

Test of Aruba AP-124,125 802.11a/b/g/n AP

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

Test Report Serial No.: ARUB20-A2 Rev C



TEST REPORT
FROM
MiCOM Labs

Test of Aruba AP-124,125 802.11a/b/g/n AP
to
To FCC 47 CFR Part 15.247 & IC RSS-210

Test Report Serial No.: ARUB20-A2 Rev C

This report supersedes: ARUB20-A2 Rev B

Manufacturer: Aruba Networks
1322 Crossman Avenue
Sunnyvale
California 94089, USA

Product Function: Wireless Access Point

Copy No: pdf **Issue Date:** 29th February 2008

This Test Report is Issued Under the Authority of:

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



CERTIFICATE #2381.01

MiCOM Labs is an ISO 17025 Accredited Testing Laboratory



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ACCREDITATION, LISTINGS & RECOGNITION

ACCREDITITION

MiCOM Labs, Inc. an accredited laboratory complies with the international standard BS 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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LISTINGS

MiCOM Labs test facilities are listed by the following organizations;

North America

United States of America

Federal Communications Commission (FCC): 102167

Canada

Industry Canada (IC) Listing #:4143A-2

RECOGNITION

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

Conformity Assessment Body (CAB) – MiCOM Labs

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

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

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DOCUMENT HISTORY

Document History		
Revision	Date	Comments
Draft		
Rev A	11 th December '07	Initial Release
Rev B	18 th December '07	Product descriptive change on pages 10 & 11
Rev C	29 th February '08	Correction of typographical errors.

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1. TEST RESULT CERTIFICATE

Manufacturer:	Aruba Networks 1322 Crossman Avenue Sunnyvale California 94089, USA	Tested By:	MiCOM Labs, Inc. 440 Boulder Court Suite 200 Pleasanton California, 94566, USA
EUT:	Wireless Access Point	Telephone:	+1 925 462 0304
Model:	AP-124/125	Fax:	+1 925 462 0306
S/N:	AD0000142		
Test Date(s):	7th Nov to 10th Dec 2007	Website:	www.micomlabs.com

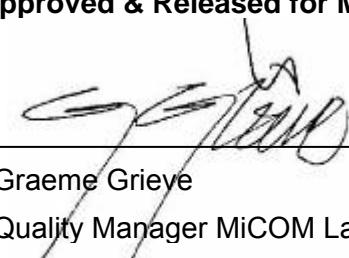
STANDARD(S)	TEST RESULTS
FCC 47 CFR Part 15.247 & IC RSS-210	EQUIPMENT COMPLIES

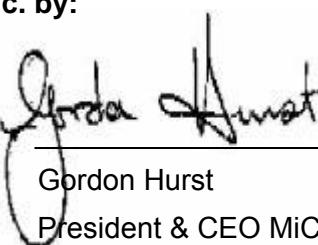
MiCOM Labs, Inc. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report.

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,


CERTIFICATE #2381.01

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 15.247	2007	Code of Federal Regulations
(ii)	Industry Canada RSS-210	Issue 7 June 2007	Low Power License-Exempt Radiocommunication Devices (All Frequency Bands)
(iii)	Industry Canada RSS-Gen	Issue 2 June 2007	General Requirements and Information for the Certification of Radiocommunication Equipment.
(iv)	ANSI C63.4	2003	American National Standards for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
(v)	CISPR 22/ EN 55022	1997 1998	Limits and Methods of Measurements of Radio Disturbance Characteristics of Information Technology Equipment
(vi)	M 3003	Edition 1 Dec. 1997	Expression of Uncertainty and Confidence in Measurements
(vii)	LAB34	Edition 1 Aug 2002	The expression of uncertainty in EMC Testing
(viii)	ETSI TR 100 028	2001	Parts 1 and 2 Electromagnetic compatibility and Radio Spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics
(ix)	A2LA	14 th September 2005	Reference to A2LA Accreditation Status – A2LA Advertising Policy

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.

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3. PRODUCT DETAILS AND TEST CONFIGURATIONS

3.1. Technical Details

Details	Description
Purpose:	Test of the Aruba AP-124,125 802.11a/b/g/n AP to FCC Part 15.247 and Industry Canada RSS-210 regulations.
Applicant:	As Manufacturer
Manufacturer:	Aruba Networks 1322 Crossman Avenue Sunnyvale California 94089, USA
Laboratory performing the tests:	MiCOM Labs, Inc. 440 Boulder Court, Suite 200 Pleasanton, California 94566 USA
Test report reference number:	ARUB20-A2 Rev C
Date EUT received:	12 TH November 2007
Standard(s) applied:	FCC 47 CFR Part 15.247 & IC RSS-210
Dates of test (from - to):	7th Nov to 10th Dec 2007
No of Units Tested:	1
Type of Equipment:	802.11a/b/g/n Wireless Access Point, 3x3 Spatial Multiplexing MIMO configuration
Manufacturers Trade Name:	Wireless Access Point
Model(s):	AP-124 (external) and AP-125 (integral) antenna
Location for use:	Indoor
Declared Frequency Range(s):	2400 - 2483.5 MHz; 5725 - 5850 MHz
Software Release	3.3.1.0
Type of Modulation:	Per 802.11 -CCK, BPSK, QPSK, DSSS, OFDM
Declared Nominal Average Output Power:	802.11b: +19 dBm 802.11g:Leg. +17dBm,HT-20 +19 dBm,HT-40 +19 dBm 802.11a:Leg. +17dBm,HT-20 +19 dBm,HT-40 +19 dBm
EUT Modes of Operation:	Legacy 802.11a/b/g, 802.11n HT-20, HT-40
Transmit/Receive Operation:	Time Division Duplex
Rated Input Voltage and Current:	5 Vdc, 2.5 A POE 48 Vdc 350 mA
Operating Temperature Range:	Declared range 0 to +40°C
ITU Emission Designator:	2412 – 2462 MHz 802.11n – HT-20 18M0W7D 2422 – 2472 MHz 802.11n – HT-40 36M7W7D 5745 – 5825 MHz 802.11n – HT-40 36M3W7D
Frequency Stability:	±20 ppm max
Equipment Dimensions:	Retracted 124 x 130 x 51mm (4.9 x 5.13 x 2.0 in.)
Weight:	18oz (0.42 kgs)
Primary function of equipment:	Wireless Access Point for transmitting data and voice

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3.2. Scope of Test Program

The scope of the test program was to test the Aruba Networks AP-124 and 125 802.11a/b/g/n Wireless Access Point, 3x3 Spatial Multiplexing MIMO configurations in the frequency ranges 2400 - 2483.5 MHz and 5725 – 5850 MHz for compliance against FCC 47 CFR Part 15.247 and Industry Canada RSS-210 specifications.

The Aruba Networks AP-124 has external antennas with reverse SMA connectors while the AP-125 has integral antenna(s). The device has two radios and three antennae.

**Aruba Networks
AP-124 Wireless Access Point (Front)**



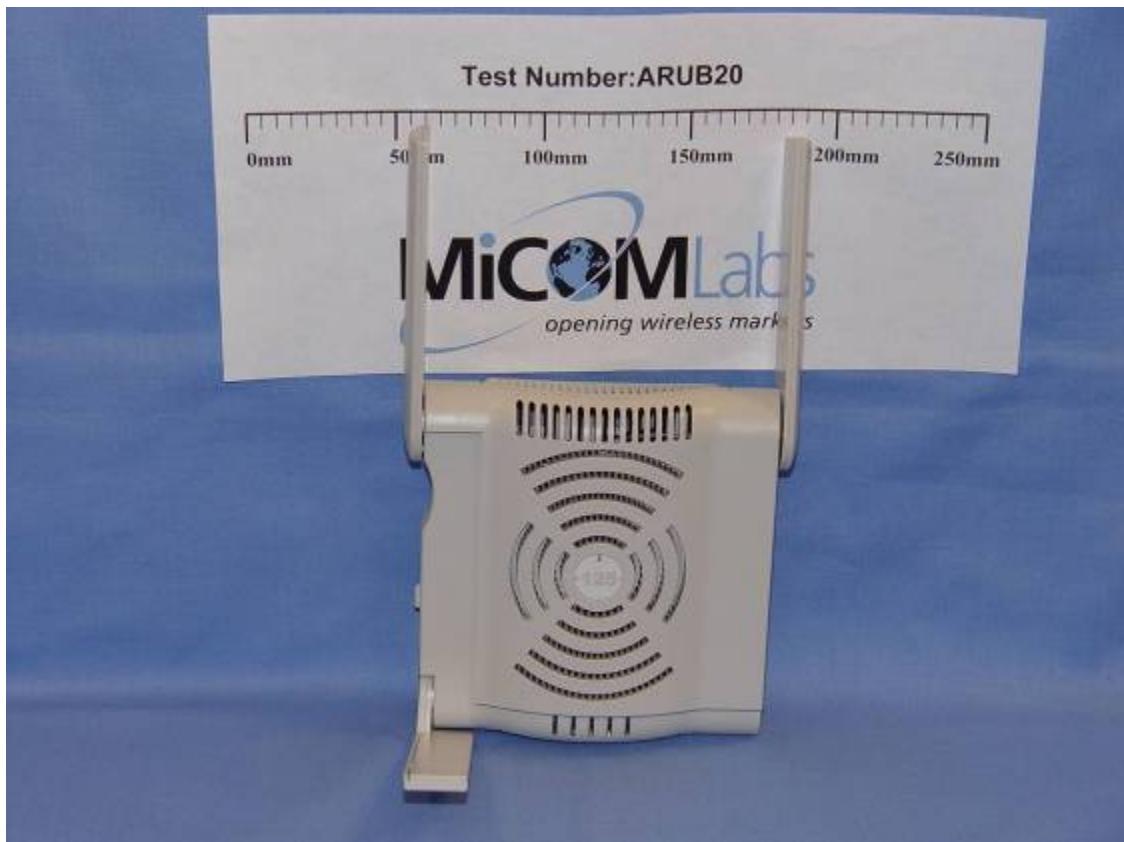
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**Aruba Networks
Wireless Access Point (Underside)**



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Aruba Networks
AP-125 Wireless Access Point (Integral Antenna)



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

Type (EUT/Support)	Equipment Description (Including Brand Name)	Mfr	Model No.	Serial No.
EUT	Access Point	Aruba Networks	AP-124/125	AD0000142
Support	Power Over LAN Hub	PowerDsine	PD-6001/AC	A03176040000172
Support	Power Supply	CUI Inc	A1-15S05	
Support	Laptop PC	IBM	Thinkpad	None

Note: the AP-125 access point identified in the above table was converted to an AP-124 for spurious emission testing on integral antenna.

3.4. Antenna Details

1. 2400-2483.5 MHz

- Integral 2.4 – 2.5 GHz Gain: 4.46 dBi
- AP-ANT-7, 12 dBi Directional
- AP-ANT-8, 5 dBi OMNI

2. 5725-5850 MHz

- Integral 5.8 GHz Gain: 5.23 dBi
- AP-ANT-10, 6 dBi OMNI
- AP-ANT-12, 14 dBi Directional

3.5. Cabling and I/O Ports

Number and type of I/O ports

1. Gigabit Ethernet (non-screened) x 2
2. 5 Vdc, 4mm supply connector

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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.

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

Legacy – data rates for 802.11abg products

Results for the above configurations are provided in this report.



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Conducted Testing

Conducted test parameters were performed on a single antenna connector. The performance testing was carried out on the transmitter port exhibiting the highest output power. A table of output power V's antenna port for each operational mode is provided below. The power from each transmitter is provided together with the aggregate power for all three transmitters. Complete characterization for each chain has been provided only for the power settings utilized in the generation of this report. Aggregate power measurements are provided for all power settings.

Channel 2,412 MHz

Configuration	ART Power Setting	Tx 1 Measured Pwr (dBm)	Tx 2 Measured Pwr (dBm)	Tx 3 Measured Pwr (dBm)	Aggregate Measured Pwr (dBm)
Legacy b	5				8.8
	6				9.12
	7				10.30
	9				12.16
	10				13.26
	11				14.08
	12				14.23
	13				15.07
	14				16.70
	15				18.28
	16	13.74	13.27	14.33	19.38
	17				19.76
	17.5	15.30	14.72	15.87	20.00
	19	17.01	16.65	17.39	22.68
Legacy g	5				8.46
	6				9.29
	7				10.47
	9				12.42
	10				13.29
	11	8.93	8.71	8.91	14.37
	12				15.30
	13				16.50
	13.5	15.39	14.70	16.21	17.00
	15				18.56
	16				19.42
	17	15.08	14.43	15.35	20.37

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Configuration	ART Power Setting	Tx 1 Measured Pwr (dBm)	Tx 2 Measured Pwr (dBm)	Tx 3 Measured Pwr (dBm)	Aggregate Measured Pwr (dBm)
HT-20	5				8.31
	6				9.22
	6.5	4.30	3.57	4.98	9.76
	9				12.37
	10				13.02
	11				14.17
	12	10.00	9.27	10.20	15.22
	13				16.27
	14				17.37
	15				18.36
	16				19.29
	17	15.02	14.31	15.48	20.54
	18				21.25
	19	17.03	16.70	17.34	22.40
Channel 2,422 MHz					
HT-40	5				8.80
	6				9.80
	7	5.60	4.74	5.90	10.88
	9				12.40
	9.5	7.66	7.28	7.68	12.84
	11				14.32
	12				15.42
	13				16.30
	14				17.26
	15	12.97	12.58	13.47	18.19
	16				19.08
	17	14.86	14.43	15.25	20.07
	18				21.35
	19	17.30	16.75	17.39	22.68

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Channel 2437 MHz

Configuration	ART Power Setting	Tx 1 Measured Pwr (dBm)	Tx 2 Measured Pwr (dBm)	Tx 3 Measured Pwr (dBm)	Aggregate Measured Pwr (dBm)
Legacy b	5				7.29
	6				8.72
	7				10.16
	9				11.43
	10				12.21
	11				13.20
	12				13.27
	13				15.89
	14				15.60
	15				17.70
	16				18.57
	17				20.87
	18				20.39
	19	16.70	16.20	17.03	21.59
	5				8.24
	6				9.30
	7				10.40
	9				11.25
	10				12.83
Legacy g	11				13.93
	12				14.94
	13				16.02
	14				16.85
	15				18.18
	16				19.20
	17	14.71	14.32	15.01	20.40

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Channel 2437 MHz

Configuration	ART Power Setting	Tx 1 Measured Pwr (dBm)	Tx 2 Measured Pwr (dBm)	Tx 3 Measured Pwr (dBm)	Aggregate Measured Pwr (dBm)
HT-20	5				8.26
	6				9.27
	7				10.21
	9				12.50
	10				12.75
	11				13.82
	12				14.80
	13				15.99
	14				16.82
	15				18.80
	16				19.94
	17				20.62
	18				21.16
	19	16.79	16.30	17.02	22.36
	5				8.75
	6				9.74
	7				10.66
	9				12.12
	10				13.23
HT-40	11				14.19
	12				15.10
	13				15.99
	14				16.06
	15				17.98
	16				18.97
	17	14.67	14.62	15.11	19.02
	18				21.19
	19	17.11	16.53	17.36	22.30

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Channel 2462 MHz

Configuration	ART Power Setting	Tx 1 Measured Pwr (dBm)	Tx 2 Measured Pwr (dBm)	Tx 3 Measured Pwr (dBm)	Aggregate Measured Pwr (dBm)
Legacy b	5				7.97
	6				8.95
	7				9.46
	7.5	5.51	5.27	5.75	10.71
	10				12.77
	11				13.60
	12				14.35
	13				15.95
	14				16.87
	15				18.46
	16	13.94	13.25	14.14	19.10
	17				20.47
	17.5	11.18	10.74	11.17	20.90
	19	16.64	16.78	17.24	22.39
Legacy g	5				8.30
	6				9.38
	7				10.29
	9				12.27
	10				12.82
	11				13.82
	12				15.01
	12.5	10.04	10.92	10.47	15.51
	14				17.19
	15				19.42
	16				20.35
	17	14.78	14.58	15.47	21.27

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Channel 2462 MHz

Configuration	ART Power Setting	Tx 1 Measured Pwr (dBm)	Tx 2 Measured Pwr (dBm)	Tx 3 Measured Pwr (dBm)	Aggregate Measured Pwr (dBm)
HT-20	5				8.25
	6				9.25
	7				10.17
	9				12.25
	10	7.49	7.02	7.71	12.63
	11				13.70
	11.5	8.63	8.35	9.30	14.23
	13				15.87
	14				17.68
	15				18.06
	16				19.36
	17				20.06
	18	15.68	15.62	16.26	21.36
	19	16.96	16.67	17.20	22.35

Channel 2,452 MHz

HT-40	3	1.67	0.78	1.70	6.72
	6				9.86
	7				10.61
	9				12.17
	9.5	7.35	6.82	7.67	12.68
	11				14.09
	12				15.15
	13				16.01
	14				17.07
	15				18.27
	16	13.88	13.90	14.50	19.26
	17	14.75	14.80	15.31	20.29
	18				21.36
	19	16.91	16.42	17.80	22.25

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Channel 5745 MHz

Configuration	ART Power Setting	Tx 1 Measured Pwr (dBm)	Tx 2 Measured Pwr (dBm)	Tx 3 Measured Pwr (dBm)	Aggregate Measured Pwr (dBm)
Legacy a	5				8.20
	6				9.16
	7				10.02
	8				10.86
	9				11.75
	10				13.08
	11.5	8.88	8.40	9.36	14.42
	12	9.46	9.83	9.80	14.95
	13	10.21	9.96	10.89	15.91
	14	11.27	11.10	12.03	17.02
	15				18.08
	16	13.10	12.95	14.10	19.02
	17	14.05	13.91	15.12	19.97
	18				20.59
	19				22.78
	5				8.16
	6				9.06
	7				9.94
	8				10.93
	9				11.74
	10				12.96
	11				13.92
HT-20	12	9.42	8.72	9.80	14.86
	12.5	9.83	9.13	10.37	15.38
	13.5	10.58	10.38	11.30	16.45
	14	11.18	11.03	12.01	16.99
	16	13.00	13.00	13.84	18.87
	17	13.95	13.75	15.00	19.98
	18				21.46
	19				22.42

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Channel 5755 MHz

Configuration	ART Power Setting	Tx 1 Measured Pwr (dBm)	Tx 2 Measured Pwr (dBm)	Tx 3 Measured Pwr (dBm)	Aggregate Measured Pwr (dBm)
HT-40	5				8.37
	6				9.24
	7				10.15
	8				10.92
	9				11.86
	10	7.06	6.53	7.73	12.70
	11				13.64
	12	8.67	8.55	9.57	14.58
	13				15.73
	14	10.67	10.65	11.48	16.76
	15				17.63
	16				18.82
	17	13.94	13.67	14.82	19.84
	18				20.89
	19				21.92

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Channel 5785 MHz

Configuration	ART Power Setting	Tx 1 Measured Pwr (dBm)	Tx 2 Measured Pwr (dBm)	Tx 3 Measured Pwr (dBm)	Aggregate Measured Pwr (dBm)
Legacy a	5				8.85
	6				9.57
	7				10.49
	8				11.12
	9				11.83
	10				12.68
	11				13.56
	12	8.90	8.52	9.21	14.50
	13				15.60
	14	10.78	10.62	11.56	16.62
	15				17.79
	16				18.45
	17				19.78
	18				21.89
	19				22.05
HT-20	5				8.80
	6				9.58
	7				10.30
	8				11.01
	9				11.86
	10				12.52
	11				13.45
	12	8.82	8.51	9.11	14.49
	13				15.62
	13.5	10.37	10.18	10.72	16.14
	14	10.87	10.57	11.49	16.66
	16				18.56
	17				19.86
	18				20.76
	19				21.64

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Channel 5785 MHz

Configuration	ART Power Setting	Tx 1 Measured Pwr (dBm)	Tx 2 Measured Pwr (dBm)	Tx 3 Measured Pwr (dBm)	Aggregate Measured Pwr (dBm)
HT-40	5				8.78
	6				9.39
	7				10.16
	8				10.85
	9				11.72
	10				12.30
	11				13.22
	12	8.44	8.29	9.12	14.32
	13				15.26
	14				16.34
	15				17.27
	16				18.40
	17	13.62	13.90	14.64	19.60
	18				20.58
	19				21.40

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Channel 5825 MHz

Configuration	ART Power Setting	Tx 1 Measured Pwr (dBm)	Tx 2 Measured Pwr (dBm)	Tx 3 Measured Pwr (dBm)	Aggregate Measured Pwr (dBm)
Legacy a	5				9.34
	6				10.20
	7				10.78
	8				11.41
	9				12.23
	10				12.51
	11				13.22
	12	8.43	8.79	9.07	14.35
	13				15.45
	14	10.70	10.54	11.02	16.39
	15				17.44
	16				18.50
	17				19.27
	18				20.35
	19				21.82
HT-20	5				9.32
	6				10.10
	7				10.76
	8				11.33
	9				12.09
	10				12.26
	11.5	7.97	8.27	8.35	13.64
	12	8.48	8.73	8.90	14.12
	12.5	9.06	9.10	9.50	14.69
	14				16.20
	15				17.22
	16				18.20
	17				19.50
	18				20.28
	19				21.85

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Channel 5815 MHz

Configuration	ART Power Setting	Tx 1 Measured Pwr (dBm)	Tx 2 Measured Pwr (dBm)	Tx 3 Measured Pwr (dBm)	Aggregate Measured Pwr (dBm)
HT-40	5				9.15
	6				9.87
	7				10.63
	8				10.15
	9				11.98
	10				12.25
	11				13.07
	11.5	7.63	7.80	8.12	13.53
	12	8.10	8.29	8.70	14.10
	14				16.27
	15				17.25
	16				18.38
	17	13.30	14.00	14.12	19.66
	18				20.49
	19				20.96

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Antenna Test Configurations for Radiated Emissions

Spurious Emission and Band-Edge Test Strategy

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

2,400 – 2483.5 MHz

15.247 ISM AP124 and AP-125			
	AP-ANT-Int	AP-ANT-7	AP-ANT-8
Legacy			
802.11b	b 2412	b 2412	b 2412
	b 2437	b 2437	b 2437
	b 2462	b 2462	b 2462
	BE b 2390	BE b 2390	BE b 2390
	b Pk 2412	b Pk 2412	b Pk 2412
	b Pk 2437	b Pk 2437	b Pk 2437
	b Pk 2462	b Pk 2462	b Pk 2462
	BE b 2483.5	BE b 2483.5	BE b 2483.5
802.11g	g 2412	g 2412	g 2412
	g 2437	g 2437	g 2437
	g 2462	g 2462	g 2462
	BE g 2390	BE g 2390	BE g 2390
	g Pk 2412	g Pk 2412	g Pk 2412
	g Pk 2437	g Pk 2437	g Pk 2437
	g Pk 2462	g Pk 2462	g Pk 2462
	BE g 2483.5	BE g 2483.5	BE g 2483.5
HT-20	g 2412	g 2412	g 2412
	g 2437	g 2437	g 2437
	g 2462	g 2462	g 2462
	BE g 2390	BE g 2390	BE g 2390
	PK g 2412	PK g 2412	PK g 2412
	PK g 2437	PK g 2437	PK g 2437
	PK g 2462	PK g 2462	PK g 2462
	BE g 2483.5	BE g 2483.5	BE g 2483.5
HT-40	g 2422	g 2422	g 2422
	g 2437	g 2437	g 2437
	g 2452	g 2452	g 2452
	BE g 2390	BE g 2390	BE g 2390
	PK g 2422	PK g 2422	PK g 2422
	PK g 2437	PK g 2437	PK g 2437
	PK g 2452	PK g 2452	PK g 2452
	BE g 2483.5	BE g 2483.5	BE g 2483.5

KEY:-

BE – Band-Edge

PK - Peak Emission

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5,725 – 5850 MHz

15.247 ISM AP124 and AP125			
	AP-ANT-Int	AP-ANT-12	AP-ANT-10
Legacy			
802.11a	a 5745	a 5745	a 5745
	a 5785	a 5785	a 5785
	a 5825	a 5825	a 5825
	Pk a 5745	Pk a 5745	Pk a 5745
	Pk a 5785	Pk a 5785	Pk a 5785
	Pk a 5825	Pk a 5825	Pk a 5825
	BE a 5460	BE a 5460	BE a 5460
HT-20	a 5745	a 5745	a 5745
	a 5785	a 5785	a 5785
	a 5825	a 5825	a 5825
	Pk a 5745	Pk a 5745	Pk a 5745
	Pk a 5785	Pk a 5785	Pk a 5785
	Pk a 5825	Pk a 5825	Pk a 5825
	BE a 5460	BE a 5460	BE a 5460
HT-40	a 5755	a 5755	a 5755
	a 5785	a 5785	a 5785
	a 5815	a 5815	a 5815
	Pk a 5755	Pk a 5755	Pk a 5755
	Pk a 5785	Pk a 5785	Pk a 5785
	Pk a 5815	Pk a 5815	Pk a 5815
	BE a 5460	BE a 5460	BE a 5460

KEY:-

BE – Band-Edge

PK - Peak Emission

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3.7. Equipment Modifications

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

EUT Software Power Settings - Radiated Testing

1. Reduction in output power to meet band-edge requirements was required in certain circumstances. When testing radiated spurious emissions a matrix has been included identifying the power settings for this scenario. The matrix identifies whether the reduction in power was as a result of band-edge issues or spurious emissions.

3.8. Deviations from the Test Standard

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

1. NONE

3.9. Subcontracted Testing or Third Party Data

1. NONE



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4. TEST SUMMARY

List of Measurements

The following table represents the list of measurements required under the **FCC CFR47 Part 15.247** and **Industry Canada RSS-210** and **Industry Canada RSS-Gen**.

Section(s)	Test Items	Description	Condition	Result	Test Report Section
15.247(a)(2) A8.2(1) 4.4	6 dB and 99 % Bandwidths	≥ 500 kHz	Conducted	Complies	5.1.1
15.247(b)(3) 15.31(e) A8.4(4)	Peak Output Power Voltage Variation	Shall not exceed 1W Variation of supply voltage 85 % -115 %	Conducted	Complies	5.1.2
15.247(e) A8.2	Peak Power Spectral Density	Shall not be greater than +8 dBm in any 3 kHz band	Conducted	Complies	5.1.3
15.247(i) 5.5	Maximum Permissible Exposure	Exposure to radio frequency energy levels	Conducted	Complies	5.1.4
15.247(d) 15.205 / 15.209 A8.5 2.2 4.7	Spurious Emissions (30MHz - 26 GHz b/g and 30 MHz - 40 GHz a)	The radiated emission in any 100 kHz of out-band shall be at least 20 dB below the highest in-band spectral density	Conducted	Complies	5.1.5

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List of Measurements (continued)

The following table represents the list of measurements required under the **FCC CFR47 Part 15.247**, **Industry Canada RSS-210**, and **Industry Canada RSS-Gen**.

Section(s)	Test Items	Description	Condition	Result	Test Report Section
15.247(d) 15.205 / 15.209 A8.5 2.2 2.6 4.7	Radiated Emissions Transmitter Radiated Spurious Emissions Radiated Band Edge Industry Canada only RSS-Gen §4.8, §6	Restricted Bands Emissions above 1 GHz Band-edge results Peak Emissions Emissions above 1 GHz	Radiated	Complies Complies Complies	5.1.6 5.1.6.1 5.1.6.2. 5.1.6.3
15.205 / 15.209 2.2	Radiated Spurious Emissions	Emissions <1 GHz (30M-1 GHz) ac/dc converter POE	Radiated	Complies	5.1.6.4
15.207 7.2.2	AC Wireline Conducted Emissions 150 kHz–30 MHz	Conducted Emissions ac/dc converter POE	Conducted	No Test Requirement	5.1.7

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

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

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

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5. TEST RESULTS

5.1. Device Characteristics

5.1.1. 6 dB and 99 % Bandwidth

FCC, Part 15 Subpart C §15.247(a)(2)

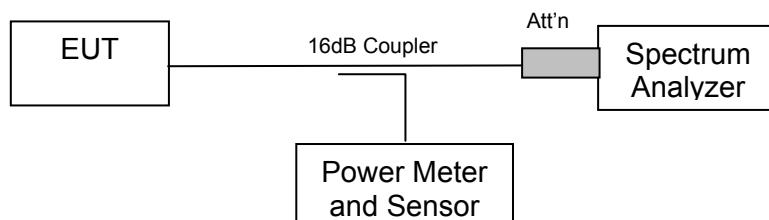
Industry Canada RSS-210 §A8.2

Industry Canada RSS-Gen §4.4

Test Procedure

The bandwidth at 6 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.

Test Measurement Set up



Measurement set up for 6 dB and 99 % bandwidth test

Measurement Results for 6 dB & 99% Bandwidth

Ambient conditions.

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

Radio Parameters

Duty Cycle: 100%

Output: Modulated Carrier

Power: Maximum Default Power

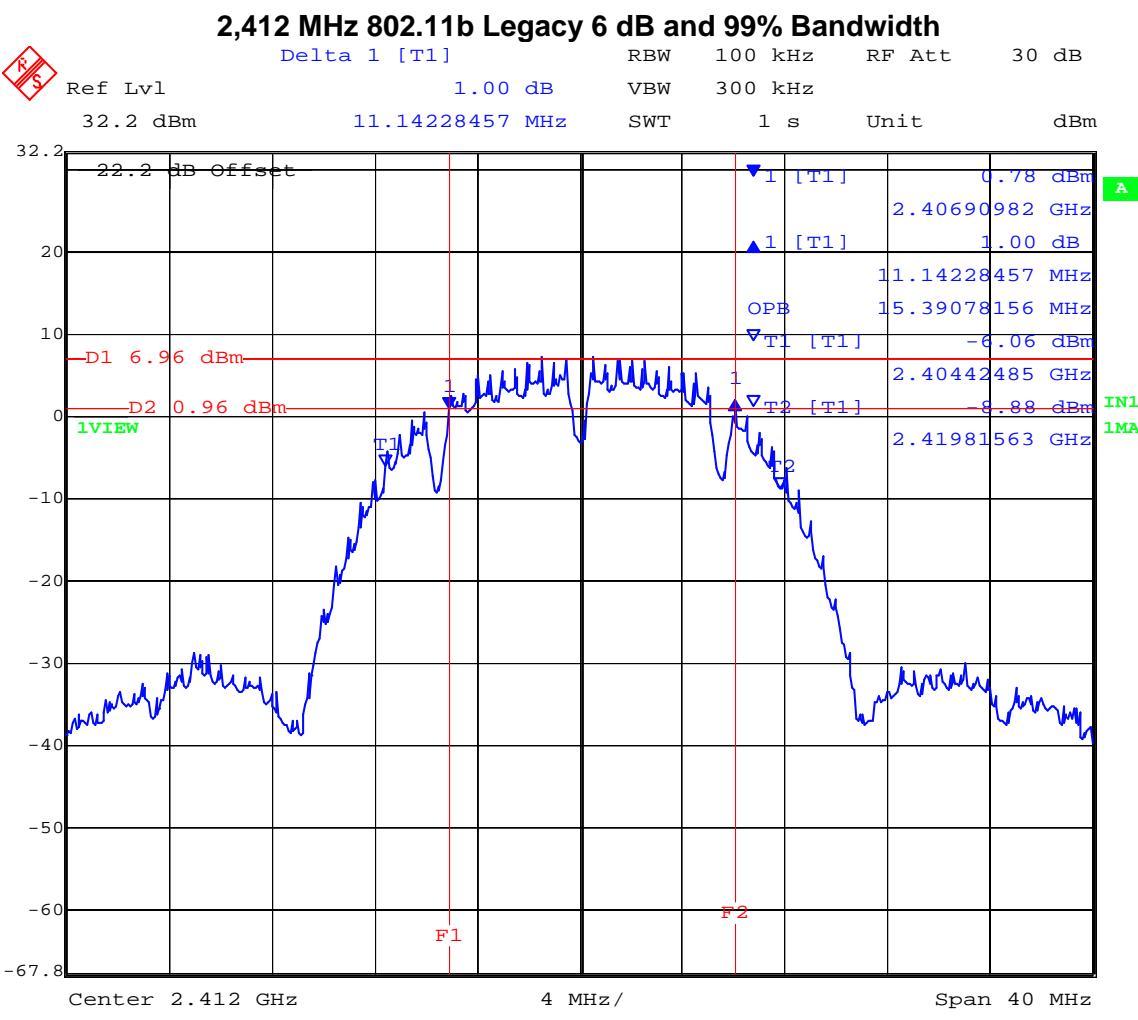
Measurement Results for 6 dB Operational Bandwidth(s)

Ambient conditions.

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

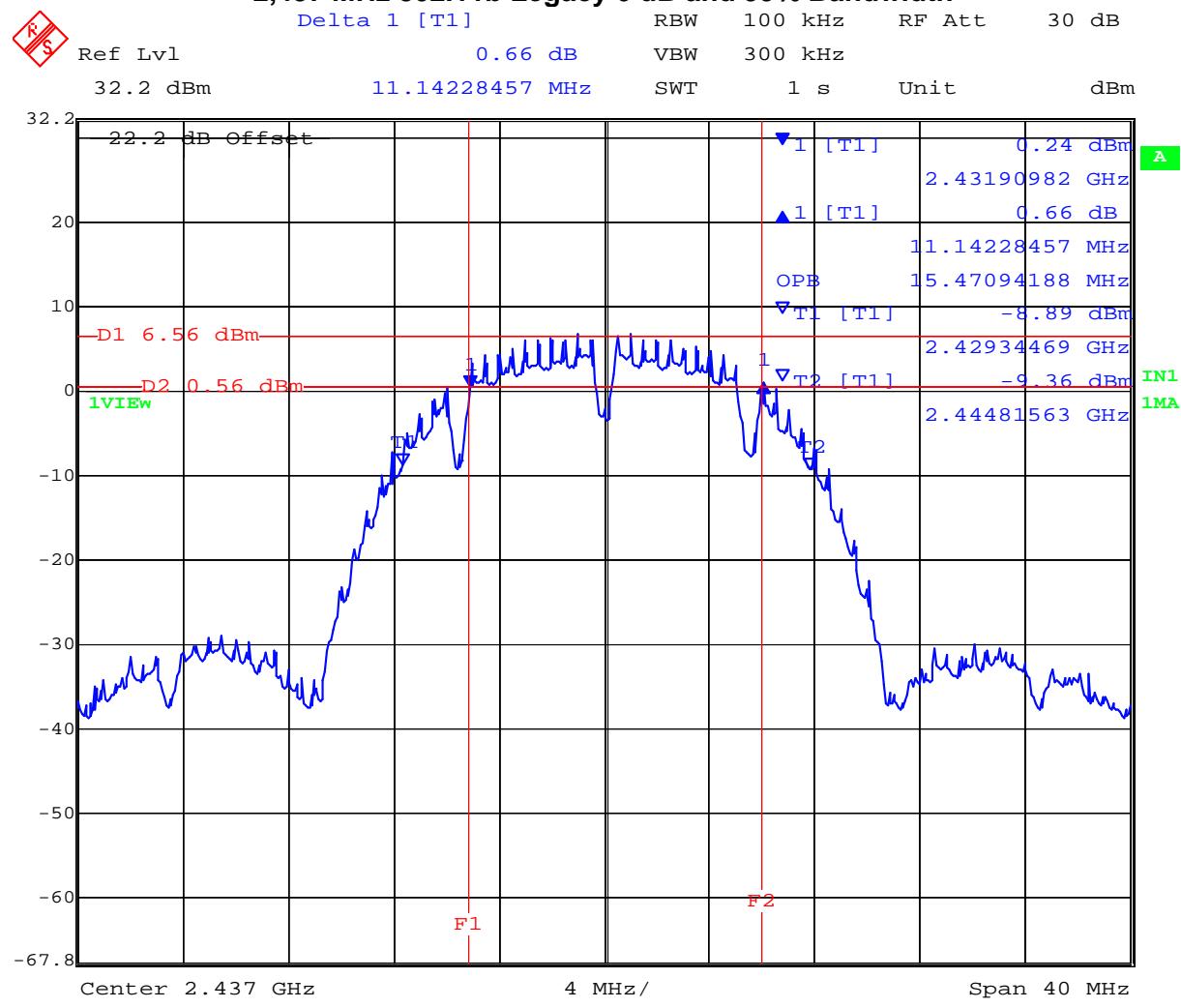
TABLE OF RESULTS – 802.11b Legacy

Center Frequency (MHz)	6 dB Bandwidth (MHz)	99% BW (MHz)
2,412	11.142	15.391
2,437	11.142	15.471
2,462	11.062	15.551



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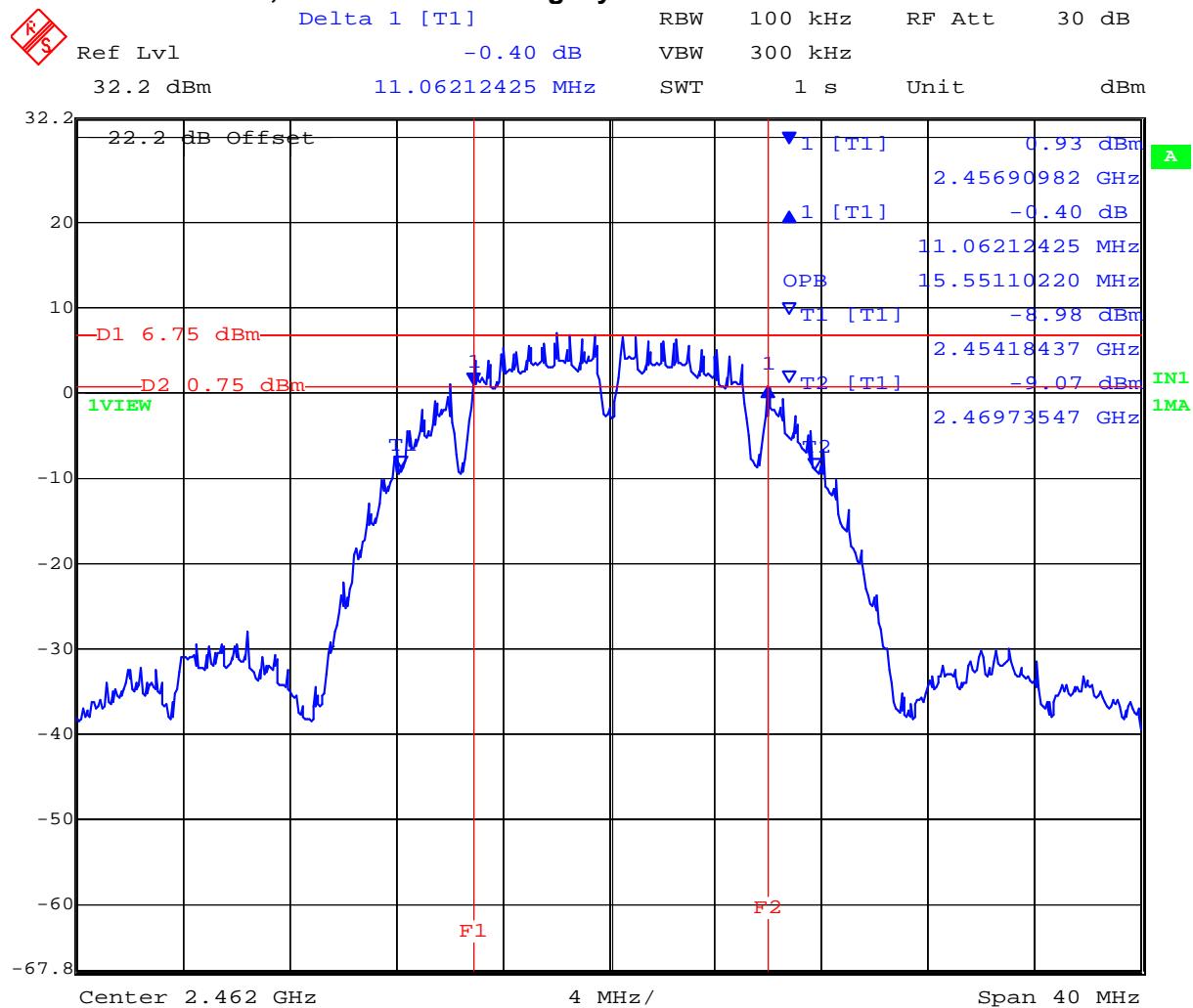
2,437 MHz 802.11b Legacy 6 dB and 99% Bandwidth



Date: 7.NOV.2007 19:00:22

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2,462 MHz 802.11b Legacy 6 dB and 99% Bandwidth



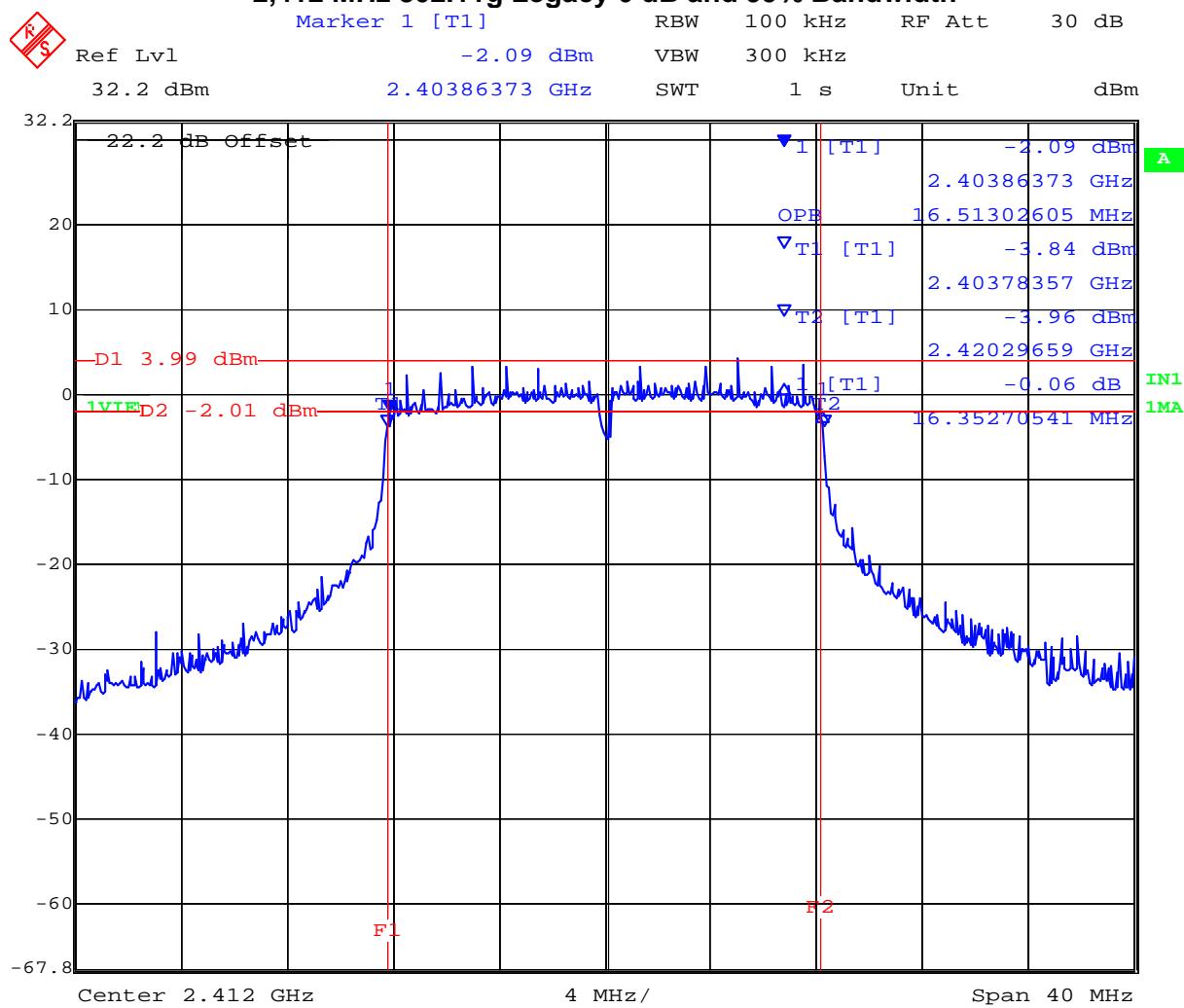
Date: 7.NOV.2007 19:02:14

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TABLE OF RESULTS – 802.11g Legacy

Center Frequency (MHz)	6 dB Bandwidth (MHz)	99% BW (MHz)
2,412	16.353	16.513
2,437	16.273	16.513
2,462	16.433	16.593

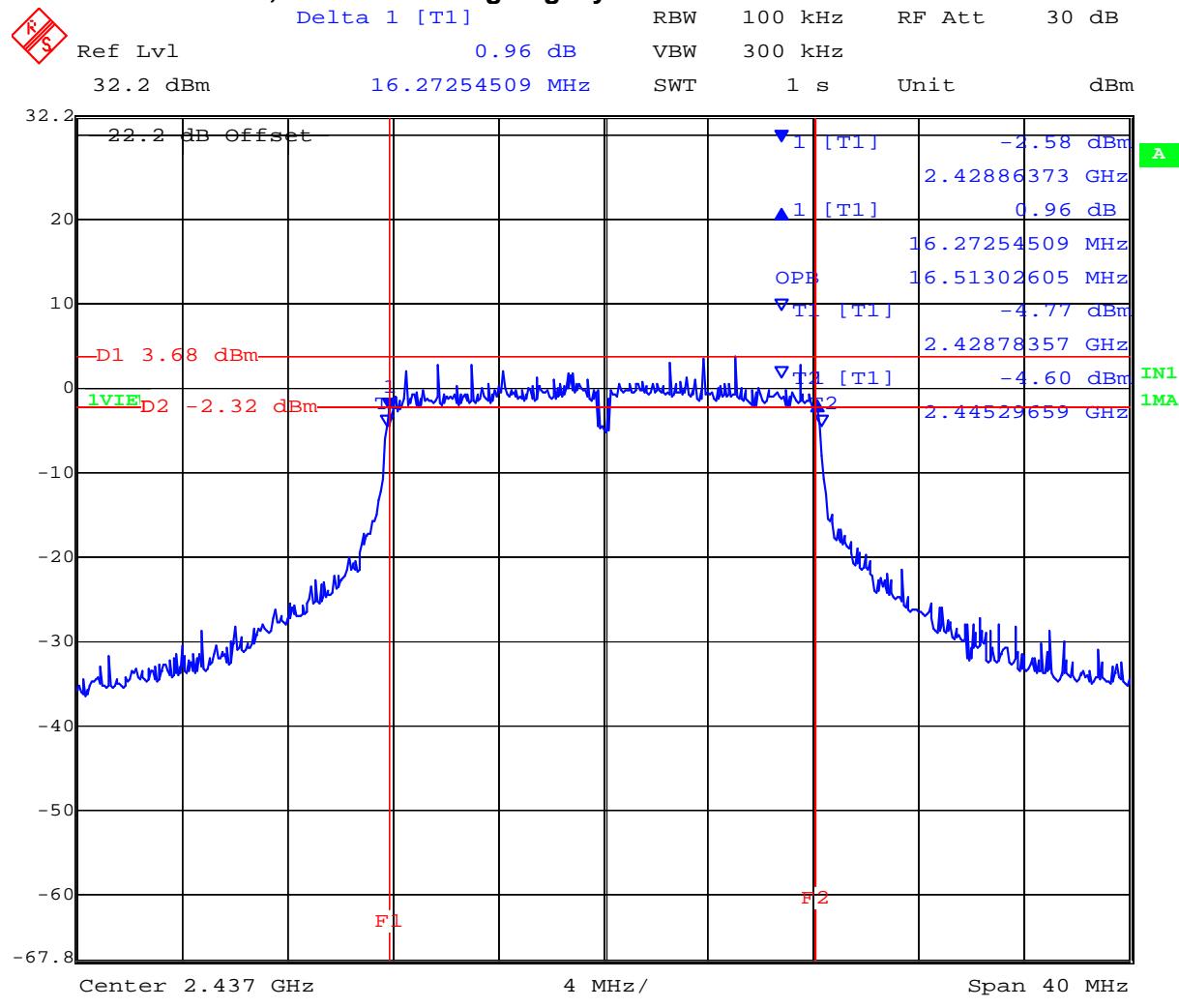
2,412 MHz 802.11g Legacy 6 dB and 99% Bandwidth



Date: 7.NOV.2007 18:49:27

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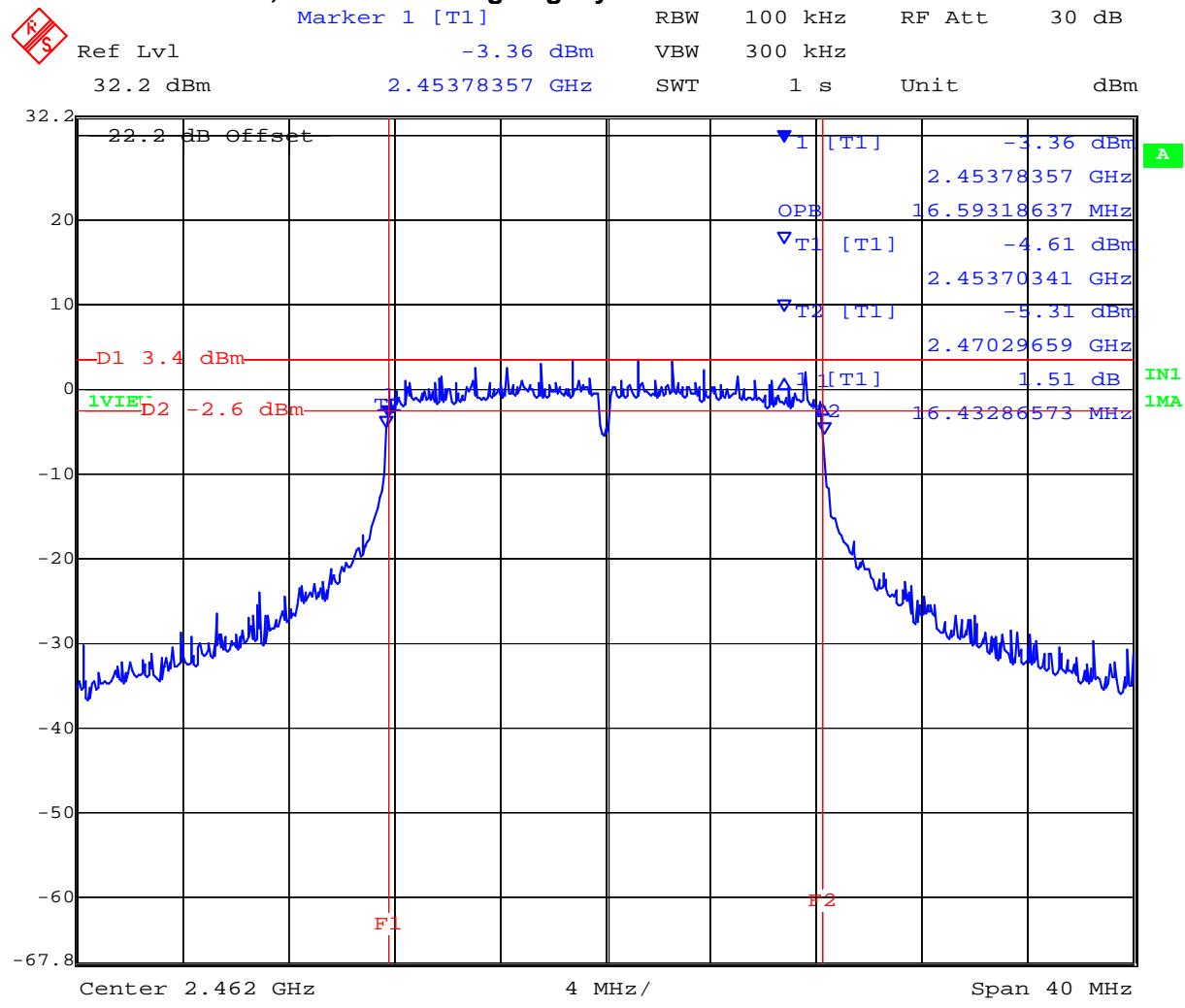
2,437 MHz 802.11g Legacy 6 dB and 99% Bandwidth



Date: 7.NOV.2007 18:53:04

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2,462 MHz 802.11g Legacy 6 dB and 99% Bandwidth



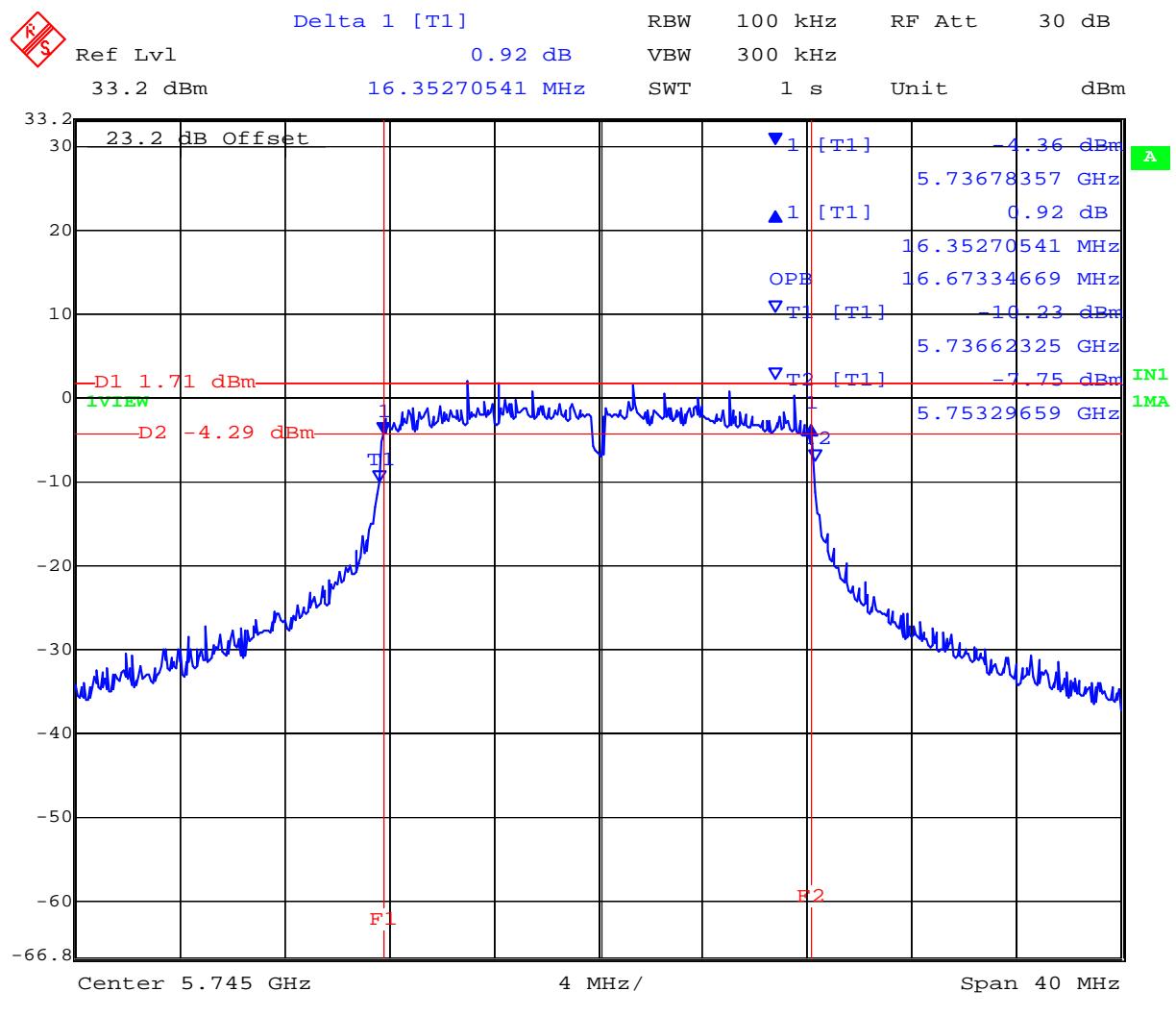
Date: 7.NOV.2007 18:55:02

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TABLE OF RESULTS – 802.11a - Legacy

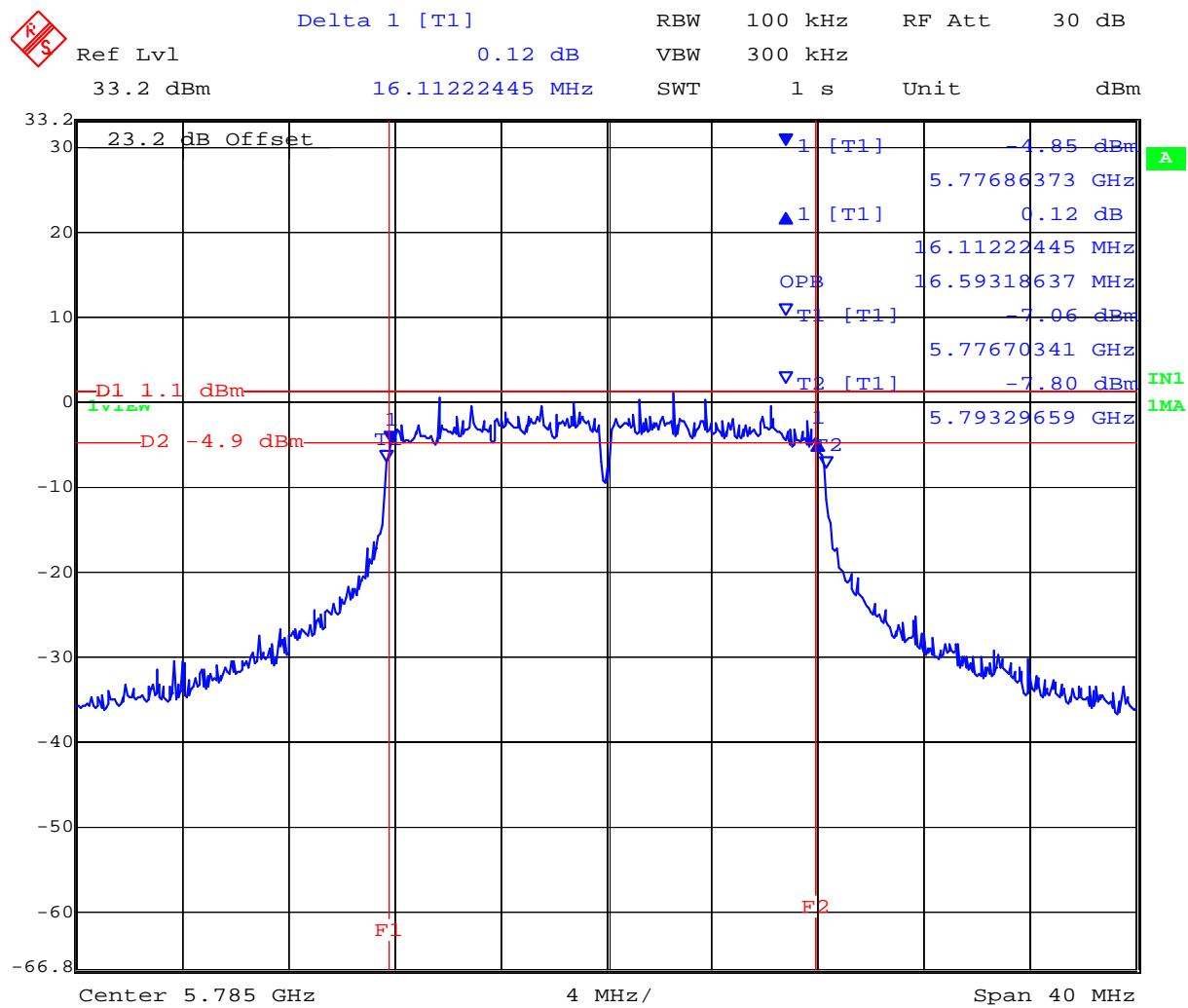
Center Frequency (MHz)	6 dB Bandwidth (MHz)	99% BW (MHz)
5,745	16.353	16.673
5,785	16.112	16.593
5,825	16.112	16.513

5,745 MHz 802.11a Legacy 6 dB and 99% Bandwidth



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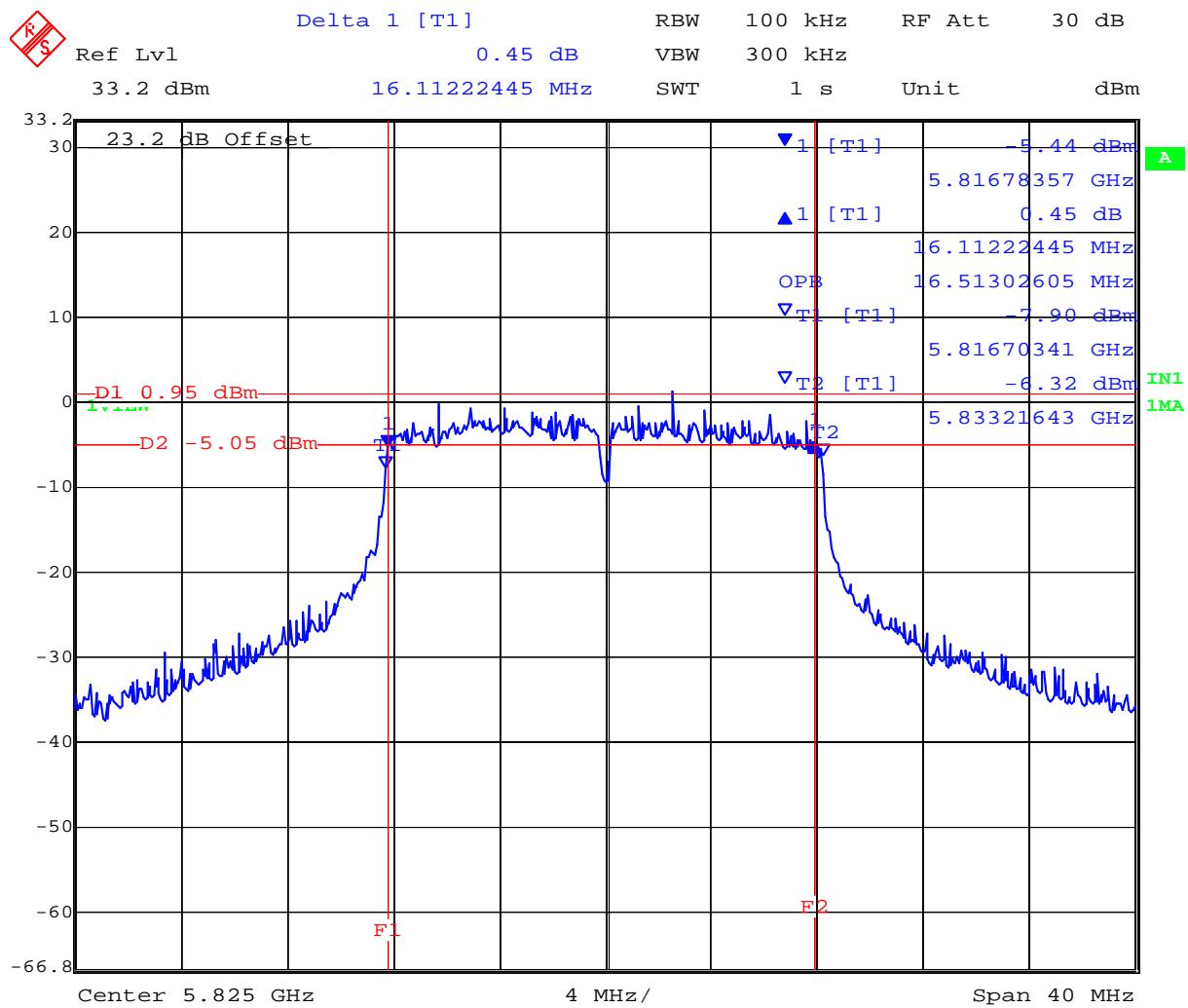
5,785 MHz 802.11a Legacy 6 dB and 99% Bandwidth



Date: 8.NOV.2007 14:40:22

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5,825 MHz 802.11a Legacy 6 dB and 99% Bandwidth



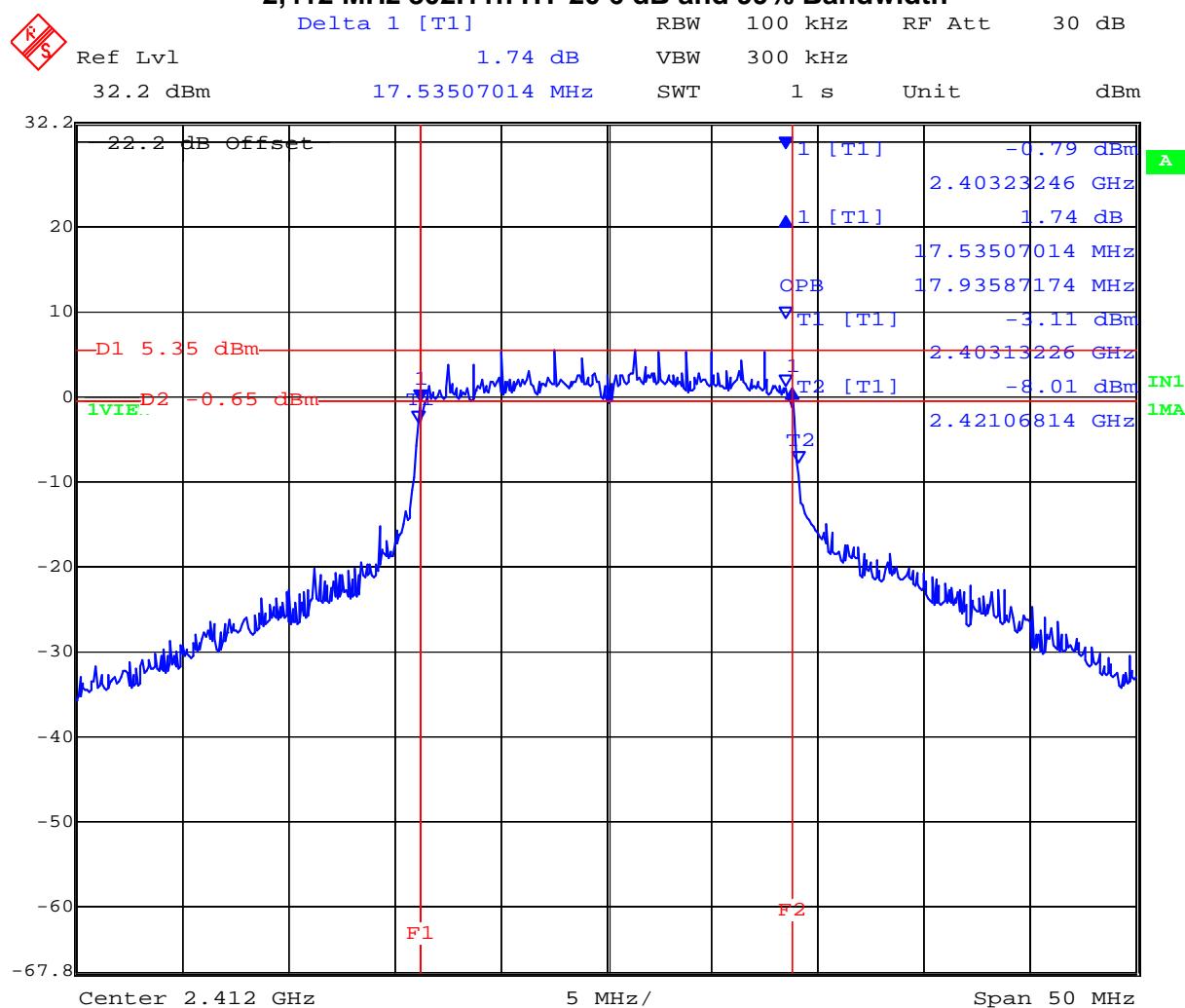
Date: 8.NOV.2007 14:42:14

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TABLE OF RESULTS – 802.11N HT-20

Center Frequency (MHz)	6 dB Bandwidth (MHz)	99% BW (MHz)
2,412	17.535	17.936
2,437	17.335	17.836
2,462	17.535	17.936

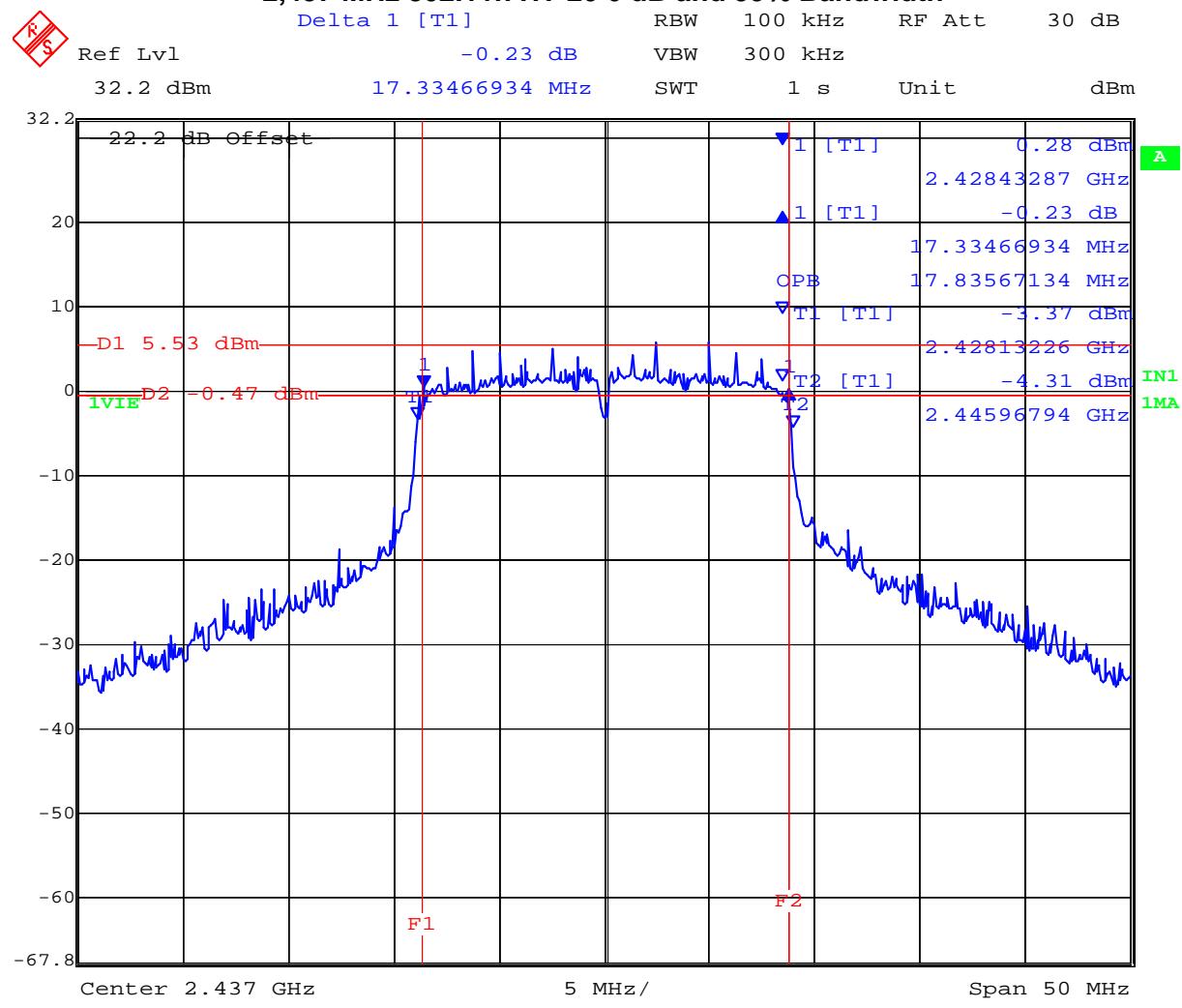
2,412 MHz 802.11n HT-20 6 dB and 99% Bandwidth



Date: 8.NOV.2007 09:18:43

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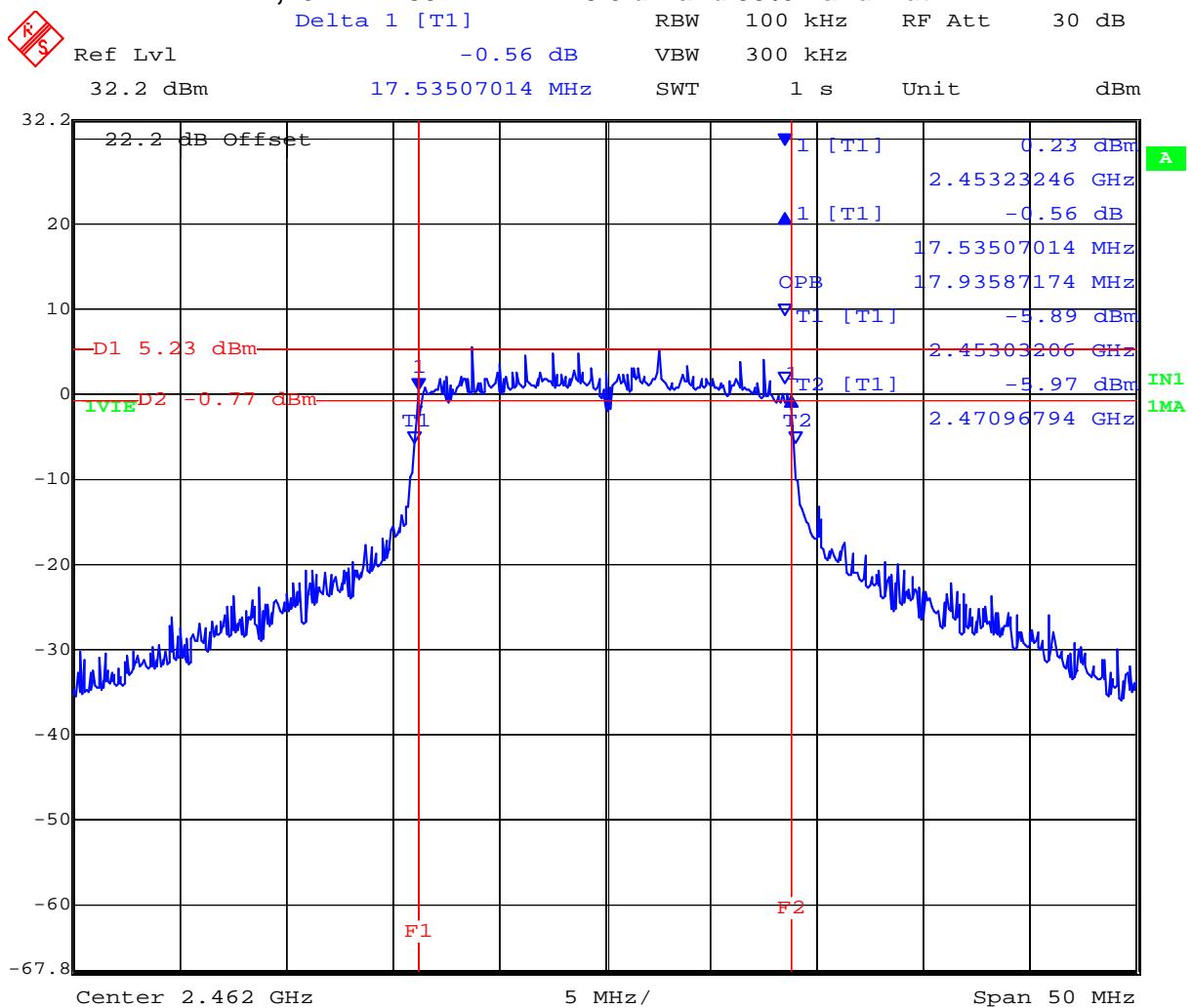
2,437 MHz 802.11n HT-20 6 dB and 99% Bandwidth



Date: 8.NOV.2007 09:22:13

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2,462 MHz 802.11n HT-20 6 dB and 99% Bandwidth



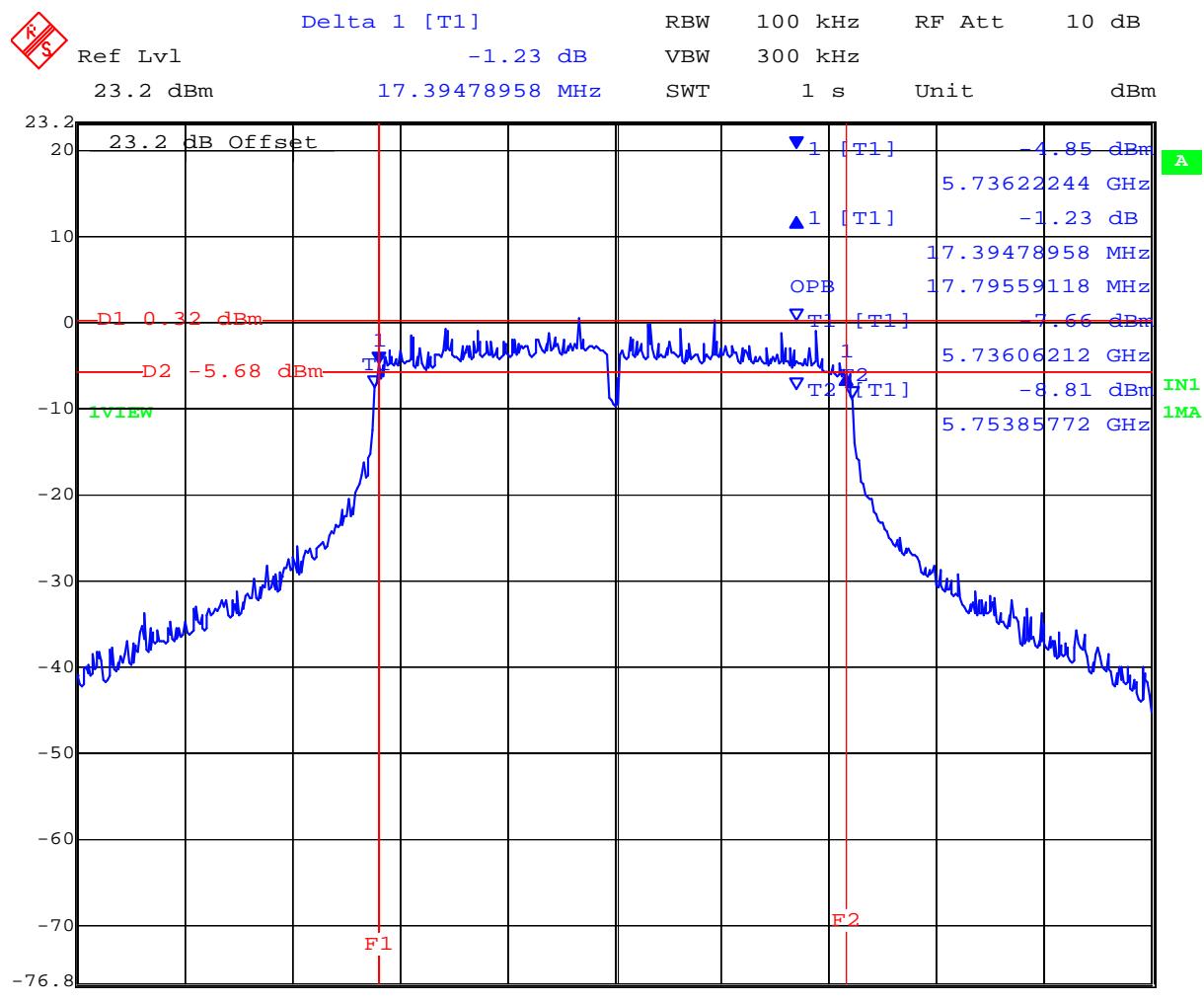
Date: 8.NOV.2007 09:24:16

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TABLE OF RESULTS – 802.11a - HT-20

Center Frequency (MHz)	6 dB Bandwidth (MHz)	99% BW (MHz)
5,745	17.395	17.796
5,785	17.315	17.715
5,825	17.315	17.796

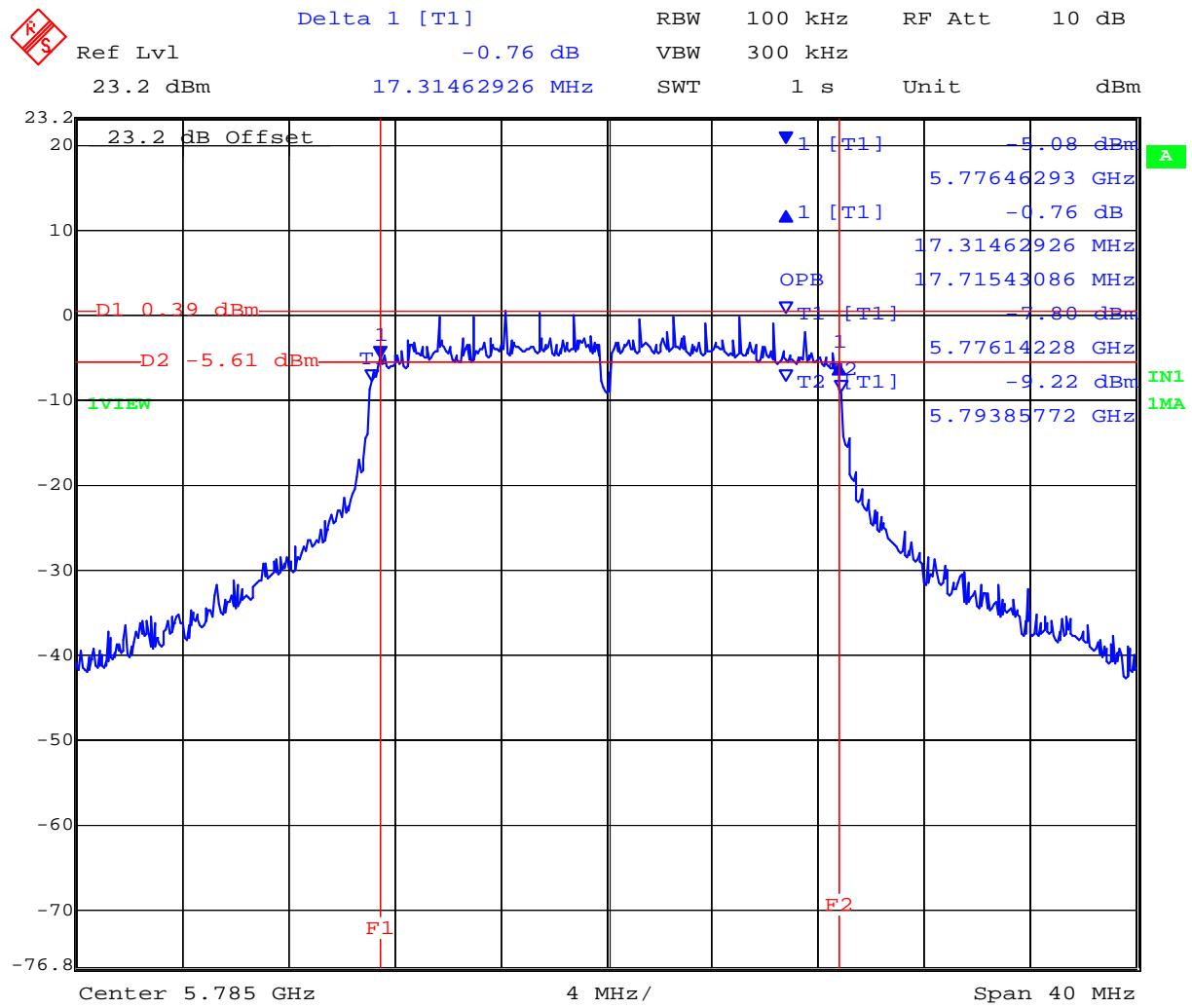
5,745 MHz 802.11n HT-20 6 dB and 99% Bandwidth



Date: 8.NOV.2007 15:52:58

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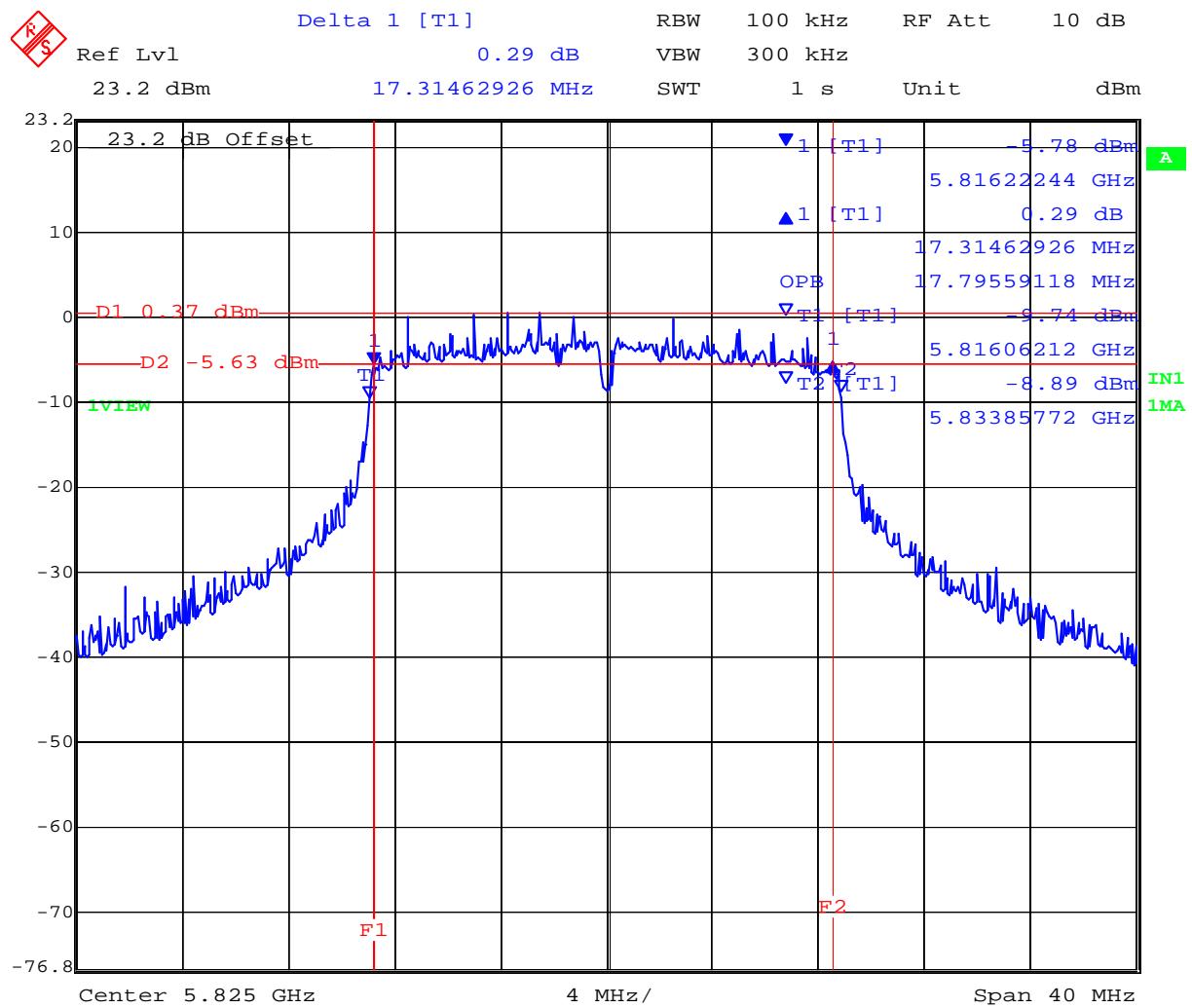
5,785 MHz 802.11n HT-20 6 dB and 99% Bandwidth



Date: 8.NOV.2007 15:55:17

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5,825 MHz 802.11n HT-20 6 dB and 99% Bandwidth



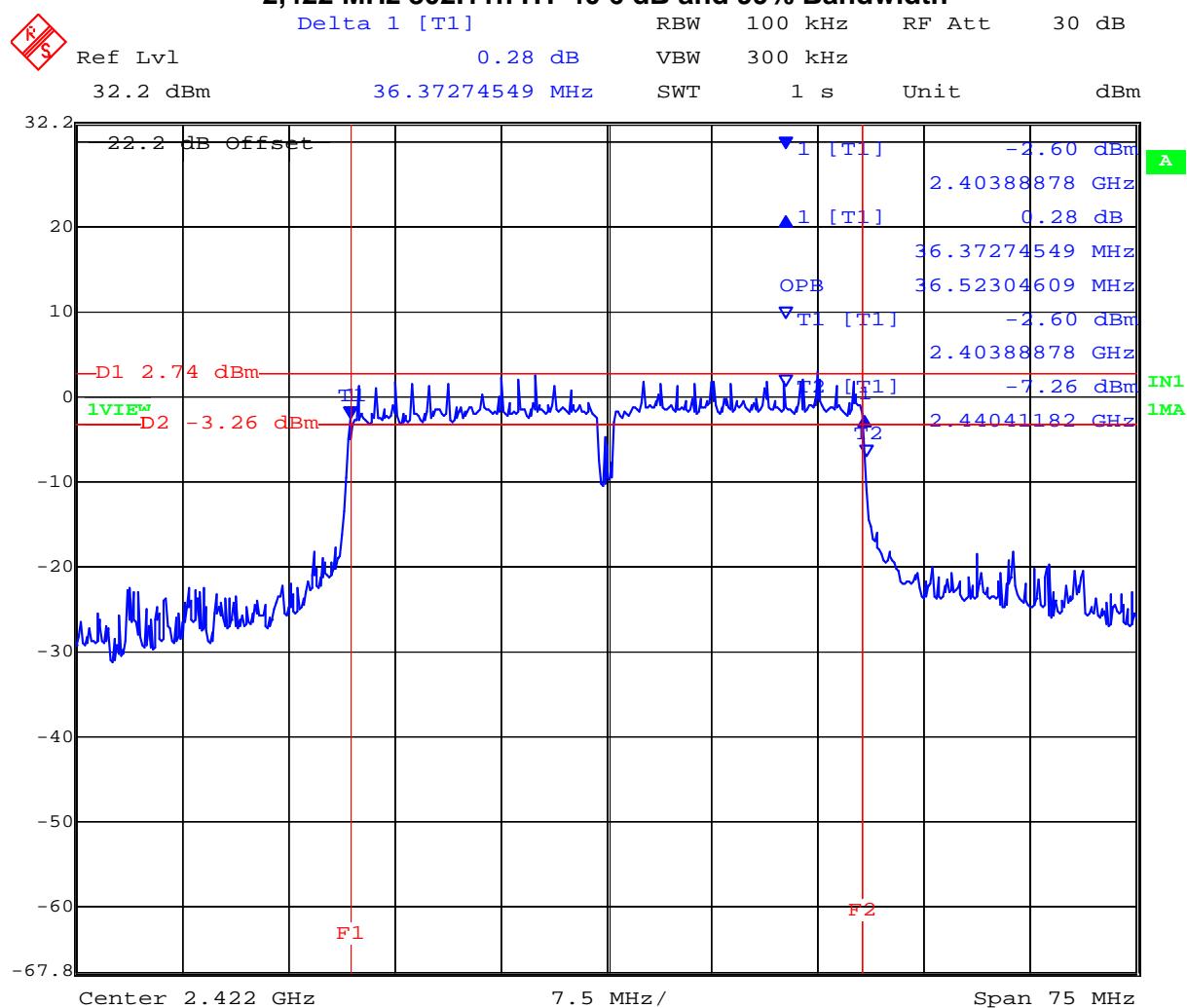
Date: 8.NOV.2007 15:56:55

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TABLE OF RESULTS – 802.11N HT-40

Center Frequency (MHz)	6 dB Bandwidth (MHz)	99% BW (MHz)
2,422	36.373	36.523
2,437	36.373	36.673
2,452	36.523	36.673

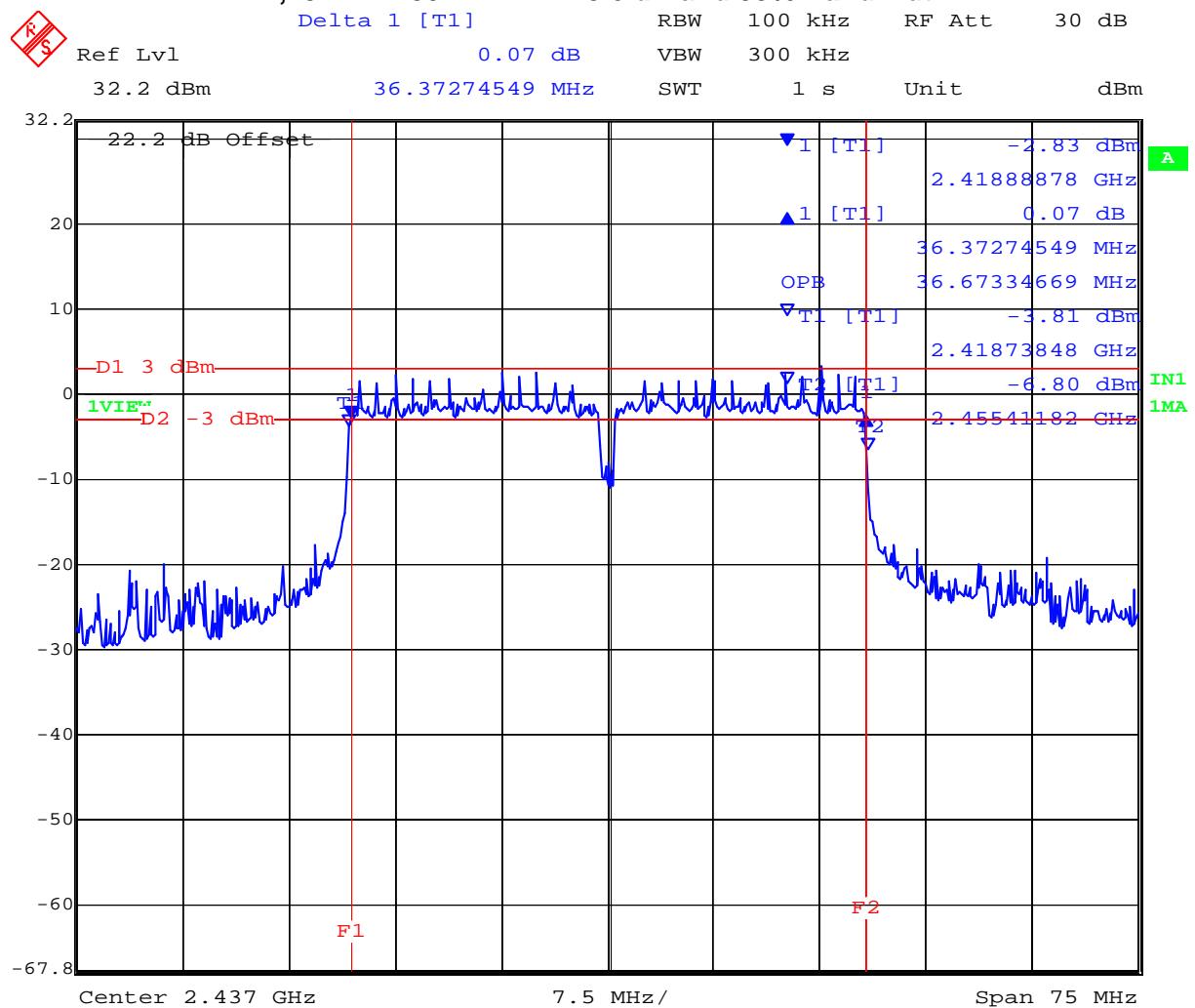
2,422 MHz 802.11n HT-40 6 dB and 99% Bandwidth



Date: 8.NOV.2007 13:17:23

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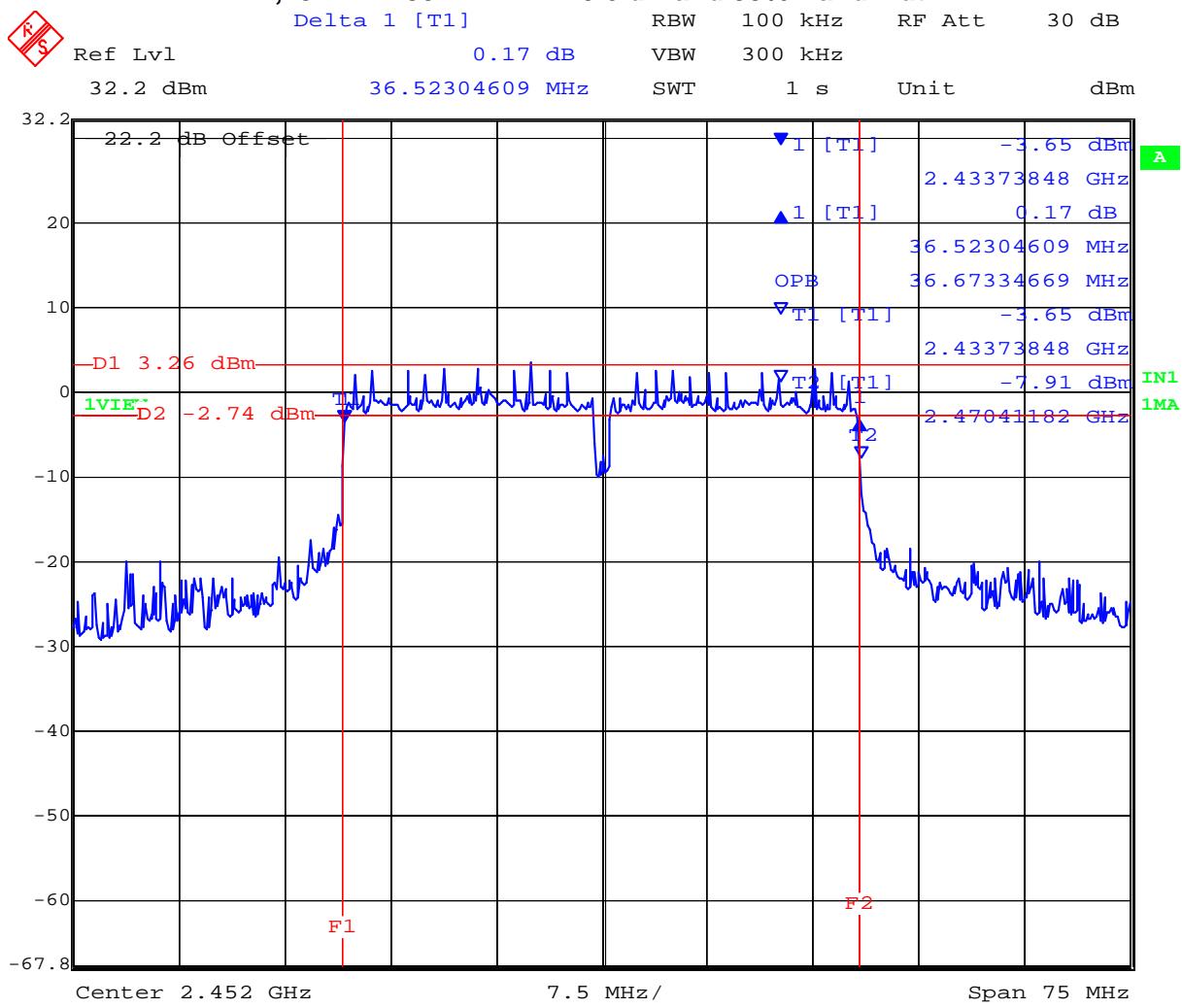
2,437 MHz 802.11n HT-40 6 dB and 99% Bandwidth



Date: 8.NOV.2007 10:49:53

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2,452 MHz 802.11n HT-40 6 dB and 99% Bandwidth



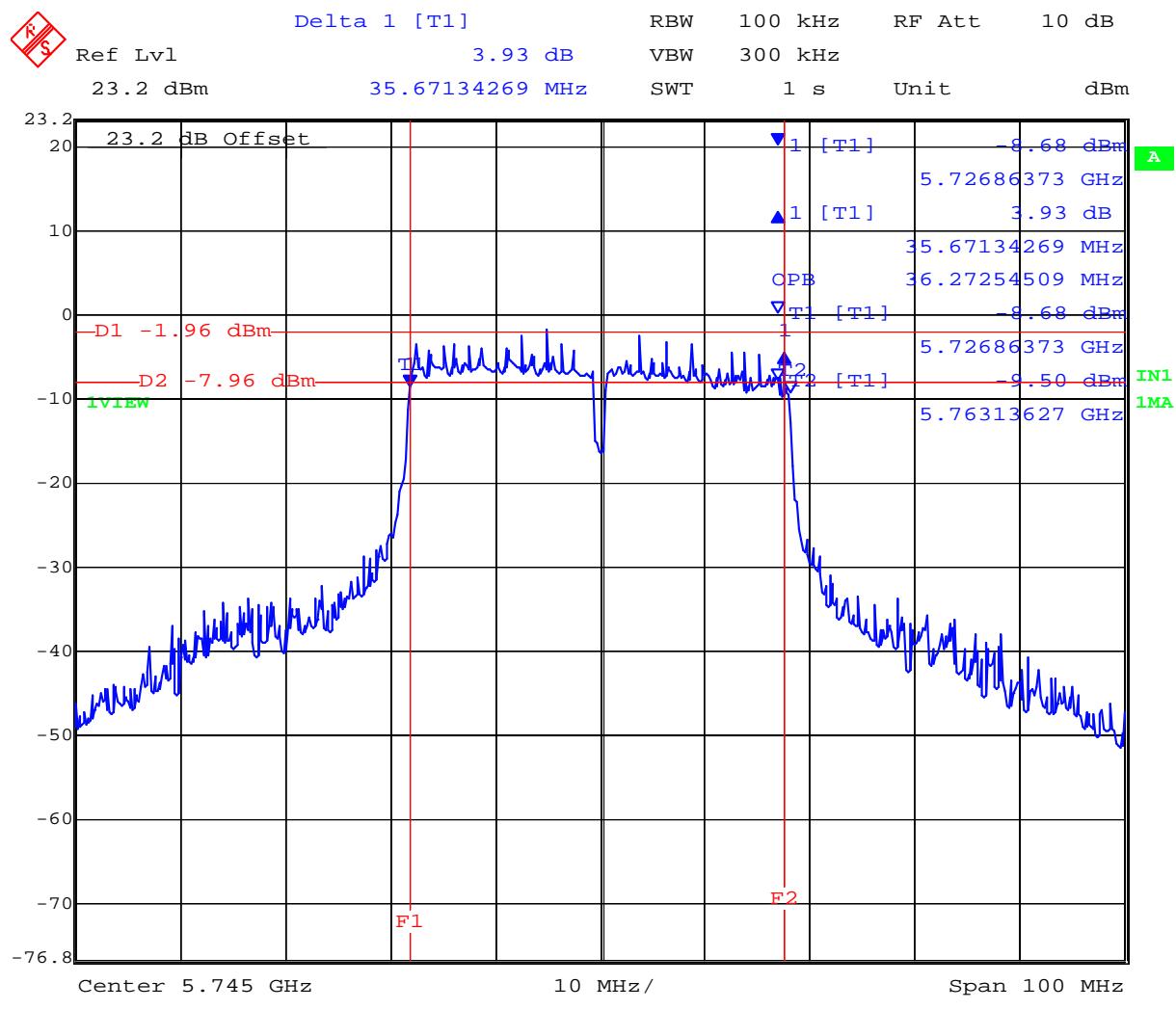
Date: 8.NOV.2007 13:14:59

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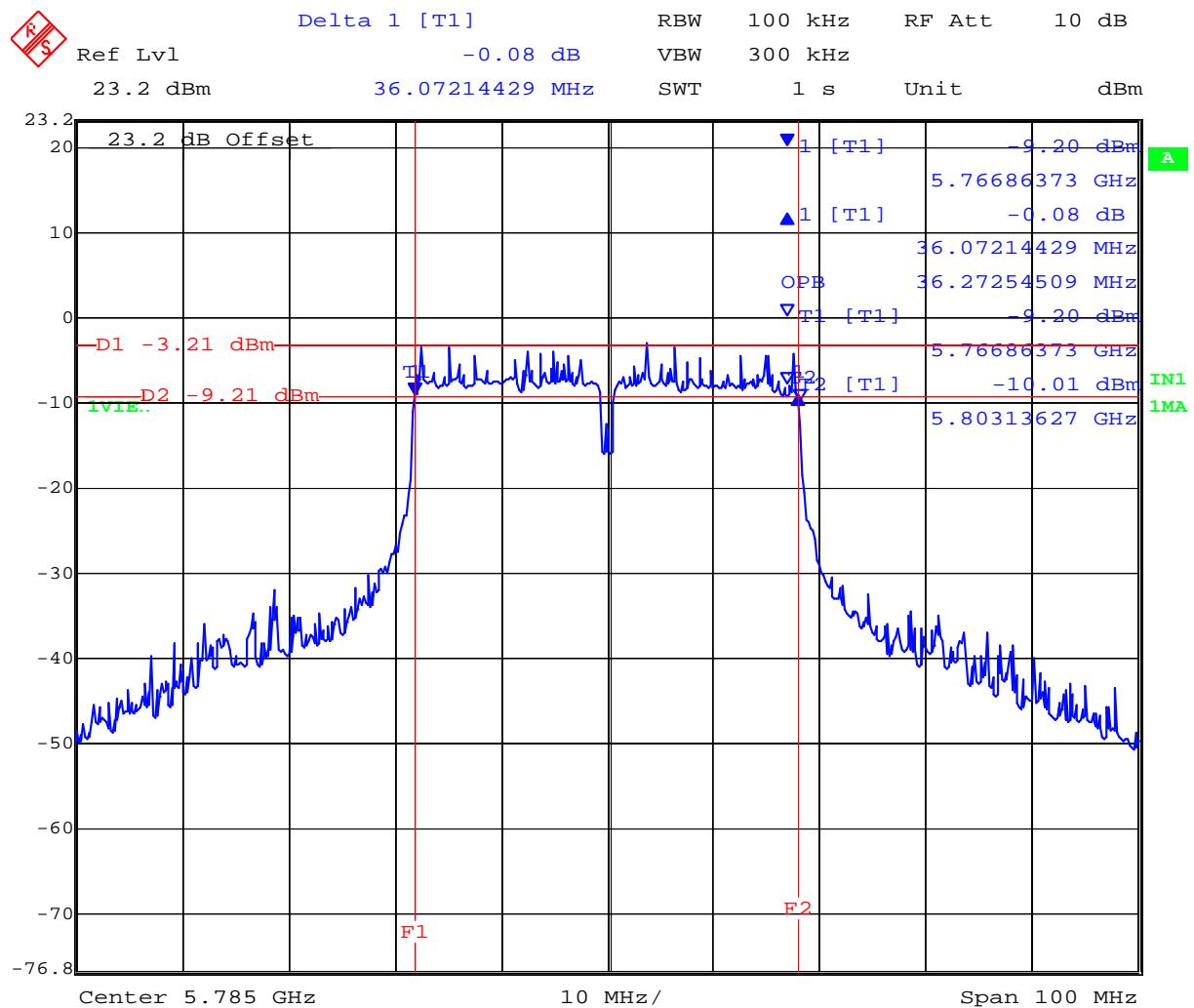
TABLE OF RESULTS – 802.11a - HT-40

Center Frequency (MHz)	6 dB Bandwidth (MHz)	99% BW (MHz)
5,745	35.671	36.273
5,785	36.072	36.273
5,825	35.872	36.273

5,745 MHz 802.11n HT-40 6 dB and 99% Bandwidth



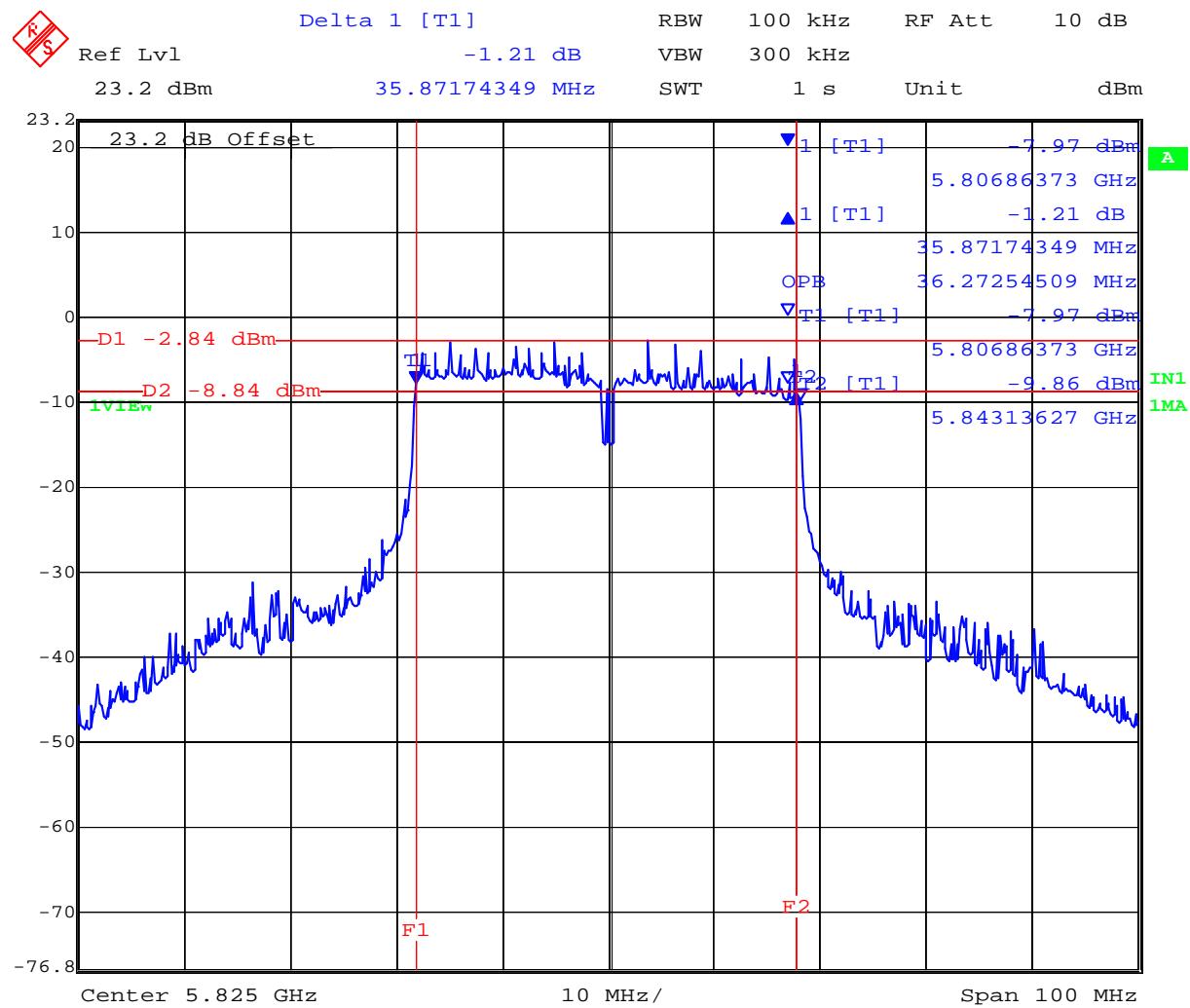
5,785 MHz 802.11n HT-40 6 dB and 99% Bandwidth



Date: 8.NOV.2007 18:25:28

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5,825 MHz 802.11n HT-40 6 dB and 99% Bandwidth



Date: 8.NOV.2007 18:23:11

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Specification

Limits

§15.247 (a)(2) & RSS-210 §A8.2(1)

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

§ IC RSS-Gen 4.4.1 Occupied Bandwidth 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.

§ IC RSS-Gen 4.4.2 6 dB Bandwidth Where indicated, the 6 dB bandwidth is measured at the points when the spectral density of the signal is 6 dB down from the in –band spectral density of the modulated signal, with the transmitter modulated by a representative signal.

Laboratory Measurement Uncertainty for Spectrum Measurement

Measurement uncertainty	±2.81 dB
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Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-03 'Measurement of RF Spectrum Mask'	0158, 0193, 0252, 0313, 0314, 0070, 0116, 0117

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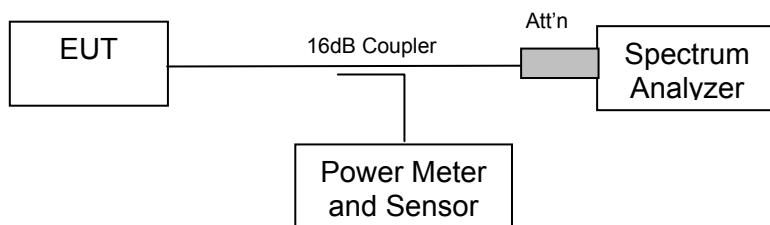
5.1.2. Peak Output Power

FCC, Part 15 Subpart C §15.247(b)(3), §15.31(e)
Industry Canada RSS-210 §A8.4(4)

Test Procedure

The transmitter terminal of EUT was connected to the input of the spectrum analyzer set to measure peak power. The resolution filter bandwidth was set to 6 dB, peak detector selected and the analyzer built-in power function was used to measure peak power over the 99 % bandwidth.

Test Measurement Set up



Measurement set up for Transmitter Peak Output Power

Ambient conditions.

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

b/g (2.4 GHz) Maximum Antenna Gain = AP-ANT-7, +12 dBi
 a (5.8 GHz) Maximum Antenna Gain = AP-ANT-12, +14 dBi

15.247 (c) 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.

Antenna Type	Gain (dBi)	Antenna Gain >6dBi (dB)	Power Reduction (dB)	Max. Allowable Conducted Peak Power (dBm)	Maximum EIRP (dBm)
(2.4 GHz) AP-ANT-7	+12	6	6	+24	+36
(5 GHz) AP-ANT-12	+14	8	8	+22	+36

Radio Parameters

Duty Cycle: 100%

Output: Modulated Carrier

Power: Maximum Default Power

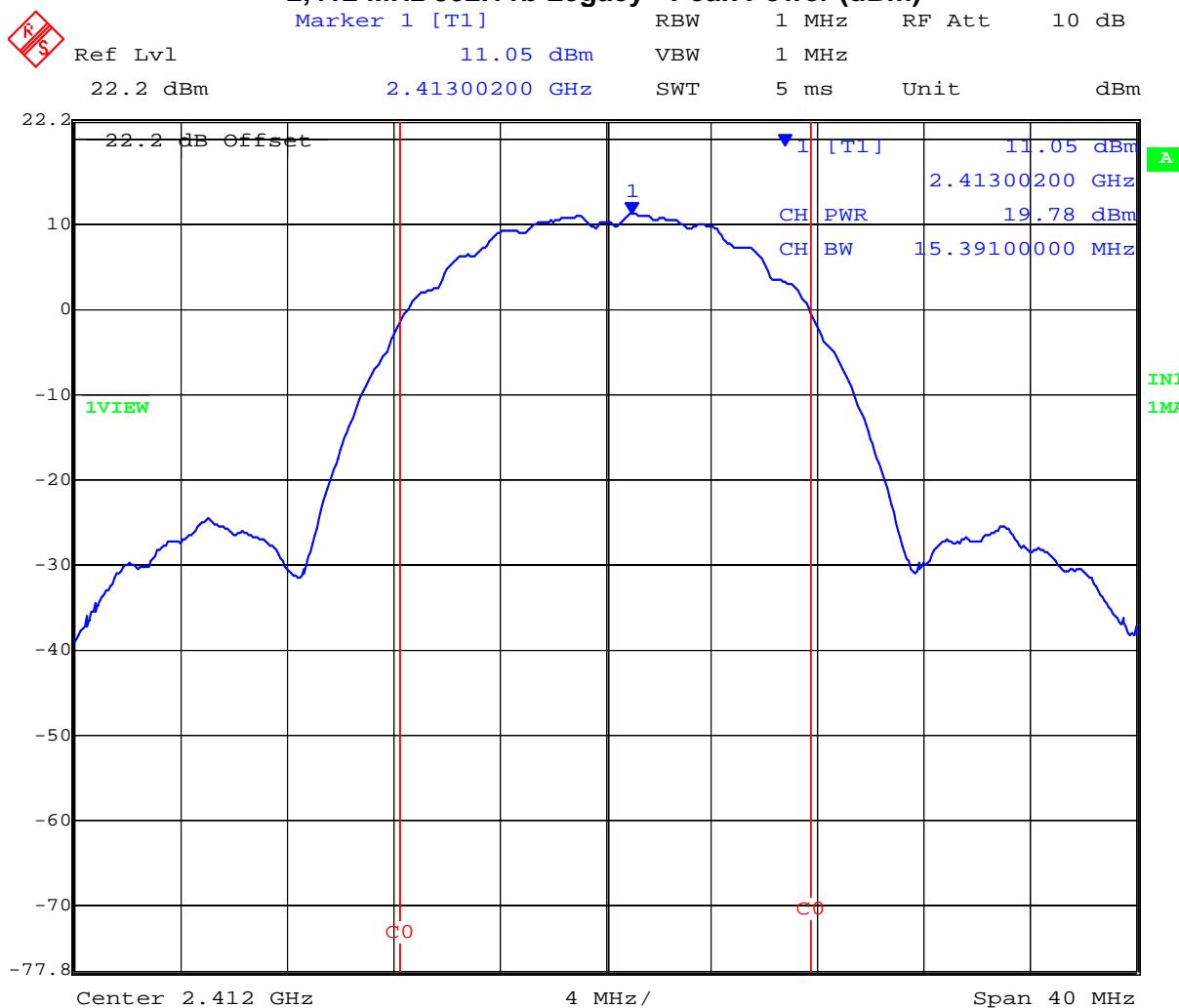
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

TABLE OF RESULTS – 802.11b – Legacy

Maximum Conducted Power

Center Frequency (MHz)	Software Setting	99% Measurement Bandwidth (MHz)	Average Power (dBm)	Peak Power (dBm)	EIRP (dBm) 0dBi Antenna
2,412	19	15.391	+17.02	+19.78	+19.78
2,437	19	15.471	+16.66	+18.96	+18.96
2,462	19	15.551	+16.80	+19.20	+19.20

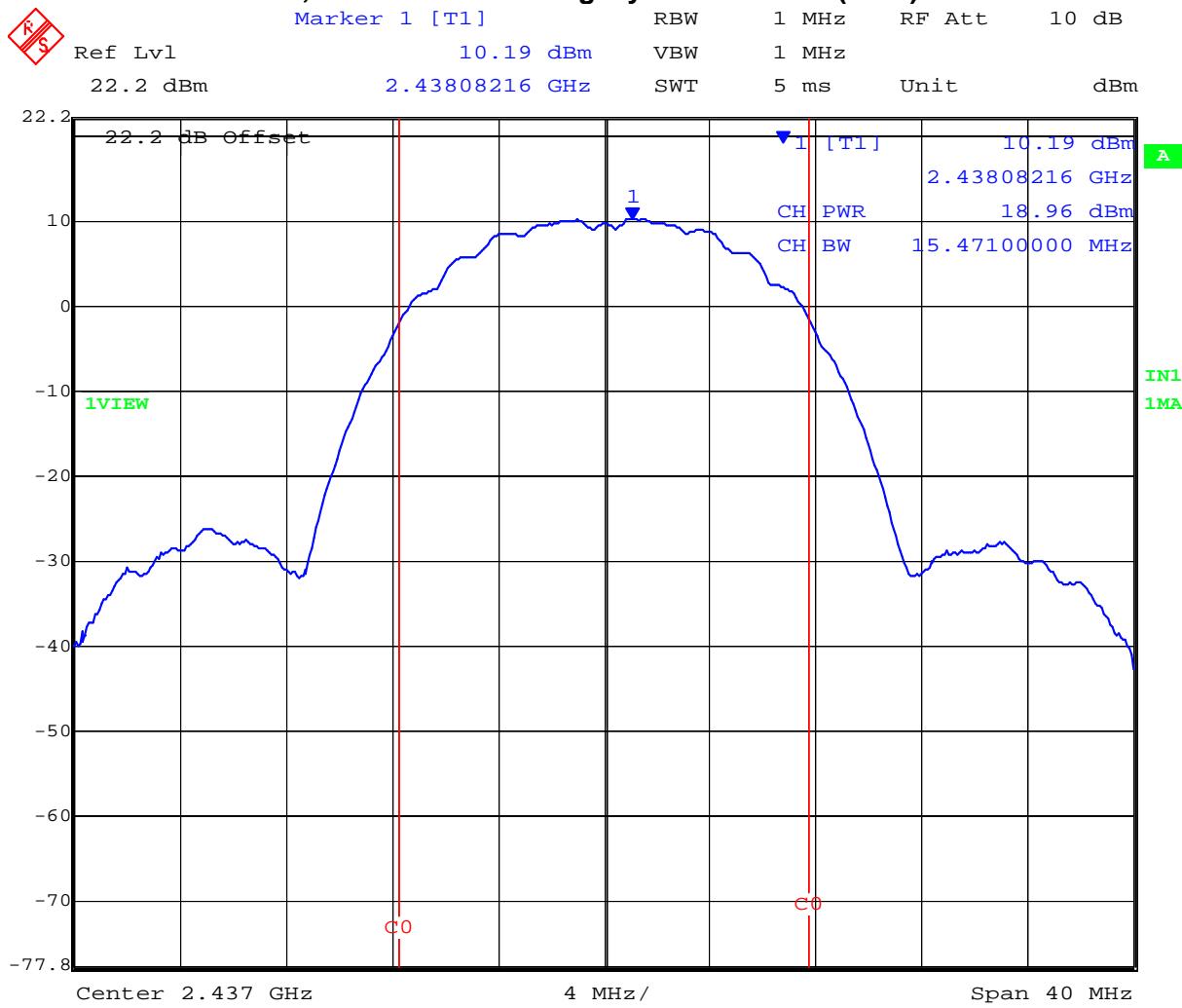
2,412 MHz 802.11b Legacy - Peak Power (dBm)



Date: 8.NOV.2007 08:56:50

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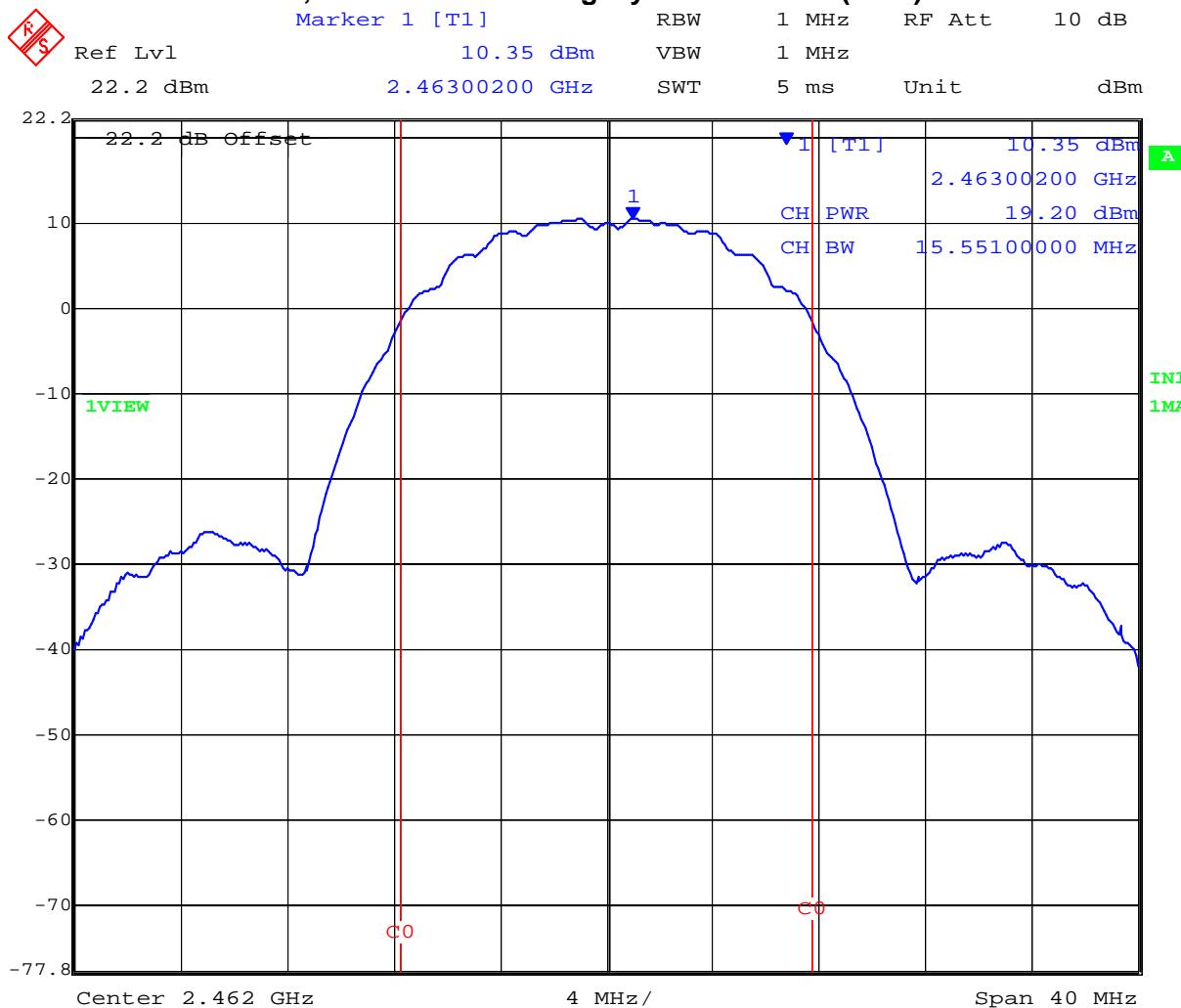
2,437 MHz 802.11b Legacy - Peak Power (dBm)



Date: 8.NOV.2007 08:58:30

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2,462 MHz 802.11b Legacy - Peak Power (dBm)



Date: 8.NOV.2007 08:59:32

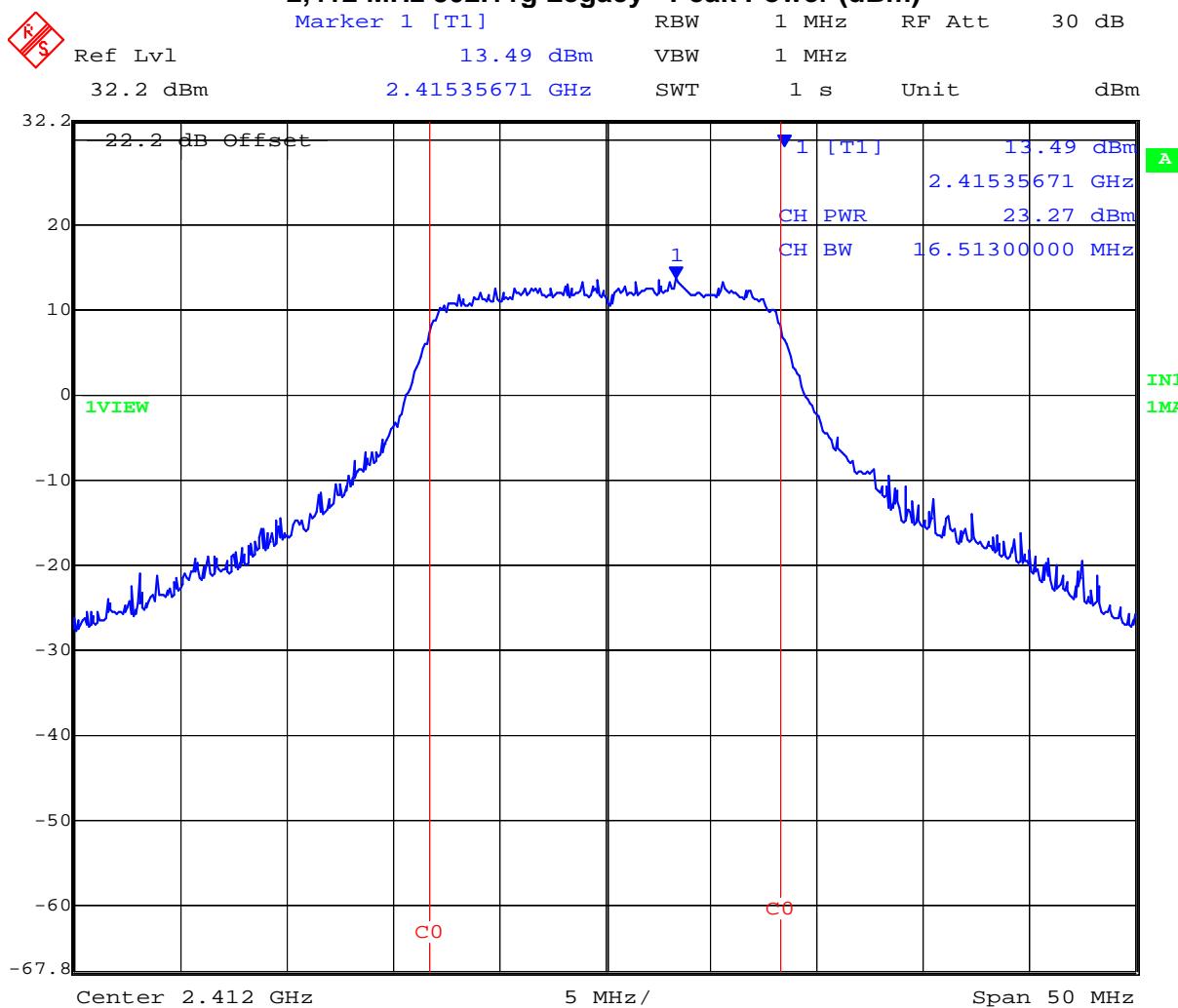
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

TABLE OF RESULTS – 802.11g – Legacy

Maximum Conducted Power

Center Frequency (MHz)	Software Setting	99% Measurement Bandwidth (MHz)	Average Power (dBm)	Peak Power (dBm)	EIRP (dBm) 0dBi Antenna
2,412	17	16.513	+15.01	+23.27	+23.27
2,437	17	16.513	+14.67	+22.94	+22.94
2,462	17	16.593	+14.88	+23.18	+23.18

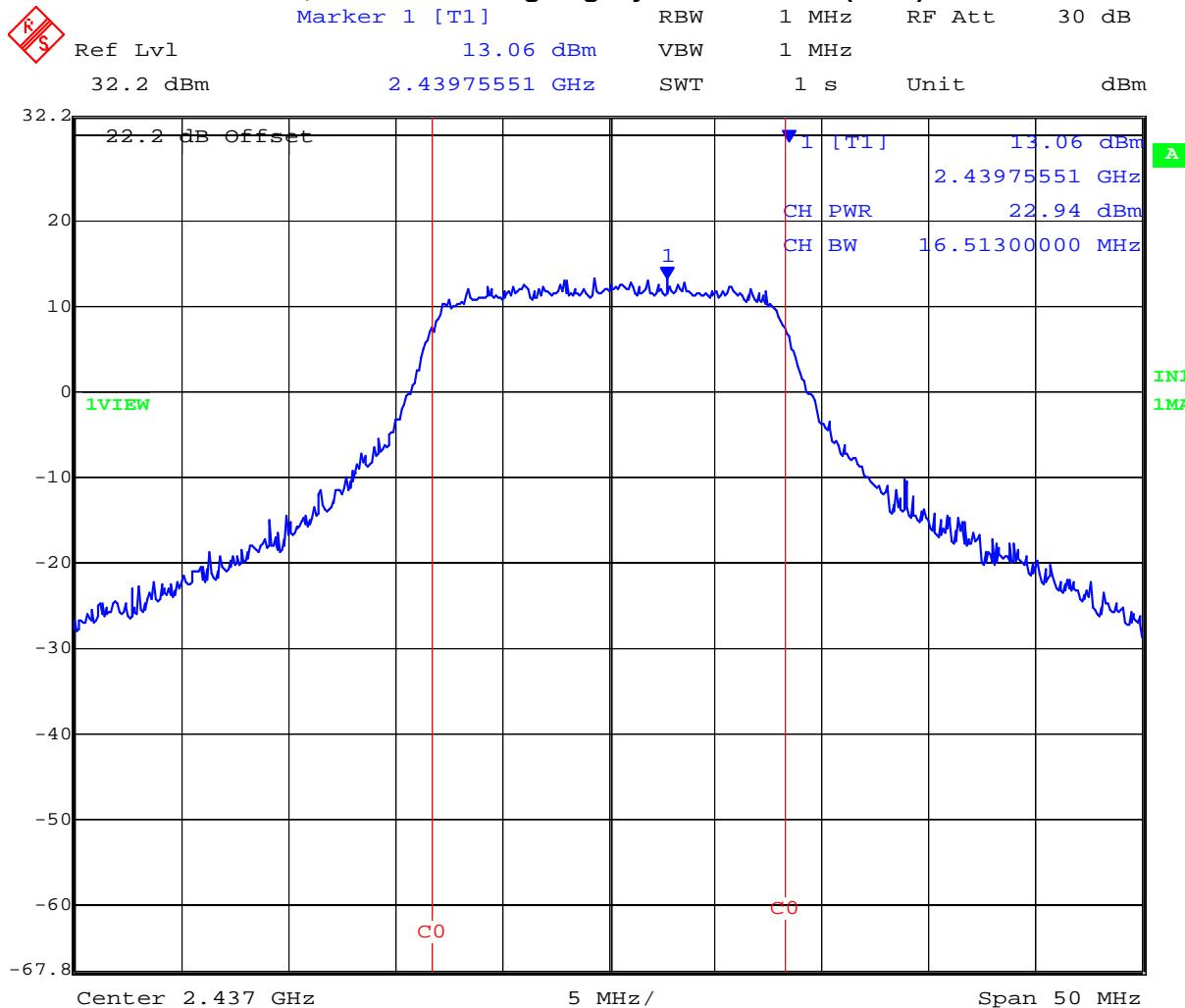
2,412 MHz 802.11g Legacy - Peak Power (dBm)



Date: 8.NOV.2007 09:04:42

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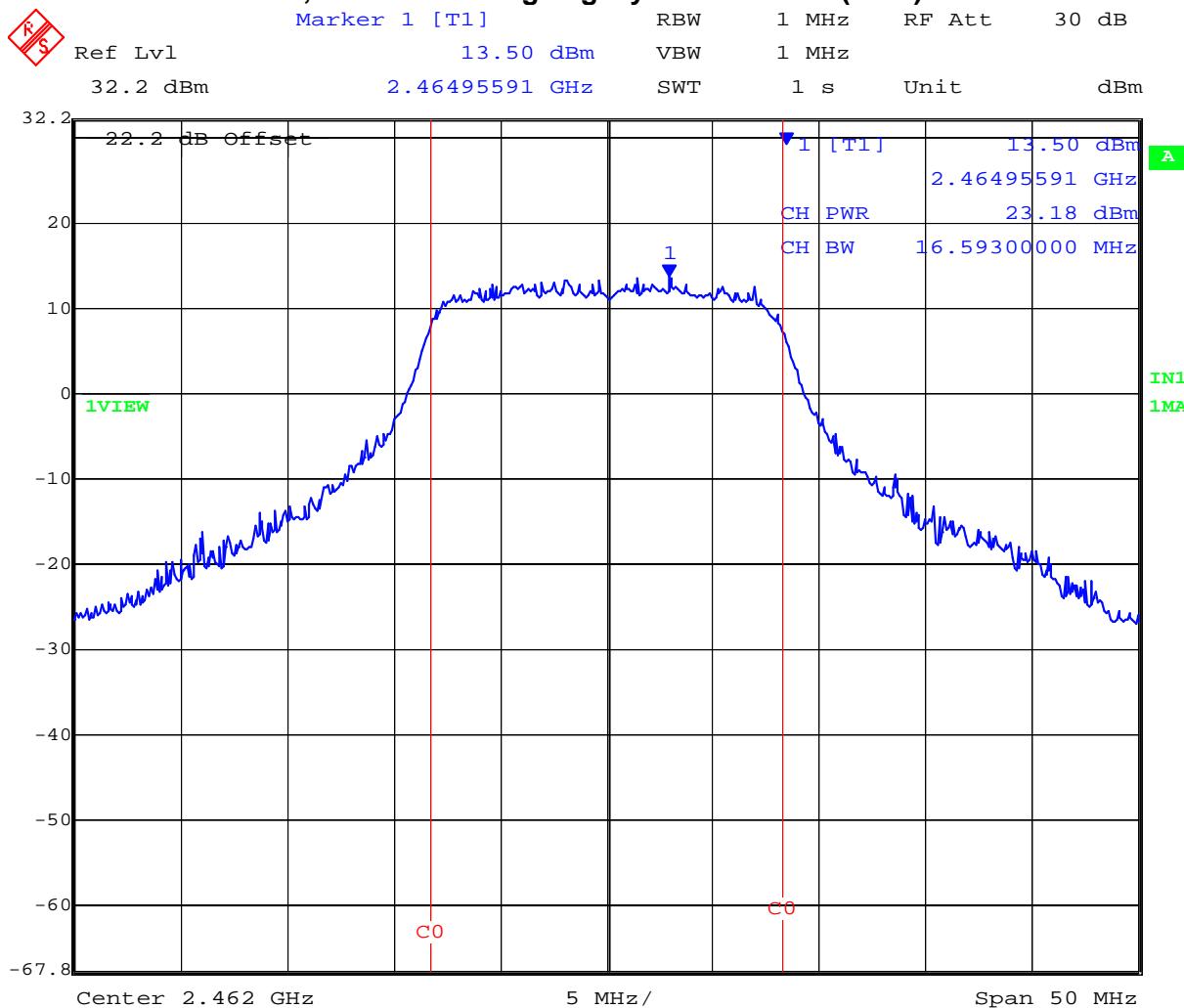
2,437 MHz 802.11g Legacy - Peak Power (dBm)



Date: 8.NOV.2007 09:03:51

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2,462 MHz 802.11g Legacy - Peak Power (dBm)



Date: 8.NOV.2007 09:02:54

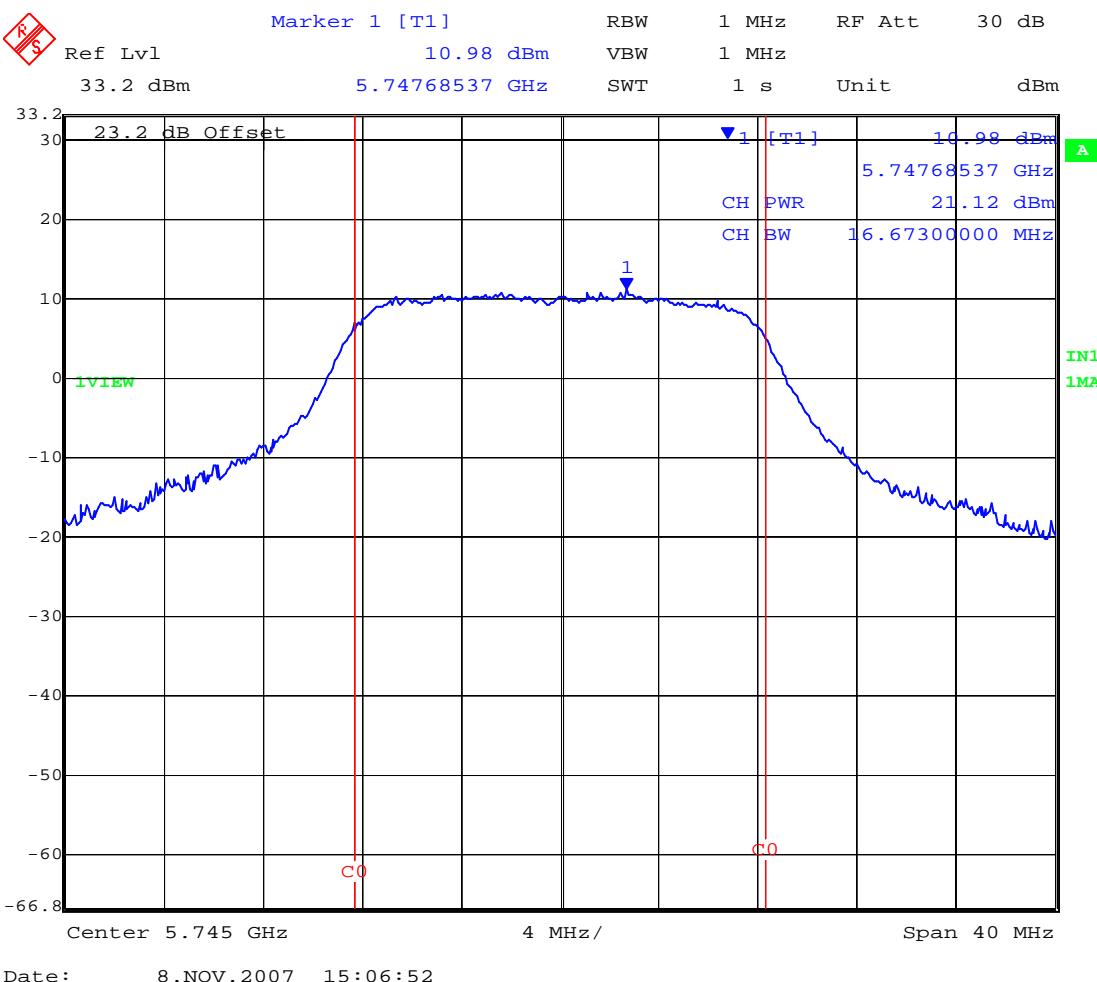
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

TABLE OF RESULTS – 802.11a – Legacy

Maximum Conducted Power

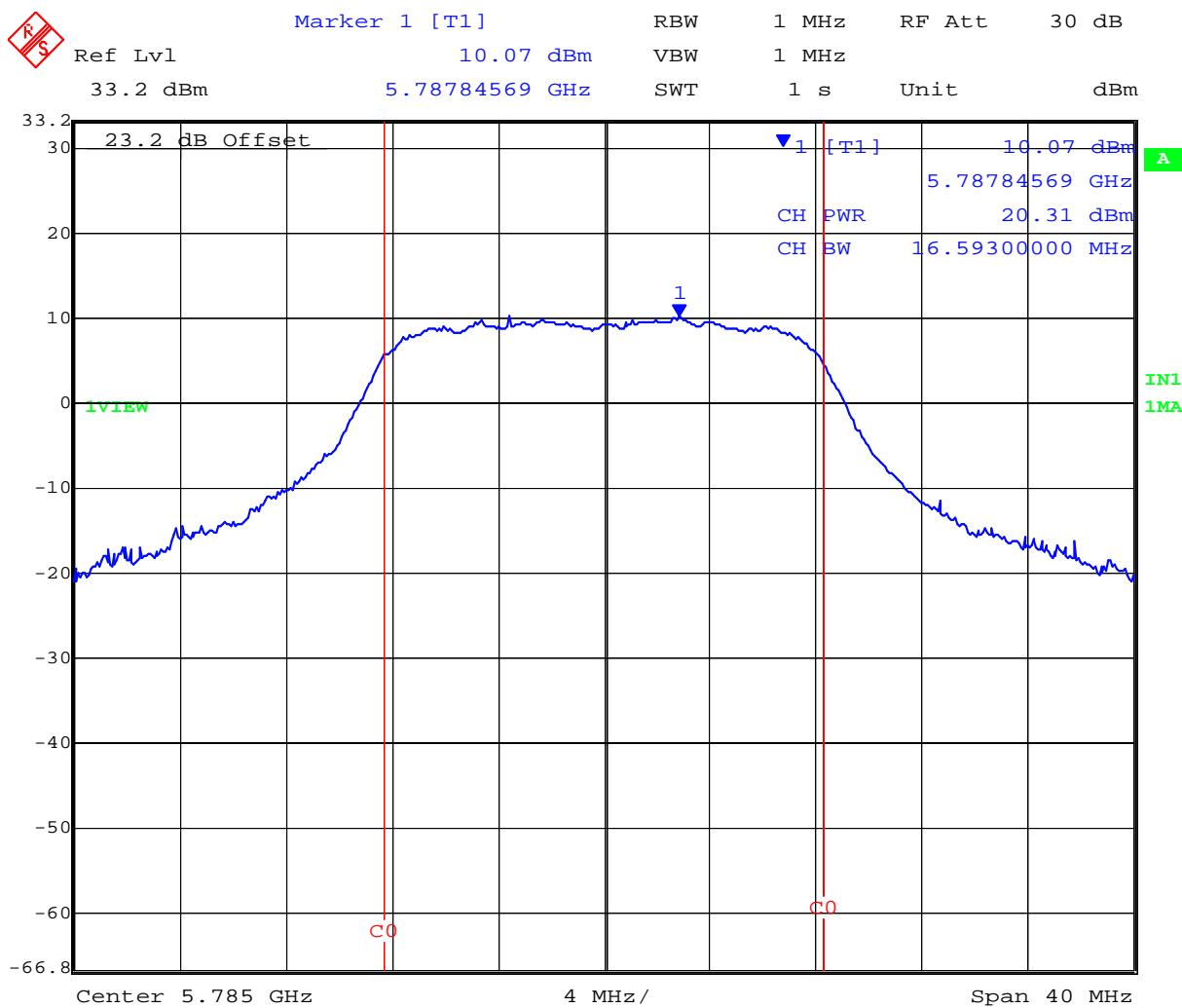
Center Frequency (MHz)	Software Setting	99% Measurement Bandwidth (MHz)	Average Power (dBm)	Peak Power (dBm)	EIRP (dBm) 0dBi Antenna
5,745	19	16.673	+13.00	+21.12	+21.12
5,785	19	16.593	+11.83	+20.31	+20.31
5,825	19	16.513	+11.68	+19.77	+19.77

5,745 MHz 802.11a Legacy Peak Power (dBm)



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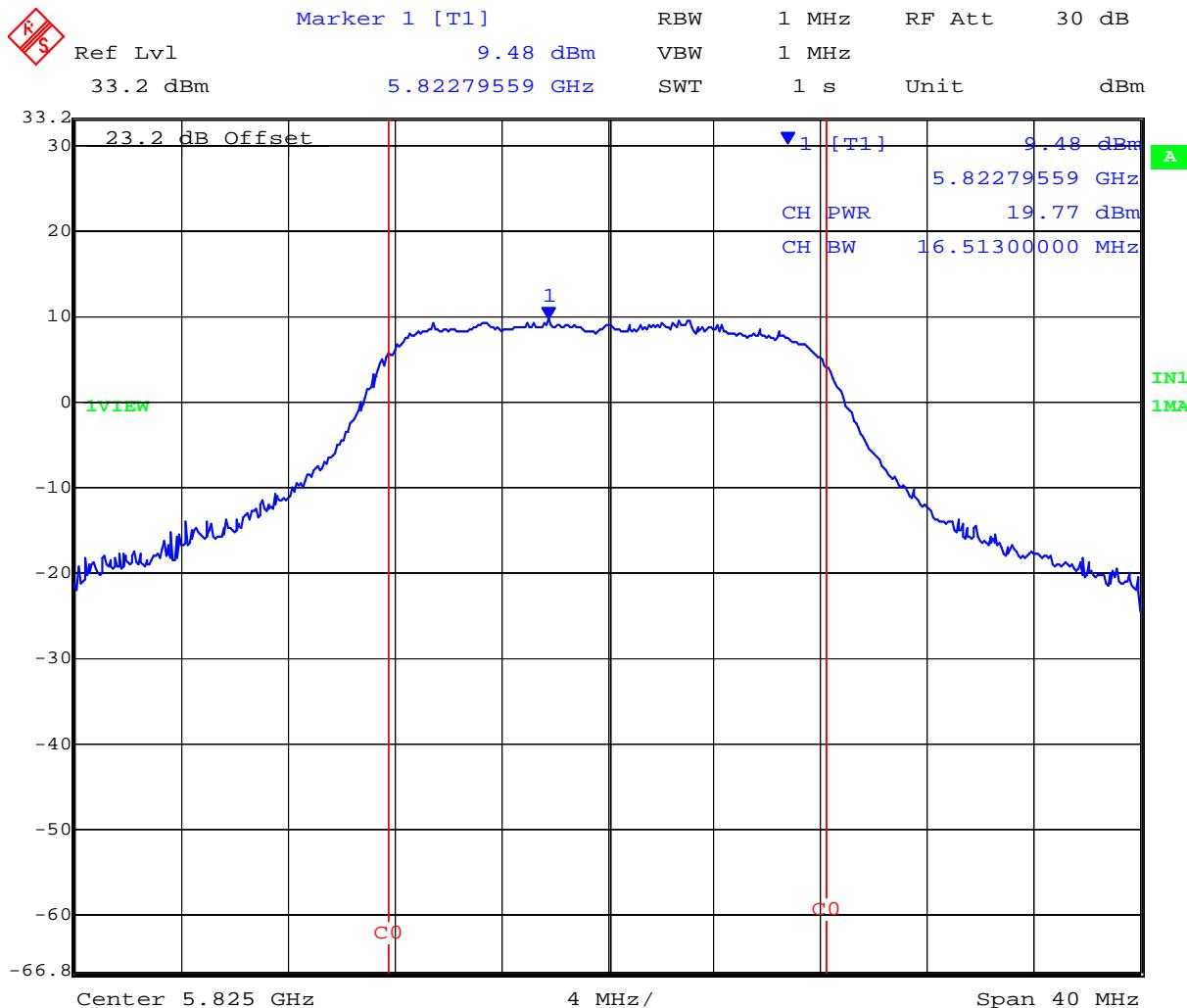
5,785 MHz 802.11a Legacy Peak Power (dBm)



Date: 8.NOV.2007 14:55:47

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5,825 MHz 802.11a Legacy Peak Power (dBm)



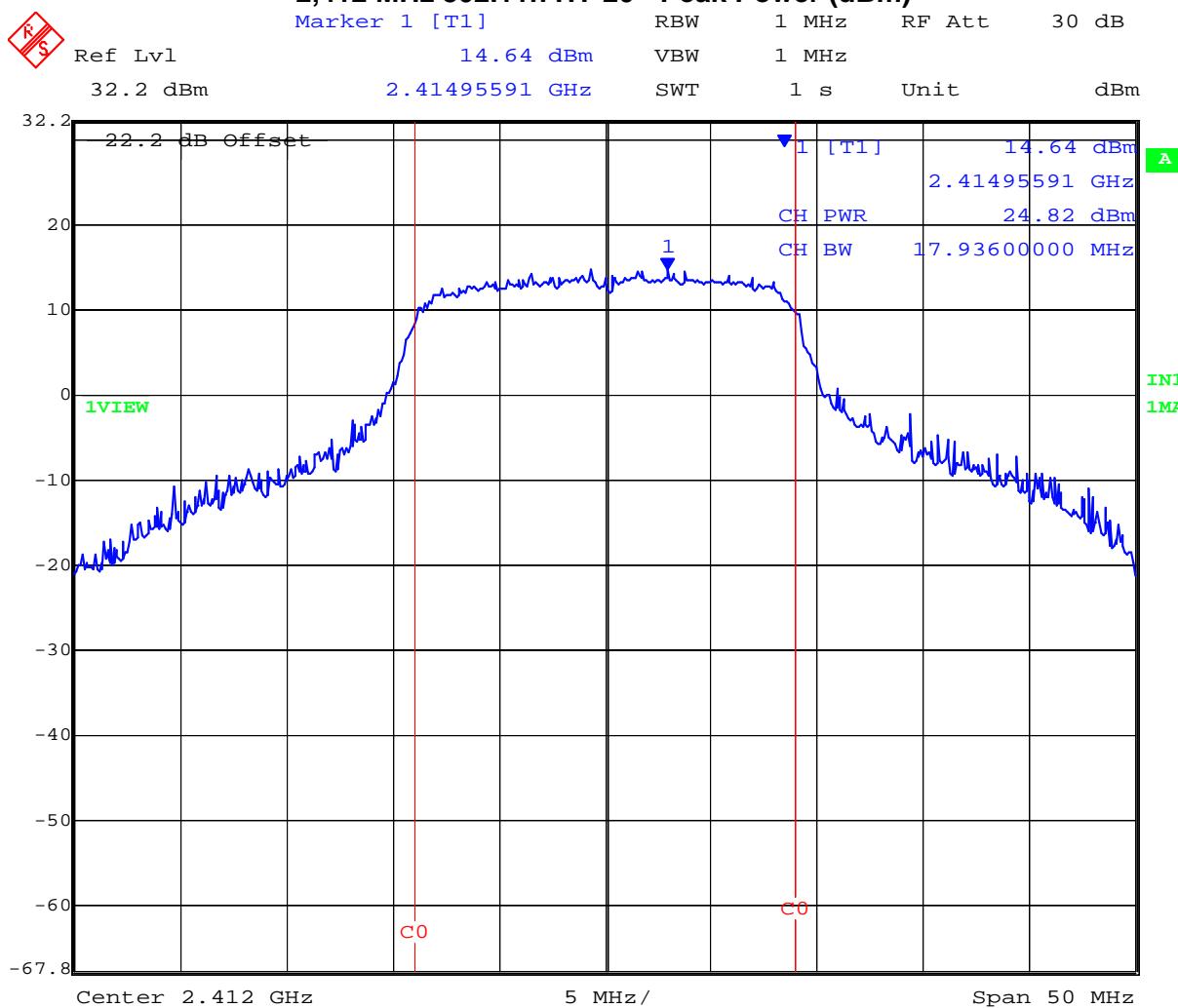
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

TABLE OF RESULTS – 802.11n – HT-20

Maximum Conducted Power

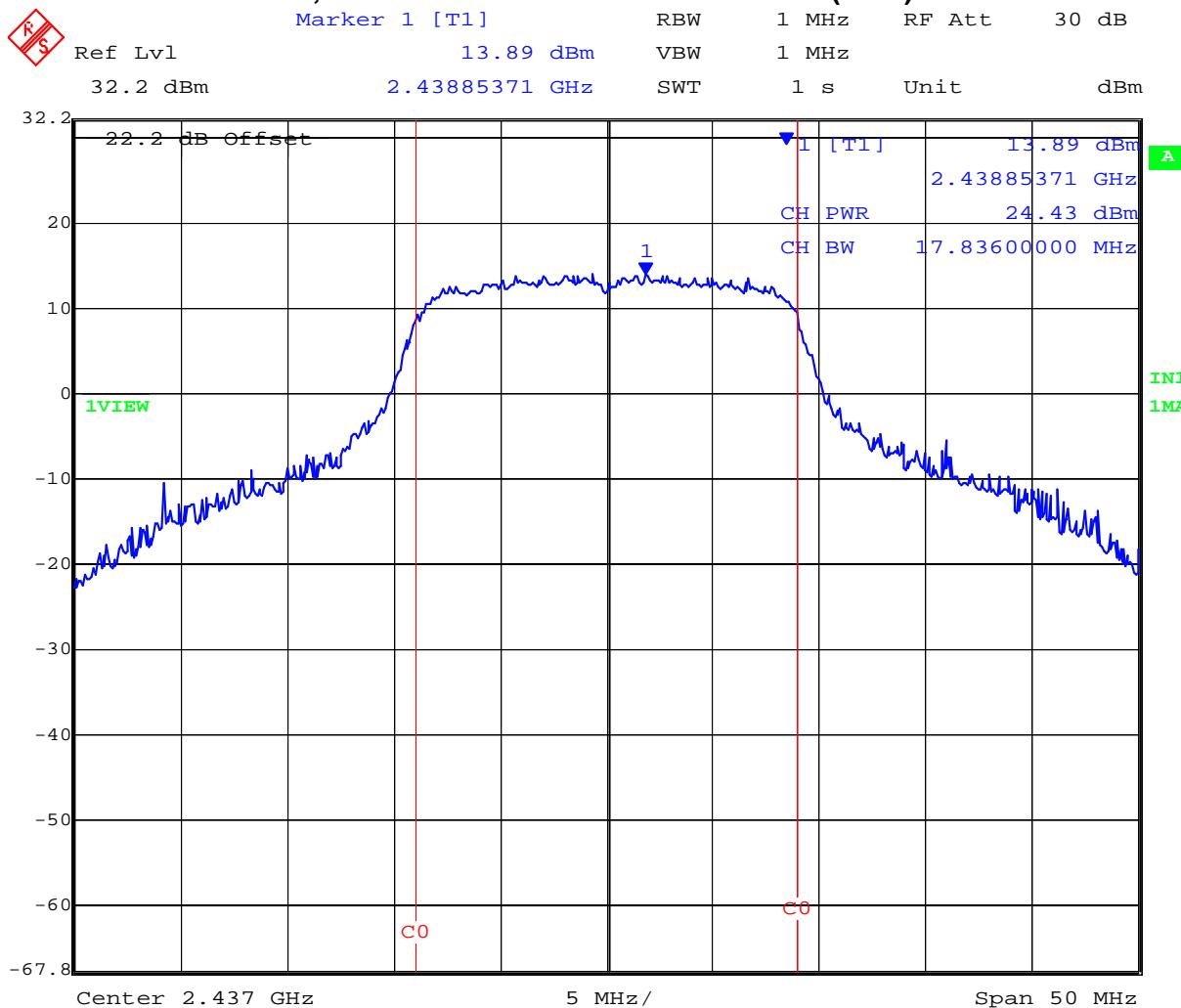
Center Frequency (MHz)	Software Setting	99% Measurement Bandwidth (MHz)	Average Power (dBm)	Peak Power (dBm)	EIRP (dBm) 0dBi Antenna
2,412	19	17.936	+16.85	+24.82	+24.82
2,437	19	17.836	+16.52	+24.43	+24.43
2,462	19	17.936	+16.66	+24.55	+24.55

2,412 MHz 802.11n HT-20 - Peak Power (dBm)



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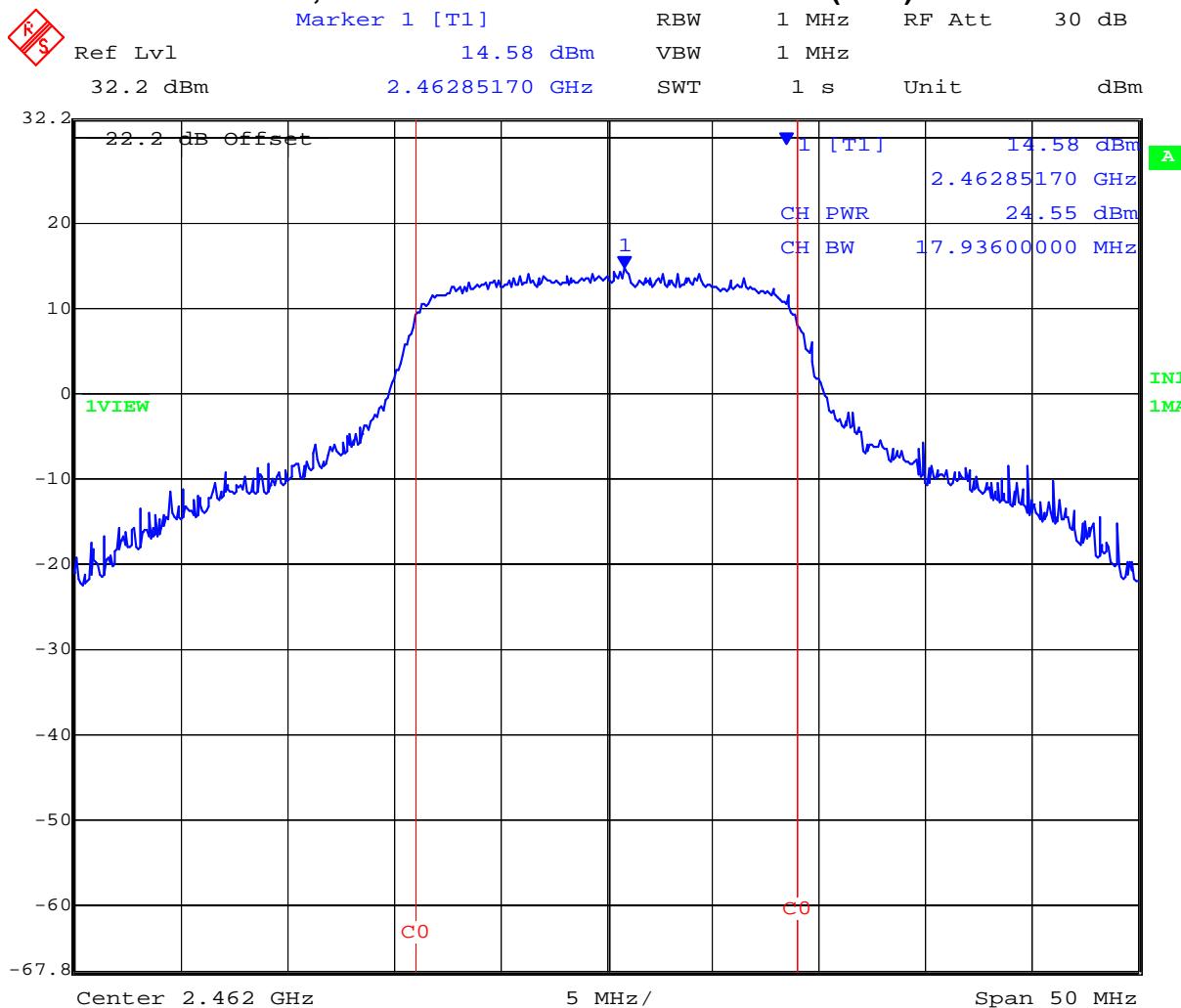
2,437 MHz 802.11n HT-20 - Peak Power (dBm)



Date: 8.NOV.2007 10:06:41

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2,462 MHz 802.11n HT-20 - Peak Power (dBm)



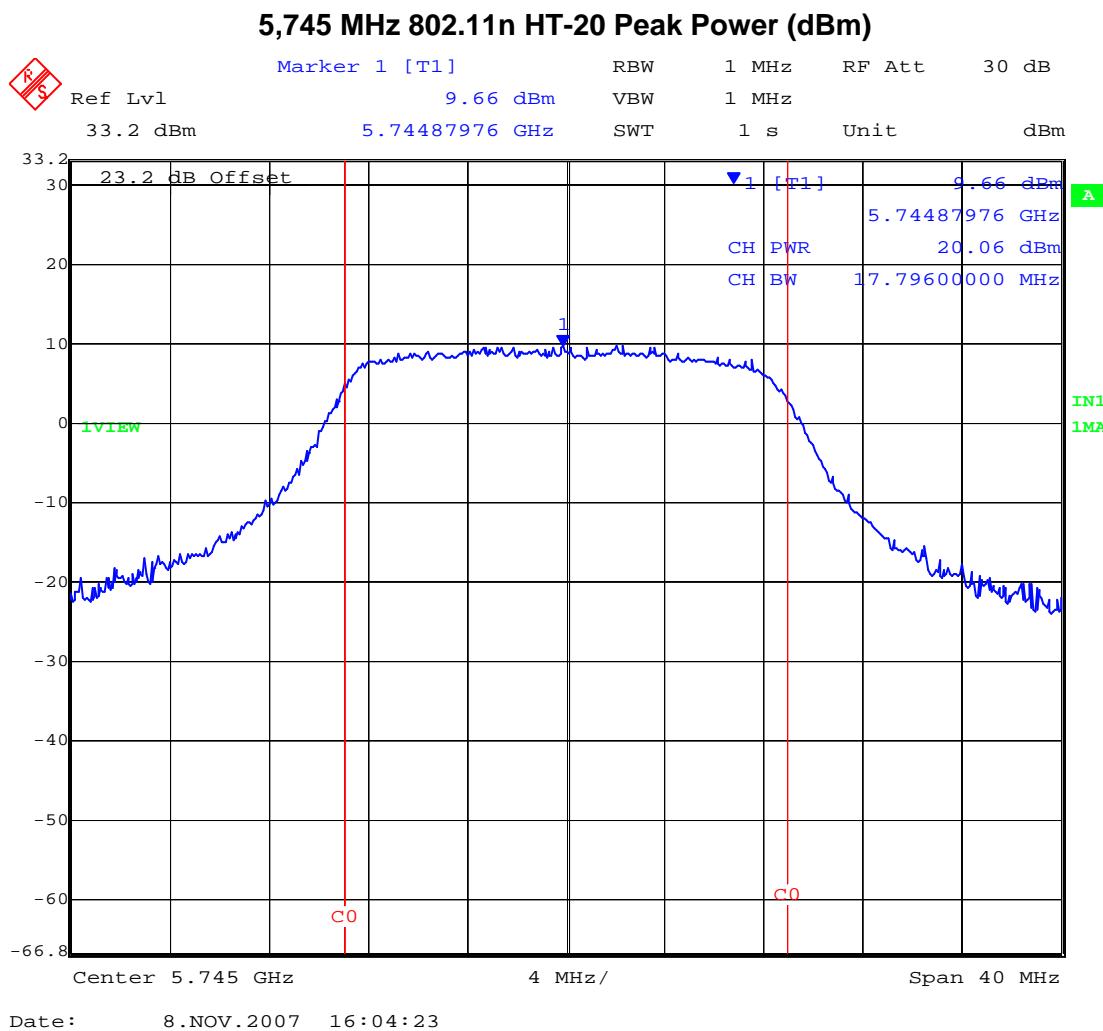
Date: 8.NOV.2007 10:05:50

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TABLE OF RESULTS – 802.11n – HT-20

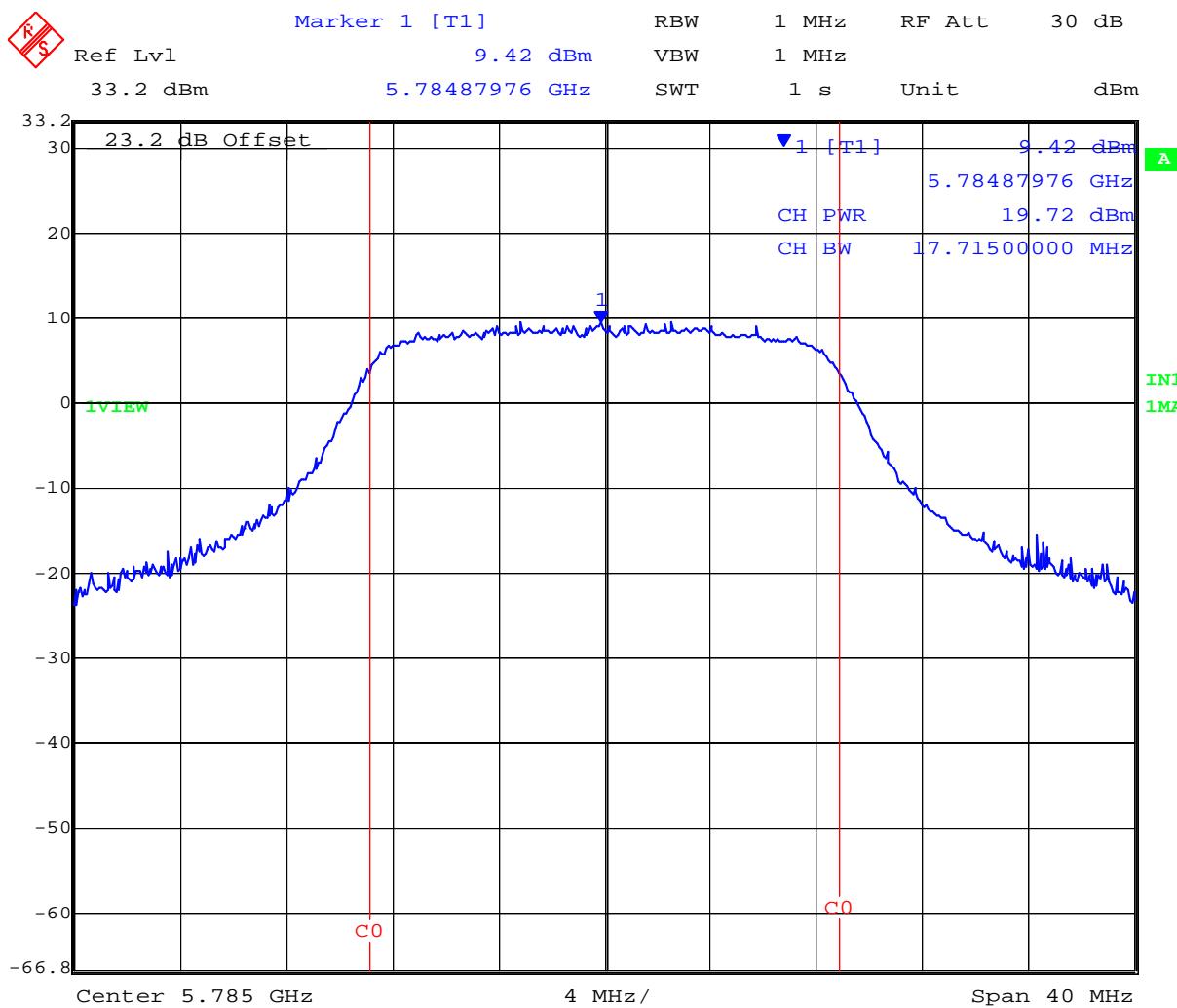
Maximum Conducted Power

Center Frequency (MHz)	Software Setting	99% Measurement Bandwidth (MHz)	Average Power (dBm)	Peak Power (dBm)	EIRP (dBm) 0dBi Antenna
5,745	19	17.796	+11.90	+20.06	+20.06
5,785	19	17.715	+11.50	+19.72	+19.72
5,825	19	17.796	+11.60	+20.01	+20.01



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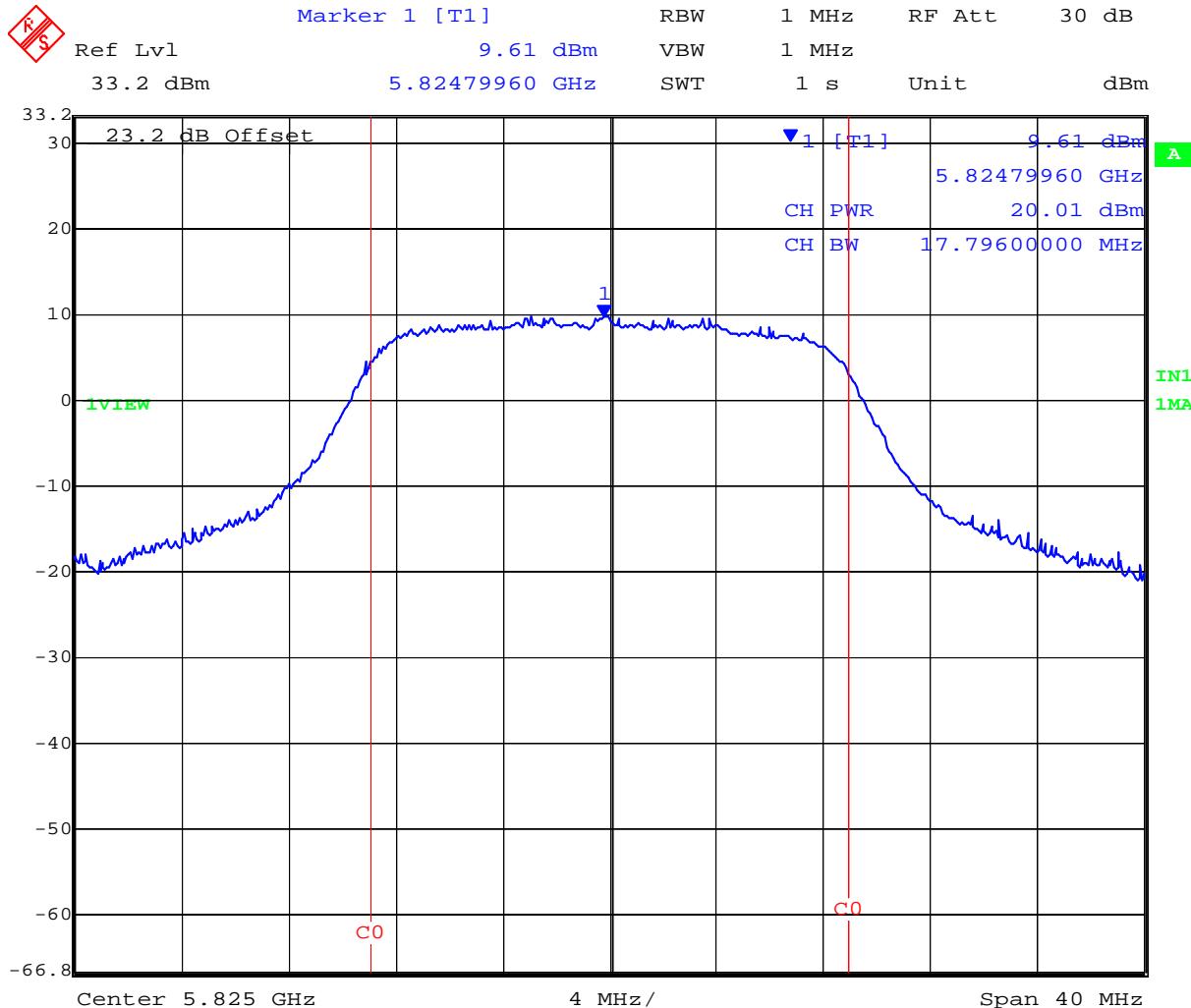
5,785 MHz 802.11n HT-20 Peak Power (dBm)



Date: 8.NOV.2007 16:06:16

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5,825 MHz 802.11n HT-20 Peak Power (dBm)



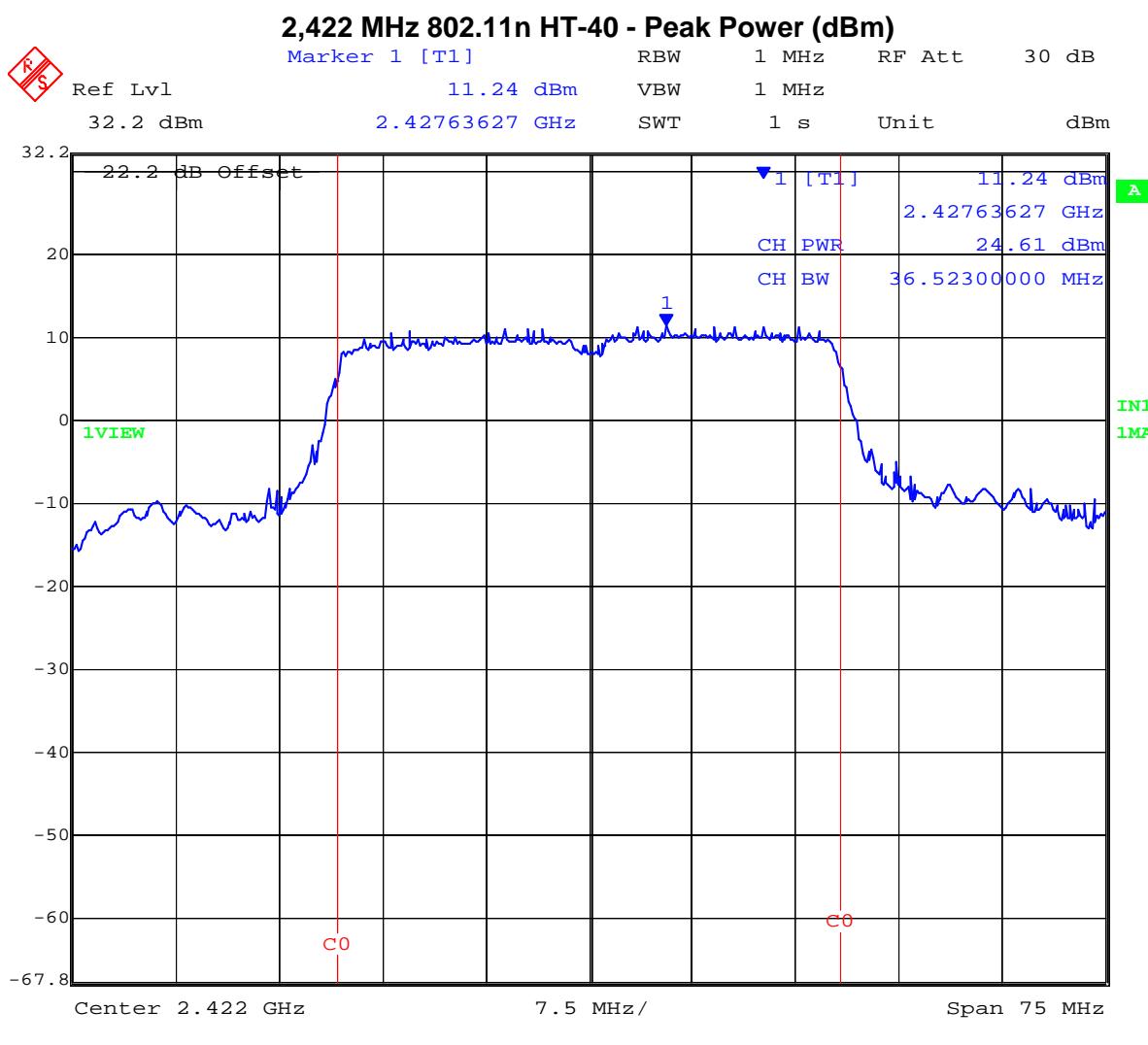
Date: 8.NOV.2007 16:02:09

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TABLE OF RESULTS – 802.11n – HT-40

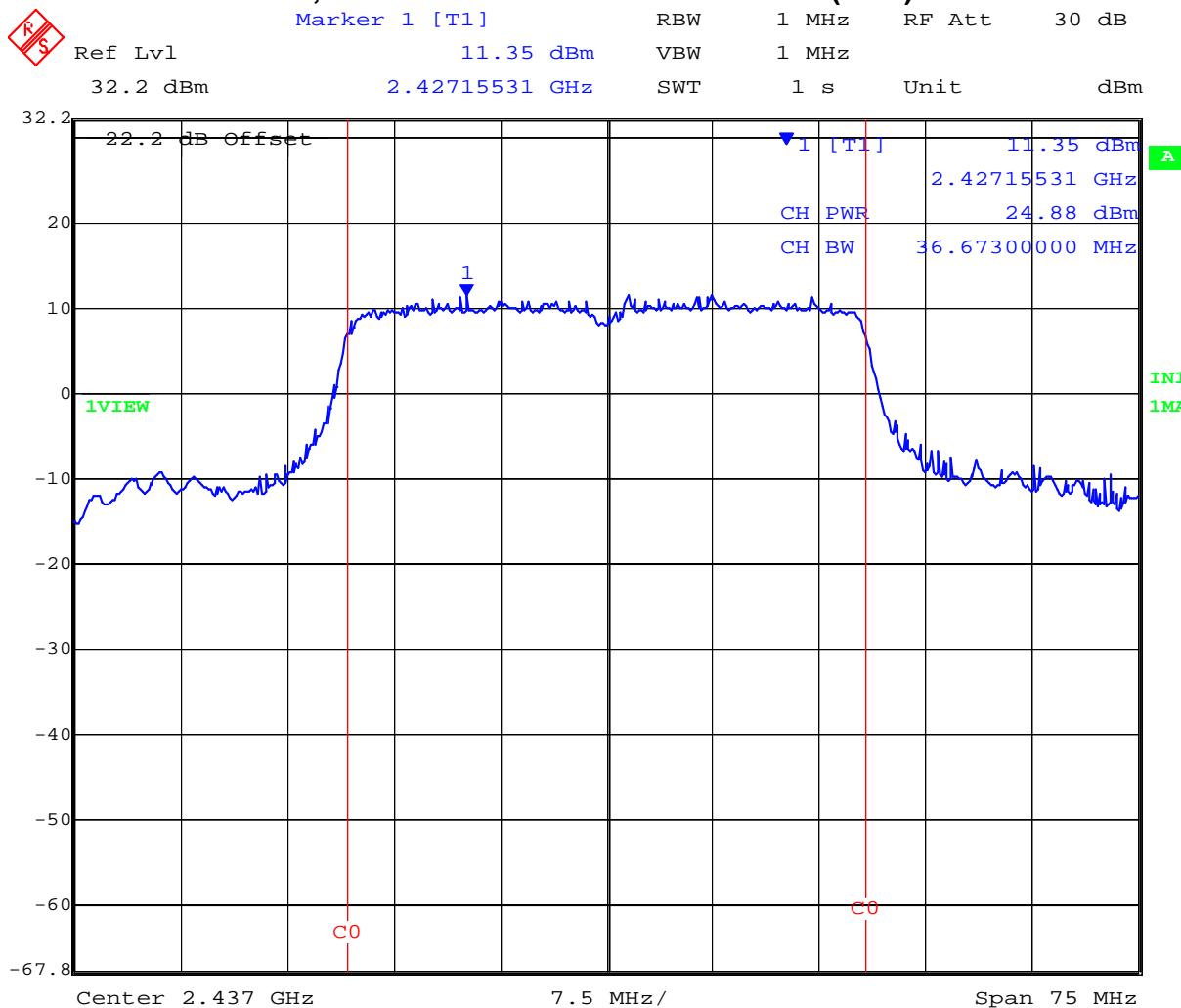
Maximum Conducted Power

Center Frequency (MHz)	Software Setting	99% Measurement Bandwidth (MHz)	Average Power (dBm)	Peak Power (dBm)	EIRP (dBm) 0dBi Antenna
2,422	19	36.523	+16.82	+24.61	+24.61
2,437	19	36.673	+16.90	+24.88	+24.88
2,452	19	36.673	+17.02	+24.99	+24.99



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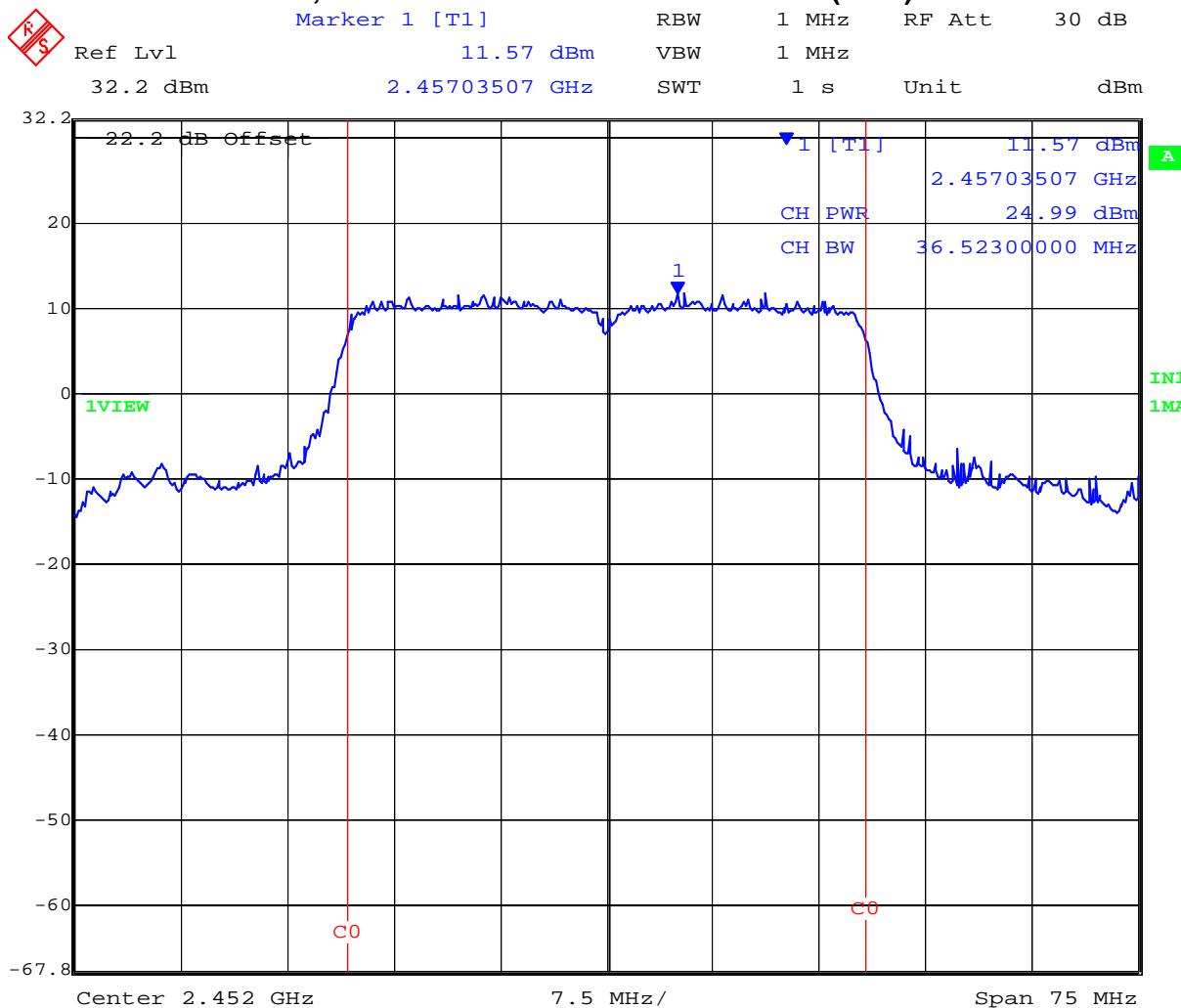
2,437 MHz 802.11n HT-40 - Peak Power (dBm)



Date: 8.NOV.2007 11:58:55

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2,452 MHz 802.11n HT-40 - Peak Power (dBm)



Date: 8.NOV.2007 13:22:42

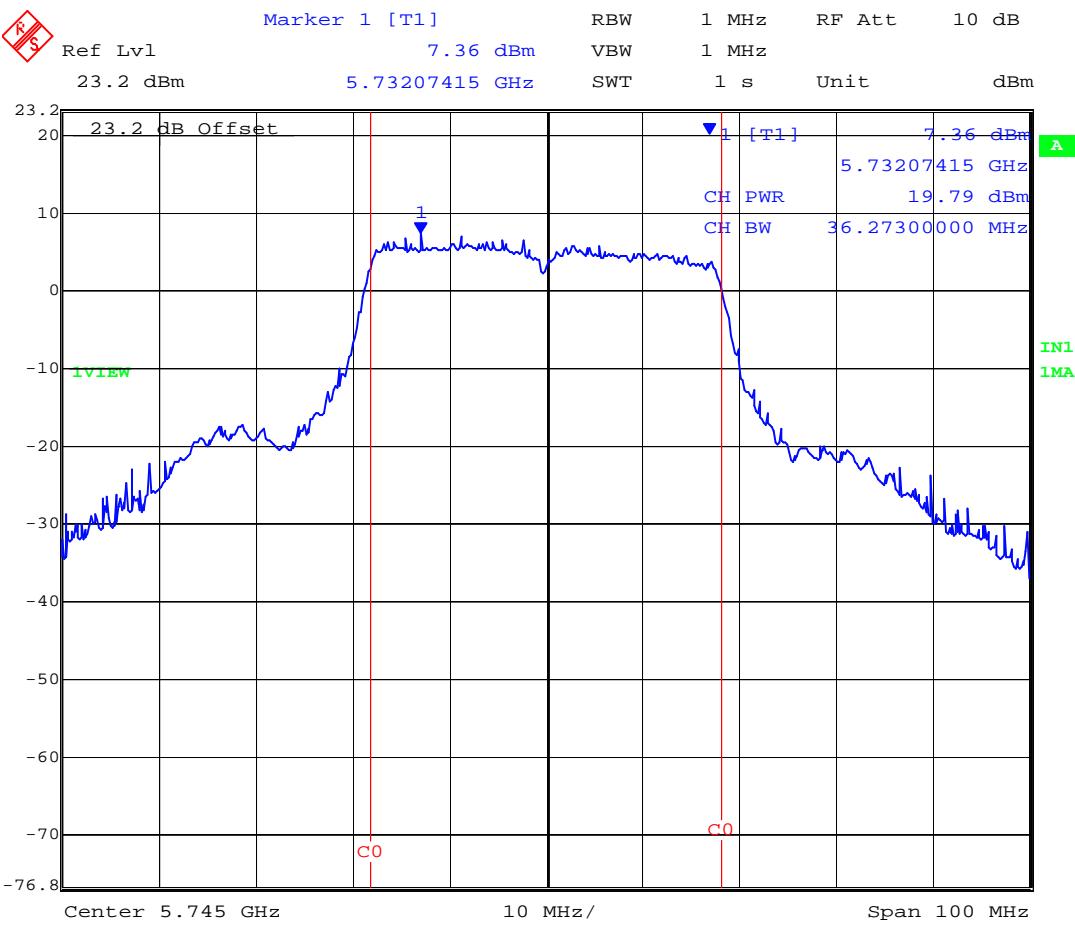
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TABLE OF RESULTS – 802.11n – HT-40

Maximum Conducted Power

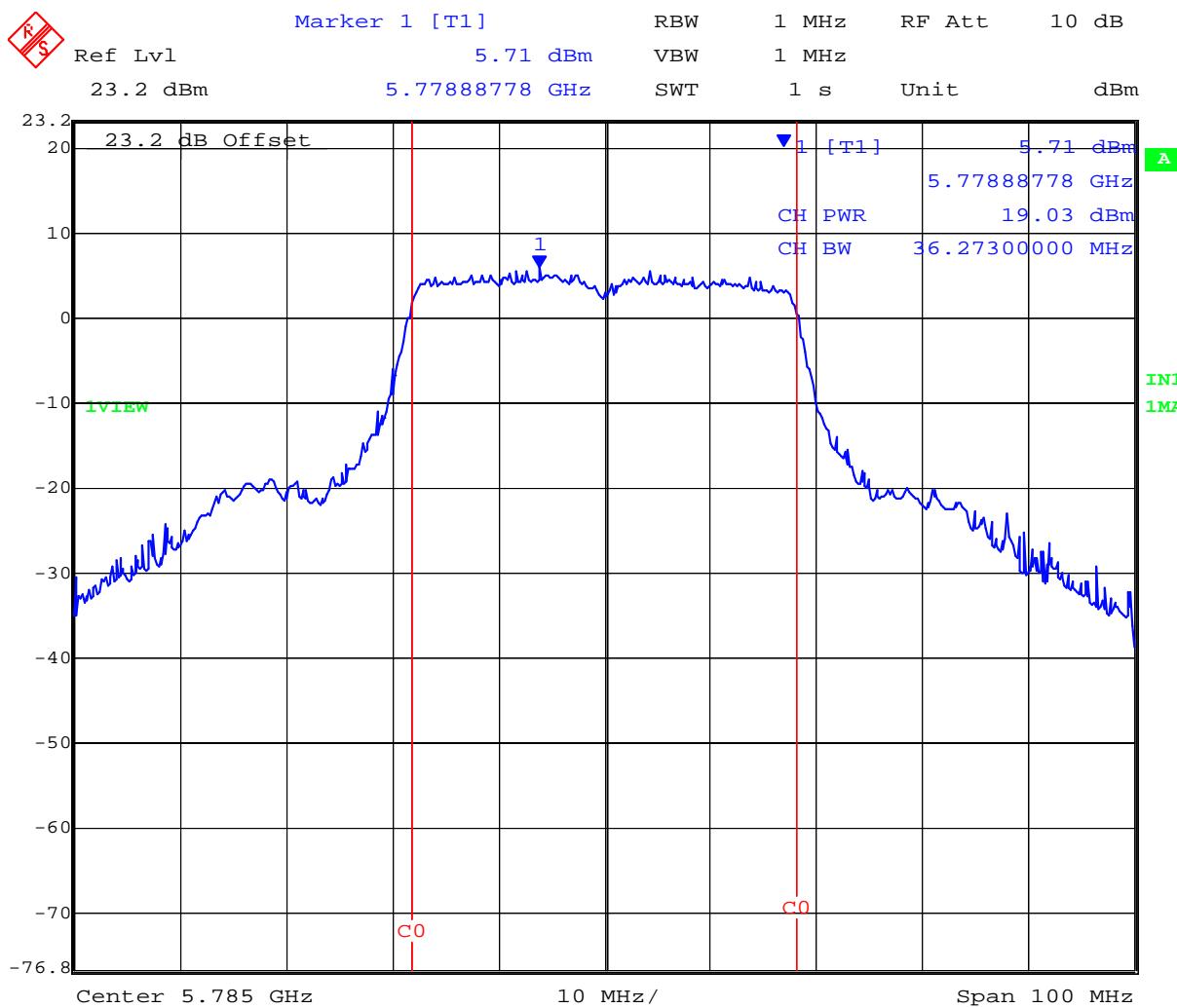
Center Frequency (MHz)	Software Setting	99% Measurement Bandwidth (MHz)	Average Power (dBm)	Peak Power (dBm)	EIRP (dBm) 0dBi Antenna
5,745	19	36.273	+11.51	+19.79	+19.79
5,785	19	36.273	+11.01	+19.03	+19.03
5,825	19	36.273	+11.33	+19.15	+19.15

5,745 MHz 802.11n HT-40 Peak Power (dBm)



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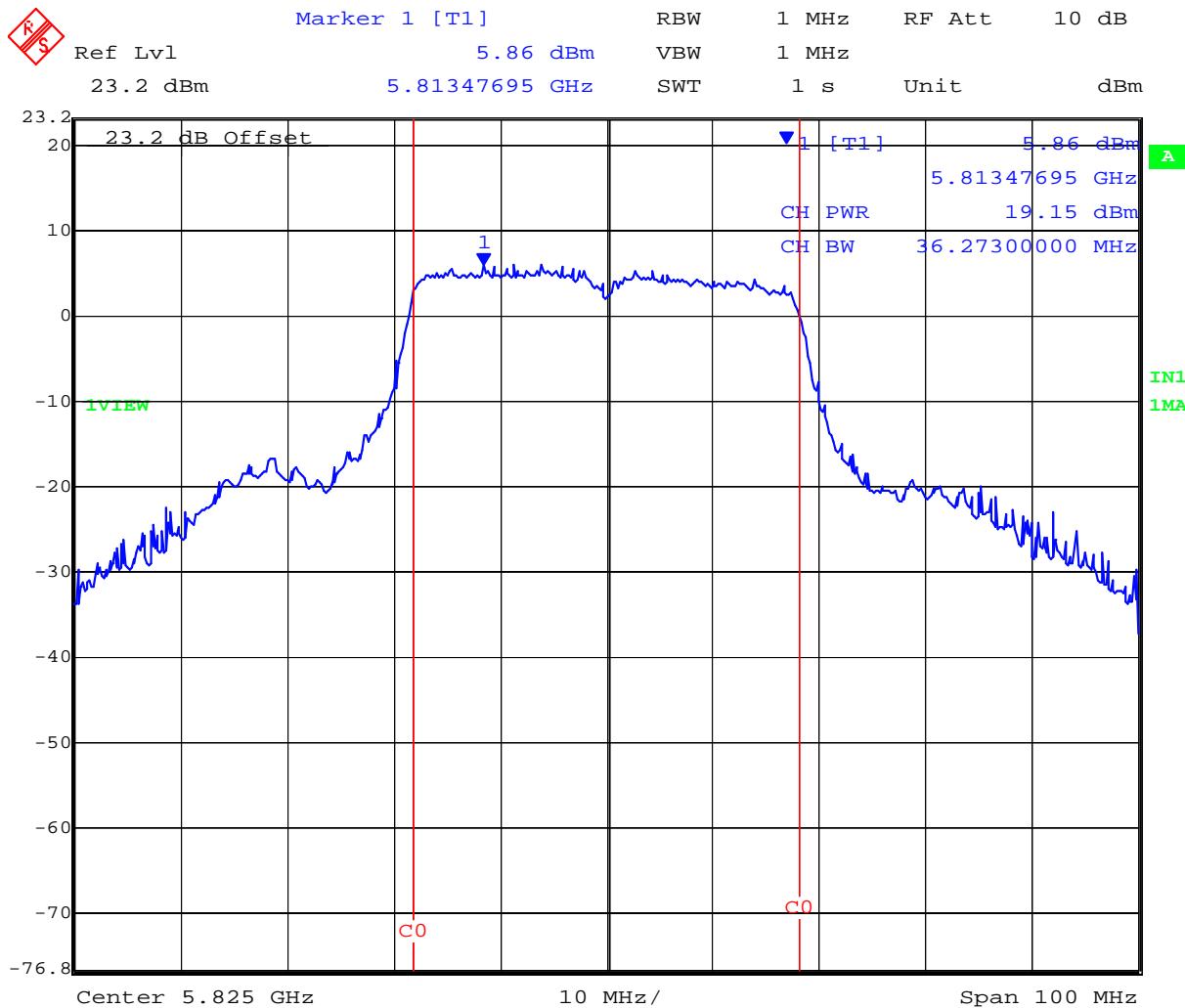
5,785 MHz 802.11a HT-40 Peak Power (dBm)



Date: 8.NOV.2007 18:33:16

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5,825 MHz 802.11a HT-40 Peak Power (dBm)



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Specification

Limits

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

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

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

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

(1) Fixed point-to-point operation:

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

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

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

§ RSS-210 A8.4(4) For systems employing digital modulation techniques operating in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands the maximum peak conducted power shall not exceed 1 watt.



Title: Aruba AP-124,125 802.11a/b/g/n AP
To: FCC 47 CFR Part 15.247 & IC RSS-210
Serial #: ARUB20-A2 Rev C
Issue Date: 29th February 2008
Page: 79 of 273

Laboratory Measurement Uncertainty for Power Measurements

Measurement uncertainty	±1.33 dB
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Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-01 'Measuring RF Output Power'	0158, 0193, 0252, 0313, 0314, 0070, 0116, 0117

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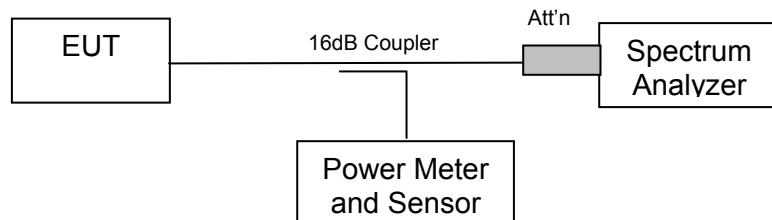
5.1.3. Peak Power Spectral Density

FCC, Part 15 Subpart C §15.247(e)
Industry Canada RSS-210 §A8.2

Test Procedure

The transmitter output was connected to a spectrum analyzer and the maximum level in a 3 kHz bandwidth was measured. A peak value was found over the full emission bandwidth and the frequency span reduced to obtain enhanced resolution. Sweep time \geq span / 3 kHz with video averaging turned off. The Peak Power Spectral Density is the highest level found across the emission in a 3 kHz resolution bandwidth.

Test Measurement Set up



Measurement set up for Peak Power Spectral Density

Measurement Results for Peak Power Spectral Density

Ambient conditions.

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

Radio Parameters

Duty Cycle: 100%

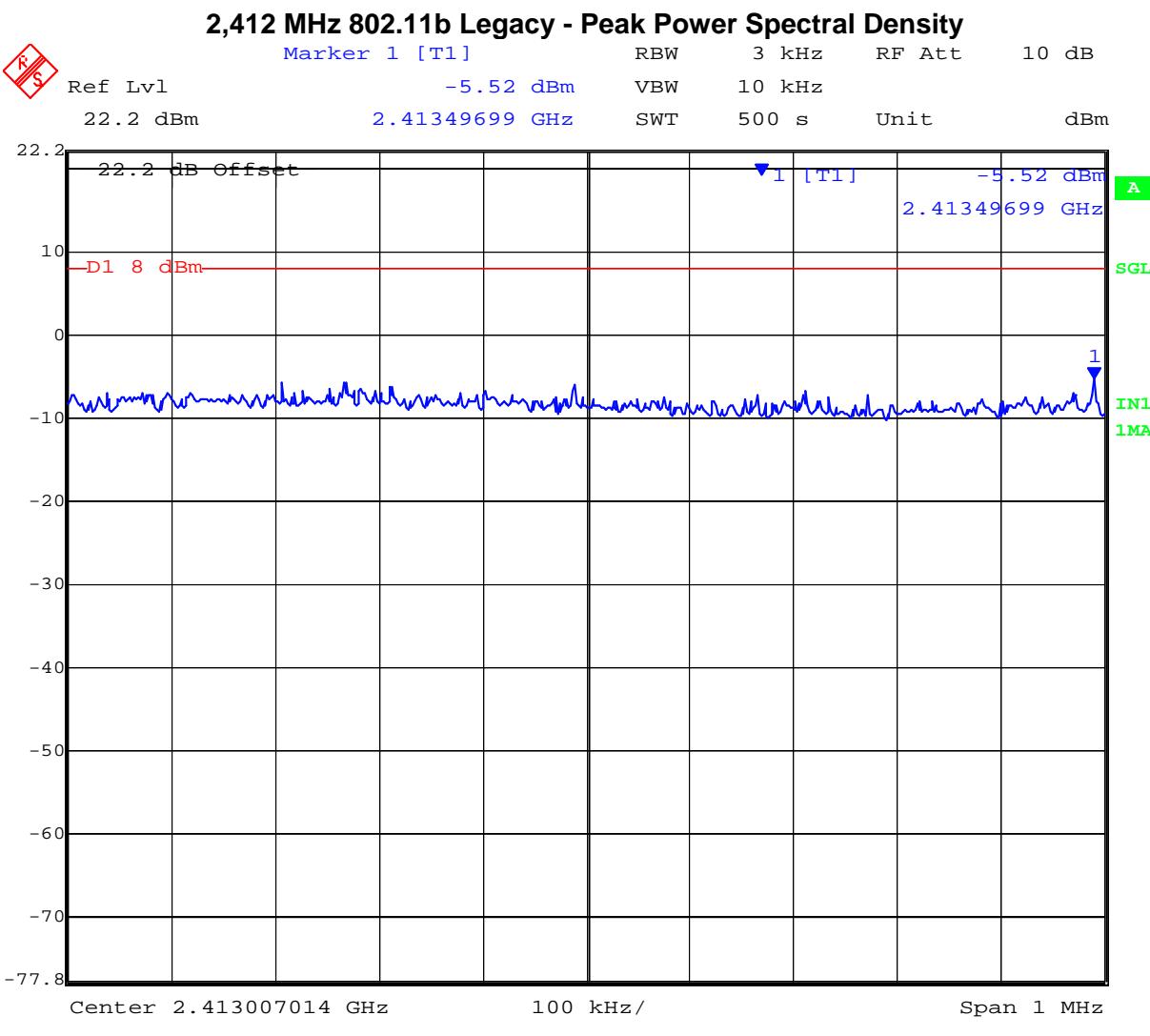
Output: Modulated Carrier

Power: Maximum Default Power

Peak Power Spectral Density

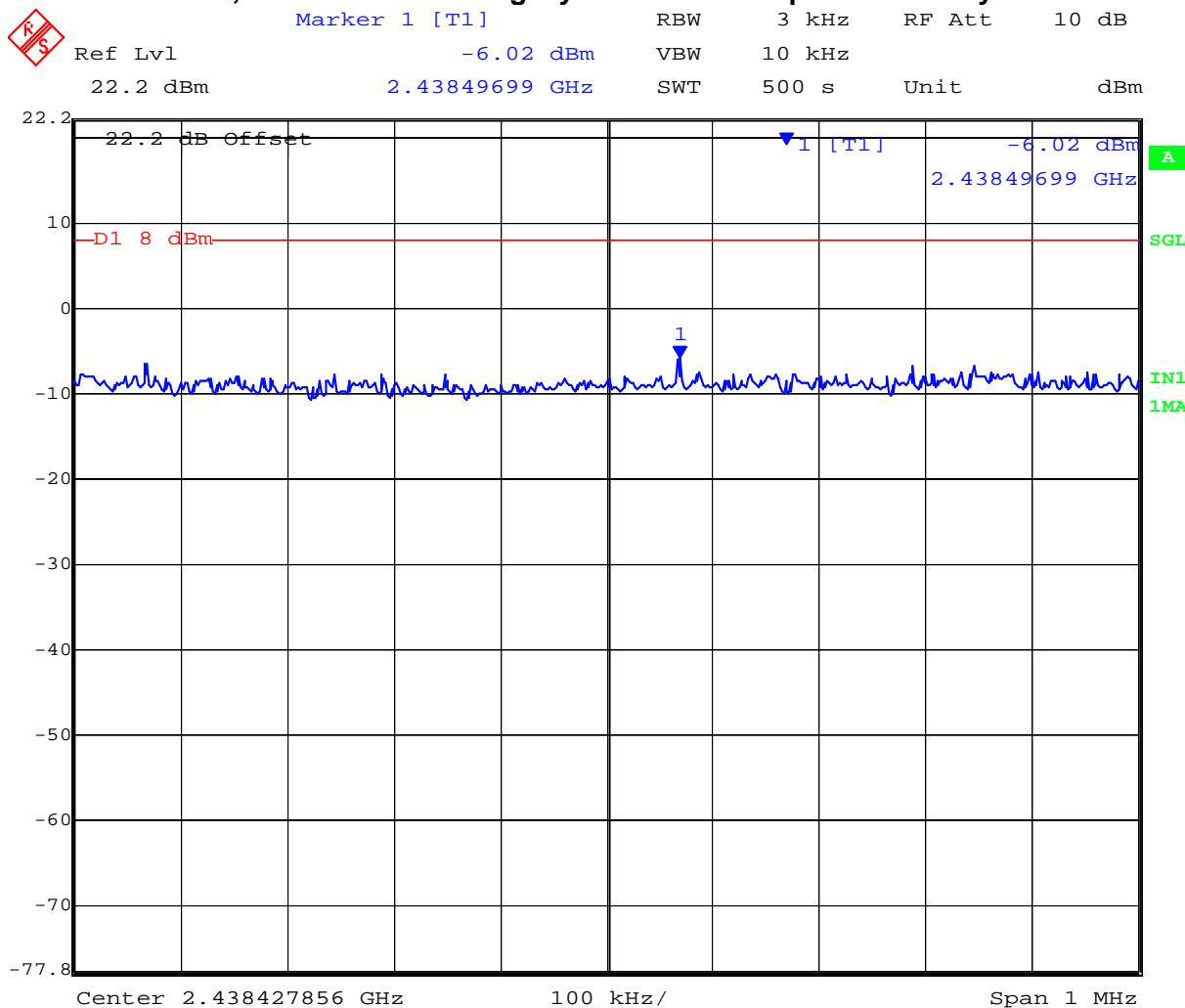
TABLE OF RESULTS – 802.11b – Legacy

Center Frequency (MHz)	Peak Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dBm)
2,412	2413.49699	-5.52	+8	-13.52
2,437	2438.49699	-6.02	+8	-14.02
2,462	2463.49599	-5.91	+8	-13.91



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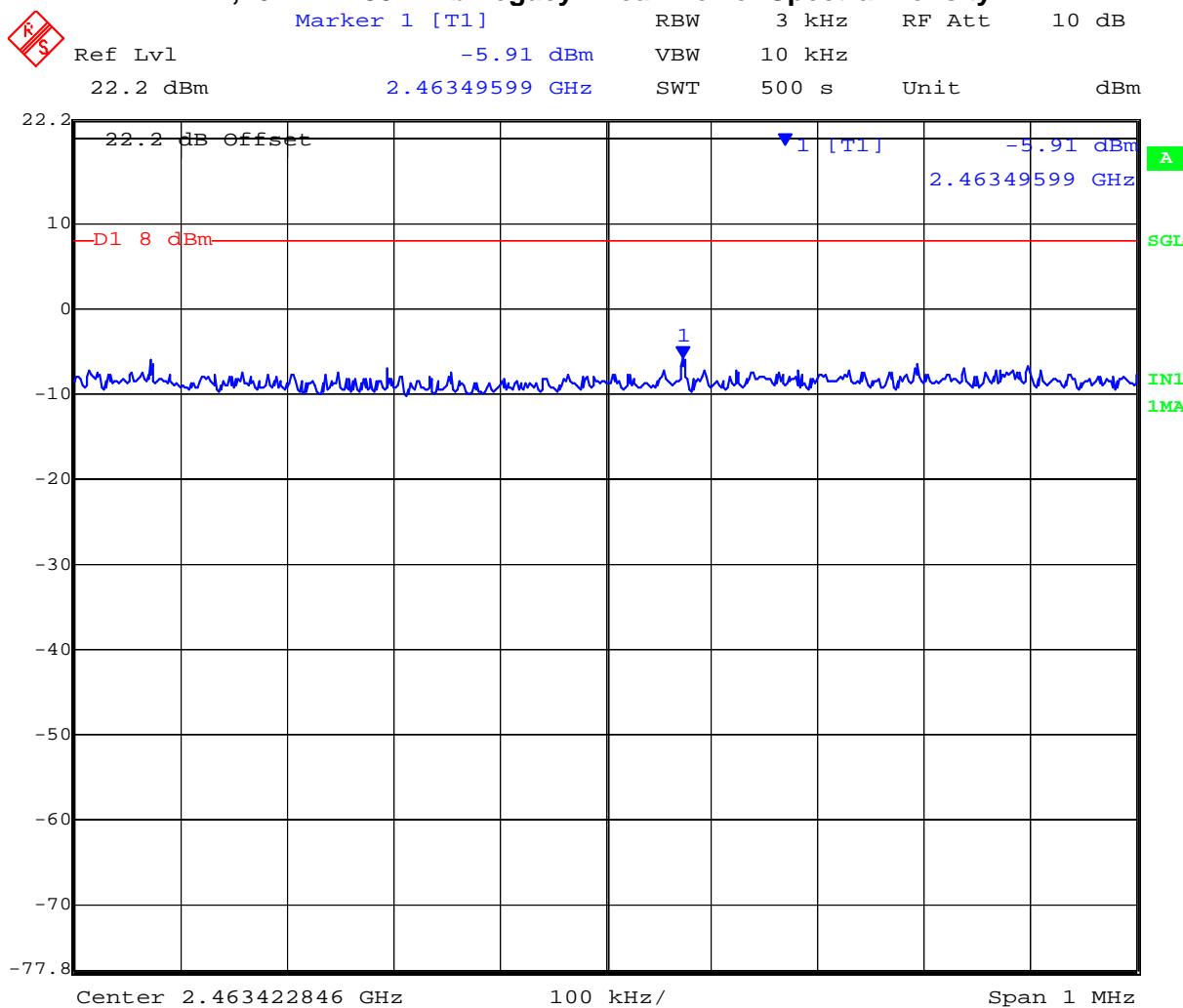
2,437 MHz 802.11b Legacy - Peak Power Spectral Density



Date: 7.NOV.2007 20:12:47

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2,462 MHz 802.11b Legacy - Peak Power Spectral Density



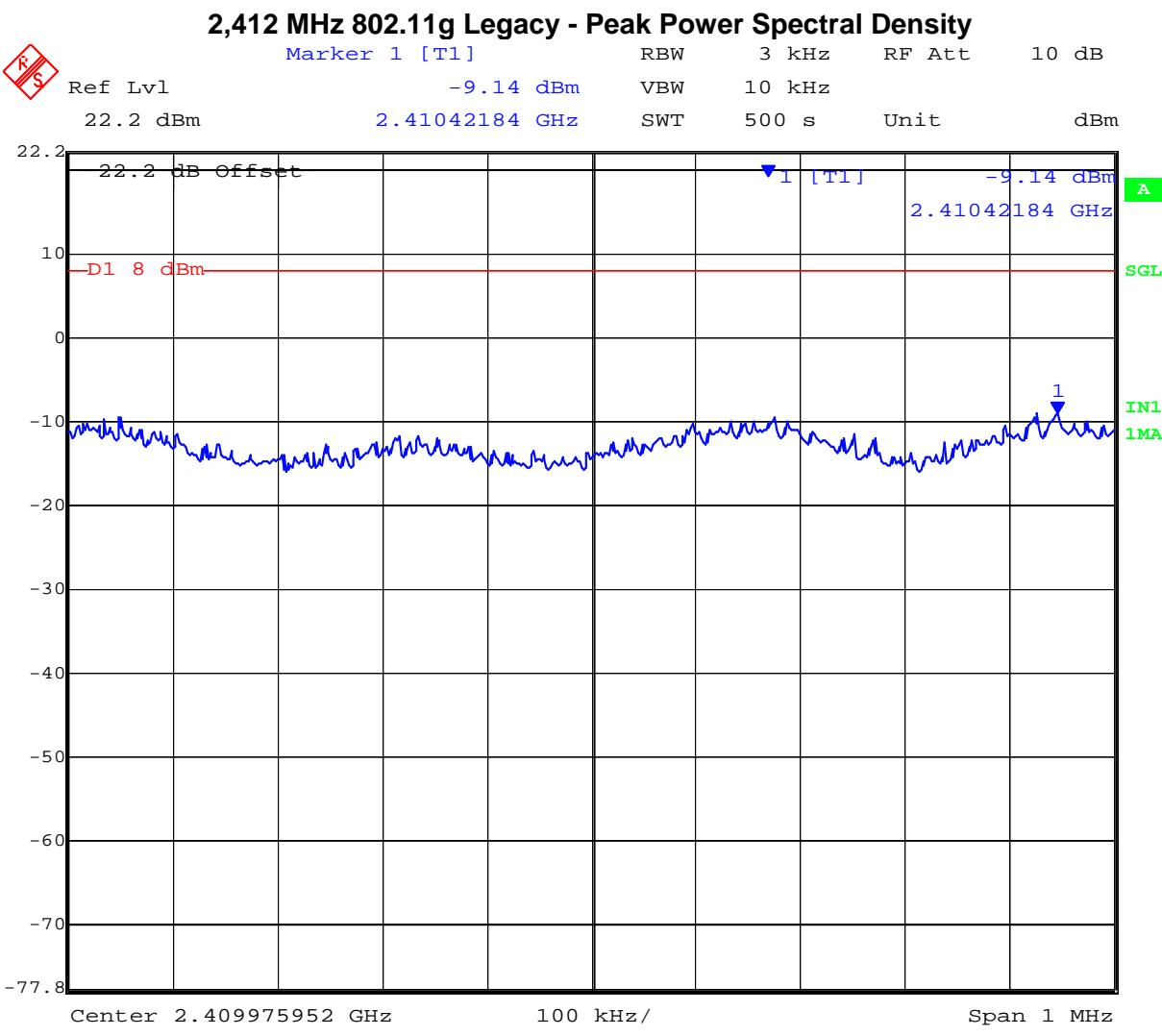
Date: 7.NOV.2007 20:31:24

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Peak Power Spectral Density

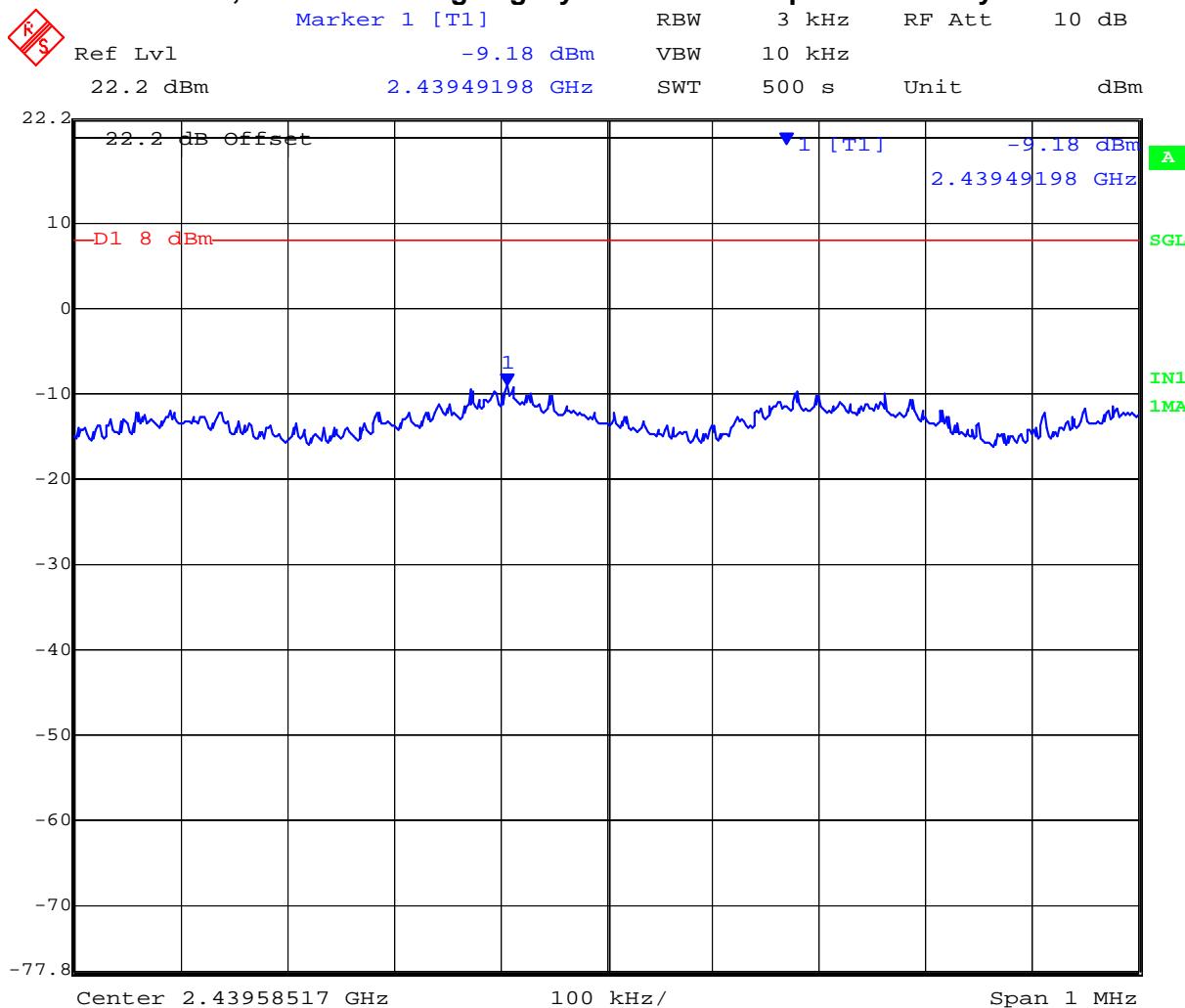
TABLE OF RESULTS – 802.11g – Legacy

Center Frequency (MHz)	Peak Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dBm)
2,412	2410.42184	-9.14	+8	-17.14
2,437	2439.49198	-9.18	+8	-17.18
2,462	2463.87275	-8.86	+8	-16.86



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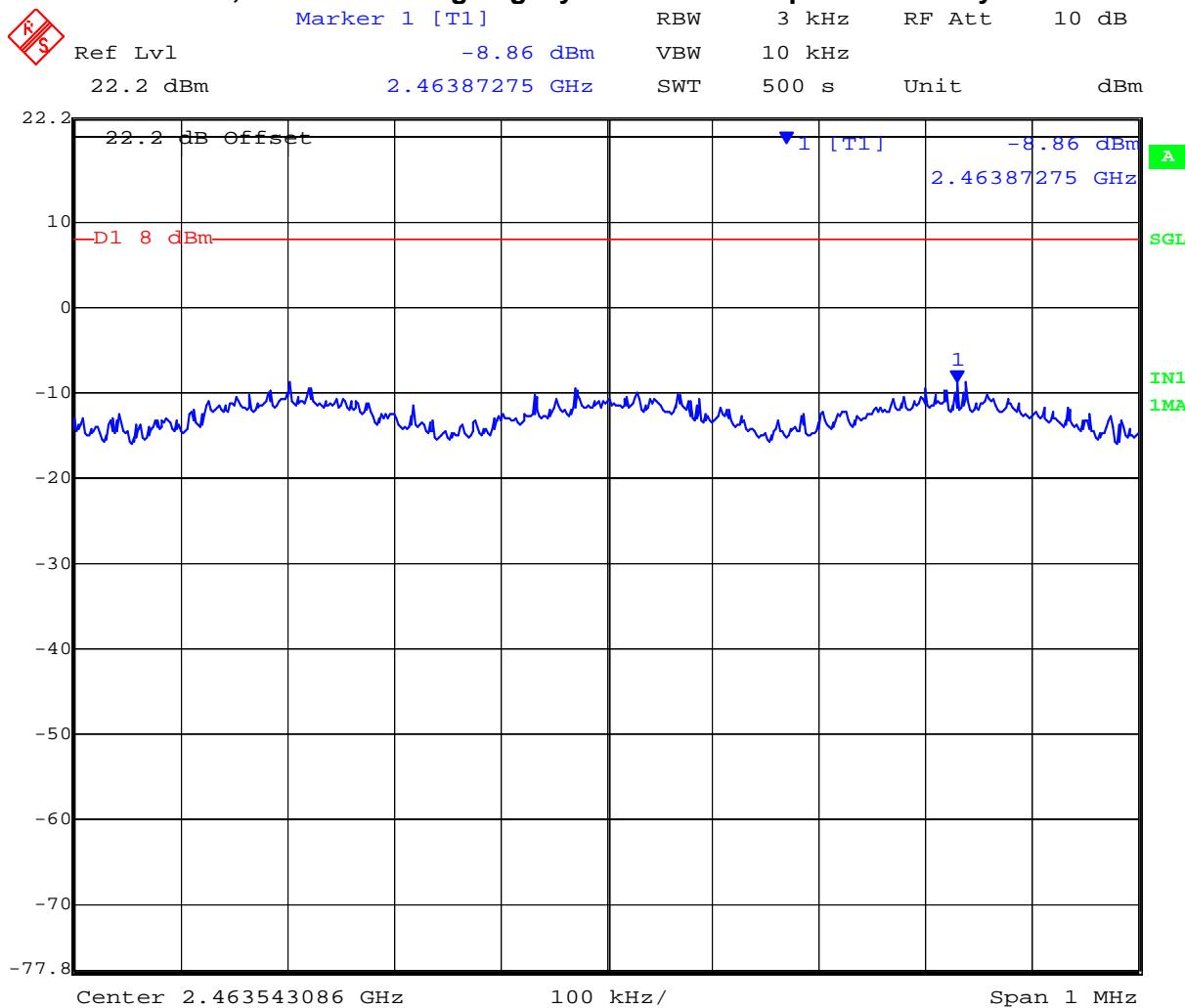
2,437 MHz 802.11g Legacy - Peak Power Spectral Density



Date: 7.NOV.2007 19:40:52

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2,462 MHz 802.11g Legacy - Peak Power Spectral Density

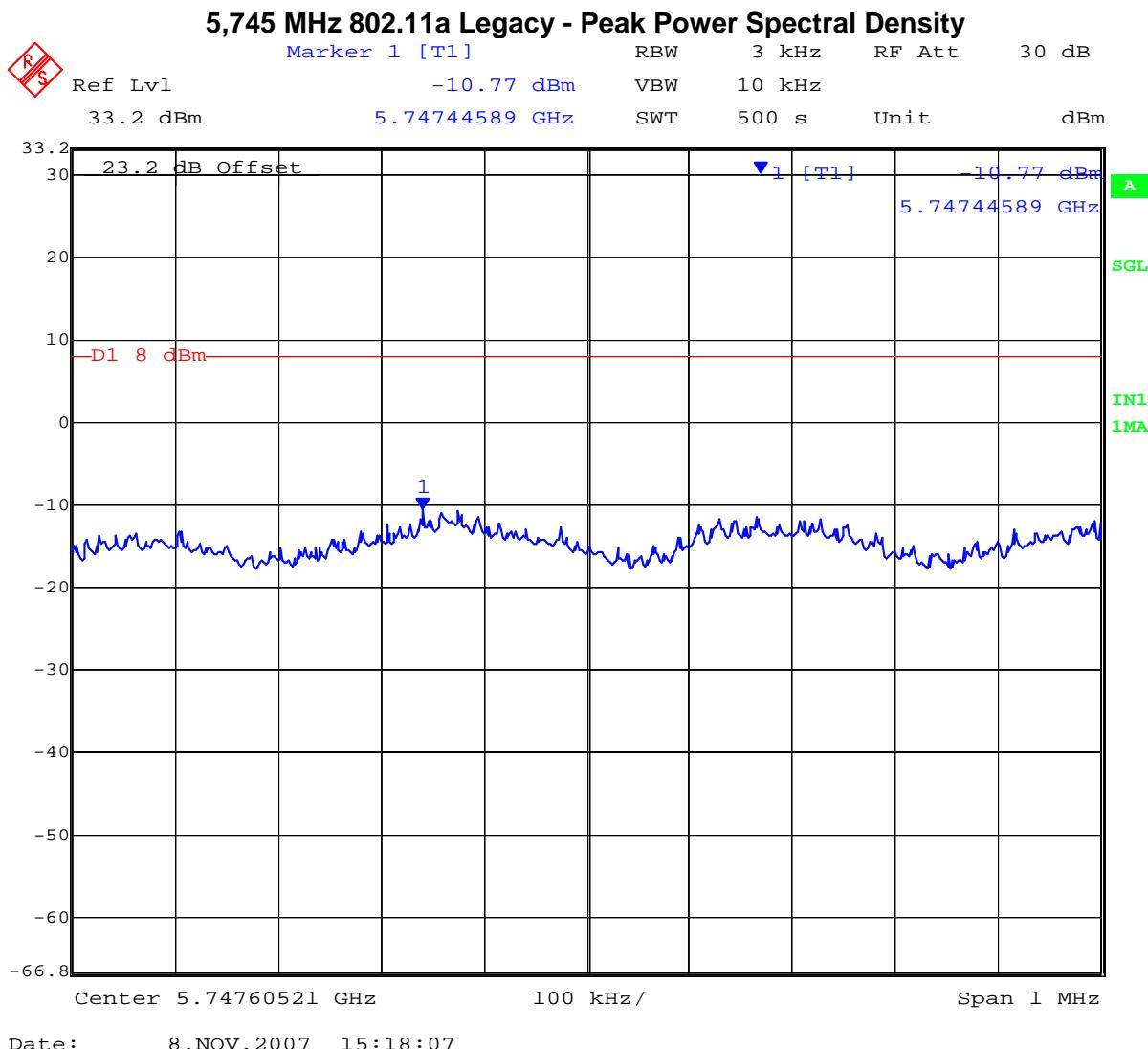


Date: 7.NOV.2007 19:29:53

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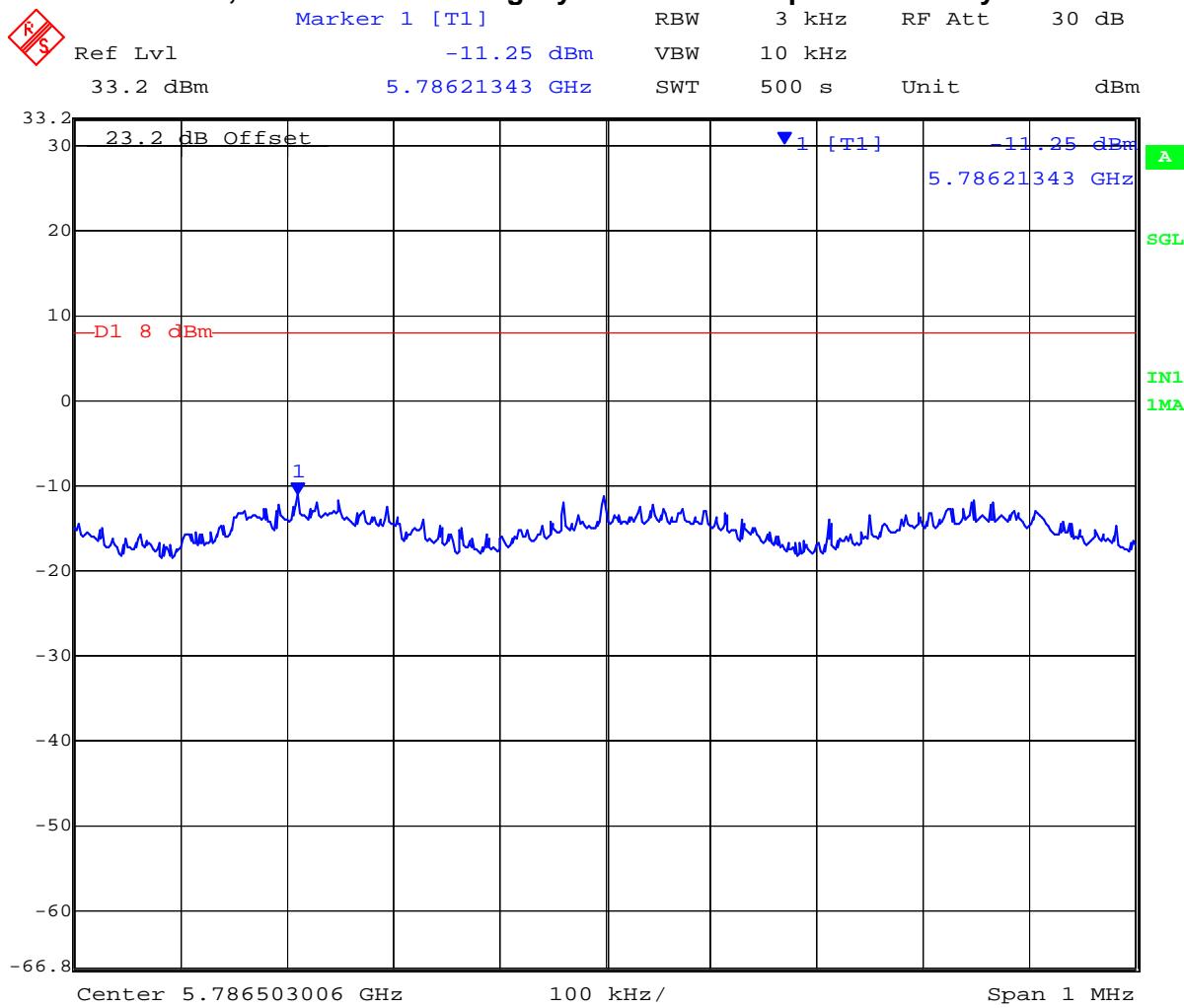
TABLE OF RESULTS – 802.11a Legacy

Center Frequency (MHz)	Peak Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dBm)
5,745	5747.44589	-10.77	+8	-18.77
5,785	5786.21343	-11.25	+8	-19.25
5,825	5822.51202	-11.98	+8	-19.98



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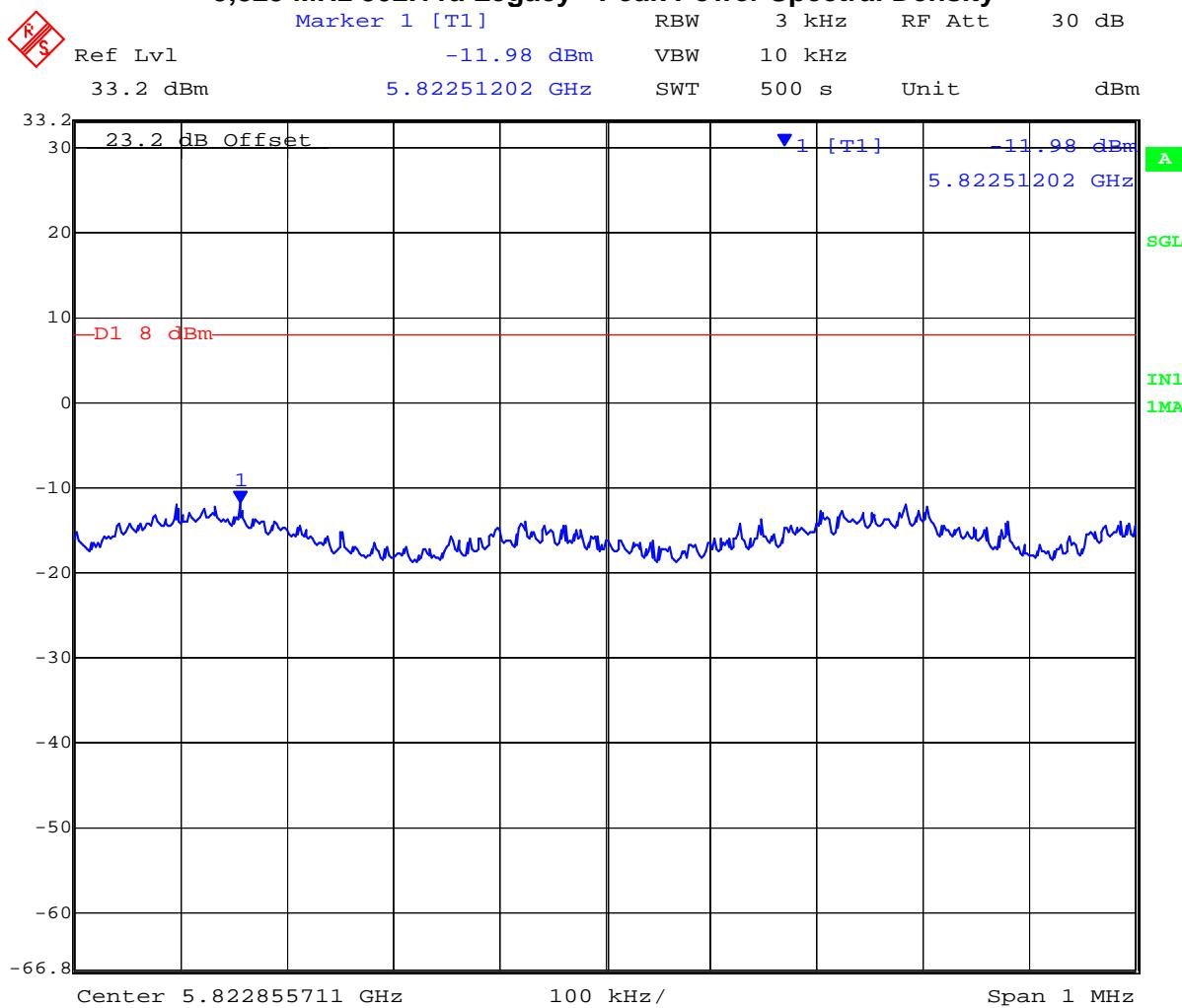
5,785 MHz 802.11a Legacy - Peak Power Spectral Density



Date: 8.NOV.2007 15:28:33

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5,825 MHz 802.11a Legacy - Peak Power Spectral Density



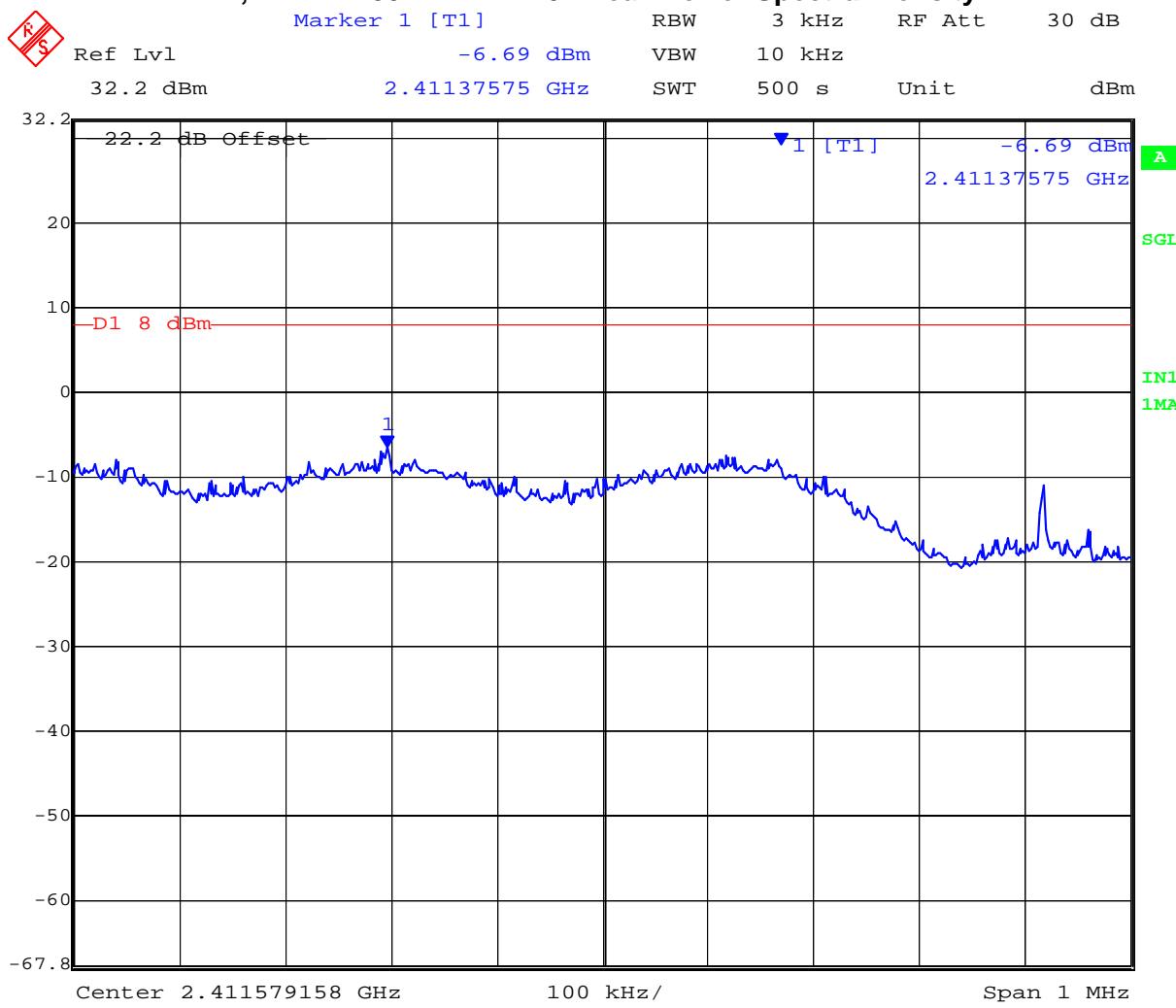
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

Peak Power Spectral Density

TABLE OF RESULTS – 802.11n – HT-20

Center Frequency (MHz)	Peak Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dBm)
2,412	2411.37575	-6.69	+8	-14.69
2,437	2437.62024	-7.18	+8	-15.18
2,462	2462.62024	-6.94	+8	-14.94

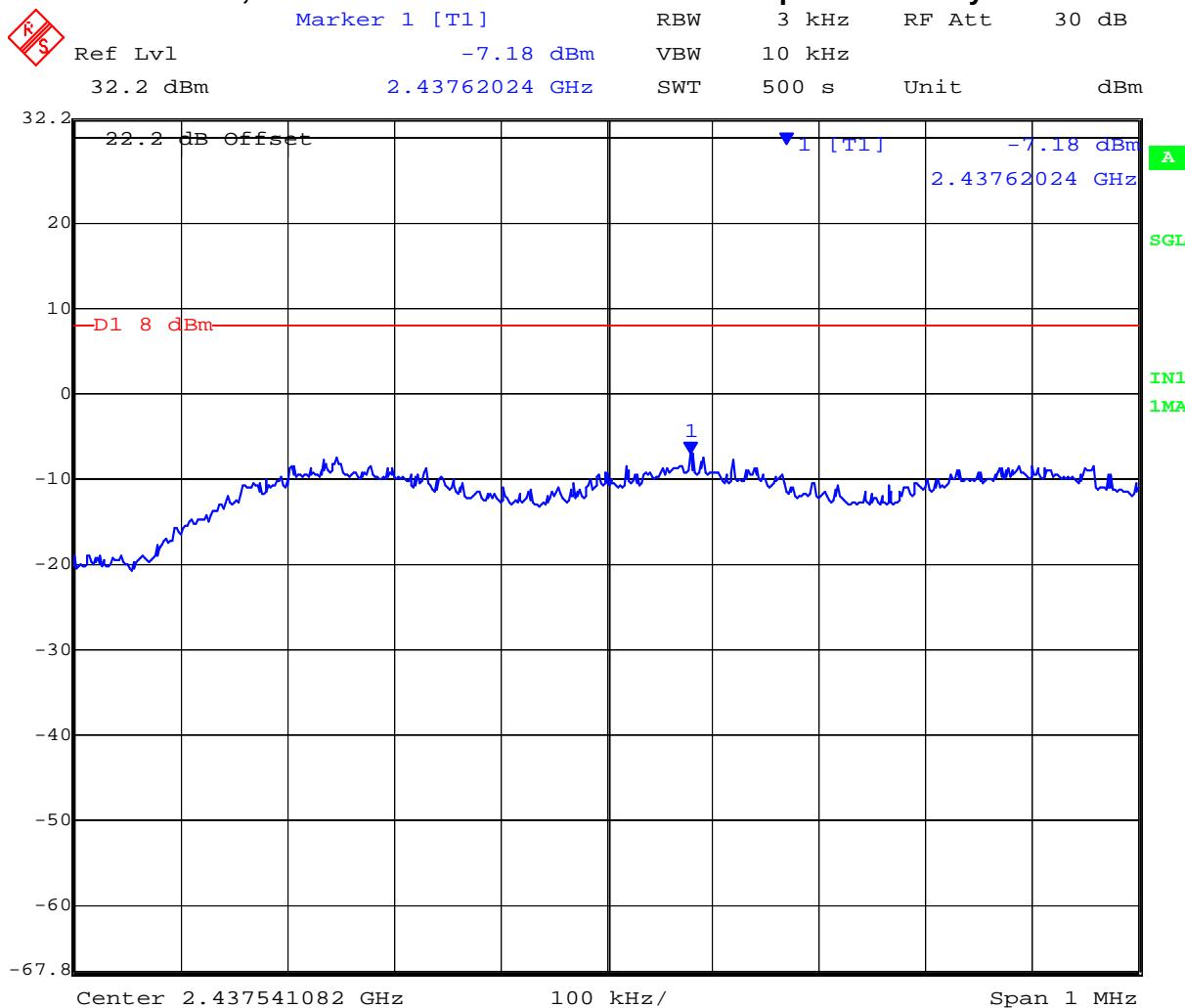
2,412 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 8.NOV.2007 09:58:16

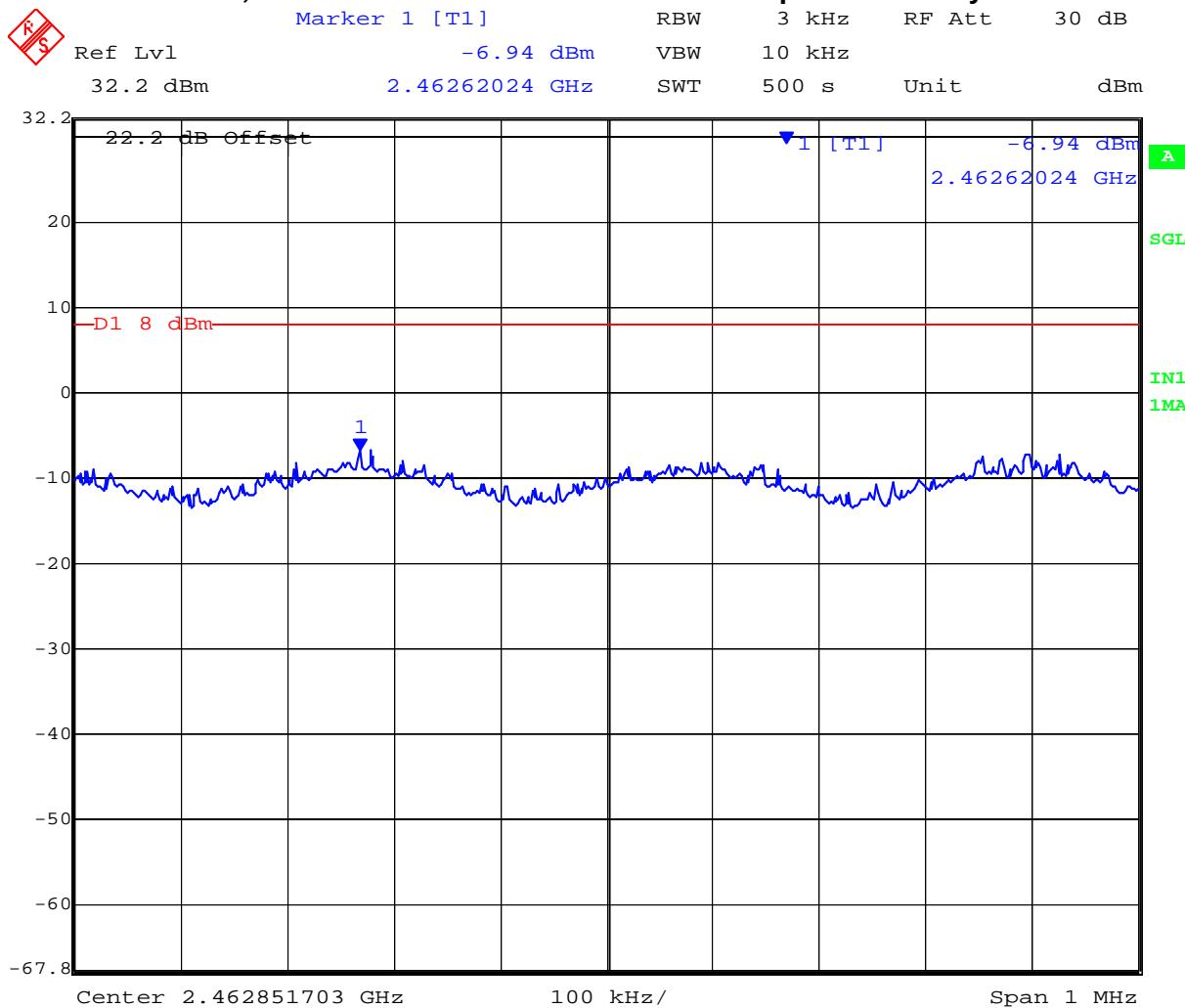
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2,437 MHz 802.11n HT-20 - Peak Power Spectral Density



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2,462 MHz 802.11n HT-20 - Peak Power Spectral Density

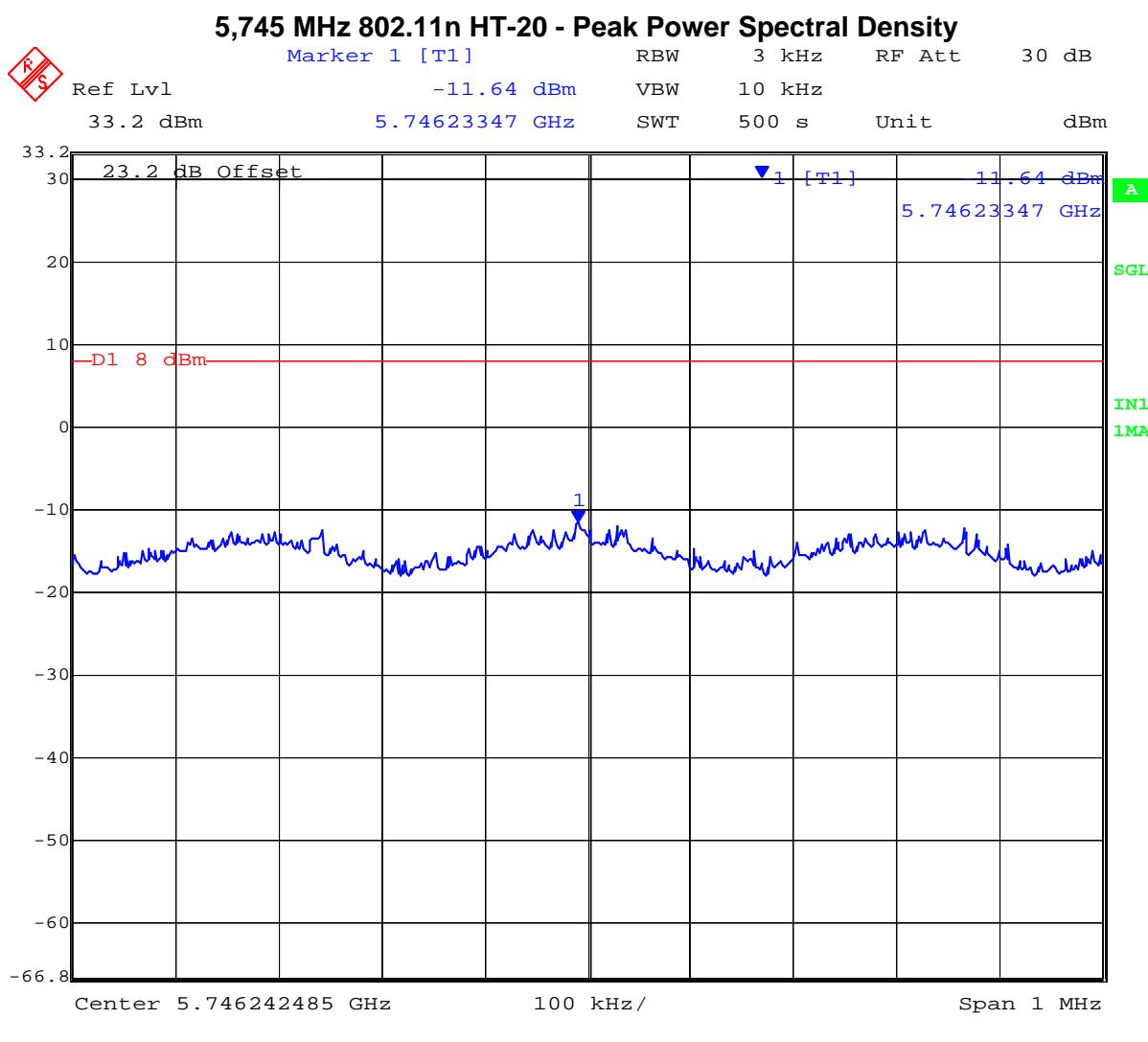


Date: 8.NOV.2007 09:34:47

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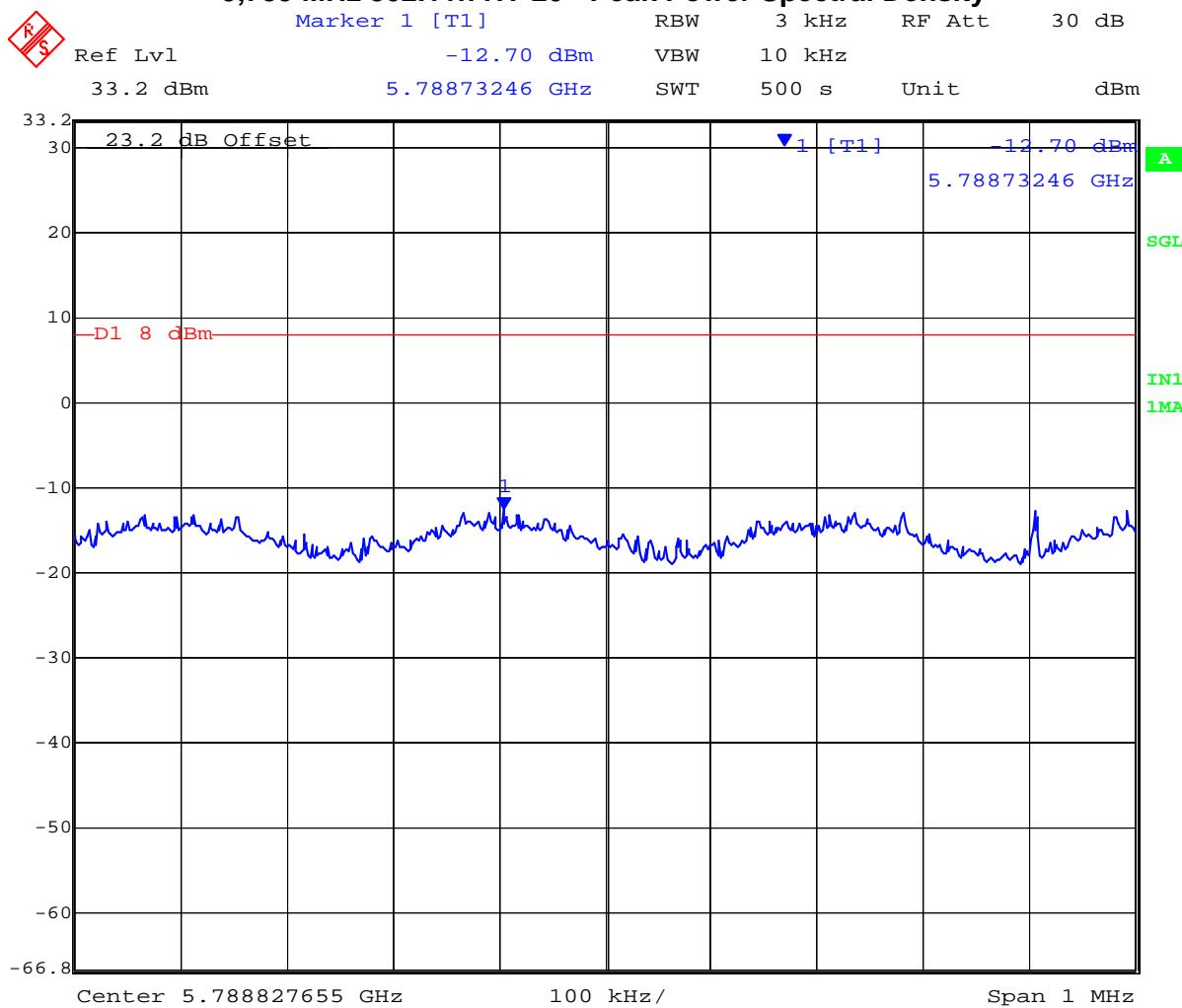
TABLE OF RESULTS – 802.11n HT-20

Center Frequency (MHz)	Peak Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dBm)
5,745	5746.23347	-11.64	+8	-19.64
5,785	5788.73246	-12.70	+8	-20.70
5,825	5826.23146	-11.91	+8	-19.91



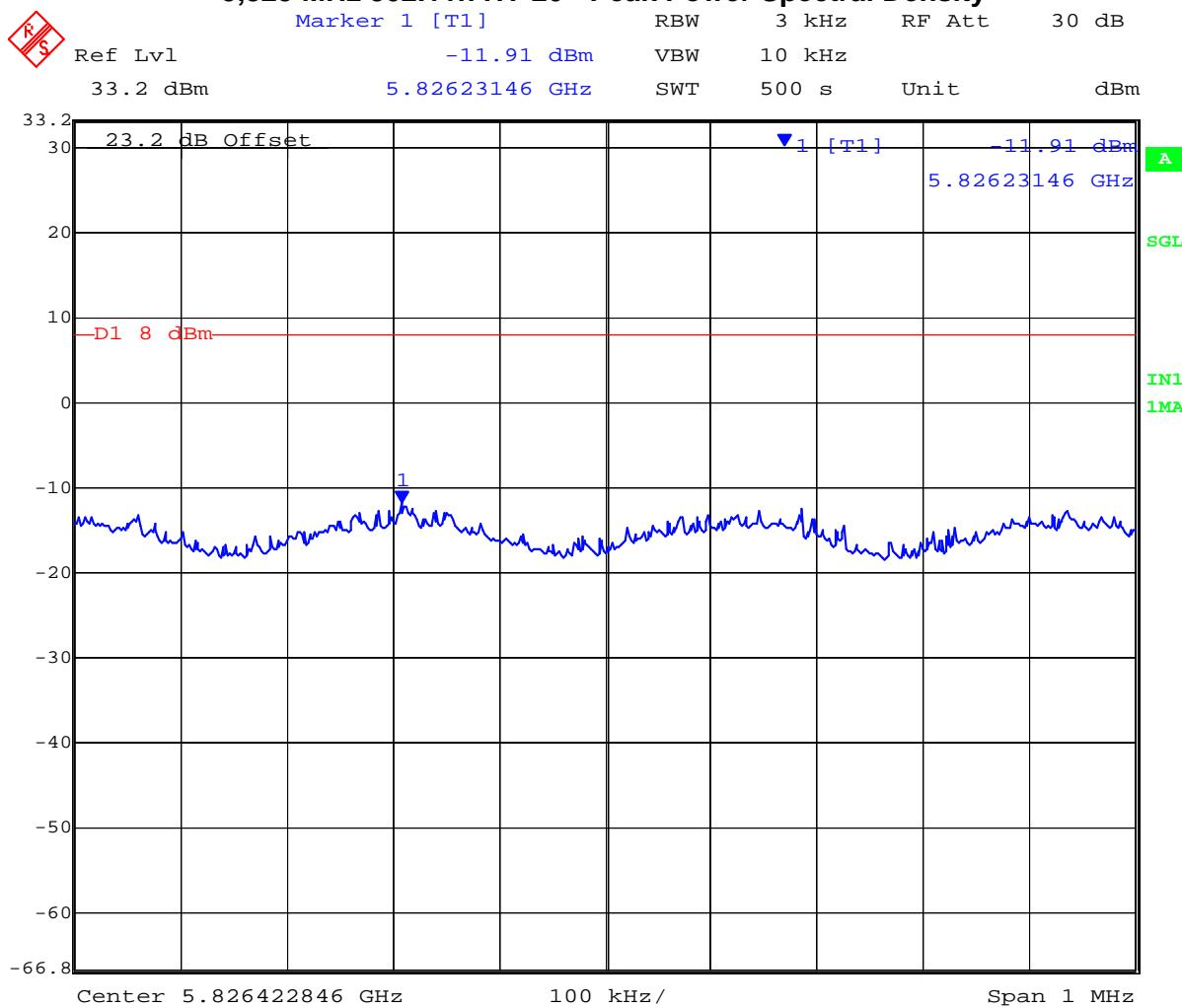
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

5,785 MHz 802.11n HT-20 - Peak Power Spectral Density



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5,825 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 8.NOV.2007 16:42:50

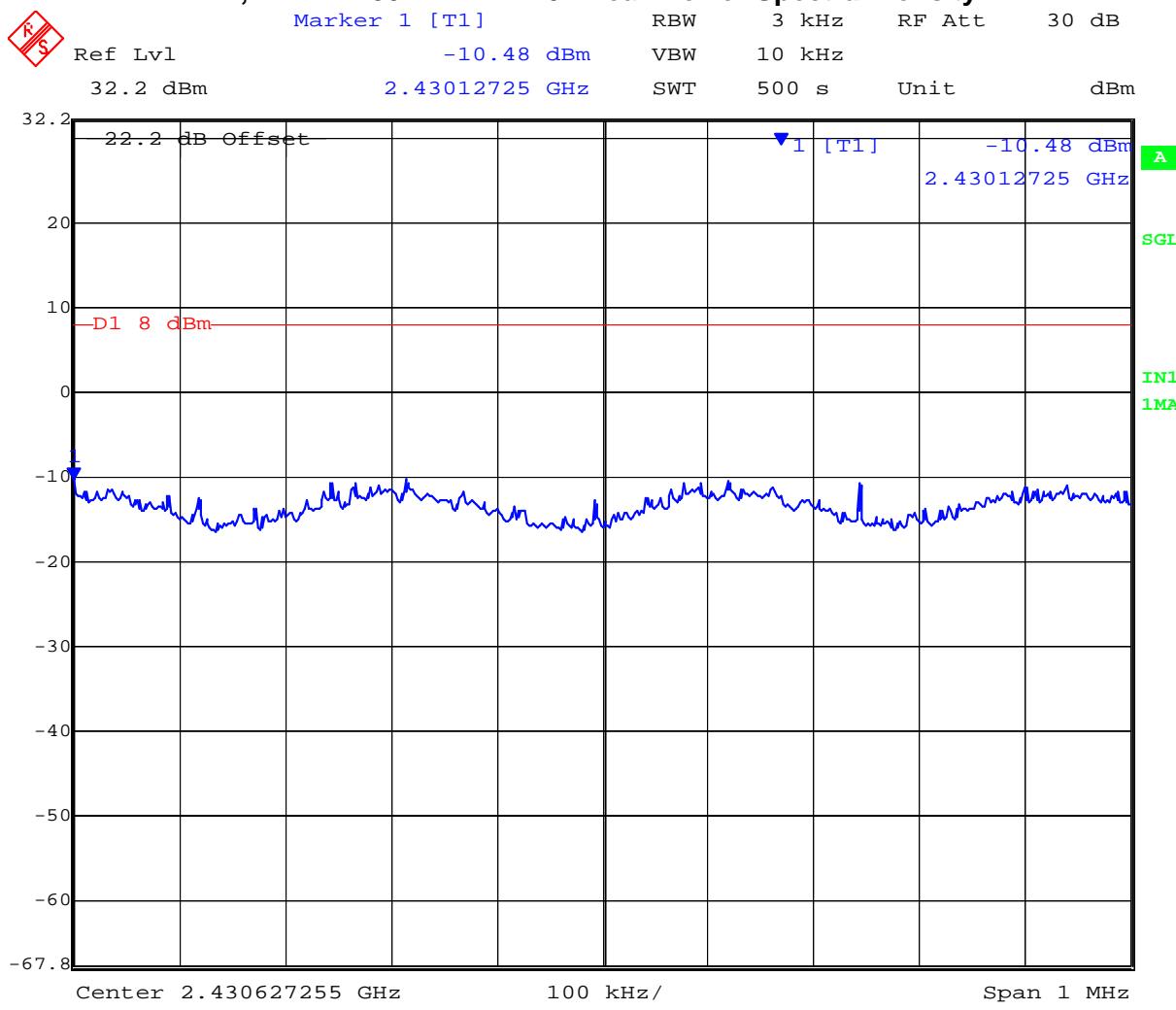
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

Peak Power Spectral Density

TABLE OF RESULTS – 802.11n – HT-40

Center Frequency (MHz)	Peak Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dBm)
2,422	2430.12725	-10.48	+8	-18.48
2,437	2444.24549	-9.13	+8	-17.13
2,452	2445.12124	-9.25	+8	-17.25

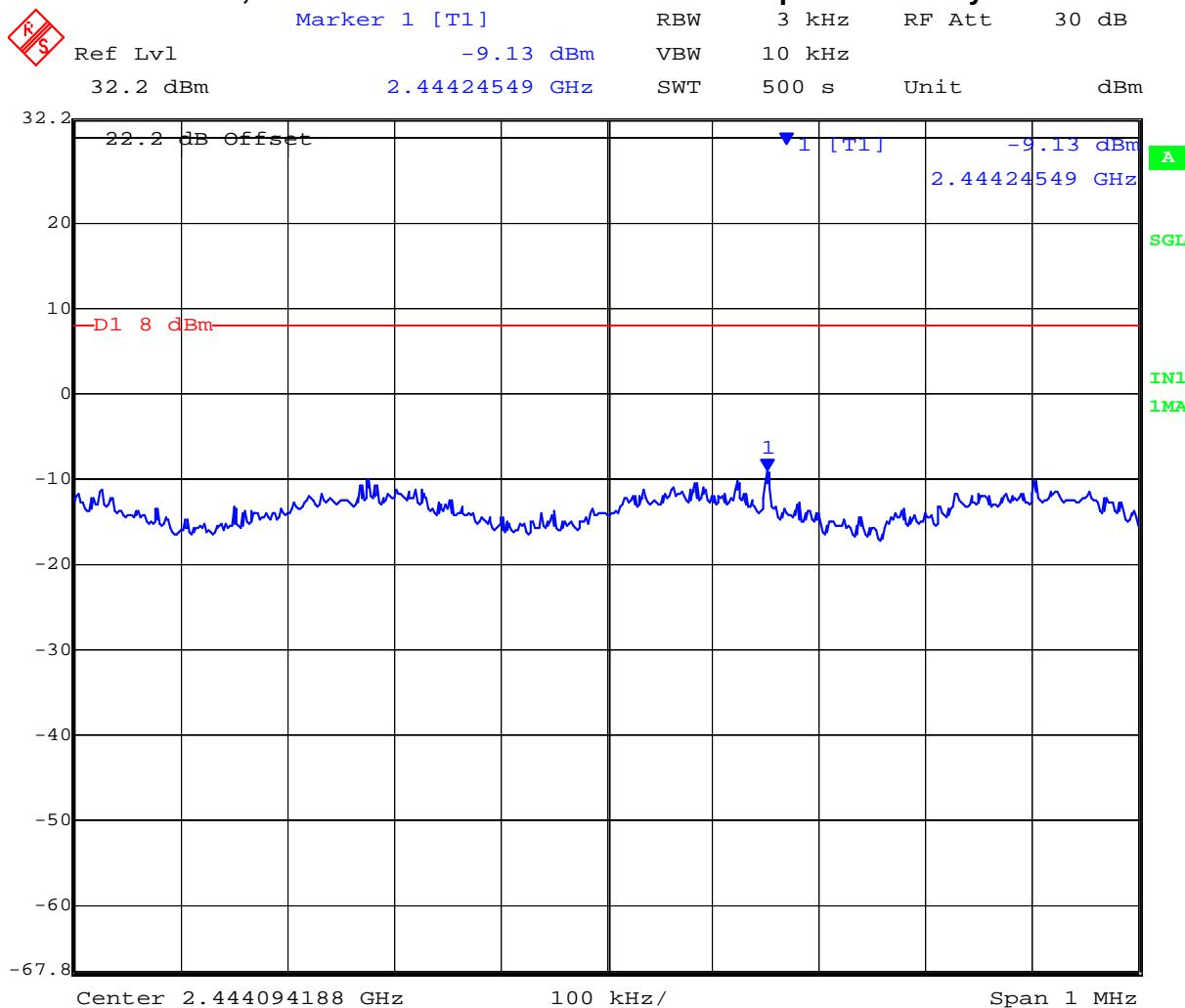
2,422 MHz 802.11n HT-40 - Peak Power Spectral Density



Date: 8.NOV.2007 12:27:31

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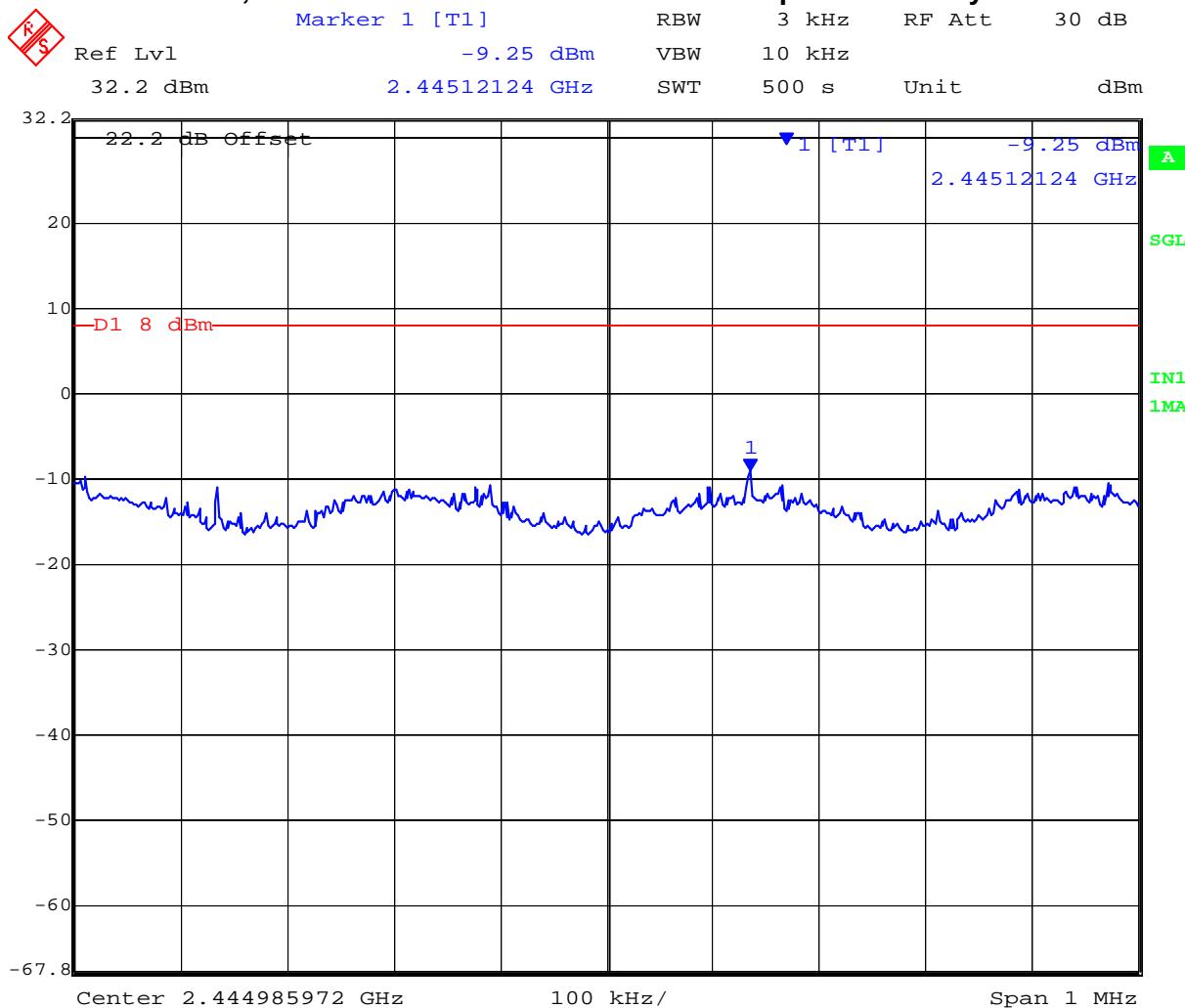
2,437 MHz 802.11n HT-40 - Peak Power Spectral Density



Date: 8.NOV.2007 11:42:05

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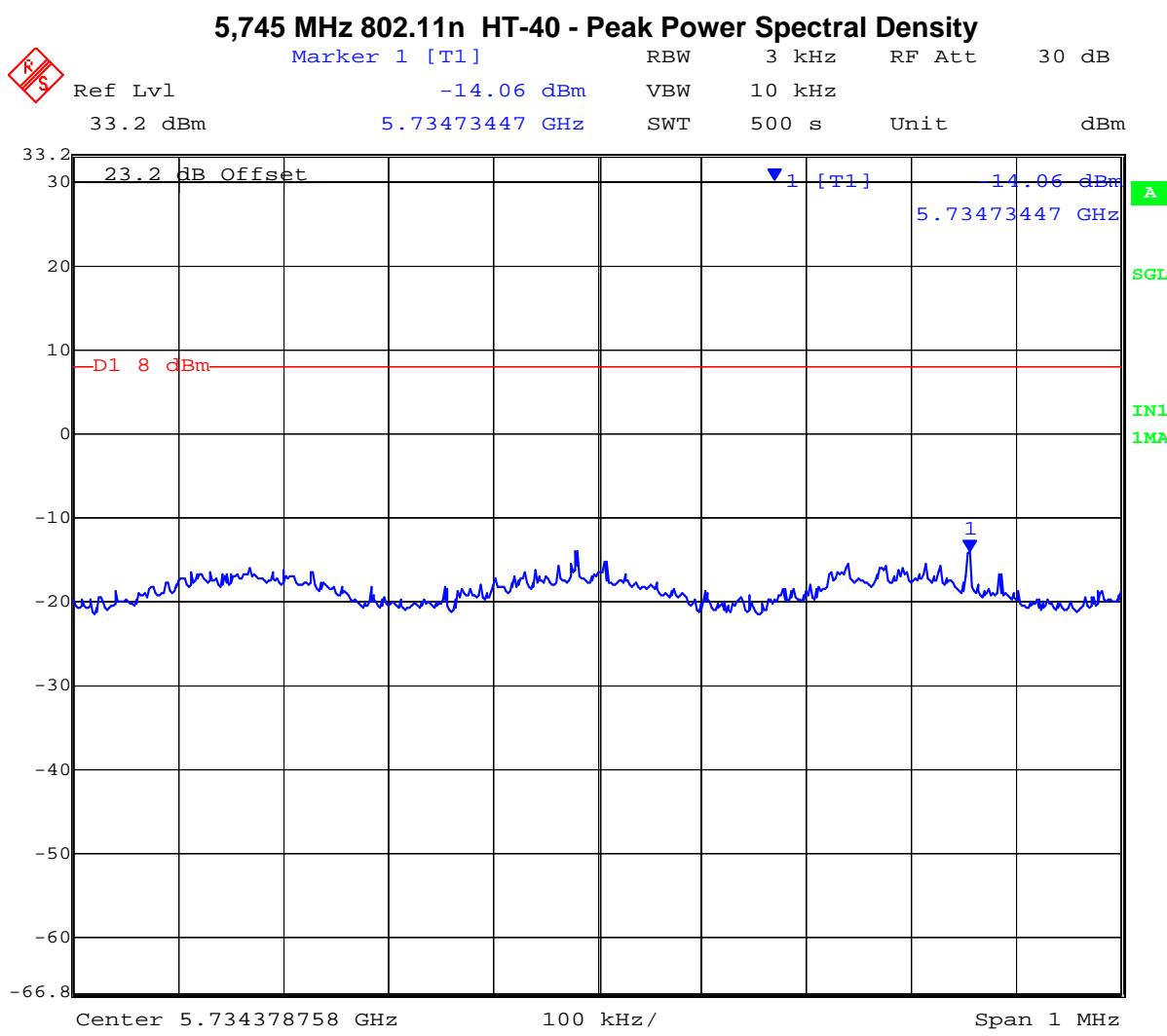
2,452 MHz 802.11n HT-40 - Peak Power Spectral Density



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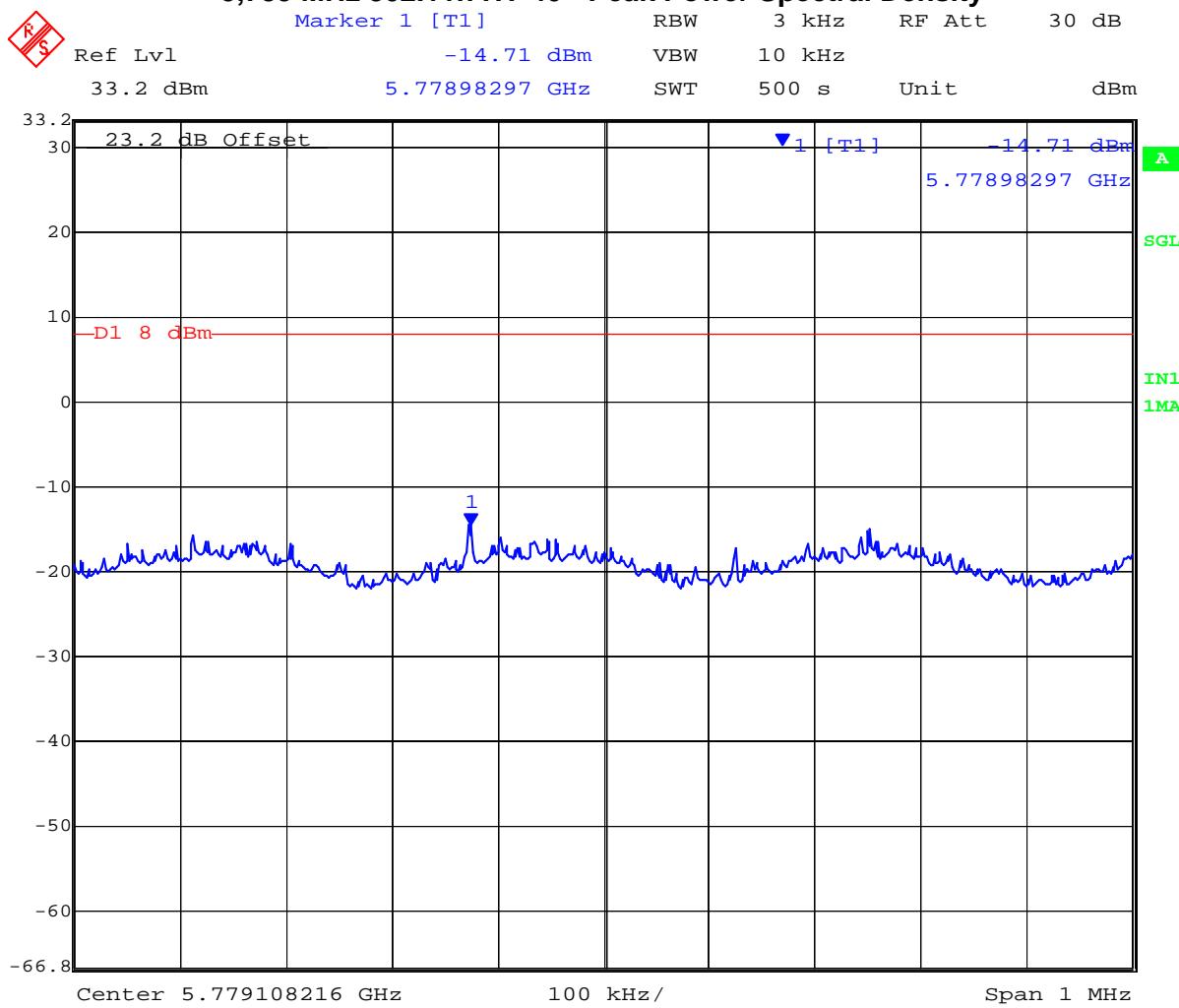
TABLE OF RESULTS – 802.11n HT-40

Center Frequency (MHz)	Peak Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dBm)
5,745	5734.73447	-14.06	+8	-22.06
5,785	5778.98297	-14.71	+8	-22.71
5,825	5815.98297	-14.68	+8	-22.68



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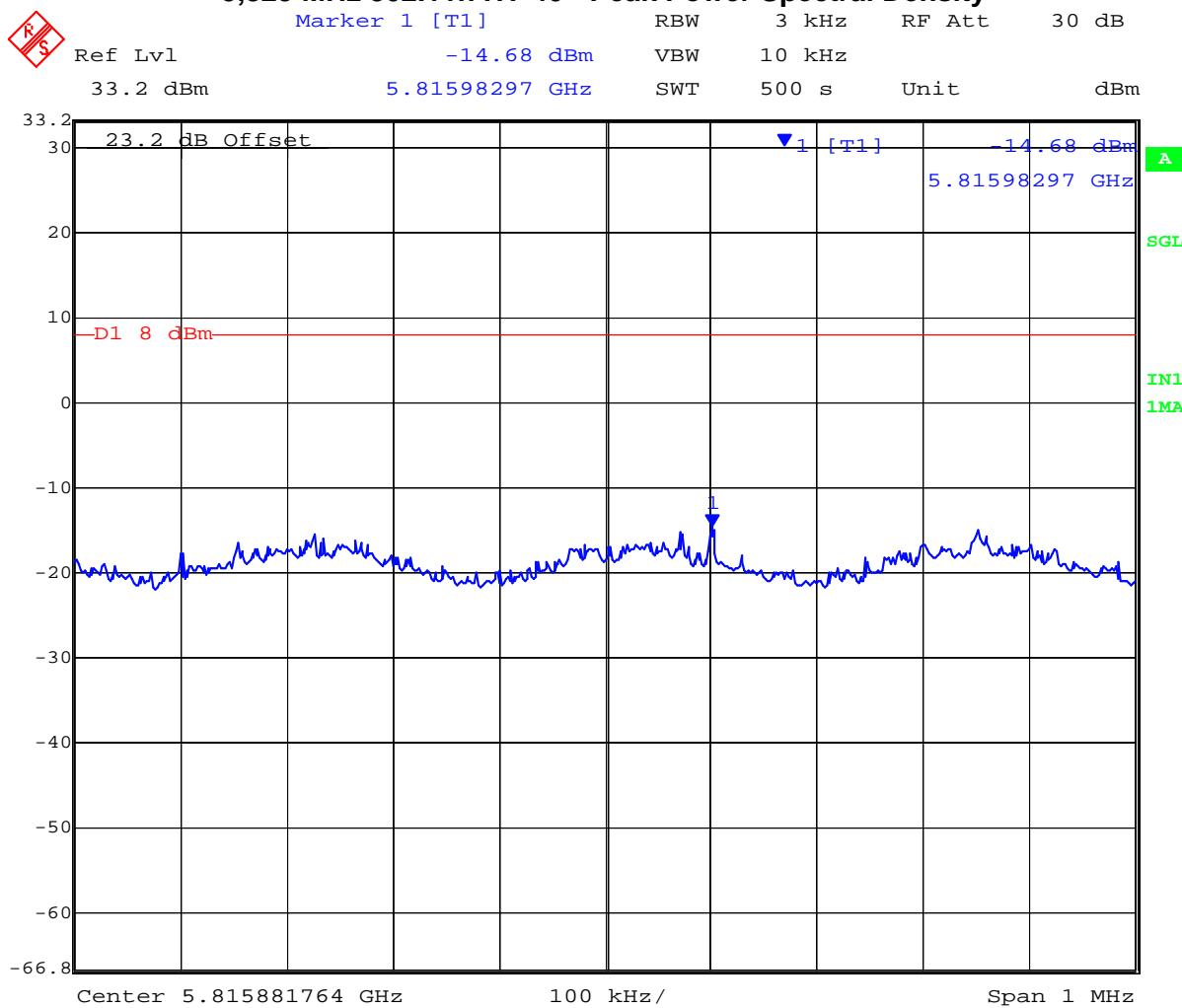
5,785 MHz 802.11n HT-40 - Peak Power Spectral Density



Date: 8.NOV.2007 19:12:41

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5,825 MHz 802.11n HT-40 - Peak Power Spectral Density



Date: 8.NOV.2007 18:44:49

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Title: Aruba AP-124,125 802.11a/b/g/n AP
To: FCC 47 CFR Part 15.247 & IC RSS-210
Serial #: ARUB20-A2 Rev C
Issue Date: 29th February 2008
Page: 102 of 273

Specification

Peak Power Spectral Density Limits

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

RSS-210 §A8.2(2) The transmitter power spectral density (into the antenna) shall not be greater than +8 dBm in any 3 kHz band during any time interval of continuous transmission or over 1.0 second if the transmission exceeds 1.0 second duration.

Laboratory Measurement Uncertainty for Spectral Density

Measurement uncertainty	±1.33 dB
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Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-01 'Measuring RF Output Power'	0158, 0193, 0252, 0313, 0314, 0070, 0116, 0117

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5.1.4. Maximum Permissible Exposure

FCC, Part 15 Subpart C §15.247(i)
Industry Canada RSS-Gen §5.5

Calculations for Maximum Permissible Exposure Levels

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

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

$$P = \text{Peak output power (mW)}$$

$$G = \text{Antenna numeric gain (numeric)}$$

$$d = \text{Separation distance (cm)}$$

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

The Aruba AP-124,125 has three transmitters. The peak power in the table below is calculated by assuming a worst case scenario where the three transmitters are operating simultaneously in the same band. The Peak Power in mW is calculated by taking the maximum allowable conducted power measured in each band and multiplying by 3.

Because the EUT belongs to the General Population/Uncontrolled Exposure the limit of power density is 1.0 mW/cm²

Freq. Band (GHz)	Antenna Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Safe Distance @ 1mW/cm ² Limit(cm)	Minimum Separation Distance (cm)
2.4	12	15.85	24.00	753.6	30.83	30.83
5.8	14	25.11	21.12	388.26	27.85	27.85

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

Specification

Maximum Permissible Exposure Limits

§15.247(i) Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency levels in excess of the Commission's guidelines.

FCC §1.1310 Limit = 1mW / cm² from 1.310 Table 1

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

Laboratory Measurement Uncertainty for Power Measurements

Measurement uncertainty	±1.33 dB
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5.1.5. Conducted Spurious Emissions

FCC, Part 15 Subpart C §15.247(d); 15.205; 15.209

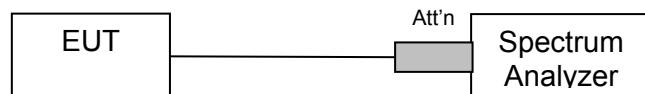
Industry Canada RSS-210 §A8.5, §2.2

Industry Canada RSS-Gen 4.7

Test Procedure

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

Test Measurement Set up



Band-edge measurement test configuration

Measurement Results of Conducted Spurious Emissions

Ambient conditions.

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

Radio Parameters

Duty Cycle: 100%

Output: Modulated Carrier

Power: Maximum Default Power

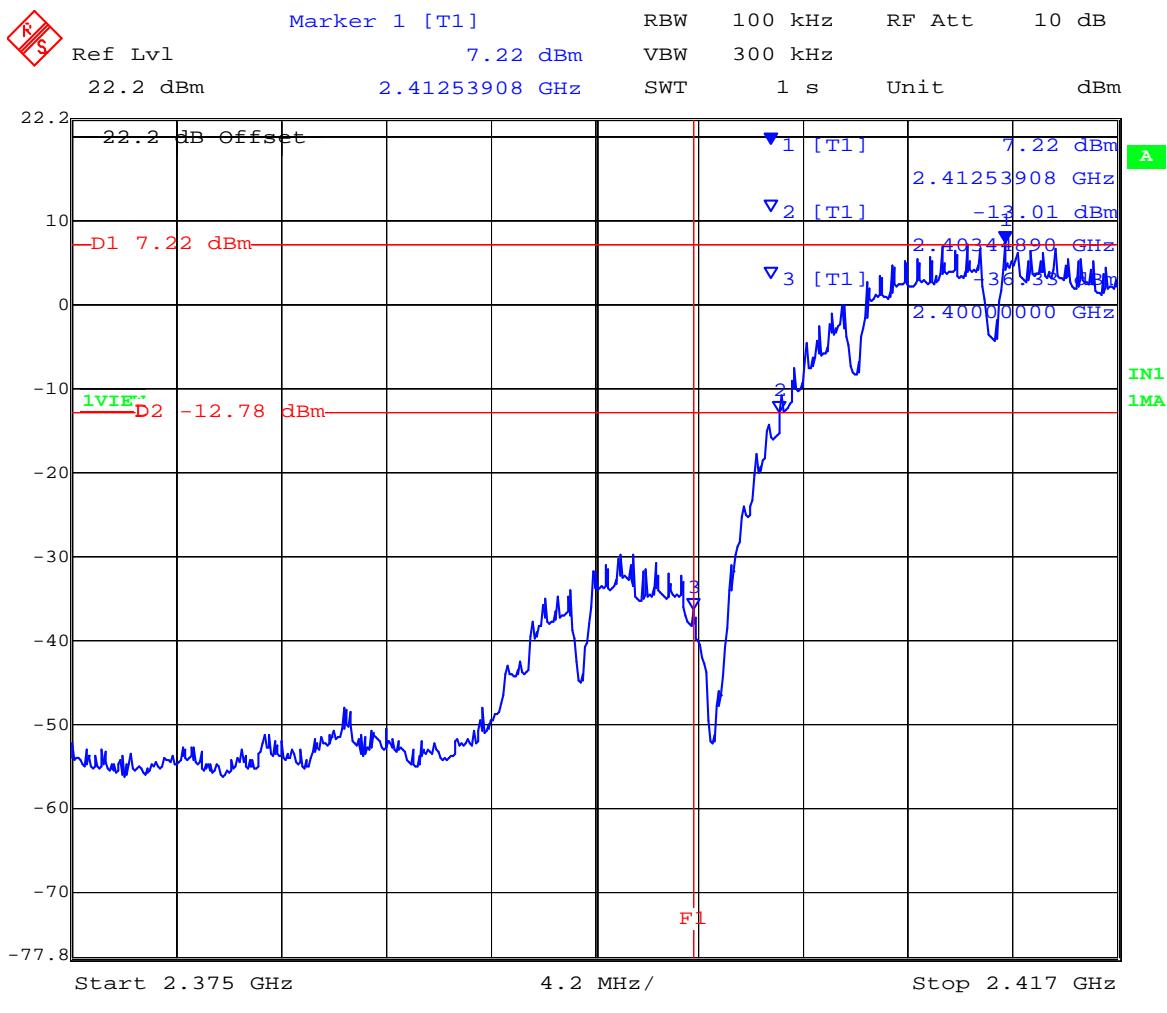
Conducted Band-Edge Results

Measurements were performed with the transmitter tuned to the channel closest to the band-edge being measured. All emissions were maximized during measurement. Limits which were derived from the band-edge measurements provided below are drawn on each plot.

TABLE OF RESULTS – 802.11b – Legacy

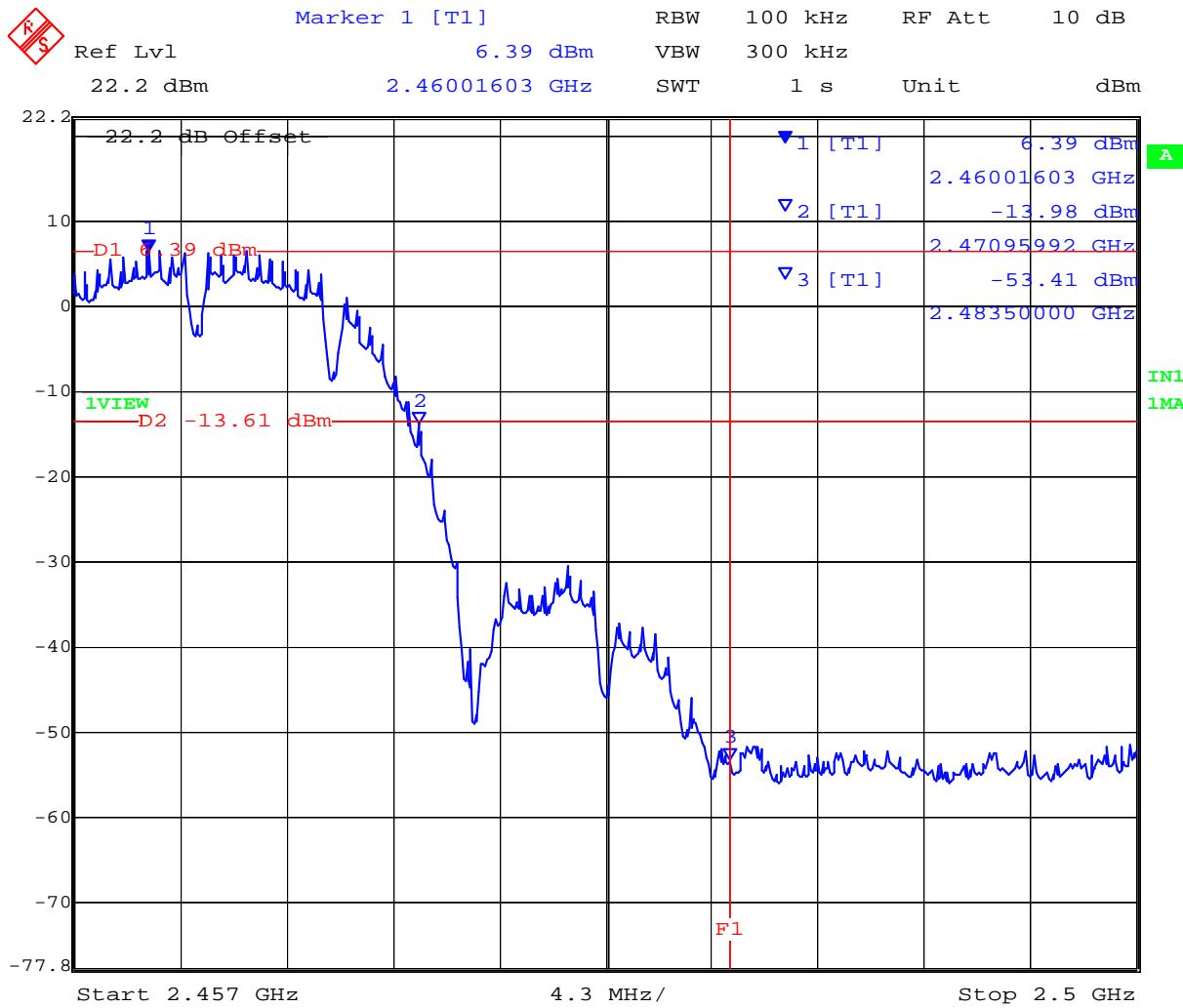
Center Frequency (MHz)	Band edge Frequency (MHz)	Limit (20 dB below peak of fundamental)	Amplitude @ Band edge (dBm)	Margin (dB)
2,412	2,400	-12.78	-36.33	-23.55
2,462	2,483.5	-13.61	-53.41	-39.80

Legacy - Conducted Spurious Emissions at the 2,400 MHz Band Edge



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Conducted Spurious Emissions at the 2,483.5 MHz Band Edge



Date: 7.NOV.2007 19:06:15

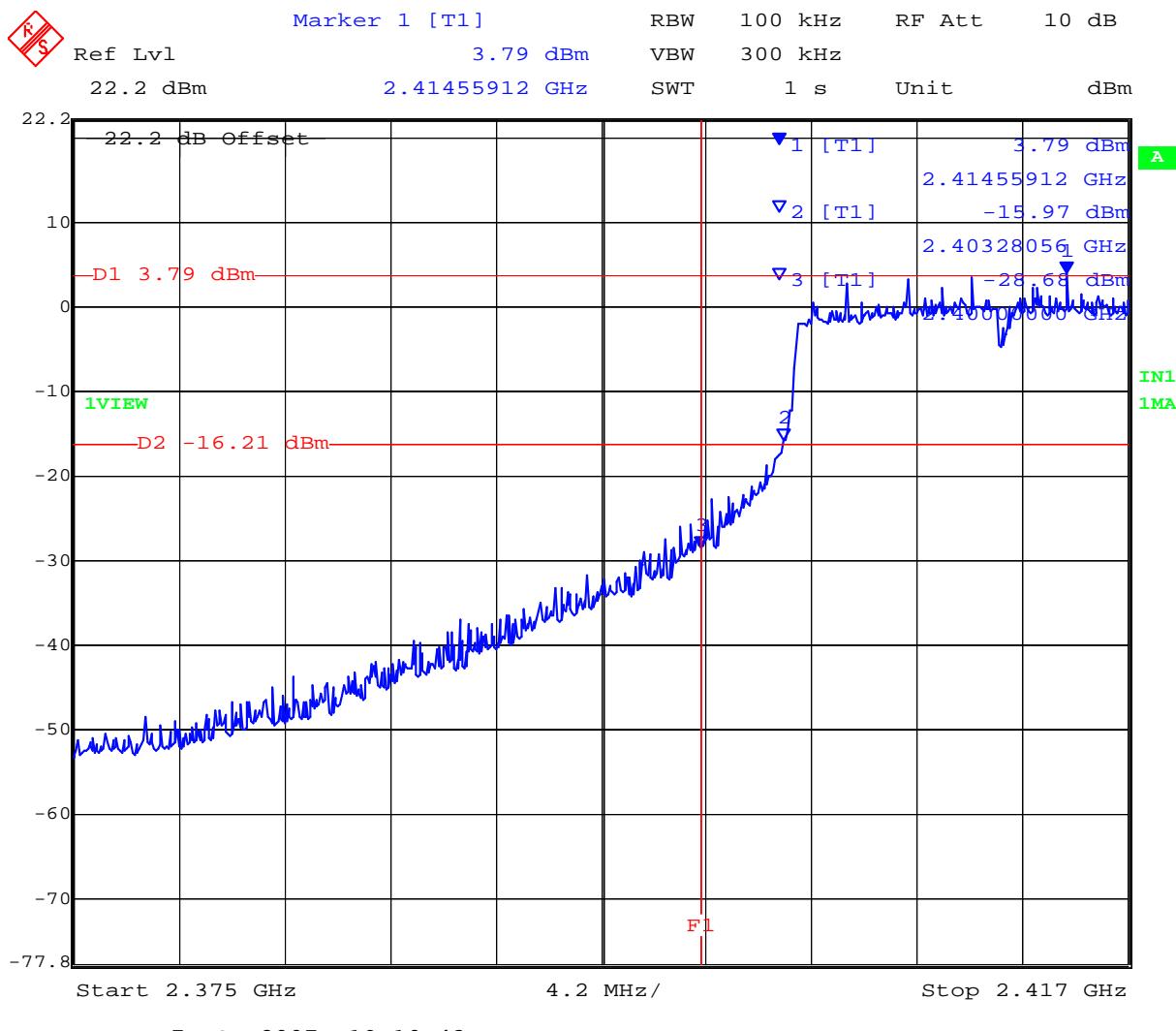
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Conducted Band-Edge Results

TABLE OF RESULTS – 802.11g – Legacy

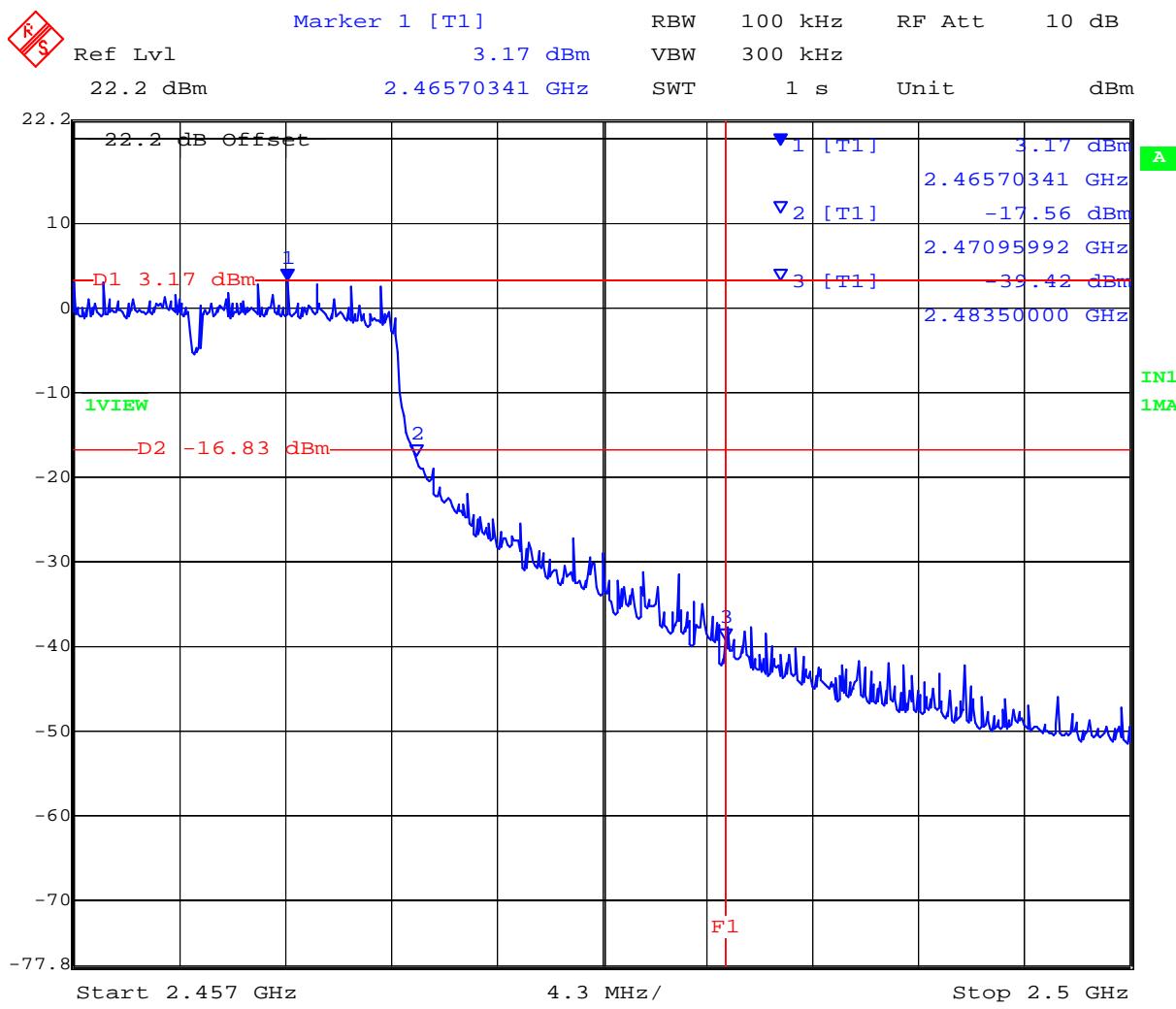
Center Frequency (MHz)	Band edge Frequency (MHz)	Limit (20 dB below peak of fundamental)	Amplitude @ Band edge (dBm)	Margin (dB)
2,412	2,400	-16.21	-28.68	-12.47
2,462	2,483.5	-16.83	-39.42	-22.59

Conducted Spurious Emissions at the 2,400 MHz Band Edge



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Conducted Spurious Emissions at the 2,483.5 MHz Band Edge



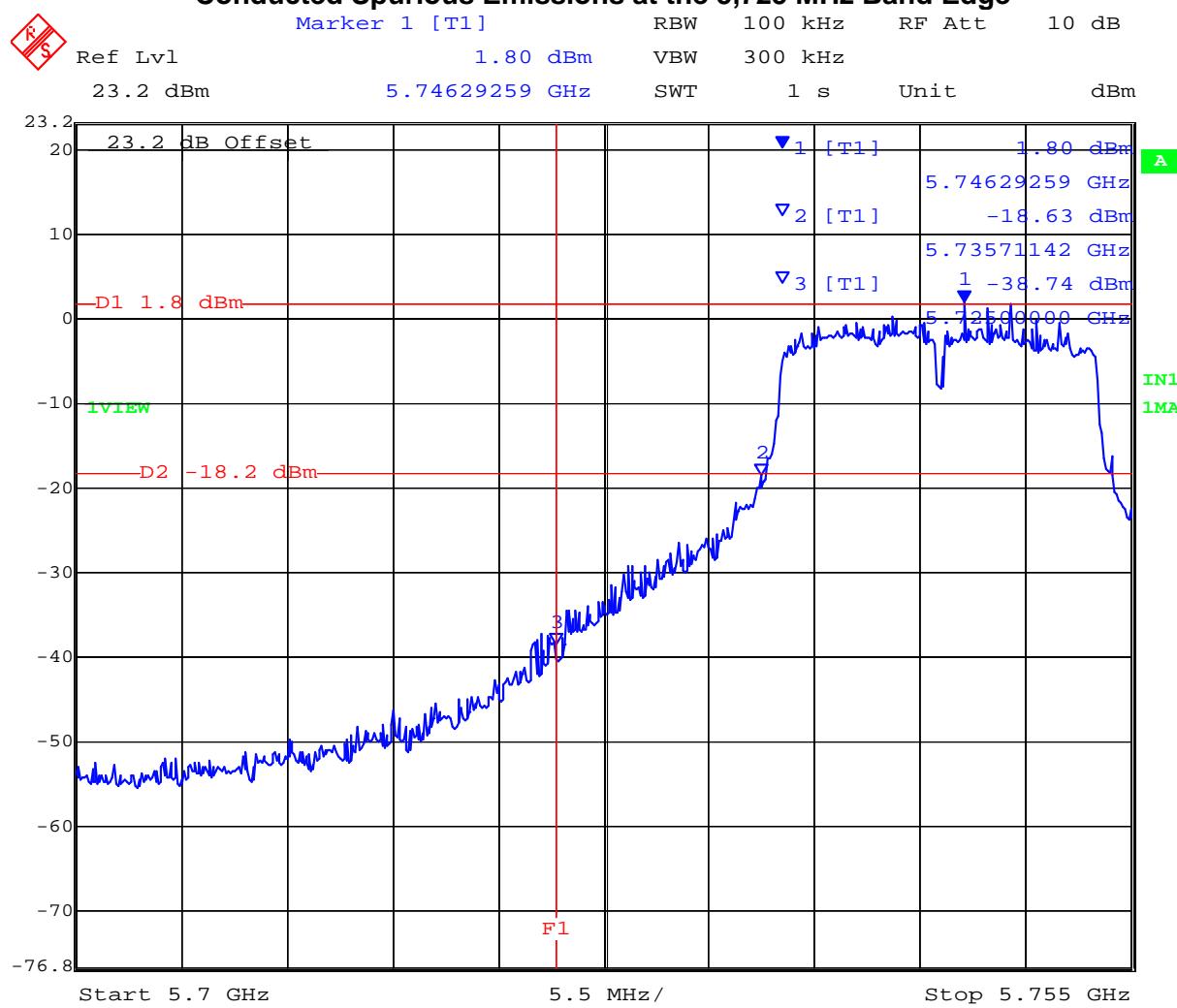
Date: 7.NOV.2007 19:13:40

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TABLE OF RESULTS – 802.11a – Legacy

Center Frequency (MHz)	Band edge Frequency (MHz)	Limit (20 dB below peak of fundamental)	Amplitude @ Band edge (dBm)	Margin (dB)
5,745	5,725	-18.20	-38.74	-20.54
5,825	5,850	-20.18	-47.11	-26.93

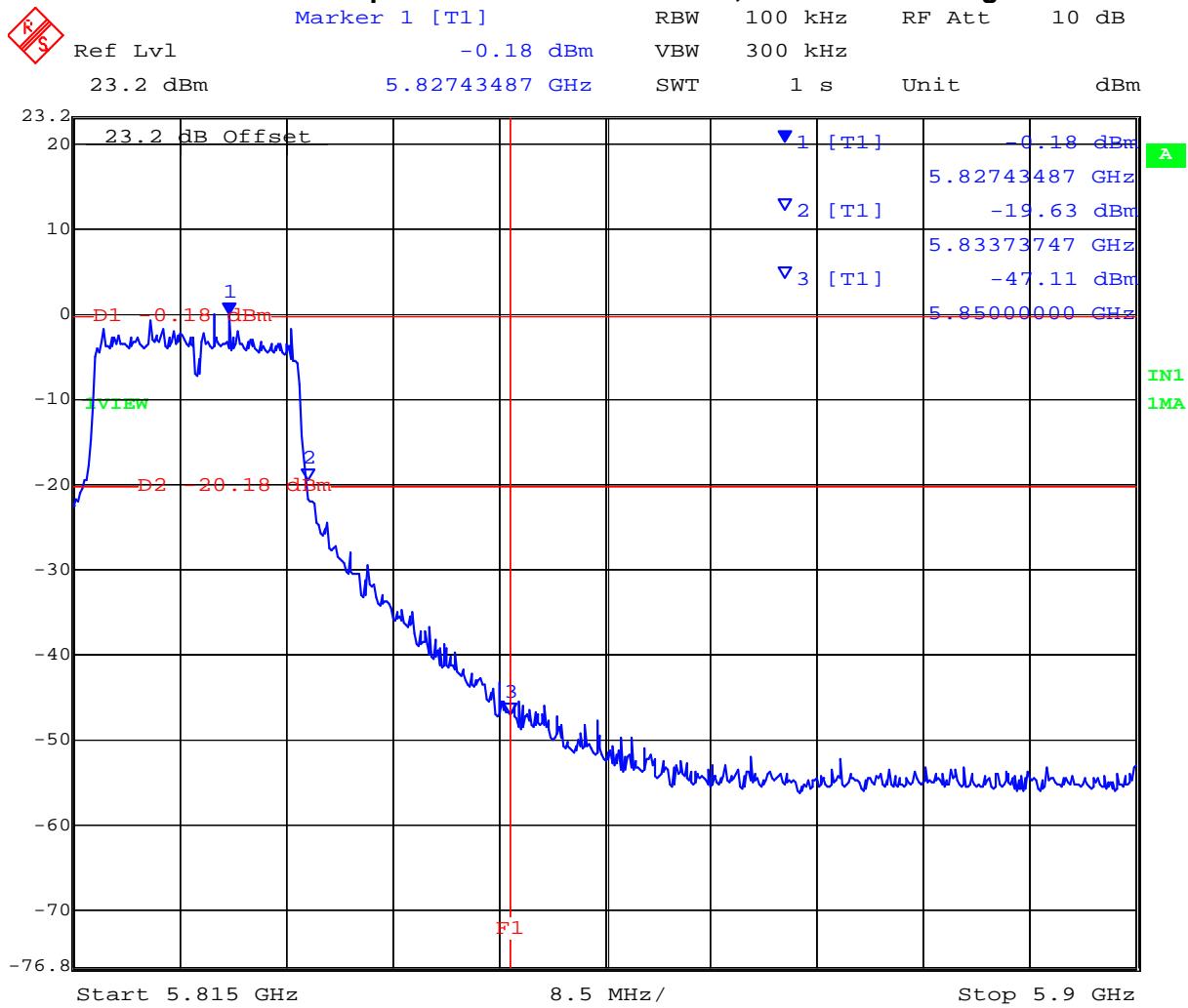
Conducted Spurious Emissions at the 5,725 MHz Band Edge



Date: 8.NOV.2007 15:47:49

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Conducted Spurious Emissions at the 5,850 MHz Band Edge



Date: 8.NOV.2007 15:44:07

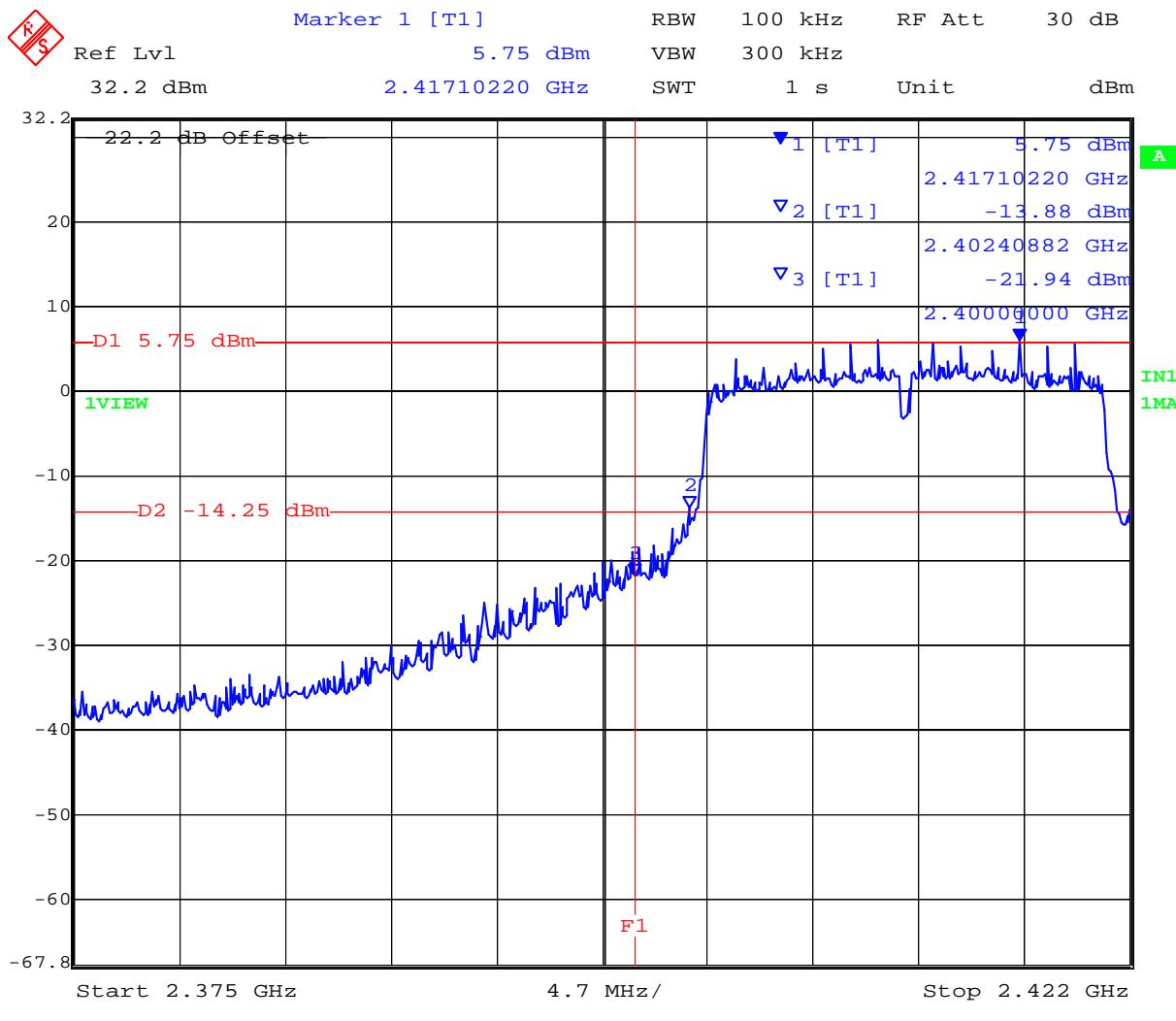
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Conducted Band-Edge Results

TABLE OF RESULTS – 802.11n – HT-20

Center Frequency (MHz)	Band edge Frequency (MHz)	Limit (20 dB below peak of fundamental)	Amplitude @ Band edge (dBm)	Margin (dB)
2,412	2,400	-14.25	-21.94	-7.69
2,462	2,483.5	-14.94	-33.16	-18.22

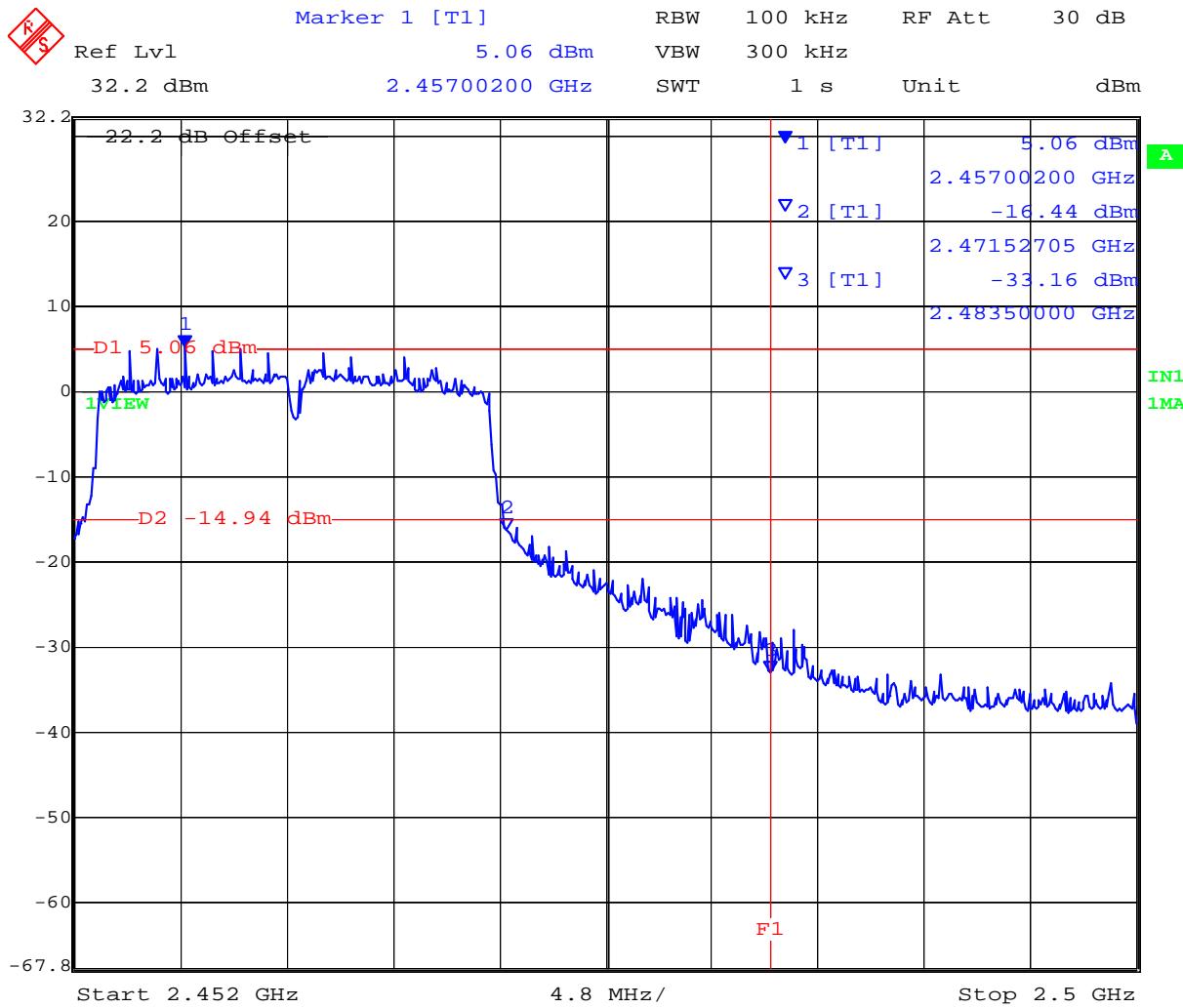
Conducted Spurious Emissions at the 2,400 MHz Band Edge



Date: 8.NOV.2007 10:16:22

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Conducted Spurious Emissions at the 2,483.5 MHz Band Edge



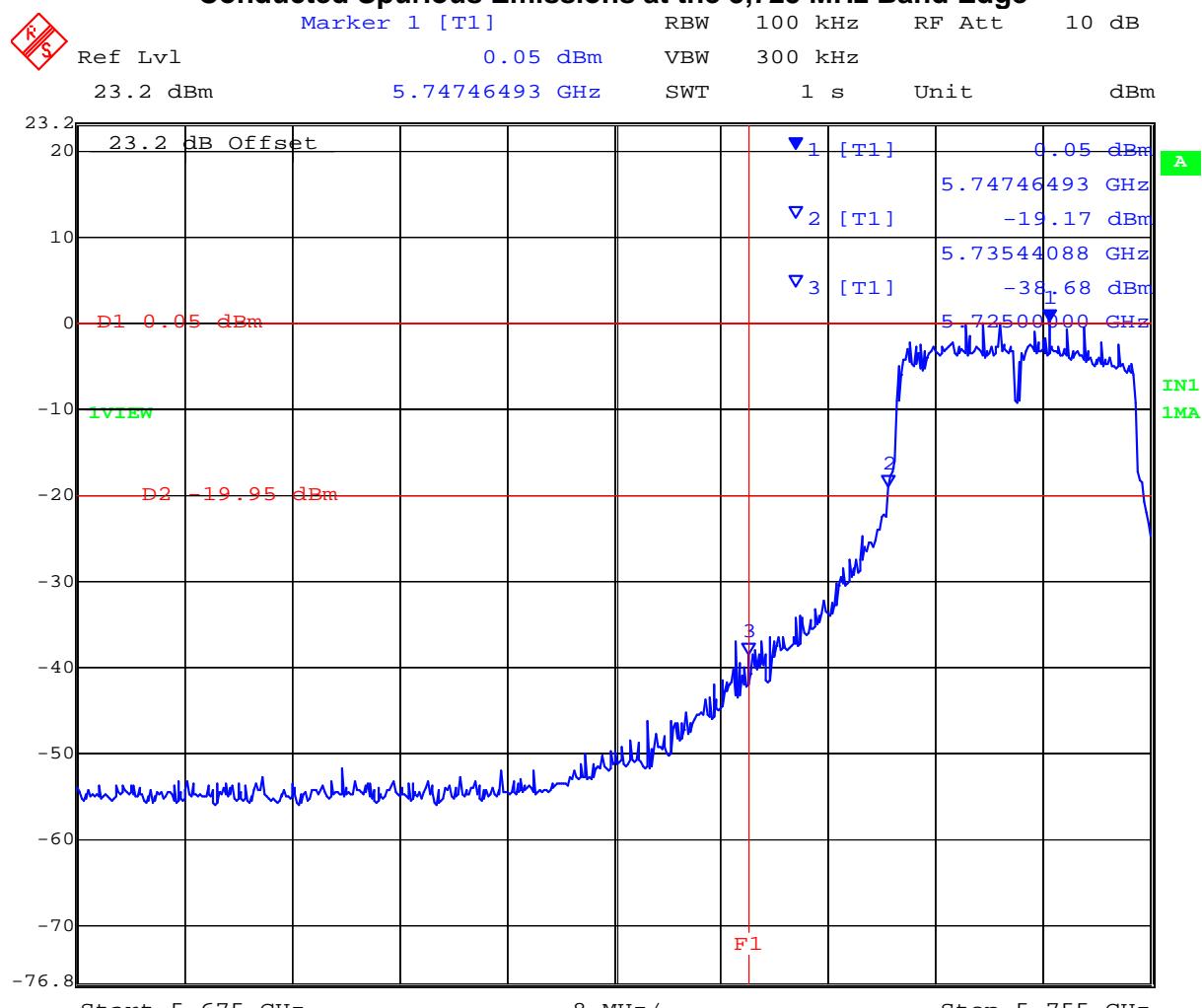
Date: 8.NOV.2007 10:19:39

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TABLE OF RESULTS – 802.11n – HT-20

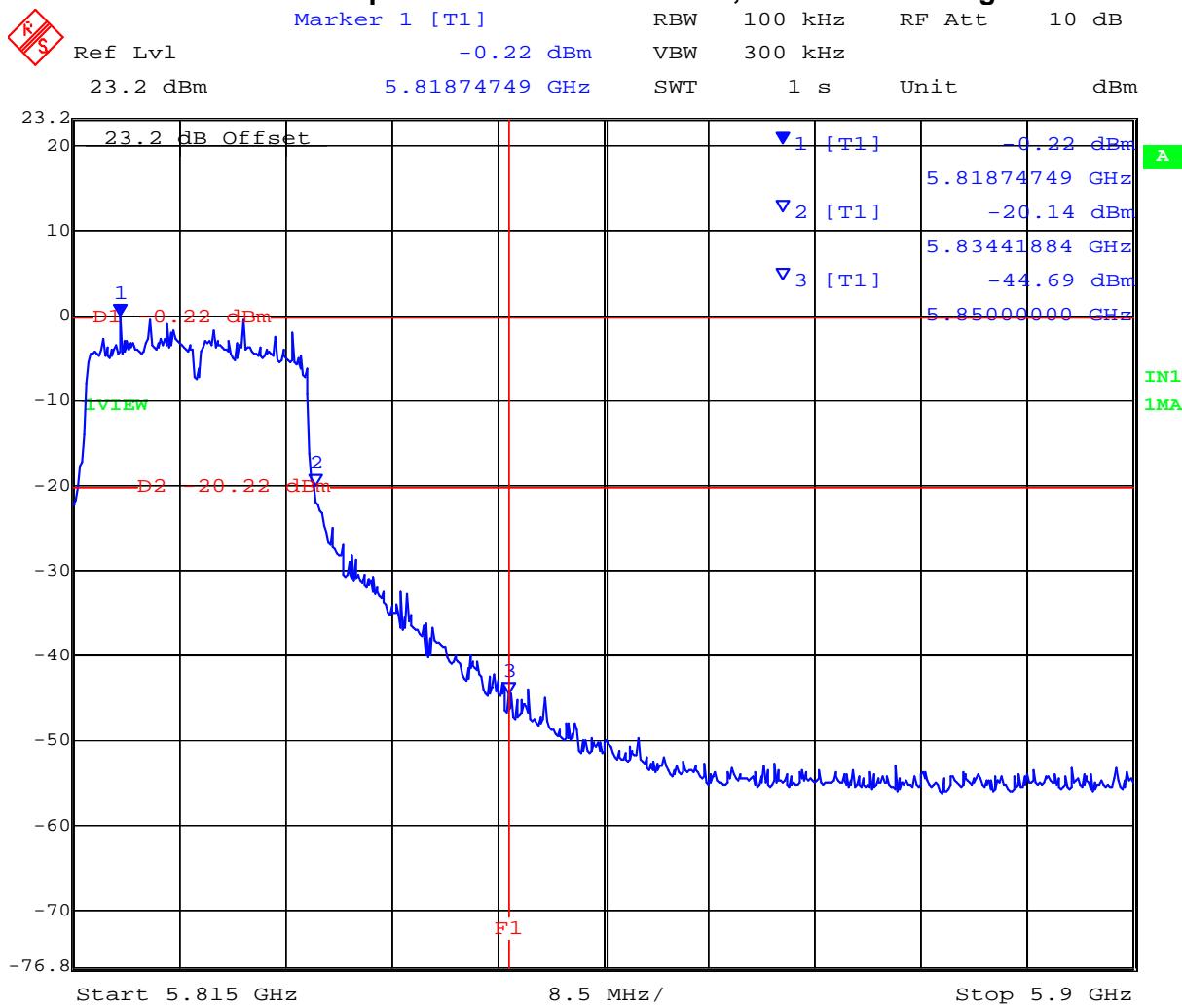
Center Frequency (MHz)	Band edge Frequency (MHz)	Limit (20 dB below peak of fundamental)	Amplitude @ Band edge (dBm)	Margin (dB)
5,745	5,725	-19.95	-38.68	-18.73
5,825	5,850	-20.22	-44.69	-24.47

Conducted Spurious Emissions at the 5,725 MHz Band Edge



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Conducted Spurious Emissions at the 5,850 MHz Band Edge



Date: 8.NOV.2007 16:49:54

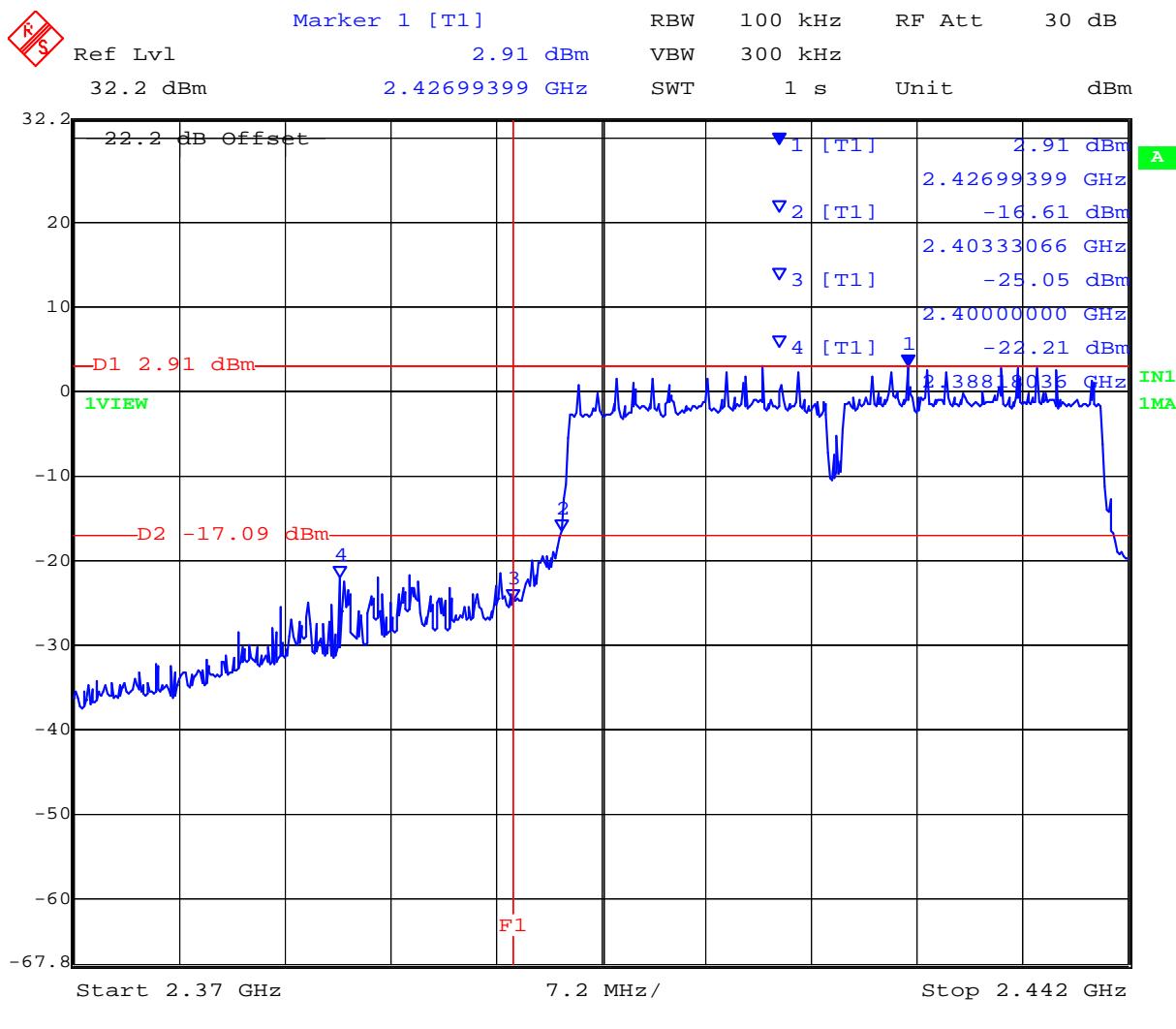
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Conducted Band-Edge Results

TABLE OF RESULTS – 802.11n – HT-40

Center Frequency (MHz)	Band edge Frequency (MHz)	Limit (20 dB below peak of fundamental)	Amplitude @ Band edge (dBm)	Margin (dB)
2,422	2,400	-17.09	-25.05	-7.96
2,452	2,483.5	-17.34	-26.20	-8.86

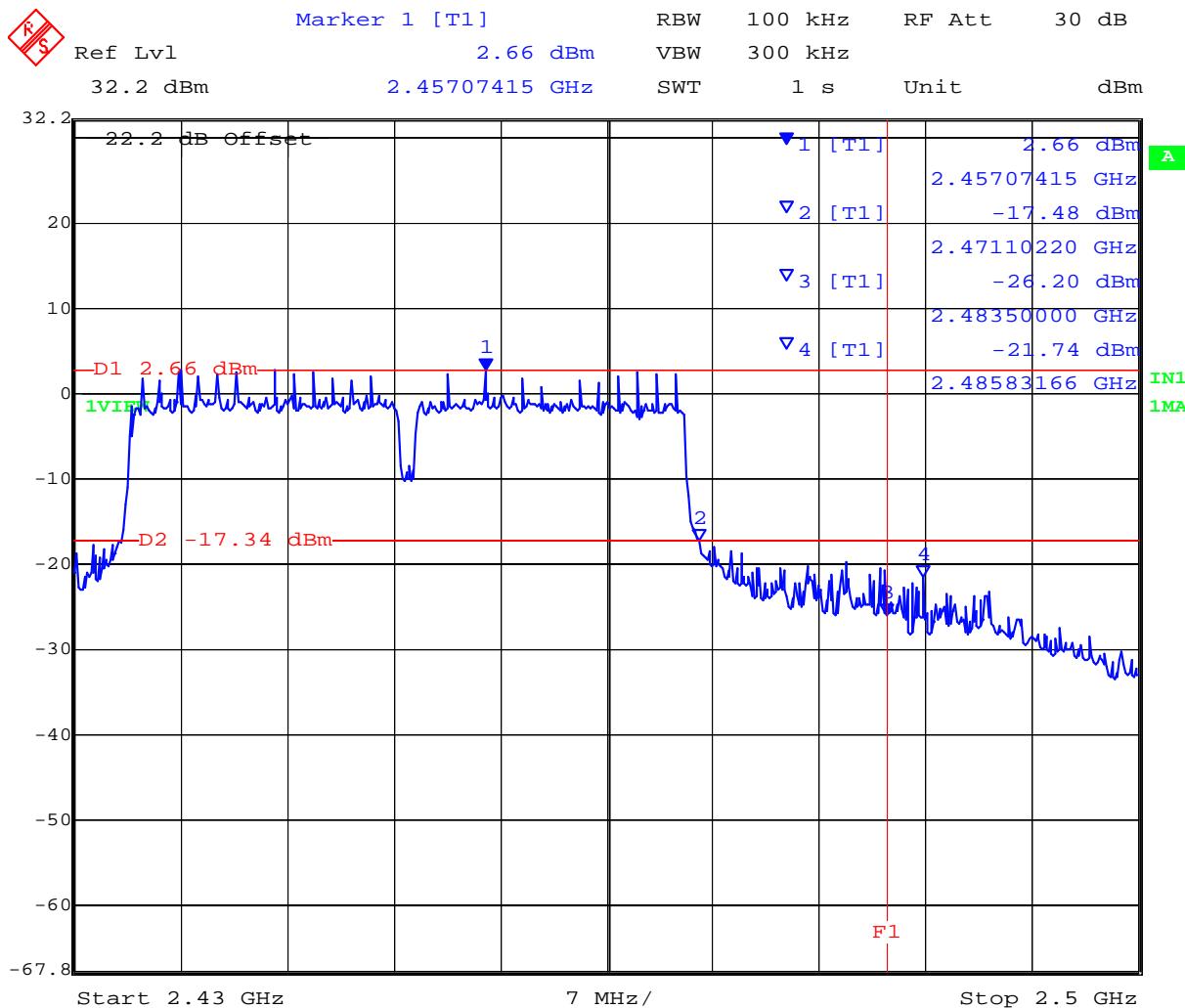
Conducted Spurious Emissions at the 2,400 MHz Band Edge



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Conducted Spurious Emissions at the 2,483.5 MHz Band Edge



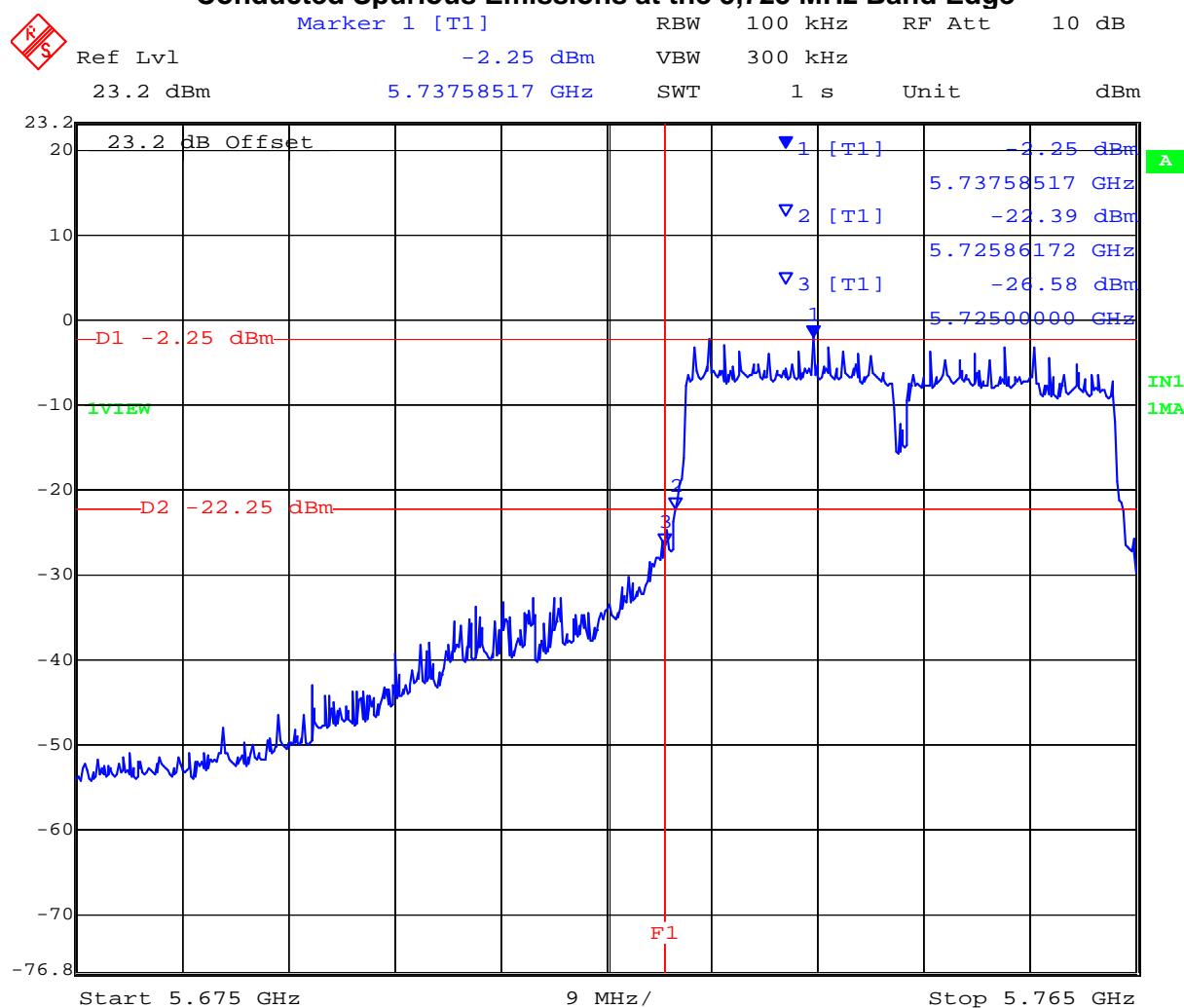
Date: 8.NOV.2007 12:09:39

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TABLE OF RESULTS – 802.11n – HT-40

Center Frequency (MHz)	Band edge Frequency (MHz)	Limit (20 dB below peak of fundamental)	Amplitude @ Band edge (dBm)	Margin (dB)
5,745	5,725	-22.25	-26.58	-4.33
5,825	5,850	-22.55	-32.99	-10.44

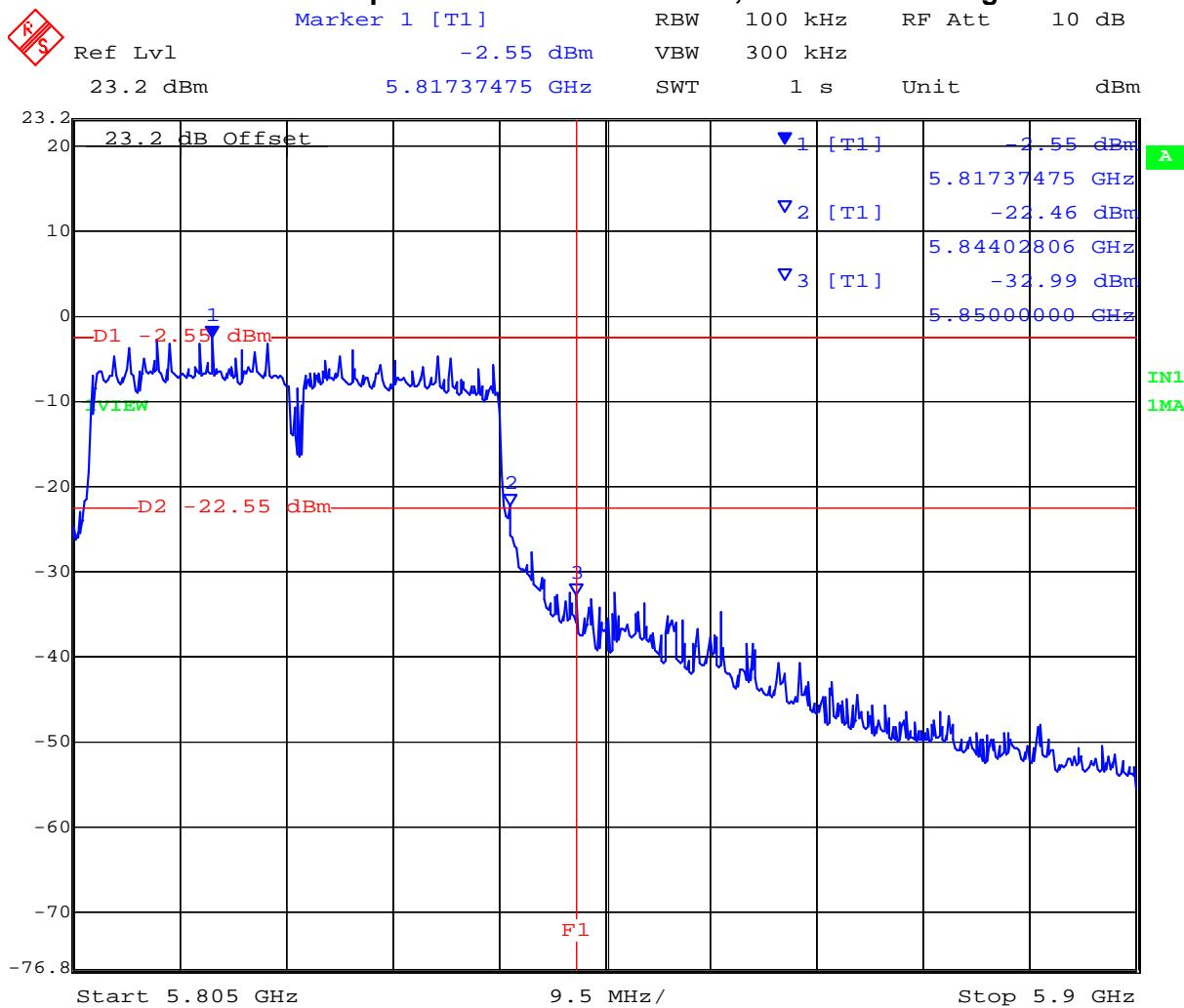
Conducted Spurious Emissions at the 5,725 MHz Band Edge



Date: 8.NOV.2007 17:52:14

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Conducted Spurious Emissions at the 5,850 MHz Band Edge



Date: 8.NOV.2007 17:56:16

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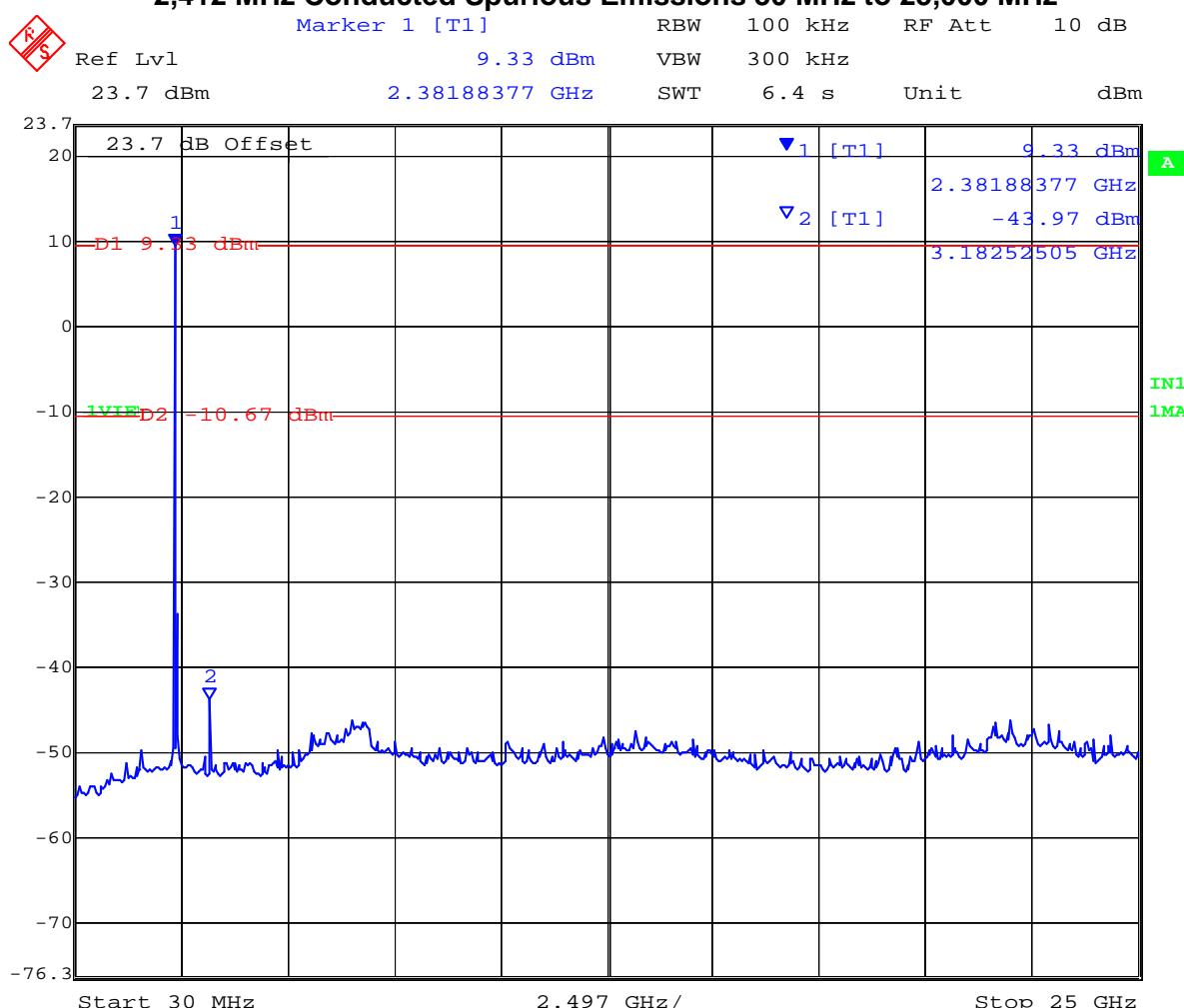
Spurious Emissions (30 - 25,000 MHz)

TABLE OF RESULTS – 802.11b – Legacy

Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
2,412	30	25,000	-43.97	-10.67	-33.30

802.11b – Legacy

2,412 MHz Conducted Spurious Emissions 30 MHz to 25,000 MHz



Date: 12.NOV.2007 20:49:13

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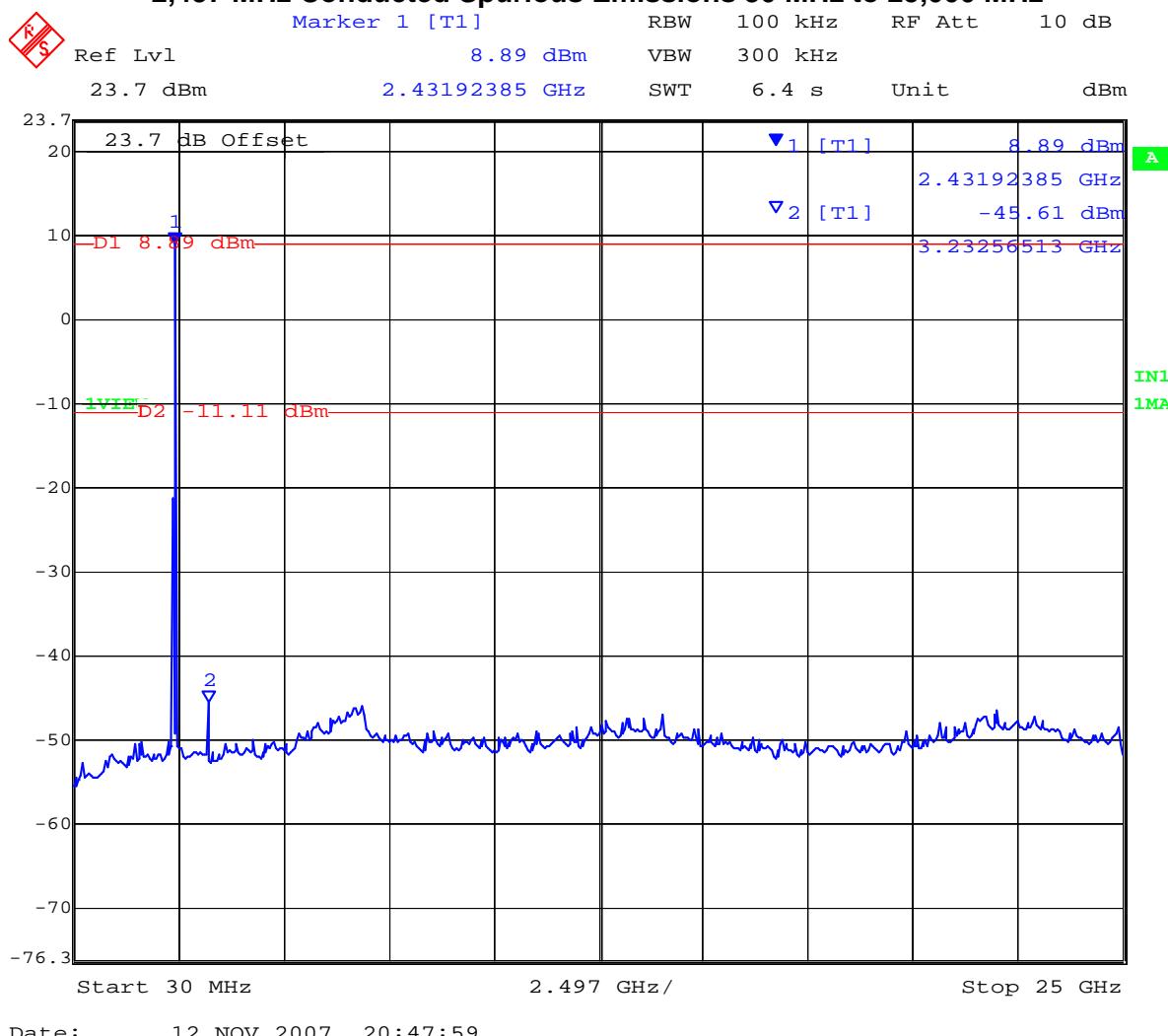
Spurious Emissions (30 - 25,000 MHz)

TABLE OF RESULTS – 802.11b – Legacy

Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
2,437	30	25,000	-45.61	-11.11	-34.50

802.11b – Legacy

2,437 MHz Conducted Spurious Emissions 30 MHz to 25,000 MHz



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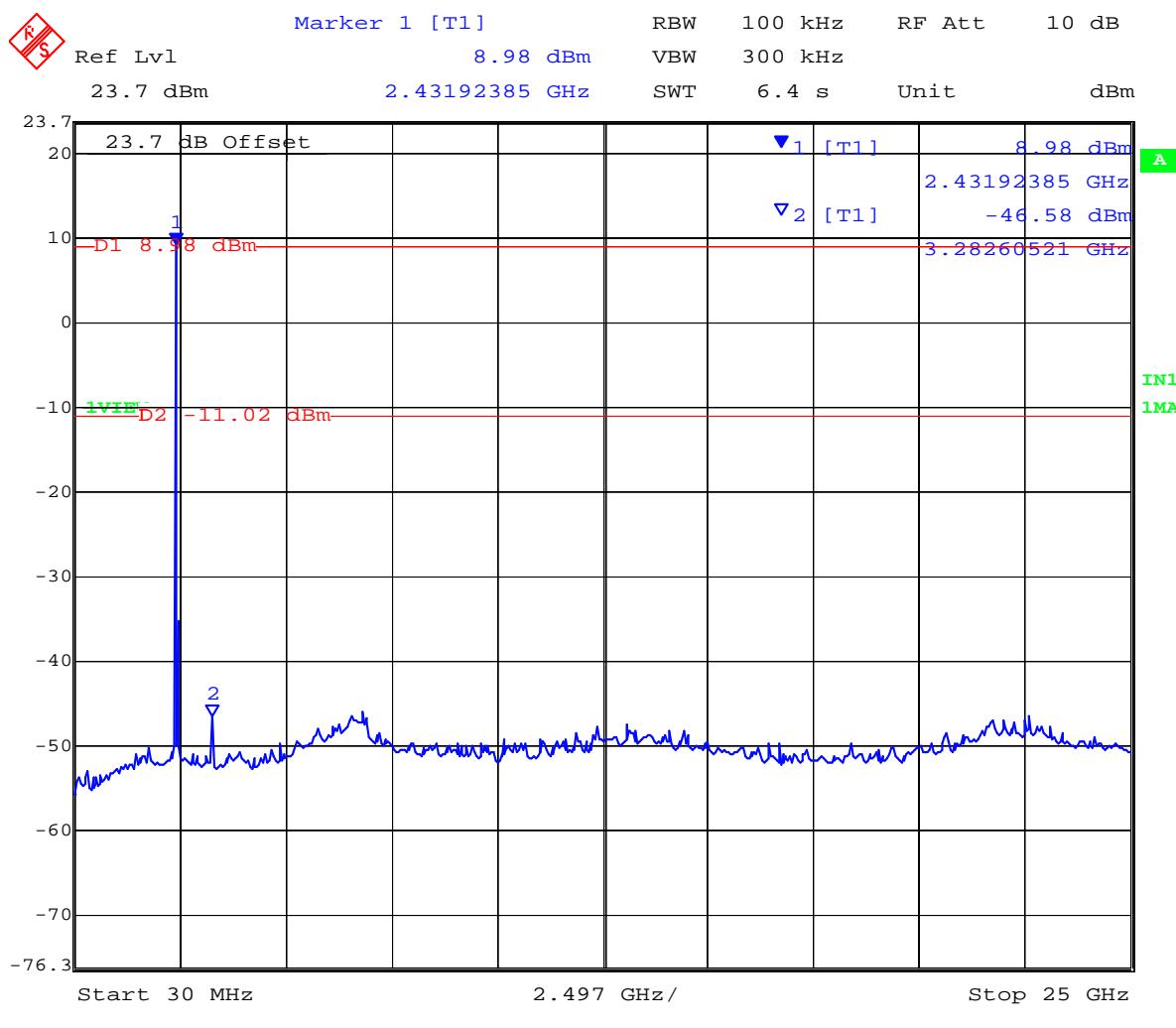
Spurious Emissions (30 - 25,000 MHz)

TABLE OF RESULTS – 802.11b – Legacy

Channel Centre Frequency (MHz)	Start Frequency(MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
2,462	30	25,000	-46.58	-11.02	-35.56

802.11b – Legacy

2,462 MHz Conducted Spurious Emissions 30 MHz to 25,000 MHz



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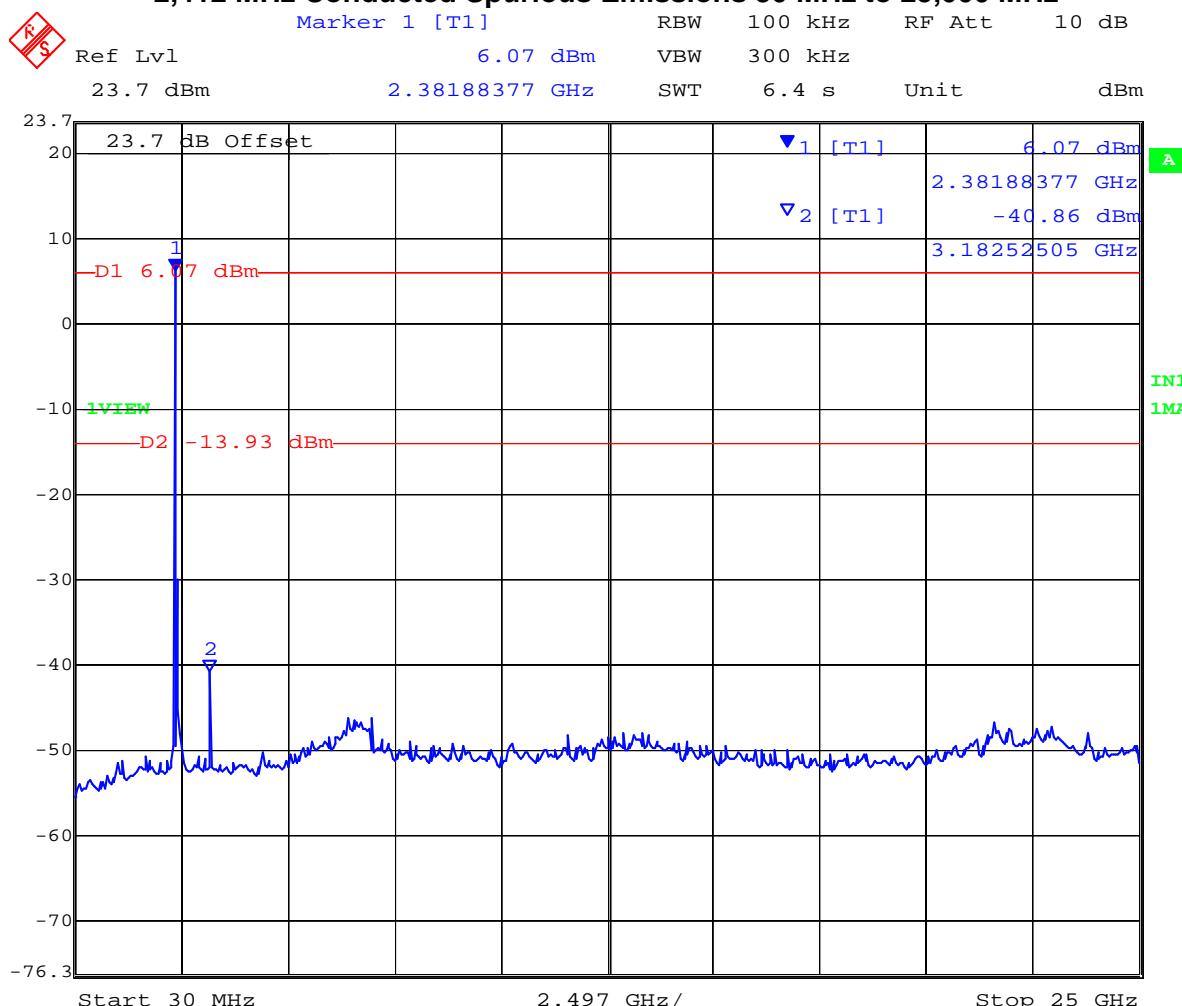
Spurious Emissions (30 - 25,000 MHz)

TABLE OF RESULTS – 802.11g – Legacy

Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
2,412	30	25,000	-40.86	-13.93	-26.93

802.11g – Legacy

2,412 MHz Conducted Spurious Emissions 30 MHz to 25,000 MHz



Date: 12.NOV.2007 20:41:04

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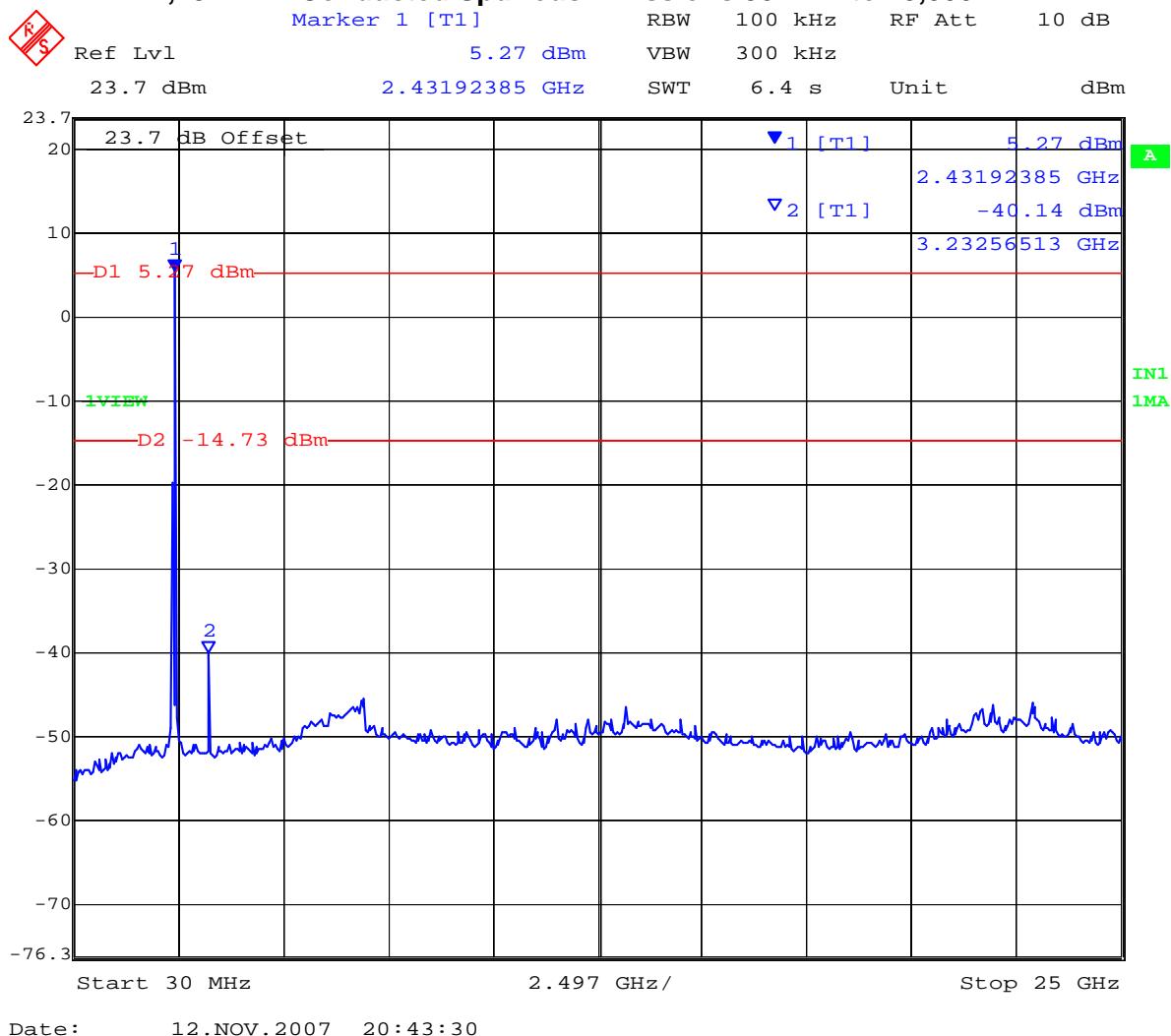
Spurious Emissions (30 - 25,000 MHz)

TABLE OF RESULTS – 802.11g – Legacy

Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
2,437	30	25,000	-40.14	-14.73	-25.41

802.11g – Legacy

2,437 MHz Conducted Spurious Emissions 30 MHz to 25,000 MHz



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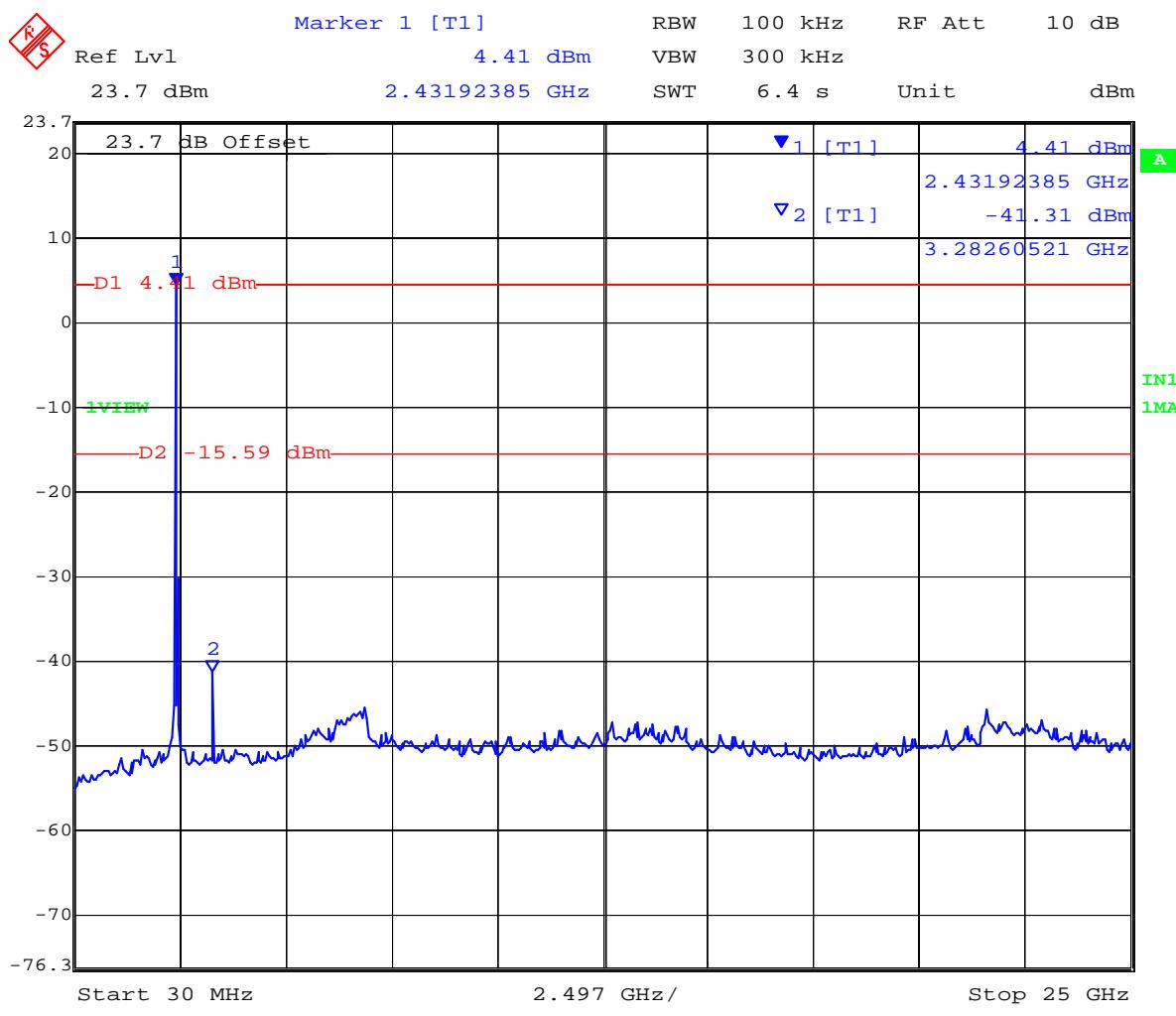
Spurious Emissions (30 - 25,000 MHz)

TABLE OF RESULTS – 802.11g – Legacy

Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
2,462	30	25,000	-41.31	-15.59	-25.72

802.11g – Legacy

2,462 MHz Conducted Spurious Emissions 30 MHz to 25,000 MHz



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Spurious Emissions (30 - 40,000 MHz)

TABLE OF RESULTS – 802.11a – Legacy

Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
5,745	30	40,000	-37.23	-18.81	-18.42

802.11a – Legacy

5,745 MHz Conducted Spurious Emissions 30 MHz to 40,000 MHz



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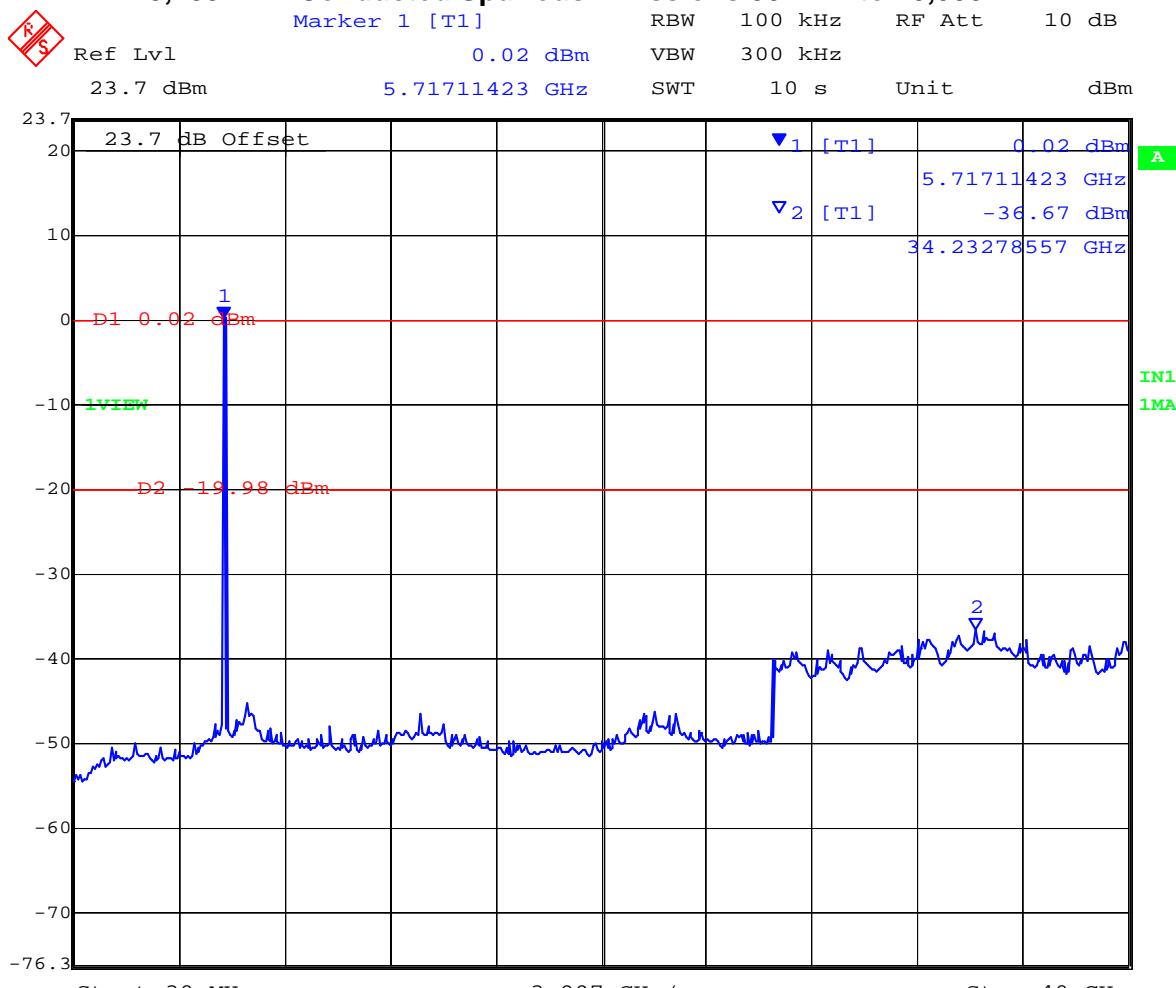
Spurious Emissions (30 - 40,000 MHz)

TABLE OF RESULTS – 802.11a – Legacy

Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
5,785	30	40,000	-36.67	-19.98	-16.69

802.11a – Legacy

5,785 MHz Conducted Spurious Emissions 30 MHz to 40,000 MHz



Date: 12.NOV.2007 21:28:42

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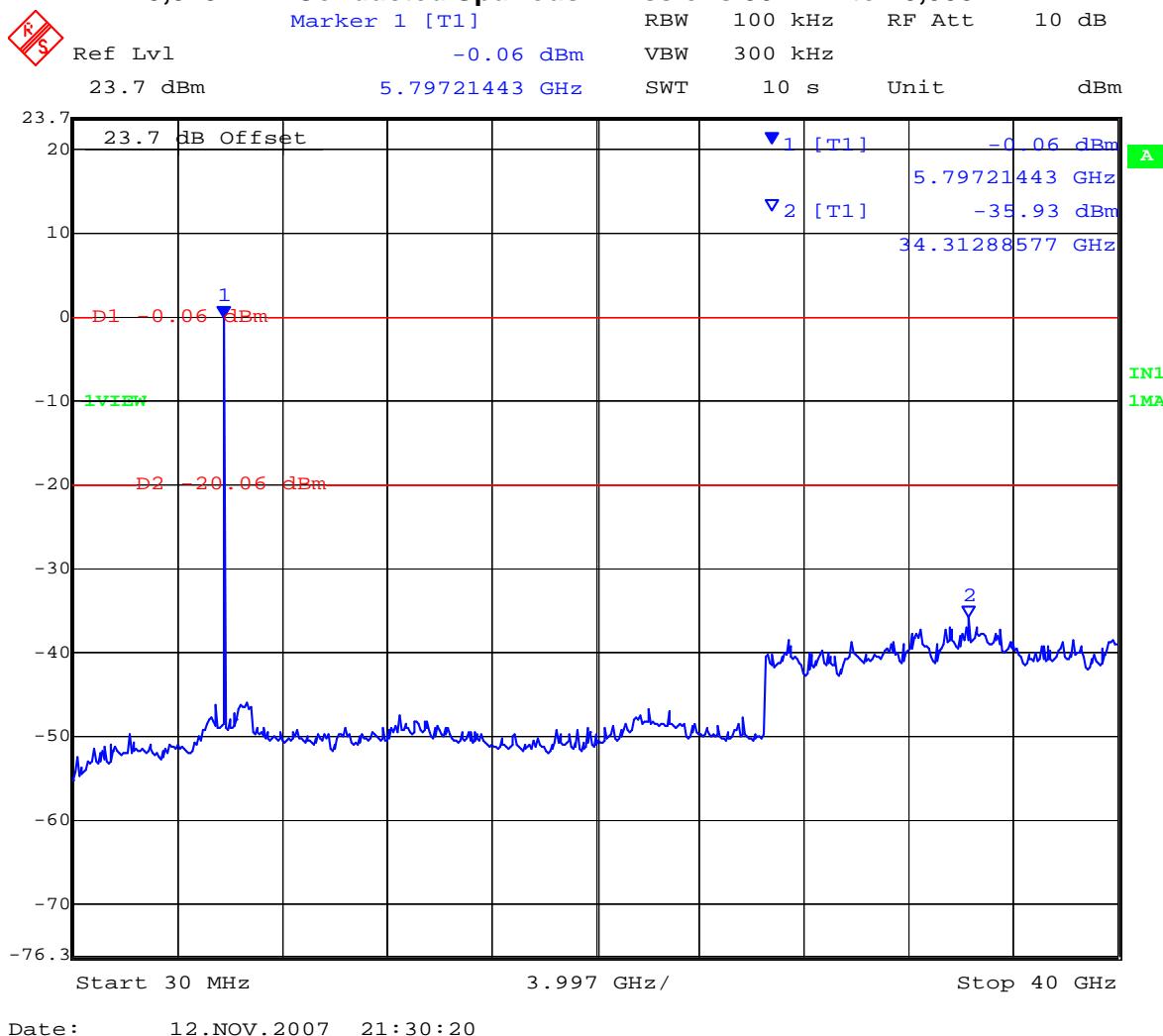
Spurious Emissions (30 - 40,000 MHz)

TABLE OF RESULTS – 802.11a – Legacy

Channel Centre Frequency (MHz)	Start Frequency(MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
5,825	30	40,000	-35.93	-20.06	-15.87

802.11a – Legacy

5,825 MHz Conducted Spurious Emissions 30 MHz to 40,000 MHz



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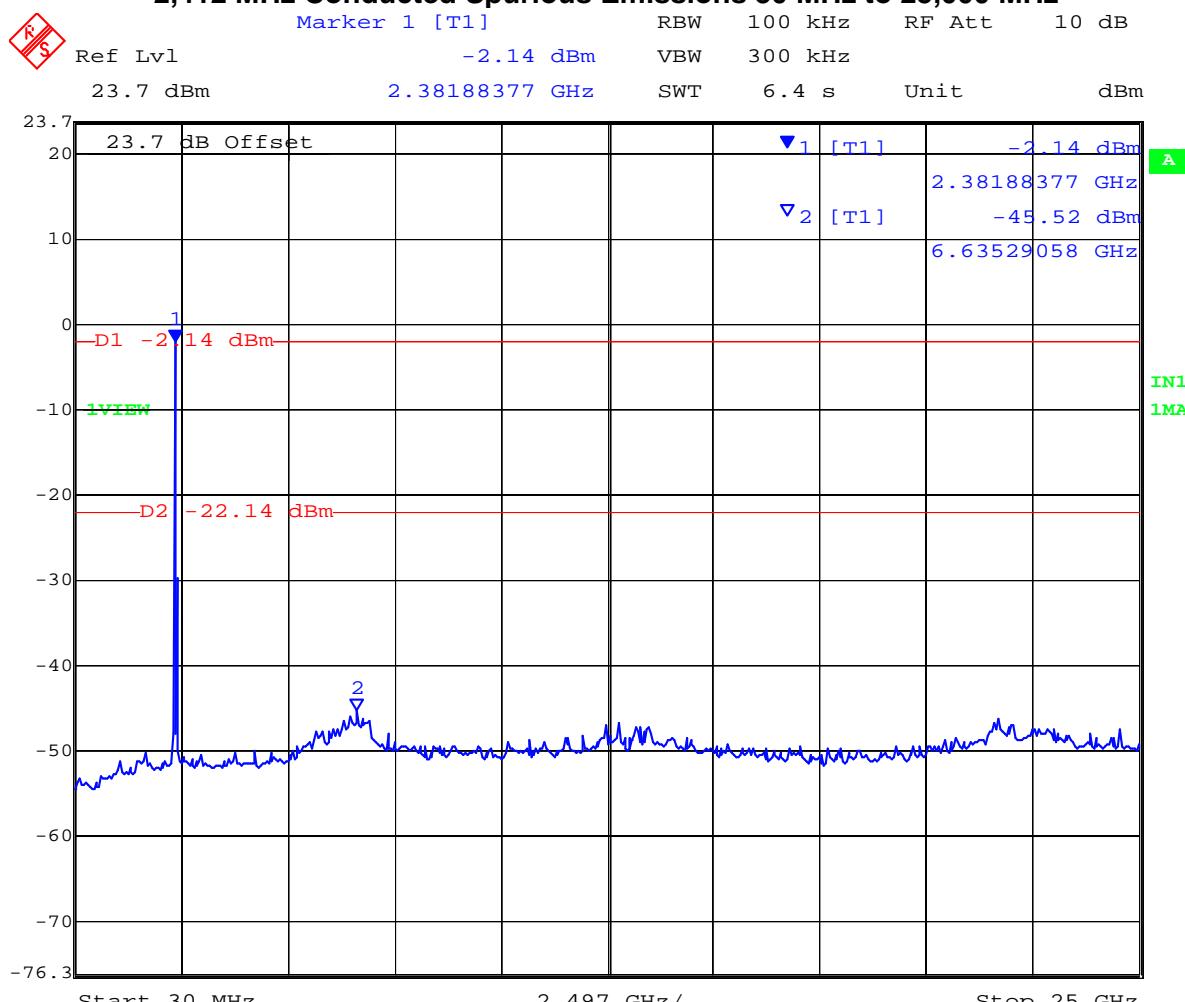
Spurious Emissions (30 - 25,000 MHz)

TABLE OF RESULTS – 802.11g – HT-20

Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
2,412	30	25,000	-45.52	-22.14	-23.38

802.11n – HT-20

2,412 MHz Conducted Spurious Emissions 30 MHz to 25,000 MHz



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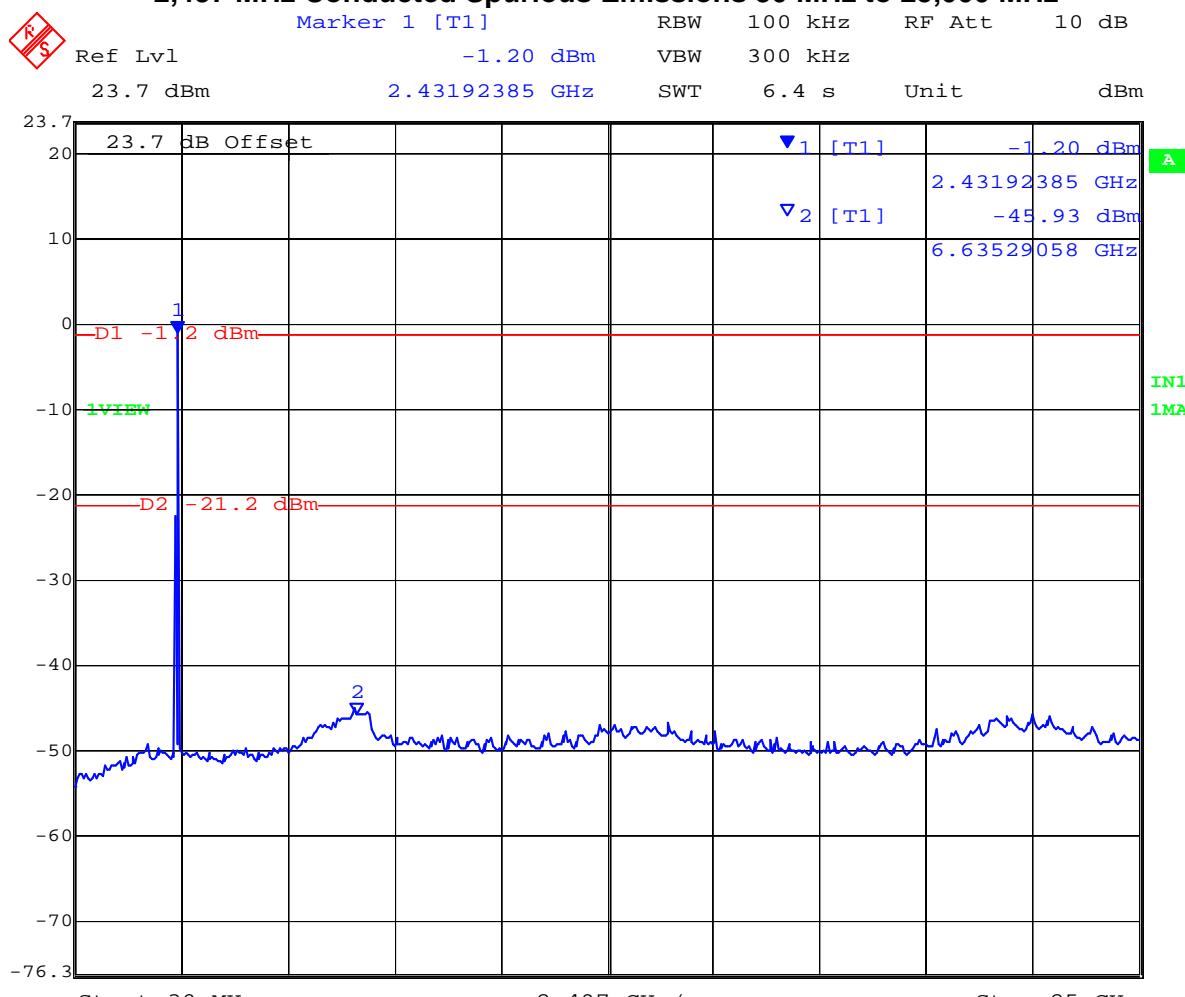
Spurious Emissions (30 - 25,000 MHz)

TABLE OF RESULTS – 802.11g – HT-20

Channel Centre Frequency (MHz)	Start Frequency(MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
2,437	30	25,000	-45.93	-21.20	-24.73

802.11n – HT-20

2,437 MHz Conducted Spurious Emissions 30 MHz to 25,000 MHz



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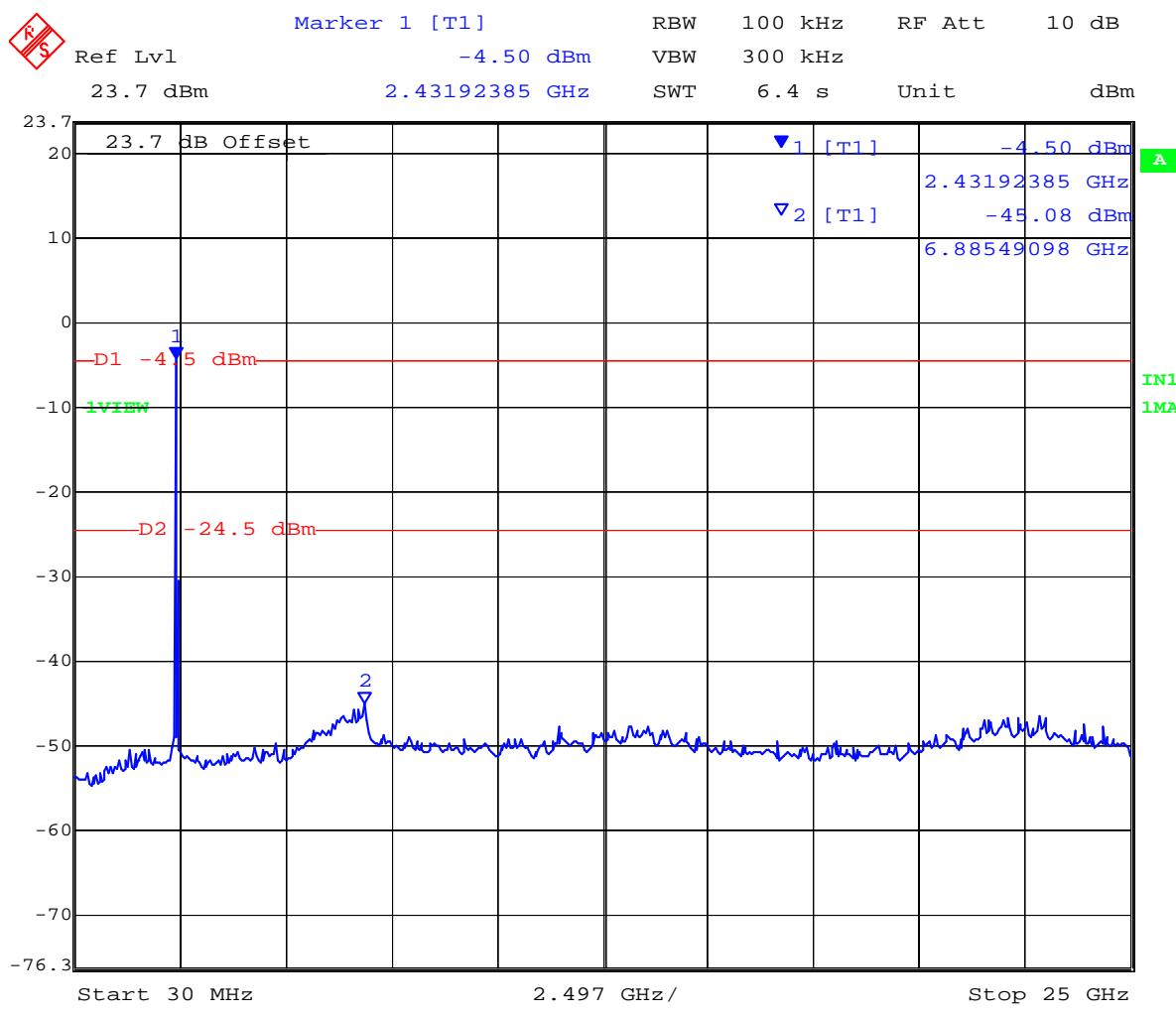
Spurious Emissions (30 - 25,000 MHz)

TABLE OF RESULTS – 802.11n – HT-20

Channel Centre Frequency (MHz)	Start Frequency(MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
2,462	30	25,000	-45.08	-24.50	-20.53

802.11n – HT-20

2,462 MHz Conducted Spurious Emissions 30 MHz to 25,000 MHz



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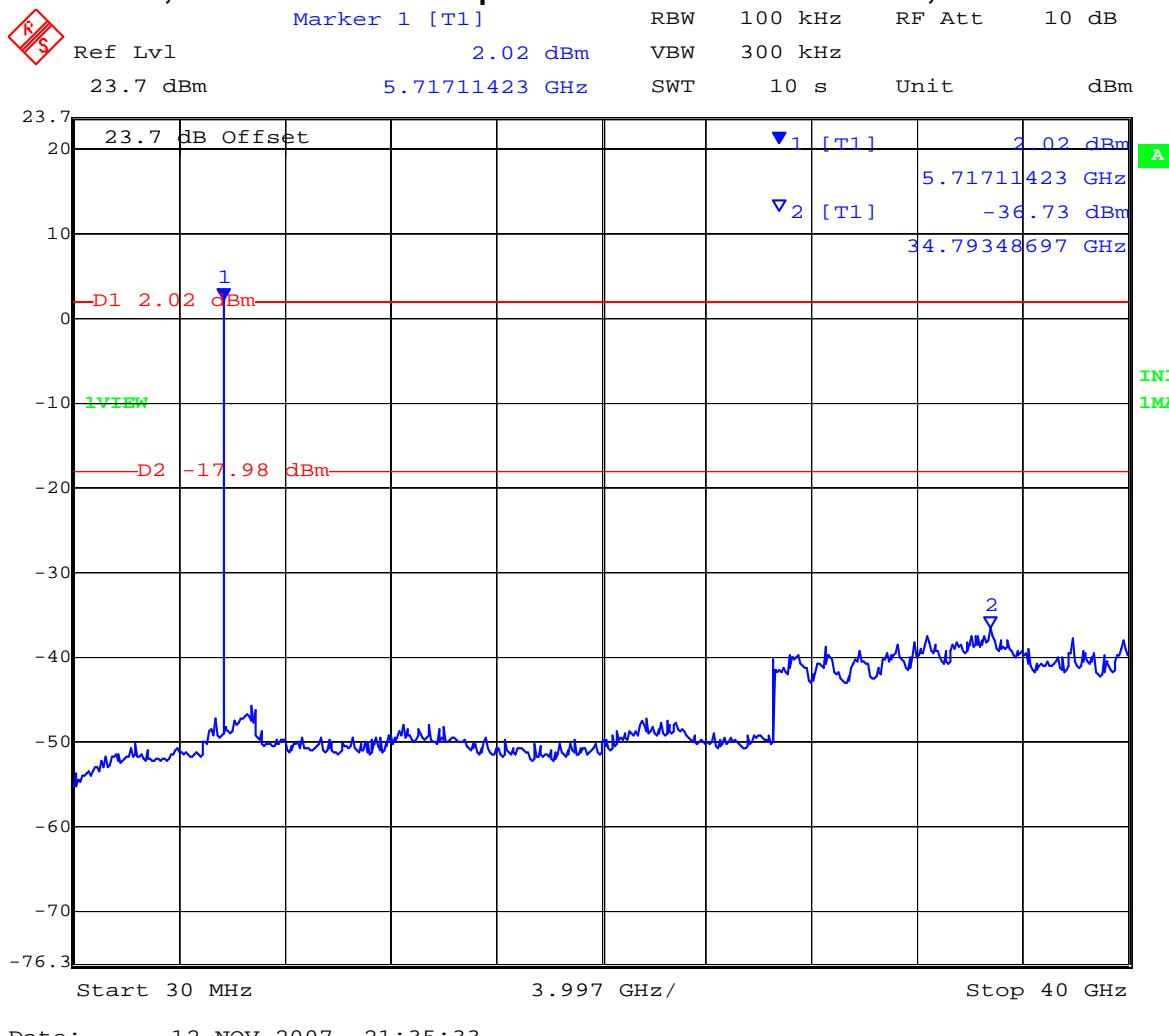
Spurious Emissions (30 - 40,000 MHz)

TABLE OF RESULTS – 802.11n – HT-20

Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
5,745	30	40,000	-36.73	-17.98	-18.75

802.11n – HT-20

5,745 MHz Conducted Spurious Emissions 30 MHz to 40,000 MHz



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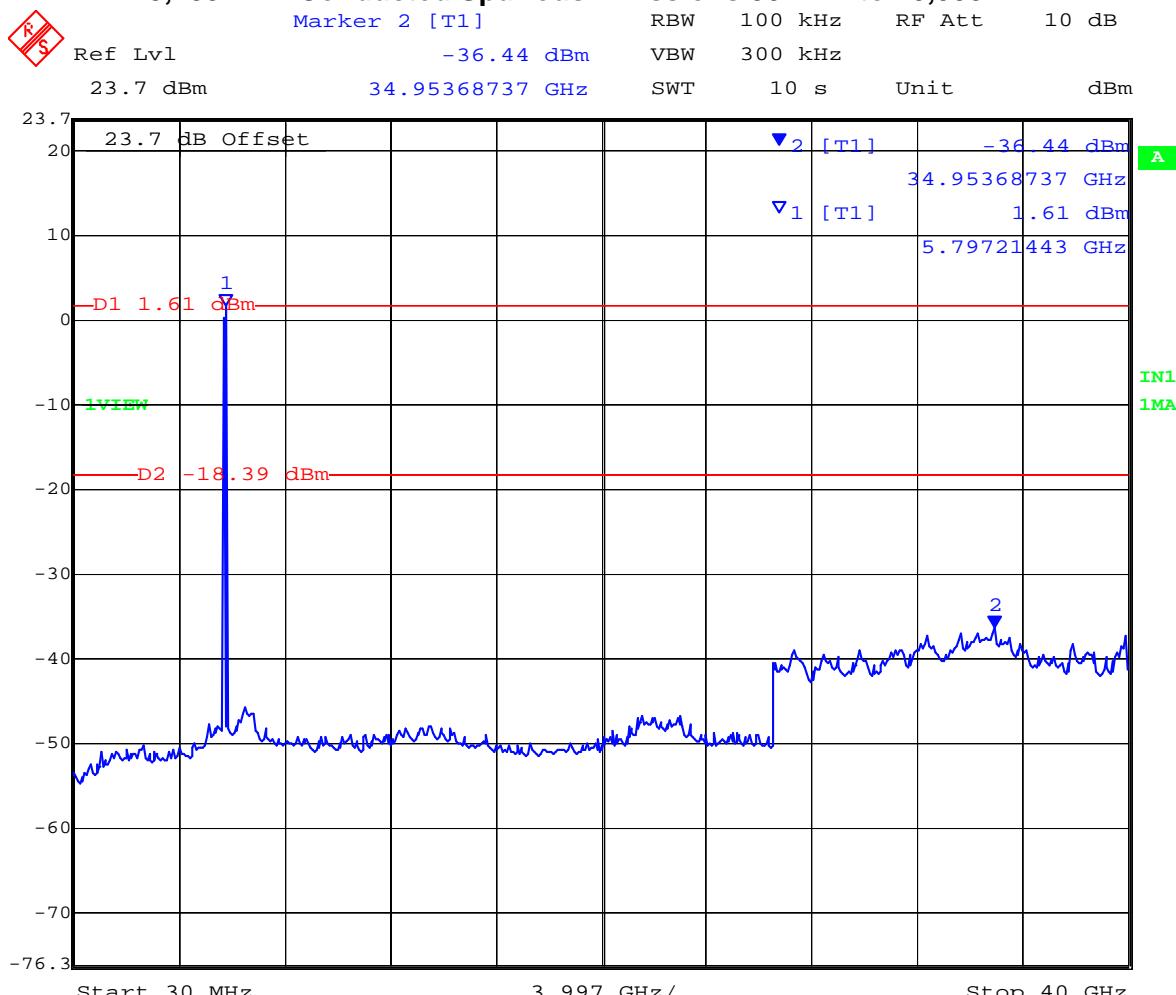
Spurious Emissions (30 - 40,000 MHz)

TABLE OF RESULTS – 802.11n – HT-20

Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
5,785	30	40,000	-36.44	-18.39	-18.05

802.11n – HT-20

5,785 MHz Conducted Spurious Emissions 30 MHz to 40,000 MHz



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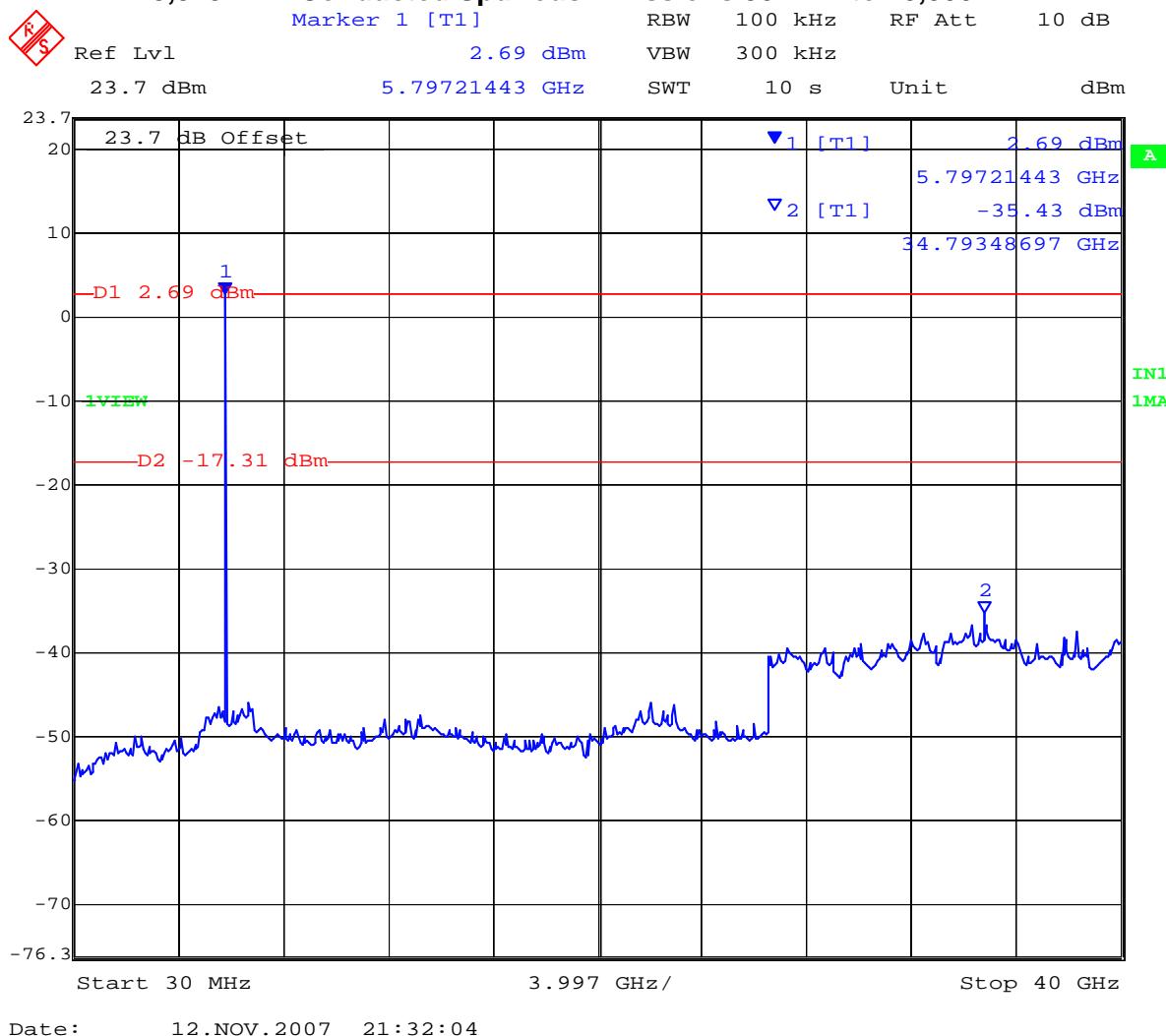
Spurious Emissions (30 - 40,000 MHz)

TABLE OF RESULTS – 802.11n – HT-20

Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
5,825	30	40,000	-35.43	-17.31	-18.12

802.11n – HT-20

5,825 MHz Conducted Spurious Emissions 30 MHz to 40,000 MHz



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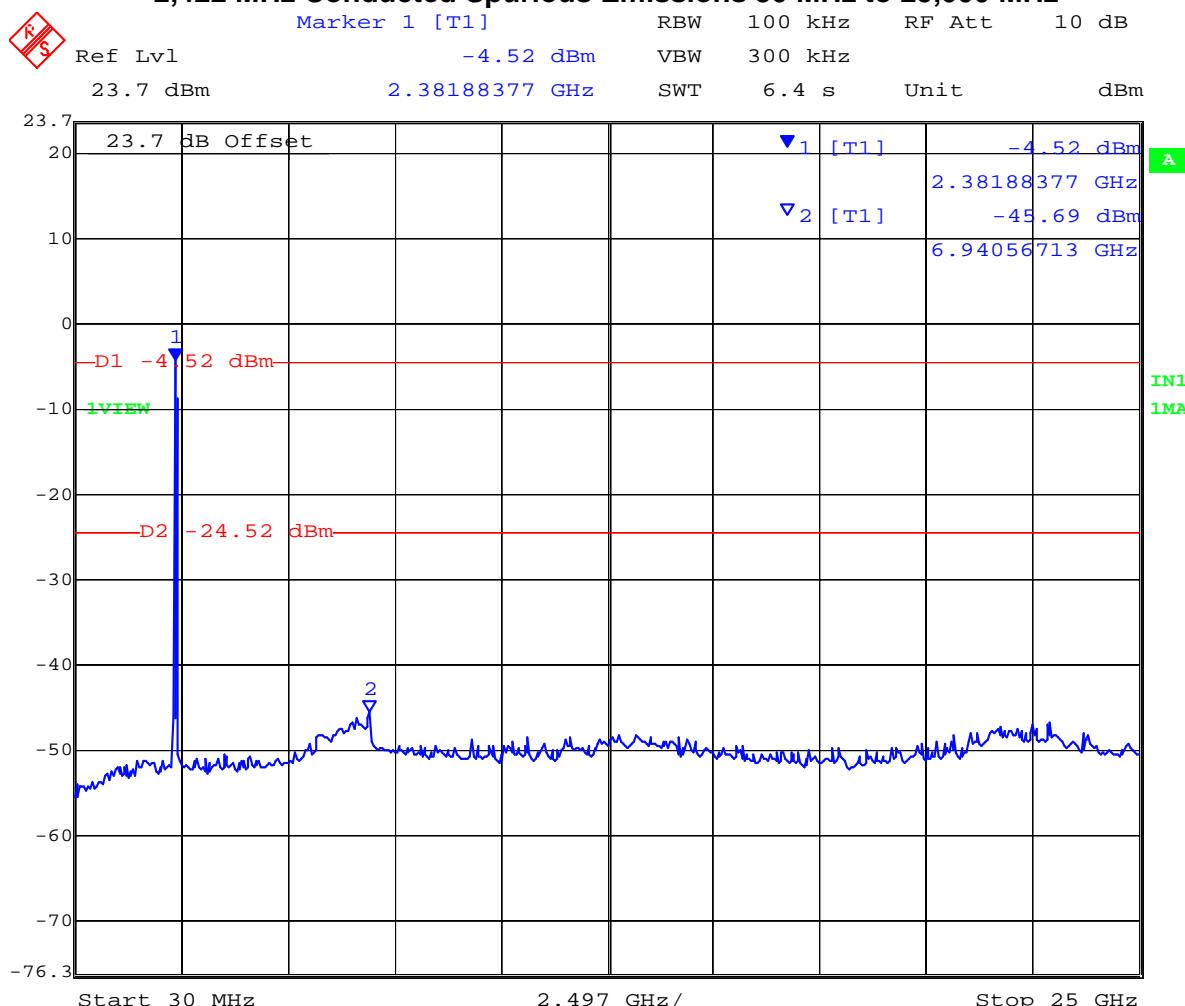
Spurious Emissions (30 - 25,000 MHz)

TABLE OF RESULTS – 802.11n – HT-40

Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
2,422	30	25,000	-45.69	-24.52	-21.17

802.11n – HT-40

2,422 MHz Conducted Spurious Emissions 30 MHz to 25,000 MHz



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Spurious Emissions (30 - 25,000 MHz)

TABLE OF RESULTS – 802.11n – HT-40

Channel Centre Frequency (MHz)	Start Frequency(MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
2,437	30	25,000	-45.80	-29.16	-16.64

802.11n – HT-40

2,437 MHz Conducted Spurious Emissions 30 MHz to 25,000 MHz



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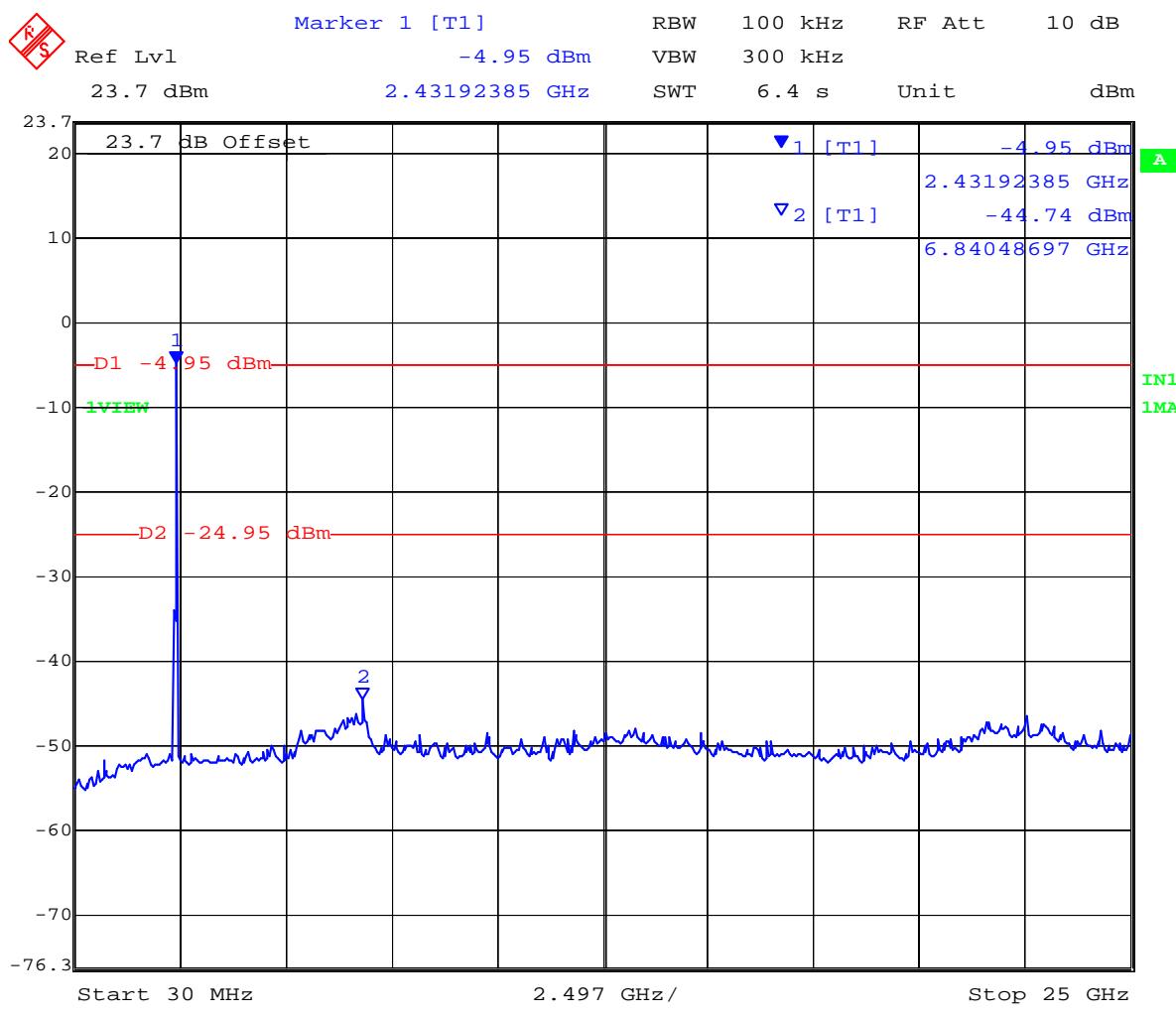
Spurious Emissions (30 - 25,000 MHz)

TABLE OF RESULTS – 802.11n – HT-40

Channel Centre Frequency (MHz)	Start Frequency(MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
2,452	30	25,000	-44.74	-24.95	-19.79

802.11n – HT-40

2,452 MHz Conducted Spurious Emissions 30 MHz to 25,000 MHz



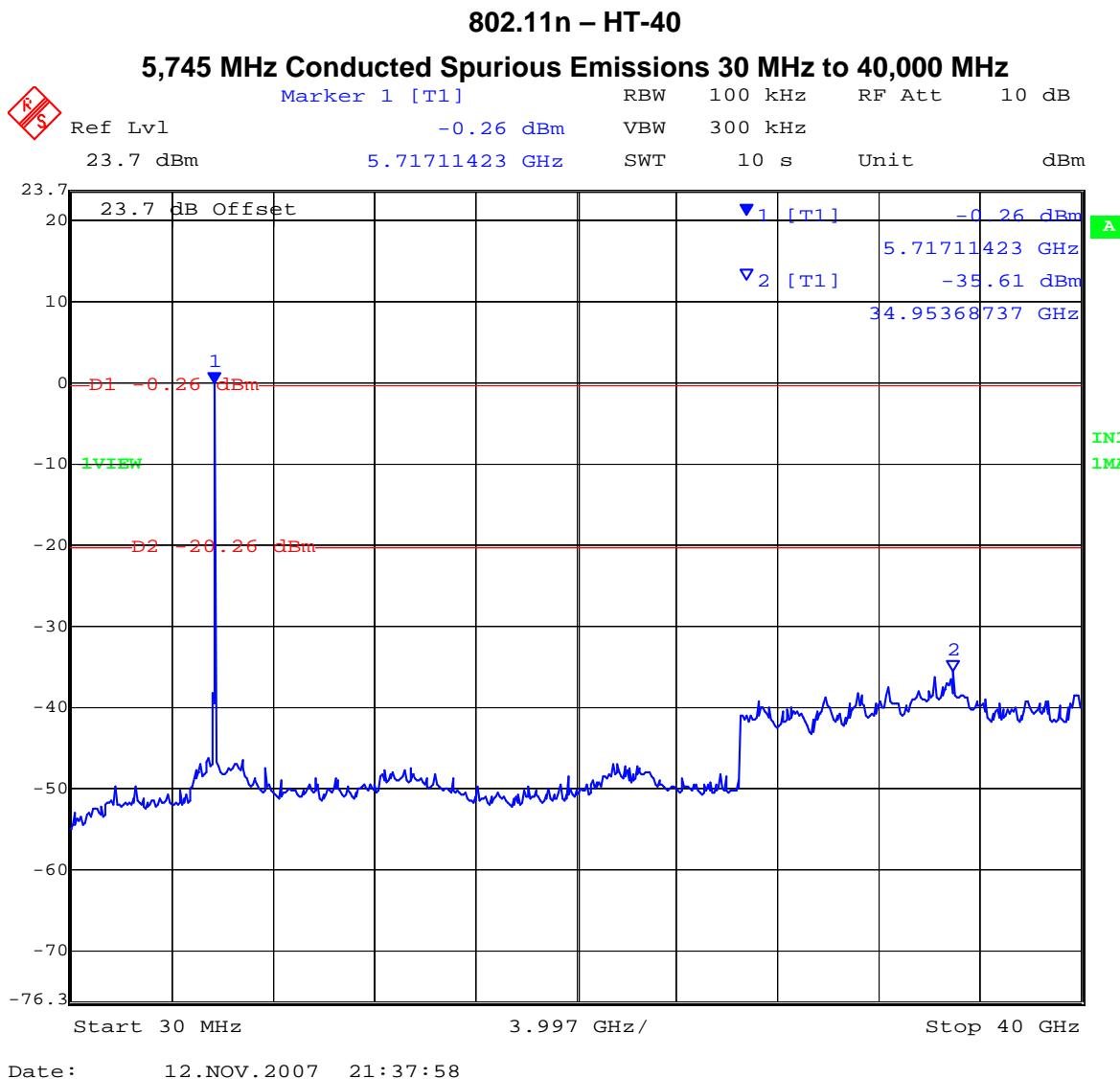
Date: 12.NOV.2007 21:22:13

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Spurious Emissions (30 - 40,000 MHz)

TABLE OF RESULTS – 802.11n – HT-40

Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
5,745	30	40,000	-35.61	-20.26	-15.35



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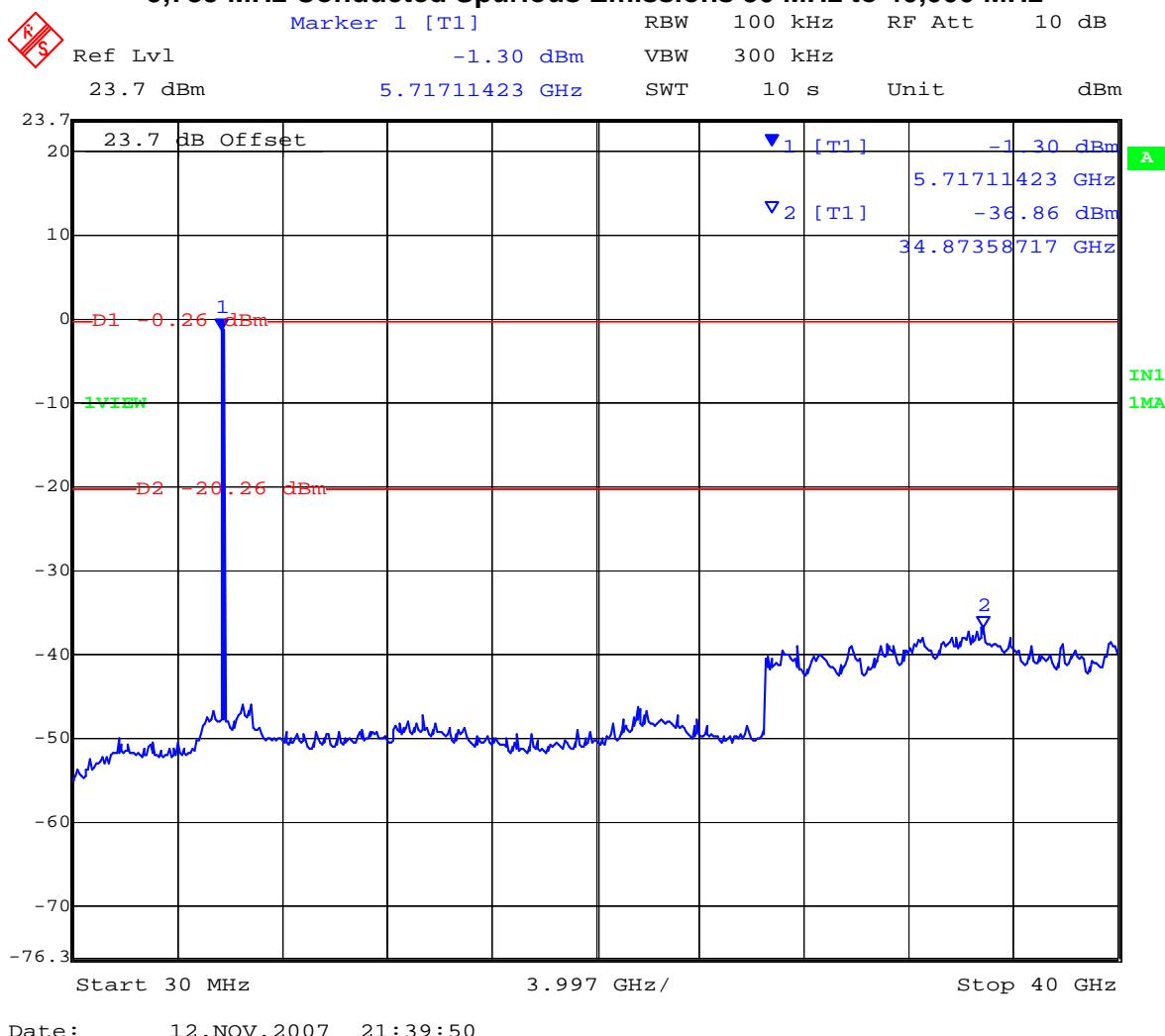
Spurious Emissions (30 - 40,000 MHz)

TABLE OF RESULTS – 802.11n – HT-40

Channel Centre Frequency (MHz)	Start Frequency(MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
5,785	30	40,000	-36.86	-20.26	-16.60

802.11n – HT-40

5,785 MHz Conducted Spurious Emissions 30 MHz to 40,000 MHz



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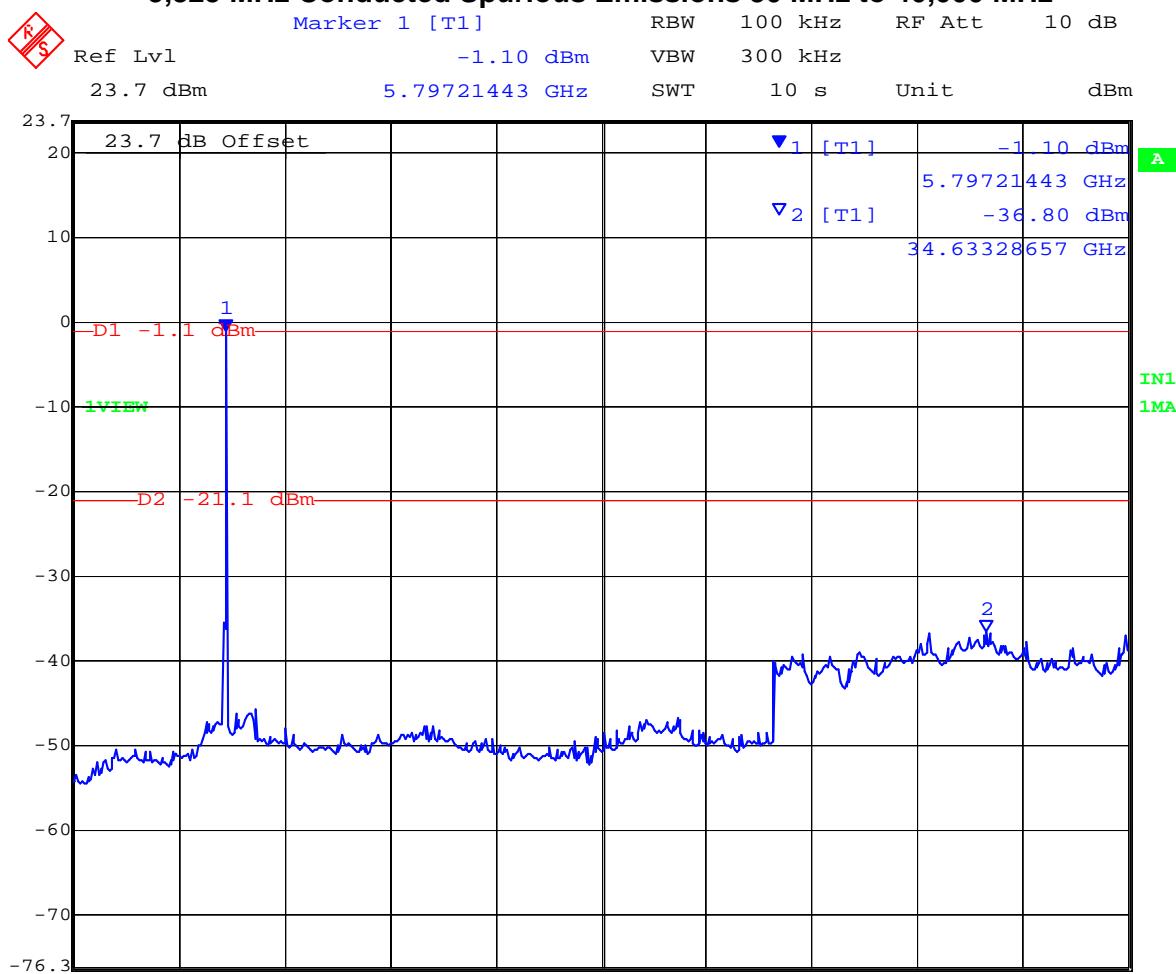
Spurious Emissions (30 - 40,000 MHz)

TABLE OF RESULTS – 802.11n – HT-40

Channel Centre Frequency (MHz)	Start Frequency(MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Margin (dB)
5,825	30	40,000	-36.80	-21.10	-15.70

802.11n – HT-40

5,825 MHz Conducted Spurious Emissions 30 MHz to 40,000 MHz



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Specification

Limits Band-Edge

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

§15.247(d) and RSS-210 §A8.5 In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

§15.247(d)

If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section §15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(a)).

RSS-210 §A8.5 If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required. In addition, radiated emissions which fall in the restricted bands of Table 1 must also comply with the radiated emission limits specified in Tables 2 and 3.

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.

Laboratory Measurement Uncertainty for Conducted Spurious Emissions

Measurement uncertainty	±2.37 dB
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Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-05 'Measurement of Spurious Emissions'	0088, 0158, 0193, 0252, 0313, 0314, 0070, 0116, 0117.

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5.1.6. Radiated Emissions

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

FCC, Part 15 Subpart C §15.247(d) 15.205; 15.209

Industry Canada RSS-210 §A8.5, §2.2, §2.6

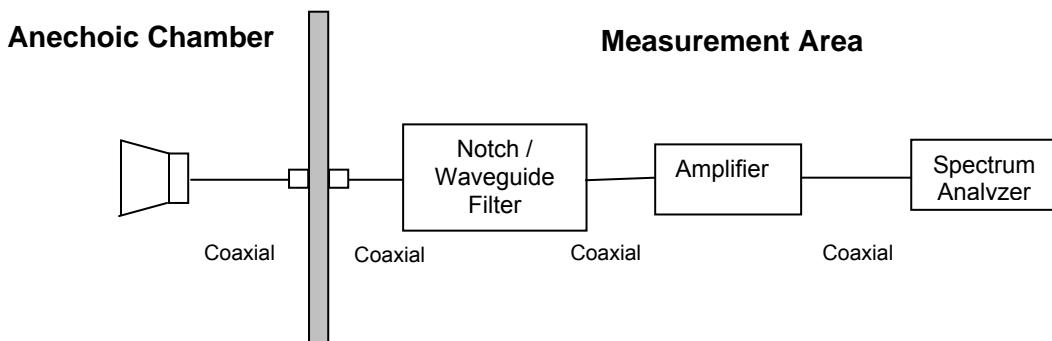
Industry Canada RSS-Gen §4.7

Test Procedure

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

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

Test Measurement Set up



Measurement set up for Radiated Emission Test

Field Strength Calculation

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

$$FS = R + AF + CORR - FO$$

where: FS = Field Strength

R = Measured Spectrum analyzer Input Amplitude

AF = Antenna Factor

CORR = Correction Factor = CL – AG + NFL

CL = Cable Loss

AG = Amplifier Gain

FO = Distance Falloff Factor

NFL = Notch Filter Loss or Waveguide Loss

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For 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:

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

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

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

Ambient conditions.

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

Emission Characterization

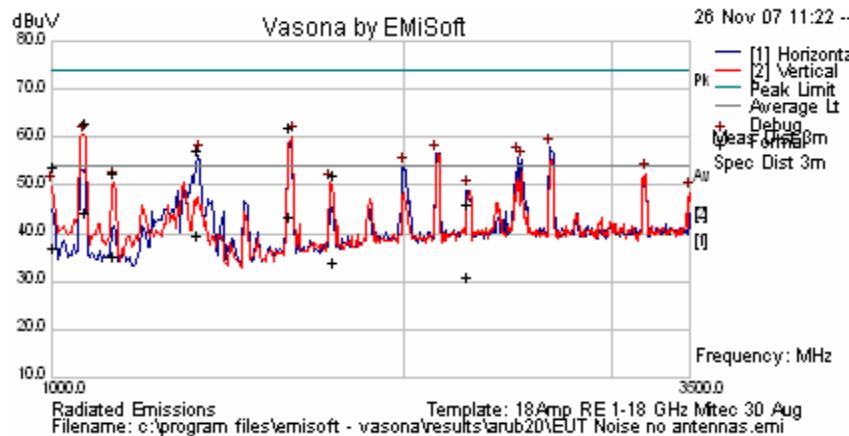
During testing it was verified that there were several emissions emanating from the body of the EUT which was unrelated to antenna type and gain. The emissions which were observed over the range 1 - 3.5 GHz were individually characterized. The peak amplitude of emissions were found to be above 54dB μ V/m however they averaged down below the average limit in all cases.

Emissions 1-3.5 GHz and corresponding measurement values are identified on the following page.

Emission Characterization

Emissions emanating from body of EUT, 50 Ohm termination on all antenna ports
 NRB = None Restrictive Band

Spurious Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
1070.391	74.79	2.02	-16.09	60.72	Peak Max	V	98	45	74	-13.28	Pass	
1594.398	71.79	2.45	-14.37	59.88	Peak Max	V	104	187	74	-14.12	Pass	
2490.768	65.69	3	-11.24	57.45	Peak Max	V	128	30	74	-16.55	Pass	
1331.012	68.73	2.25	-15.58	55.4	Peak Max	V	119	66	74	-18.60	Pass	
1129.389	64.41	2.08	-15.96	50.52	Peak Max	V	98	27	74	-23.48	Pass	
1739.83	60.74	2.57	-13.26	50.04	Peak Max	V	98	218	74	-23.96	Pass	
1002.856	66.21	1.95	-16.15	52.01	Peak Max	V	99	12	74	-21.99	Pass	
2257.515	52.19	2.89	-11.02	44.05	Peak Max	V	142	185	74	-29.95	Pass	
1070.391	56.14	2.02	-16.09	42.07	Average Max	V	98	45	54	-11.93	Pass	
1594.398	53.15	2.45	-14.37	41.24	Average Max	V	104	187	54	-12.76	Pass	
2490.768	52.71	3	-11.24	44.47	Average Max	V	128	30	54	-9.53	Pass	
1331.012	51.05	2.25	-15.58	37.72	Average Max	H	106	18	54	-16.28	Pass	
1129.389	47.2	2.08	-15.96	33.31	Average Max	V	98	27	54	-20.69	Pass	
1739.83	42.47	2.57	-13.26	31.78	Average Max	V	98	218	54	-22.22	Pass	
1002.856	49.16	1.95	-16.15	34.96	Average Max	V	99	12	54	-19.04	Pass	
2257.515	37.03	2.89	-11.02	28.89	Average Max	H	125	134	54	-25.11	Pass	
2658.317	66.27	3.13	-11.37	58.02	Peak [Scan]	H	100	0				NRB
2127.255	64.97	2.82	-11.04	56.75	Peak [Scan]	H	100	0				NRB
2513.026	63.53	3.01	-11.31	55.23	Peak [Scan]	H	100	0				NRB
1996.994	62.23	2.75	-11.18	53.79	Peak [Scan]	H	100	0				NRB
3209.419	60.7	3.48	-11.65	52.53	Peak [Scan]	V	100	0				NRB
3494.99	56.73	3.6	-11.68	48.65	Peak [Scan]	V	100	0				NRB

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ARUB20 AP-125 (ANT-INTEGRAL)
ART Settings V Aggregate Measured Power

The following matrix identifies the ART power setting V's each output chain. The aggregate power was also measured for all three chains.

As a result of either spurious emissions (harmonic) or band-edge issues the power was reduced to bring the unit into compliance.

Configuration	ART Power Setting	Tx 1 Measured Pwr (dBm)	Tx 2 Measured Pwr (dBm)	Tx 3 Measured Pwr (dBm)	Aggregate Measured Pwr (dBm)
Legacy b (2390 2412 MHz)BE	17.5	15.30	14.72	15.87	20.0
Legacy g (2390 2412 MHz)BE	13.5	15.39	14.70	16.21	17.0
Legacy b (2390 2462 MHz)BE	17.5	11.18	10.74	11.17	20.9
Legacy g (2483.5 2462 MHz)BE	12.5	10.04	10.92	10.47	15.51
HT-20 (2390 2412 MHz)BE	12	10.00	9.27	10.20	15.22
HT-20 (2483.5 2462 MHz)BE	11.5	8.63	8.35	9.30	14.23
HT-40 (2390 2422 MHz)BE	9.5	7.66	7.28	7.68	12.84
HT-40 (2483.5 2452 MHz)BE	9.5	7.35	6.82	7.67	12.68
Legacy b (2412 MHz)SE	19	17.01	16.65	17.39	22.68
Legacy b (2437 MHz)SE	19	16.70	16.20	17.03	21.59
Legacy b (2462 MHz)SE	19	16.64	16.78	17.24	22.39
Legacy g (2412 MHz)SE	17	15.08	14.43	15.35	20.37
Legacy g (2437 MHz)SE	17	14.71	14.32	15.01	20.40
Legacy g (2462 MHz)SE	17	14.78	14.58	15.47	21.27
HT-20 (2412 MHz)SE	19	17.03	16.70	17.34	22.40
HT-20 (2437 MHz)SE	19	16.79	16.30	17.02	22.36
HT-20 (2462 MHz)SE	19	16.96	16.67	17.20	22.35
HT-40 (2422 MHz)SE	17	14.86	14.43	15.25	20.07
HT-40 (2437 MHz)SE	17	14.67	14.62	15.11	19.02
HT-40 (2452 MHz)SE	17	14.75	14.80	15.31	20.29

Note BE = Band-edge, SE – Spurious emissions

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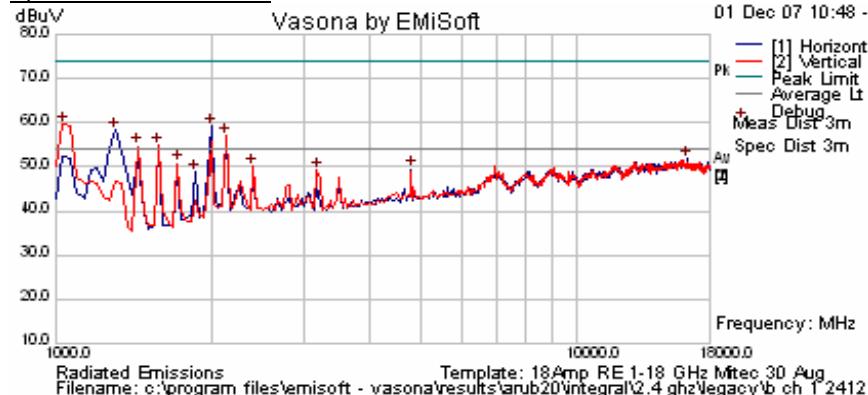
AP125: 2400 - 2483.5 MHz INTEGRAL Legacy Data Rates

AP125 - INTEGRAL Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
1	2412	ART 19	99%	b 1 MBit/s Legacy	Yes

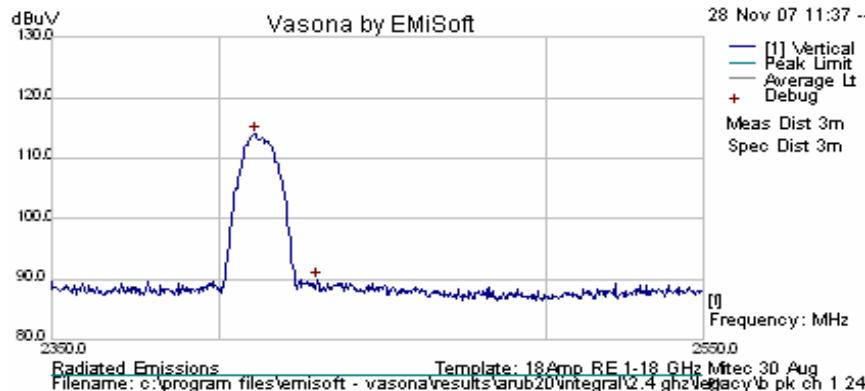
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

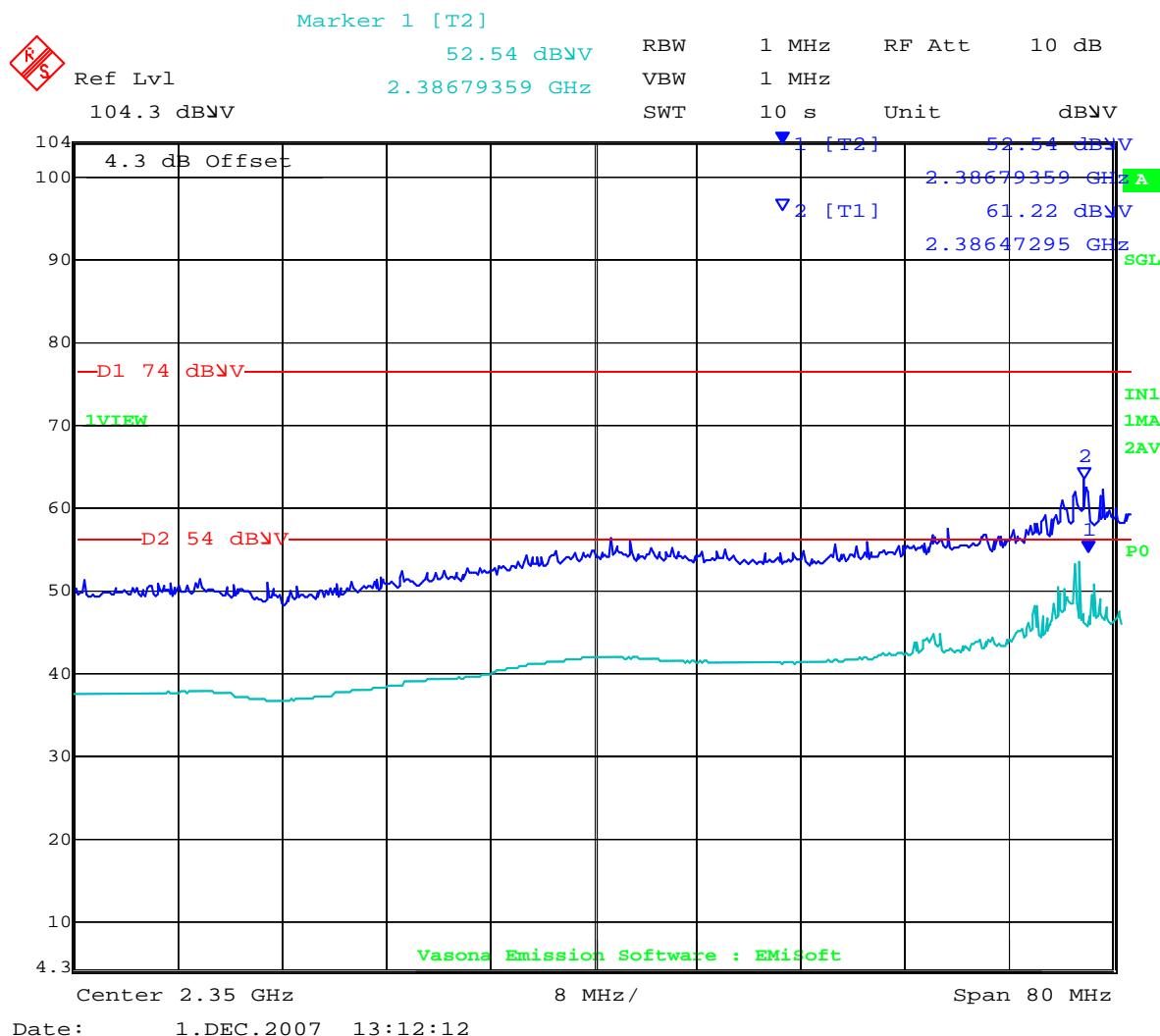


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2410.922	72.66	8.96	32.35	113.97	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
2390.0 Pk	ART Power Setting = 17.5			61.22	Formal Peak	V			74	-12.78	Pass	Band-edge
2390.0 Ave				52.54	Formal Average	V			54	-1.46	Pass	Band-edge

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802.11b Legacy Band-edge 2390 MHz

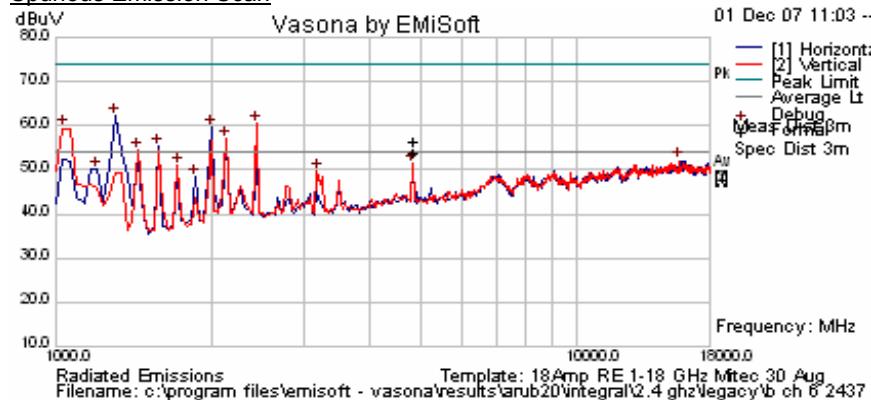
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AP125 - INTEGRAL Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
6	2437	ART 19	99%	b 1 MBit/s Legacy	Yes

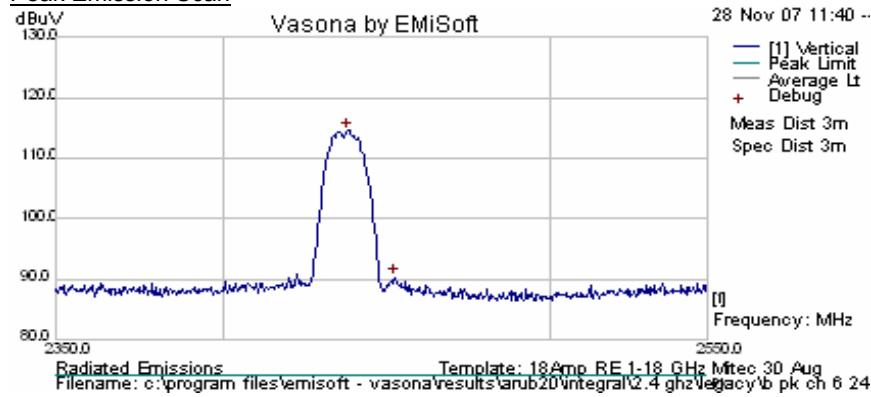
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2437.776	73.31	8.97	32.37	114.65	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
4873.897	59.26	4.51	-9.16	54.61	Peak Max	V	131	360	74	-19.39	Pass	
4873.897	56.34	4.51	-9.16	51.69	Average Max	V	131	360	54	-2.31	Pass	

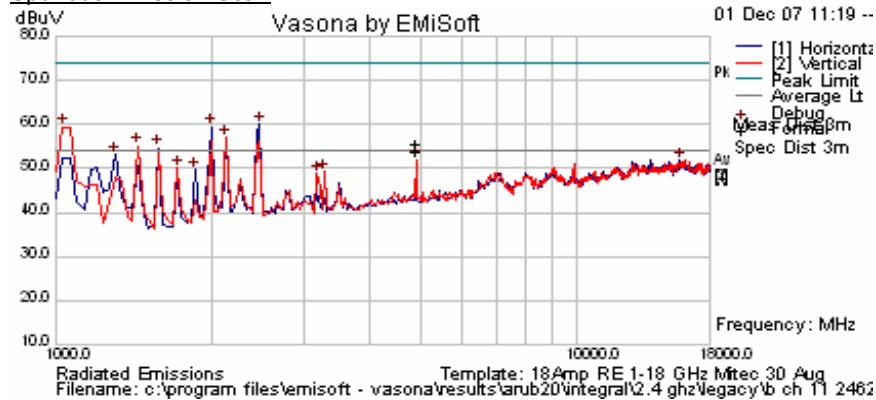
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AP125 - INTEGRAL Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
11	2462	ART 19	99%	b 1 MBit/s Legacy	Yes

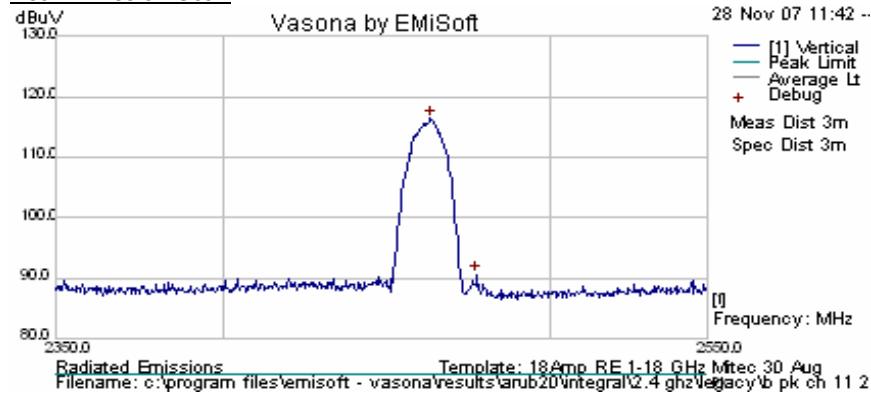
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

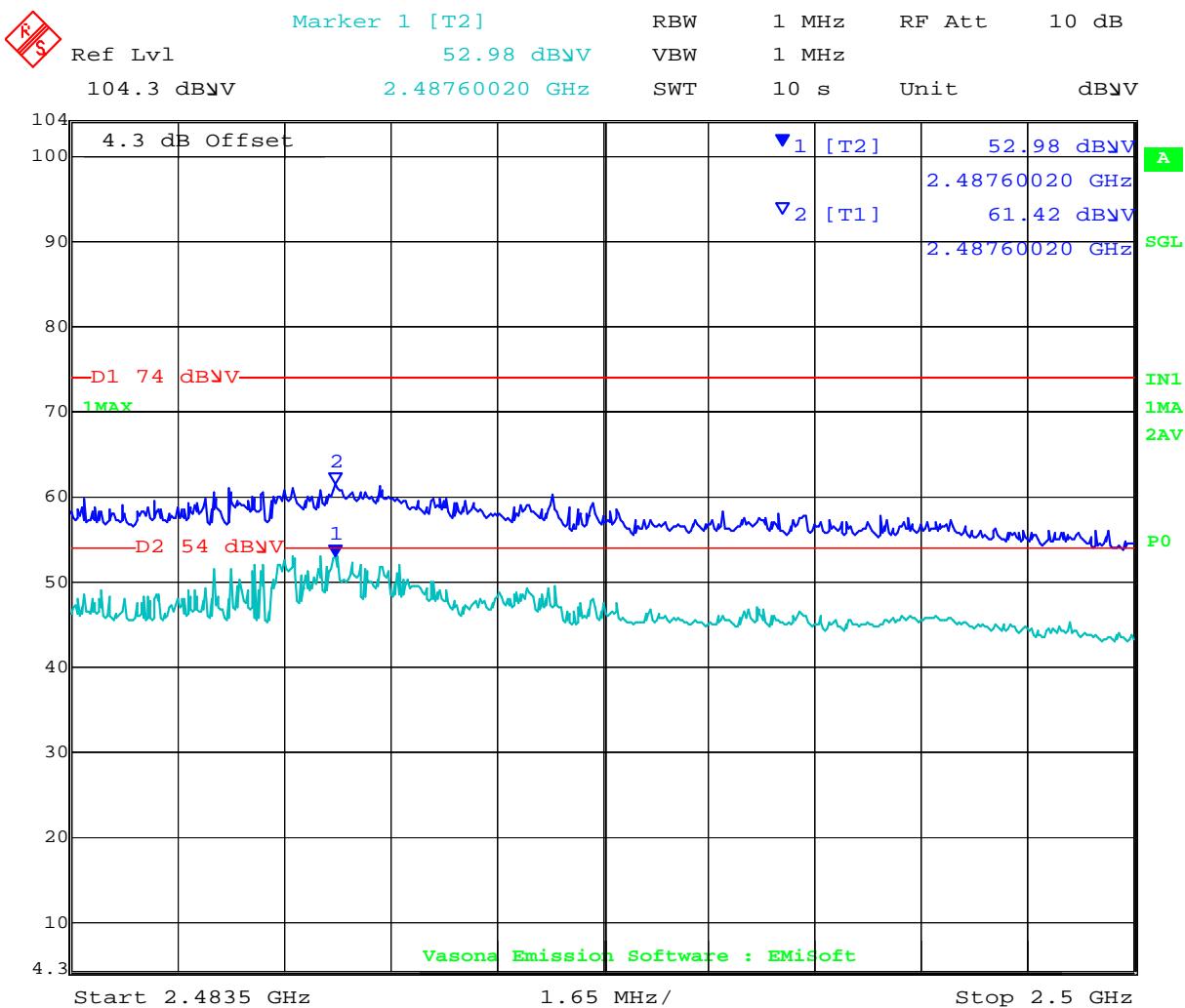


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2463.026	75.06	8.98	32.38	116.42	Peak [Scan]	V	100	0	N/A	N/A	N/A	PK Emission
2483.5	ART Power Setting = 17.5			61.42	Formal Peak	V			74	-12.58	Pass	Band-edge
2483.5				52.98	Formal Average	V			54	-1.02	Pass	Band-edge
4924.033	58.2	4.55	-9.25	53.51	Peak Max	V	151	1	74	-20.49	Pass	
4924.033	56.53	4.55	-9.25	51.83	Average Max	H	116	42	54	-2.17	Pass	

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Date: 1.DEC.2007 13:42:32

802.11b Legacy Band-edge 2483.5 MHz

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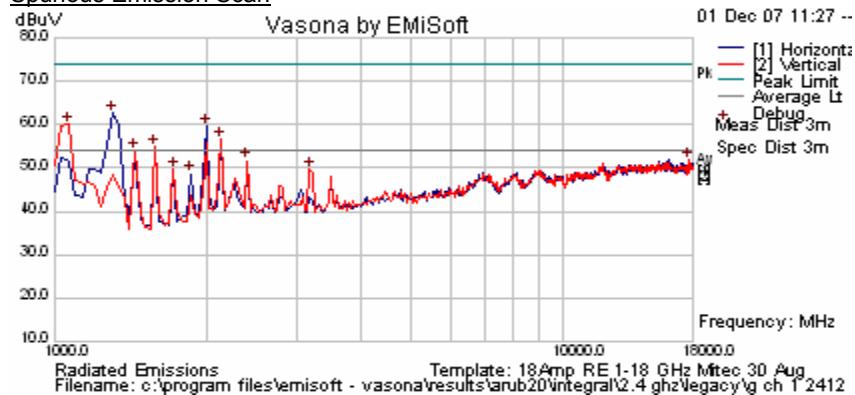
AP125: 2400 - 2483.5 MHz INTEGRAL Legacy Data Rates

AP125 - INTEGRAL Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
1	2412	ART 17	99%	g 6 MBit/s Legacy	Yes

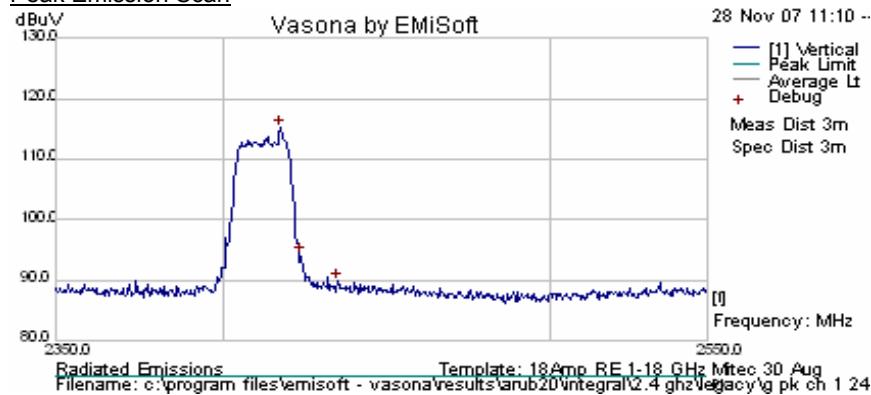
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

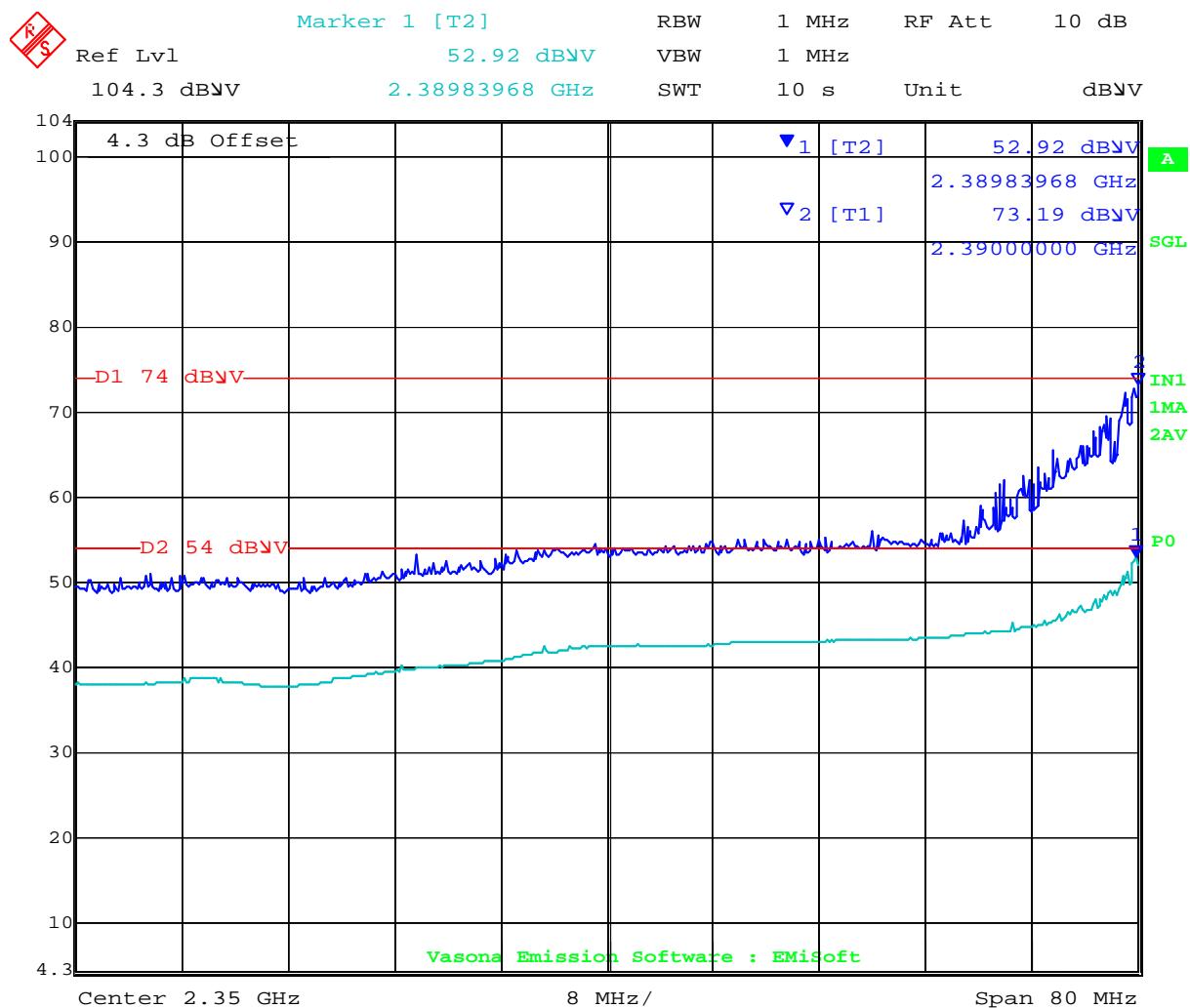


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2417.335	73.74	8.96	32.35	115.06	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
2390.0	ART Power Setting = 13.5			73.19	Formal Peak	V			74	-0.81	Pass	Band-edge
2390.0				52.92	Formal Average	V			54	-1.08	Pass	Band-edge

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Date: 1.DEC.2007 13:15:43

802.11g Legacy Band-edge 2390 MHz

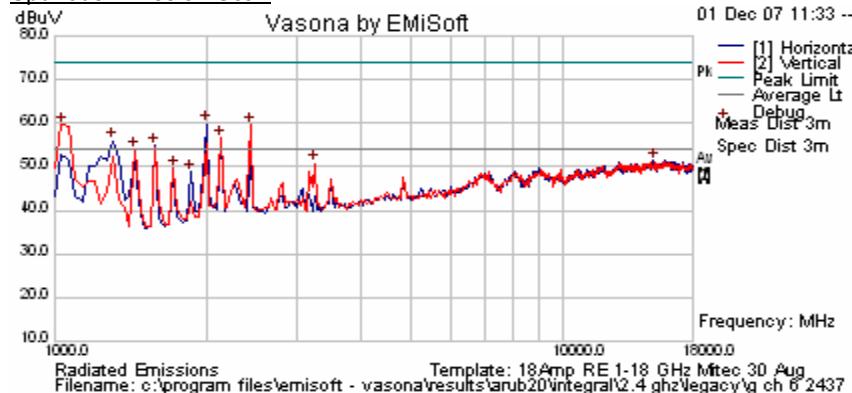
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AP125 - INTEGRAL Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
6	2437	ART 17	99%	g 6 MBit/s Legacy	Yes

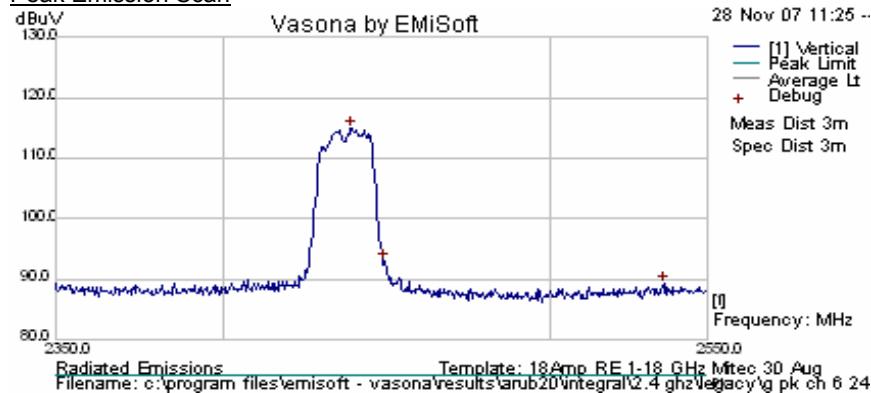
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2438.978	73.44	8.97	32.37	114.78	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission

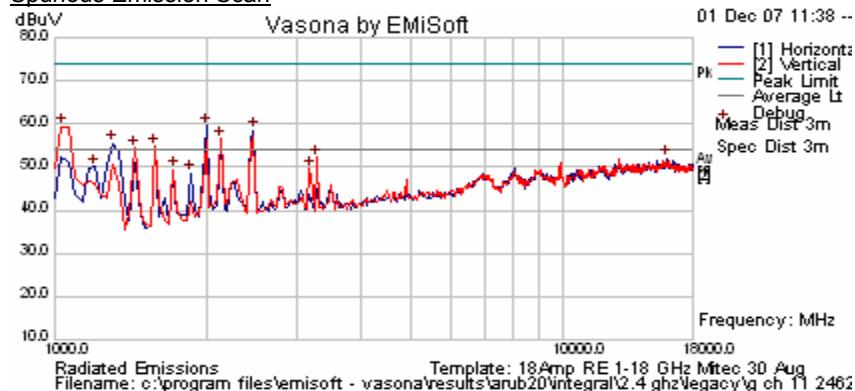
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AP125 - INTEGRAL Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
11	2462	ART 17	99%	g 6 MBit/s Legacy	Yes

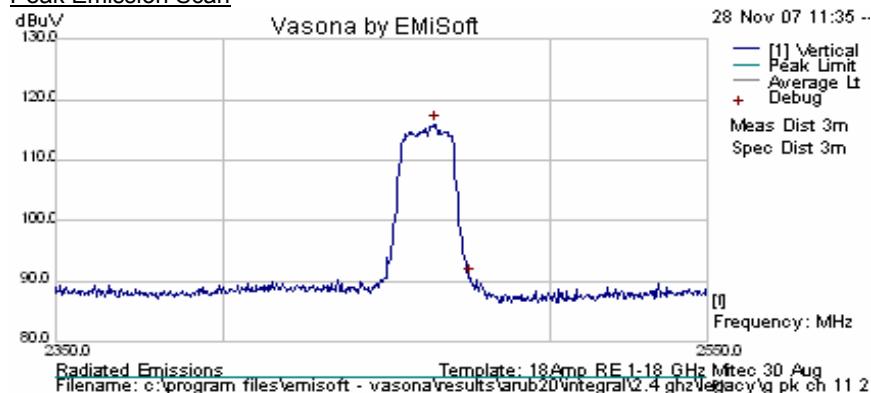
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

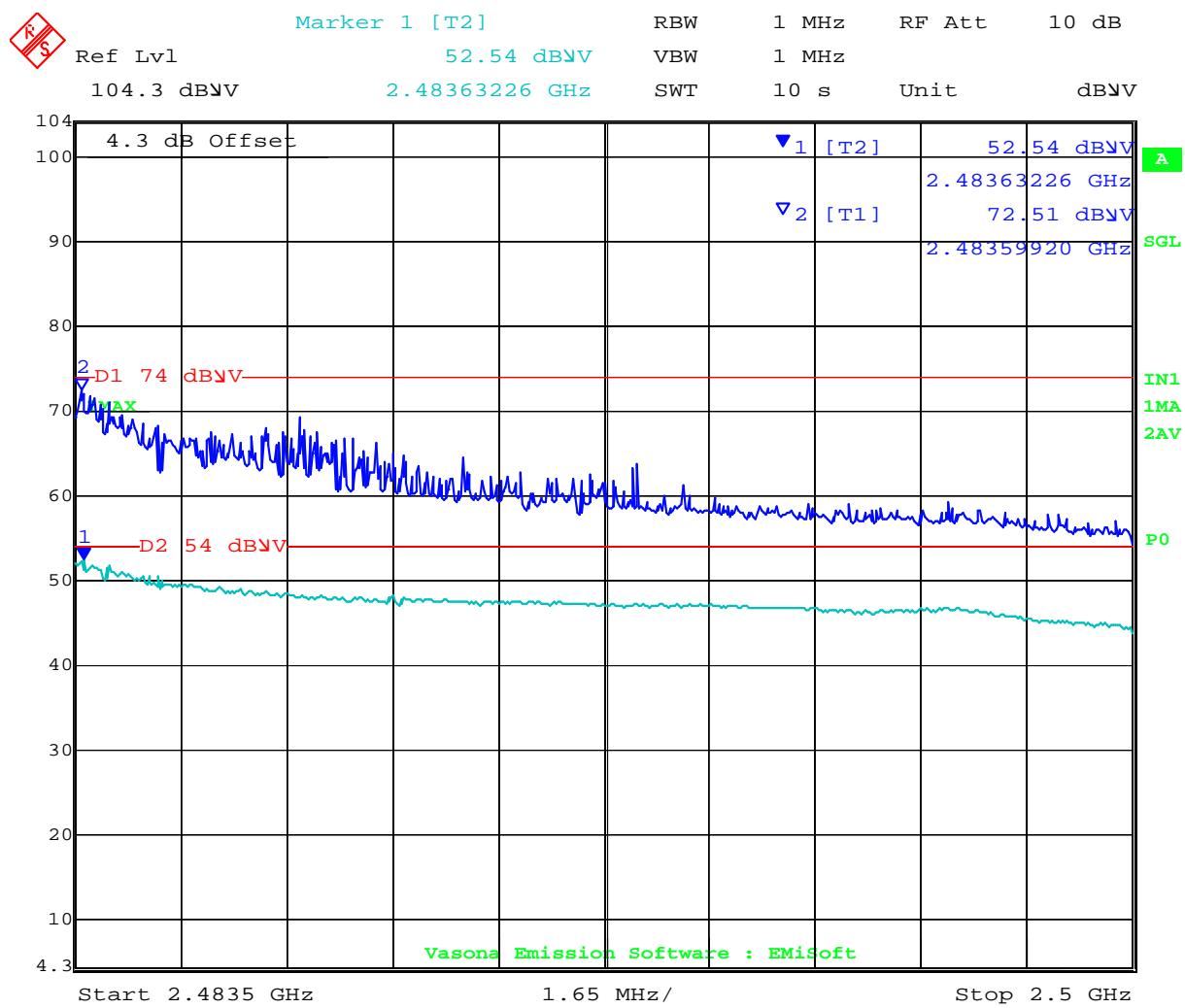


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2464.629	74.58	8.98	32.38	115.95	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
2483.5	ART Power Setting = 12.5			72.51	Formal Peak	V			74	-1.49	Pass	Band-edge
2483.5				52.54	Formal Average	V			54	-1.46	Pass	Band-edge

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Date: 1.DEC.2007 13:45:10

802.11g Legacy Band-edge 2483.5 MHz

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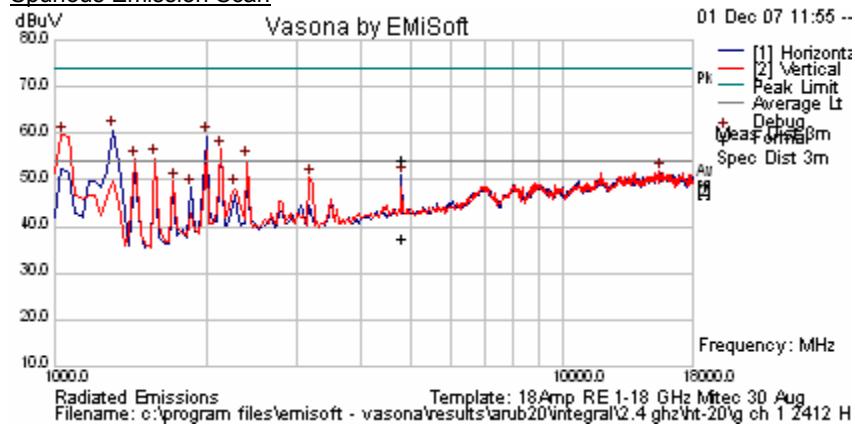
AP125: 2400 - 2483.5 MHz INTEGRAL HT-20 Data Rates

AP125 - INTEGRAL Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
1	2412	ART 17	99%	n 6.5 MCS HT-20	Yes

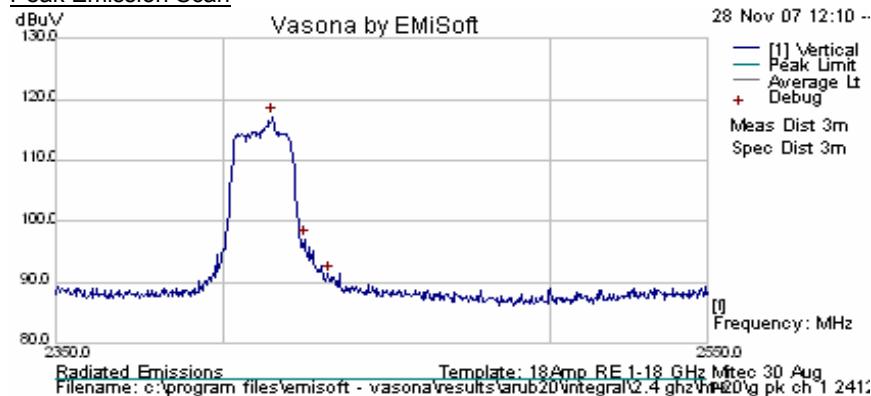
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

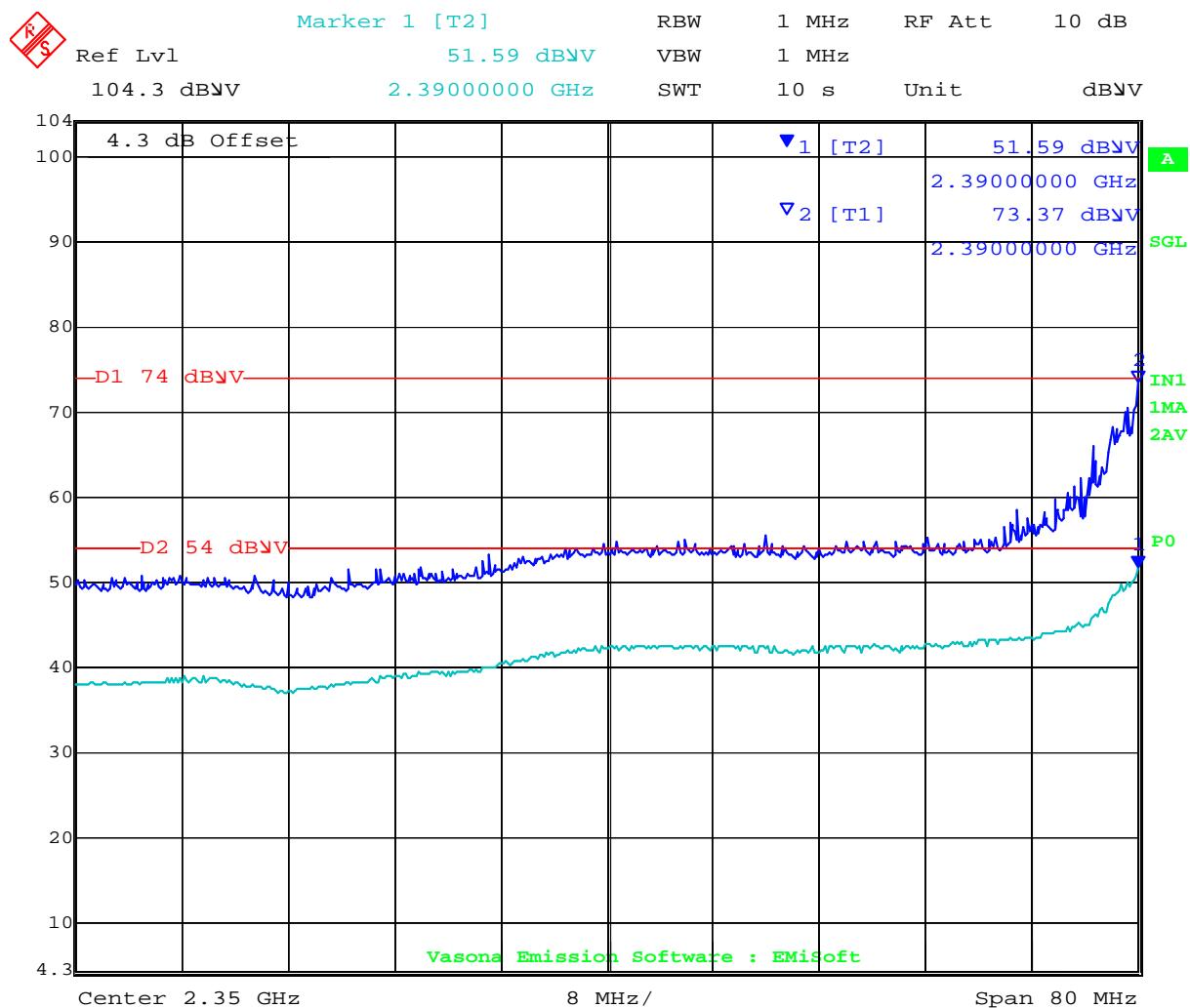


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2414.93	75.87	8.96	32.35	117.18	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
2390.0	ART Power Setting = 12.0			73.37	Formal Peak	V			74	-0.63	Pass	Band-edge
2390.0				5159	Formal Average	V			54	-2.41	Pass	Band-edge
4827.906	57.03	4.47	-9.19	52.31	Peak Max	V	98	225	74	-21.69	Pass	
4827.906	40.25	4.47	-9.19	35.53	Average Max	V	98	225	54	-18.47	Pass	
3180.361	58.69	3.46	-11.63	50.52	Peak [Scan]	V	100	0	54	-3.48	Pass	

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Date: 1.DEC.2007 13:25:30

802.11n HT--20 Band-edge 2390 MHz

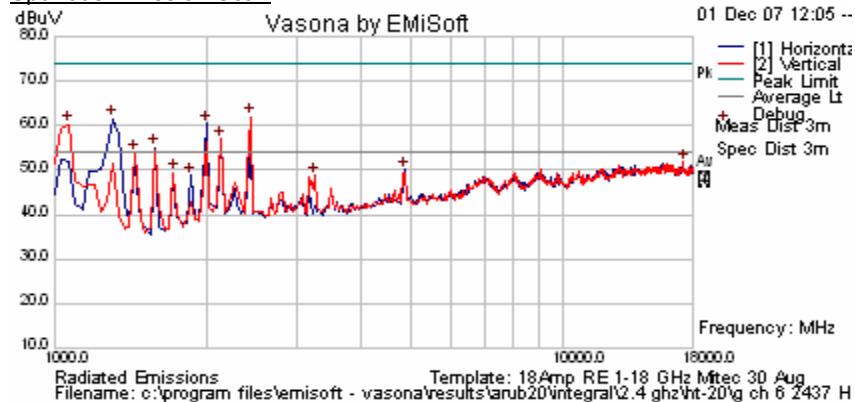
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AP125 - INTEGRAL Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
6	2437	ART 17	99%	n 6.5 MCS HT-20	Yes

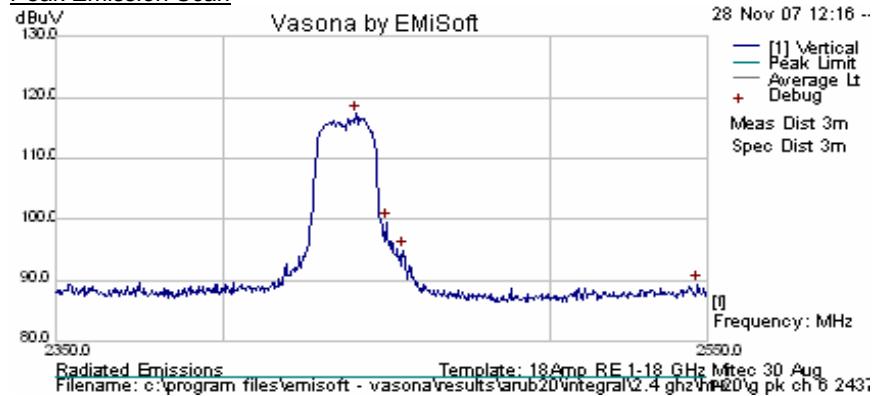
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2440.18	75.93	8.97	32.37	117.27	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission

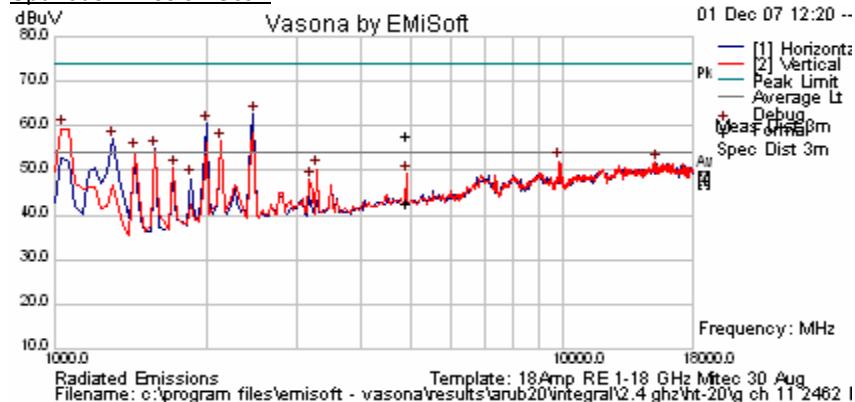
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AP125 - INTEGRAL Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
11	2462	ART 17	99%	n 6.5 MCS HT-20	Yes

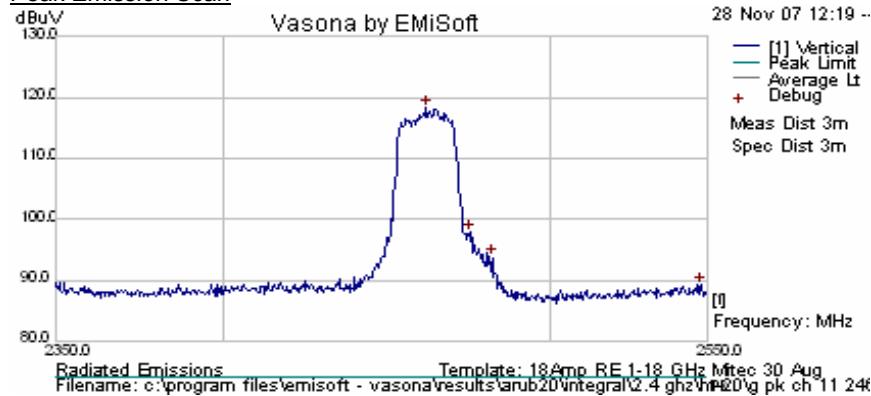
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

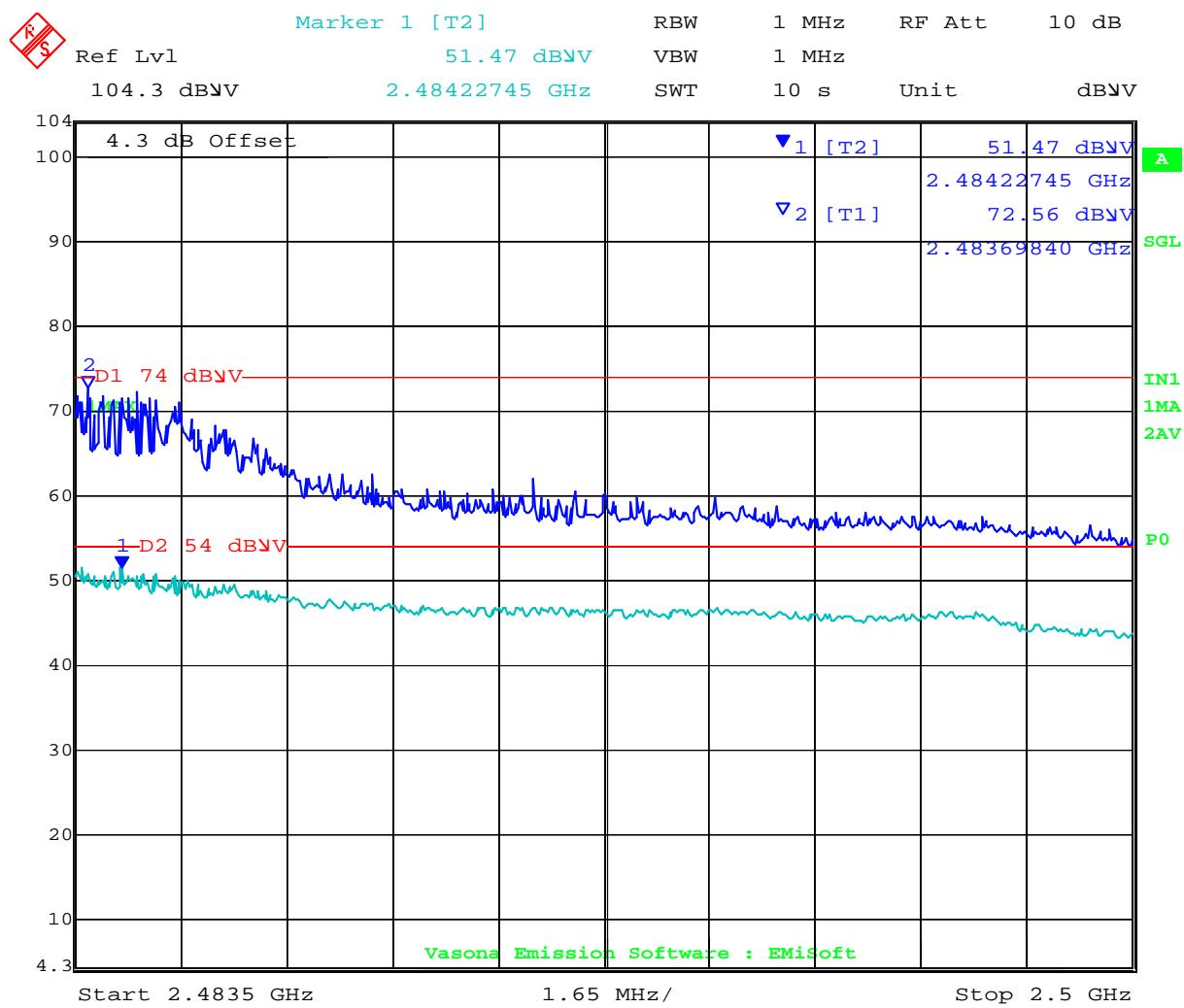


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2461.824	76.98	8.98	32.38	118.34	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
2483.5				72.56	Formal Peak	V			74	-1.44	Pass	Band-edge
2483.5				51.47	Formal Average	V			54	-2.53	Pass	Band-edge
4925.602	60.6	4.56	-9.25	55.9	Peak Max	V	114	360	74	-18.1	Pass	
4925.602	45.24	4.56	-9.25	40.54	Average Max	V	114	360	54	-13.46	Pass	
9823.647	47.16	6.39	-1.39	52.16	Peak [Scan]	V	100	0	54	-1.84	Pass	NRB
3282.565	58.39	3.51	-11.56	50.34	Peak [Scan]	V	100	0	54	-3.66	Pass	NRB

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Date: 1.DEC.2007 13:46:52

802.11n HT--20 Band-edge 2483.5 MHz

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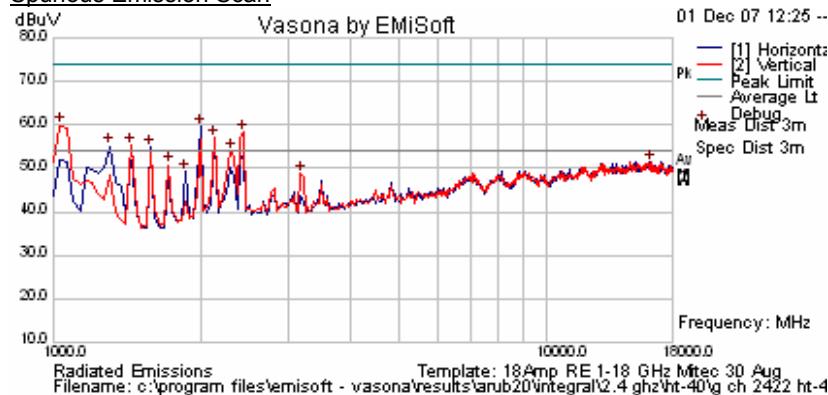
AP125: 2400 - 2483.5 MHz INTEGRAL HT-40 Data Rates

AP125 - INTEGRAL Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
2422	ART 17		99%	n 13.5 MCS HT-40	Yes

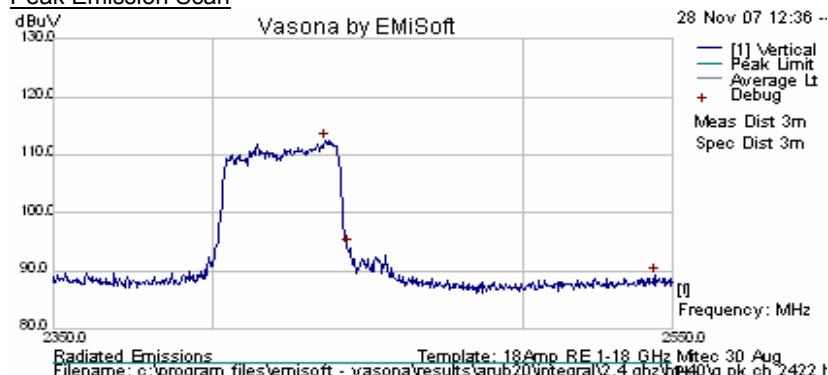
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

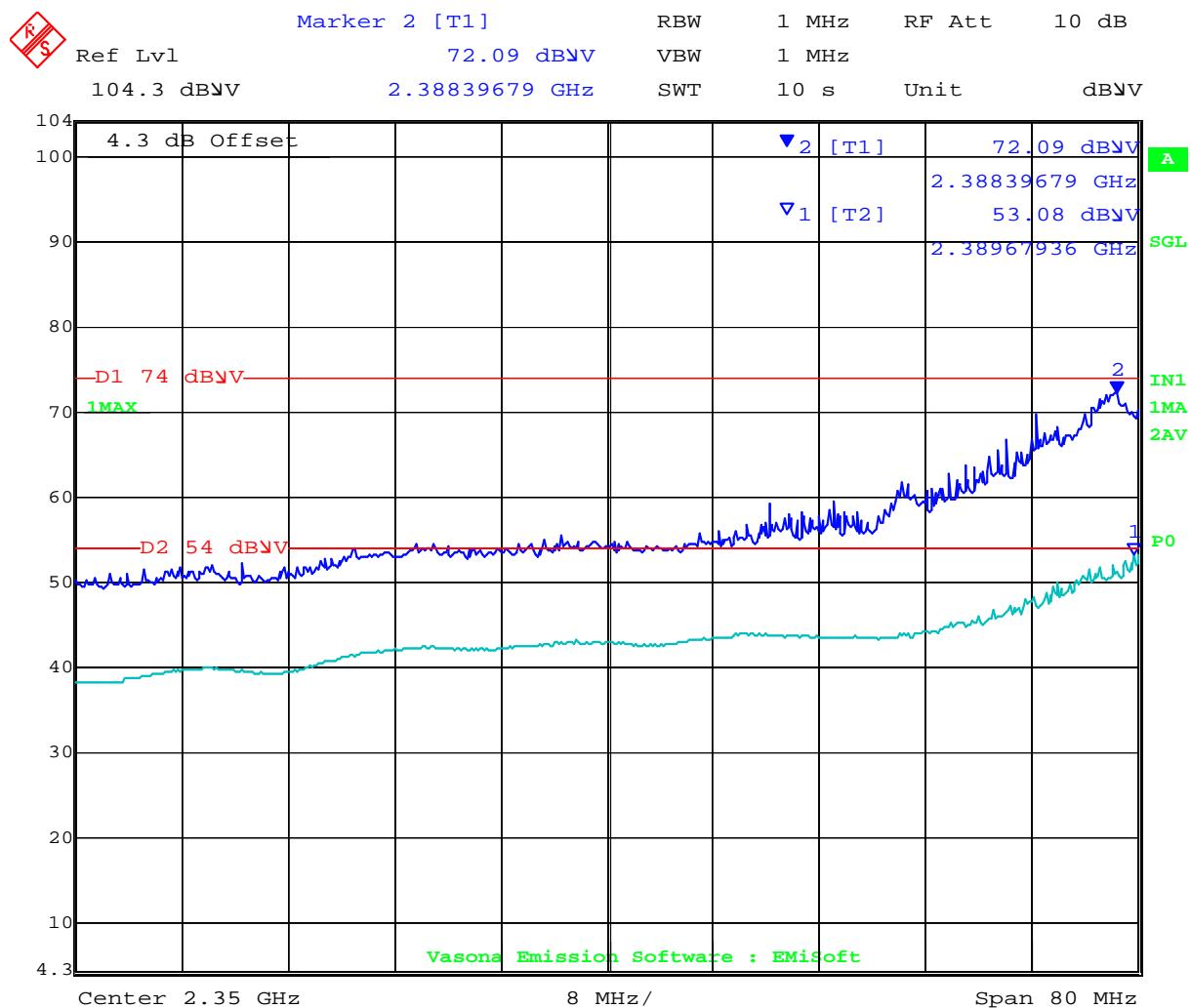


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2435.772	71.03	8.97	32.37	112.37	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
2390.0				72.09	Formal Peak	V			74	-1.91	Pass	Band-edge
2390.0				53.08	Formal Average	V			54	-0.92	Pass	Band-edge

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802.11n HT-40 Band-edge 2390 MHz

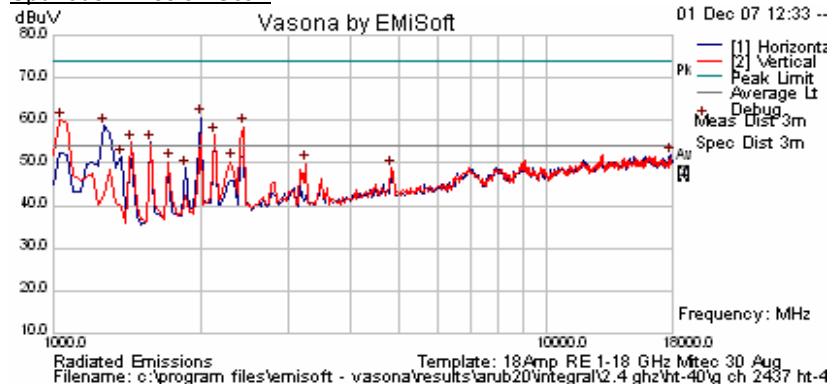
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AP125 - INTEGRAL Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
	2437	ART 17	99%	n 13.5 MCS HT-40	Yes

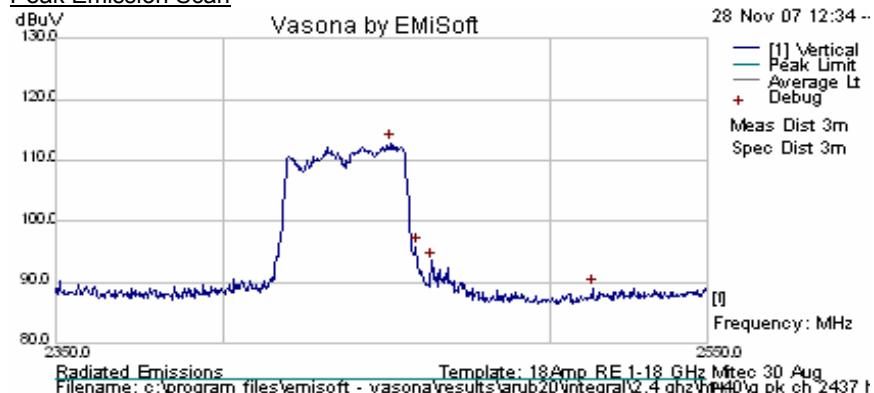
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2450.601	71.51	8.98	32.37	112.86	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission

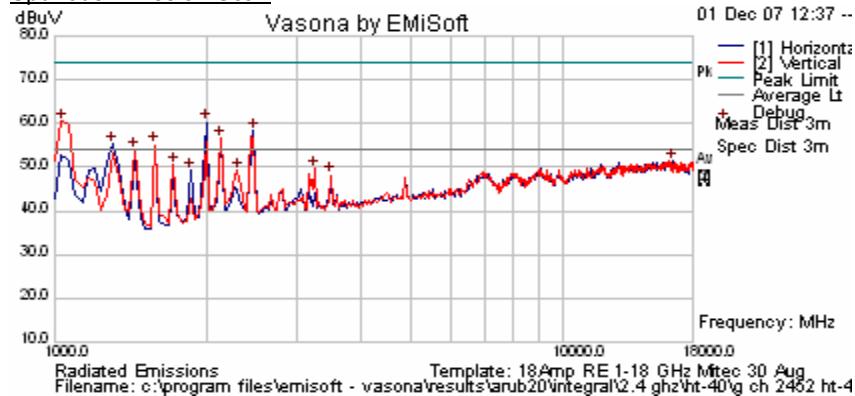
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AP125 - INTEGRAL Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
	2452	ART 17	99%	n 13.5 MCS HT-40	Yes

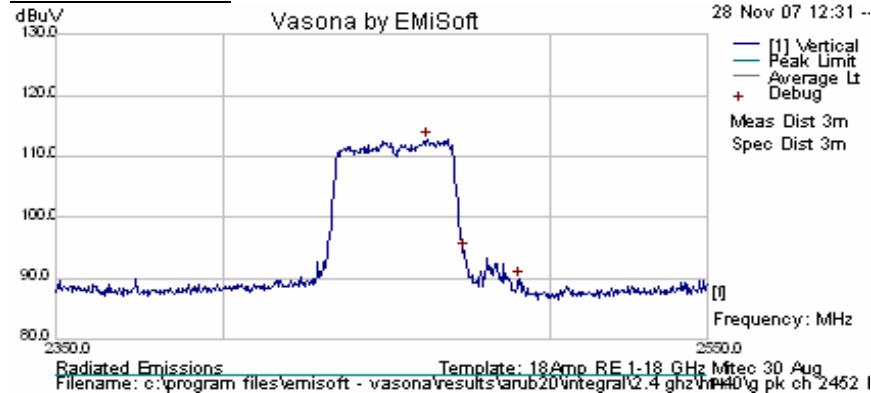
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

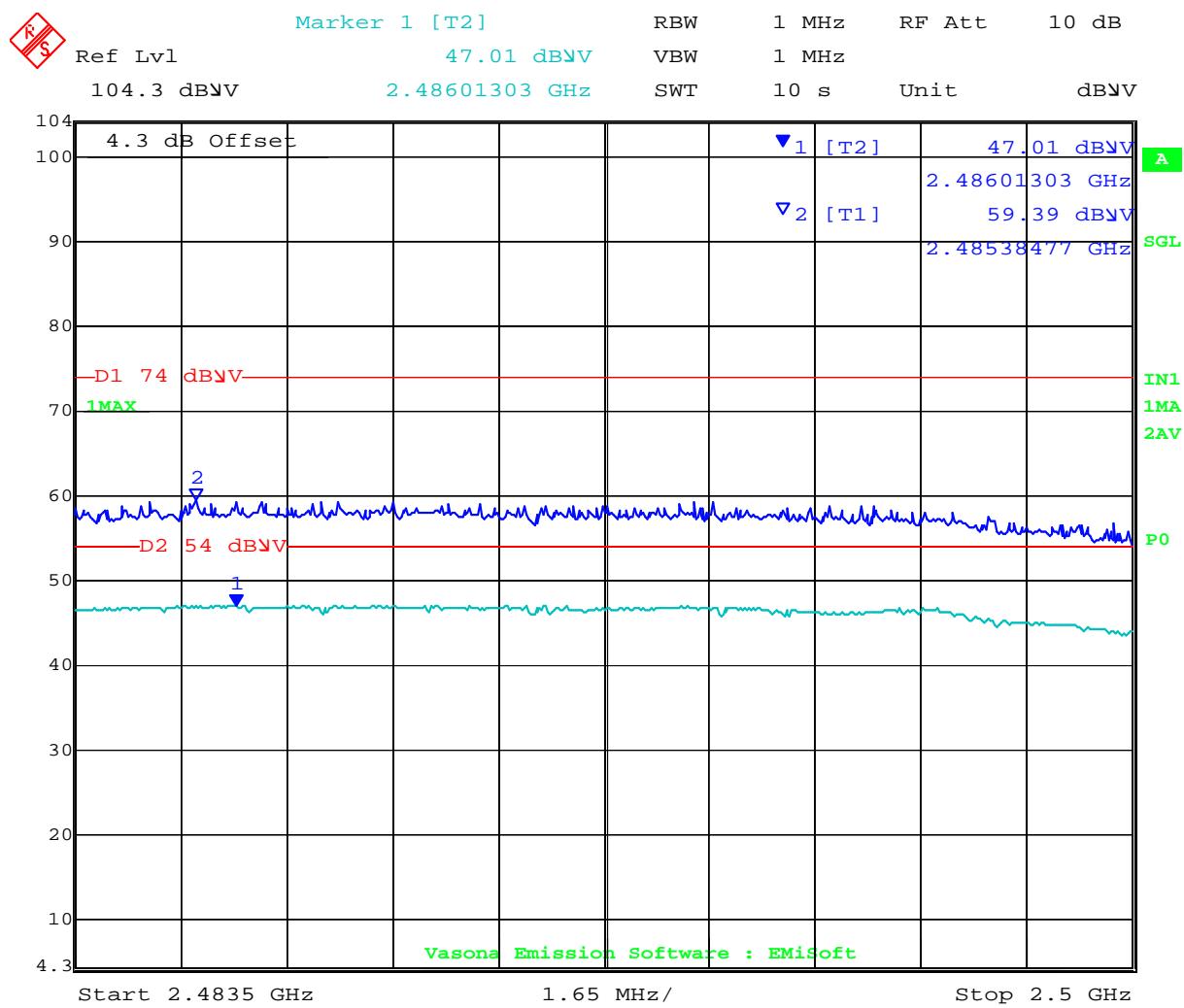


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2462.224	71.4	8.98	32.38	112.77	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
2483.5		ART Power Setting = 9.5		59.39	Formal Peak	V			74	-14.61	Pass	Band-edge
2483.5				47.01	Formal Average	V			54	-6.99	Pass	Band-edge

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Date: 1.DEC.2007 13:40:35

802.11n HT-40 Band-edge 2483.5 MHz

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Title: Aruba AP-124,125 802.11a/b/g/n AP
To: FCC 47 CFR Part 15.247 & IC RSS-210
Serial #: ARUB20-A2 Rev C
Issue Date: 29th February 2008
Page: 165 of 273

ARUB20 AP-125 (ANT-INTEGRAL 5.8 GHz) ART Settings V Aggregate Measured Power

The following matrix identifies the ART power setting V's each output chain. The aggregate power was also measured for all three chains.

As a result of either spurious emissions (harmonic) or band-edge issues the power was reduced to bring the unit into compliance.

Configuration	ART Power Setting	Tx 1 Measured Pwr (dBm)	Tx 2 Measured Pwr (dBm)	Tx 3 Measured Pwr (dBm)	Aggregate Measured Pwr (dBm)
Legacy a (5460 5150 5745 MHz)BE	17	14.05	13.91	15.12	19.97
HT-20 (5460 5150 5745 MHz)BE	17	13.95	13.75	15.00	19.98
HT-40 (5150 5190 5755 MHz)BE	17	13.94	13.67	14.82	19.84
Legacy a (5745MHz)SE	14	11.27	11.10	12.03	17.02
Legacy a (5785 MHz)SE	14	10.78	10.62	11.56	16.62
Legacy a (5825 MHz)SE	14	10.70	10.54	11.02	16.39
HT-20 (5745 MHz)SE	13.5	10.58	10.38	11.30	16.45
HT-20 (5785 MHz)SE	13.5	10.37	10.18	10.72	16.14
HT-20 (5825 MHz)SE	12.5	9.06	9.10	9.50	14.69
HT-40 (5755 MHz)SE	17	13.94	13.79	14.69	19.84
HT-40 (5785 MHz)SE	17	13.62	13.90	14.64	19.60
HT-40 (5815 MHz)SE	17	13.30	14.00	14.12	19.66

Note BE = Band-edge, SE – Spurious emissions

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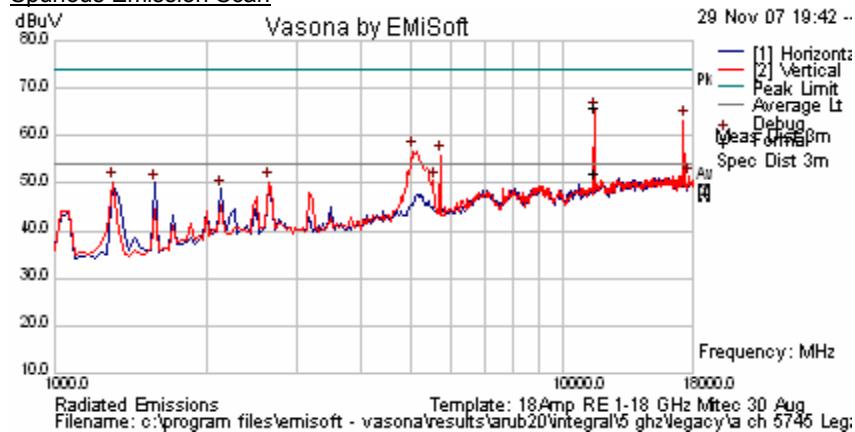
AP125: 5725-5850 MHz INTEGRAL Legacy Data Rates

AP125 - INTEGRAL Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
149	5745	ART 14	99%	a 6 Legacy	Yes

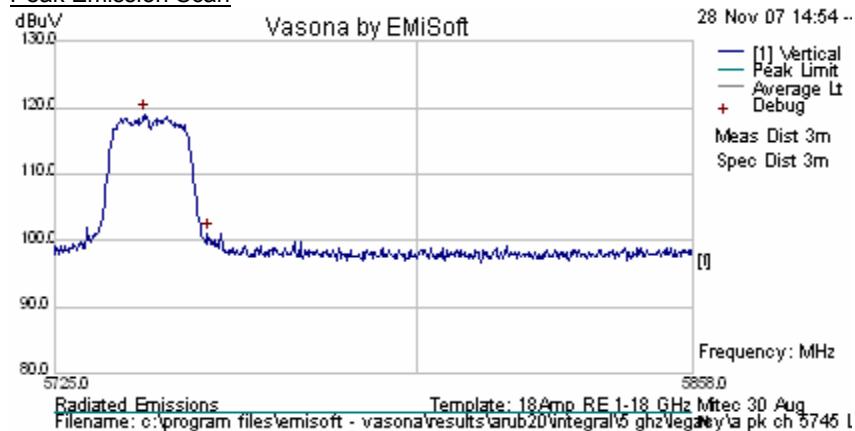
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

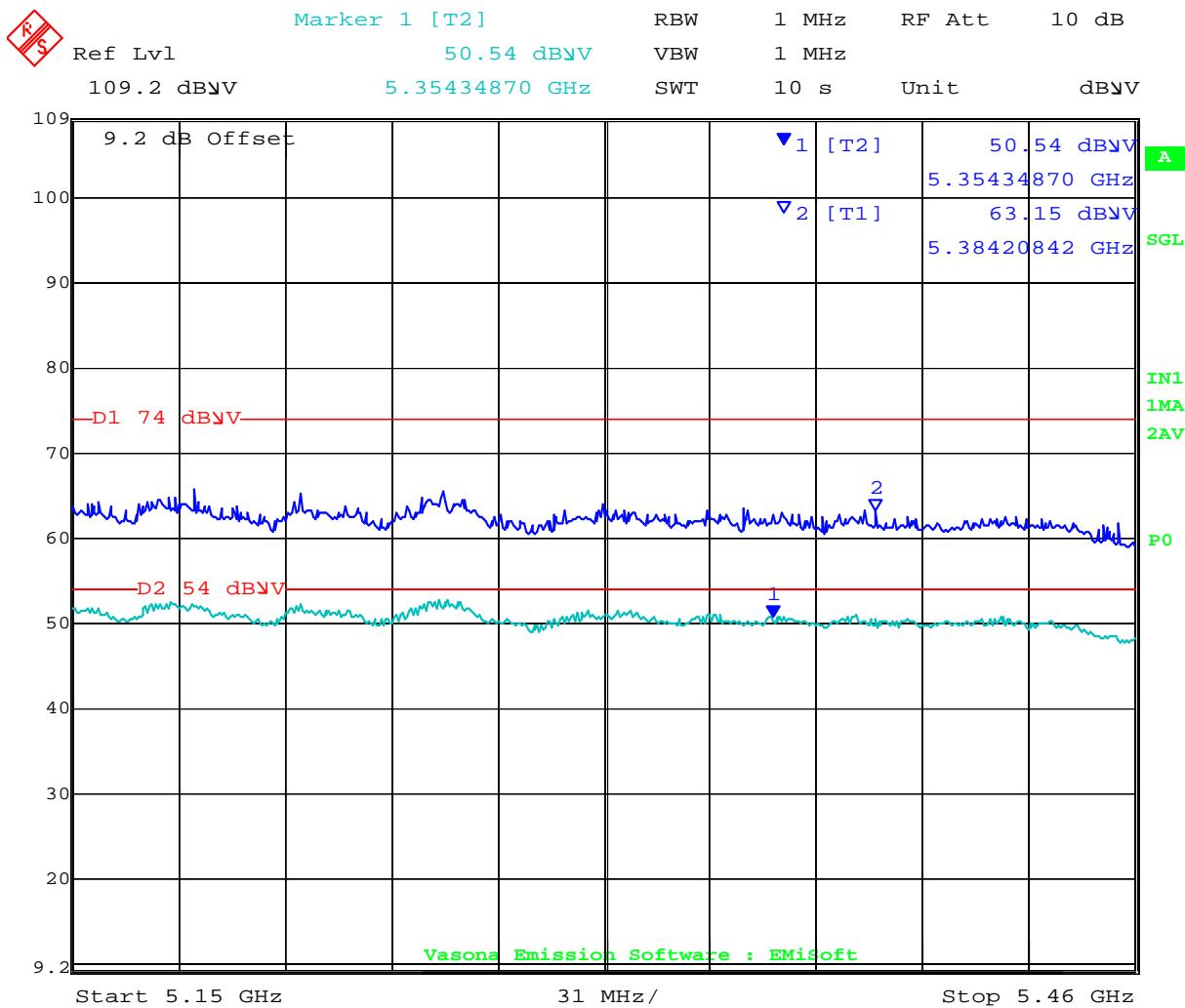


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5743.657	73.19	10.75	35.1	119.05	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
5460				63.15	Formal Peak	V			74	-10.85	Pass	Band-edge
5460				50.54	Formal Average	V			54	-3.46	Pass	Band-edge
5150				63.4	Formal Peak	V			74	-10.6	Pass	Band-edge
5150				51.60	Formal Average	V			54	-2.4	Pass	Band-edge
11495.79	59	6.79	-1.72	64.08	Peak Max	V	98	79	74	-9.92	Pass	
11495.79	44.95	6.79	-1.72	50.03	Average Max	V	98	79	54	-3.97	Pass	
17625.25	43.06	8.77	-0.38	51.45	Peak [Scan]	V	100	0	99.05	-47.6	Pass	NRB

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802.11a Legacy Band-edge 5150, 5460 MHz

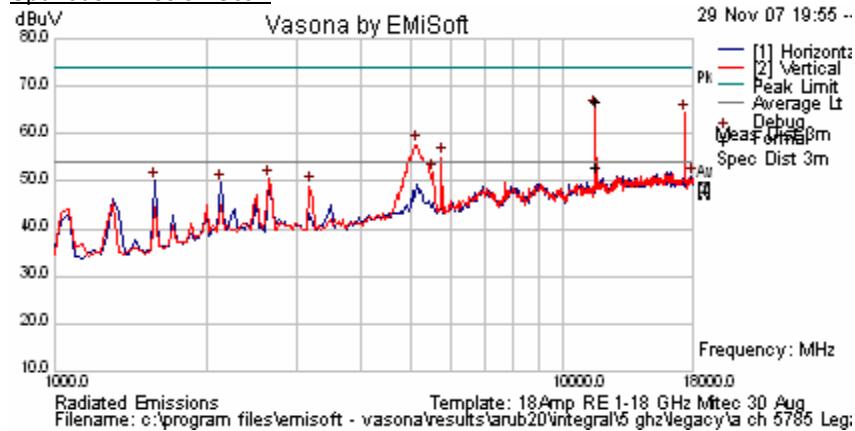
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AP125 - INTEGRAL Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
157	5785	ART 14	99%	a 6 Legacy	Yes

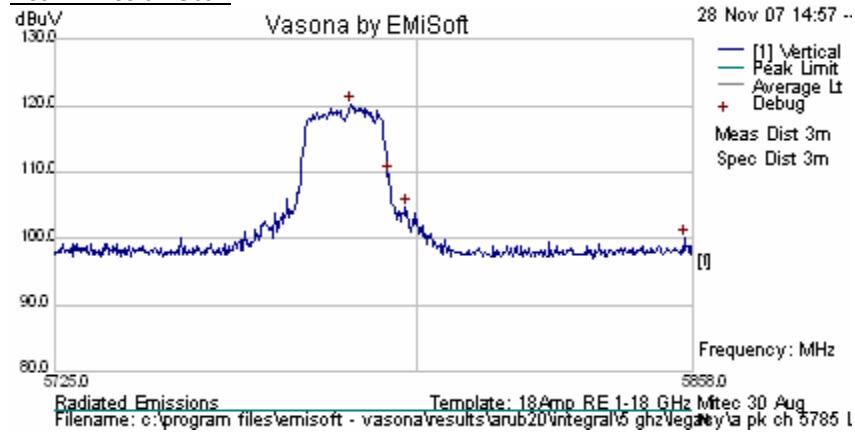
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5786.303	74.24	10.78	35.13	120.15	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
11574.43	59.52	6.81	-1.57	64.76	Peak Max	V	98	79	74	-9.24	Pass	
11574.43	45.78	6.81	-1.57	51.02	Average Max	V	98	79	54	-2.98	Pass	
17352.71	56.41	8.68	-0.57	64.53	Peak [Scan]	V	100	0	100.15	-35.62	Pass	NRB

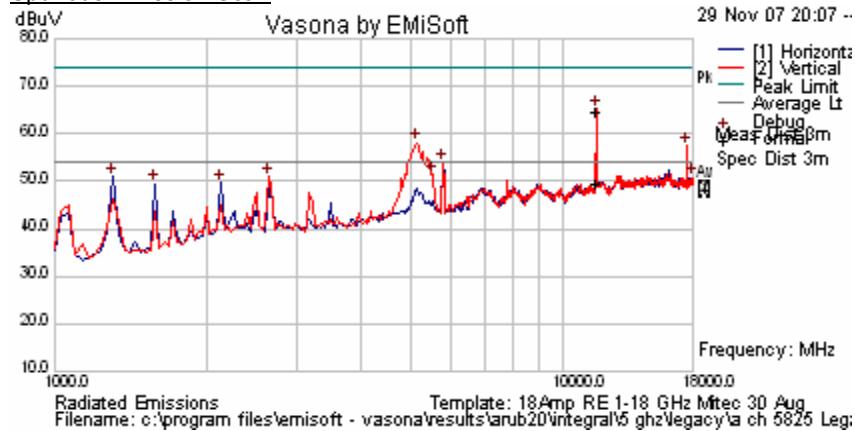
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AP125 - INTEGRAL Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
165	5825	ART 14	99%	a 6 Legacy	Yes

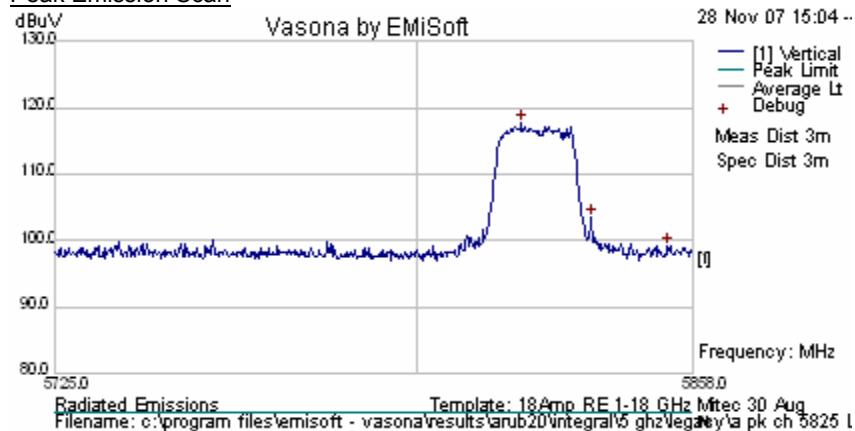
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5822.018	71.72	10.8	35.16	117.68	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
11645.65	57.42	6.83	-1.43	62.81	Peak Max	V	98	248	74	-11.19	Pass	
11645.65	41.99	6.83	-1.43	47.39	Average Max	V	98	248	54	-6.61	Pass	
17488.98	49.27	8.76	-0.62	57.42	Peak [Scan]	V	100	0	97.68	-40.26	Pass	NRB

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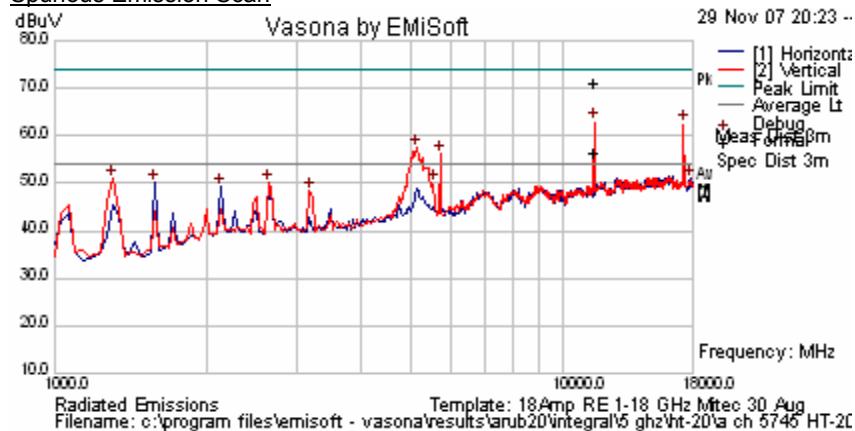
AP125: 5725-5850 MHz INTEGRAL HT-20 Data Rates

AP125 - INTEGRAL Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MCS)	Compliant
149	5745	ART 13.5	99%	n 6.5 HT-20	Yes

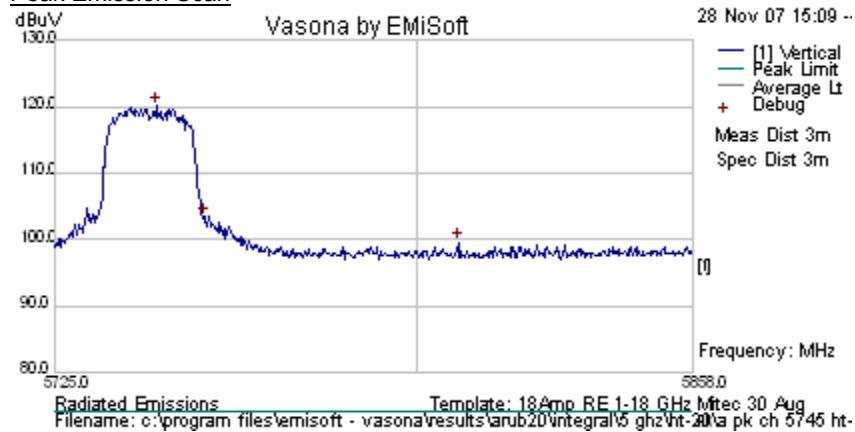
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

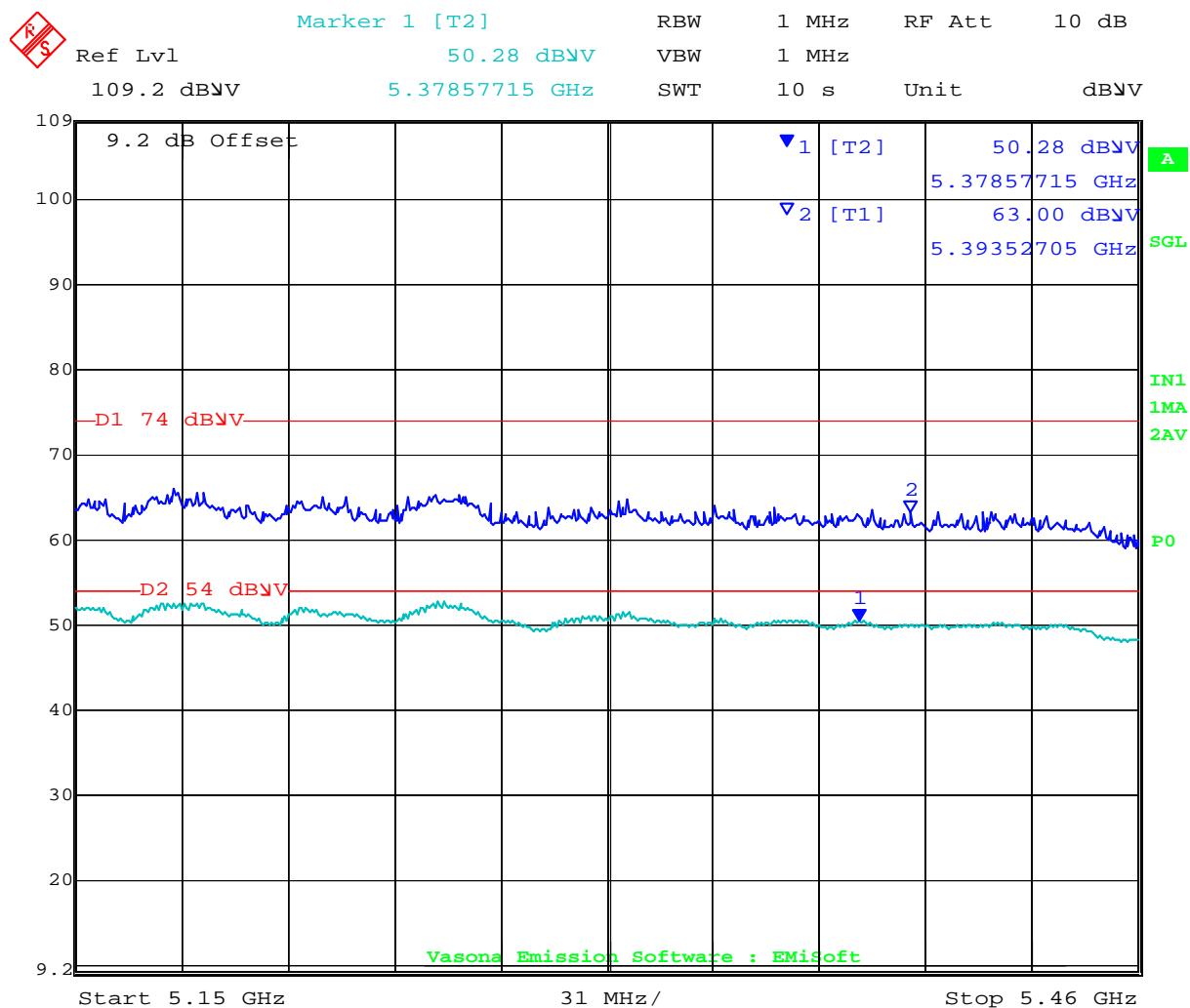


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5746.056	74.28	10.76	35.1	120.13	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
5460				63.00	Formal Peak	V			74	-11.00	Pass	Band-edge
5460				50.28	Formal Average	V			54	-3.72	Pass	Band-edge
5150				63.90	Formal Peak	V			74	-10.1	Pass	Band-edge
5150				52.00	Formal Average	V			54	-2.00	Pass	Band-edge
11493.47	63.9	6.79	-1.72	68.97	Peak Max	V	105	175	74	-5.03	Pass	
11493.42	48.76	6.79	-1.72	53.83	Average Max	V	105	175	54	-0.17	Pass	
17250.5	54.34	8.62	-0.48	62.48	Peak [Scan]	V	100	0	100.13	-37.65	Pass	NRB

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Date: 1.DEC.2007 14:05:02

802.11a HT-20 Band-edge 5150, 5460 MHz

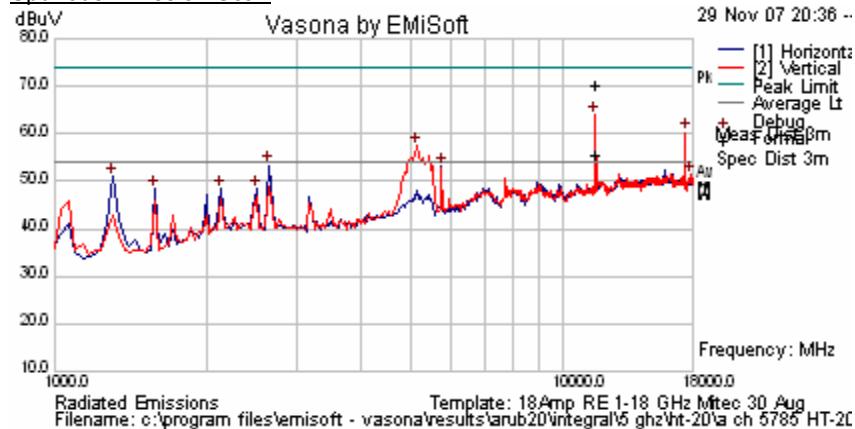
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AP125 - INTEGRAL Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MCS)	Compliant
157	5785	ART 13.5	99%	n 6.5 HT-20	Yes

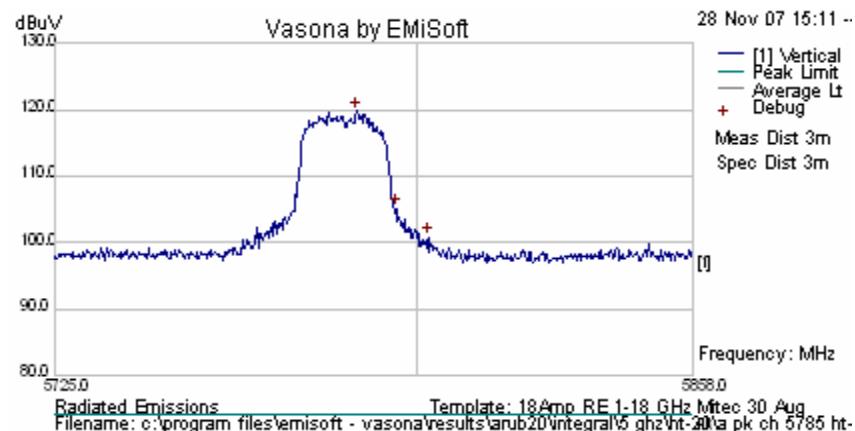
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5787.635	73.86	10.78	35.13	119.77	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
11571.42	62.83	6.81	-1.58	68.06	Peak Max	V	140	68	74	-5.94	Pass	
11571.42	48.24	6.81	-1.58	53.47	Average Max	V	140	68	54	-0.53	Pass	
17386.77	52.27	8.7	-0.64	60.33	Peak [Scan]	V	100	0	99.77	-39.44	pASS	NRB

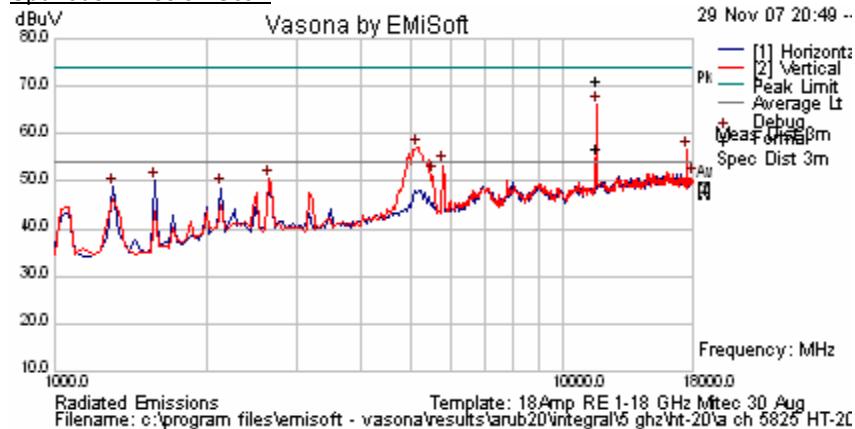
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AP125 - INTEGRAL Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MCS)	Compliant
165	5825	ART 12.5	99%	n 6.5 HT-20	Yes

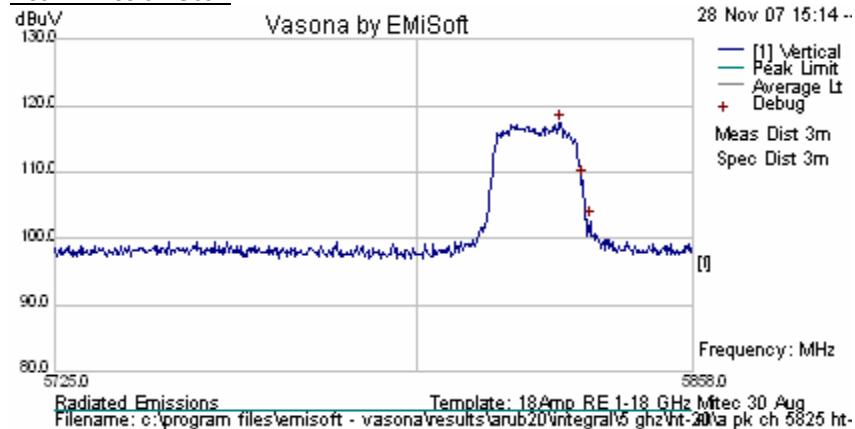
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5830.014	71.29	10.8	35.17	117.26	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
11653.34	62.83	6.83	-1.45	68.2	Peak Max	V	120	68	74	-5.8	Pass	
11653.34	47.99	6.83	-1.45	53.36	Average Max	V	120	68	54	-0.64	Pass	
17488.98	48.49	8.76	-0.62	56.63	Peak [Scan]	V	100	0	97.26	-40.63	Pass	NRB

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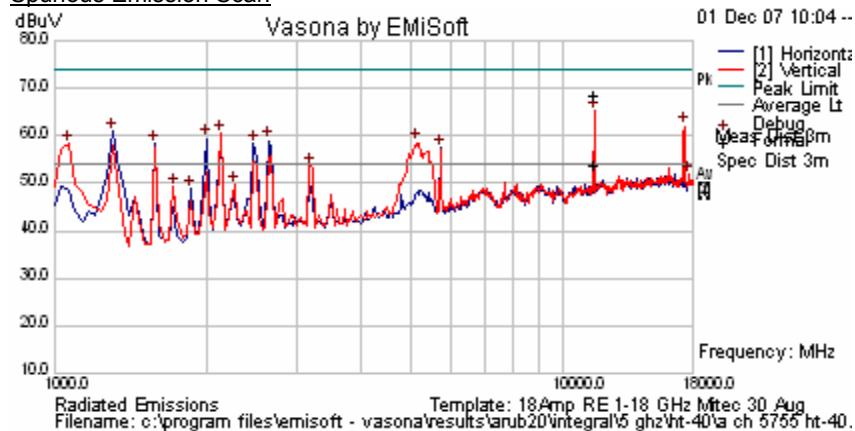
AP125: 5725-5850 MHz INTEGRAL HT-40 Data Rates

AP125 - INTEGRAL Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MCS)	Compliant
	5755	ART 17	99%	n 13.5 HT-40	Yes

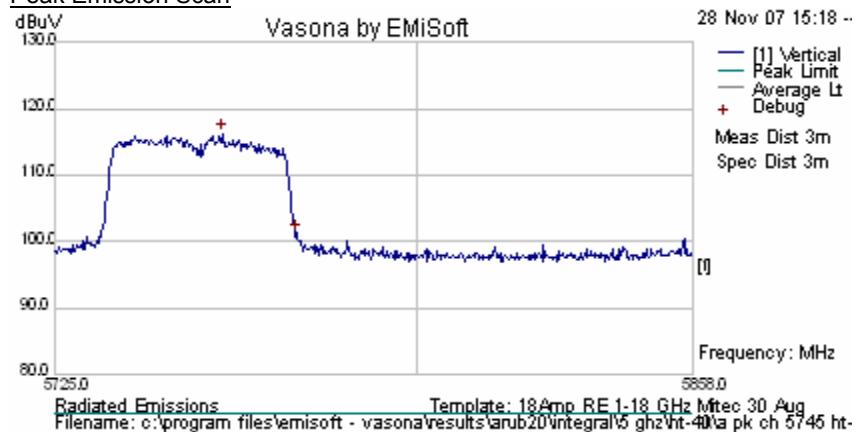
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

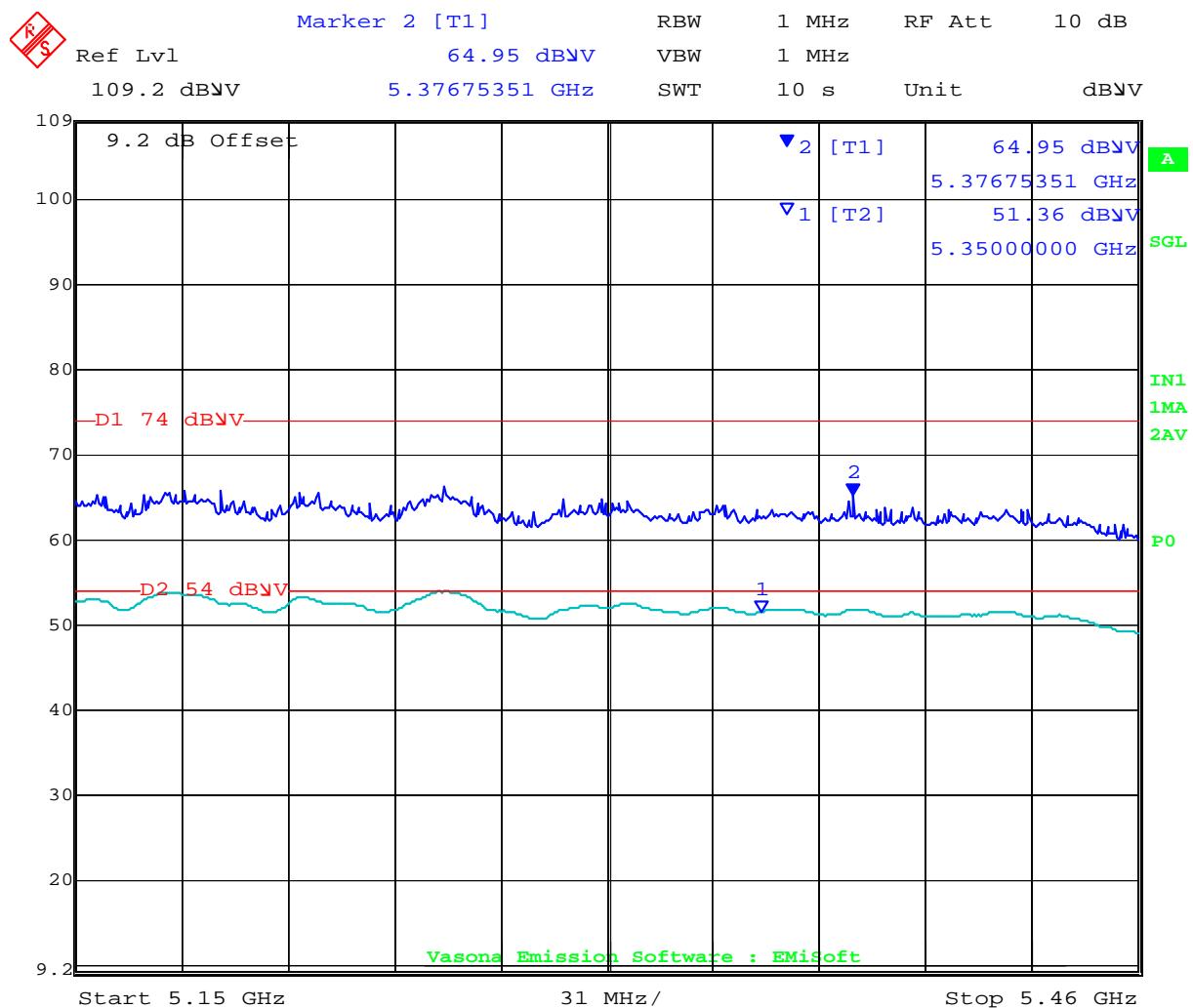


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5759.649	70.37	10.76	35.11	116.24	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
5460.00				64.95	Formal Peak	V			74	-9.05	Pass	Band-edge
5460.00				51.36	Formal Average	V			54	-2.64	Pass	Band-edge
5150.00				64.80	Formal Peak	V			74	-9.20	Pass	Band-edge
5150.00				53.10	Formal Average	V			54	-0.90	Pass	Band-edge
11515.13	61.29	6.79	-1.71	66.38	Peak Max	V	106	64	74	-7.62	Pass	
11515.13	46.85	6.79	-1.71	51.93	Average Max	V	106	64	54	-2.07	Pass	
17284.57	54.1	8.64	-0.64	62.11	Peak [Scan]	V	100	0	96.24	-34.13	Pass	NRB

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Date: 1.DEC.2007 14:06:56

802.11a HT-40 Band-edge 5150, 5460 MHz

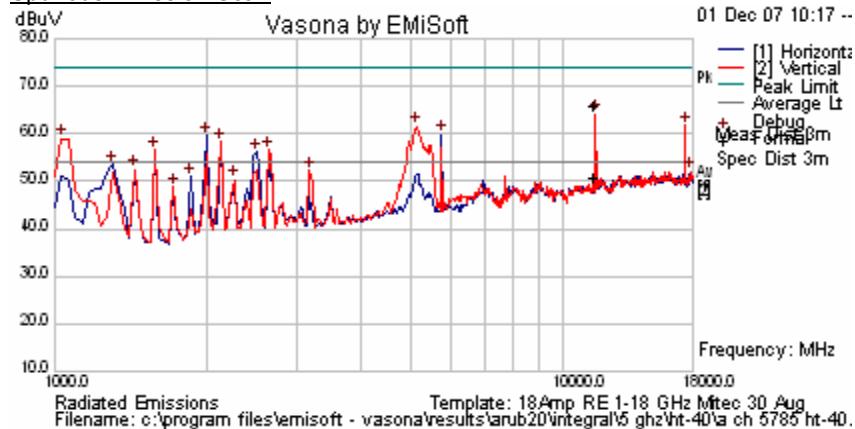
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AP125 - INTEGRAL Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MCS)	Compliant
157	5785	ART 17	99%	13.5 HT-40	Yes

Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5789.768	69.49	10.78	35.14	115.4	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
11565.63	58.6	6.81	-1.6	63.81	Peak Max	V	102	76	74	-10.19	Pass	
11565.63	43.45	6.81	-1.6	48.66	Average Max	V	102	76	54	-5.34	Pass	
17386.77	53.67	8.7	-0.64	61.73	Peak [Scan]	V	100	0	95.40	-33.67	Pass	NRB

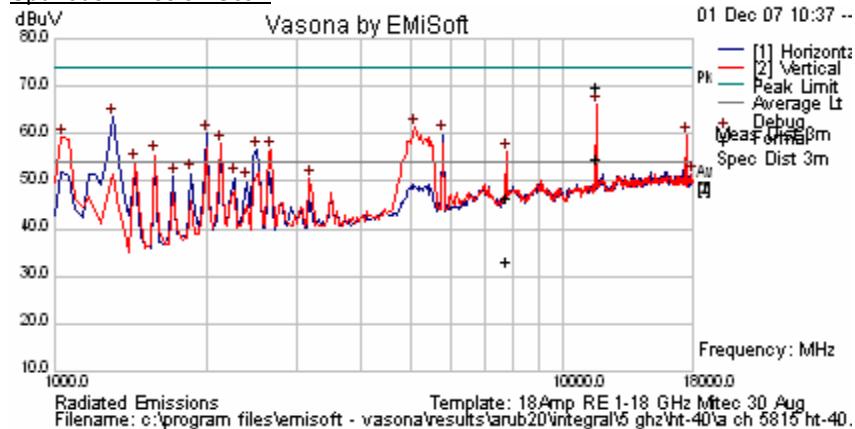
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AP125 - INTEGRAL Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MCS)	Compliant
	5815	ART 17	99%	13.5 HT-40	Yes

Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5800.162	68.78	10.78	35.14	114.71	Peak [Scan]	V	100	0	N/A	N/A	N/A	Fundamental
11625.7	62.55	6.82	-1.38	67.99	Peak Max	V	103	111	74	-6.01	Pass	
7753.351	52.47	5.54	-2.25	55.76	Peak	V	141	74	74	-18.24	Pass	
11625.7	47.01	6.82	-1.38	52.45	Average Max	V	103	111	54	-1.55	Pass	
7753.351	47.79	5.54	-2.25	51.08	Average Max	V	141	74	54	-2.92	Pass	
17454.91	51.47	8.74	-0.56	59.65	Peak [Scan]	V	100	0	94.71	-35.06	Pass	NRB

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Title: Aruba AP-124,125 802.11a/b/g/n AP
To: FCC 47 CFR Part 15.247 & IC RSS-210
Serial #: ARUB20-A2 Rev C
Issue Date: 29th February 2008
Page: 178 of 273

ARUB20 AP-124 (ANT-7)
ART Settings V Aggregate Measured Power

The following matrix identifies the ART power setting V's each output chain. The aggregate power was also measured for all three chains.

As a result of either spurious emissions (harmonic) or band-edge issues the power was reduced to bring the unit into compliance.

Configuration	ART Power Setting	Tx 1 Measured Pwr (dBm)	Tx 2 Measured Pwr (dBm)	Tx 3 Measured Pwr (dBm)	Aggregate Measured Pwr (dBm)
Legacy b (2390 2412 MHz)BE	16	13.74	13.27	14.33	19.38
Legacy g (2390 2412 MHz)BE	11	8.93	8.71	8.91	14.37
Legacy b (2483.5 2462 MHz)BE	16	13.94	13.25	14.14	19.10
Legacy g (2483.5 2462 MHz)BE	7.5	5.51	5.27	5.75	10.71
HT-20 (2390 2412 MHz)BE	6.5	4.30	3.57	4.98	9.76
HT-20 (2483.5 2462 MHz)BE	10	7.49	7.02	7.71	12.63
HT-40 (2483.5 2452 MHz)BE	3	1.67	.78	1.70	6.72
HT-40 (2390 2422 MHz)BE	7	5.60	4.74	5.90	10.88
Legacy b (2412 MHz)SE	19	16.92	16.52	17.40	22.68
Legacy b (2437 MHz)SE	19	16.80	16.32	17.02	21.59
Legacy b (2462 MHz)SE	19	17.00	16.46	17.47	22.39
Legacy g (2412 MHz)SE	17	15.19	14.19	15.52	20.37
Legacy g (2437 MHz)SE	17	14.56	14.32	14.97	20.40
Legacy g (2462 MHz)SE	17	14.84	14.68	15.46	21.27
HT-20 (2412 MHz)SE	19	16.96	16.51	17.40	22.40
HT-20 (2437 MHz)SE	19	16.73	16.23	17.06	22.36
HT-20 (2462 MHz)SE	19	16.93	16.80	17.26	22.35
HT-40 (2422 MHz)SE	19	17.30	16.75	17.39	22.68
HT-40 (2437 MHz)SE	19	17.11	16.53	17.36	22.30
HT-40 (2452 MHz)SE	19	16.91	16.42	17.80	22.25

Note BE = Band-edge, SE – Spurious emissions

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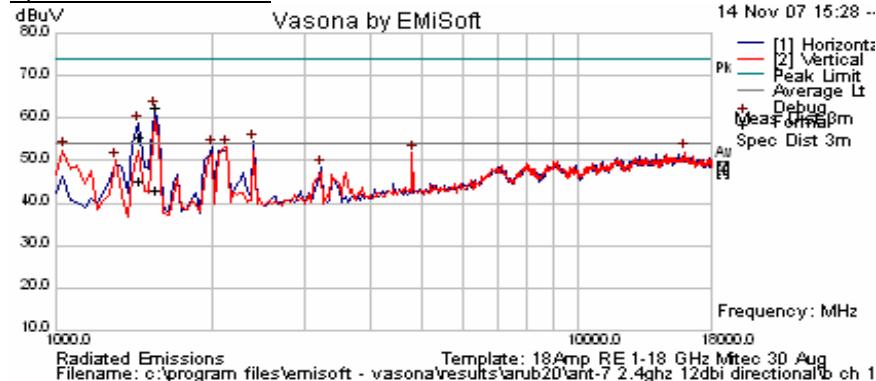
AP124: 2400 - 2483.5 MHz ANT-7 (12 dBi) Legacy Data Rates

AP124 - ANT-7 (12 dBi) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
1	2412	ART 19	99%	b 1 MBit/s Legacy	Yes

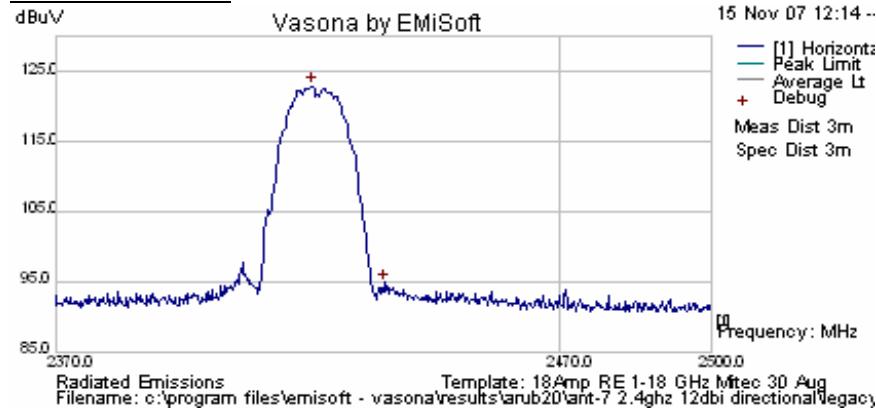
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

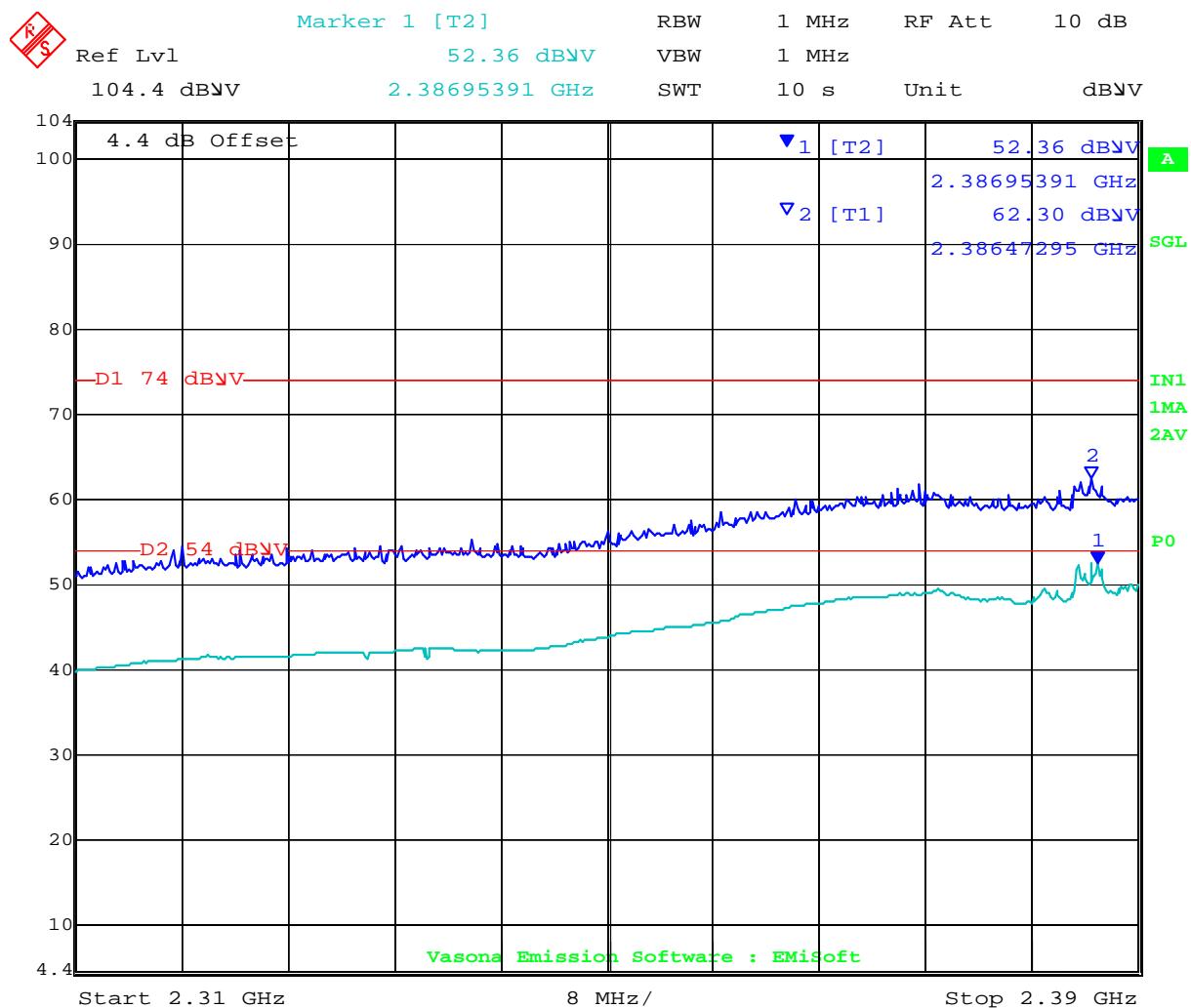


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2421.062	87.56	2.96	32.36	122.88	Peak [Scan]	H	100	0	N/A	N/A	N/A	Pk Emission
2390.0	ART Power Setting = 16			62.3	Formal Peak	V			74	-11.7	Pass	Band-edge
2390.0				52.36	Formal Average	V			54	-1.64	Pass	Band-edge
1555.897	72.8	2.42	-14.72	60.5	Peak Max	V	110	14	74	-13.5	Pass	
1451.031	66.44	2.34	-15.37	53.41	Peak Max	V	132	202	74	-20.59	Pass	
1555.897	53.12	2.42	-14.72	40.82	Average Max	H	137	22	54	-13.18	Pass	
1451.031	56.29	2.34	-15.37	43.27	Average Max	H	98	35	54	-10.73	Pass	
2396.794	62.71	2.95	-11.08	54.58	Peak [Scan]	H	100	0	102.88	-48.30	Pass	NRB
2124.248	61.34	2.82	-11.03	53.12	Peak [Scan]	V	100	0	102.88	-49.76	Pass	NRB
1987.976	61.55	2.74	-11.26	53.03	Peak [Scan]	H	100	0	102.88	-49.85	Pass	NRB
3214.429	56.46	3.48	-11.65	48.28	Peak [Scan]	H	100	0	102.88	-54.60	Pass	NRB

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802.11b Legacy Band-edge 2390 MHz

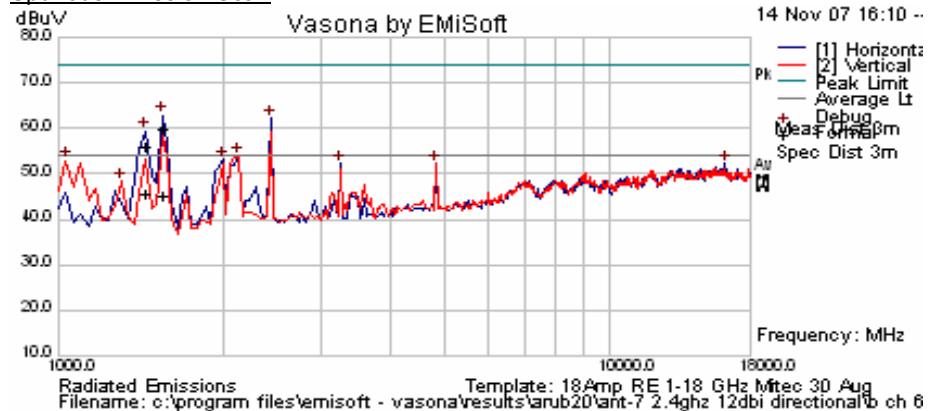
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AP124 - ANT-7 (12 dBi) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
6	2437	ART 19	99%	b 1 MBit/s Legacy	Yes

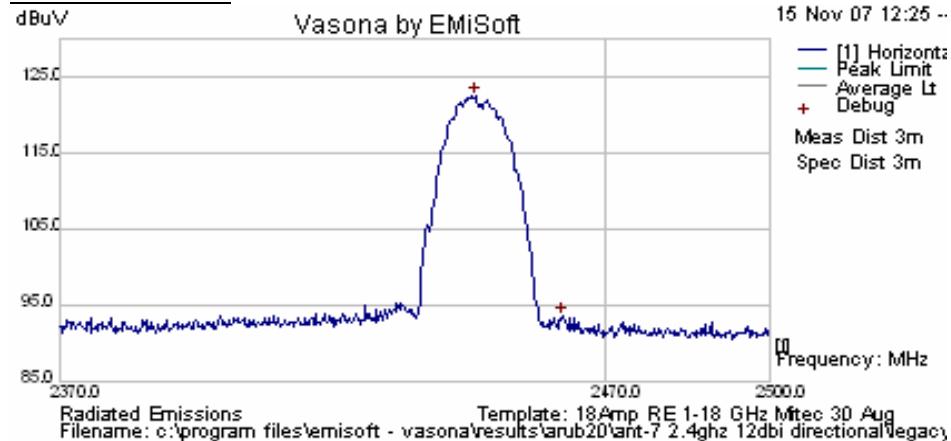
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2446.072	87.18	2.98	32.37	122.53	Peak [Scan]	H	100	0	N/A	N/A	N/A	Pk Emission
1559.398	70.02	2.42	-14.69	57.75	Peak Max	V	106	13	74	-16.25	Pass	
1451.551	66.82	2.34	-15.36	53.79	Peak Max	V	133	204	74	-20.21	Pass	
1559.398	55.46	2.42	-14.69	43.19	Average Max	H	123	50	54	-10.81	Pass	
1451.551	56.58	2.34	-15.36	43.55	Average Max	H	98	34	54	-10.45	Pass	
2430.862	70.5	2.97	-11.17	62.3	Peak [Scan]	H	100	0	102.53	-40.23	Pass	NRB
2124.248	62	2.82	-11.03	53.78	Peak [Scan]	H	100	0	102.53	-48.75	Pass	NRB
1987.976	61.73	2.74	-11.26	53.21	Peak [Scan]	H	100	0	102.53	-49.32	Pass	NRB
3248.497	60.32	3.49	-11.64	52.17	Peak [Scan]	H	100	0	102.53	-50.36	Pass	NRB

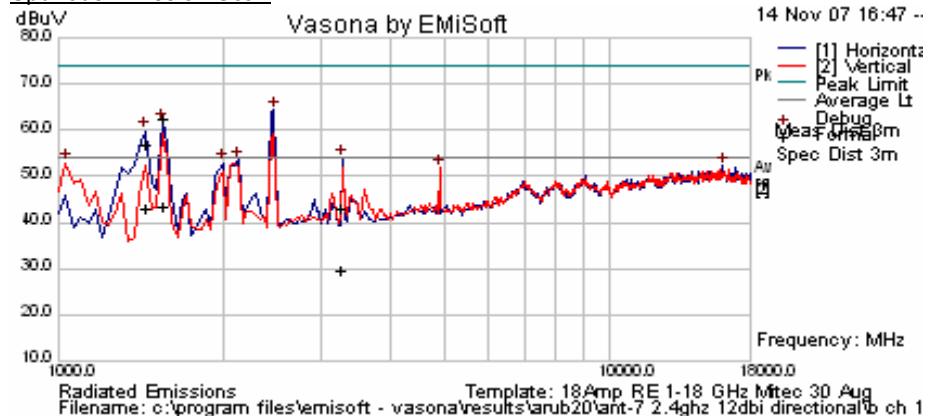
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AP124 - ANT-7 (12 dBi) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
11	2462	ART 19	99%	b 1 MBit/s Legacy	Yes

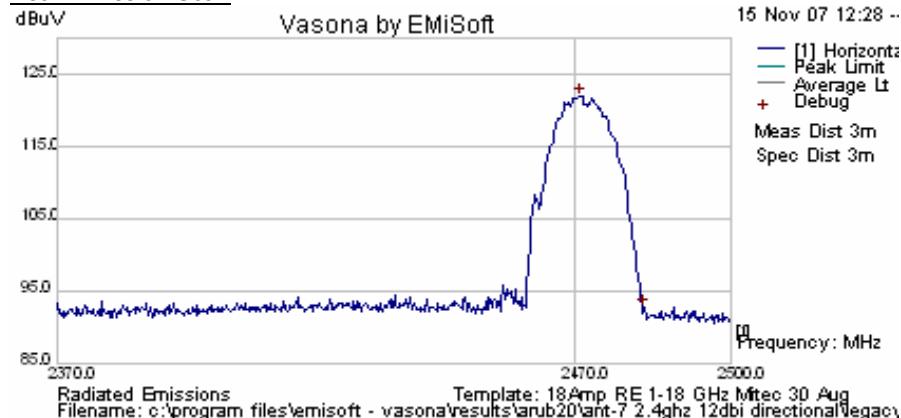
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

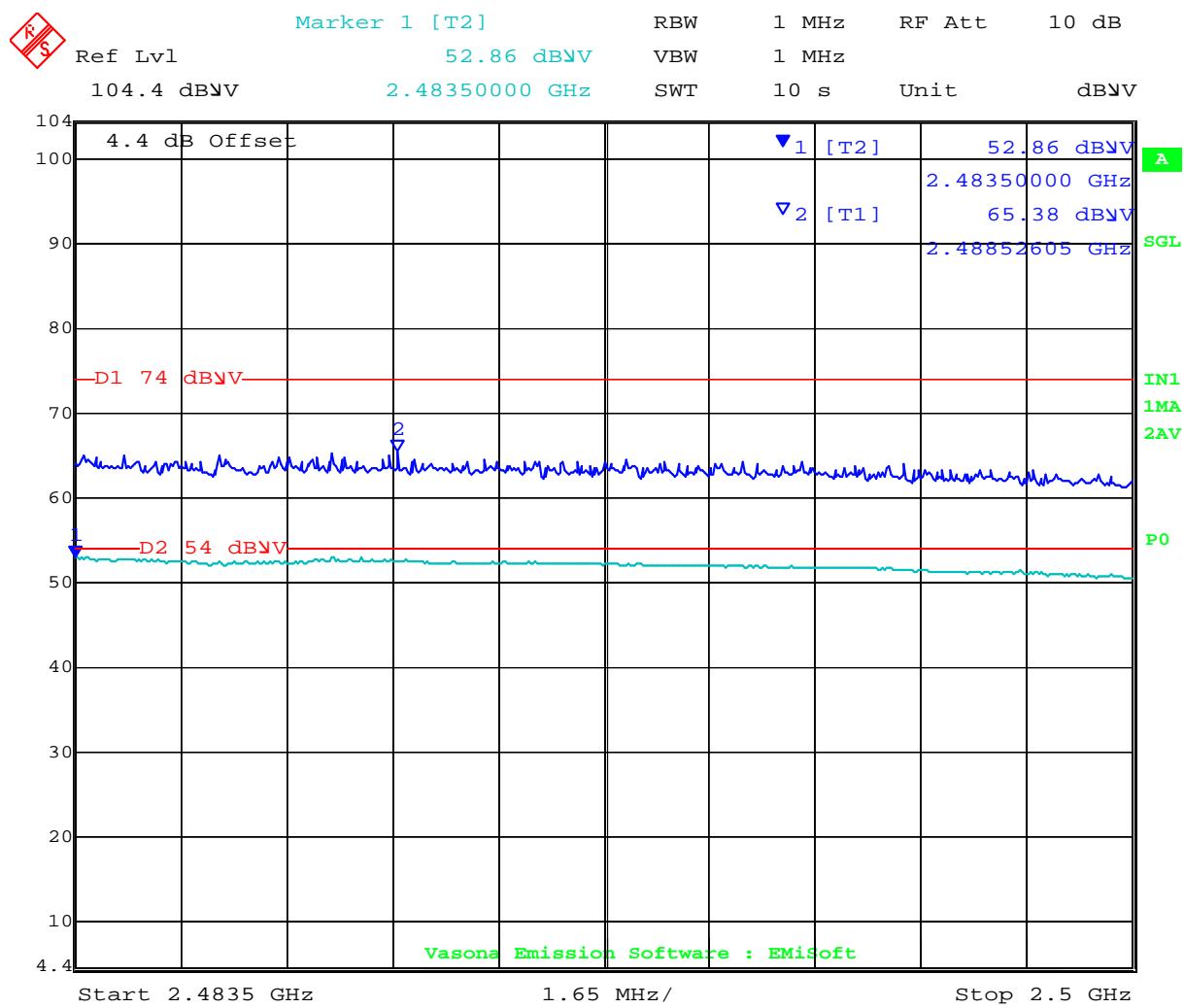


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2471.082	86.62	2.99	32.38	121.99	Peak [Scan]	H	100	0	N/A	N/A	N/A	Pk Emission
2483.5	ART Power Setting = 16			65.38	Formal Peak	V			74	-8.62	Pass	Band-edge
2483.5				52.86	Formal Average	V			54	-1.14	Pass	Band-edge
1555.912	72.93	2.42	-14.72	60.63	Peak Max	V	106	15	74	-13.37	Pass	
1454.549	67.69	2.34	-15.36	54.67	Peak Max	V	116	21	74	-19.33	Pass	
3276.057	48.89	3.51	-11.57	40.83	Peak Max	V	98	149	74	-33.17	Pass	
1555.912	53.86	2.42	-14.72	41.56	Average Max	H	98	22	54	-12.44	Pass	
1454.549	54.17	2.34	-15.36	41.15	Average Max	H	151	35	54	-12.85	Pass	
2464.93	72.68	2.98	-11.17	64.49	Peak [Scan]	H	100	0	101.99	-37.50	Pass	NRB
2124.248	61.73	2.82	-11.03	53.52	Peak [Scan]	H	100	0	101.99	-48.47	Pass	NRB
1987.976	61.49	2.74	-11.26	52.98	Peak [Scan]	H	100	0	101.99	-49.01	Pass	NRB
4917.836	56.69	4.55	-9.24	51.99	Peak [Scan]	V	100	0	101.99	-50.00	Pass	NRB

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Date: 1.DEC.2007 18:52:04

802.11b Legacy Band-edge 2483.5 MHz

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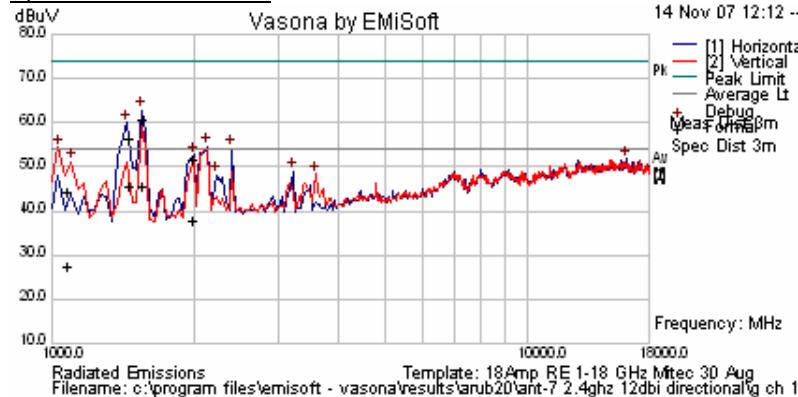
AP124: 2400 - 2483.5 MHz ANT-7 (12 dBi) Legacy Data Rates

AP124 - ANT-7 (12 dBi) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
1	2412	ART 17	99%	g 6 MBit/s Legacy	Yes

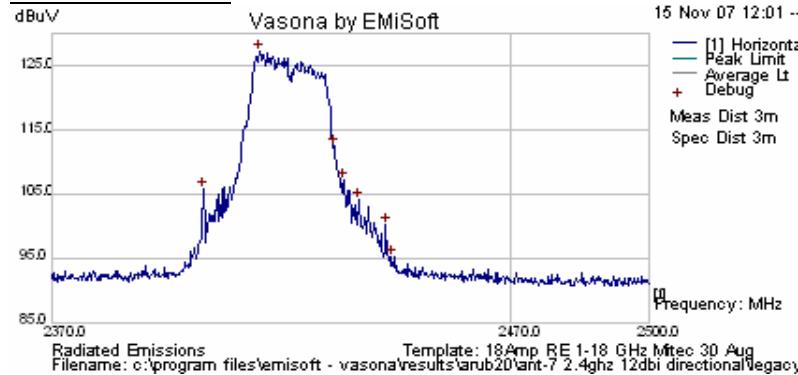
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

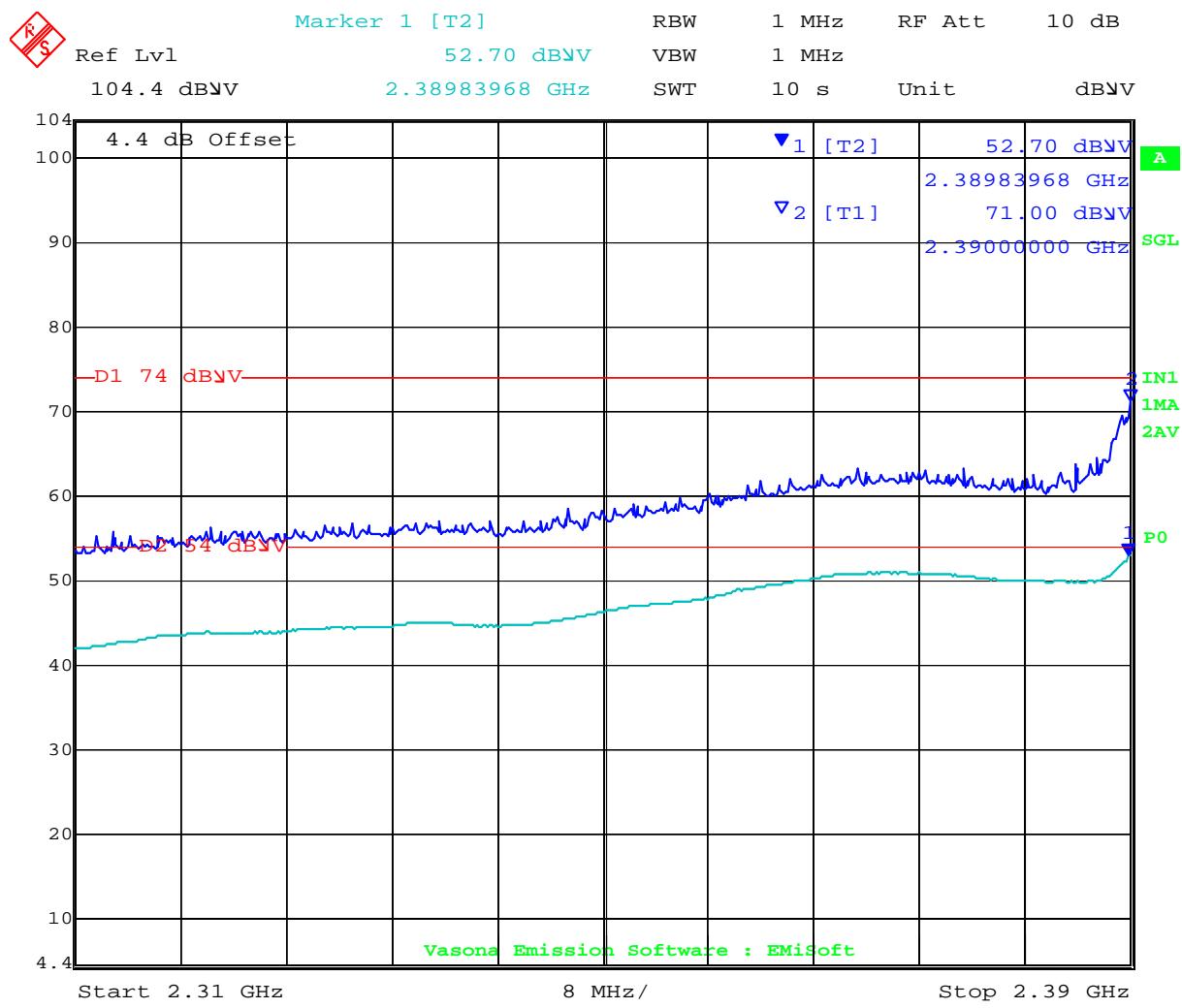


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2415.331	91.96	2.96	32.35	127.27	Peak [Scan]	H	100	0	N/A	N/A	N/A	Pk Emission
2390.0	ART Power Setting = 11			71.00	Formal Peak	V			74	-3.00	Pass	Band-edge
2390.0				52.70	Formal Average	V			54	-1.30	Pass	Band-edge
1557.459	71.11	2.42	-14.71	58.83	Peak Max	V	103	13	74	-15.17	Pass	
1459.219	67.44	2.34	-15.34	54.44	Peak Max	V	117	18	74	-19.56	Pass	
1085.204	56.53	2.03	-16.09	42.47	Peak Max	V	102	57	74	-31.53	Pass	
1989.579	58.23	2.74	-11.25	49.72	Peak Max	V	98	102	74	-24.28	Pass	
2132.645	61.41	2.82	-11.04	53.19	Peak Max	V	101	156	74	-20.81	Pass	
1557.459	55.93	2.42	-14.71	43.64	Average Max	H	124	53	54	-10.36	Pass	
1459.219	56.65	2.34	-15.34	43.65	Average Max	H	102	34	54	-10.35	Pass	
1085.204	39.49	2.03	-16.09	25.43	Average Max	V	102	57	54	-28.57	Pass	
1989.579	44.27	2.74	-11.25	35.77	Average Max	H	100	83	54	-18.23	Pass	
2132.645	41.48	2.82	-11.04	33.25	Average Max	H	98	196	54	-20.75	Pass	
3214.429	57.25	3.48	-11.65	49.08	Peak [Scan]	H	100	0	54	-4.92	Pass	NRB

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Date: 1.DEC.2007 18:42:10

802.11g Legacy Band-edge 2390 MHz

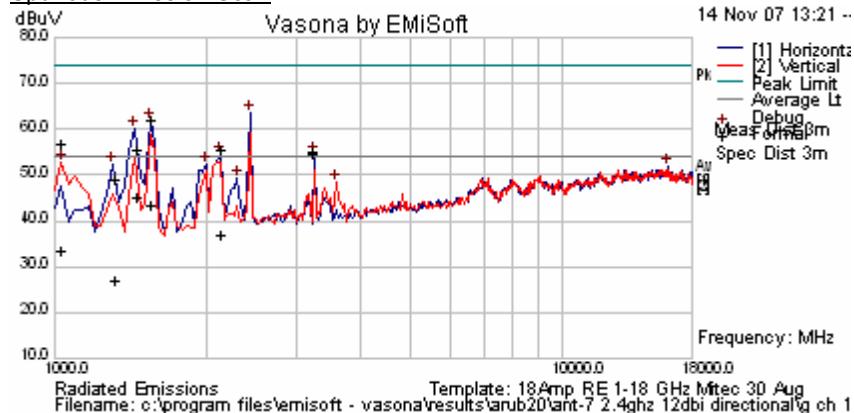
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AP124 - ANT-7 (12 dBi) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
6	2437	ART 17	99%	g 6 MBit/s Legacy	Yes

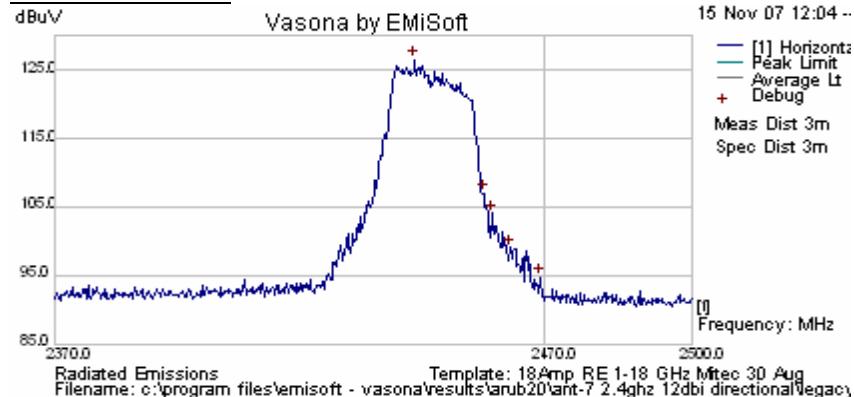
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2443.467	91.19	2.97	32.37	126.54	Peak [Scan]	H	100	0	N/A	N/A	N/A	Pk Emission
1555.391	72.55	2.42	-14.72	60.24	Peak Max	V	104	115	74	-13.76	Pass	
1460.281	66.44	2.34	-15.34	53.44	Peak Max	V	104	25	74	-20.56	Pass	
2132.024	61.69	2.82	-11.04	53.46	Peak Max	V	98	156	74	-20.54	Pass	
3249.399	61.14	3.49	-11.64	53	Peak Max	V	104	253	74	-21	Pass	
1037.515	68.82	1.99	-16.05	54.76	Peak Max	V	98	71	74	-19.24	Pass	
1327.615	60.3	2.24	-15.59	46.95	Peak Max	V	99	340	74	-27.05	Pass	
1555.391	53.67	2.42	-14.72	41.37	Average Max	H	99	23	54	-12.63	Pass	
1460.281	56.29	2.34	-15.34	43.29	Average Max	H	103	38	54	-10.71	Pass	
2132.024	43.24	2.82	-11.04	35.02	Average Max	H	114	232	54	-18.98	Pass	
3249.399	60.98	3.49	-11.64	52.83	Average Max	H	98	34	54	-1.17	Pass	
1037.515	45.55	1.99	-16.05	31.49	Average Max	V	98	71	54	-22.51	Pass	
1327.615	38.48	2.24	-15.59	25.13	Average Max	H	98	53	54	-28.87	Pass	

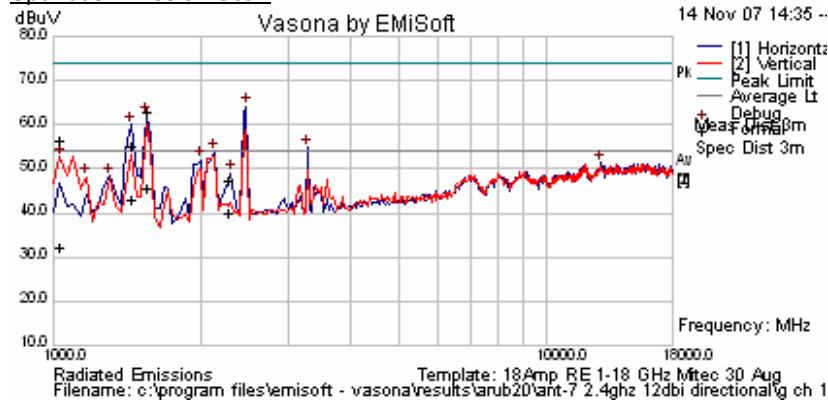
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AP124 - ANT-7 (12 dBi) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
11	2462	ART 17	99%	g 6 MBit/s Legacy	Yes

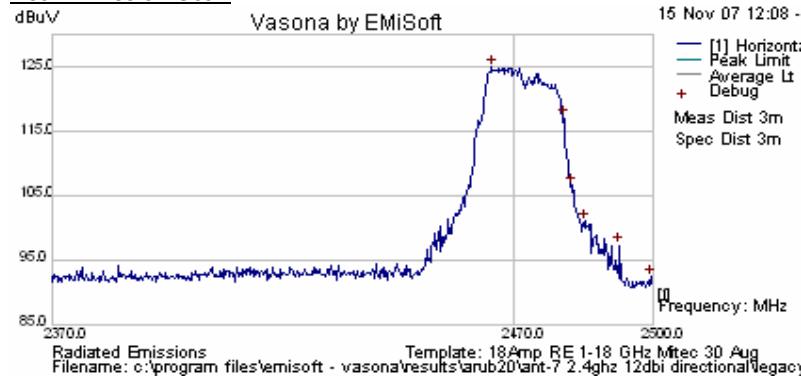
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

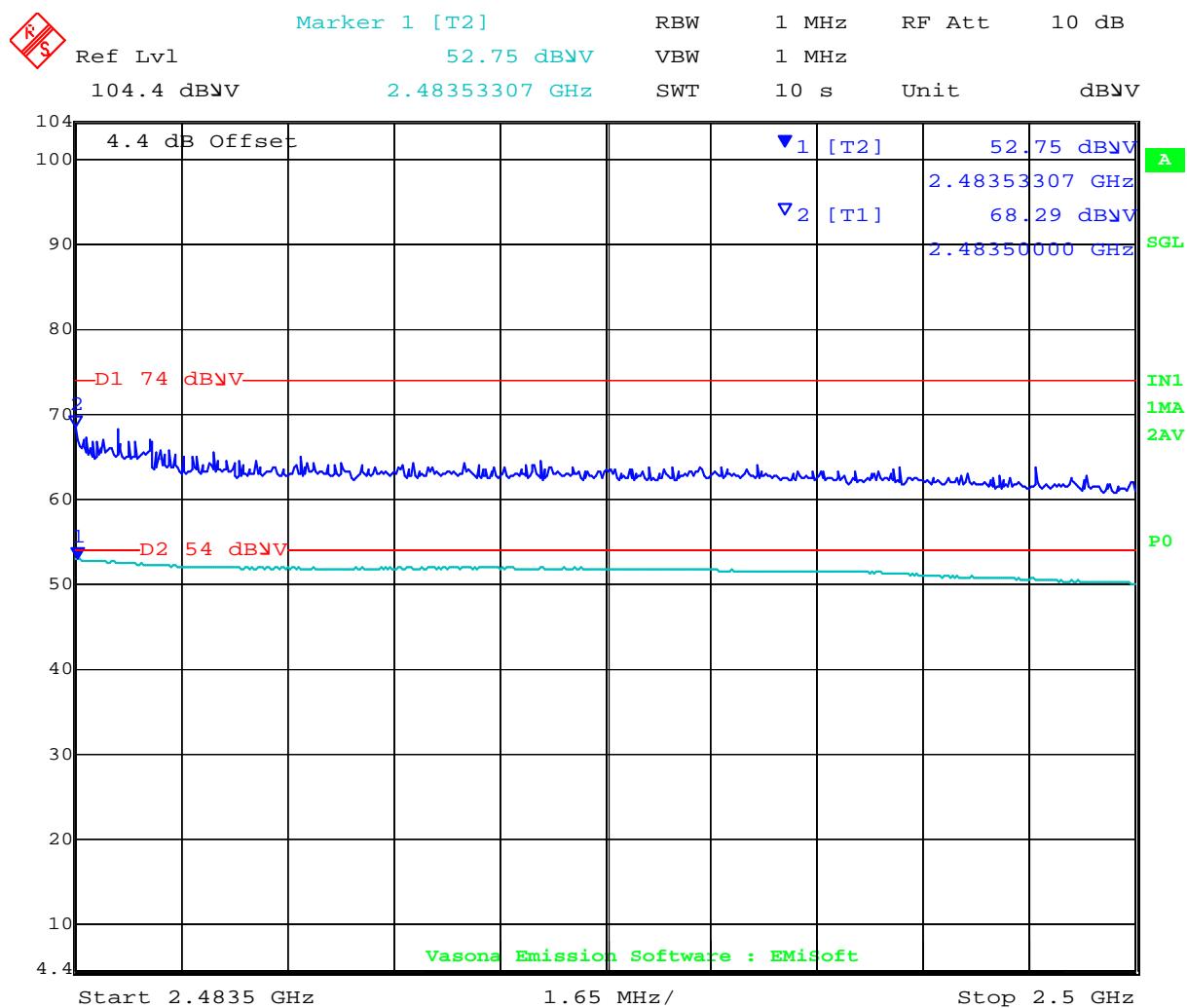


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2465.09	89.55	2.98	32.38	124.91	Peak [Scan]	H	100	0	N/A	N/A	N/A	Pk Emission
2483.5	ART Power Setting = 7.5			68.29	Formal Peak	V			74	-5.71	Pass	Band-edge
2483.5				52.75	Formal Average	V			54	-1.25	Pass	Band-edge
1555.631	73.06	2.42	-14.72	60.76	Peak Max	V	107	15	74	-13.24	Pass	
1452.766	66.31	2.34	-15.36	53.29	Peak Max	V	134	202	74	-20.71	Pass	
1036.733	68.44	1.99	-16.05	54.38	Peak Max	V	98	67	74	-19.62	Pass	
2287.214	53.34	2.9	-10.99	45.25	Peak Max	V	139	304	74	-28.75	Pass	
1555.631	55.67	2.42	-14.72	43.37	Average Max	H	124	57	54	-10.63	Pass	
1452.766	53.97	2.34	-15.36	40.94	Average Max	H	98	79	54	-13.06	Pass	
1036.733	44.37	1.99	-16.05	30.3	Average Max	V	98	67	54	-23.7	Pass	
2287.214	46.25	2.9	-10.99	38.16	Average Max	H	108	325	54	-15.84	Pass	
3282.565	63.06	3.51	-11.56	55.01	Peak [Scan]	H	100	0	104.91	-49.90	Pass	NRB
2124.248	62.03	2.82	-11.03	53.81	Peak [Scan]	H	100	0	104.91	-51.10	Pass	NRB

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Date: 1.DEC.2007 18:53:37

802.11g Legacy Band-edge 2483.5 MHz

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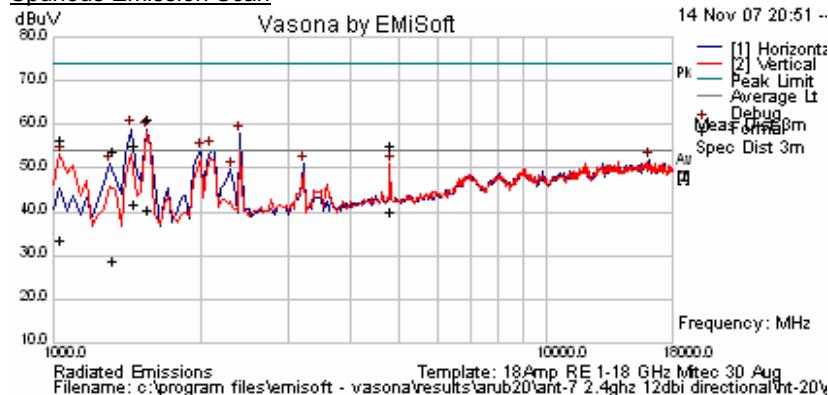
AP124: 2400 - 2483.5 MHz ANT 7 HT-20 Data Rates

AP124 - ANT 7 Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
1	2412	ART 19	99%	n 6.5 MCS HT-20	Yes

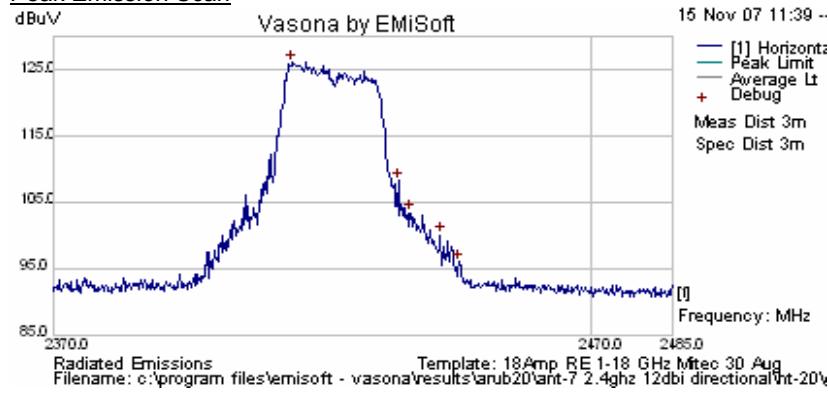
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

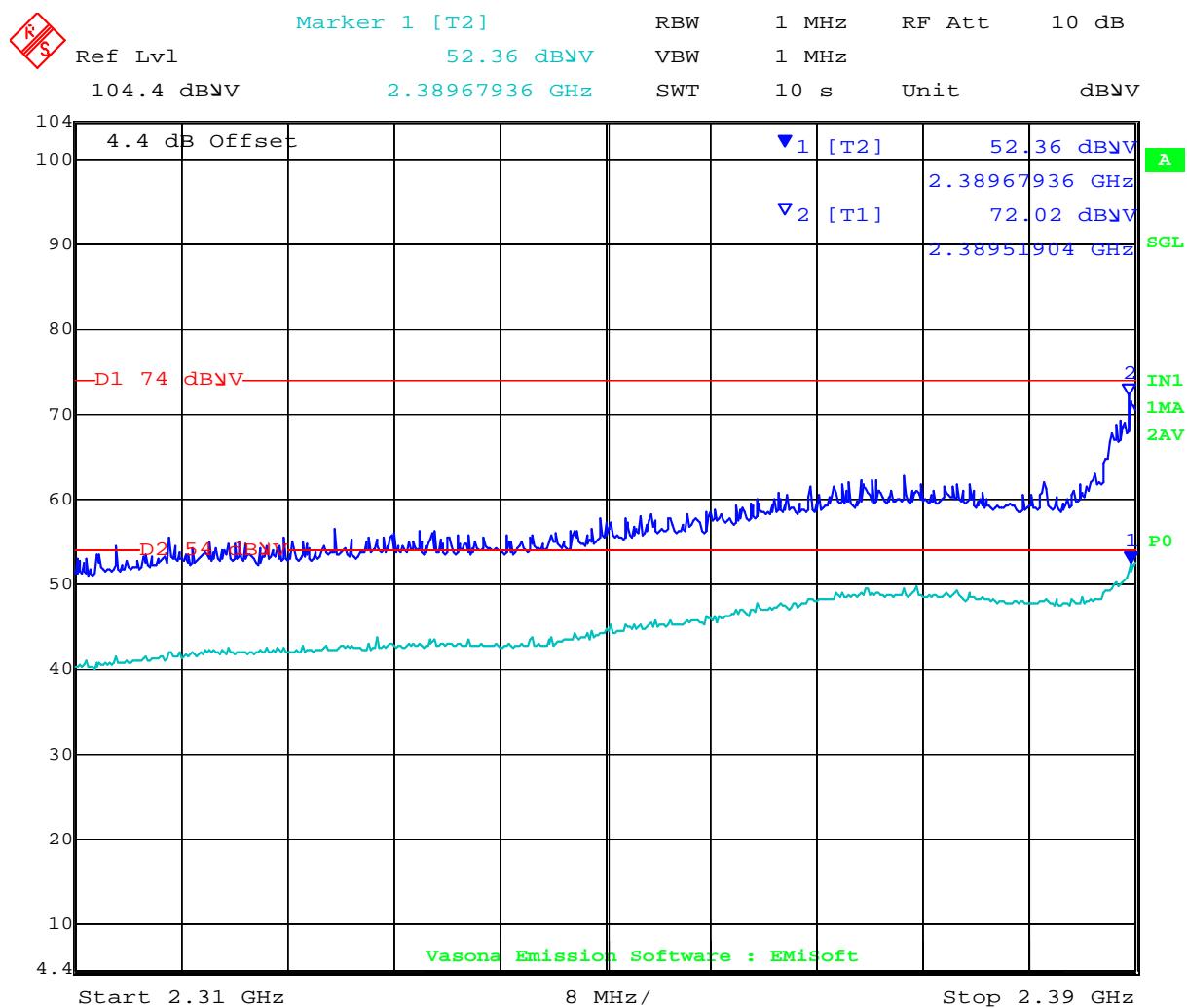


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2414.479	90.77	2.96	32.35	126.08	Peak [Scan]	H	100	0	N/A	N/A	N/A	Pk Emission
2390.0	ART Power Setting = 6.5			69.76	Formal Peak				74	-4.24	Pass	Band-edge
2390.0				52.53	Formal Average				54	-1.47	Pass	Band-edge
1555.1	71.51	2.42	-14.73	59.2	Peak Max	V	110	15	74	-14.8	Pass	
1464.589	66.19	2.35	-15.33	53.2	Peak Max	V	118	21	74	-20.8	Pass	
1037.254	68.32	1.99	-16.05	54.25	Peak Max	V	110	12	74	-19.75	Pass	
4826.513	57.96	4.47	-9.19	53.23	Peak Max	V	98	150	74	-20.77	Pass	
1320.2	65.15	2.24	-15.62	51.77	Peak Max	V	98	181	74	-22.23	Pass	
1555.1	50.7	2.42	-14.73	38.39	Average Max	H	140	21	54	-15.61	Pass	
1464.589	52.69	2.35	-15.33	39.71	Average Max	H	142	30	54	-14.29	Pass	
1037.254	45.66	1.99	-16.05	31.6	Average Max	V	110	12	54	-22.4	Pass	
4826.513	42.83	4.47	-9.19	38.1	Average Max	V	98	150	54	-15.9	Pass	
1320.2	40.19	2.24	-15.62	26.81	Average Max	H	109	48	54	-27.19	Pass	

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Date: 1.DEC.2007 18:43:37

802.11n HT--20 Band-edge 2390 MHz

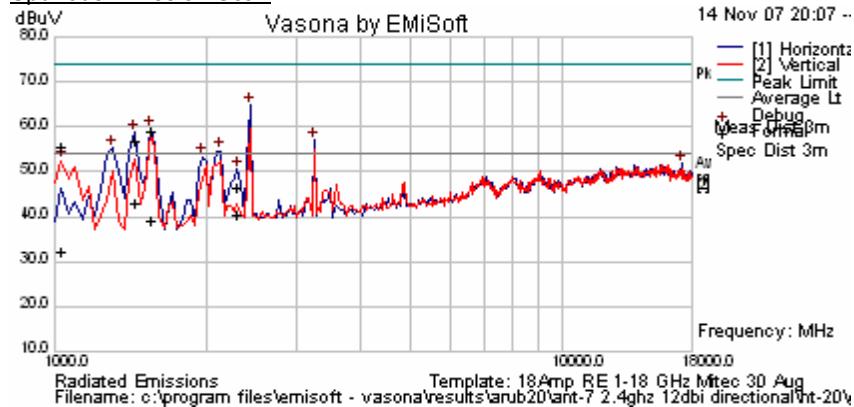
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AP124 - ANT 7 Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
6	2437	ART 19	99%	n 6.5 MCS HT-20	Yes

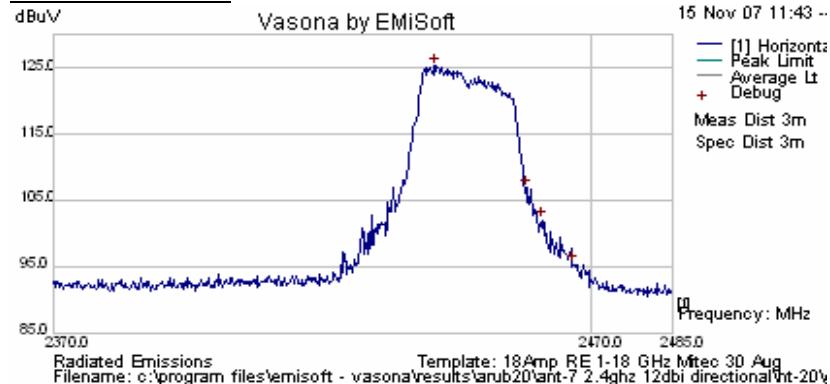
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2440.982	90.01	2.97	32.37	125.36	Peak [Scan]	H	100	0	N/A	N/A	N/A	Pk Emission
1554.86	69.35	2.42	-14.73	57.04	Peak Max	V	100	115	74	-16.96	Pass	
1451.754	67.69	2.34	-15.36	54.66	Peak Max	V	133	204	74	-19.34	Pass	
1036.924	67.44	1.99	-16.05	53.37	Peak Max	V	101	32	74	-20.63	Pass	
2307.996	52.38	2.91	-11.02	44.27	Peak Max	V	103	304	74	-29.73	Pass	
1554.86	49.49	2.42	-14.73	37.18	Average Max	H	108	222	54	-16.82	Pass	
1451.754	54.12	2.34	-15.36	41.1	Average Max	H	98	30	54	-12.9	Pass	
1036.924	44.4	1.99	-16.05	30.33	Average Max	V	101	32	54	-23.67	Pass	
2307.996	46.34	2.91	-11.02	38.23	Average Max	H	99	242	54	-15.77	Pass	
3248.497	65.33	3.49	-11.64	57.18	Peak [Scan]	H	100	0	105.36	-48.18	Pass	NRB
2124.248	62.96	2.82	-11.03	54.74	Peak [Scan]	H	100	0	105.36	-50.62	Pass	NRB
1953.908	62.24	2.72	-11.52	53.43	Peak [Scan]	H	100	0	105.36	-51.93	Pass	NRB

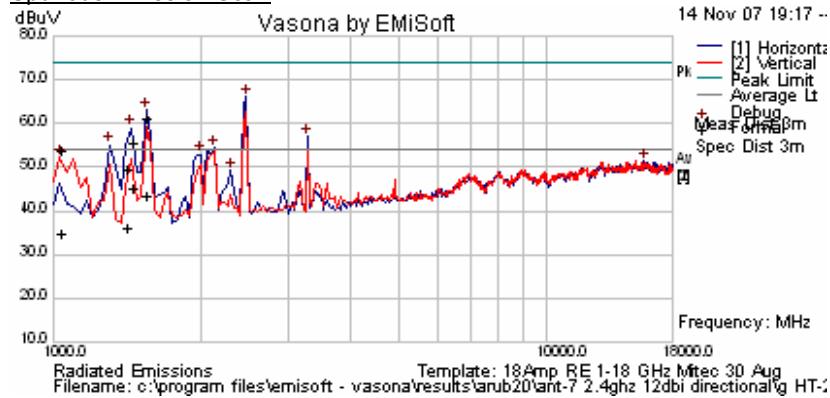
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AP124 - ANT 7 Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
11	2462	ART 19	99%	n 6.5 MCS HT-20	Yes

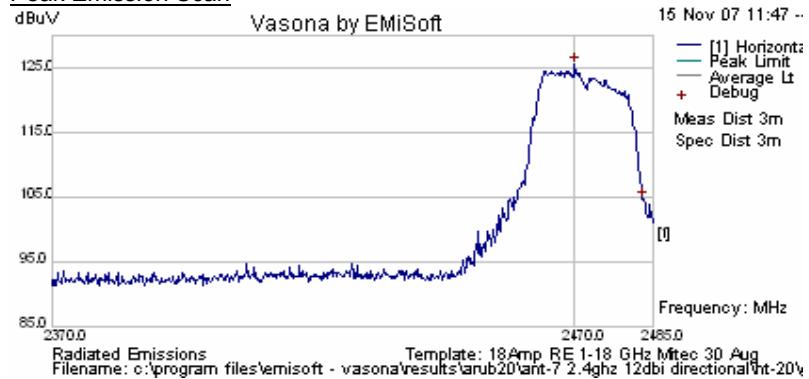
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

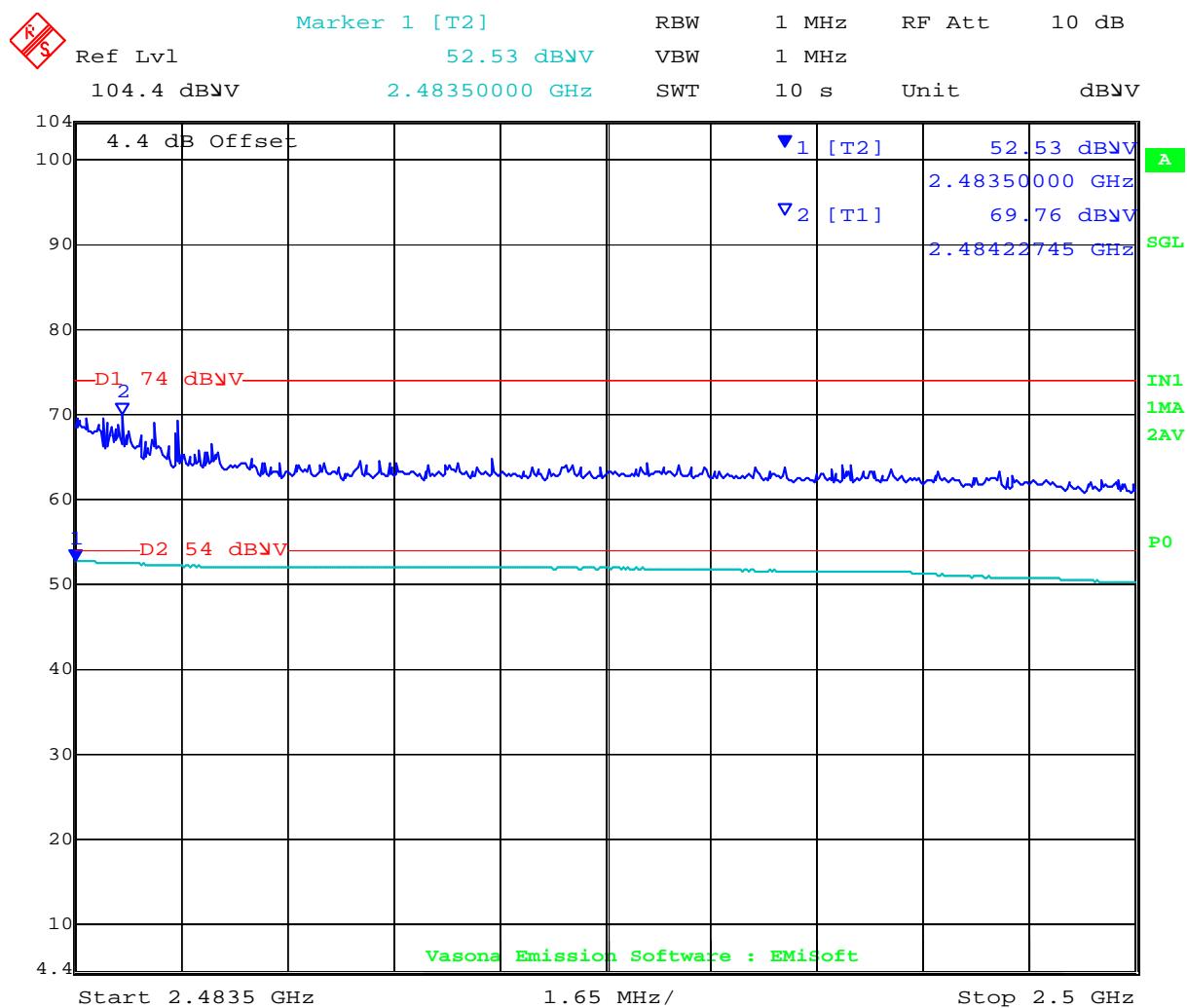


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2470.02	90.18	2.99	32.38	125.55	Peak [Scan]	H	100	0	N/A	N/A	N/A	Pk Emission
2483.5	ART Power Setting = 10.0			72.02	Formal Peak	V			74	-1.98	Pass	Band-edge
2483.5				52.36	Formal Average	V			54	-1.64	Pass	Band-edge
1555.791	71.51	2.42	-14.72	59.21	Peak Max	V	100	114	74	-14.79	Pass	
1458.638	66.44	2.34	-15.34	53.43	Peak Max	V	138	203	74	-20.57	Pass	
1426.132	60.72	2.32	-15.4	47.64	Peak Max	V	98	327	74	-26.36	Pass	
1050	65.93	2	-16.07	51.87	Peak Max	V	104	7	74	-22.13	Pass	
1555.791	53.84	2.42	-14.72	41.54	Average Max	H	98	20	54	-12.46	Pass	
1458.638	56.2	2.34	-15.34	43.2	Average Max	H	98	37	54	-10.8	Pass	
1426.132	47.35	2.32	-15.4	34.27	Average Max	H	98	38	54	-19.73	Pass	
1050	46.82	2	-16.07	32.75	Average Max	V	104	7	54	-21.25	Pass	
3282.565	65.09	3.51	-11.56	57.05	Peak [Scan]	H	100	0	105.55	-48.50	Pass	NRB
2124.248	62.69	2.82	-11.03	54.47	Peak [Scan]	H	100	0	105.55	-51.08	Pass	NRB
1987.976	61.54	2.74	-11.26	53.02	Peak [Scan]	H	100	0	105.55	-52.53	Pass	NRB

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Date: 1.DEC.2007 18:50:40

802.11n HT-20 Band-edge 2483.5 MHz

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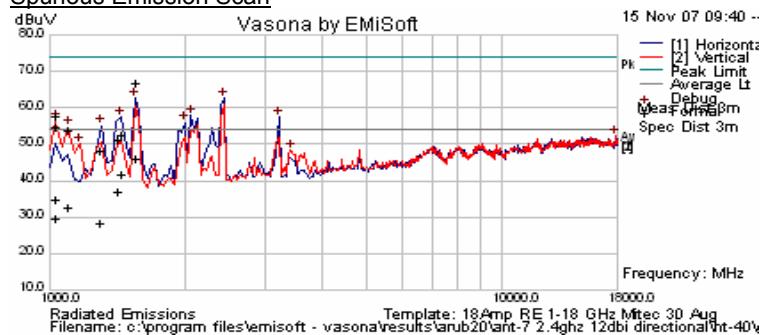
AP124: 2400 - 2483.5 MHz ANT 7 HT-40 Data Rates

AP124 - ANT 7 Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
	2422	ART 19	99%	n 13.5 MCS HT-40	Yes

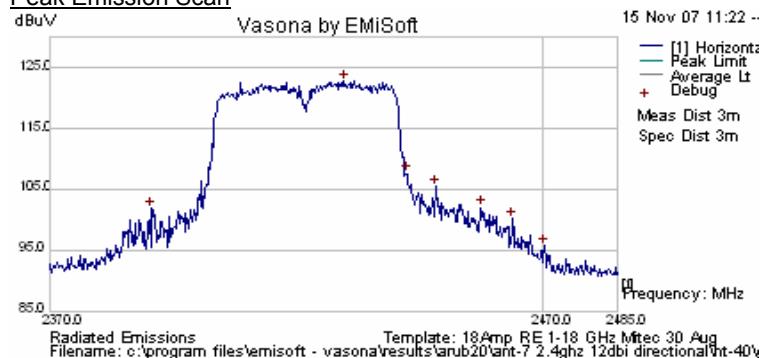
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

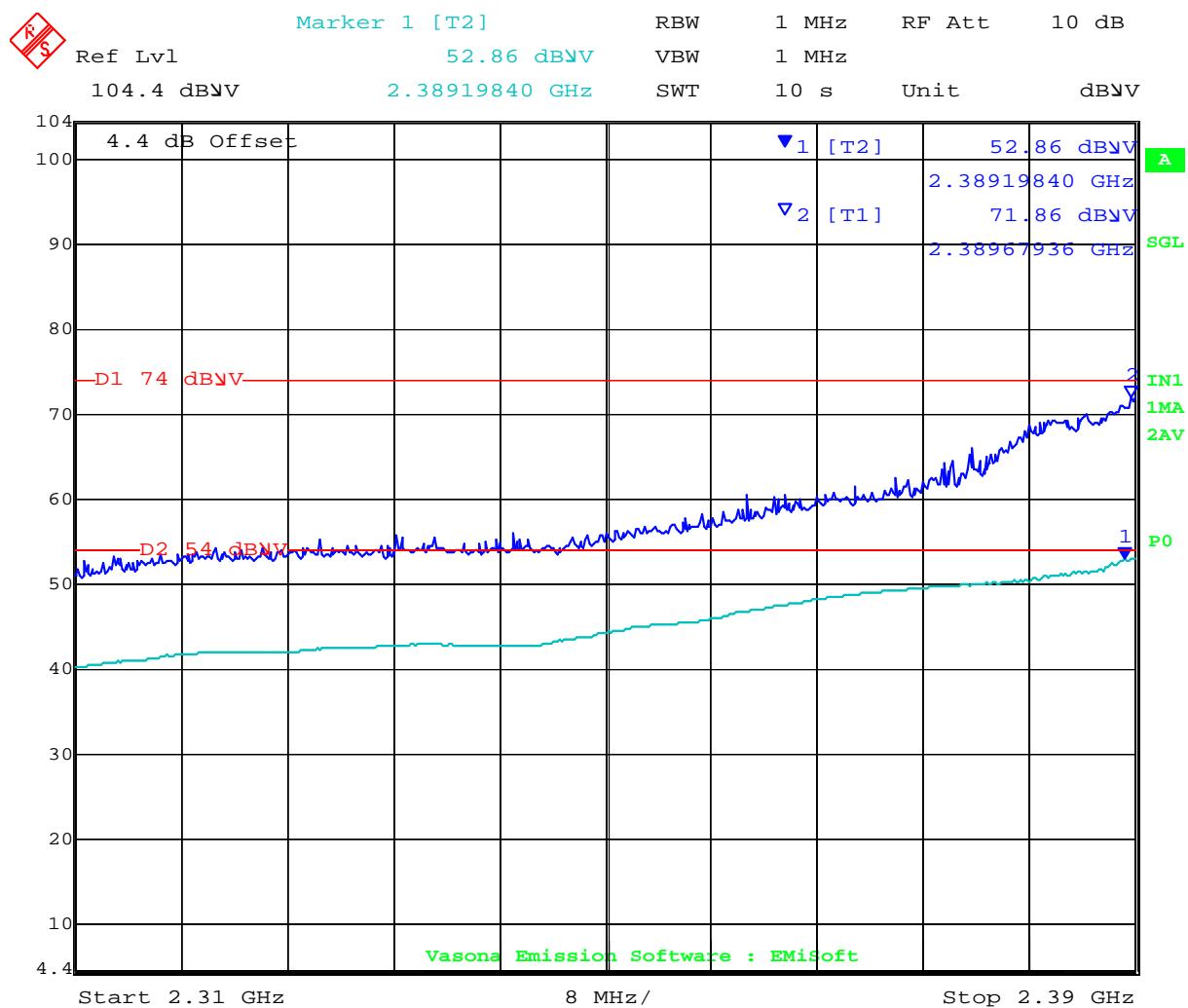


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2429.689	87.47	2.97	32.36	122.8	Peak [Scan]	H	100	0	N/A	N/A	N/A	Pk Emission
2390.0	ART Power Setting = 6.5			71.86	Formal Peak	V			74	-2.14	Pass	Band-edge
2390.0				52.86	Formal Average	V			54	-1.14	Pass	Band-edge
1555.711	77.17	2.42	-14.72	64.87	Peak Max	H	121	60	74	-9.13	Pass	
1427.966	62.24	2.32	-15.4	49.17	Peak Max	V	98	335	74	-24.83	Pass	
1449.539	63.61	2.33	-15.37	50.58	Peak Max	V	98	347	74	-23.42	Pass	
1036.024	66.69	1.99	-16.06	52.62	Peak Max	V	101	37	74	-21.38	Pass	
1037.154	69.75	1.99	-16.05	55.69	Peak Max	V	110	12	74	-18.31	Pass	
1304.962	59.64	2.23	-15.68	46.19	Peak Max	V	114	241	74	-27.81	Pass	
1104.18	65.67	2.05	-16.03	51.69	Peak Max	V	98	2	74	-22.31	Pass	
1555.711	56.32	2.42	-14.72	44.02	Average Max	H	121	60	54	-9.98	Pass	
1427.966	48.13	2.32	-15.4	35.05	Average Max	H	99	41	54	-18.95	Pass	
1449.539	52.8	2.33	-15.37	39.76	Average Max	H	137	28	54	-14.24	Pass	
1036.024	41.67	1.99	-16.06	27.6	Average Max	V	101	37	54	-26.4	Pass	
1037.154	46.69	1.99	-16.05	32.62	Average Max	V	110	12	54	-21.38	Pass	
1304.962	39.91	2.23	-15.68	26.46	Average Max	H	103	48	54	-27.54	Pass	

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Date: 1.DEC.2007 18:47:24

802.11n HT--40 Band-edge 2390 MHz

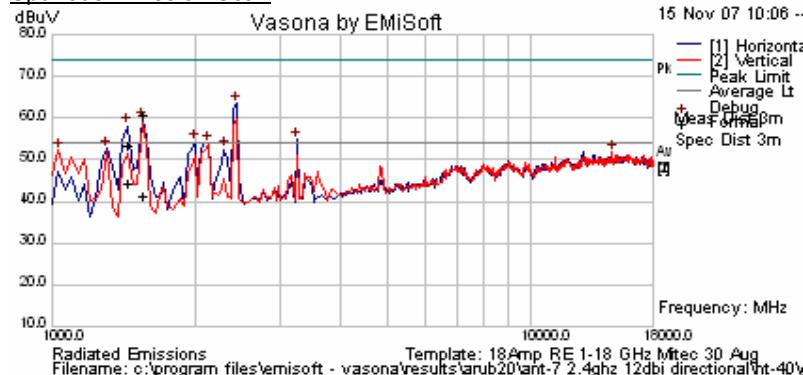
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AP124 - ANT 7 Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
	2437	ART 18.5	99%	n 13.5 MCS HT-40	Yes

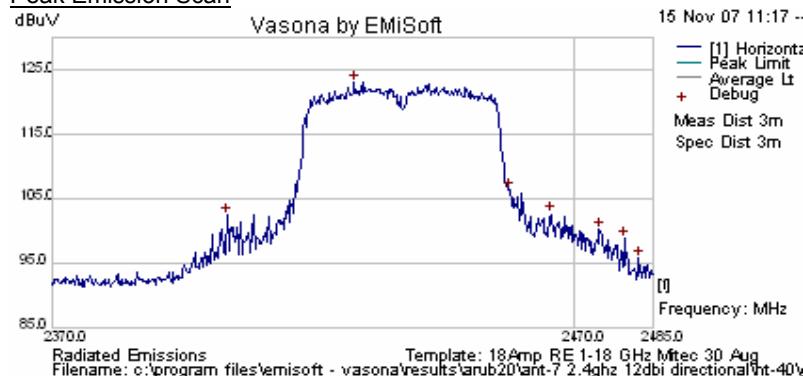
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2427.846	87.7	2.97	32.36	123.03	Peak [Scan]	H	100	0	N/A	N/A	N/A	Pk Emission
1555.831	71.11	2.42	-14.72	58.81	Peak Max	V	110	360	74	-15.19	Pass	
1451.524	64.39	2.34	-15.36	51.36	Peak Max	V	98	342	74	-22.64	Pass	
1555.831	51.74	2.42	-14.72	39.43	Average Max	H	101	224	54	-14.57	Pass	
1451.524	55.51	2.34	-15.36	42.48	Average Max	H	98	29	54	-11.52	Pass	
2430.862	71.84	2.97	-11.17	63.64	Peak [Scan]	H	100	0	103.03	-39.39	Pass	NRB
3248.497	63.19	3.49	-11.64	55.05	Peak [Scan]	H	100	0	103.03	-47.98	Pass	NRB
1987.976	62.72	2.74	-11.26	54.2	Peak [Scan]	H	100	0	103.03	-48.83	Pass	NRB
2124.248	62.34	2.82	-11.03	54.12	Peak [Scan]	H	100	0	103.03	-48.91	Pass	NRB
2294.589	60.62	2.9	-10.98	52.54	Peak [Scan]	H	100	0	103.03	-50.49	Pass	NRB

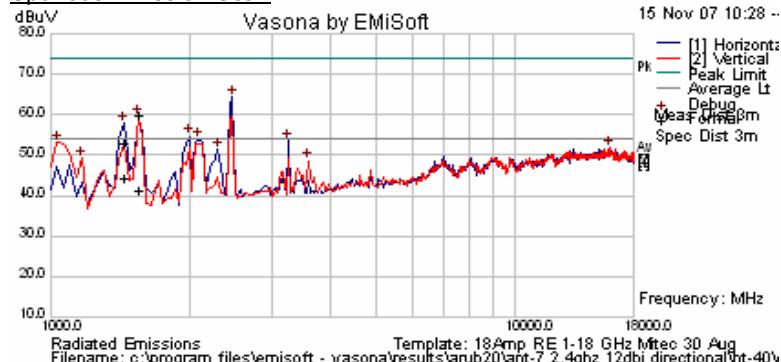
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AP124 - ANT 7 Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
	2452	ART 18.5	99%	n 13.5 MCS HT-40	Yes

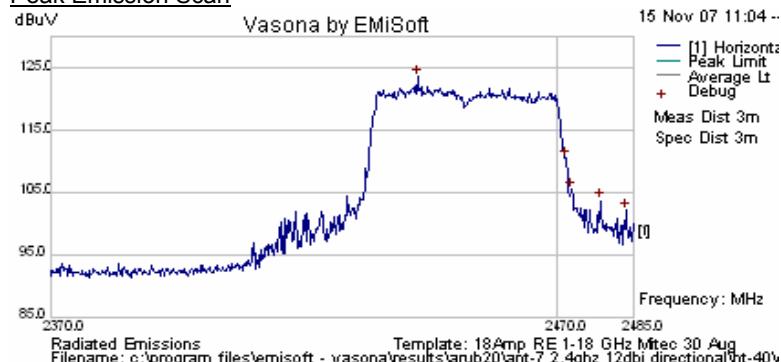
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

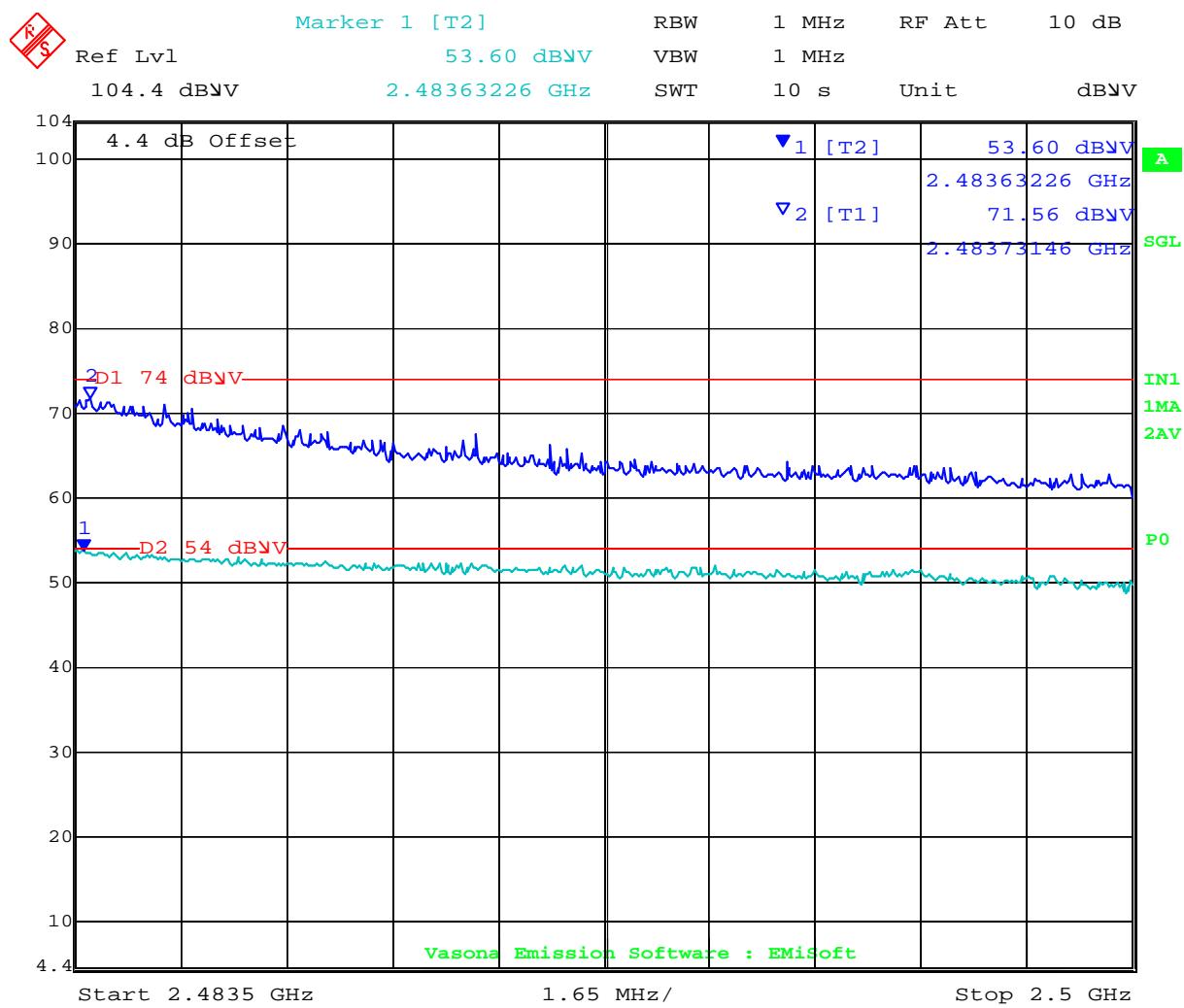


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2442.365	88.22	2.97	32.37	123.56	Peak [Scan]	H	100	0	N/A	N/A	N/A	Pk Emission
2483.5	ART Power Setting = 3.0			71.56	Formal Peak	V			74	-2.44	Pass	Band-edge
2483.5				53.60	Formal Average	V			54	-0.4	Pass	Band-edge
1555.391	70.02	2.42	-14.72	57.71	Peak Max	V	99	17	74	-16.29	Pass	
1450.04	64.01	2.33	-15.37	50.97	Peak Max	V	98	345	74	-23.03	Pass	
1555.391	51.38	2.42	-14.72	39.07	Average Max	H	101	224	54	-14.93	Pass	
1450.04	55.12	2.33	-15.37	42.09	Average Max	H	135	30	54	-11.91	Pass	
2464.93	72.57	2.98	-11.17	64.39	Peak [Scan]	H	100	0	103.56	-39.17	Pass	NRB
1987.976	63.22	2.74	-11.26	54.7	Peak [Scan]	H	100	0	103.56	-48.86	Pass	NRB
2090.18	62.06	2.8	-11.1	53.75	Peak [Scan]	H	100	0	103.56	-49.81	Pass	NRB
3248.497	61.73	3.49	-11.64	53.58	Peak [Scan]	H	100	0	103.56	-49.98	Pass	NRB

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Date: 1.DEC.2007 18:49:09

802.11n HT-40 Band-edge 2483.5 MHz

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ARUB20 AP-124 (ANT-8)
ART Settings V Aggregate Measured Power

The following matrix identifies the ART power setting V's each output chain. The aggregate power was also measured for all three chains.

As a result of either spurious emissions (harmonic) or band-edge issues the power was reduced to bring the unit into compliance.

Configuration	ART Power Setting	Tx 1 Measured Pwr (dBm)	Tx 2 Measured Pwr (dBm)	Tx 3 Measured Pwr (dBm)	Aggregate Measured Pwr (dBm)
Legacy b (2390 2412 MHz)BE	19	16.86	16.72	17.52	22.68
Legacy g (2390 2412 MHz)BE	17	15.06	14.36	15.07	20.37
Legacy b (2483.5 2462 MHz)BE	19	16.58	16.74	17.11	22.39
Legacy g (2483.5 2462 MHz)BE	17	14.72	14.78	15.38	21.27
HT-20 (2390 2412 MHz)BE	17	15.02	14.31	15.48	20.54
HT-20 (2483.5 2462 MHz)BE	18	15.68	15.62	16.26	21.36
HT-40 (2390 2422 MHz)BE	15	12.97	12.58	13.47	18.19
HT-40 (2483.5 2452 MHz)BE	16	13.88	13.90	14.50	19.26
Legacy b (2412 MHz)SE	19	16.86	16.72	17.36	22.68
Legacy b (2437 MHz)SE	19	16.61	16.31	16.87	21.59
Legacy b (2462 MHz)SE	19	16.58	16.74	17.12	22.39
Legacy g (2412 MHz)SE	17	15.06	14.36	15.07	20.37
Legacy g (2437 MHz)SE	17	14.63	14.37	15.55	20.40
Legacy g (2462 MHz)SE	17	14.72	14.78	15.38	21.27
HT-20 (2412 MHz)SE	19	16.84	16.57	17.60	22.40
HT-20 (2437 MHz)SE	19	16.64	16.40	17.06	22.36
HT-20 (2462 MHz)SE	19	16.71	16.75	17.16	22.35
HT-40 (2422 MHz)SE	19	17.30	16.81	17.38	22.68
HT-40 (2437 MHz)SE	19	17.30	16.64	17.46	22.30
HT-40 (2452 MHz)SE	19	16.97	16.40	17.58	22.25

Note BE = Band-edge, SE – Spurious emissions

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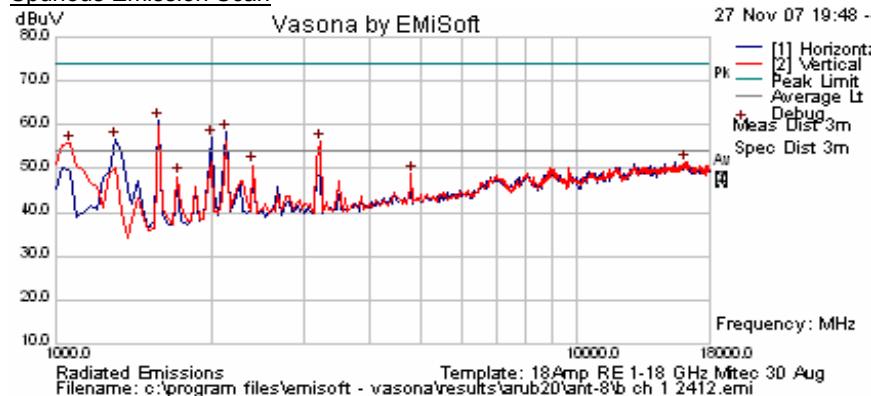
AP124: 2400 - 2483.5 MHz ANT-8 (5 dBi) Legacy Data Rates

AP124 - ANT-8 (5 dBi) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
1	2412	ART 19	99%	b 1 MBit/s Legacy	Yes

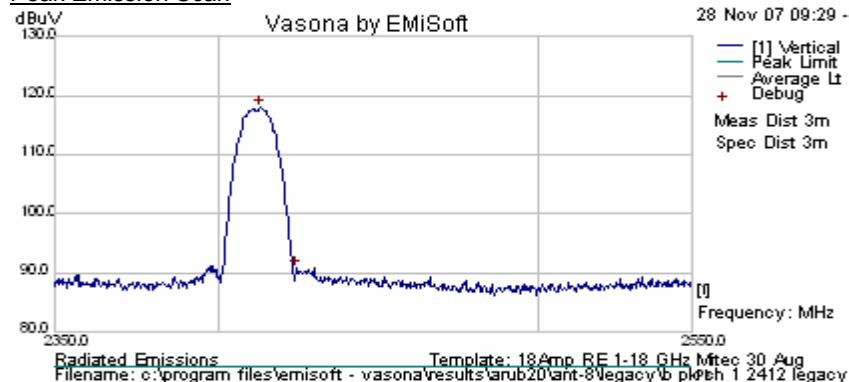
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

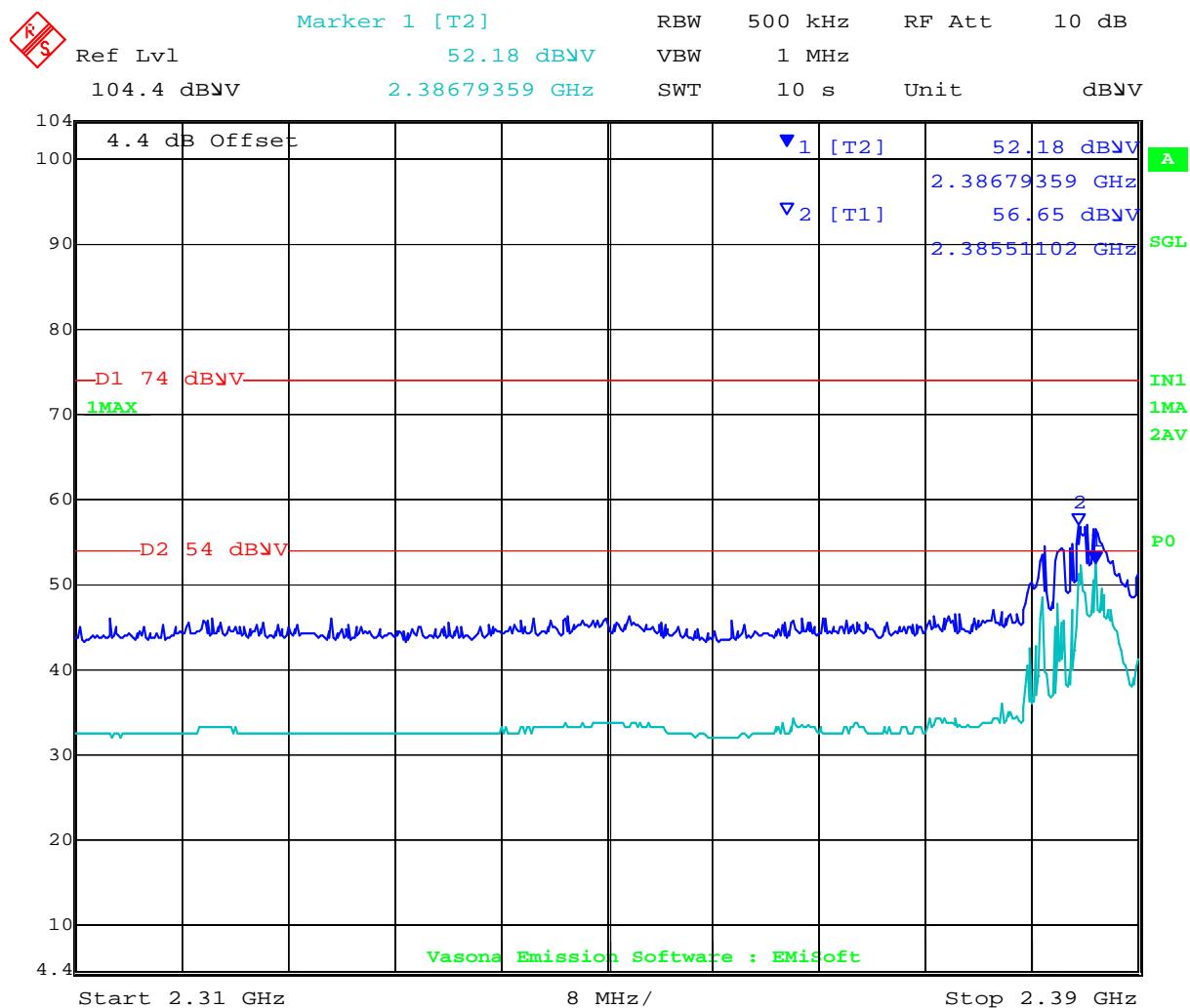


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2412.926	76.69	8.96	32.35	118	Peak [Scan]	H	100	0	N/A	N/A	N/A	Pk Emission
2390.0				56.65	Formal Peak	V			74	-17.35	Pass	Band-edge
2390.0				52.18	Formal Average	V			54	-1.82	Pass	Band-edge

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Date: 1.DEC.2007 19:08:16

802.11b Legacy Band-edge 2390 MHz

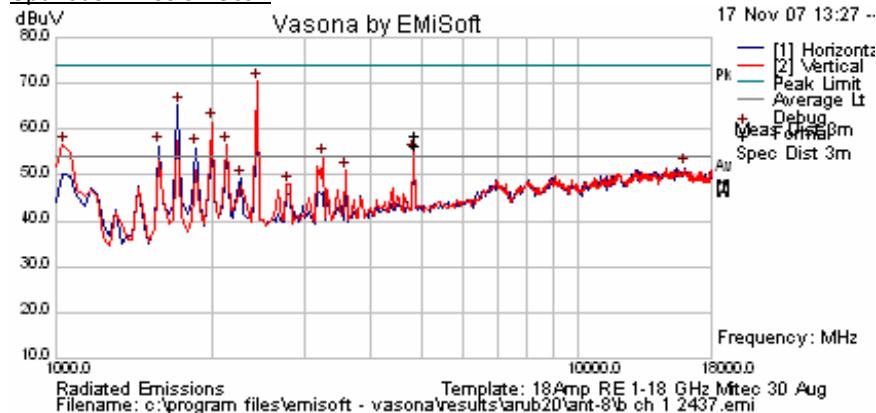
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AP124 - ANT-8 (5 dBi) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
6	2437	ART 19	99%	b 1 MBit/s Legacy	Yes

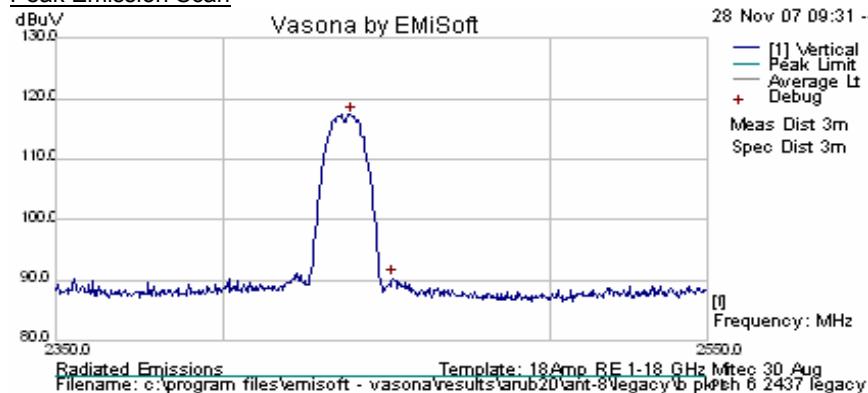
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2438.577	76.06	8.97	32.37	117.4	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
4873.982	62.39	4.51	-9.16	57.74	Peak Max	V	98	130	74	-16.26	Pass	
1033.079	62.53	1.98	-16.06	48.45	Peak Max	V	102	16	74	-25.55	Pass	
1604.609	65.54	2.46	-14.27	53.73	Peak Max	V	98	74	74	-20.27	Pass	
2260.521	60.86	2.89	-11.02	52.73	Peak Max	V	122	218	74	-21.27	Pass	
1624.807	56.53	2.48	-14.09	44.92	Peak Max	V	98	190	74	-29.08	Pass	
4873.982	57.68	4.51	-9.16	53.03	Average Max	V	98	130	54	-0.97	Pass	
1033.079	46.39	1.98	-16.06	32.31	Average Max	V	102	16	54	-21.69	Pass	
1604.609	50.98	2.46	-14.27	39.17	Average Max	H	100	309	54	-14.83	Pass	
2260.521	43.26	2.89	-11.02	35.13	Average Max	V	122	218	54	-18.87	Pass	
1624.807	50.98	2.48	-14.09	39.37	Average Max	V	98	190	54	-14.63	Pass	

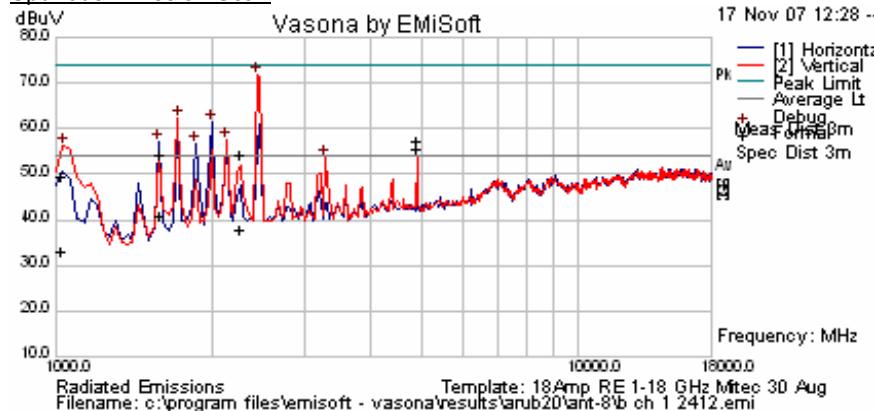
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AP124 - ANT-8 (5 dBi) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
11	2462	ART 19	99%	b 1 MBit/s Legacy	Yes

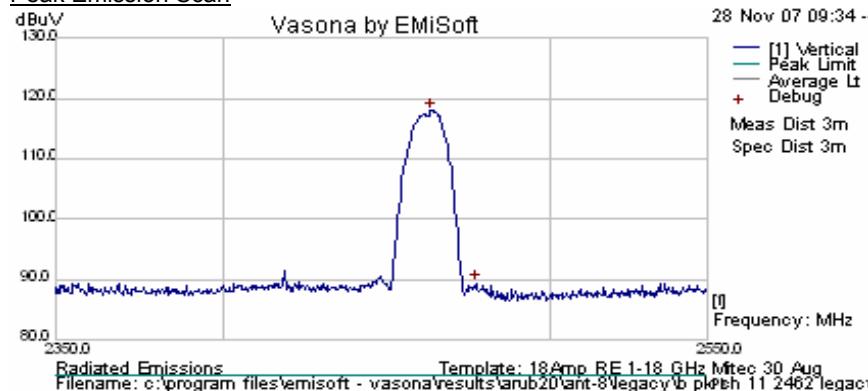
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

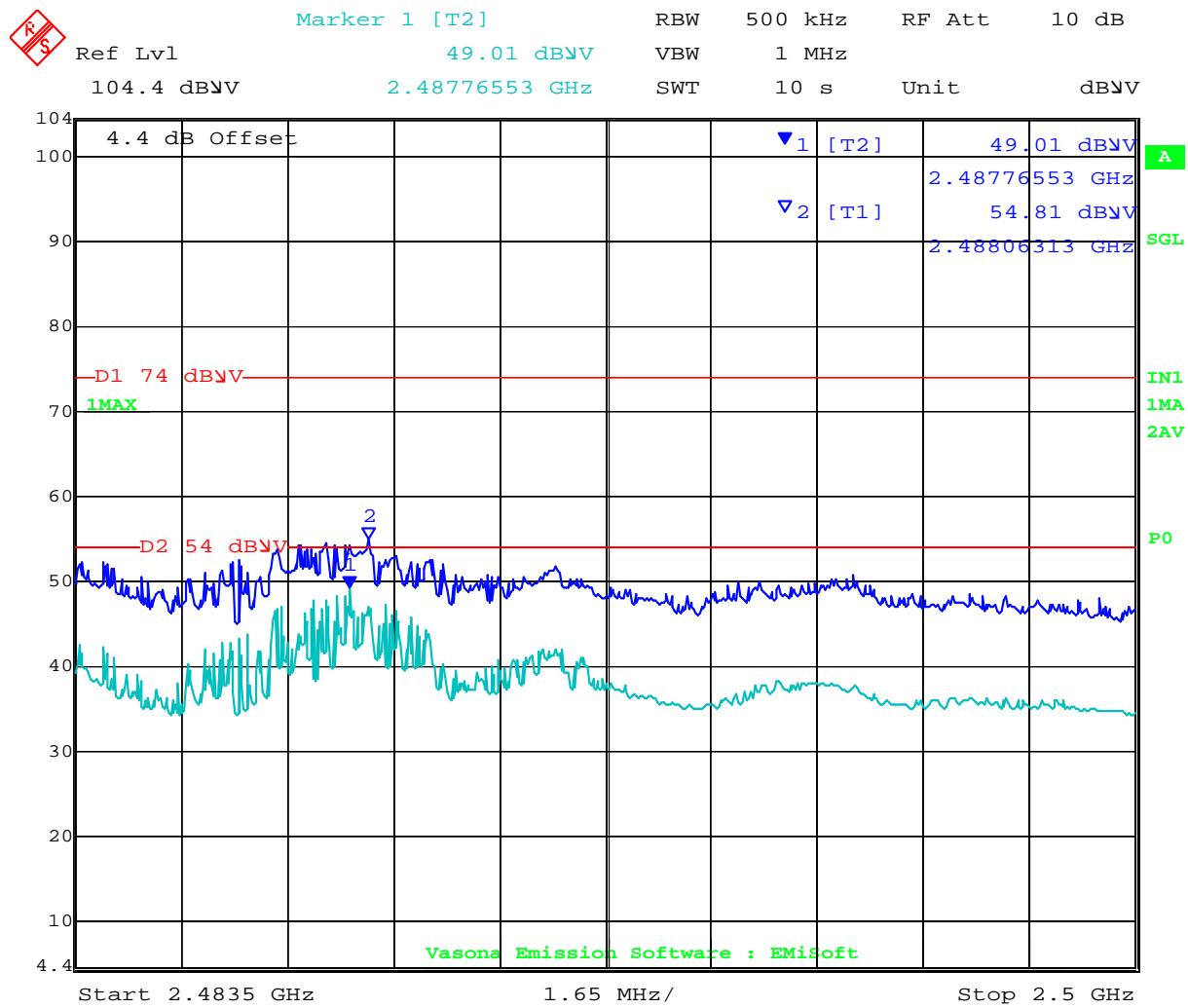


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2463.026	76.67	8.98	32.38	118.04	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
2483.5				54.81	Formal Peak	V			74	-19.19	Pass	Band-edge
2483.5				49.01	Formal Average	V			54	-4.99	Pass	Band-edge
1594.699	64.26	2.45	-14.36	52.35	Peak Max	V	98	329	74	-21.65	Pass	
1031.383	61.55	1.98	-16.07	47.46	Peak Max	V	107	16	74	-26.54	Pass	
4923.973	60.02	4.55	-9.25	55.32	Peak Max	V	98	128	74	-18.68	Pass	
2265.852	60.16	2.89	-11.01	52.03	Peak Max	V	98	255	74	-21.97	Pass	
1594.699	50.66	2.45	-14.36	38.75	Average Max	H	136	305	54	-15.25	Pass	
1031.383	45.03	1.98	-16.07	30.94	Average Max	V	107	16	54	-23.06	Pass	
4923.973	58.1	4.55	-9.25	53.41	Average Max	H	98	130	54	-0.59	Pass	
2265.852	43.84	2.89	-11.01	35.72	Average Max	H	98	250	54	-18.28	Pass	

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802.11b Legacy Band-edge 2483.5 MHz

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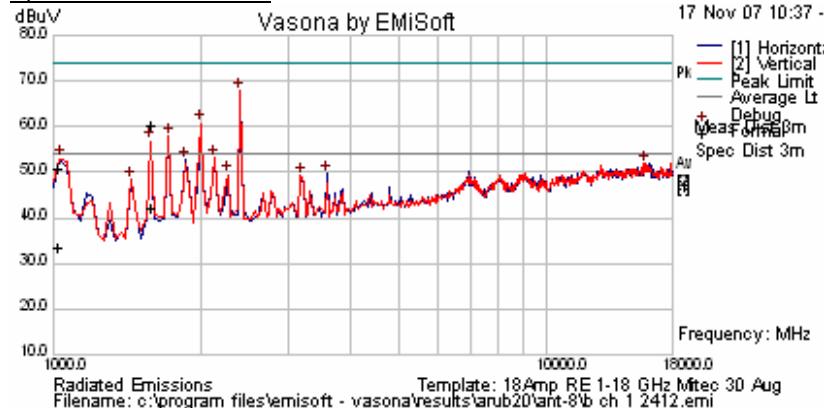
AP124: 2400 - 2483.5 MHz ANT-8 (5 dBi) Legacy Data Rates

AP124 - ANT-8 (5 dBi) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
1	2412	ART 17	99%	g 6 MBit/s Legacy	Yes

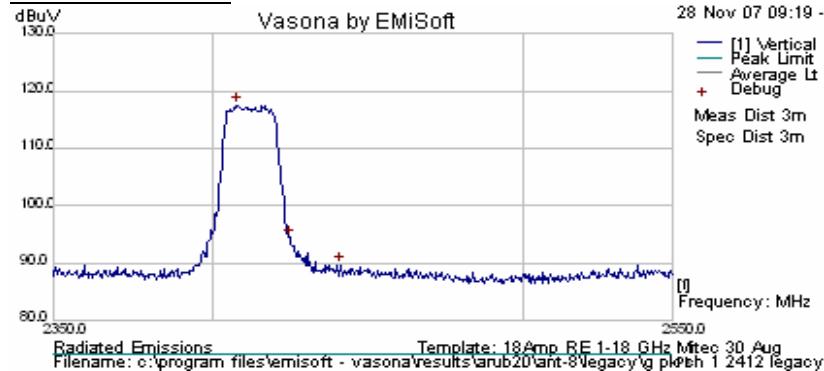
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

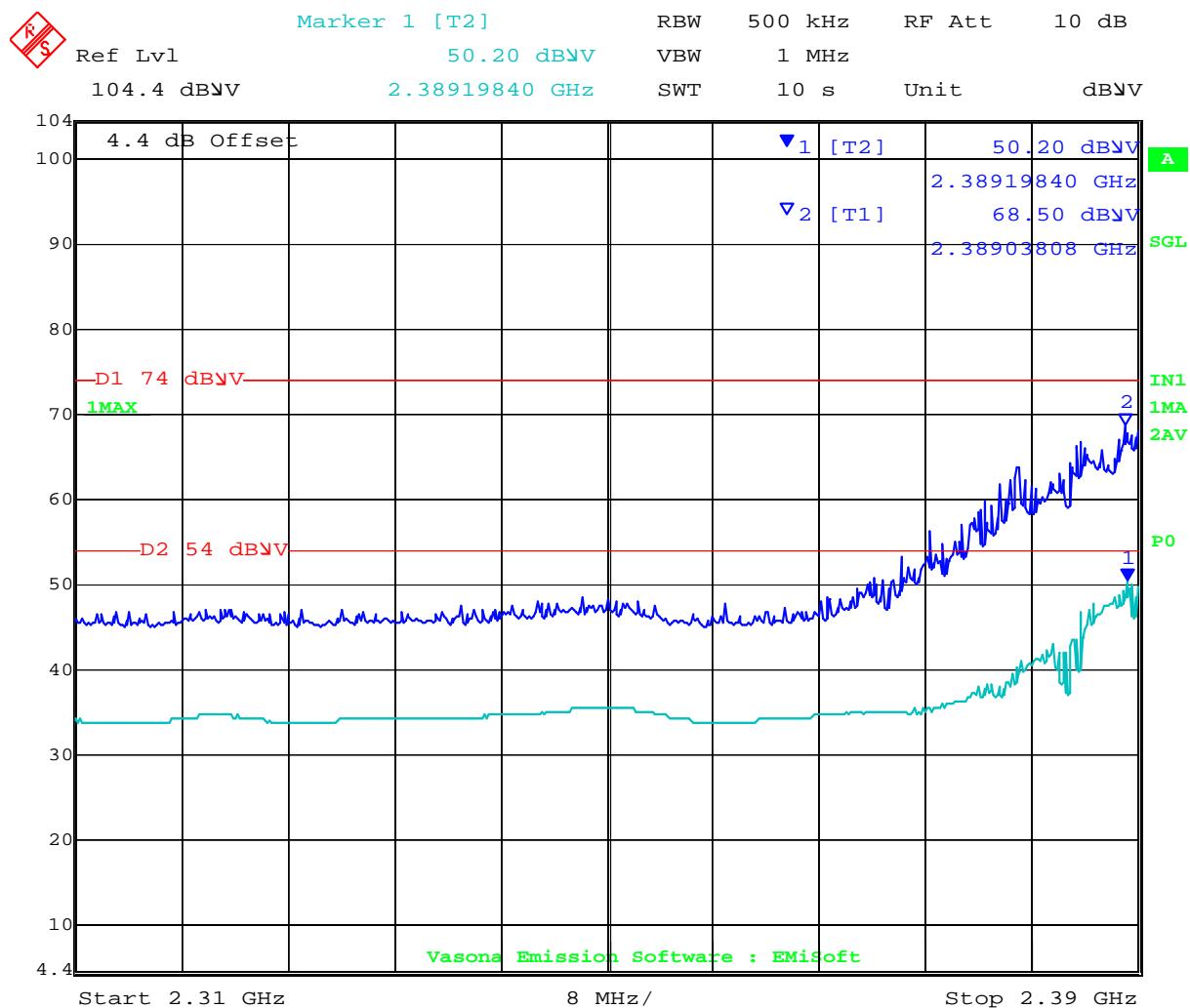


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2408.116	76.18	8.96	32.35	117.49	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
2390.0	ART Power Setting = 17			68.50	Formal Peak	V			74	-5.5	Pass	Band-edge
2390.0				50.20	Formal Average	V			54	-3.8	Pass	Band-edge
1594.469	70.29	2.45	-14.37	58.38	Peak Max	H	136	299	74	-15.62	Pass	
1030.1	62.95	1.98	-16.07	48.86	Peak Max	V	106	185	74	-25.14	Pass	
1594.469	51.89	2.45	-14.37	39.98	Average Max	H	136	299	54	-14.02	Pass	
1030.1	45.38	1.98	-16.07	31.29	Average Max	V	106	185	54	-22.71	Pass	
1987.976	69.28	2.74	-11.26	60.76	Peak [Scan]	V	100	0	97.49	-36.73	Pass	NRB
1715.431	68.7	2.55	-13.44	57.81	Peak [Scan]	V	100	0	97.49	-39.68	Pass	NRB
2124.248	61.34	2.82	-11.03	53.13	Peak [Scan]	V	100	0	97.49	-44.36	Pass	NRB
1851.703	62.6	2.65	-12.42	52.83	Peak [Scan]	H	100	0	97.49	-44.66	Pass	NRB
3589.178	57.61	3.66	-11.49	49.78	Peak [Scan]	H	100	0	97.49	-47.71	Pass	NRB

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Date: 1.DEC.2007 19:06:14

802.11g Legacy Band-edge 2390 MHz

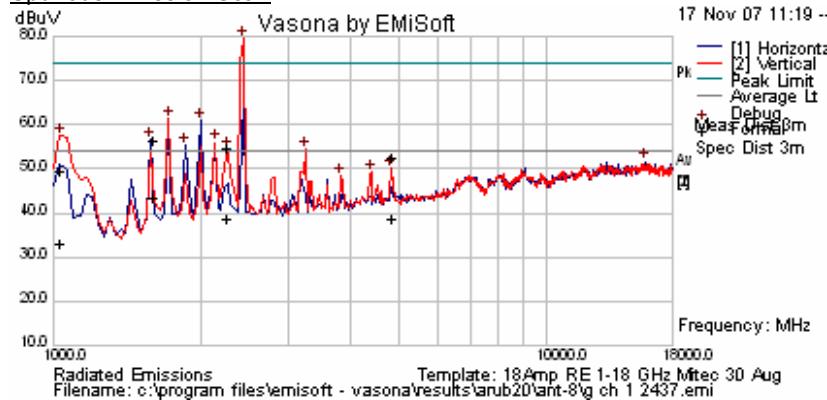
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AP124 - ANT-8 (5 dBi) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
6	2437	ART 17	99%	g 6 MBit/s Legacy	Yes

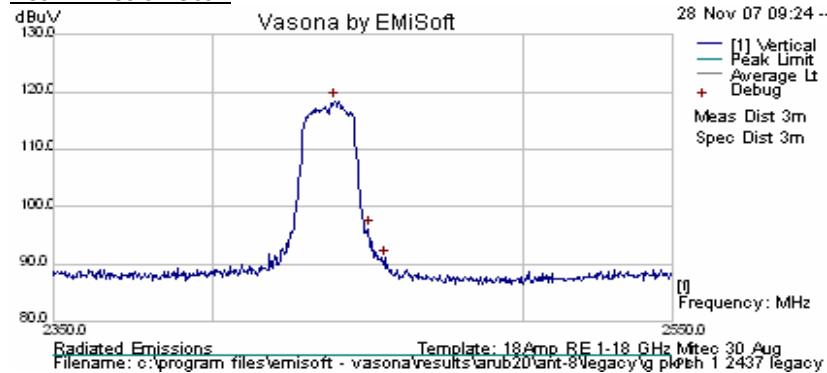
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2438.978	77.07	8.97	32.37	118.41	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
1034.349	61.69	1.98	-16.06	47.61	Peak Max	V	100	41	74	-26.39	Pass	
1595.711	66.44	2.45	-14.35	54.54	Peak Max	V	98	205	74	-19.46	Pass	
2263.607	61	2.89	-11.02	52.87	Peak Max	V	98	211	74	-21.13	Pass	
4875.31	55.15	4.51	-9.16	50.5	Peak Max	V	120	157	74	-23.5	Pass	
1034.349	44.96	1.98	-16.06	30.89	Average Max	V	100	41	54	-23.11	Pass	
1595.711	53.32	2.45	-14.35	41.42	Average Max	H	134	299	54	-12.58	Pass	
2263.607	44.76	2.89	-11.02	36.64	Average Max	V	98	211	54	-17.36	Pass	
4875.31	41.37	4.51	-9.16	36.72	Average Max	V	120	157	54	-17.28	Pass	
1728.777	72.3	2.6	-13.3	61.48	Peak [Scan]	V	100	0	98.41	-36.93	Pass	NRB
1987.976	69.42	2.74	-11.26	60.9	Peak [Scan]	H	100	0	98.41	-37.51	Pass	NRB
2139.719	64.2	2.8	-11.1	55.93	Peak [Scan]	V	100	0	98.41	-42.48	Pass	NRB
1851.703	65	2.65	-12.42	55.23	Peak [Scan]	H	100	0	98.41	-43.18	Pass	NRB
3248.497	62.57	3.49	-11.64	54.42	Peak [Scan]	V	100	0	98.41	-43.99	Pass	NRB

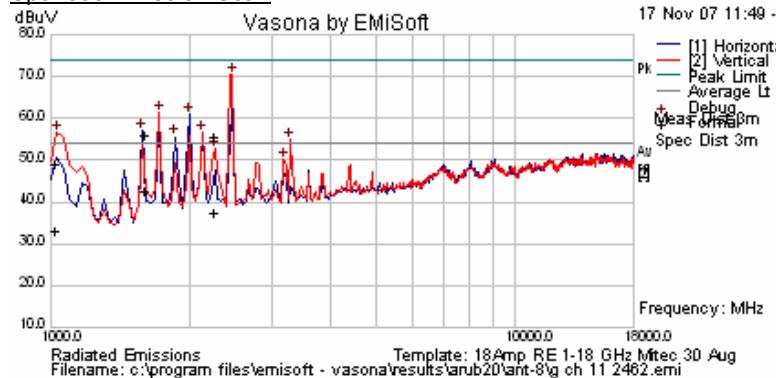
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AP124 - ANT-8 (5 dBi) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
11	2462	ART 17	99%	g 6 MBit/s Legacy	Yes

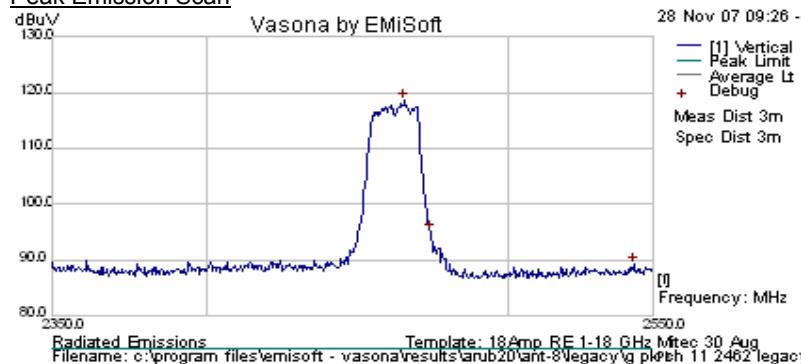
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

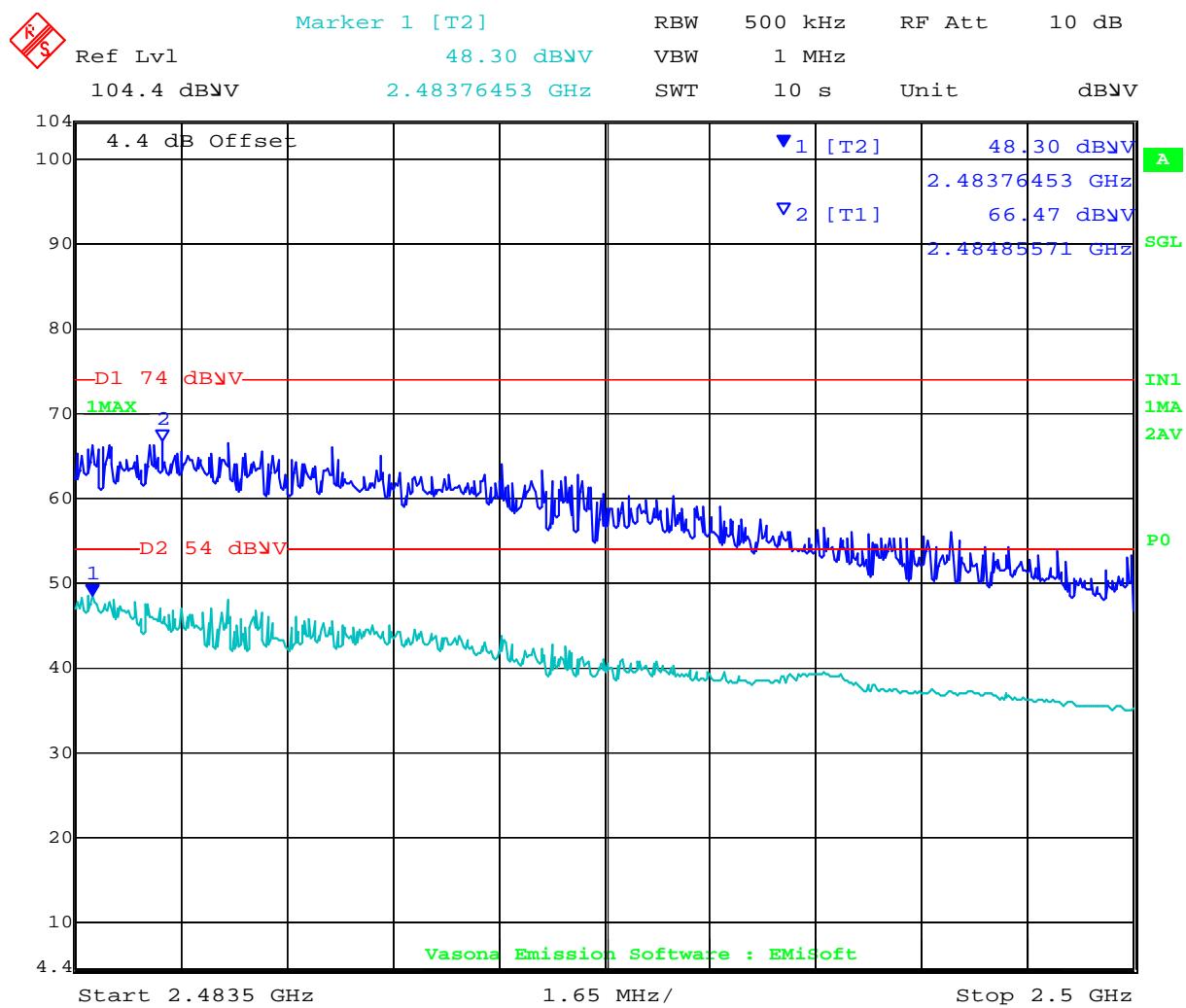


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2465.431	77.15	8.98	32.38	118.52	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
2483.5	ART Power Setting = 17			66.47	Formal Peak	V			74	-7.53	Pass	Band-edge
2483.5				48.30	Formal Average	V			54	-5.70	Pass	Band-edge
1595.741	65.8	2.45	-14.35	53.9	Peak Max	V	98	210	74	-20.1	Pass	
1032.224	61.28	1.98	-16.07	47.19	Peak Max	V	108	10	74	-26.81	Pass	
2258.607	61.82	2.89	-11.02	53.69	Peak Max	V	98	217	74	-20.31	Pass	
1595.741	52.46	2.45	-14.35	40.56	Average Max	H	134	296	54	-13.44	Pass	
1032.224	45.04	1.98	-16.07	30.95	Average Max	V	108	10	54	-23.05	Pass	
2258.607	43.68	2.89	-11.02	35.55	Average Max	V	98	217	54	-18.45	Pass	
1715.431	72.41	2.55	-13.44	61.52	Peak [Scan]	V	100	0	98.52	-37.00	Pass	NRB
1987.976	69.4	2.74	-11.26	60.88	Peak [Scan]	H	100	0	98.52	-37.64	Pass	NRB
2124.248	64.93	2.82	-11.03	56.72	Peak [Scan]	V	100	0	98.52	-41.80	Pass	NRB
1851.703	65.36	2.65	-12.42	55.59	Peak [Scan]	H	100	0	98.52	-42.93	Pass	NRB
3282.565	63.06	3.51	-11.56	55.01	Peak [Scan]	V	100	0	98.52	-43.51	Pass	NRB
3180.361	58.43	3.46	-11.63	50.27	Peak [Scan]	V	100	0	98.52	-48.25	Pass	NRB

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Date: 1.DEC.2007 19:17:13

802.11g Legacy Band-edge 2483.5 MHz

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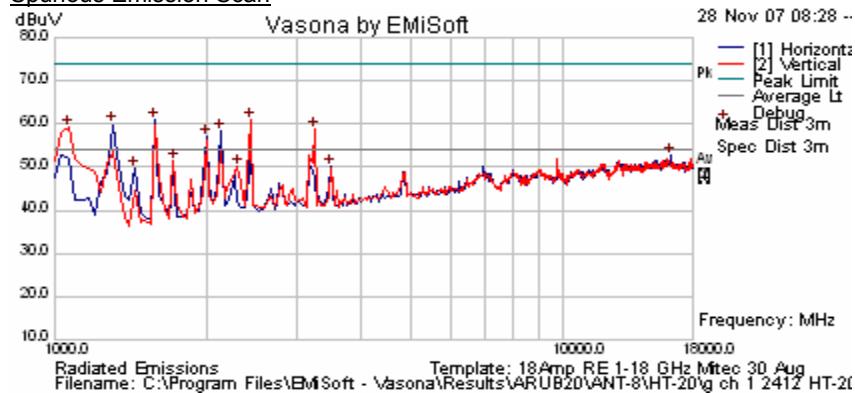
AP124: 2400 - 2483.5 MHz ANT 8 HT-20 Data Rates

AP124 - ANT 8 Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
1	2412	ART 19	99%	n 6.5 MCS HT-20	Yes

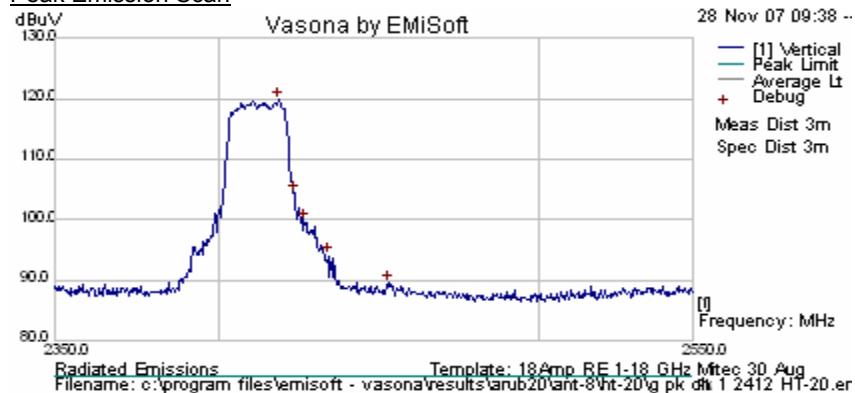
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan

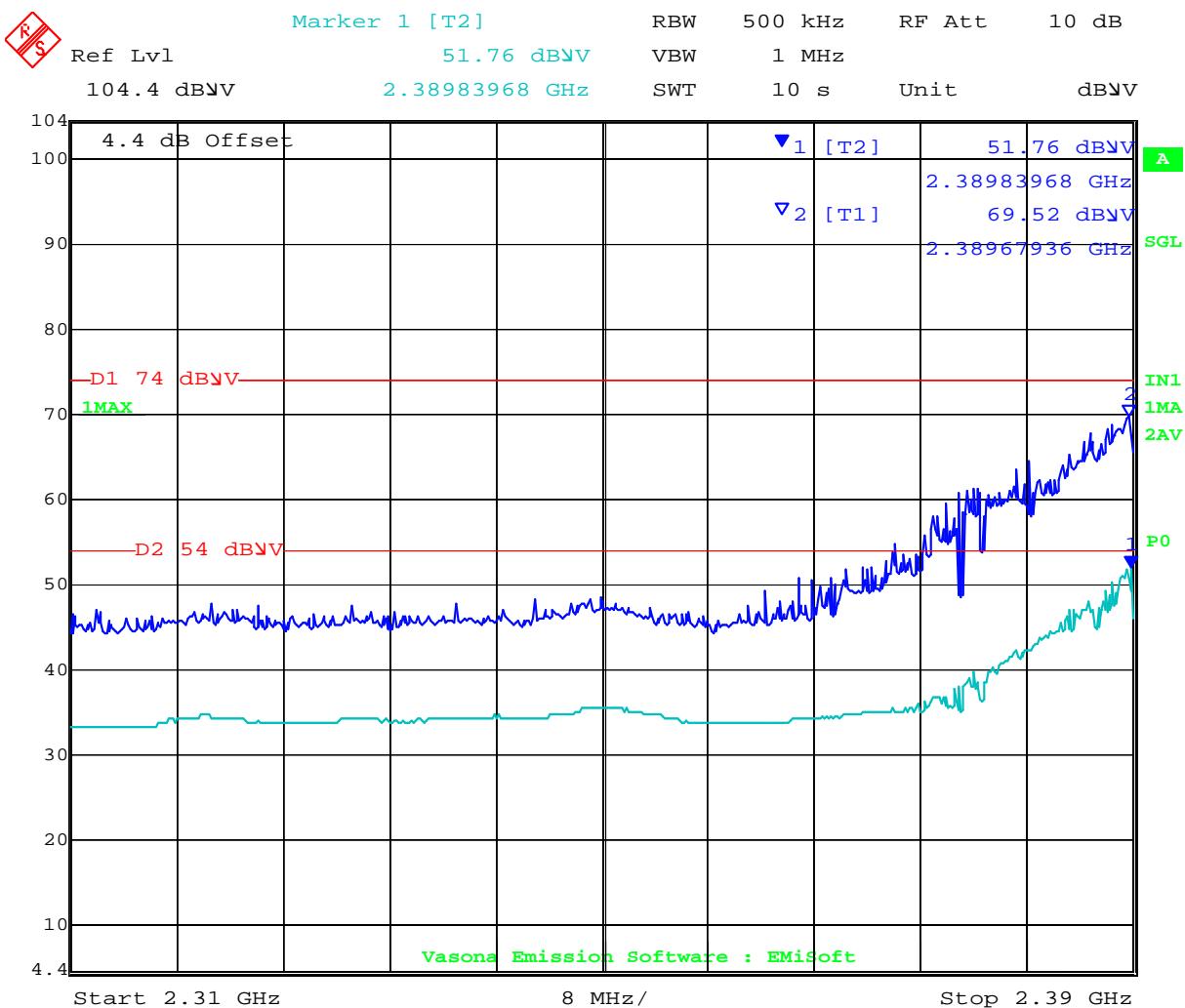


Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2418.537	78.44	8.96	32.36	119.76	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
2390.0				69.52	Formal Peak	V			74	-4.48	Pass	Band-edge
2390.0				51.76	Formal Average	V			54	-2.24	Pass	Band-edge

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Title: Aruba AP-124,125 802.11a/b/g/n AP
To: FCC 47 CFR Part 15.247 & IC RSS-210
Serial #: ARUB20-A2 Rev C
Issue Date: 29th February 2008
Page: 211 of 273



802.11n HT 20 Band edge 2300 MHz

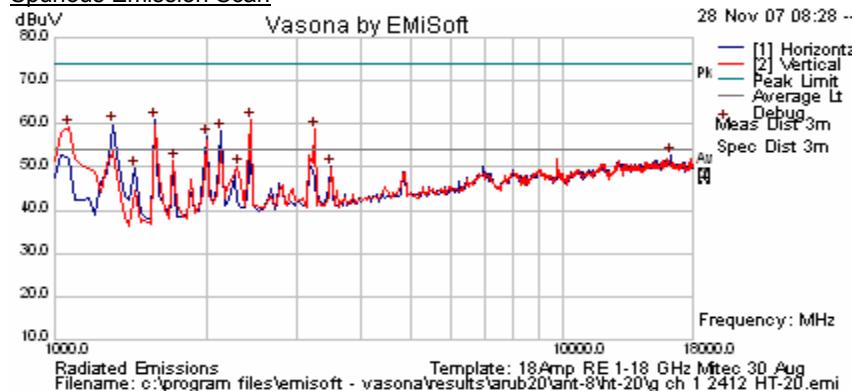
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AP124 - ANT 8 Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
6	2437	ART 19	99%	n 6.5 MCS HT-20	Yes

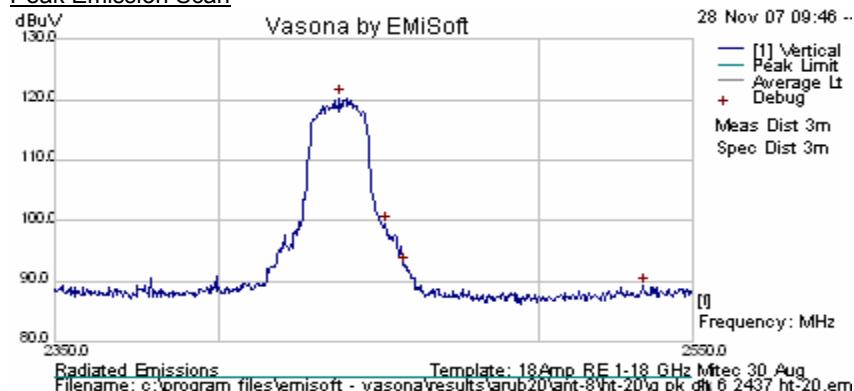
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2437.375	78.95	8.97	32.37	120.29	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission

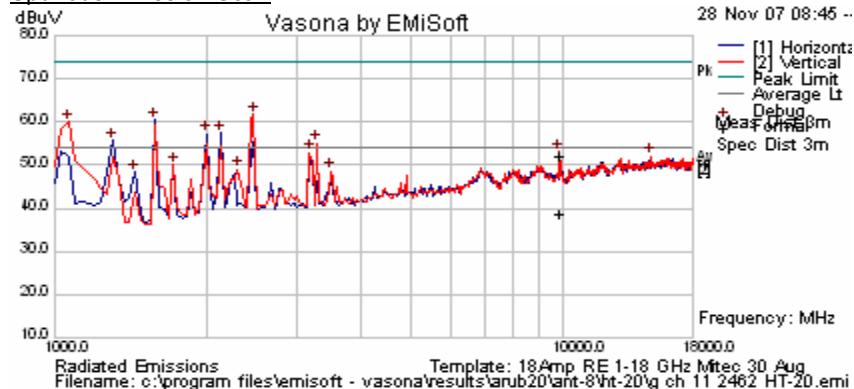
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AP124 - ANT 8 Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
11	2462	ART 19	99%	n 6.5 MCS HT-20	Yes

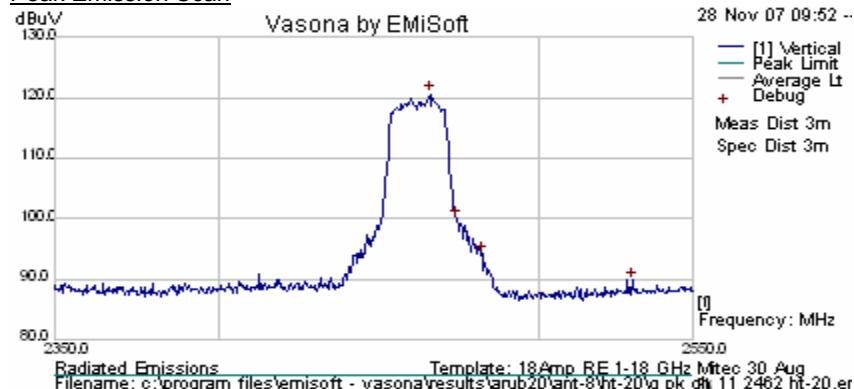
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan

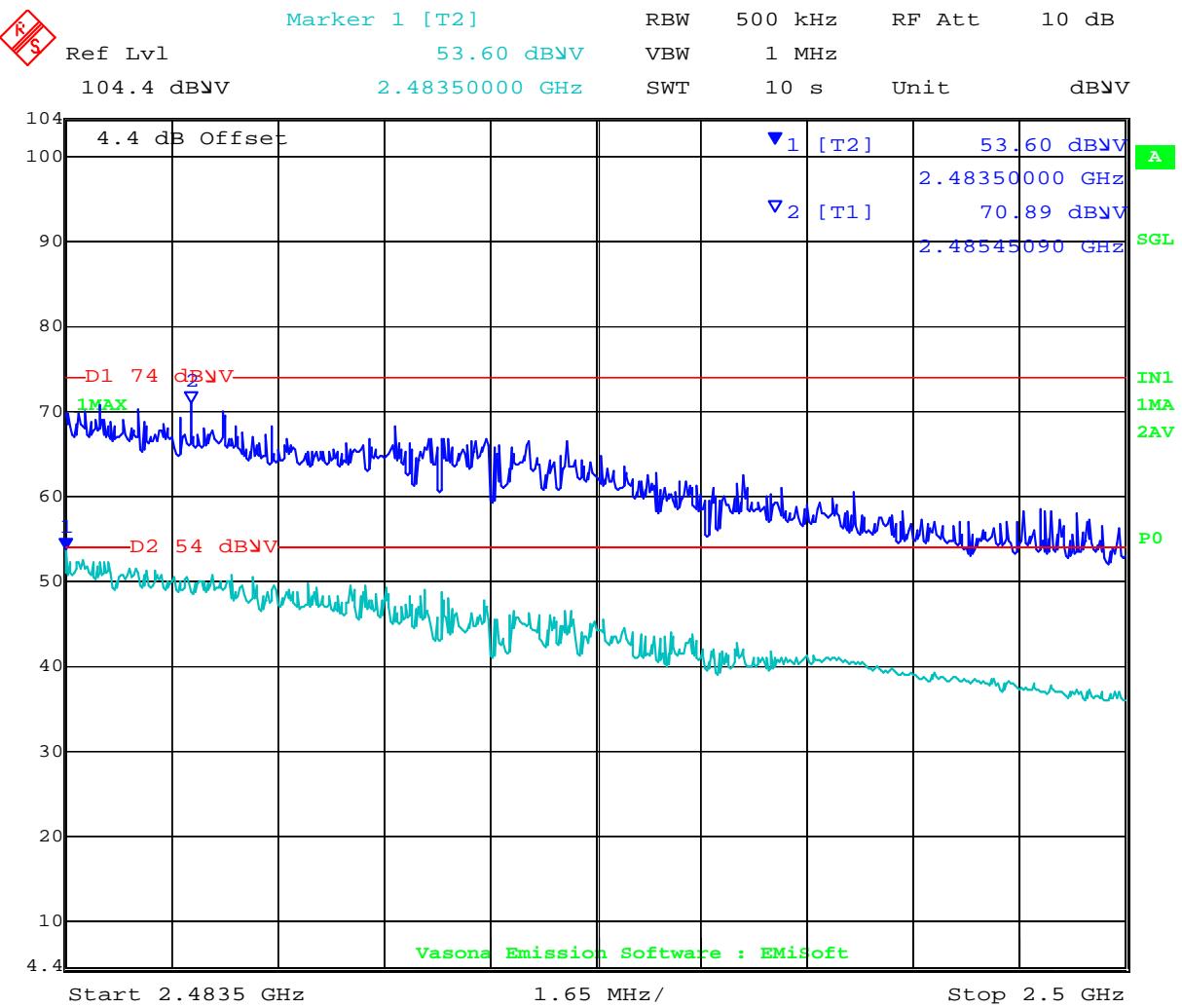


Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2465.832	79.23	8.98	32.38	120.6	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
2483.5	ART Power Setting = 18			70.89	Formal Peak	V			74	-3.11	Pass	Band-edge
2483.5				53.60	Formal Average	V			54	-0.4	Pass	Band-edge
9849.643	45.25	6.4	-1.44	50.21	Peak Max	V	104	335	74	-23.79	Pass	
9849.643	31.87	6.4	-1.44	36.83	Average Max	V	104	335	54	-17.17	Pass	

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Title: Aruba AP-124,125 802.11a/b/g/n AP
To: FCC 47 CFR Part 15.247 & IC RSS-210
Serial #: ARUB20-A2 Rev C
Issue Date: 29th February 2008
Page: 214 of 273



Date: 1.DEC.2007 19:15:07

802.11n HT--20 Band-edge 2483.5 MHz

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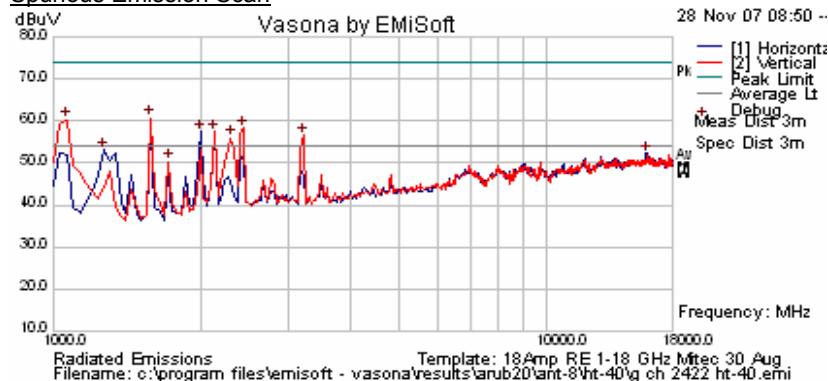
AP124: 2400 - 2483.5 MHz ANT 8 HT-40 Data Rates

AP124 - ANT 8 Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
3	2422	ART 19	99%	n 13.5 MCS HT-40	Yes

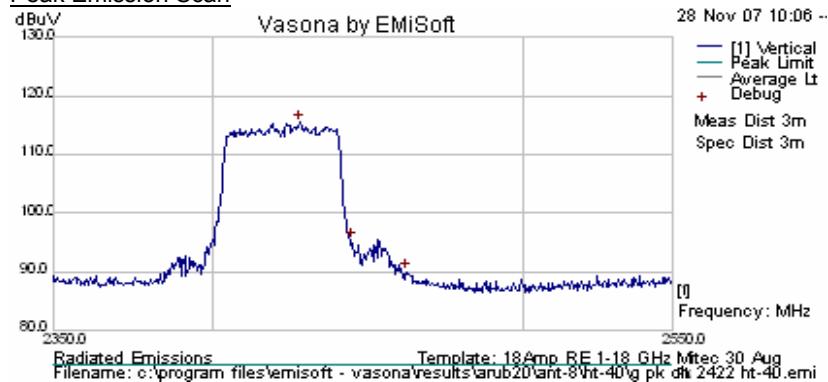
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

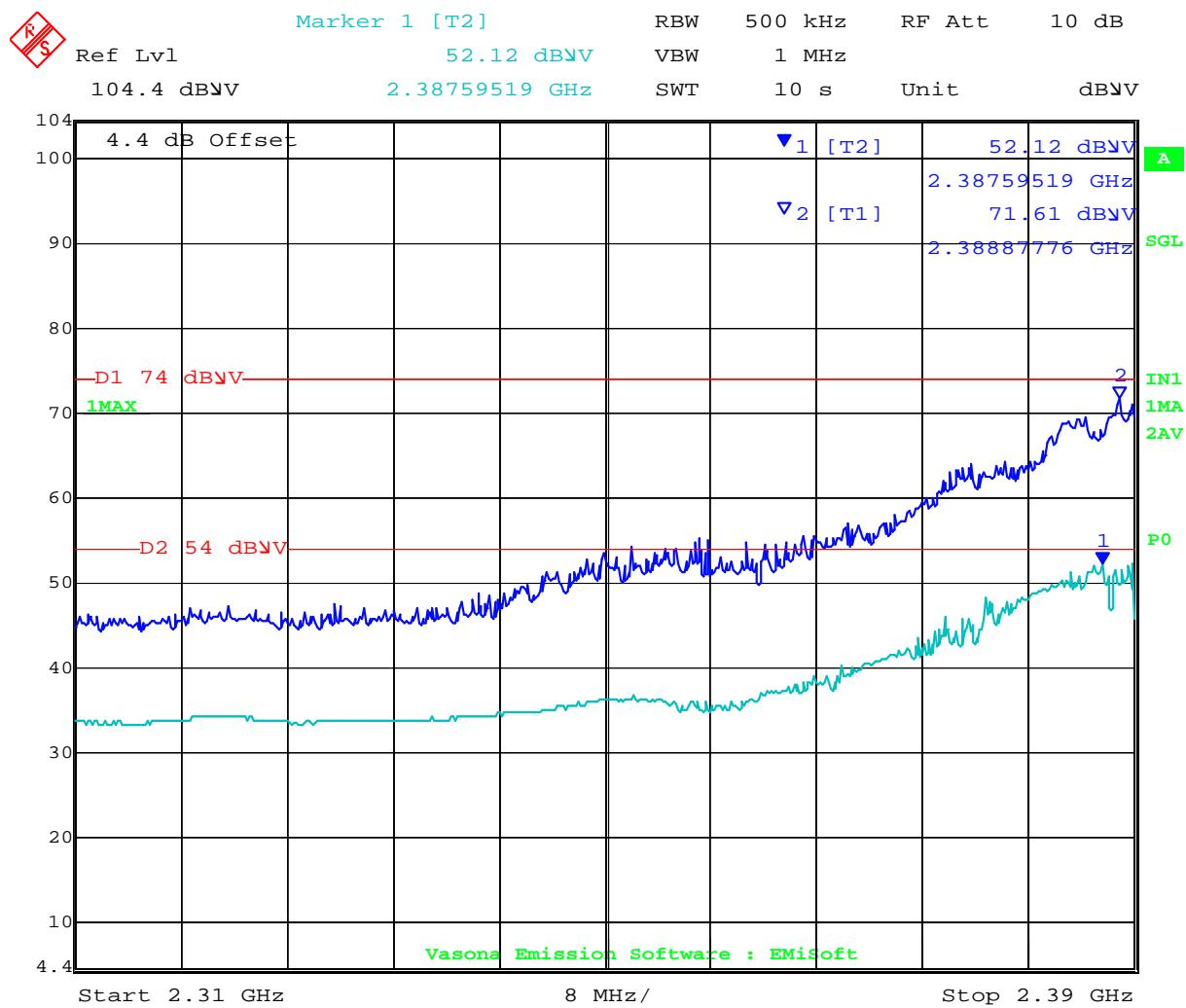


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2427.756	74.13	8.97	32.36	115.45	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
2390.0		ART Power Setting = 15		71.61	Formal Peak	V			74	-2.39	Pass	Band-edge
2390.0				52.12	Formal Average	V			54	-1.88	Pass	Band-edge

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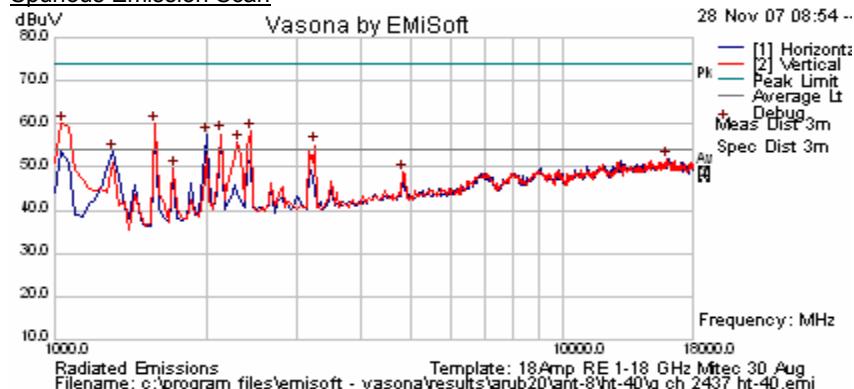
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

AP124 - ANT 8 Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
6	2437	ART 19	99%	n 13.5 MCS HT-40	Yes

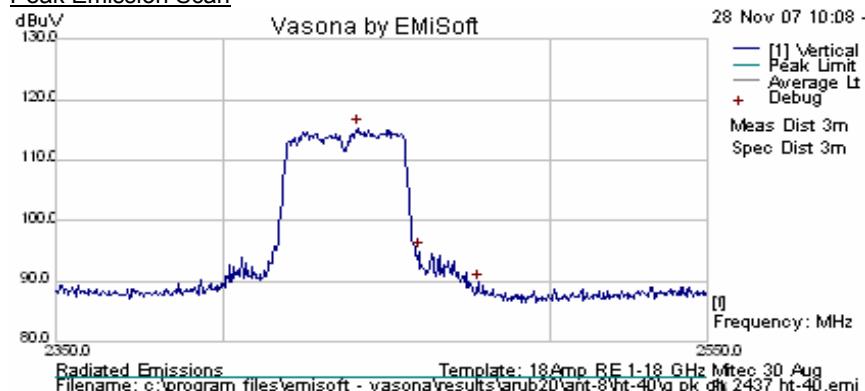
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2440.581	74	8.97	32.37	115.34	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission

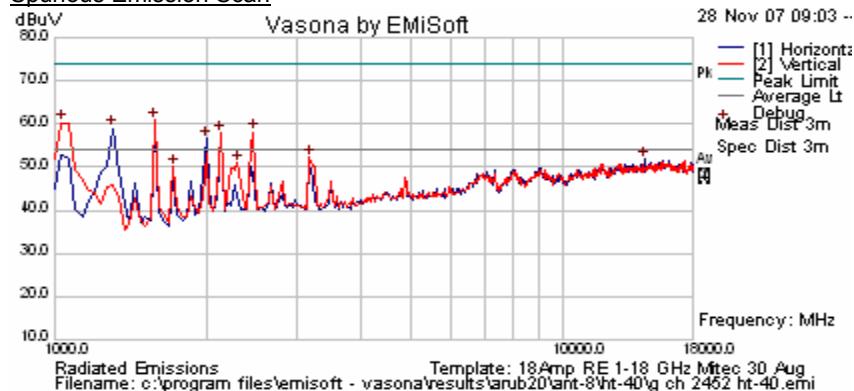
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AP124 - ANT 8 Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
9	2452	ART 19	99%	n 13.5 MCS HT-40	Yes

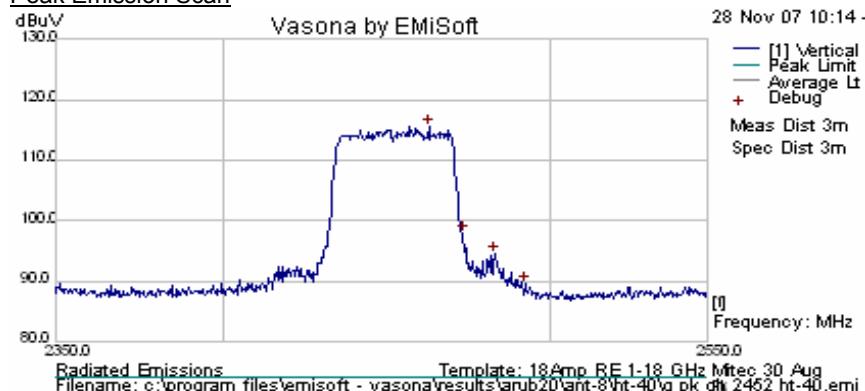
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

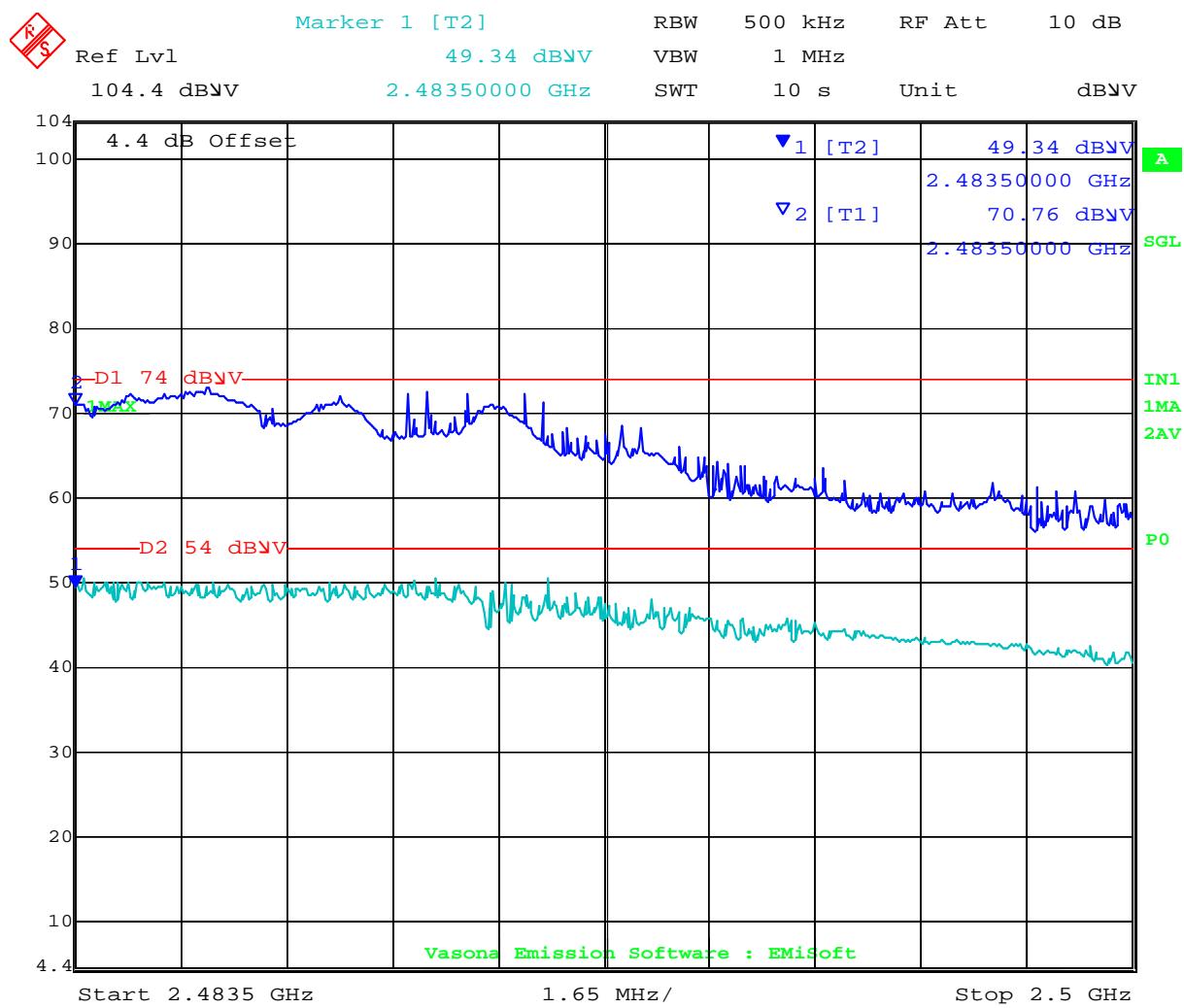


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
2462.625	74.18	8.98	32.38	115.54	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
2483.5	ART Power Setting = 16			70.76	Formal Peak	V			74	-3.24	Pass	Band-edge
2483.5				49.34	Formal Average	V			54	-4.66	Pass	Band-edge

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Date: 1.DEC.2007 19:13:10

802.11n HT-40 Band-edge 2483.5 MHz

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Title: Aruba AP-124,125 802.11a/b/g/n AP
To: FCC 47 CFR Part 15.247 & IC RSS-210
Serial #: ARUB20-A2 Rev C
Issue Date: 29th February 2008
Page: 220 of 273

ARUB20 AP-124 (ANT-10)
ART Settings V Aggregate Measured Power

The following matrix identifies the ART power setting V's each output chain. The aggregate power was also measured for all three chains.

As a result of either spurious emissions (harmonic) or band-edge issues the power was reduced to bring the unit into compliance.

Configuration	ART Power Setting	Tx 1 Measured Pwr (dBm)	Tx 2 Measured Pwr (dBm)	Tx 3 Measured Pwr (dBm)	Aggregate Measured Pwr (dBm)
Legacy a (5460 5150 5745 MHz)BE	16	13.10	12.95	14.10	19.02
HT-20 (5460 5150 5745 MHz)BE	16	13.00	13.00	13.84	18.87
HT-40 (5150 5190 5755 MHz)BE	14	10.67	10.65	11.48	16.76
Legacy a (5745MHz)SE	12	9.46	9.83	9.80	14.95
Legacy a (5785 MHz)SE	12	8.90	8.52	9.21	14.50
Legacy a (5825 MHz)SE	12	8.43	8.79	9.07	14.35
HT-20 (5745 MHz)SE	12	9.42	8.72	9.80	14.86
HT-20 (5785 MHz)SE	12	8.82	8.51	9.11	14.49
HT-20 (5825 MHz)SE	12	8.48	8.73	8.90	14.12
HT-40 (5755 MHz)SE	12	8.67	8.55	9.57	14.58
HT-40 (5785 MHz)SE	12	8.44	8.29	9.12	14.32
HT-40 (5815 MHz)SE	11.5	7.63	7.80	8.12	13.53

Note BE = Band-edge, SE – Spurious emissions

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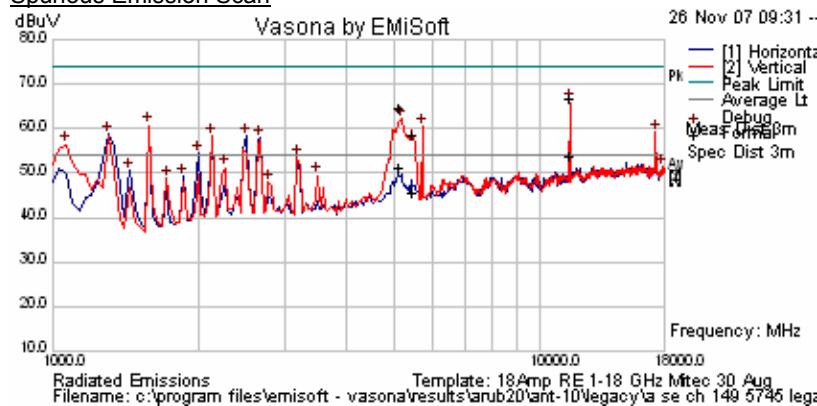
AP124: 5725-5850 MHz ANT-10 (6 dBi) Legacy Data Rates

AP124 - ANT-10 (6 dBi) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
149	5745	ART 12	99%	6 Legacy	Yes

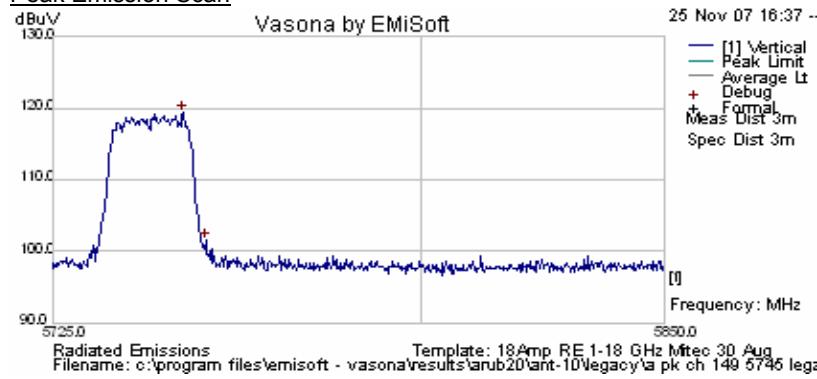
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5751.553	73.54	10.76	35.11	119.41	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
5460	ART Power Setting = 16.0			60.50	Formal Peak	V			74	-13.5	Pass	Band-edge
5460				49.00	Formal Average	V			54	-5.00	Pass	Band-edge
5150				64.03	Formal Peak	V			74	-9.97	Pass	Band-edge
5150				52.32	Formal Average	V			54	-1.68	Pass	Band-edge
11493.32	59.65	6.79	-1.72	64.72	Peak Max	V	138	72	74	-9.28	Pass	
1605.851	72.04	2.46	-14.26	60.24	Peak Max	V	99	182	74	-13.76	Pass	
1329.399	69.62	2.24	-15.58	56.28	Peak Max	V	105	239	74	-17.72	Pass	
1064.829	72.93	2.02	-16.08	58.86	Peak Max	V	98	124	74	-15.14	Pass	
11493.32	46.53	6.79	-1.72	51.61	Average Max	V	138	72	54	-2.39	Pass	
1605.851	53.48	2.46	-14.26	41.68	Average Max	V	99	182	54	-12.32	Pass	
1329.399	46.76	2.24	-15.58	33.42	Average Max	H	151	103	54	-20.58	Pass	
1064.829	55.32	2.02	-16.08	41.25	Average Max	V	98	124	54	-12.75	Pass	

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Date: 1.DEC.2007 16:46:25

802.11a Legacy Band-edge 5150, 5460MHz

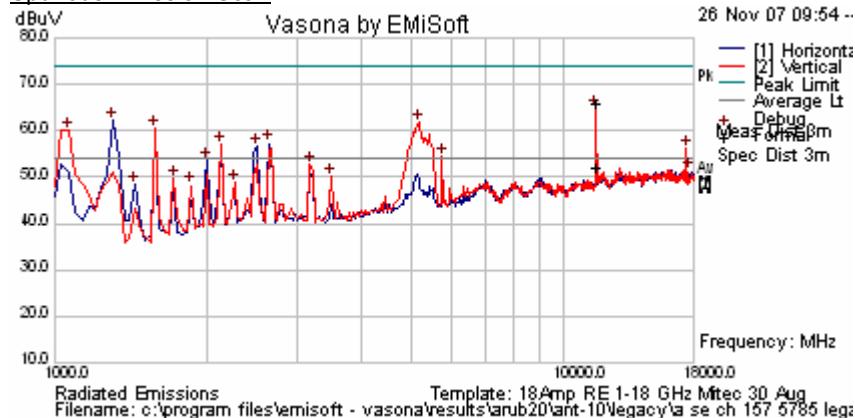
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

AP124 - ANT-10 (6 dBi OMNI) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
157	5785	ART 12	99%	6 Legacy	Yes

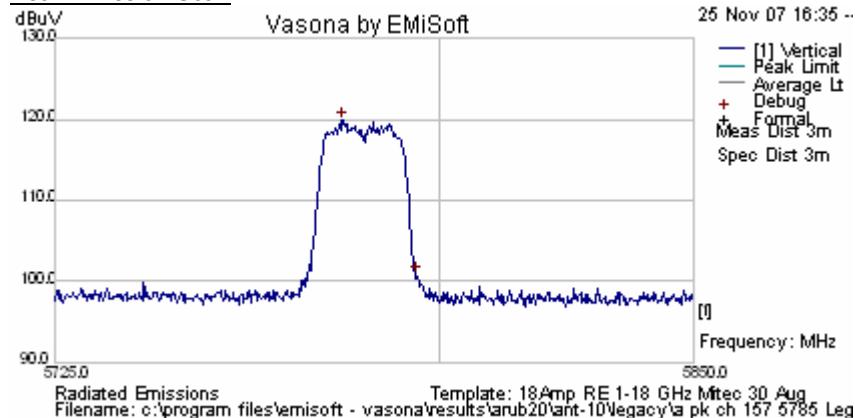
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5781.112	74.03	10.77	35.13	119.94	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
11573.99	58.6	6.81	-1.57	63.84	Peak Max	V	98	305	74	-10.16	Pass	
11573.99	44.7	6.81	-1.57	49.94	Average Max	V	98	305	54	-4.06	Pass	
17.357.21	48.03	8.7	-0.64	56.09	Peak [Scan]	V	100	0	99.94	-43.85	Pass	

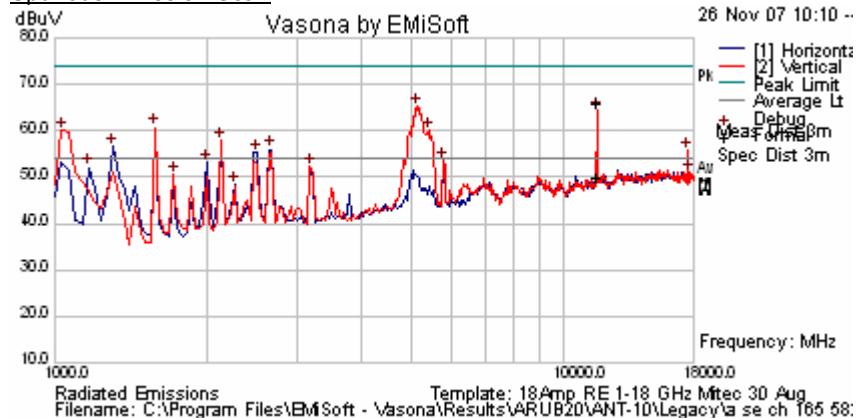
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

AP124 - ANT-10 (6 dBi OMNI) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
165	5825	ART 12	99%	6 Legacy	Yes

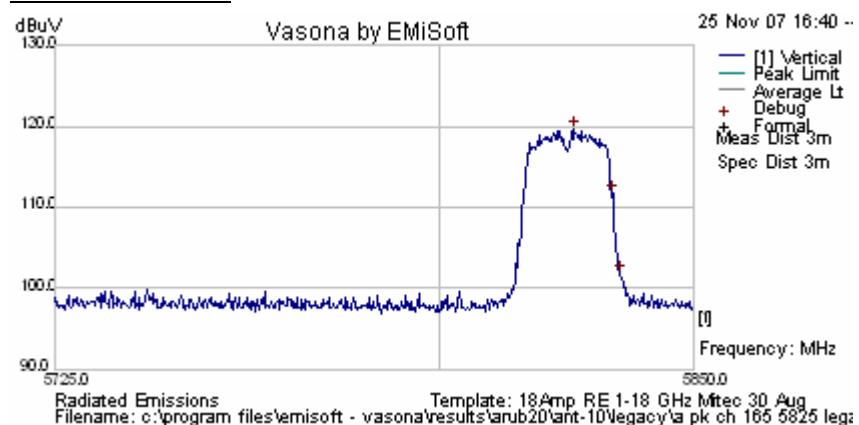
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5826.453	73.64	10.8	35.17	119.6	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
11645.89	58.74	6.83	-1.43	64.13	Peak Max	V	115	54	74	-9.87	Pass	
11645.89	42.64	6.83	-1.43	48.03	Average Max	V	115	54	54	-5.97	Pass	

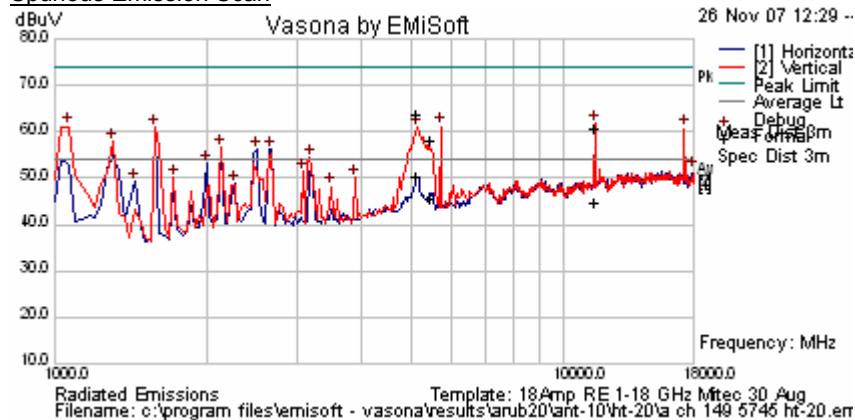
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AP124 - ANT-10 (6 dBi OMNI) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MCS)	Compliant
149	5745	ART 12	99%	6.5 HT-20	Yes

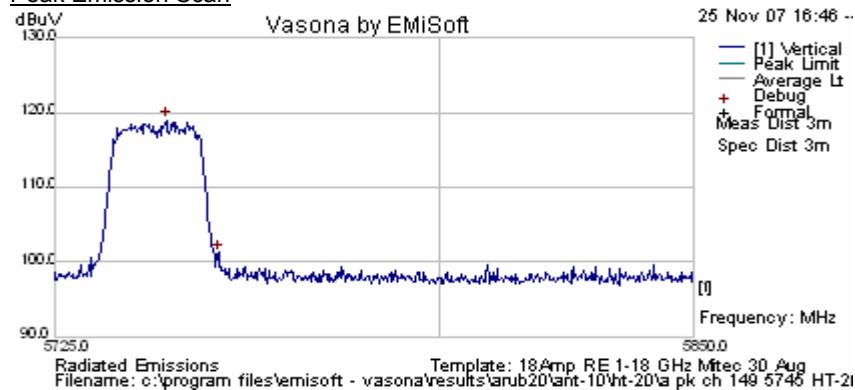
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5746.794	73.12	10.76	35.1	118.98	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
5460				60.00	Formal Peak	V			74	-14.00	Pass	Band-edge
5460				49.50	Formal Average	V			54	-4.50	Pass	Band-edge
5150				64.39	Formal Peak	V			74	-9.61	Pass	Band-edge
5150				52.82	Formal Average	V			54	-1.18	Pass	Band-edge
11500.68	53.7	6.79	-1.72	58.77	Peak Max	V	135	34	74	-15.23	Pass	
11500.68	37.81	6.79	-1.72	42.88	Average Max	V	135	34	54	-11.12	Pass	
17250.5	52.65	8.62	-0.48	60.79	Peak [Scan]	V	100	0	98.98	-38.19	Pass	NRB

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Date: 1.DEC.2007 16:50:42

802.11a HT-20 Band-edge 5150, 5460MHz

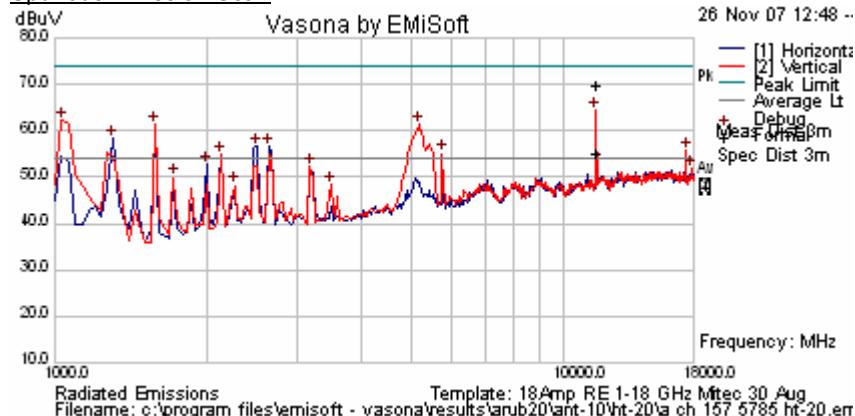
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

AP124 - ANT-10 (6 dBi OMNI) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MCS)	Compliant
157	5785	ART 12	99%	6.5 HT-20	Yes

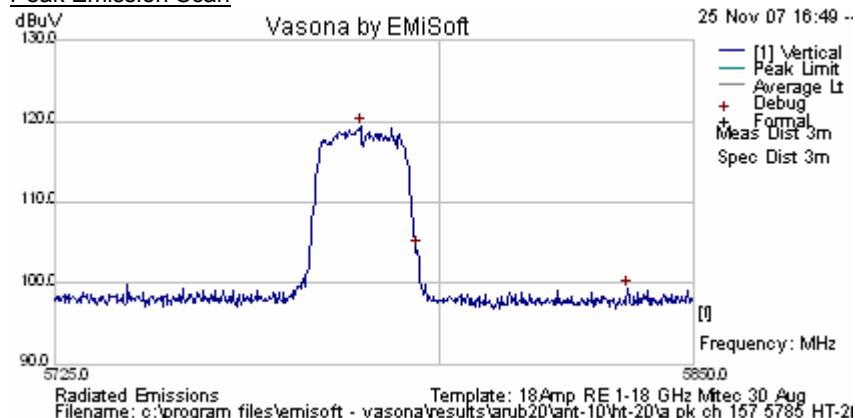
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5784.619	73.4	10.78	35.13	119.31	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
11571.4	62.69	6.81	-1.58	67.92	Peak Max	V	100	57	74	-6.08	Pass	
11571.4	48.08	6.81	-1.58	53.31	Average Max	V	100	57	54	-0.69	Pass	
17795.59	43.18	8.78	-0.09	51.86	Peak [Scan]	V	100	0	99.31	-47.45	Pass	NRB

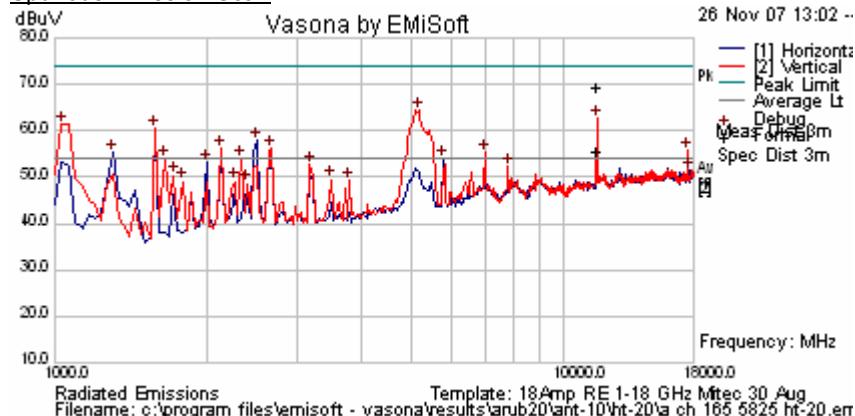
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AP124 - ANT-10 (6 dBi OMNI) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MCS)	Compliant
165	5825	ART 12	99%	6.5 HT-20	Yes

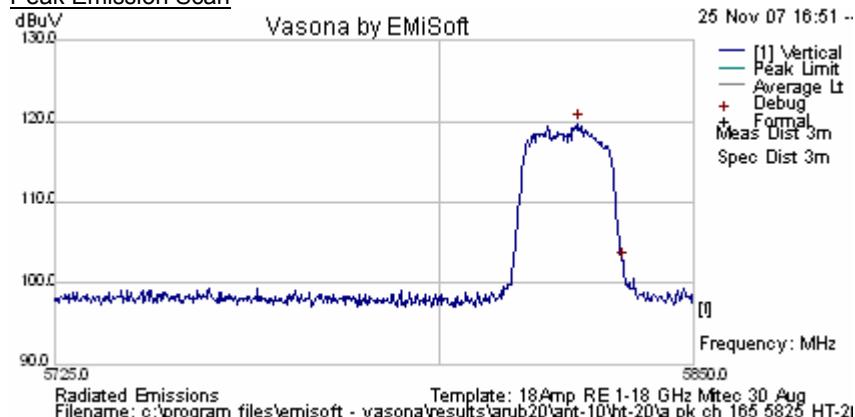
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5827.204	73.76	10.8	35.17	119.72	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
11651.3	62.13	6.83	-1.45	67.51	Peak Max	V	124	59	74	-6.49	Pass	
11651.3	48.22	6.83	-1.45	53.6	Average Max	V	124	59	54	-0.4	Pass	
17488.98	47.54	8.76	-0.62	55.69	Peak [Scan]	V	100	0	99.72	-44.03	Pass	NRB
6995.992	52.08	5.38	-2.24	55.22	Peak [Scan]	V	100	0	99.72	-44.50	Pass	NRB
7779.559	48.78	5.54	-2.1	52.22	Peak [Scan]	V	100	0	99.72	-47.50	Pass	NRB

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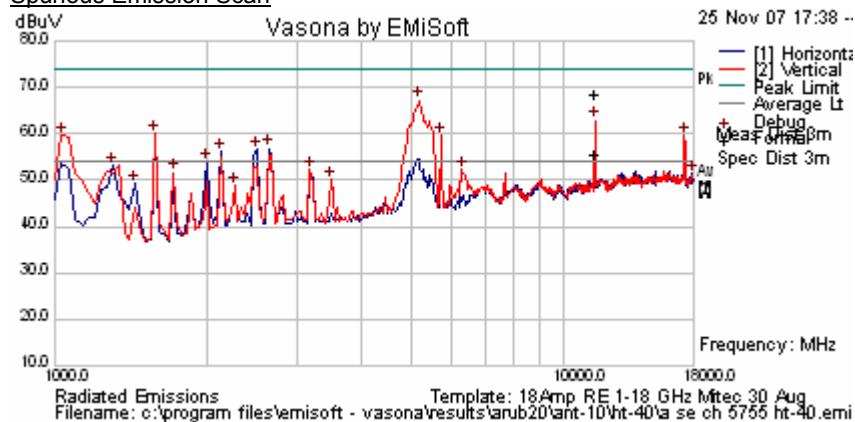
AP124: 5725-5850 MHz ANT-10 (6 dBi OMNI) HT-40 Data Rates

AP124 - ANT-10 (6 dBi OMNI) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MCS)	Compliant
	5755	ART 12	99%	13.5 HT-40	Yes

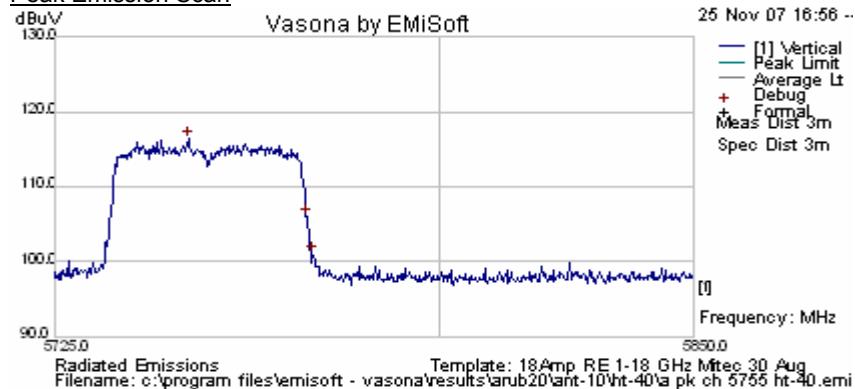
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

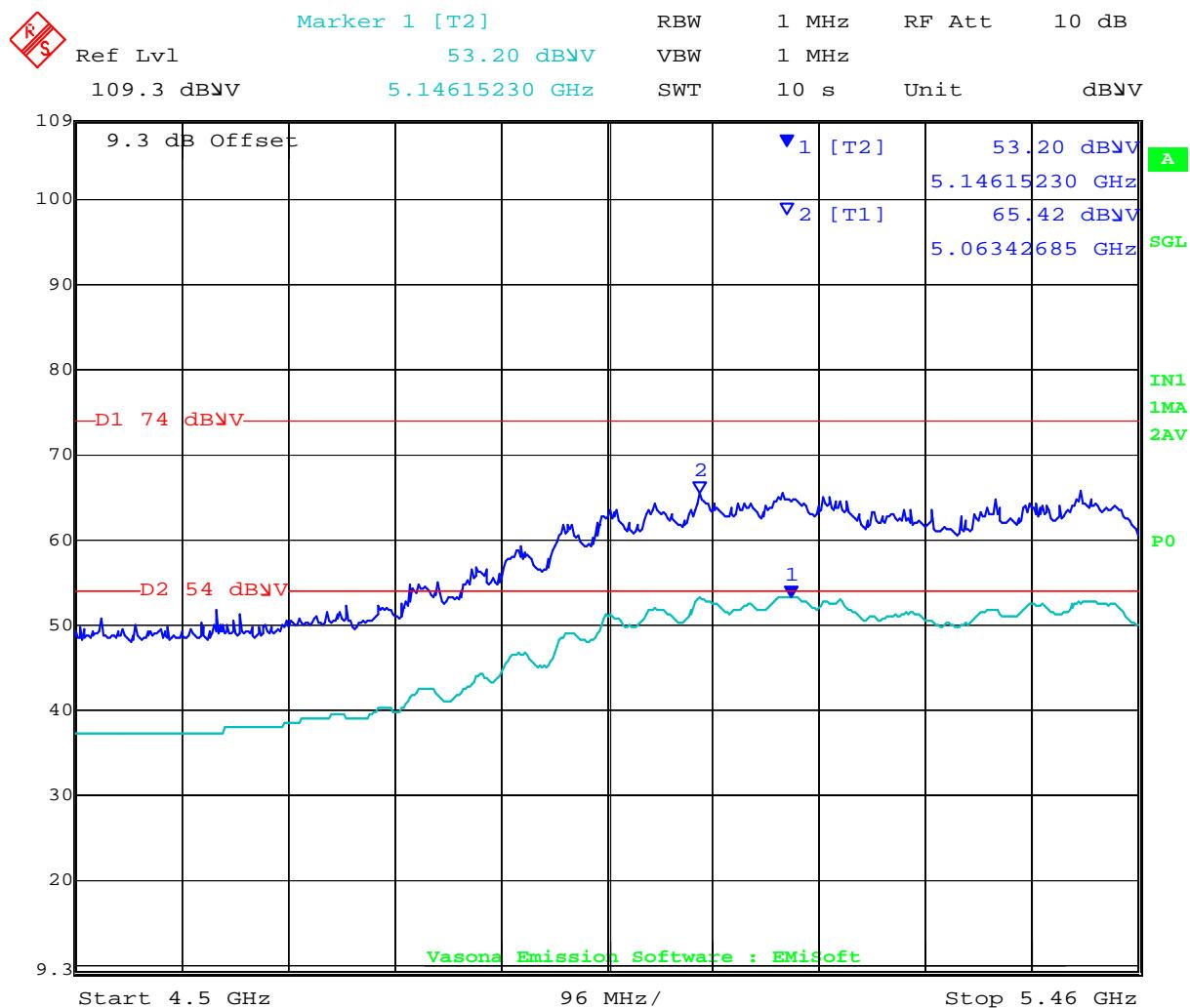


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5751.052	70.59	10.76	35.11	116.45	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
5460.00				65.00	Formal Peak	V			74	-9.00	Pass	Band-edge
5460.00				53.40	Formal Average	V			54	-0.6	Pass	Band-edge
5150.00				65.42	Formal Peak	V			74	-8.58	Pass	Band-edge
5150.00				53.20	Formal Average	V			54	-0.80	Pass	Band-edge
11513.95	59.43	6.79	-1.71	64.52	Peak Max	V	134	44	74	-9.48	Pass	
11513.95	46.24	6.79	-1.71	51.33	Average Max	V	134	44	54	-2.67	Pass	
5190.381	71.78	4.62	-9.21	67.19	Peak [Scan]	V	100	0	96.45	-29.26	Pass	NRB
17250.5	51.55	8.62	-0.48	59.69	Peak [Scan]	V	100	0	96.45	-36.76	Pass	NRB
2635.271	65.13	3.11	-11.37	56.86	Peak [Scan]	H	100	0	96.45	-39.45	Pass	NRB
2124.248	64.5	2.82	-11.03	56.29	Peak [Scan]	H	100	0	96.45	-40.16	Pass	NRB

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802.11a HT-40 Band-edge 5150, 5460MHz

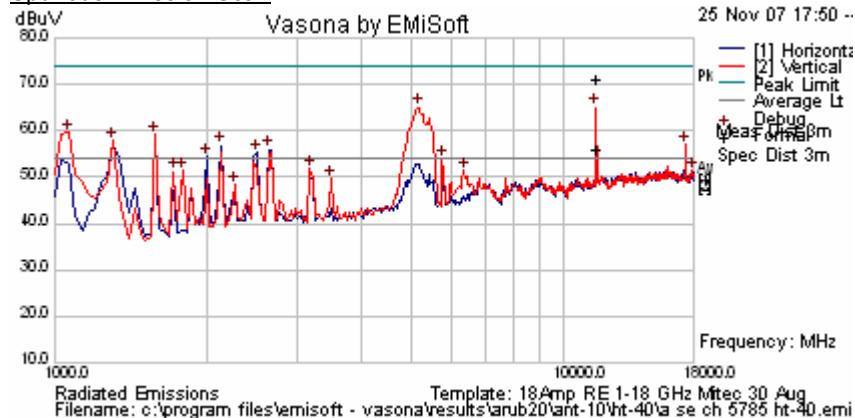
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 Labs personnel. Any changes will be noted in the Document History section of the report.

AP124 - ANT-10 (6 dBi OMNI) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MCS)	Compliant
157	5785	ART 12	99%	13.5 HT-40	Yes

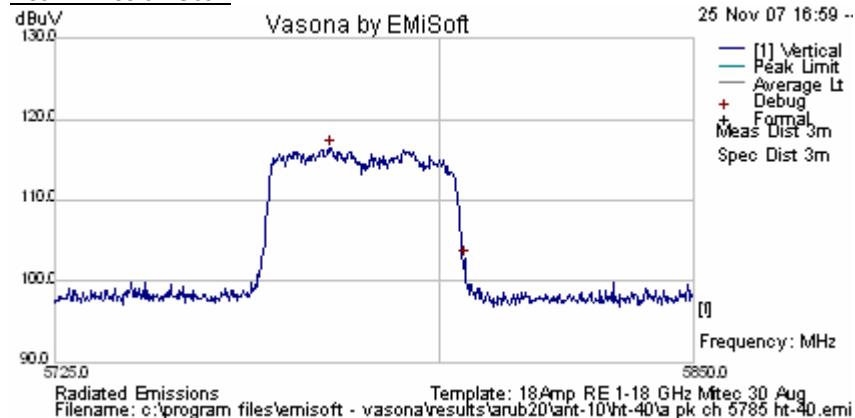
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5778.858	70.54	10.77	35.13	116.44	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
11570.02	63.76	6.81	-1.58	68.99	Peak Max	V	105	57	74	-5.01	Pass	
11570.02	48.76	6.81	-1.58	53.99	Average Max	V	105	57	54	-0.01	Pass	
5190.381	69.65	4.62	-9.21	65.06	Peak [Scan]	V	100	0	96.44	-31.38	Pass	NRB
17352.71	49.05	8.68	-0.57	57.17	Peak [Scan]	V	100	0	96.44	-39.27	Pass	NRB
2124.248	65.12	2.82	-11.03	56.91	Peak [Scan]	H	100	0	96.44	-39.53	Pass	NRB
2635.271	64.24	3.11	-11.37	55.97	Peak [Scan]	H	100	0	96.44	-40.47	Pass	NRB

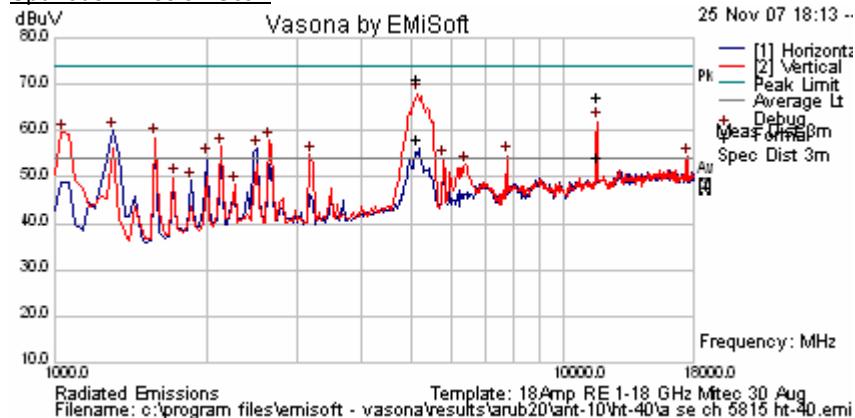
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AP124 - ANT-10 (6 dBi OMNI) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MCS)	Compliant
	5815	ART 12	99%	13.5 HT-40	Yes

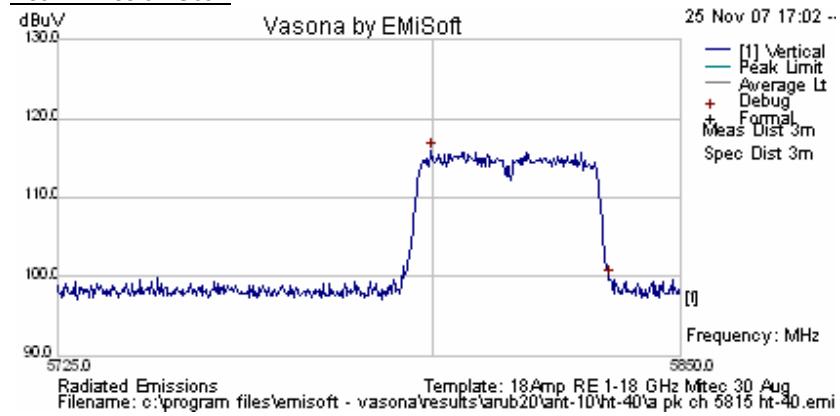
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5799.649	69.97	10.78	35.14	115.9	Peak [Scan]	V	100	0	N/A	N/A	N/A	Fundamental
11634.43	59.78	6.82	-1.39	65.21	Peak Max	V	99	48	74	-8.79	Pass	
1605.851	73.57	2.46	-14.26	61.77	Peak Max	V	99	182	74	-12.23	Pass	
1329.399	72.11	2.24	-15.58	58.77	Peak Max	V	105	239	74	-15.23	Pass	
1064.829	71.81	2.02	-16.08	57.75	Peak Max	V	98	124	74	-16.25	Pass	
11634.43	46.66	6.82	-1.39	52.09	Average Max	V	99	48	54	-1.91	Pass	
11401.30	48.75	6.82	-1.73	53.84	Average Max	V	103	166	54	-0.16	Pass	
1605.851	54.38	2.46	-14.26	42.58	Average Max	V	99	182	54	-11.42	Pass	
1329.399	48.18	2.24	-15.58	34.84	Average Max	H	151	103	54	-19.16	Pass	
1064.829	56.78	2.02	-16.08	42.72	Average Max	V	98	124	54	-11.28	Pass	

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ARUB20 AP-124 (ANT-12)
ART Settings V Aggregate Measured Power

The following matrix identifies the ART power setting V's each output chain. The aggregate power was also measured for all three chains.

As a result of either spurious emissions (harmonic) or band-edge issues the power was reduced to bring the unit into compliance.

Configuration	ART Power Setting	Tx 1 Measured Pwr (dBm)	Tx 2 Measured Pwr (dBm)	Tx 3 Measured Pwr (dBm)	Aggregate Measured Pwr (dBm)
Legacy a (5460 5150 5745 MHz)BE	13	10.21	9.96	10.89	15.91
HT-20 (5460 5150 5745 MHz)BE	12.5	9.83	9.13	10.37	15.38
HT-40 (5150 5190 5755 MHz)BE	10	7.06	6.53	7.73	12.70
Legacy a (5745MHz)SE	11.5	8.88	8.40	9.36	14.42
Legacy a (5785 MHz)SE	12	8.90	8.53	9.21	14.50
Legacy a (5825 MHz)SE	12	8.45	8.76	9.05	14.35
HT-20 (5745 MHz)SE	14	11.18	11.03	12.01	16.99
HT-20 (5785 MHz)SE	14	10.87	10.57	11.49	16.66
HT-20 (5825 MHz)SE	11.5	7.97	8.27	8.35	13.64
HT-40 (5755 MHz)SE	12	8.75	8.36	9.51	14.58
HT-40 (5785 MHz)SE	12	8.49	8.30	9.25	14.32
HT-40 (5815 MHz)SE	12	8.10	8.29	8.70	14.10

Note BE = Band-edge, SE – Spurious emissions

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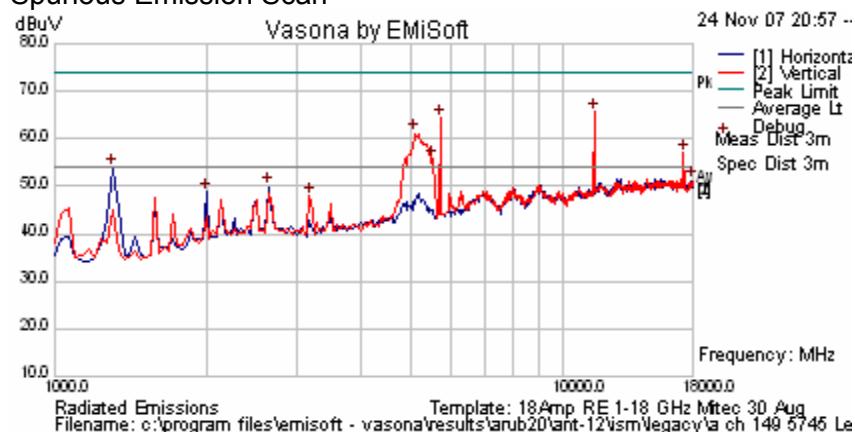
AP124: 5725-5850 MHz ANT-12 (14 dBi OMNI) Legacy Data Rates

AP124 - ANT-12 (14 dBi OMNI) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
149	5745	ART 11.5	99%	6 Legacy	Yes

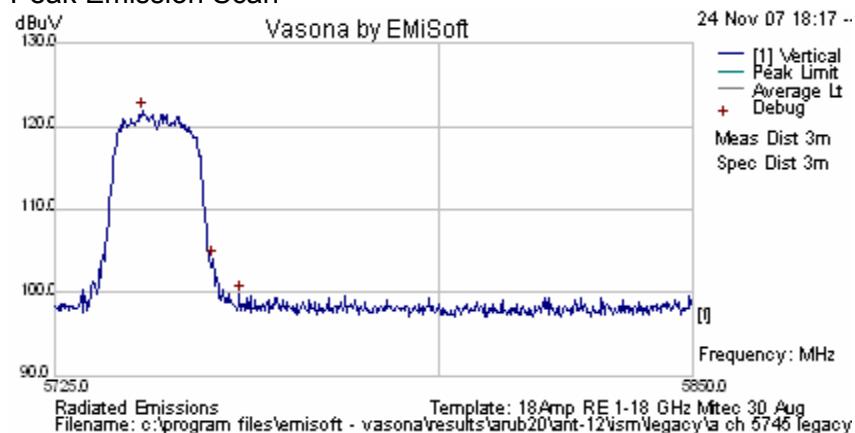
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

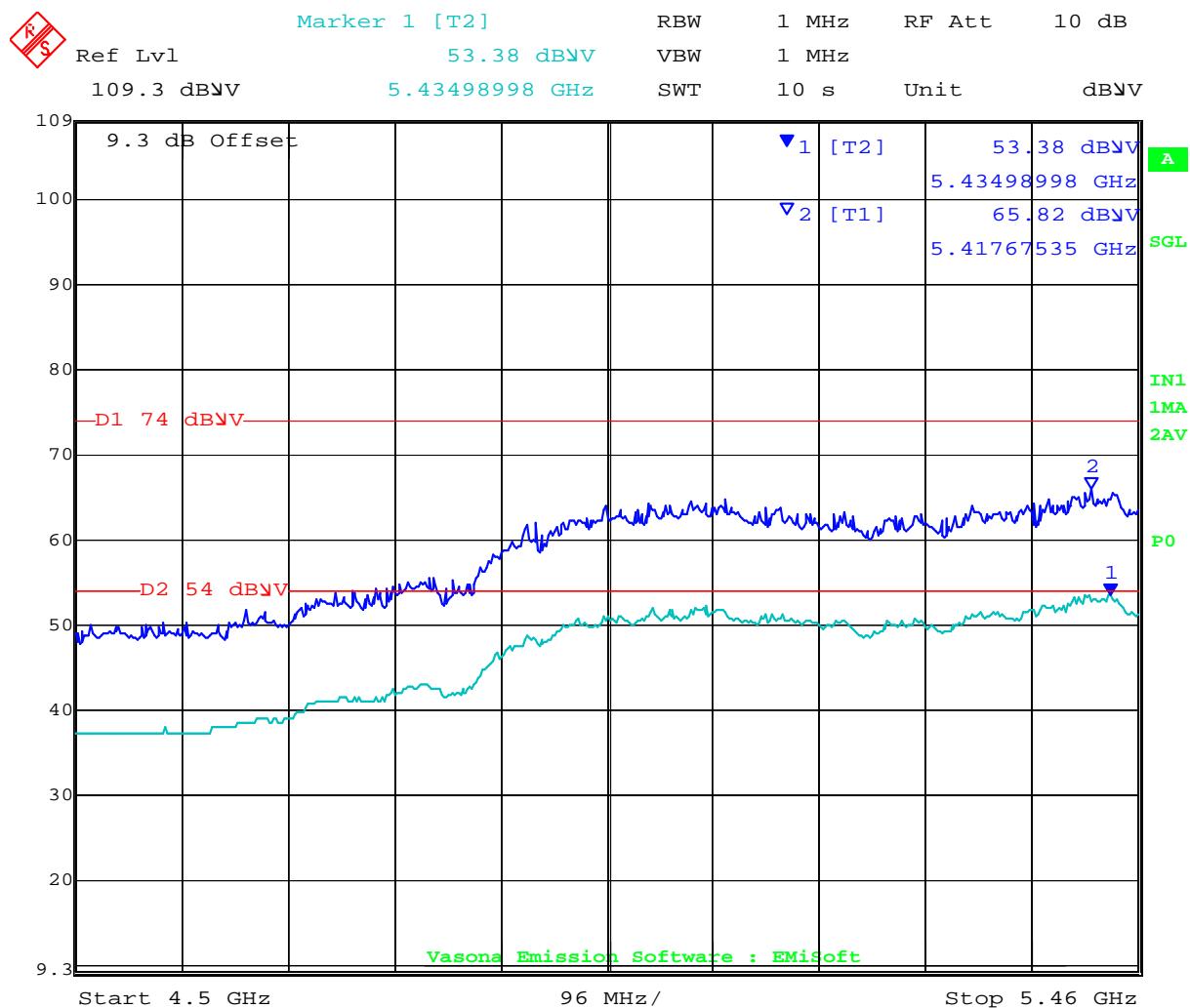


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5742.034	76.06	10.75	35.1	121.91	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
5460	ART Power Setting = 13.0			65.82	Formal Peak	V			74	-8.18	Pass	Band-edge
5460				53.38	Formal Average	V			54	-0.62	Pass	Band-edge
5150				64.10	Formal Peak	V			74	-9.90	Pass	Band-edge
5150				52.50	Formal Average	V			54	-1.50	Pass	Band-edge
11497.32	63.09	6.79	-1.72	68.16	Peak Max	V	106	63	74	-5.84	Pass	
11497.32	48.88	6.79	-1.72	53.95	Average Max	V	106	63	54	-0.05	Pass	
17250.5	53.75	8.62	-0.48	61.89	Peak [Scan]	V	100	0	101.91	-40.02	Pass	NRB

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Date: 1.DEC.2007 17:14:15

802.11a Legacy Band-edge 5150, 5460MHz

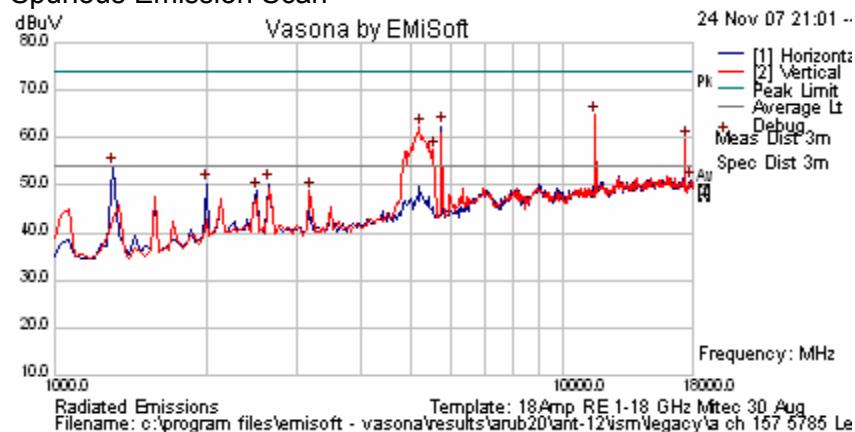
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AP124 - ANT-12 (14 dBi OMNI) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
157	5785	ART 12	99%	6 Legacy	Yes

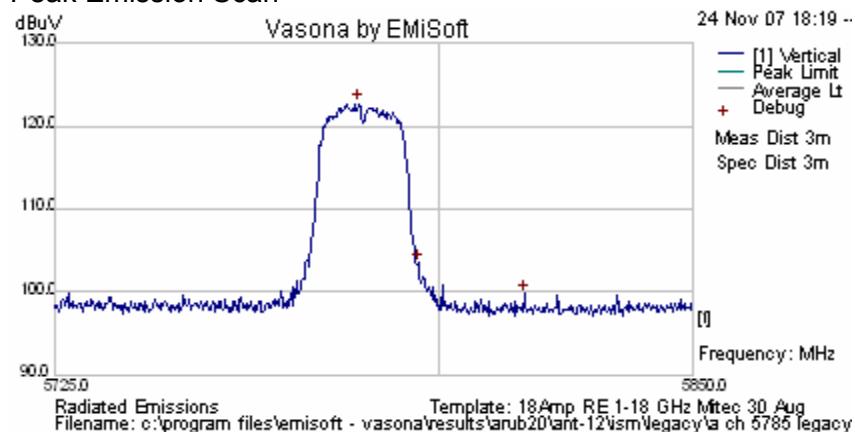
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5784.118	76.83	10.78	35.13	122.74	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
11561.12	58.23	6.8	-1.61	63.42	Peak Max	V	102	330	74	-10.58	Pass	
11561.12	39.19	6.8	-1.61	44.39	Average Max	H	120	86	54	-9.61	Pass	
17352.71	55.32	8.68	-0.57	63.44	Peak [Scan]	V	100	0	102.74	-39.30	Pass	NRB

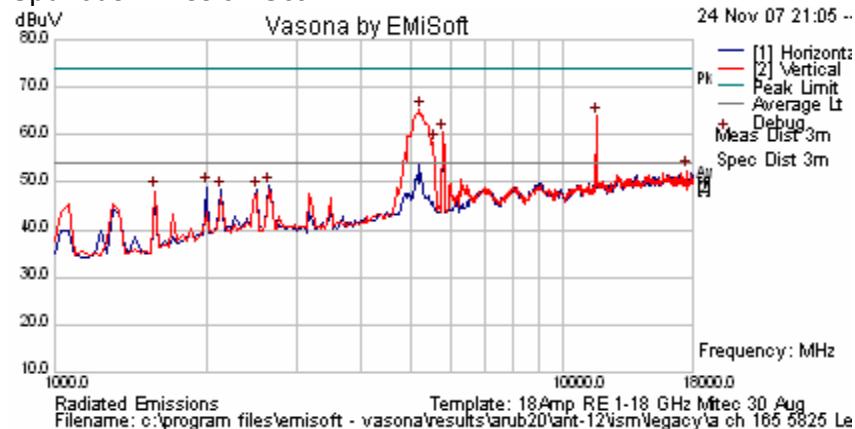
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AP124 - ANT-12 (14 dBi OMNI) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MBit/s)	Compliant
165	5825	ART 12	99%	6 Legacy	Yes

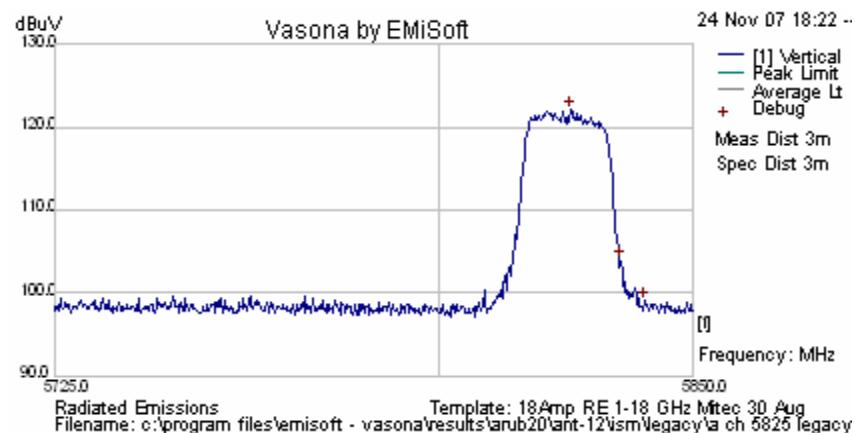
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5825.701	76.18	10.8	35.16	122.15	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
11650.81	62.95	6.83	-1.45	68.33	Peak Max	V	130	329	74	-5.67	Pass	
11650.81	47.97	6.83	-1.45	53.35	Average Max	V	130	329	54	-0.65	Pass	

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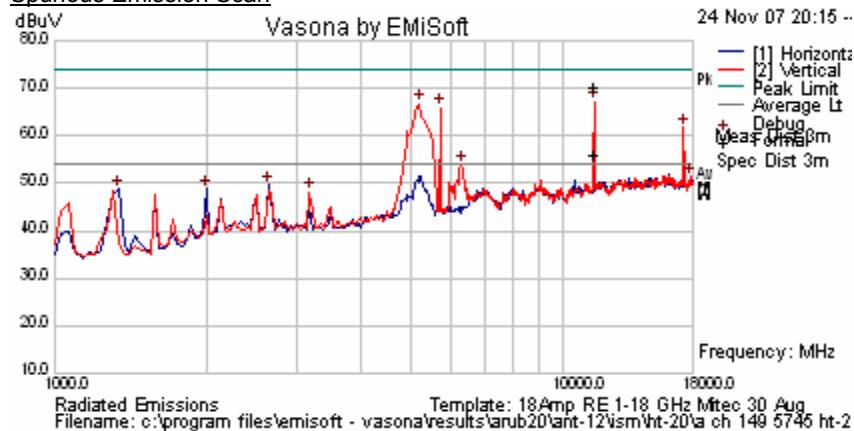
AP124: 5725-5850 MHz ANT-12 (14 dBi OMNI) Legacy Data Rates

AP124 - ANT-12 (14 dBi OMNI) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MCS)	Compliant
149	5745	ART 14	99%	6.5 HT-20	Yes

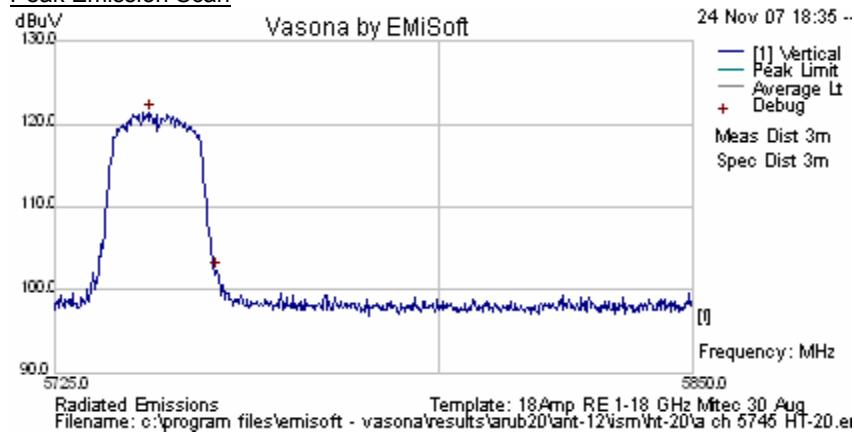
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

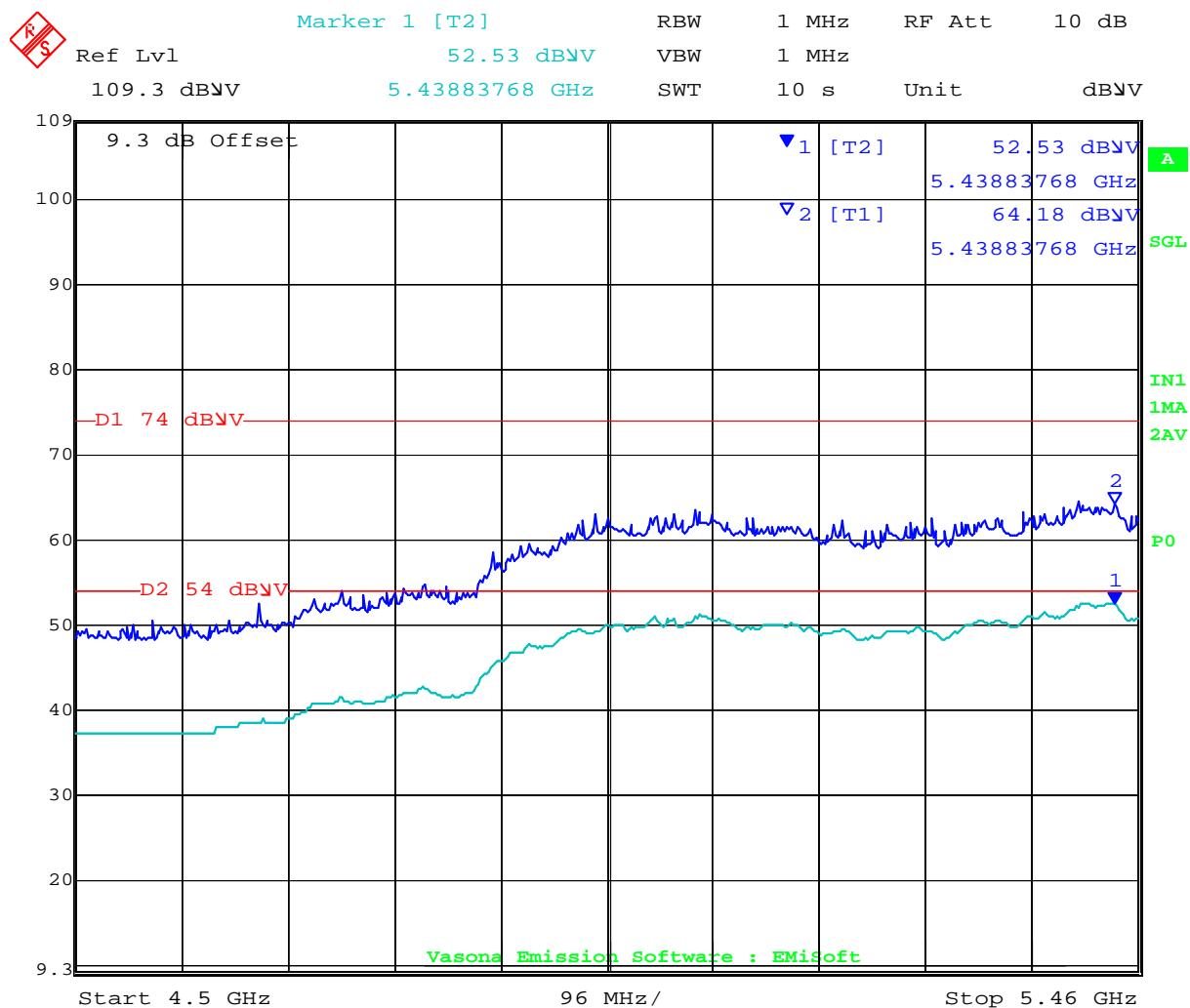


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5743.537	75.52	10.75	35.1	121.37	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
5460				64.18	Formal Peak	V			74	-9.82	Pass	Band-edge
5460				52.53	Formal Average	V			54	-1.47	Pass	Band-edge
5150				63.10	Formal Peak	V			74	-10.9	Pass	Band-edge
5150				51.00	Formal Average	V			54	-3.00	Pass	Band-edge
11497.32	63.09	6.79	-1.72	68.16	Peak Max	V	106	63	74	-5.84	Pass	
11497.32	48.88	6.79	-1.72	53.95	Average Max	V	106	63	54	-0.05	Pass	
5224.449	71.24	4.62	-9.09	66.77	Peak [Scan]	V	100	0	101.37	-34.60	Pass	NRB
17250.5	53.75	8.62	-0.48	61.89	Peak [Scan]	V	100	0	101.37	-39.48	Pass	NRB
6314.629	56.29	5.04	-7.18	54.16	Peak [Scan]	V	100	0	101.37	-47.21	Pass	NRB

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802.11a HT-20 Band-edge 5150, 5460MHz

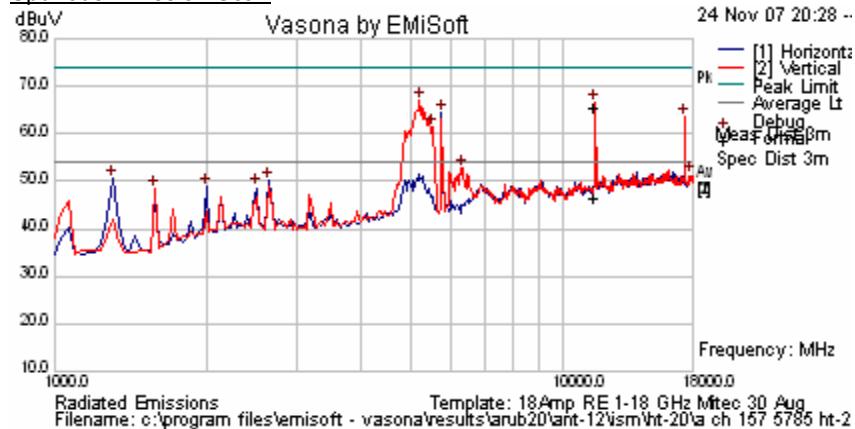
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AP124 - ANT-12 (14 dBi OMNI) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MCS)	Compliant
157	5785	ART 14	99%	6.5 HT-20	Yes

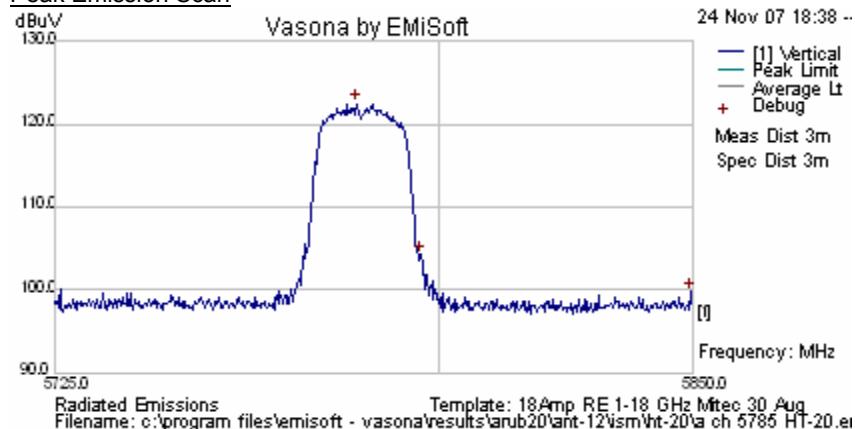
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5783.868	76.53	10.78	35.13	122.44	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
11561.12	58.23	6.8	-1.61	63.42	Peak Max	V	102	330	74	-10.58	Pass	
11561.12	39.19	6.8	-1.61	44.39	Average Max	H	120	86	54	-9.61	Pass	
17352.71	55.32	8.68	-0.57	63.44	Peak [Scan]	V	100	0	102.44	-39.00	Pass	NRB
5531.062	65.05	4.64	-8.32	61.37	Peak [Scan]	V	100	0	102.44	-41.07	Pass	NRB
6348.697	54.79	5.06	-7.05	52.81	Peak [Scan]	V	100	0	102.44	-49.63	Pass	NRB

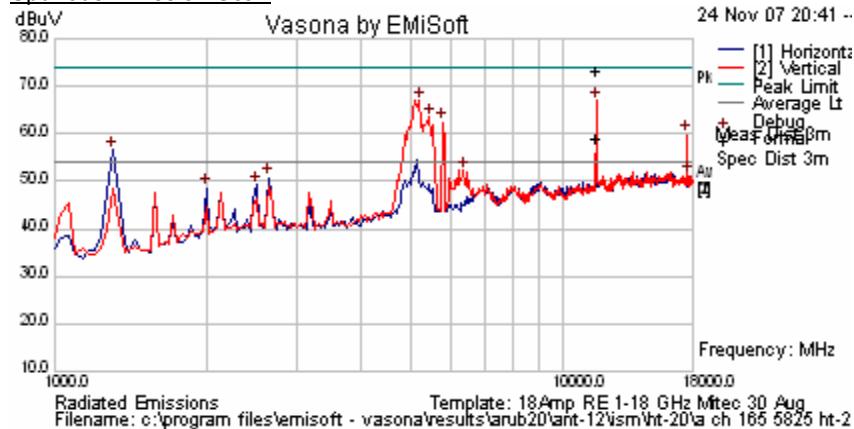
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AP124 - ANT-12 (14 dBi OMNI) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MCS)	Compliant
165	5825	ART 11.5	99%	6.5 HT-20	Yes

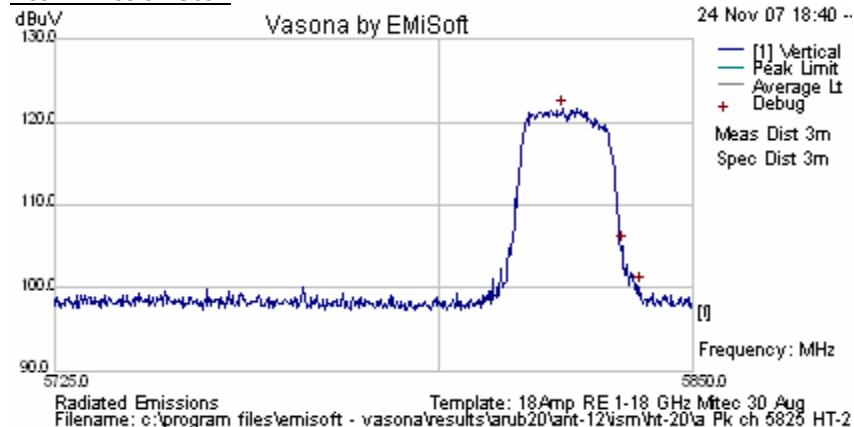
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5824.198	75.65	10.8	35.16	121.62	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
11650.81	62.95	6.83	-1.45	68.33	Peak Max	V	130	329	74	-5.67	Pass	
11650.81	47.97	6.83	-1.45	53.35	Average Max	V	130	329	54	-0.65	Pass	
17488.98	51.68	8.76	-0.62	59.83	Peak [Scan]	V	100	0	101.62	-41.79	Pass	NRB
6382.766	54.13	5.08	-6.9	52.3	Peak [Scan]	V	100	0	101.62	-49.32	Pass	NRB

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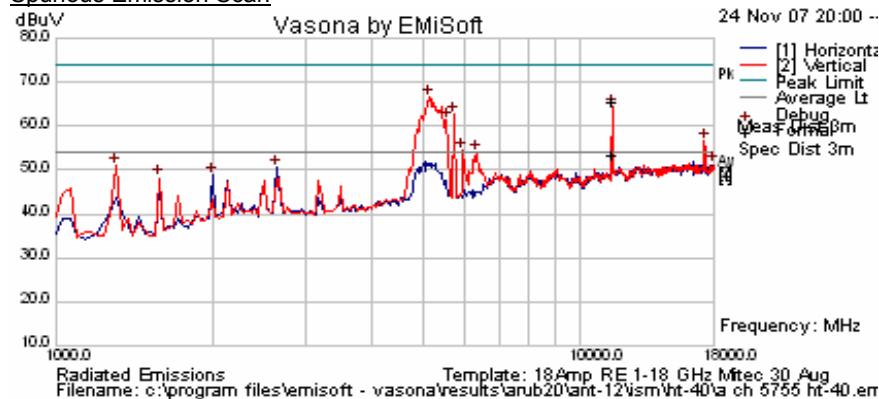
AP124: 5725-5850 MHz ANT-12 (14 dBi OMNI) HT-40 Data Rates

AP124 - ANT-12 (14 dBi OMNI) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MCS)	Compliant
	5755	ART 12	99%	13.5 HT-40	Yes

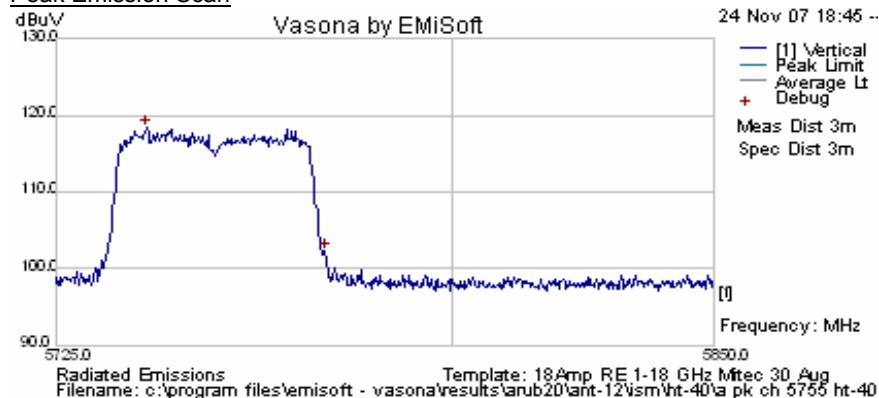
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan

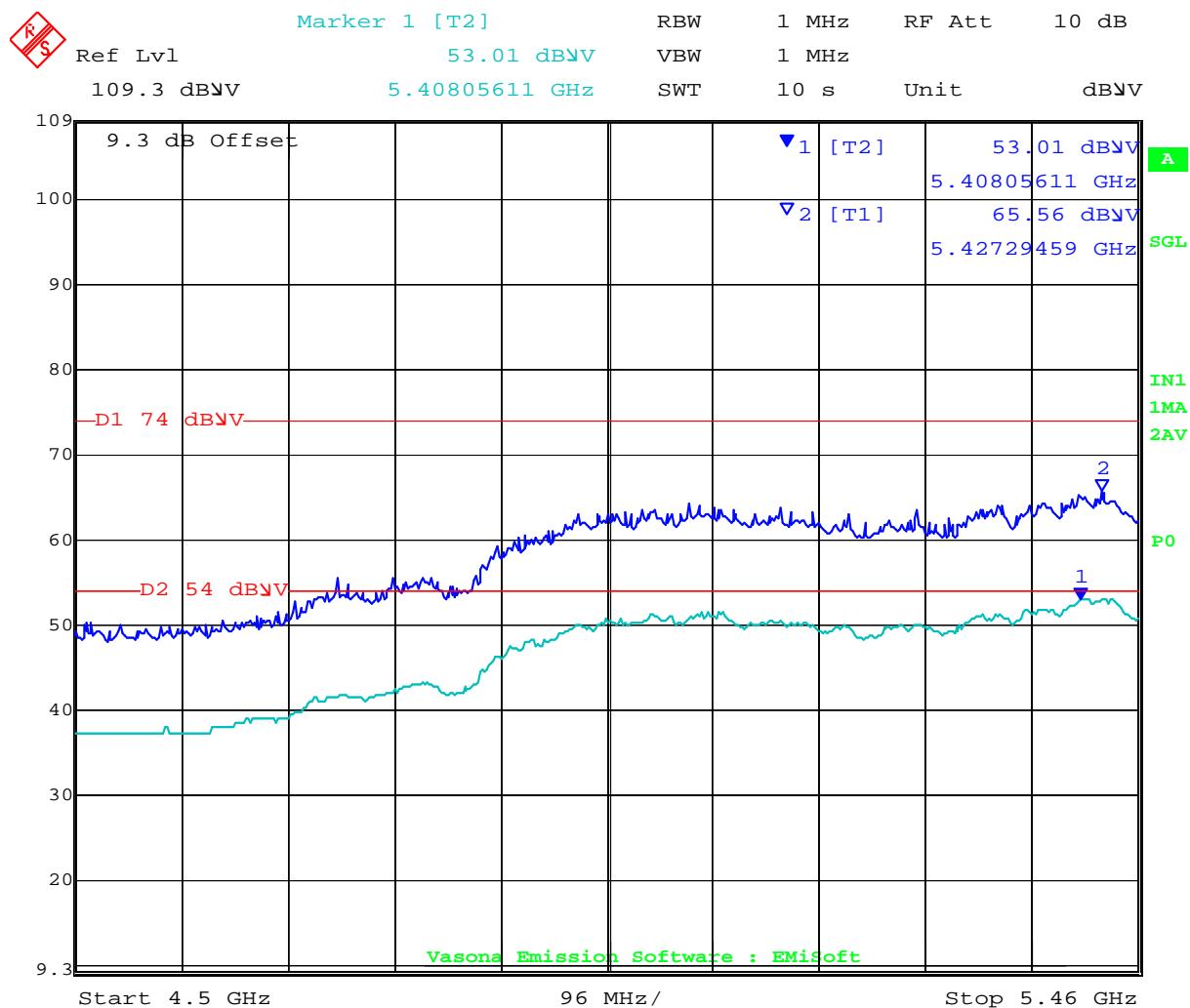


Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5742.285	72.55	10.75	35.1	118.4	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
5460	ART Power Setting = 10.0			65.56	Formal Peak	V			74	-8.44	Pass	Band-edge
5460				53.01	Formal Average	V			54	-0.99	Pass	Band-edge
5150				64.90	Formal Peak	V			74	-9.10	Pass	Band-edge
5150				52.10	Formal Average	V			54	-1.90	Pass	Band-edge
11519.118	58.49	6.79	-1.7	63.59	Peak Max	V	108	168	74	-10.41	Pass	
11519.118	46.09	6.79	-1.7	51.18	Average Max	V	108	168	54	-2.82	Pass	
5156.313	71.39	4.62	-9.28	66.73	Peak [Scan]	V	100	0	98.4	-31.67	Pass	NRB
5565.13	64.97	4.66	-8.35	61.28	Peak [Scan]	V	100	0	98.4	-37.12	Pass	NRB
17250.501	48.54	8.62	-0.48	56.69	Peak [Scan]	V	100	0	98.4	-41.71	Pass	NRB
5973.948	57.36	4.88	-7.8	54.44	Peak [Scan]	V	100	0	98.4	-43.96	Pass	NRB
6348.697	55.81	5.06	-7.05	53.82	Peak [Scan]	V	100	0	98.4	-44.58	Pass	NRB

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802.11a HT-40 Band-edge 5150, 5460MHz

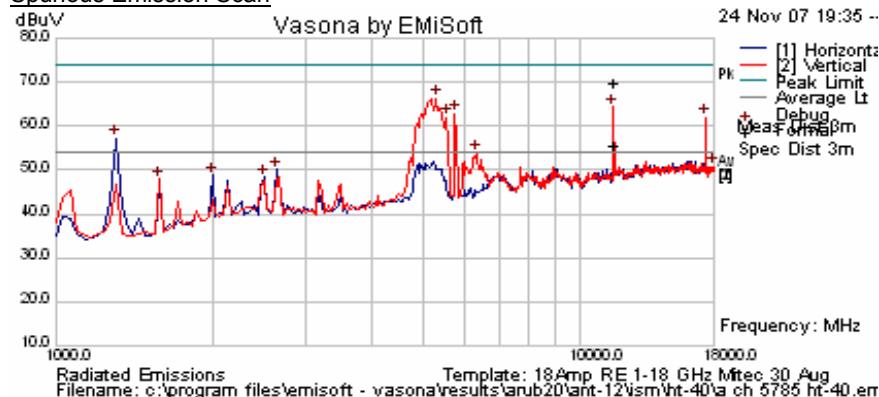
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AP124 - ANT-12 (14 dBi OMNI) Test Configuration					
Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MCS)	Compliant
157	5785	ART 12	99%	13.5 HT-40	Yes

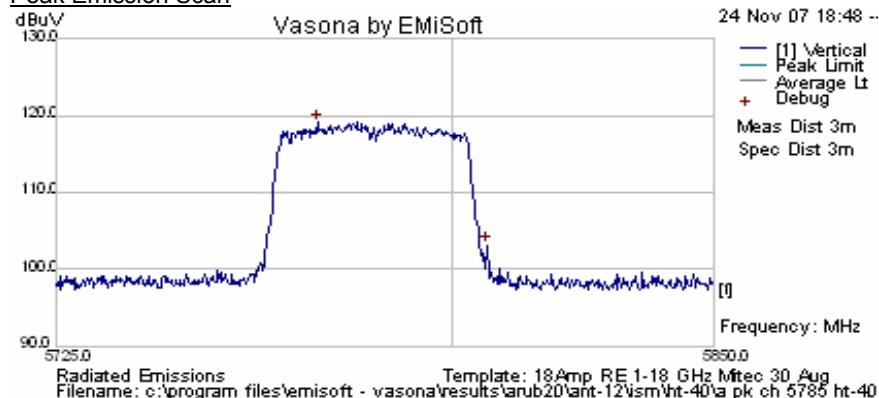
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5774.349	73.31	10.77	35.12	119.2	Peak [Scan]	V	100	0	N/A	N/A	N/A	Pk Emission
11571.09	62.39	6.81	-1.58	67.62	Peak Max	V	129	330	74	-6.38	Pass	
11571.09	48.09	6.81	-1.58	53.32	Average Max	V	129	330	54	-0.68	Pass	
17352.705	53.91	8.68	-0.57	62.02	Peak [Scan]	V	100	0	99.2	-37.18	Pass	NRB
5565.13	65.69	4.66	-8.35	62	Peak [Scan]	V	100	0	99.2	-37.20	Pass	NRB
6348.697	55.77	5.06	-7.05	53.78	Peak [Scan]	V	100	0	99.2	-45.42	Pass	NRB
18000	42.59	8.78	-0.43	50.94	Peak [Scan]	V	100	0	54	-3.06	Pass	
2635.271	58.33	3.11	-11.37	50.07	Peak [Scan]	H	100	0	99.2	-49.13	Pass	NRB
1987.976	57.32	2.74	-11.26	48.8	Peak [Scan]	H	100	0	54	-5.2	Pass	
2498.998	56.77	3	-11.26	48.51	Peak [Scan]	H	100	0	54	-5.49	Pass	
1579.158	60.09	2.44	-14.51	48.01	Peak [Scan]	V	100	0	54	-5.99	Pass	

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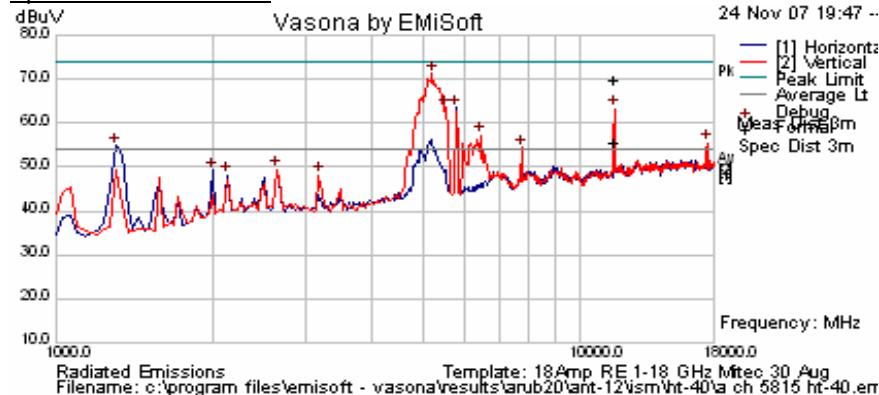
AP124 - ANT-12 (14 dBi OMNI) Test Configuration

Channel	Freq (MHz)	Software Pwr Setting	Duty Cycle	Data Rate (MCS)	Compliant
	5815	ART 12	99%	13.5 HT-40	Yes

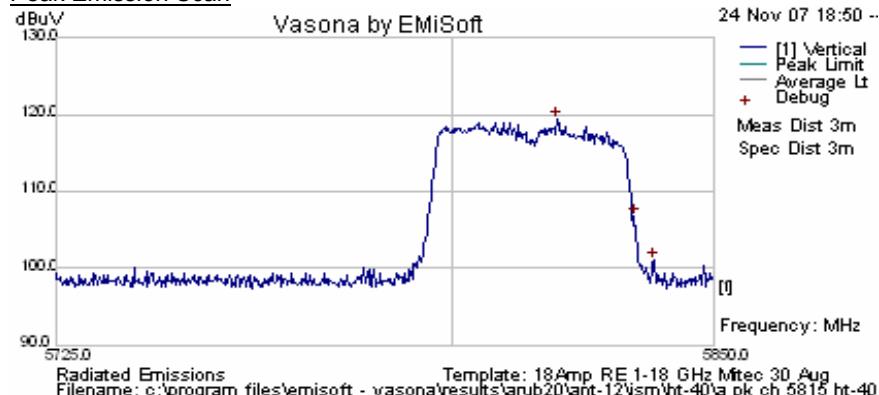
Three antennas operating simultaneously

NRB = None Restrictive Band

Spurious Emission Scan



Peak Emission Scan



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
5819.94	73.36	10.8	35.16	119.32	Peak [Scan]	V	100	0	N/A	N/A	N/A	Fundamental
11631.934	62.39	6.82	-1.39	67.82	Peak Max	V	142	329	74	-6.18	Pass	
11631.934	48	6.82	-1.39	53.44	Average Max	V	142	329	54	-0.56	Pass	
5224.449	75.78	4.62	-9.09	71.31	Peak [Scan]	V	100	0	99.32	-28.01	Pass	NRB
5531.062	67.27	4.64	-8.32	63.59	Peak [Scan]	V	100	0	99.32	-35.73	Pass	NRB
6450.902	58.7	5.11	-6.57	57.24	Peak [Scan]	V	100	0	99.32	-42.08	Pass	NRB
17454.91	47.36	8.74	-0.56	55.55	Peak [Scan]	V	100	0	99.32	-43.77	Pass	NRB

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Specification Limits

FCC §15.247(d) and RSS-210 §A8.5 In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

FCC §15.247(d)

If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section §15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(a)).

IC RSS-210 §A8.5 If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required. In addition, radiated emissions which fall in the restricted bands of Table 1 must also comply with the radiated emission limits specified in Tables 2 and 3.

IC 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.

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.



Title: Aruba AP-124,125 802.11a/b/g/n AP
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§15.209 (a) Limit Matrix

Frequency(MHz)	Field Strength (μ V/m)	Field Strength (dB μ 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

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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5.1.6.2. Receiver Radiated Spurious Emissions (above 1 GHz)

Industry Canada RSS-Gen §4.8, §6

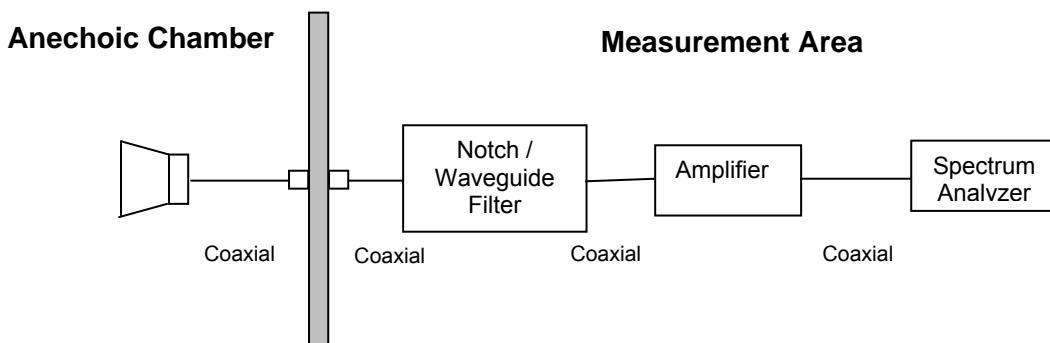
Test Procedure

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

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

All Sectors of the EUT were tested simultaneously

Test Measurement Set up



Measurement set up for Radiated Emission Test

Field Strength Calculation

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

$$FS = R + AF + CORR - FO$$

where: FS = Field Strength

R = Measured Spectrum analyzer Input Amplitude

AF = Antenna Factor

CORR = Correction Factor = CL - AG + NFL

CL = Cable Loss

AG = Amplifier Gain

FO = Distance Falloff Factor

NFL = Notch Filter Loss or Waveguide Loss

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For 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:

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

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

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

Section 5.1.6.1 Transmitter Spurious above 1 GHz identifies that emissions peaking above 54 dB μ V/m emanate from the EUT and not transmitted through the antenna port. These (1 – 3.5 GHz) emissions were formally measured and characterized and are not considered when examining Receiver Radiated Spurious above 1 GHz.

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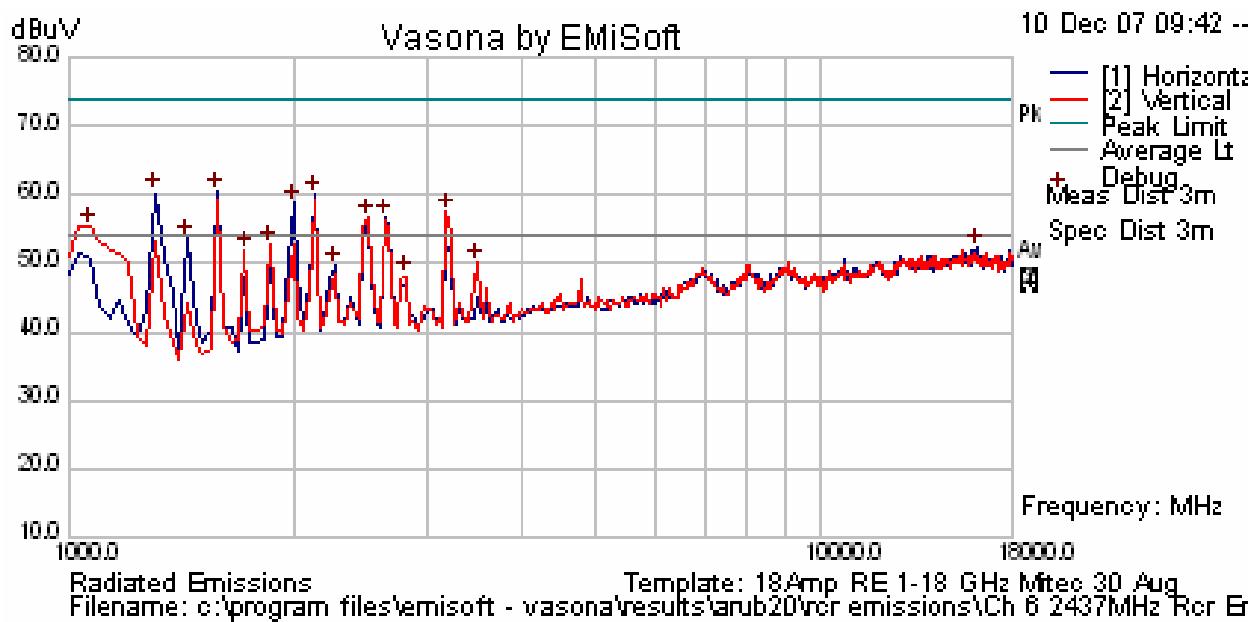
Receiver Radiated Spurious Emissions above 1 GHz

Test Setup – Integral Antenna channel 2437 MHz, all modes Legacy, HT-20, HT-40.

TABLE OF RESULTS –

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V/m)	Correction Factor (dB)	Corrected Field Strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)

Channel 2437 MHz Receiver Radiated Emissions



See Section 5.1.6.1 for characterization of emissions (1 – 3.5 GHz) breaking the 54 dB μ V/m limit line.

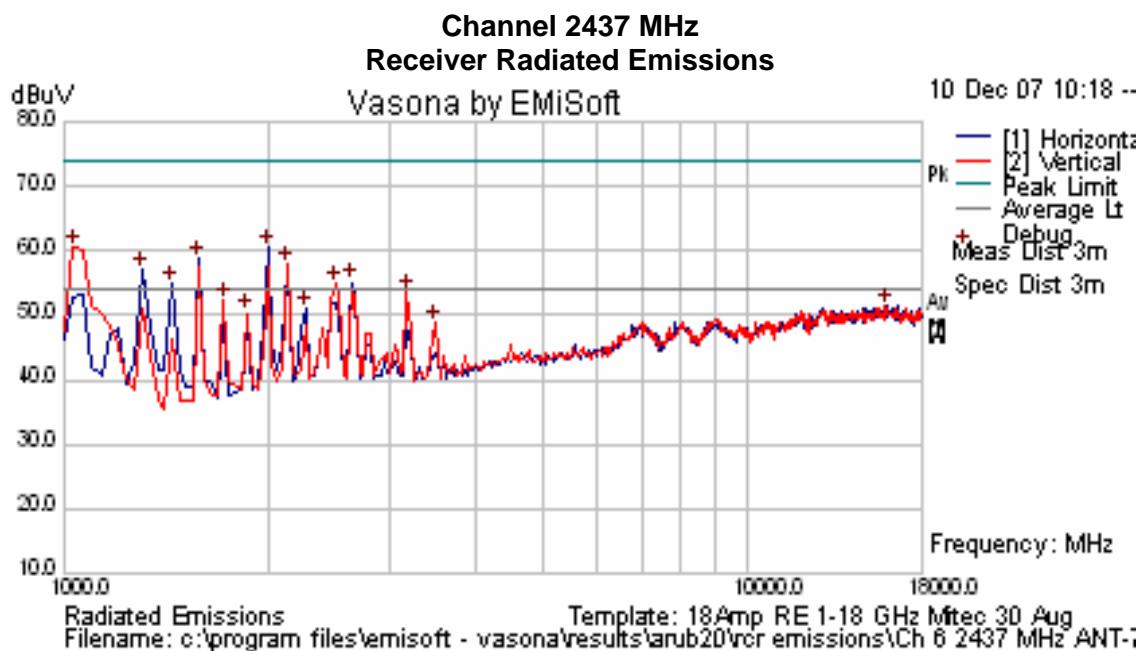
No receiver emissions were observed.

Receiver Radiated Spurious Emissions above 1 GHz

Test Setup – Antenna ANT-7- Channel 2437 MHz, all modes Legacy, HT-20, HT-40.

TABLE OF RESULTS –

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V/m)	Correction Factor (dB)	Corrected Field Strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)



See Section 5.1.6.1 for characterization of emissions (1 – 3.5 GHz) breaking the 54 dB μ V/m limit line.

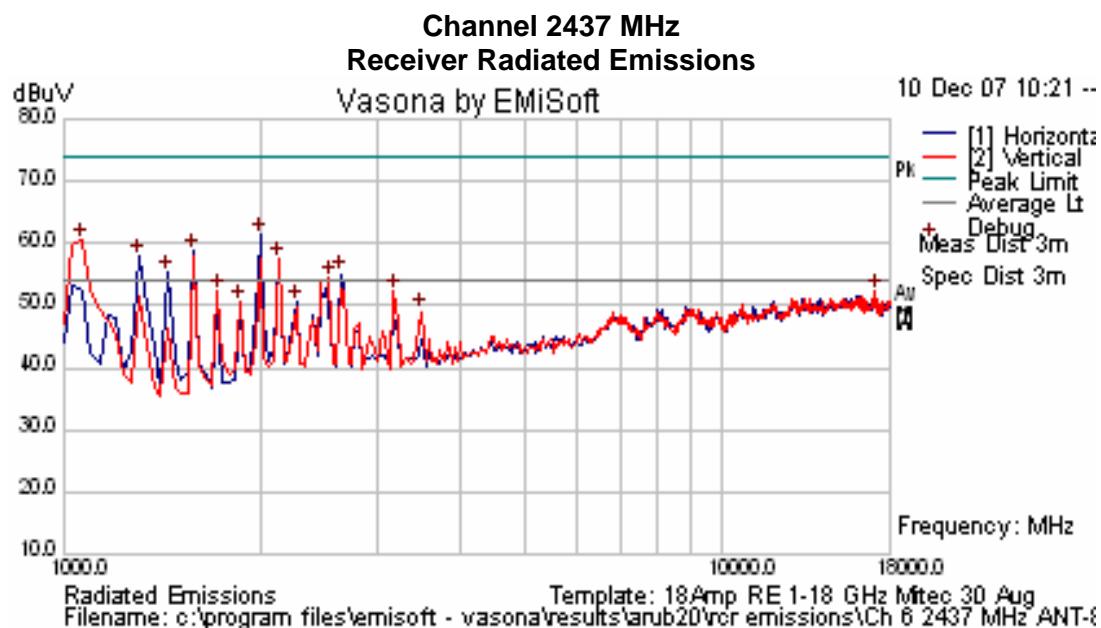
No receiver emissions were observed.

Receiver Radiated Spurious Emissions above 1 GHz

Test Setup – Antenna ANT-8- Channel 2437 MHz, all modes Legacy, HT-20, HT-40.

TABLE OF RESULTS –

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V/m)	Correction Factor (dB)	Corrected Field Strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)



See Section 5.1.6.1 for characterization of emissions (1 – 3.5 GHz) breaking the 54 dB μ V/m limit line.

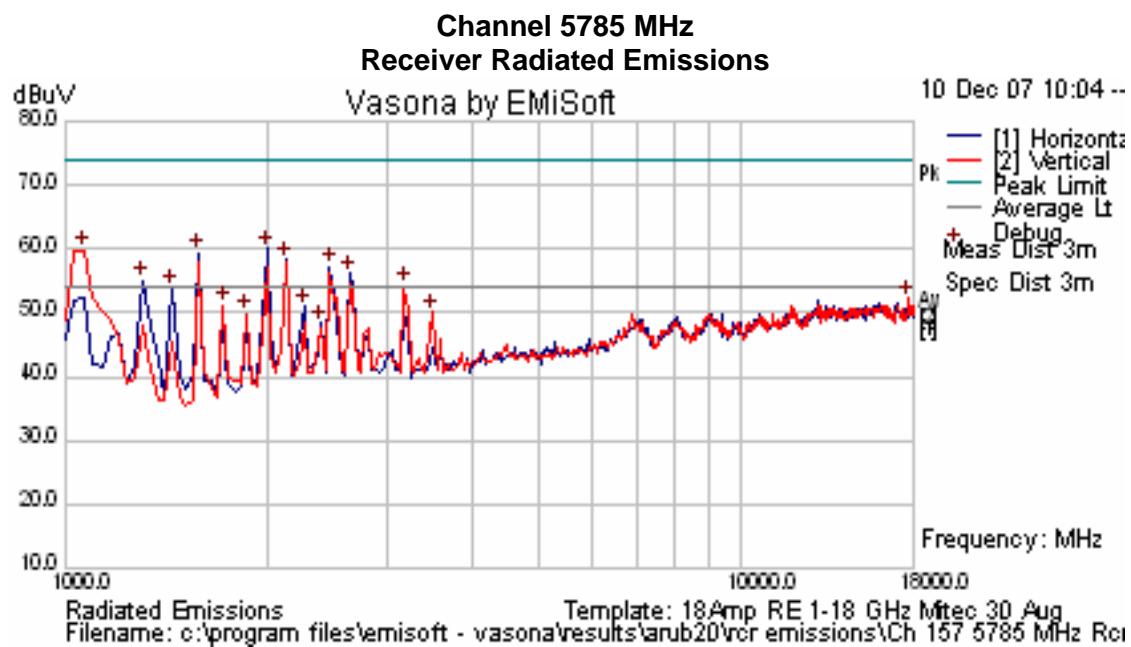
No receiver emissions were observed.

Receiver Radiated Spurious Emissions above 1 GHz

Test Setup – Integral Antenna Channel 5785 MHz, all modes Legacy, HT-20, HT-40.

TABLE OF RESULTS –

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V/m)	Correction Factor (dB)	Corrected Field Strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)



See Section 5.1.6.1 for characterization of emissions (1 – 3.5 GHz) breaking the 54 dB μ V/m limit line.

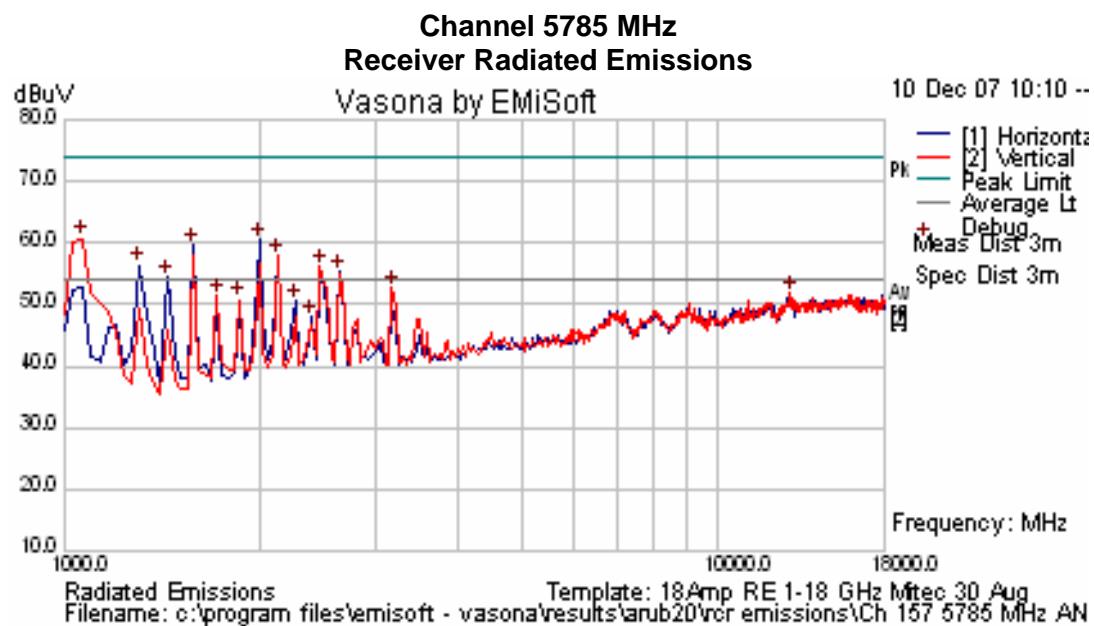
No receiver emissions were observed.

Receiver Radiated Spurious Emissions above 1 GHz

Test Setup – Antenna ANT-10 - Channel 5785 MHz, all modes Legacy, HT-20, HT-40.

TABLE OF RESULTS –

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V/m)	Correction Factor (dB)	Corrected Field Strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)



See Section 5.1.6.1 for characterization of emissions (1 – 3.5 GHz) breaking the 54 dB μ V/m limit line.

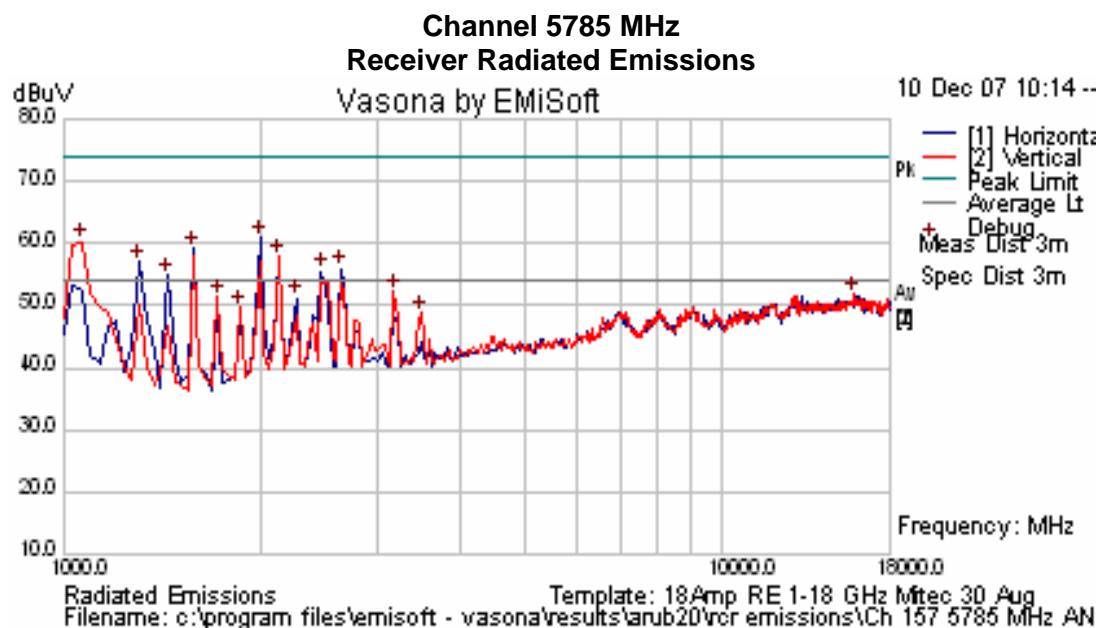
No receiver emissions were observed.

Receiver Radiated Spurious Emissions above 1 GHz

Test Setup – Antenna ANT-12- Channel 5785 MHz, all modes Legacy, HT-20, HT-40.

TABLE OF RESULTS –

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V/m)	Correction Factor (dB)	Corrected Field Strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)



See Section 5.1.6.1 for characterization of emissions (1 – 3.5 GHz) breaking the 54 dB μ V/m limit line.

No receiver emissions were observed.

Specification

Receiver Radiated Spurious Emissions

Industry Canada RSS-Gen §4.8,

The search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (e.g. local oscillator, intermediate or carrier frequency), or 30 MHz, whichever is the higher, to at least 3 times the highest tunable or local oscillator frequency, whichever is the higher, without exceeding 40 GHz.

RSS-Gen §6

The following receiver spurious emission limits shall be complied with;

(a) If a radiated measurement is made, all spurious emissions shall comply with the limits of Table 1.

Frequency (MHz)	Field Strength (μ V/m)	Field Strength (dB μ 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

Laboratory Measurement Uncertainty for Radiated Emissions

Measurement uncertainty	+5.6/ -4.5 dB
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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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5.1.6.3. Radiated Spurious Emissions (30M-1 GHz)

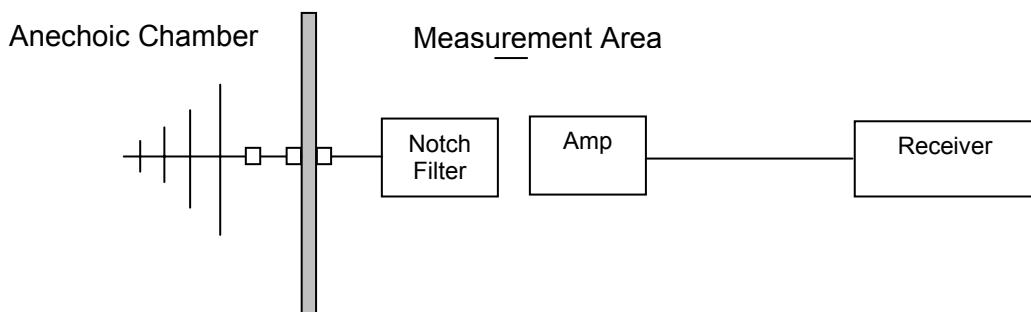
FCC, Part 15 Subpart C §15.205/ §15.209
Industry Canada RSS-210 §2.2

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.

Test Measurement Set up



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:

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

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

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

Measurement Results for Spurious Emissions (30 MHz – 1 GHz)

Ambient conditions.

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

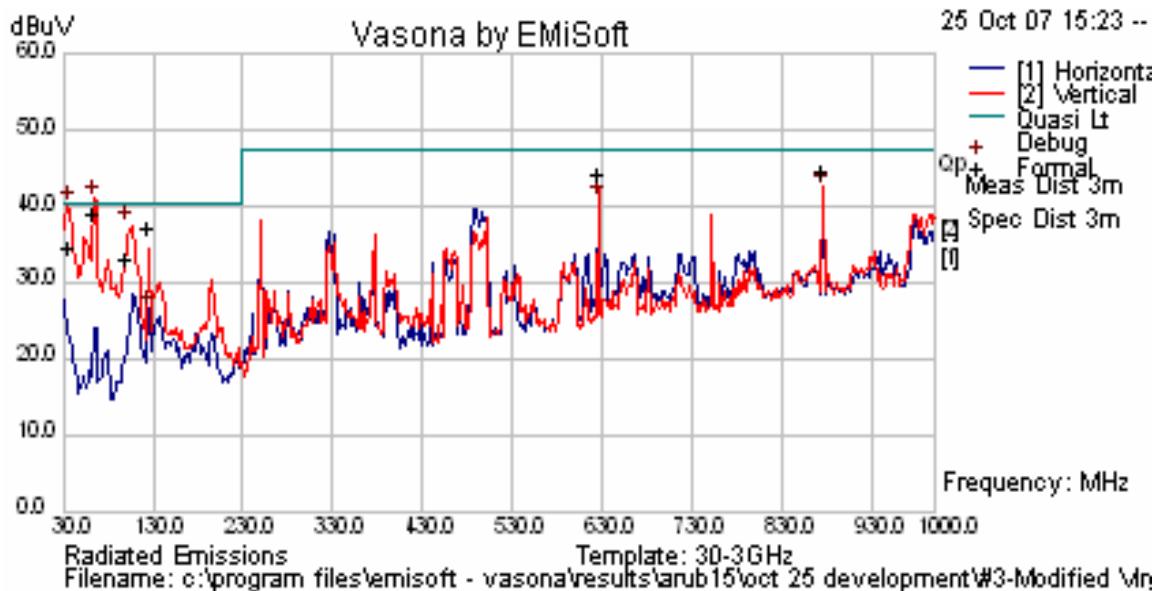
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TABLE OF RESULTS

EUT powered via AC/DC Convertor

Freq. (MHz)	Peak (dBuV/m)	QP (dBuV/m)	QP Lmt (dBuV/m)	QP Margin (dB)	Angle (deg)	Height (cm)	Polarity
37.435	40.29	32.89	40.5	-7.61	303	98	V
65.034	41.09	37.15	40.5	-3.35	286	98	V
100.489	37.58	31.55	40.5	-8.95	105	103	V
125.008	26.69	35.38	40.5	-5.12	174	98	V
625.011	41.2	42.51	47.5	-4.99	130	110	H
875.054	42.57	42.84	47.5	-4.66	0	102	V

Radiated Spurious Emissions 30 MHz to 1 GHz – AC/DC Convertor



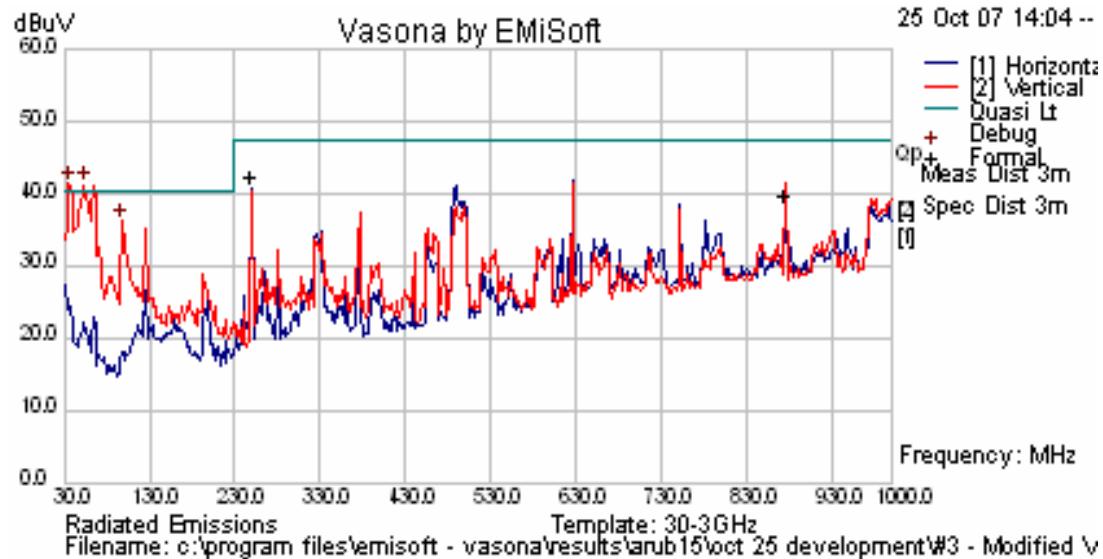
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TABLE OF RESULTS

EUT powered via POE

Freq. (MHz)	Peak (dBuV/m)	QP (dBuV/m)	QP Lmt (dBuV/m)	QP Margin (dB)	Angle (deg)	Height (cm)	Polarity
38.846	41.38	34.54	40.5	-5.96	243	98	V
55.443	41.3	38.15	40.5	-2.35	44	101	V
98.097	36.18	34.47	40.5	-6.03	80	118	V

Radiated Spurious Emissions 30 MHz to 1 GHz - POE



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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 (μ V/m)	Field Strength (dB μ 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

Laboratory Measurement Uncertainty for Radiated Emissions

Measurement uncertainty	+5.6/ -4.5 dB
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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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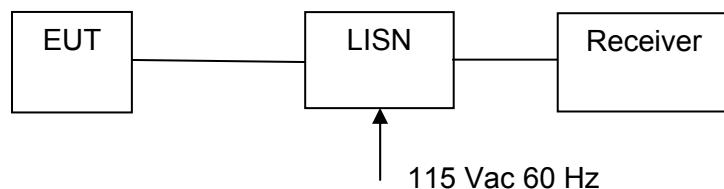
5.1.7. AC Wireline Conducted Emissions (150 kHz – 30 MHz)

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.

Test Measurement Set up



Measurement set up for AC Wireline Conducted Emissions Test

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

Ambient conditions.

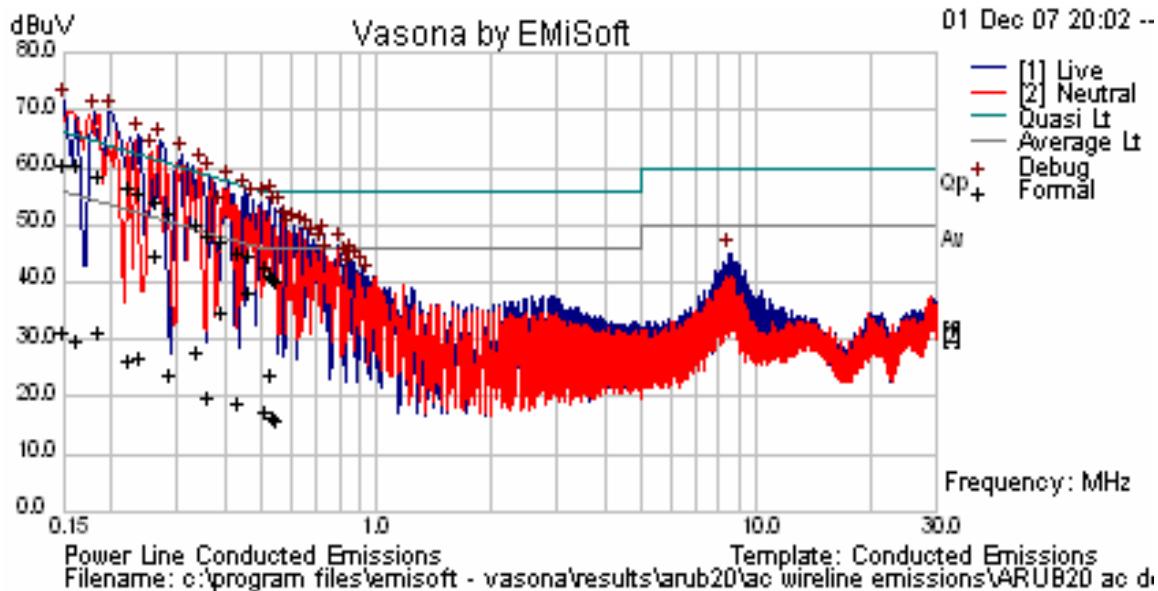
Temperature: 17 to 23 °C Relative humidity: 31 to 57 % Pressure: 999 to 1012 mbar

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TABLE OF RESULTS – ac/dc Converter

Freq (MHz)	LLine	Peak (dB μ V)	QP (dB μ V)	QP Limit (dB μ V)	QP Margin (dB)	Ave. (dB μ V)	Ave. Limit (dB μ V)	Ave. Margin (dB)
0.150	Live	71.57	58.36	65.99	-7.64	29.19	55.99	-26.80
0.187	Live	69.74	55.98	64.18	-8.21	29.05	54.18	-25.13
0.265	Live	64.52	51.52	61.27	-9.75	42.39	51.27	-8.89
0.392	Live	52.92	45.03	58.02	-12.99	32.22	48.02	-15.8
0.463	Live	55.83	42.49	56.65	-14.16	35.68	46.65	-10.97
0.534	Live	54.53	38.97	56.00	-17.03	21.39	46.00	-24.61

AC Wireline Conducted Emissions –150 kHz – 30 MHz) ac/dc Converter

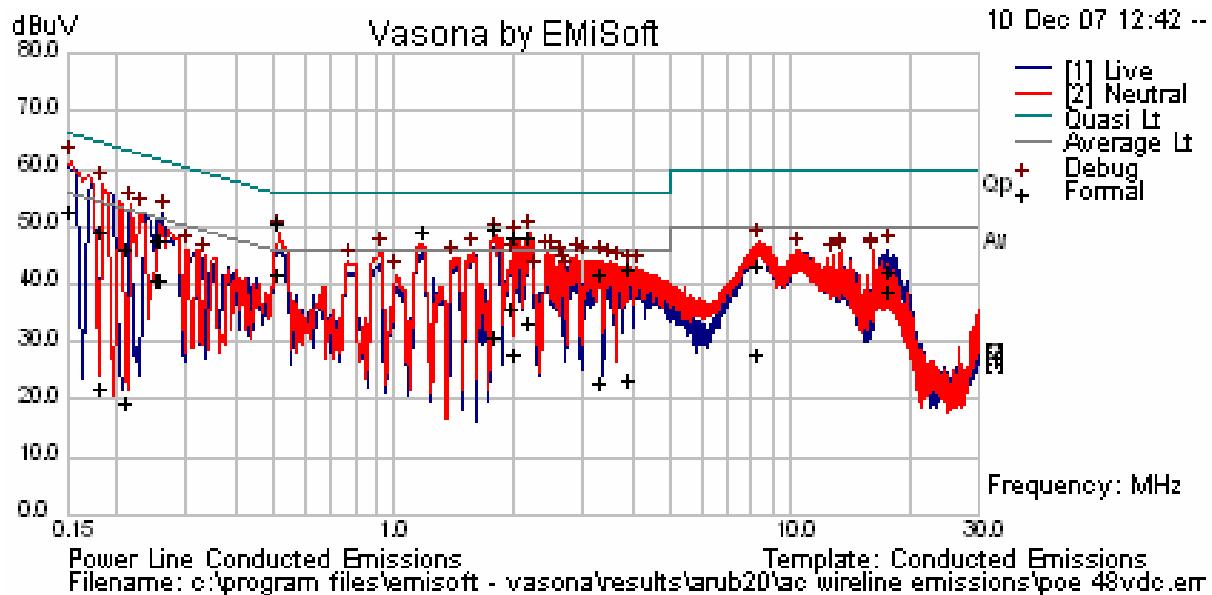


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TABLE OF RESULTS – POE

Freq (MHz)	LLine	Peak (dB μ V)	QP (dB μ V)	QP Limit (dB μ V)	QP Margin (dB)	Ave. (dB μ V)	Ave. Limit (dB μ V)	Ave. Margin (dB)
0.154	Neutral		50.3	65.78	-15.48	50.3	55.78	-5.48
0.515	Neutral		48.08	56.00	-7.92	39.28	46.00	-6.72
2.204	Neutral		45.93	56.00	-10.07	30.93	46.00	-15.17
1.803	Neutral		47.31	56.00	-8.69	28.60	46.00	-17.40
2.039	Neutral		45.94	56.00	-10.06	25.65	46.00	-20.35
1.195	Neutral		44.77	56.00	-11.23	23.71	46.00	-22.29

AC Wireline Conducted Emissions –150 kHz – 30 MHz) POE



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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
-------------------------	---------------

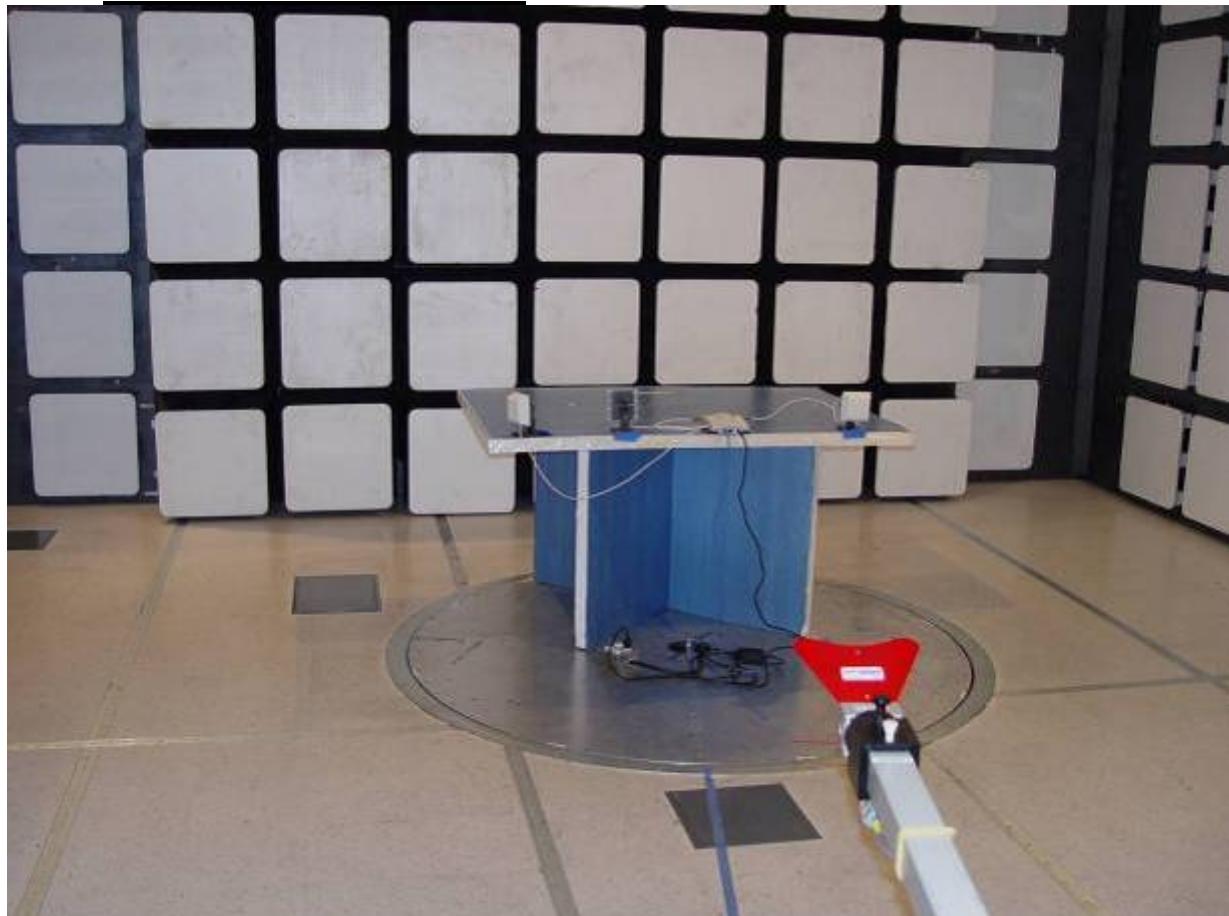
Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-EMC-01 'Measurement of Conducted Emissions'	0158, 0184, 0193, 0190, 0293, 0307

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6. PHOTOGRAPHS

6.1. Radiated Emissions > 1GHz



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6.2. Radiated Emissions < 1GHz with ac Power Converter



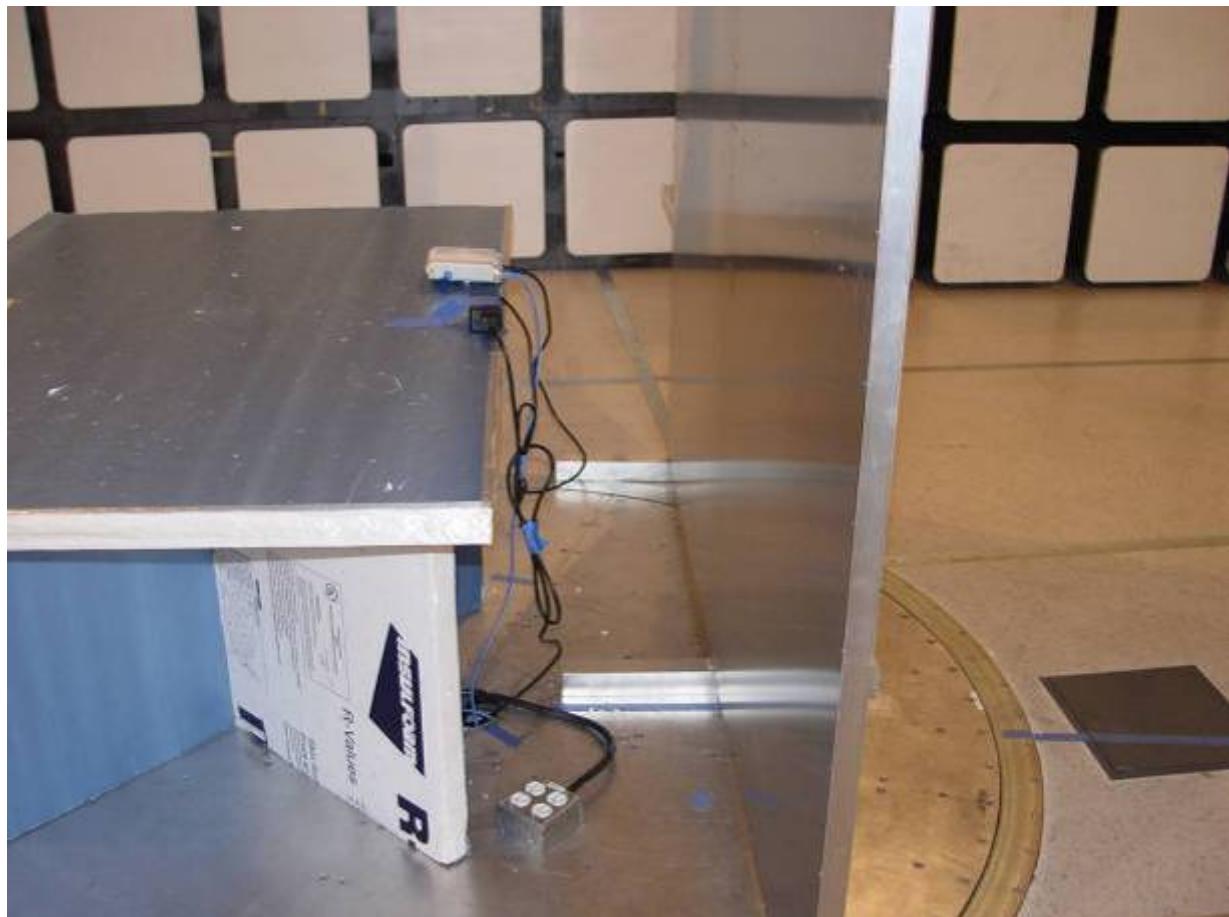
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6.3. Radiated Emissions < 1GHz with POE (Power Over EtherNet)



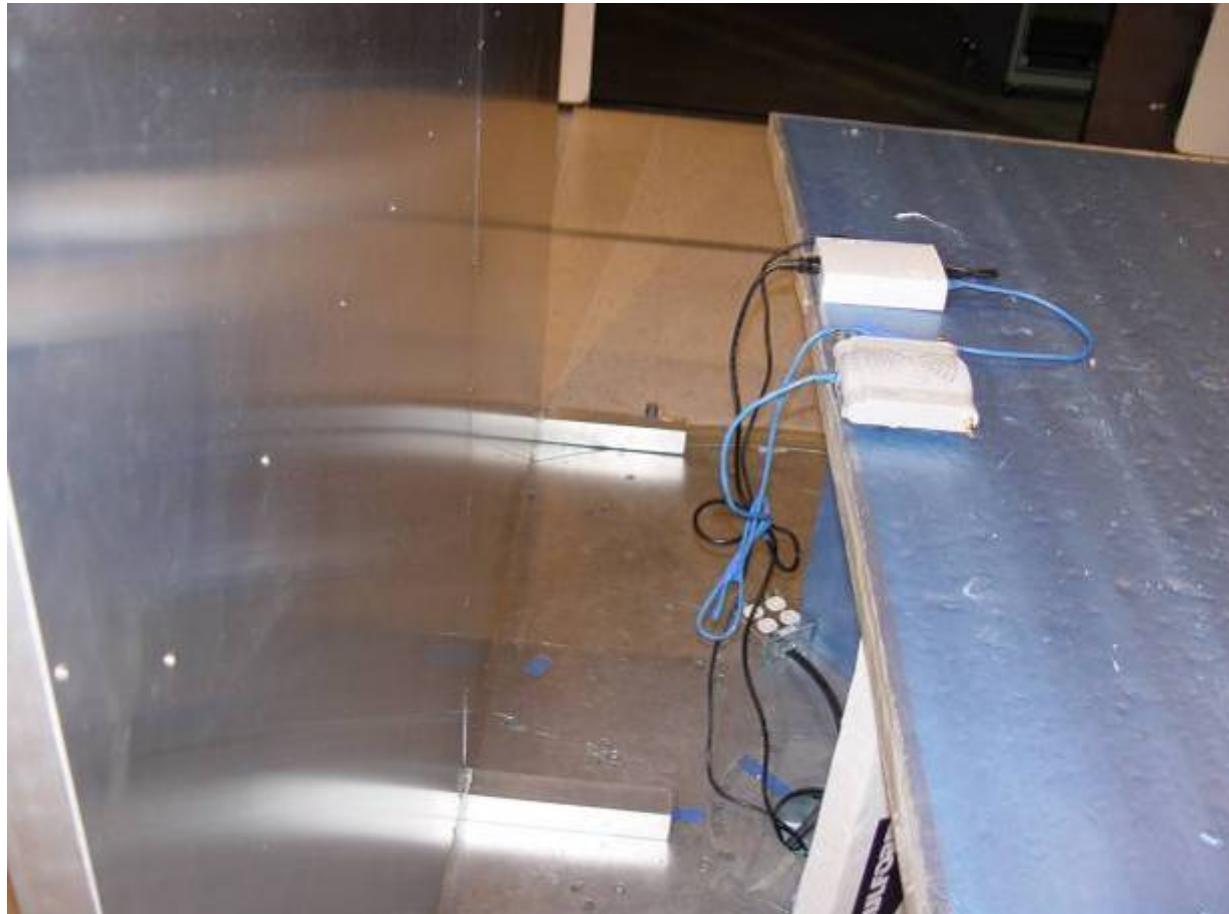
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6.4. AC Wireline Conducted Emissions ac/dc Converter



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6.5. AC Wireline Conducted Emissions POE



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6.6. General Measurement Test Set-Up



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7. TEST EQUIPMENT DETAILS

Asset #	Instrument	Manufacturer	Part #	Serial #
0088	Spectrum Analyzer	Hewlett Packard	8564E	3410A00141
0134	Amplifier	Com Power	PA 122	181910
0158	Barometer /Thermometer	Control Co.	4196	E2846
0193	EMI Receiver	Rhode & Schwartz	ESI 7	838496/007
0252	SMA Cable	Megaphase	Sucoflex 104	None
0310	2m SMA Cable	Micro-Coax	UFA210A-0-0787- 3G03G0	209089-001
0312	3m SMA Cable	Micro-Coax	UFA210A-1-1181- 3G0300	209092-001
0313	Coupler	Hewlett Packard	86205A	3140A01285
0314	30dB N-Type Attenuator	ARRA	N9444-30	1623
0070	Power Meter	Hewlett Packard	437B	3125U11552
0116	Power Sensor	Hewlett Packard	8485A	3318A19694
0117	Power Sensor	Hewlett Packard	8487D	3318A00371
0184	Pulse Limiter	Rhode & Schwartz	ESH3Z2	357.8810.52
0190	LISN	Rhode & Schwartz	ESH3Z5	836679/006
0293	BNC Cable	Megaphase	1689 1GVT4	15F50B001
0301	5.6 GHz Notch Filter	Micro-Tronics	RBC50704	001
0302	5.25 GHz Notch Filter	Micro-Tronics	BRC50703	002
0303	5.8 GHz Notch Filter	Micro-Tronics	BRC50705	003
0304	2.4GHzHz Notch Filter	Micro-Tronics	--	001
0307	BNC Cable	Megaphase	1689 1GVT4	15F50B002
0335	1-18GHz Horn Antenna	ETS- Lindgren	3117	00066580
0337	Amplifier	MiCOM Labs	--	--
0338	Antenna	Sunol Sciences	JB-3	A052907

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440 Boulder Court, Suite 200
Pleasanton, CA 94566, USA
Tel: 1.925.462.0304
Fax: 1.925.462.0306
www.micomlabs.com