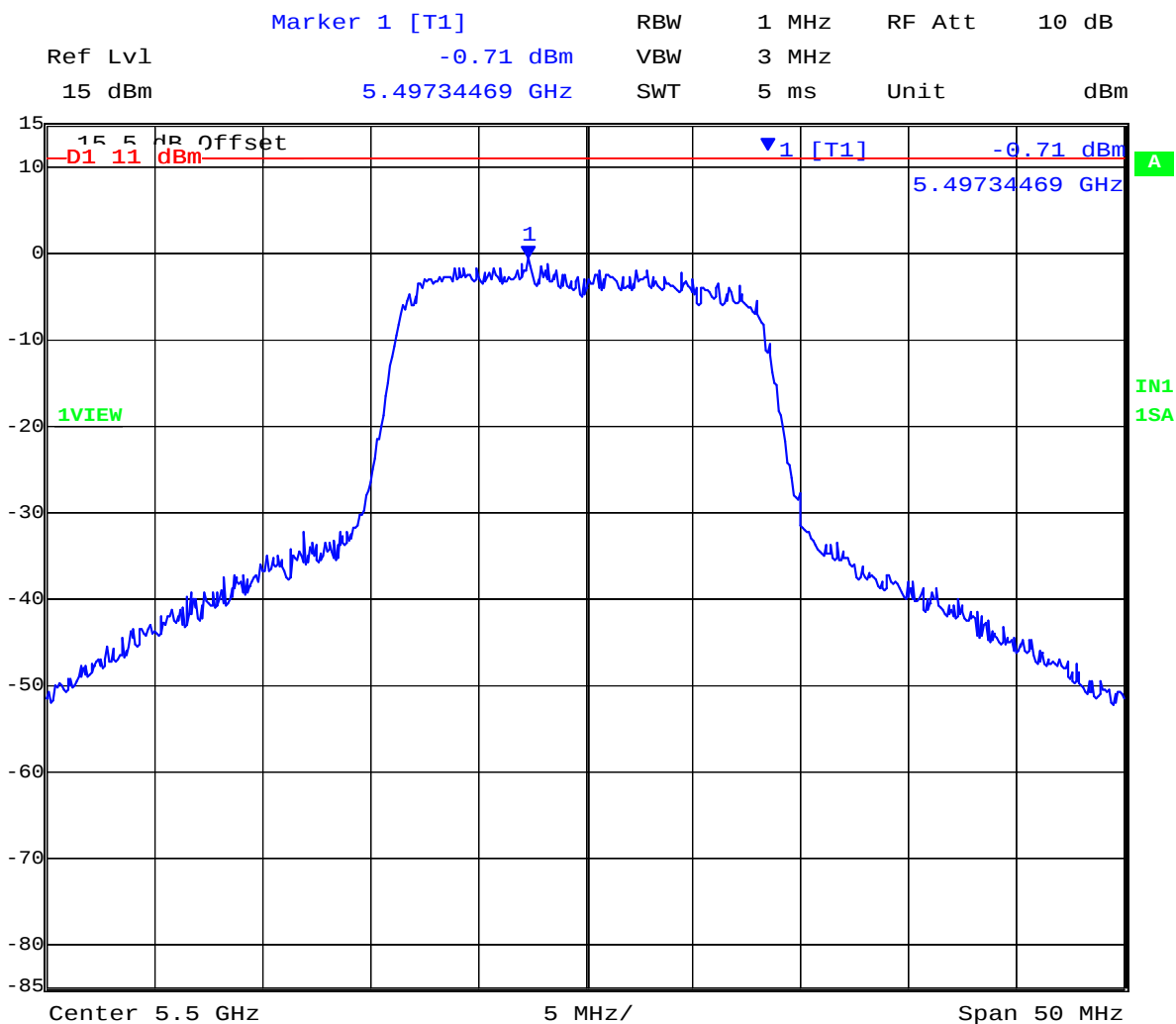
Date: 19.OCT.2010 14:31:16

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 157 of 465

5,500 MHz 802.11a Legacy - MIMO radio Chain c Peak Power Spectral Density



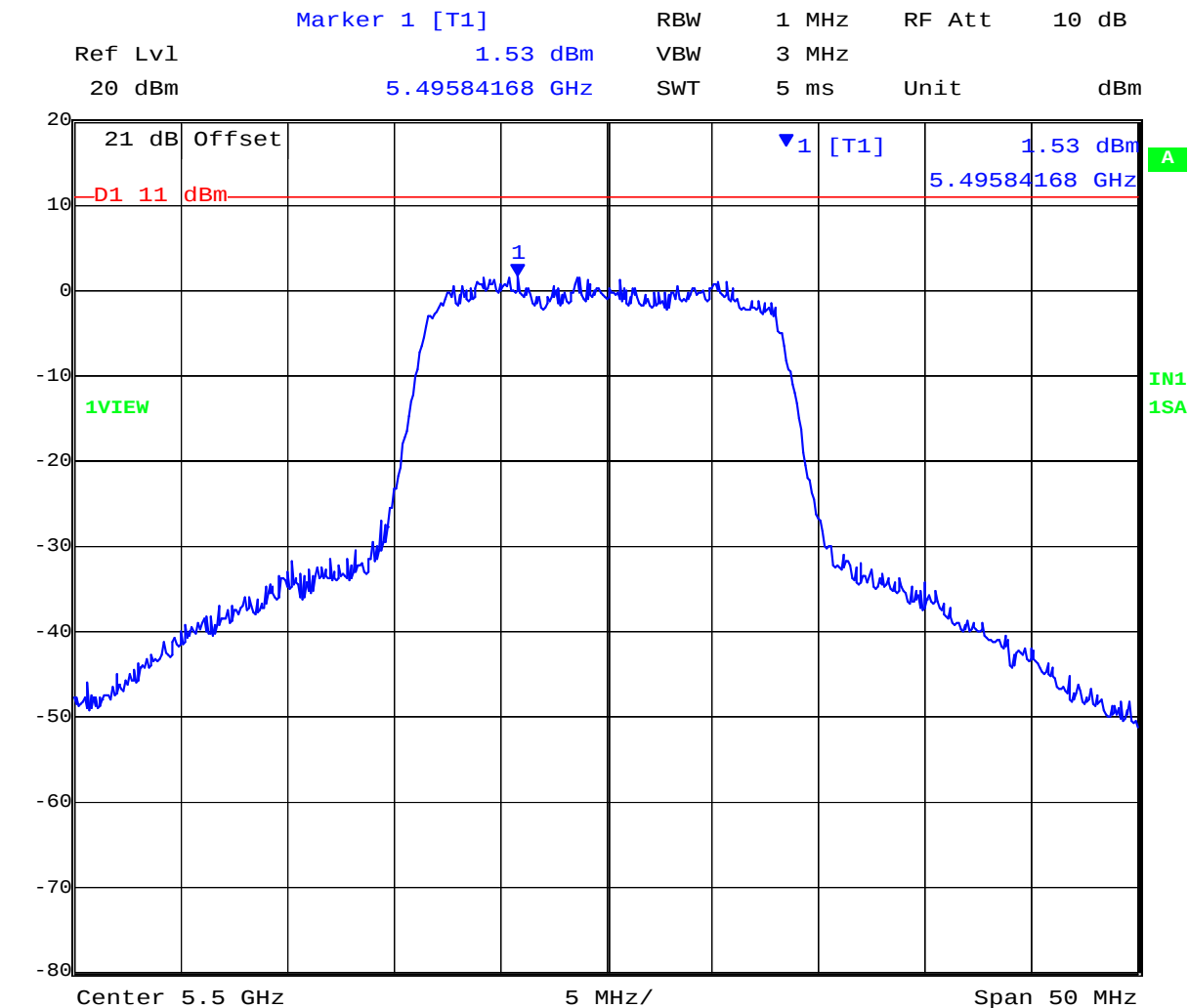
Date: 19.OCT.2010 14:33:37

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 158 of 465

5,500 MHz 802.11a Legacy - MIMO radio Combined Peak Power Spectral Density



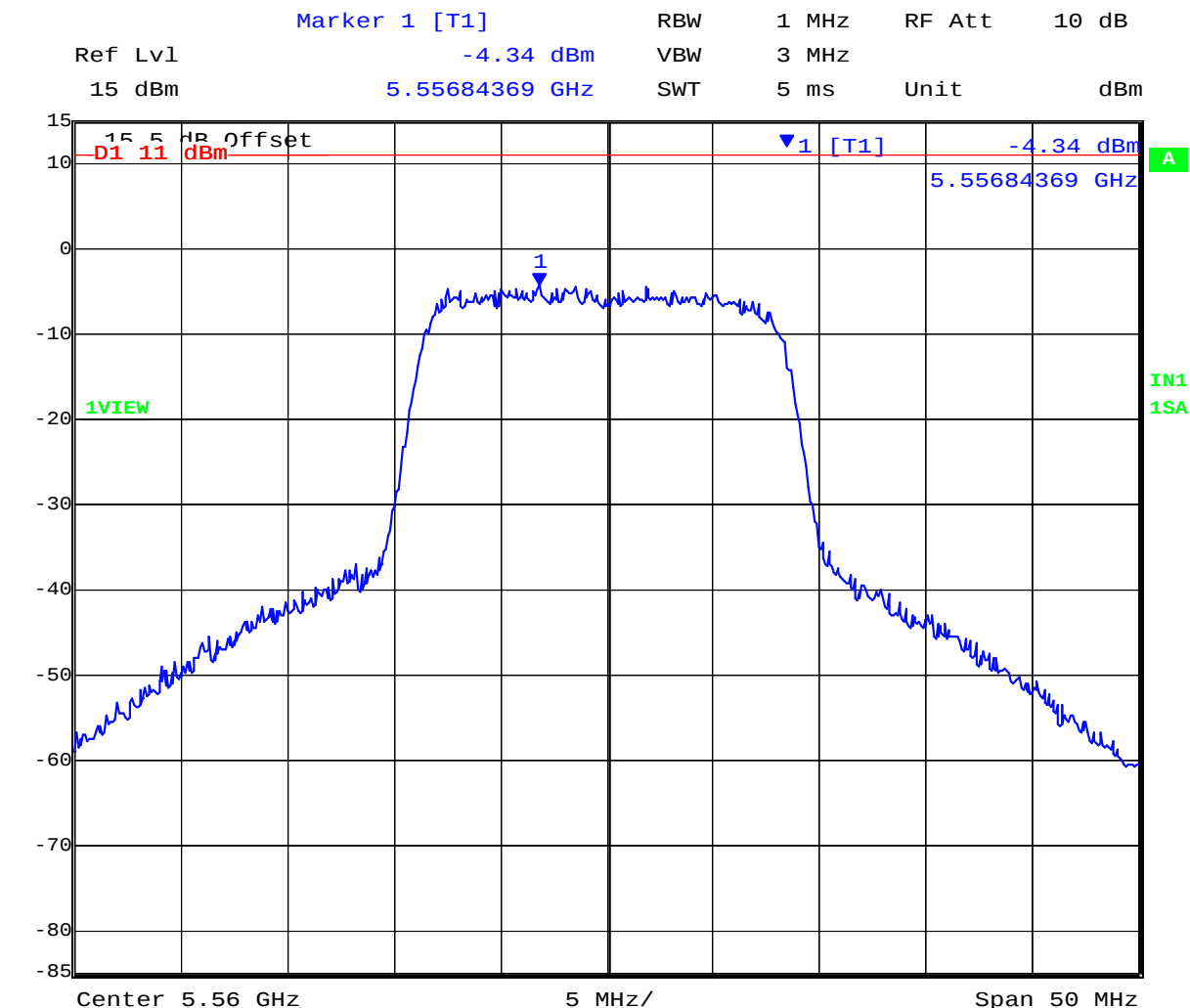
Date: 19.OCT.2010 14:36:02

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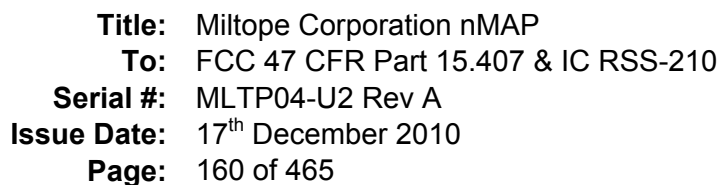
Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 159 of 465

5,560 MHz 802.11a Legacy - MIMO radio Chain a Peak Power Spectral Density



Date: 19.OCT.2010 15:04:22

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	Marker 1 [T1]	RBW	1 MHz	RF Att	10 dB
Ref Lvl	-2.49 dBm	VBW	3 MHz		
16 dBm	5.56045090 GHz	SWT	5 ms	Unit	dBm

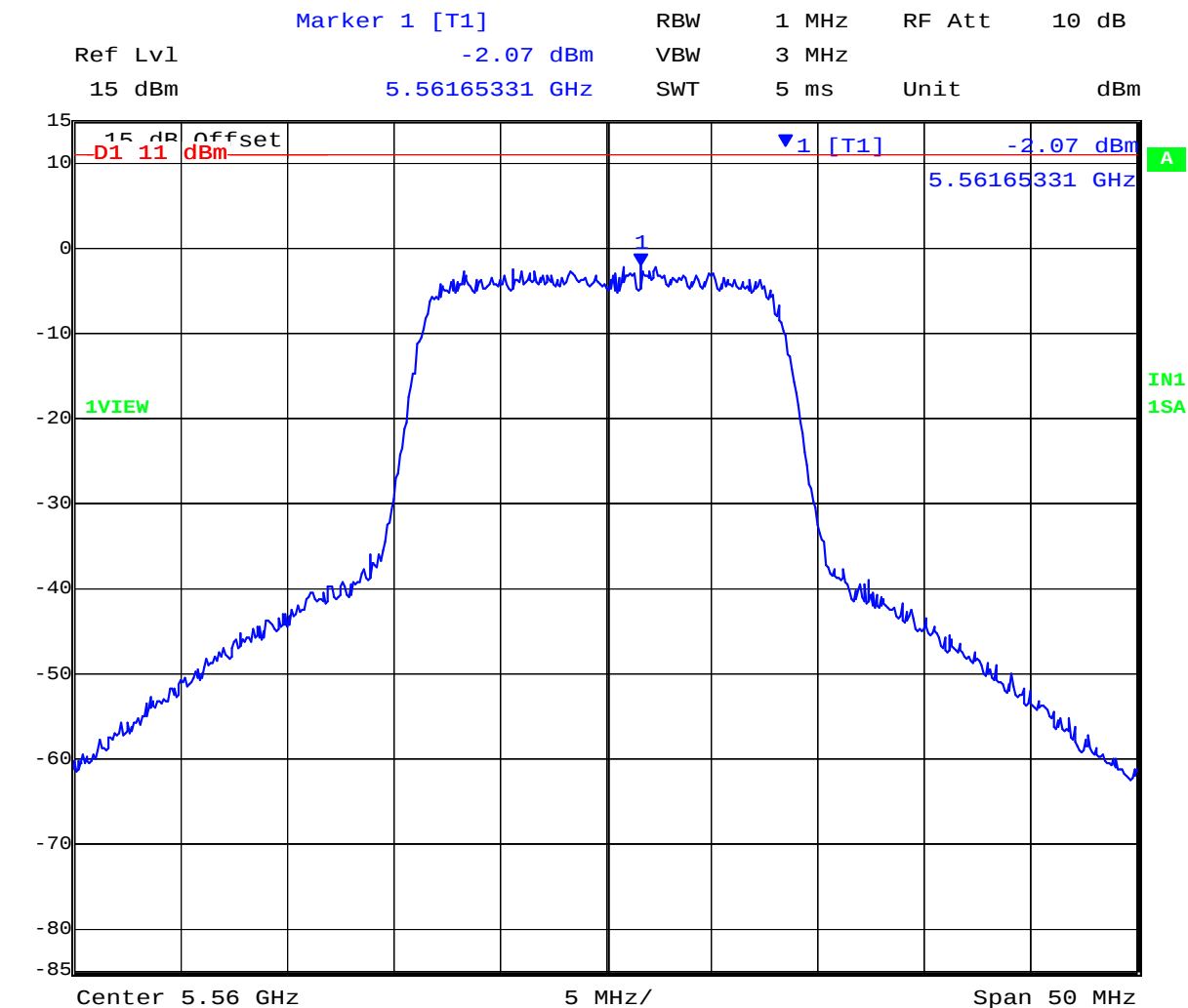


MiCOM Labs, 440 Boulder Court, Suite 200, Pleasanton, CA 94566 USA, Phone: 925.462.0304, Fax: 925.462.0306, www.micomlabs.com



Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 161 of 465

5,560 MHz 802.11a Legacy - MIMO radio Chain c Peak Power Spectral Density



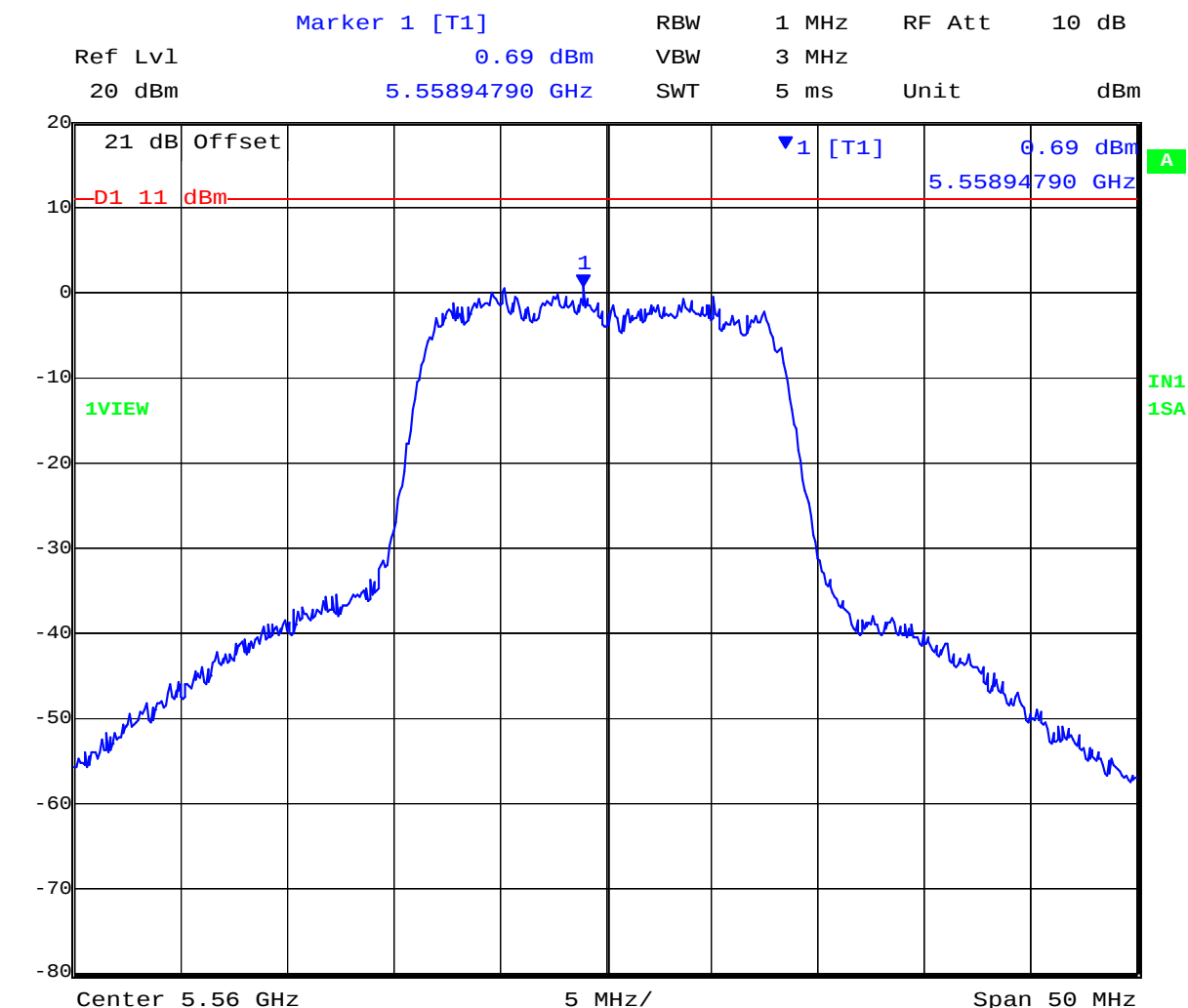
Date: 19.OCT.2010 15:02:01

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 162 of 465

5,560 MHz 802.11a Legacy - MIMO radio Combined Peak Power Spectral Density



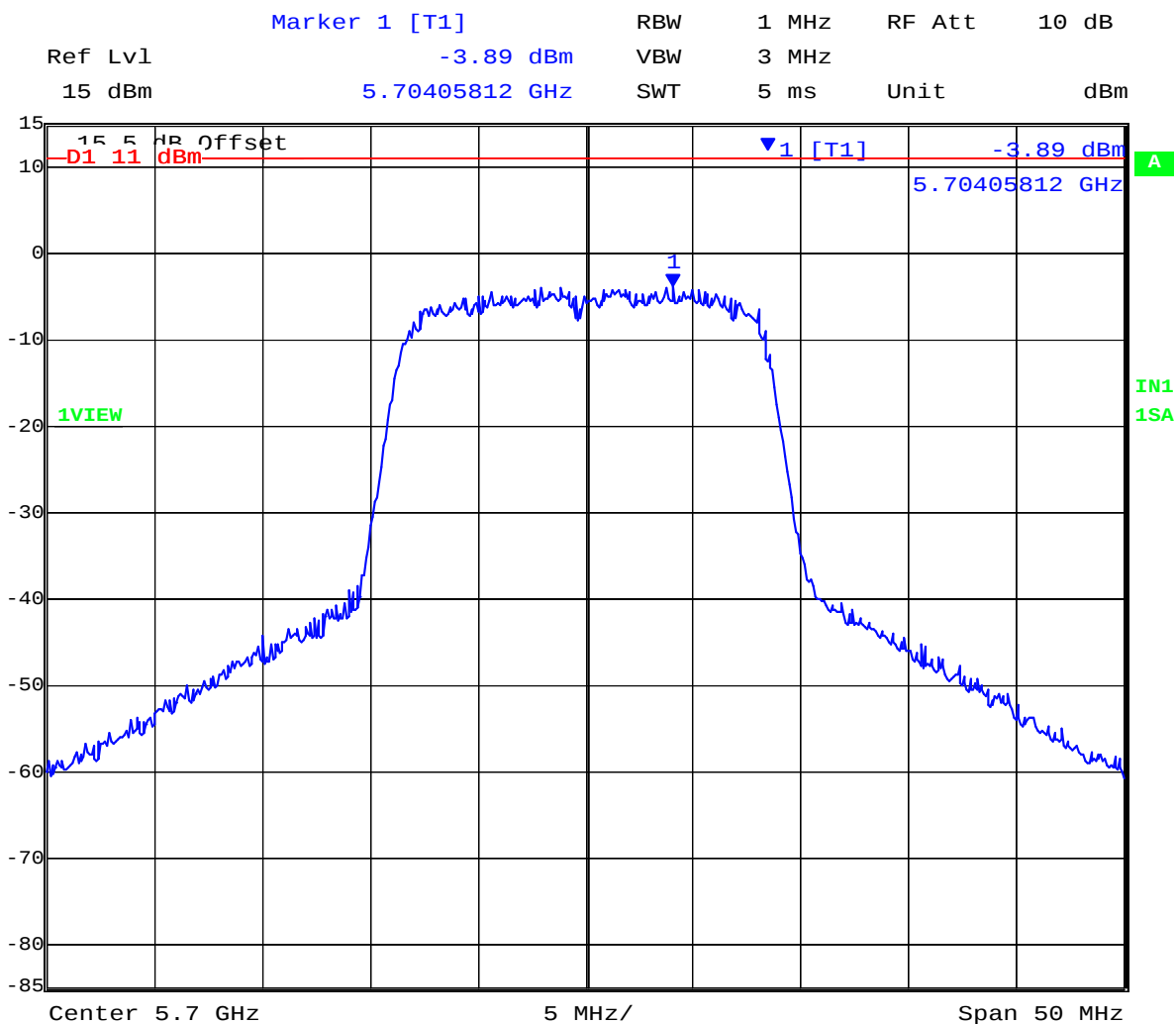
Date: 19.OCT.2010 15:06:48

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 163 of 465

5,700 MHz 802.11a Legacy - MIMO radio Chain a Peak Power Spectral Density



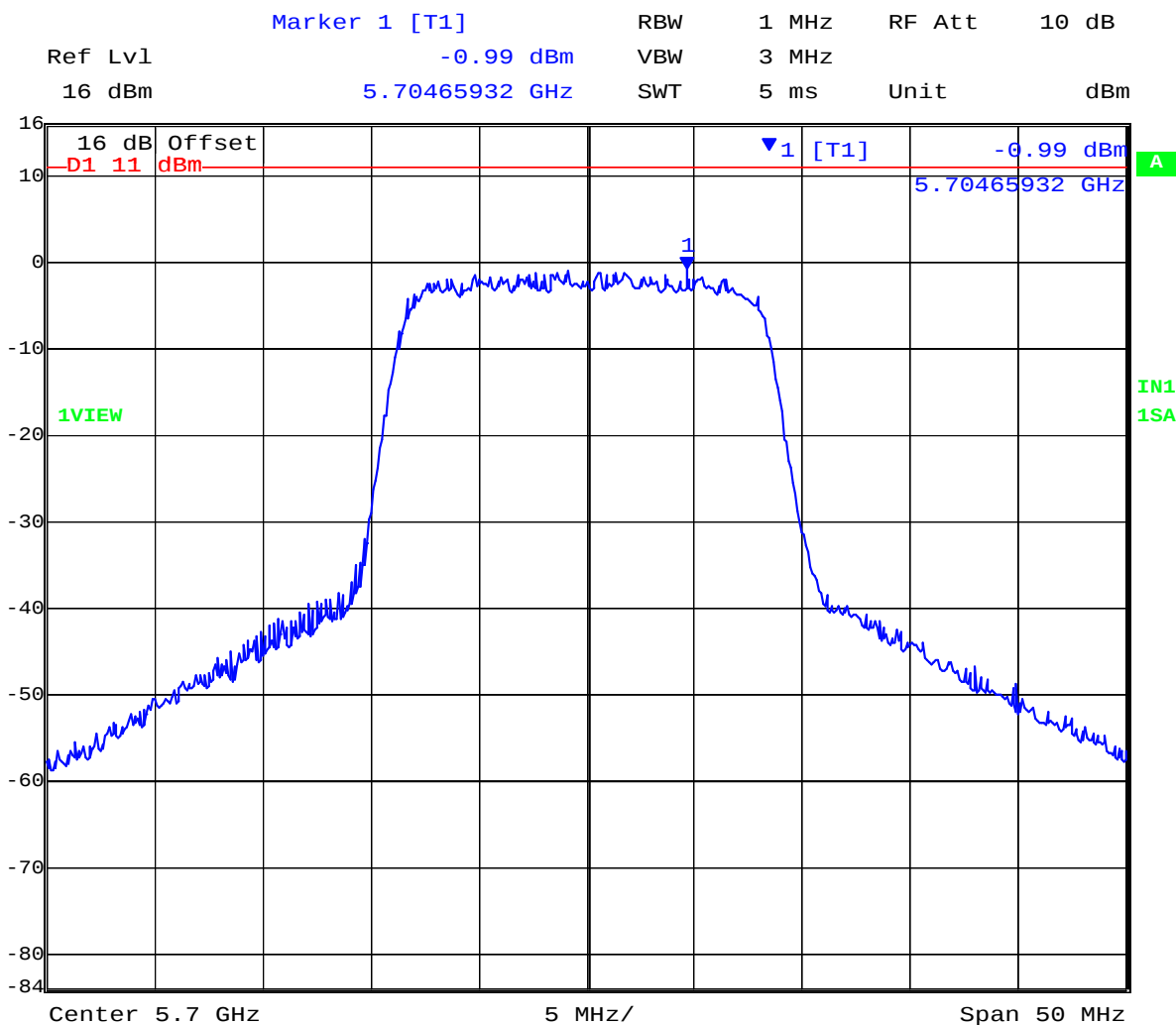
Date: 19.OCT.2010 15:36:50

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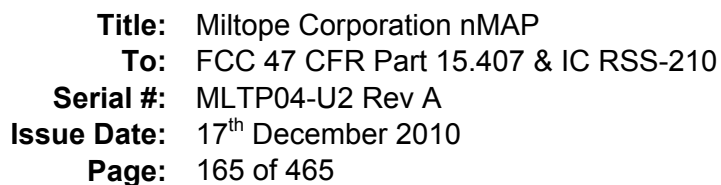
Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 164 of 465

5,700 MHz 802.11a Legacy - MIMO radio Chain b Peak Power Spectral Density

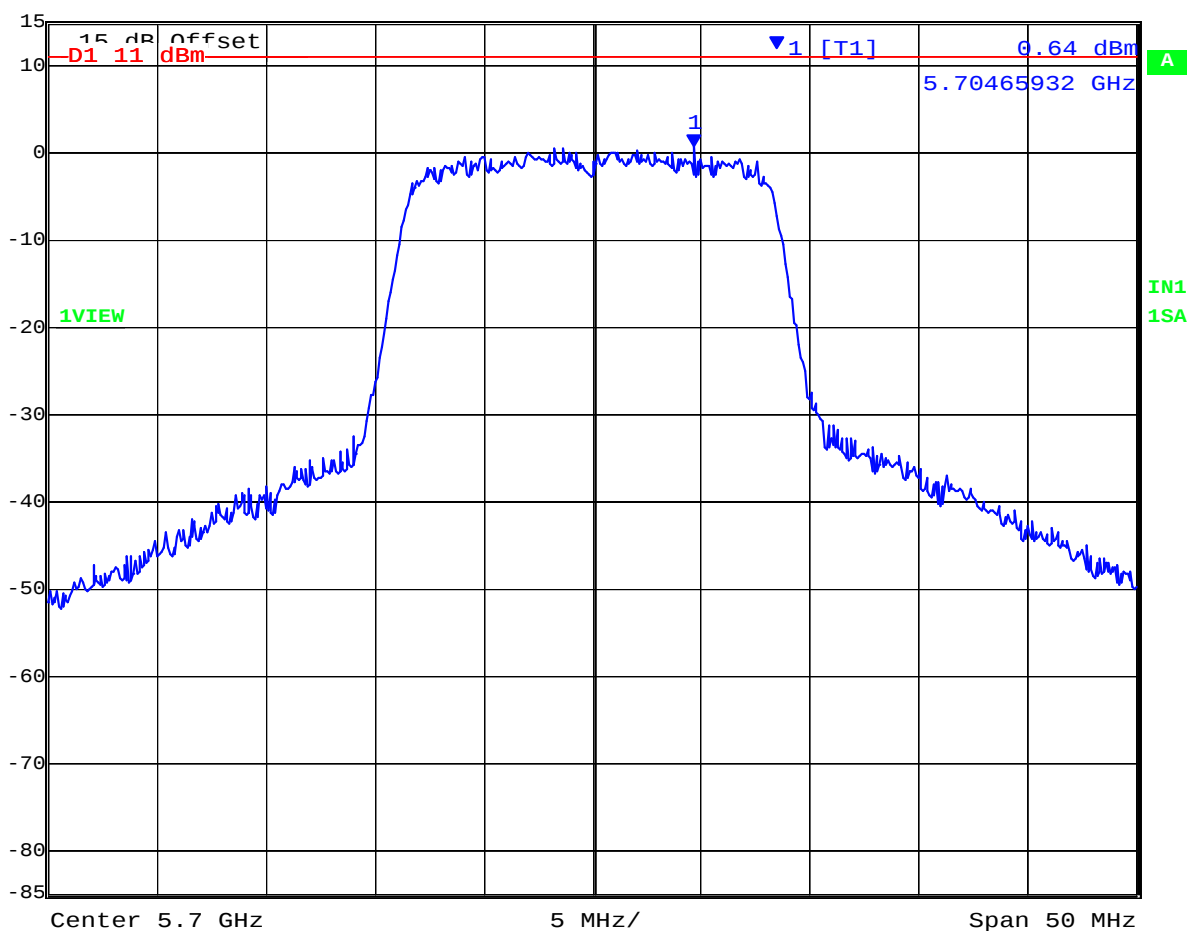


Date: 19.OCT.2010 15:32:05

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	Marker 1 [T1]	RBW	1 MHz	RF Att	10 dB
Ref Lvl	0.64 dBm	VBW	3 MHz		
15 dBm	5.70465932 GHz	SWT	5 ms	Unit	dBm



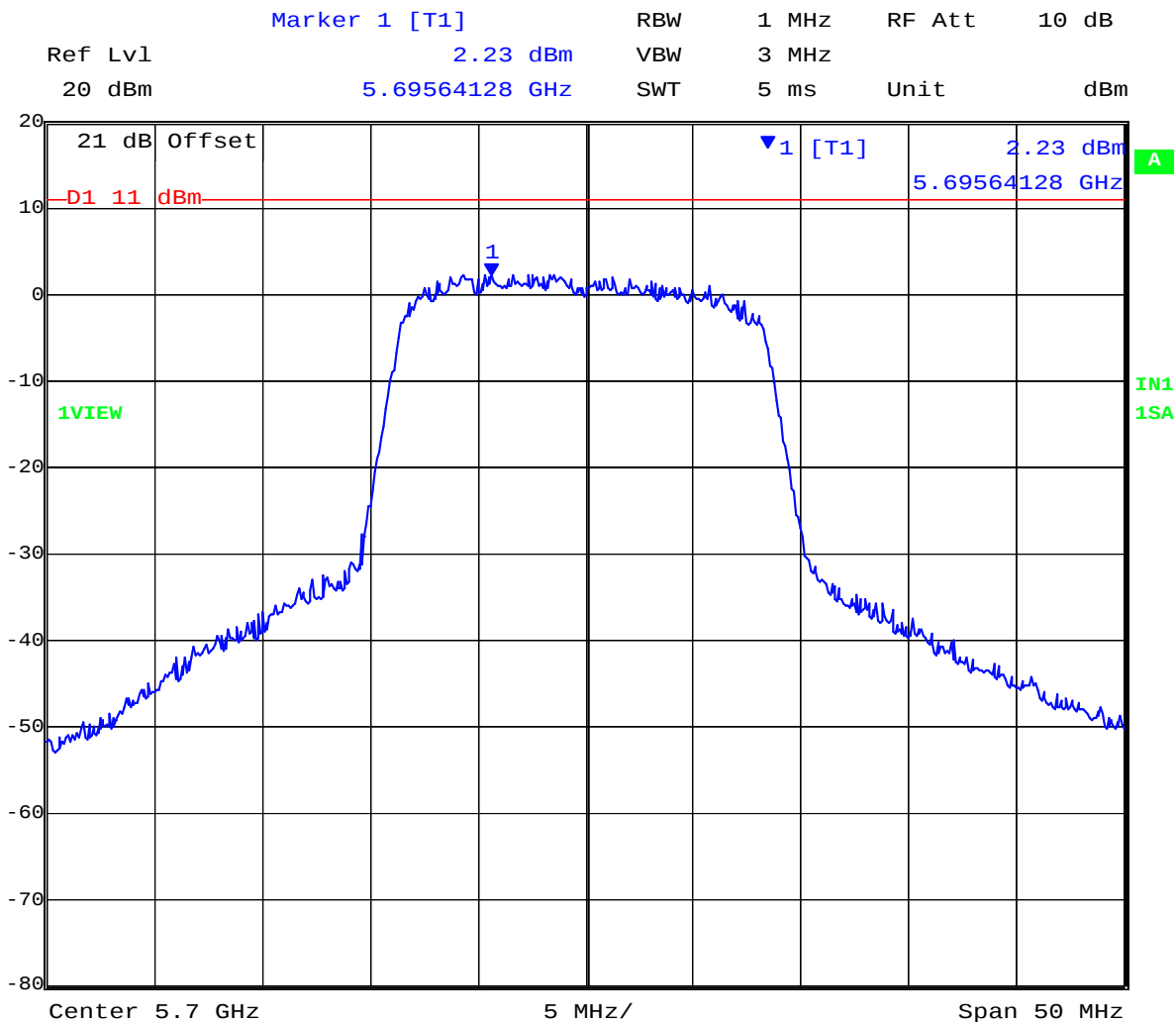
Date: 19.OCT.2010 15:34:28

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 166 of 465

5,700 MHz 802.11a Legacy - MIMO radio Combined Peak Power Spectral Density



Date: 19.OCT.2010 15:39:16

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 167 of 465

TABLE OF RESULTS – 802.11n HT20 - MIMO RADIO

5150 - 5250 MHZ

Test Conditions:	15.407 (a)	Rel. Humidity (%):	35	to	42
Variant:	802.11 n HT-20	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2 dBi		
Applied Voltage:	28.0 Vdc				
Notes 1:					
Notes 2:					

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5180	-1.64	-1.51	-2.10		0.40		4.00	-3.60
5200	-2.24	-2.49	-3.36		0.20		4.00	-3.80
5240	-2.06	-0.96	-2.71		0.76		4.00	-3.24

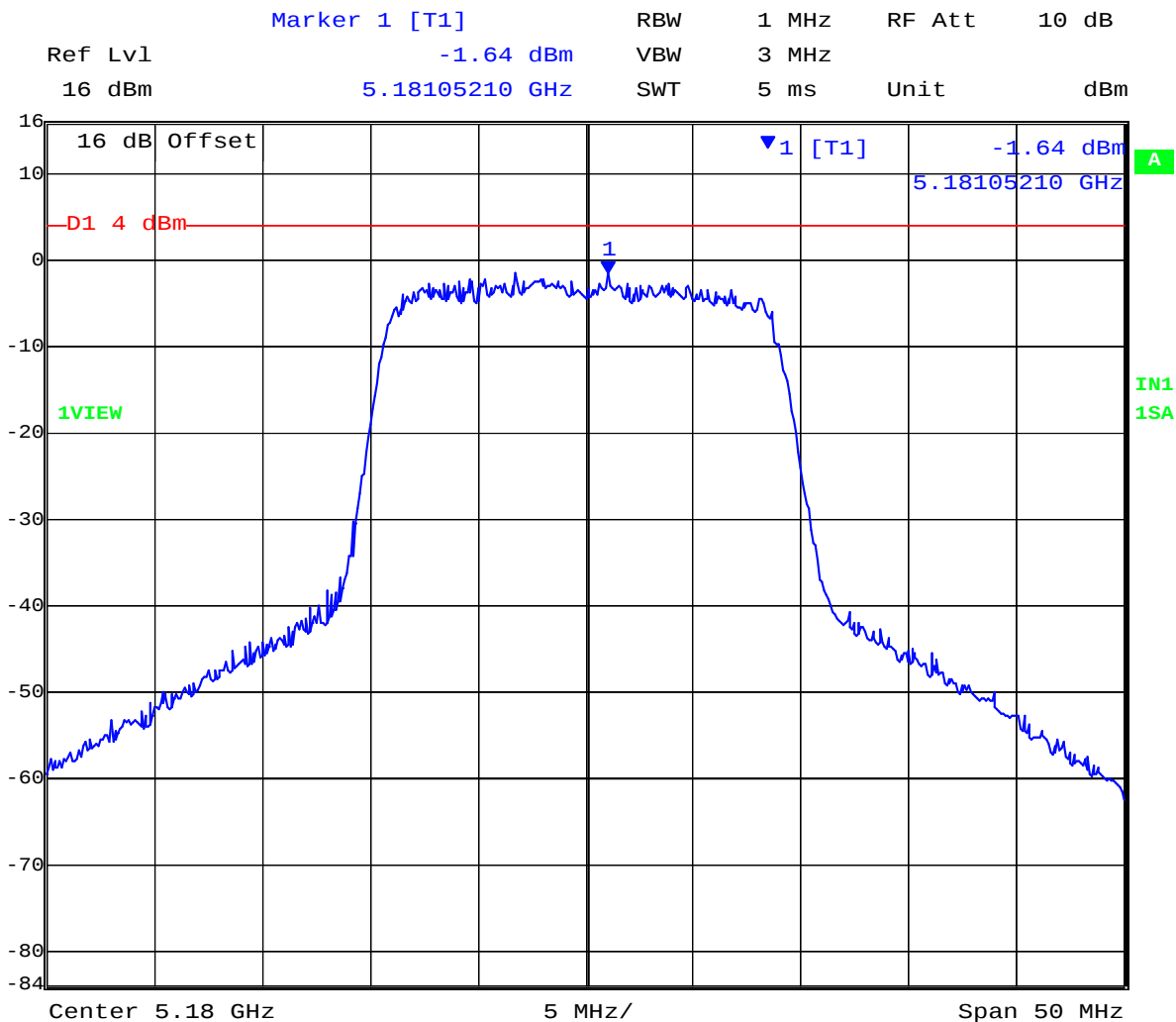
Measurement uncertainty:	±1.33 dB
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 168 of 465

5,180 MHz 802.11n HT20 - MIMO RADIO Chain a Peak Power Spectral Density



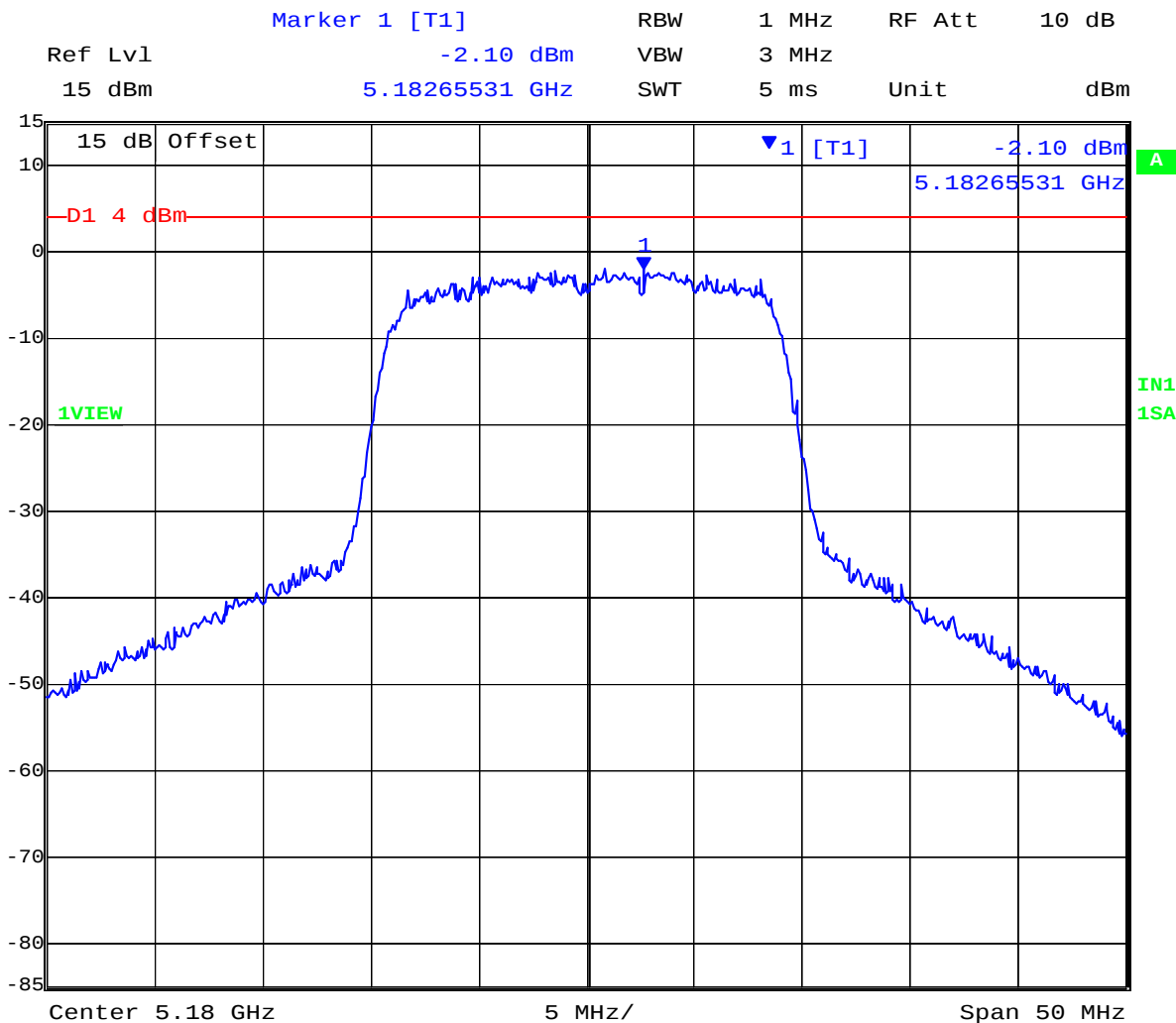
Date: 18.OCT.2010 14:01:04

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 169 of 465

5,180 MHz 802.11n HT20 - MIMO RADIO Chain b Peak Power Spectral Density



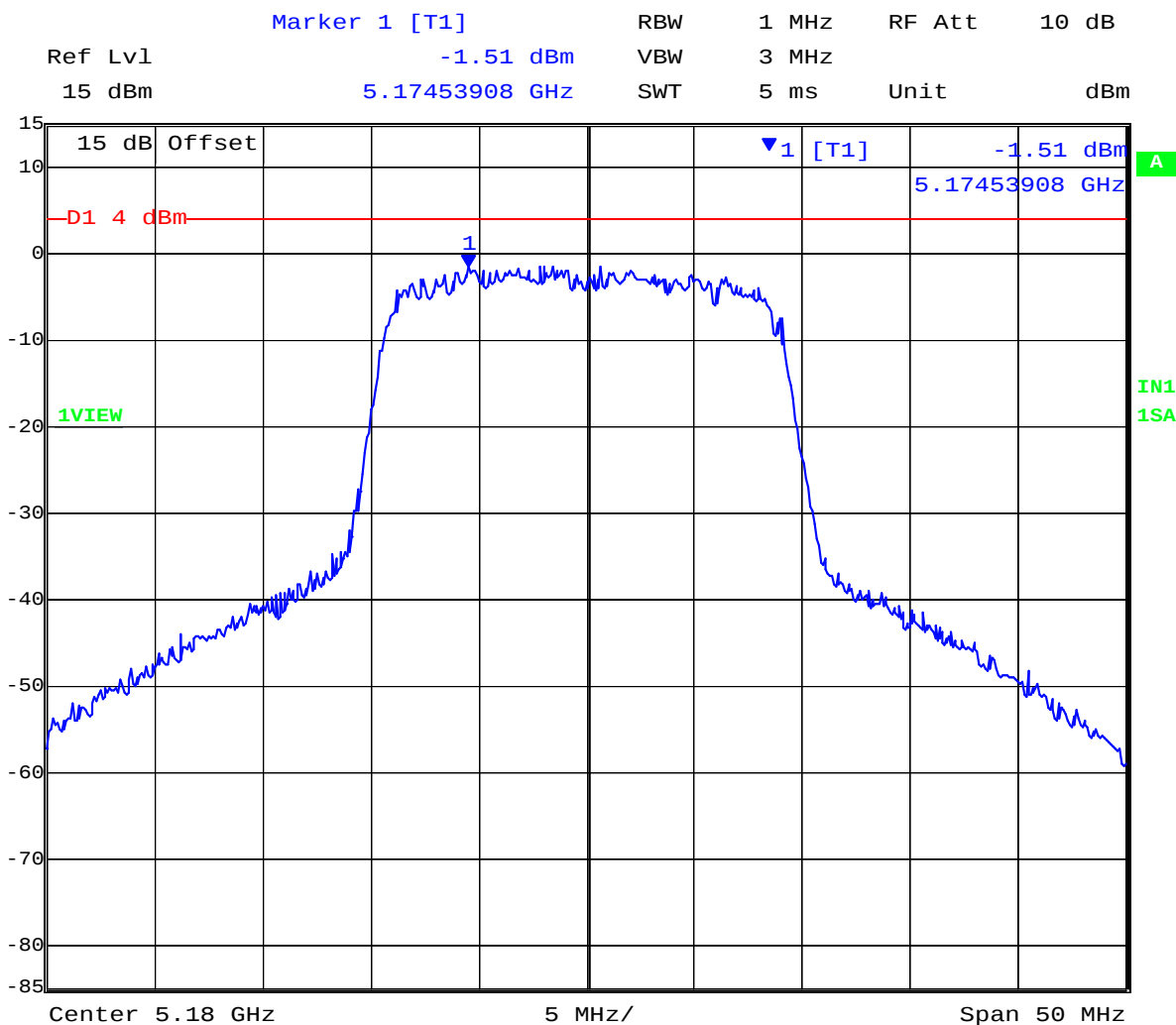
Date: 18.OCT.2010 14:05:46

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 170 of 465

5,180 MHz 802.11n HT20 - MIMO RADIO Chain c Peak Power Spectral Density



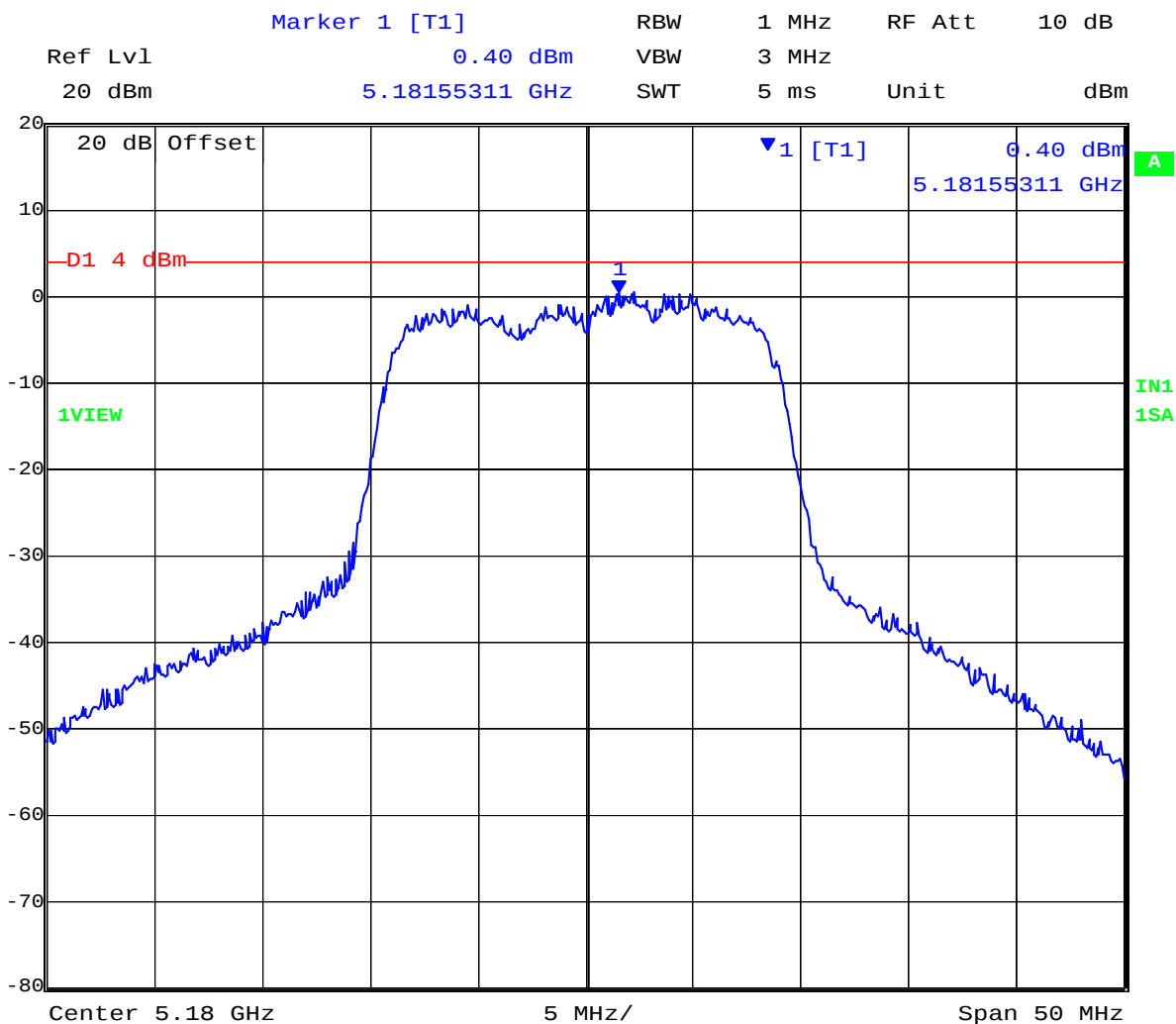
Date: 18.OCT.2010 14:03:24

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 171 of 465

5,180 MHz 802.11n HT20 - MIMO RADIO Combined Peak Power Spectral Density



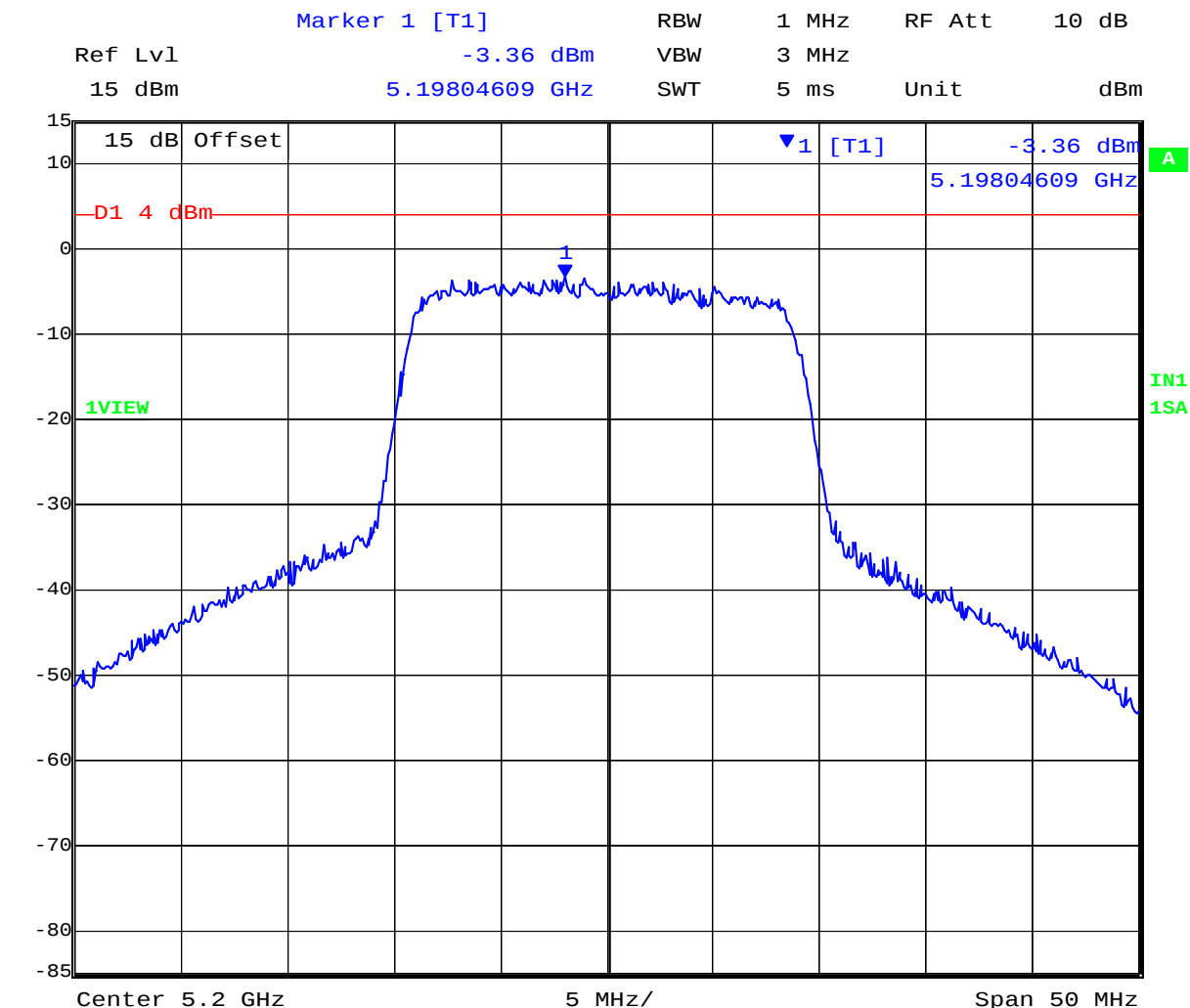
Date: 18.OCT.2010 14:08:12

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 172 of 465

5,200 MHz 802.11n HT20 - MIMO RADIO Chain a Peak Power Spectral Density



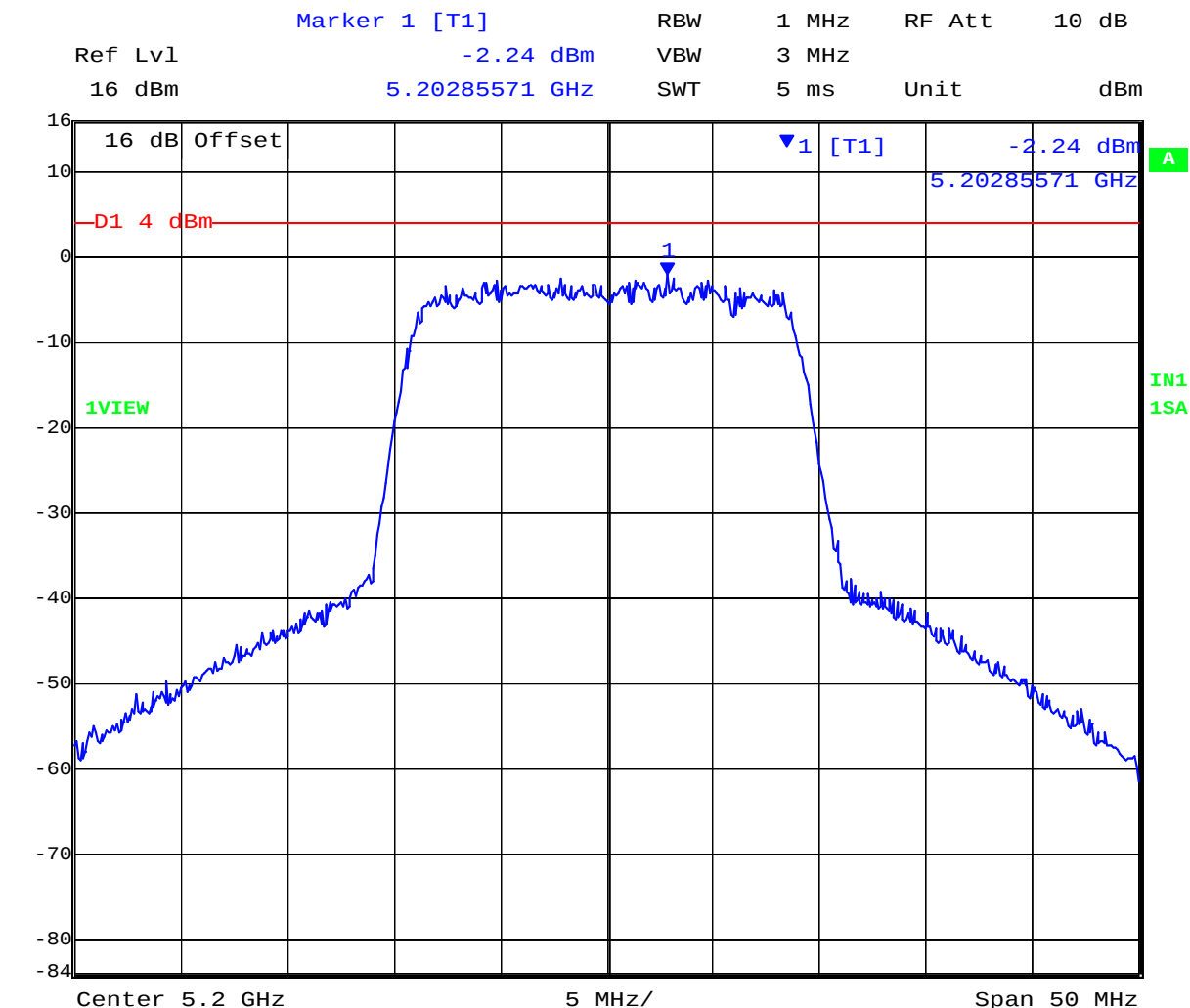
Date: 18.OCT.2010 14:35:46

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 173 of 465

5,200 MHz 802.11n HT20 - MIMO RADIO Chain b Peak Power Spectral Density



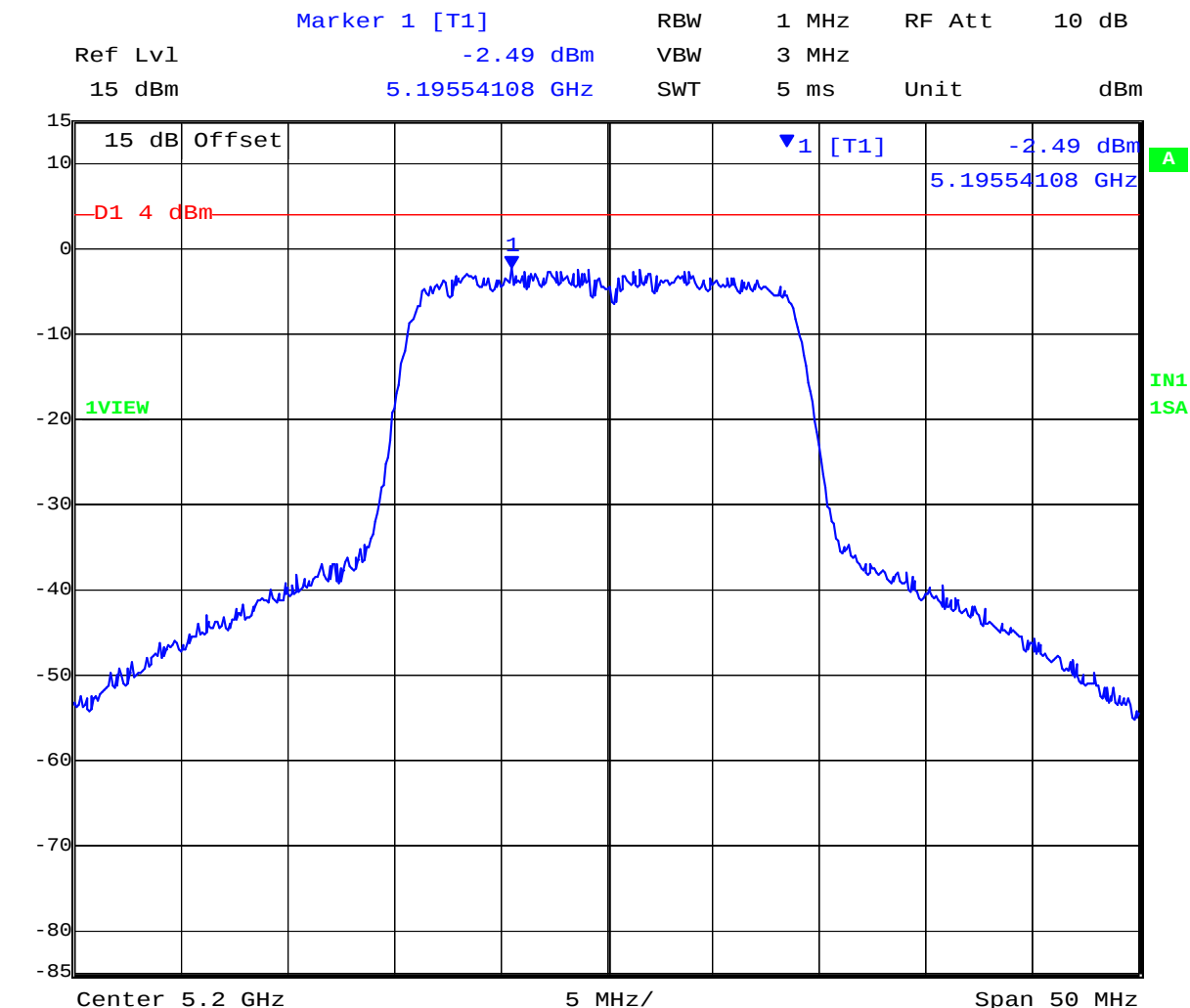
Date: 18.OCT.2010 14:31:04

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 174 of 465

5,200 MHz 802.11n HT20 - MIMO RADIO Chain c Peak Power Spectral Density



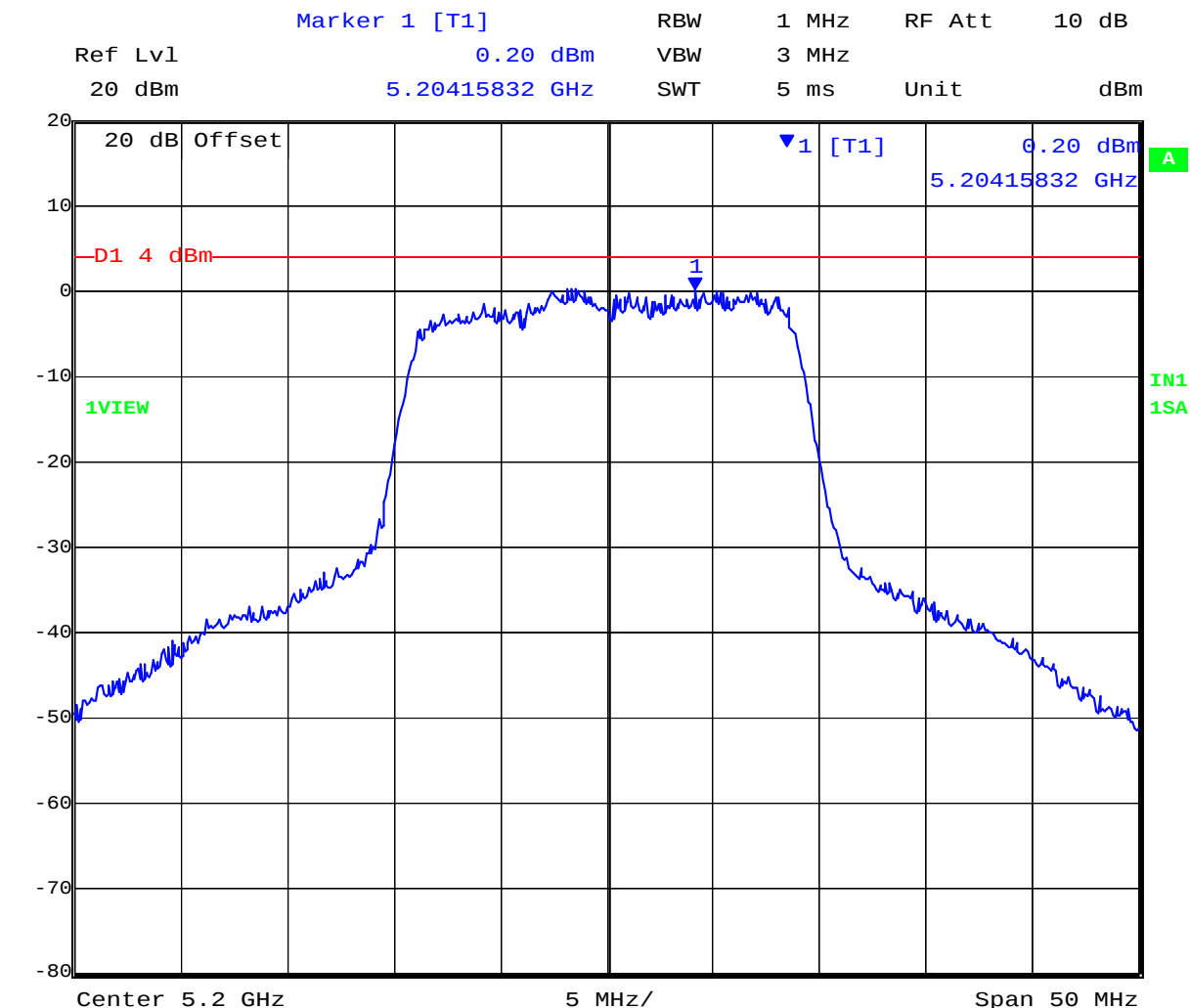
Date: 18.OCT.2010 14:33:24

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 175 of 465

5,200 MHz 802.11n HT20 - MIMO RADIO Combined Peak Power Spectral Density



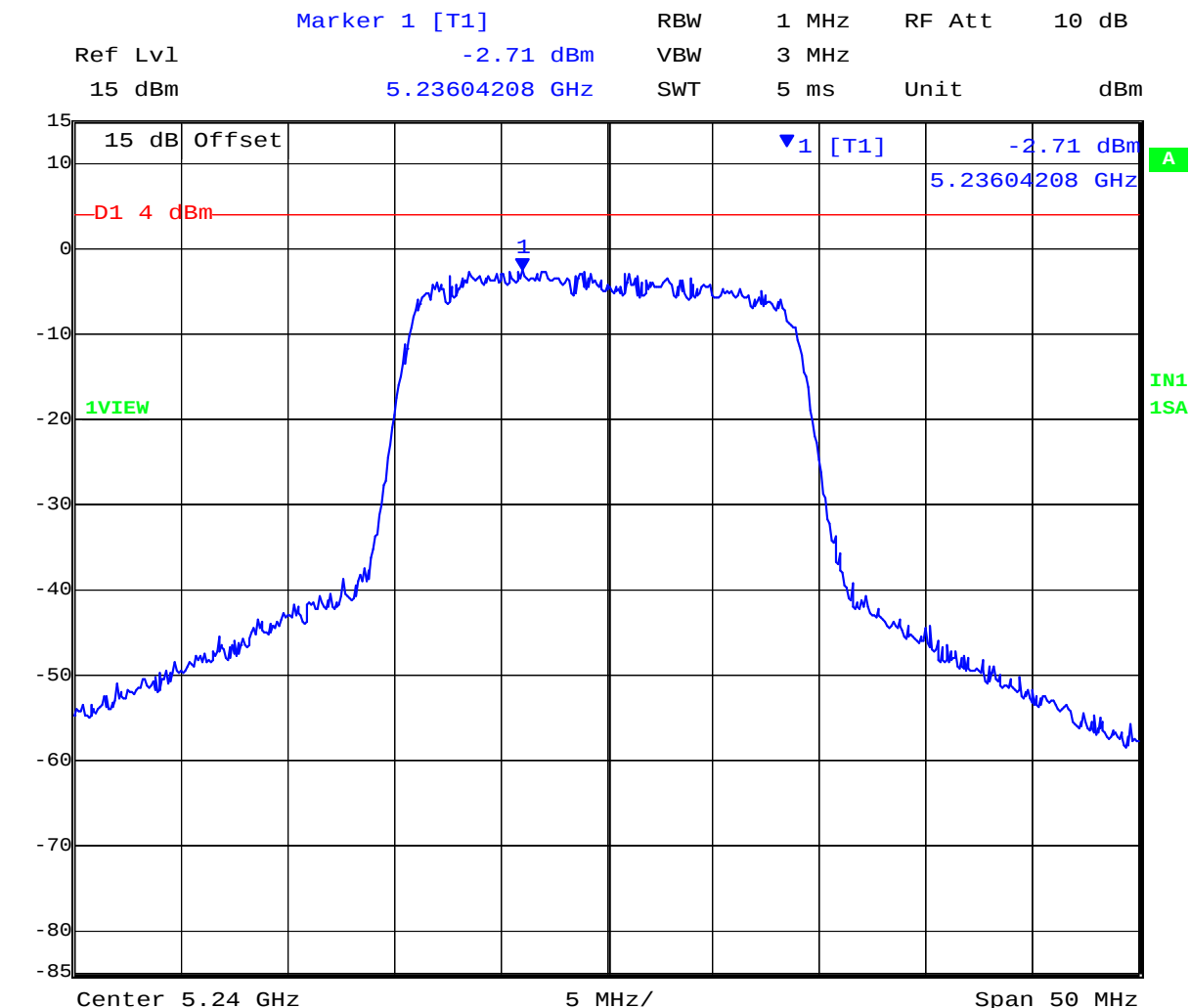
Date: 18.OCT.2010 14:38:11

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 176 of 465

5,240 MHz 802.11n HT20 - MIMO RADIO Chain a Peak Power Spectral Density



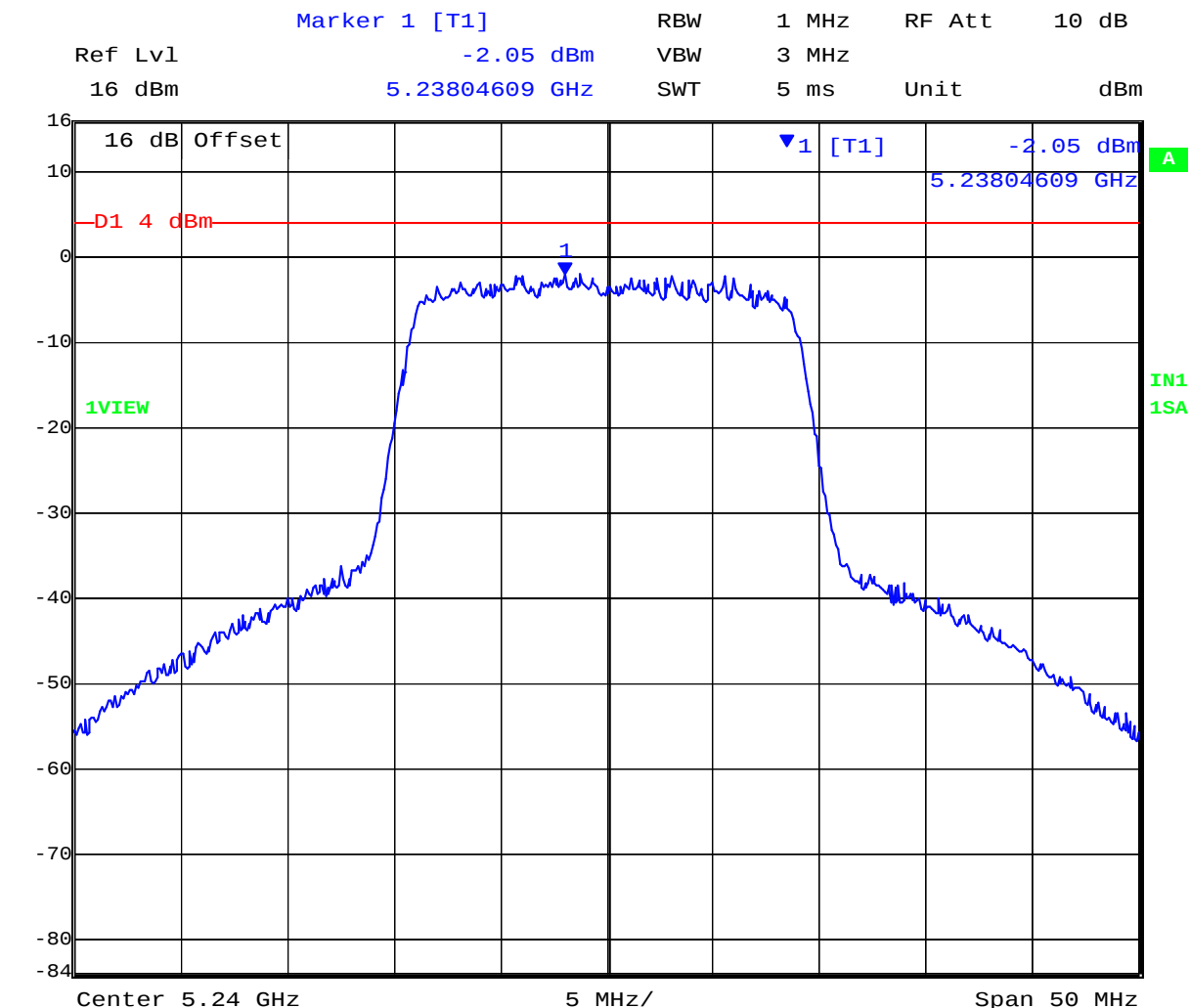
Date: 18.OCT.2010 15:06:28

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 177 of 465

5,240 MHz 802.11n HT20 - MIMO RADIO Chain b Peak Power Spectral Density



Date: 18.OCT.2010 15:01:45

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 178 of 465

5,240 MHz 802.11n HT20 - MIMO RADIO Chain c Peak Power Spectral Density



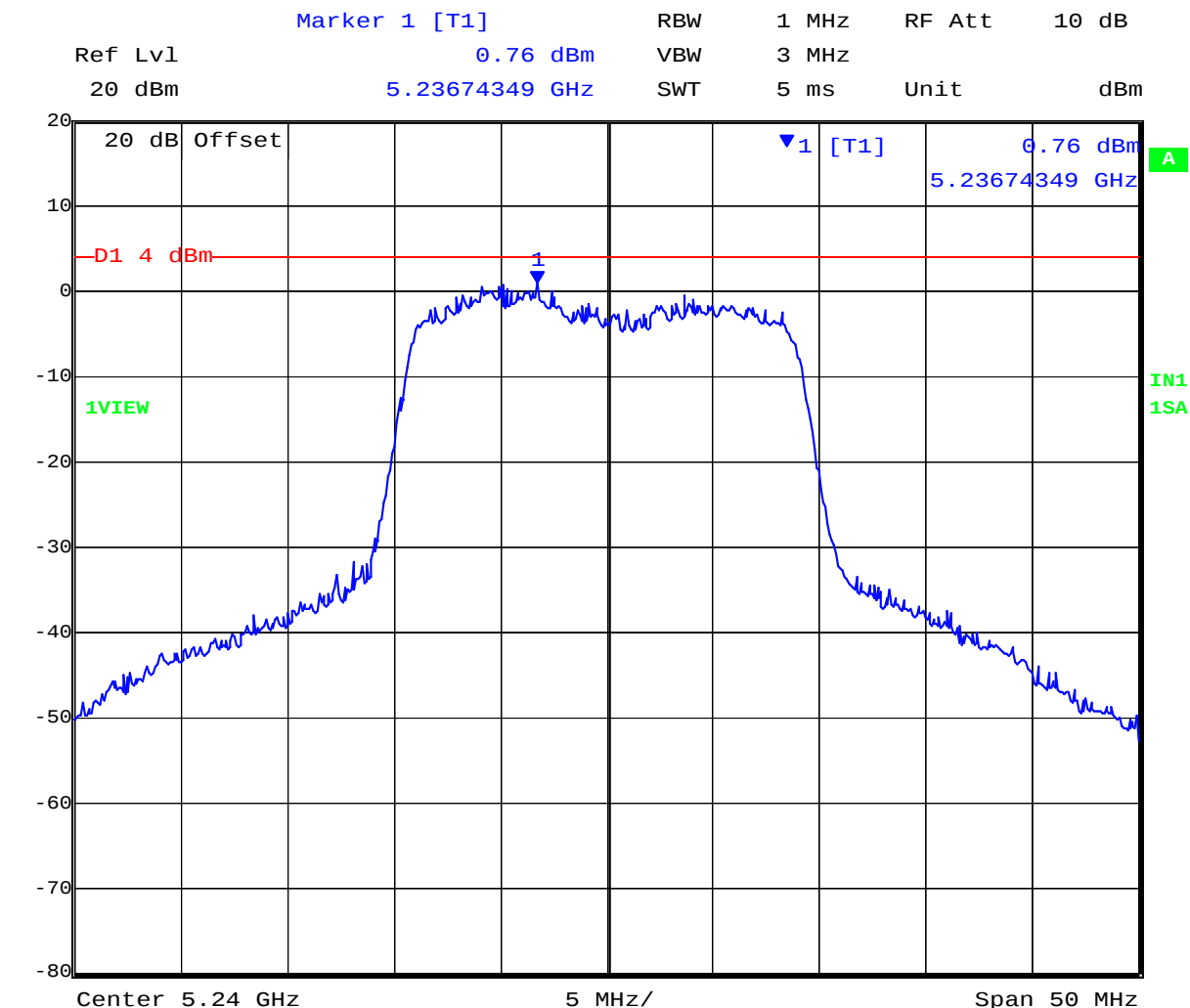
Date: 18.OCT.2010 15:04:05

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 179 of 465

5,240 MHz 802.11n HT20 - MIMO RADIO Combined Peak Power Spectral Density



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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 180 of 465

TABLE OF RESULTS – 802.11n HT20 - MIMO RADIO

5250 -5350 MHZ

Test Conditions:	15.407 (a)		Rel. Humidity (%):	35	to	42
Variant:	802.11 n HT-20		Ambient Temp. (°C):	19	to	22
TPC:	HIGH		Pressure (mBars):	998	to	1003
Modulation:	ON		Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A	dB	Antenna Gain:	1.2 dBi		
Applied Voltage:	28.0	Vdc				
Notes 1:						
Notes 2:						

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5260	-0.51	-1.21	-3.09		1.44		11.00	-9.56
5300	-0.18	0.56	-2.22		1.35		11.00	-9.65
5320	1.34	1.34	-1.06		3.99		11.00	-7.01

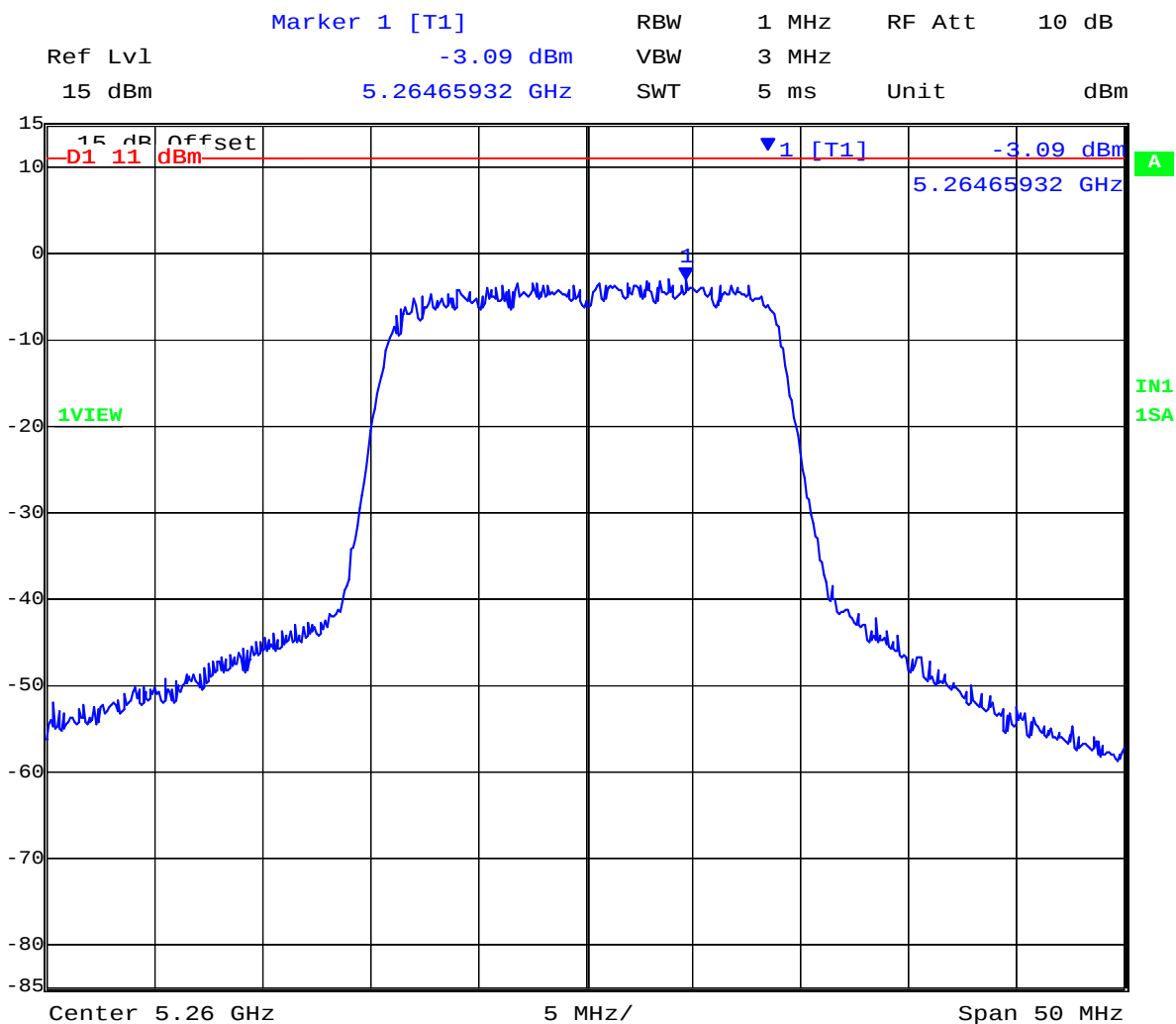
Measurement uncertainty:	±1.33 dB
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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 181 of 465

5,260 MHz 802.11n HT20 - MIMO RADIO Chain a Peak Power Spectral Density



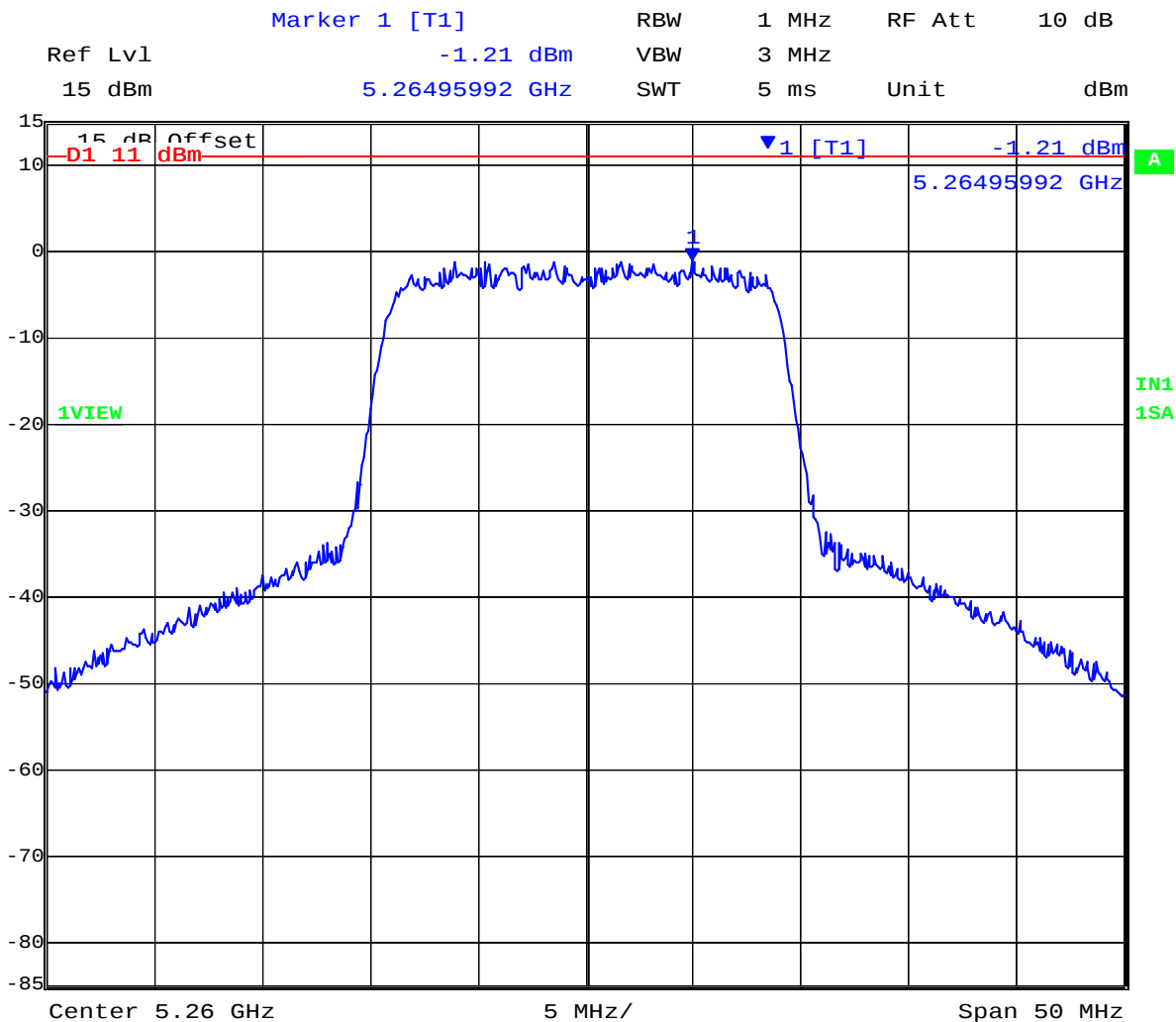
Date: 19.OCT.2010 10:31:37

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 182 of 465

5,260 MHz 802.11n HT20 - MIMO RADIO Chain b Peak Power Spectral Density



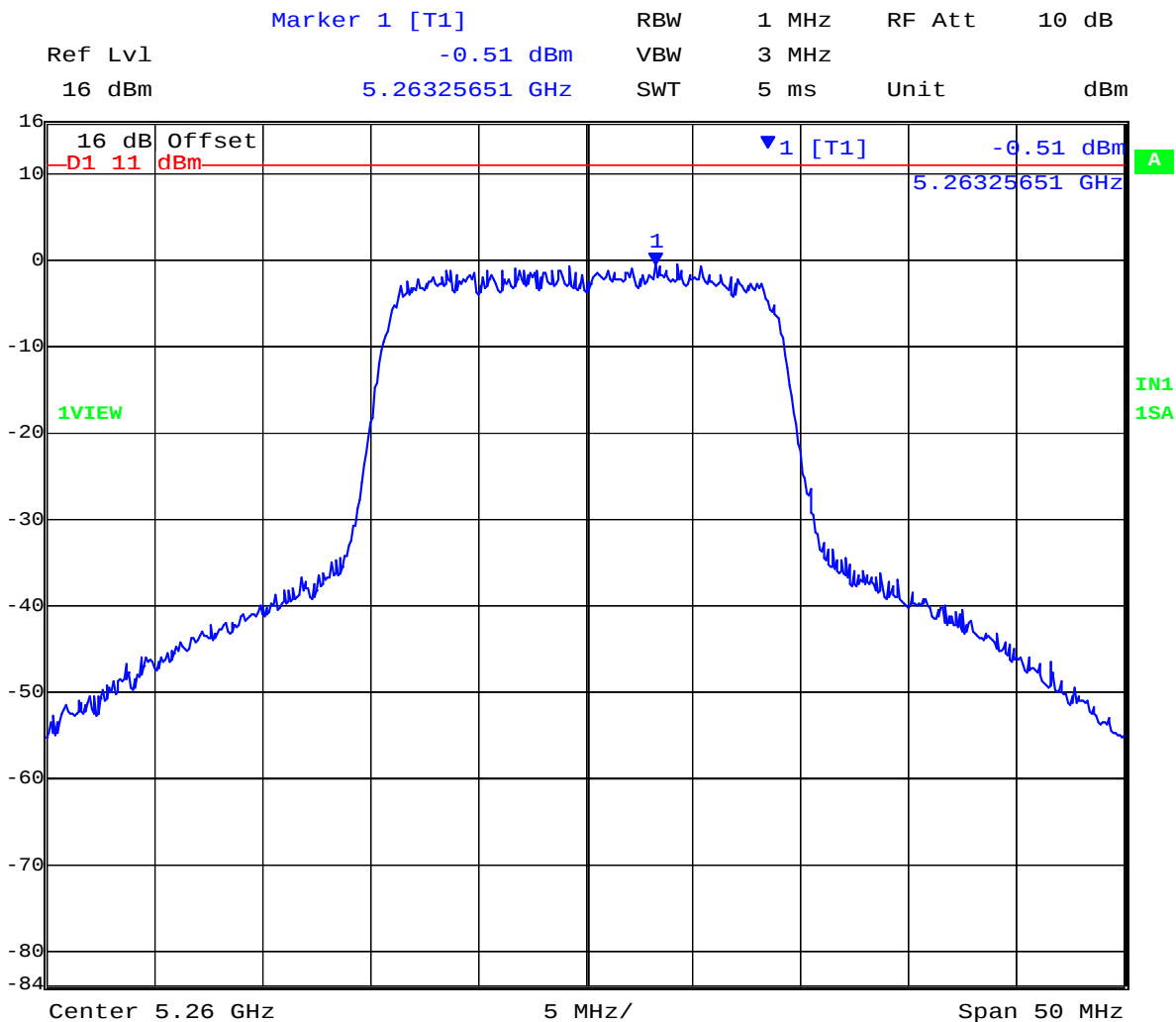
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 183 of 465

5,260 MHz 802.11n HT20 - MIMO RADIO Chain c Peak Power Spectral Density



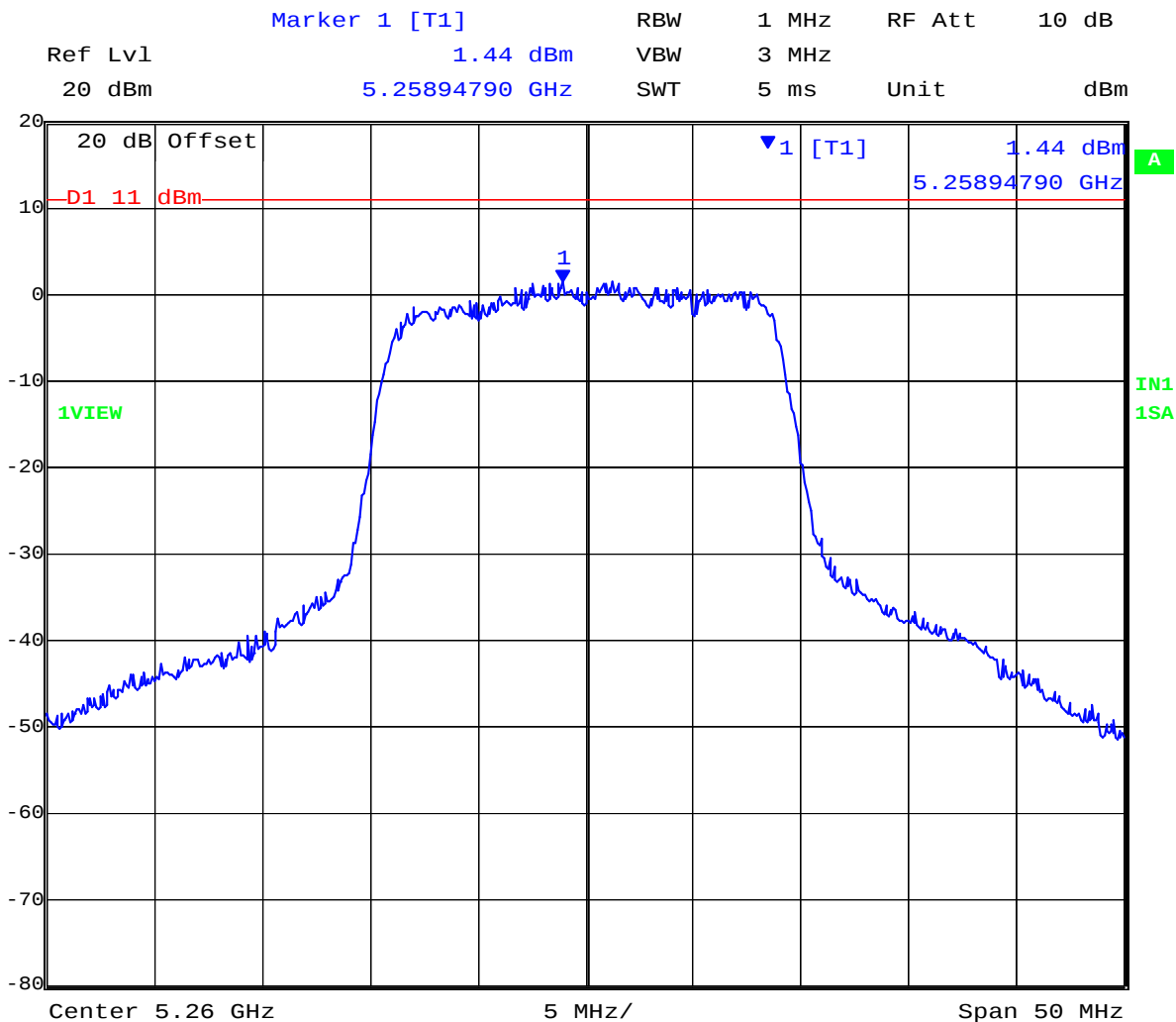
Date: 19.OCT.2010 10:26:54

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 184 of 465

5,260 MHz 802.11n HT20 - MIMO RADIO Combined Peak Power Spectral Density



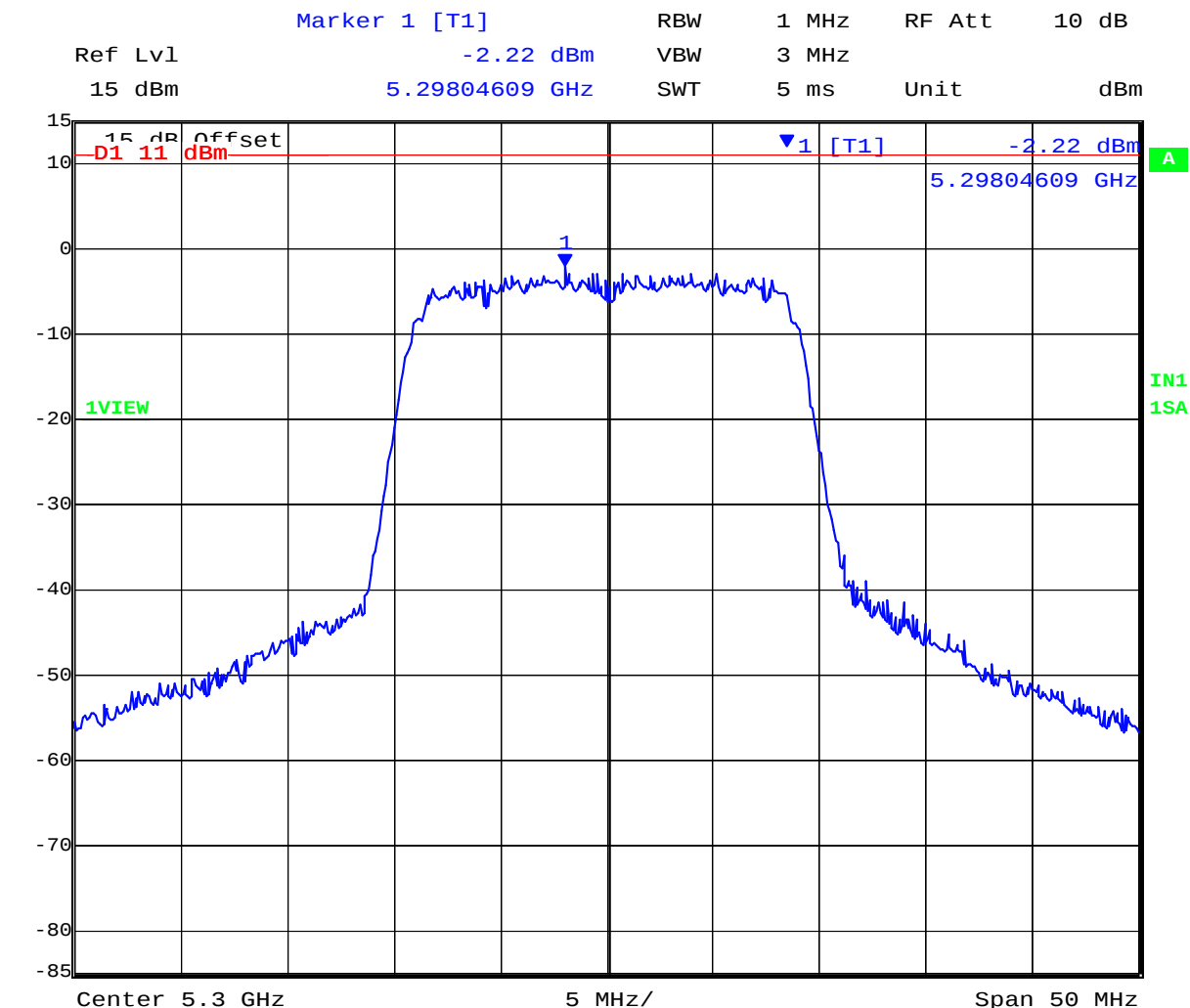
Date: 19.OCT.2010 10:34:01

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 185 of 465

5,300 MHz 802.11n HT20 - MIMO RADIO Chain a Peak Power Spectral Density



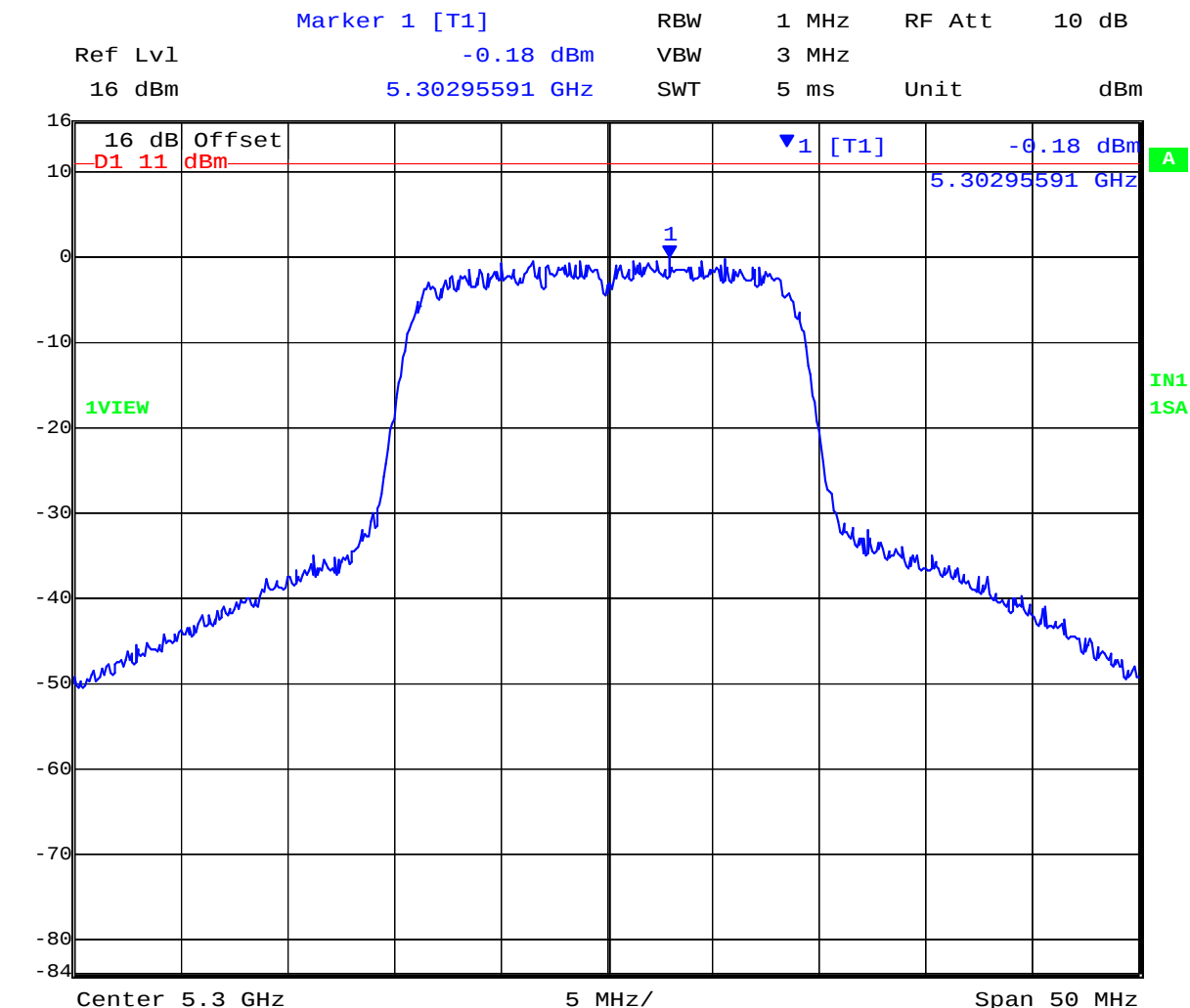
Date: 19.OCT.2010 11:17:12

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 186 of 465

5,300 MHz 802.11n HT20 - MIMO RADIO Chain b Peak Power Spectral Density



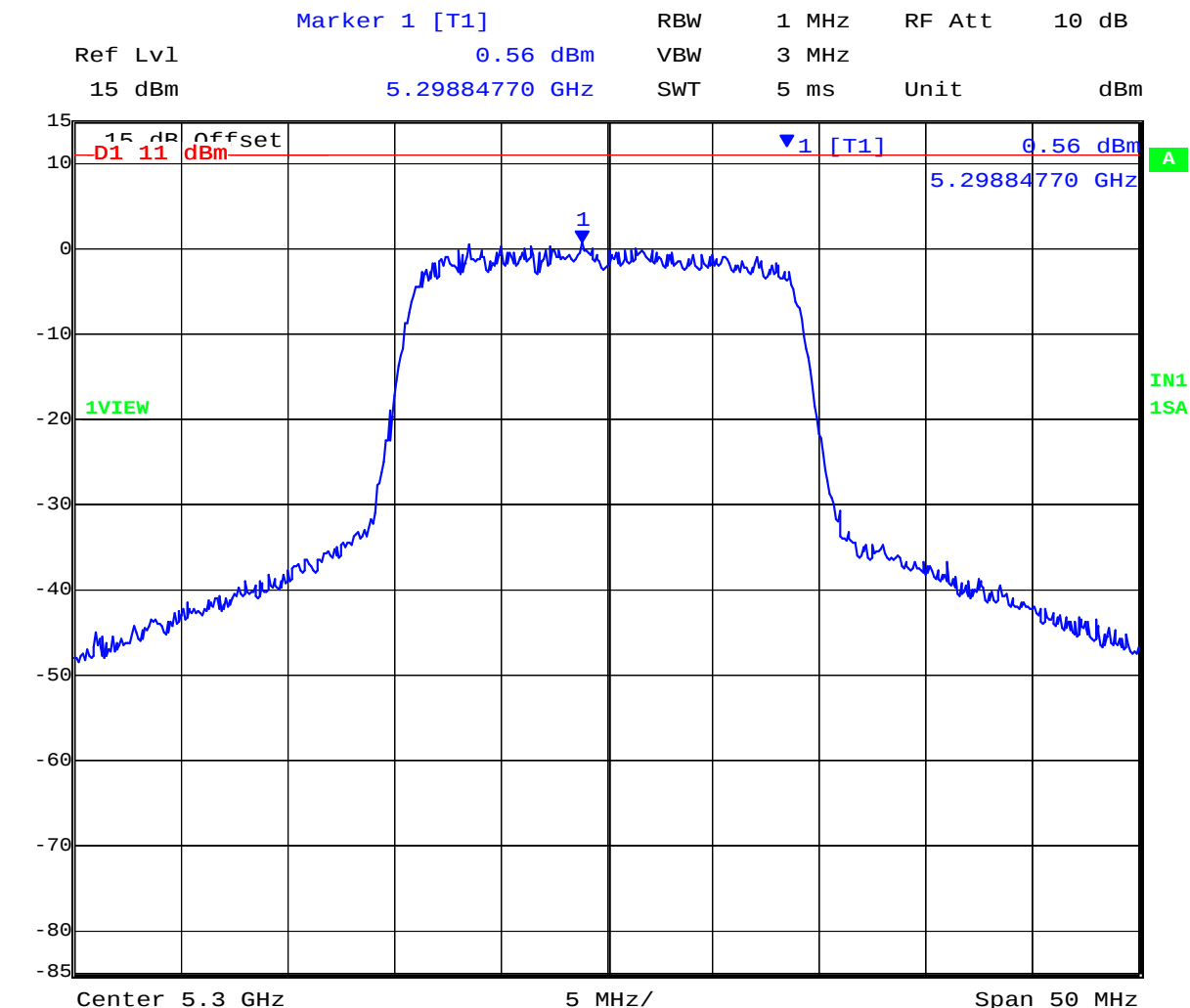
Date: 19.OCT.2010 11:12:29

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 187 of 465

5,300 MHz 802.11n HT20 - MIMO RADIO Chain c Peak Power Spectral Density



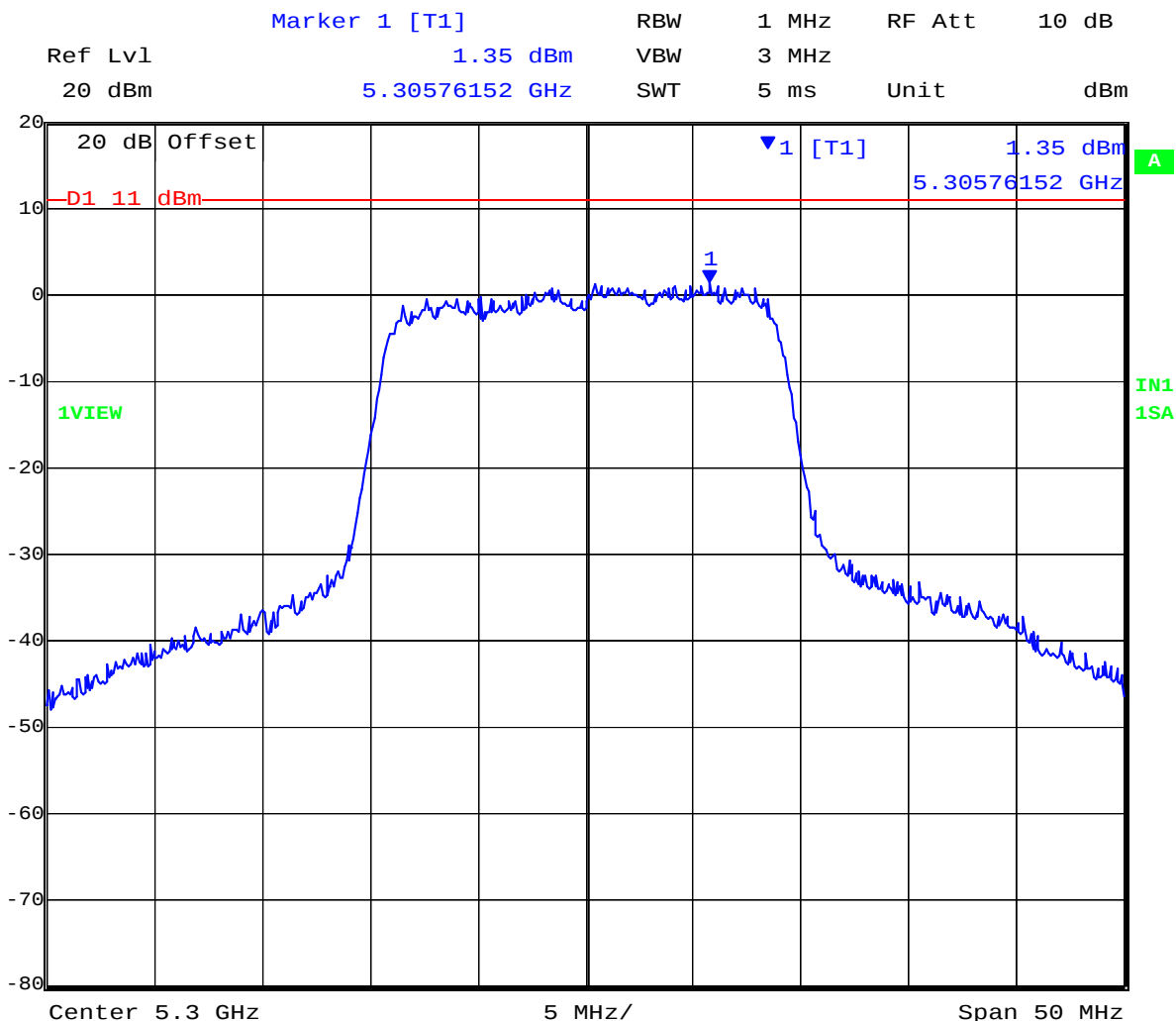
Date: 19.OCT.2010 11:14:50

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 188 of 465

5,300 MHz 802.11n HT20 - MIMO RADIO Combined Peak Power Spectral Density



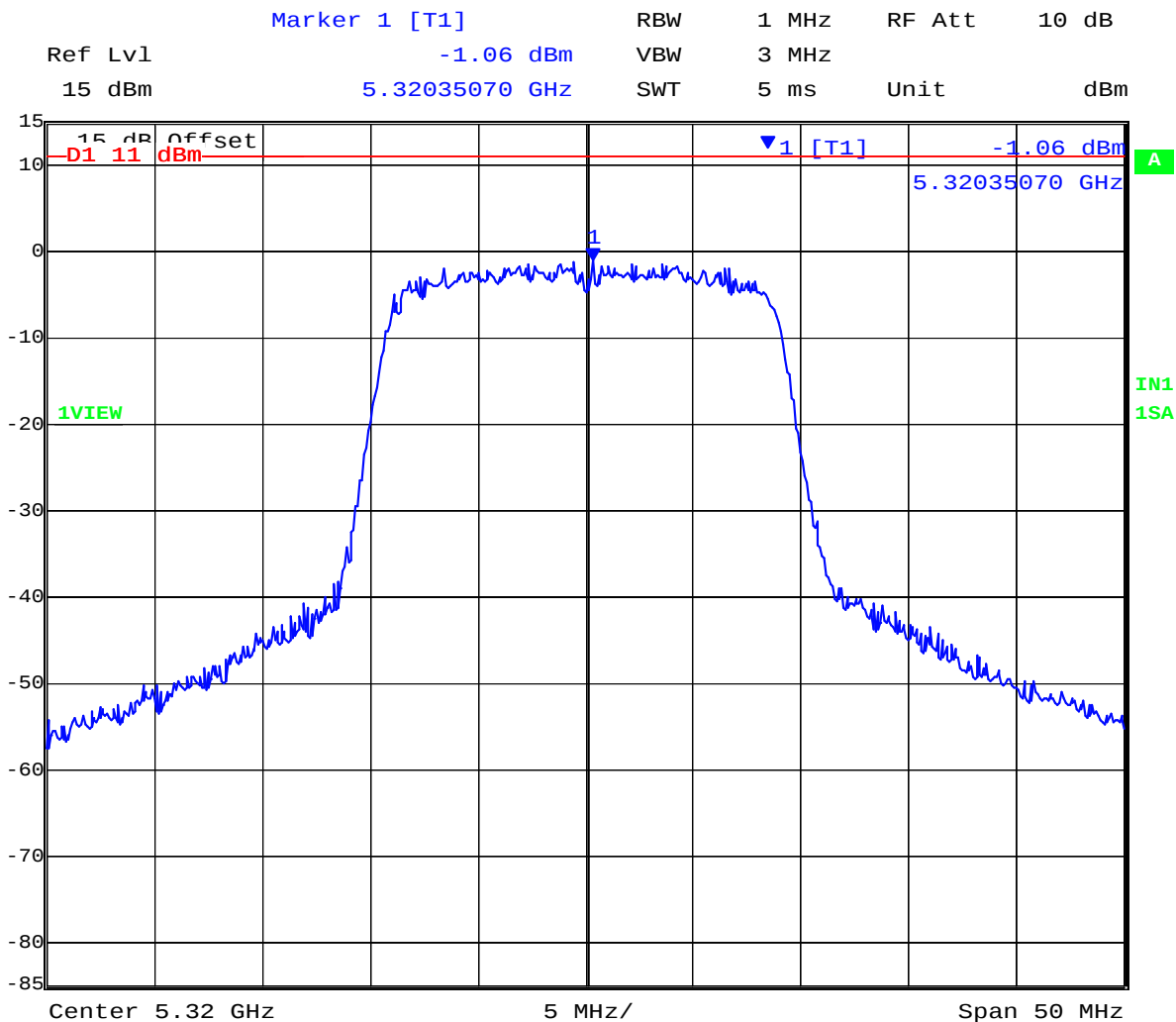
Date: 19.OCT.2010 11:19:37

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Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 189 of 465

5,320 MHz 802.11n HT20 - MIMO RADIO Chain a Peak Power Spectral Density



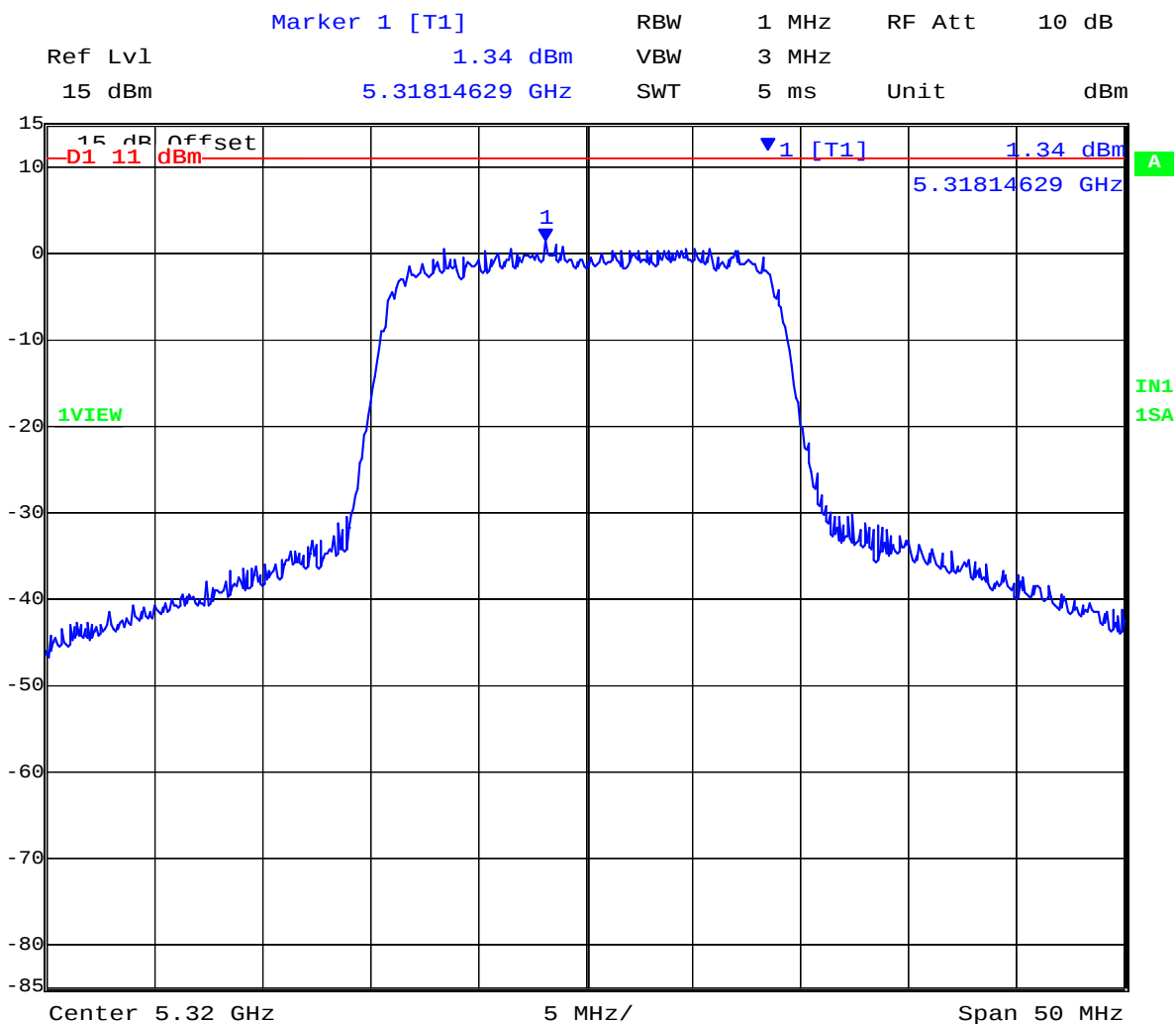
Date: 19.OCT.2010 12:02:56

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Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 190 of 465

5,320 MHz 802.11n HT20 - MIMO RADIO Chain b Peak Power Spectral Density



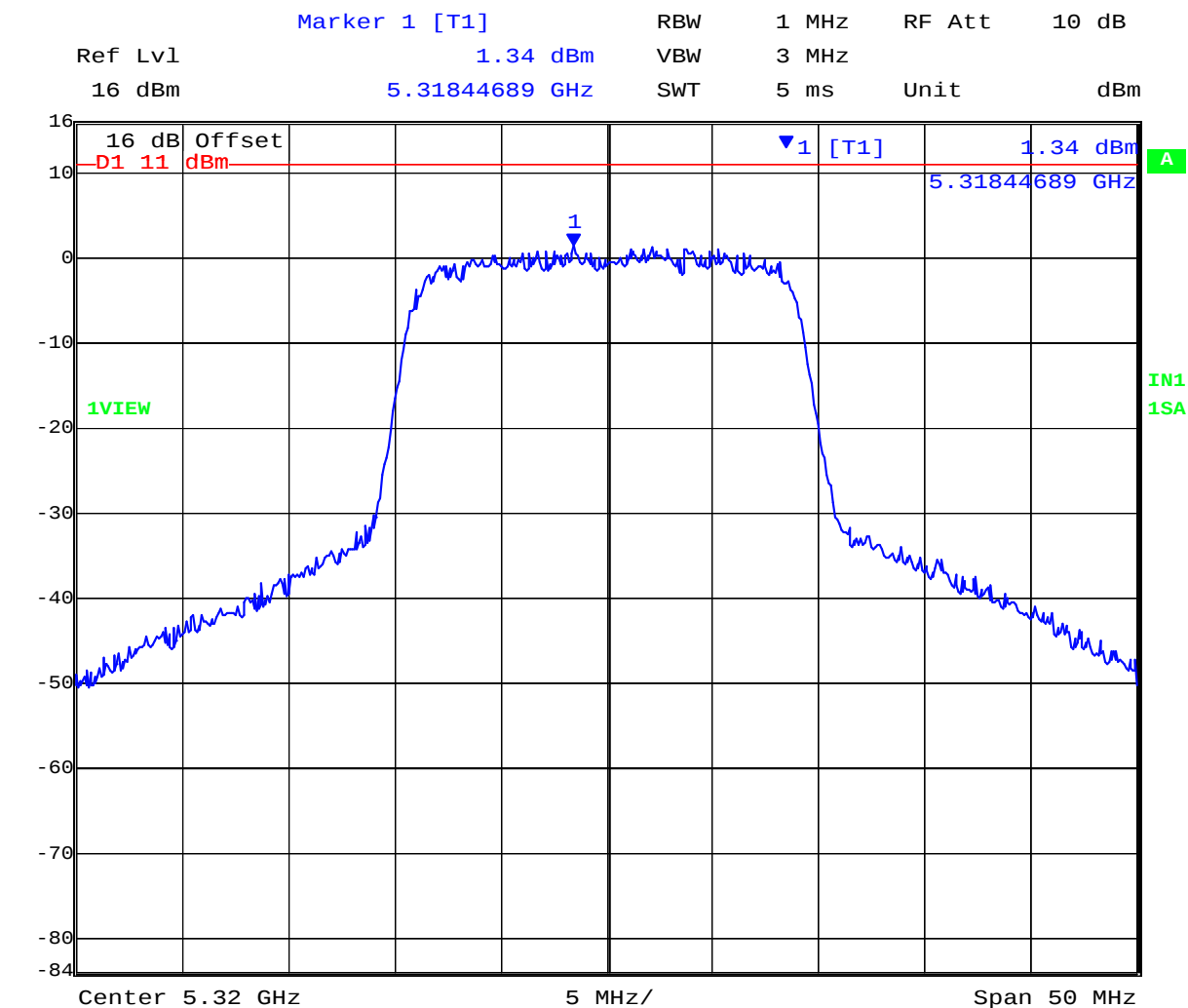
Date: 19.OCT.2010 12:00:34

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Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 191 of 465

5,320 MHz 802.11n HT20 - MIMO RADIO Chain c Peak Power Spectral Density



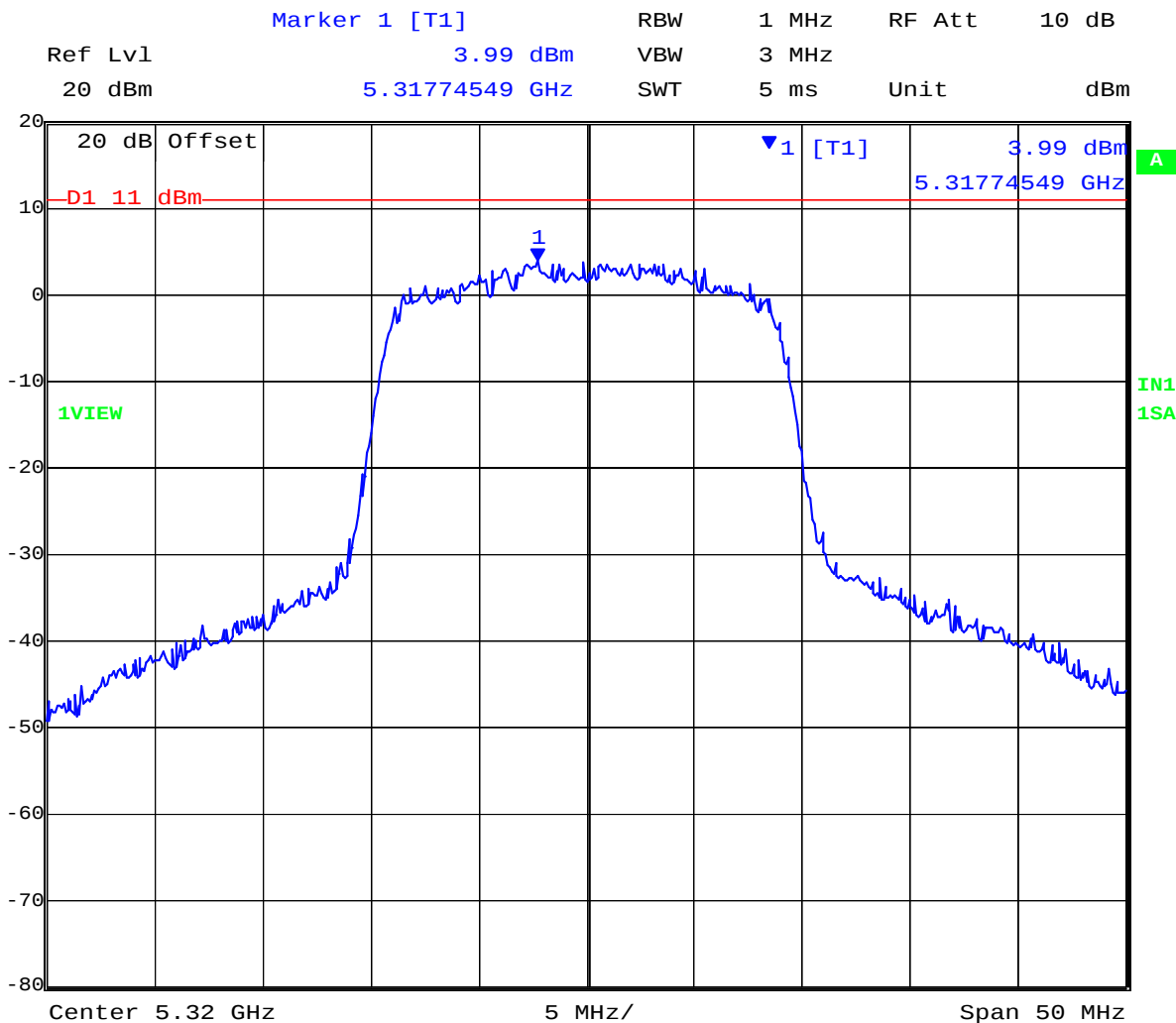
Date: 19.OCT.2010 11:58:13

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 192 of 465

5,320 MHz 802.11n HT20 - MIMO RADIO Combined Peak Power Spectral Density



Date: 19.OCT.2010 12:05:22

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 193 of 465

TABLE OF RESULTS – 802.11n HT20 - MIMO RADIO

5470 -5725 MHZ

Test Conditions:	15.407 (a)	Rel. Humidity (%):	35	to	42
Variant:	802.11 n HT-20	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2 dBi		
Applied Voltage:	28.0 Vdc				
Notes 1:					
Notes 2:					

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5500	-1.95	-2.58	-1.82		1.19		11.00	-9.81
5560	-2.49	-2.73	-4.69		-0.90		11.00	-11.90
5700	-1.50	-0.39	-4.37		2.04		11.00	-8.96

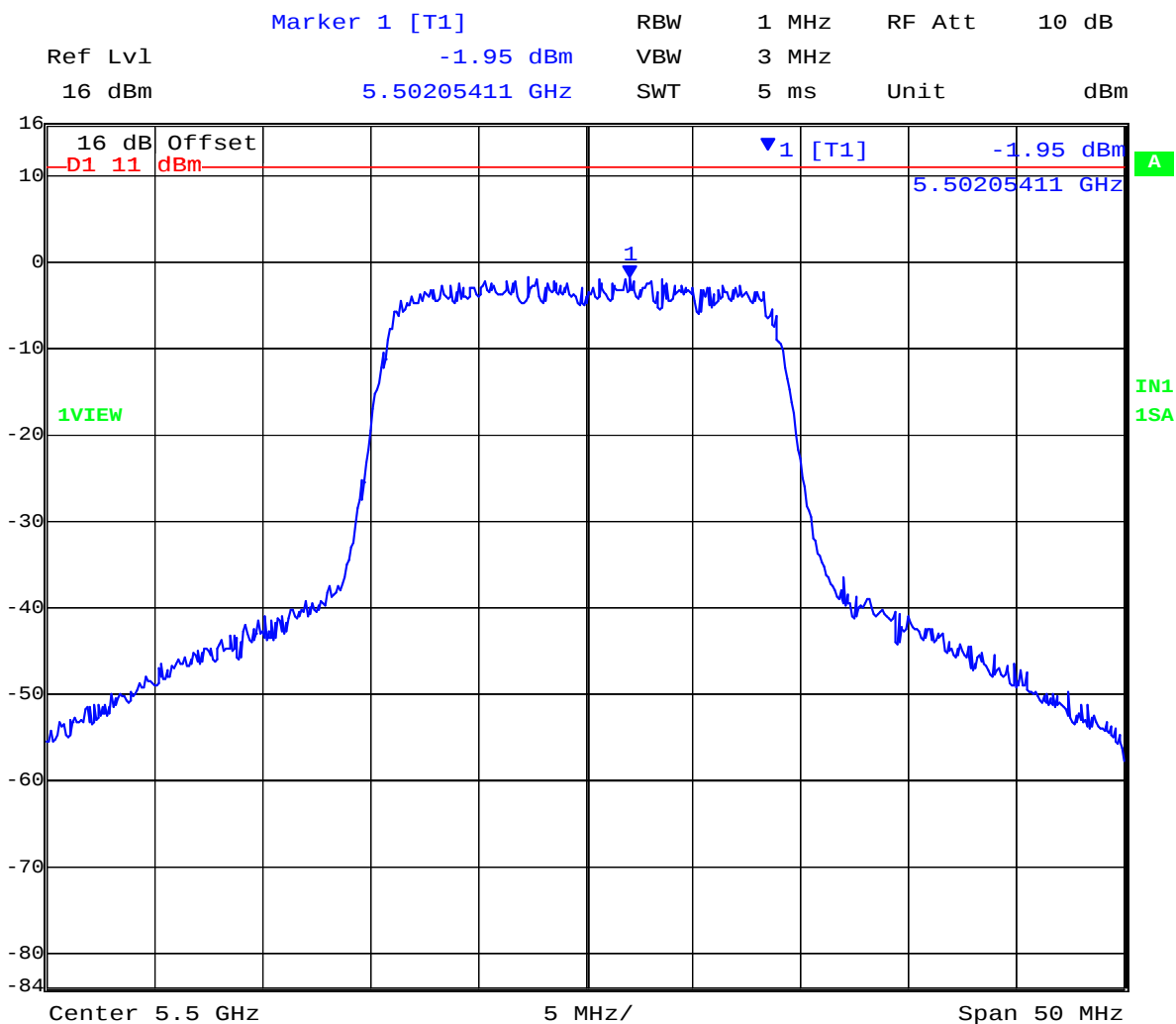
Measurement uncertainty:	±1.33 dB
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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 194 of 465

5,500 MHz 802.11n HT20 - MIMO RADIO Chain a Peak Power Spectral Density



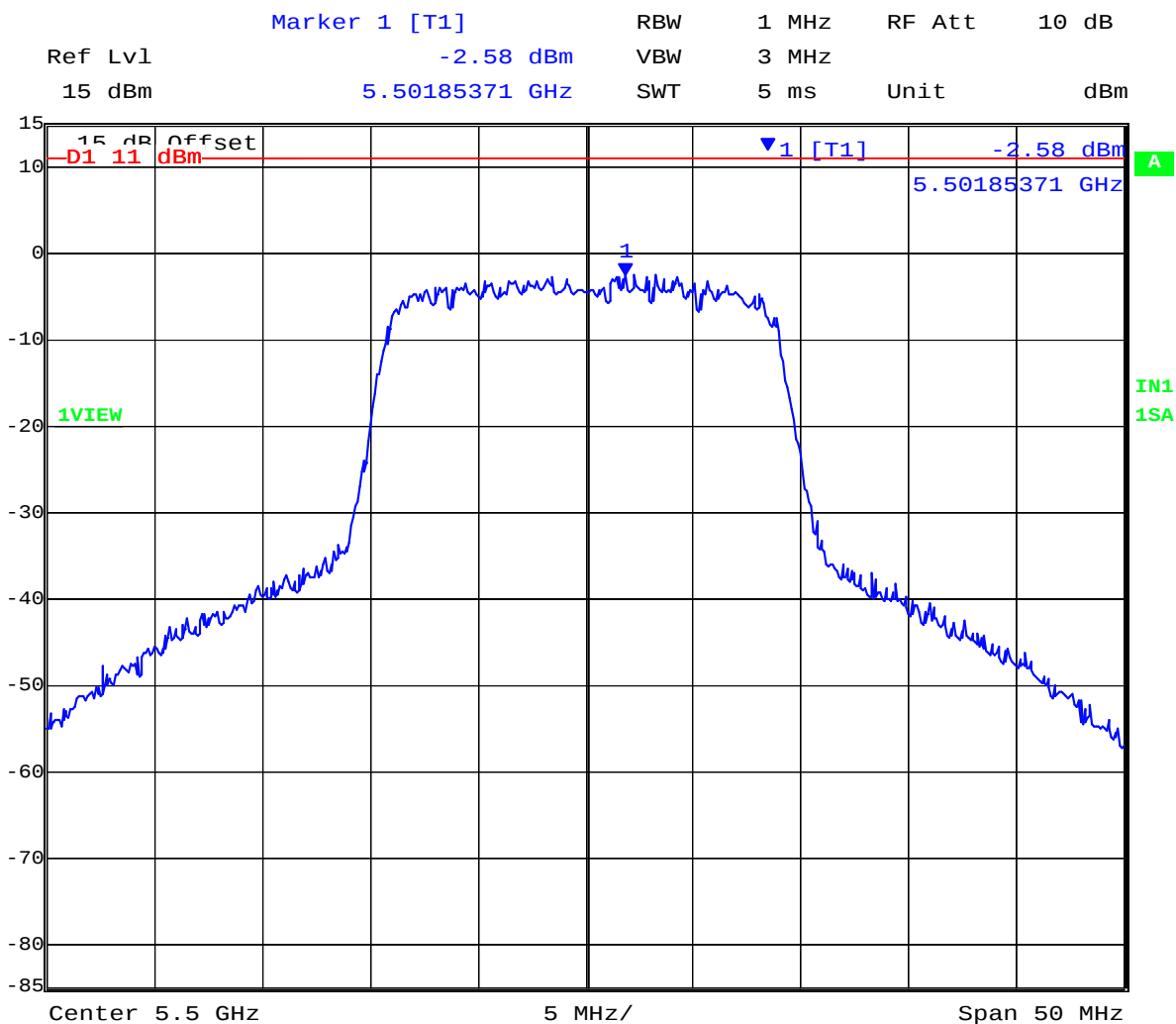
Date: 19.OCT.2010 16:04:45

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 195 of 465

5,500 MHz 802.11n HT20 - MIMO RADIO Chain b Peak Power Spectral Density



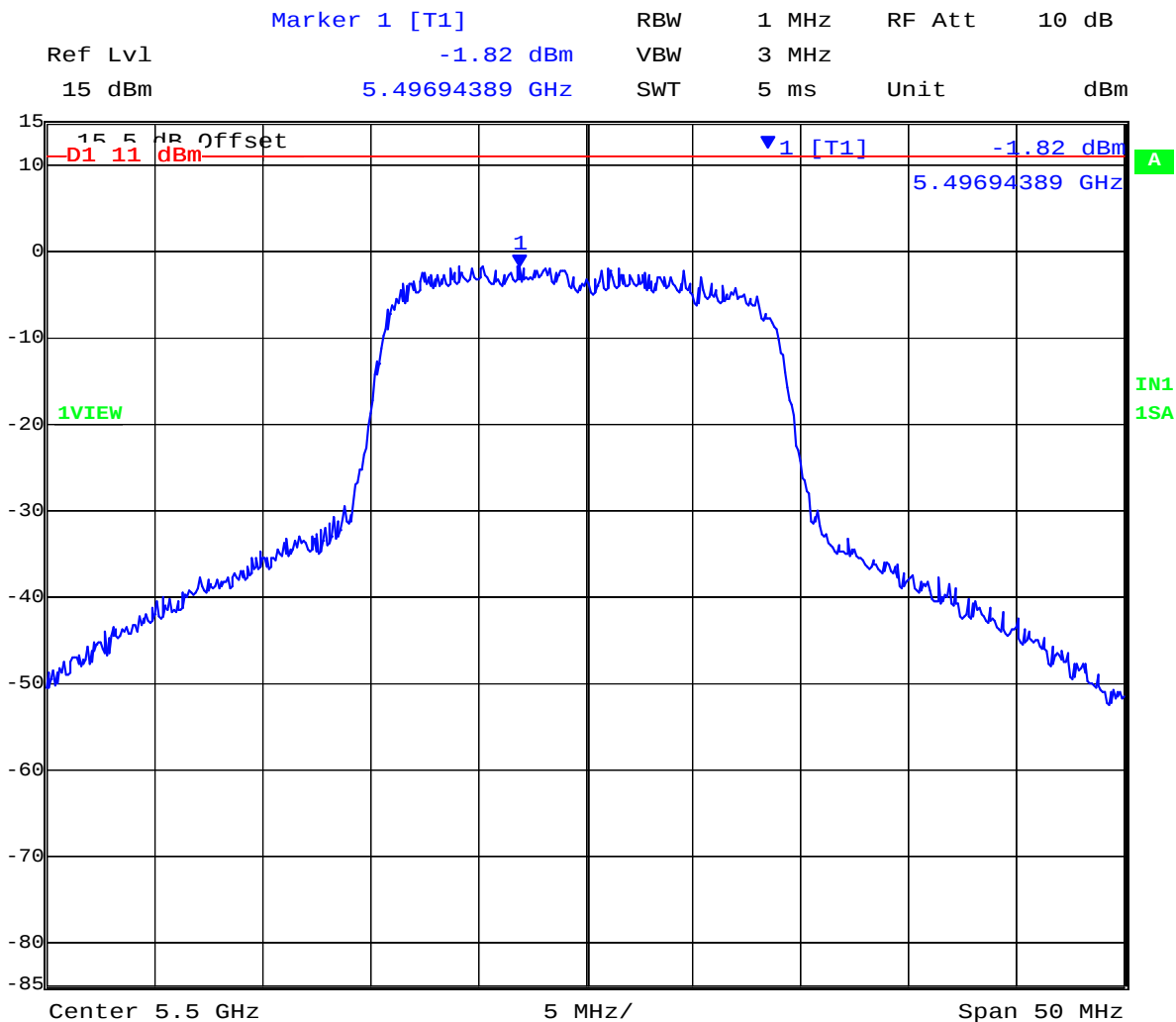
Date: 19.OCT.2010 16:07:06

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 196 of 465

5,500 MHz 802.11n HT20 - MIMO RADIO Chain c Peak Power Spectral Density



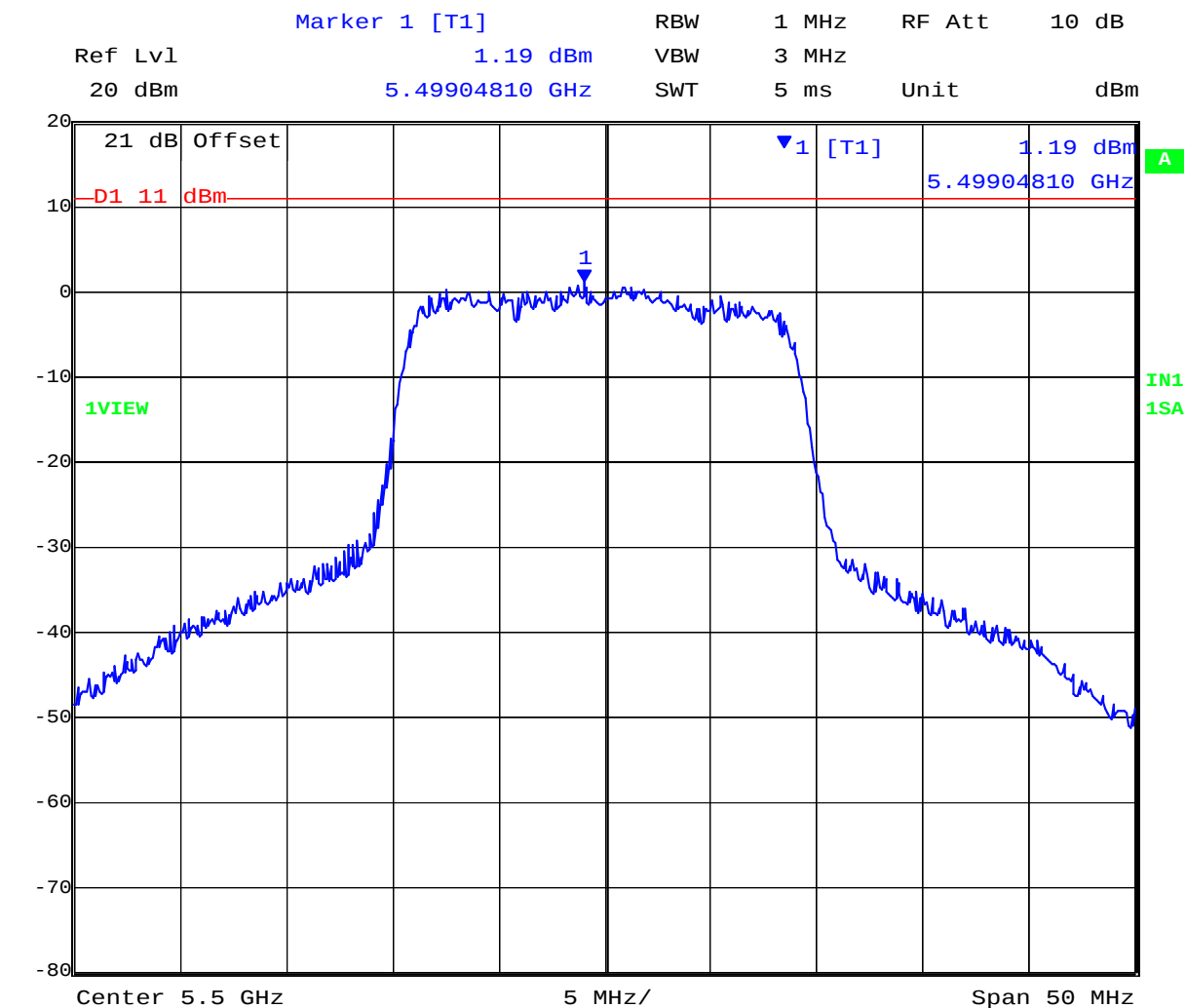
Date: 19.OCT.2010 16:09:29

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 197 of 465

5,500 MHz 802.11n HT20 - MIMO RADIO Combined Peak Power Spectral Density



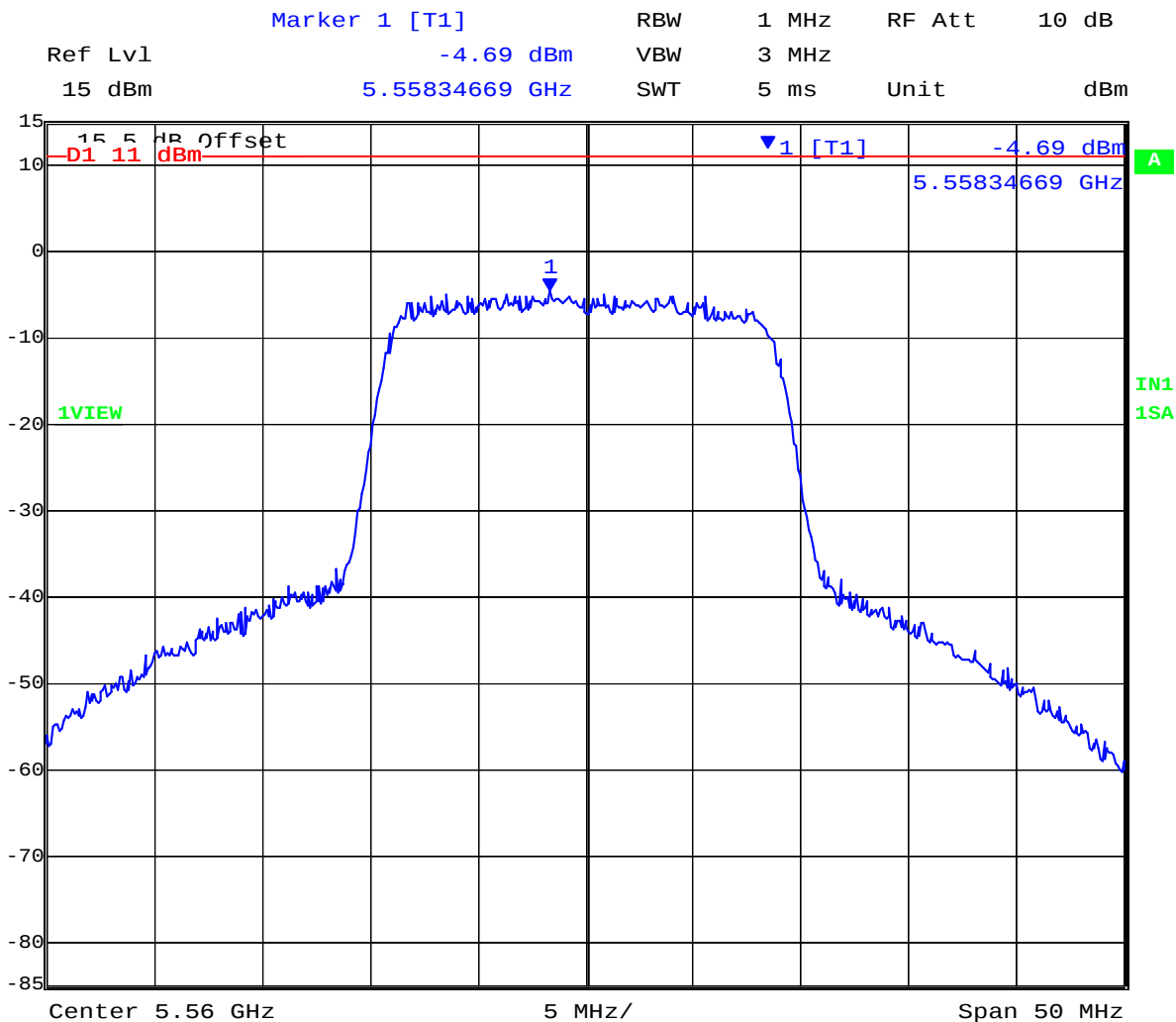
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Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 198 of 465

5,560 MHz 802.11n HT20 - MIMO RADIO Chain a Peak Power Spectral Density



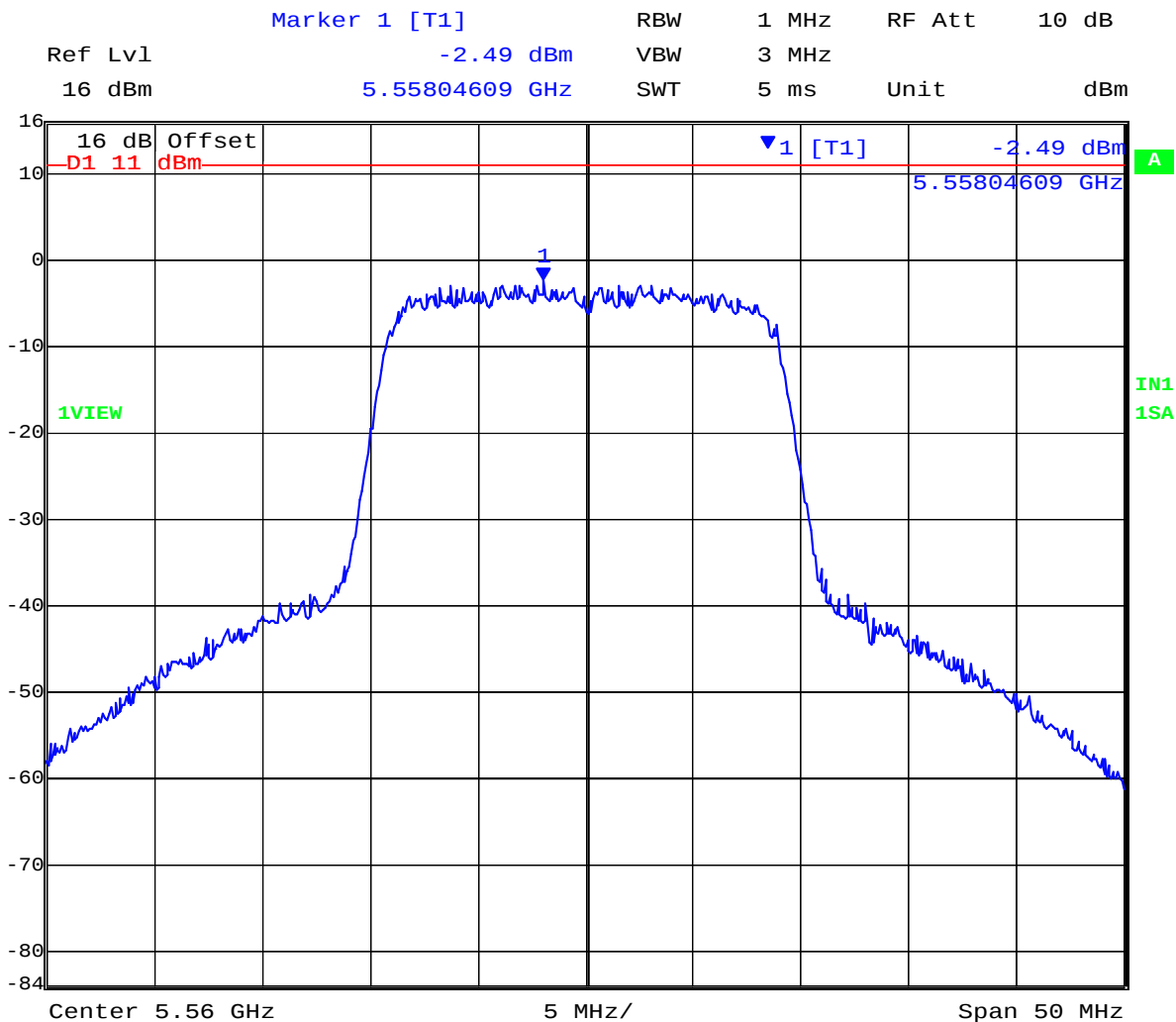
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Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 199 of 465

5,560 MHz 802.11n HT20 - MIMO RADIO Chain b Peak Power Spectral Density



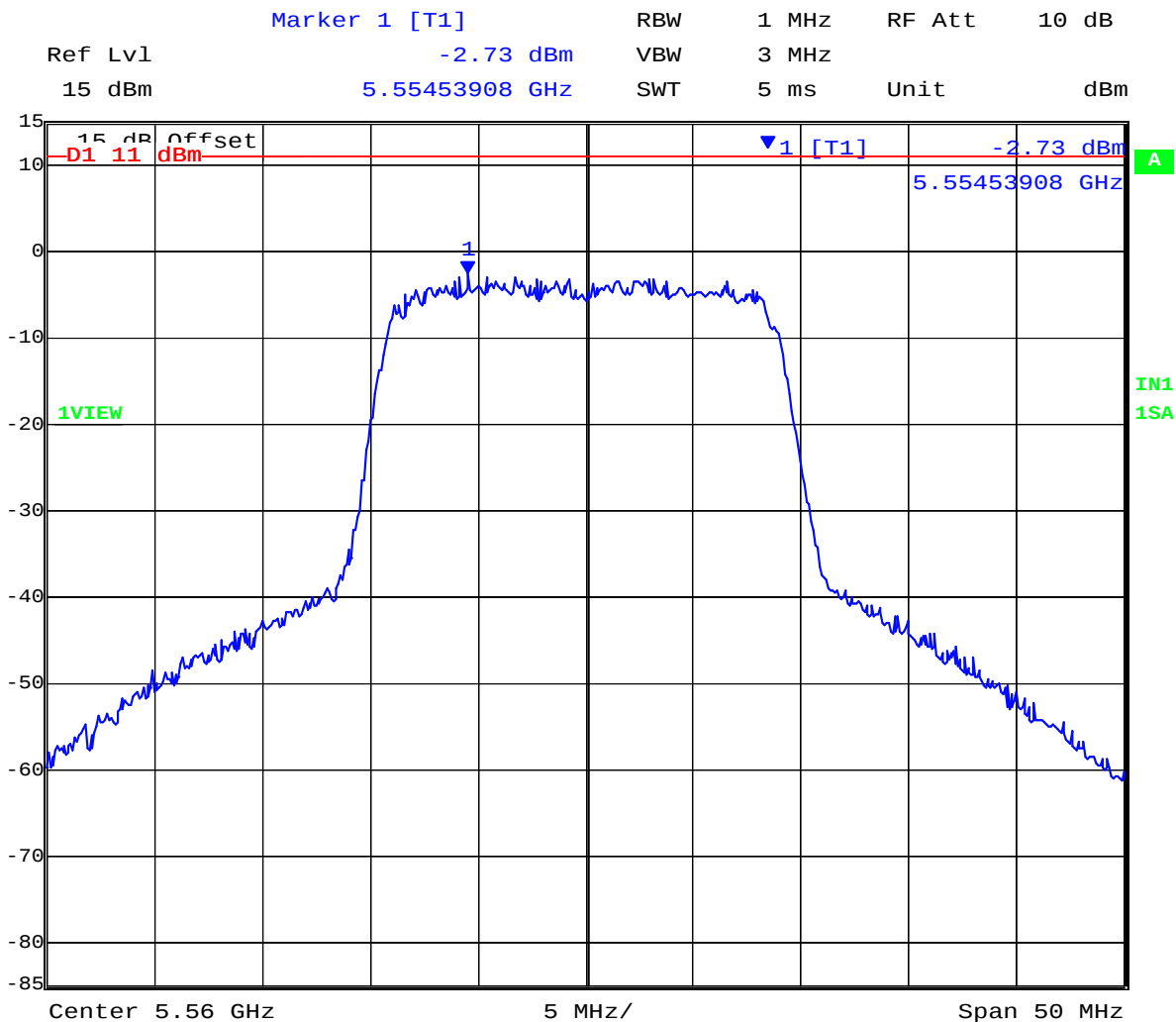
Date: 19.OCT.2010 16:40:32

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 200 of 465

5,560 MHz 802.11n HT20 - MIMO RADIO Chain c Peak Power Spectral Density



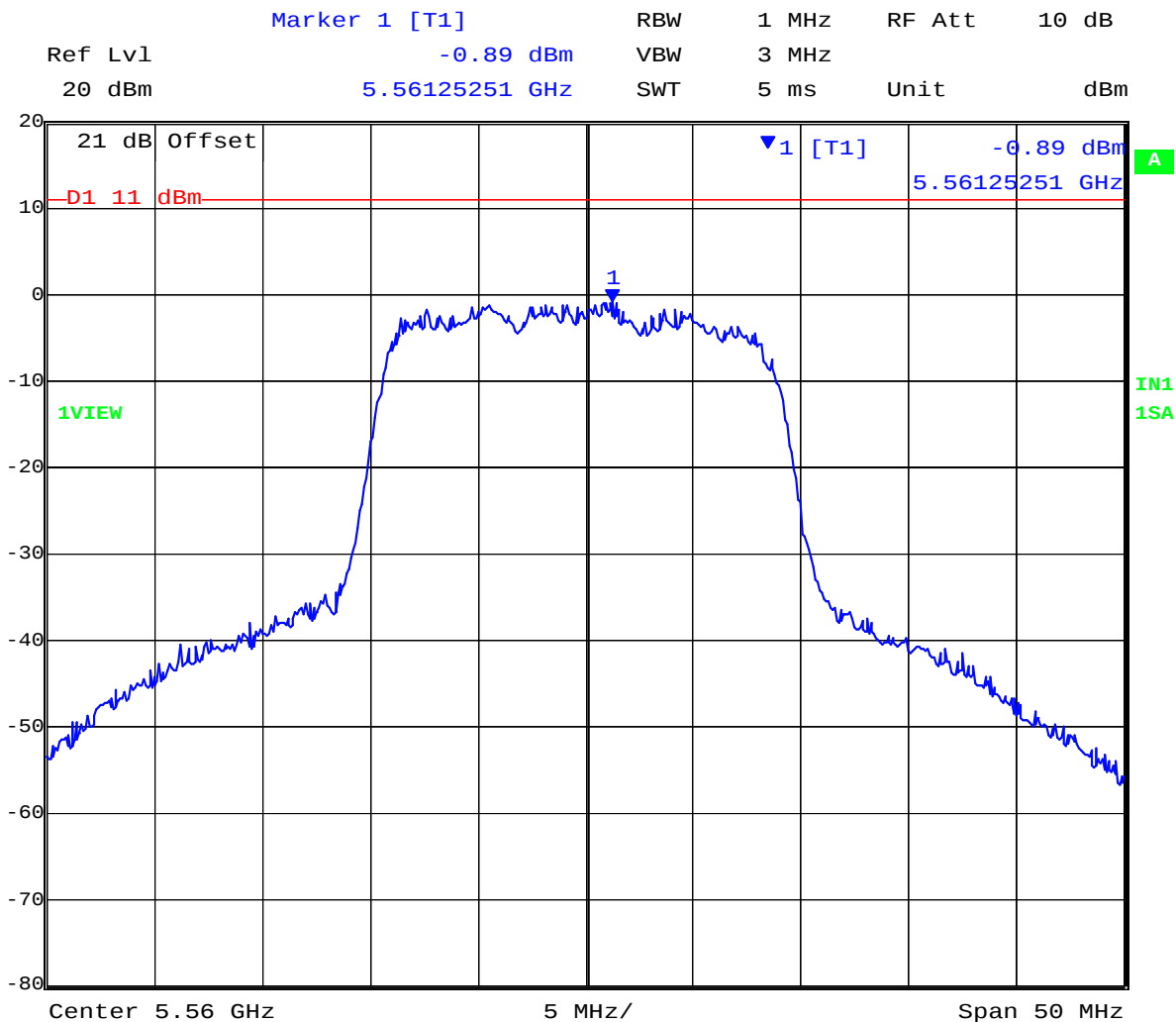
Date: 19.OCT.2010 16:42:54

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 201 of 465

5,560 MHz 802.11n HT20 - MIMO RADIO Combined Peak Power Spectral Density



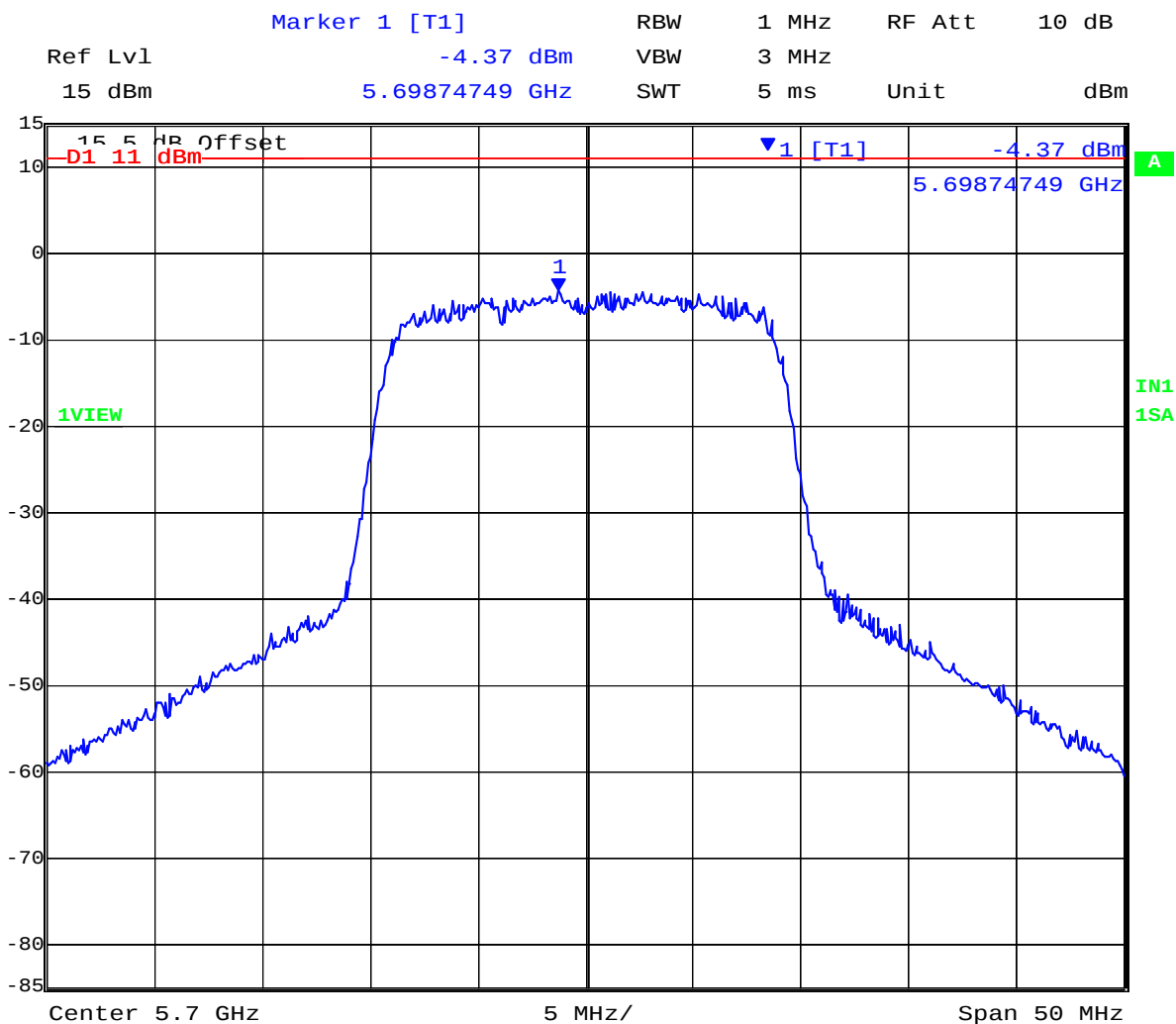
Date: 19.OCT.2010 16:47:43

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 202 of 465

5,700 MHz 802.11n HT20 - MIMO RADIO Chain a Peak Power Spectral Density



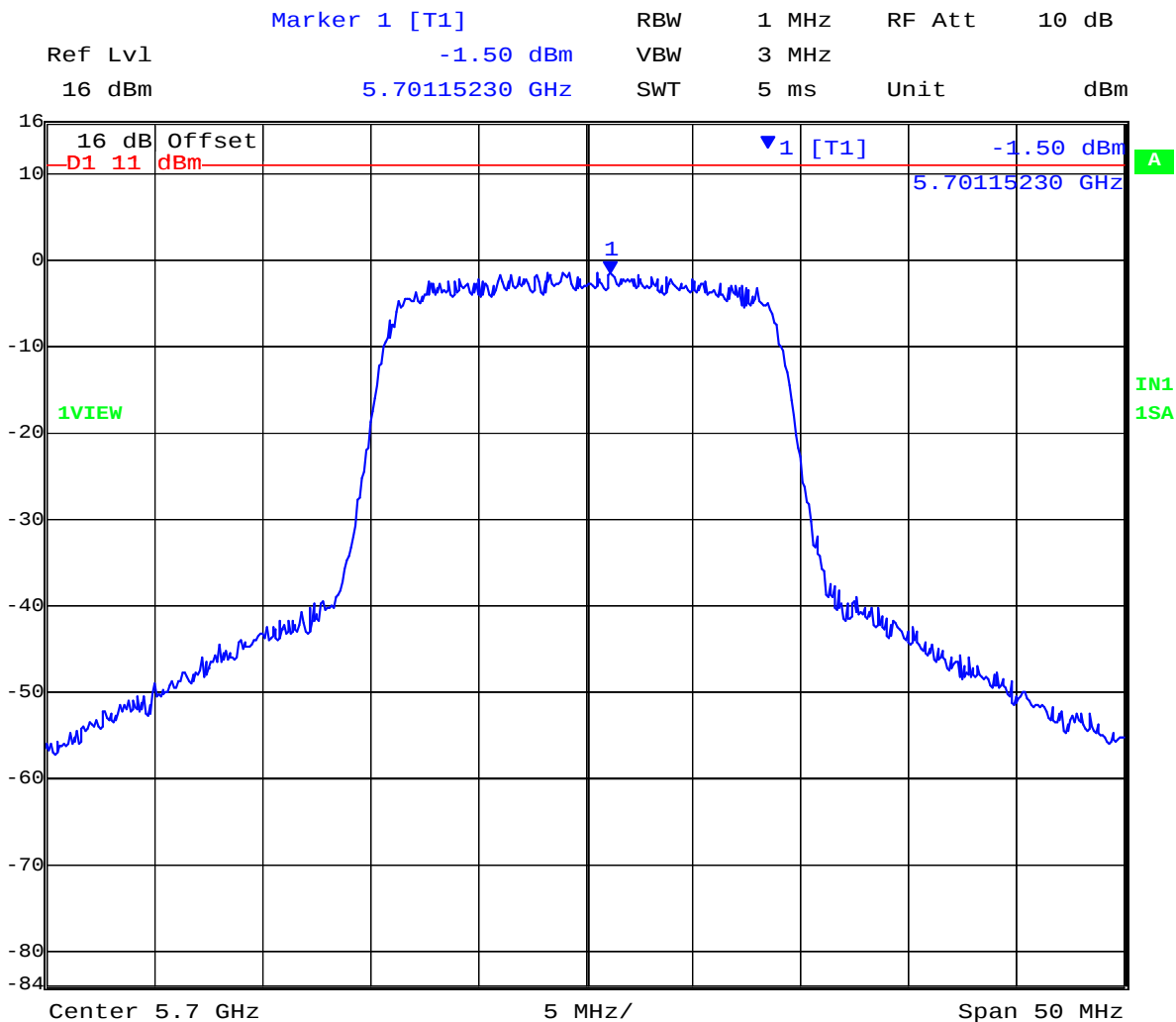
Date: 19.OCT.2010 17:18:22

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 203 of 465

5,700 MHz 802.11n HT20 - MIMO RADIO Chain b Peak Power Spectral Density



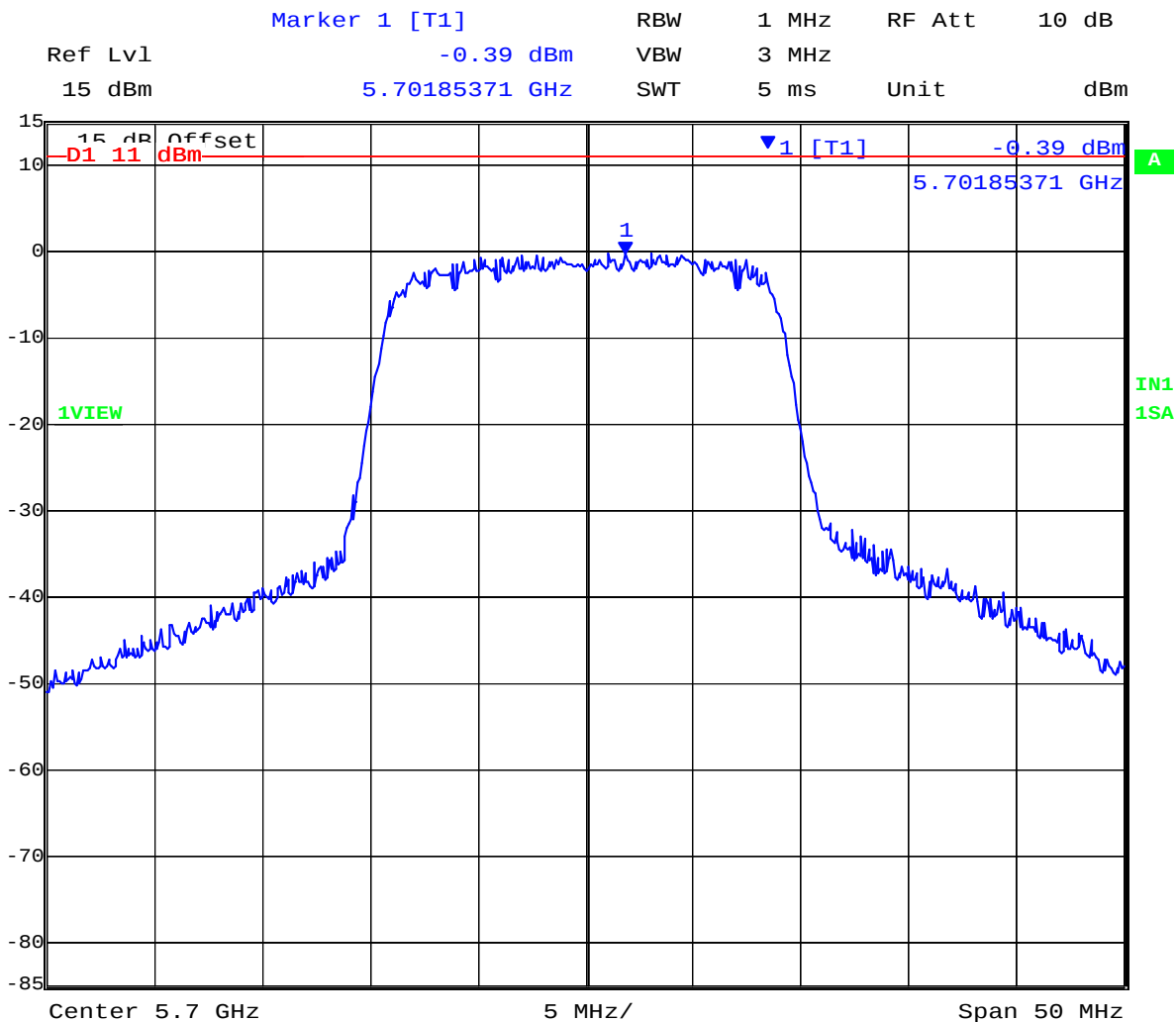
Date: 19.OCT.2010 17:13:36

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 204 of 465

5,700 MHz 802.11n HT20 - MIMO RADIO Chain c Peak Power Spectral Density



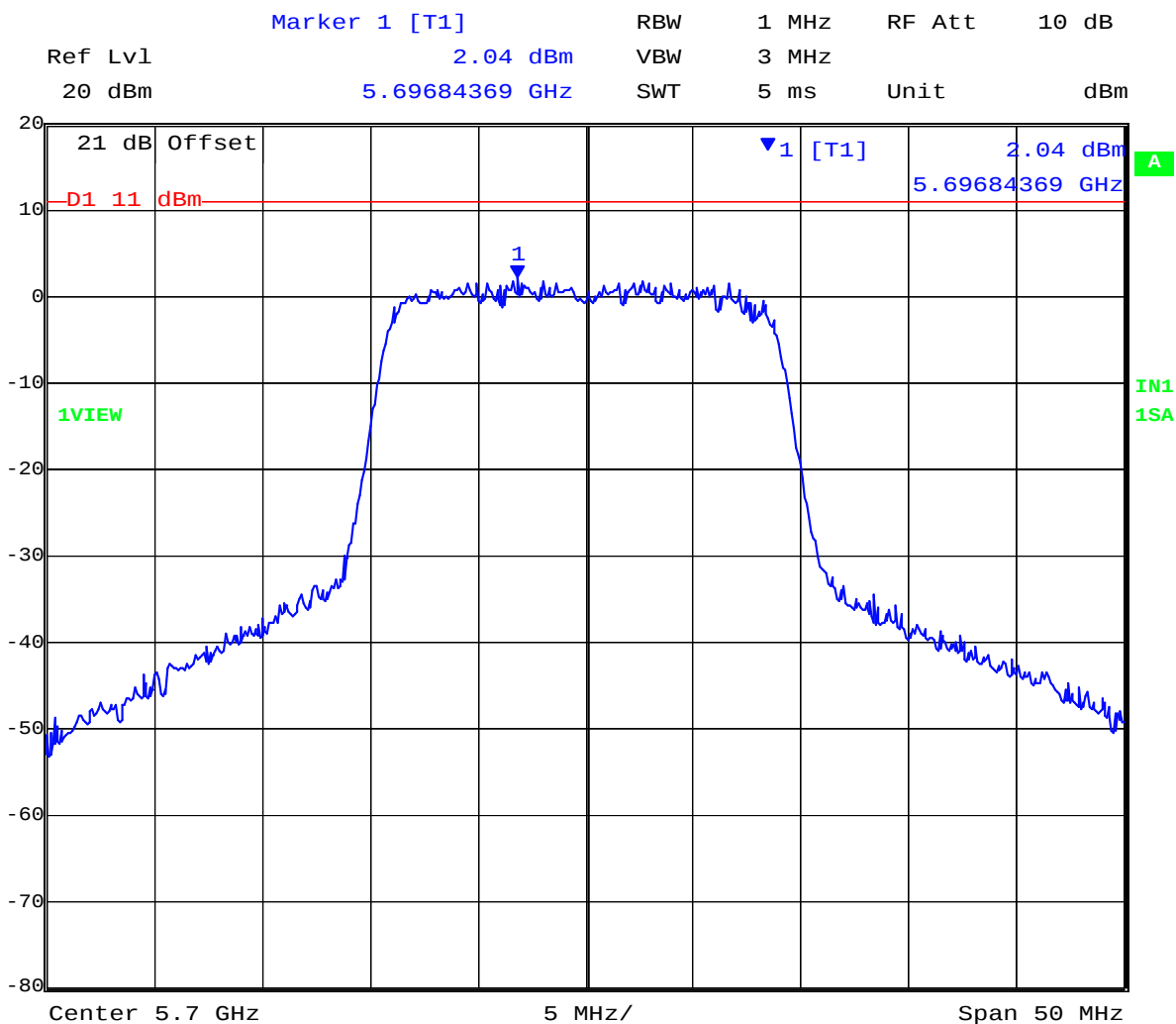
Date: 19.OCT.2010 17:15:58

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Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 205 of 465

5,700 MHz 802.11n HT20 - MIMO RADIO Combined Peak Power Spectral Density



Date: 19.OCT.2010 17:20:49

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 206 of 465

TABLE OF RESULTS – 802.11n HT40 - MIMO RADIO

5150 - 5250 MHZ

Test Conditions:	15.407 (a)	Rel. Humidity (%):	35	to	42
Variant:	HT-40	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A	Antenna Gain:	1.2		dBi
Applied Voltage:	28.0	Vdc			
Notes 1:					
Notes 2:					

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5190	-5.83	-5.84	-6.76		-4.33		4.00	-8.33
5230	-5.97	-5.25	-6.54		-3.22		4.00	-7.22

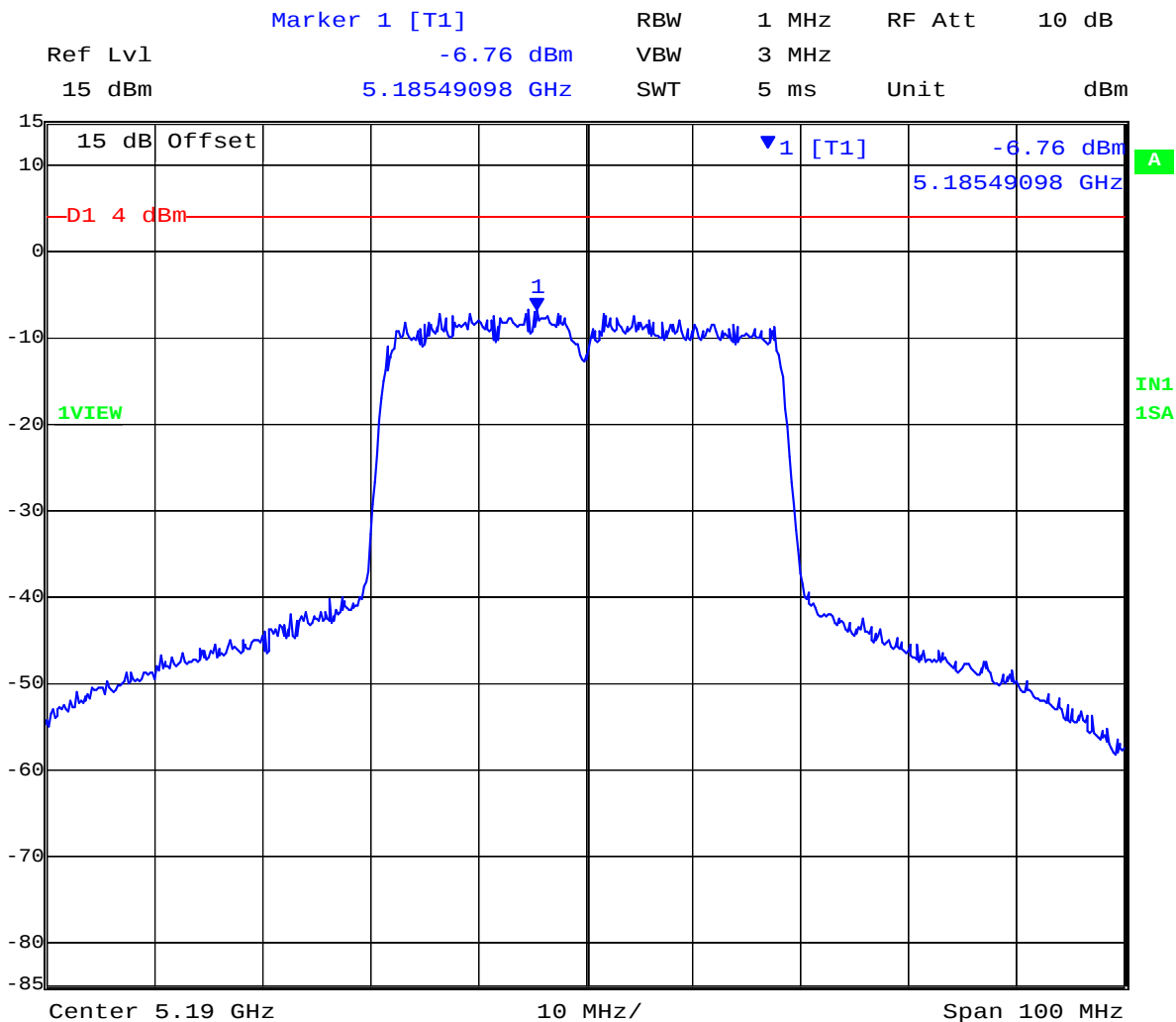
Measurement uncertainty:	±1.33 dB
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 207 of 465

5,190 MHz 802.11n HT40 - MIMO RADIO Chain a Peak Power Spectral Density



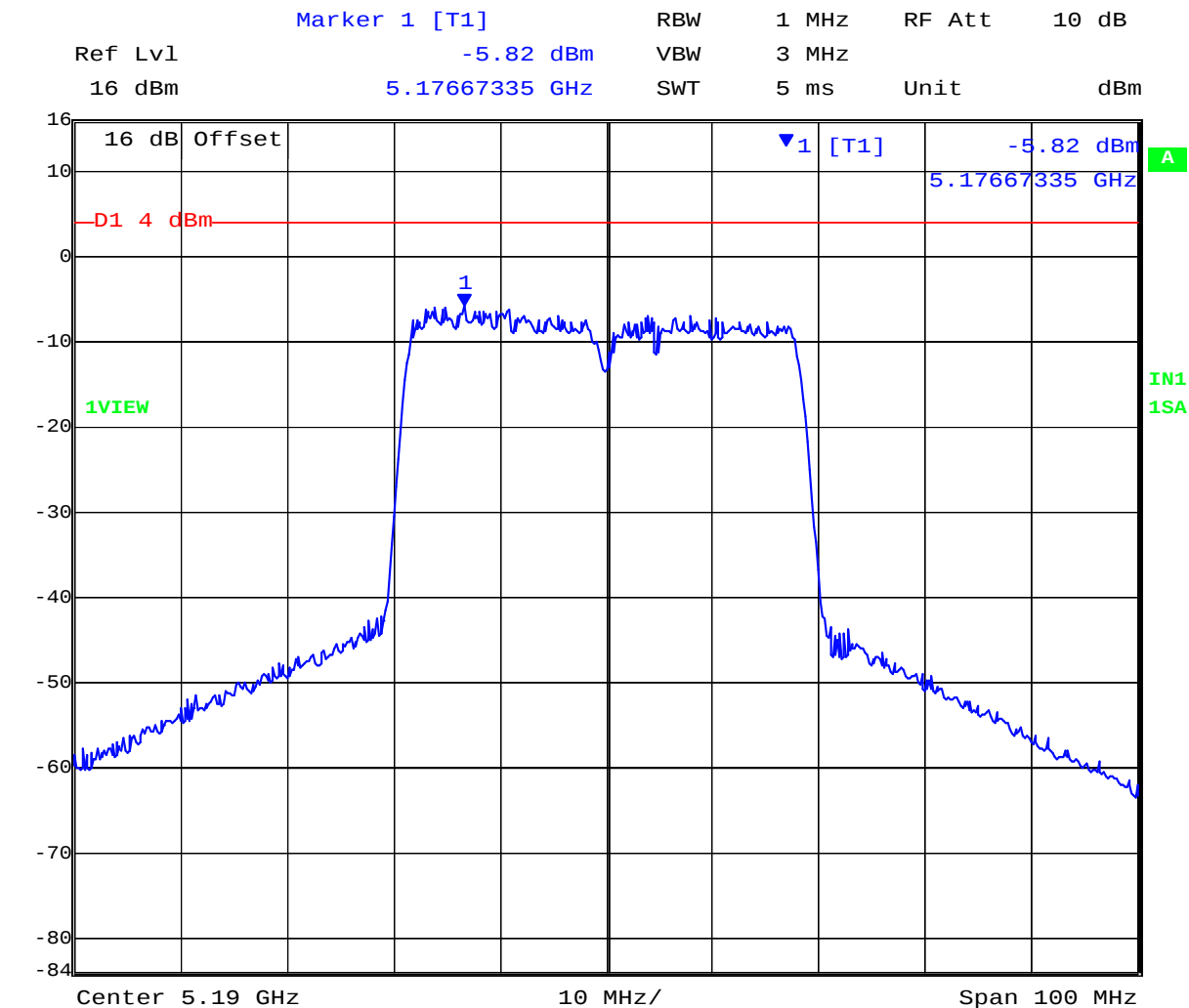
Date: 18.OCT.2010 15:40:37

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 208 of 465

5,190 MHz 802.11n HT40 - MIMO RADIO Chain b Peak Power Spectral Density



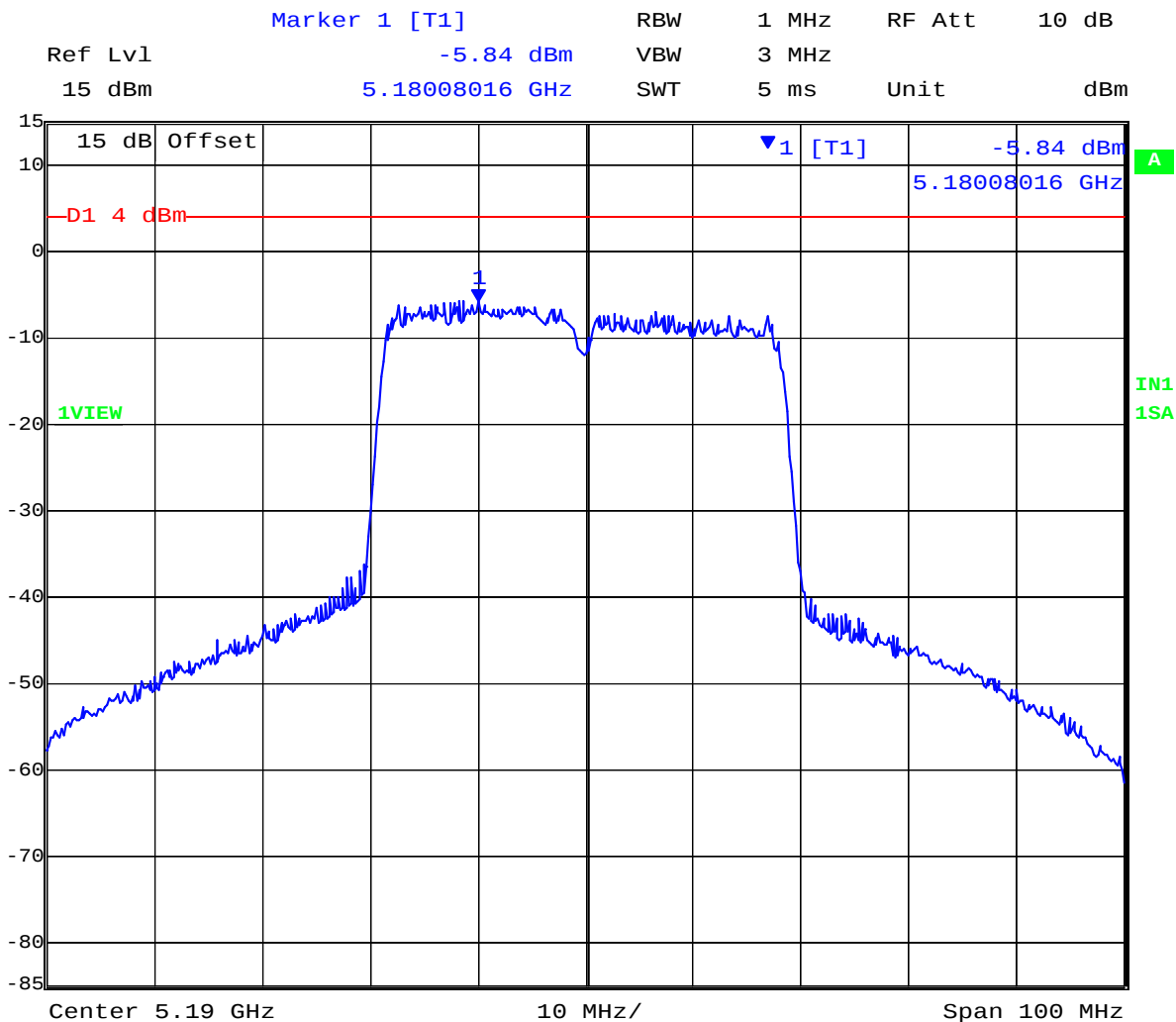
Date: 18.OCT.2010 15:35:55

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 209 of 465

5,190 MHz 802.11n HT40 - MIMO RADIO Chain c Peak Power Spectral Density



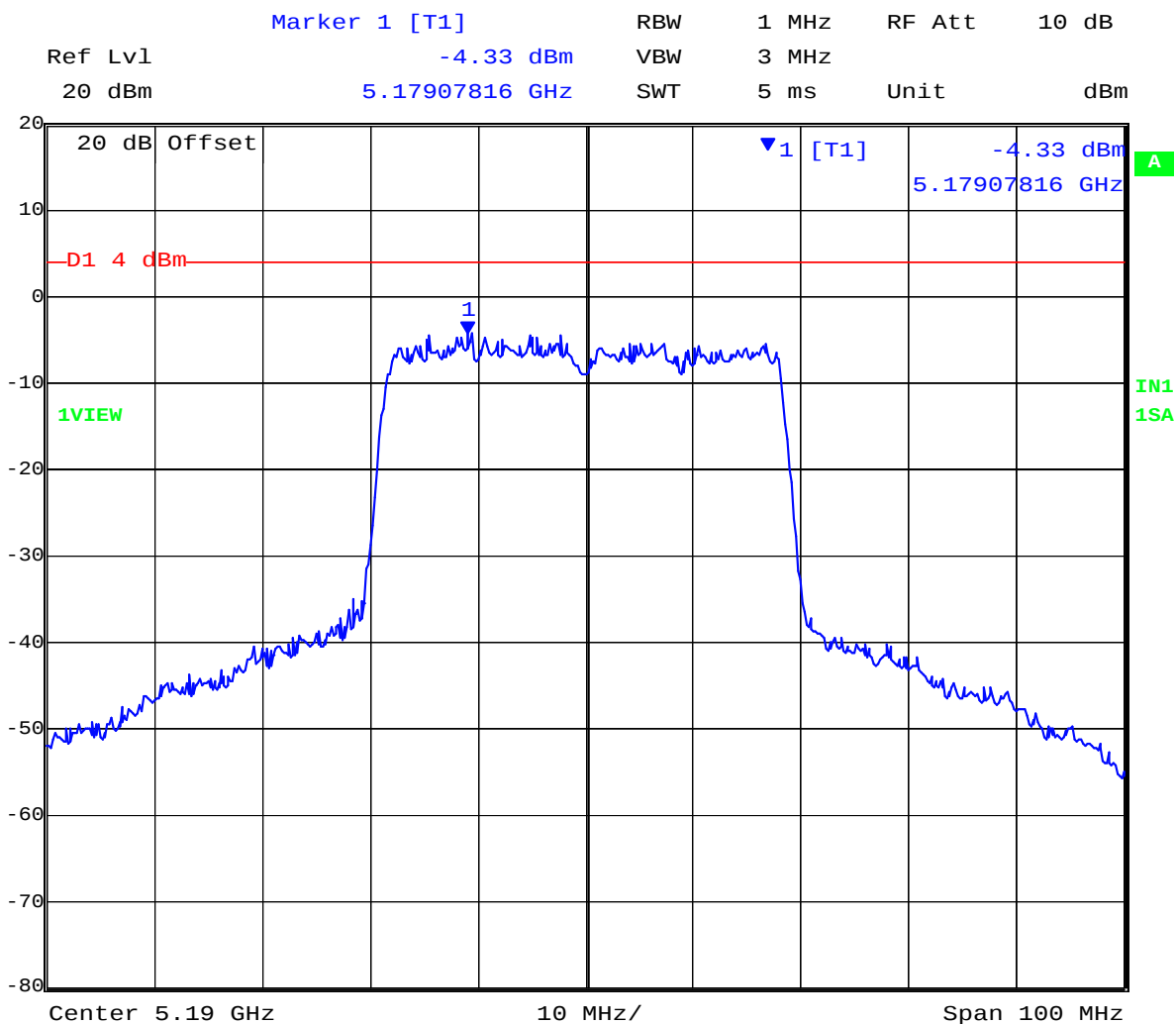
Date: 18.OCT.2010 15:38:16

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Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 210 of 465

5,190 MHz 802.11n HT40 - MIMO RADIO Combined Peak Power Spectral Density



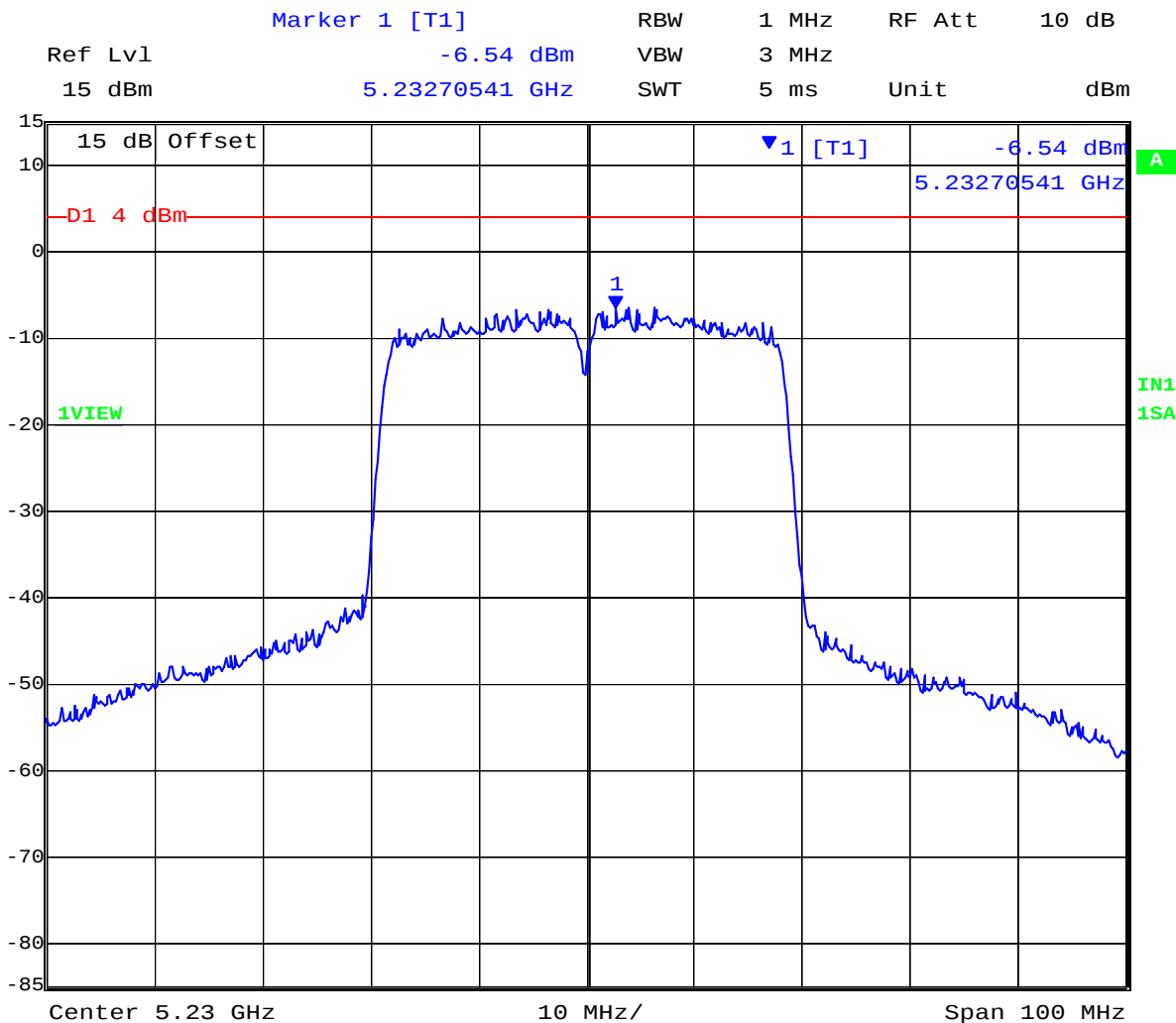
Date: 18.OCT.2010 15:43:03

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 211 of 465

5,230 MHz 802.11n HT40 - MIMO RADIO Chain a Peak Power Spectral Density



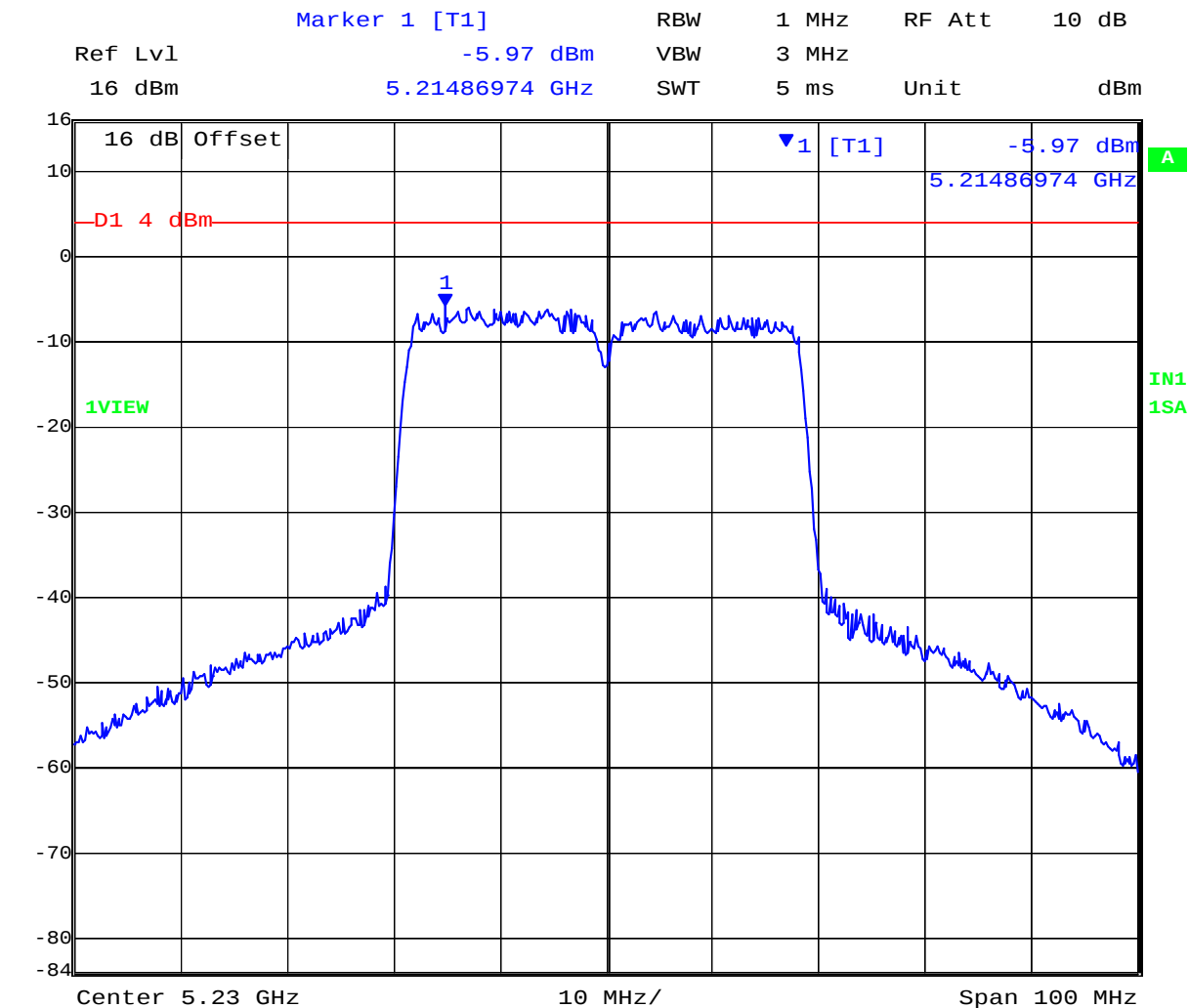
Date: 18.OCT.2010 16:11:16

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 212 of 465

5,230 MHz 802.11n HT40 - MIMO RADIO Chain b Peak Power Spectral Density



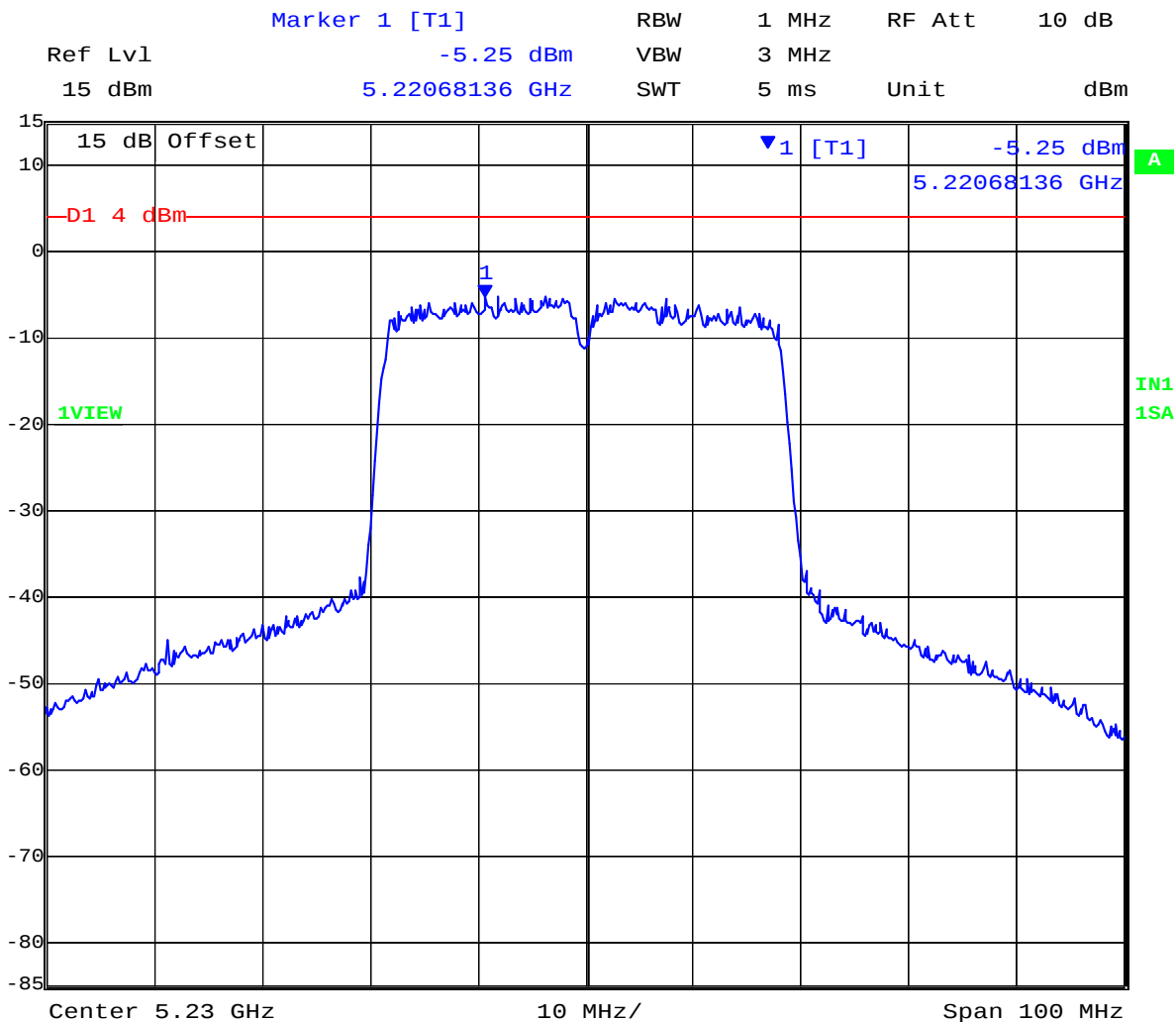
Date: 18.OCT.2010 16:06:32

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 213 of 465

5,230 MHz 802.11n HT40 - MIMO RADIO Chain c Peak Power Spectral Density



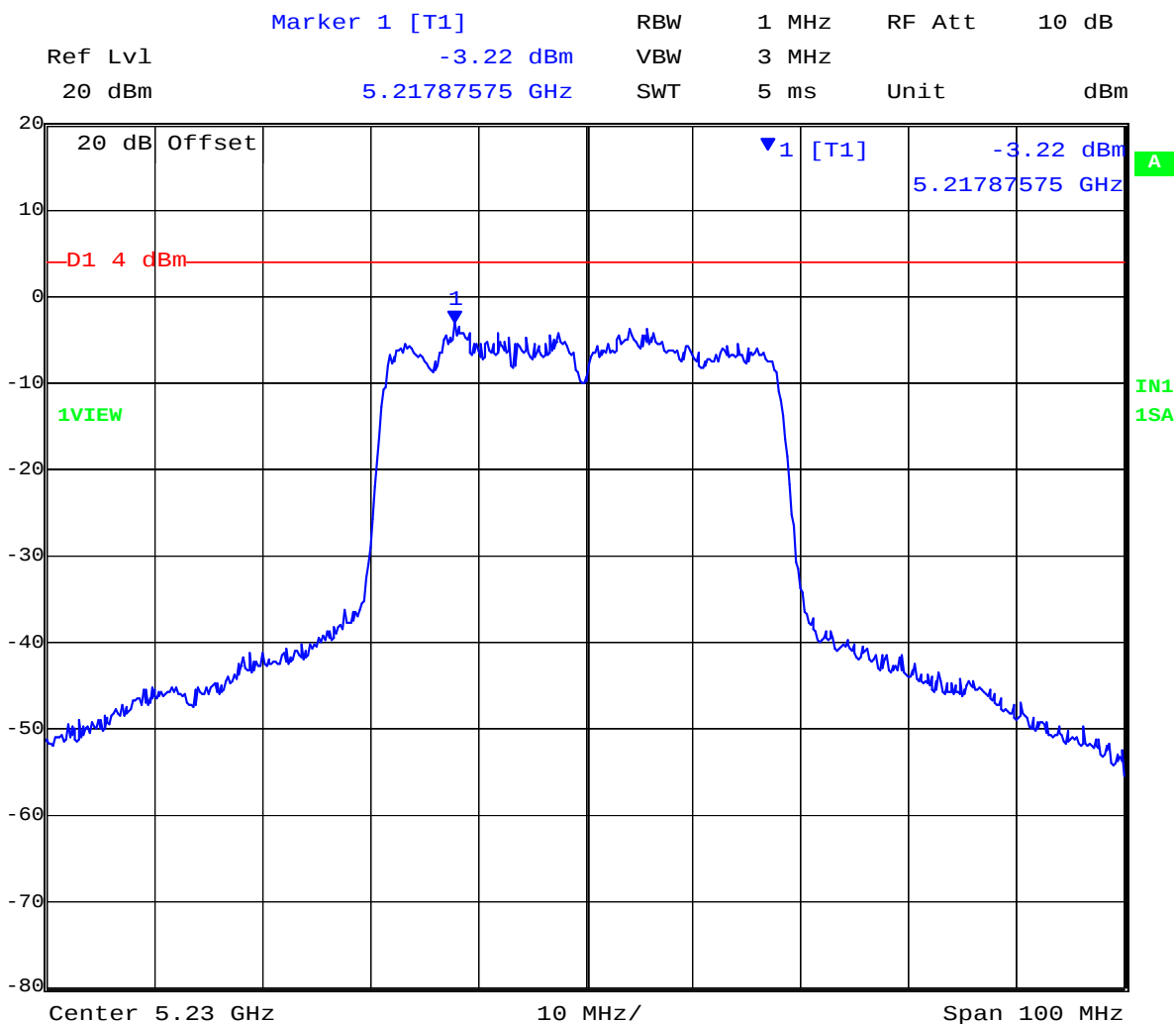
Date: 18.OCT.2010 16:08:54

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 214 of 465

5,230 MHz 802.11n HT40 - MIMO RADIO Combined Peak Power Spectral Density



Date: 18.OCT.2010 16:13:42

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 215 of 465

TABLE OF RESULTS – 802.11n HT40 - MIMO RADIO

5250 -5350 MHZ

Test Conditions:	15.407 (a)	Rel. Humidity (%):	35	to	42
Variant:	802.11 n HT-40	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2 dBi		
Applied Voltage:	28.0 Vdc				
Notes 1:					
Notes 2:					

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)				Combined	Calculated		
MHz	a	b	c	d			dBm	dB
5270	-4.76	-4.69	-6.15		-2.62		11.00	-13.62
5310	-3.24	-3.83	-5.66		-0.59		11.00	-11.59

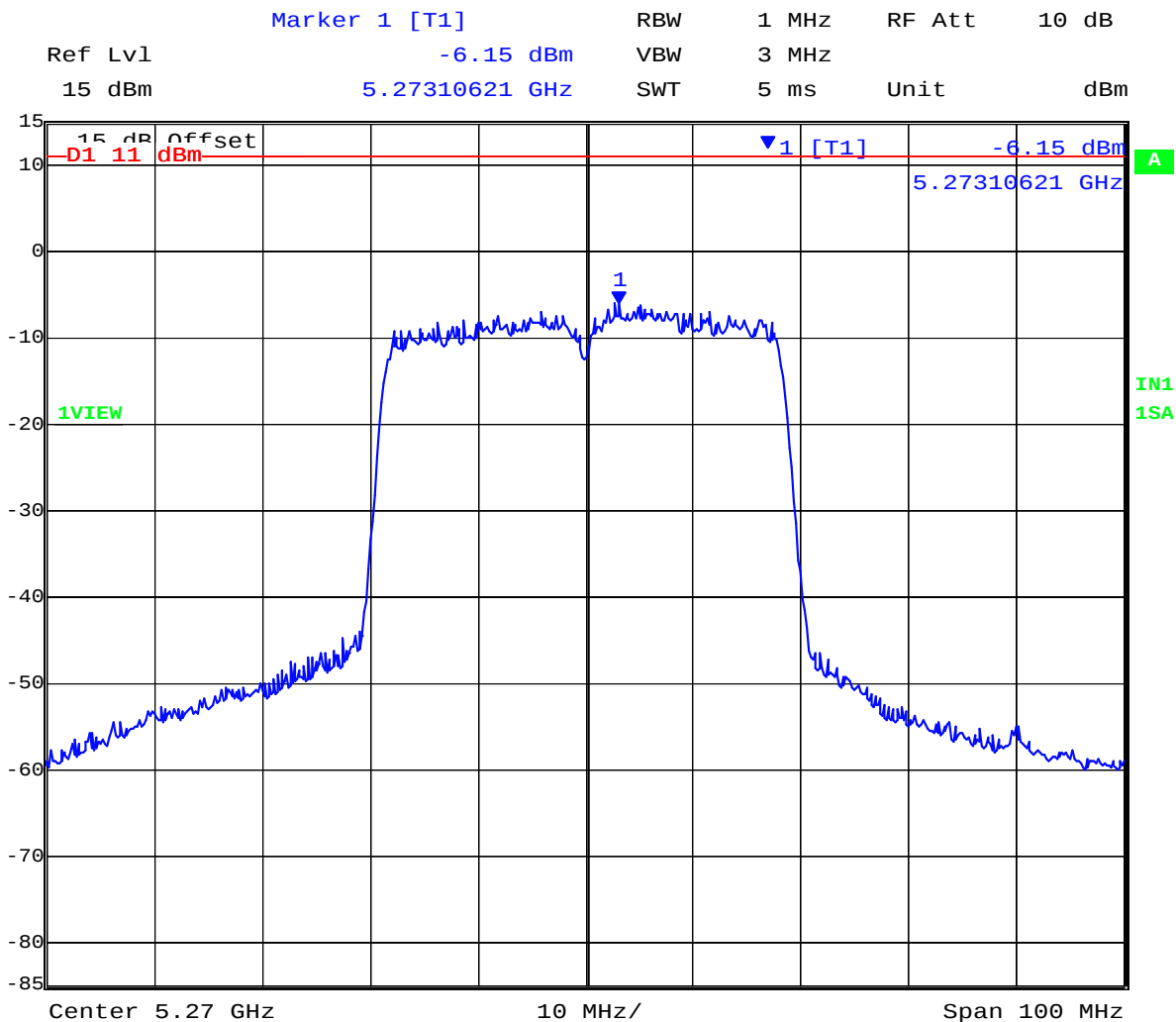
Measurement uncertainty:	±1.33 dB
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 216 of 465

5,270 MHz 802.11n HT40 - MIMO RADIO Chain a Peak Power Spectral Density



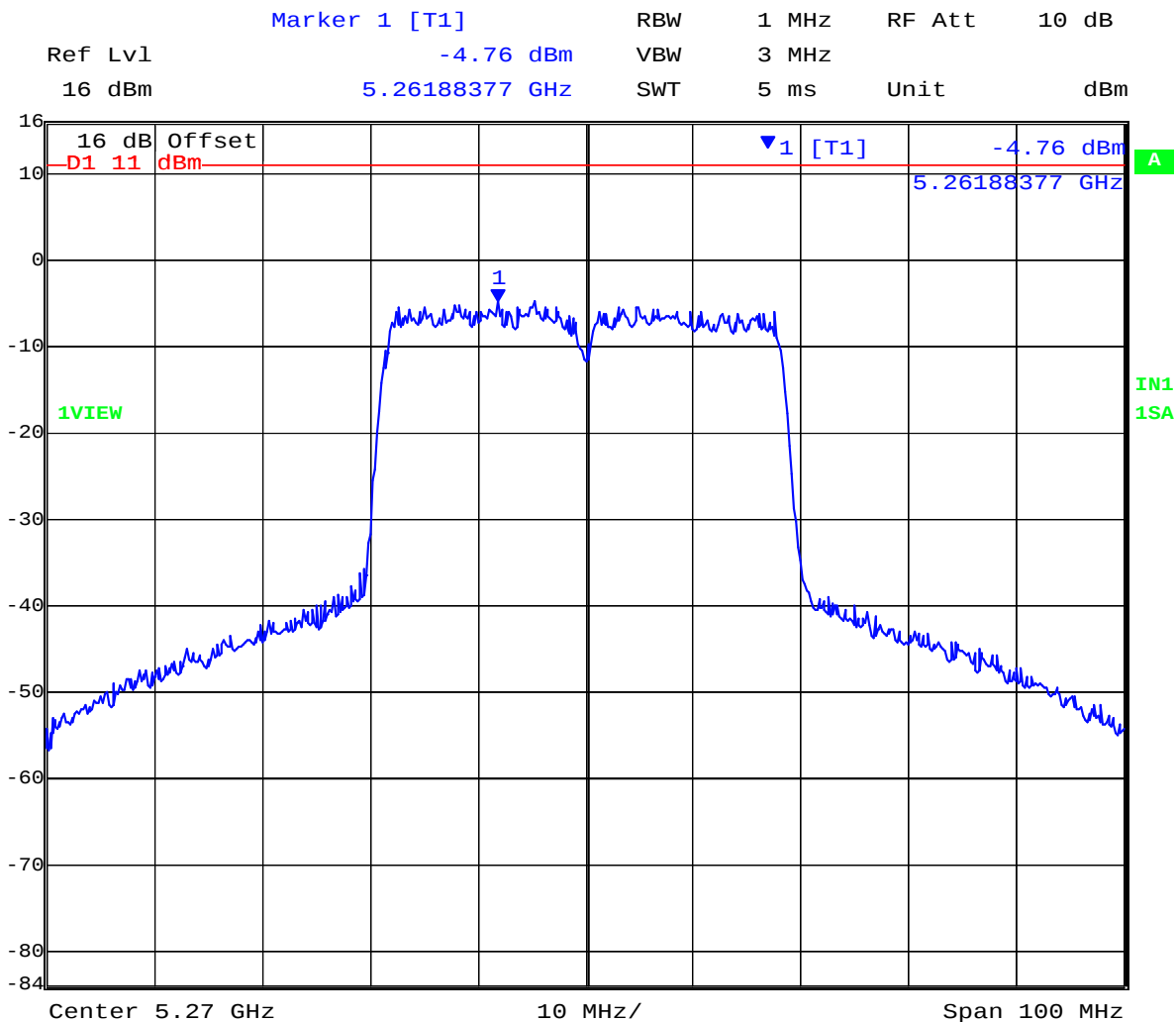
Date: 19.OCT.2010 12:34:19

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 217 of 465

5,270 MHz 802.11n HT40 - MIMO RADIO Chain b Peak Power Spectral Density



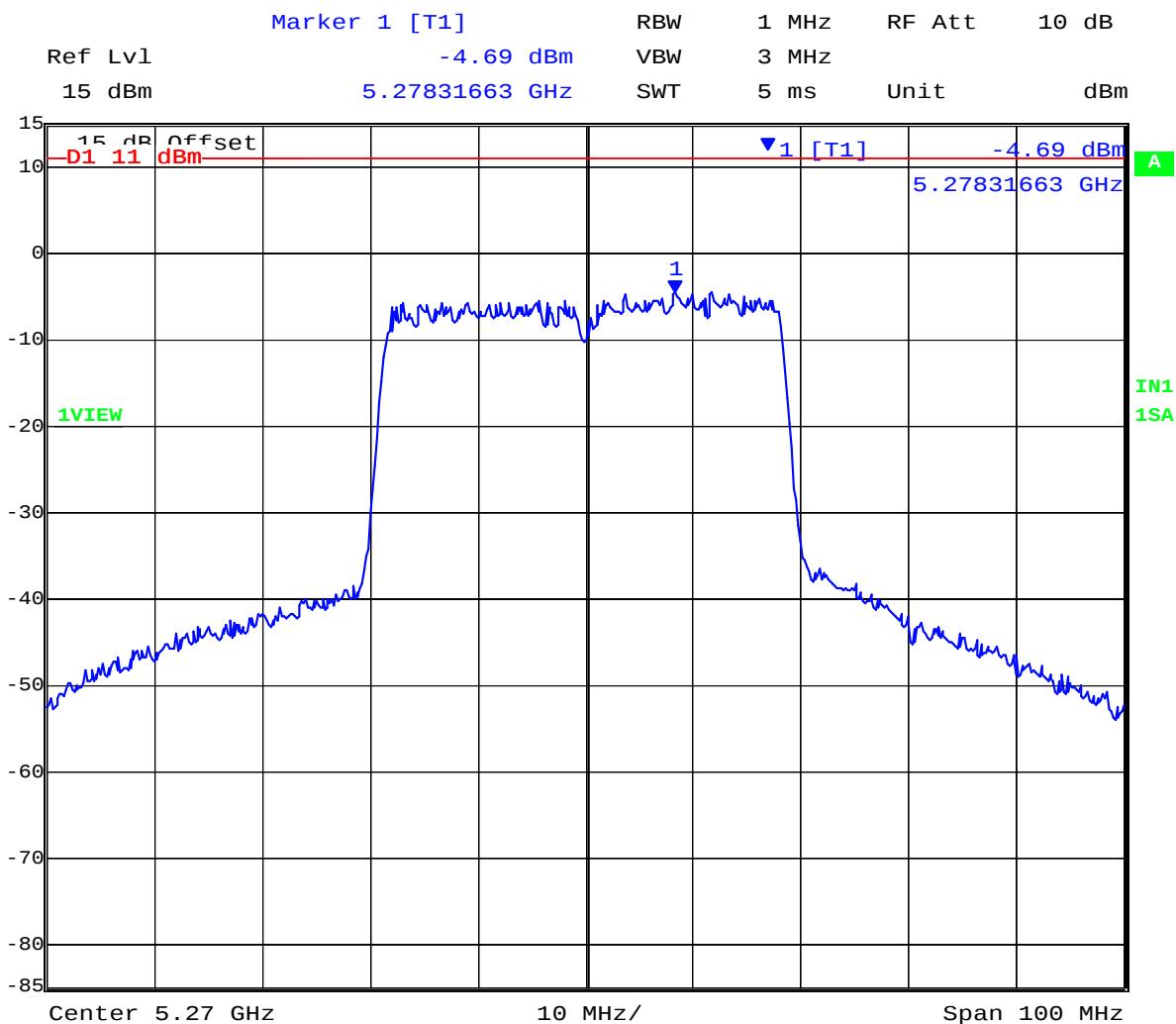
Date: 19.OCT.2010 12:29:38

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 218 of 465

5,270 MHz 802.11n HT40 - MIMO RADIO Chain c Peak Power Spectral Density



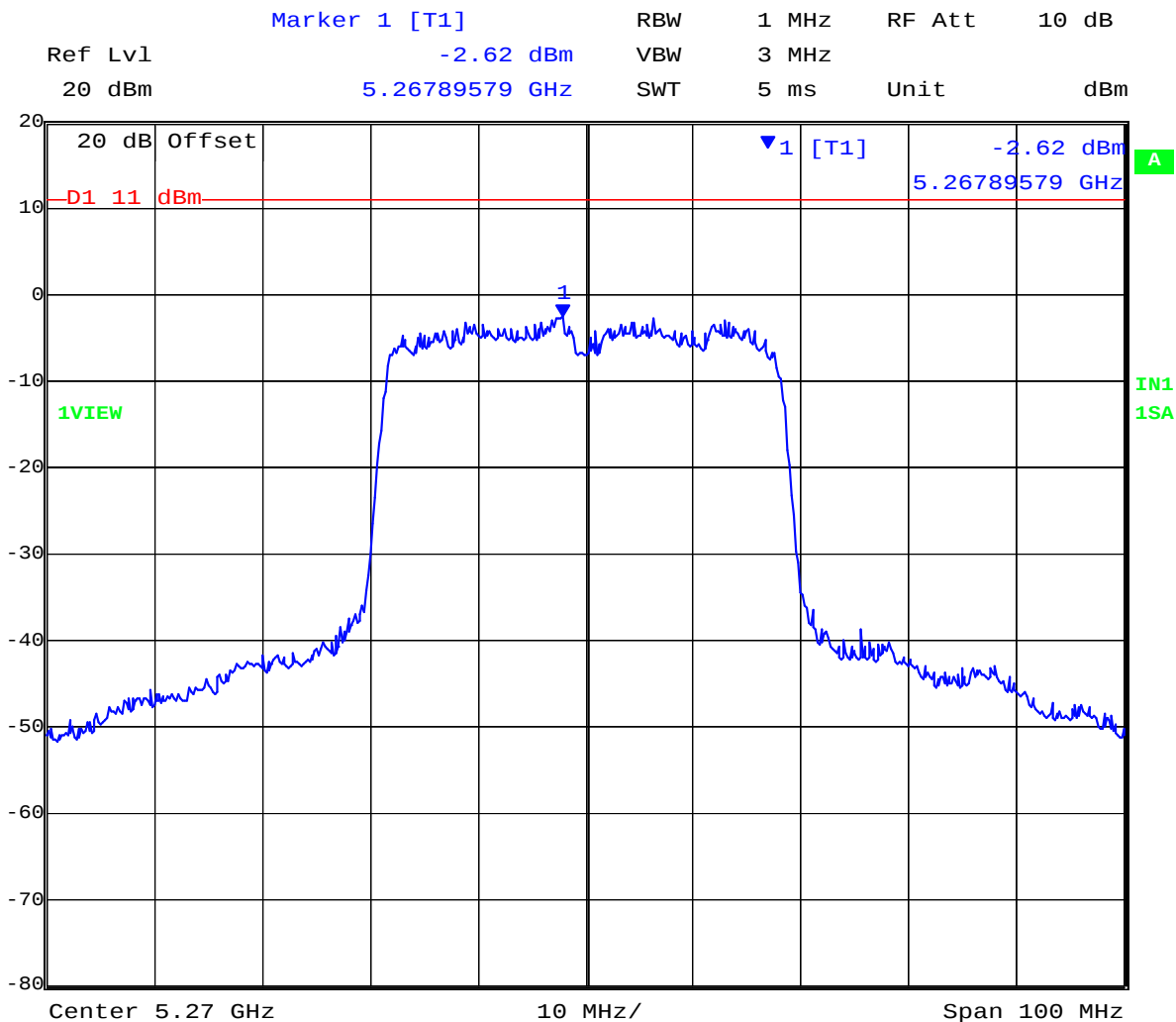
Date: 19.OCT.2010 12:31:58

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 219 of 465

5,270 MHz 802.11n HT40 - MIMO RADIO Combined Peak Power Spectral Density



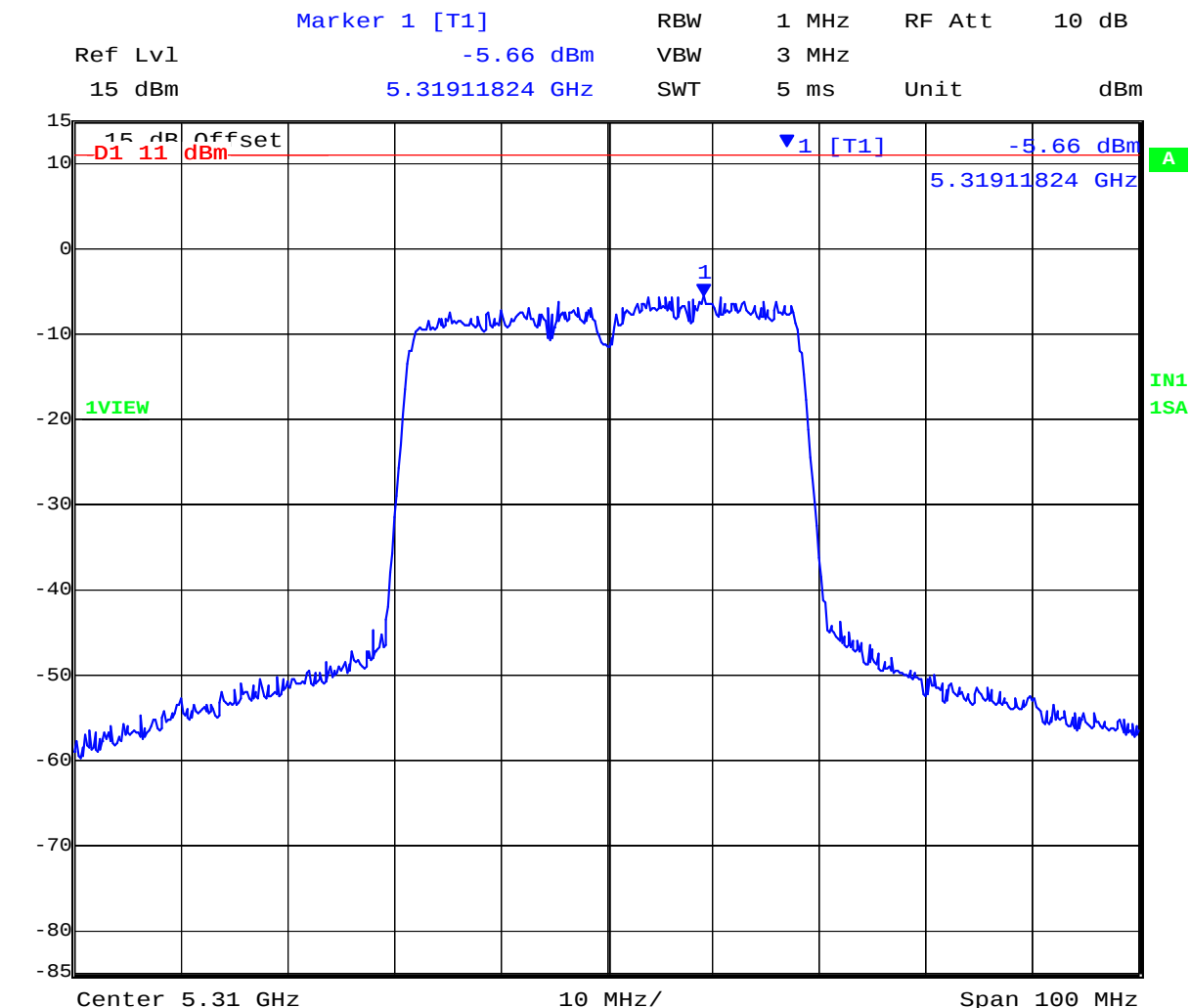
Date: 19.OCT.2010 12:36:34

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 220 of 465

5,310 MHz 802.11n HT40 - MIMO RADIO Chain a Peak Power Spectral Density



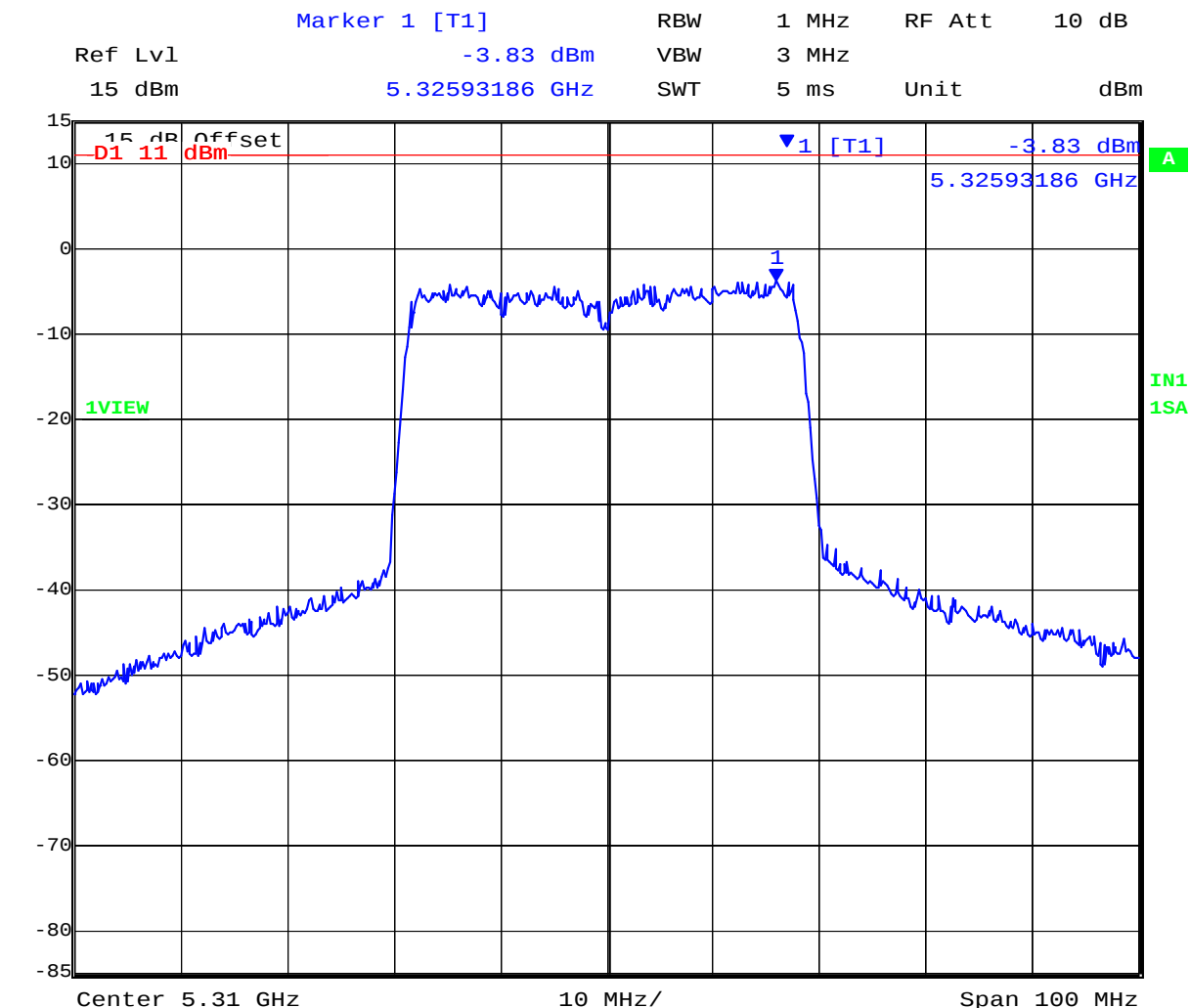
Date: 19.OCT.2010 13:28:50

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 221 of 465

5,310 MHz 802.11n HT40 - MIMO RADIO Chain b Peak Power Spectral Density



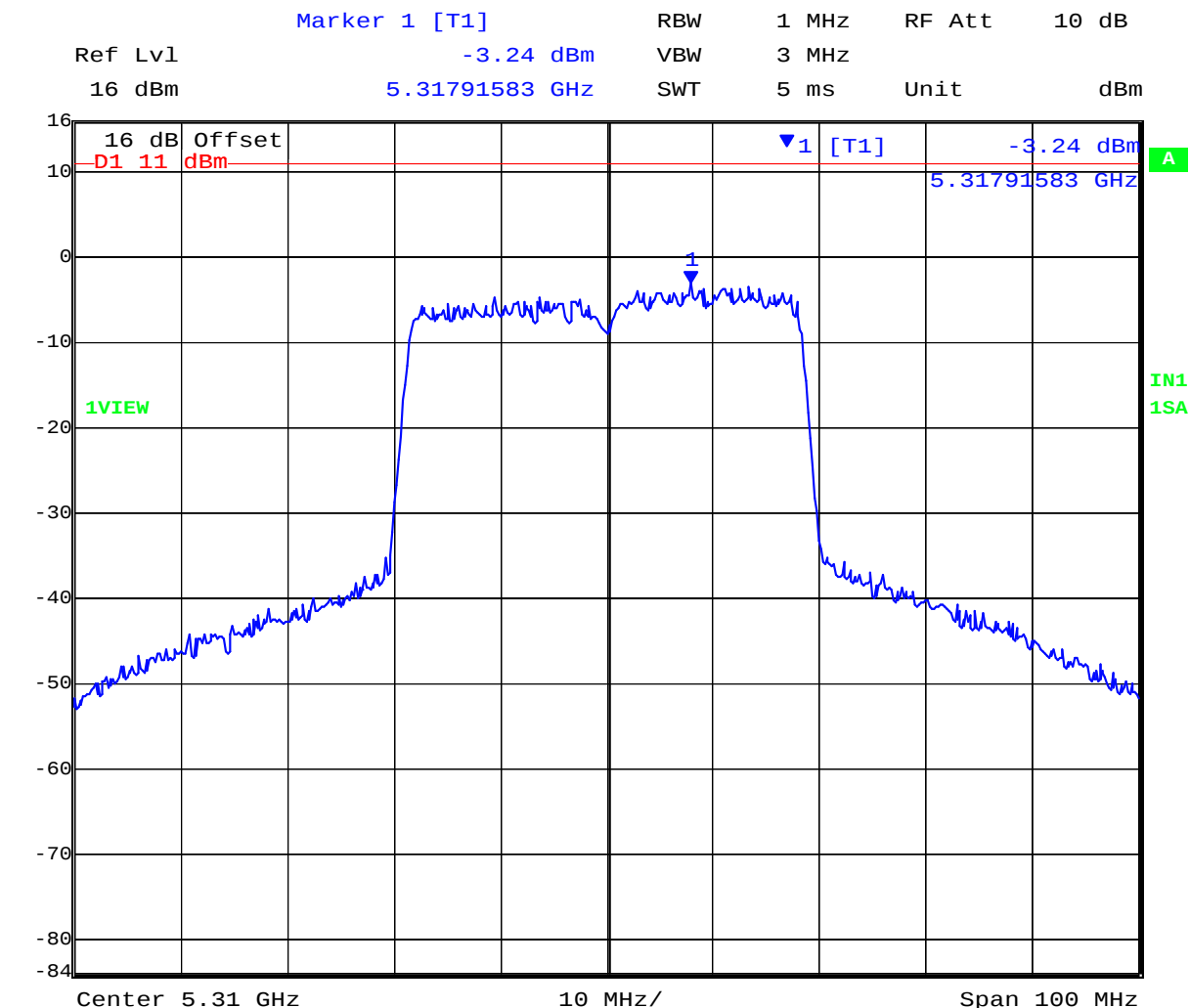
Date: 19.OCT.2010 13:26:26

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 222 of 465

5,310 MHz 802.11n HT40 - MIMO RADIO Chain c Peak Power Spectral Density



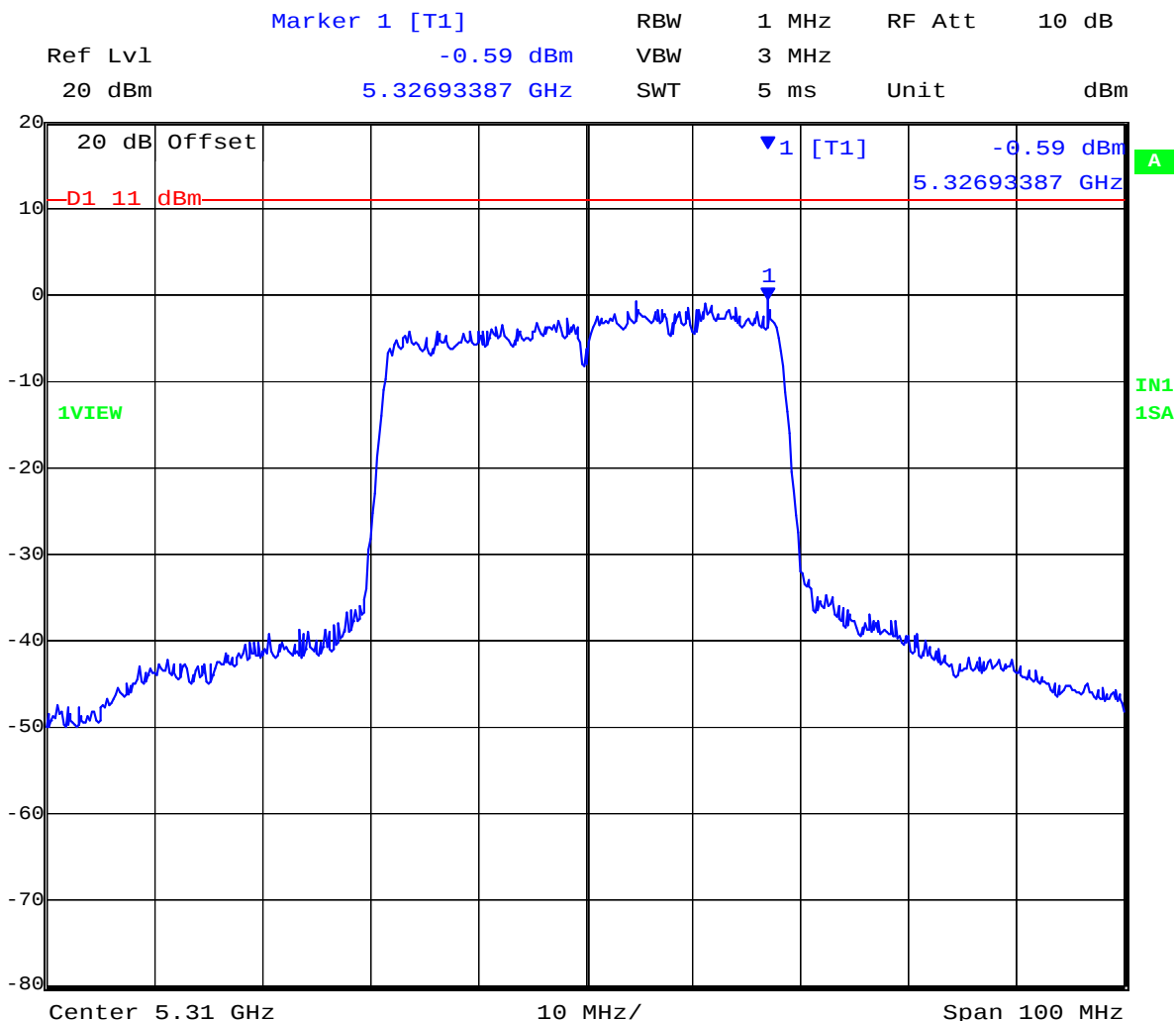
Date: 19.OCT.2010 13:24:06

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 223 of 465

5,310 MHz 802.11n HT40 - MIMO RADIO Combined Peak Power Spectral Density



Date: 19.OCT.2010 13:31:15

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 224 of 465

TABLE OF RESULTS – 802.11n HT40 - MIMO RADIO
5470 - 5725 MHZ

Test Conditions:	15.407 (a)	Rel. Humidity (%):	35	to	42
Variant:	802.11 n HT-40	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2 dBi		
Applied Voltage:	28.0 Vdc				
Notes 1:					
Notes 2:					

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5510	-4.55	-6.43	-5.95		-2.82		11.00	-13.82
5550	-6.24	-6.57	-7.29		-2.05		11.00	-13.05
5690	-5.65	-4.49	-9.04		-1.97		11.00	-12.97

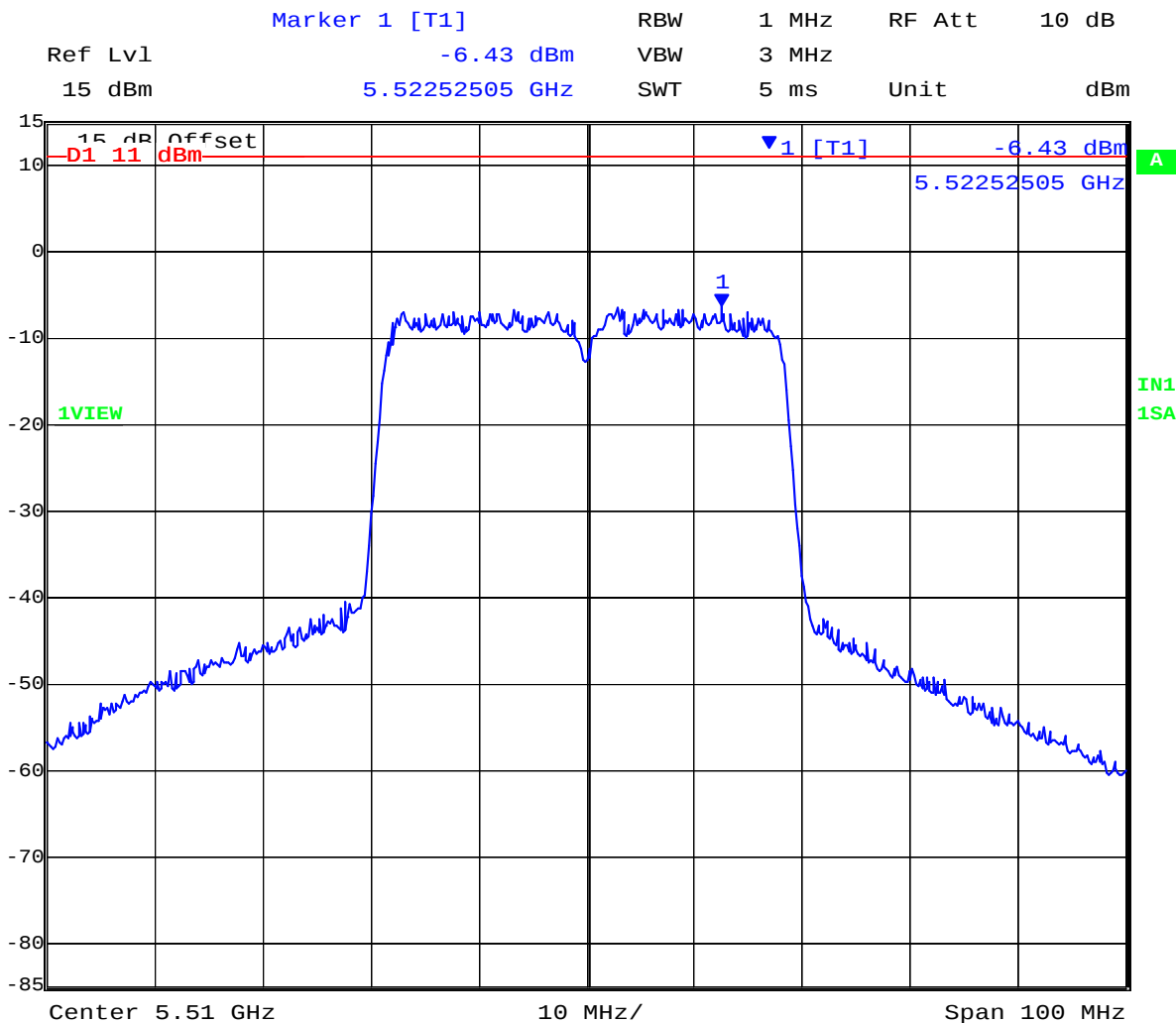
Measurement uncertainty:	±1.33 dB
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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 225 of 465

5,510 MHz 802.11n HT40 - MIMO RADIO Chain a Peak Power Spectral Density



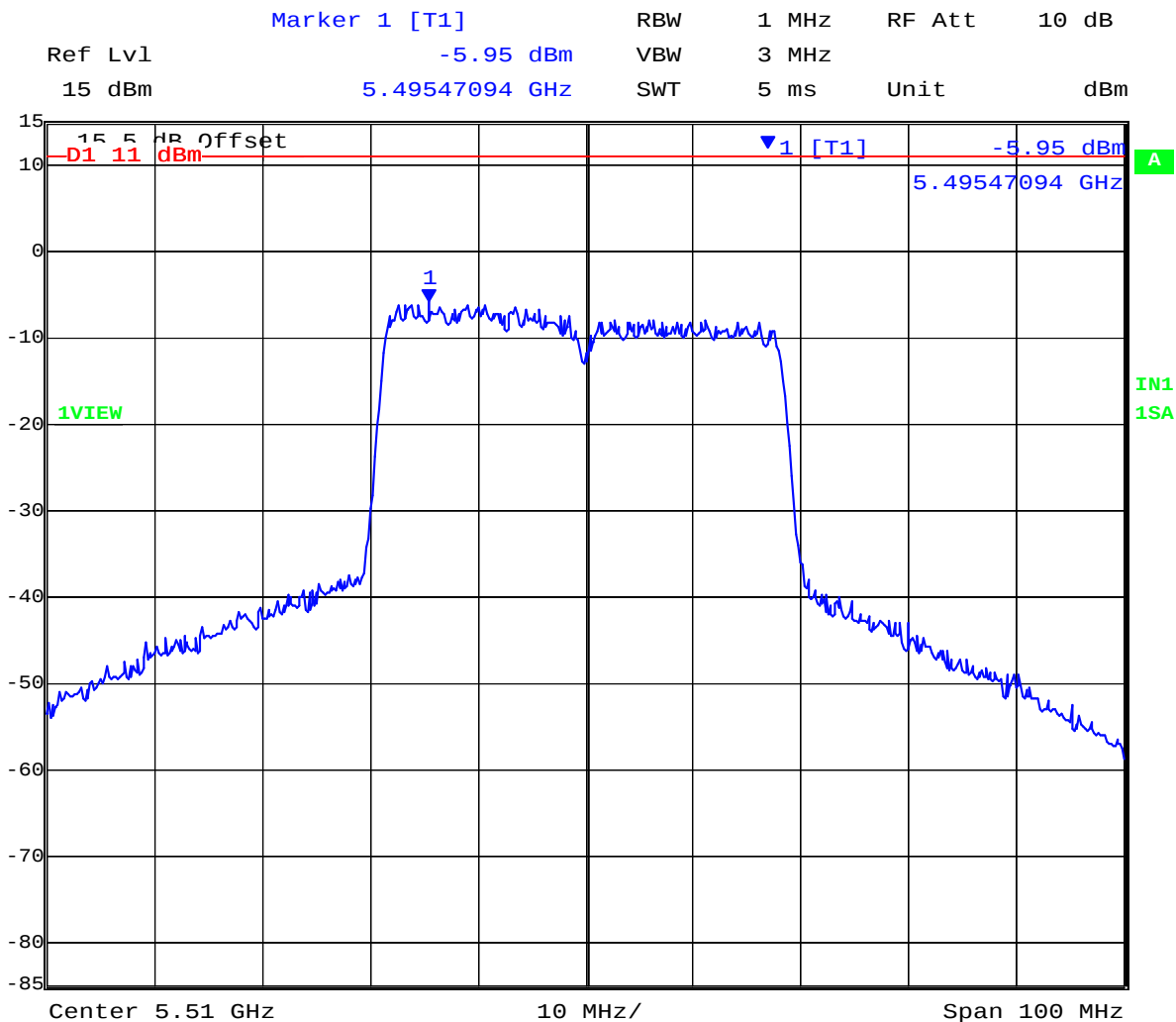
Date: 19.OCT.2010 17:47:50

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 226 of 465

5,510 MHz 802.11n HT40 - MIMO RADIO Chain b Peak Power Spectral Density



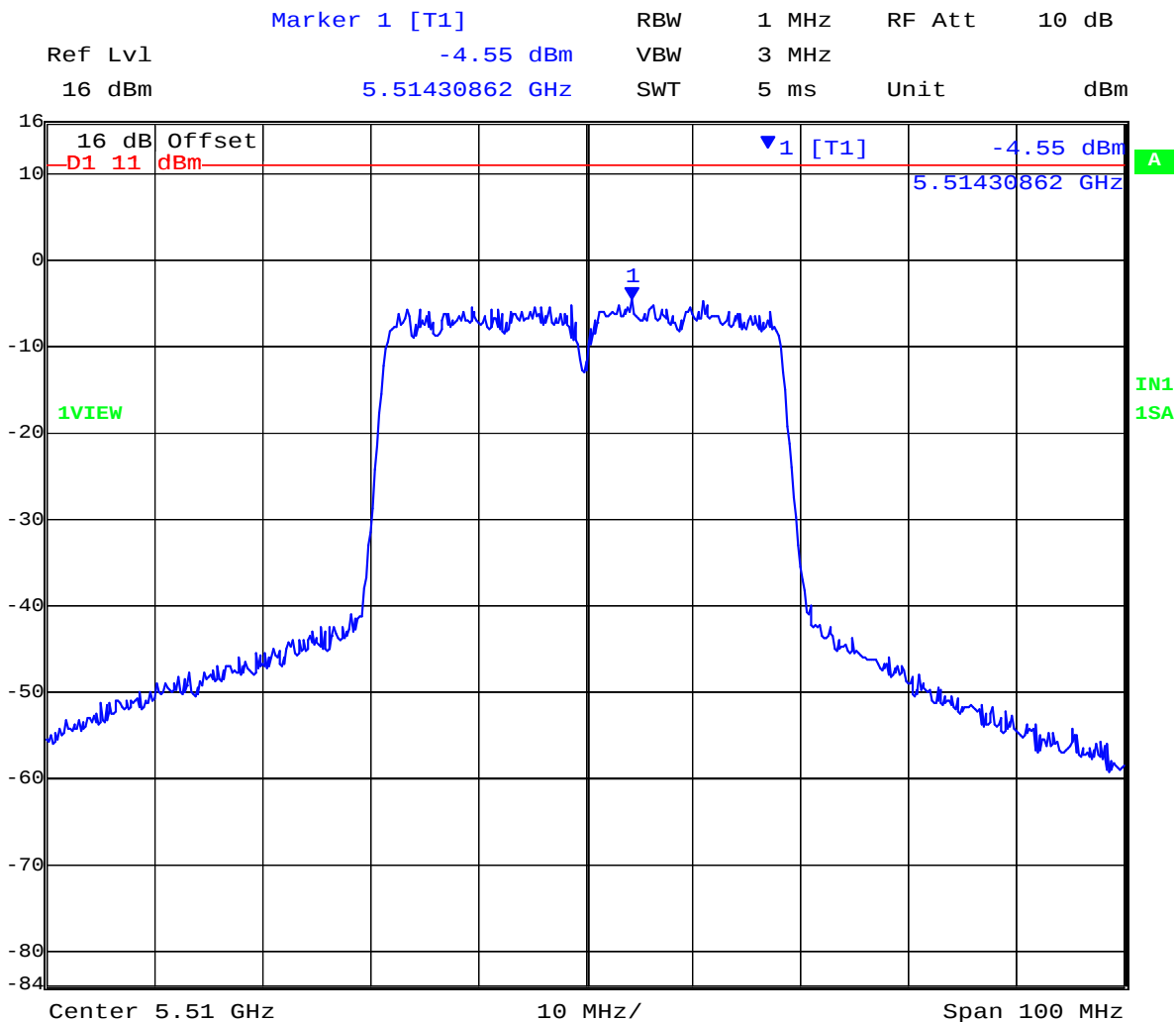
Date: 19.OCT.2010 17:50:14

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 227 of 465

5,510 MHz 802.11n HT40 - MIMO RADIO Chain c Peak Power Spectral Density



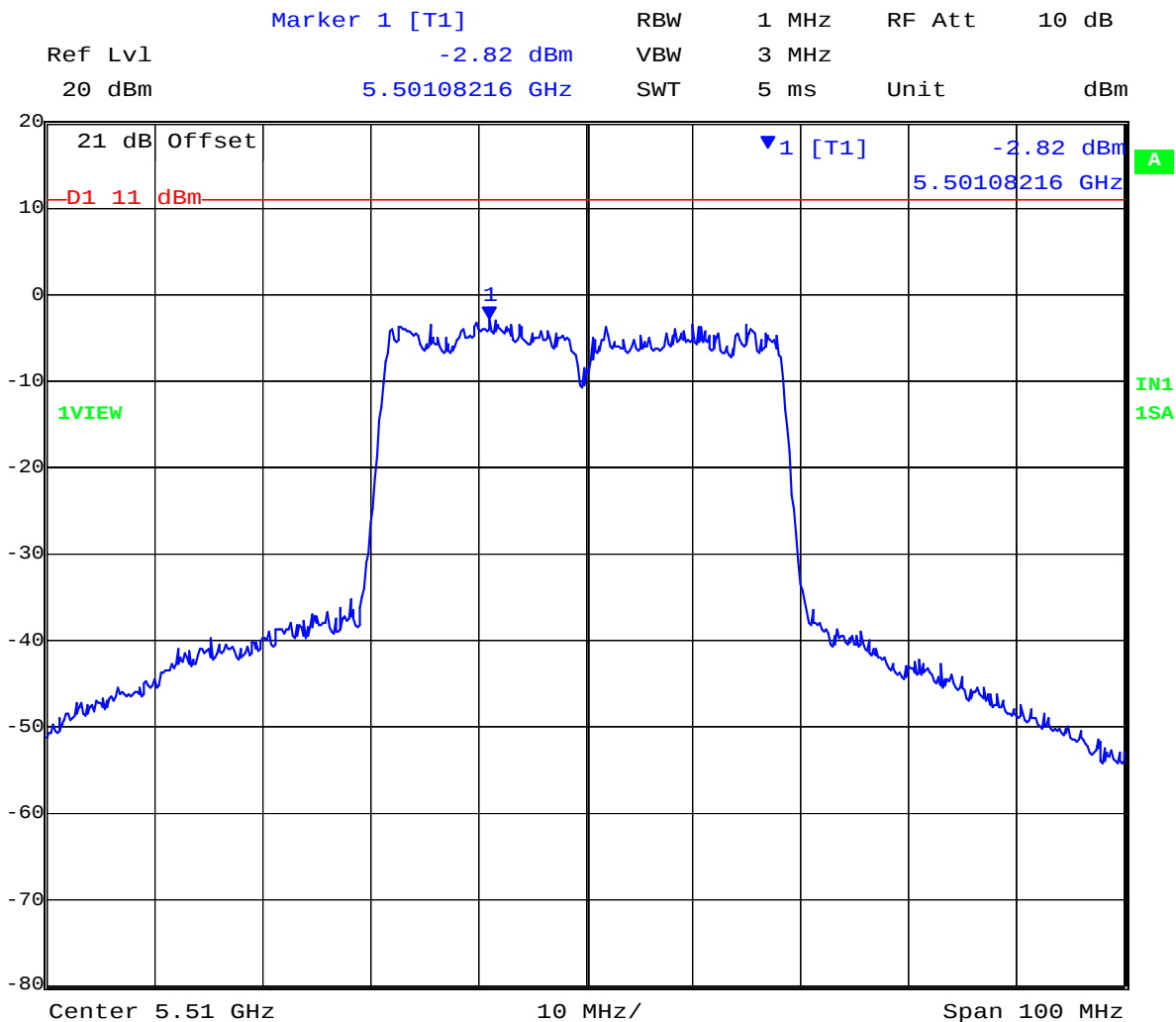
Date: 19.OCT.2010 17:45:27

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 228 of 465

5,510 MHz 802.11n HT40 - MIMO RADIO Combined Peak Power Spectral Density



Date: 19.OCT.2010 17:52:39

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 229 of 465

5,550 MHz 802.11n HT40 - MIMO RADIO Chain a Peak Power Spectral Density



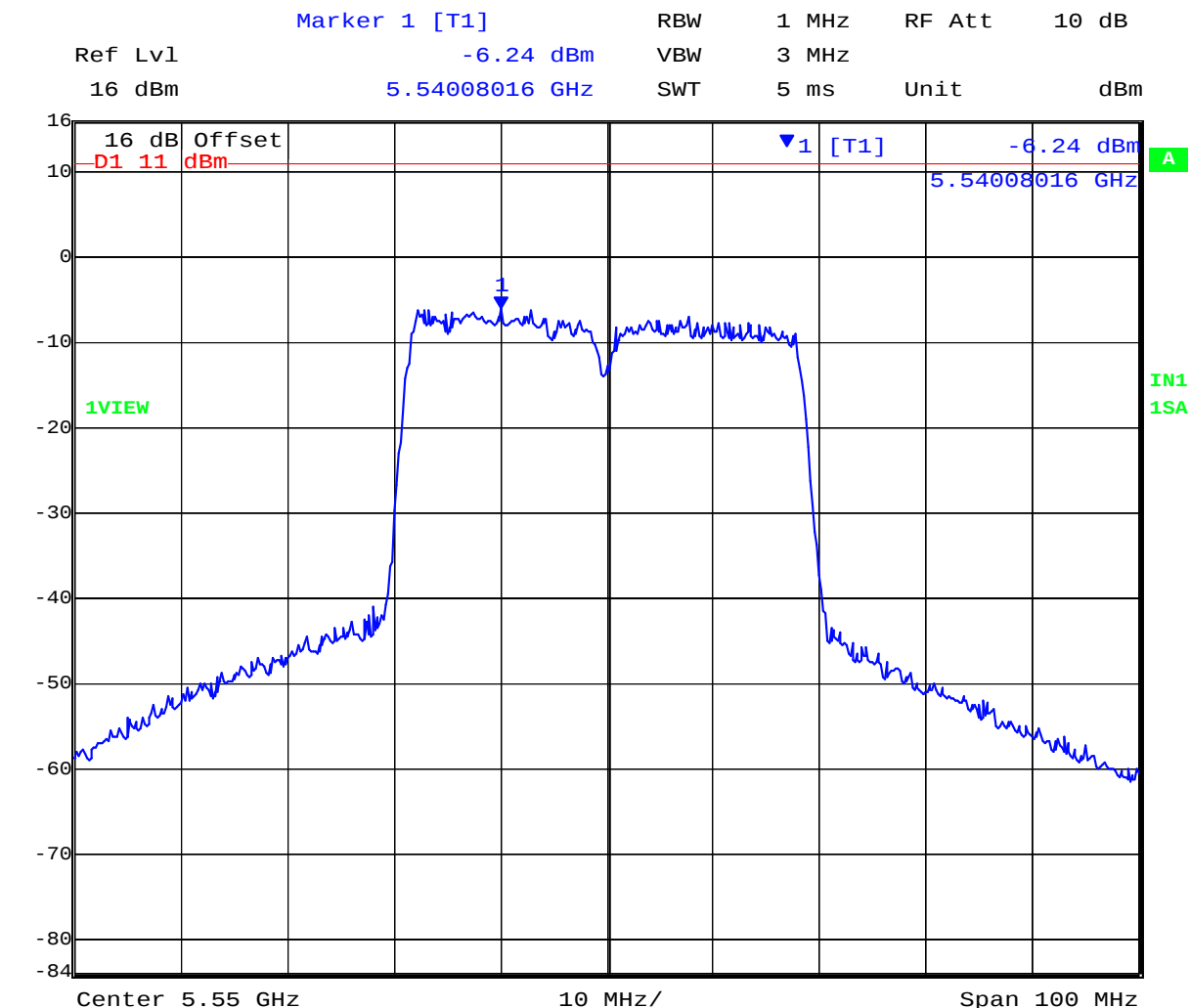
Date: 19.OCT.2010 18:22:53

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 230 of 465

5,550 MHz 802.11n HT40 - MIMO RADIO Chain b Peak Power Spectral Density

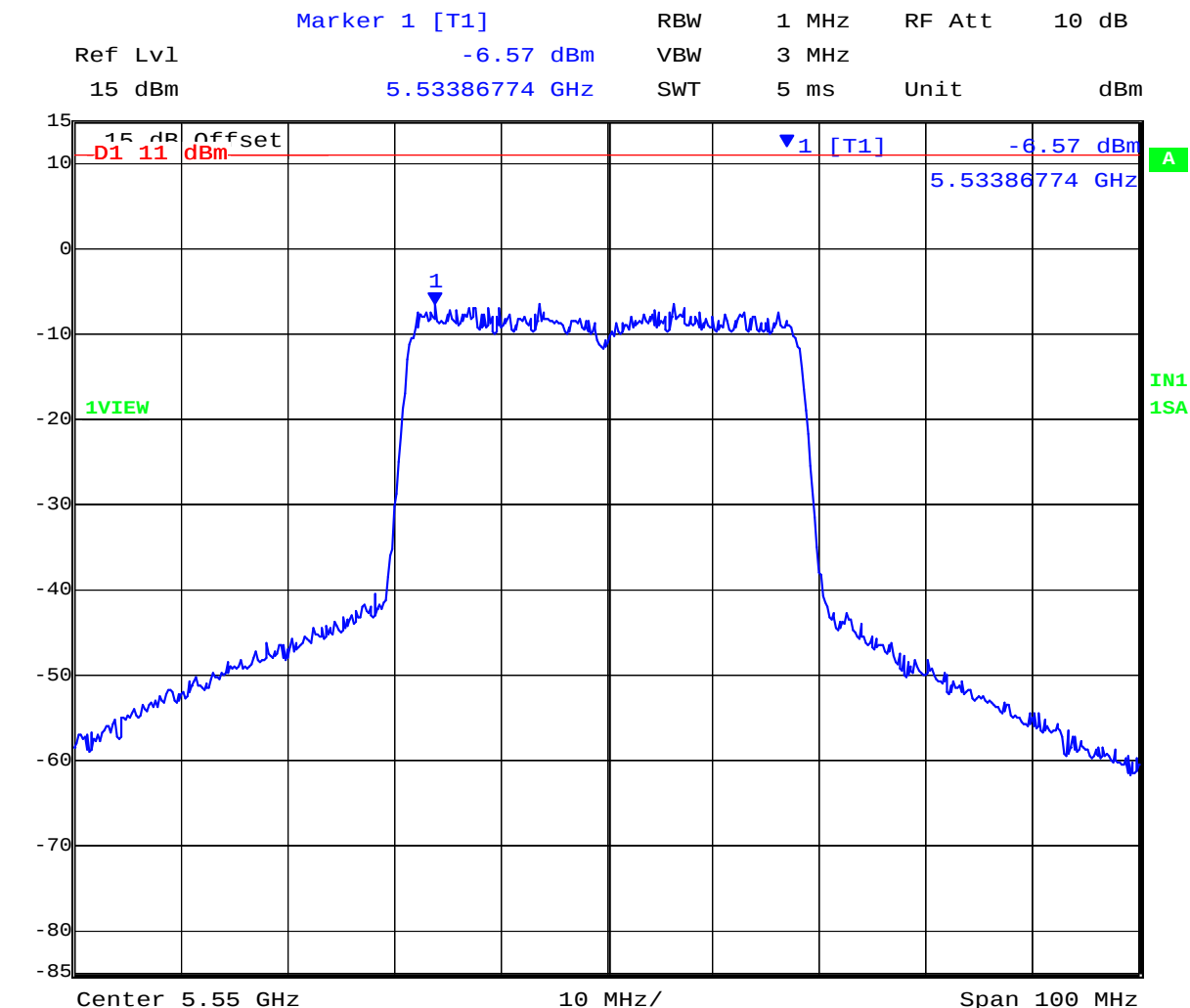


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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 231 of 465

5,550 MHz 802.11n HT40 - MIMO RADIO Chain c Peak Power Spectral Density



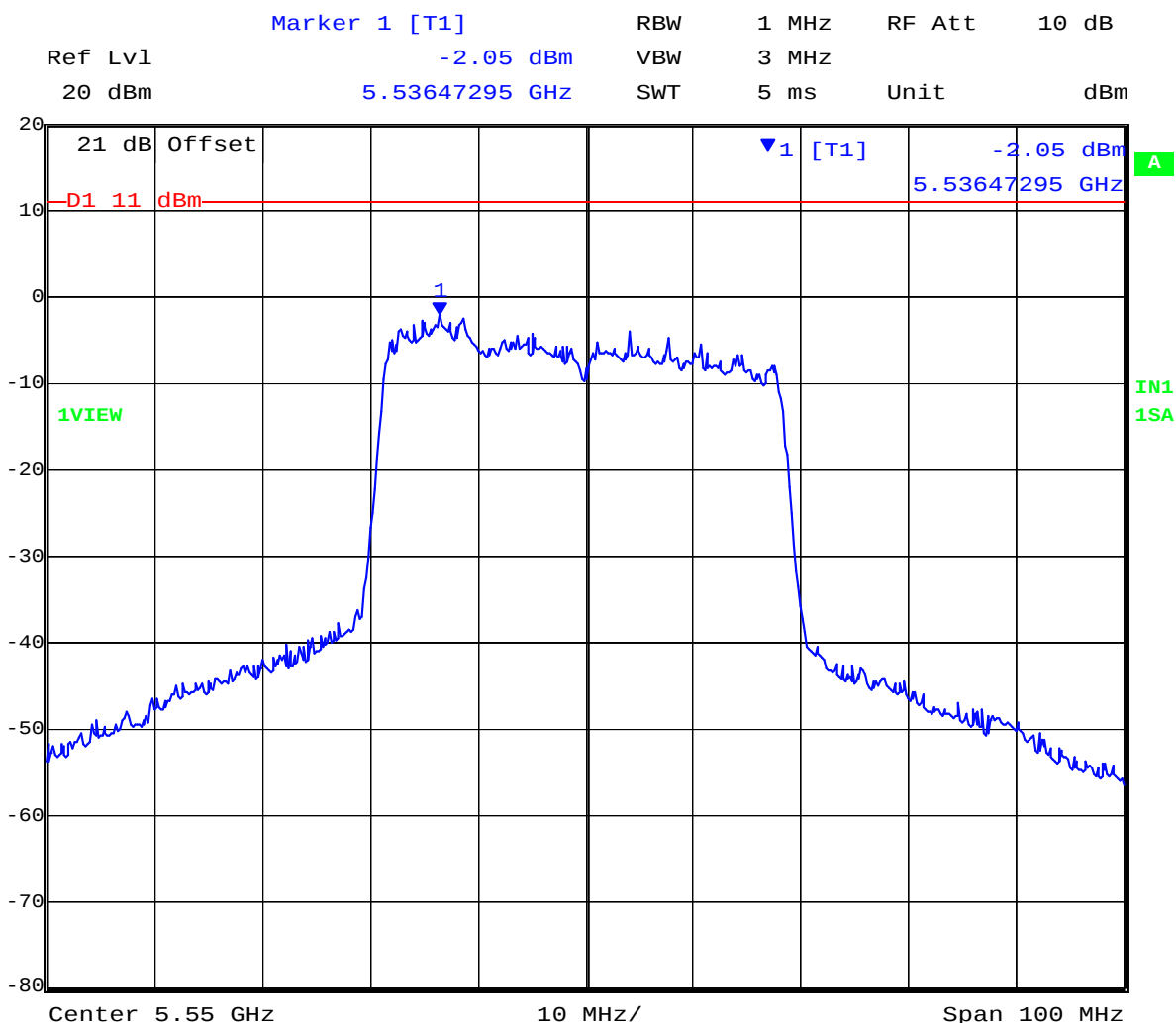
Date: 19.OCT.2010 18:20:30

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 232 of 465

5,550 MHz 802.11n HT40 - MIMO RADIO Combined Peak Power Spectral Density



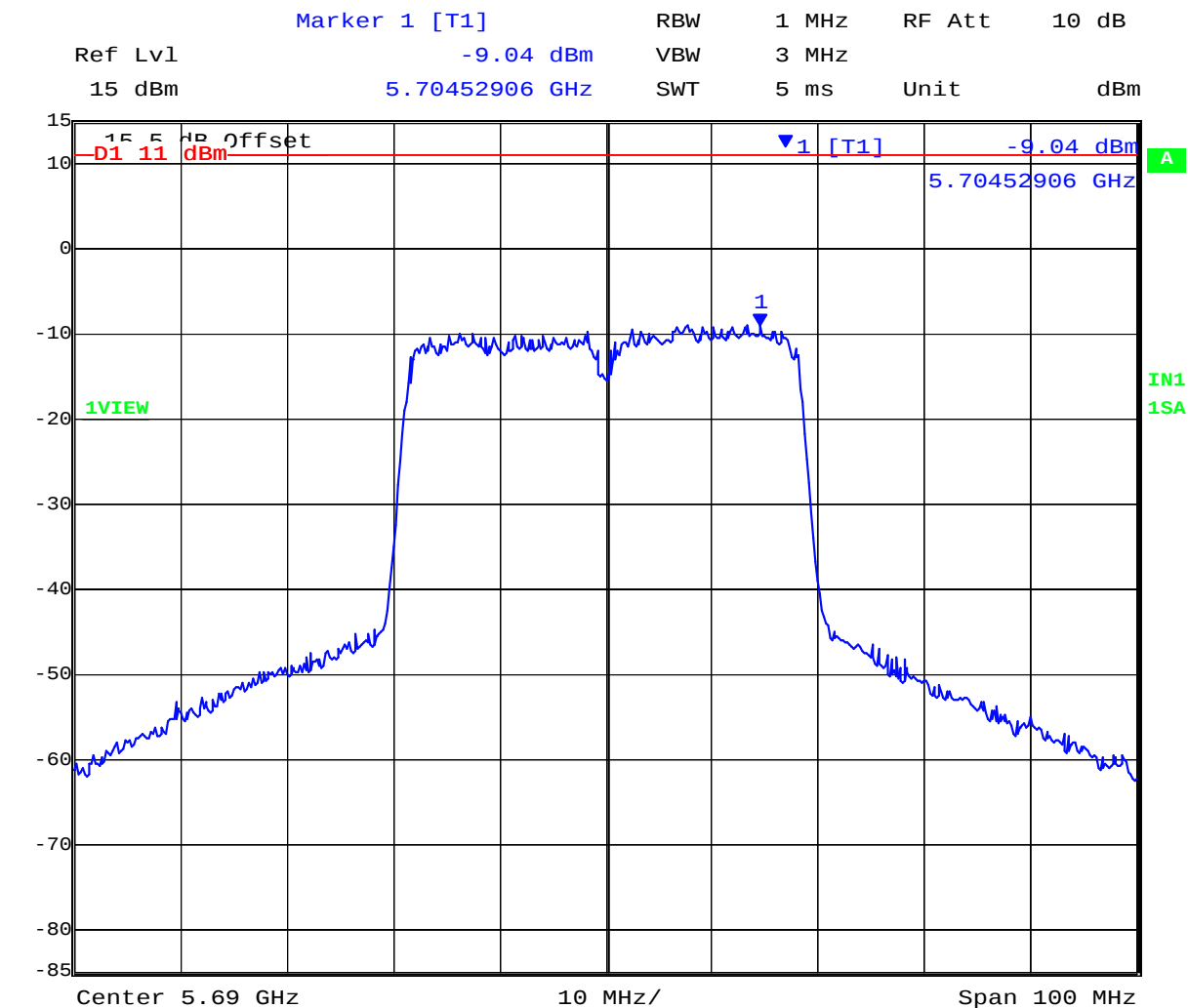
Date: 19.OCT.2010 18:25:19

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 233 of 465

5,690 MHz 802.11n HT40 - MIMO RADIO Chain a Peak Power Spectral Density



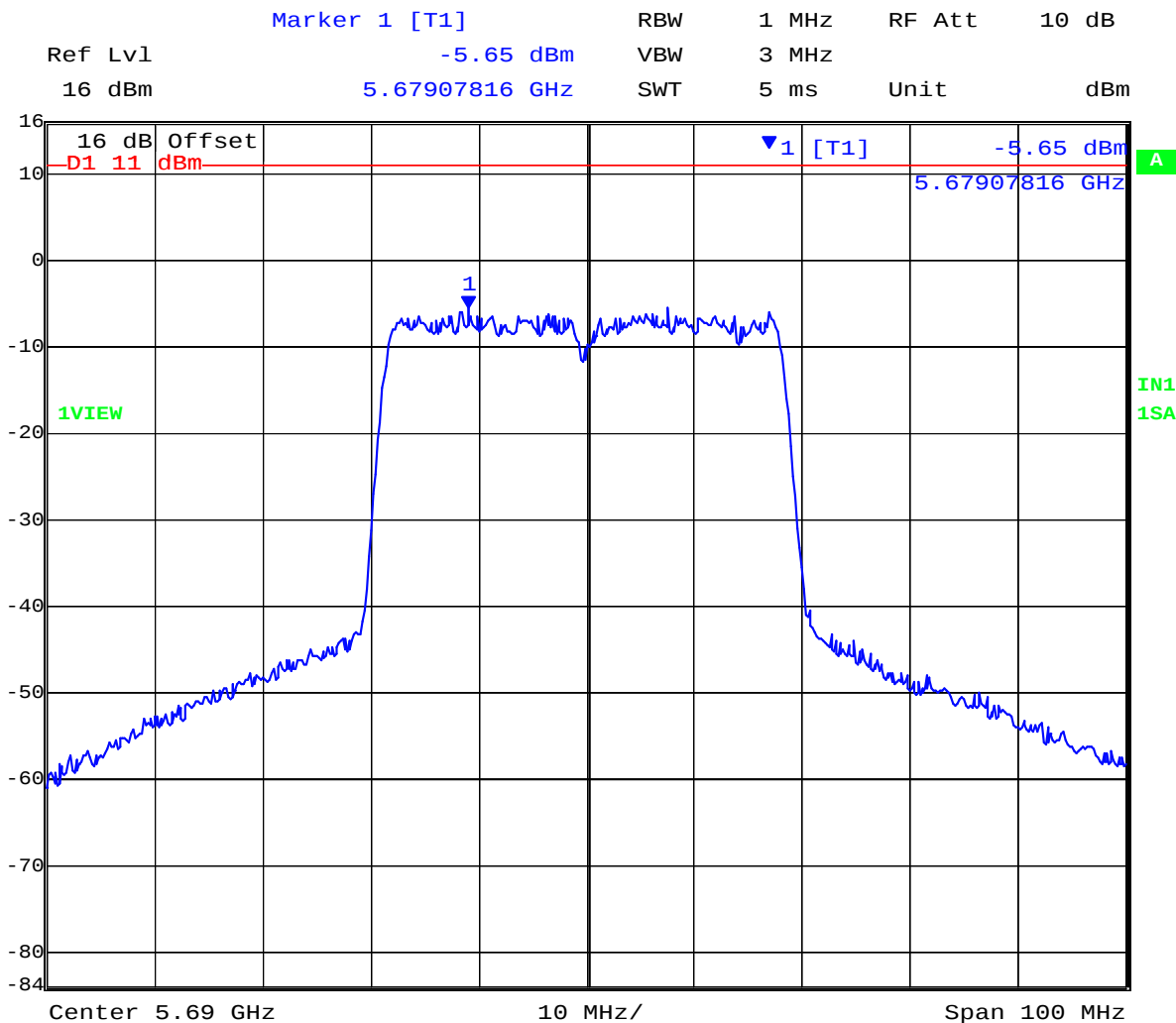
Date: 19.OCT.2010 19:07:14

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 234 of 465

5,690 MHz 802.11n HT40 - MIMO RADIO Chain b Peak Power Spectral Density



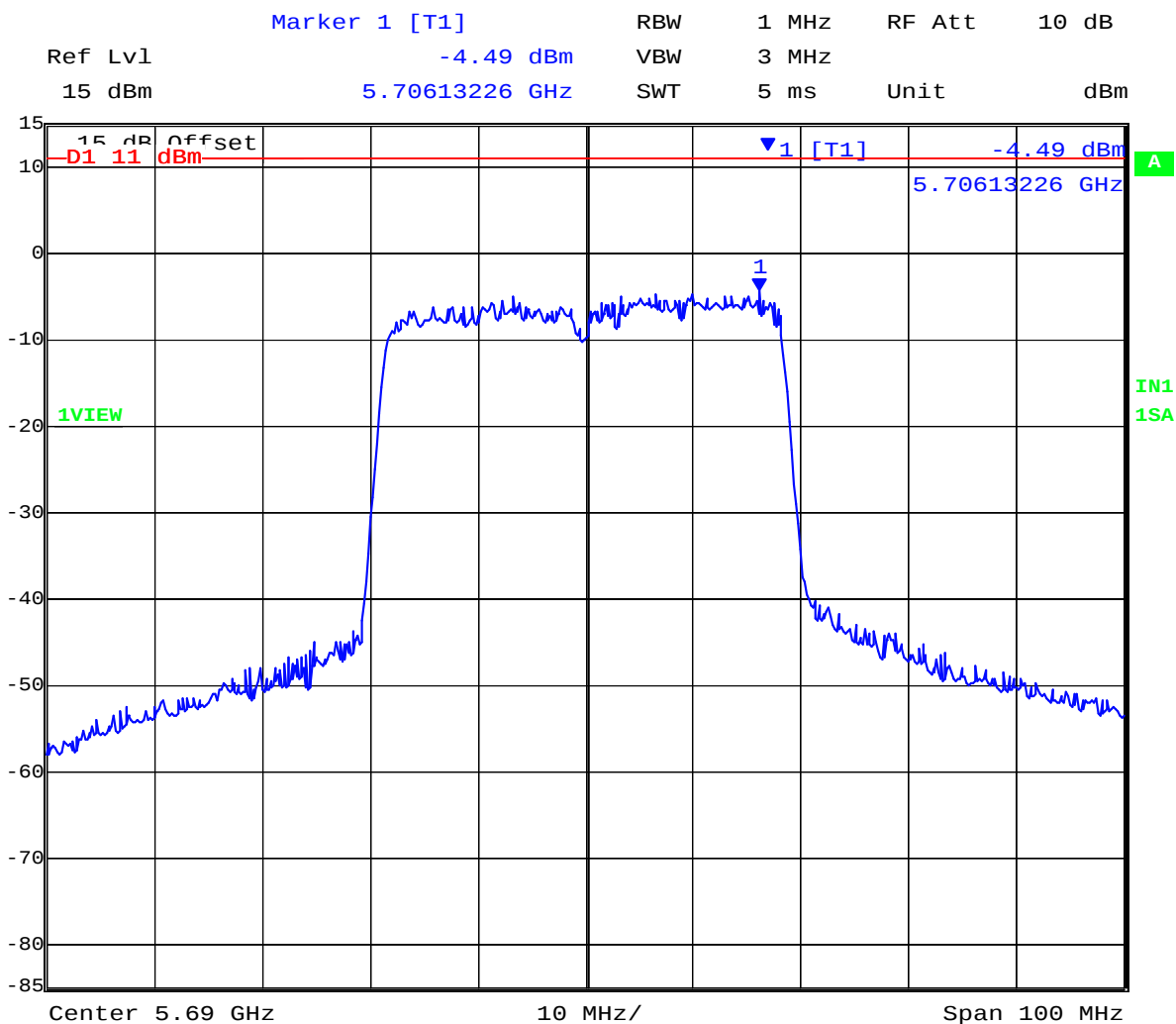
Date: 19.OCT.2010 19:02:28

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 235 of 465

5,690 MHz 802.11n HT40 - MIMO RADIO Chain c Peak Power Spectral Density



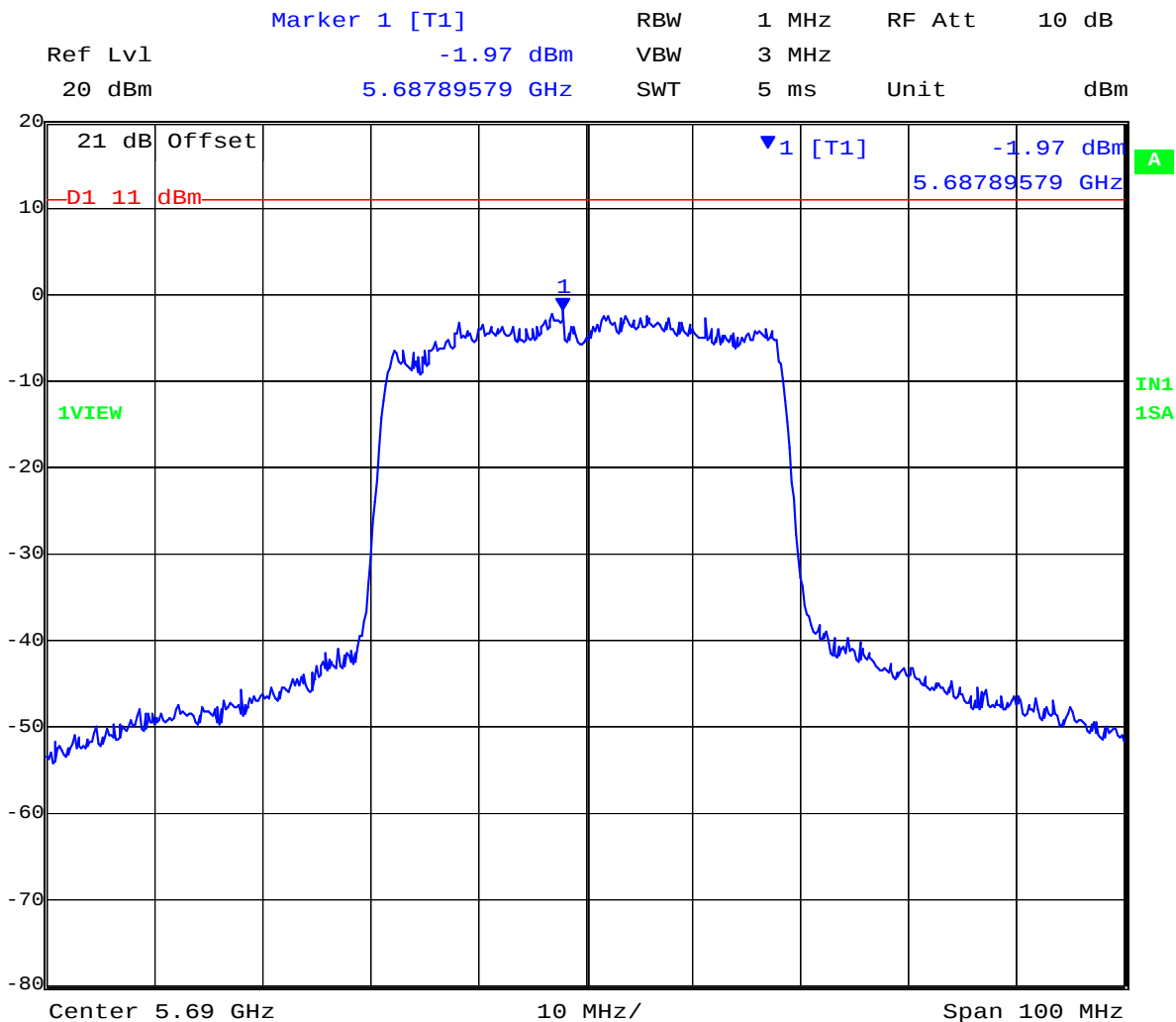
Date: 19.OCT.2010 19:04:51

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 236 of 465

5,690 MHz 802.11n HT40 - MIMO RADIO Combined Peak Power Spectral Density



Date: 19.OCT.2010 19:09:41

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 237 of 465

802.11a Legacy only radio Transmit Peak Power Spectral Density Results

Test Conditions:	15.407 (a)	Rel. Humidity (%):	35	to	42
Variant:	802.11 a	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2		dBi
Applied Voltage:	28.0 Vdc				
Notes 1:					
Notes 2:					

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5180	-3.92				-3.92		4.00	-7.92
5200	-4.07				-4.07		4.00	-8.07
5240	-4.60				-4.60		4.00	-8.60

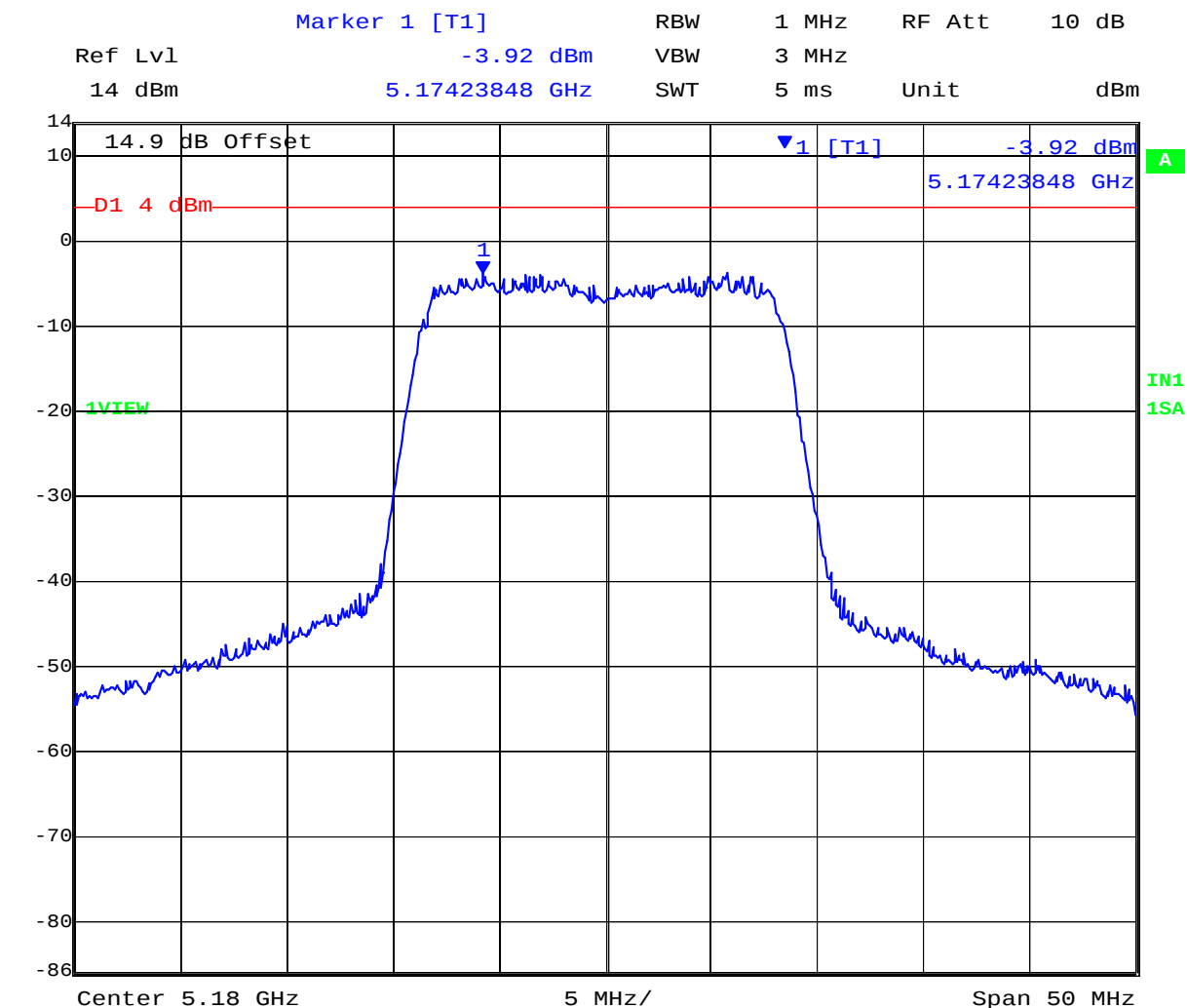
Measurement uncertainty:	±1.33 dB
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 238 of 465

5180 MHz 802.11a Peak Power Spectral Density



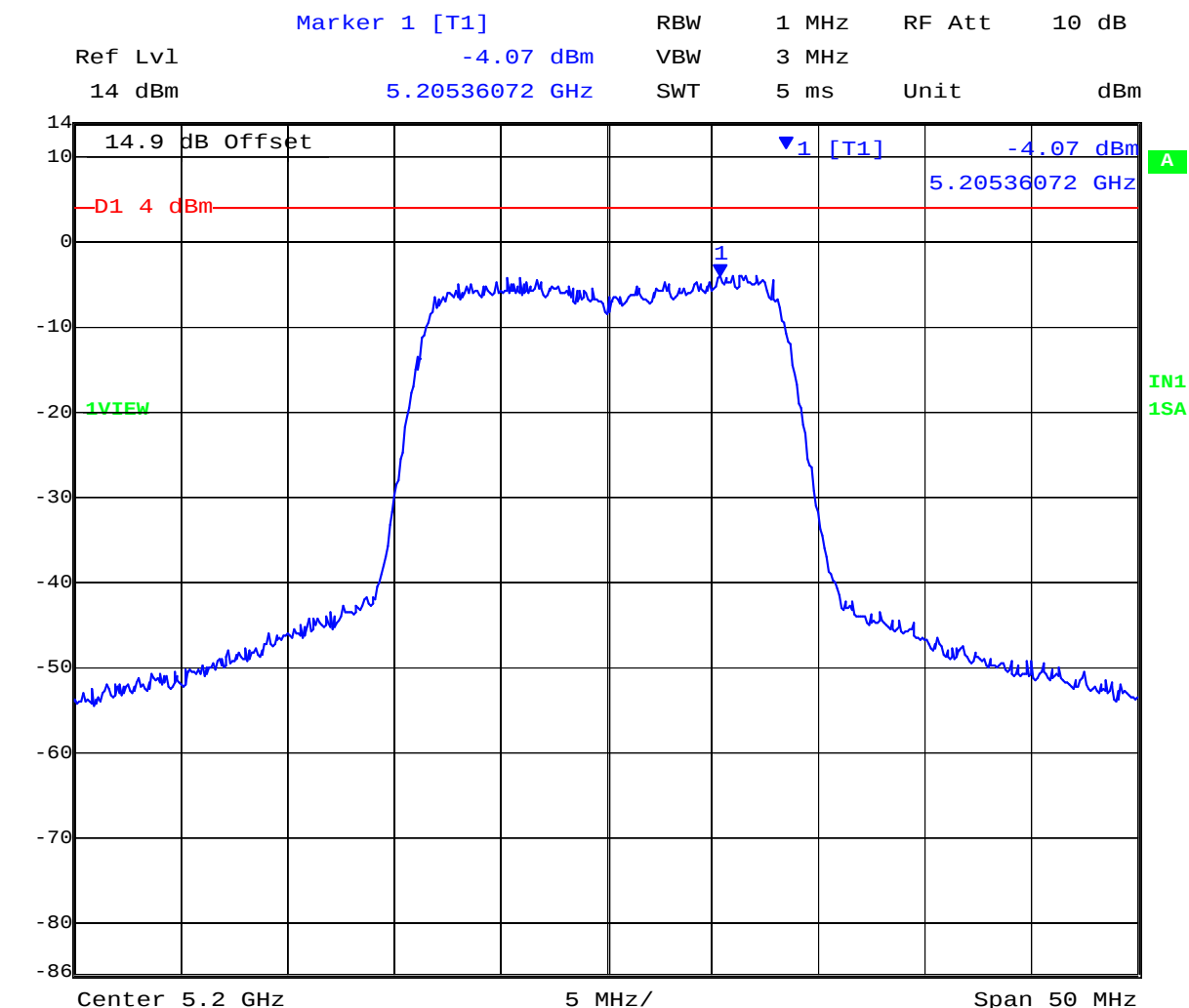
Date: 18.NOV.2010 20:34:05

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 239 of 465

5200 MHz 802.11a Peak Power Spectral Density



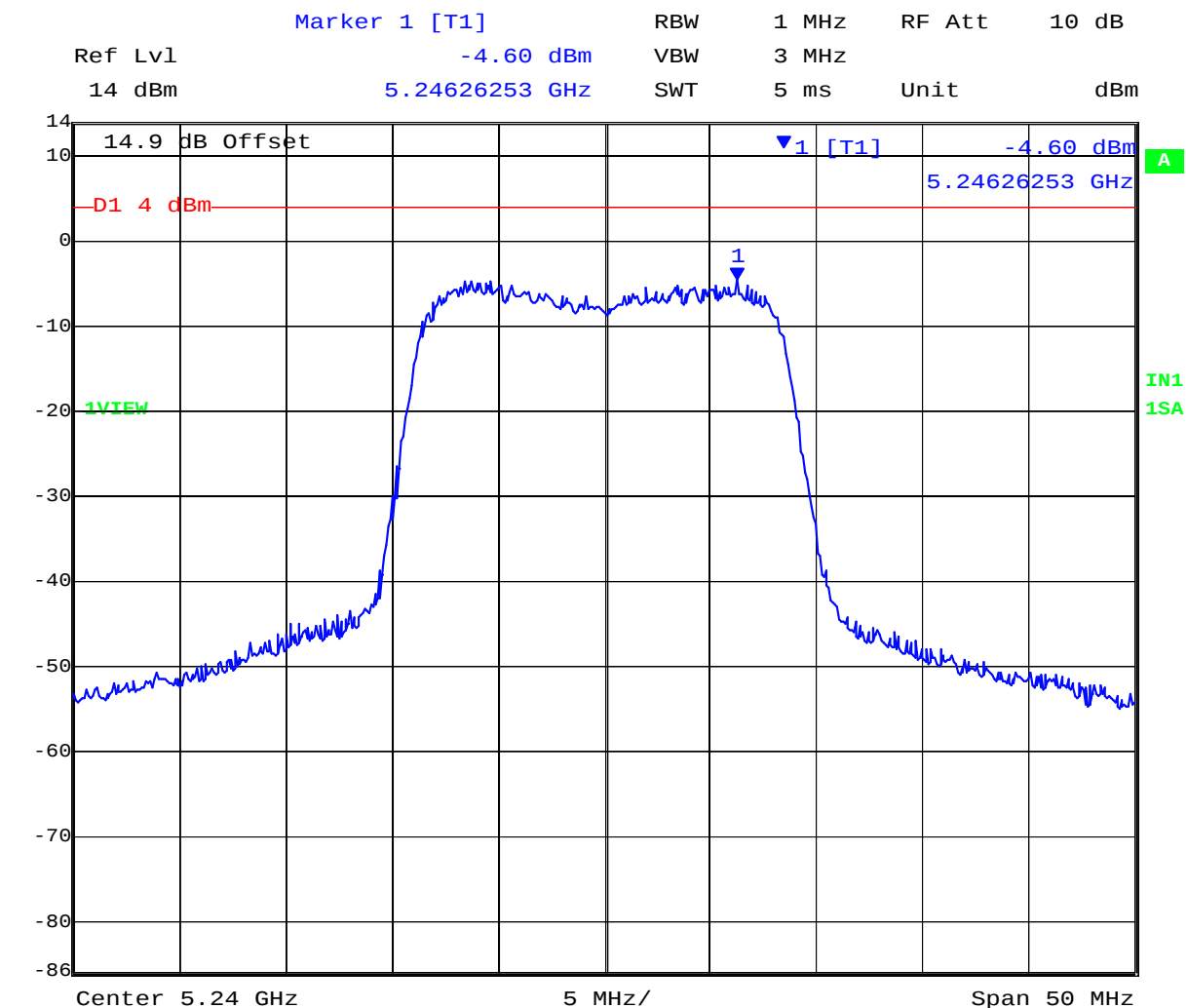
Date: 18.NOV.2010 19:02:16

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 240 of 465

5240 MHz 802.11a Peak Power Spectral Density



Date: 18.NOV.2010 19:57:59

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 241 of 465

Specification

FCC, Part 15 §15.407 (a)(1), (a)(2)

5150 – 5250 MHz

(a)(1) The peak power spectral density shall not exceed +4 dBm in any 1 megahertz band.

5250 – 5350 MHz & 5470 – 5725 MHz

(a)(2) The peak power spectral density shall not exceed +11 dBm in any 1 megahertz band.

Industry Canada RSS-210 § A9.2(1), A9.2(2)

5150 – 5250 MHz

§ A9.2(1) The eirp spectral density shall not exceed +10 dBm in any 1 MHz band

5250 – 5350 MHz & 5470 – 5725 MHz

§ A9.2(2) The power spectral density shall not exceed +11 dBm in any 1 MHz band

Laboratory Measurement Uncertainty for Spectral Density

Measurement uncertainty	±1.33 dB
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Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-01 'Measuring RF Output Power'	0158, 0287, 0252, 0313, 0314, 0070, 0116, 0117

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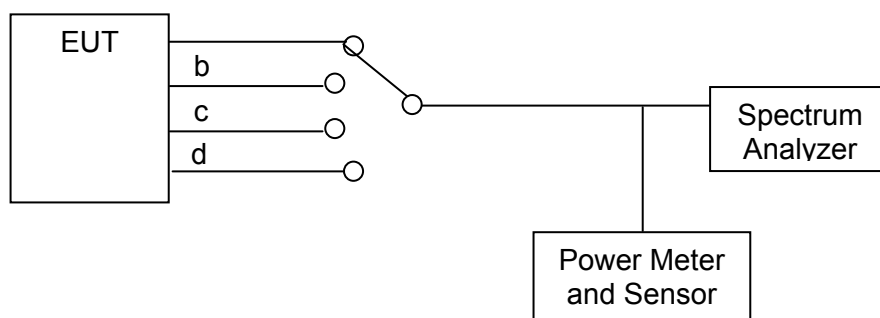
7.1.4. Peak Excursion Ratio

FCC, Part 15 Subpart C §15.407(a)(6)

Test Procedure

Normative Reference (xi) Section 2.1 Measurement Procedure DA 02-2138 “Measurement Procedure Updated for Peak Transmit Power in the UNII Bands” was implemented to determine the Peak Excursion Ratio. This is a conducted measurement using a spectrum analyzer. The Peak Excursion Ratio is the difference in amplitude (dB) between the two traces.

Test Measurement Set up



Measurement set up for Peak Excursion Ratio

Measurement Results for Peak Excursion Ratio

Ambient conditions.

Temperature: 17 to 23 °C Relative humidity: 31 to 57% Pressure: 999 to 1012 mbar

Radio Parameters

Duty Cycle: 100%

Output: Modulated Carrier

Power: Maximum Default Power



Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 243 of 465

TABLE OF RESULTS – 802.11a Legacy - MIMO radio

Measurement Results for Peak Excursion Ratio

Test Conditions:	15.407 (a)	Rel. Humidity (%):	35	to	42
Variant:	802.11a	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2		dBi
Applied Voltage:	28.0 Vdc				

	Trace Peak Power Markers		Δ Marker (Marker 1 – 2)	Limit	Margin
	1	2			

Frequency 5180 MHz

Chain	dBm	dBm	dB	dB	dB
a	10.97	-0.73	-11.70	-13.00	-1.30
b	9.16	-1.20	-10.36		-2.64
c	11.21	-0.56	-11.77		-1.23

Frequency 5200 MHz

Chain	dBm	dBm	dB	dB	dB
a	7.74	-2.09	-9.83	-13.00	-3.17
b	9.96	-1.50	-11.46		-1.54
c	9.21	-1.30	-10.51		-2.49

Frequency 5240 MHz

Chain	dBm	dBm	dB	dB	dB
a	8.78	-1.21	-9.99	-13.00	-3.01
b	10.76	-0.68	-11.44		-1.56
c	11.10	-0.28	-11.38		-1.62

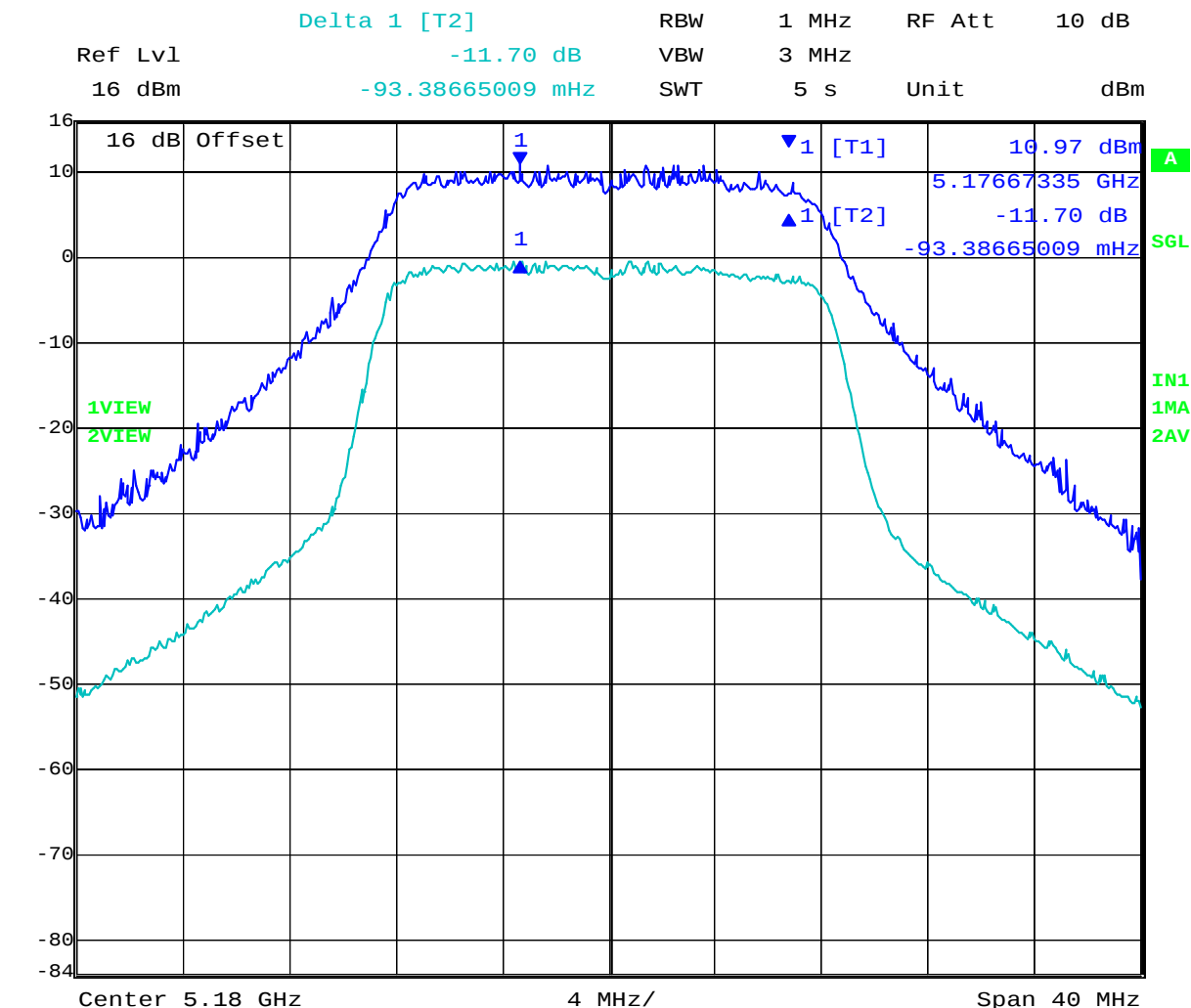
Measurement uncertainty:	± 1.33 dB
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 244 of 465

5,180 MHz 802.11a Legacy - MIMO radio Chain a - Peak Excursion Ratio



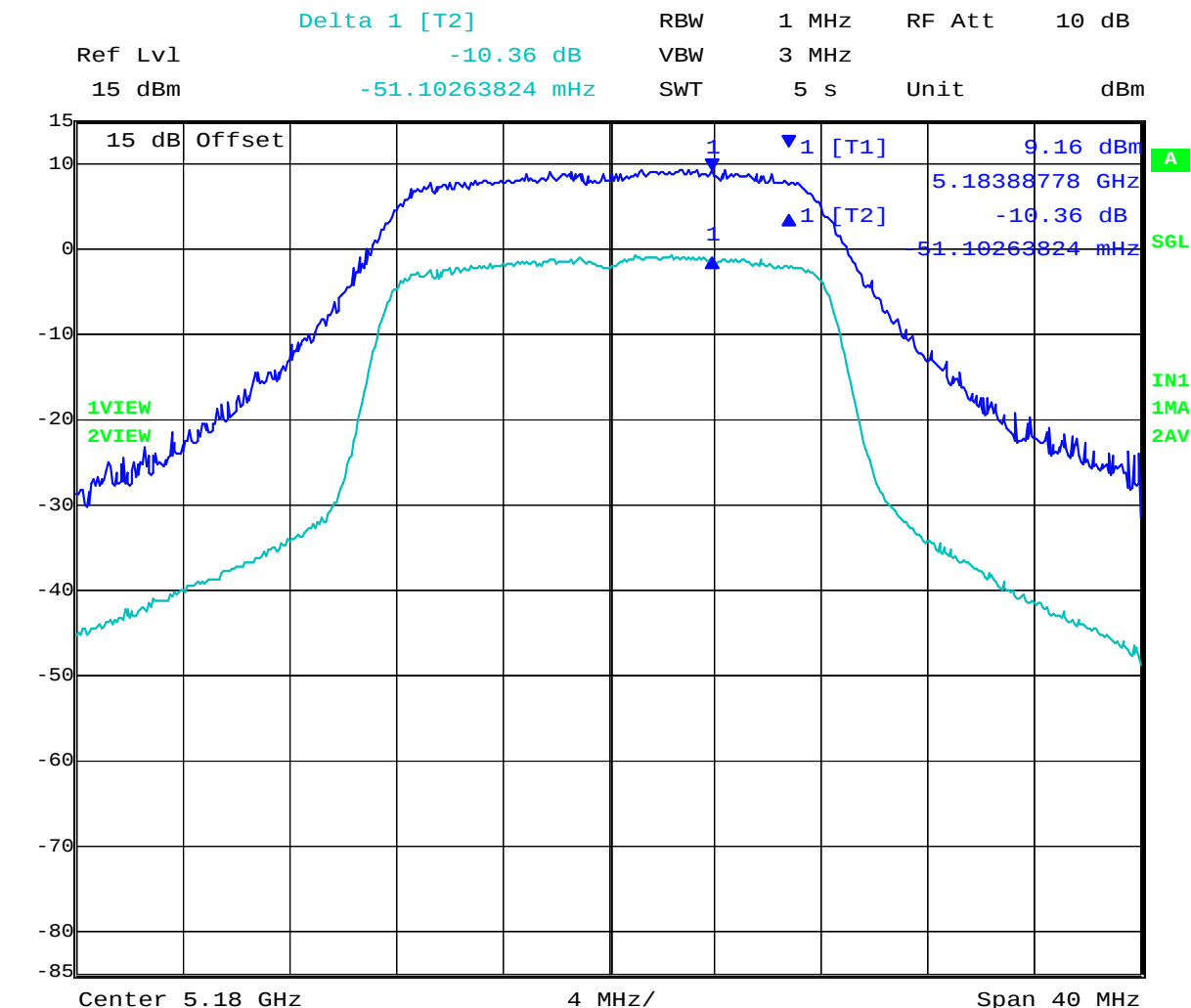
Date: 18.OCT.2010 12:29:10

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 245 of 465

5,180 MHz 802.11a Legacy - MIMO radio Chain b - Peak Excursion Ratio



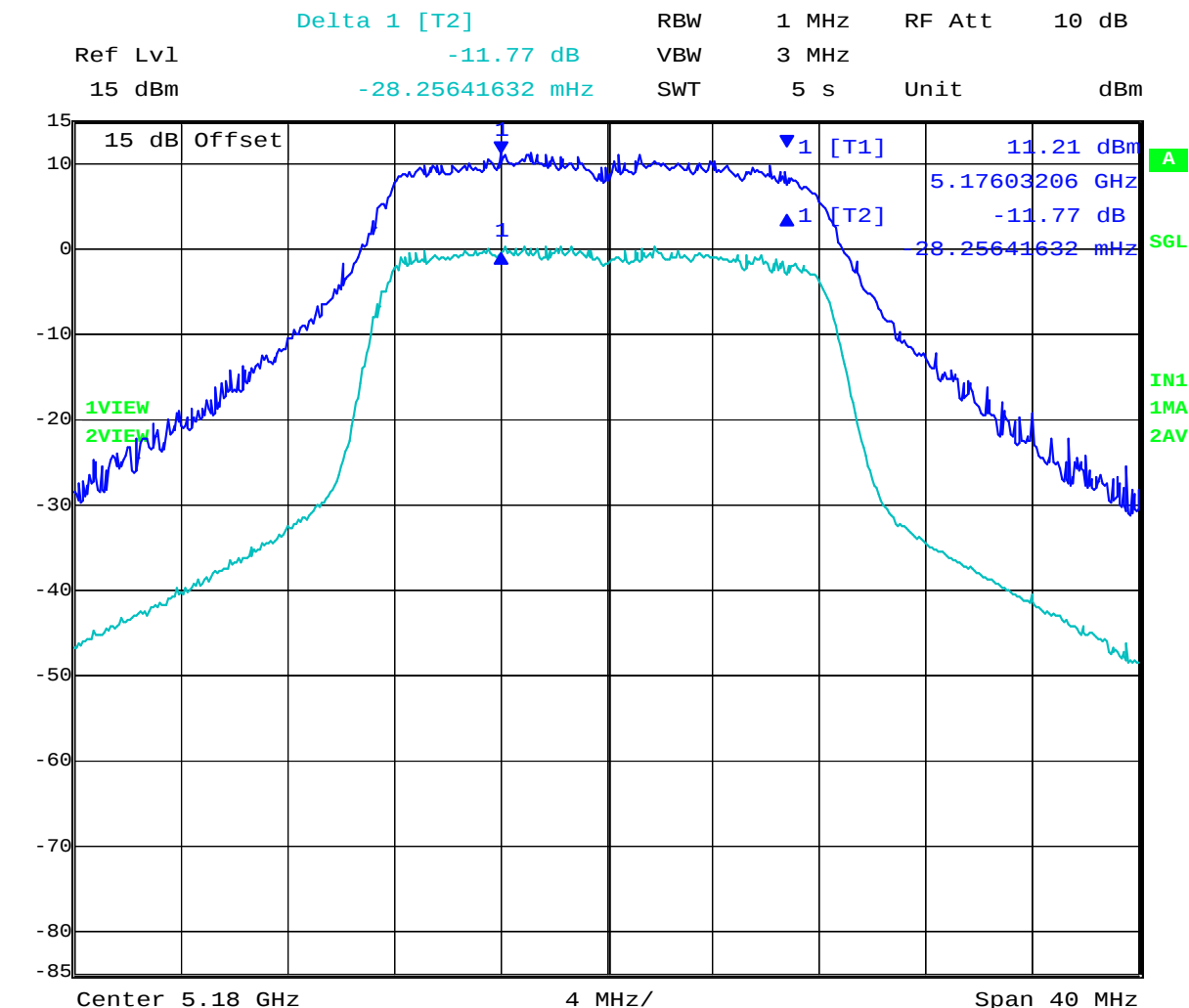
Date: 18.OCT.2010 12:31:31

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 246 of 465

5,180 MHz 802.11a Legacy - MIMO radio Chain c - Peak Excursion Ratio



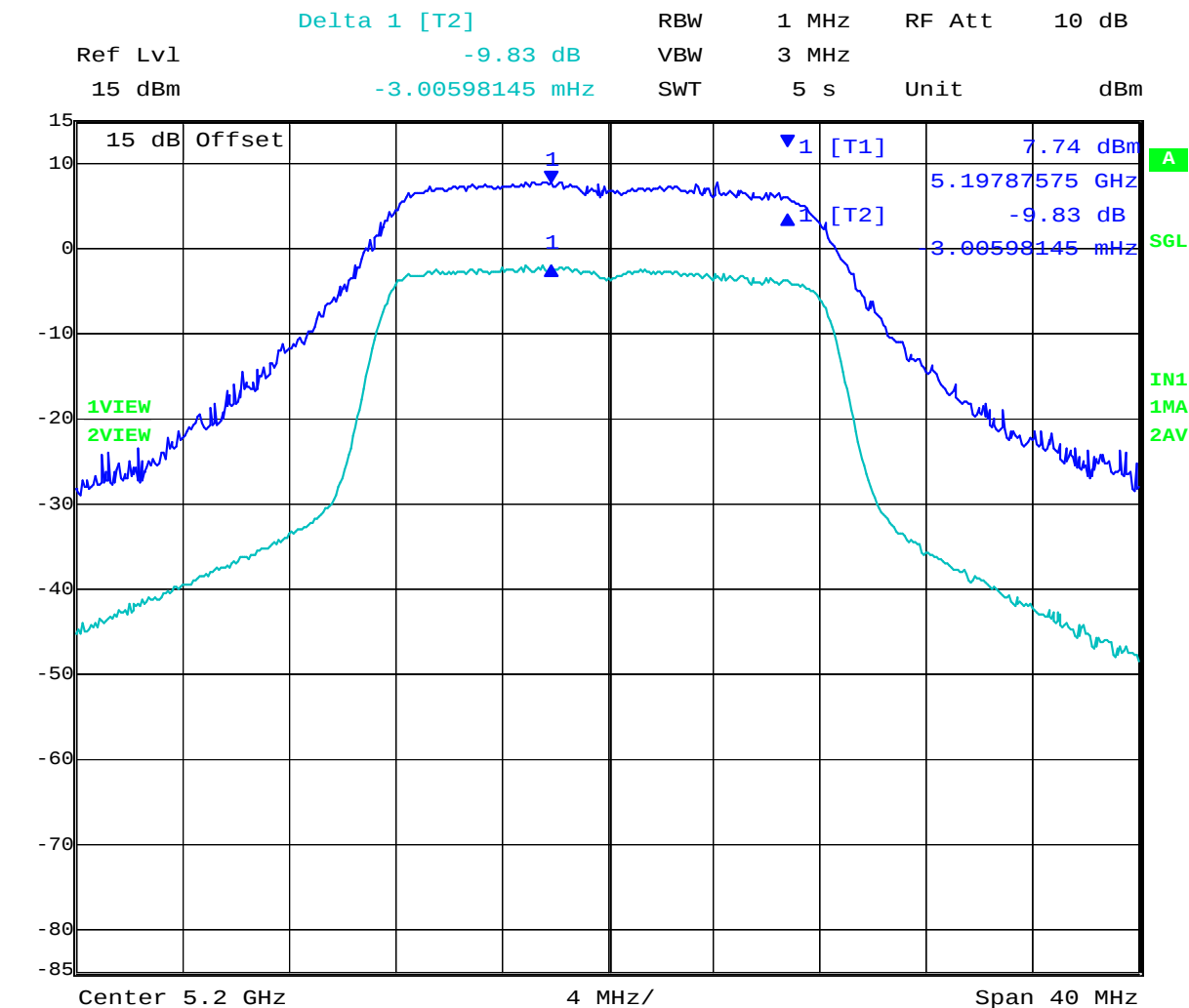
Date: 18.OCT.2010 12:30:20

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 247 of 465

5,200 MHz 802.11a Legacy - MIMO radio Chain a - Peak Excursion Ratio



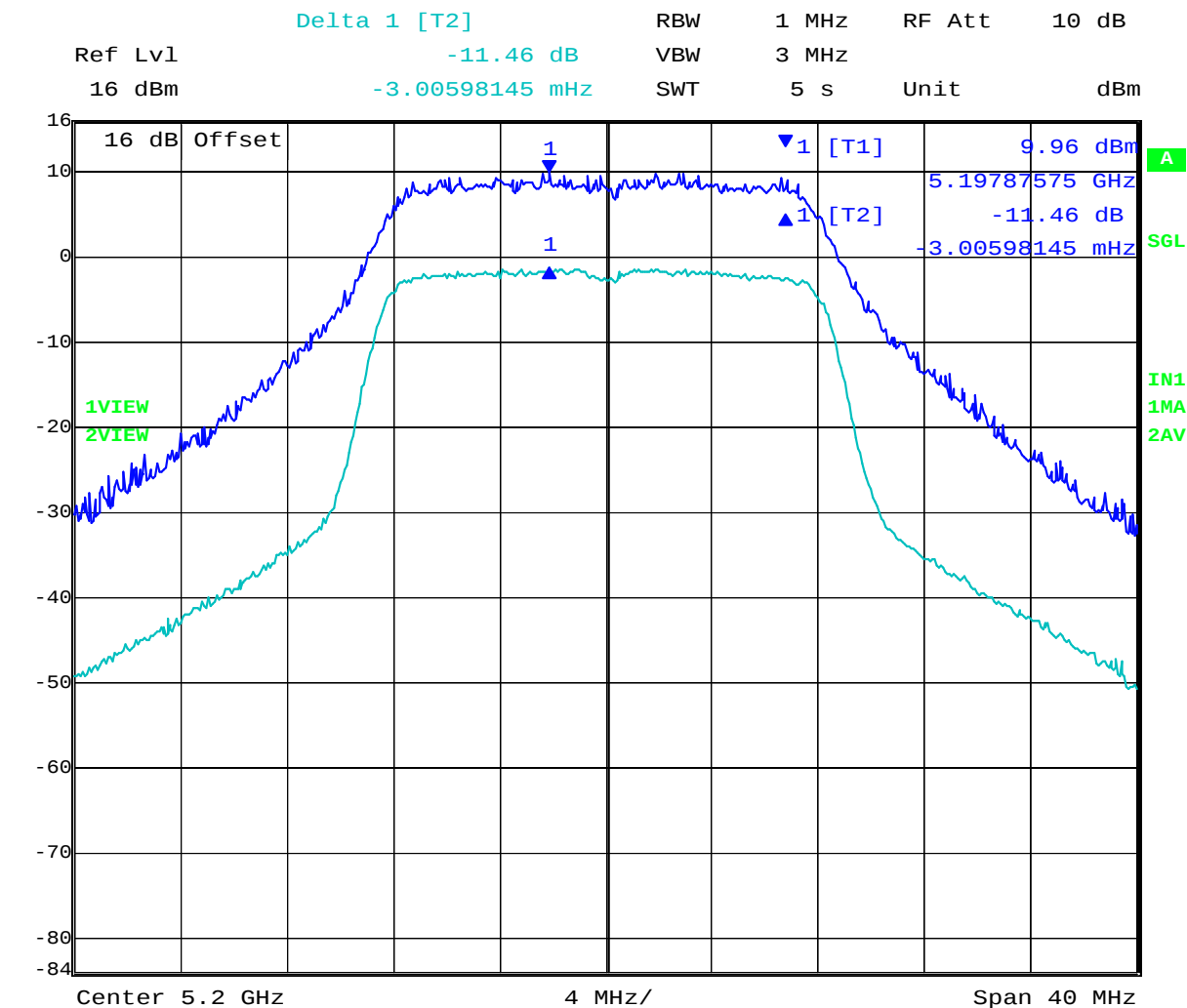
Date: 18.OCT.2010 13:05:55

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 248 of 465

5,200 MHz 802.11a Legacy - MIMO radio Chain b - Peak Excursion Ratio



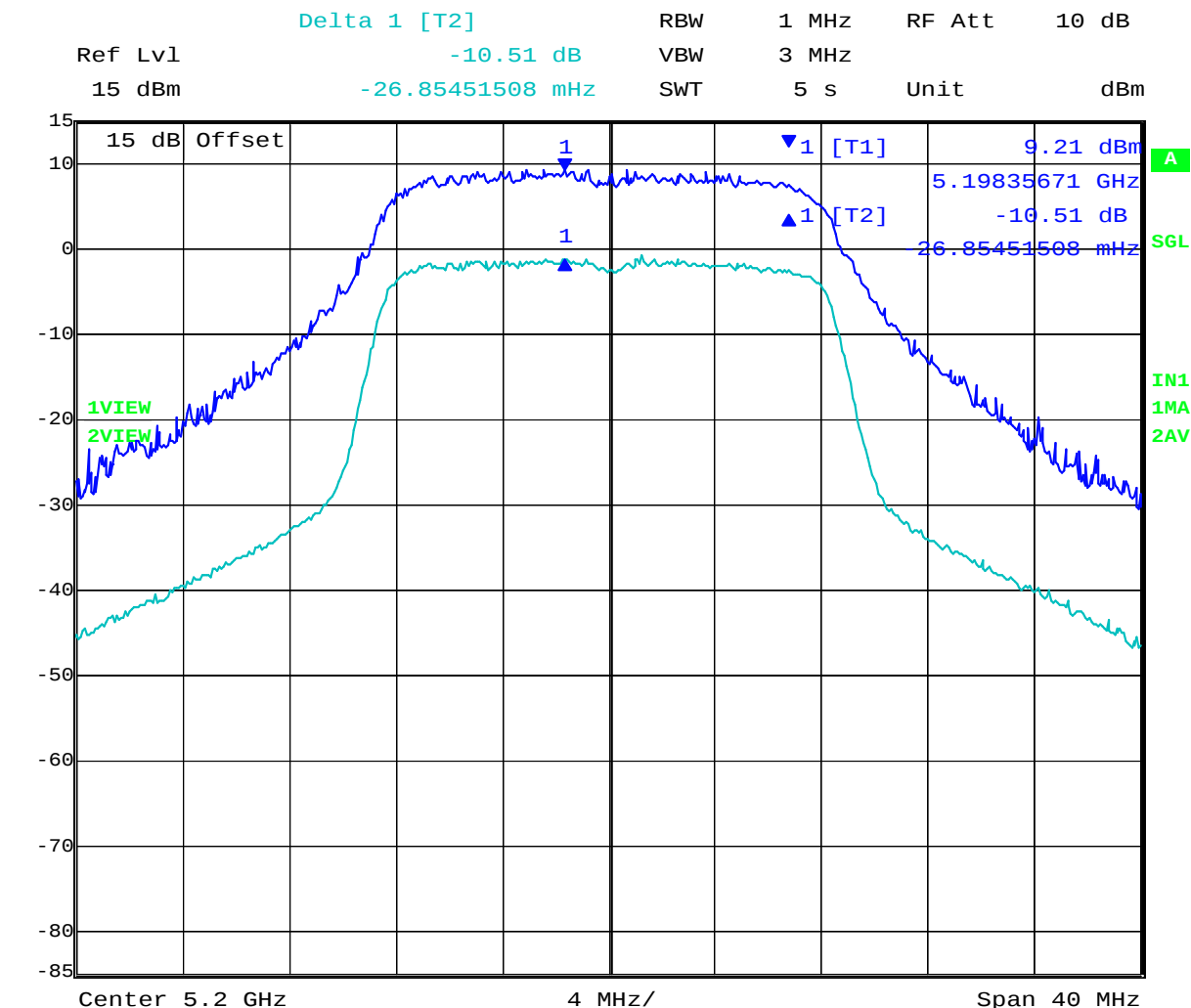
Date: 18.OCT.2010 13:03:33

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 249 of 465

5,200 MHz 802.11a Legacy - MIMO radio Chain c - Peak Excursion Ratio



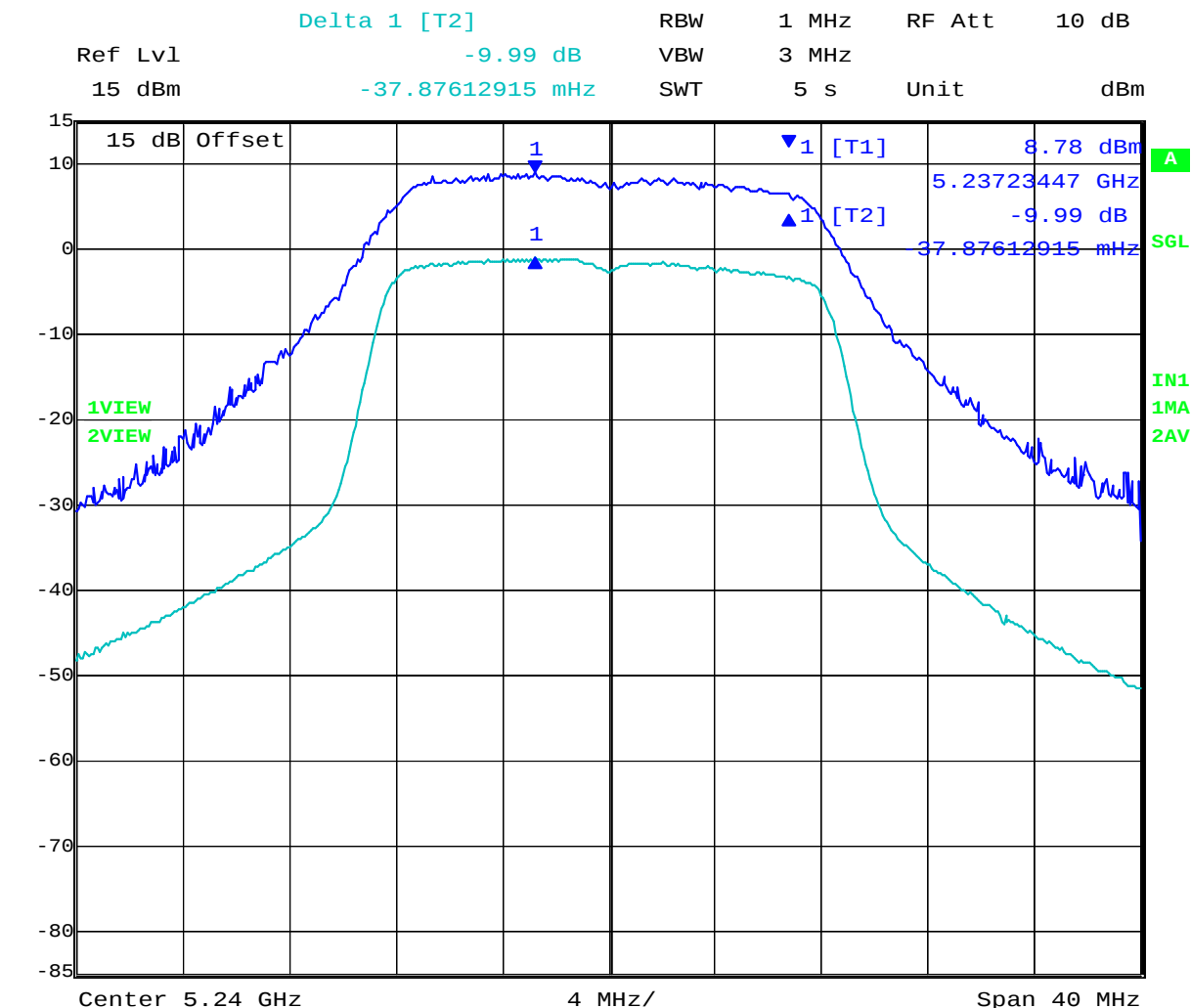
Date: 18.OCT.2010 13:04:43

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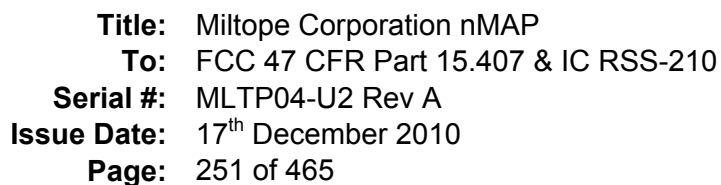
Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 250 of 465

5,240 MHz 802.11a Legacy - MIMO radio Chain a - Peak Excursion Ratio



Date: 18.OCT.2010 13:39:58

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Ref Lvl 16 dBm Delta 1 [T2] -11.44 dB RBW 1 MHz RF Att 10 dB

16 dB Offset 10.76 dBm 5.24276553 GHz

16 dB Offset -11.44 dB -62.12425232 MHz

1VIEW 2VIEW

1 [T1] 1 [T2]

Center 5.24 GHz 4 MHz/ Span 40 MHz

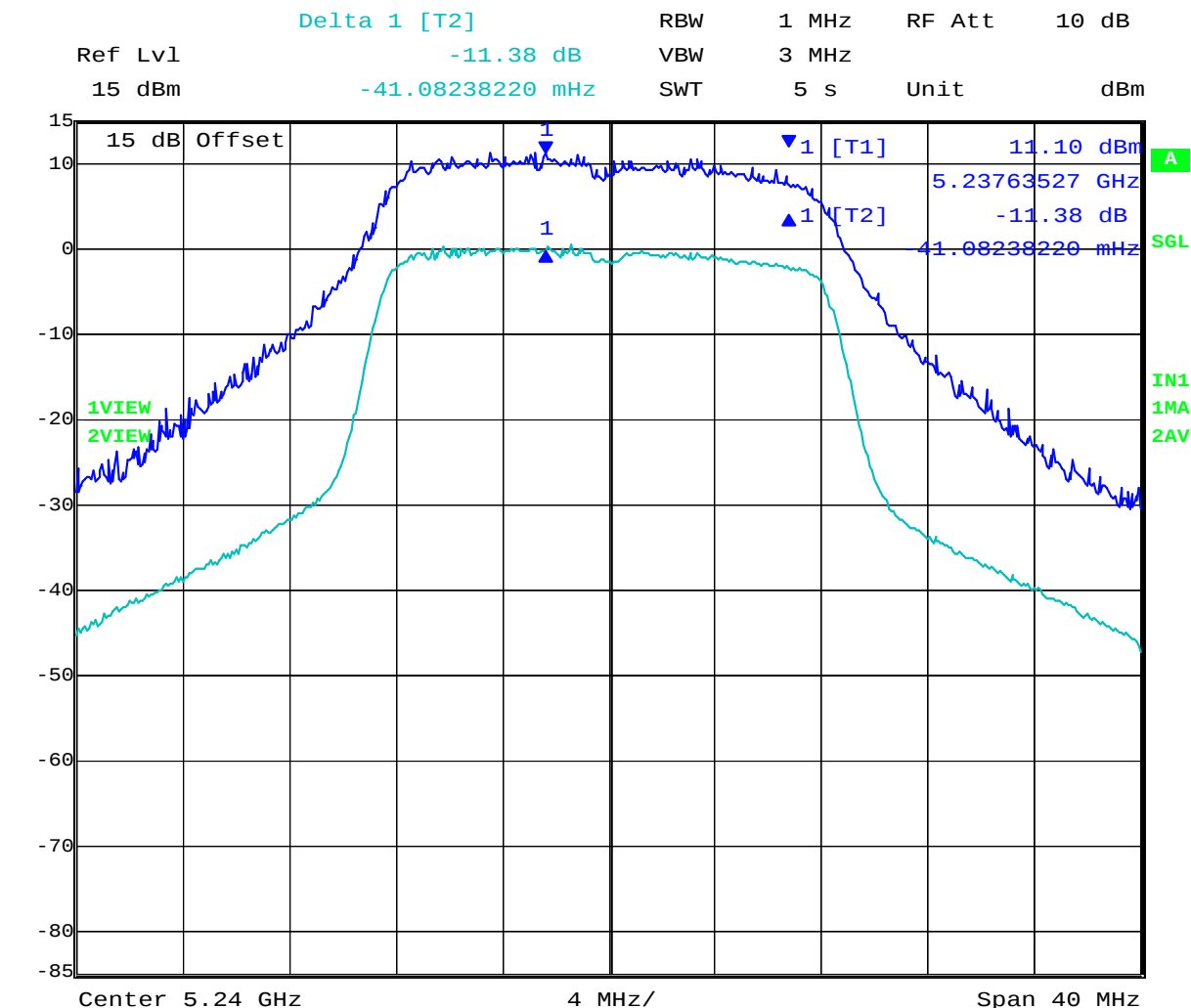
Date: 18.OCT.2010 13:37:37

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 252 of 465

5,240 MHz 802.11a Legacy - MIMO radio Chain c - Peak Excursion Ratio



Date: 18.OCT.2010 13:38:47

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 253 of 465

TABLE OF RESULTS – 802.11a Legacy - MIMO radio

Measurement Results for Peak Excursion Ratio

Test Conditions:	15.407 (a)	Rel. Humidity (%):	35	to	42
Variant:	802.11a	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2		dBi
Applied Voltage:	28.0 Vdc				

	Trace Peak Power Markers		Δ Marker (Marker 1 – 2)	Limit	Margin
	1	2			

Frequency 5260 MHz

Chain	dBm	dBm	dB	dB	dB
a	8.59	-1.76	-10.35	-13.00	-2.65
b	11.06	-0.33	-11.39		-1.61
c	12.13	-0.55	-12.68		-0.32

Frequency 5300 MHz

Chain	dBm	dBm	dB	dB	dB
a	9.23	-1.83	-11.06	-13.00	-1.94
b	12.58	0.54	-12.04		-0.96
c	11.87	0.77	-11.10		-1.90

Frequency 5320 MHz

Chain	dBm	dBm	dB	dB	dB
a	10.48	0.31	-10.17	-13.00	-2.83
b	12.44	1.74	-10.70		-2.30
c	14.21	1.83	-12.38		-0.62

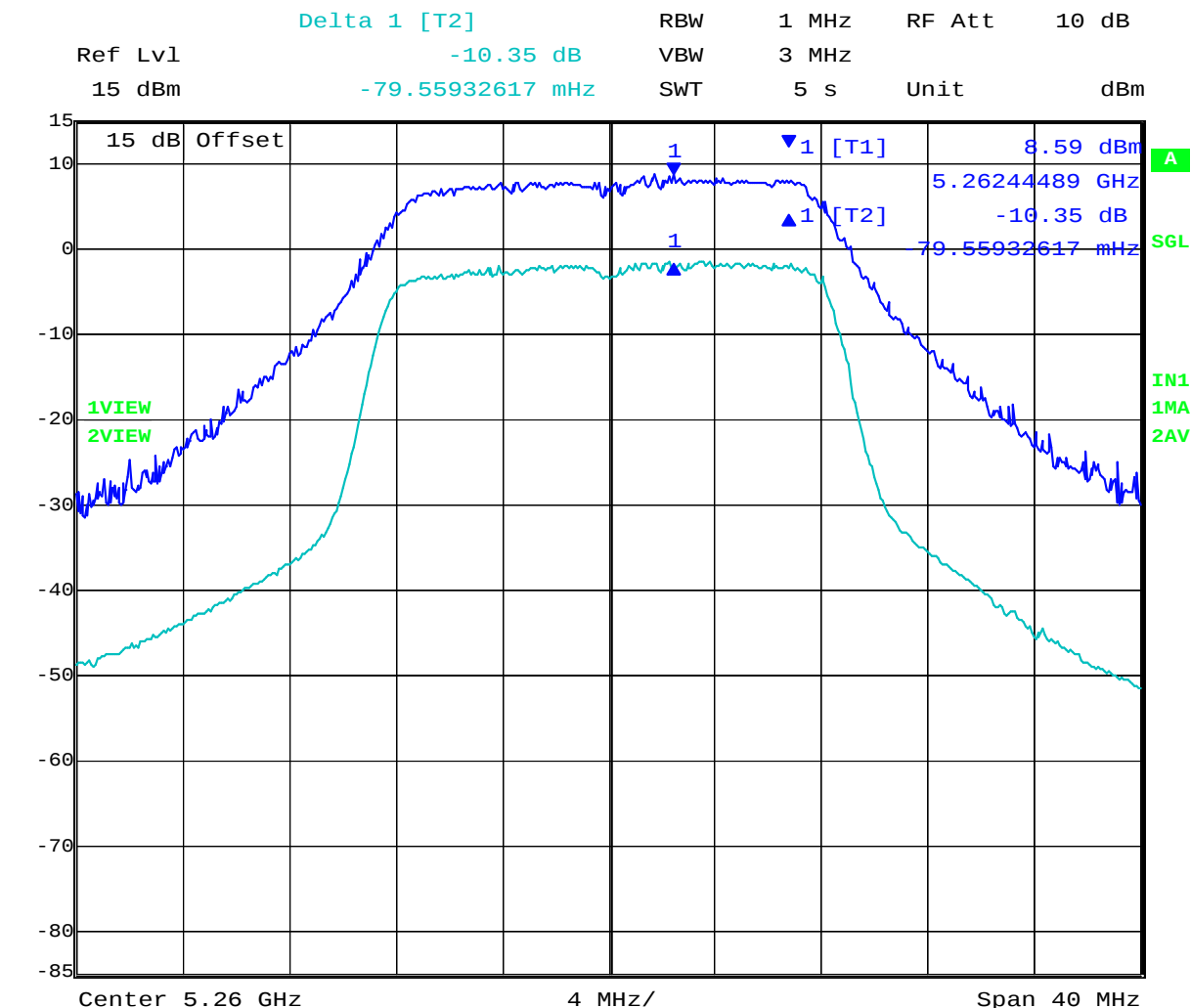
Measurement uncertainty:	± 1.33 dB
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 254 of 465

5,260 MHz 802.11a Legacy - MIMO radio Chain a - Peak Excursion Ratio



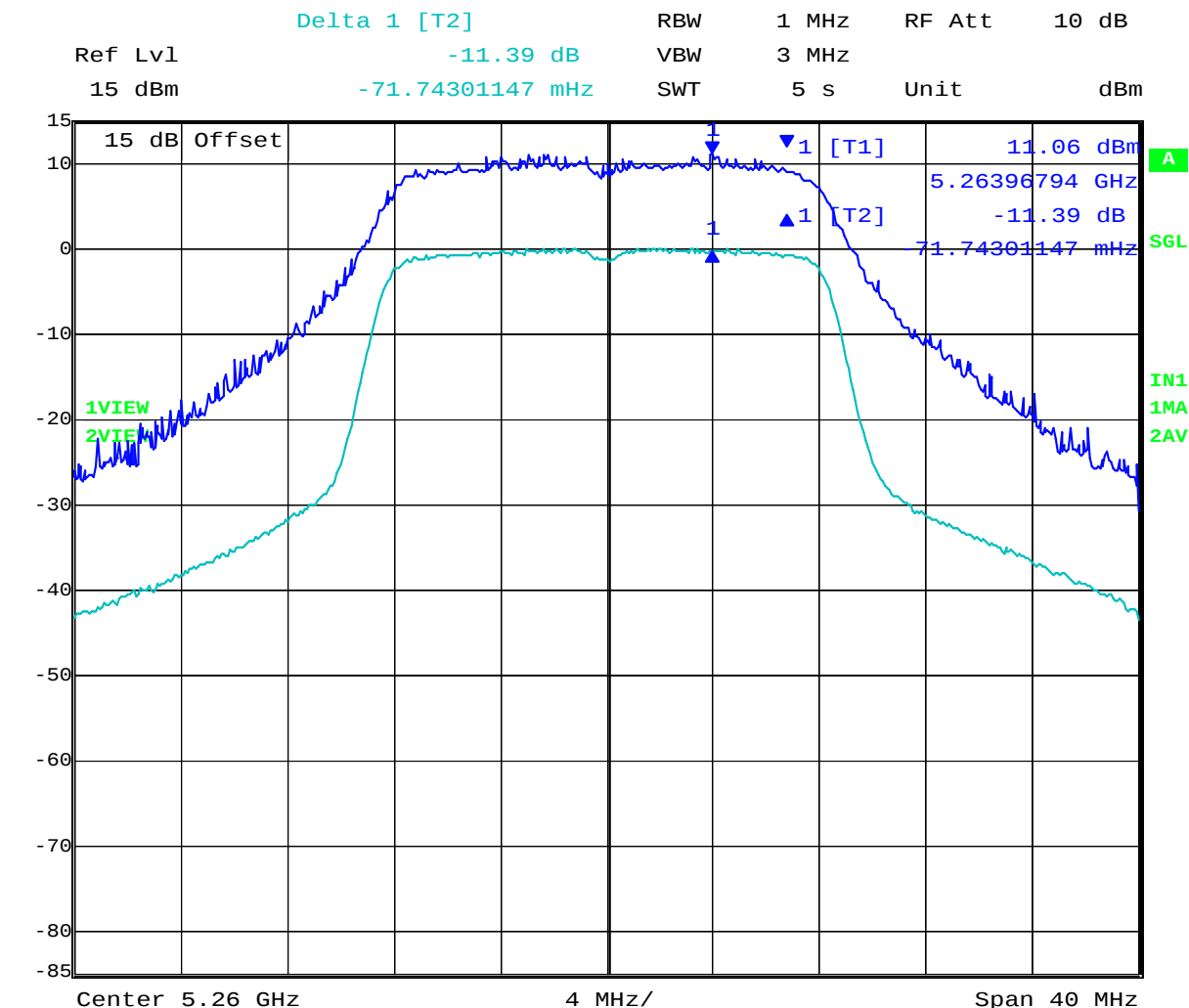
Date: 19.OCT.2010 08:57:48

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 255 of 465

5,260 MHz 802.11a Legacy - MIMO radio Chain b - Peak Excursion Ratio



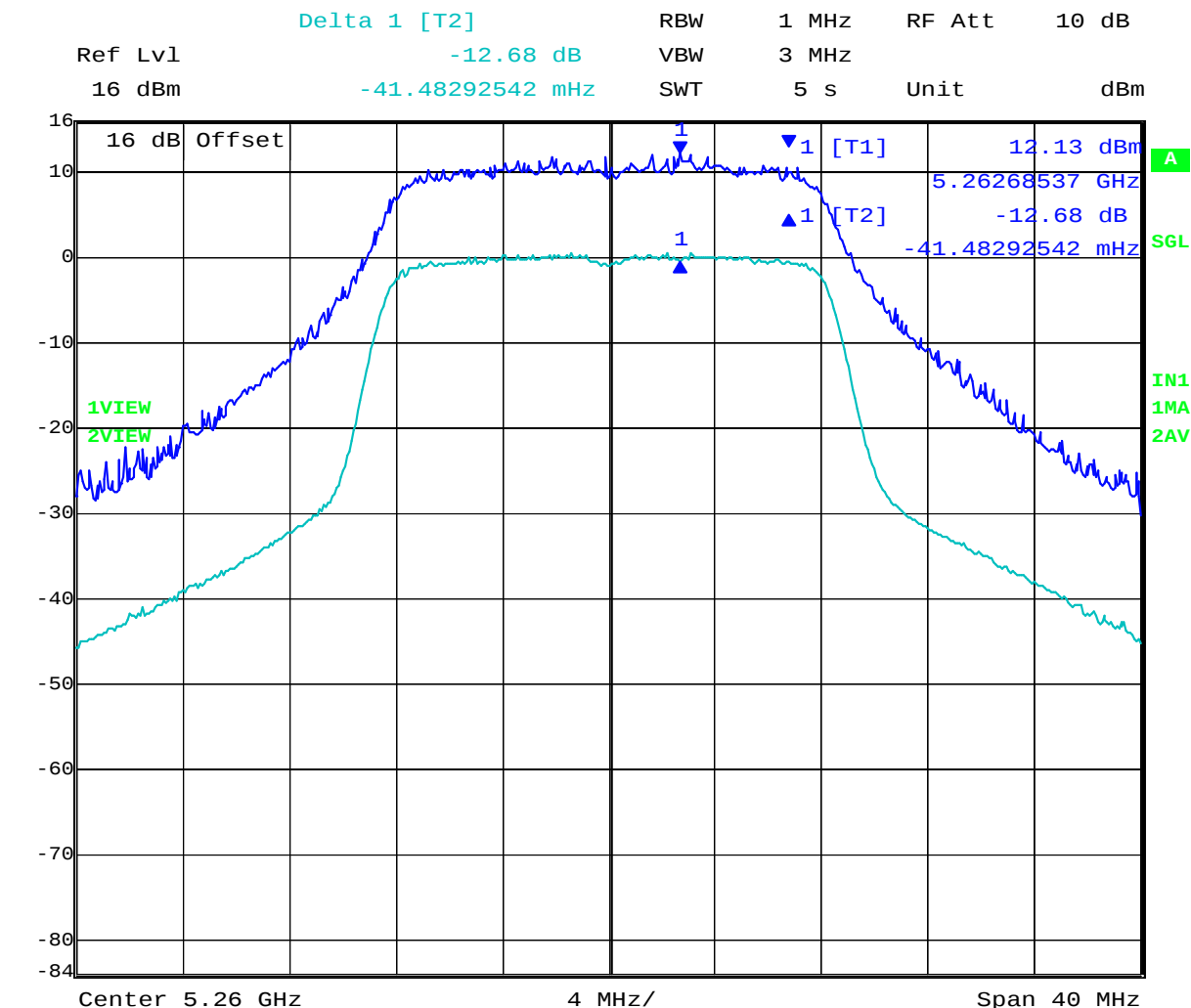
Date: 19.OCT.2010 08:56:37

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 256 of 465

5,260 MHz 802.11a Legacy - MIMO radio Chain c - Peak Excursion Ratio



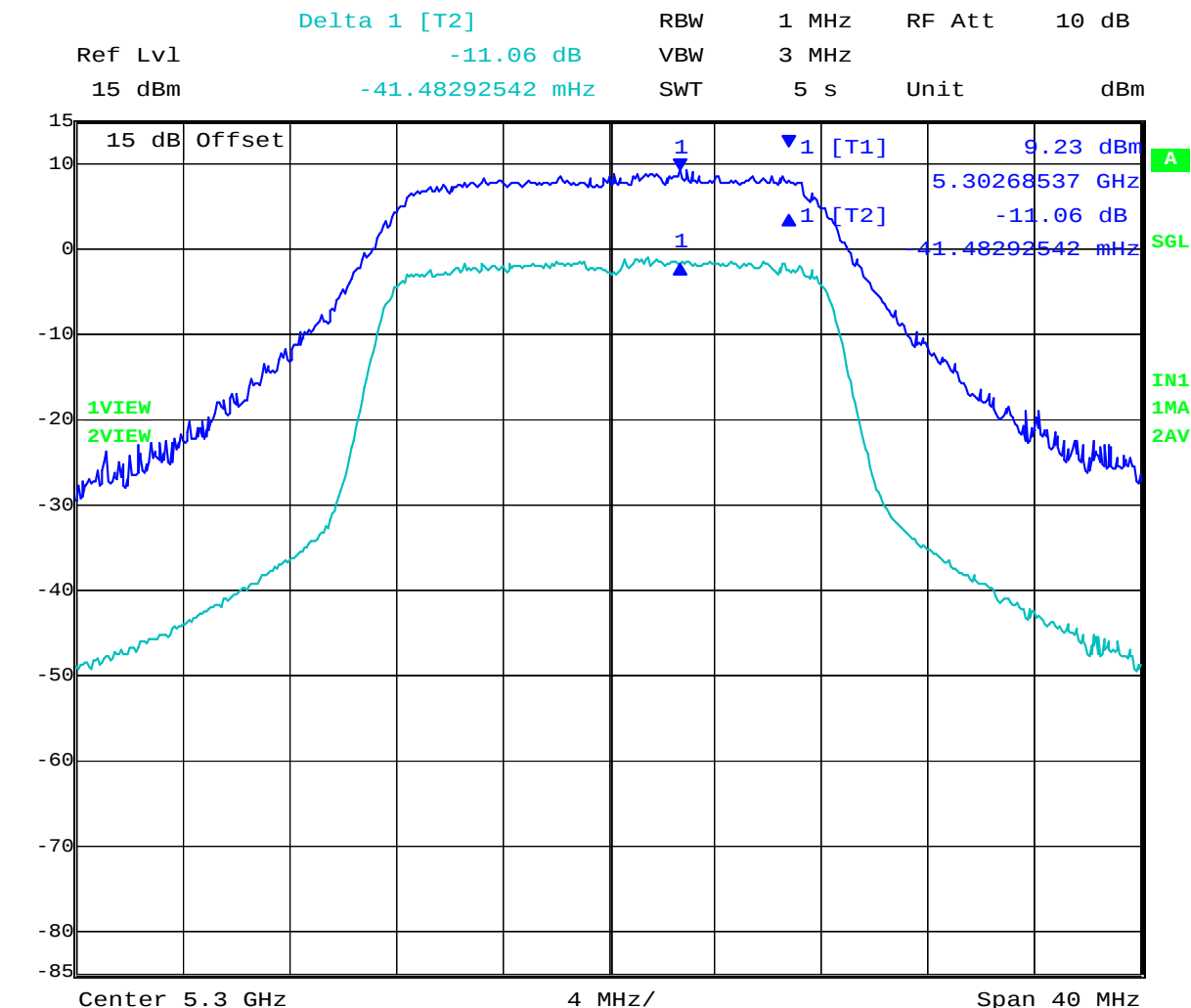
Date: 19.OCT.2010 08:55:27

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 257 of 465

5,300 MHz 802.11a Legacy - MIMO radio Chain a - Peak Excursion Ratio



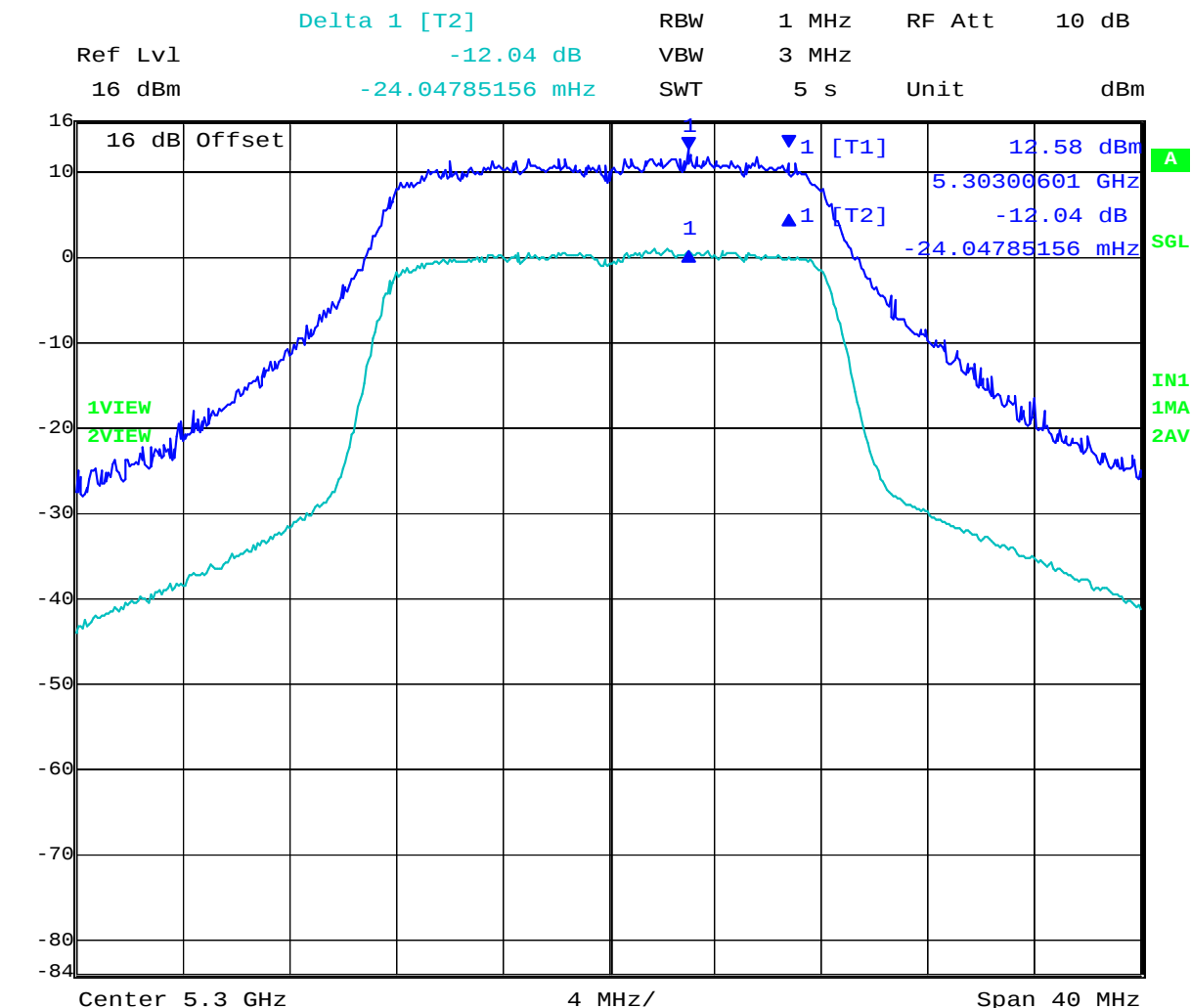
Date: 19.OCT.2010 09:31:06

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 258 of 465

5,300 MHz 802.11a Legacy - MIMO radio Chain b - Peak Excursion Ratio



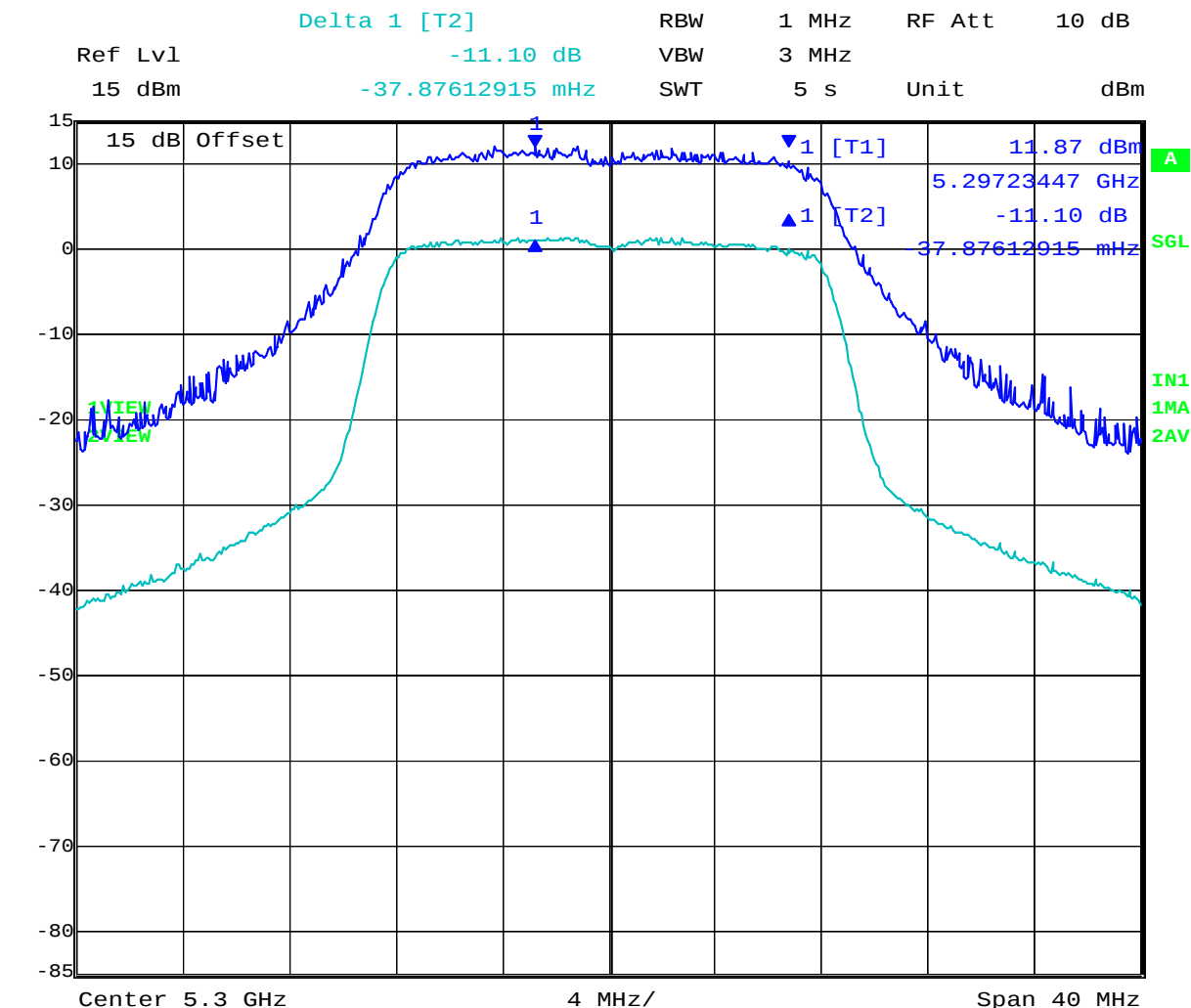
Date: 19.OCT.2010 09:28:44

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 259 of 465

5,300 MHz 802.11a Legacy - MIMO radio Chain c - Peak Excursion Ratio



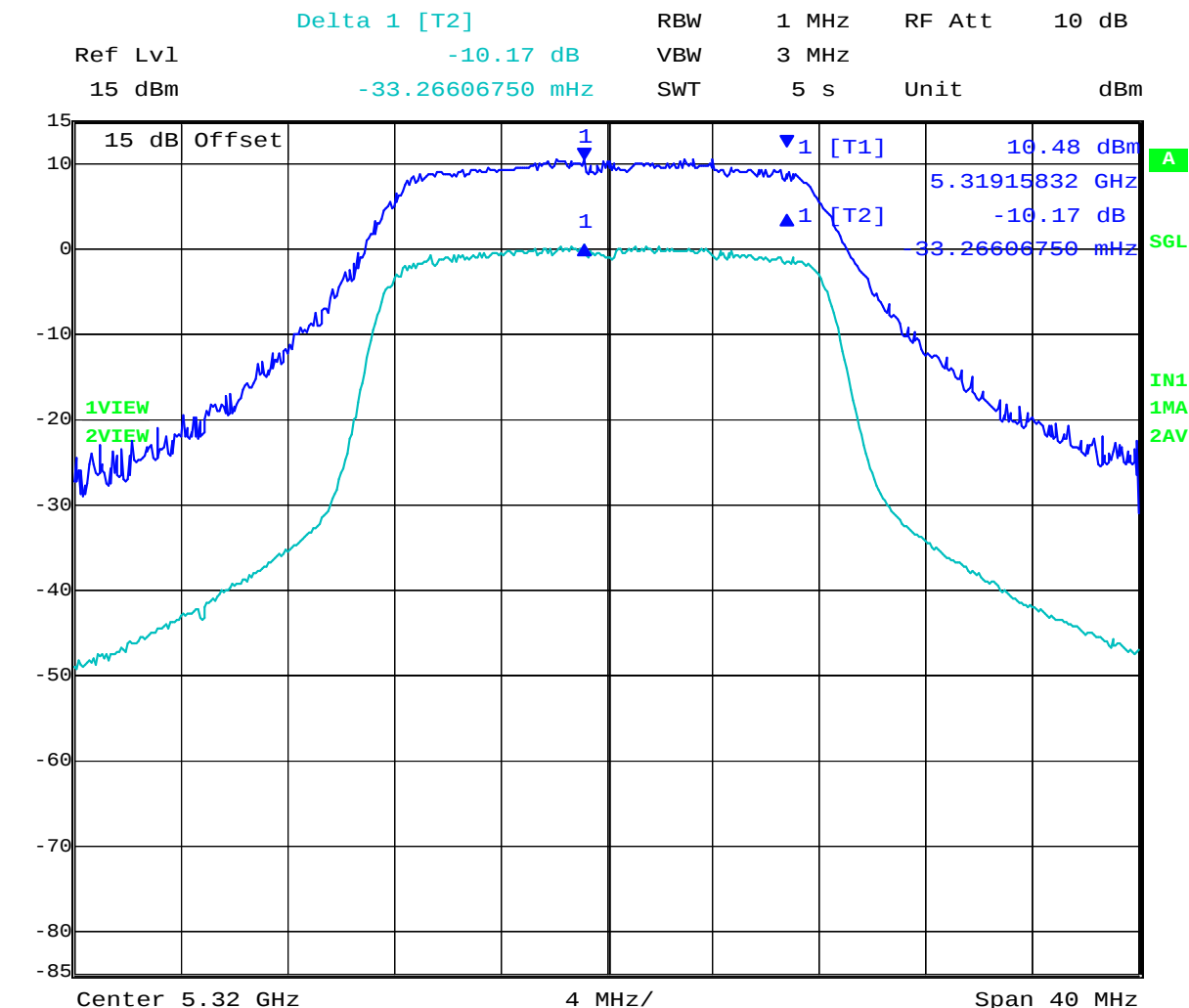
Date: 19.OCT.2010 09:29:54

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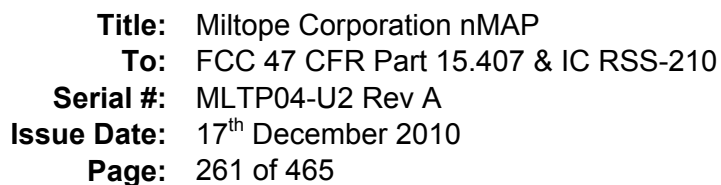
Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 260 of 465

5,320 MHz 802.11a Legacy - MIMO radio Chain a - Peak Excursion Ratio



Date: 19.OCT.2010 10:09:16

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Ref Lvl 15 dBm Delta 1 [T2] -10.70 dB RBW 1 MHz RF Att 10 dB
 15 dBm -9.41944122 mHz VBW 3 MHz Unit dBm

15 dB Offset

12.44 dBm
 5.31867735 GHz
 -10.70 dB
 9.41944122 mHz

1 [T1]
 1 [T2]

VIEW
 2VIEW

IN1
 1MA
 2AV

Center 5.32 GHz 4 MHz/ Span 40 MHz

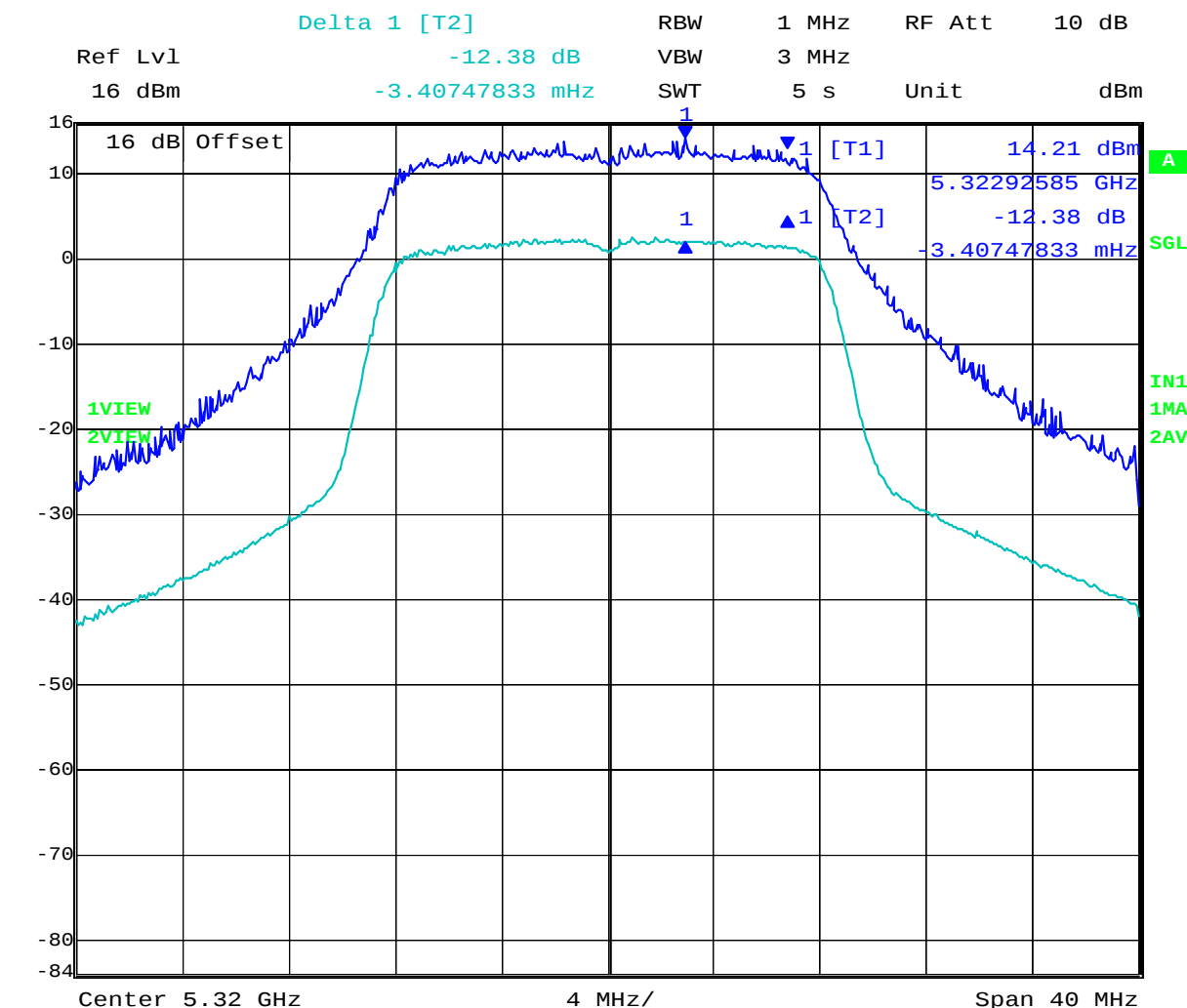
Date: 19.OCT.2010 10:08:04

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 262 of 465

5,320 MHz 802.11a Legacy - MIMO radio Chain c - Peak Excursion Ratio



Date: 19.OCT.2010 10:06:54

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 263 of 465

TABLE OF RESULTS – 802.11a Legacy - MIMO radio

Measurement Results for Peak Excursion Ratio

Test Conditions:	15.407 (a)	Rel. Humidity (%):	35	to	42
Variant:	802.11a	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2		dBi
Applied Voltage:	28.0 Vdc				

	Trace Peak Power Markers		Δ Marker (Marker 1 – 2)	Limit	Margin
	1	2			

Frequency 5500 MHz

Chain	dBm	dBm	dB	dB	dB
a	10.81	-1.03	-11.84	-13.00	-1.16
b	10.10	-1.40	-11.50		-1.50
c	9.35	-1.41	-10.76		-2.24

Frequency 5560 MHz

Chain	dBm	dBm	dB	dB	dB
a	6.98	-3.16	-10.14	-13.00	-2.86
b	10.05	-2.52	-12.57		-0.43
c	9.56	-1.87	-11.43		-1.57

Frequency 5700 MHz

Chain	dBm	dBm	dB	dB	dB
a	7.50	-3.40	-10.90	-13.00	-2.10
b	12.08	-0.20	-12.28		-0.72
c	12.65	0.35	-12.30		-0.70

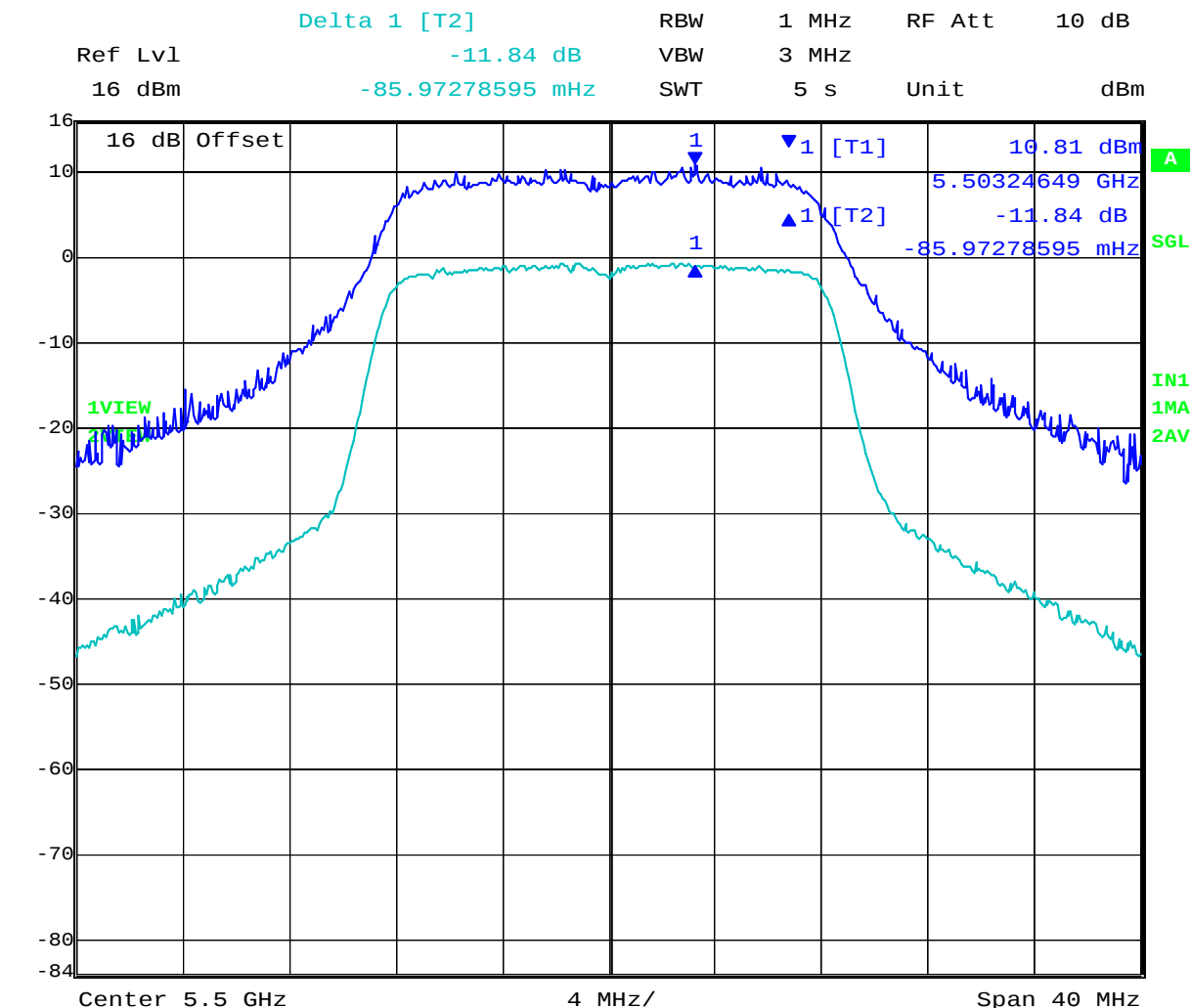
Measurement uncertainty:	± 1.33 dB
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 264 of 465

5,500 MHz 802.11a Legacy - MIMO radio Chain a - Peak Excursion Ratio



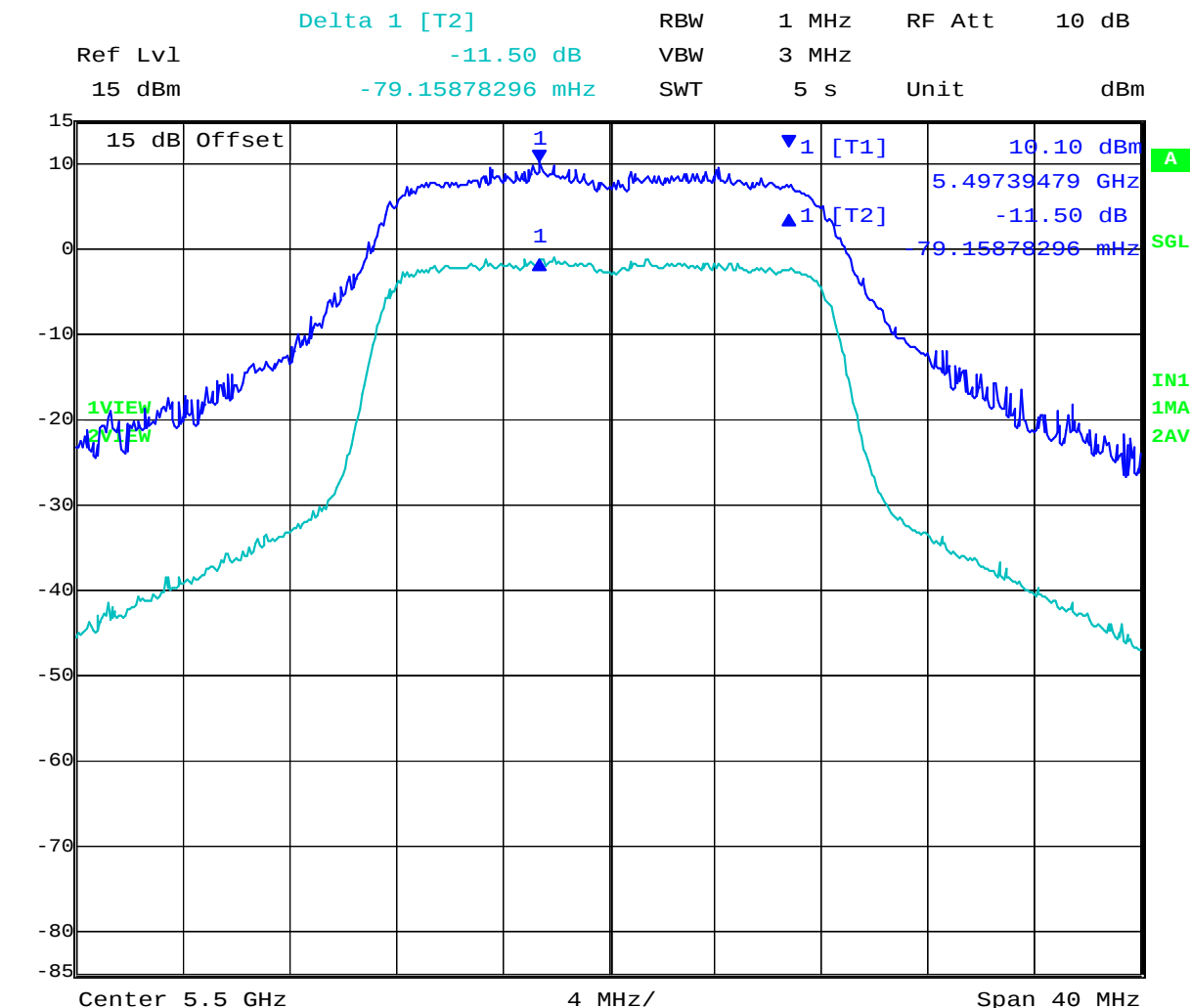
Date: 19.OCT.2010 14:39:44

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 265 of 465

5,500 MHz 802.11a Legacy - MIMO radio Chain b - Peak Excursion Ratio



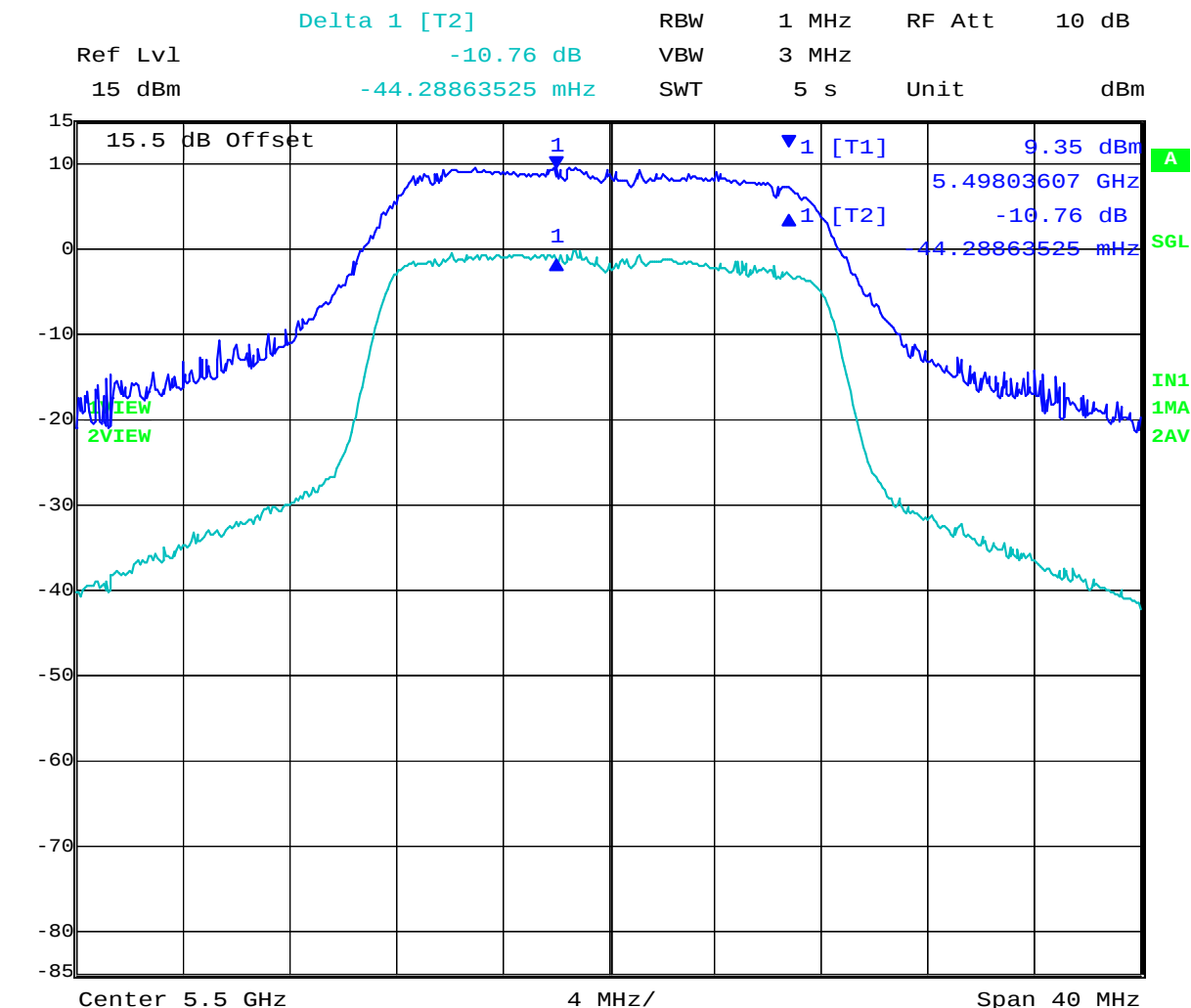
Date: 19.OCT.2010 14:40:54

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 266 of 465

5,500 MHz 802.11a Legacy - MIMO radio Chain c - Peak Excursion Ratio



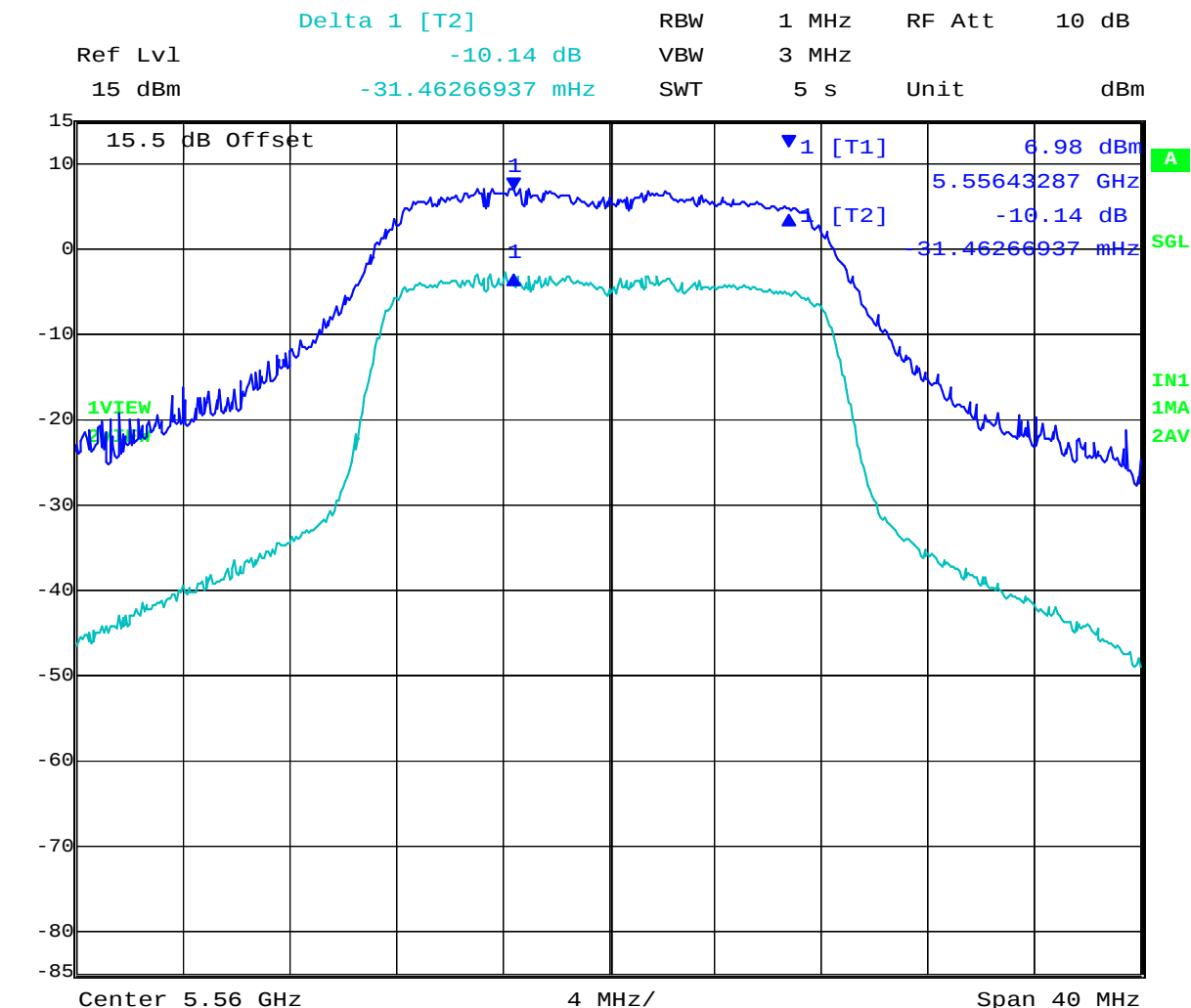
Date: 19.OCT.2010 14:42:05

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 267 of 465

5,560 MHz 802.11a Legacy - MIMO radio Chain a - Peak Excursion Ratio



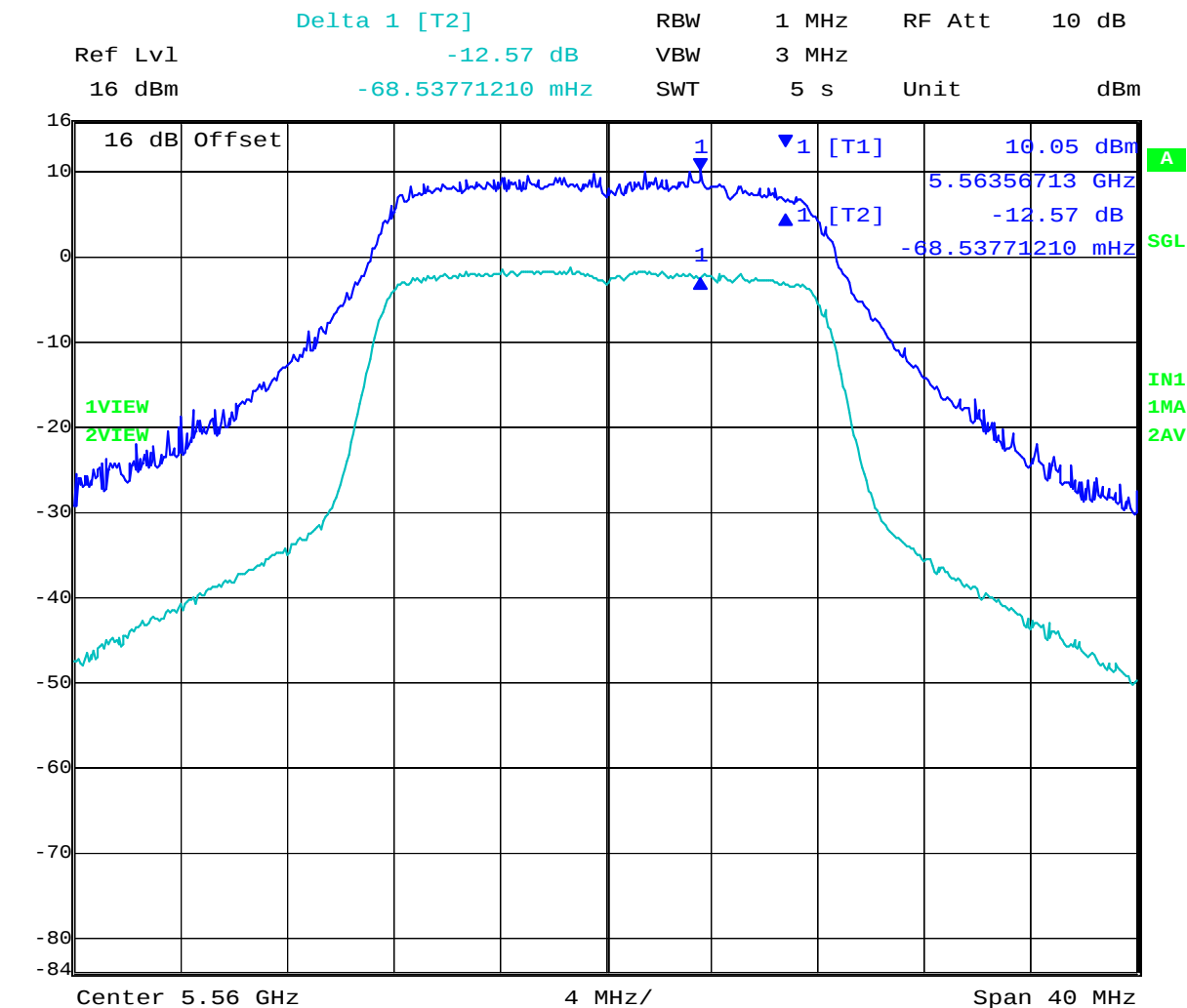
Date: 19.OCT.2010 15:12:52

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 268 of 465

5,560 MHz 802.11a Legacy - MIMO radio Chain b - Peak Excursion Ratio



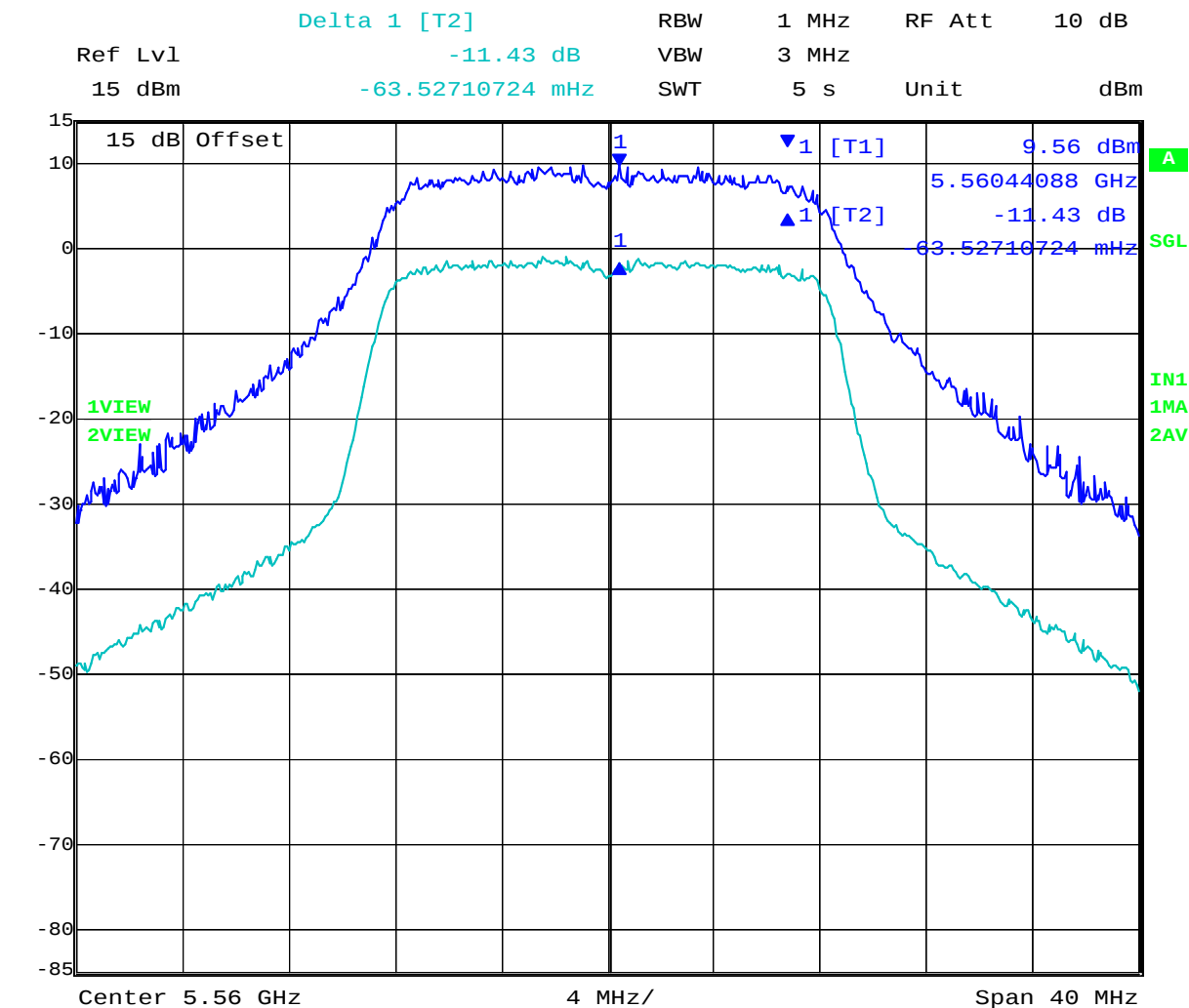
Date: 19.OCT.2010 15:10:30

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 269 of 465

5,560 MHz 802.11a Legacy - MIMO radio Chain c - Peak Excursion Ratio



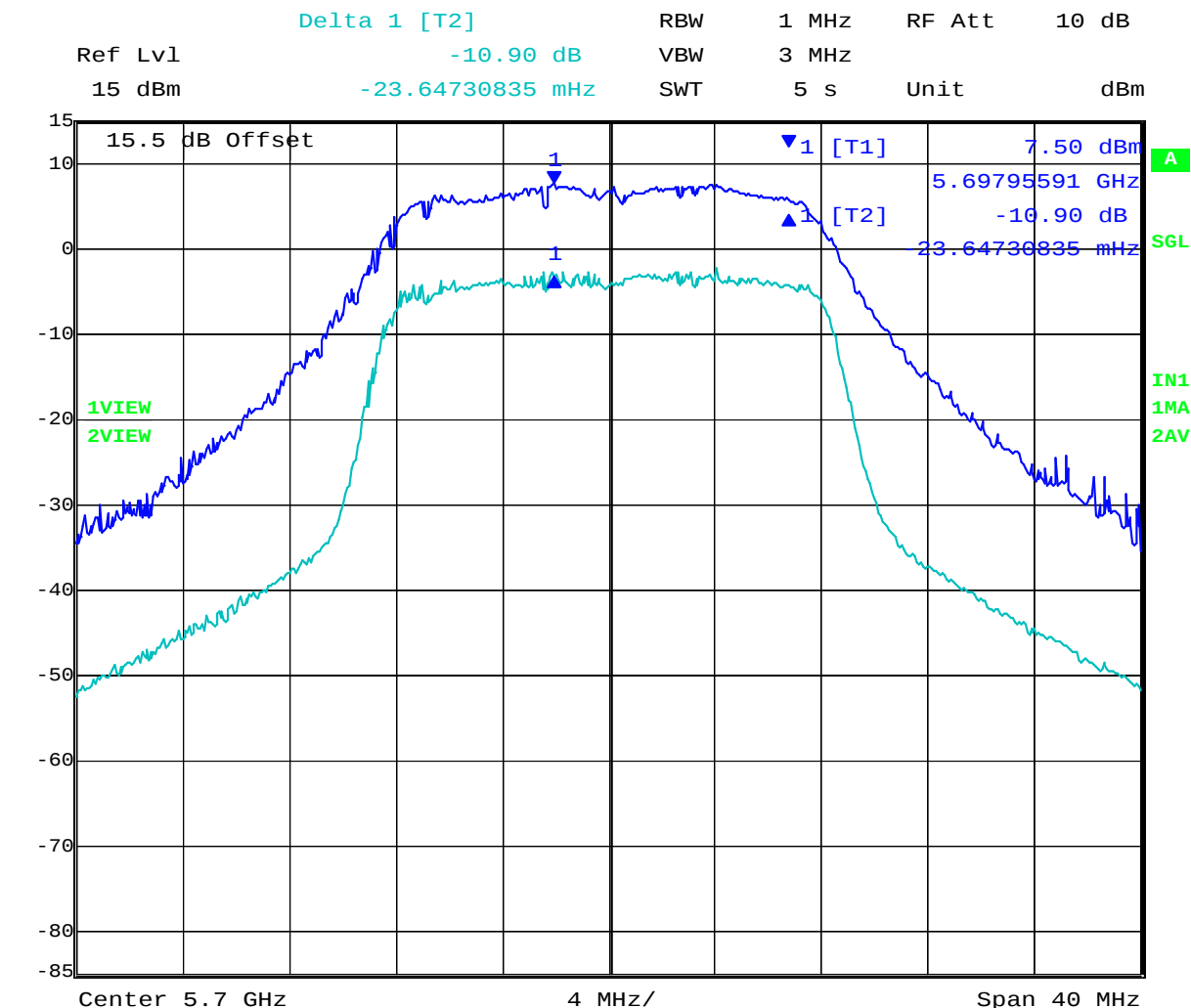
Date: 19.OCT.2010 15:11:40

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 270 of 465

5,700 MHz 802.11a Legacy - MIMO radio Chain a- Peak Excursion Ratio



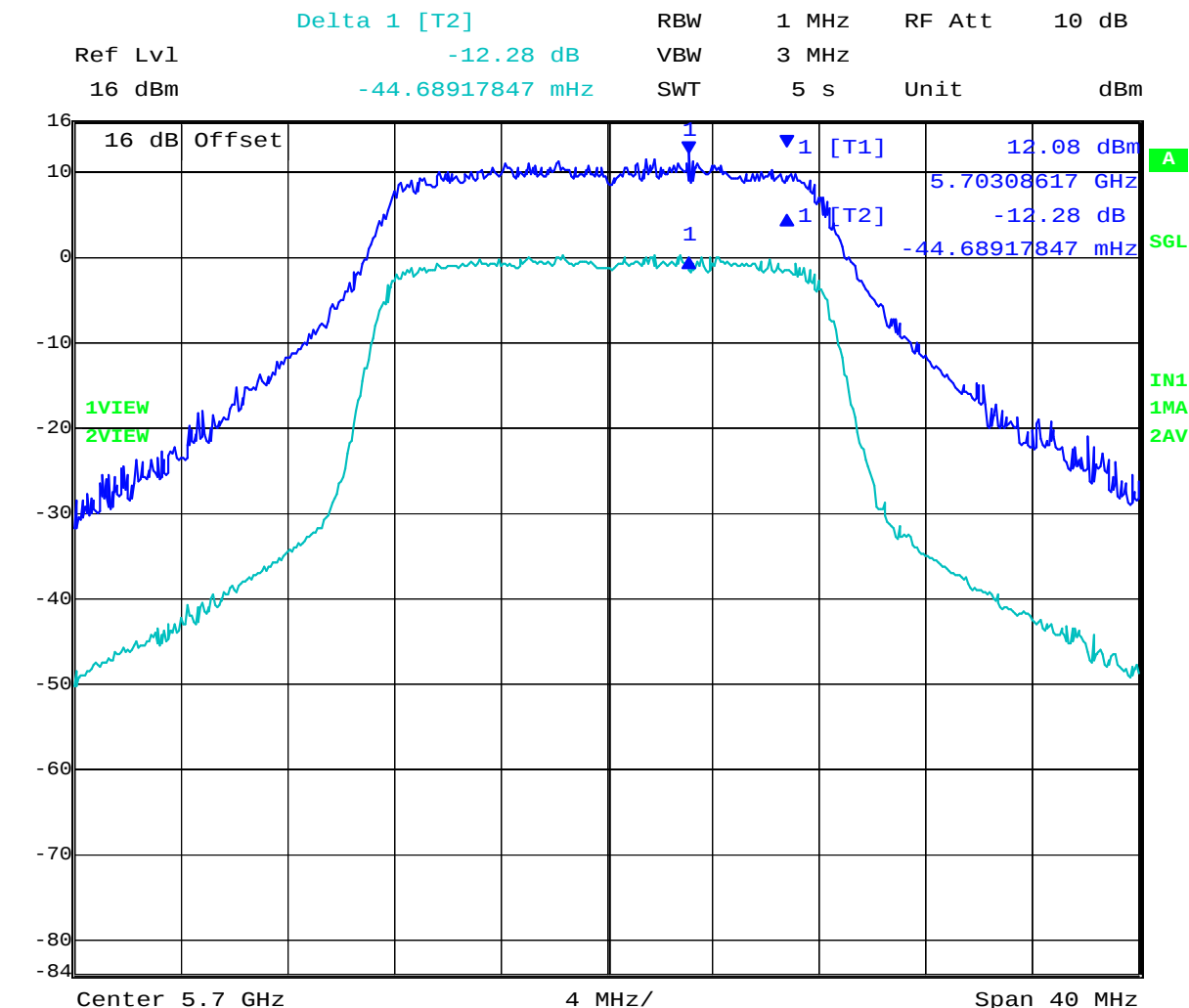
Date: 19.OCT.2010 15:45:20

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 271 of 465

5,700 MHz 802.11a Legacy - MIMO radio Chain b- Peak Excursion Ratio



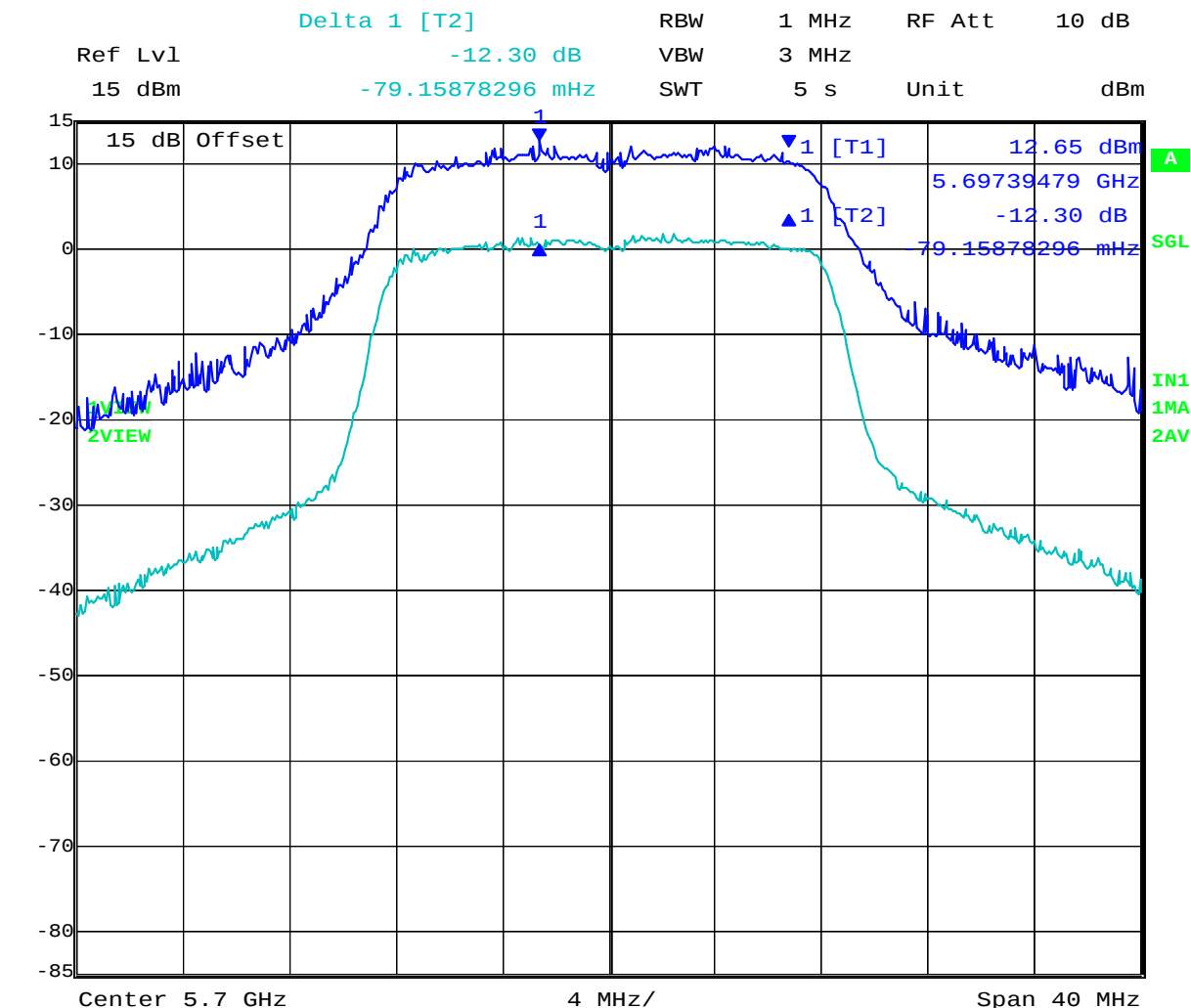
Date: 19.OCT.2010 15:42:59

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 272 of 465

5,700 MHz 802.11a Legacy - MIMO radio Chain c- Peak Excursion Ratio



Date: 19.OCT.2010 15:44:09

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 273 of 465

TABLE OF RESULTS – 802.11n HT20 - MIMO RADIO

Measurement Results for Peak Excursion Ratio

Test Conditions:	15.407 (a)	Rel. Humidity (%):	35	to	42
Variant:	802.11n HT-20	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2		dBi
Applied Voltage:	28.0 Vdc				

	Trace Peak Power Markers		Δ Marker (Marker 1 – 2)	Limit	Margin
	1	2			

Frequency 5180 MHz

Chain	dBm	dBm	dB	dB	dB
a	10.06	-1.49	-11.55	-13.00	-1.45
b	9.20	-2.02	-11.22		-1.78
c	10.56	-0.73	-11.29		-1.71

Frequency 5200 MHz

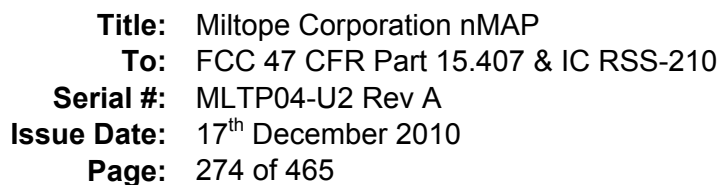
Chain	dBm	dBm	dB	dB	dB
a	8.13	-3.84	-11.97	-13.00	-1.03
b	9.64	-2.15	-11.79		-1.21
c	9.43	-1.83	-11.26		-1.74

Frequency 5240 MHz

Chain	dBm	dBm	dB	dB	dB
a	8.27	-2.24	-10.51	-13.00	-2.49
b	9.57	-1.82	-11.39		-1.61
c	10.62	0.09	-10.53		-2.47

Measurement uncertainty:	± 1.33 dB
---------------------------------	---------------

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Ref Lvl 16 dBm

Delta 1 [T2] -11.55 dB

Delta 1 [T1] -6.21223450 mHz

RBW 1 MHz

VBW 3 MHz

SWT 5 s

RF Att 10 dB

Unit dBm

16 dB Offset

1VIEW

2VIEW

1 [T1]

1 [T2]

5.17827655 GHz

-11.55 dB

-6.21223450 mHz

10.06 dBm

Center 5.18 GHz

4 MHz/

Span 40 MHz

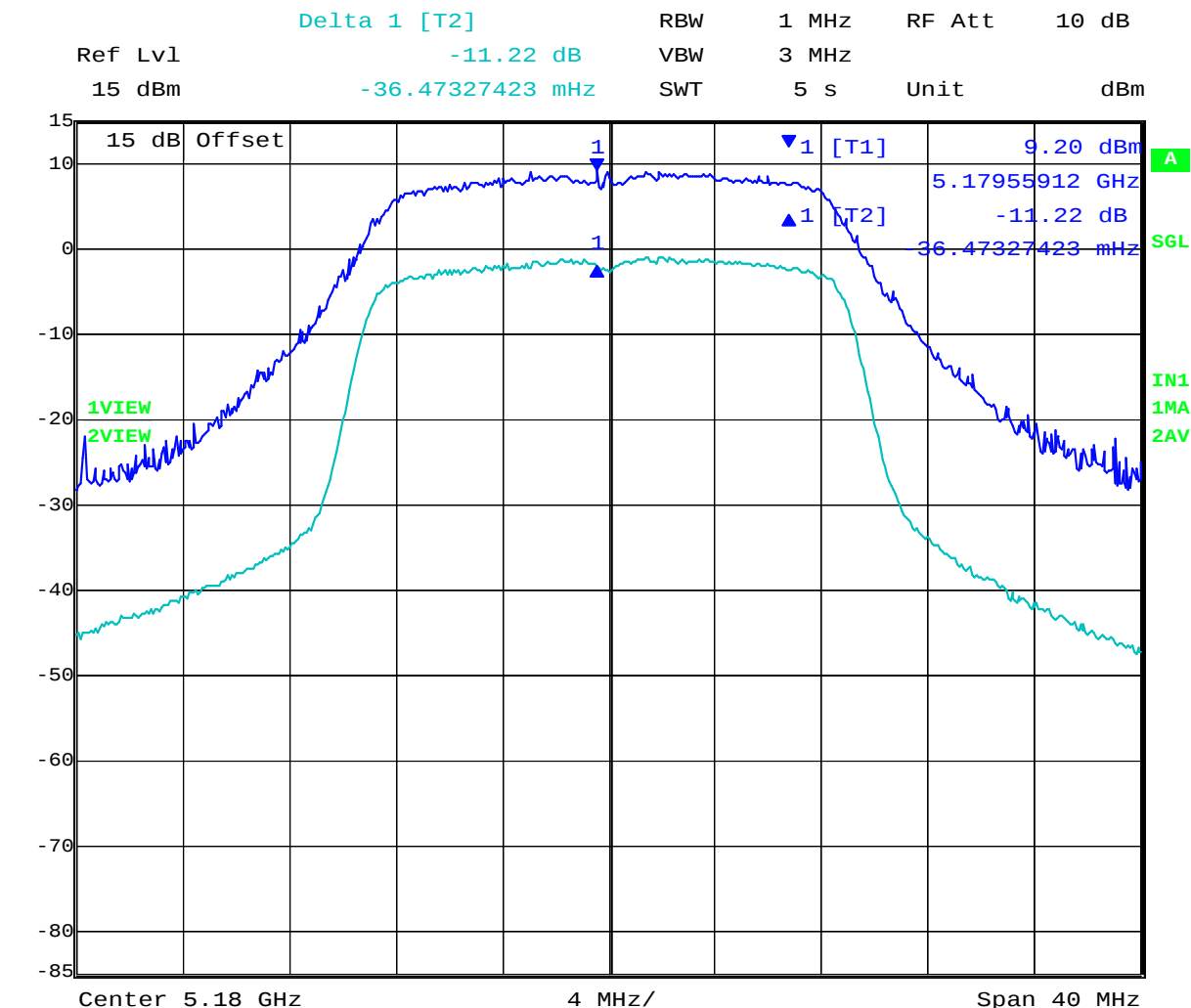
Date: 18.OCT.2010 14:11:49

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 275 of 465

5,180 MHz 802.11n HT20 - MIMO RADIO Chain b - Peak Excursion Ratio



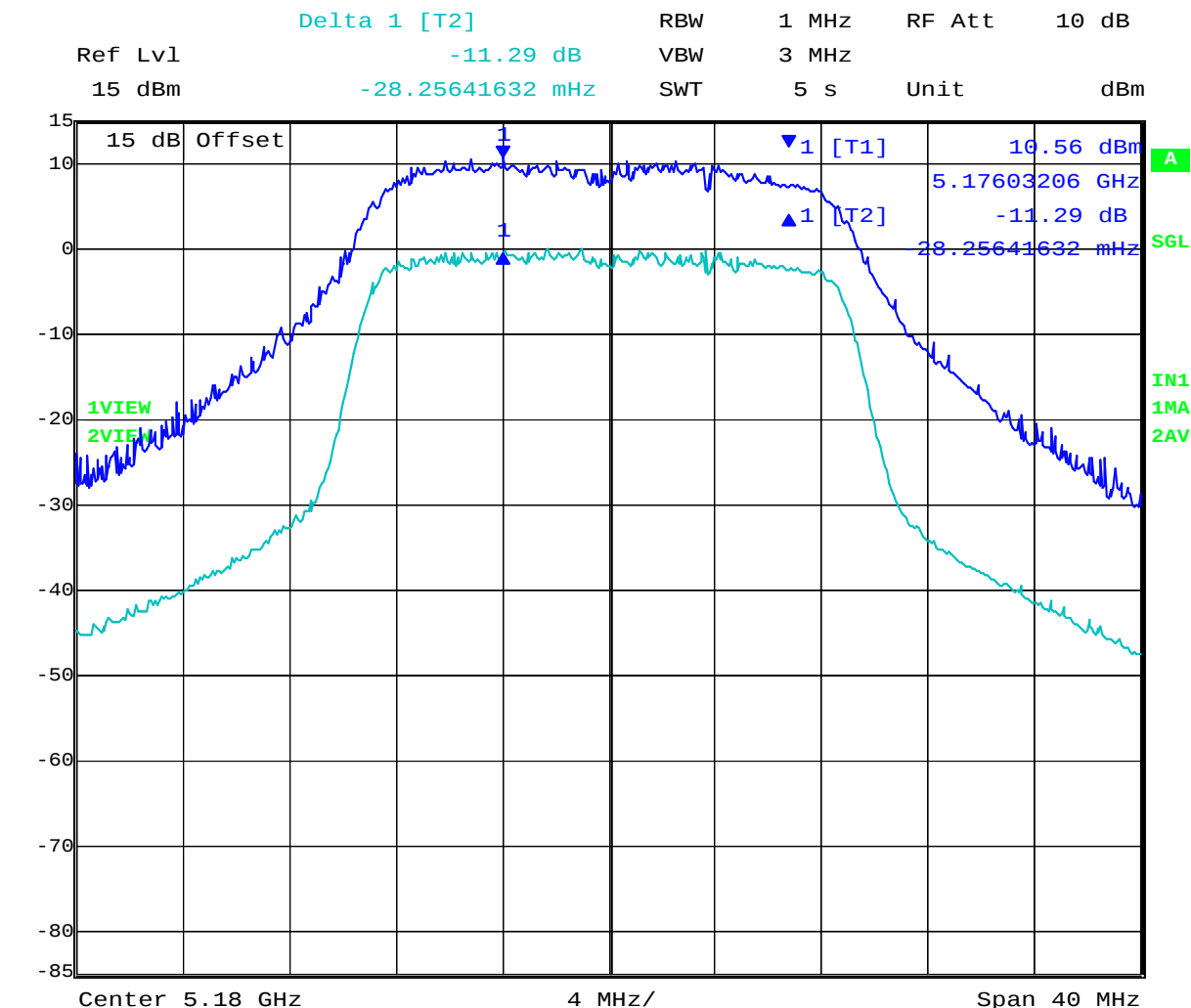
Date: 18.OCT.2010 14:14:11

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 276 of 465

5,180 MHz 802.11n HT20 - MIMO RADIO Chain c - Peak Excursion Ratio



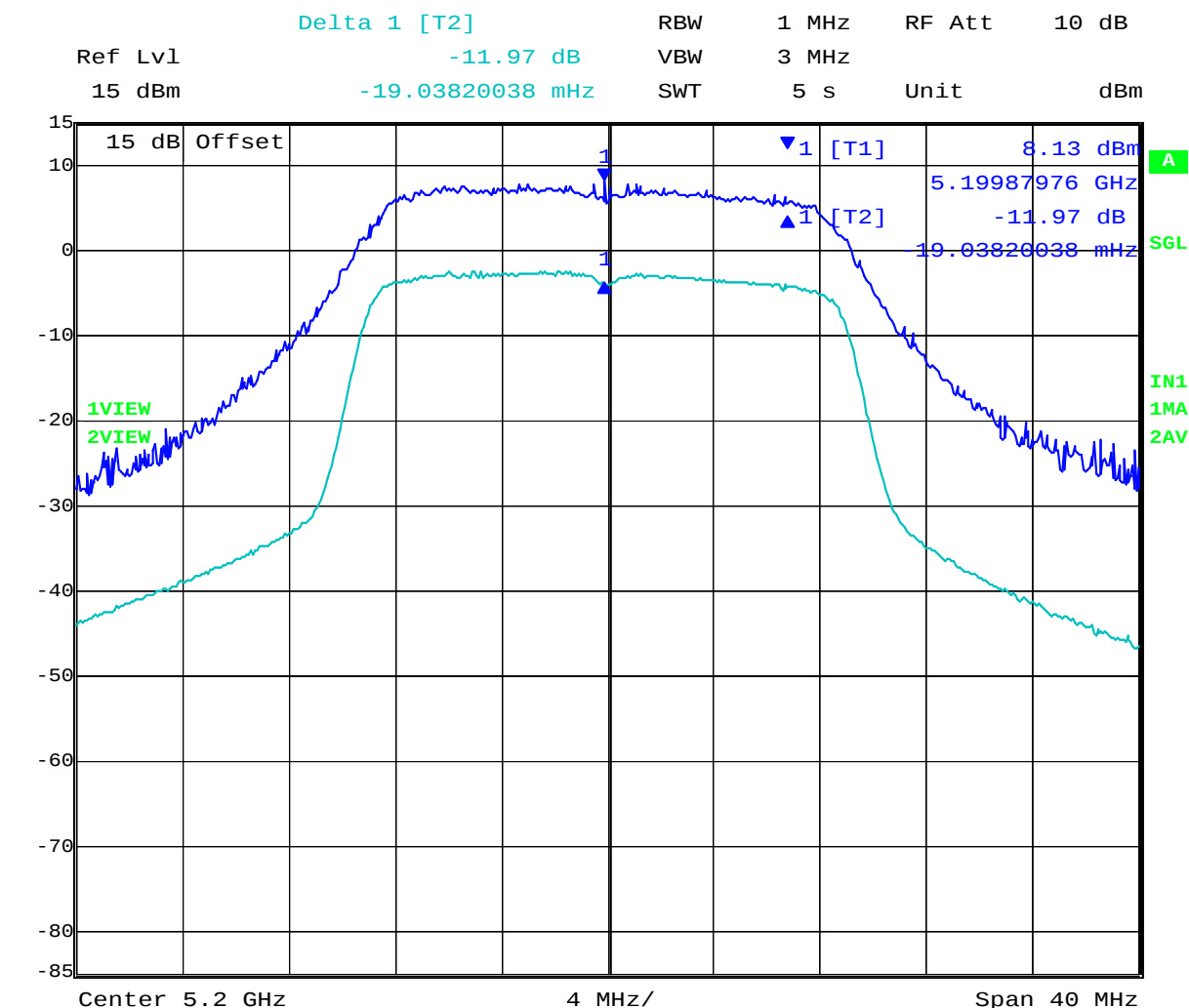
Date: 18.OCT.2010 14:12:59

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 277 of 465

5,200 MHz 802.11n HT20 - MIMO RADIO Chain a - Peak Excursion Ratio



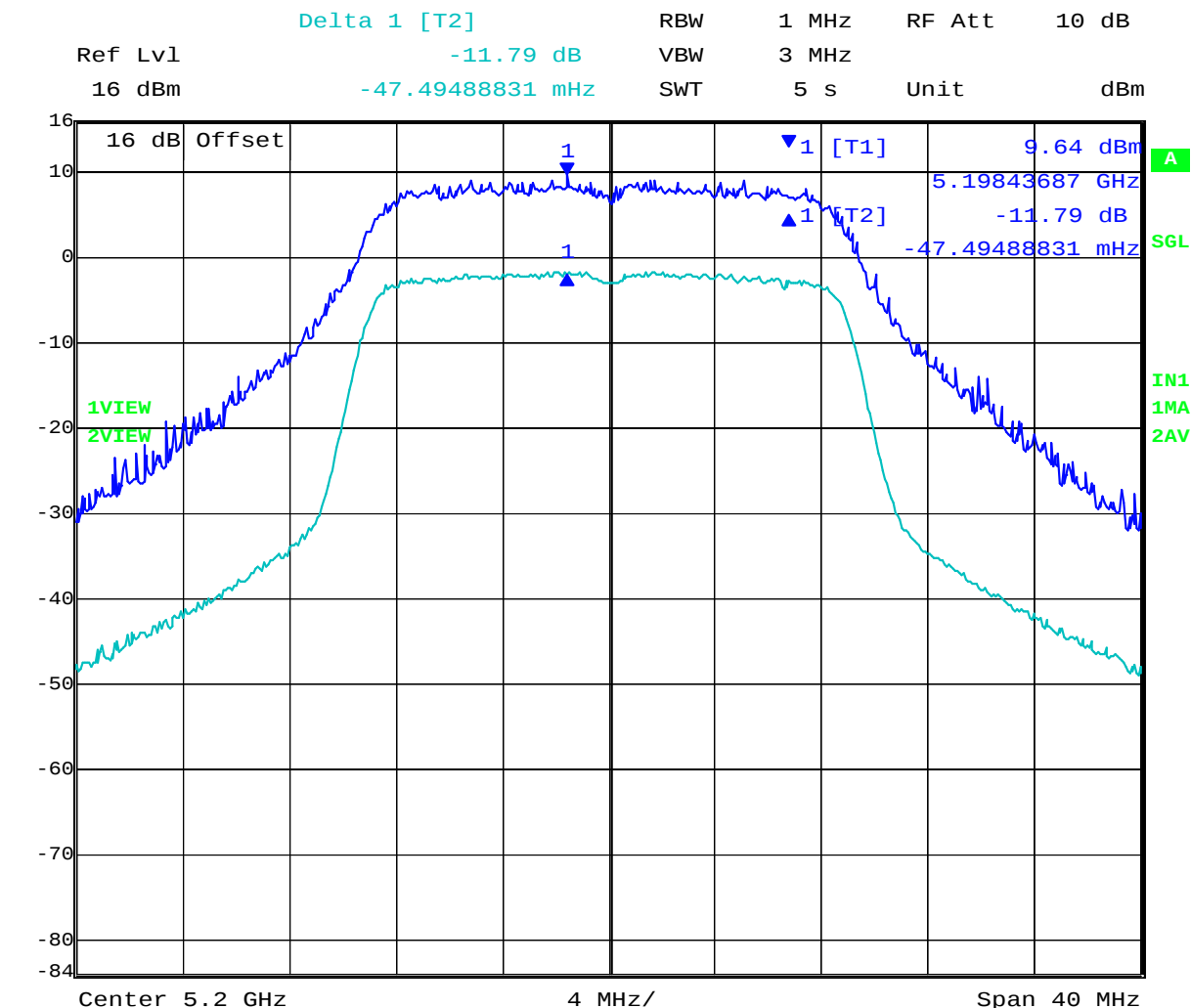
Date: 18.OCT.2010 14:44:12

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 278 of 465

5,200 MHz 802.11n HT20 - MIMO RADIO Chain b - Peak Excursion Ratio



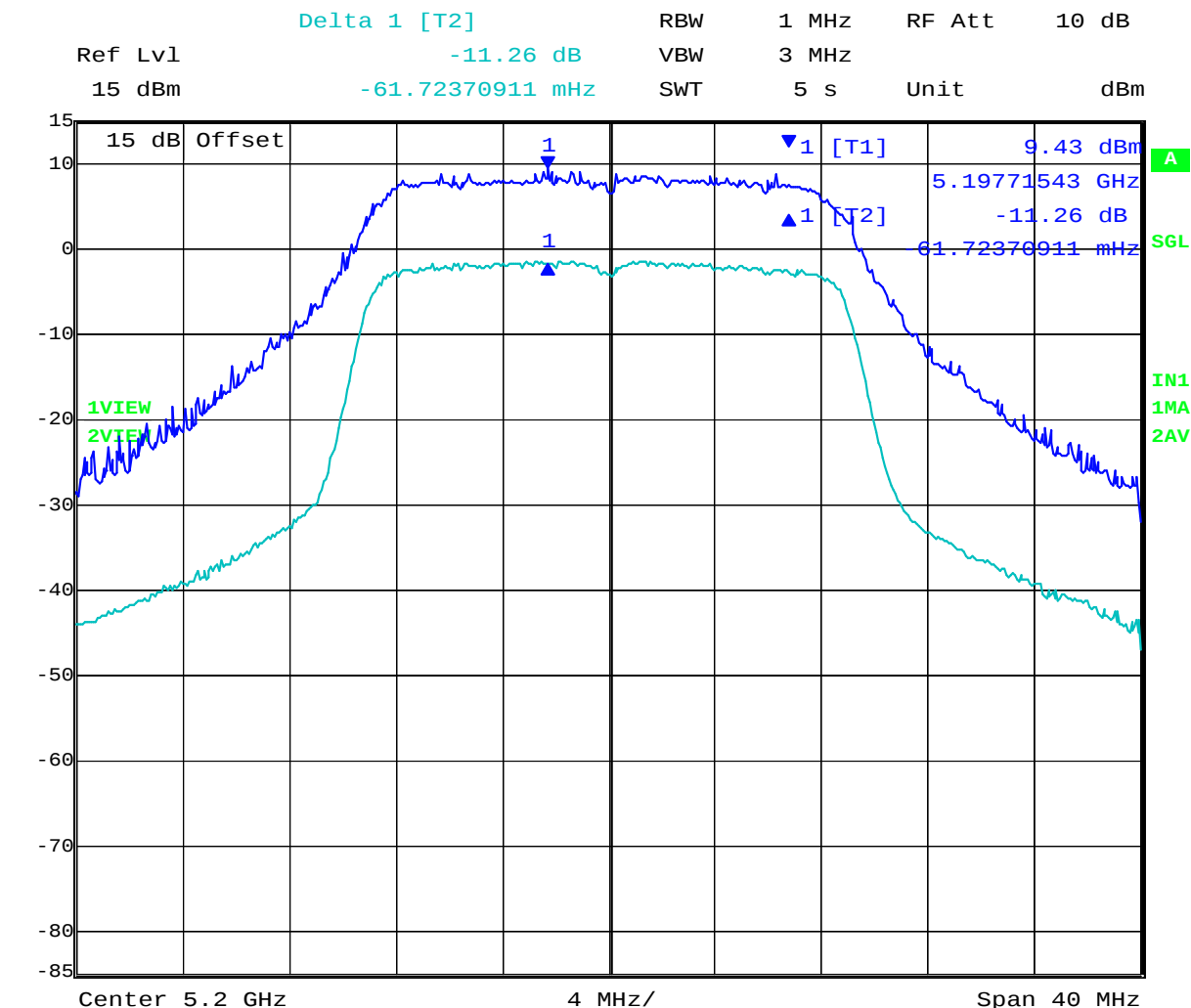
Date: 18.OCT.2010 14:41:51

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 279 of 465

5,200 MHz 802.11n HT20 - MIMO RADIO Chain c - Peak Excursion Ratio



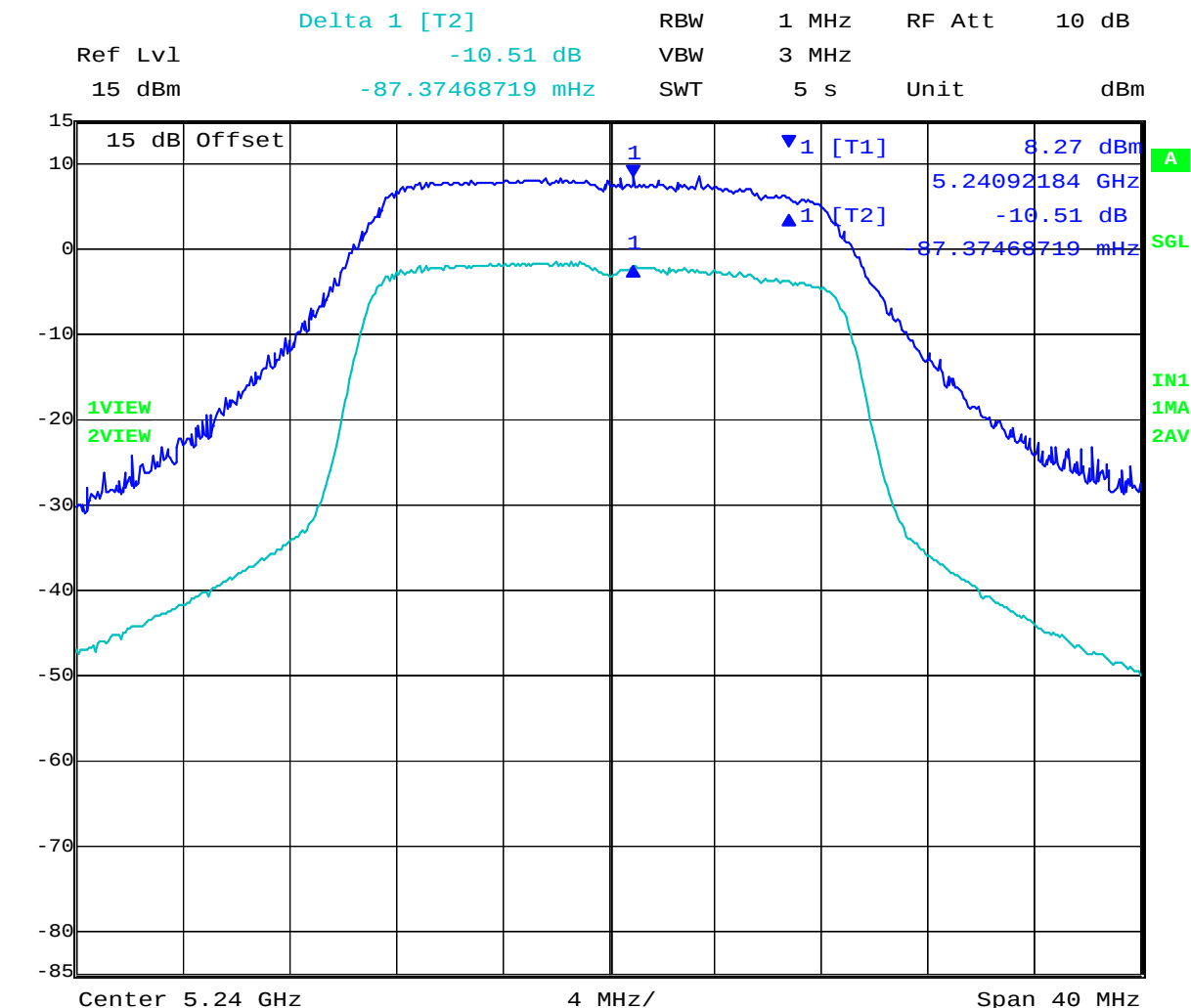
Date: 18.OCT.2010 14:43:01

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 280 of 465

5,240 MHz 802.11n HT20 - MIMO RADIO Chain a - Peak Excursion Ratio



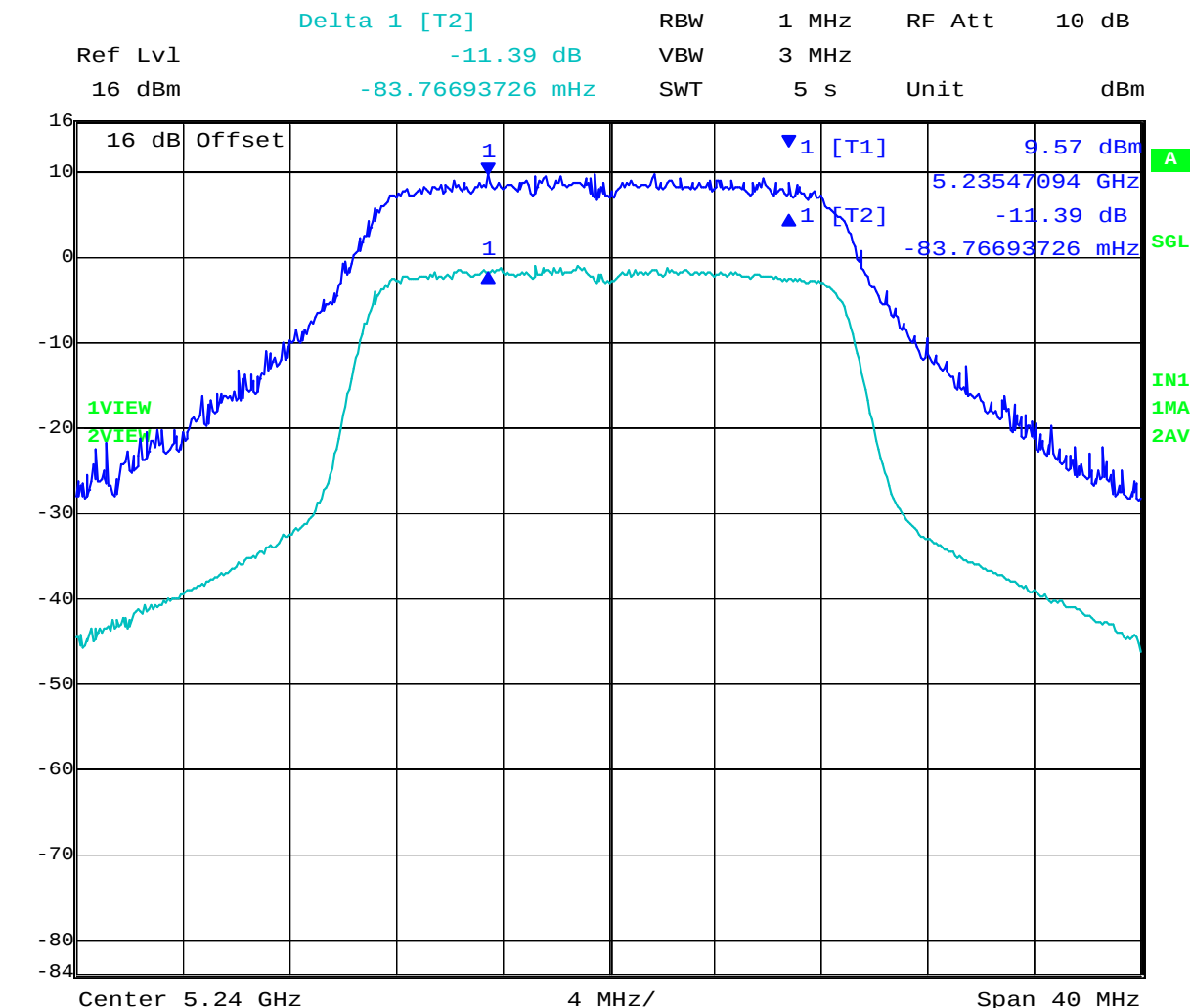
Date: 18.OCT.2010 15:14:56

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 281 of 465

5,240 MHz 802.11n HT20 - MIMO RADIO Chain b - Peak Excursion Ratio



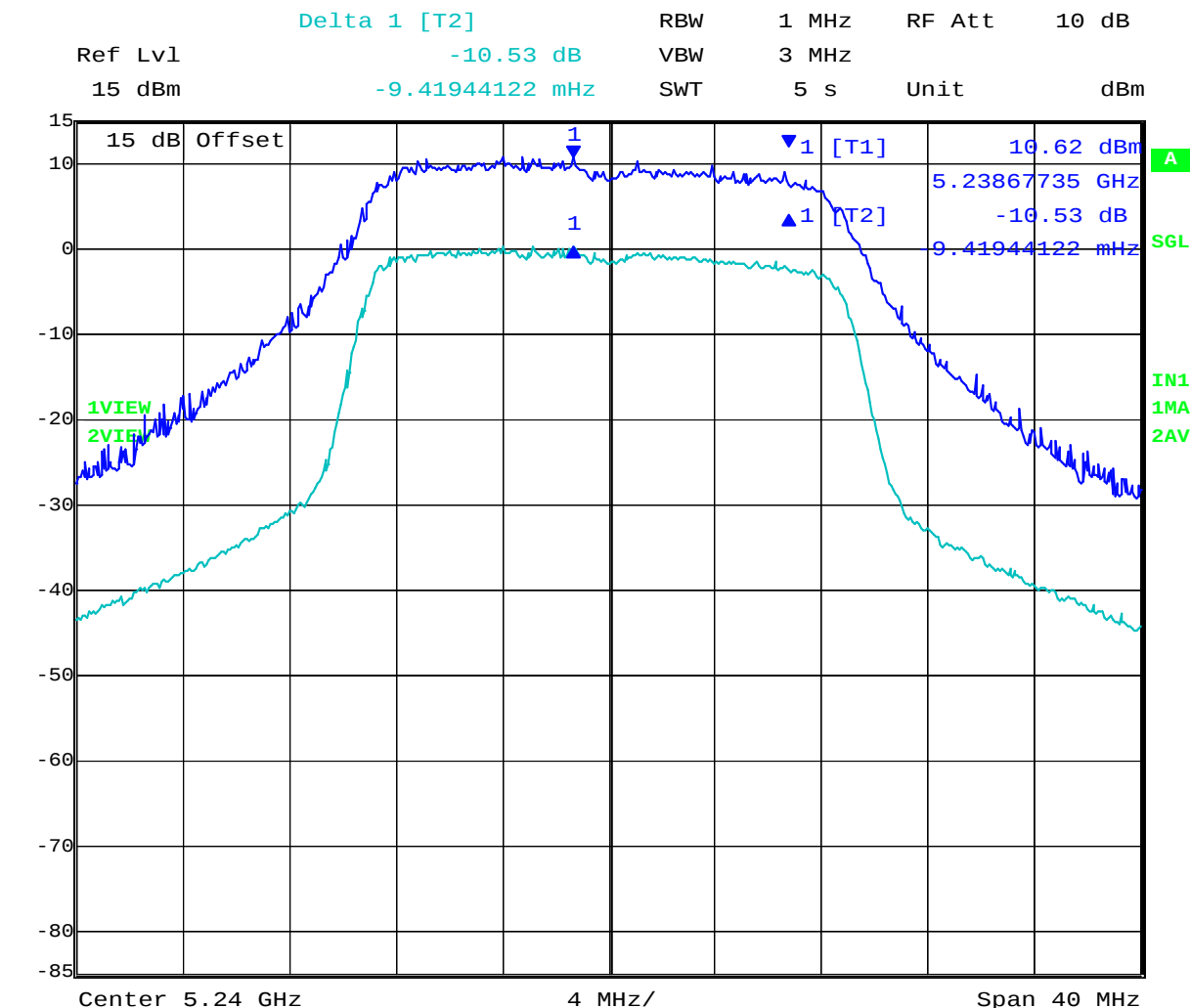
Date: 18.OCT.2010 15:12:35

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 282 of 465

5,240 MHz 802.11n HT20 - MIMO RADIO Chain c - Peak Excursion Ratio



Date: 18.OCT.2010 15:13:45

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 283 of 465

TABLE OF RESULTS – 802.11n HT20 - MIMO RADIO

Measurement Results for Peak Excursion Ratio

Test Conditions:	15.407 (a)	Rel. Humidity (%):	35	to	42
Variant:	802.11N HT-20	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2		dBi
Applied Voltage:	28.0 Vdc				

	Trace Peak Power Markers		Δ Marker (Marker 1 – 2)	Limit	Margin
	1	2			

Frequency 5260 MHz

Chain	dBm	dBm	dB	dB	dB
a	8.25	-2.71	-10.96	-13.00	-2.04
b	9.80	-0.70	-10.50		-2.50
c	11.07	-0.29	-11.36		-1.64

Frequency 5300 MHz

Chain	dBm	dBm	dB	dB	dB
a	9.21	-2.60	-11.81	-13.00	-1.19
b	11.50	-0.02	-11.52		-1.48
c	11.75	0.64	-11.11		-1.89

Frequency 5320 MHz

Chain	dBm	dBm	dB	dB	dB
a	10.38	-0.53	-10.91	-13.00	-2.09
b	12.74	1.84	-10.90		-2.10
c	13.29	1.88	-11.41		-1.59

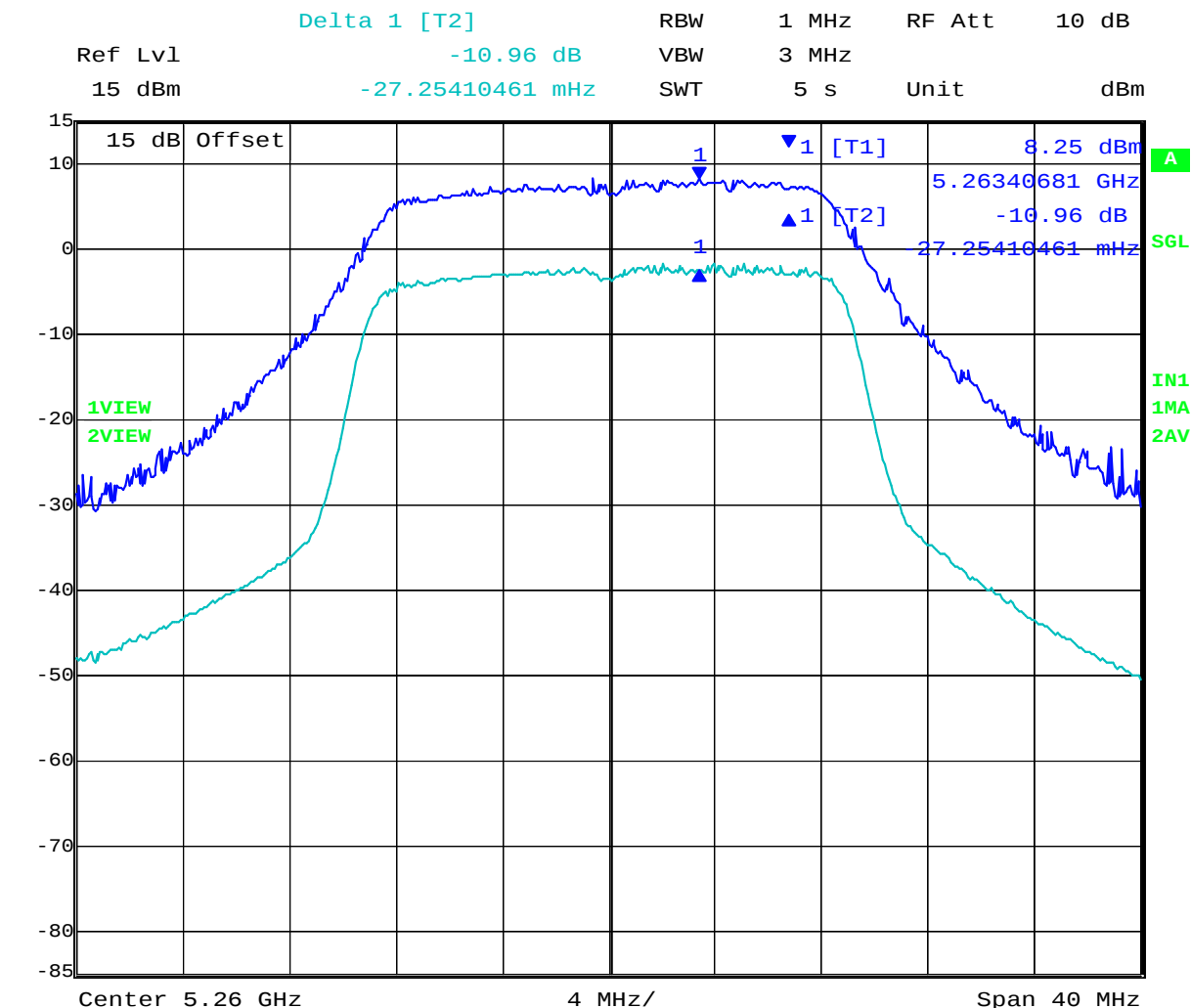
Measurement uncertainty:	± 1.33 dB
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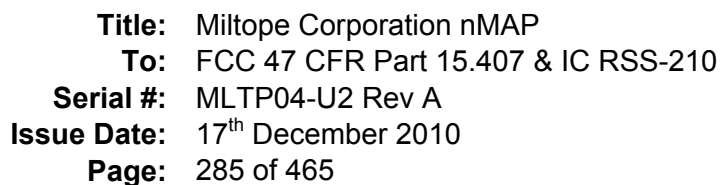
Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 284 of 465

5,260 MHz 802.11n HT20 - MIMO RADIO Chain a - Peak Excursion Ratio



Date: 19.OCT.2010 10:40:03

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Ref Lvl 15 dBm

Delta 1 [T2] -10.50 dB

RBW 1 MHz

VBW 3 MHz

RF Att 10 dB

SWT 5 s

Unit dBm

15 dB Offset

1 [T1] 9.80 dBm

1 [T2] -10.50 dB

5.26092184 GHz

-87.37468719 mHz

1VIEW

2VIEW

IN1

1MA

2AV

Center 5.26 GHz

4 MHz/

Span 40 MHz

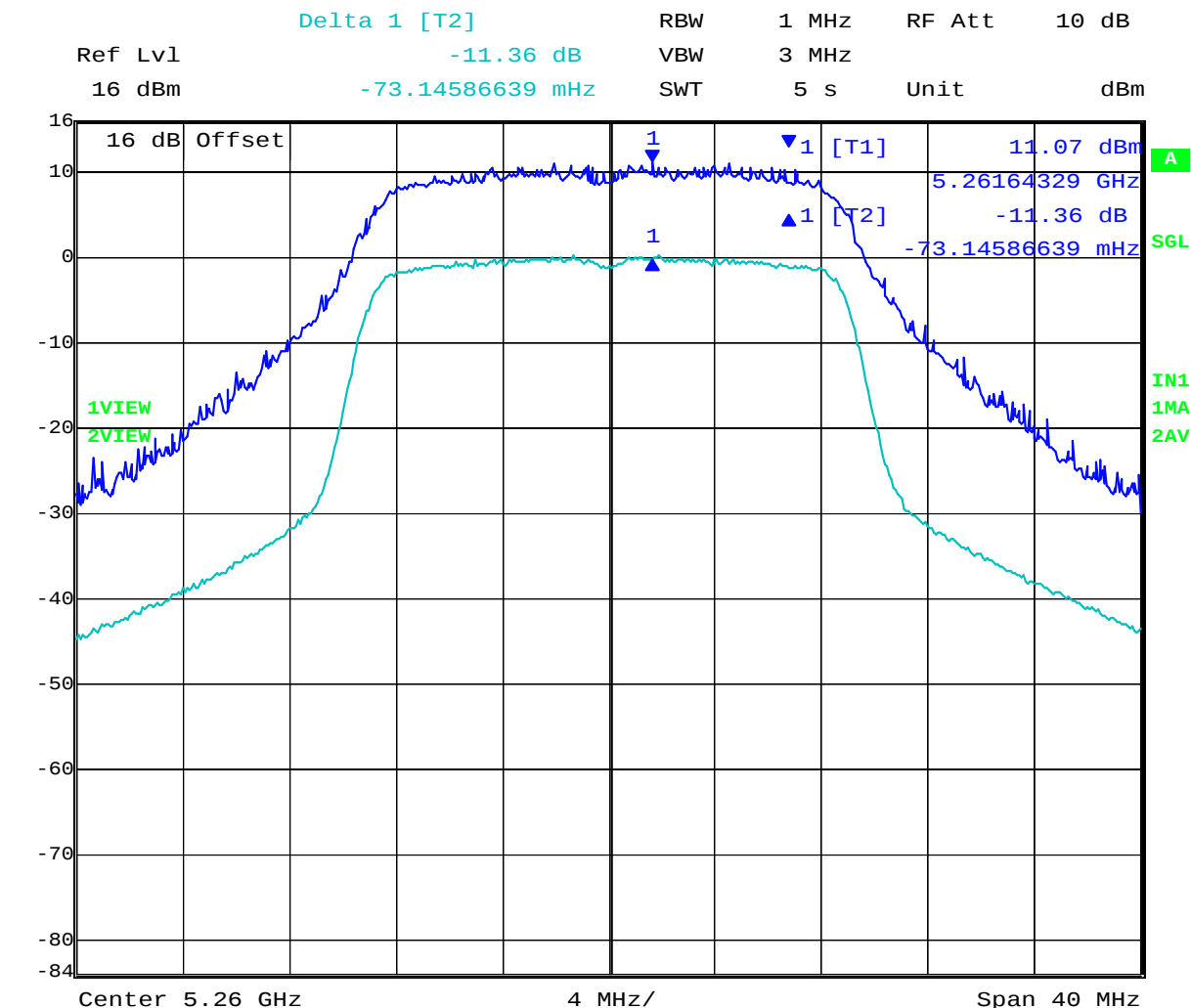
Date: 19.OCT.2010 10:38:50

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 286 of 465

5,260 MHz 802.11n HT20 - MIMO RADIO Chain c - Peak Excursion Ratio



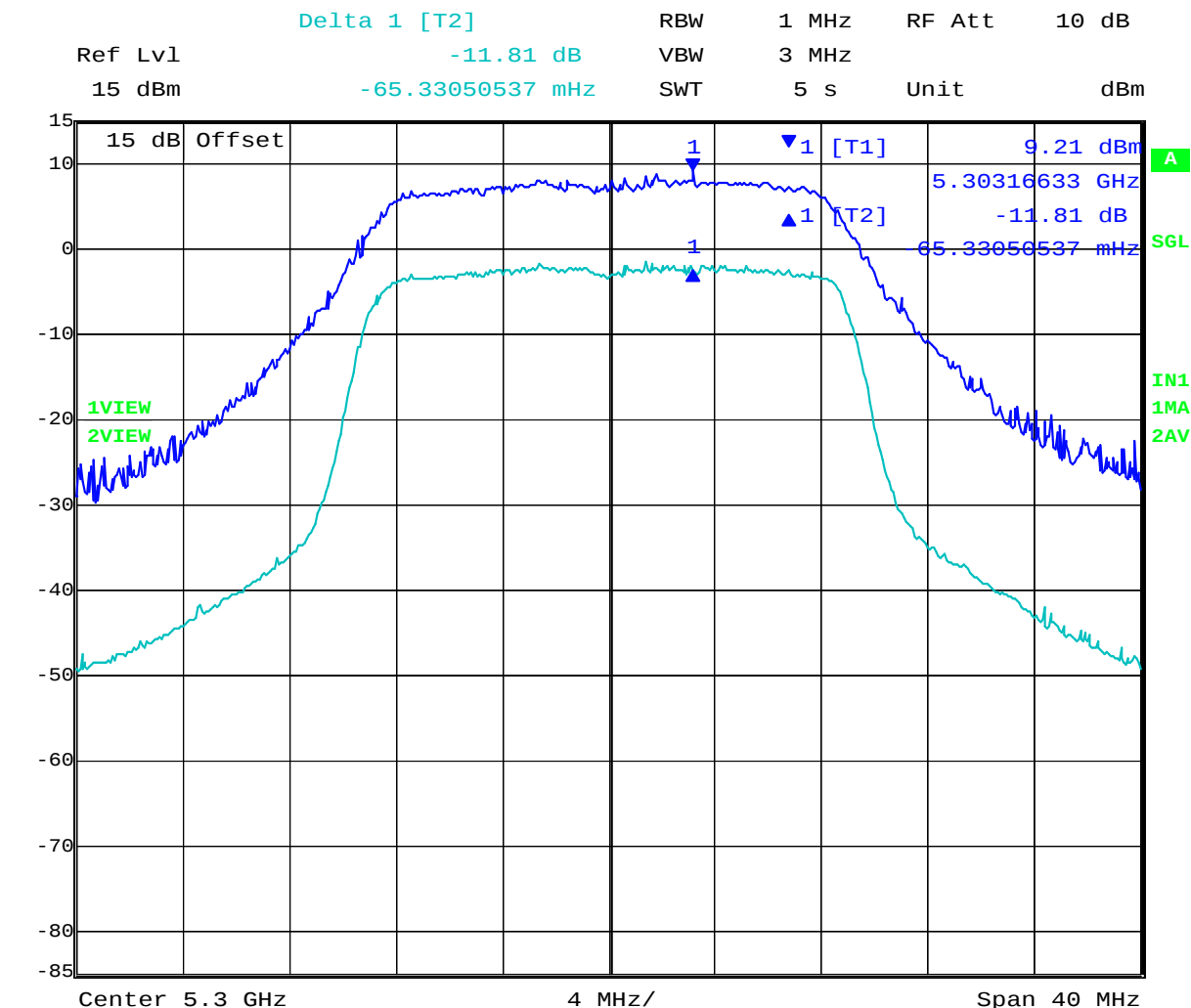
Date: 19.OCT.2010 10:37:41

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 287 of 465

5,300 MHz 802.11n HT20 - MIMO RADIO Chain a - Peak Excursion Ratio



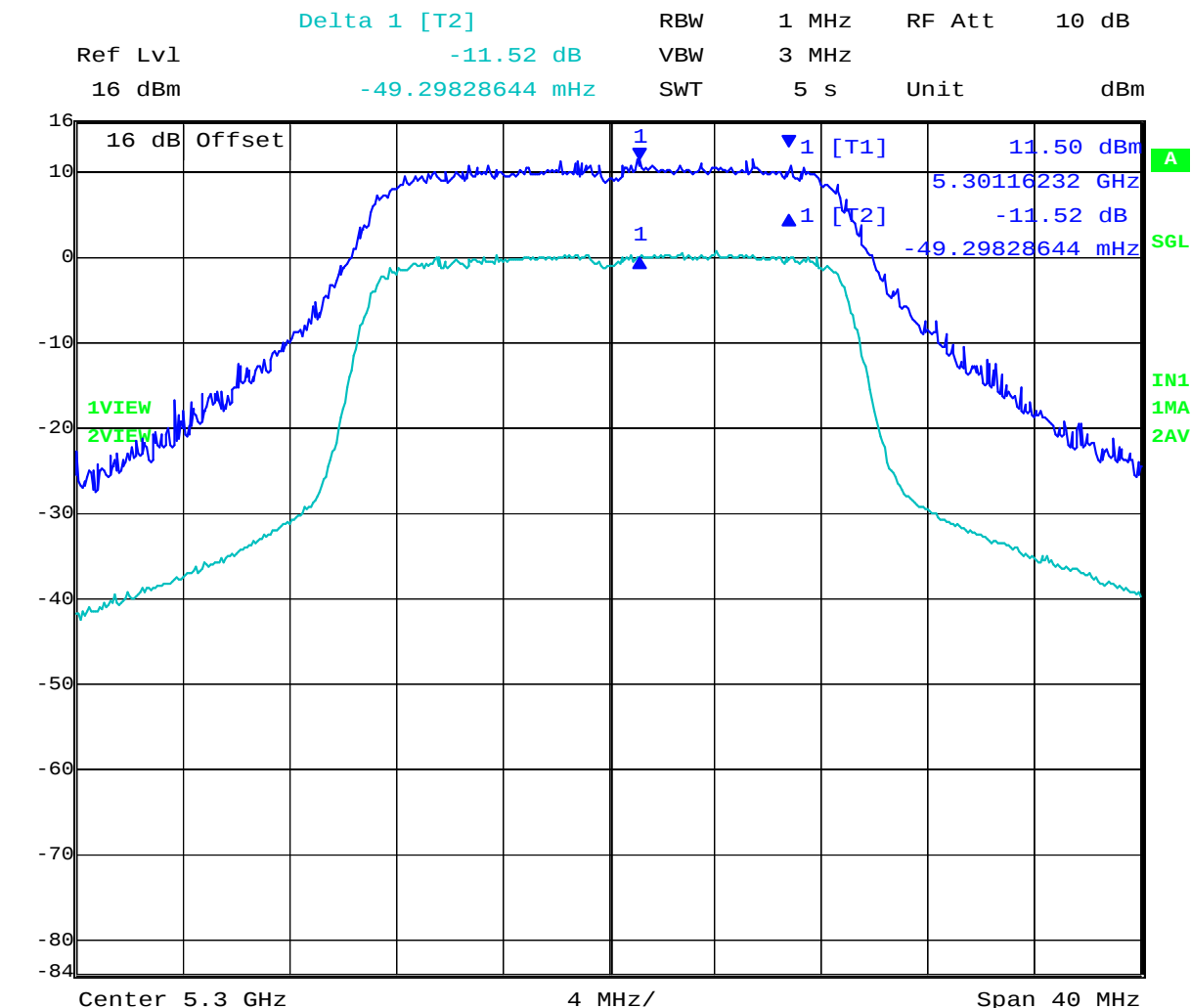
Date: 19.OCT.2010 11:25:39

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 288 of 465

5,300 MHz 802.11n HT20 - MIMO RADIO Chain b - Peak Excursion Ratio



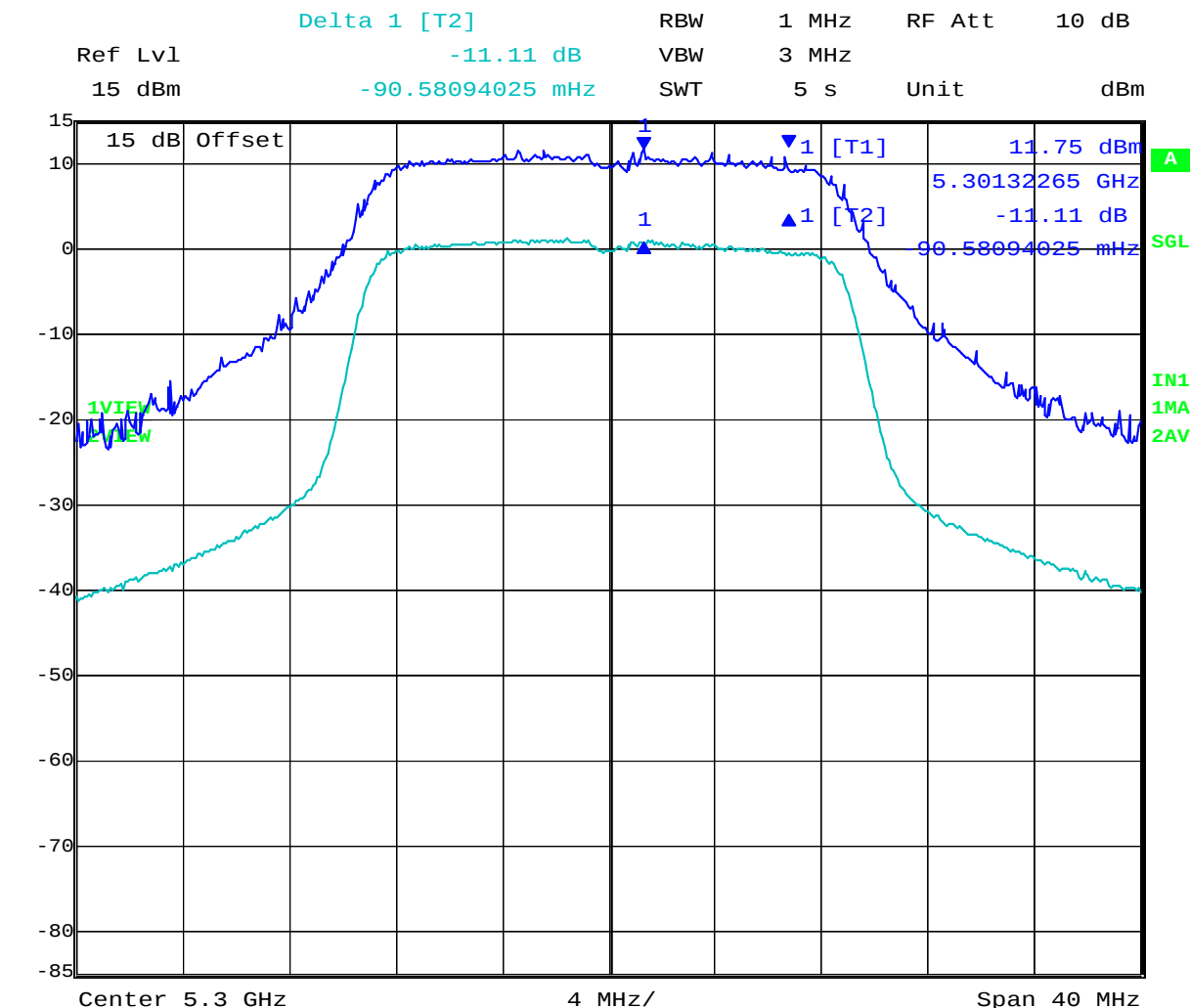
Date: 19.OCT.2010 11:23:17

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 289 of 465

5,300 MHz 802.11n HT20 - MIMO RADIO Chain c - Peak Excursion Ratio



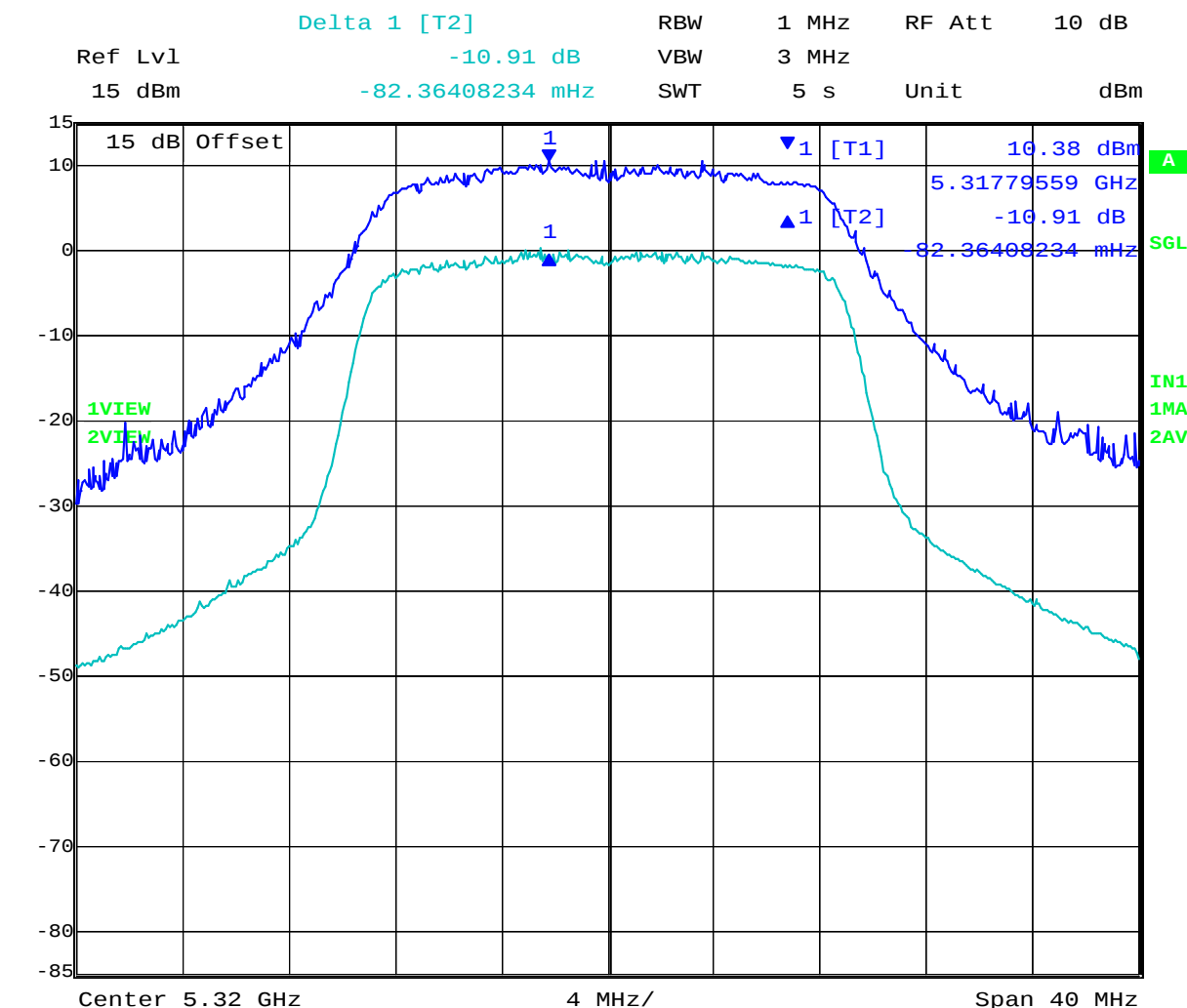
Date: 19.OCT.2010 11:24:27

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 290 of 465

5,320 MHz 802.11n HT20 - MIMO RADIO Chain a - Peak Excursion Ratio



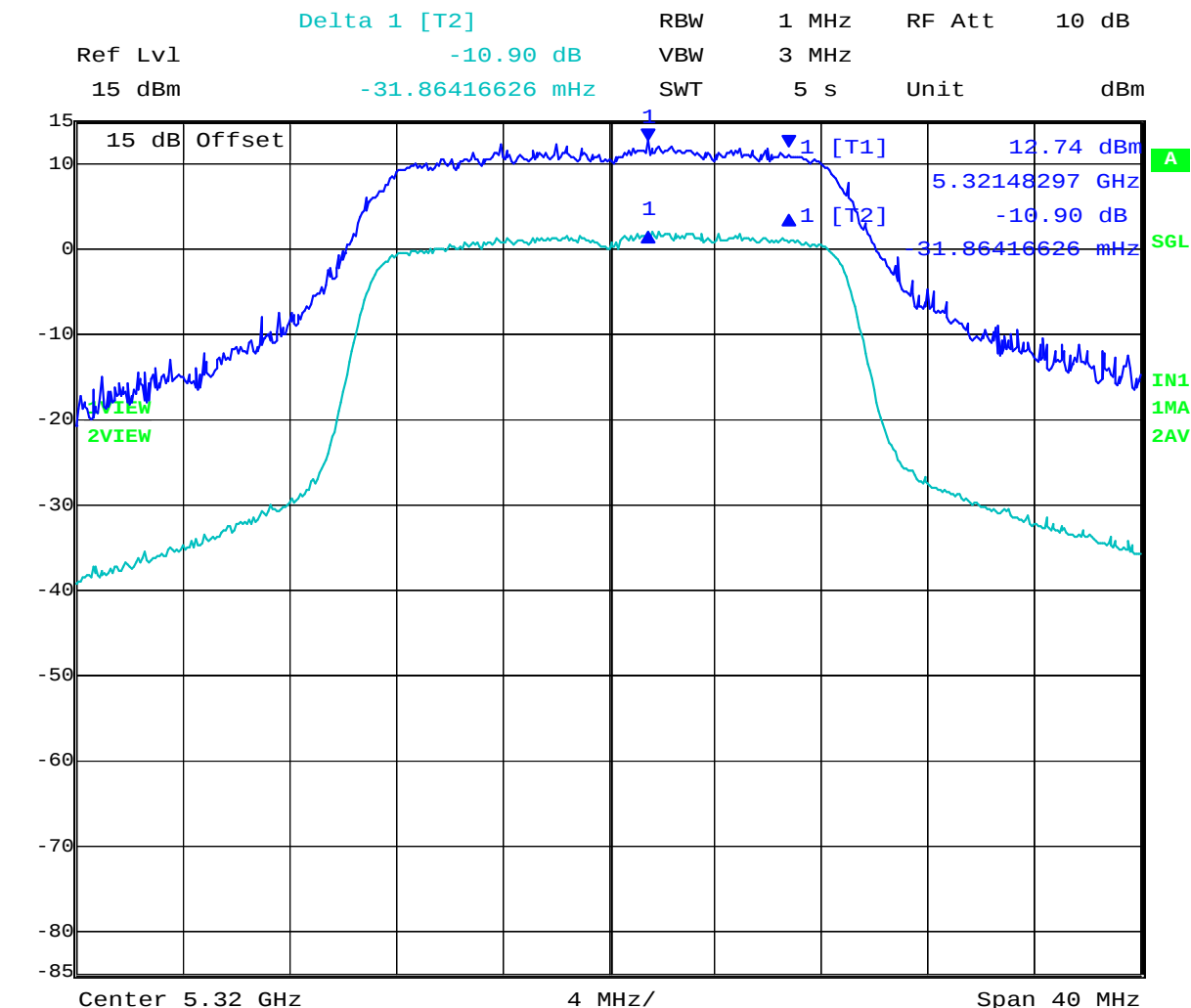
Date: 19.OCT.2010 12:11:27

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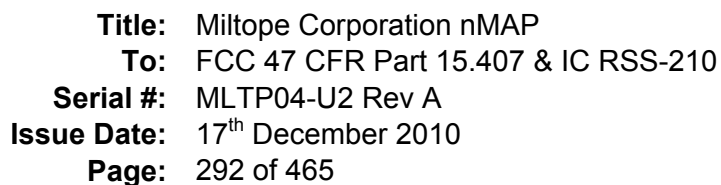
Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 291 of 465

5,320 MHz 802.11n HT20 - MIMO RADIO Chain b - Peak Excursion Ratio



Date: 19.OCT.2010 12:10:15

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Ref Lvl 16 dBm

Delta 1 [T2] -11.41 dB

RBW 1 MHz VBW 3 MHz RF Att 10 dB

16 dBm -96.99440002 mHz SWT 5 s Unit dBm

16 dB Offset

13.29 dBm

5.32212425 GHz

-11.41 dB

-96.99440002 mHz

1VIEW

2VIEW

IN1

1MA

2AV

Center 5.32 GHz

4 MHz/

Span 40 MHz

Date: 19.OCT.2010 12:09:05

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 293 of 465

TABLE OF RESULTS – 802.11n HT20 - MIMO RADIO

Measurement Results for Peak Excursion Ratio

Test Conditions:	15.407 (a)	Rel. Humidity (%):	35	to	42
Variant:	802.11N HT-20	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2		dBi
Applied Voltage:	28.0 Vdc				

	Trace Peak Power Markers		Δ Marker (Marker 1 – 2)	Limit	Margin
	1	2			

Frequency 5500 MHz

Chain	dBm	dBm	dB	dB	dB
a	9.58	-1.23	-10.81	-13.00	-2.19
b	9.19	-1.72	-10.91		-2.09
c	10.03	-1.97	-12.00		-1.00

Frequency 5560 MHz

Chain	dBm	dBm	dB	dB	dB
a	6.90	-4.70	-11.60	-13.00	-1.40
b	8.70	-2.41	-11.11		-1.89
c	9.09	-2.54	-11.63		-1.37

Frequency 5700 MHz

Chain	dBm	dBm	dB	dB	dB
a	7.48	-3.88	-11.36	-13.00	-1.64
b	10.78	-0.40	-11.18		-1.82
c	11.28	0.64	-10.64		-2.36

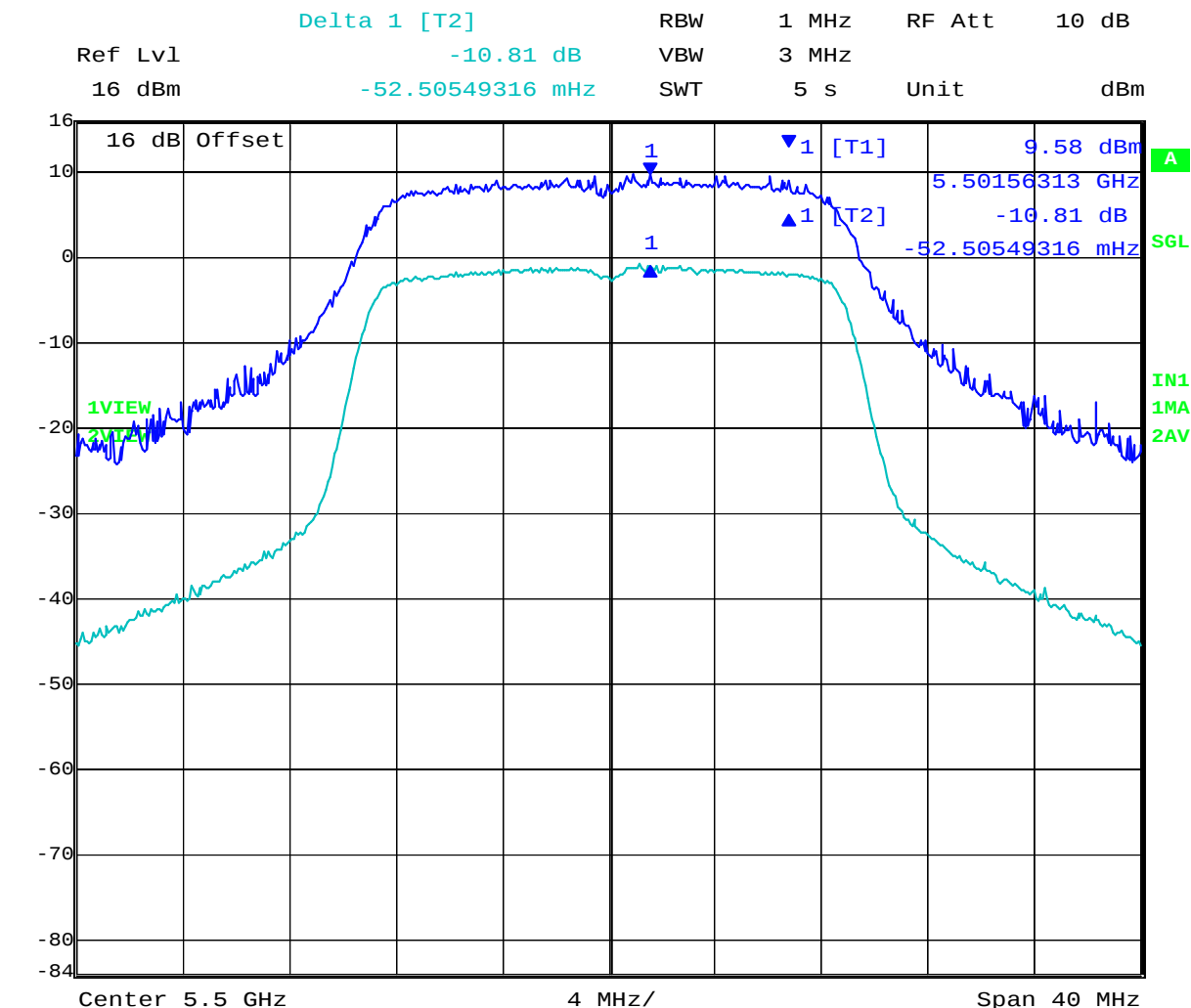
Measurement uncertainty:	± 1.33 dB
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 294 of 465

5,500 MHz 802.11n HT20 - MIMO RADIO Chain a - Peak Excursion Ratio



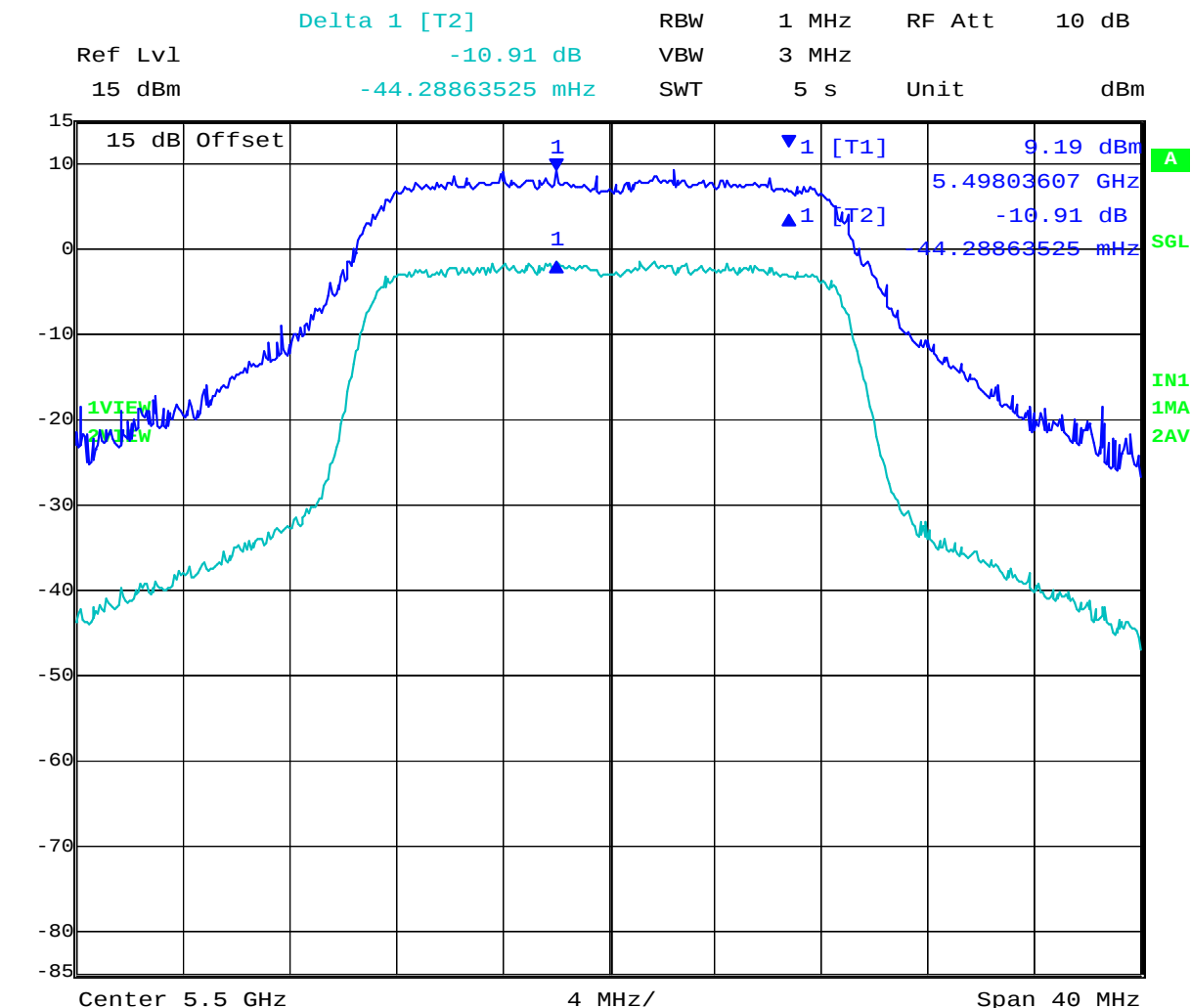
Date: 19.OCT.2010 16:15:26

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 295 of 465

5,500 MHz 802.11n HT20 - MIMO RADIO Chain b - Peak Excursion Ratio



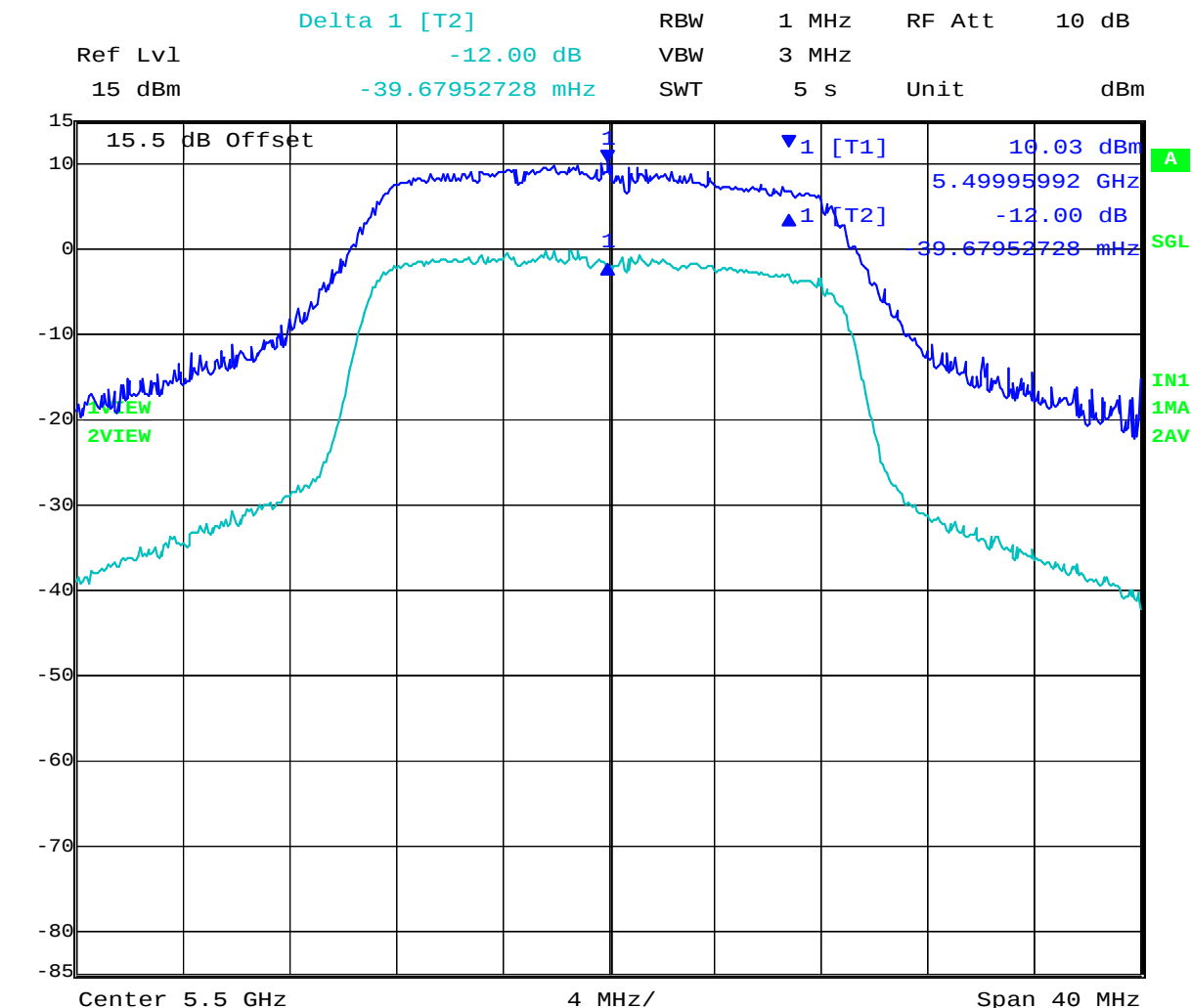
Date: 19.OCT.2010 16:16:36

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 296 of 465

5,500 MHz 802.11n HT20 - MIMO RADIO Chain c - Peak Excursion Ratio



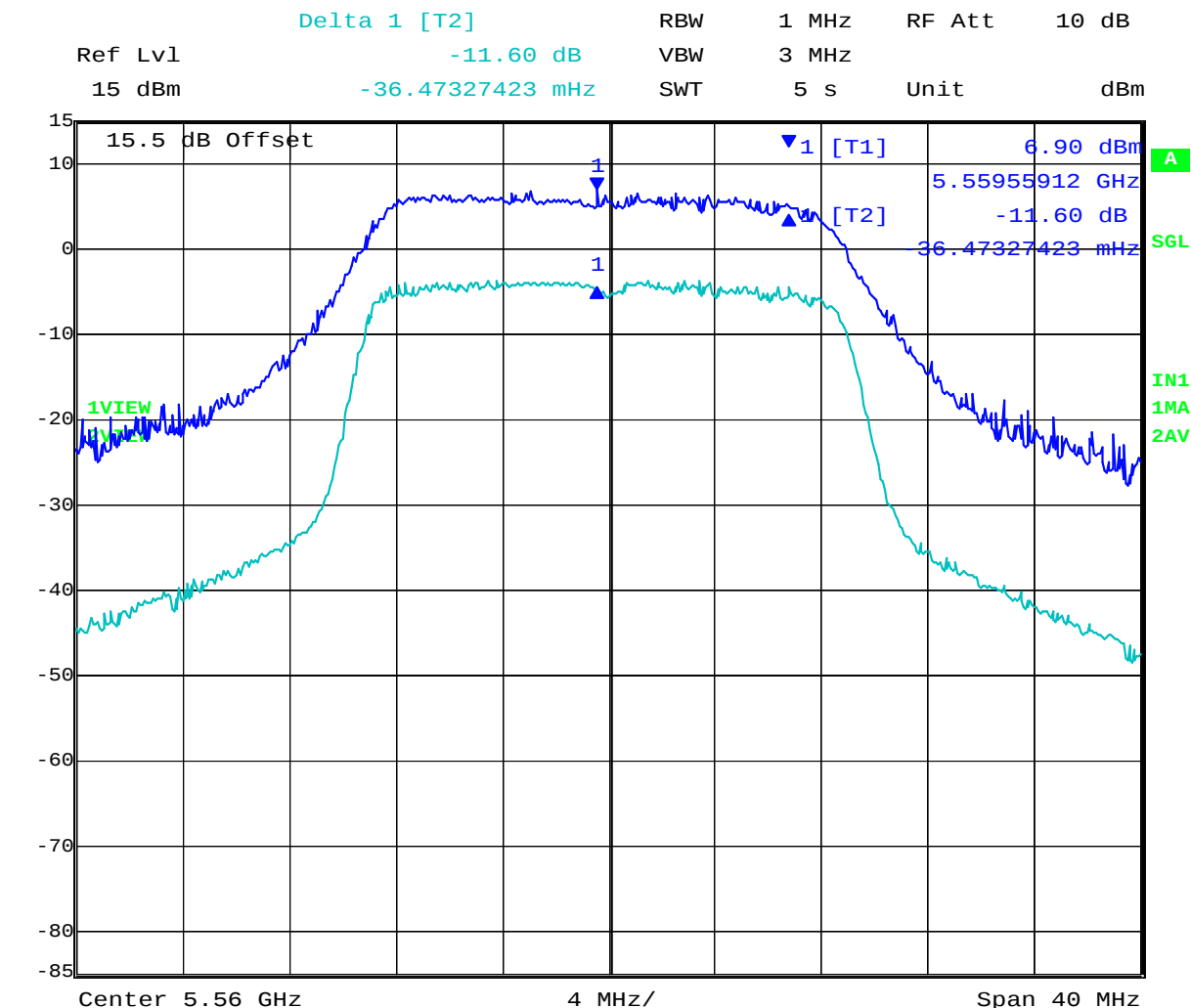
Date: 19.OCT.2010 16:17:48

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 297 of 465

5,560 MHz 802.11n HT20 - MIMO RADIO Chain a - Peak Excursion Ratio



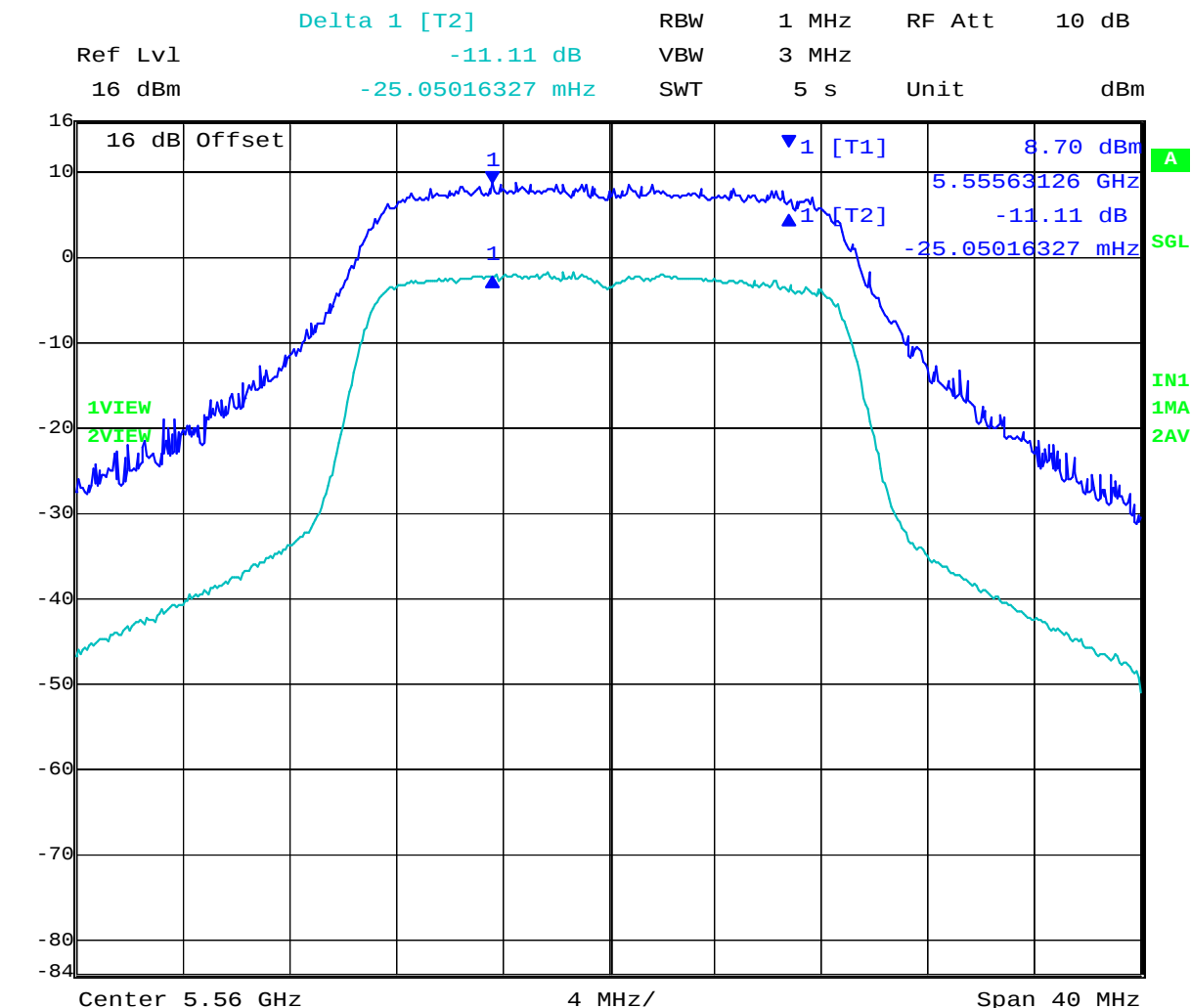
Date: 19.OCT.2010 16:53:47

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 298 of 465

5,560 MHz 802.11n HT20 - MIMO RADIO Chain b - Peak Excursion Ratio



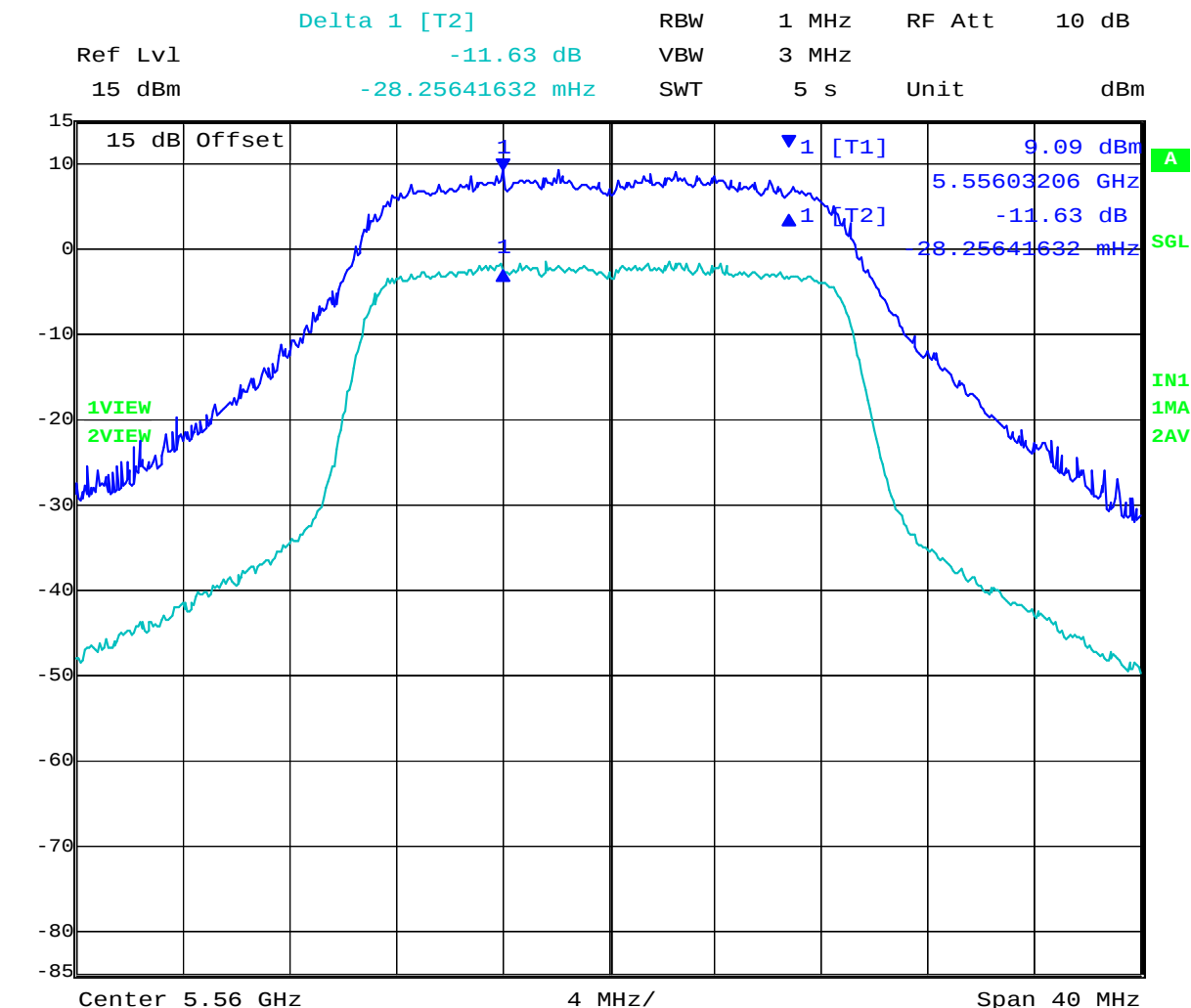
Date: 19.OCT.2010 16:51:25

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 299 of 465

5,560 MHz 802.11n HT20 - MIMO RADIO Chain c - Peak Excursion Ratio



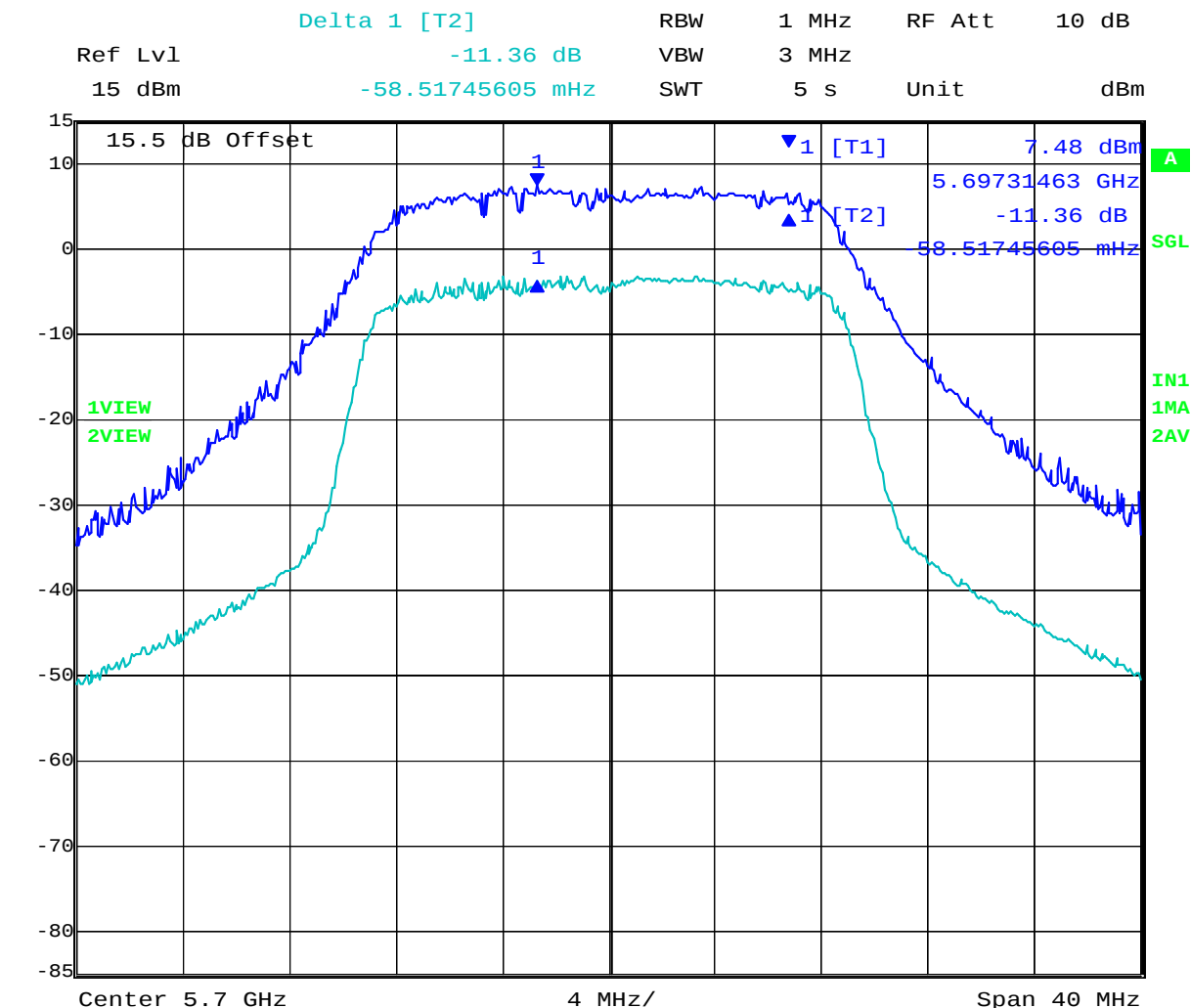
Date: 19.OCT.2010 16:52:35

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 300 of 465

5,700 MHz 802.11n HT20 - MIMO RADIO Chain a - Peak Excursion Ratio



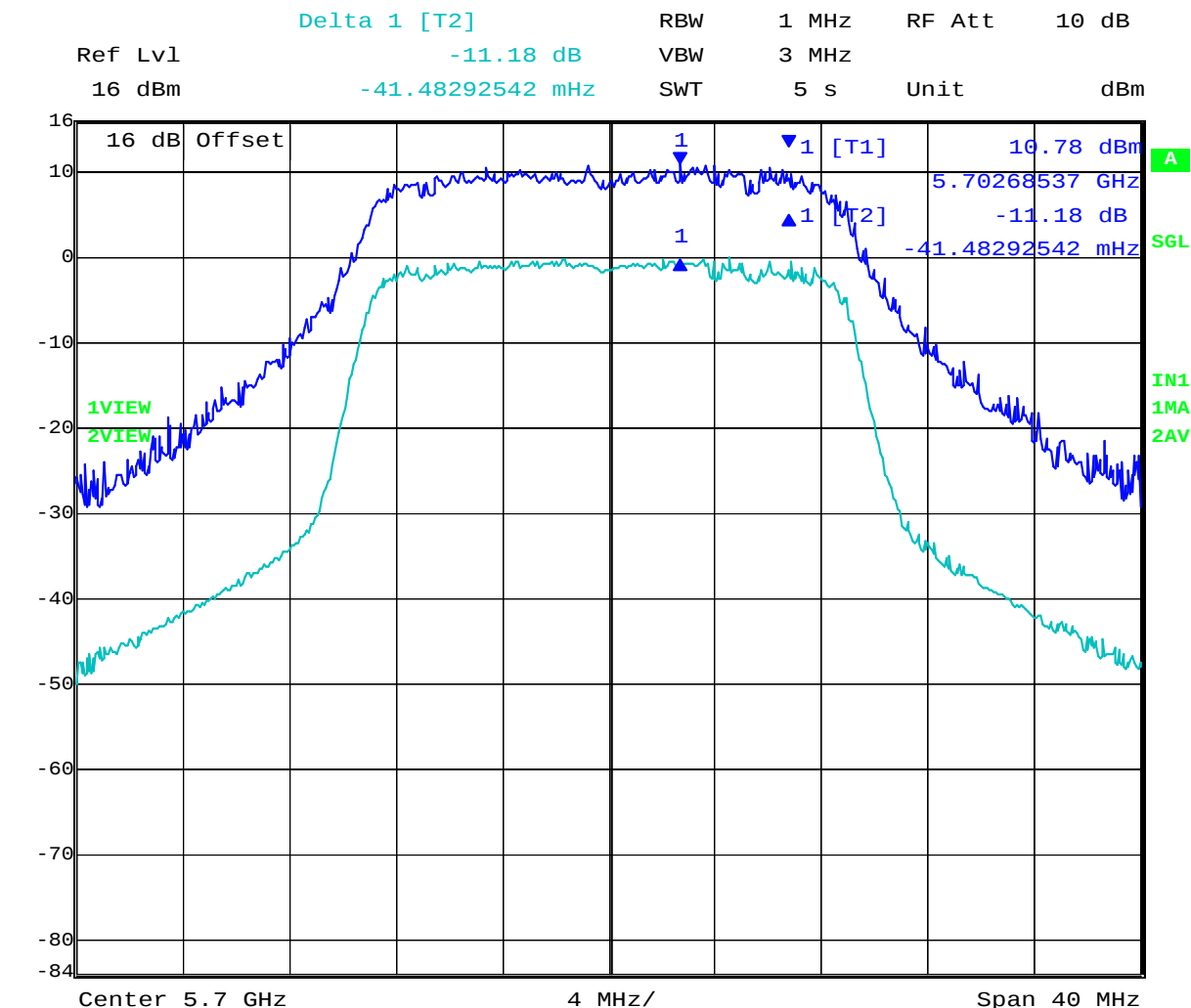
Date: 19.OCT.2010 17:26:55

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 301 of 465

5,700 MHz 802.11n HT20 - MIMO RADIO Chain b - Peak Excursion Ratio



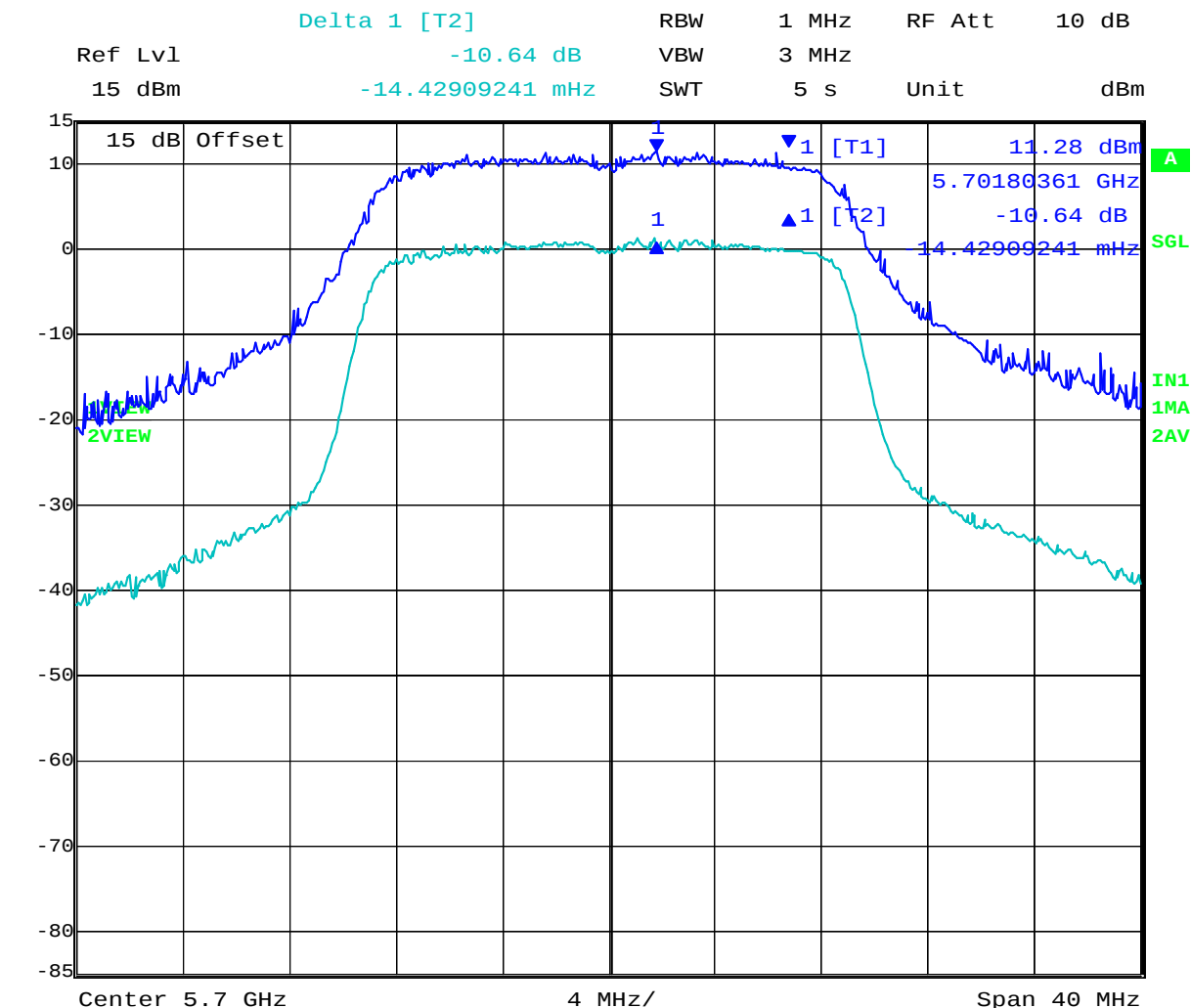
Date: 19.OCT.2010 17:24:33

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 302 of 465

5,700 MHz 802.11n HT20 - MIMO RADIO Chain c - Peak Excursion Ratio



Date: 19.OCT.2010 17:25:43

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 303 of 465

TABLE OF RESULTS – 802.11n HT40 - MIMO RADIO

Measurement Results for Peak Excursion Ratio

Test Conditions:	15.407 (a)	Rel. Humidity (%):	35	to	42
Variant:	802.11n HT-40	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2		dBi
Applied Voltage:	28.0 Vdc				

	Trace Peak Power Markers		Δ Marker (Marker 1 – 2)	Limit	Margin
	1	2			

Frequency 5190 MHz

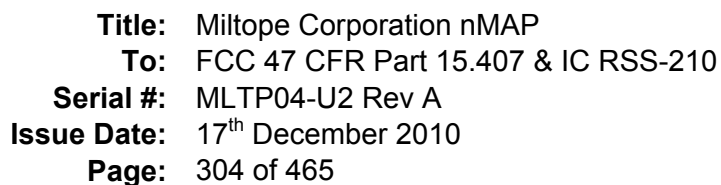
Chain	dBm	dBm	dB	dB	dB
a	4.67	-6.74	-11.41	-13.00	-1.59
b	6.09	-5.51	-11.60		-1.40
c	6.74	-4.91	-11.65		-1.35

Frequency 5230 MHz

Chain	dBm	dBm	dB	dB	dB
a	4.68	-6.09	-10.77	-13.00	-2.23
b	7.07	-5.80	-12.87		-0.13
c	7.43	-4.54	-11.97		-1.03

Measurement uncertainty:	± 1.33 dB
---------------------------------	---------------

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Ref Lvl 15 dBm

Delta 1 [T2] -11.41 dB

RBW 1 MHz

VBW 3 MHz

RF Att 10 dB

SWT 5 s

Unit dBm

15 dB Offset

▼1 [T1] 4.67 dBm

1 [T2] 5.17853707 GHz

1 -11.41 dB

1 48.29597473 MHz

1VIEW

2VIEW

IN1

1MA

2AV

Center 5.19 GHz

8 MHz/

Span 80 MHz

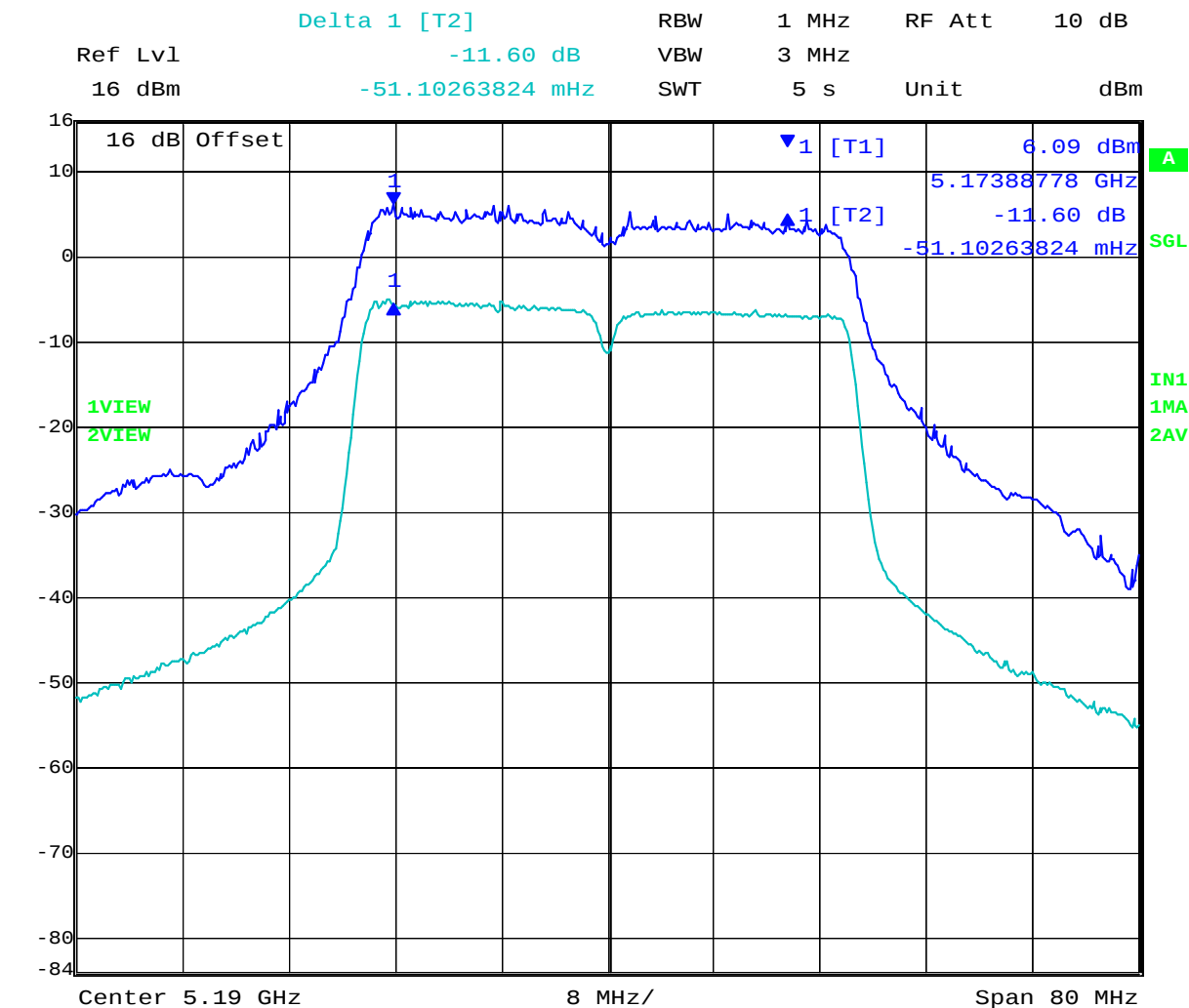
Date: 18.OCT.2010 15:49:04

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 305 of 465

5,190 MHz 802.11n HT40 - MIMO RADIO Chain b - Peak Excursion Ratio



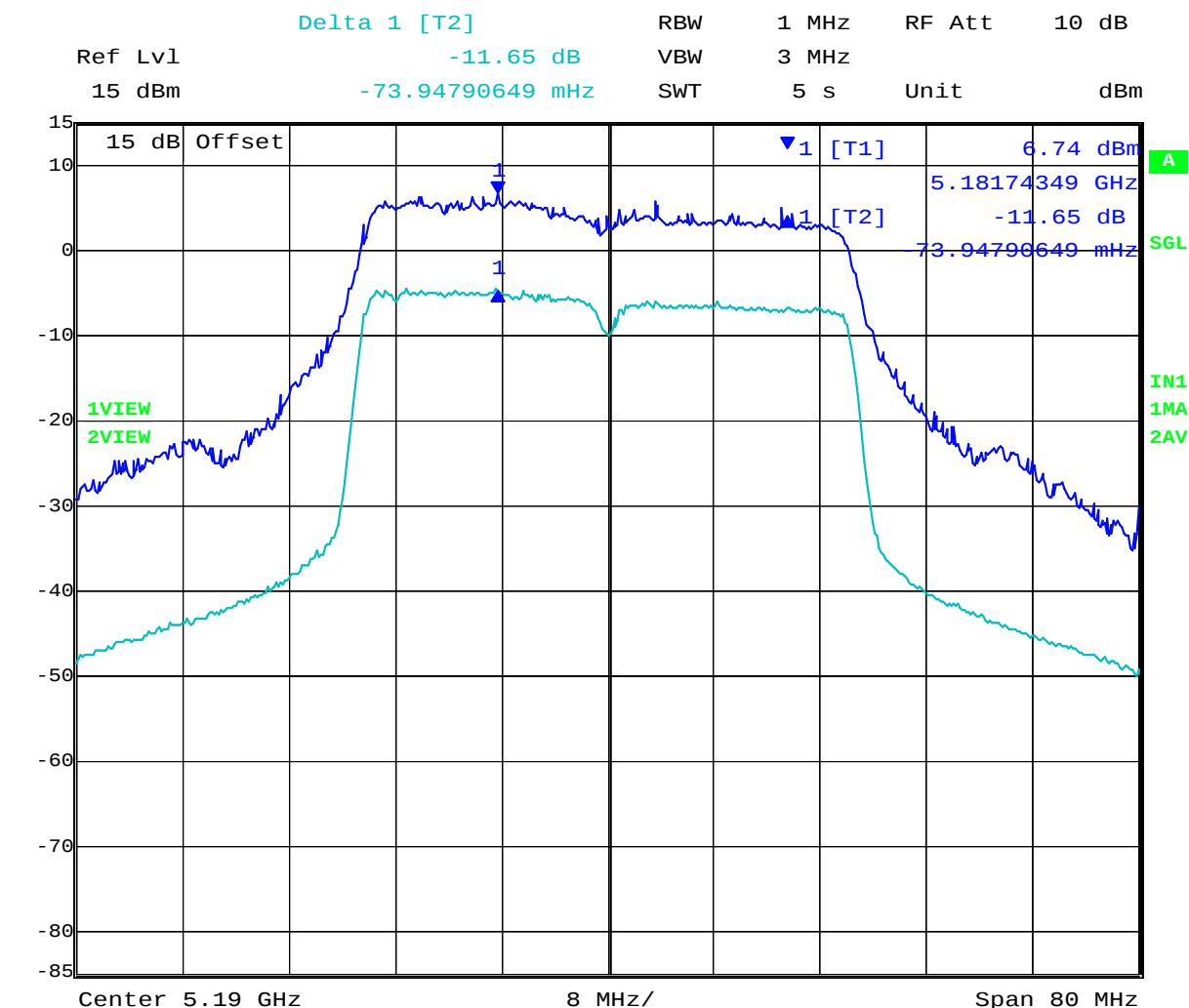
Date: 18.OCT.2010 15:46:42

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 306 of 465

5,190 MHz 802.11n HT40 - MIMO RADIO Chain c - Peak Excursion Ratio



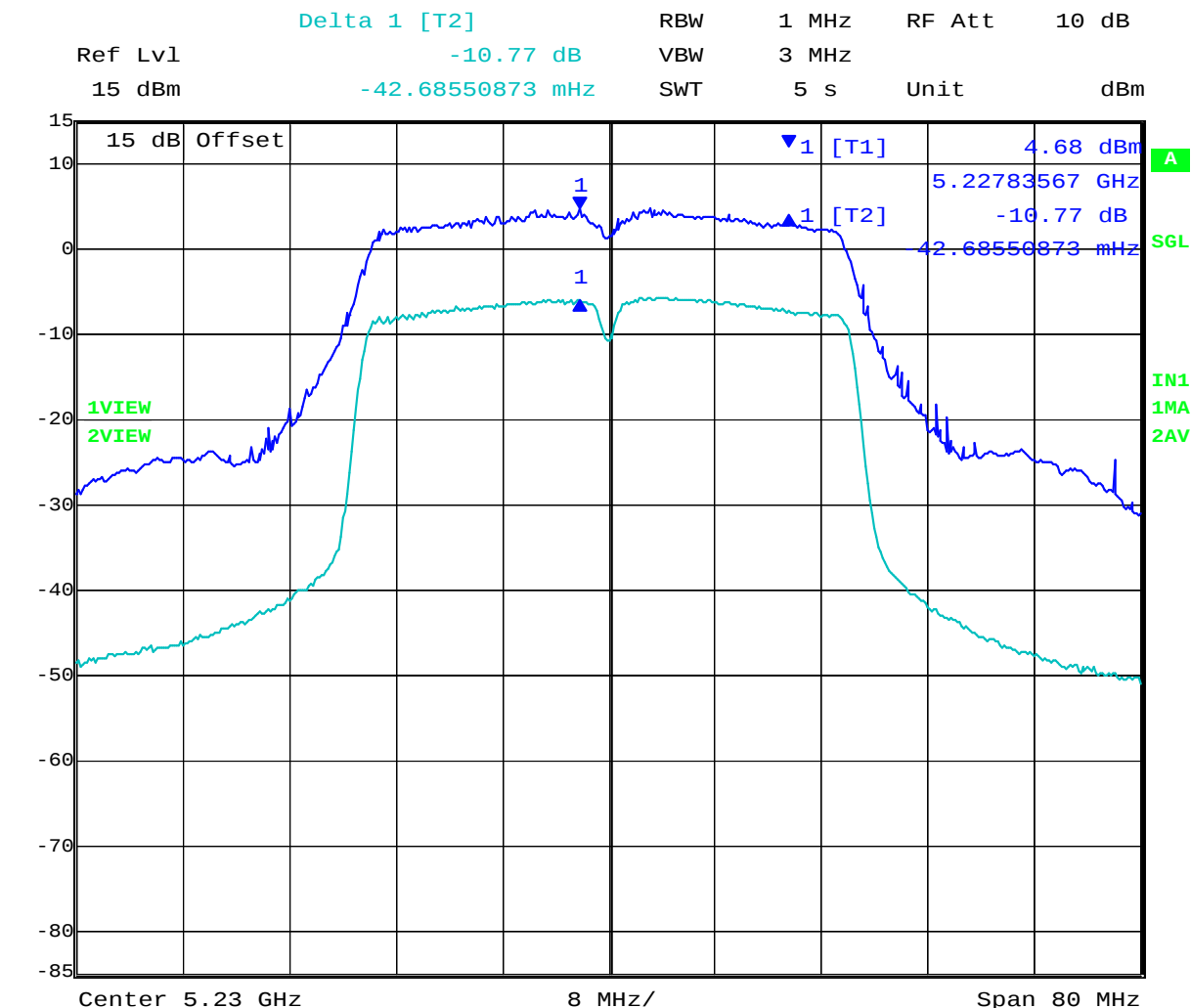
Date: 18.OCT.2010 15:47:52

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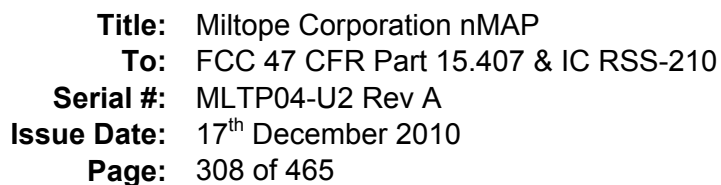
Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 307 of 465

5,230 MHz 802.11n HT40 - MIMO RADIO Chain a - Peak Excursion Ratio



Date: 18.OCT.2010 16:19:44

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Ref Lvl 16 dBm

Delta 1 [T2] -12.87 dB

RBW 1 MHz

VBW 3 MHz

RF Att 10 dB

SWT 5 s

Unit dBm

16 dB Offset

▼1 [T1] 7.07 dBm

5.22174349 GHz

-12.87 dB

-73.94790649 mHz

1VIEW

2VIEW

IN1

1MA

2AV

Center 5.23 GHz

8 MHz/

Span 80 MHz

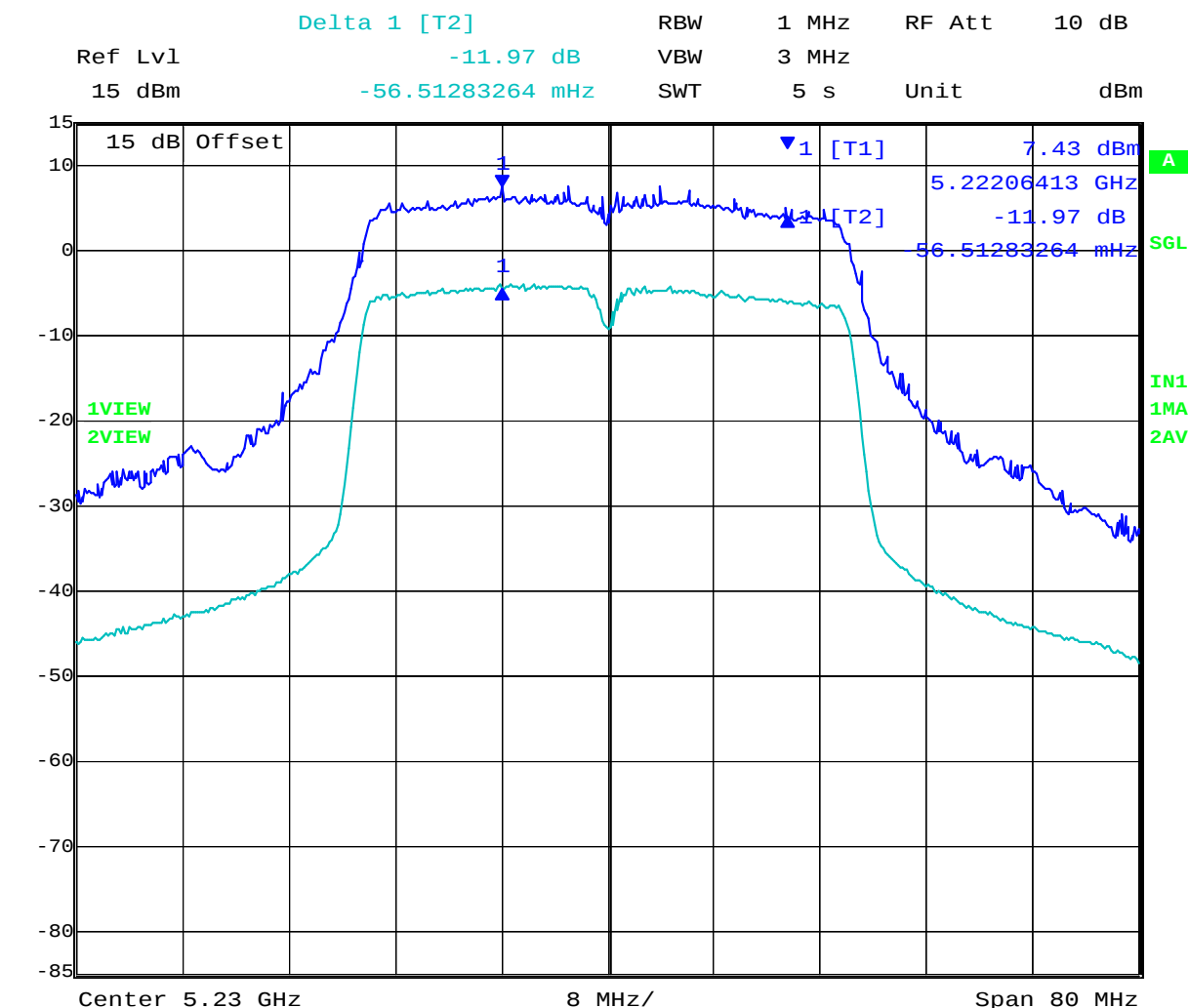
Date: 18.OCT.2010 16:17:23

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 309 of 465

5,230 MHz 802.11n HT40 - MIMO RADIO Chain c - Peak Excursion Ratio



Date: 18.OCT.2010 16:18:33

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 310 of 465

TABLE OF RESULTS – 802.11n HT40 - MIMO RADIO

Measurement Results for Peak Excursion Ratio

Test Conditions:	15.407 (a)	Rel. Humidity (%):	35	to	42
Variant:	802.11N HT-40	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2		dBi
Applied Voltage:	28.0 Vdc				

	Trace Peak Power Markers		Δ Marker (Marker 1 – 2)	Limit	Margin
	1	2			

Frequency 5270 MHz

Chain	dBm	dBm	dB	dB	dB
a	4.81	-5.94	-10.75	-13.00	-2.25
b	7.80	-4.35	-12.15		-0.85
c	7.59	-4.25	-11.84		-1.16

Frequency 5310 MHz

Chain	dBm	dBm	dB	dB	dB
a	5.77	-5.26	-11.03	-13.00	-1.97
b	7.80	-3.34	-11.14		-1.86
c	8.69	-2.75	-11.44		-1.56

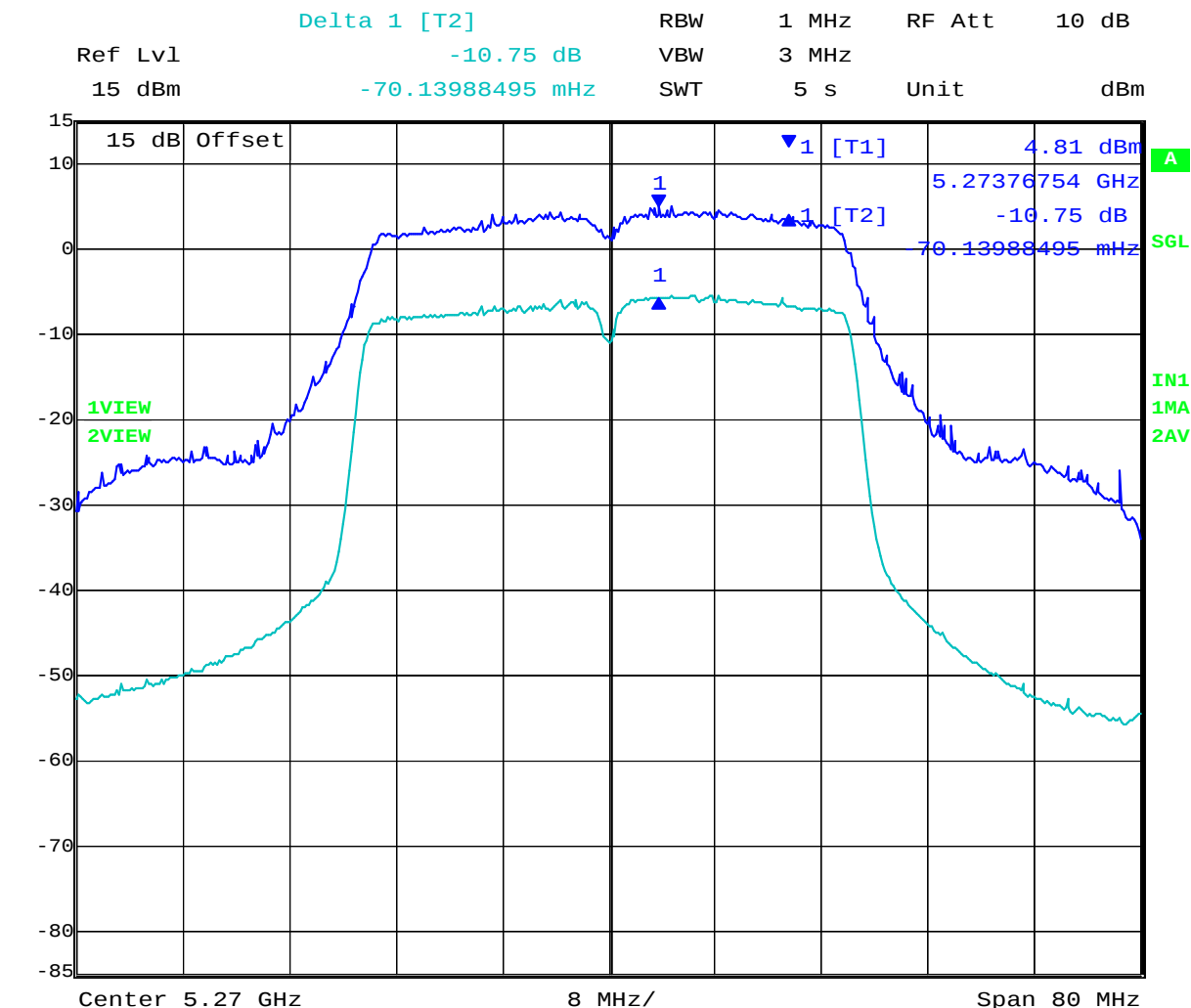
Measurement uncertainty:	± 1.33 dB
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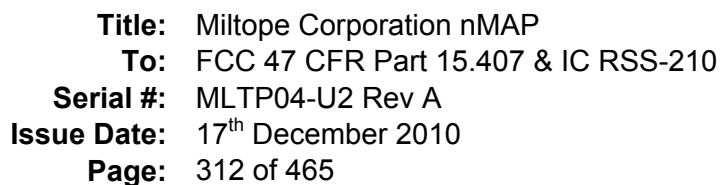
Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 311 of 465

5,270 MHz 802.11n HT40 - MIMO RADIO Chain a - Peak Excursion Ratio



Date: 19.OCT.2010 12:42:35

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Ref Lvl 16 dBm Delta 1 [T2] -12.15 dB RBW 1 MHz RF Att 10 dB

16 dB Offset 16 dBm -6.01196289 MHz SWT 5 s Unit dBm

16 dB Offset

1VIEW 2VIEW

1 [T1] 7.80 dBm 5.26575150 GHz -12.15 dB -6.01196289 MHz

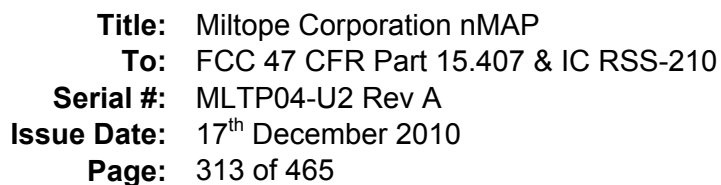
1

IN1 1MA 2AV

Center 5.27 GHz 8 MHz/ Span 80 MHz

Date: 19.OCT.2010 12:40:14

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Ref Lvl 15 dBm

Delta 1 [T2] -11.84 dB

Delta 1 [T1] -11.84 dB

RBW 1 MHz

VBW 3 MHz

SWT 5 s

Unit dBm

15 dB Offset

1VIEW

2VIEW

5.27969940 GHz

8 MHz/

Span 80 MHz

7.59 dBm

5.27969940 GHz

-11.84 dB

-97.59521484 mHz

1 [T1]

1 [T2]

1

IN1

1MA

2AV

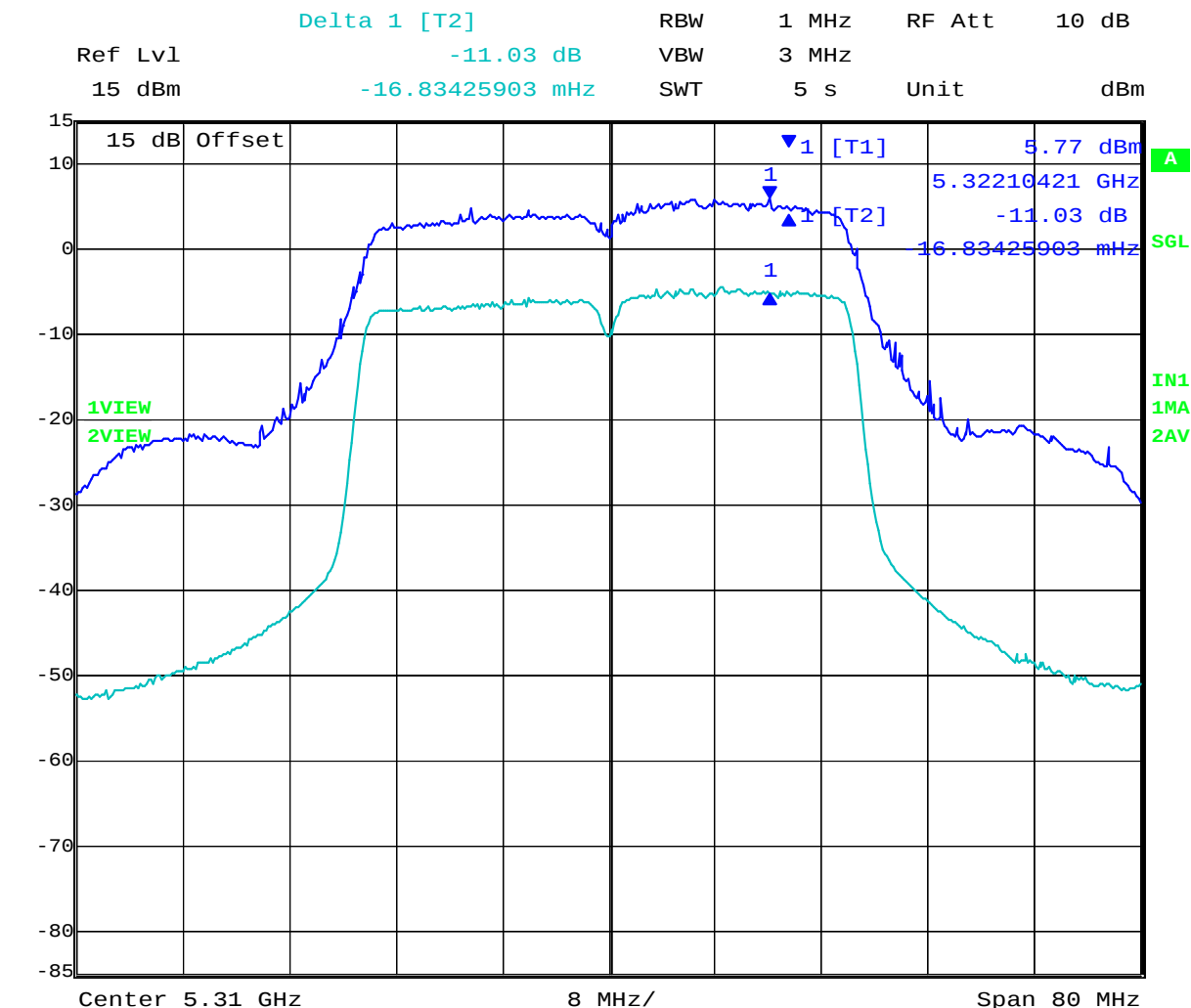
Date: 19.OCT.2010 12:41:24

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 314 of 465

5,310 MHz 802.11n HT40 - MIMO RADIO Chain a - Peak Excursion Ratio



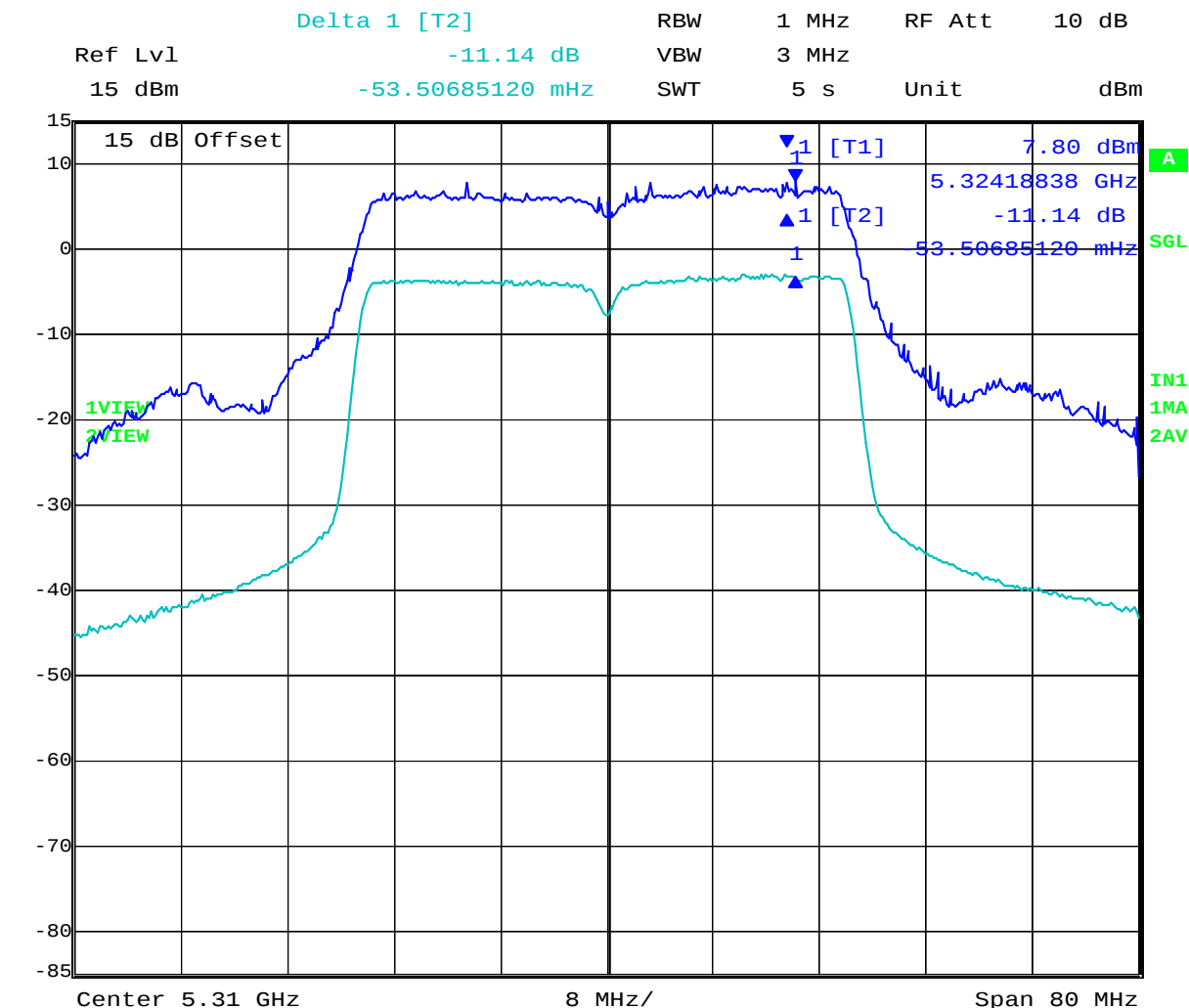
Date: 19.OCT.2010 13:37:18

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 315 of 465

5,310 MHz 802.11n HT40 - MIMO RADIO Chain b - Peak Excursion Ratio



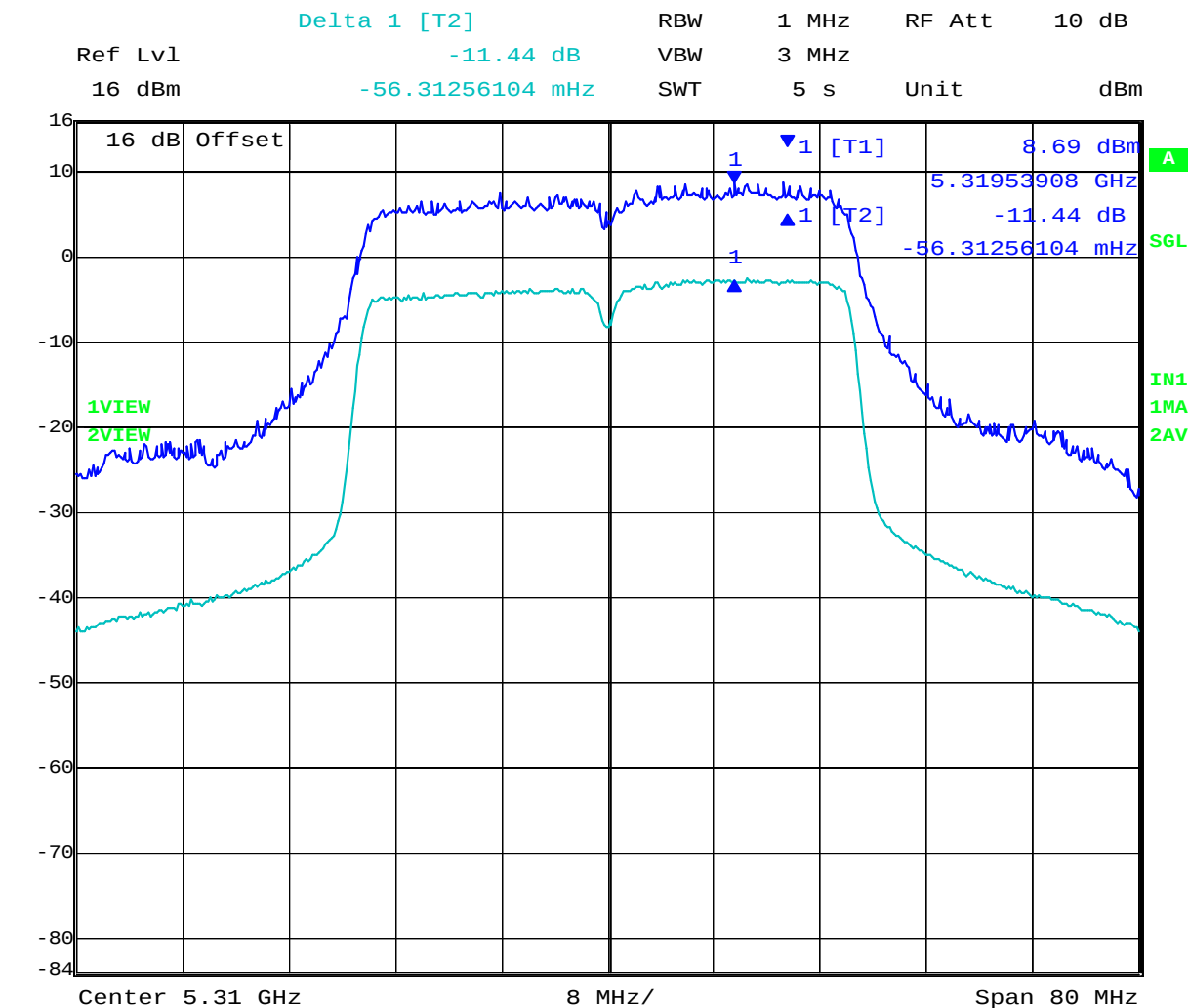
Date: 19.OCT.2010 13:36:07

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 316 of 465

5,310 MHz 802.11n HT40 - MIMO RADIO Chain c - Peak Excursion Ratio



Date: 19.OCT.2010 13:34:57

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 317 of 465

TABLE OF RESULTS – 802.11n HT40 - MIMO RADIO

Measurement Results for Peak Excursion Ratio

Test Conditions:	15.407 (a)	Rel. Humidity (%):	35	to	42
Variant:	802.11N HT-40	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2		dBi
Applied Voltage:	28.0 Vdc				

	Trace Peak Power Markers		Δ Marker (Marker 1 – 2)	Limit	Margin
	1	2			

Frequency 5510 MHz

Chain	dBm	dBm	dB	dB	dB
a	5.68	-6.18	-11.86	-13.00	-1.14
b	5.83	-5.71	-11.54		-1.46
c	7.05	-4.59	-11.64		-1.36

Frequency 5550 MHz

Chain	dBm	dBm	dB	dB	dB
a	4.72	-6.06	-10.78	-13.00	-2.22
b	6.57	-5.97	-12.54		-0.46
c	4.89	-7.15	-12.04		-0.96

Frequency 5690 MHz

Chain	dBm	dBm	dB	dB	dB
a	3.12	-8.50	-11.62	-13.00	-1.38
b	6.43	-5.79	-12.22		-0.78
c	7.28	-3.92	-11.20		-1.80

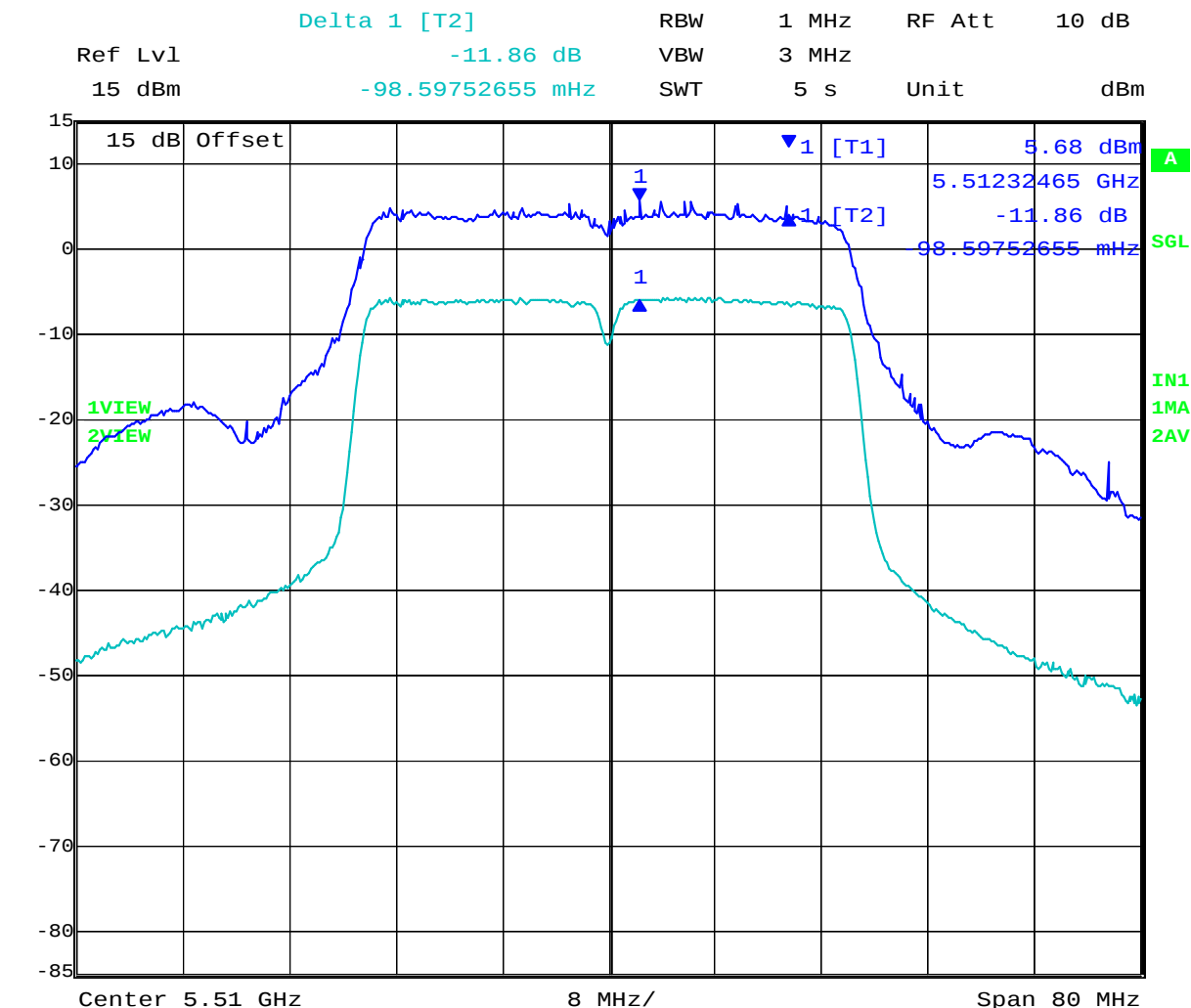
Measurement uncertainty:	± 1.33 dB
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 318 of 465

5,510 MHz 802.11n HT40 - MIMO RADIO Chain a - Peak Excursion Ratio



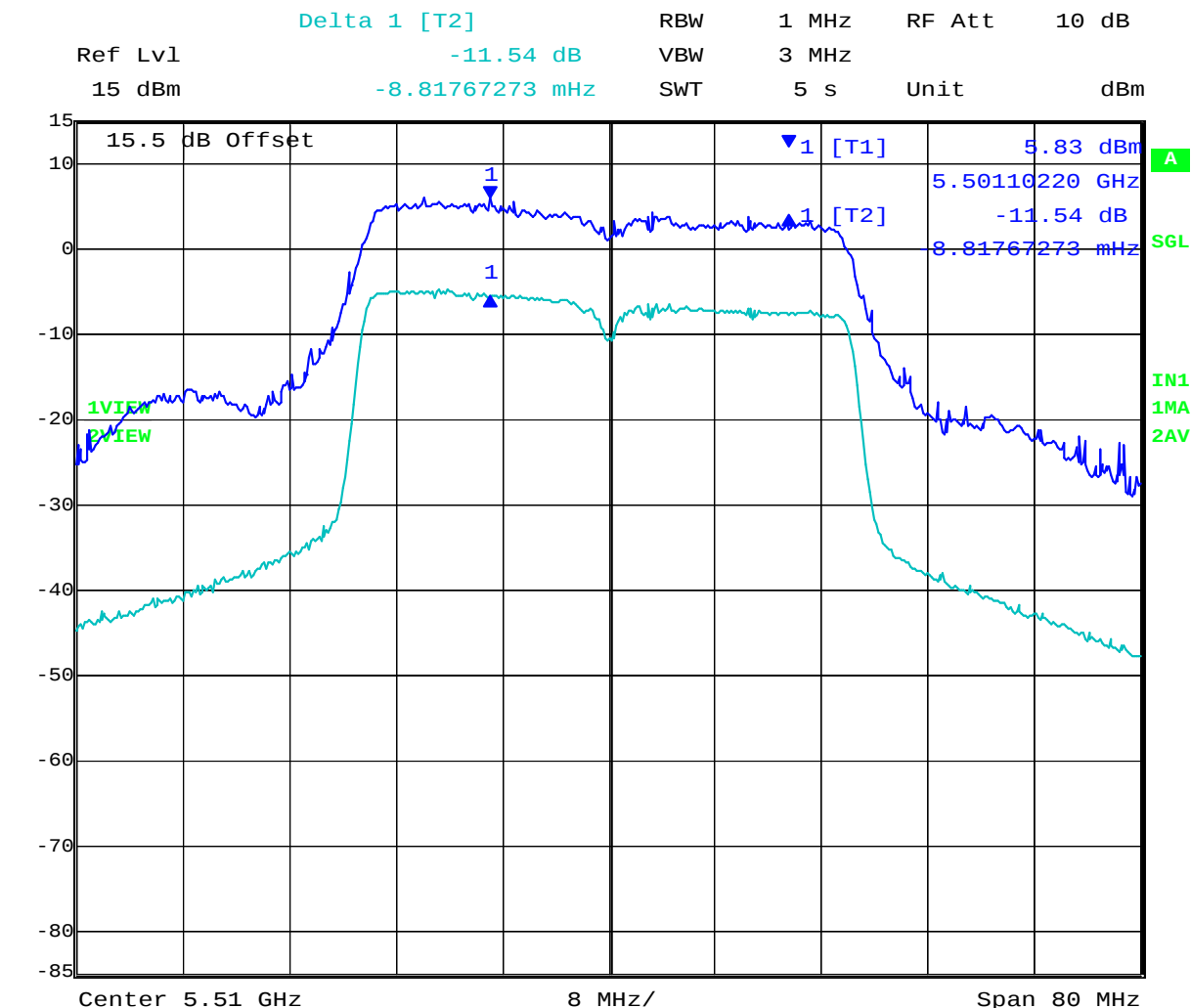
Date: 19.OCT.2010 17:57:33

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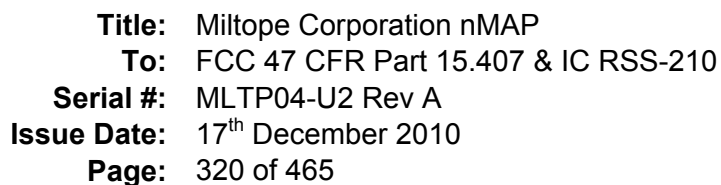
Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 319 of 465

5,510 MHz 802.11n HT40 - MIMO RADIO Chain b - Peak Excursion Ratio



Date: 19.OCT.2010 17:58:43

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Ref Lvl 16 dBm Delta 1 [T2] -11.64 dB RBW 1 MHz RF Att 10 dB
 16 dBm -11.42311096 mHz SWT 5 s Unit dBm

16 dB Offset

▼1 [T1] 7.05 dBm
 5.51392786 GHz
 -11.64 dB
 -11.42311096 mHz

1VIEW
 2VIEW

IN1
 1MA
 2AV

Center 5.51 GHz 8 MHz/ Span 80 MHz

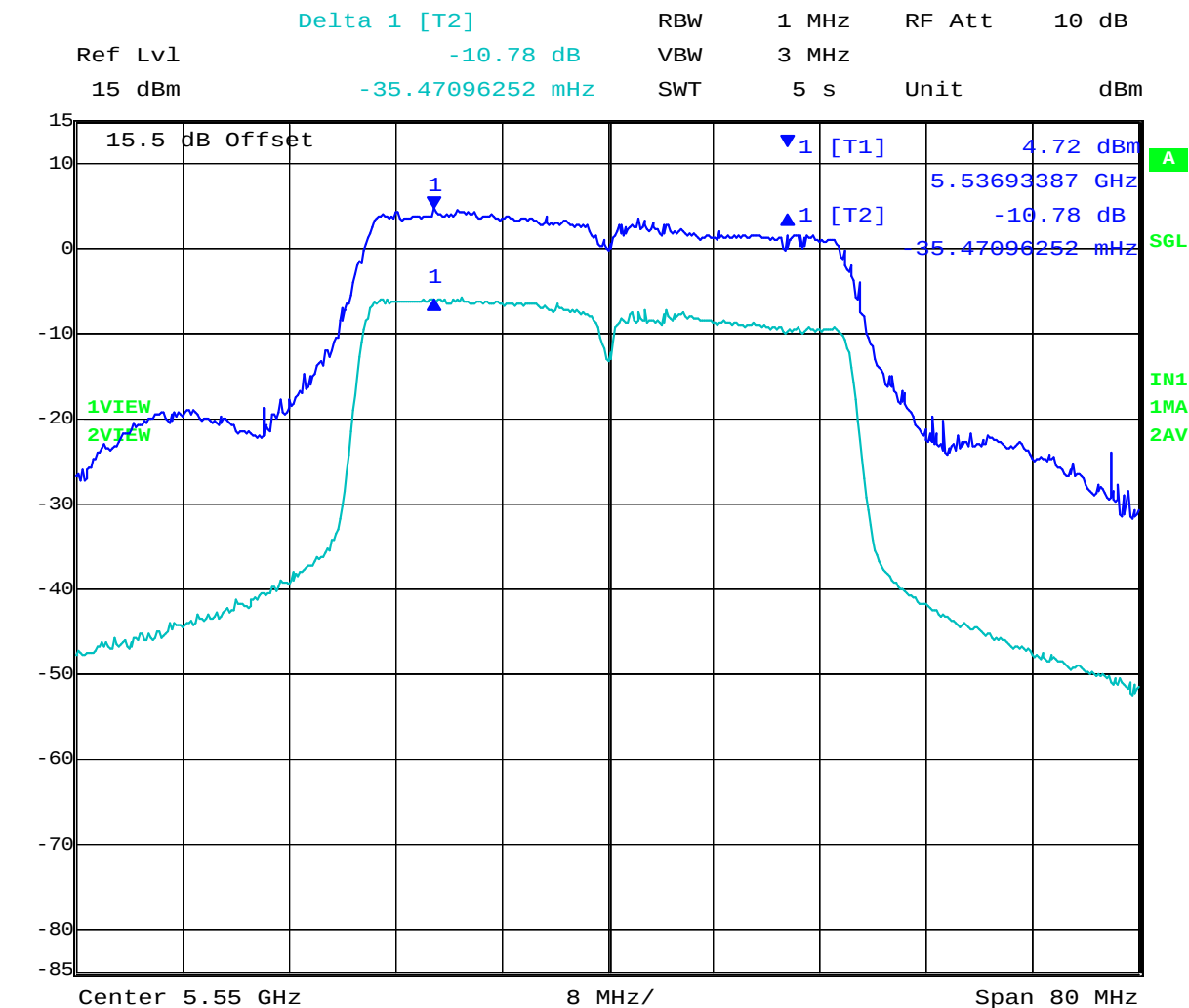
Date: 19.OCT.2010 17:56:22

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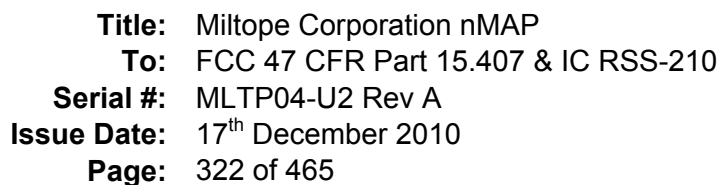
Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 321 of 465

5,550 MHz 802.11n HT40 - MIMO RADIO Chain a - Peak Excursion Ratio



Date: 19.OCT.2010 18:31:24

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Ref Lvl 16 dBm

Delta 1 -12.54 dB

RBW 1 MHz

RF Att 10 dB

VBW 3 MHz

SWT 5 s

Unit dBm

16 dB Offset

▼1 [T1] 6.57 dBm

5.53965932 GHz

▲1 [T2] -12.54 dB

-37.27436066 mHz

1VIEW

2VIEW

IN1

1MA

2AV

Center 5.55 GHz

8 MHz/

Span 80 MHz

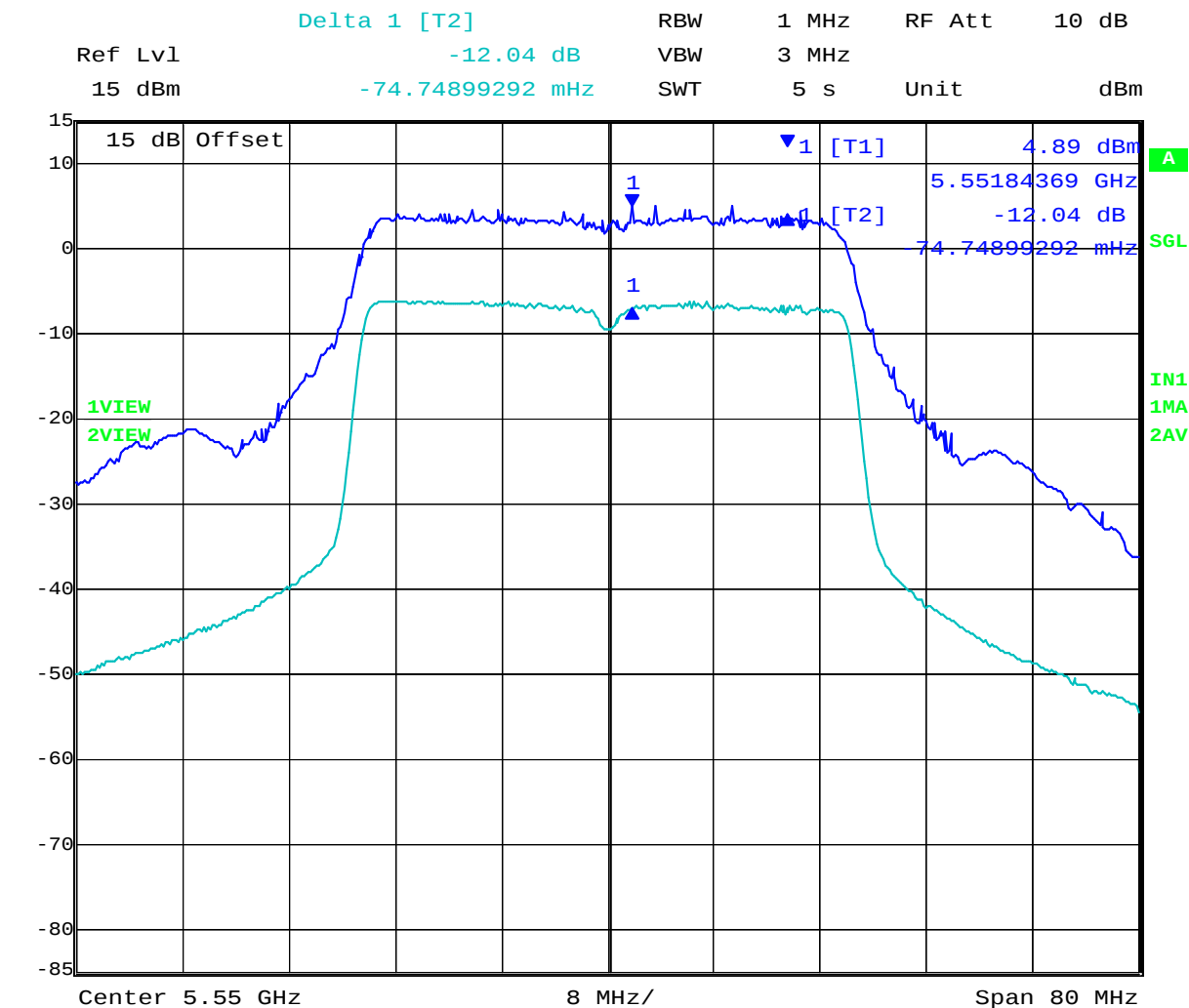
Date: 19.OCT.2010 18:29:03

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 323 of 465

5,550 MHz 802.11n HT40 - MIMO RADIO Chain c - Peak Excursion Ratio



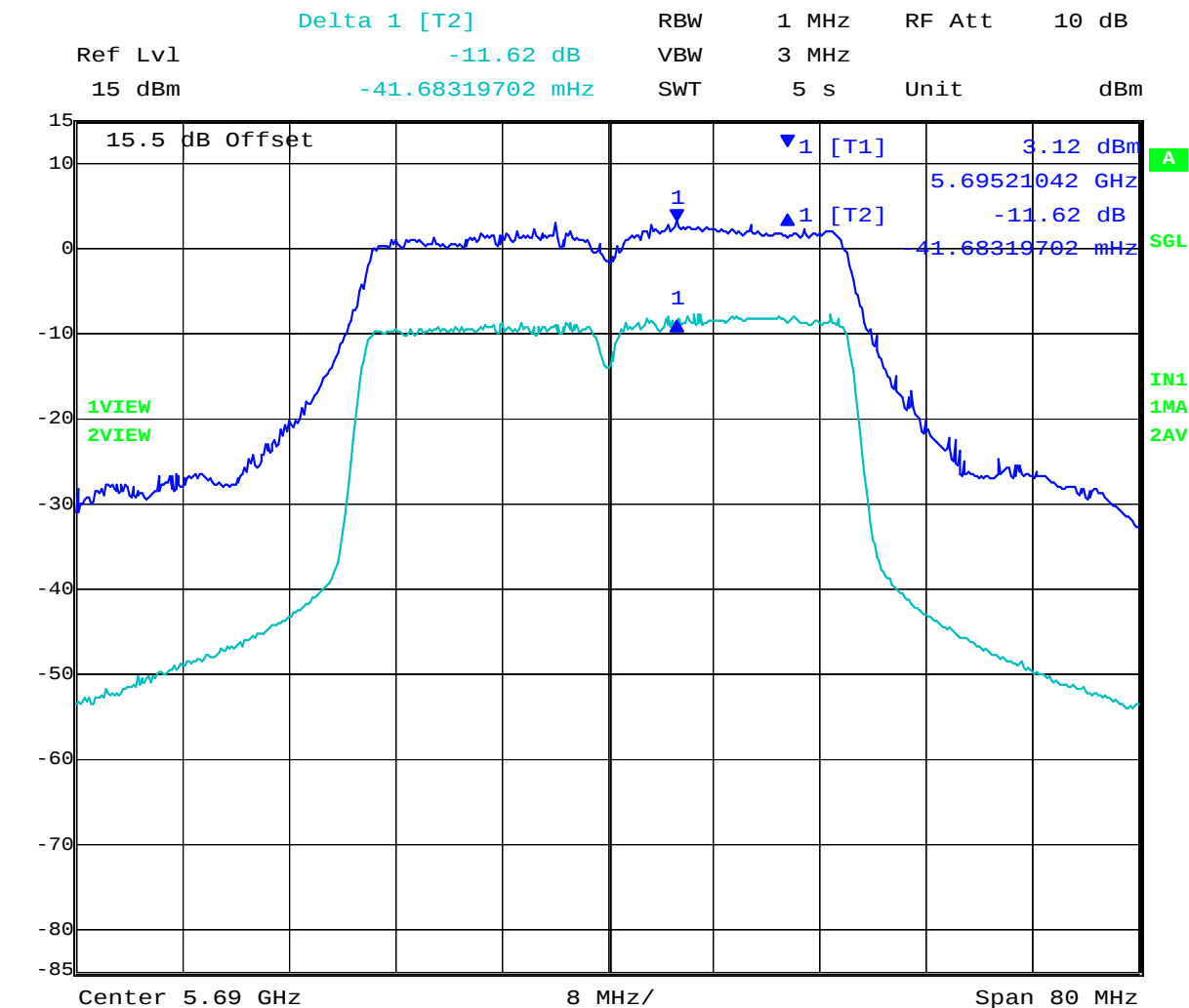
Date: 19.OCT.2010 18:30:13

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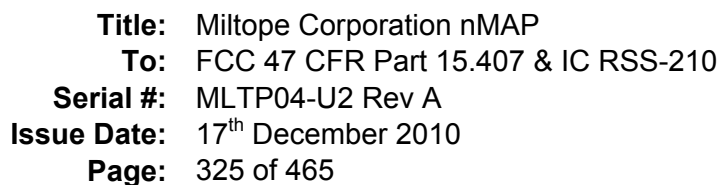
Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 324 of 465

5,690 MHz 802.11n HT40 - MIMO RADIO Chain a - Peak Excursion Ratio



Date: 19.OCT.2010 19:15:47

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Ref Lvl 16 dBm Delta 1 [T2] -12.22 dB RBW 1 MHz RF Att 10 dB
 16 dBm -74.74899292 mHz SWT 5 s Unit dBm

16 dB Offset

▼1 [T1] 6.43 dBm
 5.69184369 GHz
 -12.22 dB
 -74.74899292 mHz

1VIEW
 2VIEW

IN1
 1MA
 2AV

Center 5.69 GHz 8 MHz/ Span 80 MHz

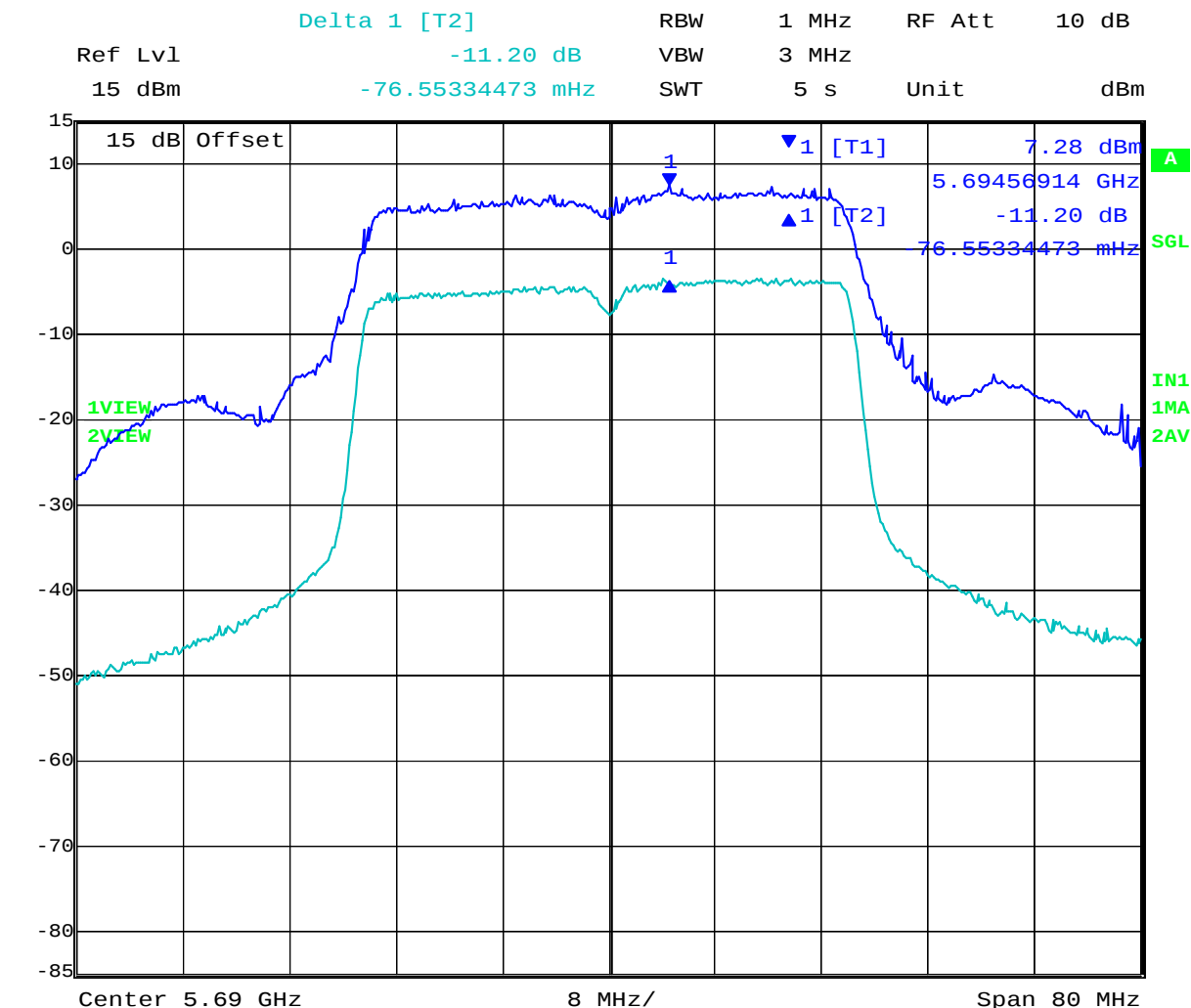
Date: 19.OCT.2010 19:13:25

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To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 326 of 465

5,690 MHz 802.11n HT40 - MIMO RADIO Chain c - Peak Excursion Ratio



Date: 19.OCT.2010 19:14:35

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 327 of 465

802.11a Legacy only radio – Measurement Results for Peak Excursion Ratio.

Test Conditions:	15.407 (a)	Rel. Humidity (%):	35	to	42
Variant:	802.11a	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	1.2		dBi
Applied Voltage:	28.0 Vdc				

	Trace Peak Power Markers		Δ Marker (Marker 1 – 2)	Limit	Margin
	1	2			

Frequency 5180 MHz

Chain	dBm	dBm	dB	dB	dB
a	7.25	-3.05	-10.30	-13.00	-2.70

Frequency 5200 MHz

Chain	dBm	dBm	dB	dB	dB
a	7.72	-2.91	-10.63	-13.00	-2.37

Frequency 5240 MHz

Chain	dBm	dBm	dB	dB	dB
a	7.90	-2.24	-10.14	-13.00	-2.86

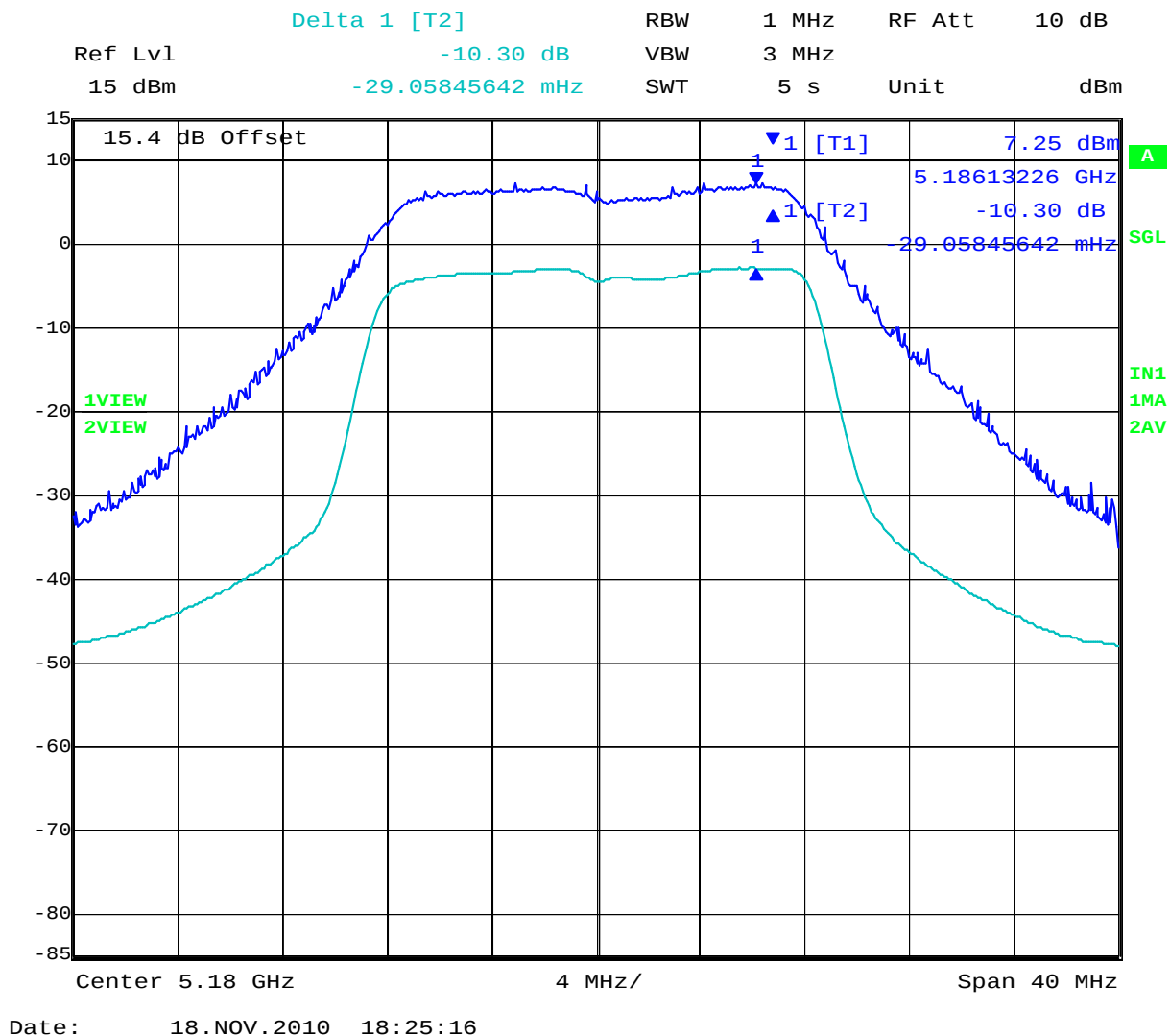
Measurement uncertainty:	± 1.33 dB
---------------------------------	---------------

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 328 of 465

5180 MHz 802.11a, Peak Excursion Ratio



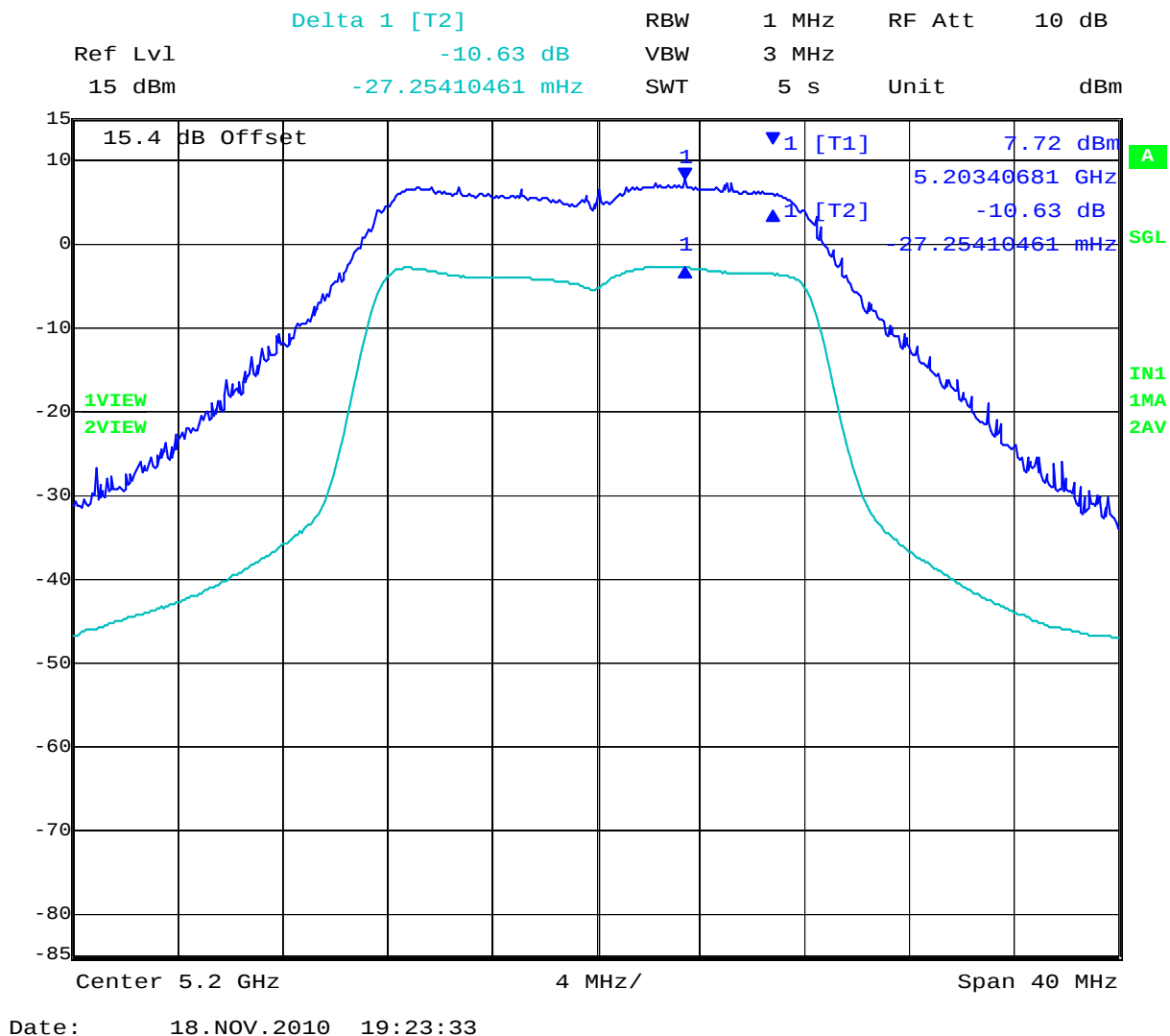
Date: 18.NOV.2010 18:25:16

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 329 of 465

5200 MHz 802.11a, Peak Excursion Ratio



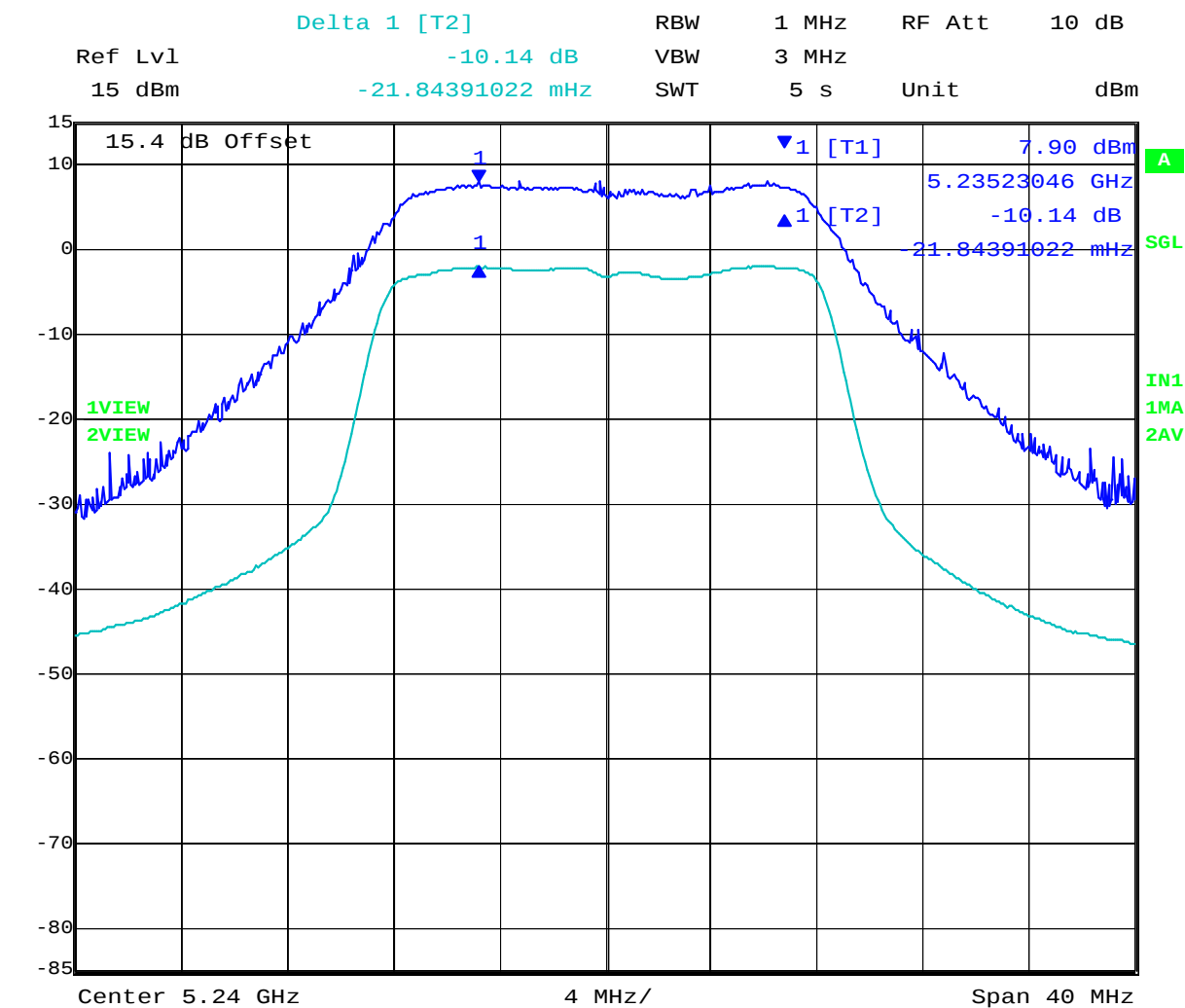
Date: 18.NOV.2010 19:23:33

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 330 of 465

5240 MHz 802.11a, Peak Excursion Ratio



Date: 18.NOV.2010 20:19:11

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 331 of 465

Specification

Limits

§15.407 (a)(6) The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified in this paragraph) shall not exceed 13dB across any 1MHz bandwidth or the emission bandwidth whichever is less

Laboratory Measurement Uncertainty for Spectrum Measurement

Measurement uncertainty	$\pm 2.81\text{dB}$
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Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-03 'Measurement of RF Spectrum Mask'	0158, 0287, 0252, 0313, 0314, 0070, 0116, 0117

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 332 of 465

7.1.5. Frequency Stability

FCC, Part 15 Subpart C §15.407(g)
Industry Canada RSS-210 §2.1

Test Procedure

The manufacturer of the equipment is responsible for ensuring that the frequency stability is such that emissions are always maintained within the band of operation under all conditions.

Manufacturer Declaration

The frequency stability of the reference oscillator sets the frequency stability of the RF transceiver signals. Therefore all of the RF signals should have ± 20 ppm stability.

This stability accounts for room temp tolerance of the crystal oscillator circuit, frequency variation across temperature, and crystal ageing.

± 20 ppm at 5.250 GHz translates to a maximum frequency shift of ± 105 KHz. As the edge of the channels is at least one MHz from either of the band edges, ± 105 KHz is more than sufficient to guarantee that the intentional emission will remain in the band over the entire operating range of the EUT.

Specification

Limits

§15.407 (g) Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.



7.1.6. 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 = P_d (mW/cm²) = $EIRP / (4\pi d^2)$

$EIRP = P * G$

P = Peak output power (mW)

G = Antenna numeric gain (numeric)

d = Separation distance (cm)

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

The peak power in the table below is calculated by assuming a worst case scenario where all of the EUT transmitters for both the MIMO 3x3 and legacy radio are operating simultaneously in the same band. The Peak Power in mW is the highest transmitter power measured and combined for both radios.

1).. Radio 1 - 802.11a/b/g/n 3x3 Spatial Multiplexing MIMO.

2).. Radio 2 - 802.11a/b/g legacy device (does not operate in 5250 – 5350 MHz and 5470 – 5725 MHz bands)

Because the EUT belongs to the General Population/Uncontrolled Exposure the limit of power density is 1.0 mW/cm²

Freq. Band (MHz)	Ant Gain (dBi)	Antenna Numeric Gain (numeric)	Radio1 Pk Power (dBm)	Radio2 Pk Power (dBm)	Peak Output Power (mW)	Calculated Safe Distance @ 1mW/cm ² Limit(cm)	Minimum Separation Distance (cm)
5150 - 5250	+1.2	1.32	+14.49	+14.89	58.95	2.5	20.00
5250 - 5350	+1.2	1.32	+17.65		58.21	2.5	20.00
5470 - 5725	+1.2	1.32	+15.61		36.39	2.0	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 / cm² 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

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 334 of 465

7.1.7. Radiated Emissions

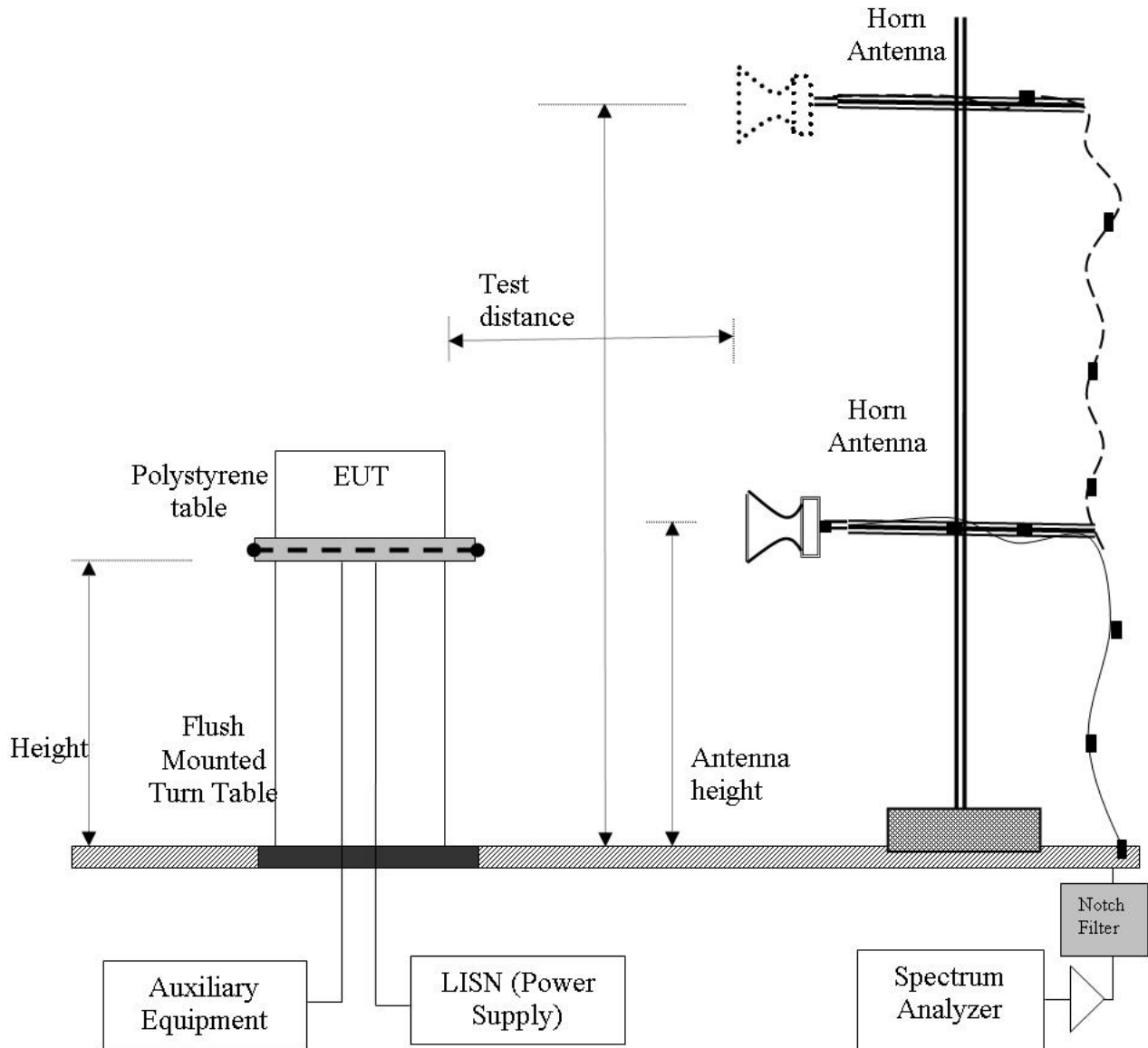
FCC, Part 15 Subpart C §15.407(b)(2), §15.205(a)/15.209(a)
Industry Canada RSS-210 §A9.3(2); §2.2; §2.6; RSS-Gen §4.7

Test Procedure

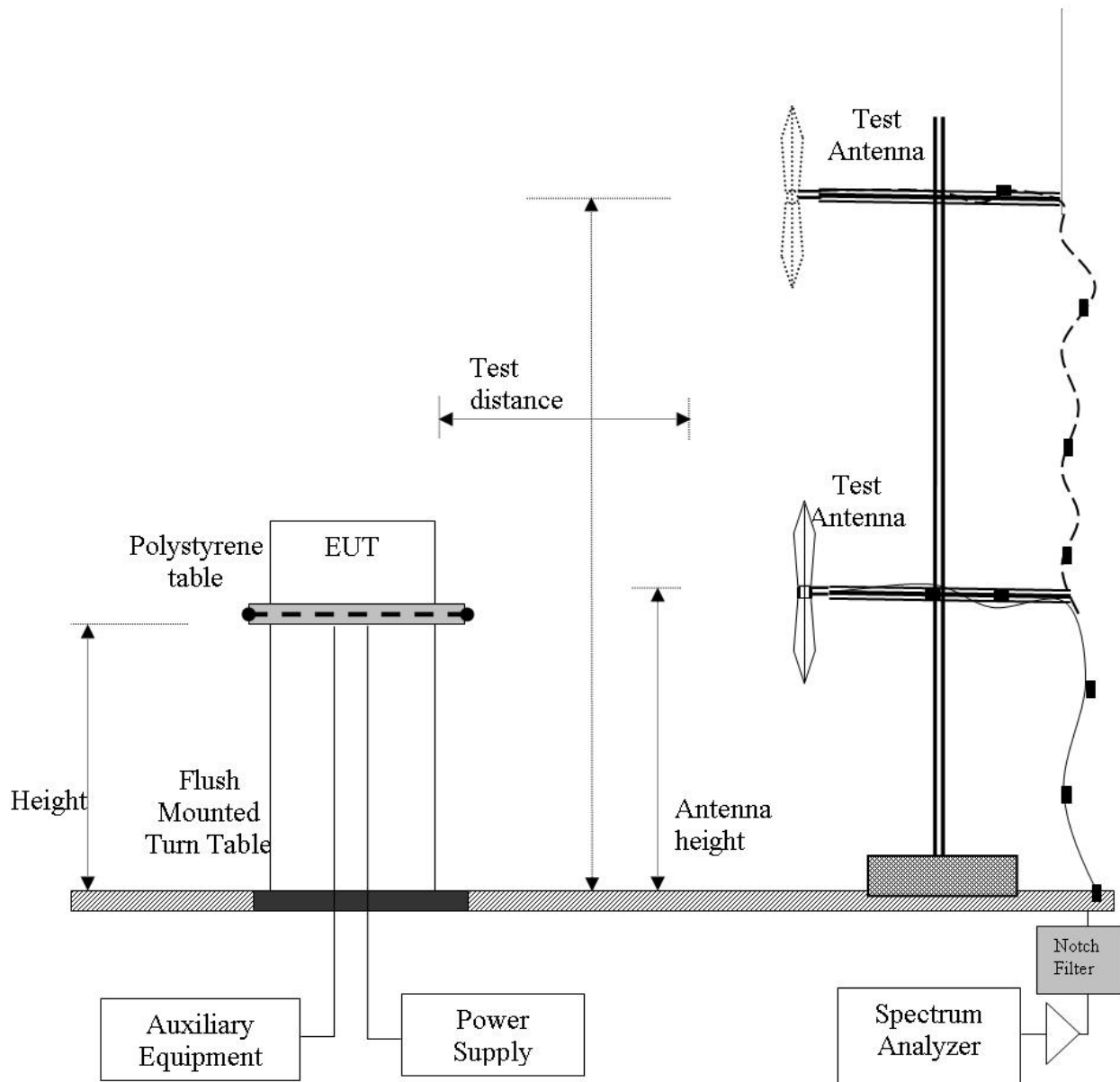
Testing was performed in a 3-meter anechoic chamber. Preliminary radiated emissions were measured on every azimuth and with the receiving antenna in both horizontal and vertical polarizations. Preliminary emissions were recorded with in Spectrum Analyzer mode, using a maximum peak detector while in peak hold mode. Depending on the frequency band spanned a notch filter and/or waveguide filter was used to remove the fundamental frequency.

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

Test Measurement Set Up



Radiated Emission Measurement Setup – Above 1 GHz



Radiated Emission Measurement Setup – Below 1 GHz



Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 337 of 465

Field Strength Calculation

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

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

FS = Field Strength

R = Measured Spectrum analyzer Input Amplitude

AF = Antenna Factor

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

CL = Cable Loss

AG = Amplifier Gain

FO = Distance Falloff Factor

NFL = Notch Filter Loss or Waveguide Loss

Field Strength Calculation Example:

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

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

Conversion between dB μ V/m (or dB μ V) and μ V/m (or μ V) are done as:

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

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

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

The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength (dB μ V/m);

$$E = 1000000 \times \sqrt{30P} / 3 \mu\text{V/m}$$

where P is the EIRP in Watts

$$\text{Therefore: } -27 \text{ dBm/MHz} = 68.23 \text{ dB}\mu\text{V/m}$$

Note: The data in this Section identifies that the EUT is in compliance with the -27dBm/MHz EIRP limit (68.23 dB μ V/m) for out of band emissions. All out of band emissions are less than 68.23 dB μ V/m.

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 338 of 465

Specification

Radiated Spurious Emissions

15.407 (b)(2). All emissions outside of the 5,150-5,350MHz band shall not exceed an EIRP of -27dBm/MHz.

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

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

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

RSS-210 §A9.3(2) For transmitters operating in the 5250-5350 MHz band, all emissions outside the 5150-5350 MHz band shall not exceed -27 dBm/MHz e.i.r.p. Devices operating in the 5250-5350 MHz band that generate emissions in the 5150-5250 MHz band shall not exceed out of band emission limit of 27 dBm/MHz e.i.r.p. in the 5150-5250 MHz band in order to operate indoor/outdoor, or alternatively shall comply with the spectral power density for operation within the 5150-5250 MHz band and shall be labeled "for indoor use only".

RSS-Gen §4.7 The search for unwanted emissions shall be from the lowest frequency internally generated or used in the device (local oscillator, intermediate of carrier frequency), or from 30 MHz, whichever is the lowest frequency, to the 5th harmonic of the highest frequency generated without exceeding 40 GHz.

RSS-Gen §6 Receiver Spurious Emission Standard

If a radiated measurement is made, all spurious emissions shall comply with the limits of the following Table. The resolution bandwidth of the spectrum analyzer shall be 100 kHz for spurious emission measurements below 1.0 GHz and 1.0 MHz for measurements above 1.0 GHz



Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 339 of 465

Table 1: FCC 15.209 Spurious Emissions Limits

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

Laboratory Measurement Uncertainty for Spectrum Measurement

Measurement Uncertainty	+5.6/ -4.5 dB
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Traceability:

Method	Test Equipment Used
Work instruction WI-03	0158, 0134, 0304, 0311, 0315, 0310, 0312

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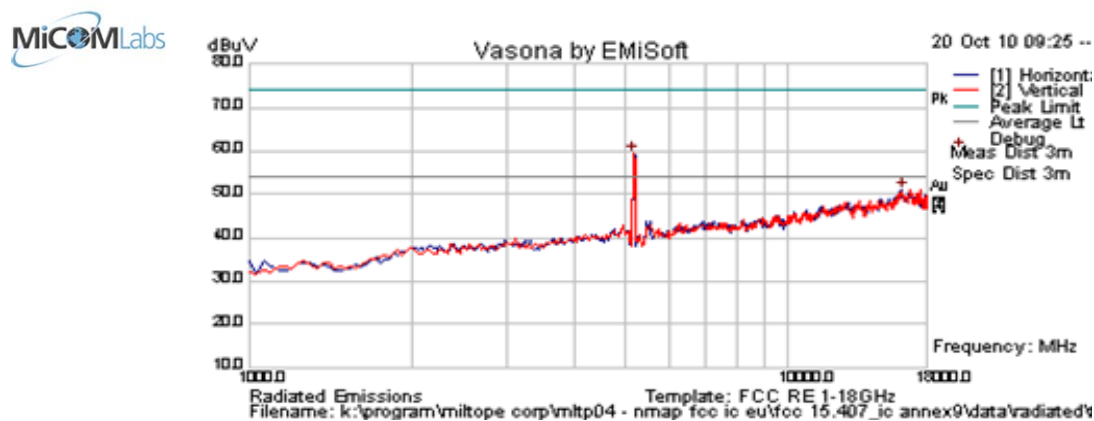


Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 340 of 465

901167-2 Antenna – Radiated Spurious Emissions – Above 1 GHz

BAND: 5150 – 5250 MHz: 802.11a

Test Freq.	5180 MHz	Engineer	SB
Variant	802.11a; 6 Mbps	Temp (°C)	24
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	18	Press. (mBars)	998
Antenna	1TLP3 / 901167-2 Rev D	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5156.313	63.8	4.6	-9.0	59.5	Peak [Scan]	V	--	--	--	--	n/a	FUND
16262.525	41.0	8.9	1.0	50.9	Peak [Scan]	H	150	0	54	-3.1	Pass	NRB

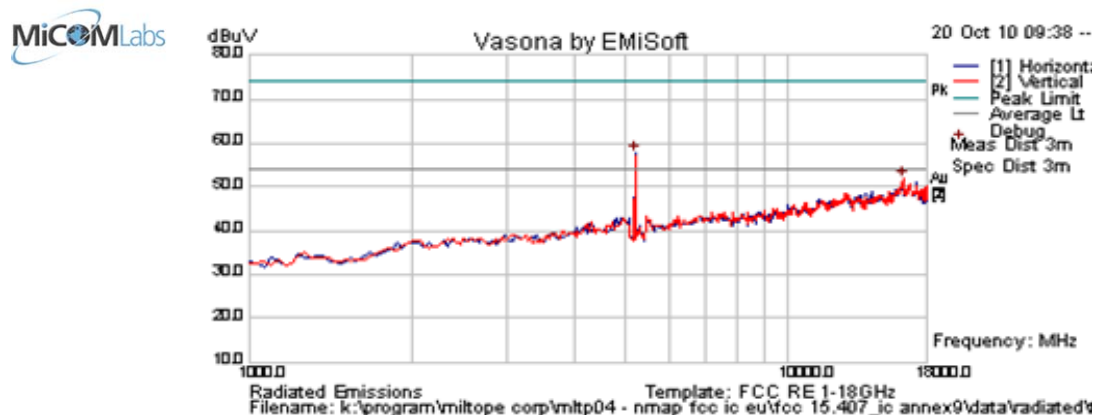
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
 NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 341 of 465

Test Freq.	5200 MHz	Engineer	SB
Variant	802.11a; 6 Mbs	Temp (°C)	24
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	18	Press. (mBars)	998
Antenna	1TLP3 / 901167-2 Rev D	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

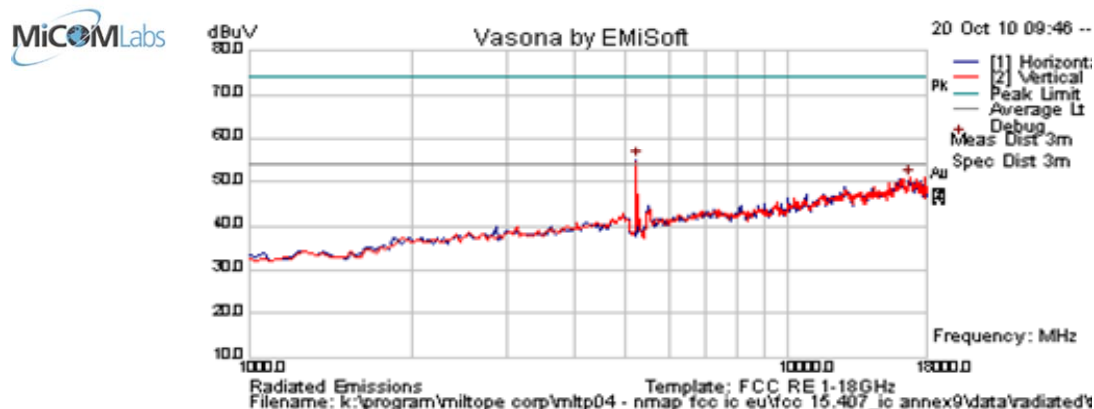
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5190.381	62.2	4.6	-9.2	57.7	Peak [Scan]	H	--	--	--	--	n/a	FUND
16296.593	42.1	8.9	0.7	51.7	Peak [Scan]	V	150	0	54	-2.3	Pass	NRB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 342 of 465

Test Freq.	5240 MHz	Engineer	SB
Variant	802.11a; 6 Mbs	Temp (°C)	24
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	18	Press. (mBars)	998
Antenna	1TLP3 / 901167-2 Rev D	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5224.449	59.8	4.6	-9.4	54.9	Peak [Scan]	H	--	--	--	--	n/a	FUND
16807.615	40.8	8.6	1.6	51.0	Peak [Scan]	V	200	0	54.0	-3.0	Pass	NRB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

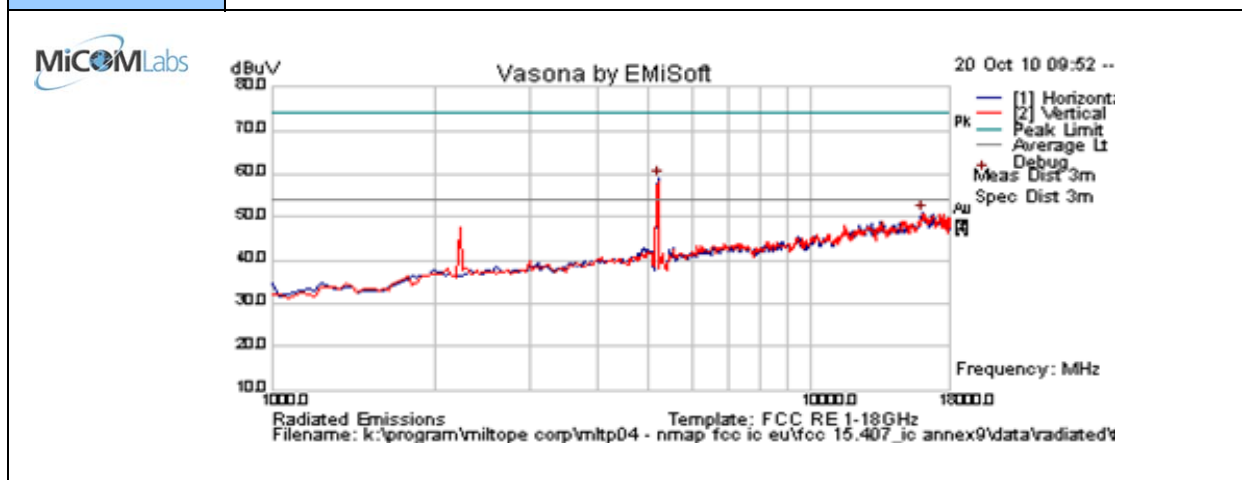
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 343 of 465

BAND: 5150 – 5250 MHz: 802.11n HT-20

Test Freq.	5180 MHz	Engineer	SB
Variant	802.11n; HT-20; 6.5 MCS	Temp (°C)	24
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	18	Press. (mBars)	998
Antenna	1TLP3 / 901167-2 Rev D	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

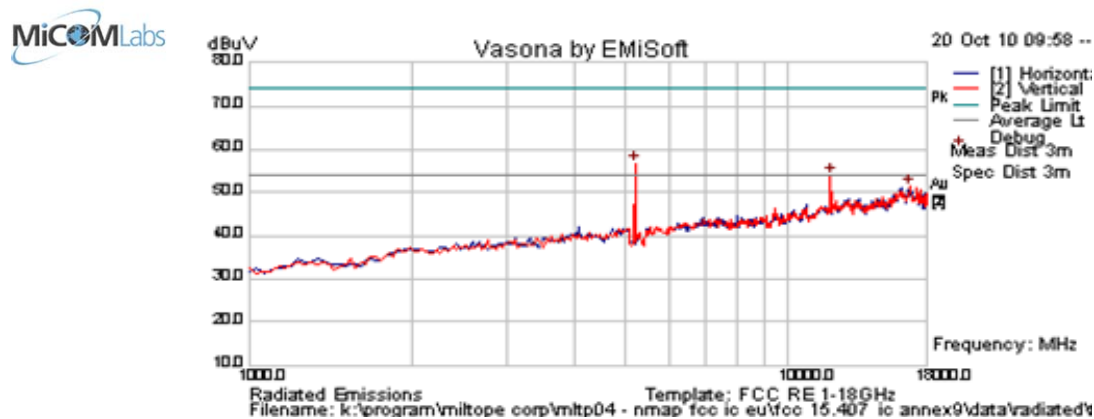
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5190.381	63.5	4.6	-9.2	59.0	Peak [Scan]	H	--	--	--	--	n/a	FUND
16224.048	41.3	9.0	0.5	50.8	Peak [Scan]	H	100	0	54	-3.2	Pass	NRB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 344 of 465

Test Freq.	5200 MHz	Engineer	SB
Variant	802.11n; HT-20; 6.5 MCS	Temp (°C)	24
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	18	Press. (mBars)	998
Antenna	1TLP3 / 901167-2 Rev D	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

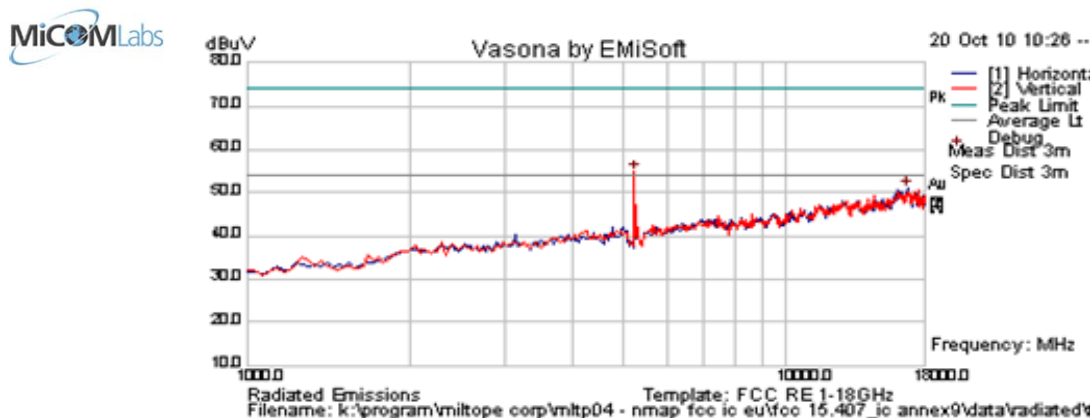
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
11990.722	-4.5	6.9	-2.5	0.0	Peak Max	V	113	151	74.0	-74.0	Pass	
11990.722	31.4	6.9	-2.5	35.9	Average Max	V	113	151	54.0	-18.1	Pass	
5190.381	61.2	0.0	0.0	0.0	Peak [Scan]		--	--	--	--	n/a	FUND
16773.547	41.1	0.0	0.0	0.0	Peak [Scan]		0	0	0	0.0	Pass	NRB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 345 of 465

Test Freq.	5240 MHz	Engineer	SB
Variant	802.11n; HT-20; 6.5 MCS	Temp (°C)	24
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	18	Press. (mBars)	998
Antenna	1TLP3 / 901167-2 Rev D	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5224.449	59.5	4.6	-9.4	54.7	Peak [Scan]	V	--	--	--	--	n/a	FUND
16739.479	40.7	8.7	1.5	50.8	Peak [Scan]	H	100	0	54.0	-3.2	Pass	NRB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

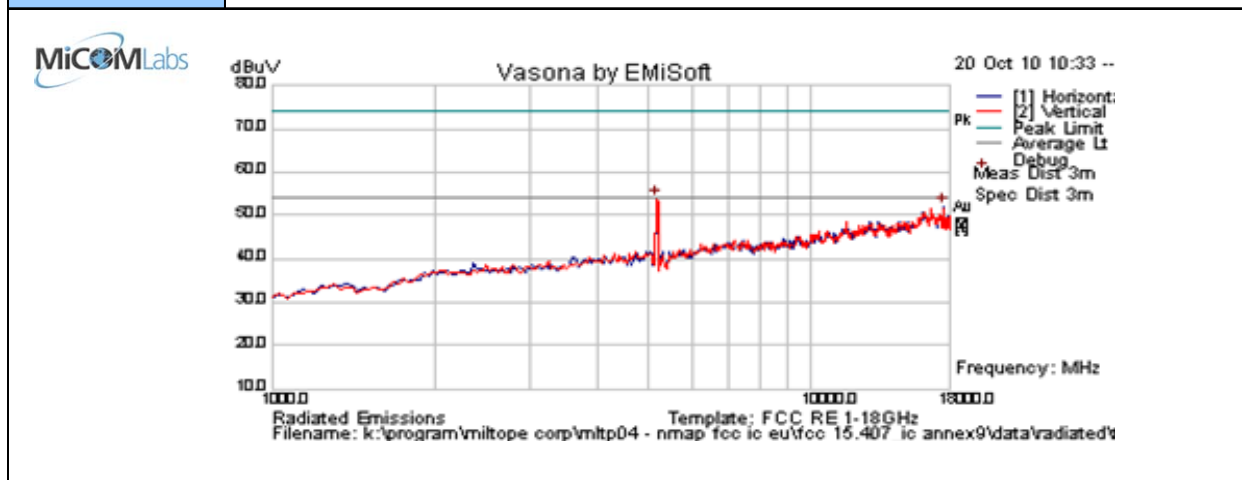
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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 346 of 465

BAND: 5150 – 5250 MHz: 802.11n HT-40

Test Freq.	5190 MHz	Engineer	SB
Variant	802.11n; HT-40; 13.5 MCS	Temp (°C)	24
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	17	Press. (mBars)	998
Antenna	1TLP3 / 901167-2 Rev D	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

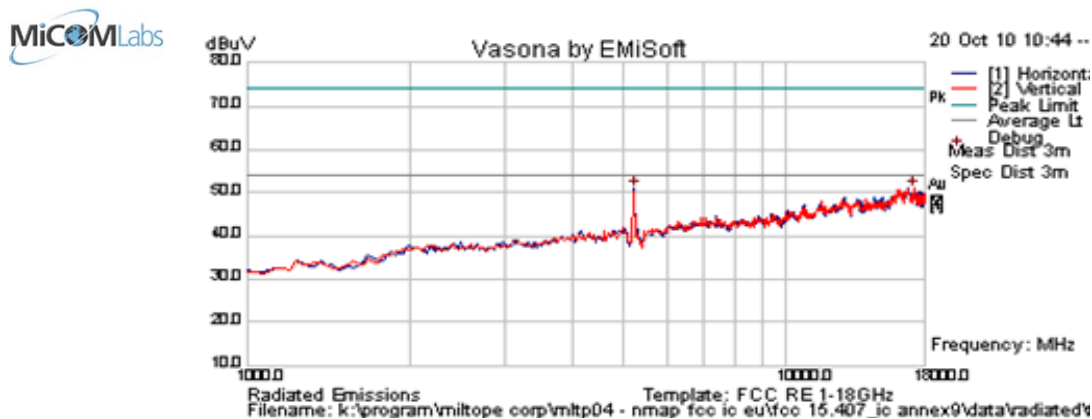
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5156.313	58.0	4.6	-9.0	53.7	Peak [Scan]	V	--	--	--	--	n/a	FUND
17591.182	42.2	8.8	1.1	52.1	Peak [Scan]	H	100	0	54	-1.9	Pass	NRB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 347 of 465

Test Freq.	5230 MHz	Engineer	SB
Variant	802.11n; HT-40; 13.5 MCS	Temp (°C)	24
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	18	Press. (mBars)	998
Antenna	1TLP3 / 901167-2 Rev D	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
17182.365	41.6	8.6	0.8	51.0	Peak [Scan]	V	150	0	54.0	-3.0	Pass	NRB
5224.449	55.8	4.6	-9.4	50.9	Peak [Scan]	H	--	--	--	--	n/a	FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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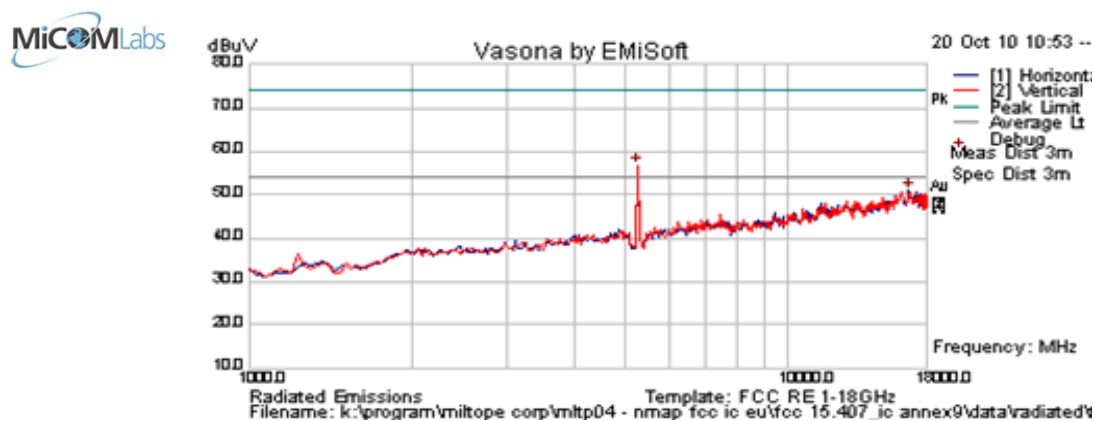


Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 348 of 465

901167-2 Antenna – Radiated Spurious Emissions – Above 1 GHz

BAND: 5250 – 5350 MHz: 802.11a

Test Freq.	5260 MHz	Engineer	SB
Variant	802.11a; 6 Mbs	Temp (°C)	24
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	18	Press. (mBars)	998
Antenna	1TLP3 / 901167-2 Rev D	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

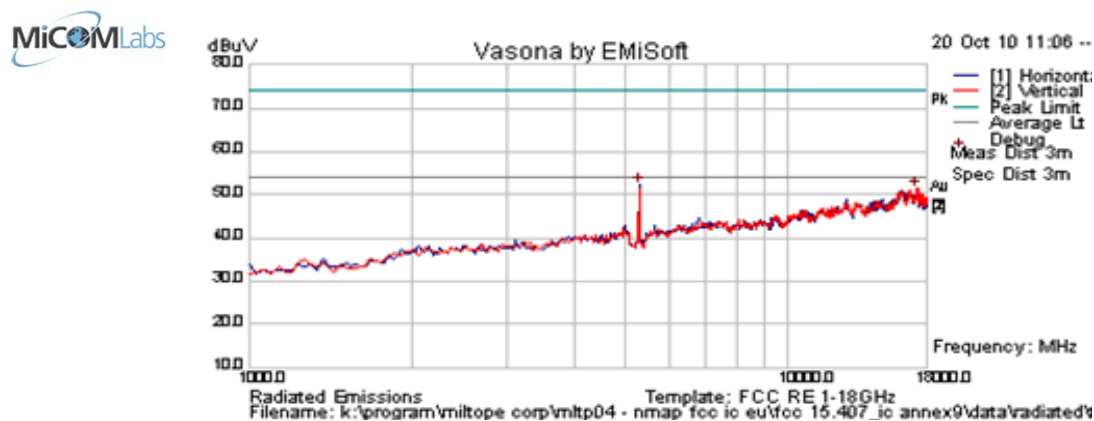
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5258.517	61.6	4.6	-9.5	56.7	Peak [Scan]	V	--	--	--	--	n/a	FUND
16705.411	40.7	8.7	1.4	50.8	Peak [Scan]	H	100	0	54.0	-3.2	Pass	NRB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 349 of 465

Test Freq.	5300 MHz	Engineer	SB
Variant	802.11a; 6 Mbs	Temp (°C)	24
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	18	Press. (mBars)	998
Antenna	1TLP3 / 901167-2 Rev D	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

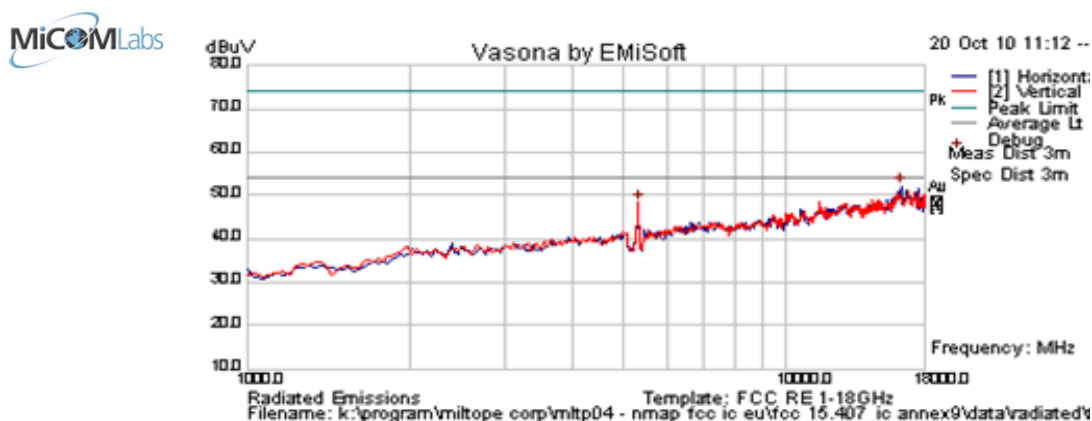
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5292.585	57.1	4.6	-9.5	52.2	Peak [Scan]	H	--	--	--	--	n/a	FUND
17250.501	41.1	8.6	1.6	51.3	Peak [Scan]	V	200	0	54.0	-2.7	Pass	NRB
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Miltope Corporation nMAP
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: MLTP04-U2 Rev A
Issue Date: 17th December 2010
Page: 350 of 465

Test Freq.	5320 MHz	Engineer	SB
Variant	802.11a; 6 Mbs	Temp (°C)	24
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	33
Power Setting	18	Press. (mBars)	998
Antenna	1TLP3 / 901167-2 Rev D	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
16296.593	42.4	8.9	0.7	52.0	Peak [Scan]	H	200	0	54.0	-2.0	Pass	NRB
5326.653	53.3	4.6	-9.5	48.4	Peak [Scan]	V	--	--	--	--	n/a	FUND

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

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