

Test of Juniper Networks WLA532E Wireless LAN
Access Point

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

Test Report Serial No.: JNIP22-U2 Rev A





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to

To FCC 47 CFR Part 15.407 & IC RSS-210

Test Report Serial No.: JNIP22-U2 Rev A

Note: this report contains data with regard to the 5,150 to 5,250 MHz band for Juniper Networks, WLA532E Wireless Access Point. 2.4 and 5.8 GHz test data are reported in MiCOM Labs test report JNIP22-U1

This report supersedes None

Applicant: Juniper Networks, Inc
1194 North Mathilda Avenue
Sunnyvale
California 94089, USA

Product Function: Wireless Access Point

Copy No: pdf Issue Date: 5th October 2012

This Test Report is Issued Under the Authority of:

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TEST CERTIFICATE #2381.01

MiCOM Labs is an ISO 17025 Accredited Testing Laboratory



Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 3 of 169

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 4 of 169

TABLE OF CONTENTS

ACCREDITATION, LISTINGS & RECOGNITION	6
TESTING ACCREDITATION	6
RECOGNITION	7
PRODUCT CERTIFICATION	8
1. TEST RESULT CERTIFICATE.....	10
2. REFERENCES AND MEASUREMENT UNCERTAINTY	11
2.1. Normative References.....	11
2.2. Test and Uncertainty Procedures.....	12
3. PRODUCT DETAILS AND TEST CONFIGURATIONS	13
3.1. Technical Details	13
3.2. Scope of Test Program	14
3.3. Equipment Model(s) and Serial Number(s)	18
3.4. Antenna Details	18
3.5. Cabling and I/O Ports	18
3.6. Test Configurations	19
3.7. Equipment Modifications	20
3.8. Deviations from the Test Standard	20
3.9. Subcontracted Testing or Third Party Data	20
4. TESTING EQUIPMENT CONFIGURATION(S)	21
4.1. Conducted RF Emission Test Set-up	21
4.2. Radiated Spurious Emission Test Set-up > 1 GHz	22
4.3. Digital Emissions Test Set-up (0.03 – 1 GHz).....	23
4.4. ac Wireline Emission Test Set-up	24
5. TEST SUMMARY.....	25
6. TEST RESULTS	27
6.1. Device Characteristics.....	27
6.1.1. Conducted Testing.....	27
6.1.2. Radiated Emission Testing	47
6.1.3. AC Wireline Conducted Emissions (150 kHz – 30 MHz)	87
7. PHOTOGRAPHS	89
7.1. Conducted Test Setup	89
7.2. Test Setup - Digital Emissions below 1 GHz.....	90
7.3. Radiated Emissions Test Setup >1 GHz – WLA-ANT-7360P-IN	91
7.4. Radiated Emissions Test Setup >1 GHz – WLA-ANT-7360A-OUT	92
7.5. Radiated Emissions Test Setup >1 GHz – WLA-ANT-77555-OUT	93
8. TEST EQUIPMENT DETAILS	94
APPENDIX	95
A. SUPPORTING INFORMATION.....	95
A.1. CONDUCTED TEST PLOTS	95
A.1.1. 26 dB & 99% Bandwidth	96
A.1.2. Peak Power Spectral Density	120

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: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 5 of 169

A.1.3. Peak Excursion Ratio.....	145
----------------------------------	-----



Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 6 of 169

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>



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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 7 of 169

RECOGNITION

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

Country	Recognition Body	Status	Phase	Identification No.
USA	Federal Communications Commission (FCC)	TCB	-	US0159 Listing #: 102167
Canada	Industry Canada (IC)	FCB	APEC MRA 2	US0159 Listing #: 4143A-2
Japan	MIC (Ministry of Internal Affairs and Communication)	CAB	APEC MRA 2	RCB 210
	VCCI	--	--	A-0012
Europe	European Commission	NB	EU MRA	NB 2280
Australia	Australian Communications and Media Authority (ACMA)	CAB	APEC MRA 1	US0159
Hong Kong	Office of the Telecommunication Authority (OFTA)	CAB	APEC MRA 1	
Korea	Ministry of Information and Communication Radio Research Laboratory (RRL)	CAB	APEC MRA 1	
Singapore	Infocomm Development Authority (IDA)	CAB	APEC MRA 1	
Taiwan	National Communications Commission (NCC) Bureau of Standards, Metrology and Inspection (BSMI)	CAB	APEC MRA 1	
Vietnam	Ministry of Communication (MIC)	CAB	APEC MRA 1	

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

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

Phase I - recognition for product testing

Phase II – recognition for both product testing and certification

N/A – Not Applicable

**EU MRA – European Union Mutual Recognition Agreement.

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

**NB – Notified Body

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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>



USA Telecommunication Certification Body (TCB) - TCB Identifier – US0159

Industry Canada Certification Body - CAB Identifier – US0159

European Notified Body - Notified Body Identifier - 2280

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

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 9 of 169

DOCUMENT HISTORY

Document History		
Revision	Date	Comments
Draft		
Rev A	5 th October 2012	Initial release

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 10 of 169

1. TEST RESULT CERTIFICATE

Applicant:	Juniper Networks, Inc 1194 North Mathilda Avenue Sunnyvale California 94089, USA	Tested By:	MiCOM Labs, Inc. 440 Boulder Court Suite 200 Pleasanton California, 94566, USA
EUT:	Wireless LAN Access point	Tel:	+1 925 462 0304
Model:	WLA532E-US, WLA532E-WW	Fax:	+1 925 462 0306
S/N:	JB021153959		
Test Date(s):	1st to 14th August 2012	Website:	www.micomlabs.com

STANDARD(S)	TEST RESULTS
FCC 47 CFR Part 15.407 & IC RSS-210	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.

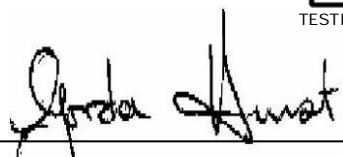
Notes:

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:



Graeme Grieve
Quality Manager MiCOM Labs,



Gordon Hurst
President & CEO MiCOM Labs, Inc.



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2. REFERENCES AND MEASUREMENT UNCERTAINTY

2.1. Normative References

Ref.	Publication	Year	Title
(i)	FCC 47 CFR Part 15.407	2012	Code of Federal Regulations
(ii)	FCC 06-96	June 2006	Memorandum Opinion and Order
(iii)	FCC OET KDB 662911	4 th April 2011	Emissions Testing of Transmitters with Multiple Outputs in the Same Band
(iv)	Industry Canada RSS-210	2010	Low Power License-Exempt Radiocommunication Devices (All Frequency Bands): Category 1 Equipment
(v)	Industry Canada RSS-Gen	2010	General Requirements and Information for the Certification of Radiocommunication Equipment
(vi)	ANSI C63.4	2009	American National Standards for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
(vii)	CISPR 22/ EN 55022	2008 2006+A1:2007	Limits and Methods of Measurements of Radio Disturbance Characteristics of Information Technology Equipment
(viii)	M 3003	Edition 1 Dec. 1997	Expression of Uncertainty and Confidence in Measurements
(ix)	LAB34	Edition 1 Aug 2002	The expression of uncertainty in EMC Testing
(x)	ETSI TR 100 028	2001	Parts 1 and 2 Electromagnetic compatibility and Radio Spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics
(xi)	A2LA	July 2012	Reference to A2LA Accreditation Status – A2LA Advertising Policy
(xii)	FCC Public Notice – DA 02-2138	2002	Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices



Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 12 of 169

2.2. Test and Uncertainty Procedures

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

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

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



Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 13 of 169

3. PRODUCT DETAILS AND TEST CONFIGURATIONS

3.1. Technical Details

Details	Description
Purpose:	Test of the Juniper Networks WLA532E Wireless LAN Access Point in the frequency range 5,150 to 5,250 MHz to FCC Part 15.407 and Industry Canada RSS-210 regulations.
Applicant:	Juniper Networks, Inc 1194 North Mathilda Avenue Sunnyvale California 94089, USA
Manufacturer:	As applicant
Laboratory performing the tests:	MiCOM Labs, Inc. 440 Boulder Court, Suite 200 Pleasanton, California 94566 USA
Test report reference number:	JNIP22-U2 Rev A
Date EUT received:	26 th July 2012
Standard(s) applied:	FCC 47 CFR Part 15.407 & IC RSS-210
Dates of test (from - to):	1st to 14th August 2012
No of Units Tested:	One
Type of Equipment:	Wireless LAN Access Point, 3x3 Spatial Multiplexing MIMO configuration
Applicants Trade Name:	Wireless Access Point
Model(s):	WLA532E-US ; WLA532E-WW
Location for use:	Indoor / Outdoor
Declared Frequency Range(s):	5,150 – 5,250 MHz
Hardware Rev	P1b
Software Rev	MSS8.0.0.0.090
Type of Modulation:	Per 802.11 – OFDM
Declared Nominal Output Power: (Average Power)	802.11a: Legacy +18 dBm 802.11n: HT-20 +18 dBm 802.11n: HT-40 +18 dBm
EUT Modes of Operation:	Legacy 802.11a, 802.11n HT-20, HT-40
Transmit/Receive Operation:	Time Division Duplex
System Beam Forming:	WLA532E has no capability for beam forming
Rated Input Voltage and Current:	POE 48 Vdc 0.625 A
Operating Temperature Range:	Declared range 0° to +50°C at 95% humidity non condensing
ITU Emission Designator:	802.11a 16M9D1D 802.11n HT-20 18M2D1D 802.11n HT-40 36M7D1D
Equipment Dimensions:	6.5" (Diameter) x 2.1" (H) inches 16 (Diameter) x 5.34 (H) cm
Weight:	25.185 oz
Primary function of equipment:	Wireless Access Point for transmitting data and voice.

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 14 of 169

3.2. Scope of Test Program

Juniper Networks WLA532E Access Point RF Testing

The scope of the test program was to test the Juniper Networks WLA532E Wireless LAN Access Point, 3x3 Spatial Multiplexing MIMO configurations in the frequency range 5,150 to 5,250 MHz for compliance against FCC 47 CFR Part 15.407 and Industry Canada RSS-210 specifications.

WLA532E-US (for US distribution)

WLA532E-WW, WLA532E-XX (where –XX can be any alphanumeric, for world wide distribution)

FCC OET KDB Implementation

This test program implements the following FCC KDB – 662911 4/4/2011;

Emissions Testing of Transmitters with Multiple Outputs in the Same Band

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

This guidance does not apply to the multiple transmitters included in a composite device, such as a device that combines an 802.11 modem with a cell phone in one enclosure with each driving its own antenna.



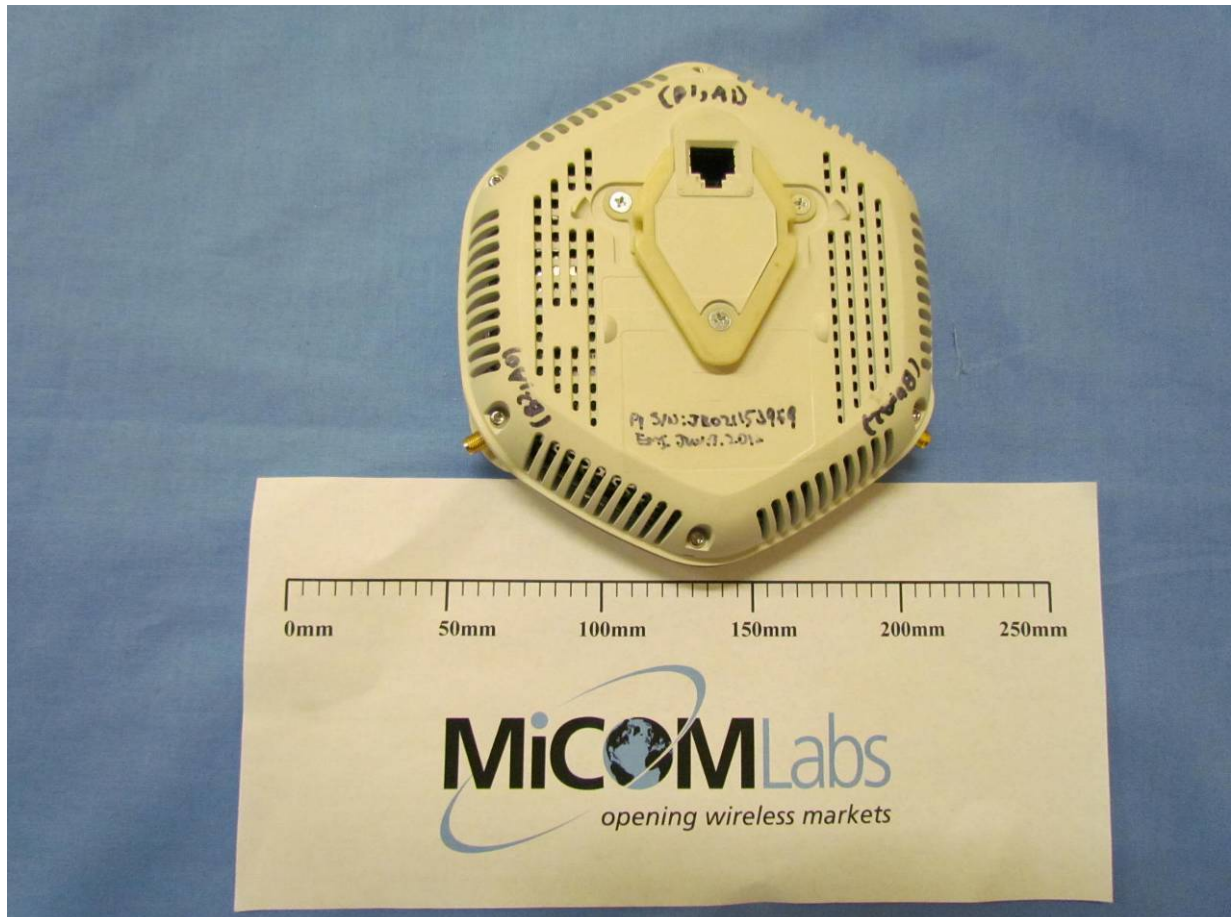
Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 15 of 169

WLA532E Wireless LAN Access Point

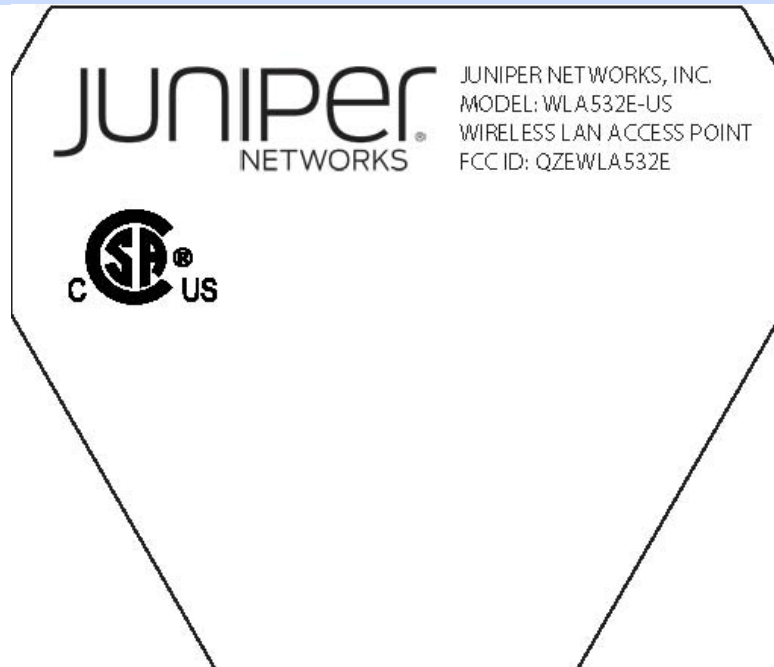


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WLA532E Wireless LAN Access Point (Rear)



WLA532E Wireless LAN Access Point Label



I



Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 18 of 169

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

Type (EUT/Support)	Equipment Description (Including Brand Name)	Mfr	Model No.	Serial No.
EUT	Wireless LAN Access Point	Juniper Networks	WLA532E-US, WLA532E-WW	JB021153959
Support	Laptop PC	IBM	Thinkpad	None

3.4. Antenna Details

Antenna Type	Manufacturer	Model Number	Antenna Gain (dBi)	
			2.4 GHz	5 GHz
Dual Band OMNI	Accton	WLA-ANT-7360P-IN	3.0	5.0
Dual Band OMNI	PC-Tel/Maxrad	ANT-7360A-OUT	6.0	8.0
Dual Band Panel	Laird	ANT-77555-OUT	8.0	10.7

3.5. Cabling and I/O Ports

Number and type of I/O ports

1. 1 x 10/100/1000 Ethernet includes POE (Power over Ethernet +48 Vdc)

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 19 of 169

3.6. Test Configurations

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

Matrix of test configurations

Operational Mode(s) (802.11)	Variant	Data Rates with Highest Power	Frequencies (MHz)
a,n	Legacy	6 MBit/s	5180/5,200/5,240
	HT-20	6.5 MCS	
	HT-40	13.5 MCS	5,190, 5,230

Antenna Test Configurations for Radiated Emissions and Band-Edge

The following measurements were performed on all antenna configurations identified in Section 3.4 Antenna Details.

Spurious Emission and Band-Edge Test Strategy Bands 5,150 – 5,250; 5,250 – 5,350

11a	11n HT-20	11n HT-40
SE 5180	SE 5180	SE 5190
SE 5200	SE 5200	
SE 5240	SE 5240	SE 5230
BE 5350	BE 5350	BE 5350

KEY:-

SE – Spurious Emissions

BE – Band-Edge

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 20 of 169

3.7. Equipment Modifications

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

1. NONE

3.8. Deviations from the Test Standard

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

2. NONE

3.9. Subcontracted Testing or Third Party Data

1. NONE

4. TESTING EQUIPMENT CONFIGURATION(S)

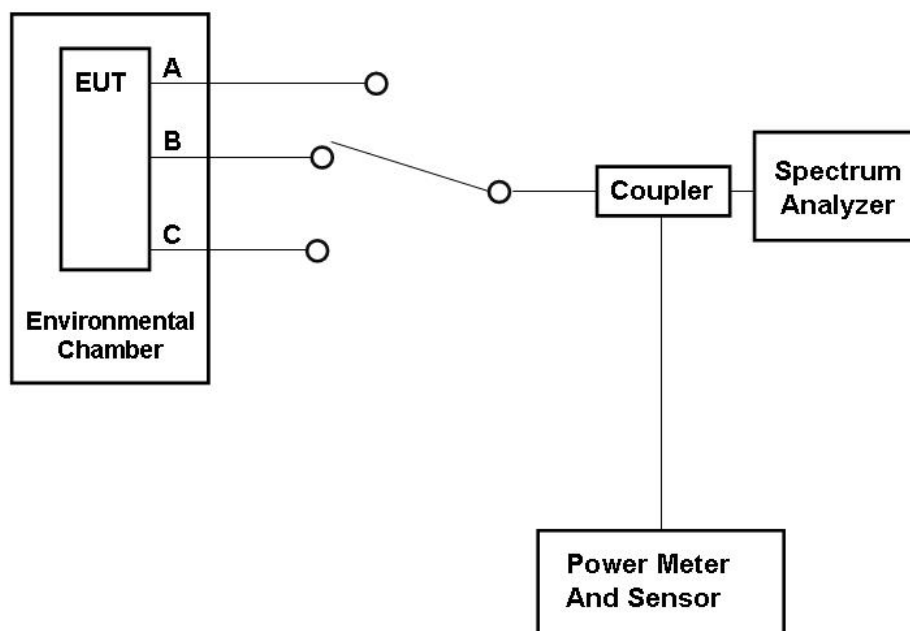
4.1. Conducted RF Emission Test Set-up

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

1. Section 6.1.1.1. 26 dB and 99% Bandwidth
2. Section 6.1.1.2. Maximum Conducted Output Power
3. Section 6.1.1.3. Peak Power Spectral Density
4. Section 6.1.1.4. Peak Excursion Ratio

Conducted Test Set-Up Pictorial Representation

3 - Port Test Configuration

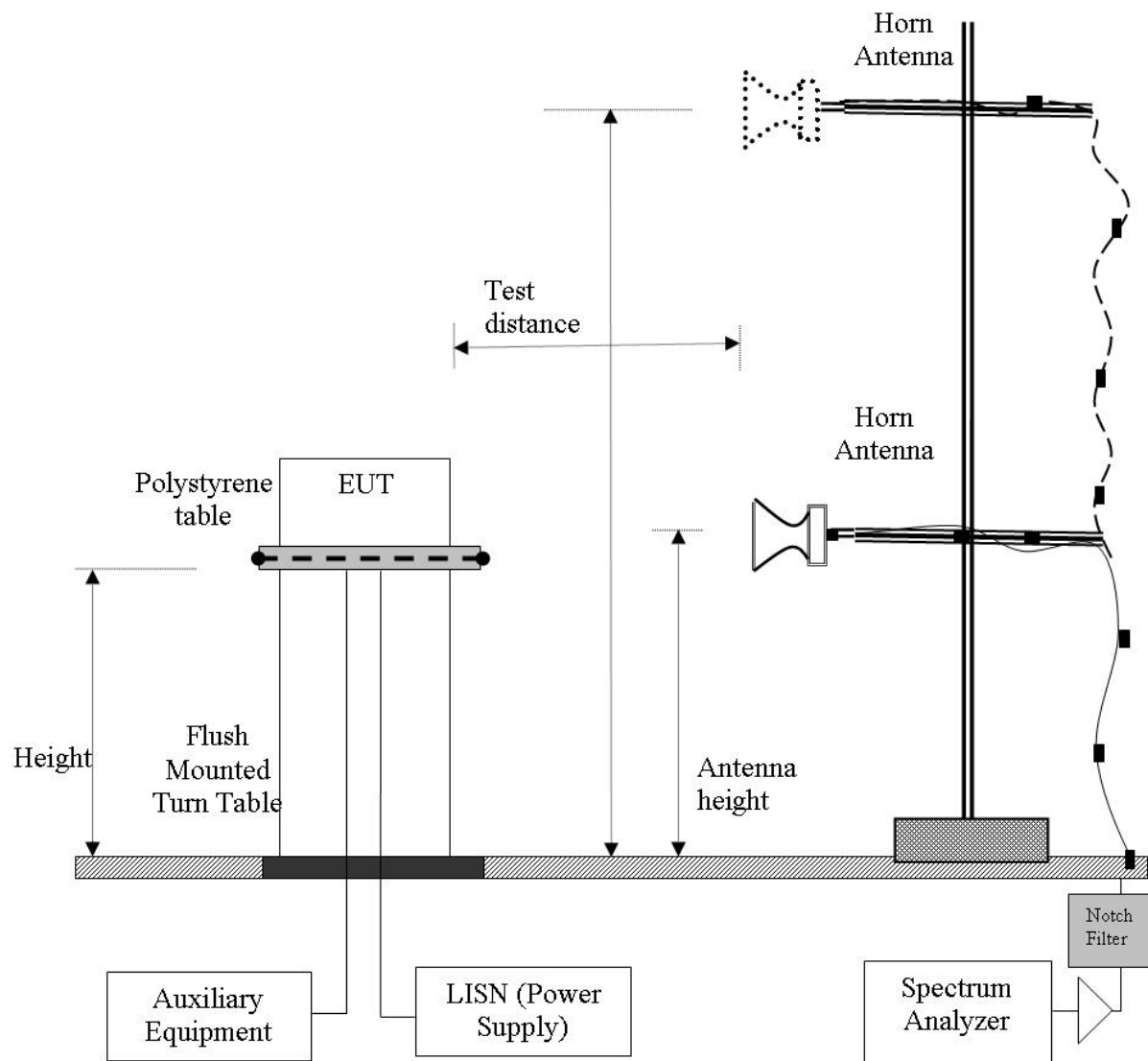


4.2. Radiated Spurious Emission Test Set-up > 1 GHz

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

1. Section 6.1.2.1. Dual Band OMNI Paddle WLA-ANT-7360P-IN
2. Section 6.1.2.2. Dual Band OMNI WLA-ANT-7360A-OUT
3. Section 6.1.2.3. Dual Band PANEL WLA-ANT-77555-OUT

Radiated Emission Measurement Setup – Above 1 GHz



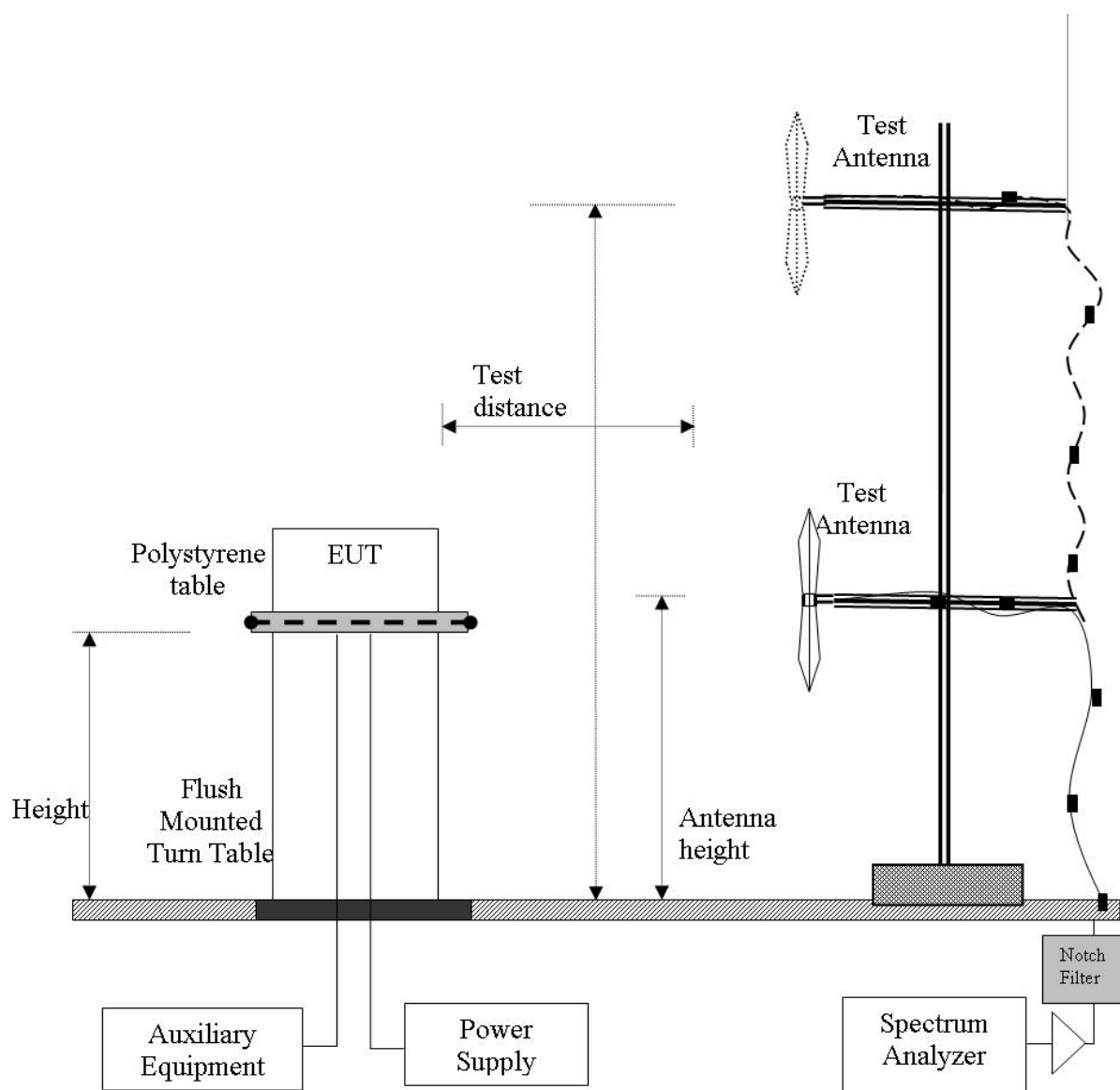
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4.3. Digital Emissions Test Set-up (0.03 – 1 GHz)

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

1. Section 6.1.2.4. Digital Emissions

Digital Emission Measurement Setup – Below 1 GHz

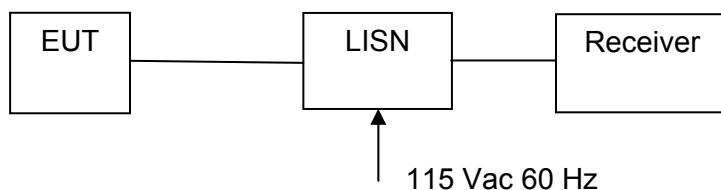


4.4. ac Wireline Emission Test Set-up

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

1. Section 6.1.3 ac Wireline Conducted Emissions

Conducted Test Set-Up Pictorial Representation



Measurement set up for ac Wireline Conducted Emissions Test



5. 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	6.1.1.1 A.1.1
15.407(a) A9.2(2) 4.6	Maximum Conducted Output Power	Power Measurement	Conducted	Complies	6.1.1.2
15.407(a) A9.2(2)	Peak Power Spectral Density	PPSD	Conducted	Complies	6.1.1.3 A.1.2
15.407(a)(6)	Peak Excursion Ratio	<13dB in any 1MHz bandwidth	Conducted	Complies	6.1.1.4 A.1.3
15.407(g) 15.31 2.1 4.5	Frequency Stability	Limits: contained within band of operation at all times.	Applicant declaration	Complies	6.1.1.5
15.407(f) 5.5	Radio Frequency Radiation Exposure	Exposure to radio frequency energy levels, Maximum Permissible Exposure (MPE)	Conducted	See included MPE exhibit	--



Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 26 of 169

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		6.1.2
	Transmitter Radiated Spurious Emissions	Emissions above 1 GHz		Complies	6.1.2.1 6.1.2.2 6.1.2.3
	Radiated Band Edge	Band edge results		Complies	6.1.2.1 6.1.2.2 6.1.2.3
15.407(b)(6) 15.205(a) 15.209(a) 2.2	Radiated Emissions	Emissions <1 GHz (30M-1 GHz)		Complies	6.1.2.4
15.407(b)(6) 15.207 7.2.2	AC Wireline Conducted Emissions 150 kHz– 30 MHz	Conducted Emissions	Conducted	N/A EUT is POE powered - not shipped with equipment	6.1.3

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

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

Note 3: Section 3.7 Equipment Modifications highlights the equipment modifications that were required to bring the product into compliance with the above test matrix

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 27 of 169

6. TEST RESULTS

6.1. Device Characteristics

6.1.1. Conducted Testing

6.1.1.1. 26 dB and 99 % Bandwidth

Conducted Test Conditions for 26 dB and 99% Bandwidth			
Standard:	FCC CFR 47:15.407	Ambient Temp. (°C):	24.0 - 27.5
Test Heading:	26 dB and 99 % Bandwidth	Rel. Humidity (%):	32 - 45
Standard Section(s):	15.407 (a)	Pressure (mBars):	999 - 1001
Reference Document(s):	KDB 789033 - D01 DTS General UNII Test Procedures v01		
Test Procedure for 26 dB and 99% Bandwidth Measurement			
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. KDB 789033 Section 5.1 Emission Bandwidth was used in order to prove compliance. The Resolution Bandwidth was set to approximately 1% of the emission bandwidth.			

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 28 of 169

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

Equipment Configuration for 26 dB and 99% Bandwidth			
Variant:	802.11a	Duty Cycle (%):	99
Data Rate:	6 MBit/s	Antenna Gain (dBi):	N/A
Modulation:	OFDM	Beam Forming Gain (Y):	N/A
TPC:	Maximum Power		
Engineering Test Notes:			

Test Measurement Results								
Test Frequency	Measured 26 dB Bandwidth (MHz)				26 dB Bandwidth (MHz)		Limit	Lowest Margin
	Port(s)							
MHz	a	b	c	d	Highest	Lowest	MHz	MHz
5180.0	23.146	23.146	22.745	--	23.146	22.745	0.5	-22.25
5200.0	23.647	23.046	22.946	--	23.647	22.946	0.5	-22.45
5240.0	23.647	23.246	22.846	--	23.647	22.846	0.5	-22.35
Test Frequency	Measured 99% Bandwidth (MHz)				Maximum 99% Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d				
5180.0	16.934	16.834	16.733	--	16.934			
5200.0	16.834	16.733	16.733	--	16.834			
5240.0	16.834	16.733	16.733	--	16.834			

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 Measuring RF Spectrum Mask
Measurement Uncertainty:	±2.81 dB

[Click on the links above to see the plot](#)

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 29 of 169

Equipment Configuration for 26 dB and 99% Bandwidth			
Variant:	802.11n HT-20	Duty Cycle (%):	99
Data Rate:	6.5 MBit/S	Antenna Gain (dBi):	N/A
Modulation:	OFDM	Beam Forming Gain (Y):	N/A
TPC:	Maximum Power		
Engineering Test Notes:			

Test Measurement Results								
Test Frequency	Measured 26 dB Bandwidth (MHz)				26 dB Bandwidth (MHz)		Limit	Lowest Margin
	Port(s)							
MHz	a	b	c	d	Highest	Lowest	MHz	MHz
5180.0	24.749	24.248	23.948	--	24.749	23.948	0.5	-23.45
5200.0	24.950	23.747	23.547	--	24.950	23.547	0.5	-23.05
5240.0	24.850	23.848	24.549	--	24.850	23.848	0.5	-23.35
Test Frequency	Measured 99% Bandwidth (MHz)				Maximum 99% Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d				
5180.0	18.036	17.936	17.936	--	18.036			
5200.0	18.036	17.936	17.936	--	18.036			
5240.0	18.036	17.936	17.936	--	18.036			

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 Measuring RF Spectrum Mask
Measurement Uncertainty:	±2.81 dB

[Click on the links above to see the plot](#)

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 30 of 169

Equipment Configuration for 26 dB and 99% Bandwidth			
Variant:	802.11n HT-40	Duty Cycle (%):	99
Data Rate:	13.5 MBit/s	Antenna Gain (dBi):	N/A
Modulation:	OFDM	Beam Forming Gain (Y):	N/A
TPC:	Maximum Power		
Engineering Test Notes:			

Test Measurement Results								
Test Frequency	Measured 26 dB Bandwidth (MHz)				26 dB Bandwidth (MHz)		Limit	Lowest Margin
	Port(s)				Highest	Lowest		
MHz	a	b	c	d			MHz	MHz
5190.0	46.293	45.090	44.890	--	46.293	44.890	0.5	-44.39
5230.0	47.495	45.090	44.890	--	47.495	44.890	0.5	-44.39
Test Frequency	Measured 99% Bandwidth (MHz)				Maximum 99% Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d				
5190.0	36.473	36.273	36.473	--	36.473			
5230.0	36.673	36.273	36.273	--	36.673			

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 Measuring RF Spectrum Mask
Measurement Uncertainty:	±2.81 dB

[Click on the links above to see the plot](#)

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 31 of 169

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-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.

Traceability

Test Equipment Used
0158, 0287, 0252, 0313, 0314, 0070, 0116, 0117



Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 32 of 169

6.1.1.2. Maximum Conducted Output Power

Conducted Test Conditions for Maximum Conducted Output Power			
Standard:	FCC CFR 47:15.407	Ambient Temp. (°C):	24.0 - 27.5
Test Heading:	Maximum Conducted Output Power	Rel. Humidity (%):	32 - 45
Standard Section(s):	15.407 (a)	Pressure (mBars):	999 - 1001
Reference Document(s):	KDB 789033 - D01 DTS General UNII Test Procedures v01		
Test Procedure for Maximum Conducted Output Power Measurement			
<u>Method PM (Measurement using an RF average power meter).</u> Section C) 4) of KDB 789033 defines a methodology using an average wideband power meter. Measurements were made while the EUT was operating in a continuous transmission mode (100% duty cycle) at the appropriate center frequency. All cable losses and offsets were taken into consideration in the measured result. All operational modes and frequency bands were measured independently and the resultant \square calculated. For multiple outputs, the measurements were made simultaneously on each output port and summed in a linear fashion. This technique was used in order to prove compliance.			

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Antenna Beam and Non-Beam Forming Power Levels

15. 407 (a)(1), (a) (2) Operation with directional antenna gains greater than 6 dBi.

If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. Further FCC KDB 662911 D01 Multiple Transmitter Output v01 requires that the gain of antennas transmitting the same data (legacy 802.11a mode) must be increased by $10 * \log(N)$ when N is the number of antenna elements.

Operating Frequency Band 5150-5250 MHz

Antenna (dB)	Gain (dBi)	Max. Allowable Conducted Peak Power (dBm)		Maximum EIRP (dBm)
		Non-Beam Forming	Beam Forming	
WLA-ANT-7360P-IN	5.0	+17.0	--	+23.0
ANT-7360A-OUT	8.0	+15.0	--	+23.0
ANT-77555-OUT	10.7	+12.3	--	+23.0

The WLA532E has no beam-forming capability



Maximum Transmit (Conducted) Power, FCC Limits and Industry Canada Limits

Bands 5150 – 5250 MHz

FCC Limits

Conducted Power Limit lesser of: 50 mW or 4 dBm + 10 log (B) dBm. B is the 26 dB emission bandwidth in MHz.

Mode	Frequency Range (MHz)	Minimum 26 dB Bandwidth (MHz)	4 + 10 Log (B) (dBm)	Limit (dBm)
a	5150 – 5250	22.745	+17.57	+17.00
HT-20		23.547	+17.72	+17.00
HT-40		45.090	+20.54	+17.00

Industry Canada Limits

EIRP Limit 5150 – 5250 MHz: Lesser of 200 mW (+23 dBm) or 10 + 10 Log (B) dBm. B is the 99% emission bandwidth in MHz.

Mode	Frequency Range (MHz)	Minimum 99 % Bandwidth (MHz)	4 + 10 Log (B) (dBm)	EIRP Limit (dBm)
a	5150 – 5250	16.733	+22.24	+22.26
HT-20		17.936	+22.54	+22.54
HT-40		36.273	+25.60	+23.00



Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 35 of 169

Measurement Results for Maximum Conducted Output Power

Equipment Configuration for Maximum Conducted Output Power			
Variant:	802.11a	Duty Cycle (%):	99
Data Rate:	6 MBit/s	Antenna Gain (dBi):	N/A
Modulation:	OFDM	Beam Forming Gain (Y):	N/A
TPC:	Maximum Power		
Engineering Test Notes:			

Test Measurement Results								
Test Frequency	Measured Conducted Output Power (dBm)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
	Port(s)							
MHz	a	b	c	d	dBm	dBm	dBm	
5180.0	10.47	11.43	10.12	--	15.48	17.00	-1.52	
5200.0	10.22	10.85	9.87	--	15.10	17.00	-1.90	
5240.0	9.99	11.31	10.76	--	15.49	17.00	-1.51	

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-01 Measuring RF Output Power
Measurement Uncertainty:	± 1.33 dB

Equipment Configuration for Maximum Conducted Output Power			
Variant:	802.11a	Duty Cycle (%):	99
Data Rate:	6.5 MBit/s	Antenna Gain (dBi):	N/A
Modulation:	OFDM	Beam Forming Gain (Y):	N/A
TPC:	Maximum Power		
Engineering Test Notes:			

Test Measurement Results								
Test Frequency	Measured Conducted Output Power (dBm)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
	Port(s)							
MHz	a	b	c	d	dBm	dBm	dBm	
5180.0	10.30	11.33	9.59	--	15.24	17.00	-1.76	11.5
5200.0	10.34	11.10	9.92	--	15.25	17.00	-1.75	11.5
5240.0	9.99	11.31	10.89	--	15.54	17.00	-1.46	11.0

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-01 Measuring RF Output Power
Measurement Uncertainty:	± 1.33 dB

[Click on the links above to see the plot](#)

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 36 of 169

Equipment Configuration for Maximum Conducted Output Power			
Variant:	802.11n HT-40	Duty Cycle (%):	99
Data Rate:	13.5 MBit/s	Antenna Gain (dBi):	N/A
Modulation:	OFDM	Beam Forming Gain (Y):	N/A
TPC:	Maximum Power		
Engineering Test Notes:			

Test Measurement Results								
Test Frequency	Measured Conducted Output Power (dBm)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
	Port(s)							
MHz	a	b	c	d	dBm	dBm	dBm	
5190.0	11.13	13.43	11.42	--	16.89	17.00	-0.11	13.5
5230.0	11.74	12.77	11.71	--	16.87	17.00	-0.13	13.5

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-01 Measuring RF Output Power
Measurement Uncertainty:	± 1.33 dB

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 37 of 169

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 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 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 log₁₀ 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 log₁₀ 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 log₁₀ 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.

Traceability

Test Equipment Used

0158, 0287, 0252, 0313, 0314, 0070, 0116, 0117
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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 38 of 169

6.1.1.3. Peak Power Spectral Density

Conducted Test Conditions for Power Spectral Density			
Standard:	FCC CFR 47:15.407	Ambient Temp. (°C):	24.0 - 27.5
Test Heading:	Power Spectral Density	Rel. Humidity (%):	32 - 45
Standard Section(s):	15.247 (a)	Pressure (mBars):	999 - 1001
Reference Document(s):	KDB 789033 - D01 DTS General UNII Test Procedures v01		

Test Procedure for Power Spectral Density

The In-Band power spectral density was measured using the measure and sum approach per FCC KDB 662911 (D01 Multiple Transmitter Output v01.)

Measure and sum the spectra across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The individual spectra are then summed mathematically in linear power units. Unlike in-band power measurements, in which the sum involves a single measured value (output power) from each output, measurements for compliance with PSD limits involve summing entire spectra across corresponding frequency bins on the various outputs. Consistency is maintained for any device with N transmitter outputs to be certain the individual outputs are all aligned with the same span and same number of points. In this instance, the linear power spectrum value within the first spectral bin of output 0 is summed with that in the first spectral bin of output 1, and the first spectral bin of output 2, and so on up to the Nth output to obtain the true value for the first frequency bin of the summed spectrum. The summed spectrum value for each frequency bin is computed in this fashion. These summed spectral values were calculated on a computer, and the results read back into the spectrum analyzer as a data file to produce a representative plot of total spectral power density.

Calculated Power = A + 10 log (1/x) dBm

A = Total Power Spectral Density [10 Log10 (10a/10 + 10 b/10 + 10c/10 + 10d/10)]

x = Duty Cycle

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 39 of 169

Equipment Configuration for Power Spectral Density			
Variant:	802.11a	Duty Cycle (%):	100
Data Rate:	6 MBit/s	Antenna Gain (dBi):	N/A
Modulation:	OFDM	Beam Forming Gain (Y):	N/A
TPC:	Maximum Power		
Engineering Test Notes:	¹ Although the unit apparently fails during the calculation of Total Power Spectral Density when the individual power spectral density plots are combined the EUT was found to be compliant. The combined power spectral density plot is appended below addition of individual plots below		

Test Measurement Results								
Test Frequency	Measured Power Spectral Density (dBm)				Calculated Total Power Spectral Density (dBm)		Limit	Margin
	Port(s)							
MHz	a	b	c	d	Σ Port(s)	Conversion to 3 kHz RBW	dBm	dB
5180.0	-1.352	-0.407	-1.781	--	3.630	N/A	4.0	-0.37
5200.0	-1.267	-0.466	-1.613	--	3.683	N/A	4.0	-0.32
5240.0	-1.385	0.034	-0.547	--	4.177 ¹	N/A	4.0	-0.11 ¹

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 Measuring RF Spectrum Mask
Measurement Uncertainty:	±2.81 dB

Equipment Configuration for Power Spectral Density			
Variant:	802.11n HT-20	Duty Cycle (%):	100
Data Rate:	6.5 MBit/S	Antenna Gain (dBi):	N/A
Modulation:	OFDM	Beam Forming Gain (Y):	N/A
TPC:	Maximum Power		
Engineering Test Notes:	¹ Although the plot shows the spectrum breaking the limit line on two plots (5180 Chain B and 5200 Chain B) the Σ Port(s) calculation for Total Power Spectral Density indicates the EUT to be compliant.		

Test Measurement Results								
Test Frequency	Measured Power Spectral Density (dBm)				Calculated Total Power Spectral Density (dBm)		Limit	Margin
	Port(s)							
MHz	a	b	c	d	Σ Port(s)	Conversion to 3 kHz RBW	dBm	dB
5180.0	-1.075	0.132 ¹	-2.146	--	3.841	N/A	4.0	-0.16
5200.0	-1.572	-0.612 ¹	-1.697	--	3.505	N/A	4.0	-0.49
5240.0	-3.080	-1.071	-2.401	--	2.669	N/A	4.0	-1.33

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 Measuring RF Spectrum Mask
Measurement Uncertainty:	±2.81 dB

[Click on the links above to see the plot](#)

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 40 of 169

Equipment Configuration for Power Spectral Density			
Variant:	802.11n HT-40	Duty Cycle (%):	100
Data Rate:	13.5 MBit/s	Antenna Gain (dBi):	N/A
Modulation:	OFDM	Beam Forming Gain (Y):	N/A
TPC:	Maximum Power		
Engineering Test Notes:	¹ Although the plot shows the spectrum breaking the limit line on two plots (5190 Chain B and 5230 Chain B) the Σ Port(s) calculation for Total Power Spectral Density indicates the EUT to be compliant.		

Test Measurement Results								
Test Frequency	Measured Power Spectral Density (dBm)				Calculated Total Power Spectral Density (dBm)		Limit	Margin
	Port(s)							
MHz	a	b	c	d	Σ Port(s)	Conversion to 3 kHz RBW	dBm	dB
5190.0	-2.358	-0.617 ¹	-2.440	--	3.051	N/A	4.0	-0.95
5230.0	-1.493	-0.571 ¹	-1.695	--	3.546	N/A	4.0	-0.45

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 Measuring RF Spectrum Mask
Measurement Uncertainty:	± 2.81 dB

[Click on the links above to see the plot](#)

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 41 of 169

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

Traceability

Test Equipment Used

0158, 0287, 0252, 0313, 0314, 0070, 0116, 0117
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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 42 of 169

6.1.1.4. Peak Excursion Ratio

Conducted Test Conditions for Peak Excursion Ratio			
Standard:	FCC CFR 47:15.407	Ambient Temp. (°C):	24.0 - 27.5
Test Heading:	Peak Excursion Ratio	Rel. Humidity (%):	32 - 45
Standard Section(s):	15.407 (a)(6)	Pressure (mBars):	999 - 1001
Reference Document(s):	KDB 789033 - D01 DTS General UNII Test Procedures v01		
Test Procedure for Peak Excursion Ratio			
<u>Compliance with the peak excursion requirement is demonstrated by confirming the ratio of the maximum of the peak-hold spectrum to the maximum of the average spectrum</u> during continuous transmission. Section F) of KDB 789033 was used in order to prove compliance. This is a conducted measurement using a spectrum analyzer using dual traces. Peak Excursion Ratio is the difference in amplitude (dB) between both traces; The following identifies two spectrum traces on the same plot. <u>Trace 1</u> is the max hold Peak detector, and <u>Trace 2</u> is the recalled trace data from Peak Power Spectral Density measurements. Each frequency and operational mode is recalled in order to prove compliance.			

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 43 of 169

Equipment Configuration for Peak Excursion Ratio			
Variant:	802.11a	Duty Cycle (%):	99
Data Rate:	6 MBit/s	Antenna Gain (dBi):	N/A
Modulation:	OFDM	Beam Forming Gain (Y):	N/A
TPC:	Maximum Power		
Engineering Test Notes:			

Test Measurement Results								
Test Frequency	Measured Peak Excursion Ratio (dB)				Ratio (dB)		Limit	Lowest Margin
	Port(s)				Highest	Lowest	dB	MHz
MHz	a	b	c	d				
5180.0	9.64	10.47	11.14	--	11.14	9.64	13.0	-1.86
5200.0	8.98	10.22	10.52	--	10.52	8.98	13.0	-2.48
5240.0	9.33	9.57	10.56	--	10.56	9.33	13.0	-2.44

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 Measuring Spectrum Mask
Measurement Uncertainty:	±2.81 dB

Equipment Configuration for Peak Excursion Ratio			
Variant:	802.11n HT-20	Duty Cycle (%):	99
Data Rate:	6.5 MBit/s	Antenna Gain (dBi):	N/A
Modulation:	OFDM	Beam Forming Gain (Y):	N/A
TPC:	Maximum Power		
Engineering Test Notes:			

Test Measurement Results								
Test Frequency	Measured Peak Excursion Ratio (dB)				Ratio (dB)		Limit	Lowest Margin
	Port(s)				Highest	Lowest	dB	MHz
MHz	a	b	c	d				
5180.0	8.74	9.28	9.95	--	9.95	8.74	13.0	-3.05
5200.0	9.17	9.52	10.45	--	10.45	9.17	13.0	-2.55
5240.0	10.69	10.44	12.17	--	12.17	10.44	13.0	-0.83

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 Measuring Spectrum Mask
Measurement Uncertainty:	±2.81 dB

[Click on the links above to see the plot](#)

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 44 of 169

Equipment Configuration for Peak Excursion Ratio			
Variant:	802.11n HT-40	Duty Cycle (%):	99
Data Rate:	13.5 MBit/s	Antenna Gain (dBi):	N/A
Modulation:	OFDM	Beam Forming Gain (Y):	N/A
TPC:	Maximum Power		
Engineering Test Notes:			

Test Measurement Results								
Test Frequency	Measured Peak Excursion (dB)				Ratio (dB)		Limit	Lowest Margin
	Port(s)				Highest	Lowest		
MHz	a	b	c	d			dB	MHz
5190.0	9.28	10.40	10.44	--	10.44	9.28	13.0	-2.56
5230.0	9.02	10.20	10.17	--	10.20	9.02	13.0	-2.80

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 Measuring Spectrum Mask
Measurement Uncertainty:	±2.81 dB

[Click on the links above to see the plot](#)

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 45 of 169

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

Traceability

Test Equipment Used

0158, 0287, 0252, 0313, 0314, 0070, 0116, 0117
--

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 46 of 169

6.1.1.5. 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.



6.1.2. Radiated Emission Testing

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.

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:

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

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

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

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 48 of 169

The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength (dBμV/m);

$$E = 1000000 \times \sqrt{30P} / 3 \text{ } \mu\text{V/m}$$

where P is the EIRP in Watts

Therefore: -27 dBm/MHz = 68.23 dBμV/m

Note: The data in this Section identifies that the EUT is in compliance with the -27dBm/MHz EIRP limit (68.23 dBμV/m) for out of band emissions. All out of band emissions are less than 68.23 dB μV/m.



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: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 50 of 169

Table 1: FCC 15.209 Spurious Emissions Limits

Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Field Strength ($\text{dB}\mu\text{V/m}$)	Measurement Distance (meters)
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

Traceability:

Test Equipment Used
0088, 0158, 0134, 0304, 0311, 0315, 0310, 0312

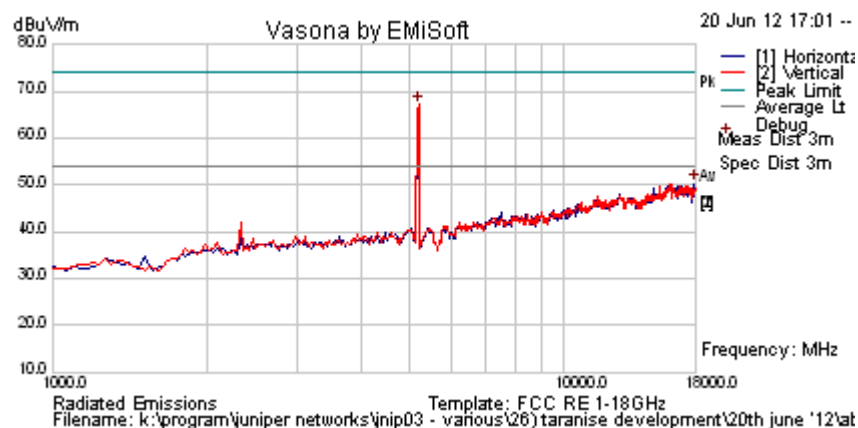
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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 51 of 169

6.1.2.1. Dual Band OMNI Paddle WLA-ANT-7360P-IN, 5 dBi

Test Freq.	5180 MHz	Engineer	GMH
Variant	802.11a; 6 Mbs	Temp (°C)	29
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	18	Press. (mBars)	995
Antenna	Accton Paddle	Duty Cycle (%)	100
Test Notes 1	EUT S/N: JB021153959		
Test Notes 2			



Formally measured emission peaks

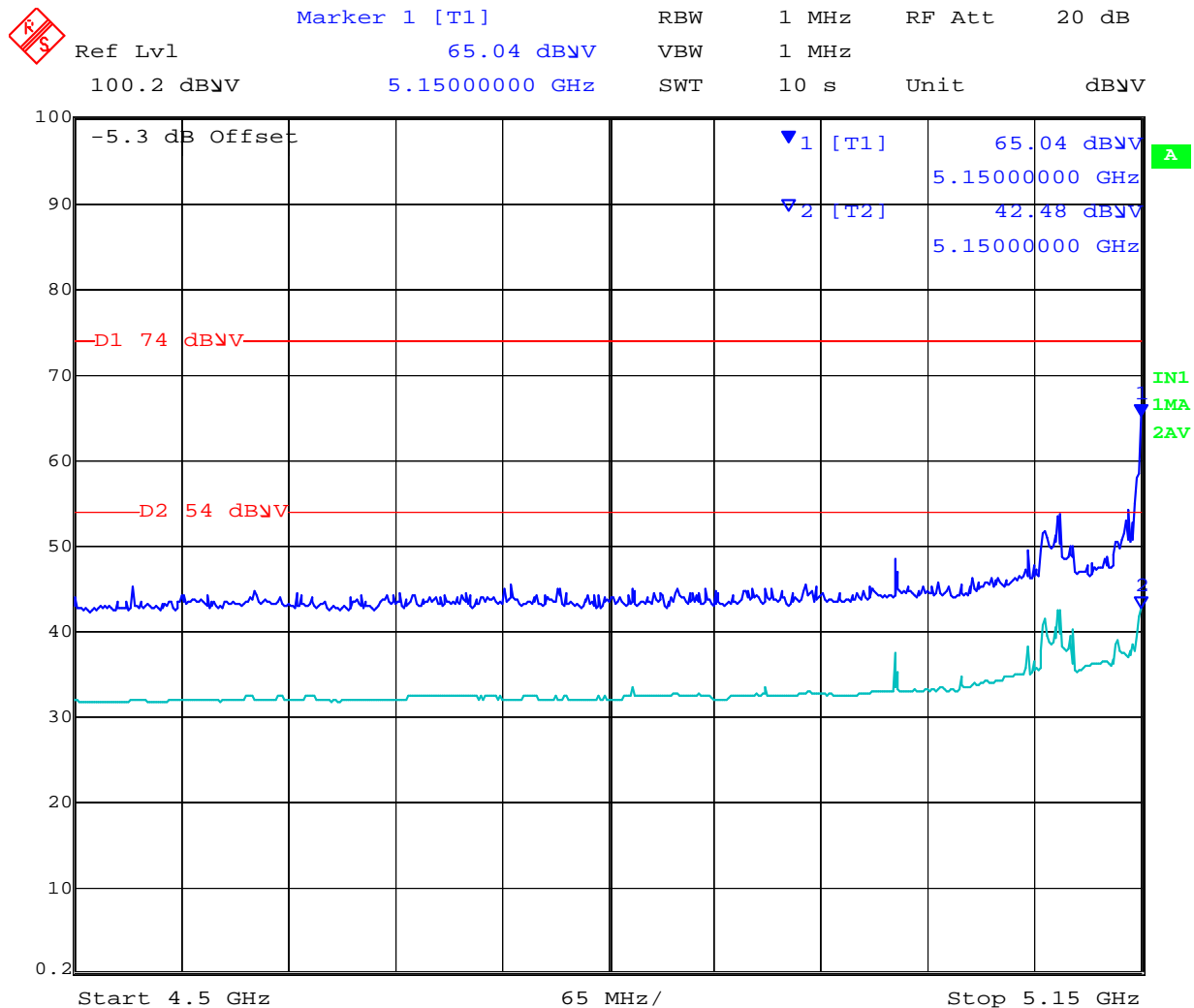
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	72.5	4.6	-9.9	67.2	Peak [Scan]	V						FUND
17931.864	40.8	8.8	0.6	50.2	Peak [Scan]	H	100	0	54.0	-3.8	Pass	NOISE
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 52 of 169

802.11a 5150 Restricted Band-edge



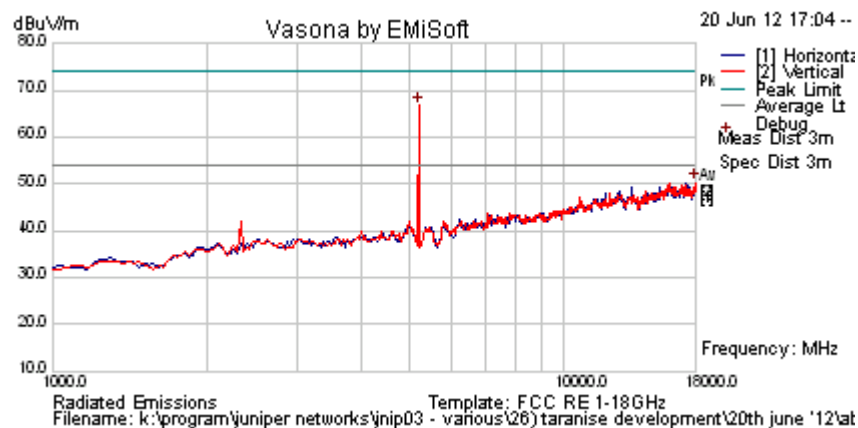
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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 53 of 169

Test Freq.	5200 MHz	Engineer	GMH
Variant	802.11a; 6 Mbs	Temp (°C)	29
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	18	Press. (mBars)	995
Antenna	Accton Paddle	Duty Cycle (%)	100
Test Notes 1	EUT S/N: JB021153959		
Test Notes 2			



Formally measured emission peaks

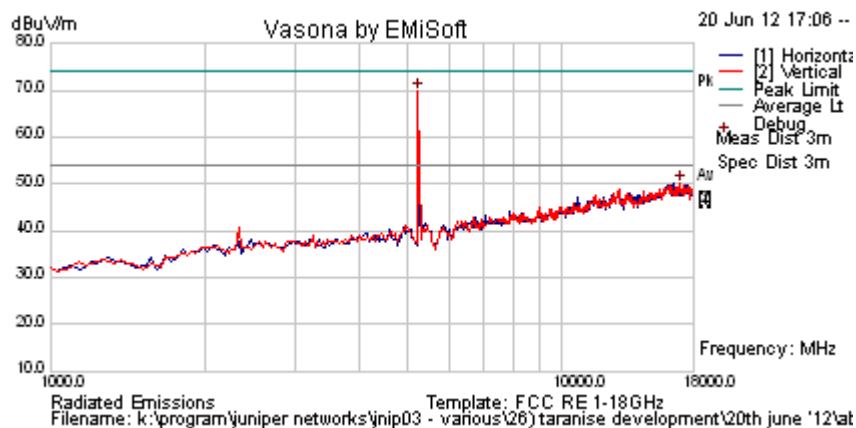
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	72.1	4.6	-9.9	66.9	Peak [Scan]	V						FUND
18000	40.9	8.8	0.7	50.4	Peak [Scan]	V	100	0	54.0	-3.6	Pass	NOISE
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 54 of 169

Test Freq.	5240 MHz	Engineer	GMH
Variant	802.11a; 6 Mbs	Temp (°C)	29
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	18	Press. (mBars)	995
Antenna	Accton Paddle	Duty Cycle (%)	100
Test Notes 1	EUT S/N: JB021153959		
Test Notes 2			



Formally measured emission peaks

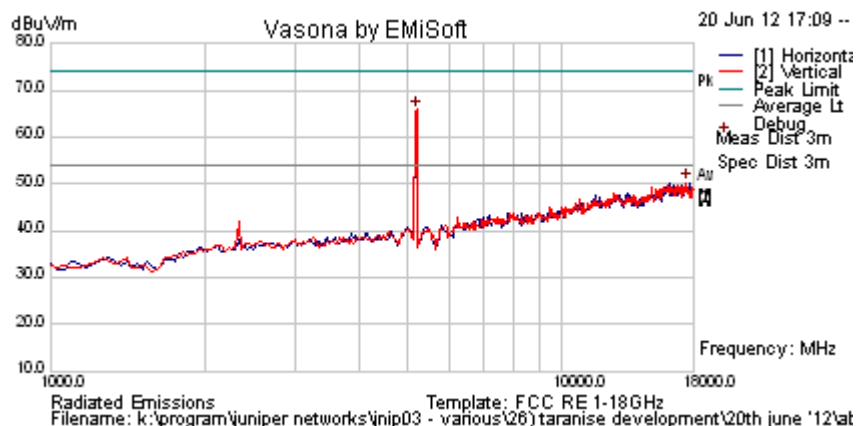
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5224.449	75.0	4.6	-9.8	69.8	Peak [Scan]	V						FUND
17012.024	41.3	8.5	0.3	50.1	Peak [Scan]	V	100	0	54.0	-3.9	Pass	NOISE
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 55 of 169

Test Freq.	5180 MHz	Engineer	GMH
Variant	802.11n HT-20; 6.5 Mbit/s	Temp (°C)	29
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	18	Press. (mBars)	995
Antenna	Accton Paddle	Duty Cycle (%)	100
Test Notes 1	EUT S/N: JB021153959		
Test Notes 2			



Formally measured emission peaks

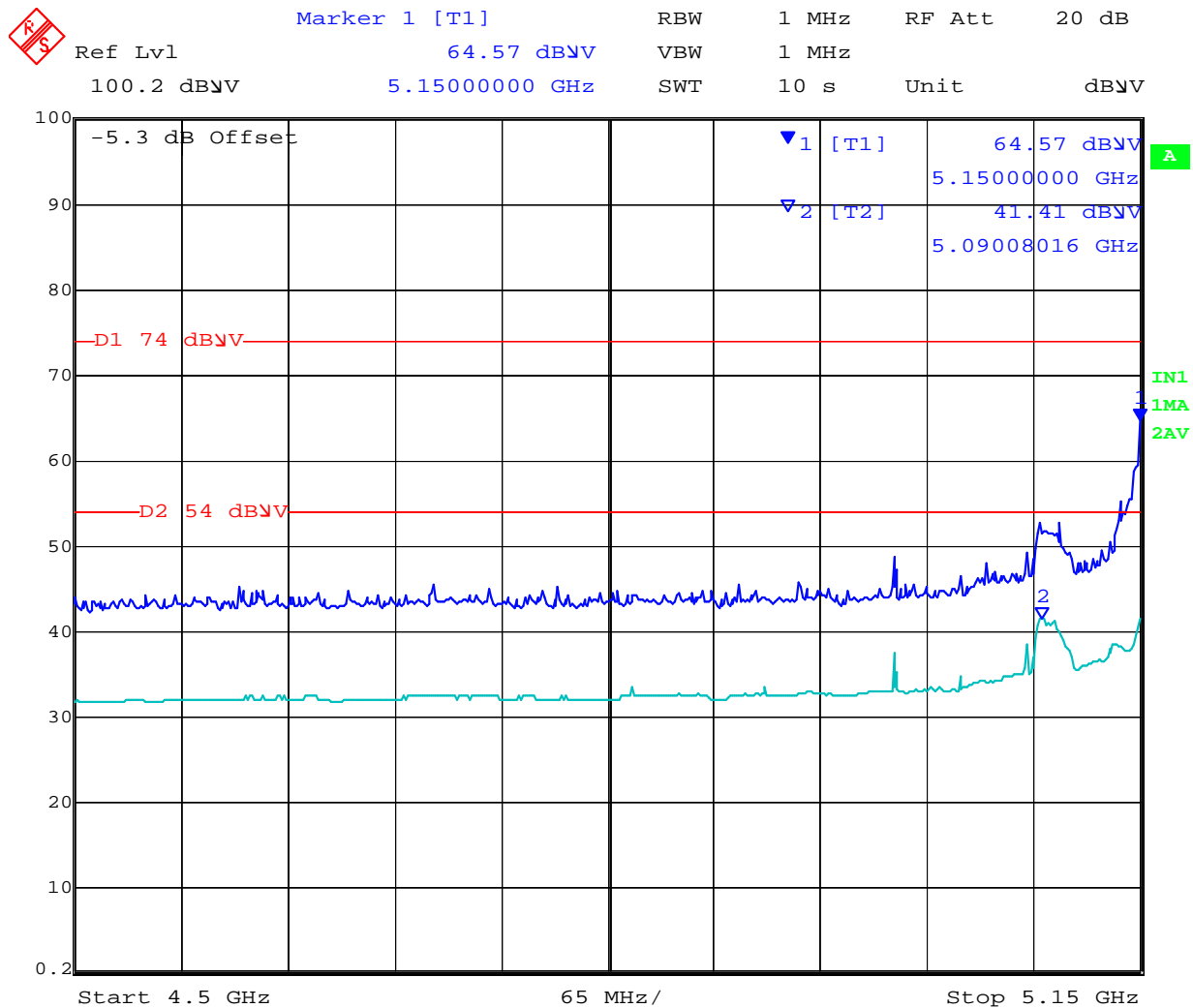
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	71.2	4.6	-9.9	65.9	Peak [Scan]	V						FUND
17454.91	40.4	8.7	1.2	50.3	Peak [Scan]	V	100	0	54.0	-3.7	Pass	
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; 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: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 56 of 169

802.11n HT-20 5150 Restricted Band-edge



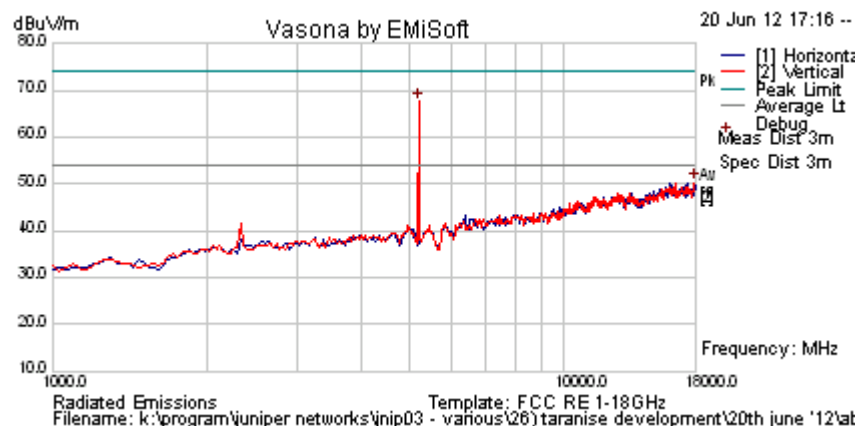
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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 57 of 169

Test Freq.	5200 MHz	Engineer	GMH
Variant	802.11n HT-20; 6.5 Mbit/s	Temp (°C)	29
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	18	Press. (mBars)	995
Antenna	Accton Paddle	Duty Cycle (%)	100
Test Notes 1	EUT S/N: JB021153959		
Test Notes 2			



Formally measured emission peaks

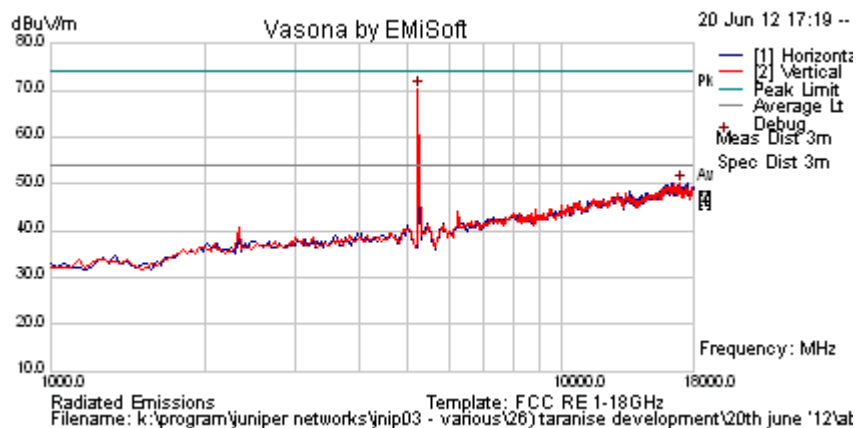
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	72.9	4.6	-9.9	67.6	Peak [Scan]	V						FUND
18000	40.7	8.8	0.7	50.3	Peak [Scan]	H	100	0	54.0	-3.7	Pass	NOISE
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 58 of 169

Test Freq.	5240 MHz	Engineer	GMH
Variant	802.11n HT-20; 6.5 Mbit/s	Temp (°C)	29
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	18	Press. (mBars)	995
Antenna	Accton Paddle	Duty Cycle (%)	100
Test Notes 1	EUT S/N: JB021153959		
Test Notes 2			



Formally measured emission peaks

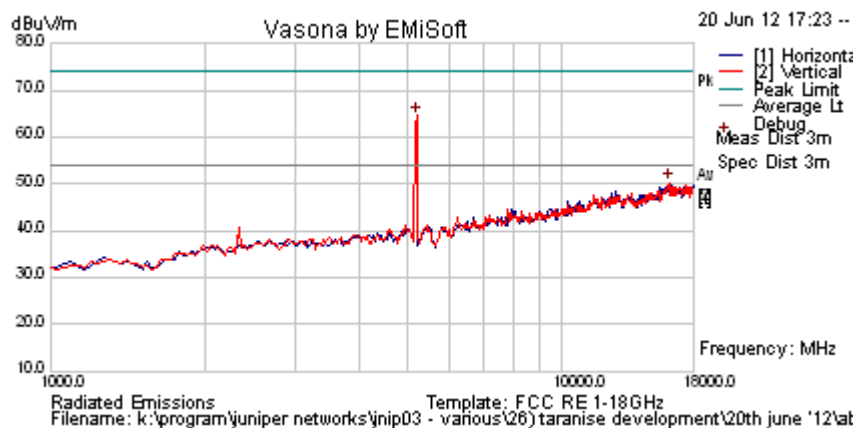
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5224.449	75.4	4.6	-9.8	70.2	Peak [Scan]	V						FUND
16977.956	41.3	8.5	0.4	50.1	Peak [Scan]	V	100	0	54.0	-3.9	Pass	NOISE
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 59 of 169

Test Freq.	5190 MHz	Engineer	GMH
Variant	802.11n HT-40; 13.5 MCS	Temp (°C)	29
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	100
Power Setting	18	Press. (mBars)	995
Antenna	Accton Paddle	Duty Cycle (%)	100
Test Notes 1	EUT S/N: JB021153959		
Test Notes 2			



Formally measured emission peaks

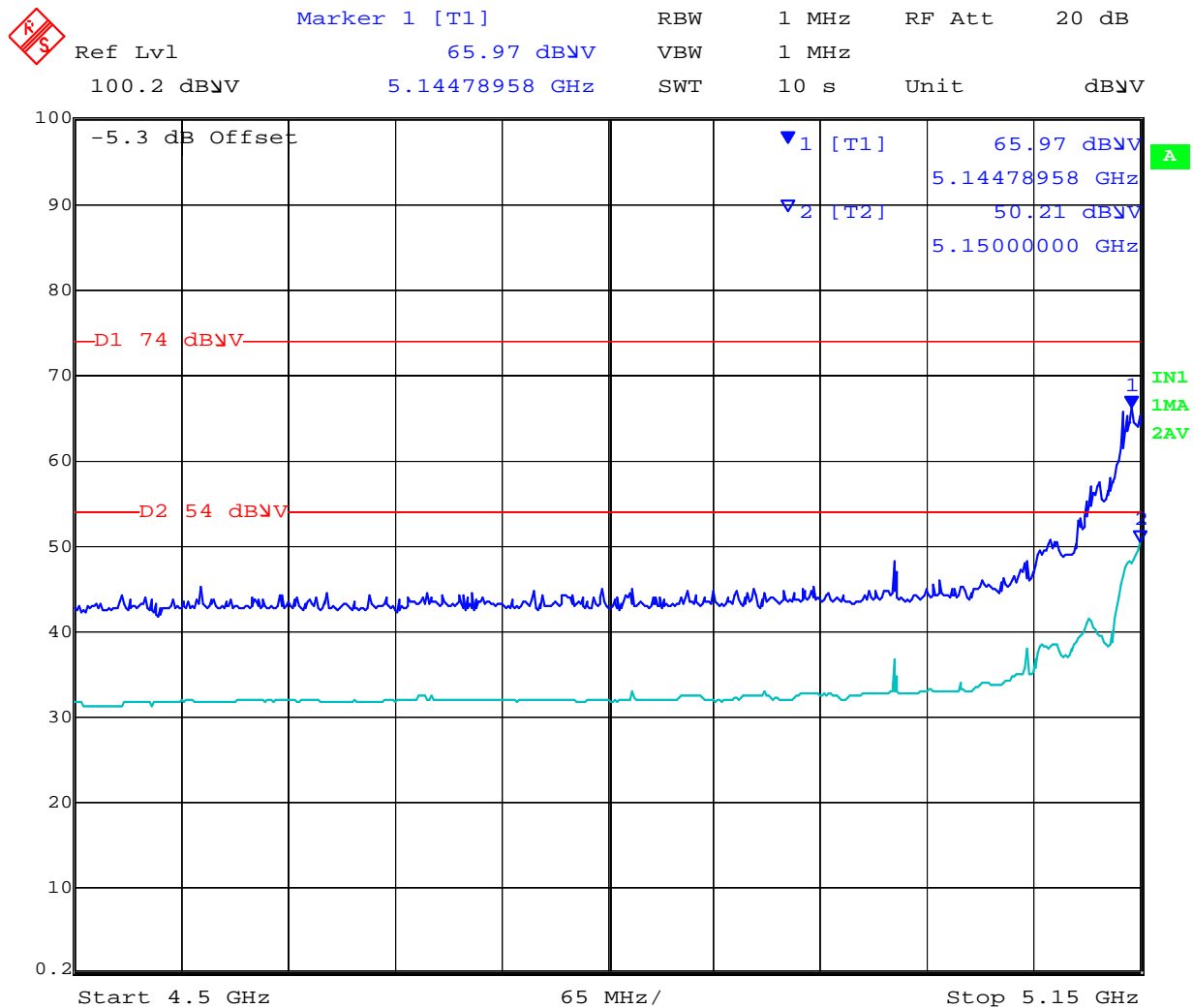
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	69.8	4.6	-9.9	64.5	Peak [Scan]	V						FUND
16228.457	41.2	8.9	0.1	50.3	Peak [Scan]	V	100	0	54.0	-3.8	Pass	NOISE
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 60 of 169

802.11n HT-40 5150 Restricted Band-edge



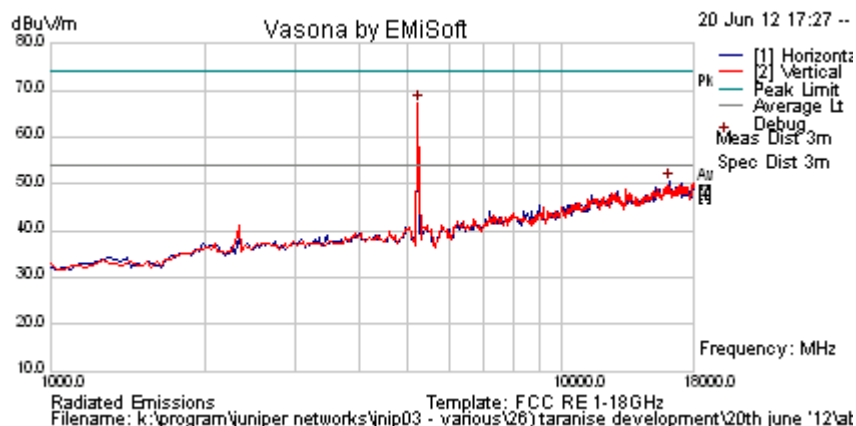
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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 61 of 169

Test Freq.	5230 MHz	Engineer	GMH
Variant	802.11n HT-40; 13.5 MCS	Temp (°C)	29
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	100
Power Setting	18	Press. (mBars)	995
Antenna	Accton Paddle	Duty Cycle (%)	100
Test Notes 1	EUT S/N: JB021153959		
Test Notes 2			



Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5224.449	72.4	4.6	-9.8	67.2	Peak [Scan]	V						FUND
16126.253	41.3	9.0	0.2	50.5	Peak [Scan]	H	100	0	54.0	-3.5	Pass	NOISE
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

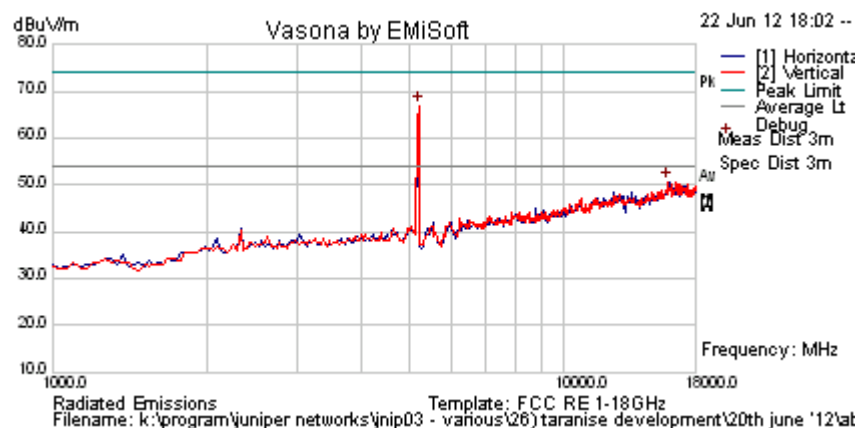
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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 62 of 169

6.1.2.2. Dual Band OMNI WLA-ANT-7360A-OUT, 8 dBi

Test Freq.	5180 MHz	Engineer	GMH
Variant	802.11a; 6 Mbs	Temp (°C)	29
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	18	Press. (mBars)	995
Antenna	Dipole Dual Band	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

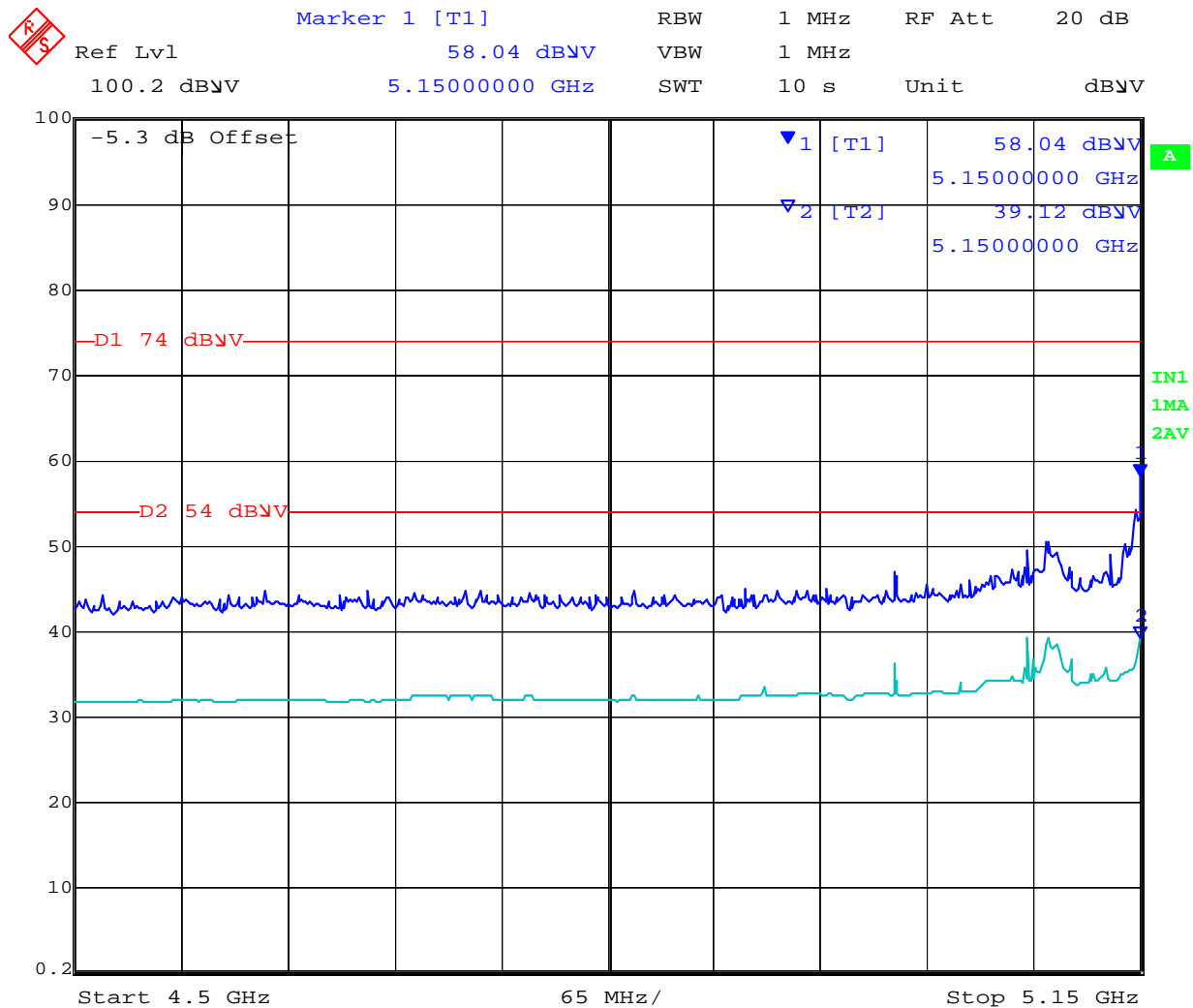
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	72.3	4.6	-9.9	67.0	Peak [Scan]	V						FUND
15921.844	41.9	8.9	-0.1	50.7	Peak [Scan]	V	100	0	54.0	-3.3	Pass	NOISE
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 63 of 169

802.11a 5150 Restricted Band-edge



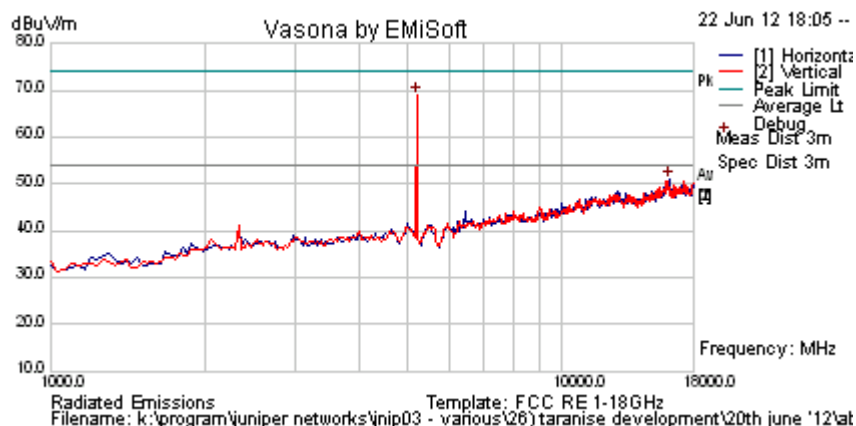
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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 64 of 169

Test Freq.	5200 MHz	Engineer	GMH
Variant	802.11a; 6 Mbs	Temp (°C)	29
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	18	Press. (mBars)	995
Antenna	Dipole Dual Band	Duty Cycle (%)	100
Test Notes 1	0		
Test Notes 2			



Formally measured emission peaks

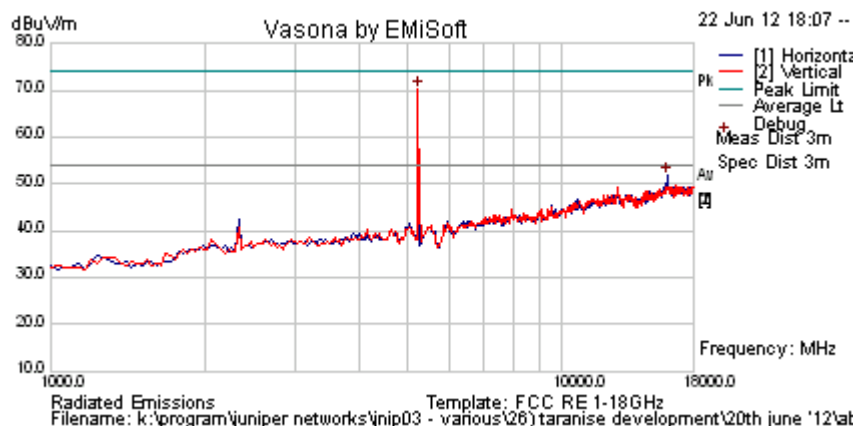
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	74.2	4.6	-9.9	68.9	Peak [Scan]	V						FUND
16160.321	41.7	9.0	0.2	50.8	Peak [Scan]	H	100	0	54.0	-3.2	Pass	NOISE
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 65 of 169

Test Freq.	5240 MHz	Engineer	GMH
Variant	802.11a; 6 Mbs	Temp (°C)	29
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	18	Press. (mBars)	995
Antenna	Dipole Dual Band	Duty Cycle (%)	100
Test Notes 1	0		
Test Notes 2			



Formally measured emission peaks

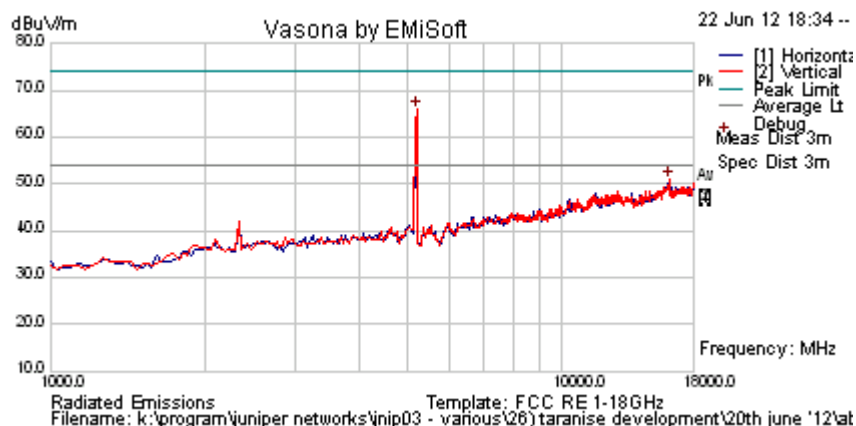
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5224.449	75.3	4.6	-9.8	70.1	Peak [Scan]	V						FUND
15989.98	42.6	9.0	0.1	51.7	Peak [Scan]	H	100	0	54.0	-2.3	Pass	NOISE
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 66 of 169

Test Freq.	5180 MHz	Engineer	GMH
Variant	802.11n HT-20; 6.5 MCS	Temp (°C)	29
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	18	Press. (mBars)	995
Antenna	Dipole Dual Band	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

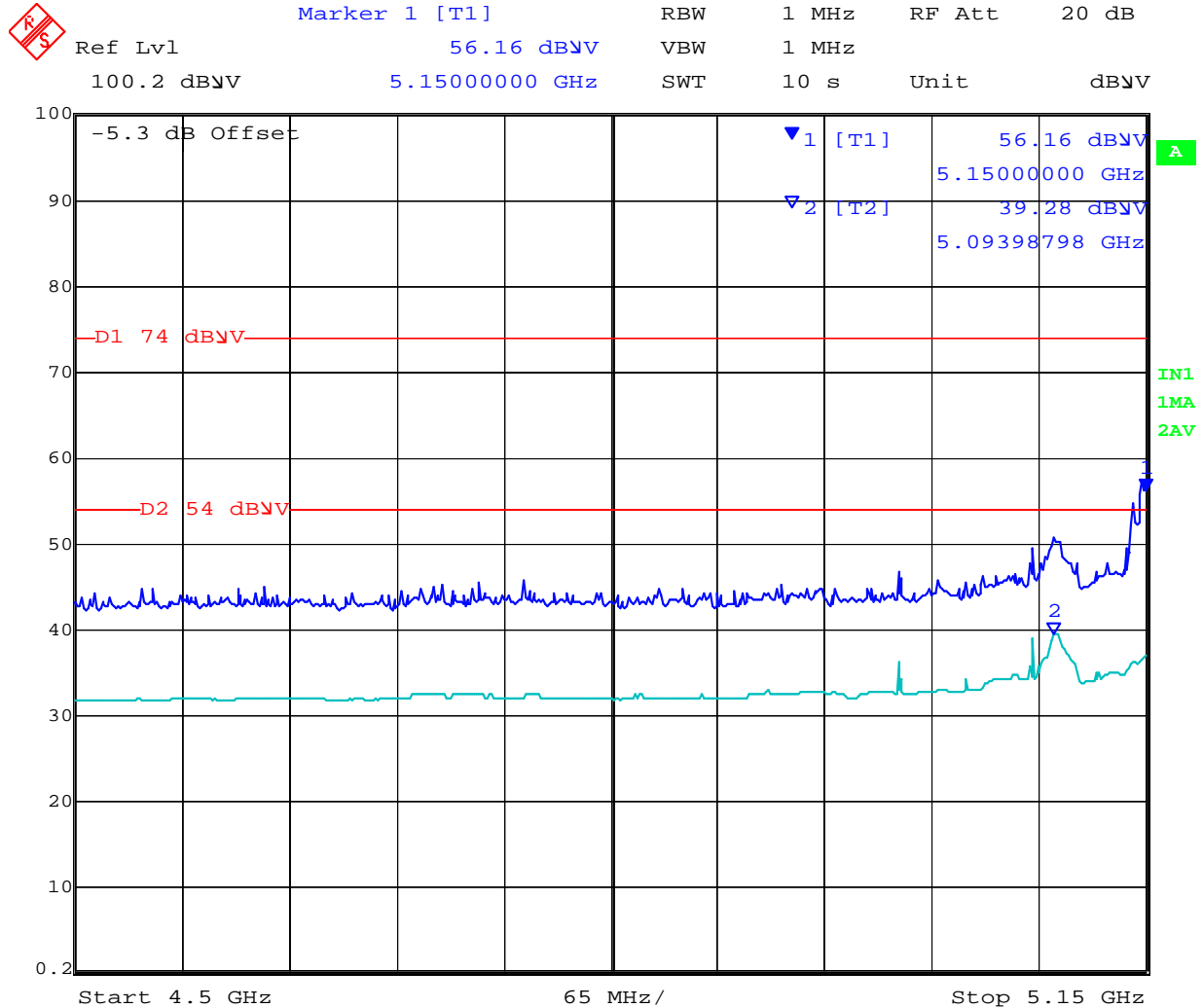
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	71.2	4.6	-9.9	65.9	Peak [Scan]	V						FUND
16160.321	41.9	9.0	0.2	51.0	Peak [Scan]	V	100	0	54.0	-3.0	Pass	NOISE
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 67 of 169

802.11n HT-20 5150 Restricted Band-edge



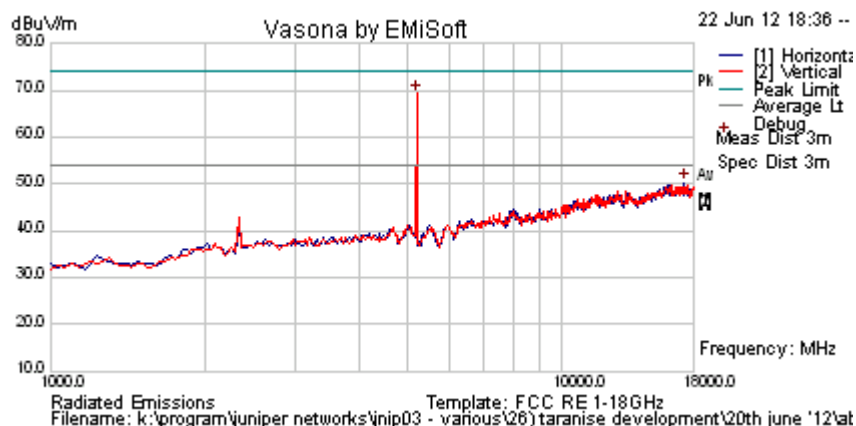
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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 68 of 169

Test Freq.	5200 MHz	Engineer	GMH
Variant	802.11n HT-20; 6.5 MCS	Temp (°C)	29
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	18	Press. (mBars)	995
Antenna		Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

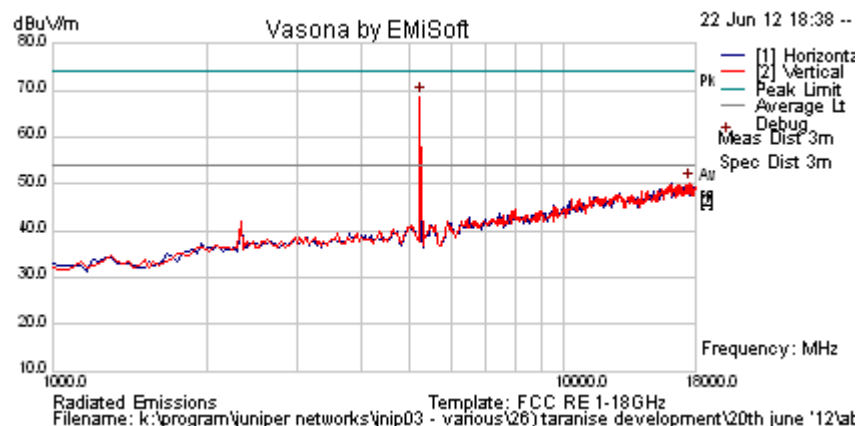
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	74.5	4.6	-9.9	69.3	Peak [Scan]	V						FUND
17284.569	40.6	8.6	1.1	50.3	Peak [Scan]	H	100	0	54.0	-3.7	Pass	NOISE
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 69 of 169

Test Freq.	5240 MHz	Engineer	GMH
Variant	802.11n HT-20; 6.5 MCS	Temp (°C)	29
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	18	Press. (mBars)	995
Antenna		Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

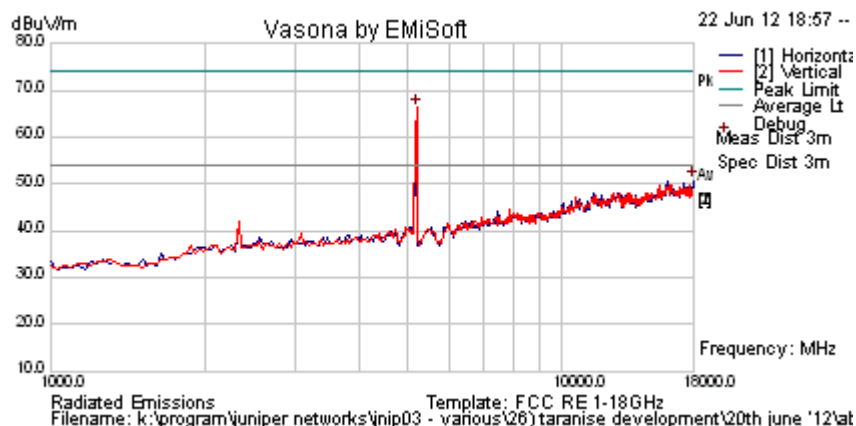
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5224.449	73.8	4.6	-9.8	68.6	Peak [Scan]	V						FUND
17591.182	40.8	8.8	0.6	50.2	Peak [Scan]	V	100	0	54.0	-3.8	Pass	NOISE
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 70 of 169

Test Freq.	5190 MHz	Engineer	GMH
Variant	802.11n HT-40; 13.5 MCS	Temp (°C)	29
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	18	Press. (mBars)	995
Antenna	Dipole Dual Band	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

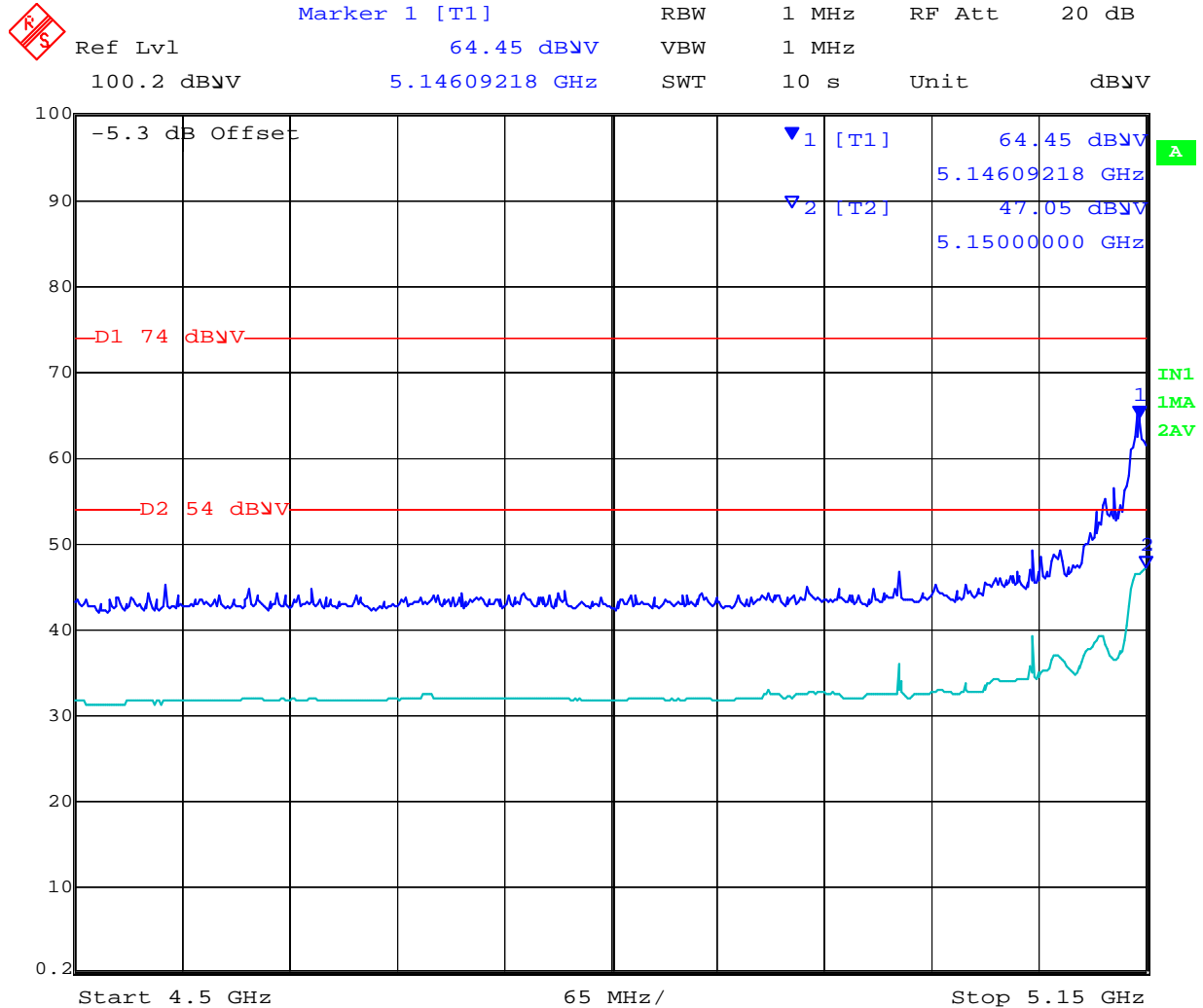
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	71.5	4.6	-9.9	66.2	Peak [Scan]	V						FUND
17965.932	41.3	8.8	0.7	50.7	Peak [Scan]	H	100	0	54.0	-3.3	Pass	NOISE
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 71 of 169

802.11n HT-40 5150 Restricted Band-edge



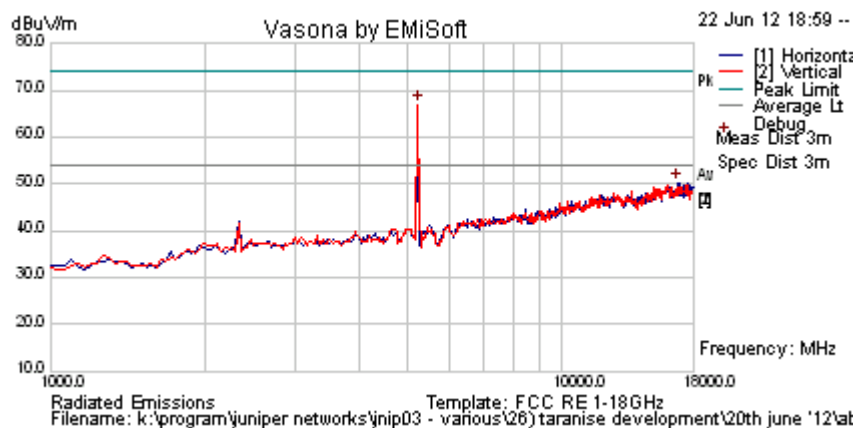
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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 72 of 169

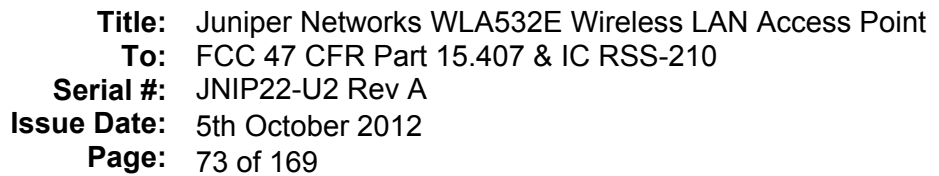
Test Freq.	5230 MHz	Engineer	GMH
Variant	802.11n HT-40; 13.5 MCS	Temp (°C)	29
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	18	Press. (mBars)	995
Antenna		Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



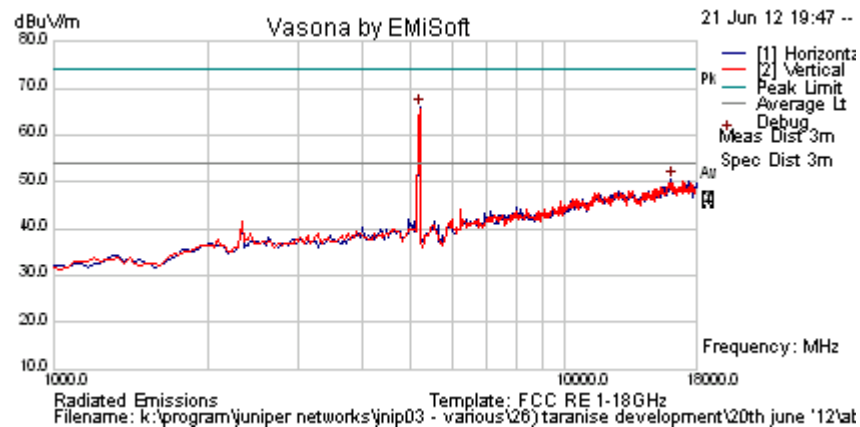
Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5224.449	72.2	4.6	-9.8	67.0	Peak [Scan]	V						FUND
16773.547	40.6	8.6	0.9	50.2	Peak [Scan]	H	100	0	54.0	-3.8	Pass	NOISE
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Test Freq.	5180 MHz	Engineer	GMH
Variant	802.11a; 6 Mbs	Temp (°C)	29
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	18	Press. (mBars)	995
Antenna	WLA-ANT-77555 Directional	Duty Cycle (%)	100
Test Notes 1	EUT S/N: JB021153959		
Test Notes 2			

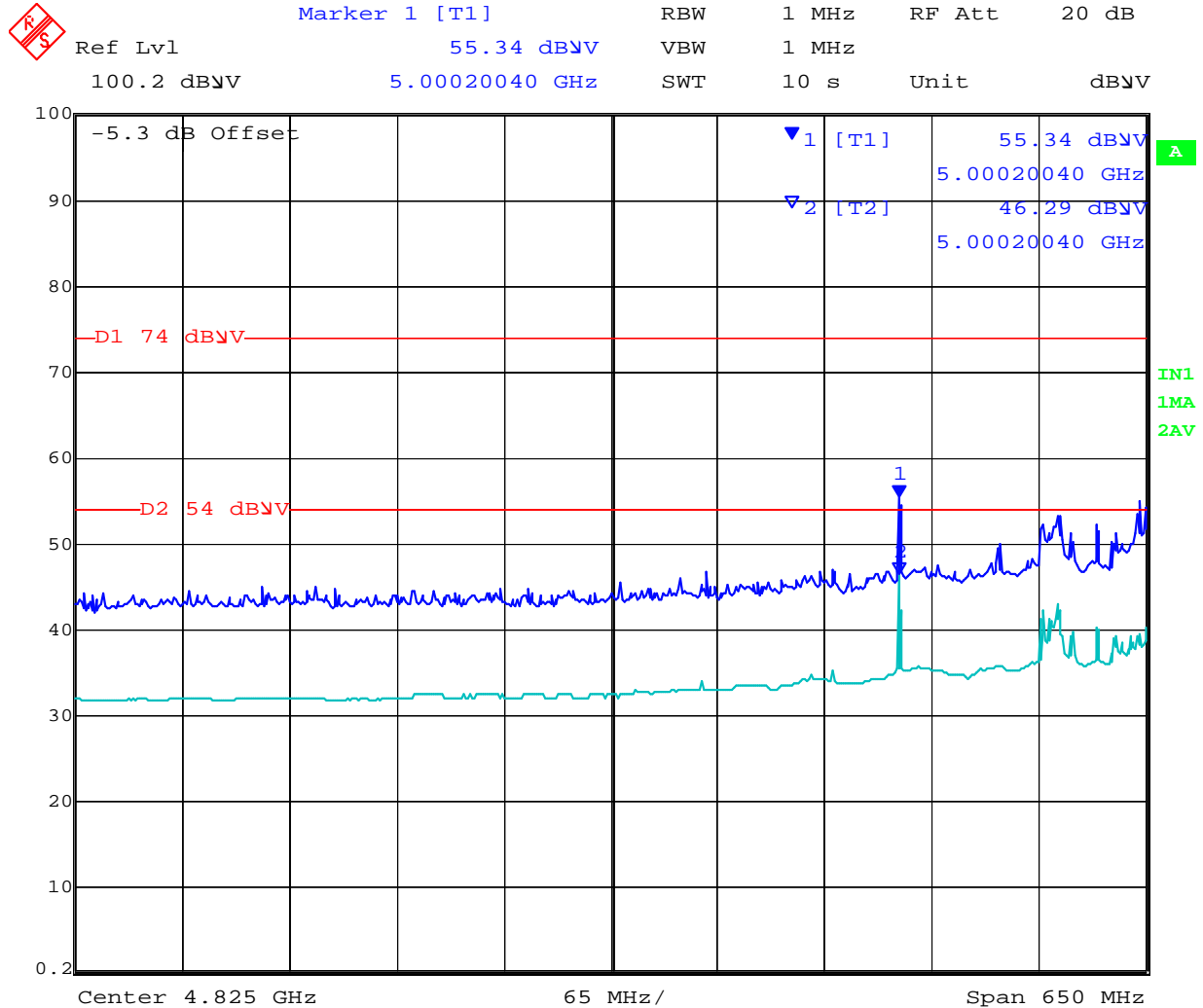
[illegible]

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



Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 74 of 169

802.11a 5150 Restricted Band-edge



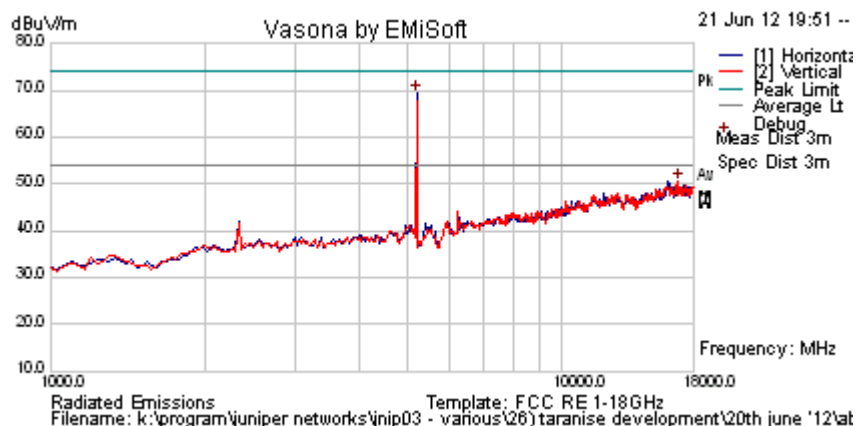
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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 75 of 169

Test Freq.	5200 MHz	Engineer	GMH
Variant	802.11a; 6 Mbs	Temp (°C)	29
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	18	Press. (mBars)	995
Antenna	WLA-ANT-77555 Directional	Duty Cycle (%)	100
Test Notes 1	EUT S/N: JB021153959		
Test Notes 2			



Formally measured emission peaks

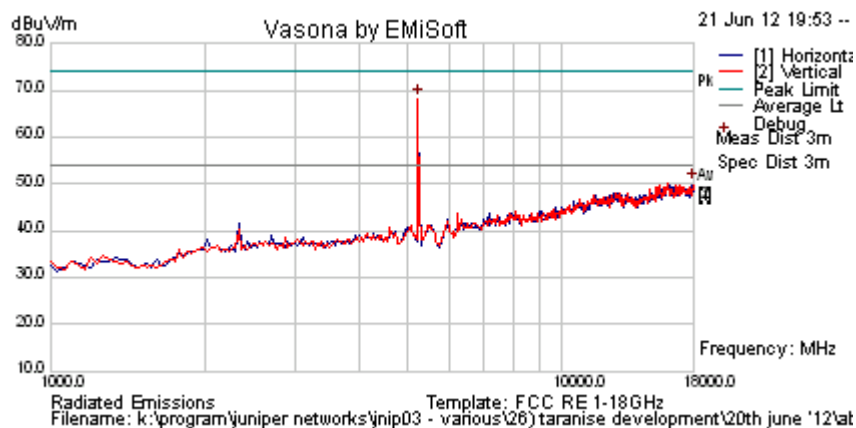
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	74.6	4.6	-9.9	69.4	Peak [Scan]	H						FUND
16841.683	41.2	8.6	0.8	50.6	Peak [Scan]	V	100	0	54.0	-3.5	Pass	NOISE
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 76 of 169

Test Freq.	5240 MHz	Engineer	GMH
Variant	802.11a; 6 Mbs	Temp (°C)	29
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	18	Press. (mBars)	995
Antenna	WLA-ANT-77555 Directional	Duty Cycle (%)	100
Test Notes 1	EUT S/N: JB021153959		
Test Notes 2			



Formally measured emission peaks

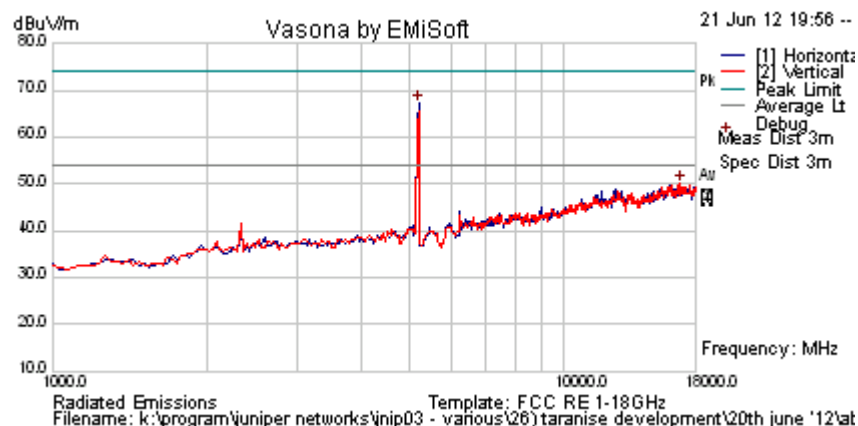
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5224.449	73.4	4.6	-9.8	68.2	Peak [Scan]	H						FUND
18000	40.7	8.8	0.7	50.2	Peak [Scan]	V	100	0	54.0	-3.8	Pass	NOISE
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 77 of 169

Test Freq.	5180 MHz	Engineer	GMH
Variant	802.11n HT-20; 6.5 MCS	Temp (°C)	29
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	18	Press. (mBars)	995
Antenna	WLA-ANT-77555 Directional	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

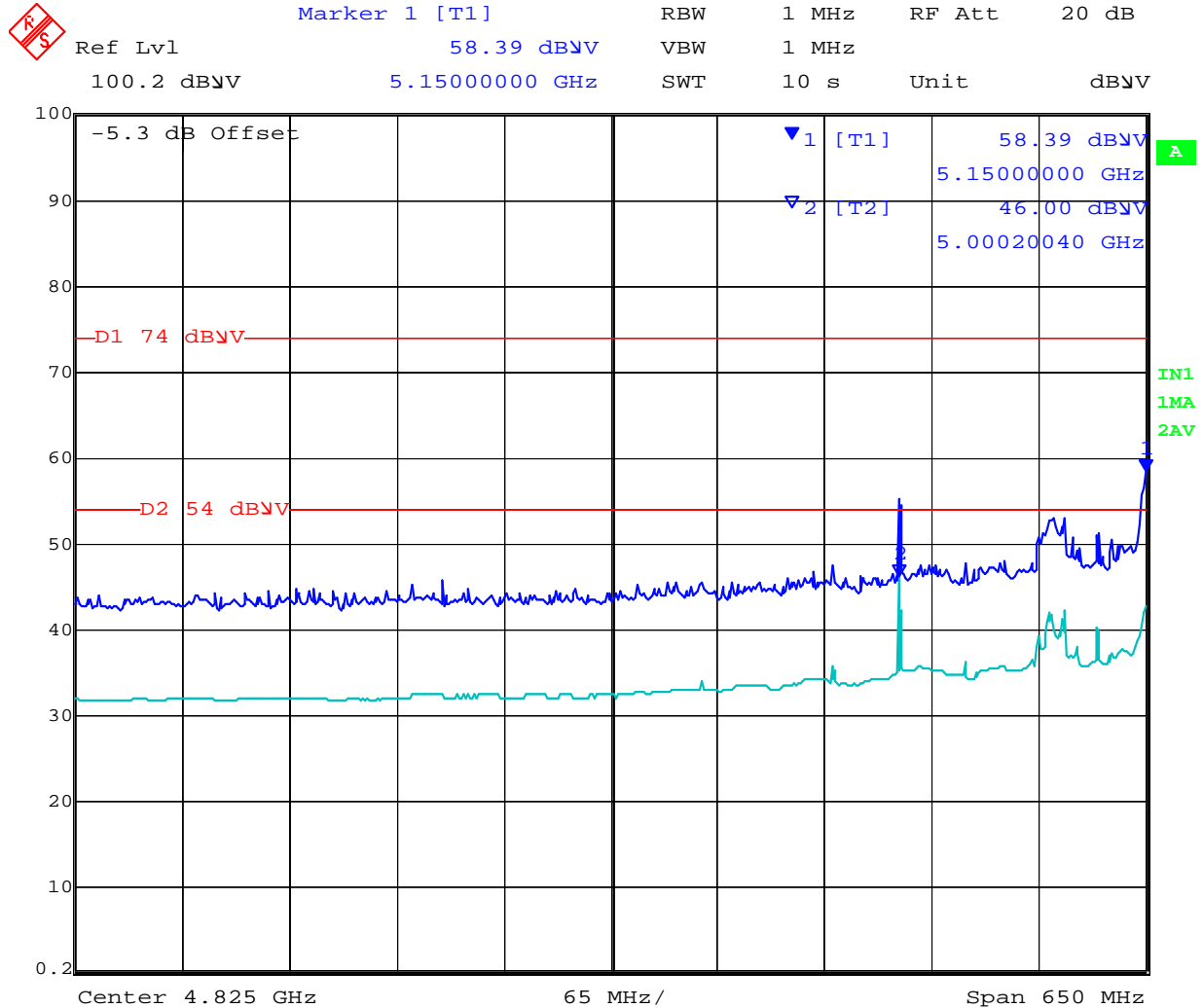
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	72.4	4.6	-9.9	67.1	Peak [Scan]	H						FUND
16841.683	40.8	8.6	0.8	50.1	Peak [Scan]	V	100	0	54.0	-3.9	Pass	NOISE
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 78 of 169

802.11n HT-20 5150 Restricted Band-edge



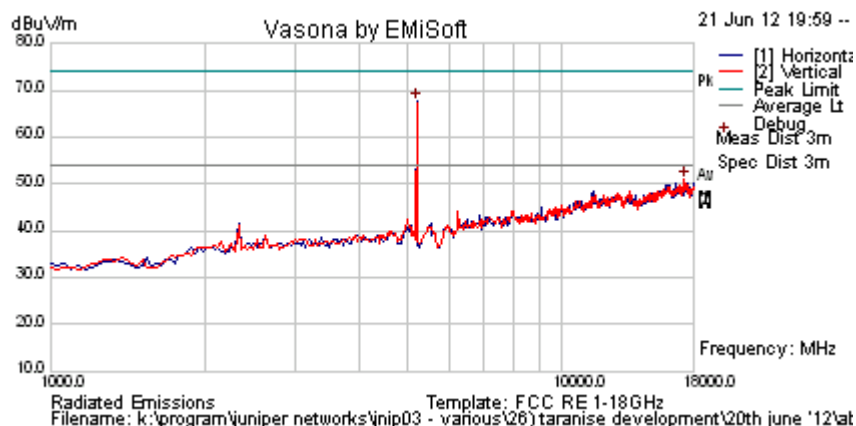
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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 79 of 169

Test Freq.	5200 MHz	Engineer	GMH
Variant	802.11n HT-20; 6.5 MCS	Temp (°C)	29
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	18	Press. (mBars)	995
Antenna	WLA-ANT-77555 Directional	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

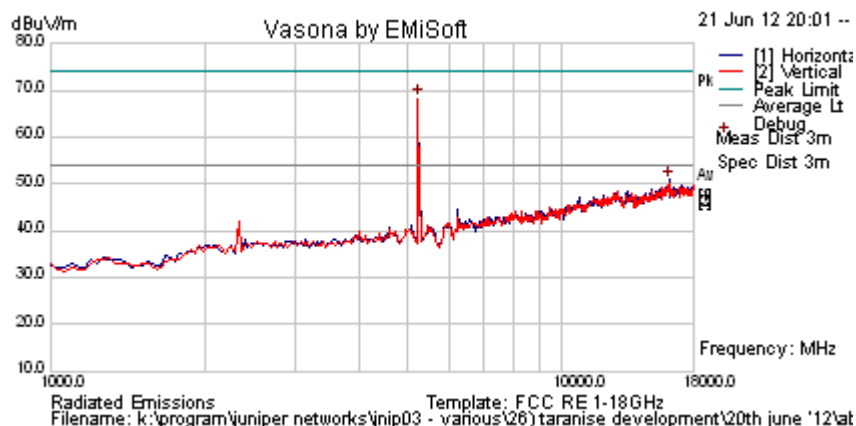
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	73.0	4.6	-9.9	67.7	Peak [Scan]	H						FUND
17318.637	40.9	8.7	1.2	50.8	Peak [Scan]	V	100	0	54.0	-3.2	Pass	NOISE
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 80 of 169

Test Freq.	5240 MHz	Engineer	GMH
Variant	802.11n HT-20; 6.5 MCS	Temp (°C)	29
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	18	Press. (mBars)	995
Antenna	WLA-ANT-77555 Directional	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

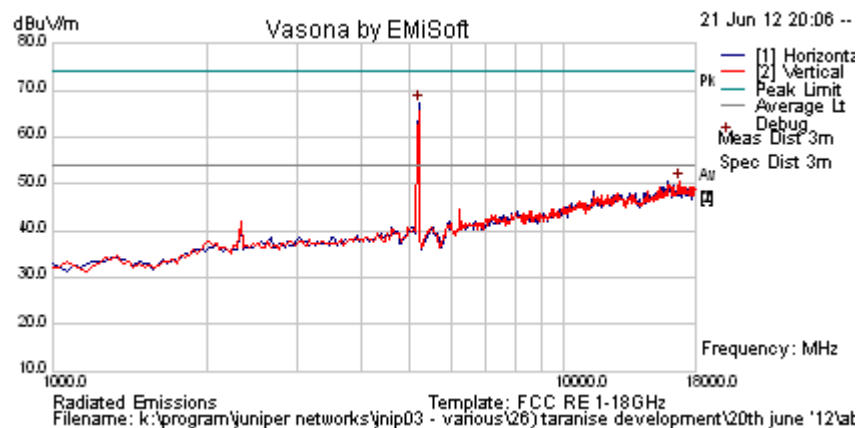
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5224.449	73.5	4.6	-9.8	68.3	Peak [Scan]	V						FUND
16160.321	41.8	9.0	0.2	50.9	Peak [Scan]	H	100	0	54.0	-3.1	Pass	NOISE
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 81 of 169

Test Freq.	5190 MHz	Engineer	GMH
Variant	802.11n HT-40; 13.5 MCS	Temp (°C)	29
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	18	Press. (mBars)	995
Antenna	WLA-ANT-77555 Directional	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

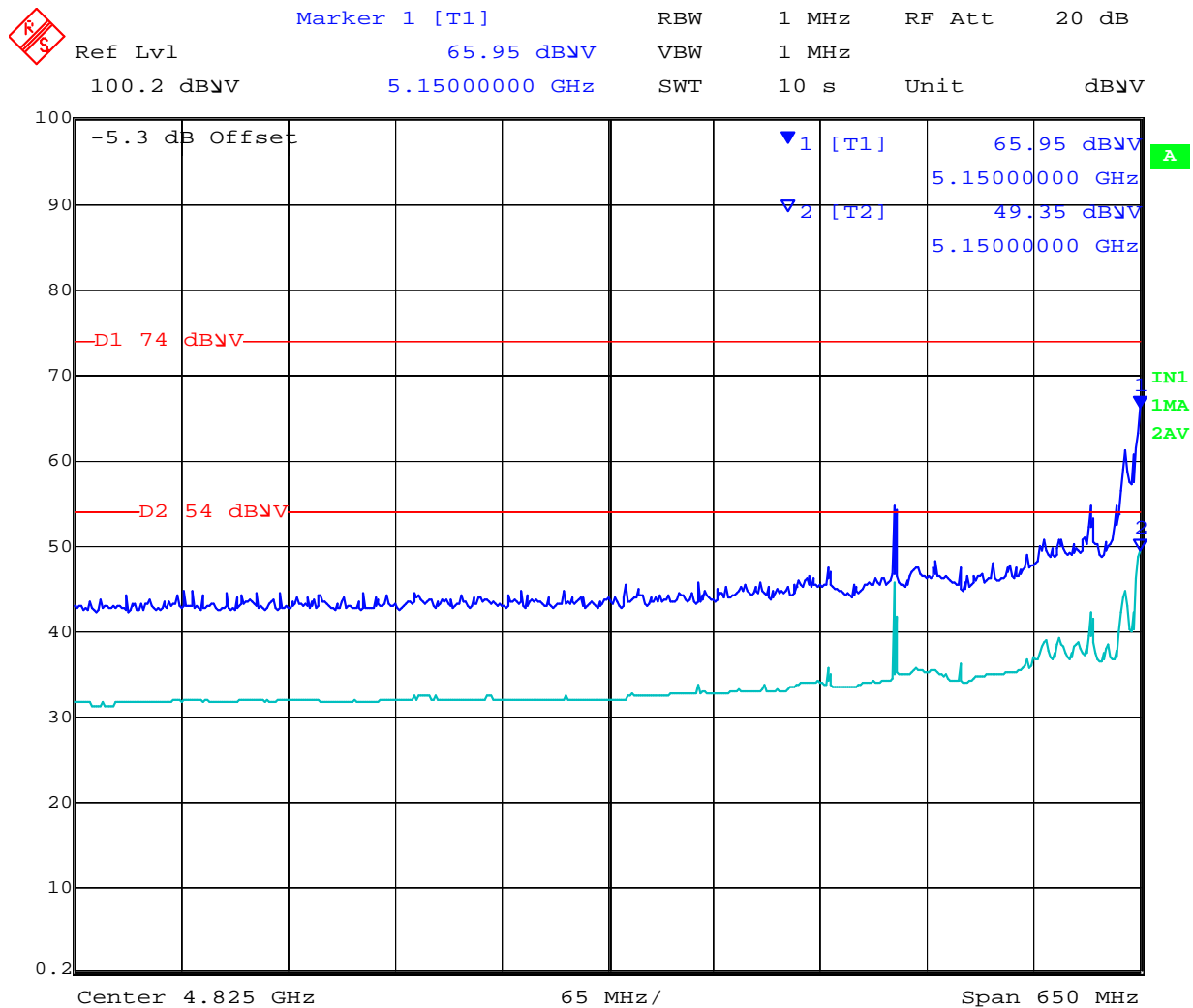
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	72.4	4.6	-9.9	67.2	Peak [Scan]	H						FUND
16773.547	41.0	8.6	0.9	50.6	Peak [Scan]	V	100	0	54.0	-3.5	Pass	NOISE
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 82 of 169

802.11n HT-40 5150 Restricted Band-edge



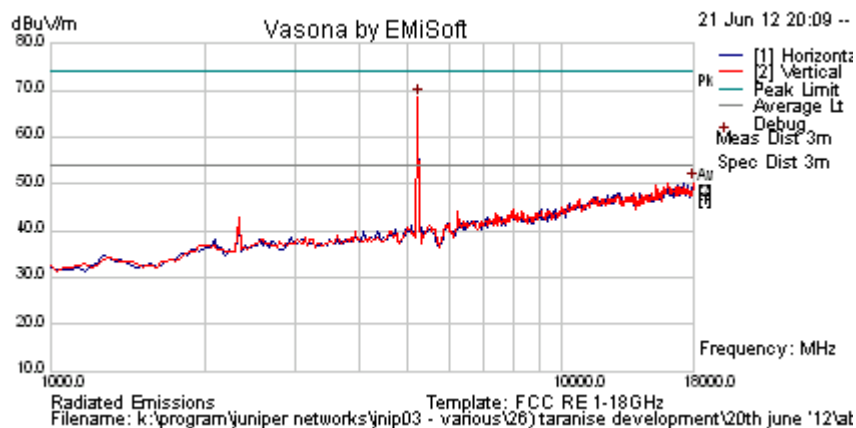
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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 83 of 169

Test Freq.	5230 MHz	Engineer	GMH
Variant	802.11n HT-40; 13.5 MCS	Temp (°C)	29
Freq. Range	1000 MHz - 18000 MHz	Rel. Hum.(%)	34
Power Setting	18	Press. (mBars)	995
Antenna	WLA-ANT-77555 Directional	Duty Cycle (%)	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5224.449	73.6	4.6	-9.8	68.4	Peak [Scan]	V						FUND
18000	40.9	8.8	0.7	50.4	Peak [Scan]	V	100	0	54.0	-3.6	Pass	NOISE
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 84 of 169

6.1.2.4. Digital Emissions (30M-1 GHz)

FCC, Part 15 Subpart C §15.205/ §15.209
Industry Canada RSS-210 §2.2

Test Procedure

Testing 30M-1 GHz was performed in a 3-meter anechoic chamber using a CISPR compliant receiver. Preliminary radiated emissions were measured on every azimuth and with the receiving antenna in both horizontal and vertical polarizations. To further maximize emissions the receive antenna was varied between 1 and 4 meters. The emissions are recorded with receiver in peak hold mode. Emissions closest to the limits are measured in the quasi-peak mode with the tuned receiver using a bandwidth of 120 kHz. Only the highest emissions relative to the limit are listed. The anechoic chamber test set-up is identified in Section 6 Test Set-Up Photographs.

The EUT had two methods of powering on ac/dc converter and Power over Ethernet (POE). Both modes were tested for emissions below 1GHz.

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Loss, and subtracting Amplifier Gain from the measured reading. In this test facility, the Antenna Factor, Cable Loss, and Amplifier Gains are loaded into the Rohde & Schwarz Receiver and the corrected field strength can be read directly on the receiver.

$$FS = R + AF + CORR$$

where:

FS = Field Strength

R = Measured Receiver Input Amplitude

AF = Antenna Factor

CORR = Correction Factor = CL – AG + NFL

CL = Cable Loss

AG = Amplifier Gain

For example:

Given a Receiver input reading of 51.5dB μ V; Antenna Factor of 8.5dB; Cable Loss of 1.3dB; Falloff Factor of 0dB, an Amplifier Gain of 26dB and Notch Filter Loss of 1dB. 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:

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

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

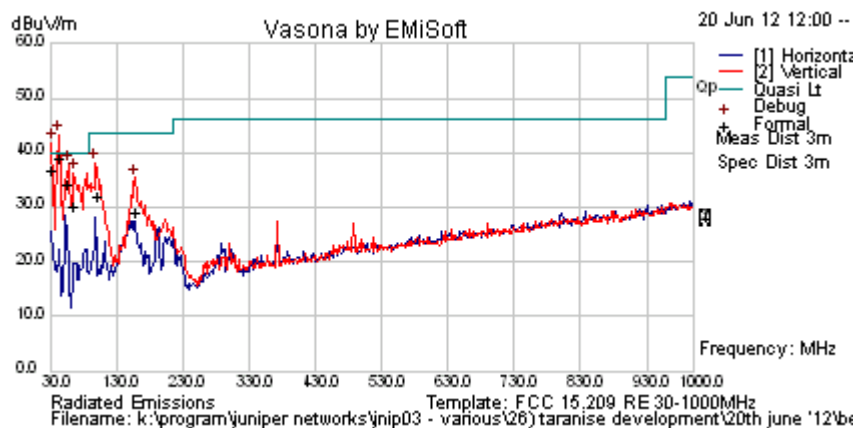
$$48 \text{ dB}\mu\text{V/m} = 250\mu\text{V/m}$$

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 85 of 169

Test Freq.	N/A	Engineer	GMH
Variant	Digital Emissions	Temp (°C)	27.5
Freq. Range	30 MHz - 1000 MHz	Rel. Hum.(%)	30
Power Setting	18	Press. (mBars)	995
Antenna	Dual Band (Small Paddle)		
Test Notes 1	Serial Number: JB021153959		
Test Notes 2			



Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
43.843	55.6	3.6	-20.2	39.0	Quasi Max	V	98	194	40	-1.1	Pass	
32.350	44.7	3.5	-11.5	36.7	Quasi Max	V	131	73	40.0	-3.3	Pass	
57.755	54.5	3.8	-24.1	34.1	Quasi Max	V	101	207	40.0	-5.9	Pass	
65.960	49.7	3.8	-23.5	30.0	Quasi Max	V	163	353	40.0	-10.0	Pass	
101.899	48.6	4.1	-20.7	32.0	Quasi Max	V	110	124	43.5	-11.5	Pass	
159.036	43.4	4.4	-18.8	28.9	Quasi Max	V	116	332	43.5	-14.6	Pass	

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

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 86 of 169

Specification

Limits

§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.

§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.

§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.

§15.209 (a) and RSS-Gen §2.2 Limit Matrix

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 Radiated Emissions

Measurement uncertainty	+5.6/ -4.5 dB
-------------------------	---------------

Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-03 'Measurement of Radiated Emissions'	0088, 0158, 0134, 0304, 0311, 0315, 0310, 0312

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 87 of 169

6.1.3. AC Wireline Conducted Emissions (150 kHz – 30 MHz)

FCC, Part 15 Subpart C §15.207

Industry Canada RSS-Gen §7.2.2

Test Procedure

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

Measurement Results for AC Wireline Conducted Emissions (150 kHz – 30 MHz)

Ambient conditions.

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

Not required - EUT is POE only.



Specification

Limit

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

RSS-Gen §7.2.2

The radio frequency voltage that is conducted back into the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in the table below. The tighter limit applies at the frequency range boundaries.

§15.207 (a) and **RSS-Gen §7.2.2** Limit Matrix

The lower limit applies at the boundary between frequency ranges

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

* Decreases with the logarithm of the frequency

Laboratory Measurement Uncertainty for Conducted Emissions

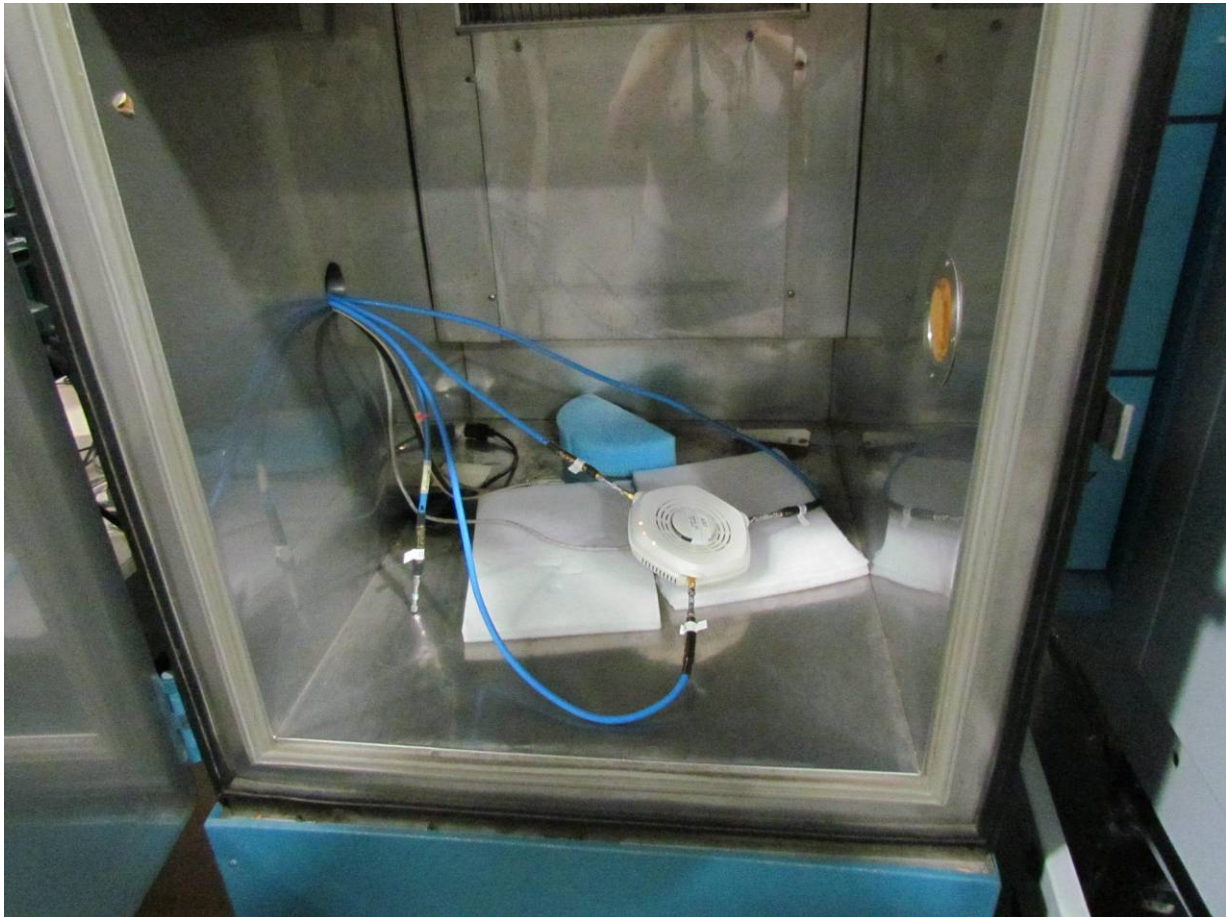
Measurement uncertainty	± 2.64 dB
-------------------------	---------------

Traceability

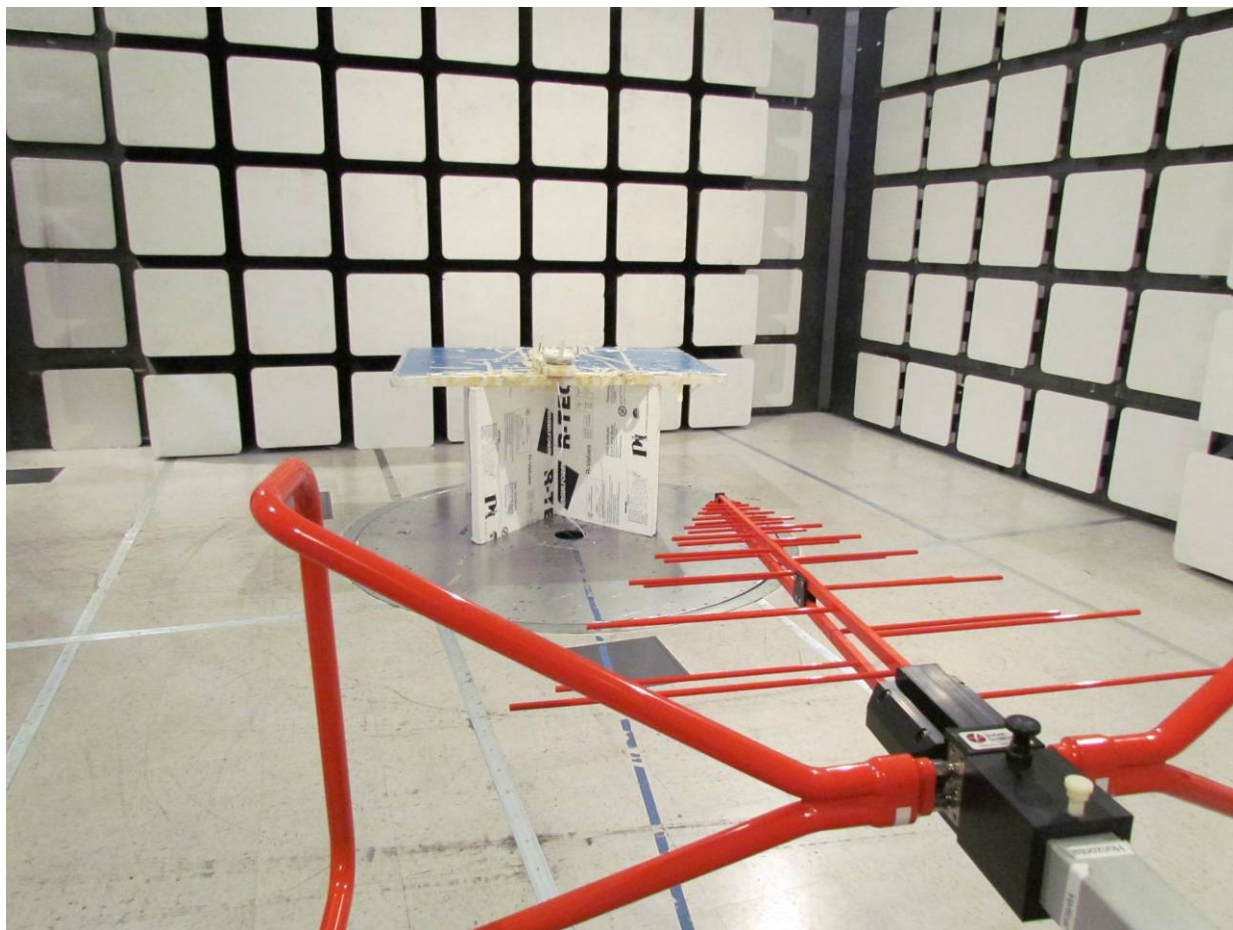
Method	Test Equipment Used
Measurements were made per work instruction WI-EMC-01 'Measurement of Conducted Emissions'	0158, 0184, 0287, 0190, 0293, 0307

7. PHOTOGRAPHS

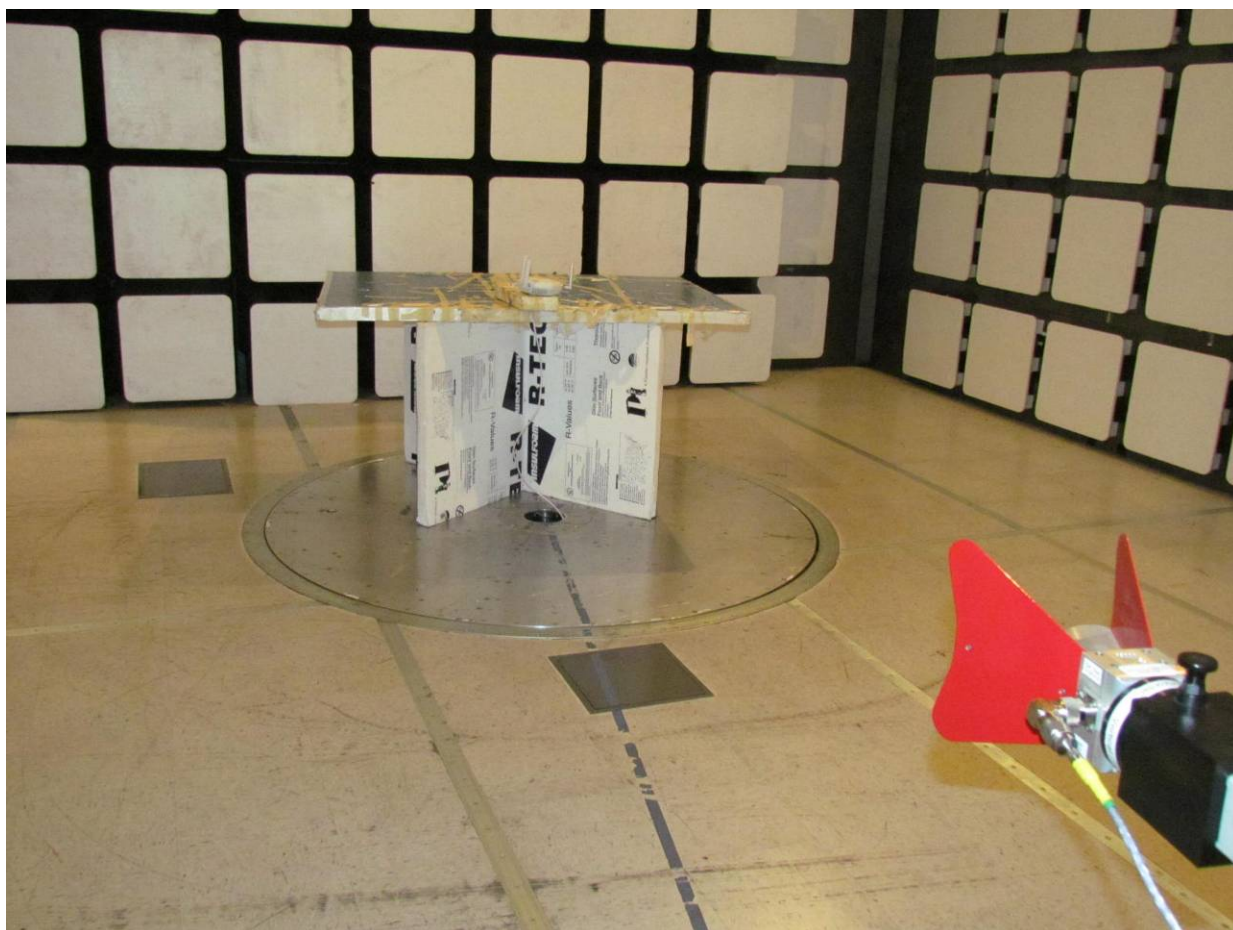
7.1. Conducted Test Setup



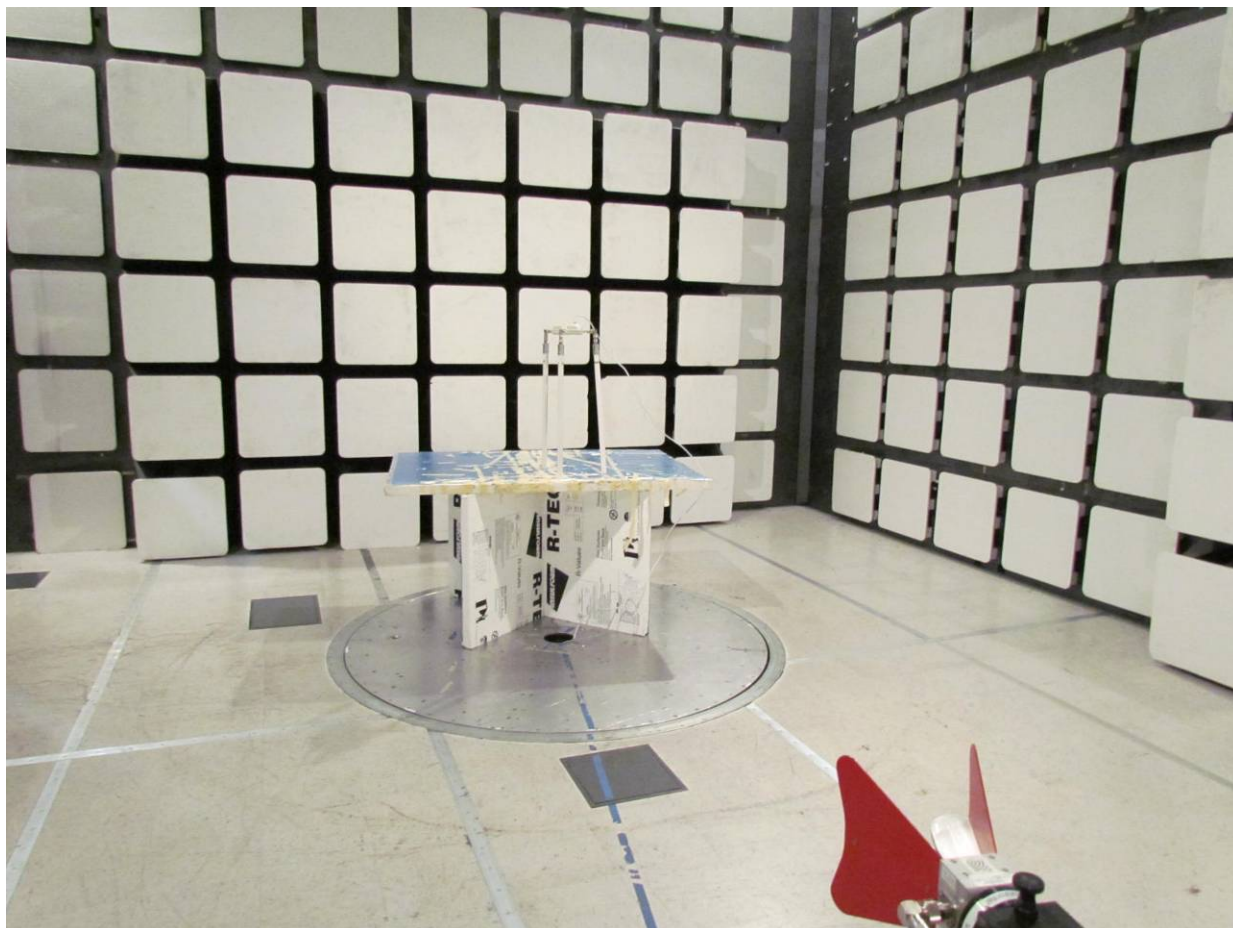
7.2. Test Setup - Digital Emissions below 1 GHz



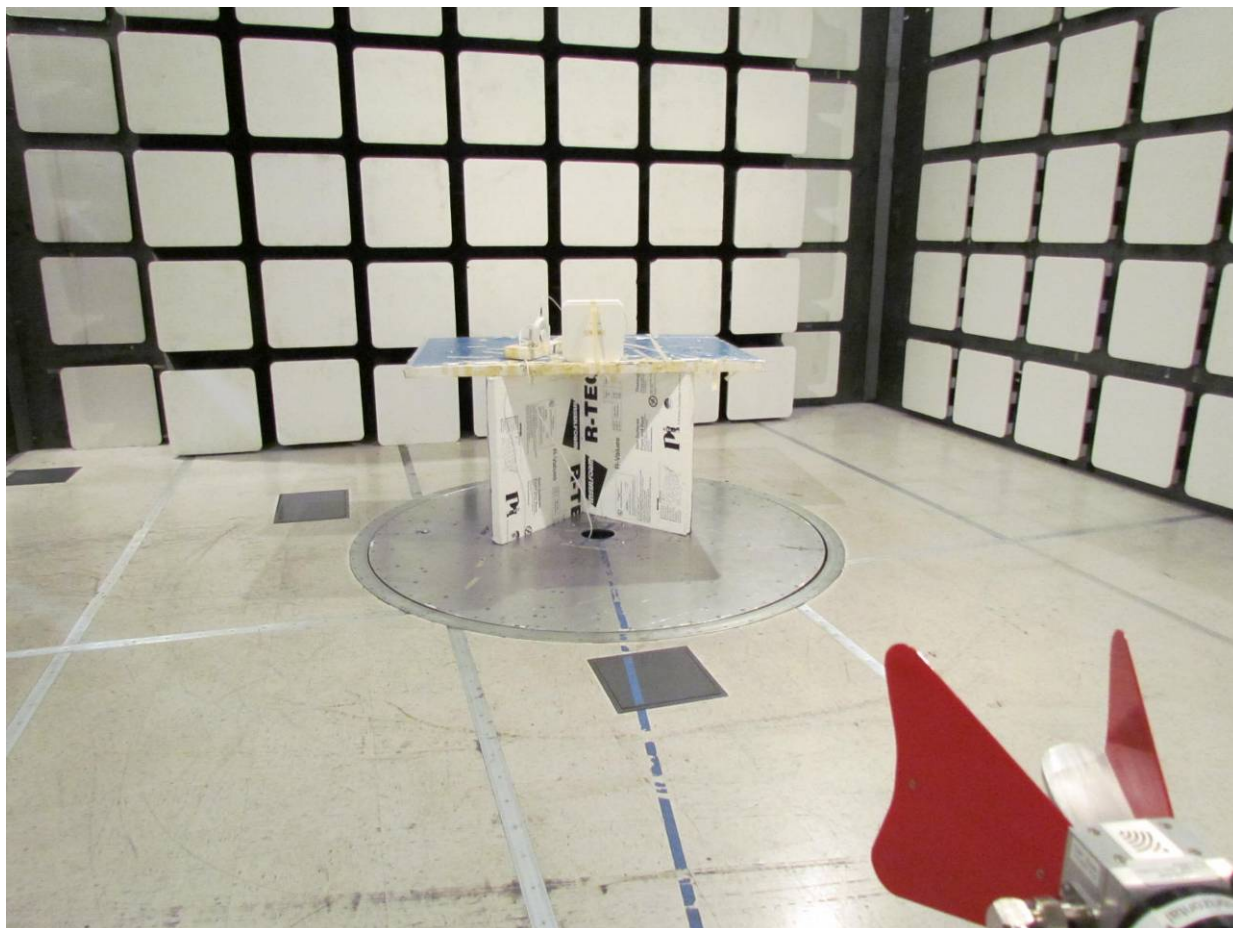
7.3. Radiated Emissions Test Setup >1 GHz – WLA-ANT-7360P-IN



7.4. Radiated Emissions Test Setup >1 GHz – WLA-ANT-7360A-OUT



7.5. Radiated Emissions Test Setup >1 GHz – WLA-ANT-77555-OUT





Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 94 of 169

8. TEST EQUIPMENT DETAILS

Asset #	Instrument	Manufacturer	Part #	Serial #	Calibration Due Date
0070	Power Meter	Hewlett Packard	437B	3125U11552	28 th Nov 12
0117	Power Sensor	Hewlett Packard	8487D	3318A00371	15 th Nov 12
0223	Power Meter	Hewlett Packard	EPM-442A	US37480256	15 th Nov 12
0374	Power Sensor	Hewlett Packard	8485A	3318A19694	29 th Nov 12
0158	Barometer /Thermometer	Control Co.	4196	E2846	8 th Dec 12
0193	EMI Receiver	Rhode & Schwartz	ESI 7	838496/007	2 nd Dec 12
0287	EMI Receiver	Rhode & Schwartz	ESIB40	100201	16 th Nov 12
0338	30 - 3000 MHz Antenna	Sunol	JB3	A052907	8 th Nov 12
0335	1-18 GHz Horn Antenna	EMCO	3117	00066580	7 th Nov 12
0252	SMA Cable	Megaphase	Sucoflex 104	None	N/A
0293	BNC Cable	Megaphase	1689 1GVT4	15F50B001	N/A
0307	BNC Cable	Megaphase	1689 1GVT4	15F50B002	N/A
0310	2m SMA Cable	Micro-Coax	UFA210A-0-0787-3G03G0	209089-001	N/A
0312	3m SMA Cable	Micro-Coax	UFA210A-1-1181-3G0300	209092-001	N/A
0314	30dB N-Type Attenuator	ARRA	N9444-30	1623	N/A
0301	5.6 GHz Notch Filter	Micro-Tronics	RBC50704	001	N/A
0302	5.25 GHz Notch Filter	Micro-Tronics	BRC50703	002	N/A
0303	5.8 GHz Notch Filter	Micro-Tronics	BRC50705	003	N/A
0304	2.4GHzHz Notch Filter	Micro-Tronics	--	001	N/A

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 95 of 169

APPENDIX

A. SUPPORTING INFORMATION

A.1. CONDUCTED TEST PLOTS

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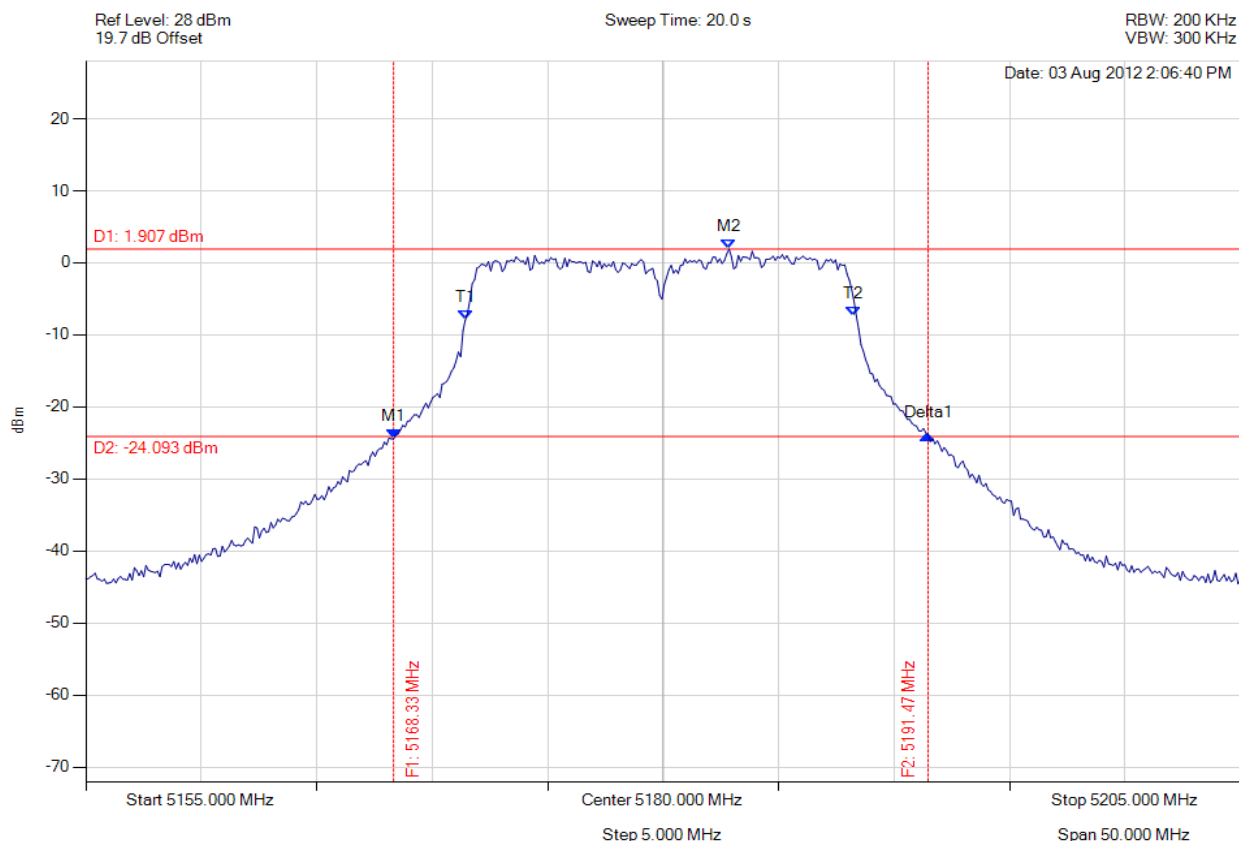
Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 96 of 169

A.1.1. 26 dB & 99% Bandwidth



26 dB and 99% Emission Bandwidth

Variant: 802.11a, Channel: 5180.00 MHz, Chain A, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5168.327 MHz : -24.422 dBm M2 : 5182.856 MHz : 1.907 dBm Delta1 : 23.146 MHz : 0.537 dBm T1 : 5171.433 MHz : -7.932 dBm T2 : 5188.267 MHz : -7.379 dBm OBW : 16.934 MHz	Measured 26 dB Bandwidth: 23.146 MHz Limit 26 dB Bandwidth: 0.5 MHz Margin 26 dB Bandwidth: -22.65 MHz Measured 99% Bandwidth: 16.934 MHz

[Back to the Matrix](#)

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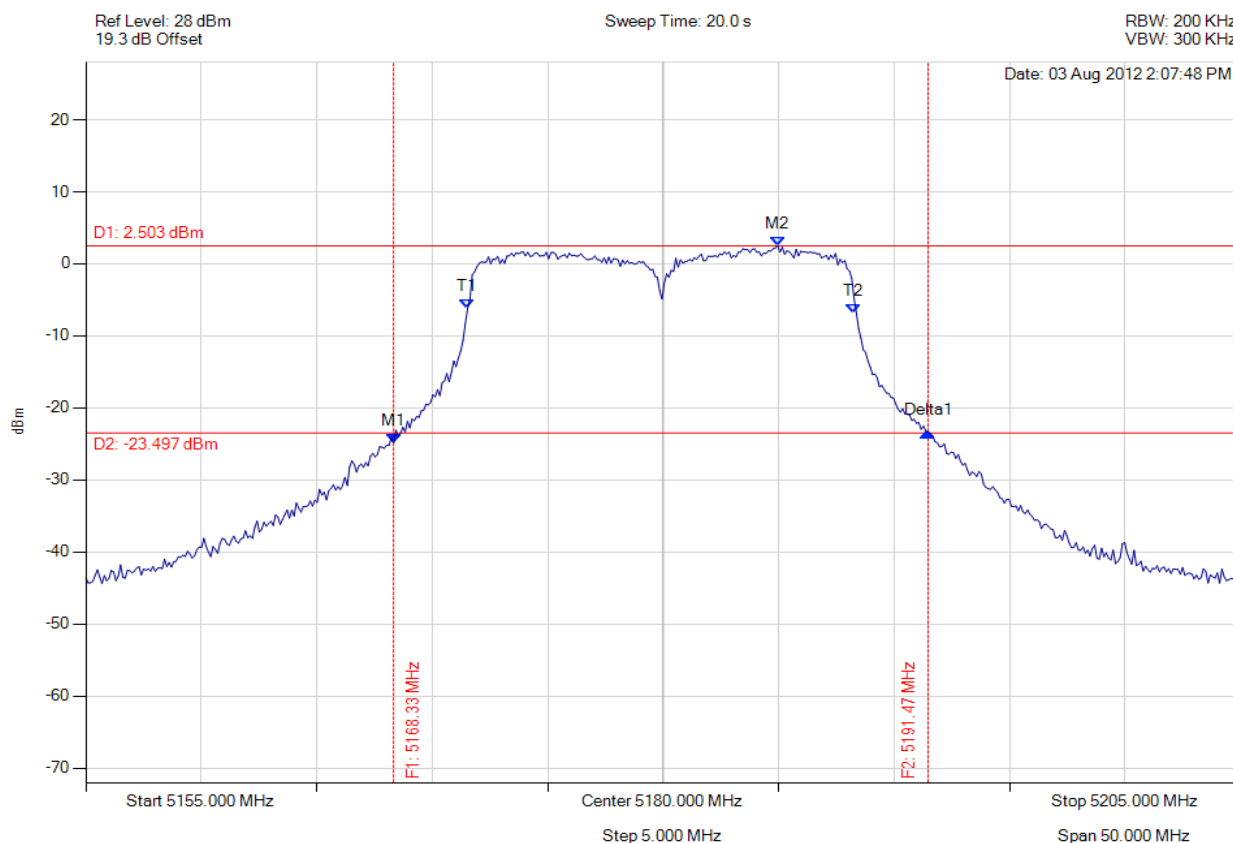


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 97 of 169



26 dB and 99% Emission Bandwidth

Variant: 802.11a, Channel: 5180.00 MHz, Chain B, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5168.327 MHz : -24.847 dBm M2 : 5184.960 MHz : 2.503 dBm Delta1 : 23.146 MHz : 1.458 dBm T1 : 5171.533 MHz : -6.185 dBm T2 : 5188.267 MHz : -6.801 dBm OBW : 16.834 MHz	Measured 26 dB Bandwidth: 23.146 MHz Limit 26 dB Bandwidth: 0.5 MHz Margin 26 dB Bandwidth: -22.65 MHz Measured 99% Bandwidth: 16.834 MHz

[Back to the Matrix](#)

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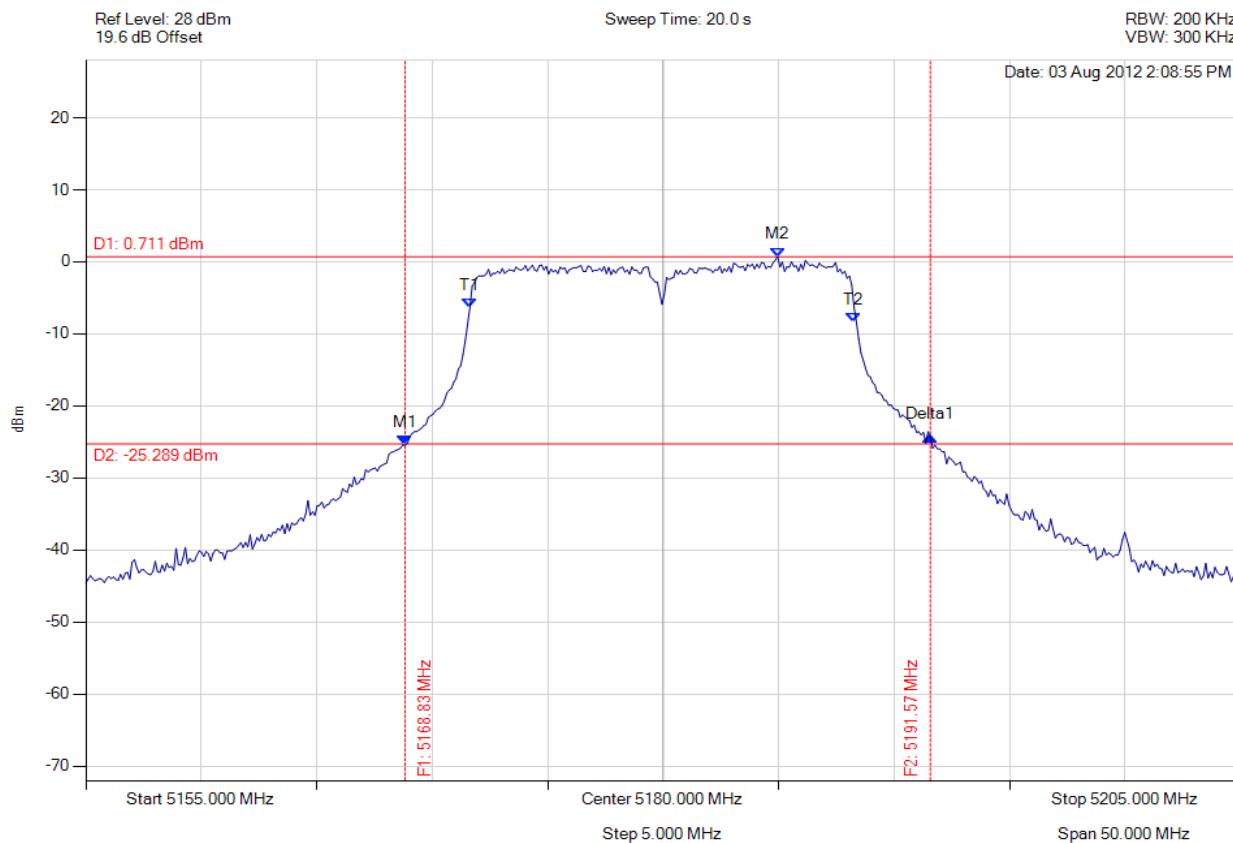


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 98 of 169



26 dB and 99% Emission Bandwidth

Variant: 802.11a, Channel: 5180.00 MHz, Chain C, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5168.828 MHz : -25.451 dBm M2 : 5184.960 MHz : 0.711 dBm Delta1 : 22.745 MHz : 1.218 dBm T1 : 5171.633 MHz : -6.301 dBm T2 : 5188.267 MHz : -8.310 dBm OBW : 16.733 MHz	Measured 26 dB Bandwidth: 22.745 MHz Limit 26 dB Bandwidth: 0.5 MHz Margin 26 dB Bandwidth: -22.25 MHz Measured 99% Bandwidth: 16.733 MHz

[Back to the Matrix](#)

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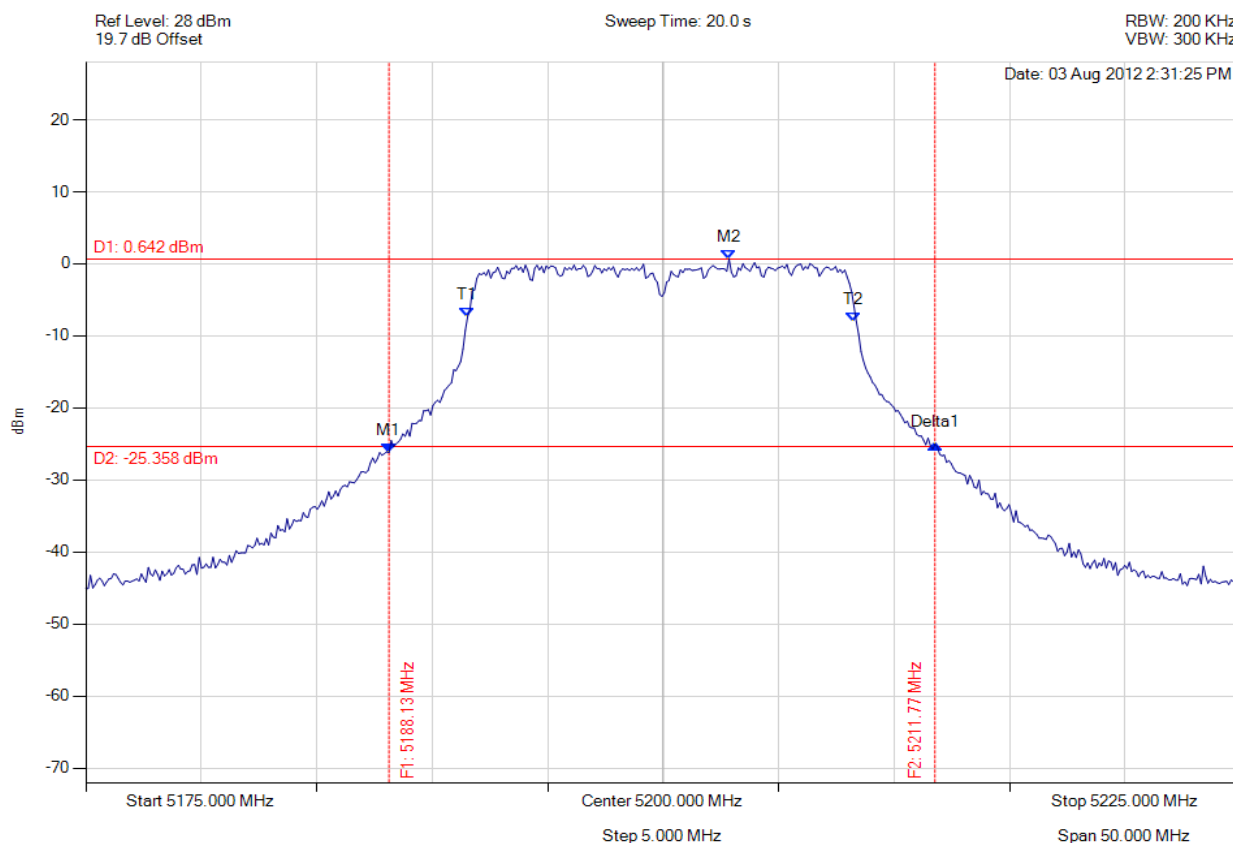


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 99 of 169



26 dB and 99% Emission Bandwidth

Variant: 802.11a, Channel: 5200.00 MHz, Chain A, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5188.126 MHz : -26.207 dBm M2 : 5202.856 MHz : 0.642 dBm Delta1 : 23.647 MHz : 1.192 dBm T1 : 5191.533 MHz : -7.361 dBm T2 : 5208.267 MHz : -8.040 dBm OBW : 16.834 MHz	Measured 26 dB Bandwidth: 23.647 MHz Limit 26 dB Bandwidth: 0.5 MHz Margin 26 dB Bandwidth: -22.55 MHz Measured 99% Bandwidth: 16.834 MHz

[Back to the Matrix](#)

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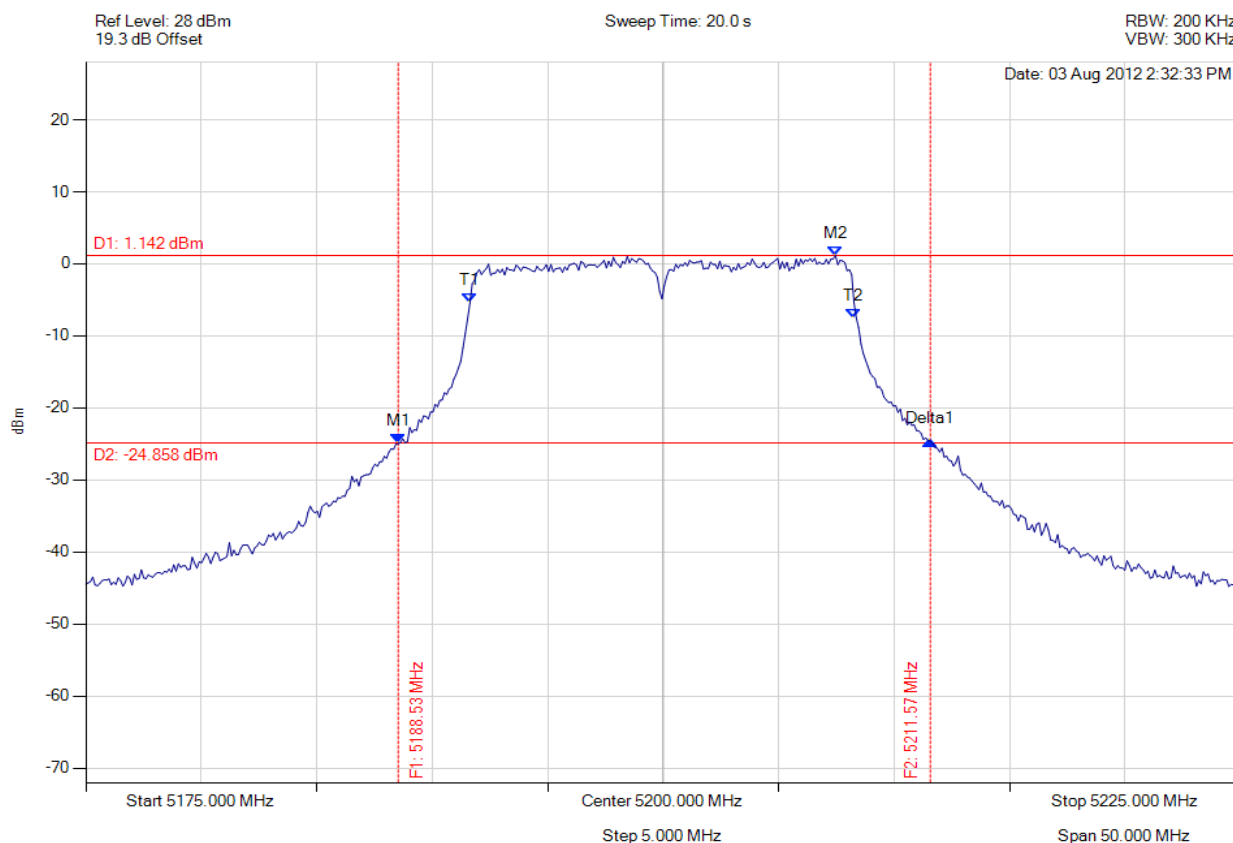


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 100 of 169



26 dB and 99% Emission Bandwidth

Variant: 802.11a, Channel: 5200.00 MHz, Chain B, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5188.527 MHz : -24.961 dBm M2 : 5207.465 MHz : 1.142 dBm Delta1 : 23.046 MHz : 0.354 dBm T1 : 5191.633 MHz : -5.429 dBm T2 : 5208.267 MHz : -7.538 dBm OBW : 16.733 MHz	Measured 26 dB Bandwidth: 23.046 MHz Limit 26 dB Bandwidth: 0.5 MHz Margin 26 dB Bandwidth: -22.55 MHz Measured 99% Bandwidth: 16.733 MHz

[Back to the Matrix](#)

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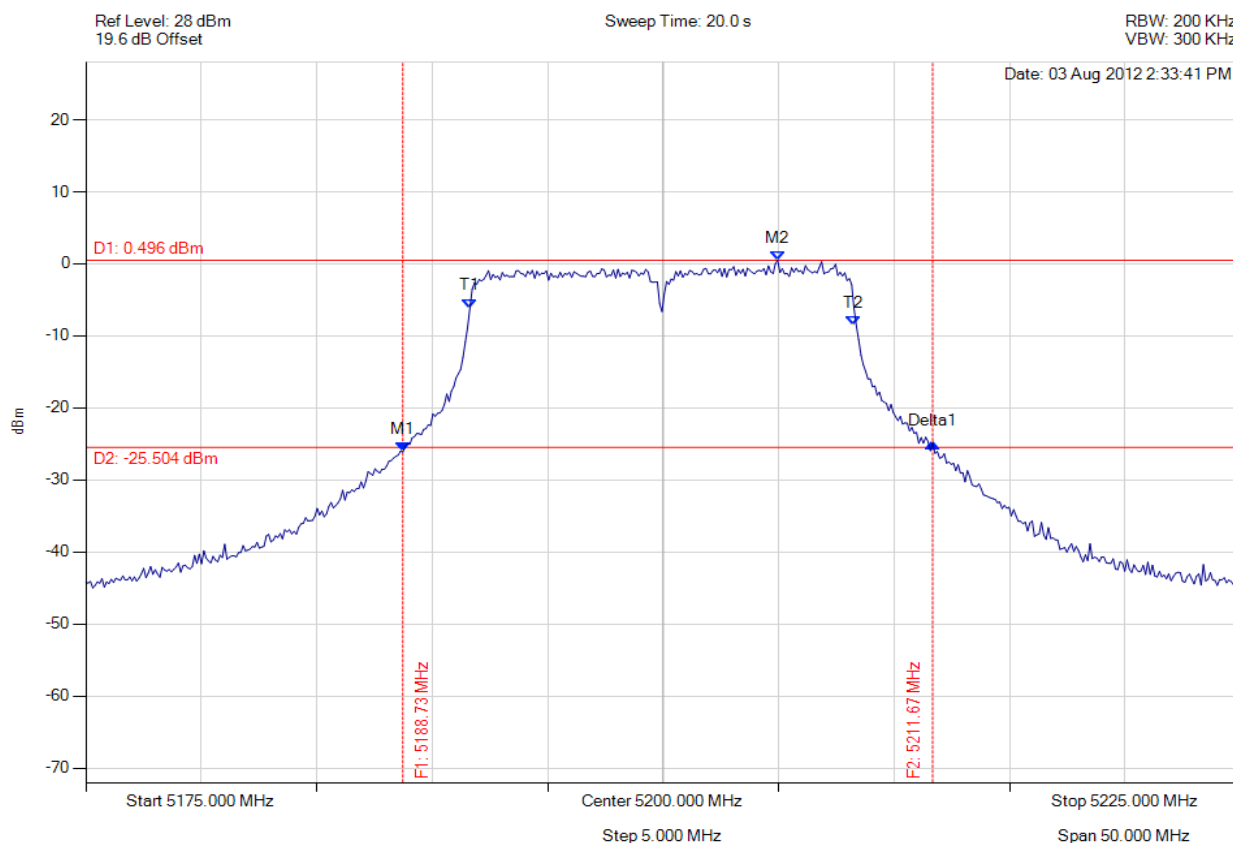


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 101 of 169



26 dB and 99% Emission Bandwidth

Variant: 802.11a, Channel: 5200.00 MHz, Chain C, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5188.727 MHz : -26.114 dBm M2 : 5204.960 MHz : 0.496 dBm Delta1 : 22.946 MHz : 1.224 dBm T1 : 5191.633 MHz : -6.124 dBm T2 : 5208.267 MHz : -8.603 dBm OBW : 16.733 MHz	Measured 26 dB Bandwidth: 22.946 MHz Limit 26 dB Bandwidth: 0.5 MHz Margin 26 dB Bandwidth: -22.45 MHz Measured 99% Bandwidth: 16.733 MHz

[Back to the Matrix](#)

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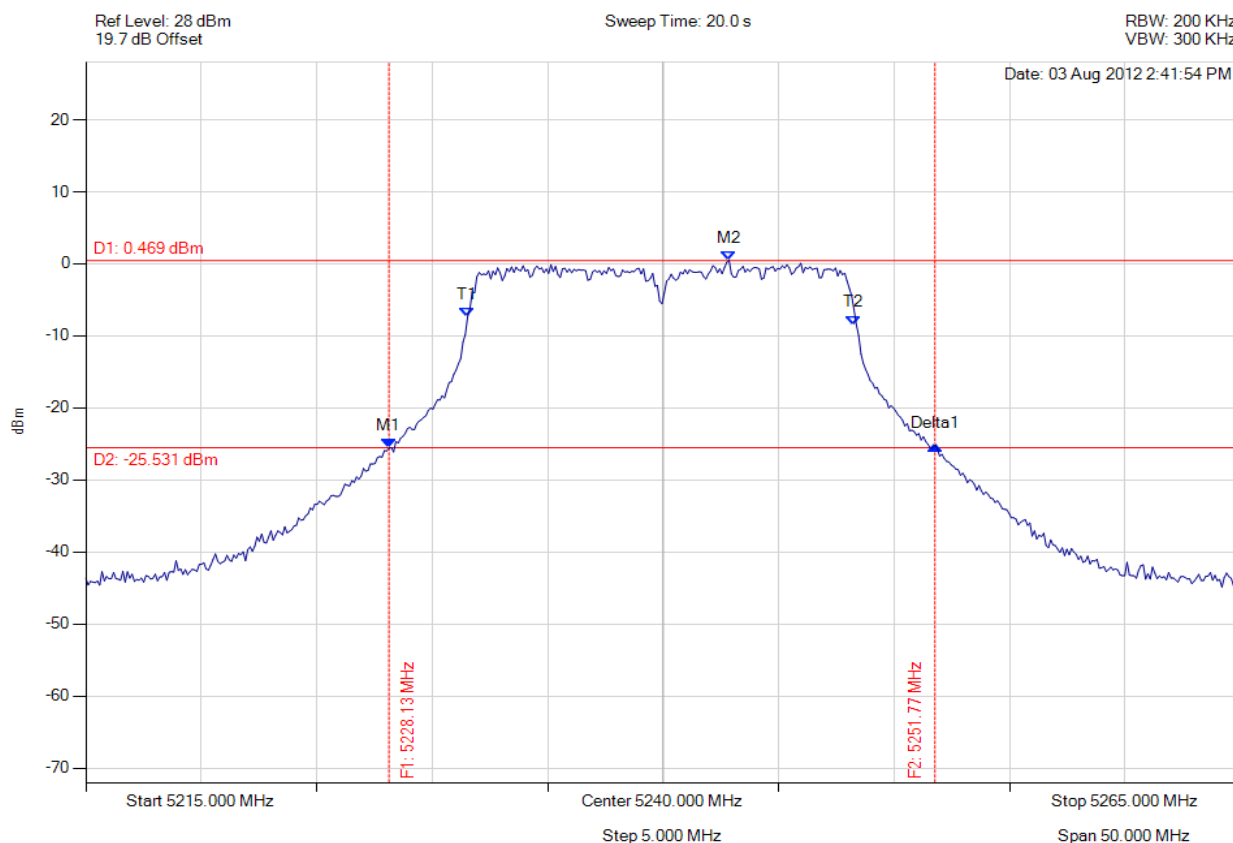


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 102 of 169



26 dB and 99% Emission Bandwidth

Variant: 802.11a, Channel: 5240.00 MHz, Chain A, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5228.126 MHz : -25.616 dBm M2 : 5242.856 MHz : 0.469 dBm Delta1 : 23.647 MHz : 0.403 dBm T1 : 5231.533 MHz : -7.367 dBm T2 : 5248.267 MHz : -8.457 dBm OBW : 16.834 MHz	Measured 26 dB Bandwidth: 23.647 MHz Limit 26 dB Bandwidth: 0.5 MHz Margin 26 dB Bandwidth: -23.15 MHz Measured 99% Bandwidth: 16.834 MHz

[Back to the Matrix](#)

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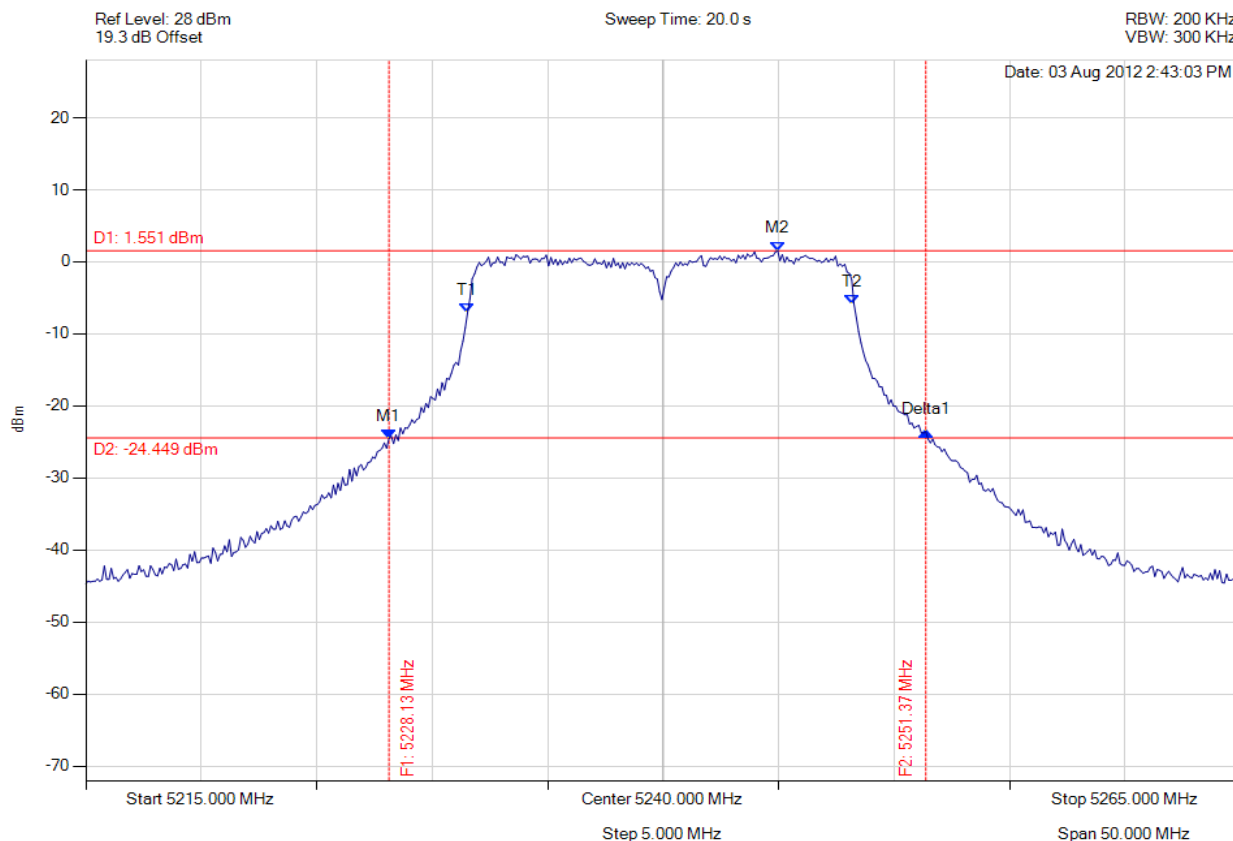


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 103 of 169



26 dB and 99% Emission Bandwidth

Variant: 802.11a, Channel: 5240.00 MHz, Chain B, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5228.126 MHz : -24.517 dBm M2 : 5244.960 MHz : 1.551 dBm Delta1 : 23.246 MHz : 0.940 dBm T1 : 5231.533 MHz : -7.025 dBm T2 : 5248.166 MHz : -5.858 dBm OBW : 16.733 MHz	Measured 26 dB Bandwidth: 23.246 MHz Limit 26 dB Bandwidth: 0.5 MHz Margin 26 dB Bandwidth: -22.75 MHz Measured 99% Bandwidth: 16.733 MHz

[Back to the Matrix](#)

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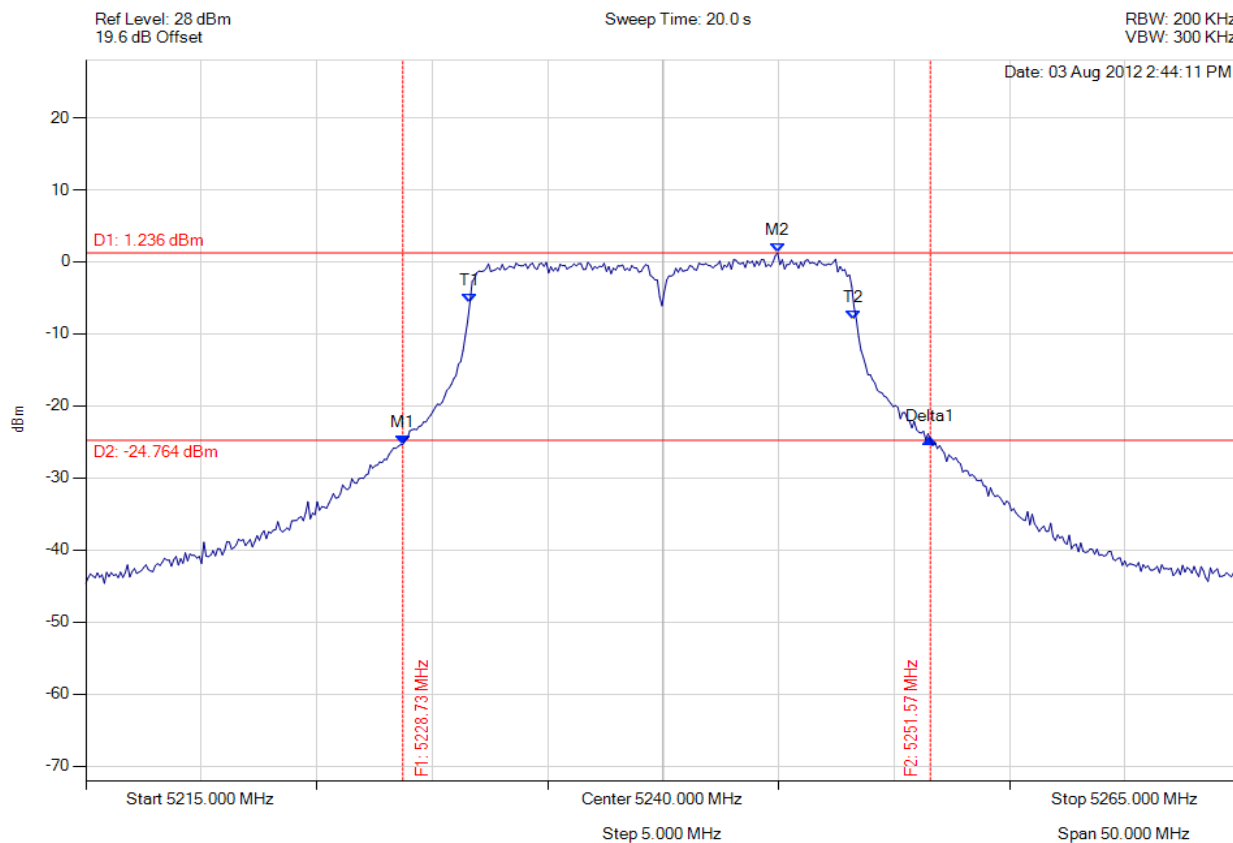


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 104 of 169



26 dB and 99% Emission Bandwidth

Variant: 802.11a, Channel: 5240.00 MHz, Chain C, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5228.727 MHz : -25.331 dBm M2 : 5244.960 MHz : 1.236 dBm Delta1 : 22.846 MHz : 0.710 dBm T1 : 5231.633 MHz : -5.638 dBm T2 : 5248.267 MHz : -8.016 dBm OBW : 16.733 MHz	Measured 26 dB Bandwidth: 22.846 MHz Limit 26 dB Bandwidth: 0.5 MHz Margin 26 dB Bandwidth: -22.35 MHz Measured 99% Bandwidth: 16.733 MHz

[Back to the Matrix](#)

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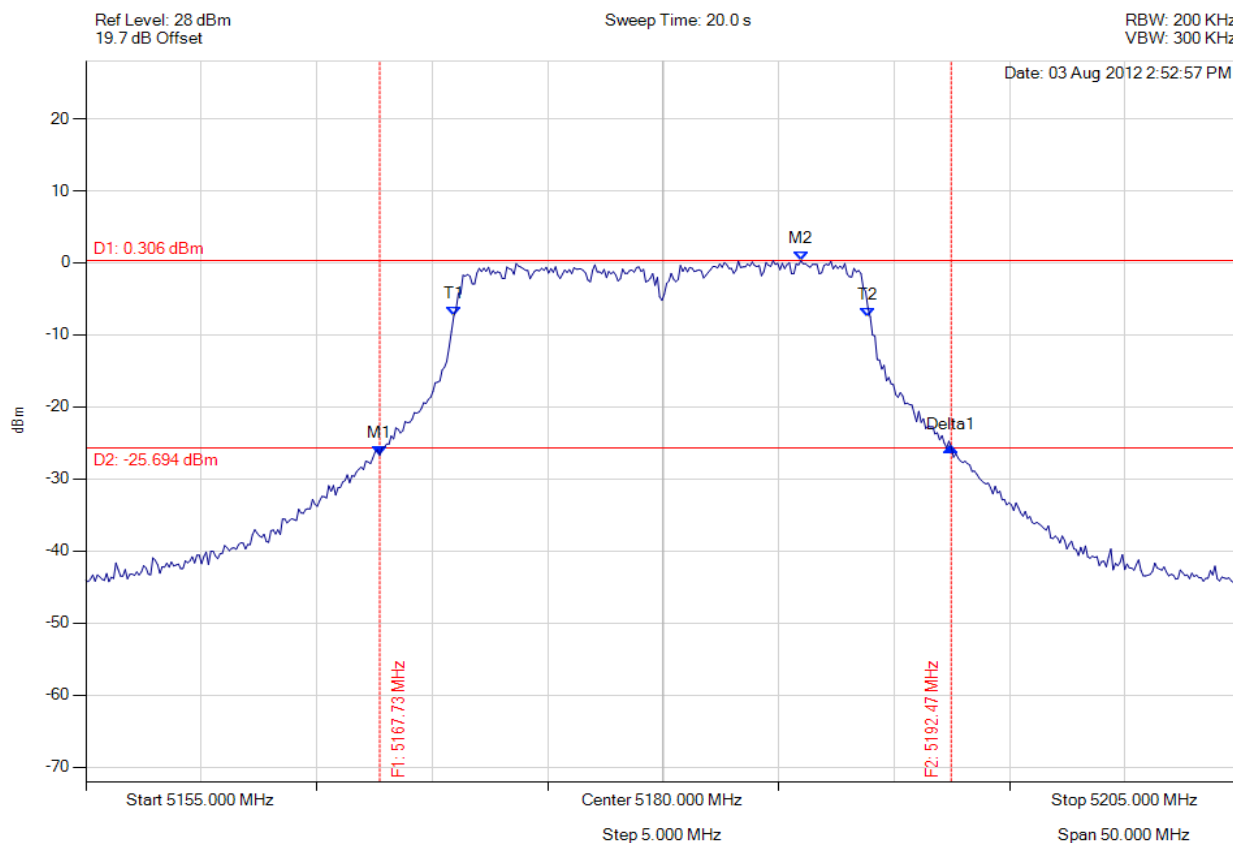


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 105 of 169



26 dB and 99% Emission Bandwidth

Variant: 802.11n HT-20, Channel: 5180.00 MHz, Chain A, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5167.725 MHz : -26.763 dBm M2 : 5185.962 MHz : 0.306 dBm Delta1 : 24.749 MHz : 1.163 dBm T1 : 5170.932 MHz : -7.399 dBm T2 : 5188.868 MHz : -7.493 dBm OBW : 18.036 MHz	Measured 26 dB Bandwidth: 24.749 MHz Limit 26 dB Bandwidth: 0.5 MHz Margin 26 dB Bandwidth: -24.25 MHz Measured 99% Bandwidth: 18.036 MHz

[Back to the Matrix](#)

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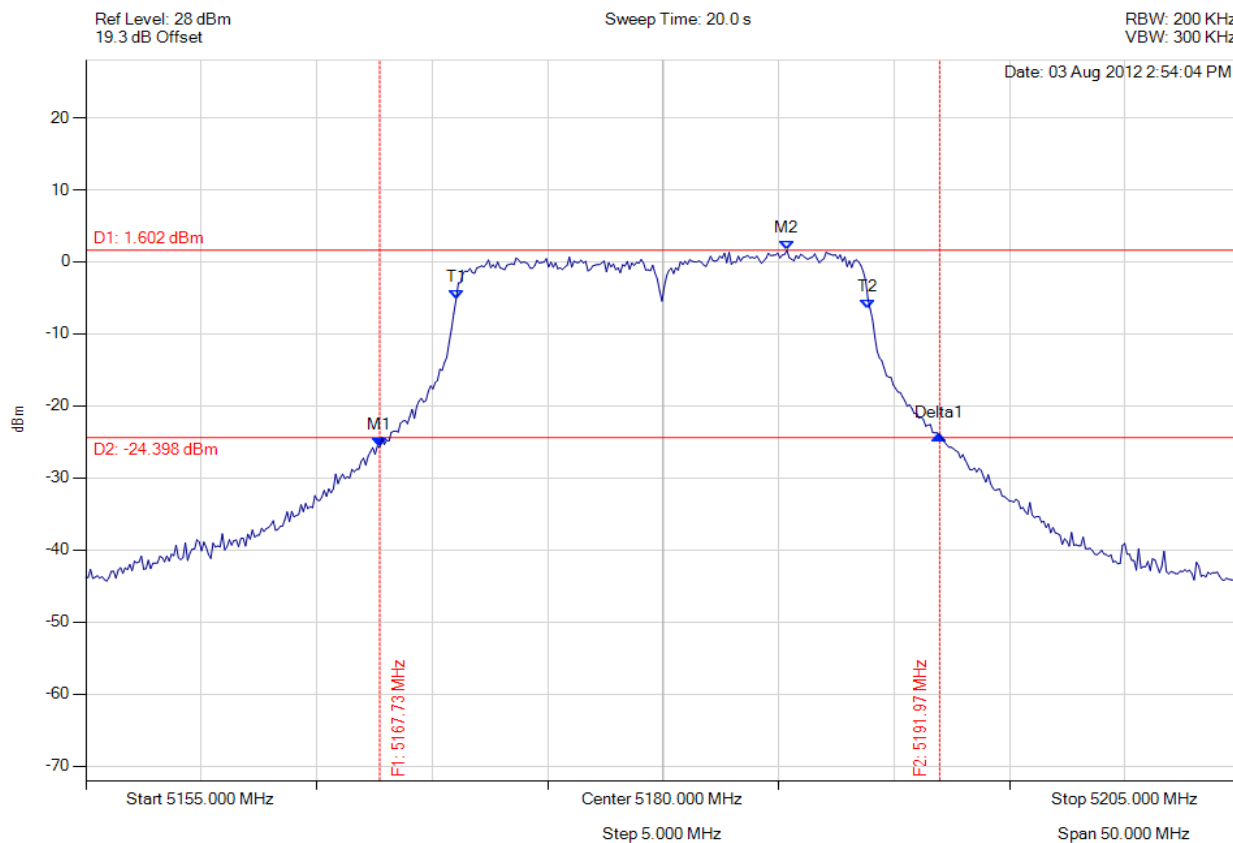


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 106 of 169



26 dB and 99% Emission Bandwidth

Variant: 802.11n HT-20, Channel: 5180.00 MHz, Chain B, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5167.725 MHz : -25.713 dBm M2 : 5185.361 MHz : 1.602 dBm Delta1 : 24.248 MHz : 1.729 dBm T1 : 5171.032 MHz : -5.268 dBm T2 : 5188.868 MHz : -6.596 dBm OBW : 17.936 MHz	Measured 26 dB Bandwidth: 24.248 MHz Limit 26 dB Bandwidth: 0.5 MHz Margin 26 dB Bandwidth: -23.75 MHz Measured 99% Bandwidth: 17.936 MHz

[Back to the Matrix](#)

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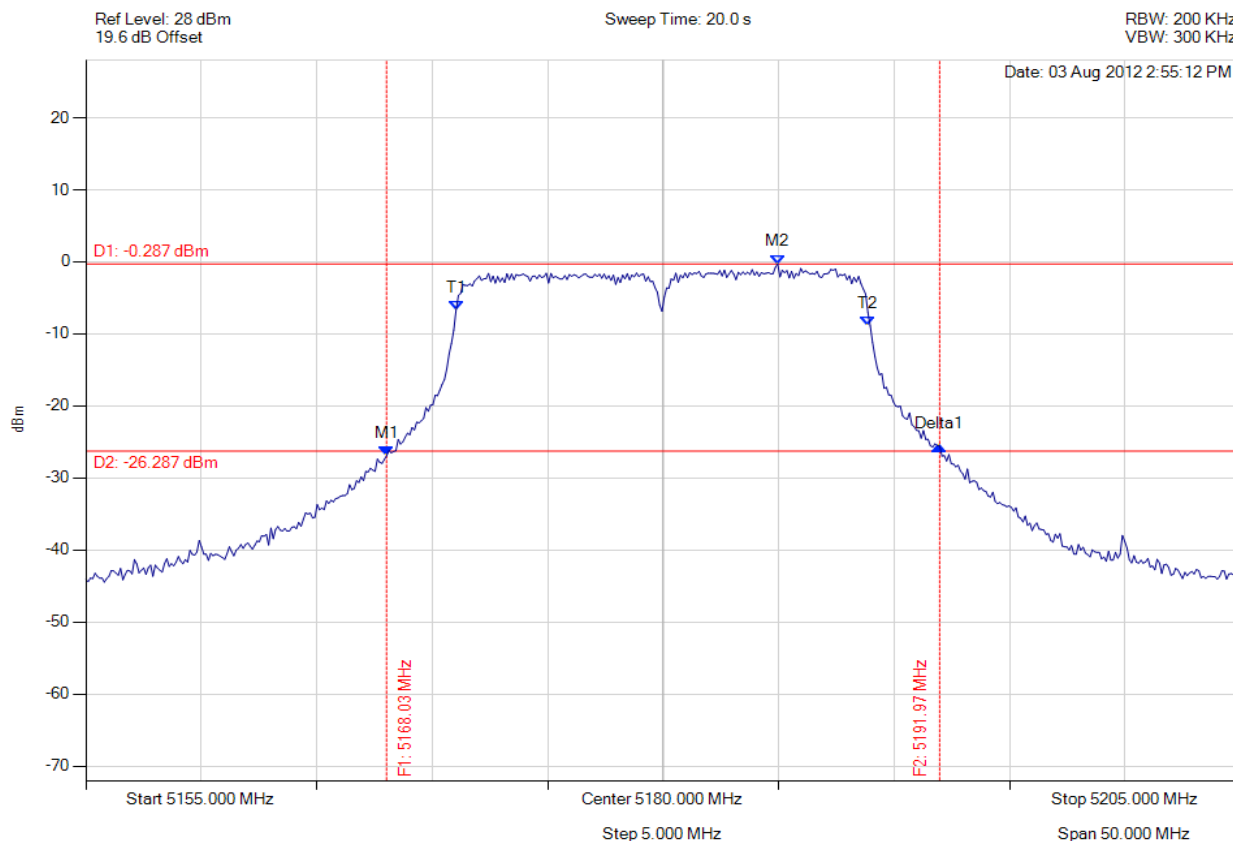


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 107 of 169



26 dB and 99% Emission Bandwidth

Variant: 802.11n HT-20, Channel: 5180.00 MHz, Chain C, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5168.026 MHz : -26.925 dBm M2 : 5184.960 MHz : -0.287 dBm Delta1 : 23.948 MHz : 1.383 dBm T1 : 5171.032 MHz : -6.681 dBm T2 : 5188.868 MHz : -8.919 dBm OBW : 17.936 MHz	Measured 26 dB Bandwidth: 23.948 MHz Limit 26 dB Bandwidth: 0.5 MHz Margin 26 dB Bandwidth: -23.45 MHz Measured 99% Bandwidth: 17.936 MHz

[Back to the Matrix](#)

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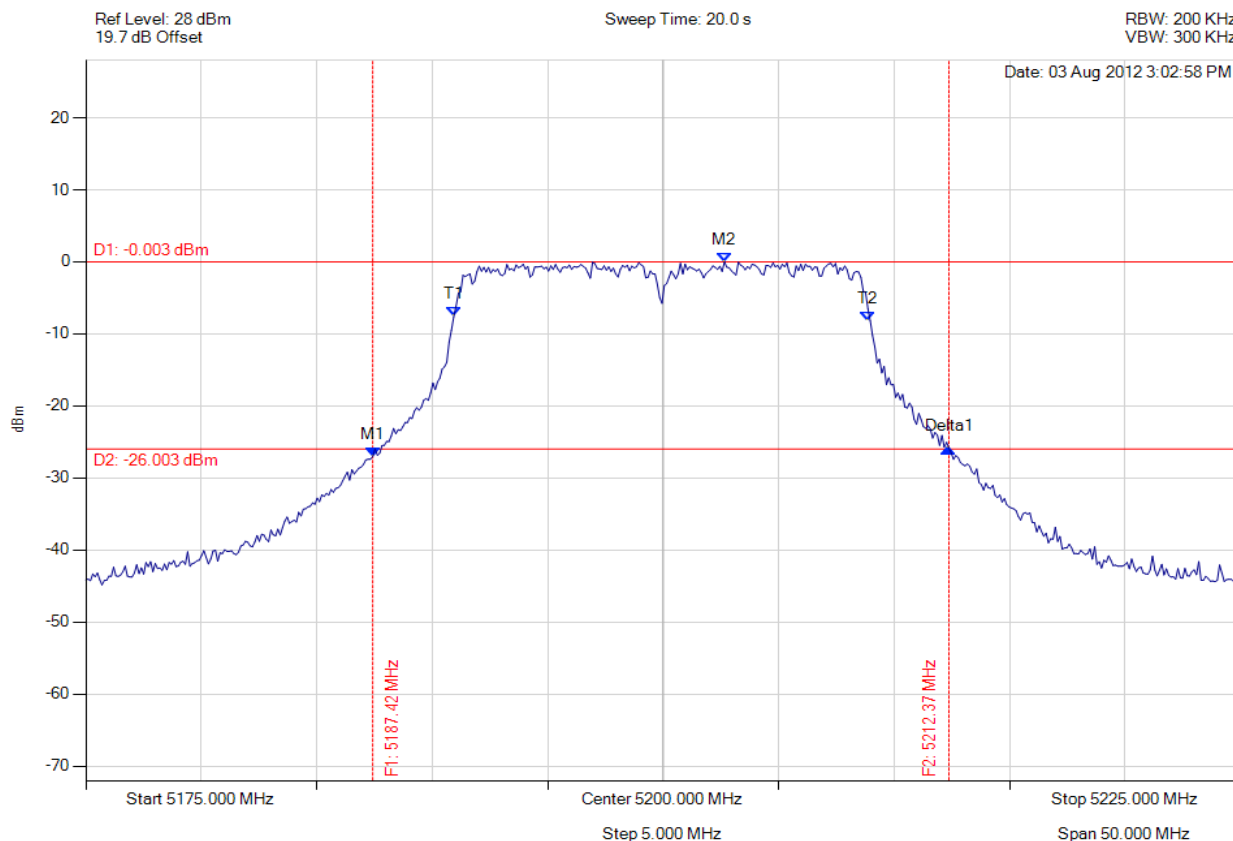


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 108 of 169



26 dB and 99% Emission Bandwidth

Variant: 802.11n HT-20, Channel: 5200.00 MHz, Chain A, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5187.425 MHz : -27.007 dBm M2 : 5202.655 MHz : -0.003 dBm Delta1 : 24.950 MHz : 1.139 dBm T1 : 5190.932 MHz : -7.613 dBm T2 : 5208.868 MHz : -8.197 dBm OBW : 18.036 MHz	Measured 26 dB Bandwidth: 24.950 MHz Limit 26 dB Bandwidth: 0.5 MHz Margin 26 dB Bandwidth: -23.25 MHz Measured 99% Bandwidth: 18.036 MHz

[Back to the Matrix](#)

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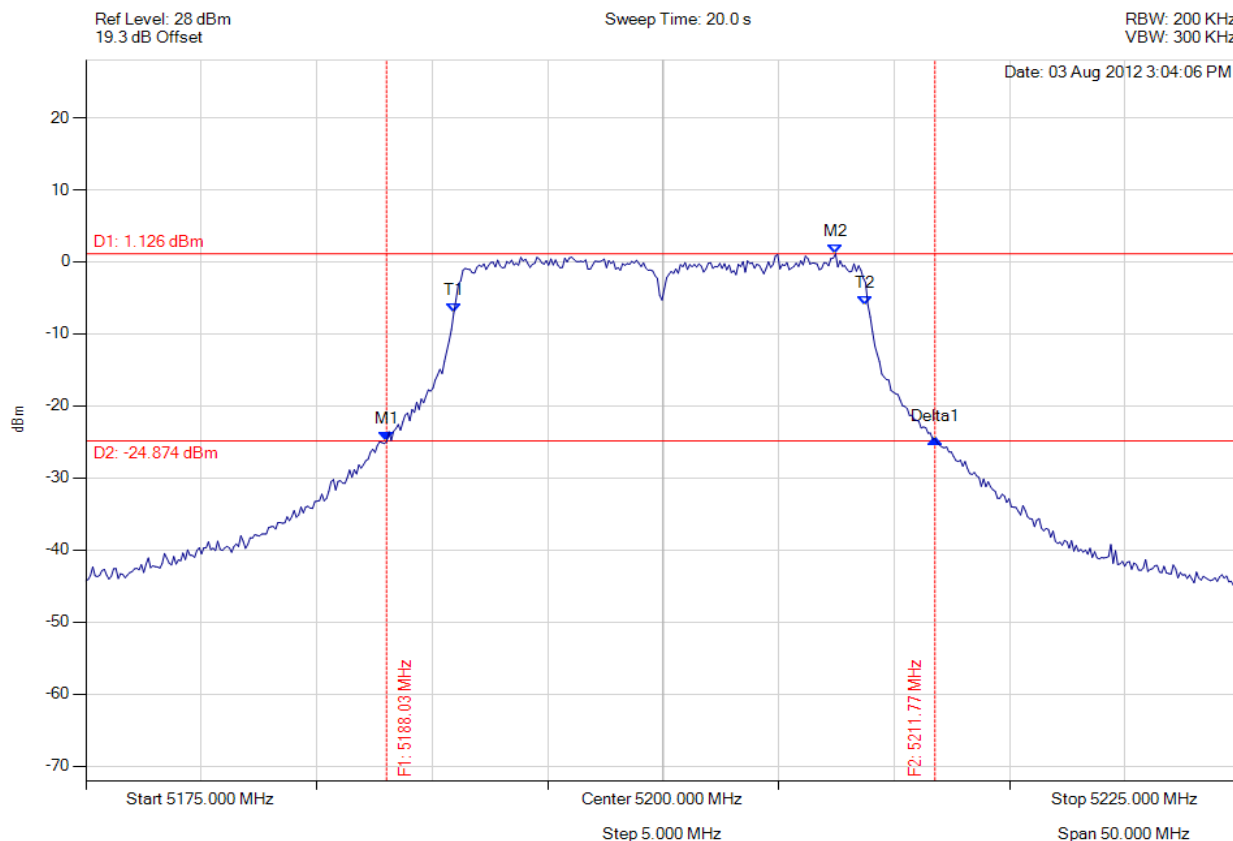


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 109 of 169



26 dB and 99% Emission Bandwidth

Variant: 802.11n HT-20, Channel: 5200.00 MHz, Chain B, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5188.026 MHz : -24.963 dBm M2 : 5207.465 MHz : 1.126 dBm Delta1 : 23.747 MHz : 0.427 dBm T1 : 5190.932 MHz : -7.096 dBm T2 : 5208.768 MHz : -5.992 dBm OBW : 17.936 MHz	Measured 26 dB Bandwidth: 23.747 MHz Limit 26 dB Bandwidth: 0.5 MHz Margin 26 dB Bandwidth: -23.25 MHz Measured 99% Bandwidth: 17.936 MHz

[Back to the Matrix](#)

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.

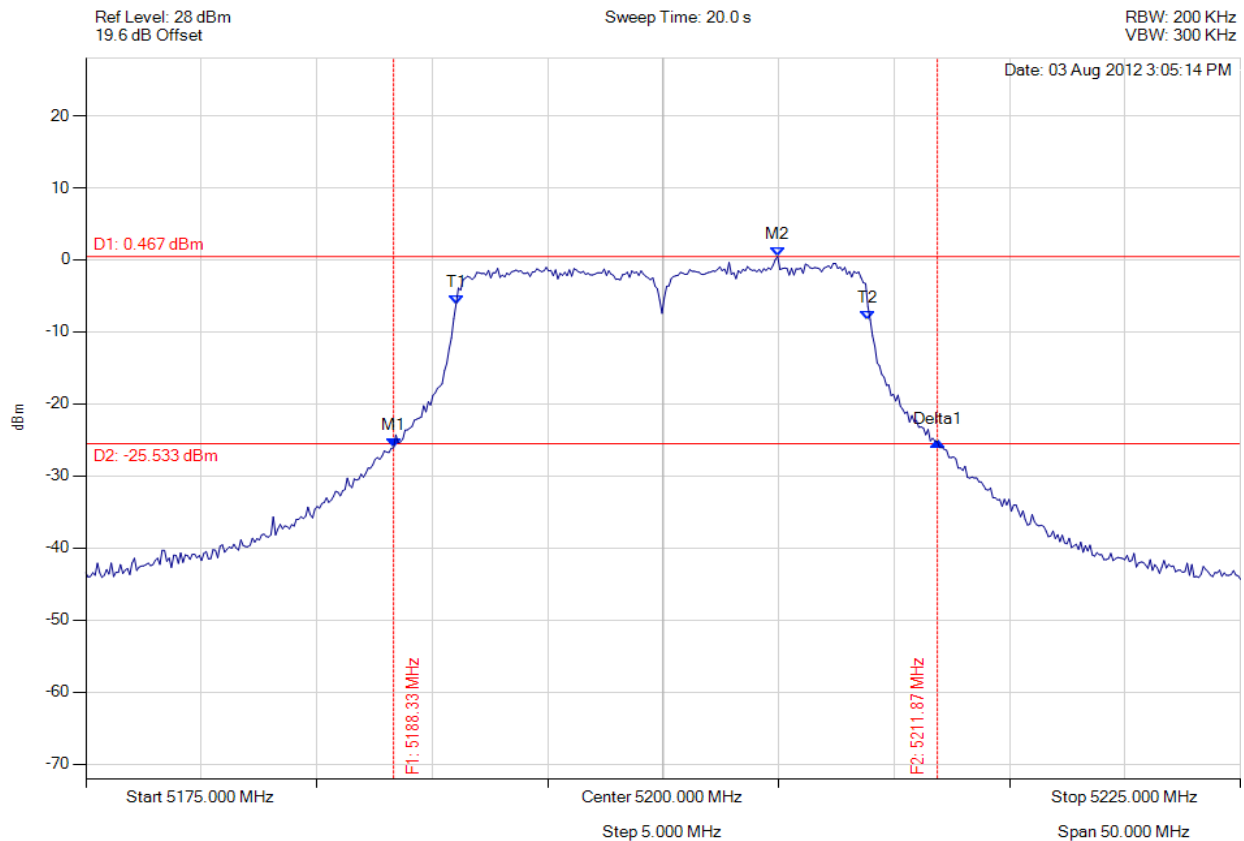


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 110 of 169



26 dB and 99% Emission Bandwidth

Variant: 802.11n HT-20, Channel: 5200.00 MHz, Chain C, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5188.327 MHz : -26.094 dBm M2 : 5204.960 MHz : 0.467 dBm Delta1 : 23.547 MHz : 0.840 dBm T1 : 5191.032 MHz : -6.173 dBm T2 : 5208.868 MHz : -8.363 dBm OBW : 17.936 MHz	Measured 26 dB Bandwidth: 23.547 MHz Limit 26 dB Bandwidth: 0.5 MHz Margin 26 dB Bandwidth: -23.05 MHz Measured 99% Bandwidth: 17.936 MHz

[Back to the Matrix](#)

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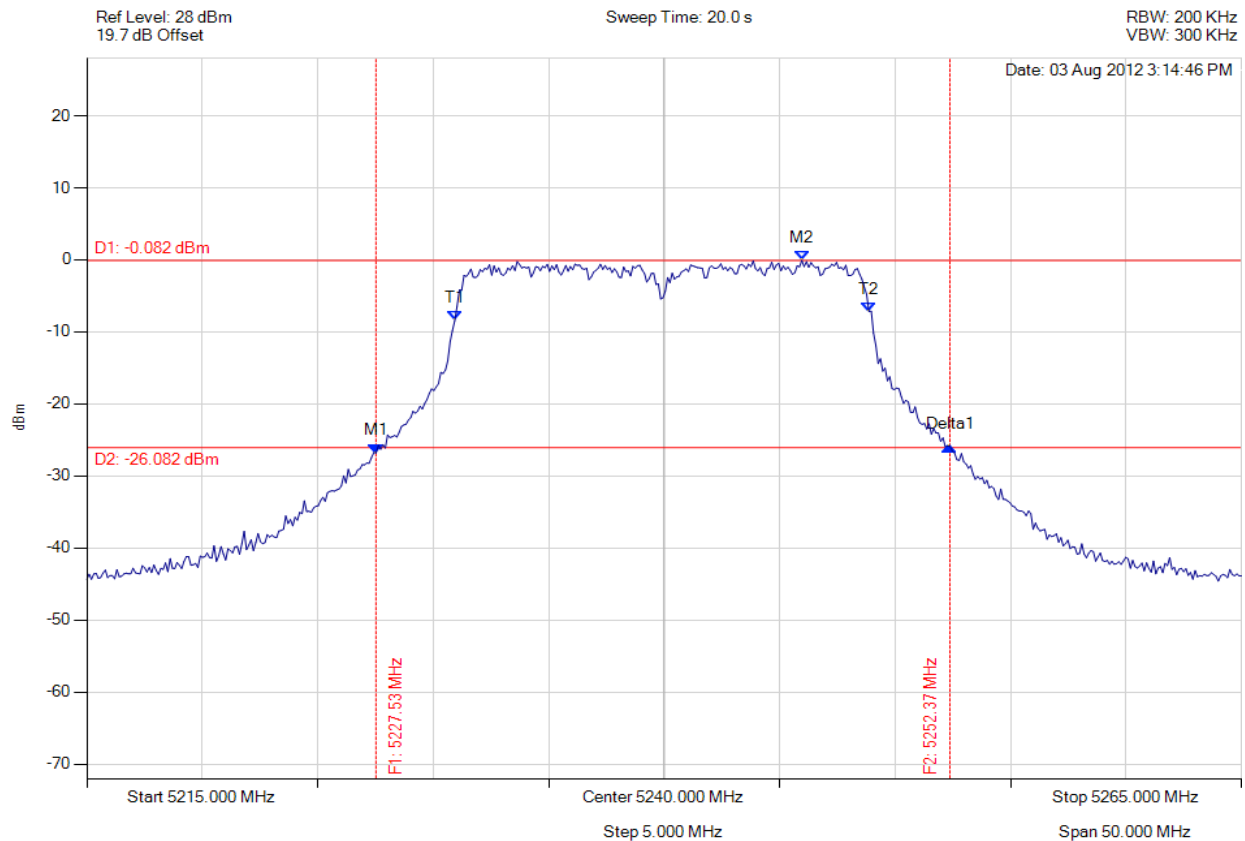


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 111 of 169



26 dB and 99% Emission Bandwidth

Variant: 802.11n HT-20, Channel: 5240.00 MHz, Chain A, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5227.525 MHz : -26.799 dBm M2 : 5245.962 MHz : -0.082 dBm Delta1 : 24.850 MHz : 0.960 dBm T1 : 5230.932 MHz : -8.435 dBm T2 : 5248.868 MHz : -7.137 dBm OBW : 18.036 MHz	Measured 26 dB Bandwidth: 24.850 MHz Limit 26 dB Bandwidth: 0.5 MHz Margin 26 dB Bandwidth: -24.35 MHz Measured 99% Bandwidth: 18.036 MHz

[Back to the Matrix](#)

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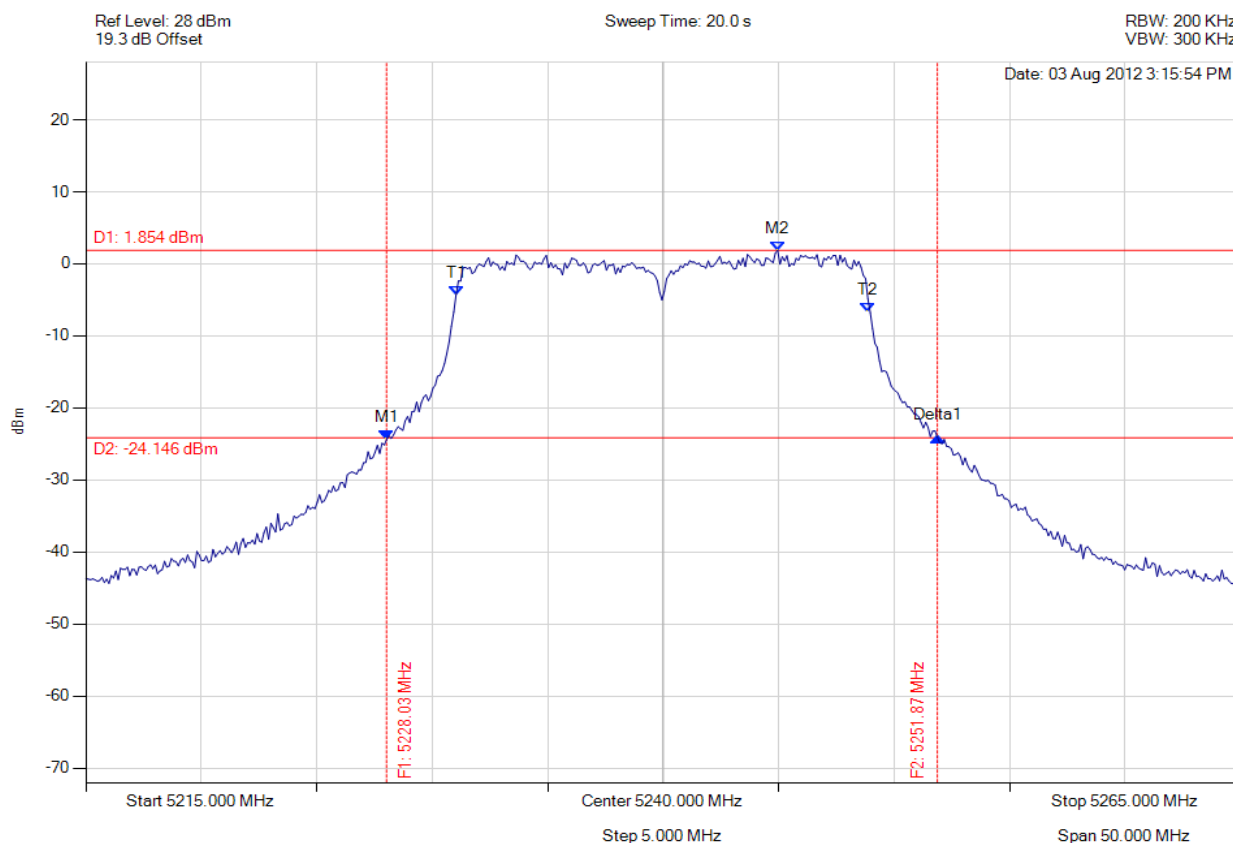


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 112 of 169



26 dB and 99% Emission Bandwidth

Variant: 802.11n HT-20, Channel: 5240.00 MHz, Chain B, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5228.026 MHz : -24.408 dBm M2 : 5244.960 MHz : 1.854 dBm Delta1 : 23.848 MHz : 0.352 dBm T1 : 5231.032 MHz : -4.312 dBm T2 : 5248.868 MHz : -6.767 dBm OBW : 17.936 MHz	Measured 26 dB Bandwidth: 23.848 MHz Limit 26 dB Bandwidth: 0.5 MHz Margin 26 dB Bandwidth: -23.35 MHz Measured 99% Bandwidth: 17.936 MHz

[Back to the Matrix](#)

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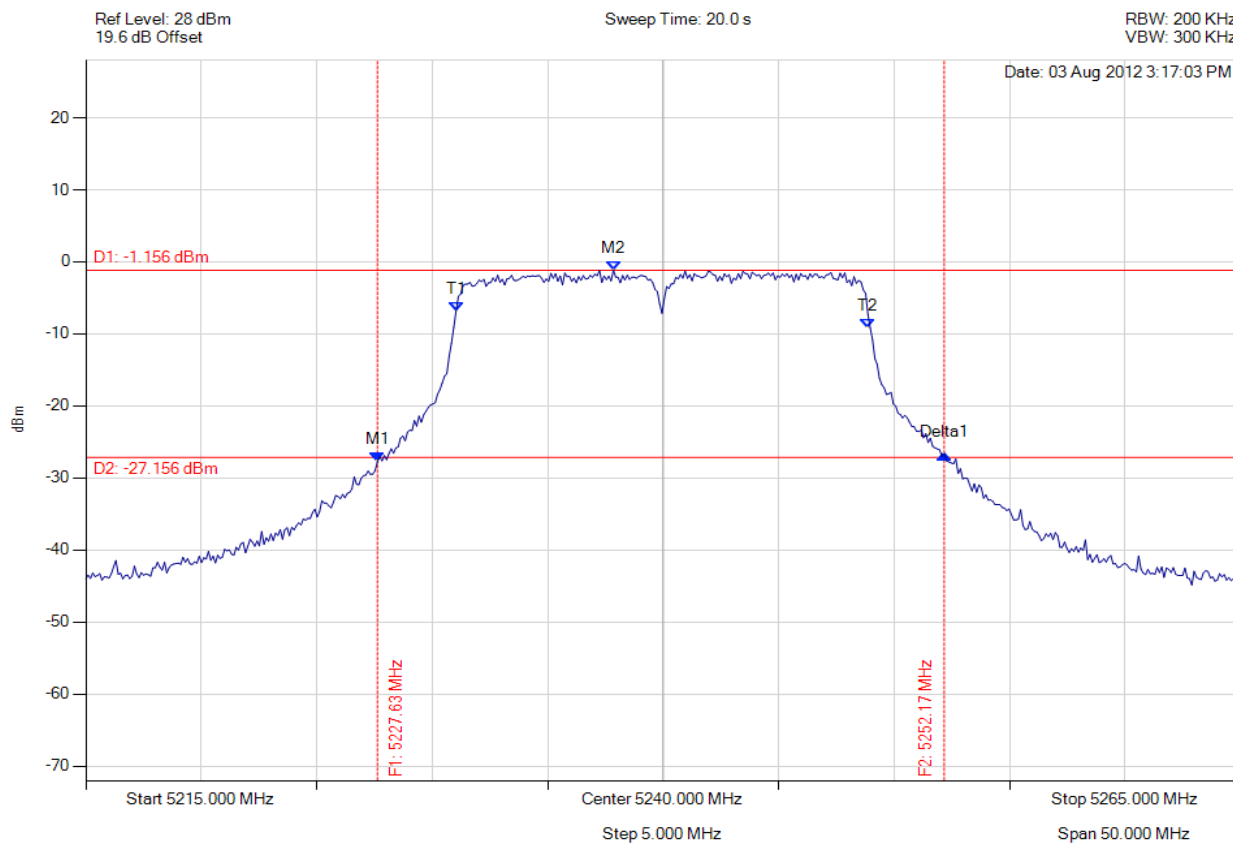


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 113 of 169



26 dB and 99% Emission Bandwidth

Variant: 802.11n HT-20, Channel: 5240.00 MHz, Chain C, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5227.625 MHz : -27.751 dBm M2 : 5237.846 MHz : -1.156 dBm Delta1 : 24.549 MHz : 1.090 dBm T1 : 5231.032 MHz : -6.844 dBm T2 : 5248.868 MHz : -9.175 dBm OBW : 17.936 MHz	Measured 26 dB Bandwidth: 24.549 MHz Limit 26 dB Bandwidth: 0.5 MHz Margin 26 dB Bandwidth: -24.05 MHz Measured 99% Bandwidth: 17.936 MHz

[Back to the Matrix](#)

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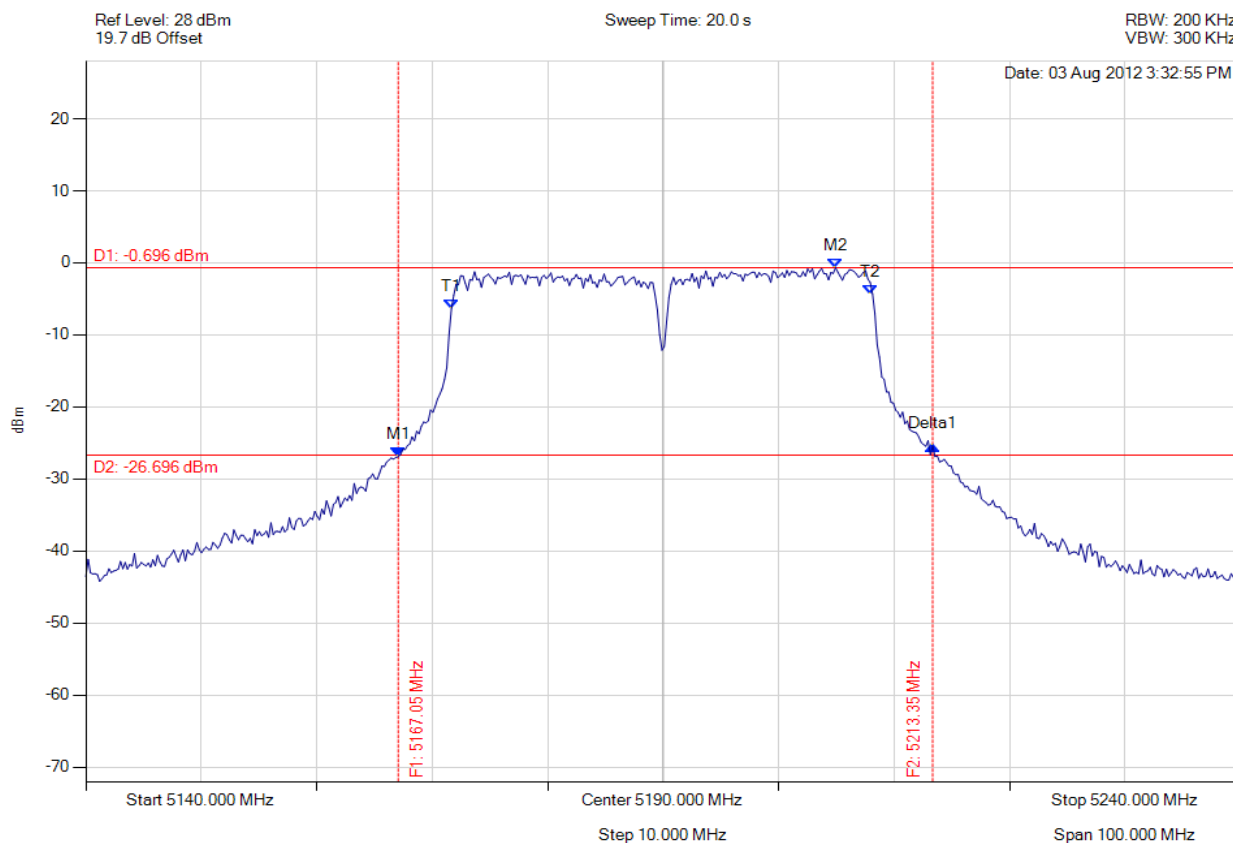


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 114 of 169



26 dB and 99% Emission Bandwidth

Variant: 802.11n HT-40, Channel: 5190.00 MHz, Chain A, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5167.054 MHz : -26.929 dBm M2 : 5204.930 MHz : -0.696 dBm Delta1 : 46.293 MHz : 1.509 dBm T1 : 5171.663 MHz : -6.389 dBm T2 : 5207.936 MHz : -4.308 dBm OBW : 36.473 MHz	Measured 26 dB Bandwidth: 46.293 MHz Limit 26 dB Bandwidth: 0.5 MHz Margin 26 dB Bandwidth: -45.79 MHz Measured 99% Bandwidth: 36.473 MHz

[Back to the Matrix](#)

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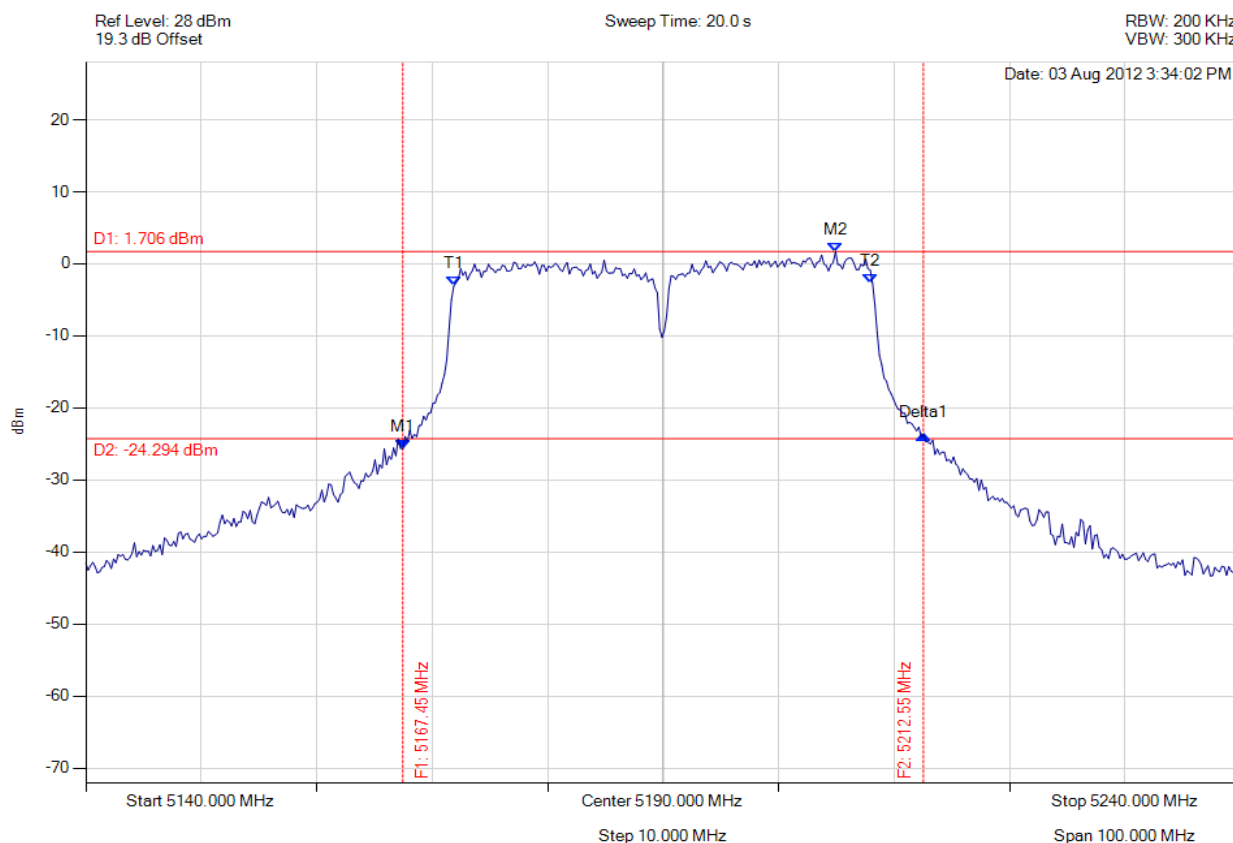


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 115 of 169



26 dB and 99% Emission Bandwidth

Variant: 802.11n HT-40, Channel: 5190.00 MHz, Chain B, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5167.455 MHz : -25.660 dBm M2 : 5204.930 MHz : 1.706 dBm Delta1 : 45.090 MHz : 1.979 dBm T1 : 5171.864 MHz : -3.098 dBm T2 : 5207.936 MHz : -2.665 dBm OBW : 36.273 MHz	Measured 26 dB Bandwidth: 45.090 MHz Limit 26 dB Bandwidth: 0.5 MHz Margin 26 dB Bandwidth: -44.59 MHz Measured 99% Bandwidth: 36.273 MHz

[Back to the Matrix](#)

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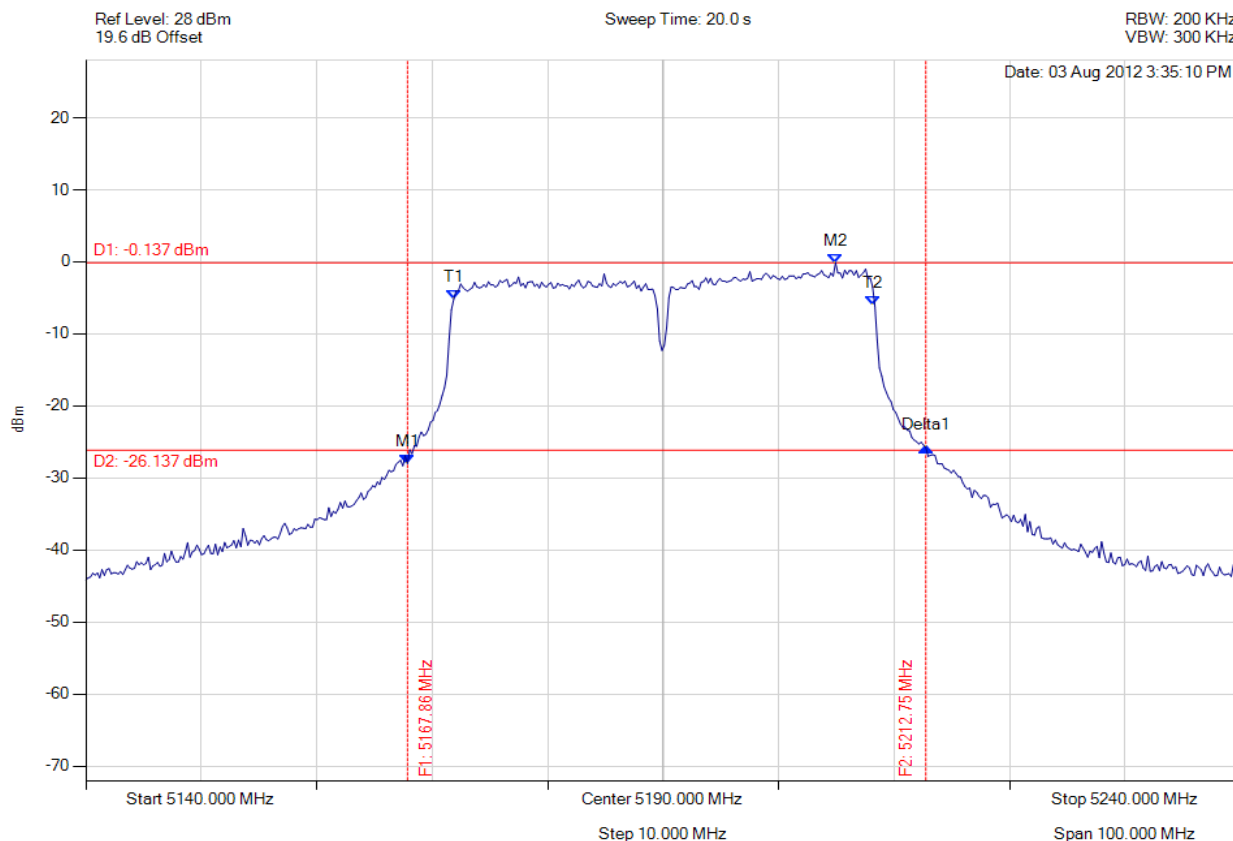


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 116 of 169



26 dB and 99% Emission Bandwidth

Variant: 802.11n HT-40, Channel: 5190.00 MHz, Chain C, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5167.856 MHz : -28.009 dBm M2 : 5204.930 MHz : -0.137 dBm Delta1 : 44.890 MHz : 2.249 dBm T1 : 5171.864 MHz : -5.183 dBm T2 : 5208.136 MHz : -6.088 dBm OBW : 36.473 MHz	Measured 26 dB Bandwidth: 44.890 MHz Limit 26 dB Bandwidth: 0.5 MHz Margin 26 dB Bandwidth: -44.39 MHz Measured 99% Bandwidth: 36.473 MHz

[Back to the Matrix](#)

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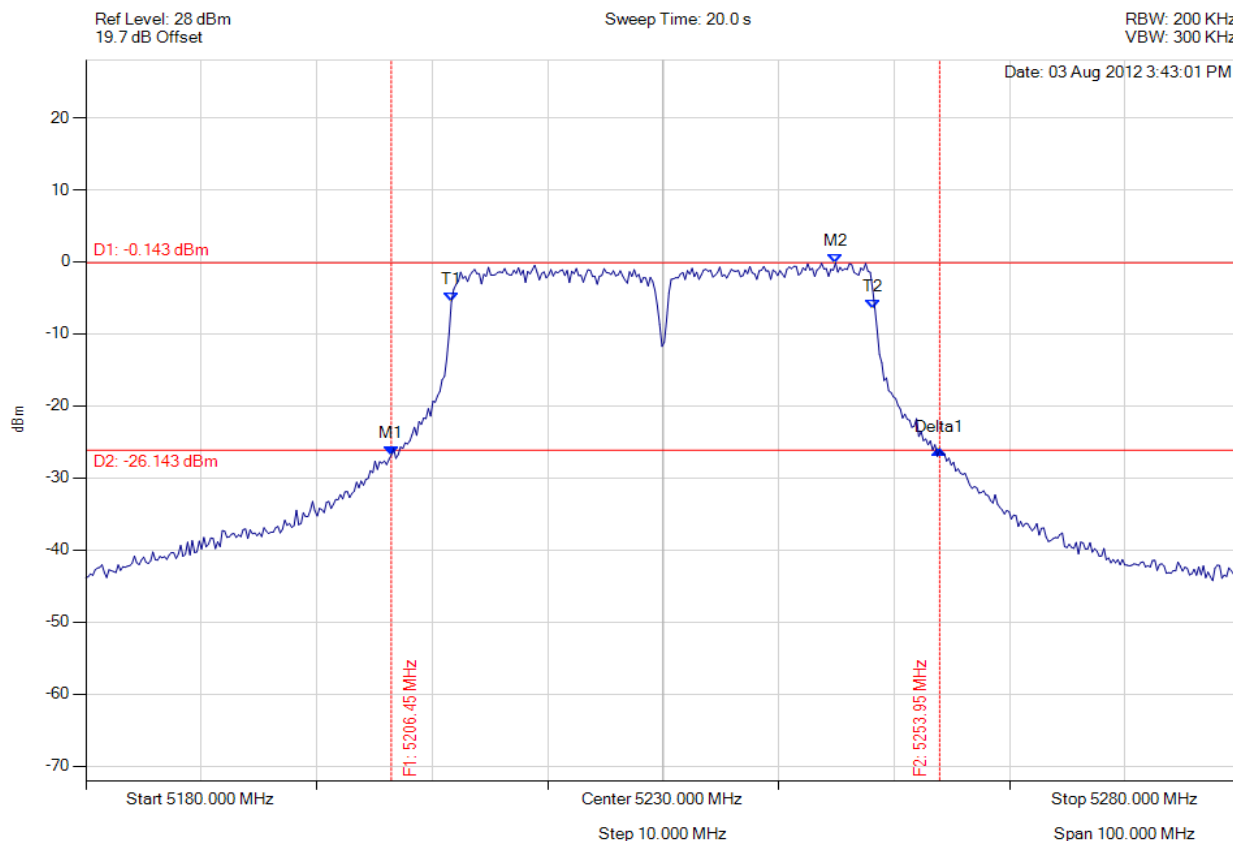


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 117 of 169



26 dB and 99% Emission Bandwidth

Variant: 802.11n HT-40, Channel: 5230.00 MHz, Chain A, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5206.453 MHz : -26.818 dBm M2 : 5244.930 MHz : -0.143 dBm Delta1 : 47.495 MHz : 0.696 dBm T1 : 5211.663 MHz : -5.508 dBm T2 : 5248.136 MHz : -6.470 dBm OBW : 36.673 MHz	Measured 26 dB Bandwidth: 47.495 MHz Limit 26 dB Bandwidth: 0.5 MHz Margin 26 dB Bandwidth: -44.59 MHz Measured 99% Bandwidth: 36.673 MHz

[Back to the Matrix](#)

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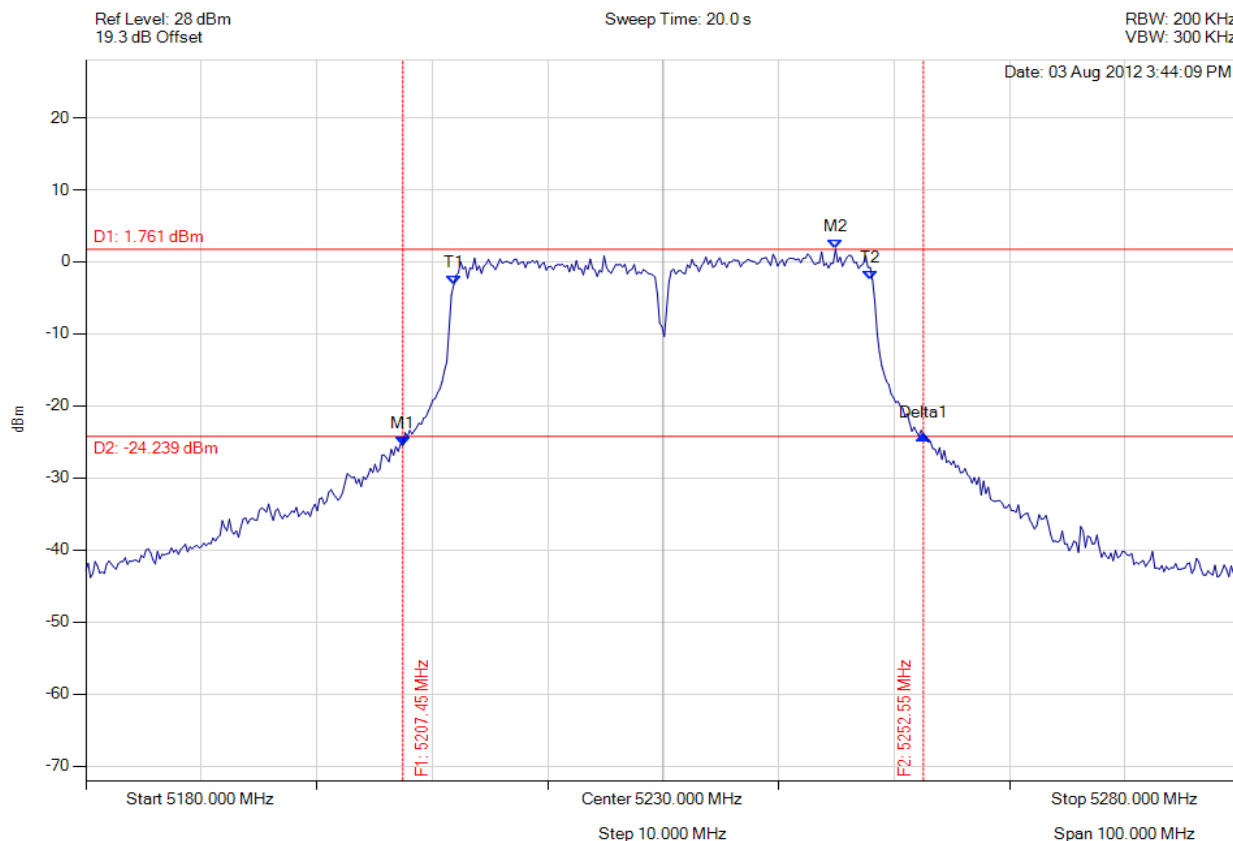


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 118 of 169



26 dB and 99% Emission Bandwidth

Variant: 802.11n HT-40, Channel: 5230.00 MHz, Chain B, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5207.455 MHz : -25.490 dBm M2 : 5244.930 MHz : 1.761 dBm Delta1 : 45.090 MHz : 1.442 dBm T1 : 5211.864 MHz : -3.137 dBm T2 : 5247.936 MHz : -2.506 dBm OBW : 36.273 MHz	Measured 26 dB Bandwidth: 45.090 MHz Limit 26 dB Bandwidth: 0.5 MHz Margin 26 dB Bandwidth: -44.59 MHz Measured 99% Bandwidth: 36.273 MHz

[Back to the Matrix](#)

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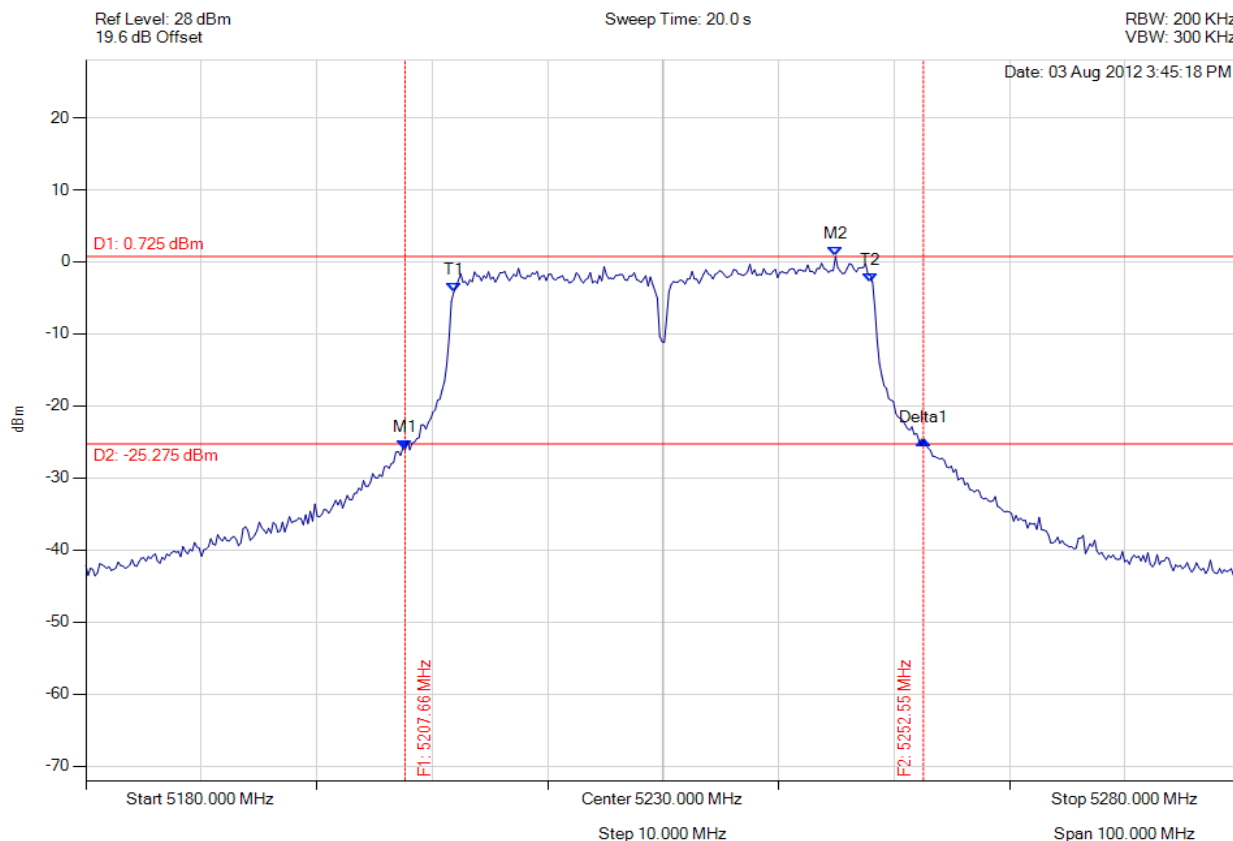


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 119 of 169



26 dB and 99% Emission Bandwidth

Variant: 802.11n HT-40, Channel: 5230.00 MHz, Chain C, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5207.655 MHz : -26.124 dBm M2 : 5244.930 MHz : 0.725 dBm Delta1 : 44.890 MHz : 1.369 dBm T1 : 5211.864 MHz : -4.184 dBm T2 : 5247.936 MHz : -2.797 dBm OBW : 36.273 MHz	Measured 26 dB Bandwidth: 44.890 MHz Limit 26 dB Bandwidth: 0.5 MHz Margin 26 dB Bandwidth: -44.39 MHz Measured 99% Bandwidth: 36.273 MHz

[Back to the Matrix](#)

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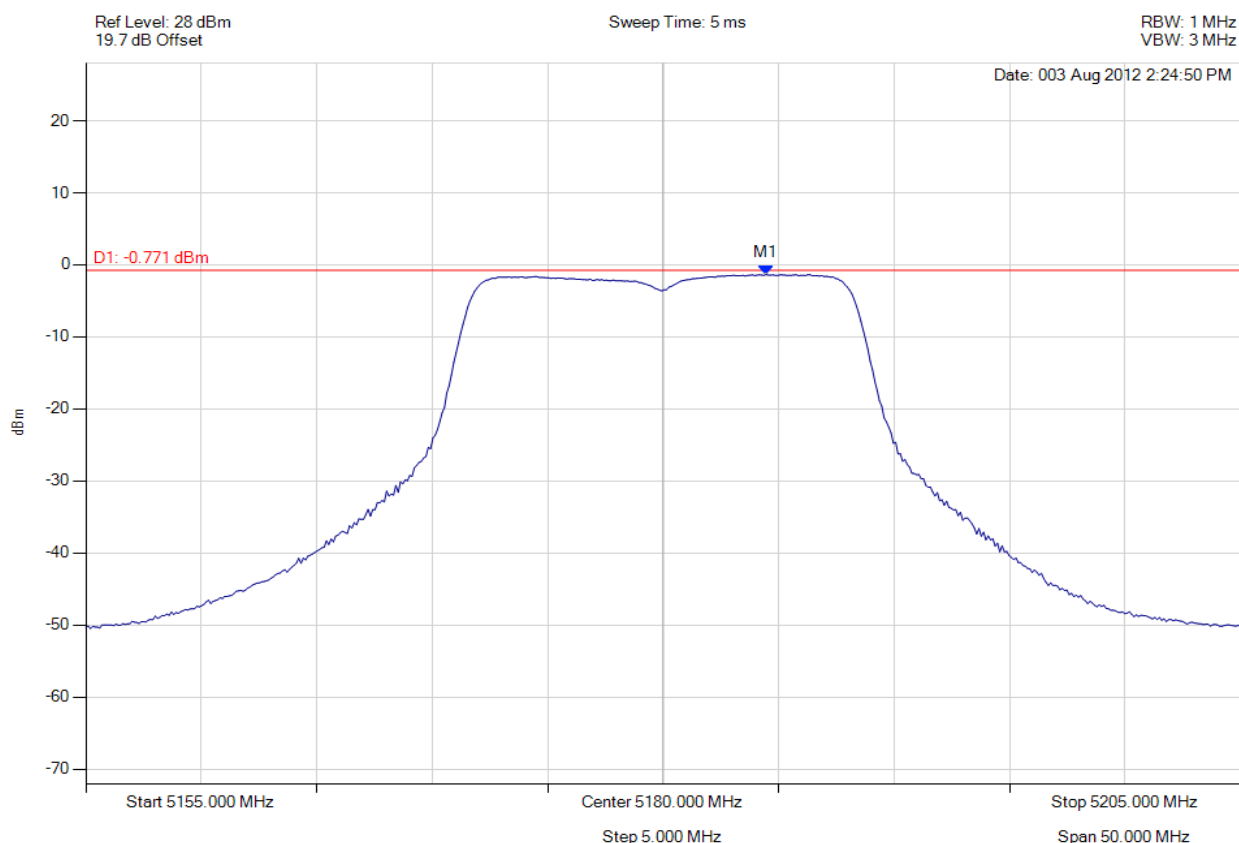
Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 120 of 169

A.1.2. Peak Power Spectral Density



Power Spectral Density

Variant: 802.11a, Channel: 5180.00 MHz, Chain A, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5184.459 MHz : -1.352 dBm	Limit: 3.229 dBm Margin: -4.58 dB

[Back to the Matrix](#)

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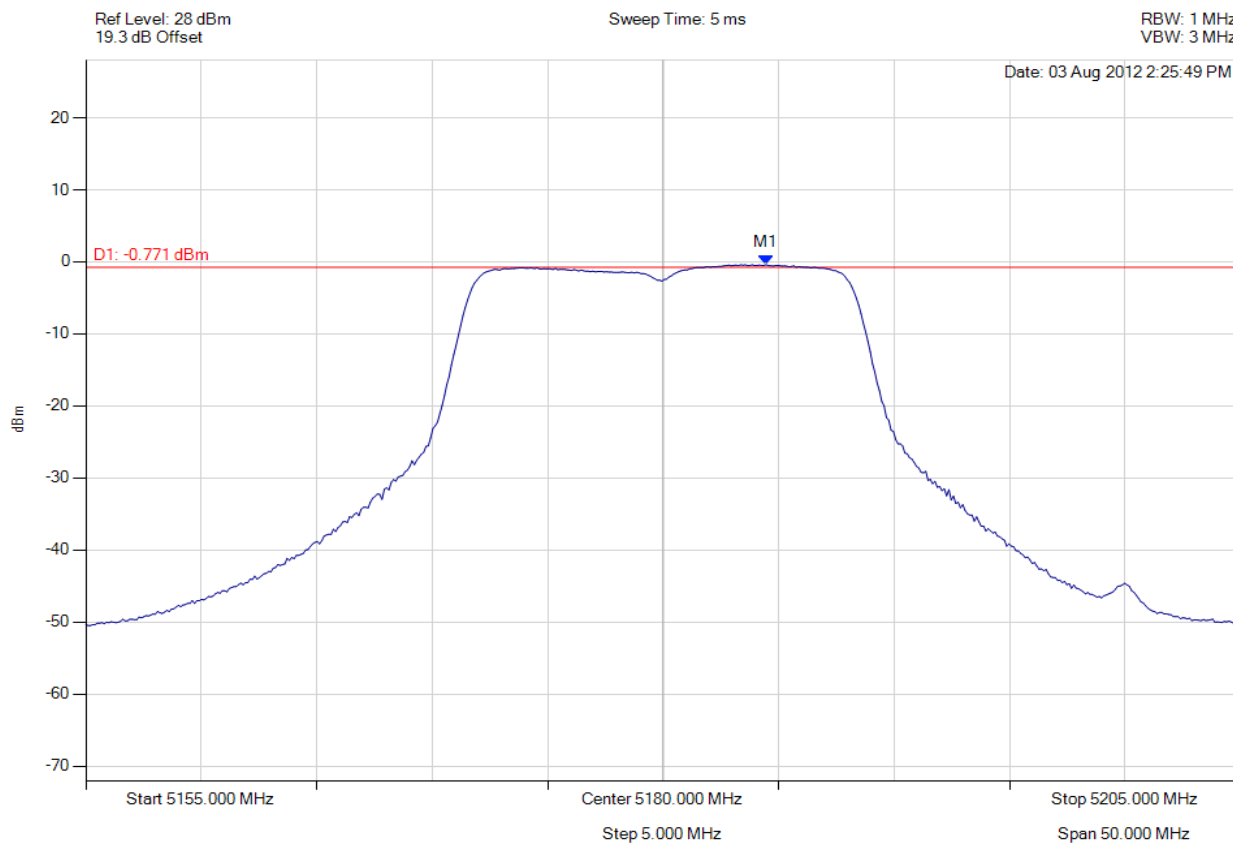


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 121 of 169



Power Spectral Density

Variant: 802.11a, Channel: 5180.00 MHz, Chain B, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5184.459 MHz : -0.407 dBm	Limit: 3.229 dBm Margin: -3.64 dB

[Back to the Matrix](#)

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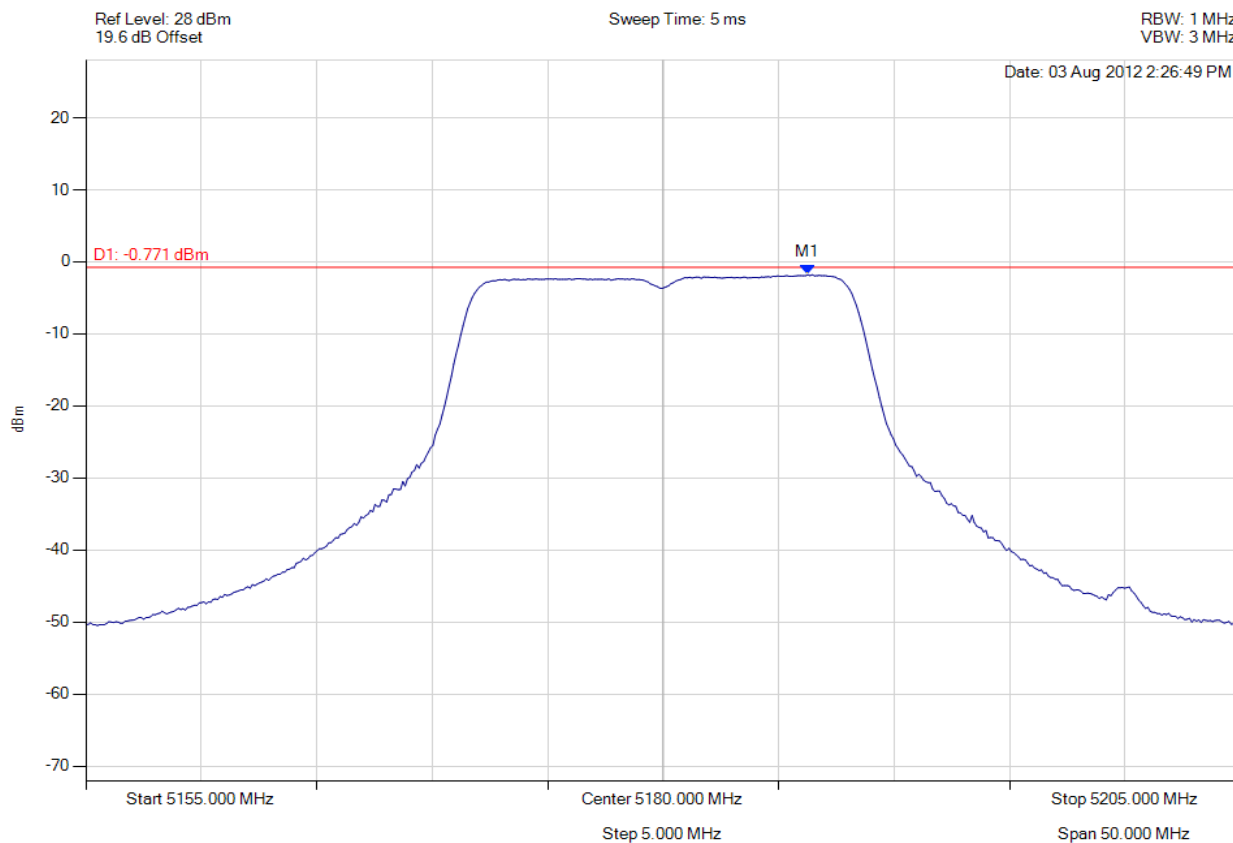


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 122 of 169



Power Spectral Density

Variant: 802.11a, Channel: 5180.00 MHz, Chain C, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5186.263 MHz : -1.781 dBm	Limit: 3.229 dBm Margin: -5.01 dB

[Back to the Matrix](#)

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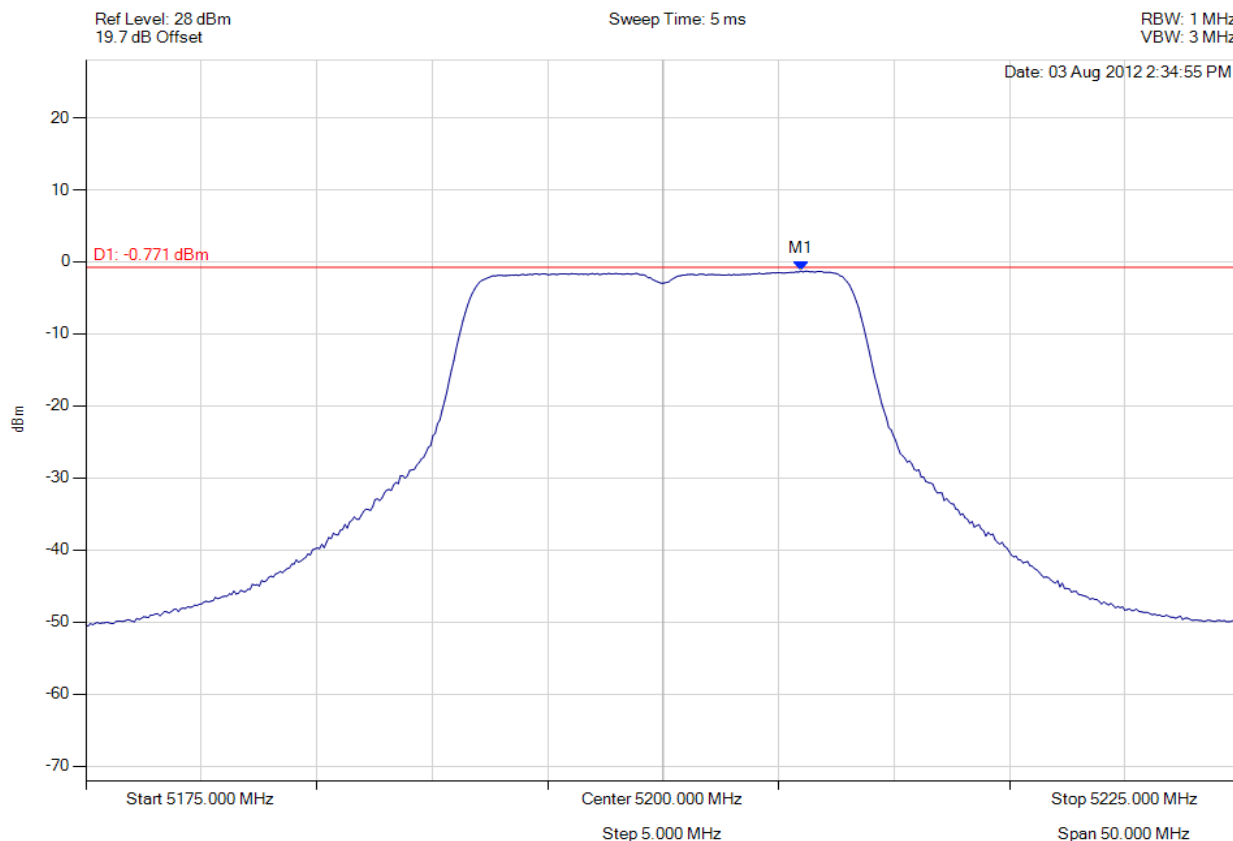


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 123 of 169



Power Spectral Density

Variant: 802.11a, Channel: 5200.00 MHz, Chain A, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5205.962 MHz : -1.267 dBm	Limit: 3.229 dBm Margin: -4.50 dB

[Back to the Matrix](#)

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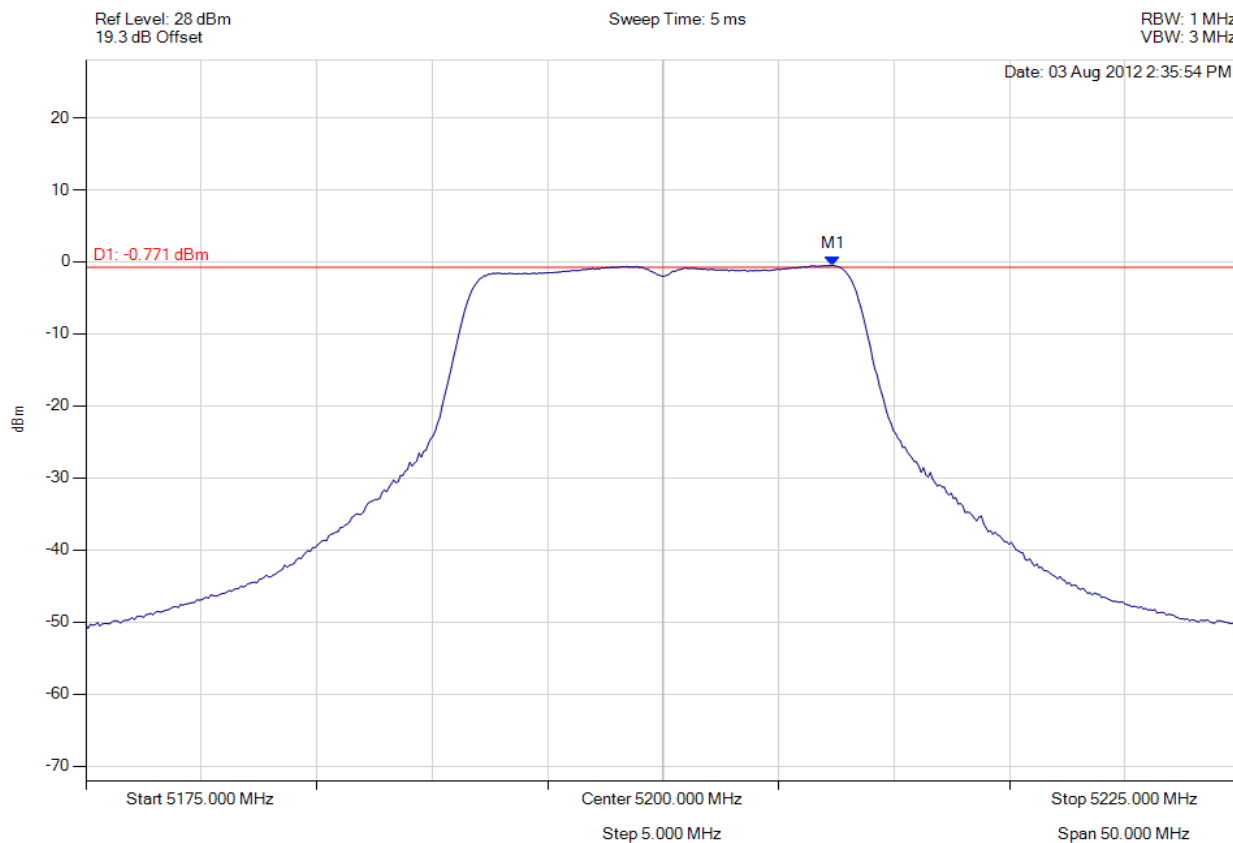


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 124 of 169



Power Spectral Density

Variant: 802.11a, Channel: 5200.00 MHz, Chain B, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5207.365 MHz : -0.466 dBm	Limit: 3.229 dBm Margin: -3.69 dB

[Back to the Matrix](#)

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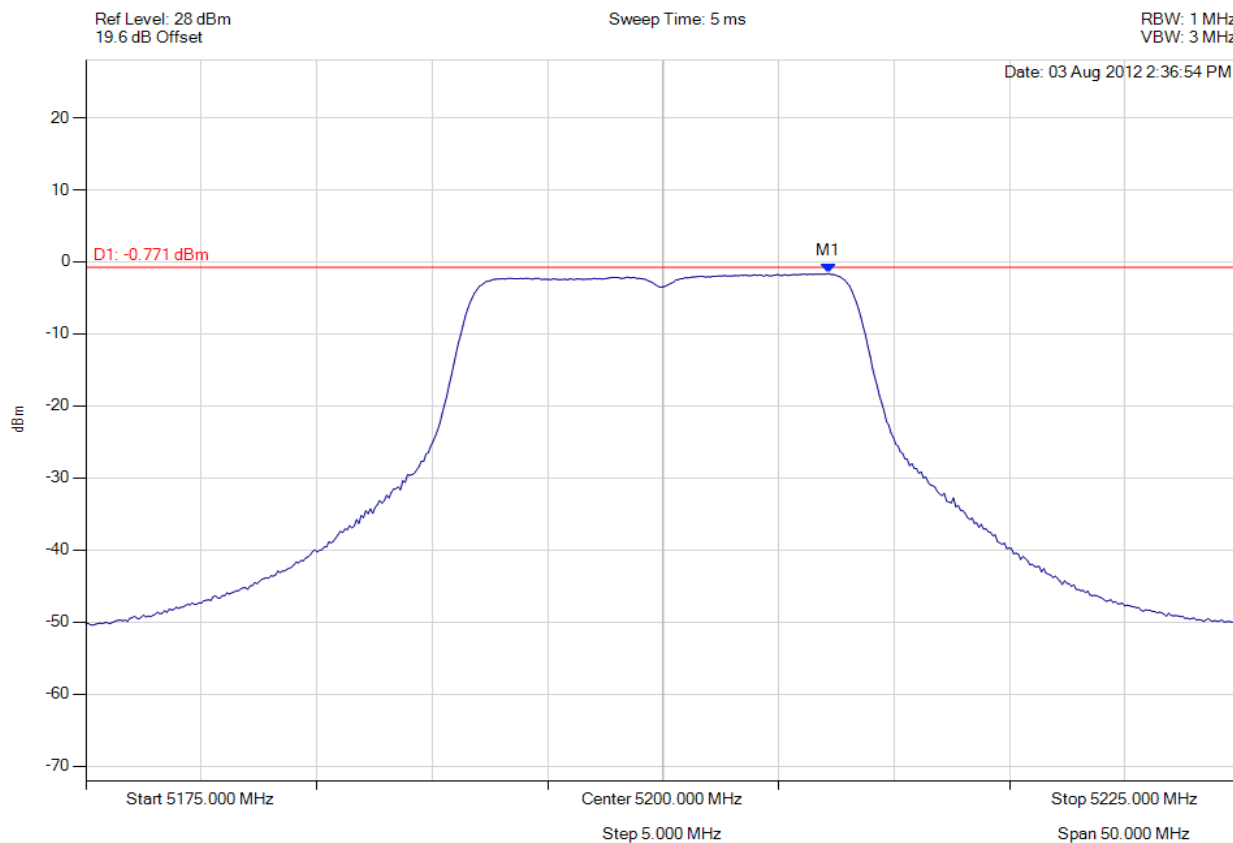


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 125 of 169



Power Spectral Density

Variant: 802.11a, Channel: 5200.00 MHz, Chain C, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5207.164 MHz : -1.613 dBm	Limit: 3.229 dBm Margin: -4.84 dB

[Back to the Matrix](#)

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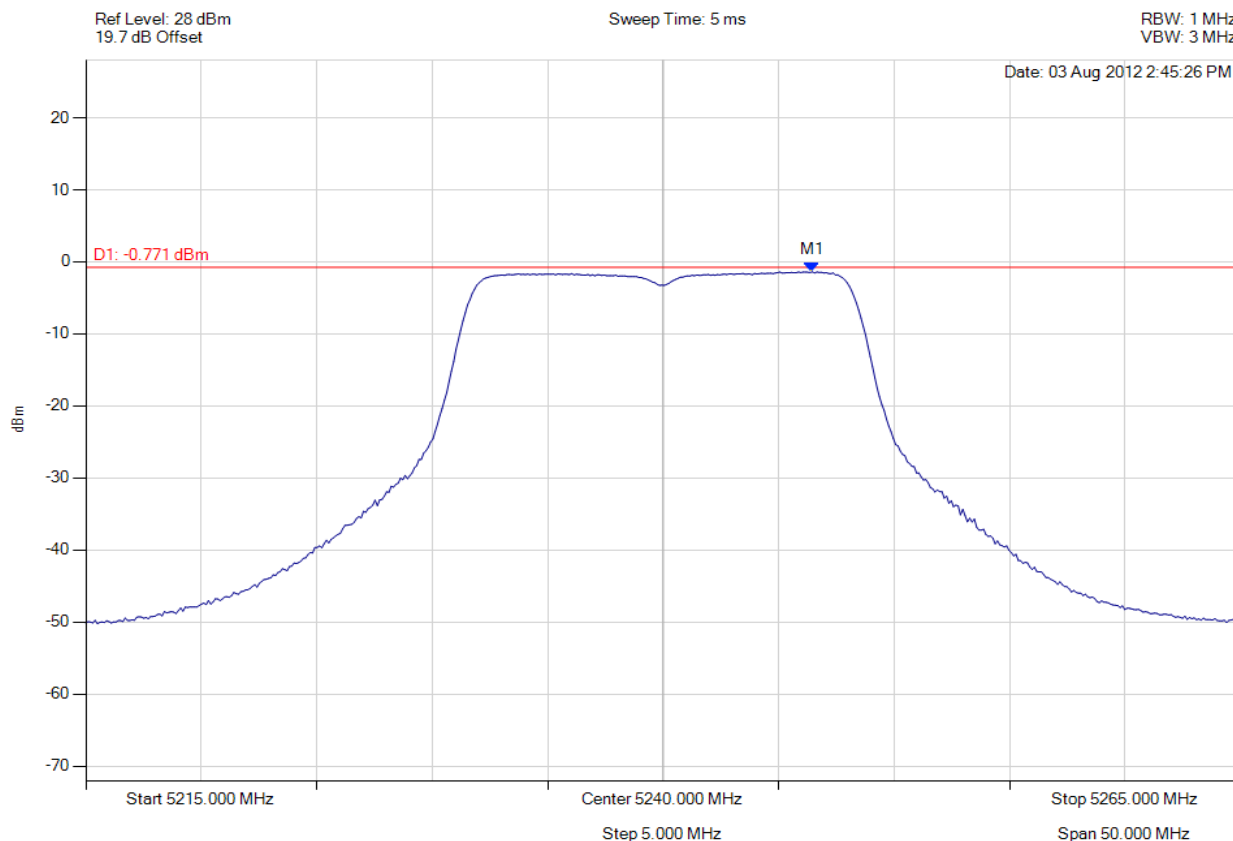


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 126 of 169



Power Spectral Density

Variant: 802.11a, Channel: 5240.00 MHz, Chain A, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5246.463 MHz : -1.385 dBm	Limit: 3.229 dBm Margin: -4.61 dB

[Back to the Matrix](#)

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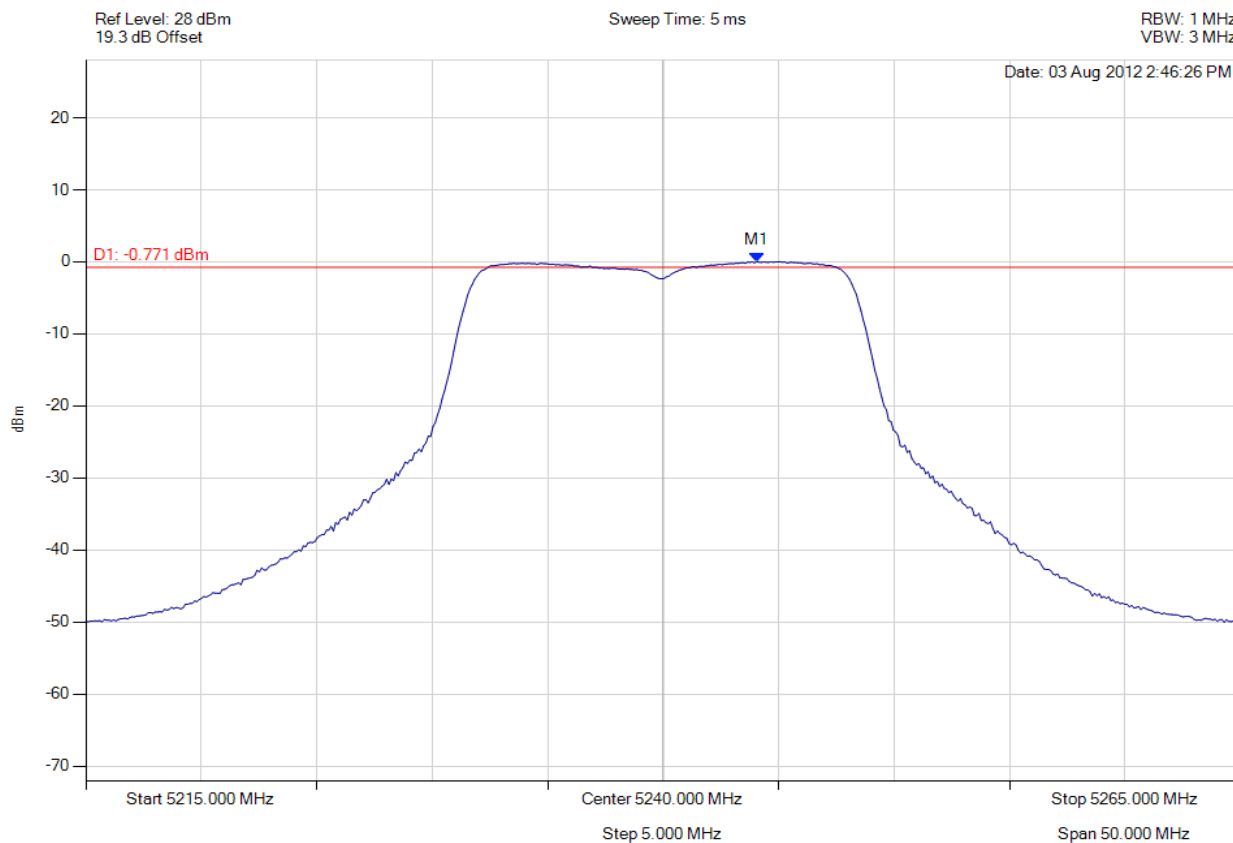


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 127 of 169



Power Spectral Density

Variant: 802.11a, Channel: 5240.00 MHz, Chain B, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5244.058 MHz : 0.034 dBm	Limit: 3.229 dBm Margin: -3.19 dB

[Back to the Matrix](#)

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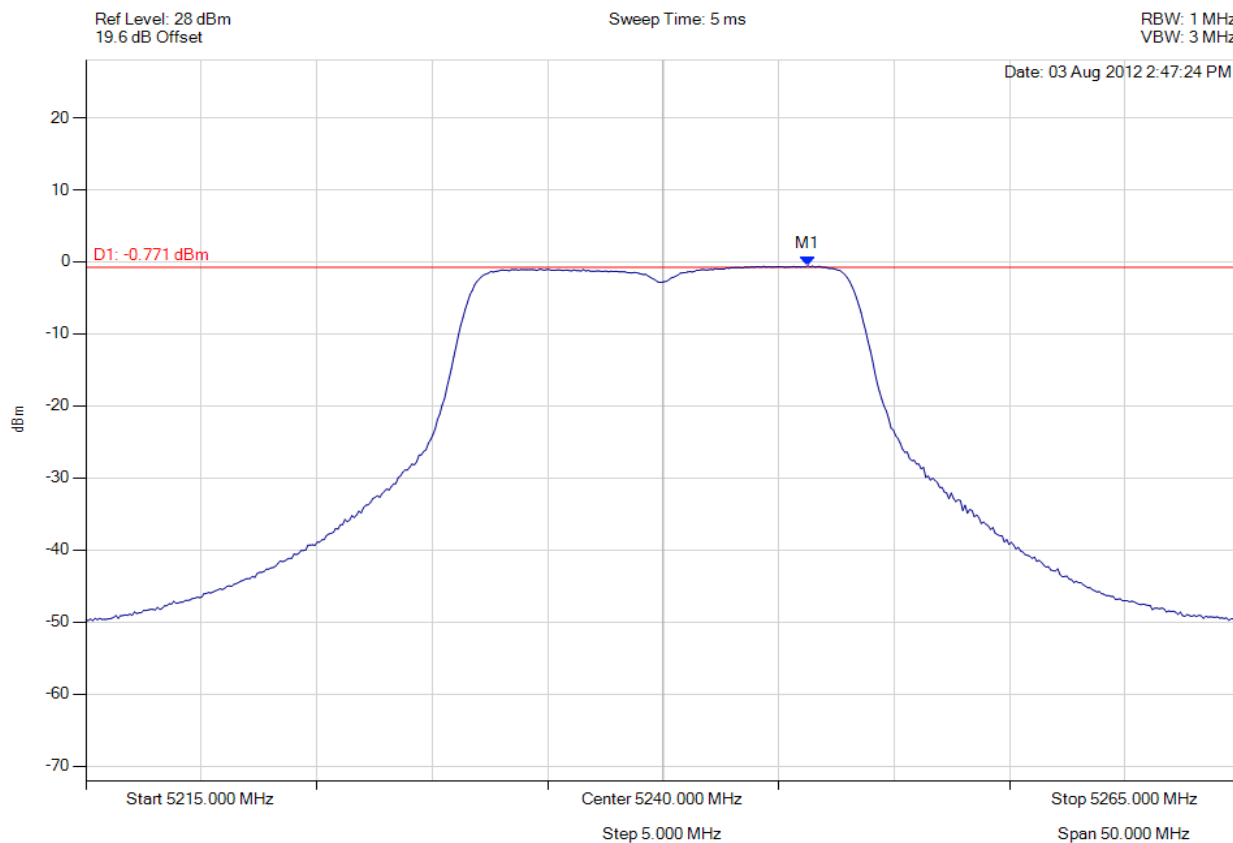


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 128 of 169



Power Spectral Density

Variant: 802.11a, Channel: 5240.00 MHz, Chain C, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5246.263 MHz : -0.547 dBm	Limit: 3.229 dBm Margin: -3.78 dB

[Back to the Matrix](#)

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Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 129 of 169

NOTE: The following combined power spectral density plot (Chain a + Chain b + Chain c) identifies that the WLA532E complies with the +4 dBm limit. To generate this plot the spectrum analyzer data was downloaded for each of the individual chains summed and re-uploaded to the analyzer.

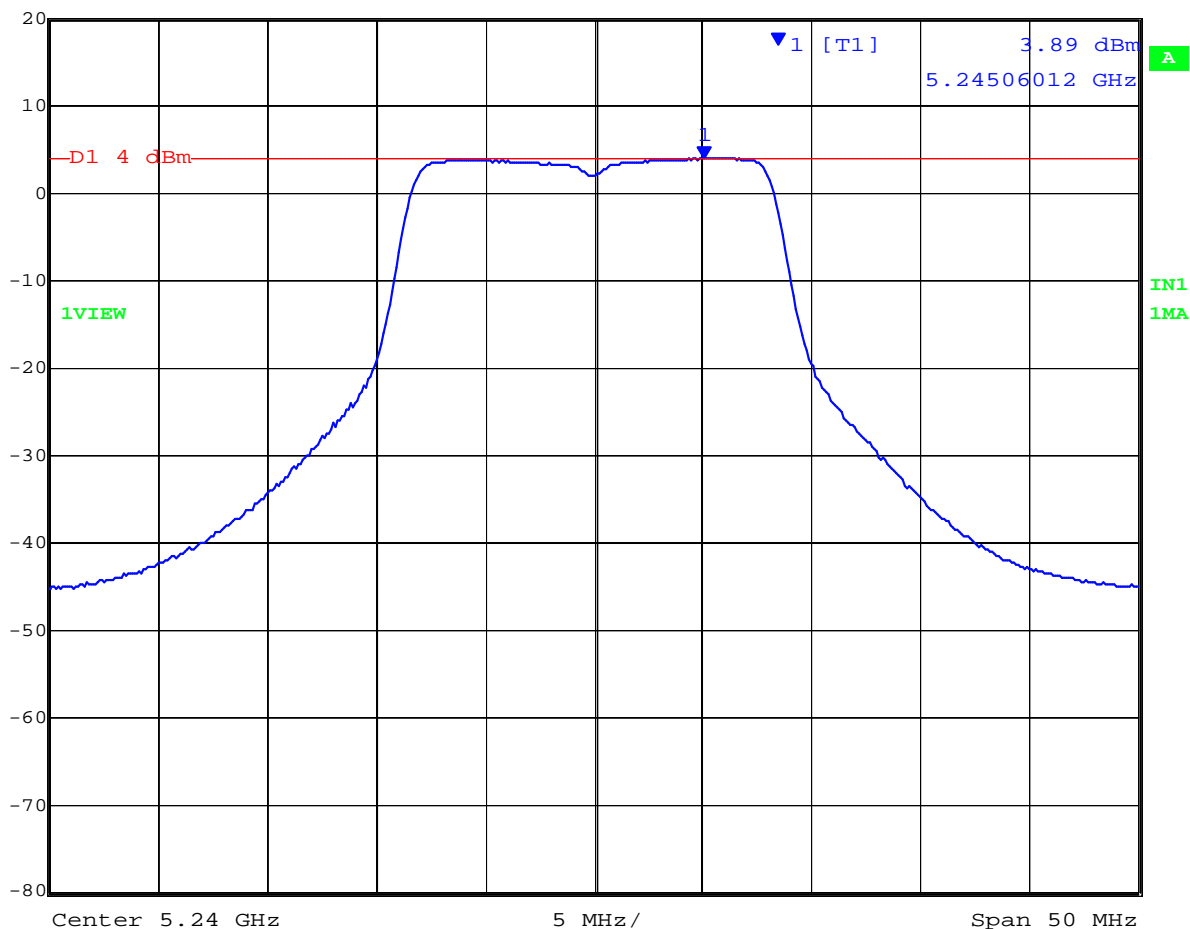


Power Spectral Density

Variant: 802.11a, Channel: 5240.00 MHz, Chain A + Chain B + Chain C, Temp: Ambient, Voltage: 48.00 Vdc



Ref Lvl 20 dBm
Marker 1 [T1] 3.89 dBm
5.24506012 GHz
RBW 1 MHz
VBW 1 MHz
SWT 5 ms
RF Att 30 dB
Unit dBm



Date: 3.AUG.2012 18:15:10

[Back to the Matrix](#)

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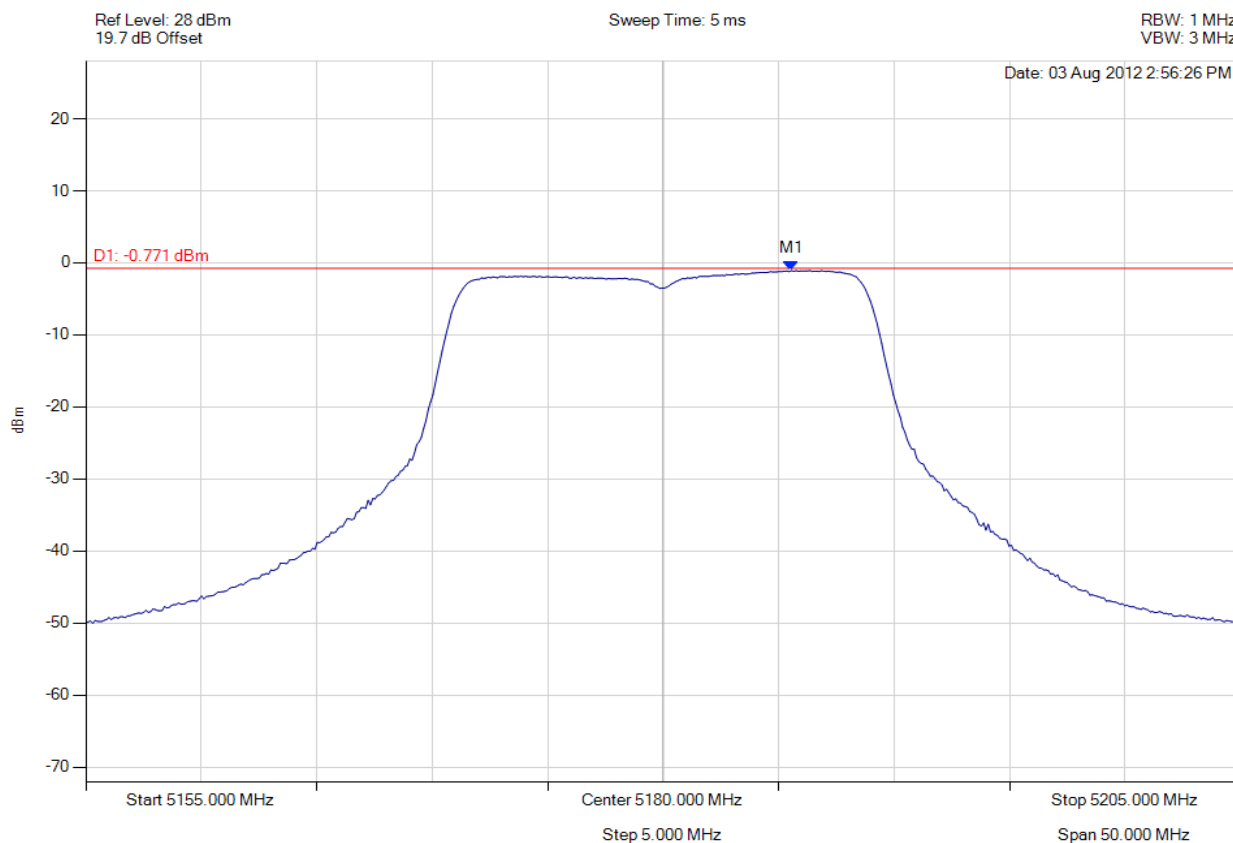


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 130 of 169



Power Spectral Density

Variant: 802.11n HT-20, Channel: 5180.00 MHz, Chain A, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5185.561 MHz : -1.075 dBm	Limit: 3.229 dBm Margin: -4.30 dB

[Back to the Matrix](#)

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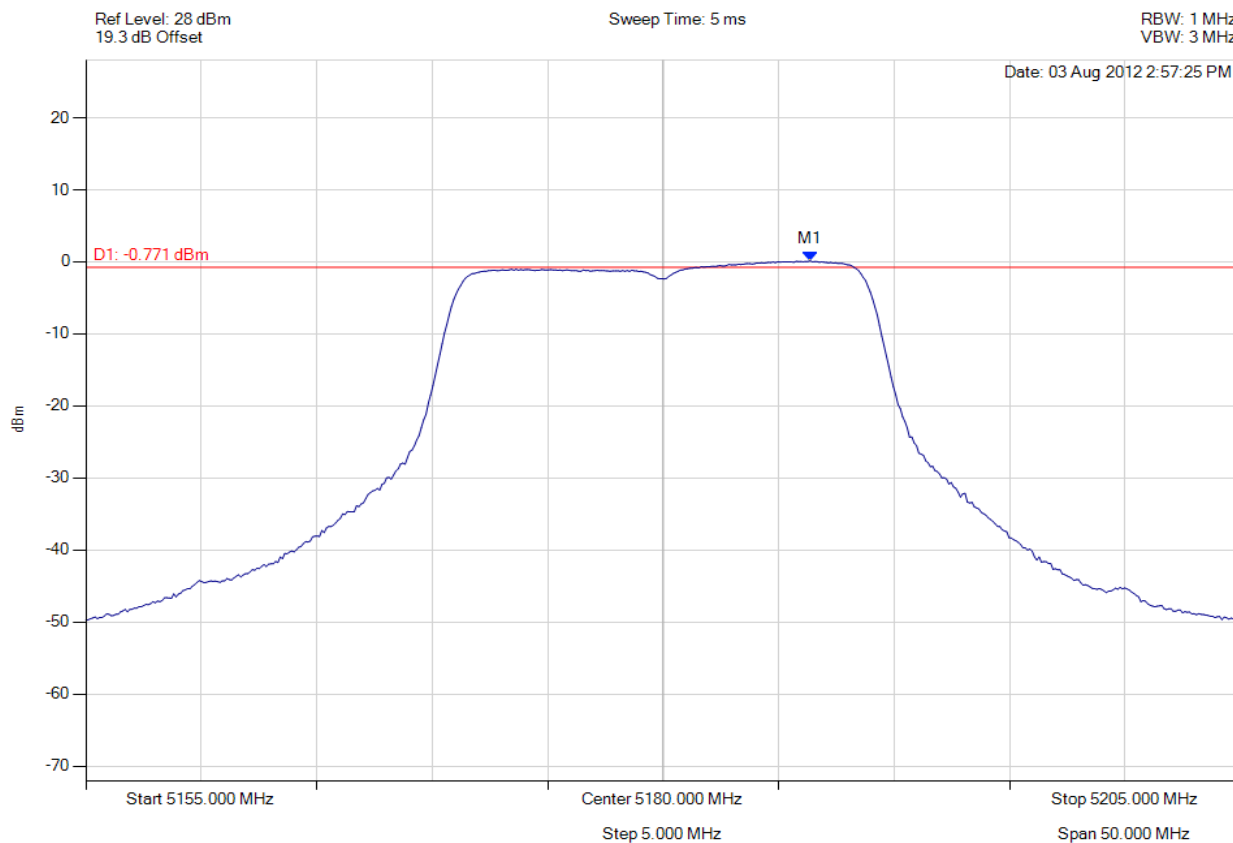


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 131 of 169



Power Spectral Density

Variant: 802.11n HT-20, Channel: 5180.00 MHz, Chain B, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5186.363 MHz : 0.132 dBm	Limit: 3.229 dBm Margin: -3.10 dB

[Back to the Matrix](#)

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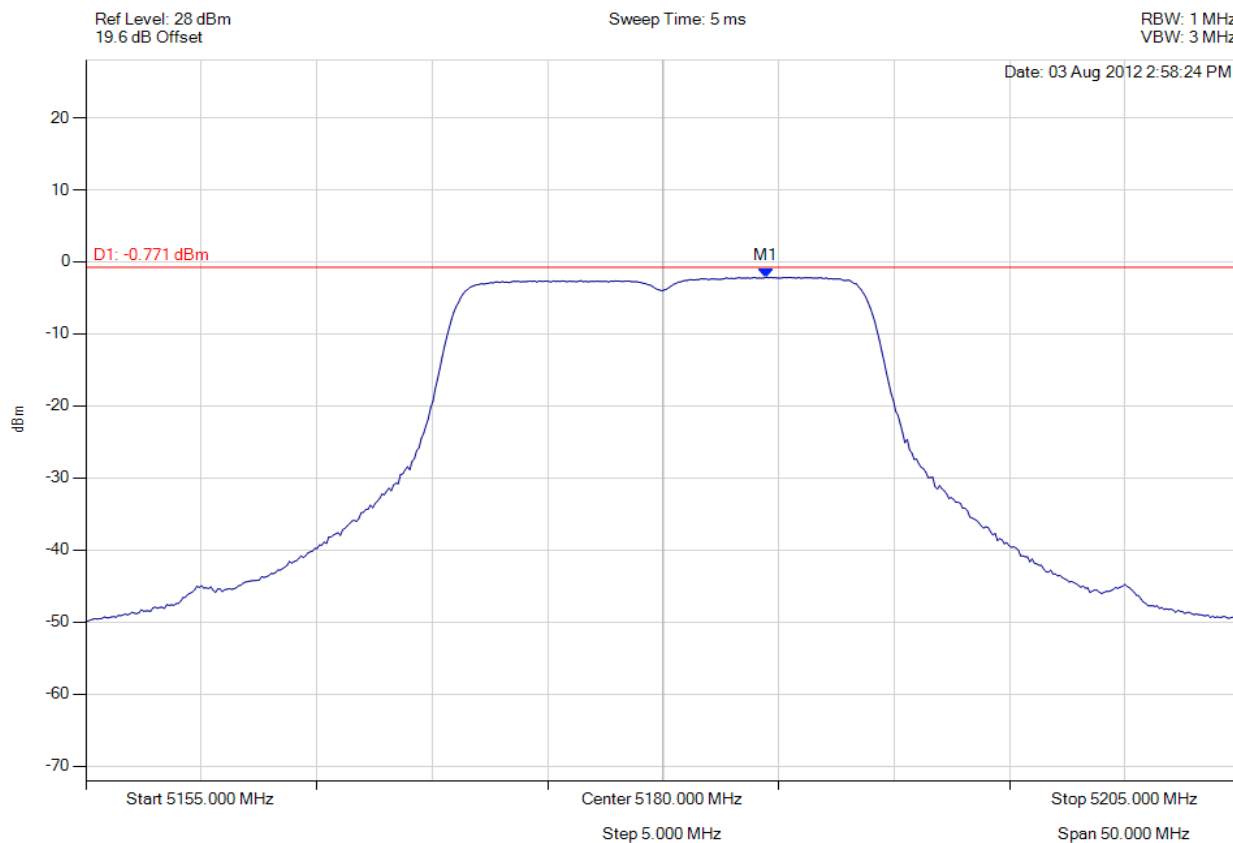


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 132 of 169



Power Spectral Density

Variant: 802.11n HT-20, Channel: 5180.00 MHz, Chain C, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5184.459 MHz : -2.146 dBm	Limit: 3.229 dBm Margin: -5.37 dB

[Back to the Matrix](#)

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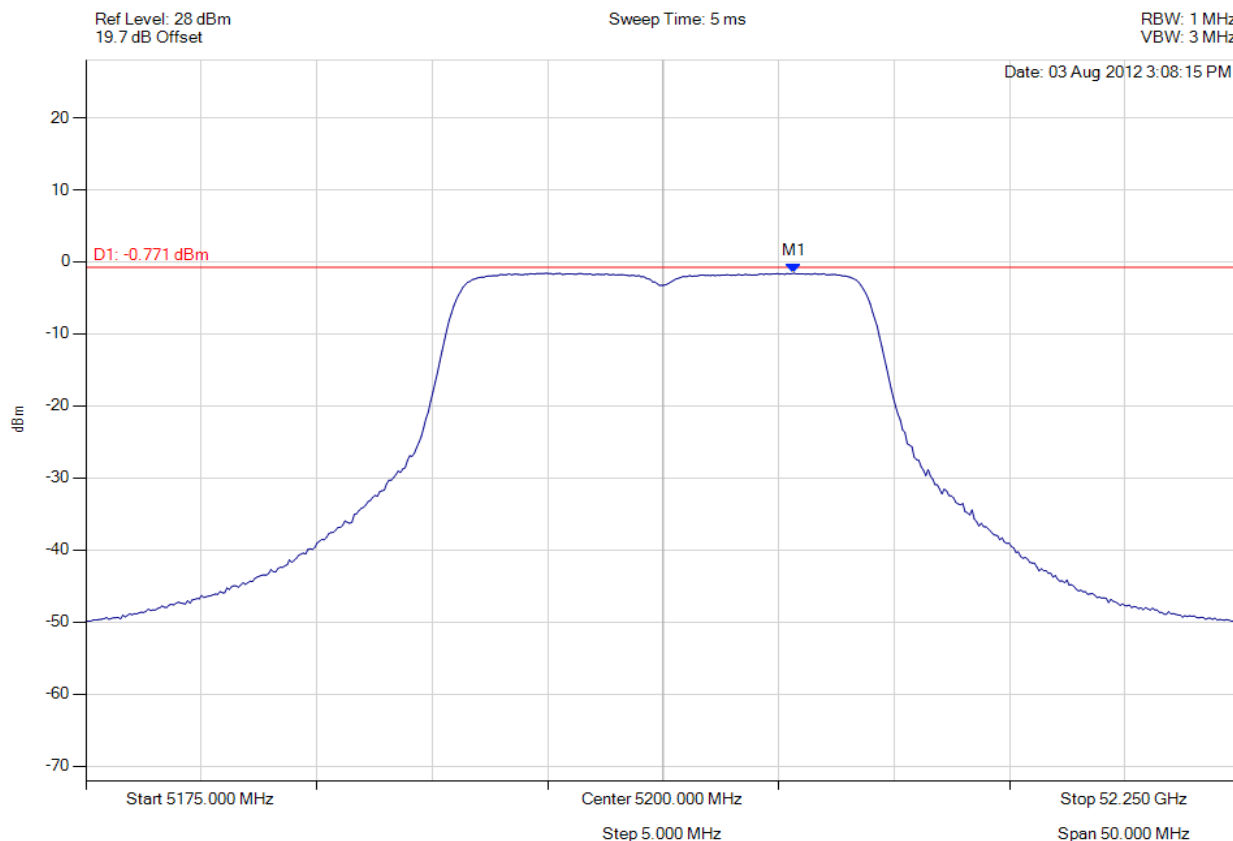


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 133 of 169



Power Spectral Density

Variant: 802.11n HT-20, Channel: 5200.00 MHz, Chain A, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5205.661 MHz : -1.572 dBm	Limit: 3.229 dBm Margin: -4.80 dB

[Back to the Matrix](#)

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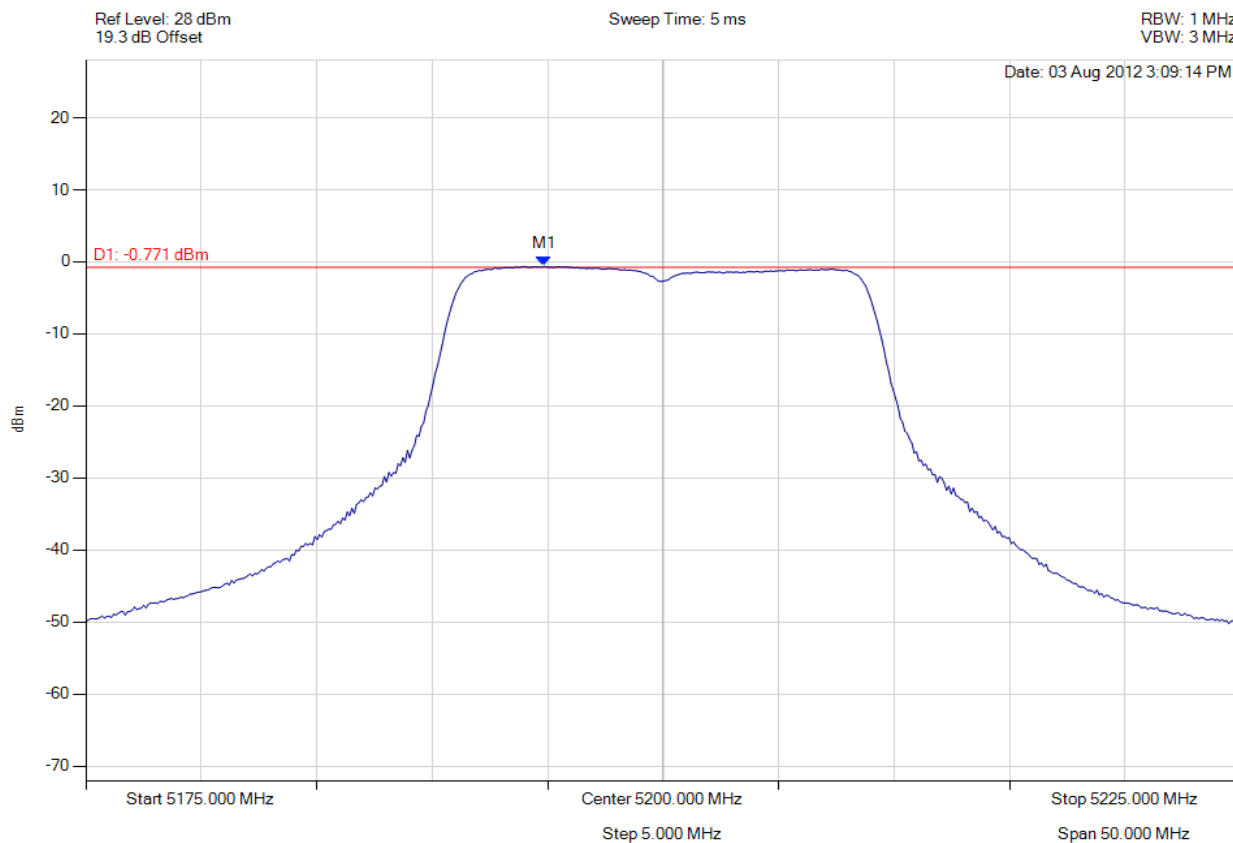


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 134 of 169



Power Spectral Density

Variant: 802.11n HT-20, Channel: 5200.00 MHz, Chain B, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5194.840 MHz : -0.612 dBm	Limit: 3.229 dBm Margin: -3.84 dB

[Back to the Matrix](#)

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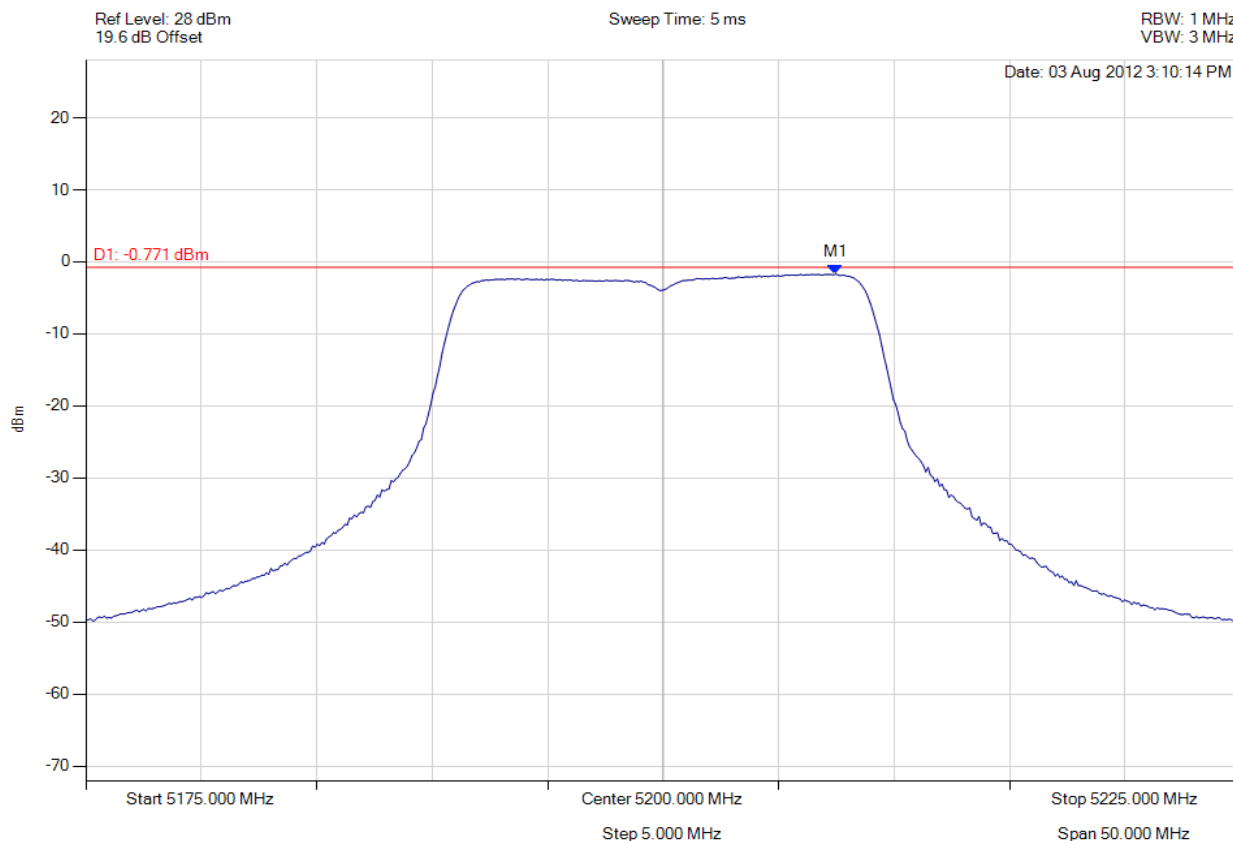


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 135 of 169



Power Spectral Density

Variant: 802.11n HT-20, Channel: 5200.00 MHz, Chain C, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5207.465 MHz : -1.697 dBm	Limit: 3.229 dBm Margin: -4.93 dB

[Back to the Matrix](#)

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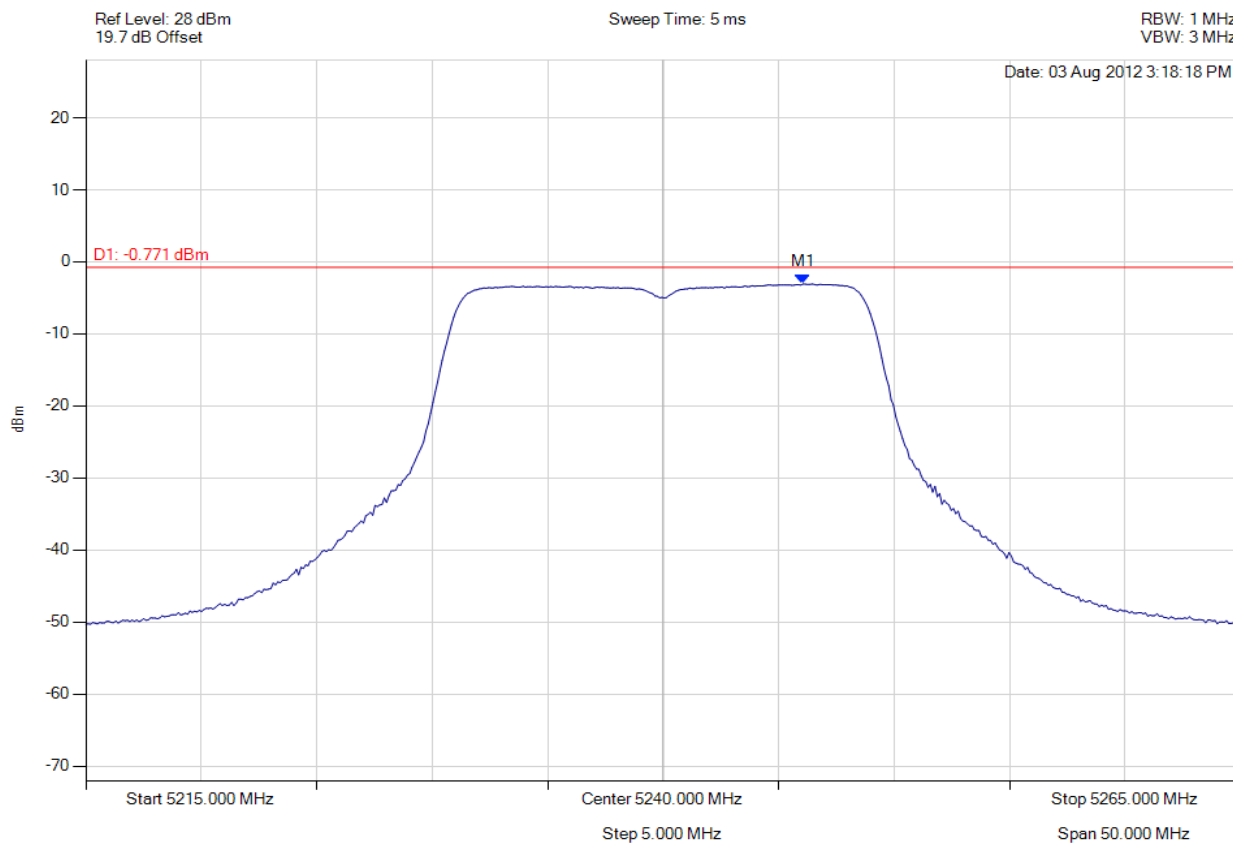


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 136 of 169



Power Spectral Density

Variant: 802.11n HT-20, Channel: 5240.00 MHz, Chain A, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5246.062 MHz : -3.080 dBm	Limit: 3.229 dBm Margin: -6.31 dB

[Back to the Matrix](#)

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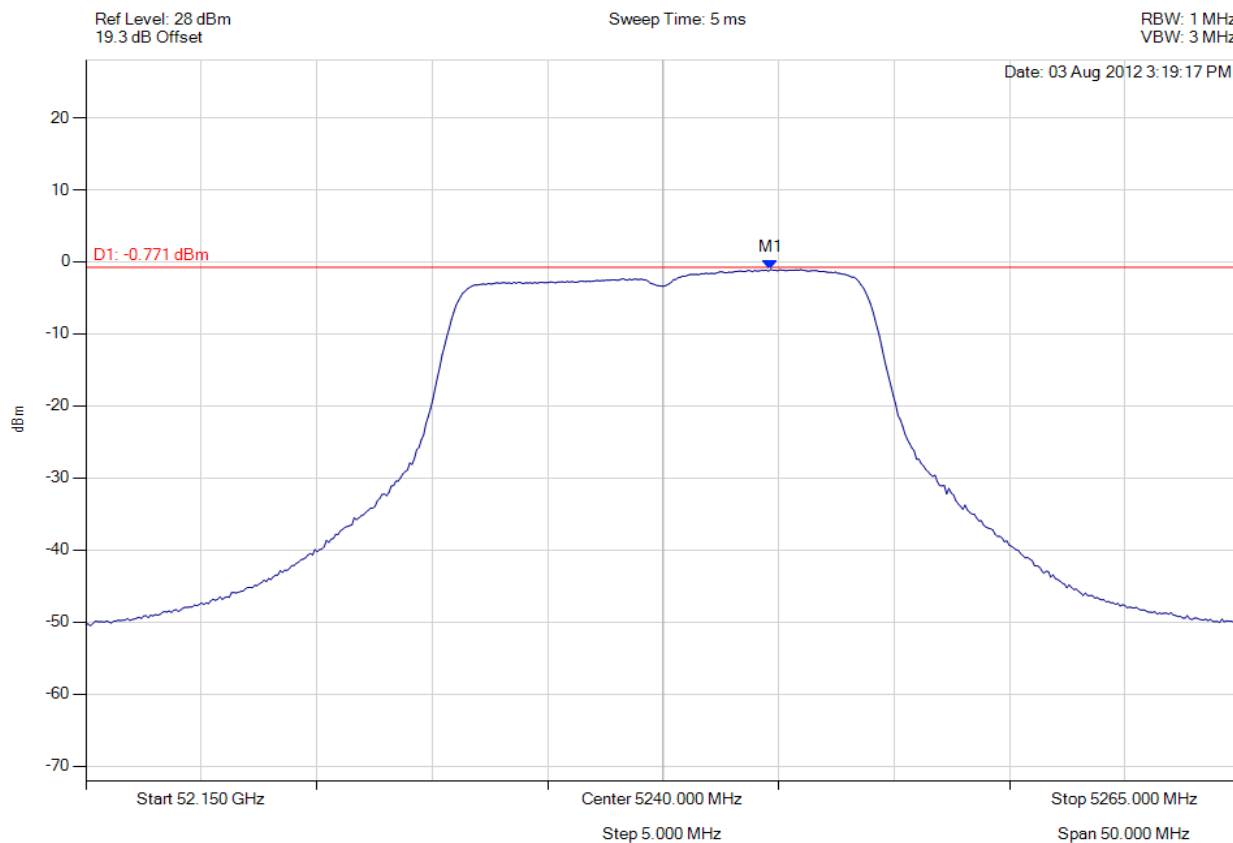


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 137 of 169



Power Spectral Density

Variant: 802.11n HT-20, Channel: 5240.00 MHz, Chain B, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5244.659 MHz : -1.071 dBm	Limit: 3.229 dBm Margin: -4.30 dB

[Back to the Matrix](#)

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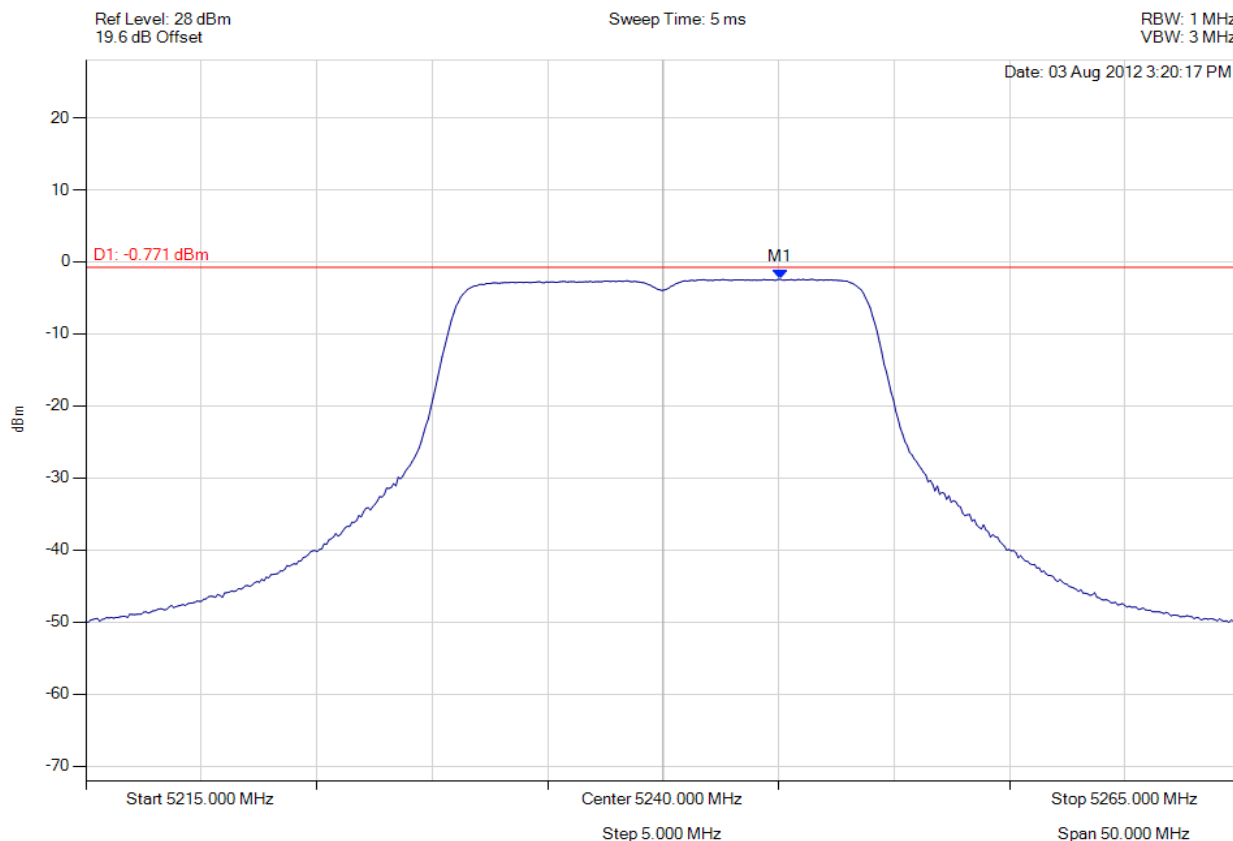


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 138 of 169



Power Spectral Density

Variant: 802.11n HT-20, Channel: 5240.00 MHz, Chain C, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5245.060 MHz : -2.401 dBm	Limit: 3.229 dBm Margin: -5.63 dB

[Back to the Matrix](#)

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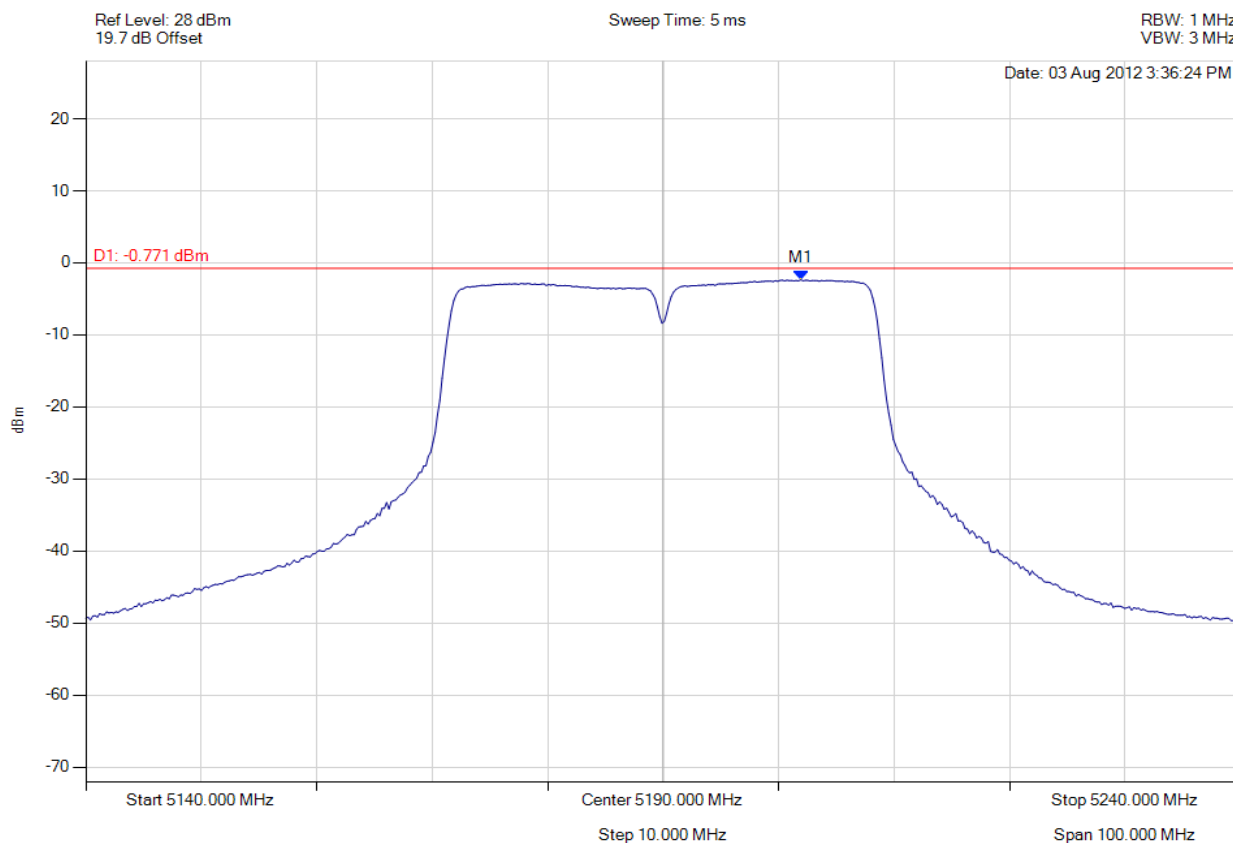


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 139 of 169



Power Spectral Density

Variant: 802.11n HT-40, Channel: 5190.00 MHz, Chain A, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5201.924 MHz : -2.358 dBm	Limit: 3.229 dBm Margin: -5.59 dB

[Back to the Matrix](#)

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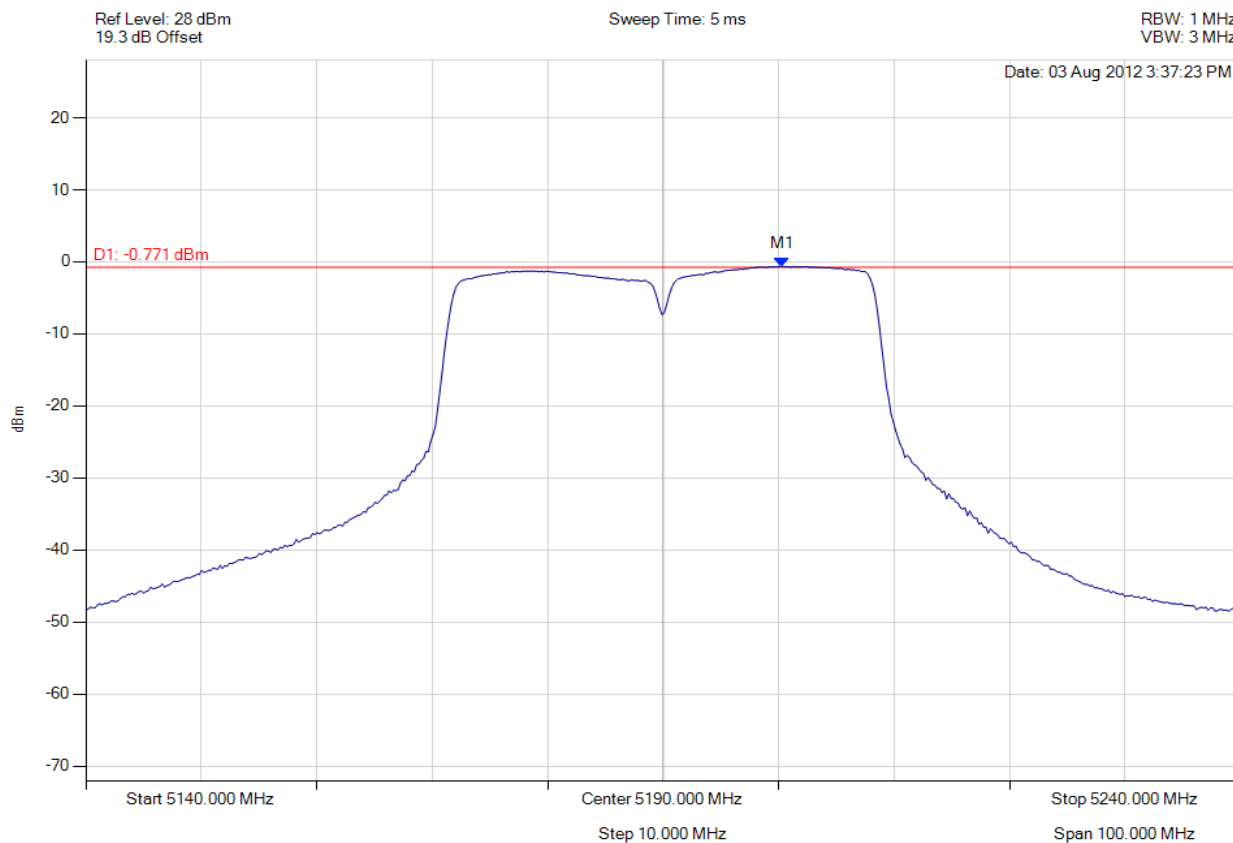


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 140 of 169



Power Spectral Density

Variant: 802.11n HT-40, Channel: 5190.00 MHz, Chain B, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5200.321 MHz : -0.617 dBm	Limit: 3.229 dBm Margin: -3.85 dB

[Back to the Matrix](#)

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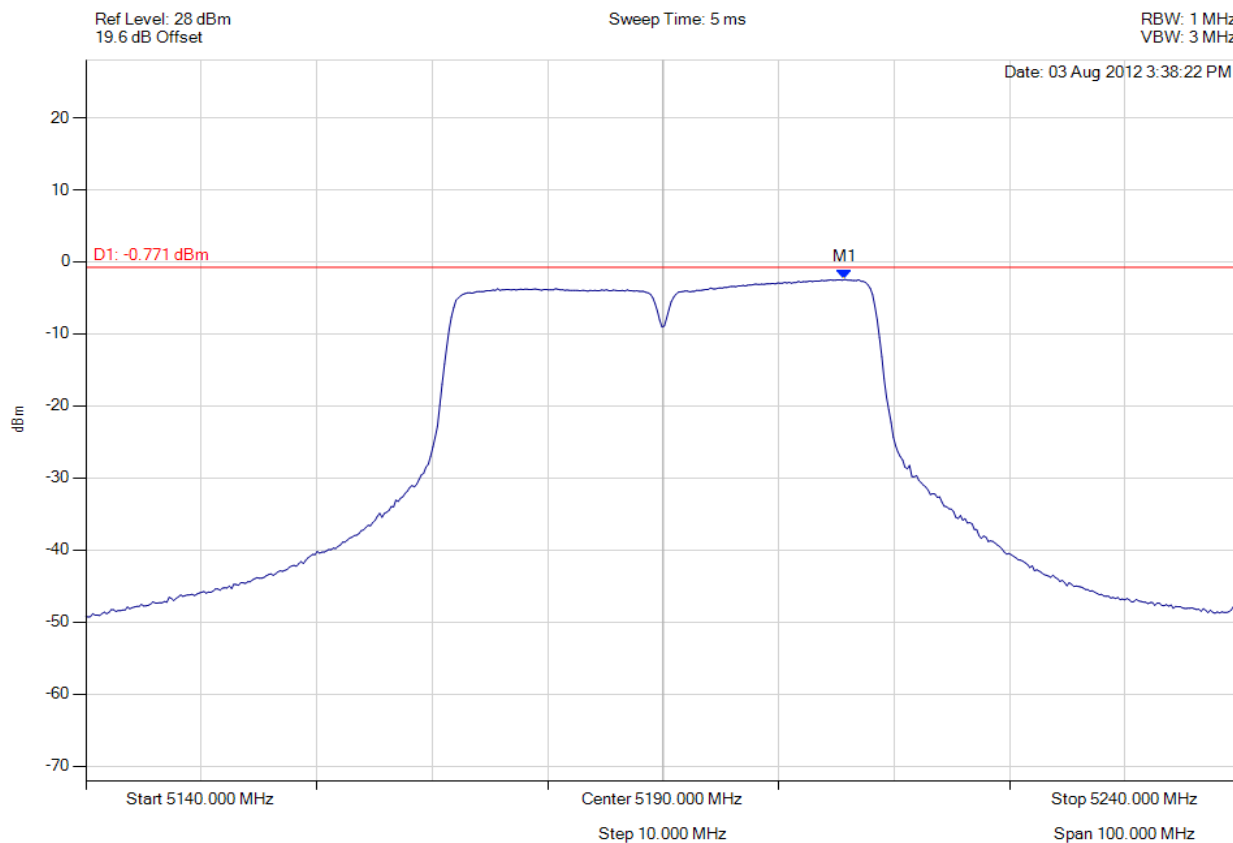


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 141 of 169



Power Spectral Density

Variant: 802.11n HT-40, Channel: 5190.00 MHz, Chain C, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5205.731 MHz : -2.440 dBm	Limit: 3.229 dBm Margin: -5.67 dB

[Back to the Matrix](#)

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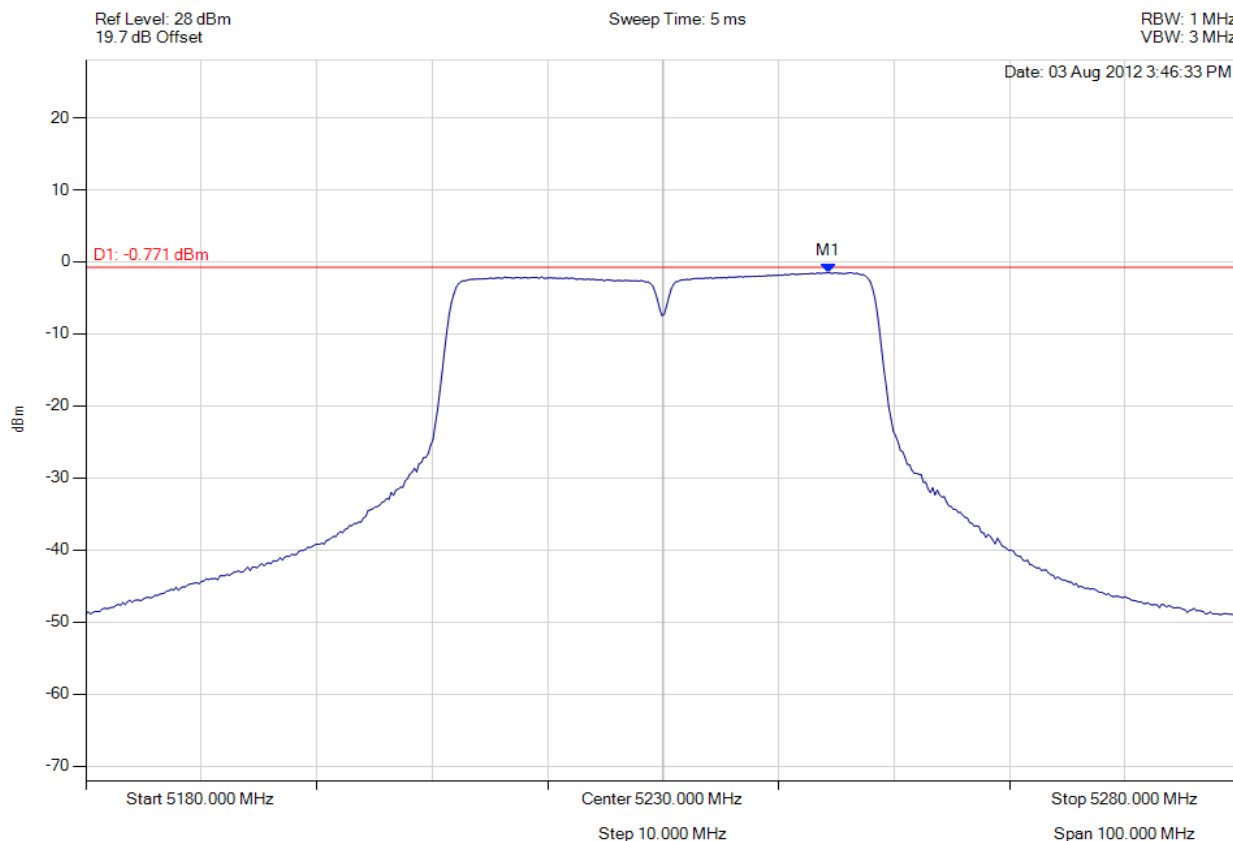


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 142 of 169



Power Spectral Density

Variant: 802.11n HT-40, Channel: 5230.00 MHz, Chain A, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5244.329 MHz : -1.493 dBm	Limit: 3.229 dBm Margin: -4.72 dB

[Back to the Matrix](#)

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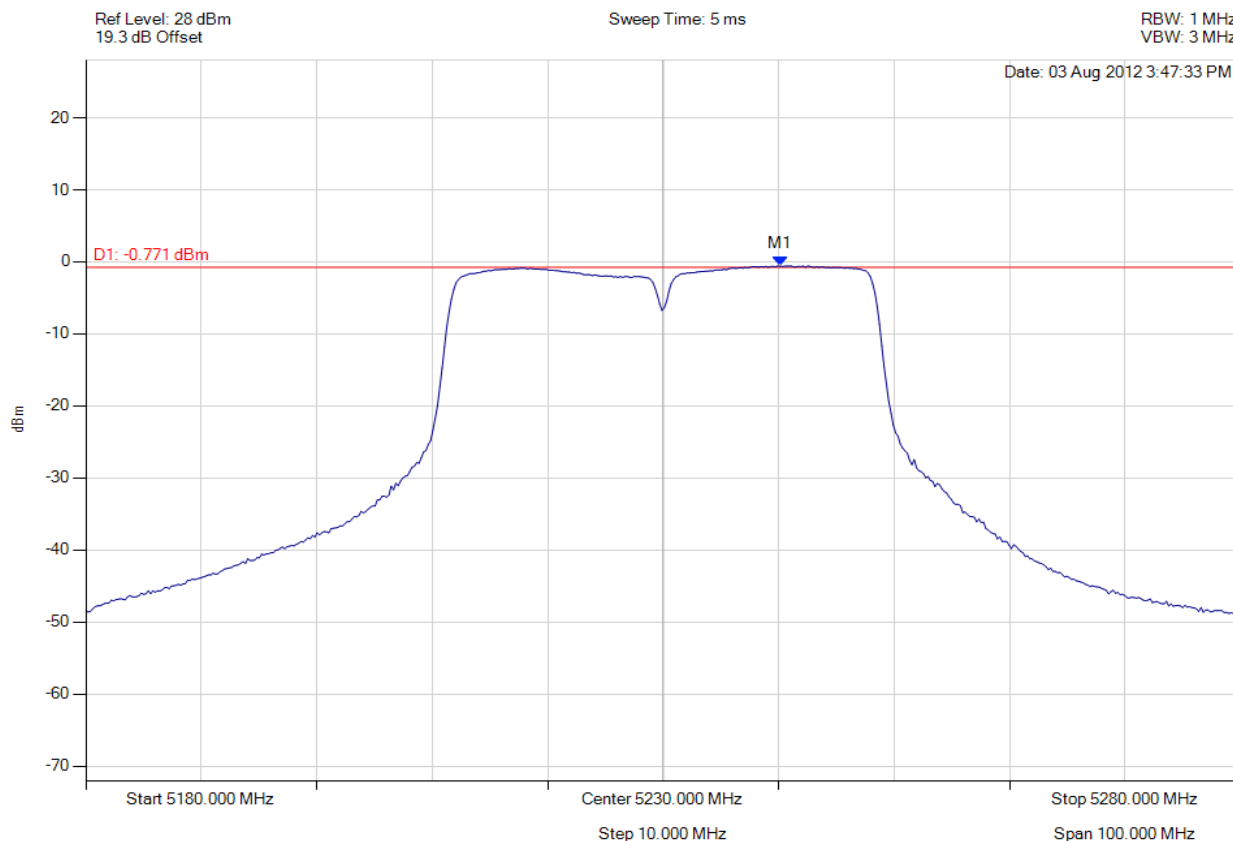


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 143 of 169



Power Spectral Density

Variant: 802.11n HT-40, Channel: 5230.00 MHz, Chain B, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5240.120 MHz : -0.571 dBm	Limit: 3.229 dBm Margin: -3.80 dB

[Back to the Matrix](#)

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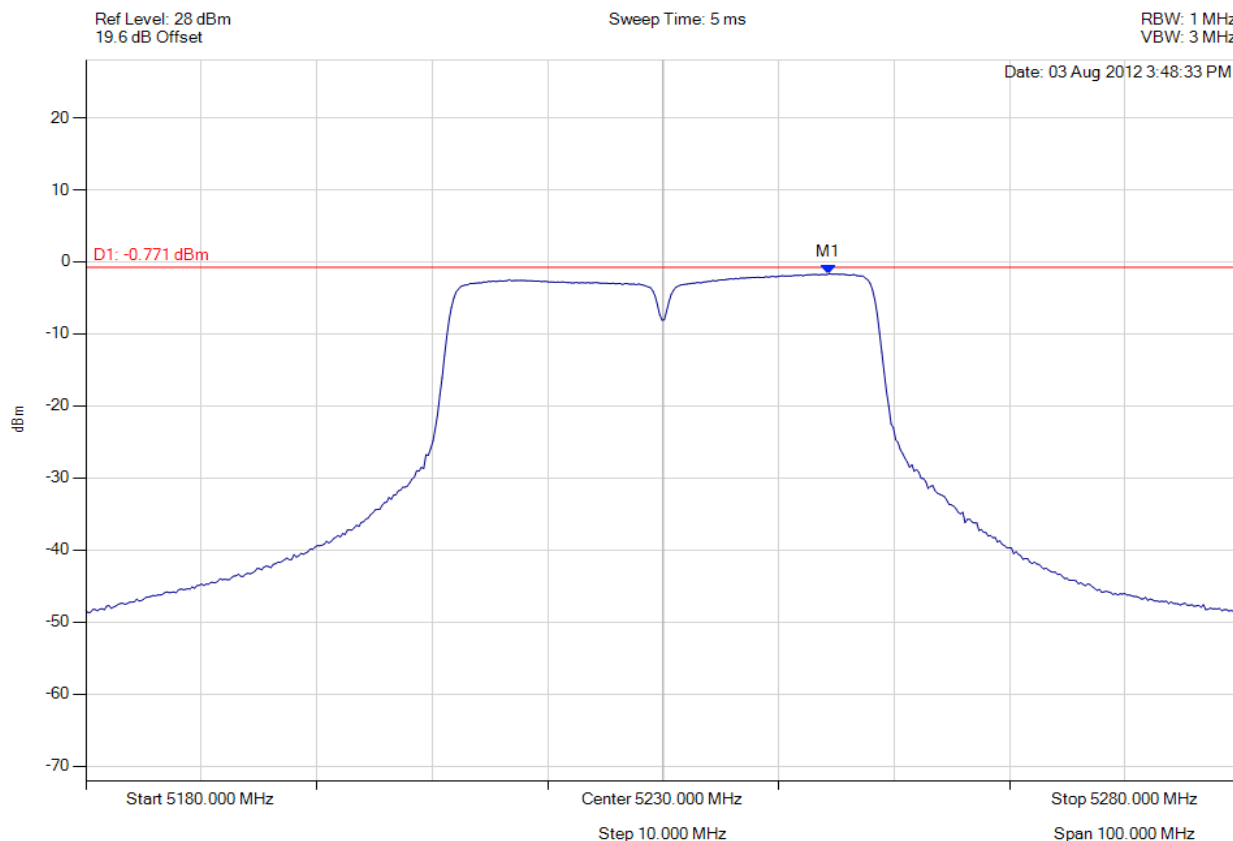


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 144 of 169



Power Spectral Density

Variant: 802.11n HT-40, Channel: 5230.00 MHz, Chain C, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = RMS Sweep Count = 100 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 5244.329 MHz : -1.695 dBm	Limit: 3.229 dBm Margin: -4.92 dB

[Back to the Matrix](#)

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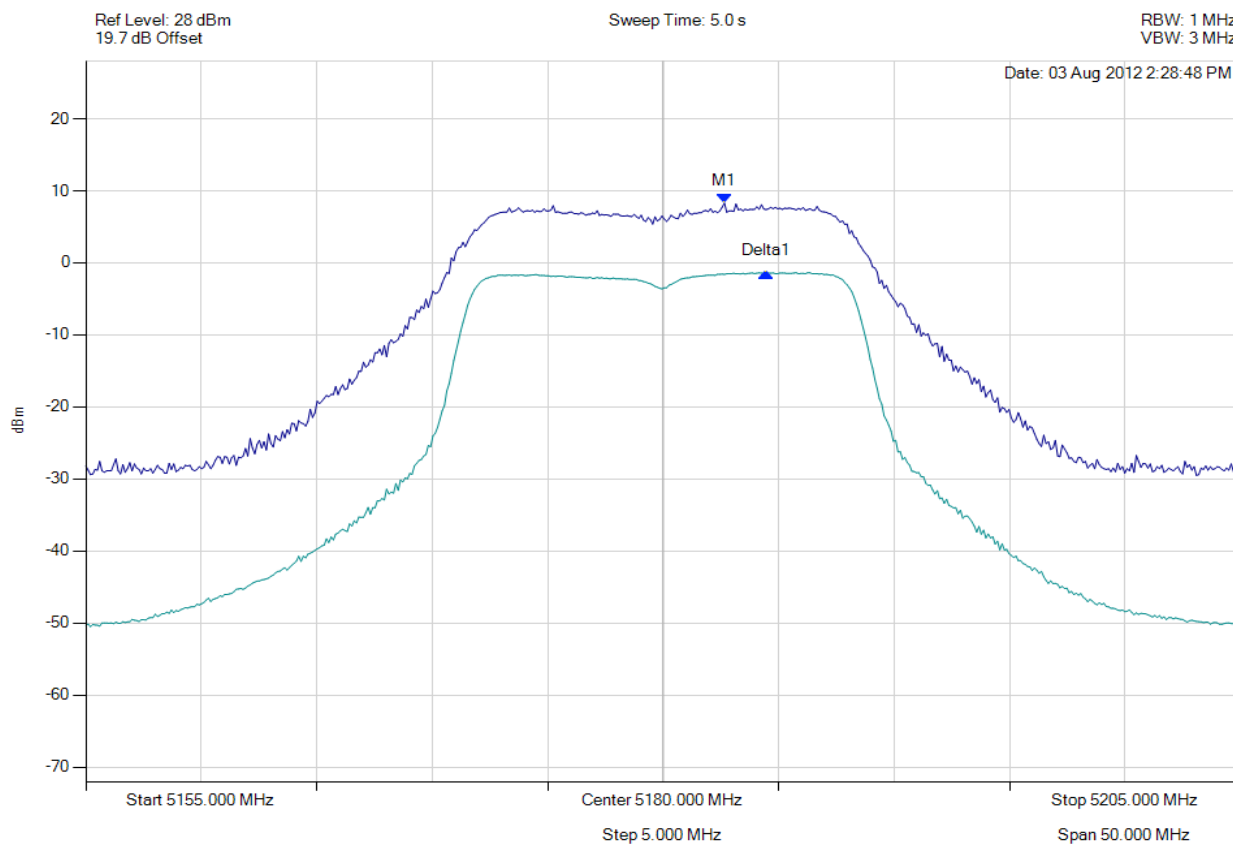
Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 145 of 169

A.1.3. Peak Excursion Ratio



Peak Excursion Ratio

Variant: 802.11a, Channel: 5180.00 MHz, Chain A, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Sweep Count = 0 RF Atten (dB) = 30 TRACE 1 Detector = MAX PEAK Trace Mode = VIEW TRACE 2 Detector = RMS Trace Mode = VIEW	M1 : 5182.655 MHz : 8.284 dBm Delta1 : 5180.000 MHz : -9.642 dB	Measured Excursion Ratio Ratio: 9.64 dB Limit: 13.0 dB Margin: -3.36 dB

[Back to the Matrix](#)

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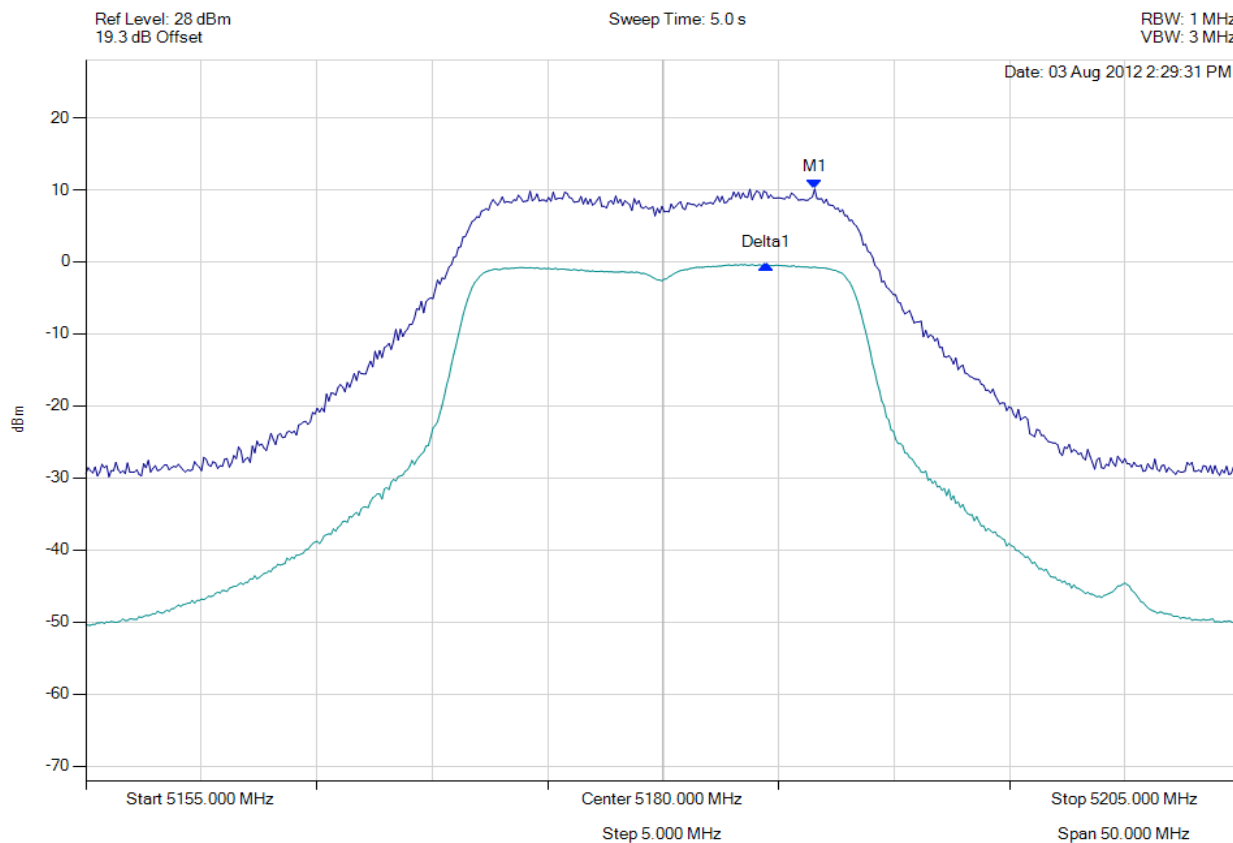


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 146 of 169



Peak Excursion Ratio

Variant: 802.11a, Channel: 5180.00 MHz, Chain B, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Sweep Count = 0 RF Atten (dB) = 30 TRACE 1 Detector = MAX PEAK Trace Mode = VIEW TRACE 2 Detector = RMS Trace Mode = VIEW	M1 : 5186.563 MHz : 10.103 dBm Delta1 : -2104208 Hz : -10.471 dB	Measured Excursion Ratio Ratio: 10.47 dB Limit: 13.0 dB Margin: -2.53 dB

[Back to the Matrix](#)

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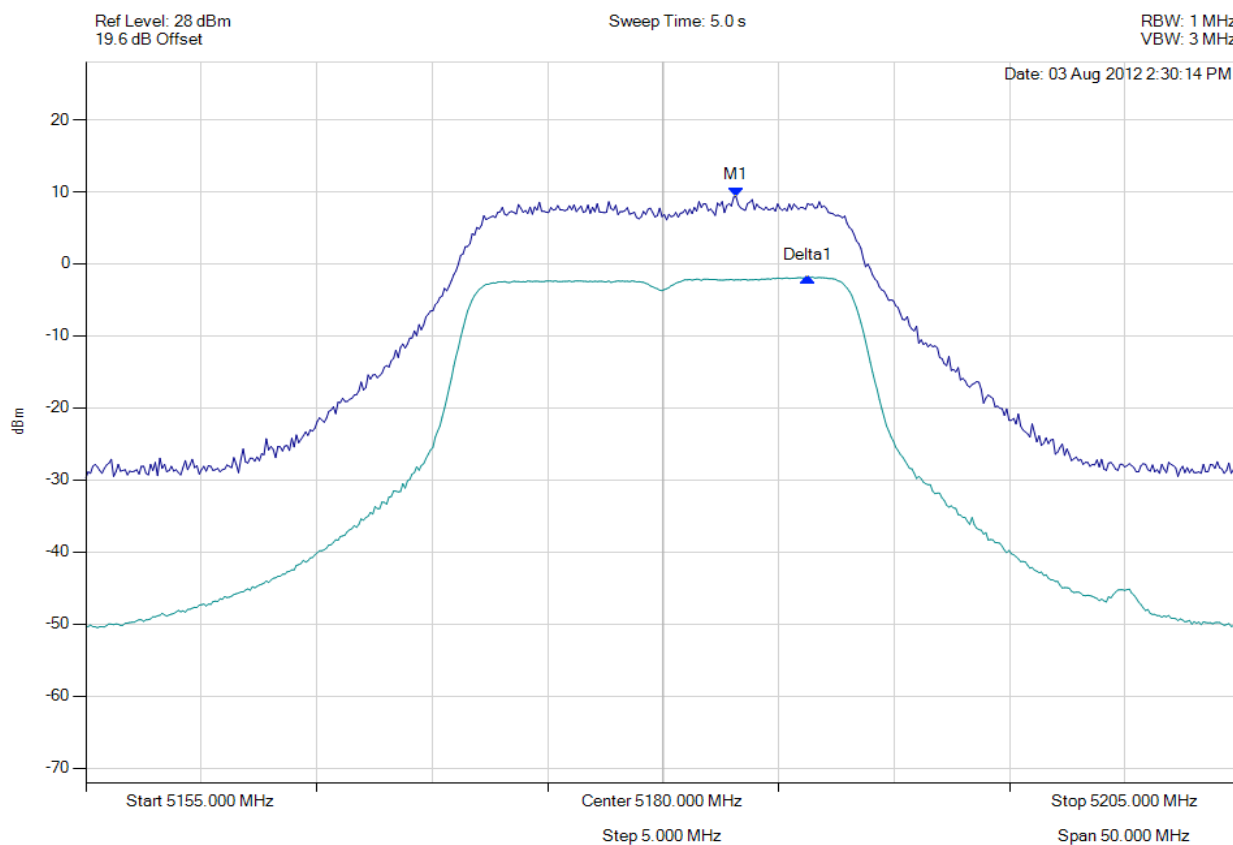


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 147 of 169



Peak Excursion Ratio

Variant: 802.11a, Channel: 5180.00 MHz, Chain C, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Sweep Count = 0 RF Atten (dB) = 30 TRACE 1 Detector = MAX PEAK Trace Mode = VIEW TRACE 2 Detector = RMS Trace Mode = VIEW	M1 : 5183.156 MHz : 9.335 dBm Delta1 : 3.106 MHz : -11.135 dB	Measured Excursion Ratio Ratio: 11.14 dB Limit: 13.0 dB Margin: -1.86 dB

[Back to the Matrix](#)

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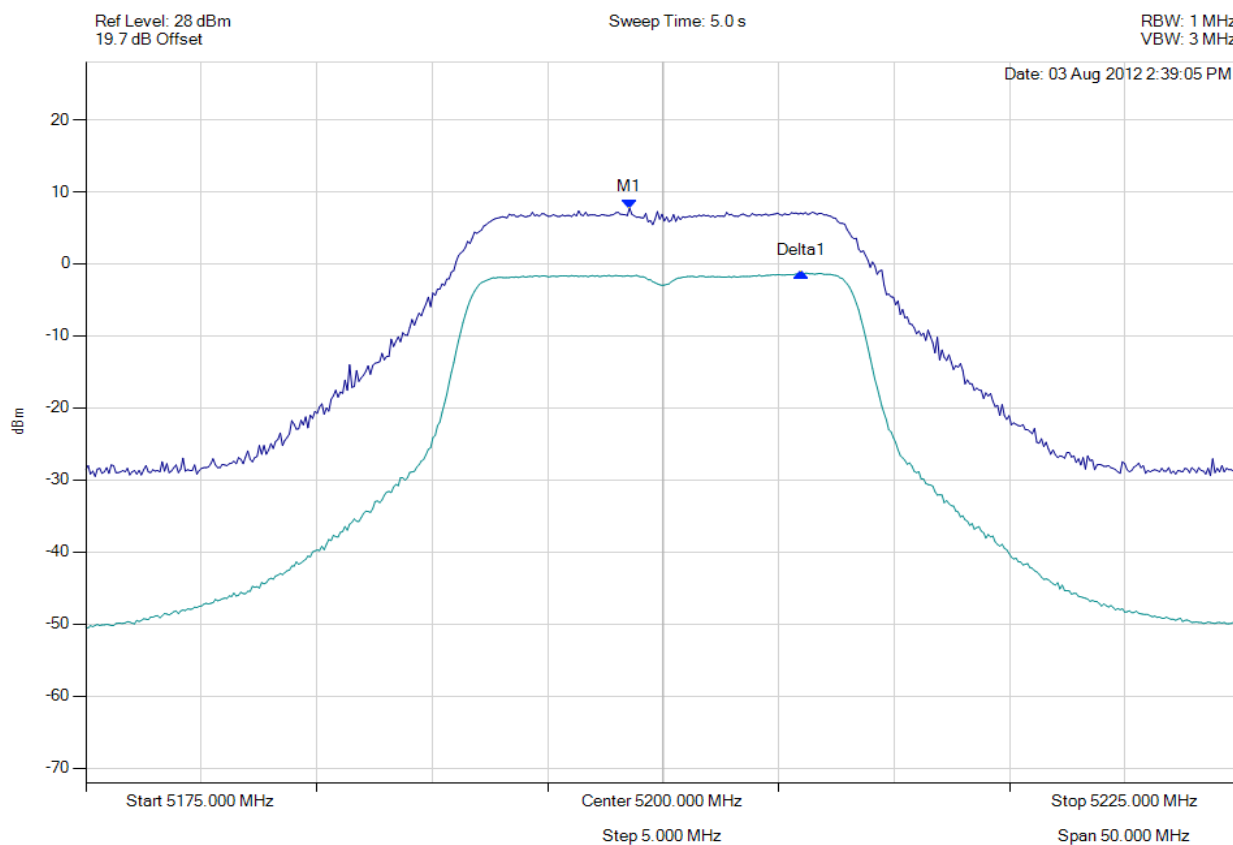


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 148 of 169



Peak Excursion Ratio

Variant: 802.11a, Channel: 5200.00 MHz, Chain A, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Sweep Count = 0 RF Atten (dB) = 30 TRACE 1 Detector = MAX PEAK Trace Mode = VIEW TRACE 2 Detector = RMS Trace Mode = VIEW	M1 : 5198.547 MHz : 7.708 dBm Delta1 : 7.415 MHz : -8.980 dB	Measured Excursion Ratio Ratio: 8.98 dB Limit: 13.0 dB Margin: -4.02 dB

[Back to the Matrix](#)

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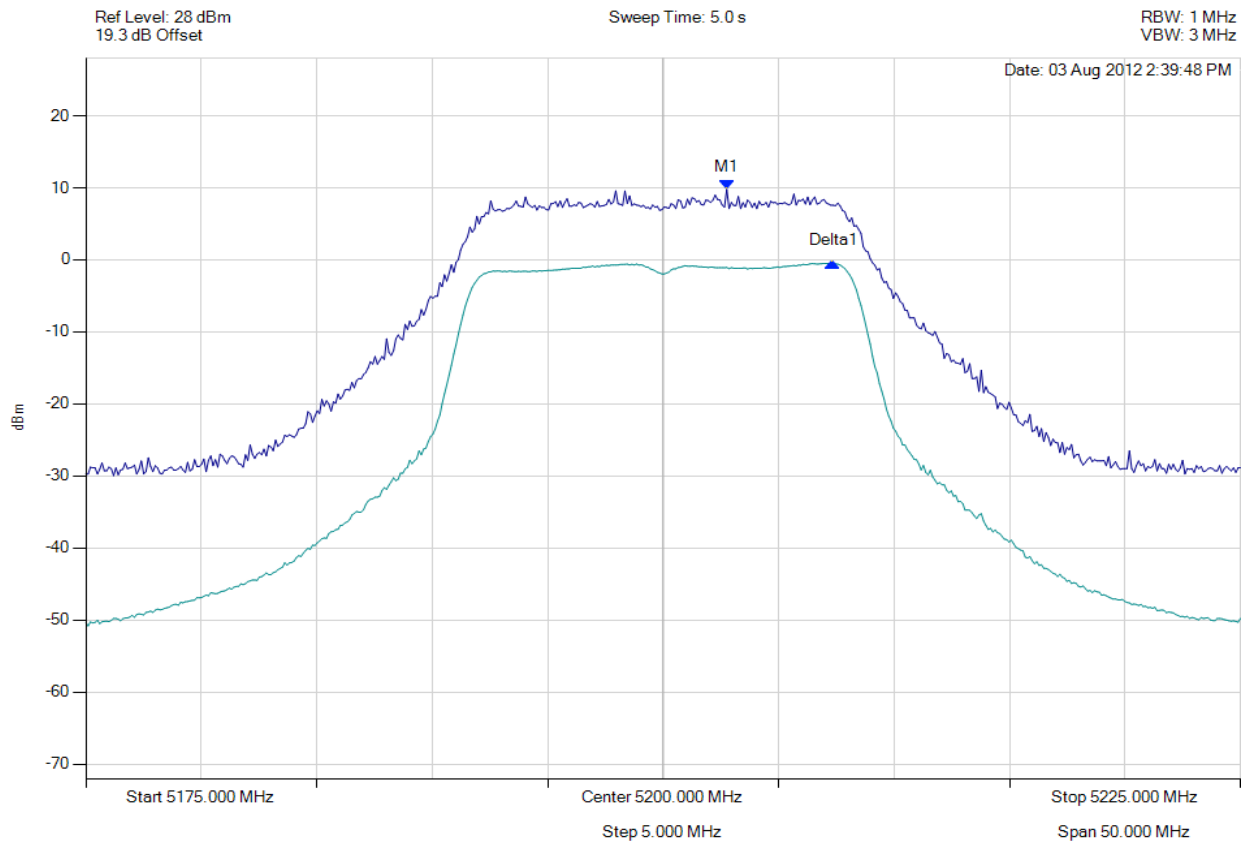


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 149 of 169



Peak Excursion Ratio

Variant: 802.11a, Channel: 5200.00 MHz, Chain B, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Sweep Count = 0 RF Atten (dB) = 30 TRACE 1 Detector = MAX PEAK Trace Mode = VIEW TRACE 2 Detector = RMS Trace Mode = VIEW	M1 : 5202.756 MHz : 9.795 dBm Delta1 : 4.609 MHz : -10.222 dB	Measured Excursion Ratio Ratio: 10.22 dB Limit: 13.0 dB Margin: -2.78 dB

[Back to the Matrix](#)

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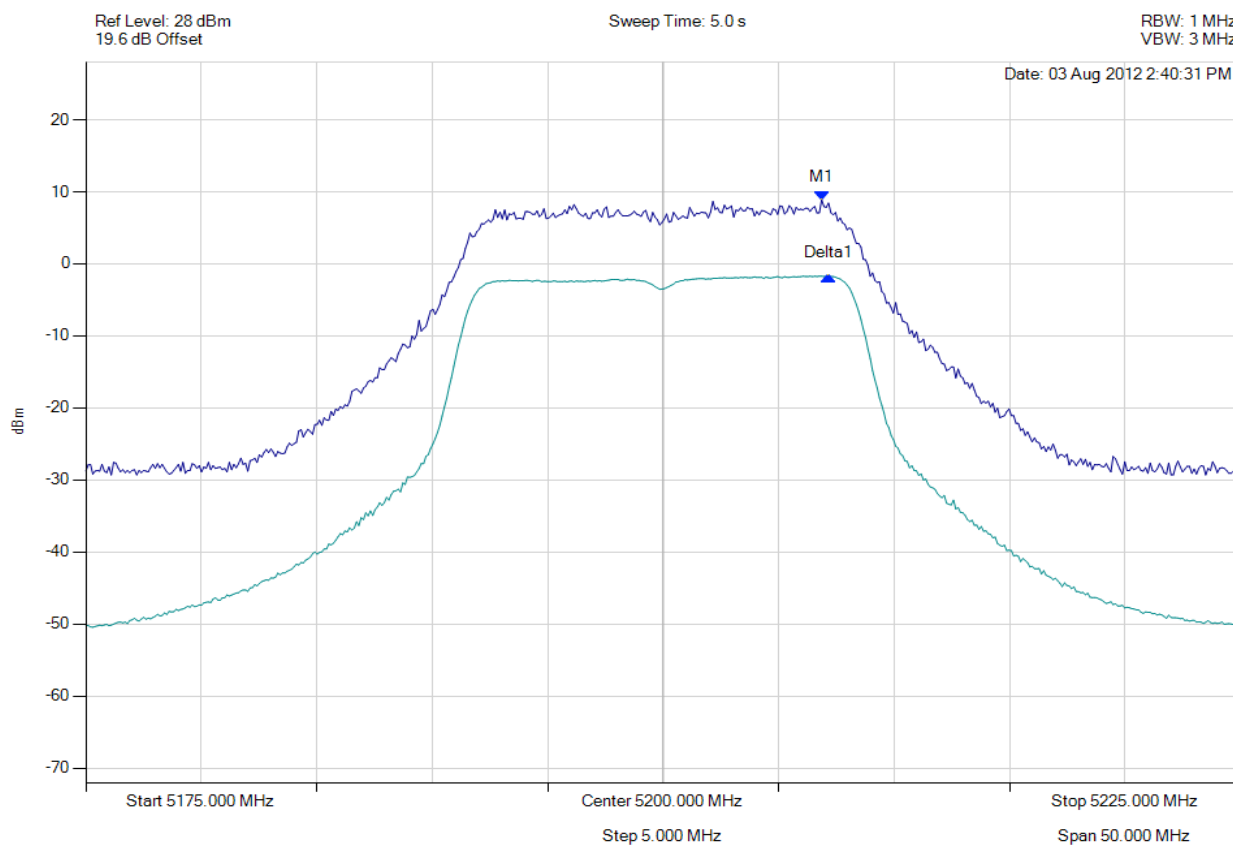


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 150 of 169



Peak Excursion Ratio

Variant: 802.11a, Channel: 5200.00 MHz, Chain C, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Sweep Count = 0 RF Atten (dB) = 30 TRACE 1 Detector = MAX PEAK Trace Mode = VIEW TRACE 2 Detector = RMS Trace Mode = VIEW	M1 : 5206.864 MHz : 8.892 dBm Delta1 : 301 KHz : -10.520 dB	Measured Excursion Ratio Ratio: 10.52 dB Limit: 13.0 dB Margin: -2.48 dB

[Back to the Matrix](#)

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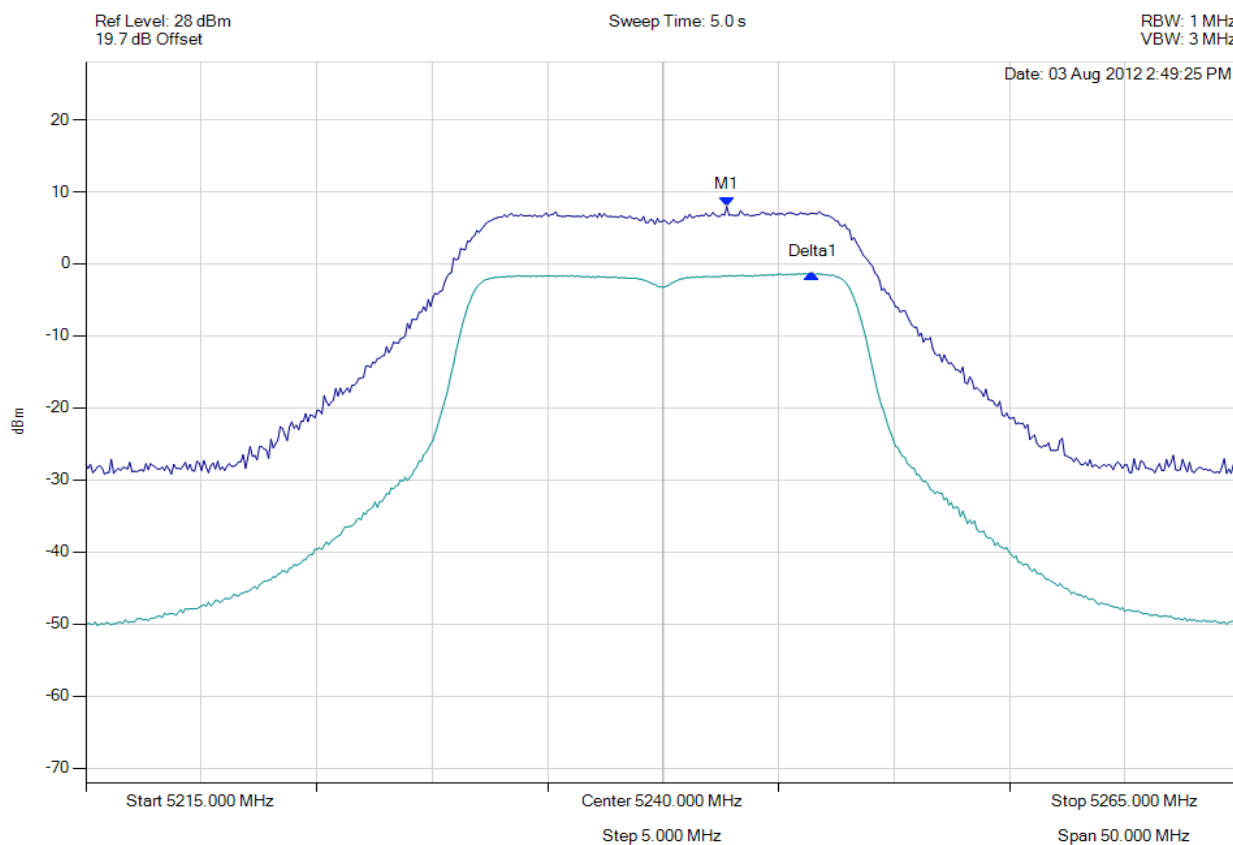


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 151 of 169



Peak Excursion Ratio

Variant: 802.11a, Channel: 5240.00 MHz, Chain A, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Sweep Count = 0 RF Atten (dB) = 30 TRACE 1 Detector = MAX PEAK Trace Mode = VIEW TRACE 2 Detector = RMS Trace Mode = VIEW	M1 : 5242.756 MHz : 7.976 dBm Delta1 : 3.707 MHz : -9.327 dB	Measured Excursion Ratio Ratio: 9.33 dB Limit: 13.0 dB Margin: -3.67 dB

[Back to the Matrix](#)

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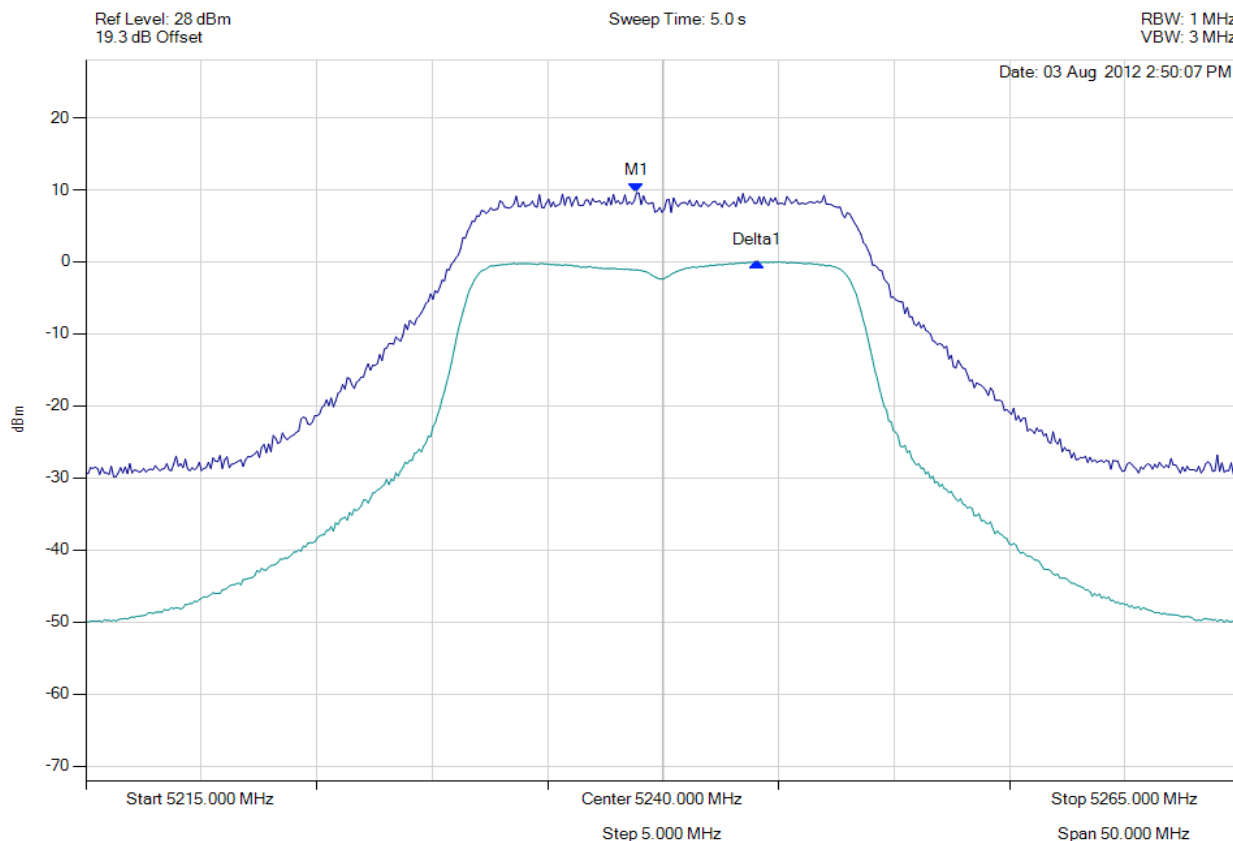


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 152 of 169



Peak Excursion Ratio

Variant: 802.11a, Channel: 5240.00 MHz, Chain B, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Sweep Count = 0 RF Atten (dB) = 30 TRACE 1 Detector = MAX PEAK Trace Mode = VIEW TRACE 2 Detector = RMS Trace Mode = VIEW	M1 : 5238.848 MHz : 9.583 dBm Delta1 : 5210 MHz : -9.572 dB	Measured Excursion Ratio Ratio: 9.57 dB Limit: 13.0 dB Margin: -3.43 dB

[Back to the Matrix](#)

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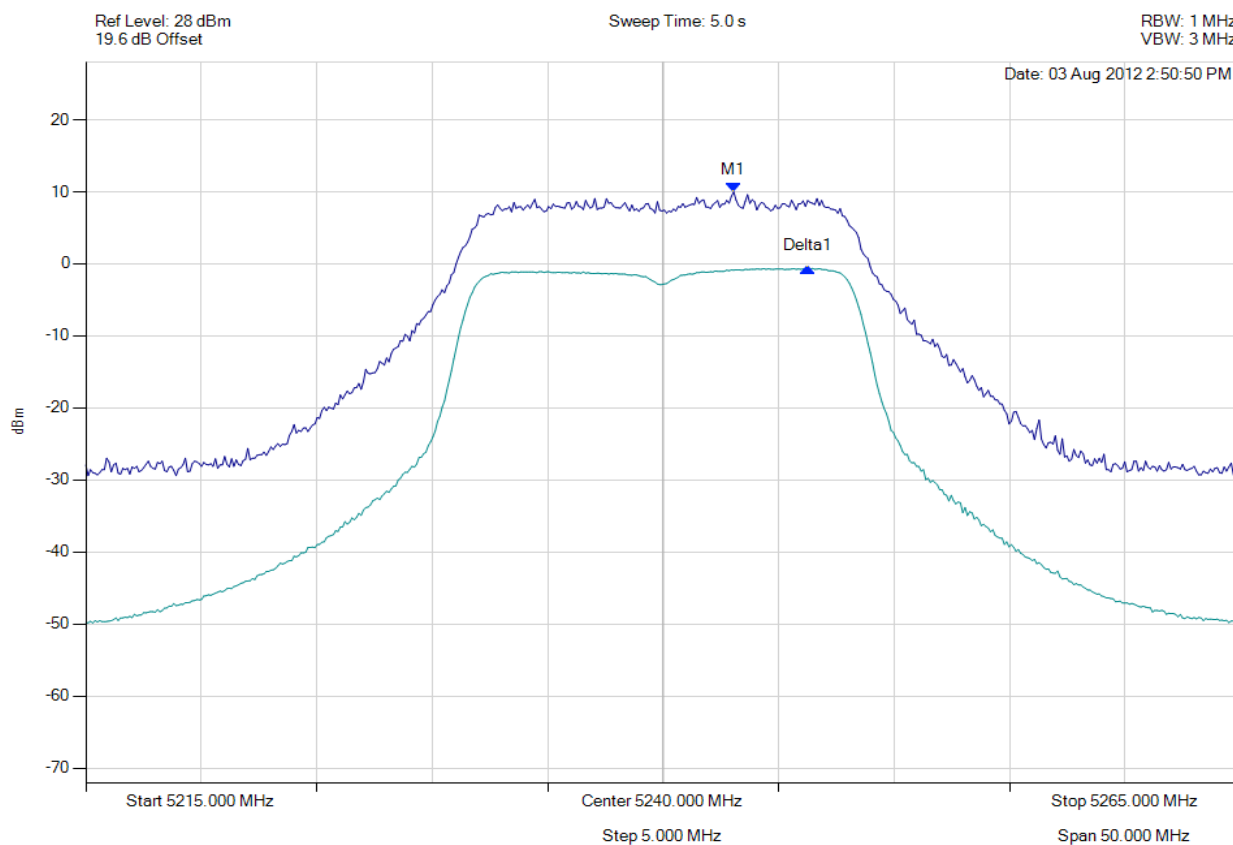


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 153 of 169



Peak Excursion Ratio

Variant: 802.11a, Channel: 5240.00 MHz, Chain C, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Sweep Count = 0 RF Atten (dB) = 30 TRACE 1 Detector = MAX PEAK Trace Mode = VIEW TRACE 2 Detector = RMS Trace Mode = VIEW	M1 : 5243.056 MHz : 9.974 dBm Delta1 : 3.206 MHz : -10.560 dB	Measured Excursion Ratio Ratio: 10.56 dB Limit: 13.0 dB Margin: -2.44 dB

[Back to the Matrix](#)

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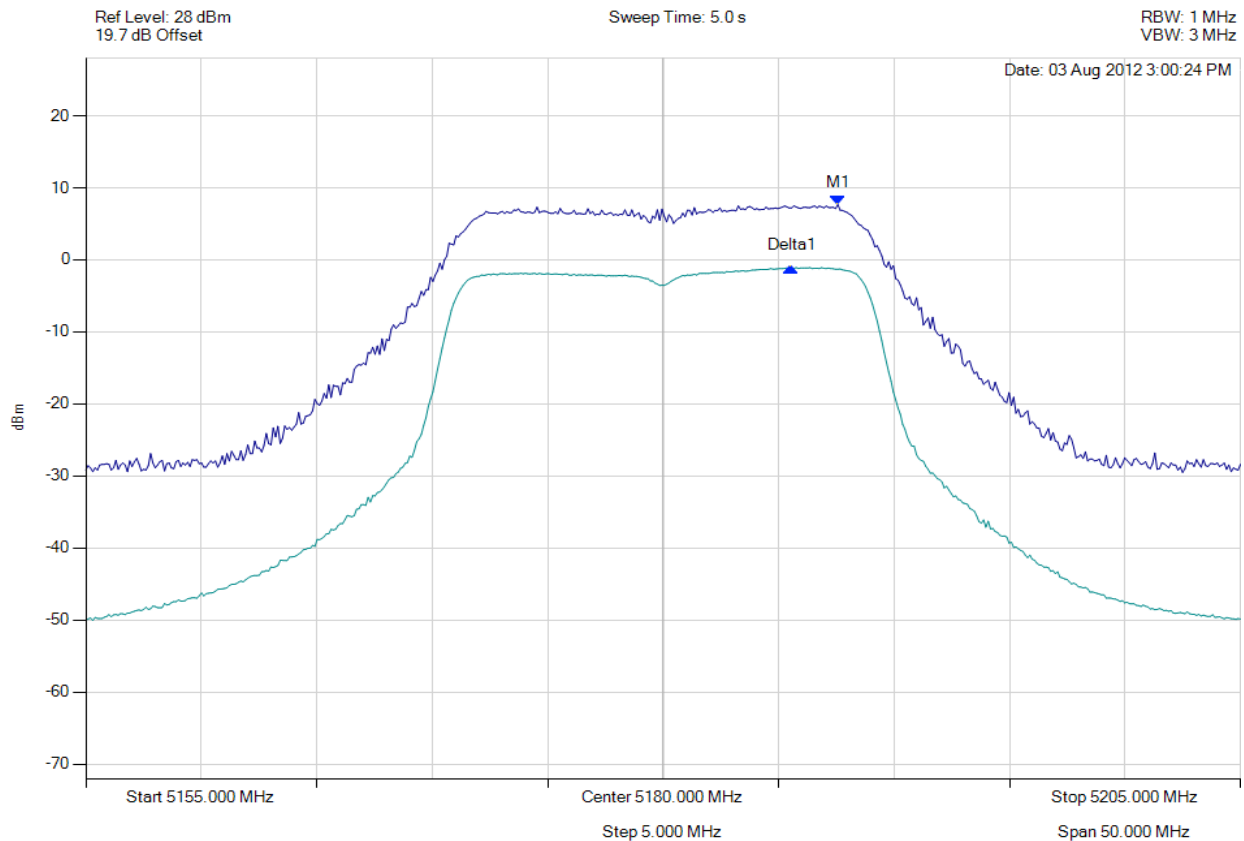


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 154 of 169



Peak Excursion Ratio

Variant: 802.11n HT-20, Channel: 5180.00 MHz, Chain A, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Sweep Count = 0 RF Atten (dB) = 30 TRACE 1 Detector = MAX PEAK Trace Mode = VIEW TRACE 2 Detector = RMS Trace Mode = VIEW	M1 : 5187.565 MHz : 7.661 dBm Delta1 : -2004008 Hz : -8.742 dB	Measured Excursion Ratio: 8.74 dB Limit: 13.0 dB Margin: -4.26 dB

[Back to the Matrix](#)

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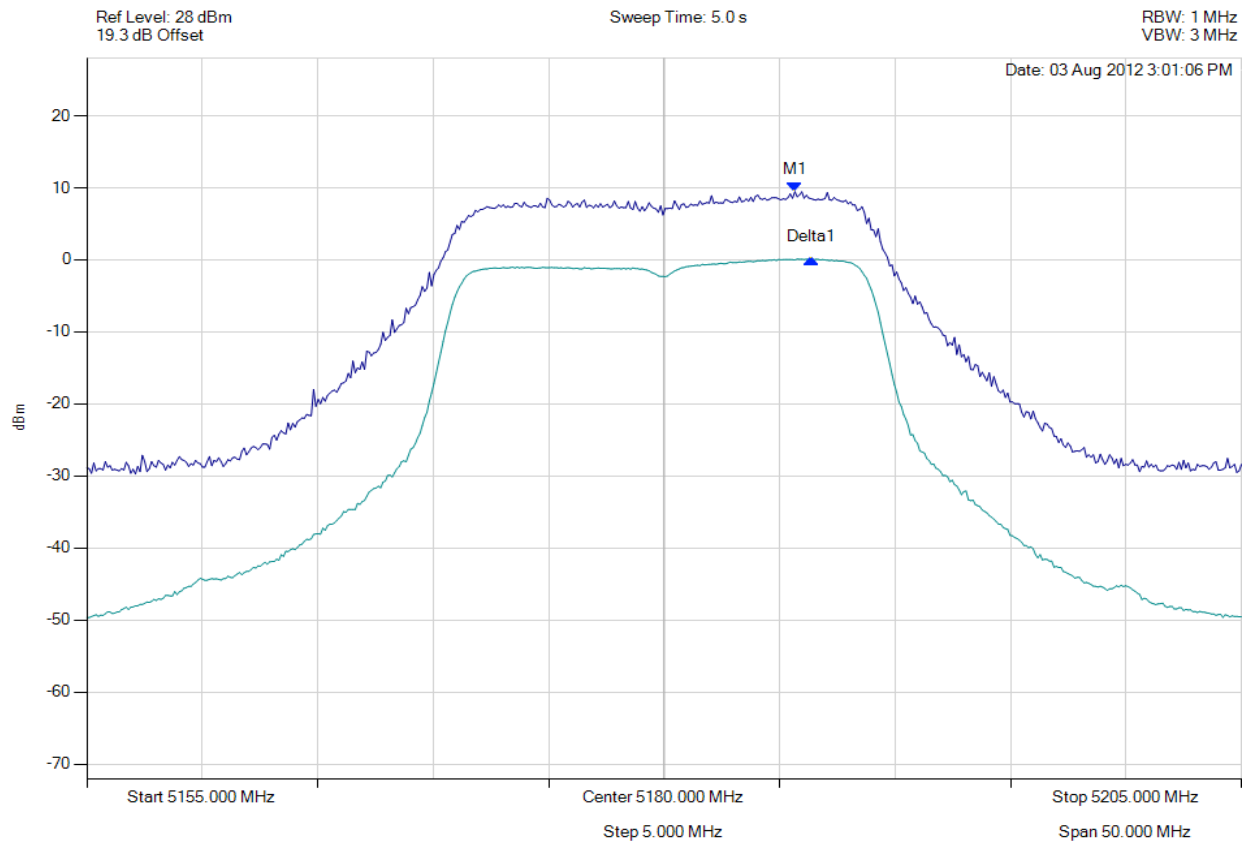


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 155 of 169



Peak Excursion Ratio

Variant: 802.11n HT-20, Channel: 5180.00 MHz, Chain B, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Sweep Count = 0 RF Atten (dB) = 30 TRACE 1 Detector = MAX PEAK Trace Mode = VIEW TRACE 2 Detector = RMS Trace Mode = VIEW	M1 : 5185.661 MHz : 9.449 dBm Delta1 : 701 KHz : -9.278 dB	Measured Excursion Ratio: 9.28 dB Limit: 13.0 dB Margin: -3.72 dB

[Back to the Matrix](#)

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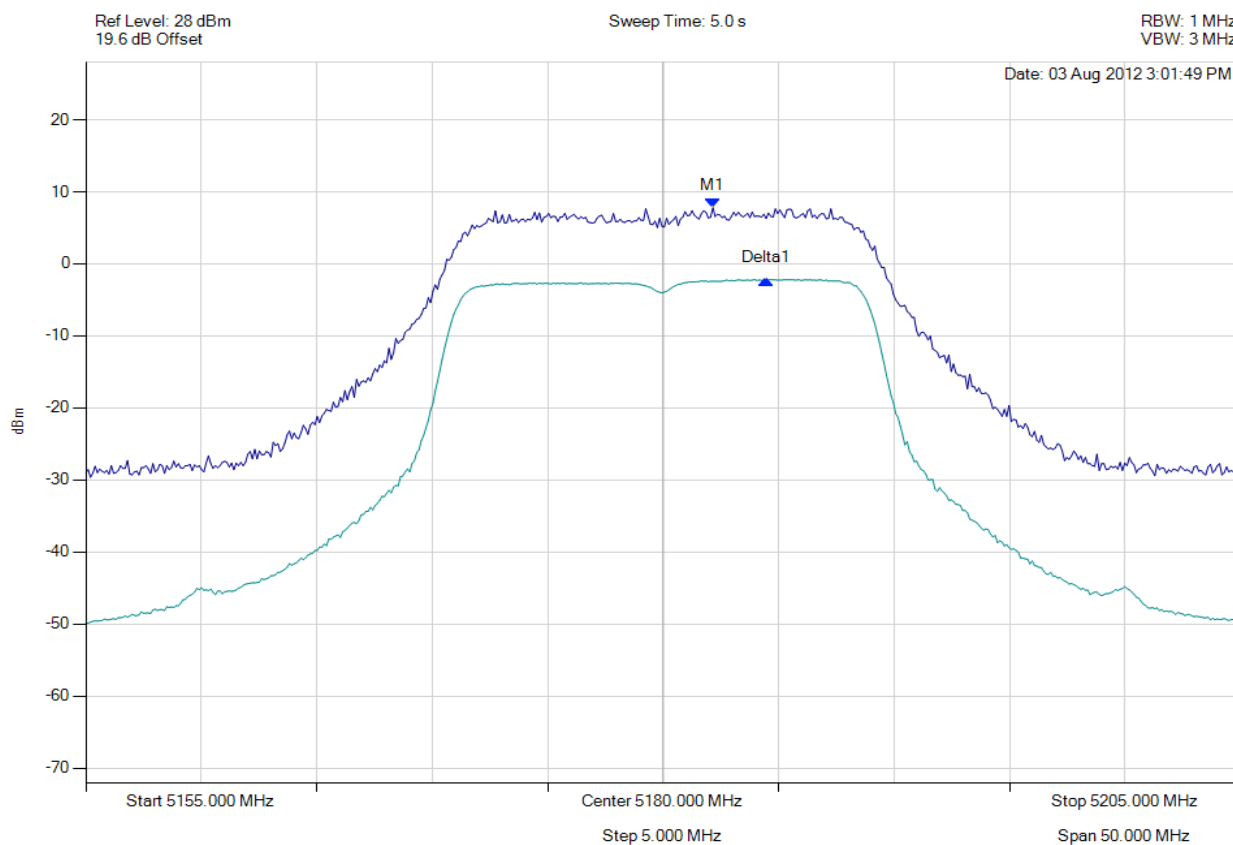


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 156 of 169



Peak Excursion Ratio

Variant: 802.11n HT-20, Channel: 5180.00 MHz, Chain C, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Sweep Count = 0 RF Atten (dB) = 30 TRACE 1 Detector = MAX PEAK Trace Mode = VIEW TRACE 2 Detector = RMS Trace Mode = VIEW	M1 : 5182.154 MHz : 7.785 dBm Delta1 : 2.305 MHz : -9.950 dB	Measured Excursion Ratio: 9.95 dB Limit: 13.0 dB Margin: -3.05 dB

[Back to the Matrix](#)

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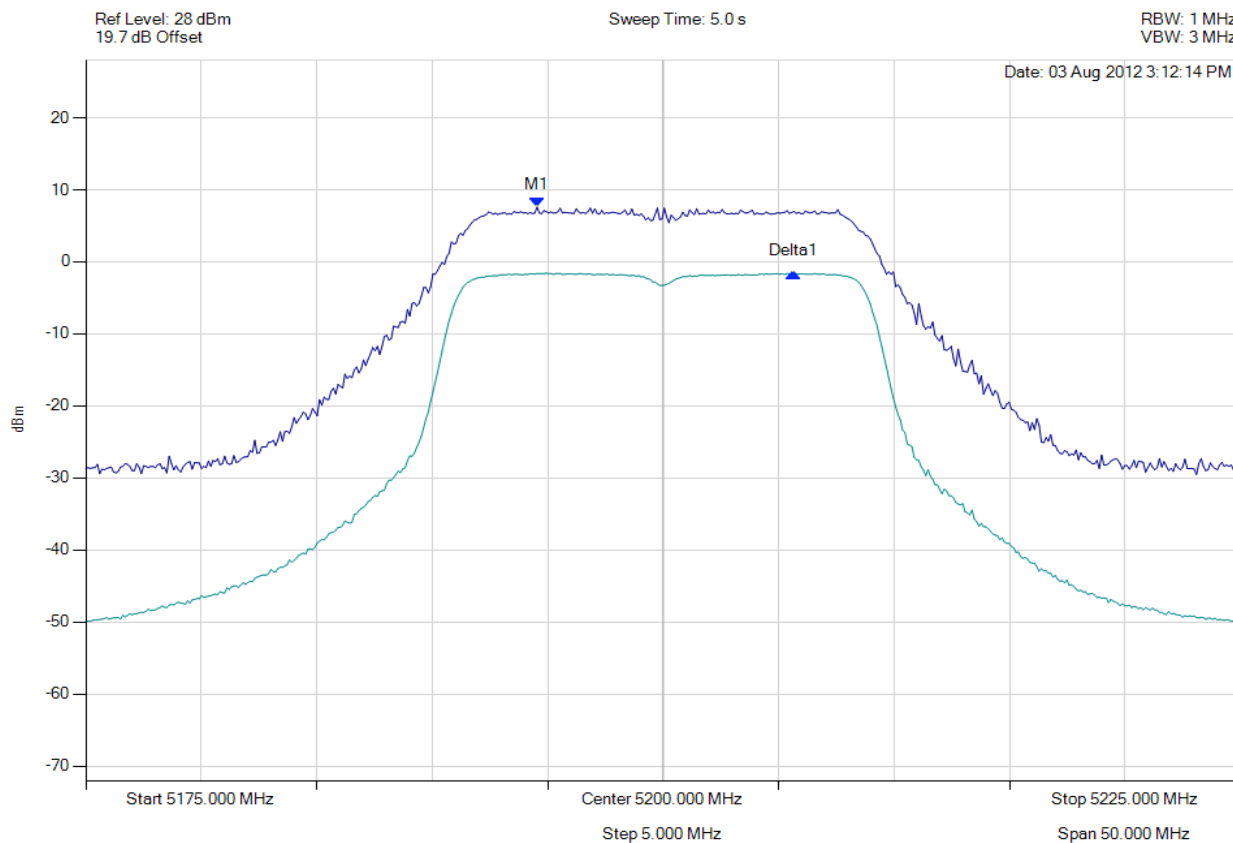


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 157 of 169



Peak Excursion Ratio

Variant: 802.11n HT-20, Channel: 5200.00 MHz, Chain A, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Sweep Count = 0 RF Atten (dB) = 30 TRACE 1 Detector = MAX PEAK Trace Mode = VIEW TRACE 2 Detector = RMS Trace Mode = VIEW	M1 : 5194.539 MHz : 7.592 dBm Delta1 : 11.122 MHz : -9.170 dB	Measured Excursion Ratio: 9.17 dB Limit: 13.0 dB Margin: -3.83 dB

[Back to the Matrix](#)

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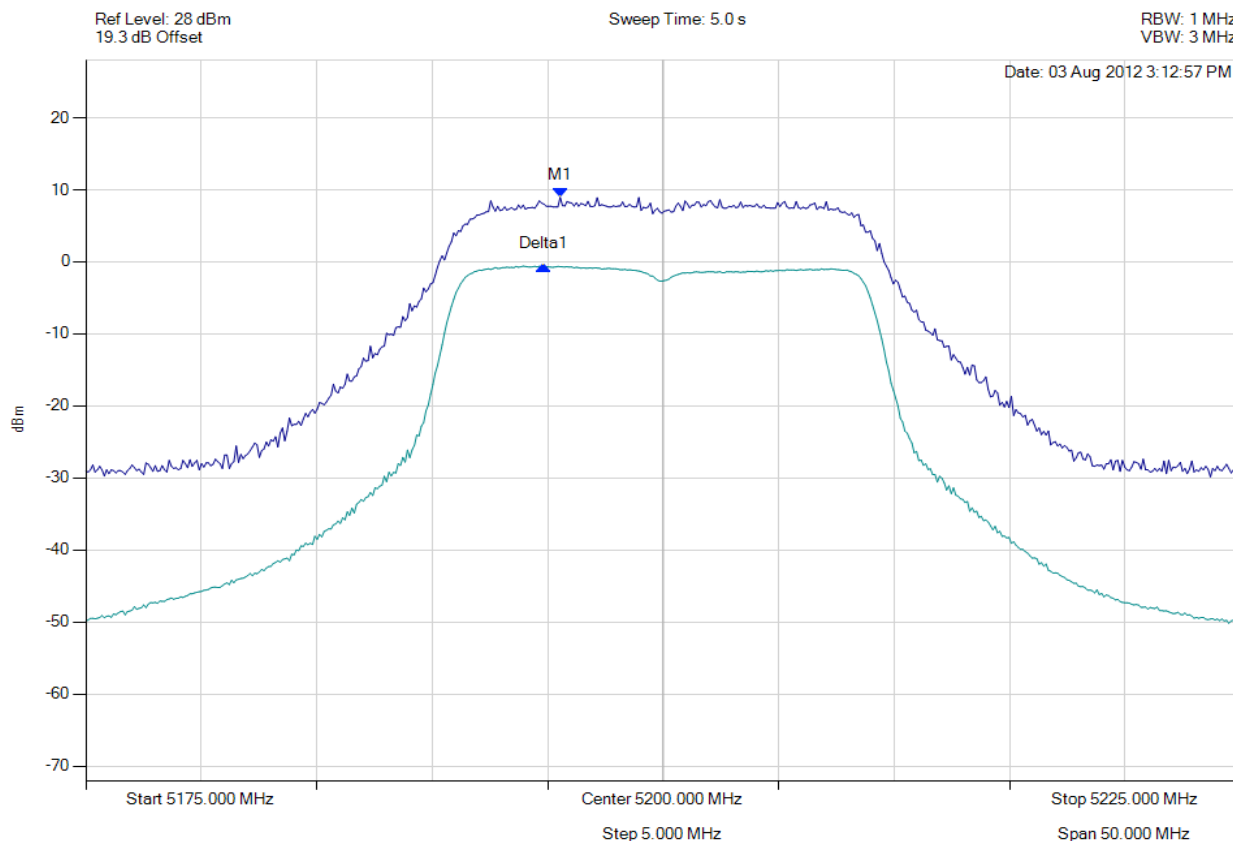


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 158 of 169



Peak Excursion Ratio

Variant: 802.11n HT-20, Channel: 5200.00 MHz, Chain B, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Sweep Count = 0 RF Atten (dB) = 30 TRACE 1 Detector = MAX PEAK Trace Mode = VIEW TRACE 2 Detector = RMS Trace Mode = VIEW	M1 : 5195.541 MHz : 8.946 dBm Delta1 : -701403 Hz : -9.519 dB	Measured Excursion Ratio: 9.52 dB Limit: 13.0 dB Margin: -3.48 dB

[Back to the Matrix](#)

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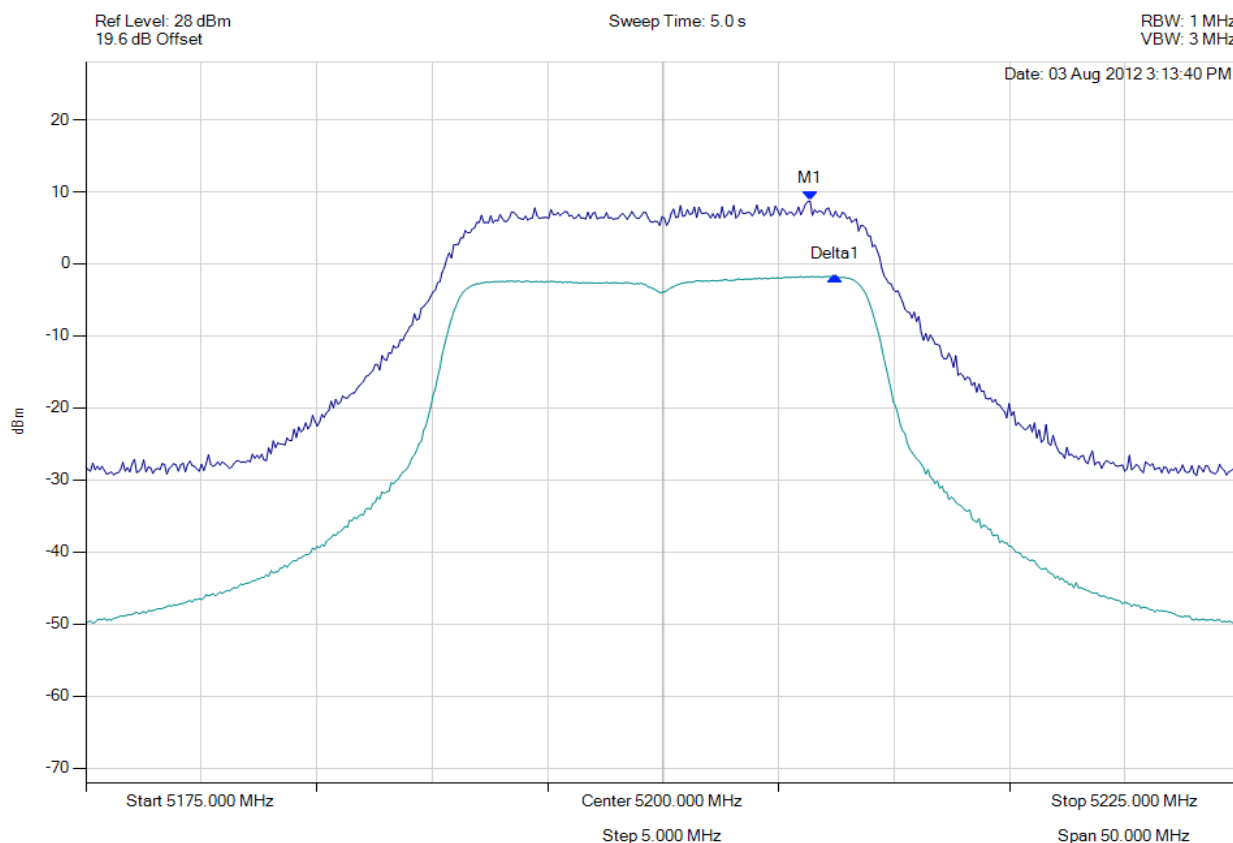


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 159 of 169



Peak Excursion Ratio

Variant: 802.11n HT-20, Channel: 5200.00 MHz, Chain C, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Sweep Count = 0 RF Atten (dB) = 30 TRACE 1 Detector = MAX PEAK Trace Mode = VIEW TRACE 2 Detector = RMS Trace Mode = VIEW	M1 : 5206.363 MHz : 8.733 dBm Delta1 : 1.102 MHz : -10.445 dB	Measured Excursion Ratio: 10.45 dB Limit: 13.0 dB Margin: -2.55 dB

[Back to the Matrix](#)

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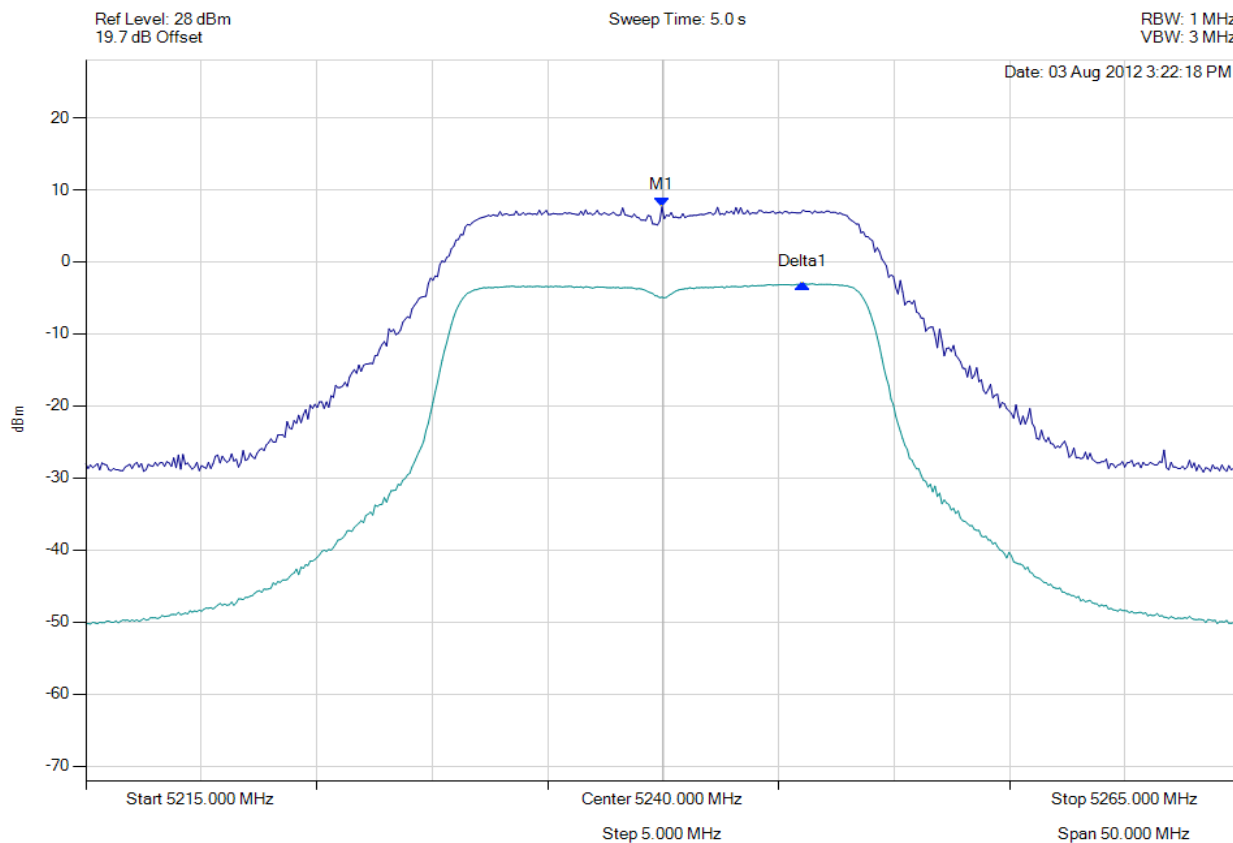


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 160 of 169



Peak Excursion Ratio

Variant: 802.11n HT-20, Channel: 5240.00 MHz, Chain A, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Sweep Count = 0 RF Atten (dB) = 30 TRACE 1 Detector = MAX PEAK Trace Mode = VIEW TRACE 2 Detector = RMS Trace Mode = VIEW	M1 : 5239.950 MHz : 7.643 dBm Delta1 : 6.112 MHz : -10.689 dB	Measured Excursion Ratio: 10.69 dB Limit: 13.0 dB Margin: -2.31 dB

[Back to the Matrix](#)

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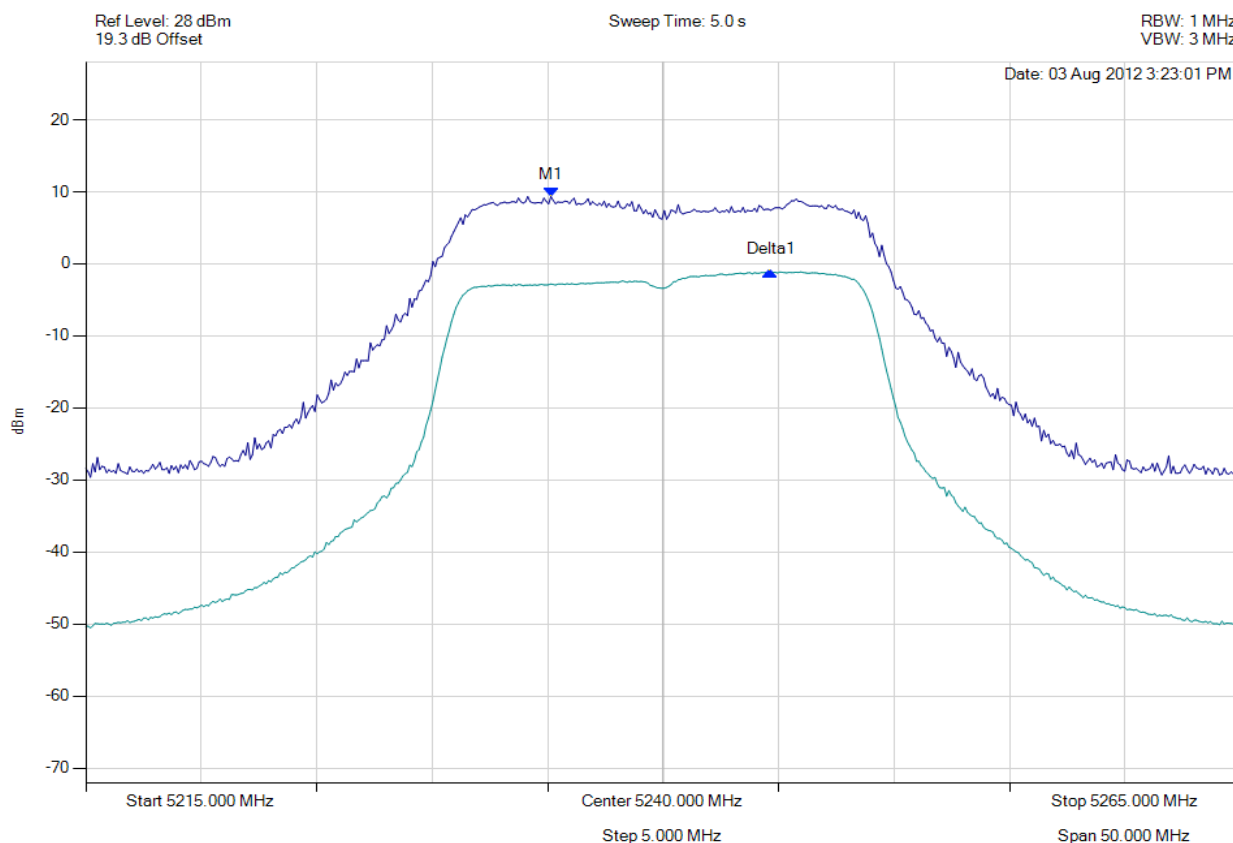


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 161 of 169



Peak Excursion Ratio

Variant: 802.11n HT-20, Channel: 5240.00 MHz, Chain B, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Sweep Count = 0 RF Atten (dB) = 30 TRACE 1 Detector = MAX PEAK Trace Mode = VIEW TRACE 2 Detector = RMS Trace Mode = VIEW	M1 : 5235.140 MHz : 9.345 dBm Delta1 : 5235.140 MHz : -10.439 dB	Measured Excursion Ratio: 10.44 dB Limit: 13.0 dB Margin: -2.56 dB

[Back to the Matrix](#)

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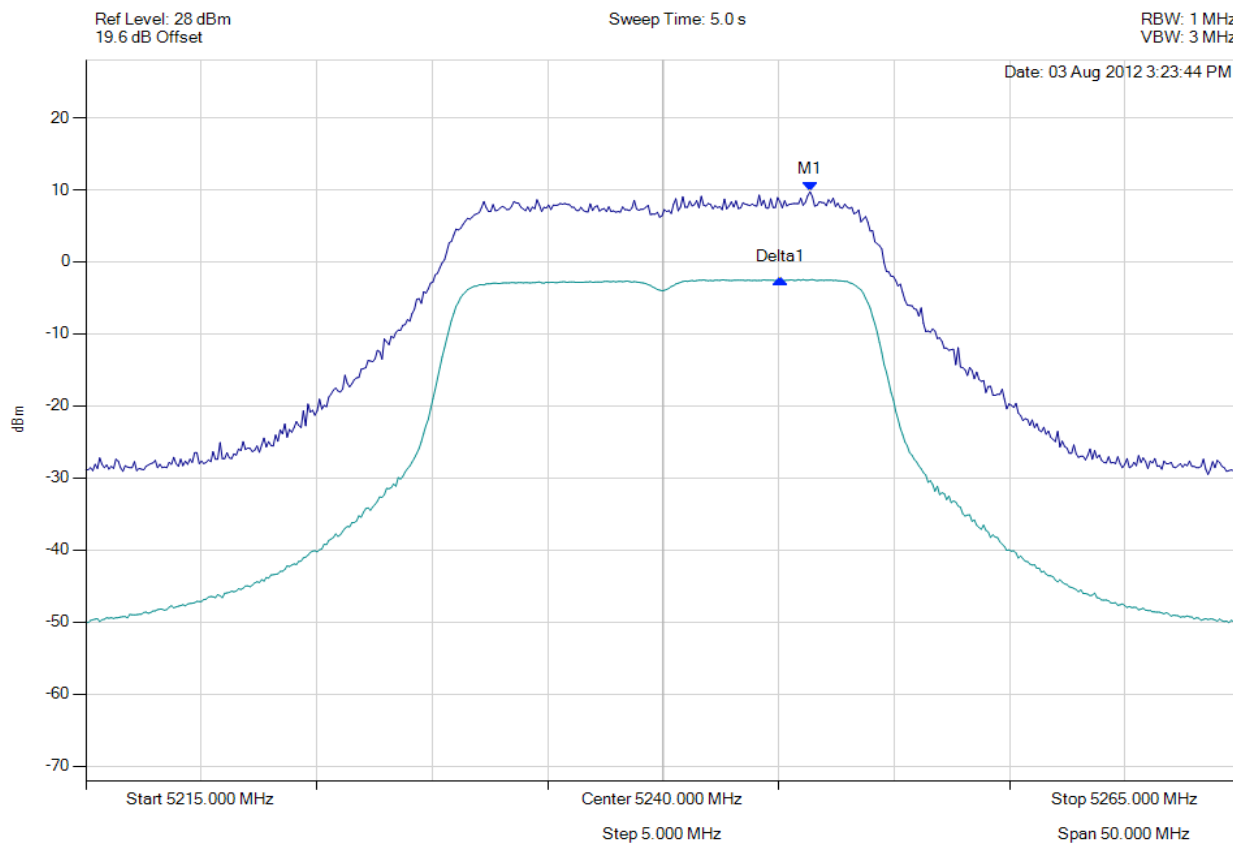


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 162 of 169



Peak Excursion Ratio

Variant: 802.11n HT-20, Channel: 5240.00 MHz, Chain C, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Sweep Count = 0 RF Atten (dB) = 30 TRACE 1 Detector = MAX PEAK Trace Mode = VIEW TRACE 2 Detector = RMS Trace Mode = VIEW	M1 : 5246.363 MHz : 9.728 dBm Delta1 : -1302605 Hz : -12.168 dB	Measured Excursion Ratio: 12.17 dB Limit: 13.0 dB Margin: -0.83 dB

[Back to the Matrix](#)

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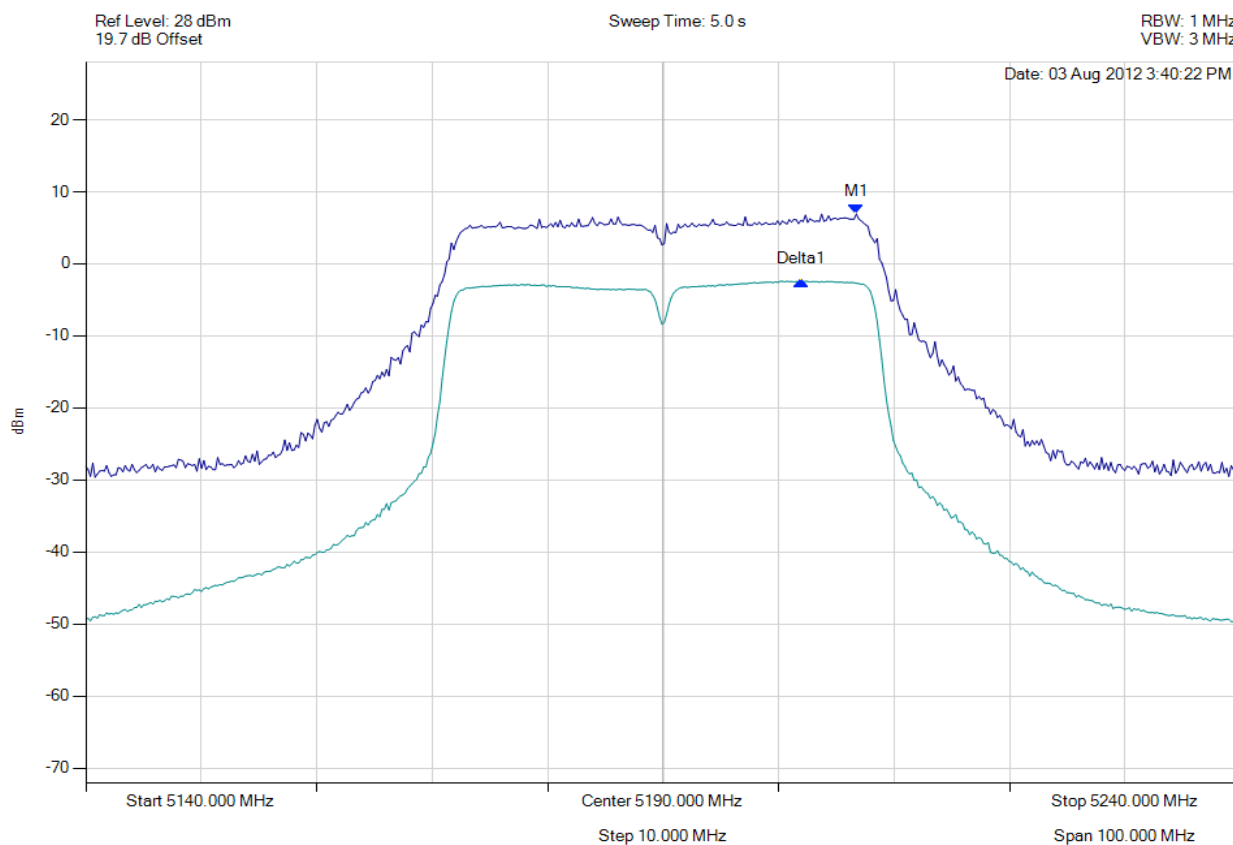


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 163 of 169



peak excursion

Variant: 802.11n HT-40, Channel: 5190.00 MHz, Chain A, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Sweep Count = 0 RF Atten (dB) = 30 TRACE 1 Detector = MAX PEAK Trace Mode = VIEW TRACE 2 Detector = RMS Trace Mode = VIEW	M1 : 5206.733 MHz : 6.919 dBm Delta1 : -4809619 Hz : -9.282 dB	Measured Excursion Ratio: 9.28 dB Limit: 13.0 dB Margin: -3.72 dB

[Back to the Matrix](#)

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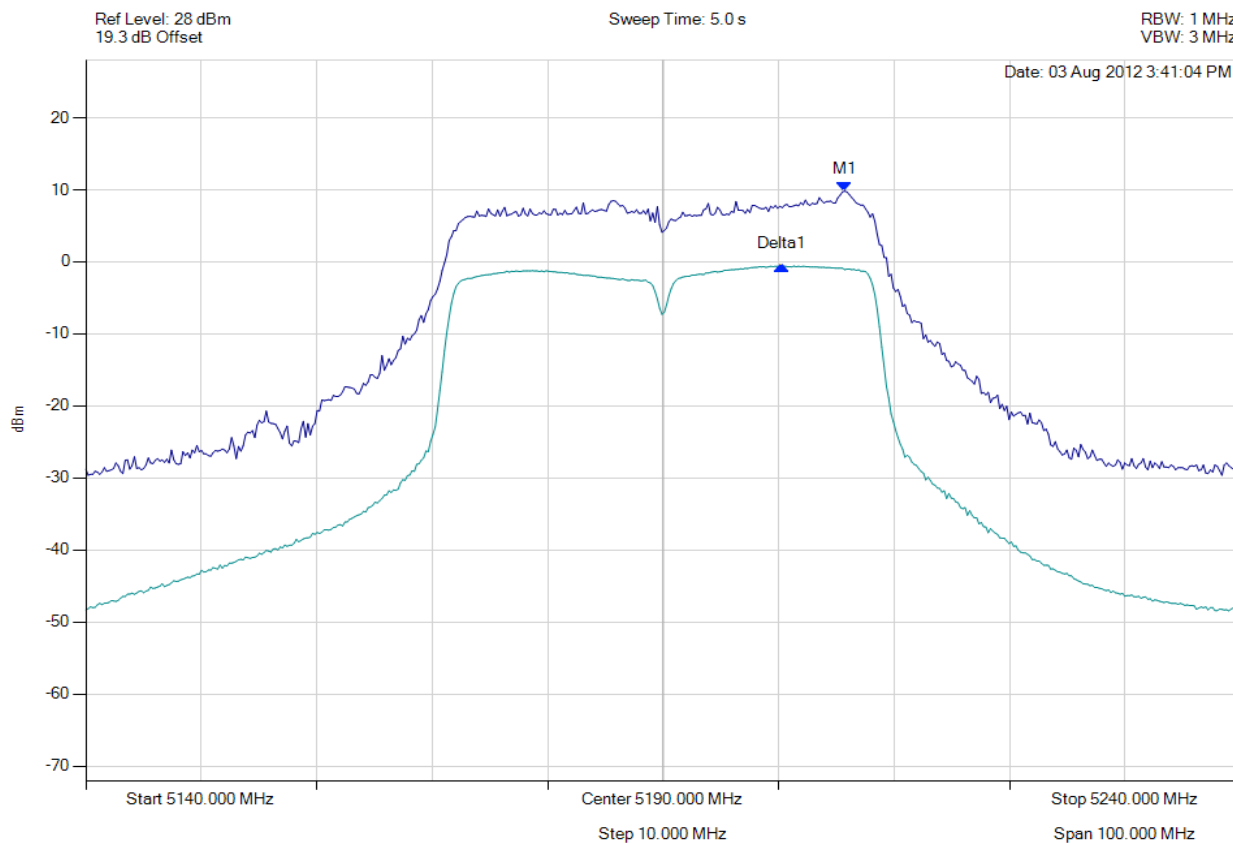


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 164 of 169



peak excursion

Variant: 802.11n HT-40, Channel: 5190.00 MHz, Chain B, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Sweep Count = 0 RF Atten (dB) = 30 TRACE 1 Detector = MAX PEAK Trace Mode = VIEW TRACE 2 Detector = RMS Trace Mode = VIEW	M1 : 5205.731 MHz : 9.820 dBm Delta1 : -5410822 Hz : -10.398 dB	Measured Excursion Ratio: 10.40 dB Limit: 13.0 dB Margin: -2.60 dB

[Back to the Matrix](#)

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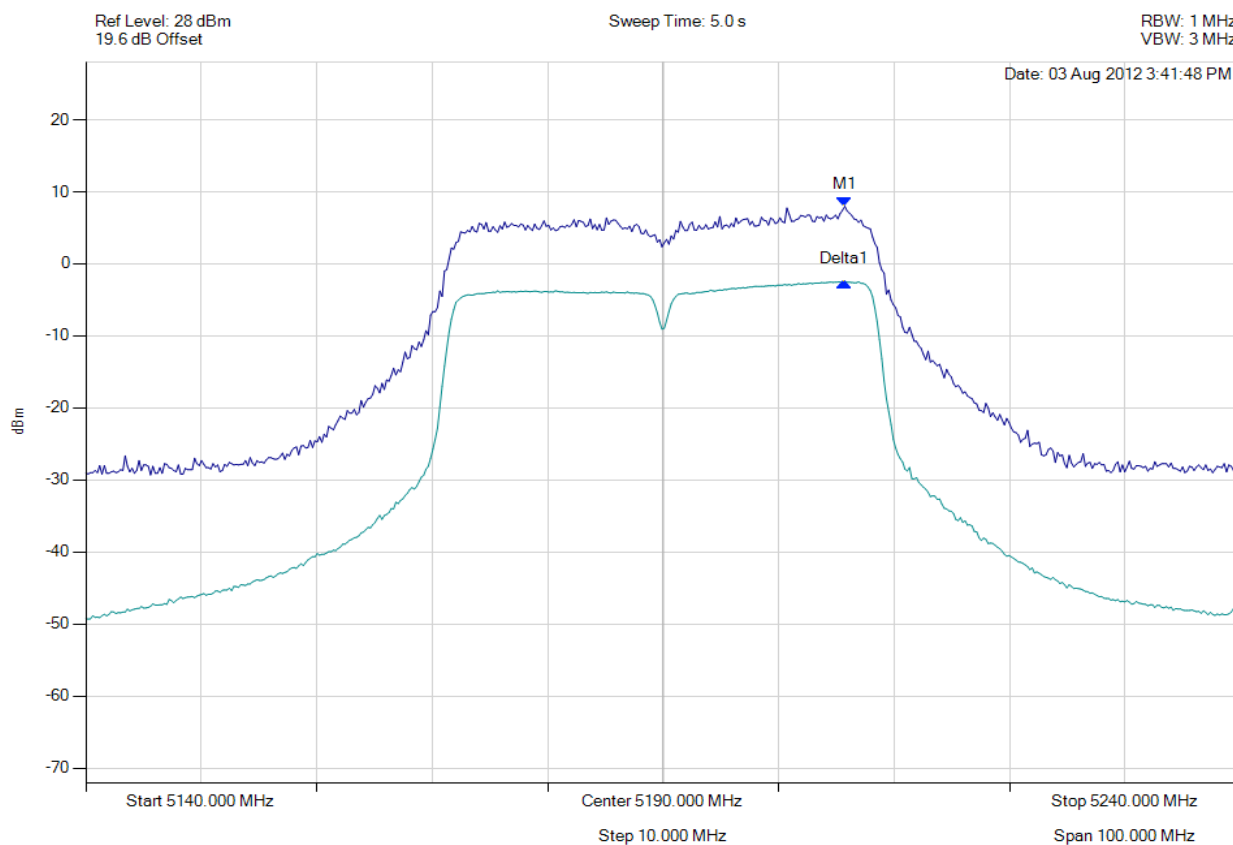


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 165 of 169



peak excursion

Variant: 802.11n HT-40, Channel: 5190.00 MHz, Chain C, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Sweep Count = 0 RF Atten (dB) = 30 TRACE 1 Detector = MAX PEAK Trace Mode = VIEW TRACE 2 Detector = RMS Trace Mode = VIEW	M1 : 5205.731 MHz : 7.982 dBm Delta1 : 0 Hz : -10.437 dB	Measured Excursion Ratio: 10.44 dB Limit: 13.0 dB Margin: -2.56 dB

[Back to the Matrix](#)

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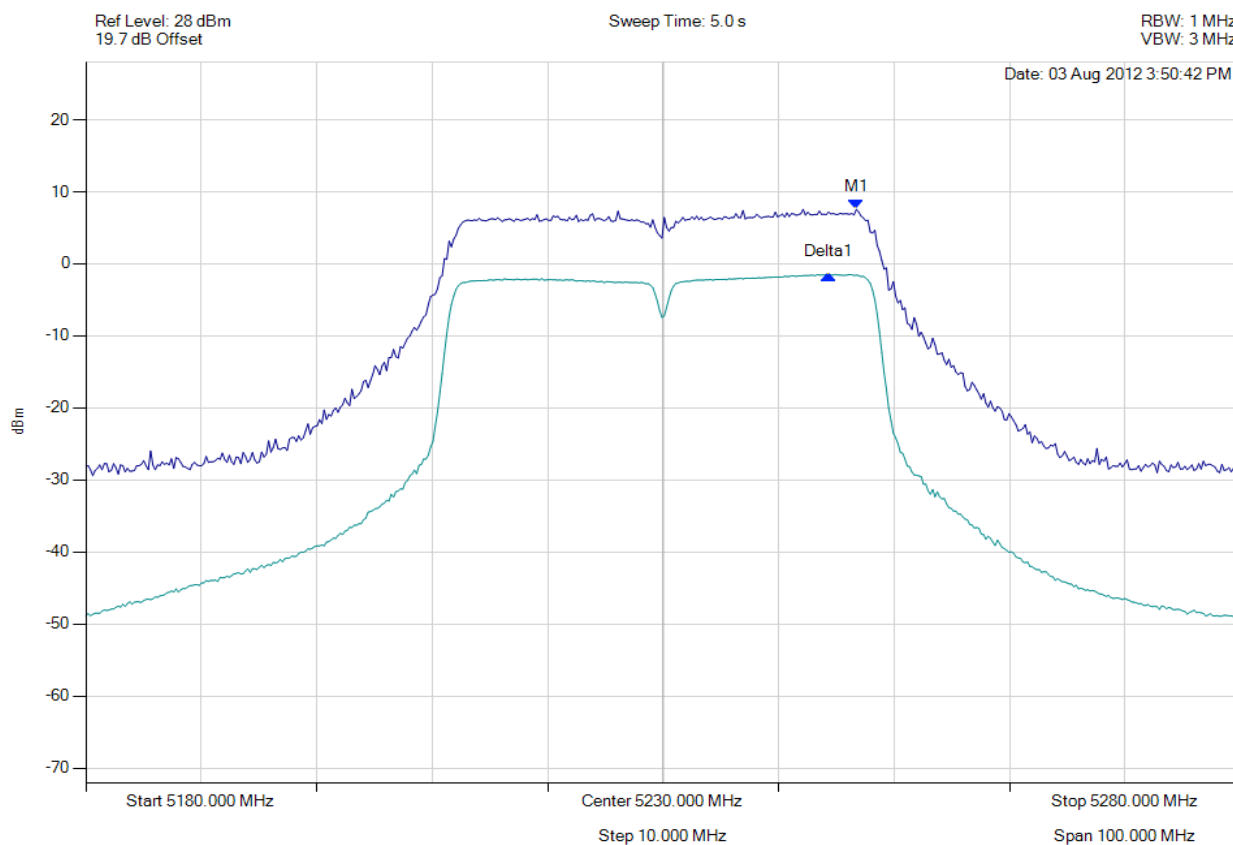


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 166 of 169



peak excursion

Variant: 802.11n HT-40, Channel: 5230.00 MHz, Chain A, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Sweep Count = 0 RF Atten (dB) = 30 TRACE 1 Detector = MAX PEAK Trace Mode = VIEW TRACE 2 Detector = RMS Trace Mode = VIEW	M1 : 5246.733 MHz : 7.564 dBm Delta1 : -2404810 Hz : -9.023 dB	Measured Excursion Ratio: 9.02 dB Limit: 13.0 dB Margin: -3.98 dB

[Back to the Matrix](#)

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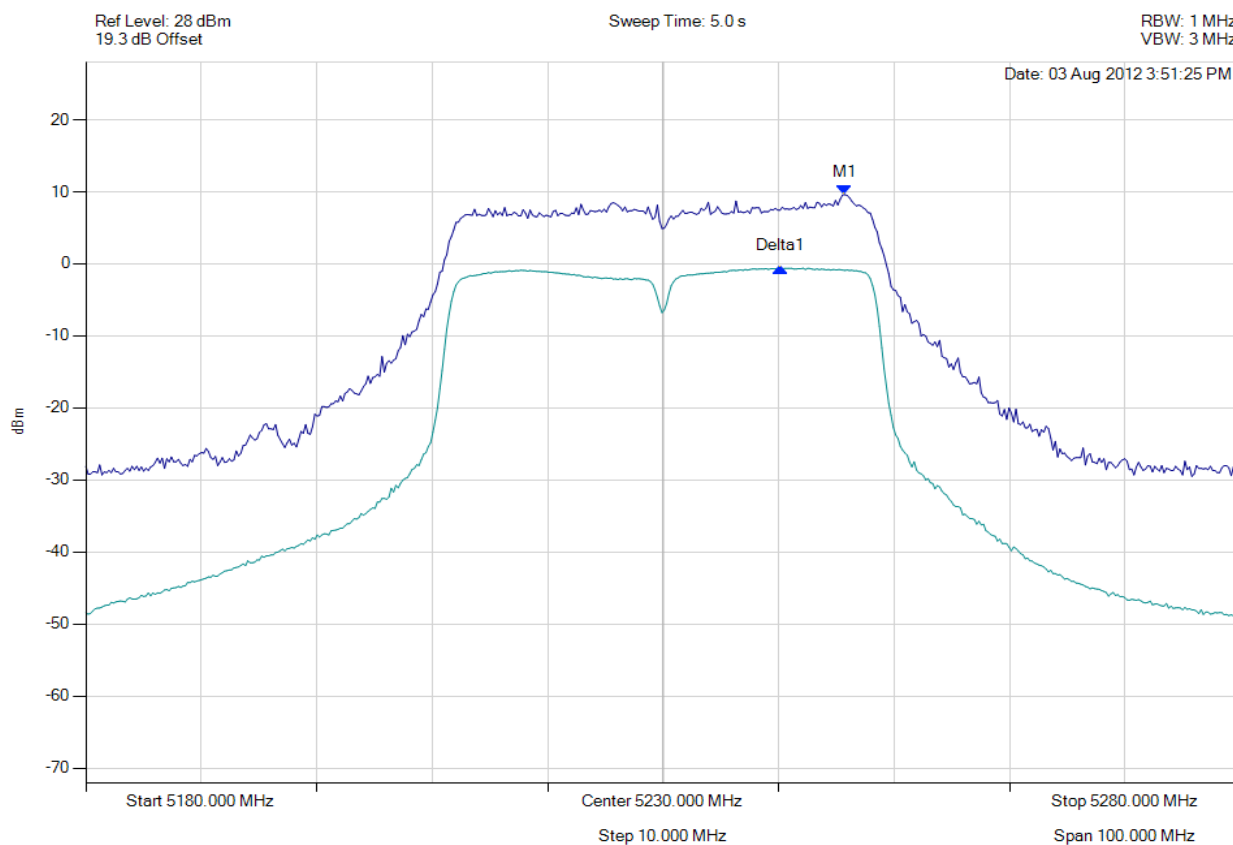


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 167 of 169



peak excursion

Variant: 802.11n HT-40, Channel: 5230.00 MHz, Chain B, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Sweep Count = 0 RF Atten (dB) = 30 TRACE 1 Detector = MAX PEAK Trace Mode = VIEW TRACE 2 Detector = RMS Trace Mode = VIEW	M1 : 5245.731 MHz : 9.603 dBm Delta1 : -5611222 Hz : -10.197 dB	Measured Excursion Ratio: 10.20 dB Limit: 13.0 dB Margin: -2.80 dB

[Back to the Matrix](#)

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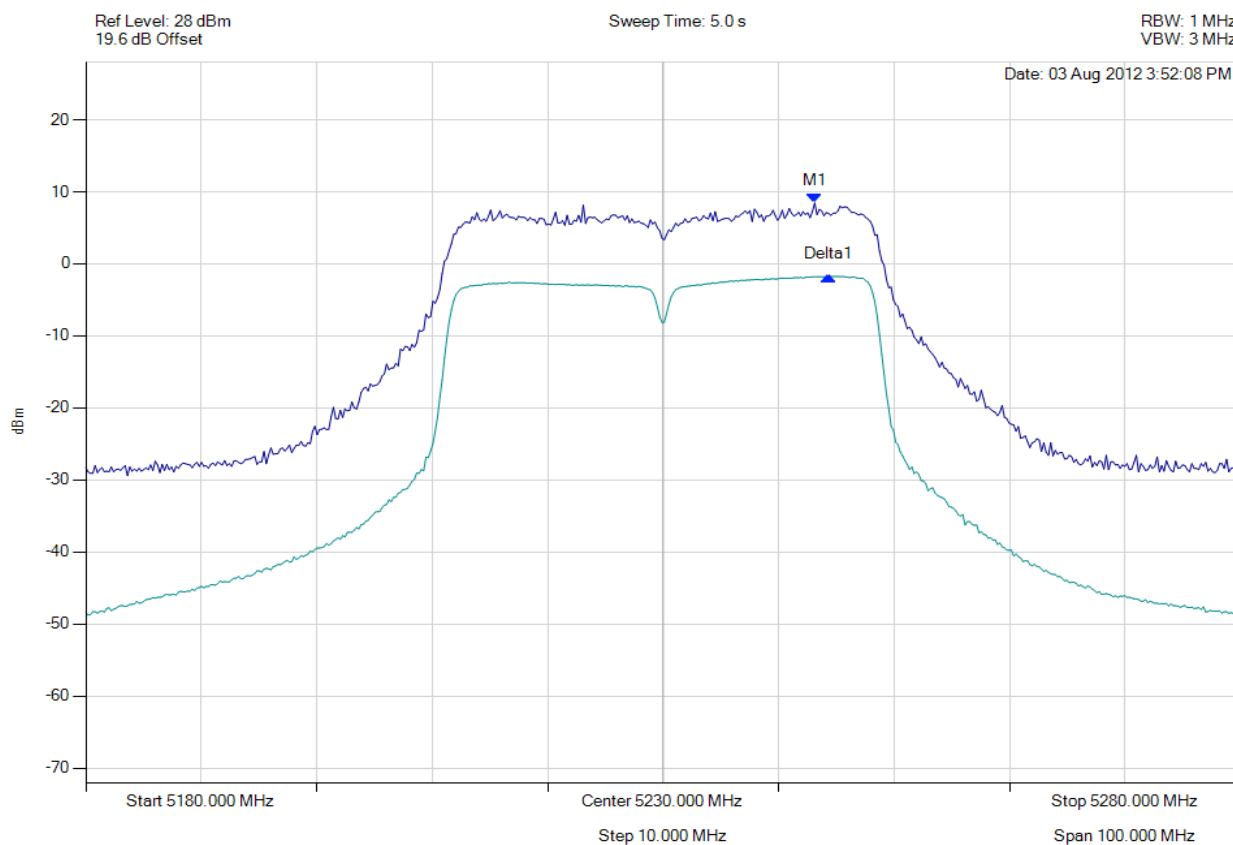


Title: Juniper Networks WLA532E Wireless LAN Access Point
To: FCC 47 CFR Part 15.407 & IC RSS-210
Serial #: JNIP22-U2 Rev A
Issue Date: 5th October 2012
Page: 168 of 169



peak excursion

Variant: 802.11n HT-40, Channel: 5230.00 MHz, Chain C, Temp: Ambient, Voltage: 48.00 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Sweep Count = 0 RF Atten (dB) = 30 TRACE 1 Detector = MAX PEAK Trace Mode = VIEW TRACE 2 Detector = RMS Trace Mode = VIEW	M1 : 5243.126 MHz : 8.435 dBm Delta1 : 1.202 MHz : -10.170 dB	Measured Excursion Ratio: 10.17 dB Limit: 13.0 dB Margin: -2.83 dB

[Back to the Matrix](#)

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