SGS-CSTC Standards
Technical Services Co., Ltd.

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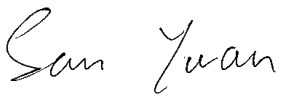
Tino.Pan@sgs.com

TEST REPORT

Application No. :	SHEMO09110133901
Applicant:	CC&C Technologies,Inc.
FCC ID:	WKLWL6203
Fundamental Frequency :	2.4GHz ISM Band
Equipment Under Test (EUT):	
Name:	WLAN 11n Mini USB Adapter
Model No.:	WL-6203-V1
Standards:	FCC PART 15 SUBPART C, Section 15.247
Date of Receipt:	November 30,2009
Date of Test:	November 30,2009 to December 8,2009
Date of Issue:	December 9,2009
Test Result :	**PASS ***

* In the configuration tested, the EUT complied with the standards specified above.

Approved by: **Tested By:**



Tino Pan
E&E Section Manager

San Yuan
EMC TEST Engineer

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Test Summary

The customer requested FCC tests for a 2.4GHz transmitter.			
Test	**Test Requirement**	**Stanadard Paragraph**	**Result**
AC Power Line Conducted Emission	FCC PART 15	Section 15.207(a)	PASS
Peak Output Power	FCC PART 15	Section 15.247(b)(3),(4)(c)	PASS
6dB Bandwidth	FCC PART 15	Section 15.247(a)(2)	PASS
100KHz Bandwidth of Frequency Band Edges	FCC PART 15	Section 15.247(d)	PASS
Spurious Emission	FCC PART 15	Section 15.247(d)	PASS
Peak Power Density	FCC PART 15	Section 15.247(e)	PASS
Antenna Requirement	FCC PART 15	Section 15.203	PASS
RF Exposure Compliance Requirement	FCC PART 15	Section 15.247(b)(4)	PASS

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3 General Information

3.1 Client Information

Applicant Name:	CC&C Technologies,Inc.
Applicant Address:	No.9 Building,3rd Main Street,Kunshan Export Processing Zone, P.R.China

3.2 Details of E.U.T.

Name:	WLAN 11n Mini USB Adapter
Model No.:	WL-6203-V1
Power Supply:	5V DC from USB of host PC
Power Cord:	N/A
Frequency Band :	2.4GHz ISM Band
Modulation tye	CCK,DQPSK,DBPSK for DSSS 64QAM,16QAM,QPSK,BPSK for OFDM
Spread Spectrum:	IEEE 802.11b:DSSS IEEE 802.11g/n :OFDM
Frequency Range& Channel number	802.11b/g/n_20M:2412-2462MHz,11 channels 802.11 n_40M:2422-2452 MHz, 7 channels
Dimension	52.3*24.4*9.9mm(L*W*H)

3.3 Description of Support Units

Name / Function	Model No.	Remark	S/N
Notebook Computer	2374	IBM	99-4CACA

3.4 Test Location

Tests were performed at:
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
No.588 West Jindu Road, Songjiang District, Shanghai, China. 201612.
Tel: +86 21 6191 5666 Fax: +86 21 6191 5655
No tests were sub-contracted.

3.5 Other Information Requested by the Customer

None.

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3.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2011-07-29.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2012-03-17.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2011-09-29.

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4 Test Results

4.1 Test Instruments

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	Spectrum Analyzer	Rohde & Schwarz	FSP-30	100324	2009-4-21	2010-4-20
2	EMI test receiver	Rohde & Schwarz	ESU40	100109	2009-6-4	2010-6-3
3	Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-679	2009-6-4	2010-6-3
4	Horn Antenna	Rohde & Schwarz	HF906	100284	2009-4-11	2010-4-10
5	Horn Antenna	Rohde & Schwarz	HF906	100285	2009-10-9	2010-10-8
6	ANTENNA	SCHWARZBECK	VULB9168	9168-313	2009-6-4	2010-6-3
7	Low nosie amplifier	TESEQ	LNA6900	70133	2009-7-7	2010-7-6
8	Atmosphere pressure meter	Shanghai ZhongXuan Electronic Co;Ltd	BY－2003P	--	2009-10-15	2010-10-14
9	CLAMP METER	FLUKE	316	86080010	2009-04-27	2010-04-26
10	Thermo-Hygrometer	ZHICHEN	ZC1-2	01050033	2009-10-21	2010-10-20
11	Digital illuminance meter	TES electrical electronic Corp.	TES-1330A	050602219	2009-10-16	2010-10-15
12	TEMPERATURE& HUMIDITY BOX	KSON	THS-D2C-100	K40723	2009-11-18	2010-11-17
13	DC power	KIKUSUI	PMC35－3	NF100260	--	--
14	Line impedance stabilization network	SCHWARZBECK	NSLK8127	8127-490	2009-5-8	2010-5-7
15	High pass Filter	FSCW	HP 12/2800-5AA2	19A45-02	2009-4-11	2010-4-10

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4.2 E.U.T. Operation

Input voltage: 5V DC from USB of PC

Operating Environment:

Temperature: 25.0 °C

Humidity: 56 % RH

Atmospheric Pressure: 1008 mbar

EUT Operation: The EUT has been tested under operating condition.

Test program was used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

802.11 b mode:Channel low (2412MHz) mid(2437MHz) high(2462MHz) with the worst case 1Mbps date rate was report for radiated spurious emission.

802.11 g mode:Channel low (2412MHz) mid(2437MHz) high(2462MHz) with the worst case 6Mbps date rate was report for radiated spurious emission.

802.11 n _20M mode:Channel low (2412MHz) mid(2437MHz) high(2437MHz) with the worst case 6.5Mbps date rate was report for radiated spurious emission.

802.11 n _40M mode:Channel low (2422MHz) mid(2437MHz) high(2452MHz) with the worst case 13.5Mbps date rate was report for radiated spurious emission.

4.3 Test Procedure & Measurement Data

4.3.1 Antenna Requirement

Test Requirement: FCC Part15 15.203

Test Date: December 1,2009

Measurement Distance: 3m (Semi-Anechoic Chamber)

Requirements: An intentional radiator shall be designed to ensure that no antenna other than fumished by the responsible party shall be used with the device.The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.The manufacturer may design the unit so that a broken antenna can be replaced by the user,but the use of a standard antenna jack or electrical connector is prohibited.This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211,15.213,15.217,15.219or 15.221.Further, this requirement does not apply to intentional radiators that must be professionally installed,such as perimeter protection systems and some field disturbance sensors,or to other Intentional radiators which,in accordance with Section 15.31(d), Must be measured at the installation site,However,the installer

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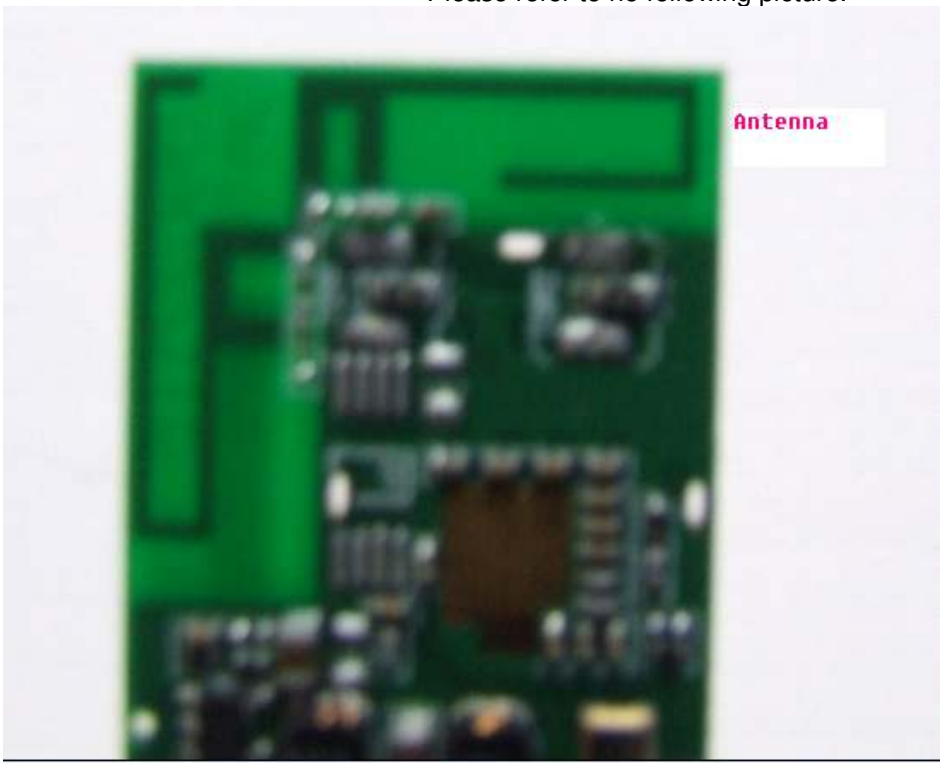
	shall be responsible for ensuring that the proper antenna is employed so That the limits in this part are not exceeded.
FCC Rules (Section15.203)	Described how the EUT complies with the requirement that either its antenna is permanently attached,or that it employs a unique Antenna connector,for every antenna proposed for use with the EUT. The exception in those cases where EUT must be professionally Installed.In order to demonstrate that professional installation is Required,the following 3 points must be addressed: • The application(or intended use)of the EUT • The installation requirements of the EUT • The method by which the EUT will be marketed
Conclusion	The directional gains of antenna used for transmitting is 0dBi, The RF transmitter uses an integrate antenna withot connector, Please refer to he following picture.



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4.3.2 Conducted Emission Test

Test Requirement: FCC Part15 15.207

Test date: December 1,2009

Standard Applicable According to section 15.207,frequency 150KHz to 30MHz shall not not exceed the limit table as blew.

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

*

EUT Setup 1.The conducted emission tests were performed in the test site,using the setup in accordance with the ANSI C63.4-2003.

2.The AC/DC Power adaptor of EUT was plug-in LISN.The rear of the EUT and periphearals were placed flushed with the rear of the tabletop.

3.The LISN was connected with 110V AC/60Hz power source.

Measurement Result Operation mode:Normal Link Mode

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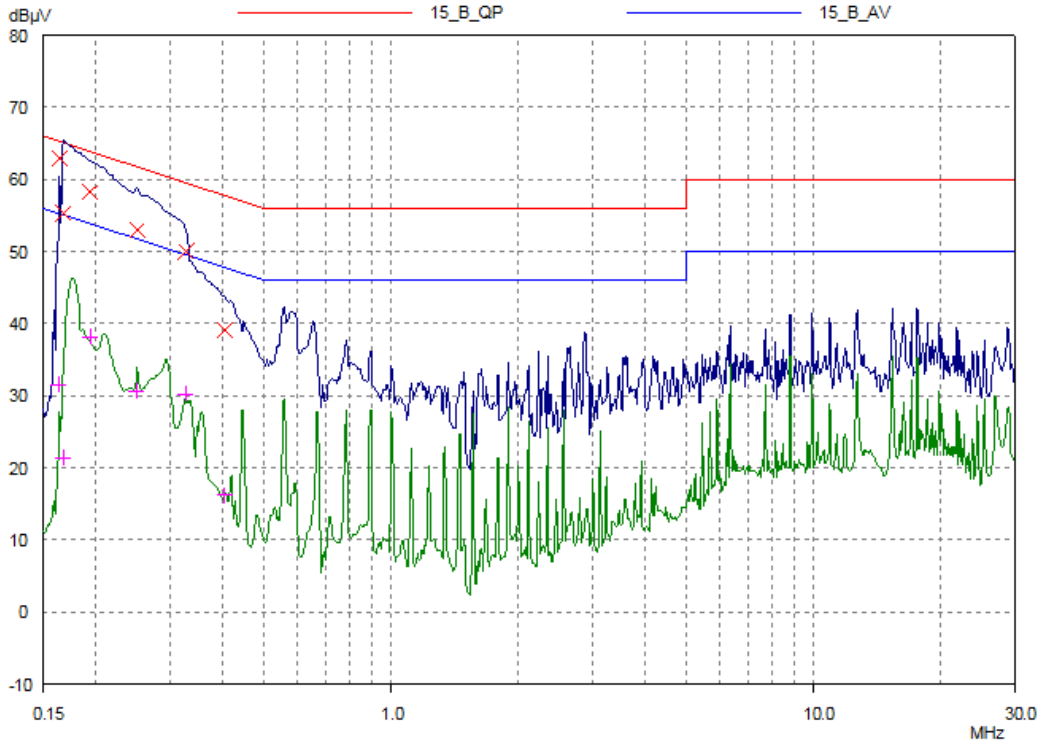
L line:



Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB
0.16374	62.90	65.27	2.37
0.1677	55.37	65.07	9.70
0.19356	58.25	63.88	5.63
0.24978	52.98	61.76	8.78
0.3275	49.92	59.51	9.59
0.40289	39.04	57.79	18.75

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB
0.16374	31.48	55.27	23.79
0.1677	21.25	55.07	33.82
0.19356	38.16	53.88	15.72
0.24978	30.57	51.76	21.19
0.3275	30.23	49.51	19.28
0.40289	16.15	47.79	31.64

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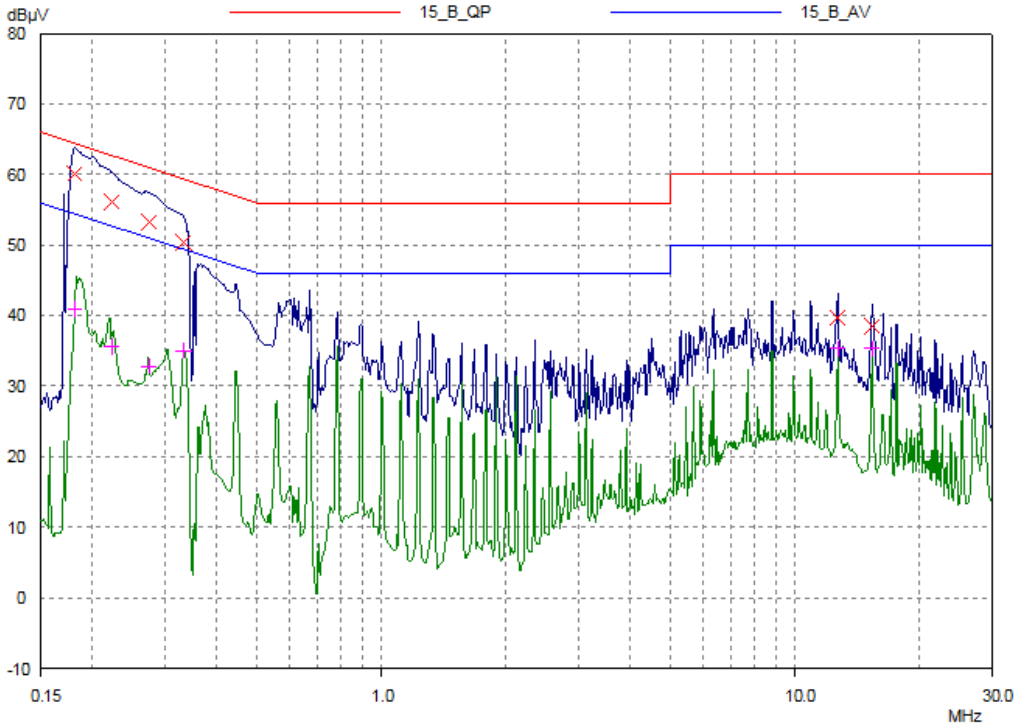
N Line:



Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB
0.18161	60.09	64.41	4.32
0.22341	56.06	62.69	6.63
0.27484	53.27	60.97	7.70
0.33277	50.32	59.38	9.06
12.69426	39.70	60.00	20.30
15.36952	38.42	60.00	21.58

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB
0.18161	40.86	54.41	13.55
0.22341	35.56	52.69	17.13
0.27484	32.76	50.97	18.21
0.33277	35.01	49.38	14.37
12.69426	35.25	50.00	14.75
15.36952	35.27	50.00	14.73

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4.3.3 Peak Output Power Measurement

Test Requirement: FCC Part 15 15.247(a)(2),(b)

Test date December 2,2009

Standard Applicable: According to section 15.247(a)(2),(b)
(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.
(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennaswith 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.

(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 fore very 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.

Measuremet Produre

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF calbe from the antenna port to the spectrum.

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3. Record the max.reading
4. Repeat above procedures until all the frequency measured were complete.

Measurement Result:

Test Results(802.11b)1M

CH	Frequency (MHz)	Reading Power(dBm)	Cable Loss (dB)	Output Power (dBm)	Limit (dBm)	Result
LOW	2412	12.72	0.00	12.72	30	PASS
MID	2437	12.63	0.00	12.63	30	PASS
HIGH	2462	12.31	0.00	12.31	30	PASS

Test Results(802.11g)6M

CH	Frequency (MHz)	Reading Power(dBm)	Cable Loss (dB)	Output Power (dBm)	Limit (dBm)	Result
LOW	2412	11.61	0.00	11.61	30	PASS
MID	2437	11.69	0.00	11.69	30	PASS
HIGH	2462	11.19	0.00	11.19	30	PASS

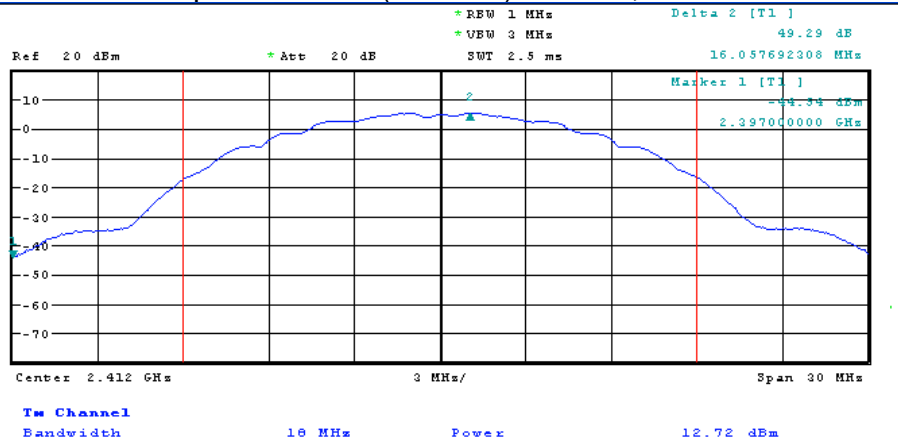
Test Results(802.11n_20M) 6.5M

CH	Frequency (MHz)	Reading Power(dBm)	Cable Loss (dB)	Output Power (dBm)	Limit (dBm)	Result
LOW	2412	11.73	0.00	11.73	30	PASS
MID	2437	12.95	0.00	12.95	30	PASS
HIGH	2462	12.20	0.00	12.20	30	PASS

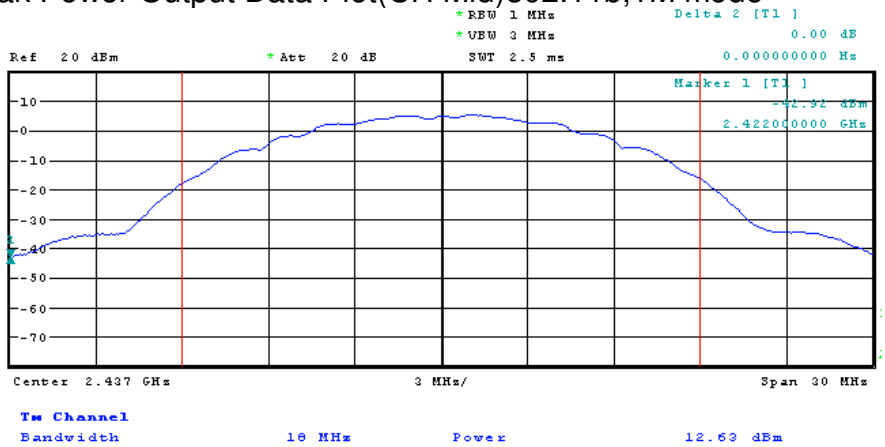
Test Results(802.11n_40M) 13.5M

CH	Frequency (MHz)	Reading Power(dBm)	Cable Loss (dB)	Output Power (dBm)	Limit (dBm)	Result
LOW	2422	12.69	0.00	12.69	30	PASS
MID	2437	12.84	0.00	12.84	30	PASS
HIGH	2452	12.81	0.00	12.81	30	PASS

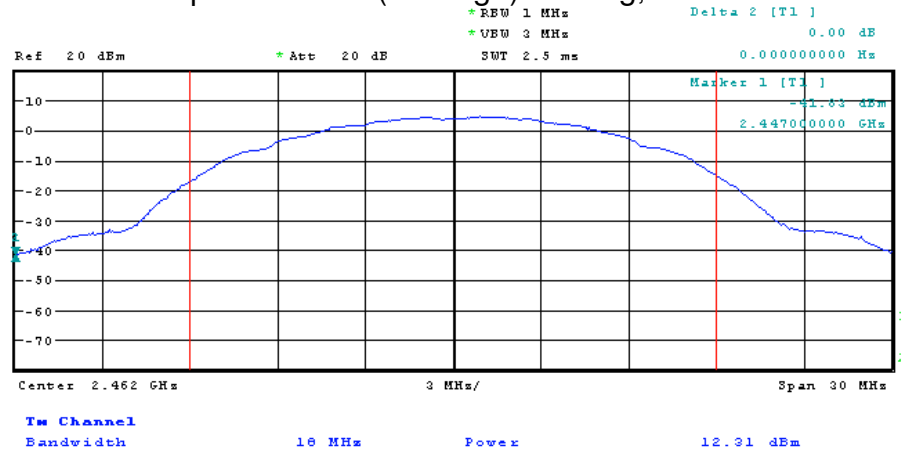
Peak Power Output Data Plot(CH Low)802.11b,1M mode



Peak Power Output Data Plot(CH Mid)802.11b,1M mode



Peak Power Output Data Plot(CH High)802.11g,1M mode



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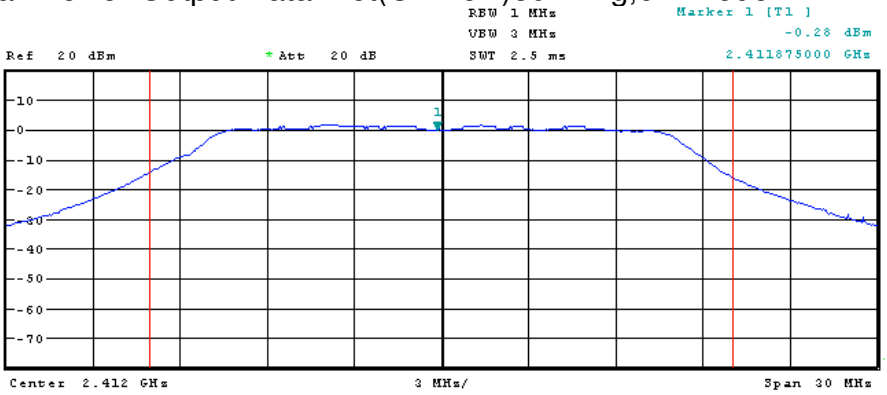
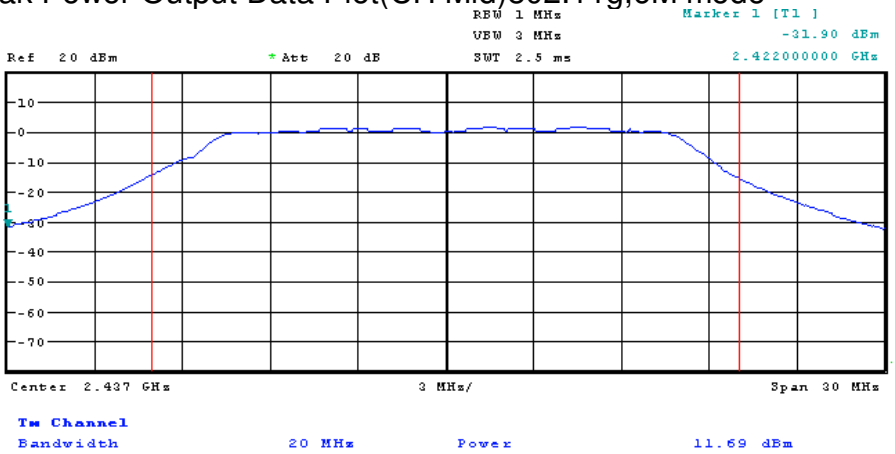
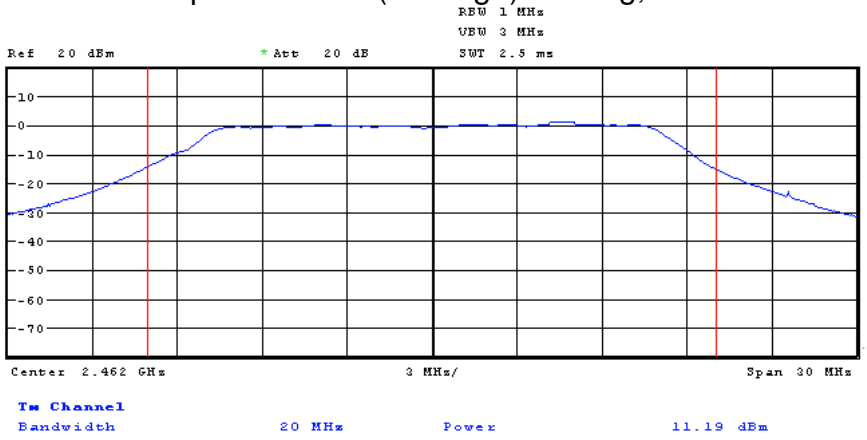
Peak Power Output Data Plot(CH Low)802.11g,6M mode



Peak Power Output Data Plot(CH Mid)802.11g,6M mode



Peak Power Output Data Plot(CH High)802.11g,6M mode



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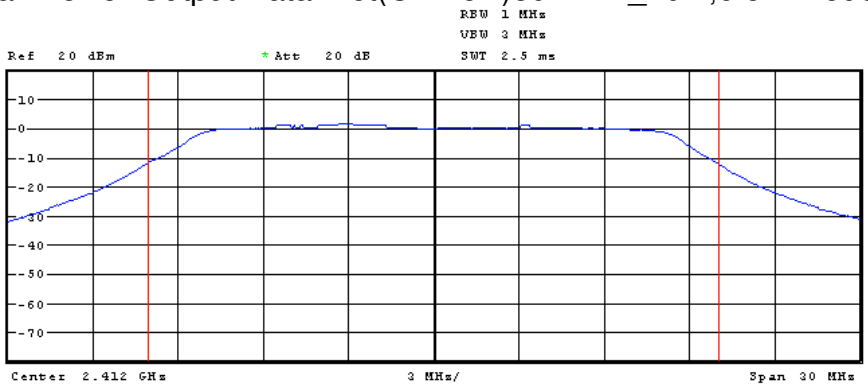
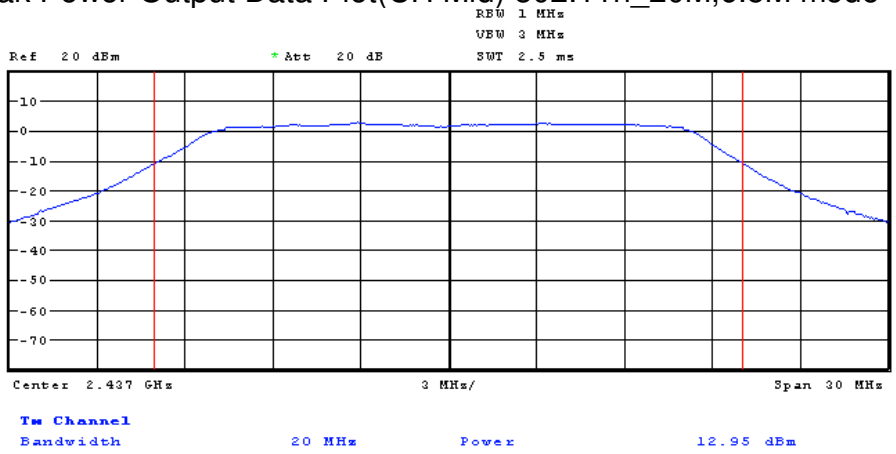
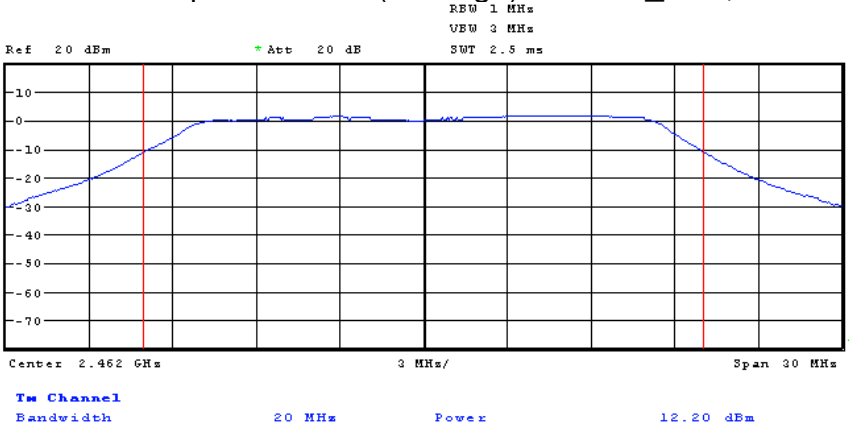
Peak Power Output Data Plot(CH Low)802.11n_20M,6.5M mode



Peak Power Output Data Plot(CH Mid) 802.11n_20M,6.5M mode



Peak Power Output Data Plot(CH High) 802.11n_20M,6.5M mode



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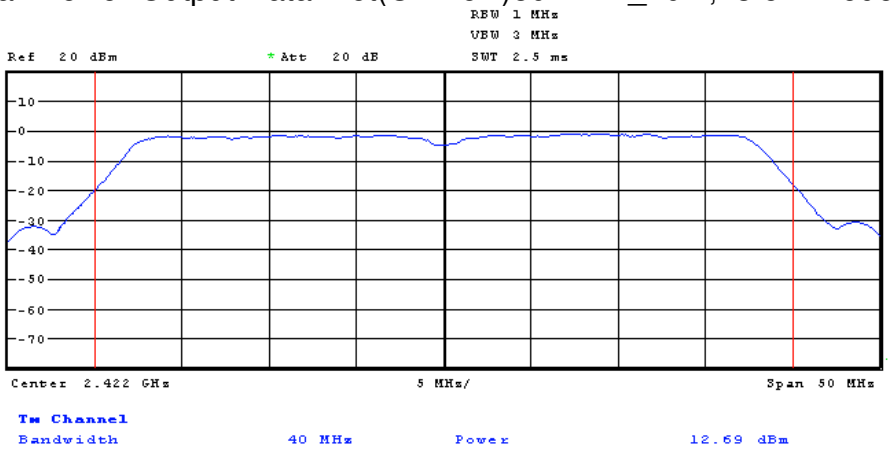
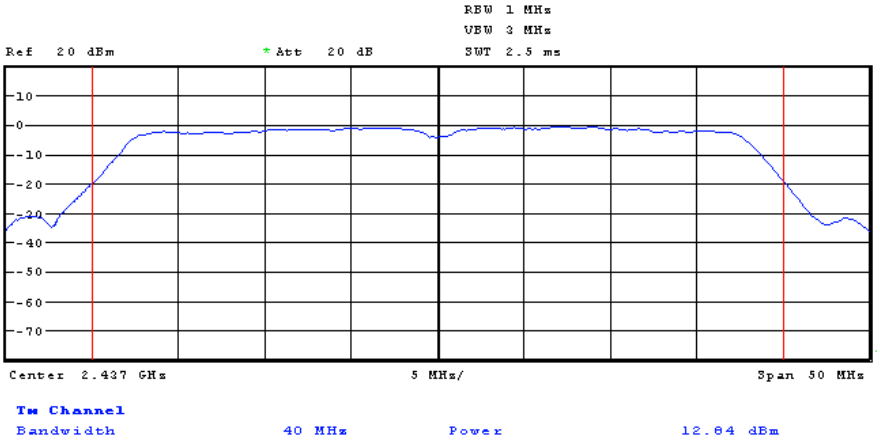
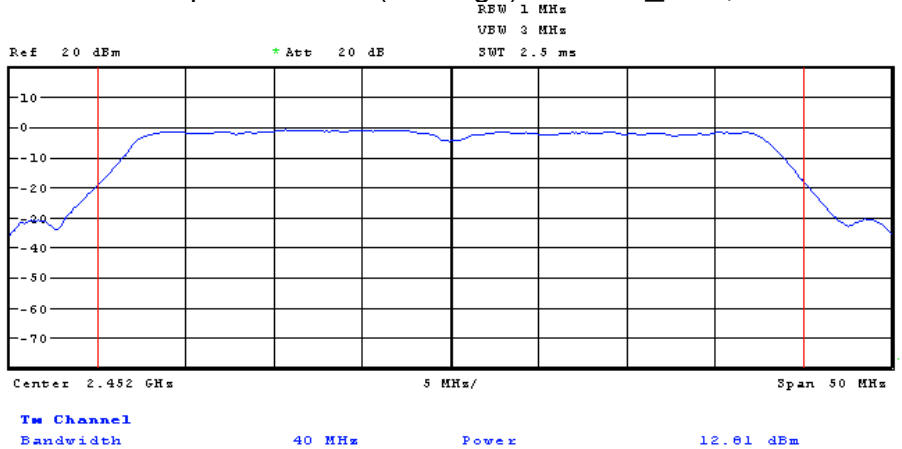
Peak Power Output Data Plot(CH Low)802.11n_40M,13.5M mode



Peak Power Output Data Plot(CH Mid) 802.11n_40M,13.5M mode



Peak Power Output Data Plot(CH High) 802.11n_40M,13.5M mode



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4.3.4 6dB Bandwidth

Test Requirement: FCC Part15 247(a)(2)

Test date: December 2,2009

Standard Applicable: According to section 15.247(a)(2),Systems using digital modulationg techniques may operate in the 902-928MHz,2400-2483.5MHz,and 5725-5850MHz bands.The minimum 6dB bandwidth shall be at least 500KHz.

Measurement Procedure:
1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=1% bandwidth, VBW =3* RBW, Span=30/ 50MHz, Sweep=auto
4. Mark the peak frequency and –6dB (upper and lower) frequency.
5. Repeat above procedures until all frequency measured were complete.

Measurement Result:

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Test Results(802.11b)1M

CH	Frequency (MHz)	Bandwidth (MHz)	Limit Bandwidth (KHz)	Result
LOW	2412	10.095	500	PASS
MID	2437	10.096	500	PASS
HIGH	2462	10.143	500	PASS

Test Results(802.11g)6M

CH	Frequency (MHz)	Bandwidth (MHz)	Limit Bandwidth (KHz)	Result
LOW	2412	16.442	500	PASS
MID	2437	16.490	500	PASS
HIGH	2462	16.586	500	PASS

Test Results(802.11n_20M)6.5M

CH	Frequency (MHz)	Bandwidth (MHz)	Limit Bandwidth (KHz)	Result
LOW	2412	17.692	500	PASS
MID	2437	17.740	500	PASS
HIGH	2462	17.836	500	PASS

Test Results(802.11n_40M)13.5M

CH	Frequency (MHz)	Bandwidth (MHz)	Limit Bandwidth (KHz)	Result
LOW	2422	36.458	500	PASS
MID	2437	36.298	500	PASS
HIGH	2452	36.462	500	PASS

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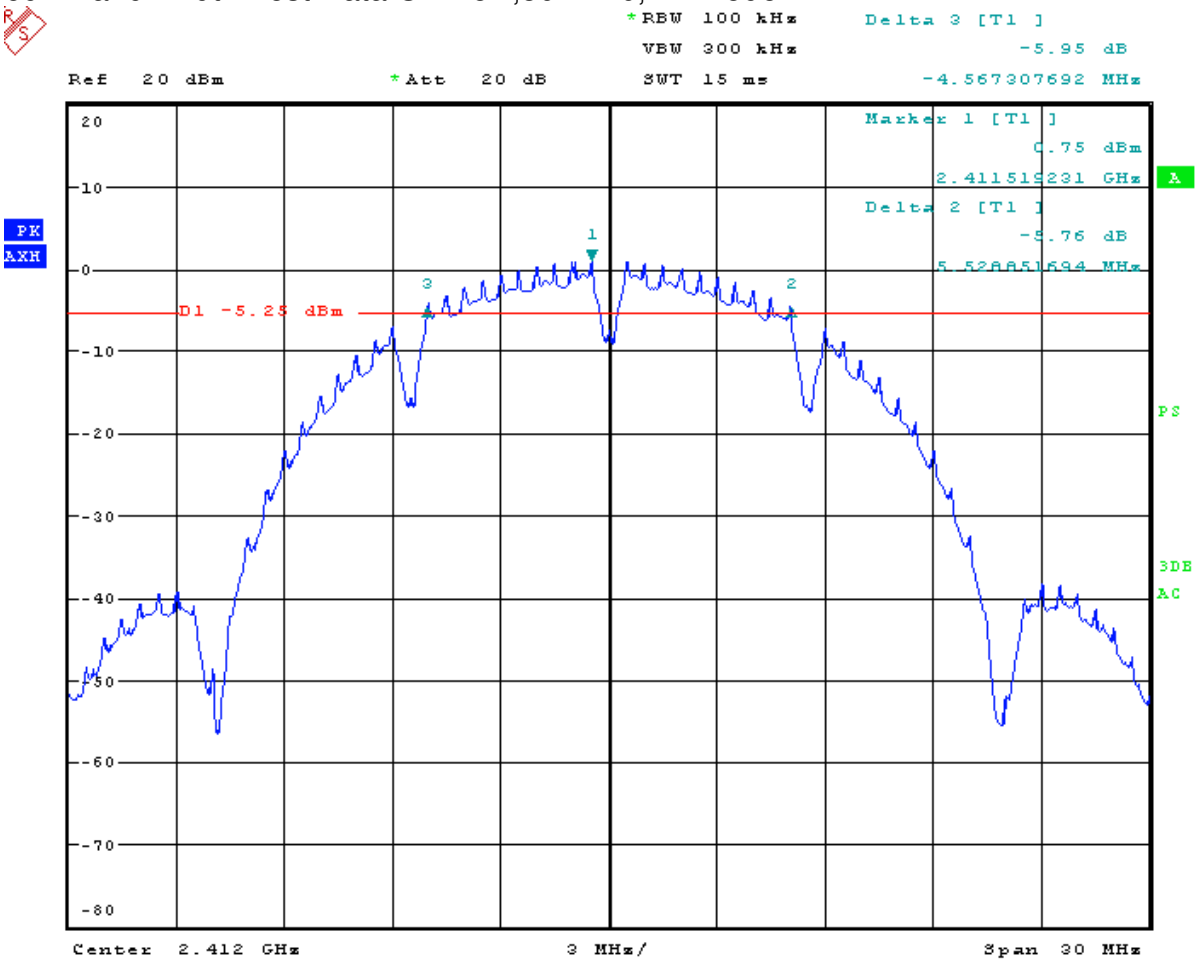
6dB Band Width Test Data CH-Low,802.11b,1M mode



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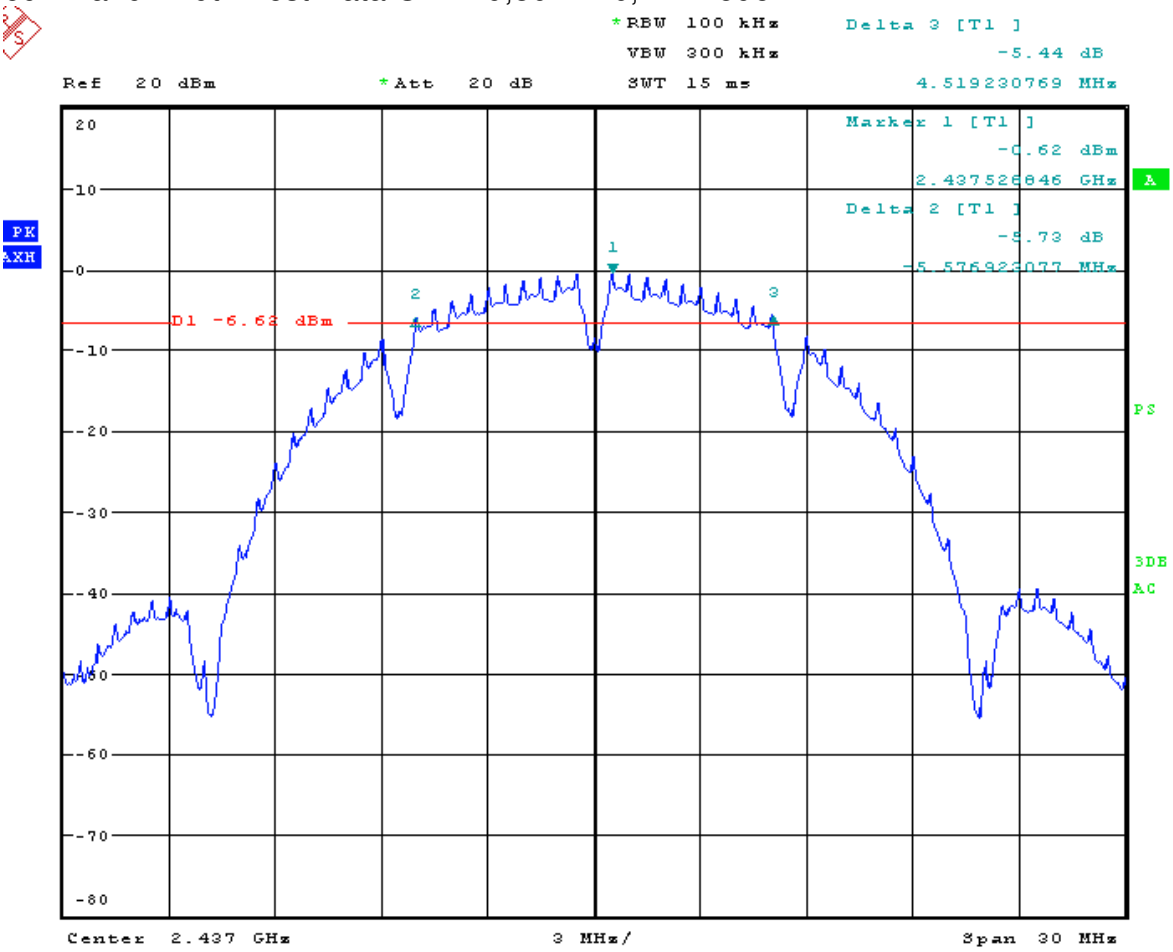
6dB Band Width Test Data CH-Mid,802.11b,1M mode



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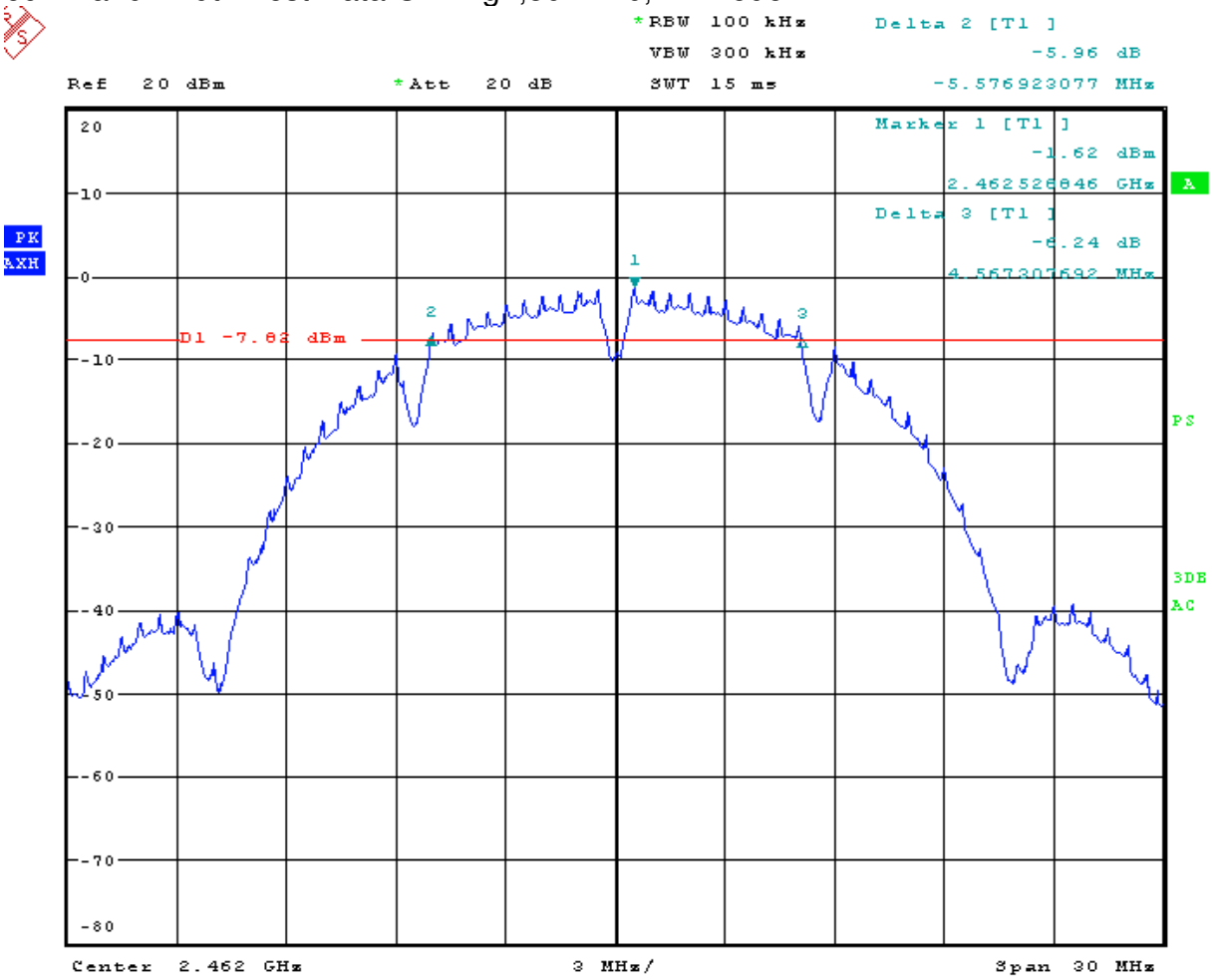
6dB Band Width Test Data CH-High,802.11b,1M mode



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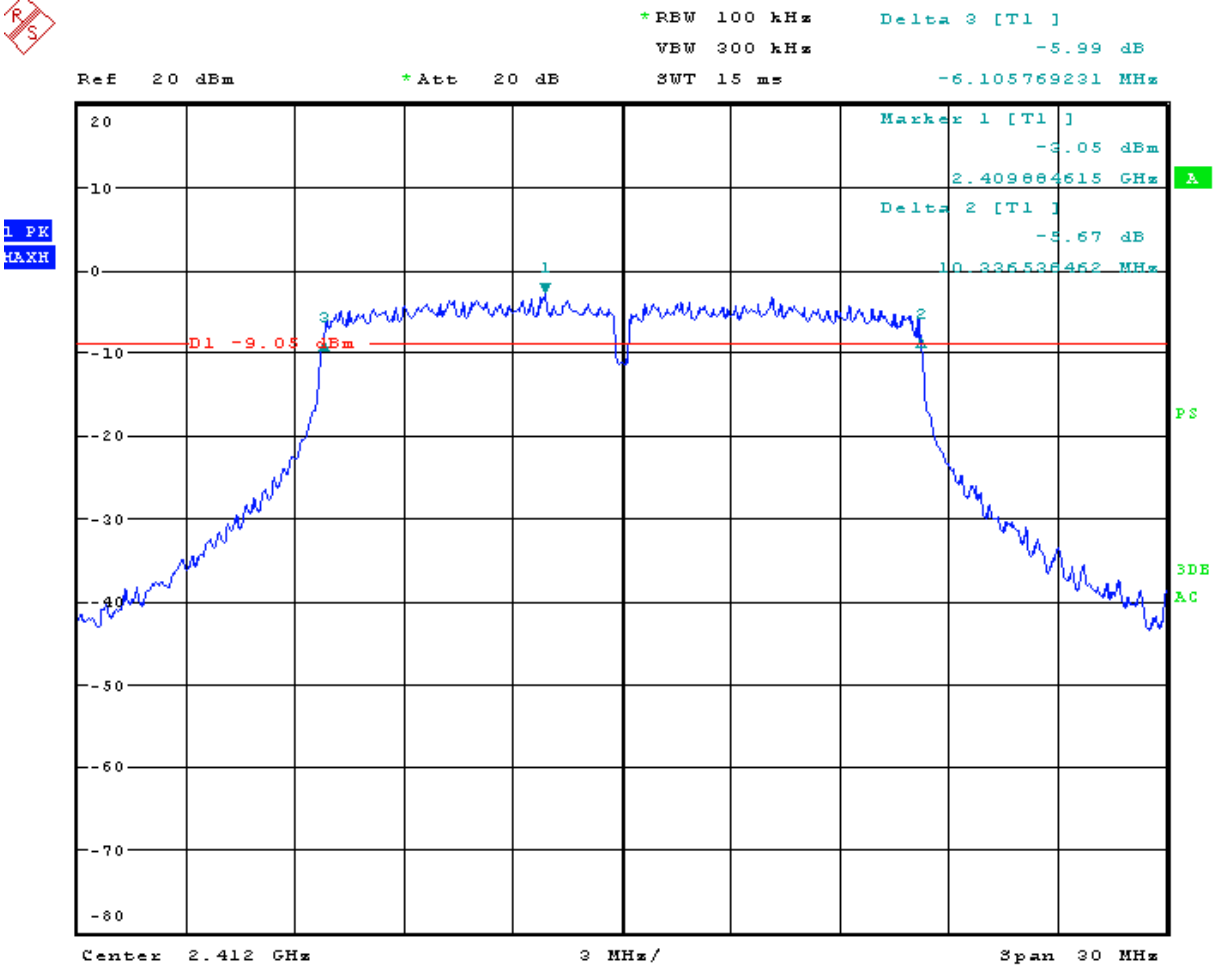
6dB Band Width Test Data CH-Low,802.11g,6M mode



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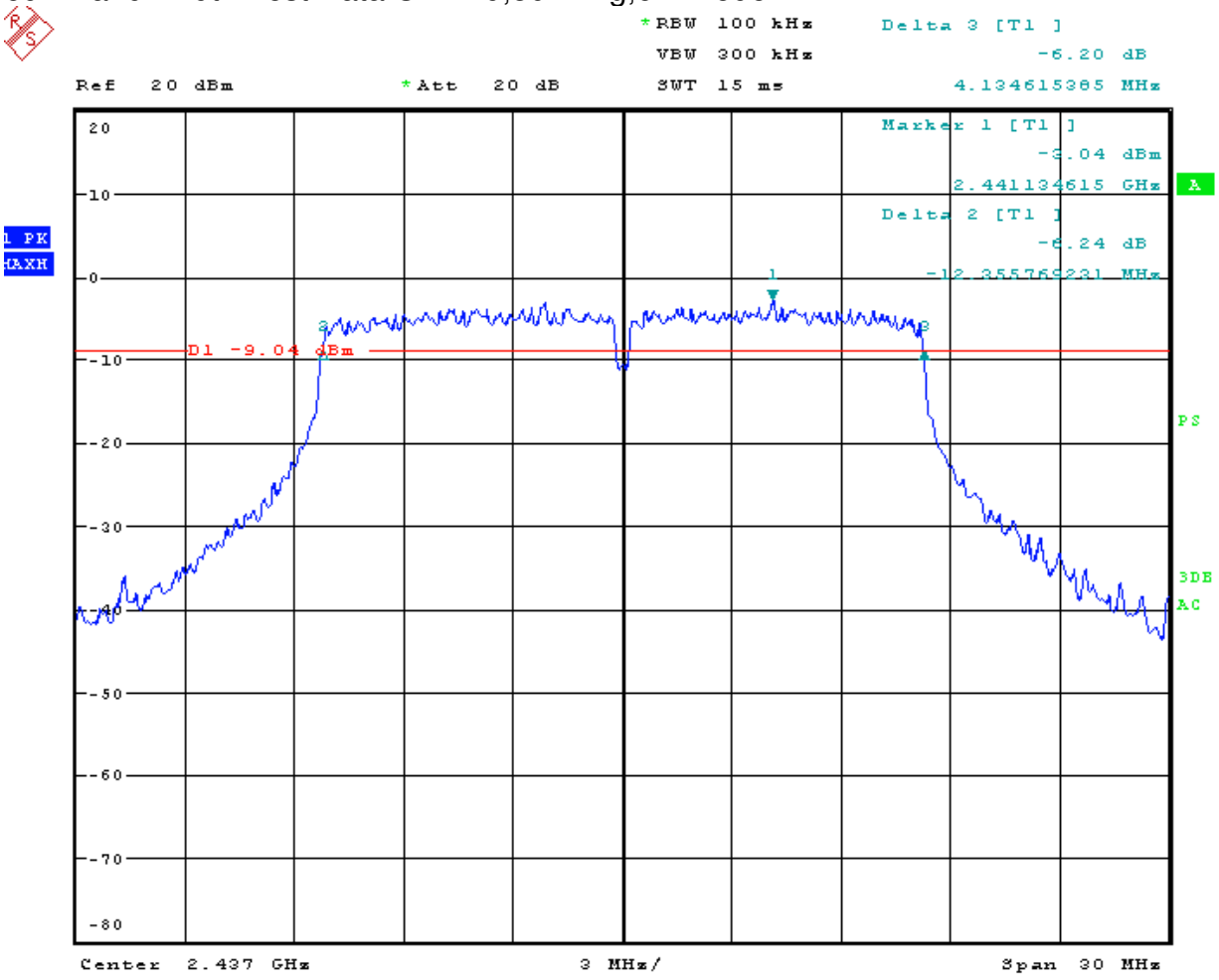
6dB Band Width Test Data CH-Mid,802.11g,6M mode



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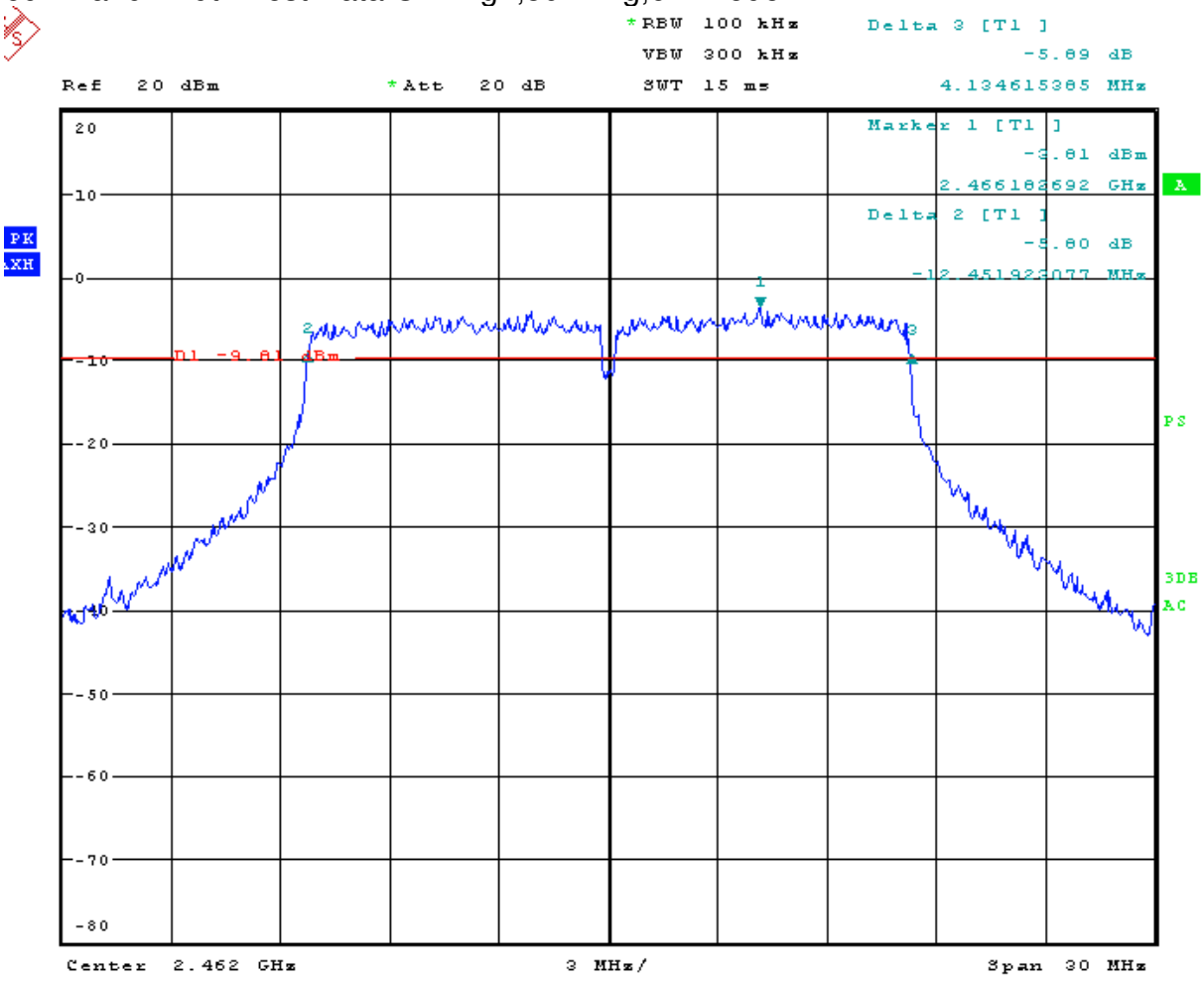
6dB Band Width Test Data CH-High,802.11g,6M mode



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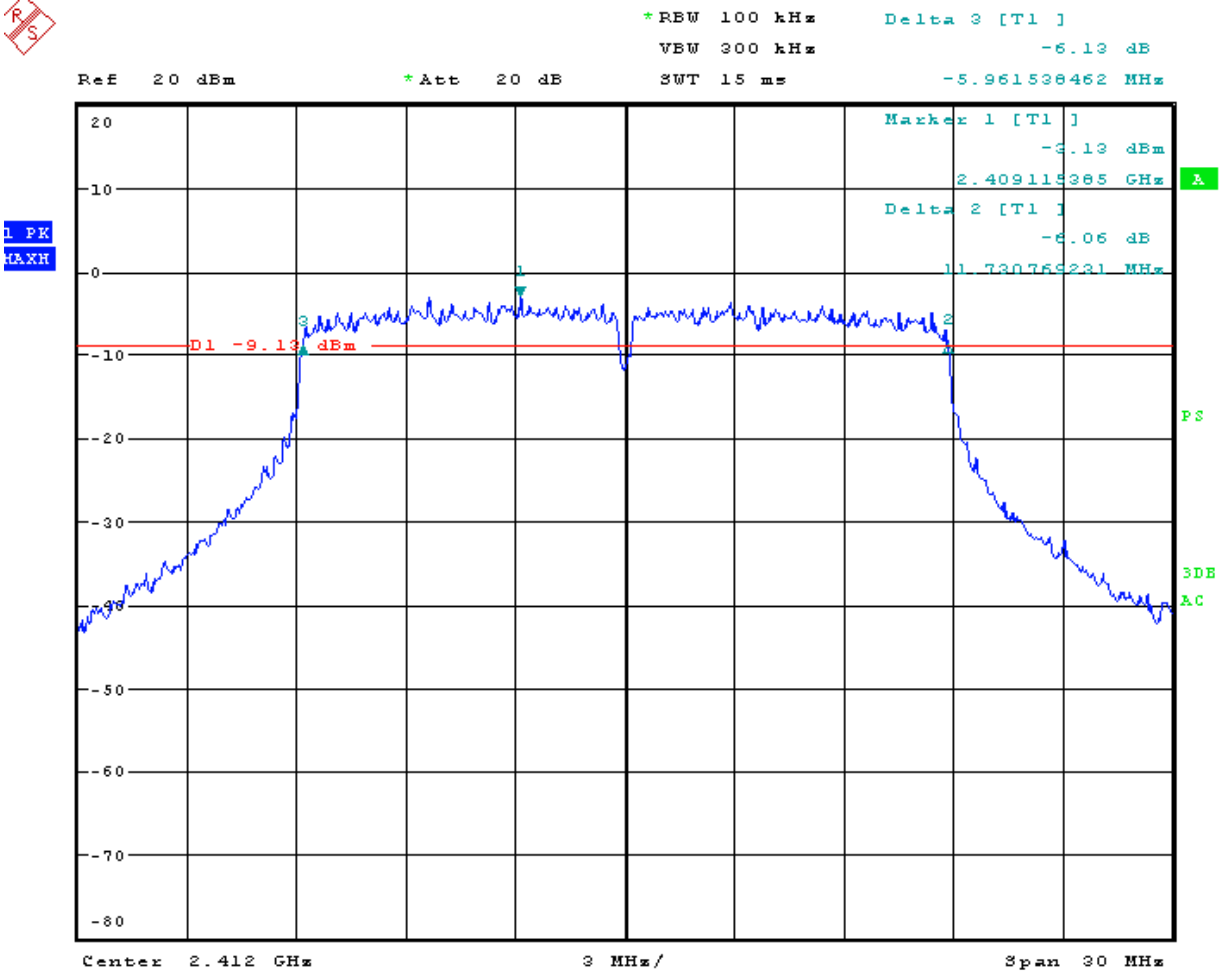
6dB Band Width Test Data CH-Low, 802.11n_20M,6.5M mode



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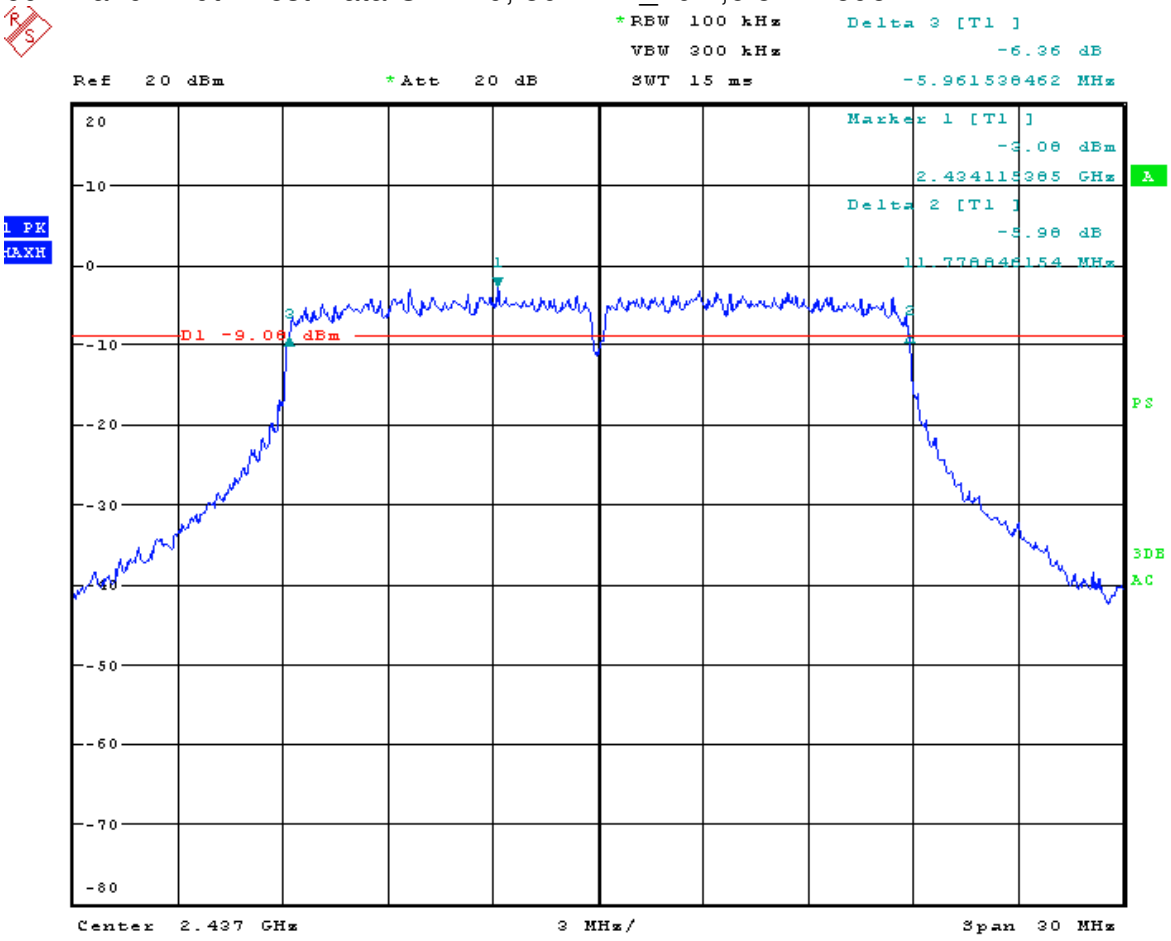
6dB Band Width Test Data CH-Mid, 802.11n_20M,6.5M mode



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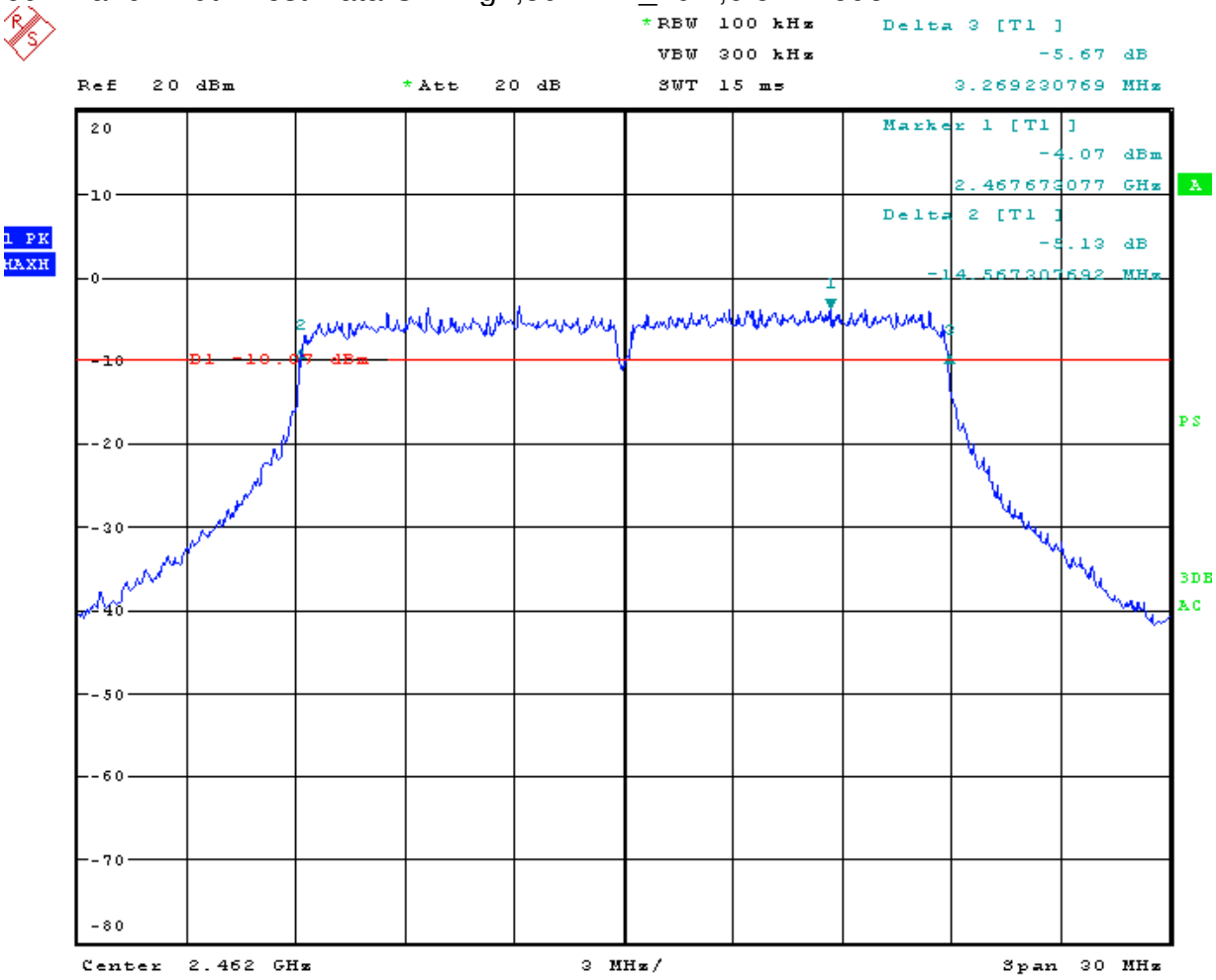
6dB Band Width Test Data CH-High,802.11n_20M,6.5M mode



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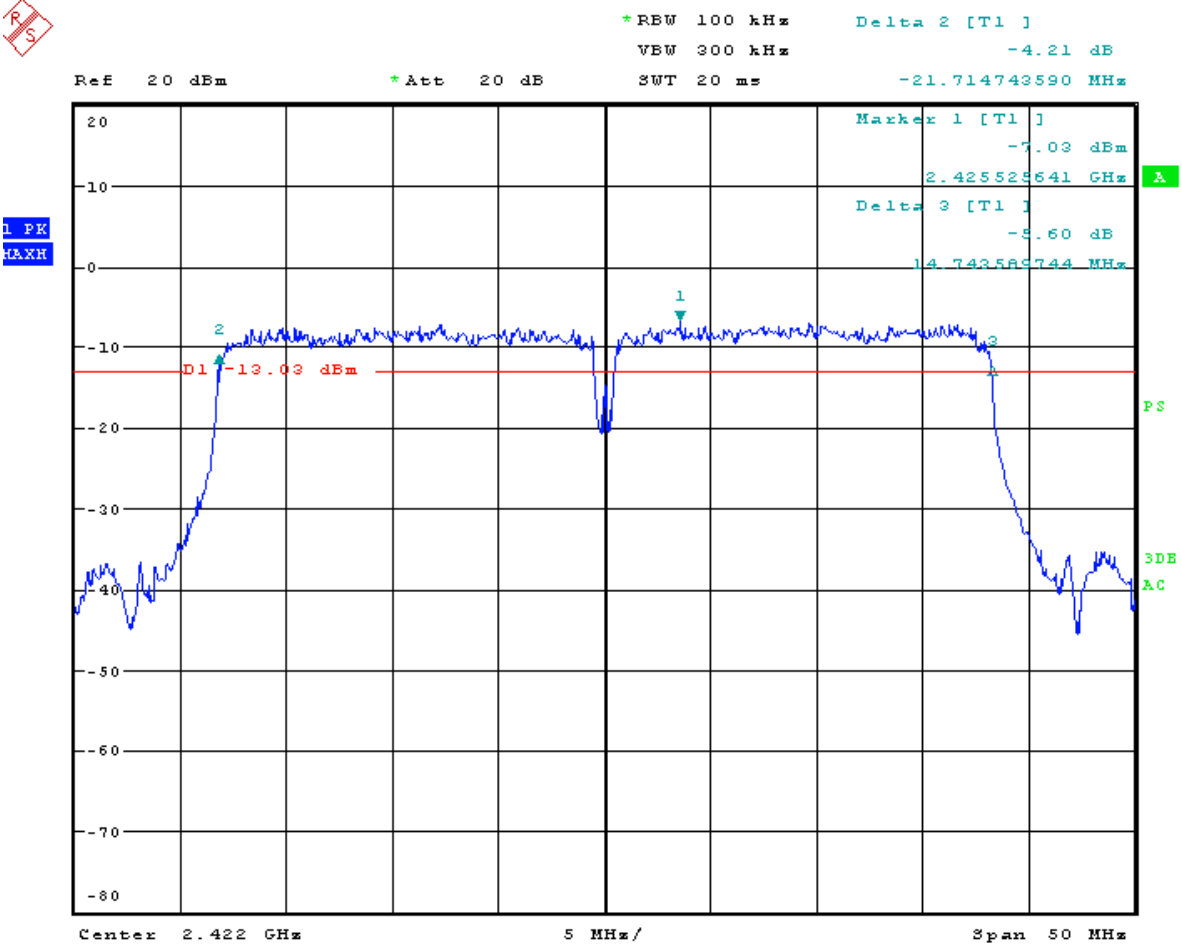
6dB Band Width Test Data CH-Low,802.11n_40M,13.5M mode



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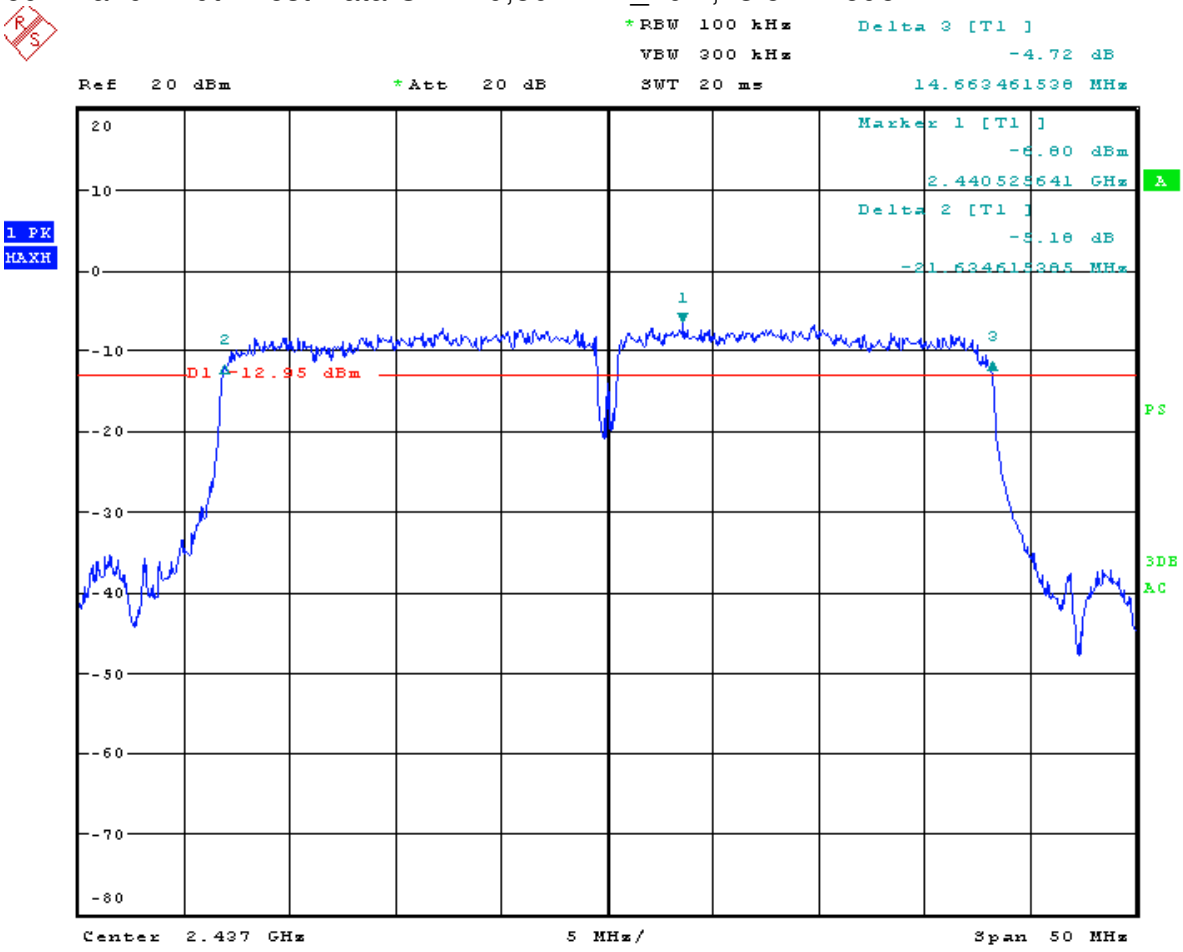
6dB Band Width Test Data CH-Mid,802.11n_40M,13.5M mode



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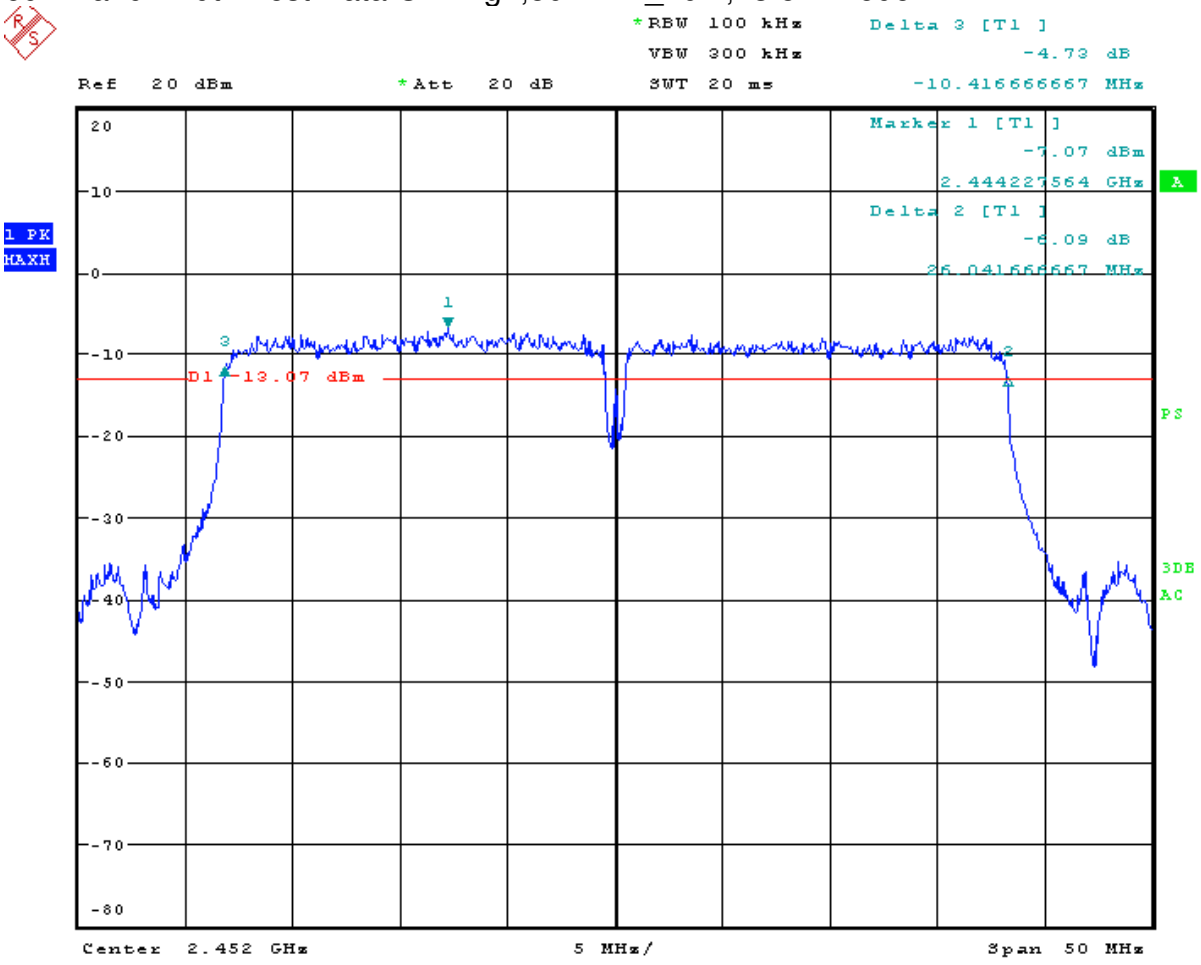
6dB Band Width Test Data CH-High,802.11n_40M,13.5M mode



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4.3.5 100KHz Bandwidth Of Band Edges Measuremnet

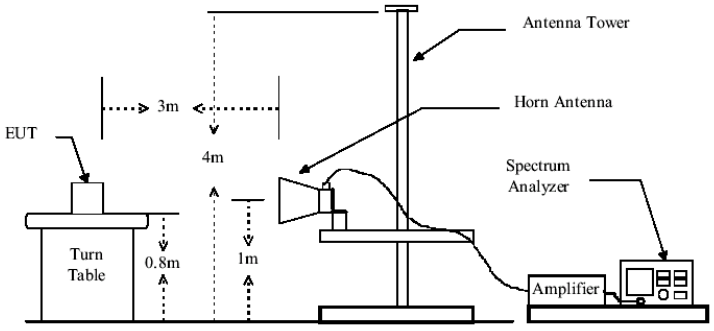
Test Requirement: FCC Part15 247(c)

Test date: December 2,2009 to December 4,2009

Standard Applicable: According to section 15.247(c),in any 100KHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating,the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power,In addition,radiated emissions which fall in the restricted bands,as defined in section 15.205(a),must also comply with the radiated emission limits specified in 15.209(a).

Measurement Procedure:
1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer = operating frequency.
4. Set the spectrum analyzer as RBW=100KHz VBW=300KHz, Sweep = auto
5. Mark Peak, 2.390GHz and 2.4835GHz and record the max. level. The turn table shall rotate 360 degrees to determine the position of maximum emission level.EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
6. Repeat above procedures until all frequency measured were complete.

Radiated Emission Test Set-up Frequency Over 1GHz



The field strength is calculated by adding the Antenna Factor, Cable Factor & preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – preamplifier Factor

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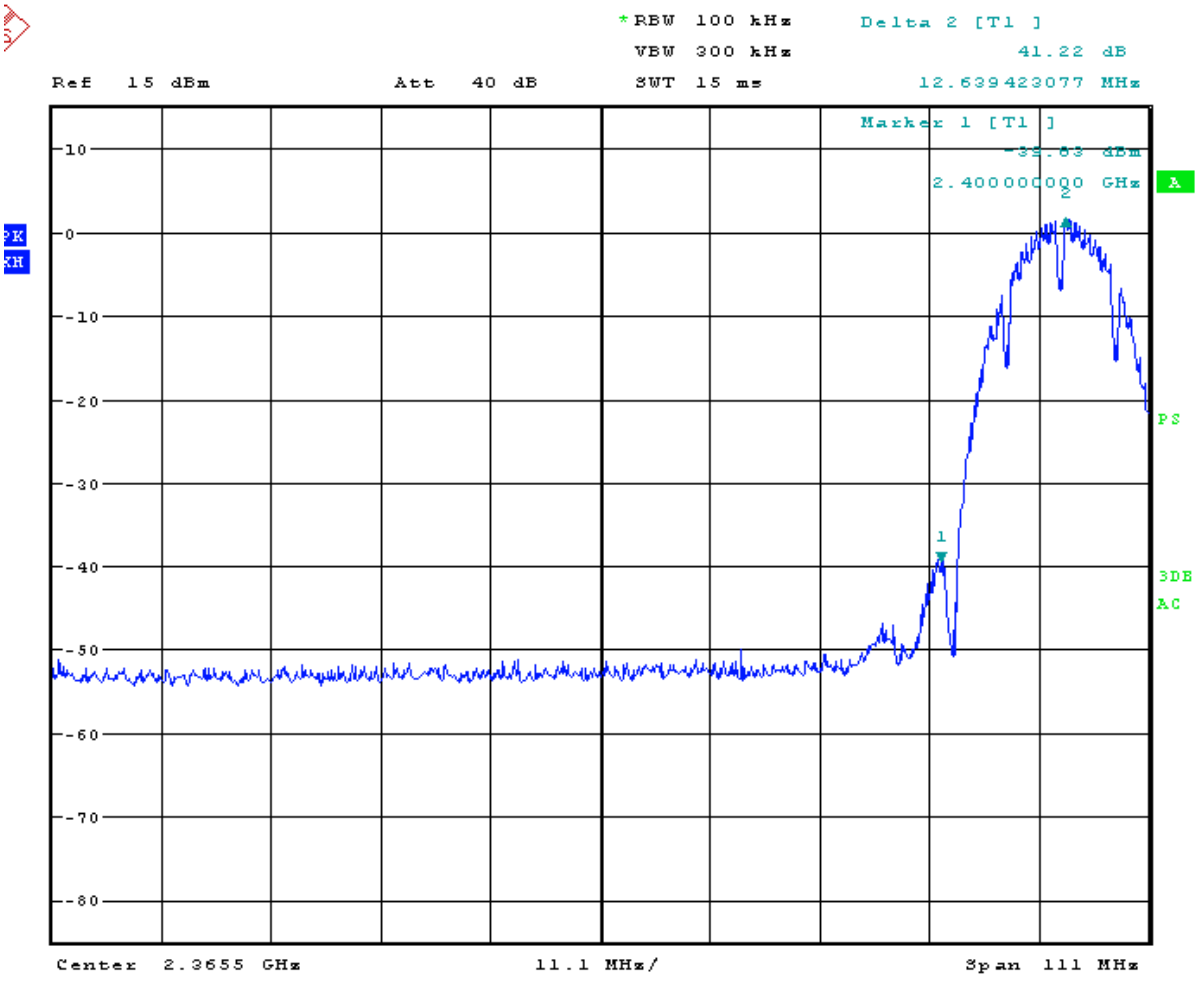
Measurement Result:
Band Edges Test Data CH-Low 802.11b,1M mode



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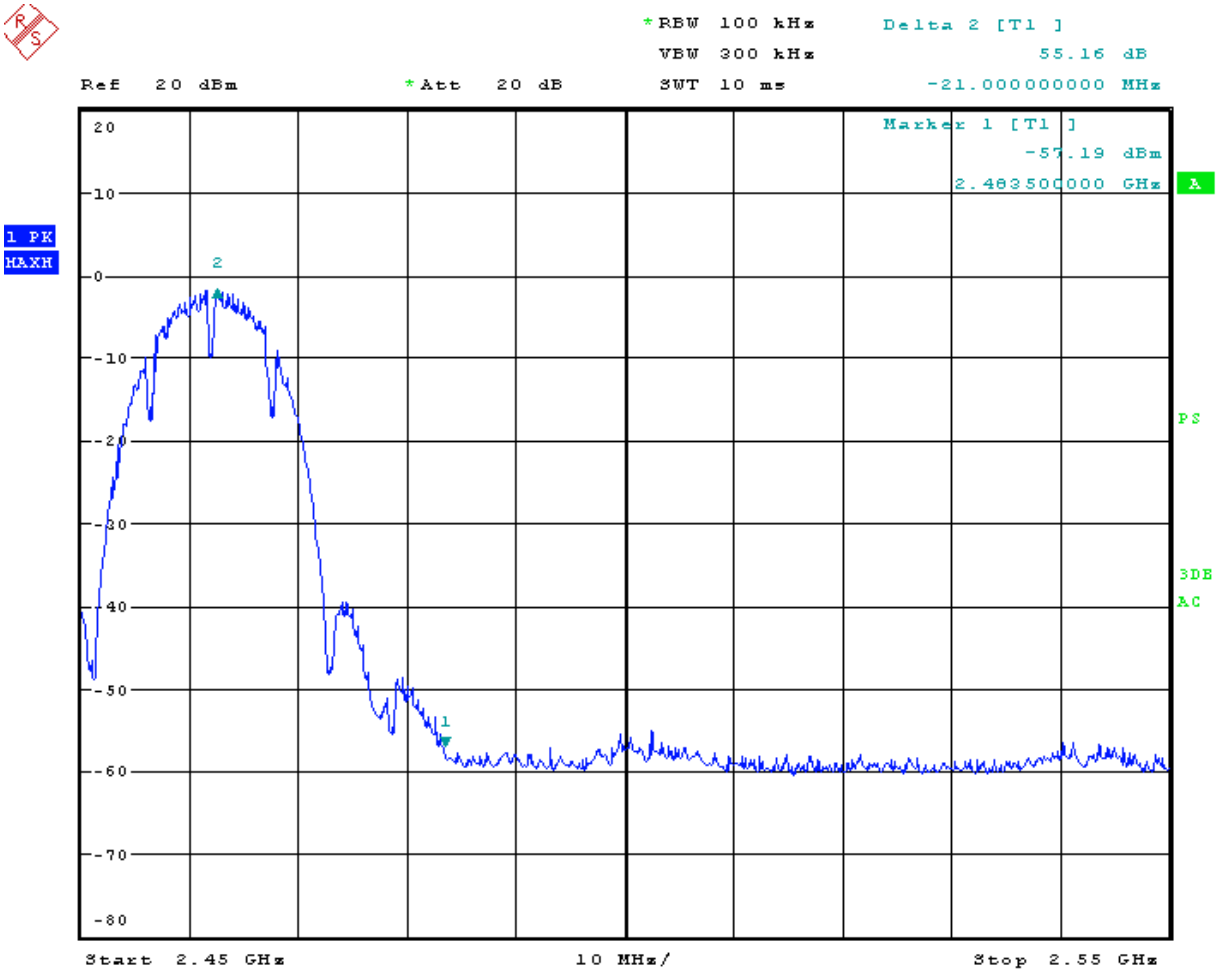
Band Edges Test Data CH-High 802.11b,1M mode



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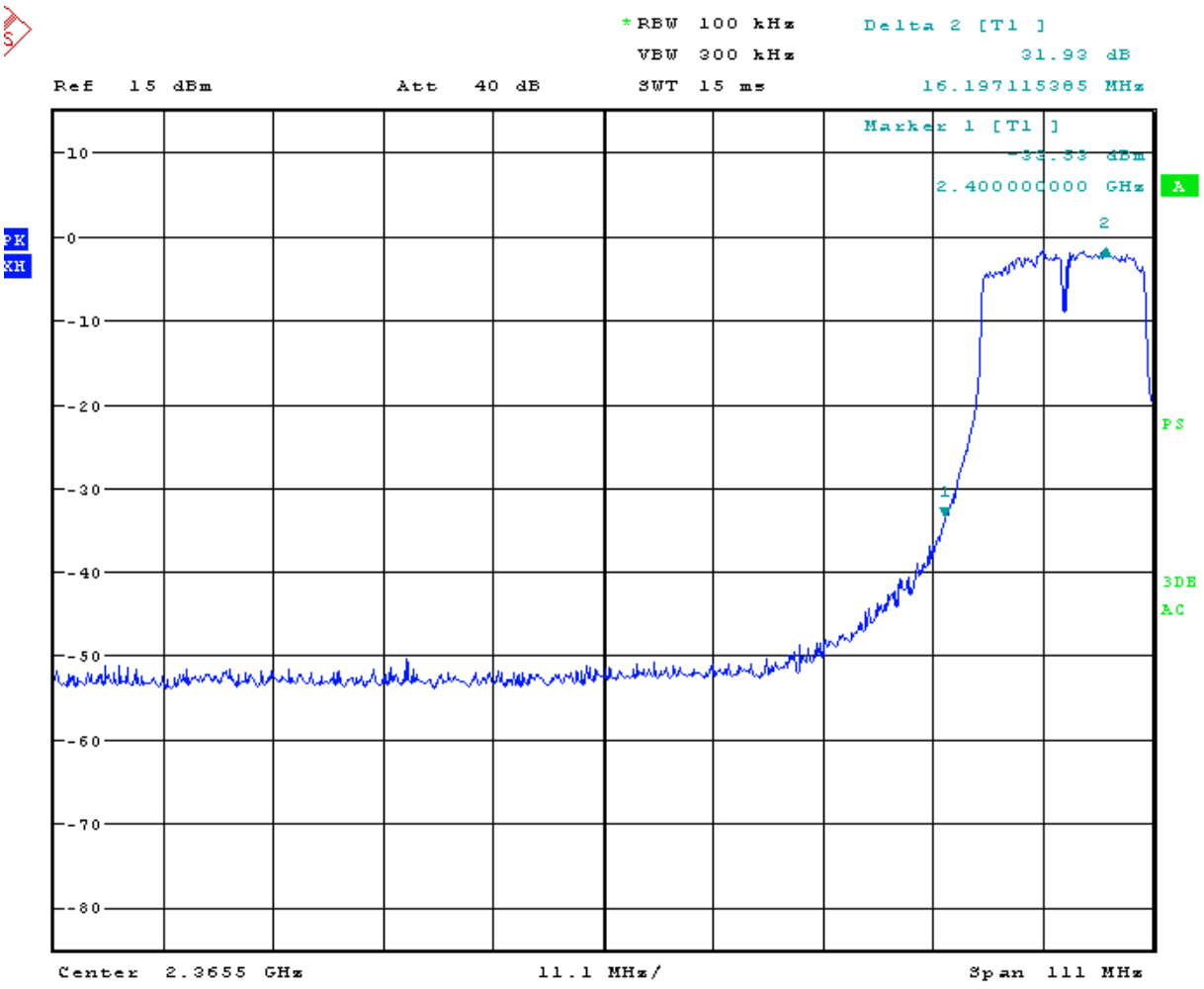
Band Edges Test Data CH-Low 802.11g,6M mode



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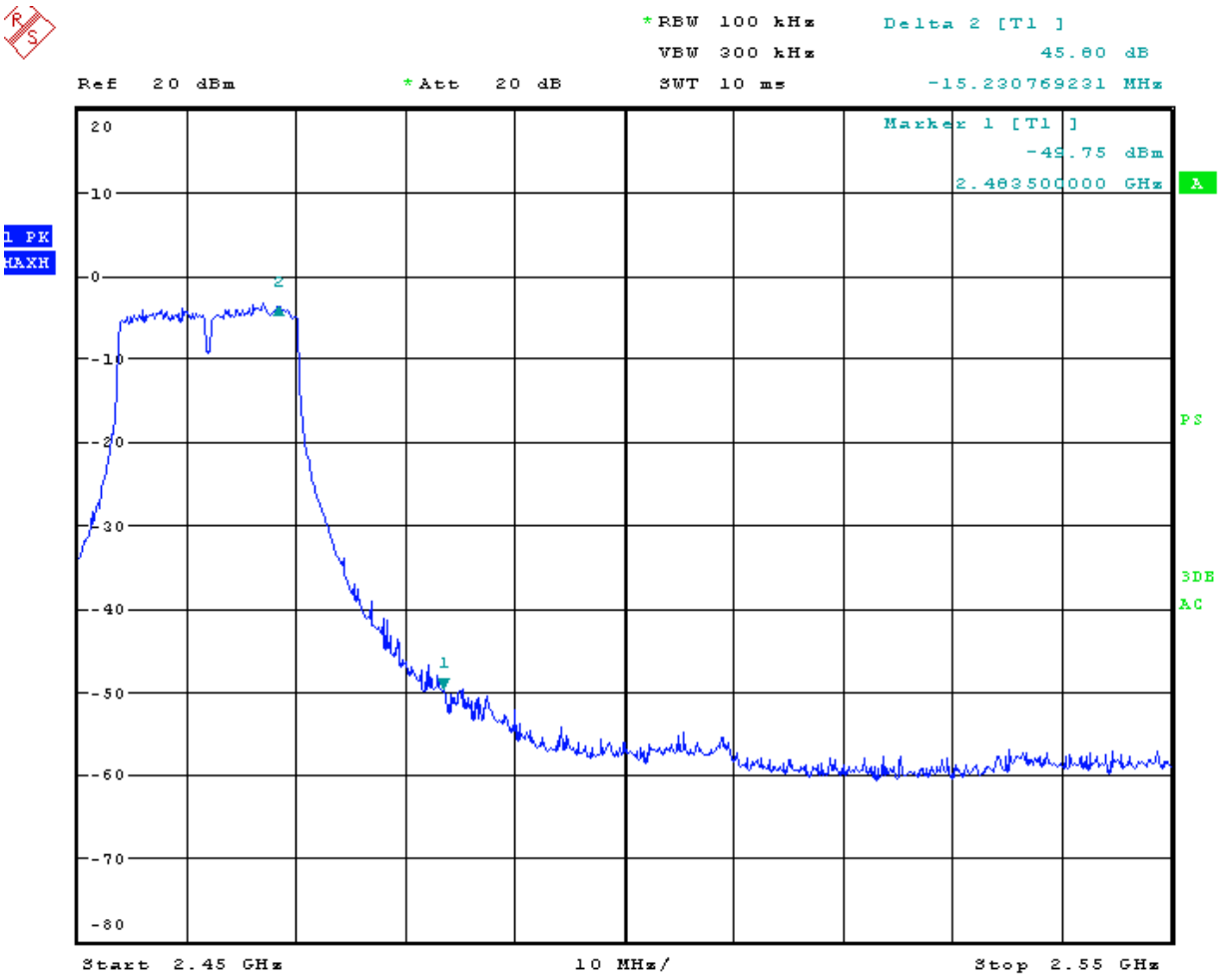
Band Edges Test Data CH-High 802.11g,1M mode



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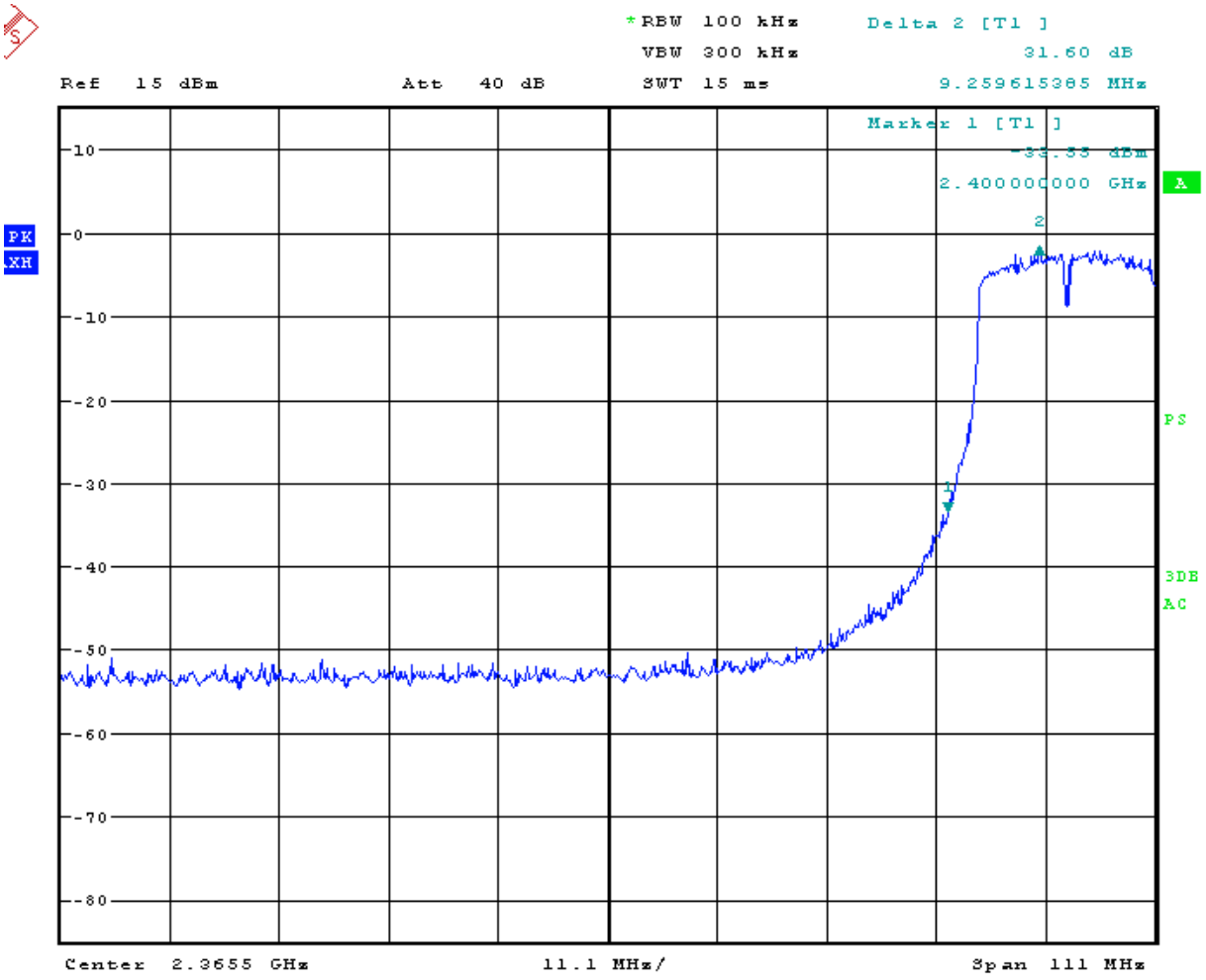
Band Edges Test Data CH-Low 802.11n_20M,6.5M mode



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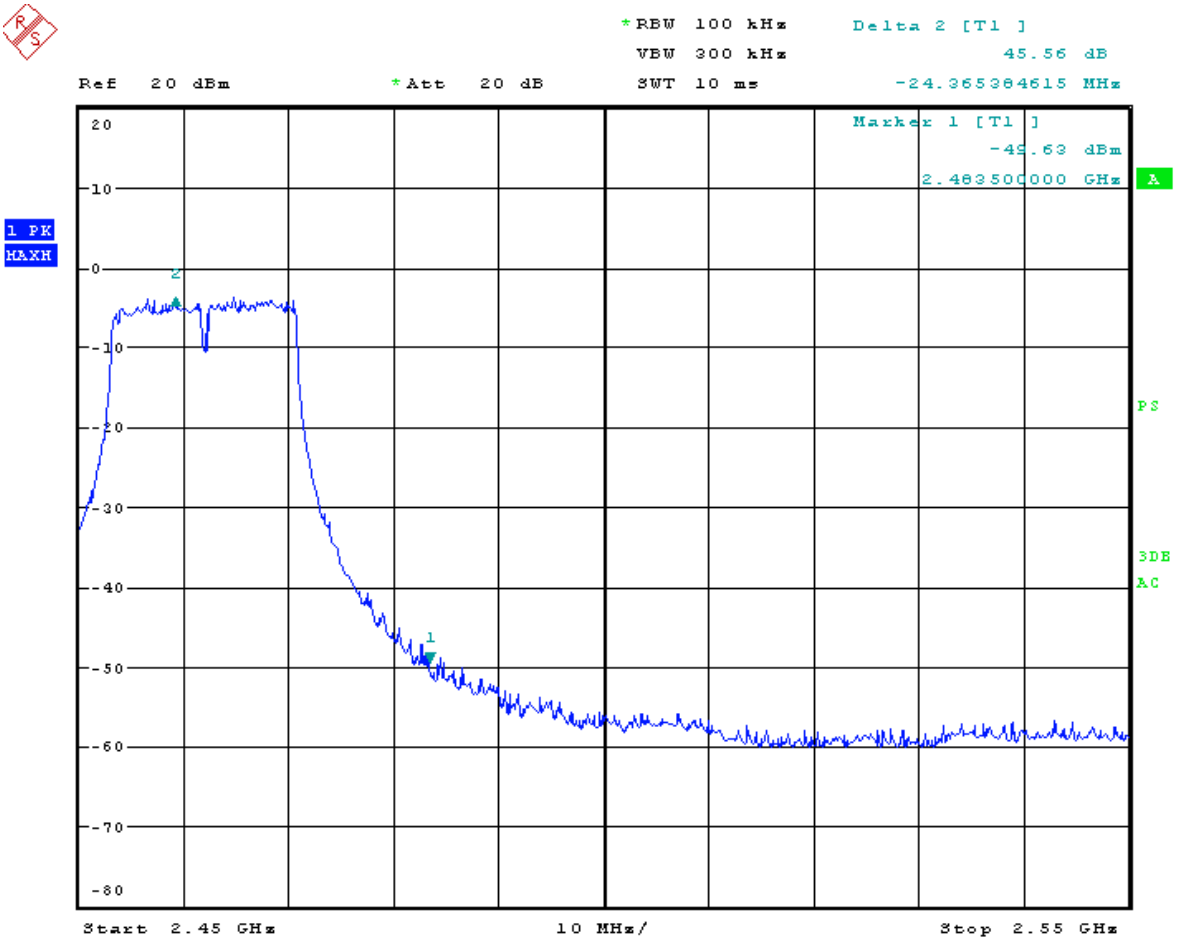
Band Edges Test Data CH-High 802.11n_20M,6.5M mode



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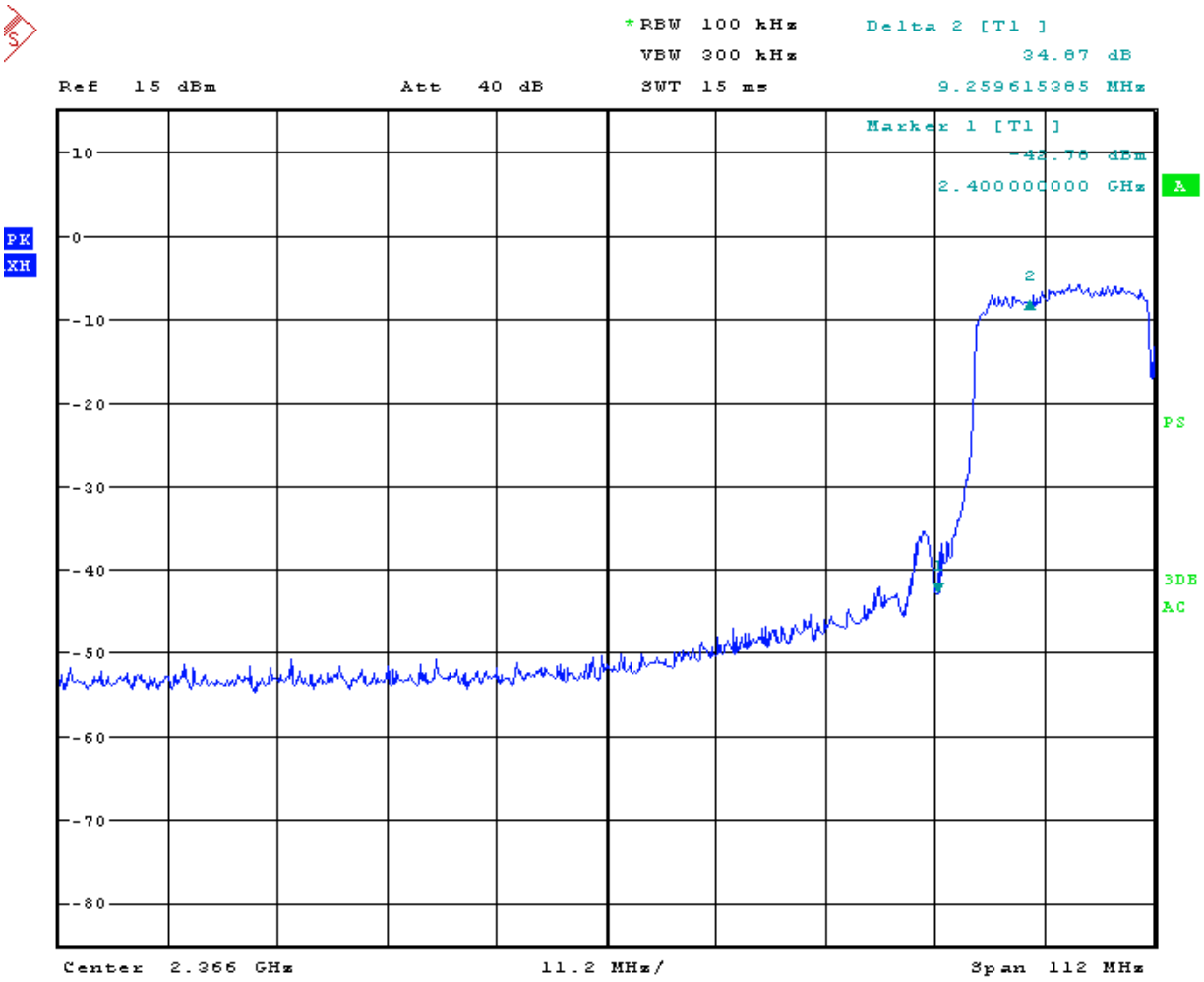
Band Edges Test Data CH-Low 802.11n_40M,13.5M mode



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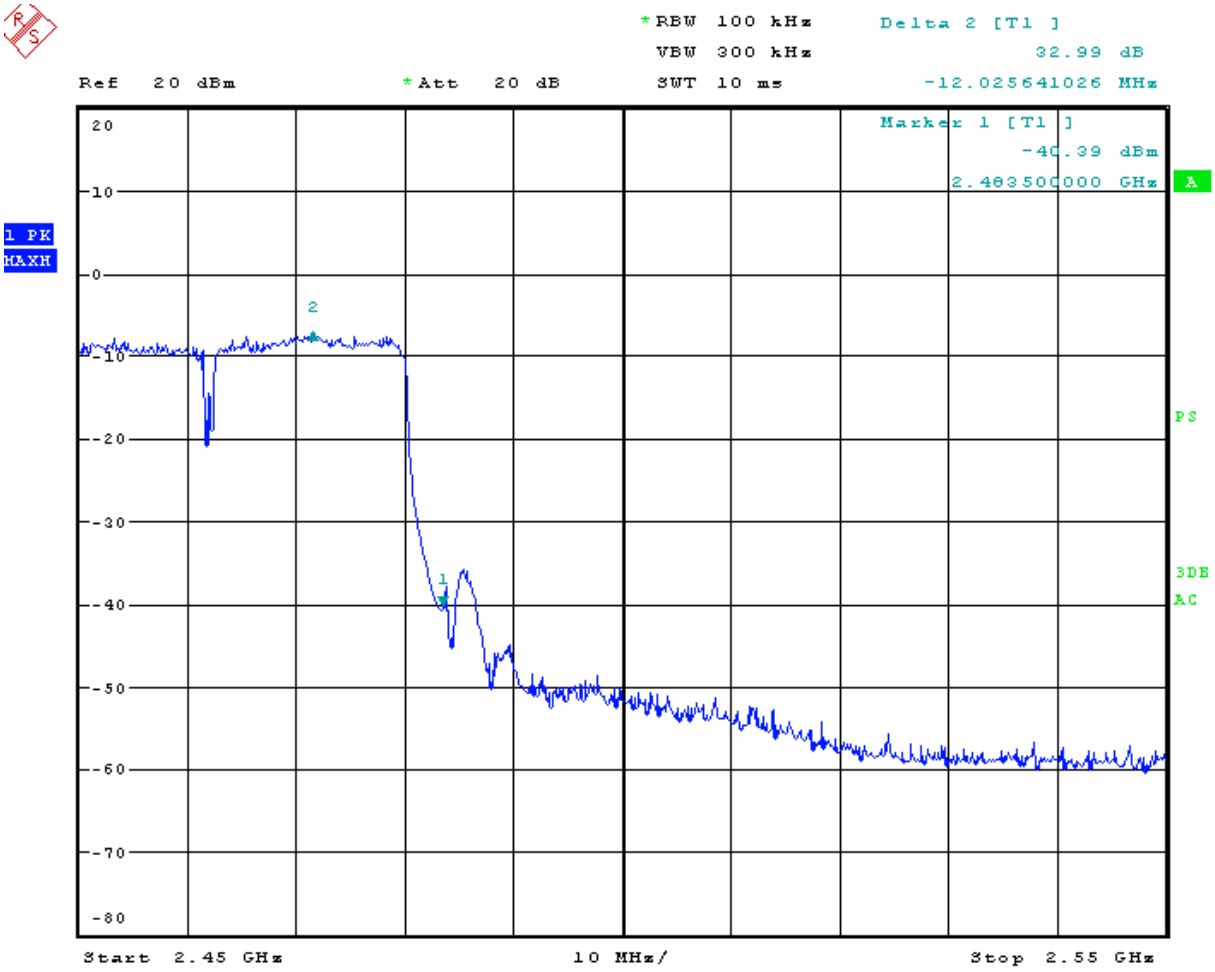
Band Edges Test Data CH-High 802.11n_40M,13.5M mode



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Radiated Emission:

CH Low 802.11b Mode 1M

Horizontal:

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2390.00	42.47	-	-1.39	41.08	-	74.00	54.00	12.92

Vertical:

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2390.00	43.04	-	-1.39	41.65	-	74.00	54.00	12.35

CH High 802.11b Mode 1M

Horizontal:

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2483.56	43.04	-	--1.92	41.12	-	74.00	54.00	12.82

Vertical:

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2483.50	44.22	-	-1.92	42.30	-	74.00	54.00	11.70

Remark:

(1)Data of measurement within this frequency range shown"-"in the table above means the reading of emissions are attenuated more than 6dB below the permissible limits or the field strength is too small to be measured.

(2)Radiated emissions measured in the frequency above 1GHz were made with an instrument using Peak detector mode and average detector mode of the emission show in Actual FS colum.When measured Peak value is under AV Limit,It does not need to measure AV value again.

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CH Low 802.11g Mode 6M

Horizontal:

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2390.00	35.52	-	-1.39	34.13	-	74.00	54.00	20.07

Vertical:

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2390.00	38.93	-	-1.39	37.54	-	74.00	54.00	16.46

CH High 802.11g Mode 6M

Horizontal:

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2483.50	43.32	-	--1.92	41.40	-	74.00	54.00	12.60

Vertical:

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2483.50	42.55	-	-1.92	40.63	-	74.00	54.00	13.37

Remark:

(1)Data of measurement within this frequency range shown"-"in the table above means the reading of emissions are attenuated more than 6dB below the permissible limits or the field strength is too small to be measured.

(2)Radiated emissions measured in the frequency above 1GHz were made with an instrument using Peak detector mode and average detector mode of the emission show in Actual FS colum.When measured Peak value is under AV Limit,It does not need to measure AV value again.

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CH Low 802.11n_20M ,6.5M Mode

Horizontal:

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2390.00	43.40	-	-1.39	42.01	-	74.00	54.00	11.99

Vertical:

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2390.00	44.39	-	-1.39	43.00	-	74.00	54.00	11.00

CH High 802.11n_20M ,6.5M Mode

Horizontal:

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2483.50	44.73	-	--1.92	42.81	-	74.00	54.00	11.19

Vertical:

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2483.50	45.39	-	-1.92	43.47	-	74.00	54.00	10.53

Remark:

(1)Data of measurement within this frequency range shown"-"in the table above means the reading of emissions are attenuated more than 6dB below the permissible limits or the field strength is too small to be measured.

(2)Radiated emissions measured in the frequency above 1GHz were made with an instrument using Peak detector mode and average detector mode of the emission show in Actual FS colum.When measured Peak value is under AV Limit,It does not need to measure AV value again.

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CH Low 802.11n_40M,13.5M Mode

Horizontal:

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2390.00	44.15	-	-1.39	42.76	-	74.00	54.00	11.24

Vertical:

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2390.00	45.44	-	-1.39	44.05	-	74.00	54.00	9.95

CH High 802.11n_40M,13.5M Mode

Horizontal:

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2483.50	44.60	-	--1.92	42.68	-	74.00	54.00	11.32

Vertical:

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2483.50	45.88	-	-1.92	43.96	-	74.00	54.00	10.04

Remark:

(1)Data of measurement within this frequency range shown"-"in the table above means the reading of emissions are attenuated more than 6dB below the permissible limits or the field strength is too small to be measured.

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4.3.6 Spurious Radiated Emission Test

Test Requirement: FCC Part15 247(c)

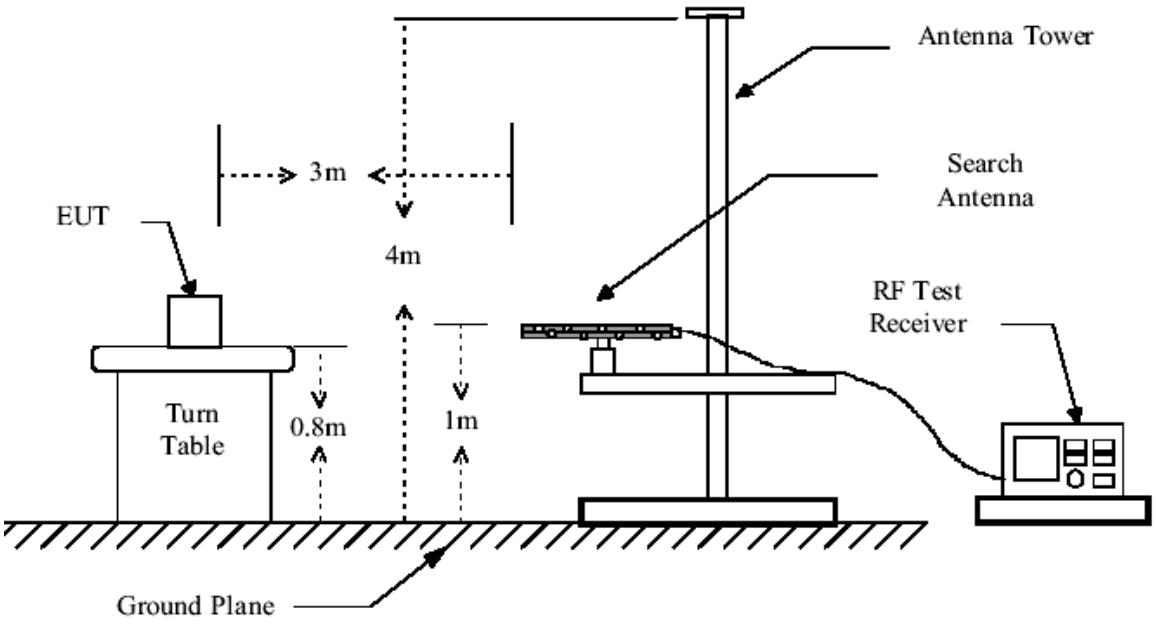
Test date: December 3,2009

Standard Applicable: According to section 15.247(c),all other emissions outside these bands shall not exceed the general radiated emission limits specified in section15.209(a).And according to section 15.33(a)(1),for an intentional radiator operates below 10GHz,the frequency range of measurements:to the tenth harmonic of the highest fundamental frequency or to 40GHz,which is lower.

Measurement Procedure:
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until all frequency measured were complete.

Radiated Test Set-up:

Radiated Emission Test Set-up,Frequency Below 1000MHz



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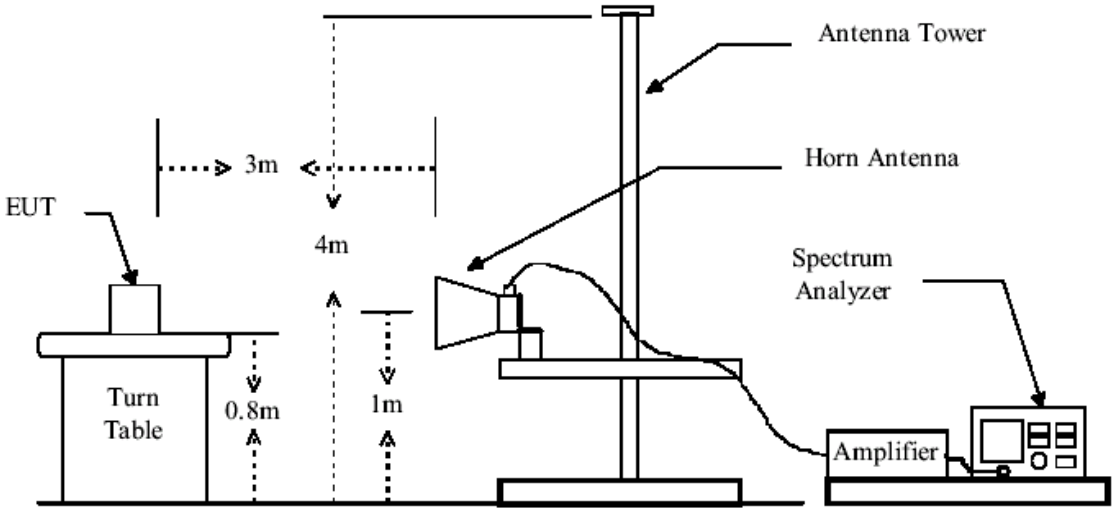
Radiated Emission Test Set-up Frequency Over 1GHz



The field strength is calculated by adding the Antenna Factor, Cable Factor & preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – preamplifier Factor

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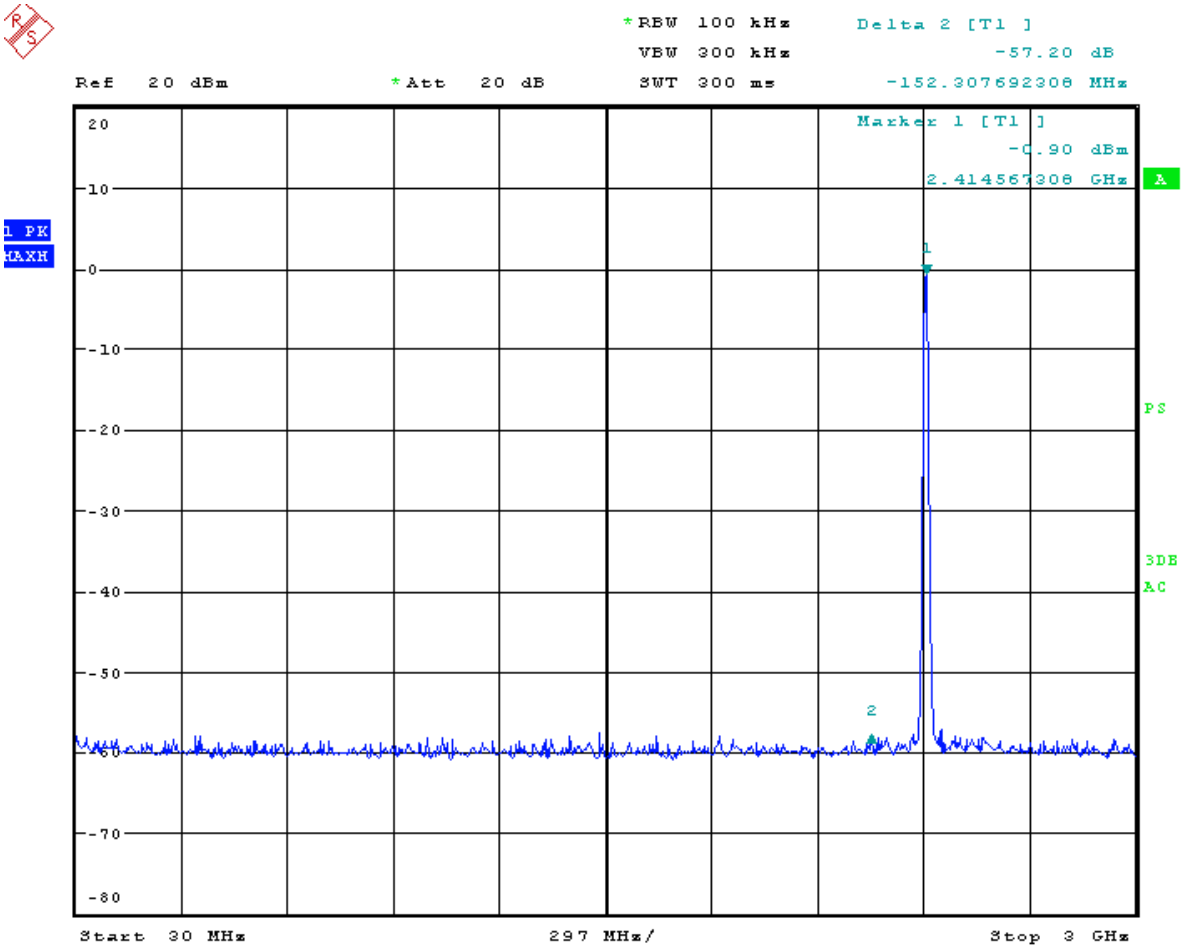
Measurement Result:

Conducted spurious Emission Measurement Result (802.11b)1M

CH Low 30MHz-3GHz



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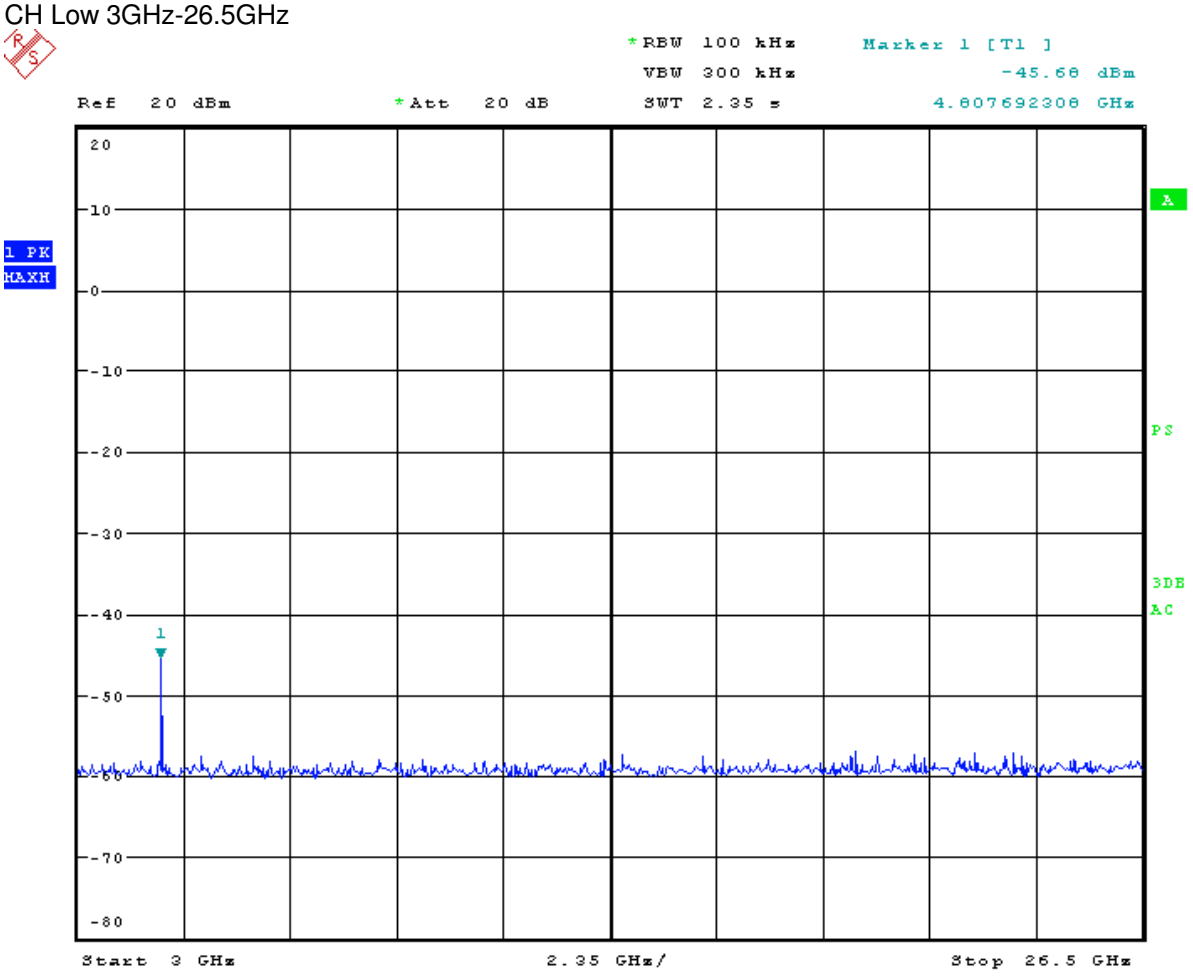
CH Low 3GHz-26.5GHz



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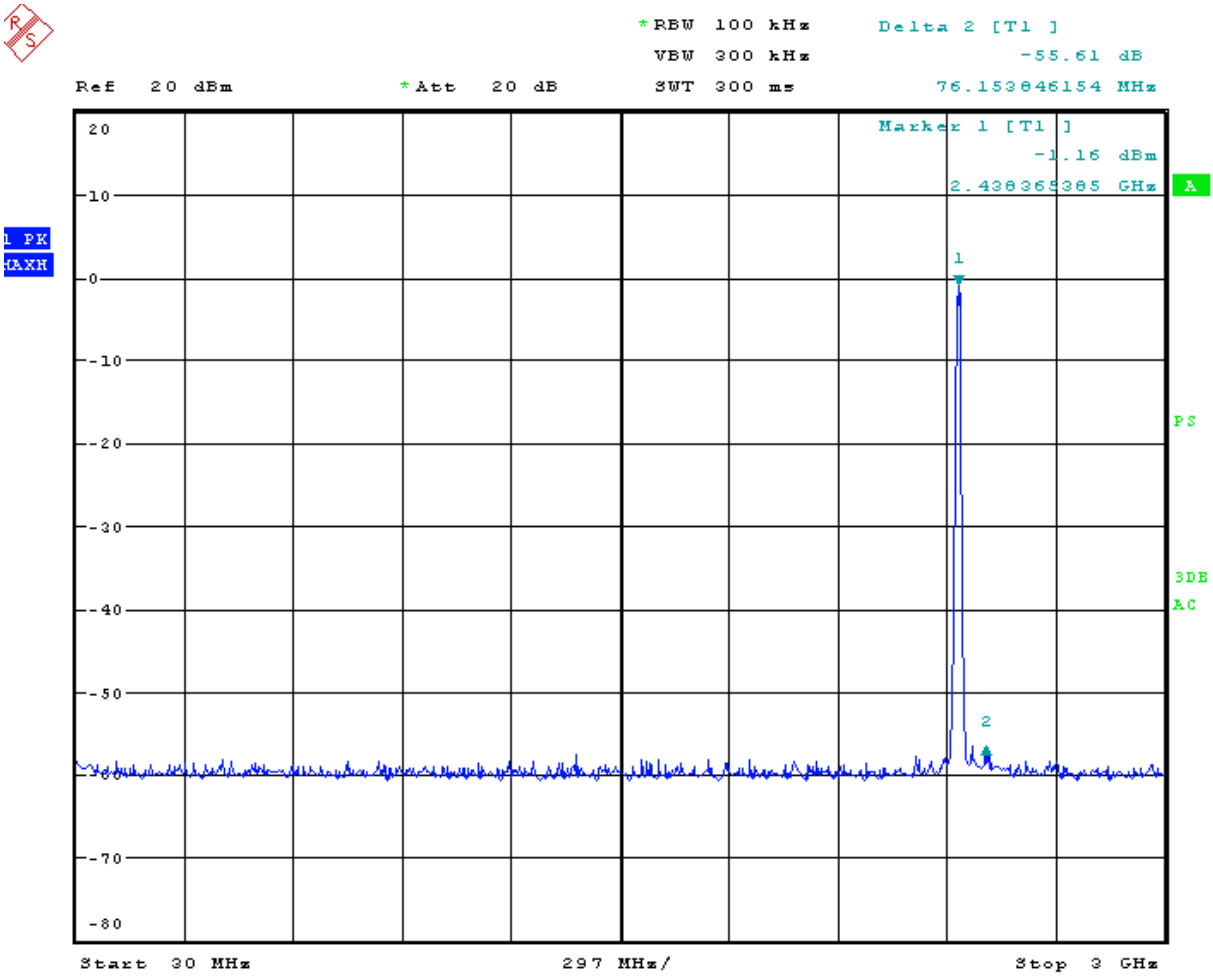
Ch Mid 30MHz-3GHz



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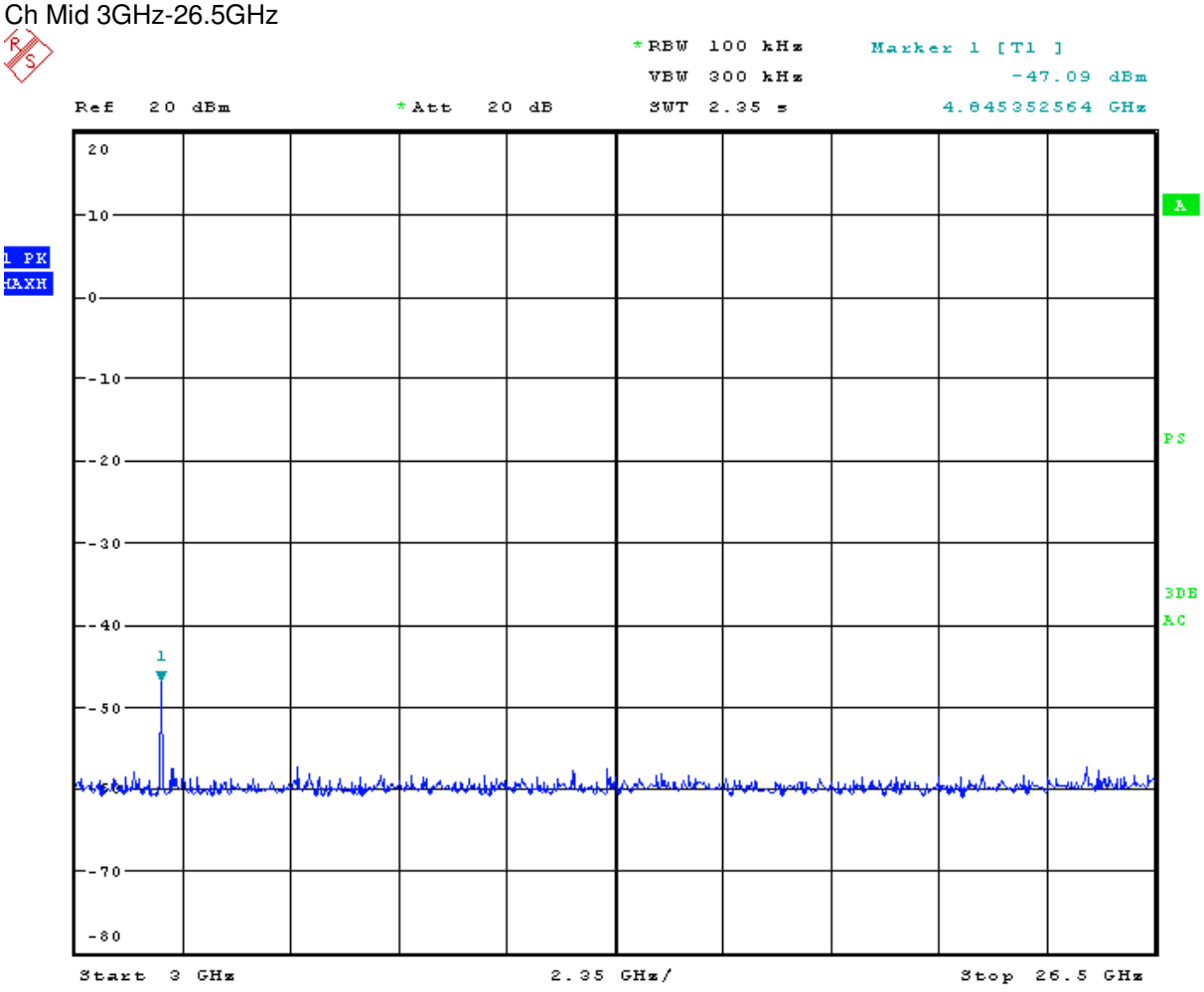
Ch Mid 3GHz-26.5GHz



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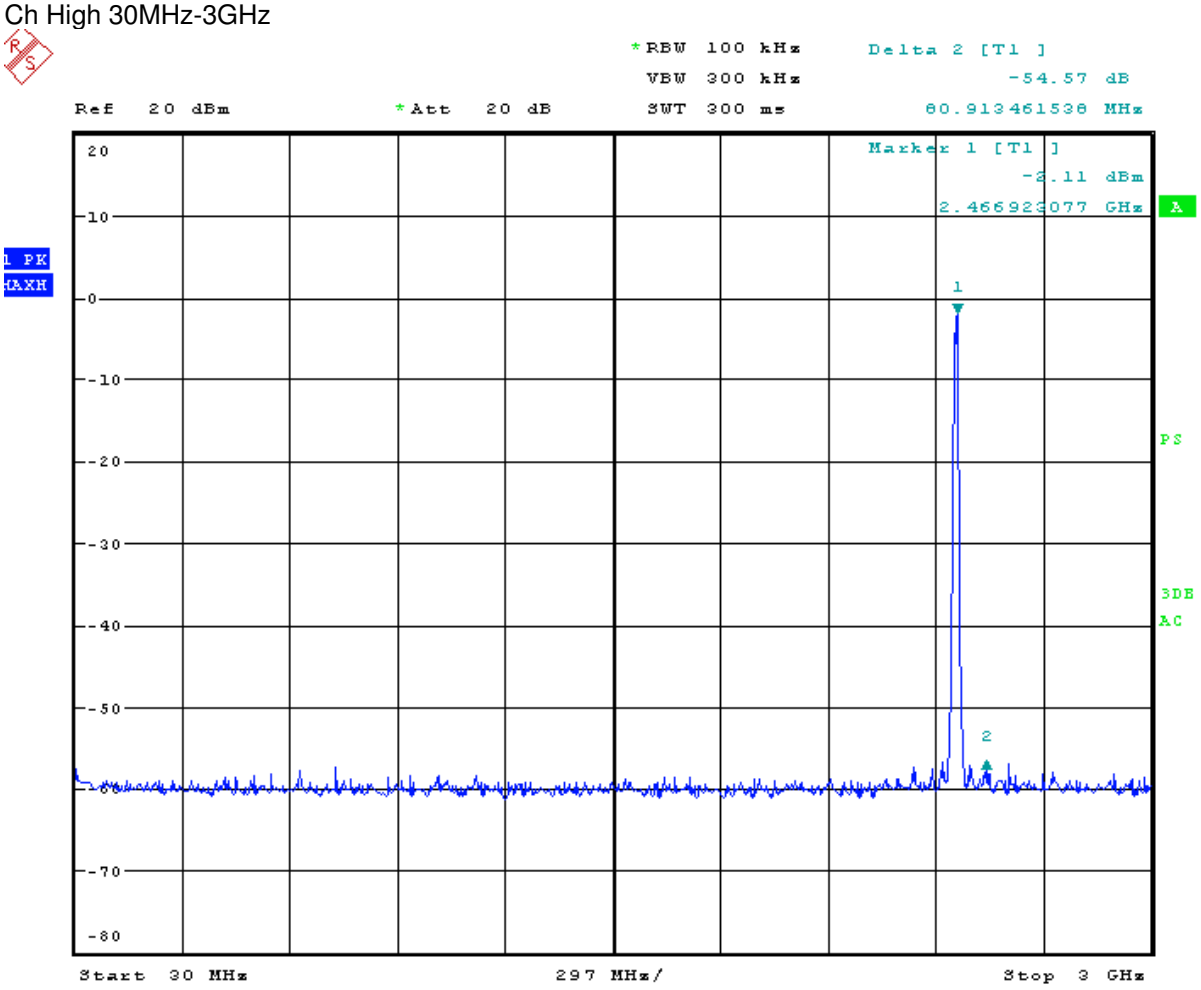
Ch High 30MHz-3GHz



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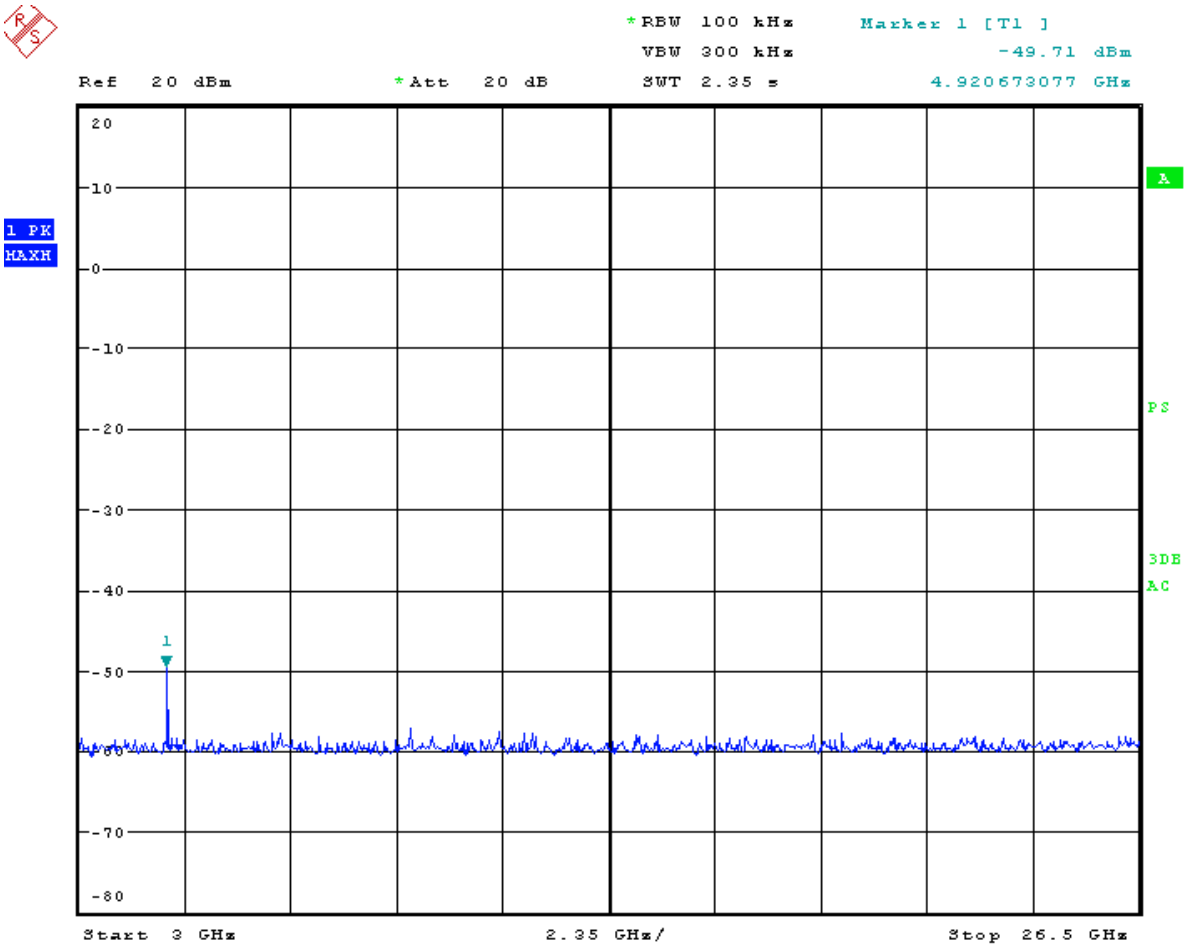
Ch High 3GHz-26.5GHz



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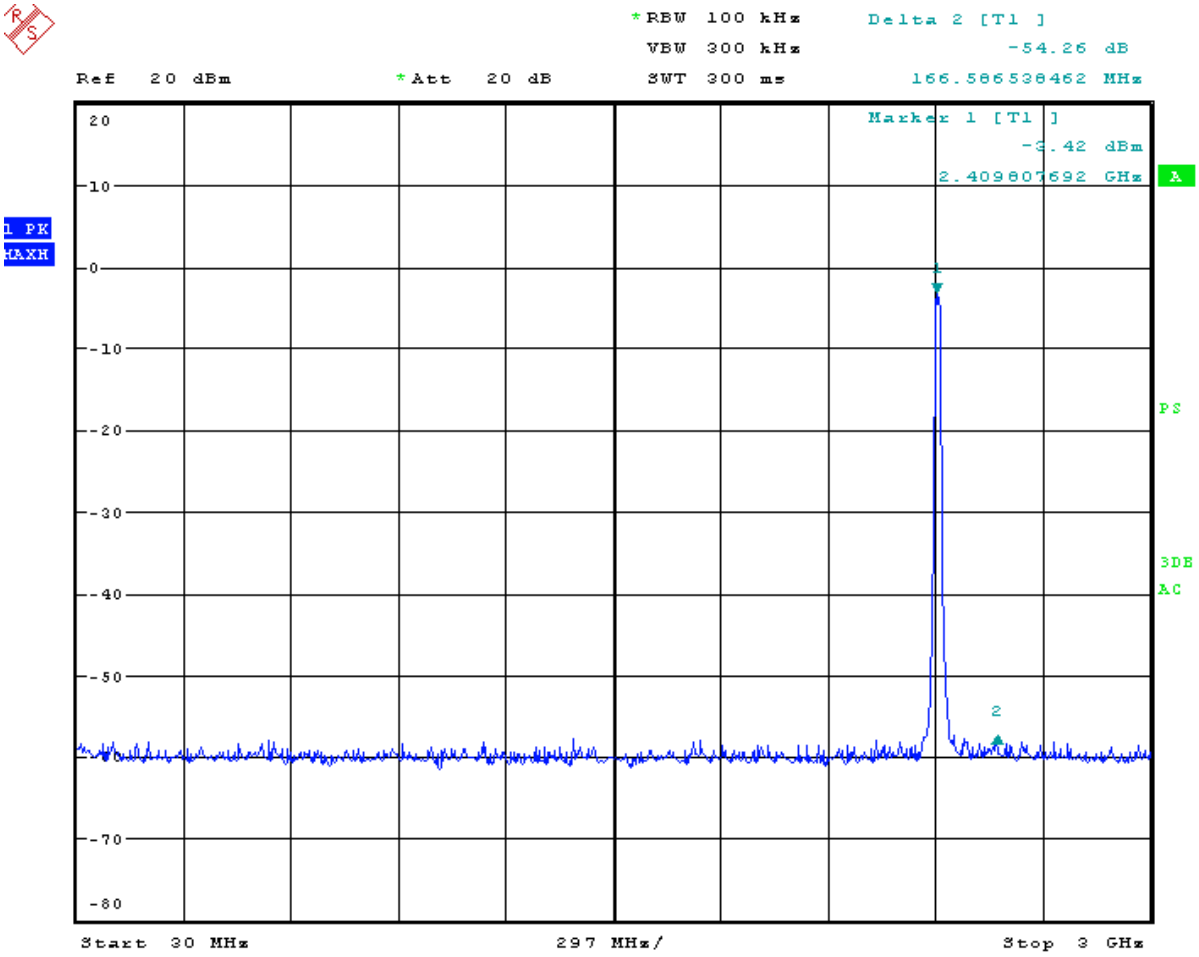
Conducted Spurious Emission Measurement Result(802.11g),6M

Ch Low 30MHz-3GHz



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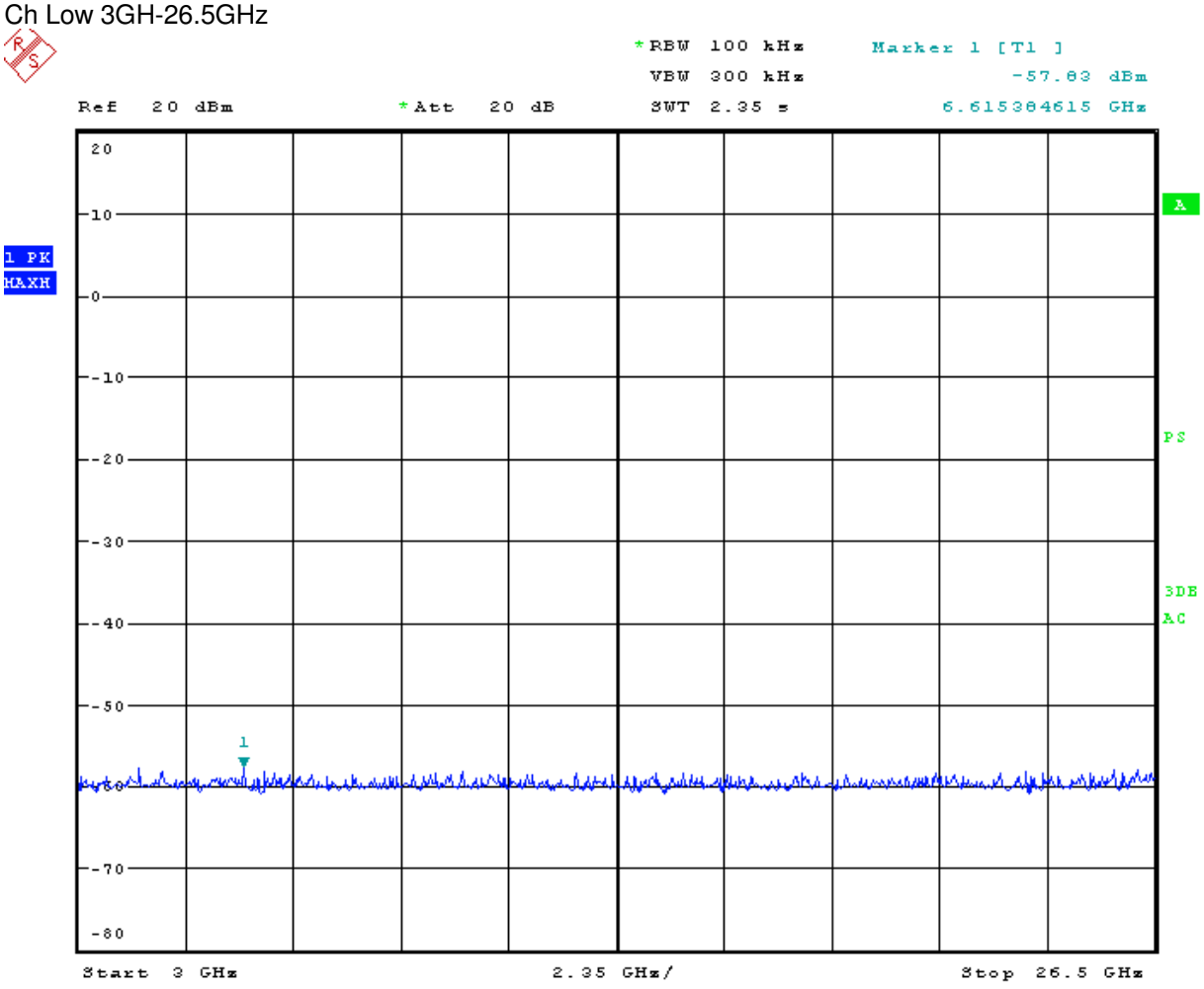
Ch Low 3GH-26.5GHz



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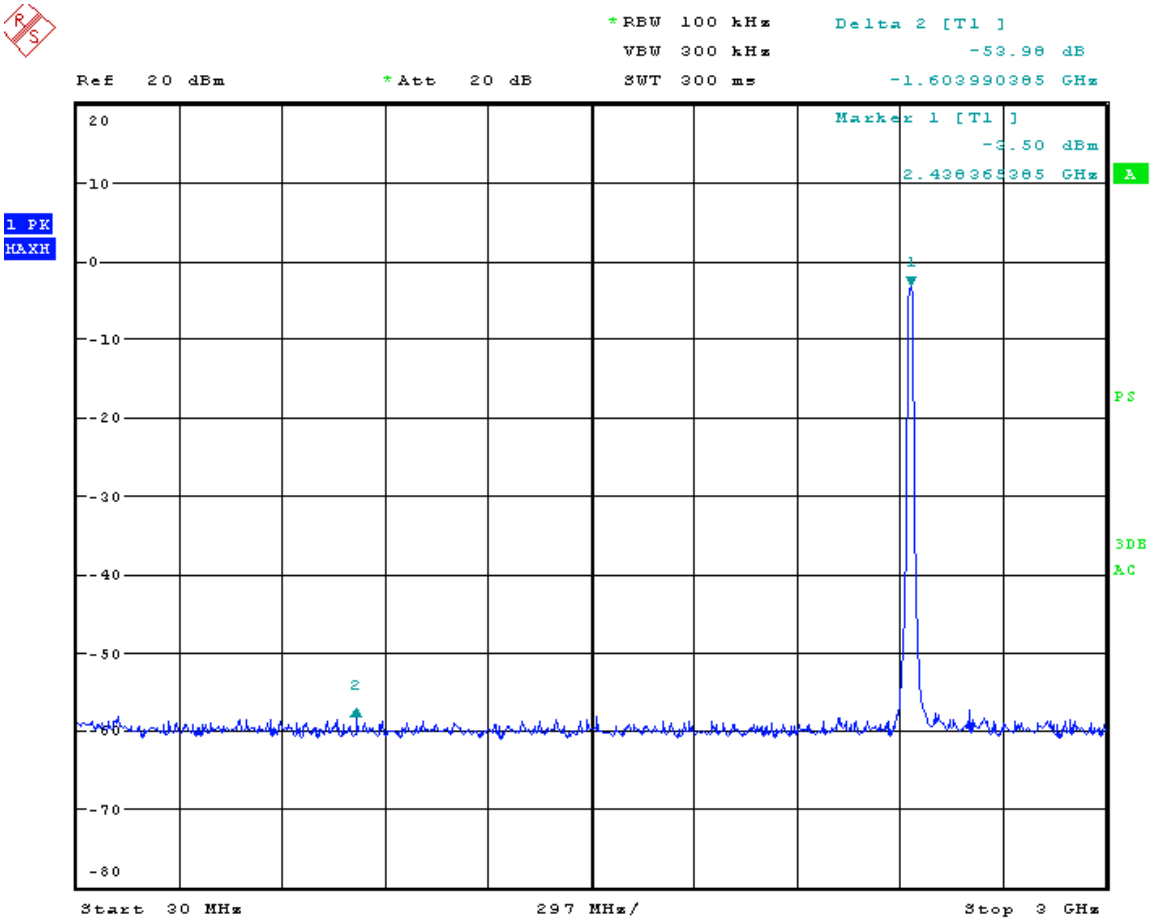
Ch Mid 30MHz-3GHz



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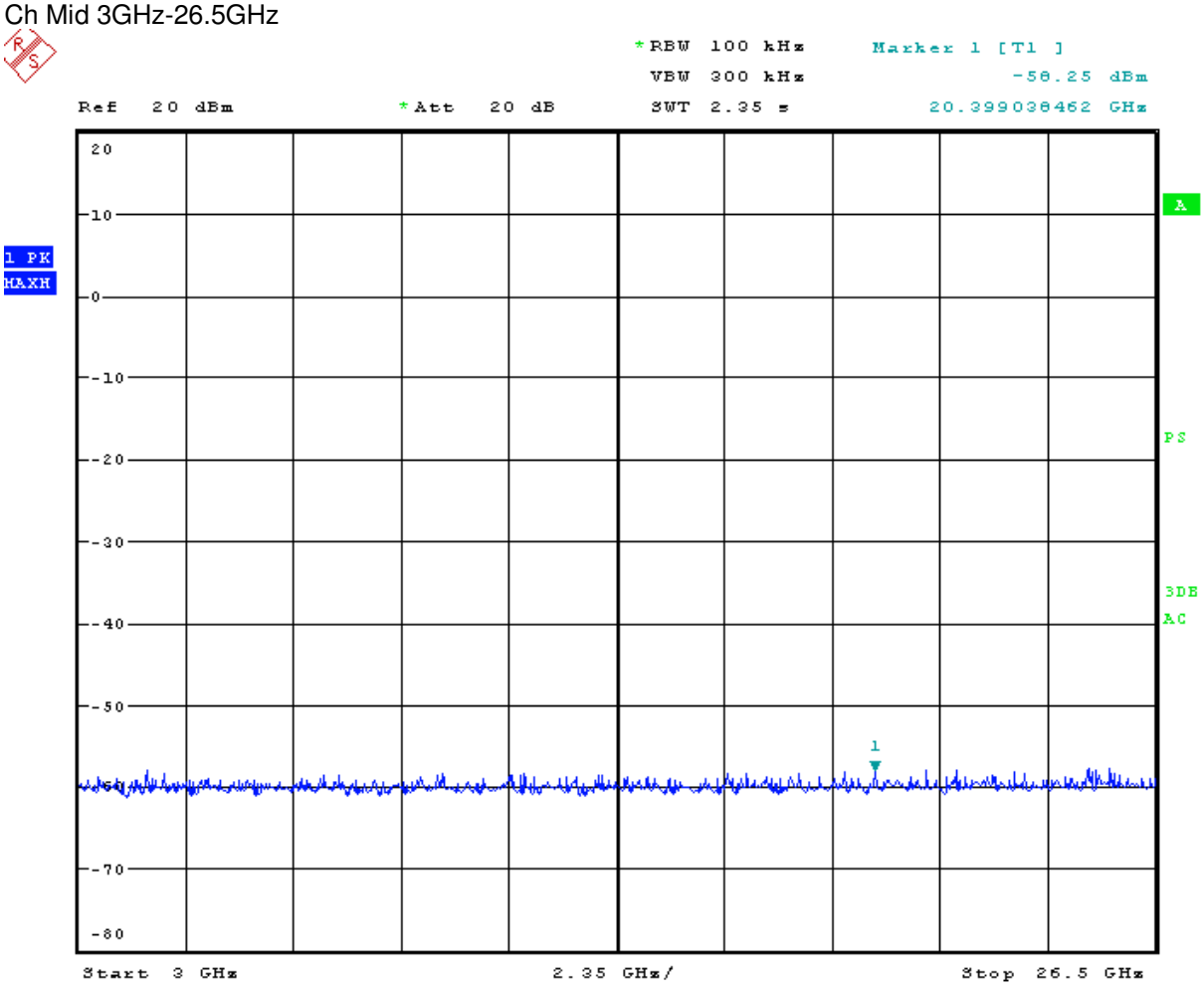
Ch Mid 3GHz-26.5GHz



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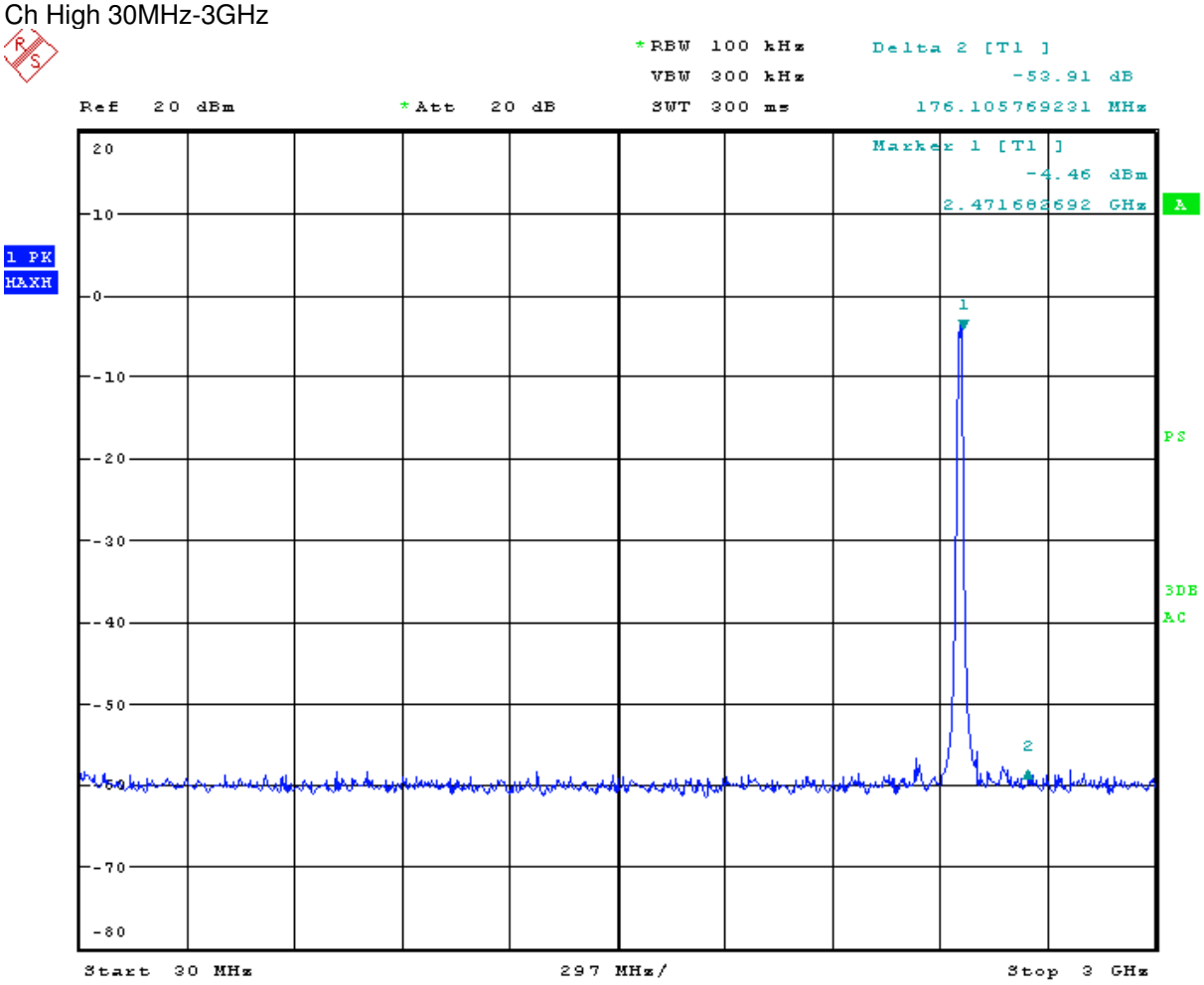
Ch High 30MHz-3GHz



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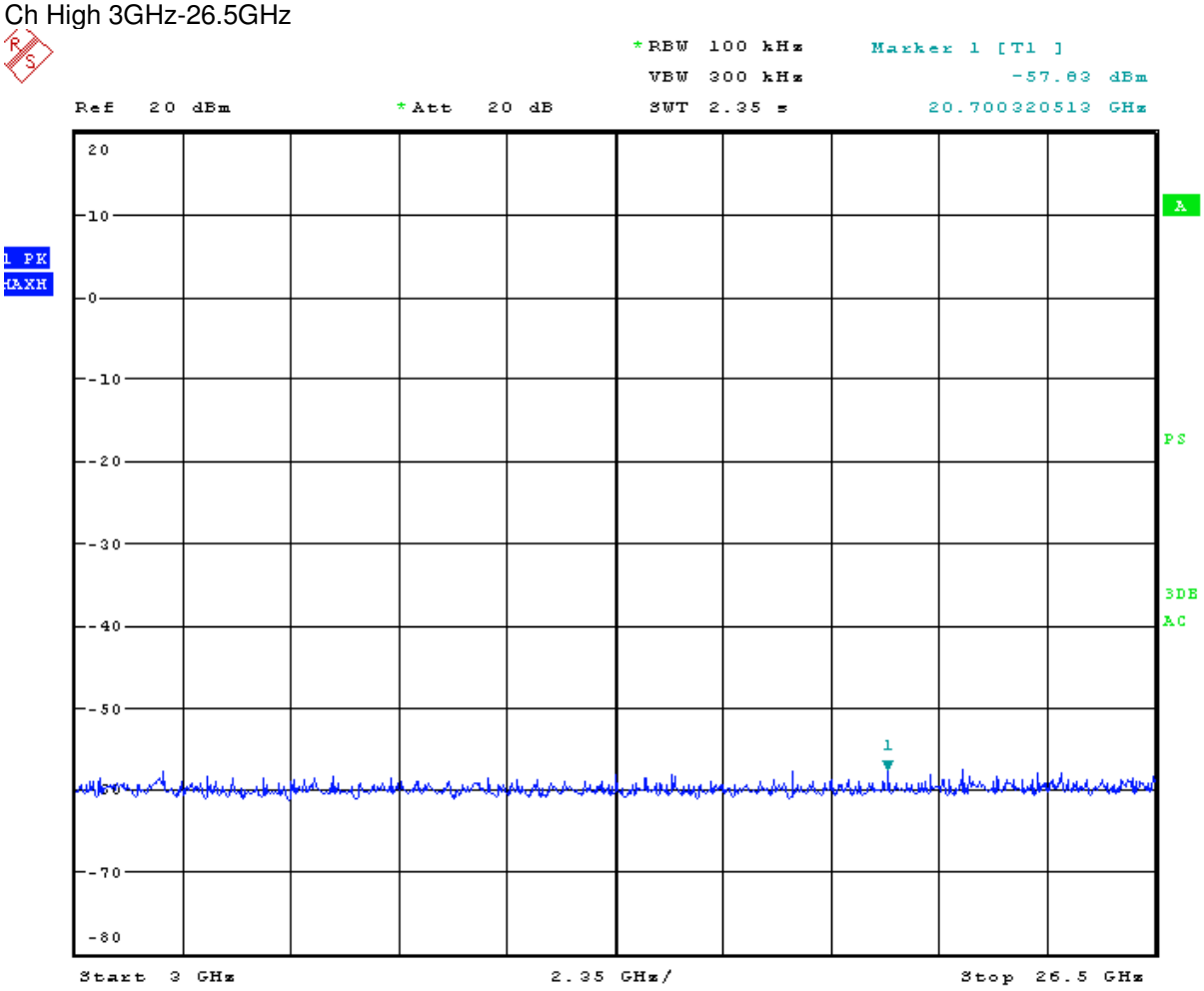
Ch High 3GHz-26.5GHz



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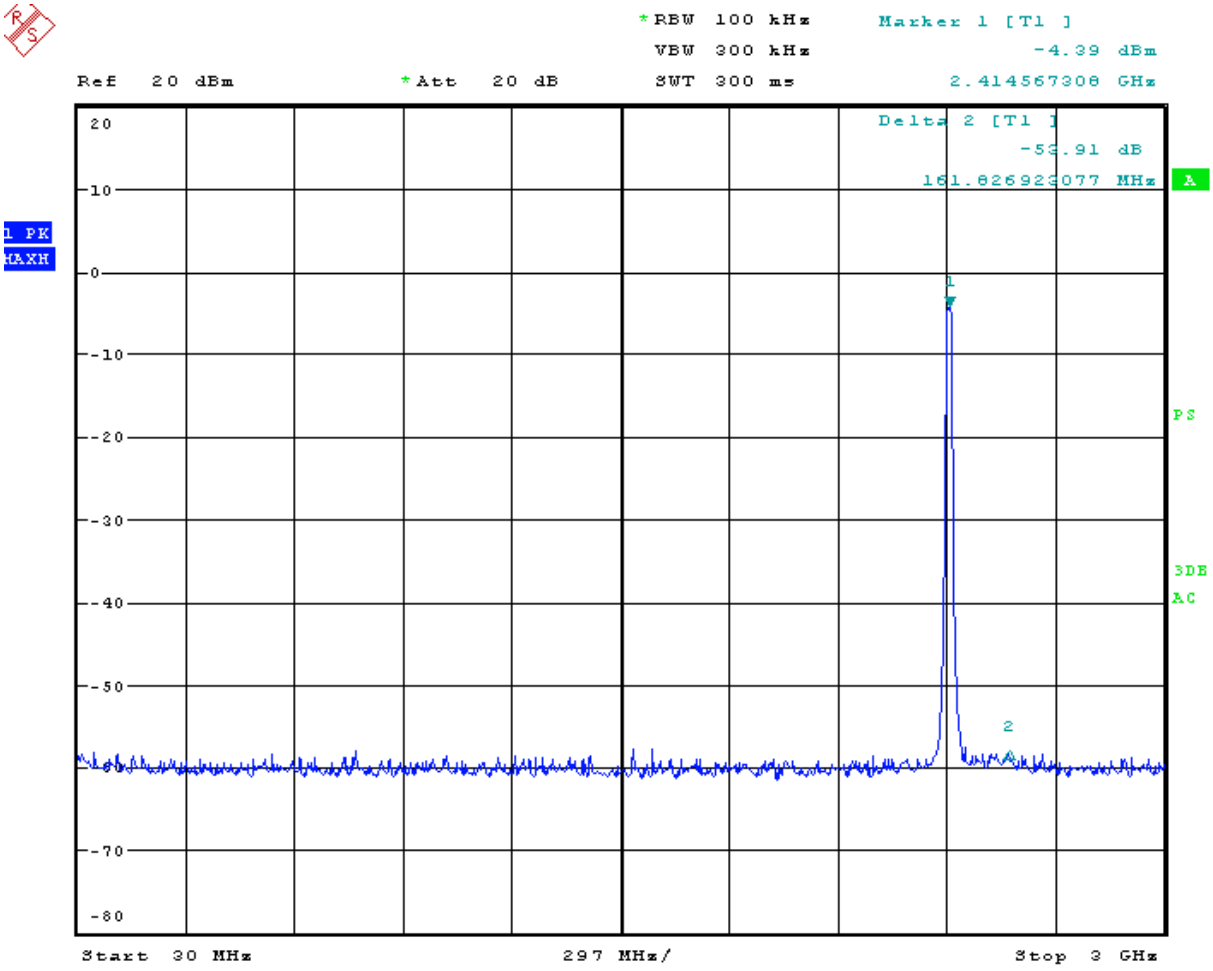
Conducted Spurious Emission Measurement Result(802.11n_20M)6.5M

Ch Low 30MHz-3GHz



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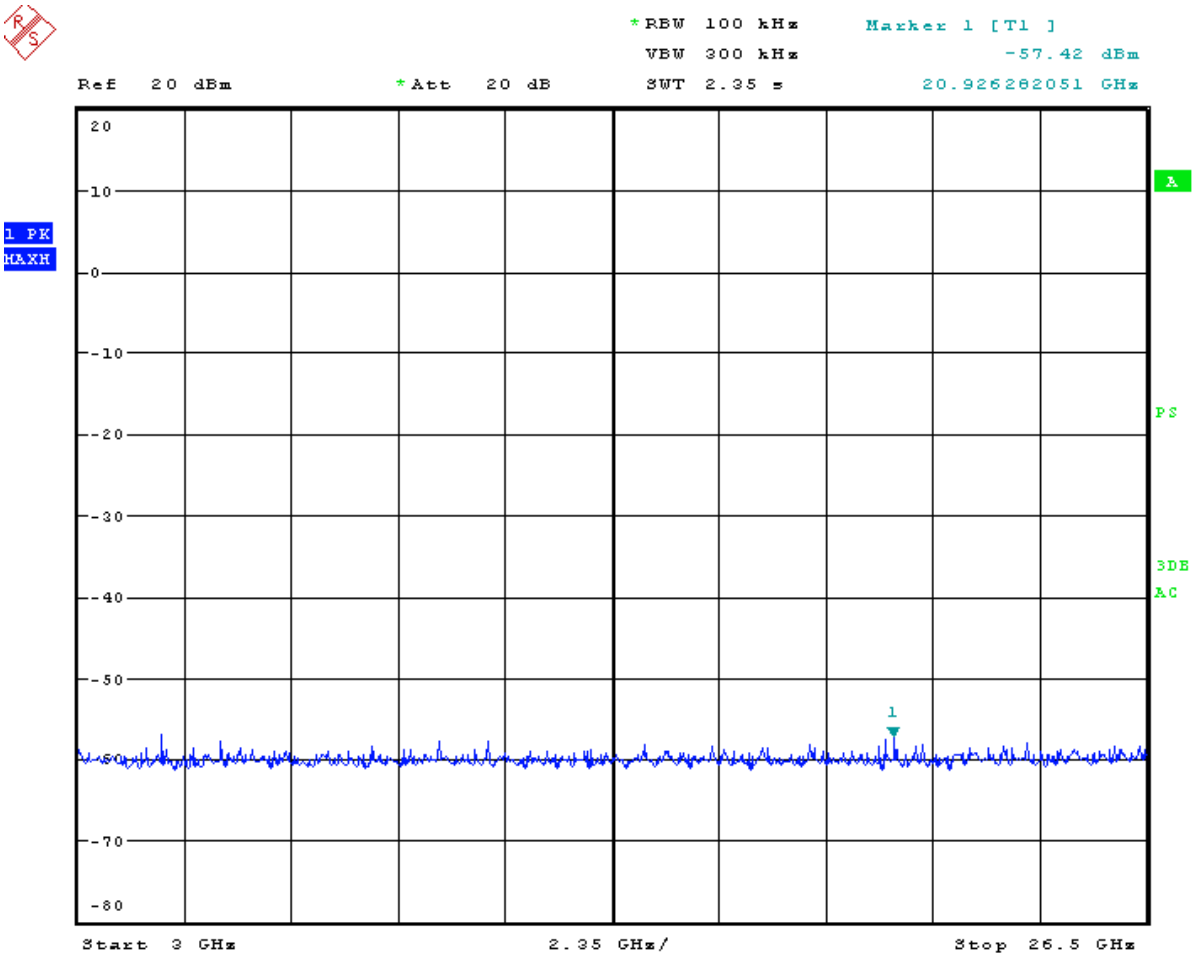
Ch Low 3GHz-26.5GHz



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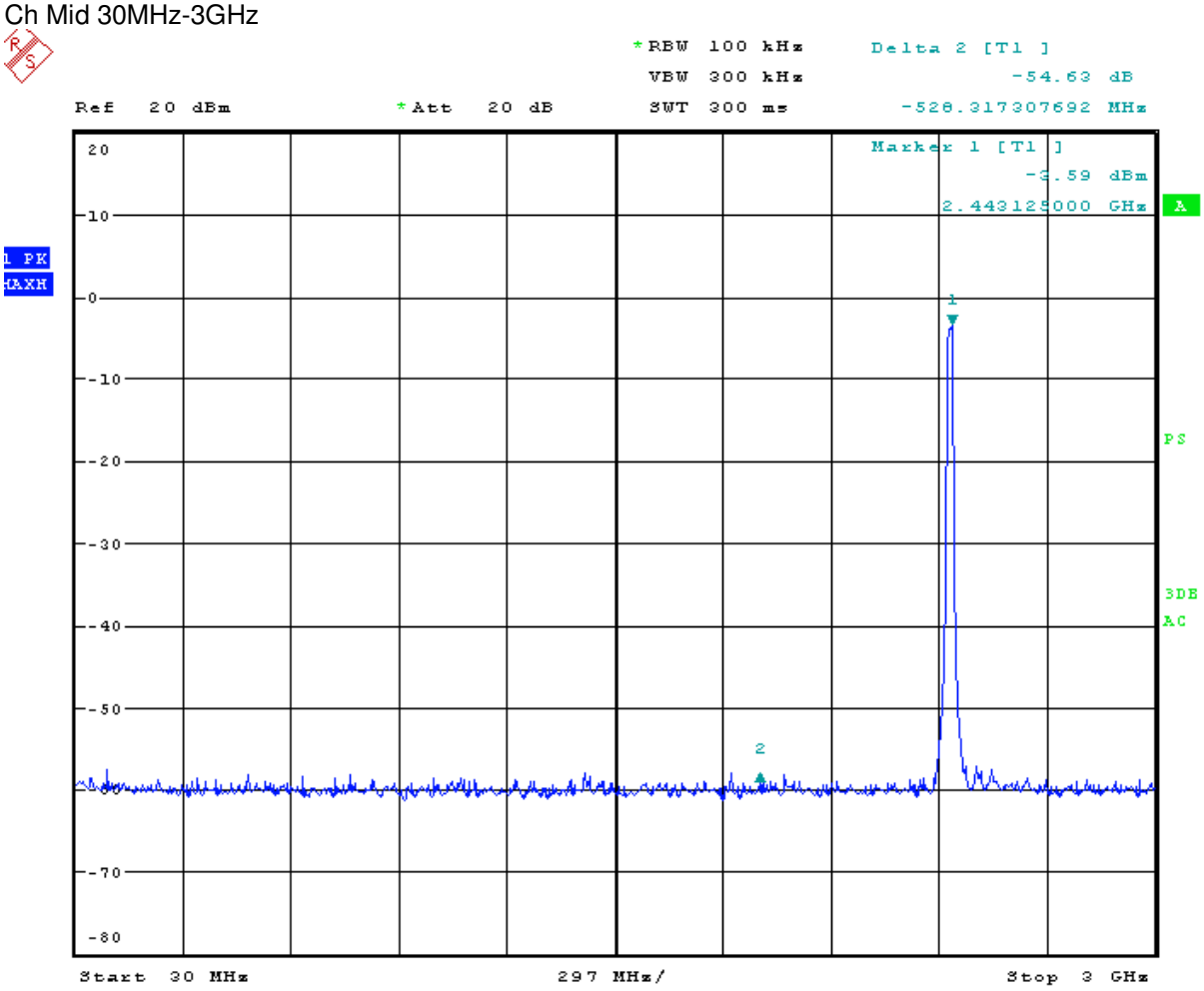
Ch Mid 30MHz-3GHz



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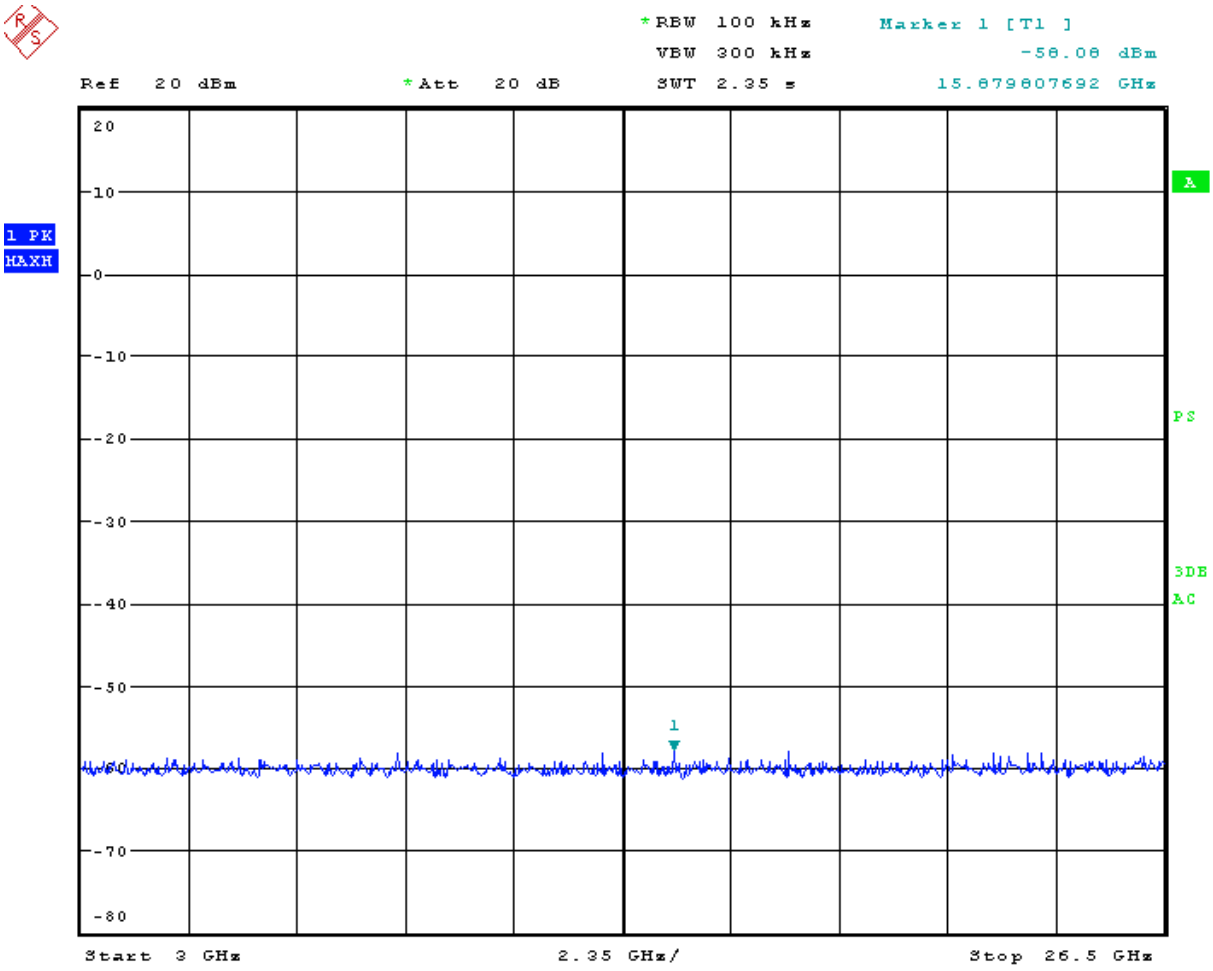
Ch Mid 3GHz-26.5GHz



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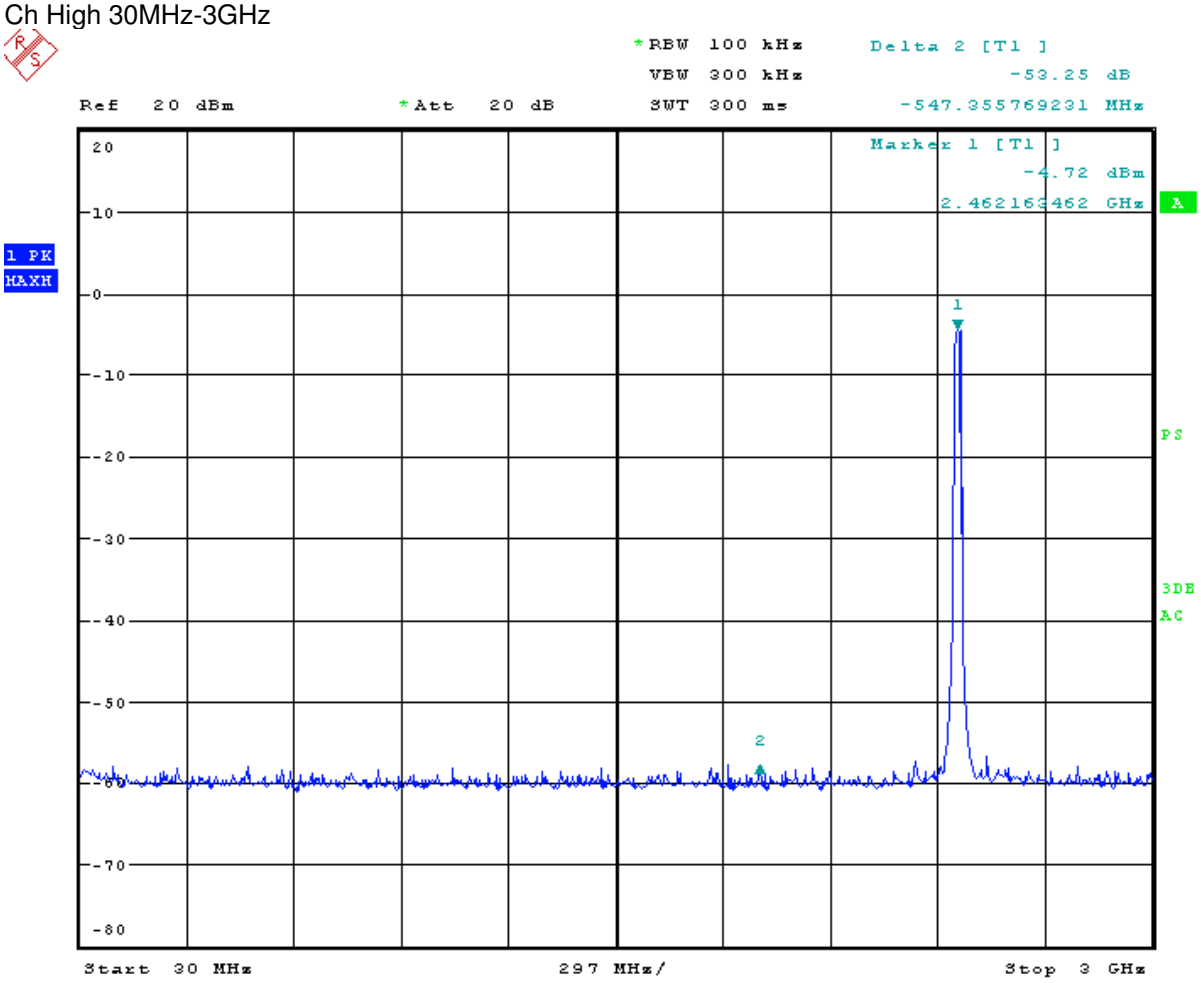
Ch High 30MHz-3GHz



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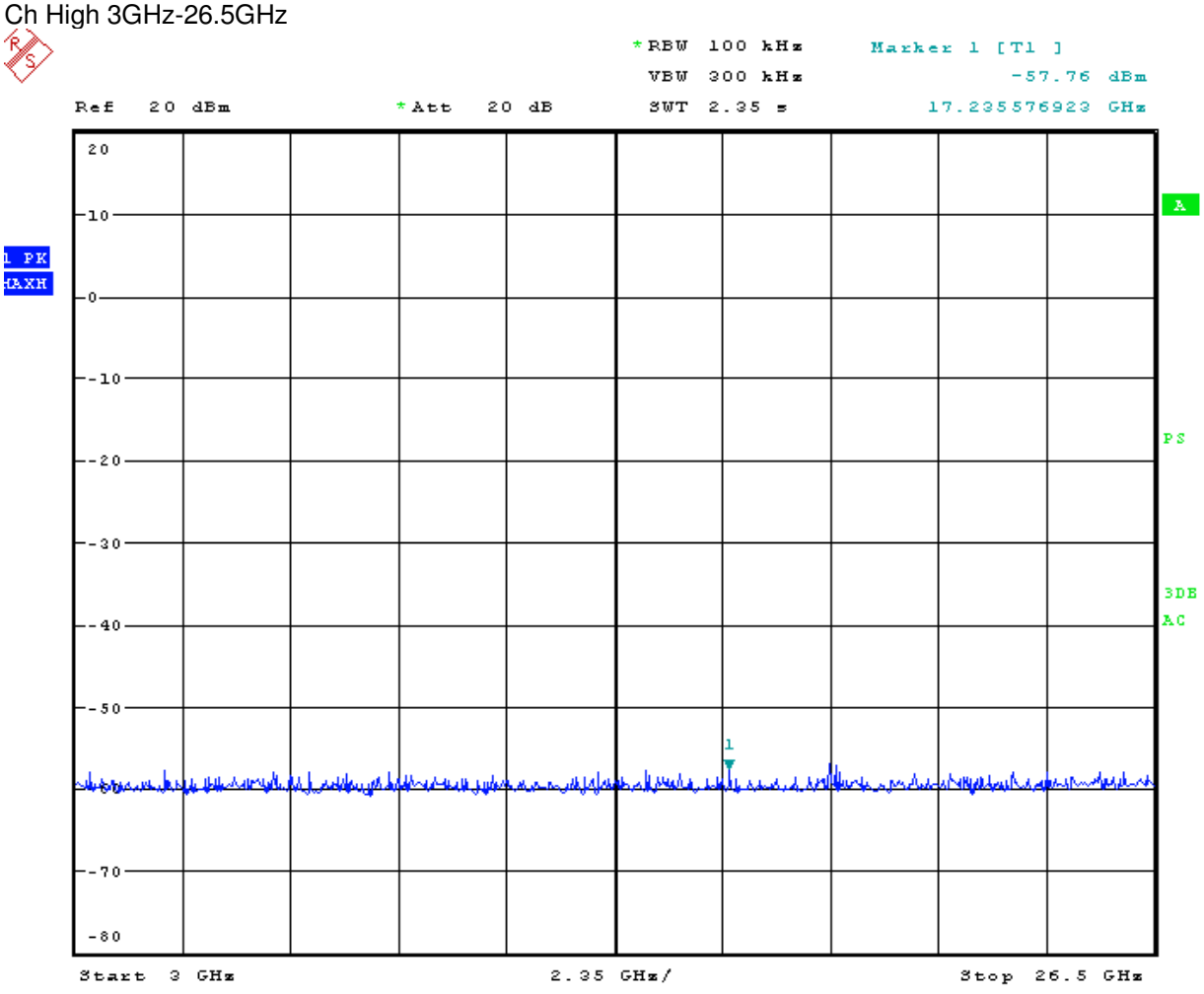
Ch High 3GHz-26.5GHz



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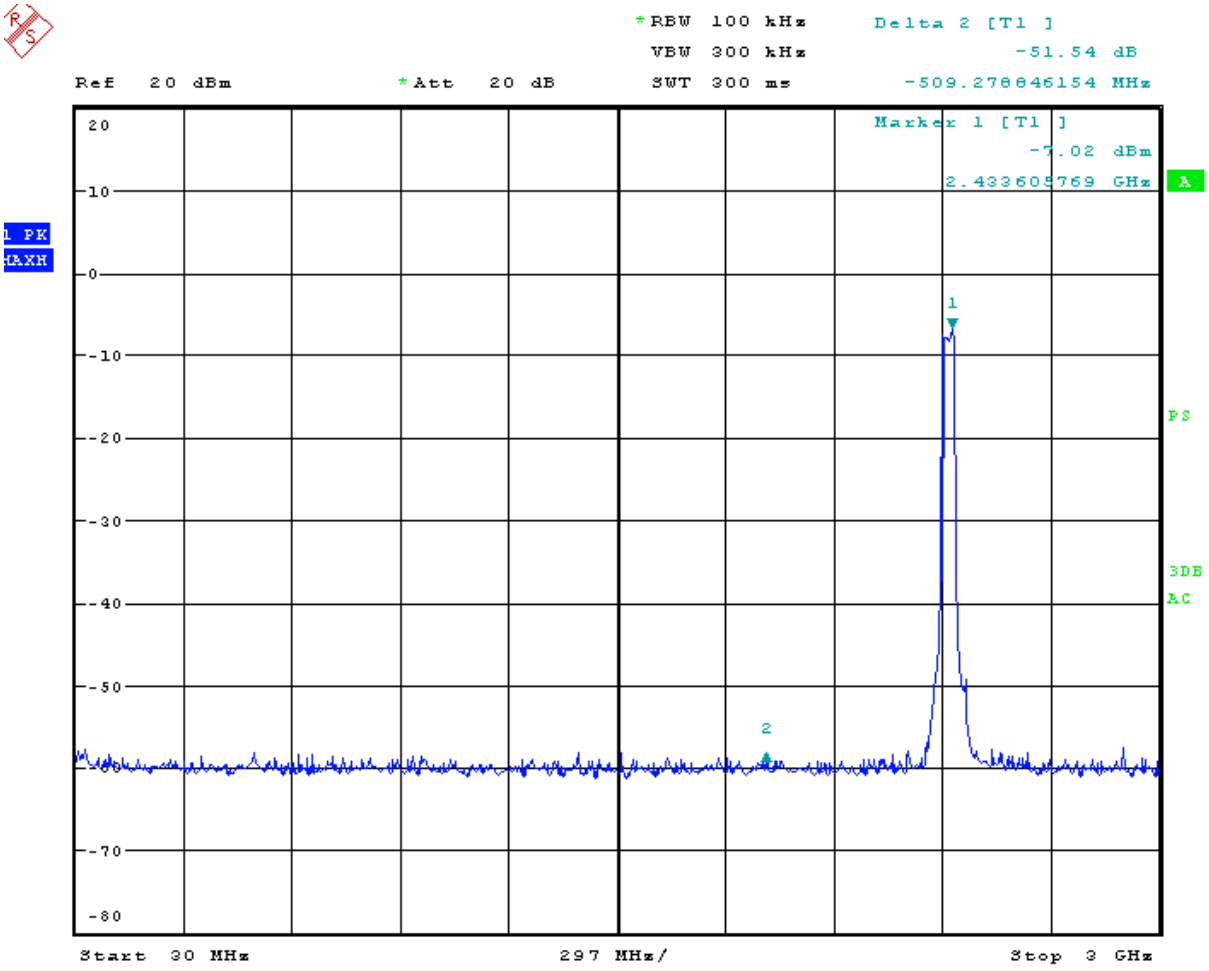
Conducted Spurious Emission Measurement Result(802.11n_40M)13.5M

Ch Low 30MHz-3GHz



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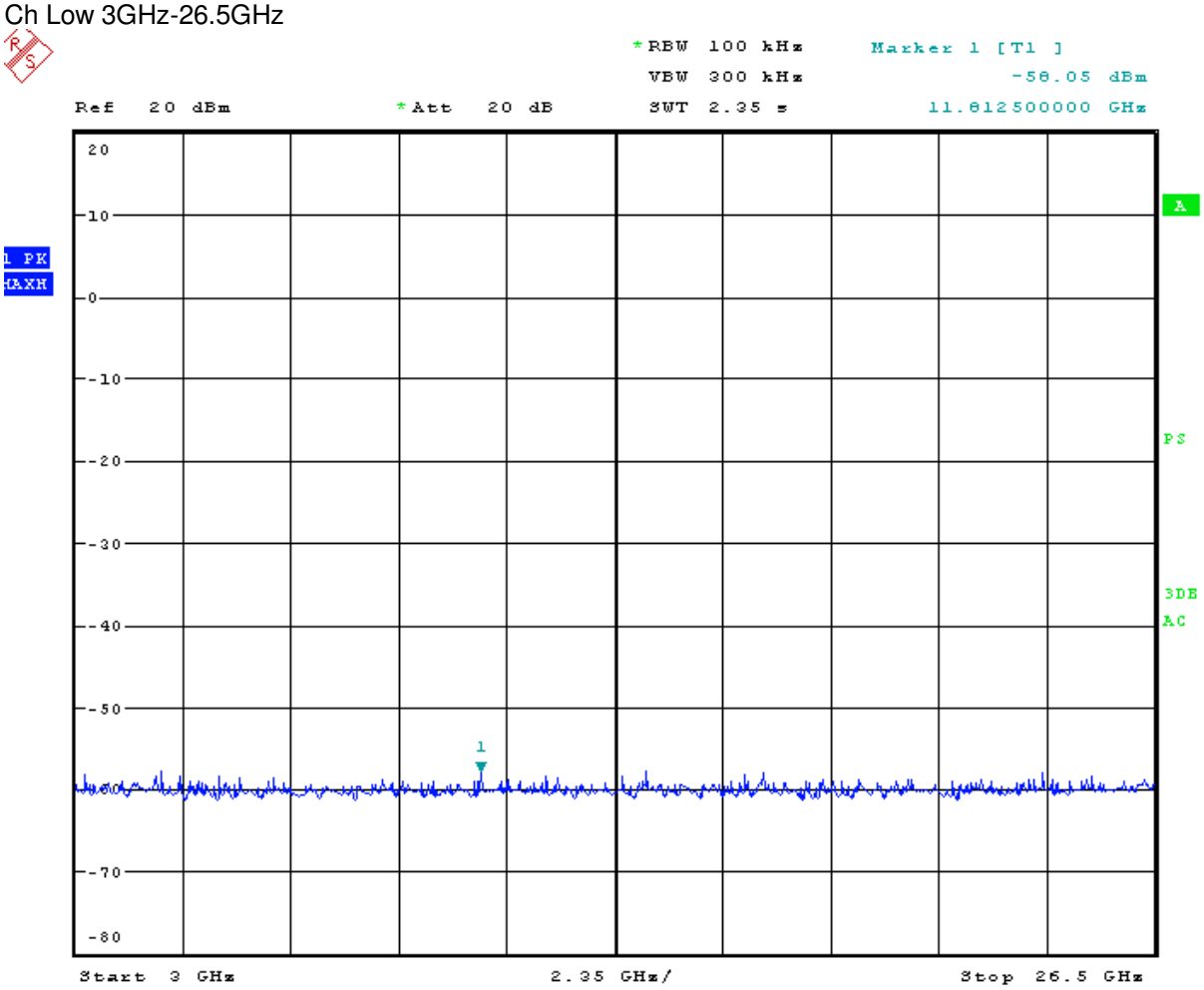
Ch Low 3GHz-26.5GHz



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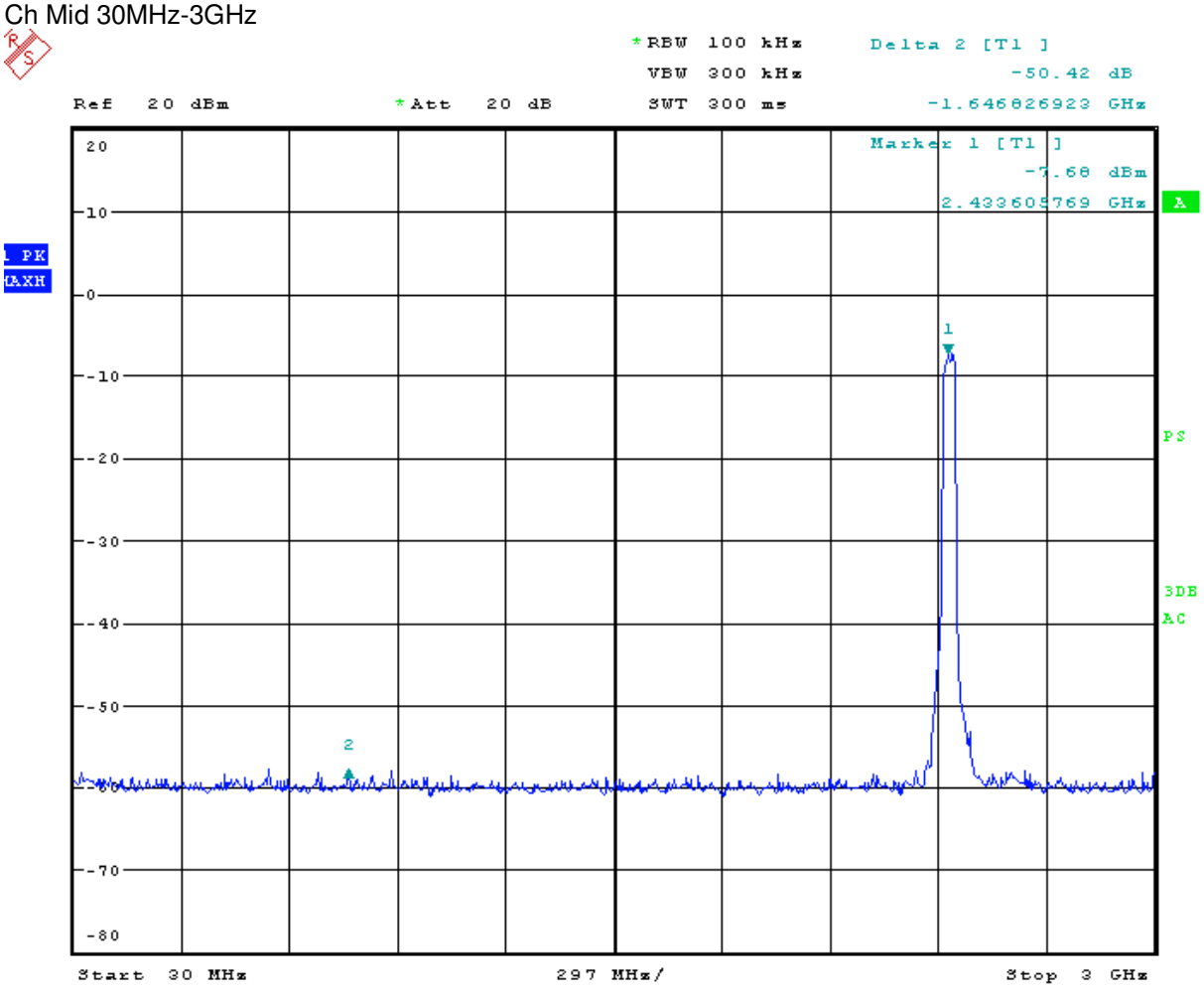
Ch Mid 30MHz-3GHz



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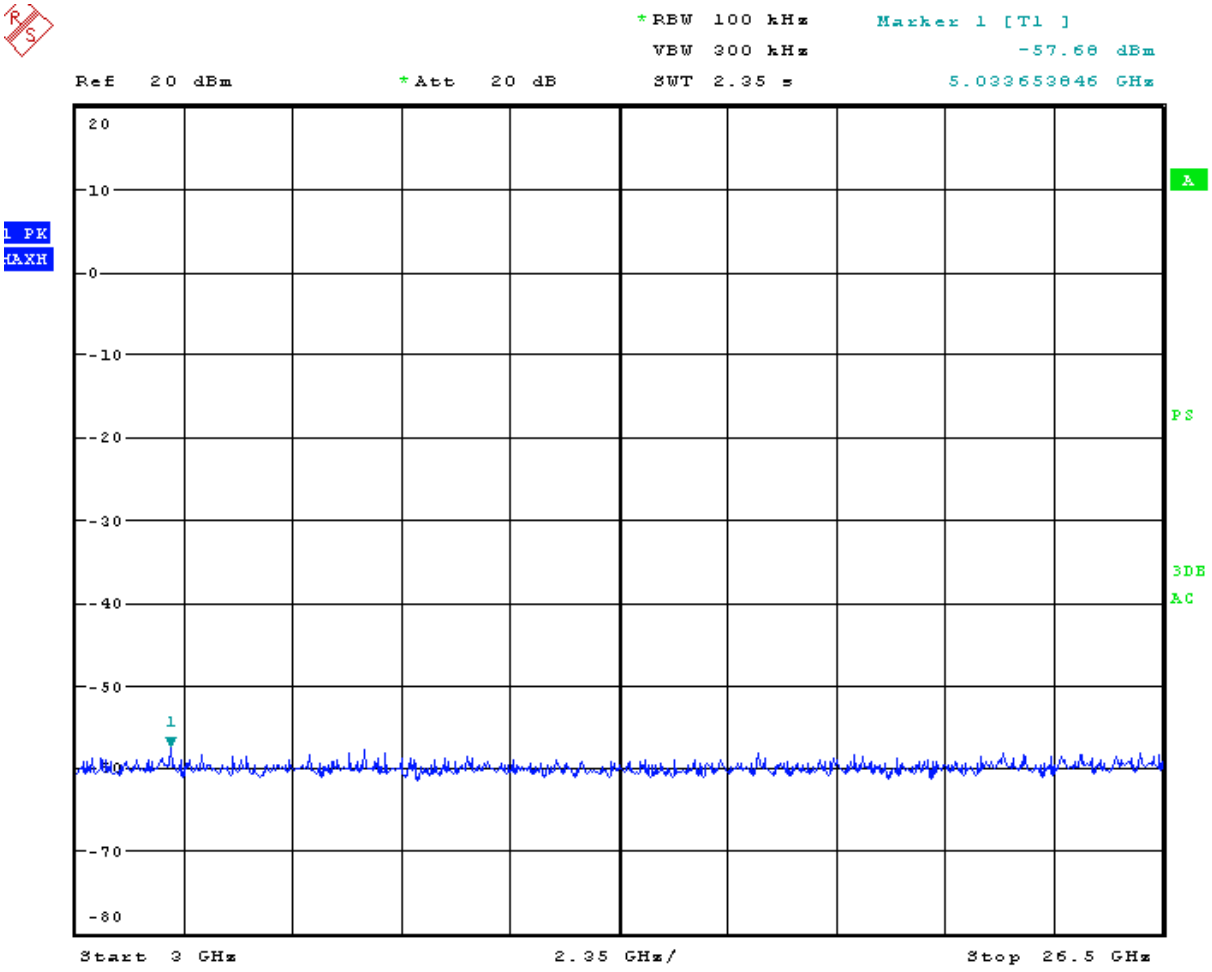
Ch Mid 3GHz-26.5GHz



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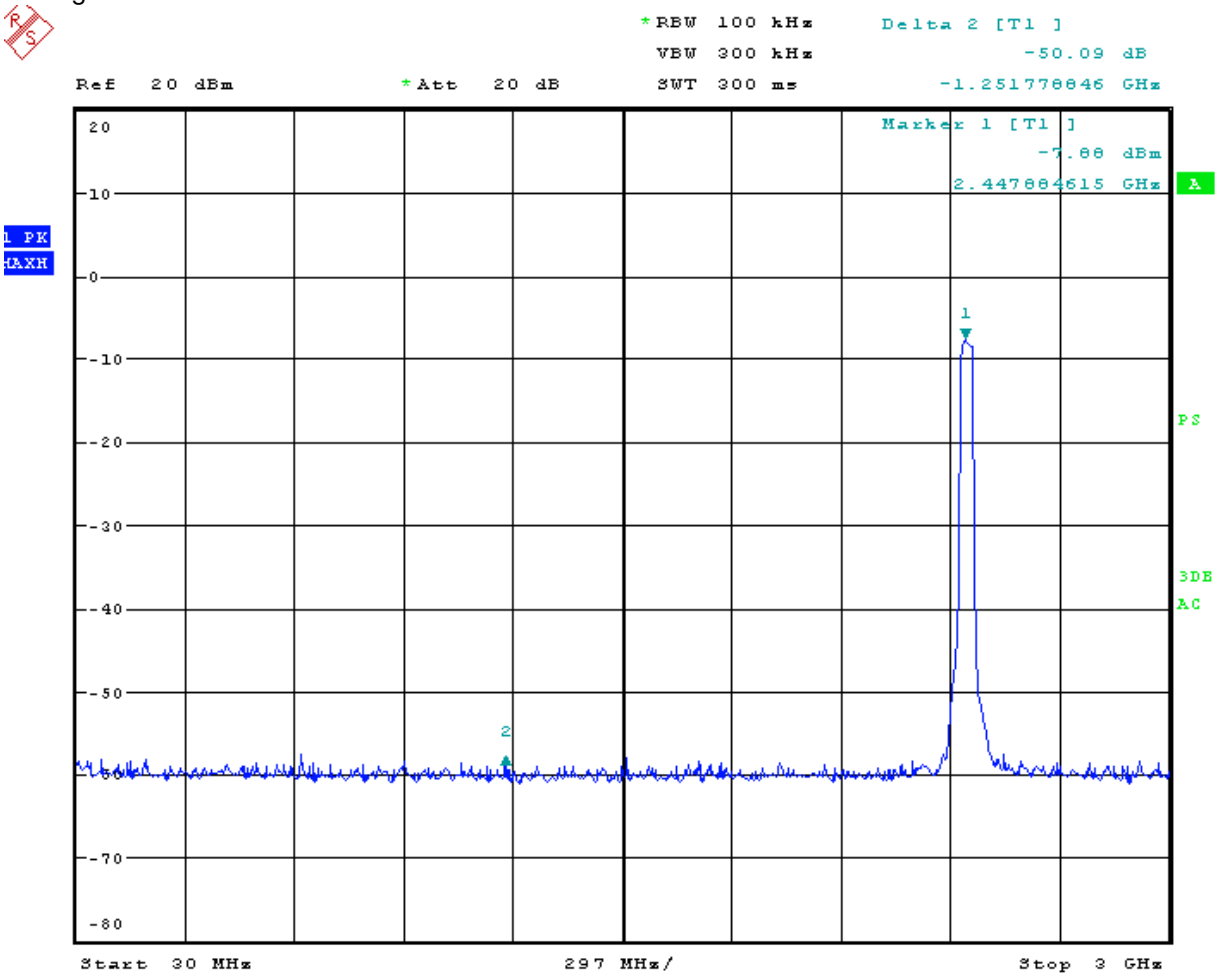
Ch High 30MHz-3GHz



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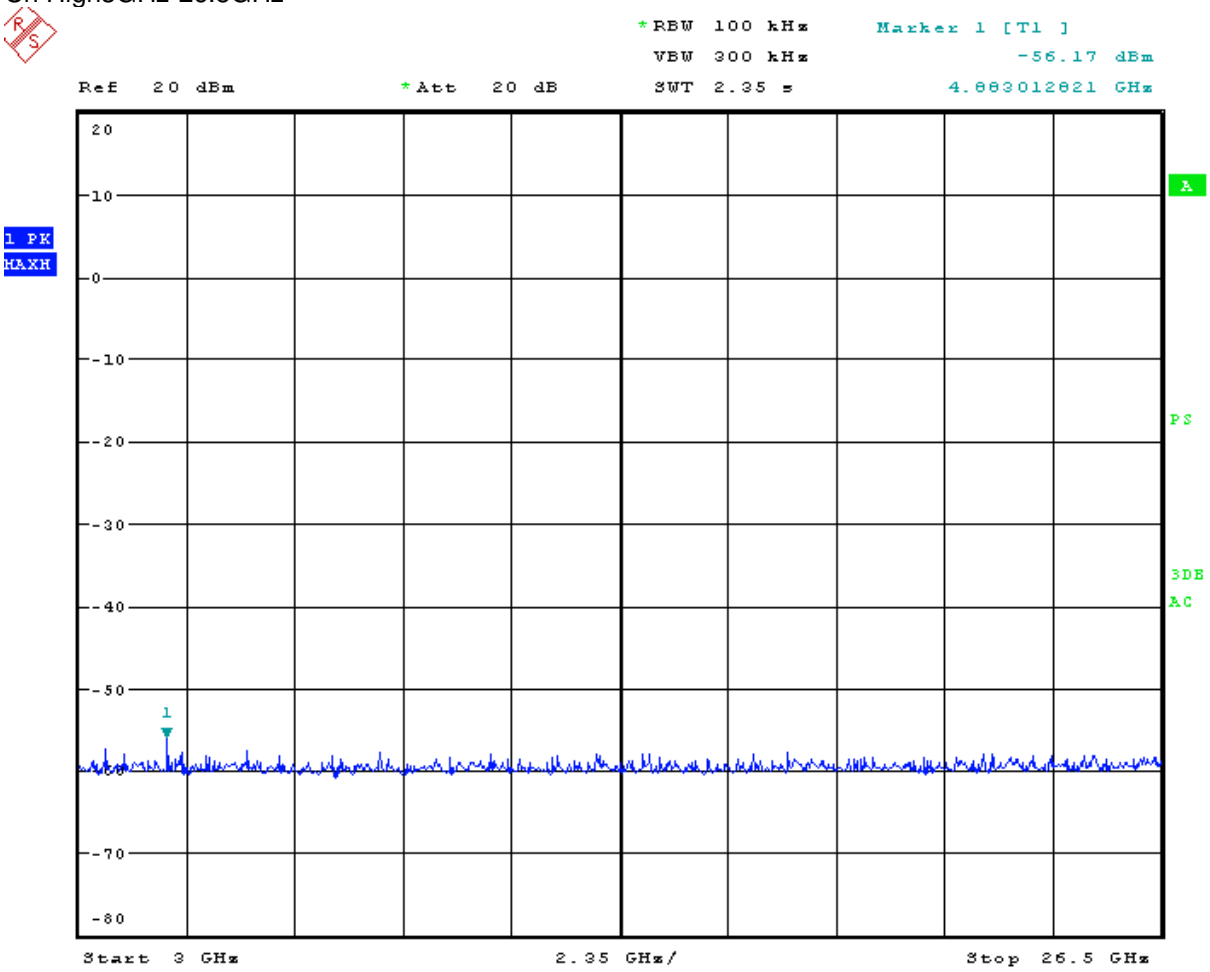
Ch High3GHz-26.5GHz



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Radiated Spurious Emission Quasi-Peak Measurement Result(below 1GHz)

Note: Final Test Level =Receiver Reading +Factor,Factor= Antenna Factor + Cable Factor-preamplifier Factor

Operation Mode:802.11b TX CH Low 1M

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Safe Margin (dB)	Ant.Pol (H/V)
408.44	42.7	-4.1	38.6	46.0	7.4	V
408.43	41.4	-4.1	37.3	46.0	8.7	H

Operation Mode:802.11b TX CH Mid 1M

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Safe Margin (dB)	Ant.Pol (H/V)
408.44	43.0	-4.1	38.9	46.0	7.1	V
408.43	42.1	-4.1	38.0	46.0	8.0	H

Operation Mode:802.11b TX CH High 1M

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Safe Margin (dB)	Ant.Pol (H/V)
408.44	42.8	-4.1	38.7	46.0	7.3	V
408.43	41.8	-4.1	37.7	46.0	8.3	H

Operation Mode:802.11g TX CH Low 6M

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Safe Margin (dB)	Ant.Pol (H/V)
408.44	41.4	-4.1	37.3	46.0	8.7	V
408.43	40.6	-4.1	36.5	46.0	9.5	H

Operation Mode:802.11g TX CH Mid 6M

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Safe Margin (dB)	Ant.Pol (H/V)
408.44	41.9	-4.1	37.8	46.0	8.2	V
408.43	40.8	-4.1	36.7	46.0	9.3	H

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Operation Mode:802.11g TX CH High 6M

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Safe Margin (dB)	Ant.Pol (H/V)
408.44	41.8	-4.1	37.7	46.0	8.3	V
408.43	41.3	-4.1	37.2	46.0	8.8	H

Operation Mode:802.11n_20M TX CH Low 6.5M

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Safe Margin (dB)	Ant.Pol (H/V)
408.44	41.7	-4.1	37.6	46.0	8.4	V
408.43	41.2	-4.1	37.1	46.0	8.9	H

Operation Mode:802.11n_20M TX CH Mid 6.5M

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Safe Margin (dB)	Ant.Pol (H/V)
408.44	43.5	-4.1	39.4	46.0	6.6	V
408.43	41.4	-4.1	37.3	46.0	8.7	H

Operation Mode:802.11n_20MX CH High 6.5M

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Safe Margin (dB)	Ant.Pol (H/V)
408.44	42.5	-4.1	38.4	46.0	7.6	V
408.43	41.6	-4.1	37.5	46.0	8.5	H

Operation Mode:802.11n_40M TX CH Low13.5M

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Safe Margin (dB)	Ant.Pol (H/V)
408.44	43.0	-4.1	38.9	46.0	7.1	V
408.43	41.6	-4.1	37.5	46.0	8.5	H

Operation Mode:802.11n_40M TX CH Mid 13.5M

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Safe Margin (dB)	Ant.Pol (H/V)
408.44	41.5	-4.1	37.4	46.0	8.6	V
408.43	40.5	-4.1	36.4	46.0	9.6	H

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Operation Mode:802.11n _40MTX CH High 13.5M

Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Safe Margin (dB)	Ant.Pol (H/V)
408.44	41.7	-4.1	37.6	46.0	8.4	V
408.43	40.4	-4.1	36.3	46.0	9.7	H

Radiated Spurious Emission Peak and Average Measurement Result(above 1GHz)

Note:

1. **Measuring frequencies scanned from 1GHz to the 10th harmonic of highest fundamental frequency.**
2. **Data of measurement within this frequency range show"-"in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.**
3. **Spectrum Peak Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 3MHz, Sweep time= 200 ms.**
   Spectrum AV Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.
4. **Final Test Level =Receiver Reading +Factor**
   Factor= Antenna Factor + Cable Factor – preamplifier Factor

Operation Mode:802.11b TX CH Low 1M

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Peak Margin (dB)	AV Margin (dB)
4824.0	60.90	49.9	-4.90	56.0	45.0	74.00	54.00	18.00	9.00
7236.0	-	-							
7449.0	-	-							
9648.0	-	-							
24120.0	-	-							

Operation Mode:802.11b TX CH Mid 1M

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Peak Margin (dB)	AV Margin (dB)
4874.0	62.3	52.6	-5.00	57.3	47.60	74.00	54.00	16.7	6.4
7311.0	-	-							
9748.0	-	-							
14622.0	-	-							
24370.0	-	-							

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Operation Mode:802.11b TX CH High 1M

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Peak Margin (dB)	AV Margin (dB)
4924.0	62.9	52.2	-5.10	57.8	47.10	74.00	54.00	16.2	6.1
7386.0	-	-				-			
9848.0	-	-				-			
14772.0	-	-				-			
24620.0	-	-				-			

Operation Mode:802.11g TX CH Low 6M

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Peak Margin (dB)	AV Margin (dB)
4824.0	51.20	42.10	-4.9	46.30	37.20	74.00	54.00	27.70	16.80
7236.0	-	-							
7449.0	-	-							
9648.0	-	-							
24120.0	-	-							

Operation Mode:802.11g TX CH Mid 6M

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Peak Margin (dB)	AV Margin (dB)
4874.0	50.10	40.00	-5.0	45.10	35.00	74.00	54.00	28.90	19.00
7311.0	-	-							
9748.0	-	-							
14622.0	-	-							
24370.0	-	-							

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Operation Mode:802.11g TX CH High 6M

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Peak Margin (dB)	AV Margin (dB)
4924.0	52.15	41.10	-5.1	47.05	36.00	74.00	54.00	26.95	18.00
7386.0	-	-							
9848.0	-	-							
14772.0	-	-							
24620.0	-	-							

Operation Mode:802.11n_20M TX CH Low 6.5M

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Peak Margin (dB)	AV Margin (dB)
4824.0	49.90	40.80	-4.90	45.0	35.90	74.00	54.00	25.00	18.1
7236.0	-	-							
7449.0	-	-							
9648.0	-	-							
24120.0	-	-				-			

Operation Mode:802.11n_20M TX CH Mid 6.5M

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Peak Margin (dB)	AV Margin (dB)
4874.0	51.37	42.70	-5.00	46.37	37.70	74.00	54.00	27.63	16.3
7311.0	-	-							
9748.0	-	-							
14622.0	-	-							
24370.0	-	-							

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Operation Mode:802.11n_20M TX CH High 6.5M

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Peak Margin (dB)	AV Margin (dB)
4924.0	53.60	44.40	-5.10	48.50	39.3	74.00	54.00	25.5	14.7
7386.0	-	-							
9848.0	-	-							
14772.0	-	-							
24620.0	-	-							

Operation Mode:802.11n_40M TX CH Low 13.5M

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Peak Margin (dB)	AV Margin (dB)
4844.0	51.15	40.00	-5.0	46.15	35.00	74.00	54.00	27.75	19.00
7266.0	-	-							
7440.0	-	-							
9688.0	-	-							
24220.0	-	-				-			

Operation Mode:802.11n_40M TX CH Mid 13.5M

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Peak Margin (dB)	AV Margin (dB)
4874.0	50.47	41.50	-5.00	45.47	36.50	74.00	54.00	28.63	17.50
7311.0	-	-							
9748.0	-	-							
14622.0	-	-							
24370.0	-	-							

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Operation Mode:802.11n_40M TX CH High 13.5M

Frequency (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	AV Level (dBuV/m)	Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Peak Margin (dB)	AV Margin (dB)
4904.0	50.55	41.10	-5.1	45.45	36.0	74.00	54.00	28.55	18.00
7356.0	-	-							
9808.0	-	-							
14712.0	-	-							
24520.0	-	-							

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4.3.7 Peak Power Spectral Density

Test Requirement: FCC Part15 247(e)

Test date: December 2,2009

Standard Applicable: According to section 15.247(e),For digitally modulated systems,the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dB in any 3KHz band during any time in terval of continuous transmission.This power spectral density shall be determined in accordance with the provisions of paragraph(b) of this section.The same method of determining the conducted output power shall be used to determine the powr spectral density.

Measurement Procedure:
1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Record the max. reading.
4. Repeat above procedures until all frequency measured were complete.

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Measurement Result:

Test Results(802.11b)1M

CH	Frequency (MHz)	RF Power Density Reading (dBm)	Cable loss (Db)	RF Power Density Level(dBm)	Max Limit (dbm)
LOW	2412	-17.32	0.00	-17.32	8
MID	2437	-16.91	0.00	-16.91	8
HIGH	2462	-16.80	0.00	-16.80	8

Test Results(802.11g)6M

CH	Frequency (MHz)	RF Power Density Reading (MHz)	Cable loss (Db)	RF Power Density Level(dBm)	Max Limit (dbm)
LOW	2412	-17.72	0.00	-17.72	8
MID	2437	-17.09	0.00	-17.09	8
HIGH	2462	-17.72	0.00	-17.72	8

Test Results(802.11n_20M)6.5M

CH	Frequency (MHz)	RF Power Density Reading (MHz)	Cable loss (Db)	RF Power Density Level(dBm)	Max Limit (dbm)
LOW	2412	-17.84	0.00	-17.84	8
MID	2437	-17.25	0.00	-17.25	8
HIGH	2462	-17.96	0.00	-17.96	8

Test Results(802.11n_40M)13.5M

CH	Frequency (MHz)	RF Power Density Reading (MHz)	Cable loss (Db)	RF Power Density Level(dBm)	Max Limit (dbm)
LOW	2422	-18.04	0.00	-18.04	8
MID	2437	-17.32	0.00	-17.32	8
HIGH	2452	-17.46	0.00	-17.46	8

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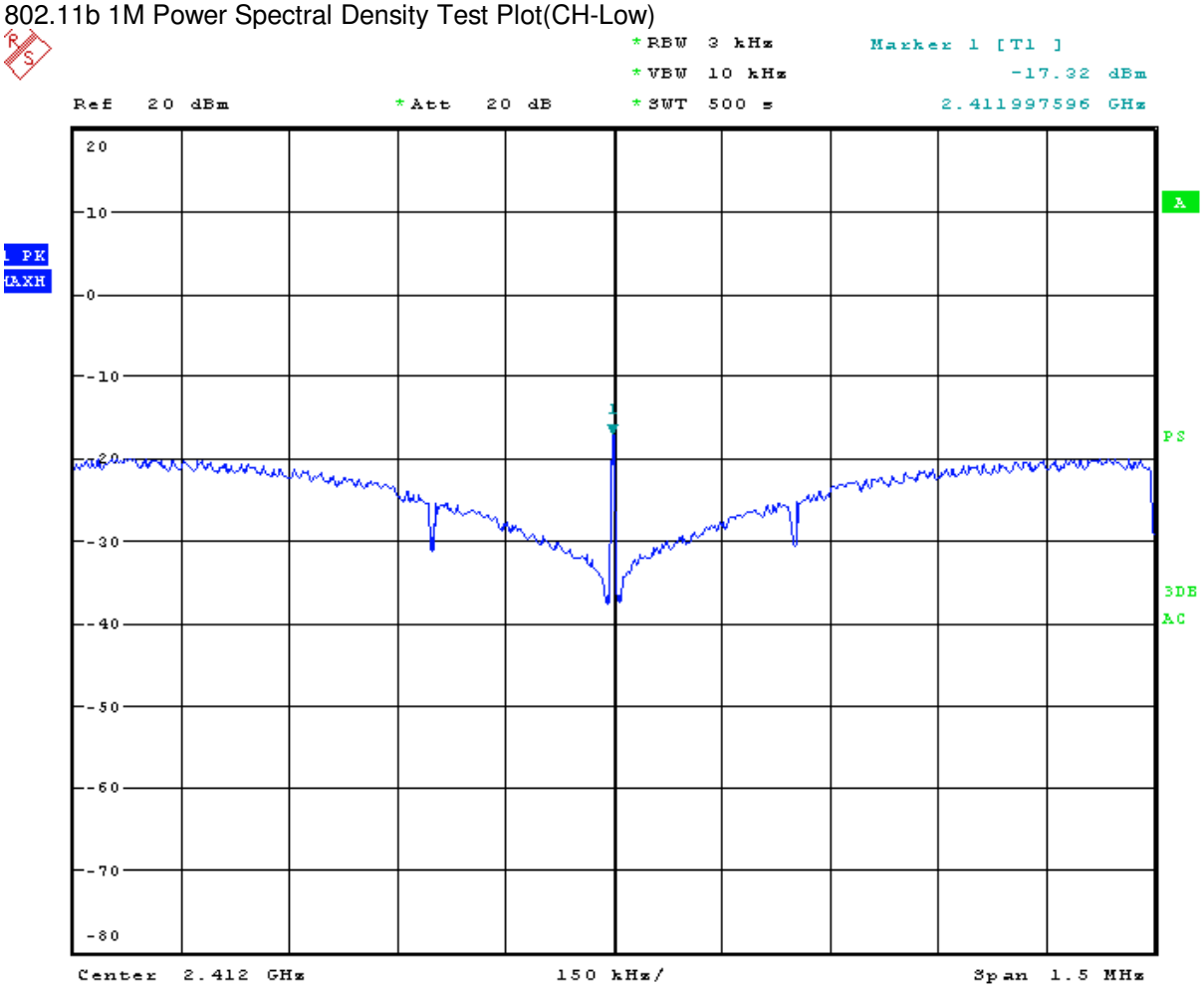
802.11b 1M Power Spectral Density Test Plot(CH-Low)



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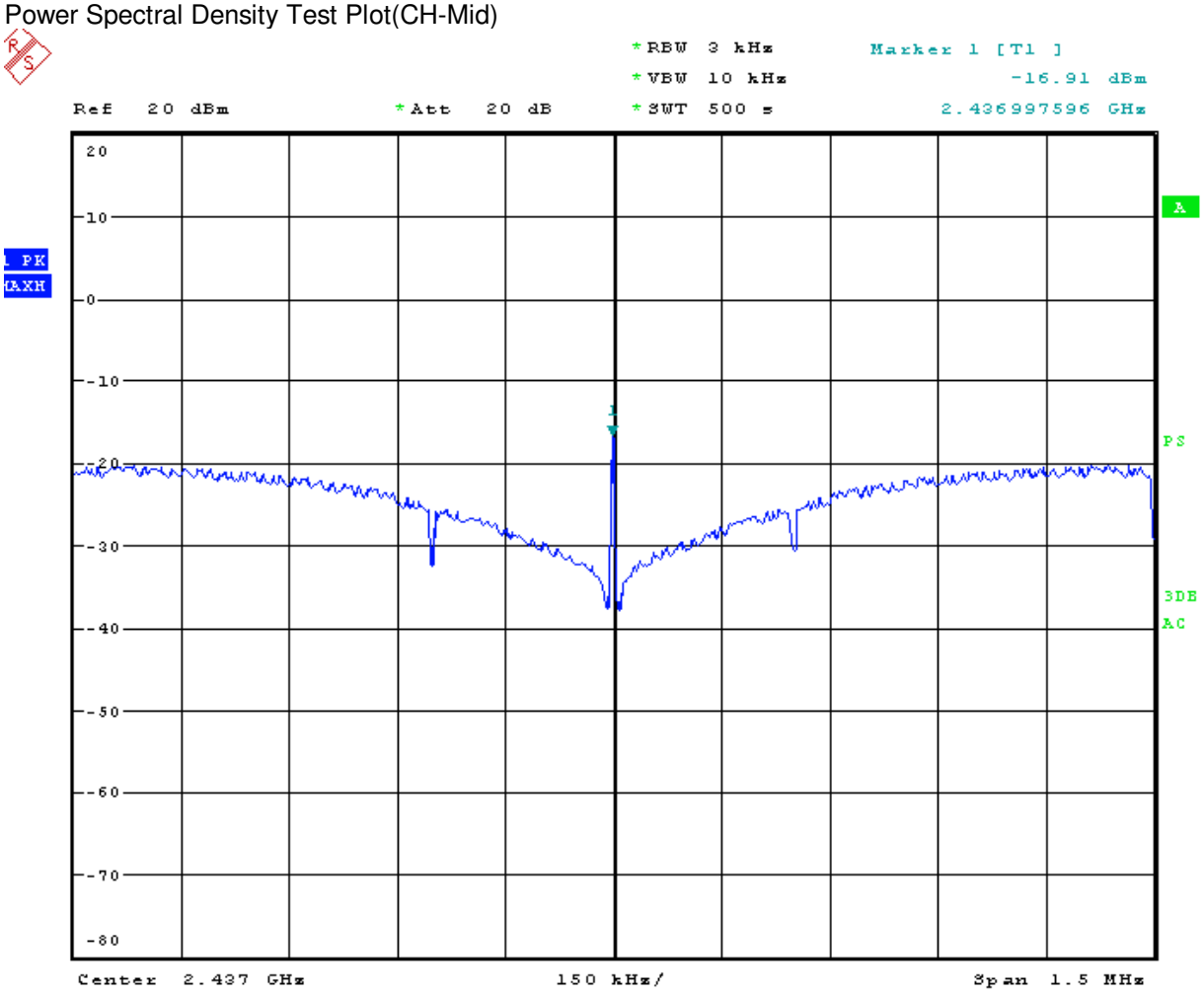
Power Spectral Density Test Plot(CH-Mid)



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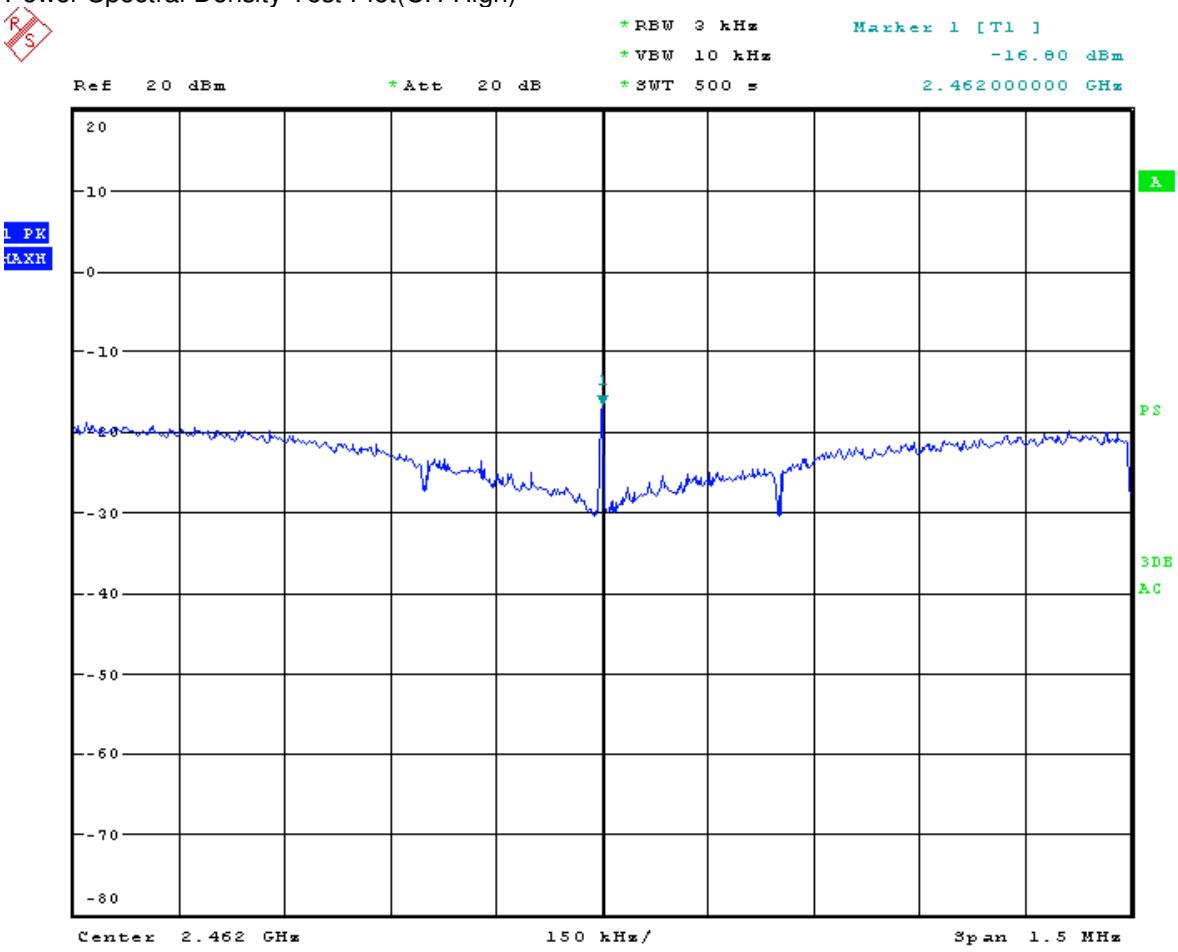
Power Spectral Density Test Plot(CH-High)



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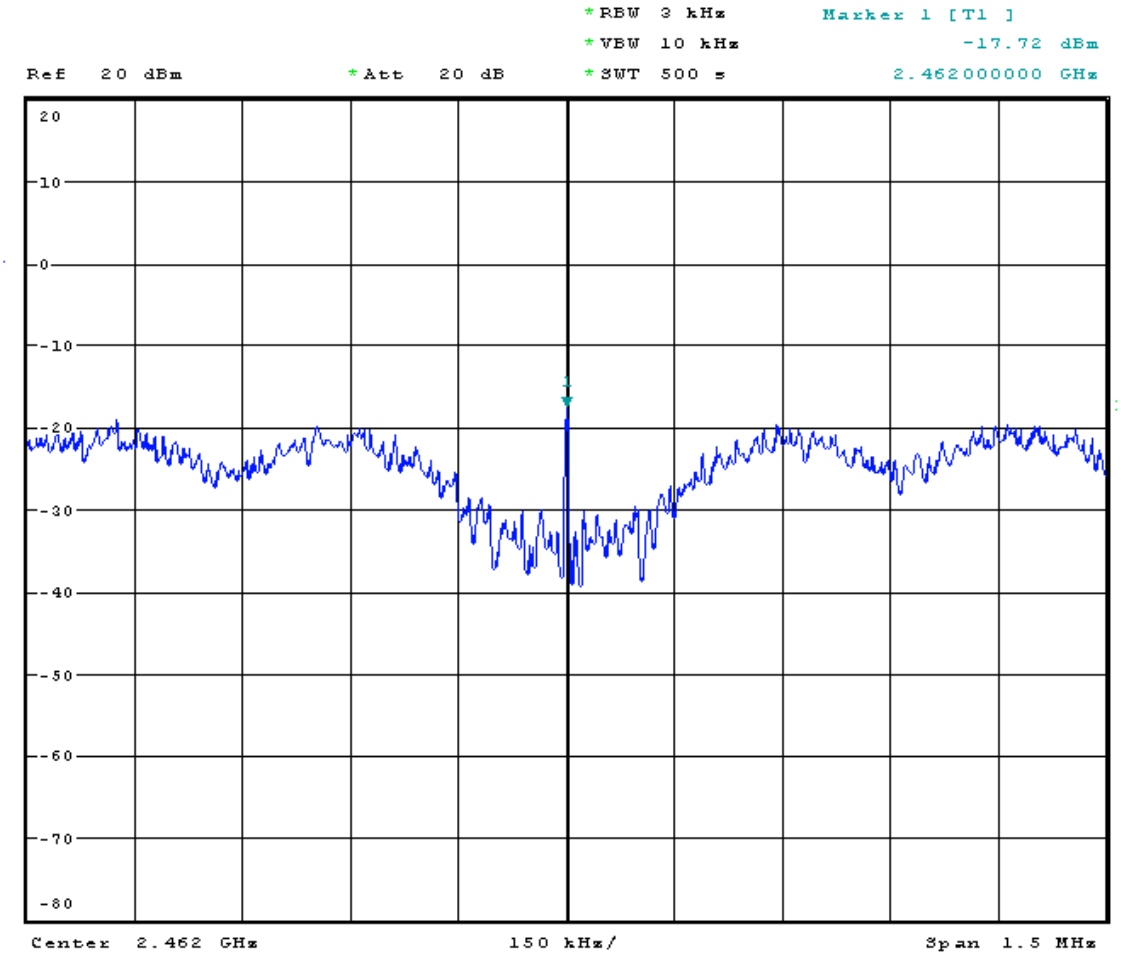
802.11g 6M Power Spectral Density Test Plot(CH-Low)



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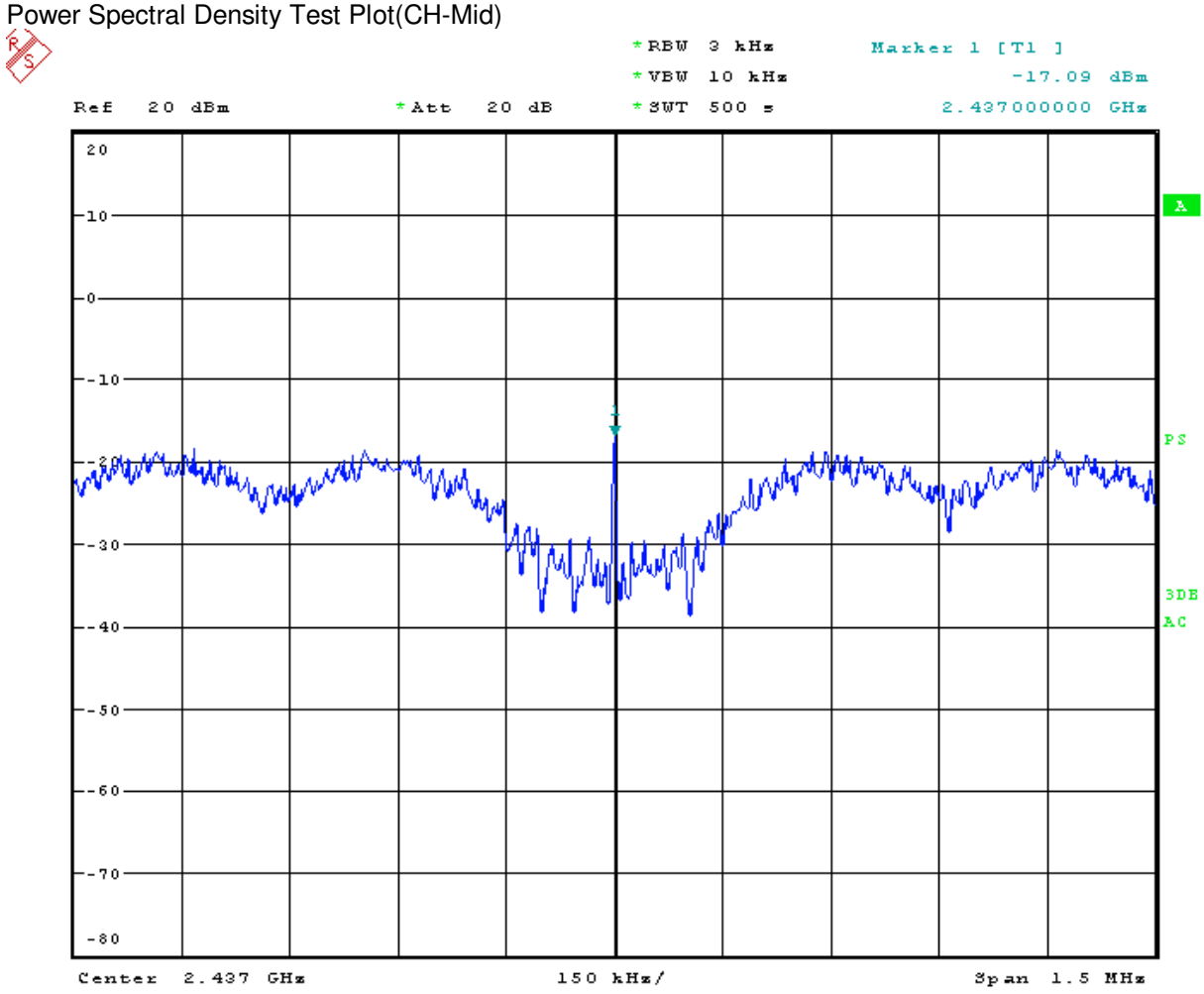
Power Spectral Density Test Plot(CH-Mid)



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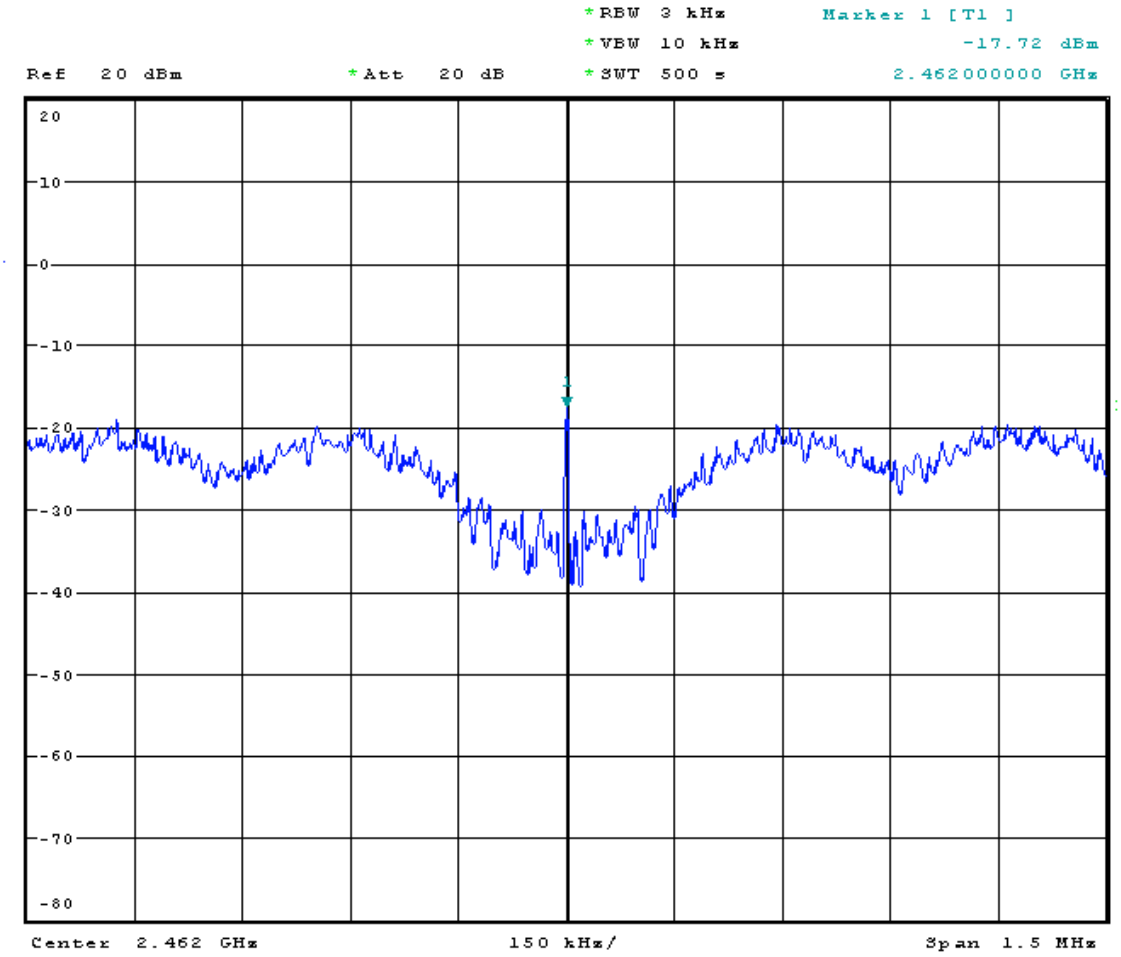
Power Spectral Density Test Plot(CH-High)



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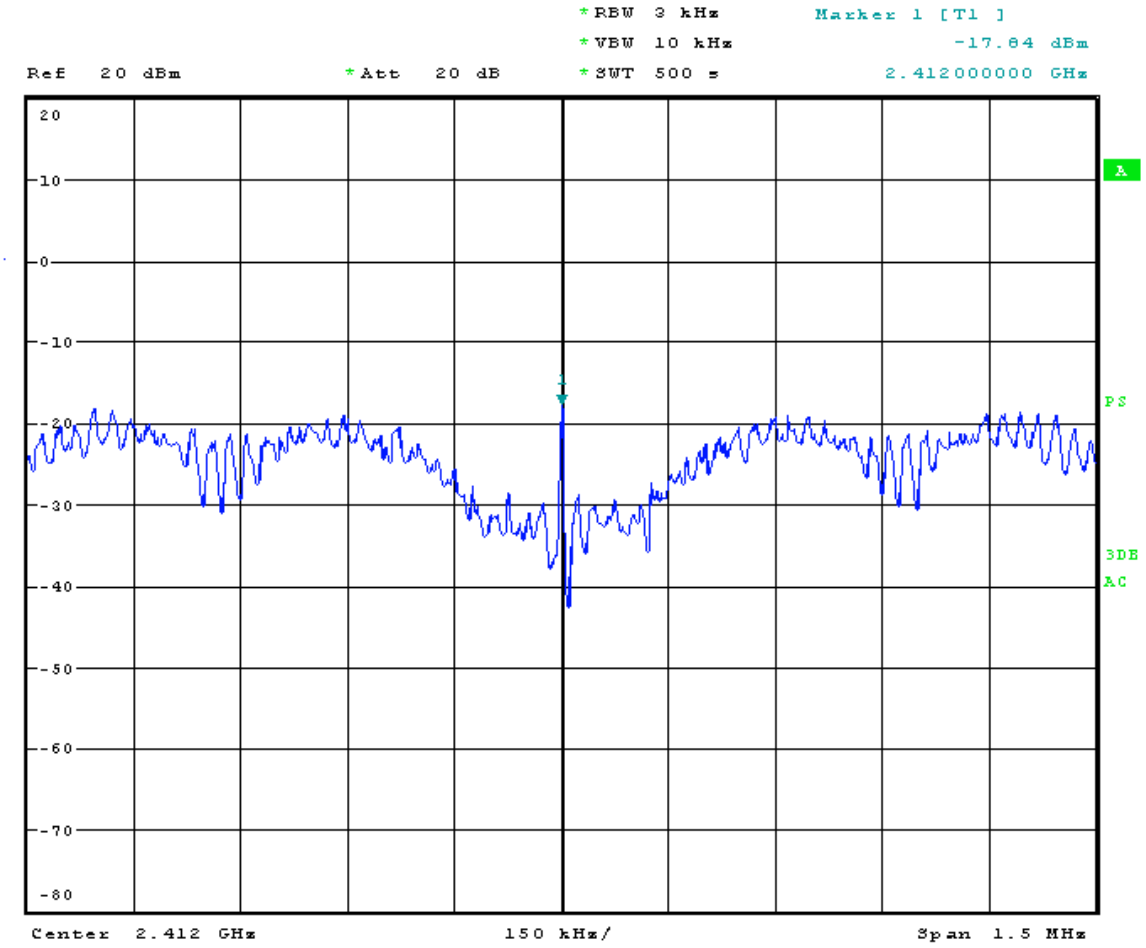
802.11n_20M 6.5M Power Spectral Density Test Plot(CH-Low)



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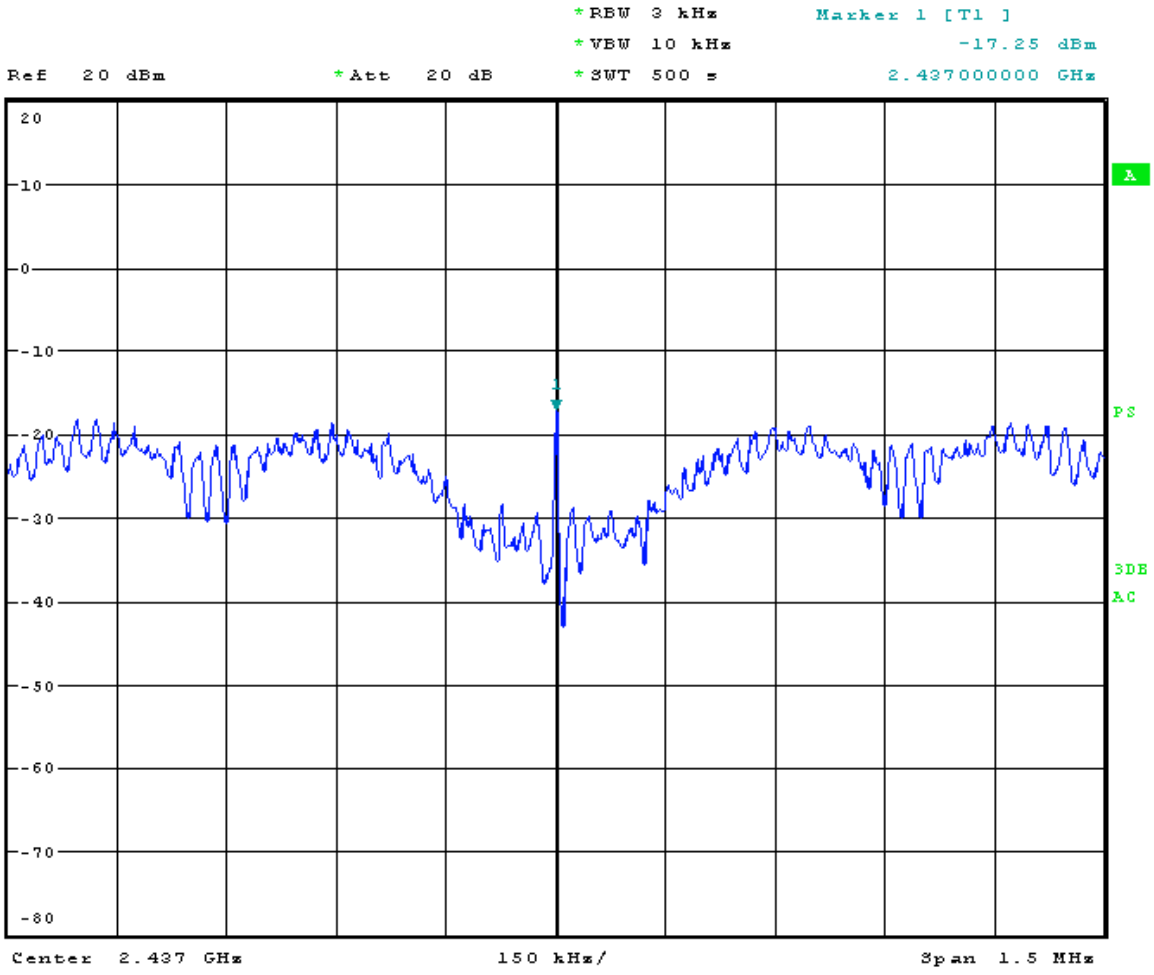
Power Spectral Density Test Plot(CH-Mid)



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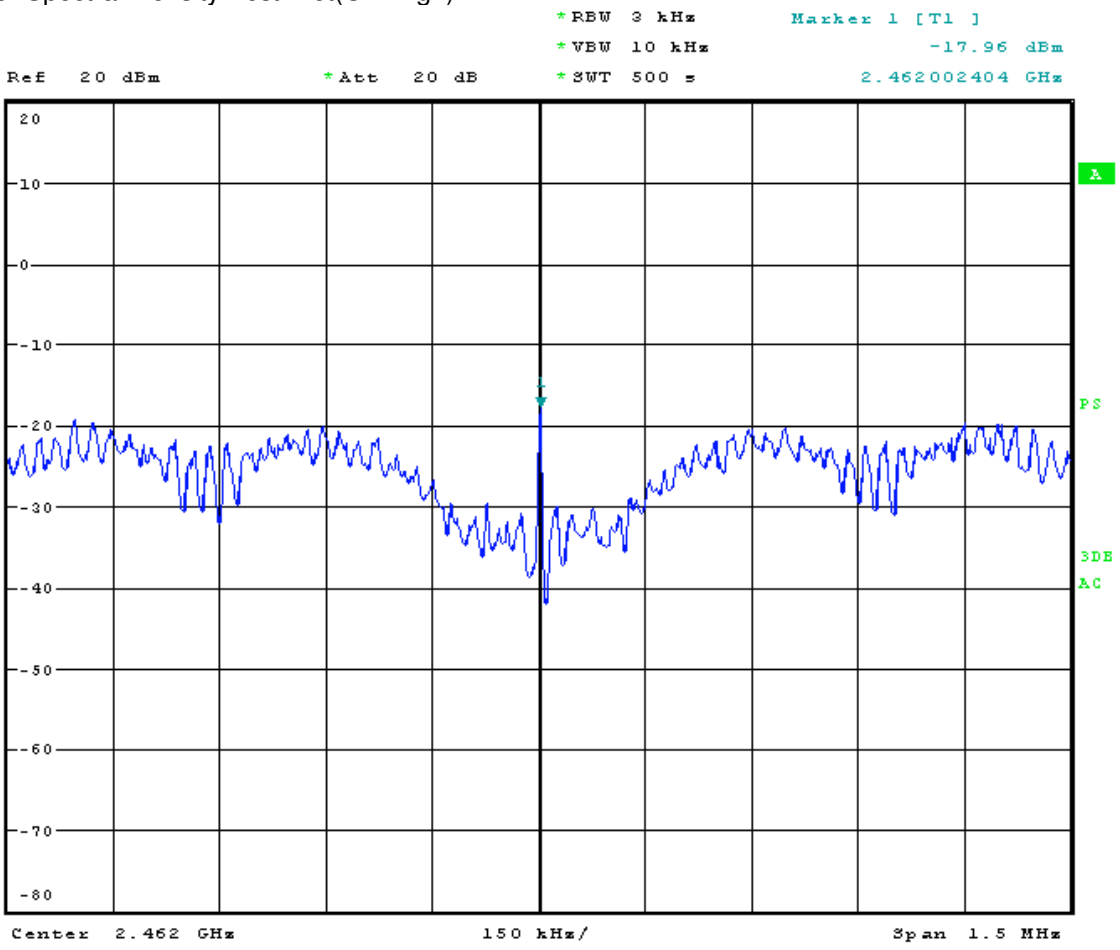
Power Spectral Density Test Plot(CH-High)



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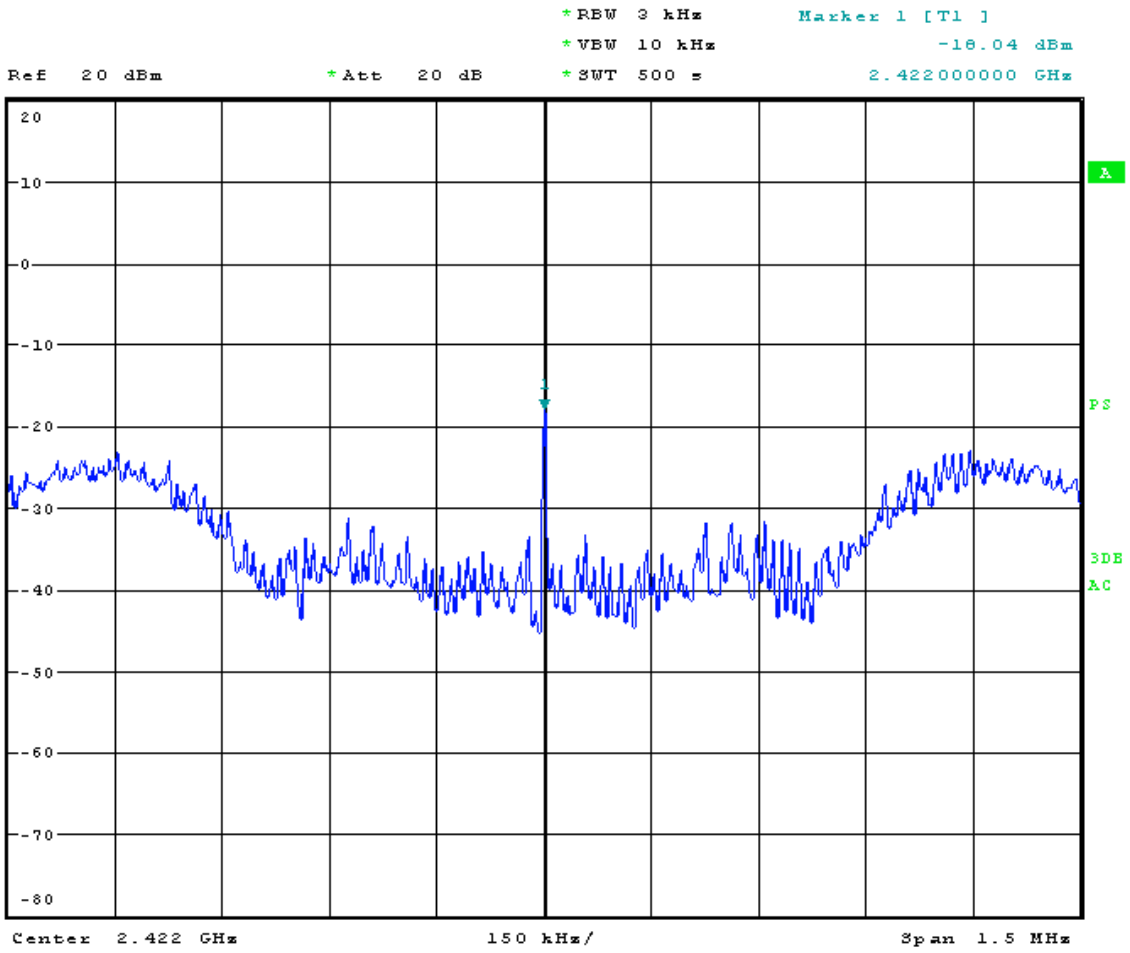
802.11n_40M 13.5M Power Spectral Density Test Plot(CH-Low)



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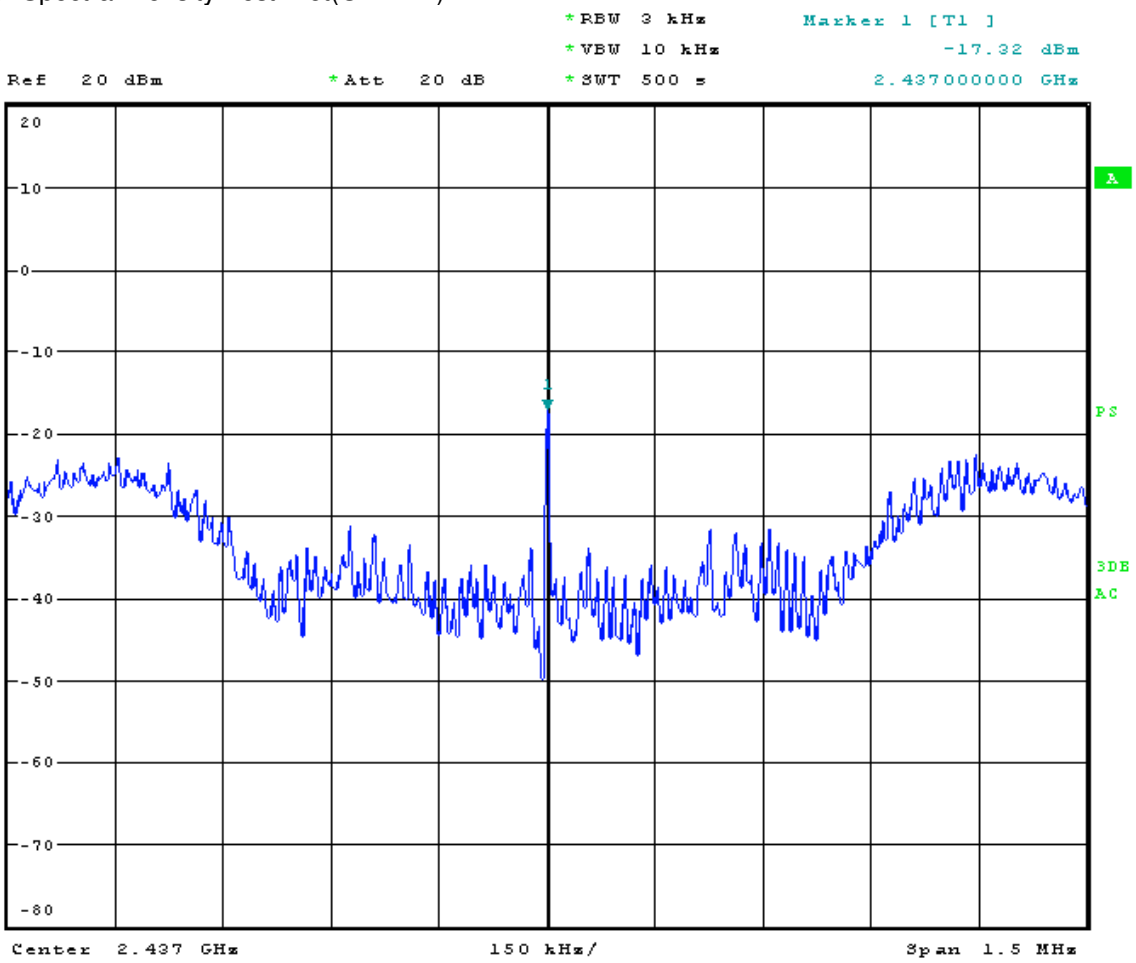
Power Spectral Density Test Plot(CH-MID)



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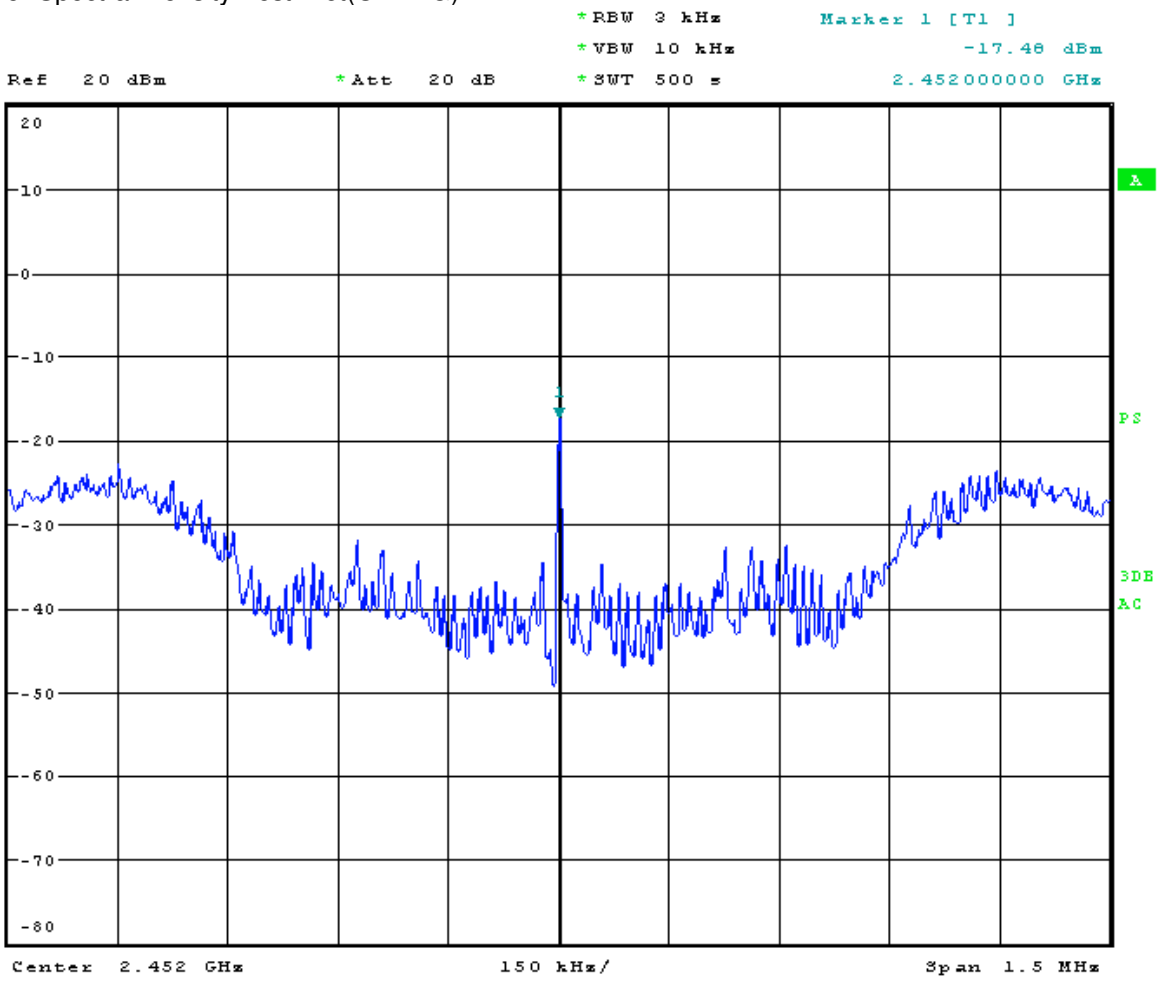
Power Spectral Density Test Plot(CH-HIG)



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4.4 RF Exposure Compliance Requirement

4.4.1 Standard requirement

15.247(b)(4) requirement:
(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.

TCB Exclusion List (7 July 2002)

Exposure category	low threshold	high threshold
general population	(60/*f*GHz) mW. $d < 2.5$ cm (120/*f*GHz) mW. $d \geq 2.5$ cm	(900/*f*GHz) mW. $d < 20$ cm
occupational	(375/*f*GHz) mW. $d < 2.5$ cm (900/*f*GHz) mW. $d \geq 2.5$ cm	(2250/*f*GHz) mW. $d < 20$ cm

4.4.2 EUT RF Exposure

The Max Conducted Peak Output Power is **12.95dBm(19.72mW)** in channel **0**;
Antenna Gain(dBi)=0 dBi
According to the formula. calculate the EIRP test result:

EIRP= P x G = 19.72 mW x 1 = 19.72mW ①
SAR requirement:
Low theshold= 60 / f(GHz) = 60/2.450 = 24.5 mW ② ;
① < ②.
So the SAR report is not required.