EMC
TEST REPORT

Report No. : **TS09080100-EME**
Model No. : **EchoLife HG556**
Issued Date : **Jan. 07, 2010**

Applicant: **Huawei Technologies Co. Ltd.**
Administration Building, Huawei Base, Bantian.
Longgang District, Shenzhen

Test Method/ Standard: **47 CFR FCC Part 15.247 & ANSI C63.4 2003**

Test By: **Intertek Testing Services Taiwan Ltd.**
No. 11, Lane 275, Ko-Nan 1 Street, Chia-Tung Li,
Shiang-Shan District, Hsinchu City, Taiwan

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The test report was prepared by: Sign on File
Julie Liu/ Assistant

These measurements were taken by: Sign on File
Rex Liao/ Engineer

The test report was reviewed by: Jacky Chen

Name Jacky Chen
Title Engineer

Table of Contents

1. Summary of Test Data 3
2. General Information 4
3. Maximum 6 dB Bandwidth 7
4. 99 % Occupied Bandwidth 21
5. Maximum Output Power 35
6. Power Spectral Density 37
7. RF Antenna conducted Spurious 51
8. Radiated Spurious Emission 88
9. Emission on Band Edge 97

Appendix A: Test Equipment List 112

1. Summary of Test Data

Test/Requirement Description	Applicable Rule	Result
Minimum 6 dB Bandwidth	15.247(a)(2)	Pass
Maximum Output Power	15.247(b)	Pass
Power Spectral Density	15.247(e)	Pass
RF Antenna Conducted Spurious	15.247(d)	Pass
Radiated Spurious Emission	15.247(d), 15.205, 15.209	Pass
Emission on the Band Edge	15.247(d)	Pass
AC Power Line Conducted Emission	15.207	Pass

2. General Information

Identification of the EUT

Product:	Home Gateway
Model No.:	HG556
FCC ID.:	QISHG556
Frequency Range:	1. 2412 MHz to 2462 MHz for 802.11b/g/n HT20 2. 2422 MHz to 2452 MHz for 802.11n HT40
Channel Number:	1. 11 channels for 802.11b/g/n HT20 2. 7 channels for 802.11n HT40
Rated Power:	DC 12 V from adapter model: FM120015-US I/P Voltage: 100-240 Vac, 50/60Hz
Power Cord:	N/A
Data Cable:	RJ-45 UTP Cat.5 10meter × 1
Sample Received:	Aug. 25, 2009
Test Date(s):	Aug. 27, 2009 ~ Sep. 03, 2009
Note 1:	This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.
Note 2:	When determining the test conclusion, the Measurement Uncertainty of test has been considered.

Description of EUT

The EUT is a Home Gateway, which is an 802.11b/g/n MIMO product with dual transmitters and dual receivers and was defined as information technology equipment.
The EUT has 802.11b/g/n function which can transmitter independently and simultaneous transmit

For more detail features, please refer to User's manual as file name “Installation guide.pdf”

Antenna description

Antenna 1

The EUT uses a permanently connected antenna.

Antenna Gain:	2dBi max
Antenna Type:	PCB Printed
Connector Type:	N/A

Antenna 2

The EUT uses a permanently connected antenna.

Antenna Gain:	2dBi max
Antenna Type:	PCB Printed
Connector Type:	N/A

Operation mode

The EUT was supplied with DC 12 V from adapter (Test voltage: 120 Vac, 60 Hz).

The EUT was transmitted continuously during the test.

With individual verifying, the maximum output power was found at 1 Mbps data rate for 802.11b mode, 6 Mbps data rate for 802.11g mode, 6.5 Mbps data rate for 802.11n HT20 mode and 13.5 Mbps data rate for 802.11n HT40 mode. The final tests were executed under these conditions and recorded in this report individually.

802.11b ch6 chain0

Data rate(MHz)	PK(dBm)
1	17.87
2	17.65
5.5	17.5
11	17.38

802.11g ch6 chain0

Data rate(MHz)	PK(dBm)
6	22.71
9	22.6
12	22.46
18	22.36
24	22.29
36	22.11
48	22.03
54	21.96

802.11n HT20 ch6 chain0

Data rate(MHz)	PK(dBm)
6.5	21.56
13	21.37
19.5	21.27
26	21.11
39	20.94
52	20.84
58.5	20.73
65	20.72

802.11n HT40 ch6 chain0

Data rate(MHz)	PK(dBm)
13.5	20.76
27	20.63
40.5	20.62
54	20.48
81	20.3
108	20.18
121.5	20.06
135	20.05

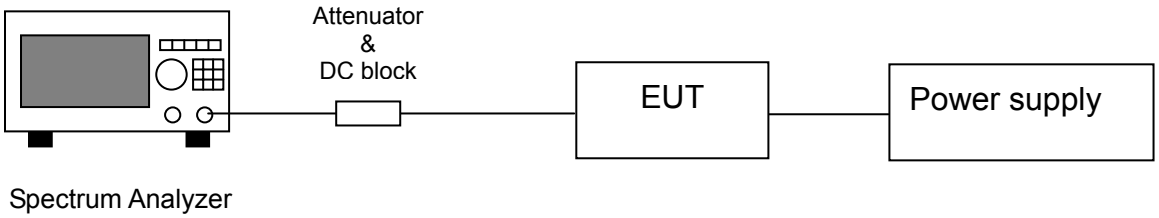
3. Maximum 6 dB Bandwidth

Name of Test	Maximum 6 dB Bandwidth
Base Standard	FCC 15.247 (a)(2)

Test Result: Complies
Measurement Data: See Table 1 & plots below

Method of Measurement:
Reference FCC document: KDB558074
A portion of the transmitted signal is coupled to a Spectrum Analyzer with a resolution bandwidth of at least 1 % of the bandwidth of the transmitted signal. The resolution bandwidth is chosen so as not to reduce the peak level of the measured waveform. The appropriate bandwidth mask is applied to the output waveform to verify compliance.

Test Diagram:



Note: The EUT was tested while in a continuous transmit mode and the worst case data rates are Mbps data rate for 802.11b mode, 6 Mbps data rate for 802.11g mode, 6.5 Mbps data rate for 802.11n HT20 mode and 13.5 Mbps data rate for 802.11n HT40 mode. The EUT was tuned to a low, middle and high channel.

Table1. Maximum 6 dB Bandwidth

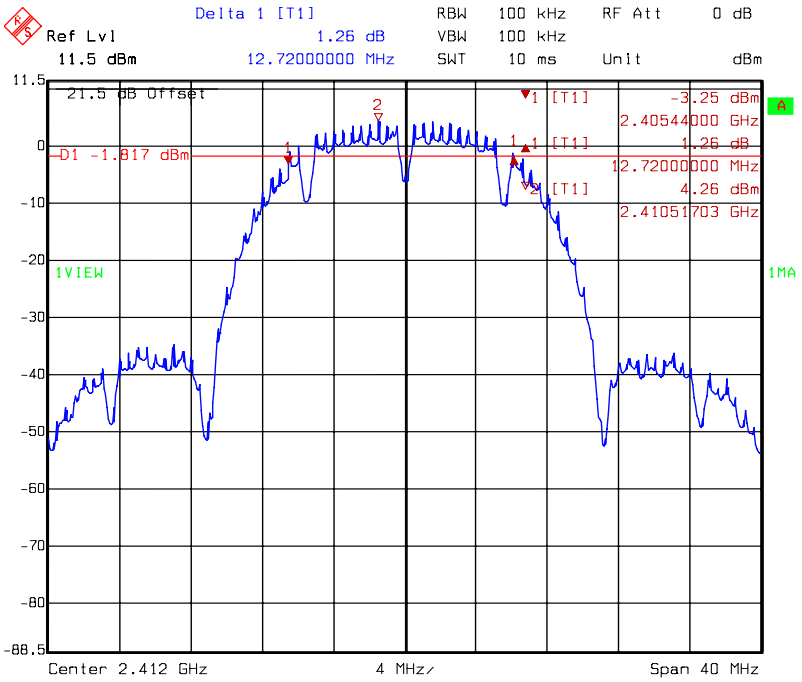
2 Tx

Mode	Channel	Data rate Mbps	6dB Bandwidth (MHz)		Limit (MHz)
			chain0	chain1	
802.11b	1	1	12.72	13.12	0.5
	6		13.04	13.60	0.5
	11		13.12	13.68	0.5
802.11g	1	6	16.80	16.64	0.5
	6		16.80	16.88	0.5
	11		16.72	16.80	0.5

2 Tx

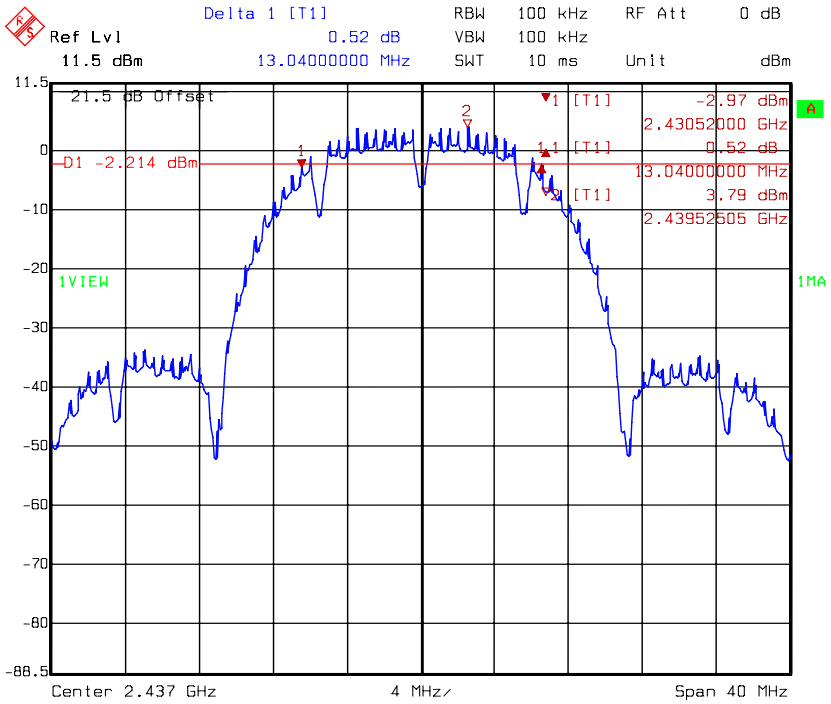
Mode	Channel	Data rate Mbps	6dB Bandwidth (MHz)		Limit (MHz)
			chain0	chain1	
802.11n HT20	1	6.5	17.84	18.16	0.5
	6		17.84	18.00	0.5
	11		17.84	17.84	0.5
802.11n HT40	3	13.5	36.66	36.66	0.5
	6		36.78	36.66	0.5
	9		36.66	36.66	0.5

Chain 0:6 dB Bandwidth @ 802.11b mode channel 1



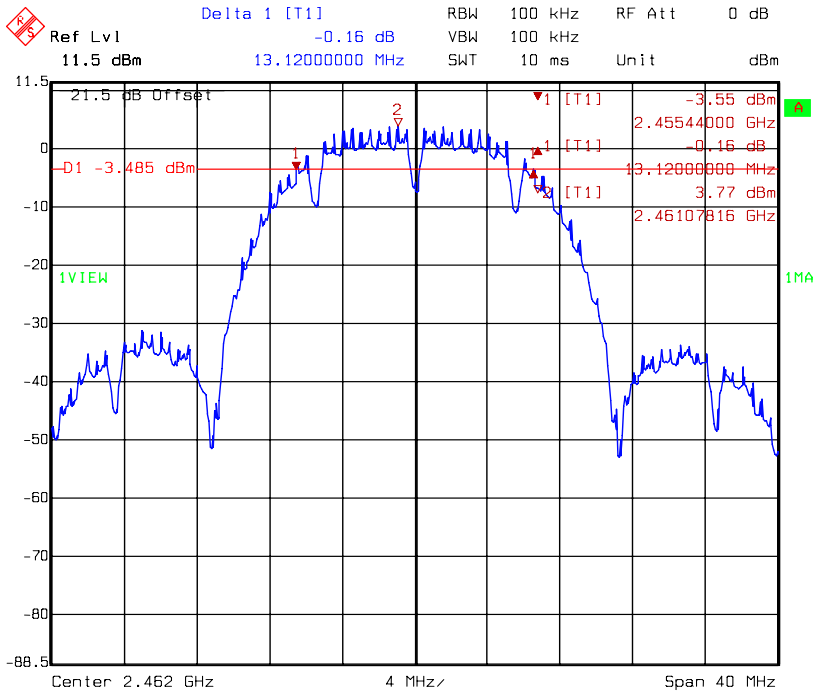
Title: 6dB Band-Width
Comment A: CH 1 at 802.11b mode chain0
Date: 02.SEP.2009 09:39:16

Chain 0:6 dB Bandwidth @ 802.11b mode channel 6



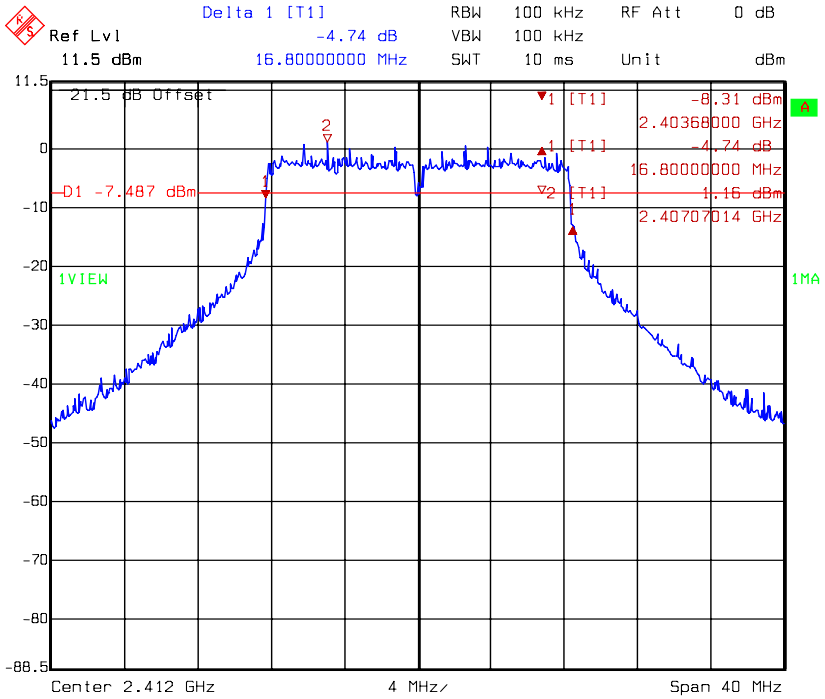
Title: 6dB Band-Width
Comment A: CH 6 at 802.11b mode chain0
Date: 02.SEP.2009 09:42:30

Chain 0:6 dB Bandwidth @ 802.11b mode channel 11



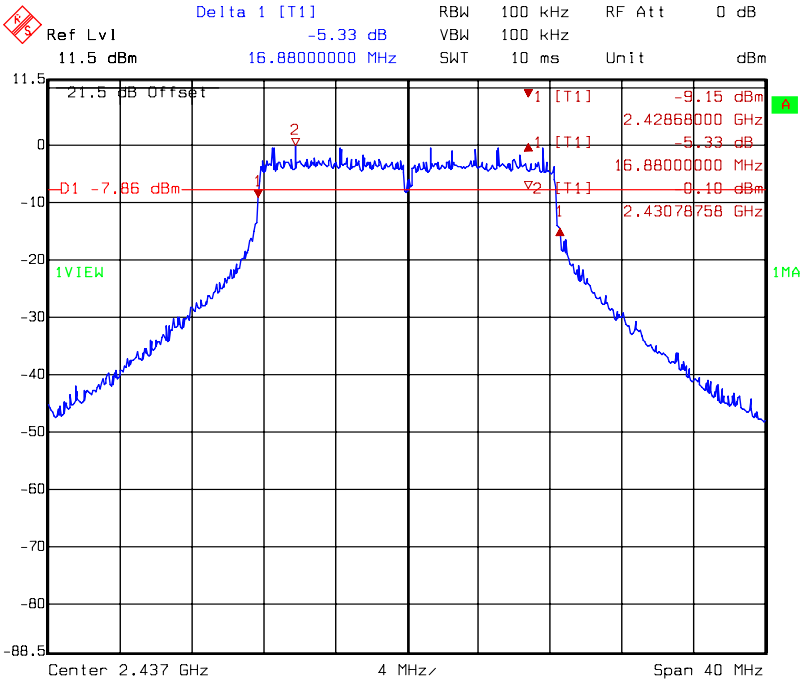
Title: 6dB Band-Width
Comment A: CH 11 at 802.11b mode chain0
Date: 02.SEP.2009 09:54:05

Chain 0:6 dB Bandwidth @ 802.11g mode channel 1



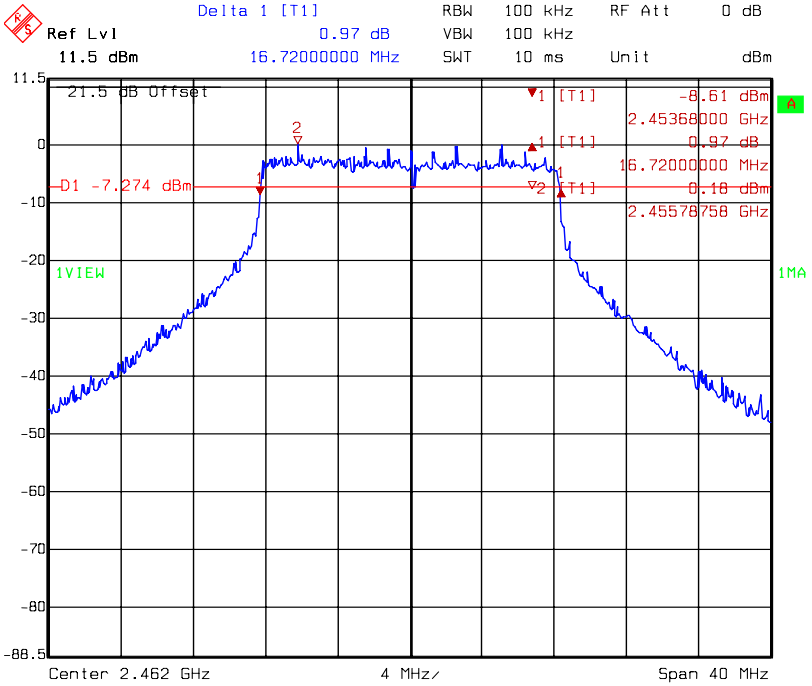
Title: 6dB Band-Width
Comment A: CH 1 at 802.11g mode chain0
Date: 02.SEP.2009 11:38:29

Chain 0:6 dB Bandwidth @ 802.11g mode channel 6



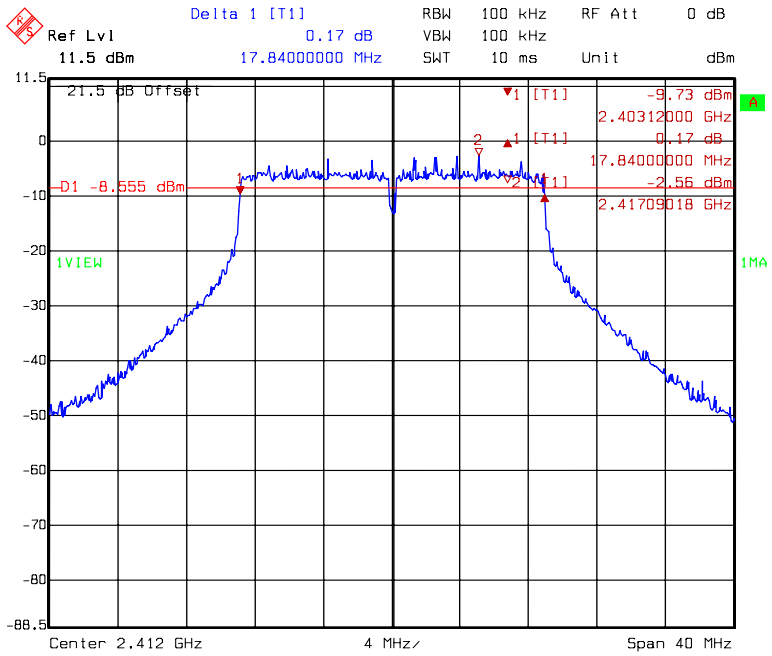
Title: 6dB Band-Width
Comment A: CH 6 at 802.11g mode chain0
Date: 02.SEP.2009 11:41:15

Chain 0:6 dB Bandwidth @ 802.11g mode channel 11



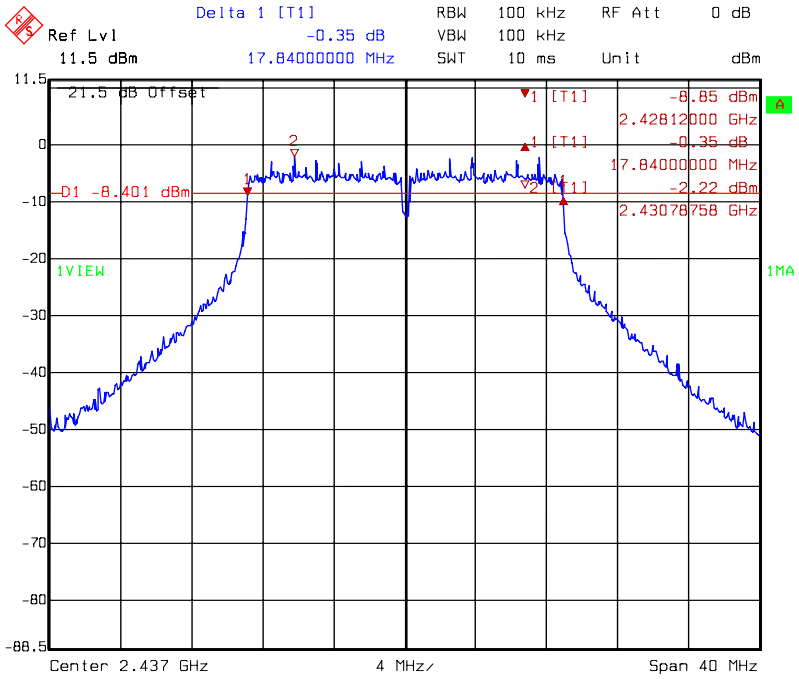
Title: 6dB Band-Width
Comment A: CH 11 at 802.11g mode chain0
Date: 02.SEP.2009 11:43:58

Chain 0: 6dB Bandwidth @ 802.11n HT20 mode channel 1



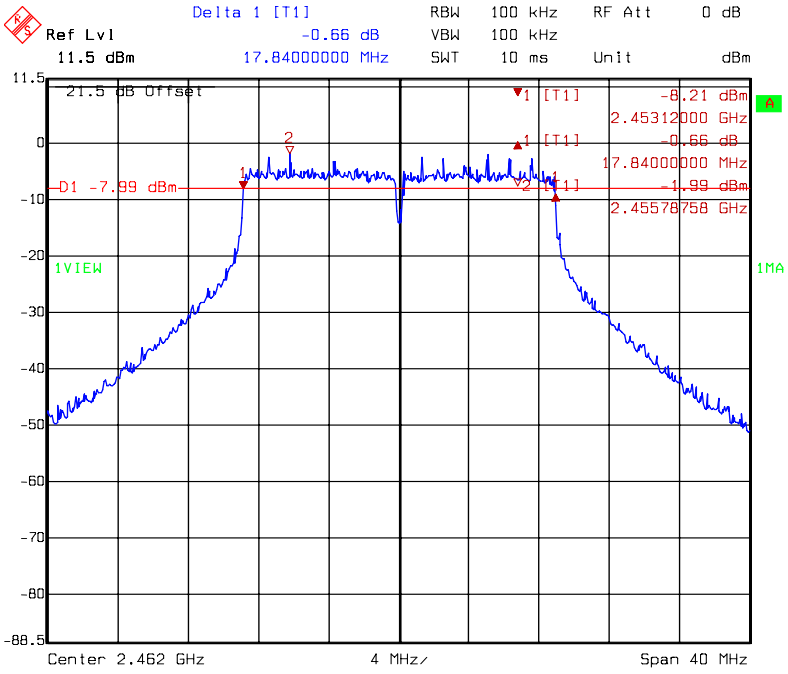
Title: 6dB Band-Width
Comment A: CH 1 at 802.11n 20MHz mode chain0
Date: 02.SEP.2009 14:48:57

Chain 0: 6dB Bandwidth @ 802.11n HT20 mode channel 6



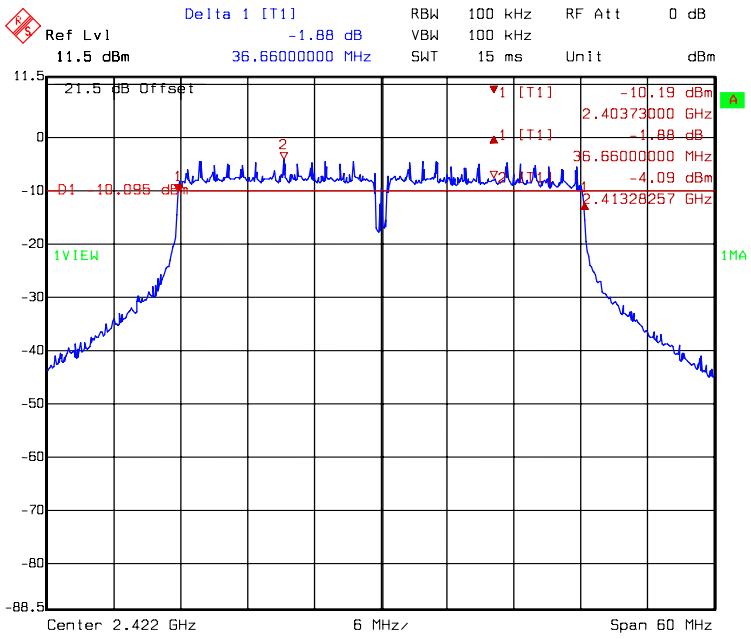
Title: 6dB Band-Width
Comment A: CH 6 at 802.11n 20MHz mode chain0
Date: 02.SEP.2009 14:50:36

Chain 0: 6dB Bandwidth @ 802.11n HT20 mode channel 11



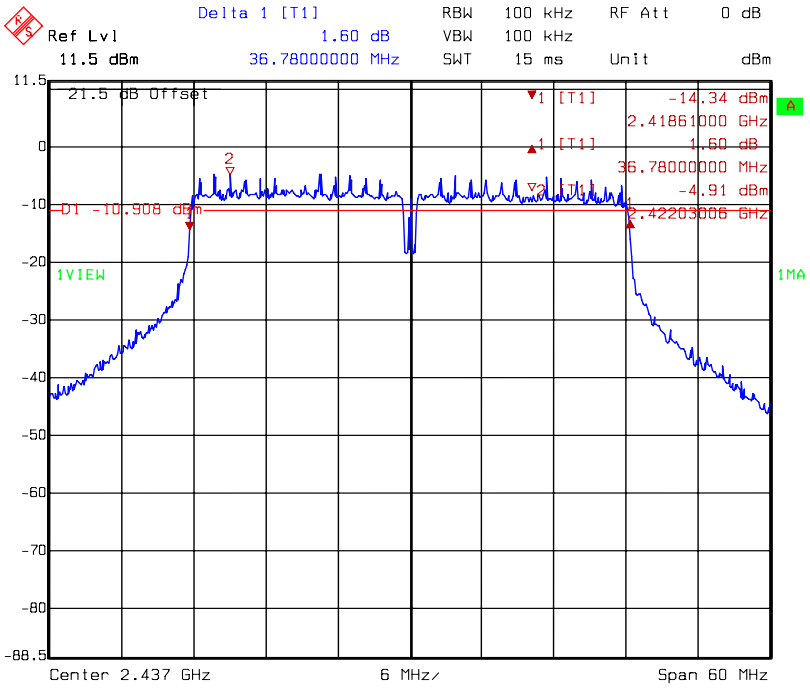
Title: 6dB Band-Width
Comment A: CH 11 at 802.11n 20MHz mode chain0
Date: 02.SEP.2009 14:51:33

Chain 0: 6dB Bandwidth @ 802.11n HT40 mode channel 3



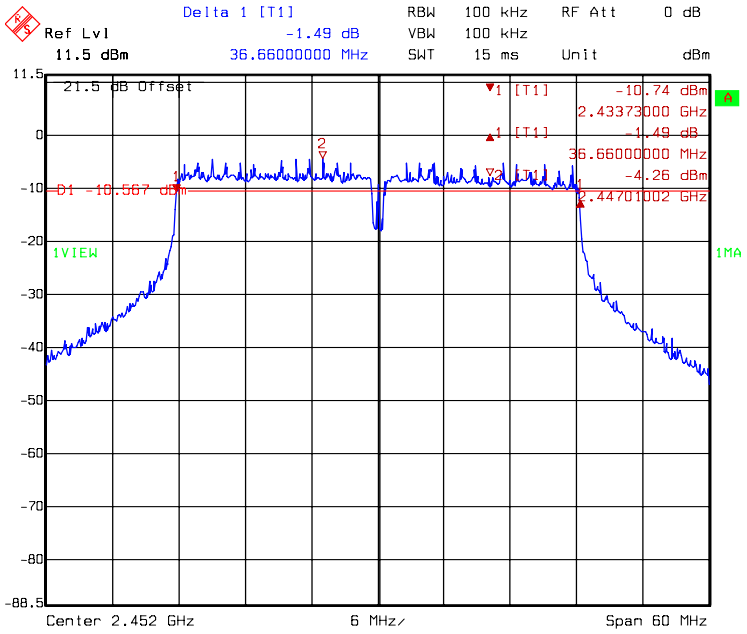
Title: 6dB Band-Width
Comment A: CH 3 at 802.11n 40MHz mode chain0
Date: 02.SEP.2009 13:44:10

Chain 0: 6dB Bandwidth @ 802.11n HT40 mode channel 6



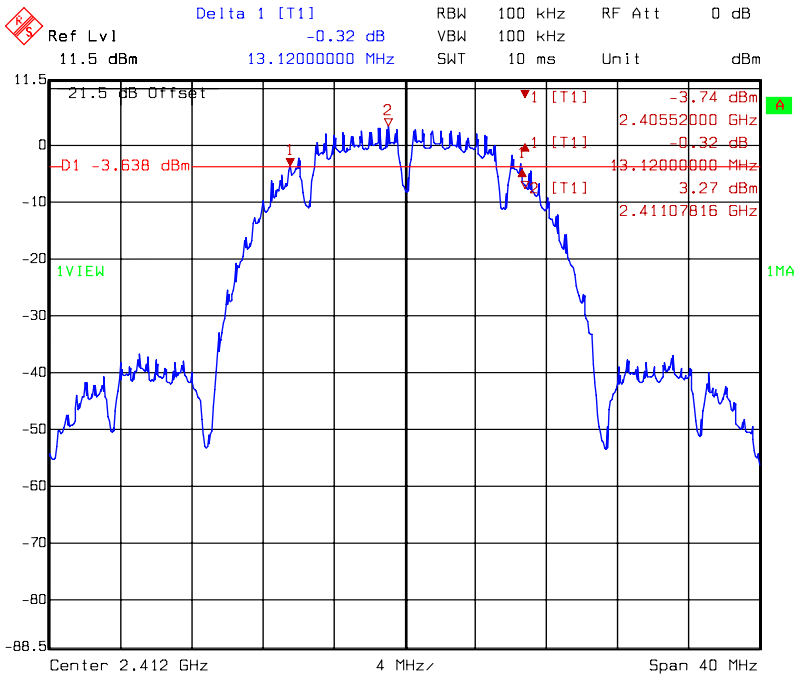
Title: 6dB Band-Width
Comment A: CH 6 at 802.11n 40MHz mode chain0
Date: 02.SEP.2009 13:47:29

Chain 0: 6dB Bandwidth @ 802.11n HT40 mode channel 9



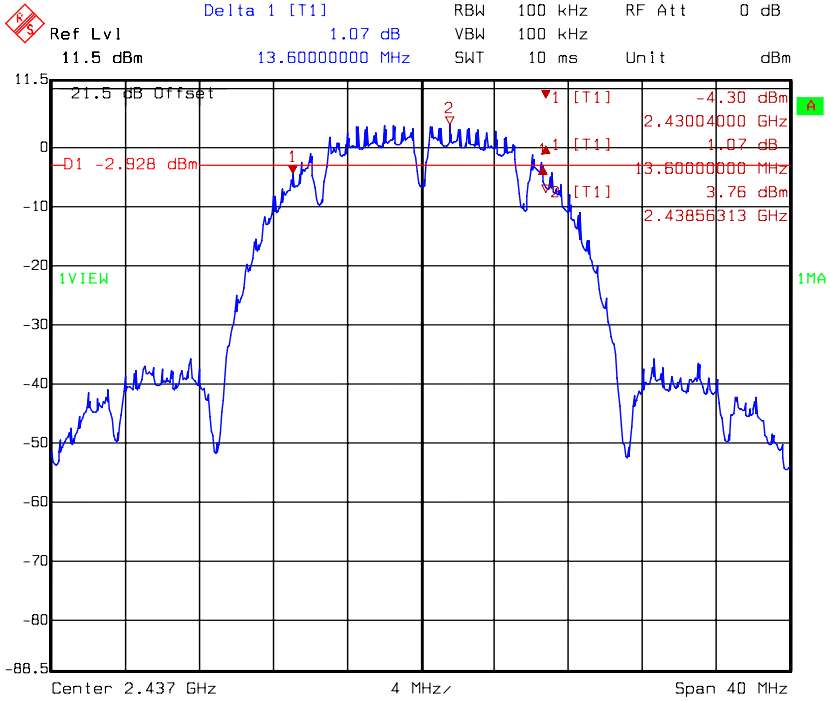
Title: 6dB Band-Width
Comment A: CH 9 at 802.11n 40MHz mode chain0
Date: 02.SEP.2009 13:53:00

Chain 1:6 dB Bandwidth @ 802.11b mode channel 1



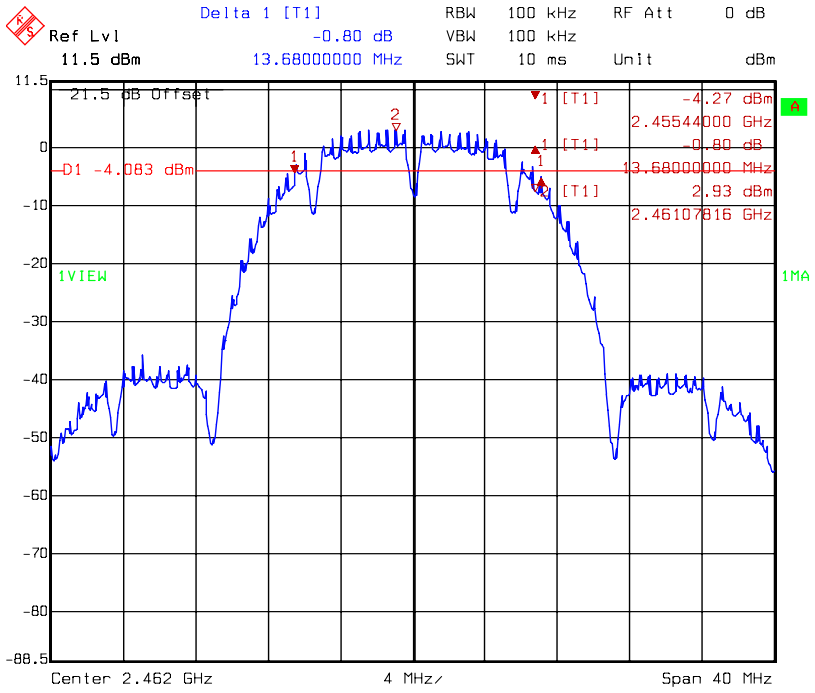
Title: 6dB Band-Width
Comment A: CH 1 at 802.11b mode chain1
Date: 02.SEP.2009 14:59:28

Chain 1:6 dB Bandwidth @ 802.11b mode channel 6



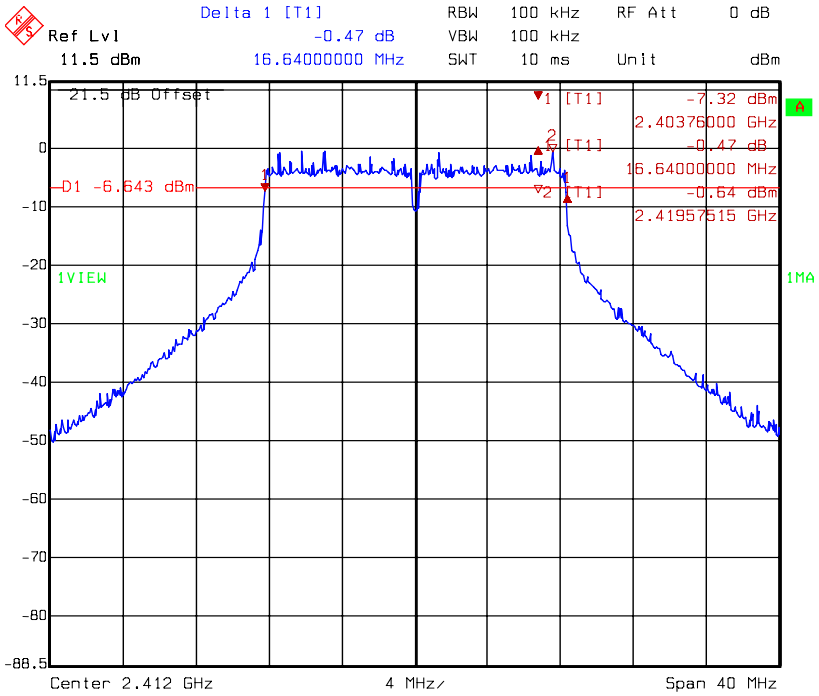
Title: 6dB Band-Width
Comment A: CH 6 at 802.11b mode chain1
Date: 02.SEP.2009 15:02:36

Chain 1:6 dB Bandwidth @ 802.11b mode channel 11



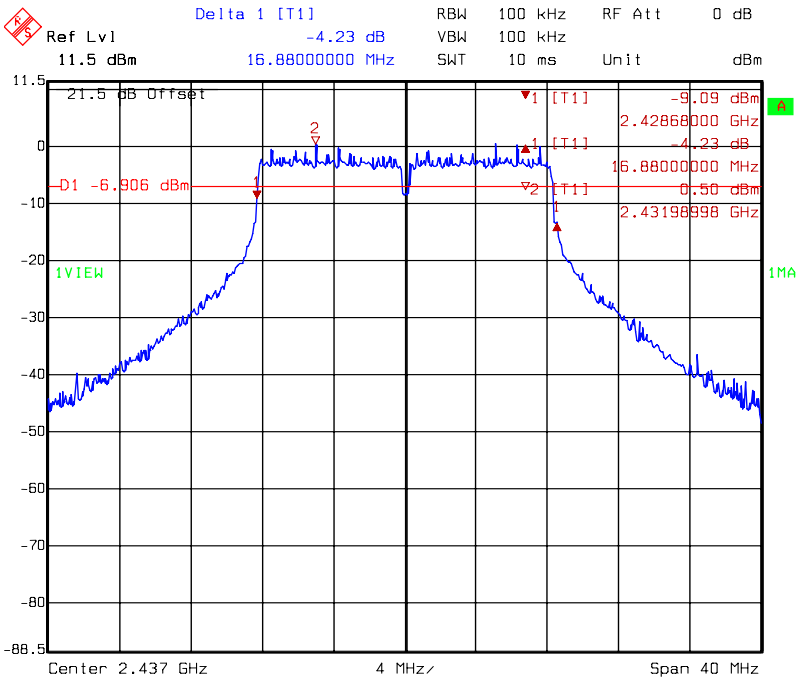
Title: 6dB Band-Width
Comment A: CH 11 at 802.11b mode chain1
Date: 02.SEP.2009 15:05:24

Chain 1:6 dB Bandwidth @ 802.11g mode channel 1



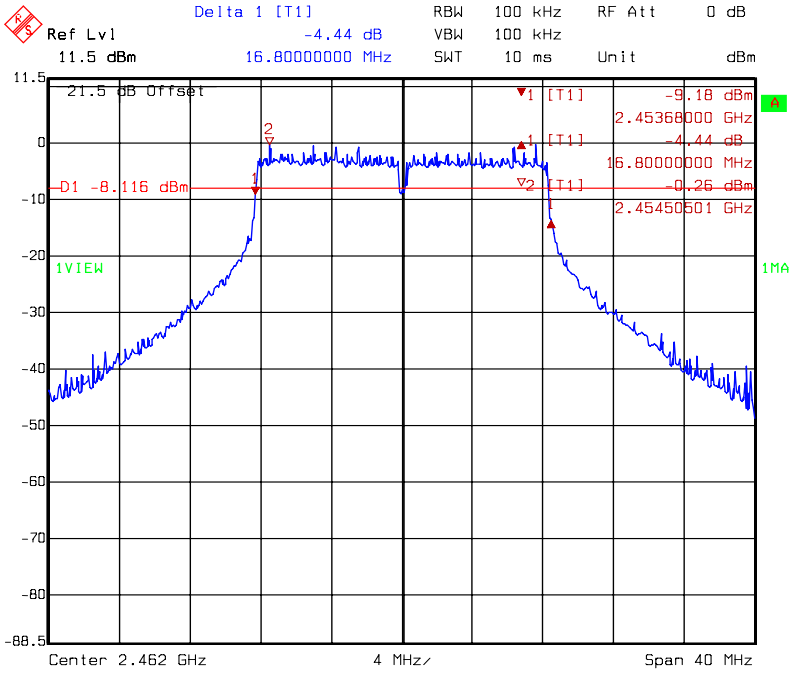
Title: 6dB Band-Width
Comment A: CH 1 at 802.11g mode chain1
Date: 02.SEP.2009 15:24:05

Chain 1:6 dB Bandwidth @ 802.11g mode channel 6



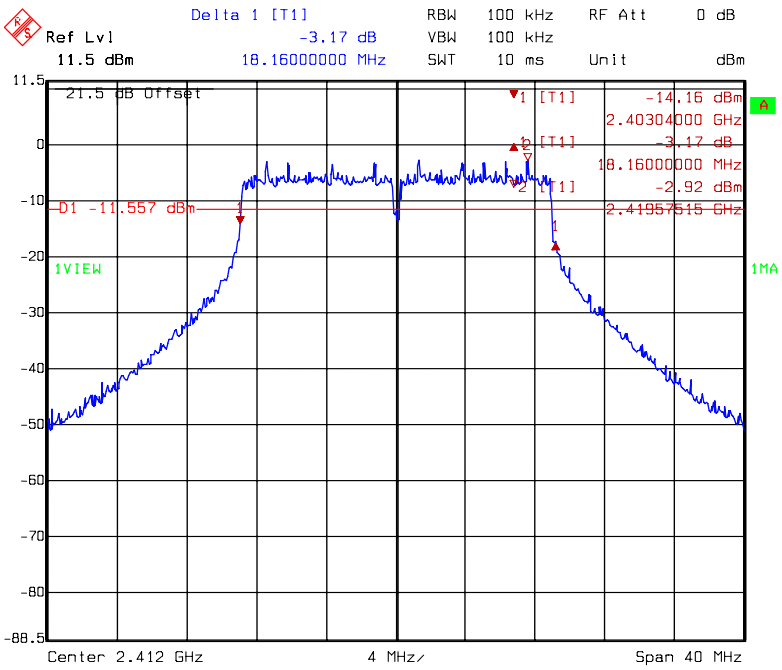
Title: 6dB Band-Width
Comment A: CH 6 at 802.11g mode chain1
Date: 02.SEP.2009 15:17:55

Chain 1:6 dB Bandwidth @ 802.11g mode channel 11



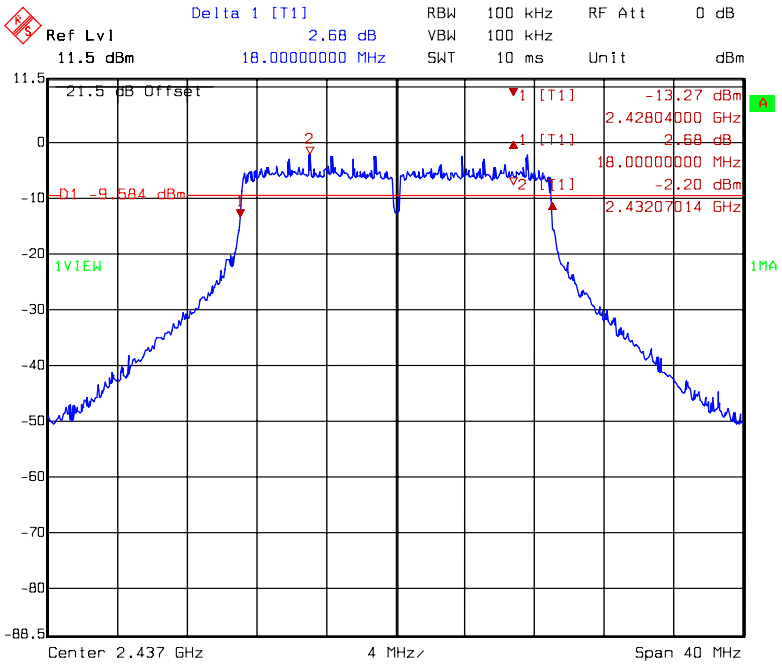
Title: 6dB Band-Width
Comment A: CH 11 at 802.11g mode chain1
Date: 02.SEP.2009 15:20:22

Chain 1: 6dB Bandwidth @ 802.11n HT20 mode channel 1



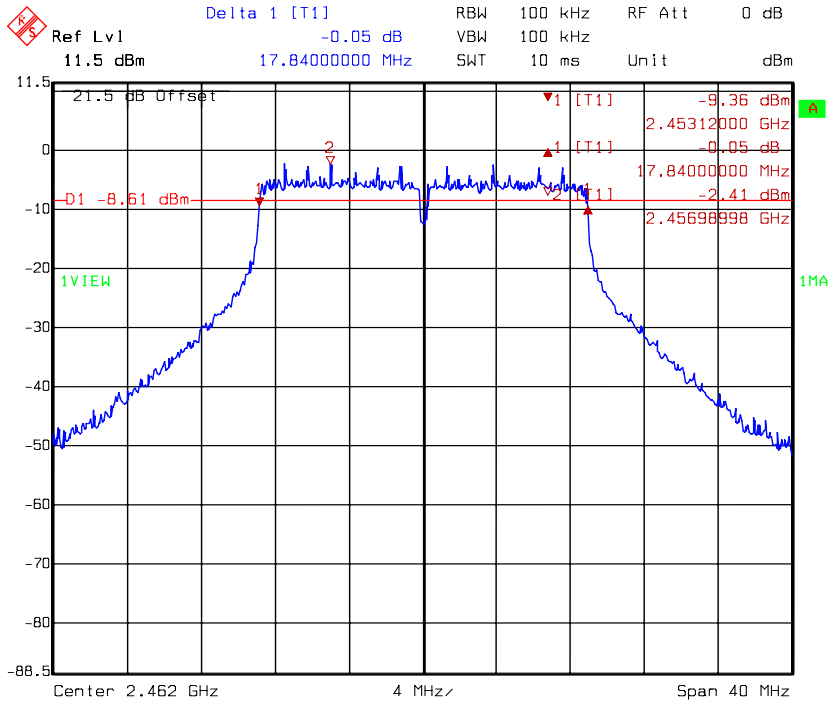
Title: 6dB Band-Width
Comment A: CH 1 at 802.11n 20MHz mode chain1
Date: 02.SEP.2009 14:46:48

Chain 1: 6dB Bandwidth @ 802.11n HT20 mode channel 6



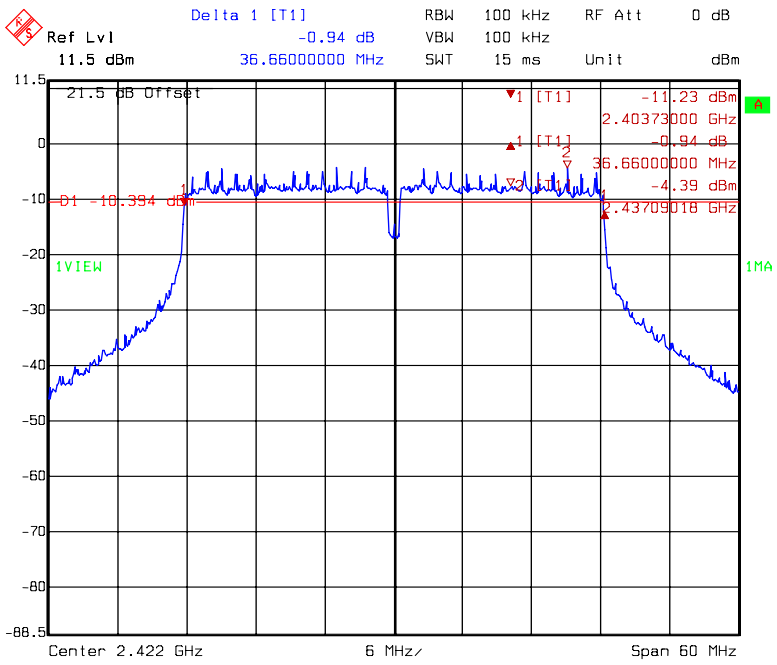
Title: 6dB Band-Width
Comment A: CH 6 at 802.11n 20MHz mode chain1
Date: 02.SEP.2009 14:44:37

Chain 1: 6dB Bandwidth @ 802.11n HT20 mode channel 11



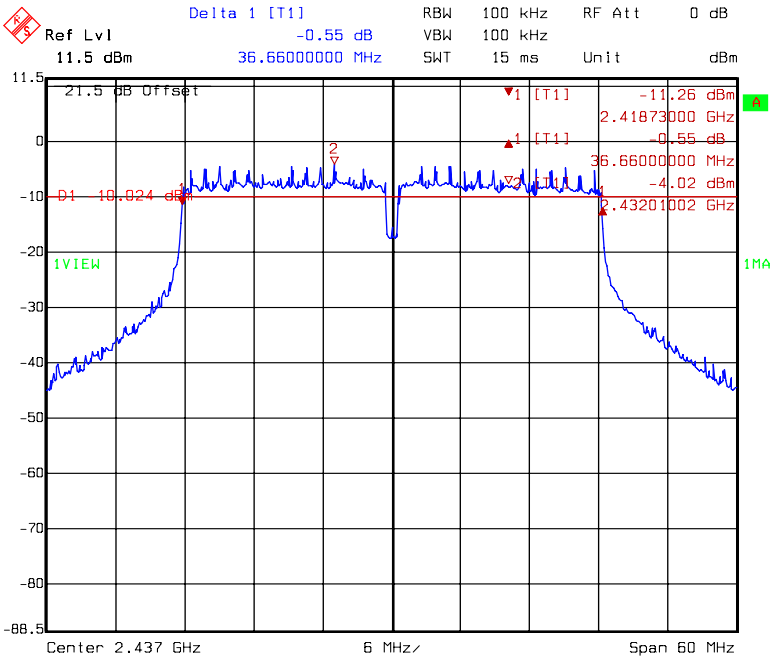
Title: 6dB Band-Width
Comment A: CH 11 at 802.11n 20MHz mode chain1
Date: 02.SEP.2009 14:42:56

Chain 1: 6dB Bandwidth @ 802.11n HT40 mode channel 3



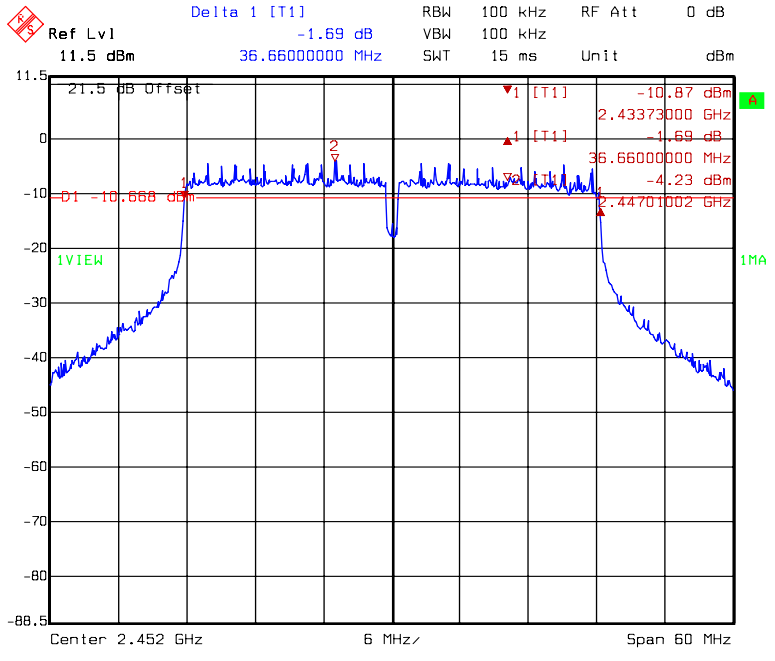
Title: 6dB Band-Width
Comment A: CH 3 at 802.11n 40MHz mode chain1
Date: 02.SEP.2009 14:20:03

Chain 1: 6dB Bandwidth @ 802.11n HT40 mode channel 6



Title: 6dB Band-Width
Comment A: CH 6 at 802.11n 40MHz mode chain1
Date: 02.SEP.2009 14:16:56

Chain 1: 6dB Bandwidth @ 802.11n HT40 mode channel 9



Title: 6dB Band-Width
Comment A: CH 9 at 802.11n 40MHz mode chain1
Date: 02.SEP.2009 14:10:58

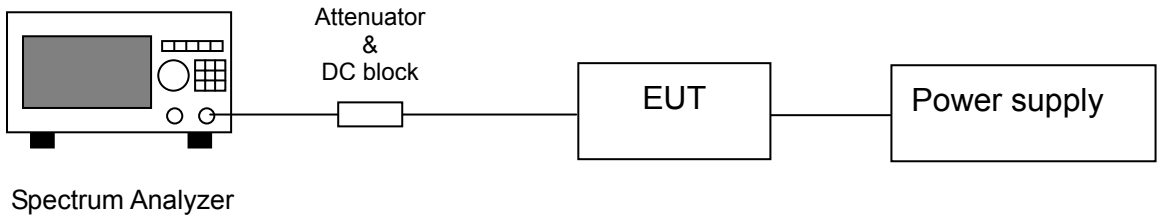
4. 99 % Occupied Bandwidth

Name of Test	99 % Occupied Bandwidth
Base Standard	None; for reporting purposes only

Test Result: Complies
Measurement Data: See Table & plots below

Method of Measurement:
Reference FCC document: KDB558074
A portion of the transmitted signal is coupled to a Spectrum Analyzer with a resolution bandwidth of at least 1 % of the bandwidth of the transmitted signal. The resolution bandwidth is chosen so as not to reduce the peak level of the measured waveform. The appropriate bandwidth mask is applied to the output waveform to verify compliance.

Test Diagram:



Note: The EUT was tested while in a continuous transmit mode and the worst case data rates are Mbps data rate for 802.11b mode, 6 Mbps data rate for 802.11g mode, 6.5 Mbps data rate for 802.11n HT20 mode and 13.5 Mbps data rate for 802.11n HT40 mode. The EUT was tuned to a low, middle and high channel.

Table 2. 99 % Occupied Bandwidth

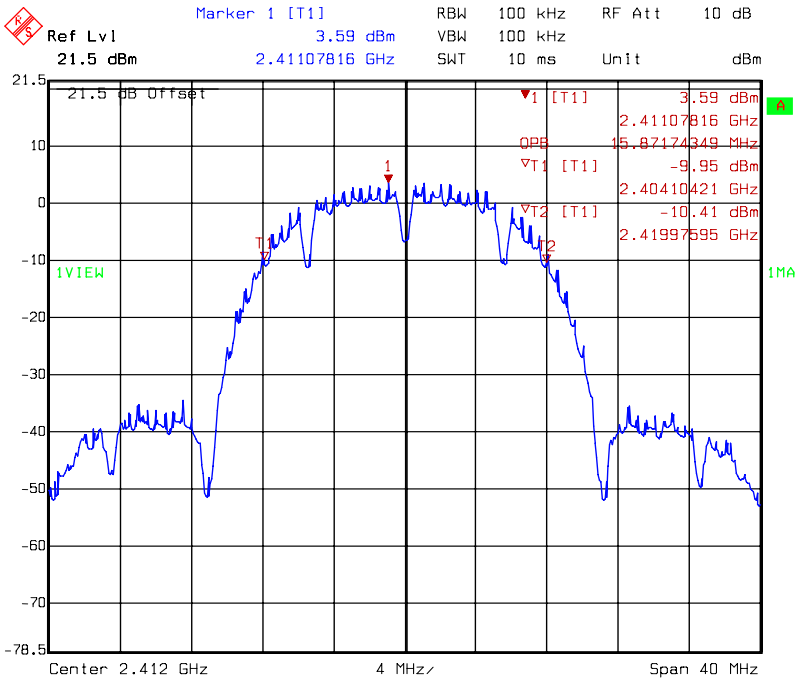
2Tx

Mode	Channel	Data rate Mbps	99% Bandwidth (MHz)	
			chain0	chain1
802.11b	1	1	15.87	15.87
	6		15.79	15.79
	11		15.97	15.71
802.11g	1	6	16.67	16.59
	6		16.59	16.59
	11		16.67	16.59

2TX

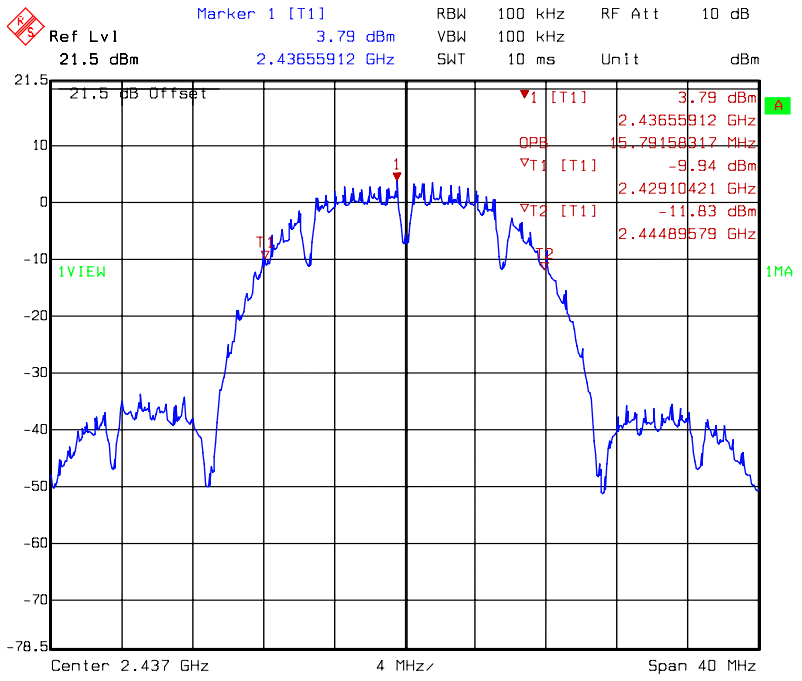
Mode	Channel	Data rate Mbps	99% Bandwidth (MHz)	
			Chain 0	Chain 1
802.11n HT 20	1	6.5	17.8	17.8
	6		17.8	17.8
	11		17.8	17.8
802.11n HT 40	3	13.5	36.31	36.31
	6		36.31	36.31
	9		36.31	36.31

Chain 0:99 % Occupied Bandwidth @ 802.11b mode channel 1



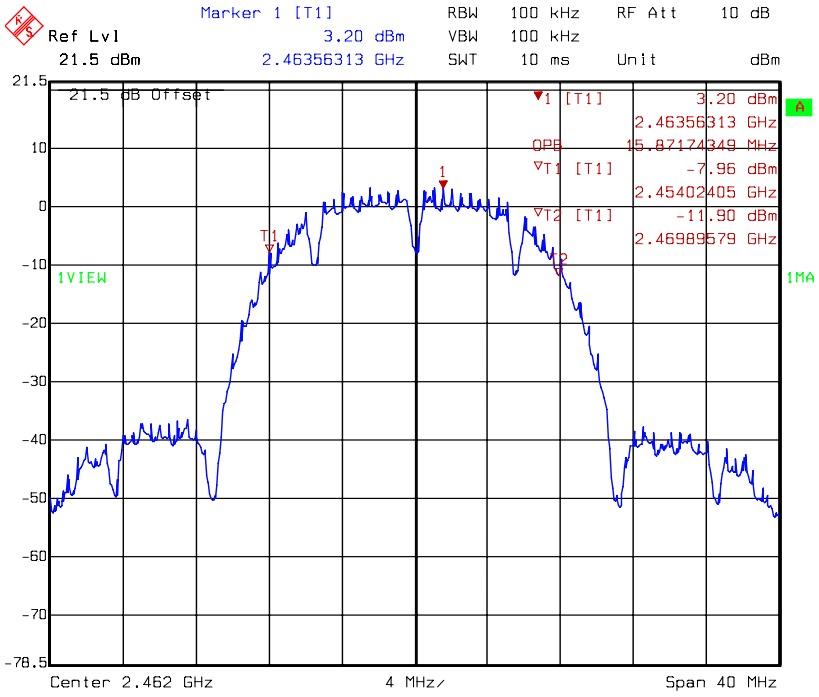
Title: Occupied Band-Width
Comment A: CH 1 at 802.11b mode chain0
Date: 02.SEP.2009 09:41:04

Chain 0:99 % Occupied Bandwidth @ 802.11b mode channel 6



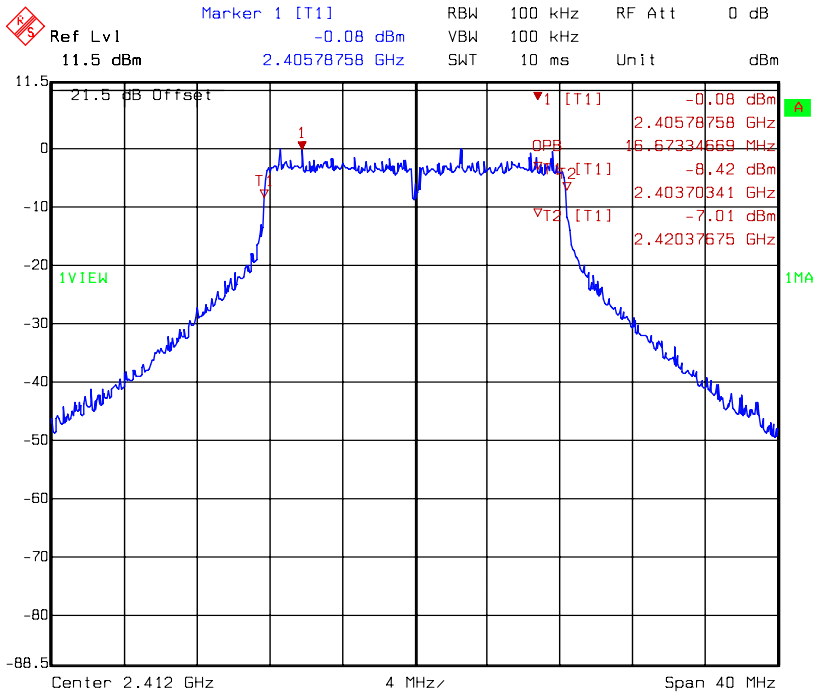
Title: Occupied Band-Width
Comment A: CH 6 at 802.11b mode chain0
Date: 02.SEP.2009 09:44:17

Chain 0:99 % Occupied Bandwidth @ 802.11b mode channel 11



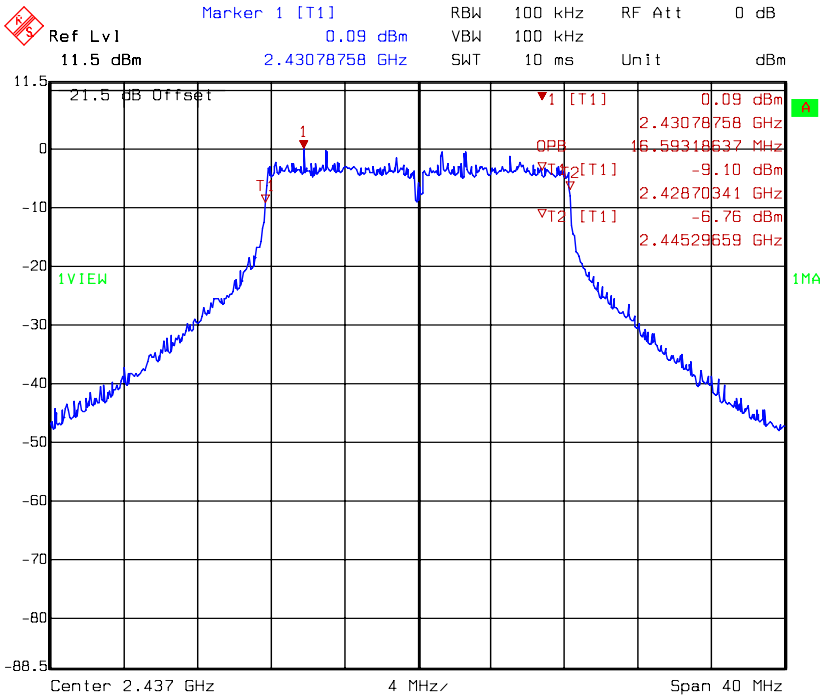
Title: Occupied Band-Width
Comment A: CH 11 at 802.11b mode chain0
Date: 02.SEP.2009 09:55:52

Chain 0:99 % Occupied Bandwidth @ 802.11g mode channel 1



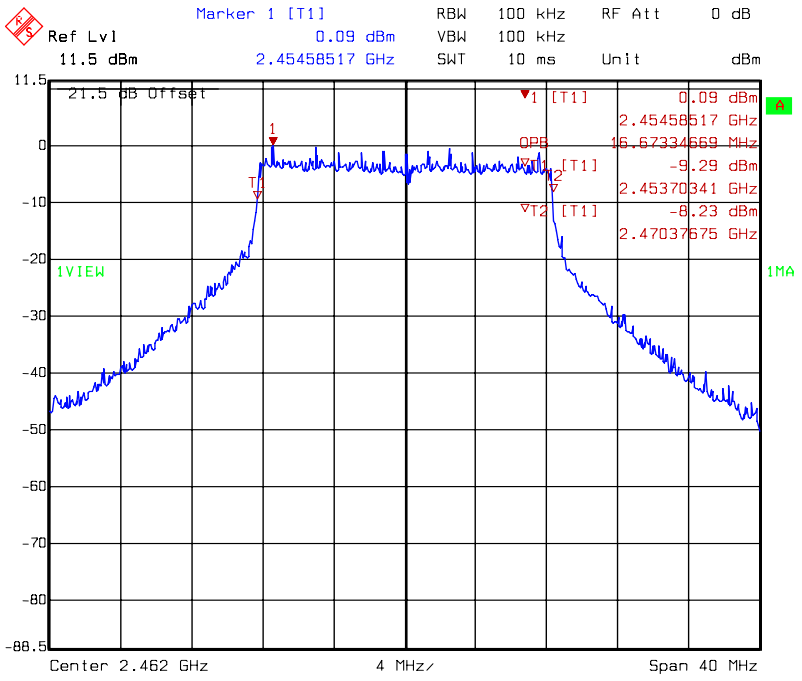
Title: Occupied Band-Width
Comment A: CH 1 at 802.11g mode chain0
Date: 02.SEP.2009 11:40:11

Chain 0:99 % Occupied Bandwidth @ 802.11g mode channel 6



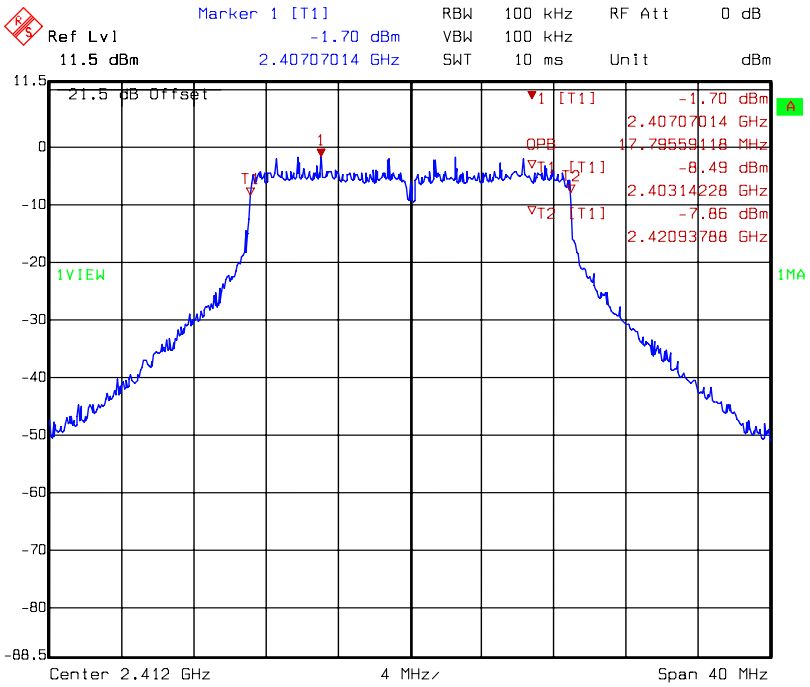
Title: Occupied Band-Width
Comment A: CH 6 at 802.11g mode chain0
Date: 02.SEP.2009 11:42:56

Chain 0:99 % Occupied Bandwidth @ 802.11g mode channel 11



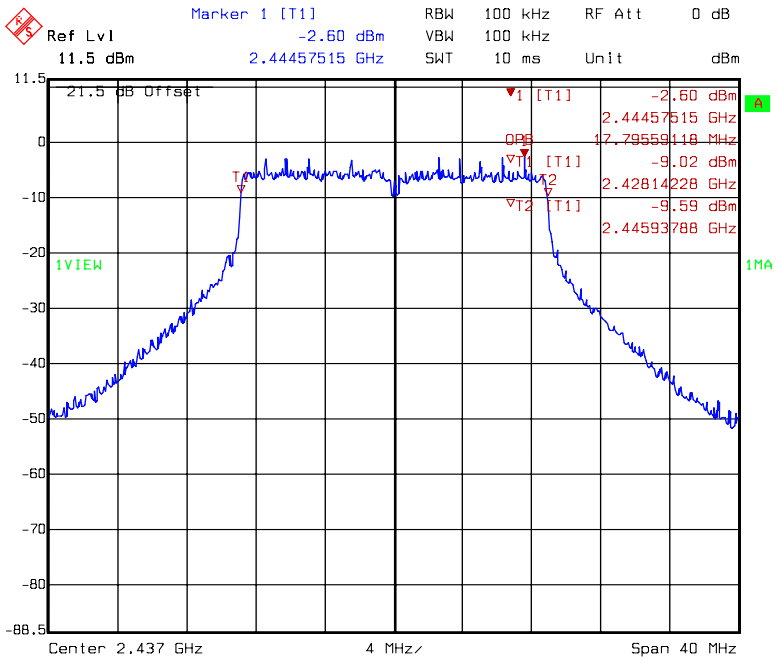
Title: Occupied Band-Width
Comment A: CH 11 at 802.11g mode chain0
Date: 02.SEP.2009 11:45:39

Chain 0: 99% Occupied Bandwidth @ 802.11n HT20 mode channel 1



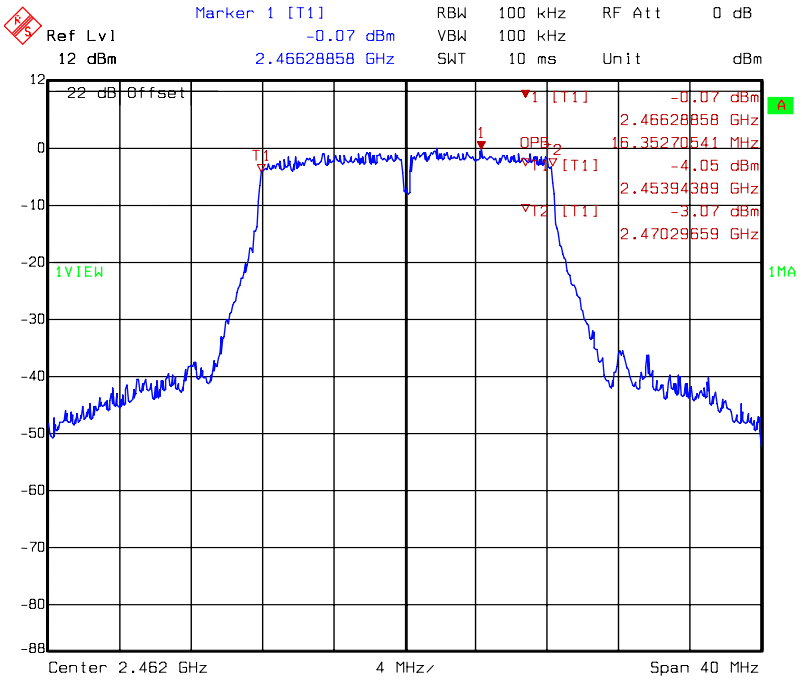
Title: Occupied Band-Width
Comment A: CH 1 at 802.11n 20MHz mode chain0
Date: 02.SEP.2009 13:36:49

Chain 0: 99% Occupied Bandwidth @ 802.11n HT20 mode channel 6

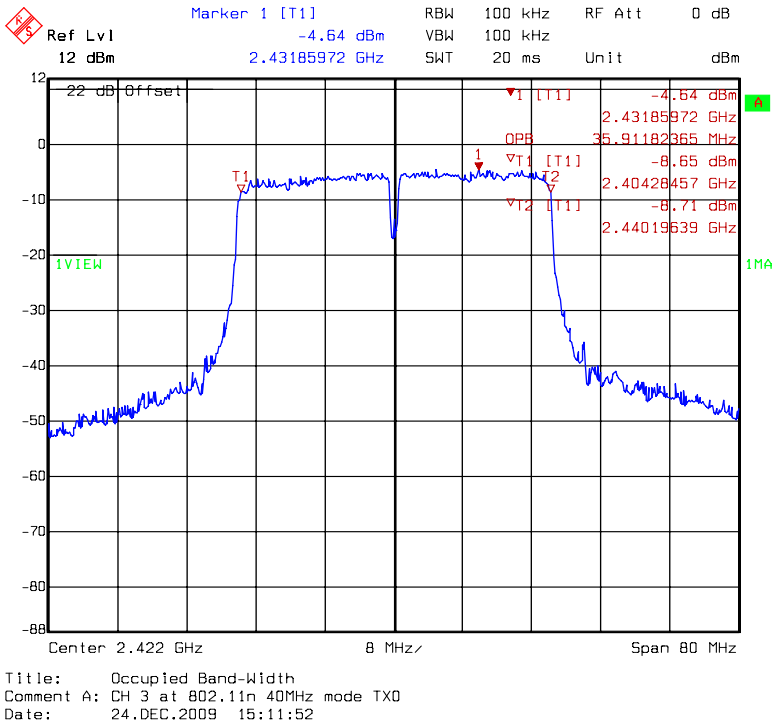


Title: Occupied Band-Width
Comment A: CH 6 at 802.11n 20MHz mode chain0
Date: 02.SEP.2009 13:39:38

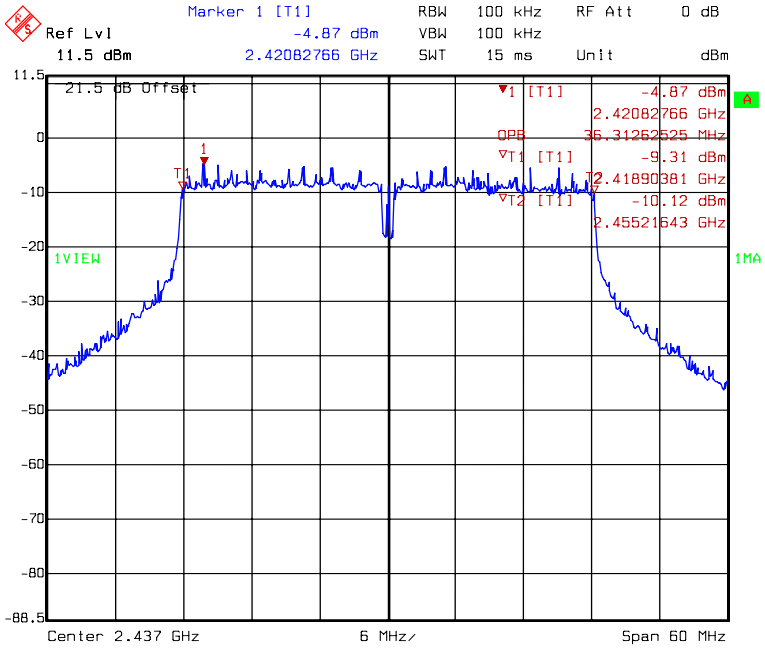
Chain 0: 99% Occupied Bandwidth @ 802.11n HT20 mode channel 11



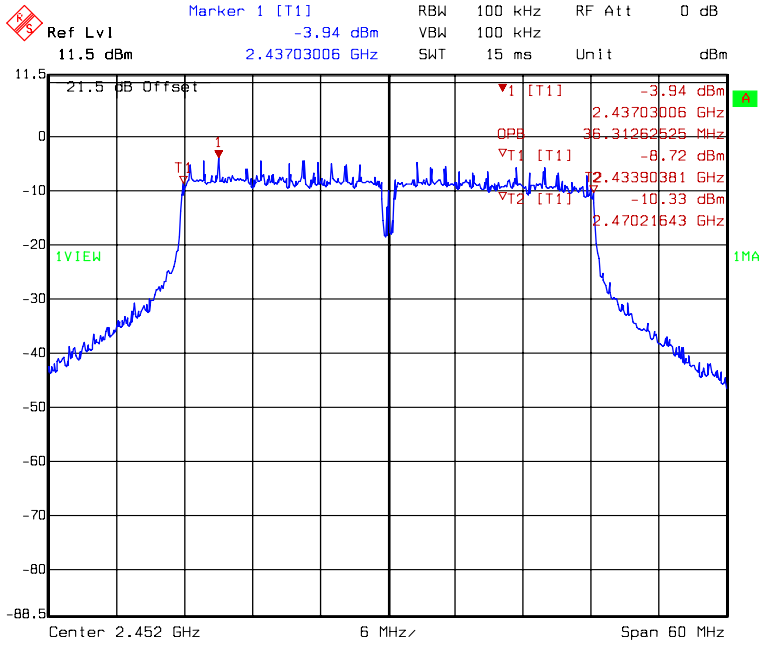
Chain 0: 99% Occupied Bandwidth @ 802.11n HT40 mode channel 3



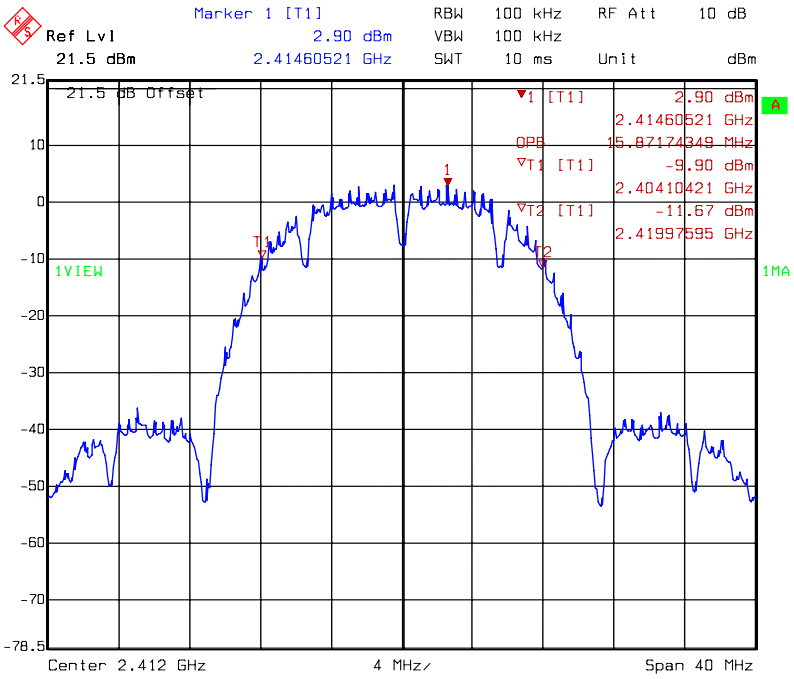
Chain 0: 99% Occupied Bandwidth @ 802.11n HT40 mode channel 6



Chain 0: 99% Occupied Bandwidth @ 802.11n HT40 mode channel 9

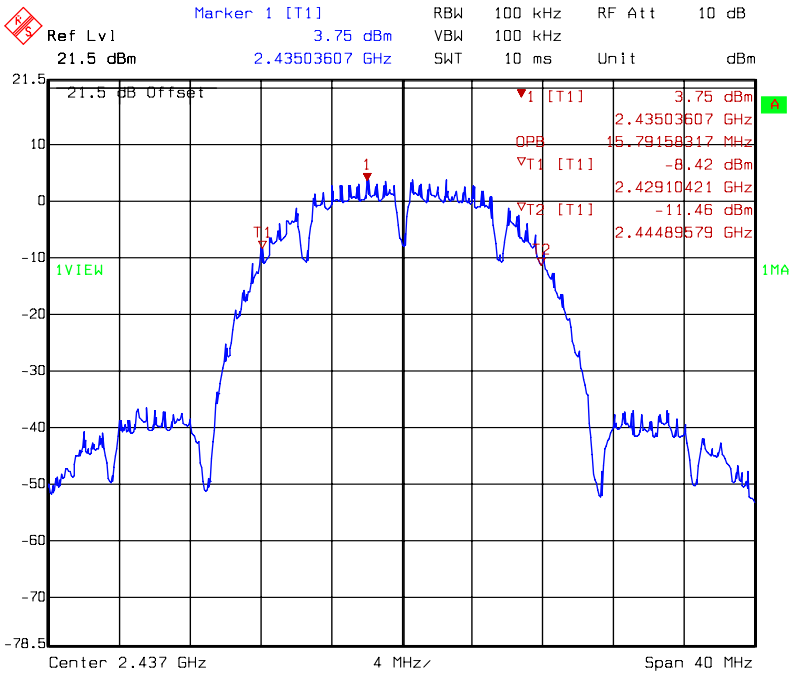


Chain 1:99 % Occupied Bandwidth @ 802.11b mode channel 1



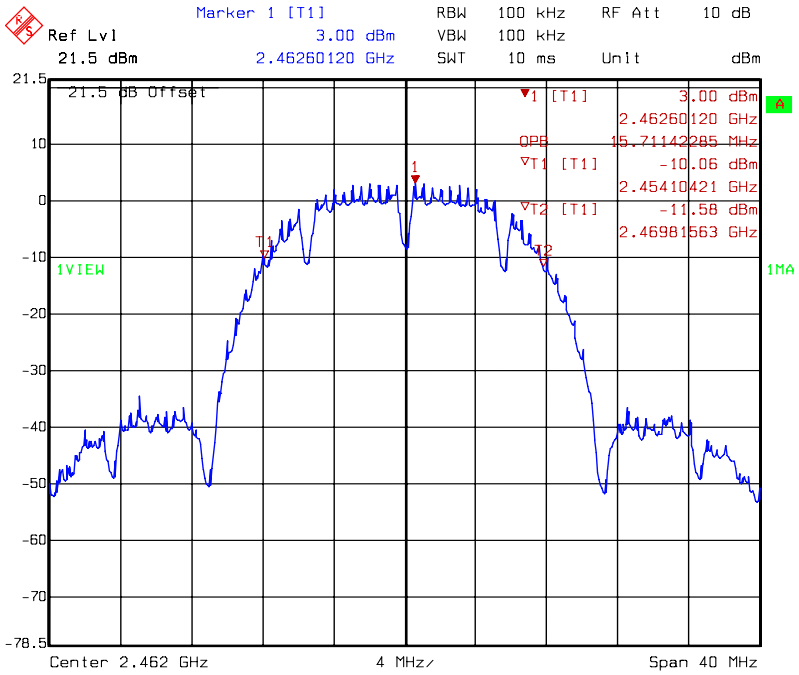
Title: Occupied Band-Width
Comment A: CH 1 at 802.11b mode chain1
Date: 02.SEP.2009 15:01:15

Chain 1:99 % Occupied Bandwidth @ 802.11b mode channel 6



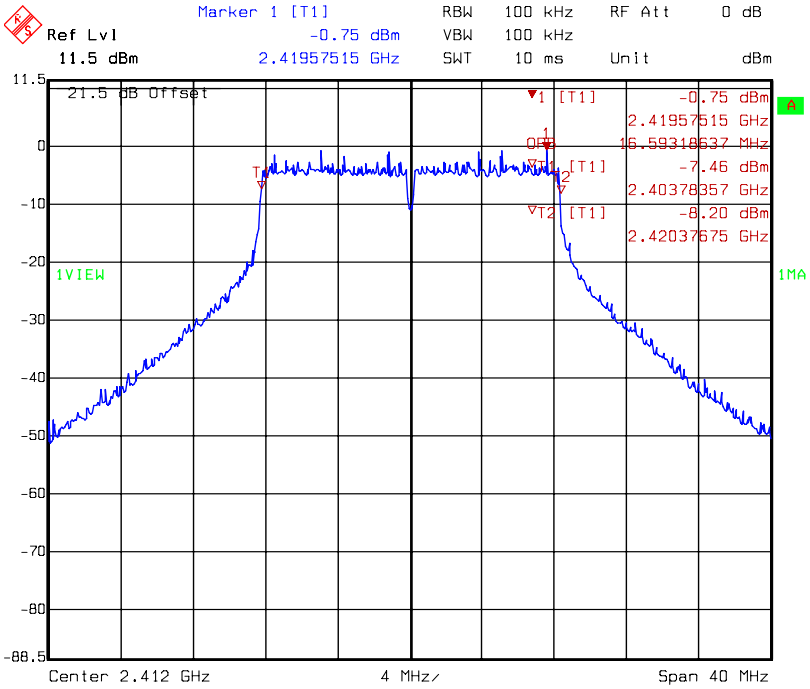
Title: Occupied Band-Width
Comment A: CH 6 at 802.11b mode chain1
Date: 02.SEP.2009 15:04:23

Chain 1:99 % Occupied Bandwidth @ 802.11b mode channel 11



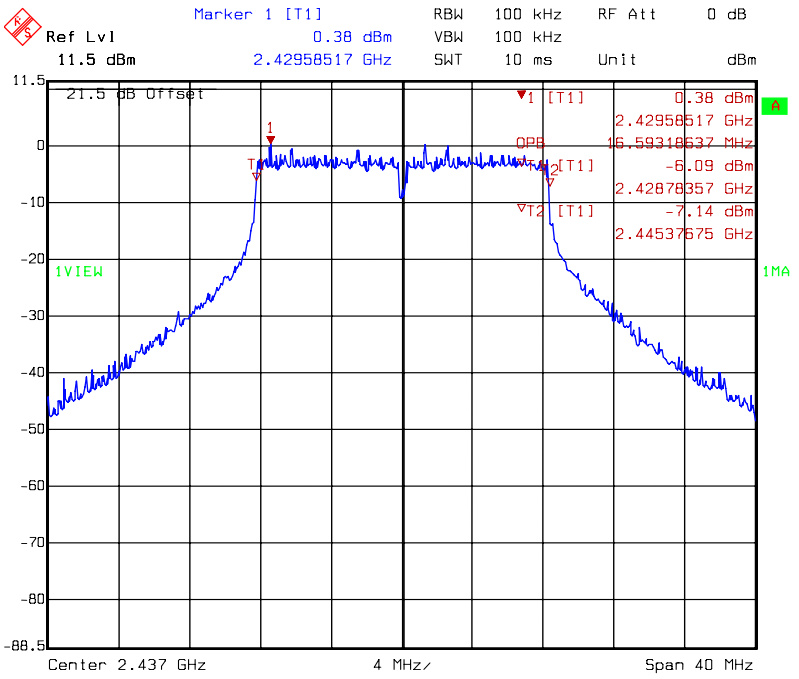
Title: Occupied Band-Width
Comment A: CH 11 at 802.11b mode chain1
Date: 02.SEP.2009 15:07:12

Chain 1:99 % Occupied Bandwidth @ 802.11g mode channel 1



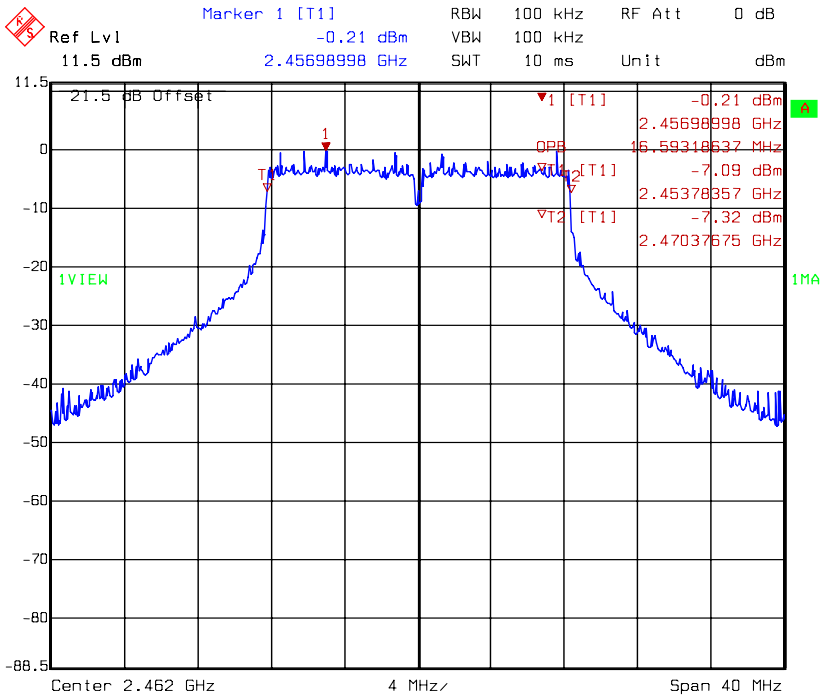
Title: Occupied Band-Width
Comment A: CH 1 at 802.11g mode chain1
Date: 02.SEP.2009 15:25:46

Chain 1:99 % Occupied Bandwidth @ 802.11g mode channel 6



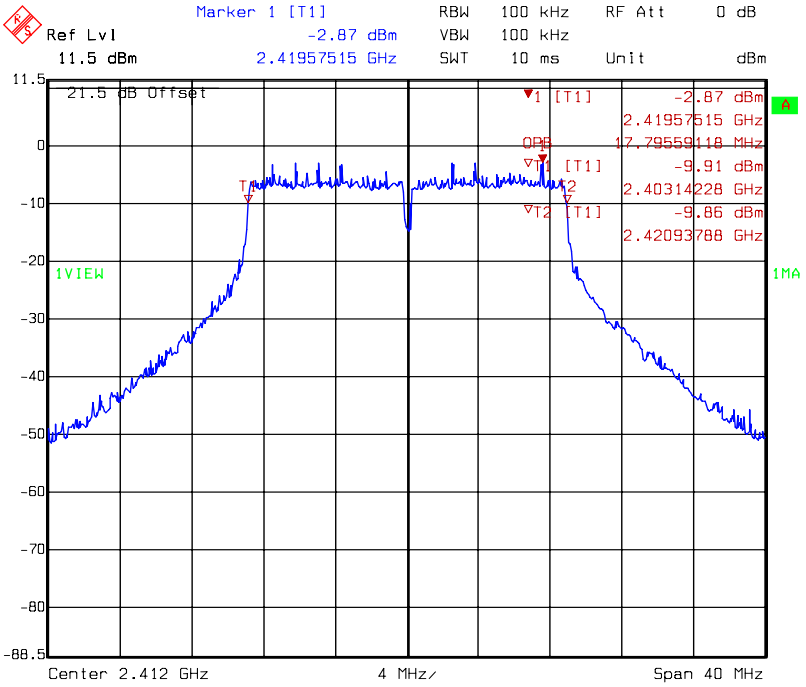
Title: Occupied Band-Width
Comment A: CH 6 at 802.11g mode chain1
Date: 02.SEP.2009 15:19:35

Chain 1:99 % Occupied Bandwidth @ 802.11g mode channel 11



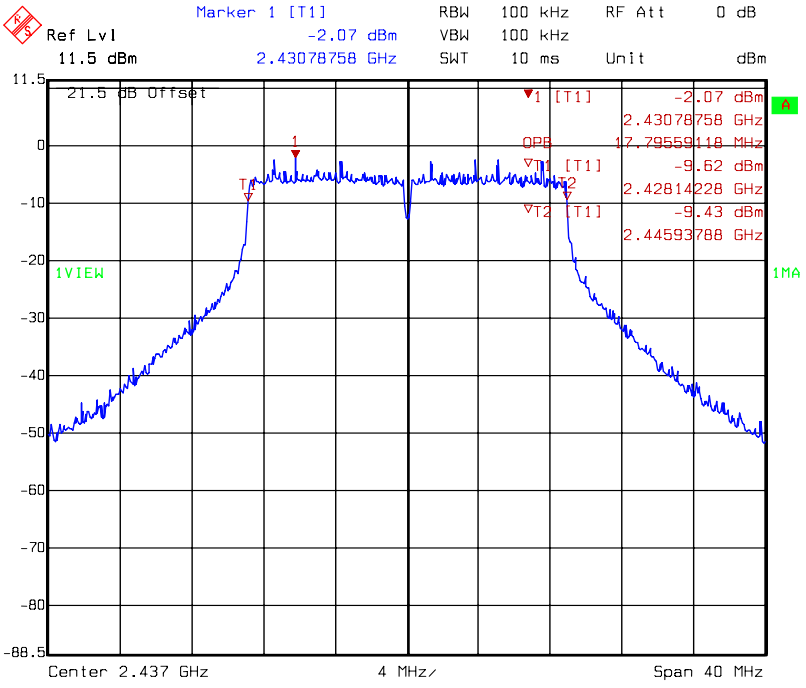
Title: Occupied Band-Width
Comment A: CH 11 at 802.11g mode chain1
Date: 02.SEP.2009 15:22:03

Chain 1: 99% Occupied Bandwidth @ 802.11n HT20 mode channel 1



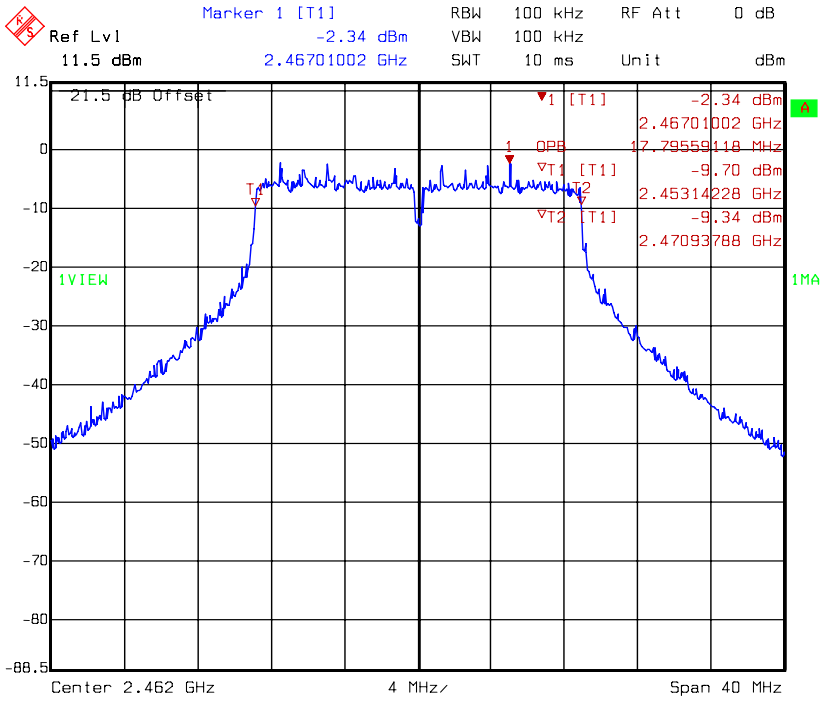
Title: Occupied Band-Width
Comment A: CH 1 at 802.11n 20MHz mode chain1
Date: 02.SEP.2009 14:27:15

Chain 1: 99% Occupied Bandwidth @ 802.11n HT20 mode channel 6



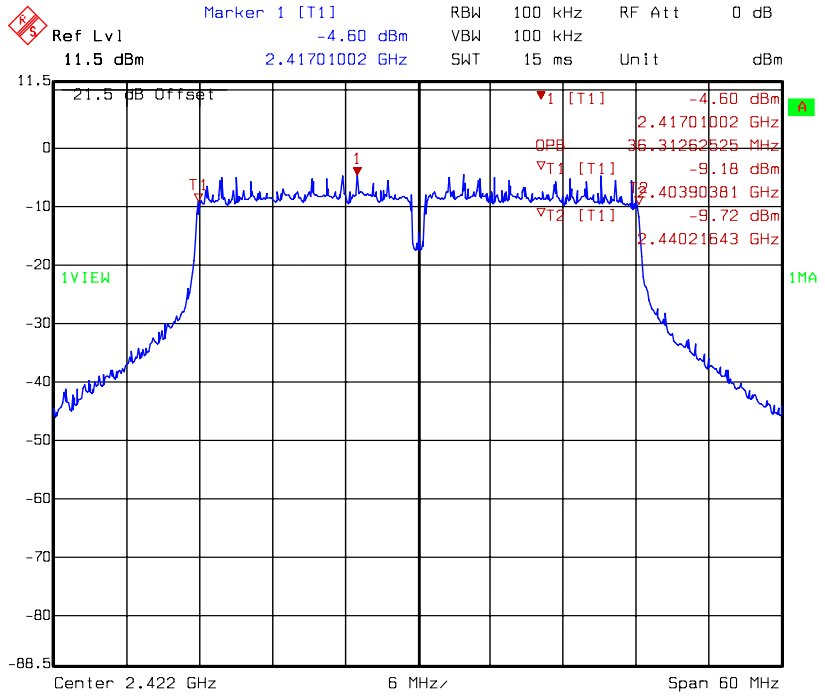
Title: Occupied Band-Width
Comment A: CH 6 at 802.11n 20MHz mode chain1
Date: 02.SEP.2009 14:30:12

Chain 1: 99% Occupied Bandwidth @ 802.11n HT20 mode channel 11



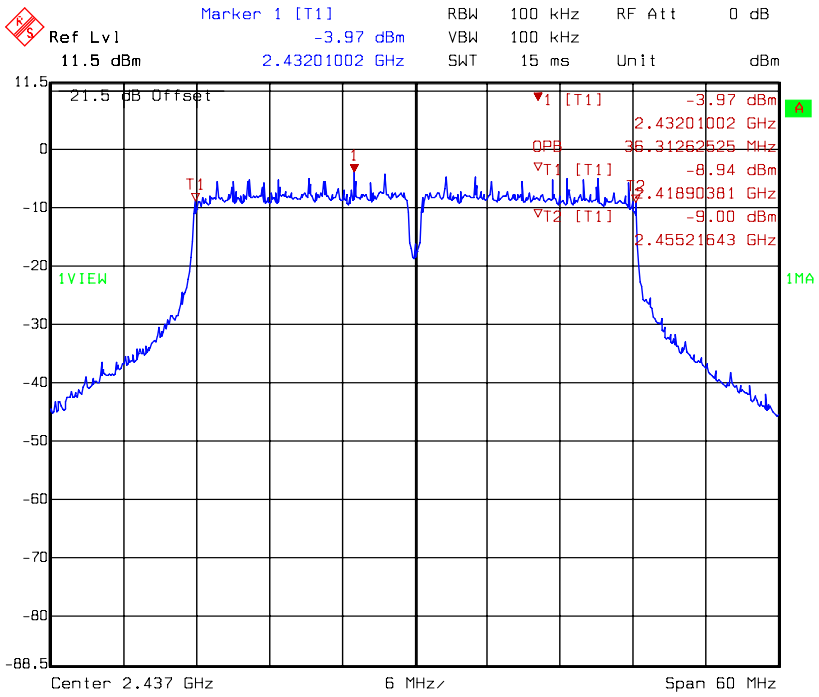
Title: Occupied Band-Width
Comment A: CH 11 at 802.11n 20MHz mode chain1
Date: 02.SEP.2009 14:38:03

Chain 1: 99% Occupied Bandwidth @ 802.11n HT40 mode channel 3



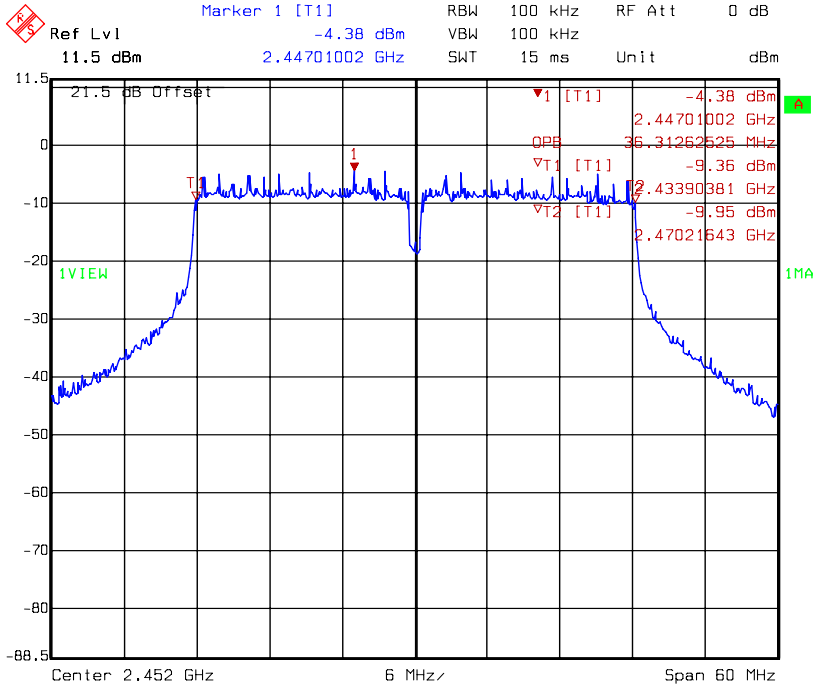
Title: Occupied Band-Width
Comment A: CH 3 at 802.11n 40MHz mode chain1
Date: 02.SEP.2009 14:21:44

Chain 1: 99% Occupied Bandwidth @ 802.11n HT40 mode channel 6



Title: Occupied Band-Width
Comment A: CH 6 at 802.11n 40MHz mode chain1
Date: 02.SEP.2009 14:18:37

Chain 1: 99% Occupied Bandwidth @ 802.11n HT40 mode channel 9



Title: Occupied Band-Width
Comment A: CH 9 at 802.11n 40MHz mode chain1
Date: 02.SEP.2009 14:12:40

5. Maximum Output Power

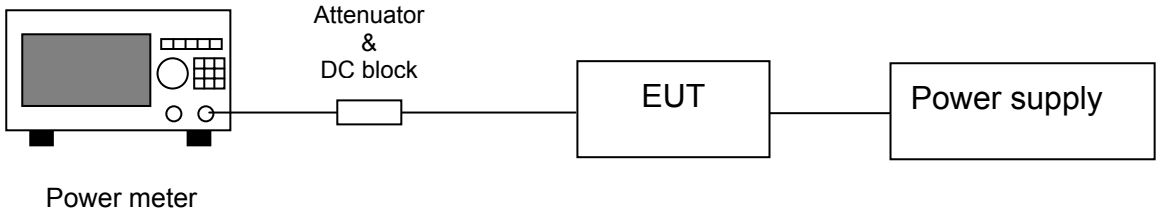
Name of Test	Maximum output power
Base Standard	FCC 15.247(b)

Measurement Uncertainty: ±0.392 dB (k=2)
Test Result: Complies
Measurement Data: See Table below

Method of Measurement:
Reference FCC document: KDB558074
The peak power at antenna terminals is measured using a Wideband Peak Power Meter which the video bandwidth can be up to 65MHz. Power output is measured with the maximum rated input level.

Note: 1. The above equipments are within the valid calibration period.
2. The test antennas (receiving antenna) are calibration per 3 years.
3. The video bandwidth of the power meter and sensor can be up to 65 MHz

Test Diagram:



Note 1: The EUT was tested while in a continuous transmit mode and the worst case data rates are Mbps data rate for 802.11b mode, 6 Mbps data rate for 802.11g mode, 6.5 Mbps data rate for 802.11n HT20 mode and 13.5 Mbps data rate for 802.11n HT40 mode. The EUT was tuned to a low, middle and high channel.

Note 2: §15.247 (b) (4) Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Table 3. Maximum output power

2 Tx

Mode	Channel	Output Power (dBm)		Total Power (PK)		Limit (dBm)
		chian0	chain1			
		PK	PK	dBm	mW	
802.11b	1	18.43	17.45	20.98	125.25	30.00
	6	17.87	17.57	20.73	118.38	30.00
	11	17.55	17.18	20.38	109.12	30.00
802.11g	1	23.67	23.18	26.44	440.78	30.00
	6	22.71	22.66	25.70	371.14	30.00
	11	22.14	22.31	25.24	333.90	30.00

2 Tx

Mode	Channel	Output Power (dBm)		Total Power (PK)		Limit (dBm)
		chian0	chain1			
		PK	PK	dBm	mW	
802.11n HT20	1	22.37	21.5	24.97	313.84	30.00
	6	21.56	21.46	24.52	283.18	30.00
	11	21.12	20.87	24.01	251.60	30.00
802.11n HT40	3	20.83	21.14	24.00	251.08	30.00
	6	20.76	21.32	24.06	254.64	30.00
	9	20.55	20.67	23.62	230.18	30.00

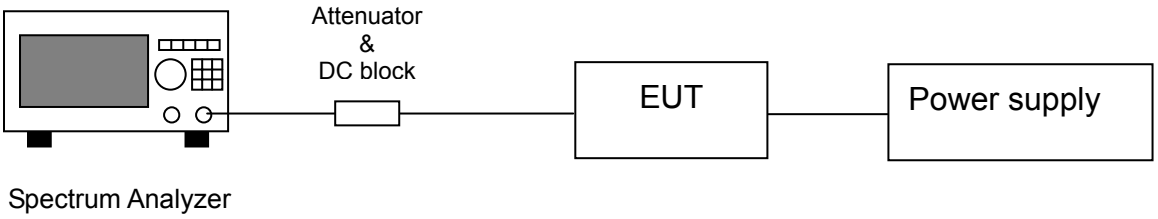
6. Power Spectral Density

Name of Test	Power Spectral Density
Base Standard	FCC 15.247(e)

Test Result: Complies
Measurement Data: See Table & plots below

Method of Measurement:
Reference FCC document: KDB558074
A portion of the transmitted signal is coupled to a Spectrum Analyzer with a resolution bandwidth of at least 1 % of the bandwidth of the transmitted signal. The resolution bandwidth is chosen so as not to reduce the peak level of the measured waveform. The appropriate bandwidth mask is applied to the output waveform to verify compliance.

Test Diagram:



Note: The EUT was tested while in a continuous transmit mode and the worst case data rates are Mbps data rate for 802.11b mode, 6 Mbps data rate for 802.11g mode, 6.5 Mbps data rate for 802.11n HT20 mode and 13.5 Mbps data rate for 802.11n HT40 mode. The EUT was tuned to a low, middle and high channel.

Table 4. Power Spectral Density

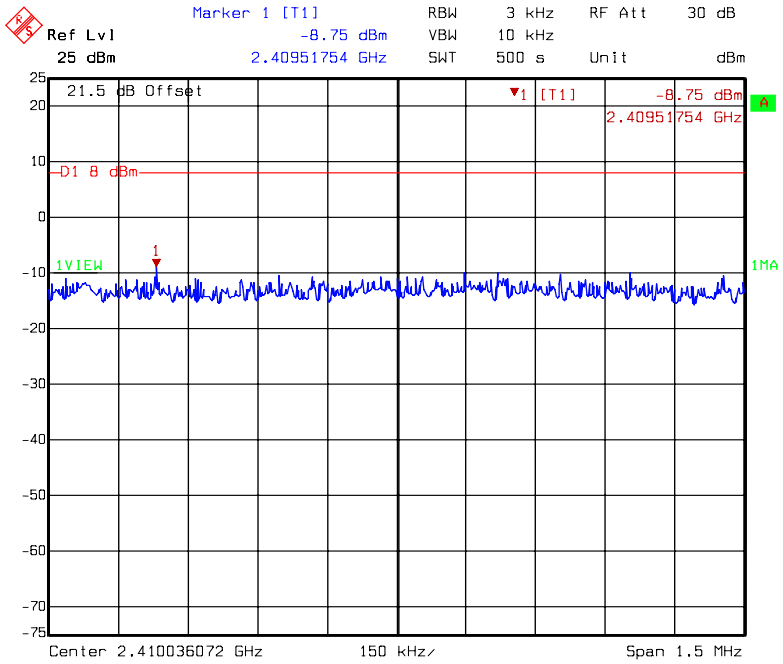
2 Tx

Mode	Channel	Data rate Mbps	PSD (dBm)		Total PSD		Limit (dBm)
			chain 0	chain 1	mW	dBm	
802.11b	1	1	-8.75	-10.72	-6.61	0.22	8
	6		-9.42	-10.04	-6.71	0.21	8
	11		-10.01	-11.44	-7.66	0.17	8
802.11g	1	6	-13.21	-13.77	-10.47	0.09	8
	6		-13.83	-12.25	-9.96	0.10	8
	11		-12.71	-14.24	-10.40	0.09	8

2TX

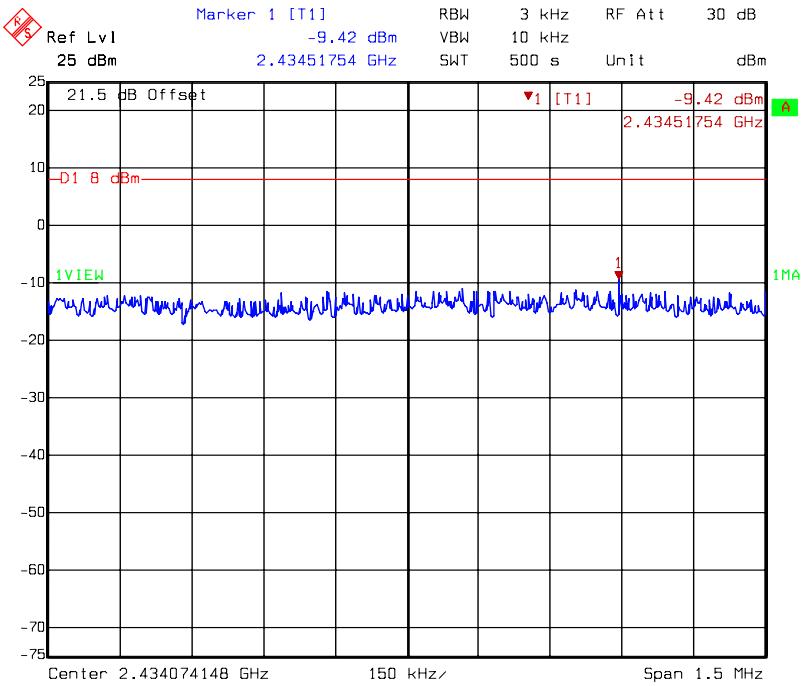
Mode	Channel	Data rate Mbps	PSD (dBm)		Total PSD		Limit (dBm)
			chain 0	chain 1	mW	dBm	
802.11n HT 20	1	6.5	-15	-15.33	-12.15	0.06	8
	6		-15.65	-15.98	-12.80	0.05	8
	11		-15.7	-16.22	-12.94	0.05	8
802.11n HT 40	3	13.5	-18.33	-18.99	-15.64	0.03	8
	6		-17.97	-18.39	-15.16	0.03	8
	9		-18.43	-17.97	-15.18	0.03	8

Chain 0: Power Spectral Density @ 802.11b mode channel 1



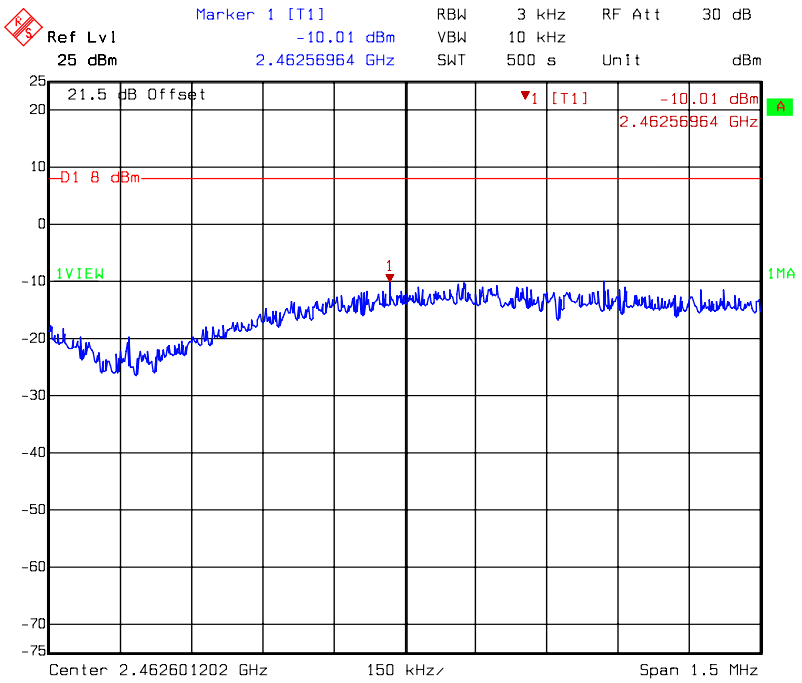
Title: Power density
Comment A: CH 1 at 802.11b mode chain0
Date: 02.SEP.2009 09:39:32

Chain 0: Power Spectral Density @ 802.11b mode channel 6



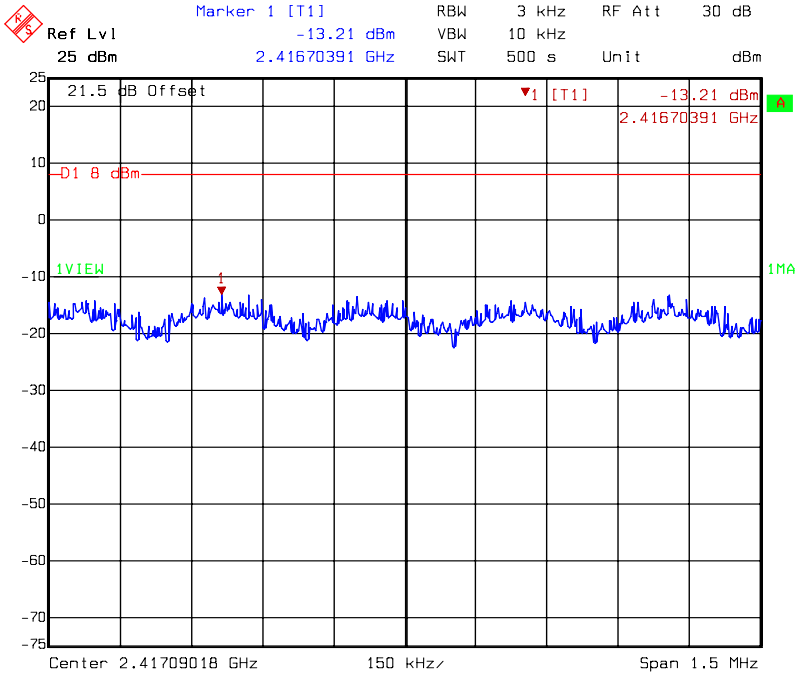
Title: Power density
Comment A: CH 6 at 802.11b mode chain0
Date: 02.SEP.2009 09:42:45

Chain 0: Power Spectral Density @ 802.11b mode channel 11



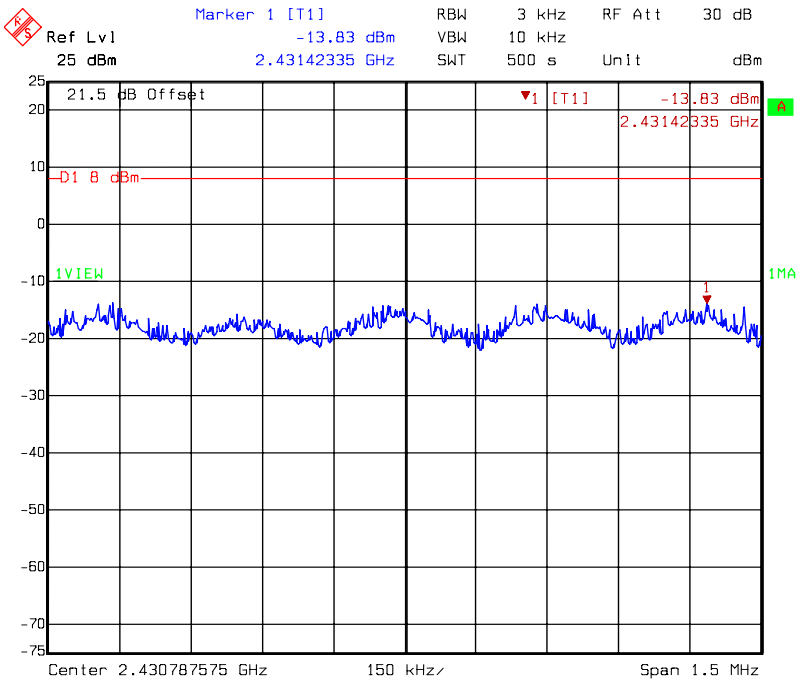
Title: Power density
Comment A: CH 11 at 802.11b mode chain0
Date: 02.SEP.2009 09:54:20

Chain 0: Power Spectral Density @ 802.11g mode channel 1



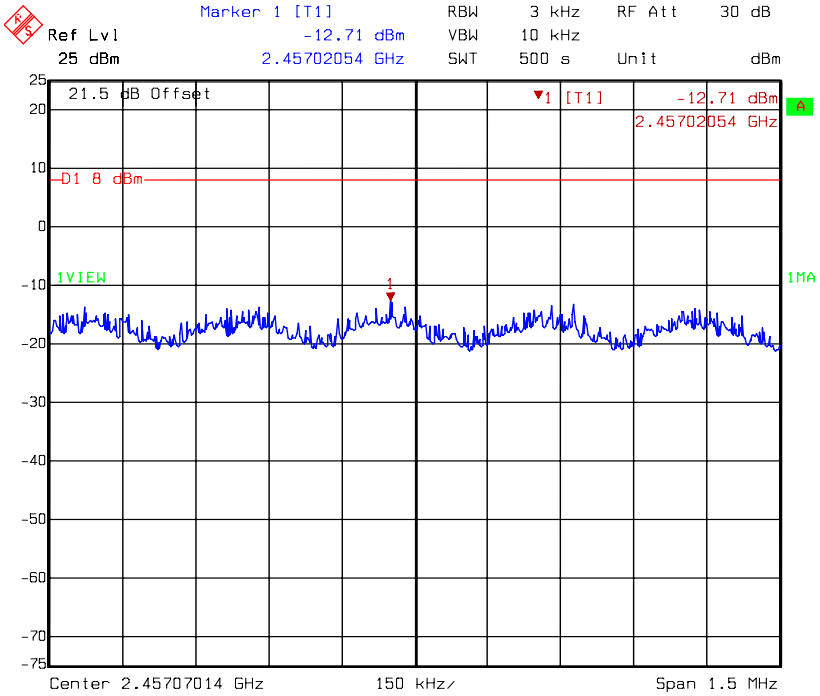
Title: Power density
Comment A: CH 1 at 802.11g mode chain0
Date: 02.SEP.2009 11:38:45

Chain 0: Power Spectral Density @ 802.11g mode channel 6



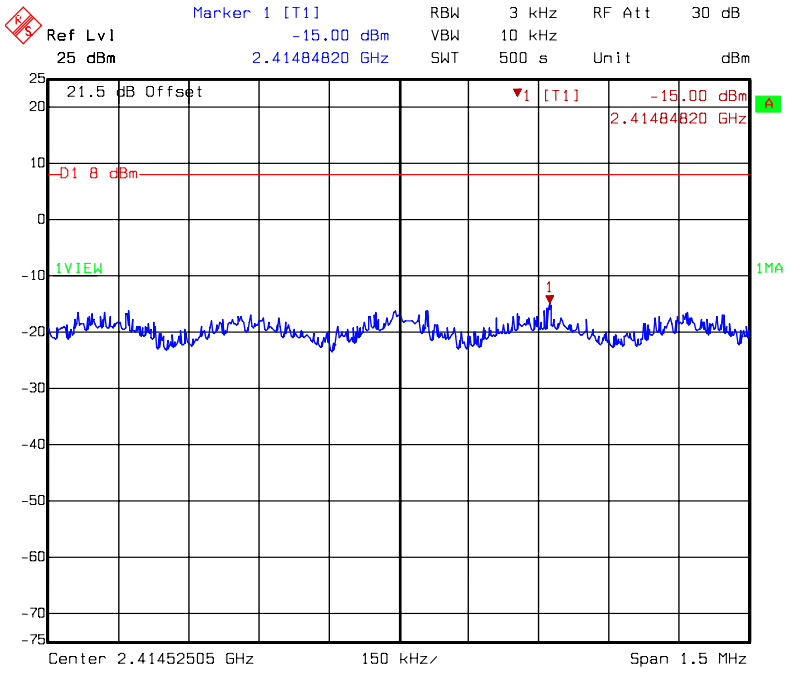
Title: Power density
Comment A: CH 6 at 802.11g mode chain0
Date: 02.SEP.2009 11:41:30

Chain 0: Power Spectral Density @ 802.11g mode channel 11



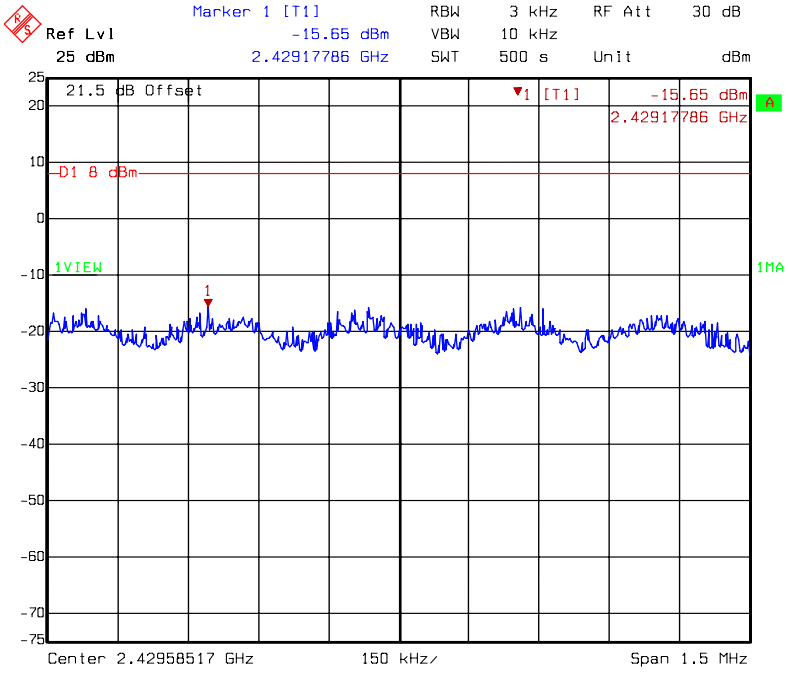
Title: Power density
Comment A: CH 11 at 802.11g mode chain0
Date: 02.SEP.2009 11:44:13

Chain 0: Power Spectral Density @ 802.11n HT20 mode channel 1



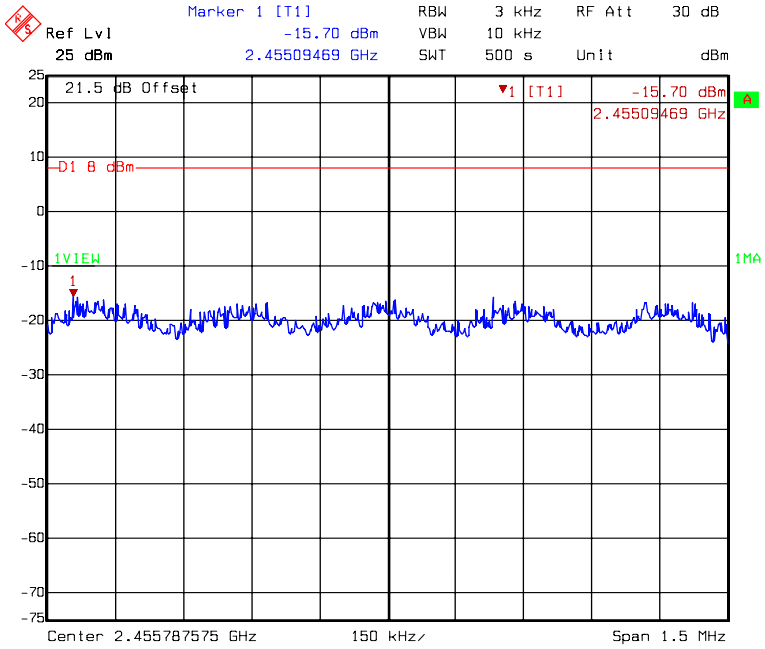
Title: Power density
Comment A: CH 1 at 802.11n 20MHz mode chain0
Date: 02.SEP.2009 13:35:23

Chain 0: Power Spectral Density @ 802.11n HT20 mode channel 6



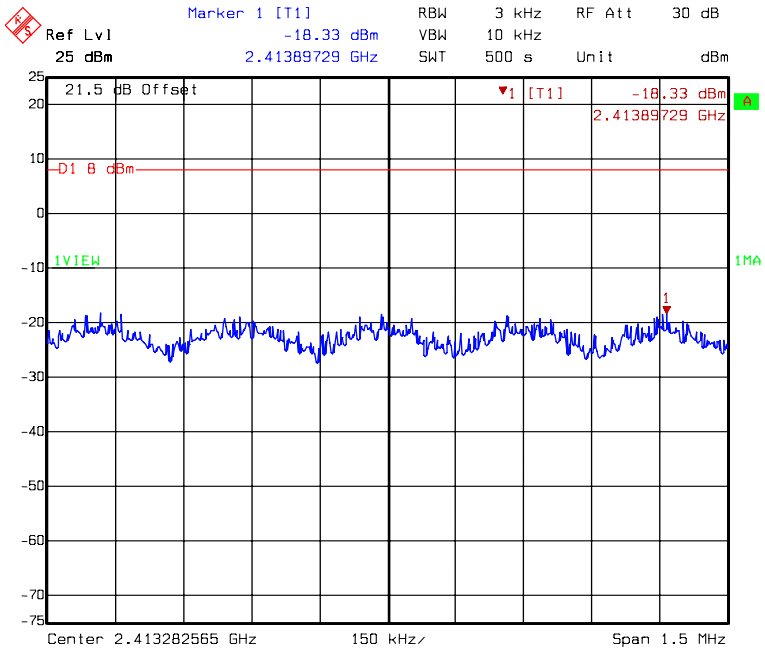
Title: Power density
Comment A: CH 6 at 802.11n 20MHz mode chain0
Date: 02.SEP.2009 13:38:12

Chain 0: Power Spectral Density @ 802.11n HT20 mode channel 11



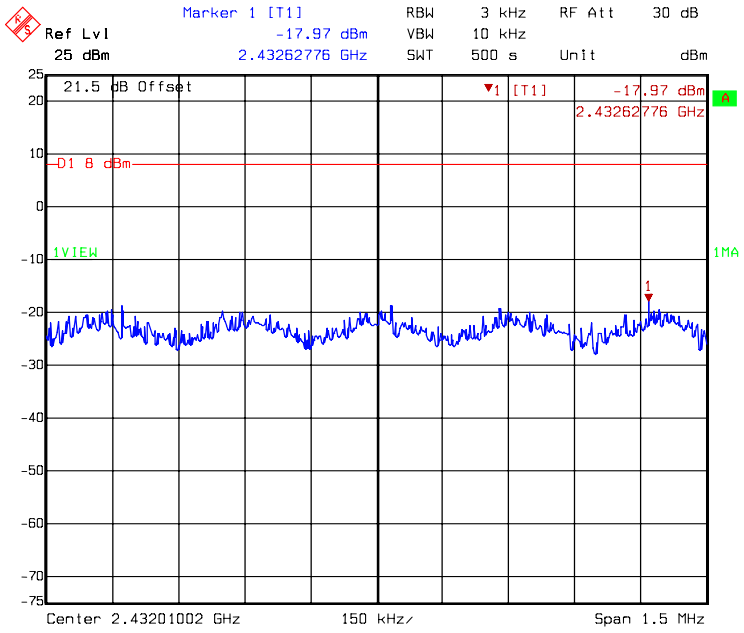
Title: Power density
Comment A: CH 11 at 802.11n 20MHz mode chain0
Date: 02.SEP.2009 13:41:03

Chain 0: Power Spectral Density @ 802.11n HT40 mode channel 3



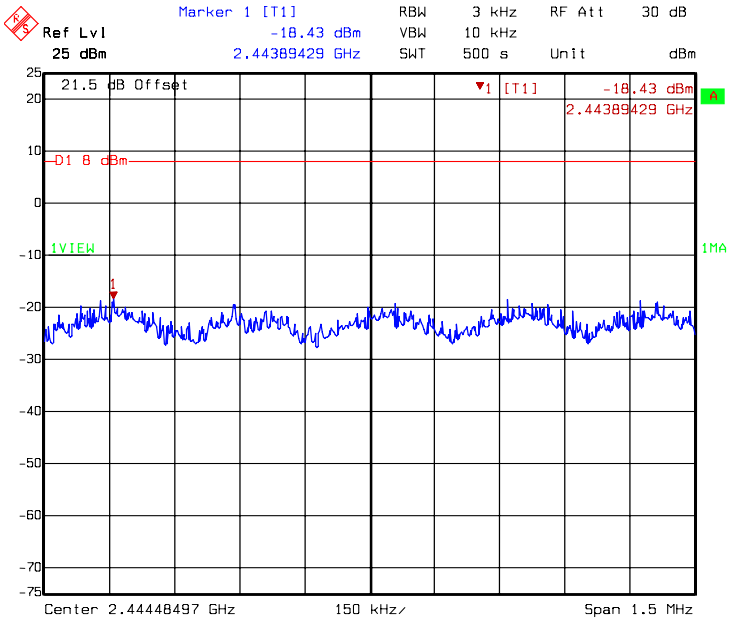
Title: Power density
Comment A: CH 3 at 802.11n 40MHz mode chain0
Date: 02.SEP.2009 13:44:25

Chain 0: Power Spectral Density @ 802.11n HT40 mode channel 6



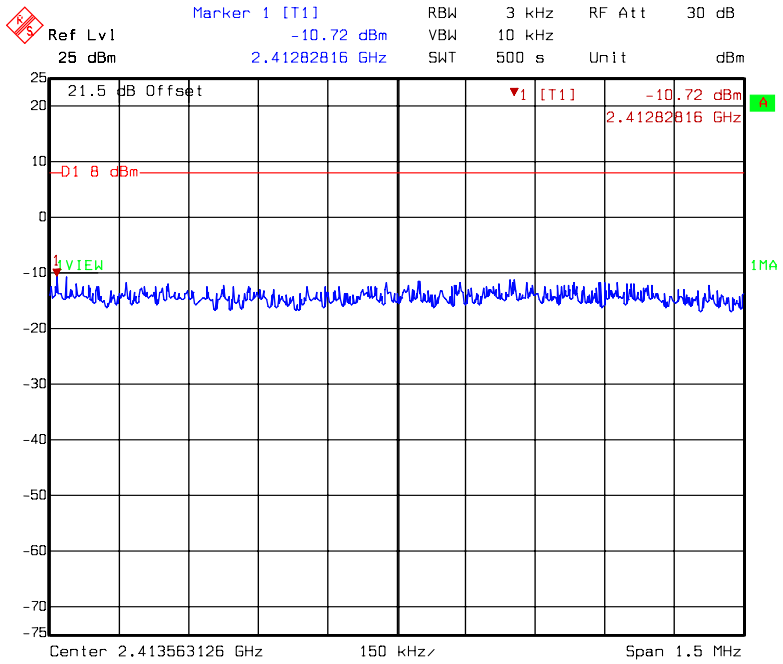
Title: Power density
Comment A: CH 6 at 802.11n 40MHz mode chain0
Date: 02.SEP.2009 13:47:44

Chain 0: Power Spectral Density @ 802.11n HT40 mode channel 9

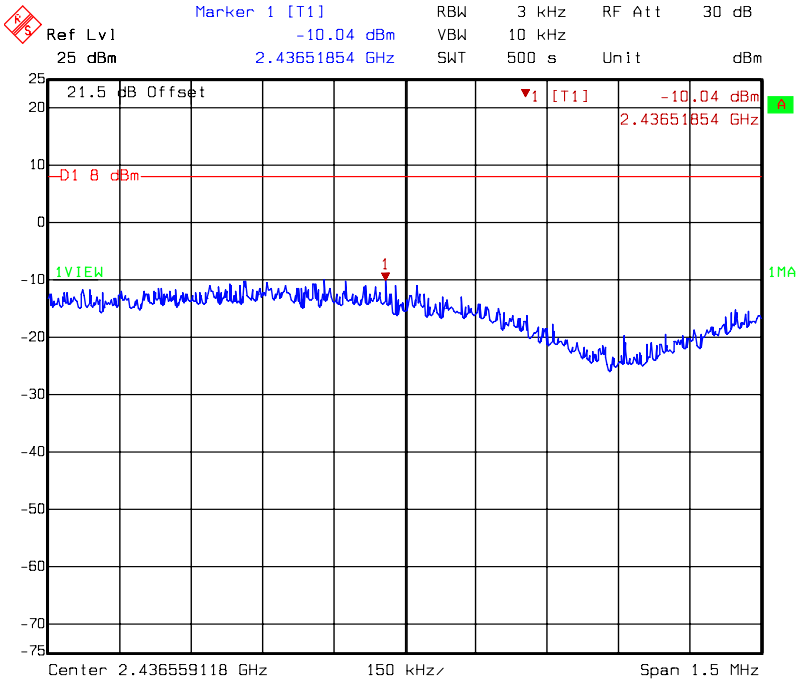


Title: Power density
Comment A: CH 9 at 802.11n 40MHz mode chain0
Date: 02.SEP.2009 13:53:15

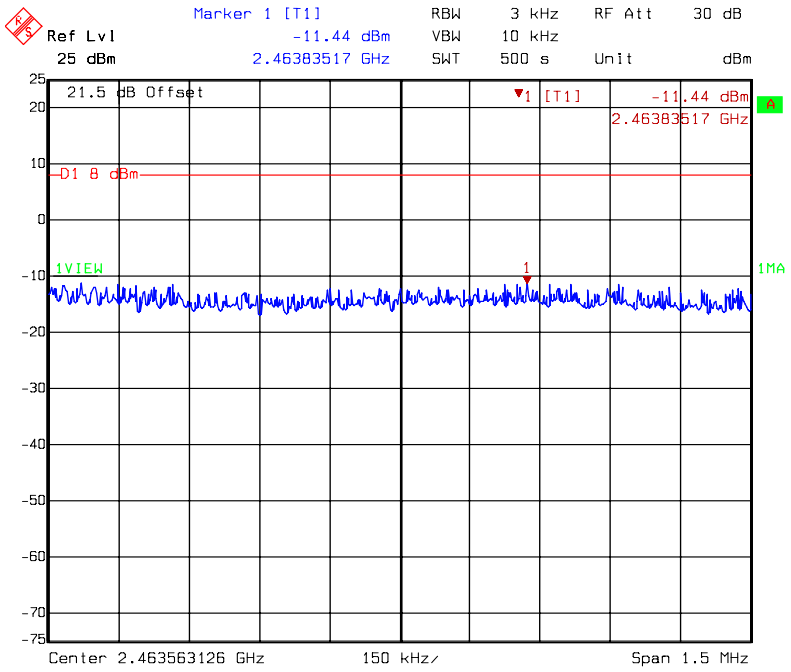
Chain 1: Power Spectral Density @ 802.11b mode channel 1



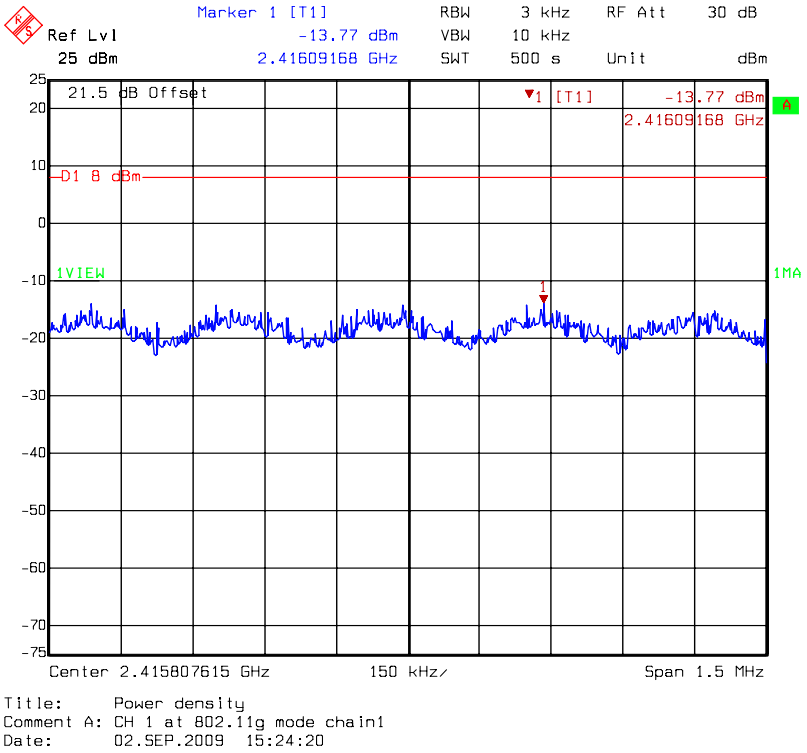
Chain 1: Power Spectral Density @ 802.11b mode channel 6



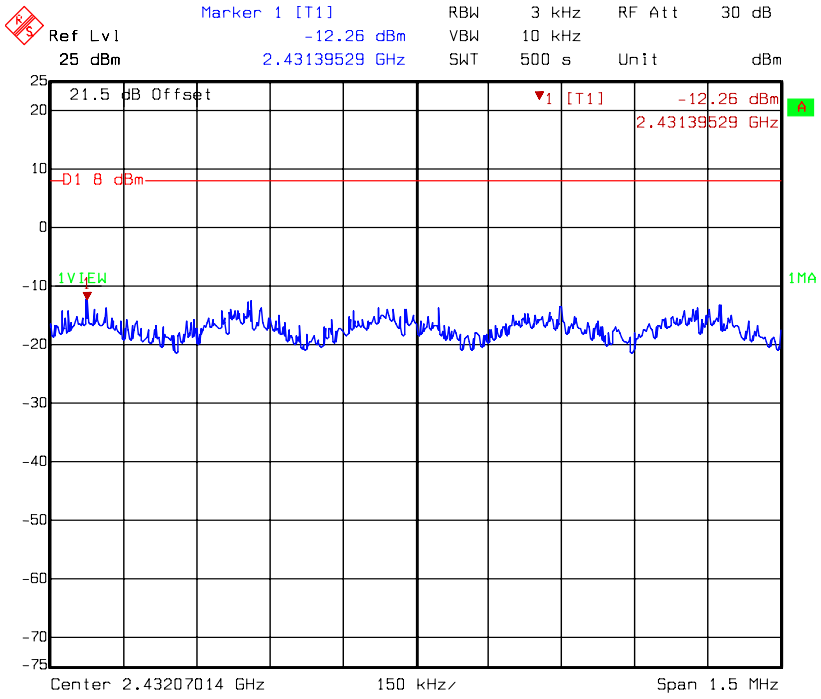
Chain 1: Power Spectral Density @ 802.11b mode channel 11



Chain 1: Power Spectral Density @ 802.11g mode channel 1

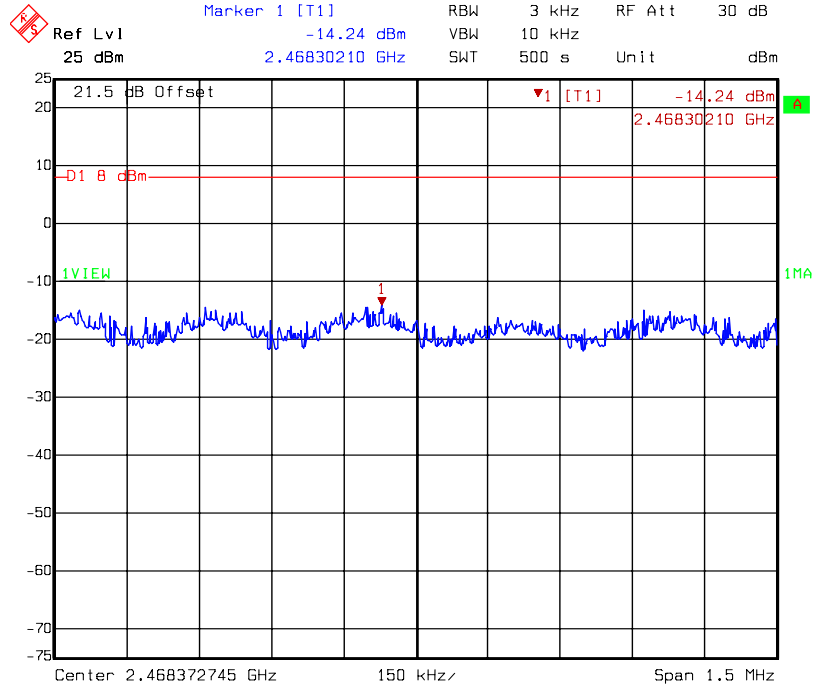


Chain 1: Power Spectral Density @ 802.11g mode channel 6



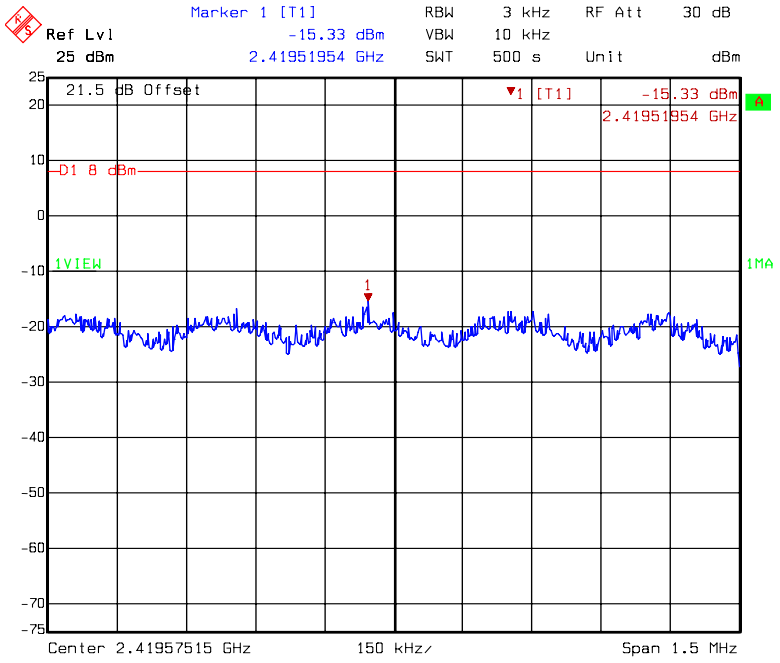
Title: Power density
Comment A: CH 6 at 802.11g mode chain1
Date: 02.SEP.2009 15:18:10

Chain 1: Power Spectral Density @ 802.11g mode channel 11

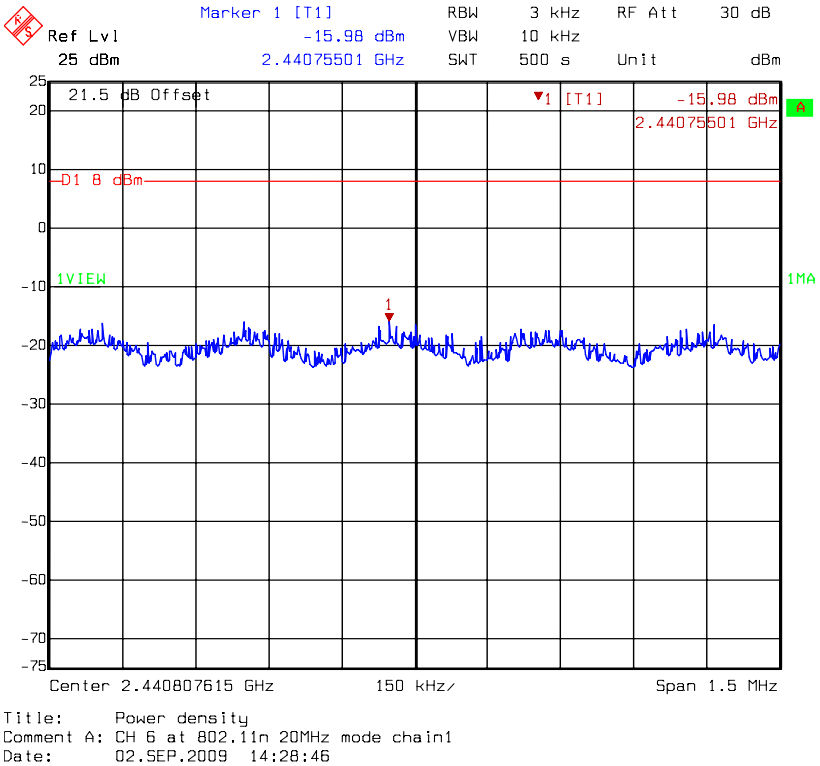


Title: Power density
Comment A: CH 11 at 802.11g mode chain1
Date: 02.SEP.2009 15:20:38

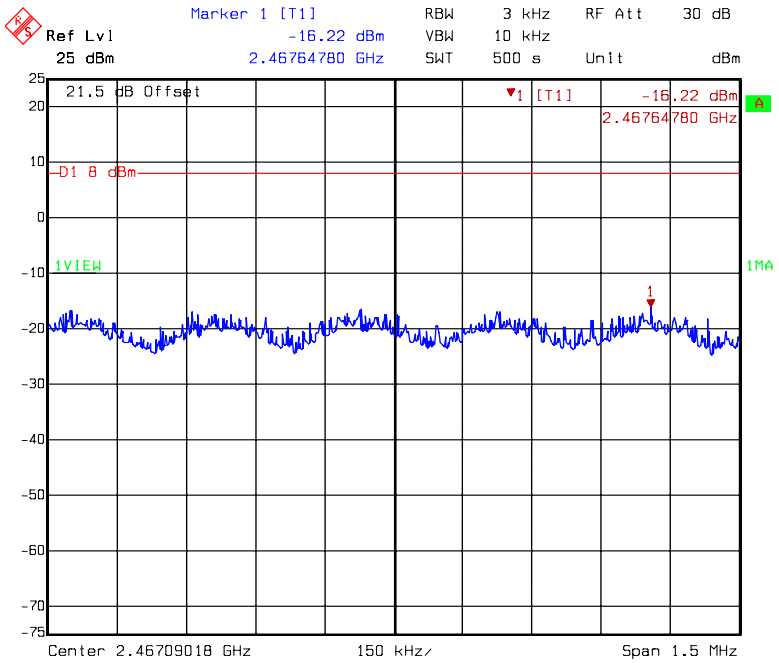
Chain 1: Power Spectral Density @ 802.11n HT20 mode channel 1



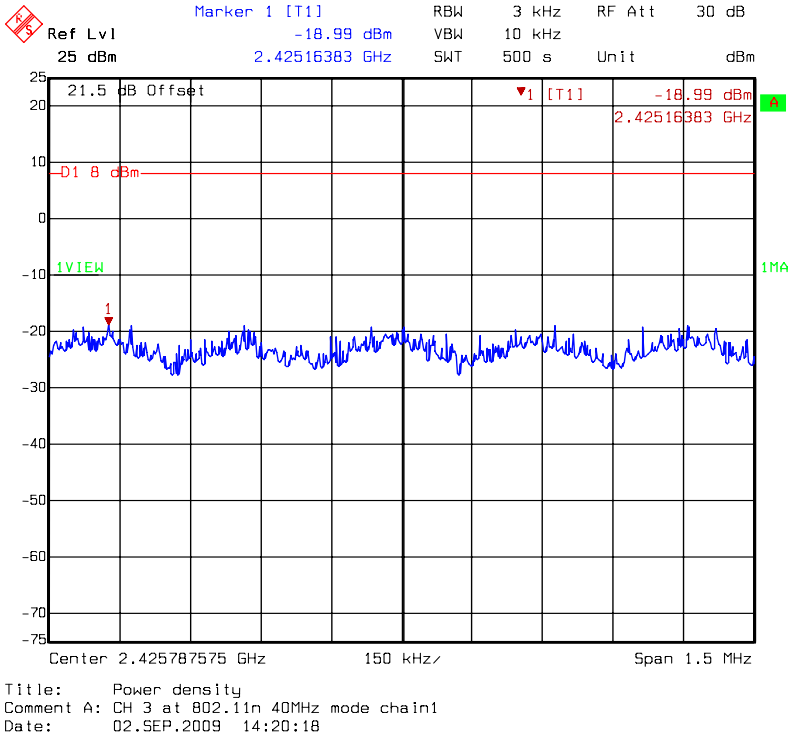
Chain 1: Power Spectral Density @ 802.11n HT20 mode channel 6



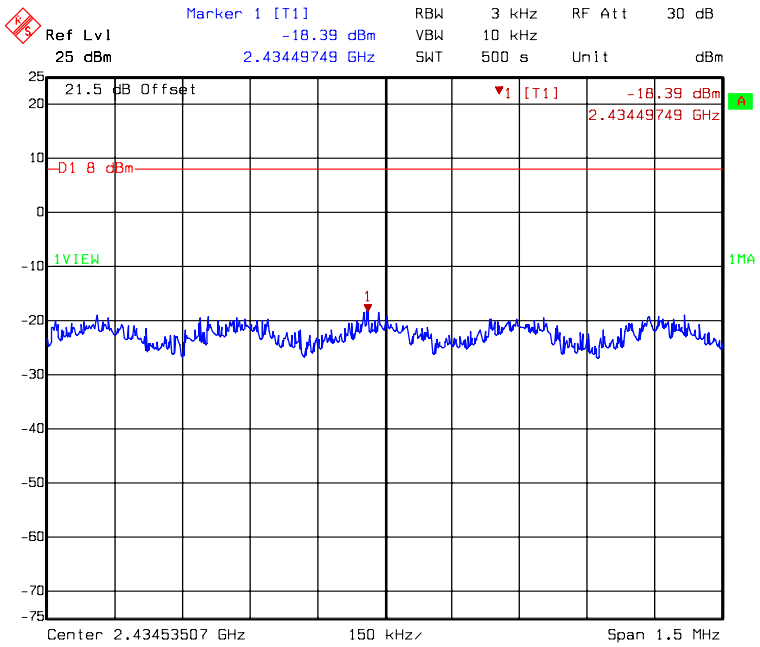
Chain 1: Power Spectral Density @ 802.11n HT20 mode channel 11



Chain 1: Power Spectral Density @ 802.11n HT40 mode channel 3

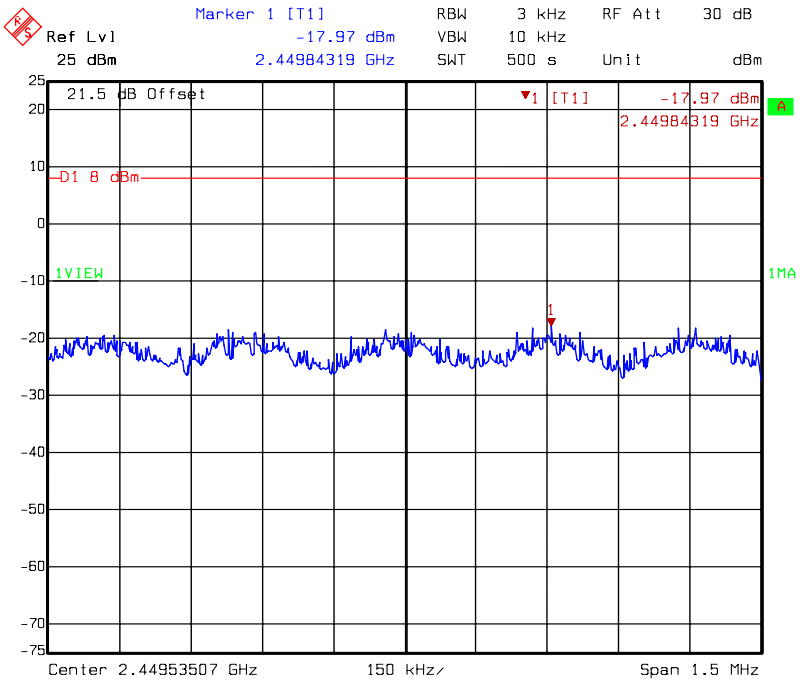


Chain 1: Power Spectral Density @ 802.11n HT40 mode channel 6



Title: Power density
Comment A: CH 6 at 802.11n 40MHz mode chain1
Date: 02.SEP.2009 14:17:11

Chain 1: Power Spectral Density @ 802.11n HT40 mode channel 9



Title: Power density
Comment A: CH 9 at 802.11n 40MHz mode chain1
Date: 02.SEP.2009 14:11:13

7. RF Antenna conducted Spurious

Name of Test	RF Antenna Conducted Spurious
Base Standard	FCC 15.247(d)

Test Result: Complies

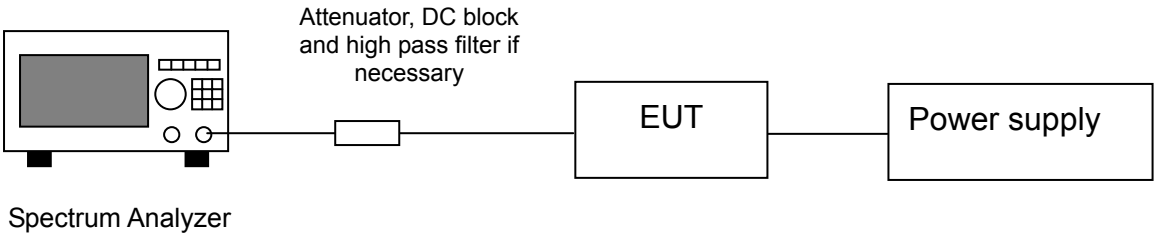
Measurement Data: See plots below

Method of Measurement:

Reference FCC document: KDB558074

The measurements were performed from 30 MHz to 25 GHz RF antenna conducted per FCC 15.247 (d) was measured from the EUT antenna port using a 50 ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set at 100 kHz. Harmonics and spurious noise must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. The table below is the results from the highest emission for each channel within the authorized band. This table was used to determine the spurious limits for each channel.

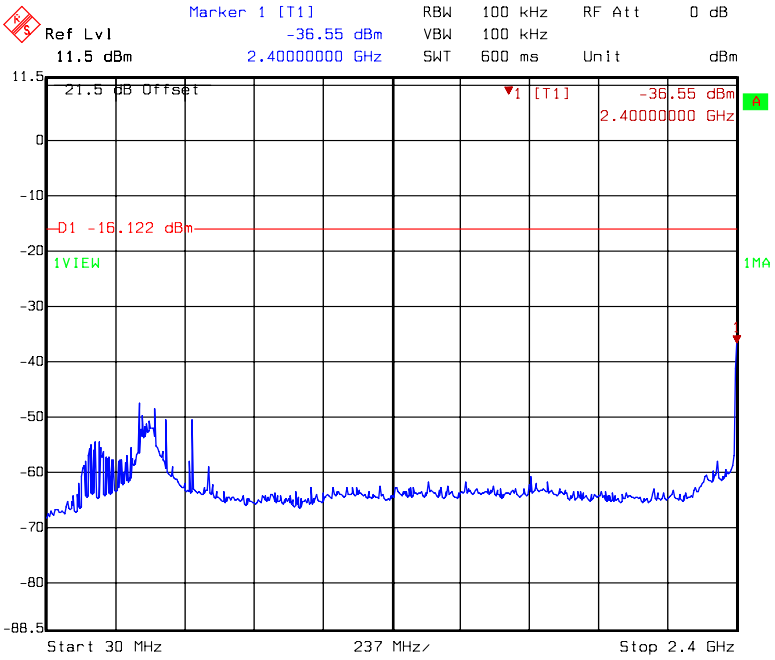
Test Diagram:



Note: (1) he EUT was tested while in a continuous transmit mode and the worst case data rates are Mbps data rate for 802.11b mode, 6 Mbps data rate for 802.11g mode, 6.5 Mbps data rate for 802.11n HT20 mode and 13.5 Mbps data rate for 802.11n HT40 mode. The EUT was tuned to a low, middle and high channel.

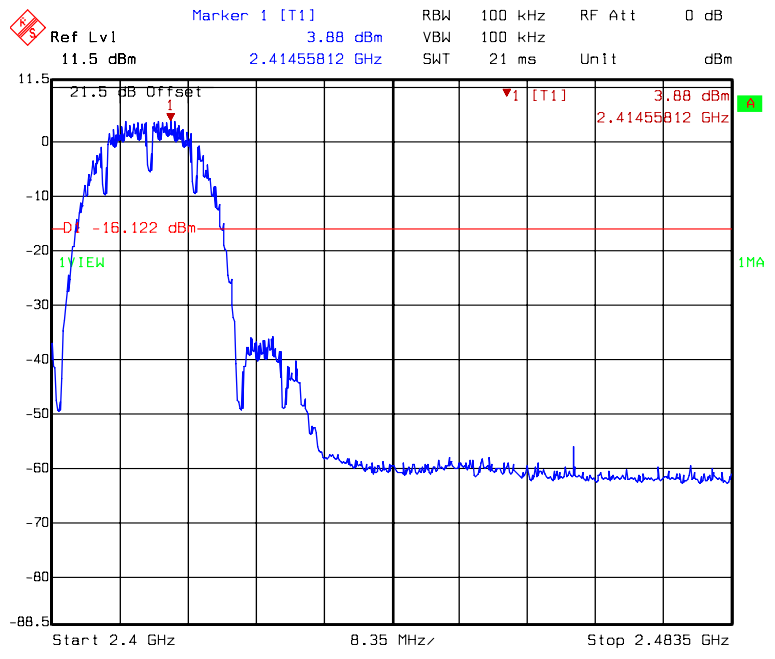
(2) The EUT operating at 2.4 GHz ISM band. Frequency Range scanned from 30 MHz to 25 GHz.

Chain 0: conducted spurious @ 802.11b mode channel 1 (1of 3)



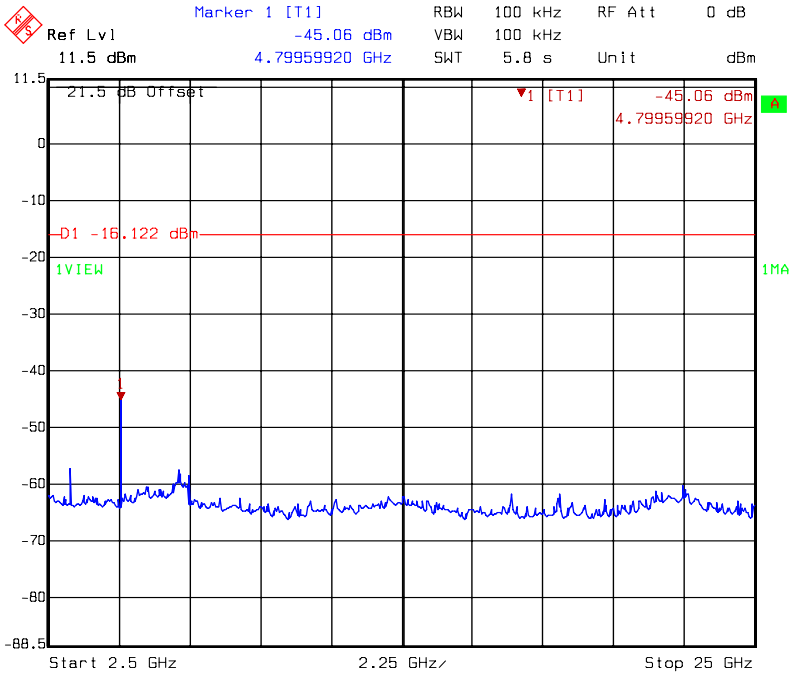
Title: Conductive-Spurious
Comment A: CH 1 at 802.11b mode 30MHz~2400MHzchain0
Date: 02.SEP.2009 09:40:12

Chain 0: conducted spurious @ 802.11b mode channel 1 (2of 3)



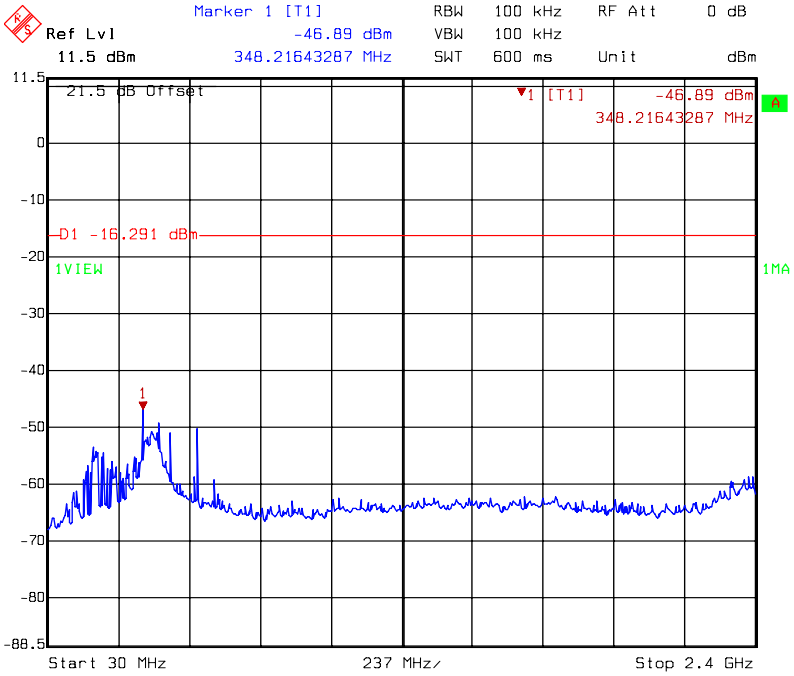
Title: Conductive-Spurious
Comment A: CH 1 at 802.11b mode 2400MHz~2483.5MHzchain0
Date: 02.SEP.2009 09:39:52

Chain 0: conducted spurious @ 802.11b mode channel 1 (3of 3)



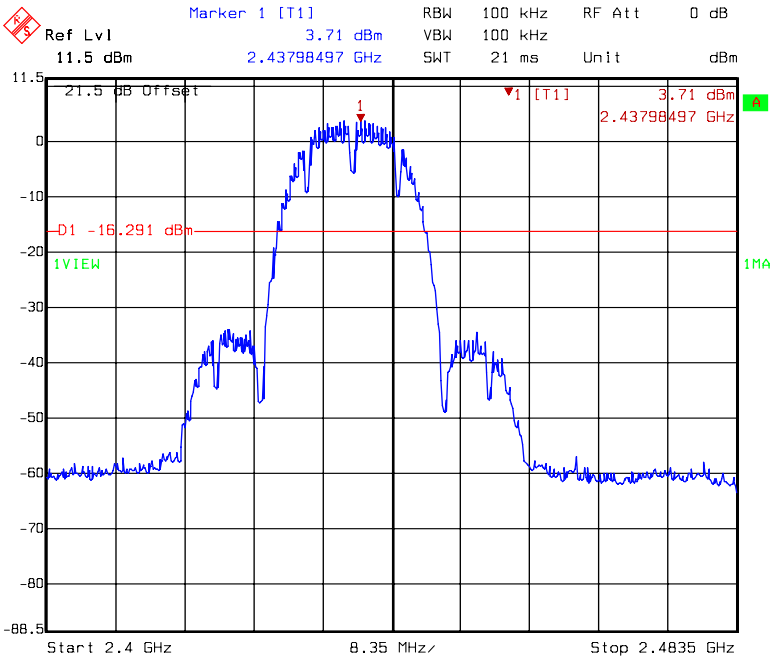
Title: Conductive-Spurious
Comment A: CH 1 at 802.11b mode 2483.5MHz~25GHzchain0
Date: 02.SEP.2009 09:40:39

Chain 0: conducted spurious @ 802.11b mode channel 6 (1of 3)



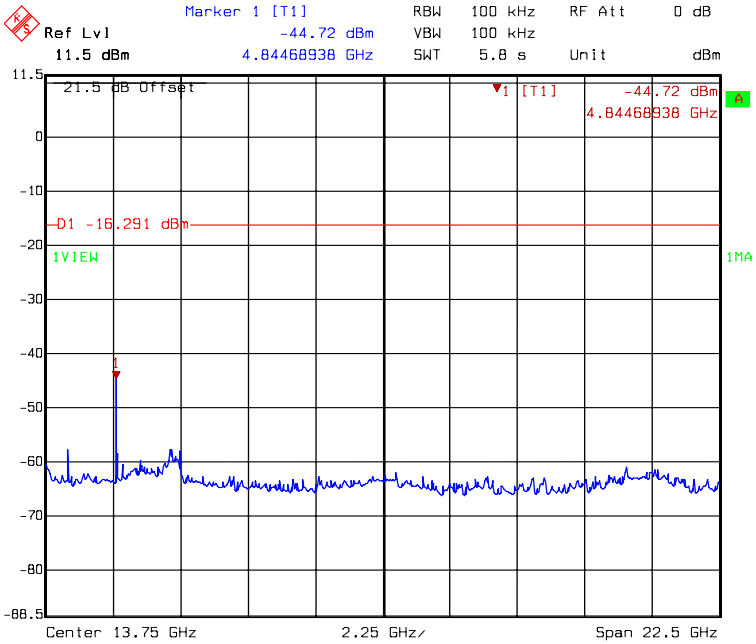
Title: Conductive-Spurious
Comment A: CH 6 at 802.11b mode 30MHz~2400MHzchain0
Date: 02.SEP.2009 09:43:26

Chain 0: conducted spurious @ 802.11b mode channel 6 (2of 3)



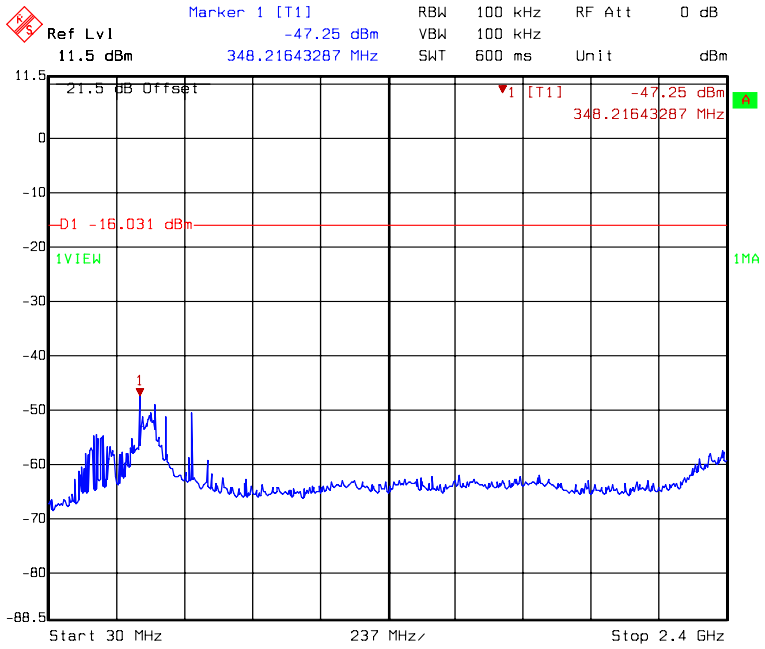
Title: Conductive-Spurious
Comment A: CH 6 at 802.11b mode 2400MHz~2483.5MHzchain0
Date: 02.SEP.2009 09:43:05

Chain 0: conducted spurious @ 802.11b mode channel 6 (3of 3)



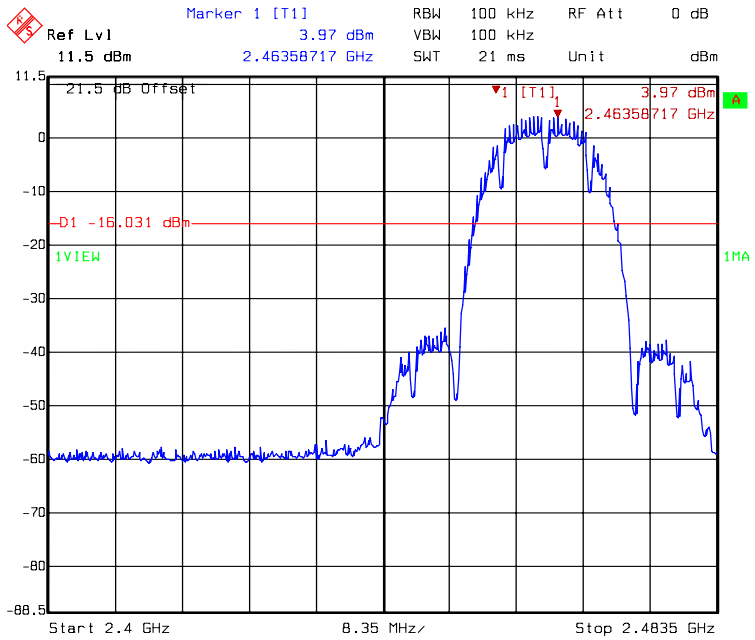
Title: Conductive-Spurious
Comment A: CH 6 at 802.11b mode 2483.5MHz~25GHzchain0
Date: 02.SEP.2009 09:43:52

Chain 0: conducted spurious @ 802.11b mode channel 11 (1of 3)



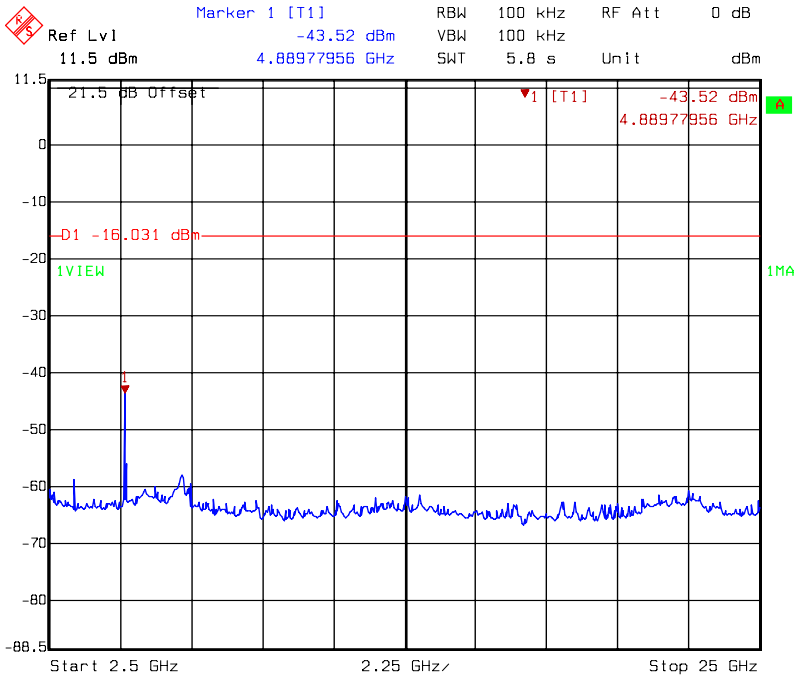
Title: Conductive-Spurious
Comment A: CH 11 at 802.11b mode 30MHz~2400MHzchain0
Date: 02.SEP.2009 09:55:00

Chain 0: conducted spurious @ 802.11b mode channel 11 (2of 3)



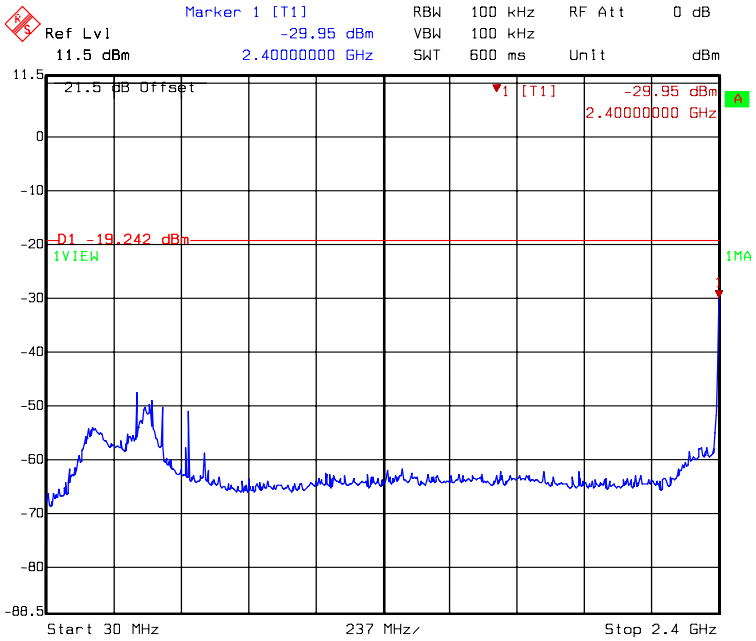
Title: Conductive-Spurious
Comment A: CH 11 at 802.11b mode 2400MHz~2483.5MHzchain0
Date: 02.SEP.2009 09:54:40

Chain 0: conducted spurious @ 802.11b mode channel 11 (3of 3)



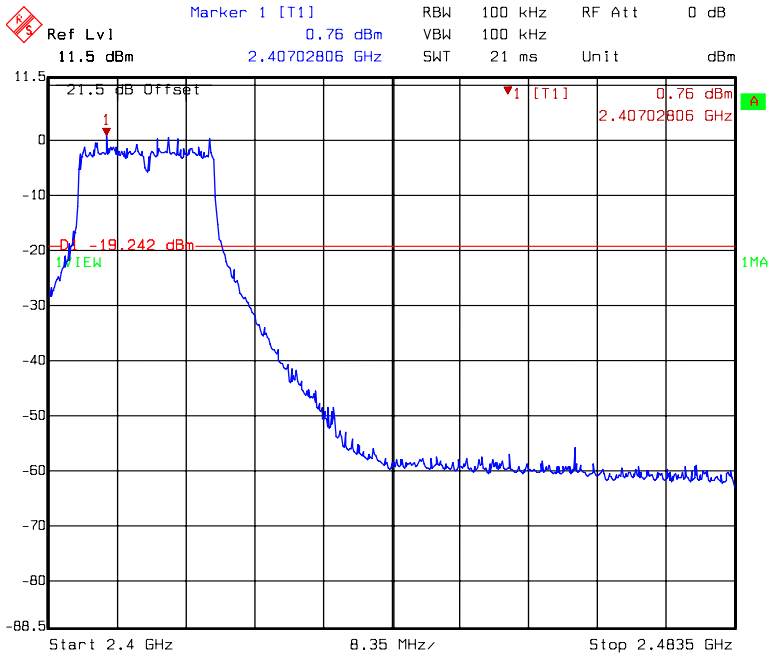
Title: Conductive-Spurious
Comment A: CH 11 at 802.11b mode 2483.5MHz~25GHzchain0
Date: 02.SEP.2009 09:55:27

Chain 0: conducted spurious @ 802.11g mode channel 1 (1of 3)



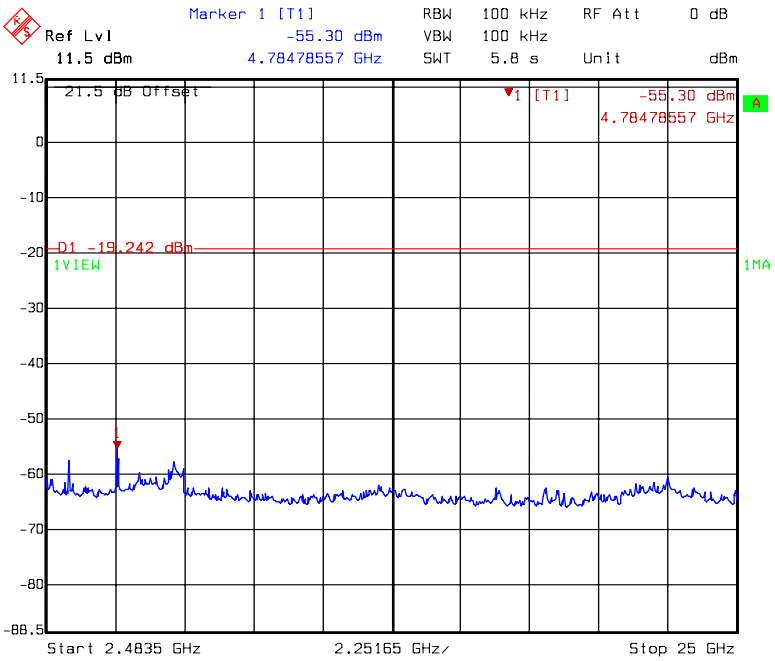
Title: Conductive-Spurious
Comment A: CH 1 at 802.11g mode 30MHz~2400MHzchain0
Date: 02.SEP.2009 11:39:25

Chain 0: conducted spurious @ 802.11g mode channel 1 (2of 3)



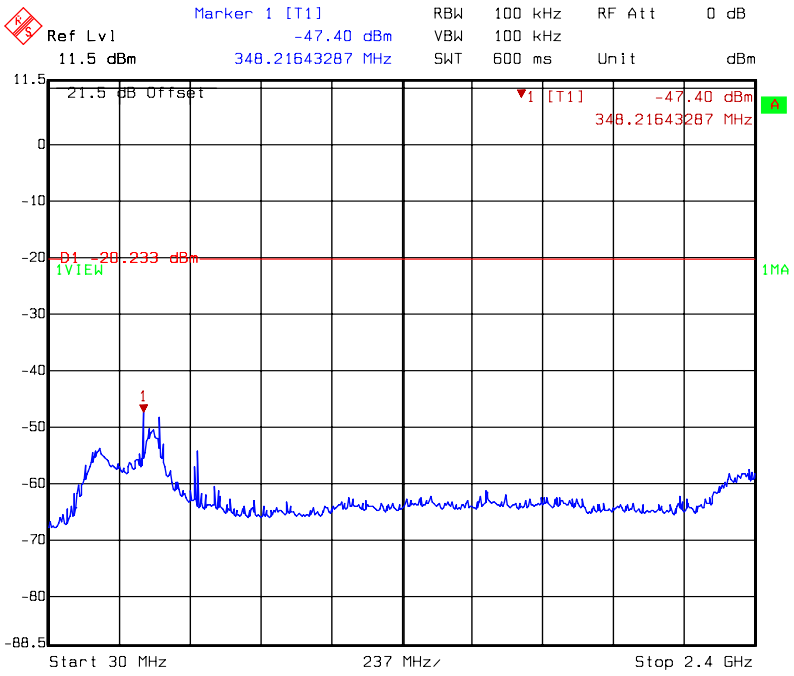
Title: Conductive-Spurious
Comment A: CH 1 at 802.11g mode 2400MHz~2483.5MHzchain0
Date: 02.SEP.2009 11:39:05

Chain 0: conducted spurious @ 802.11g mode channel 1 (3of 3)



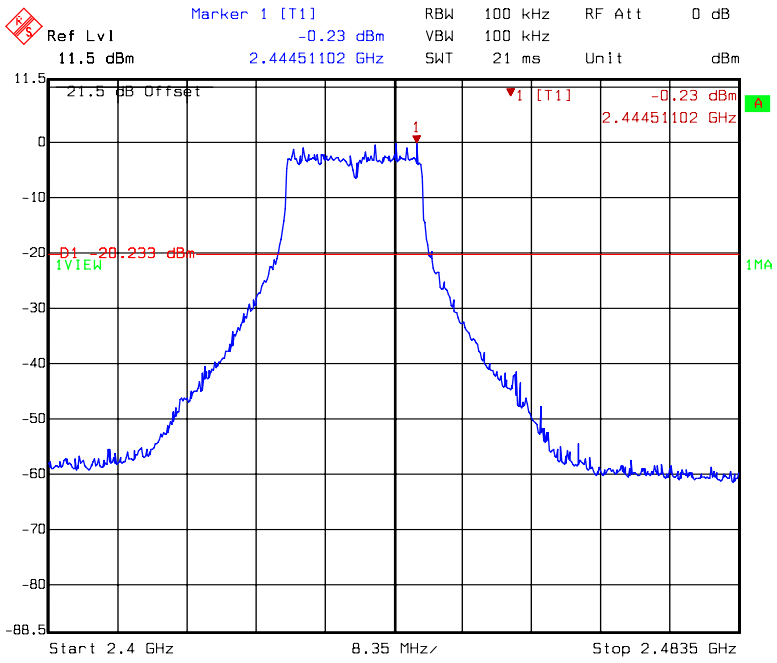
Title: Conductive-Spurious
Comment A: CH 1 at 802.11g mode 2483.5MHz~25000MHzchain0
Date: 02.SEP.2009 11:39:52

Chain 0: conducted spurious @ 802.11g mode channel 6 (1of 3)



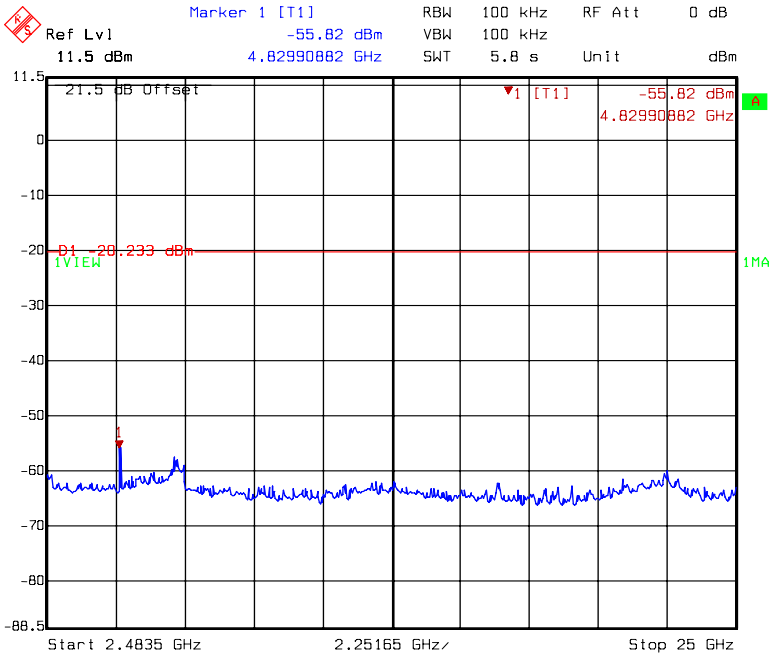
Title: Conductive-Spurious
Comment A: CH 6 at 802.11g mode 30MHz~2400MHzchain0
Date: 02.SEP.2009 11:42:11

Chain 0: conducted spurious @ 802.11g mode channel 6 (2of 3)



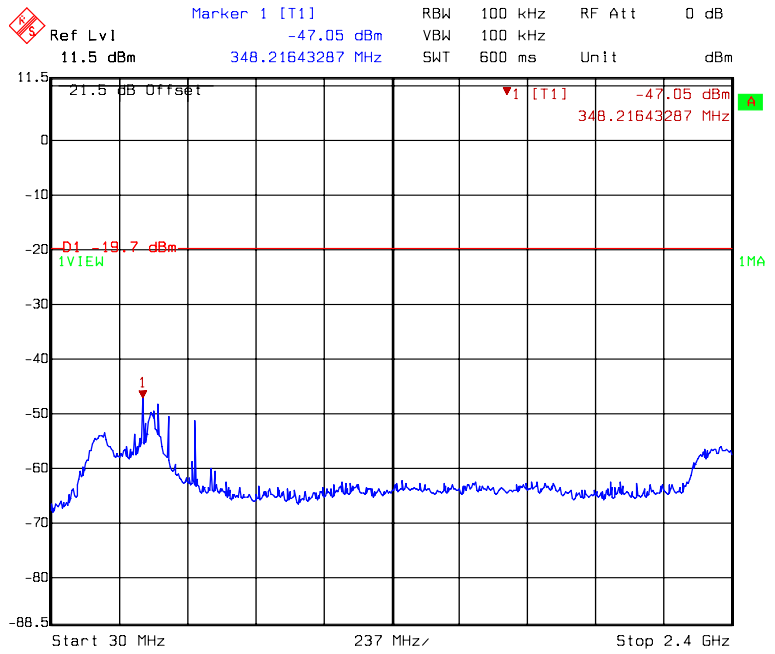
Title: Conductive-Spurious
Comment A: CH 6 at 802.11g mode 2400MHz~2483.5MHzchain0
Date: 02.SEP.2009 11:41:50

Chain 0: conducted spurious @ 802.11g mode channel 6 (3of 3)



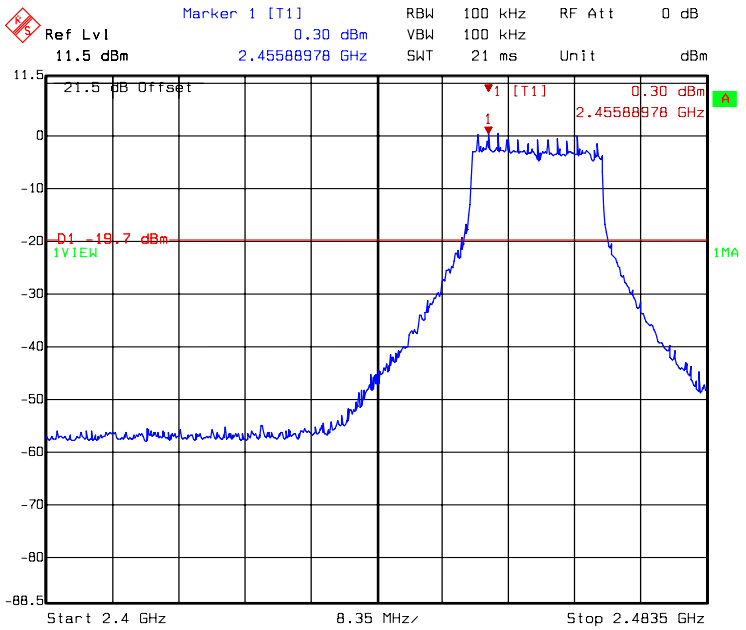
Title: Conductive-Spurious
Comment A: CH 6 at 802.11g mode 2483.5MHz~25000MHzchain0
Date: 02.SEP.2009 11:42:37

Chain 0: conducted spurious @ 802.11g mode channel 11 (1of 3)



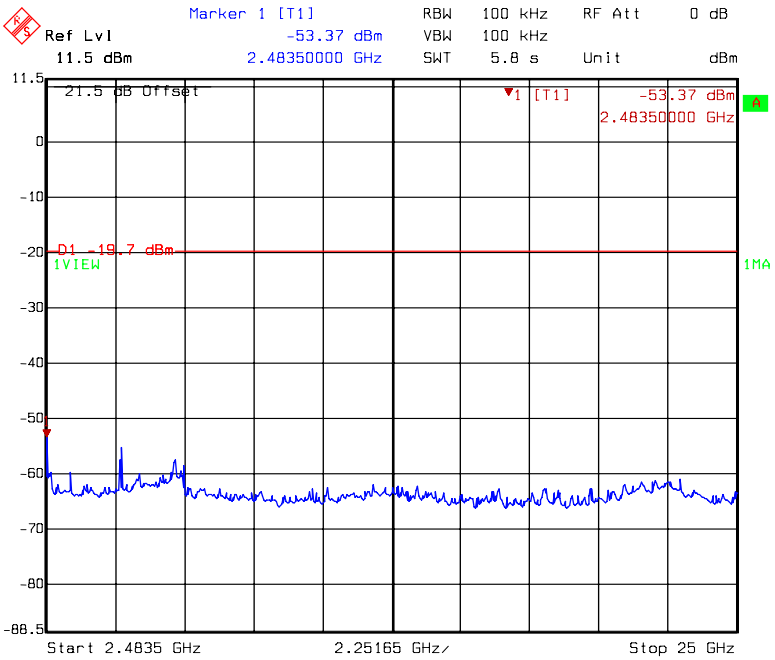
Title: Conductive-Spurious
Comment A: CH 11 at 802.11g mode 30MHz~2400MHzchain0
Date: 02.SEP.2009 11:44:53

Chain 0: conducted spurious @ 802.11g mode channel 11 (2of 3)



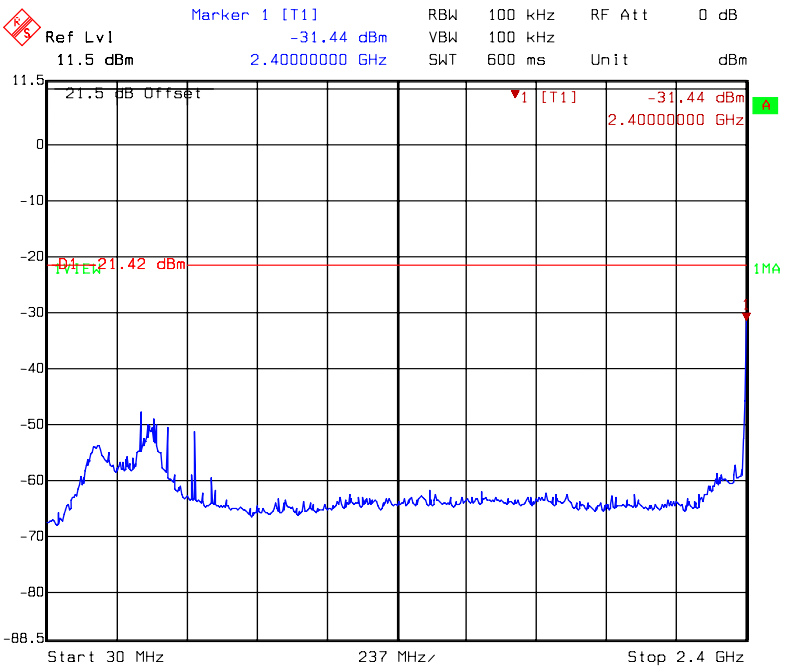
Title: Conductive-Spurious
Comment A: CH 11 at 802.11g mode 2400MHz~2483.5MHzchain0
Date: 02.SEP.2009 11:44:33

Chain 0: conducted spurious @ 802.11g mode channel 11 (3of 3)

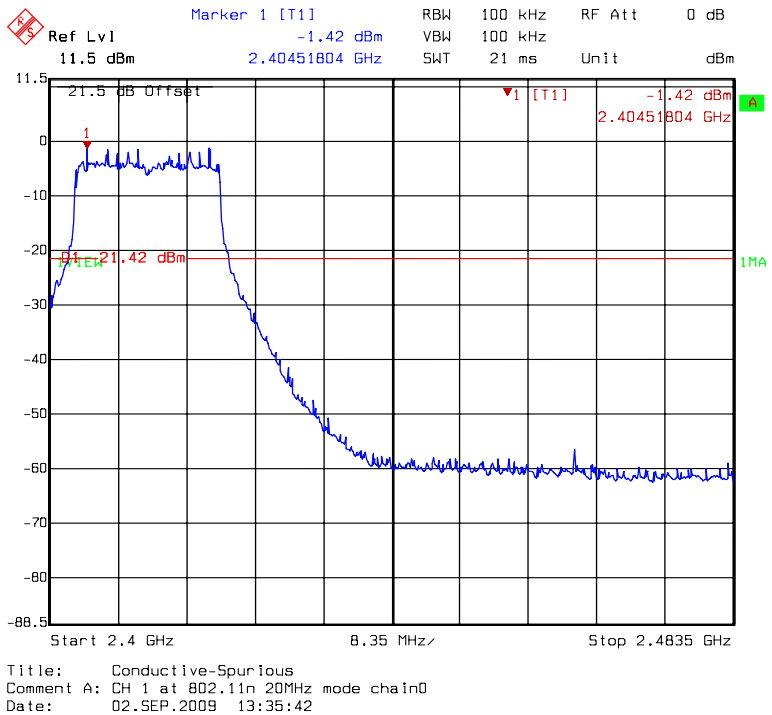


Title: Conductive-Spurious
Comment A: CH 11 at 802.11g mode 2483.5MHz~25000MHzchain0
Date: 02.SEP.2009 11:45:20

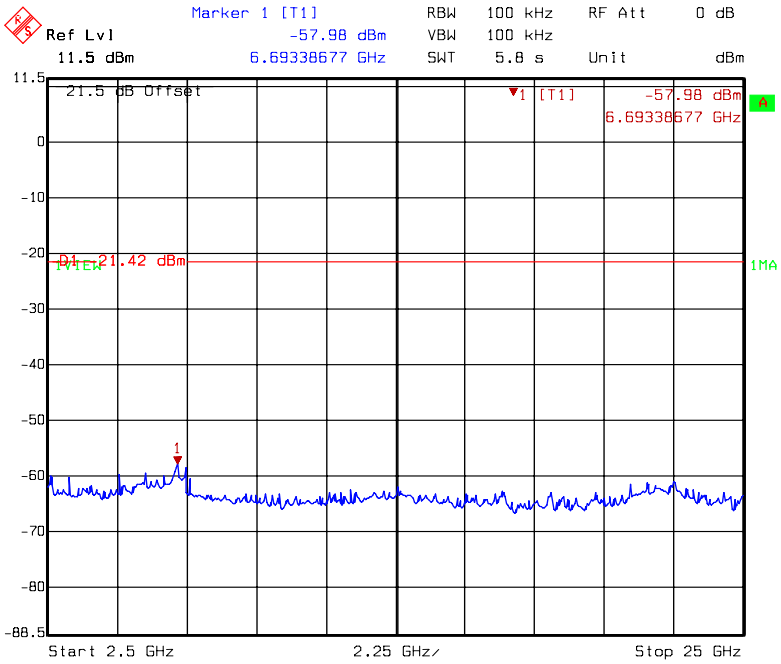
Chain 0: conducted spurious @ 802.11n HT20 mode channel 1 (1of 3)



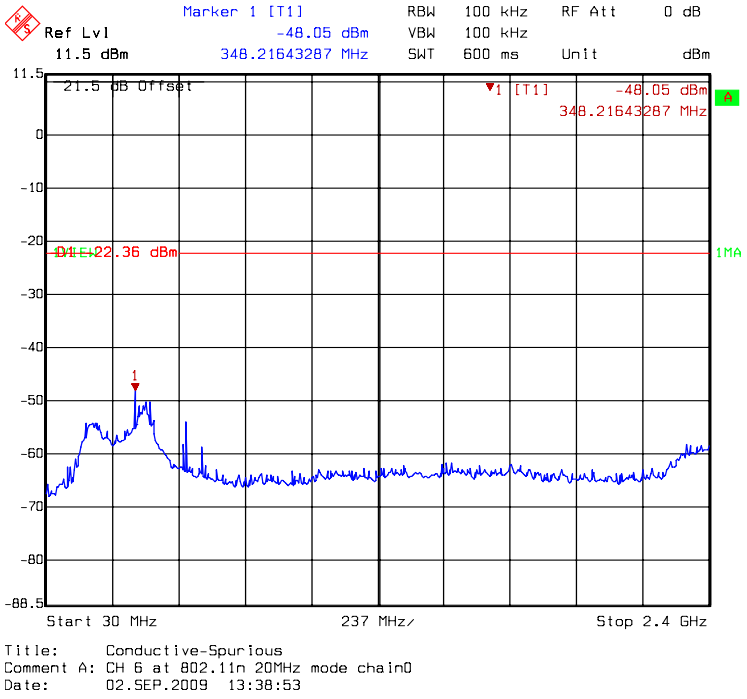
Chain 0: conducted spurious @ 802.11n HT20 mode channel 1 (2of 3)



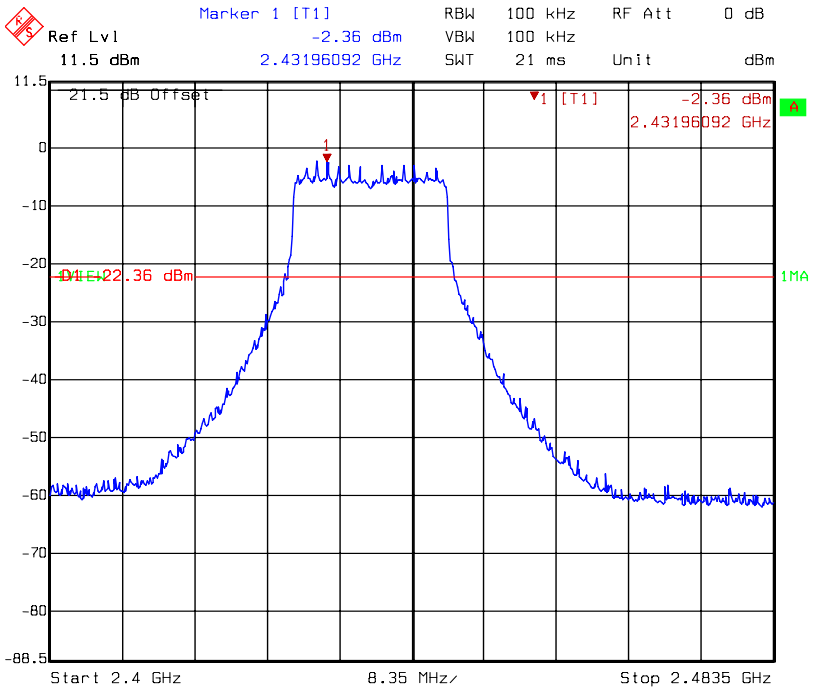
Chain 0: conducted spurious @ 802.11n HT20 mode channel 1 (3of 3)



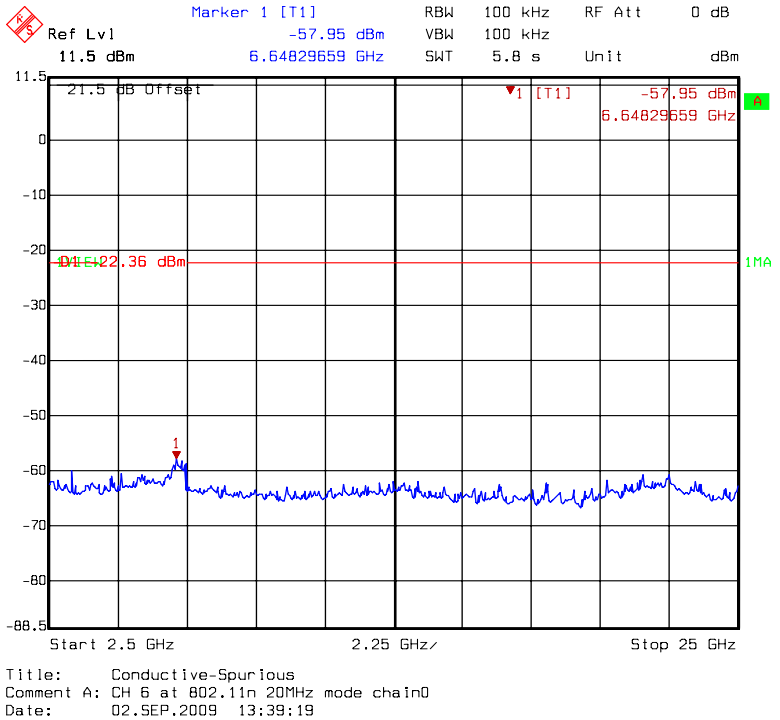
Chain 0: conducted spurious @ 802.11n HT20 mode channel 6 (1of 3)



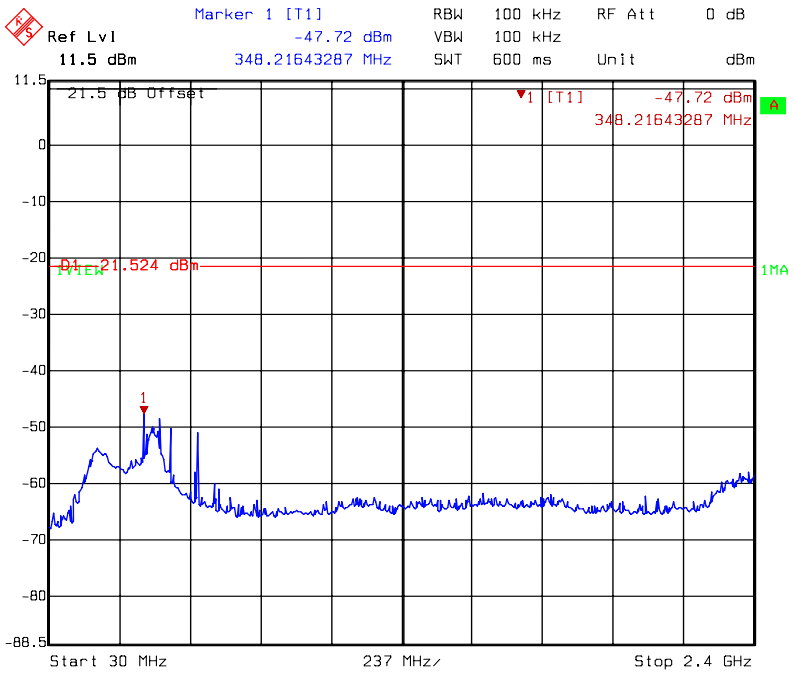
Chain 0: conducted spurious @ 802.11n HT20 mode channel 6 (2of 3)



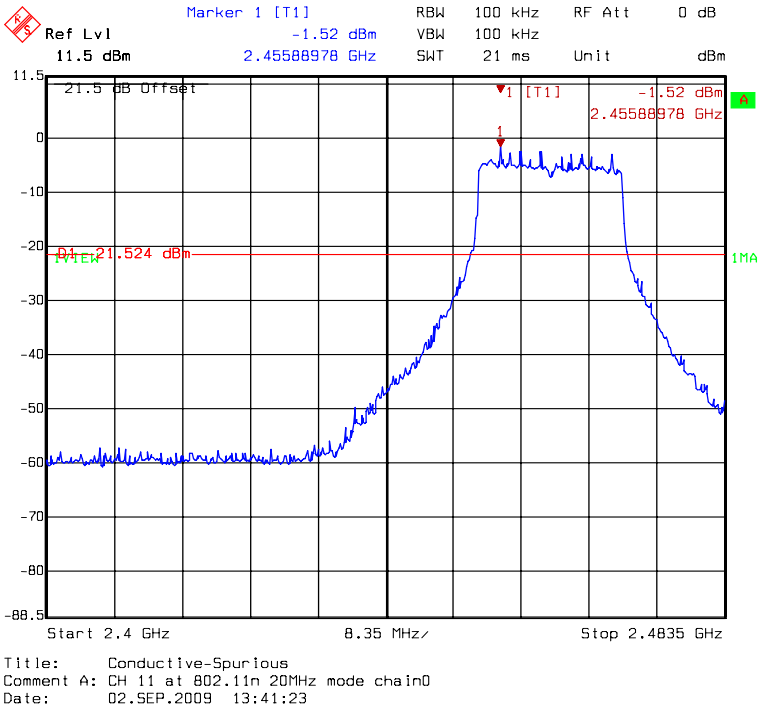
Chain 0: conducted spurious @ 802.11n HT20 mode channel 6 (3of 3)



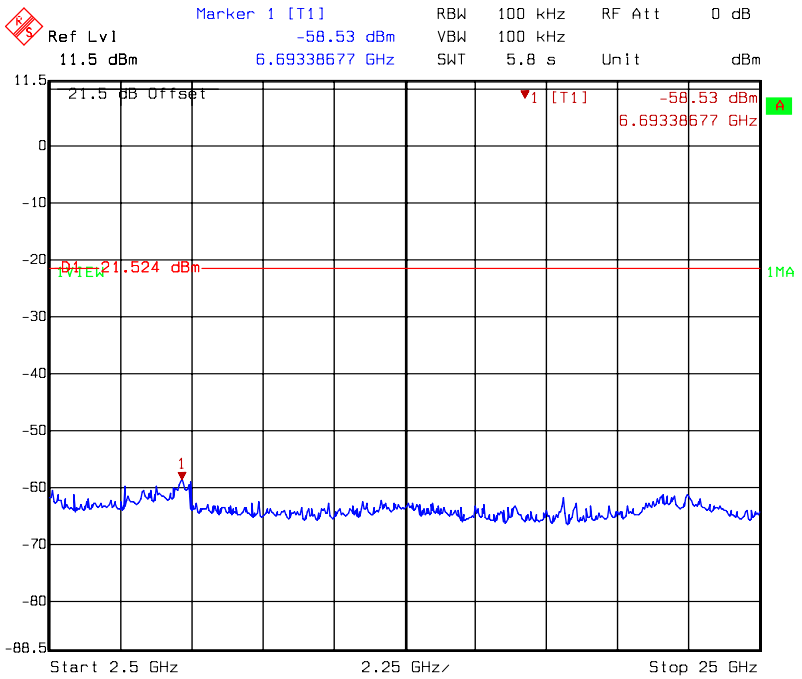
Chain 0: conducted spurious @ 802.11n HT20 mode channel 11 (1of 3)



Chain 0: conducted spurious @ 802.11n HT20 mode channel 11 (2of 3)

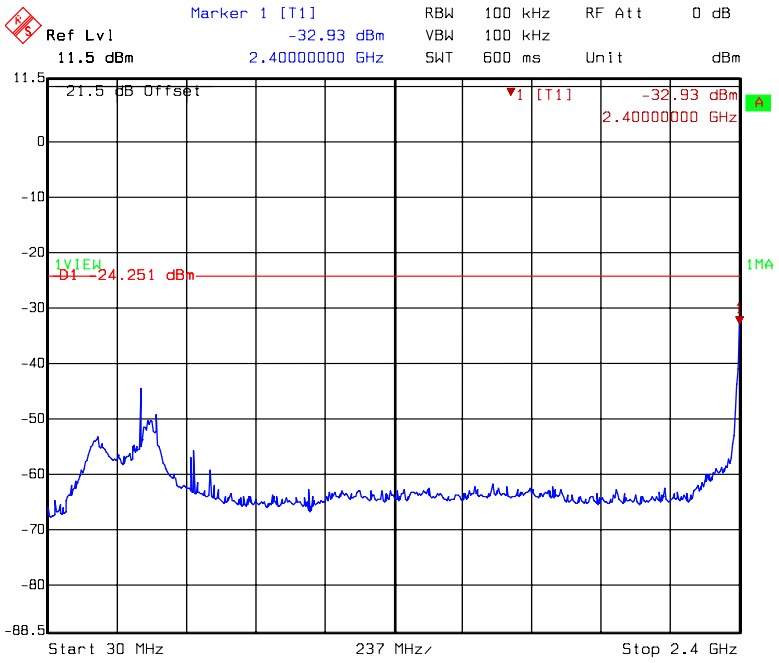


Chain 0: conducted spurious @ 802.11n HT20 mode channel 11 (3of 3)



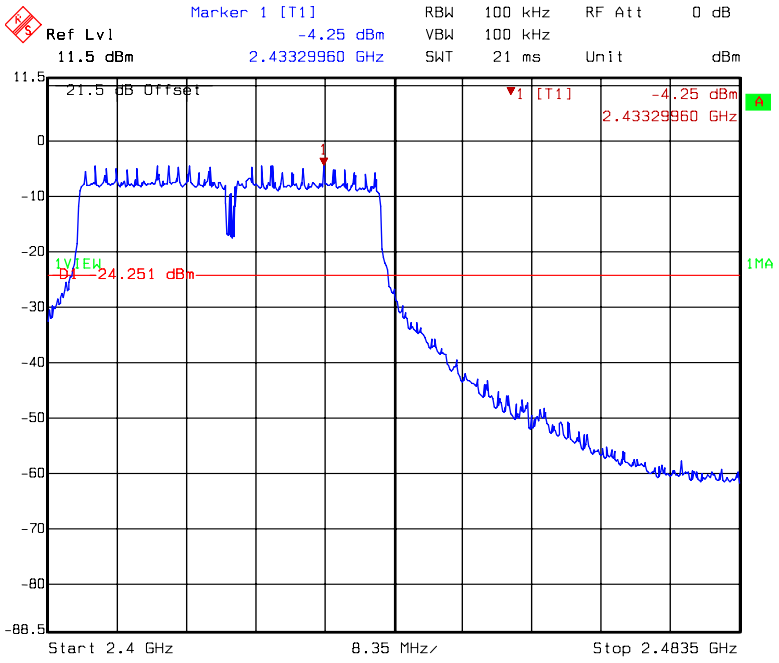
Title: Conductive-Spurious
Comment A: CH 11 at 802.11n 20MHz mode chain0
Date: 02.SEP.2009 13:42:11

Chain 0: conducted spurious @ 802.11n HT40 mode channel 3 (1of 3)



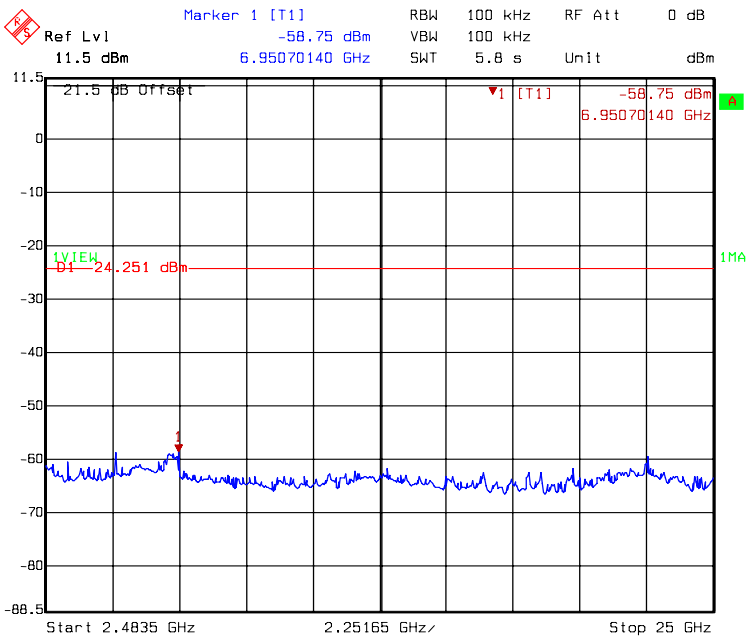
Title: Conductive-Spurious
Comment A: CH 3 at 802.11n 40MHz mode chain0
Date: 02.SEP.2009 13:45:05

Chain 0: conducted spurious @ 802.11n HT40 mode channel 3 (2of 3)



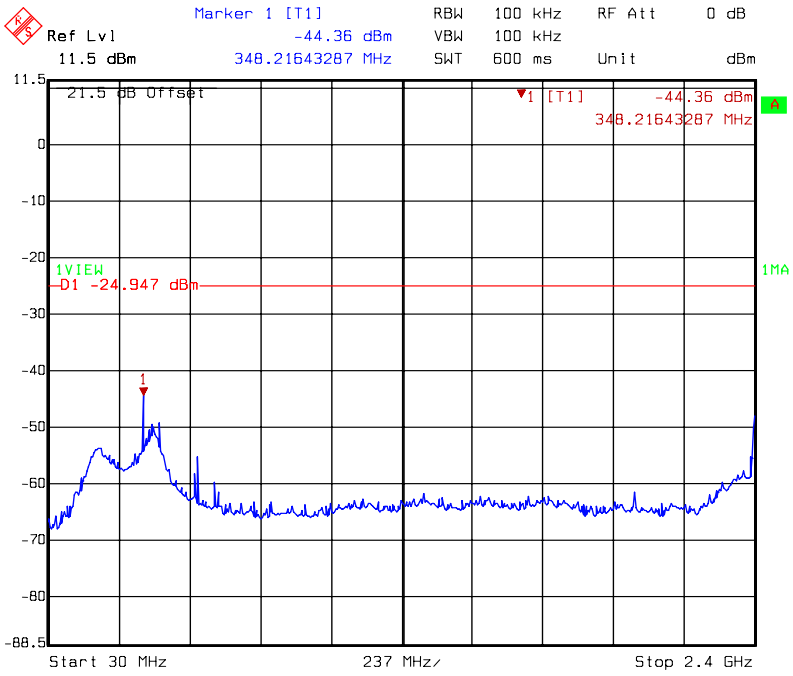
Title: Conductive-Spurious
Comment A: CH 3 at 802.11n 40MHz mode chain0
Date: 02.SEP.2009 13:44:44

Chain 0: conducted spurious @ 802.11n HT40 mode channel 3 (3of 3)



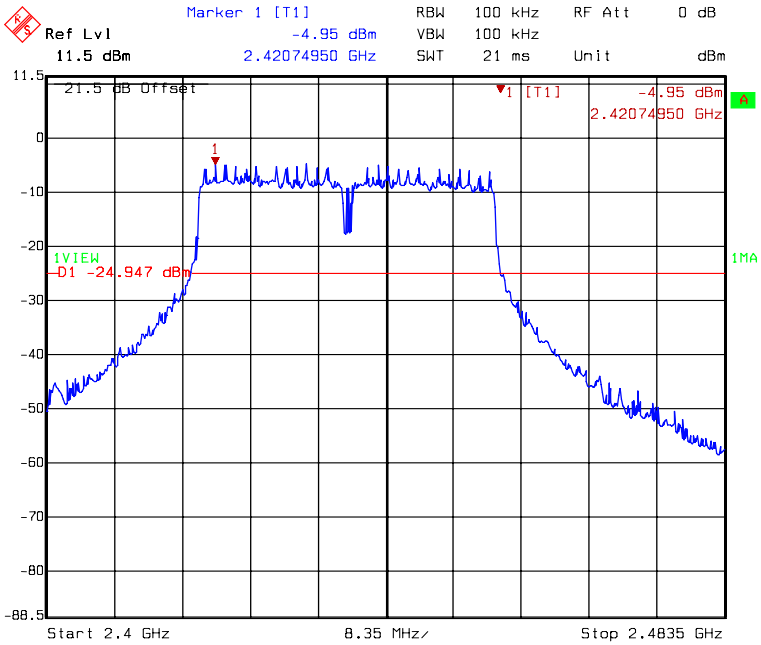
Title: Conductive-Spurious
Comment A: CH 3 at 802.11n 40MHz mode chain0
Date: 02.SEP.2009 13:45:32

Chain 0: conducted spurious @ 802.11n HT40 mode channel 6 (1of 3)



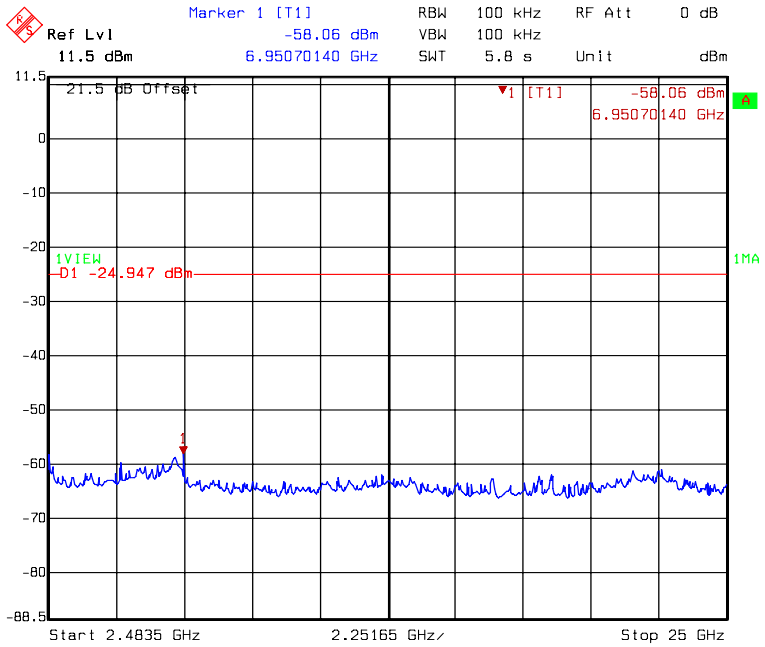
Title: Conductive-Spurious
Comment A: CH 6 at 802.11n 40MHz mode chain0
Date: 02.SEP.2009 13:48:25

Chain 0: conducted spurious @ 802.11n HT40 mode channel 6 (2of 3)

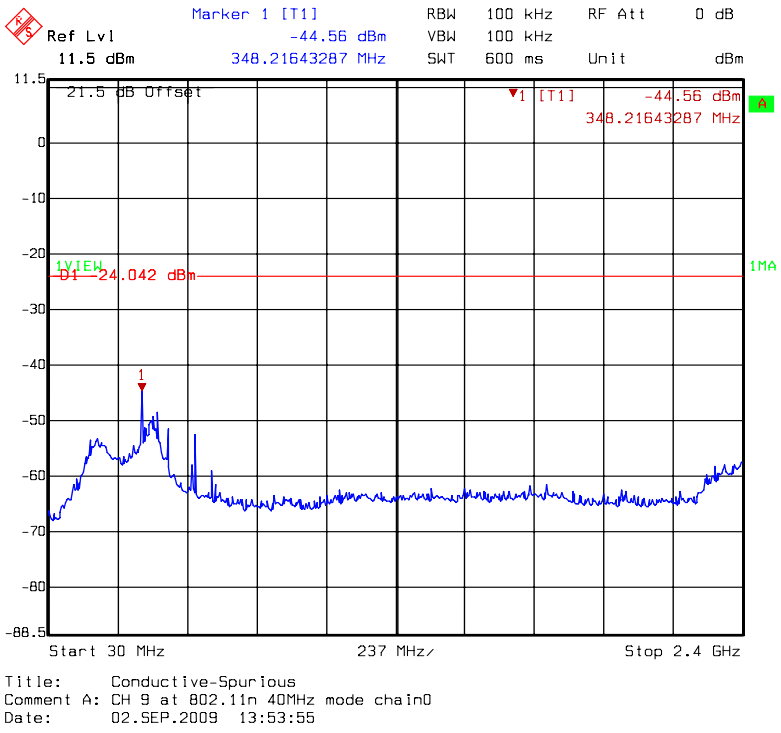


Title: Conductive-Spurious
Comment A: CH 6 at 802.11n 40MHz mode chain0
Date: 02.SEP.2009 13:48:04

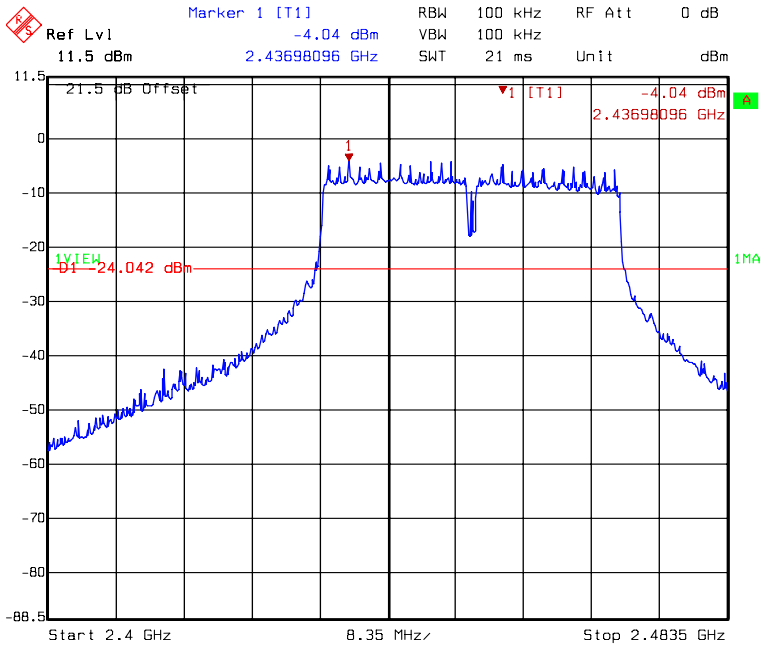
Chain 0: conducted spurious @ 802.11n HT40 mode channel 6 (3of 3)



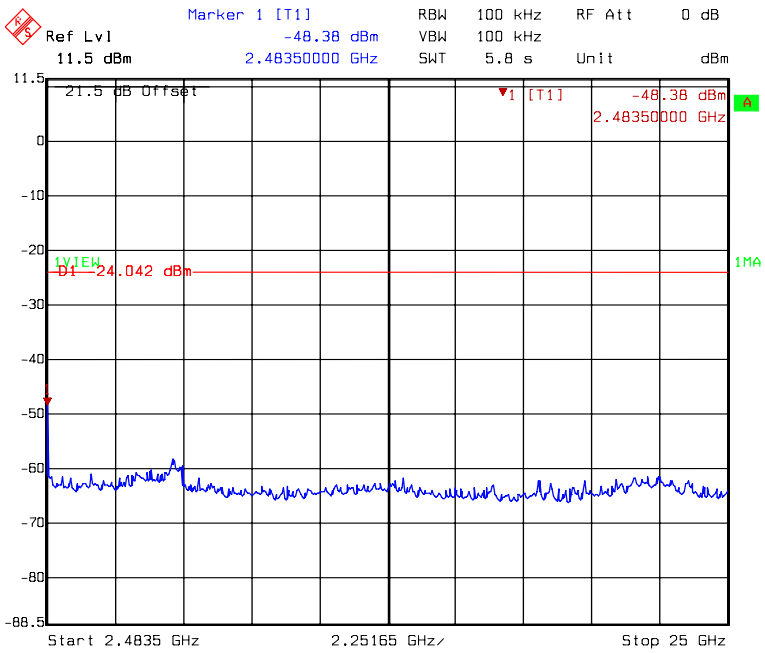
Chain 0: conducted spurious @ 802.11n HT40 mode channel 9 (1of 3)



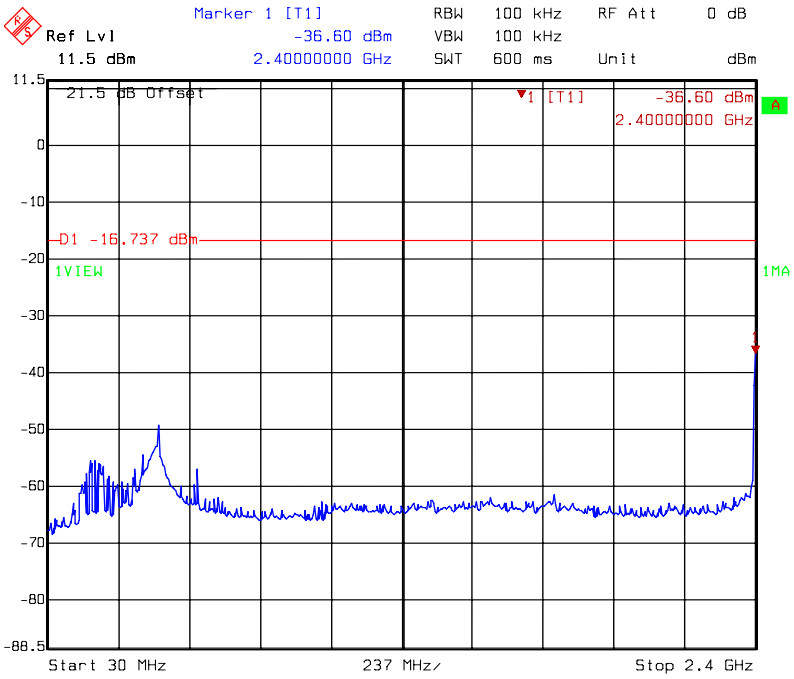
Chain 0: conducted spurious @ 802.11n HT40 mode channel 9 (2of 3)



Chain 0: conducted spurious @ 802.11n HT40 mode channel 9 (3of 3)

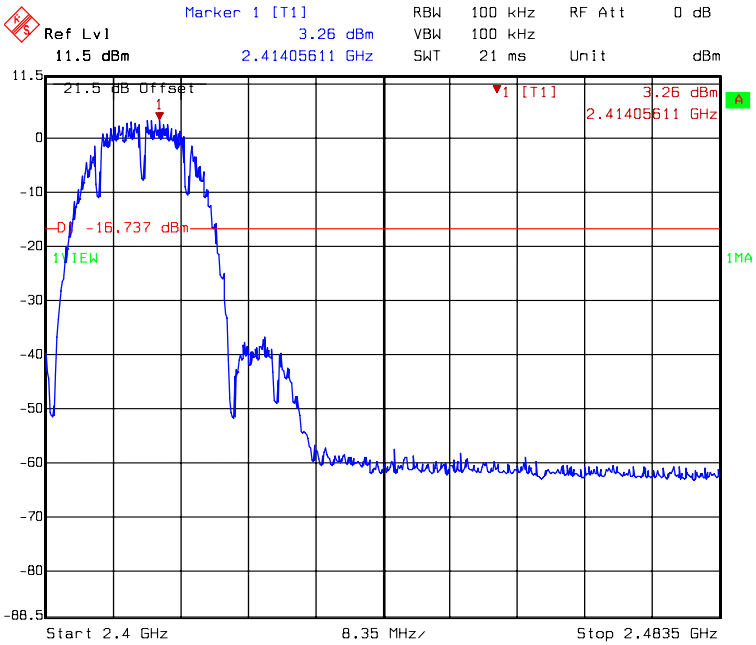


Chain 1: conducted spurious @ 802.11b mode channel 1 (1of 3)



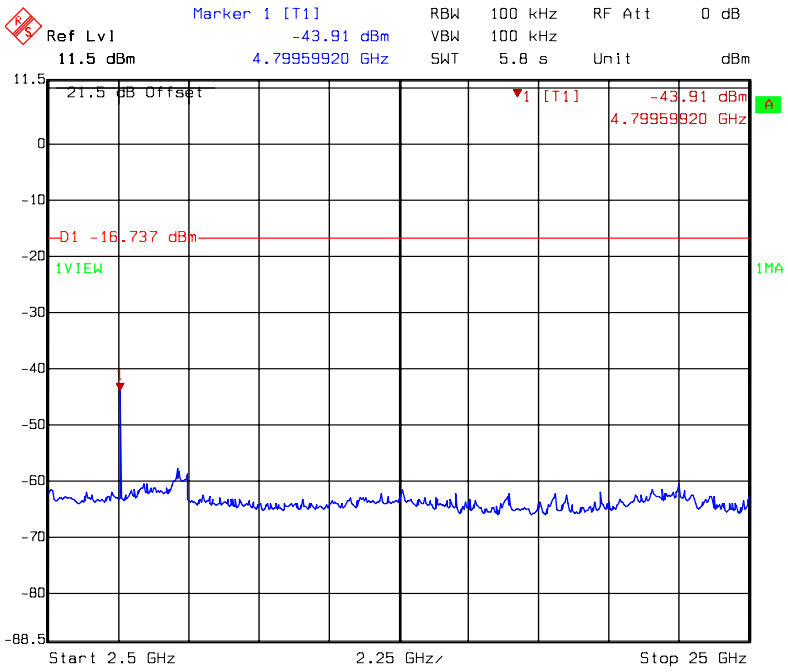
Title: Conductive-Spurious
Comment A: CH 1 at 802.11b mode 30MHz~2400MHzchain1
Date: 02.SEP.2009 15:00:24

Chain 1: conducted spurious @ 802.11b mode channel 1 (2of 3)

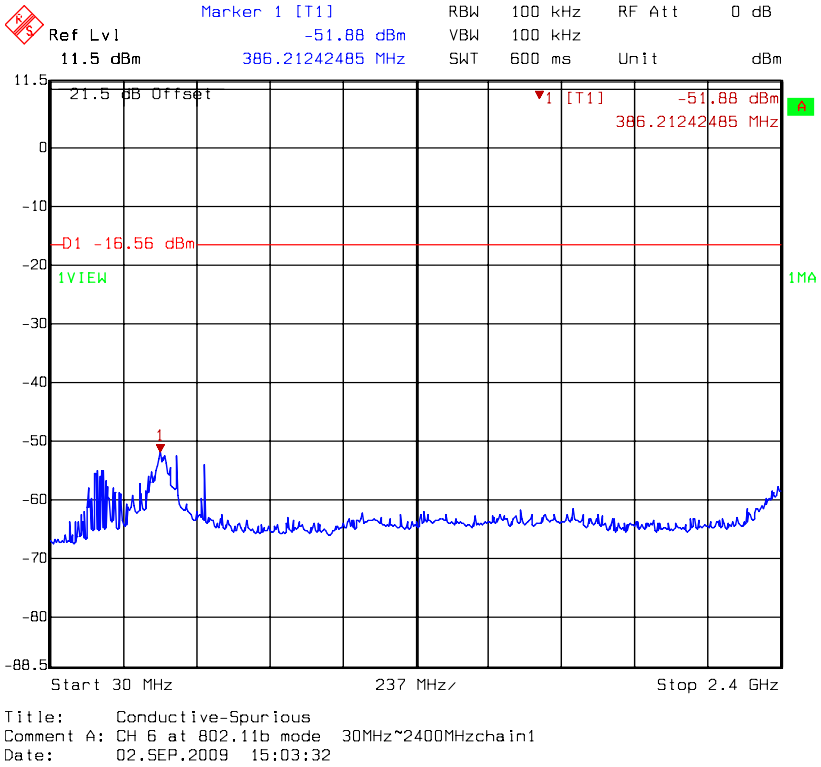


Title: Conductive-Spurious
Comment A: CH 1 at 802.11b mode 2400MHz~2483.5MHzchain1
Date: 02.SEP.2009 15:00:03

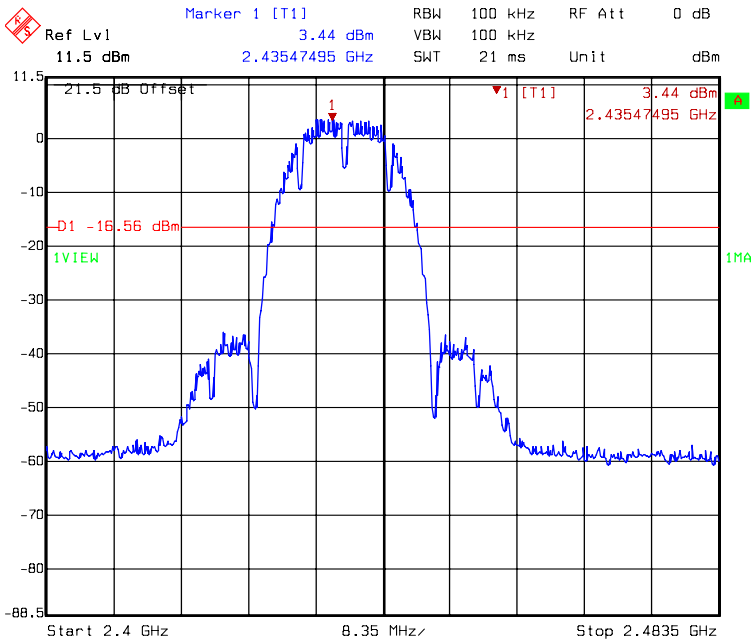
Chain 1: conducted spurious @ 802.11b mode channel 1 (3of 3)



Chain 1: conducted spurious @ 802.11b mode channel 6 (1of 3)

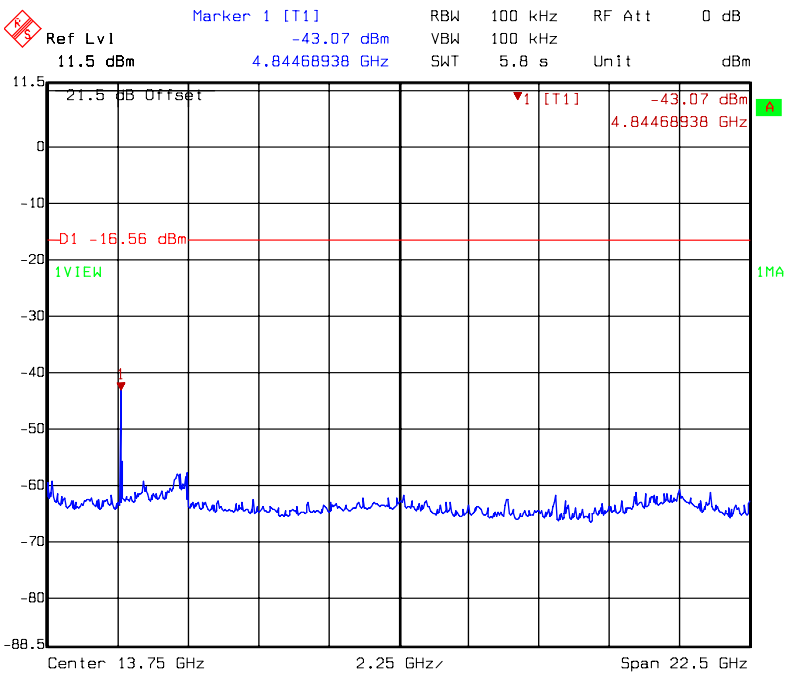


Chain 1: conducted spurious @ 802.11b mode channel 6 (2of 3)



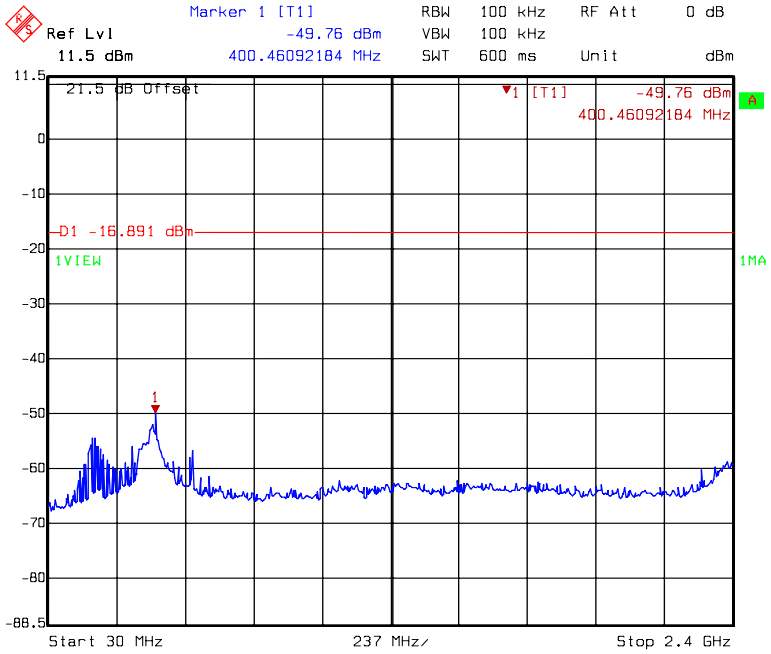
Title: Conductive-Spurious
Comment A: CH 6 at 802.11b mode 2400MHz~2483.5MHzchain1
Date: 02.SEP.2009 15:03:11

Chain 1: conducted spurious @ 802.11b mode channel 6 (3of 3)

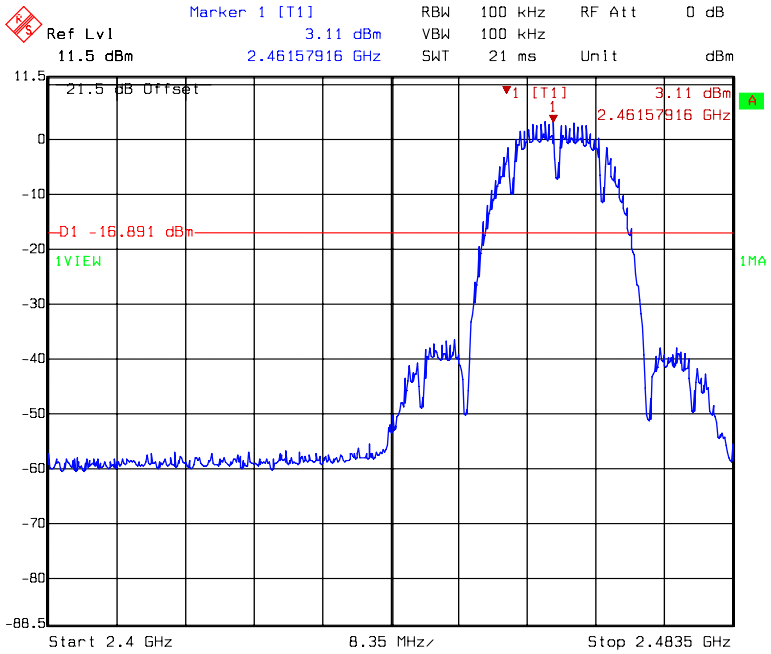


Title: Conductive-Spurious
Comment A: CH 6 at 802.11b mode 2483.5MHz~25GHzchain1
Date: 02.SEP.2009 15:03:59

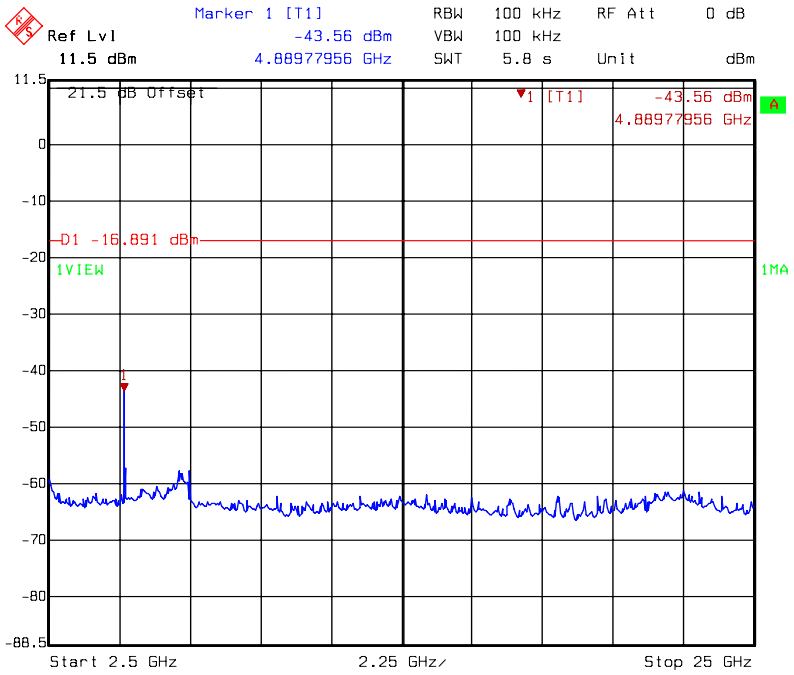
Chain 1: conducted spurious @ 802.11b mode channel 11 (1of 3)



Chain 1: conducted spurious @ 802.11b mode channel 11 (2of 3)

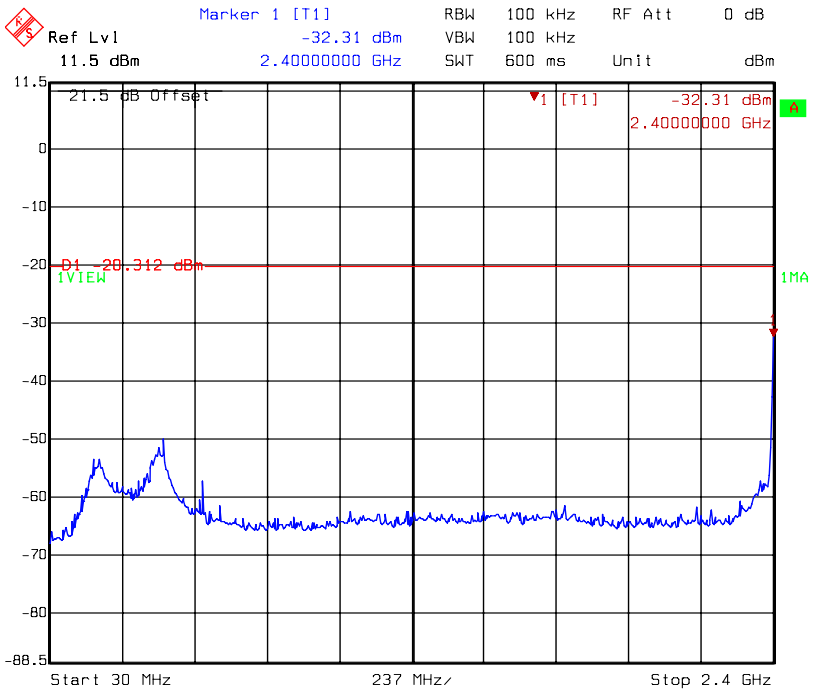


Chain 1: conducted spurious @ 802.11b mode channel 11 (3of 3)



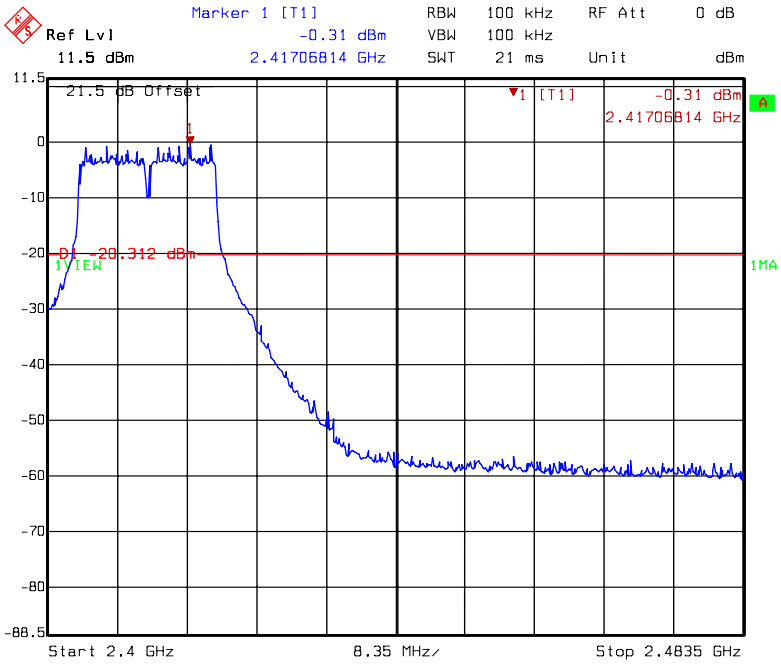
Title: Conductive-Spurious
Comment A: CH 11 at 802.11b mode 2483.5MHz~25GHzchain1
Date: 02.SEP.2009 15:06:46

Chain 1: conducted spurious @ 802.11g mode channel 1 (1of 3)



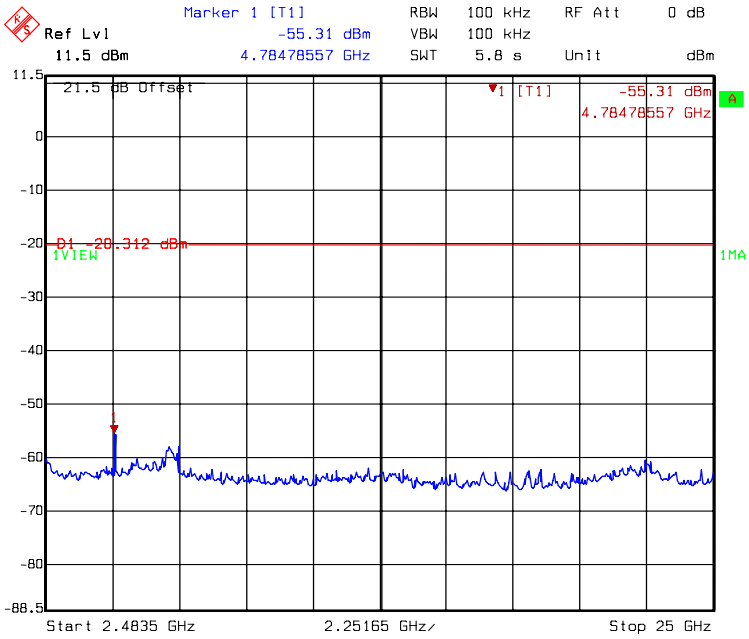
Title: Conductive-Spurious
Comment A: CH 1 at 802.11g mode 30MHz~2400MHzchain1
Date: 02.SEP.2009 15:25:01

Chain 1: conducted spurious @ 802.11g mode channel 1 (2of 3)



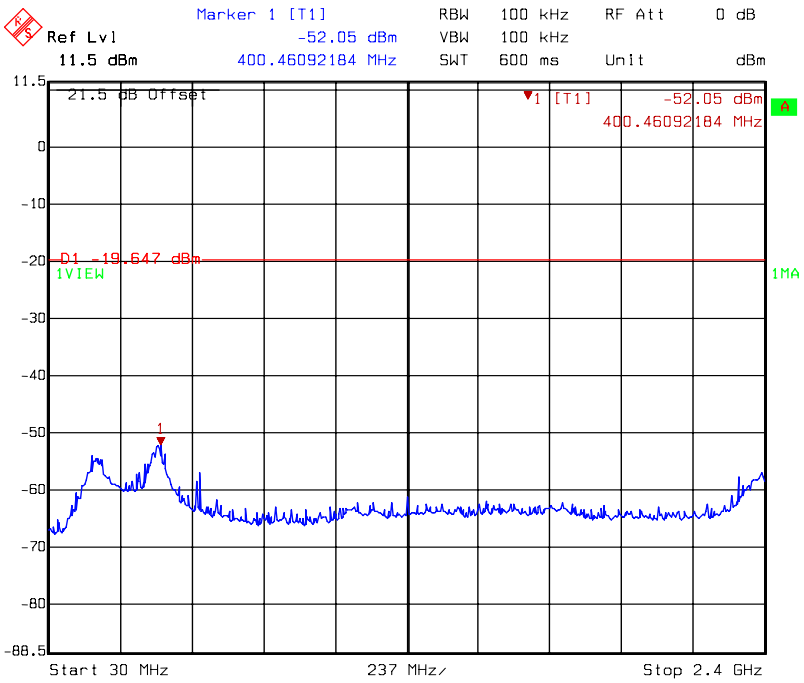
Title: Conductive-Spurious
Comment A: CH 1 at 802.11g mode 2400MHz~2483.5MHzchain1
Date: 02.SEP.2009 15:24:40

Chain 1: conducted spurious @ 802.11g mode channel 1 (3of 3)



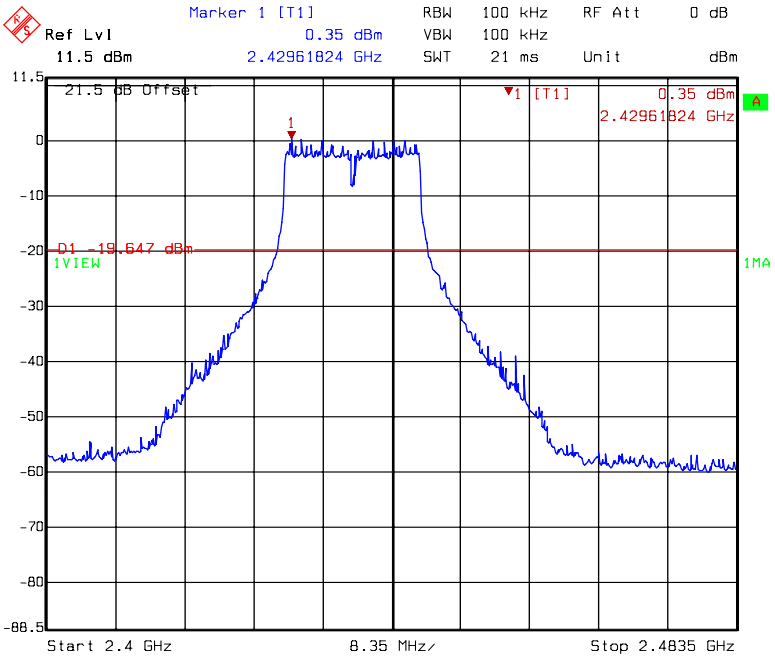
Title: Conductive-Spurious
Comment A: CH 1 at 802.11g mode 2483.5MHz~25000MHzchain1
Date: 02.SEP.2009 15:25:28

Chain 1: conducted spurious @ 802.11g mode channel 6 (1of 3)



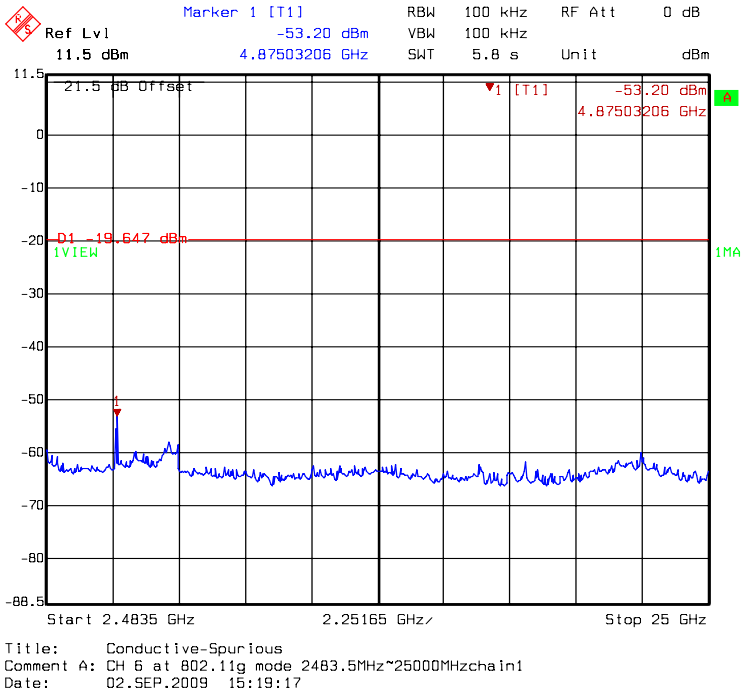
Title: Conductive-Spurious
Comment A: CH 6 at 802.11g mode 30MHz~2400MHzchain1
Date: 02.SEP.2009 15:18:50

Chain 1: conducted spurious @ 802.11g mode channel 6 (2of 3)

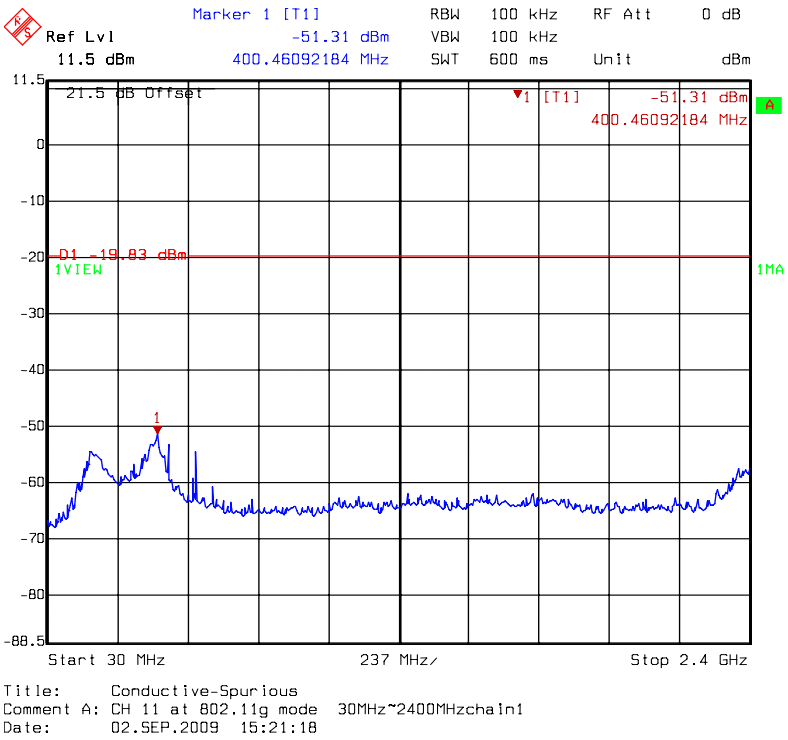


Title: Conductive-Spurious
Comment A: CH 6 at 802.11g mode 2400MHz~2483.5MHzchain1
Date: 02.SEP.2009 15:18:30

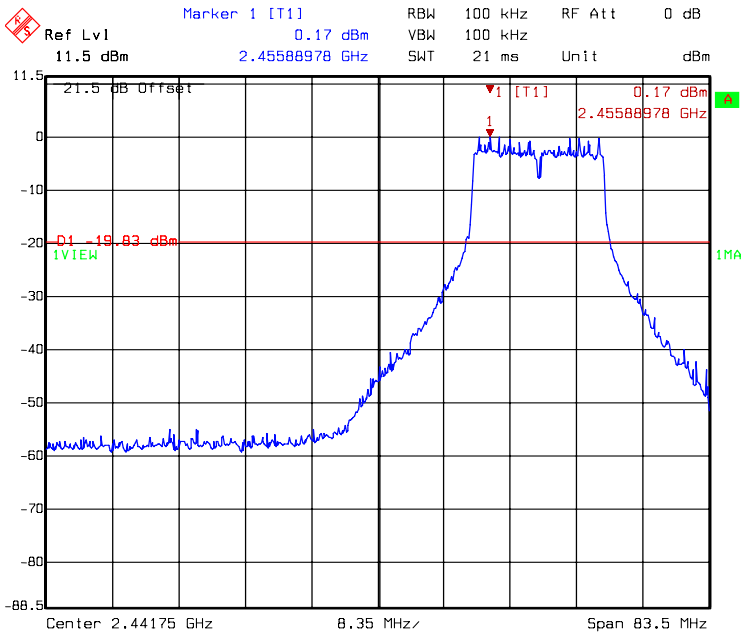
Chain 1: conducted spurious @ 802.11g mode channel 6 (3of 3)



Chain 1: conducted spurious @ 802.11g mode channel 11 (1of 3)

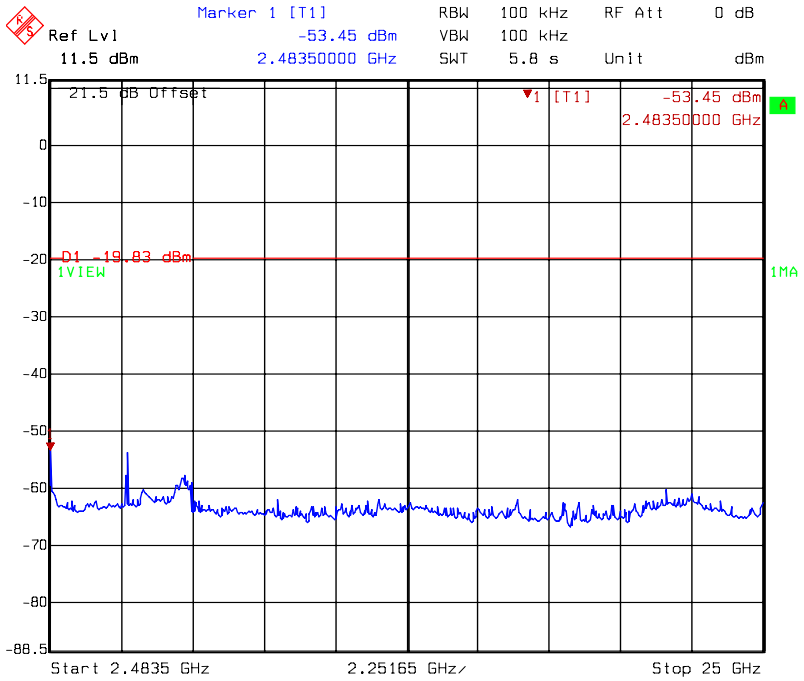


Chain 1: conducted spurious @ 802.11g mode channel 11 (2of 3)



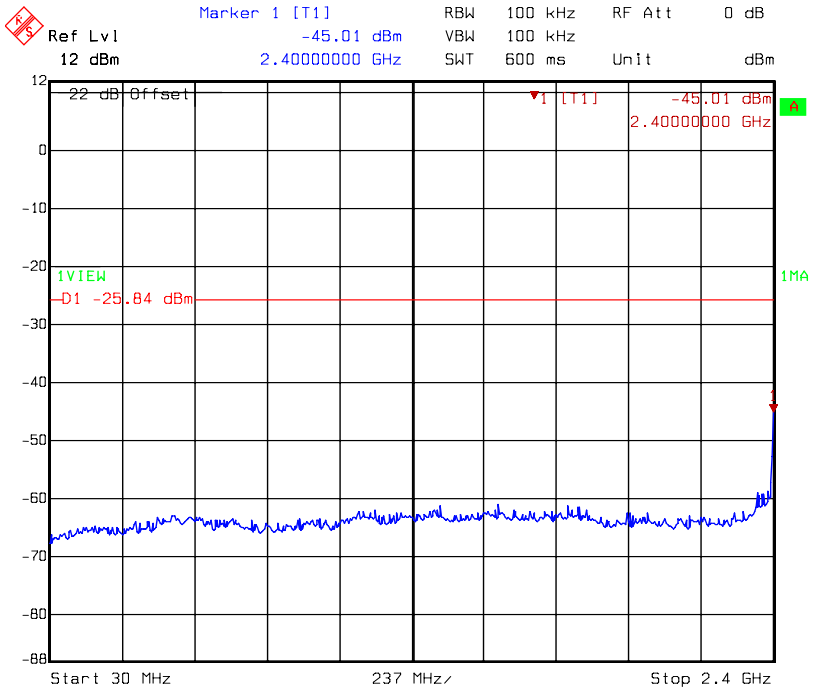
Title: Conductive-Spurious
Comment A: CH 11 at 802.11g mode 2400MHz~2483.5MHzchain1
Date: 02.SEP.2009 15:20:57

Chain 1: conducted spurious @ 802.11g mode channel 11 (3of 3)



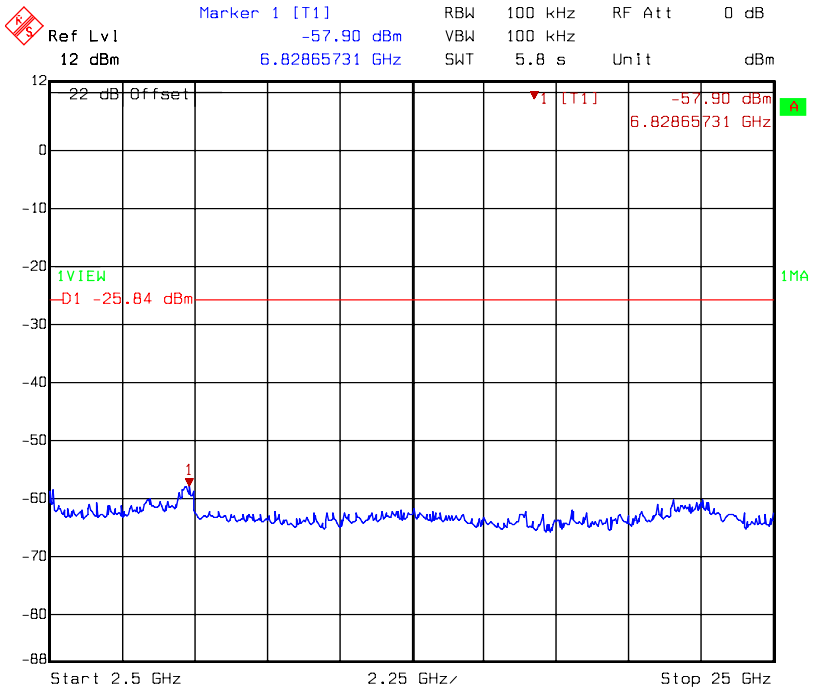
Title: Conductive-Spurious
Comment A: CH 11 at 802.11g mode 2483.5MHz~25000MHzchain1
Date: 02.SEP.2009 15:21:44

Chain 1: conducted spurious @ 802.11n HT20 mode channel 1 (1of 3)

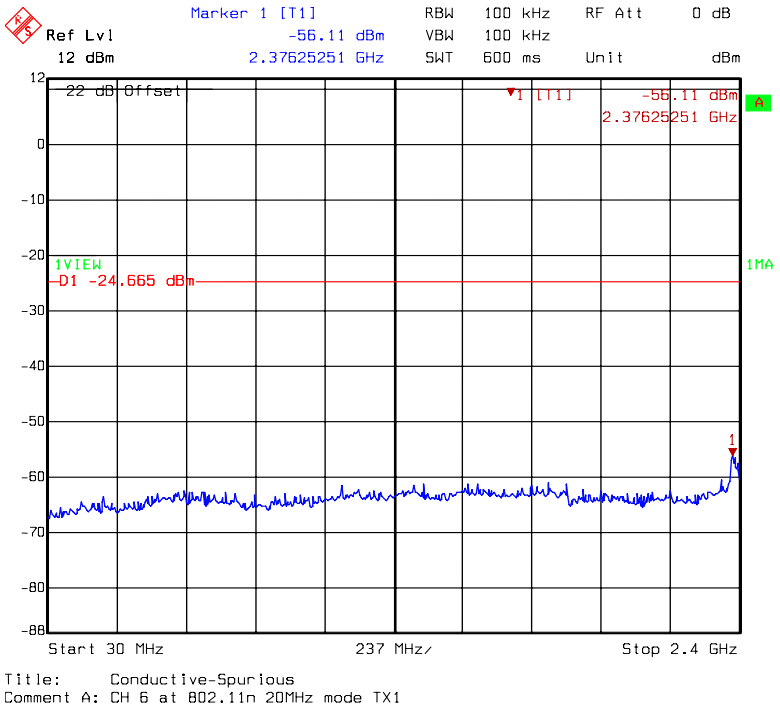


Chain 1: conducted spurious @ 802.11n HT20 mode channel 1 (2of 3)

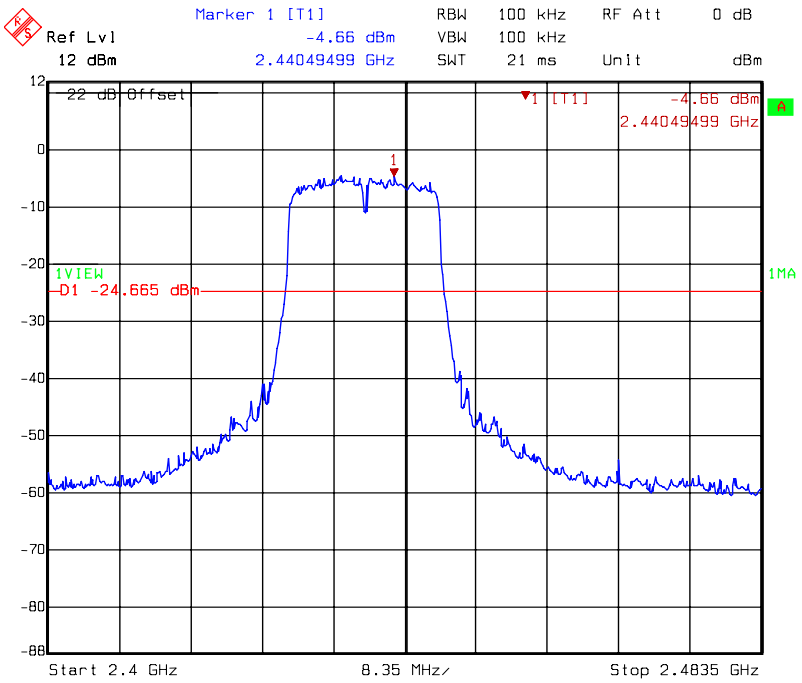
Chain 1: conducted spurious @ 802.11n HT20 mode channel 1 (3of 3)



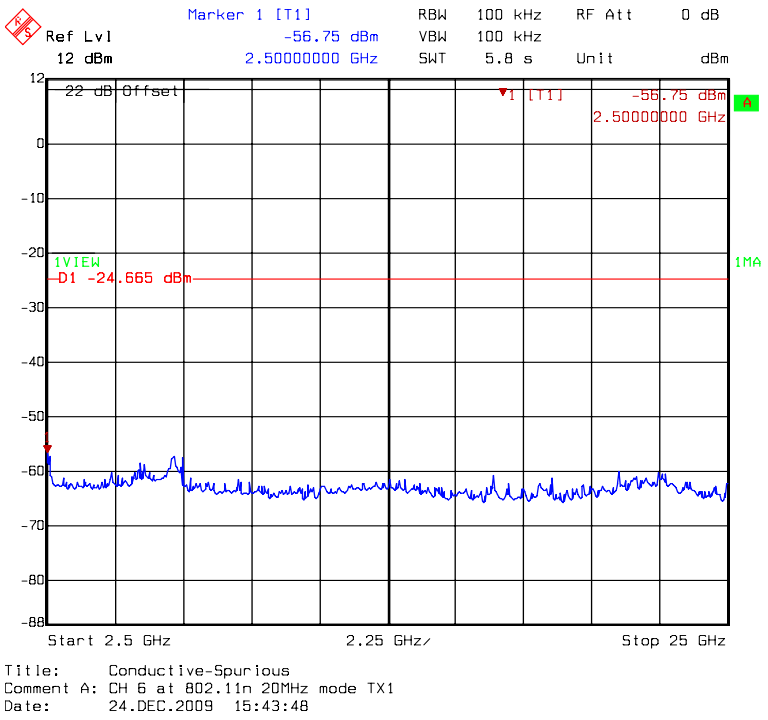
Chain 1: conducted spurious @ 802.11n HT20 mode channel 6 (1of 3)



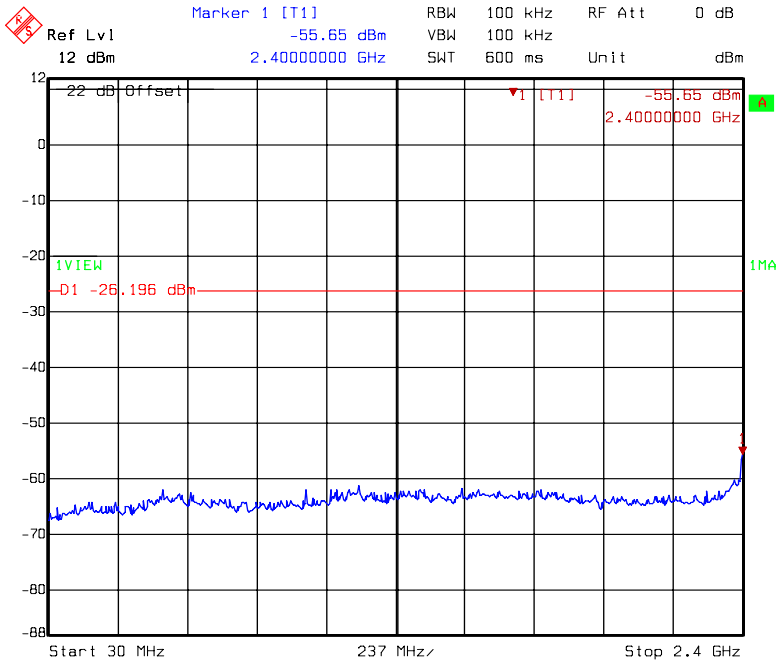
Chain 1: conducted spurious @ 802.11n HT20 mode channel 6 (2of 3)



Chain 1: conducted spurious @ 802.11n HT20 mode channel 6 (3of 3)

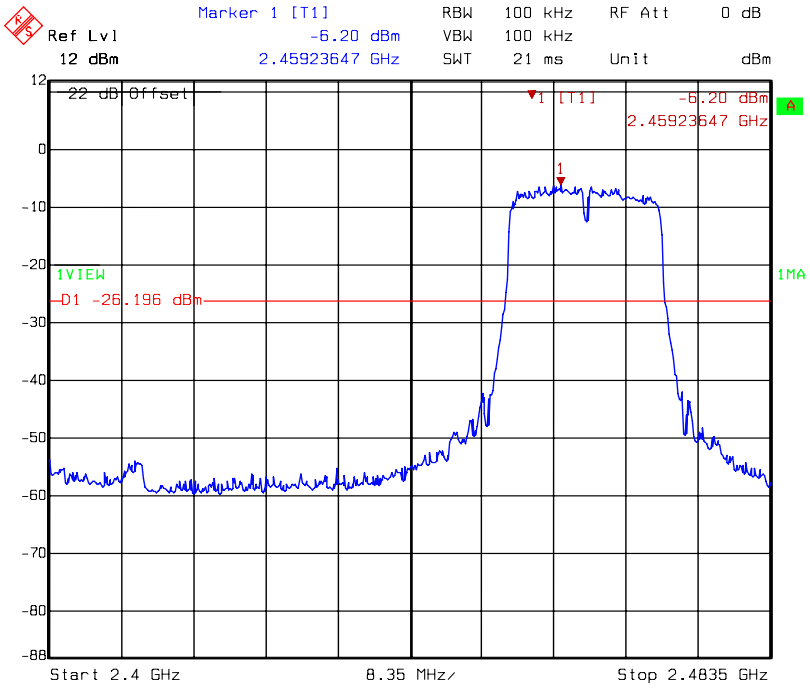


Chain 1: conducted spurious @ 802.11n HT20 mode channel 11 (1of 3)



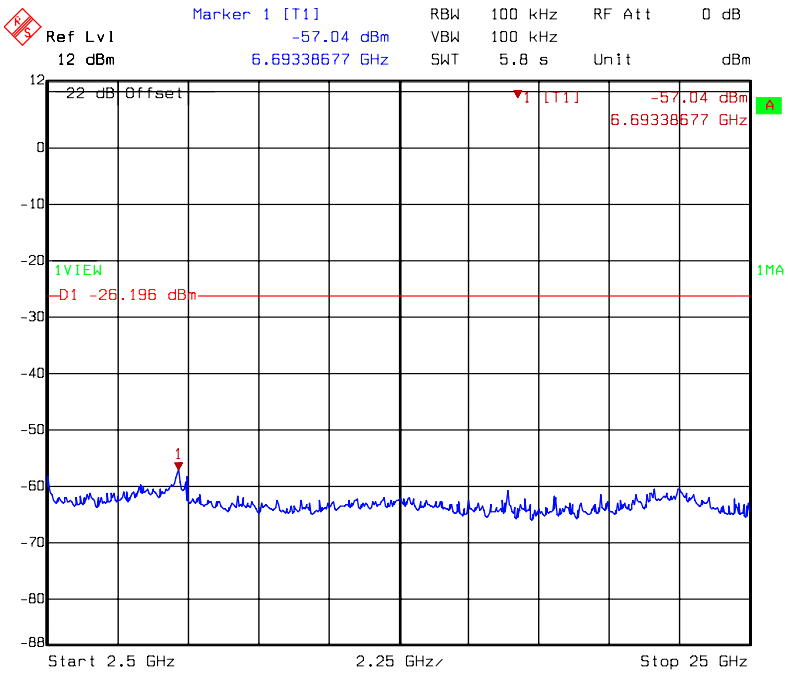
Title: Conductive-Spurious
Comment A: CH 11 at 802.11n 20MHz mode TX1
Date: 24.DEC.2009 15:46:18

Chain 1: conducted spurious @ 802.11n HT20 mode channel 11 (2of 3)

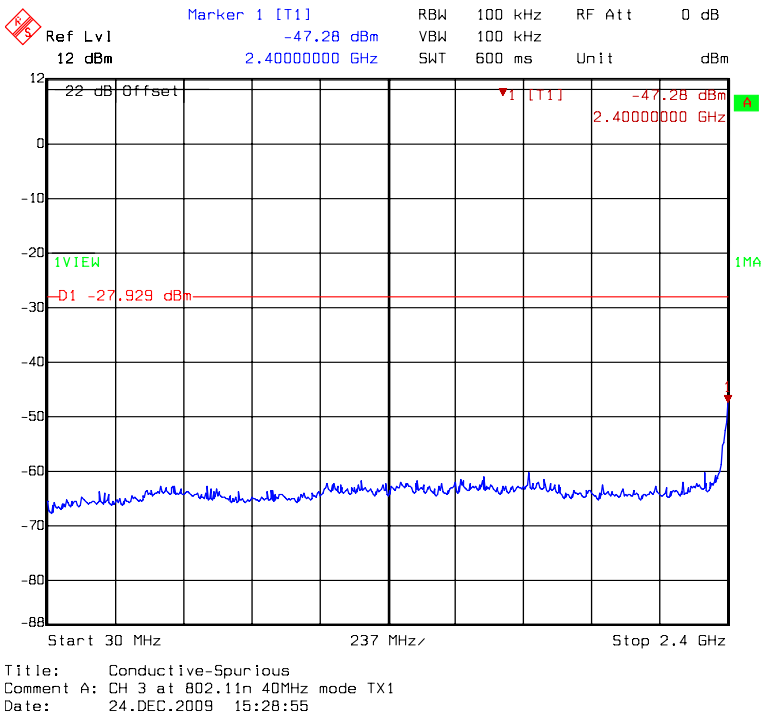


Title: Conductive-Spurious
Comment A: CH 11 at 802.11n 20MHz mode TX1
Date: 24.DEC.2009 15:45:57

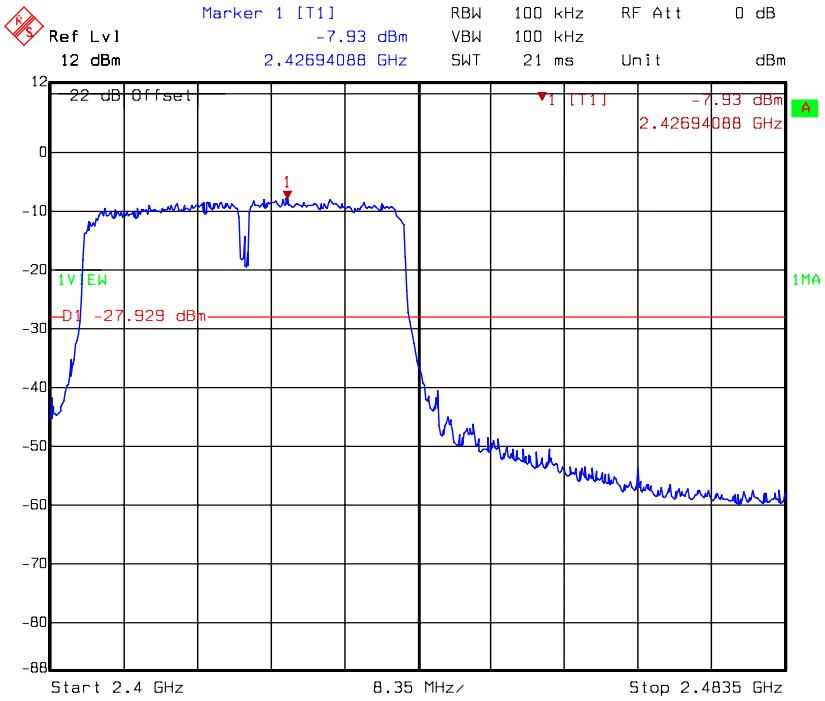
Chain 1: conducted spurious @ 802.11n HT20 mode channel 11 (3of 3)



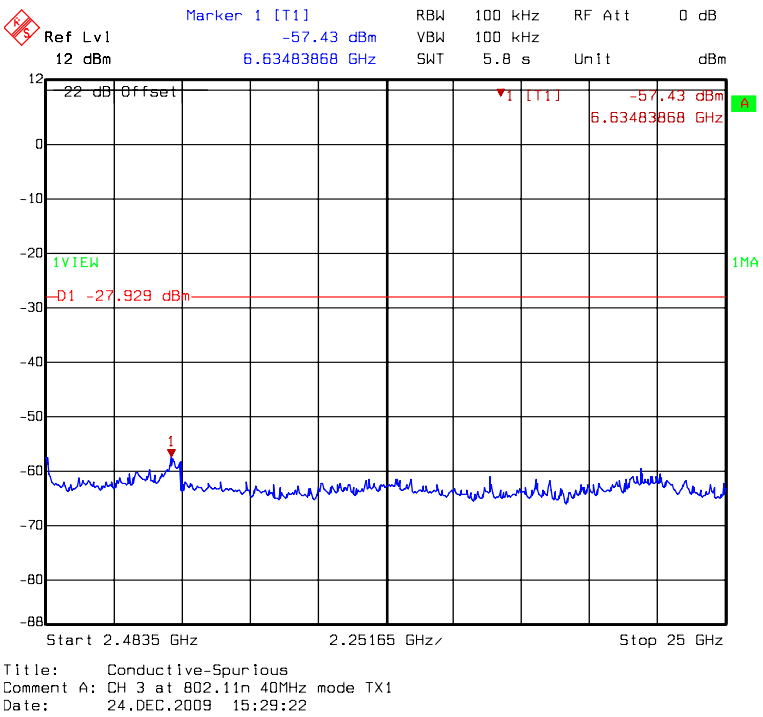
Chain 1: conducted spurious @ 802.11n HT40 mode channel 3 (1of 3)



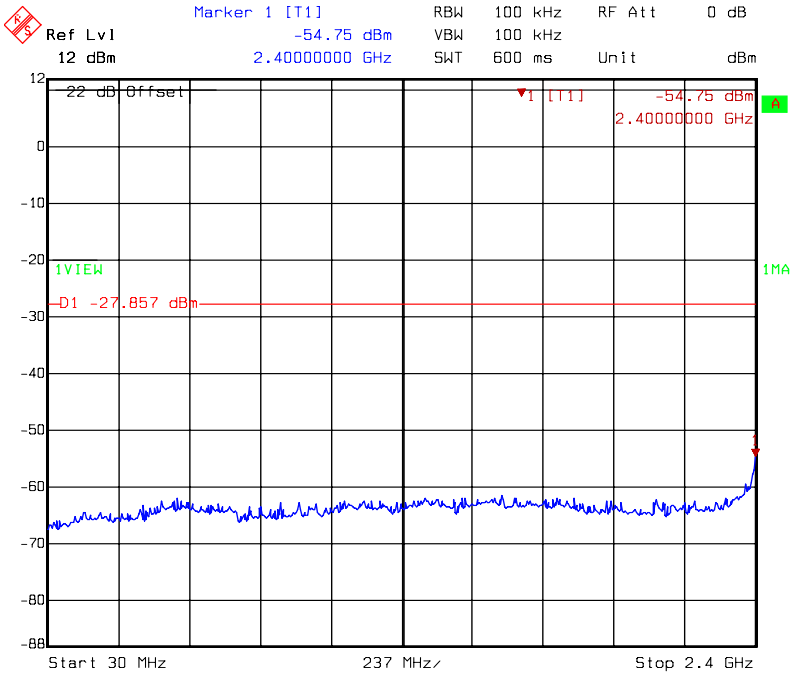
Chain 1: conducted spurious @ 802.11n HT40 mode channel 3 (2of 3)



Chain 1: conducted spurious @ 802.11n HT40 mode channel 3 (3of 3)

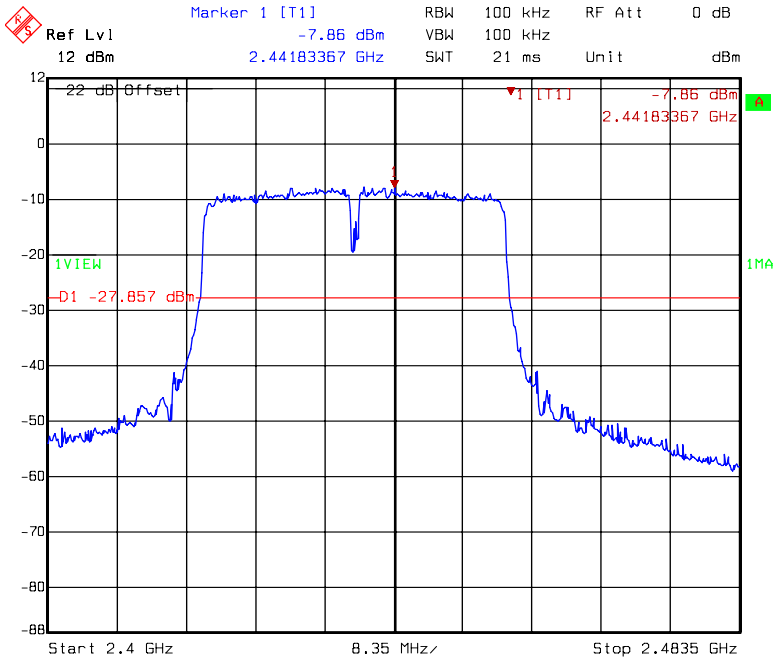


Chain 1: conducted spurious @ 802.11n HT40 mode channel 6 (1of 3)



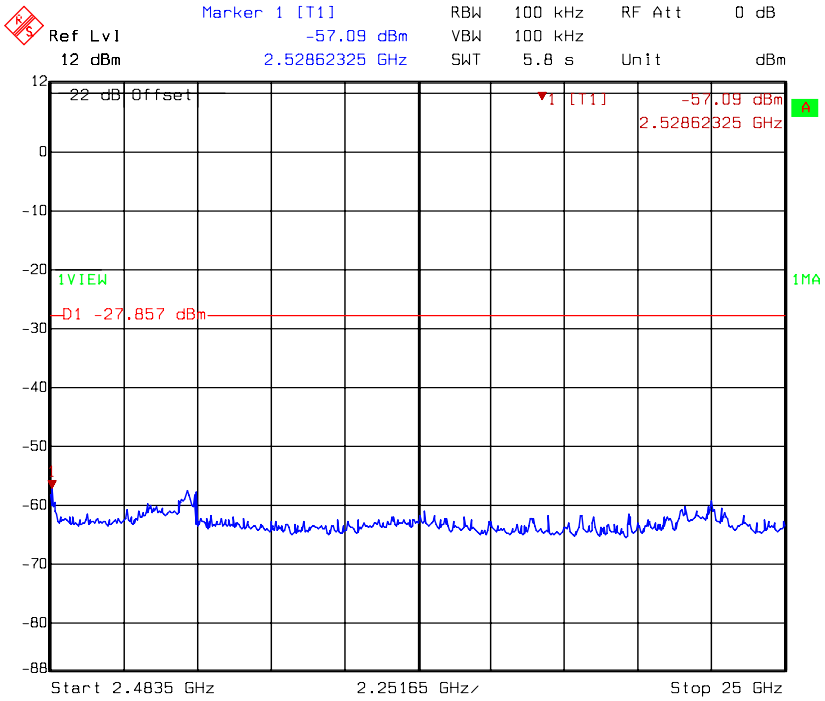
Title: Conductive-Spurious
Comment A: CH 6 at 802.11n 40MHz mode TX1
Date: 24.DEC.2009 15:26:10

Chain 1: conducted spurious @ 802.11n HT40 mode channel 6 (2of 3)



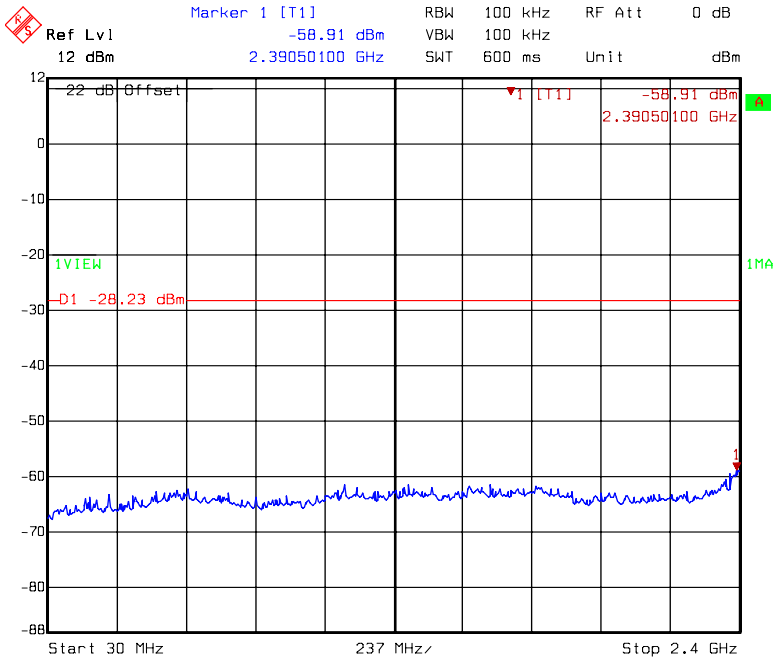
Title: Conductive-Spurious
Comment A: CH 6 at 802.11n 40MHz mode TX1
Date: 24.DEC.2009 15:25:49

Chain 1: conducted spurious @ 802.11n HT40 mode channel 6 (3of 3)



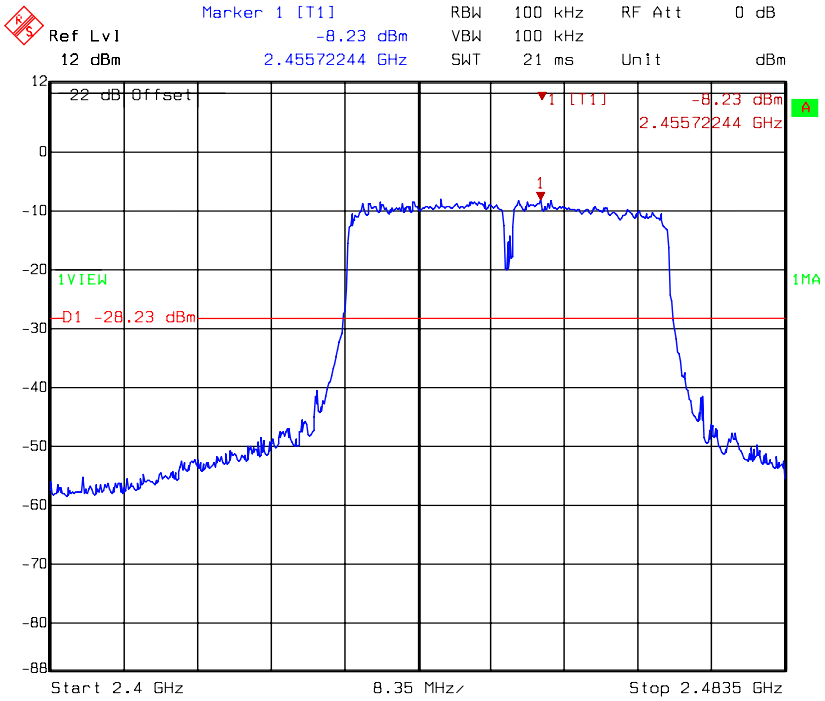
Title: Conductive-Spurious
Comment A: CH 6 at 802.11n 40MHz mode TX1
Date: 24.DEC.2009 15:26:37

Chain 1: conducted spurious @ 802.11n HT40 mode channel 9 (1of 3)



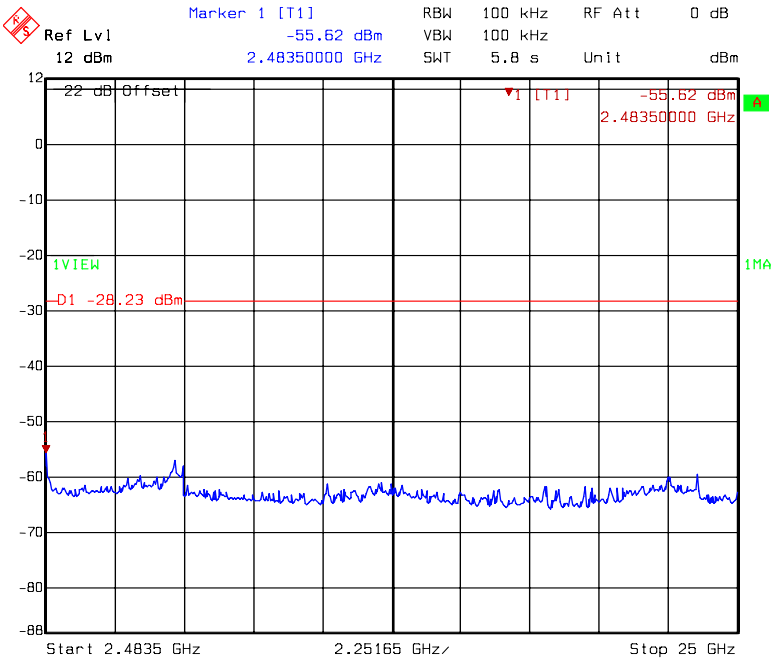
Title: Conductive-Spurious
Comment A: CH 9 at 802.11n 40MHz mode TX1
Date: 24.DEC.2009 15:21:45

Chain 1: conducted spurious @ 802.11n HT40 mode channel 9 (2of 3)



Title: Conductive-Spurious
Comment A: CH 9 at 802.11n 40MHz mode TX1
Date: 24.DEC.2009 15:21:23

Chain 1: conducted spurious @ 802.11n HT40 mode channel 9 (3of 3)



Title: Conductive-Spurious
Comment A: CH 9 at 802.11n 40MHz mode TX1
Date: 24.DEC.2009 15:22:12

8. Radiated Spurious Emission

Name of Test	Radiated Spurious Emission
Base Standard	FCC 15.247(d), 15.209, 15.205

Test Result: Complies
Measurement Data: See Tables below

Method of Measurement:

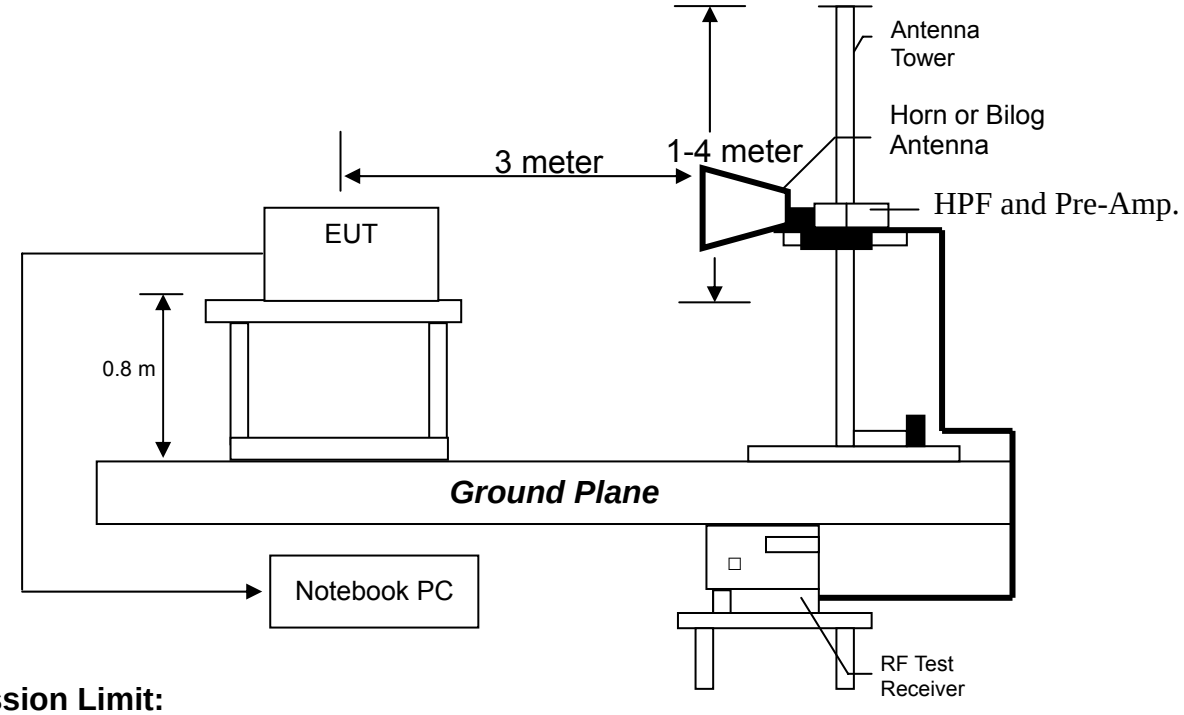
Reference FCC document: KDB558074, ANSI C63.4

The frequency range from 30 MHz to 1000 MHz using Bilog Antenna.
The frequency range over 1 GHz using Horn Antenna.

Radiated emissions were invested cover the frequency range from 30 MHz to 1000 MHz using a receiver RBW of 120 kHz record QP reading, and the frequency over 1 GHz using a spectrum analyzer RBW of 1 MHz and 10 Hz VBW record Average reading. (15.209 paragraph), the Peak reading (1 MHz RBW/VBW) recorded also on the report. The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter. The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent 3 meters reading using inverse scaling with distance.

The EUT configuration please refer to the “Spurious set-up photo.pdf”.

Test Diagram:



Emission Limit:

The spurious Emission shall test through the 10th harmonic. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

Frequency (MHz)	Limits (dBμV/m@ 3 meter)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Remark:
1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

Note: (1) he EUT was tested while in a continuous transmit mode and the worst case data rates are Mbps data rate for 802.11b mode, 6 Mbps data rate for 802.11g mode, 6.5 Mbps data rate for 802.11n HT20 mode and 13.5 Mbps data rate for 802.11n HT40 mode. The EUT was tuned to a low, middle and high channel.

(2) The EUT operating at 2.4 GHz ISM band. Frequency Range scanned from 30 MHz to 25 GHz.

Measurement results: frequencies equal to or less than 1 GHz

The test was performed on EUT under 802.11b/g/n continuously transmitting mode. The worst case occurred at 802.11b Tx channel 1.

EUT : HG556
Worst Case : 802.11b Tx at channel 1

Antenna Polariz. (V/H)	Freq. (MHz)	Receiver Detector	Corr. Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
V	37.76	QP	12.62	26.12	38.74	40.0	-1.26
V	53.28	QP	12.90	25.75	38.64	40.0	-1.36
V	137.67	QP	11.39	24.95	36.34	43.5	-7.16
V	399.57	QP	16.40	21.69	38.09	46.0	-7.91
V	527.61	QP	19.46	12.09	31.55	46.0	-14.45
V	666.32	QP	21.50	13.02	34.52	46.0	-11.48
H	97.90	QP	7.93	26.42	34.34	43.5	-9.16
H	108.57	QP	9.03	25.46	34.48	43.5	-9.02
H	138.64	QP	12.32	22.91	35.23	43.5	-8.27
H	399.57	QP	16.74	22.77	39.51	46.0	-6.49
H	666.32	QP	21.52	18.00	39.51	46.0	-6.49
H	749.74	QP	22.95	14.88	37.83	46.0	-8.17

Remark:

1. Corr. Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Corr. Factor

Measurement results: frequency above 1GHz

EUT : HG556
Test Condition : 802.11b Tx at channel 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4824	PK	V	35.1	38.54	45.18	48.62	54	-5.38
4824	PK	H	35.1	38.54	43.93	47.37	54	-6.63

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz.The data value listed above which is higher than the system noise floor.

EUT : HG556
Test Condition : 802.11b Tx at channel 6

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4874	PK	V	35.1	38.54	48.4	51.84	54	-2.16
4874	PK	H	35.1	38.54	45.44	48.88	54	-5.12

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz.The data value listed above which is higher than the system noise floor.

EUT : HG556
Test Condition : 802.11b Tx at channel 11

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4924	PK	V	35.1	38.54	48.92	52.36	54	-1.64
4924	PK	H	35.1	38.54	46.49	49.93	54	-4.07

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz.The data value listed above which is higher than the system noise floor.

EUT : HG556
Test Condition : 802.11g Tx at channel 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4824	PK	V	35.1	38.54	43.49	46.93	54	-7.07
4824	PK	H	35.1	38.54	42.37	45.81	54	-8.19

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz.The data value listed above which is higher than the system noise floor.

EUT : HG556
Test Condition : 802.11g Tx at channel 6

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4874	PK	V	35.1	38.54	54.45	57.89	74	-16.11
4874	AV	V	35.1	38.54	31.1	34.54	54	-19.46
4874	PK	H	35.1	38.54	40.49	43.93	54	-10.07

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz.The data value listed above which is higher than the system noise floor.

EUT : HG556
Test Condition : 802.11g Tx at channel 11

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4924	PK	V	35.1	38.54	48.92	52.36	54	-1.64
4924	PK	H	35.1	38.54	41.1	44.54	54	-9.46

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz.The data value listed above which is higher than the system noise floor.

EUT : HG556
Test Condition : 802.11n HT20 Tx at channel 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4824	PK	V	35.1	38.54	40.05	43.49	54	-10.51
4824	PK	H	35.1	38.54	37.18	40.62	54	-13.38

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz.The data value listed above which is higher than the system noise floor.

EUT : HG556
Test Condition : 802.11n HT20 Tx at channel 6

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4874	PK	V	35.1	38.54	41.28	44.72	54	-9.28
4874	PK	H	35.1	38.54	37.09	40.53	54	-13.47

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz.The data value listed above which is higher than the system noise floor.

EUT : HG556
Test Condition : 802.11n HT20 Tx at channel 11

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4924	PK	V	35.1	38.54	41.52	44.96	54	-9.04
4924	PK	H	35.1	38.54	38.16	41.6	54	-12.40

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz.The data value listed above which is higher than the system noise floor.

EUT : HG556
Test Condition : 802.11n HT40 Tx at channel 3

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4844	PK	V	35.1	38.54	44.01	47.45	54	-6.55
4844	PK	H	35.1	38.54	38.84	42.28	54	-11.72

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz.The data value listed above which is higher than the system noise floor.

EUT : HG556
Test Condition : 802.11n HT40 Tx at channel 6

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4874	PK	V	35.1	38.54	42.64	46.08	54	-7.92
4874	PK	H	35.1	38.54	38.69	42.13	54	-11.87

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz.The data value listed above which is higher than the system noise floor.

EUT : HG556
Test Condition : 802.11n HT40 Tx at channel 9

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4904	PK	V	35.1	38.54	44.17	47.61	54	-6.39
4904	PK	H	35.1	38.54	41.42	44.86	54	-9.14

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz.The data value listed above which is higher than the system noise floor.

9. Emission on Band Edge

Name of Test	Emission Band Edge
Base Standard	FCC 15.247(d)

Test Result: Complies

Measurement Data: See Tables & plots below

Method of Measurement:

Reference FCC document: KDB558074, ANSI C63.4

The frequency range from 30 MHz to 1000 MHz using Bilog Antenna.
The frequency range over 1 GHz using Horn Antenna.

Radiated emissions were invested cover the frequency range from 30 MHz to 1000 MHz using a receiver RBW of 120 kHz record QP reading, and the frequency over 1 GHz using a spectrum analyzer RBW of 1 MHz and 10 Hz VBW record Average reading. (15.209 paragraph), the Peak reading (1 MHz RBW/VBW) recorded also on the report.

Note: The EUT was tested while in a continuous transmit mode and the worst case data rates are Mbps data rate for 802.11b mode, 6 Mbps data rate for 802.11g mode, 6.5 Mbps data rate for 802.11n HT20 mode and 13.5 Mbps data rate for 802.11n HT40 mode. The EUT was tuned to a low, middle and high channel.

Test Mode: 802.11b Chain 0+1

Channel	Measurement Freq.Band (MHz)	Detector	The Max. Field Strength in Restrict Band (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
1 (lowest)	2310-2390	PK	58.73	74	-15.27
		AV	46.40	54	-7.6
11 (highest)	2483.5-2500	PK	58.45	74	-15.55
		AV	46.56	54	-5.44

Test Mode: 802.11g Chain 0+1

Channel	Measurement Freq.Band (MHz)	Detector	The Max. Field Strength in Restrict Band (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
1 (lowest)	2310-2390	PK	61.68	74	-12.32
		AV	47.96	54	-6.04
11 (highest)	2483.5-2500	PK	64.53	74	-9.47
		AV	49.10	54	-4.9

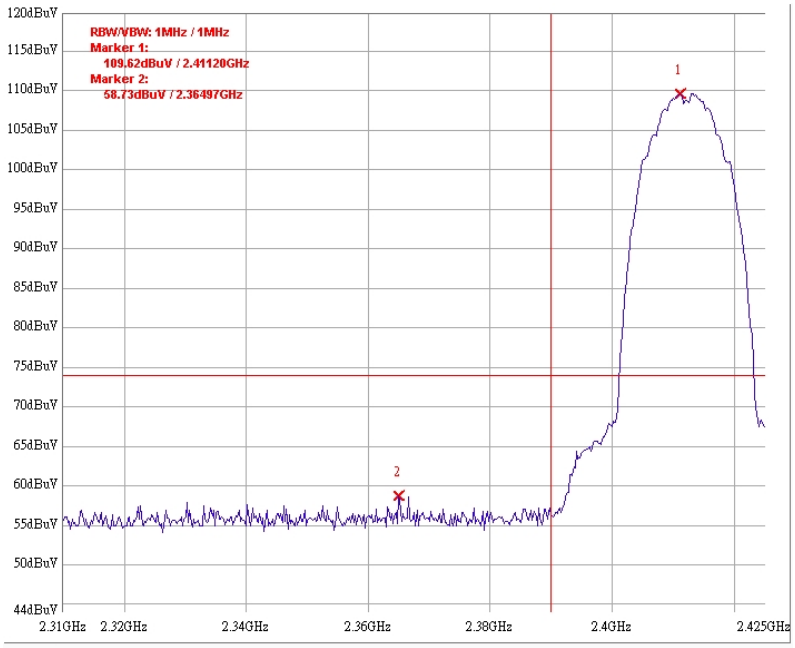
Test Mode: 802.11n HT20 Chain 0+1

Channel	Measurement Freq.Band (MHz)	Detector	The Max. Field Strength in Restrict Band (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
1 (lowest)	2310-2390	PK	58.04	74	-15.96
		AV	46.67	54	-7.33
11 (highest)	2483.5-2500	PK	63.71	74	-10.29
		AV	48.43	54	-5.57

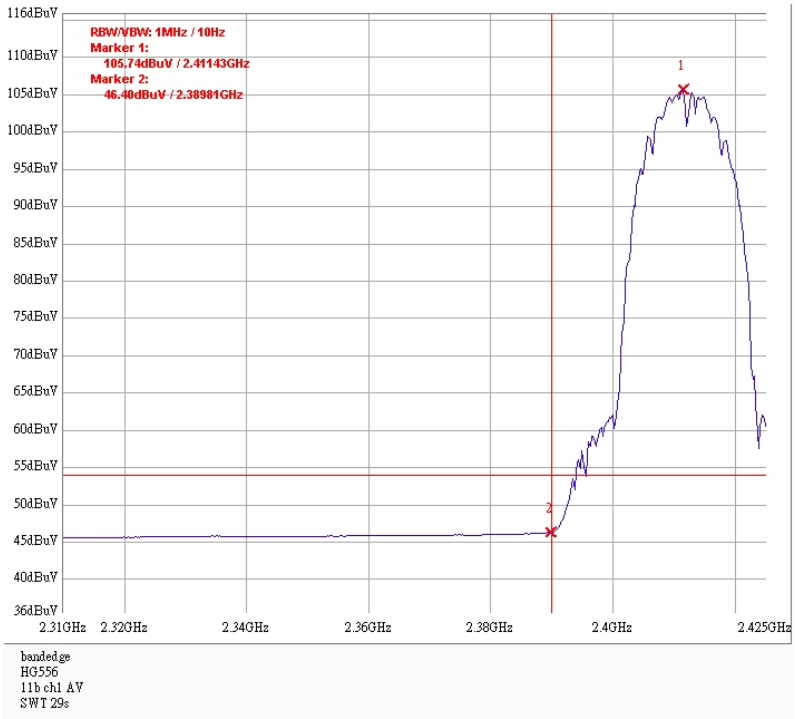
Test Mode: 802.11n HT40 Chain 0+1

Channel	Measurement Freq.Band (MHz)	Detector	The Max. Field Strength in Restrict Band (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
3 (lowest)	2310-2390	PK	66.16	74	-7.84
		AV	48.99	54	-5.01
9 (highest)	2483.5-2500	PK	69.52	74	-4.48
		AV	51.87	54	-2.13

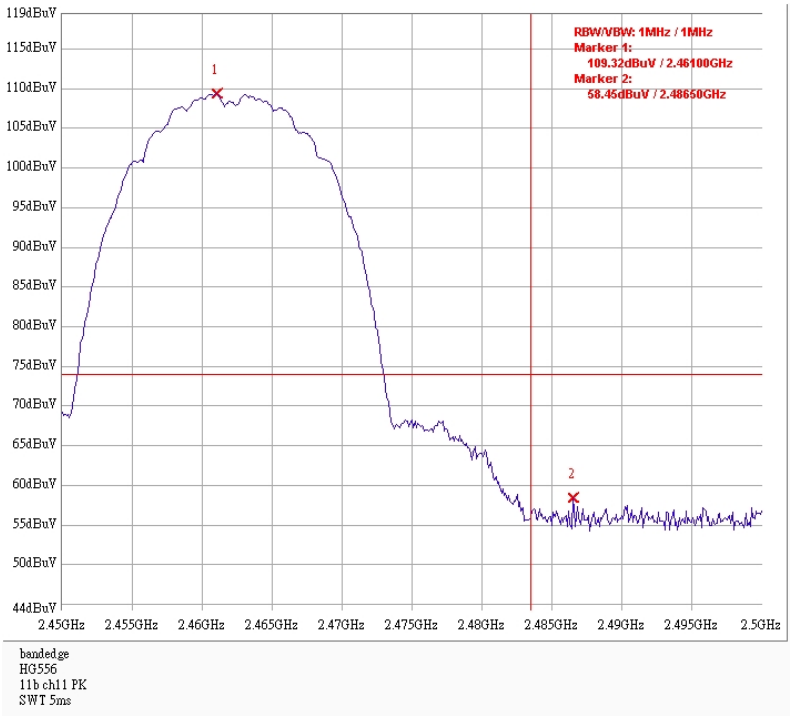
Chain 0+1: 1Band edge @ 802.11b mode channel 1 PK



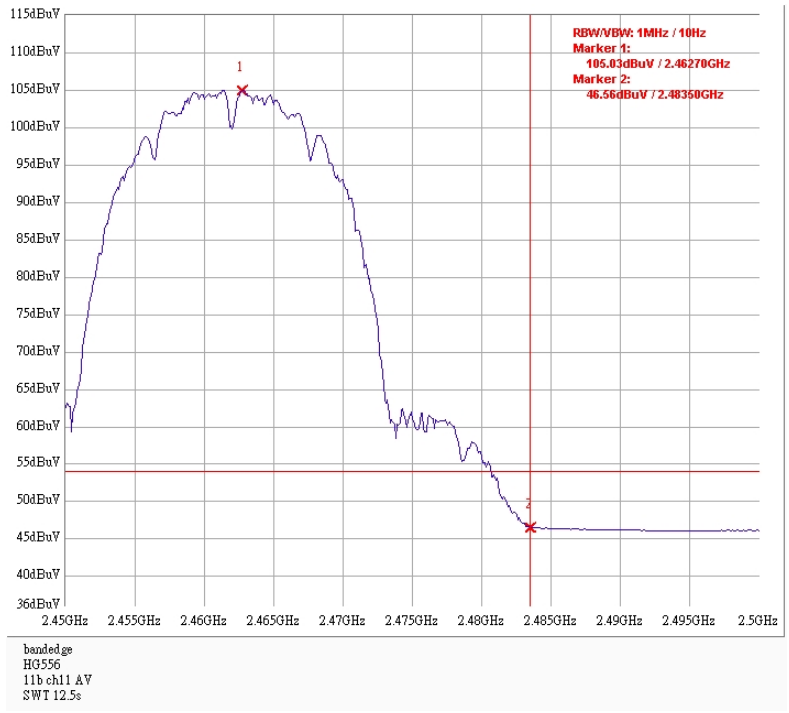
Chain 0+1: Band edge @ 802.11b mode channel 1 AV



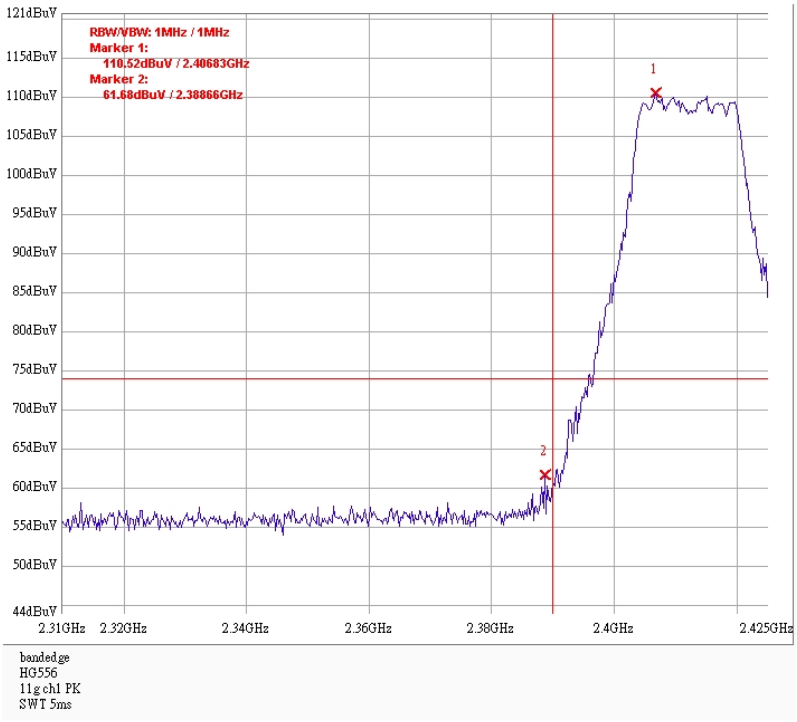
Chain 0+1: Band edge @ 802.11b mode channel 11 PK



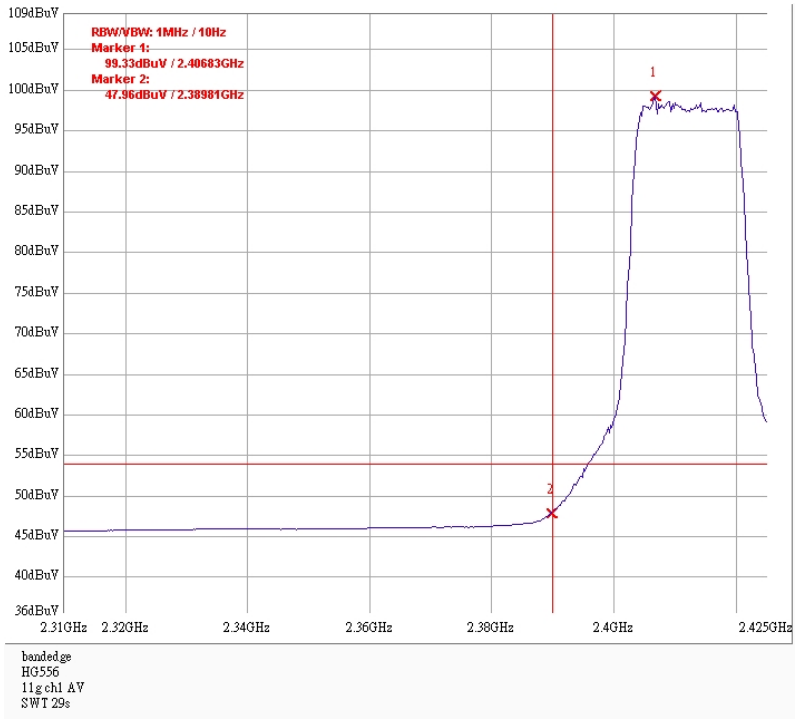
Chain 0+1: Band edge @ 802.11b mode channel 11 AV



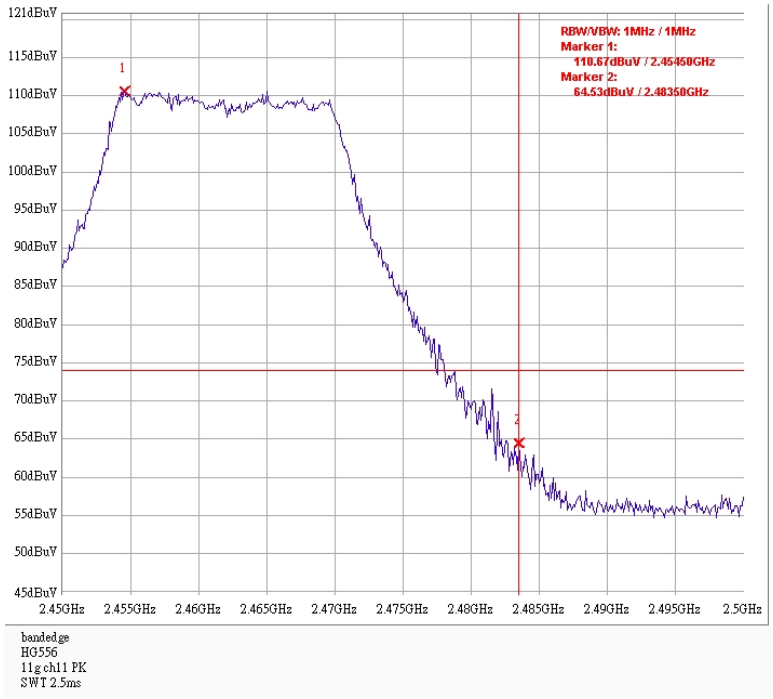
Chain 0+1: Band edge @ 802.11g mode channel 1 PK



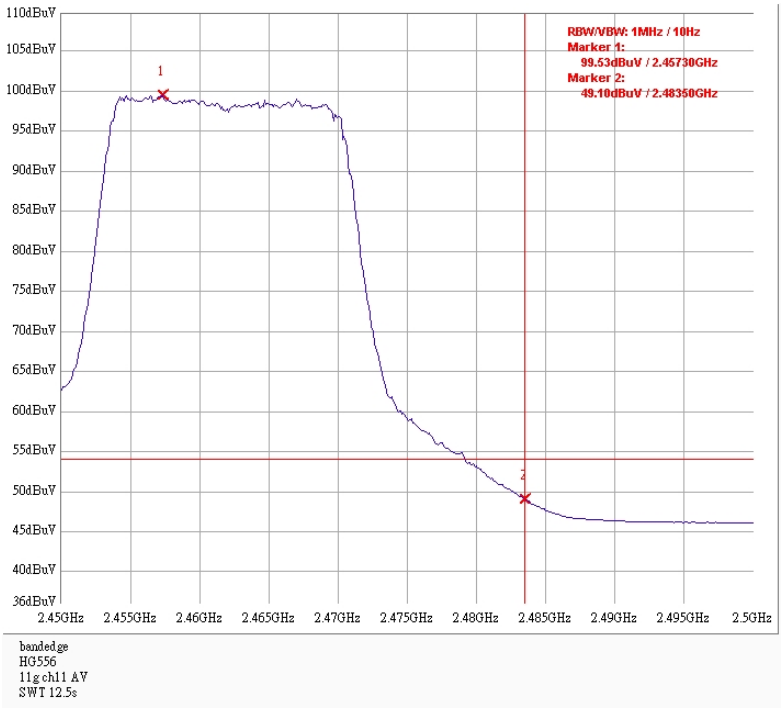
Chain 0+1: Band edge @ 802.11g mode channel 1 AV



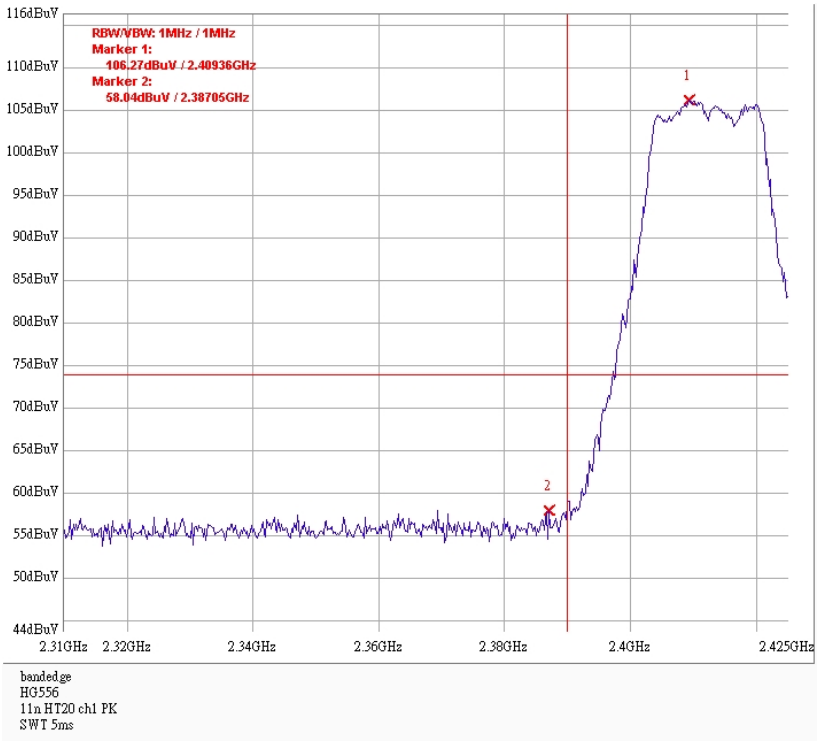
Chain 0+1: Band edge @ 802.11g mode channel 11 PK



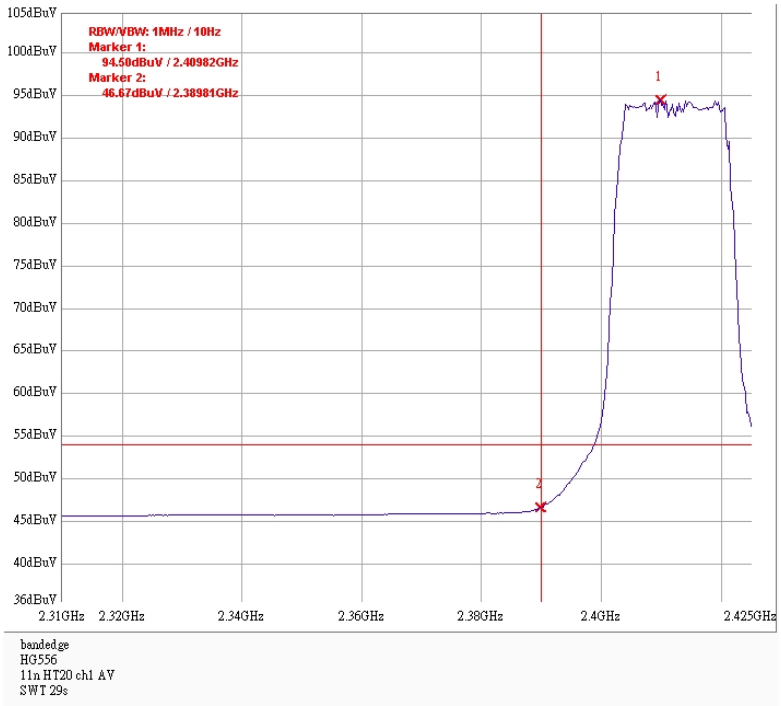
Chain 0+1: Band edge @ 802.11g mode channel 11 AV



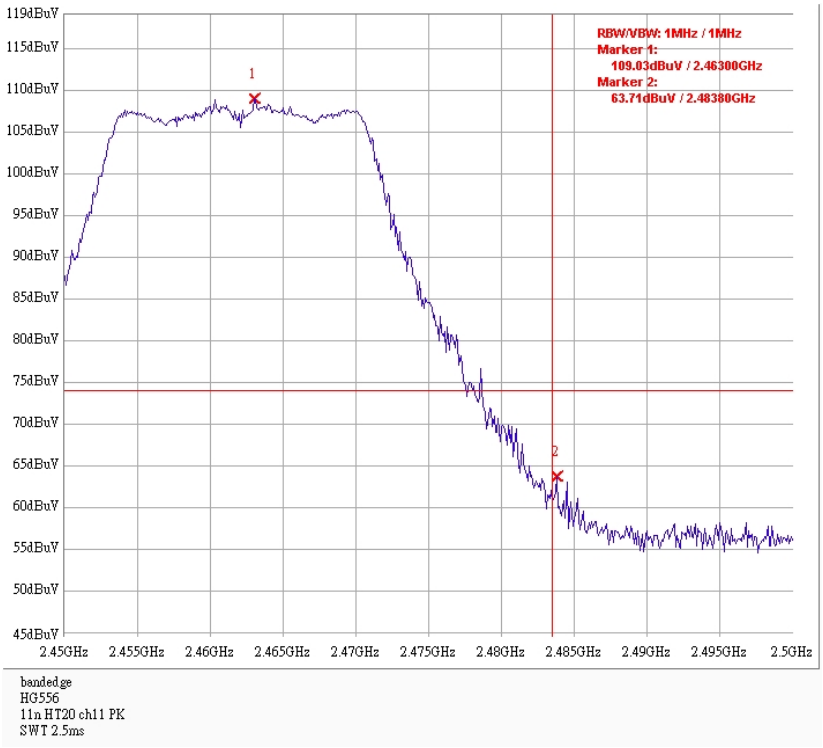
Chain 0+1: Band edge @802.11n HT20 mode channel 1 PK



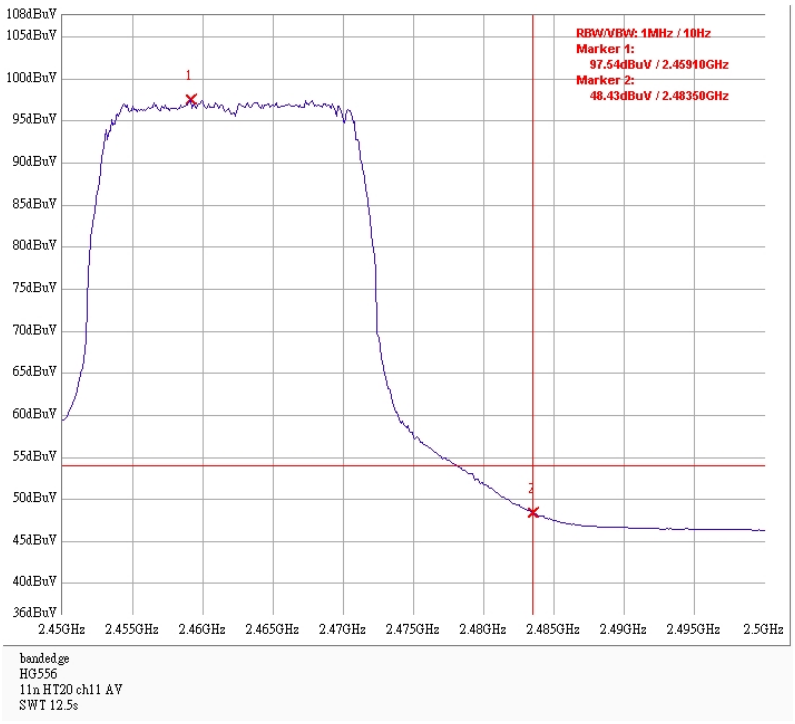
Chain 0+1: Band edge @802.11n HT20 mode channel 1 AV



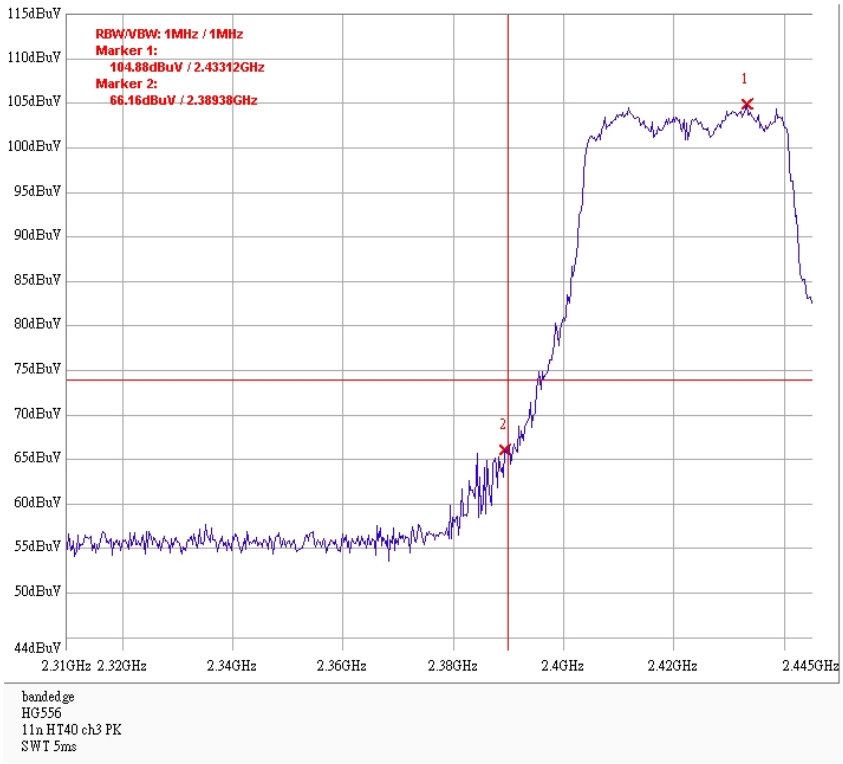
Chain 0+1: Band edge @802.11n HT20 mode channel 11 PK



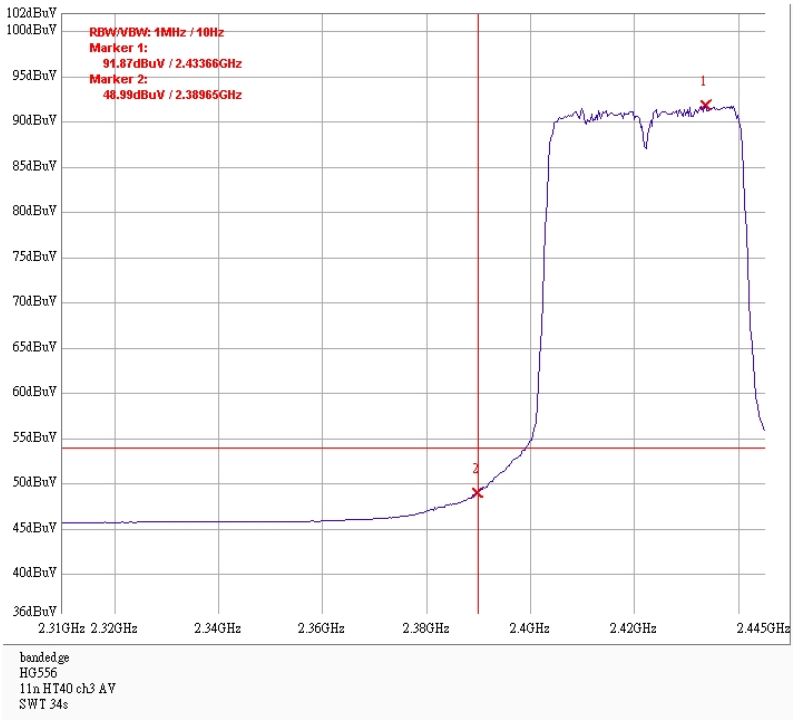
Chain 0+1: Band edge @802.11n HT20 mode channel 11 AV



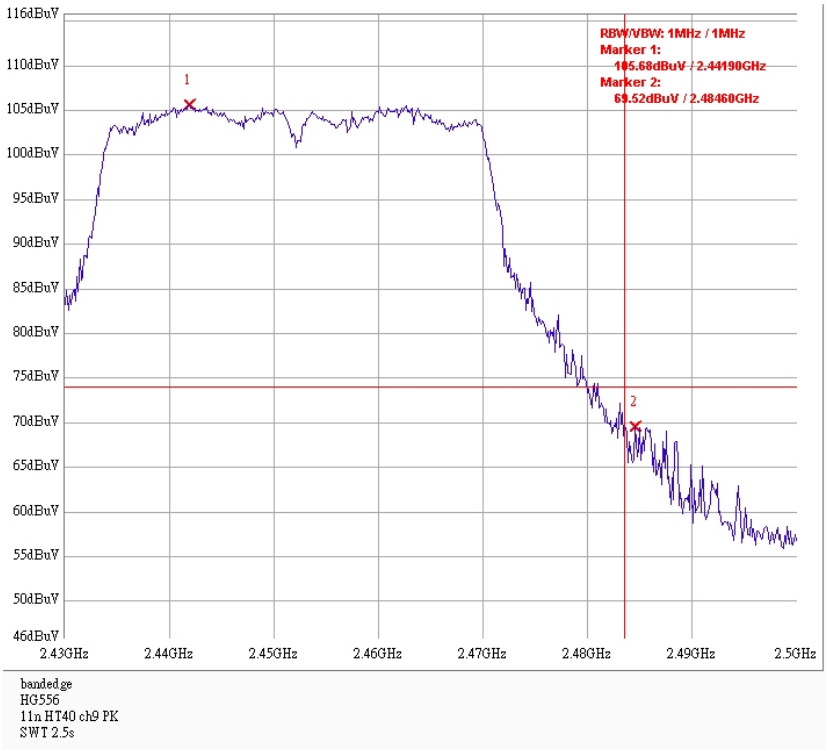
Chain 0+1: Band edge @802.11n HT40 mode channel 3 PK



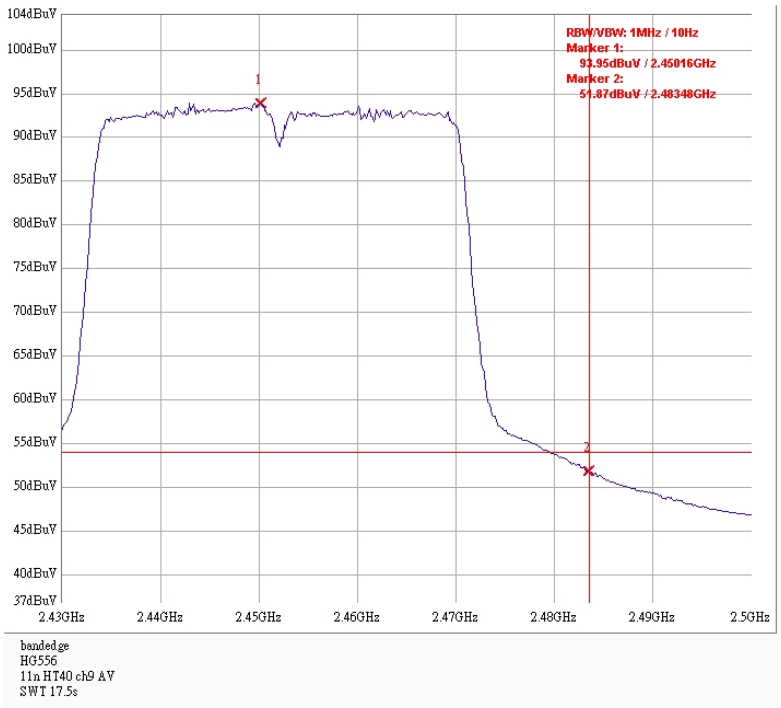
Chain 0+1: Band edge @802.11n HT40 mode channel 3 AV



Chain 0+1: Band edge @802.11n HT40 mode channel 9 PK



Chain 0+1: Band edge @802.11n HT40 mode channel 9 AV



10. AC power line conducted emission

Name of Test	AC power line conducted emission
Base Standard	FCC 15.207

Test Result: Complies
Measurement Data: See Tables & plots below

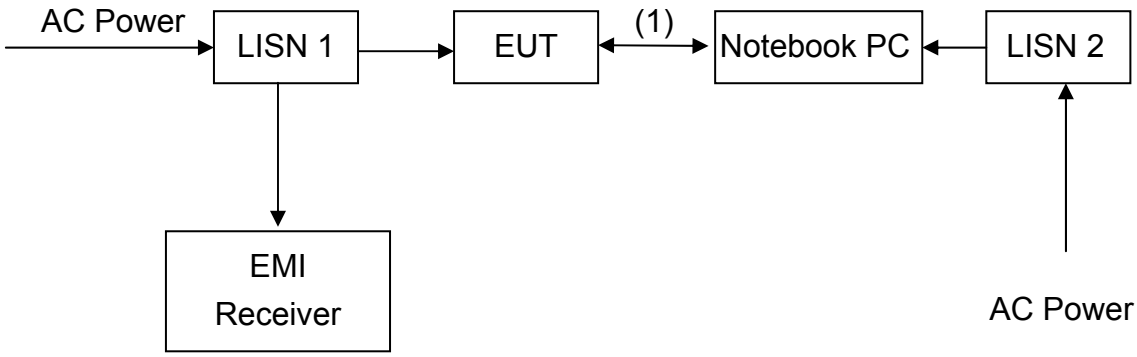
Method of Measurement:
Reference FCC document: KDB558074, ANSI C63.4

The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a 50 ohm/50 uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50 ohm/ 50 uH coupling impedance with 50 ohm termination.

Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4/2003 on conducted measurement.
The bandwidth of the field strength meter (R & S Test Receiver ESCS 30) is set at 9kHz.

The EUT configuration please refer to the “Conducted set-up photo.pdf”.

Test Diagram:



(1) RJ-45 UTP Cat.5 10 meter

Emission Limit:

Freq. (MHz)	Conducted Limit (dBuV)	
	Q.P.	Ave.
0.15~0.50	66 – 56*	56 – 46*
0.50~5.00	56	46
5.00~30.0	60	50

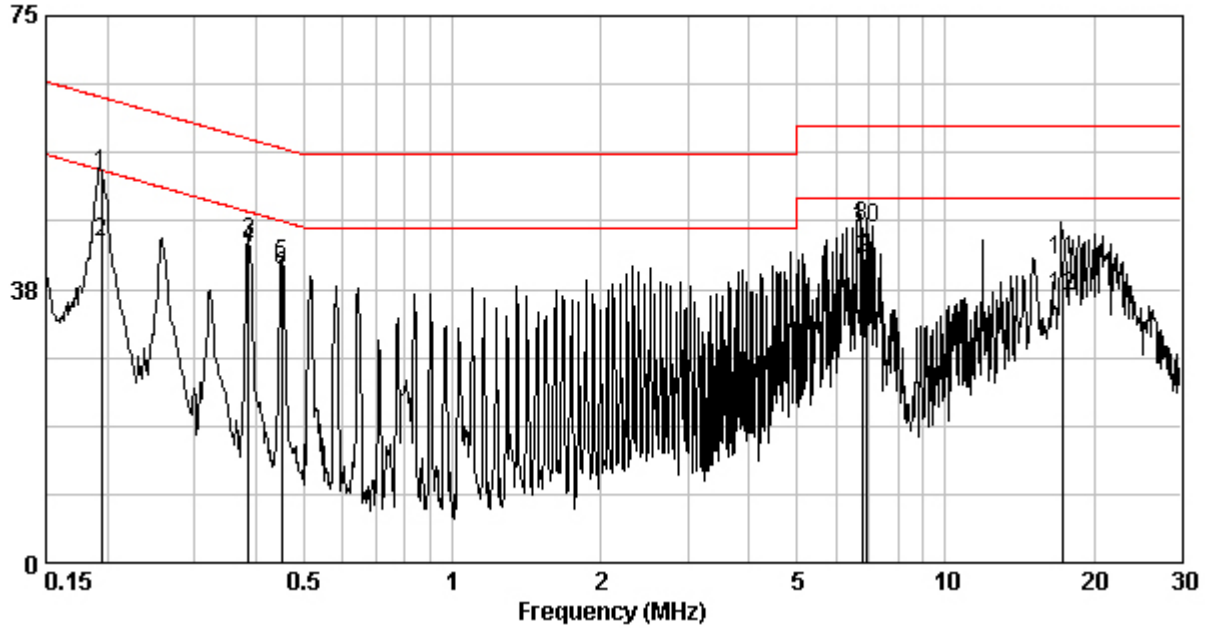
*Decreases with the logarithm of the frequency.

Note: The EUT was tested while in normal communication mode.

Phase	: Line
EUT	: HG556
Test Condition	: Normal operating mode

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level AV (dBuV)	Limit Av (dBuV)	Margin (dB) Qp	Margin (dB) Av
0.19	0.81	53.38	63.85	43.94	53.85	-10.48	-9.92
0.39	0.14	43.99	58.12	43.15	48.12	-14.13	-4.97
0.45	0.11	41.05	56.85	40.08	46.85	-15.80	-6.77
6.77	0.42	46.02	60.00	41.40	50.00	-13.98	-8.60
6.90	0.42	45.96	60.00	41.86	50.00	-14.04	-8.14
17.22	0.87	41.62	60.00	36.61	50.00	-18.38	-13.39

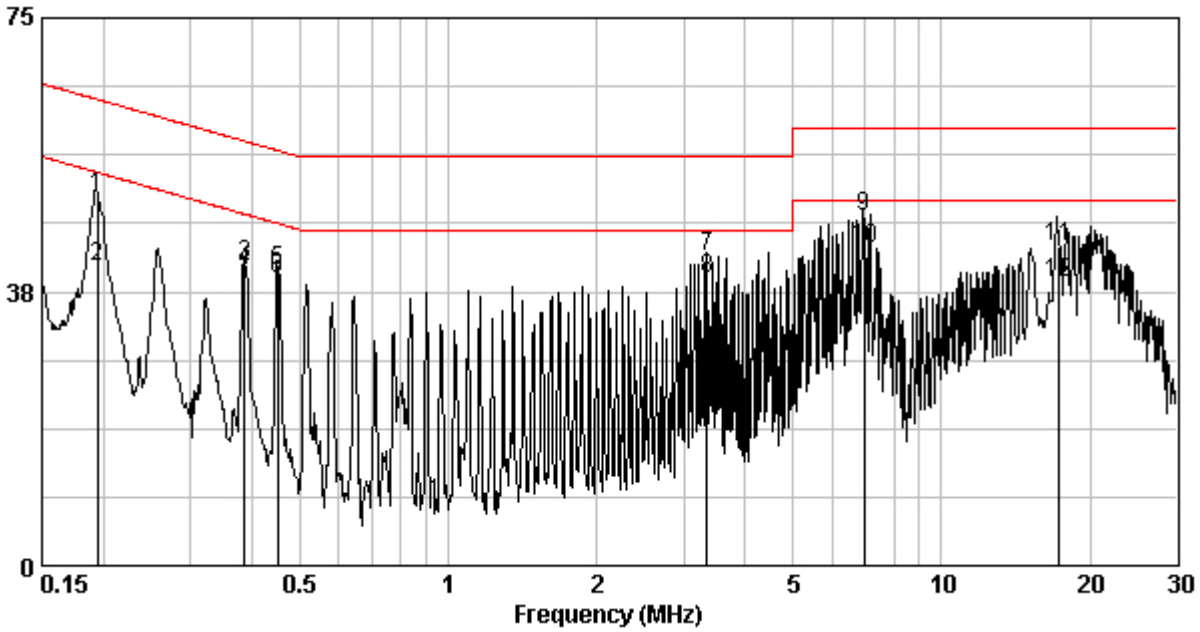
Remark:
1. Correction Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)



Phase : Neutral
EUT : HG556
Test Condition : Normal operating mode

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level AV (dBuV)	Limit Av (dBuV)	Margin (dB) Qp	Margin (dB) Av
0.19	0.11	50.57	63.85	40.83	53.85	-13.28	-13.02
0.39	0.11	41.22	58.12	40.50	48.12	-16.90	-7.62
0.45	0.11	40.26	56.85	39.38	46.85	-16.59	-7.47
3.35	0.25	42.22	56.00	39.28	46.00	-13.78	-6.72
6.96	0.36	47.84	60.00	43.44	50.00	-12.16	-6.56
17.28	0.52	43.60	60.00	38.84	50.00	-16.40	-11.16

Remark:
1. Correction Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)



Appendix A: Test Equipment List

Equipment	Brand	Model No.
EMI Test Receiver	Rohde & Schwarz	ESCS 30
Spectrum Analyzer	Rohde & Schwarz	FSP 30
Spectrum Analyzer	Rohde & Schwarz	FSEK 30
Signal Generator	Rohde & Schwarz	SMR27
Horn Antenna	SCHWARZBECK	BBHA 9120 D
Horn Antenna	SCHWARZBECK	BBHA 9170
Bilog Antenna	SCHWARZBECK	VULB 9168
Pre-Amplifier	MITEQ	919981
Pre-Amplifier	MITEQ	828825
Controller	HDGmbH	CM 100
Antenna Tower	HDGmbH	MA 2400
LISN	Rohde & Schwarz	ESH3-Z5
Wideband Peak Power Meter/ Sensor	Anritsu	ML2495A/ MA2411B
Temperature Humidity Test Chamber	Juror	TR-4010

Note: 1. The above equipments are within the valid calibration period.
2. The test antennas (receiving antenna) are calibration per 3 years.
3. The video bandwidth of the power meter and sensor can be up to 65 MHz

Measurement Uncertainty:

Measurement uncertainty was calculated in accordance with TR 100 028-1.

Parameter	Uncertainty
Radiated Emission	±5.056 dB
Conducted Emission	±2.786 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of k=2.