

# EMC

## TEST REPORT

**Report No.** : 150500230TWN-001  
**Model No.** : WiFiHU2s-a, WiFiHU2s-c  
**Issued Date** : Jun. 02, 2015

**Applicant:** Radicom Research Inc.  
2148 Bering Dr., San Jose, CA. 95131, USA

**Test Method/ Standard:** 47 CFR FCC Part 15.247 & ANSI C63.4 2009  
KDB 558074 D01 v03r03

**Test Site:** 93910


**Test By:** Intertek Testing Services Taiwan Ltd.  
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## 1. Summary of Test Data

Test Requirement	Applicable Rule (Section 15.247)	Result
Minimum 6 dB Bandwidth	15.247(a)(2)	Pass
Maximum Peak Conducted Output Power	15.247(b)(3)	Pass
Power Spectral Density	15.247(e)	Pass
Emissions In Non-Restricted Frequency Bands	15.247(d)	Pass
Emissions In Restricted Frequency Bands (Radiated emission measurements)	15.247(d), 15.205, 15.209	Pass
Emission On The Band Edge	15.247(d), 15.205	Pass
AC Power Line Conducted Emission	15.207	Pass
Antenna Requirement	15.203	Pass

## 2. General Information

### 2.1 Identification of the EUT

Product:	USB WiFi Module
Model No:	WiFiHU2s-a, WiFiHU2s-c
FCC ID:	K7T-WIFIHU2S
Operating Frequency:	2412 MHz ~ 2462 MHz for 802.11b, 802.11g, 802.11n (HT20) 2422 MHz ~ 2452 MHz for 802.11n (HT40)
Channel Number:	11 channels for 2412 MHz ~ 2462 MHz 9 channels for 2422 MHz ~ 2452 MHz
Frequency of Each Channel:	2407+5 k MHz, k=1~11 for 802.11b, 802.11g, 802.11n HT20 2407+5 k MHz, k=3~9 for 802.11n (HT40)
Access scheme:	DSSS, OFDM
Rated Power:	DC 5V from Notebook
Power Cord:	N/A
Sample Received:	May 15, 2015
Sample condition:	Workable
Test Date(s):	May 27, 2015 ~ Jun. 01, 2015
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Note 2:	When determining the test conclusion, the Measurement Uncertainty of test has been considered.

## 2.2 Description of EUT

Modulation mode	Transmit path	
	Chain 0 / Main	Chain 1 / AUX
802.11b	V	X
802.11g	V	V
802.11 n (HT20)	V	V
802.11 n (HT40)	V	V

Product SW/HW version :	SW: V010 / HW: RA6/RA7
Radio SW/HW version :	SW: V010 / HW: RA6/RA7
Test SW Version :	V010_RTL11n_SingleChip_9xC_USB_v010_20100428

The differences of WiFiHU2s-a and WiFiHU2s-c (EUT) are listed as below.

Model Number	Product Description
WiFiHU2s-a	Modules (with on- board antenna) SMD type, half-hole pad to solder to base board
WiFiHU2s-c	Modules (with two antenna connectors) SMD type, half-hole pad to solder to base board

### 2.3 Antenna description

For WiFiHU2s-a:

The EUT uses a permanently connected antenna.

- Antenna Gain : 0 dBi
- Antenna Type : Chip antenna
- Connector Type : Fixed

For WiFiHU2s-c:

The antenna is affixed to the EUT using a unique connector, which allows for replacement of a broken antenna, but DOES NOT use a standard antenna jack or electrical connector.

- Antenna Gain : 2 dBi
- Antenna Type : Dipole antenna
- Connector Type : I-PEX

### 2.4 Peripherals equipment

Peripherals	Brand	Model No.	Serial No.	Data cable
Notebook PC	DELL	Latitude D610	4YWZK1S	USB 0.5 meter × 1

## 2.5 Operation mode

The EUT was supplied with DC 5V from Notebook PC.

TX-MODE was based on a specific test program “MP819xVC.exe program”, and the program could select different frequency and modulation.

With individual verifying, the maximum output power were found out 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 recorded in this report individually.

The final tests were executed under these conditions recorded in this report individually.

For WiFiHU2s-a:

802.11b ch6 chain0		802.11g ch6 chain0		802.11g ch6 chain1	
Data rate (Mbps)	AV (dBm)	Data rate (Mbps)	AV (dBm)	Data rate (Mbps)	AV (dBm)
1	20.73	6	21.14	6	19.31
2	20.69	9	20.77	9	19.18
5.5	20.55	12	20.64	12	18.95
11	20.47	18	20.51	18	18.82
-	-	24	20.42	24	18.77
-	-	36	20.35	36	18.69
-	-	48	20.19	48	18.51
-	-	54	20.02	54	18.43



For WiFiHU2s-a:

802.11n HT20 ch6 chain0		802.11n HT20 ch6 chain1		802.11n HT20 ch6 chain1+chain0	
Data rate (Mbps)	AV (dBm)	Data rate (Mbps)	AV (dBm)	Data rate (Mbps)	AV (dBm)
MCS0	17.44	MCS0	16.55	MCS0	20.02
MCS1	17.33	MCS1	16.41	MCS1	19.91
MCS2	17.25	MCS2	16.29	MCS2	19.77
MCS3	17.11	MCS3	16.16	MCS3	19.64
MCS4	16.98	MCS4	16.03	MCS4	19.53
MCS5	16.84	MCS5	15.94	MCS5	19.48
MCS6	16.71	MCS6	15.8	MCS6	19.32
MCS7	16.59	MCS7	15.67	MCS7	19.21
802.11n HT40 ch6 chain0		802.11n HT40 ch6 chain1		802.11n HT40 ch6 chain1+chain0	
Data rate	AV (dBm)	Data rate (Mbps)	AV (dBm)	Data rate (Mbps)	AV (dBm)
MCS0	16.2	MCS0	15.34	MCS0	18.8
MCS1	16.13	MCS1	15.21	MCS1	18.71
MCS2	16.05	MCS2	15.14	MCS2	18.58
MCS3	15.91	MCS3	15.01	MCS3	18.46
MCS4	15.83	MCS4	14.92	MCS4	18.31
MCS5	15.71	MCS5	14.79	MCS5	18.19
MCS6	15.59	MCS6	14.71	MCS6	18.12
MCS7	15.5	MCS7	14.58	MCS7	18.03

Note: The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

For WiFiHU2s-c:

802.11b ch6 chain0		802.11g ch6 chain0		802.11g ch6 chain1	
Data rate (Mbps)	AV (dBm)	Data rate (Mbps)	AV (dBm)	Data rate (Mbps)	AV (dBm)
1	15.88	6	15.36	6	14.18
2	15.73	9	15.25	9	14.04
5.5	15.61	12	15.12	12	13.91
11	15.48	18	14.96	18	13.79
-	-	24	14.88	24	13.67
-	-	36	14.74	36	13.55
-	-	48	14.71	48	13.41
-	-	54	14.58	54	13.29
802.11n HT20 ch6 chain0		802.11n HT20 ch6 chain1		802.11n HT20 ch6 chain1+chain0	
Data rate (Mbps)	AV (dBm)	Data rate (Mbps)	AV (dBm)	Data rate (Mbps)	AV (dBm)
MCS0	13.63	MCS0	12.52	MCS0	16.12
MCS1	13.51	MCS1	12.41	MCS1	15.98
MCS2	13.38	MCS2	12.28	MCS2	15.85
MCS3	13.27	MCS3	12.15	MCS3	15.74
MCS4	13.14	MCS4	12.03	MCS4	15.61
MCS5	13	MCS5	11.9	MCS5	15.5
MCS6	12.87	MCS6	11.79	MCS6	15.39
MCS7	12.73	MCS7	11.84	MCS7	15.26
802.11n HT40 ch6 chain0		802.11n HT40 ch6 chain1		802.11n HT40 ch6 chain1+chain0	
Data rate	AV (dBm)	Data rate (Mbps)	AV (dBm)	Data rate (Mbps)	AV (dBm)
MCS0	13.29	MCS0	12.01	MCS0	15.71
MCS1	13.15	MCS1	11.92	MCS1	15.59
MCS2	13.04	MCS2	11.79	MCS2	15.44
MCS3	12.91	MCS3	11.65	MCS3	15.31
MCS4	12.78	MCS4	11.52	MCS4	15.18
MCS5	12.64	MCS5	11.38	MCS5	15.05
MCS6	12.51	MCS6	11.26	MCS6	14.88
MCS7	12.37	MCS7	11.13	MCS7	14.72

Note: The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

## 2.6 Applied test modes and channels

Test items	Mode	Data Rate (Mbps)	Channel	Antenna
Minimum 6 dB Bandwidth	802.11 b	1	1, 6, 11	Chain
	802.11 g	6	1, 6, 11	Chain0/Chain1
	802.11 n (HT20)	6.5	1, 6, 11	Chain0/Chain1
	802.11 n (HT40)	13.5	3, 6, 9	Chain0/Chain1
Maximum peak conducted output power	802.11 b	1	1, 6, 11	Chain0
	802.11 g	6	1, 6, 11	Chain0/Chain1
	802.11 n (HT20)	6.5	1, 6, 11	Chain0+Chain1
	802.11 n (HT40)	13.5	3, 6, 9	Chain0+Chain1
Power Spectral Density	802.11 b	1	1, 6, 11	Chain0
	802.11 g	6	1, 6, 11	Chain0/Chain1
	802.11 n (HT20)	6.5	1, 6, 11	Chain0+Chain1
	802.11 n (HT40)	13.5	3, 6, 9	Chain0+Chain1
RF Antenna Conducted Spurious	802.11 b	1	1, 6, 11	Chain0
	802.11 g	6	1, 6, 11	Chain0/Chain1
	802.11 n (HT20)	6.5	1, 6, 11	Chain0/Chain1
	802.11 n (HT40)	13.5	3, 6, 9	Chain0/Chain1
Radiated spurious Emission 9kHz~1GHz	Normal Link			
Radiated Spurious Emission 10GHz~10th Harmonic	802.11 b	1	1, 6, 11	Chain0
	802.11 g	6	1, 6, 11	Chain0/Chain1
	802.11 n (HT20)	6.5	1, 6, 11	Chain0+Chain1
	802.11 n (HT40)	13.5	3, 6, 9	Chain0+Chain1
Emission on the Band Edge	802.11 b	1	1, 6, 11	Chain0
	802.11 g	6	1, 6, 11	Chain0/Chain1
	802.11 n (HT20)	6.5	1, 6, 11	Chain0+Chain1
	802.11 n (HT40)	13.5	3, 6, 9	Chain0+Chain1
AC Power Line Conducted Emission	Normal Link			

## 2.7 Power setting of test software

Channels & power setting software provided by the client was used to change the operating channels as well as the output power level and is going to be installed in the final end product.

For WiFiHU2s-a:

Mode	Software Version: N/A		
	Channel	Frequency	Power setting
802.11b (chain0)	1	2412	50
	6	2437	50
	11	2462	50
802.11g (chain0)	1	2412	63
	6	2437	63
	11	2462	63
802.11g (chain1)	1	2412	59
	6	2437	59
	11	2462	59
802.11n (HT20) (chain0)	1	2412	55
	6	2437	55
	11	2462	55
802.11n (HT20) (chain1)	1	2412	52
	6	2437	52
	11	2462	52
802.11n (HT40) (chain0)	3	2422	53
	6	2437	53
	9	2452	53
802.11n (HT40) (chain1)	3	2422	50
	6	2437	50
	9	2452	50

For WiFiHU2s-c:

Mode	Software Version: N/A		
	Channel	Frequency	Power setting
802.11b (chain0)	1	2412	38
	6	2437	38
	11	2462	38
802.11g (chain0)	1	2412	47
	6	2437	47
	11	2462	47
802.11g (chain1)	1	2412	44
	6	2437	44
	11	2462	44
802.11n (HT20) (chain0)	1	2412	46
	6	2437	46
	11	2462	46
802.11n (HT20) (chain1)	1	2412	43
	6	2437	43
	11	2462	43
802.11n (HT40) (chain0)	3	2422	46
	6	2437	46
	9	2452	46
802.11n (HT40) (chain1)	3	2422	43
	6	2437	43
	9	2452	43

Note: The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

### 3. Minimum 6 dB Bandwidth

#### 3.1 Operating environment

Temperature:	25	°C
Relative Humidity:	50	%
Atmospheric Pressure	1008	hPa
Requirement & Test method	15.247(a)(2) KDB 558074 D01 v03r03	

#### 3.2 Limit for minimum 6dB bandwidth

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

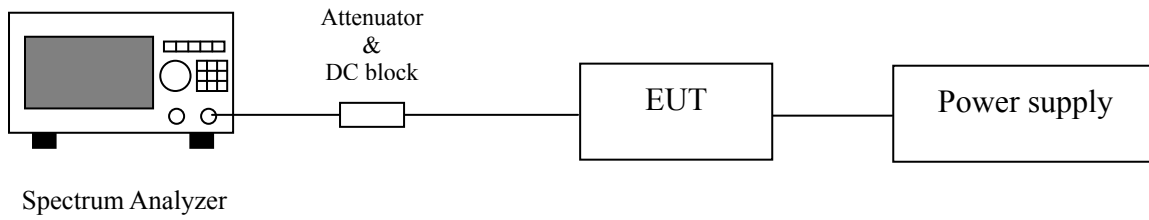
#### 3.3 Measuring instrument setting

Spectrum analyzer settings	
Spectrum Analyzer function	Setting
Detector	Peak
RBW	100kHz
VBW	$\geq 3 \times \text{RBW}$
Sweep	Auto couple
Trace	Allow the trace to stabilize.
Span	Between two times and five times the occupied bandwidth
Attenuation	Auto

#### 3.4 Test procedure

1. The transmitter output was connected to the spectrum analyzer.
2. Test was performed in accordance with clause 8.1 option1 of KDB 558074 D01
3. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

### 3.5 Test diagram



### 3.6 Test results

For WiFiHU2s-a:  
Single TX

Mode	Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Pass/Fail
11b (chain0)	1	2412	9.604	0.5	Pass
	6	2437	10.057	0.5	Pass
	11	2462	10.062	0.5	Pass
11g (chain0)	1	2412	16.463	0.5	Pass
	6	2437	16.362	0.5	Pass
	11	2462	16.426	0.5	Pass
11g (chain1)	1	2412	16.597	0.5	Pass
	6	2437	16.559	0.5	Pass
	11	2462	16.45	0.5	Pass

### 2TX

Mode	Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Limit (MHz)	Pass/Fail
			chain0	chain1		
11n (HT20)	1	2412	17.646	17.601	0.5	Pass
	6	2437	17.715	17.663	0.5	Pass
	11	2462	17.731	17.674	0.5	Pass
11n (HT40)	3	2422	36.321	36.345	0.5	Pass
	6	2437	36.343	36.312	0.5	Pass
	9	2452	36.318	36.356	0.5	Pass

For WiFiHU2s-c:  
Single TX

Mode	Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Pass/Fail
11b (chain0)	1	2412	10.082	0.5	Pass
	6	2437	10.037	0.5	Pass
	11	2462	10.056	0.5	Pass
11g (chain0)	1	2412	16.544	0.5	Pass
	6	2437	16.563	0.5	Pass
	11	2462	16.47	0.5	Pass
11g (chain1)	1	2412	16.53	0.5	Pass
	6	2437	16.56	0.5	Pass
	11	2462	16.498	0.5	Pass

2TX

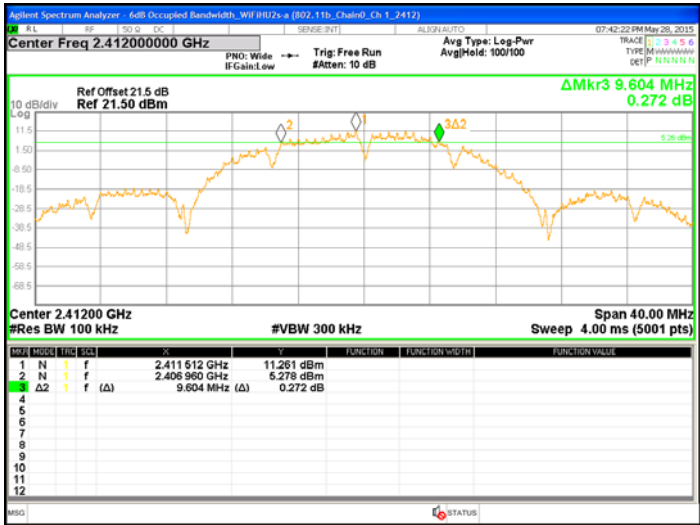
Mode	Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Limit (MHz)	Pass/Fail
			chain0	chain1		
11n (HT20)	1	2412	17.673	17.639	0.5	Pass
	6	2437	17.717	17.643	0.5	Pass
	11	2462	17.701	17.677	0.5	Pass
11n (HT40)	3	2422	36.335	36.335	0.5	Pass
	6	2437	36.351	36.321	0.5	Pass
	9	2452	36.323	36.323	0.5	Pass



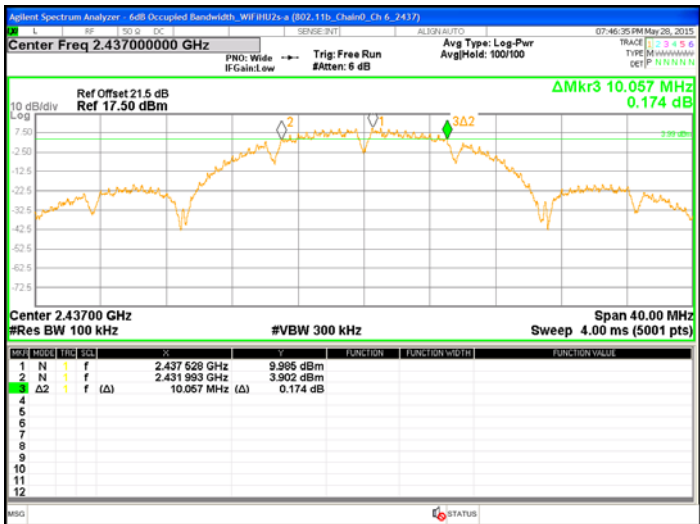


For WiFiHU2s-a:

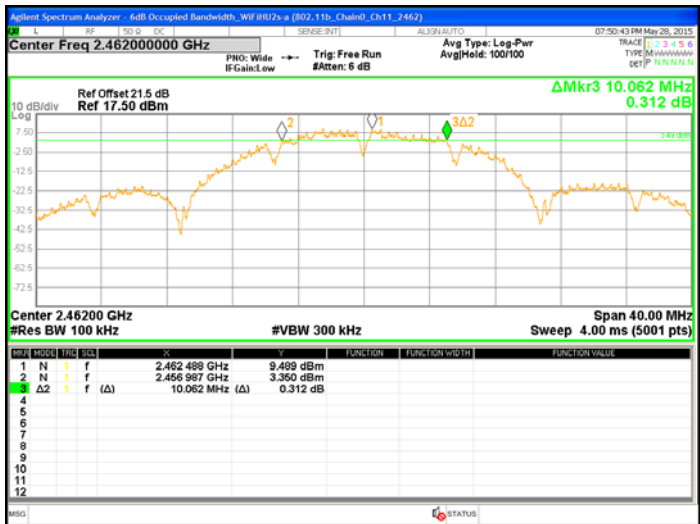
Chain0 : 6dB Bandwidth @ 802.11b mode Ch 1



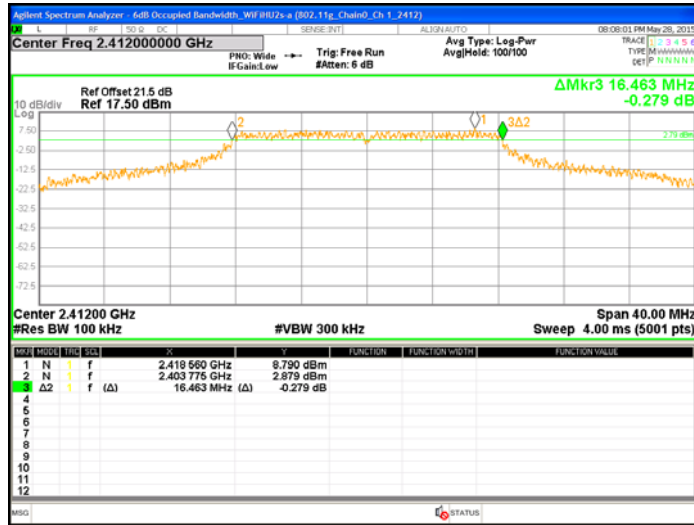
Chain0 : 6dB Bandwidth @ 802.11b mode Ch 6



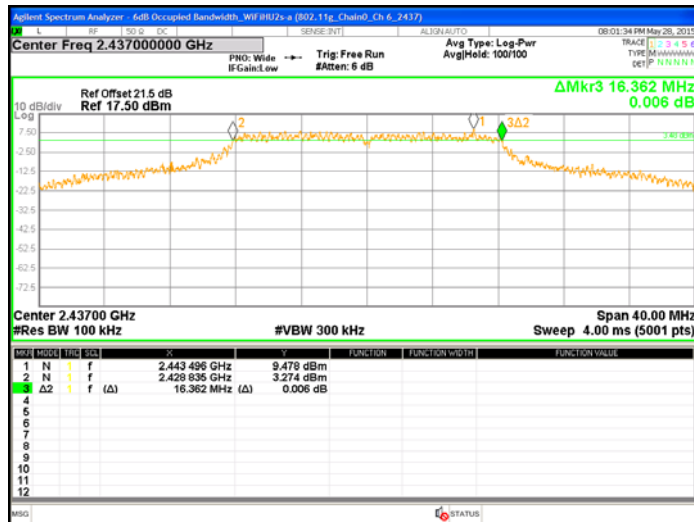
Chain0 : 6dB Bandwidth @ 802.11b mode Ch11



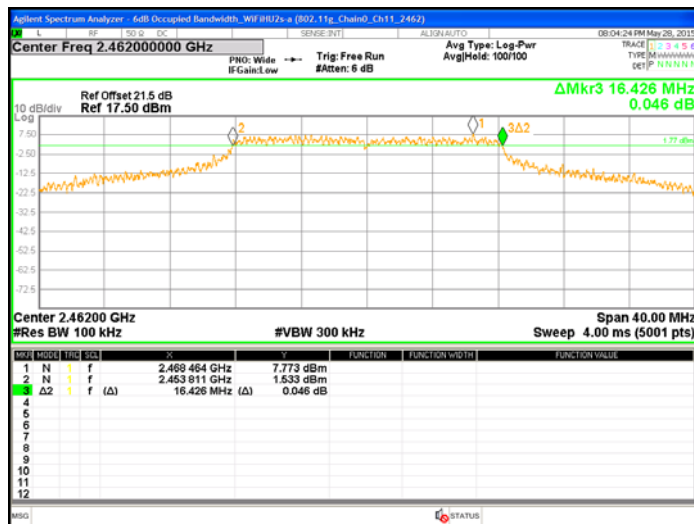
Chain0 : 6dB Bandwidth @ 802.11g mode Ch 1



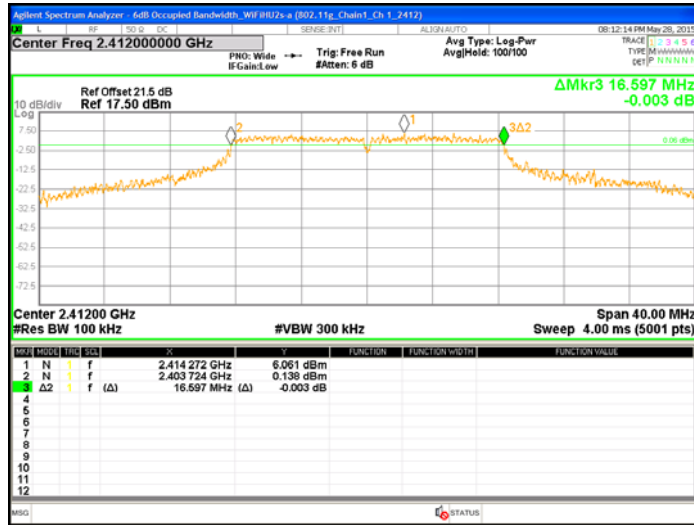
Chain0 : 6dB Bandwidth @ 802.11g mode Ch 6



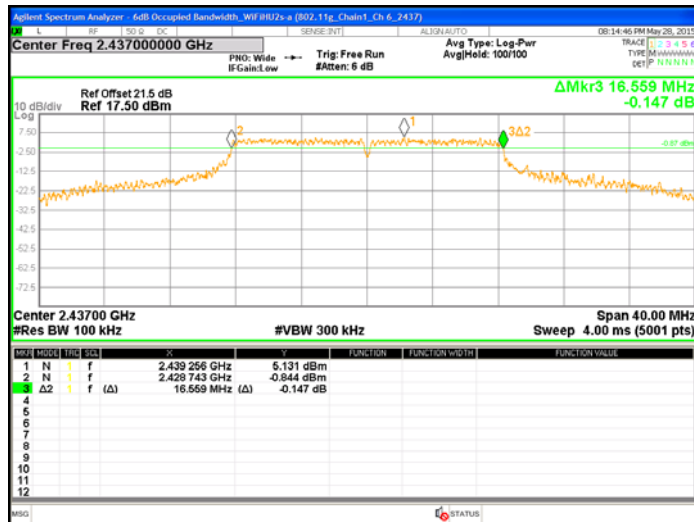
Chain0 : 6dB Bandwidth @ 802.11g mode Ch11



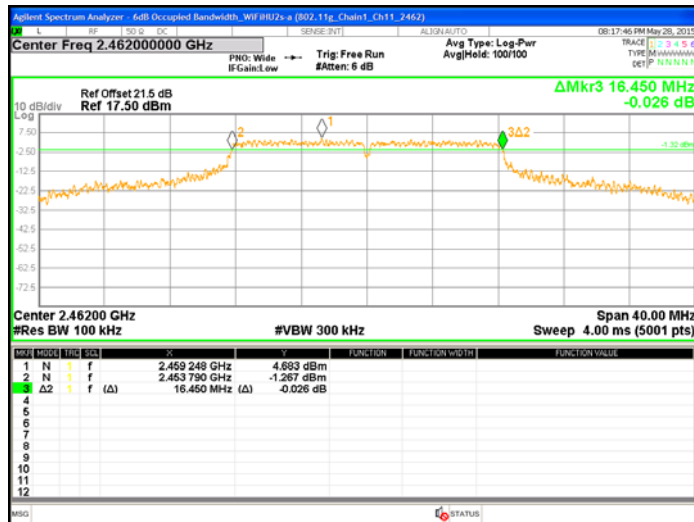
Chain1 : 6dB Bandwidth @ 802.11g mode Ch 1



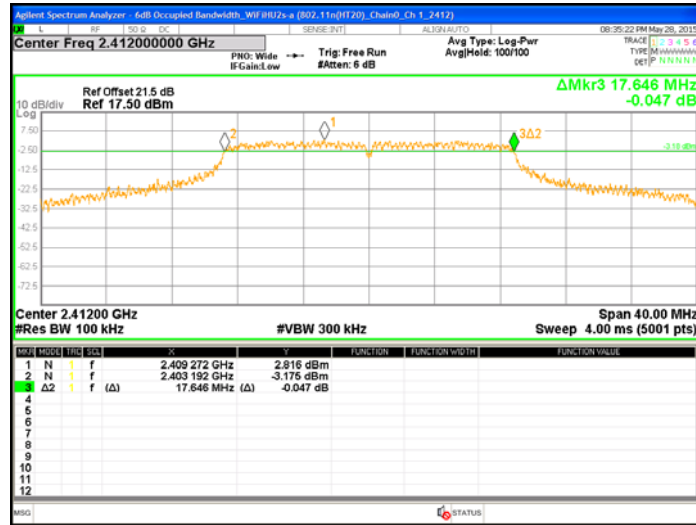
Chain1 : 6dB Bandwidth @ 802.11g mode Ch 6



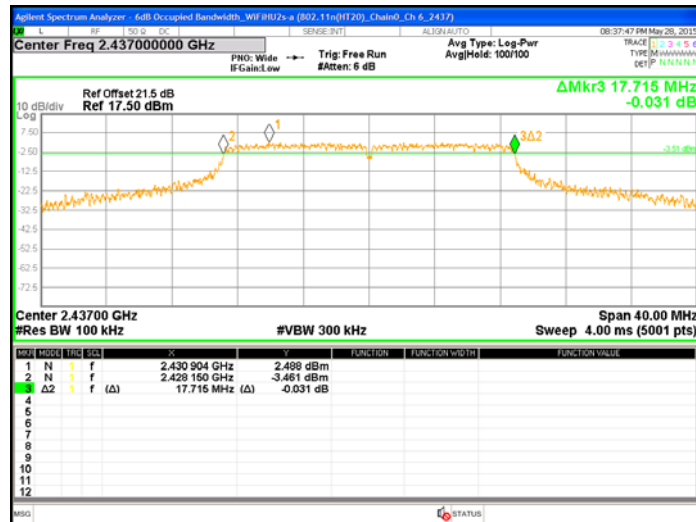
Chain1 : 6dB Bandwidth @ 802.11g mode Ch 11



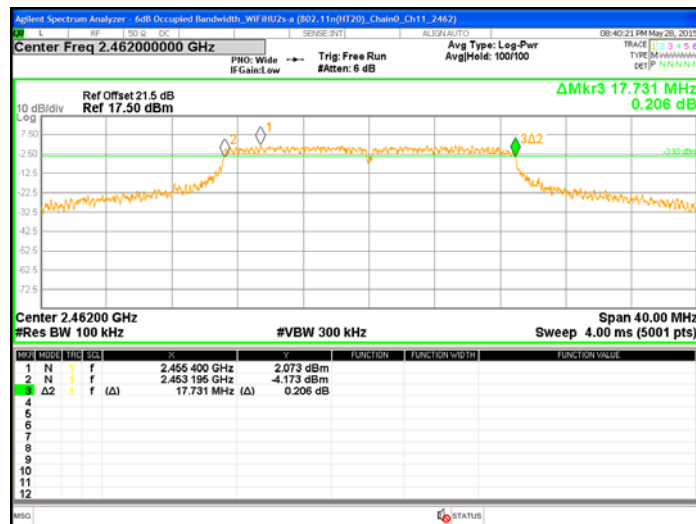
Chain0 : 6dB Bandwidth @ 802.11n(HT20) mode Ch 1



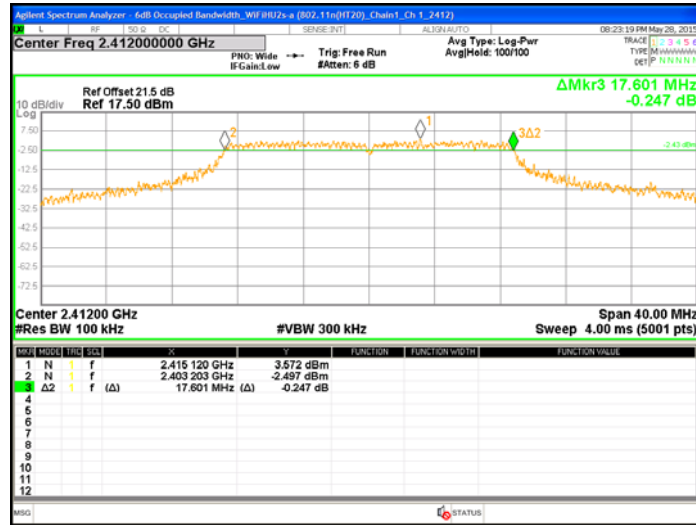
Chain0 : 6dB Bandwidth @ 802.11n(HT20) mode Ch 6



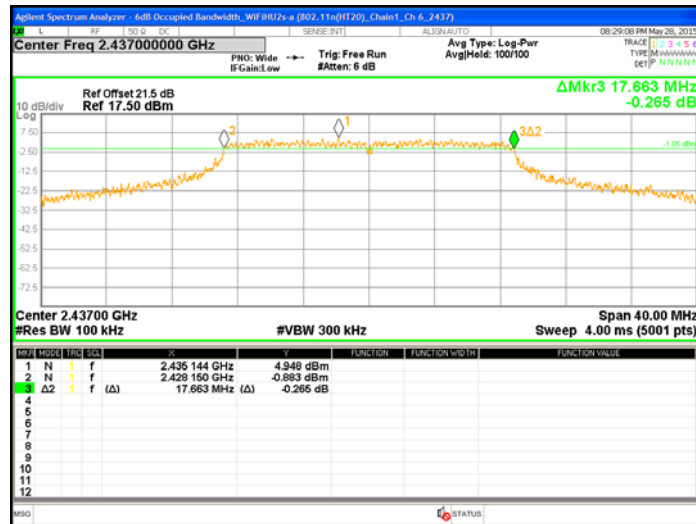
Chain0 : 6dB Bandwidth @ 802.11n(HT20) mode Ch11



Chain1 : 6dB Bandwidth @ 802.11n(HT20) mode Ch 1



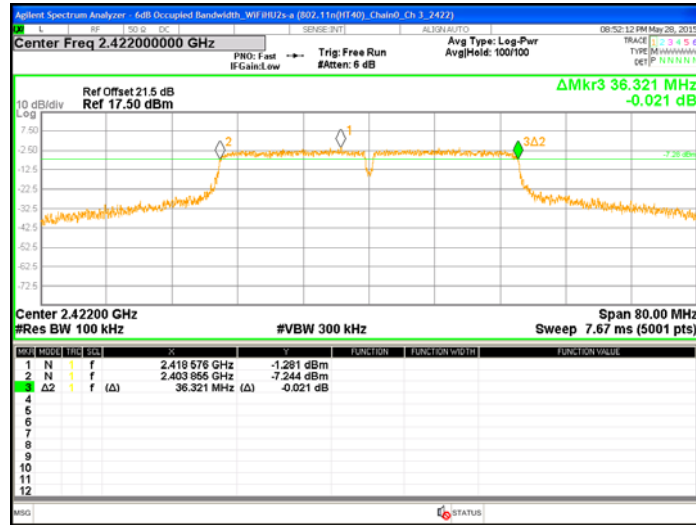
Chain1 : 6dB Bandwidth @ 802.11n(HT20) mode Ch 6



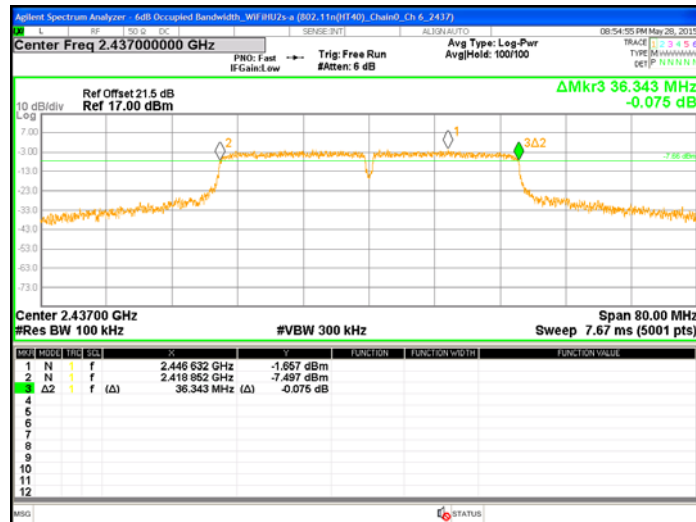
Chain1 : 6dB Bandwidth @ 802.11n(HT20) mode Ch11



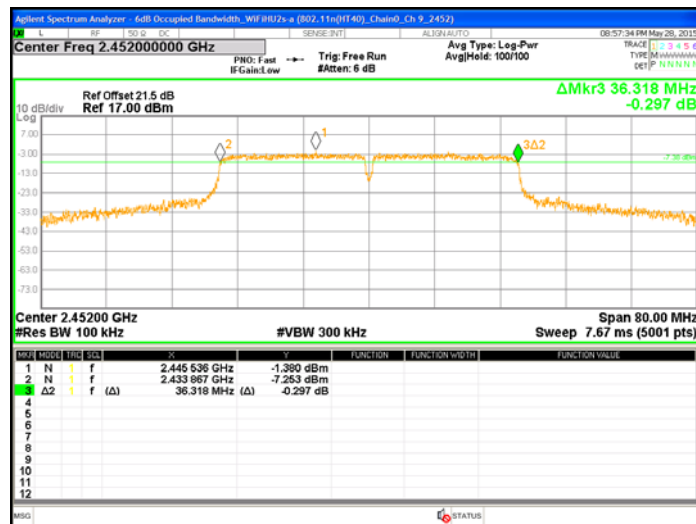
Chain0 : 6dB Bandwidth @ 802.11n(HT40) mode Ch 3



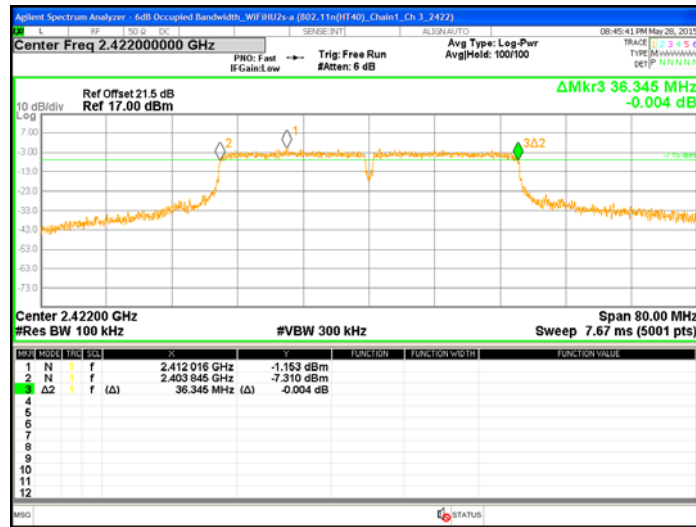
Chain0 : 6dB Bandwidth @ 802.11n(HT40) mode Ch 6



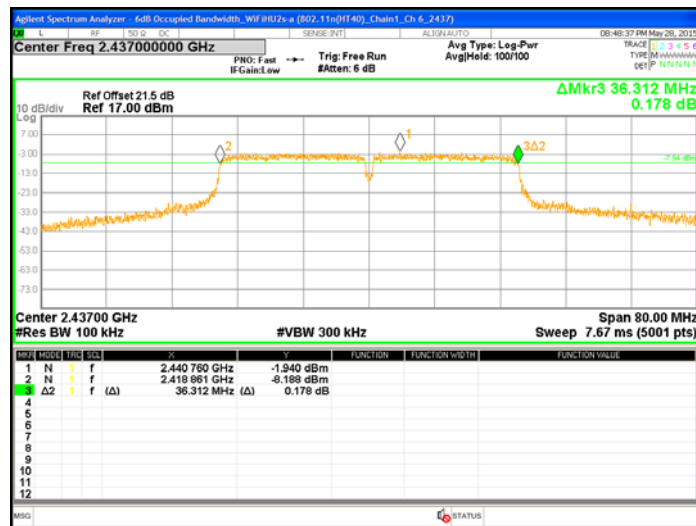
Chain0 : 6dB Bandwidth @ 802.11n(HT40) mode Ch 9



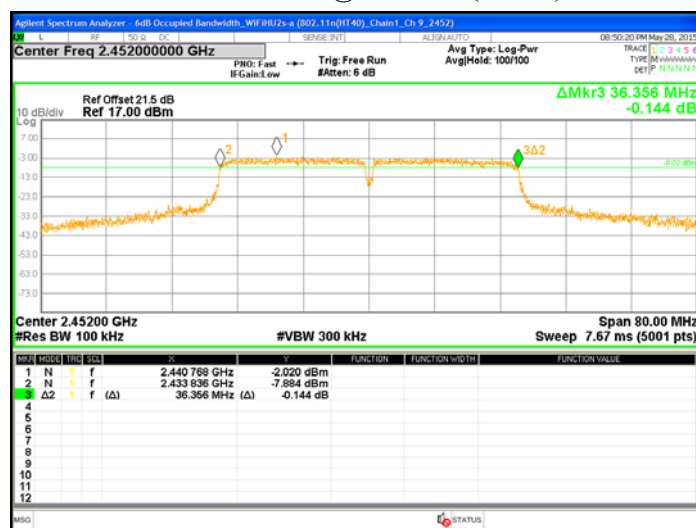
Chain1 : 6dB Bandwidth @ 802.11n(HT40) mode Ch 3



Chain1 : 6dB Bandwidth @ 802.11n(HT40) mode Ch 6



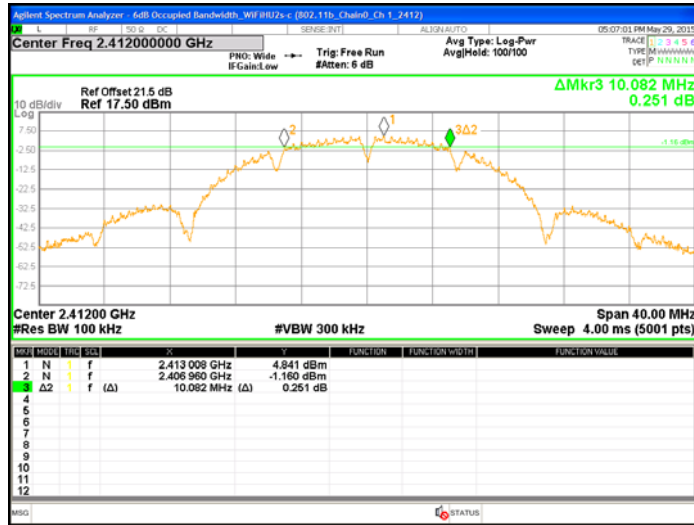
Chain1 : 6dB Bandwidth @ 802.11n(HT40) mode Ch 9



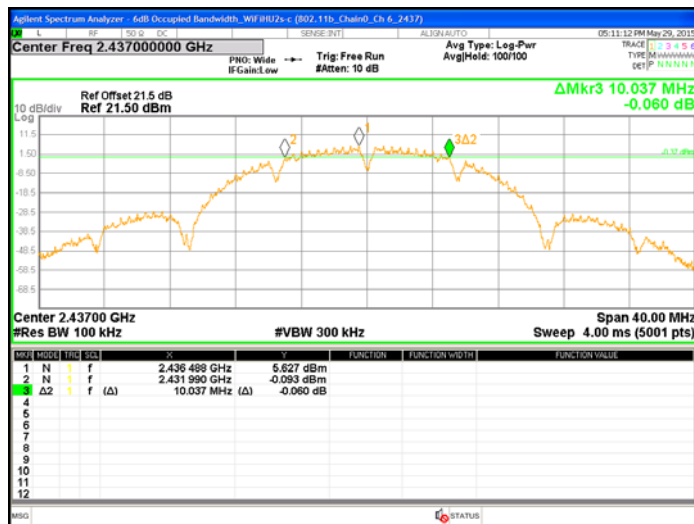


For WiFiHU2s-c:

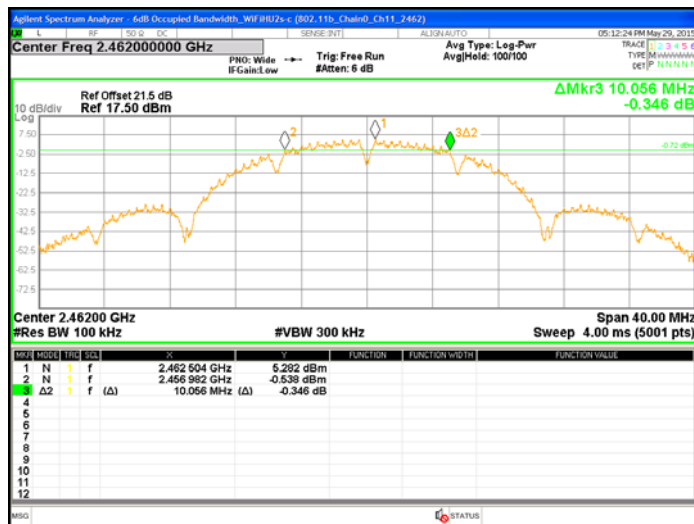
Chain0 : 6dB Bandwidth @ 802.11b mode Ch 1



Chain0 : 6dB Bandwidth @ 802.11b mode Ch 6

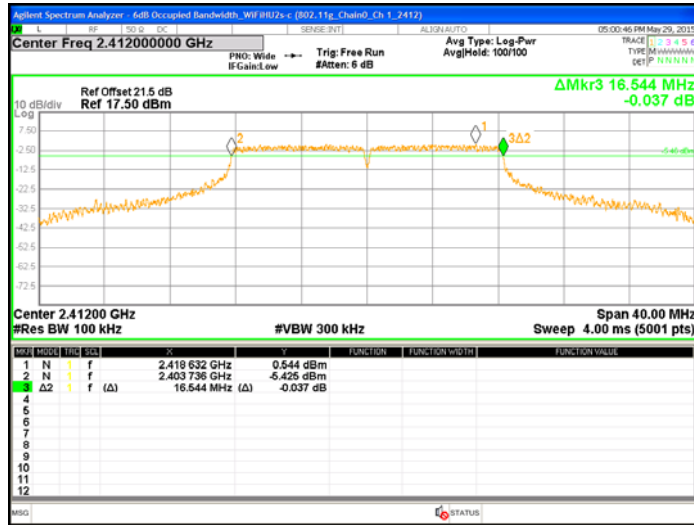


Chain0 : 6dB Bandwidth @ 802.11b mode Ch11

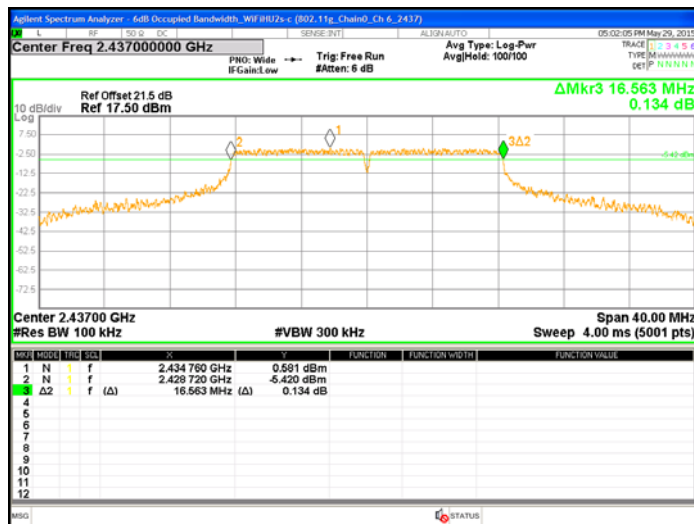




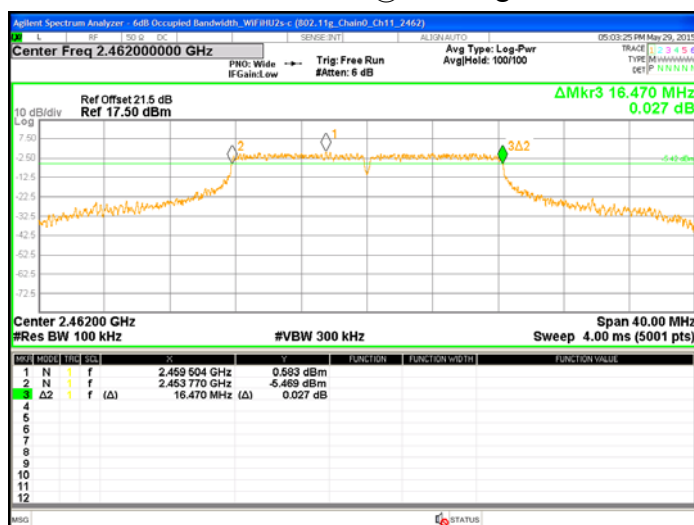
Chain0 : 6dB Bandwidth @ 802.11g mode Ch 1



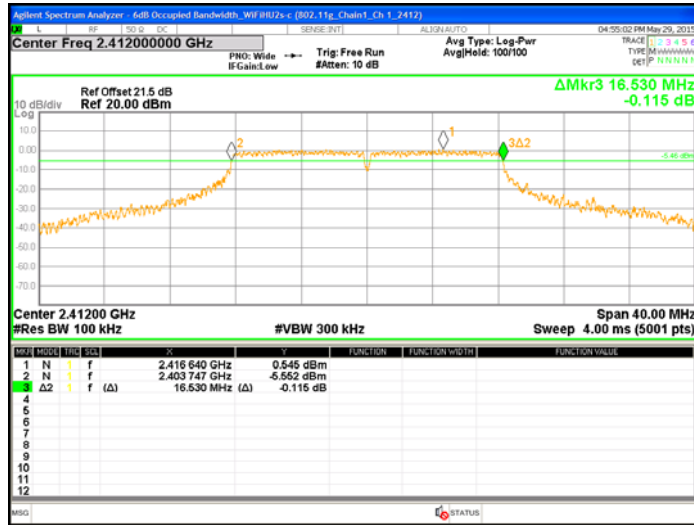
Chain0 : 6dB Bandwidth @ 802.11g mode Ch 6



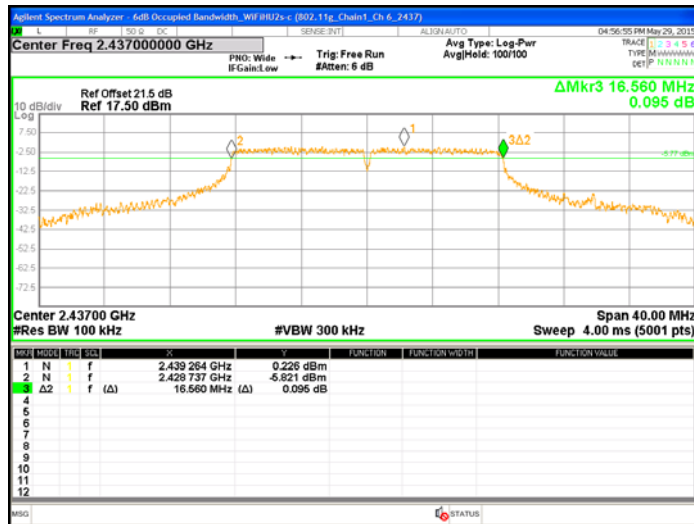
Chain0 : 6dB Bandwidth @ 802.11g mode Ch11



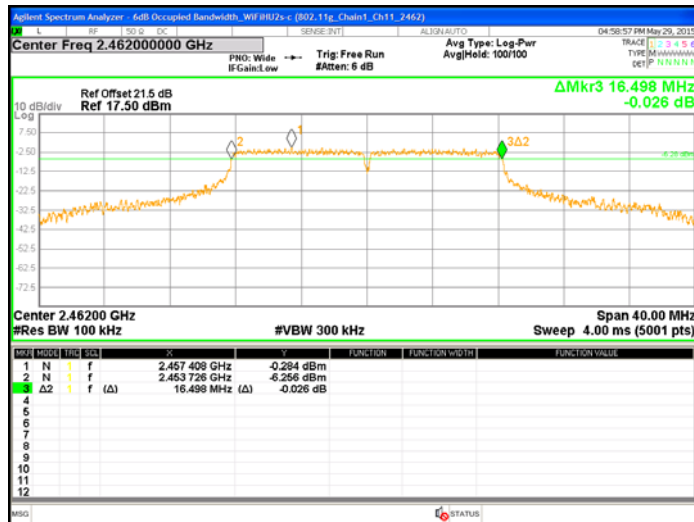
Chain1 : 6dB Bandwidth @ 802.11g mode Ch 1



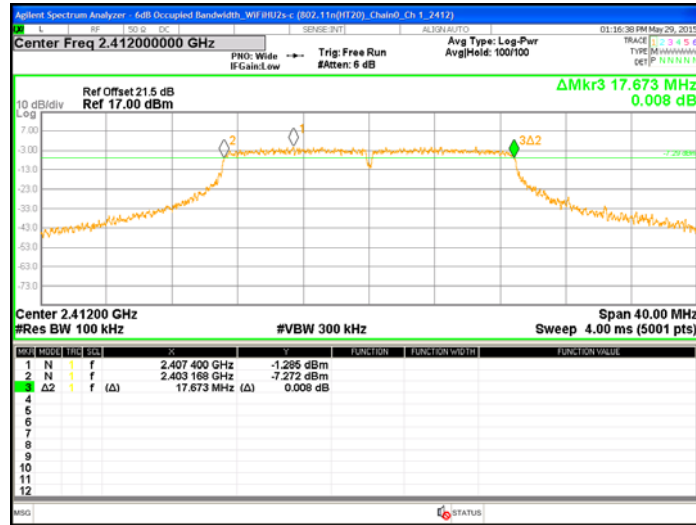
Chain1 : 6dB Bandwidth @ 802.11g mode Ch 6



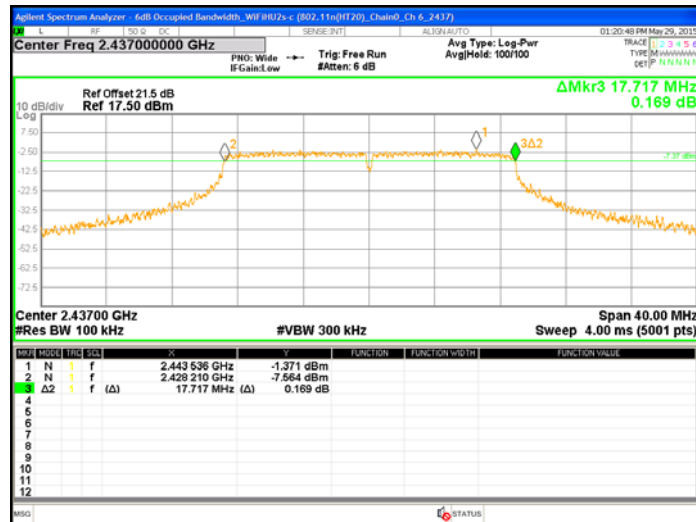
Chain1 : 6dB Bandwidth @ 802.11g mode Ch11



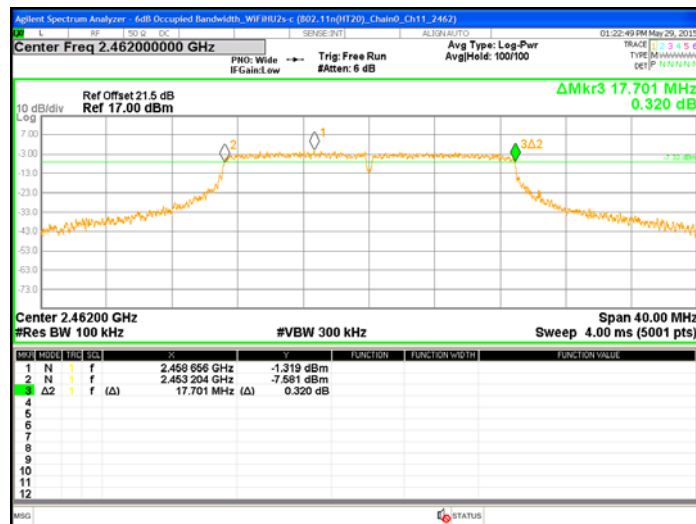
Chain0 : 6dB Bandwidth @ 802.11n(HT20) mode Ch 1



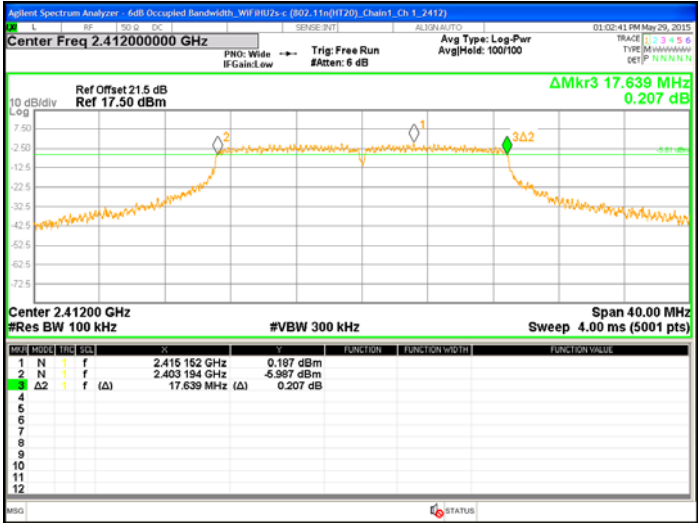
Chain0 : 6dB Bandwidth @ 802.11n(HT20) mode Ch 6



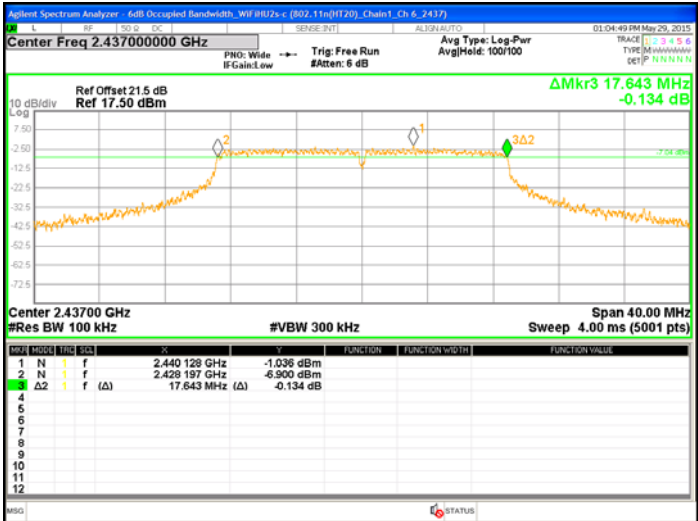
Chain0 : 6dB Bandwidth @ 802.11n(HT20) mode Ch11



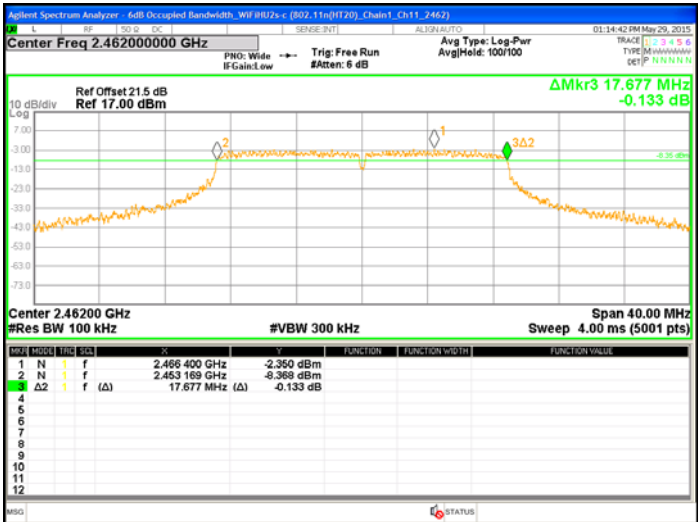
Chain1 : 6dB Bandwidth @ 802.11n(HT20) mode Ch 1



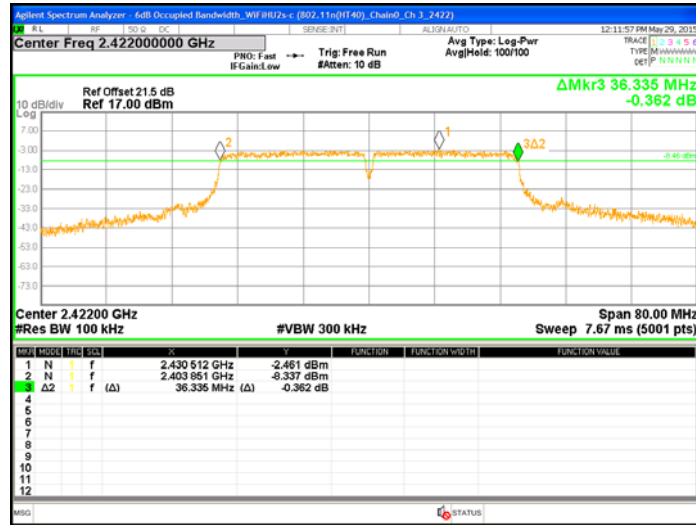
Chain1 : 6dB Bandwidth @ 802.11n(HT20) mode Ch 6



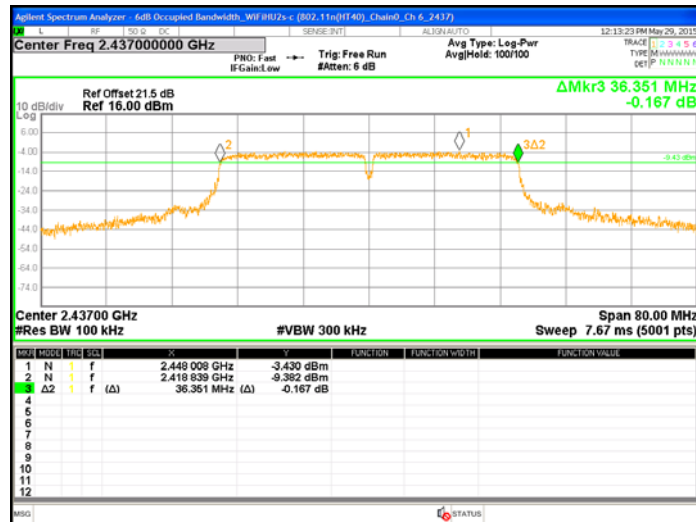
Chain1 : 6dB Bandwidth @ 802.11n(HT20) mode Ch11



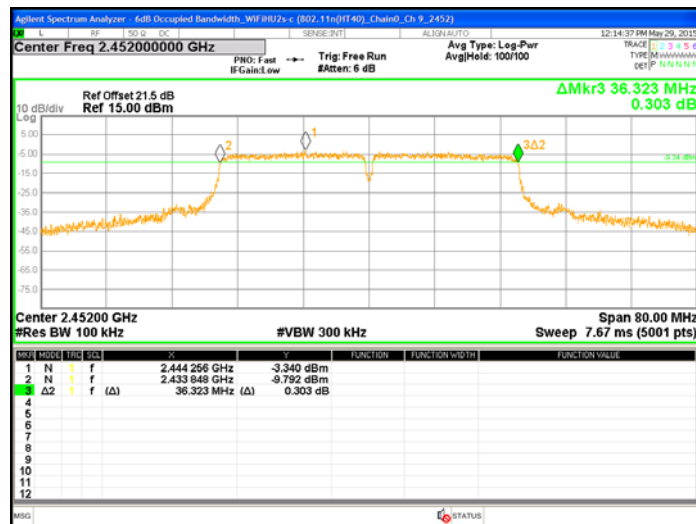
Chain0 : 6dB Bandwidth @ 802.11n(HT40) mode Ch 3



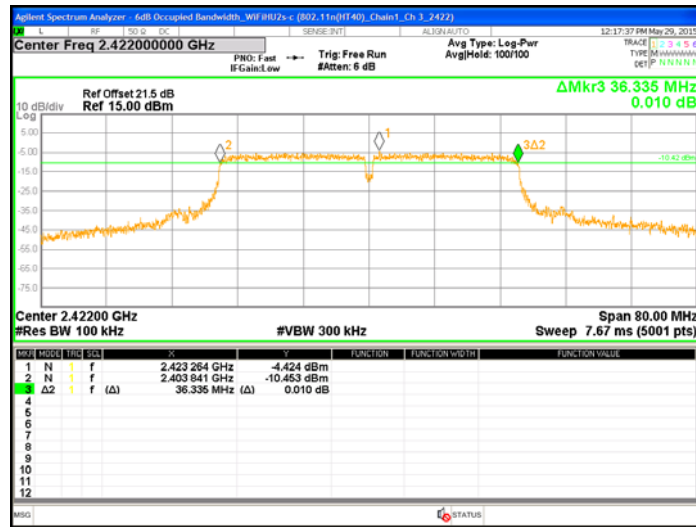
Chain0 : 6dB Bandwidth @ 802.11n(HT40) mode Ch 6



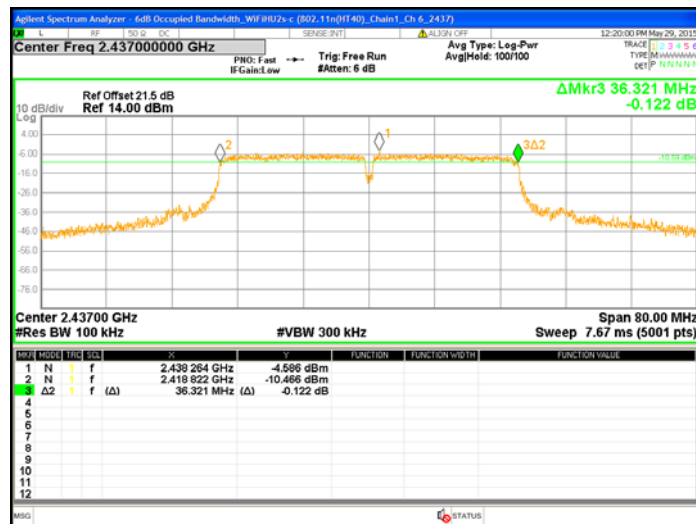
Chain0 : 6dB Bandwidth @ 802.11n(HT40) mode Ch 9



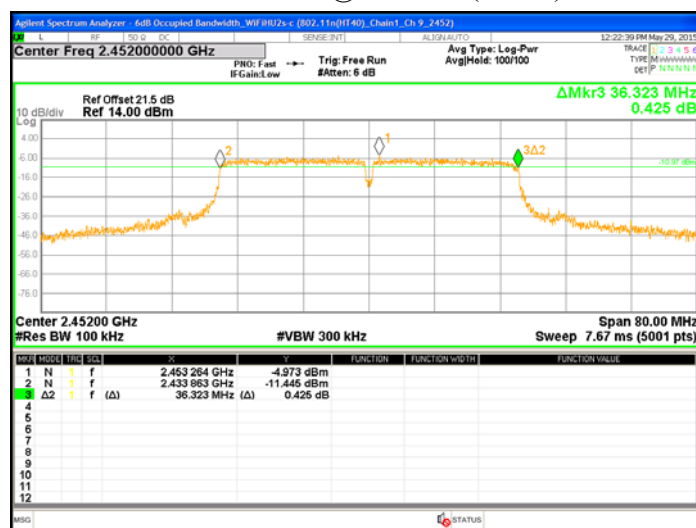
Chain1 : 6dB Bandwidth @ 802.11n(HT40) mode Ch 3



Chain1 : 6dB Bandwidth @ 802.11n(HT40) mode Ch 6



Chain1 : 6dB Bandwidth @ 802.11n(HT40) mode Ch 9



## 4. Maximum Peak Conducted Output Power

### 4.1 Operating environment

Temperature:	25	°C
Relative Humidity:	50	%
Atmospheric Pressure	1008	hPa
Requirement & Test method	15.247(b)(3) KDB 558074 D01 v03r03	

### 4.2 Limit for maximum peak conducted output power

For systems using digital modulation in the 2400-2483.5 MHz: 1 Watt (30dBm)

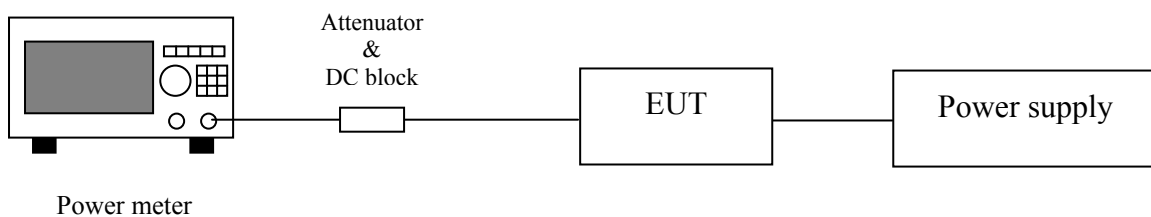
### 4.3 Measuring instrument setting

Power meter	
Power meter	Setting
Bandwidth	65MHz bandwidth is greater than the EUT emission bandwidth
Detector	Peak & Average

### 4.4 Test procedure

Test procedures refer to clause 9.1.3 peak power meter method and clause 9.2.3.2 measurement using a gated RF average power meter of KDB 558074 D01.

### 4.5 Test diagram



#### 4.6 Test result

For WiFiHU2s-a:  
Single TX

Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Output Power (AV) (dBm)	Total Power (AV) (mW)	Maximun power (PK) (dBm)	Maximun power (PK) (mW)	Limit (dBm)	Margin (dB)
11b(chain0)	1	2412	1	21.15	130.32	23.39	218.2729912	30	-6.61
	6	2437		20.73	118.30	22.42	174.5822153	30	-7.58
	11	2462		20.03	100.69	21.59	144.2115352	30	-8.41
11g(chain0)	1	2412	6	21.52	141.91	24.78	300.6076303	30	-5.22
	6	2437		21.14	130.02	24.17	261.2161354	30	-5.83
	11	2462		20.49	111.94	23.37	217.2701179	30	-6.63
11g(chain1)	1	2412	6	20.02	100.46	24.52	283.1391996	30	-5.48
	6	2437		19.31	85.31	23.86	243.2204009	30	-6.14
	11	2462		18.36	68.55	23.09	203.7042078	30	-6.91

#### 2TX

Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Output Power (dBm)				Output Power (mW)				Total Power (dBm)				Limit (dBm)	Margin (dB)
				Chian 0		Chain 1		Chain 0		Chian 1		AV		PK			
				AV	PK	AV	PK	AV	PK	AV	PK	0+1(mW)	0+1(dBm)	0+1(mW)	0+1(dBm)		
11n (HT20)	1	2412	6.5	16.95	21.93	16.47	21.81	49.55	155.96	44.36	151.71	93.91	19.73	307.66	24.88	30	-5.12
	6	2437		17.44	22.6	16.55	22.53	55.46	181.97	45.19	179.06	100.65	20.03	361.03	25.58	30	-4.42
	11	2462		17.03	22.36	15.88	21.65	50.47	172.19	38.73	146.22	89.19	19.50	318.40	25.03	30	-4.97
11n (HT40)	3	2422	13	16.26	22.39	15.24	22.2	42.27	173.38	33.42	165.96	75.69	18.79	339.34	25.31	30	-4.69
	6	2437		16.2	22.26	15.34	22.14	41.69	168.27	34.20	163.68	75.88	18.80	331.95	25.21	30	-4.79
	9	2452		16.15	22.07	14.77	21.49	41.21	161.06	29.99	140.93	71.20	18.52	301.99	24.80	30	-5.20



For WiFiHU2s-c:  
Single TX

Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Output Power (AV) (dBm)	Total Power (AV) (mW)	Maximun power (PK) (dBm)	Maximun power (PK) (mW)	Limit (dBm)	Margin (dB)
11b(chain0)	1	2412	1	15.77	37.76	17.85	60.95368972	30	-12.15
	6	2437		15.88	38.73	17.92	61.94410751	30	-12.08
	11	2462		15.54	35.81	17.5	56.23413252	30	-12.50
11g(chain0)	1	2412	6	15.41	34.75	23.46	221.819642	30	-6.54
	6	2437		15.36	34.36	22.89	194.5360082	30	-7.11
	11	2462		15.04	31.92	22.12	162.9296033	30	-7.88
11g(chain1)	1	2412	6	14.37	27.35	22.77	189.2343619	30	-7.23
	6	2437		14.18	26.18	22.04	159.9558029	30	-7.96
	11	2462		13.5	22.39	21.02	126.4736347	30	-8.98

2TX

Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Output Power (dBm)				Output Power (mW)				Total Power (dBm)				Limit (dBm)	Margin (dB)
				Chian 0		Chain 1		Chain 0		Chian 1		AV		PK			
				AV	PK	AV	PK	AV	PK	AV	PK	0+1(mW)	0+1(dBm)	0+1(mW)	0+1(dBm)		
11n (HT20)	1	2412	6.5	13.5	21.61	12.37	20.28	22.39	144.88	17.26	106.66	39.65	15.98	251.54	24.01	30	-5.99
	6	2437		13.63	21.43	12.52	20.53	23.07	139.00	17.86	112.98	40.93	16.12	251.97	24.01	30	-5.99
	11	2462		13.46	20.84	12.06	19.45	22.18	121.34	16.07	88.10	38.25	15.83	209.44	23.21	30	-6.79
11n (HT40)	3	2422	13	13.19	20.73	12.24	20.04	20.84	118.30	16.75	100.93	37.59	15.75	219.23	23.41	30	-6.59
	6	2437		13.29	20.55	12.01	19.71	21.33	113.50	15.89	93.54	37.22	15.71	207.04	23.16	30	-6.84
	9	2452		13.19	20.17	11.97	19.63	20.84	103.99	15.74	91.83	36.58	15.63	195.83	22.92	30	-7.08

## 5. Power Spectral Density

### 5.1 Operating environment

Temperature:	25	°C
Relative Humidity:	50	%
Atmospheric Pressure	1008	hPa
Requirement & Test method	15.247(e) KDB 558074 D01 v03r03	

### 5.2 Limit for power spectrum density

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

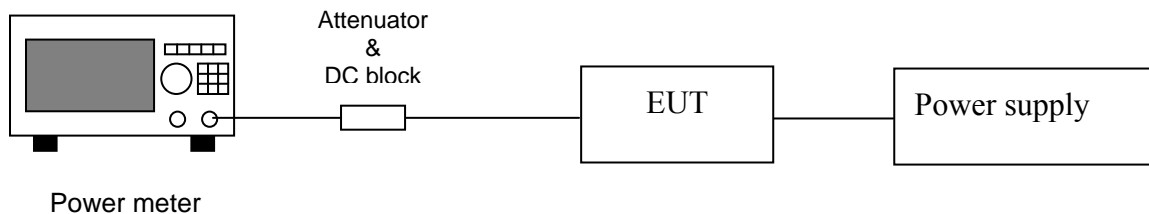
### 5.3 Measuring instrument setting

Spectrum analyzer settings	
Spectrum Analyzer function	Setting
Detector	Peak
RBW	$\geq 3$ kHz
VBW	$\geq 3$ x RBW
Sweep	Auto couple
Trace	Max hold
Span	1.5 times x 6dB bandwidth
Attenuation	Auto

## 5.4 Test procedure

1. Test procedure refer to clause 10.2 method PKPSD (peak PSD) of KDB 558074 D01 and clause E) 2) b) measure and sum spectral maxima across the outputs.
2. Using the maximum conducted output power in the fundamental emission demonstrates compliance. The EUT must be configured to transmit continuously at full power over the measurement duration.
3. Use the peak marker function to determine the maximum amplitude level within the RBW.

## 5.5 Test diagram



## 5.6 Test results

For WiFiHU2s-a:  
Single TX

Mode	Channel	Frequency (MHz)	PSD		Limit (dBm)	Margin (dB)
			(dBm)	(mw)		
11b (chain0)	1	2412	-11.288	0.07	8	-19.29
	6	2437	-12.334	0.06	8	-20.33
	11	2462	-12.379	0.06	8	-20.38
11g (chain0)	1	2412	-8.147	0.15	8	-16.15
	6	2437	-8.647	0.14	8	-16.65
	11	2462	-9.82	0.10	8	-17.82
11g (chain1)	1	2412	-10.505	0.09	8	-18.51
	6	2437	-11.779	0.07	8	-19.78
	11	2462	-13.197	0.05	8	-21.20

2TX

Mode	Channel	Frequency (MHz)	PSD (dBm)		Total PSD		MIMO Correction	Result	Limit (dBm)	Margin (dB)
			chain0	chain1	mW	dBm				
11n (HT20)	1	2412	-14.101	-13.629	0.08	-10.85	10Log(2)	-7.84	8	-15.84
	6	2437	-13.518	-13.75	0.09	-10.62	10Log(2)	-7.61	8	-15.61
	11	2462	-13.918	-14.527	0.08	-11.20	10Log(2)	-8.19	8	-16.19
11n (HT40)	3	2422	-16.455	-18.15	0.04	-14.21	10Log(2)	-11.20	8	-19.20
	6	2437	-15.612	-18.107	0.04	-13.67	10Log(2)	-10.66	8	-18.66
	9	2452	-16.651	-18.027	0.04	-14.27	10Log(2)	-11.26	8	-19.26

Note: MIMO Correction: 10log(Nant)

For WiFiHU2s-c:

Single TX

Mode	Channel	Frequency (MHz)	PSD		Limit (dBm)	Margin (dB)
			(dBm)	(mw)		
11b (chain0)	1	2412	4.726	2.97	8	-3.27
	6	2437	5.397	3.46	8	-2.60
	11	2462	4.97	3.14	8	-3.03
11g (chain0)	1	2412	0.352	1.08	8	-7.65
	6	2437	0.451	1.11	8	-7.55
	11	2462	0.02	1.00	8	-7.98
11g (chain1)	1	2412	0.095	1.02	8	-7.91
	6	2437	-0.074	0.98	8	-8.07
	11	2462	-0.683	0.85	8	-8.68

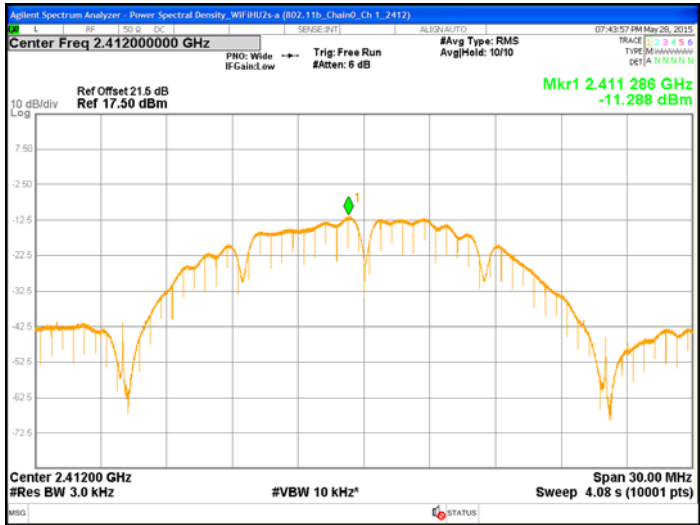
2TX

Mode	Channel	Frequency (MHz)	PSD (dBm)		Total PSD		MIMO Correction	Result	Limit (dBm)	Margin (dB)
			chain0	chain1	mW	dBm				
11n (HT20)	1	2412	-1.774	-1.071	1.45	1.60	10Log(2)	4.61	8	-3.39
	6	2437	-2.168	-2.041	1.23	0.91	10Log(2)	3.92	8	-4.08
	11	2462	-2.015	-2.54	1.19	0.74	10Log(2)	3.75	8	-4.25
11n (HT40)	3	2422	-3.115	-4.969	0.81	-0.93	10Log(2)	2.08	8	-5.92
	6	2437	-3.783	-4.882	0.74	-1.29	10Log(2)	1.72	8	-6.28
	9	2452	-4.271	-5.27	0.67	-1.73	10Log(2)	1.28	8	-6.72

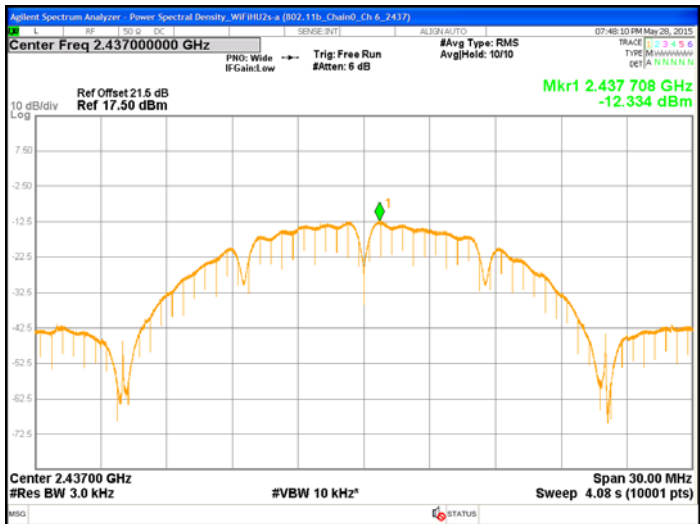
Note: MIMO Correction: 10log(Nant)

For WiFiHU2s-a:

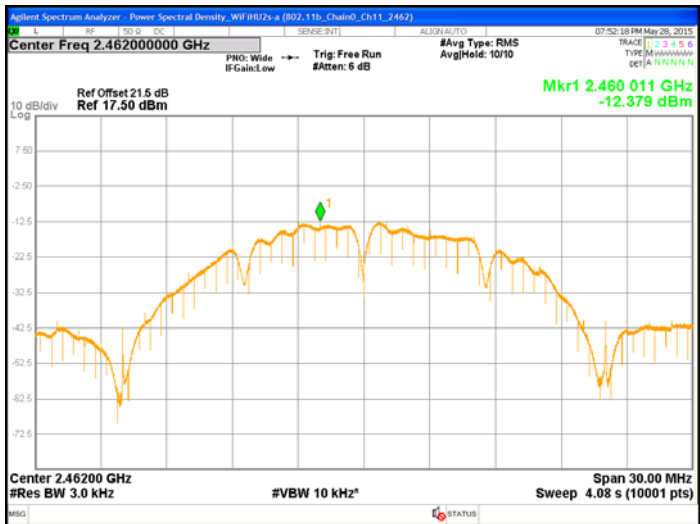
Chain0 : Power Spectral Density @ 802.11b mode Ch 1



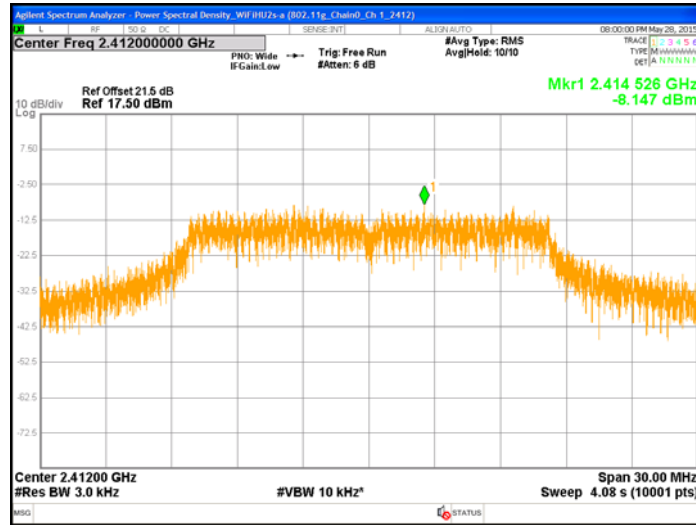
Chain0 : Power Spectral Density @ 802.11b mode Ch 6



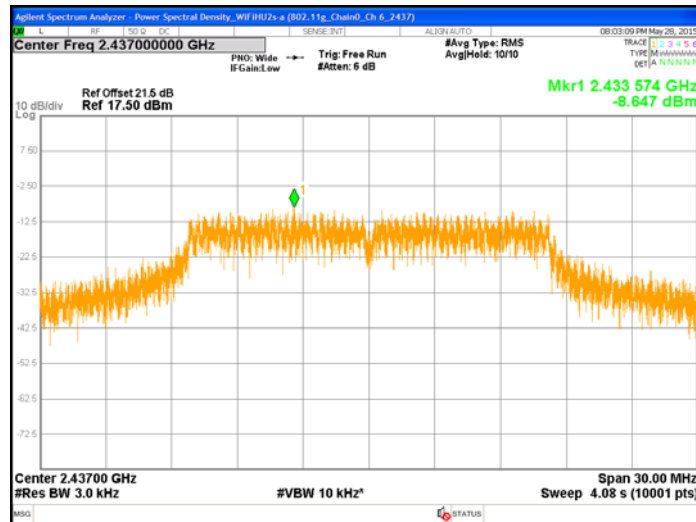
Chain0 : Power Spectral Density @ 802.11b mode Ch11



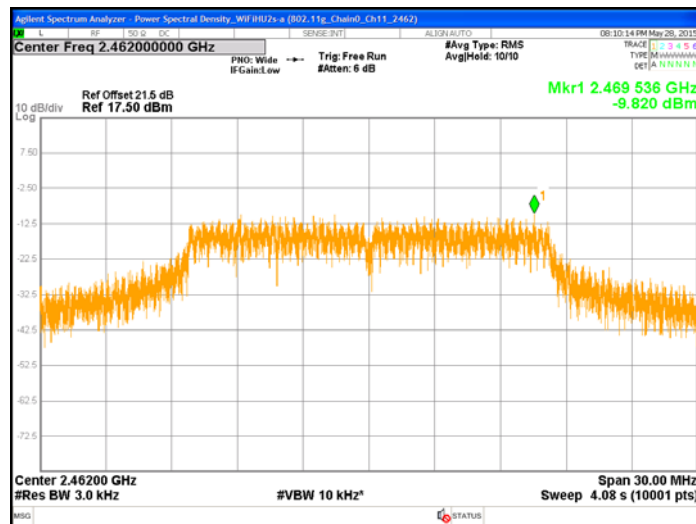
Chain0 : Power Spectral Density @ 802.11g mode Ch 1



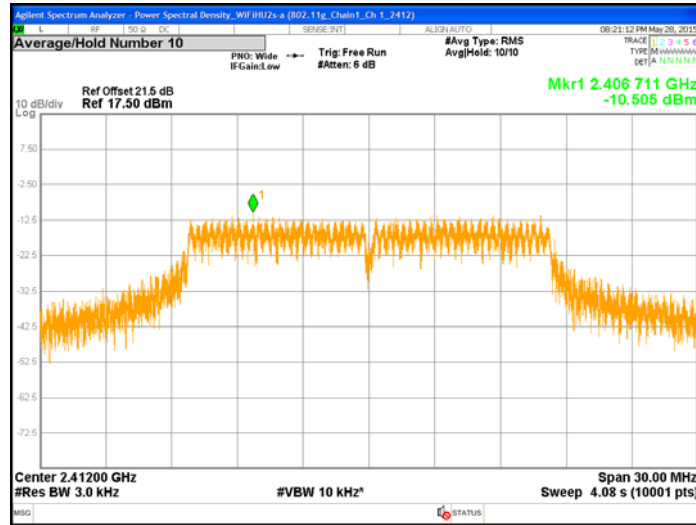
Chain0 : Power Spectral Density @ 802.11g mode Ch 6



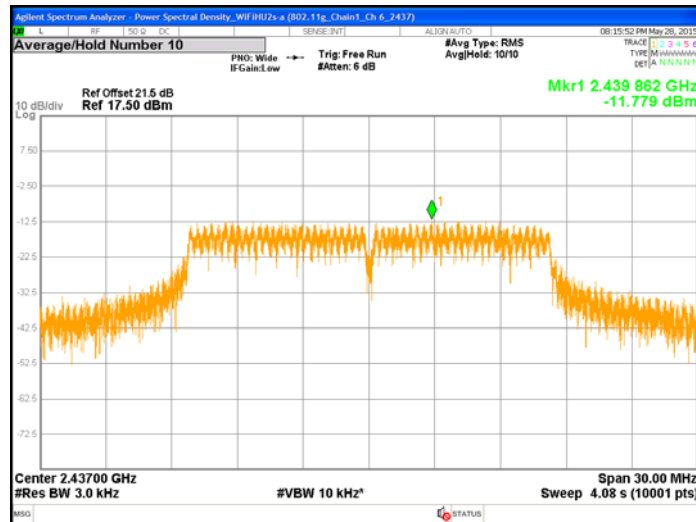
Chain0 : Power Spectral Density @ 802.11g mode Ch11



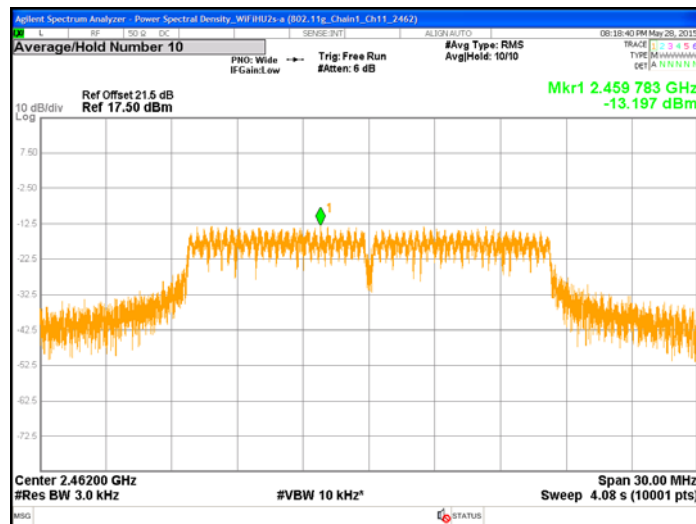
Chain1 : Power Spectral Density @ 802.11g mode Ch 1



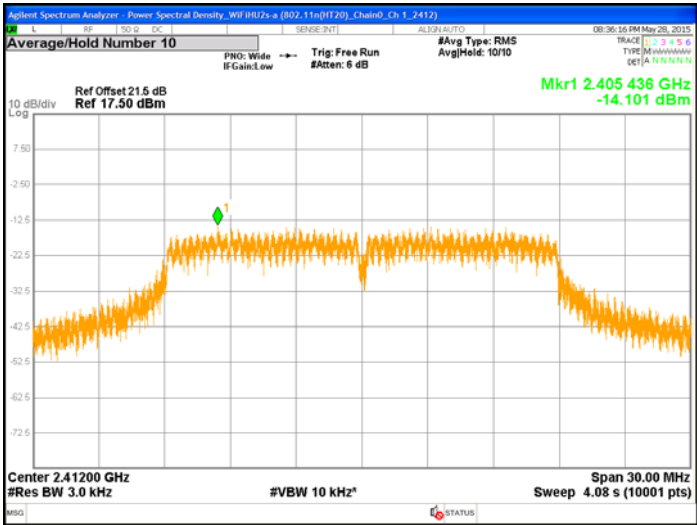
Chain1 : Power Spectral Density @ 802.11g mode Ch 6



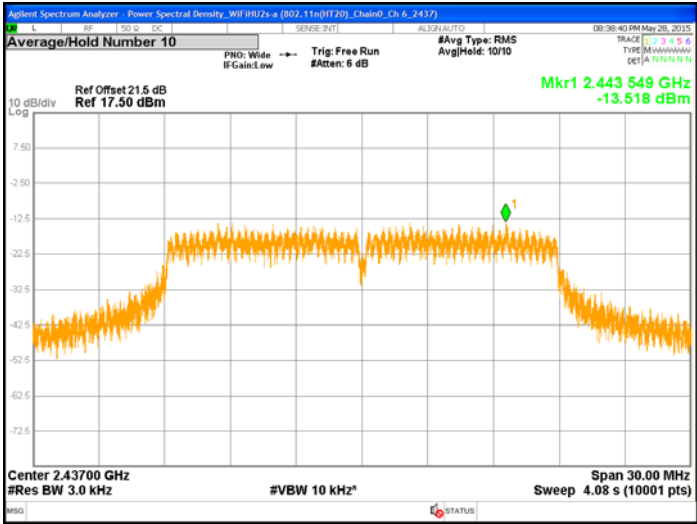
Chain1 : Power Spectral Density @ 802.11g mode Ch11



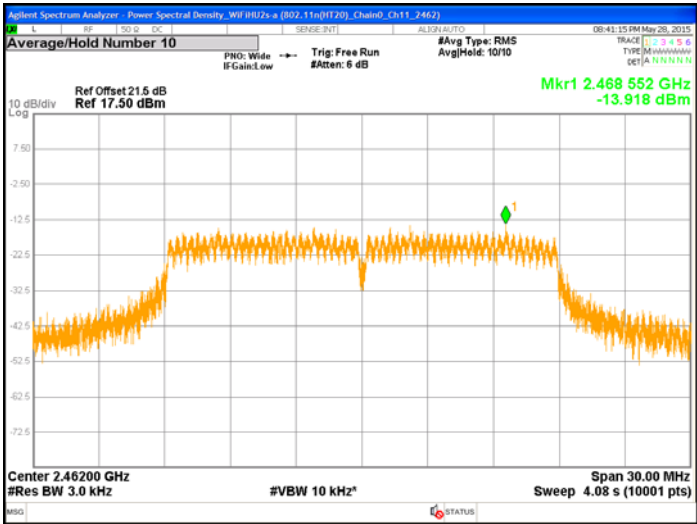
Chain0 : Power Spectral Density @ 802.11n(HT20) mode Ch 1



Chain0 : Power Spectral Density @ 802.11n(HT20) mode Ch 6

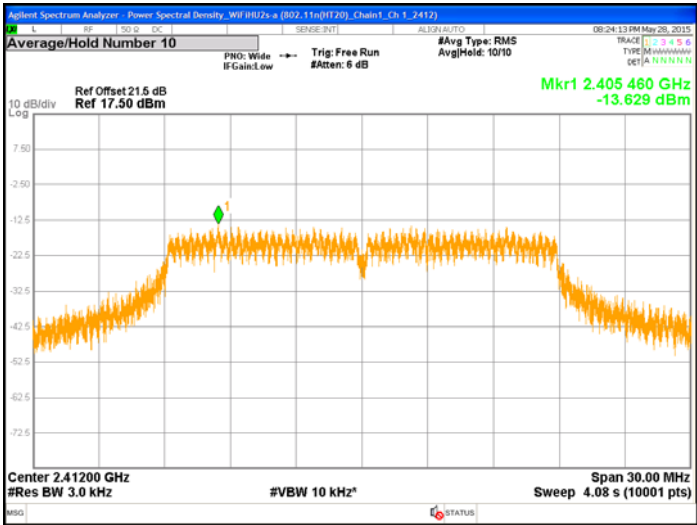


Chain0 : Power Spectral Density @ 802.11n(HT20) mode Ch11

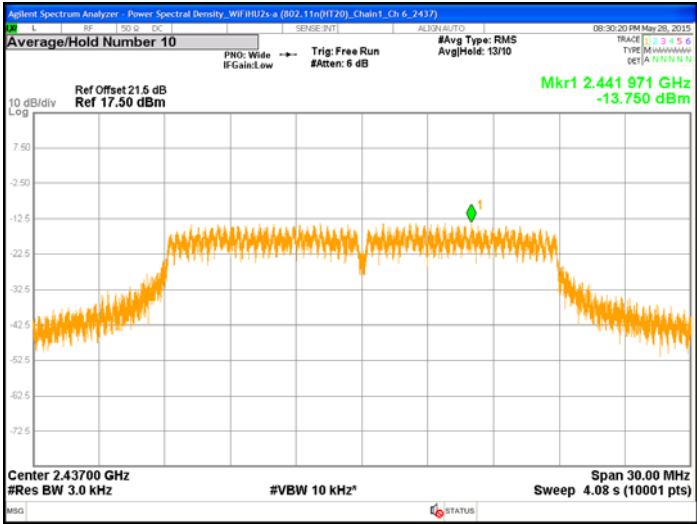




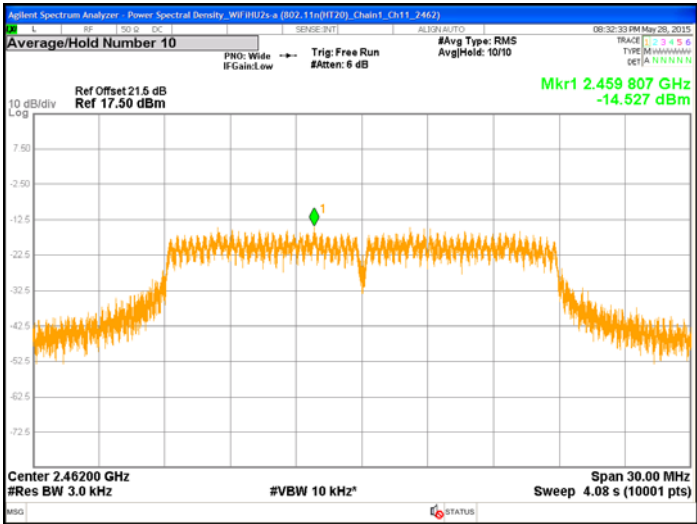
Chain1 : Power Spectral Density @ 802.11n(HT20) mode Ch 1



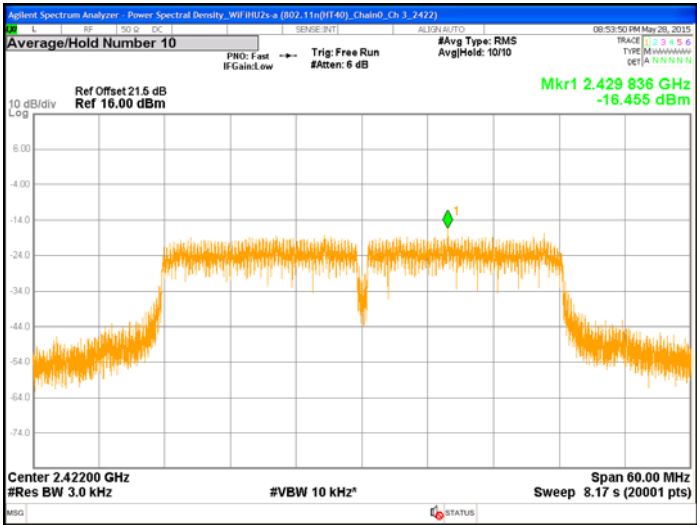
Chain1 : Power Spectral Density @ 802.11n(HT20) mode Ch 6



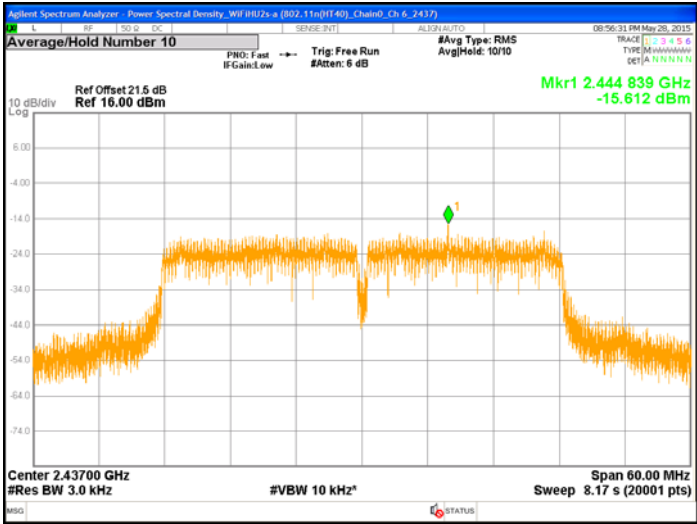
Chain1 : Power Spectral Density @ 802.11n(HT20) mode Ch11



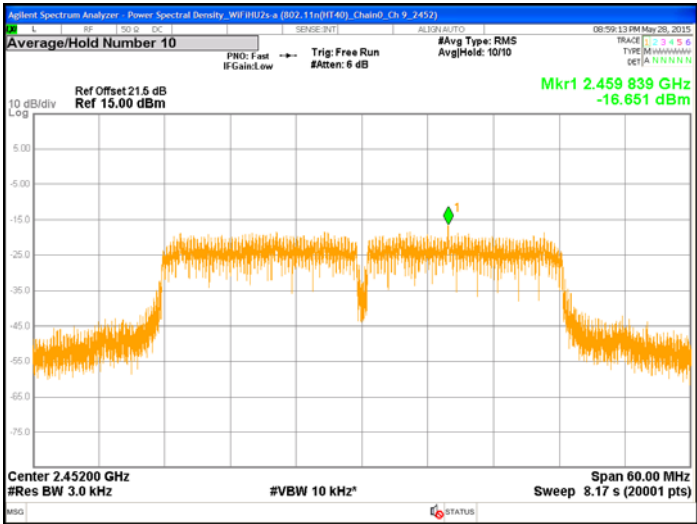
Chain0 : Power Spectral Density @ 802.11n(HT40) mode Ch 3



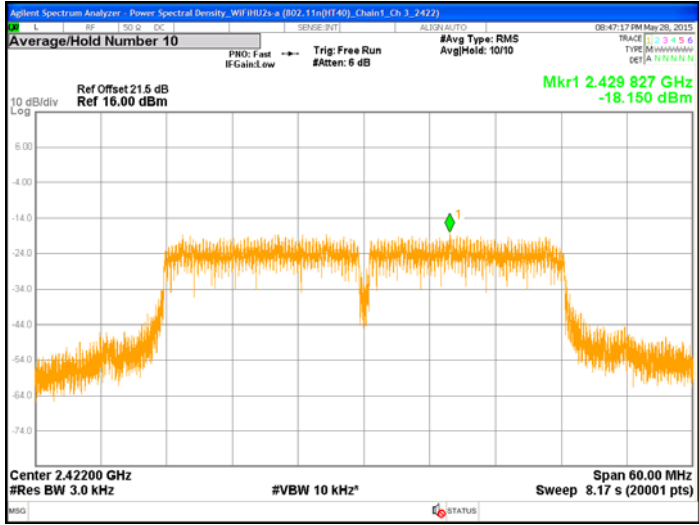
Chain0 : Power Spectral Density @ 802.11n(HT40) mode Ch 6



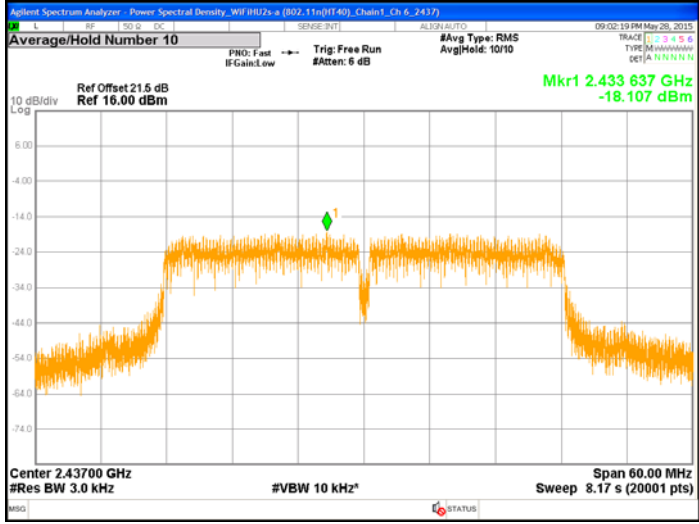
Chain0 : Power Spectral Density @ 802.11n(HT40) mode Ch 9



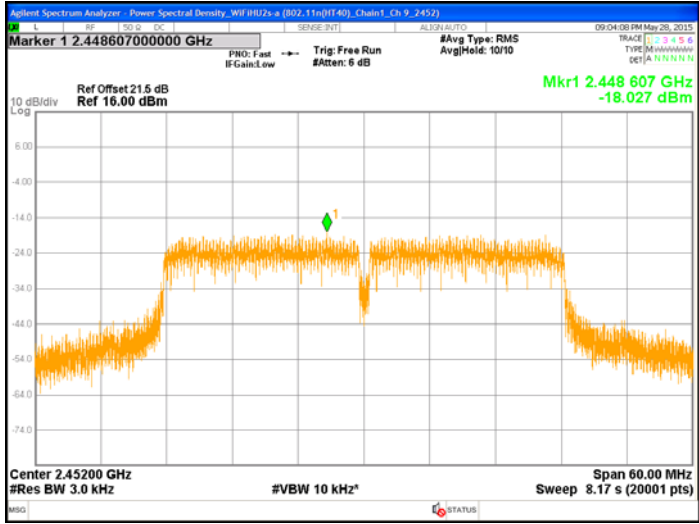
Chain1 : Power Spectral Density @ 802.11n(HT40) mode Ch 3



Chain1 : Power Spectral Density @ 802.11n(HT40) mode Ch 6

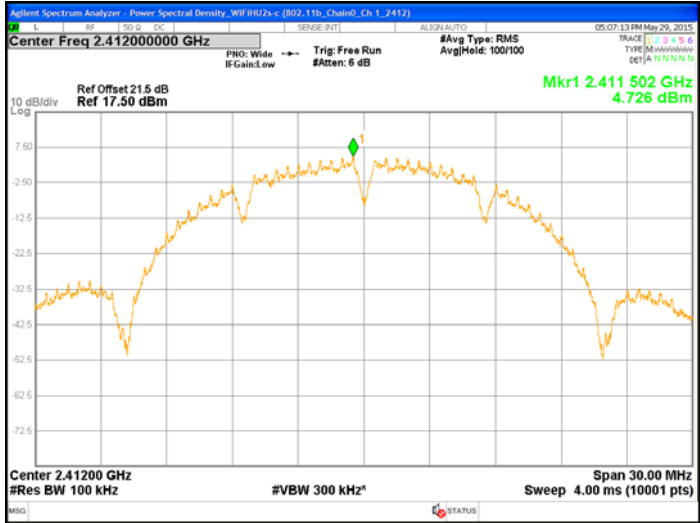


Chain1 : Power Spectral Density @ 802.11n(HT40) mode Ch 9

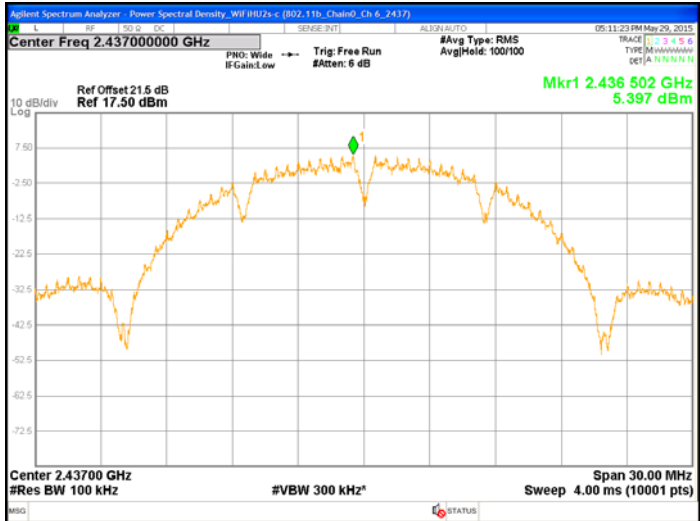


For WiFiHU2s-c:

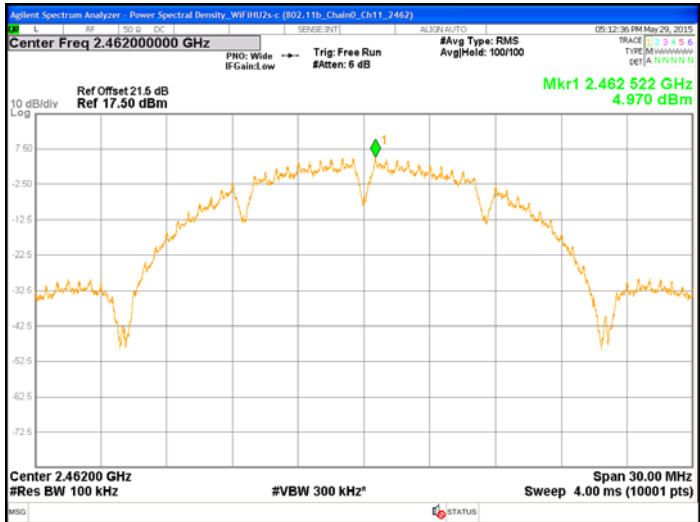
Chain0 : Power Spectral Density @ 802.11b mode Ch 1



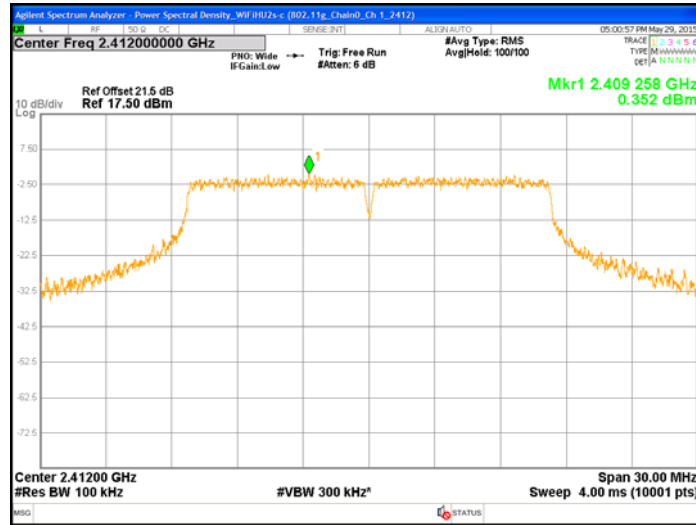
Chain0 : Power Spectral Density @ 802.11b mode Ch 6



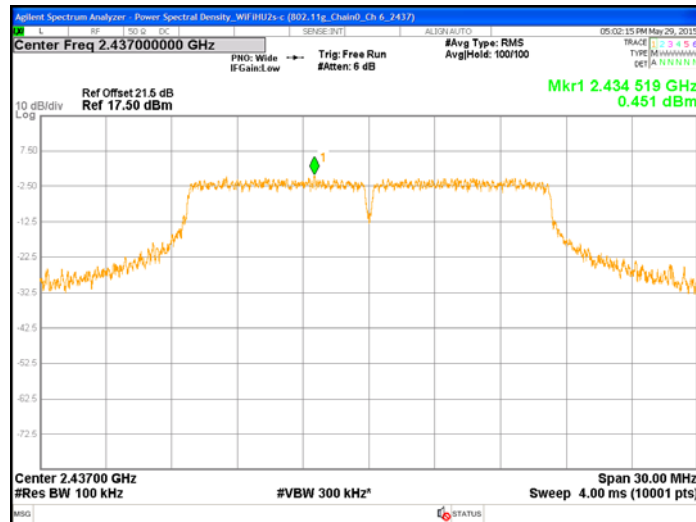
Chain0 : Power Spectral Density @ 802.11b mode Ch11



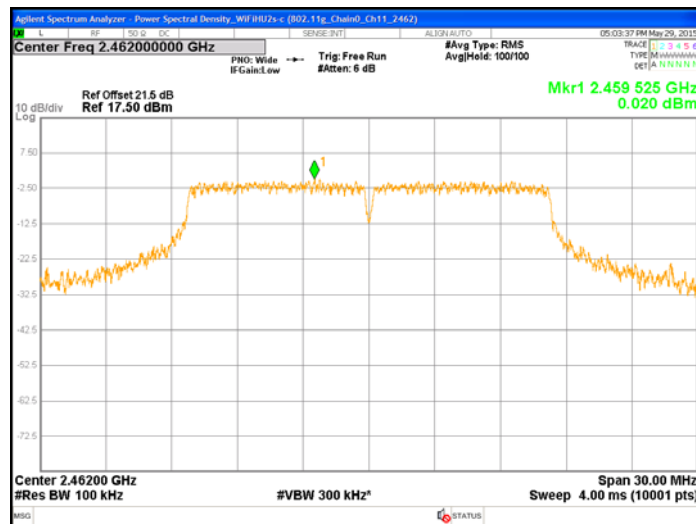
Chain0 : Power Spectral Density @ 802.11g mode Ch 1



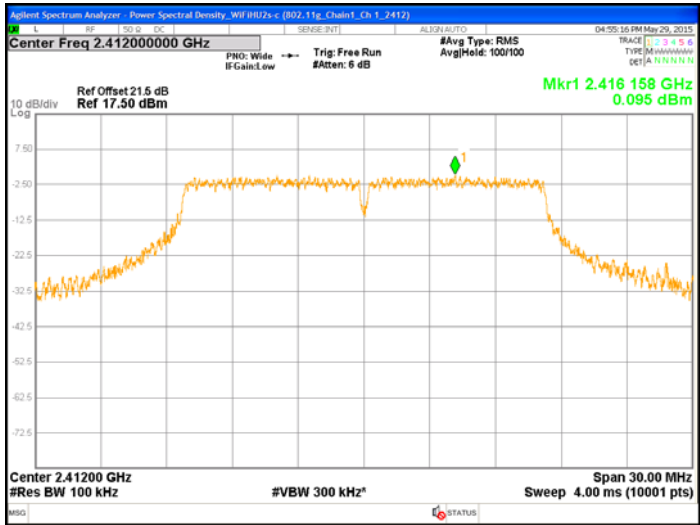
Chain0 : Power Spectral Density @ 802.11g mode Ch 6



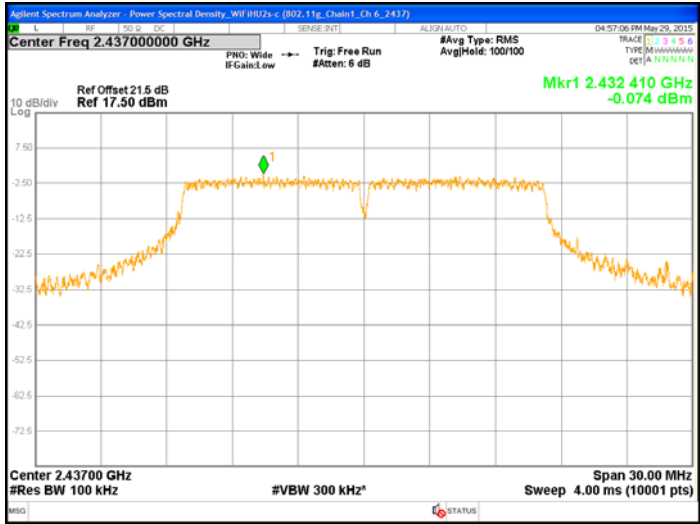
Chain0 : Power Spectral Density @ 802.11g mode Ch11



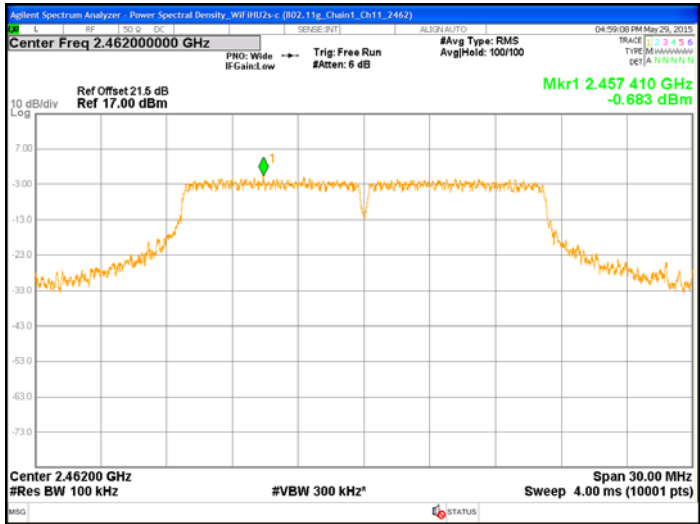
Chain1 : Power Spectral Density @ 802.11g mode Ch 1



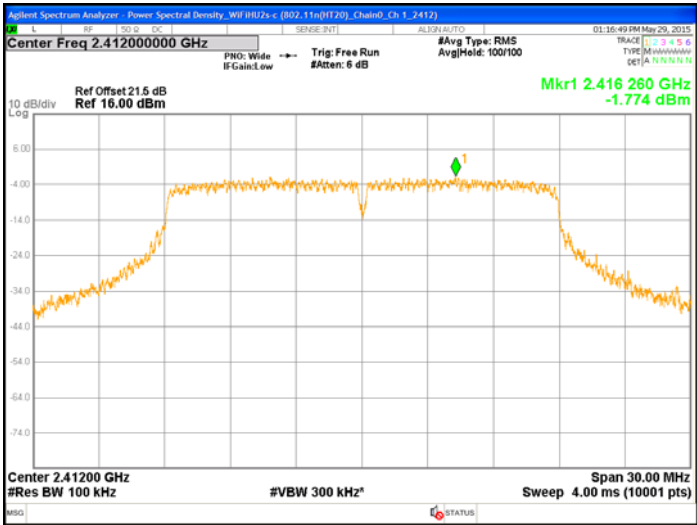
Chain1 : Power Spectral Density @ 802.11g mode Ch 6



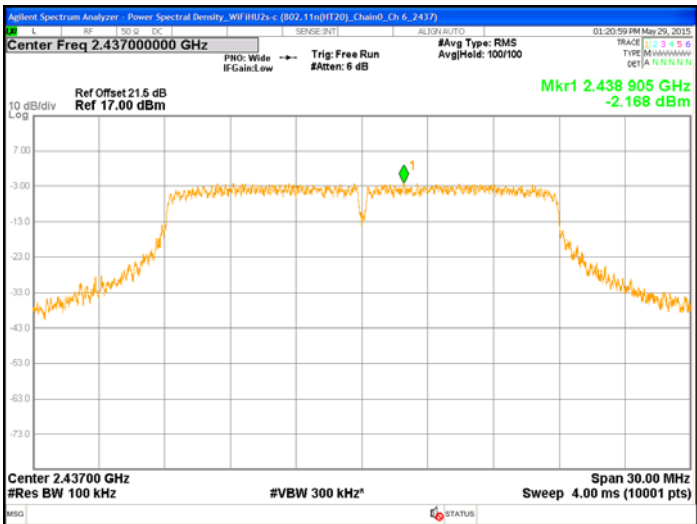
Chain1 : Power Spectral Density @ 802.11g mode Ch11



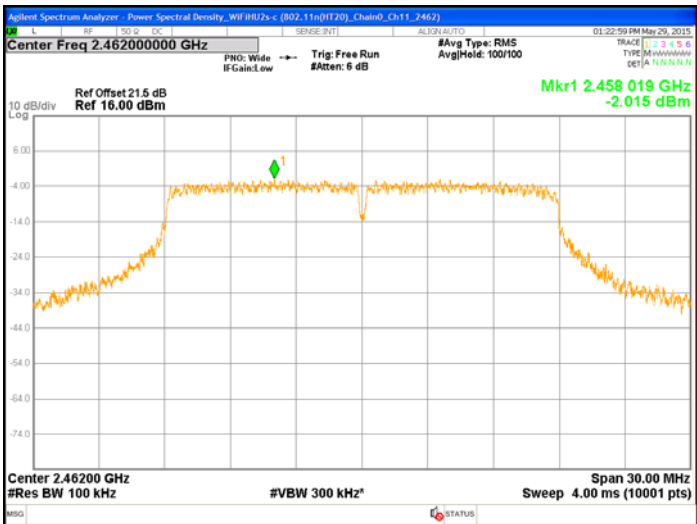
Chain0 : Power Spectral Density @ 802.11n(HT20) mode Ch 1



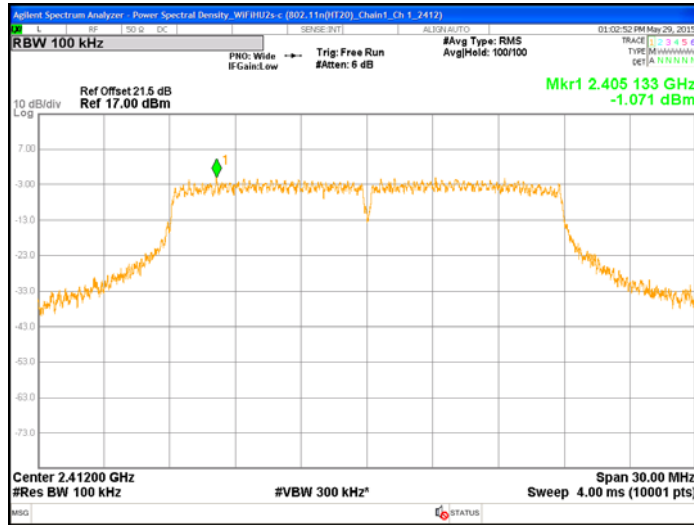
Chain0 : Power Spectral Density @ 802.11n(HT20) mode Ch 6



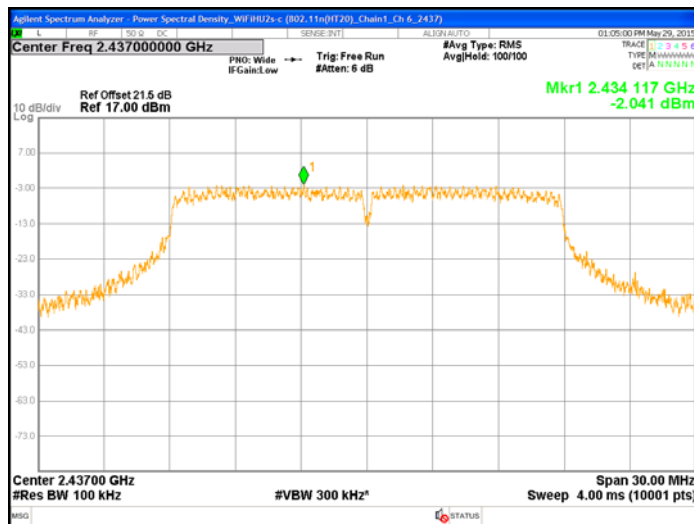
Chain0 : Power Spectral Density @ 802.11n(HT20) mode Ch11



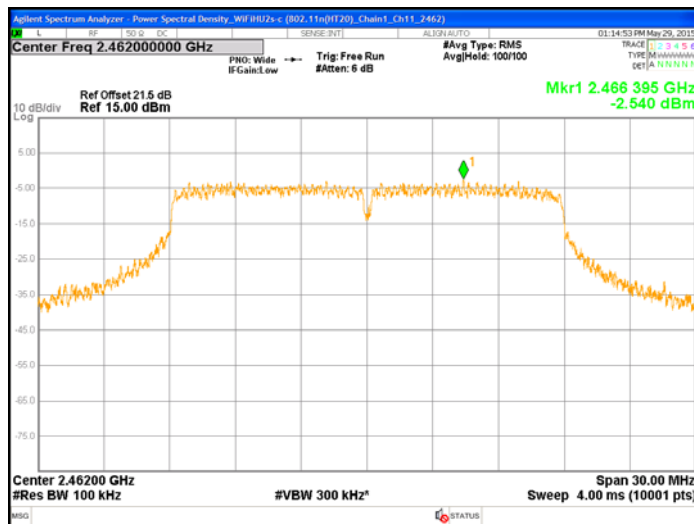
Chain1 : Power Spectral Density @ 802.11n(HT20) mode Ch 1



Chain1 : Power Spectral Density @ 802.11n(HT20) mode Ch 6

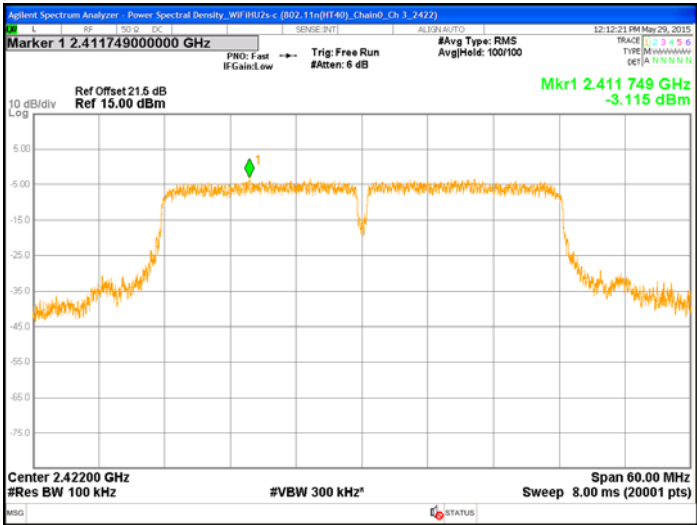


Chain1 : Power Spectral Density @ 802.11n(HT20) mode Ch11

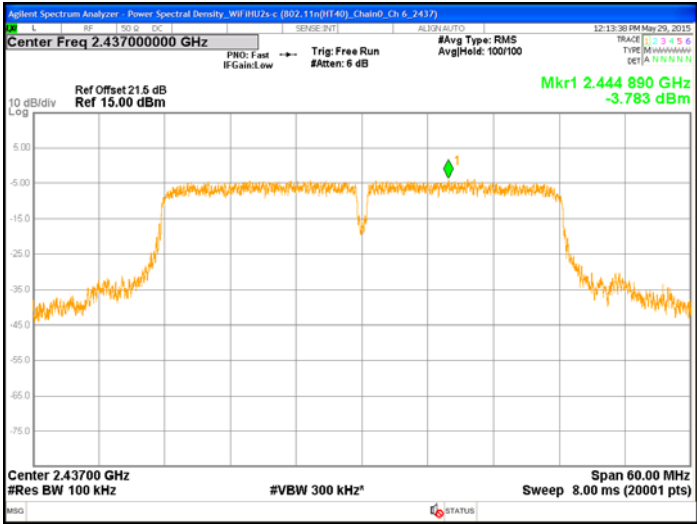




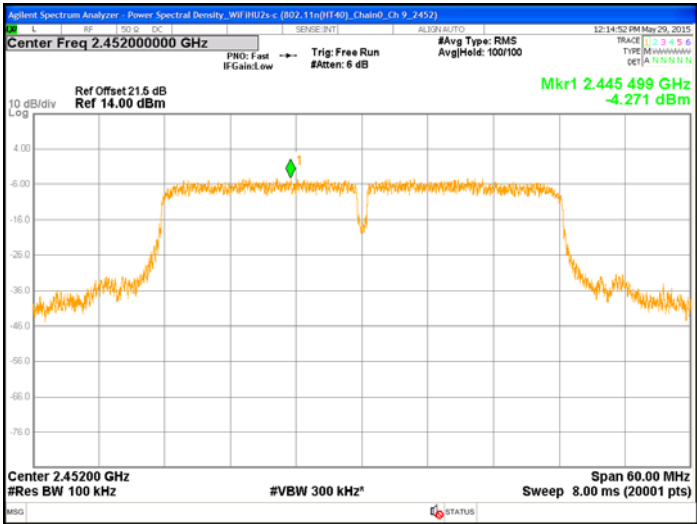
Chain0 : Power Spectral Density @ 802.11n(HT40) mode Ch 3



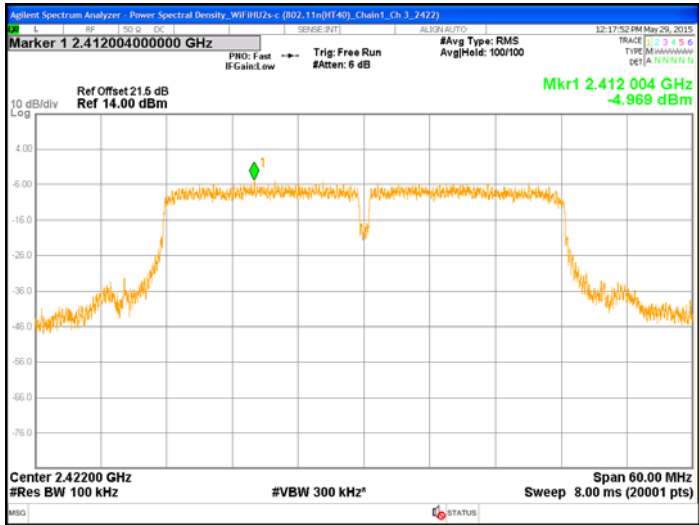
Chain0 : Power Spectral Density @ 802.11n(HT40) mode Ch 6



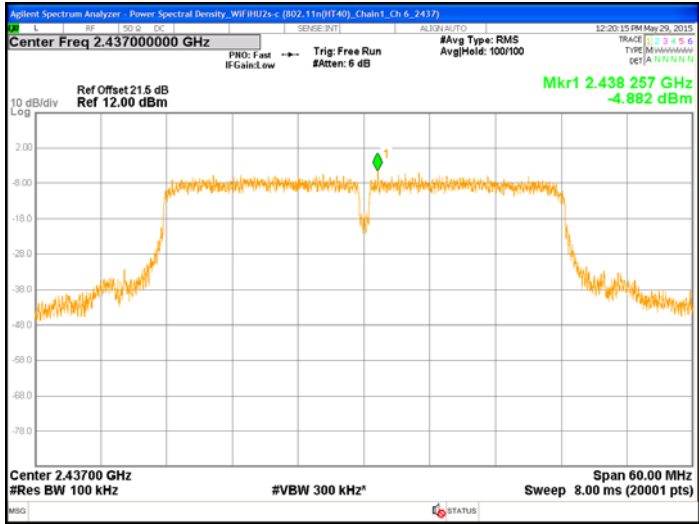
Chain0 : Power Spectral Density @ 802.11n(HT40) mode Ch 9



Chain1 : Power Spectral Density @ 802.11n(HT40) mode Ch 3



Chain1 : Power Spectral Density @ 802.11n(HT40) mode Ch 6



Chain1 : Power Spectral Density @ 802.11n(HT40) mode Ch 9

