

Test of Fluke Networks Sensor4 Wireless Client
To: FCC 47 CFR Part 15.247 & IC RSS-210
Test Report Serial No.: AMGT14-U1 Rev B



TEST REPORT

FROM



Test of Fluke Networks Sensor4 Wireless Client

to

To FCC 47 CFR Part 15.247 & IC RSS-210

Test Report Serial No.: AMGT14-U1 Rev B

Note: this report contains data with regard to the 2400 to 2483.5 MHz and 5725 to 5850 MHz operational modes of the Fluke Networks Sensor4 wireless client. FCC 15.407 test data is reported in MiCOM Labs test report AMGT14-U2

This report supersedes: AMGT14-U1 Rev A

Applicant: Fluke Networks
2575 Augustine Dr.
Santa Clara
California 95054, USA

Product Function: Wireless LAN Client

Copy No: pdf Issue Date: 20th June 2012

This Test Report is Issued Under the Authority of:

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TEST CERTIFICATE #2381.01

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ACCREDITATION, LISTINGS & RECOGNITION

TESTING ACCREDITATION

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The American Association for Laboratory Accreditation

Accredited Laboratory

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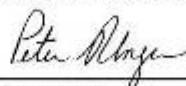
Pleasanton, CA

for technical competence in the field of

Electrical Testing

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

Presented this 27th day of March 2012.



President & CEO
For the Accreditation Council
Certificate Number 2381.01
Valid to November 30, 2013



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

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RECOGNITION

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

Country	Recognition Body	Status	Phase	Identification No.
USA	Federal Communications Commission (FCC)	TCB	-	Listing #: 102167
Canada	Industry Canada (IC)	FCB	APEC MRA 2	Listing #: 4143A-2
Japan	MIC (Ministry of Internal Affairs and Communication)	CAB	APEC MRA 2	210
	VCCI	--	--	No. 2959
Europe	European Commission	NB	EU MRA	NB 2280
Australia	Australian Communications and Media Authority (ACMA)	CAB	APEC MRA 1	US0159
Hong Kong	Office of the Telecommunication Authority (OFTA)	CAB	APEC MRA 1	
Korea	Ministry of Information and Communication Radio Research Laboratory (RRL)	CAB	APEC MRA 1	
Singapore	Infocomm Development Authority (IDA)	CAB	APEC MRA 1	
Taiwan	National Communications Commission (NCC) Bureau of Standards, Metrology and Inspection (BSMI)	CAB	APEC MRA 1	
Vietnam	Ministry of Communication (MIC)	CAB	APEC MRA 1	

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

Phase I - recognition for product testing

Phase II – recognition for both product testing and certification

N/A – Not Applicable

**EU MRA – European Union Mutual Recognition Agreement.

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

**NB – Notified Body

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PRODUCT CERTIFICATION

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The American Association for Laboratory Accreditation

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Accredited Product Certification Body

A2LA has accredited

MICOM LABS

Pleasanton, CA

for technical competence as a

Product Certification Body

This product certification body is accredited in accordance with the recognized International Standard ISO/IEC Guide 65:1996 *General requirements for bodies operating product certification systems*. This accreditation demonstrates technical competence for a defined scope and the operation of a quality management system.

Presented this 27th day of March 2012.



President & CEO
For the Accreditation Council
Certificate Number 2381.02
Valid to November 30, 2013



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

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

Industry Canada Certification Body - CAB Identifier – US0159

European Notified Body - Notified Body Identifier - 2280

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

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DOCUMENT HISTORY

Document History		
Revision	Date	Comments
Draft		
Rev A	4 th June 2012	Initial release.
Rev B	20 th June 2012	Clarification of antenna details.

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1. TEST RESULT CERTIFICATE

Manufacturer:	Fluke Networks 2575 Augustine Dr. Santa Clara California 95054, USA	Tested By:	MiCOM Labs, Inc. 440 Boulder Court Suite 200 Pleasanton California, 94566, USA
EUT:	802.11a/b/g/n Wireless LAN Client	Telephone:	+1 925 462 0304
Model:	Sensor4	Fax:	+1 925 462 0306
S/N's:	Engineering samples: Integral NG5-x & External NG5-y		
Test Date(s):	7th February - 17th May 2012	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:



TEST CERTIFICATE #2381.01

Graeme Grieve
Quality Manager MiCOM Labs,

Gordon Hurst
President & CEO MiCOM Labs, Inc.

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2. REFERENCES AND MEASUREMENT UNCERTAINTY

2.1. Normative References

REF.	PUBLICATION	YEAR	TITLE
i.	FCC 47 CFR Part 15, Subpart C	2010	Title 47: Telecommunication PART 15—RADIO FREQUENCY DEVICES Subpart C—Intentional Radiators
ii.	RSS-210 Annex 8	2010	Radio Standards Specification 210, Issue 8, Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment
iii.	FCC OET KDB 662911	4 th April 2011	Emissions Testing of Transmitters with Multiple Outputs in the Same Band
iv.	DA 00-705	2000	FCC DA 00-705 “Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems” released March 30, 2000
v.	RSS-GEN	2010	Radio Standards Specification-Gen, Issue 3, General Requirements and Information for the Certification of Radiocommunication Equipment
vi.	FCC 47 CFR Part 15, Subpart B	2010	47 CFR Part 15, SubPart B; Unintentional Radiators
vii.	ICES-003	2004	Spectrum Management and Telecommunications Policy Interference-Causing Equipment Standard Digital Apparatus; Issue 4
viii.	ANSI C63.4	2009	American National Standards for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
ix.	CISPR 22/ EN 55022	2008 2006+A1:2007	Limits and Methods of Measurements of Radio Disturbance Characteristics of Information Technology Equipment
x.	M 3003	Edition 1 Dec. 1997	Expression of Uncertainty and Confidence in Measurements
xi.	LAB34	Edition 1 Aug 2002	The expression of uncertainty in EMC Testing
xii.	ETSI TR 100 028	2001	Parts 1 and 2 Electromagnetic compatibility and Radio Spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics
xiii.	A2LA	March 2012	Reference to A2LA Accreditation Status – A2LA Advertising Policy

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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.

3. PRODUCT DETAILS AND TEST CONFIGURATIONS

3.1. Technical Details

Details	Description
Purpose:	Test of the Fluke Networks Sensor4 Wireless Client to FCC Part 15.247 and Industry Canada RSS-210 regulations.
Applicant:	Fluke Networks 2575 Augustine Dr. Santa Clara California 95054, USA
Manufacturer:	As applicant.
Laboratory performing the tests:	MiCOM Labs, Inc. 440 Boulder Court, Suite 200 Pleasanton, California 94566 USA
Test report reference number:	AMGT14-U1 Rev B
Date EUT received:	7 th February 2012
Standard(s) applied:	FCC 47 CFR Part 15.247 & IC RSS-210
Dates of test (from - to):	7th February - 17th May 2012
No of Units Tested:	Two
Type of Equipment:	802.11a/b/g/n Wireless LAN Client, 3x3 Spatial Multiplexing MIMO configuration
Manufacturers Trade Name:	Wireless Client
Model(s):	Sensor4
Location for use:	Indoor
Declared Frequency Range(s):	2400 - 2483.5 MHz; 5725 - 5850 MHz
Software Release:	Build 26809
Hardware Release:	assembly rev 5, pcb rev 3
Type of Modulation:	Per 802.11 -CCK, BPSK, QPSK, DSSS, OFDM
Declared Nominal Average Output Power:	802.11b: +25.0 dBm 802.11g:Leg. +23dBm,HT-20 +23 dBm,HT-40 +22 dBm 802.11a:Leg. +21dBm,HT-20 +21 dBm,HT-40 +21 dBm
EUT Modes of Operation:	Legacy 802.11a/b/g, 802.11n HT-20, HT-40
Transmit/Receive Operation:	Time Division Duplex
System Beam Forming:	Sensor4 has no capability for beam forming
Rated Input Voltage and Current:	12 Vdc 0.65 A: POE 48 Vdc 0.2A
Operating Temperature Range:	Declared range 0° to +50°C
ITU Emission Designator:	2400 – 2483.5 MHz 802.11b 14M9G1D 2400 – 2483.5 MHz 802.11g 17M6D1D 2400 – 2483.5 MHz 802.11n – HT-20 18M7D1D 2400 – 2483.5 MHz 802.11n – HT-40 37M7D1D 5725 – 5850 MHz 802.11a 17M2D1D 5725 – 5850 MHz 802.11n – HT-20 17M9D1D 5725 – 5850 MHz 802.11n – HT-40 36M7D1D
Equipment Dimensions:	7.5" x 7.5" x 1.5"
Weight:	1 lb (0.454 Kg)
Primary function of equipment:	WiFi scanning
Secondary function of equipment:	Spectrum analyzer

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3.2. Scope of Test Program

Fluke Networks Sensor4 Wireless Client

The scope of the test program was to test the Fluke Networks Sensor4 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 Sensor4 wireless client will be can be marketed using a number of different models each configured differently.

Sensor Model	Features
SENSOR4-R1S0-I	AIRMAGNET SENSOR, 4TH GEN, 1 X 11N RADIO, INTERNAL ANTENNA.
SENSOR4-R1S1-I	AIRMAGNET SPECTRUM SENSOR, 4TH GEN, 1 X 11N RADIO, INTERNAL ANTENNA.
SENSOR4-R2S0-I	AIRMAGNET SENSOR, 4TH GEN, 2 X 11N RADIO, INTERNAL ANTENNA.
SENSOR4-R2S1-I	AIRMAGNET SPECTRUM SENSOR, 4TH GEN, 2 X 11N RADIO, INTERNAL ANTENNA.
SENSOR4-R1S0-E	AIRMAGNET SENSOR, 4TH GEN, 1 X 11N RADIO 4 EXTERNAL ANTENNAS.
SENSOR4-R1S1-E	AIRMAGNET SPECTRUM SENSOR, 4TH GEN, 1 X 11N RADIO 4 EXTERNAL ANTENNAS.
SENSOR4-R2S0-E	AIRMAGNET SENSOR, 4TH GEN, 2 X 11N RADIO 8 EXTERNAL ANTENNAS.
SENSOR4-R2S1-E	AIRMAGNET SPECTRUM SENSOR, 4TH GEN, 2 X 11N RADIO 8 EXTERNAL ANTENNAS.

The test results reported in this document test worst case fully loaded configurations;

SENSOR4-R2S1-I (integral antenna)

SENSOR4-R2S1-E (external antenna)

**Sensor4 802.11 a/b/g/n Wireless Client
Integral Antenna**



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**Sensor4 802.11 a/b/g/n Wireless Client
External 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	802.11a/b/g/n Wireless Access Point	Fluke Networks	Sensor4	Engineering samples: Integral NG5-x & External NG5-y
EUT	POE	PowerDSine	PD-3501/AC	--
EUT	ac/dc Adaptor	Fairway Electronic 100-240Vac 50-60Hz 12Vdc, 1.66A	VE20-120	--
Support	Laptop PC	Dell	--	None

3.4. Antenna Details

Type	Model	Gain (dBi)	Frequency Range (MHz)
External	Omni Rubber Duck: Wanshih SQ1WFI0001A	2.0	2400 – 2483.5
		2.3	5150 - 5350
		1.0	5725 - 5850
Integral	Laird NanoGreen	0.9	2400 – 2483.5
		3.1	5150 - 5350
		4.8	5725 - 5850

3.5. Cabling and I/O Ports

Number and type of I/O ports

1)..	DB9	RS-232 serial console port
2)..	RJ-45	Ethernet + PoE
3)..	Dc jack	12Vdc power in
4)..	reset	reset push button
5)..	RP-TNC	Reverse polarity - TNC RF antenna 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
	Legacy	6 MBit/s	
n	HT-20	6.5 (MCS 0)	2,437
	HT-40	13.5 (MCS 0)	
a	Legacy	6 MBit/s	2,462
	HT-20	6.5 (MCS 0)	
n	HT-40	13.5 (MCS 0)	5,745
			5,785
			5,825
			5,755
			5,795

Legacy – data rates for 802.11abg products

Results for the above configurations are provided in this report.

Antenna Test Configurations for Radiated Emissions

Results for the following configurations are provided in this report.

2,400 – 2483.5 MHz

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

5,725 – 5850 MHz

15.247	
802.11a	a SE 5745
	a SE 5785
	a SE 5825
802.11n HT-20	n HT-20 SE 5745
	n HT-20 SE 5785
	n HT-20 SE 5825
802.11n HT-40	n HT-40 SE 5755
	n HT-40 SE 5795

KEY:-

SE – Spurious Emission
 BE – Band-Edge

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3.7. Equipment Modifications

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

1. Output Power Settings

The output power values reported in section 5.1.2 Peak Output Power take into account any power reduction due to radiated spurious emissions and radiated band-edge measurement results.

2. Power Fluctuation

When the EUT operates within the 2.4GHz band, the second harmonic of the fundamental would exhibit an unusual behavior where it would pulse repeatedly and slowly creep up for a small duration before dropping in power.

3. Spurious Emissions V's Antenna Installation Positioning

It was found that the positioning of the external antennas was crucial in the reduction and control of spurious emissions. The device antennas were tested per the following client supplied document. Any deviation from this installation will result in non-compliant operation.

Fluke Networks Sensor4 External Antenna Model Installation instructions

1. Screw on the supplied antennas to the RP-TNC connectors on the sensor side plates.
2. Position the antenna angles as shown in Figures 1 thru 5.
3. Hand tighten the antenna to the sensor while maintaining the angles depicted.
4. Apply a small amount of Loctite or similar adhesive in the antenna joint (elbow) to maintain antenna angle positioning during and after sensor installation.

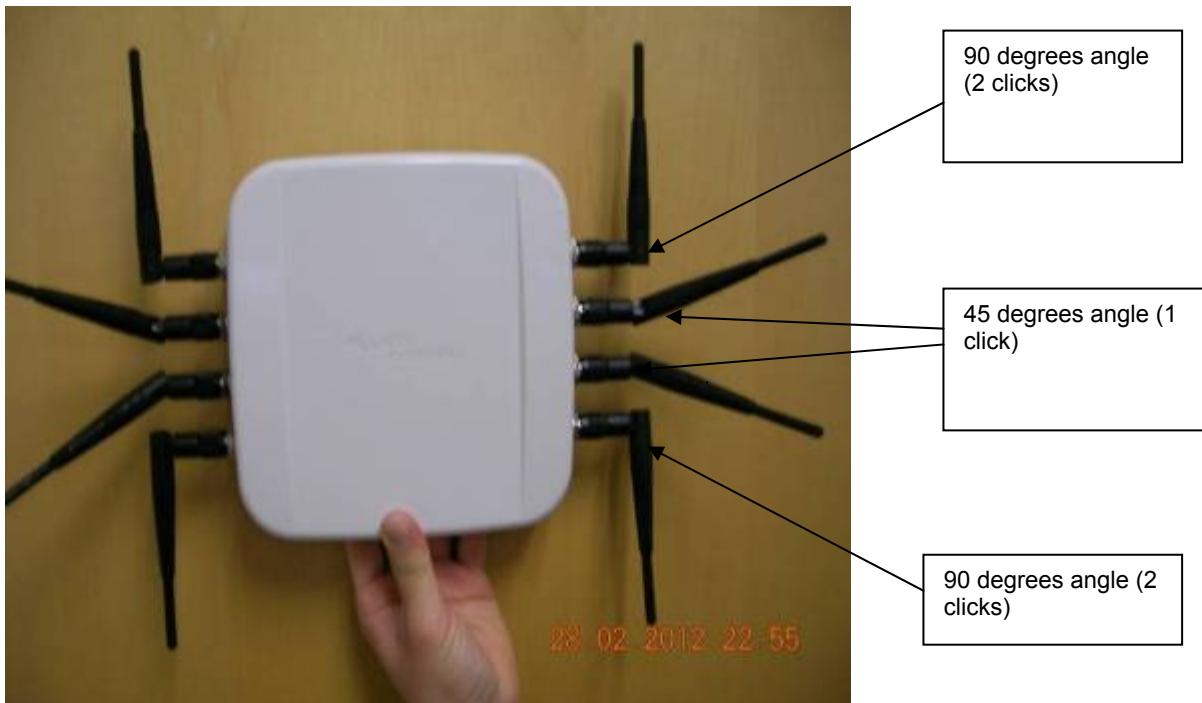


Figure 1: Top view



Figure 2: Front View

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Figure 3: Diagonal view



Figure 4: Side view left.

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90 degrees angle
between the 2
antennas

Figure 5: Side view right

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3.8. Deviations from the Test Standard

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

1. FCC OET KDB Implementation

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

Emissions Testing of Transmitters with Multiple Outputs in the Same Band

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

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

3.9. Subcontracted Testing or Third Party Data

1. NONE

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 Industry Canada only RSS-Gen §4.10, §6	Radiated Emissions Transmitter Radiated Spurious Emissions Radiated Band Edge Receiver Radiated Spurious Emissions	Restricted Bands Emissions above 1 GHz Band-edge results Peak Emissions Emissions above 1 GHz	Radiated	Complies 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)	Radiated	Complies - Class A Device	5.1.6.4
15.207 7.2.2	AC Wireline Conducted Emissions 150 kHz–30 MHz	Conducted Emissions	Conducted	Complies	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: Section 3.7 Equipment Modifications highlights the equipment modifications that were required to bring the product into compliance with the above test matrix

5. TEST RESULTS

5.1. Device Characteristics

5.1.1. 6 dB and 99 % Bandwidth

FCC, Part 15 Subpart C §15.247(a)(2)

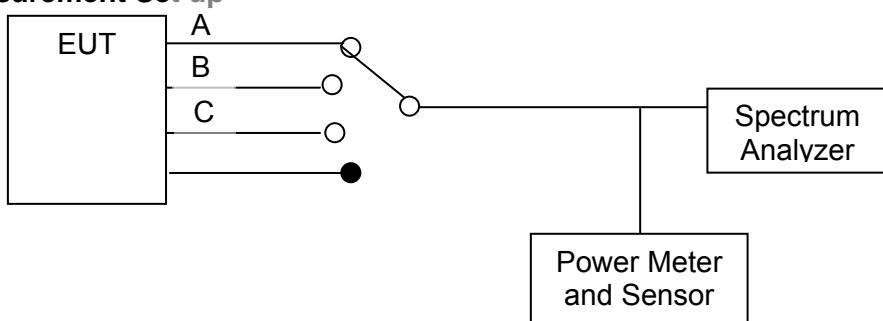
Industry Canada RSS-210 §A8.2

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: Default, Maximum Power

Test s/w: ART

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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

Test Conditions:	15.247 (a)(2)	Rel. Humidity (%):	35 to 42
Variant:	802.11b	Ambient Temp. (°C):	19 to 22
TPC:	HIGH	Pressure (mBars):	998 to 1003
Modulation:	ON	Duty Cycle (%):	100
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	2 dBi
Applied Voltage:	48.00 Vdc		
Notes 1:			
Notes 2:			

6 dB Bandwidth

Test Frequency	6 dB Bandwidth				Minimum 6dB Bandwidth Limit		Margin
	MHz						
MHz	a	b	c	d	kHz	MHz	MHz
2412.000	10.100000	10.180000	10.180000	--	500	0.5	-9.600000
2437.000	10.180000	10.100000	10.100000	--			-9.600000
2462.000	10.180000	10.180000	10.180000	--			-9.680000

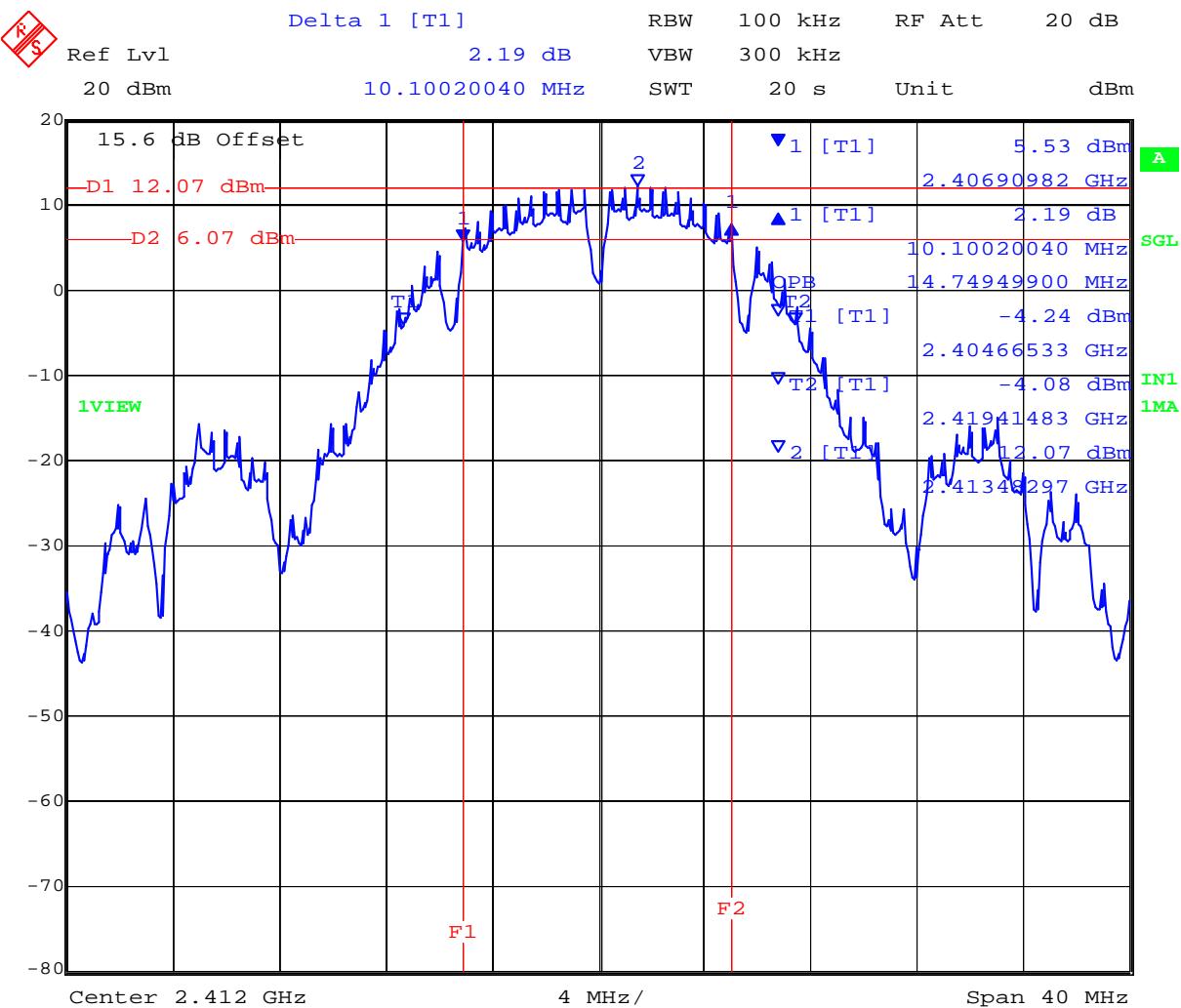
99% Bandwidth

Test Frequency	99 % Bandwidth						
	MHz						
MHz	a	b	c	d			
2412.000	14.749000	14.749000	14.910000	--			
2437.000	14.749000	14.269000	14.509000	--			
2462.000	14.509000	14.589000	14.830000	--			

Measurement uncertainty:	±2.81 dB
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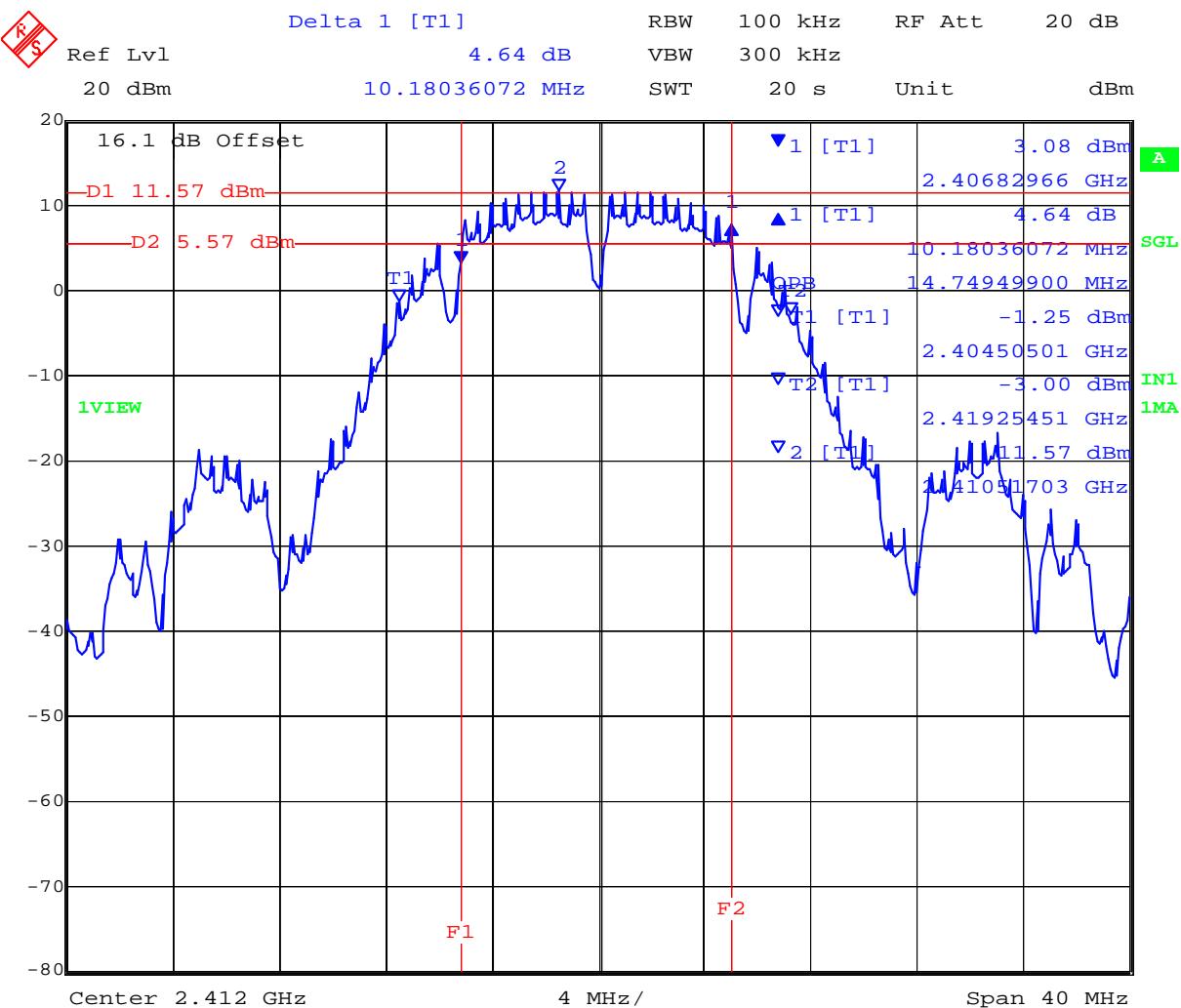
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PORT A 2,412 MHz 802.11b Legacy 6 dB and 99% Bandwidth



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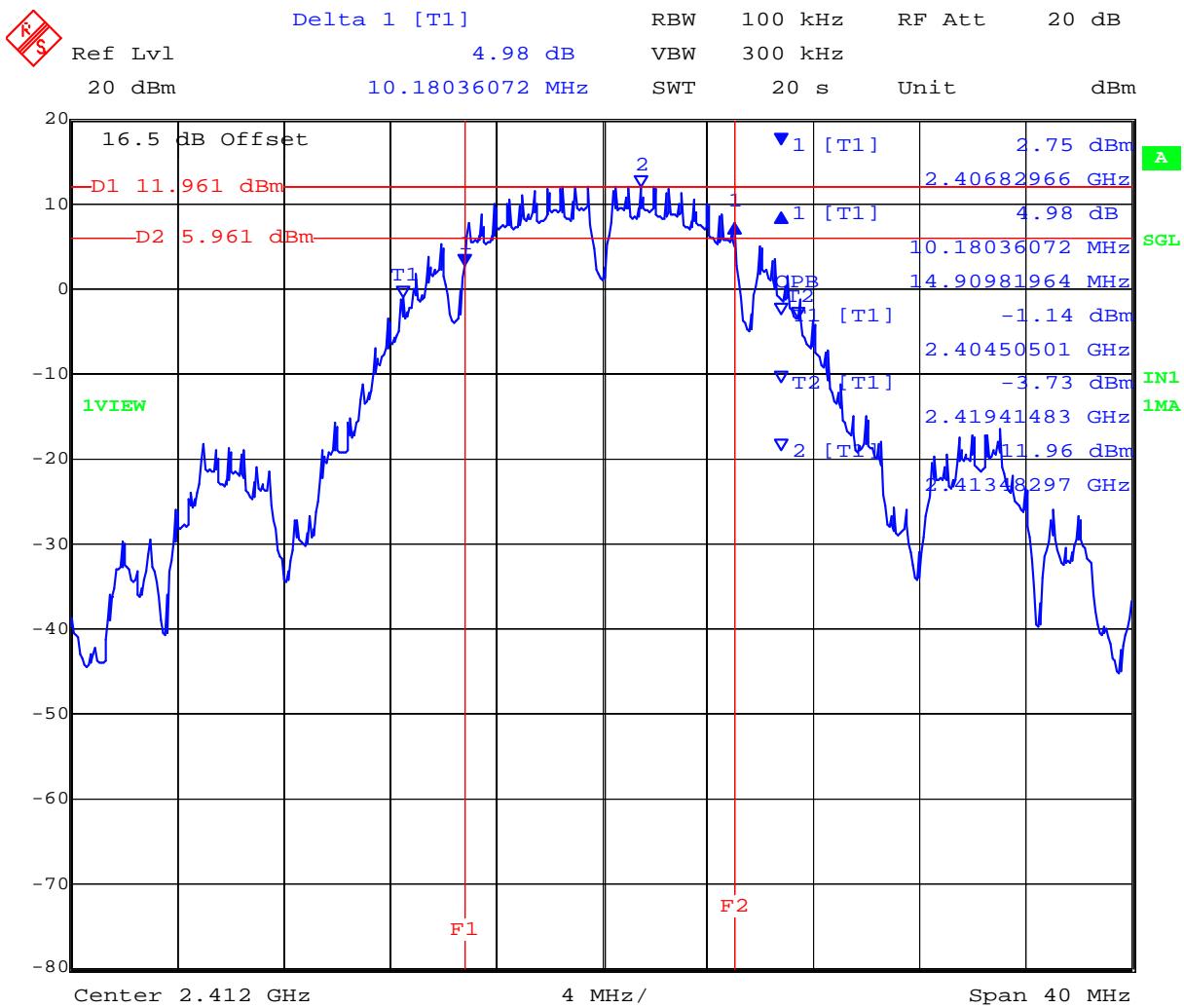
PORT B 2,412 MHz 802.11b Legacy 6 dB and 99% Bandwidth



Date: 7.FEB.2012 14:50:17

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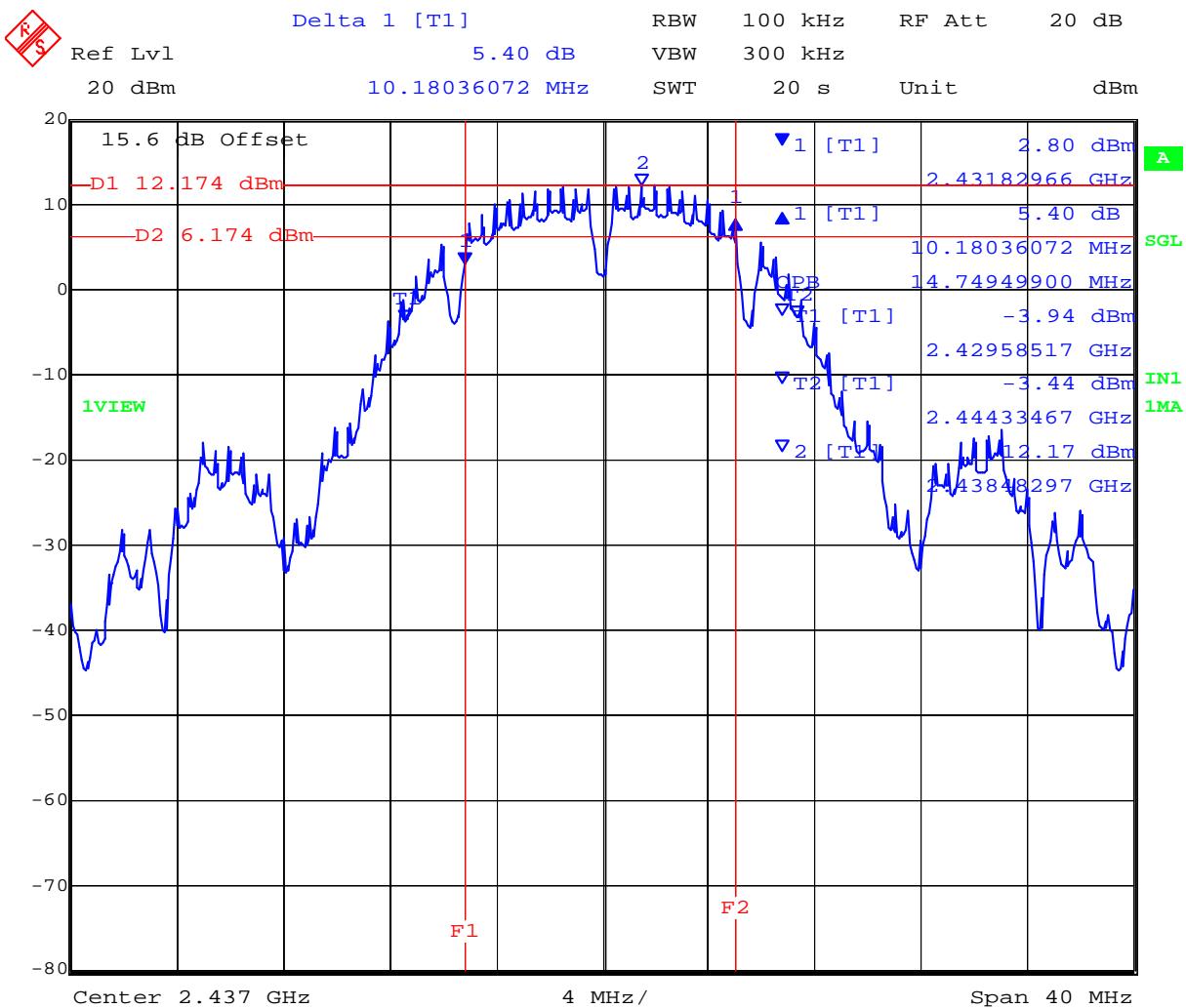
PORT C 2,412 MHz 802.11b Legacy 6 dB and 99% Bandwidth



Date: 7.FEB.2012 14:51:19

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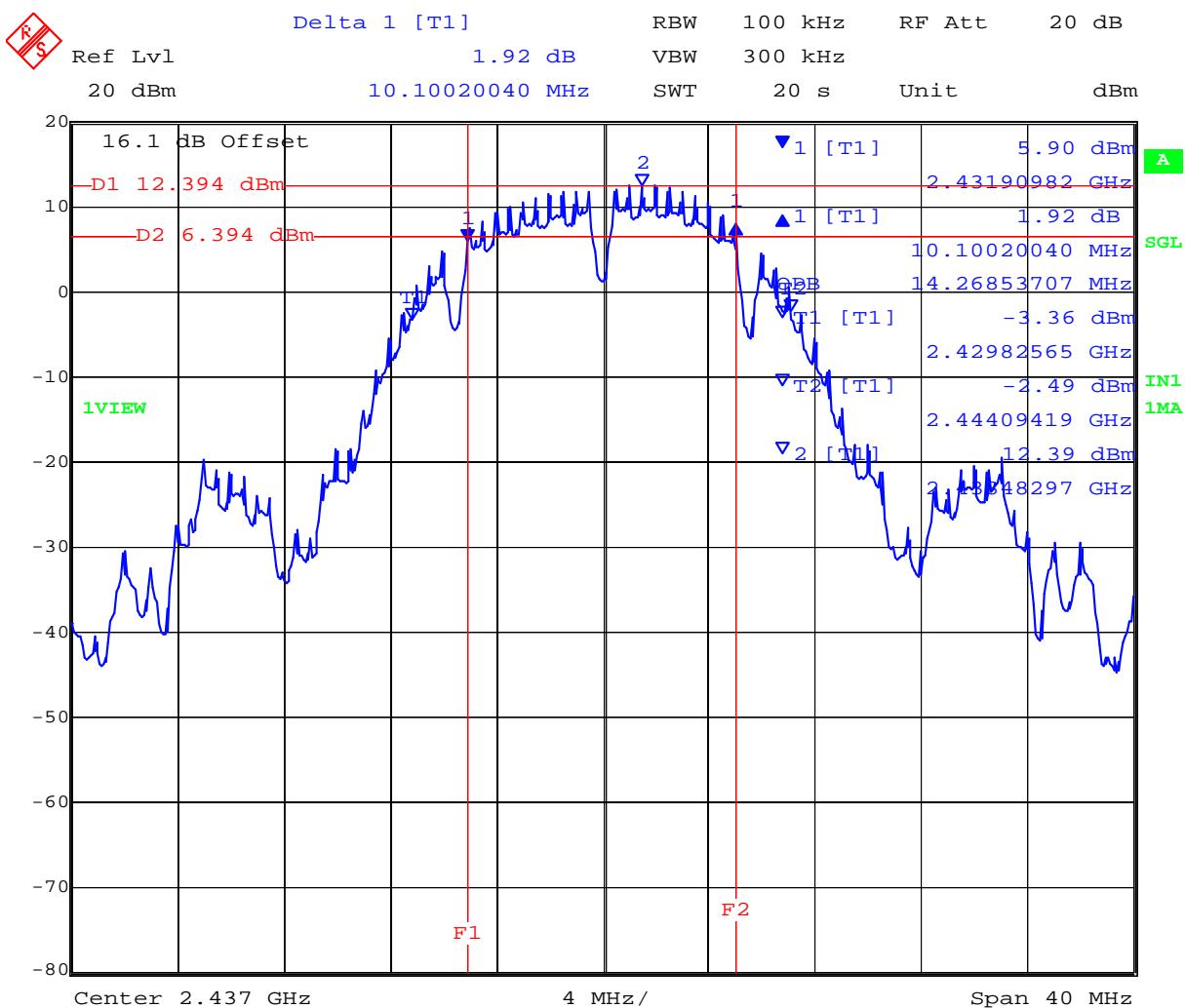
PORT A 2,437 MHz 802.11b Legacy 6 dB and 99% Bandwidth



Date: 7.FEB.2012 15:23:18

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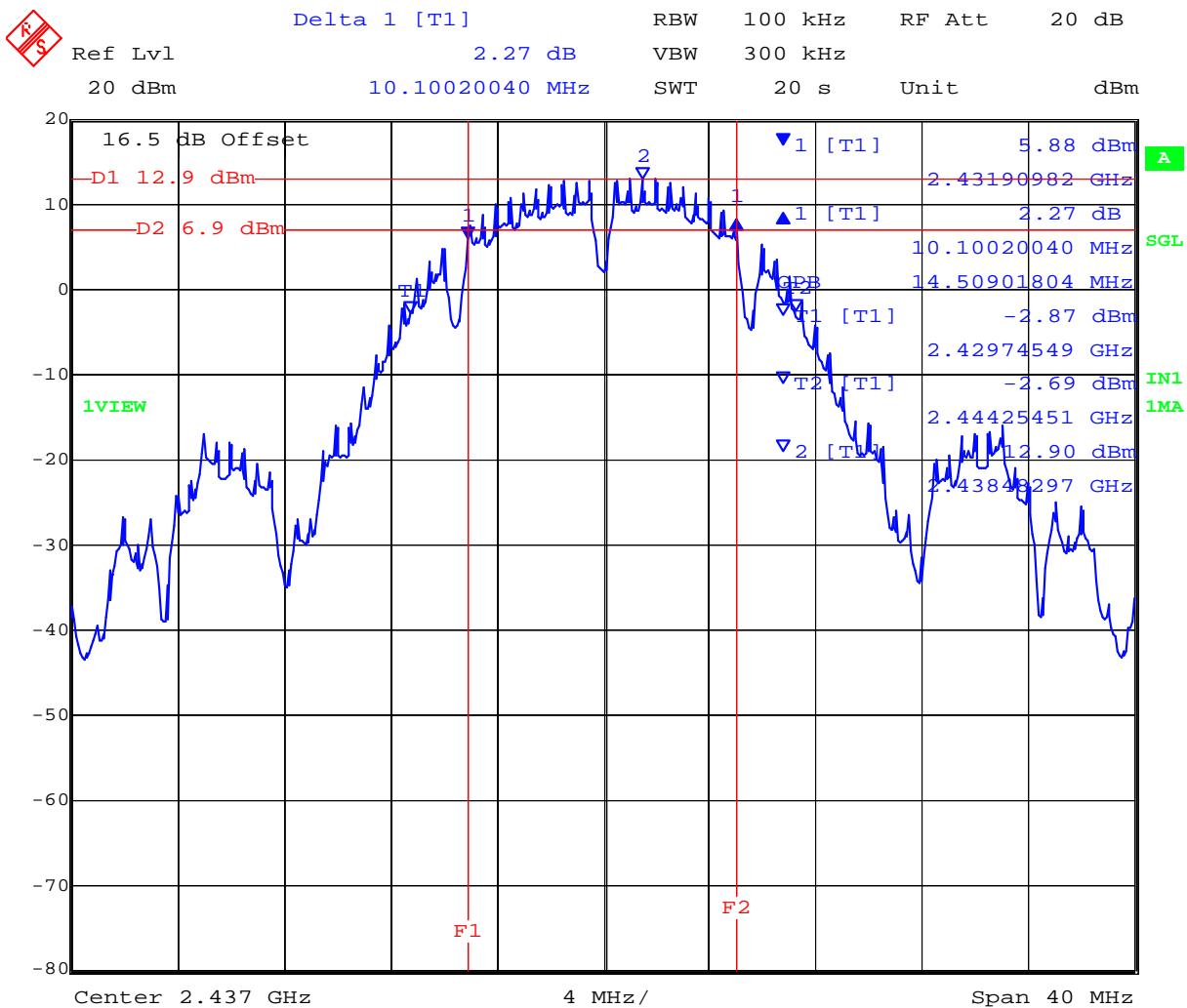
PORT B 2,437 MHz 802.11b Legacy 6 dB and 99% Bandwidth



Date: 7.FEB.2012 15:24:23

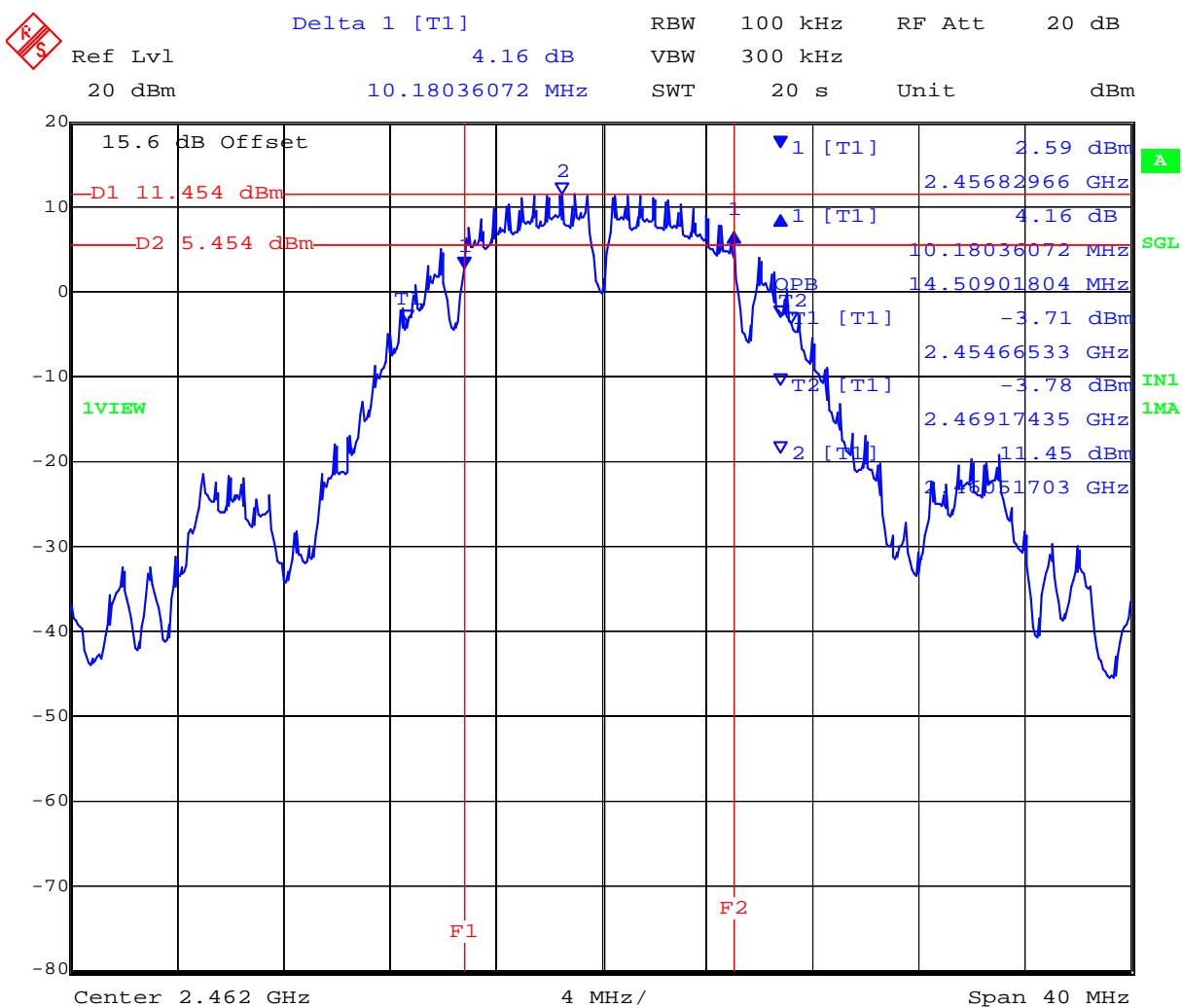
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PORT C 2,437 MHz 802.11b Legacy 6 dB and 99% Bandwidth



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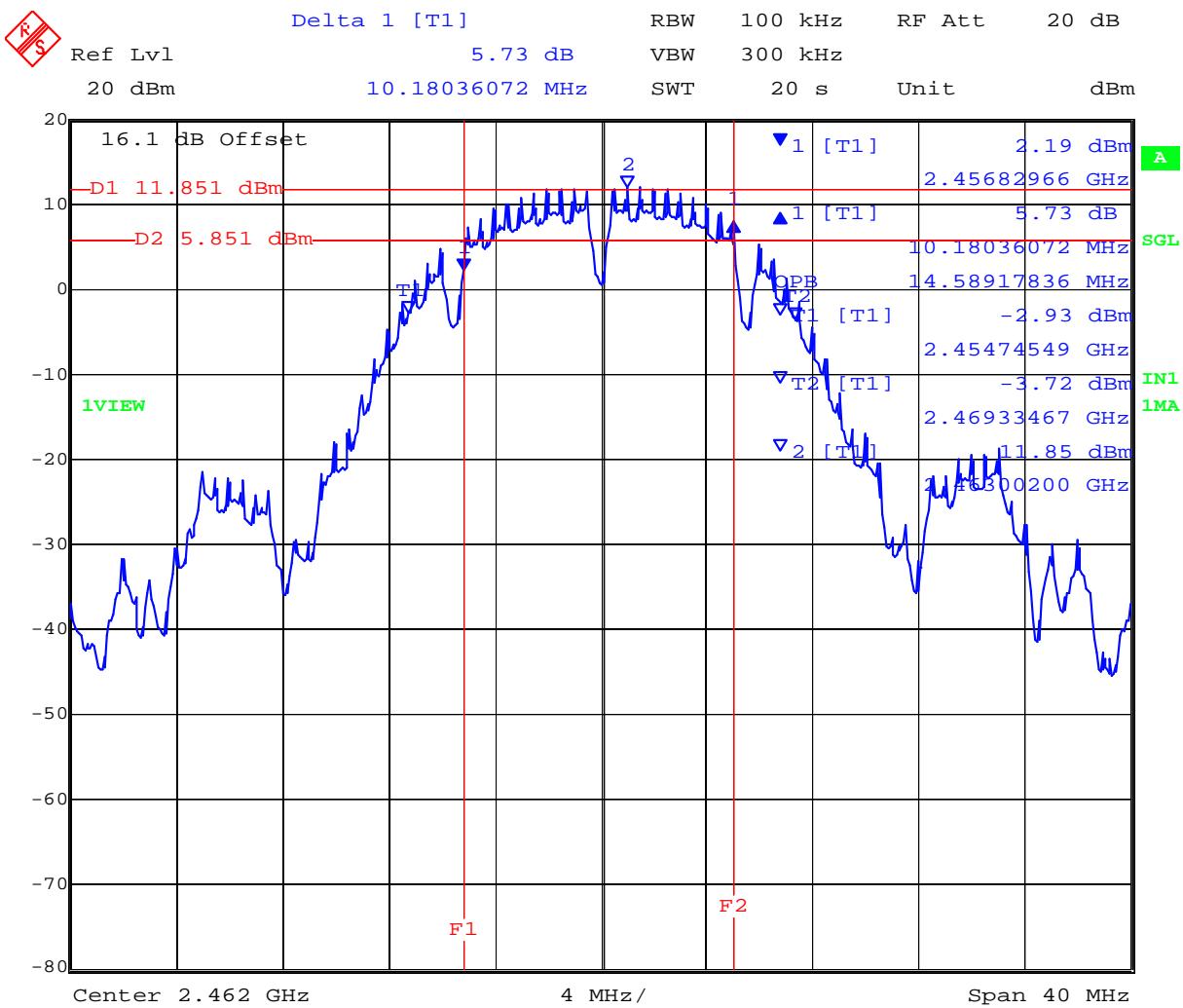
PORT A 2,462 MHz 802.11b Legacy 6 dB and 99% Bandwidth



Date: 7.FEB.2012 15:56:23

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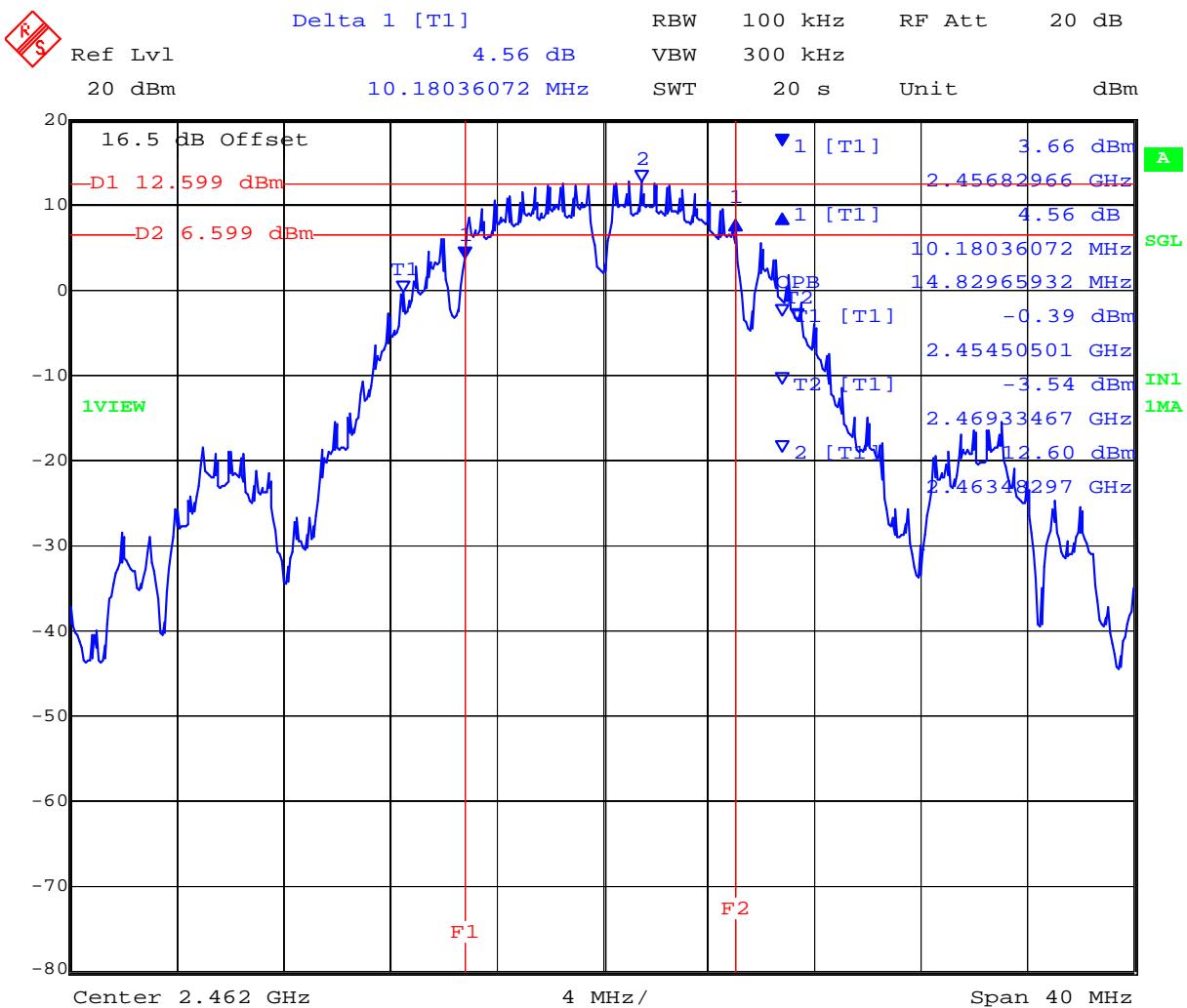
PORT B 2,462 MHz 802.11b Legacy 6 dB and 99% Bandwidth



Date: 7.FEB.2012 15:57:29

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



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Title: Fluke Networks Sensor4 Wireless Client
To: FCC 47 CFR Part 15.247 & IC RSS-210
Serial #: AMGT14-U1 Rev B
Issue Date: 20th June 2012
Page: 37 of 342

TABLE OF RESULTS – 802.11g Legacy

Test Conditions:	15.247 (a)(2)	Rel. Humidity (%):	35 to 42
Variant:	802.11g	Ambient Temp. (°C):	19 to 22
TPC:	HIGH	Pressure (mBars):	998 to 1003
Modulation:	ON	Duty Cycle (%):	100
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	2 dBi
Applied Voltage:	48.00 Vdc		
Notes 1:			
Notes 2:			

6 dB Bandwidth

Test Frequency	6 dB Bandwidth				Minimum 6dB Bandwidth Limit		Margin
	MHz						
MHz	a	b	c	d	kHz	MHz	MHz
2412.000	16.433000	16.433000	16.353000	--	500	0.5	-15.853000
2437.000	16.353000	16.353000	16.433000	--			-15.853000
2462.000	16.433000	16.433000	16.433000	--			-15.933000

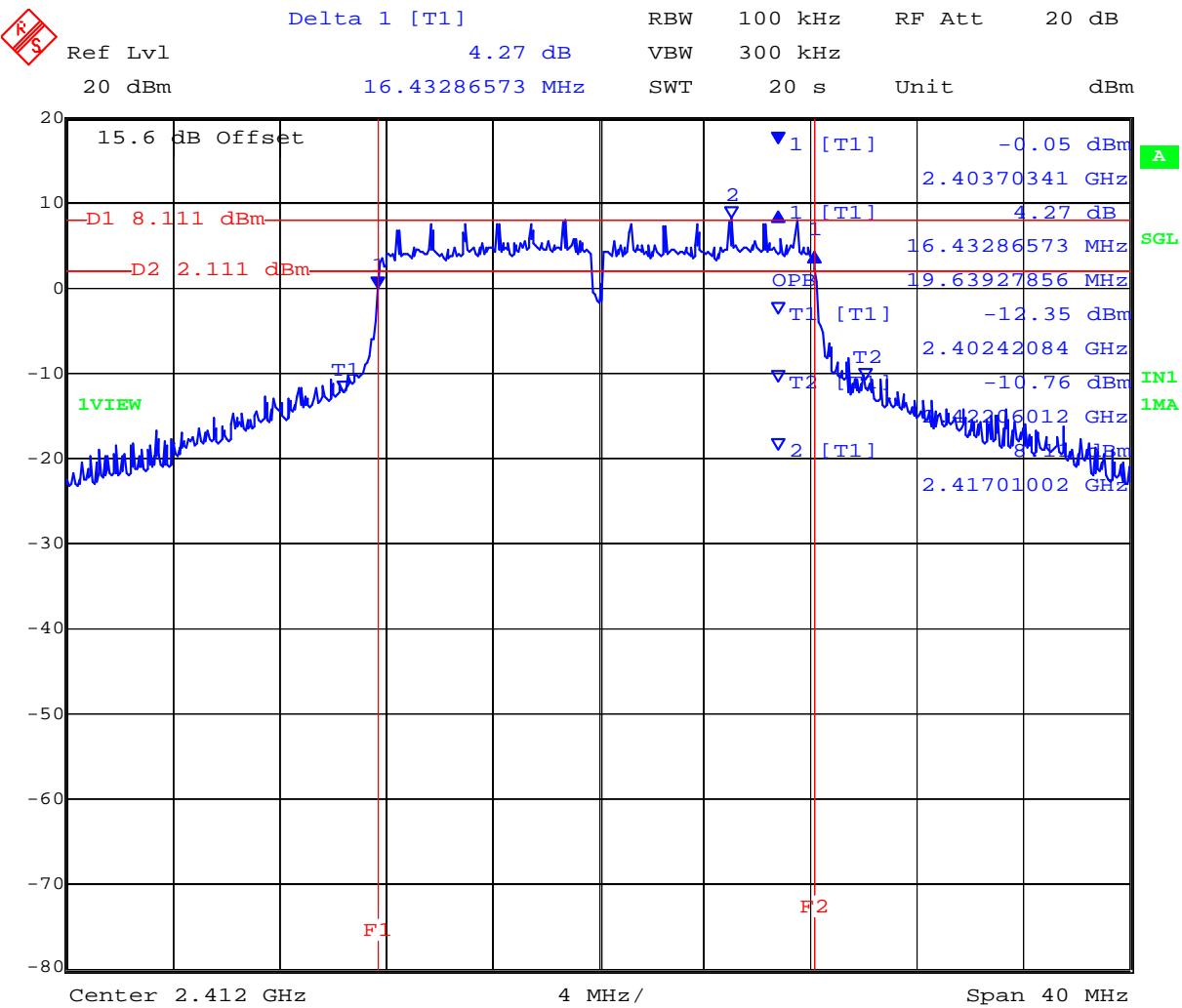
99% Bandwidth

Test Frequency	99 % Bandwidth						
	MHz						
MHz	a	b	c	d			
2412.000	19.639000	17.635000	17.635000	--			
2437.000	17.635000	16.834000	17.956000	--			
2462.000	17.234000	16.994000	17.315000	--			

Measurement uncertainty:	±2.81 dB
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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.

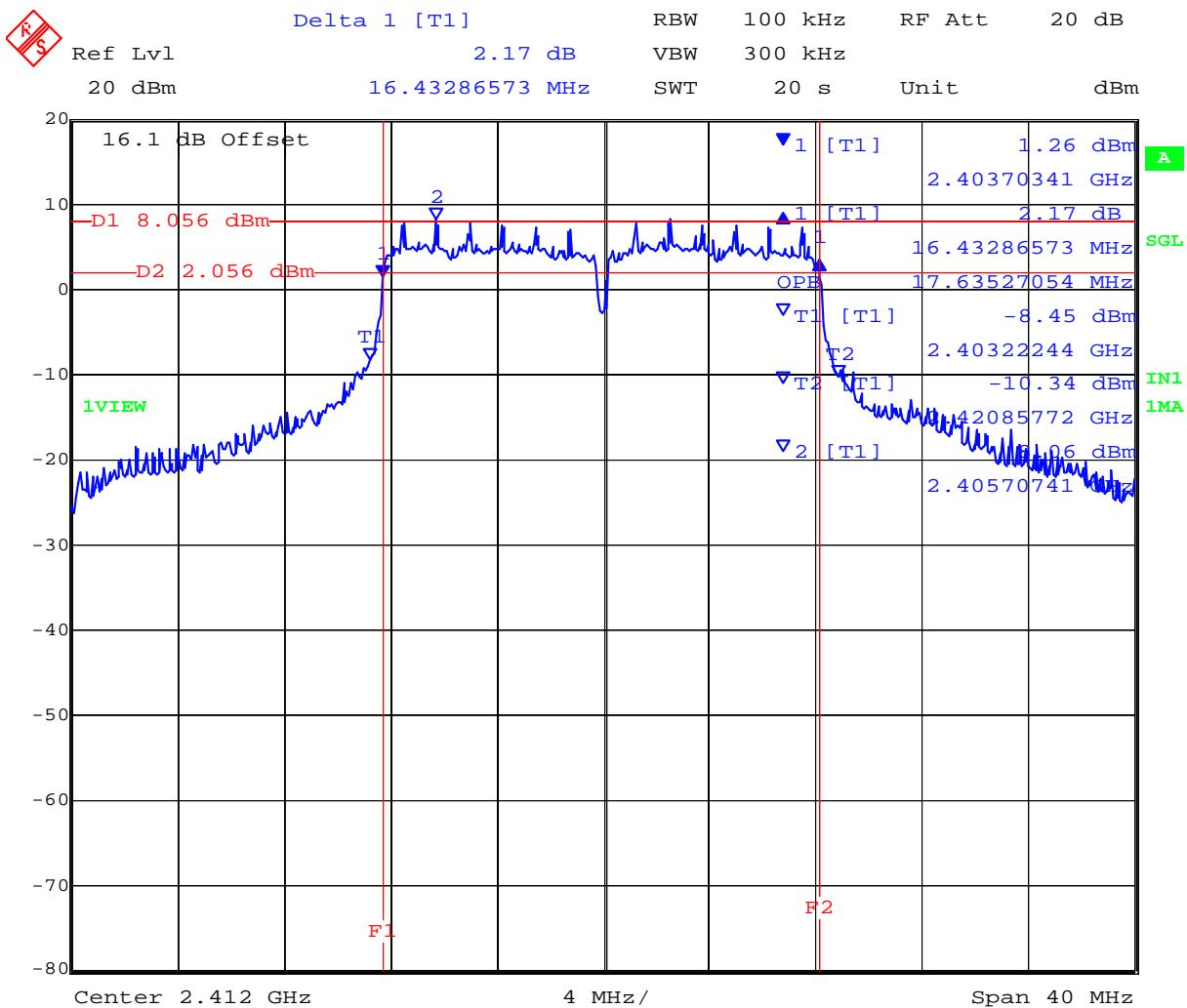
PORT A 2,412 MHz 802.11g Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 08:37:17

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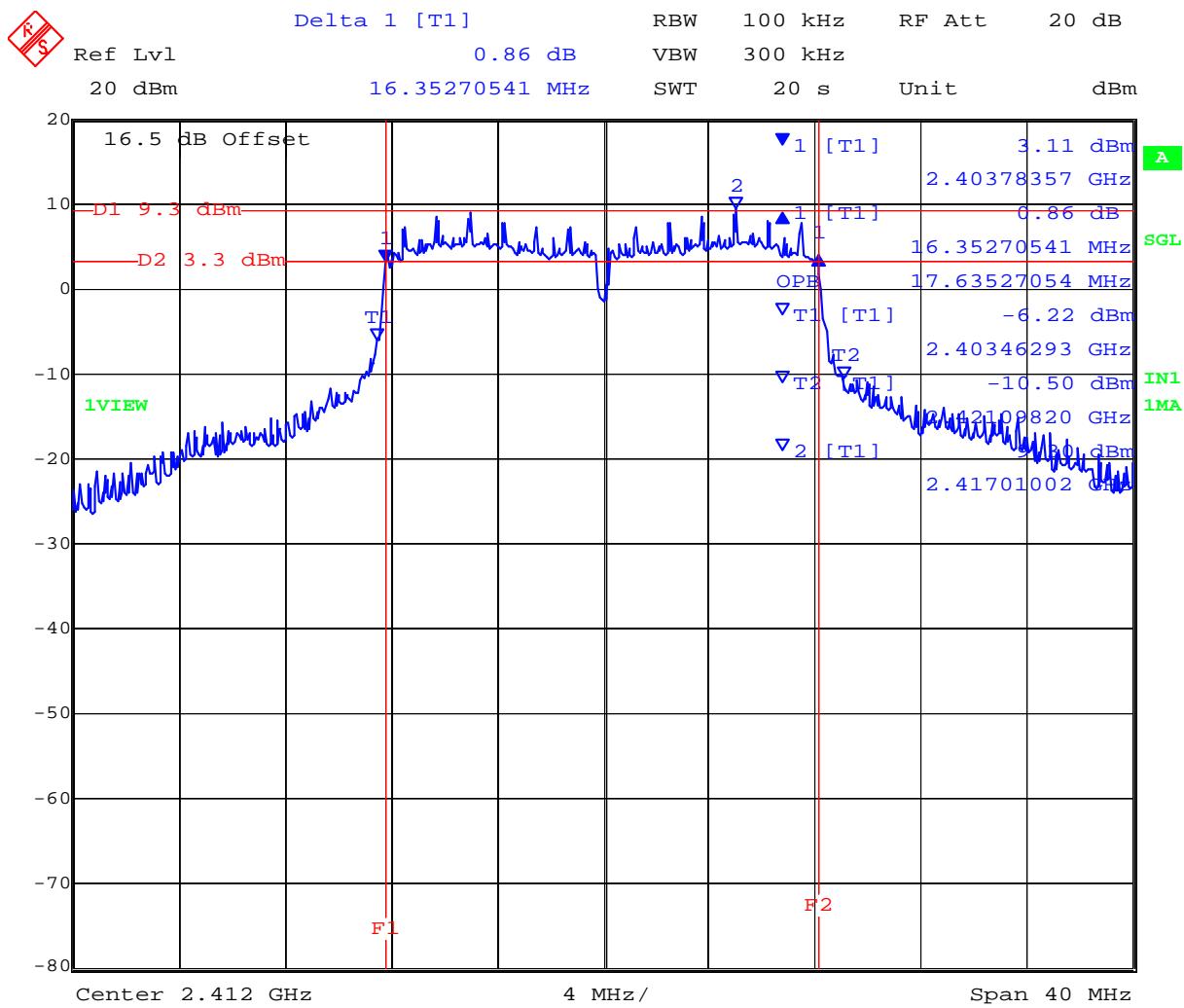
PORT B 2,412 MHz 802.11g Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 08:38:23

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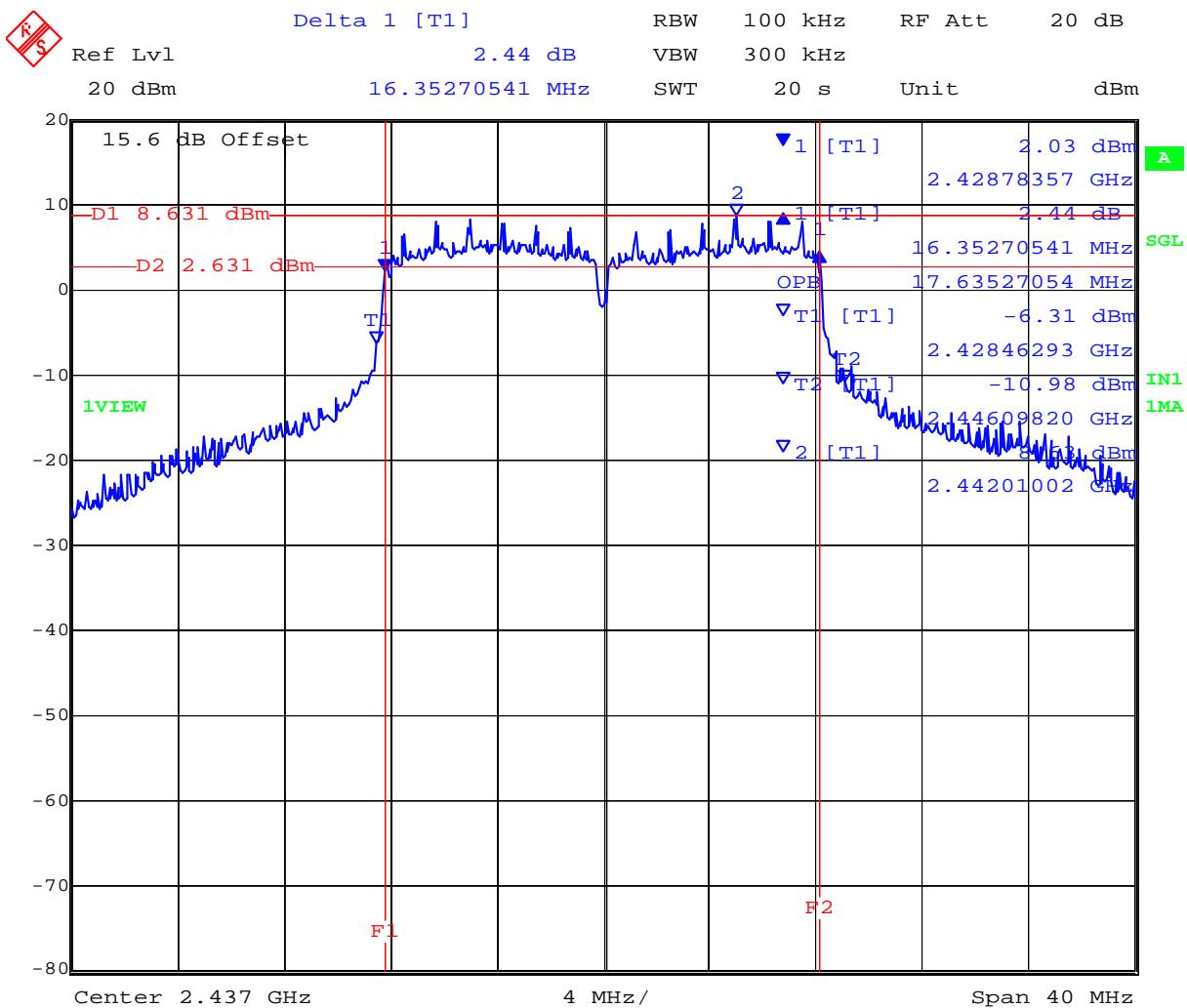
PORT C 2,412 MHz 802.11g Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 08:39:24

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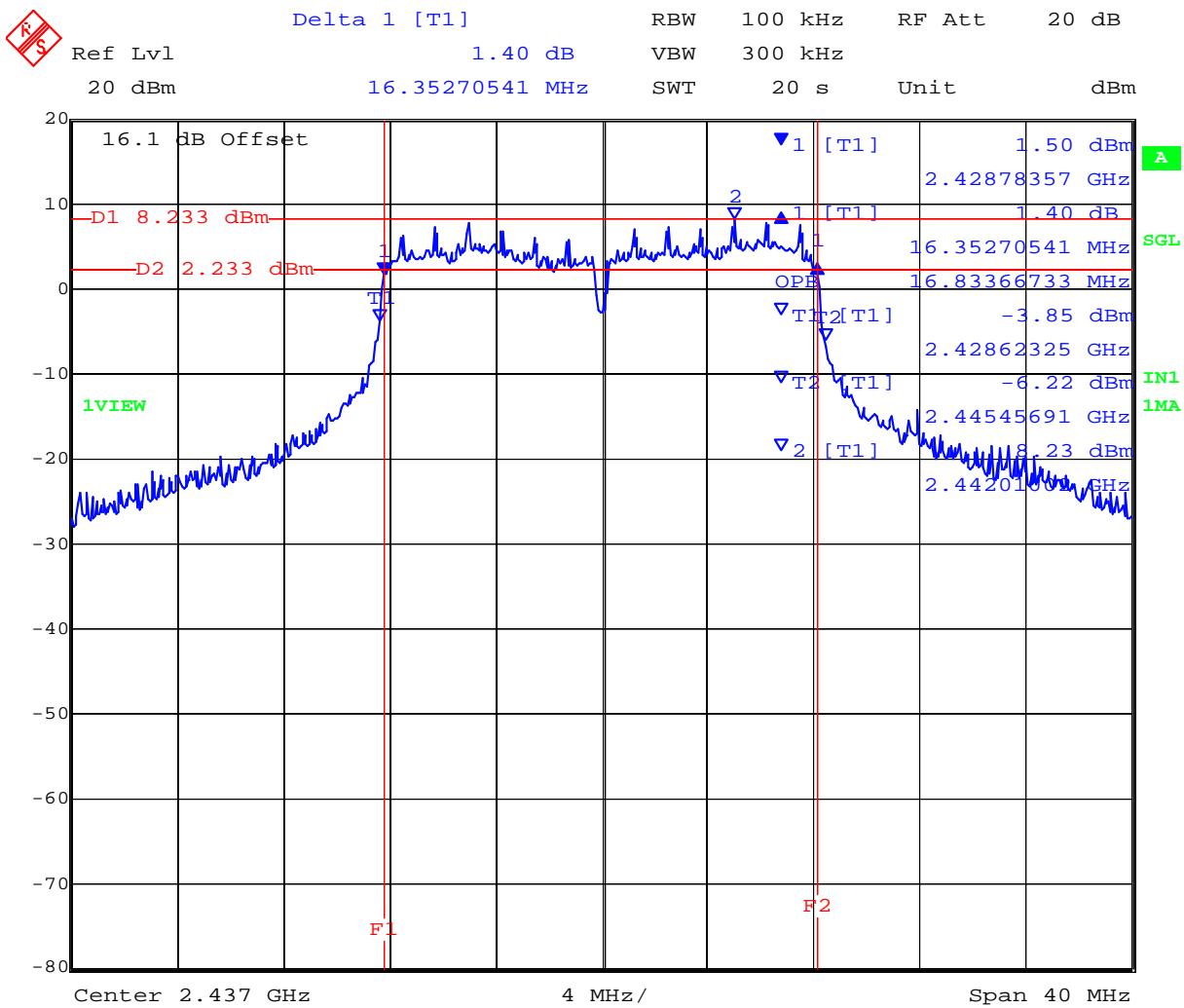
PORT A 2,437 MHz 802.11g Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 09:19:27

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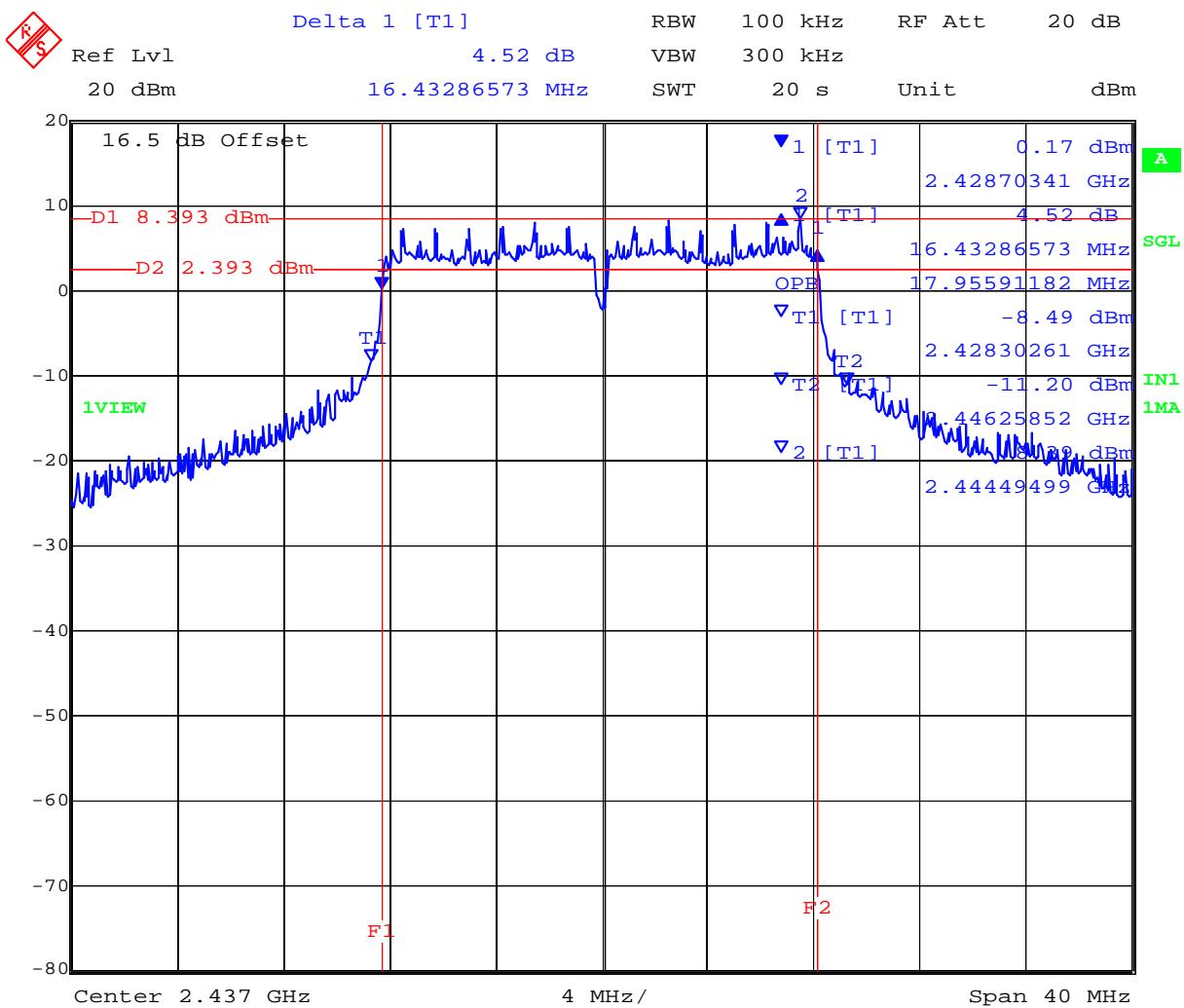
PORT B 2,437 MHz 802.11g Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 09:20:33

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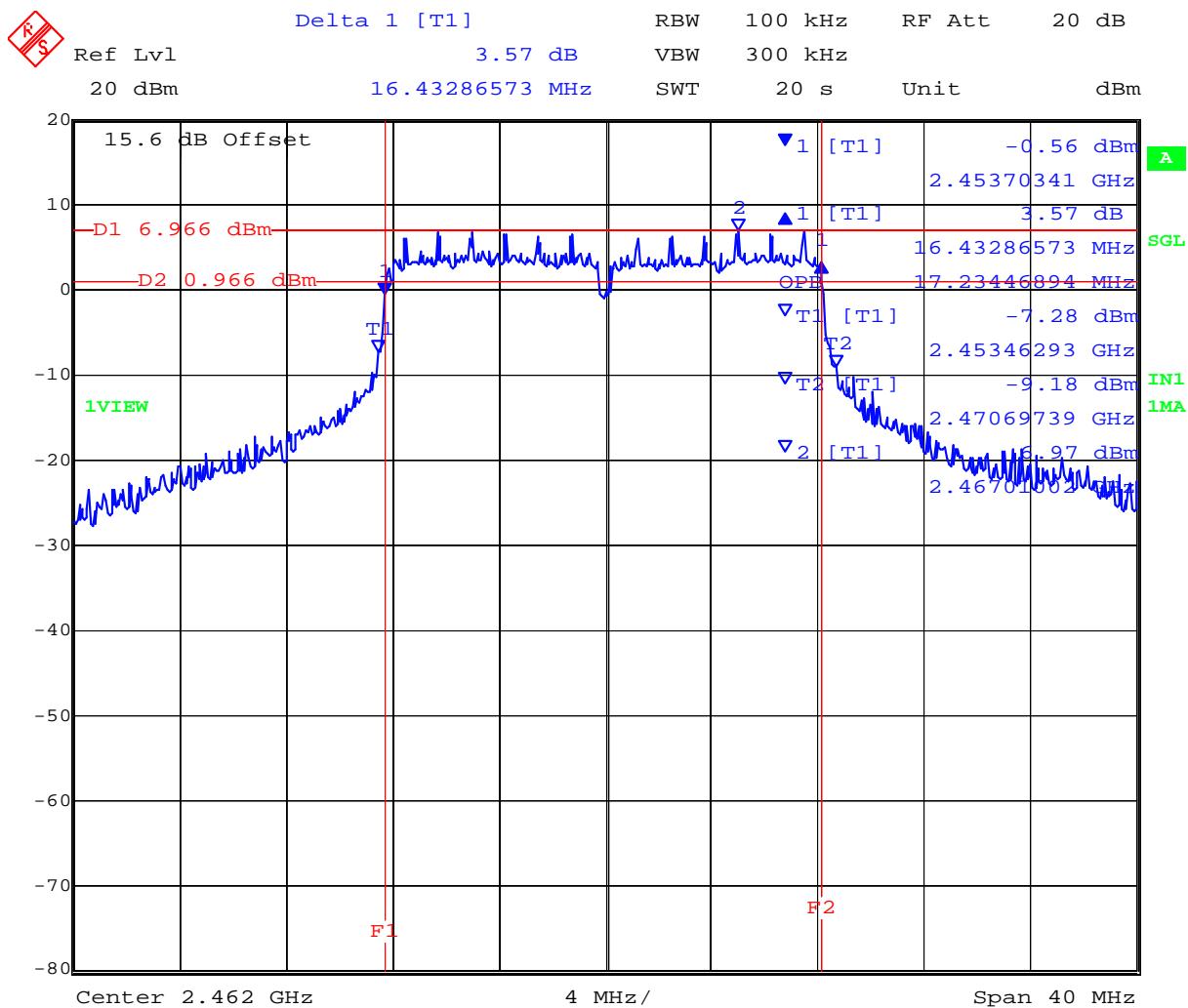
PORT C 2,412 MHz 802.11g Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 09:21:34

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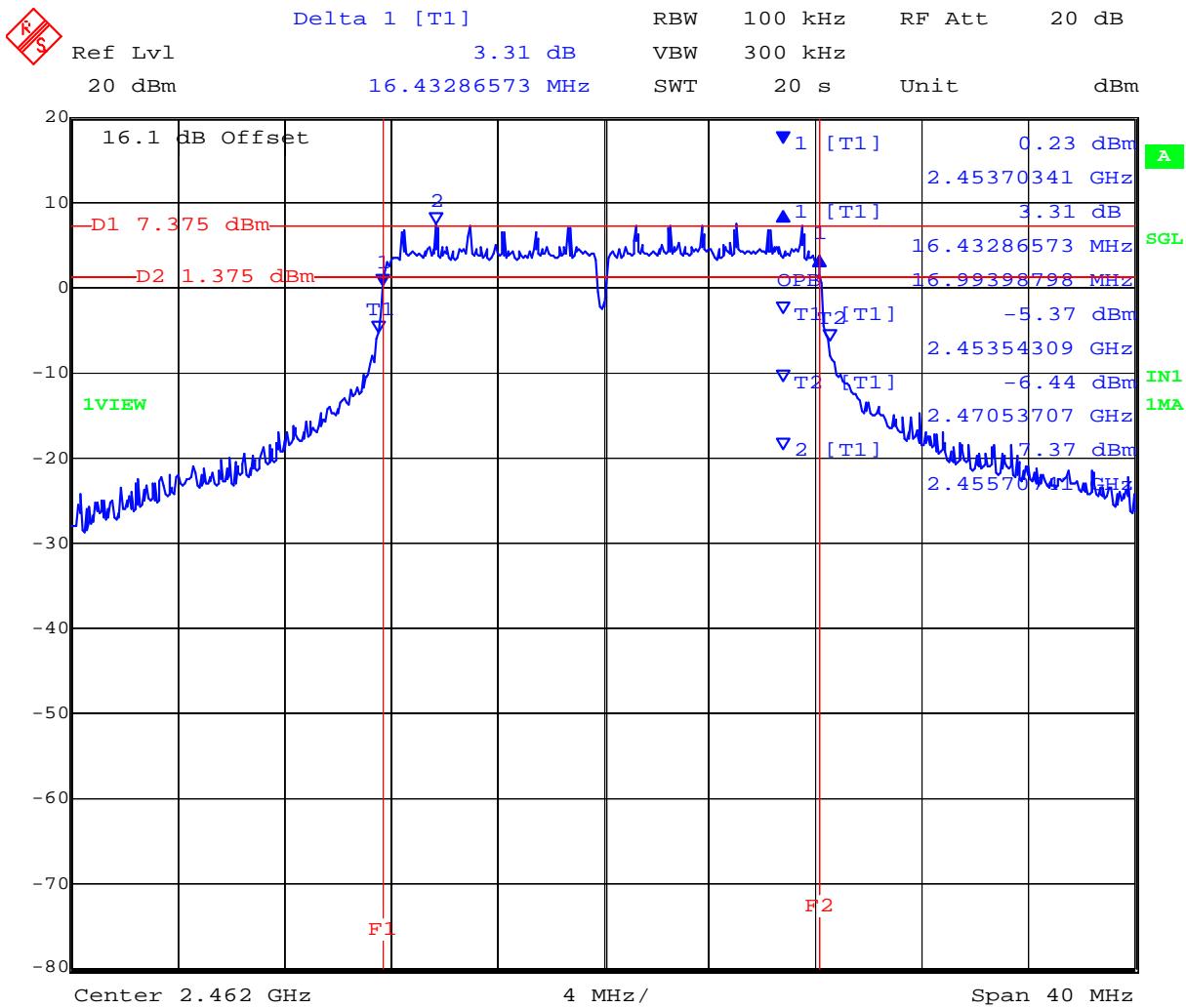
PORT A 2,462 MHz 802.11g Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 09:55:40

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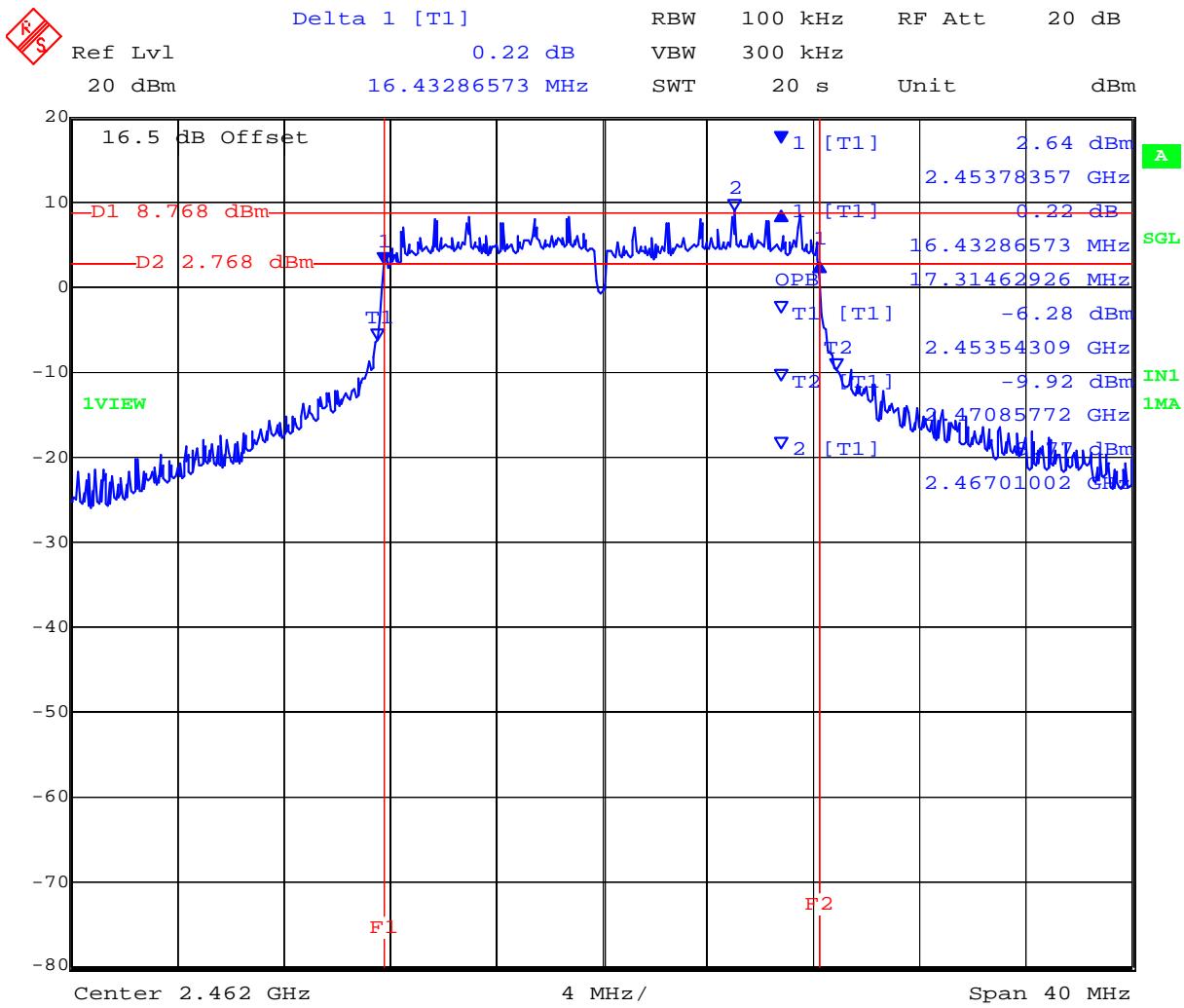
PORT B 2,462 MHz 802.11g Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 09:56:44

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



Date: 8.FEB.2012 09:57:47

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Title: Fluke Networks Sensor4 Wireless Client
To: FCC 47 CFR Part 15.247 & IC RSS-210
Serial #: AMGT14-U1 Rev B
Issue Date: 20th June 2012
Page: 47 of 342

TABLE OF RESULTS – 802.11n HT-20 Legacy

Test Conditions:	15.247 (a)(2)	Rel. Humidity (%):	35	to	42
Variant:	802.11n HT-20	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A	Antenna Gain:	2	dBi	
Applied Voltage:	48.00	Vdc			
Notes 1:					
Notes 2:					

6 dB Bandwidth

Test Frequency	6 dB Bandwidth				Minimum 6dB Bandwidth Limit	Margin	
	MHz						
MHz	a	b	c	d	kHz	MHz	MHz
2412.000	17.635000	17.635000	17.635000	--	500	0.5	-17.135000
2437.000	17.635000	17.395000	17.395000	--			-16.895000
2462.000	17.635000	17.635000	17.635000	--			-17.135000

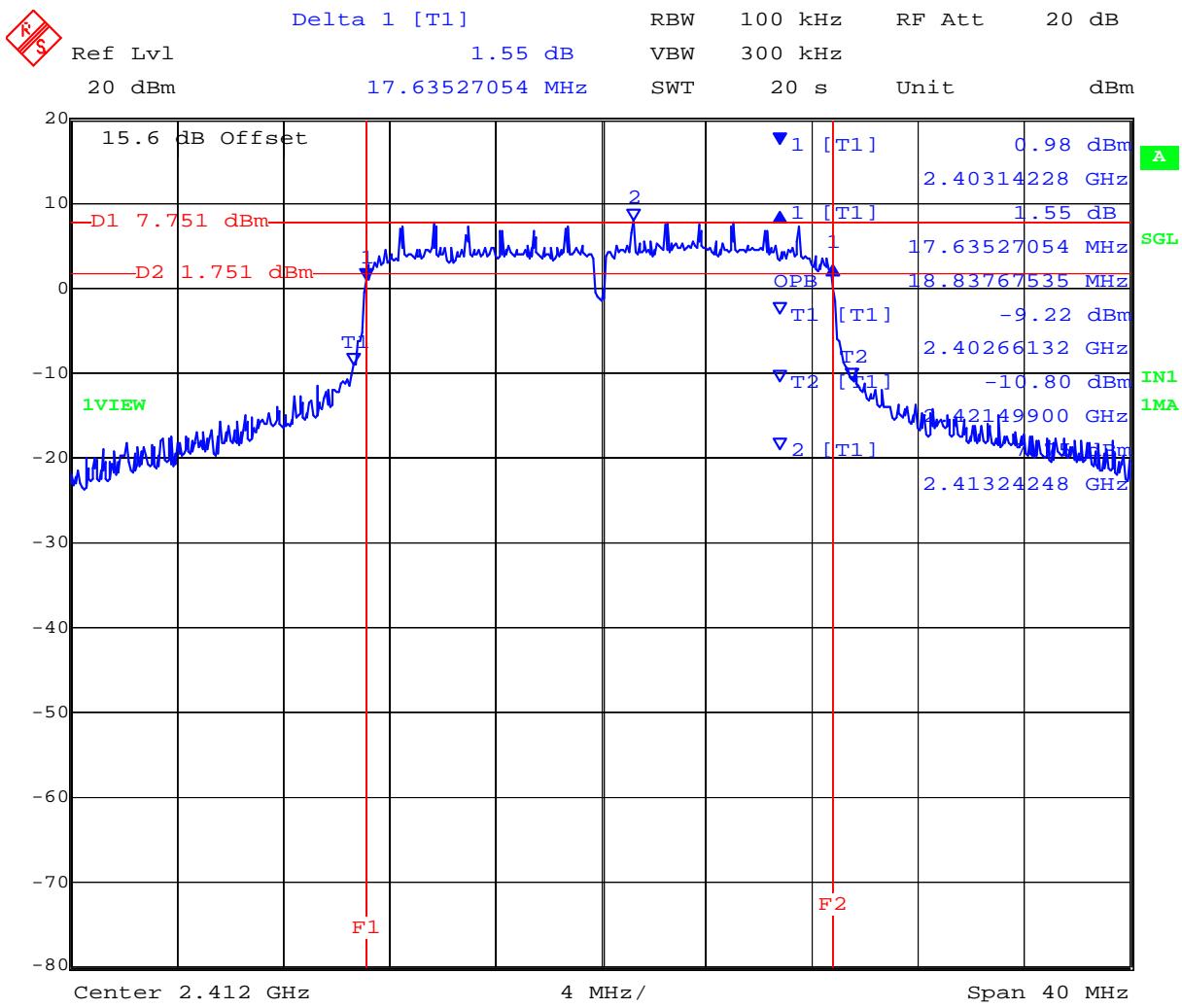
99% Bandwidth

Test Frequency	99 % Bandwidth						
	MHz						
MHz	a	b	c	d			
2412.000	18.838000	18.597000	18.677000	--			
2437.000	18.677000	18.036000	18.918000	--			
2462.000	17.956000	17.956000	18.196000	--			

Measurement uncertainty:	±2.81 dB
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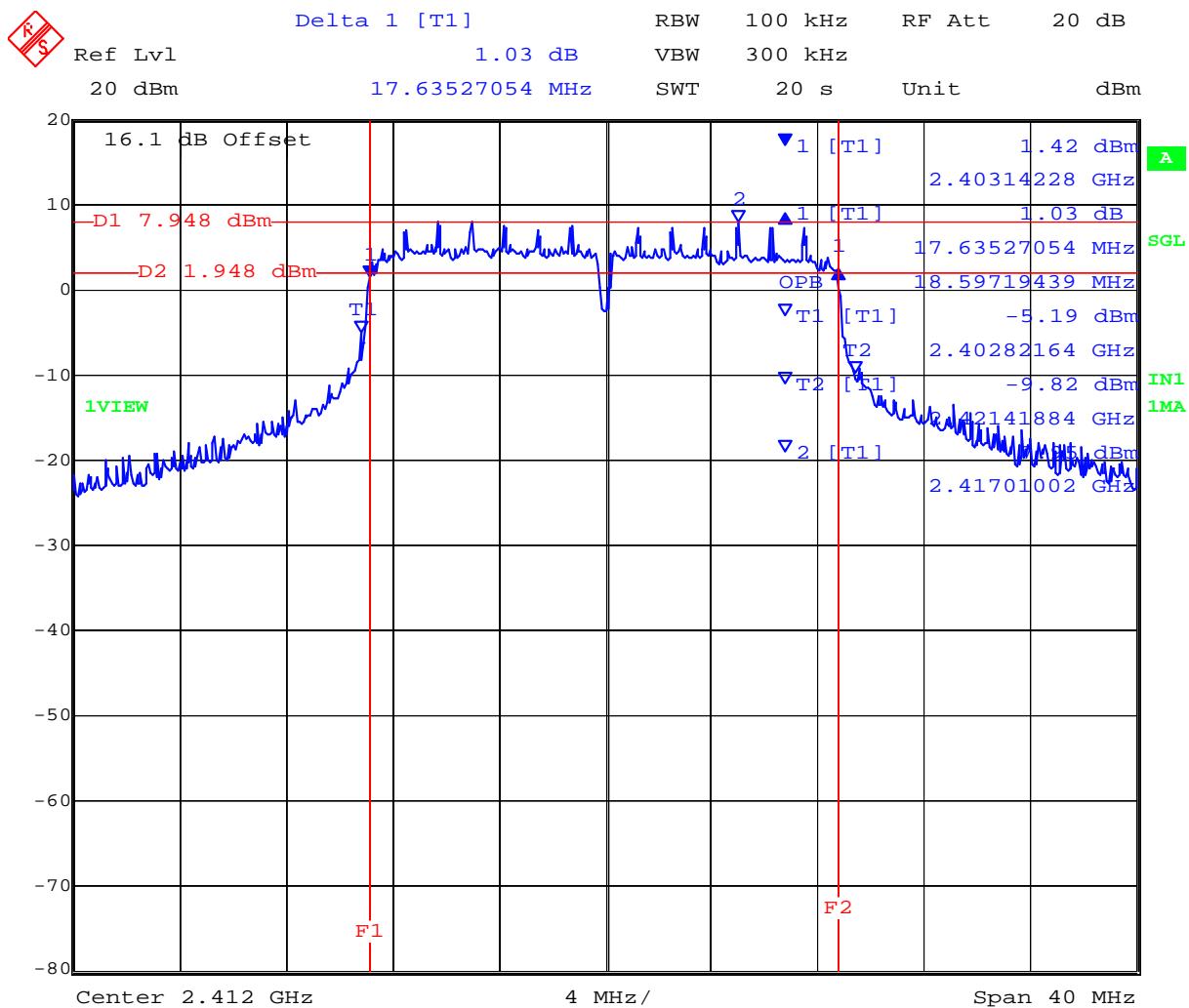
PORT A 2,412 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 11:11:56

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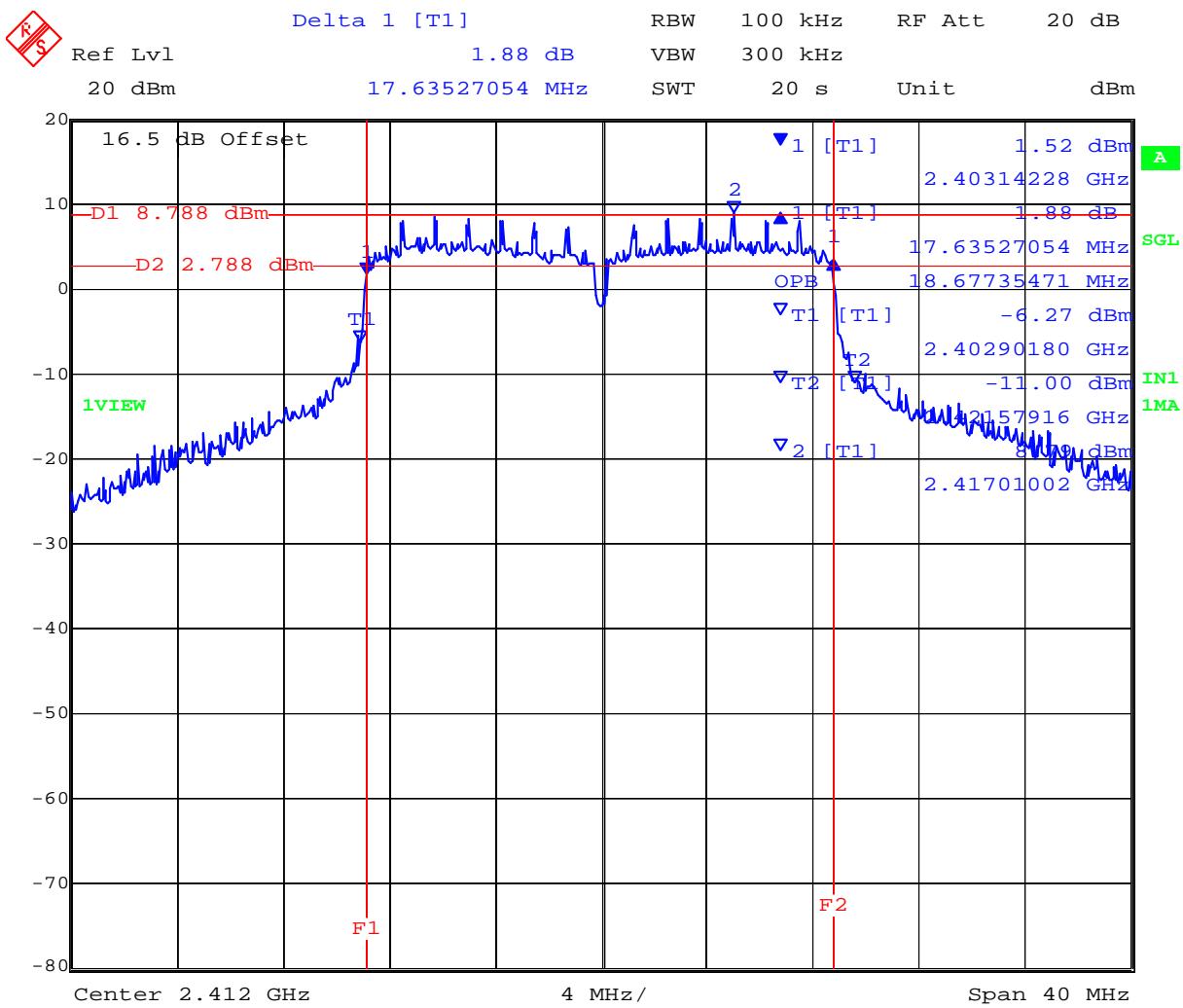
PORT B 2,412 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 11:13:01

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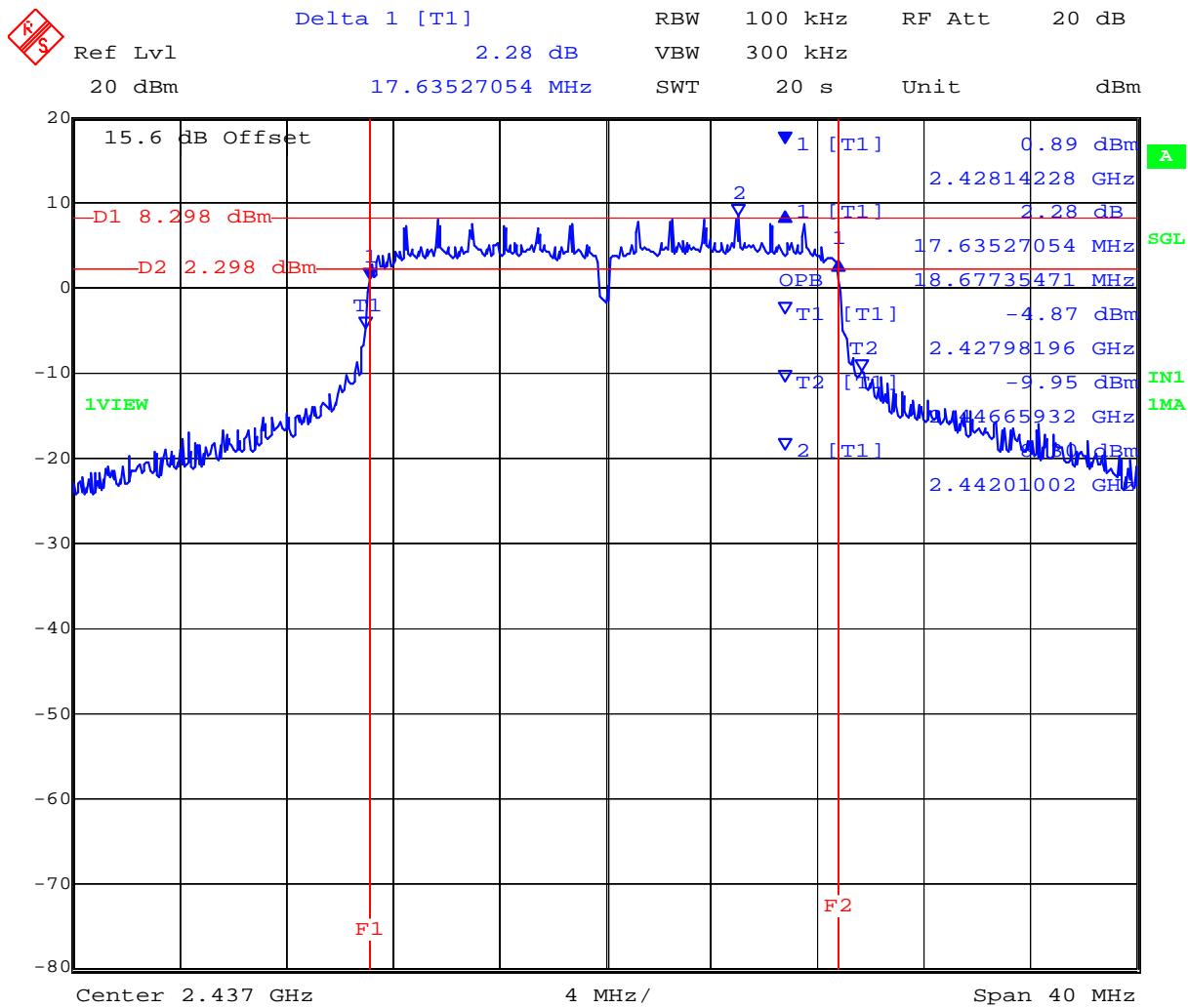
PORT C 2,412 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 11:14:03

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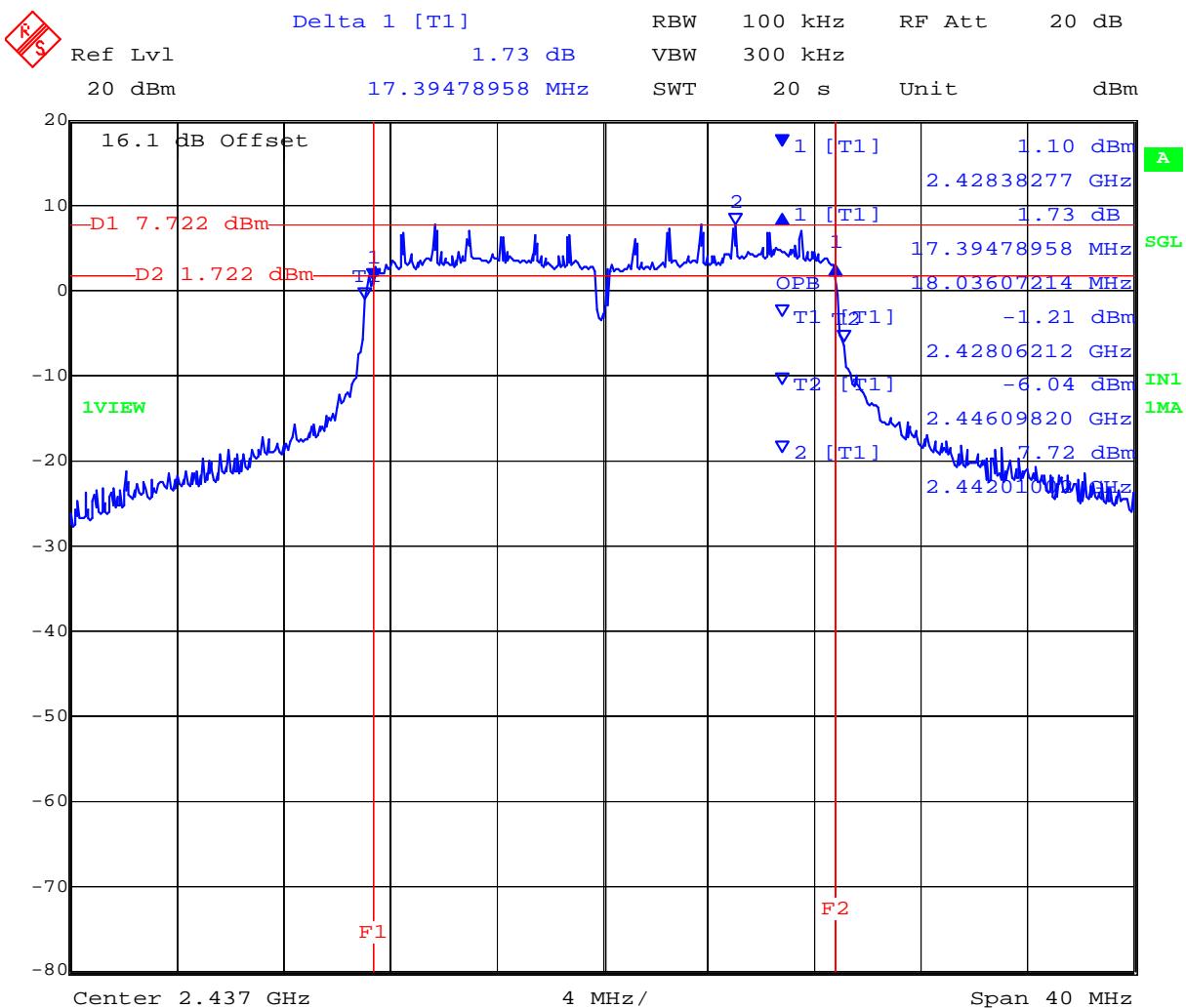
PORT A 2,437 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 11:46:35

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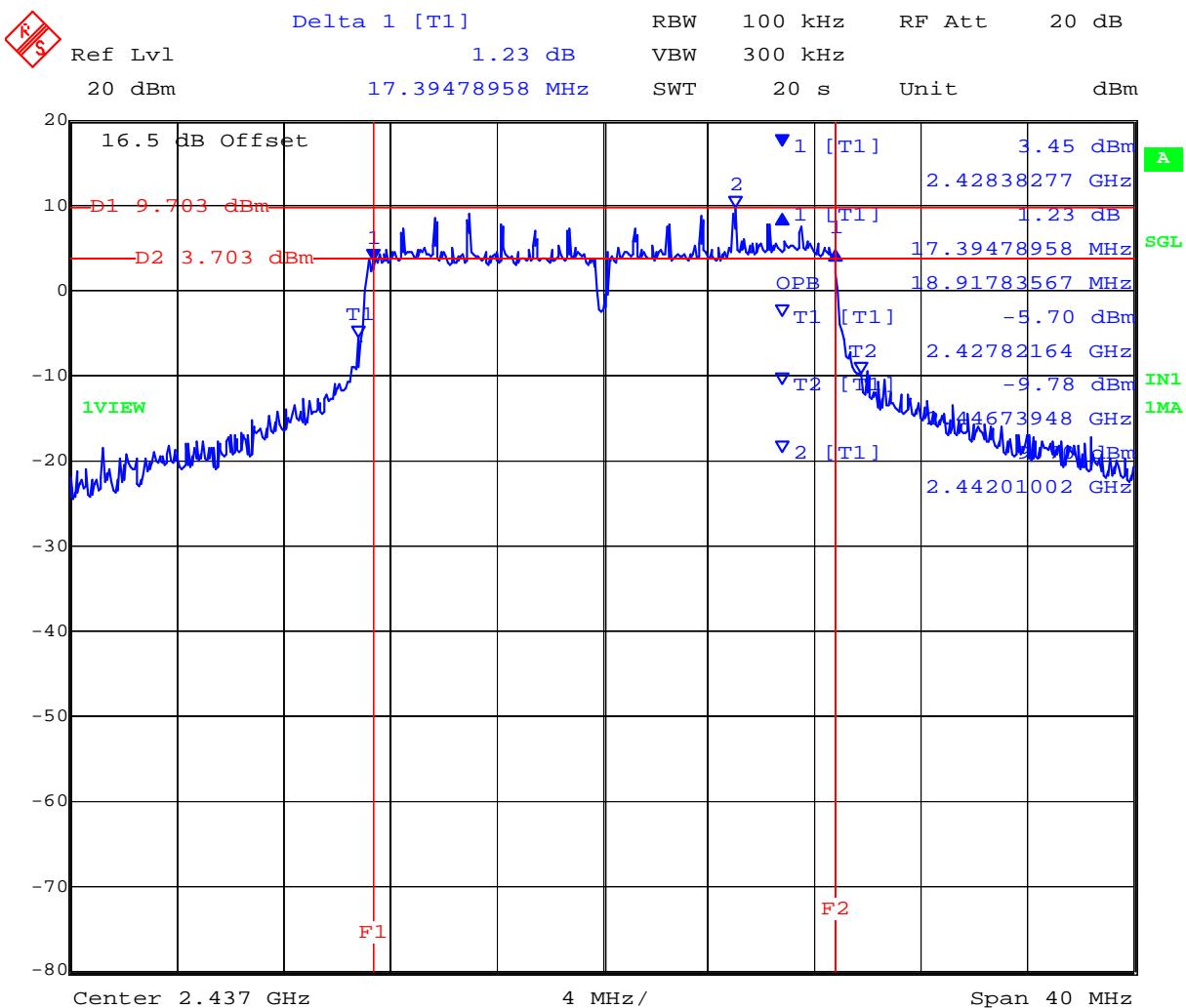
PORT B 2,437 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 11:47:40

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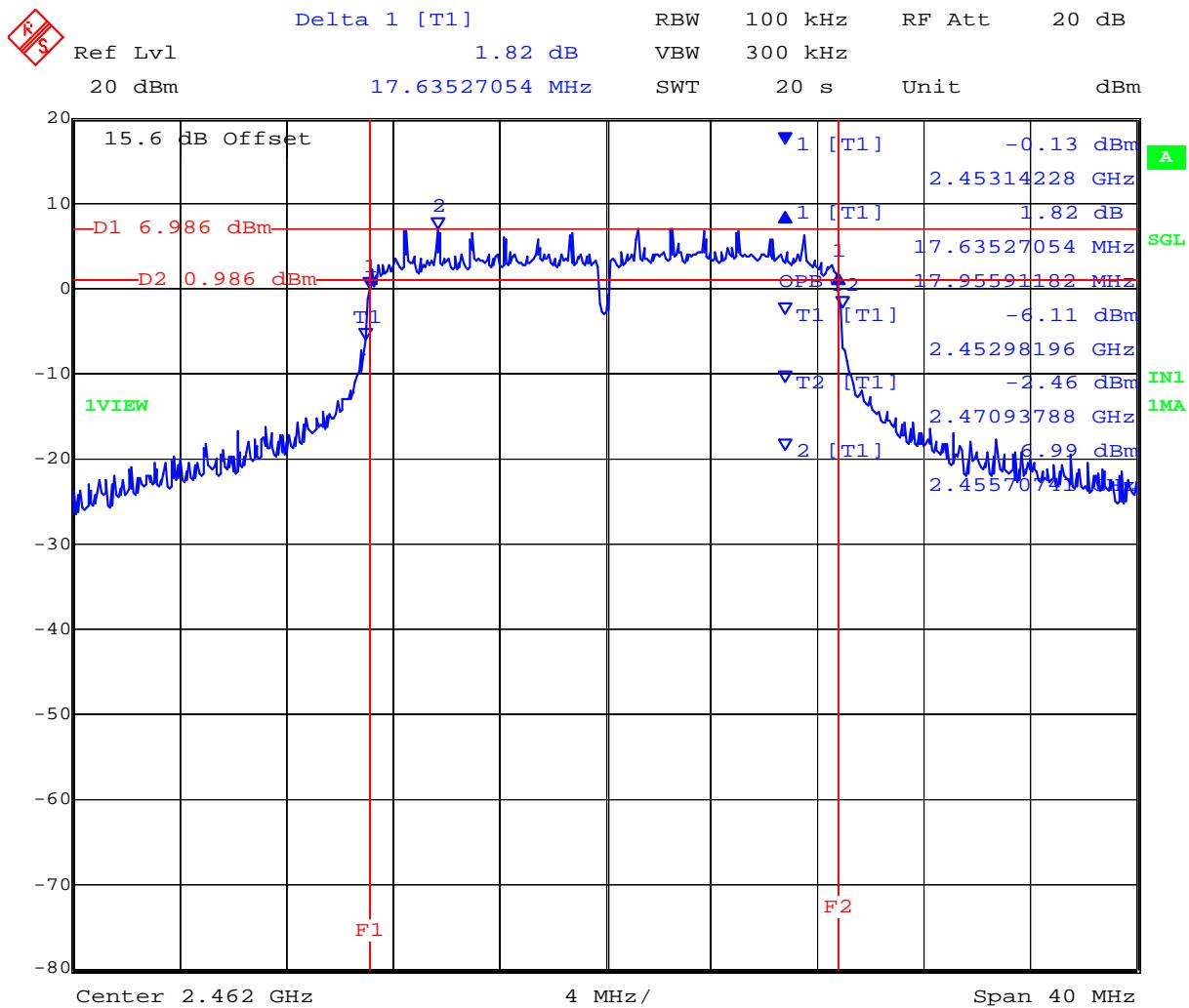
PORT C 2,437 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 11:48:42

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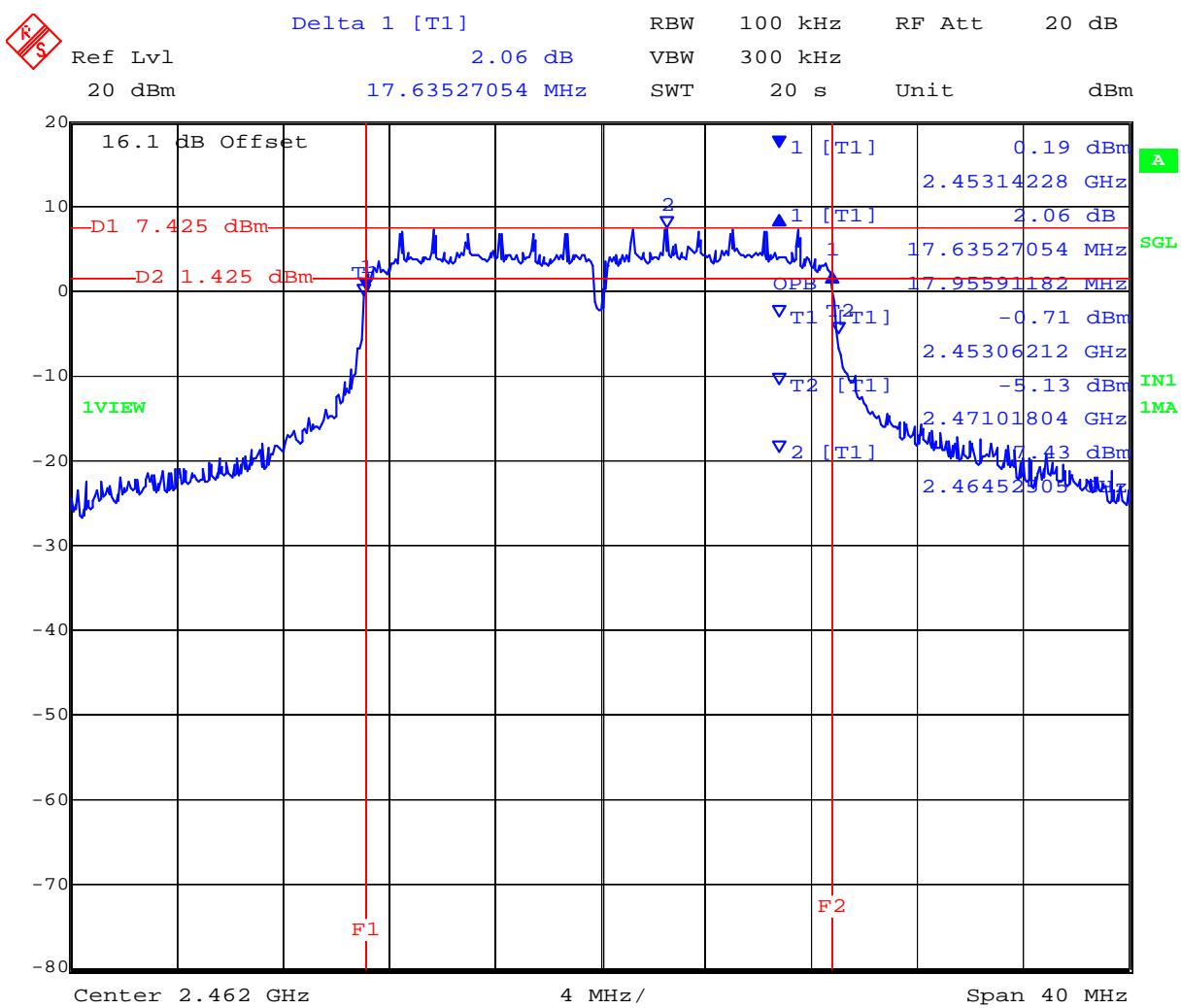
PORT A 2,462 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 12:26:59

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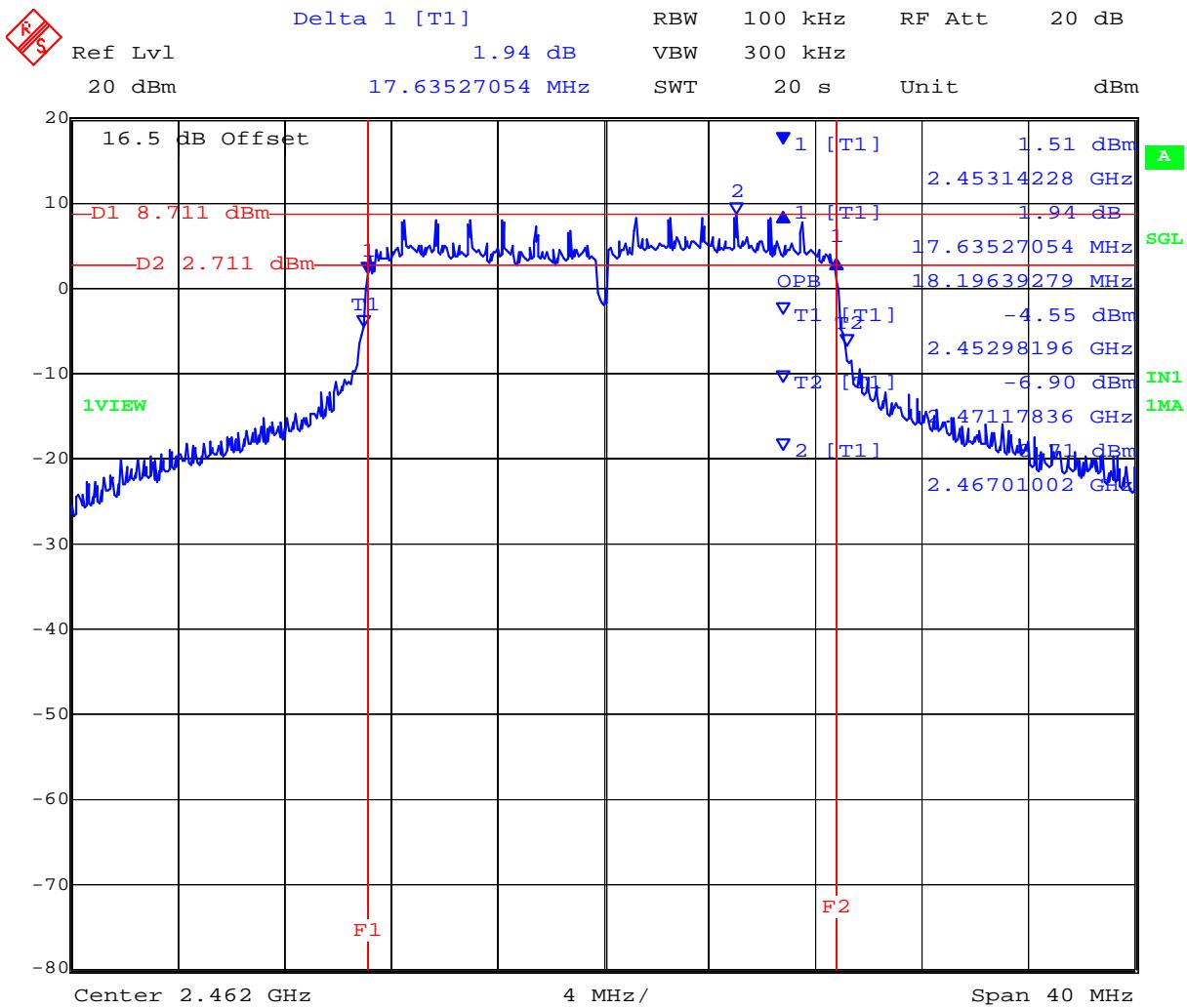
PORT B 2,462 MHz 802.11n HT-20 Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 12:28:06

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



Date: 8.FEB.2012 12:29:08

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Title: Fluke Networks Sensor4 Wireless Client
To: FCC 47 CFR Part 15.247 & IC RSS-210
Serial #: AMGT14-U1 Rev B
Issue Date: 20th June 2012
Page: 57 of 342

TABLE OF RESULTS – 802.11n HT-40 Legacy

Test Conditions:	15.247 (a)(2)	Rel. Humidity (%):	35	to	42
Variant:	802.11n HT-40	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A	Antenna Gain:	2	dBi	
Applied Voltage:	48.00	Vdc			
Notes 1:					
Notes 2:					

6 dB Bandwidth

Test Frequency	6 dB Bandwidth				Minimum 6dB Bandwidth Limit		Margin
	MHz						
MHz	a	b	c	d	kHz	MHz	MHz
2422.000	36.553000	36.713000	36.874000	--	500	0.5	-36.053000
2437.000	36.553000	36.713000	36.713000	--			-36.053000
2452.000	36.713000	36.553000	36.553000	--			-36.053000

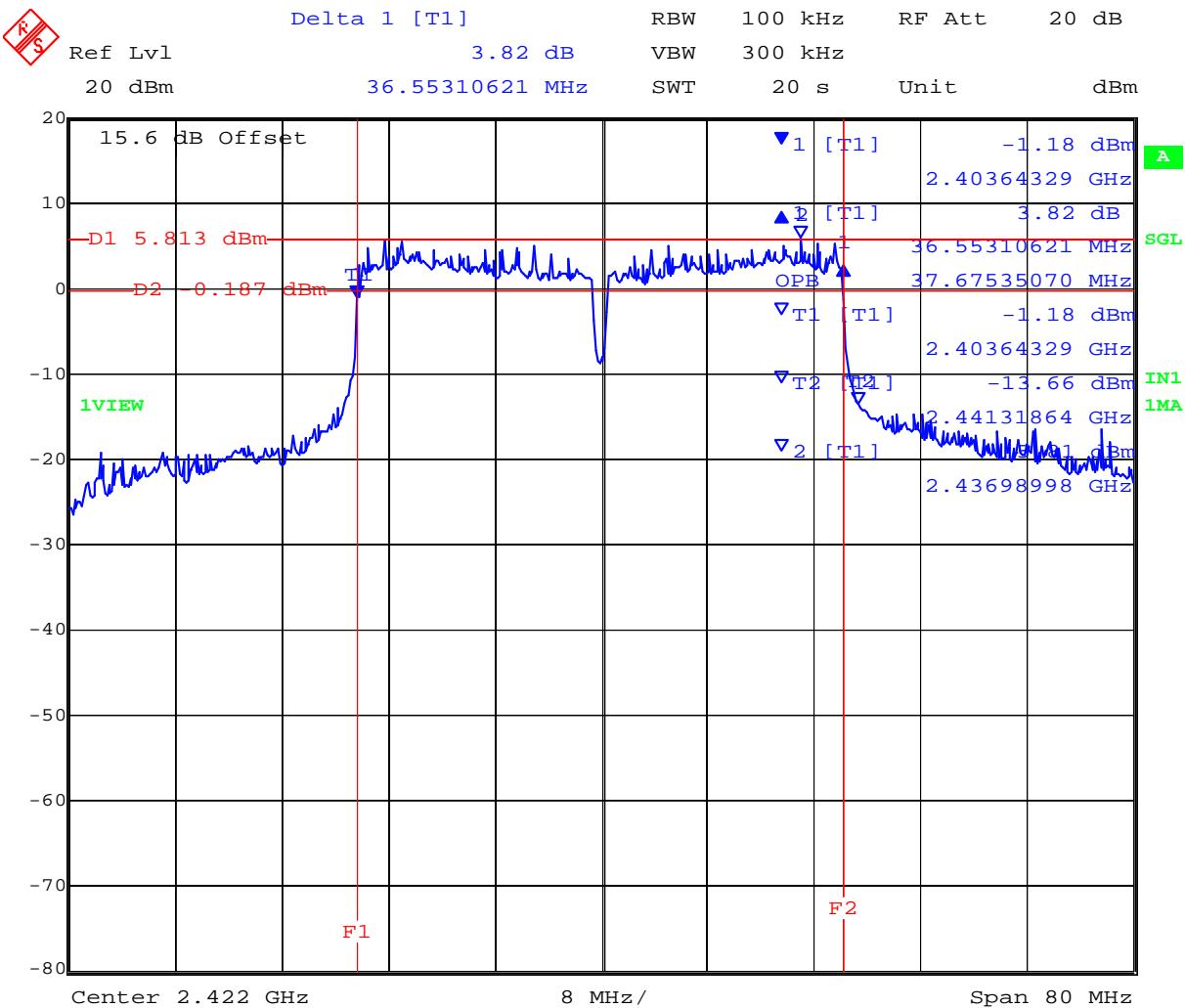
99% Bandwidth

Test Frequency	99 % Bandwidth						
	MHz						
MHz	a	b	c	d			
2422.000	37.675000	36.874000	37.355000	--			
2437.000	36.713000	36.713000	36.874000	--			
2452.000	36.874000	36.553000	37.034000	--			

Measurement uncertainty:	±2.81 dB
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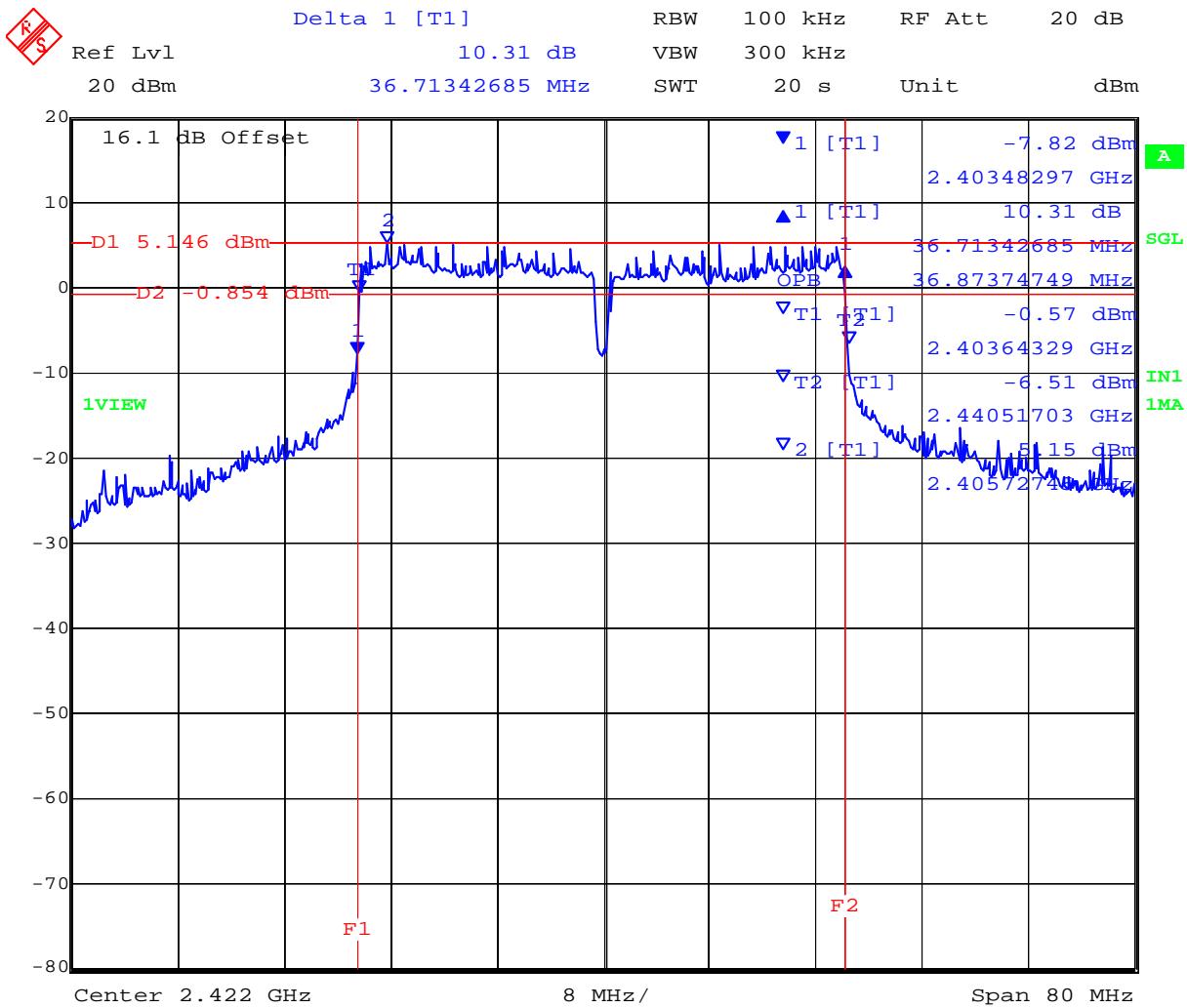
PORT A 2,422 MHz 802.11n HT-40 Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 13:56:32

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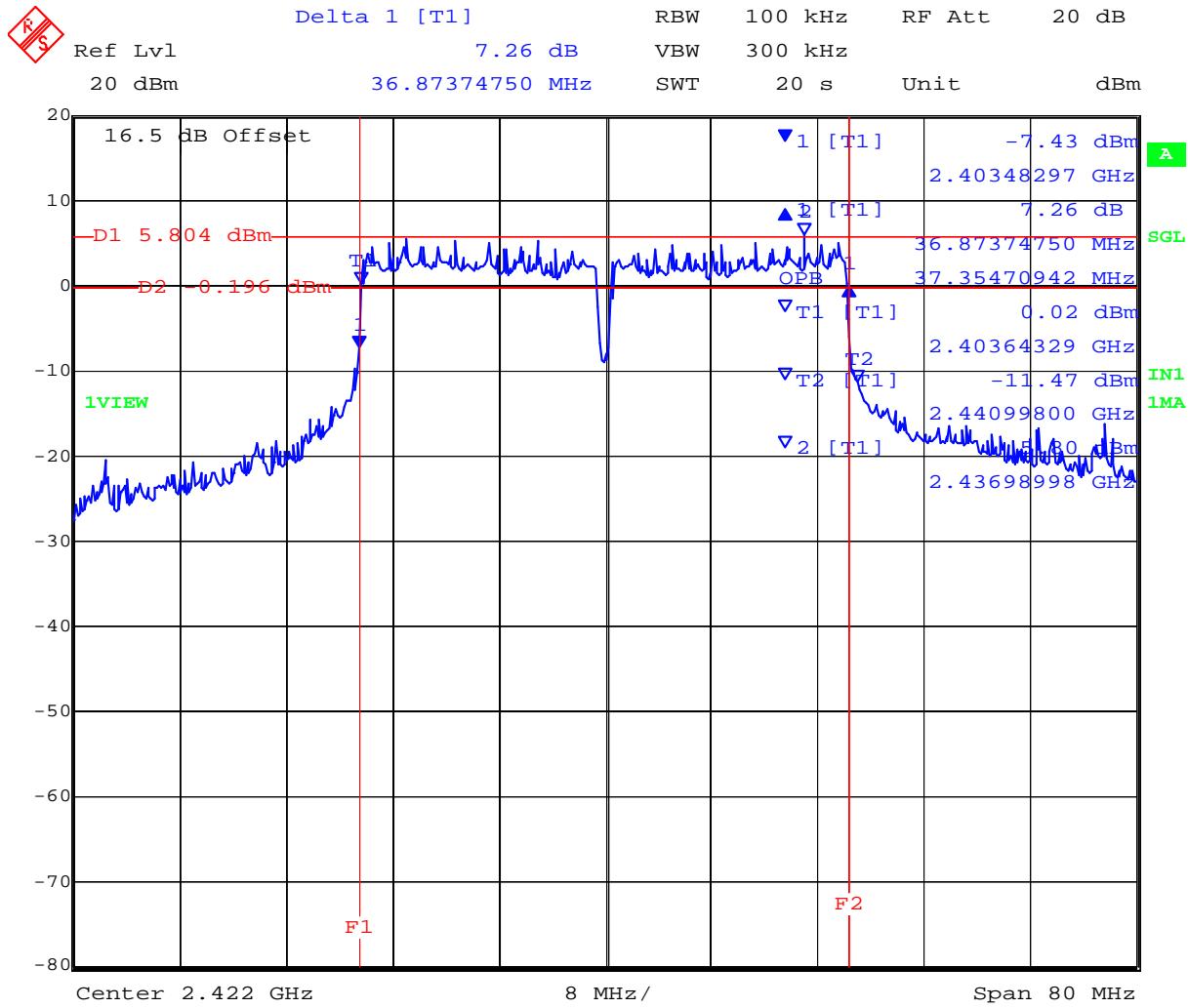
PORT B 2,422 MHz 802.11n HT-40 Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 13:57:37

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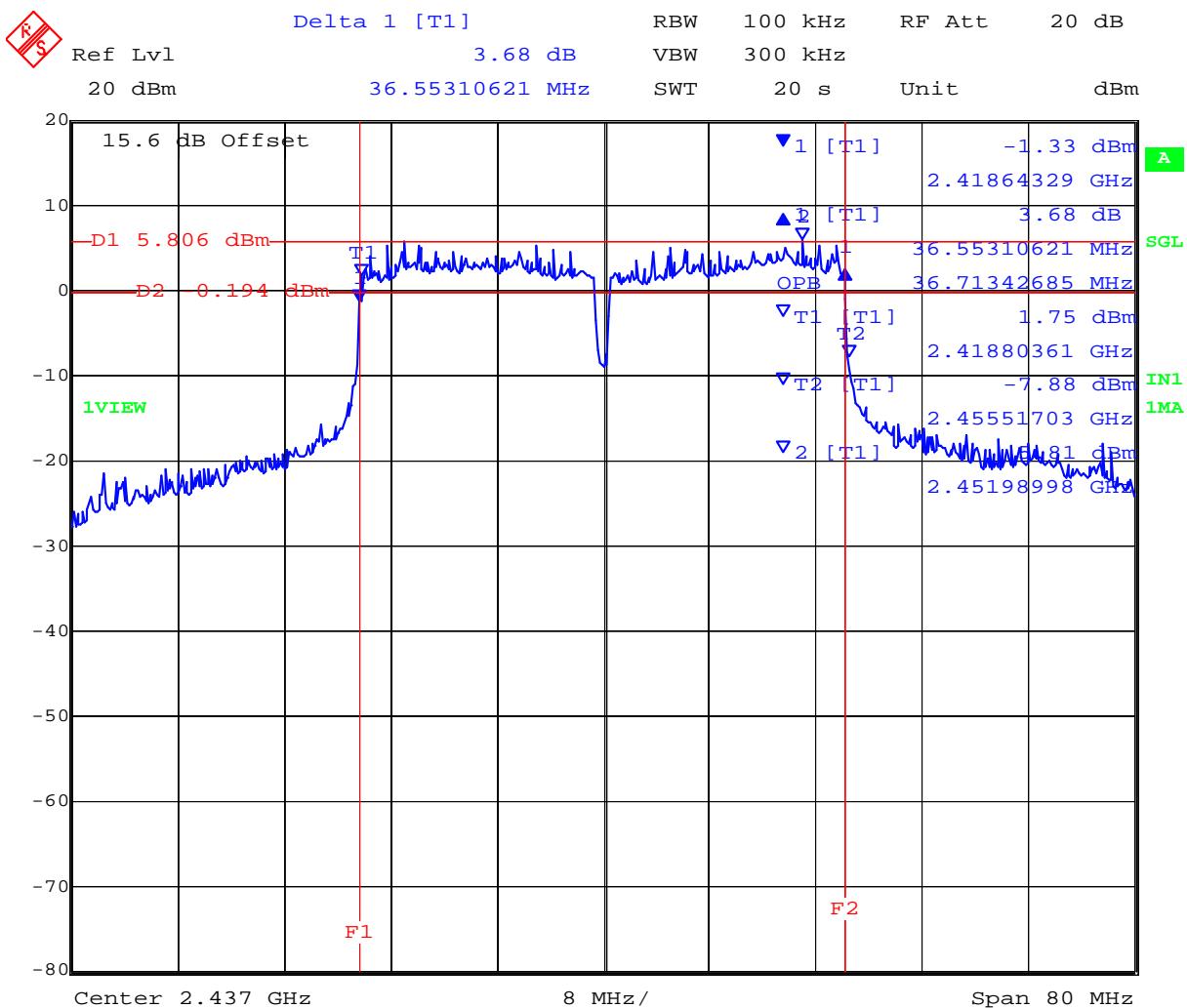
PORT C 2,422 MHz 802.11n HT-40 Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 13:58:39

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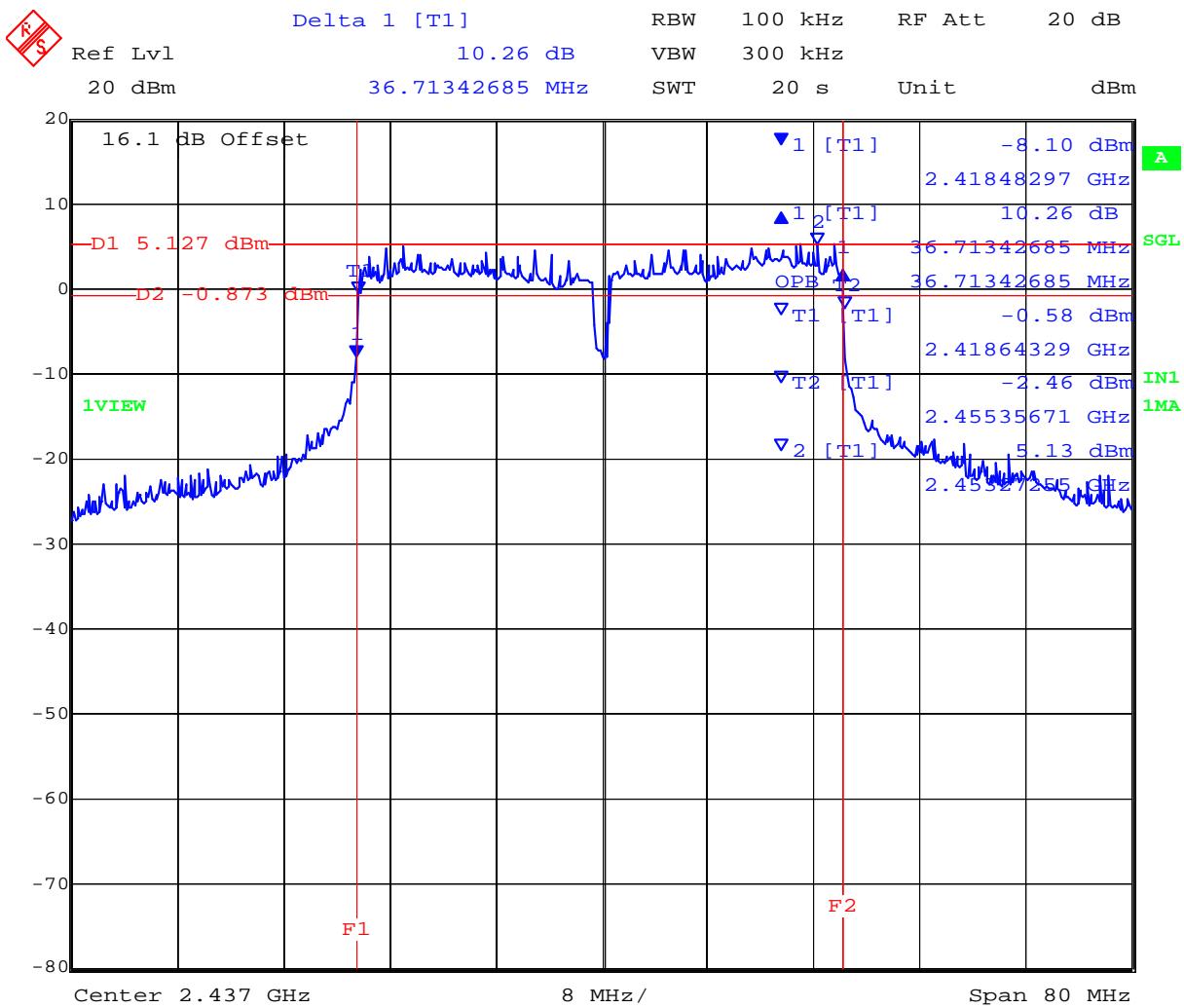
PORT A 2,437 MHz 802.11n HT-40 Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 14:32:42

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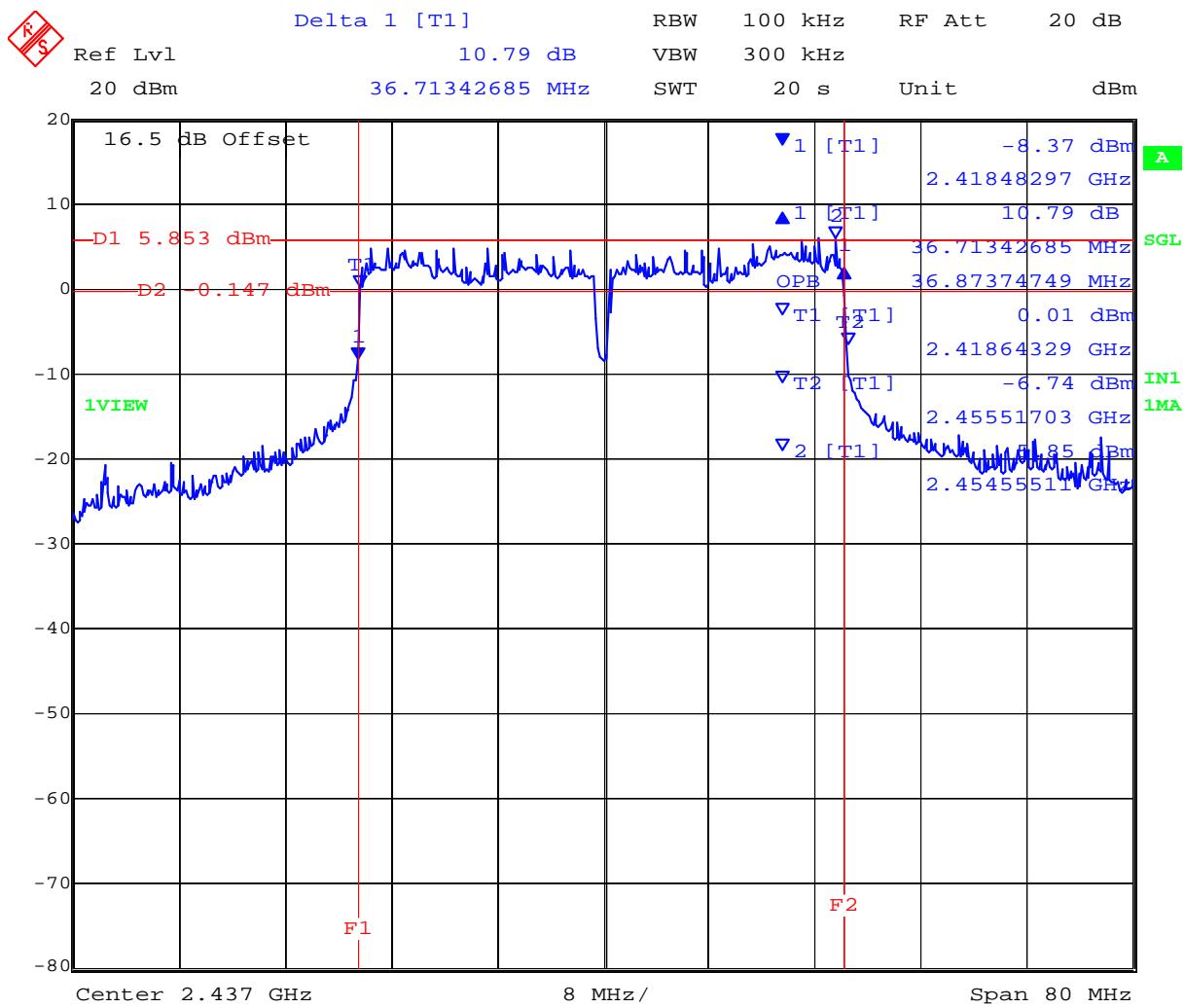
PORT B 2,437 MHz 802.11n HT-40 Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 14:33:47

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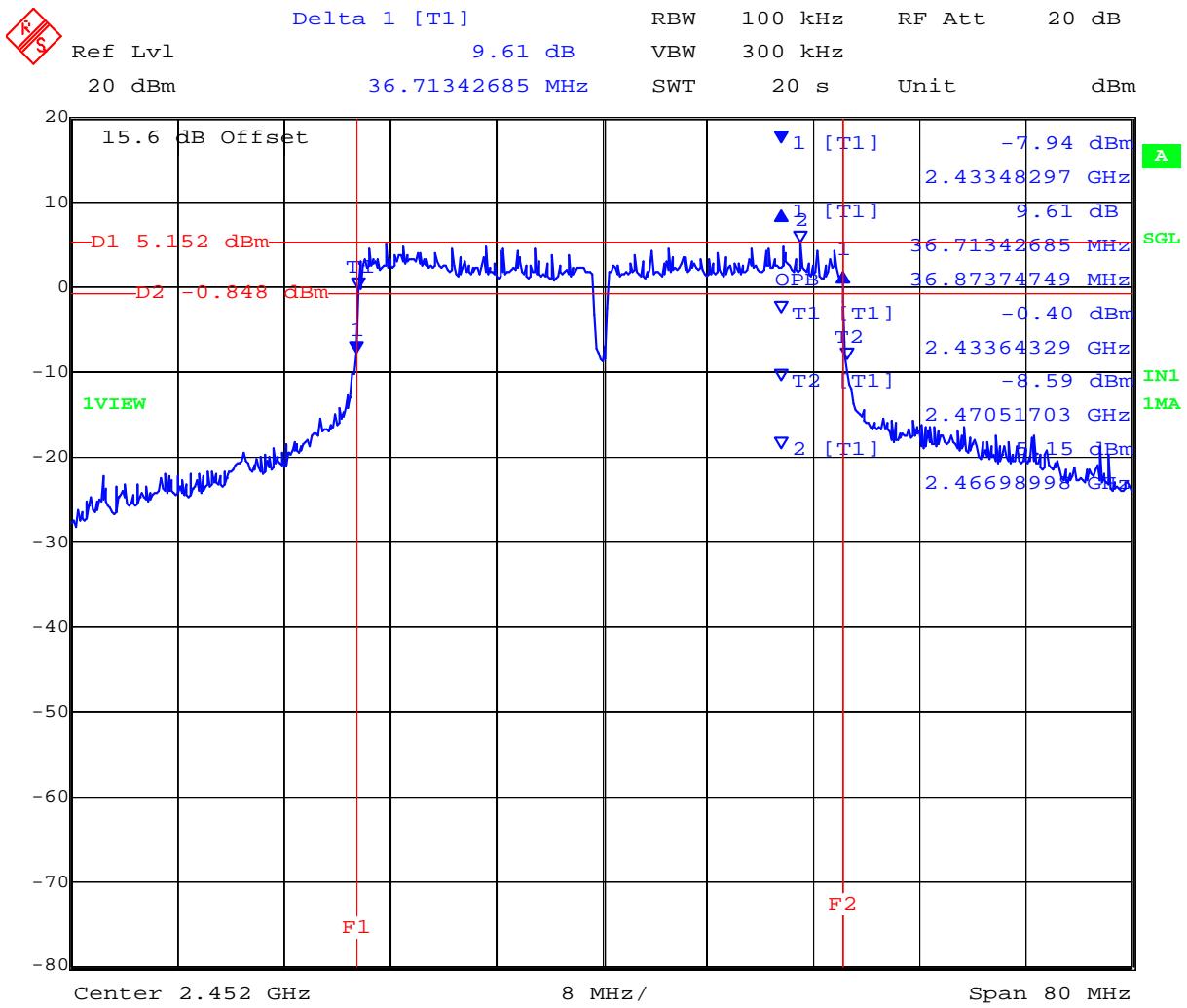
PORT C 2,437 MHz 802.11n HT-40 Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 14:34:49

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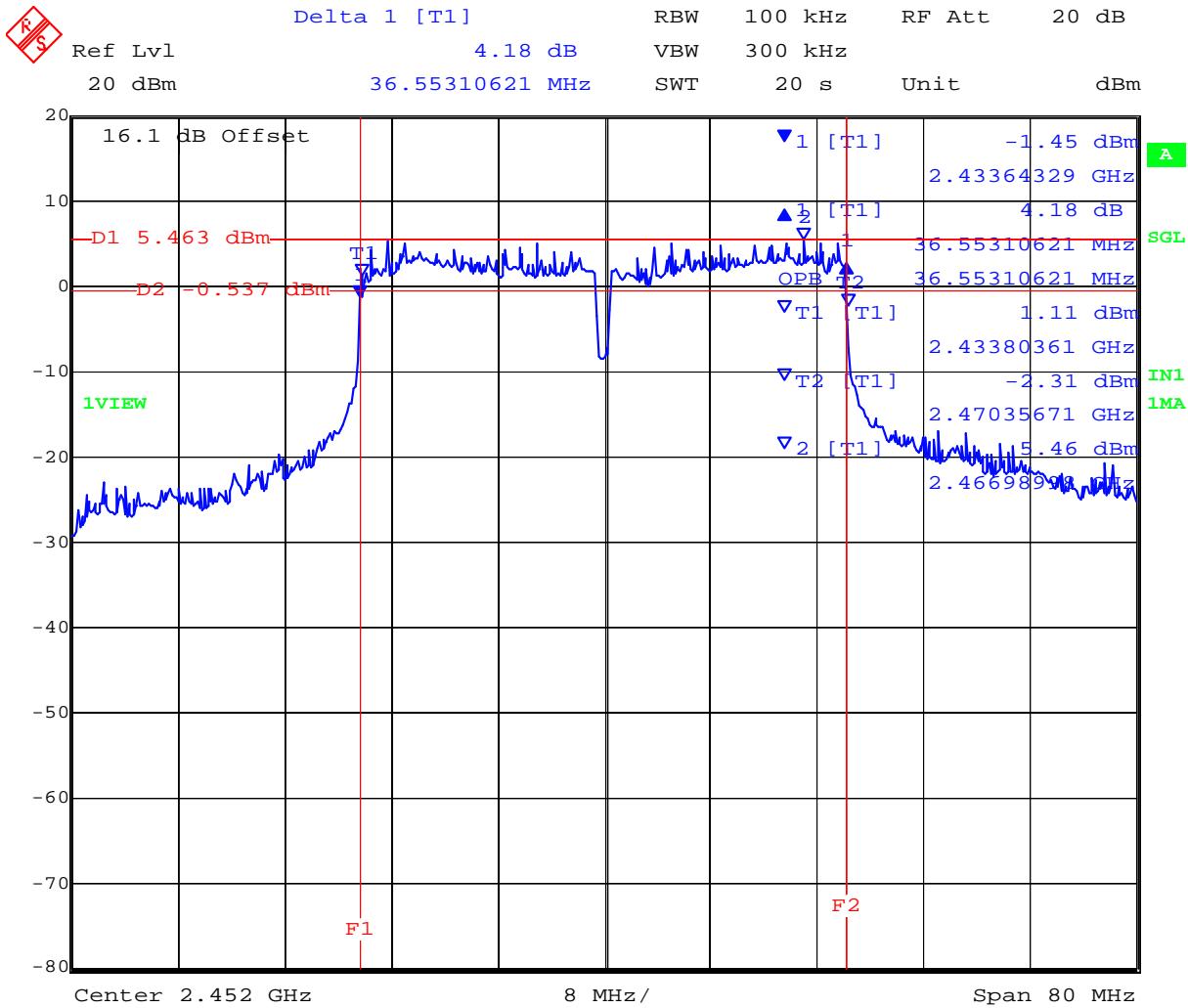
PORT A 2,452 MHz 802.11n HT-40 Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 15:07:47

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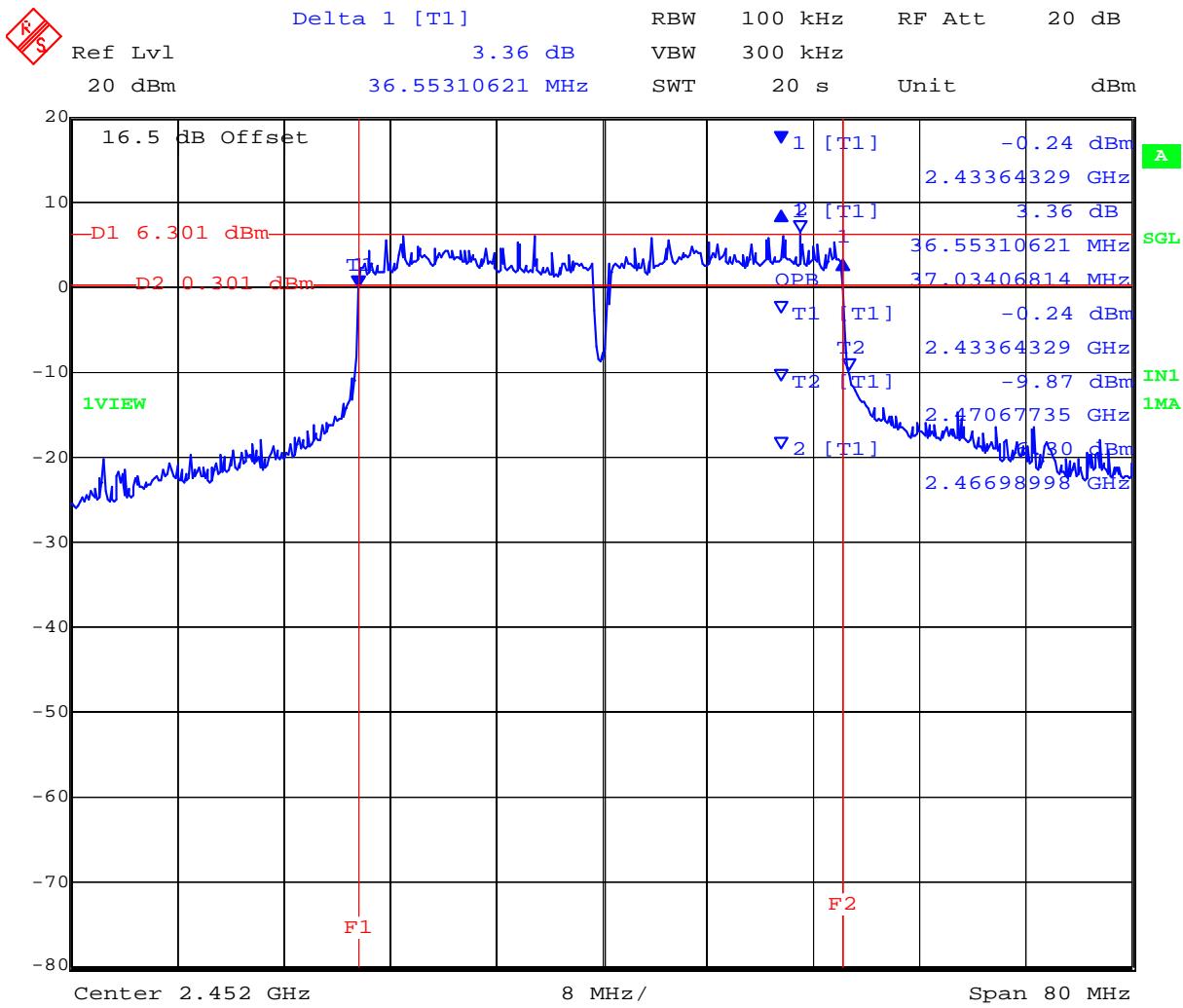
PORT B 2,452 MHz 802.11n HT-40 Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 15:08:54

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



Date: 8.FEB.2012 15:09:56

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TABLE OF RESULTS – 802.11a - Legacy

Test Conditions:	15.247 (a)(2)	Rel. Humidity (%):	35 to 42
Variant:	802.11a	Ambient Temp. (°C):	19 to 22
TPC:	HIGH	Pressure (mBars):	998 to 1003
Modulation:	ON	Duty Cycle (%):	100
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	2 dBi
Applied Voltage:	48.00 Vdc		
Notes 1:			
Notes 2:			

6 dB Bandwidth

Test Frequency	6 dB Bandwidth				Minimum 6dB Bandwidth Limit		Margin
	MHz						
MHz	a	b	c	d	kHz	MHz	MHz
5745.000	16.513000	16.353000	16.433000	--	500	0.5	-15.853000
5785.000	16.433000	16.353000	16.433000	--			-15.853000
5825.000	16.433000	16.433000	16.433000	--			-15.933000

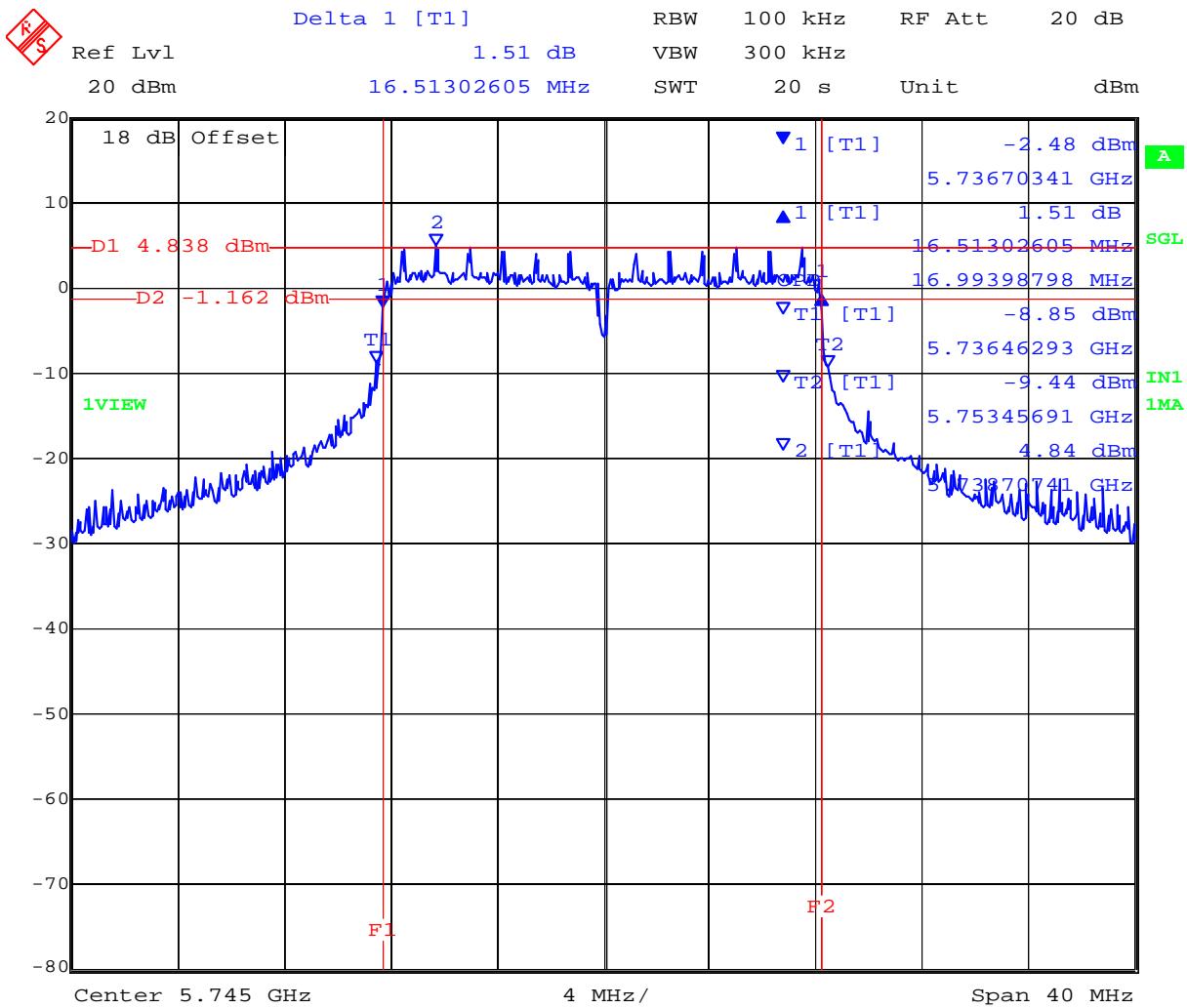
99% Bandwidth

Test Frequency	99 % Bandwidth						
	MHz						
MHz	a	b	c	d			
5745.000	16.994000	23.647000	17.234000	--			
5785.000	16.994000	27.335000	19.238000	--			
5825.000	16.914000	28.136000	20.922000	--			

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

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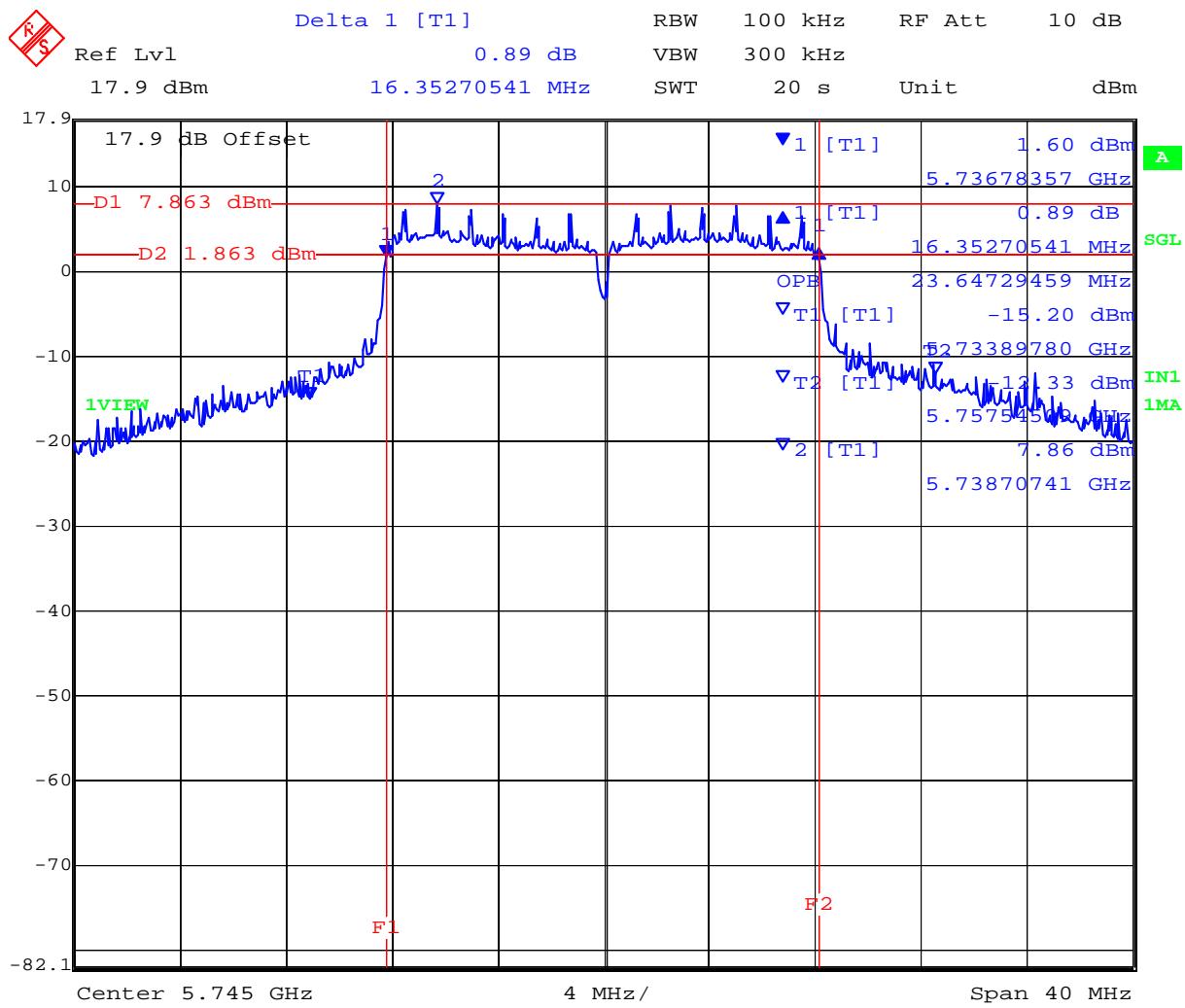
PORT A 5,745 MHz 802.11a Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 16:06:54

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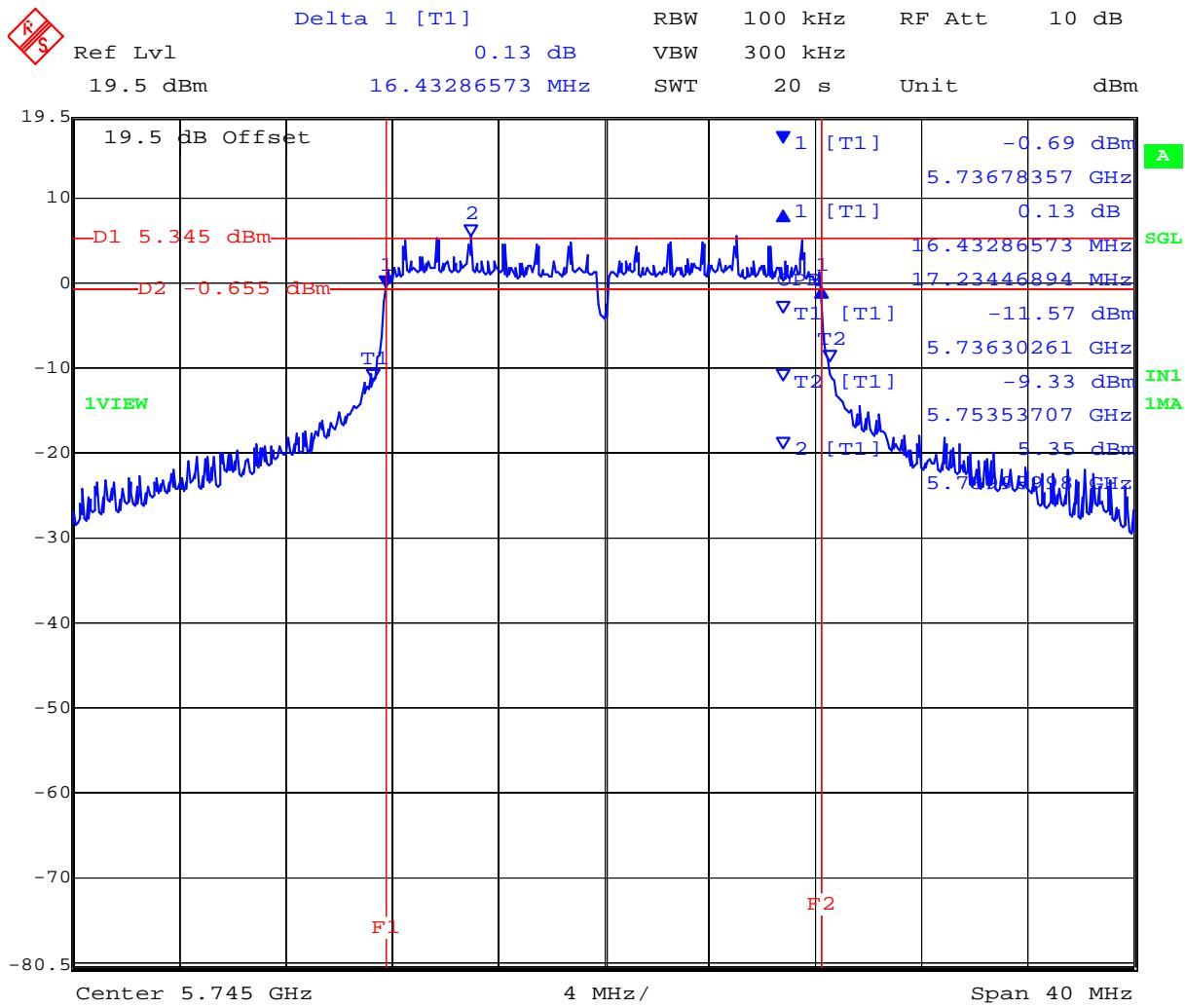
PORT B 5,745 MHz 802.11a Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 16:07:59

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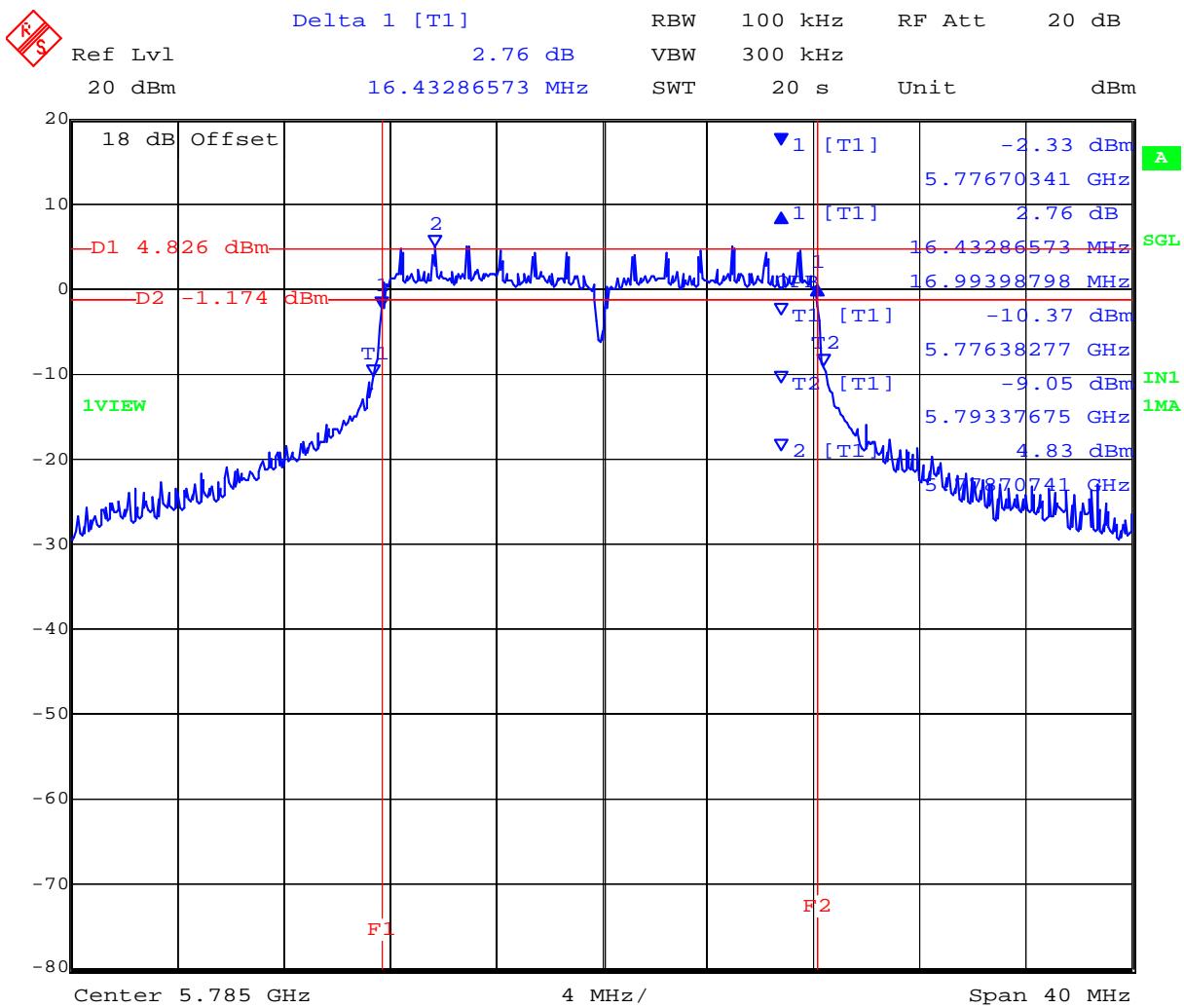
PORT C 5,745 MHz 802.11a Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 16:09:03

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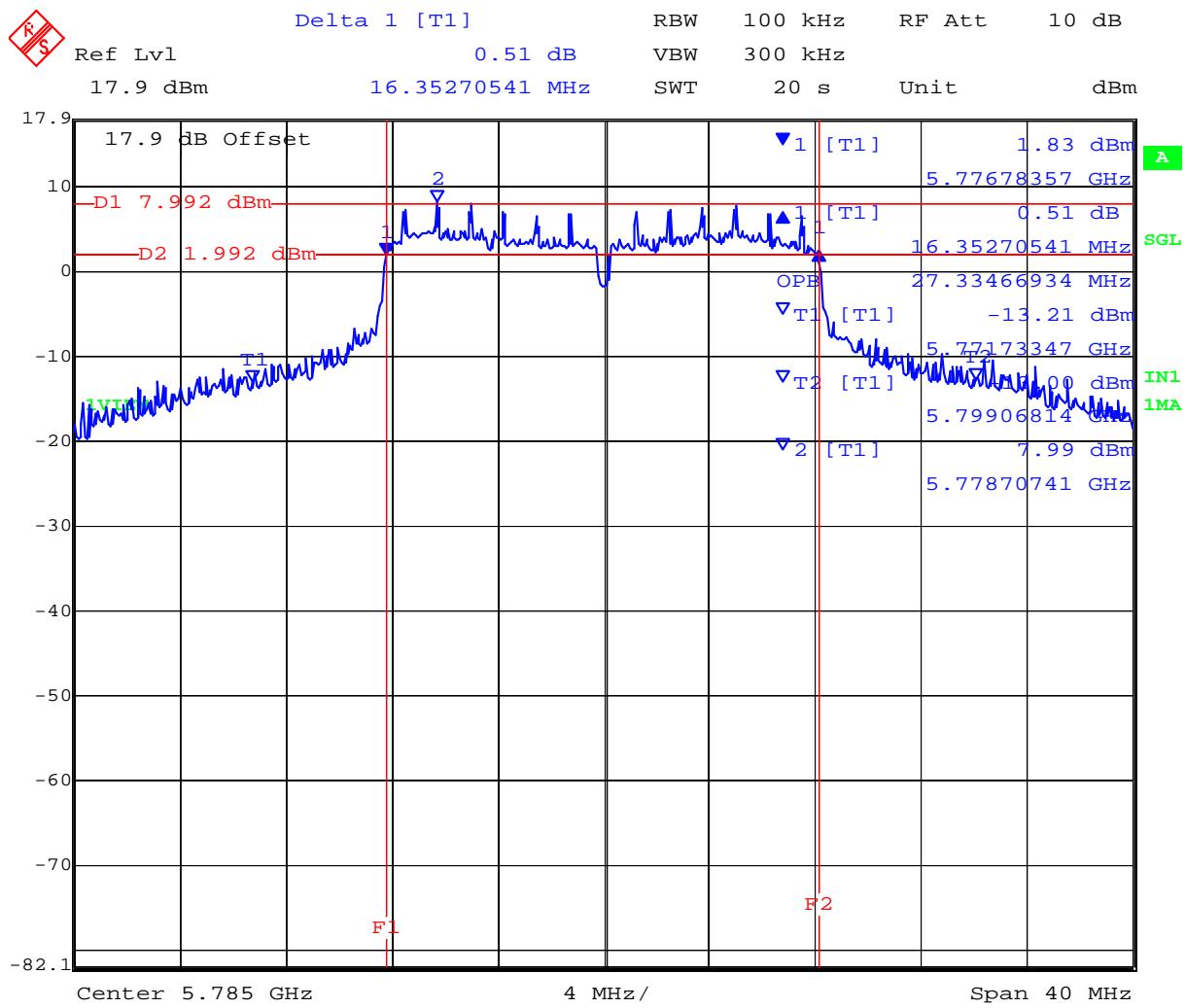
PORT A 5.785 MHz 802.11a Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 16:41:03

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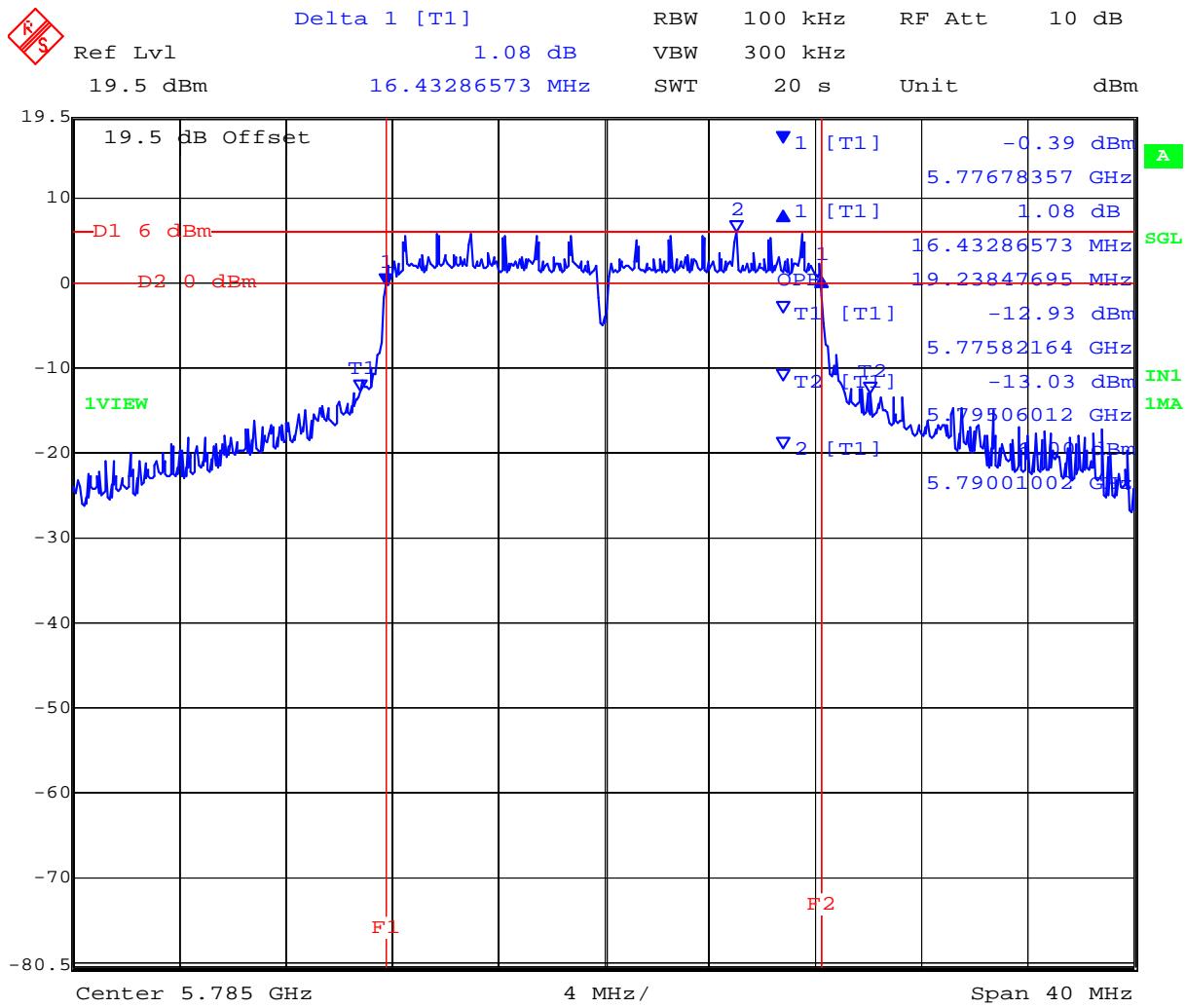
PORT B 5,785 MHz 802.11a Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 16:42:08

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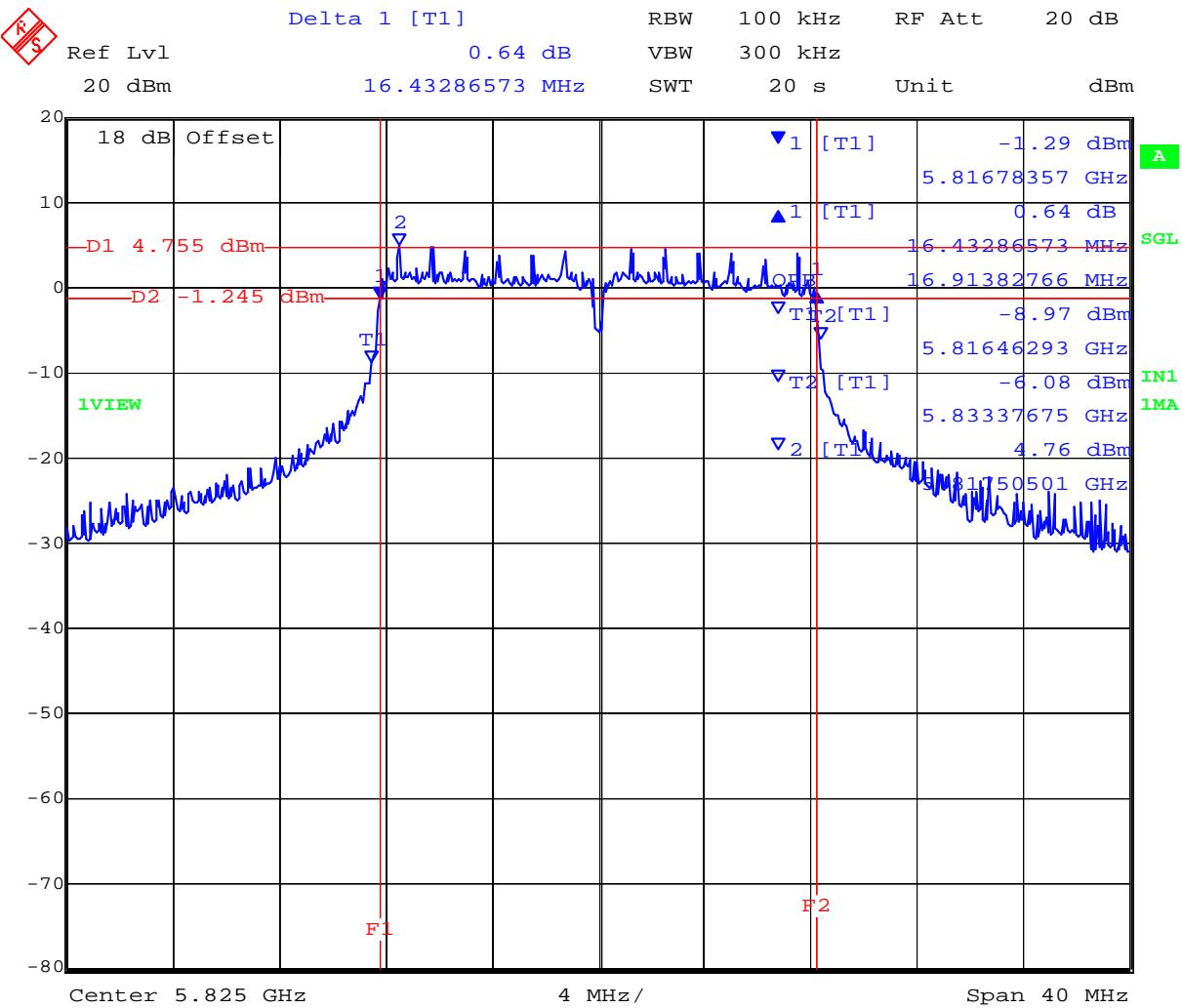
PORT C 5,785 MHz 802.11a Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 16:43:11

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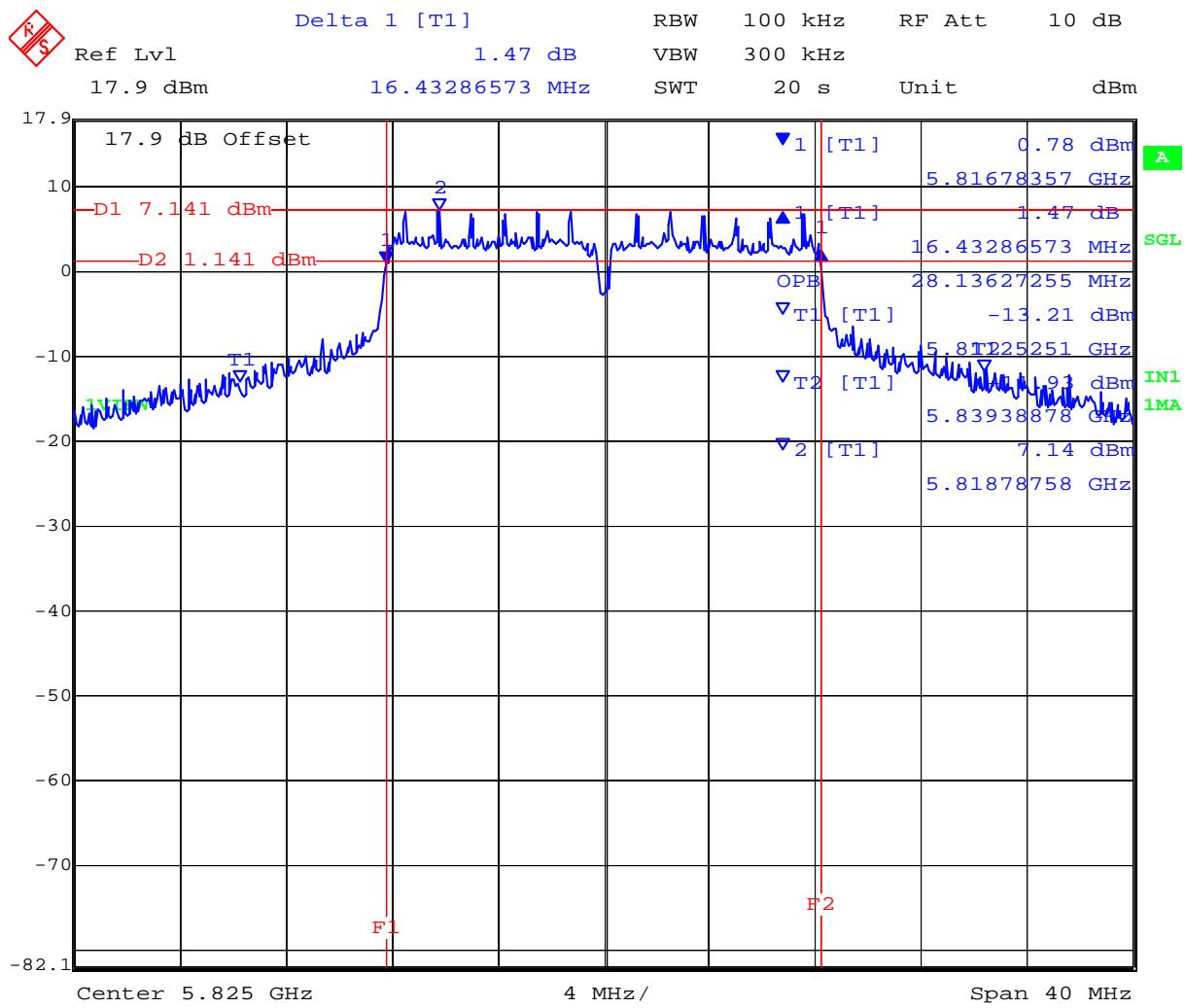
PORT A 5,825 MHz 802.11a Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 17:18:10

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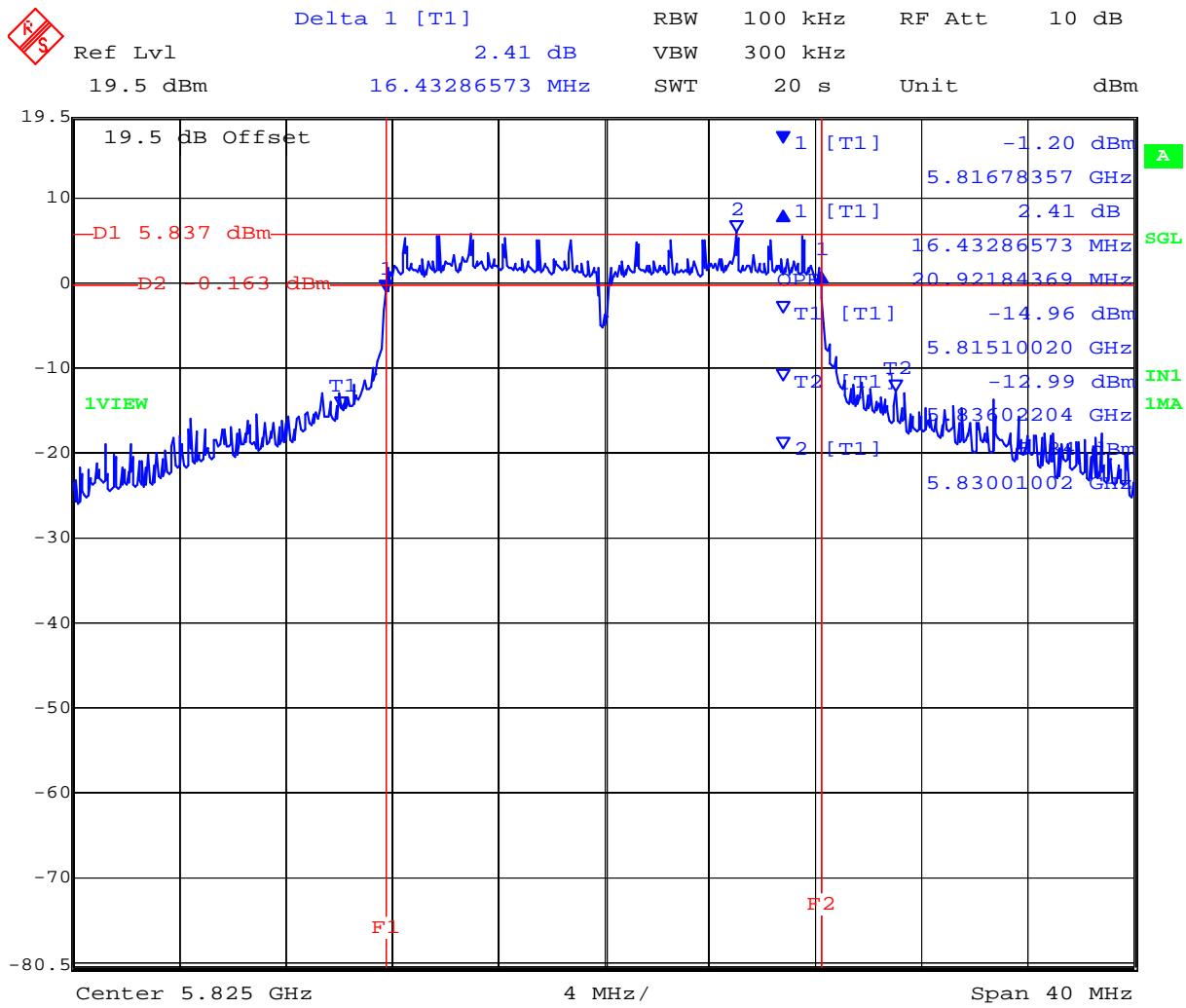
PORT B 5,825 MHz 802.11a Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 17:19:16

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PORT C 5.825 MHz 802.11a Legacy 6 dB and 99% Bandwidth



Date: 8.FEB.2012 17:20:20

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Title: Fluke Networks Sensor4 Wireless Client
To: FCC 47 CFR Part 15.247 & IC RSS-210
Serial #: AMGT14-U1 Rev B
Issue Date: 20th June 2012
Page: 77 of 342

TABLE OF RESULTS – 802.11n HT-20

Test Conditions:	15.247 (a)(2)	Rel. Humidity (%):	35 to 42
Variant:	802.11n HT-20	Ambient Temp. (°C):	19 to 22
TPC:	HIGH	Pressure (mBars):	998 to 1003
Modulation:	ON	Duty Cycle (%):	100
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	2 dBi
Applied Voltage:	48.00 Vdc		
Notes 1:			
Notes 2:			

6 dB Bandwidth

Test Frequency	6 dB Bandwidth				Minimum 6dB Bandwidth Limit		Margin
	MHz						
MHz	a	b	c	d	kHz	MHz	MHz
5745.000	17.715000	17.635000	17.635000	--	500	0.5	-17.135000
5785.000	17.715000	17.635000	17.635000	--			-17.135000
5825.000	17.635000	17.635000	17.635000	--			-17.135000

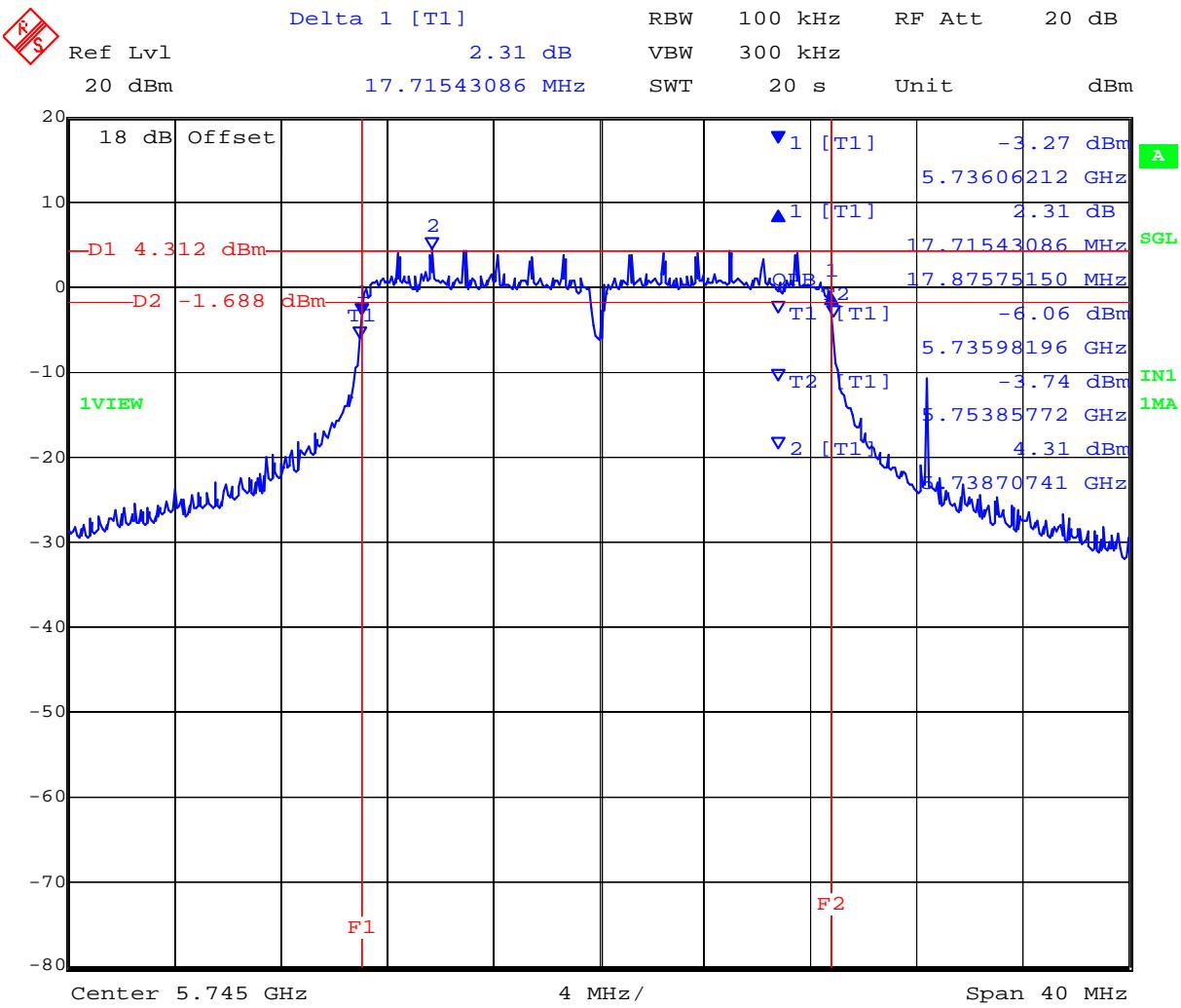
99% Bandwidth

Test Frequency	99 % Bandwidth						
	MHz						
MHz	a	b	c	d			
5745.000	17.876000	23.086000	18.036000	--			
5785.000	17.956000	26.693000	19.319000	--			
5825.000	17.956000	28.216000	19.960000	--			

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

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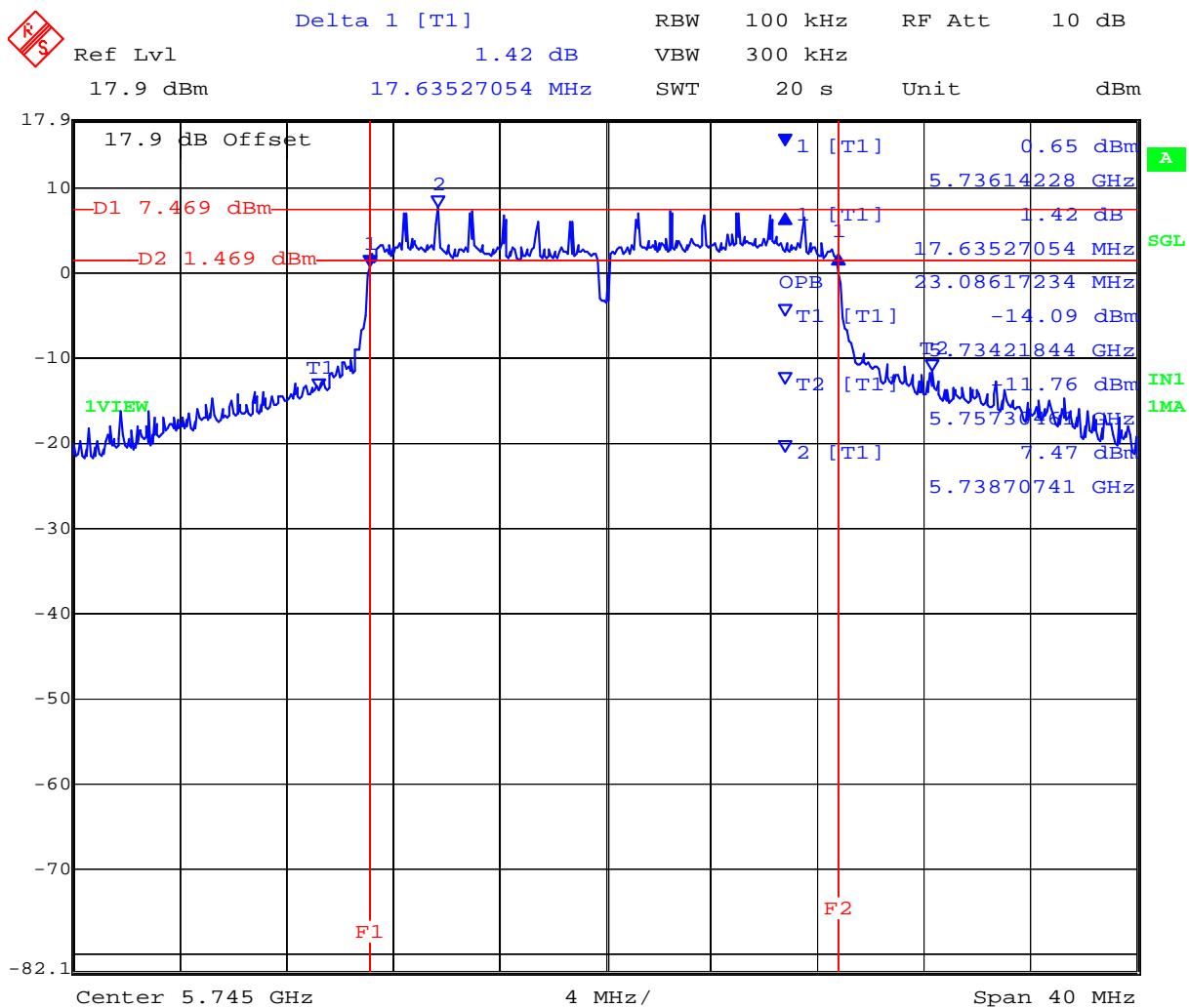
PORT A 5,745 MHz 802.11n HT-20 6 dB and 99% Bandwidth



Date: 8.FEB.2012 18:21:16

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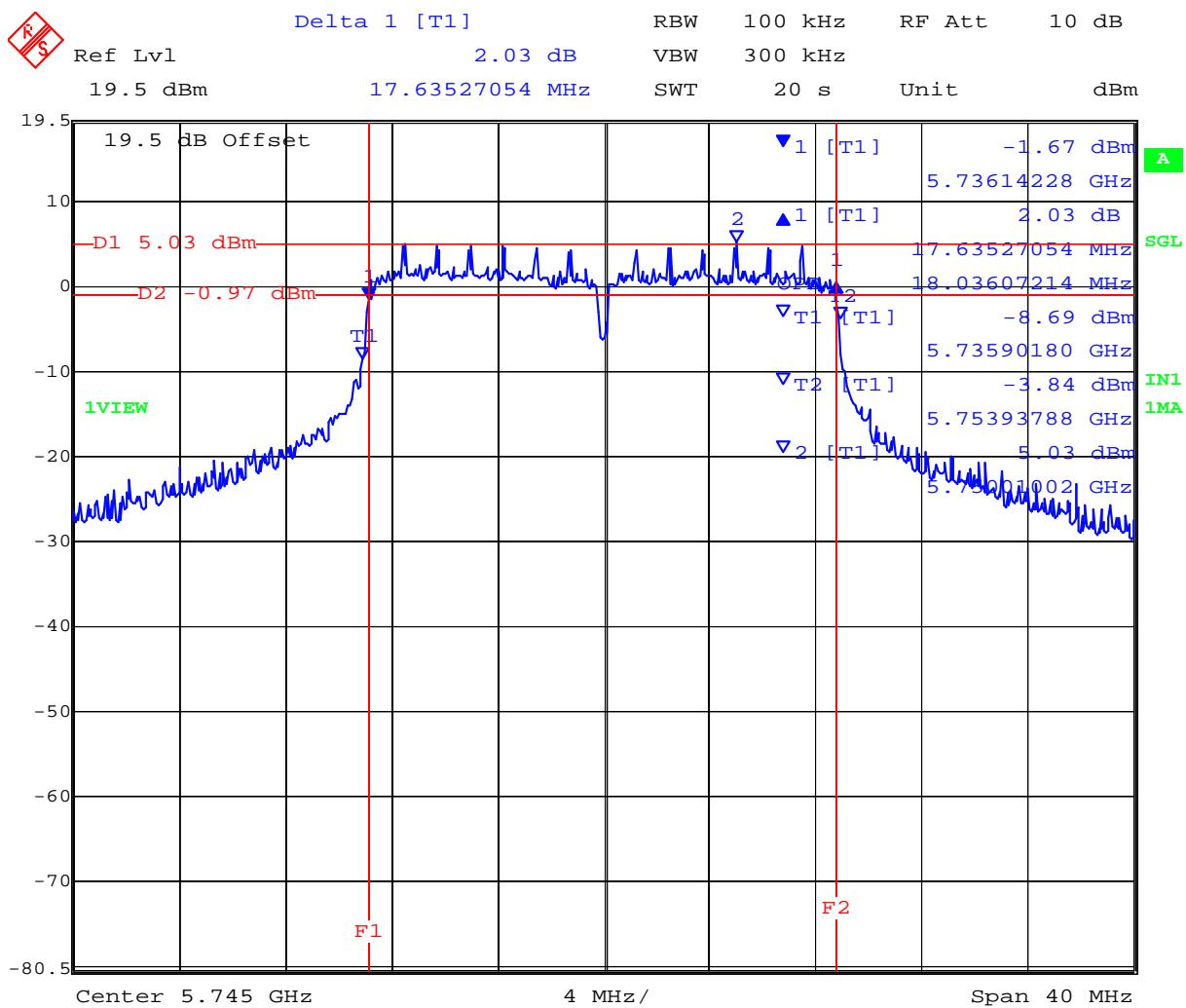
PORT B 5,745 MHz 802.11n HT-20 6 dB and 99% Bandwidth



Date: 8.FEB.2012 18:22:19

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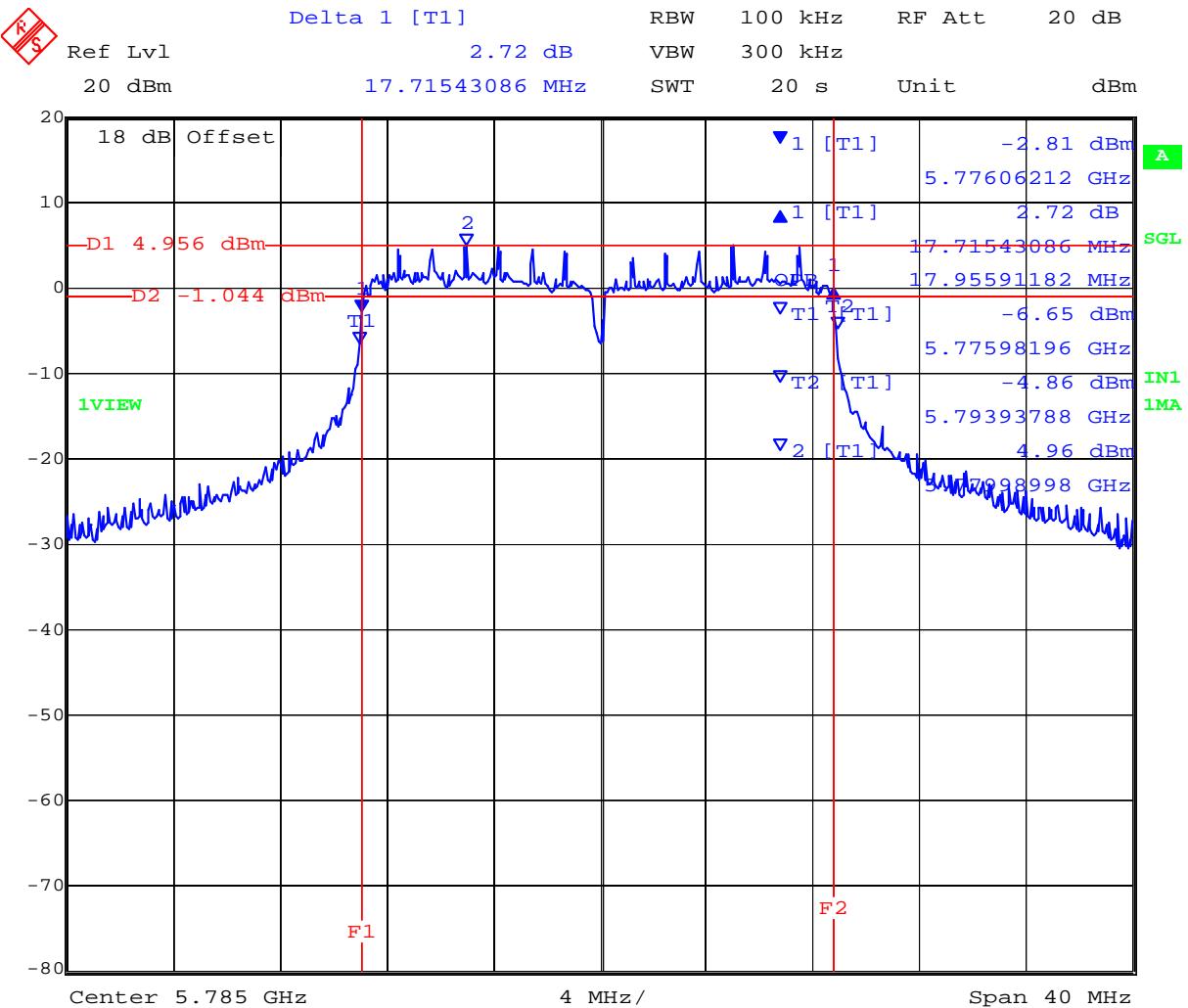
PORT C 5,745 MHz 802.11n HT-20 6 dB and 99% Bandwidth



Date: 8.FEB.2012 18:23:23

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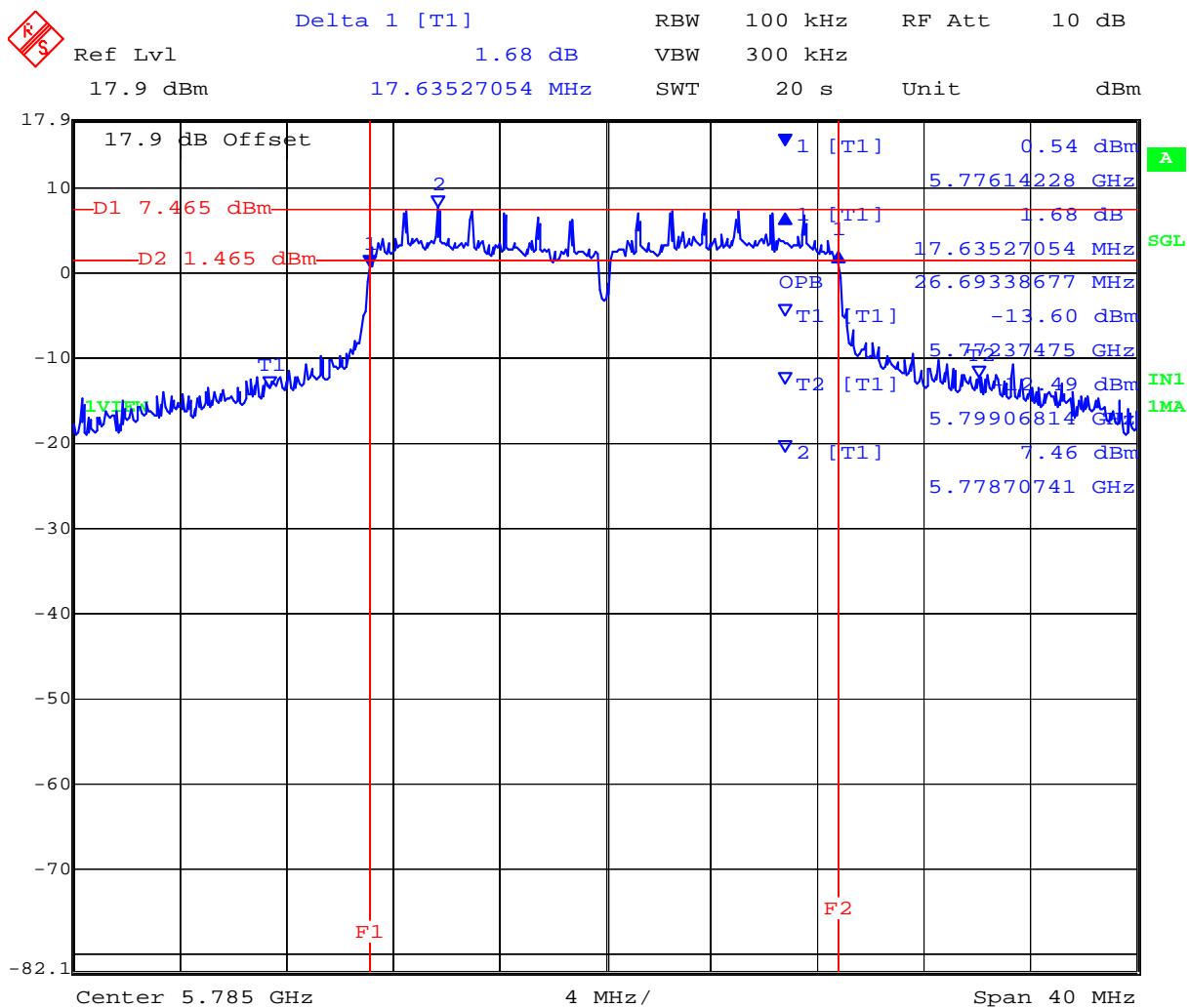
PORT A 5.785 MHz 802.11n HT-20 6 dB and 99% Bandwidth



Date: 8.FEB.2012 18:54:25

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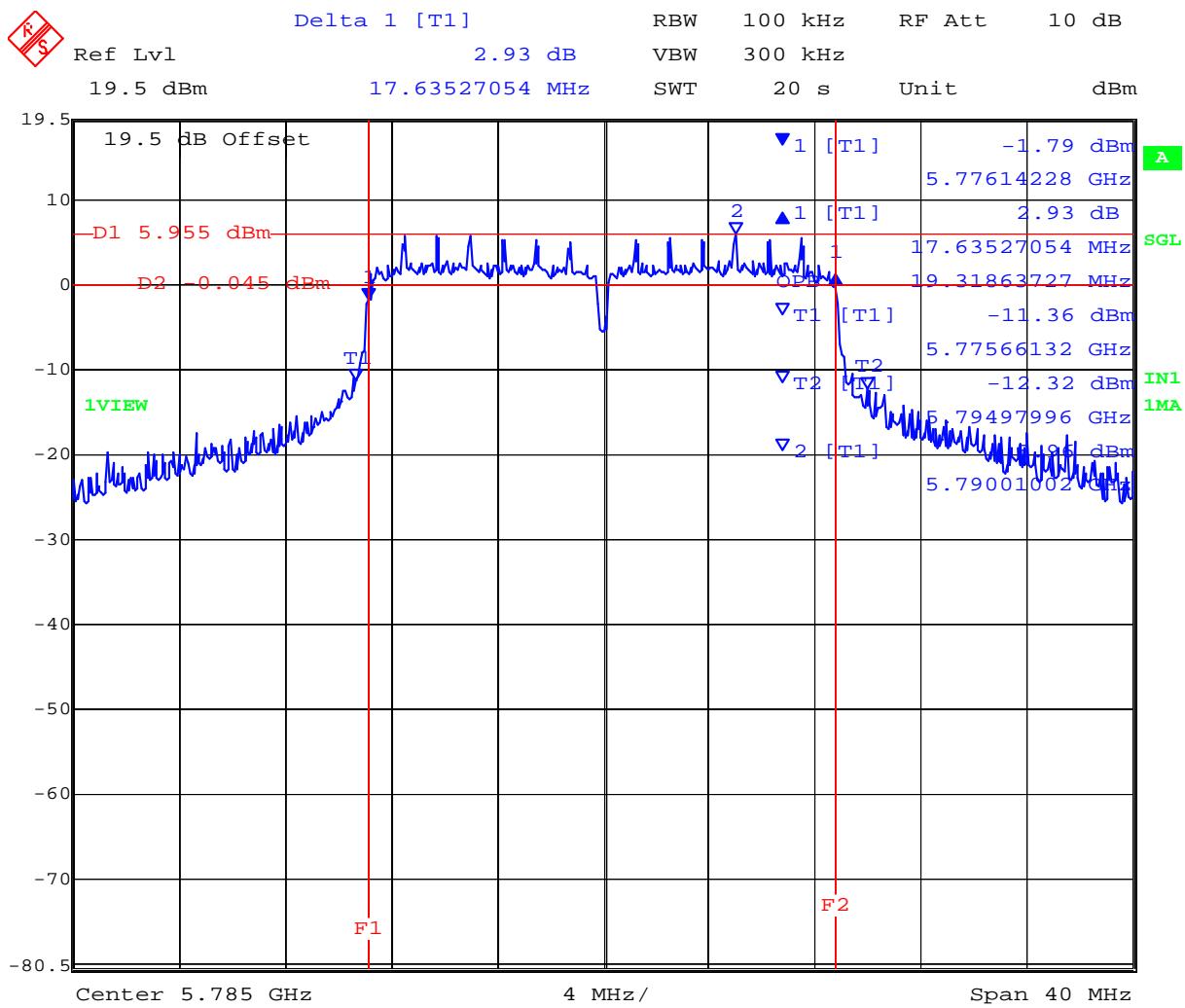
PORT B 5,785 MHz 802.11n HT-20 6 dB and 99% Bandwidth



Date: 8.FEB.2012 18:55:30

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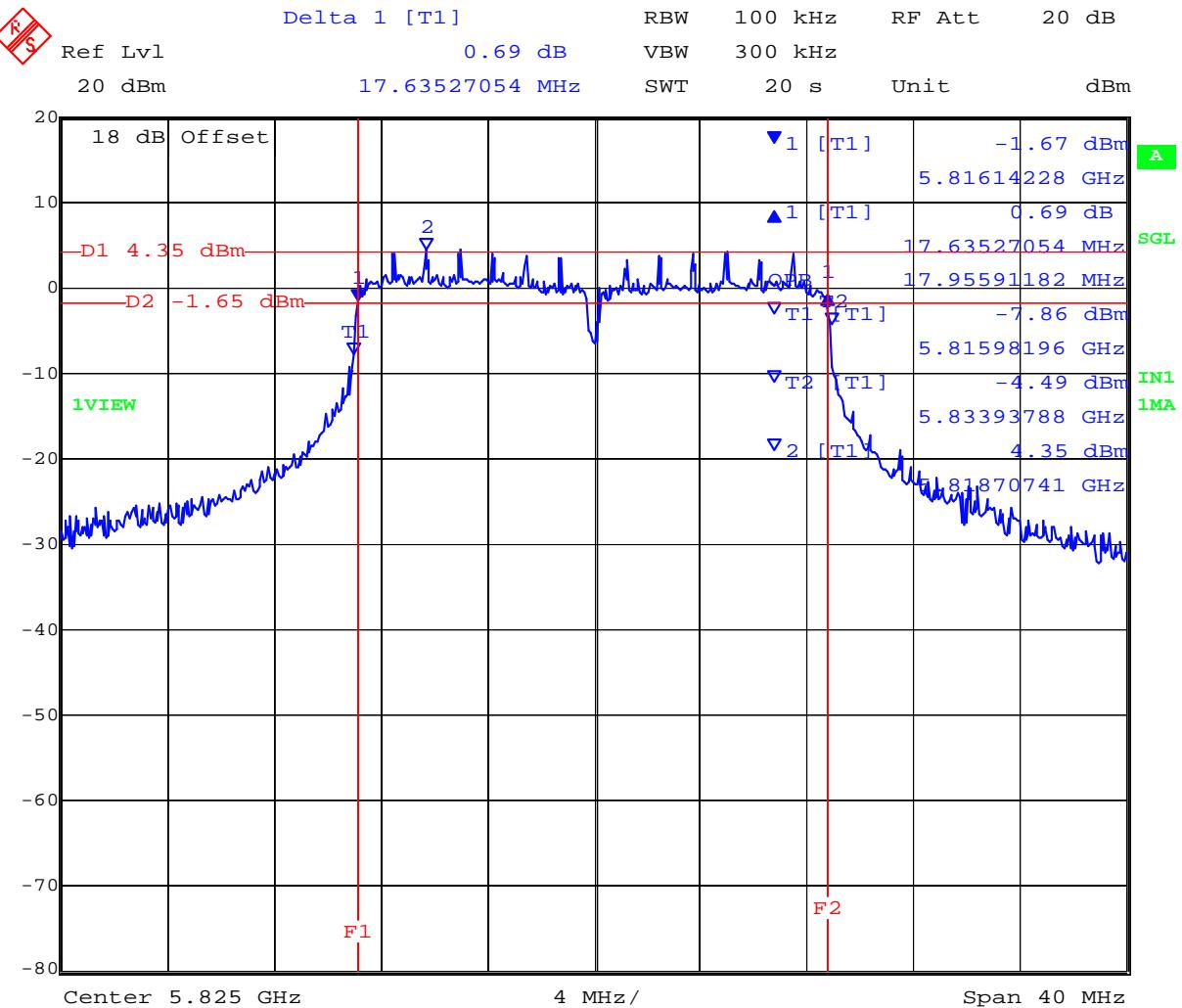
PORT C 5.785 MHz 802.11n HT-20 6 dB and 99% Bandwidth



Date: 8.FEB.2012 18:56:33

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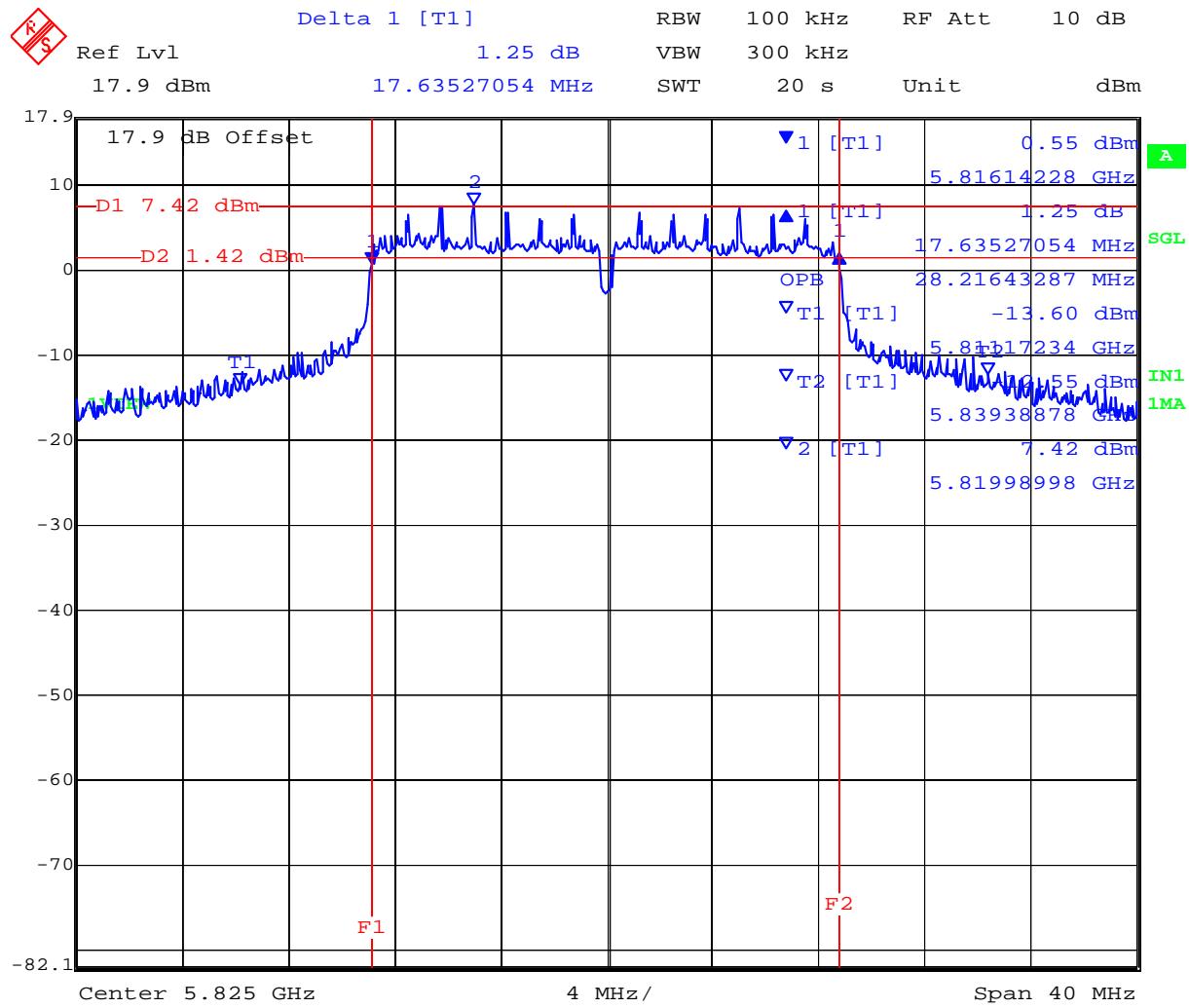
PORT A 5,825 MHz 802.11n HT-20 6 dB and 99% Bandwidth



Date: 8.FEB.2012 19:24:13

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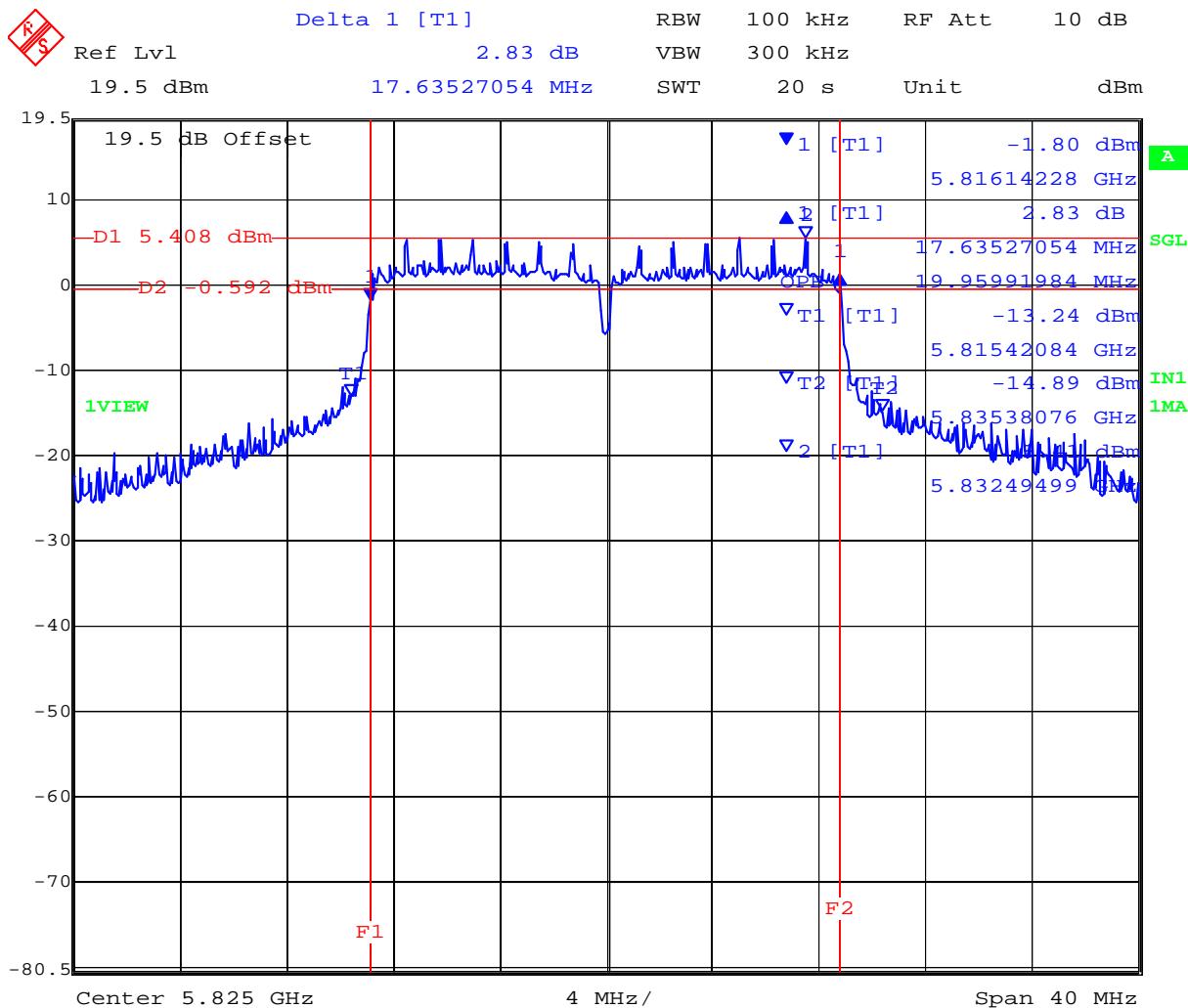
PORT B 5,825 MHz 802.11n HT-20 6 dB and 99% Bandwidth



Date: 8.FEB.2012 19:25:20

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



Date: 8.FEB.2012 19:26:24

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Title: Fluke Networks Sensor4 Wireless Client
To: FCC 47 CFR Part 15.247 & IC RSS-210
Serial #: AMGT14-U1 Rev B
Issue Date: 20th June 2012
Page: 87 of 342

TABLE OF RESULTS – 802.11n - HT-40

Test Conditions:	15.247 (a)(2)	Rel. Humidity (%):	35 to 42
Variant:	802.11n HT-40	Ambient Temp. (°C):	19 to 22
TPC:	HIGH	Pressure (mBars):	998 to 1003
Modulation:	ON	Duty Cycle (%):	100
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	2 dBi
Applied Voltage:	48.00 Vdc		
Notes 1:			
Notes 2:			

6 dB Bandwidth

Test Frequency	6 dB Bandwidth				Minimum 6dB Bandwidth Limit		Margin
	MHz						
MHz	a	b	c	d	kHz	MHz	MHz
5755.000	36.553000	36.232000	36.553000	--	500	0.5	-35.732000
5795.000	36.553000	36.232000	36.553000	--			-35.732000

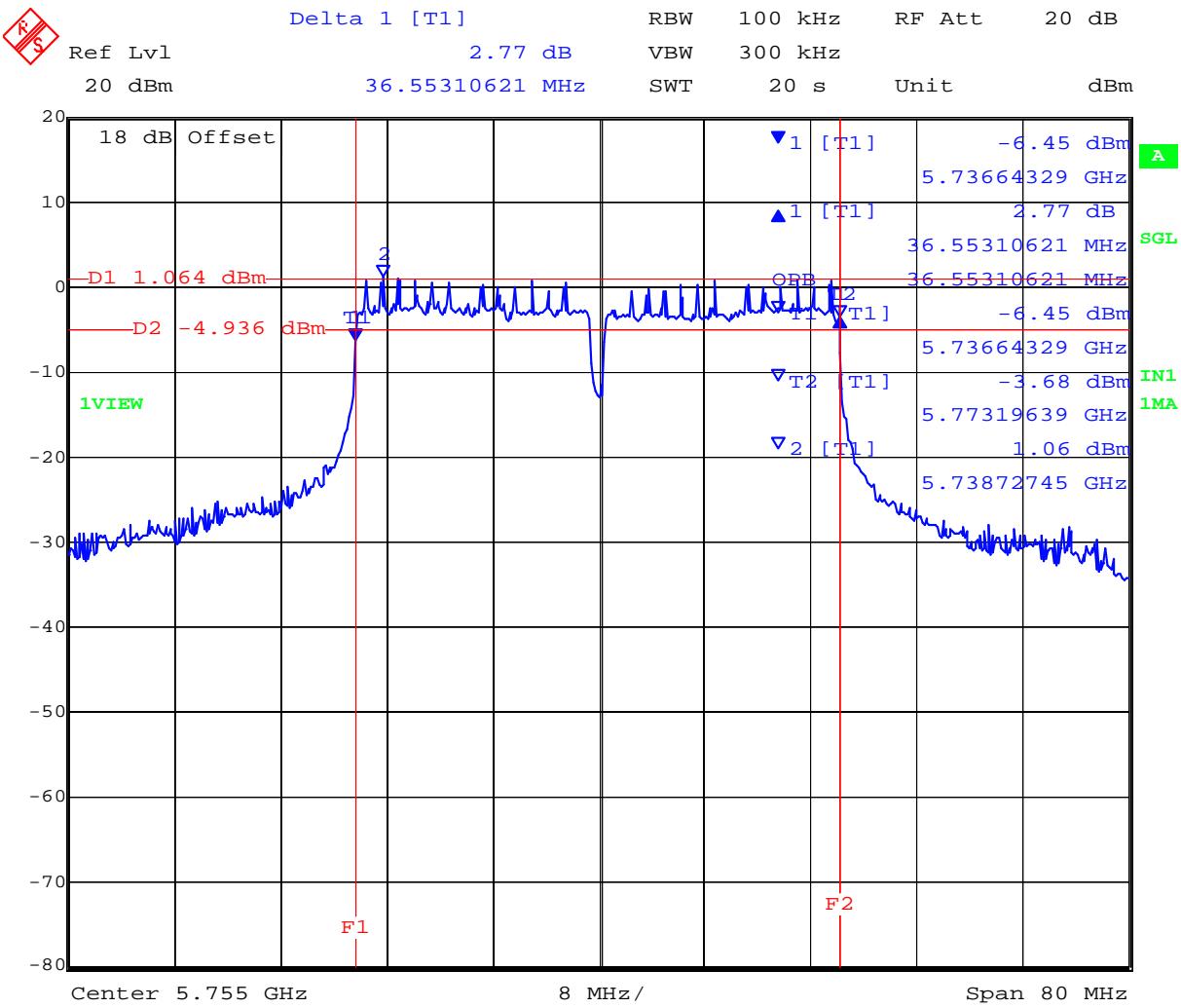
99% Bandwidth

Test Frequency	99 % Bandwidth						
	MHz						
MHz	a	b	c	d			
5755.000	36.553000	40.721000	36.553000	--			
5795.000	36.553000	51.303000	36.713000	--			

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

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.

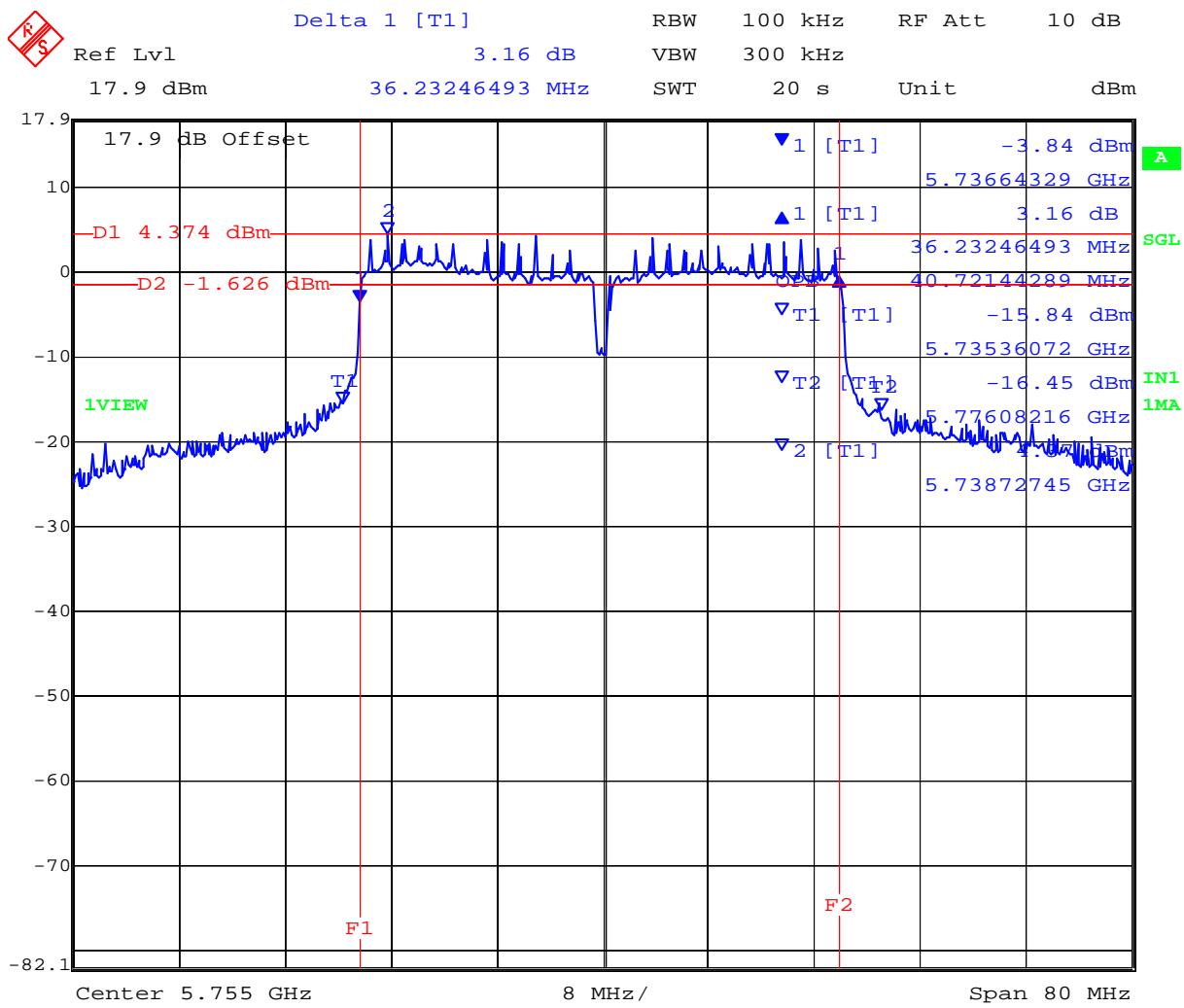
POR TA 5.755 MHz 802.11n HT-40 6 dB and 99% Bandwidth



Date: 8.FEB.2012 20:02:48

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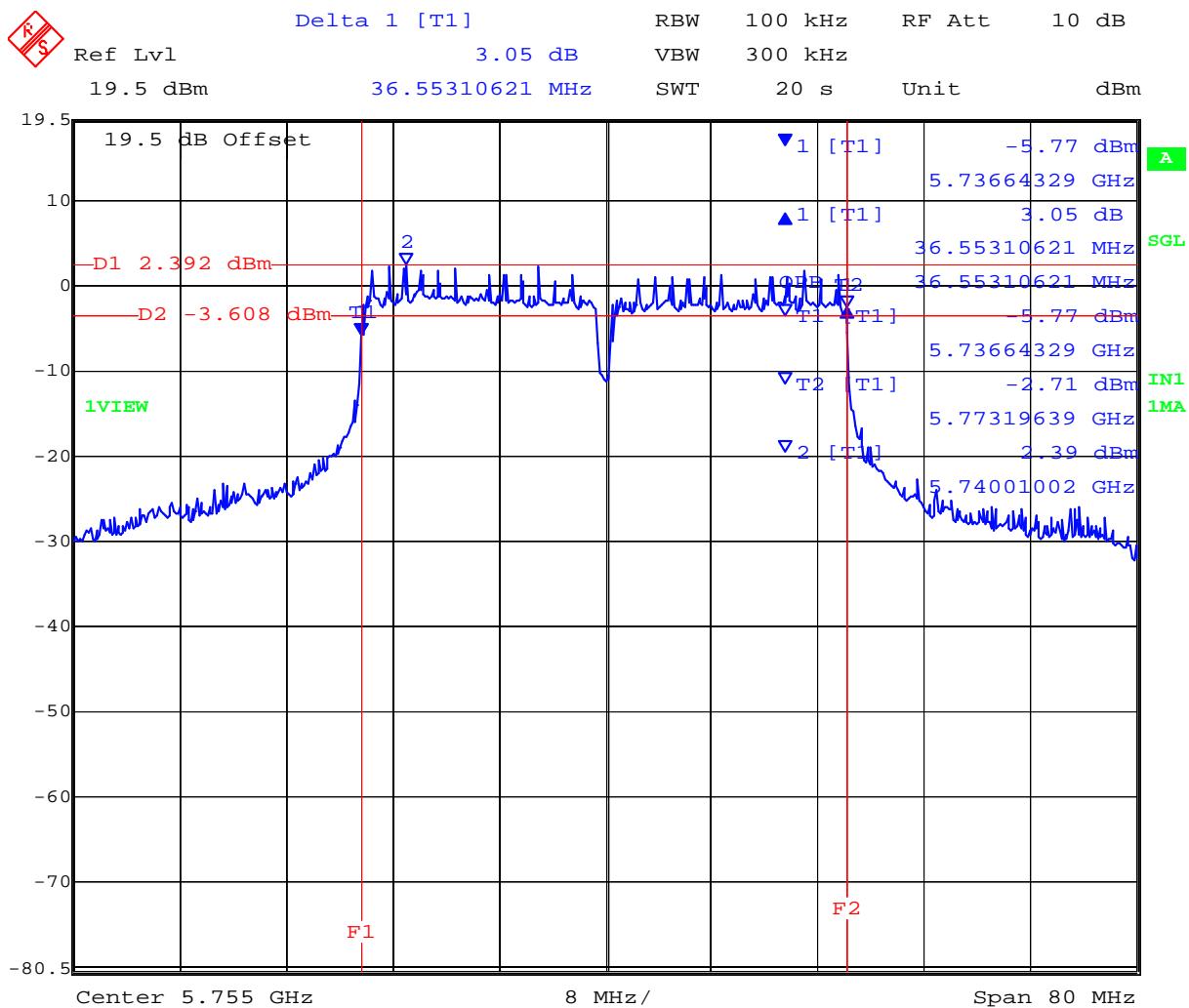
PORTB 5,755 MHz 802.11n HT-40 6 dB and 99% Bandwidth



Date: 8.FEB.2012 20:03:53

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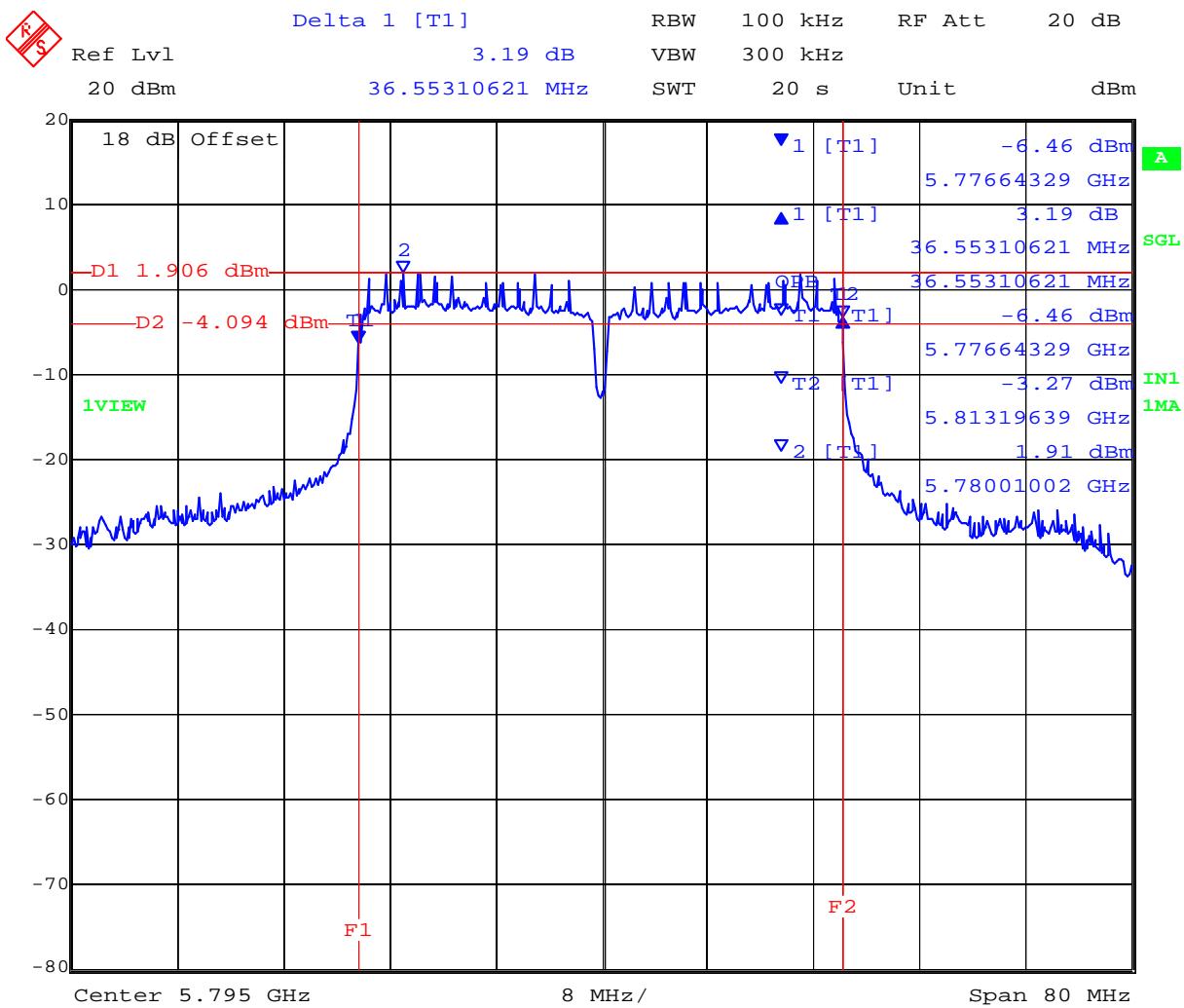
PORT C 5,755 MHz 802.11n HT-40 6 dB and 99% Bandwidth



Date: 8.FEB.2012 20:04:55

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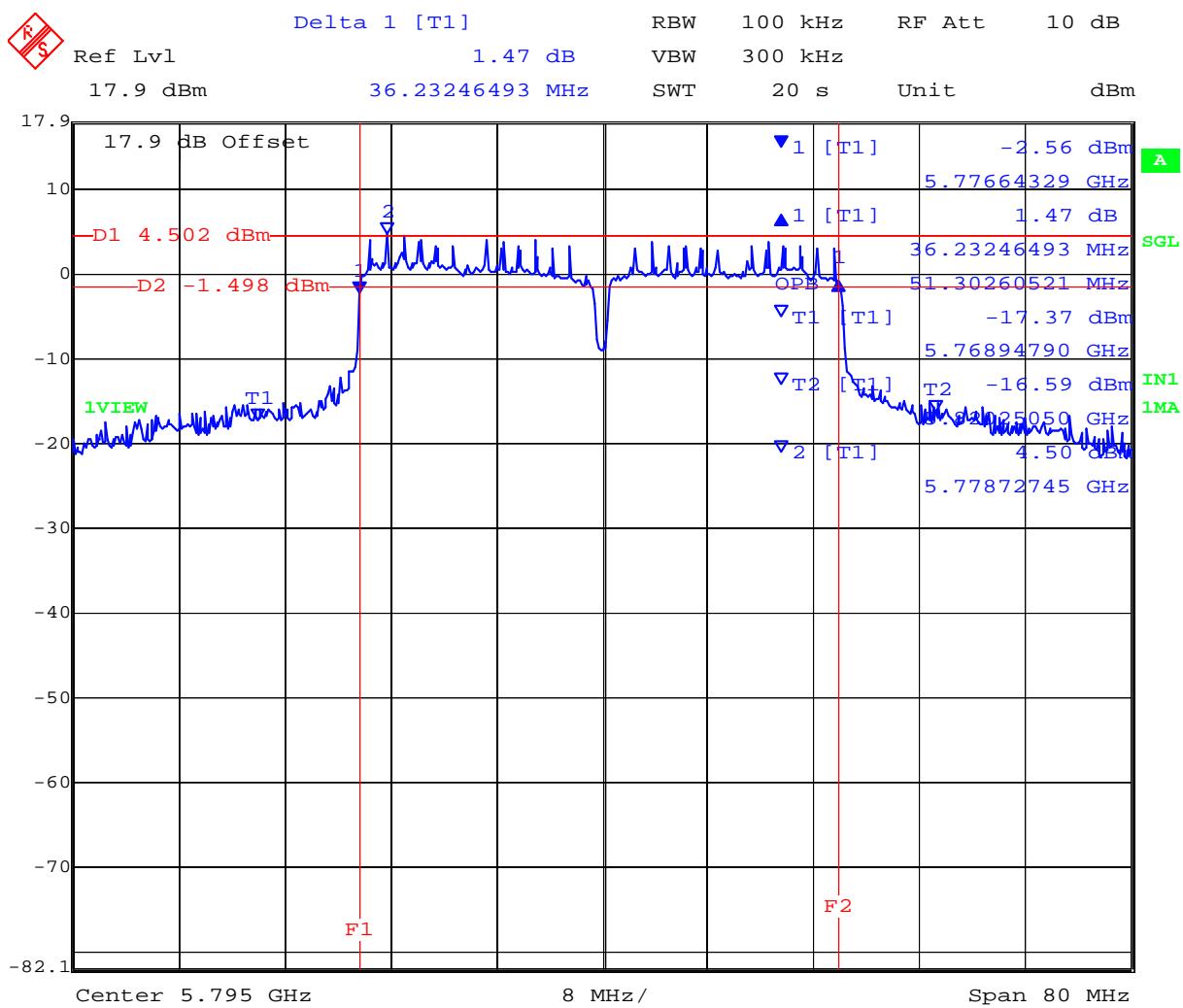
PORT A 5,795 MHz 802.11n HT-40 6 dB and 99% Bandwidth



Date: 8.FEB.2012 20:37:17

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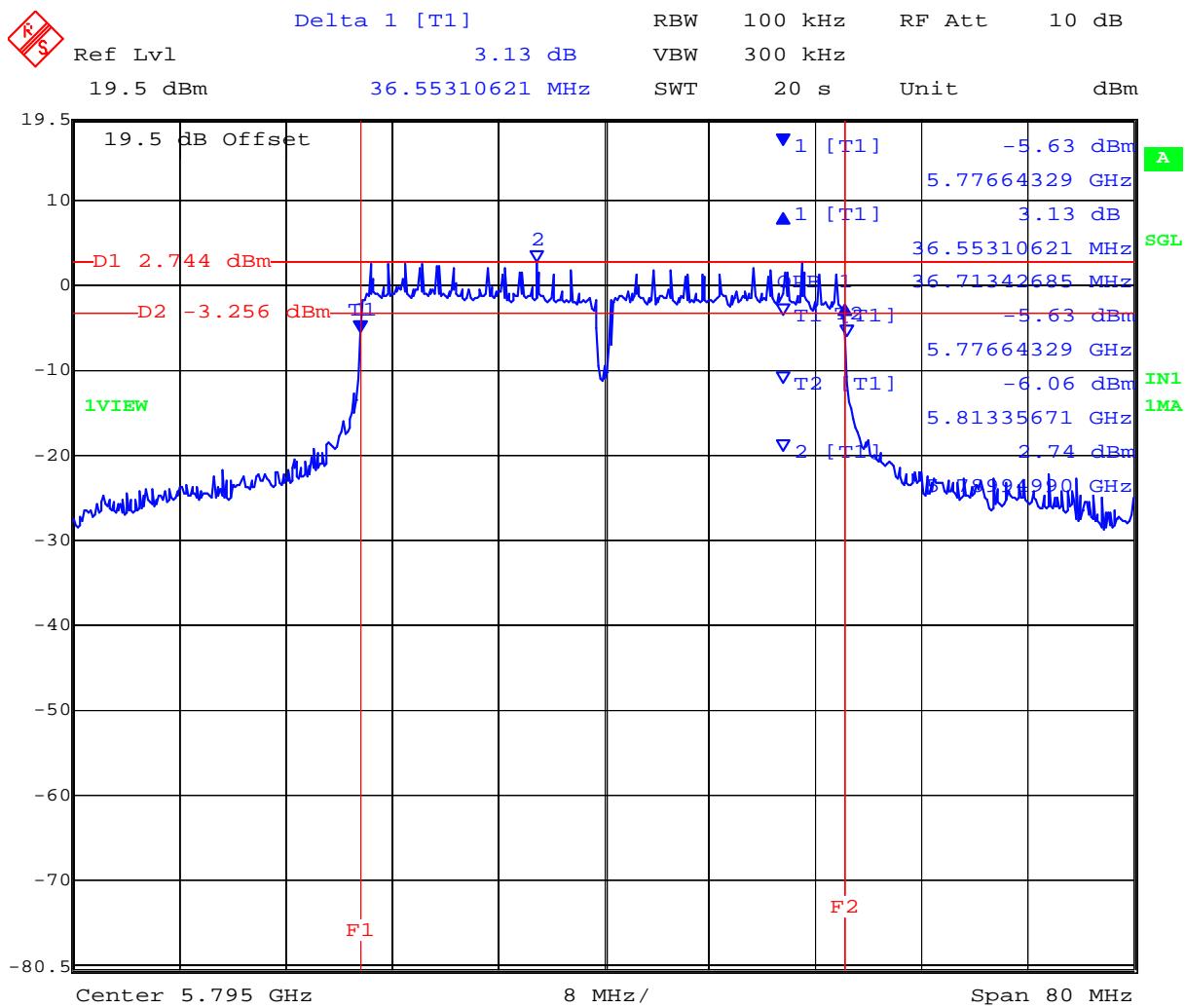
PORT B 5,795 MHz 802.11n HT-40 6 dB and 99% Bandwidth



Date: 8.FEB.2012 20:38:24

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PORT C 5,795 MHz 802.11n HT-40 6 dB and 99% Bandwidth



Date: 8.FEB.2012 20:39:28

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

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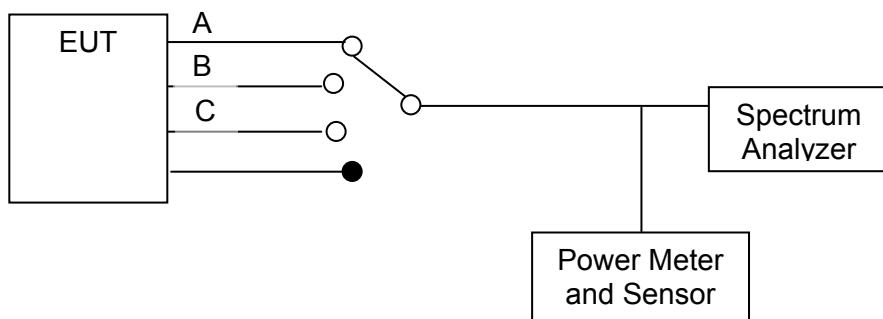
5.1.2. Peak Output Power

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

Radio Parameters

Duty Cycle: 100%

Output: Modulated Carrier

Power: Maximum Default Power

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

$A = \text{Total Power } [10 \log_{10} (10^{a/10} + 10^{b/10})]$, $G = \text{Antenna Gain}$,
 $x = \text{Duty Cycle}$

NOTE: KDB 662911 was implemented for In-band power measurements. The measure and sum technique was implemented in all cases.

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.

MIMO Operation

2.4 GHz MIMO (Non-Legacy Operation)

Antenna	Gain	Max. Allowable Conducted Peak Power (dBm)		Maximum EIRP
(dB)	(dBi)	Non-Beam Forming	Beam Forming	(dBm)
Integral	4.8	+30.0	N/A	+36.0
Integral	4.8	+30.0	N/A	+36.0

5.8 GHz MIMO Operation (Non-Legacy Operation)

Antenna	Gain	Max. Allowable Conducted Peak Power (dBm)		Maximum EIRP
(dB)	(dBi)	Non-Beam Forming	Beam Forming	(dBm)
Integral	4.8	+30.0	N/A	+36.0
Integral	4.8	+30.0	N/A	+36.0

Non-MIMO Operation

2.4 GHz Non-MIMO Operation (Legacy)

Antenna	Gain dBi	Antenna Gain Increase V's No. Antenna Ports		Total Gain	Max. Allowable Conducted Peak Power	Maximum EIRP
(dB)		Ports	dB	dB	(dBm)	(dBm)
Integral	4.8	3	4.77	9.57	+26.43	+36.0
Integral	4.8	3	4.77	9.57	+26.43	+36.0

5.8 GHz Non-MIMO Operation (Legacy)

Antenna	Gain dBi	Antenna Gain Increase V's No. Antenna Ports		Total Gain	Max. Allowable Conducted Peak Power	Maximum EIRP
(dB)		Ports	dB	dB	(dBm)	(dBm)
Integral	2.0	3	4.77	6.77	+29.23	+36.0
Integral	2.0	3	4.77	6.77	+29.23	+36.0



Title: Fluke Networks Sensor4 Wireless Client
To: FCC 47 CFR Part 15.247 & IC RSS-210
Serial #: AMGT14-U1 Rev B
Issue Date: 20th June 2012
Page: 97 of 342

TABLE OF RESULTS – 802.11b – Legacy

Output Power Conditions for Integral Antenna

Test Conditions:	15.247 (b)		Rel. Humidity (%):	35 to 42
Variant:	802.11b		Ambient Temp. (°C):	19 to 22
TPC:	HIGH		Pressure (mBars):	998 to 1003
Modulation:	ON		Duty Cycle (%):	100
Beam Forming Gain (Y):	N/A	dB	Antenna Gain:	4.8 dBi
Applied Voltage:	N/A	Vdc		
Notes 1:				
Notes 2:				

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
2412	15.78	15.99	15.64	--	N/A	20.58	30.00	-9.42
2437	20.37	20.64	20.36	--	N/A	25.23	30.00	-4.77
2462	18.30	18.67	17.32	--	N/A	22.90	30.00	-7.10

Measurement uncertainty:	±1.33 dB
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Output Power Conditions for External Antenna

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

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
2412	14.89	14.54	15.15	--	N/A	19.64	30.00	-10.36
2437	19.00	19.52	19.56	--	N/A	24.14	30.00	-5.86
2462	18.30	18.67	17.32	--	N/A	22.90	30.00	-7.10

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

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Title: Fluke Networks Sensor4 Wireless Client
To: FCC 47 CFR Part 15.247 & IC RSS-210
Serial #: AMGT14-U1 Rev B
Issue Date: 20th June 2012
Page: 98 of 342

TABLE OF RESULTS – 802.11g – Legacy

Output Power Conditions for Integral Antenna

Test Conditions:	15.247 (b)		Rel. Humidity (%):	35 to 42
Variant:	802.11g		Ambient Temp. (°C):	19 to 22
TPC:	HIGH		Pressure (mBars):	998 to 1003
Modulation:	ON		Duty Cycle (%):	100
Beam Forming Gain (Y):	N/A	dB	Antenna Gain:	4.8 dBi
Applied Voltage:	N/A	Vdc		
Notes 1:				
Notes 2:				

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
2412	15.06	14.74	15.16	--	N/A	19.76	30.00	-10.24
2437	18.01	18.28	18.52	--	N/A	23.05	30.00	-6.95
2462	14.63	13.45	14.88	--	N/A	19.13	30.00	-10.87

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

Output Power Conditions for External Antenna

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

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
2412	15.06	14.74	15.16	--	N/A	19.76	30.00	-10.24
2437	16.44	16.62	16.87	--	N/A	21.42	30.00	-8.58
2462	14.63	13.45	14.88	--	N/A	19.13	30.00	-10.87

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

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TABLE OF RESULTS – 802.11n – HT-20

Output Power Conditions for Integral Antenna

Test Conditions:	15.247 (b)		Rel. Humidity (%):	35 to 42
Variant:	802.11n HT-20		Ambient Temp. (°C):	19 to 22
TPC:	HIGH		Pressure (mBars):	998 to 1003
Modulation:	ON		Duty Cycle (%):	100
Beam Forming Gain (Y):	N/A	dB	Antenna Gain:	4.8 dBi
Applied Voltage:	N/A	Vdc		
Notes 1:				
Notes 2:				

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
2412	15.66	15.97	15.74	--	N/A	20.56	30.00	-9.44
2437	17.81	18.49	18.59	--	N/A	23.08	30.00	-6.92
2462	13.16	12.32	13.48	--	N/A	17.78	30.00	-12.22

Measurement uncertainty:	±1.33 dB
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Output Power Conditions for External Antenna

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

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
2412	15.66	15.97	15.74	--	N/A	20.56	30.00	-9.44
2437	17.82	17.58	17.80	--	N/A	22.51	30.00	-7.49
2462	14.64	14.32	15.11	--	N/A	19.47	30.00	-10.53

Measurement uncertainty:	±1.33 dB
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TABLE OF RESULTS – 802.11n – HT-40

Output Power Conditions for Integral Antenna

Test Conditions:	15.247 (b)	Rel. Humidity (%):	35 to 42
Variant:	802.11n HT-40	Ambient Temp. (°C):	19 to 22
TPC:	HIGH	Pressure (mBars):	998 to 1003
Modulation:	ON	Duty Cycle (%):	
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	4.8 dBi
Applied Voltage:	N/A Vdc		
Notes 1:			
Notes 2:			

Test Frequency	Measured Peak Power				Total Power (dBm)	Limit	Margin	
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
2422	16.22	16.12	16.44	--	N/A	21.03	30.00	-8.97
2437	20.23	20.31	20.11	--	N/A	24.99	30.00	-5.01
2452	13.75	12.90	14.19	--	N/A	18.42	30.00	-11.58

Measurement uncertainty:	±1.33 dB
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Output Power Conditions for External Antenna

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

Test Frequency	Measured Peak Power				Total Power (dBm)	Limit	Margin	
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
2422	15.39	15.43	15.85	--	N/A	20.33	30.00	-9.67
2437	17.65	17.62	18.22	--	N/A	22.61	30.00	-7.39
2452	14.91	14.54	15.42	--	N/A	19.74	30.00	-10.26

Measurement uncertainty:	±1.33 dB
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2.4 GHz Power Settings

	Integral Antenna Settings			External Antenna Settings		
	b	g	HT-20	b	g	HT-20
2412	14	13	14	13	13	14
2437	20	17	17	18	15	16
2462	17	13	12	17	13	14

	HT-40	HT-40
2422	14	13
2437	20	16
2452	12	13

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5.8 GHz Band

TABLE OF RESULTS – 802.11a – Legacy

Test Conditions:	15.247 (b)	Rel. Humidity (%):	35	to	42
Variant:	802.11a	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A	Antenna Gain:	2	dBi	
Applied Voltage:	48.00	Vdc			
Notes 1:					
Notes 2:					

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5745	14.84	17.52	15.65	--	N/A	20.92	30.00	-9.08
5785	15.07	17.48	16.16	--	N/A	21.12	30.00	-8.88
5825	14.77	17.11	16.00	--	N/A	20.84	30.00	-9.16

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

NOTE: Power settings for both the integral and external antennas are the same and use the above power values

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TABLE OF RESULTS – 802.11n – HT-20

Maximum Conducted Power

Test Conditions:	15.247 (b)	Rel. Humidity (%):	35 to 42
Variant:	802.11n HT-20	Ambient Temp. (°C):	19 to 22
TPC:	HIGH	Pressure (mBars):	998 to 1003
Modulation:	ON	Duty Cycle (%):	100
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	2 dBi
Applied Voltage:	48.00 Vdc		
Notes 1:			
Notes 2:			

Test Frequency	Measured Peak Power				Total Power (dBm)	Limit	Margin	
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5745	14.44	17.10	15.34	--	N/A	20.54	30.00	-9.46
5785	14.97	17.39	16.13	--	N/A	21.05	30.00	-8.95
5825	14.36	17.01	15.99	--	N/A	20.69	30.00	-9.31

Measurement uncertainty:	±1.33 dB
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NOTE: Power settings for both the integral and external antennas are the same and use the above power values

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TABLE OF RESULTS – 802.11n – HT-40

Maximum Conducted Power

Test Conditions:	15.247 (b)	Rel. Humidity (%):	35 to 42
Variant:	802.11n HT-40	Ambient Temp. (°C):	19 to 22
TPC:	HIGH	Pressure (mBars):	998 to 1003
Modulation:	ON	Duty Cycle (%):	100
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	2 dBi
Applied Voltage:	48.00 Vdc		
Notes 1:			
Notes 2:			

Test Frequency	Measured Peak Power				Total Power (dBm)		Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	Combined	Calculated	dBm	dB
5755	14.11	17.05	15.11	--	N/A	20.37	30.00	-9.63
5795	14.76	17.25	15.91	--	N/A	20.86	30.00	-9.14

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

NOTE: Power settings for both the integral and external antennas are the same and use the above power values

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5.8 GHz Power Settings

	Integral Antenna Settings		External Antenna Settings	
5745	a	HT-20	a	HT-20
	20	20	20	20
5785	20	20	20	20
5825	20	20	20	20
	HT-40		HT-40	
5755	20		20	
5795	20		20	

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.



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

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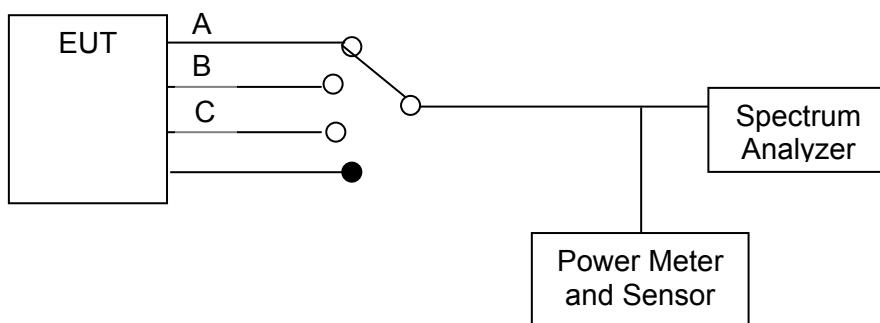
5.1.3. Peak Power Spectral Density

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

**NOTE: KDB 662911 was implemented for In-band power spectral density (PSD) measurements.
Option (2) Measure and add 10 log (N) dB was implemented**

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Peak Power Spectral Density

TABLE OF RESULTS – 802.11b

Test Conditions:	15.247 (e)	Rel. Humidity (%):	35	to	42
Variant:	802.11b	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	2	dBi	
Applied Voltage:	48.00 Vdc	Antenna Ports (N):	3		
Notes 1:					
Notes 2:					

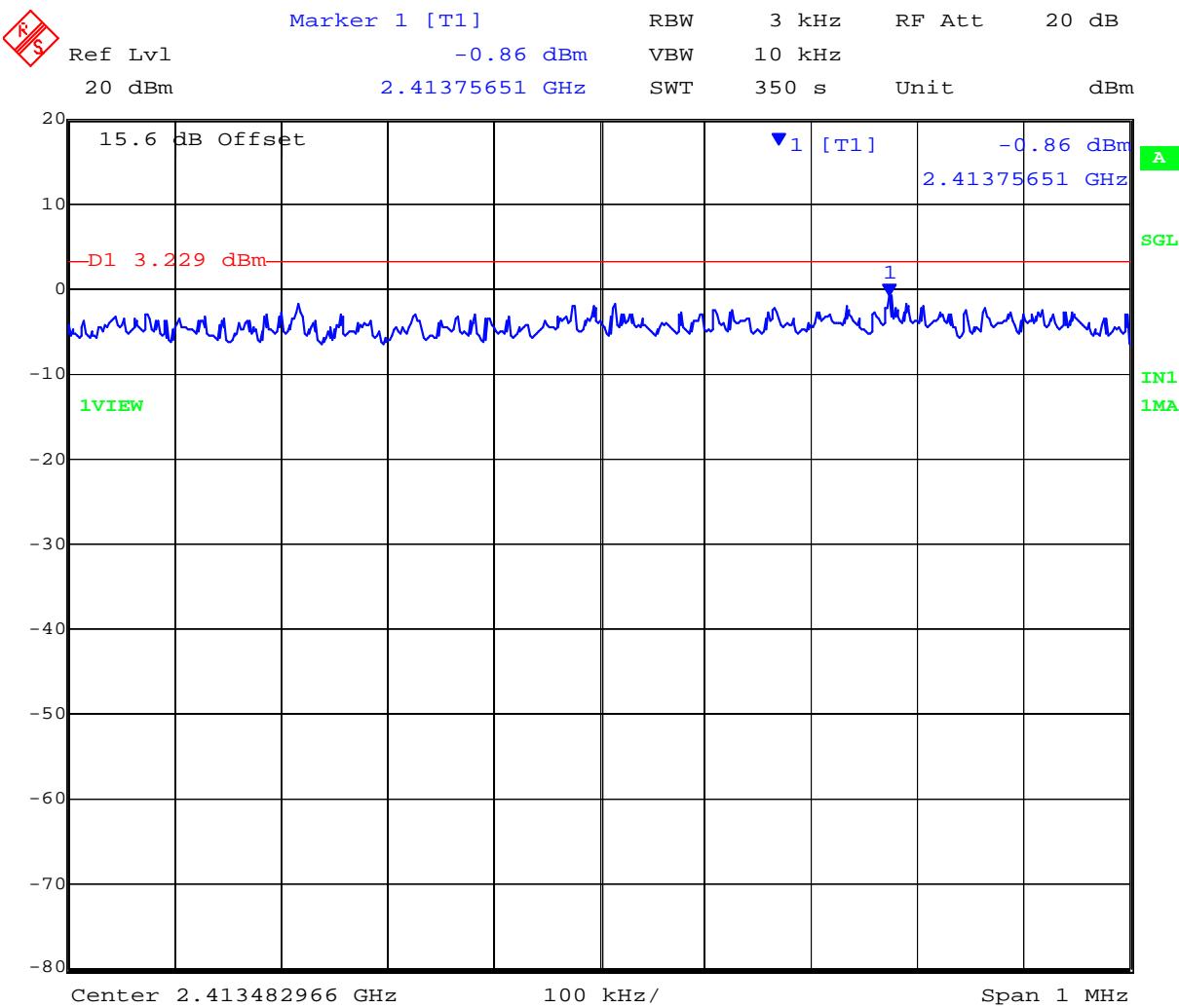
Test Frequency	Measured Power Density				Correction factor	Peak Power Spectral Density	Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	10Log(N)	dBm	dBm	dB
2412.000	-0.86	-1.53	-0.95	--	4.77	3.91	8.00	-4.09
2437.000	-1.15	-1.12	-0.38	--	4.77	4.40	8.00	-3.60
2462.000	-2.02	-1.38	-0.66	--	4.77	4.11	8.00	-3.89

Measurement uncertainty:

± 1.33 dB

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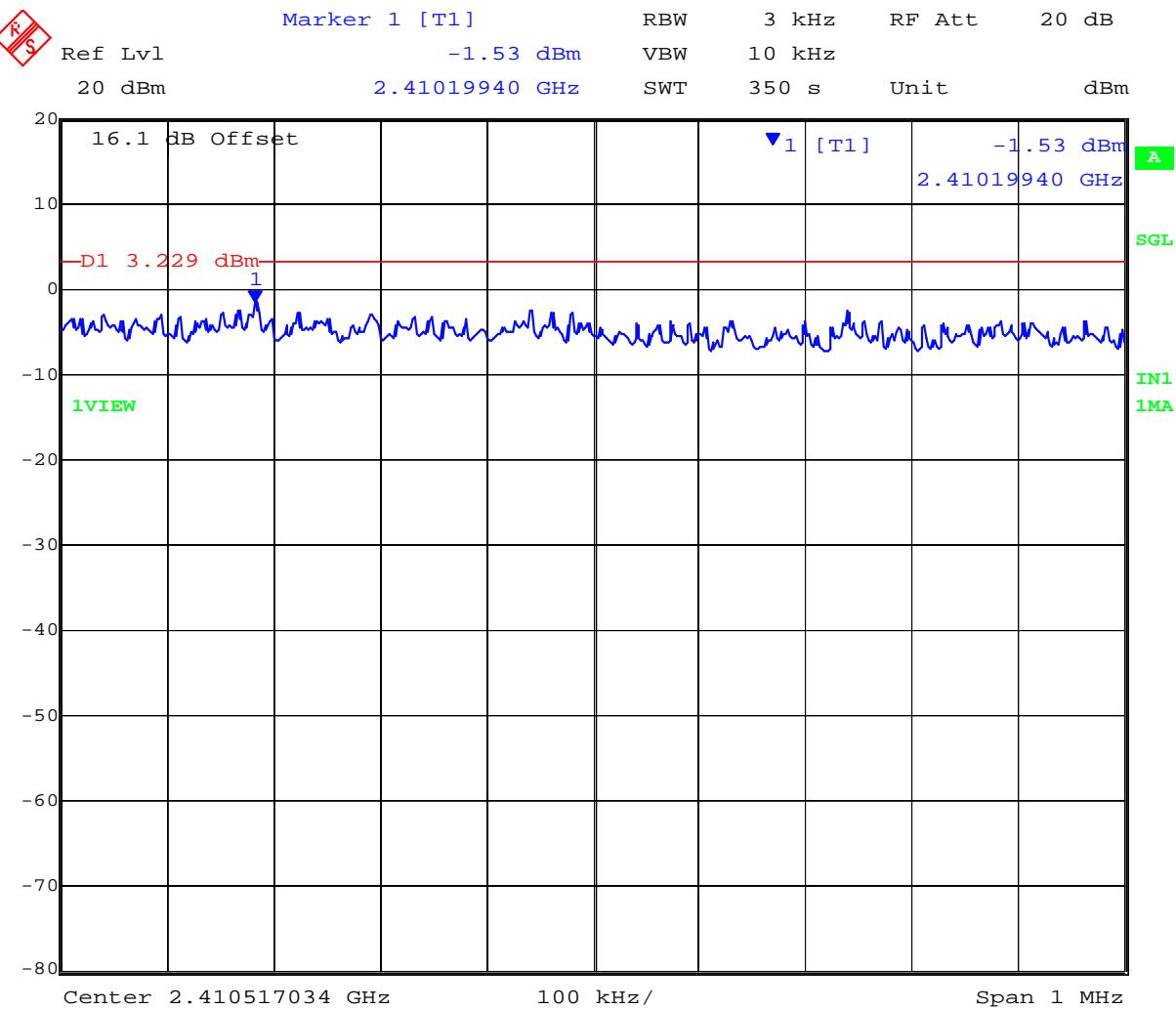
PORT A 2,412 MHz 802.11b - Peak Power Spectral Density



Date: 7.FEB.2012 15:01:44

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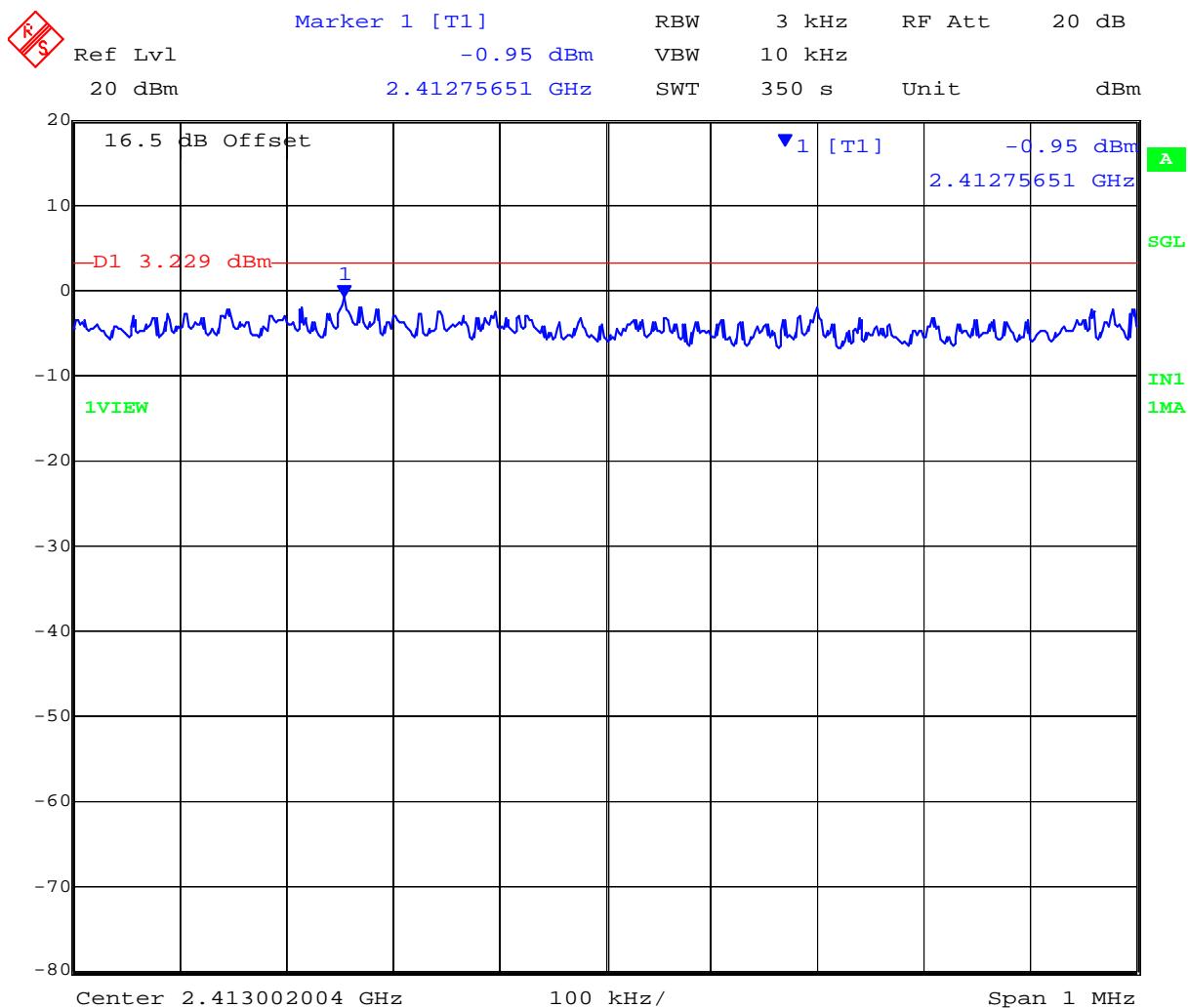
PORT B 2,412 MHz 802.11b - Peak Power Spectral Density



Date: 7.FEB.2012 15:08:15

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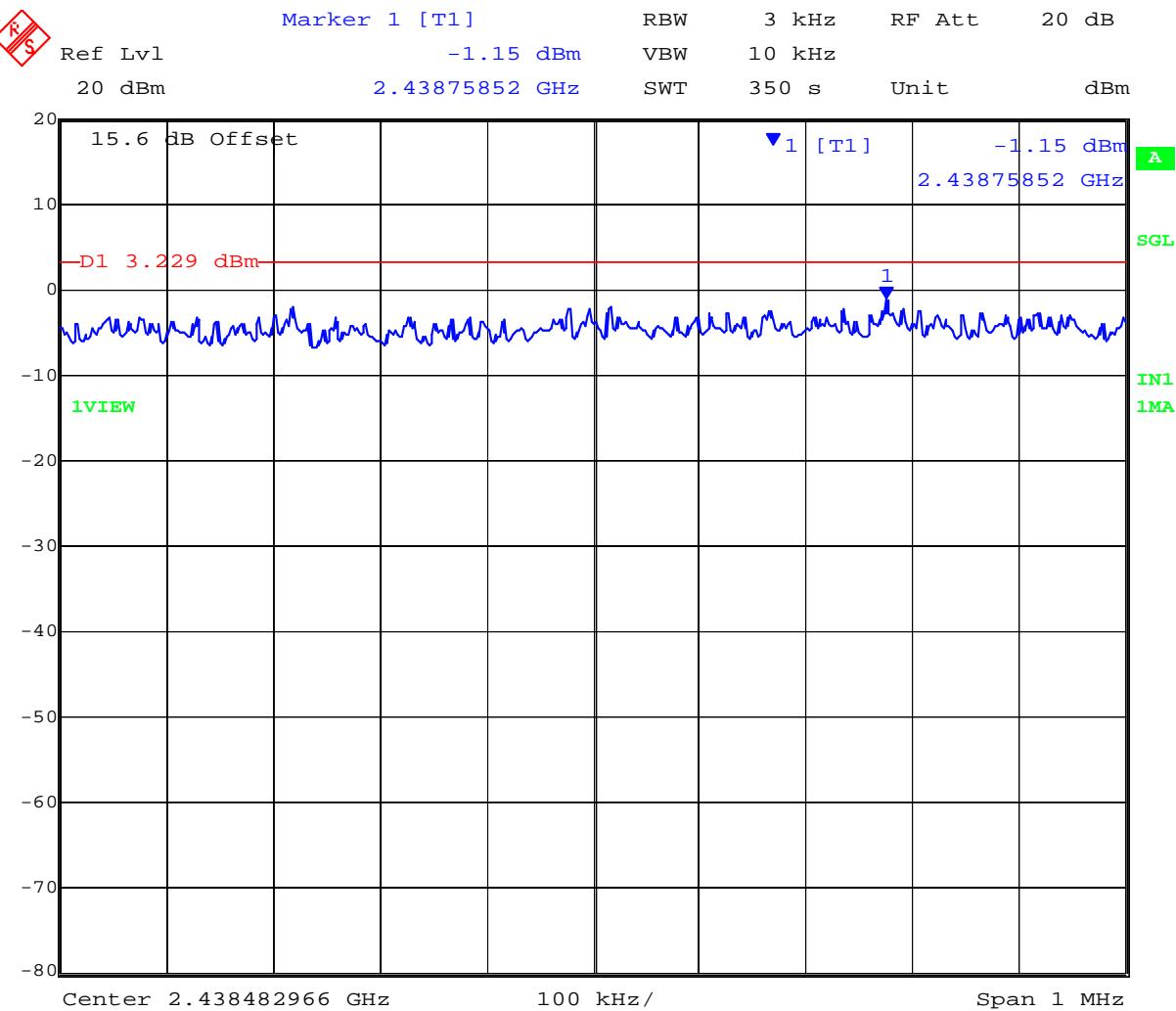
PORT C 2,412 MHz 802.11b - Peak Power Spectral Density



Date: 7.FEB.2012 15:14:44

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PORT A 2,437 MHz 802.11b - Peak Power Spectral Density



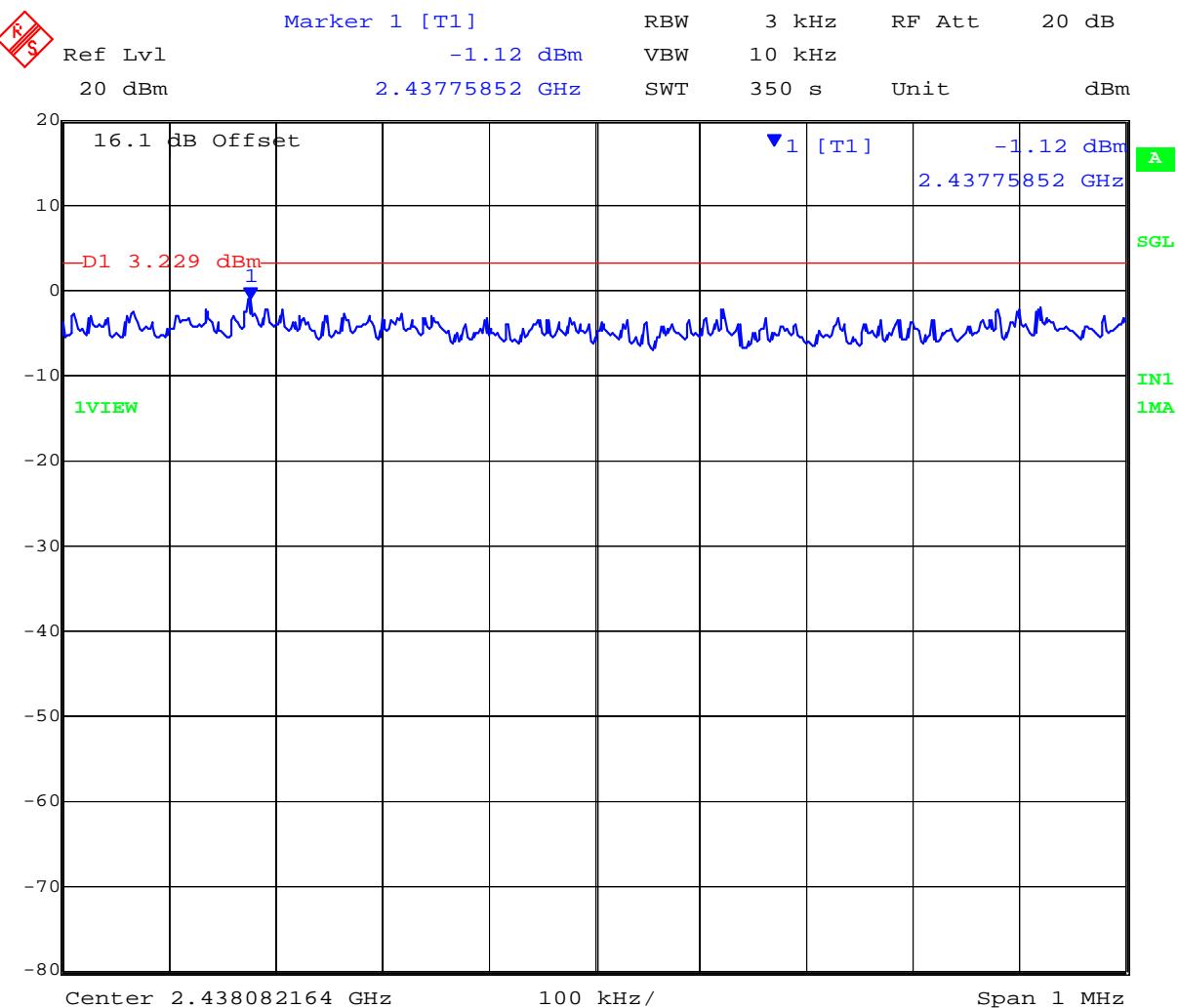
Date: 7.FEB.2012 15:32:00

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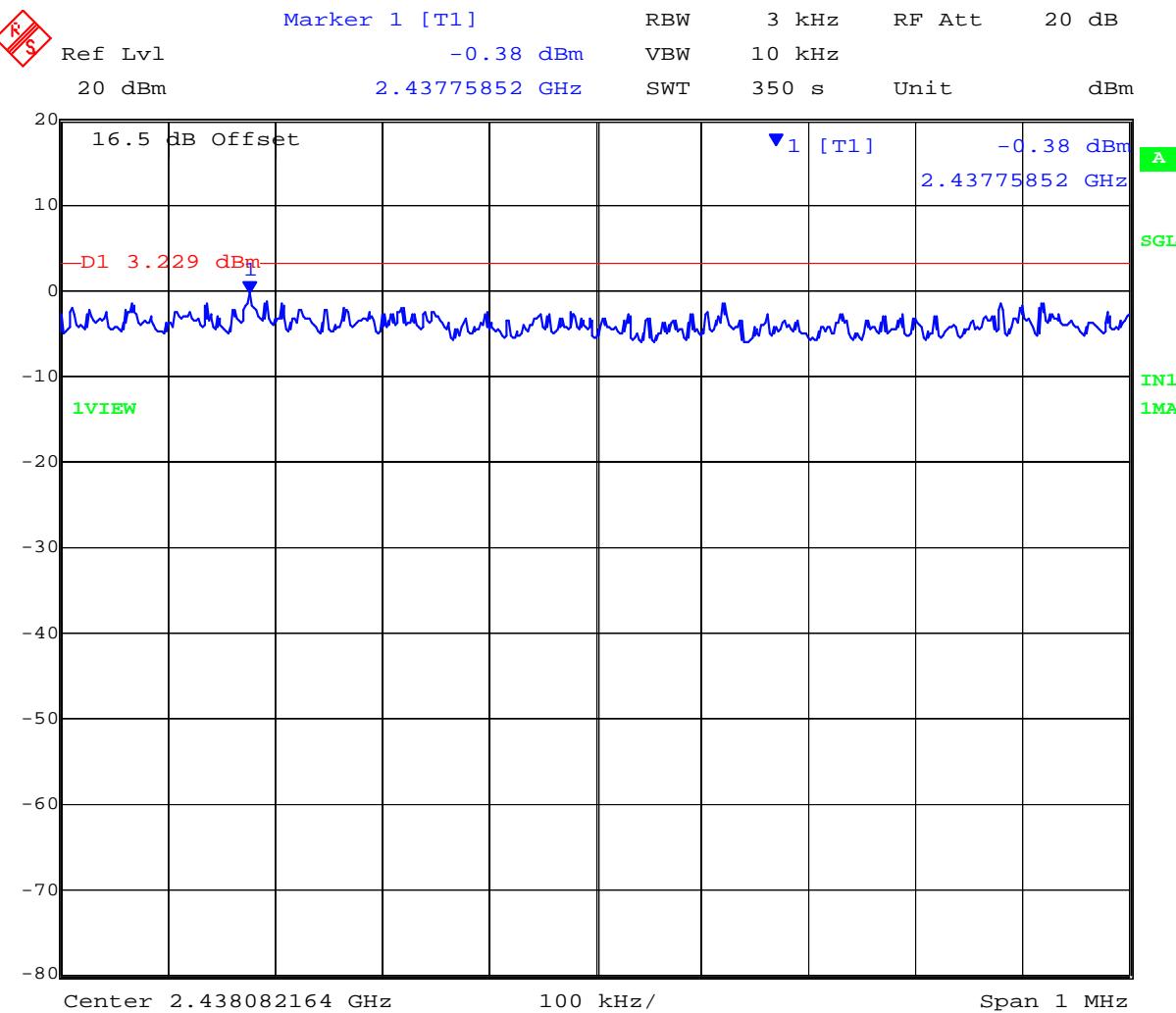
PORT B 2,437 MHz 802.11b - Peak Power Spectral Density



Date: 7.FEB.2012 15:38:30

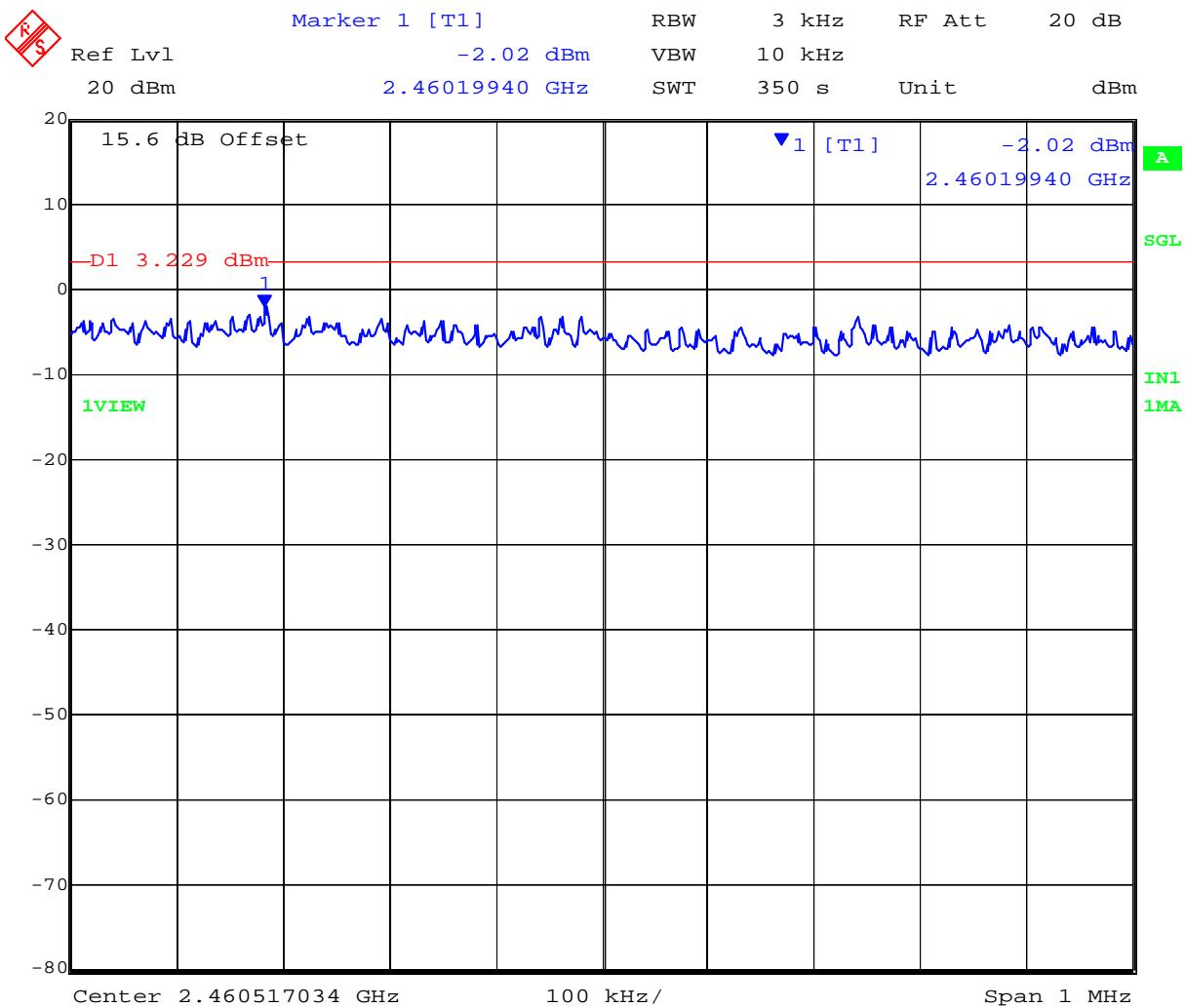
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PORT C 2,437 MHz 802.11b - Peak Power Spectral Density



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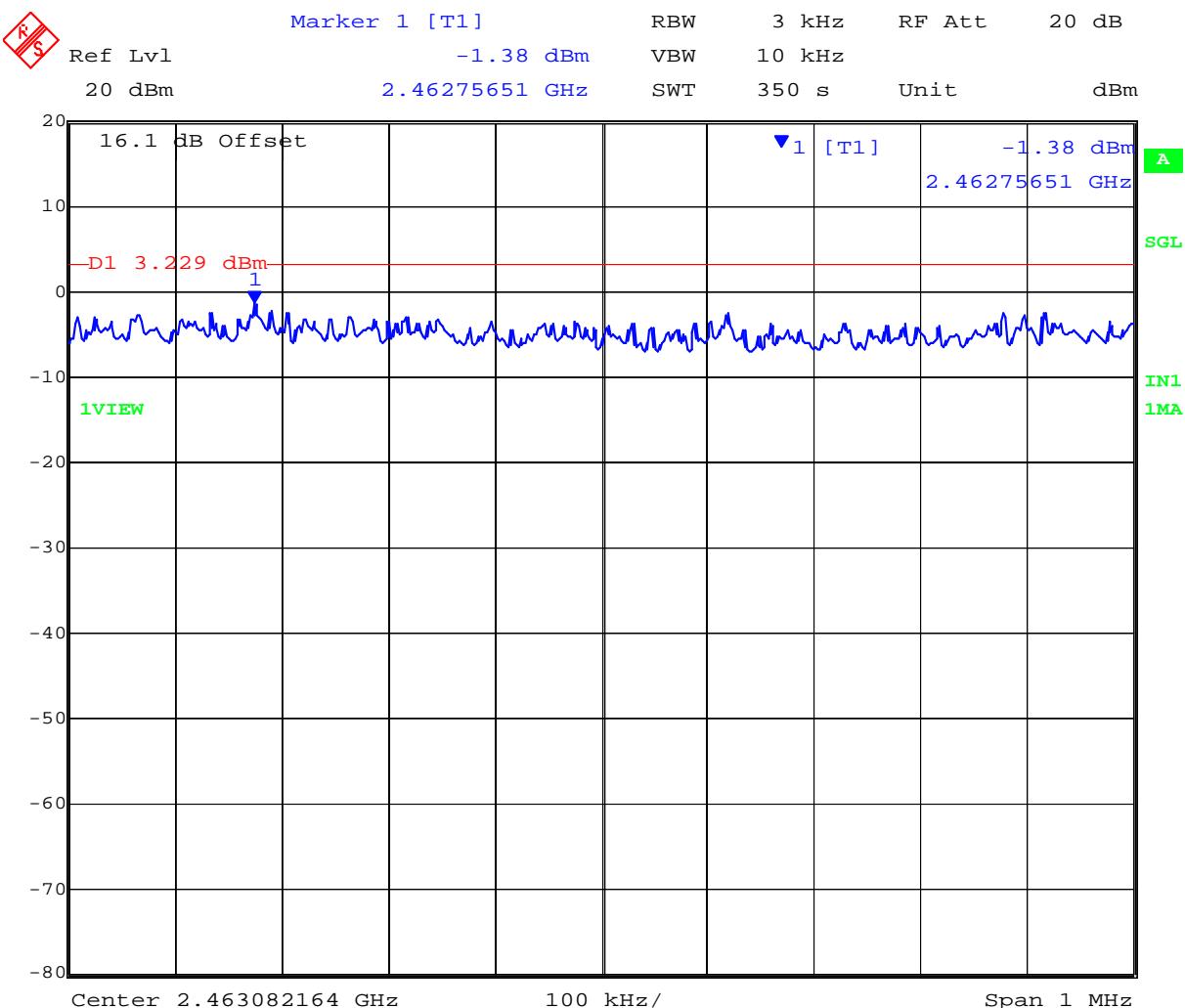
PORT A 2,462 MHz 802.11b - Peak Power Spectral Density



Date: 7.FEB.2012 16:09:06

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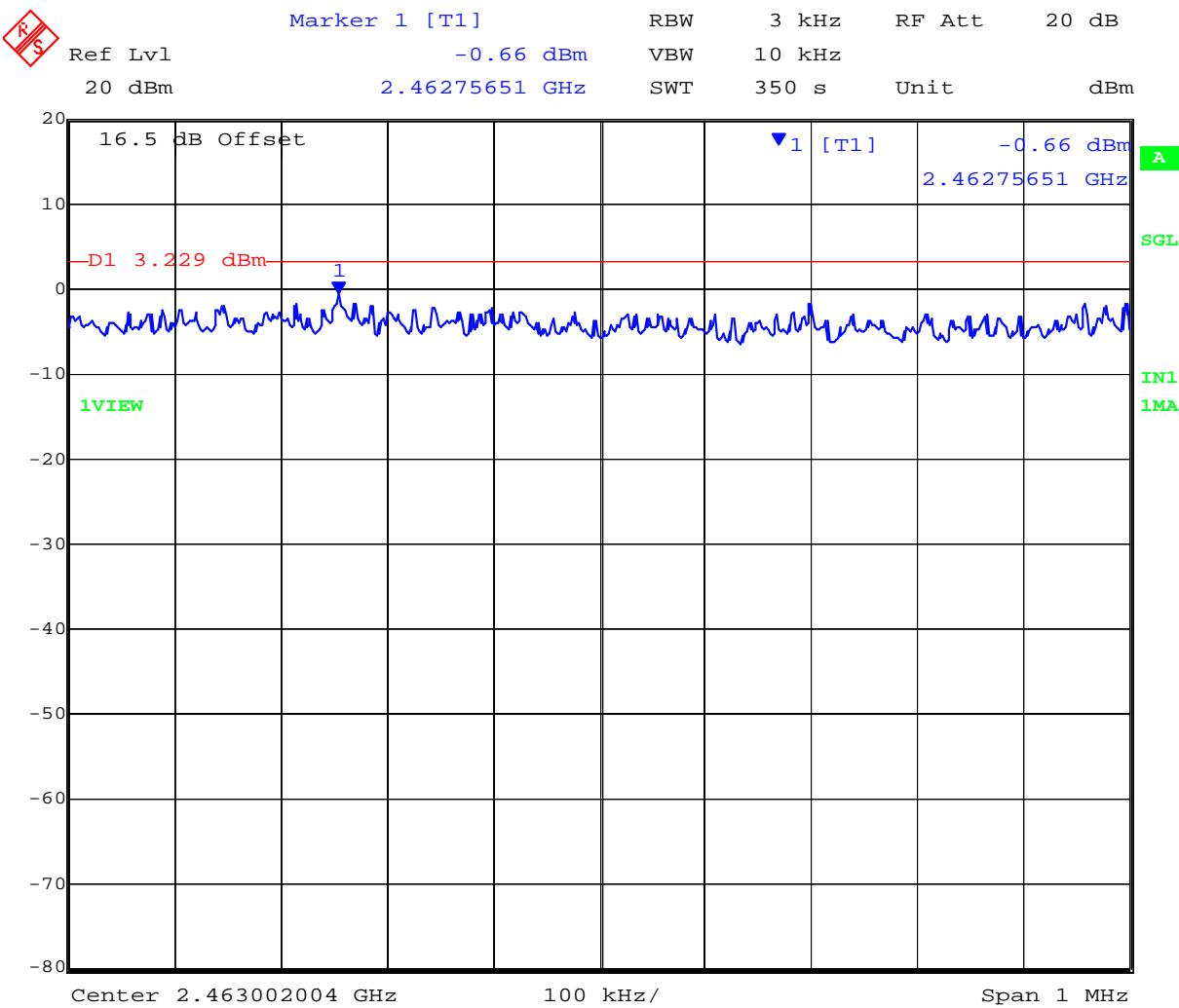
PORT B 2,462 MHz 802.11b - Peak Power Spectral Density



Date: 7.FEB.2012 16:15:39

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PORT C 2,462 MHz 802.11b - Peak Power Spectral Density



Date: 7.FEB.2012 16:22:09

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Peak Power Spectral Density

TABLE OF RESULTS – 802.11g Legacy

Test Conditions:	15.247 (e)	Rel. Humidity (%):	35	to	42
Variant:	802.11g	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A	Antenna Gain:	2	dBi	
Applied Voltage:	48.00	Antenna Ports (N):	3		
Notes 1:					
Notes 2:					

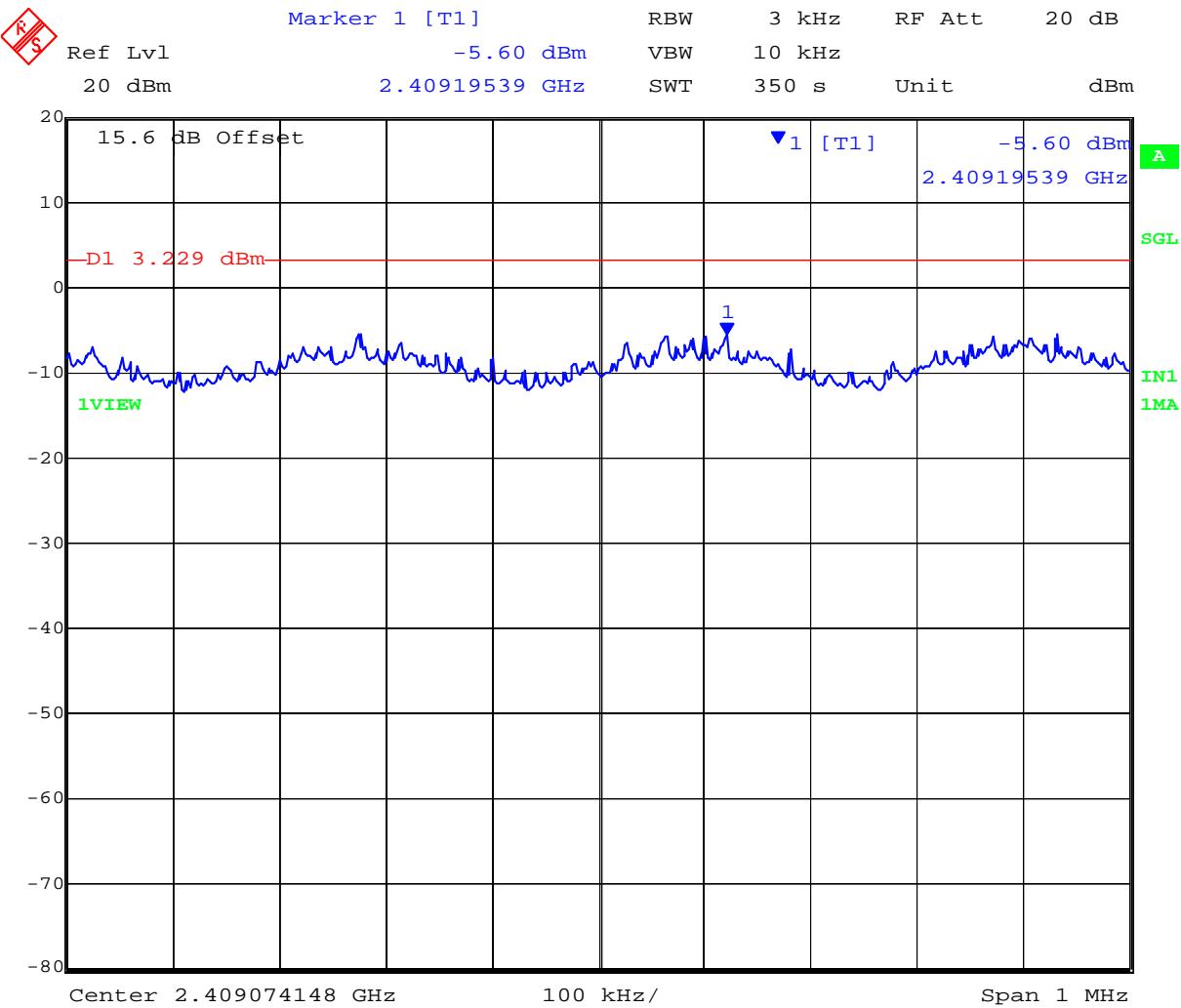
Test Frequency	Measured Power Density				Correction factor	Peak Power Spectral Density	Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	10Log(N)	dBm	dBm	dB
2412.000	-5.60	-4.66	-5.68	--	4.77	0.12	8.00	-7.88
2437.000	-6.14	-6.26	-4.54	--	4.77	0.23	8.00	-7.77
2462.000	-6.62	-6.50	-4.91	--	4.77	-0.13	8.00	-8.13

Measurement uncertainty:

± 1.33 dB

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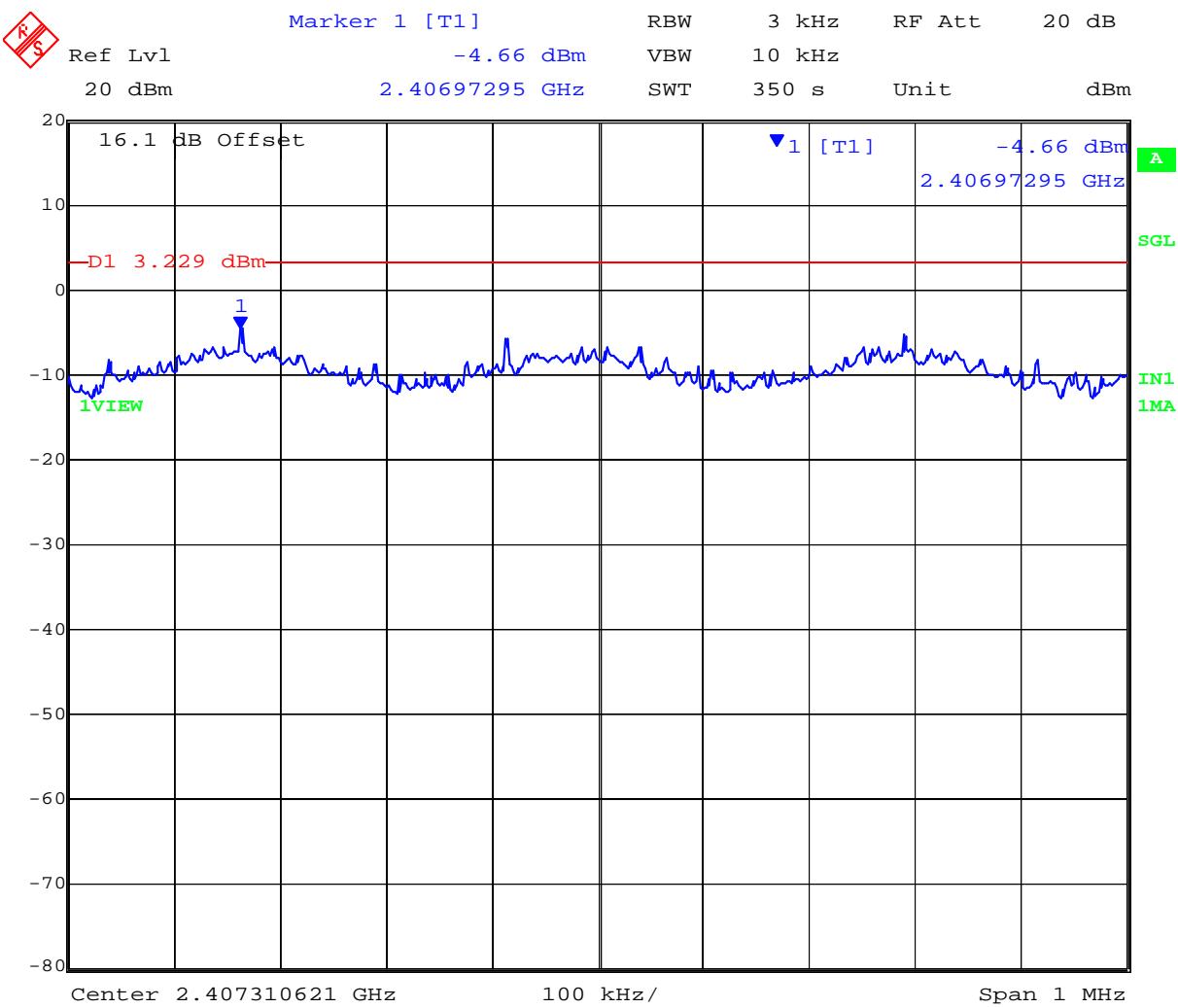
PORT A 2,412 MHz 802.11g Legacy - Peak Power Spectral Density



Date: 8.FEB.2012 08:49:49

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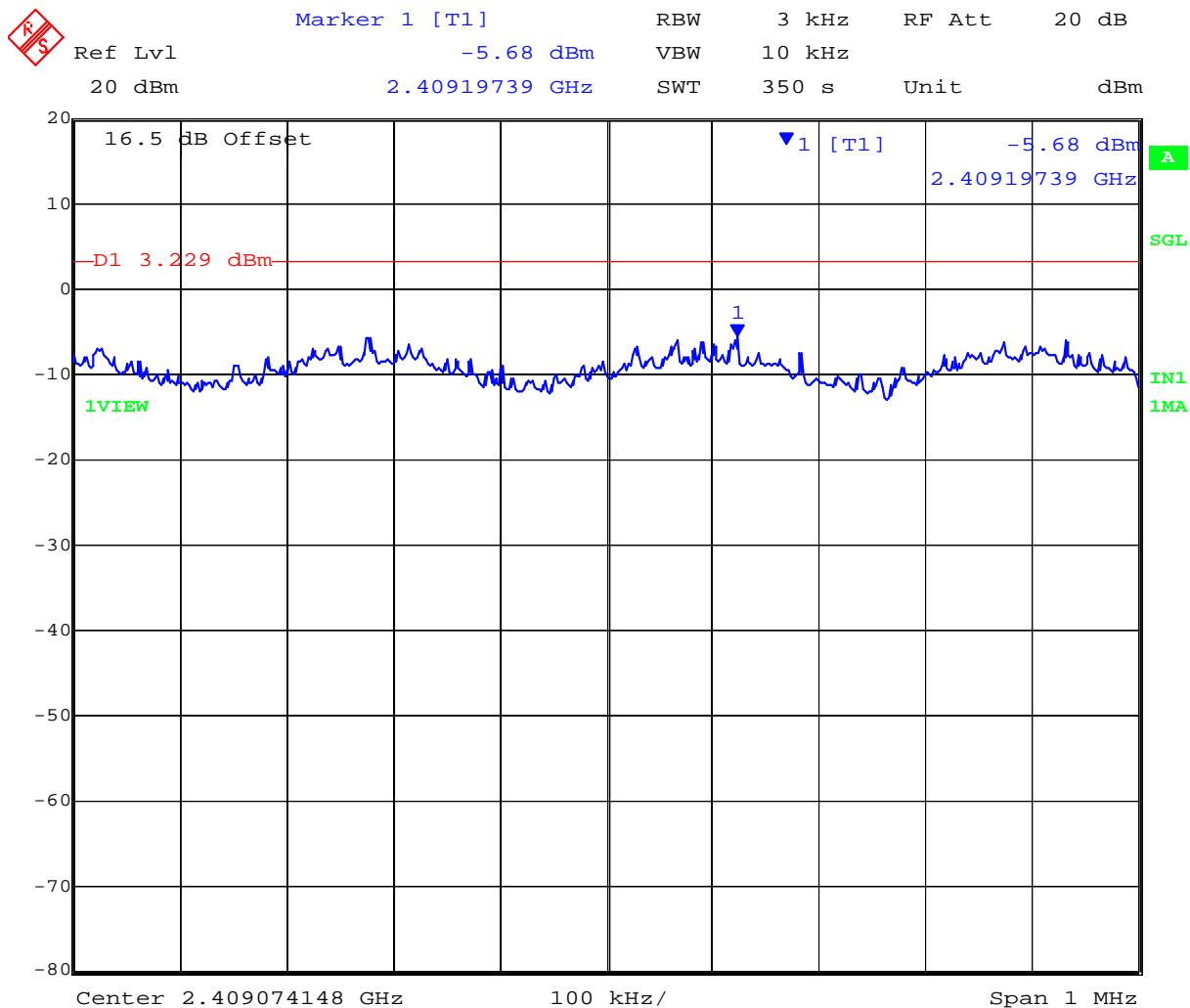
PORT B 2,412 MHz 802.11g Legacy - Peak Power Spectral Density



Date: 8.FEB.2012 08:56:20

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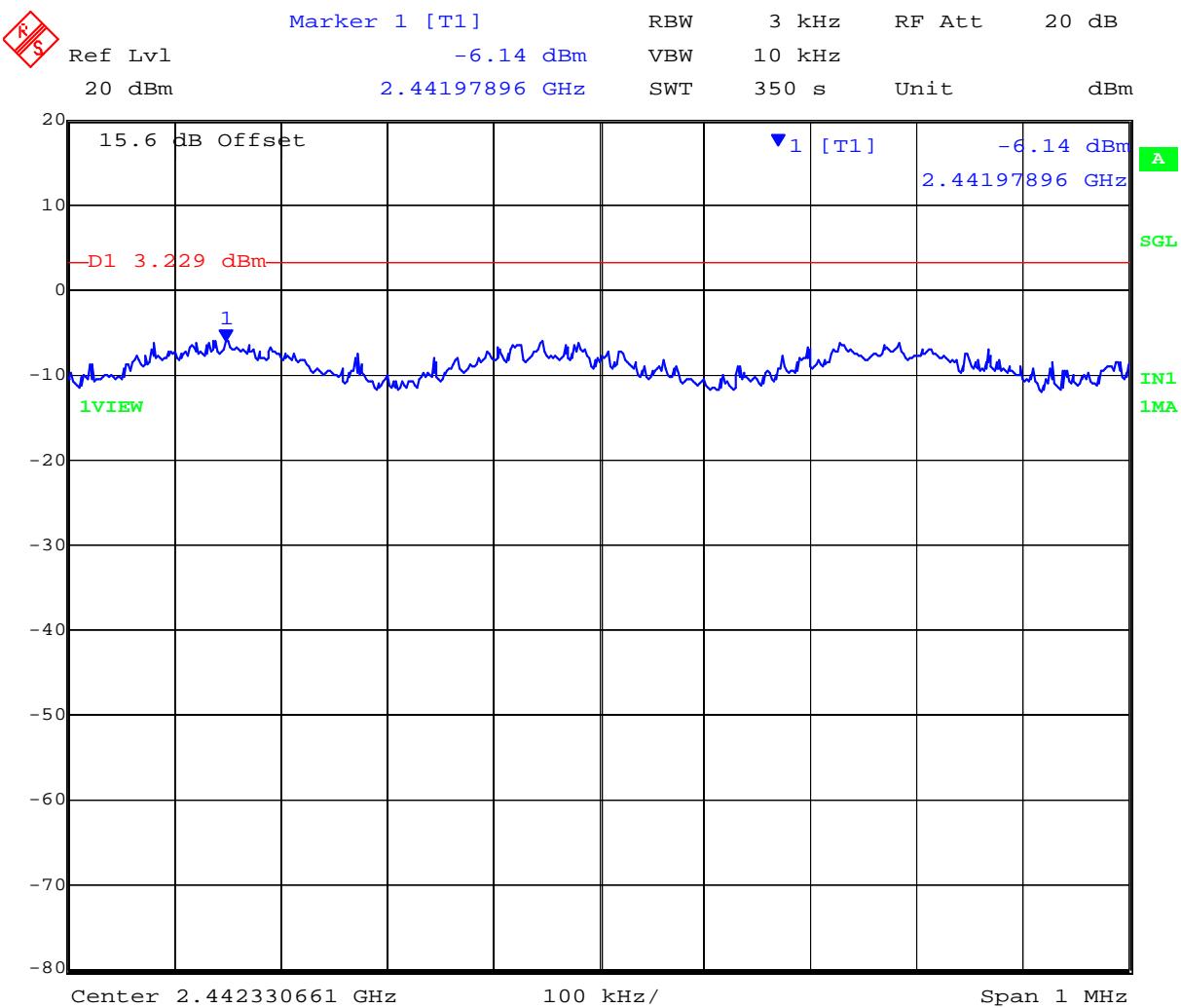
PORT C 2,412 MHz 802.11g Legacy - Peak Power Spectral Density



Date: 8.FEB.2012 09:02:49

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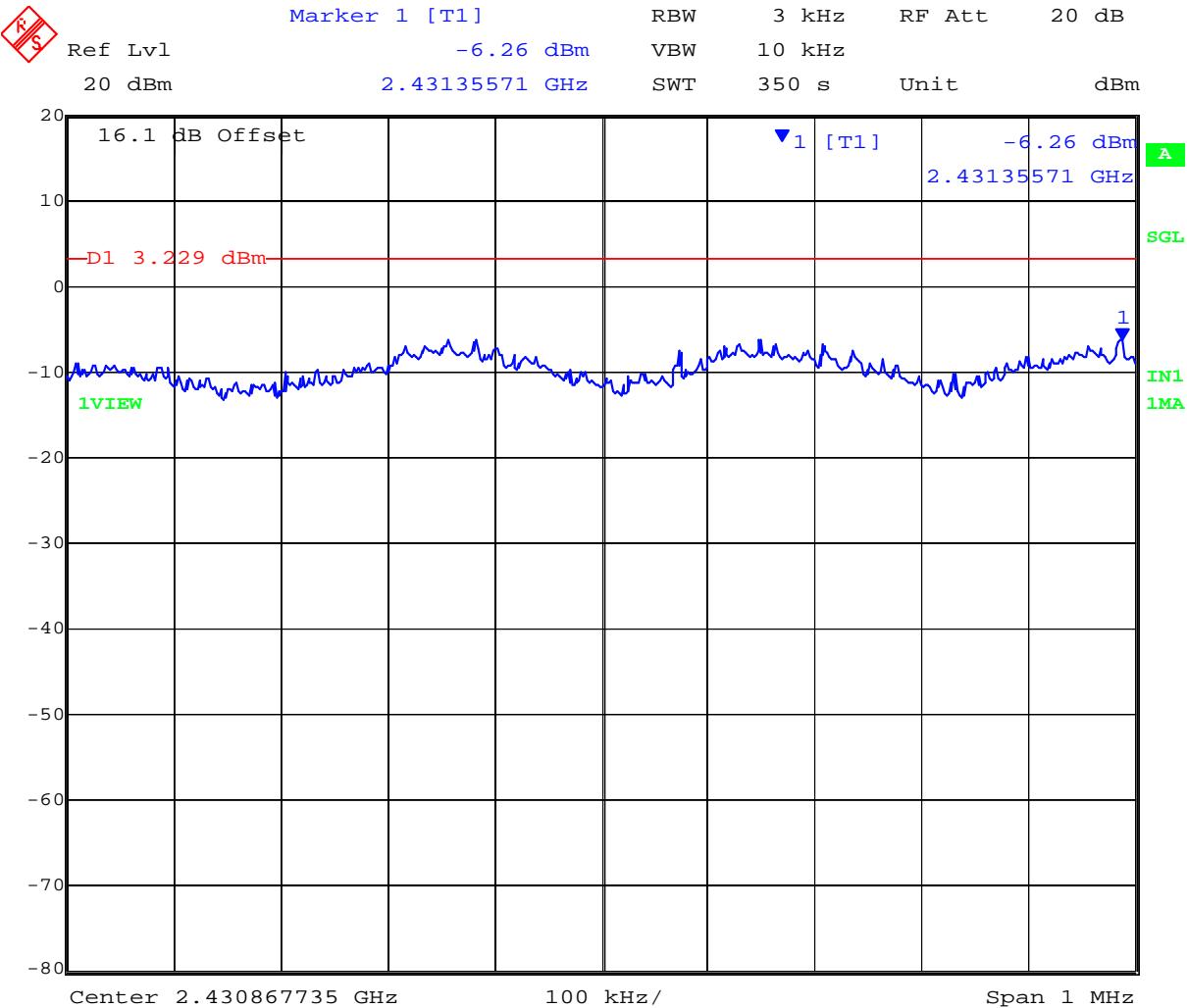
PORT A 2,437 MHz 802.11g Legacy - Peak Power Spectral Density



Date: 8.FEB.2012 09:28:07

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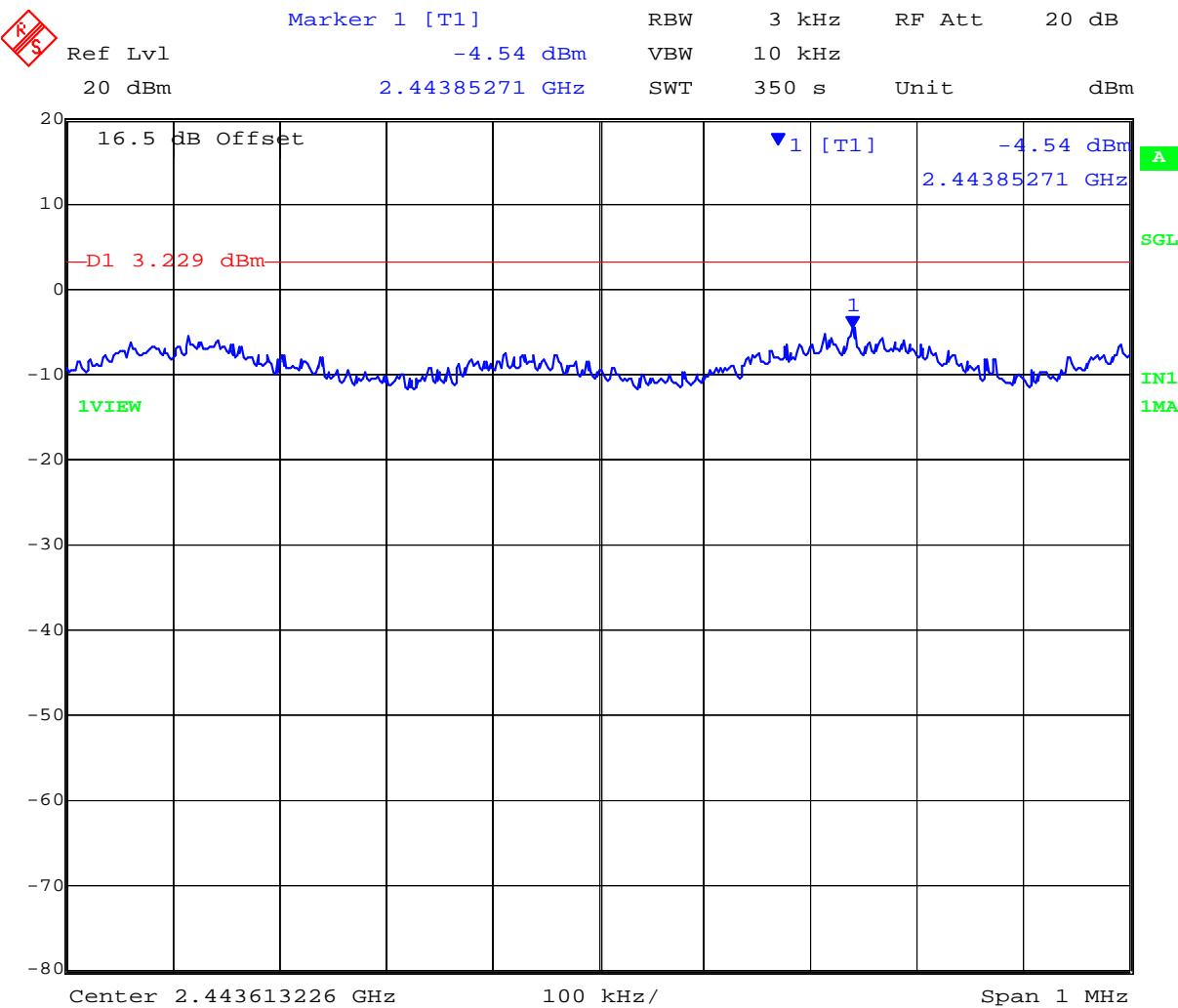
PORT B 2,437 MHz 802.11g Legacy - Peak Power Spectral Density



Date: 8.FEB.2012 09:34:39

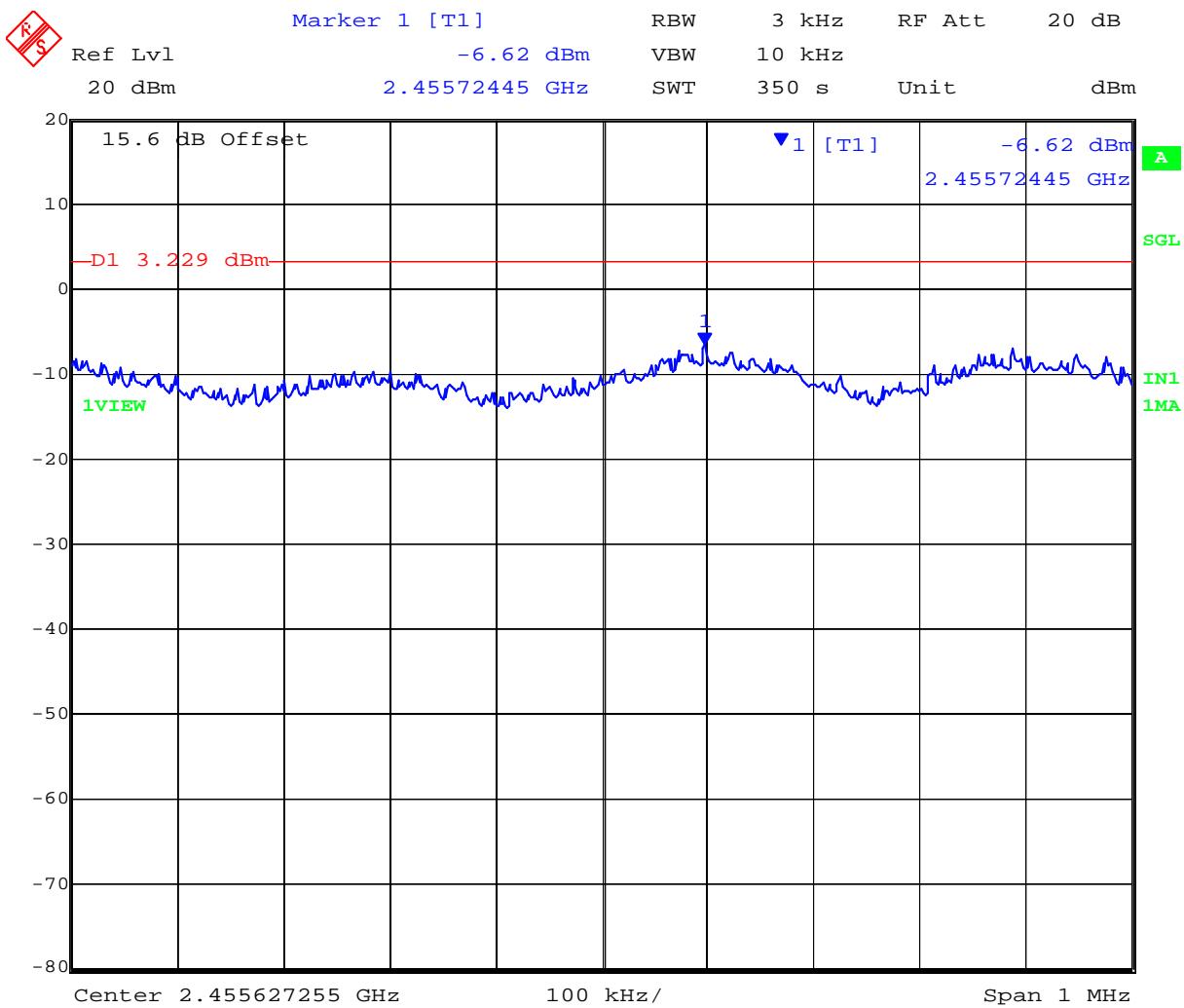
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PORT C 2,437 MHz 802.11g Legacy - Peak Power Spectral Density



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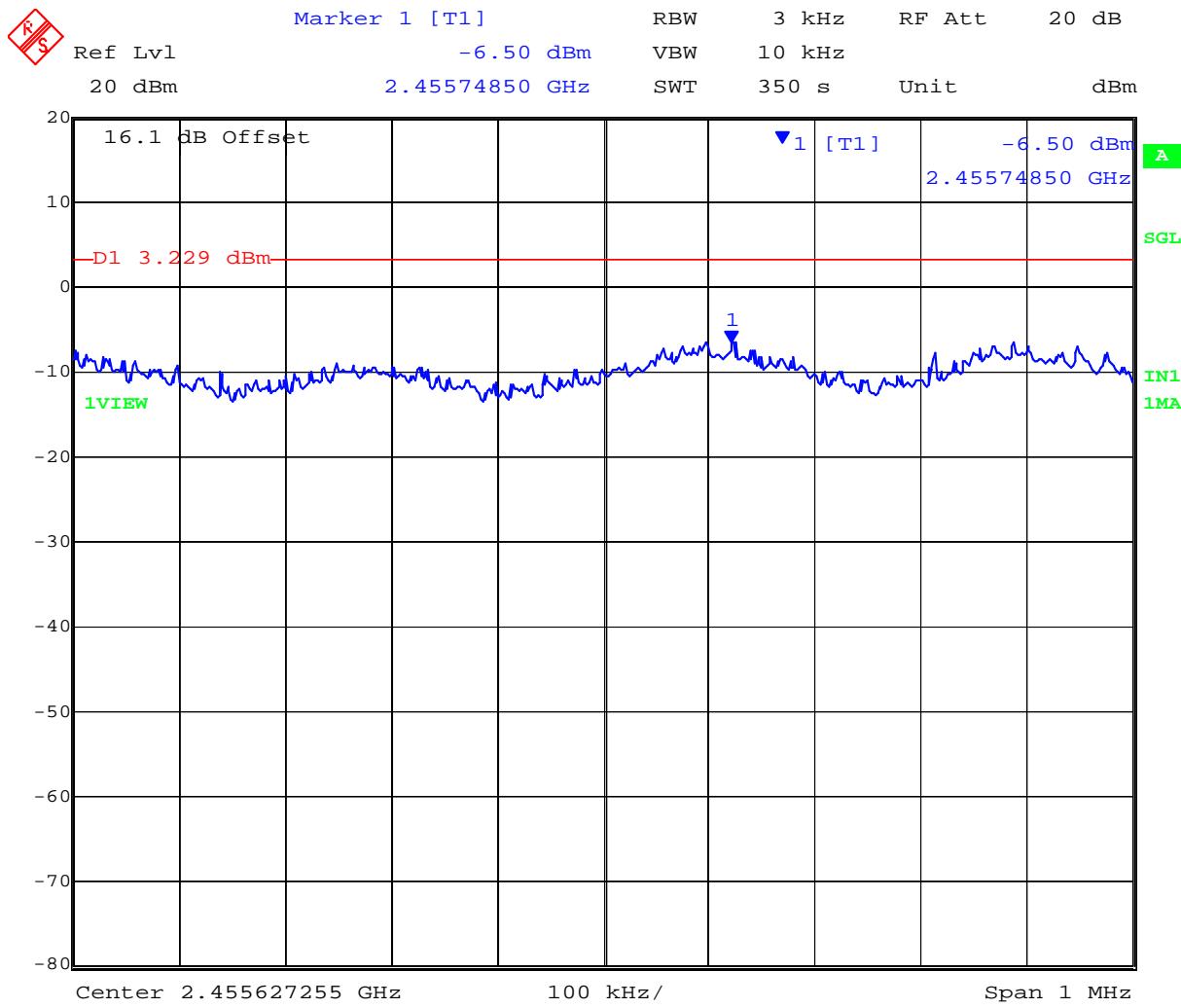
PORT A 2,462 MHz 802.11g Legacy - Peak Power Spectral Density



Date: 8.FEB.2012 10:08:24

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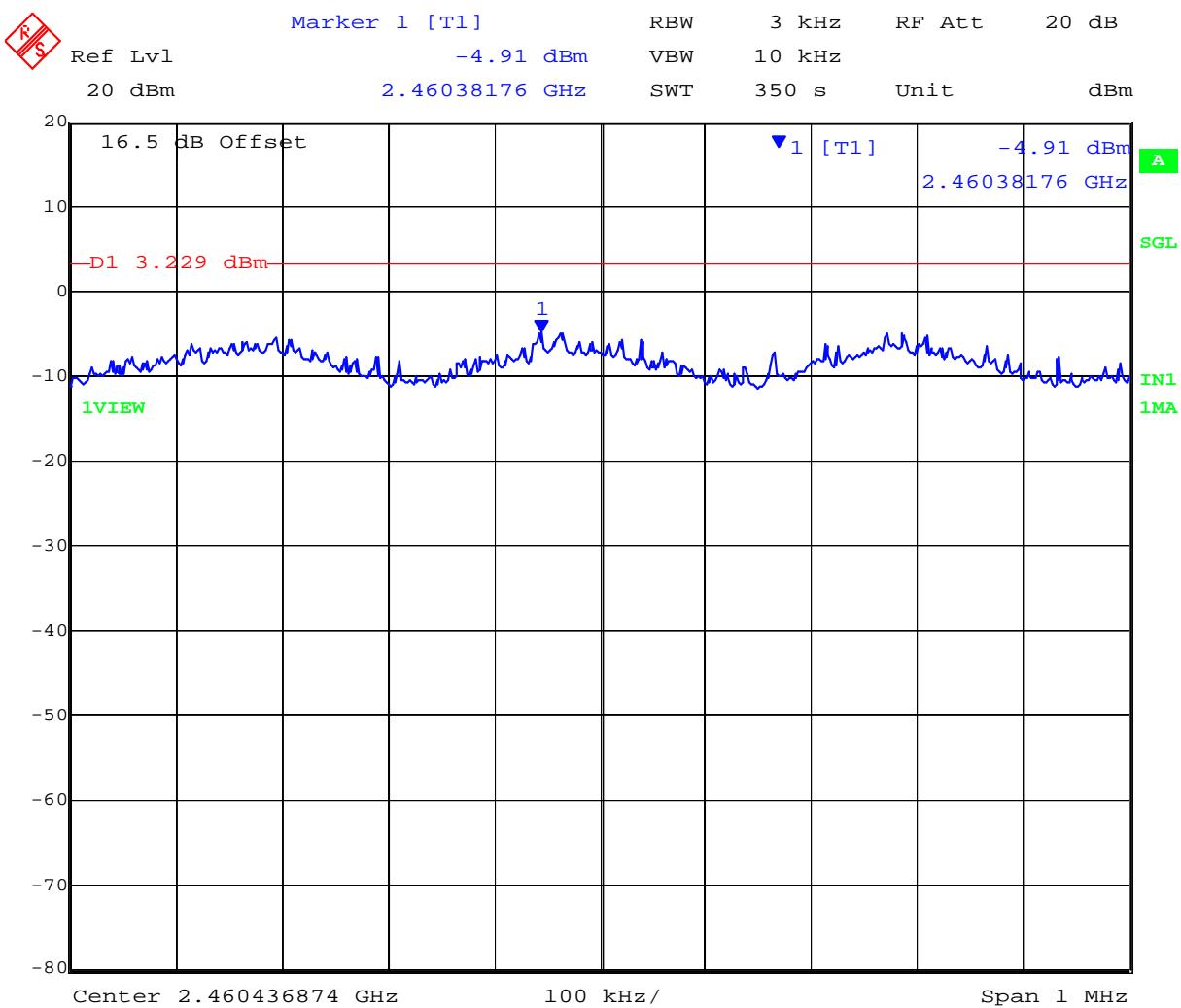
PORT B 2,462 MHz 802.11g Legacy - Peak Power Spectral Density



Date: 8.FEB.2012 10:14:56

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



Date: 8.FEB.2012 10:21:25

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Peak Power Spectral Density

TABLE OF RESULTS – 802.11n HT-20

Test Conditions:	15.247 (e)	Rel. Humidity (%):	35	to	42
Variant:	802.11n HT-20	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	2	dB	
Applied Voltage:	48.00 Vdc	Antenna Ports (N):	3		
Notes 1:					
Notes 2:					

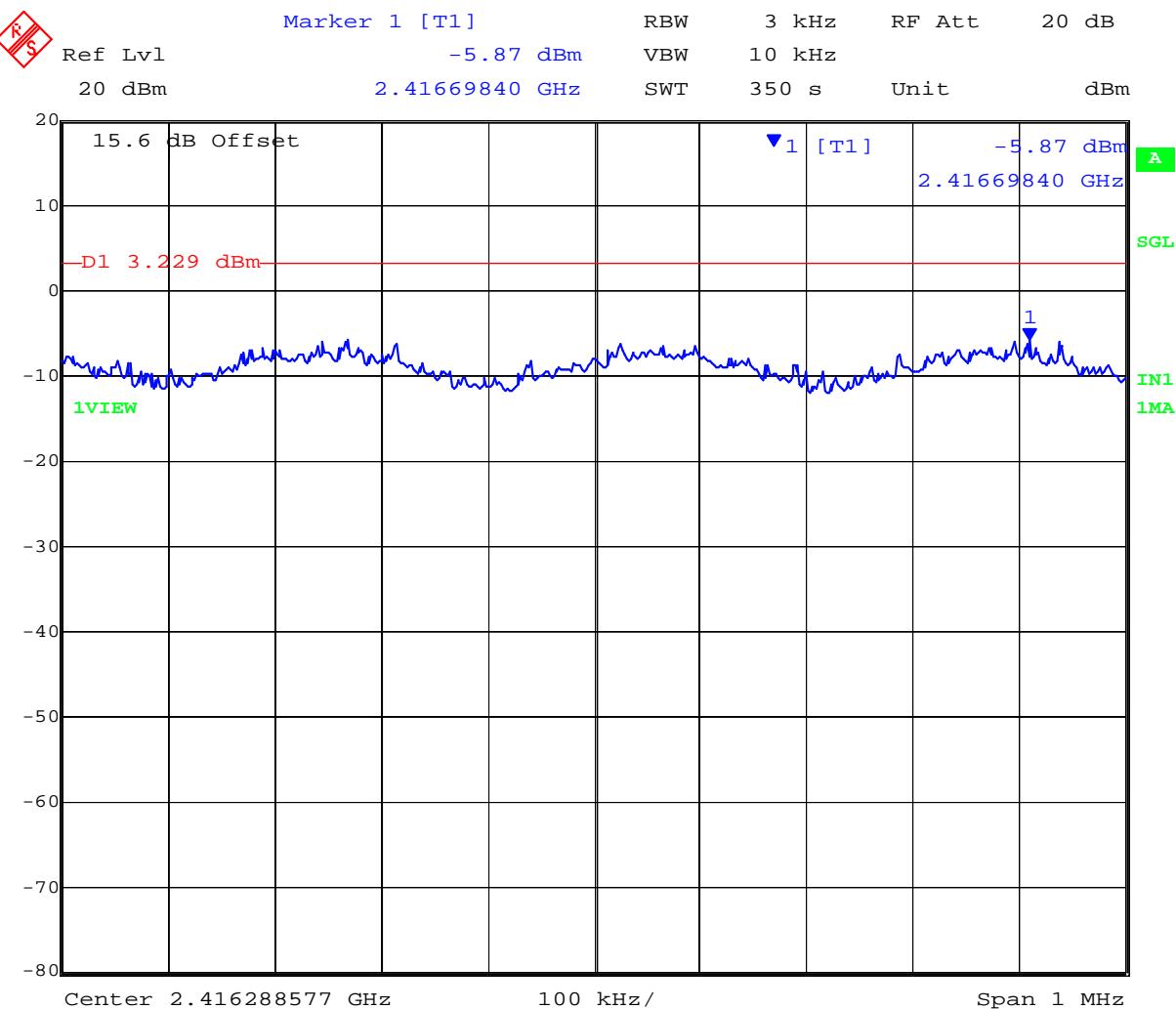
Test Frequency	Measured Power Density				Correction factor	Peak Power Spectral Density	Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	10Log(N)	dBm	dBm	dB
2412.000	-5.87	-5.86	-5.12	--	4.77	-0.35	8.00	-8.35
2437.000	-5.20	-6.77	-4.55	--	4.77	0.23	8.00	-7.77
2462.000	-6.23	-6.09	-4.57	--	4.77	0.20	8.00	-7.80

Measurement uncertainty:

± 1.33 dB

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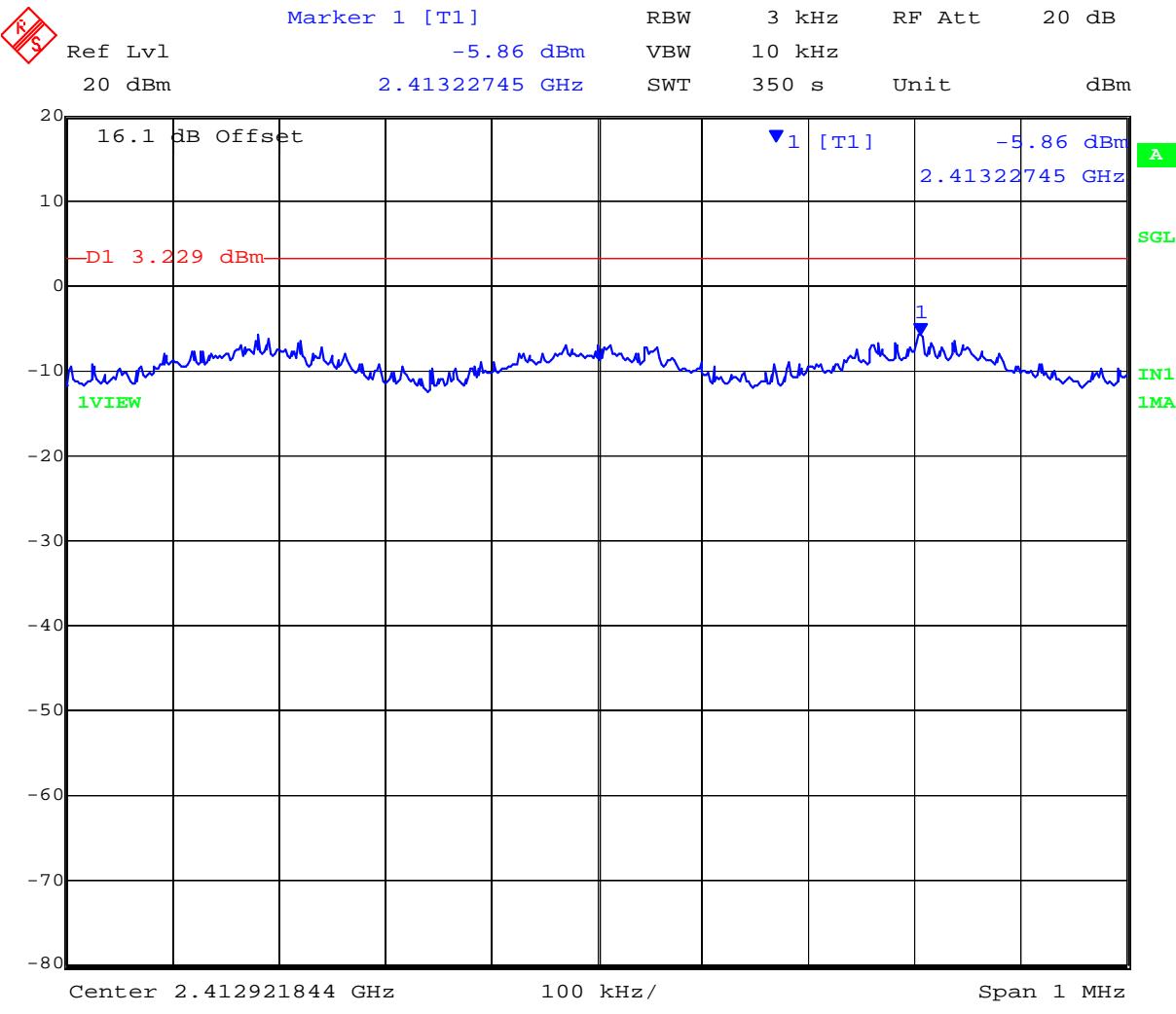
PORT A 2,412 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 8.FEB.2012 11:24:28

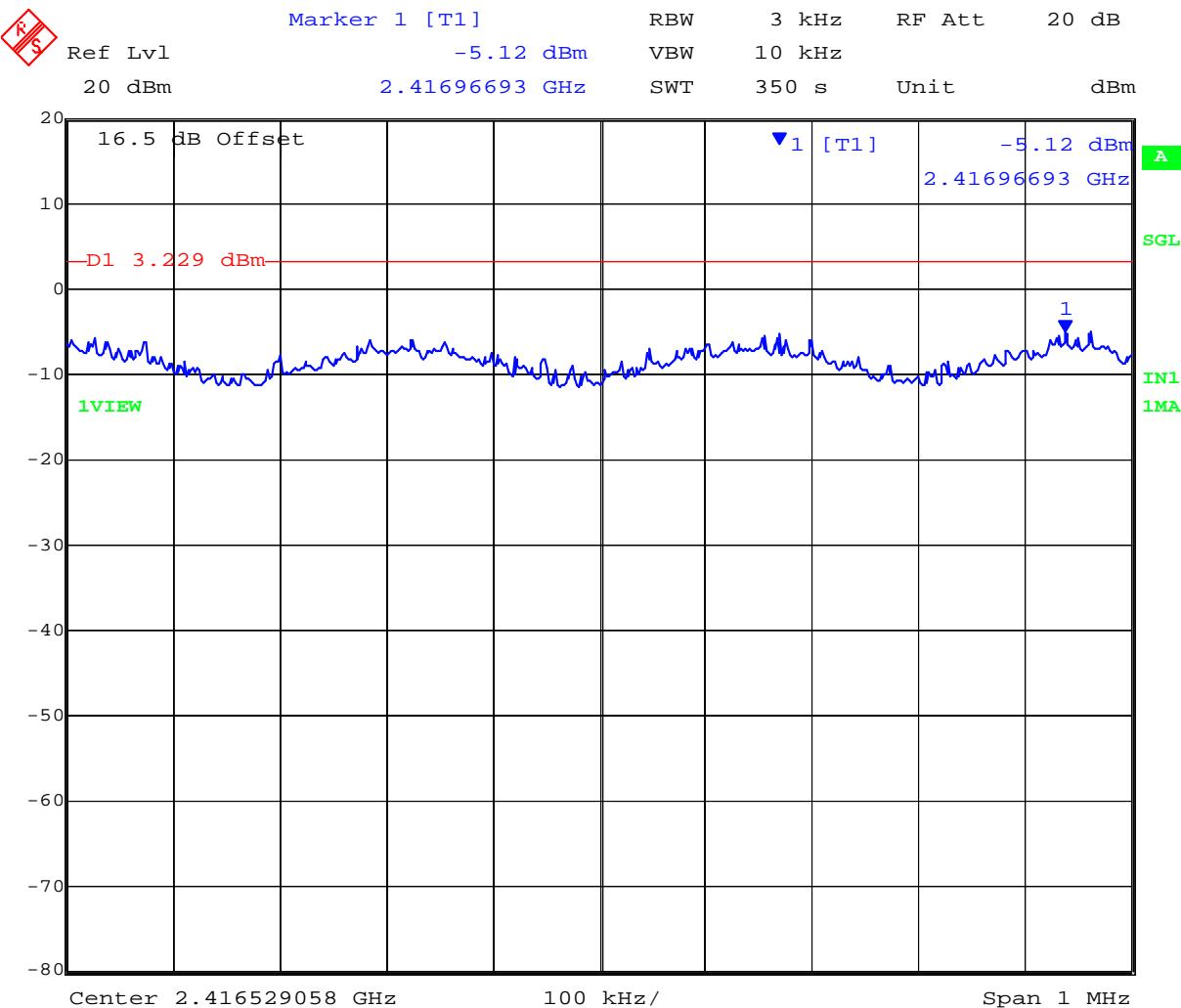
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PORT B 2,412 MHz 802.11n HT-20 - Peak Power Spectral Density



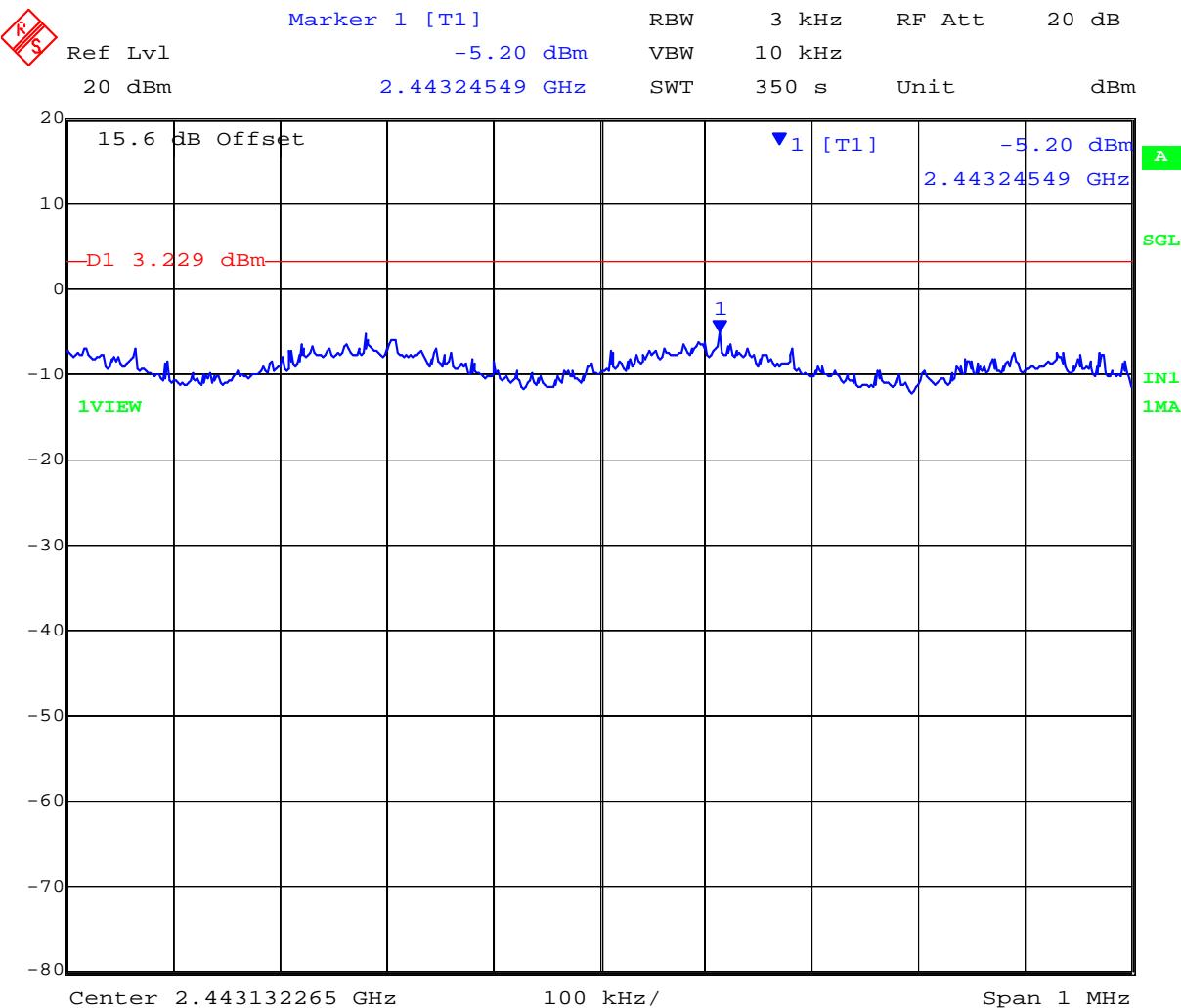
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

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



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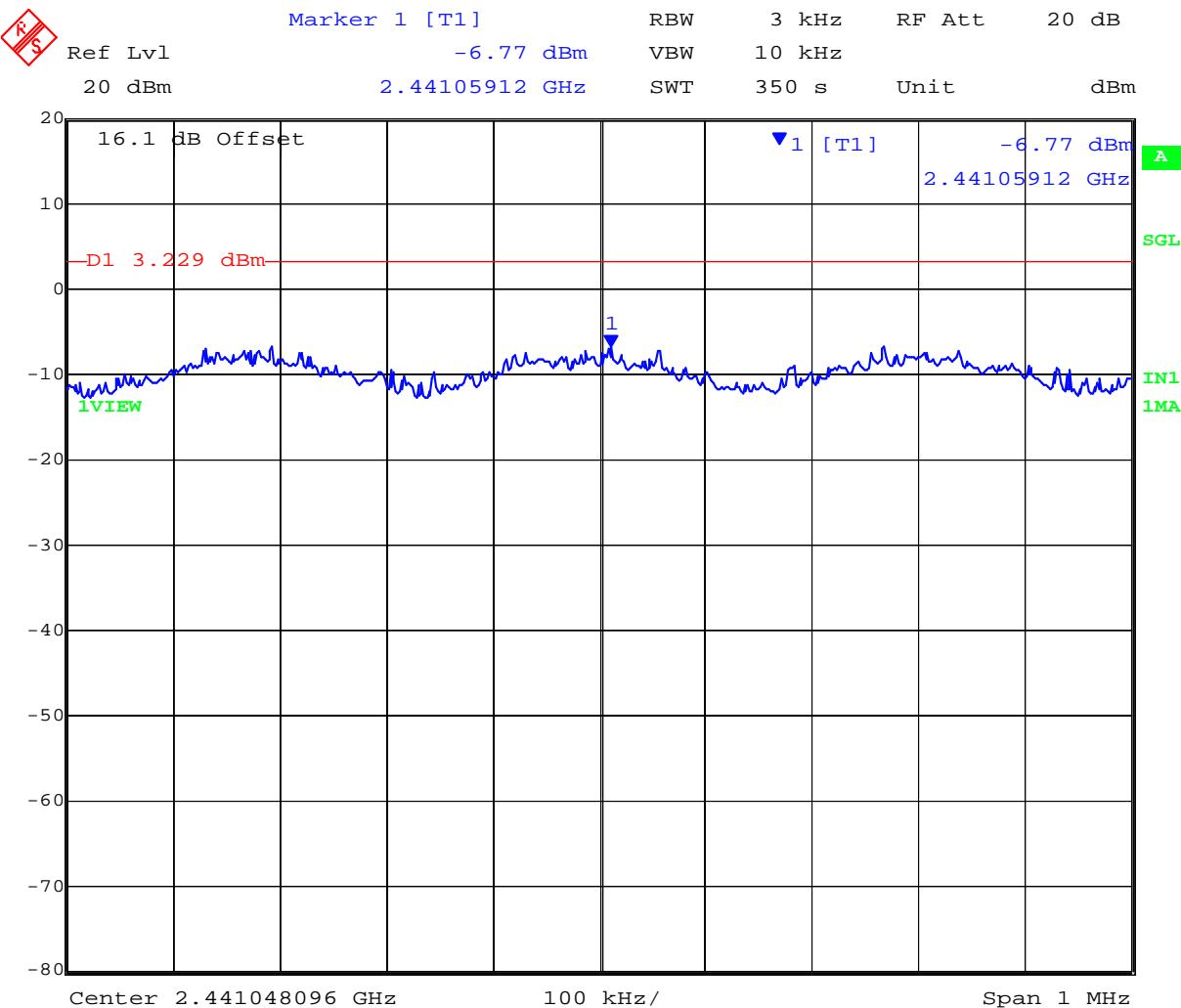
PORT A 2,437 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 8.FEB.2012 11:55:14

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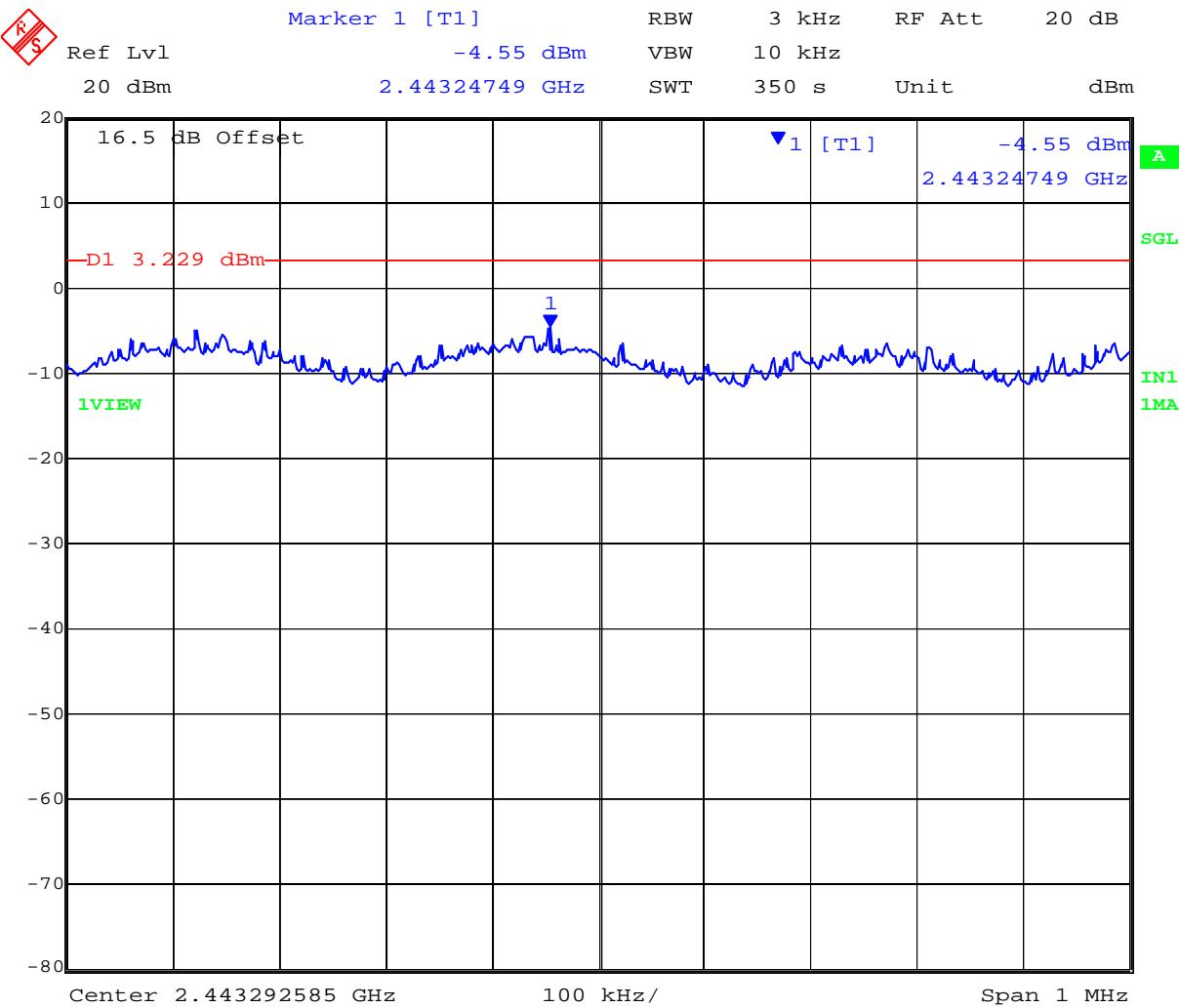
PORT B 2,437 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 8.FEB.2012 12:01:46

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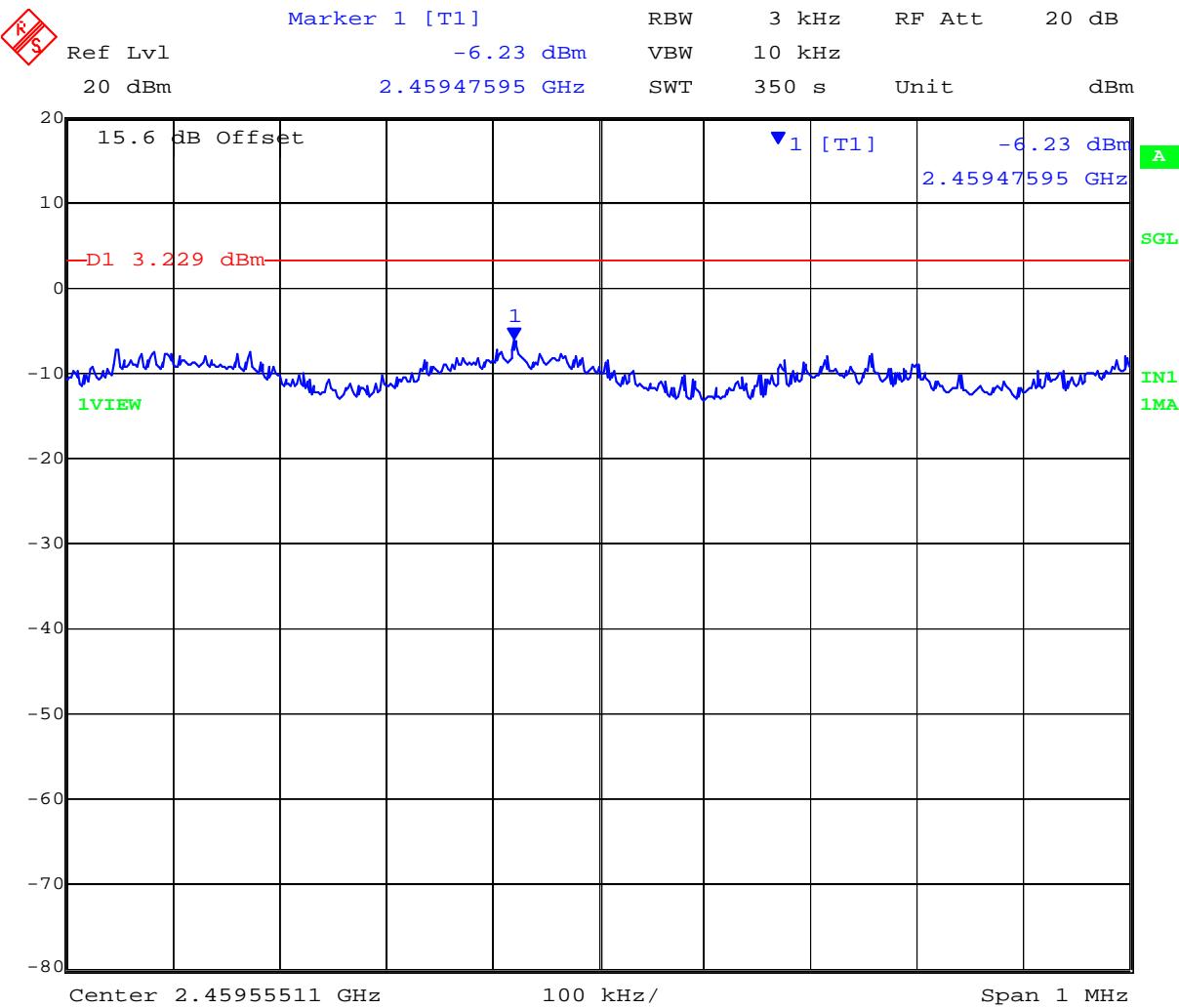
PORT C 2,437 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 8.FEB.2012 12:08:15

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.

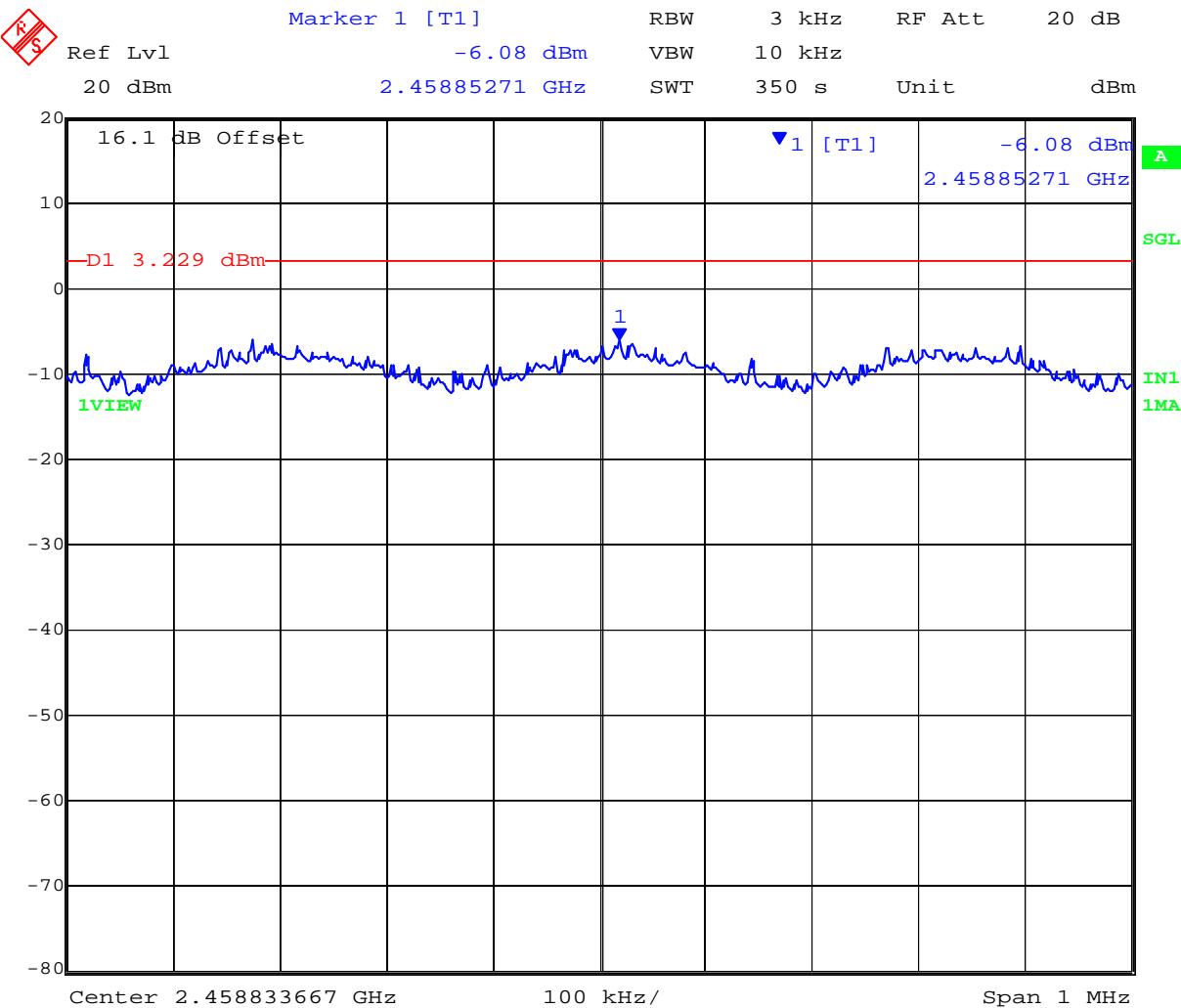
PORT A 2,462 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 8.FEB.2012 12:39:44

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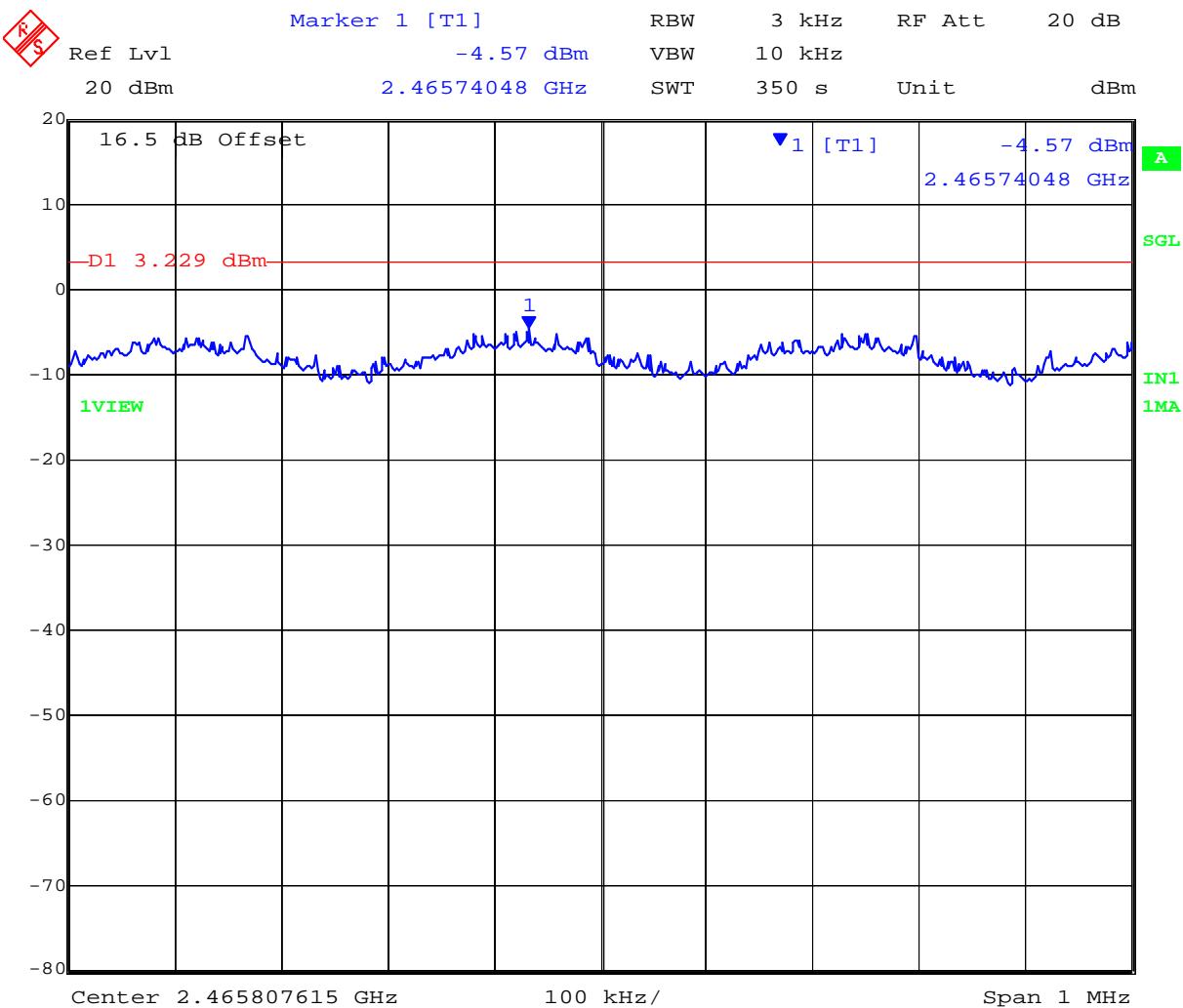
PORT B 2,462 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 8.FEB.2012 12:46:16

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



Date: 8.FEB.2012 12:52:46

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Title: Fluke Networks Sensor4 Wireless Client
To: FCC 47 CFR Part 15.247 & IC RSS-210
Serial #: AMGT14-U1 Rev B
Issue Date: 20th June 2012
Page: 139 of 342

Peak Power Spectral Density

TABLE OF RESULTS – 802.11n HT-40

Test Conditions:	15.247 (e)	Rel. Humidity (%):	35	to	42
Variant:	802.11n HT-40	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	2	dBi	
Applied Voltage:	48.00 Vdc	Antenna Ports (N):	3		
Notes 1:					
Notes 2:					

Test Frequency	Measured Power Density				Correction factor	Peak Power Spectral Density	Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	10Log(N)	dBm	dBm	dB
2422.000	-7.35	-9.48	-9.12	--	4.77	-2.58	8.00	-10.58
2437.000	-7.52	-8.23	-7.83	--	4.77	-2.75	8.00	-10.75
2452.000	-9.80	-9.54	-8.40	--	4.77	-3.63	8.00	-11.63

Measurement uncertainty:	± 1.33 dB
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PORT A 2,422 MHz 802.11n HT-40 - Peak Power Spectral Density



Date: 8.FEB.2012 14:08:59

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



Date: 8.FEB.2012 14:15:30

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



Date: 8.FEB.2012 14:21:59

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



Date: 8.FEB.2012 14:41:22

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



Date: 8.FEB.2012 14:47:54

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



Date: 8.FEB.2012 14:54:23

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



Date: 8.FEB.2012 15:20:23

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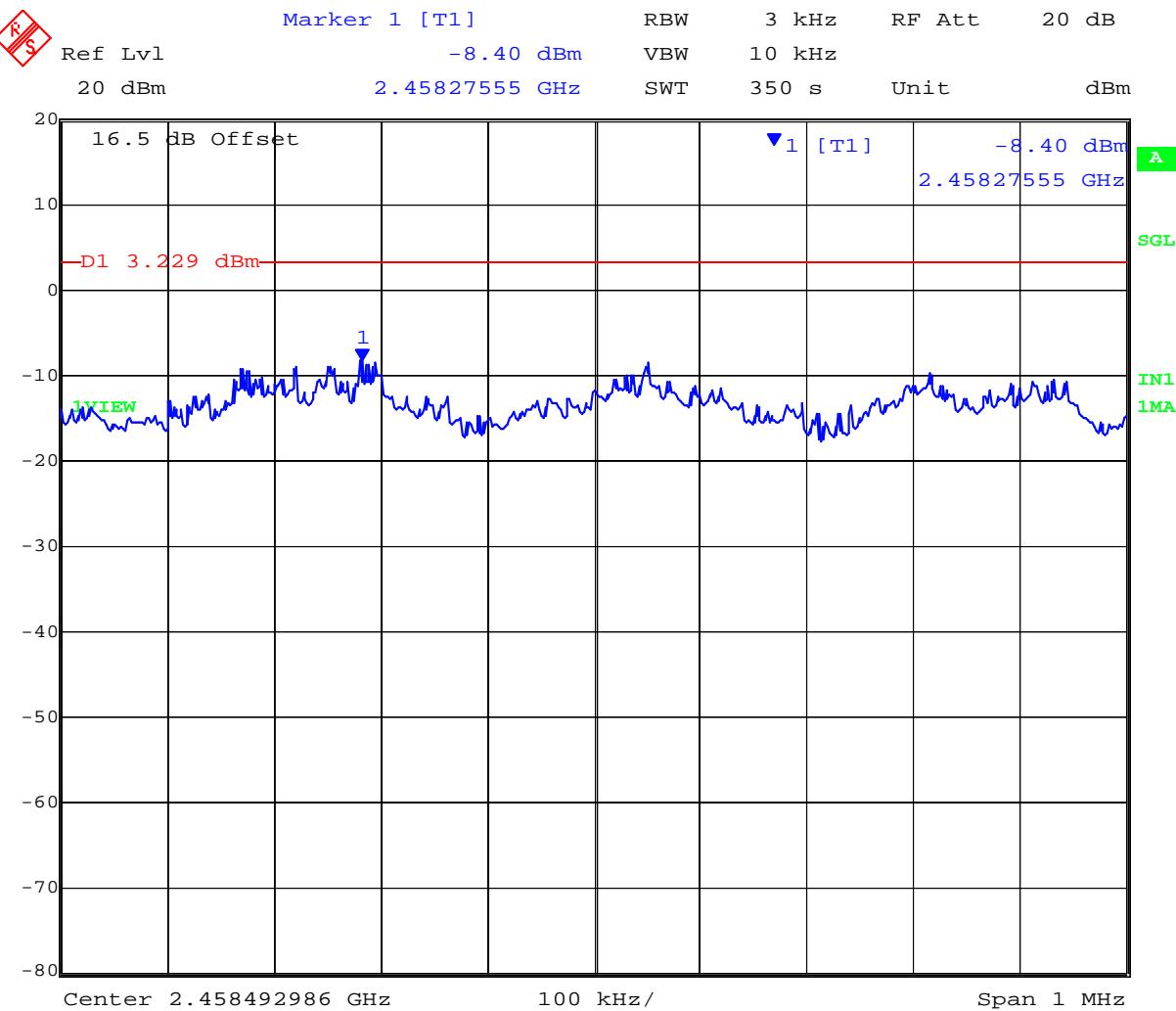
PORT B 2,452 MHz 802.11n HT-40 - Peak Power Spectral Density



Date: 8.FEB.2012 15:26:57

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



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Title: Fluke Networks Sensor4 Wireless Client
To: FCC 47 CFR Part 15.247 & IC RSS-210
Serial #: AMGT14-U1 Rev B
Issue Date: 20th June 2012
Page: 149 of 342

TABLE OF RESULTS – 802.11a Legacy

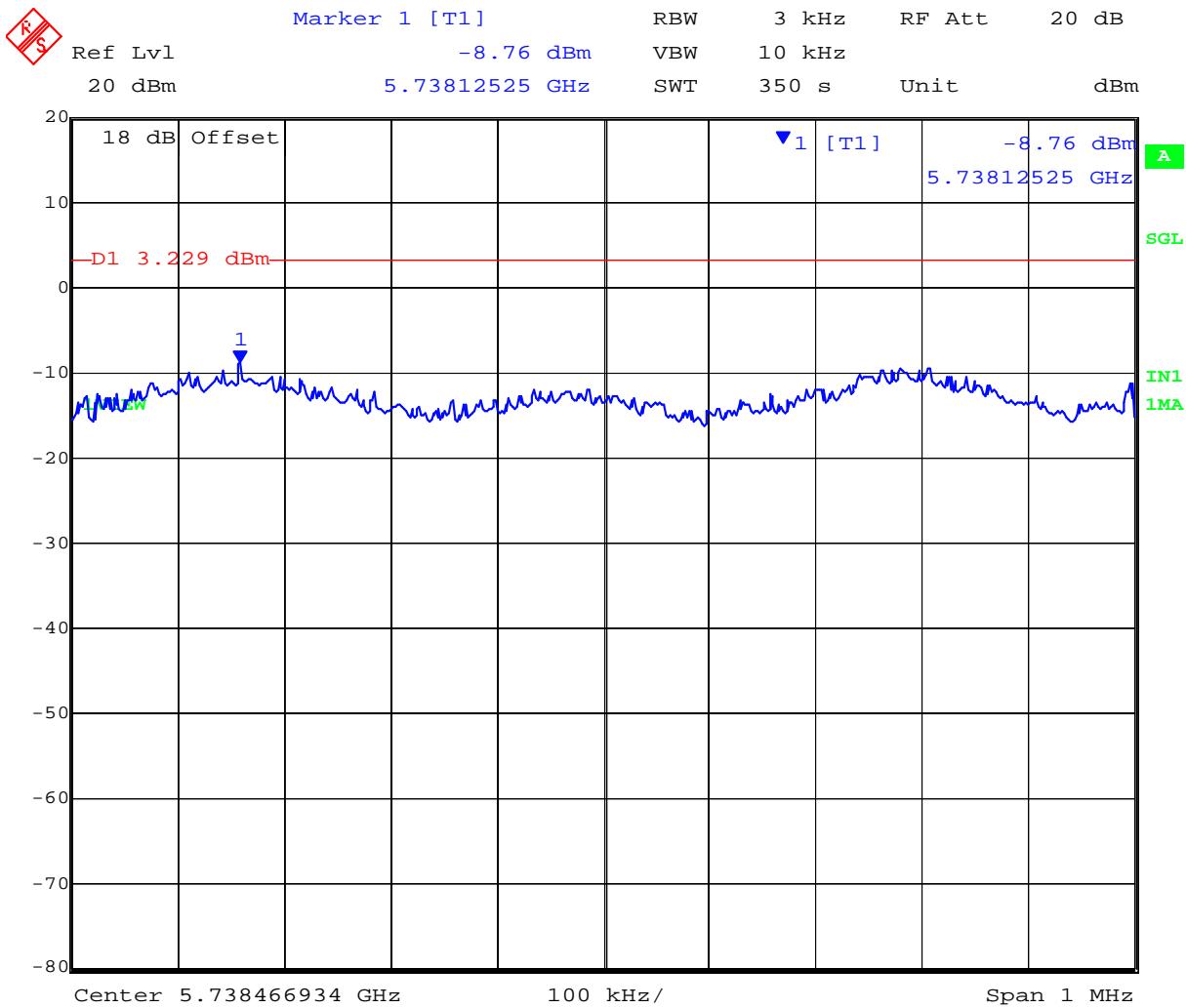
Test Conditions:	15.247 (e)	Rel. Humidity (%):	35	to	42
Variant:	802.11a	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:			2 dBi
Applied Voltage:	48.00 Vdc	Antenna Ports (N):	3		
Notes 1:					
Notes 2:					

Test Frequency	Measured Power Density				Correction factor	Peak Power Spectral Density	Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	10Log(N)	dBm	dBm	dB
5745.000	-8.76	-6.55	-8.06	--	4.77	-1.78	8.00	-9.78
5785.000	-8.51	-6.01	-7.82	--	4.77	-1.23	8.00	-9.23
5825.000	-9.19	-7.01	-8.30	--	4.77	-2.24	8.00	-10.24

Measurement uncertainty:	± 1.33 dB
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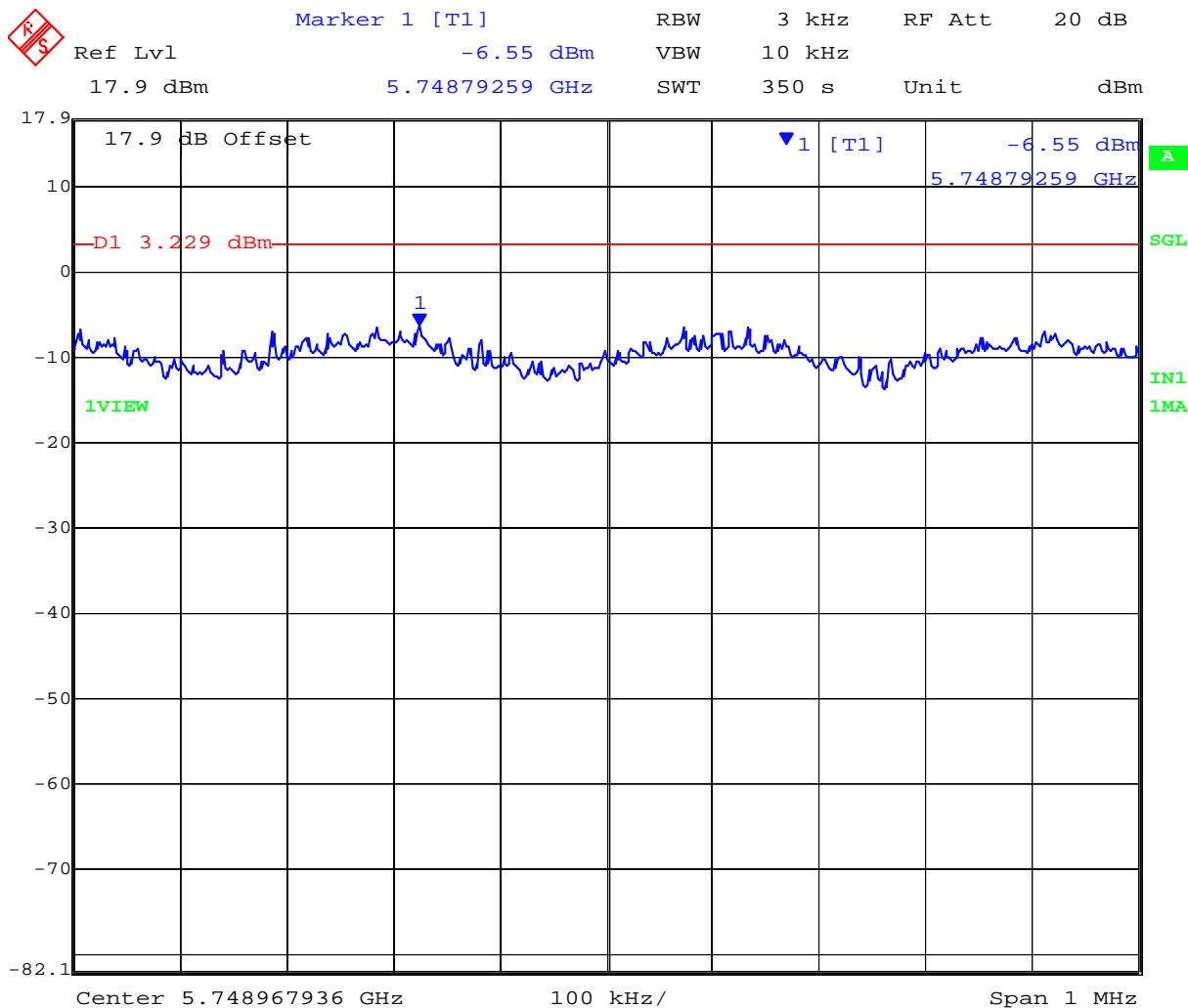
PORT A 5,745 MHz 802.11a Legacy - Peak Power Spectral Density



Date: 8.FEB.2012 16:19:27

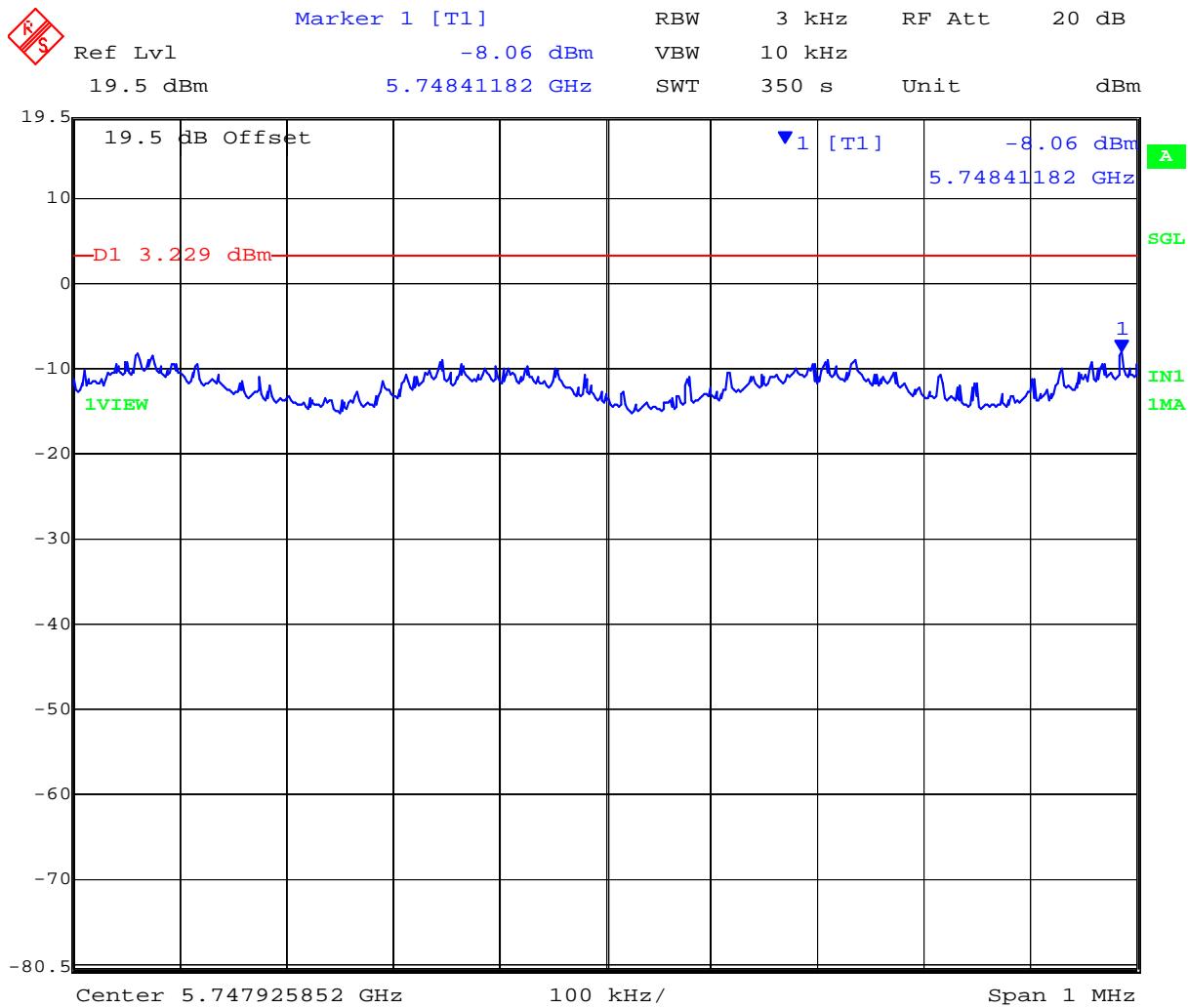
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PORT B 5,745 MHz 802.11a Legacy - Peak Power Spectral Density



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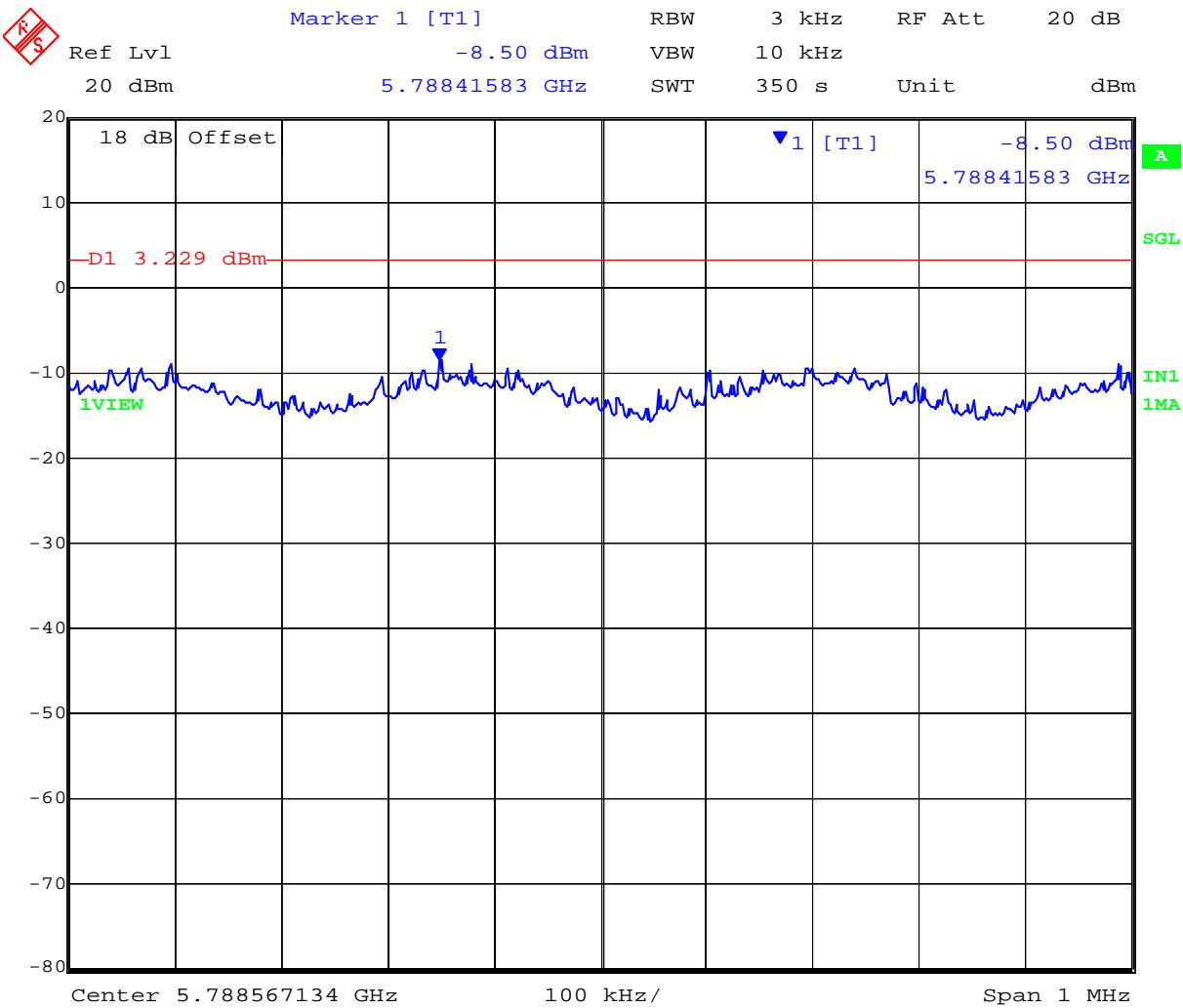
PORT C 5,745 MHz 802.11a Legacy - Peak Power Spectral Density



Date: 8.FEB.2012 16:32:27

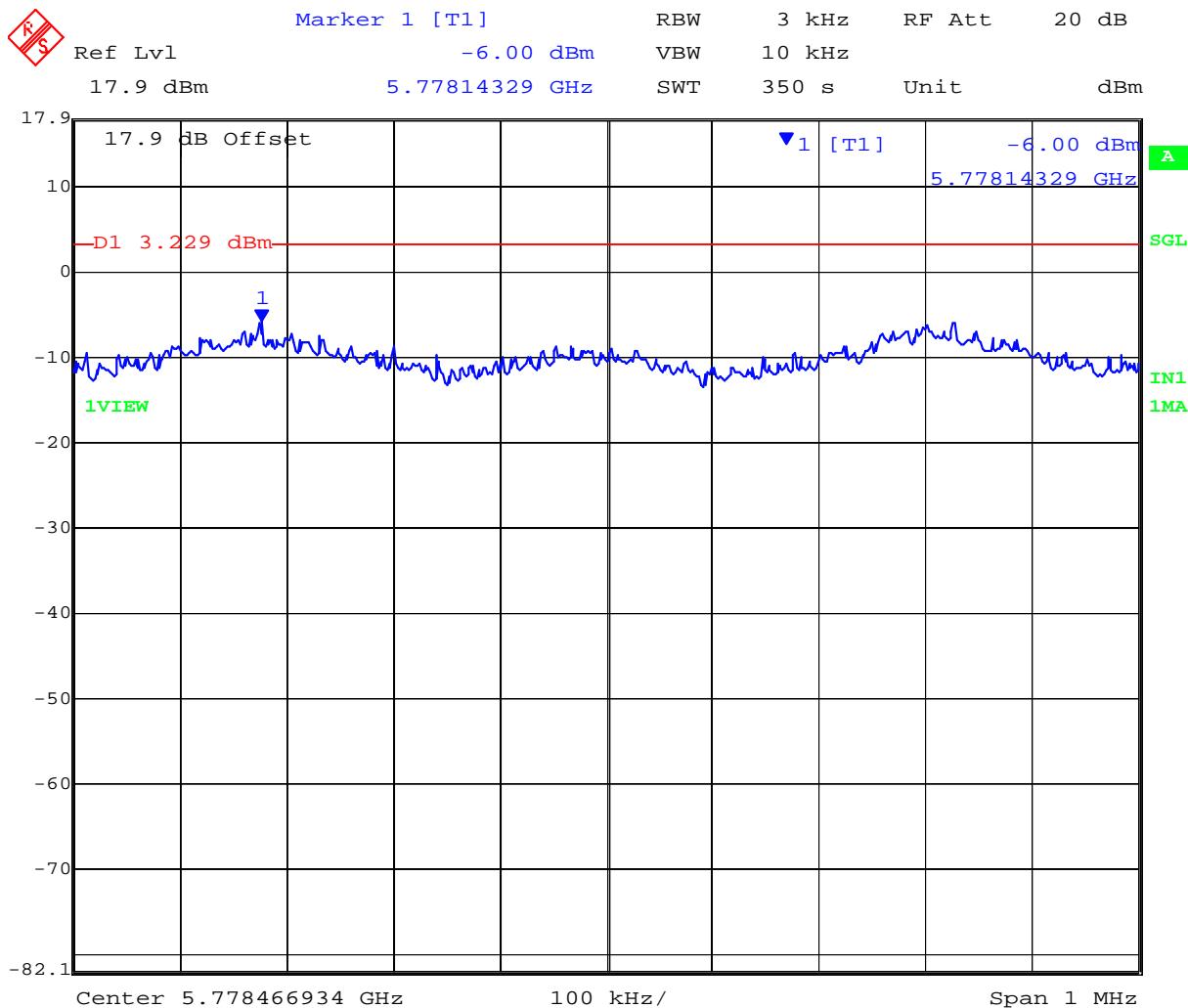
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

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



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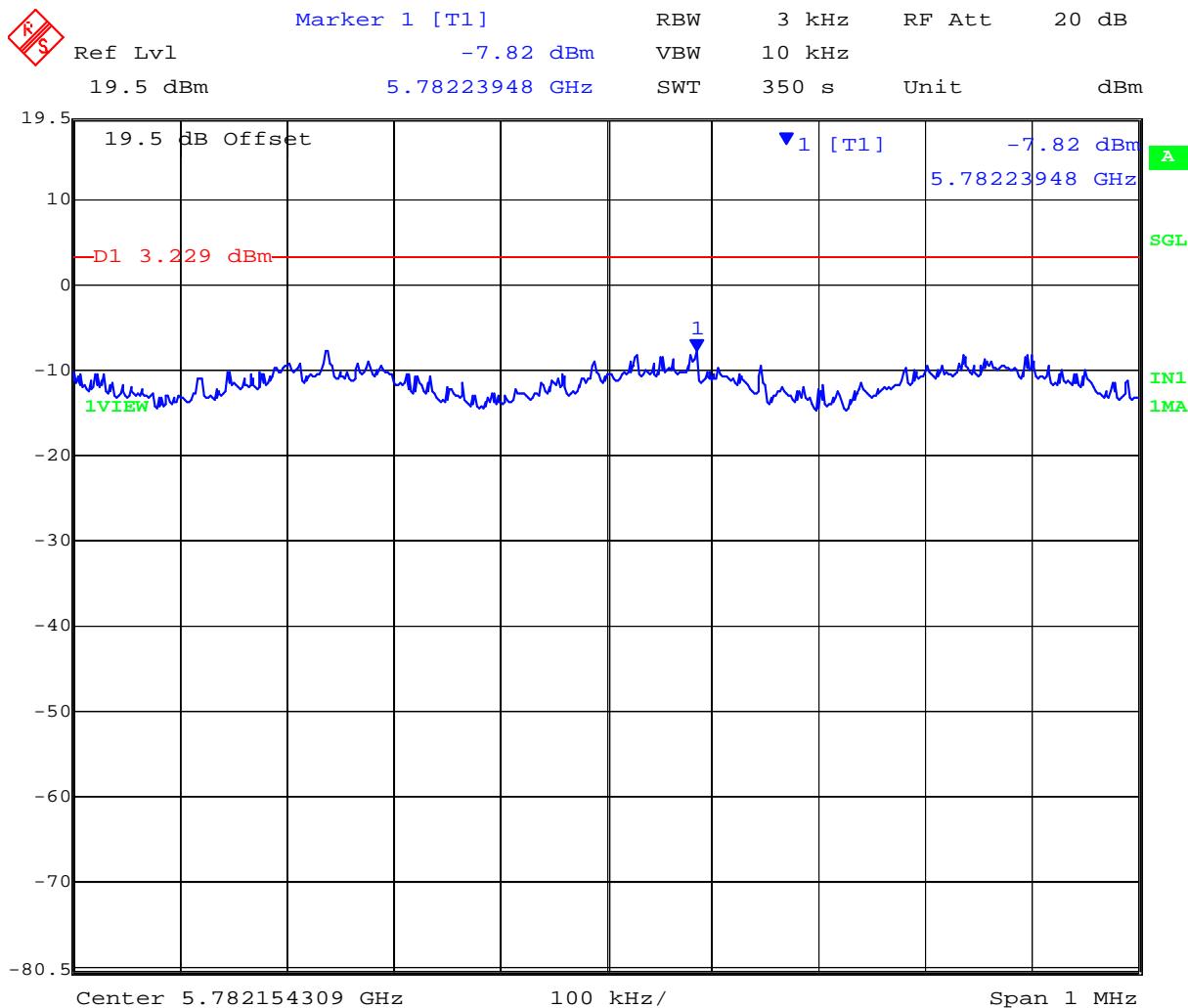
PORT B 5,785 MHz 802.11a Legacy - Peak Power Spectral Density



Date: 8.FEB.2012 16:56:16

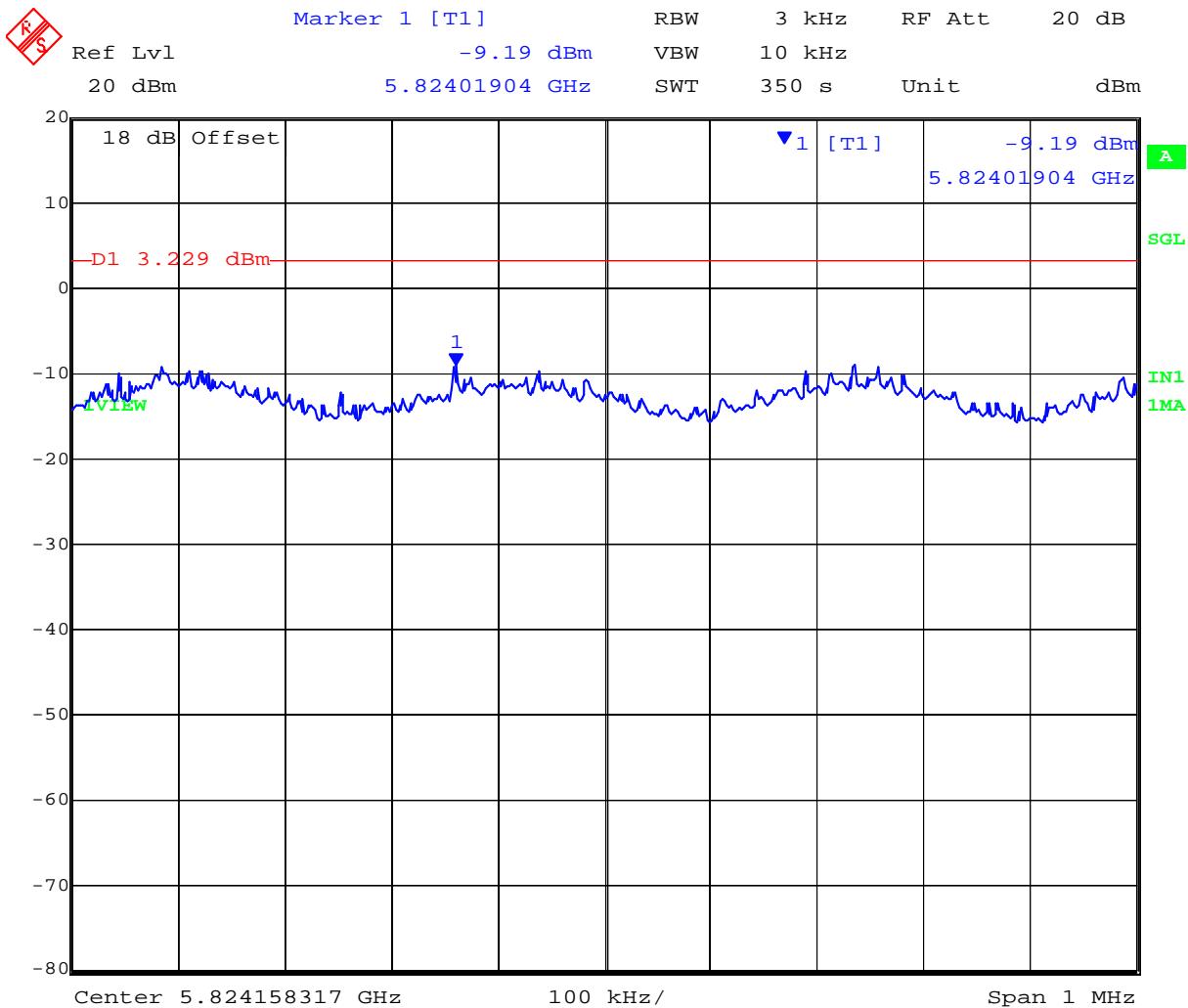
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PORT C 5,785 MHz 802.11a Legacy - Peak Power Spectral Density



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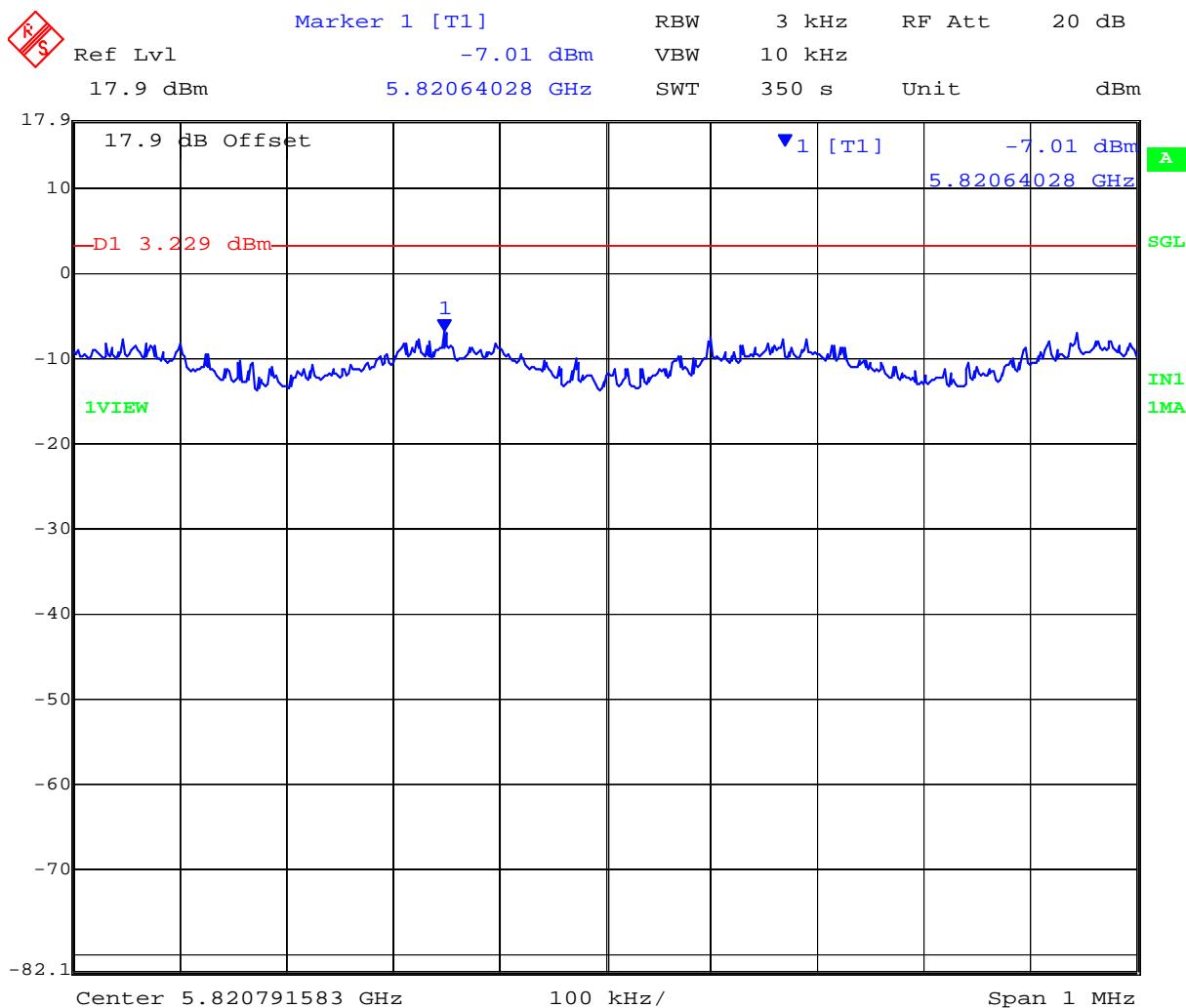
PORT A 5,825 MHz 802.11a Legacy - Peak Power Spectral Density



Date: 8.FEB.2012 17:30:54

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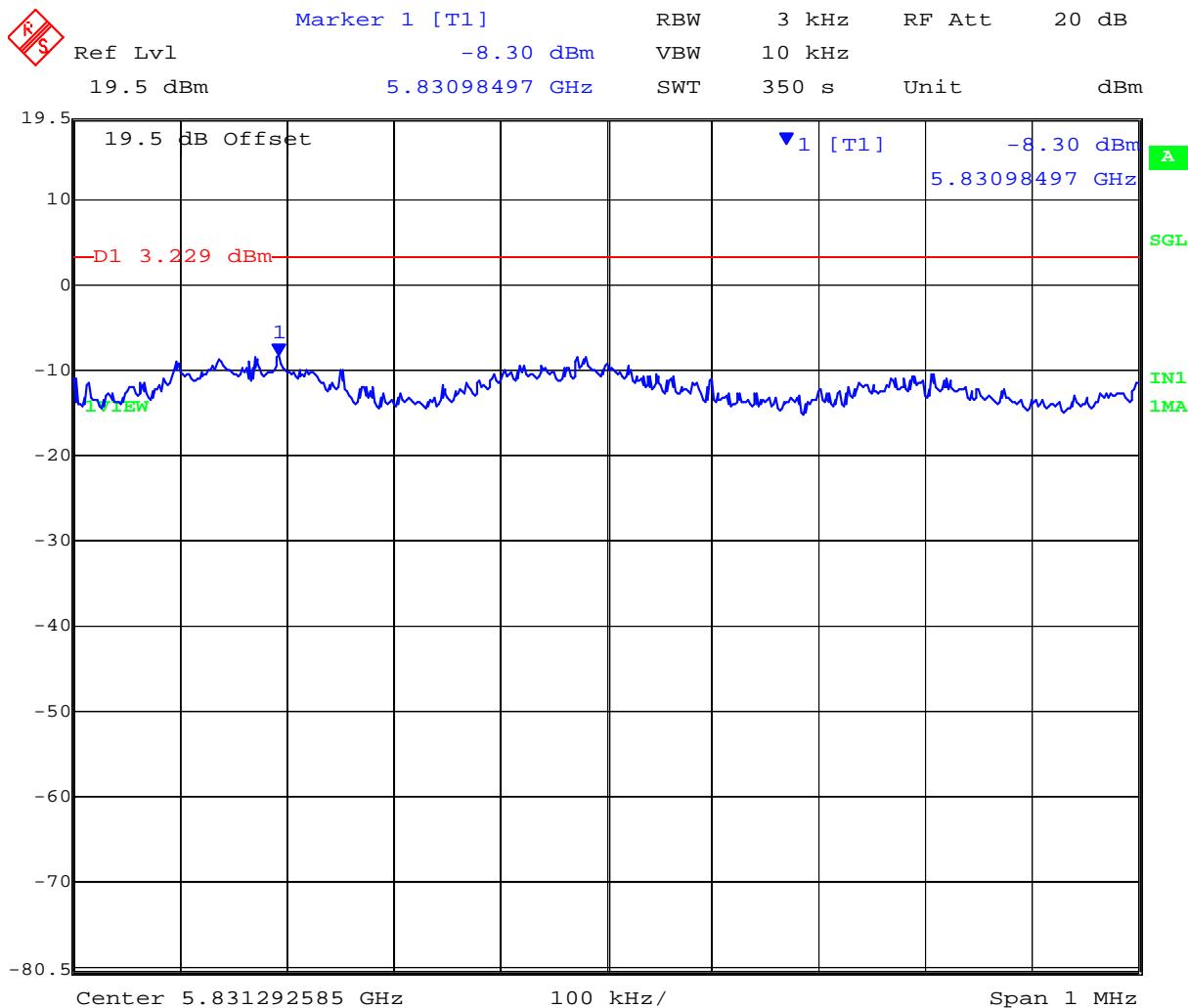
PORT B 5,825 MHz 802.11a Legacy - Peak Power Spectral Density



Date: 8.FEB.2012 17:37:28

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



Date: 8.FEB.2012 17:43:57

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Title: Fluke Networks Sensor4 Wireless Client
To: FCC 47 CFR Part 15.247 & IC RSS-210
Serial #: AMGT14-U1 Rev B
Issue Date: 20th June 2012
Page: 159 of 342

TABLE OF RESULTS – 802.11n HT-20

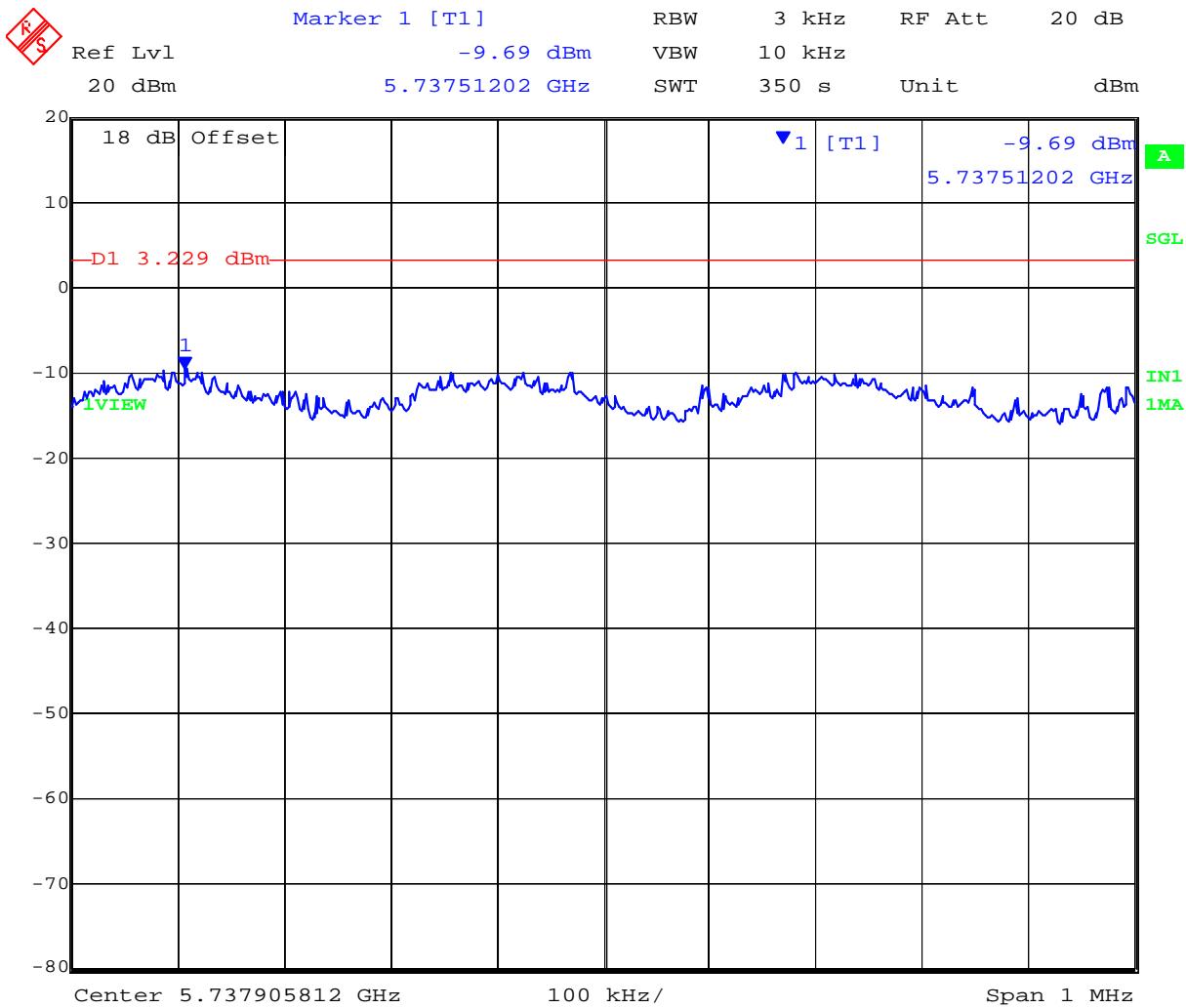
Test Conditions:	15.247 (e)	Rel. Humidity (%):	35	to	42
Variant:	802.11n HT-20	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	2 dBi		
Applied Voltage:	48.00 Vdc	Antenna Ports (N):	3		
Notes 1:					
Notes 2:					

Test Frequency	Measured Power Density				Correction factor	Peak Power Spectral Density	Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	10Log(N)	dBm	dBm	dB
5745.000	-9.69	-6.93	-8.96	--	4.77	-2.16	8.00	-10.16
5785.000	-7.98	-7.20	-7.32	--	4.77	-2.43	8.00	-10.43
5825.000	-9.19	-7.70	-7.36	--	4.77	-2.58	8.00	-10.58

Measurement uncertainty:	± 1.33 dB
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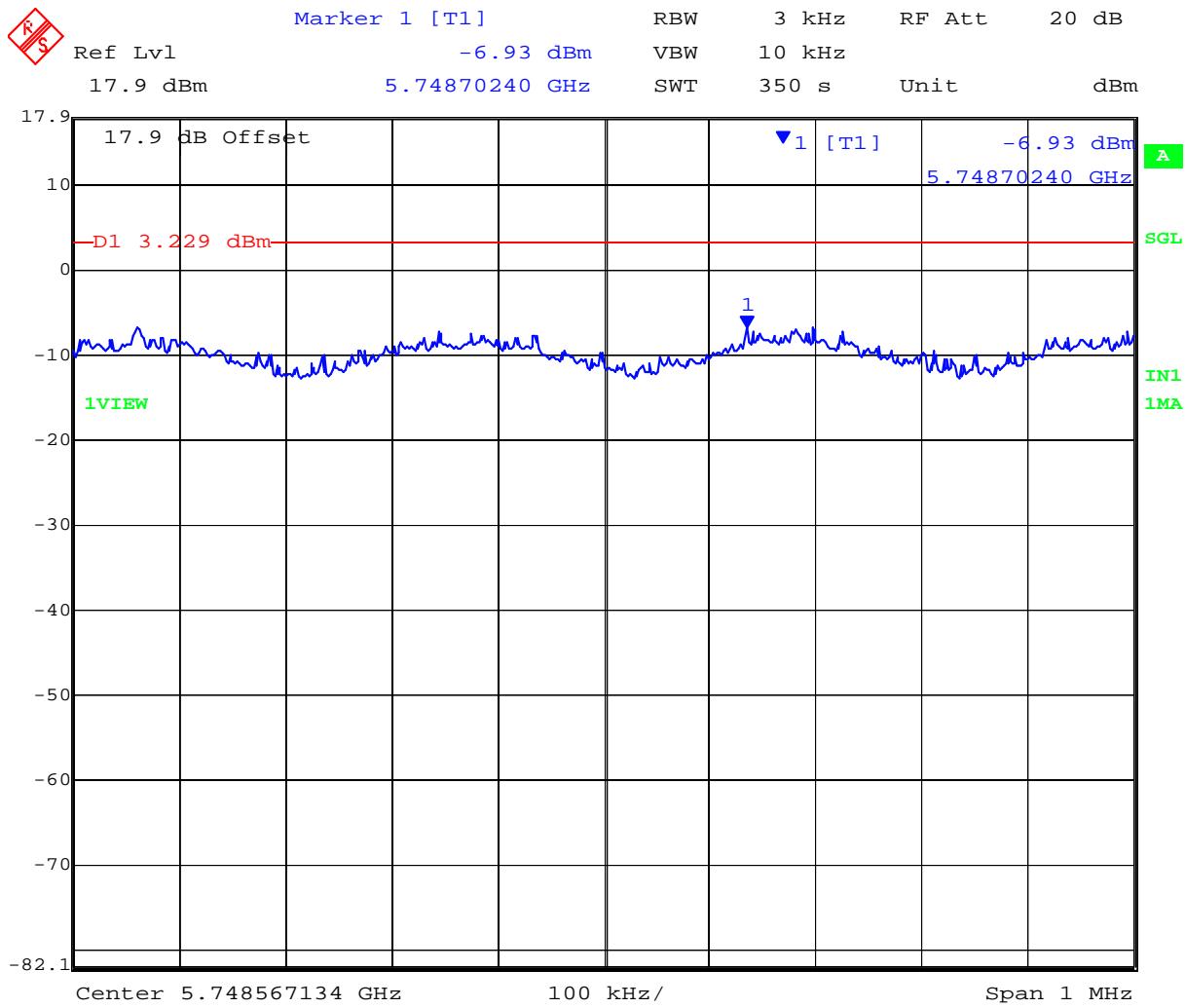
PORT A 5,745 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 8.FEB.2012 18:33:47

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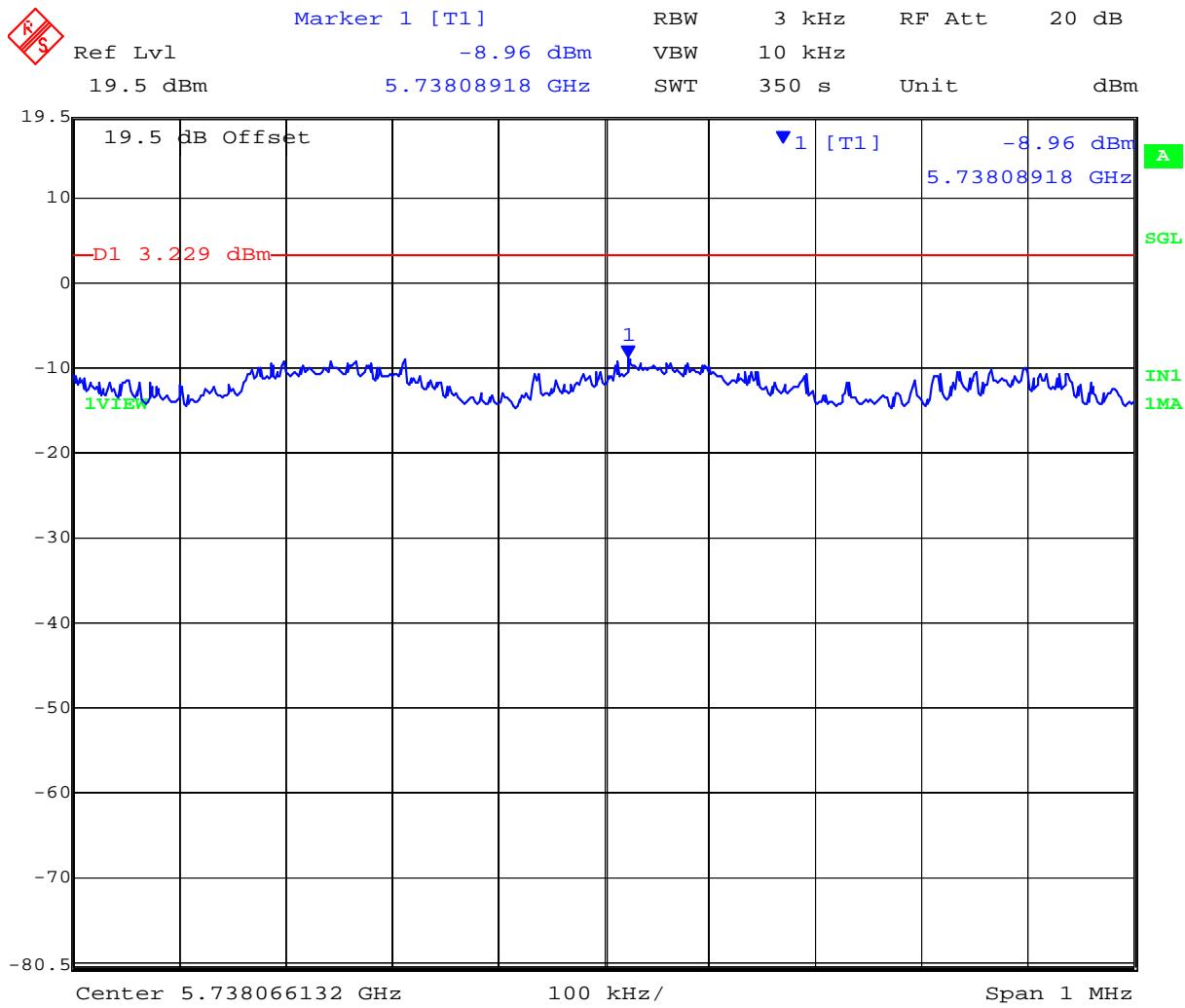
PORT B 5,745 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 8.FEB.2012 18:40:18

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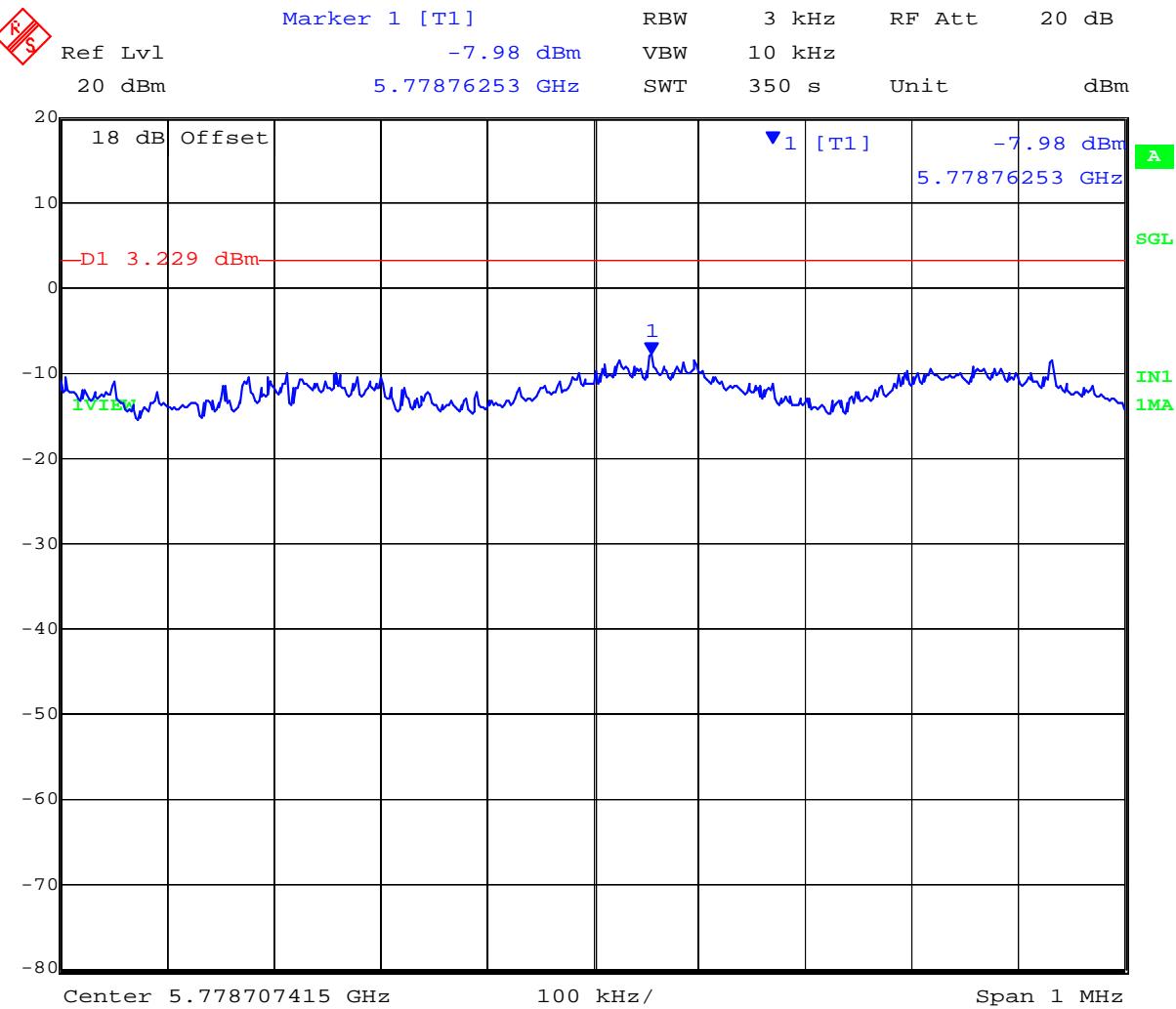
PORT C 5,745 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 8.FEB.2012 18:46:47

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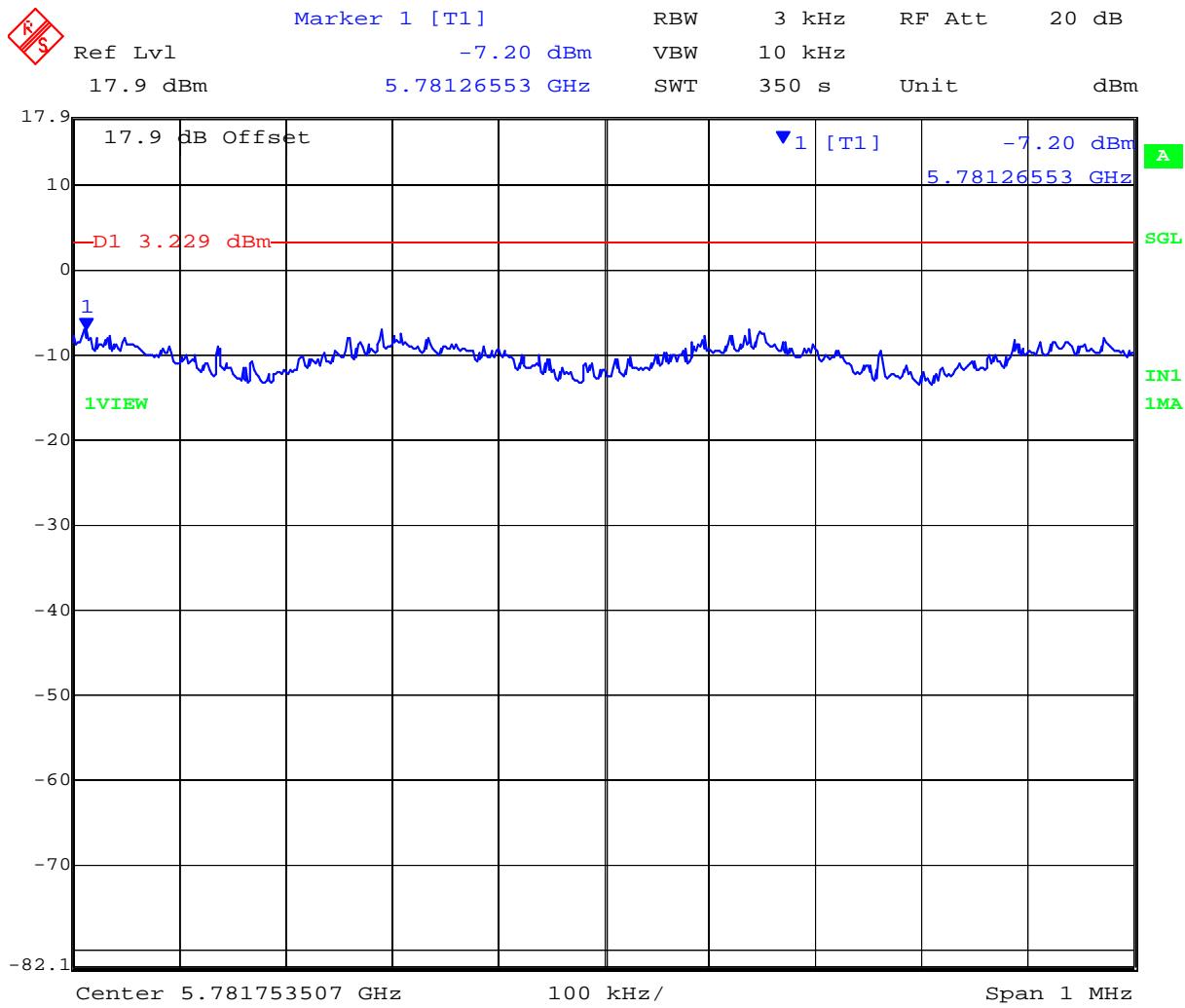
PORT A 5,785 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 8.FEB.2012 19:03:07

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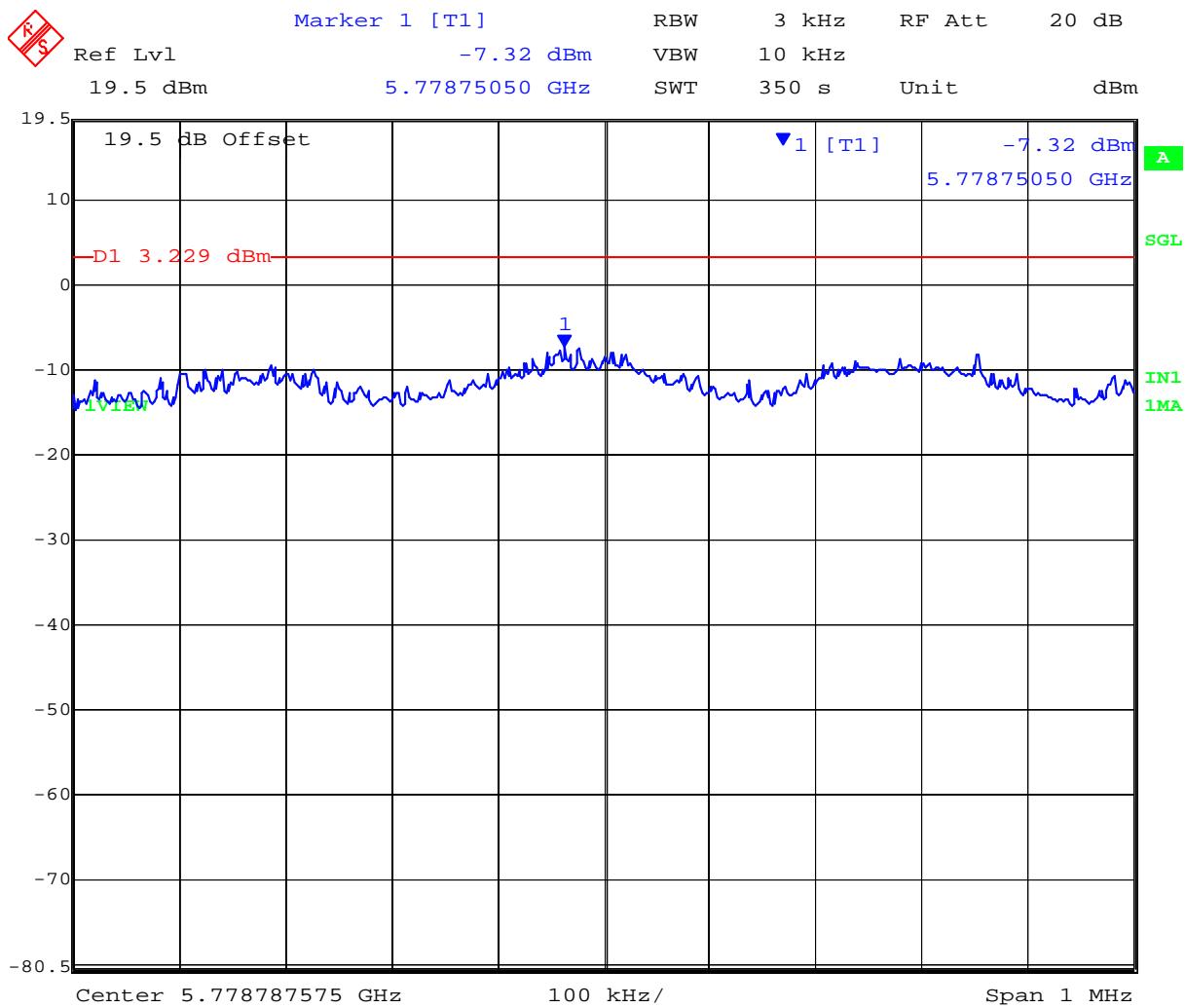
PORT B 5,785 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 8.FEB.2012 19:09:38

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



Date: 8.FEB.2012 19:16:09

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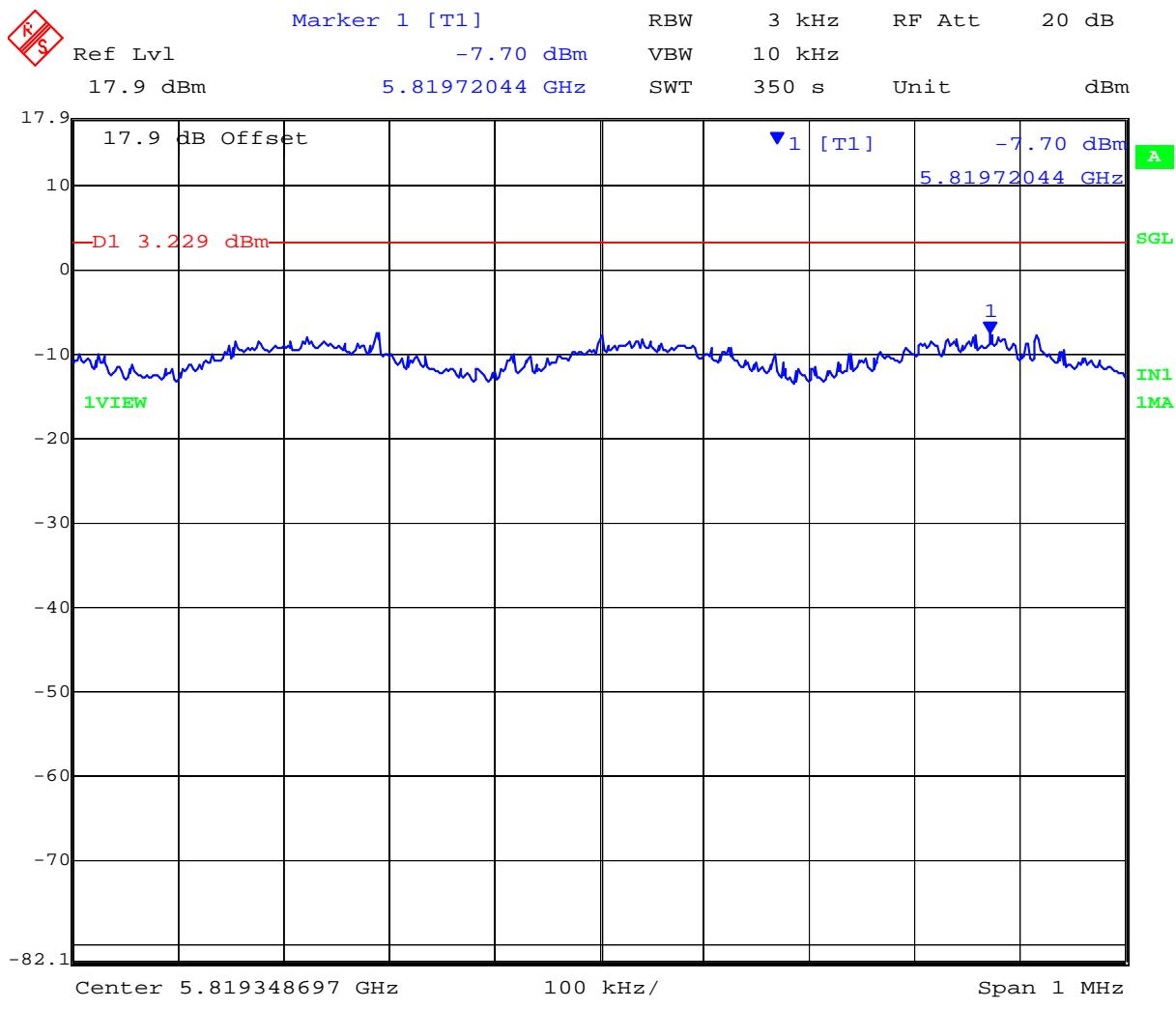
PORT A 5,825 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 8.FEB.2012 19:36:59

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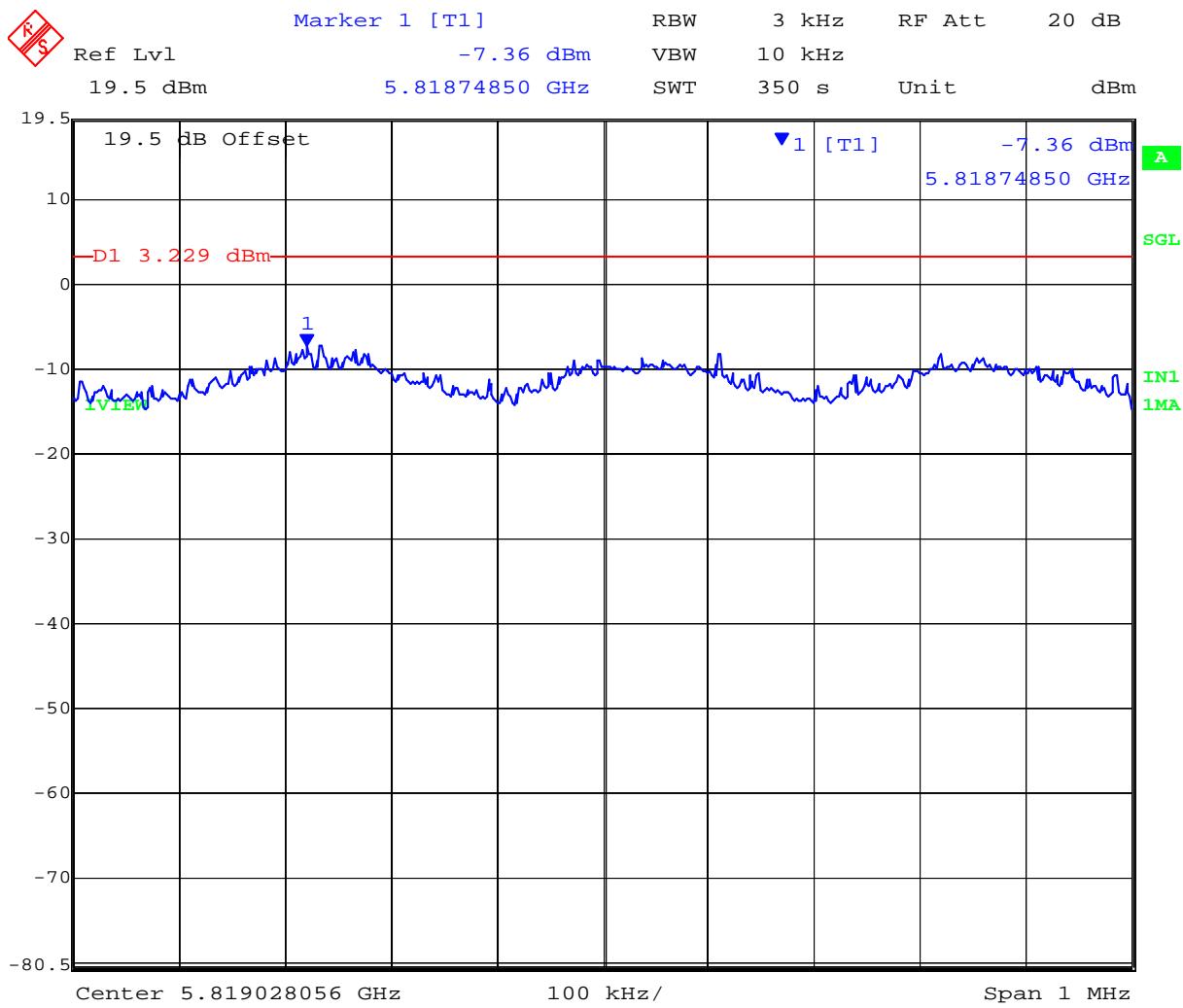
PORT B 5,825 MHz 802.11n HT-20 - Peak Power Spectral Density



Date: 8.FEB.2012 19:43:31

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



Date: 8.FEB.2012 19:50:02

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Title: Fluke Networks Sensor4 Wireless Client
To: FCC 47 CFR Part 15.247 & IC RSS-210
Serial #: AMGT14-U1 Rev B
Issue Date: 20th June 2012
Page: 169 of 342

TABLE OF RESULTS – 802.11n HT-40

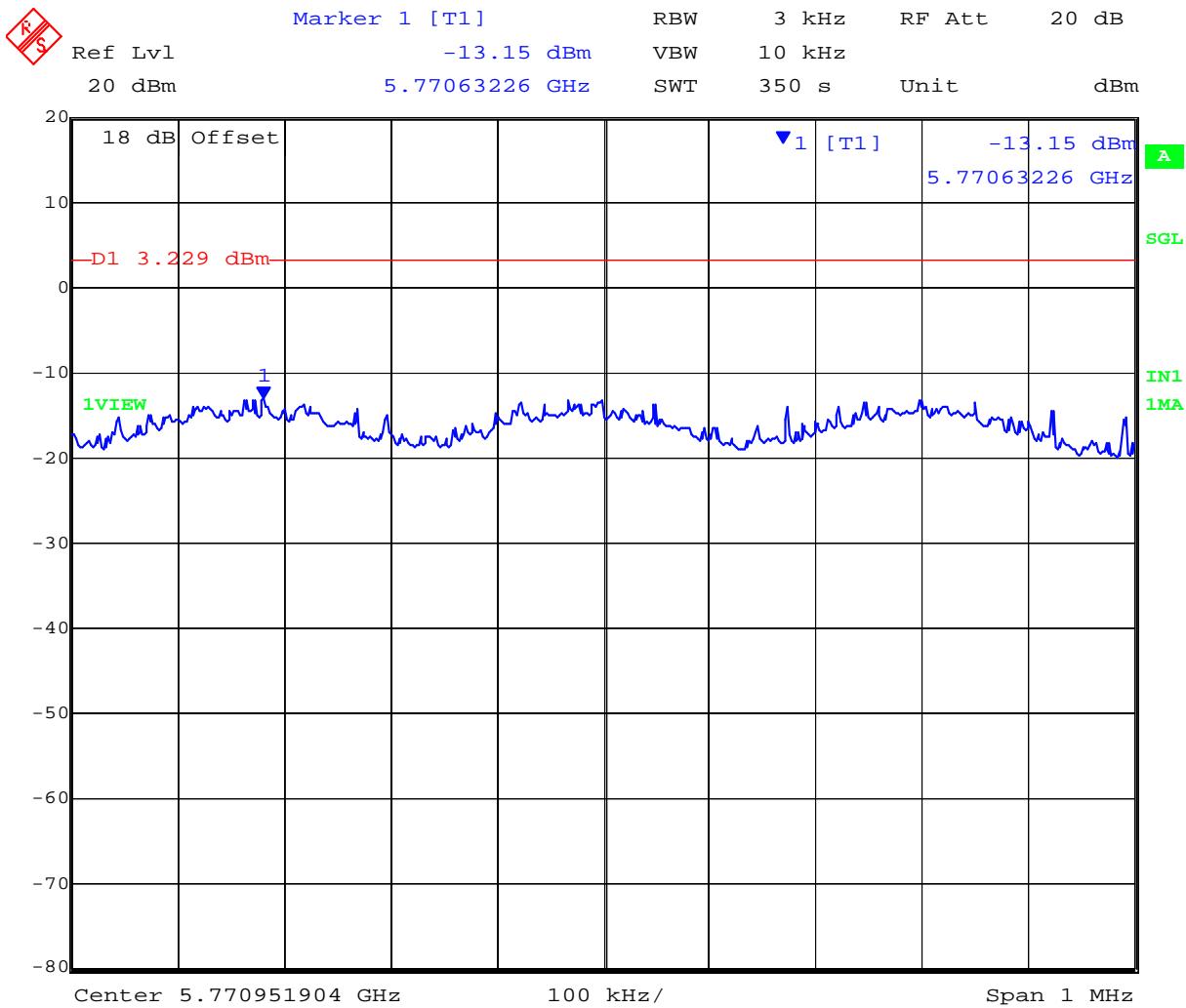
Test Conditions:	15.247 (e)	Rel. Humidity (%):	35	to	42
Variant:	802.11n HT-40	Ambient Temp. (°C):	19	to	22
TPC:	HIGH	Pressure (mBars):	998	to	1003
Modulation:	ON	Duty Cycle (%):	100		
Beam Forming Gain (Y):	N/A dB	Antenna Gain:	2 dBi		
Applied Voltage:	48.00 Vdc	Antenna Ports (N):	3		
Notes 1:					
Notes 2:					

Test Frequency	Measured Power Density				Correction factor	Peak Power Spectral Density	Limit	Margin
	RF Port (dBm)							
MHz	a	b	c	d	10Log(N)	dBm	dBm	dB
5755.000	-13.15	-7.10	-12.09	--	4.77	-2.33	8.00	-10.33
5795.000	-9.46	-7.10	-9.64	--	4.77	-2.33	8.00	-10.33

Measurement uncertainty:	± 1.33 dB
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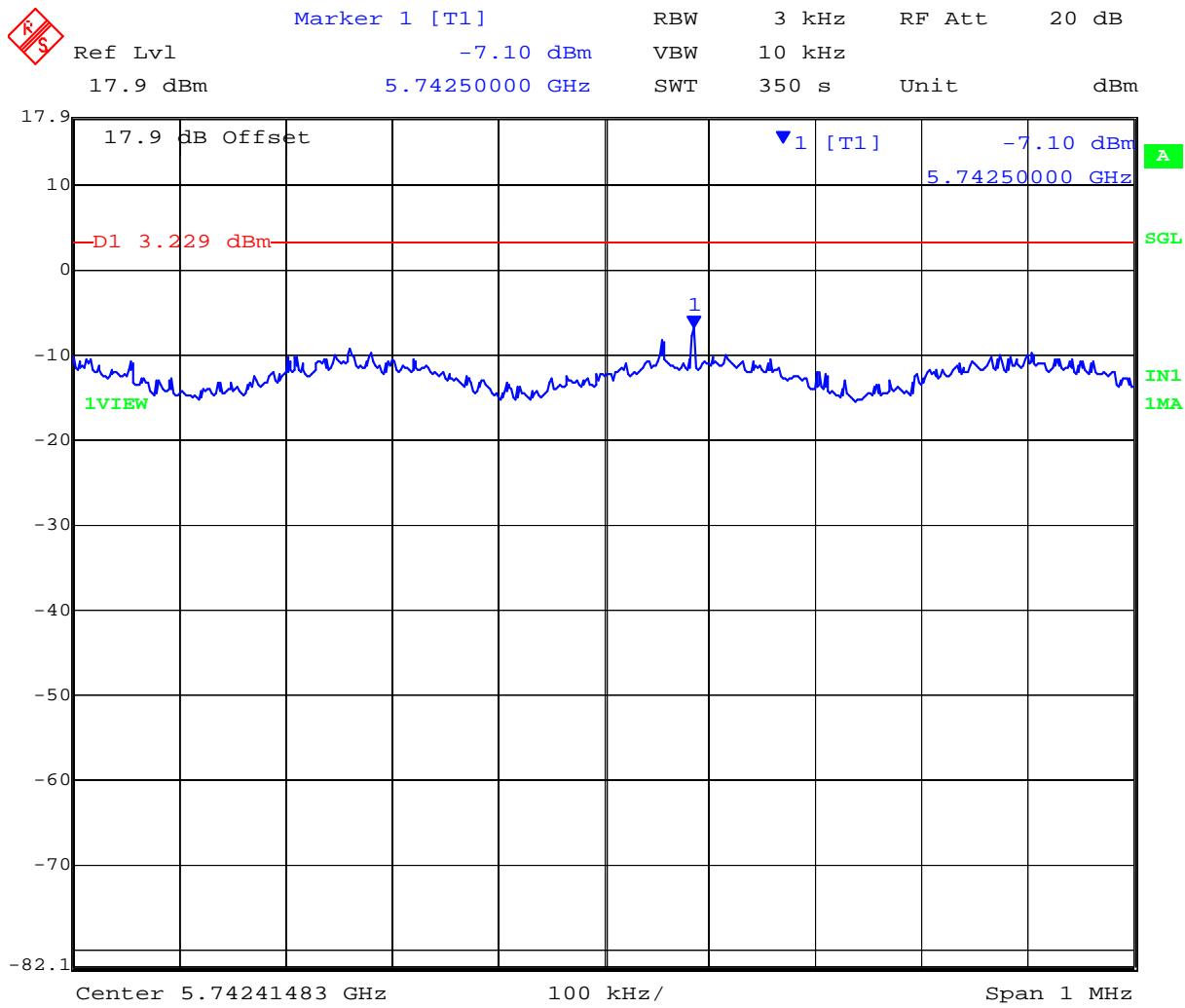
PORT A 5,755 MHz 802.11n HT-40 - Peak Power Spectral Density



Date: 8.FEB.2012 20:15:17

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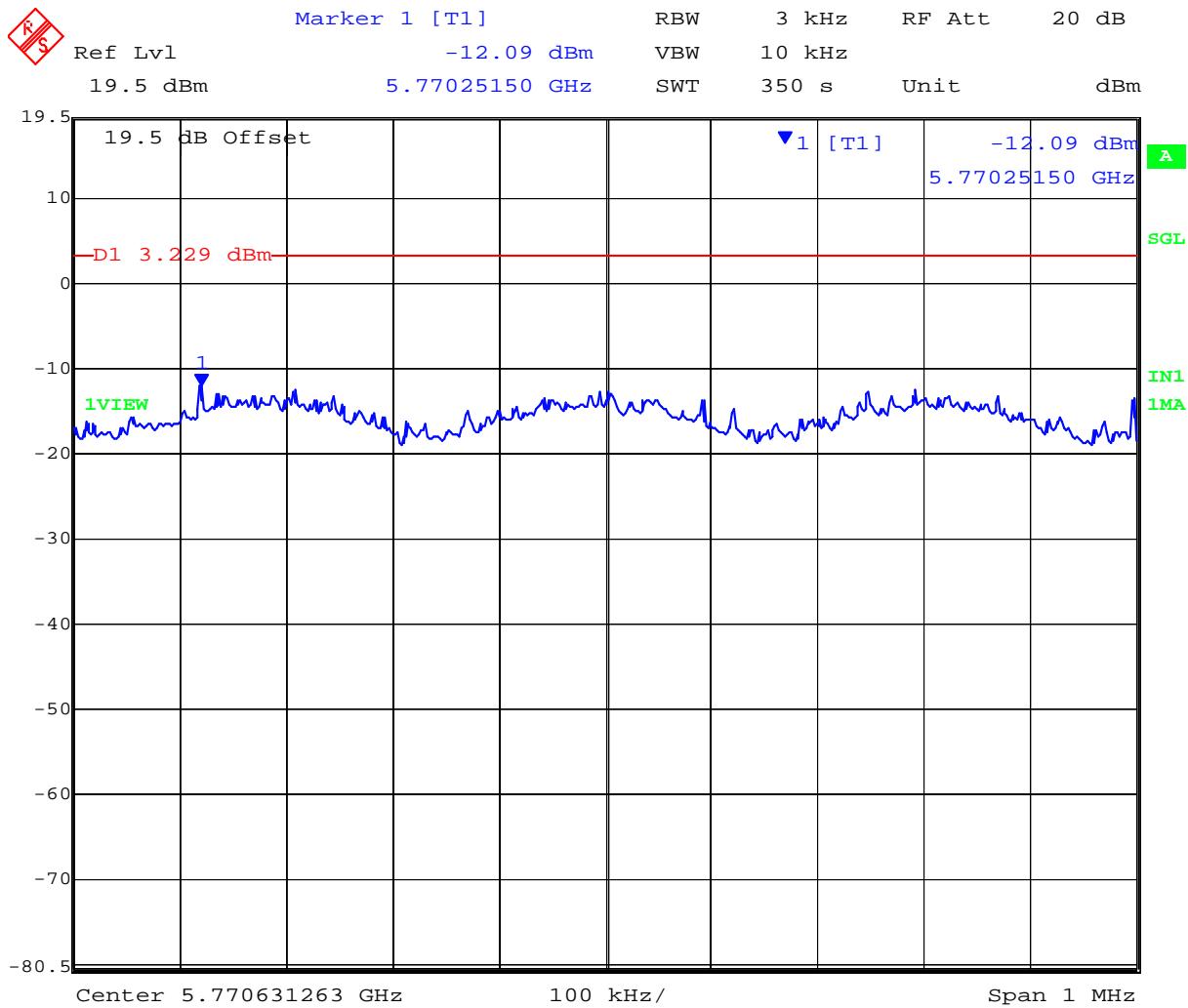
PORT B 5,755 MHz 802.11n HT-40 - Peak Power Spectral Density



Date: 8.FEB.2012 20:21:49

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PORT C 5,755 MHz 802.11n HT-40 - Peak Power Spectral Density



Date: 8.FEB.2012 20:28:17

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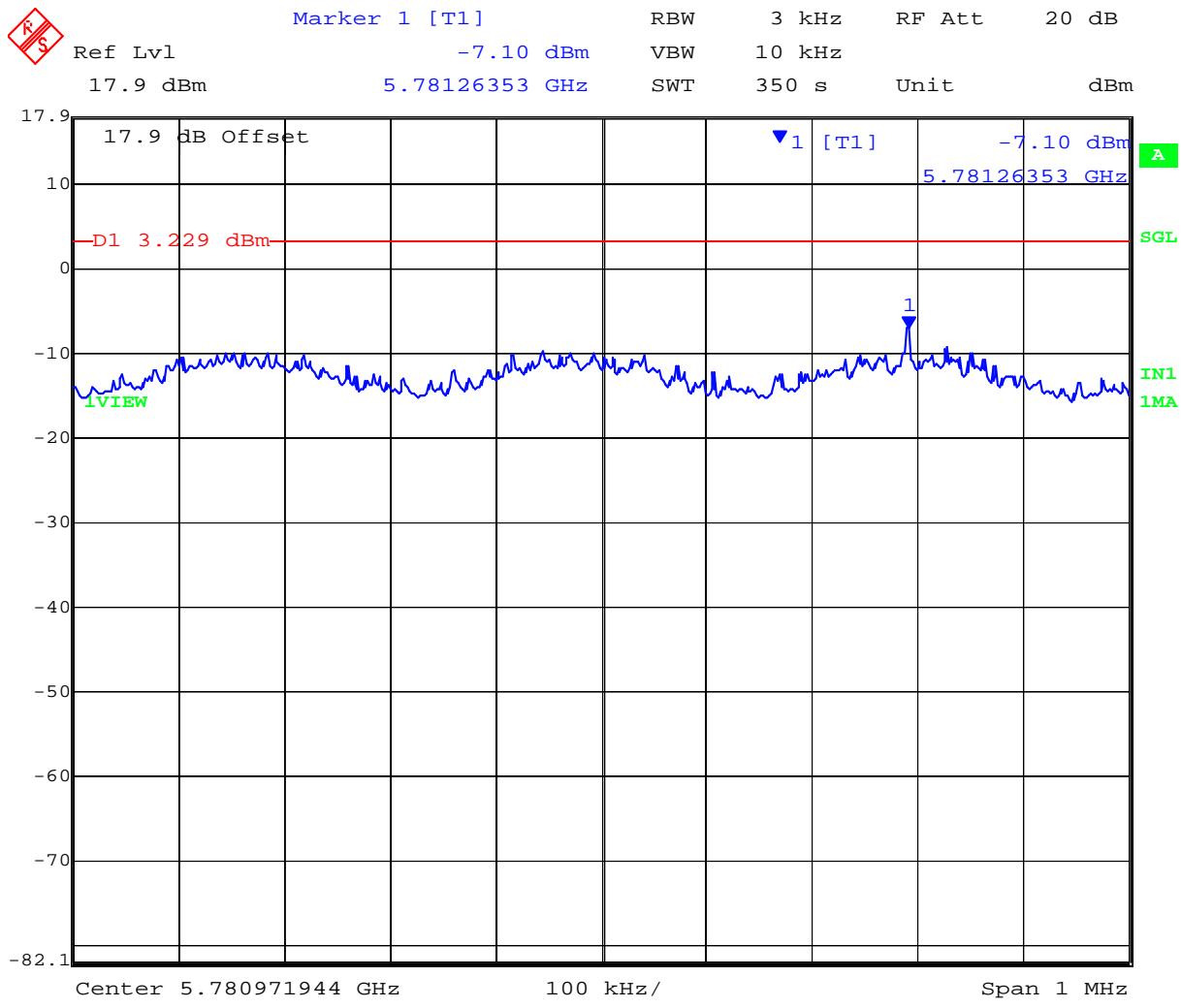
PORT A 5,795 MHz 802.11n HT-40 - Peak Power Spectral Density



Date: 8.FEB.2012 20:49:54

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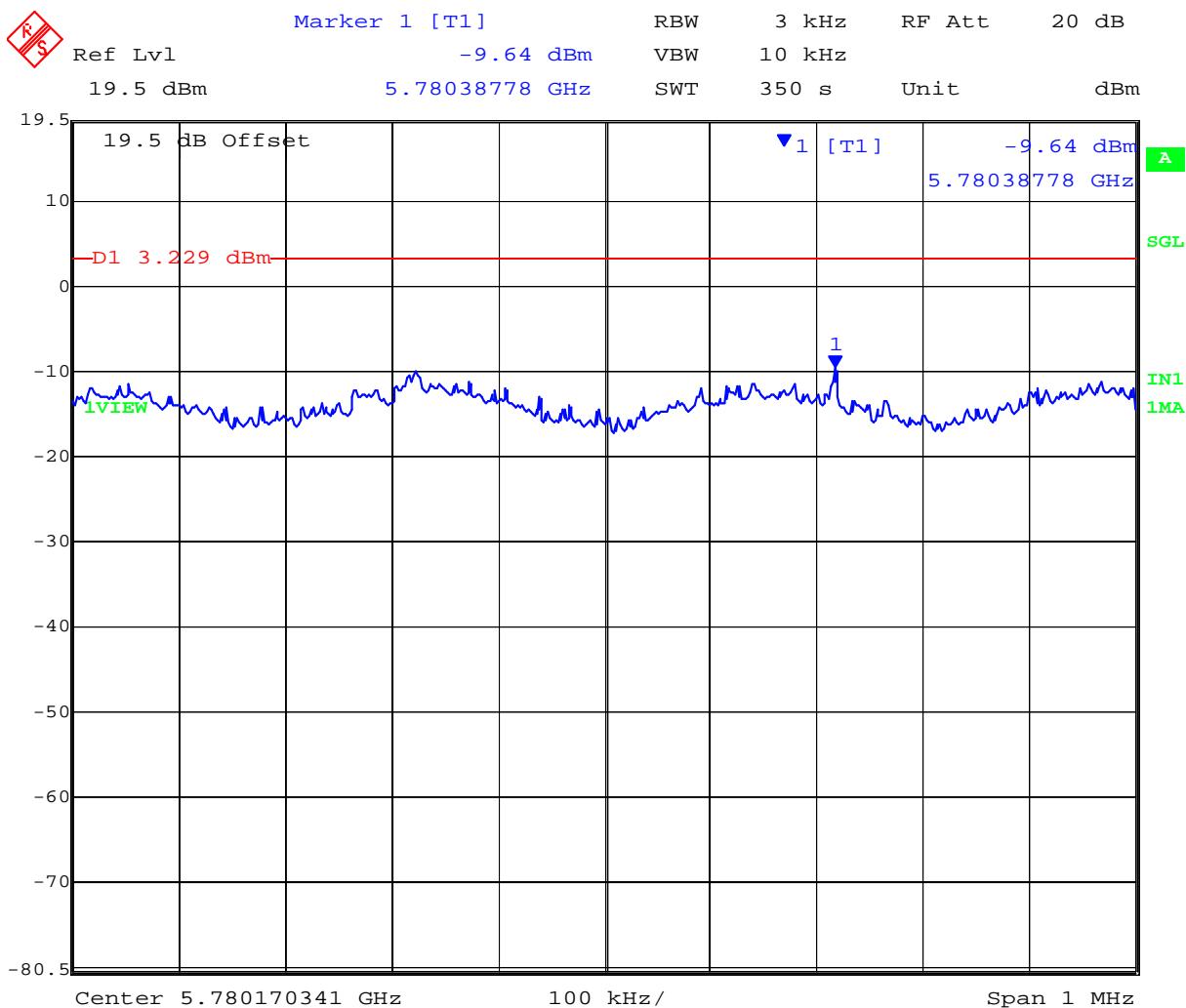
PORT B 5,795 MHz 802.11n HT-40 - Peak Power Spectral Density



Date: 8.FEB.2012 20:56:27

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PORT C 5,795 MHz 802.11n HT-40 - Peak Power Spectral Density



Date: 8.FEB.2012 21:02:58

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