

# EMC TEST REPORT

**Report No.:** TS08100104-EME

**Model No.:** H3C WA2620E-AGN

**Issued Date:** Oct. 14, 2009

**Applicant:** 3Com Corporation  
350 Campus Drive Marlborough, MA 01752-3064,  
United States

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

**Test By:** Intertek Testing Services Taiwan Ltd.  
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## 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:	Wireless LAN Access Point
Model No.:	H3C WA2620E-AGN
FCC ID.:	O9C-WA2620EAGN
Frequency Range:	1. 2412 MHz ~ 2462 MHz 2. 5745 MHz ~ 5825 MHz
Channel Number:	1. 11 channels for 2412 MHz ~ 2462 MHz for 11b,11g,11n HT20 2. 7 channels for 2422MHz ~ 2452 MHz for 11n HT40 3. 5 channels for 5745MHz ~ 5825 MHz for 11a,11n HT20 4. 2 channels for 5755MHz ~ 5795 MHz for 11n HT40
Rated Power:	DC 48 V from adapter (Model No.: FSP025-1AD207A), I/P Voltage: 100-240 Vac, 50-60 Hz
Power Cord:	3G × 18AWG × 1.8 meter unshielded cable
Data Cable:	RJ-45 UTP Cat.5 10 meter × 1
Sample Received:	Oct. 25, 2009
Test Date(s):	Oct. 28, 2009 ~ May 15, 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 Wireless LAN Access Point, the device is a MIMO product, it's three transmitter and three receiver with one wireless module embedded.

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

## Antenna description

The EUT requires professional installation (attach supporting documentation if using this option).

### For 2.4GHz Band

Ant.	Model number	Antenna Type	Connector Type	Gain (dBi)
1	C5060-510002-A	Omni Antenna Kit	RSMA female	2
2	3CWE591	Omni Antenna	N Female	6
3	3CWE596	Panel Antenna	N Female	18
4	3CWE598	Panel Antenna	N Female	8
5	MCM2458PTRPSM	Ceiling Mount Omni Antenna	Three-Port SMA female	3
6	TQJ-24/58MICX6	Ceiling Mount Omni Antenna	Six-Port RSMA female	2.5
7	TQJ-2458MIKX3	Ceiling Mount Omni Antenna	Three-Port RSMA female	2.5

## Antenna Cable description

### For 2.4GHz Band

Ant. Cable	Model number	Connector Type	Cable Length (m)	Gain (dBi)
A	3CWE580	SMA (male) to N type (male)	1.83	-2
B	3CWE581	SMA (male) to N type (male)	6.1	-2
C	3CWE582	SMA (male) to N type (male)	15.2	-5

**For 5GHz Band**

Ant.	Model number	Antenna Type	Connector Type	Gain (dBi)
1	C5060-510002-A	Omni Antenna Kit	RSMA female	3
2	3CWE591	Omni Antenna	N Female	8
3	3CWE596	Panel Antenna	N Female	20
4	3CWE598	Panel Antenna	N Female	10
5	MCM2458PTRPSM	Ceiling Mount Omni Antenna	Three-Port SMA female	4
6	TQJ-24/58MICX6	Ceiling Mount Omni Antenna	Six-Port RSMA female	4.5
7	TQJ-24/58MIKX3	Ceiling Mount Omni Antenna	Three-Port RSMA female	4

**Antenna Cable description**

**For 5GHz Band**

Ant. Cable	Model number	Connector Type	Cable Length (m)	Gain (dBi)
A	3CWE580	SMA (male) to N type (male)	1.83	-4
B	3CWE581	SMA (male) to N type (male)	6.10	-4
C	3CWE582	SMA (male) to N type (male)	15.20	-10

### Operation mode

The EUT was supplied by adapter with 120Vac, 60Hz and it was run in TX mode that was controlled by “ART” program.

The EUT was transmitted continuously during the test.

The following test mode(s) were pre- test:

Pre-Test Mode		
Mode	Antenna	Antenna cable
1	C5060-510002-A	-
2	3CWE591	3CWE580
3		3CWE581
4		3CWE582
5	3CWE596	3CWE580
6		3CWE581
7		3CWE582
8	3CWE598	3CWE580
9		3CWE581
10		3CWE582
11	MCM2458PTRPSM	-
12	TQJ-24/58MICX6	-
13	TQJ-2458MIKX3	-

After the pre-test, the following test mode was final test modes:

Final Test Mode	
Minimum 6 dB Bandwidth	Mode 1
Maximum Output Power	Mode 1, Mode 2, Mode 5, Mode 8, Mode 11, Mode 12, Mode 13
Power Spectral Density	Mode 1
Radiated Spurious Emission	Mode 1, Mode 2, Mode 5, Mode 8, Mode 11, Mode 12, Mode 13
Emission on the Band Edge	Mode 1, Mode 2, Mode 5, Mode 8, Mode 11, Mode 12, Mode 13
Power Line Conducted Emission	Mode 1

The final test was executed under test mode with highest emission and recorded in this report individually.

With individual verifying, the maximum output power was found at 1 Mbps data rate for 802.11b mode, 6 Mbps data rate for 802.11a/g mode, 6.5 Mbps data rate for 802.11n HT20 mode, 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		Chain A	
Data rate(Mbps)	PK(dBm)		
1	20.04		
2	19.82		
5.5	19.07		
11	18.67		
802.11g ch6		Chain A	
Data rate(Mbps)	PK(dBm)		
6	23.62		
9	23.07		
12	22.67		
18	22.09		
24	21.77		
36	21.34		
48	20.88		
54	20.13		
802.11n(HT 20) ch6		Chain A	
Data rate(Mbps)	PK(dBm)		
6.5	23.66		
13	23.07		
19.5	22.84		
26	22.31		
39	21.97		
52	21.33		
58.5	20.79		
65	20.14		
802.11n(HT 40) ch6		Chain A	
Data rate(Mbps)	PK(dBm)		
13.5	22.85		
27	22.07		
40.5	21.84		
54	21.41		
81	20.89		
108	20.14		
121.5	19.88		
135	19.17		

802.11a ch157		Chain A	
Data rate(Mbps)	PK(dBm)		
6	22.78		
9	22.17		
12	21.87		
18	21.17		
24	20.79		
36	20.17		
48	19.97		
54	19.47		
802.11n(HT 20) ch157		Chain A	
Data rate(Mbps)	PK(dBm)		
6.5	22.69		
13	22.01		
19.5	21.49		
26	20.99		
39	20.19		
52	19.67		
58.5	19.07		
65	18.88		
802.11n(HT 40) ch151		Chain A	
Data rate(Mbps)	PK(dBm)		
13.5	22.58		
27	22.01		
40.5	21.87		
54	21.07		
81	20.81		
108	20.26		
121.5	19.47		
135	19.07		



### Table for Parameters of Test Software Setting

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

For Ant. 1

Power Parameters of 802.11b/g/a/n

Test Software Version	ART (dBm)			
	Frequency	2412 MHz	2437 MHz	2462 MHz
802.11b		19.0	19.0	19.0
802.11g		16.5	16.5	15.5
802.11n(HT20)		16.5	16.5	15.5
802.11n(HT40)	2422 MHz	2437 MHz	2452 MHz	
	13.5	13.5	13.0	

Power Parameters of 802.11a/n

Test Software Version	ART (dBm)			
	Frequency	5745 MHz	5785 MHz	5825 MHz
802.11a		18.0	18.0	18.0
802.11n(HT20)		18.0	18.0	18.0
802.11n(HT40)	5755 MHz	5795 MHz	-	
	17.0	17.0	-	

For Ant. 2

Power Parameters of 802.11b/g/a/n

Test Software Version	ART (dBm)			
	Frequency	2412 MHz	2437 MHz	2462 MHz
802.11b		18.5	18.5	18.5
802.11g		14.0	15.0	15.0
802.11n(HT20)		13.5	14.5	14.5
802.11n(HT40)	2422 MHz	2437 MHz	2452 MHz	
	10.0	12.0	12.0	

Power Parameters of 802.11a/n

Test Software Version	ART (dBm)			
	Frequency	5745 MHz	5785 MHz	5825 MHz
802.11a		18.0	18.0	18.0
802.11n(HT20)		18.0	18.0	18.0
802.11n(HT40)	5755 MHz	5795 MHz	-	
	17.0	17.0	-	

For Ant. 3

Power Parameters of 802.11b/g/a/n

Test Software Version	ART (dBm)		
	2412 MHz	2437 MHz	2462 MHz
Frequency	2412 MHz	2437 MHz	2462 MHz
802.11b	16.5	16.5	17.0
802.11g	10.0	10.0	10.0
802.11n(HT20)	10.0	10.0	10.0
802.11n(HT40)	2422 MHz	2437 MHz	2452 MHz
	5.5	6.5	6.5

Power Parameters of 802.11a/n

Test Software Version	ART (dBm)		
	5745 MHz	5785 MHz	5825 MHz
Frequency	5745 MHz	5785 MHz	5825 MHz
802.11a	18.0	18.0	18.0
802.11n(HT20)	18.0	18.0	18.0
802.11n(HT40)	5755 MHz	5795 MHz	-
	17.0	17.0	-

For Ant. 4

Power Parameters of 802.11b/g/a/n

Test Software Version	ART (dBm)		
	2412 MHz	2437 MHz	2462 MHz
Frequency	2412 MHz	2437 MHz	2462 MHz
802.11b	16.5	16.5	17.0
802.11g	10.0	10.0	10.0
802.11n(HT20)	10.0	10.0	10.0
802.11n(HT40)	2422 MHz	2437 MHz	2452 MHz
	5.5	6.5	6.5

Power Parameters of 802.11a/n

Test Software Version	ART (dBm)		
	5745 MHz	5785 MHz	5825 MHz
Frequency	5745 MHz	5785 MHz	5825 MHz
802.11a	18.0	18.0	18.0
802.11n(HT20)	18.0	18.0	18.0
802.11n(HT40)	5755 MHz	5795 MHz	-
	17.0	17.0	-

For Ant. 5

Power Parameters of 802.11b/g/a/n

Test Software Version	ART (dBm)		
	Frequency	2412 MHz	2437 MHz
802.11b	19.0	19.0	19.0
802.11g	15.0	15.0	15.0
802.11n(HT20)	14.5	14.5	14.5
802.11n(HT40)	2422 MHz	2437 MHz	2452 MHz
	11.0	13.0	13.0

Power Parameters of 802.11a/n

Test Software Version	ART (dBm)		
	Frequency	5745 MHz	5785 MHz
802.11a	18.0	18.0	18.0
802.11n(HT20)	18.0	18.0	18.0
802.11n(HT40)	5755 MHz	5795 MHz	-
	17.0	17.0	-

For Ant. 6

Power Parameters of 802.11b/g/a/n

Test Software Version	ART (dBm)		
	Frequency	2412 MHz	2437 MHz
802.11b	18.0	18.0	18.0
802.11g	14.0	14.0	14.0
802.11n(HT20)	13.0	13.0	13.0
802.11n(HT40)	2422 MHz	2437 MHz	2452 MHz
	11.0	11.0	11.0

Power Parameters of 802.11a/n

Test Software Version	ART (dBm)		
	Frequency	5745 MHz	5785 MHz
802.11a	18.0	18.0	18.0
802.11n(HT20)	18.0	18.0	18.0
802.11n(HT40)	5755 MHz	5795 MHz	-
	17.0	17.0	-

For Ant. 7

Power Parameters of 802.11b/g/a/n

Test Software Version	ART (dBm)			
	Frequency	2412 MHz	2437 MHz	2462 MHz
802.11b		18.5	18.5	18.0
802.11g		14.5	14.5	14.0
802.11n(HT20)		14.5	14.5	14.0
802.11n(HT40)	2422 MHz		2437 MHz	2452 MHz
		11.5	11.5	11.5

Power Parameters of 802.11a/n

Test Software Version	ART (dBm)			
	Frequency	5745 MHz	5785 MHz	5825 MHz
802.11a		18.0	18.0	18.0
802.11n(HT20)		18.0	18.0	18.0
802.11n(HT40)	5755 MHz		5795 MHz	-
		17.0	17.0	-

### 3. Maximum 6 dB Bandwidth

<b>Name of Test</b>	Maximum 6 dB Bandwidth
<b>Base Standard</b>	FCC 15.247 (a)(2)

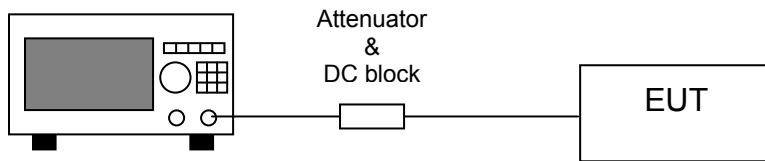
**Test Result:** Complies  
**Measurement Data:** See Table & plots below

**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:**



Spectrum Analyzer

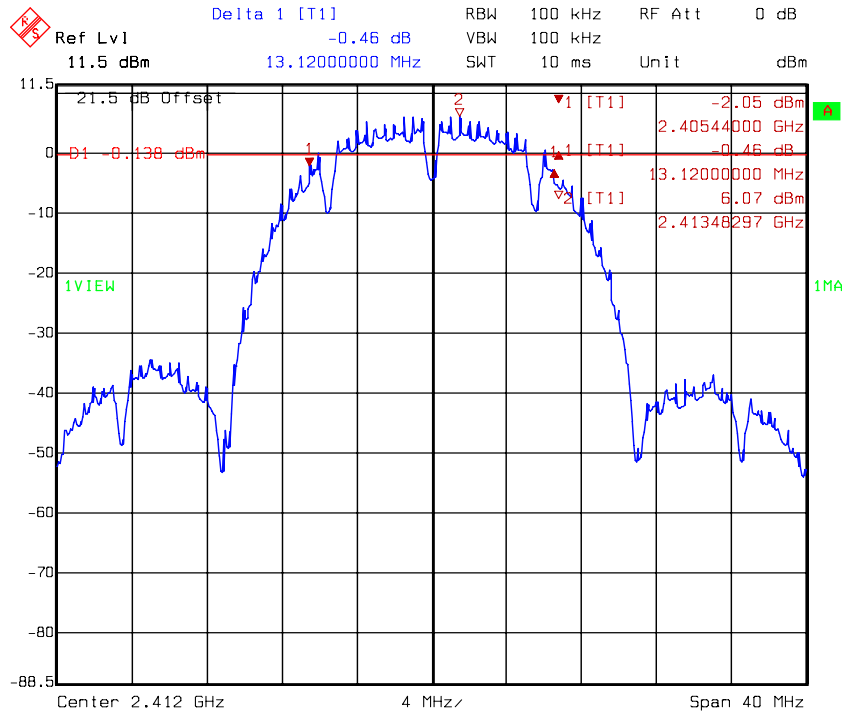
**Note:** The EUT was tested while in a continuous transmit mode and the worst case data rates are 1 Mbps for 802.11b, 6 Mbps for 802.11a/ 11g, 6.5 MHz for 802.11n HT20 and 13.5 MHz for 802.11n HT40. The EUT was tuned to a low, middle and high channel.

Table 1. Maximum 6 dB Bandwidth

Antenna : C5060-510002-A (worse case)  
3TX

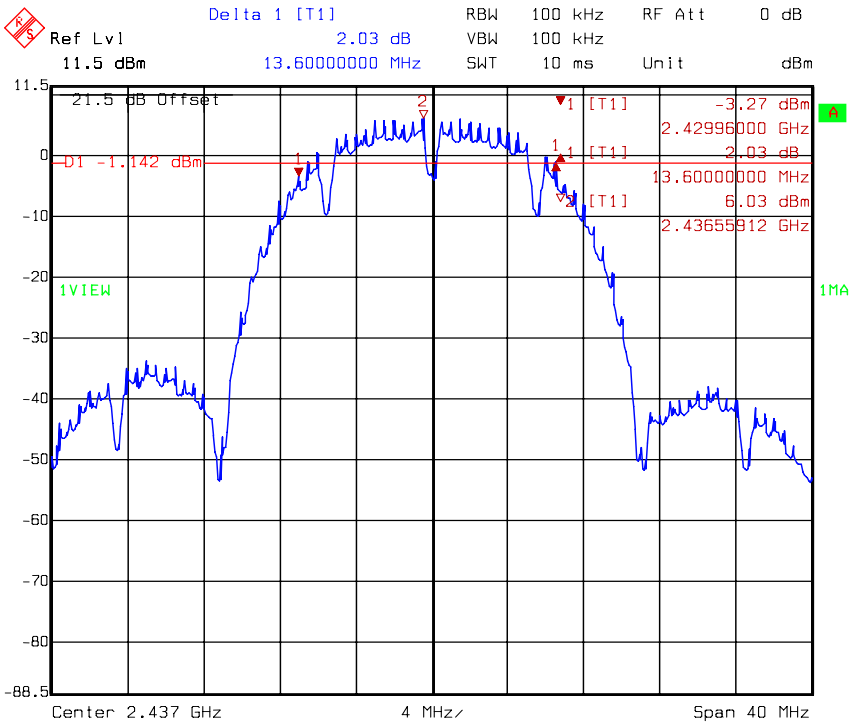
Mode	Channel	Data rate Mbps	6dB Bandwidth (MHz)			Limit (MHz)
			Chain A	Chain B	ChainC	
802.11b	1	1	13.12	12.72	12.56	0.5
	6		13.60	13.60	12.16	0.5
	11		12.48	14.08	12.64	0.5
802.11g	1	6	16.64	16.80	16.64	0.5
	6		16.80	16.80	16.64	0.5
	11		16.56	16.80	16.64	0.5
802.11n (HT20)	1	6.5	17.84	18.08	18.00	0.5
	6		17.76	18.00	18.08	0.5
	11		17.84	18.08	18.00	0.5
802.11n (HT40)	3	13.5	36.78	37.02	36.78	0.5
	6		36.78	36.90	36.78	0.5
	9		36.78	36.90	36.78	0.5
802.11a	149	6	16.48	16.56	16.72	0.5
	157		16.72	16.40	16.64	0.5
	165		16.48	16.80	16.80	0.5
802.11n (HT20)	149	6.5	17.44	17.76	17.76	0.5
	157		17.76	17.68	18.08	0.5
	165		16.80	18.08	17.84	0.5
802.11n (HT40)	151	13.5	36.78	36.90	36.66	0.5
	159		36.66	36.78	36.78	0.5

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



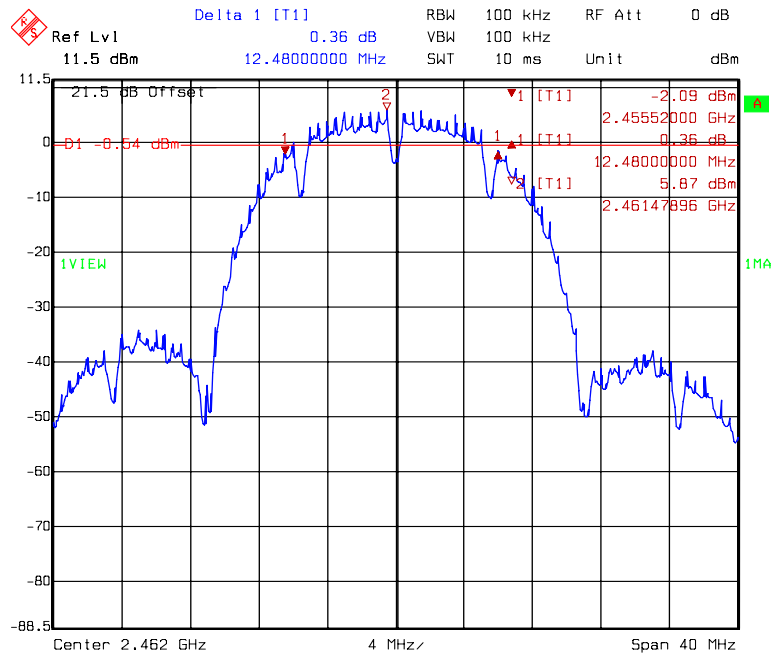
Title: 6dB Band-Width  
Comment A: CH 1 at 802.11b mode chainA  
Date: 24.OCT.2008 15:41:16

### Chain A: 6dB Bandwidth @ 802.11b mode channel 6



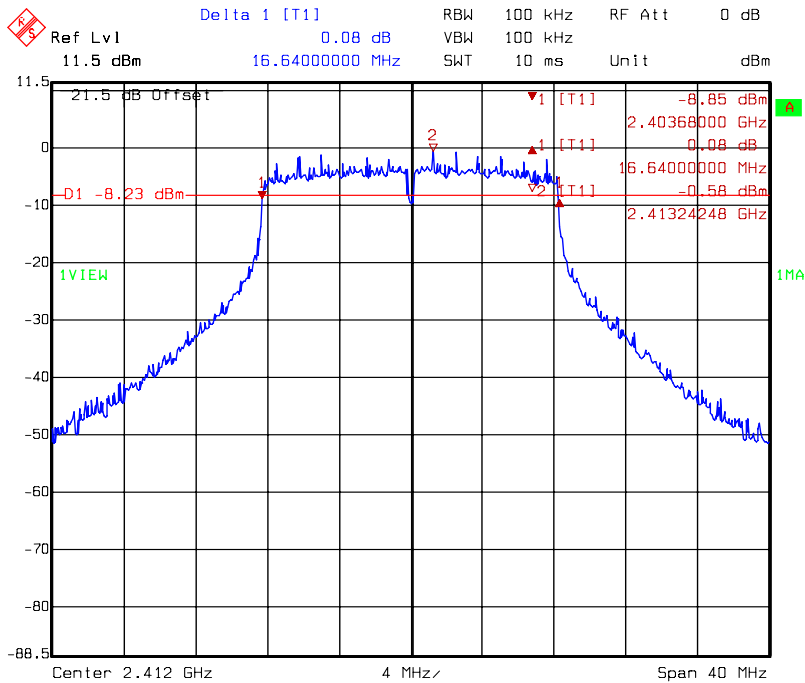
Title: 6dB Band-Width  
Comment A: CH 6 at 802.11b mode chainA  
Date: 24.OCT.2008 15:45:07

### Chain A: 6dB Bandwidth @ 802.11b mode channel 11



Title: 6dB Band-Width  
Comment A: CH 11 at 802.11b mode chainA  
Date: 24.OCT.2008 15:47:52

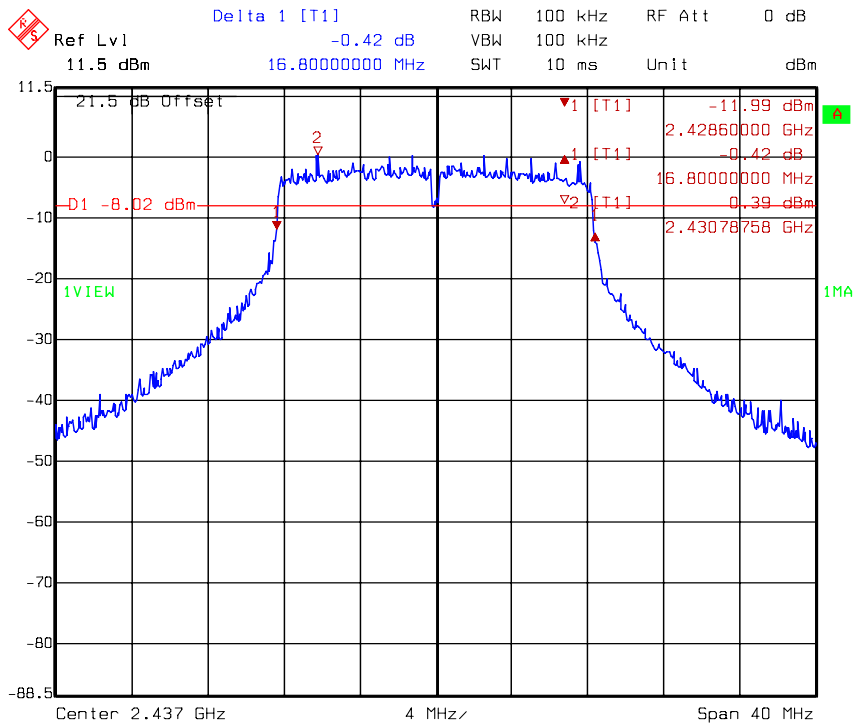
### Chain A: 6dB Bandwidth @ 802.11g mode channel 1



Title: 6dB Band-Width  
Comment A: CH 1 at 802.11g mode chainA  
Date: 24.OCT.2008 15:51:21

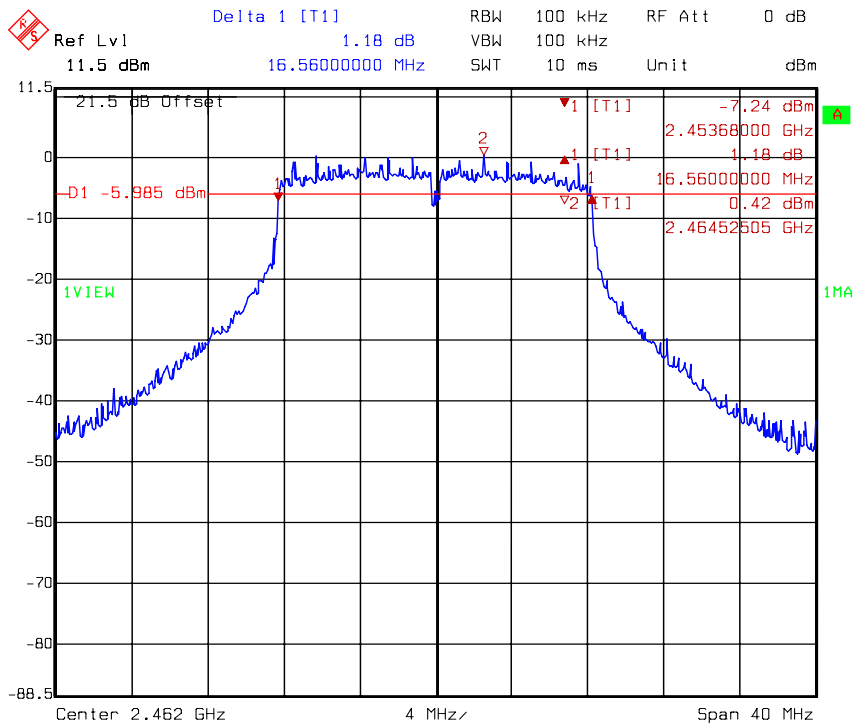


**Chain A: 6dB Bandwidth @ 802.11g mode channel 6**



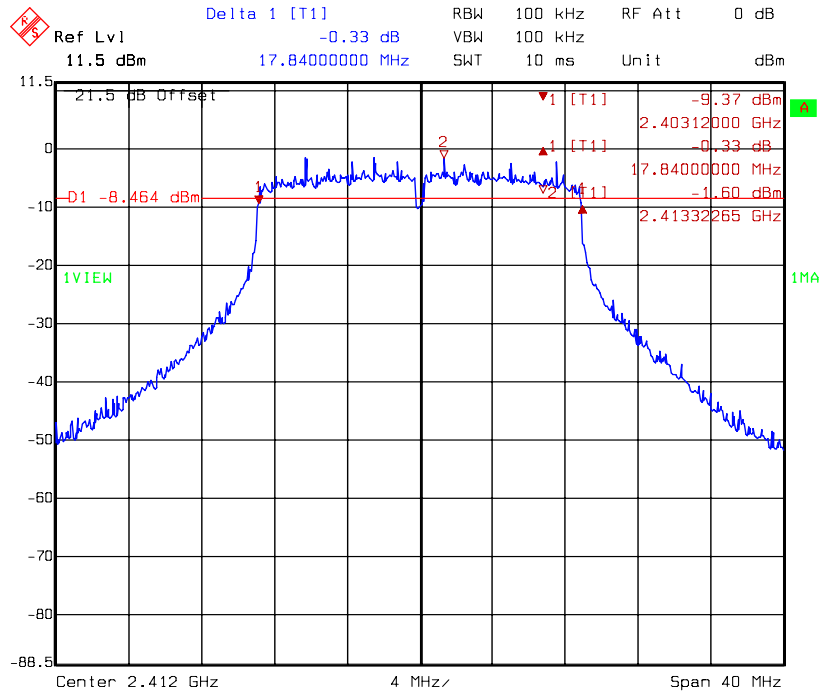
Title: 6dB Band-Width  
Comment A: CH 6 at 802.11g mode chainA  
Date: 24.OCT.2008 15:54:29

**Chain A: 6dB Bandwidth @ 802.11g mode channel 11**



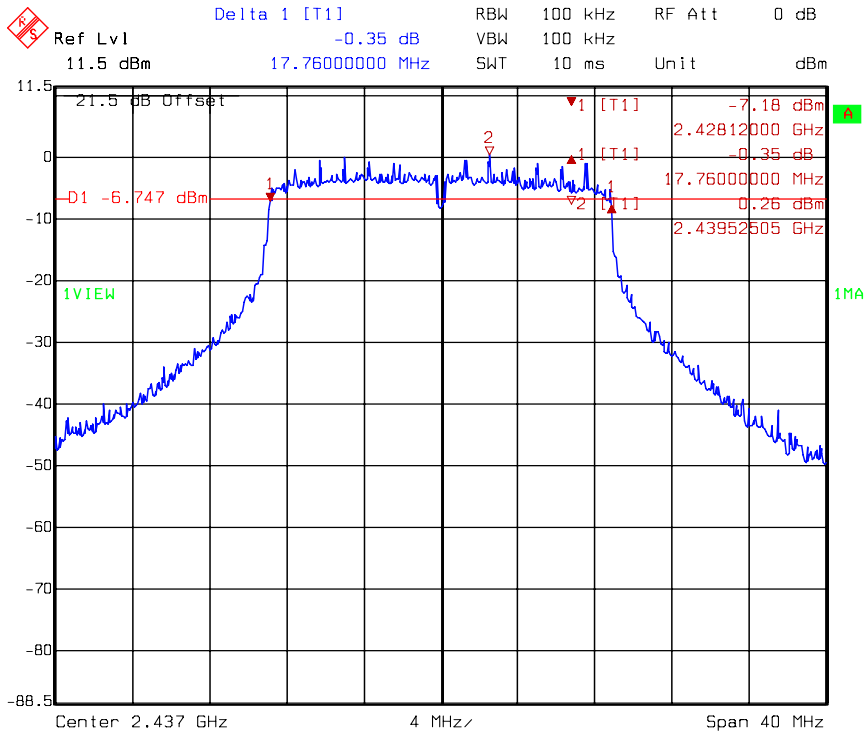
Title: 6dB Band-Width  
Comment A: CH 11 at 802.11g mode chainA  
Date: 24.OCT.2008 15:58:03

**Chain A: 6dB Bandwidth @ 802.11n (HT20) mode channel 1**



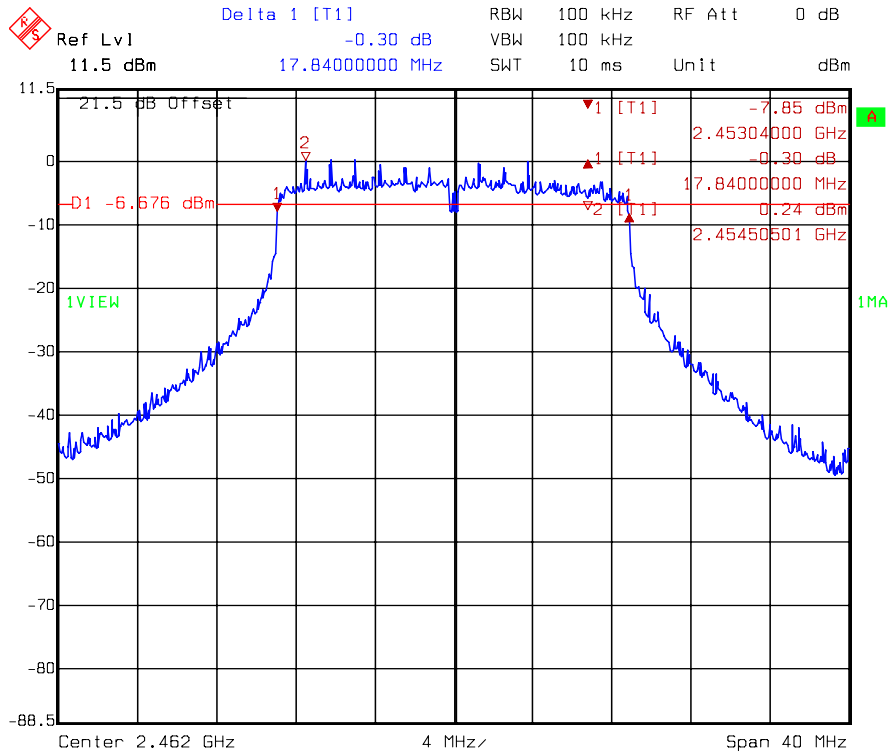
Title: 6dB Band-Width  
Comment A: CH 1 at 802.11n 20MHz mode chainA  
Date: 24.OCT.2008 16:02:16

**Chain A: 6dB Bandwidth @ 802.11n (HT20) mode channel 6**



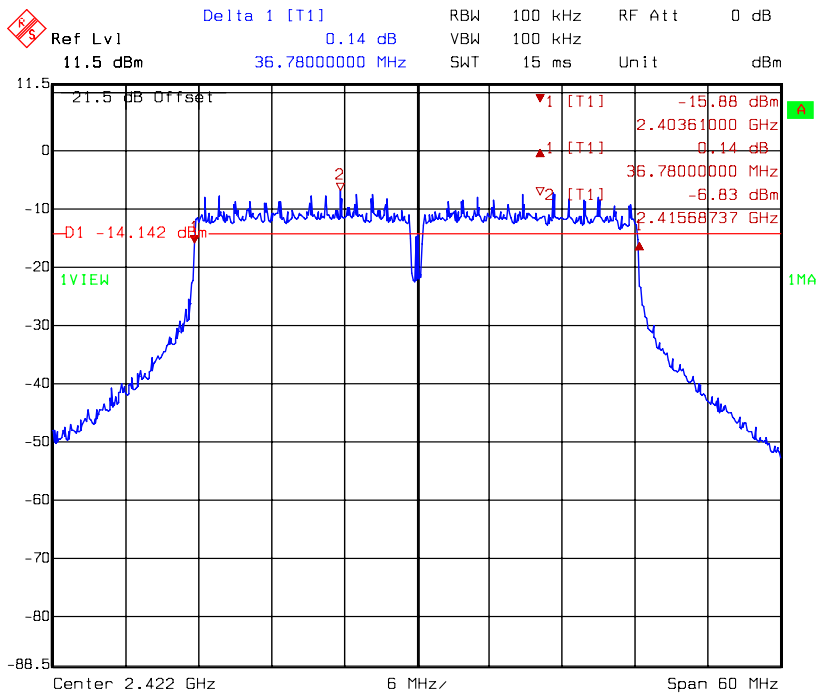
Title: 6dB Band-Width  
Comment A: CH 6 at 802.11n 20MHz mode chainA  
Date: 24.OCT.2008 16:05:08

## Chain A: 6dB Bandwidth @ 802.11n (HT20) mode channel 11



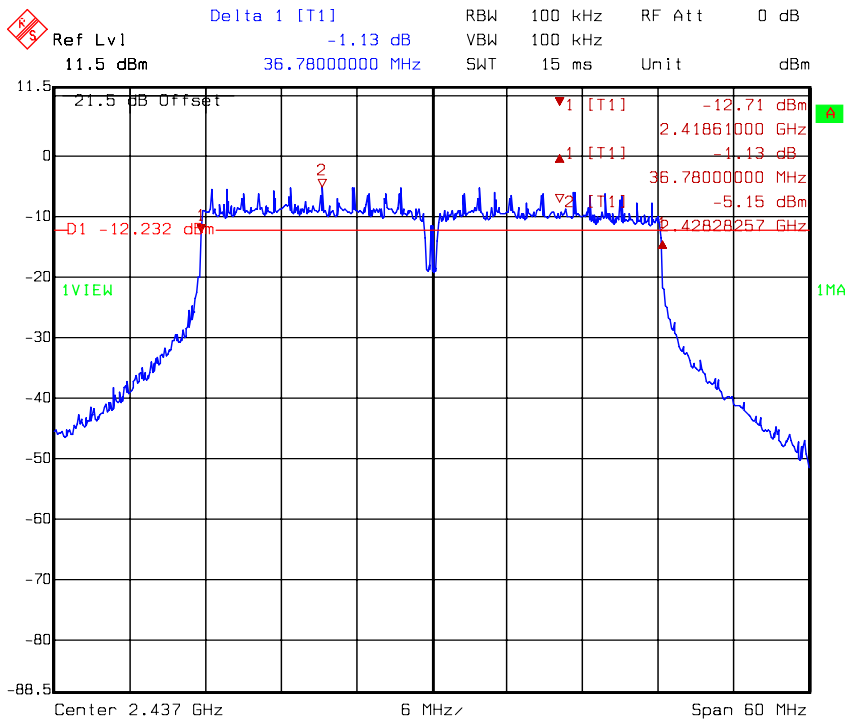
Title: 6dB Band-Width  
Comment A: CH 11 at 802.11n 20MHz mode chainA  
Date: 24.OCT.2008 16:10:29

## Chain A: 6dB Bandwidth @ 802.11n (HT40) mode channel 3



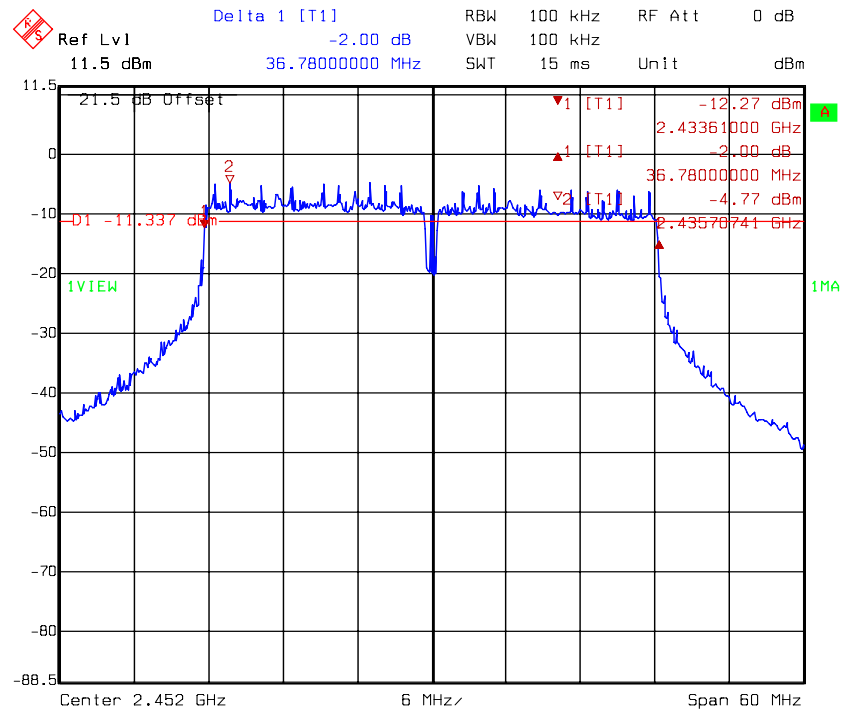
Title: 6dB Band-Width  
Comment A: CH 3 at 802.11n 40MHz mode chainA  
Date: 24.OCT.2008 16:16:44

**Chain A: 6dB Bandwidth @ 802.11n (HT40) mode channel 6**



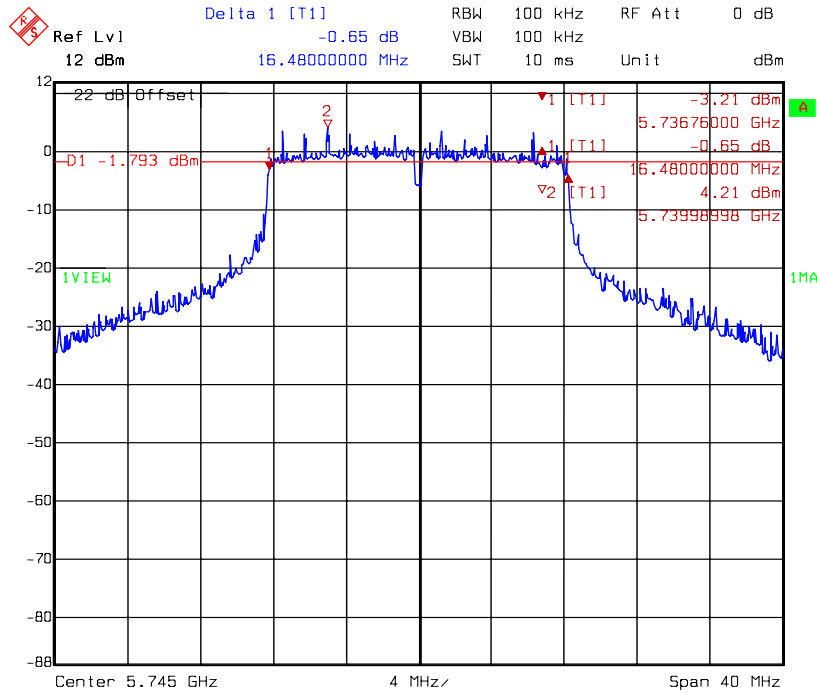
Title: 6dB Band-Width  
Comment A: CH 6 at 802.11n 40MHz mode chainA  
Date: 24.OCT.2008 16:25:16

**Chain A: 6dB Bandwidth @ 802.11n (HT40) mode channel 9**



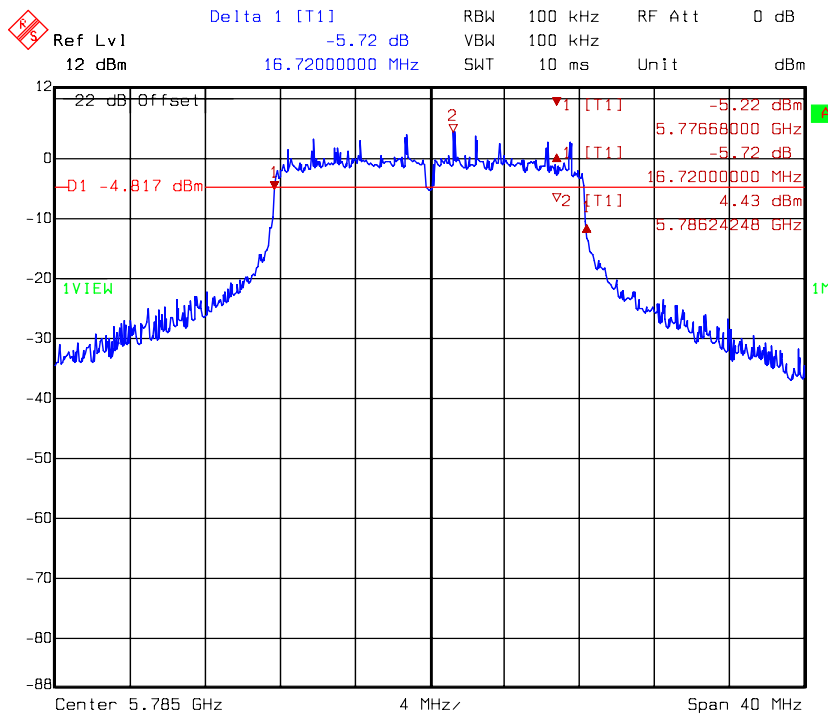
Title: 6dB Band-Width  
Comment A: CH 9 at 802.11n 40MHz mode chainA  
Date: 24.OCT.2008 16:28:06

### Chain A: 6dB Bandwidth @ 802.11a mode channel 149



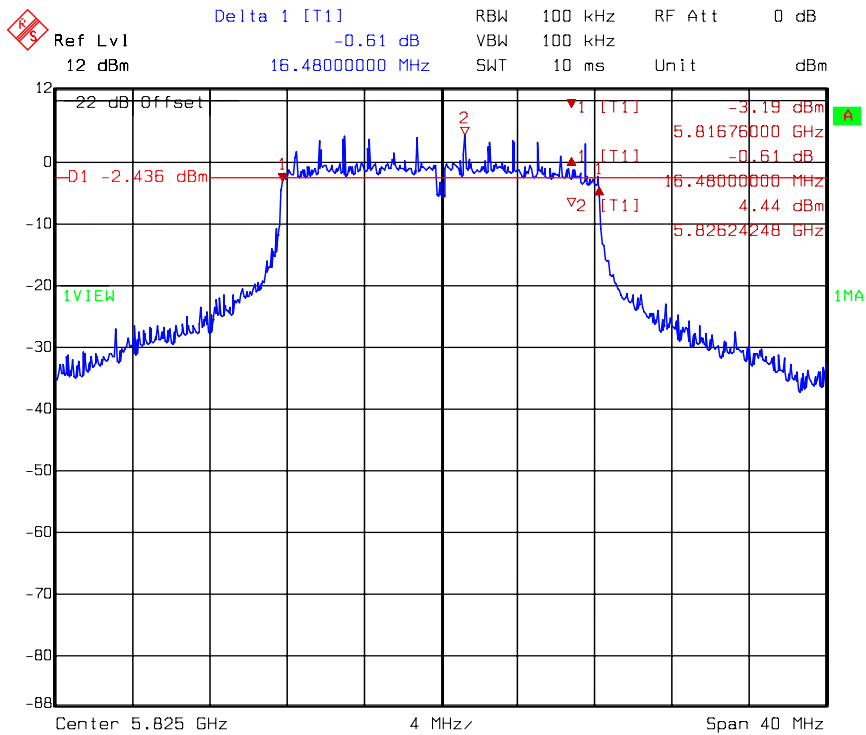
Title: 6dB Band-Width  
Comment A: CH 149 at 802.11a mode chainA  
Date: 27.OCT.2008 11:52:41

### Chain A: 6dB Bandwidth @ 802.11a mode channel 157



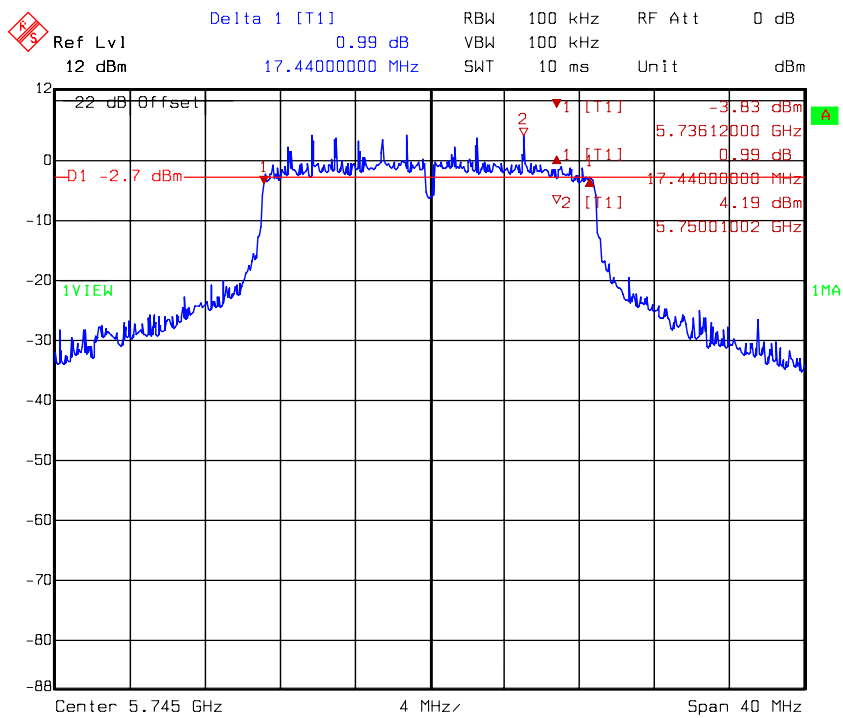
Title: 6dB Band-Width  
Comment A: CH 157 at 802.11a mode chainA  
Date: 27.OCT.2008 11:56:22

### Chain A: 6dB Bandwidth @ 802.11a mode channel 165



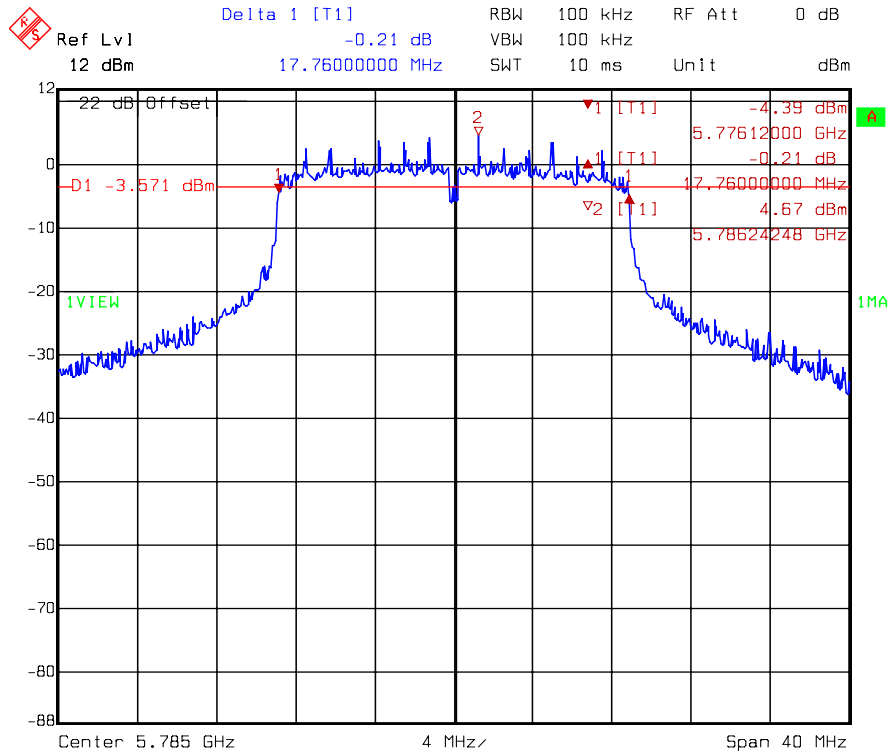
Title: 6dB Band-Width  
Comment A: CH 165 at 802.11a mode chainA  
Date: 27.OCT.2008 12:06:28

### Chain A: 6dB Bandwidth @ 802.11n (HT20) mode channel 149



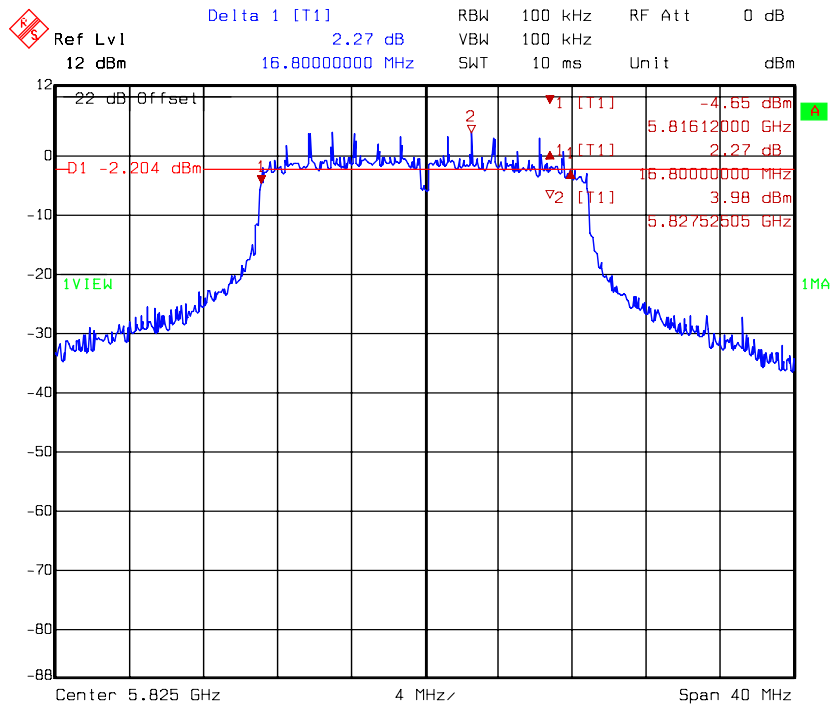
Title: 6dB Band-Width  
Comment A: CH 149 at 802.11n 20MHz mode chainA  
Date: 27.OCT.2008 14:07:34

## Chain A: 6dB Bandwidth @ 802.11n (HT20) mode channel 157



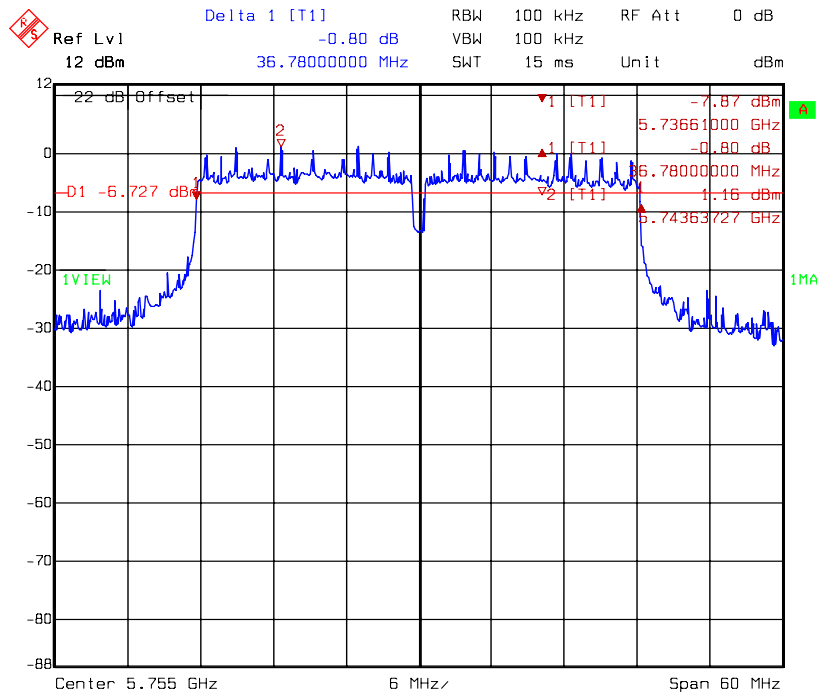
Title: 6dB Band-Width  
Comment A: CH 157 at 802.11n 20MHz mode chainA  
Date: 27.OCT.2008 14:12:49

## Chain A: 6dB Bandwidth @ 802.11n (HT20) mode channel 165



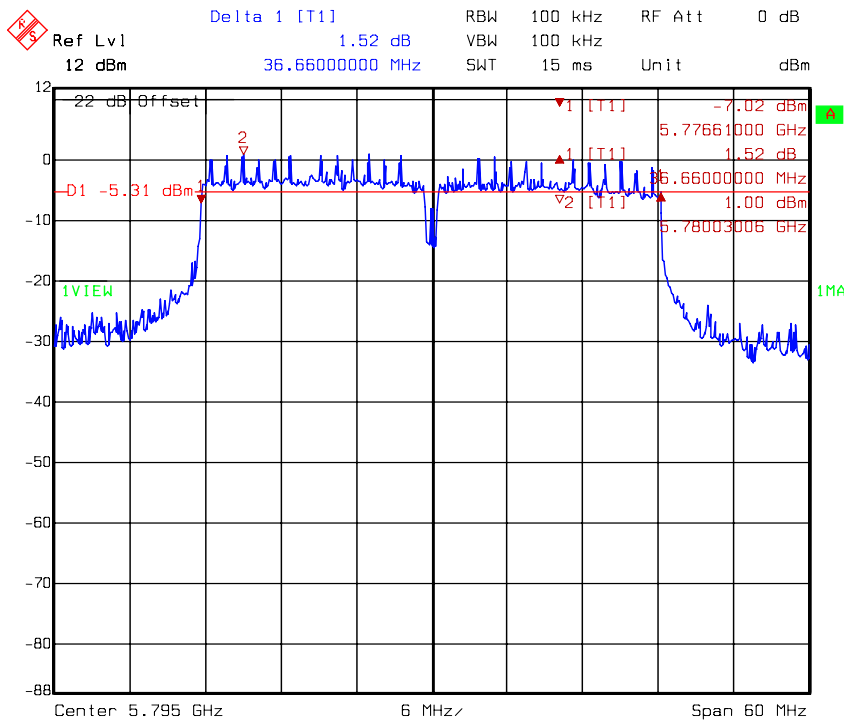
Title: 6dB Band-Width  
Comment A: CH 165 at 802.11n 20MHz mode chainA  
Date: 27.OCT.2008 14:16:32

## Chain A: 6dB Bandwidth @ 802.11n (HT40) mode channel 151



Title: 6dB Band-Width  
 Comment A: CH 151 at 802.11n 40MHz mode chainA  
 Date: 27.OCT.2008 14:21:16

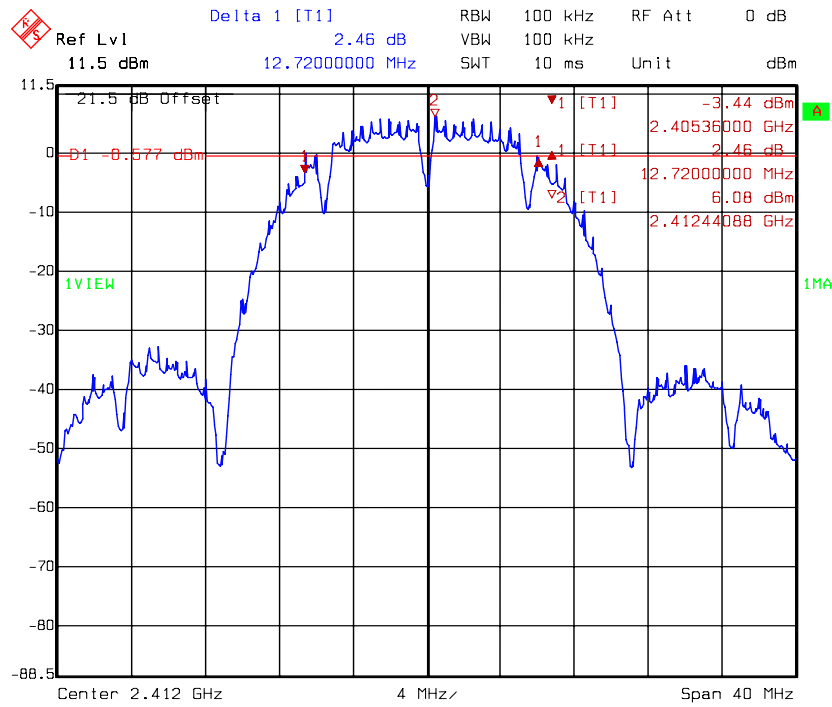
## Chain A: 6dB Bandwidth @ 802.11n (HT40) mode channel 159



Title: 6dB Band-Width  
 Comment A: CH 159 at 802.11n 40MHz mode chainA  
 Date: 27.OCT.2008 14:24:37

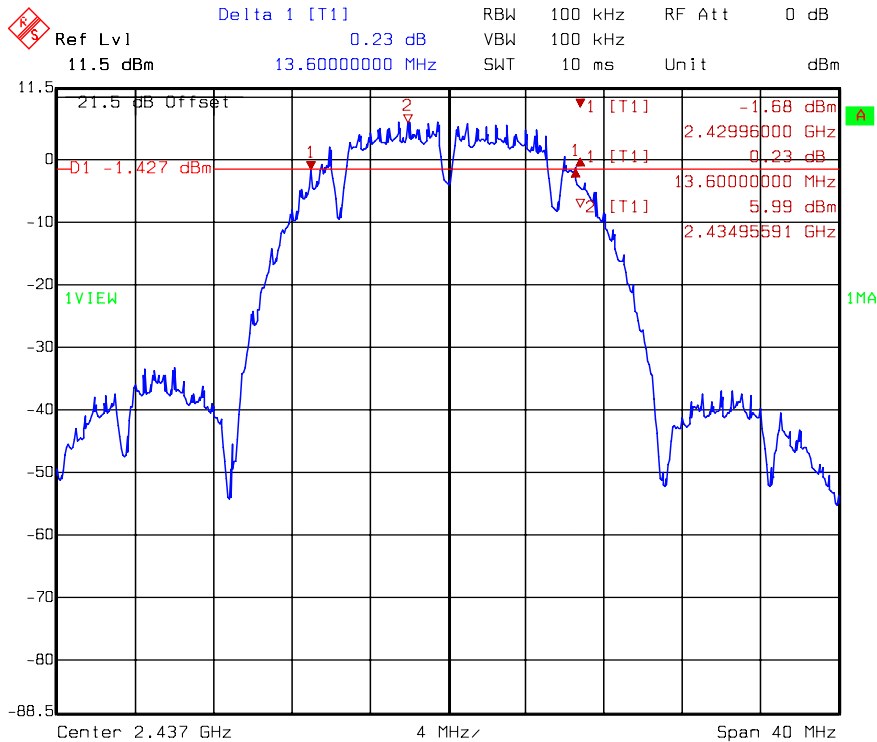


### Chain B: 6dB Bandwidth @ 802.11b mode channel 1



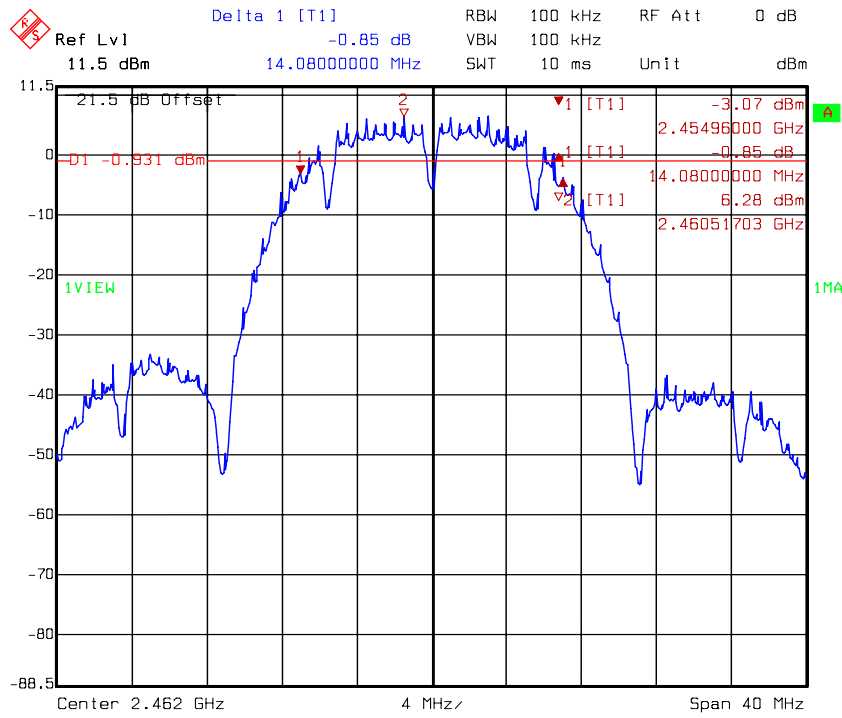
Title: 6dB Band-Width  
 Comment A: CH 1 at 802.11b mode chainB  
 Date: 27.OCT.2008 14:55:52

### Chain B: 6dB Bandwidth @ 802.11b mode channel 6



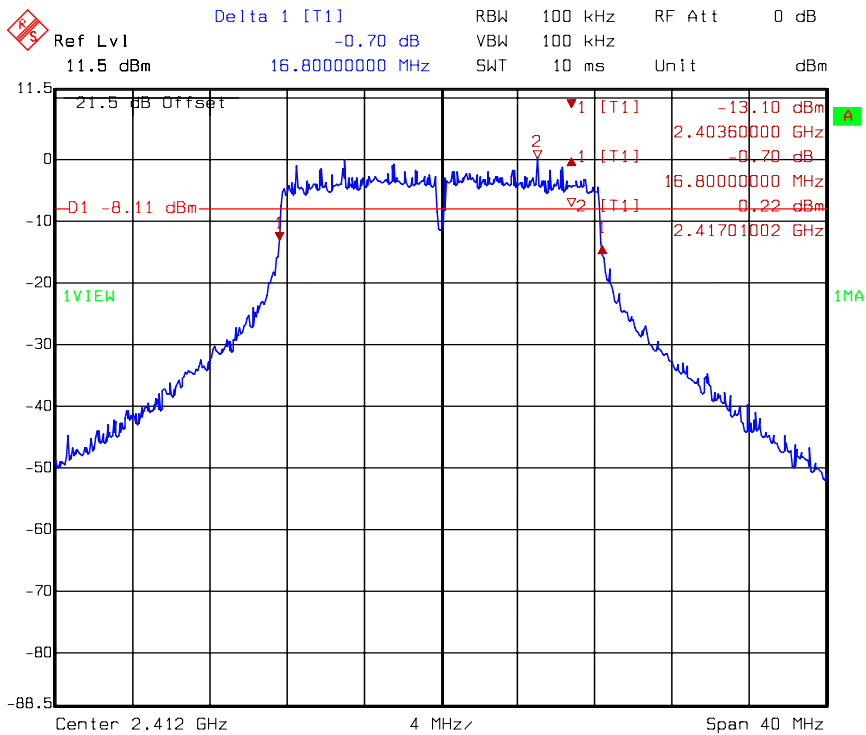
Title: 6dB Band-Width  
 Comment A: CH 6 at 802.11b mode chainB  
 Date: 27.OCT.2008 14:59:02

### Chain B: 6dB Bandwidth @ 802.11b mode channel 11



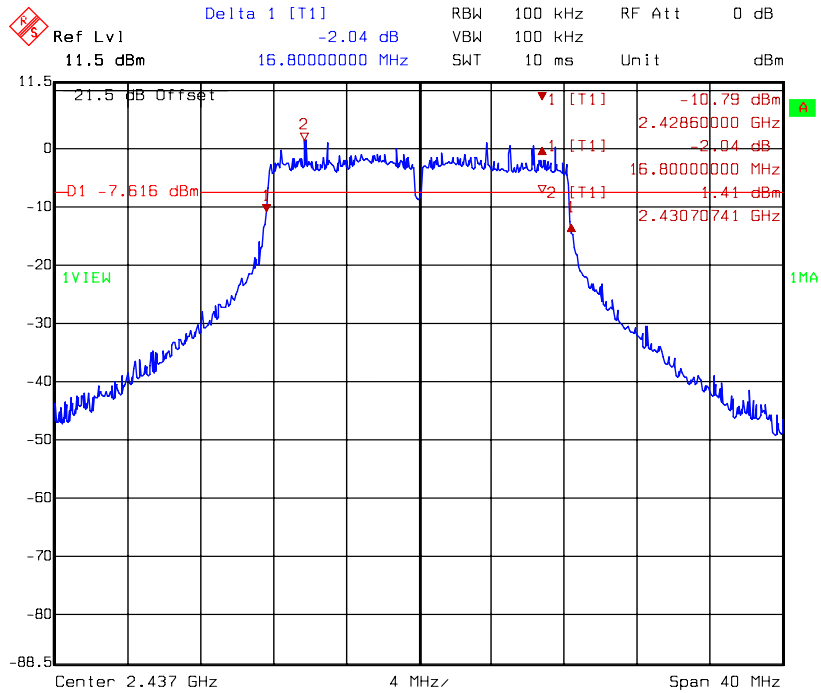
Title: 6dB Band-Width  
Comment A: CH 11 at 802.11b mode chainB  
Date: 27.OCT.2008 15:01:57

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



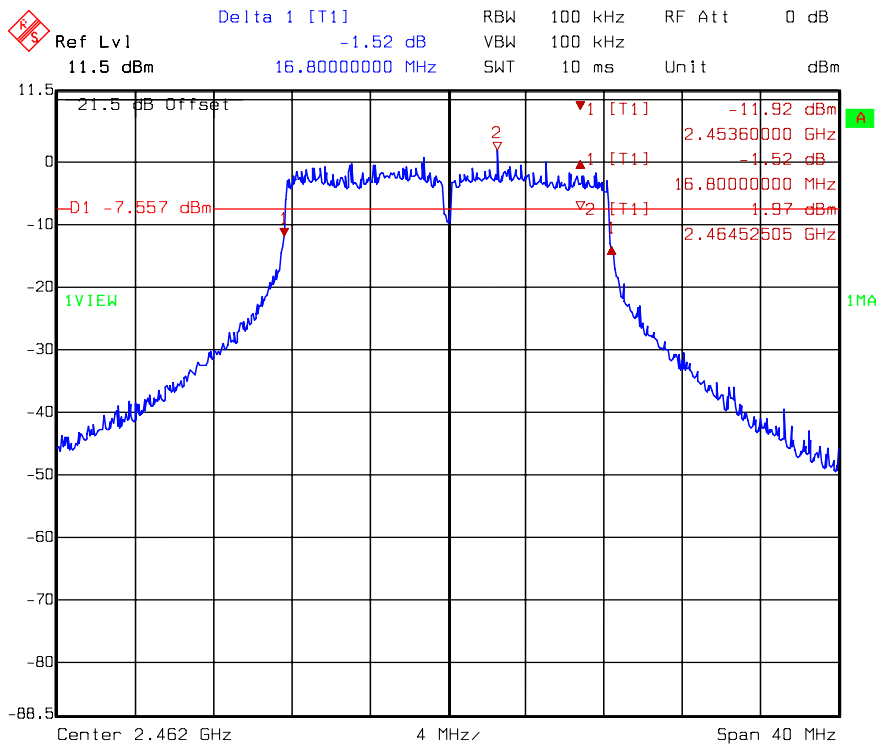
Title: 6dB Band-Width  
Comment A: CH 1 at 802.11g mode chainB  
Date: 27.OCT.2008 16:22:03

### Chain B: 6dB Bandwidth @ 802.11g mode channel 6



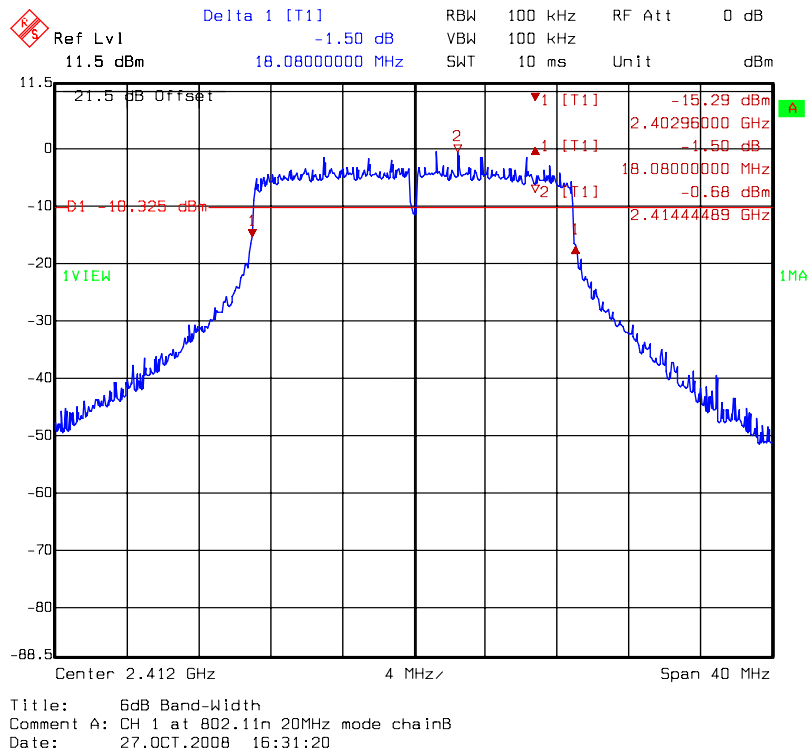
Title: 6dB Band-Width  
Comment A: CH 6 at 802.11g mode chainB  
Date: 27.OCT.2008 16:24:52

### Chain B: 6dB Bandwidth @ 802.11g mode channel 11

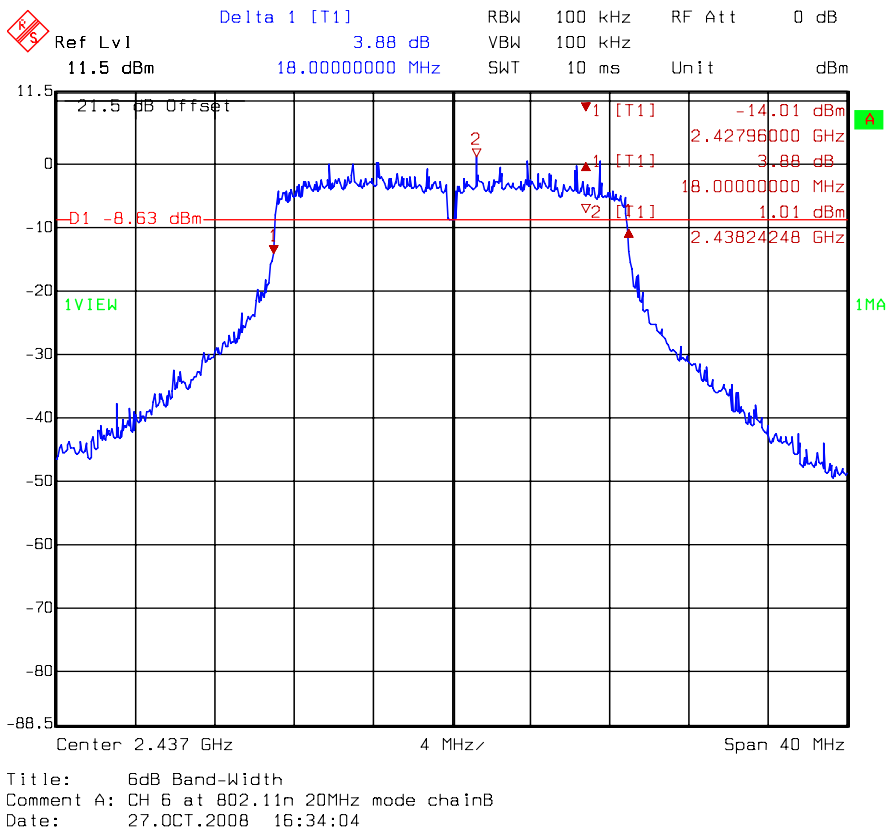


Title: 6dB Band-Width  
Comment A: CH 11 at 802.11g mode chainB  
Date: 27.OCT.2008 16:27:51

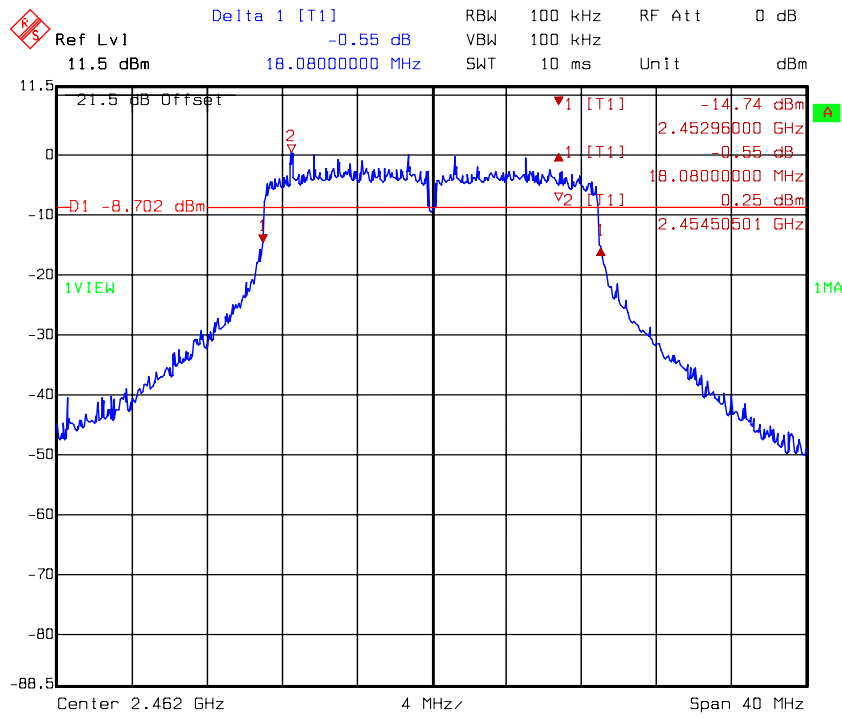
## Chain B: 6dB Bandwidth @ 802.11n (HT20) mode channel 1



## Chain B: 6dB Bandwidth @ 802.11n (HT20) mode channel 6

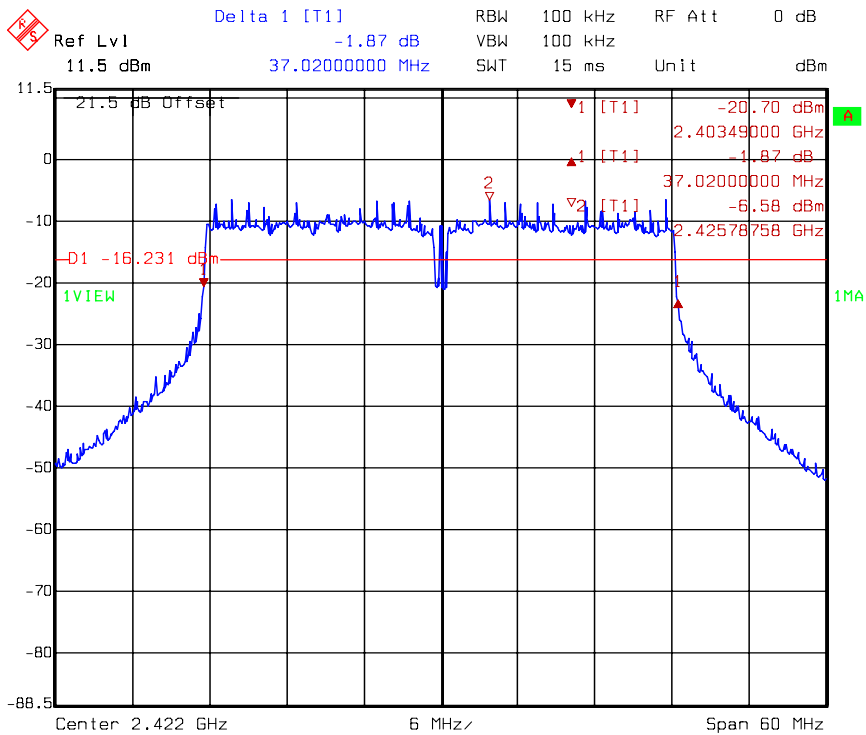


**Chain B: 6dB Bandwidth @ 802.11n (HT20) mode channel 11**



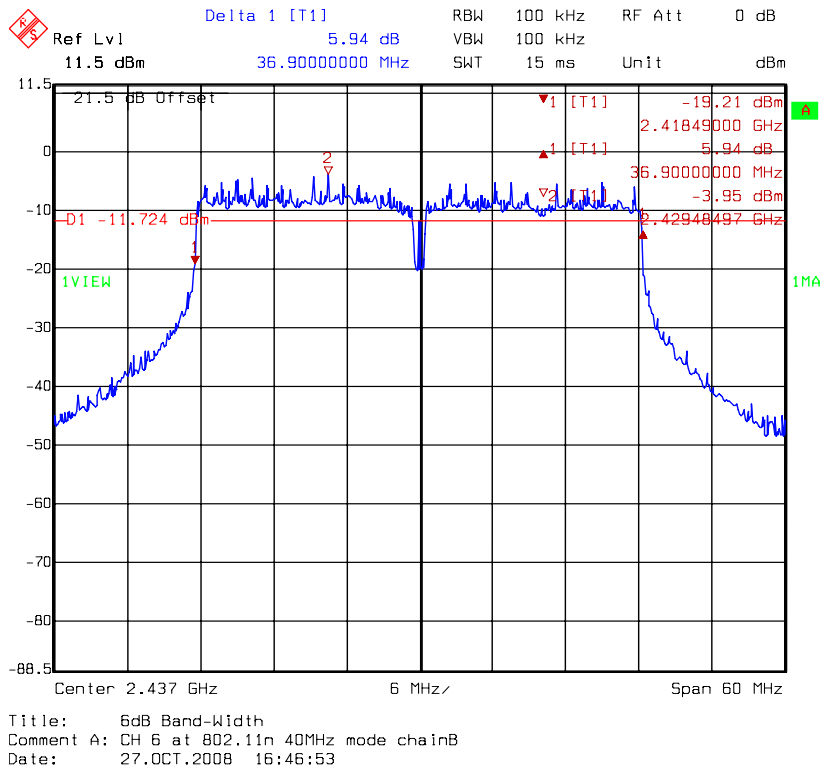
Title: 6dB Band-Width  
Comment A: CH 11 at 802.11n 20MHz mode chainB  
Date: 27.OCT.2008 16:36:38

**Chain B: 6dB Bandwidth @ 802.11n (HT40) mode channel 3**

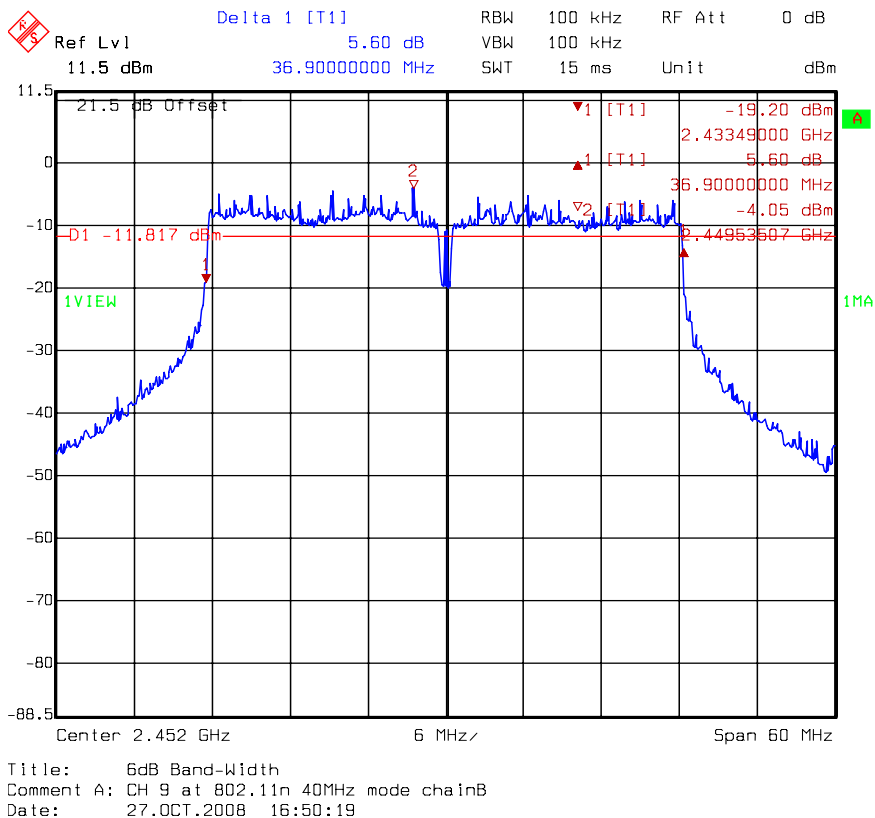


Title: 6dB Band-Width  
Comment A: CH 3 at 802.11n 40MHz mode chainB  
Date: 27.OCT.2008 16:40:05

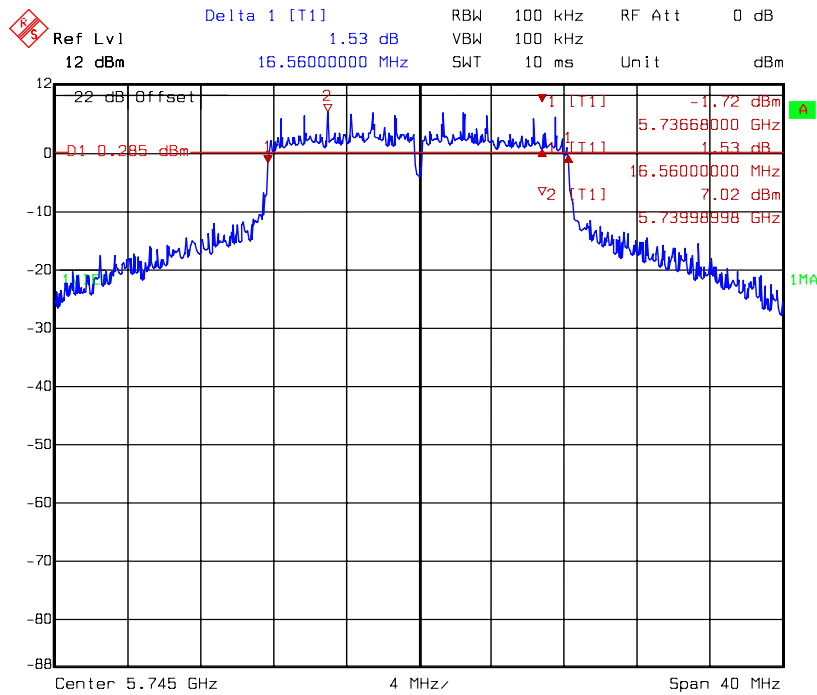
**Chain B: 6dB Bandwidth @ 802.11n (HT40) mode channel 6**



**Chain B: 6dB Bandwidth @ 802.11n (HT40) mode channel 9**

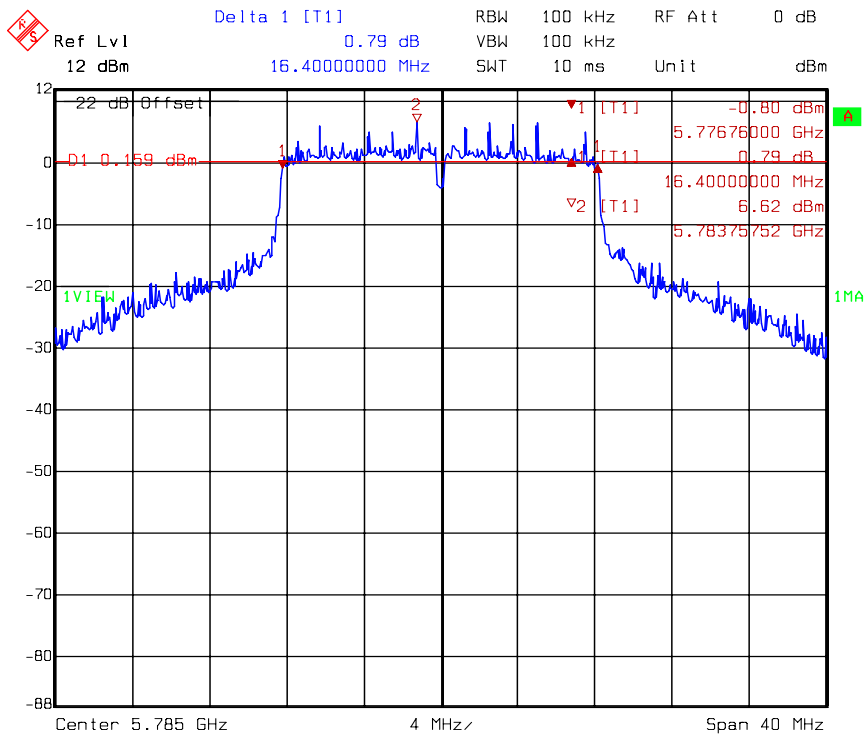


### Chain B: 6dB Bandwidth @ 802.11a mode channel 149



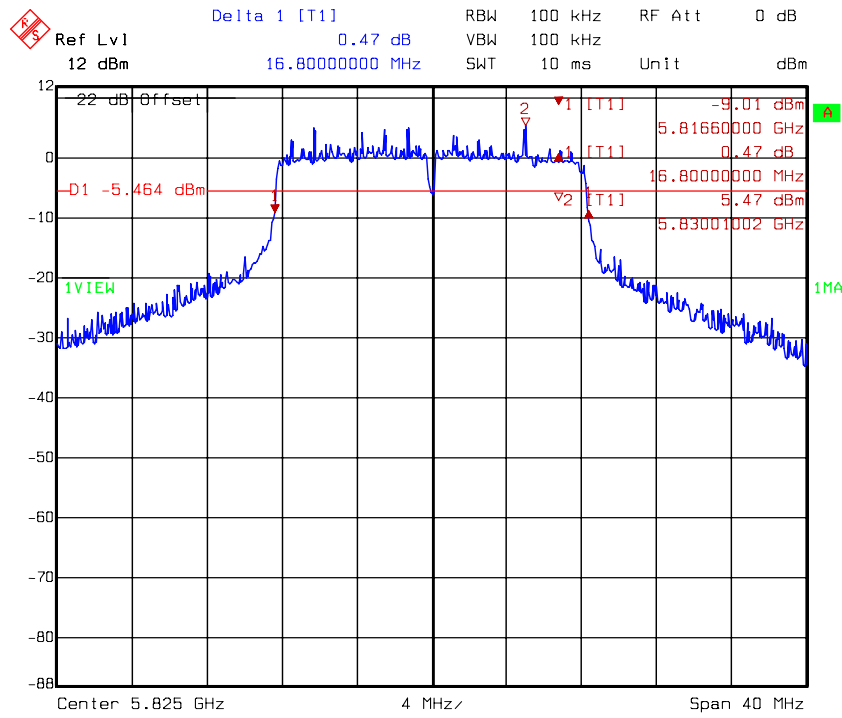
Title: 6dB Band-Width  
Comment A: CH 149 at 802.11a mode chainB  
Date: 27.OCT.2008 16:54:18

### Chain B: 6dB Bandwidth @ 802.11a mode channel 157



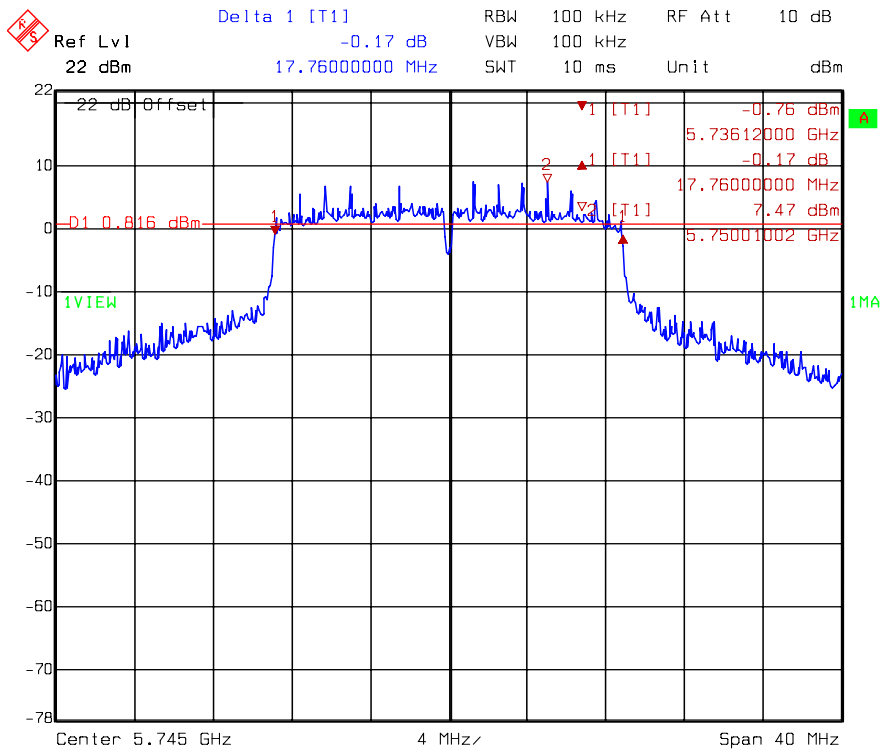
Title: 6dB Band-Width  
Comment A: CH 157 at 802.11a mode chainB  
Date: 27.OCT.2008 16:59:10

**Chain B: 6dB Bandwidth @ 802.11a mode channel 165**



Title: 6dB Band-Width  
Comment A: CH 165 at 802.11a mode chainB  
Date: 27.OCT.2008 17:02:21

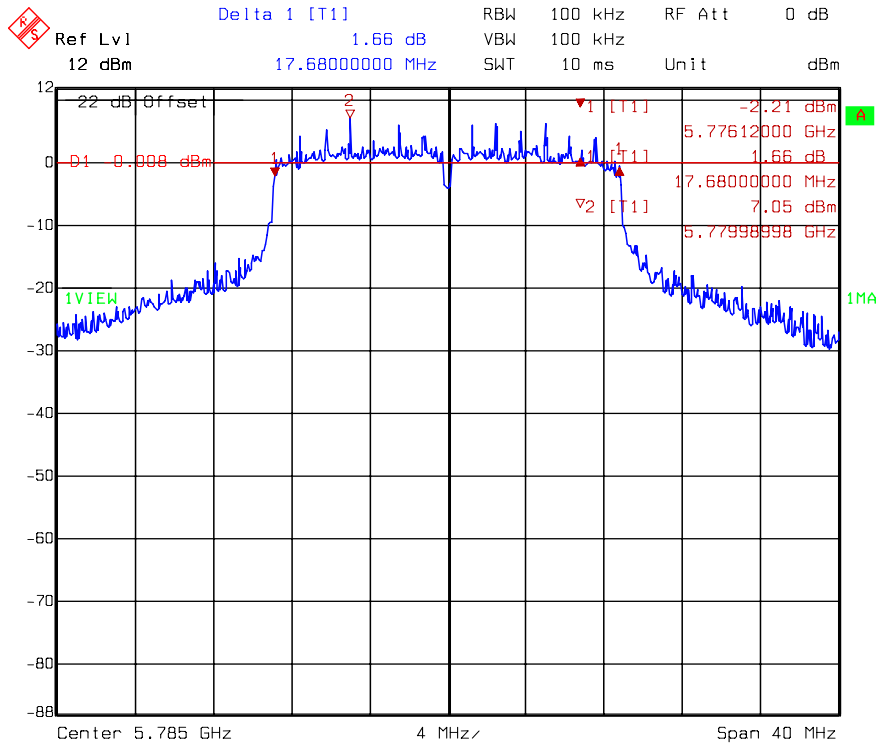
**Chain B: 6dB Bandwidth @ 802.11n (HT20) mode channel 149**



Title: 6dB Band-Width  
Comment A: CH 149 at 802.11n 20MHz mode chainB  
Date: 27.OCT.2008 17:07:38

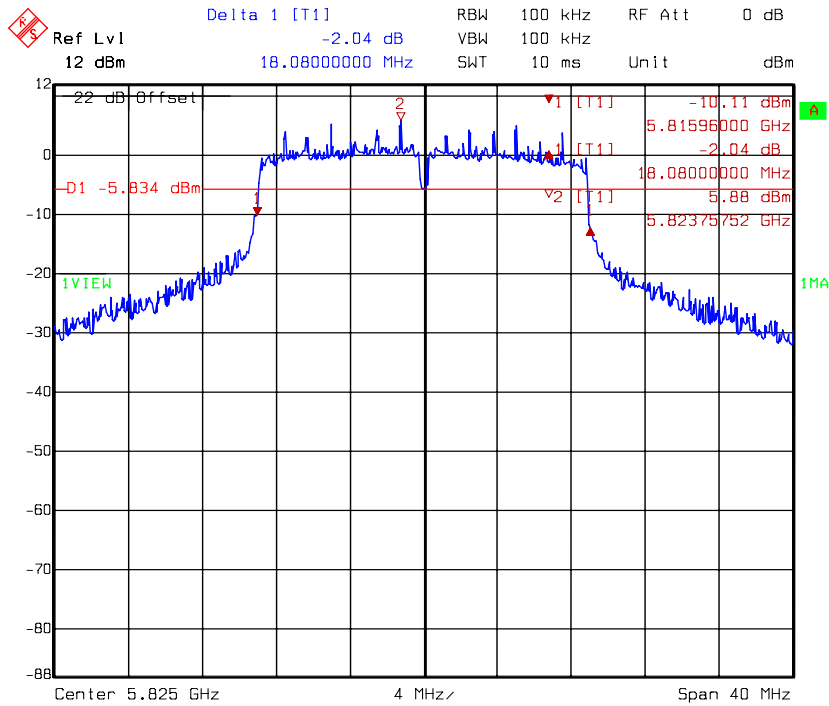


### Chain B: 6dB Bandwidth @ 802.11n (HT20) mode channel 157



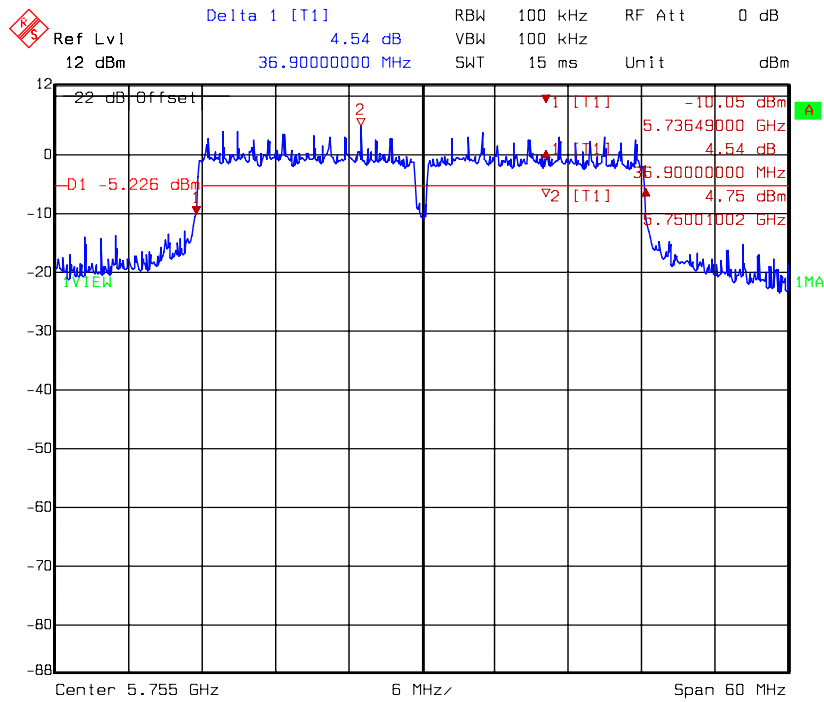
Title: 6dB Band-Width  
 Comment A: CH 157 at 802.11n 20MHz mode chainB  
 Date: 27.OCT.2008 17:10:57

### Chain B: 6dB Bandwidth @ 802.11n (HT20) mode channel 165



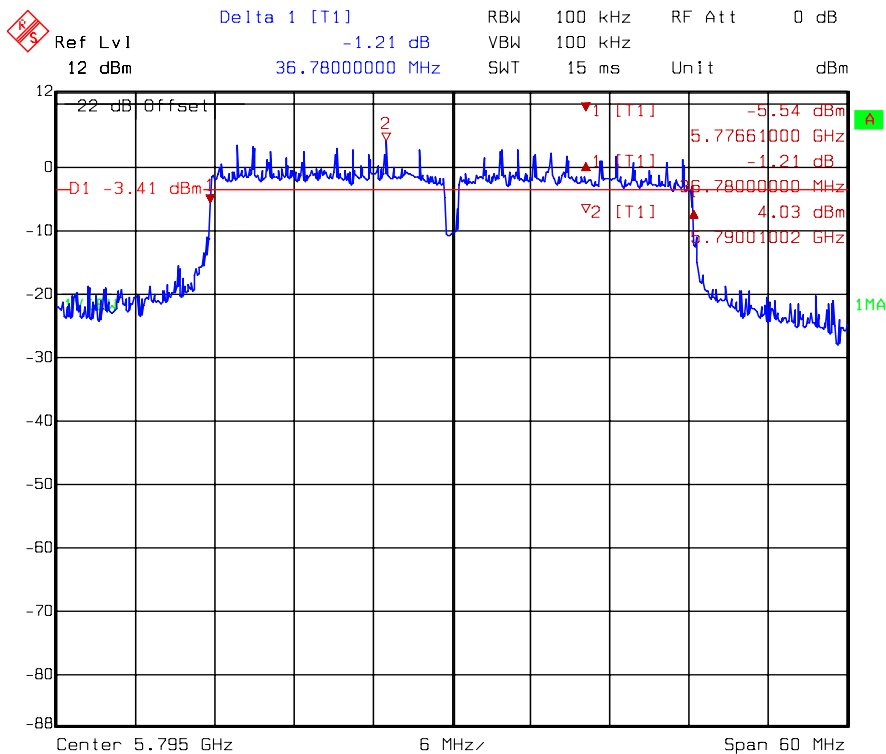
Title: 6dB Band-Width  
 Comment A: CH 165 at 802.11n 20MHz mode chainB  
 Date: 27.OCT.2008 17:16:07

### Chain B: 6dB Bandwidth @ 802.11n (HT40) mode channel 151



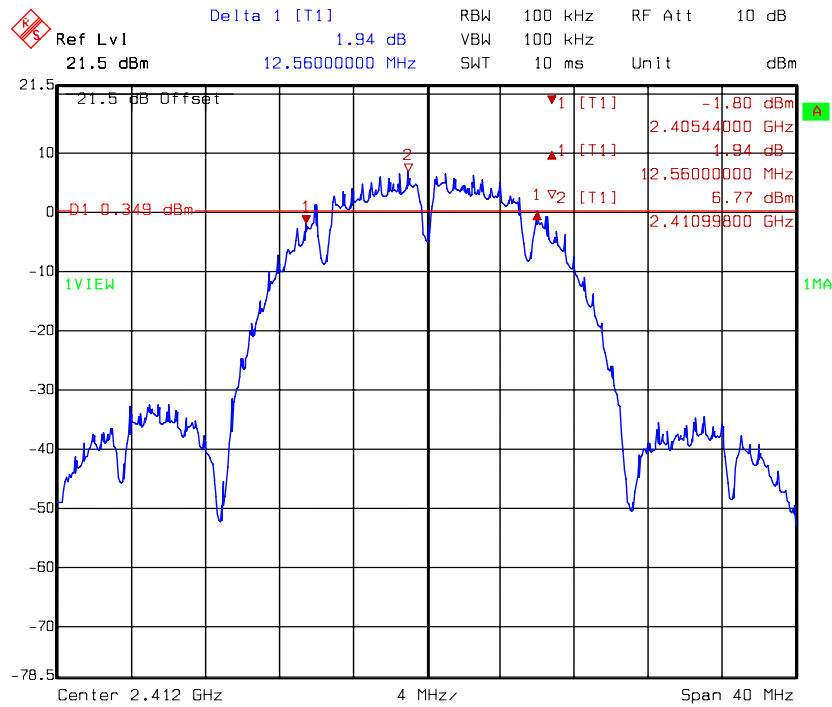
Title: 6dB Band-Width  
Comment A: CH 151 at 802.11n 40MHz mode chainB  
Date: 27.OCT.2008 17:21:58

### Chain B: 6dB Bandwidth @ 802.11n (HT40) mode channel 159



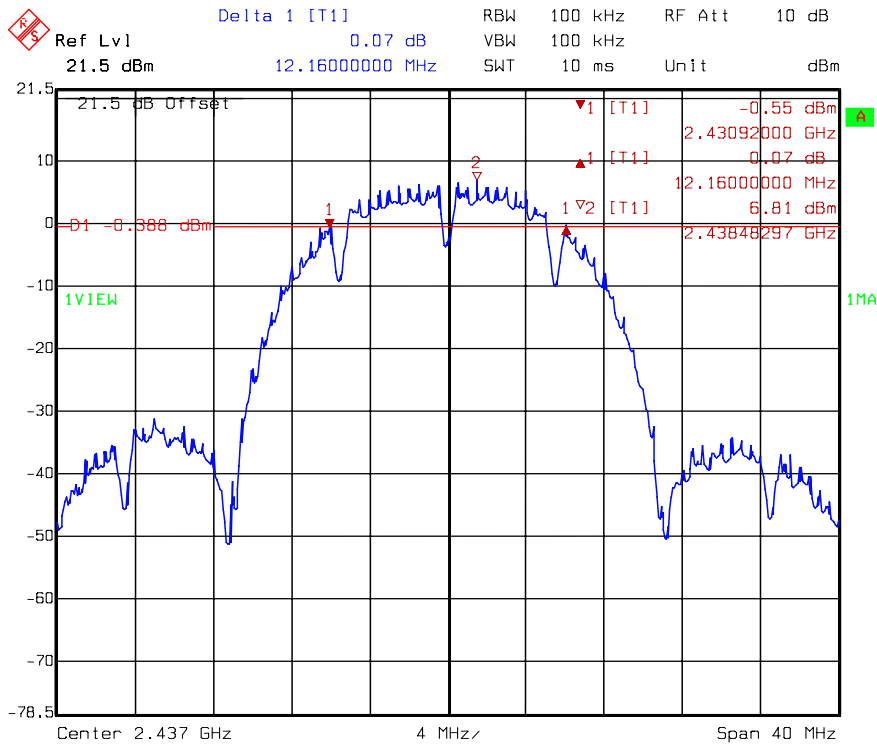
Title: 6dB Band-Width  
Comment A: CH 159 at 802.11n 40MHz mode chainB  
Date: 27.OCT.2008 17:26:03

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



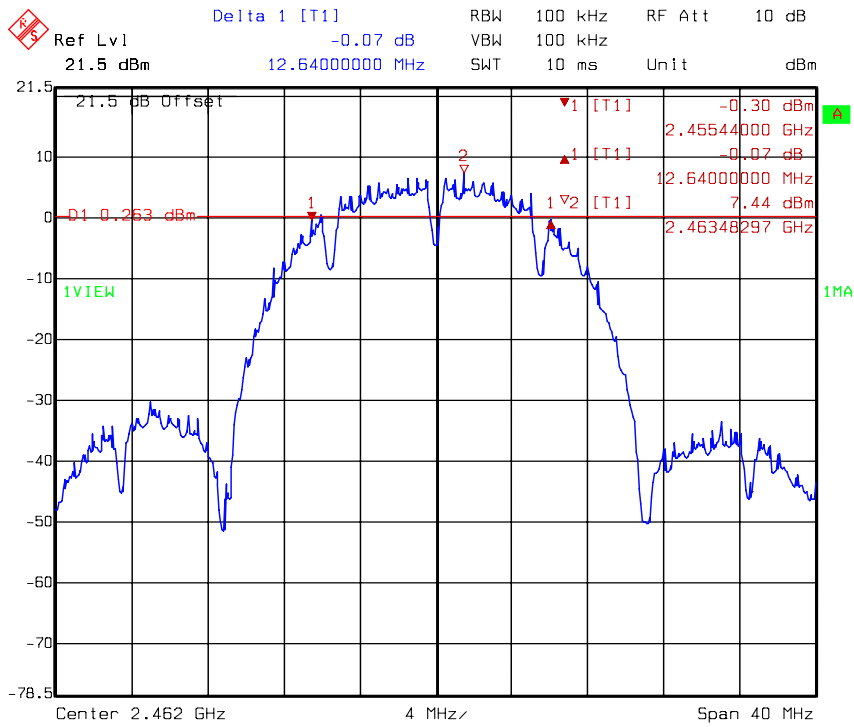
Title: 6dB Band-Width  
Comment A: CH 1 at 802.11b mode chainC  
Date: 28.OCT.2008 10:28:41

**Chain C: 6dB Bandwidth @ 802.11b mode channel 6**



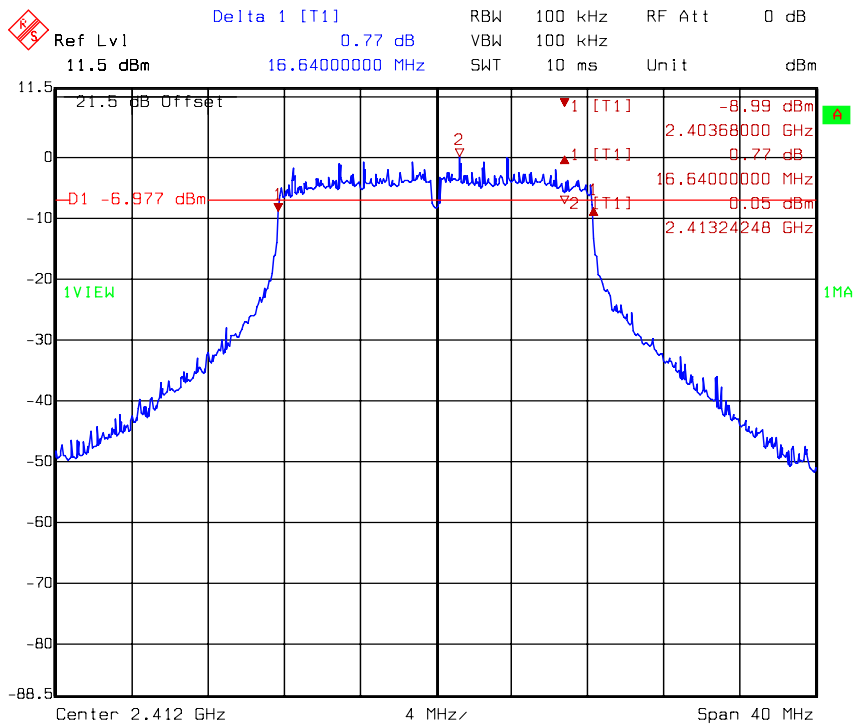
Title: 6dB Band-Width  
Comment A: CH 6 at 802.11b mode chainC  
Date: 28.OCT.2008 10:31:40

**Chain C: 6dB Bandwidth @ 802.11b mode channel 11**



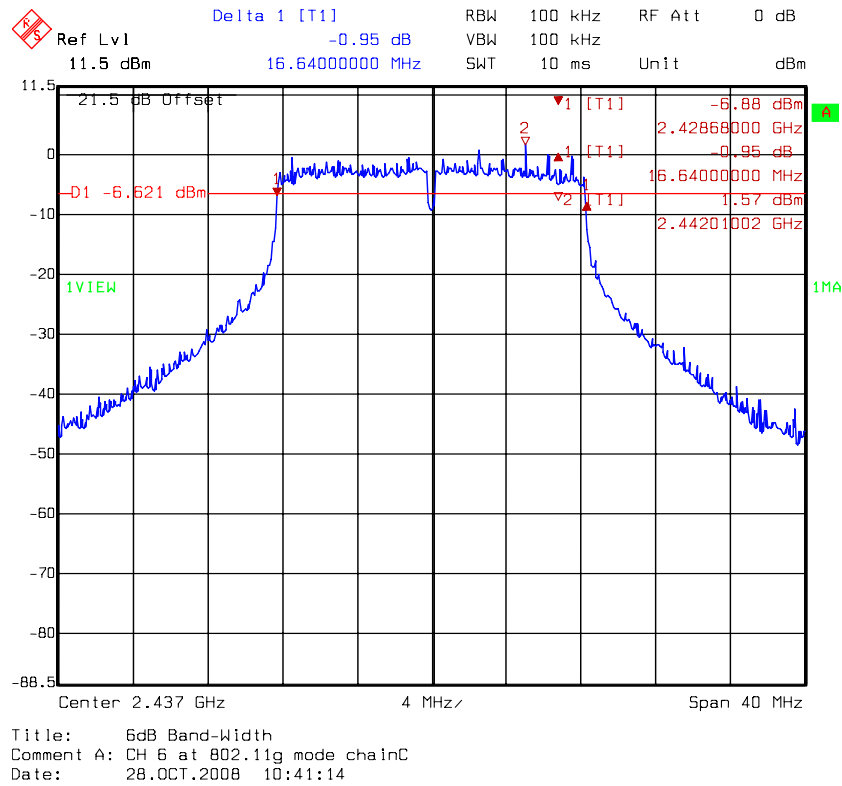
Title: 6dB Band-Width  
Comment A: CH 11 at 802.11b mode chainC  
Date: 28.OCT.2008 10:34:36

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

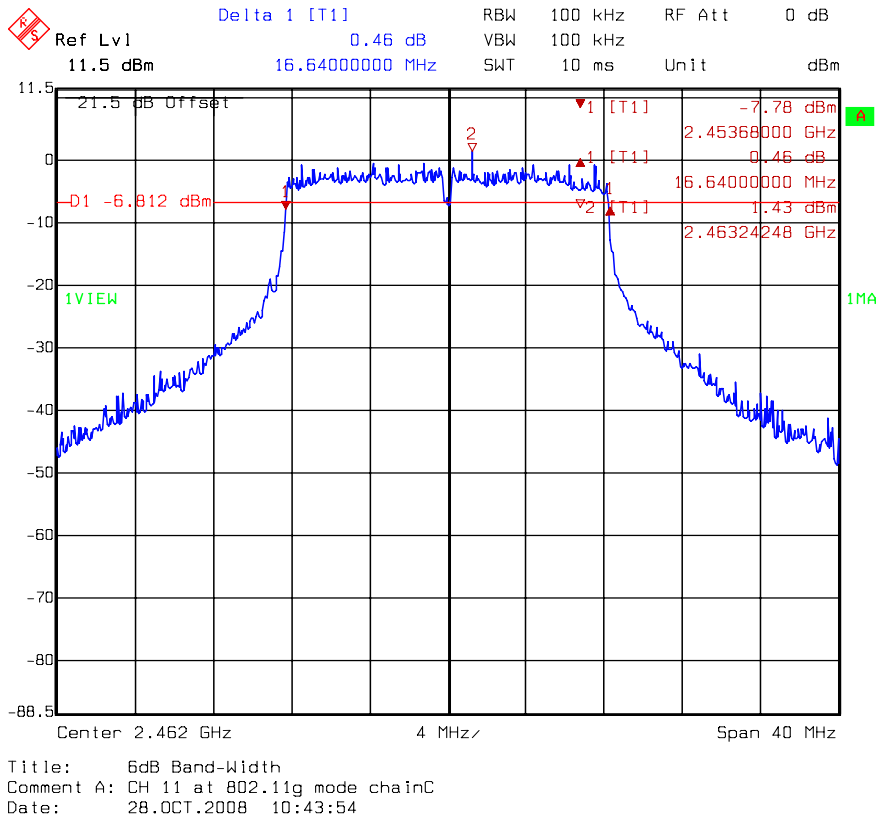


Title: 6dB Band-Width  
Comment A: CH 1 at 802.11g mode chainC  
Date: 28.OCT.2008 10:38:30

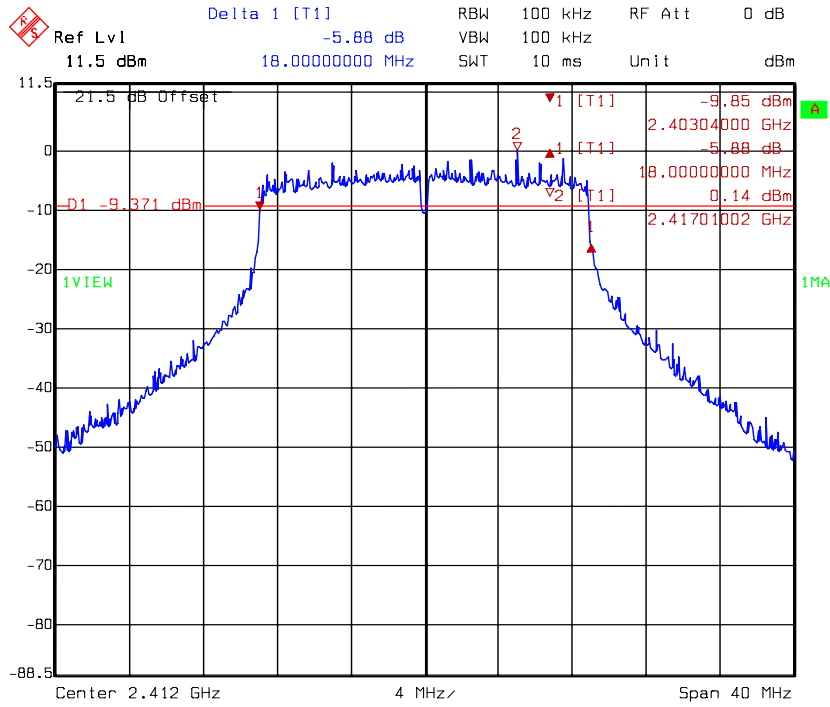
**Chain C: 6dB Bandwidth @ 802.11g mode channel 6**



**Chain C: 6dB Bandwidth @ 802.11g mode channel 11**

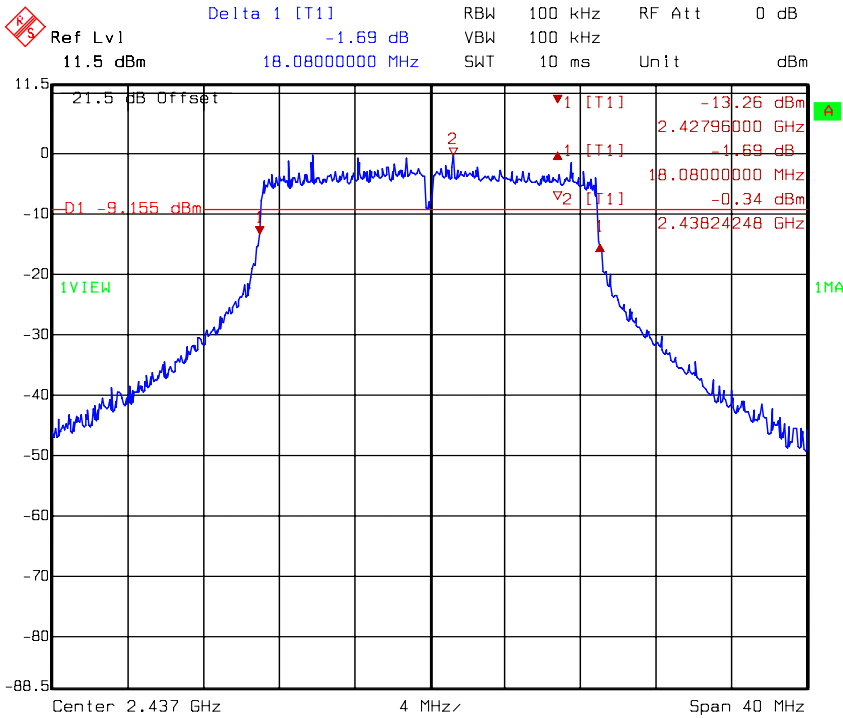


**Chain C: 6dB Bandwidth @ 802.11n (HT20) mode channel 1**



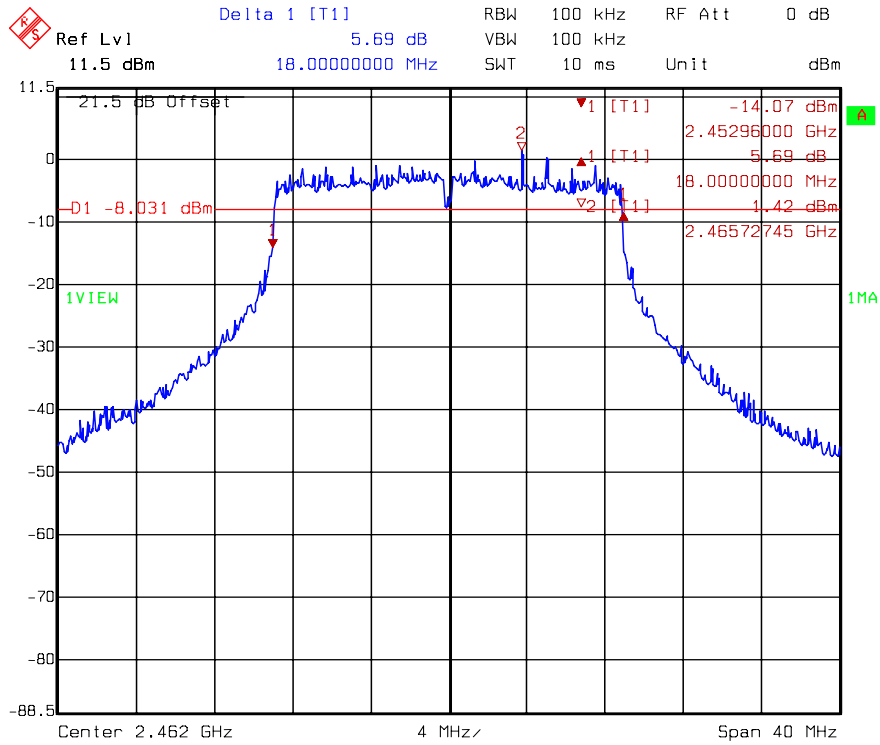
Title: 6dB Band-Width  
Comment A: CH 1 at 802.11n 20MHz mode chainC  
Date: 28.OCT.2008 10:51:23

**Chain C: 6dB Bandwidth @ 802.11n (HT20) mode channel 6**



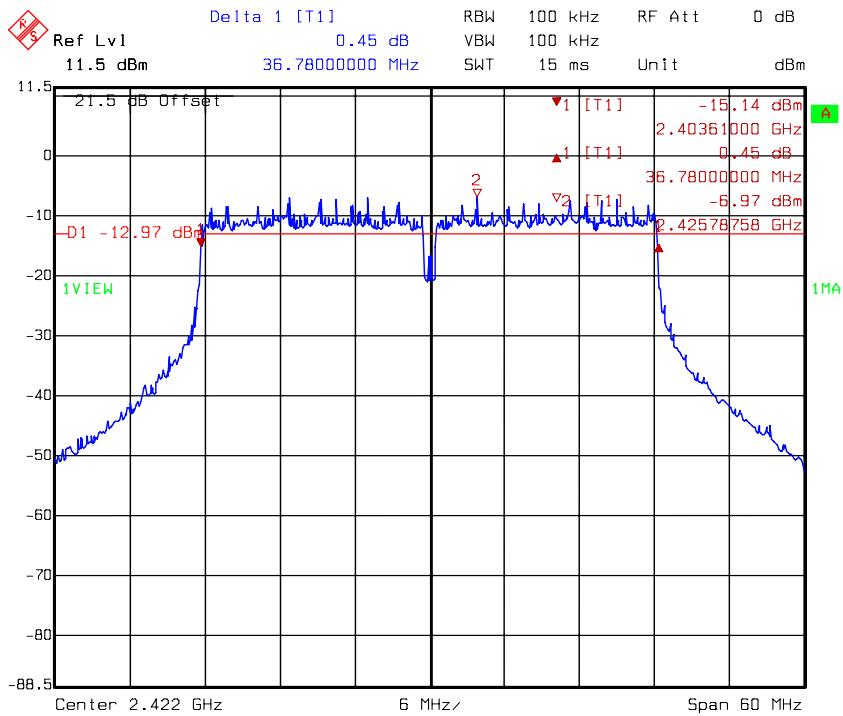
Title: 6dB Band-Width  
Comment A: CH 6 at 802.11n 20MHz mode chainC  
Date: 28.OCT.2008 11:16:36

### Chain C: 6dB Bandwidth @ 802.11n (HT20) mode channel 11



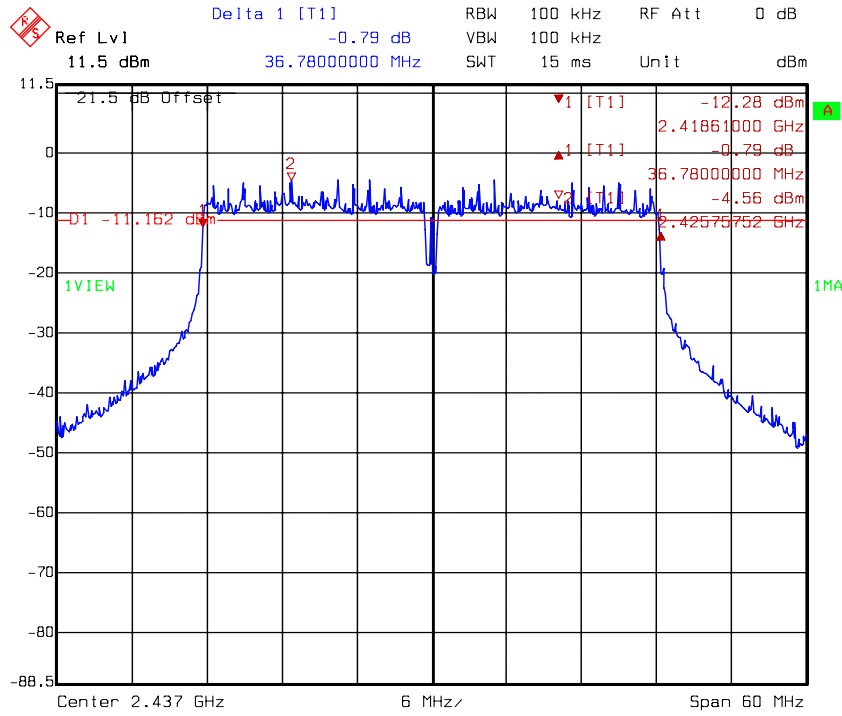
Title: 6dB Band-Width  
 Comment A: CH 11 at 802.11n 20MHz mode chainC  
 Date: 28.OCT.2008 11:19:23

### Chain C: 6dB Bandwidth @ 802.11n (HT40) mode channel 3



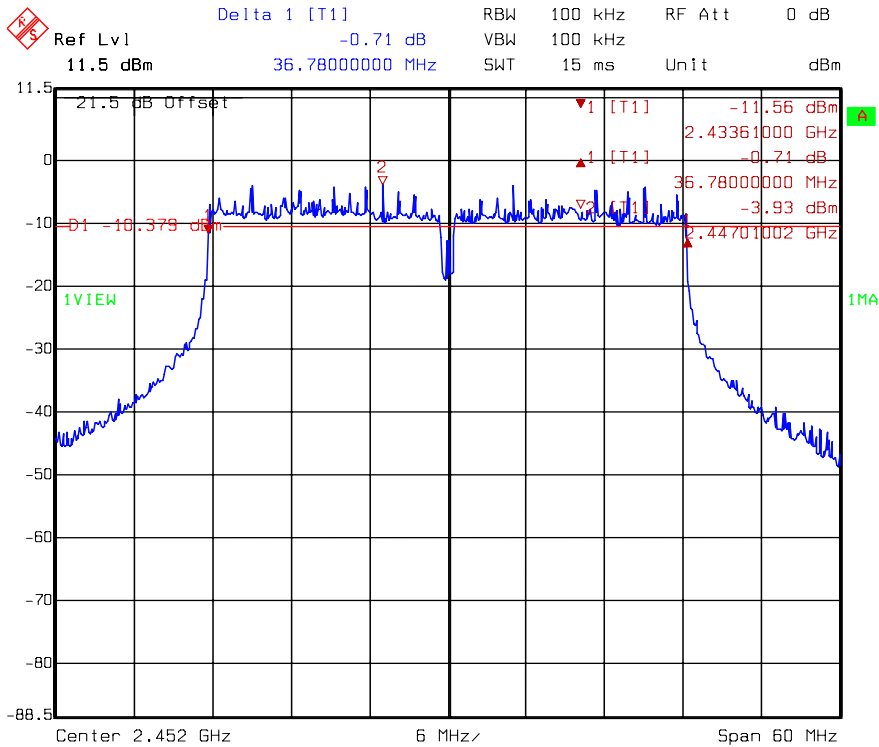
Title: 6dB Band-Width  
 Comment A: CH 3 at 802.11n 40MHz mode chainC  
 Date: 28.OCT.2008 11:31:06

### Chain C: 6dB Bandwidth @ 802.11n (HT40) mode channel 6



Title: 6dB Band-Width  
Comment A: CH 6 at 802.11n 40MHz mode chainC  
Date: 28.OCT.2008 11:36:14

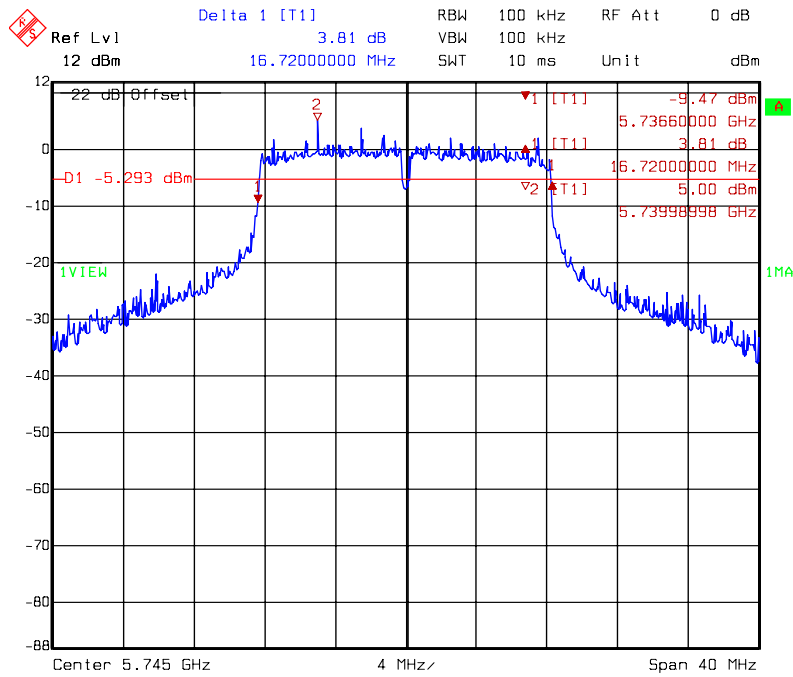
### Chain C: 6dB Bandwidth @ 802.11n (HT40) mode channel 9



Title: 6dB Band-Width  
Comment A: CH 9 at 802.11n 40MHz mode chainC  
Date: 28.OCT.2008 11:39:53

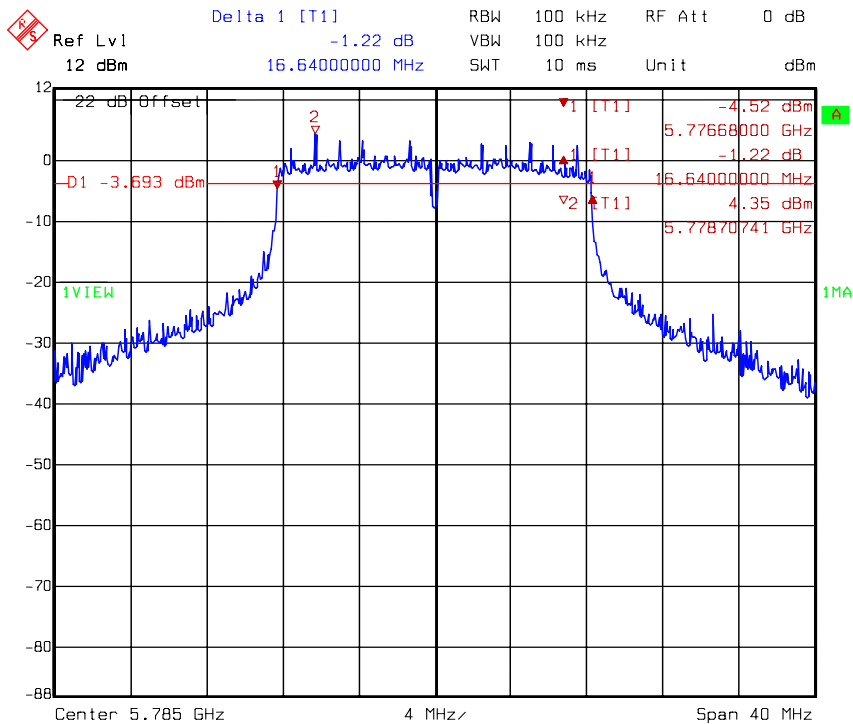


### Chain C: 6dB Bandwidth @ 802.11a mode channel 149



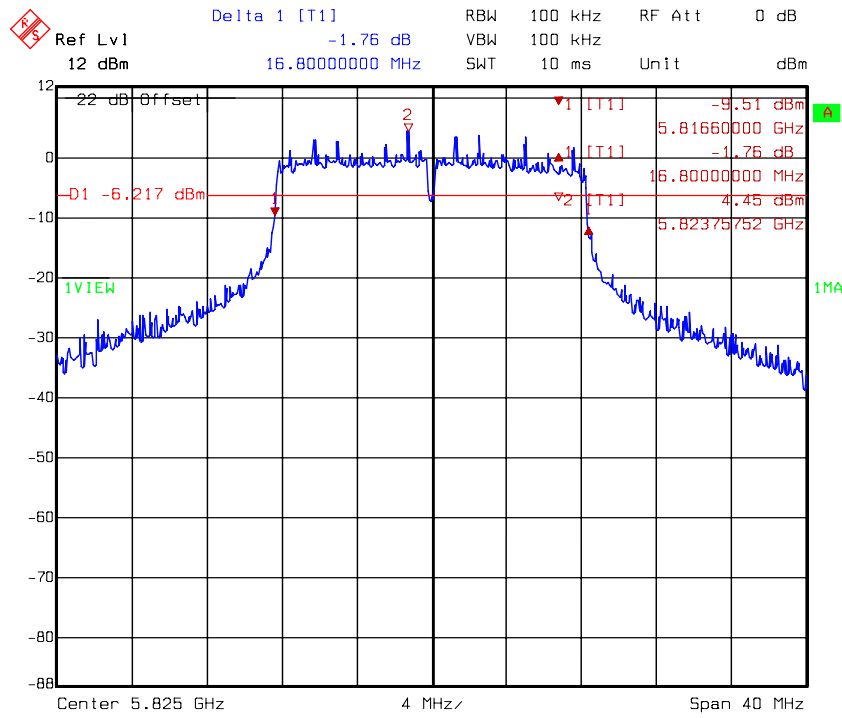
Title: 6dB Band-Width  
Comment A: CH 149 at 802.11a mode chainC  
Date: 28.OCT.2008 11:44:25

### Chain C: 6dB Bandwidth @ 802.11a mode channel 157



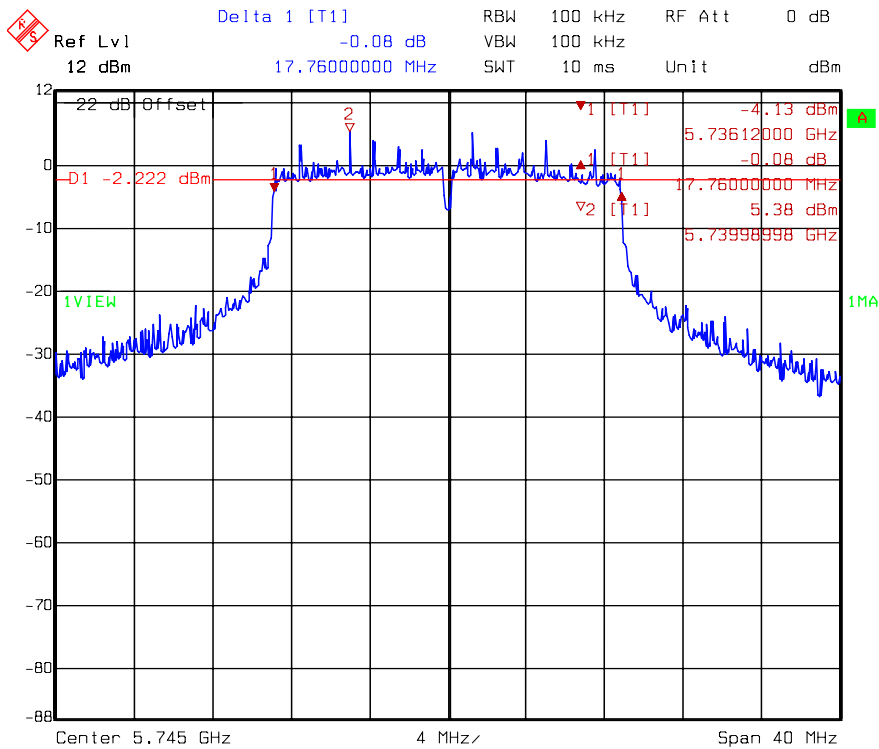
Title: 6dB Band-Width  
Comment A: CH 157 at 802.11a mode chainC  
Date: 28.OCT.2008 11:47:46

**Chain C: 6dB Bandwidth @ 802.11a mode channel 165**



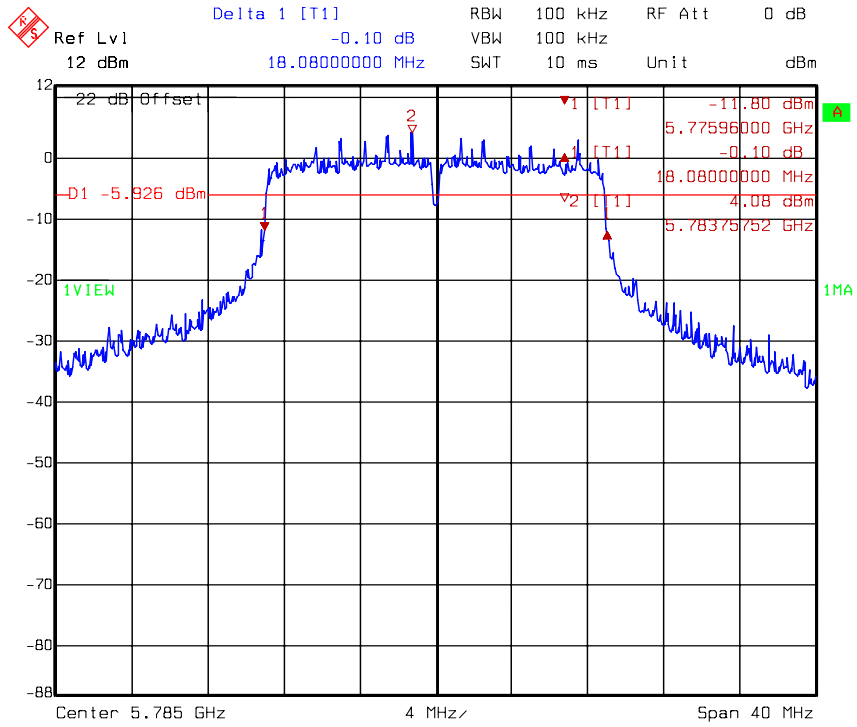
Title: 6dB Band-Width  
Comment A: CH 165 at 802.11a mode chainC  
Date: 28.OCT.2008 11:55:47

**Chain C: 6dB Bandwidth @ 802.11n (HT20) mode channel 149**



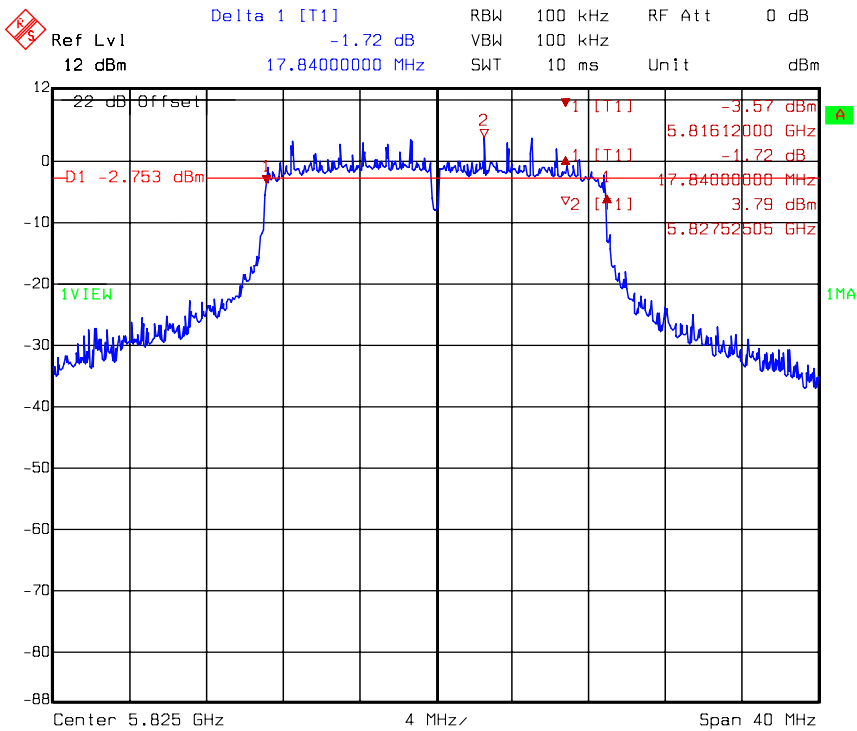
Title: 6dB Band-Width  
Comment A: CH 149 at 802.11n 20MHz mode chainC  
Date: 28.OCT.2008 12:00:56

### Chain C: 6dB Bandwidth @ 802.11n (HT20) mode channel 157



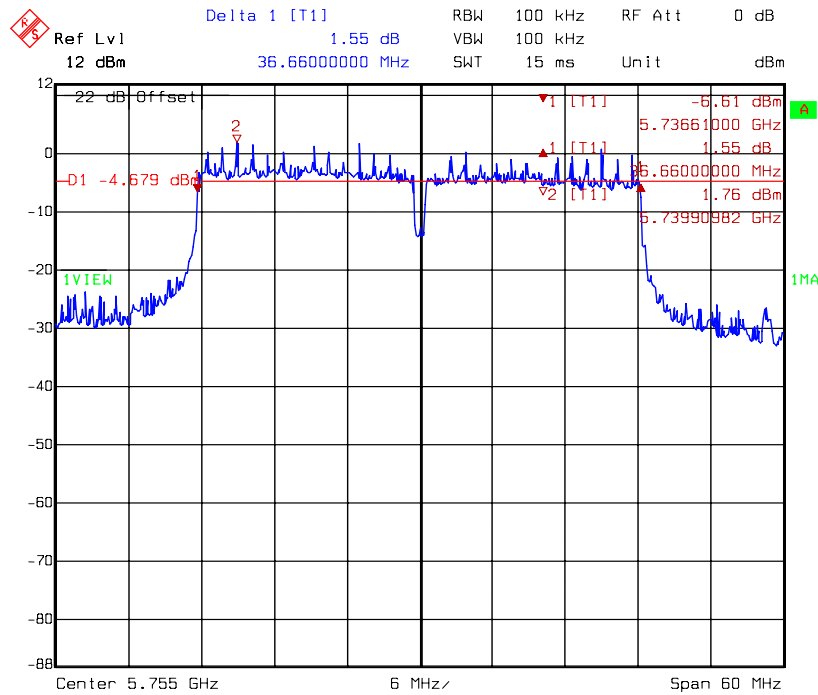
Title: 6dB Band-Width  
 Comment A: CH 157 at 802.11n 20MHz mode chainC  
 Date: 28.OCT.2008 12:04:17

### Chain C: 6dB Bandwidth @ 802.11n (HT20) mode channel 165



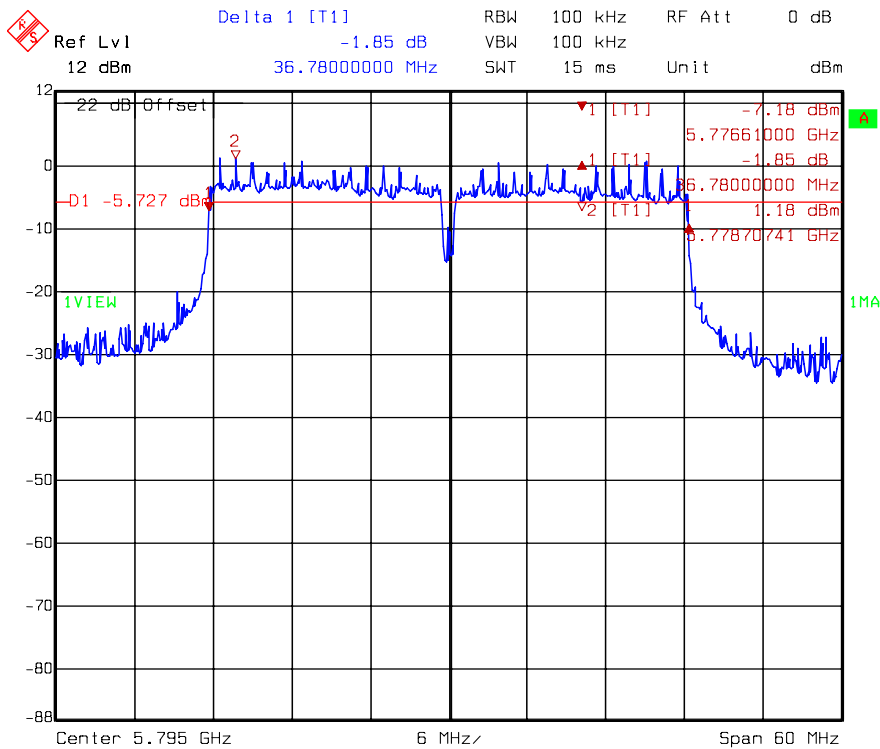
Title: 6dB Band-Width  
 Comment A: CH 165 at 802.11n 20MHz mode chainC  
 Date: 28.OCT.2008 12:07:10

**Chain C: 6dB Bandwidth @ 802.11n (HT40) mode channel 151**



Title: 6dB Band-Width  
Comment A: CH 151 at 802.11n 40MHz mode chainC  
Date: 28.OCT.2008 12:10:15

**Chain C: 6dB Bandwidth @ 802.11n (HT40) mode channel 159**



Title: 6dB Band-Width  
Comment A: CH 159 at 802.11n 40MHz mode chainC  
Date: 28.OCT.2008 12:13:11

#### 4. 99 % Occupied Bandwidth

<b>Name of Test</b>	99 % Occupied Bandwidth
<b>Base Standard</b>	None; for reporting purposes only

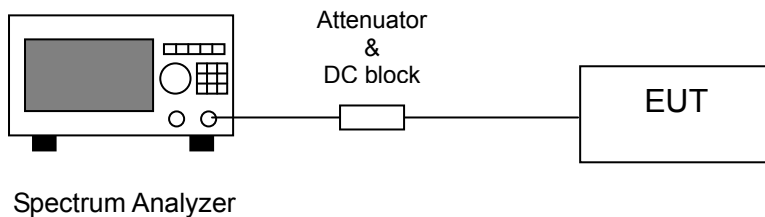
**Test Result:** Complies  
**Measurement Data:** See Table & plots below

**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 1 Mbps for 802.11b, 6 Mbps for 802.11a/ 11g, 6.5 MHz for 802.11n HT20 and 13.5 MHz for 802.11n HT40. The EUT was tuned to a low, middle and high channel.

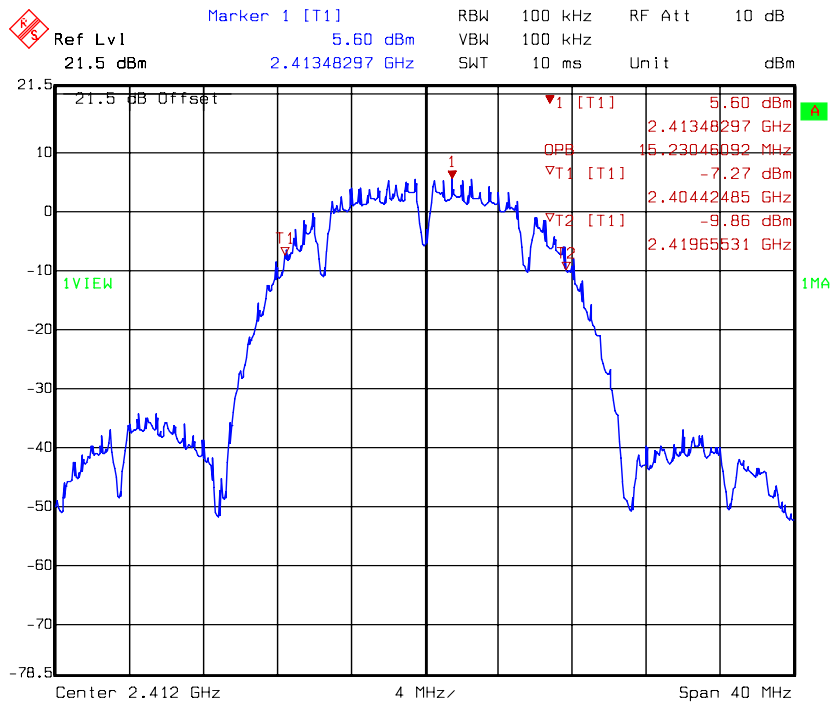
Table 2. 99 % Occupied Bandwidth

Antenna : C5060-510002-A (worse case)

3TX

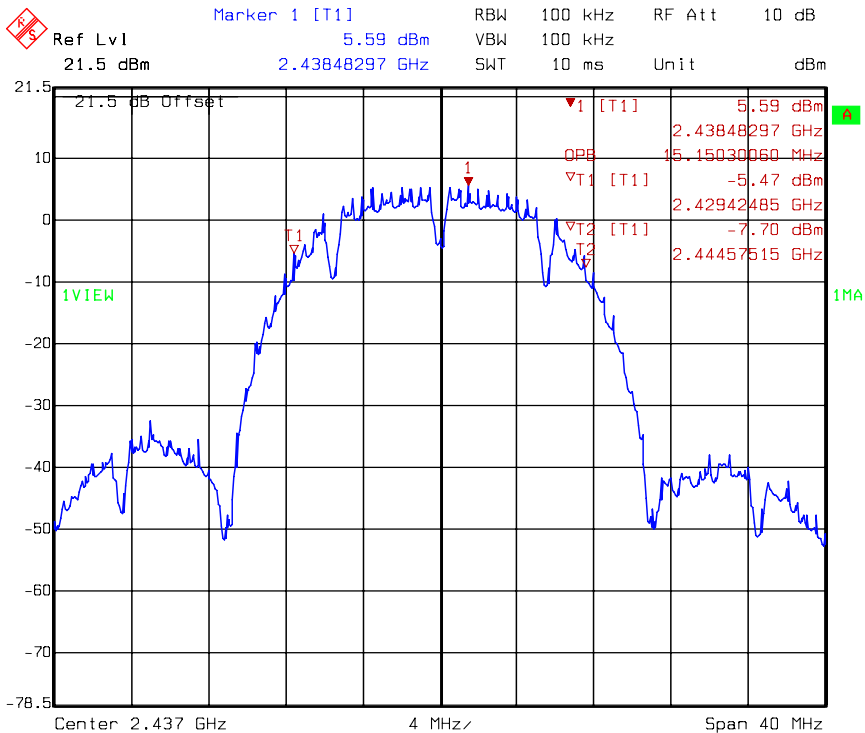
Mode	Channel	Frequency (MHz)	Data rate Mbps	99% Bandwidth (MHz)		
				Chain A	Chain B	Chain C
11b	1	2412	1	15.23	15.23	15.23
	6	2437		15.15	15.15	15.31
	11	2462		15.07	15.23	15.31
11g	1	2412	6	15.43	16.43	16.43
	6	2437		16.51	16.51	16.43
	11	2462		16.51	16.51	16.43
11n(20)	1	2412	6.5	17.72	17.72	17.72
	6	2437		17.72	17.64	17.72
	11	2462		17.72	17.72	17.72
11n(40)	3	2422	13.5	36.31	36.43	36.43
	6	2437		36.31	36.43	36.43
	9	2452		36.31	36.31	36.43
11a	149	5745	6	16.59	18.92	16.51
	157	5785		16.51	16.67	16.51
	165	5825		16.59	16.59	16.51
11n(20)	149	5745	6.5	17.72	20.2	17.8
	157	5785		17.8	17.88	17.72
	165	5825		17.72	17.8	17.72
11n(40)	151	5755	13.5	36.43	37.03	36.43
	159	5795		36.31	36.55	36.31

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



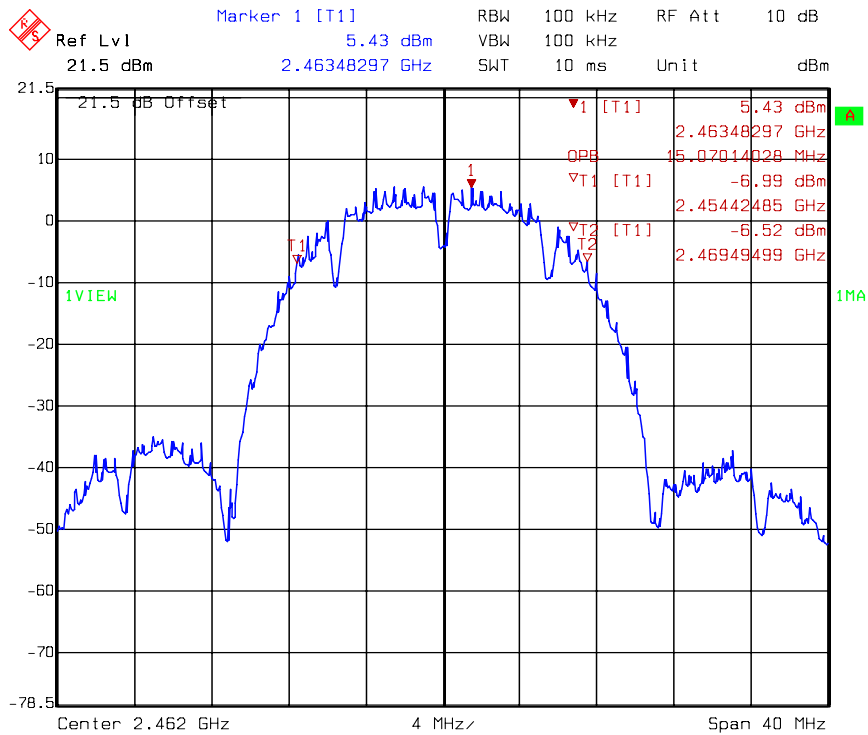
Title: Occupied Band-Width  
Comment A: CH 1 at 802.11b mode chainA  
Date: 24.OCT.2008 15:43:06

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



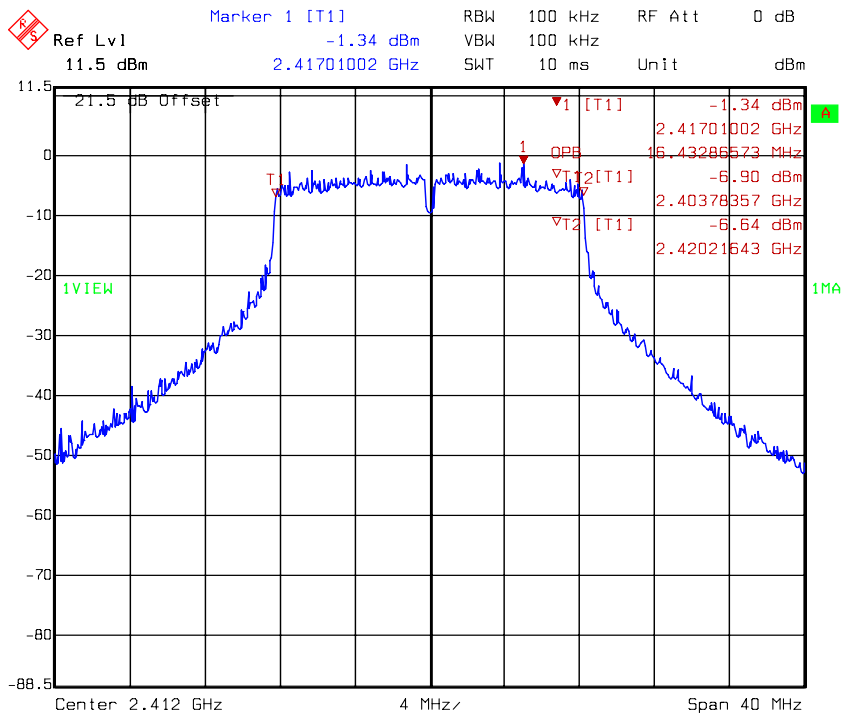
Title: Occupied Band-Width  
Comment A: CH 6 at 802.11b mode chainA  
Date: 24.OCT.2008 15:46:58

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



Title: Occupied Band-Width  
Comment A: CH 11 at 802.11b mode chainA  
Date: 24.OCT.2008 15:49:42

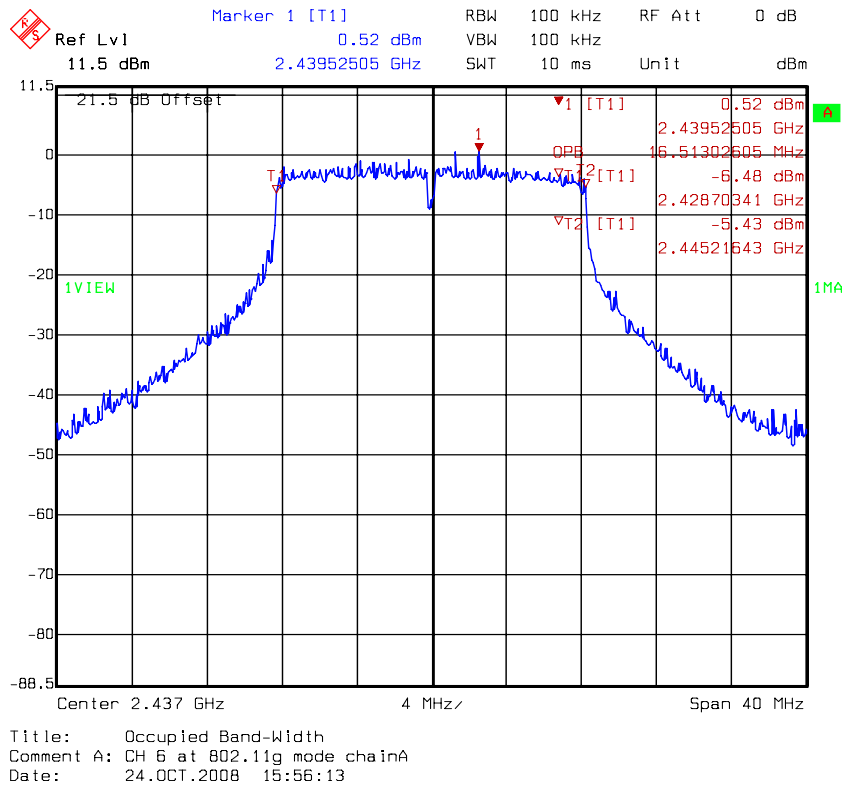
### Chain A: 99 % Occupied Bandwidth @ 802.11g mode channel 1



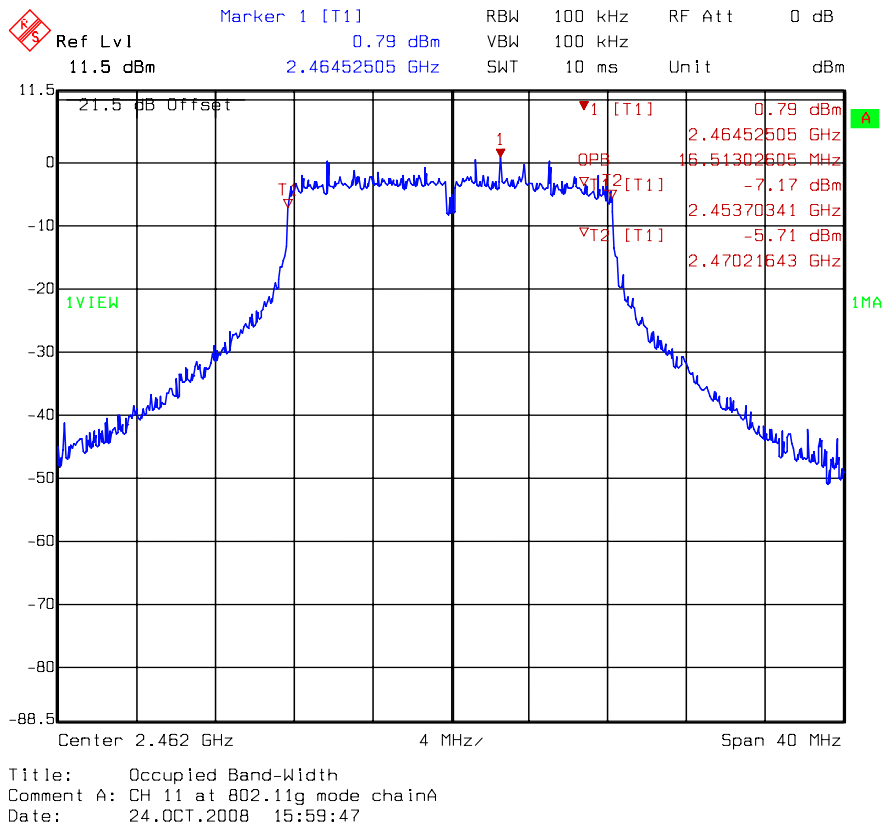
Title: Occupied Band-Width  
Comment A: CH 1 at 802.11g mode chainA  
Date: 24.OCT.2008 15:53:06



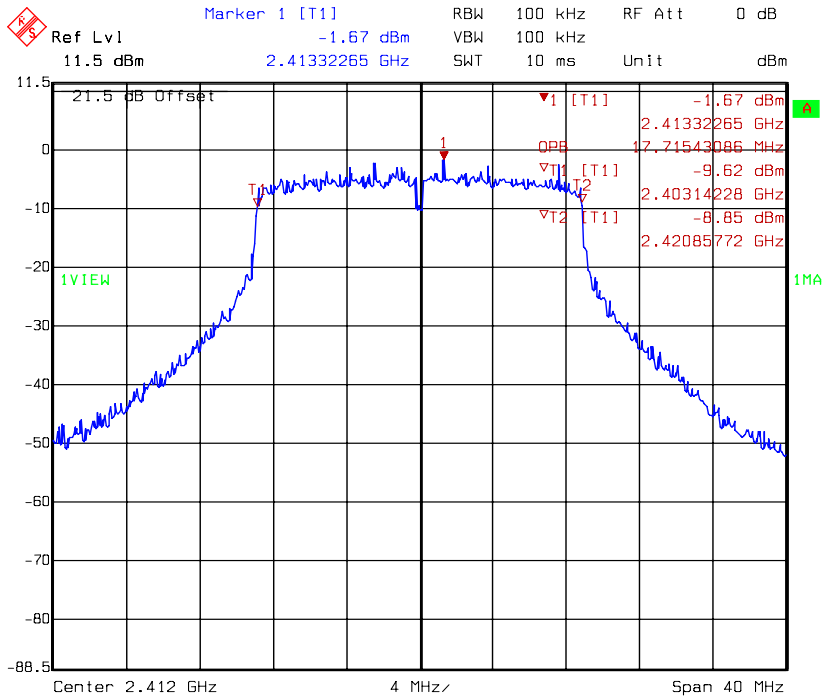
## Chain A: 99 % Occupied Bandwidth @ 802.11g mode channel 6



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

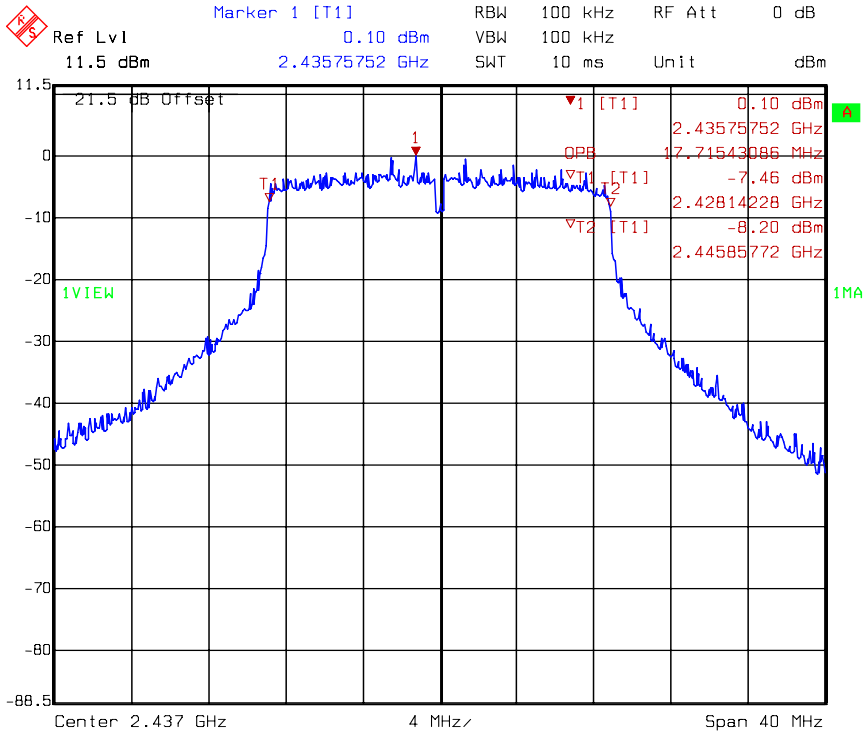


**Chain A: 99 % Occupied Bandwidth @ 802.11n (HT20) mode channel 1**



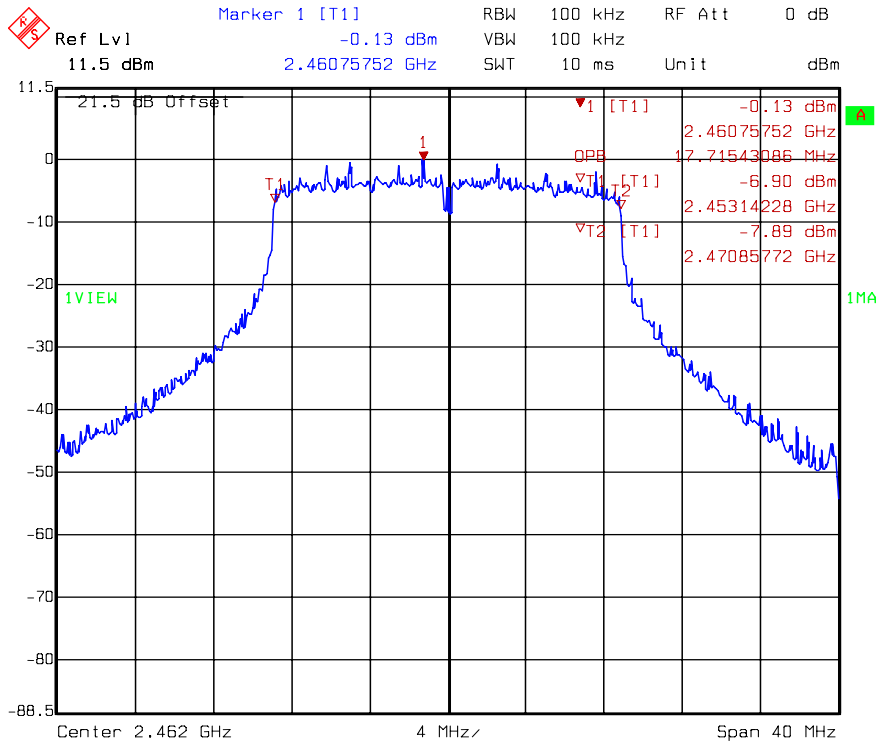
Title: Occupied Band-Width  
Comment A: CH 1 at 802.11n 20MHz mode chainA  
Date: 24.OCT.2008 16:04:00

**Chain A: 99 % Occupied Bandwidth @ 802.11n (HT20) mode channel 6**



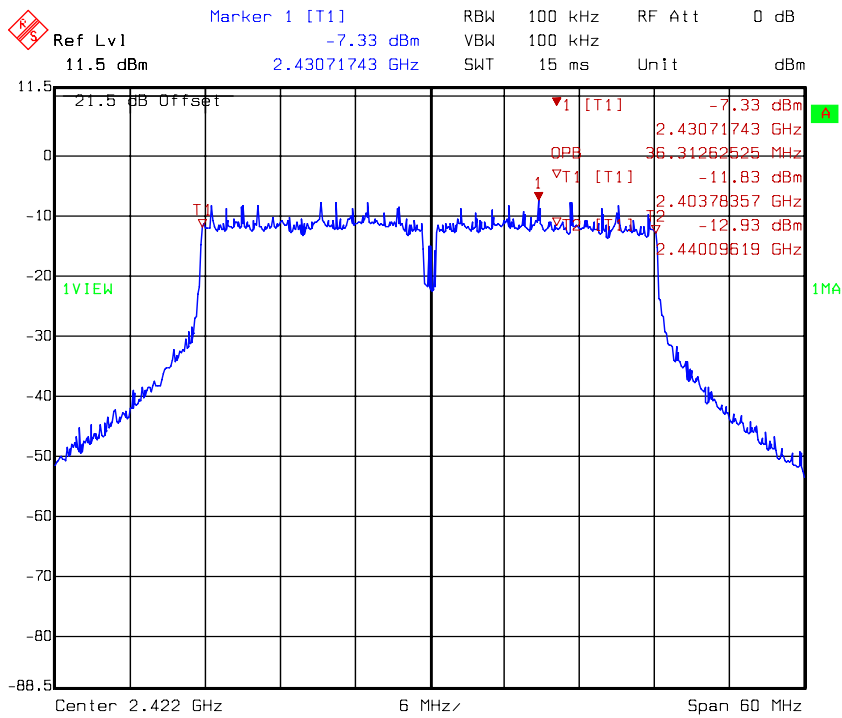
Title: Occupied Band-Width  
Comment A: CH 6 at 802.11n 20MHz mode chainA  
Date: 24.OCT.2008 16:06:52

### Chain A: 99 % Occupied Bandwidth @ 802.11n (HT20) mode channel 11



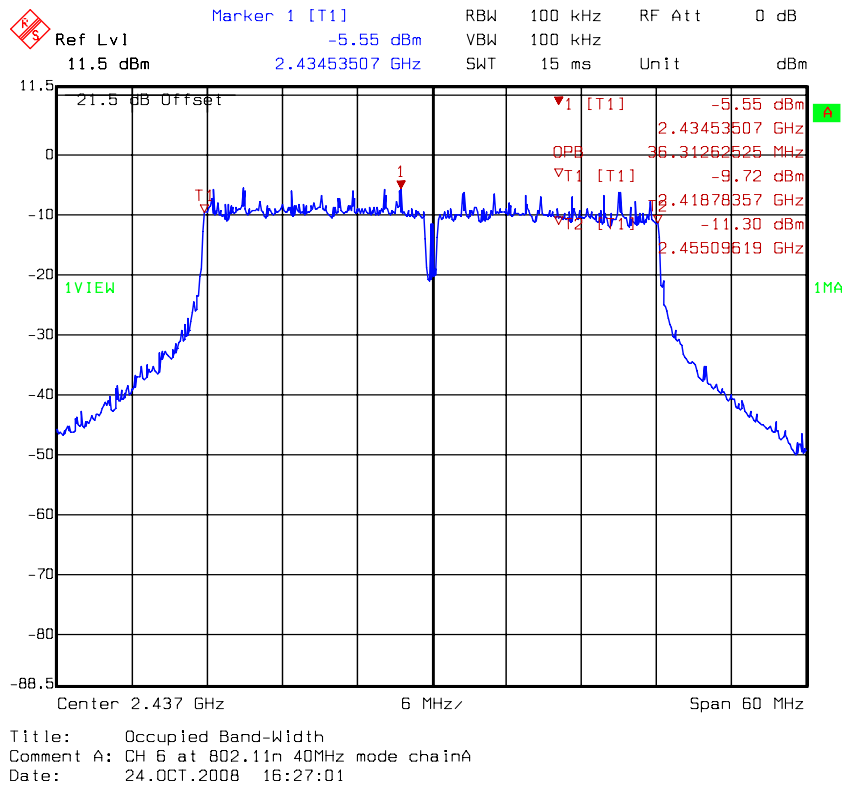
Title: Occupied Band-Width  
Comment A: CH 11 at 802.11n 20MHz mode chainA  
Date: 24.OCT.2008 16:12:13

### Chain A: 99 % Occupied Bandwidth @ 802.11n (HT40) mode channel 3

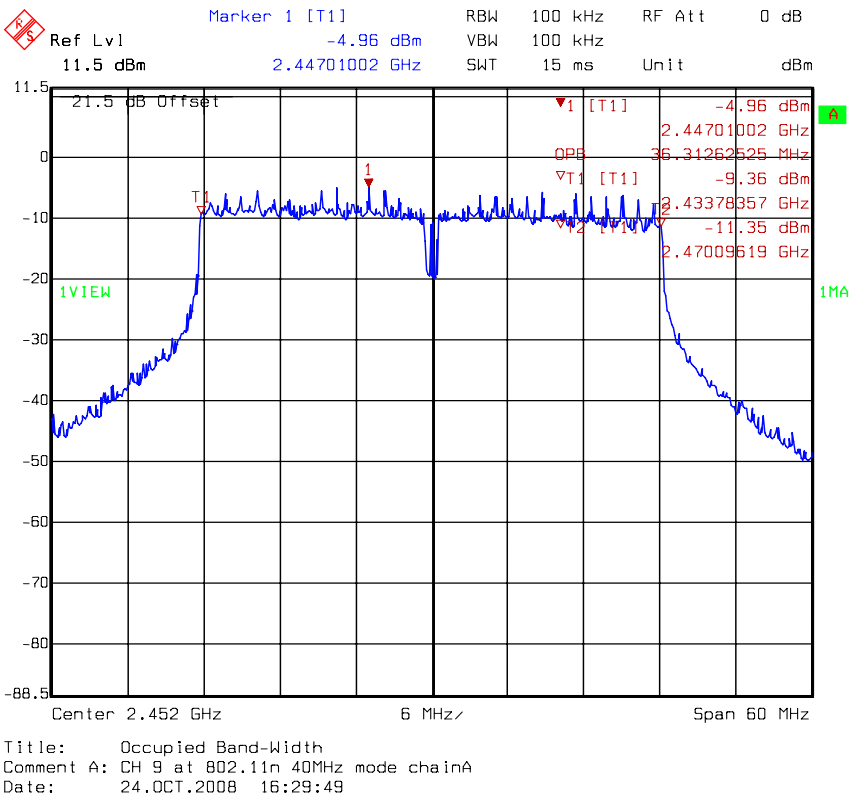


Title: Occupied Band-Width  
Comment A: CH 3 at 802.11n 40MHz mode chainA  
Date: 24.OCT.2008 16:18:28

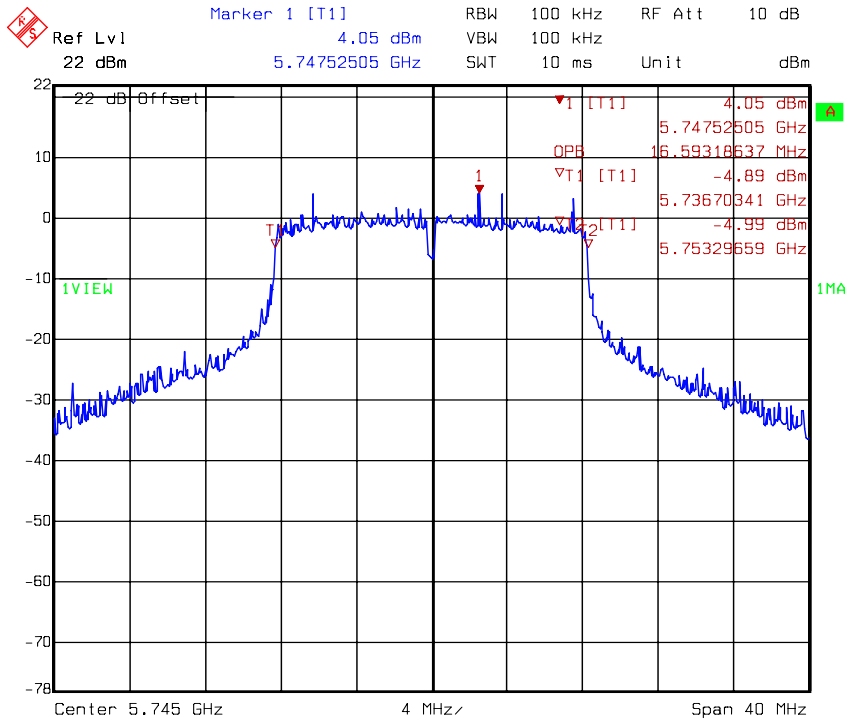
### Chain A: 99 % Occupied Bandwidth @ 802.11n (HT40) mode channel 6



### Chain A: 99 % Occupied Bandwidth @ 802.11n (HT40) mode channel 9

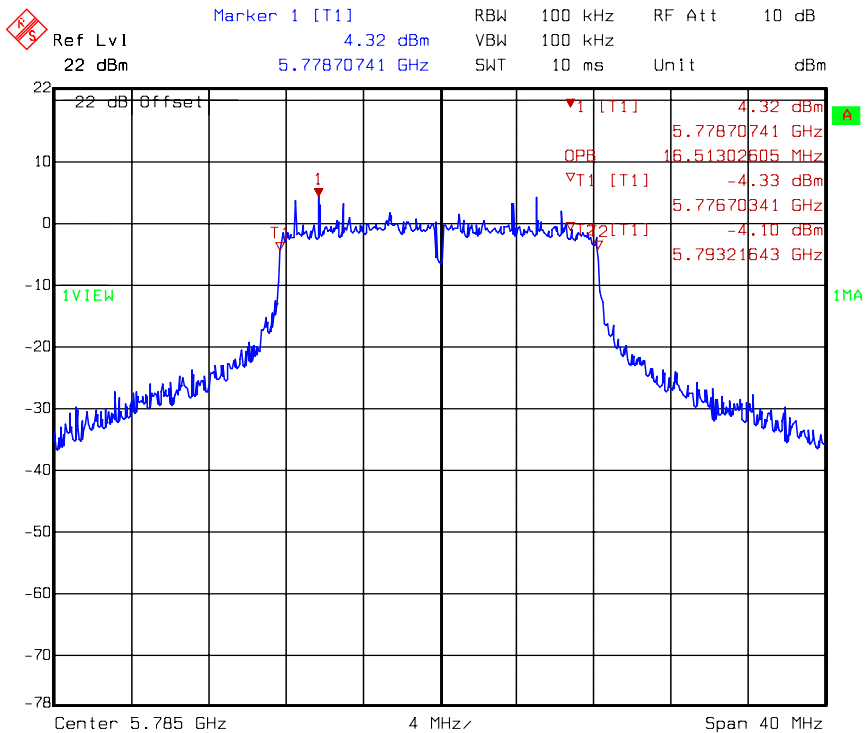


### Chain A: 99 % Occupied Bandwidth @ 802.11a mode channel 149



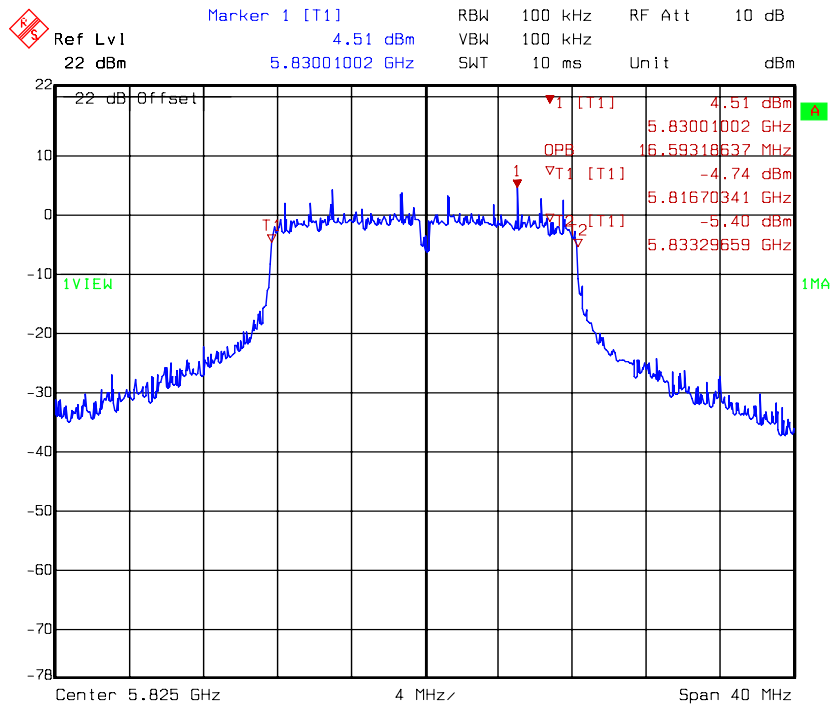
Title: Occupied Band-Width  
Comment A: CH 149 at 802.11a mode chainA  
Date: 27.OCT.2008 11:54:53

### Chain A: 99 % Occupied Bandwidth @ 802.11a mode channel 157



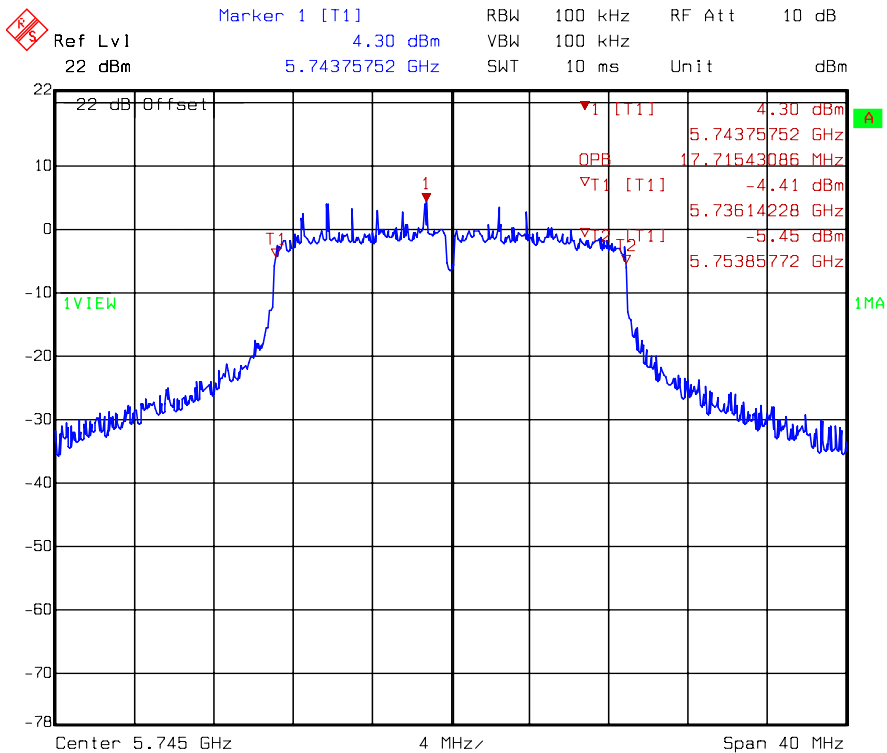
Title: Occupied Band-Width  
Comment A: CH 157 at 802.11a mode chainA  
Date: 27.OCT.2008 11:58:34

### Chain A: 99 % Occupied Bandwidth @ 802.11a mode channel 165



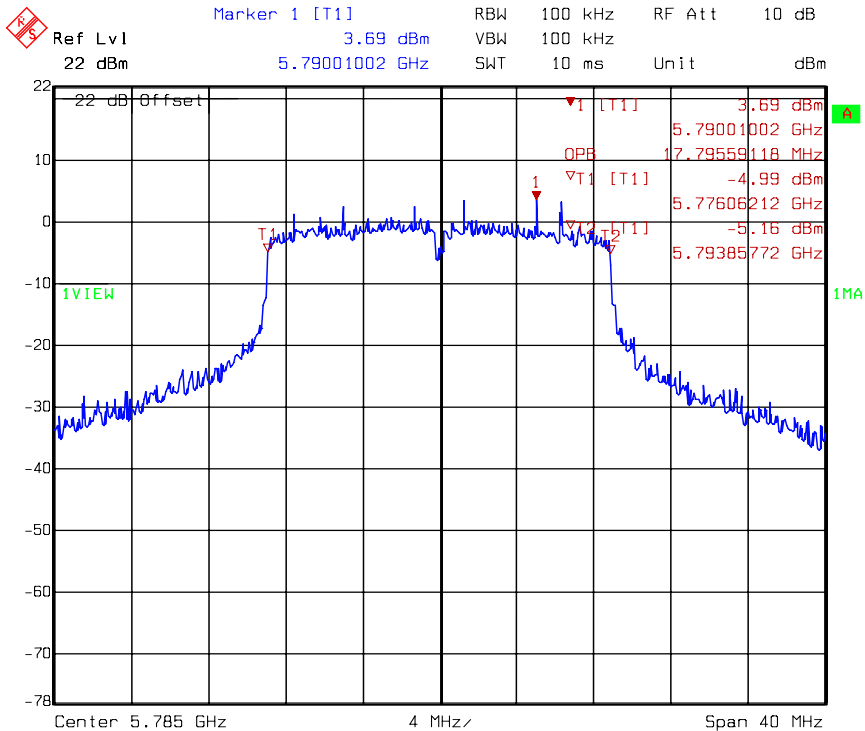
Title: Occupied Band-Width  
Comment A: CH 165 at 802.11a mode chainA  
Date: 27.OCT.2008 12:08:39

### Chain A: 99 % Occupied Bandwidth @ 802.11n (HT20) mode channel 149



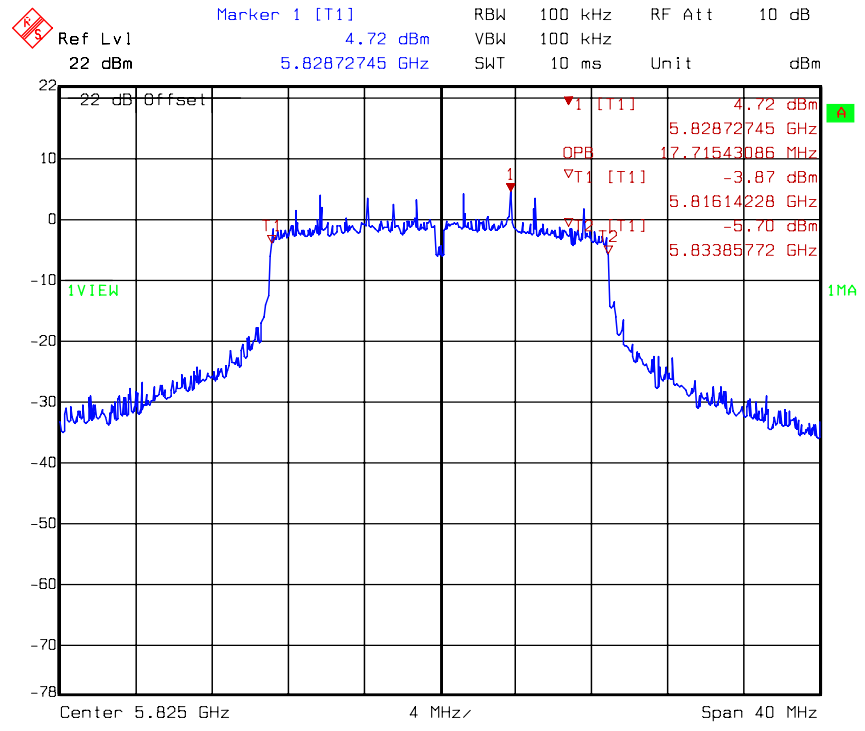
Title: Occupied Band-Width  
Comment A: CH 149 at 802.11n 20MHz mode chainA  
Date: 27.OCT.2008 14:09:29

**Chain A: 99 % Occupied Bandwidth @ 802.11n (HT20) mode channel 157**



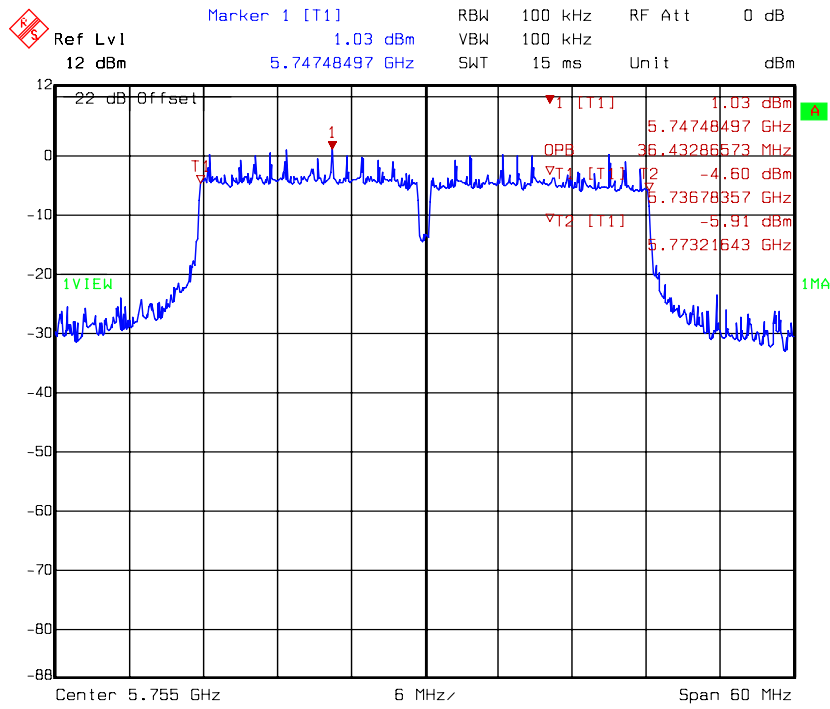
Title: Occupied Band-Width  
 Comment A: CH 157 at 802.11n 20MHz mode chainA  
 Date: 27.OCT.2008 14:14:45

**Chain A: 99 % Occupied Bandwidth @ 802.11n (HT20) mode channel 165**



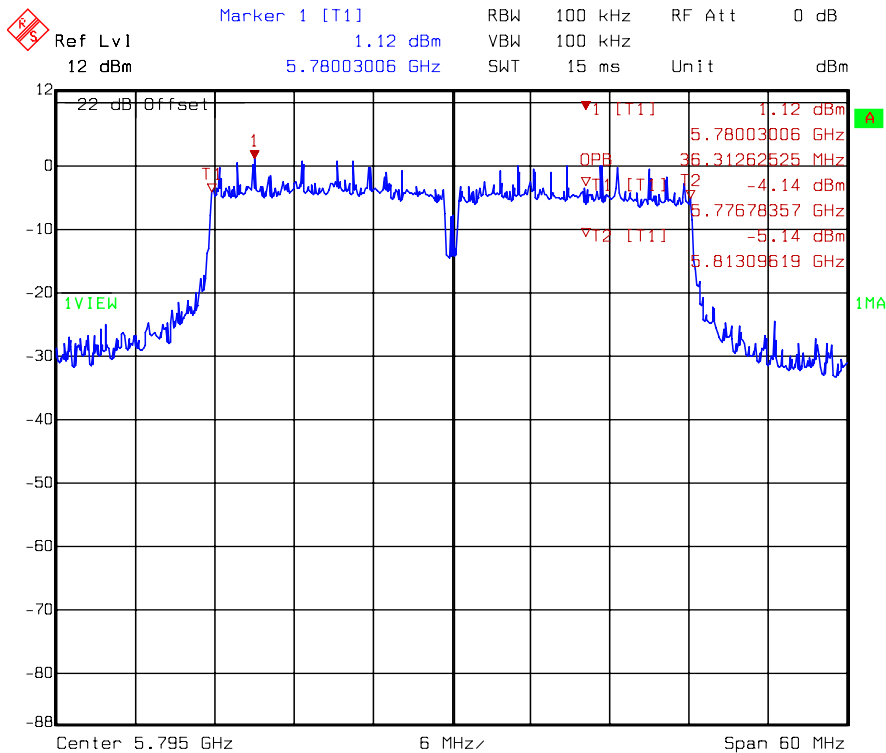
Title: Occupied Band-Width  
 Comment A: CH 165 at 802.11n 20MHz mode chainA  
 Date: 27.OCT.2008 14:18:27

**Chain A: 99 % Occupied Bandwidth @ 802.11n (HT40) mode channel 151**



Title: Occupied Band-Width  
Comment A: CH 151 at 802.11n 40MHz mode chainA  
Date: 27.OCT.2008 14:23:05

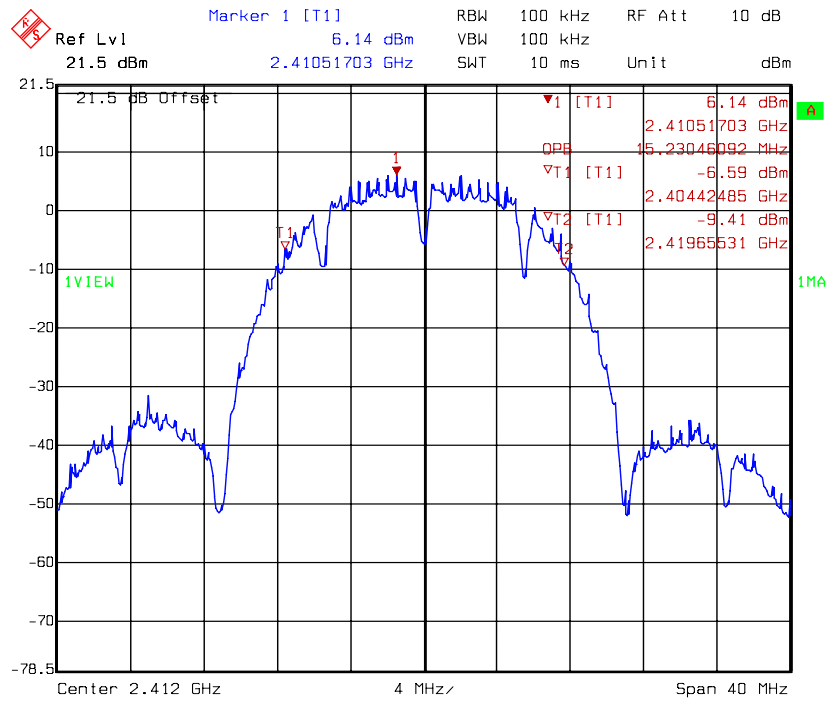
**Chain A: 99 % Occupied Bandwidth @ 802.11n (HT40) mode channel 159**



Title: Occupied Band-Width  
Comment A: CH 159 at 802.11n 40MHz mode chainA  
Date: 27.OCT.2008 14:26:26

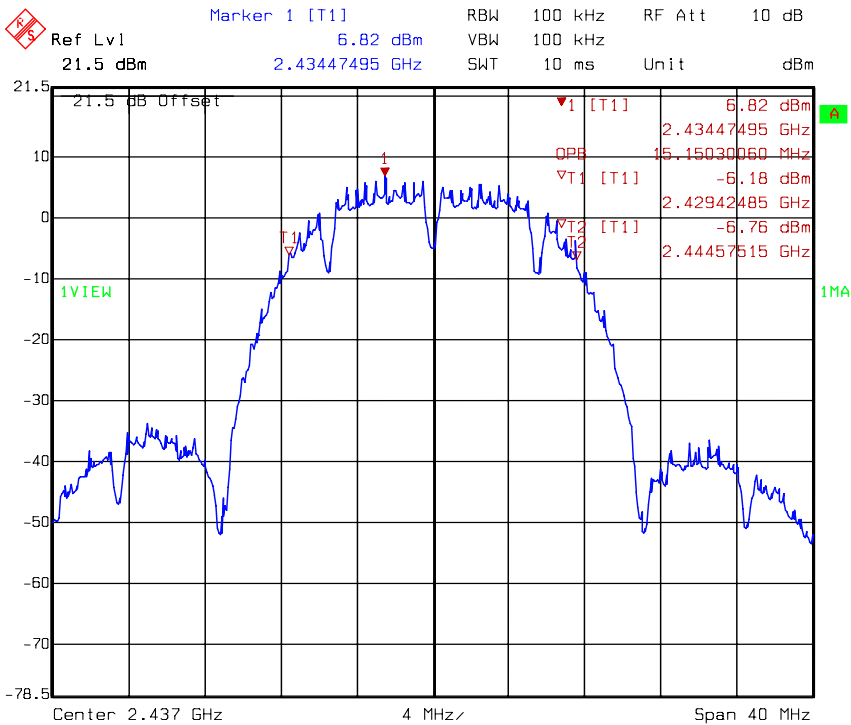


### Chain B: 99 % Occupied Bandwidth @ 802.11b mode channel 1



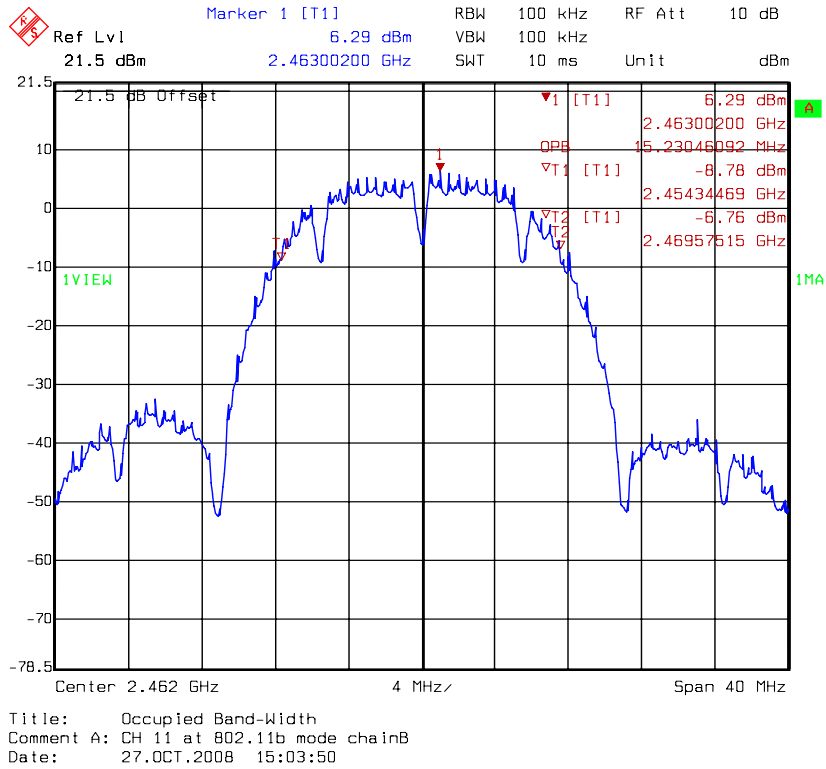
Title: Occupied Band-Width  
Comment A: CH 1 at 802.11b mode chainB  
Date: 27.OCT.2008 14:57:42

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

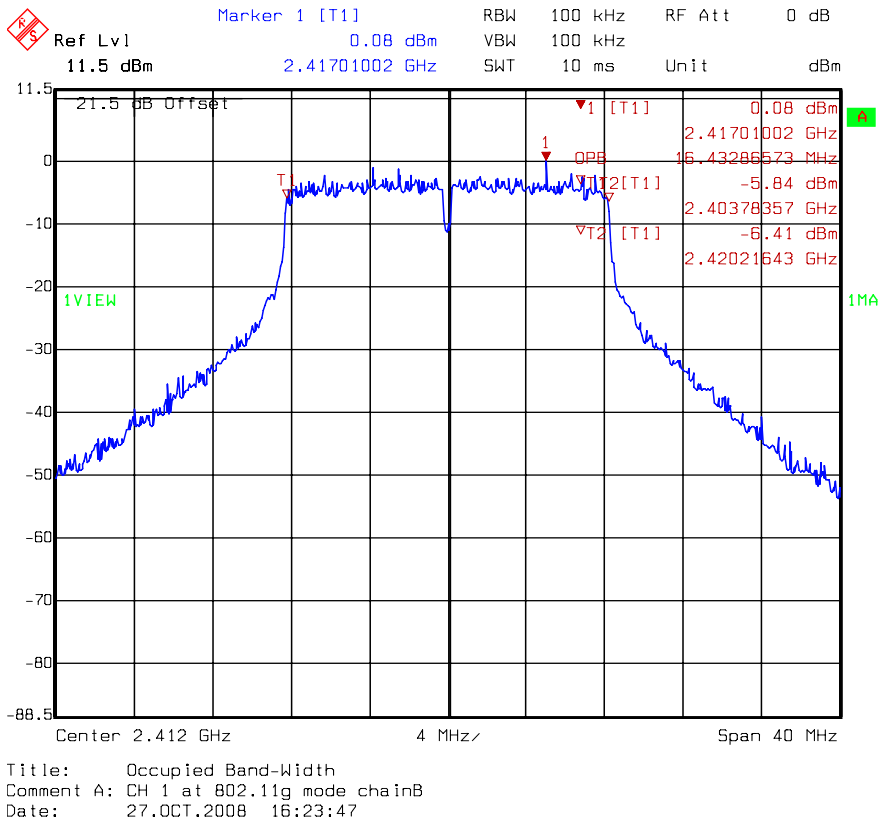


Title: Occupied Band-Width  
Comment A: CH 6 at 802.11b mode chainB  
Date: 27.OCT.2008 15:00:52

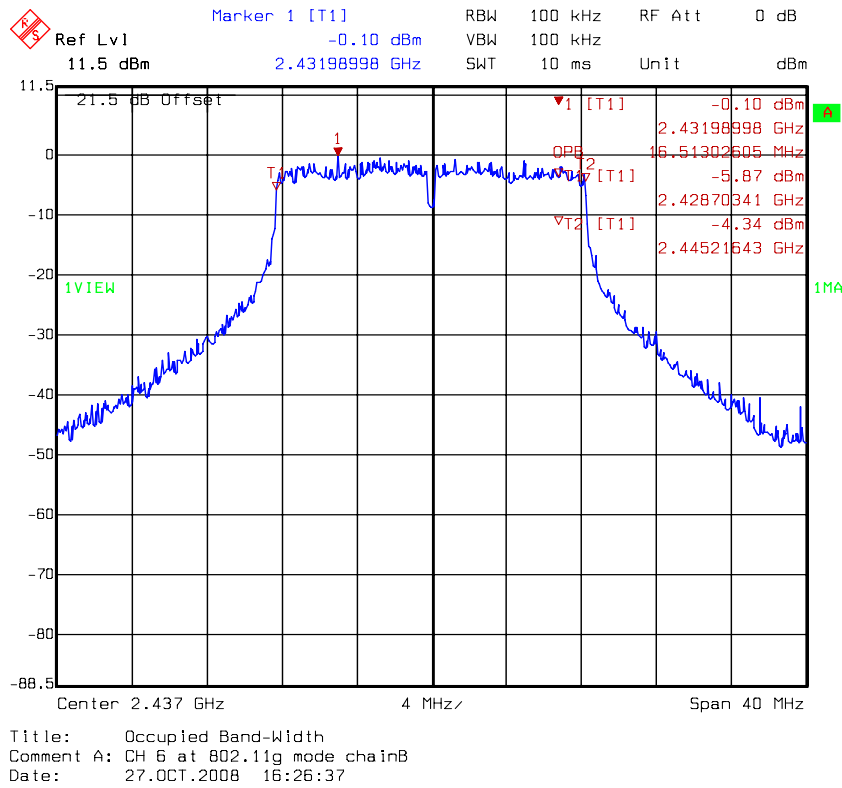
**Chain B: 99 % Occupied Bandwidth @ 802.11b mode channel 11**



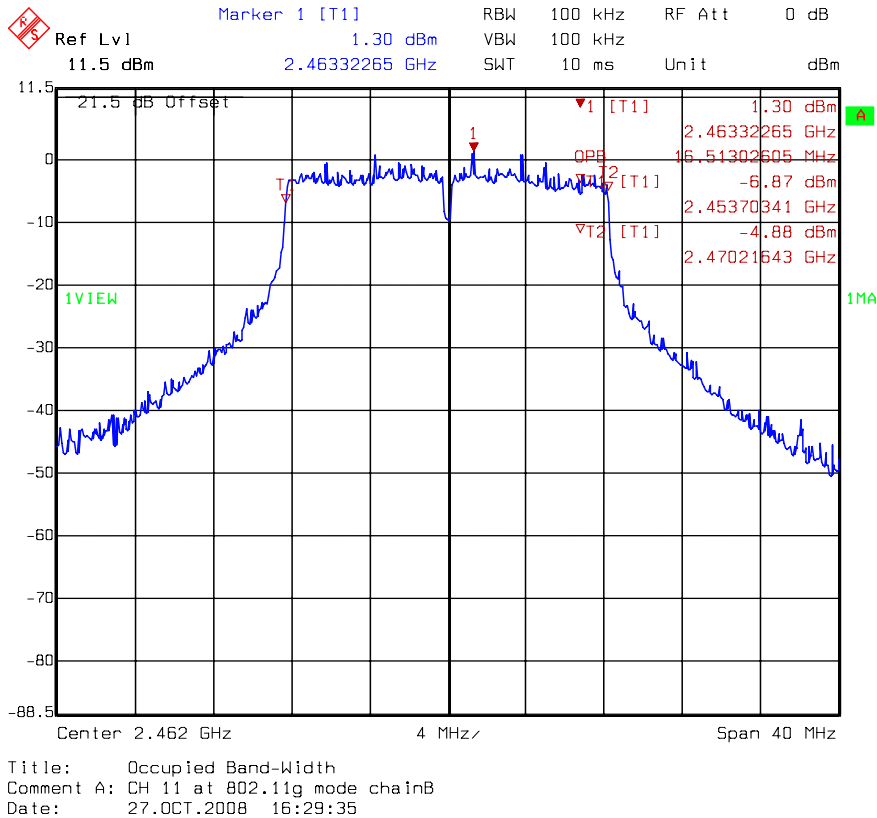
**Chain B: 99 % Occupied Bandwidth @ 802.11g mode channel 1**



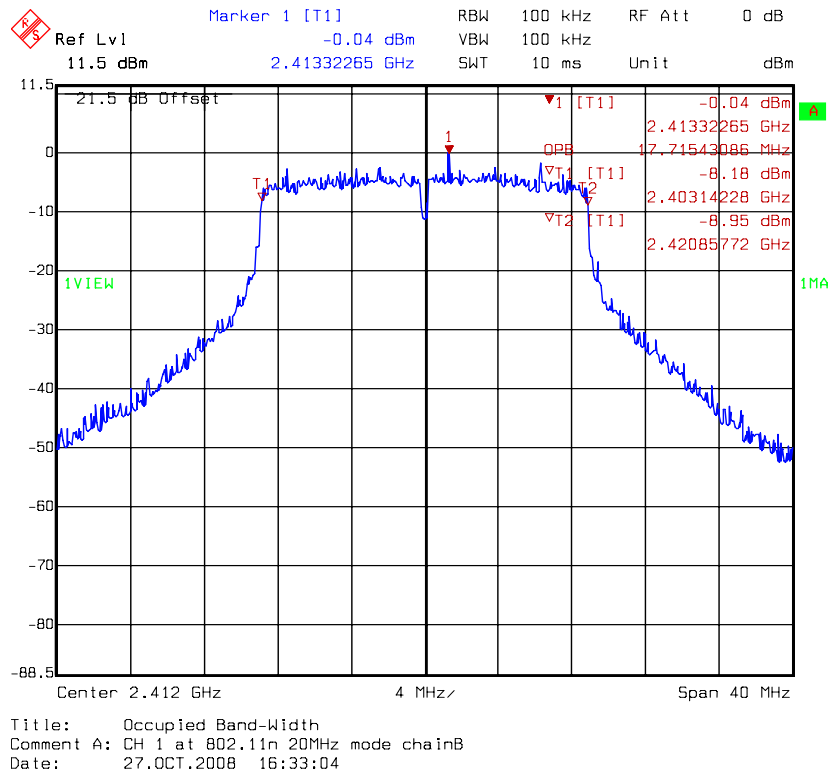
## Chain B: 99 % Occupied Bandwidth @ 802.11g mode channel 6



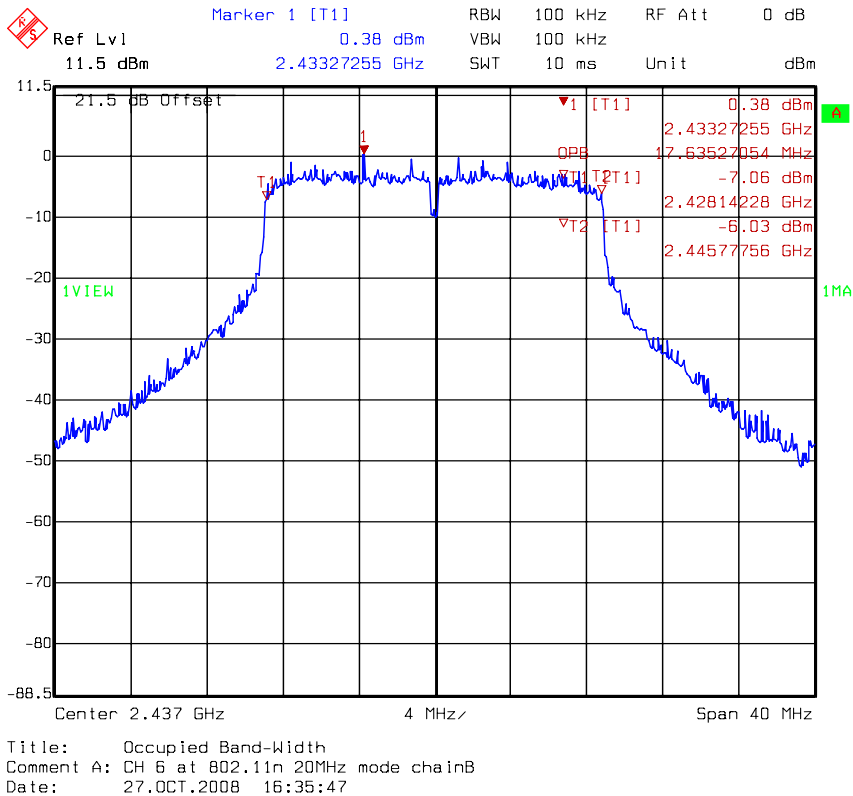
## Chain B: 99 % Occupied Bandwidth @ 802.11g mode channel 11



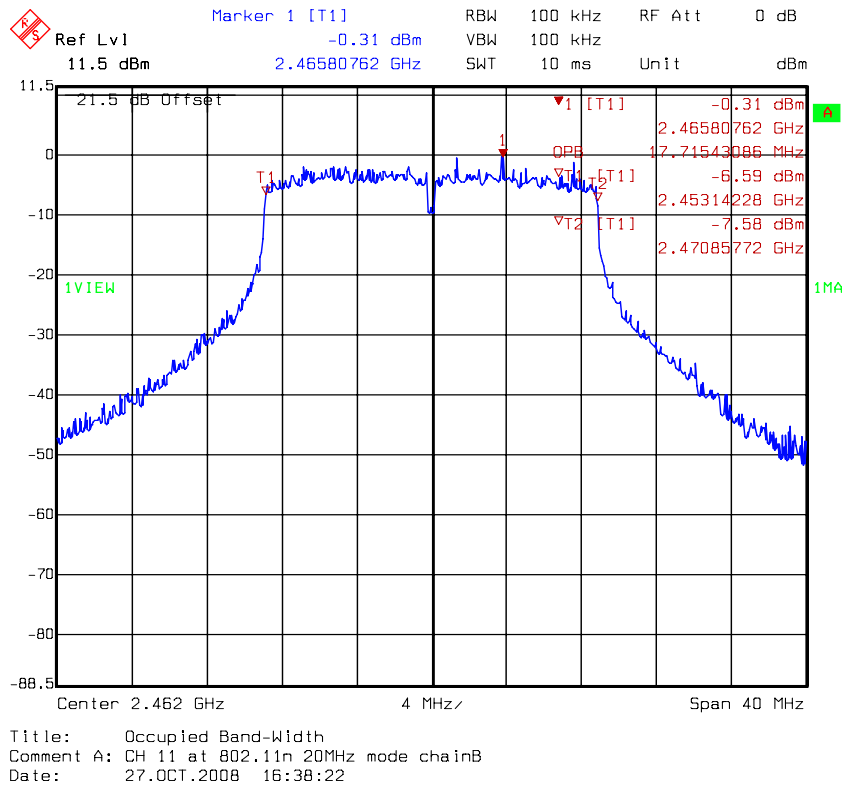
### Chain B: 99 % Occupied Bandwidth @ 802.11n (HT20) mode channel 1



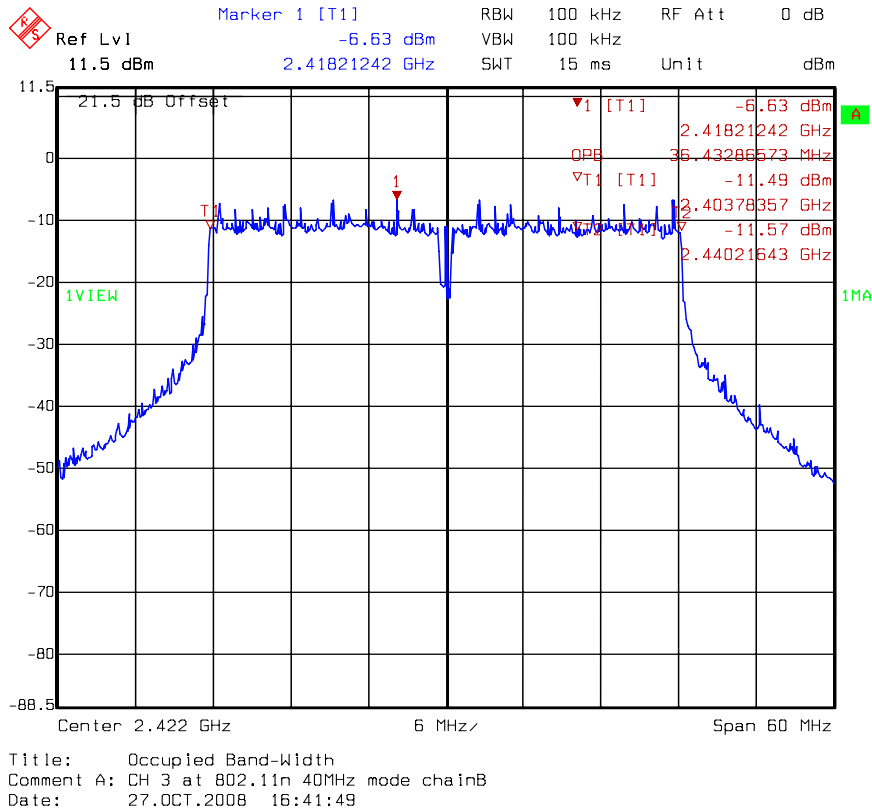
### Chain B: 99 % Occupied Bandwidth @ 802.11n (HT20) mode channel 6



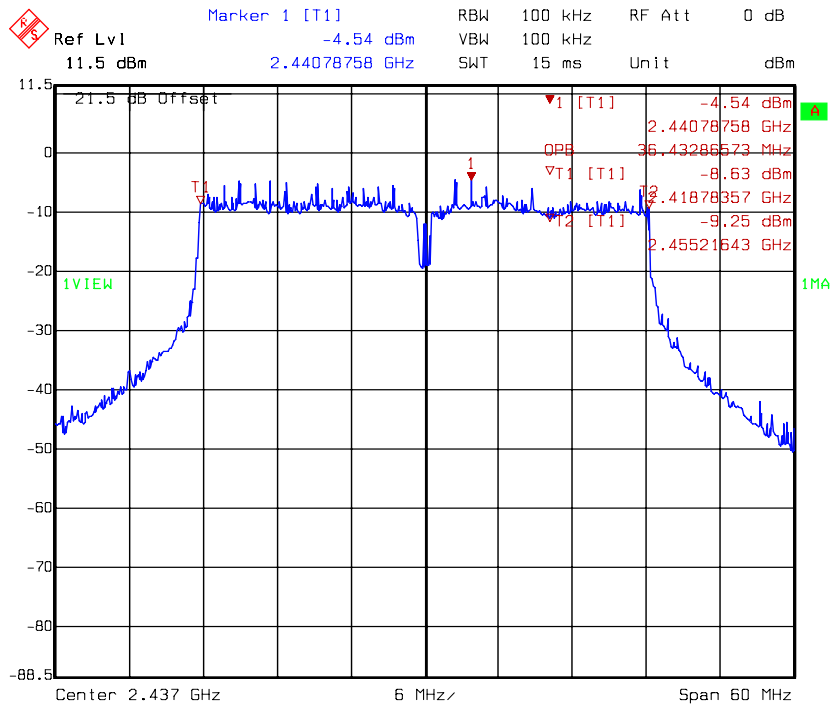
### Chain B: 99 % Occupied Bandwidth @ 802.11n (HT20) mode channel 11



### Chain B: 99 % Occupied Bandwidth @ 802.11n (HT40) mode channel 3

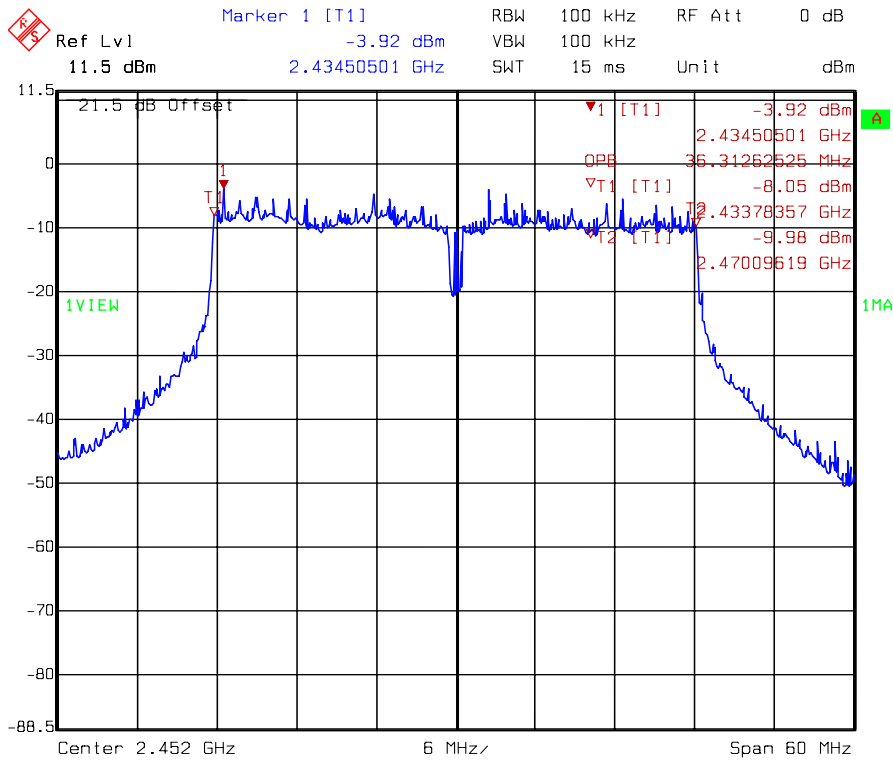


**Chain B: 99 % Occupied Bandwidth @ 802.11n (HT40) mode channel 6**



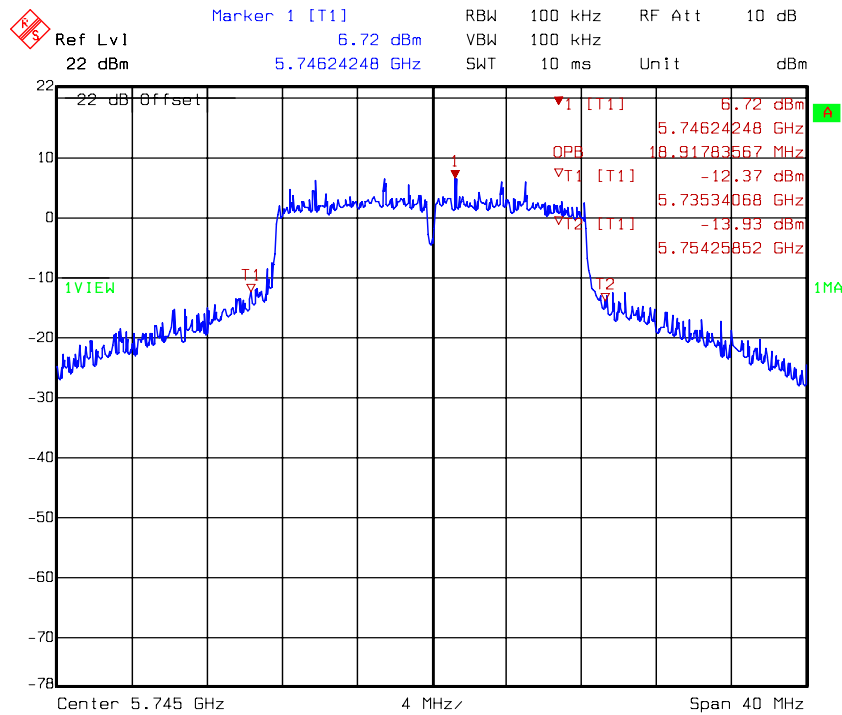
Title: Occupied Band-Width  
Comment A: CH 6 at 802.11n 40MHz mode chainB  
Date: 27.OCT.2008 16:48:37

**Chain B: 99 % Occupied Bandwidth @ 802.11n (HT40) mode channel 9**



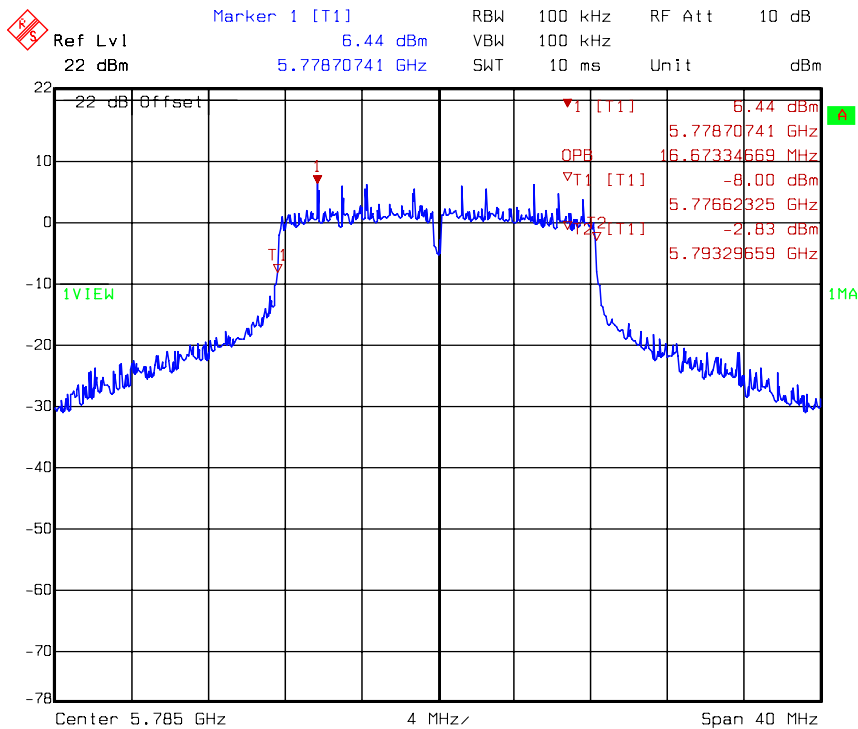
Title: Occupied Band-Width  
Comment A: CH 9 at 802.11n 40MHz mode chainB  
Date: 27.OCT.2008 16:52:03

### Chain B: 99 % Occupied Bandwidth @ 802.11a mode channel 149



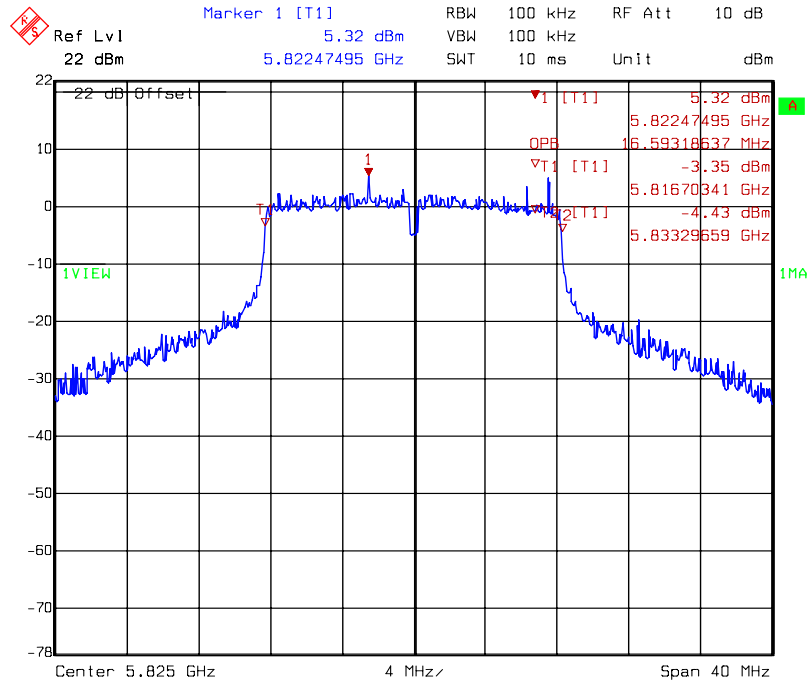
Title: Occupied Band-Width  
Comment A: CH 149 at 802.11a mode chainB  
Date: 27.OCT.2008 16:56:30

### Chain B: 99 % Occupied Bandwidth @ 802.11a mode channel 157

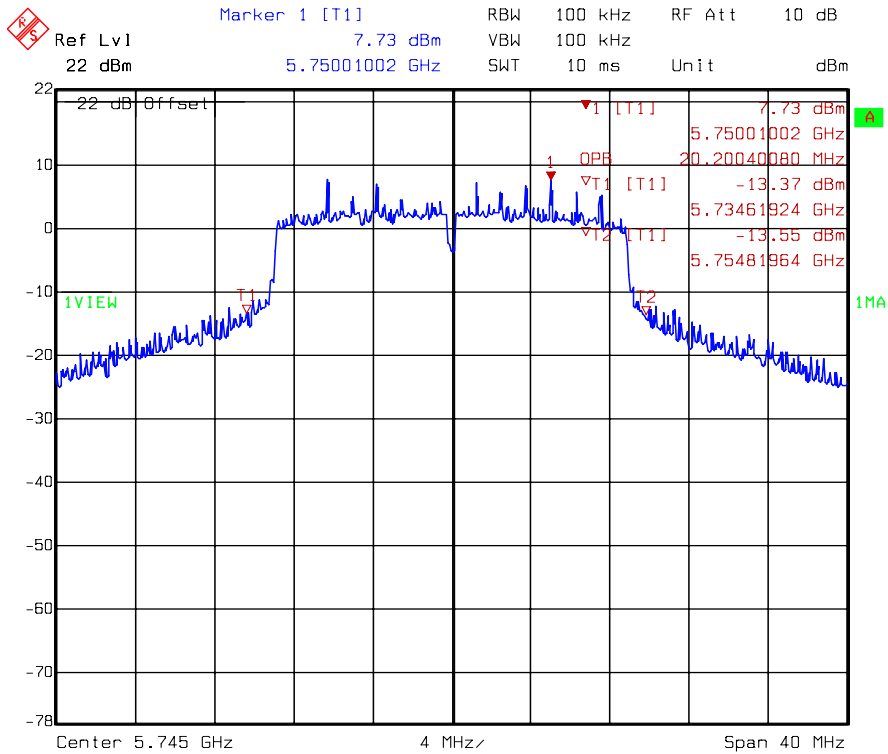


Title: Occupied Band-Width  
Comment A: CH 157 at 802.11a mode chainB  
Date: 27.OCT.2008 17:01:22

**Chain B: 99 % Occupied Bandwidth @ 802.11a mode channel 165**

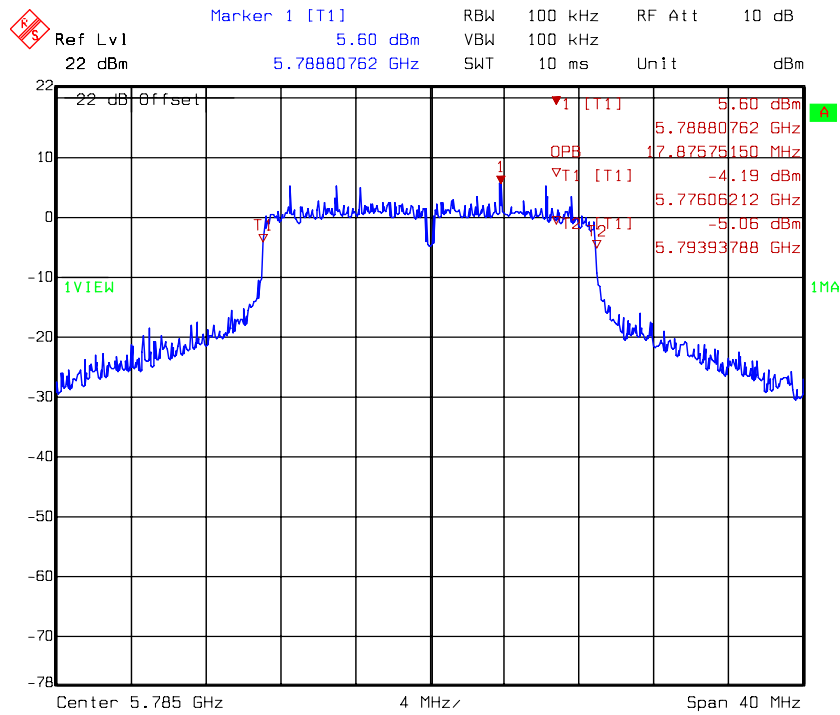


**Chain B: 99 % Occupied Bandwidth @ 802.11n (HT20) mode channel 149**



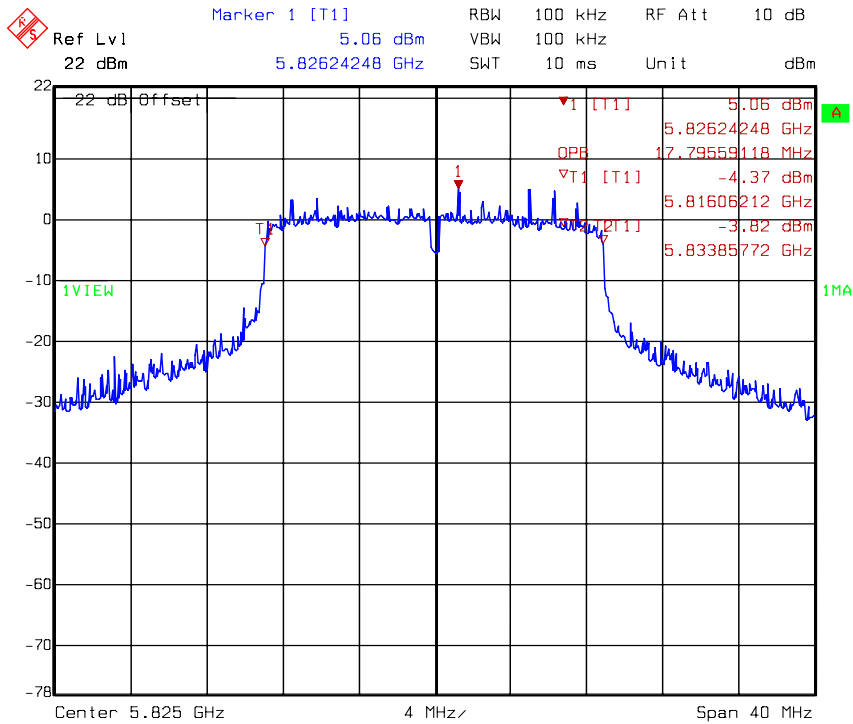


### Chain B: 99 % Occupied Bandwidth @ 802.11n (HT20) mode channel 157



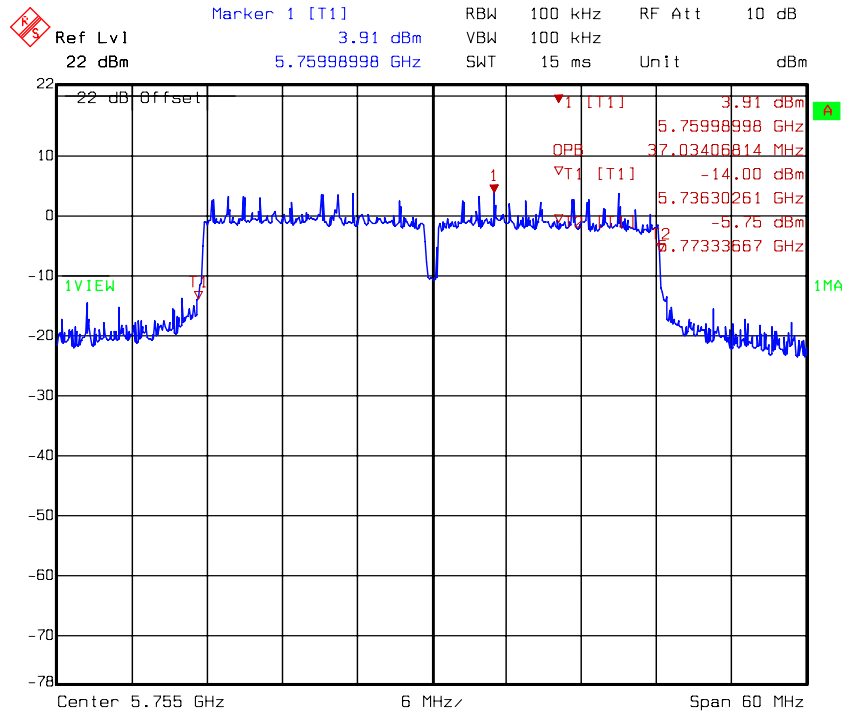
Title: Occupied Band-Width  
Comment A: CH 157 at 802.11n 20MHz mode chainB  
Date: 27.OCT.2008 17:12:53

### Chain B: 99 % Occupied Bandwidth @ 802.11n (HT20) mode channel 165



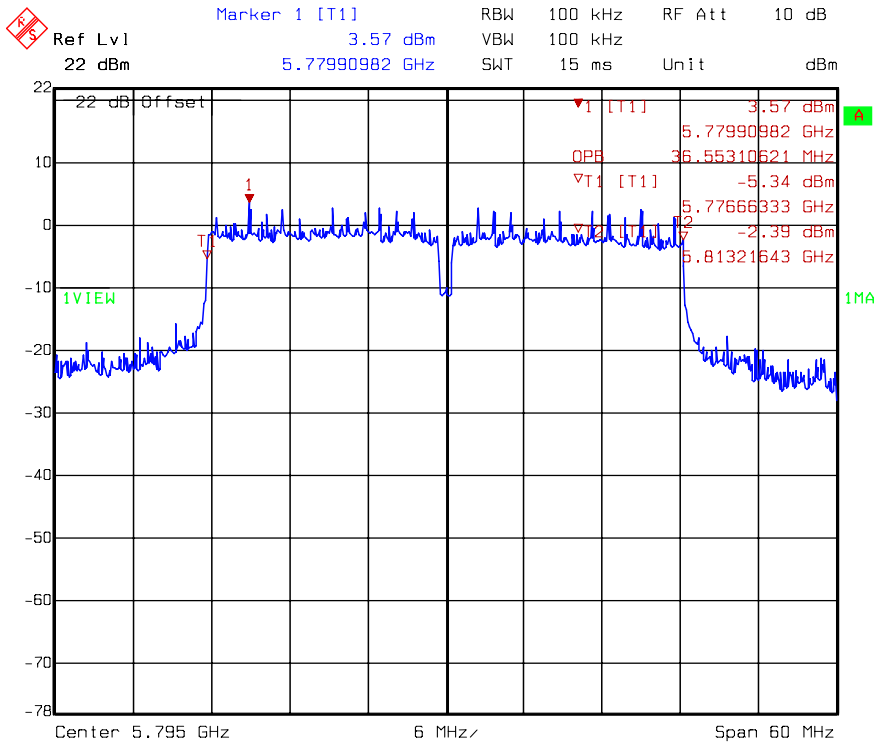
Title: Occupied Band-Width  
Comment A: CH 165 at 802.11n 20MHz mode chainB  
Date: 27.OCT.2008 17:18:02

**Chain B: 99 % Occupied Bandwidth @ 802.11n (HT40) mode channel 151**



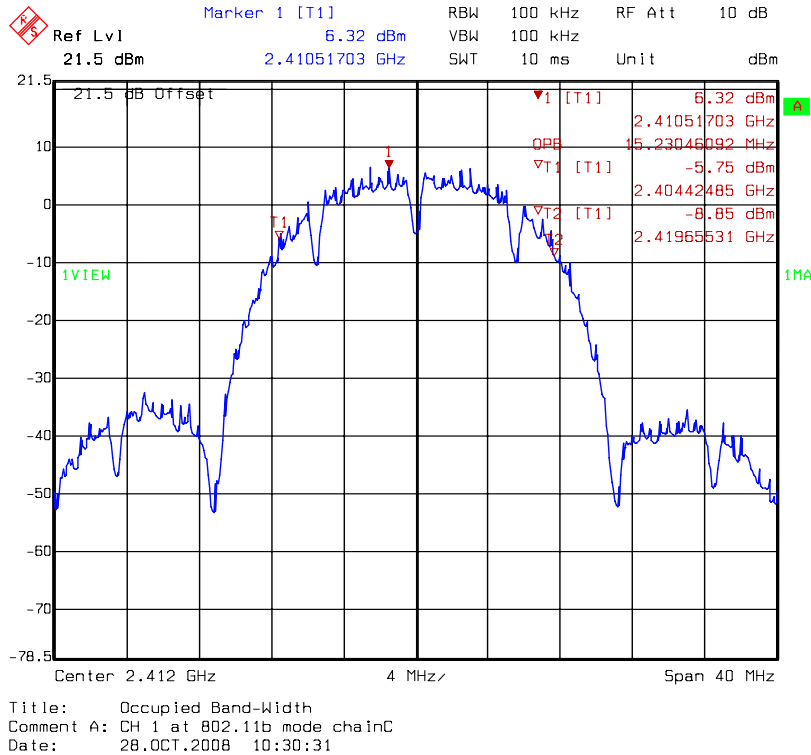
Title: Occupied Band-Width  
Comment A: CH 151 at 802.11n 40MHz mode chainB  
Date: 27.OCT.2008 17:23:54

**Chain B: 99 % Occupied Bandwidth @ 802.11n (HT40) mode channel 159**

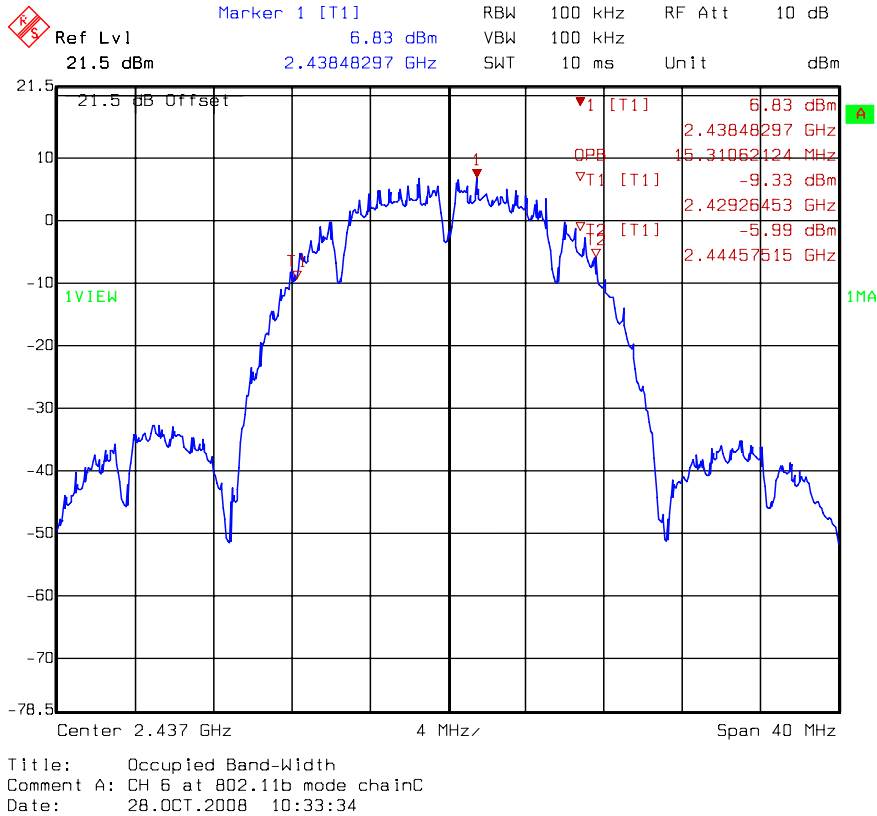


Title: Occupied Band-Width  
Comment A: CH 159 at 802.11n 40MHz mode chainB  
Date: 27.OCT.2008 17:27:59

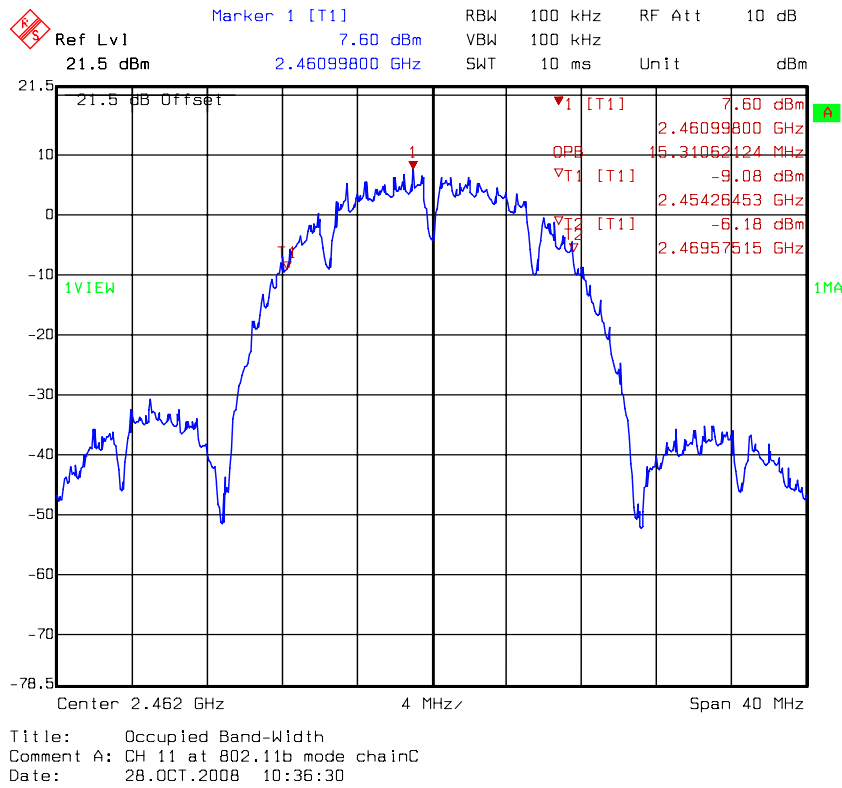
**Chain C: 99 % Occupied Bandwidth @ 802.11b mode channel 1**



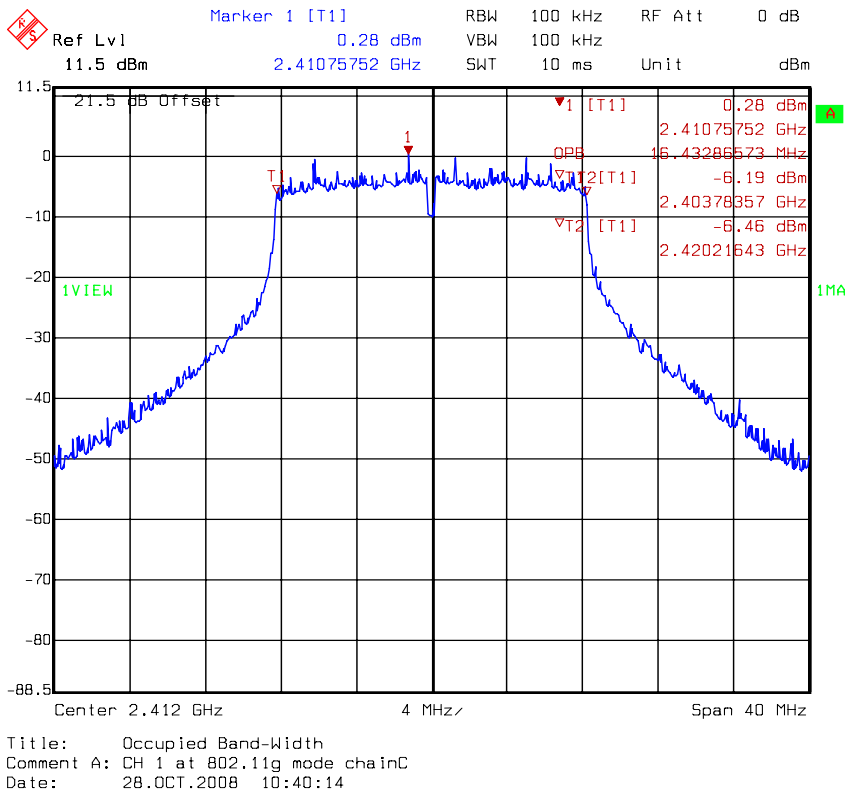
**Chain C: 99 % Occupied Bandwidth @ 802.11b mode channel 6**



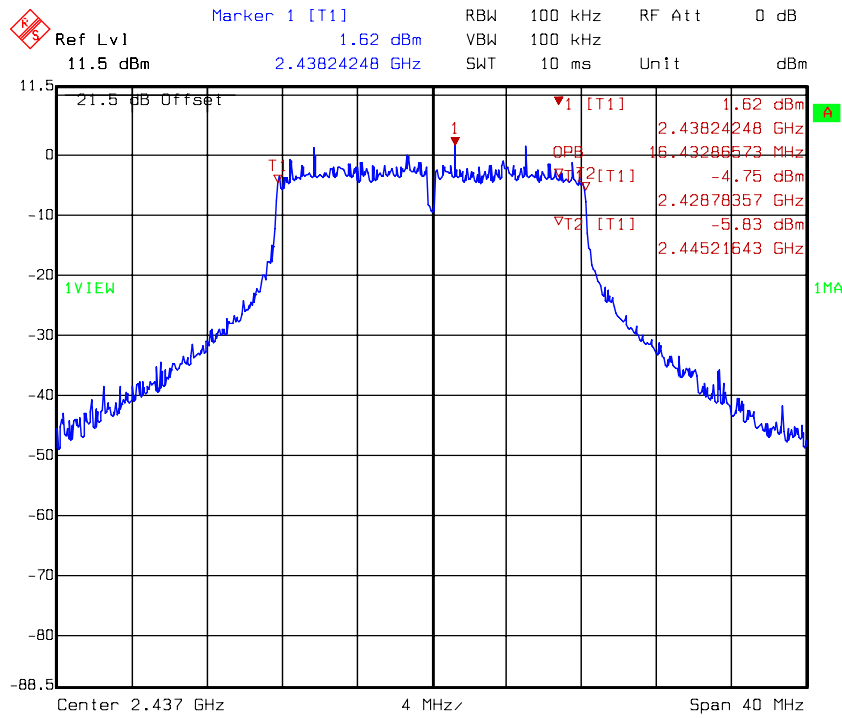
### Chain C: 99 % Occupied Bandwidth @ 802.11b mode channel 11



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

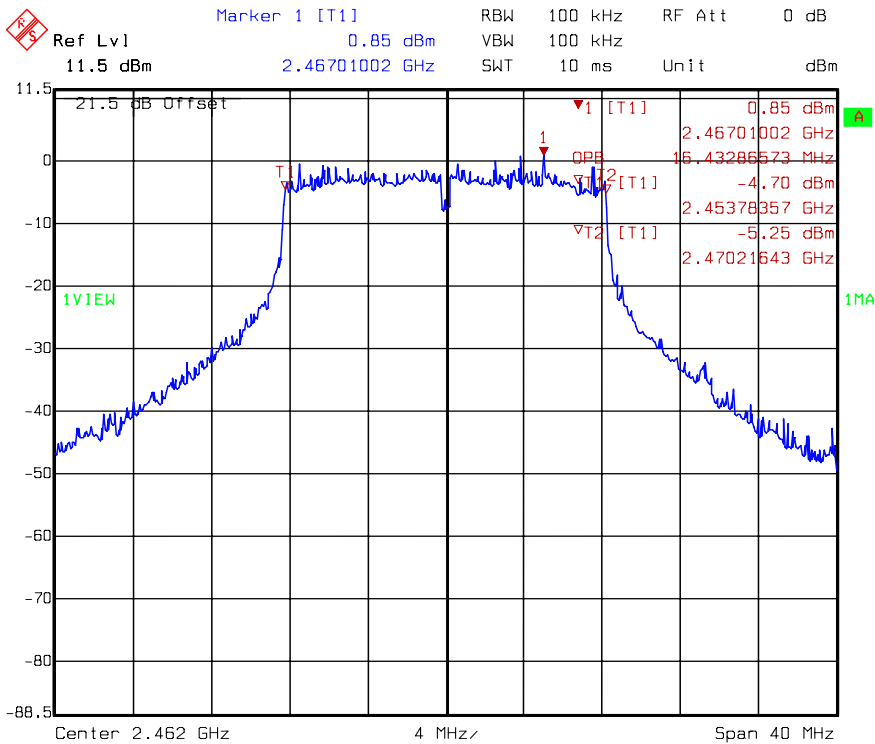


**Chain C: 99 % Occupied Bandwidth @ 802.11g mode channel 6**



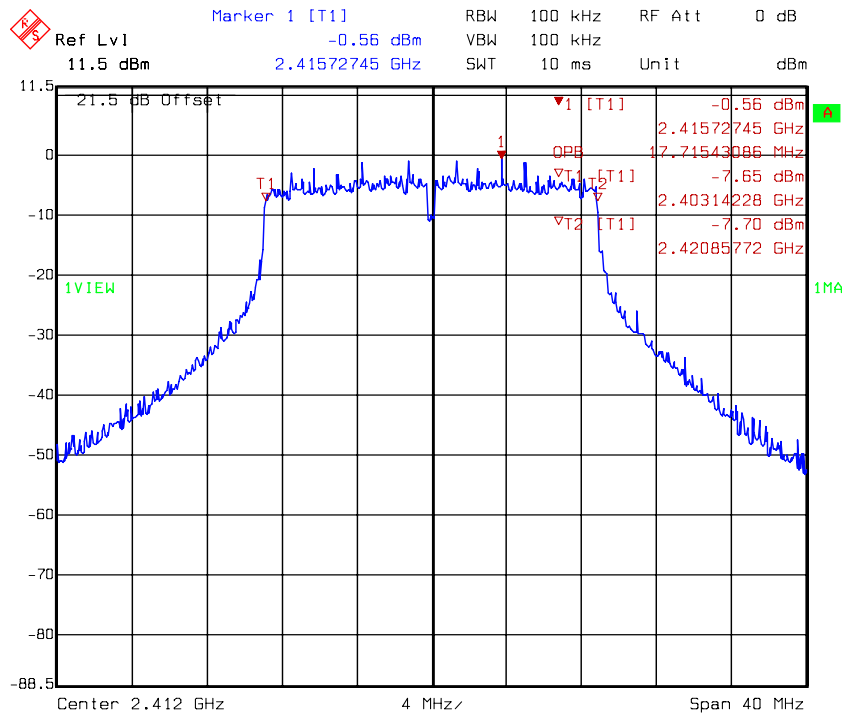
Title: Occupied Band-Width  
Comment A: CH 6 at 802.11g mode chainC  
Date: 28.OCT.2008 10:42:58

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



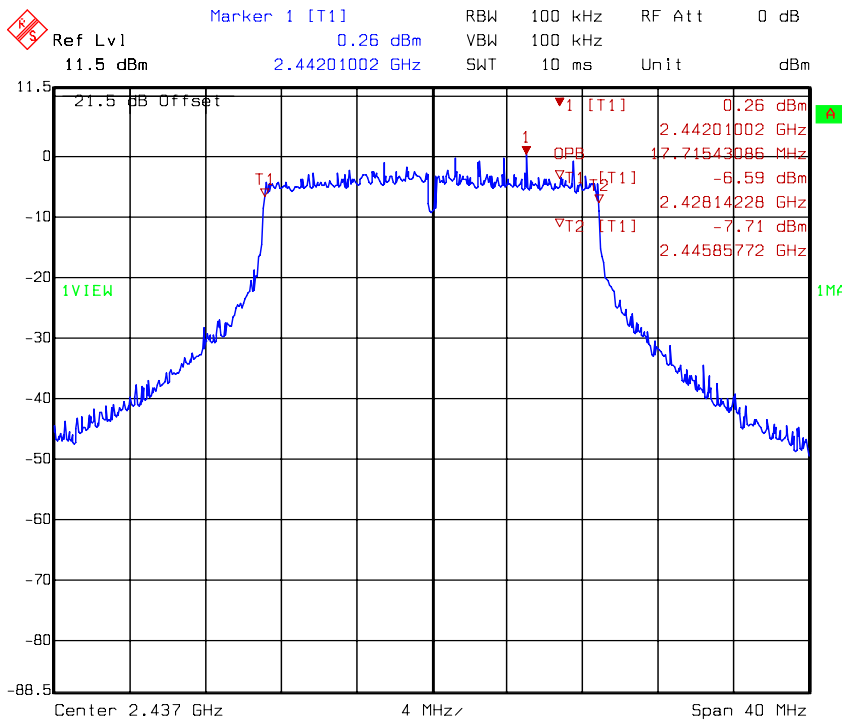
Title: Occupied Band-Width  
Comment A: CH 11 at 802.11g mode chainC  
Date: 28.OCT.2008 10:45:37

### Chain C: 99 % Occupied Bandwidth @ 802.11n (HT20) mode channel 1



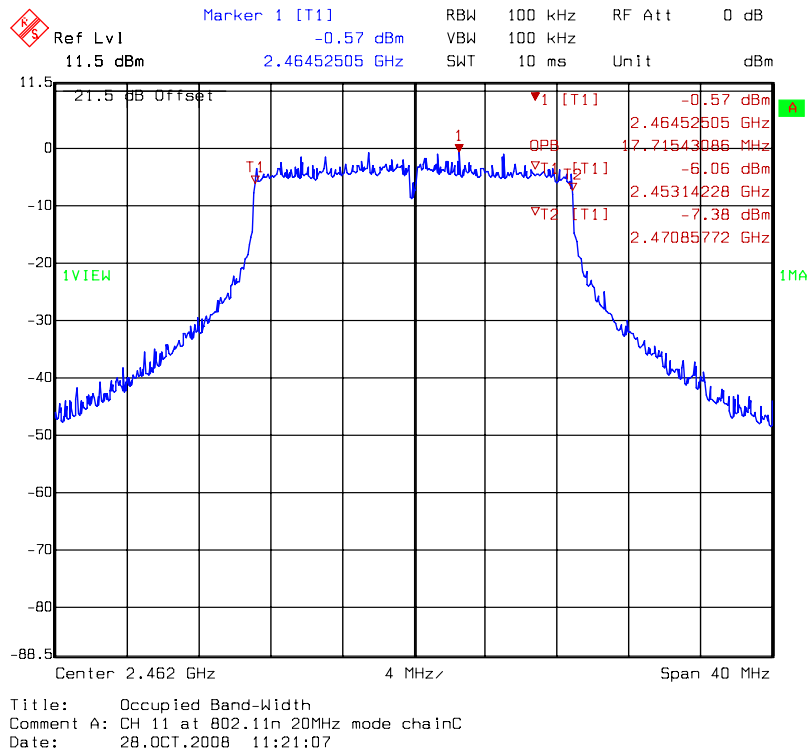
Title: Occupied Band-Width  
Comment A: CH 1 at 802.11n 20MHz mode chainC  
Date: 28.OCT.2008 10:53:06

### Chain C: 99 % Occupied Bandwidth @ 802.11n (HT20) mode channel 6

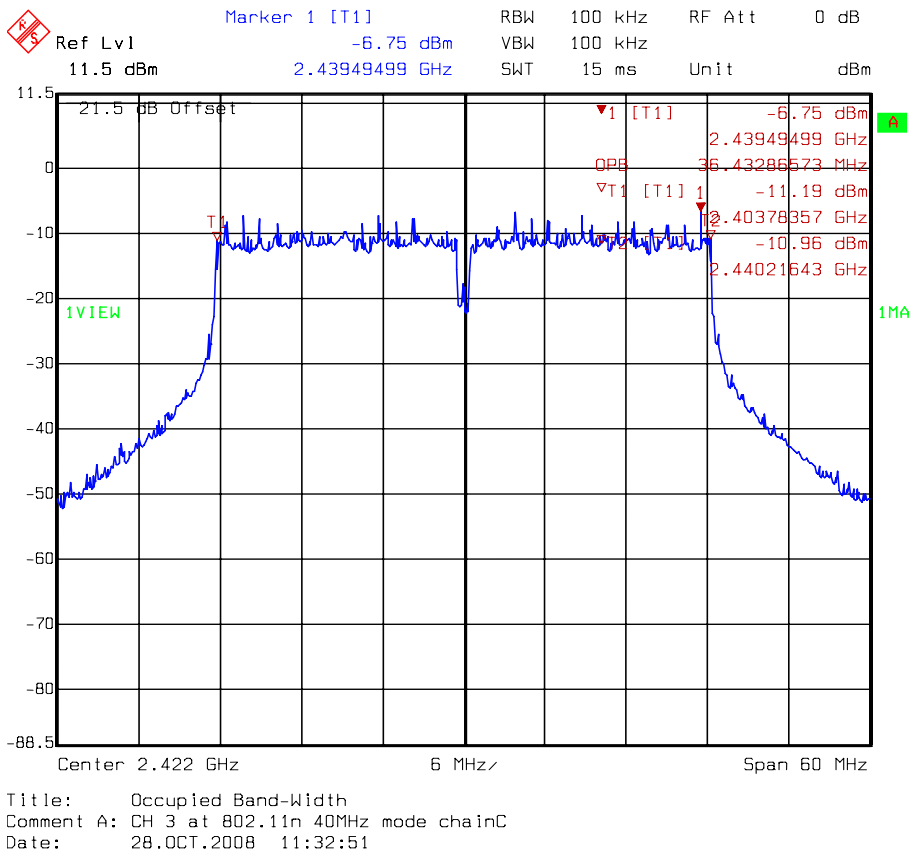


Title: Occupied Band-Width  
Comment A: CH 6 at 802.11n 20MHz mode chainC  
Date: 28.OCT.2008 11:18:20

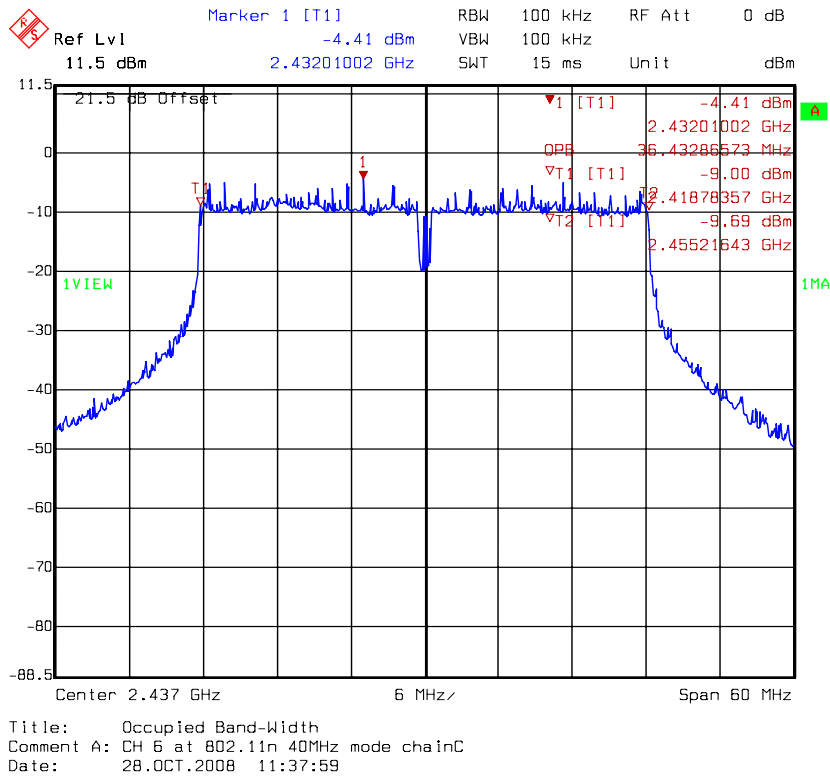
### Chain C: 99 % Occupied Bandwidth @ 802.11n (HT20) mode channel 11



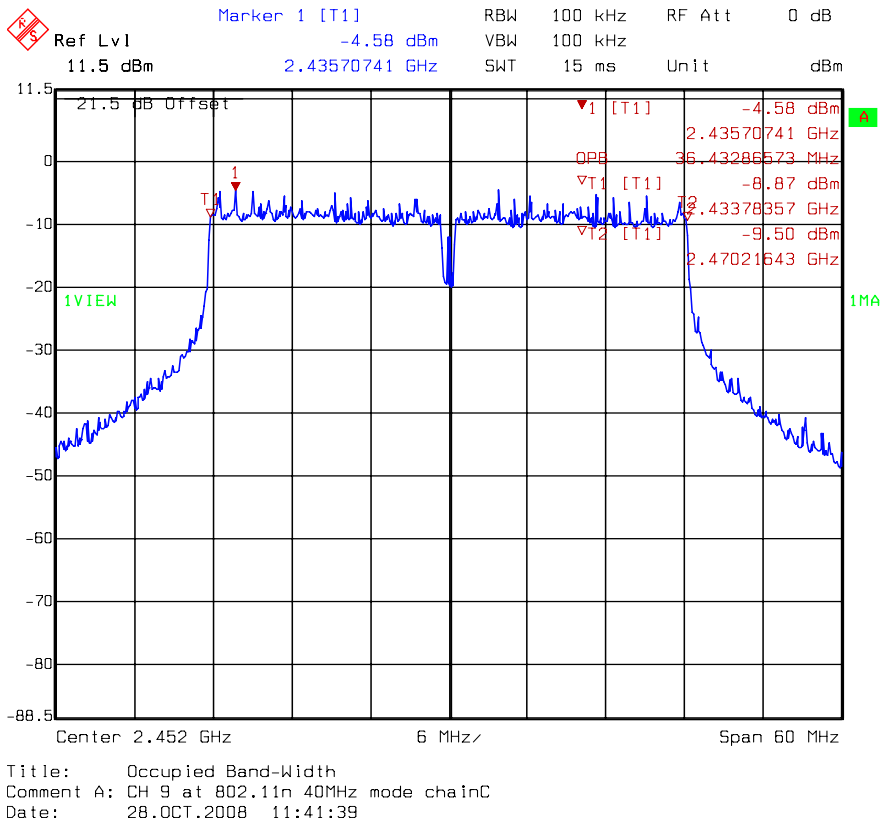
### Chain C: 99 % Occupied Bandwidth @ 802.11n (HT40) mode channel 3



### Chain C: 99 % Occupied Bandwidth @ 802.11n (HT40) mode channel 6

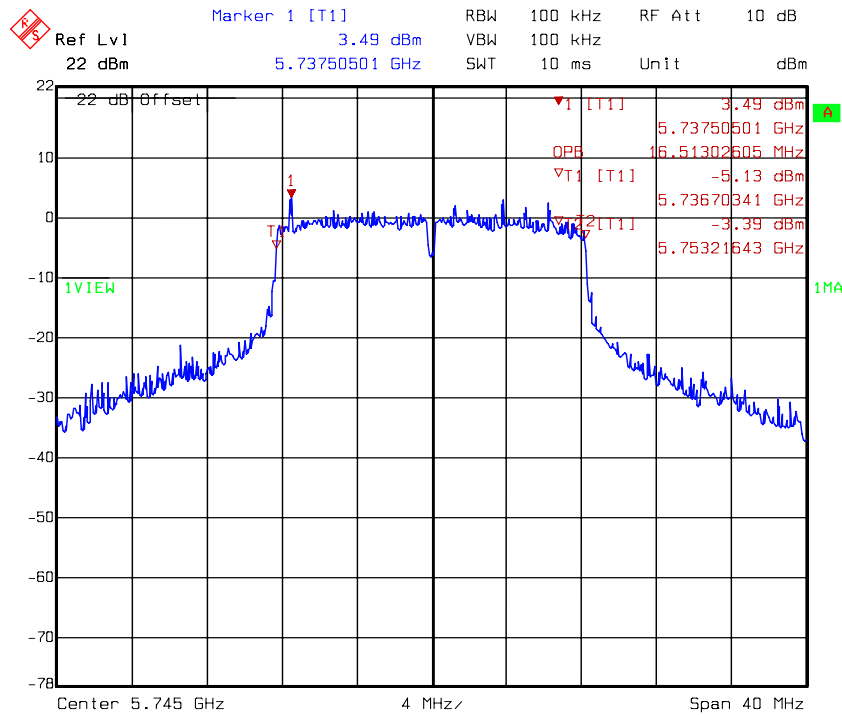


### Chain C: 99 % Occupied Bandwidth @ 802.11n (HT40) mode channel 9



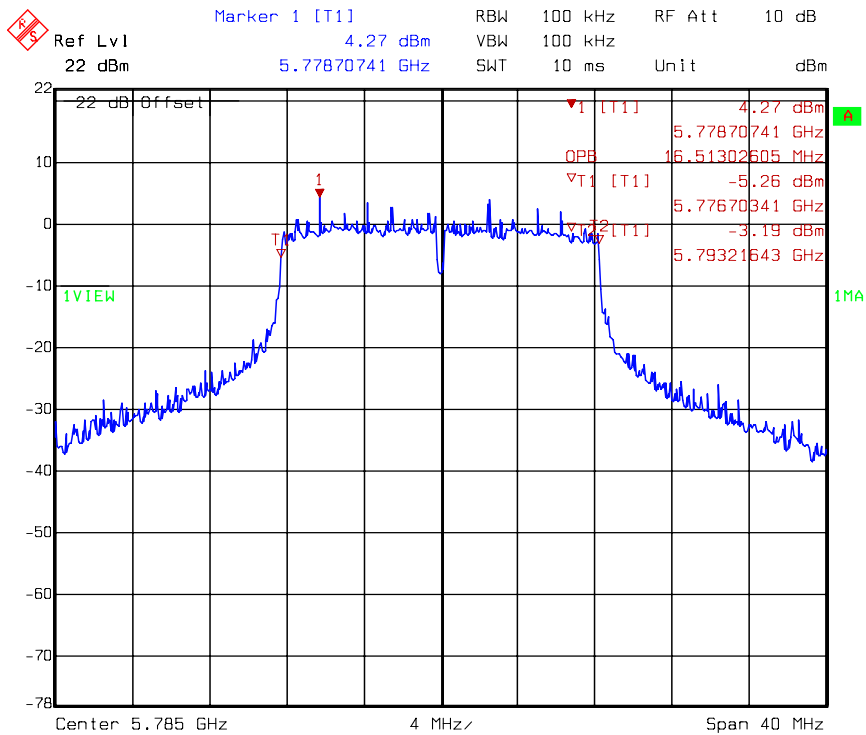


### Chain C: 99 % Occupied Bandwidth @ 802.11a mode channel 149



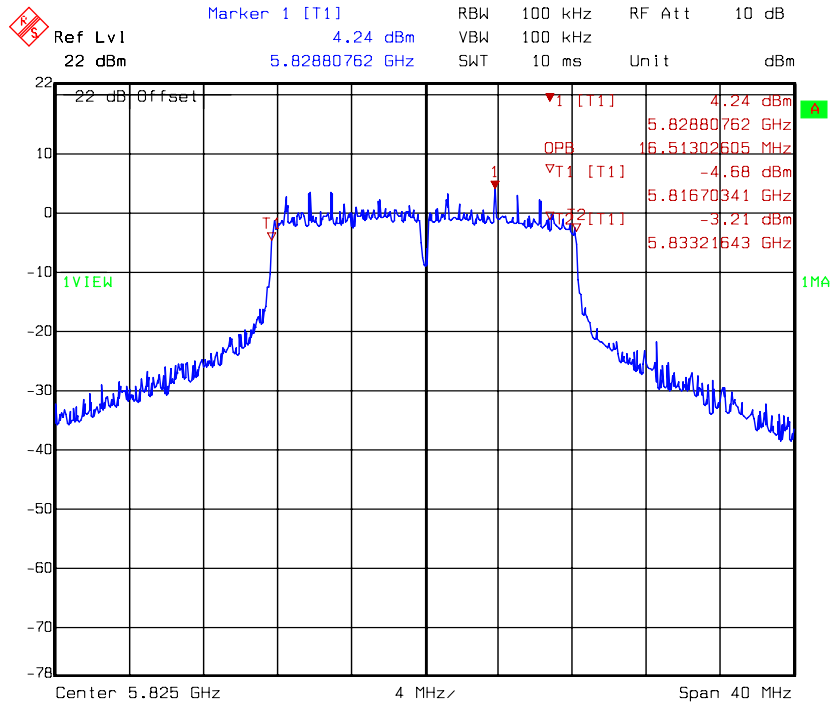
Title: Occupied Band-Width  
Comment A: CH 149 at 802.11a mode chainC  
Date: 28.OCT.2008 11:46:36

### Chain C: 99 % Occupied Bandwidth @ 802.11a mode channel 157



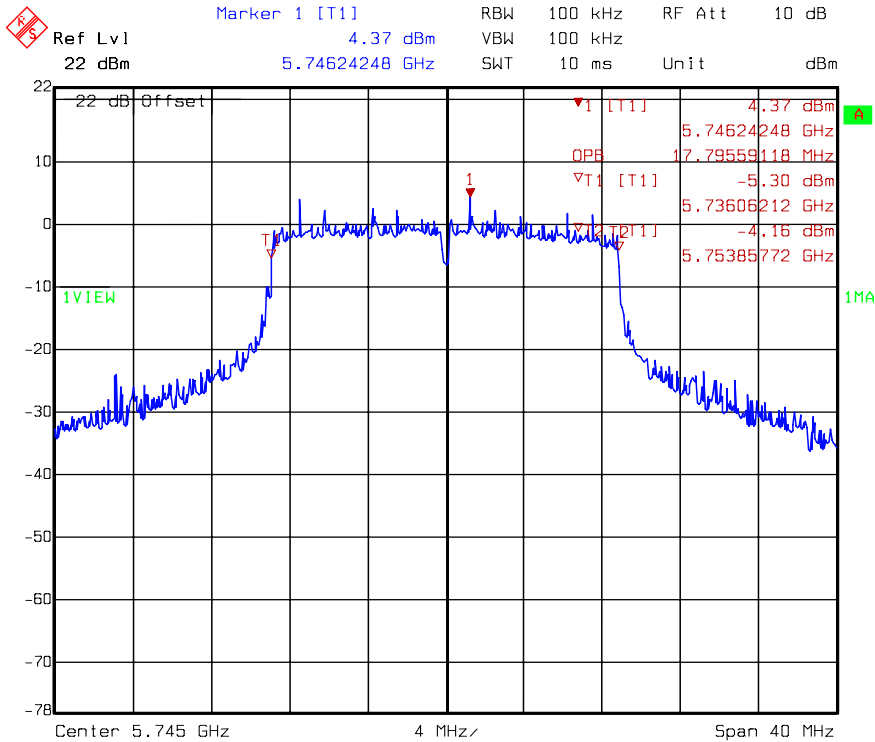
Title: Occupied Band-Width  
Comment A: CH 157 at 802.11a mode chainC  
Date: 28.OCT.2008 11:49:58

**Chain C: 99 % Occupied Bandwidth @ 802.11a mode channel 165**



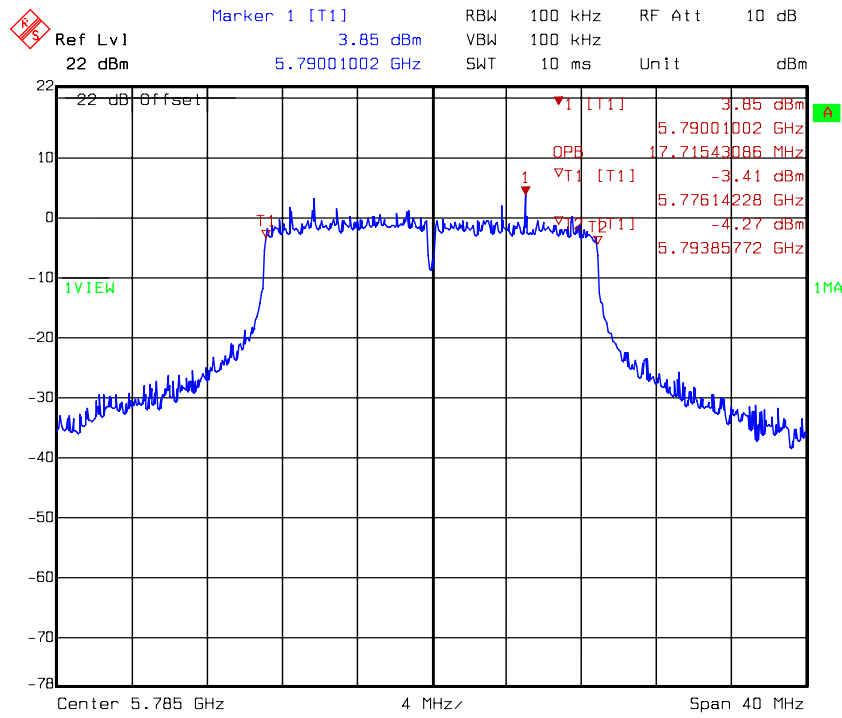
Title: Occupied Band-Width  
 Comment A: CH 165 at 802.11a mode chainC  
 Date: 28.OCT.2008 11:57:59

**Chain C: 99 % Occupied Bandwidth @ 802.11n (HT20) mode channel 149**



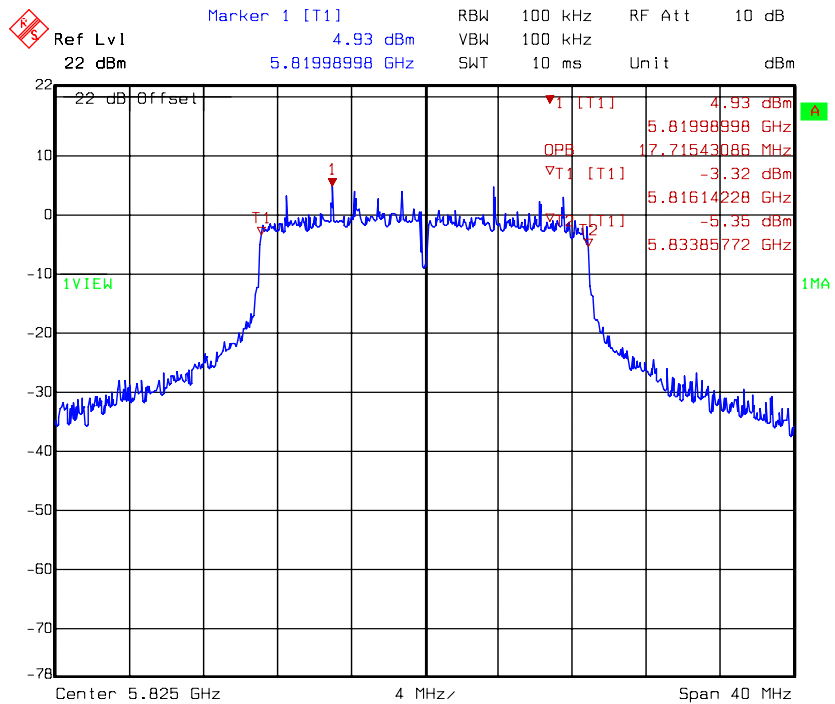
Title: Occupied Band-Width  
 Comment A: CH 149 at 802.11n 20MHz mode chainC  
 Date: 28.OCT.2008 12:02:51

### Chain C: 99 % Occupied Bandwidth @ 802.11n (HT20) mode channel 157



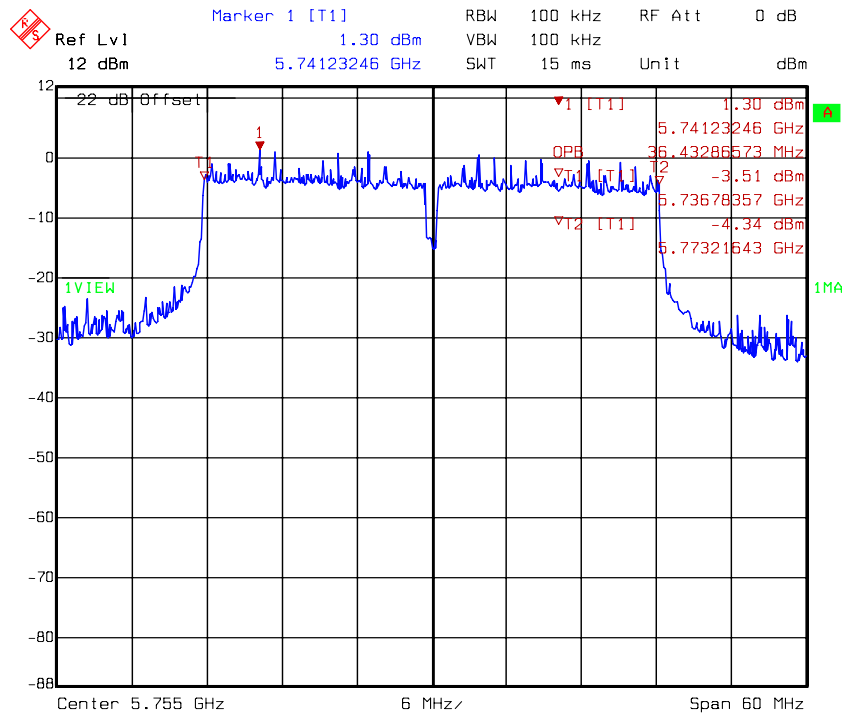
Title: Occupied Band-Width  
Comment A: CH 157 at 802.11n 20MHz mode chainC  
Date: 28.OCT.2008 12:06:13

### Chain C: 99 % Occupied Bandwidth @ 802.11n (HT20) mode channel 165



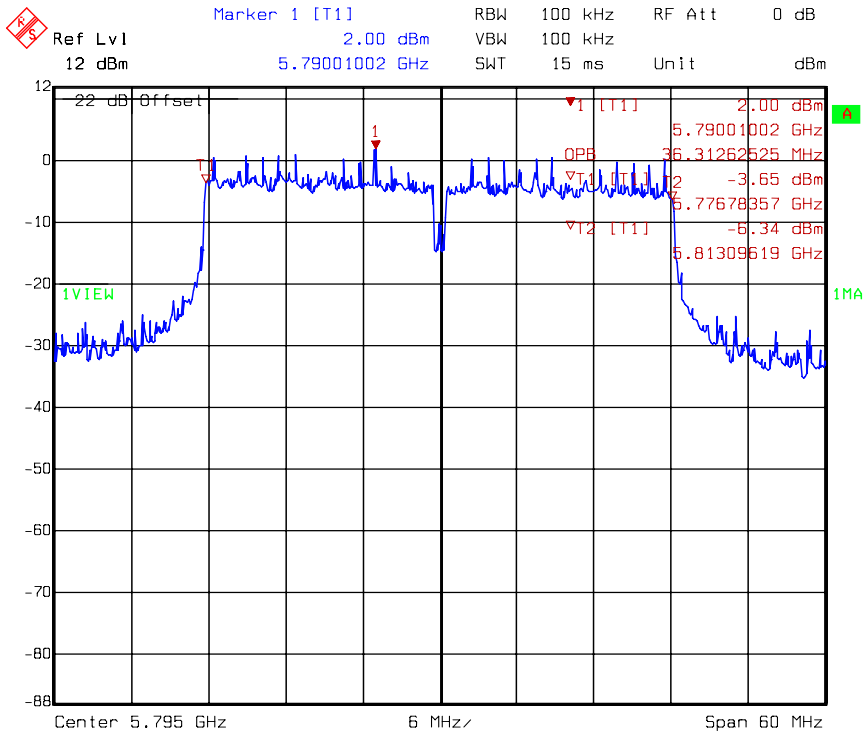
Title: Occupied Band-Width  
Comment A: CH 165 at 802.11n 20MHz mode chainC  
Date: 28.OCT.2008 12:09:06

**Chain C: 99 % Occupied Bandwidth @ 802.11n (HT40) mode channel 151**



Title: Occupied Band-Width  
Comment A: CH 151 at 802.11n 40MHz mode chainC  
Date: 28.OCT.2008 12:12:05

**Chain C: 99 % Occupied Bandwidth @ 802.11n (HT40) mode channel 159**



Title: Occupied Band-Width  
Comment A: CH 159 at 802.11n 40MHz mode chainC  
Date: 28.OCT.2008 12:15:00

## 5. Maximum Output Power

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

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

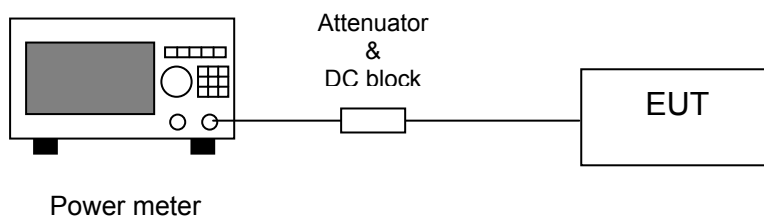
### Method of Measurement:

#### 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 1 Mbps for 802.11b, 6 Mbps for 802.11a/ 11g, 6.5 MHz for 802.11n HT20 and 13.5 MHz for 802.11n HT40. 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.

**Note 3:** §15.247 (b) (4) (ii) Systems operating in the 5725–5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter peak output power.

Table 3. Maximum output power

**Antenna 1 : C5060-510002-A**

**3Tx**

Mode	Channel	Output Power (dBm)			Total Power (PK)		Limit (dBm)
		Chain A	Chain B	Chain C	mW	dBm	
		PK	PK	PK			
802.11b	1	19.87	19.88	20.33	302.22	24.80	30
	6	20.04	19.99	20.47	312.12	24.94	30
	11	19.99	19.95	20.71	316.39	25.00	30
802.11g	1	23.58	23.59	23.91	702.63	28.47	30
	6	23.62	23.54	23.75	693.23	28.41	30
	11	23.02	23.01	23.10	604.61	27.81	30
802.11n (HT20)	1	23.66	23.71	23.91	713.27	28.53	30
	6	23.66	23.59	23.83	702.38	28.47	30
	11	23.13	23.07	23.02	608.80	27.84	30
802.11n (HT40)	3	22.65	23.06	23.13	591.97	27.72	30
	6	22.85	22.97	23.05	592.74	27.73	30
	9	22.86	22.61	22.89	570.12	27.56	30
802.11a	149	22.43	23.67	22.73	595.29	27.75	30
	157	22.78	23.74	23.08	629.50	27.99	30
	165	22.99	23.86	16.68	488.85	26.89	30
802.11n (HT20)	149	22.35	23.61	22.69	587.19	27.69	30
	157	22.69	23.71	23.00	620.27	27.93	30
	165	22.96	23.82	23.39	656.96	28.18	30
802.11n (HT40)	151	22.58	23.72	23.04	618.01	27.91	30
	159	22.91	23.92	23.39	660.31	28.20	30

**Antenna 2 : 3CWE591**

**3Tx**

Mode	Channel	Output Power (dBm)			Total Power (PK)		Limit (dBm)
		Chain A	Chain B	Chain C	mW	dBm	
		PK	PK	PK			
802.11b	1	19.30	19.30	20.01	270.46	24.32	30
	6	19.45	19.32	19.99	273.38	24.37	30
	11	19.30	19.40	20.27	278.62	24.45	30
802.11g	1	21.52	21.75	21.85	444.64	26.48	30
	6	22.59	22.62	22.82	555.79	27.45	30
	11	22.59	22.61	22.69	549.72	27.40	30
802.11n (HT20)	1	21.07	21.47	21.58	412.10	26.15	30
	6	22.15	22.26	22.25	500.21	26.99	30
	11	22.29	22.09	22.41	505.42	27.04	30
802.11n (HT40)	3	19.94	20.52	20.04	312.27	24.95	30
	6	21.83	22.41	22.19	492.16	26.92	30
	9	22.02	21.35	21.55	438.57	26.42	30
802.11a	149	22.43	23.67	22.73	595.29	27.75	30
	157	22.78	23.74	23.08	629.50	27.99	30
	165	22.99	23.86	16.68	488.85	26.89	30
802.11n (HT20)	149	22.35	23.61	22.69	587.19	27.69	30
	157	22.69	23.71	23.00	620.27	27.93	30
	165	22.96	23.82	23.39	656.96	28.18	30
802.11n (HT40)	151	22.58	23.72	23.04	618.01	27.91	30
	159	22.91	23.92	23.39	660.31	28.20	30

**Antenna 3 : 3CWE596**

**2Tx**

Mode	Channel	Output Power (dBm)		Total Power (PK)		Limit (dBm)
		Chain A	Chain B	mW	dBm	
		PK	PK			
802.11b	1	17.23	17.12	104.37	20.19	22
	6	17.33	17.3	107.78	20.33	22
	11	17.79	17.89	121.64	20.85	22
802.11g	1	17.58	17.77	117.12	20.69	22
	6	17.39	17.88	116.20	20.65	22
	11	18.01	17.86	124.34	20.95	22
802.11n (HT20)	1	17.43	17.88	116.71	20.67	22
	6	17.6	17.78	117.52	20.70	22
	11	18.16	17.72	124.62	20.96	22
802.11n (HT40)	3	16.13	16.75	88.34	19.46	22
	6	17.34	18.05	118.03	20.72	22
	9	17.61	17.42	112.88	20.53	22
802.11a	149	22.98	23.97	448.07	26.51	30
	157	23.05	24.10	458.88	26.62	30
	165	23.32	24.17	476.00	26.78	30
802.11n (HT20)	149	22.71	23.95	434.95	26.38	30
	157	23.03	24.09	457.36	26.60	30
	165	23.29	24.17	474.52	26.76	30
802.11n (HT40)	151	22.88	23.99	444.70	26.48	30
	159	23.21	24.18	471.23	26.73	30



**Antenna 4 : 3CWE598**  
**2Tx**

Mode	Channel	Output Power (dBm)		Total Power (PK)		Limit (dBm)
		Chain A	Chain B	mW	dBm	
		PK	PK			
802.11b	1	19.81	19.69	188.83	22.76	28.67
	6	20.00	19.91	197.95	22.97	28.67
	11	19.91	19.74	192.14	22.84	28.67
802.11g	1	23.58	23.68	461.38	26.64	28.67
	6	23.72	23.61	465.12	26.68	28.67
	11	23.09	23.03	404.61	26.07	28.67
802.11n (HT20)	1	23.65	23.68	465.09	26.68	28.67
	6	23.76	23.66	469.96	26.72	28.67
	11	23.19	23.05	410.29	26.13	28.67
802.11n (HT40)	3	22.44	22.83	367.25	25.65	28.67
	6	22.57	22.75	369.08	25.67	28.67
	9	22.87	22.72	380.71	25.81	28.67
802.11a	149	22.98	23.97	448.07	26.51	30
	157	23.05	24.10	458.88	26.62	30
	165	23.32	24.17	476.00	26.78	30
802.11n (HT20)	149	22.71	23.95	434.95	26.38	30
	157	23.03	24.09	457.36	26.60	30
	165	23.29	24.17	474.52	26.76	30
802.11n (HT40)	151	22.88	23.99	444.70	26.48	30
	159	23.21	24.18	471.23	26.73	30

**Antenna 5 : MCM2458PTRPSM**

**3Tx**

Mode	Channel	Output Power (dBm)			Total Power (PK)		Limit (dBm)
		Chain A	Chain B	Chain C	mW	dBm	
		PK	PK	PK			
802.11b	1	19.87	19.88	20.33	302.22	24.80	30
	6	20.04	19.99	20.47	312.12	24.94	30
	11	19.99	19.95	20.71	316.39	25.00	30
802.11g	1	23.22	23.18	23.48	640.71	28.07	30
	6	22.59	22.62	22.82	555.79	27.45	30
	11	22.59	22.61	22.69	549.72	27.40	30
802.11n (HT20)	1	22.52	22.97	22.83	568.67	27.55	30
	6	22.15	22.26	22.25	500.21	26.99	30
	11	22.29	22.09	22.41	505.42	27.04	30
802.11n (HT40)	3	20.94	21.08	20.89	375.14	25.74	30
	6	22.19	22.09	21.68	474.62	26.76	30
	9	22.86	22.61	22.89	570.12	27.56	30
802.11a	149	22.43	23.67	22.73	595.29	27.75	30
	157	22.78	23.74	23.08	629.50	27.99	30
	165	22.99	23.86	16.68	488.85	26.89	30
802.11n (HT20)	149	22.35	23.61	22.69	587.19	27.69	30
	157	22.69	23.71	23.00	620.27	27.93	30
	165	22.96	23.82	23.39	656.96	28.18	30
802.11n (HT40)	151	22.58	23.72	23.04	618.01	27.91	30
	159	22.91	23.92	23.39	660.31	28.20	30

**Antenna 6 : TQJ-24/58MICX6**

**3Tx**

Mode	Channel	Output Power (dBm)			Total Power (PK)		Limit (dBm)
		Chain A	Chain B	Chain C	mW	dBm	
		PK	PK	PK			
802.11b	1	19.27	19.16	19.84	263.32	24.20	30
	6	18.94	18.63	19.47	239.80	23.80	30
	11	19.48	18.96	19.31	252.73	24.03	30
802.11g	1	21.52	21.75	21.85	444.64	26.48	30
	6	21.93	21.85	21.98	466.83	26.69	30
	11	21.53	21.29	21.76	426.79	26.30	30
802.11n (HT20)	1	21.29	20.96	21.45	398.96	26.01	30
	6	21.13	21.04	20.95	381.23	25.81	30
	11	21.08	20.62	20.57	357.60	25.53	30
802.11n (HT40)	3	20.94	21.08	20.89	375.14	25.74	30
	6	20.96	20.88	20.71	364.96	25.62	30
	9	21.21	20.89	20.79	374.82	25.74	30
802.11a	149	22.43	23.67	22.73	595.29	27.75	30
	157	22.78	23.74	23.08	629.50	27.99	30
	165	22.99	23.86	16.68	488.85	26.89	30
802.11n (HT20)	149	22.35	23.61	22.69	587.19	27.69	30
	157	22.69	23.71	23.00	620.27	27.93	30
	165	22.96	23.82	23.39	656.96	28.18	30
802.11n (HT40)	151	22.58	23.72	23.04	618.01	27.91	30
	159	22.91	23.92	23.39	660.31	28.20	30

**Antenna 7 : TQJ-24/58MIKX3**

**3Tx**

Mode	Channel	Output Power (dBm)			Total Power (PK)		Limit (dBm)
		Chain A	Chain B	Chain C	mW	dBm	
		PK	PK	PK			
802.11b	1	19.59	19.51	20.09	282.42	24.51	30
	6	19.43	19.22	20.16	275.01	24.39	30
	11	19.48	18.96	19.31	252.73	24.03	30
802.11g	1	22.97	22.69	23.28	596.75	27.76	30
	6	22.75	22.61	22.96	568.45	27.55	30
	11	21.53	21.29	21.76	426.79	26.30	30
802.11n (HT20)	1	22.52	22.97	22.83	568.67	27.55	30
	6	22.60	22.63	22.68	550.55	27.41	30
	11	22.17	22.08	22.20	492.21	26.92	30
802.11n (HT40)	3	21.76	22.48	21.49	467.91	26.70	30
	6	21.82	21.79	21.47	443.34	26.47	30
	9	22.03	21.82	21.02	438.12	26.42	30
802.11a	149	22.43	23.67	22.73	595.29	27.75	30
	157	22.78	23.74	23.08	629.50	27.99	30
	165	22.99	23.86	16.68	488.85	26.89	30
802.11n (HT20)	149	22.35	23.61	22.69	587.19	27.69	30
	157	22.69	23.71	23.00	620.27	27.93	30
	165	22.96	23.82	23.39	656.96	28.18	30
802.11n (HT40)	151	22.58	23.72	23.04	618.01	27.91	30
	159	22.91	23.92	23.39	660.31	28.20	30

## 6. Power Spectral Density

<b>Name of Test</b>	Power Spectral Density
<b>Base Standard</b>	FCC 15.247(e)

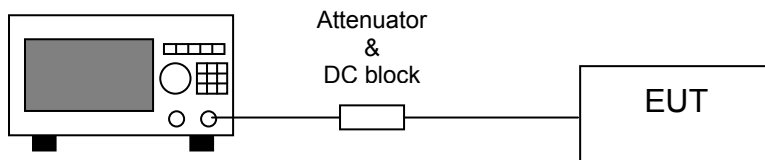
**Test Result:** Complies  
**Measurement Data:** See Table & plots below

### 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:



Spectrum Analyzer

**Note:** The EUT was tested while in a continuous transmit mode and the worst case data rates are 1 Mbps for 802.11b, 6 Mbps for 802.11a/ 11g, 6.5 MHz for 802.11n HT20 and 13.5 MHz for 802.11n HT40. The EUT was tuned to a low, middle and high channel.

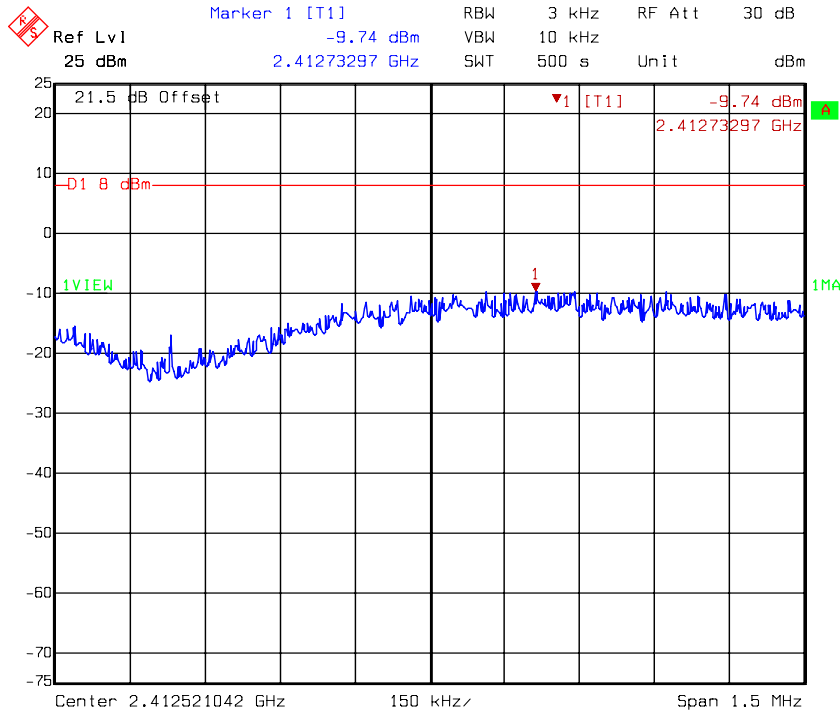
Table 4. Power Spectral Density

**Antenna 1 : C5060-510002-A (worse case)**

**3TX**

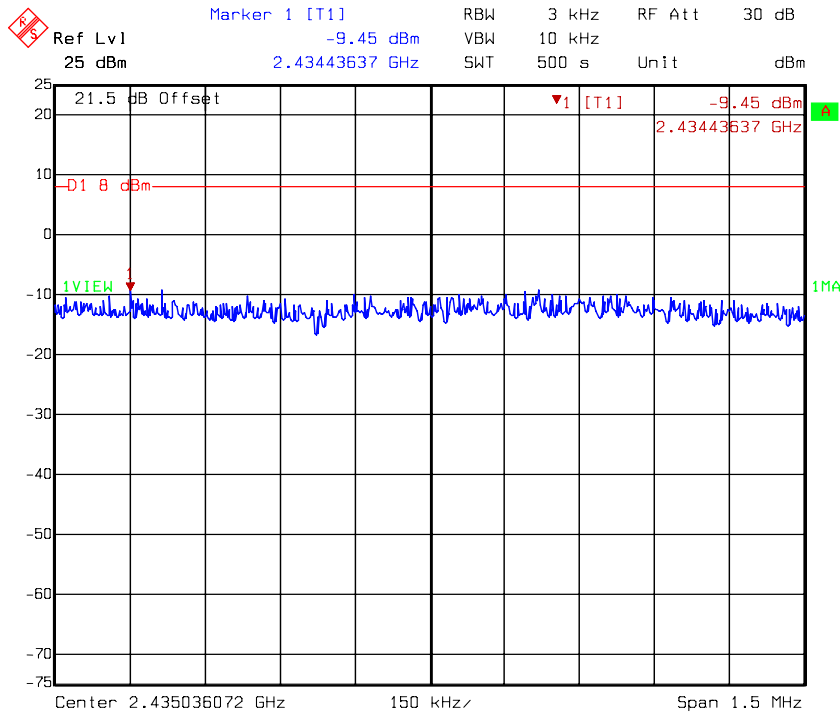
Mode	Channel	Data rate Mbps	PPSD (dBm)			Total PPSD		Limit (dBm)
			Chain A	Chain B	ChainC	mW	dBm	
802.11b	1	1	-9.74	-8.69	-8.62	0.38	-4.22	8
	6		-9.45	-9.13	-8.06	0.39	-4.07	8
	11		-8.50	-9.05	-8.31	0.41	-3.84	8
802.11g	1	6	-15.66	-15.63	-14.78	0.09	-10.57	8
	6		-14.19	-13.02	-13.21	0.14	-8.67	8
	11		-13.32	-12.90	-13.78	0.14	-8.55	8
802.11n (HT20)	1	6.5	-16.04	-15.89	-15.53	0.08	-11.04	8
	6		-14.48	-14.93	-14.97	0.10	-10.02	8
	11		-13.25	-14.02	-14.04	0.13	-8.98	8
802.11n (HT40)	3	13.5	-22.86	-21.70	-23.29	0.02	-17.79	8
	6		-20.77	-20.69	-20.71	0.03	-15.95	8
	9		-18.86	-19.15	-19.66	0.04	-14.44	8
802.11a	149	6	-11.89	-9.42	-11.65	0.25	-6.07	8
	157		-10.53	-9.31	-11.21	0.28	-5.51	8
	165		-12.36	-10.86	-10.97	0.22	-6.57	8
802.11n (HT20)	149	6.5	-12.21	-7.72	-12.65	0.28	-5.47	8
	157		-11.38	-10.48	-11.46	0.23	-6.31	8
	165		-11.22	-10.75	-12.39	0.22	-6.63	8
802.11n (HT40)	151	13.5	-14.17	-11.48	-14.74	0.14	-8.45	8
	159		-12.79	-13.50	-15.84	0.12	-9.09	8

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



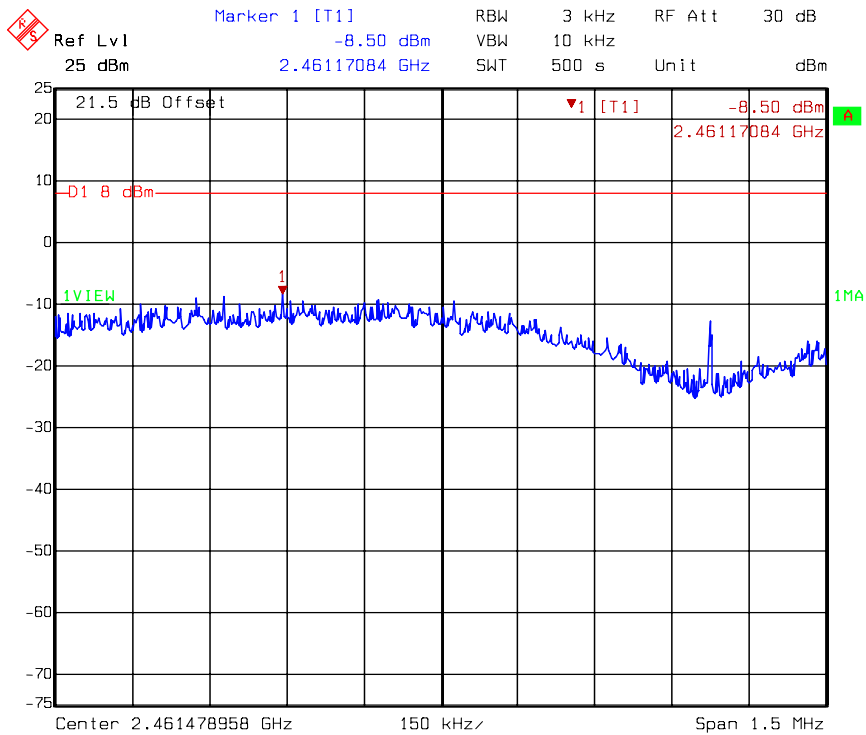
Title: Power density  
Comment A: CH 1 at 802.11b mode chainA  
Date: 24.OCT.2008 15:41:32

### Chain A: Power Spectral Density @ 802.11b mode channel 6



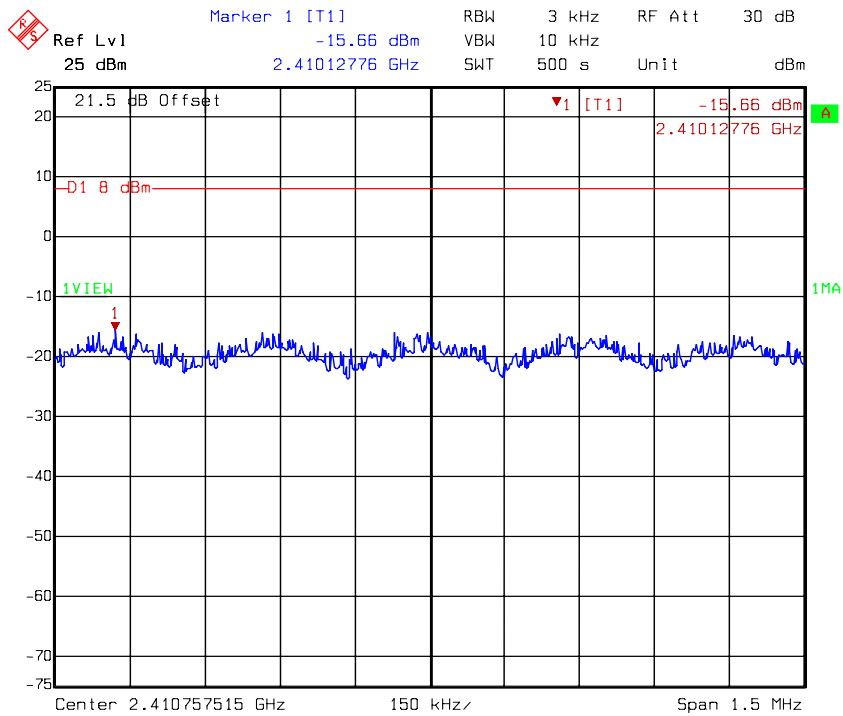
Title: Power density  
Comment A: CH 6 at 802.11b mode chainA  
Date: 24.OCT.2008 15:45:23

### Chain A: Power Spectral Density @ 802.11b mode channel 11



Title: Power density  
Comment A: CH 11 at 802.11b mode chainA  
Date: 24.OCT.2008 15:48:08

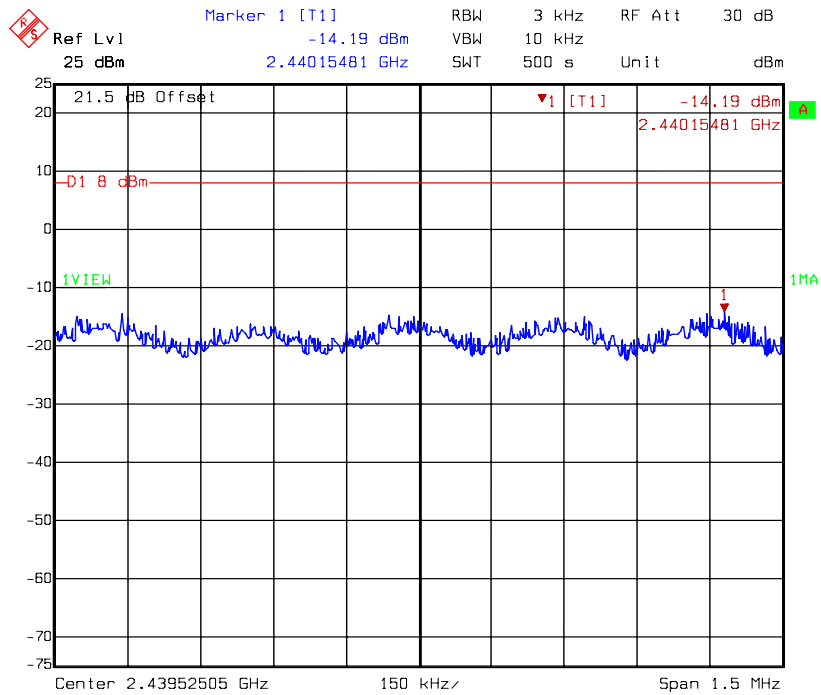
### Chain A: Power Spectral Density @ 802.11g mode channel 1



Title: Power density  
Comment A: CH 1 at 802.11g mode chainA  
Date: 24.OCT.2008 15:51:37

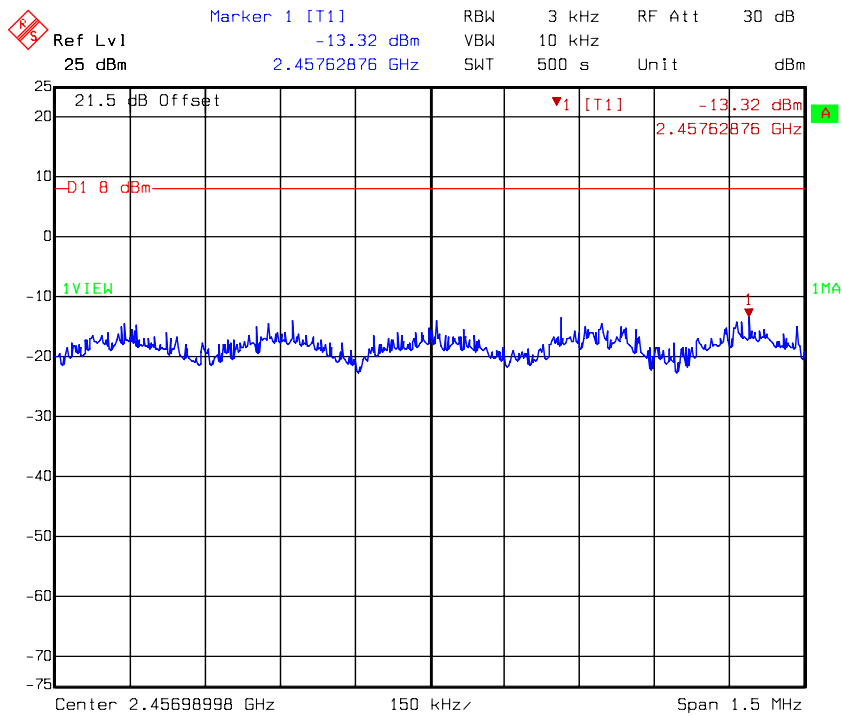


### Chain A: Power Spectral Density @ 802.11g mode channel 6



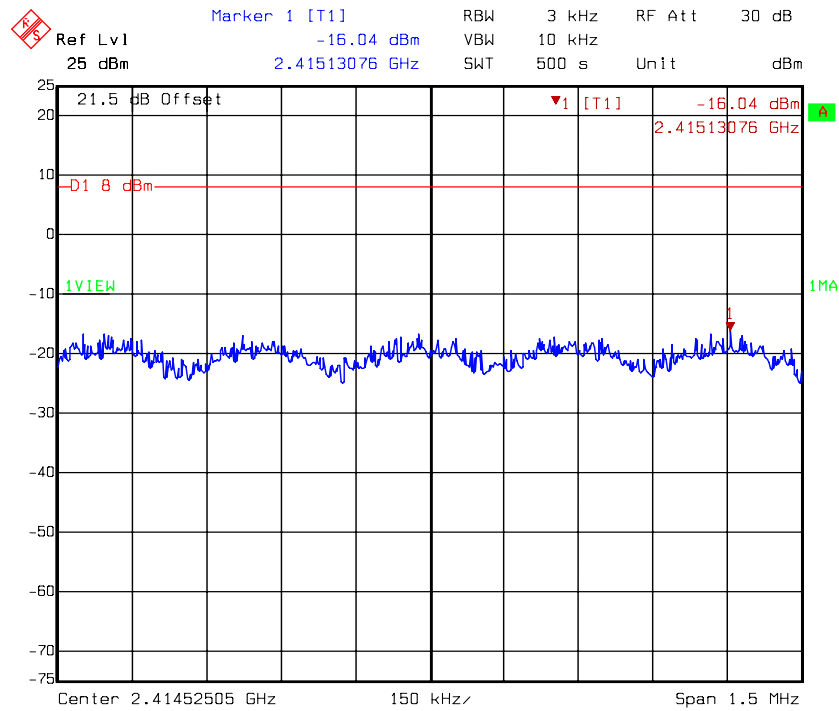
Title: Power density  
 Comment A: CH 6 at 802.11g mode chainA  
 Date: 24.OCT.2008 15:54:45

### Chain A: Power Spectral Density @ 802.11g mode channel 11



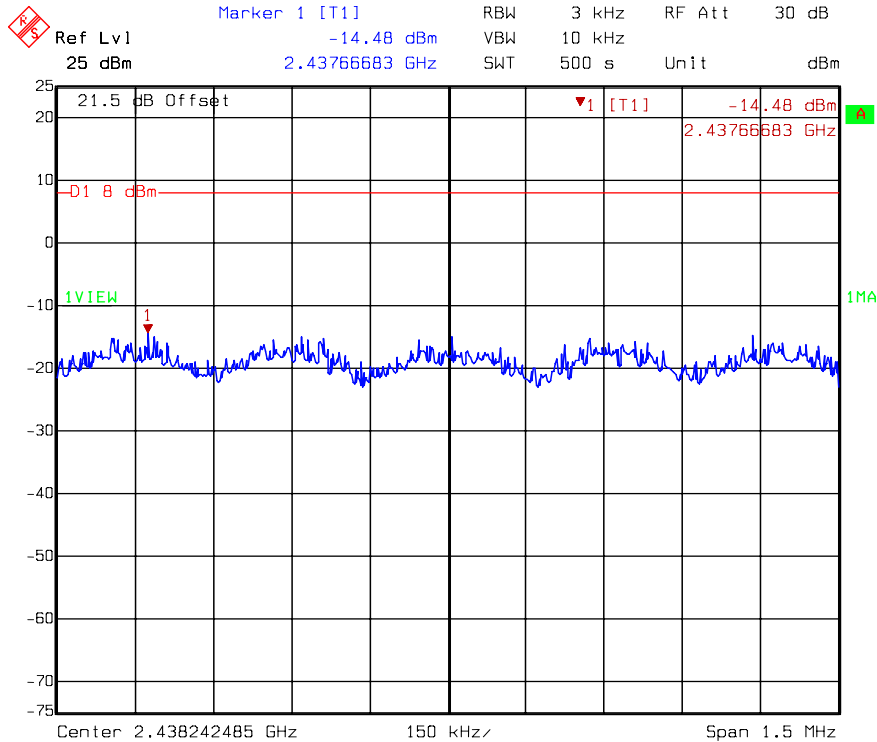
Title: Power density  
 Comment A: CH 11 at 802.11g mode chainA  
 Date: 24.OCT.2008 15:58:19

**Chain A: Power Spectral Density @ 802.11n (HT20) mode channel 1**



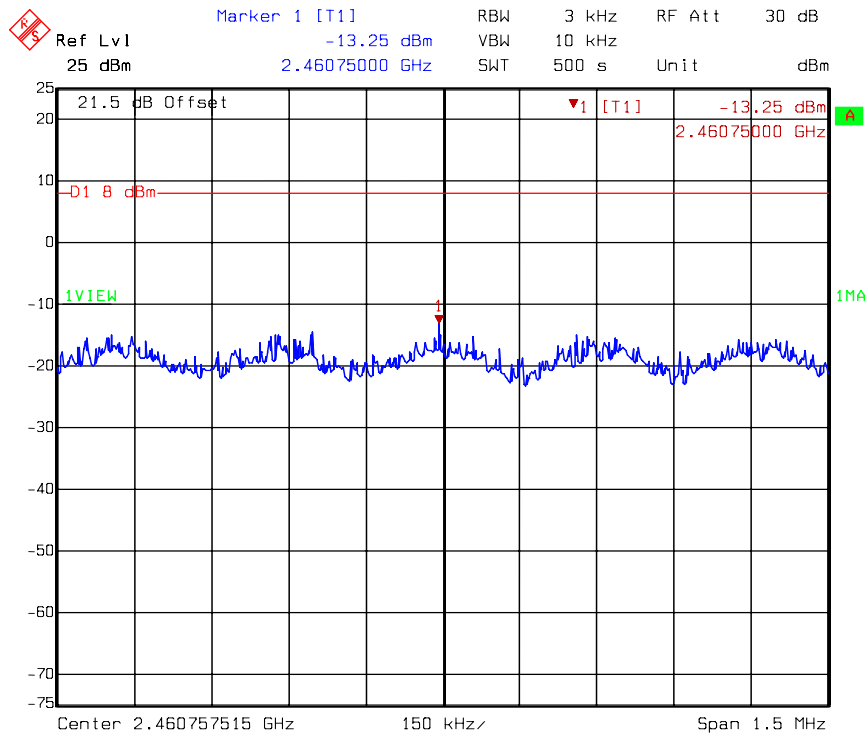
Title: Power density  
Comment A: CH 1 at 802.11n 20MHz mode chainA  
Date: 24.OCT.2008 16:02:32

**Chain A: Power Spectral Density @ 802.11n (HT20) mode channel 6**



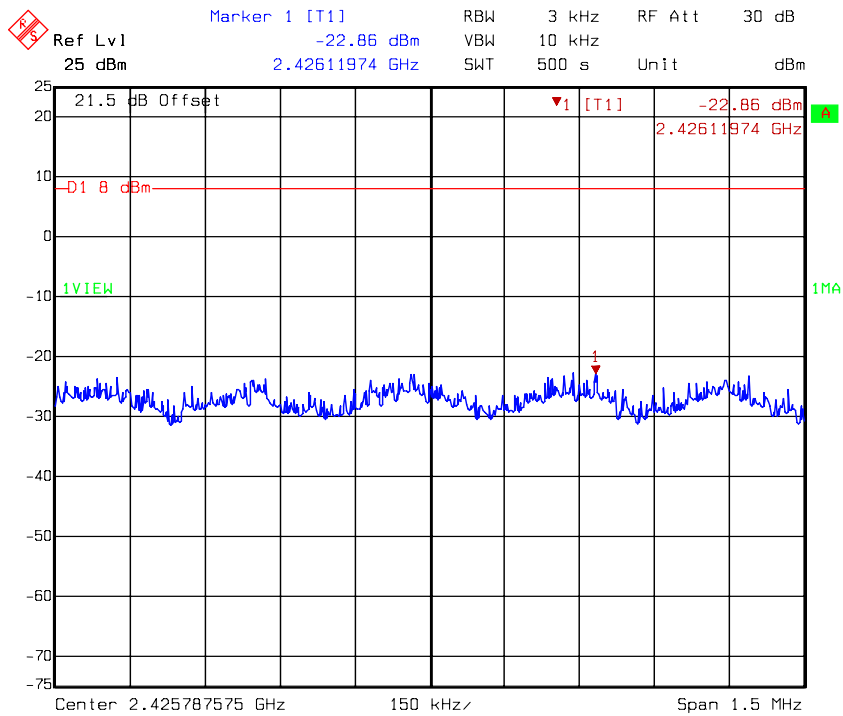
Title: Power density  
Comment A: CH 6 at 802.11n 20MHz mode chainA  
Date: 24.OCT.2008 16:05:24

### Chain A: Power Spectral Density @ 802.11n (HT20) mode channel 11



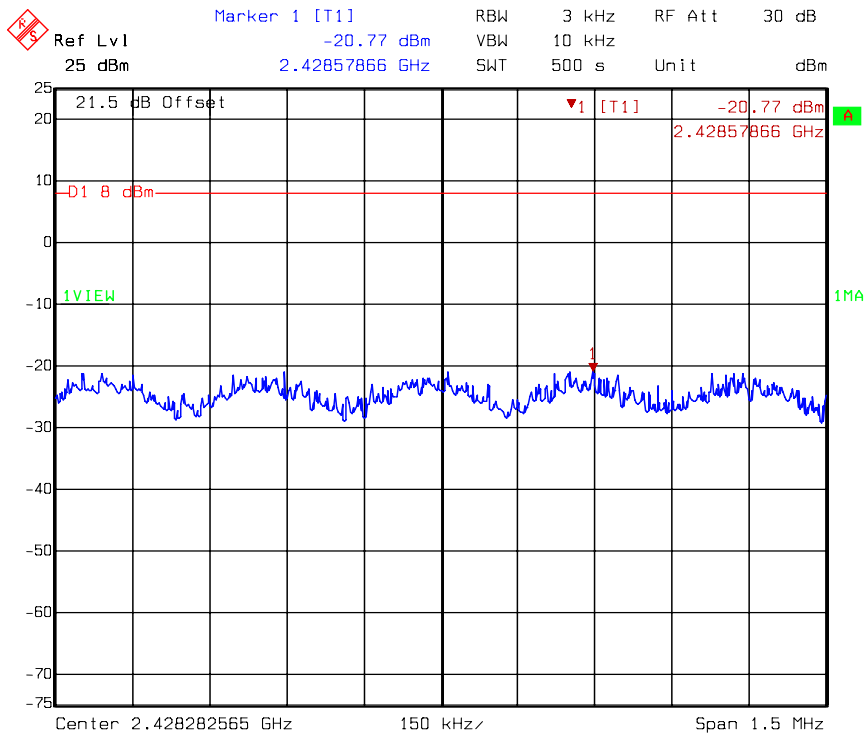
Title: Power density  
Comment A: CH 11 at 802.11n 20MHz mode chainA  
Date: 24.OCT.2008 16:10:45

### Chain A: Power Spectral Density @ 802.11n (HT40) mode channel 3



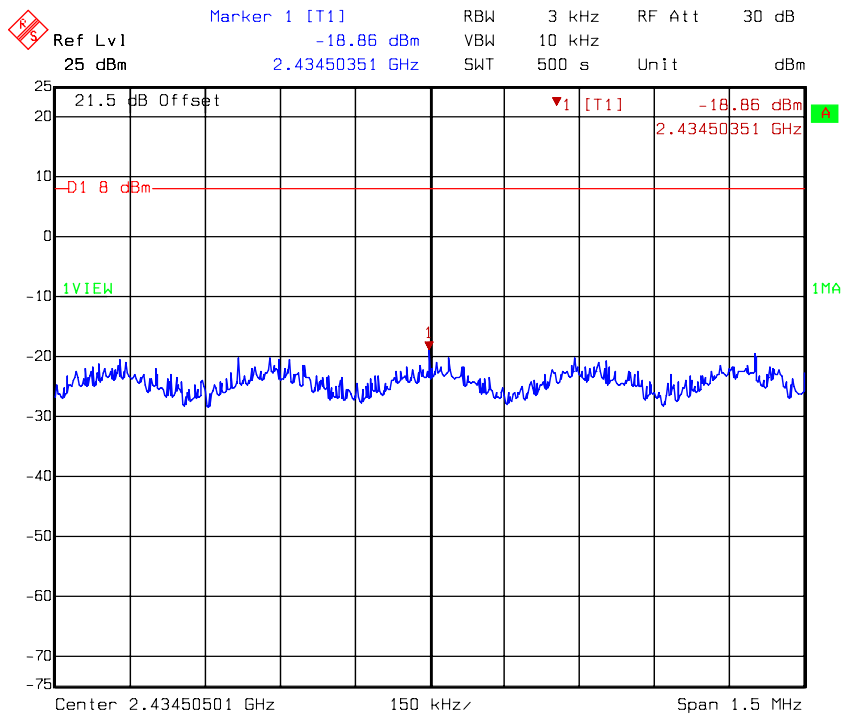
Title: Power density  
Comment A: CH 3 at 802.11n 40MHz mode chainA  
Date: 24.OCT.2008 16:17:00

### Chain A: Power Spectral Density @ 802.11n (HT40) mode channel 6



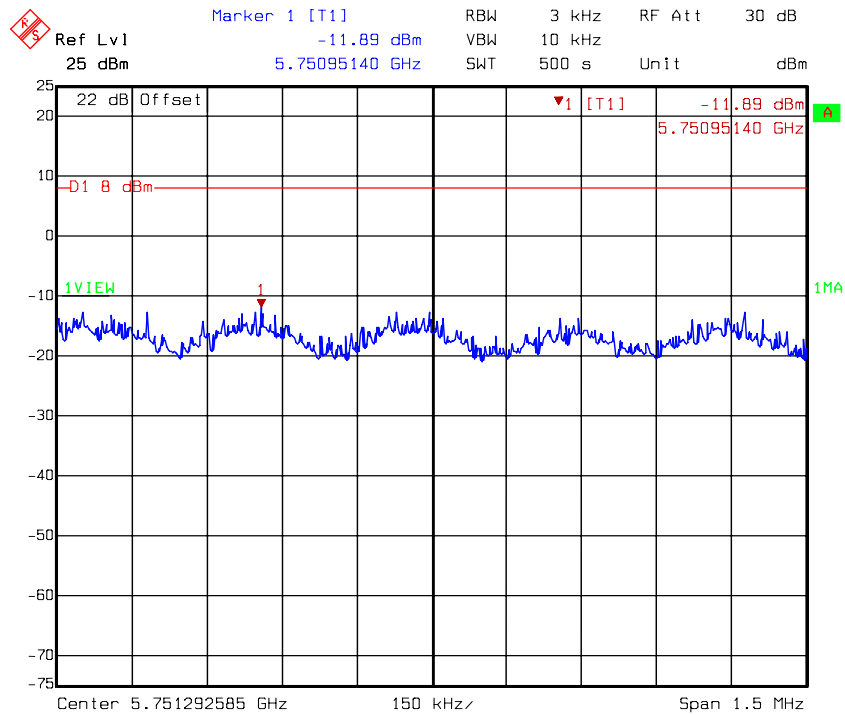
Title: Power density  
Comment A: CH 6 at 802.11n 40MHz mode chainA  
Date: 24.OCT.2008 16:25:32

### Chain A: Power Spectral Density @ 802.11n (HT40) mode channel 9



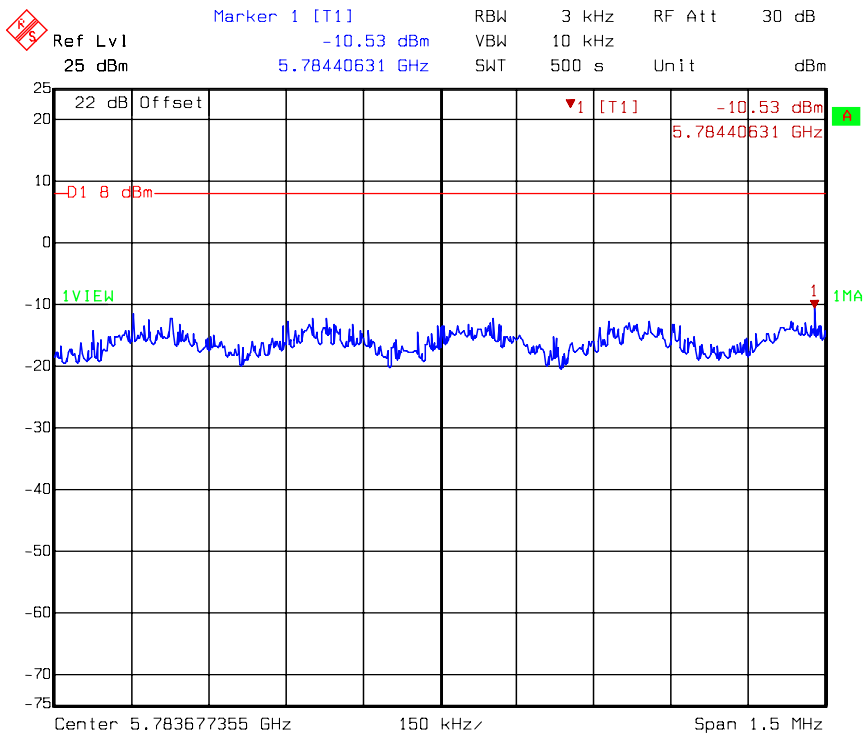
Title: Power density  
Comment A: CH 9 at 802.11n 40MHz mode chainA  
Date: 24.OCT.2008 16:28:21

### Chain A: Power Spectral Density @ 802.11a mode channel 149



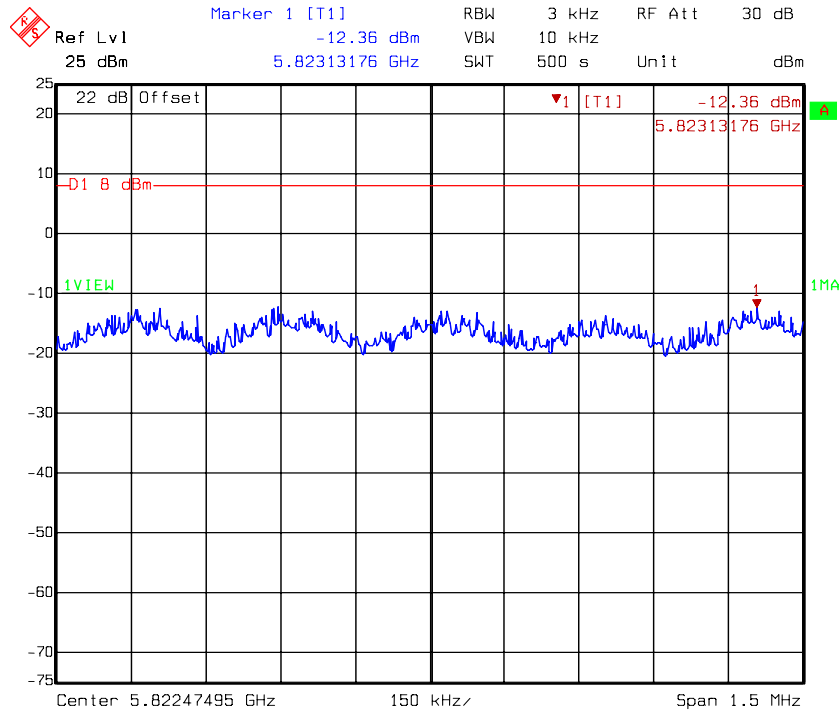
Title: Power density  
Comment A: CH 149 at 802.11a mode chainA  
Date: 27.OCT.2008 11:52:57

### Chain A: Power Spectral Density @ 802.11a mode channel 157



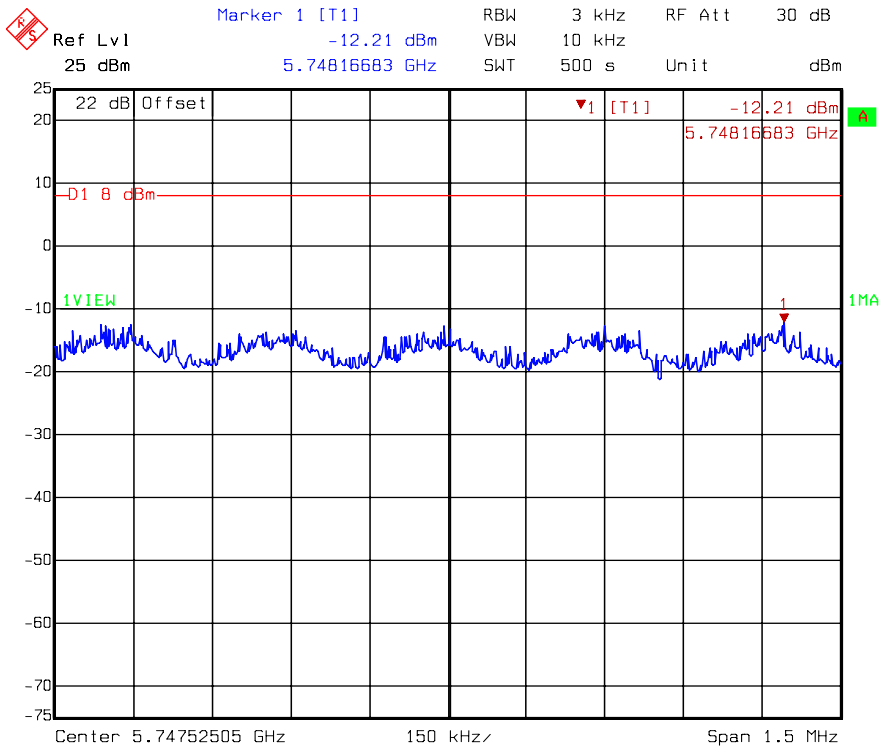
Title: Power density  
Comment A: CH 157 at 802.11a mode chainA  
Date: 27.OCT.2008 11:56:38

### Chain A: Power Spectral Density @ 802.11a mode channel 165



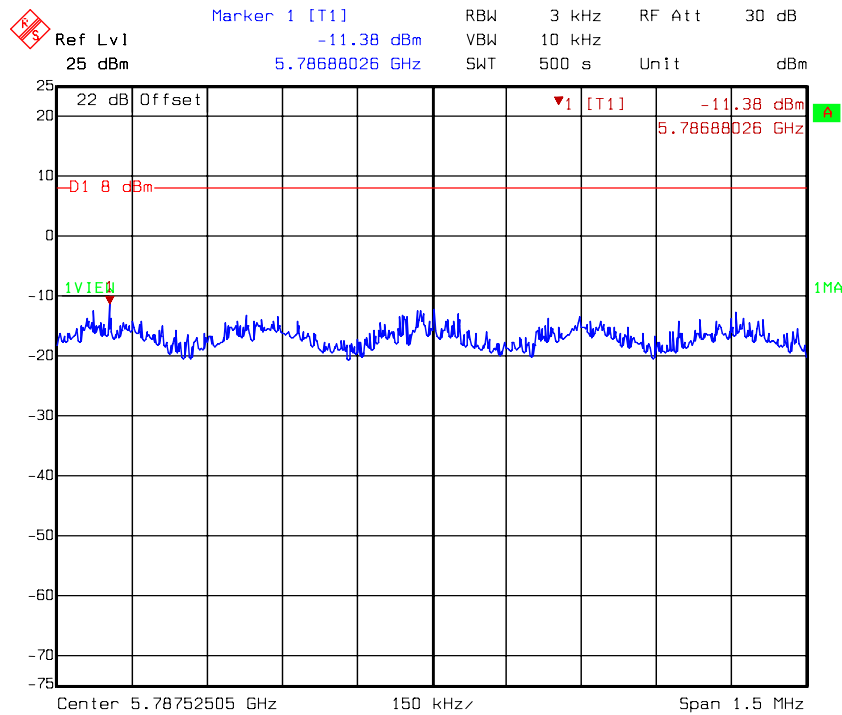
Title: Power density  
Comment A: CH 165 at 802.11a mode chainA  
Date: 27.OCT.2008 12:06:44

### Chain A: Power Spectral Density @ 802.11n (HT20) mode channel 149



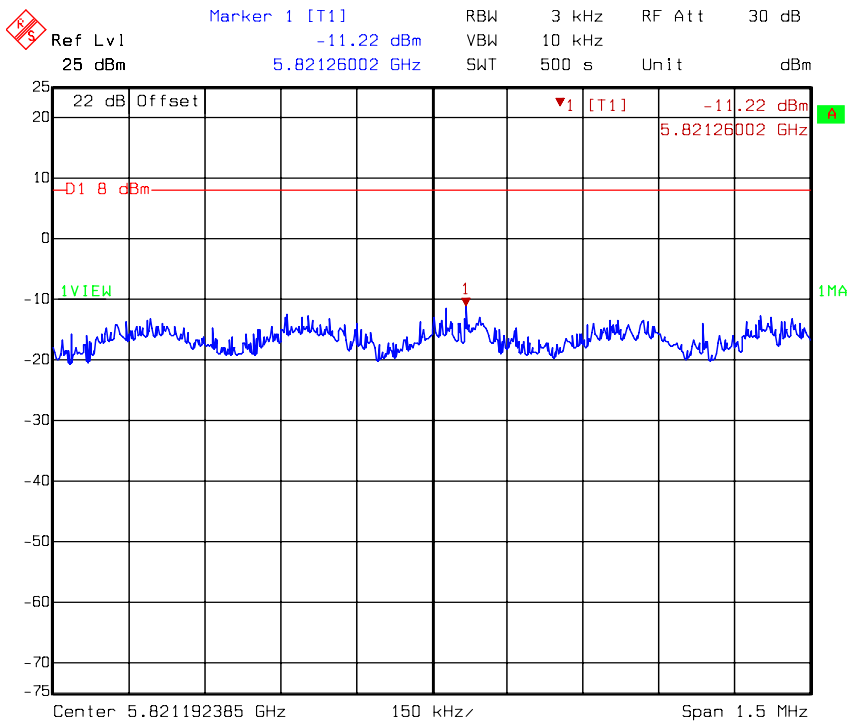
Title: Power density  
Comment A: CH 149 at 802.11n 20MHz mode chainA  
Date: 27.OCT.2008 14:07:49

### Chain A: Power Spectral Density @ 802.11n (HT20) mode channel 157



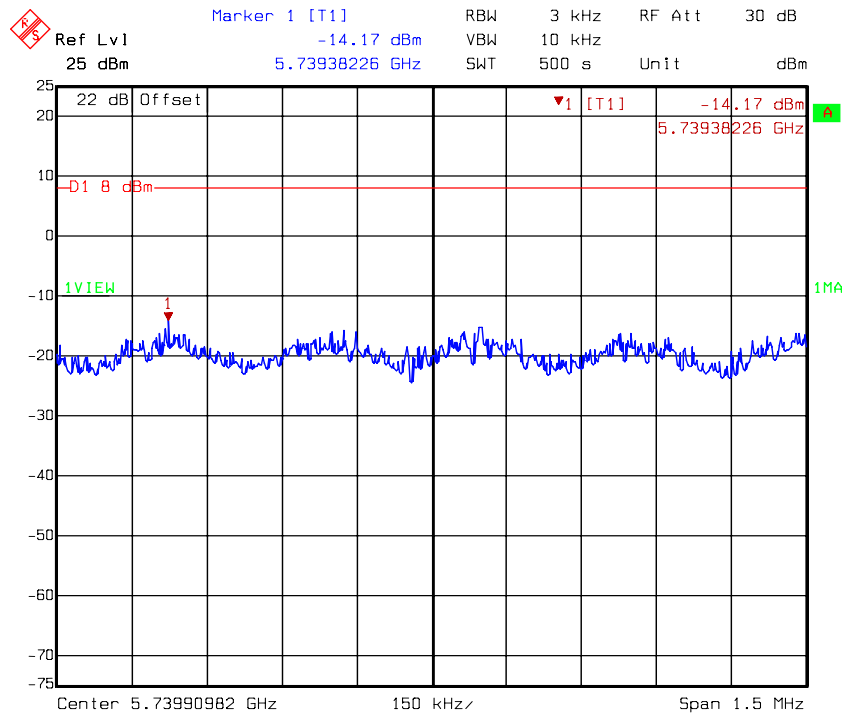
Title: Power density  
 Comment A: CH 157 at 802.11n 20MHz mode chainA  
 Date: 27.OCT.2008 14:13:05

### Chain A: Power Spectral Density @ 802.11n (HT20) mode channel 165



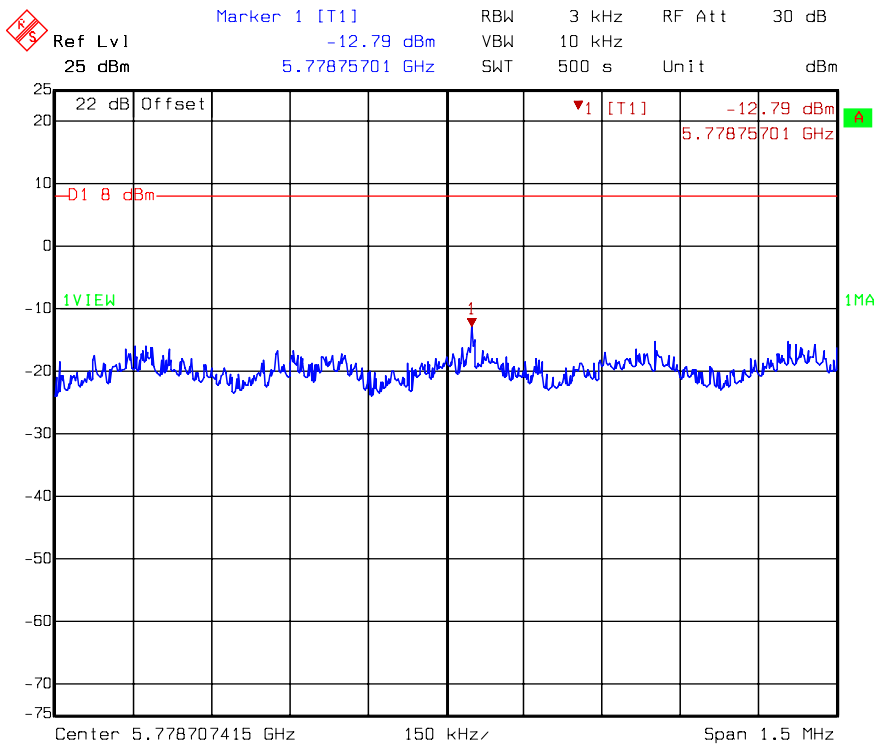
Title: Power density  
 Comment A: CH 165 at 802.11n 20MHz mode chainA  
 Date: 27.OCT.2008 14:16:48

### Chain A: Power Spectral Density @ 802.11n (HT40) mode channel 151



Title: Power density  
Comment A: CH 151 at 802.11n 40MHz mode chainA  
Date: 27.OCT.2008 14:21:32

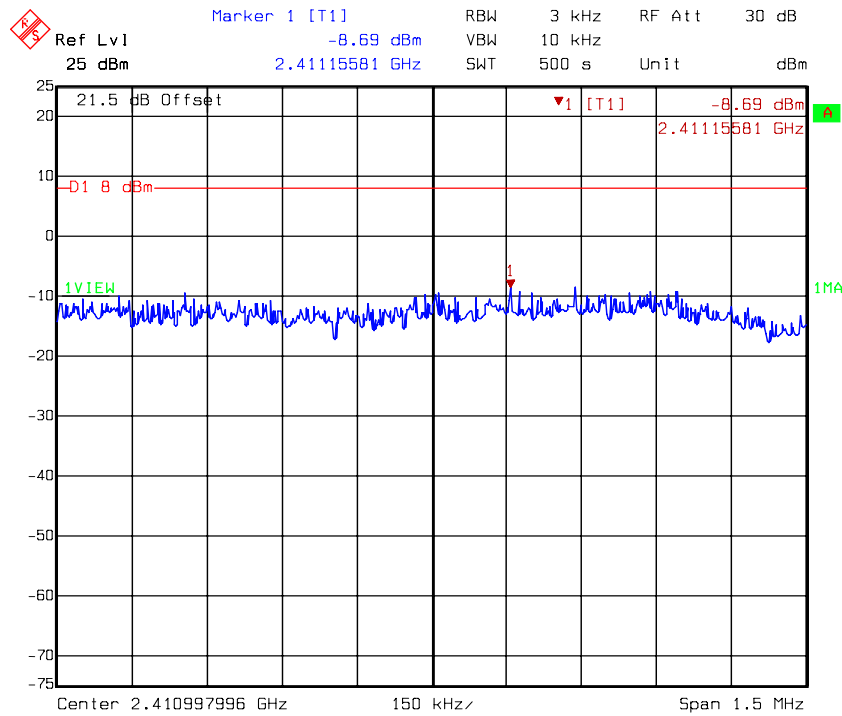
### Chain A: Power Spectral Density @ 802.11n (HT40) mode channel 159



Title: Power density  
Comment A: CH 159 at 802.11n 40MHz mode chainA  
Date: 27.OCT.2008 14:24:53

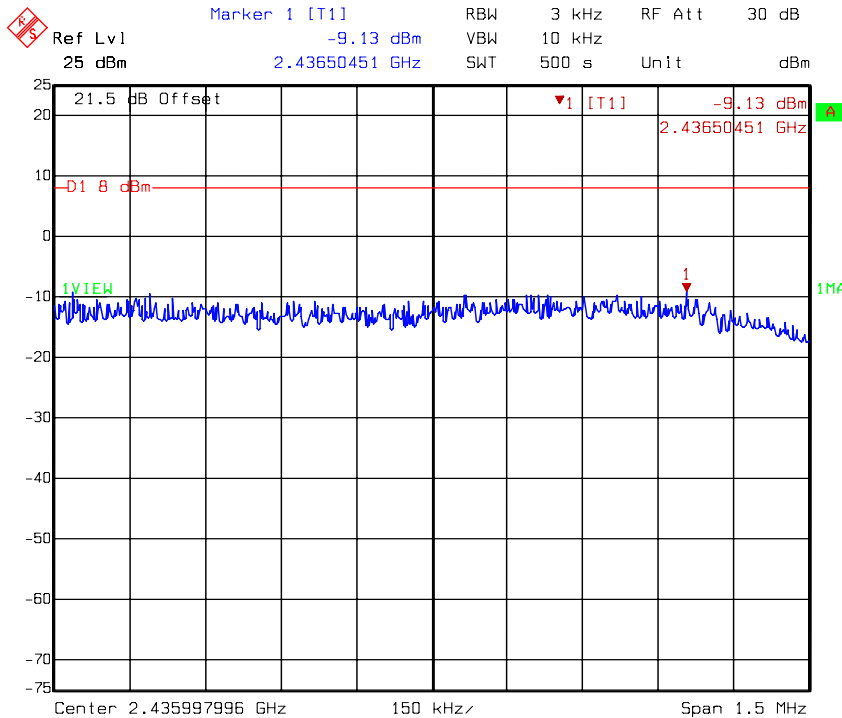


### Chain B: Power Spectral Density @ 802.11b mode channel 1



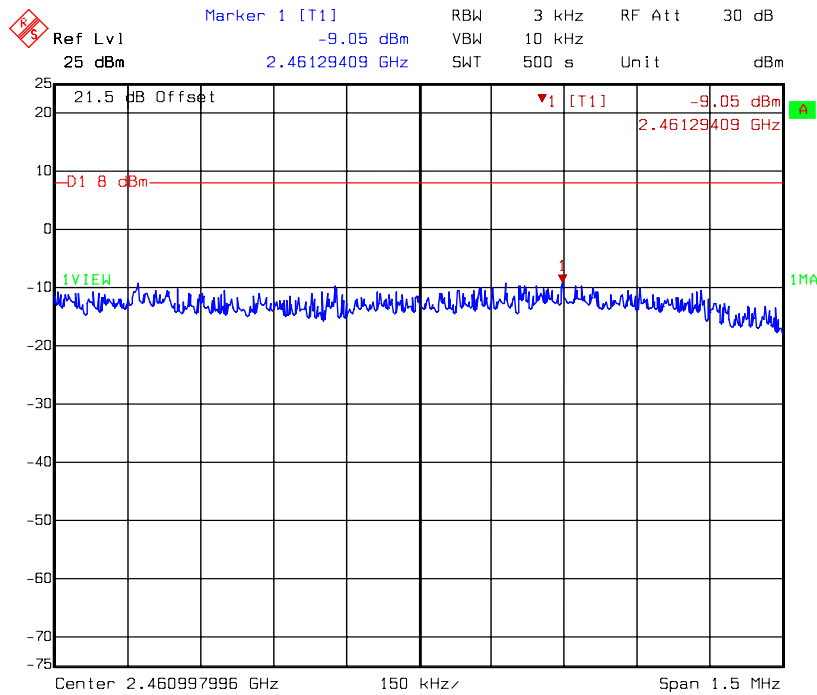
Title: Power density  
Comment A: CH 1 at 802.11b mode chainB  
Date: 27.OCT.2008 14:56:08

### Chain B: Power Spectral Density @ 802.11b mode channel 6



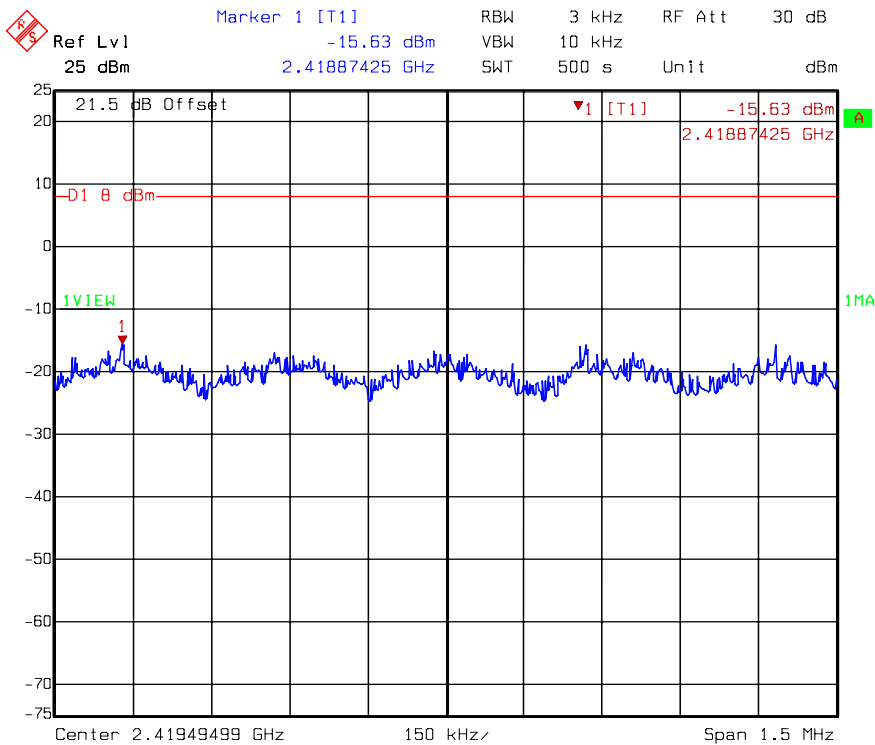
Title: Power density  
Comment A: CH 6 at 802.11b mode chainB  
Date: 27.OCT.2008 14:59:18

**Chain B: Power Spectral Density @ 802.11b mode channel 11**



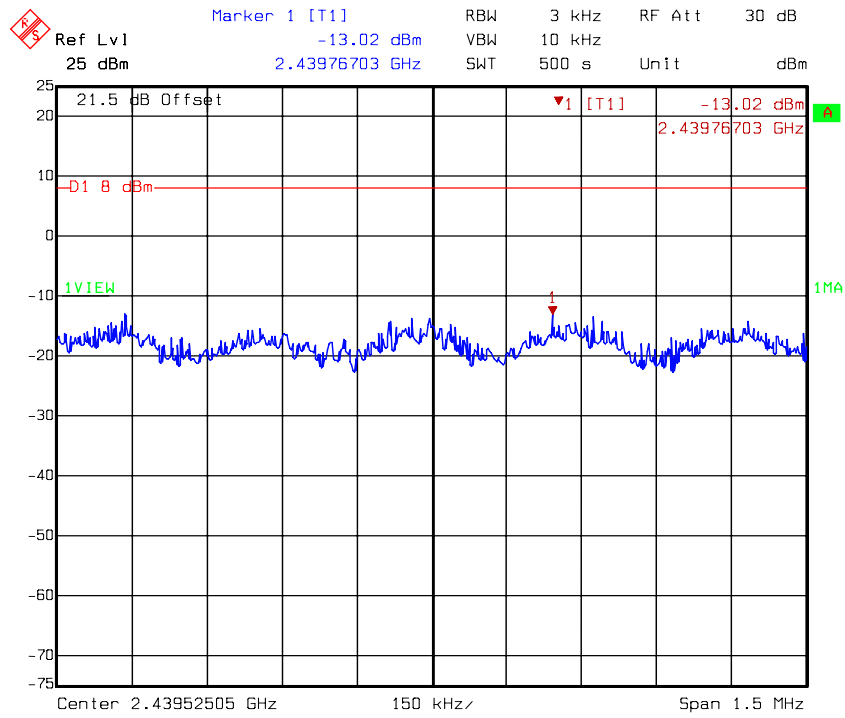
Title: Power density  
Comment A: CH 11 at 802.11b mode chainB  
Date: 27.OCT.2008 15:02:12

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



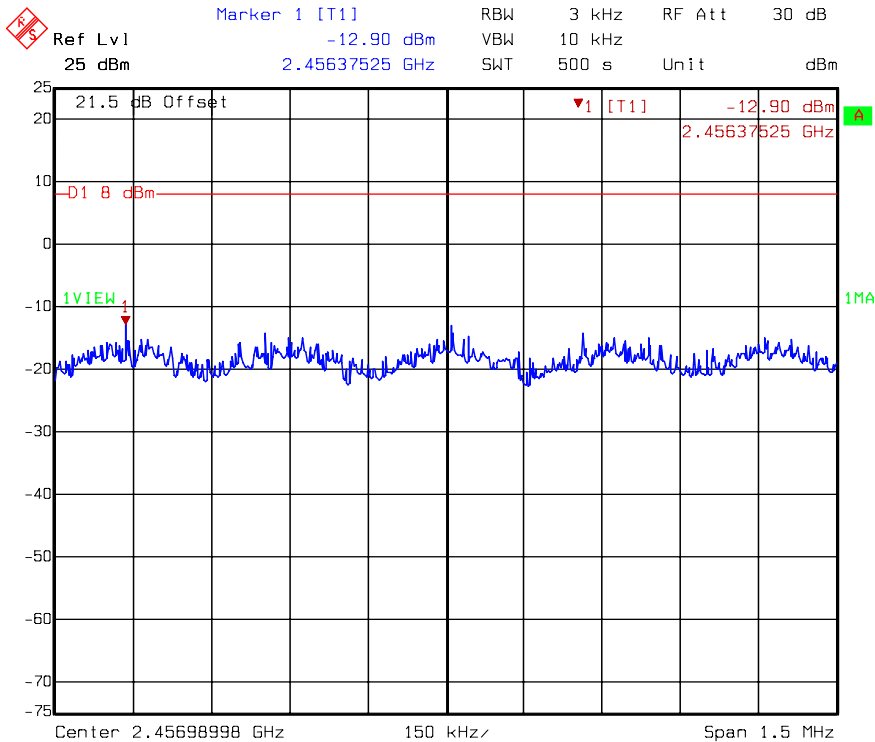
Title: Power density  
Comment A: CH 1 at 802.11g mode chainB  
Date: 27.OCT.2008 16:22:19

### Chain B: Power Spectral Density @ 802.11g mode channel 6



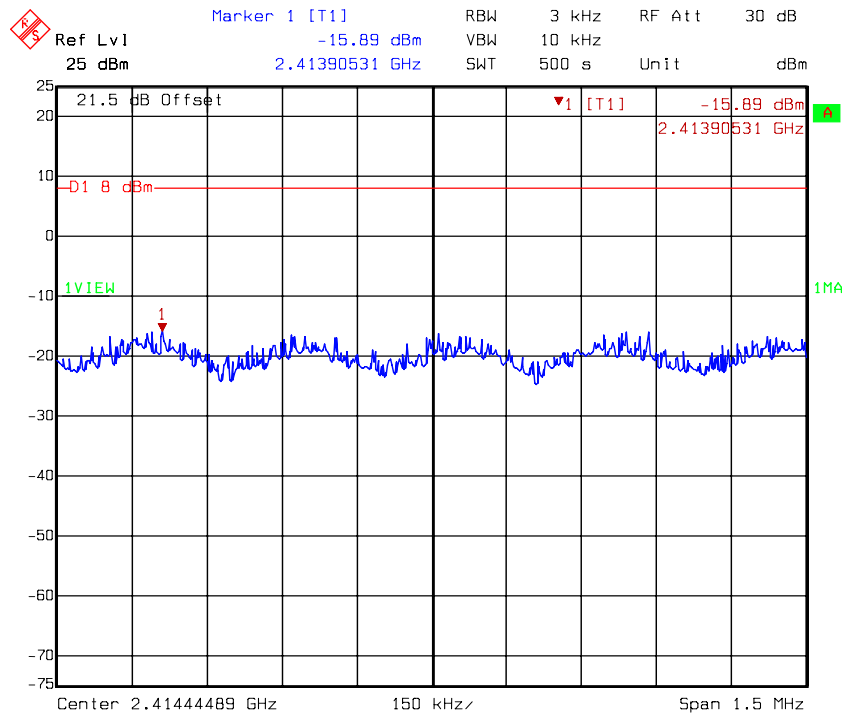
Title: Power density  
Comment A: CH 6 at 802.11g mode chainB  
Date: 27.OCT.2008 16:25:08

### Chain B: Power Spectral Density @ 802.11g mode channel 11



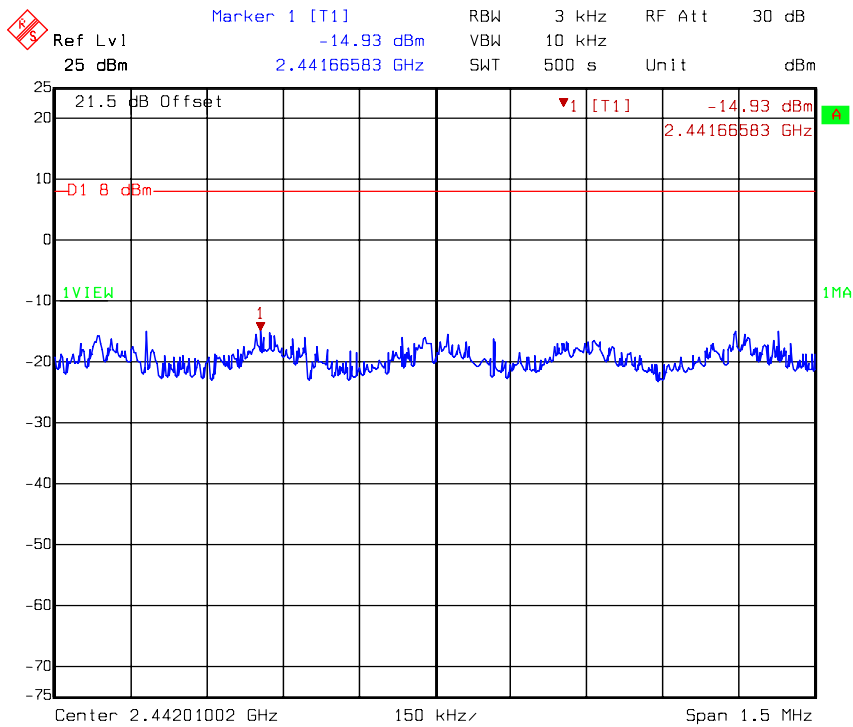
Title: Power density  
Comment A: CH 11 at 802.11g mode chainB  
Date: 27.OCT.2008 16:28:07

**Chain B: Power Spectral Density @ 802.11n (HT20) mode channel 1**



Title: Power density  
Comment A: CH 1 at 802.11n 20MHz mode chainB  
Date: 27.OCT.2008 16:31:35

**Chain B: Power Spectral Density @ 802.11n (HT20) mode channel 6**



Title: Power density  
Comment A: CH 6 at 802.11n 20MHz mode chainB  
Date: 27.OCT.2008 16:34:19