EMC

TEST REPORT

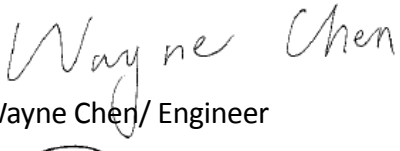
Report No.:	**180400029TWN-001**
Model No.:	**HURESAC-3XE-C**
Issued Date:	**Apr. 11, 2018**

Applicant:	**Johnson Health Tech. Co., Ltd.** **No. 999, Sec. 2, Dongda Rd., Daya Dist., Taichung City 428, Taiwan**
Test Method/ Standard:	**47 CFR FCC Part 15.247 & ANSI C63.10 2013** **KDB 558074 D01 v03r05** **KDB 662911 D01 v02r01**
Registration No.:	**960839**
Test By:	**Intertek Testing Services Taiwan Ltd.** **Hsinchu Laboratory** **No. 11, Lane 275, Ko-Nan 1 Street, Chia-Tung Li,** **Shiang-Shan District, Hsinchu City, Taiwan**

The test report was prepared by:

Candy Liu/ Assistant

These measurements were taken by:



Wayne Chen/ Engineer

The test report was reviewed by:

Name Rico Deng
Title Supervisor

Revision History

Report No.	Issue Date	Revision Summary
180400029TWN-001	Apr. 11, 2018	Add NFC module only. After engineer judgment, the difference does not affect original the RF characteristic, PCB layout and antenna location. Then the all test data and test items in this report based on report of 160300206TWN-001.

Table of Contents

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:	Console for Exercise Machine
Model No:	HURESAC-3XE-C
Radio Module:	MS-57423
Brand Name:	Matrix Fitness
Operating Frequency:	2412 MHz ~ 2462 MHz
Channel Number:	11 channels
Frequency of Each Channel:	2412+5 k, k＝0 ~ 10
Access scheme:	DSSS, OFDM
Rated Power:	DC 12 V from adapter
Power Cord:	N/A
Sample Received:	Mar. 08, 2016
Sample condition:	Workable
Test Date(s):	Apr. 20, 2016 ~ Jun. 13, 2016

Note 1: The test report only allows to be revised within three years from its original issued date unless further standard or the requirement was noticed.
Note 2: When determining the test conclusion, the Measurement Uncertainty of test has been considered.
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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 version :	UI 0.1.7.2, OS 2.0.19, IO 10
Product HW version :	v1.1
Radio SW version :	N/A
Radio HW version :	0B
Test SW Version :	USI_BCM43XX_Testing_Tool_V1_4_10r8

2.3 Antenna description

Antenna 1

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 : 2.8 dBi
Antenna Type : PIFA Antenna
Connector Type : I-PEX

Antenna 2

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 : 2.45 dBi
Antenna Type : PIFA Antenna
Connector Type : I-PEX

2.4 Peripherals equipment

Peripherals	Brand	Model No.	Serial No.	Data cable
Notebook PC	HP	HP Compaq nc2400	CNF6413CGN	Micro USB 0.5 meter × 1
Adapter	N/A	LSE0107A1240	N/A	N/A

2.5 Operation mode

The EUT was supplied with DC 12 V from adapter (Test voltage: 120 Vac, 60 Hz) .
TX-MODE is based on a specific test program “USI BCM FCC CE REG Tool”, and the program can 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, and 6.5 Mbps data rate for 802.11n(HT20) 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.

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	14.61	6	14.65	6	14.66
2	14.55	9	14.52	9	14.54
5.5	14.37	12	14.43	12	14.41
11	14.23	18	14.29	18	14.28
-	-	24	14.16	24	14.14
-	-	36	14.02	36	14.01
-	-	48	13.93	48	13.92
-	-	54	13.81	54	13.8

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	12.98	MCS0	12.7	MCS0	15.85
MCS1	12.89	MCS1	12.59	MCS1	15.75
MCS2	12.8	MCS2	12.45	MCS2	15.64
MCS3	12.71	MCS3	12.36	MCS3	15.55
MCS4	12.62	MCS4	12.22	MCS4	15.43
MCS5	12.53	MCS5	12.14	MCS5	15.35
MCS6	12.41	MCS6	12.01	MCS6	15.22
MCS7	12.29	MCS7	11.98	MCS7	15.15

802.11n HT40 ch6 chain0		802.11n HT40 ch6 chain1		802.11n HT40 ch6 chain1+chain0	
Data rate (Mbps)	AV (dBm)	Data rate (Mbps)	AV (dBm)	Data rate (Mbps)	AV (dBm)
MCS0	12.69	MCS0	12.72	MCS0	15.72
MCS1	12.58	MCS1	12.63	MCS1	15.62
MCS2	12.49	MCS2	12.55	MCS2	15.53
MCS3	12.4	MCS3	12.41	MCS3	15.42
MCS4	12.32	MCS4	12.33	MCS4	15.34
MCS5	12.25	MCS5	12.25	MCS5	15.26
MCS6	12.16	MCS6	12.14	MCS6	15.16
MCS7	12.07	MCS7	12.07	MCS7	15.08

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	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
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.

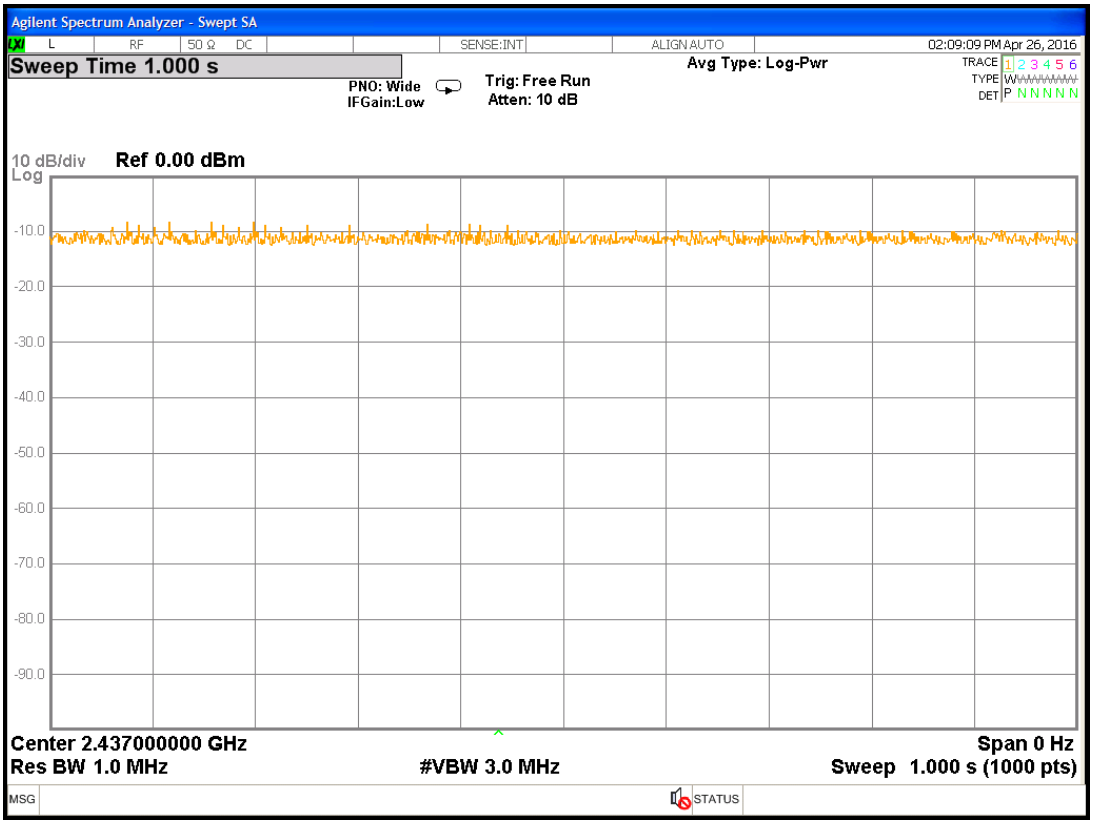
Mode	Software Version: TN73XEMAXHEADROOM		
	Channel	Frequency(MHz)	Power setting
802.11b (chain0)	1	2412	17.5
	6	2437	17.5
	11	2462	17.5
802.11g (chain0)	1	2412	17.5
	6	2437	17.5
	11	2462	17.5
802.11g (chain1)	1	2412	17.5
	6	2437	17.5
	11	2462	17.5
802.11n (HT20)	1	2412	15.5
	6	2437	15.5
	11	2462	15.5
802.11n (HT40)	3	2422	15.0
	6	2437	15.0
	9	2452	15.0

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

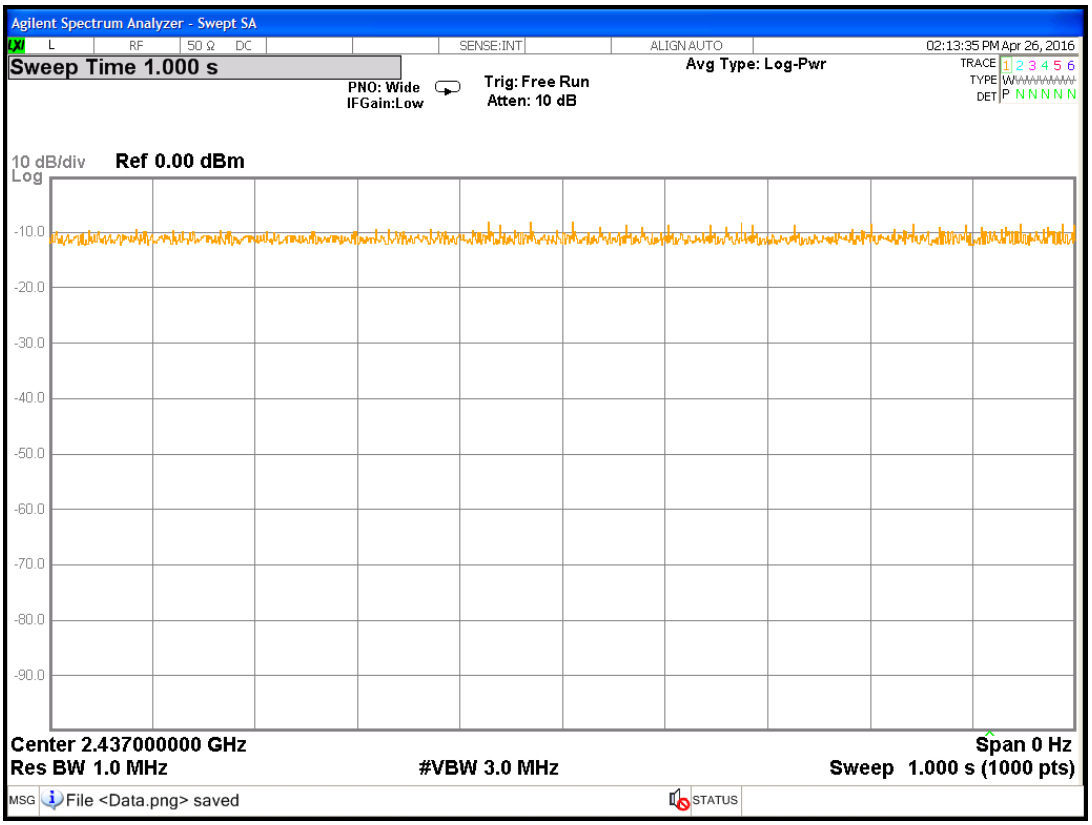
Mode	Channel	Frequency (MHz)	Data rate	Signal on time	Total signal transmit time	Duty cycle	Duty Cycle factor
802.11b	6	2437	1	1	1	1.000	0.000
802.11g (chain0)	6	2437	6	1	1	1.000	0.000
802.11g (chain1)	6	2437	6	1	1	1.000	0.000
802.11n HT20 (chain0)	6	2437	6.5	1	1	1.000	0.000
802.11n HT20 (chain1)	6	2437	6.5	1	1	1.000	0.000
802.11n HT40 (chain0)	6	2437	13.5	1	1	1.000	0.000
802.11n HT40 (chain1)	6	2437	13.5	1	1	1.000	0.000

Chain0 : Duty cycle @ 802.11b mode Ch 6

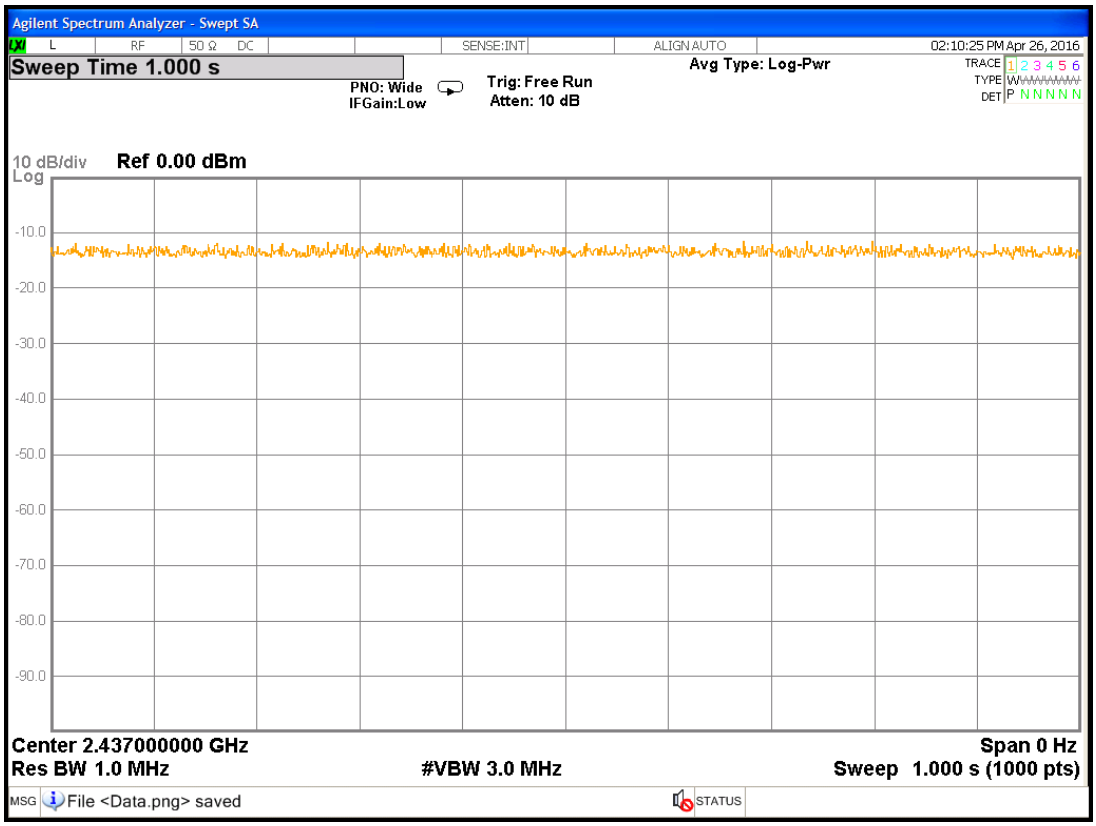
Chain0 : Duty cycle @ 802.11g mode Ch 6



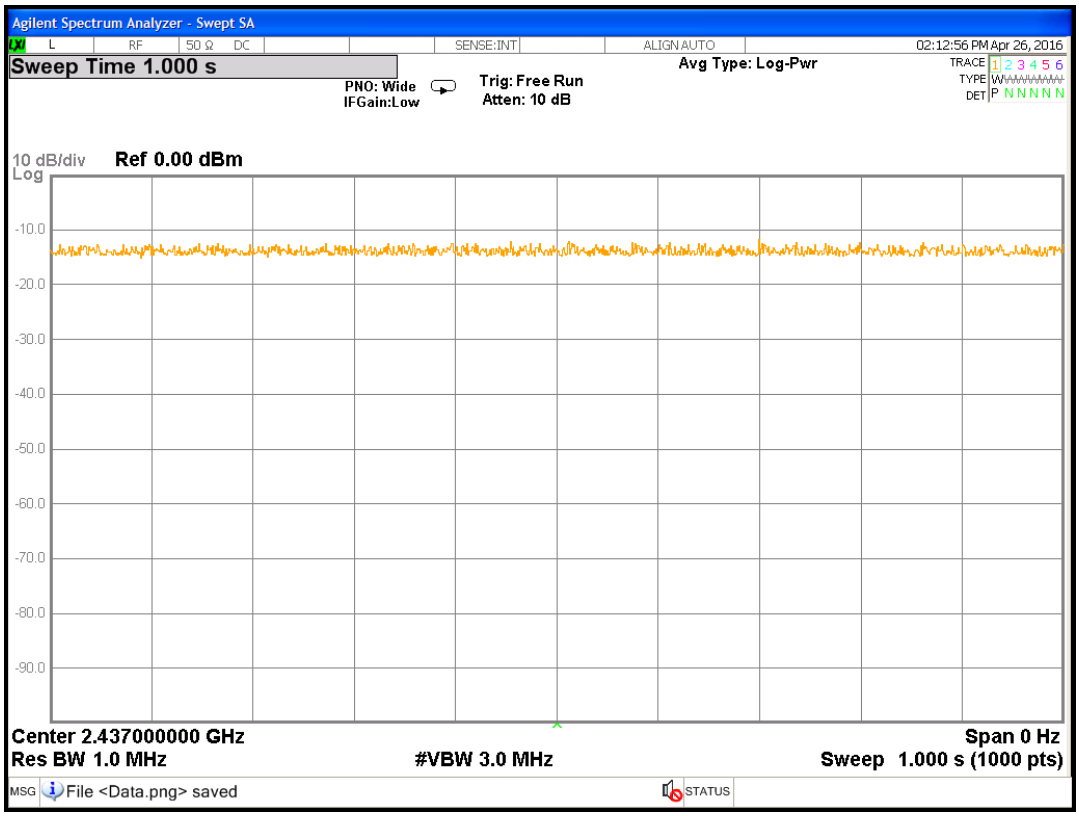
Chain1 : Duty cycle @ 802.11g mode Ch 6



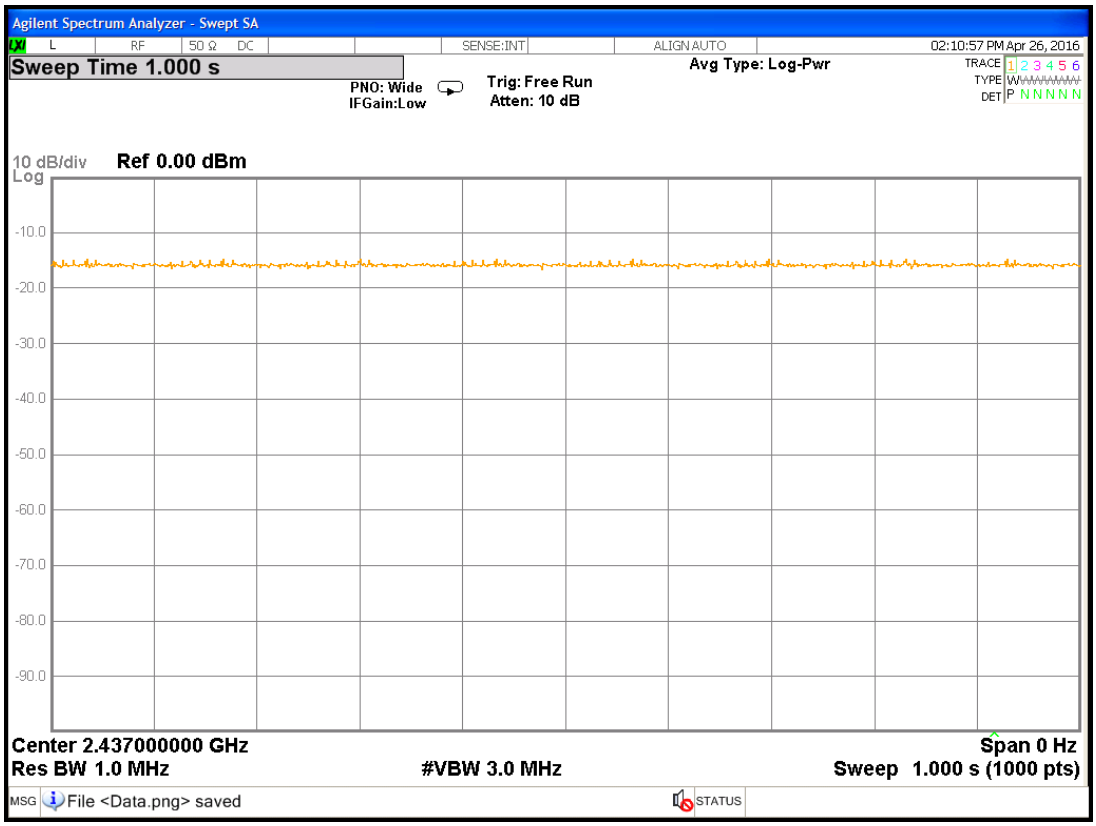
Chain0 : Duty cycle @ 802.11n(HT20) mode Ch 6



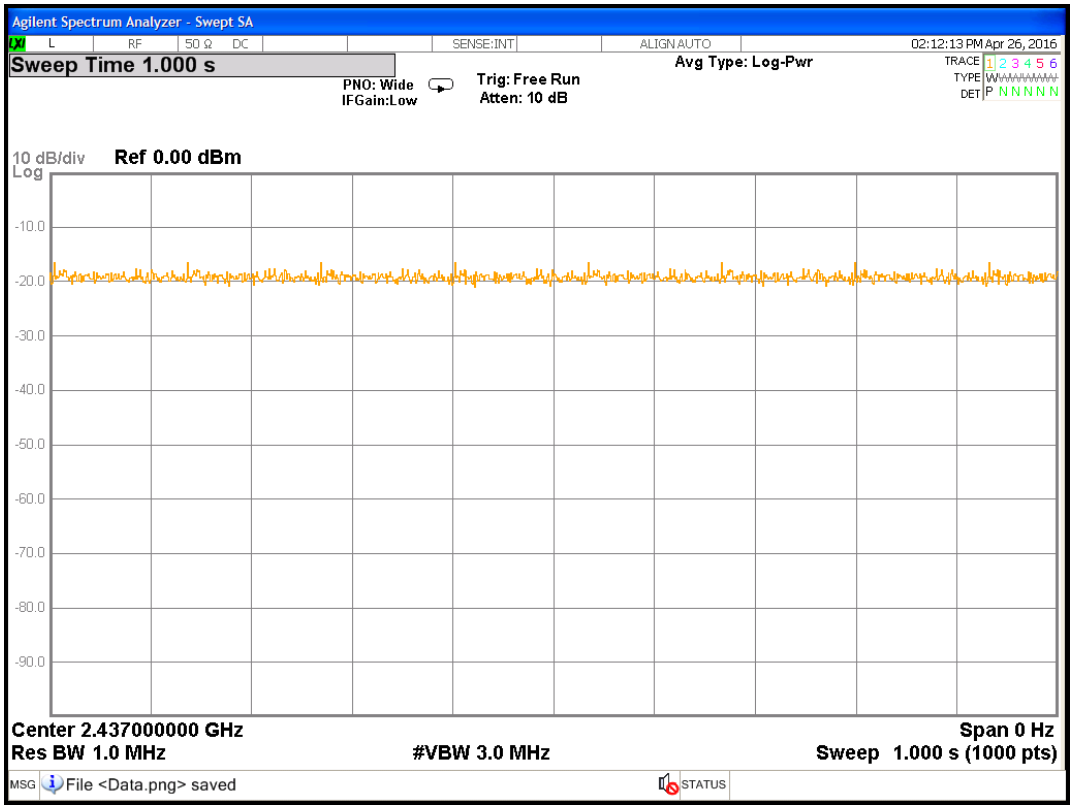
Chain1 : Duty cycle @ 802.11n(HT20) mode Ch 6



Chain0 : Duty cycle @ 802.11n(HT40) mode Ch 6



Chain1 : Duty cycle @ 802.11n(HT40) mode Ch 6



3. Minimum 6 dB Bandwidth

3.1 Operating environment

Temperature:	25	℃
Relative Humidity:	50	%
Atmospheric Pressure	1008	hPa
Requirement & Test method	15.247(a)(2) KDB 558074 D01 v03r05	

3.2 Limit for minimum 6dB bandwidth

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

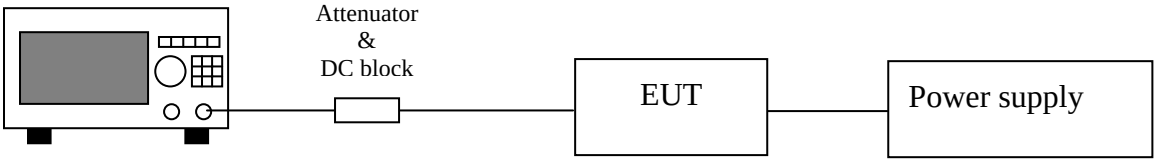
3.3 Measuring instrument setting

Spectrum analyzer settings	
Spectrum Analyzer function	**Setting**
Detector	Peak
RBW	100kHz
VBW	≧3 x 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

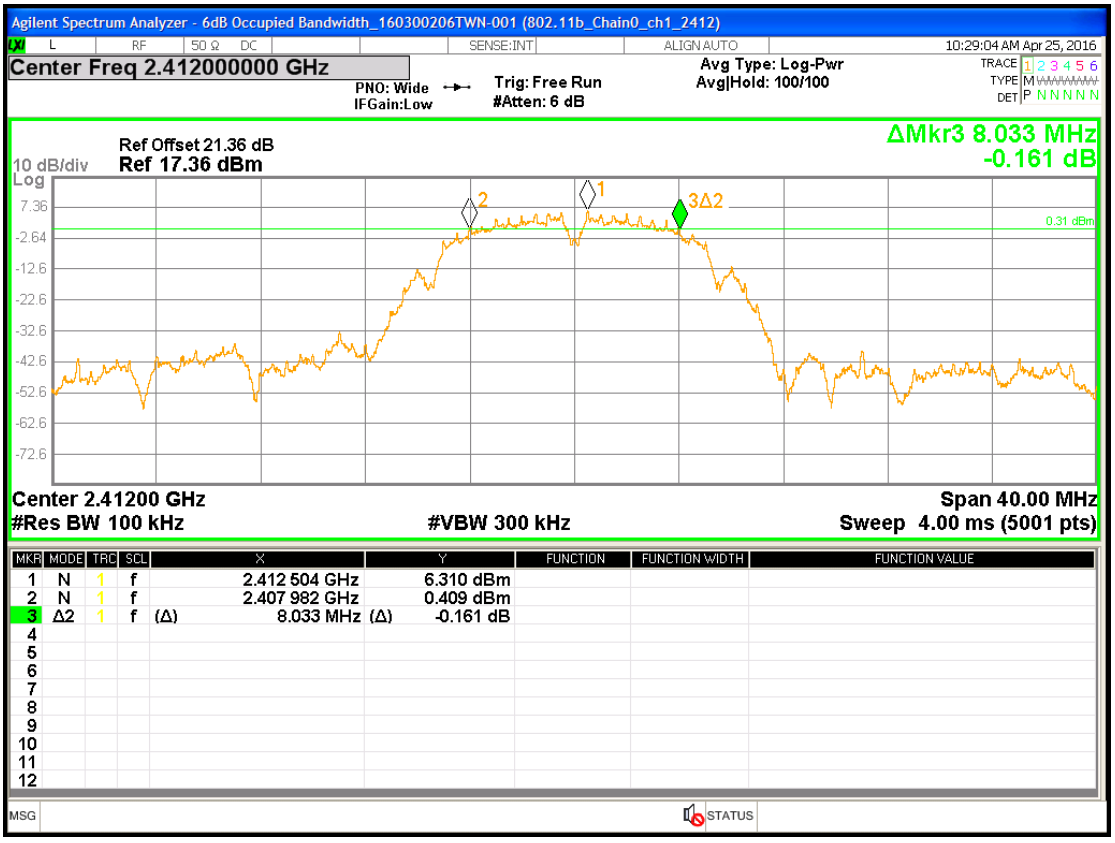
3.5 Test diagram



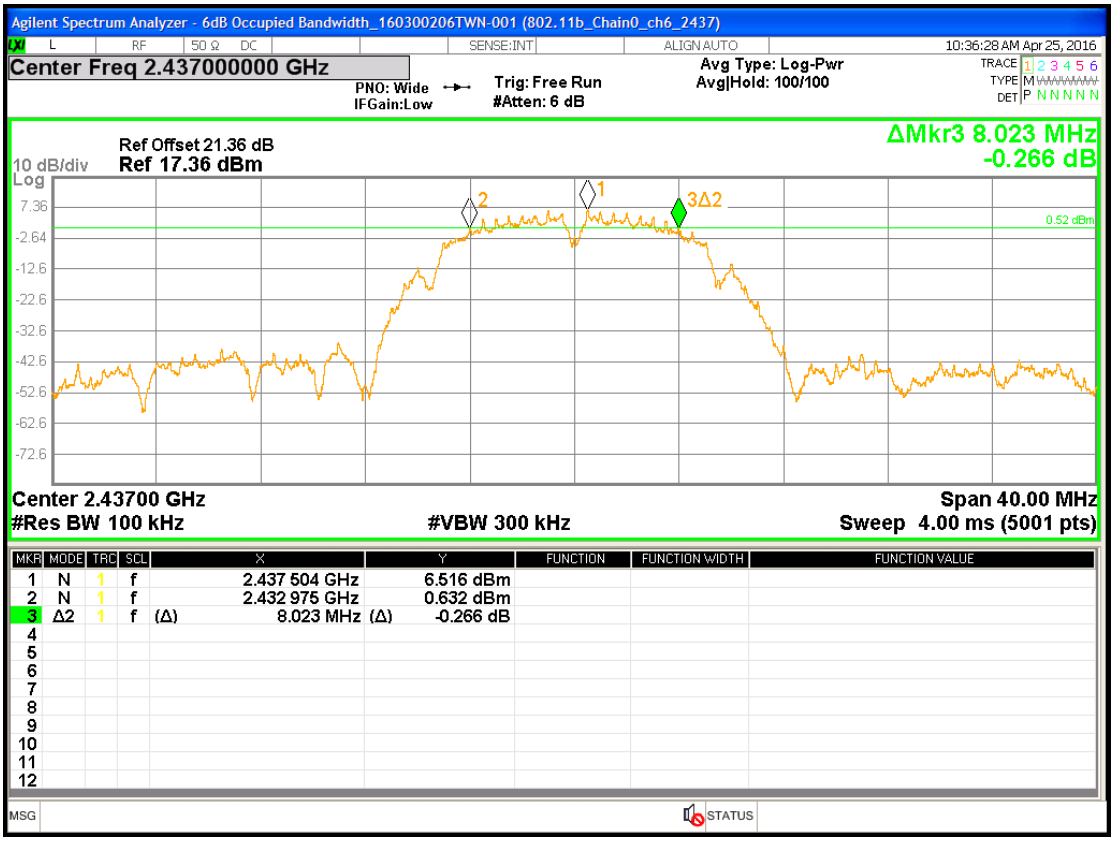
3.6 Test results

Mode	Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Test Result
802.11b (chain0)	1	2412	8.033	0.5	Pass
	6	2437	8.023	0.5	Pass
	11	2462	7.589	0.5	Pass
802.11g (chain0)	1	2412	15.281	0.5	Pass
	6	2437	14.474	0.5	Pass
	11	2462	15.791	0.5	Pass
802.11g (chain1)	1	2412	15.039	0.5	Pass
	6	2437	15.607	0.5	Pass
	11	2462	15.235	0.5	Pass
802.11n(HT20) (chain0)	1	2412	15.643	0.5	Pass
	6	2437	15.667	0.5	Pass
	11	2462	15.003	0.5	Pass
802.11n(HT20) (chain1)	1	2412	14.991	0.5	Pass
	6	2437	15.544	0.5	Pass
	11	2462	15.037	0.5	Pass
802.11n(HT40) (chain0)	3	2422	36.079	0.5	Pass
	6	2437	36.325	0.5	Pass
	9	2452	36.129	0.5	Pass
802.11n(HT40) (chain1)	3	2422	36.266	0.5	Pass
	6	2437	36.283	0.5	Pass
	9	2452	36.305	0.5	Pass

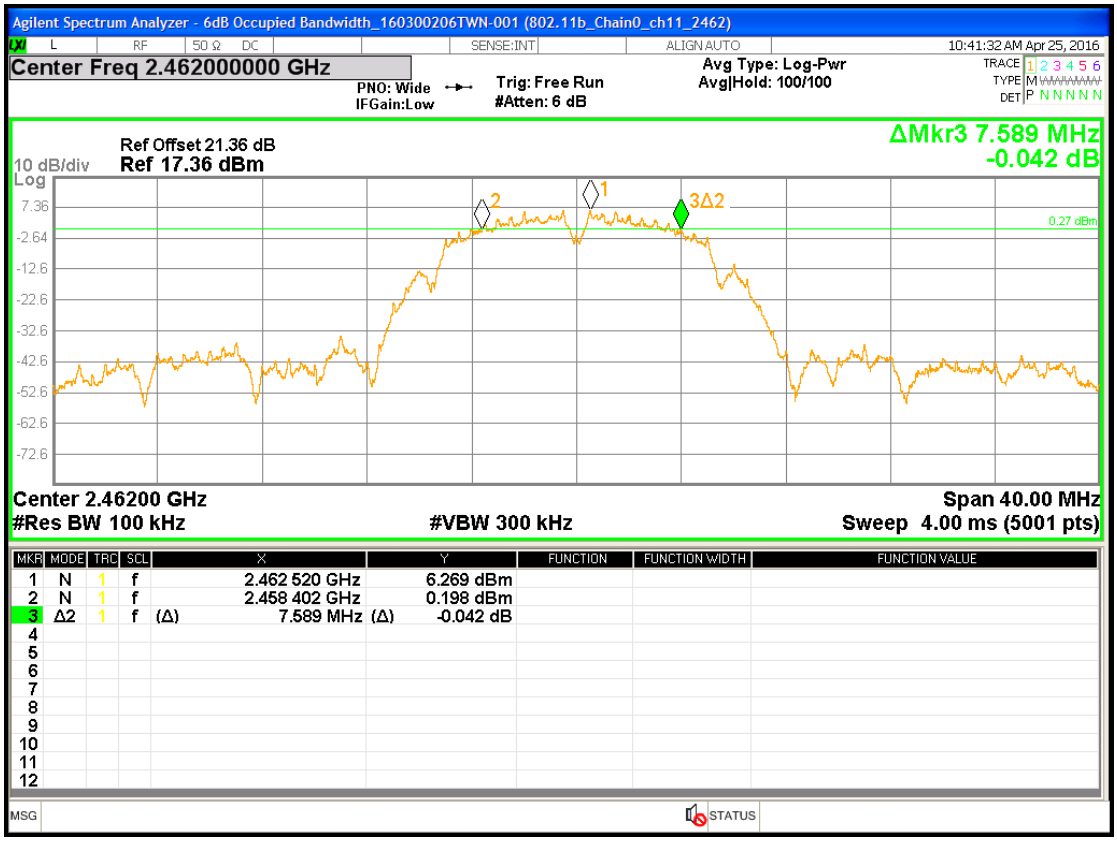
Chain0 : 6dB Bandwidth @ 802.11b mode Ch 1



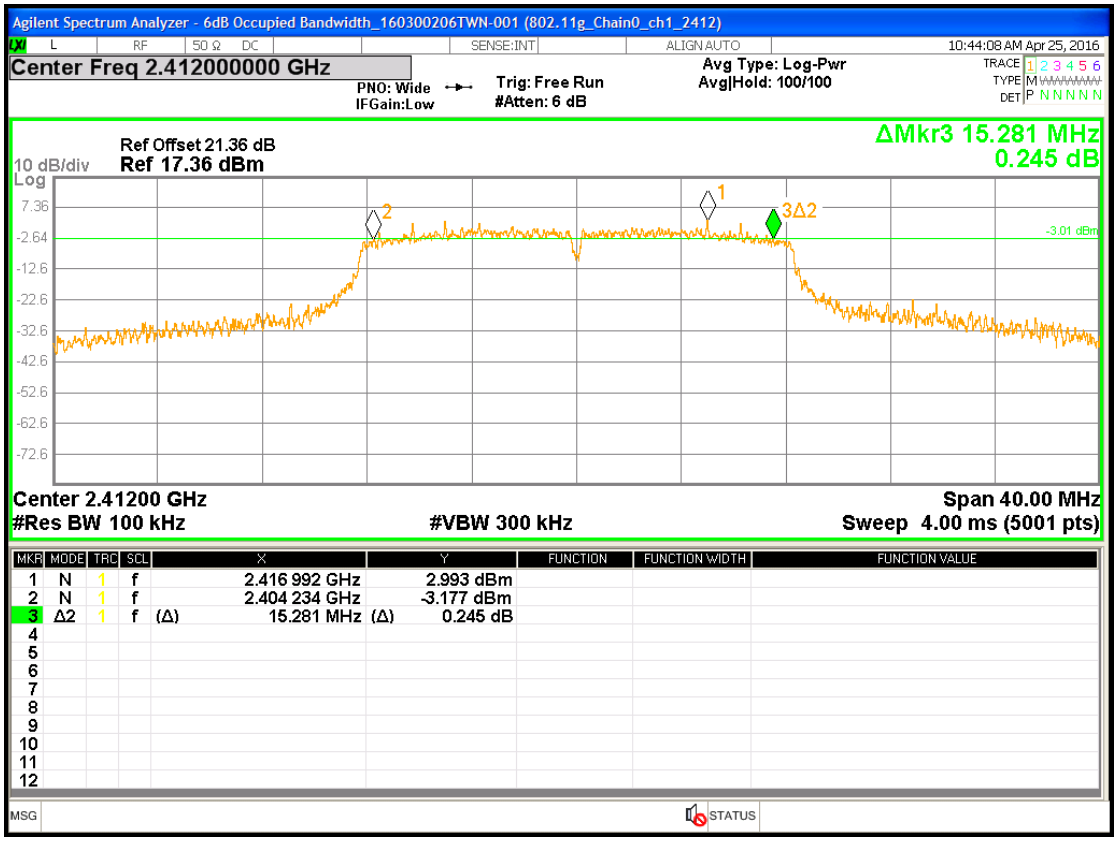
Chain0 : 6dB Bandwidth @ 802.11b mode Ch 6



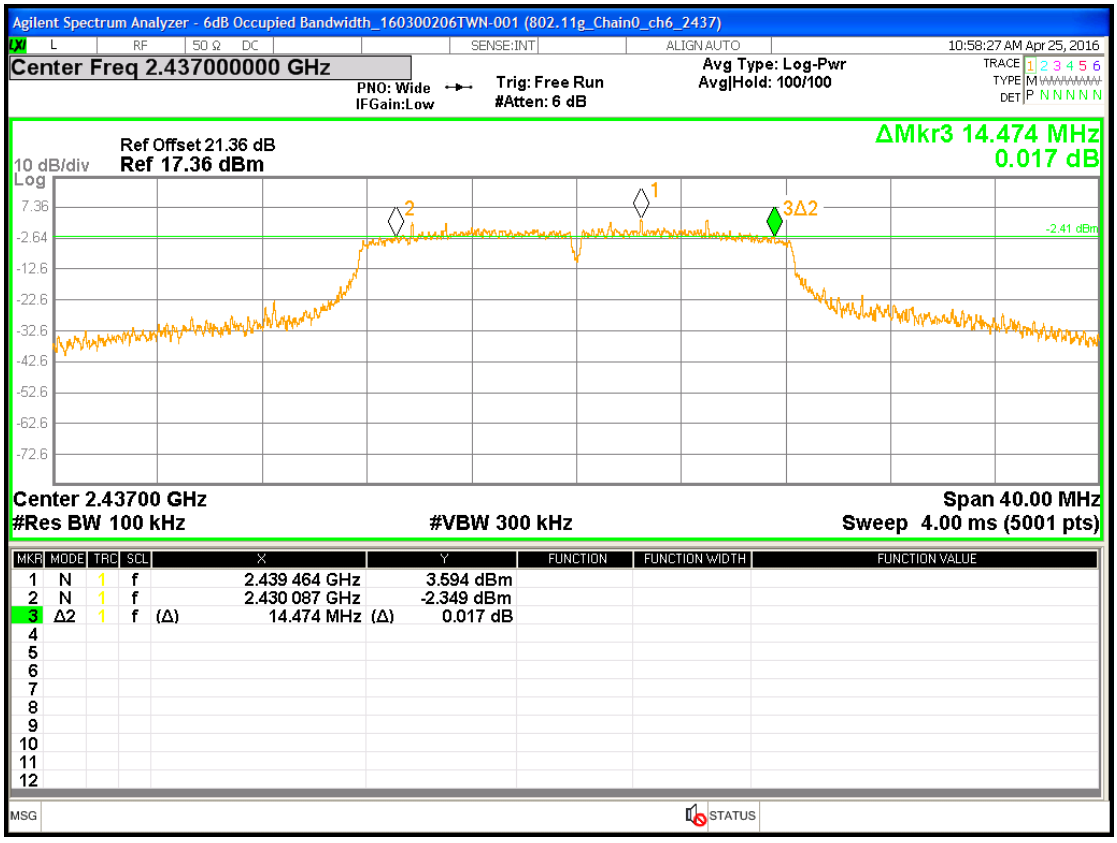
Chain0 : 6dB Bandwidth @ 802.11b mode Ch11



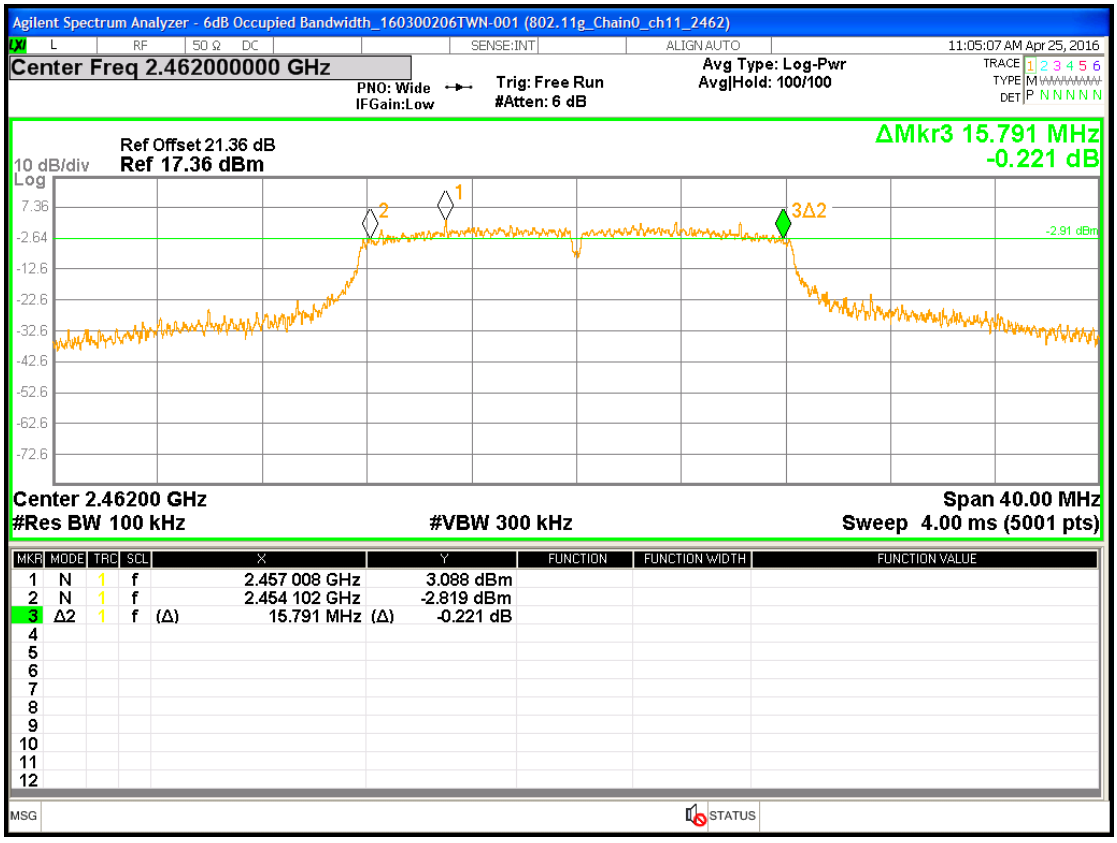
Chain0 : 6dB Bandwidth @ 802.11g mode Ch 1



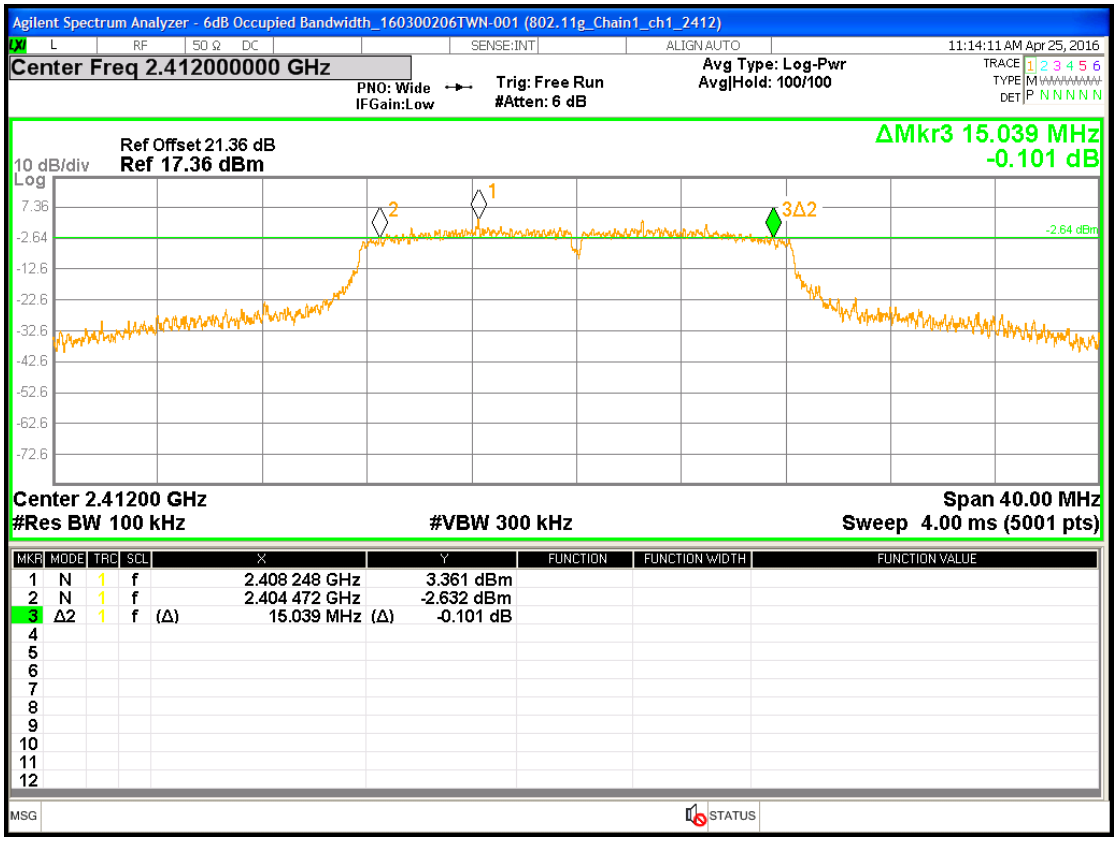
Chain0 : 6dB Bandwidth @ 802.11g mode Ch 6



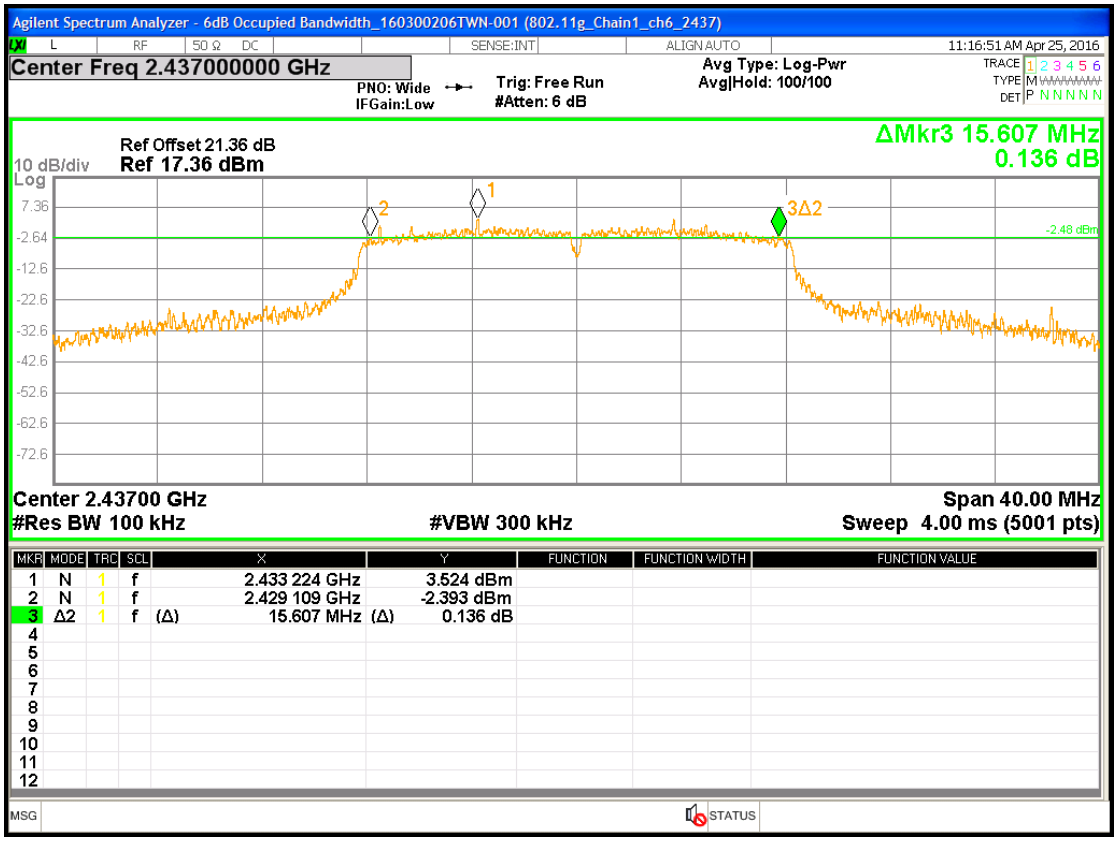
Chain0 : 6dB Bandwidth @ 802.11g mode Ch11



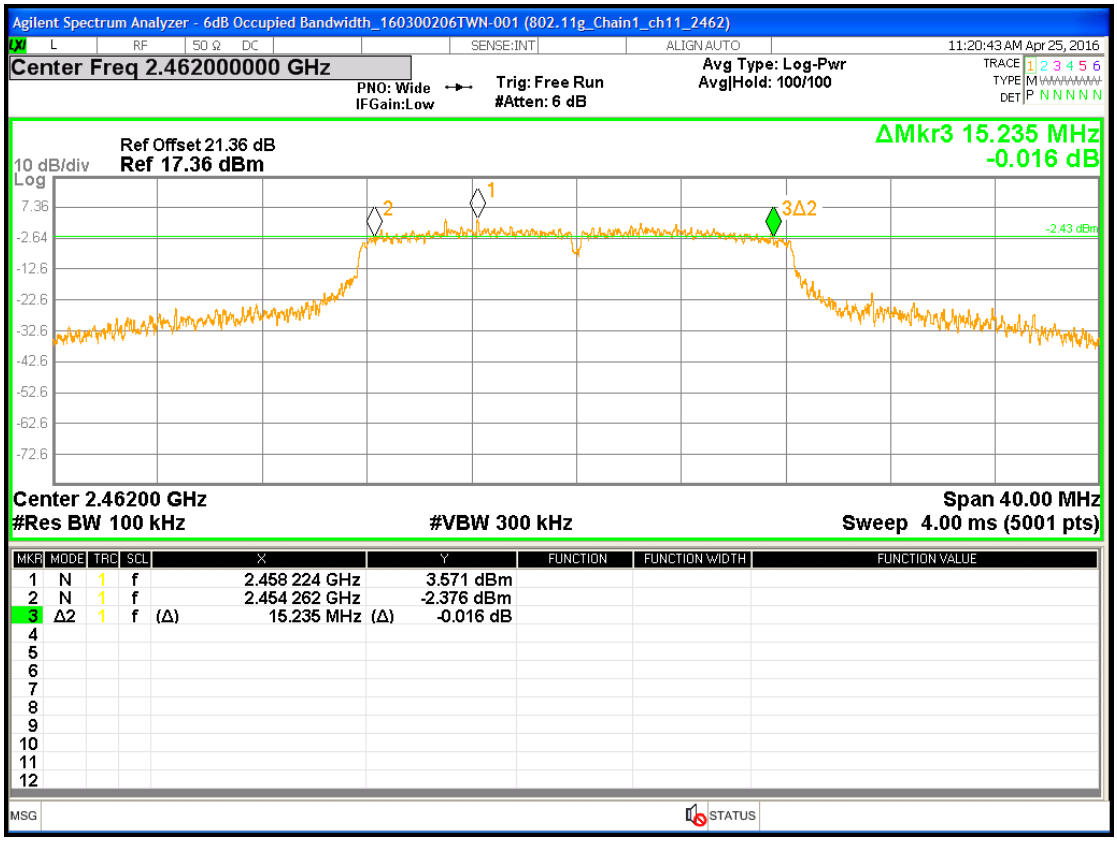
Chain1 : 6dB Bandwidth @ 802.11g mode Ch 1



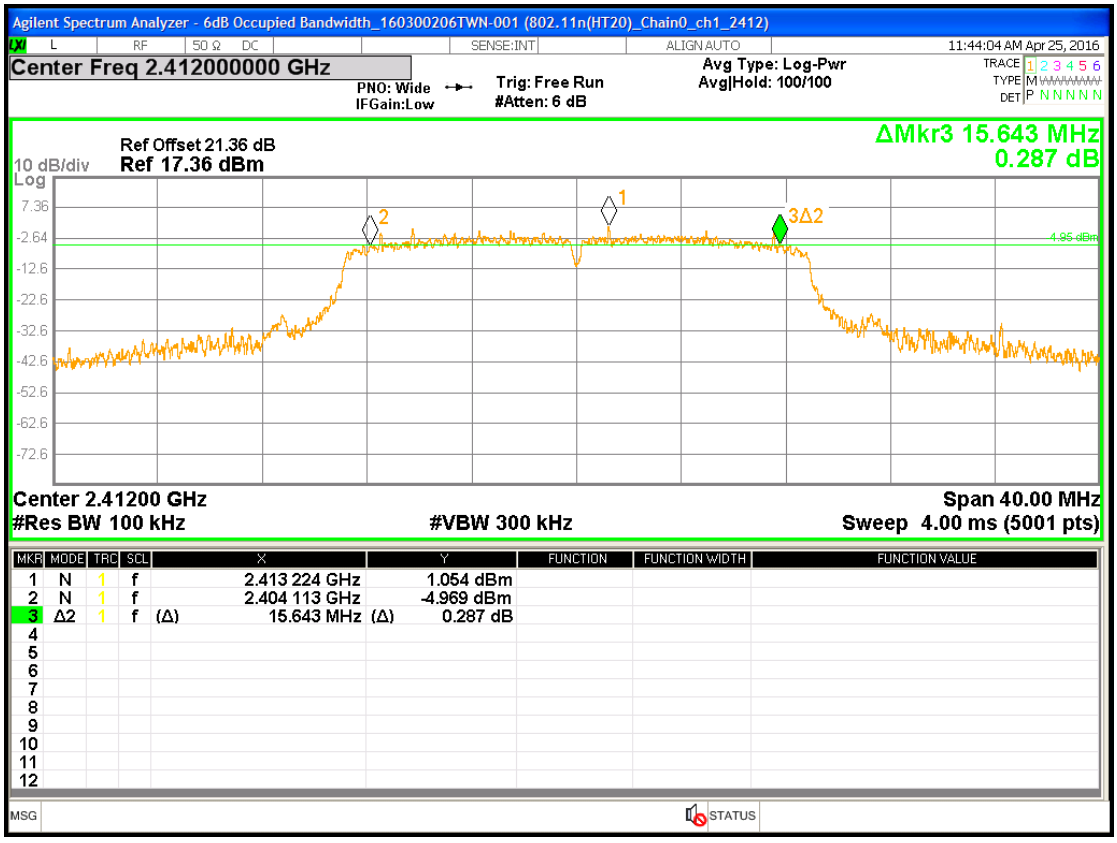
Chain1 : 6dB Bandwidth @ 802.11g mode Ch 6



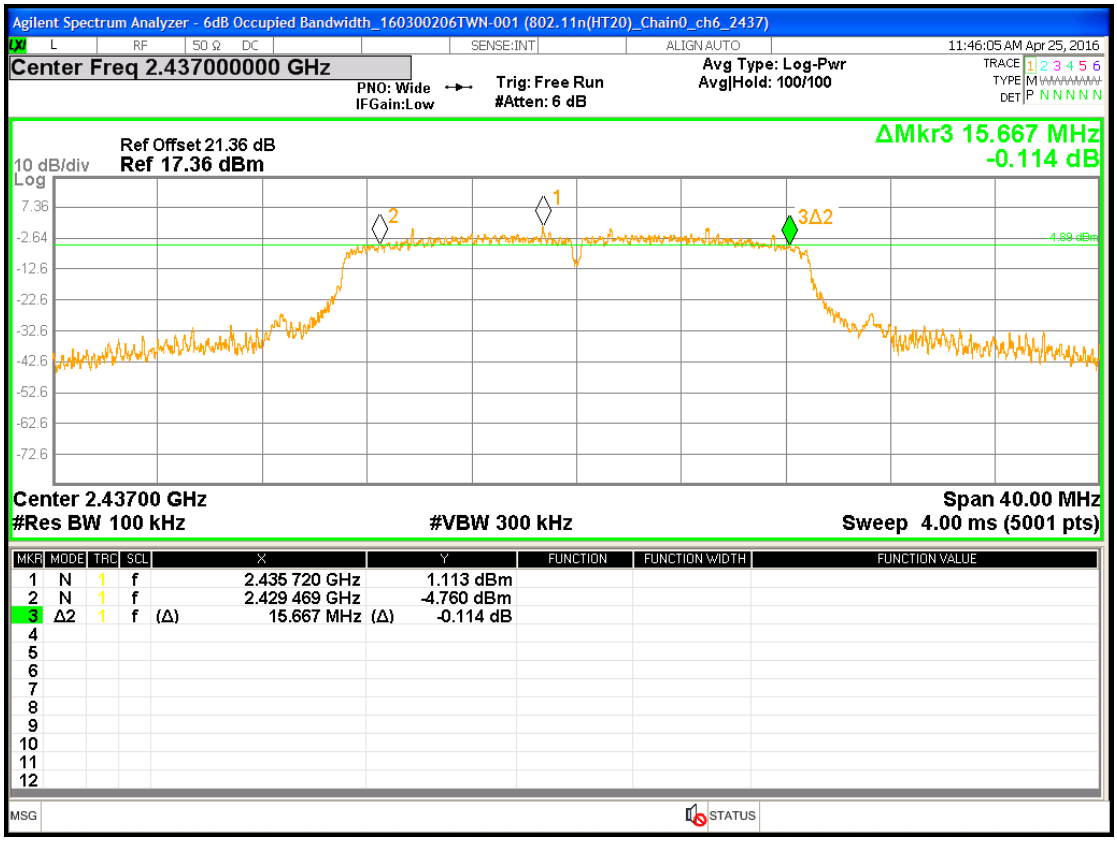
Chain1 : 6dB Bandwidth @ 802.11g mode Ch11



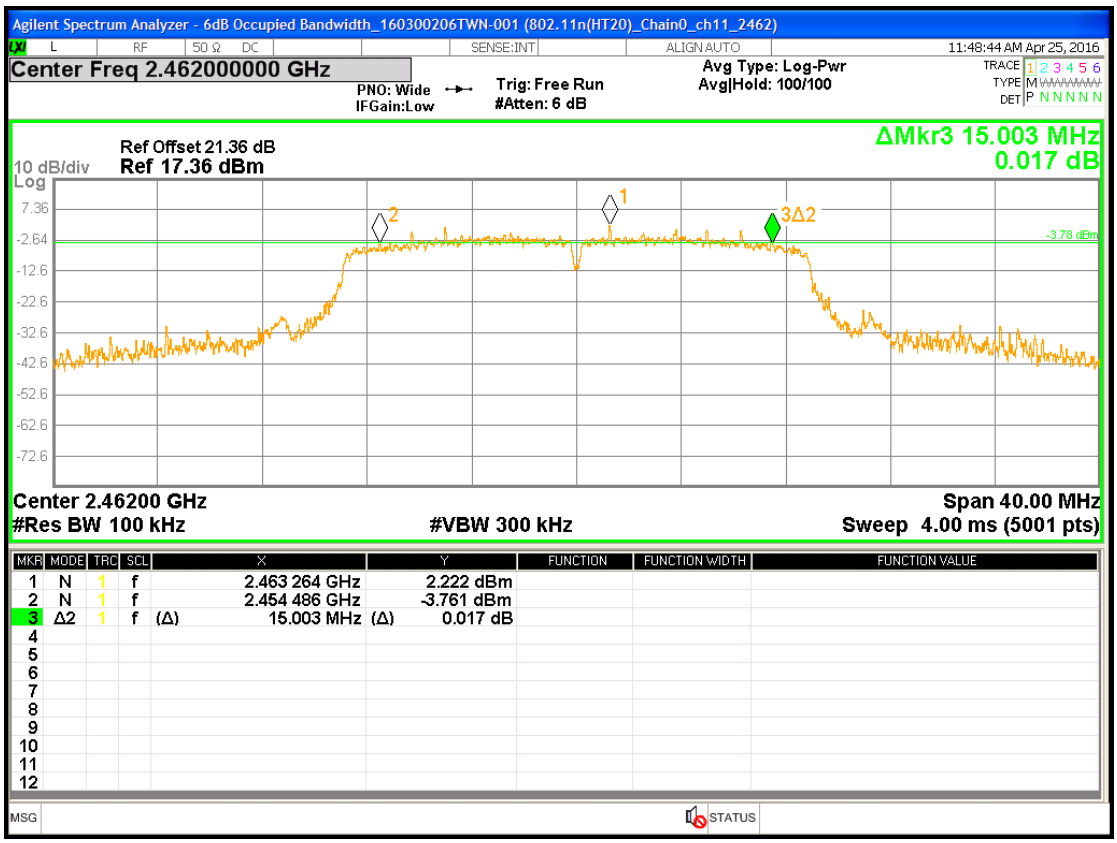
Chain0 : 6dB Bandwidth @ 802.11n(HT20) mode Ch 1



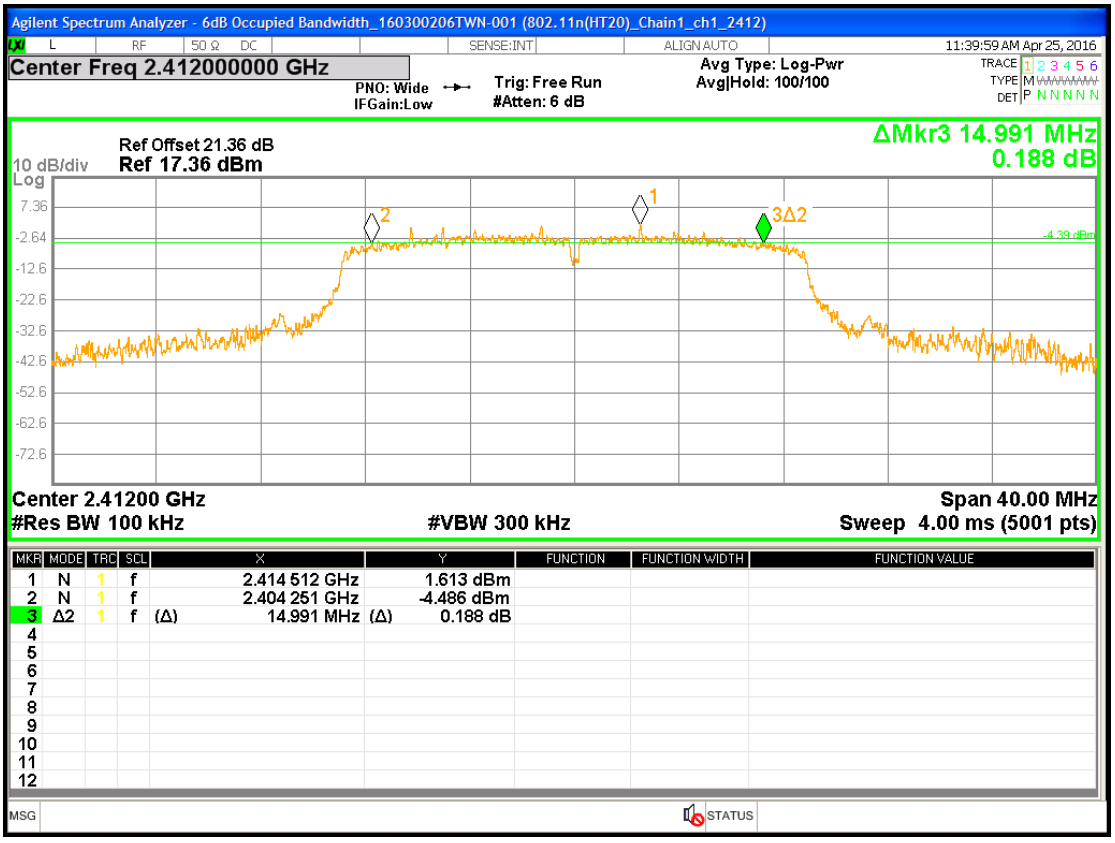
Chain0 : 6dB Bandwidth @ 802.11n(HT20) mode Ch 6



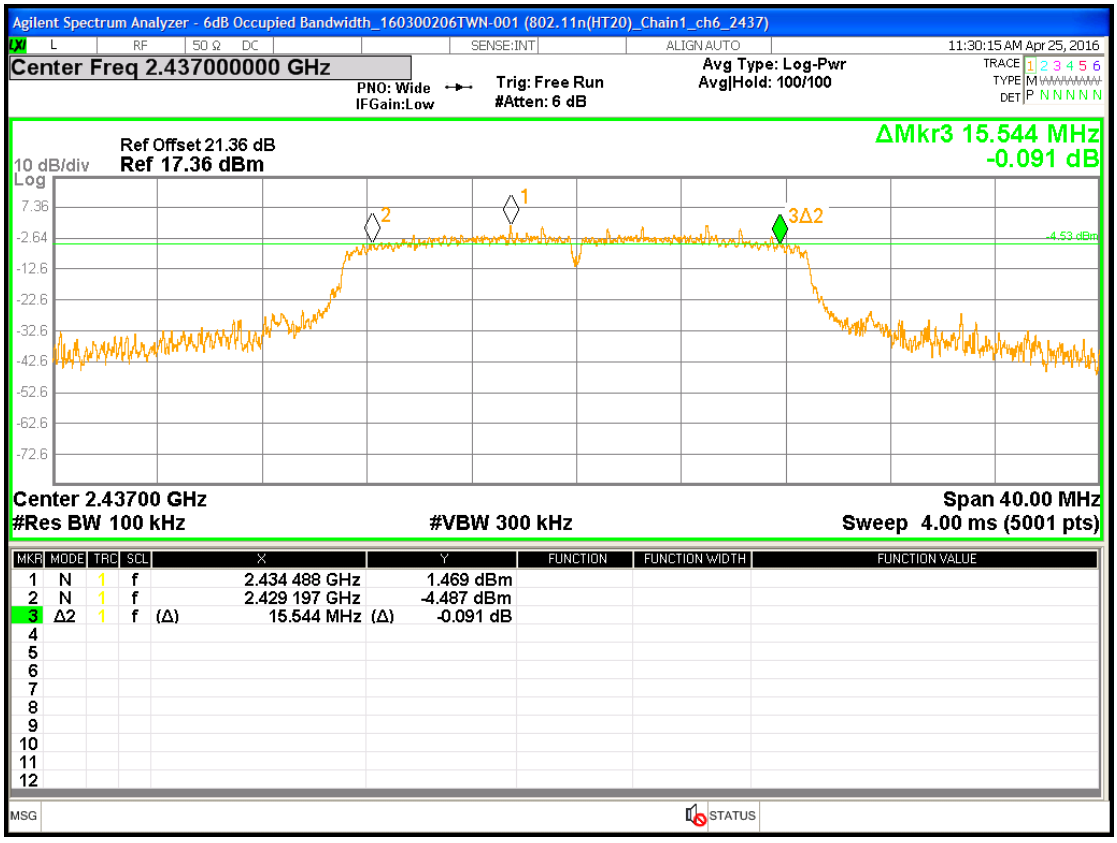
Chain0 : 6dB Bandwidth @ 802.11n(HT20) mode Ch11



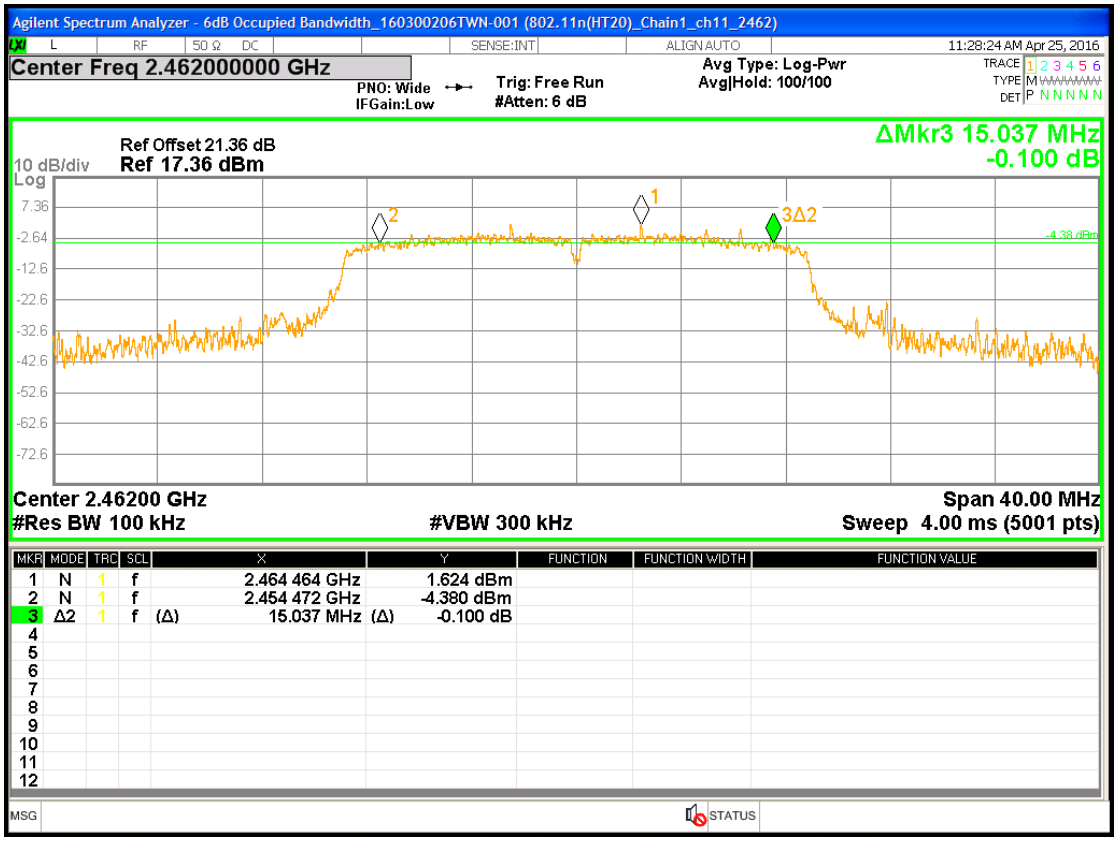
Chain1 : 6dB Bandwidth @ 802.11n(HT20) mode Ch 1



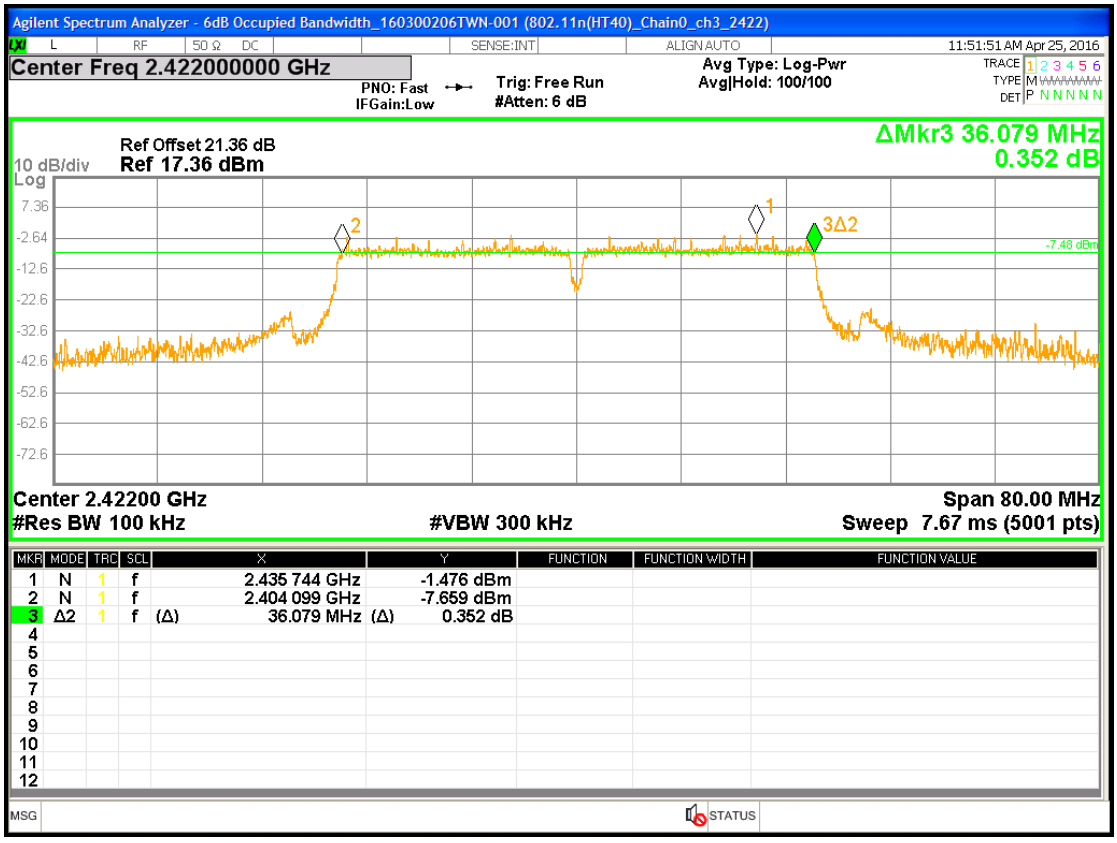
Chain1 : 6dB Bandwidth @ 802.11n(HT20) mode Ch 6



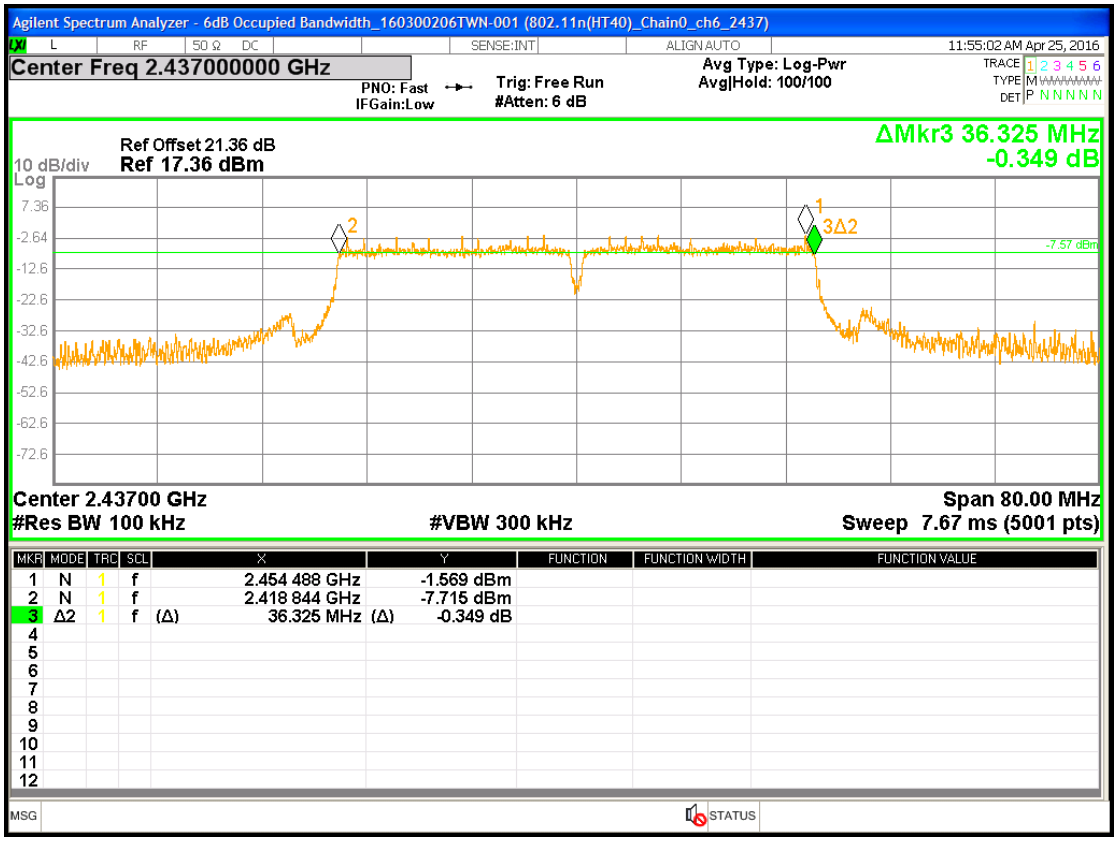
Chain1 : 6dB Bandwidth @ 802.11n(HT20) mode Ch11



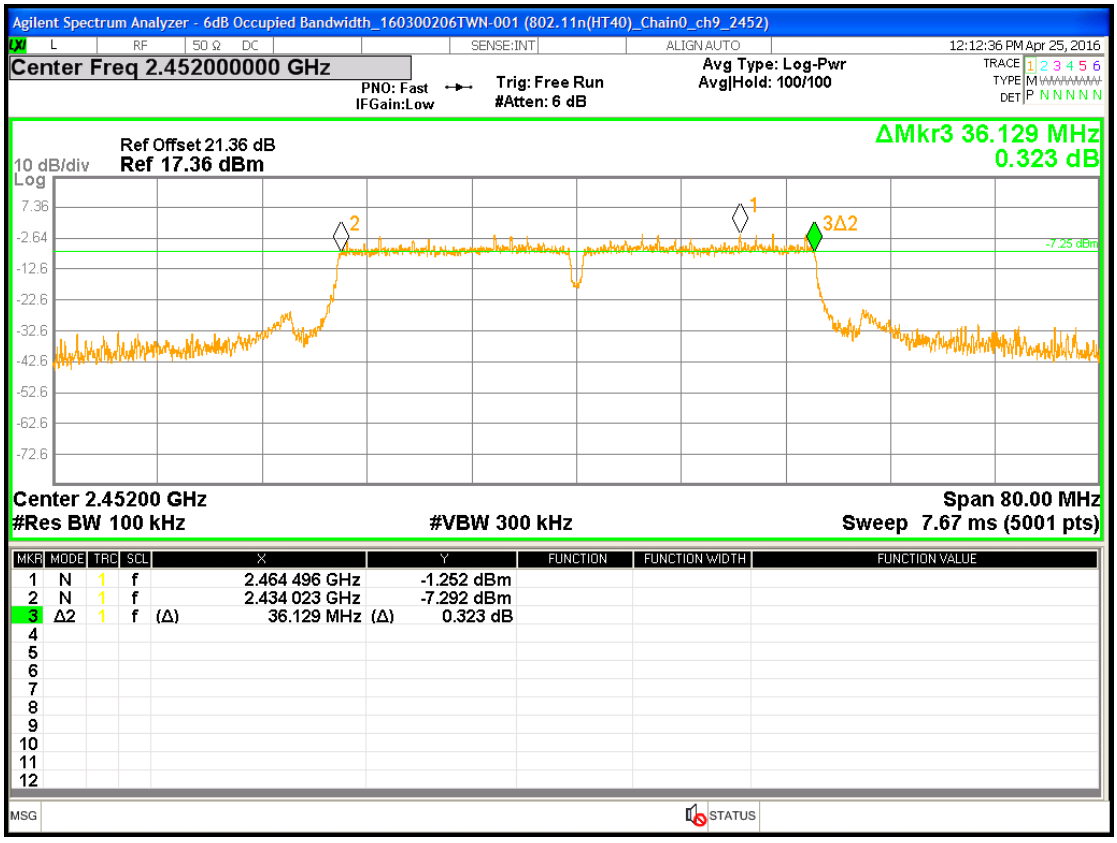
Chain0 : 6dB Bandwidth @ 802.11n(HT40) mode Ch3



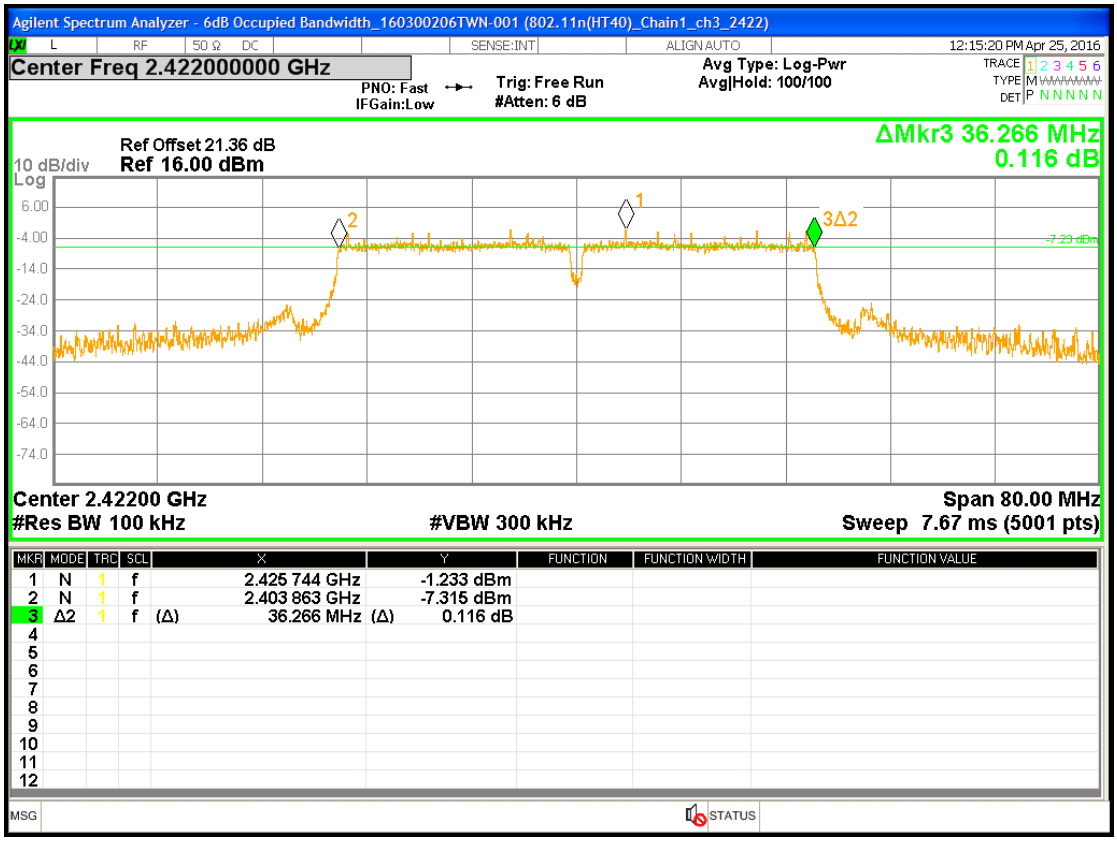
Chain0 : 6dB Bandwidth @ 802.11n(HT40) mode Ch6



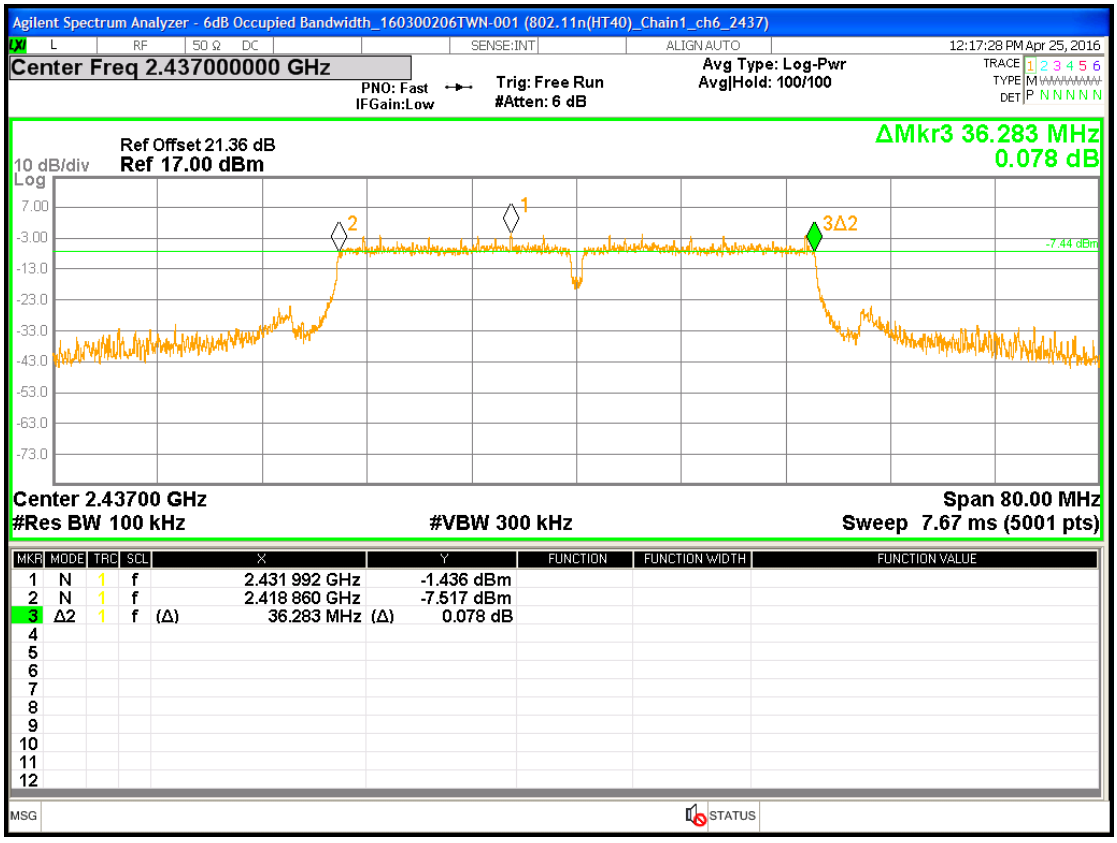
Chain0 : 6dB Bandwidth @ 802.11n(HT40) mode Ch9



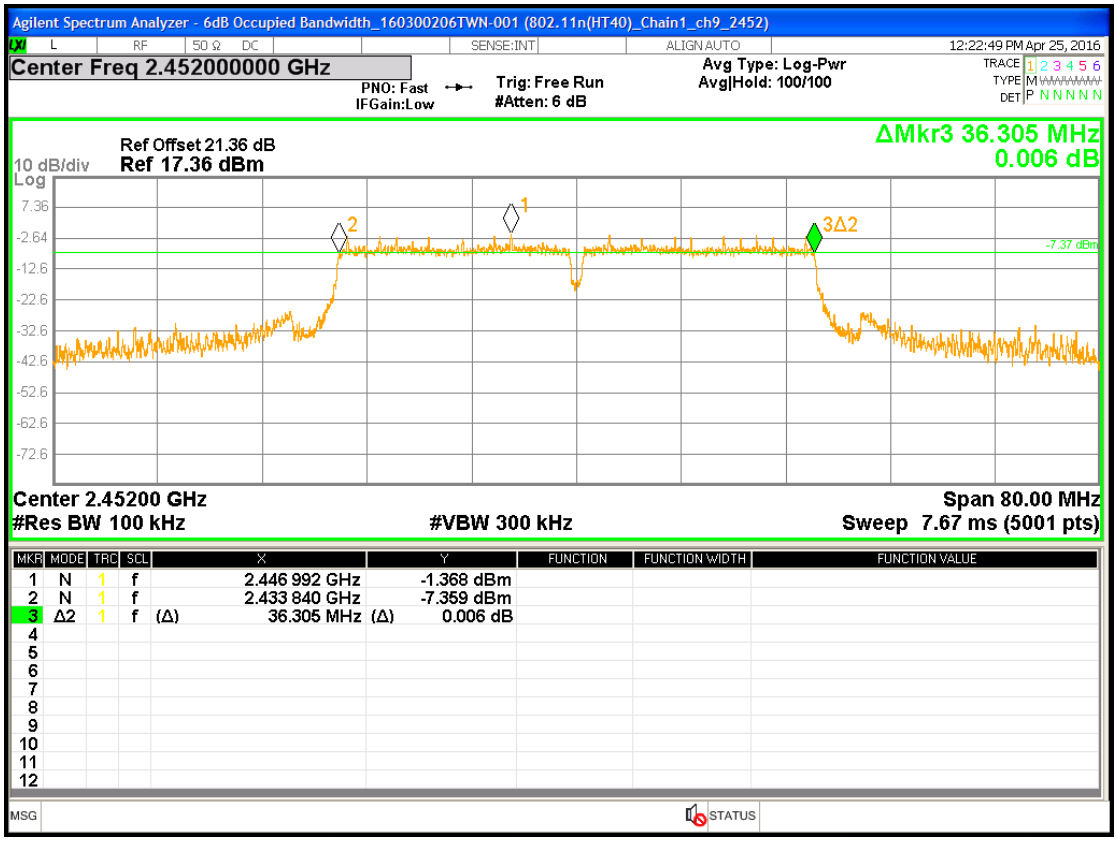
Chain1 : 6dB Bandwidth @ 802.11n(HT40) mode Ch3



Chain1 : 6dB Bandwidth @ 802.11n(HT40) mode Ch6



Chain1 : 6dB Bandwidth @ 802.11n(HT40) mode Ch9



4. Maximum Peak Conducted Output Power

4.1 Operating environment

Temperature:	25	℃
Relative Humidity:	50	%
Atmospheric Pressure	1008	hPa
Requirement & Test method	15.247(b)(3) KDB 558074 D01 v03r05	

4.2 Limit for maximum peak conducted output power

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

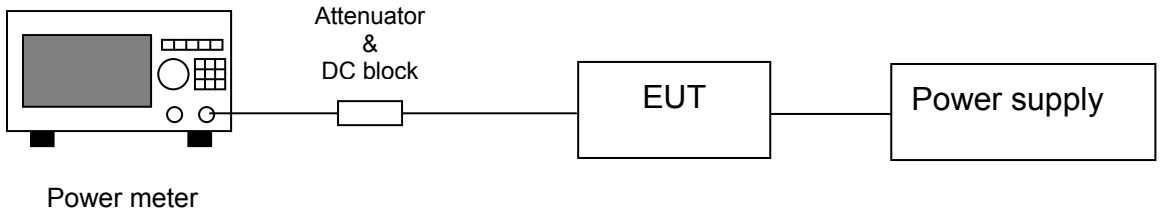
4.3 Measuring instrument setting

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 9.1.2 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

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)
802.11b (chain0)	1	2412	1	14.55	28.51	18.17	65.61	30	-11.83
	6	2437		14.61	28.91	18.23	66.53	30	-11.77
	11	2462		14.72	29.65	18.36	68.55	30	-11.64
802.11g (chain0)	1	2412	6	14.66	29.24	20.95	124.45	30	-9.05
	6	2437		14.65	29.17	21.09	128.53	30	-8.91
	11	2462		14.66	29.24	21.36	136.77	30	-8.64
802.11g (chain1)	1	2412	6	14.77	29.99	21.42	138.68	30	-8.58
	6	2437		14.66	29.24	21.55	142.89	30	-8.45
	11	2462		14.65	29.17	21.59	144.21	30	-8.41

2TX

Mode	Ch.	Freq. (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)		
802.11n (HT20)	1	2412	6.5	12.85	19.82	12.67	19.74	19.28	95.94	18.49	94.19	37.77	15.77	190.13	22.79	30	-7.21
	6	2437		12.98	20.12	12.7	19.99	19.86	102.80	18.62	99.77	38.48	15.85	202.57	23.07	30	-6.93
	11	2462		12.88	20.01	12.91	20.05	19.41	100.23	19.54	101.16	38.95	15.91	201.39	23.04	30	-6.96

Mode	Ch.	Freq. (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)		
802.11n (HT20)	1	2412	6.5	12.58	19.62	12.6	19.98	18.11	91.62	18.20	99.54	36.31	15.60	191.16	22.81	30	-7.19
	6	2437		12.69	19.71	12.72	20.2	18.58	93.54	18.71	104.71	37.28	15.72	198.25	22.97	30	-7.03
	11	2462		12.79	19.79	12.61	19.87	19.01	95.28	18.24	97.05	37.25	15.71	192.33	22.84	30	-7.16

5. Power Spectral Density

5.1 Operating environment

Temperature:	25	℃
Relative Humidity:	50	%
Atmospheric Pressure	1008	hPa
Requirement & Test method	15.247(e) KDB 558074 D01 v03r05	

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

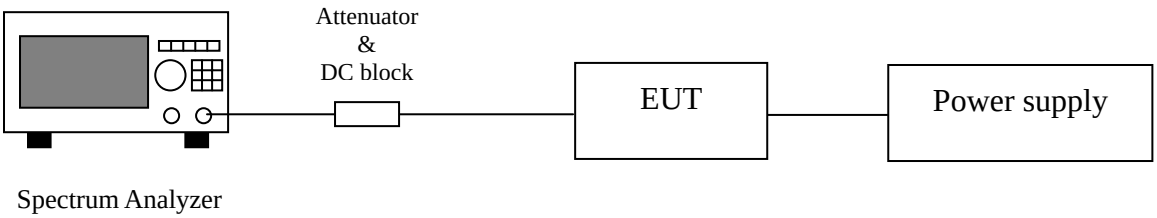
5.3 Measuring instrument setting

Spectrum analyzer settings	
Spectrum Analyzer function	**Setting**
Detector	Peak
RBW	≧3 kHz
VBW	≧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

Single TX

Mode	Channel	Frequency (MHz)	Correction Factor	PSD in 10kHz	PSD in 3kHz		Limit (dBm)	Margin (dB)
					(dBm)	(mW)		
802.11b (chain0)	1	2412	5.23	-2.56	-7.79	0.17	8	-15.79
	6	2437	5.23	-2.60	-7.82	0.17	8	-15.82
	11	2462	5.23	-2.85	-8.08	0.16	8	-16.08
802.11g (chain0)	1	2412	5.23	-4.51	-9.74	0.11	8	-17.74
	6	2437	5.23	-5.59	-10.82	0.08	8	-18.82
	11	2462	5.23	-4.43	-9.66	0.11	8	-17.66
802.11g (chain1)	1	2412	5.23	-5.01	-10.24	0.09	8	-18.24
	6	2437	5.23	-4.90	-10.12	0.10	8	-18.12
	11	2462	5.23	-4.75	-9.98	0.10	8	-17.98

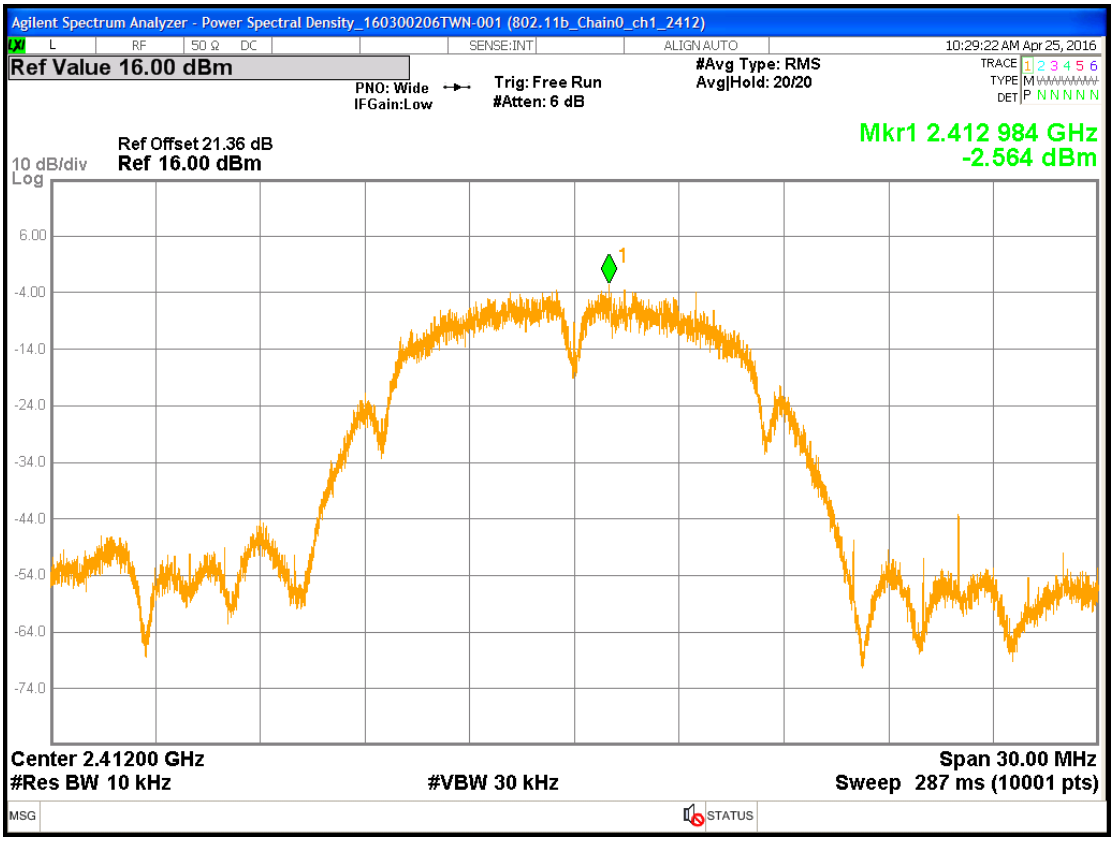
Correction Factor =10log(10kHz/3kHz)

2TX

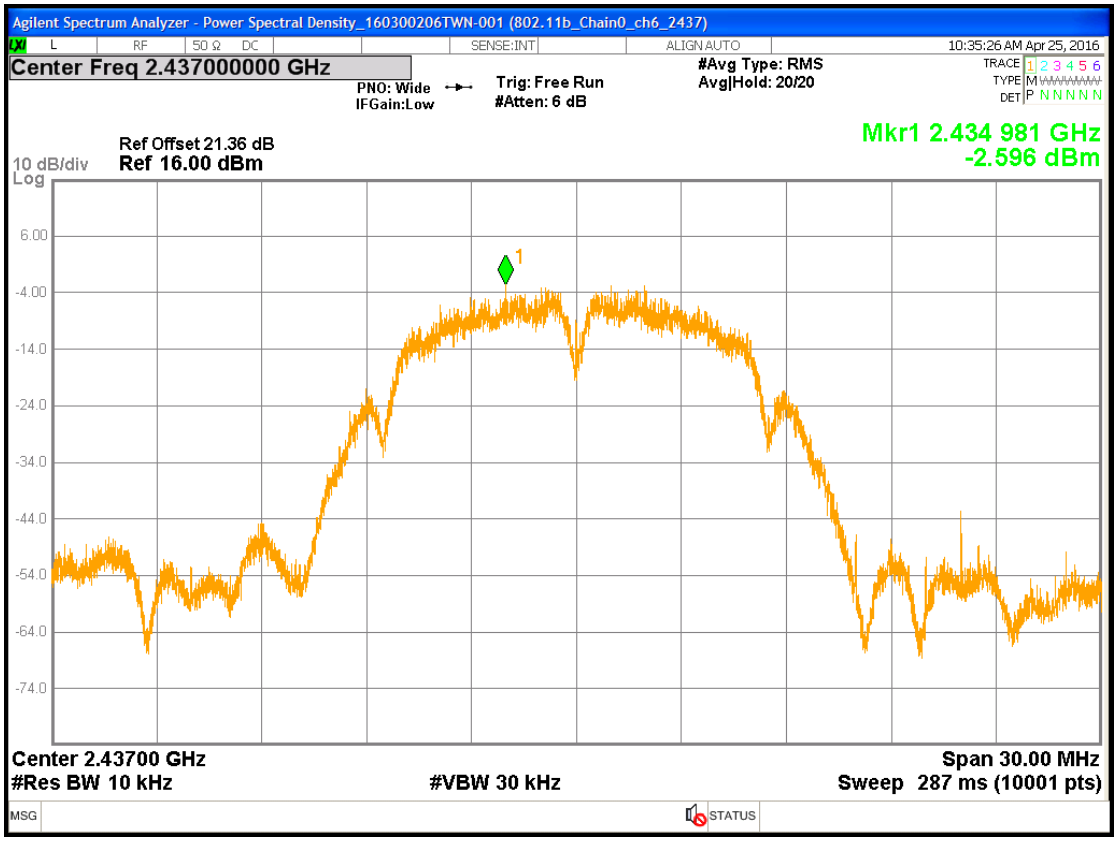
Mode	Ch.	Freq. (MHz)	Correction Factor	PSD (dBm) in 10kHz		PSD (dBm) in 3kHz		Total PSD		MIMO		Limit (dBm)	Margin (dB)
				chain0	chain1	chain0	chain1	mW	dBm	Correction	Result		
802.11n (HT20)	1	2412	5.23	-7.48	-6.10	-12.70	-11.33	0.13	-8.95	10Log(2)	-5.94	8	-13.94
	6	2437	5.23	-7.82	-7.60	-13.04	-12.83	0.10	-9.93	10Log(2)	-6.92	8	-14.92
	11	2462	5.23	-7.15	-5.99	-12.38	-11.22	0.13	-8.75	10Log(2)	-5.74	8	-13.74
802.11n (HT40)	3	2422	5.23	-10.38	-10.07	-15.61	-15.29	0.06	-12.44	10Log(2)	-9.43	8	-17.43
	6	2437	5.23	-9.87	-9.88	-15.10	-15.11	0.06	-12.09	10Log(2)	-9.08	8	-17.08
	9	2452	5.23	-9.42	-9.84	-14.65	-15.06	0.07	-11.84	10Log(2)	-8.83	8	-16.83

Note: MIMO Correction: 10log(Nant) Correction Factor =10log(10kHz/3kHz)

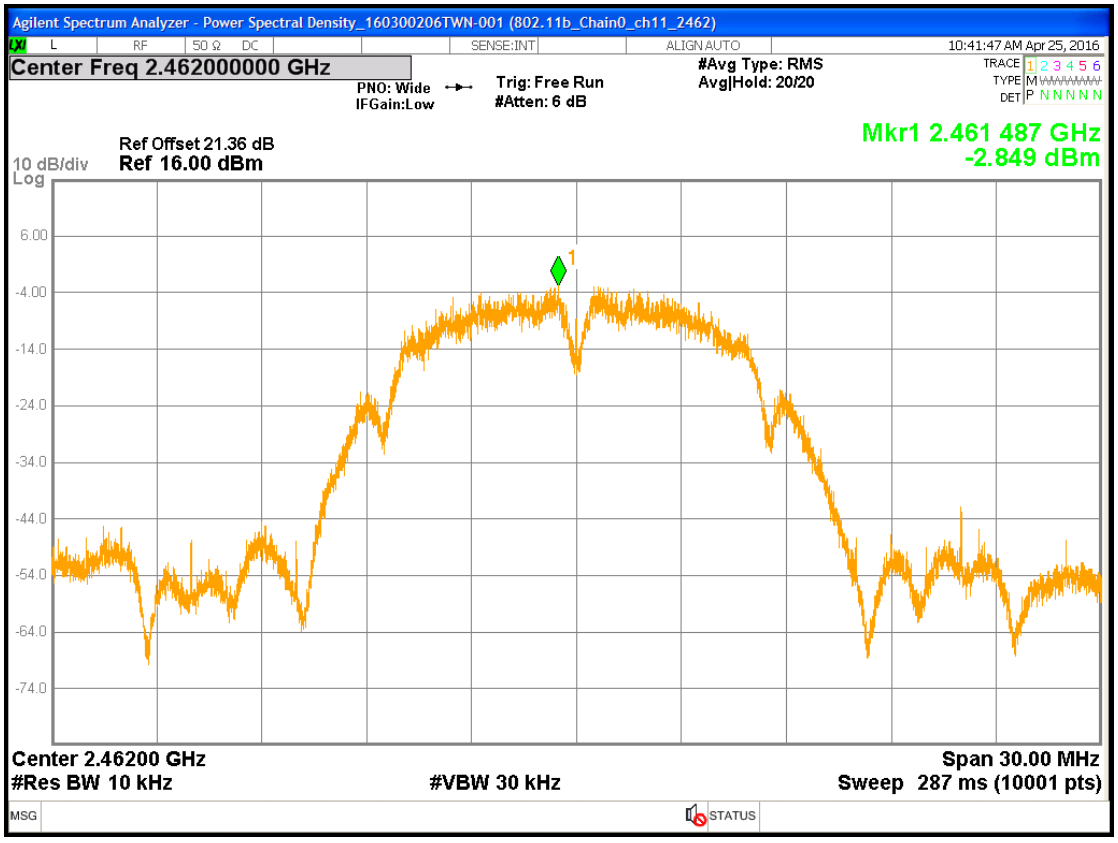
Chain0 : Power Spectral Density @ 802.11b mode Ch 1



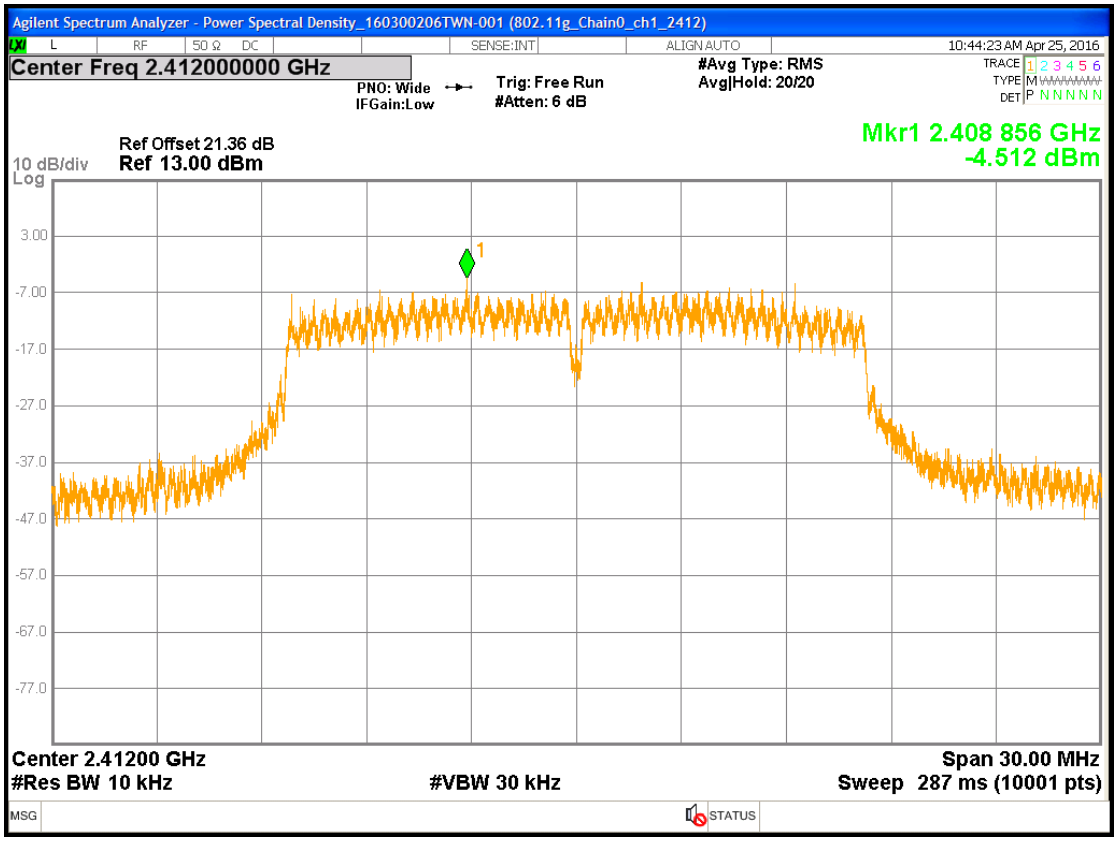
Chain0 : Power Spectral Density @ 802.11b mode Ch 6



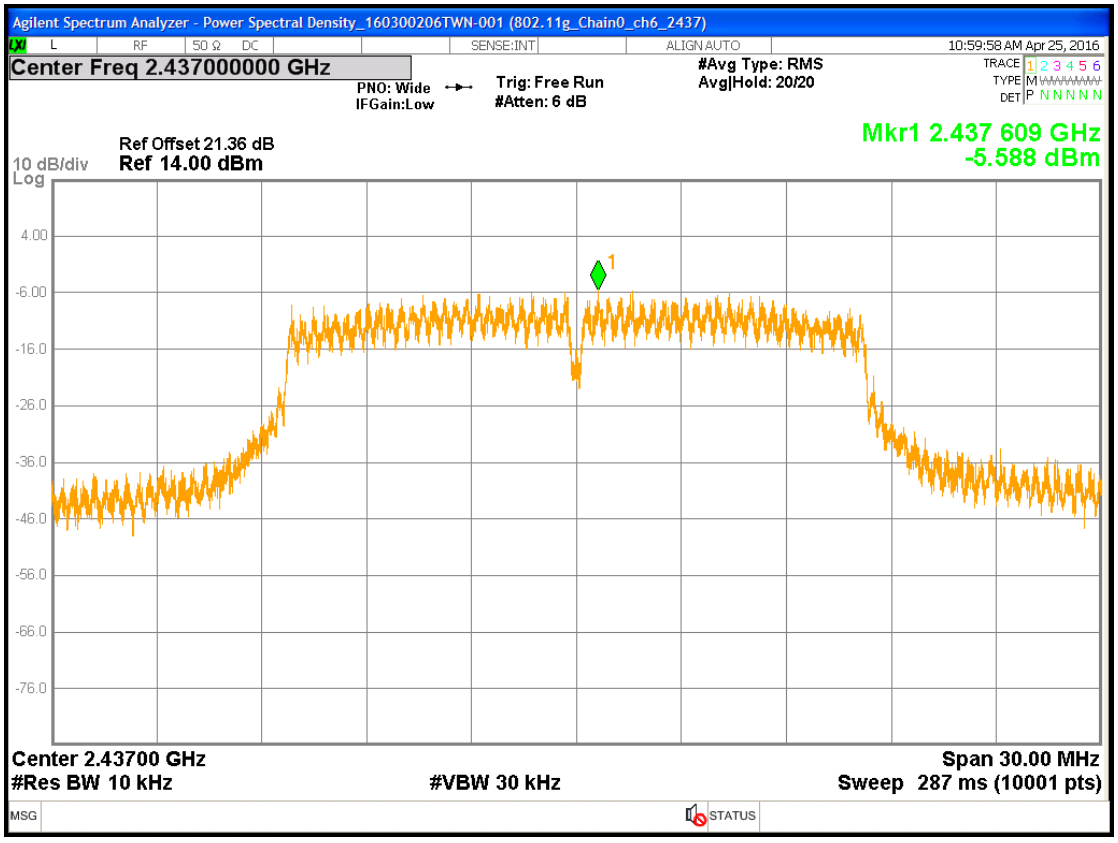
Chain0 : Power Spectral Density @ 802.11b mode Ch11



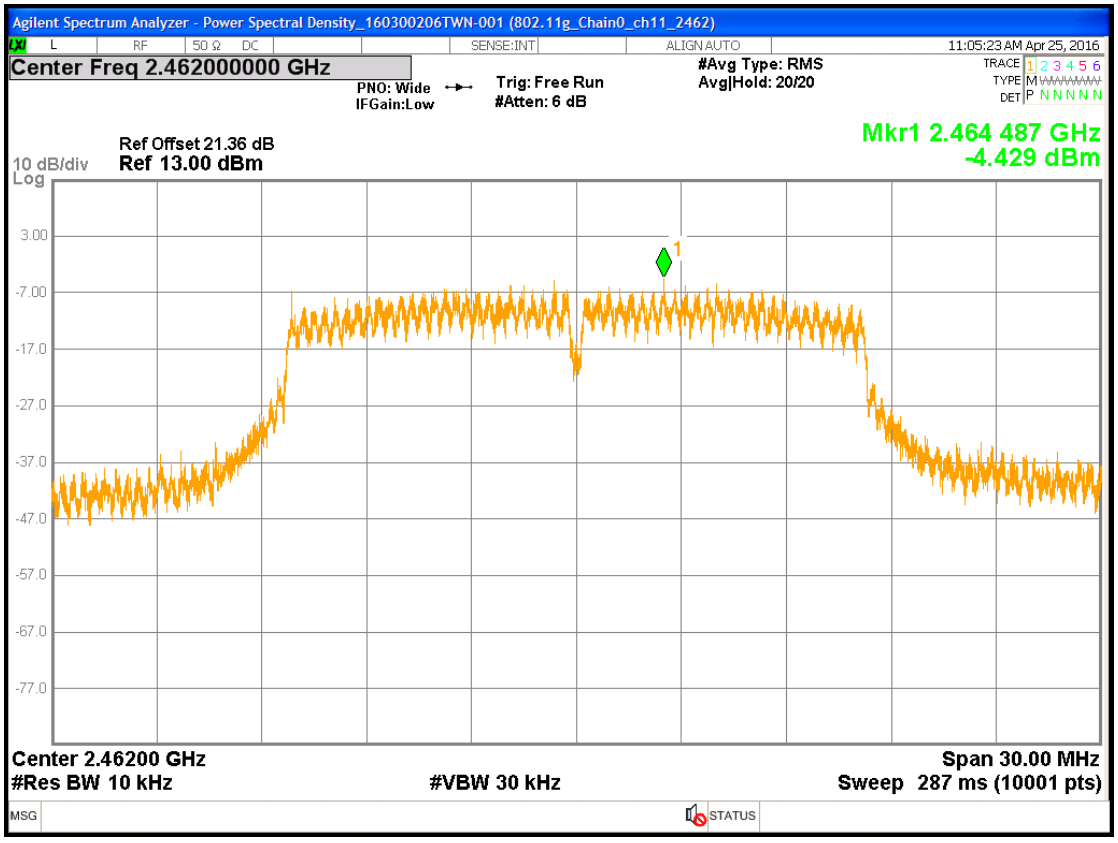
Chain0 : Power Spectral Density @ 802.11g mode Ch 1



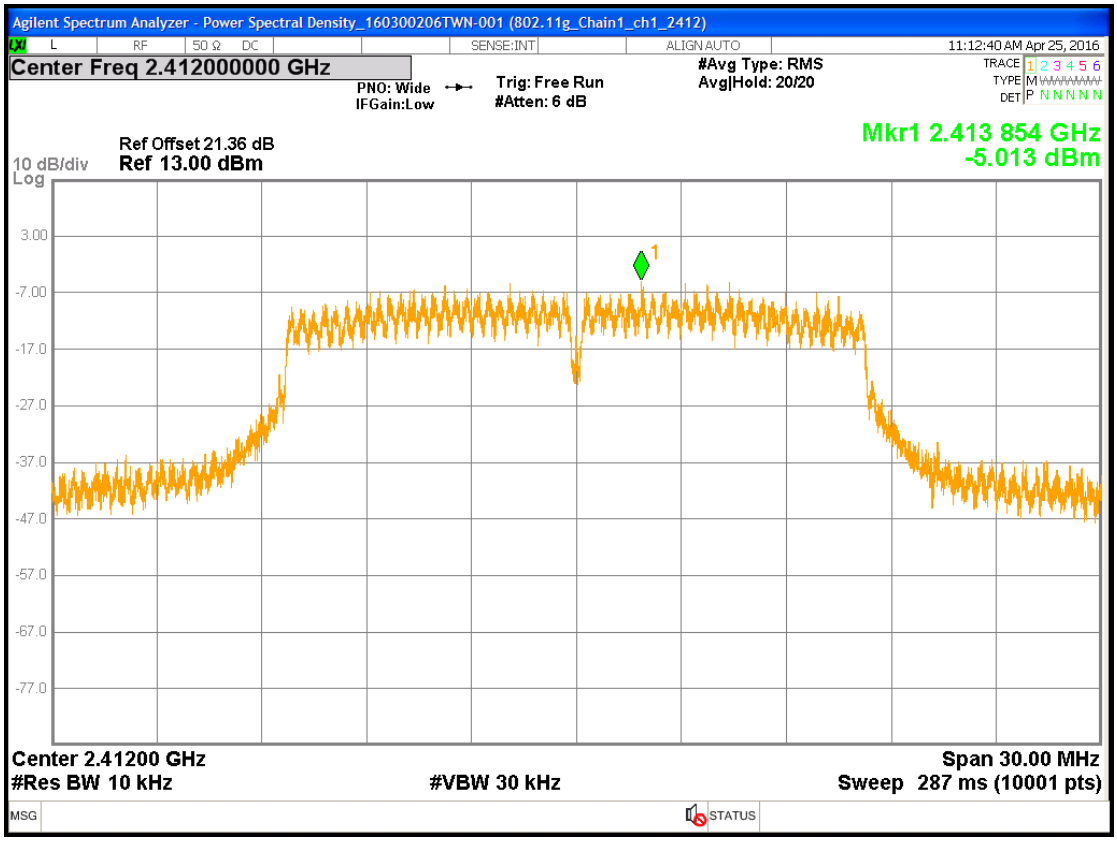
Chain0 : Power Spectral Density @ 802.11g mode Ch 6



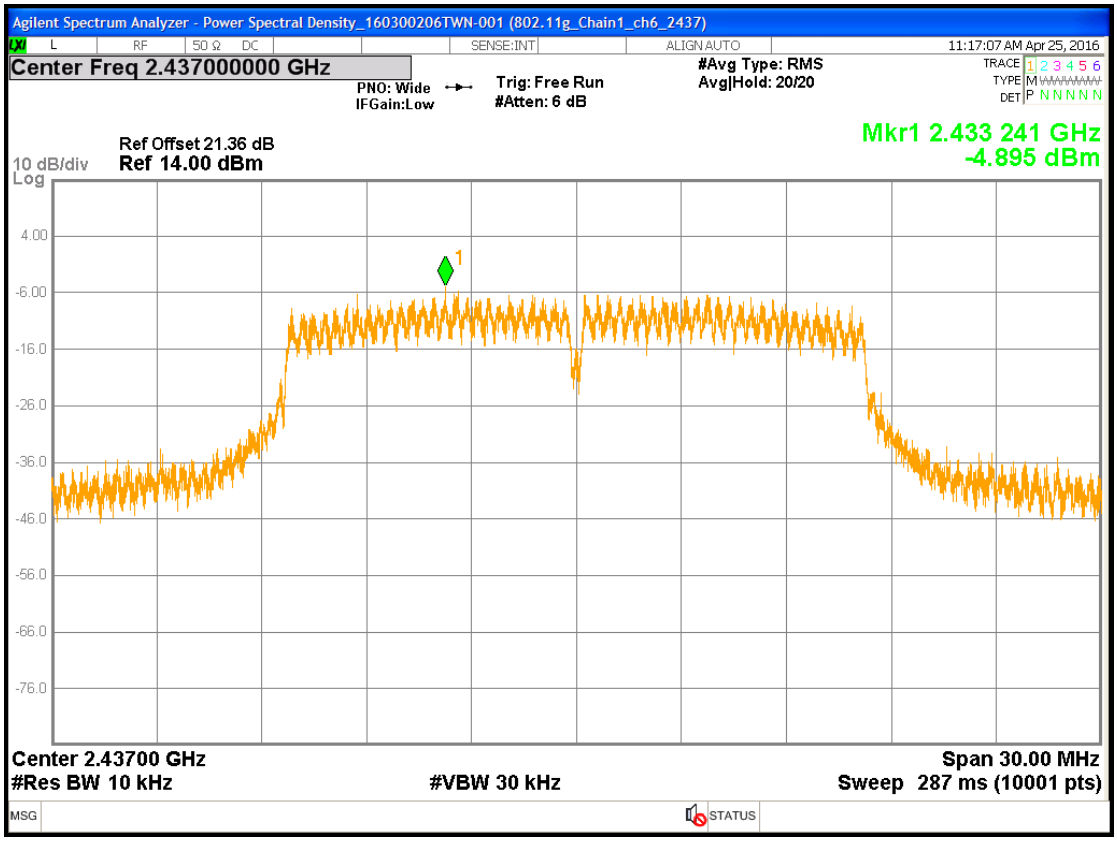
Chain0 : Power Spectral Density @ 802.11g mode Ch11



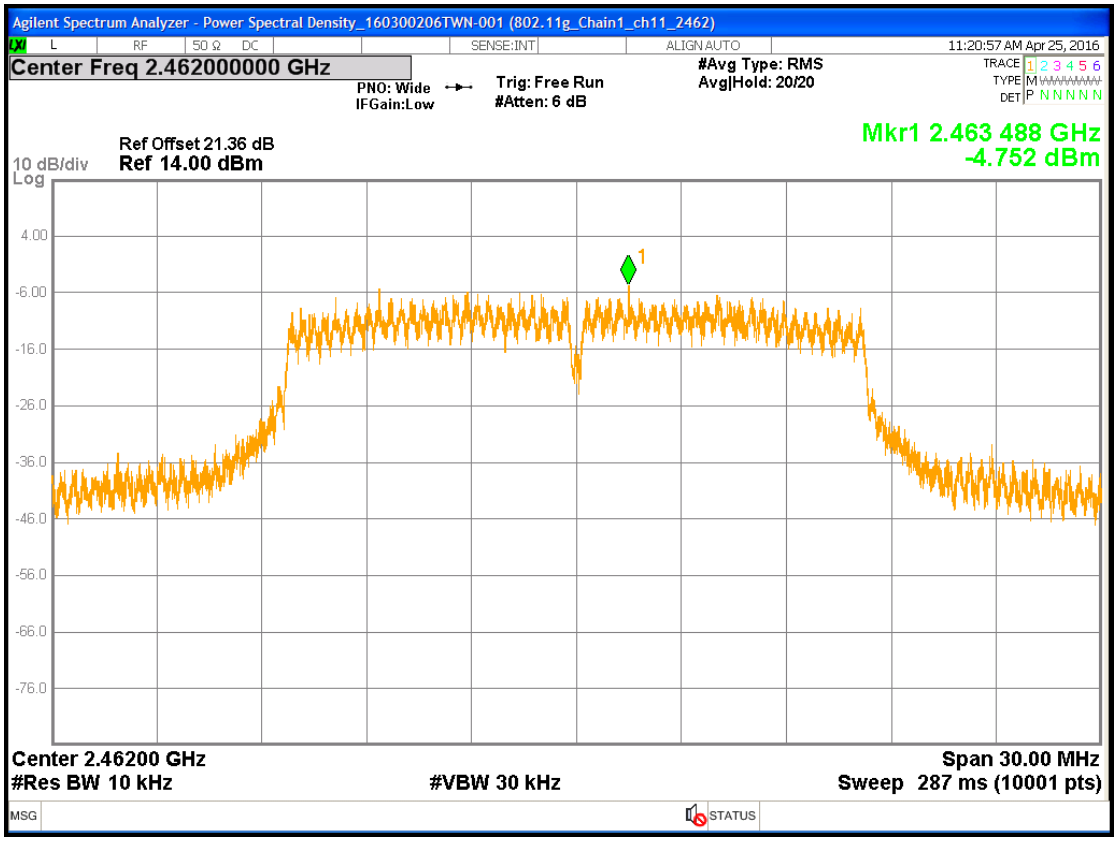
Chain1 : Power Spectral Density @ 802.11g mode Ch 1



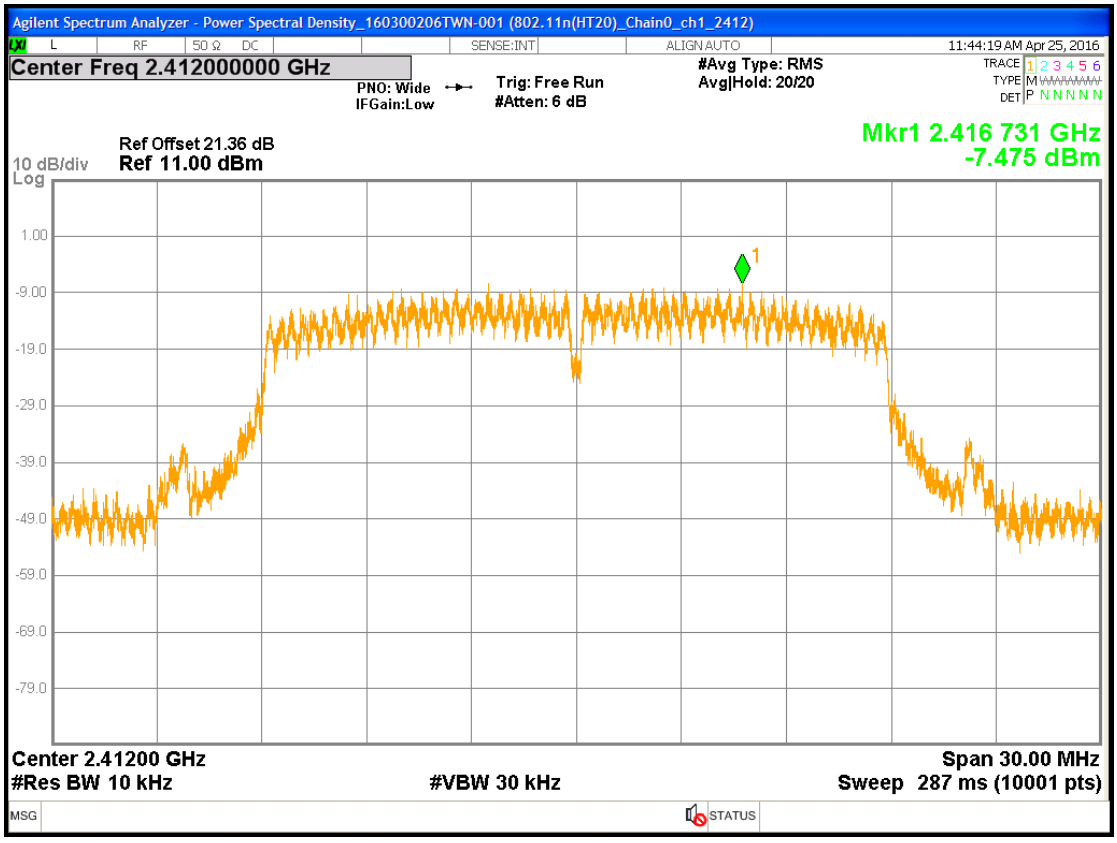
Chain1 : Power Spectral Density @ 802.11g mode Ch 6



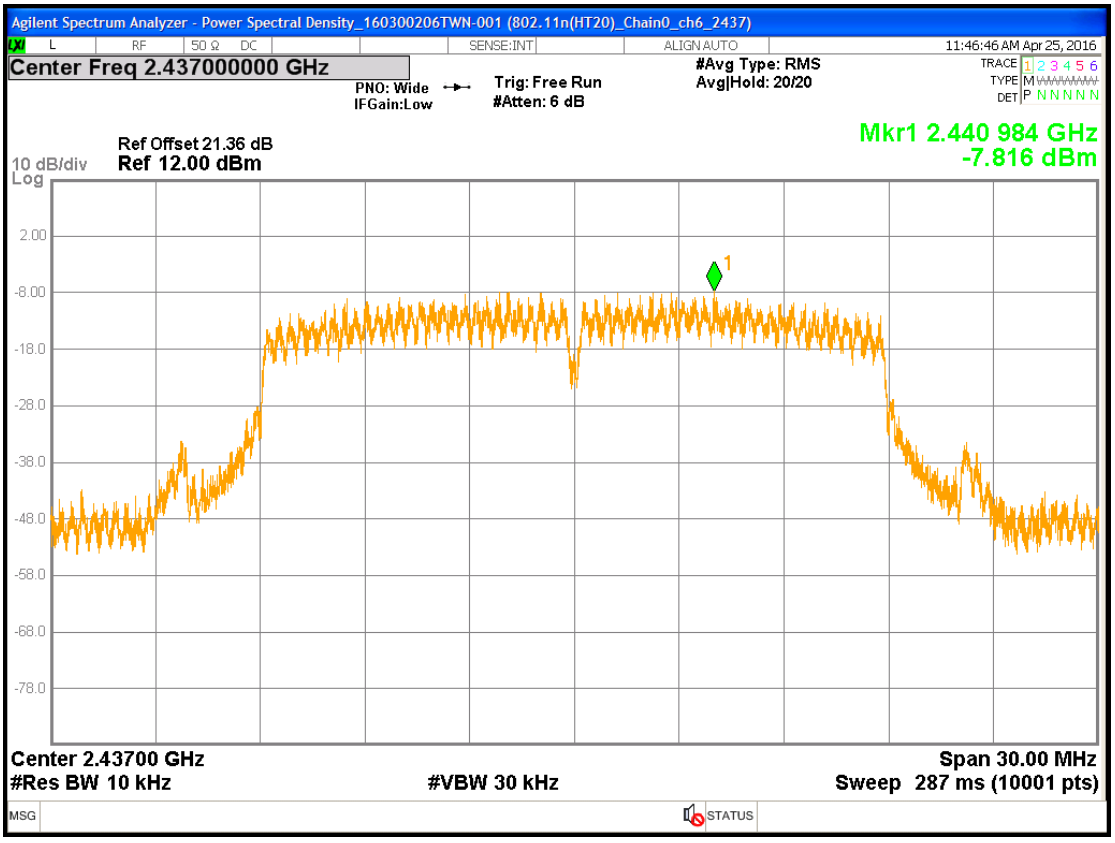
Chain1 : Power Spectral Density @ 802.11g mode Ch11



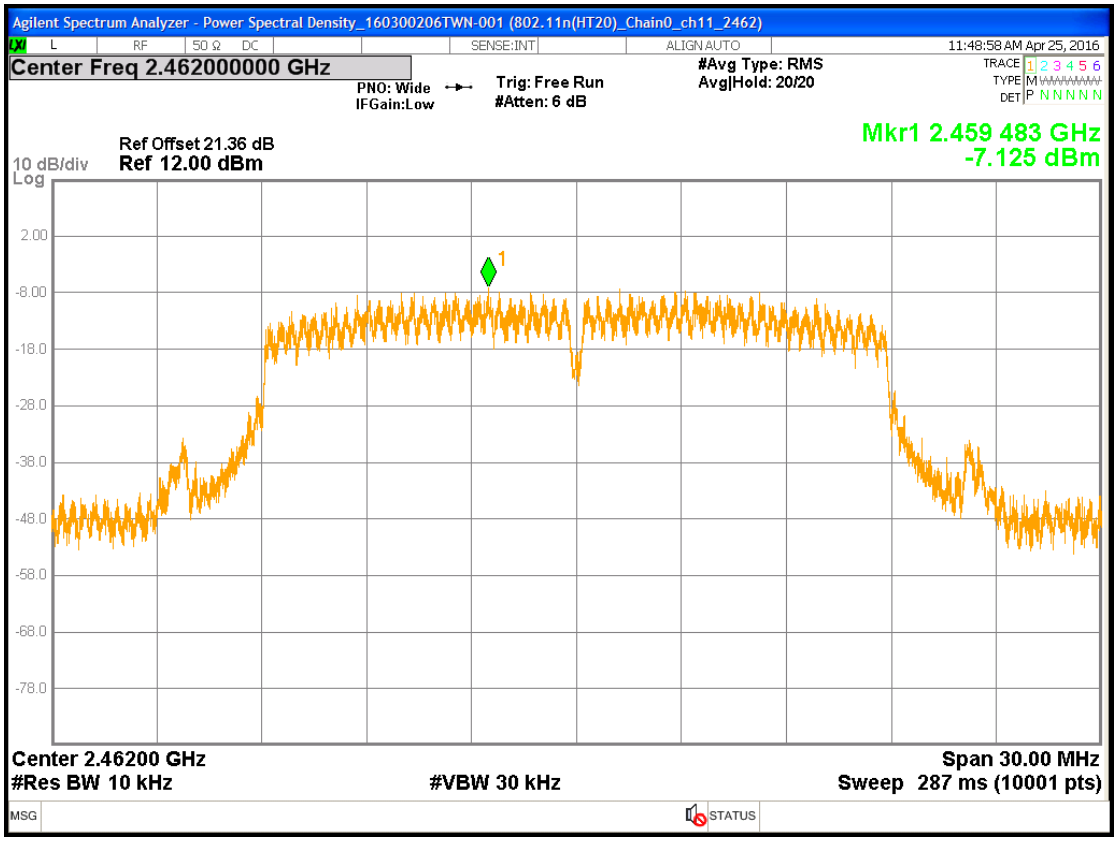
Chain0 : Power Spectral Density @ 802.11n(HT20) mode Ch 1



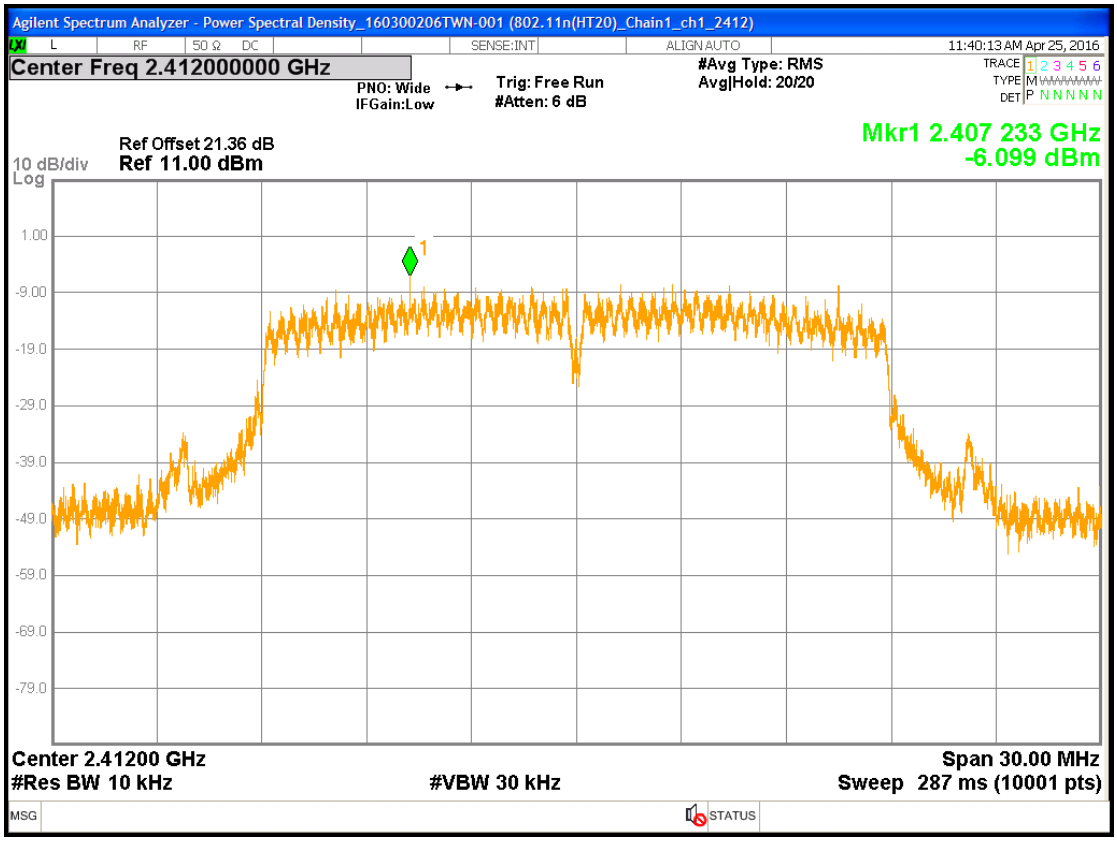
Chain0 : Power Spectral Density @ 802.11n(HT20) mode Ch 6



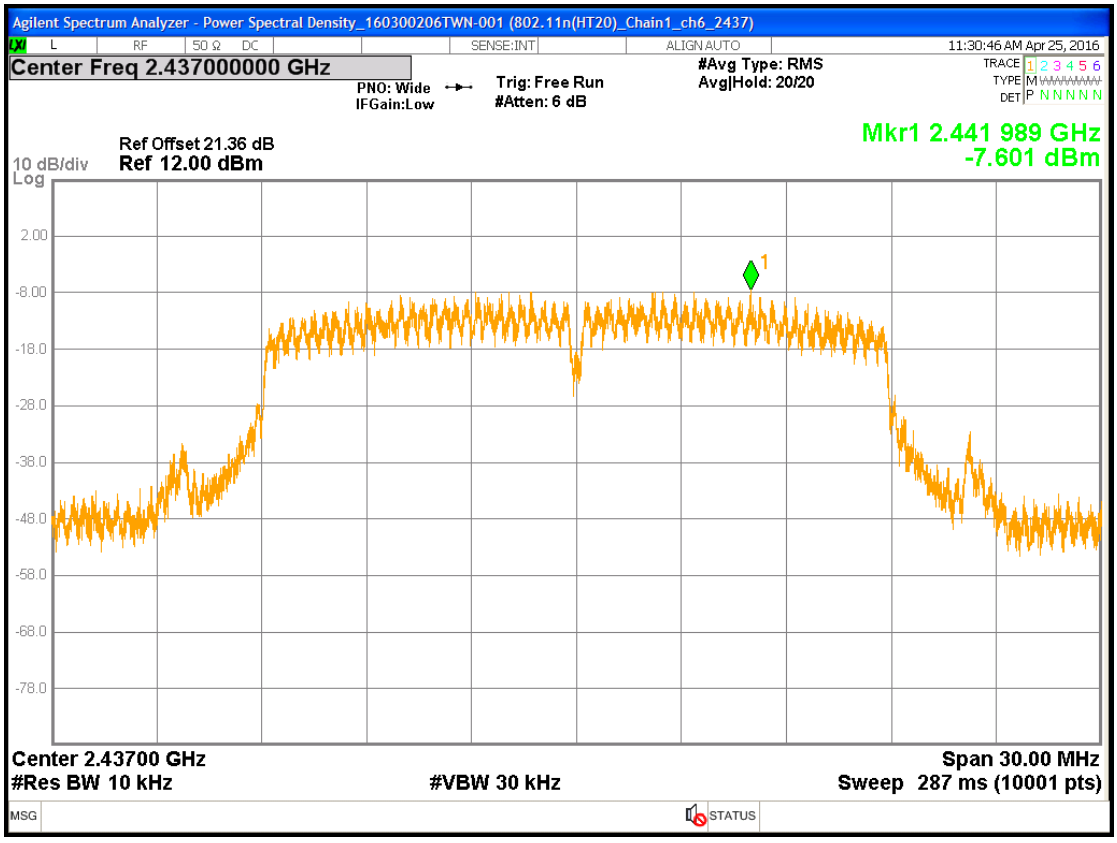
Chain0 : Power Spectral Density @ 802.11n(HT20) mode Ch11



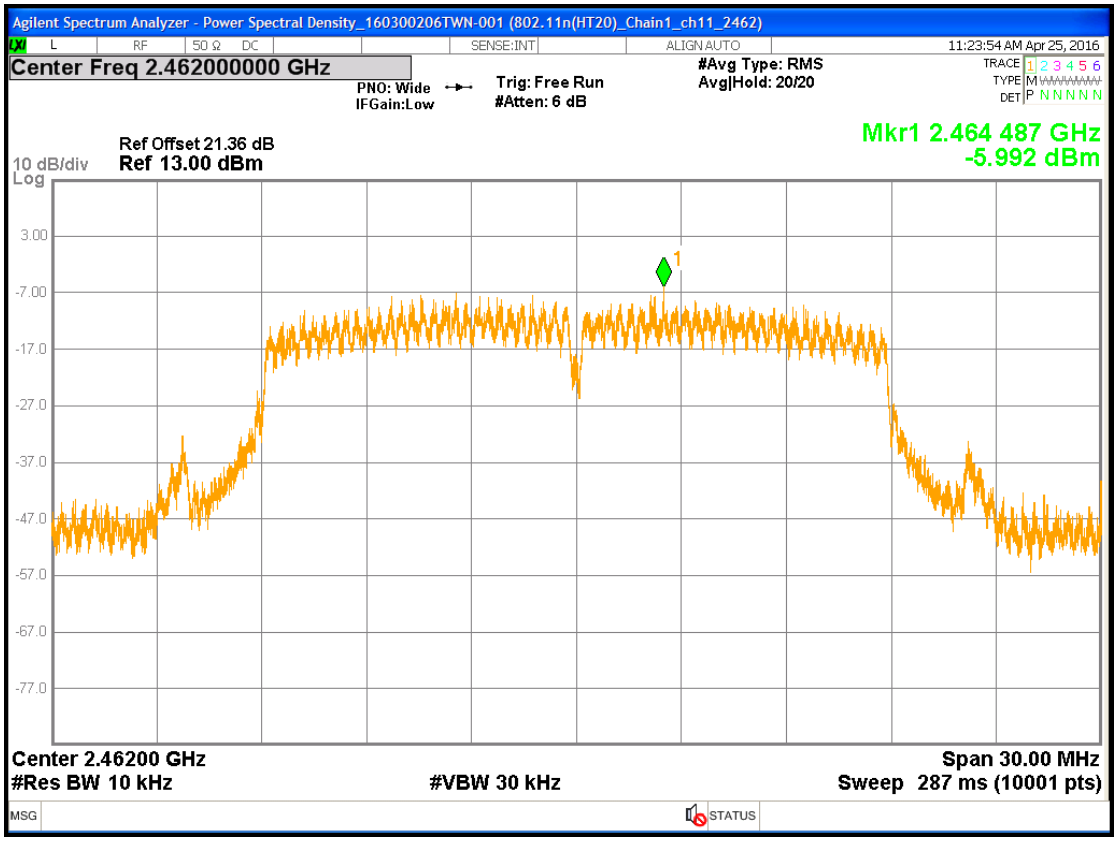
Chain1 : Power Spectral Density @ 802.11n(HT20) mode Ch 1



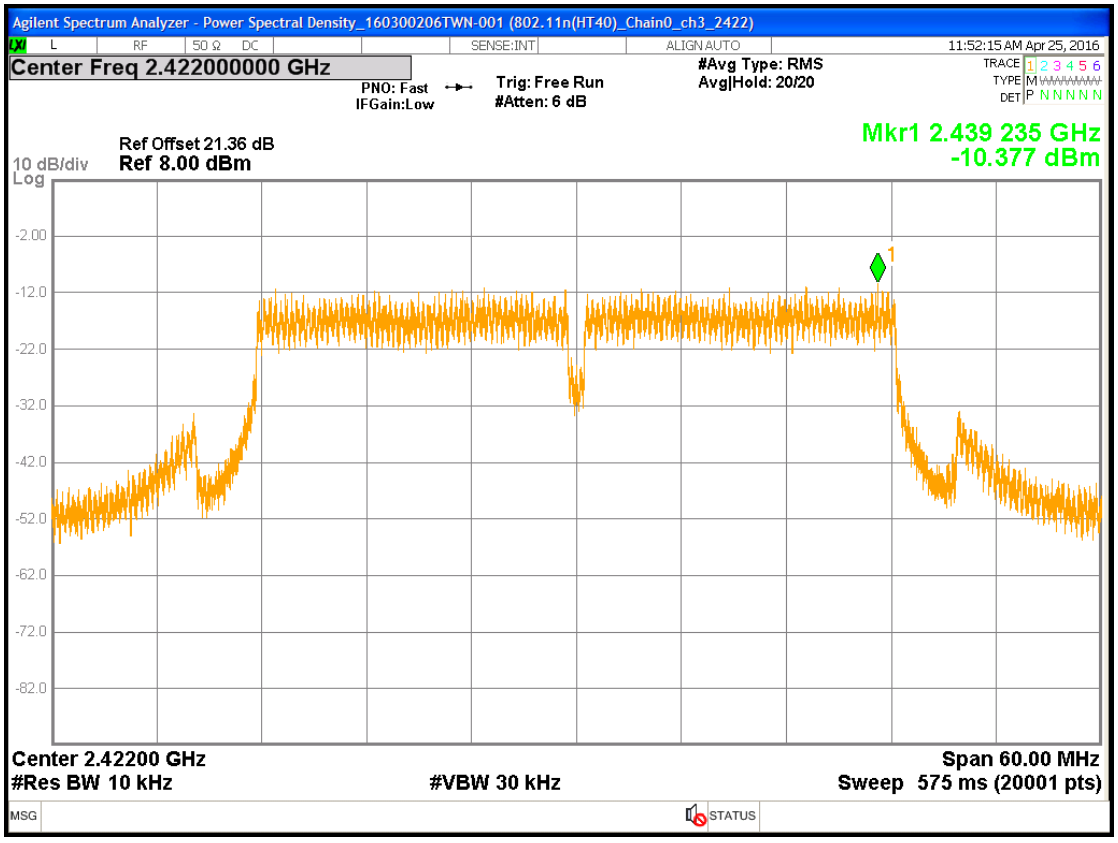
Chain1 : Power Spectral Density @ 802.11n(HT20) mode Ch 6



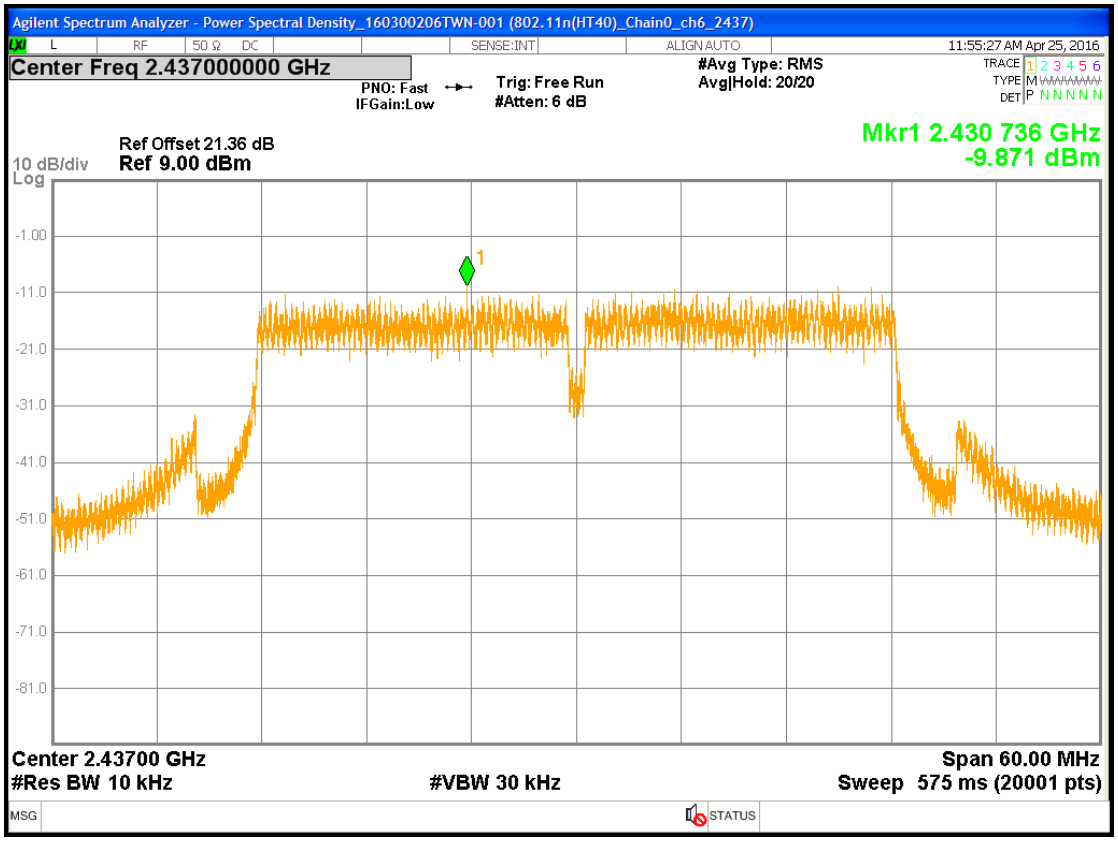
Chain1 : Power Spectral Density @ 802.11n(HT40) mode Ch11



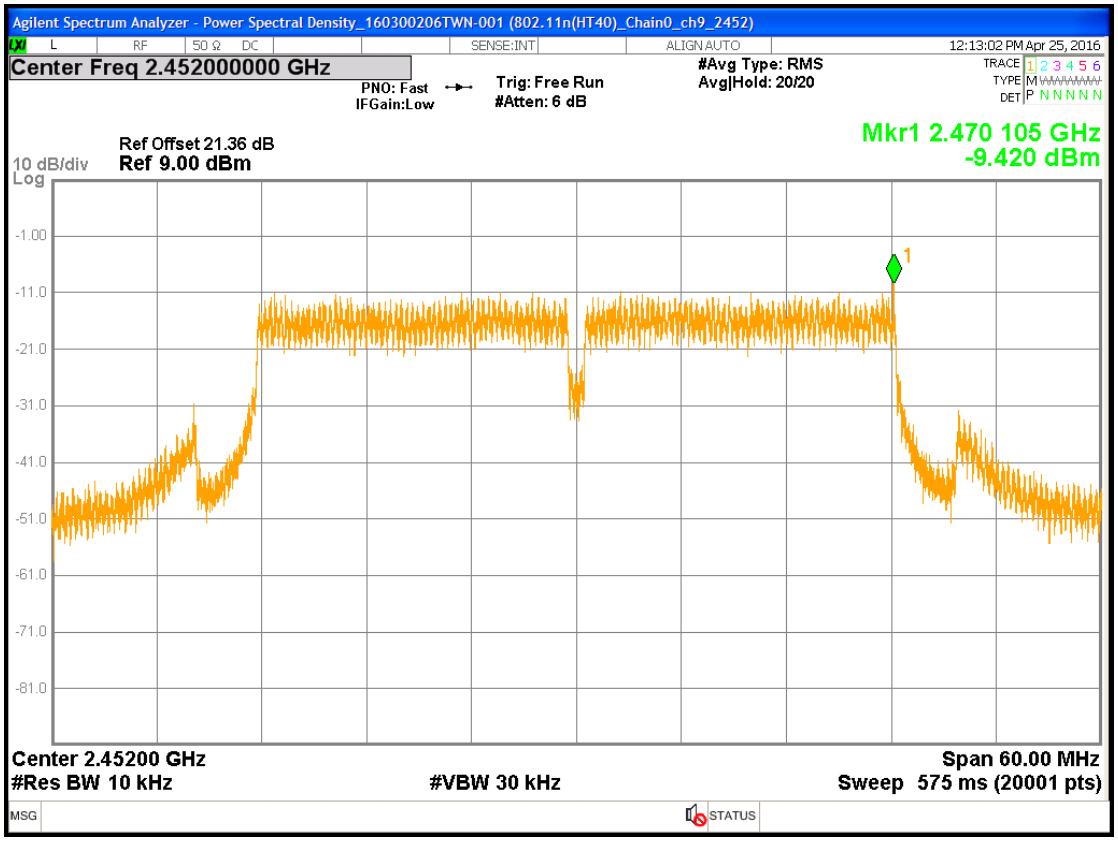
Chain0 : Power Spectral Density @ 802.11n(HT40) mode Ch 3



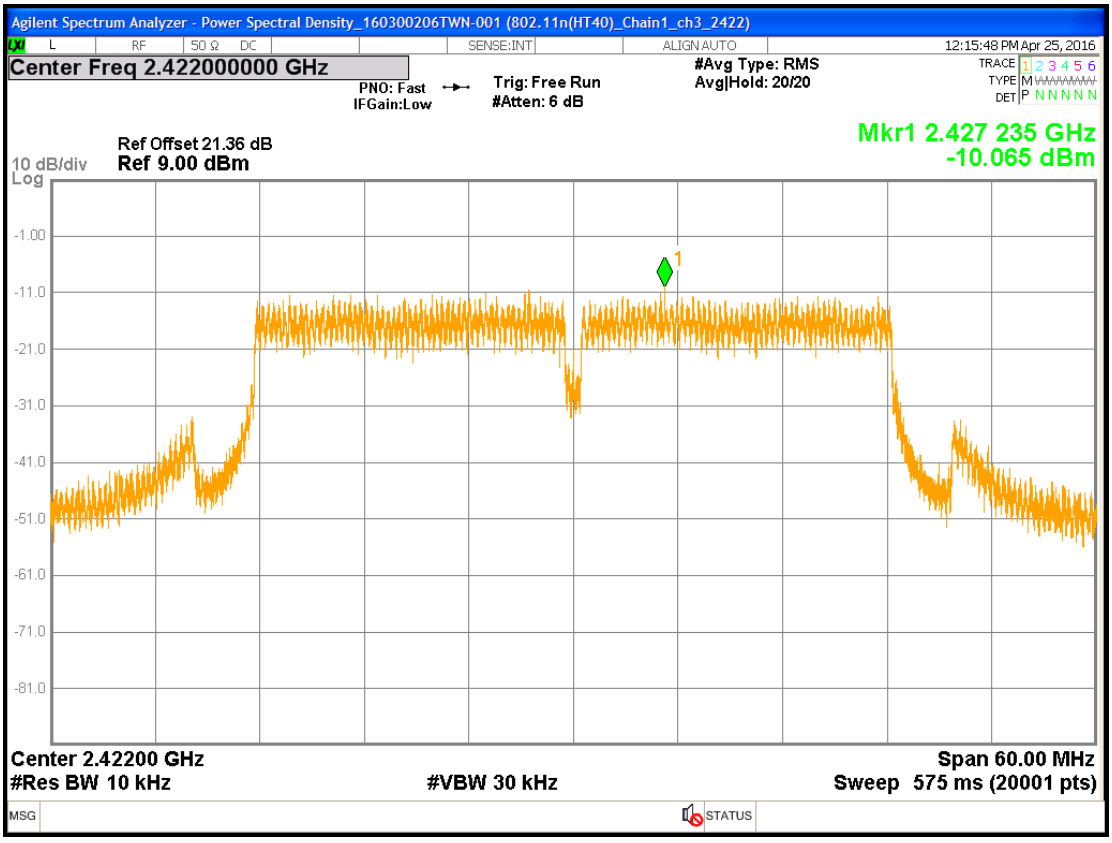
Chain0 : Power Spectral Density @ 802.11n(HT40) mode Ch 6



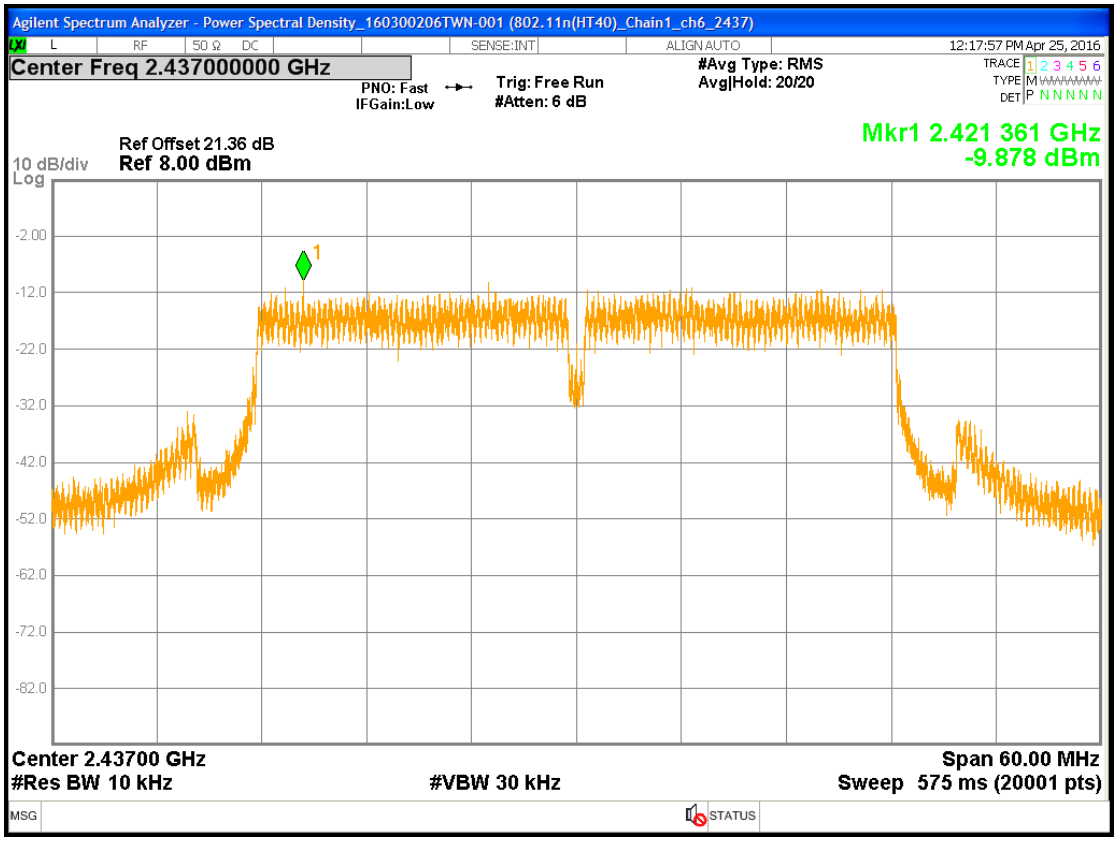
Chain0 : Power Spectral Density @ 802.11n(HT40) mode Ch 9



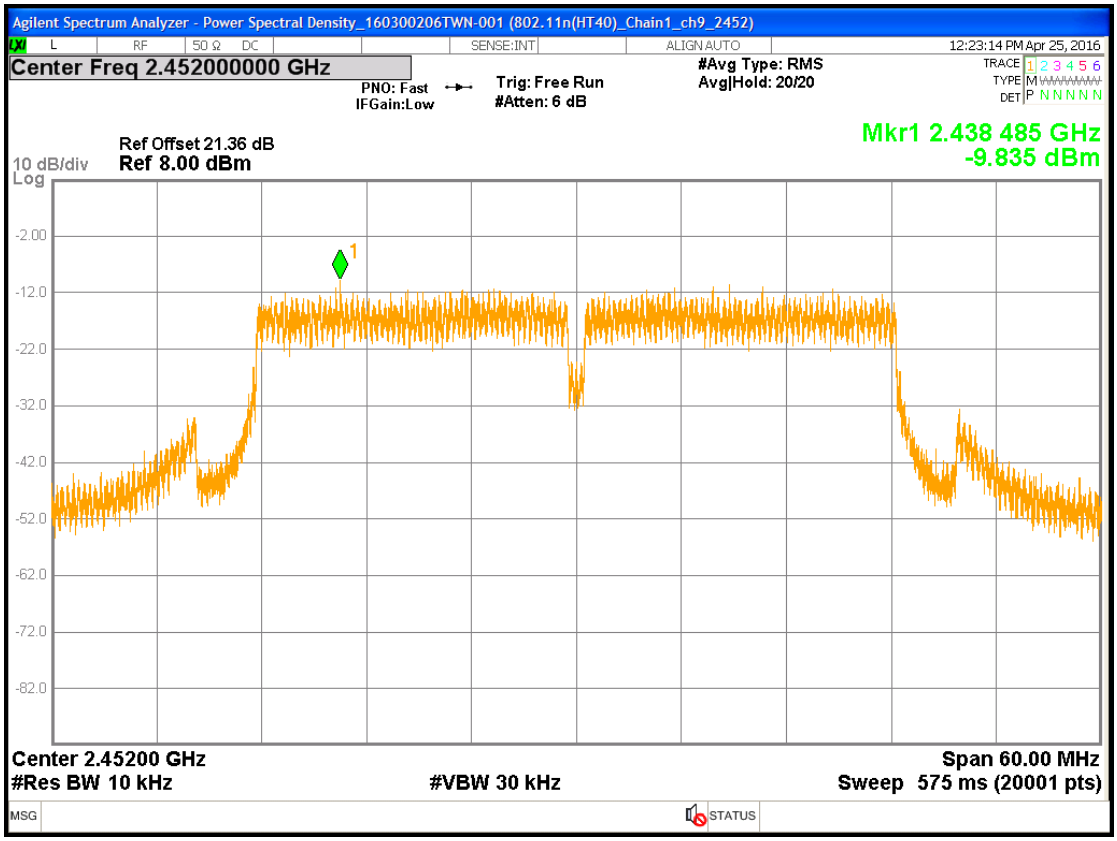
Chain1 : Power Spectral Density @ 802.11n(HT40) mode Ch 3



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



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



6. Emissions In Non-Restricted Frequency Bands

6.1 Operating environment

Temperature:	25	℃
Relative Humidity:	50	%
Atmospheric Pressure	1008	hPa
Requirement	15.247(d)	
Channel number	1、6、11	

6.2 Limit for emissions in non-restricted frequency bands

The peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz

6.3 Measuring instruments setting

Reference level measurement

Spectrum analyzer settings	
Spectrum Analyzer function	**Setting**
Detector	Peak
RBW	≧100 kHz
VBW	≧3 x RBW
Sweep	Auto couple
Trace	Max hold
Span	≧1.5 time 6dB bandwidth
Attenuation	Auto

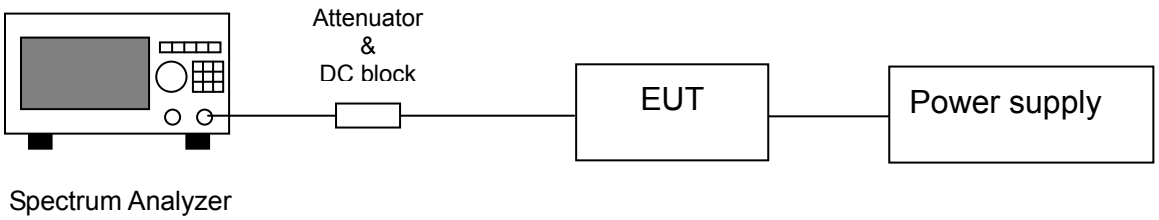
Emission level measurement

Spectrum analyzer settings	
Spectrum Analyzer function	**Setting**
Detector	Peak
RBW	≧100 kHz
VBW	≧3 x RBW
Sweep	Auto couple
Trace	Max hold
Attenuation	Auto

6.4 Test procedure

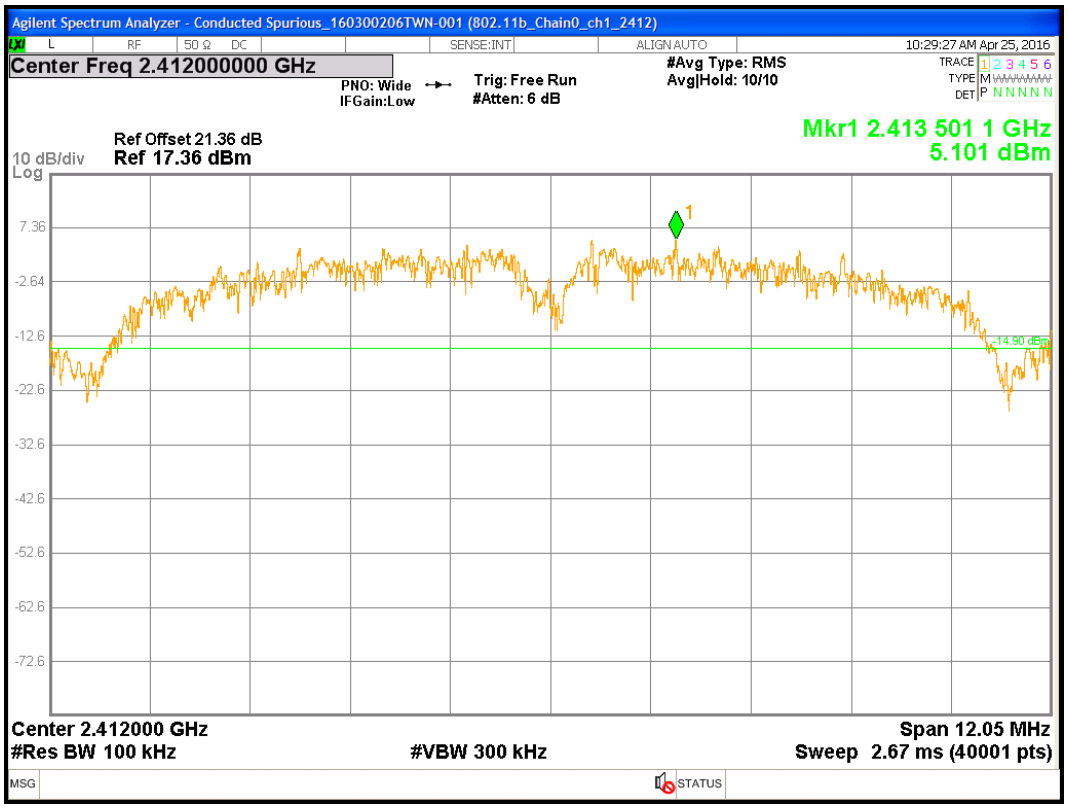
1. The procedure was used in antenna-port conducted and connected to the spectrum analyzer.
2. Set instrument center frequency to center frequency
3. Use the parameter configured in clause 6.3 to measure
4. Use the peak marker function to determine the maximum amplitude level.

6.5 Test diagram

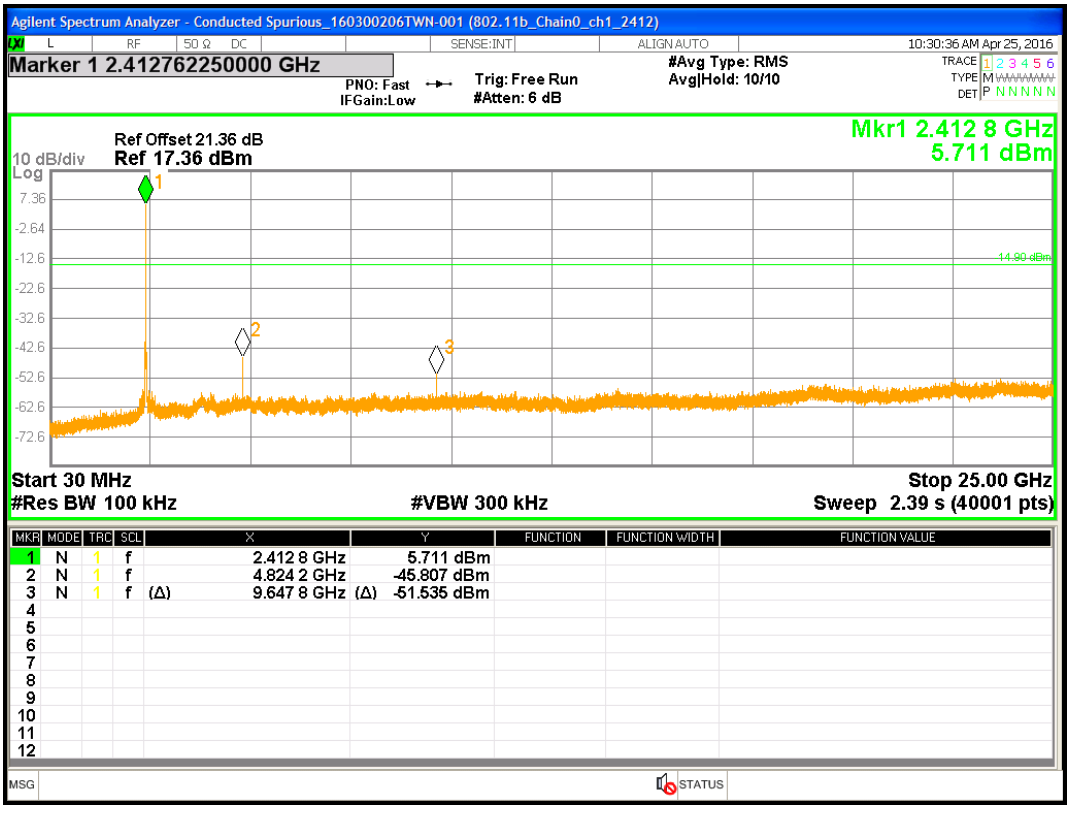


6.6 Test results

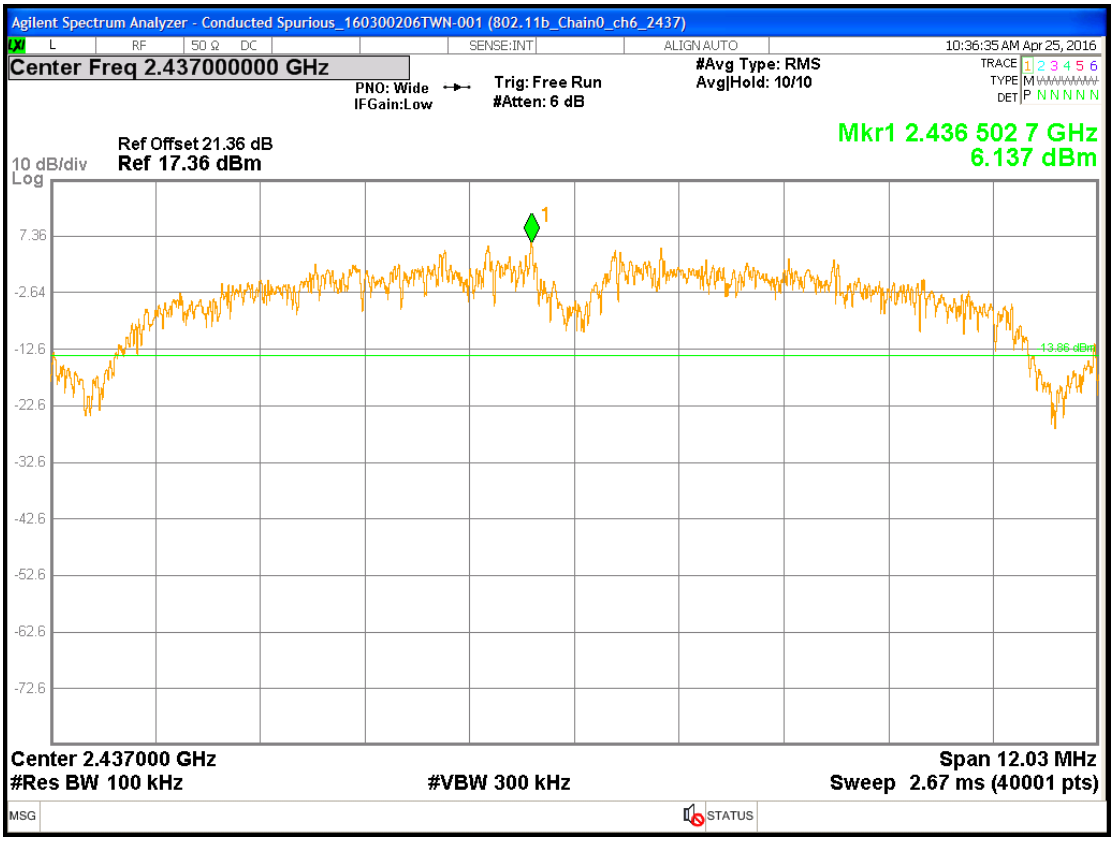
Chain0 : Conducted Spurious @ 802.11b mode Ch 1



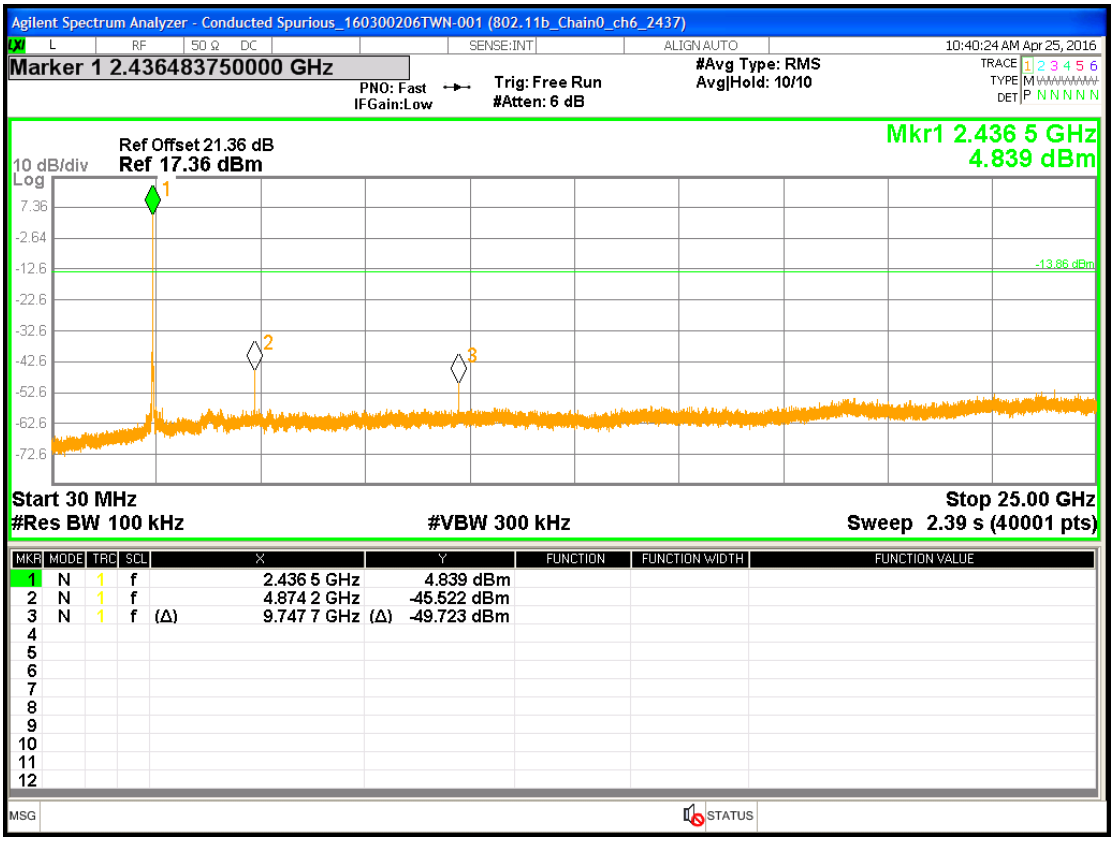
Chain0 : Conducted Spurious @ 802.11b mode Ch 1



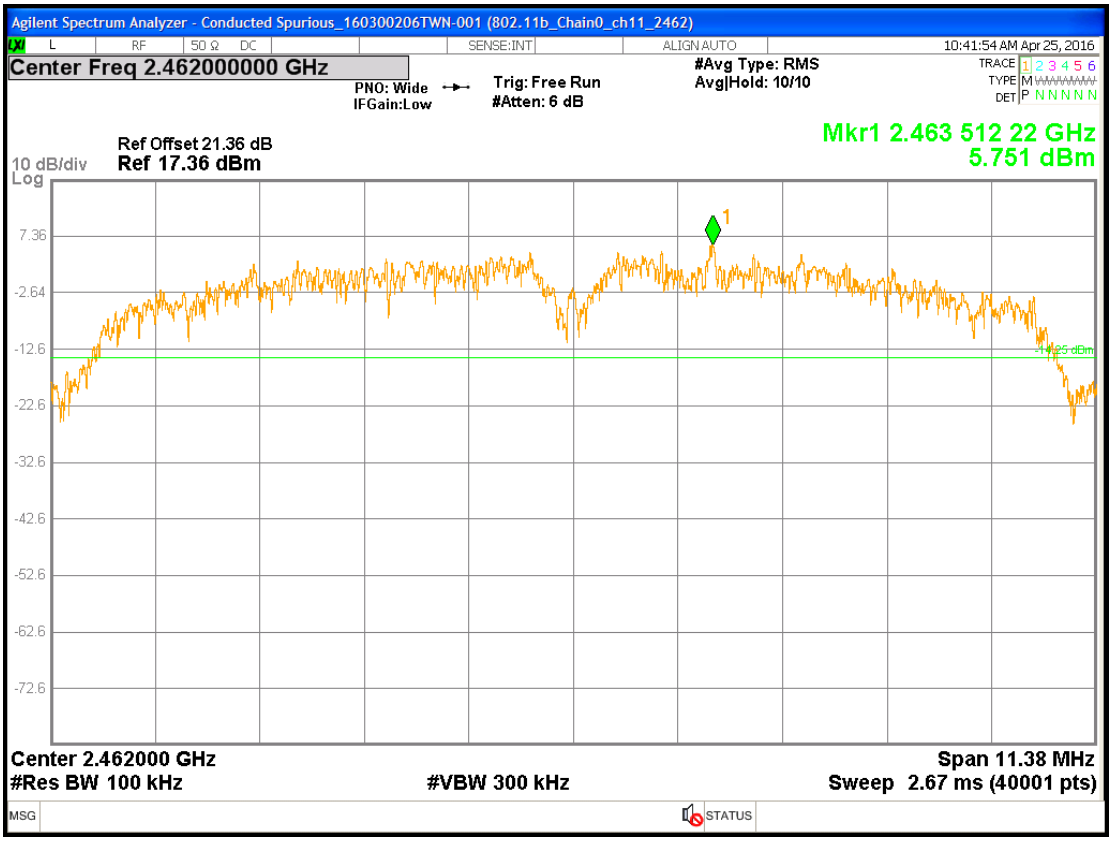
Chain0 : Conducted Spurious @ 802.11b mode Ch 6



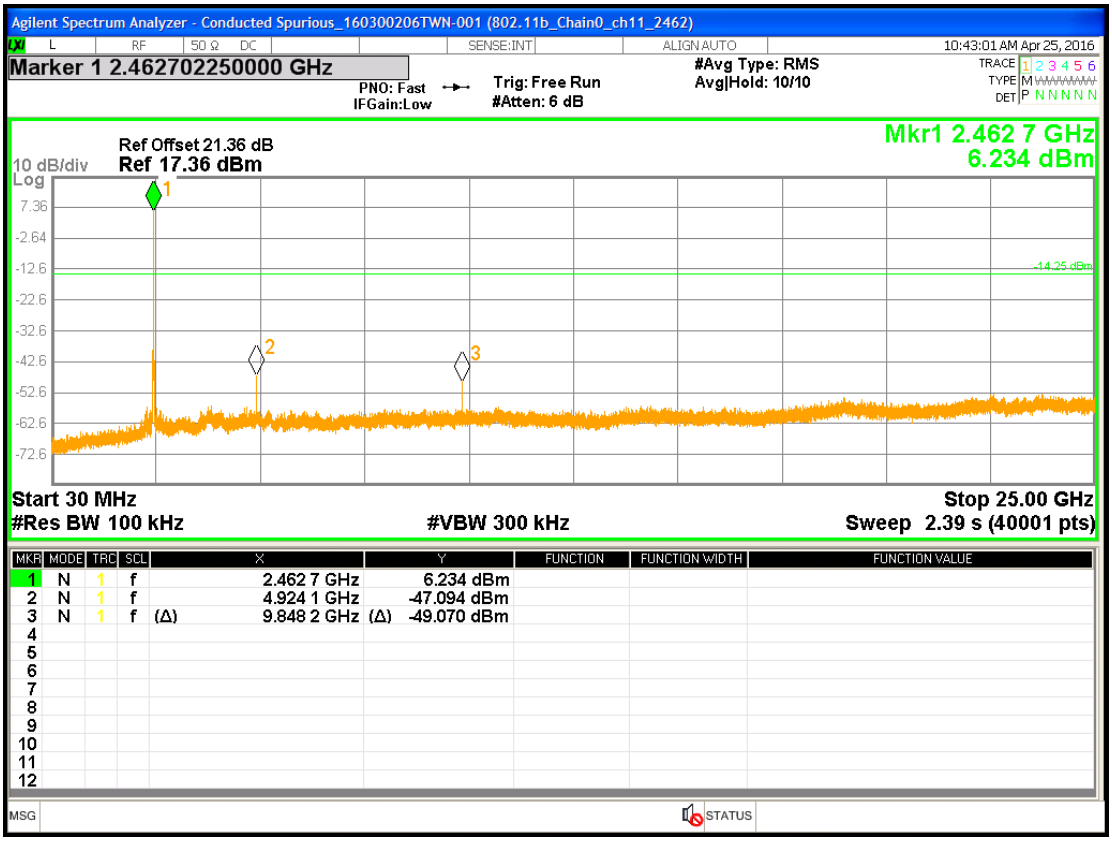
Chain0 : Conducted Spurious @ 802.11b mode Ch 6



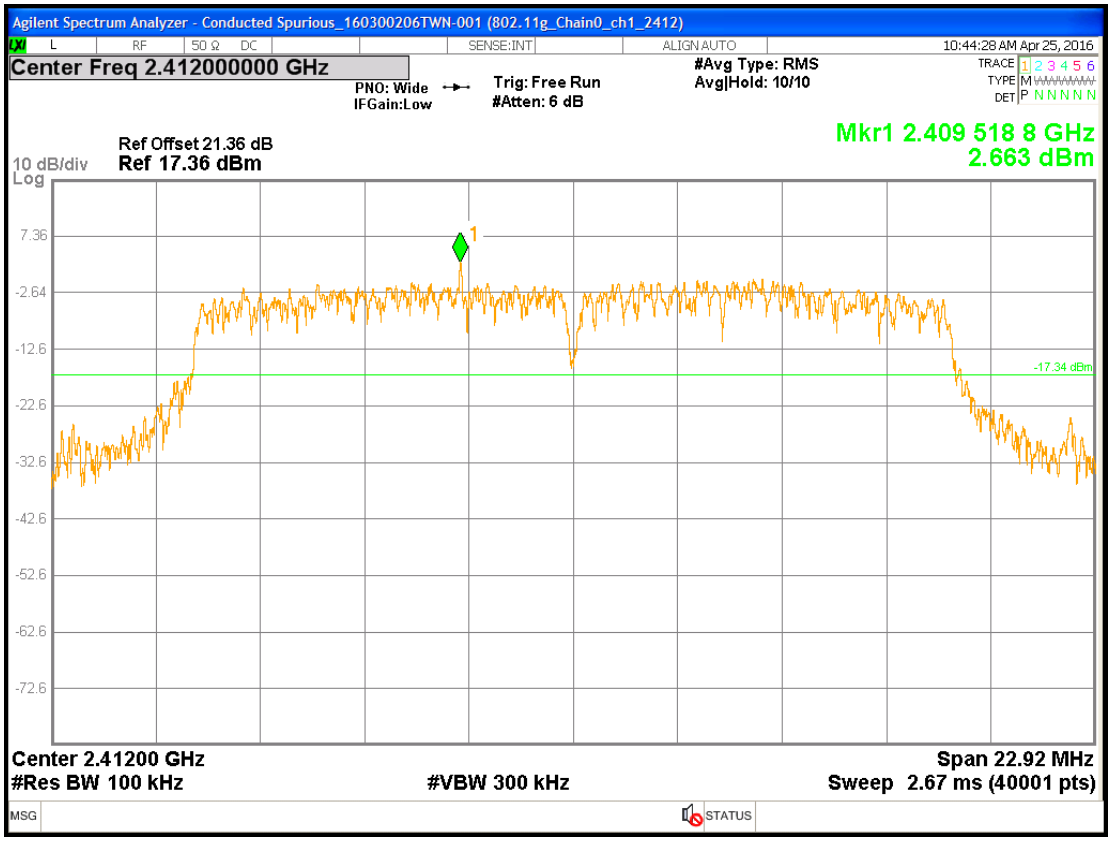
Chain0 : Conducted Spurious @ 802.11b mode Ch11



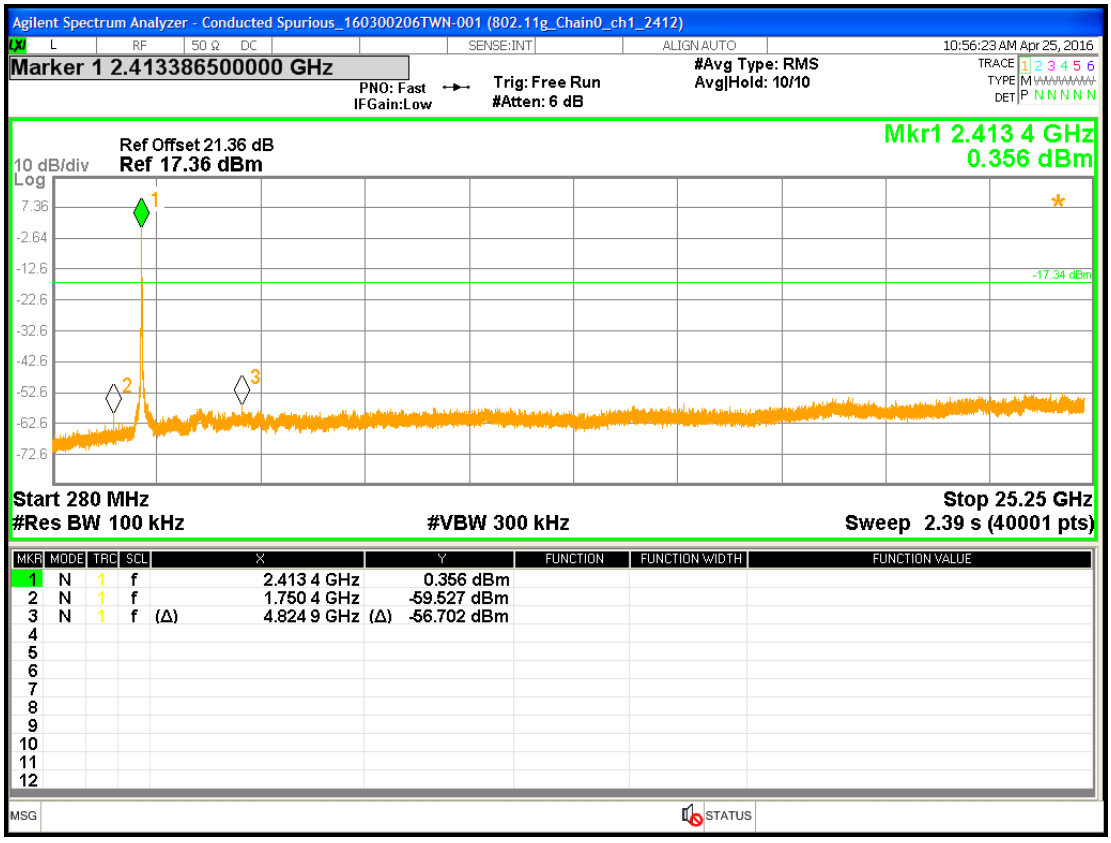
Chain0 : Conducted Spurious @ 802.11b mode Ch11



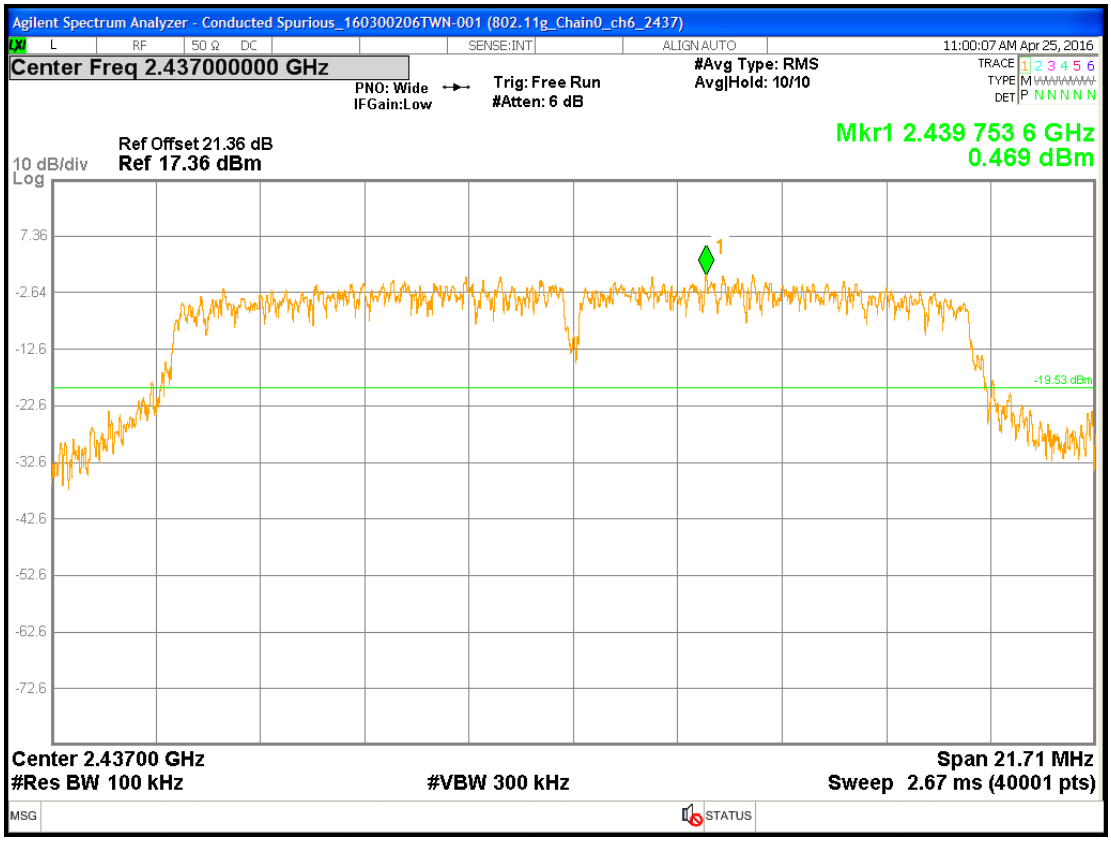
Chain0 : Conducted Spurious @ 802.11g mode Ch 1



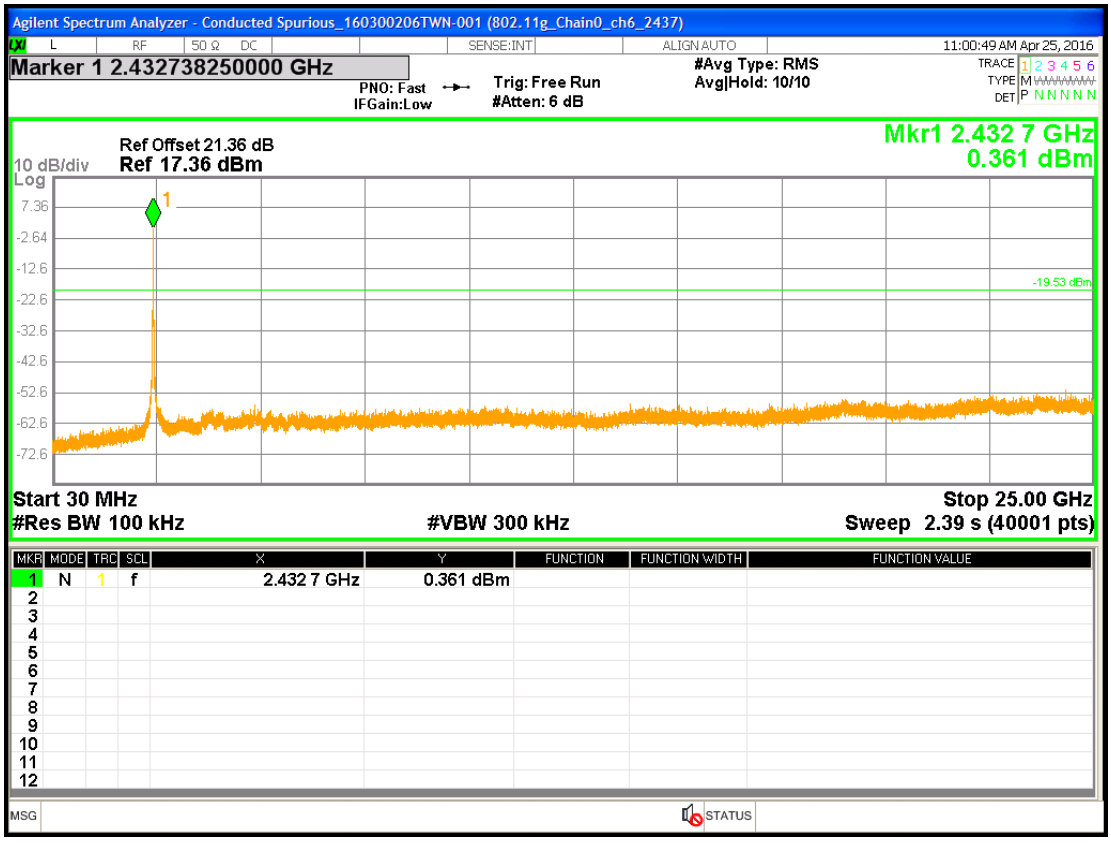
Chain0 : Conducted Spurious @ 802.11g mode Ch 1



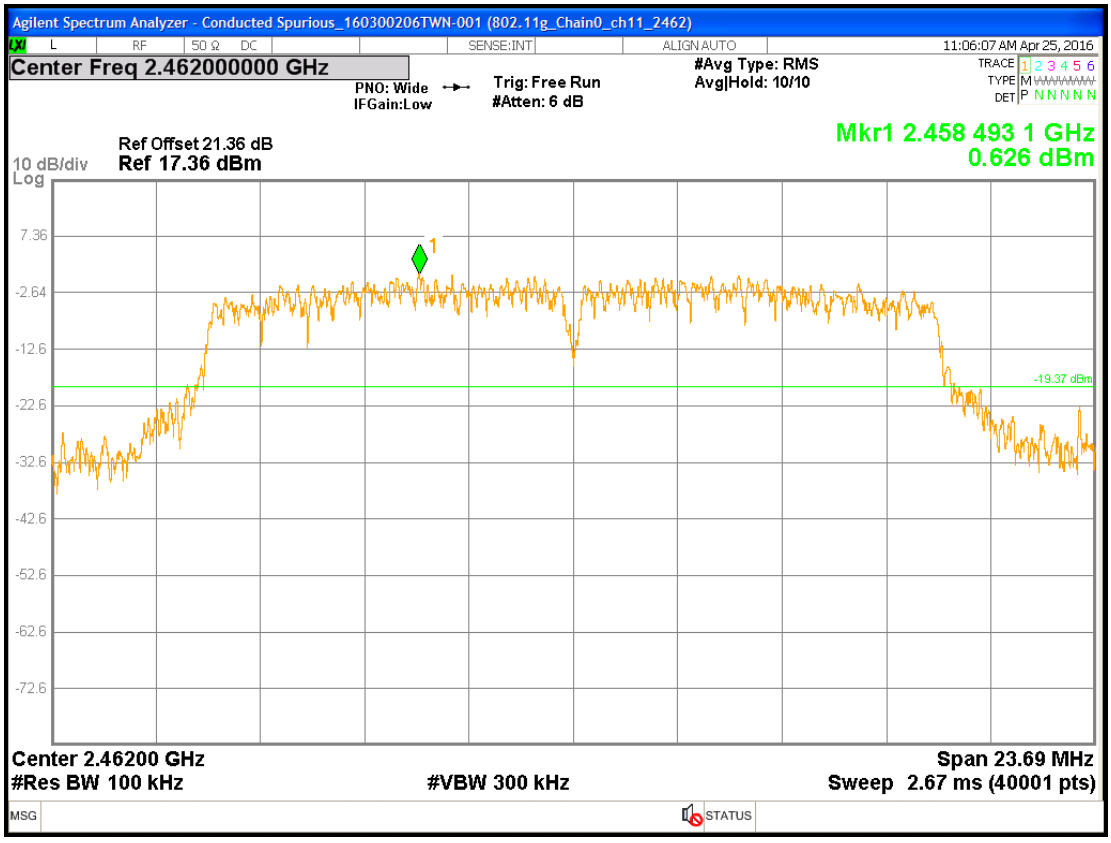
Chain0 : Conducted Spurious @ 802.11g mode Ch 6



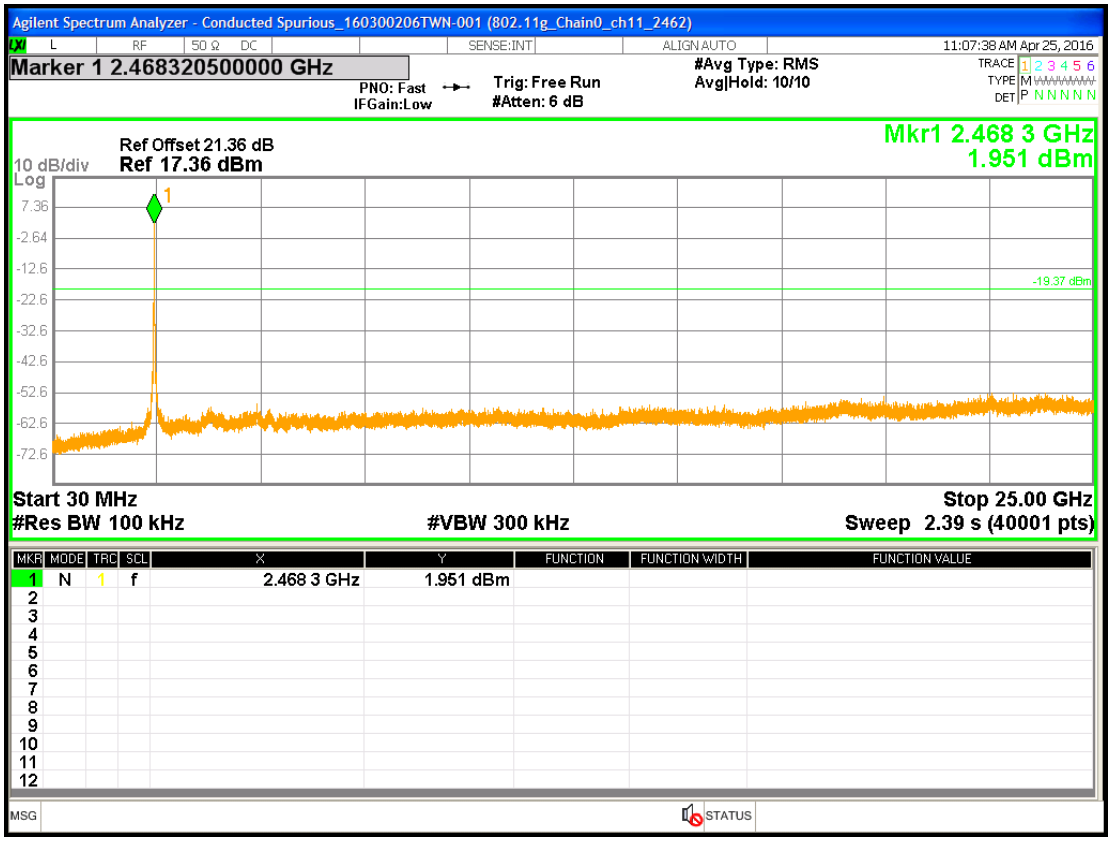
Chain0 : Conducted Spurious @ 802.11g mode Ch 6



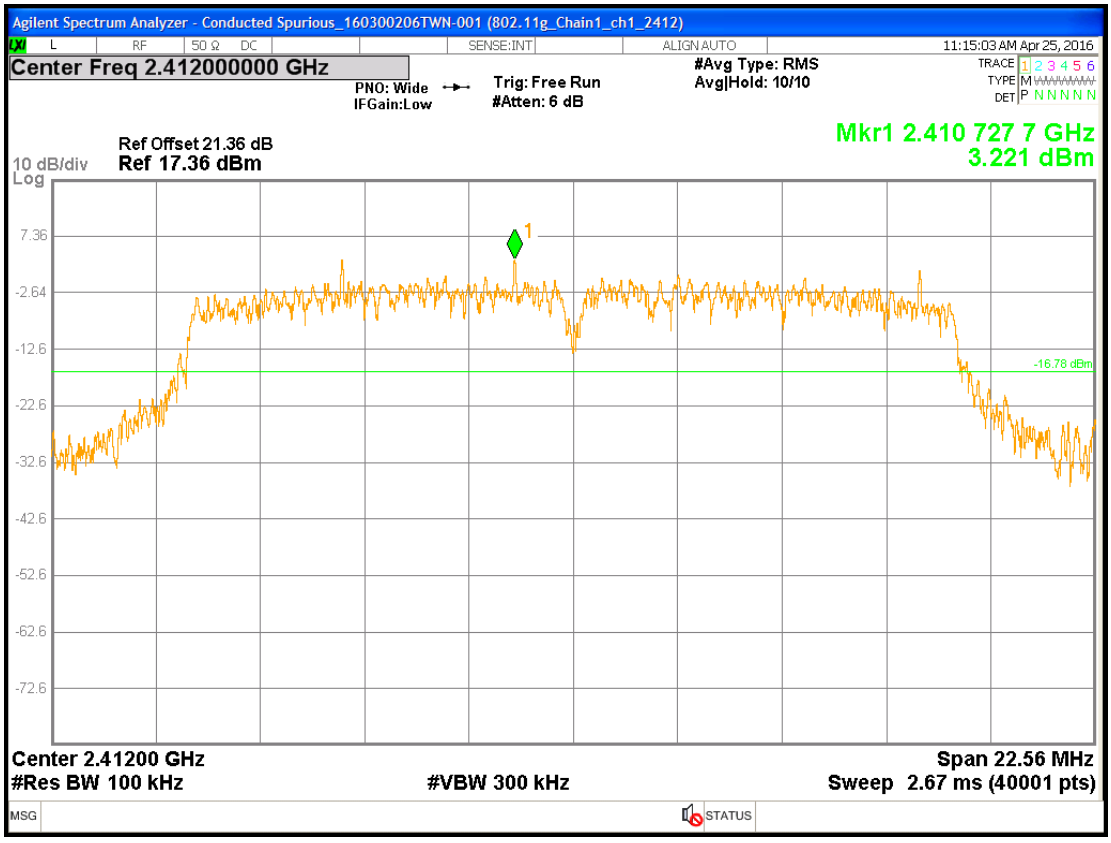
Chain0 : Conducted Spurious @ 802.11g mode Ch11



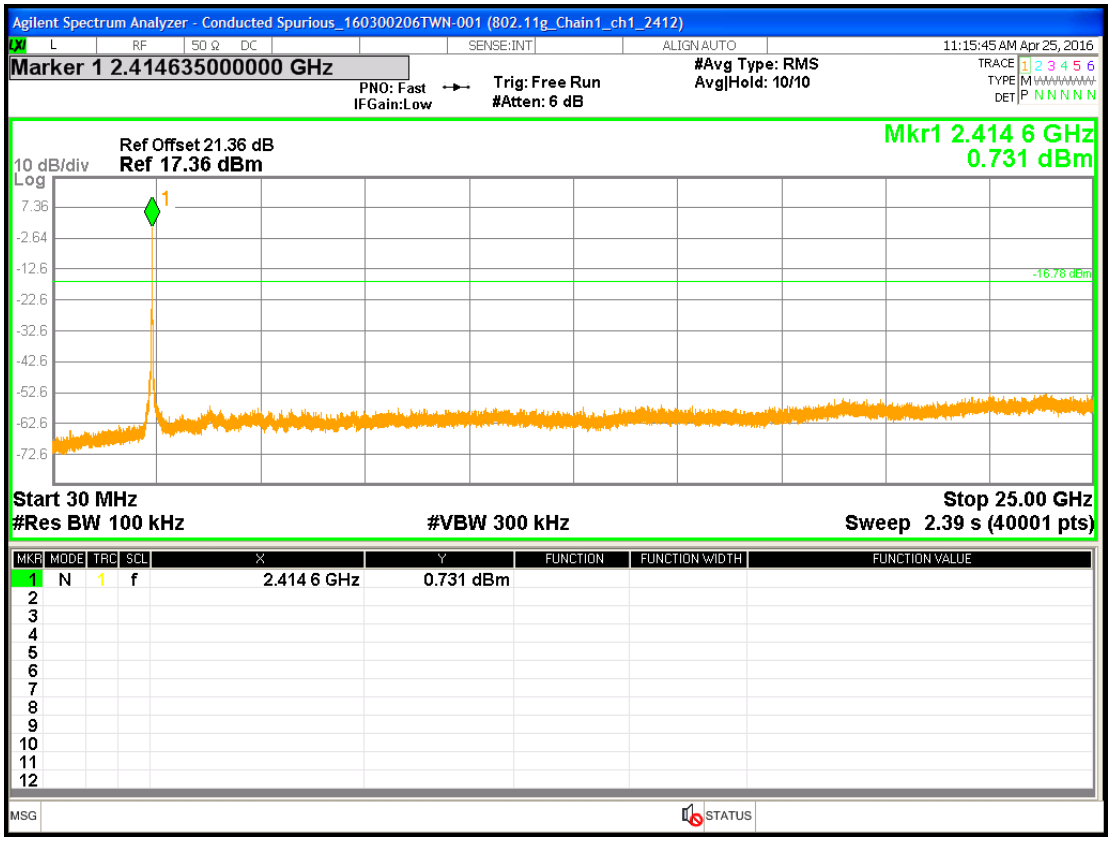
Chain0 : Conducted Spurious @ 802.11g mode Ch11



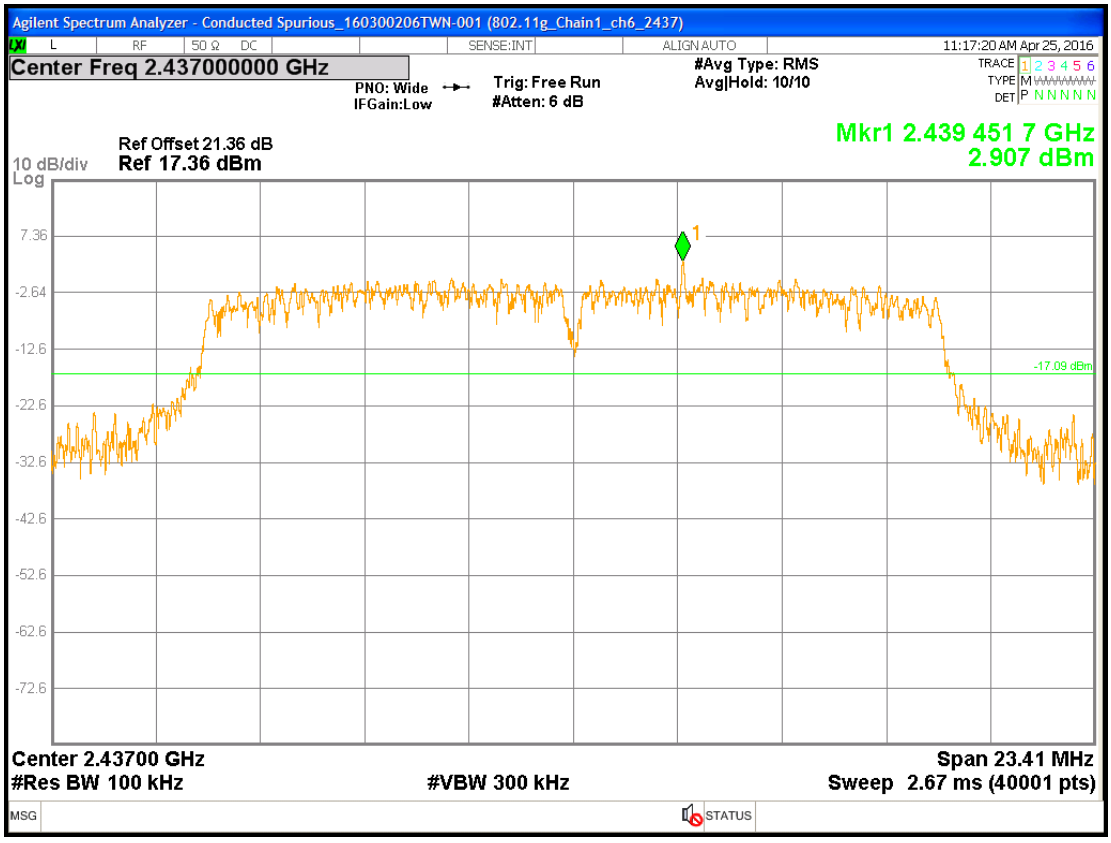
Chain1 : Conducted Spurious @ 802.11g mode Ch 1



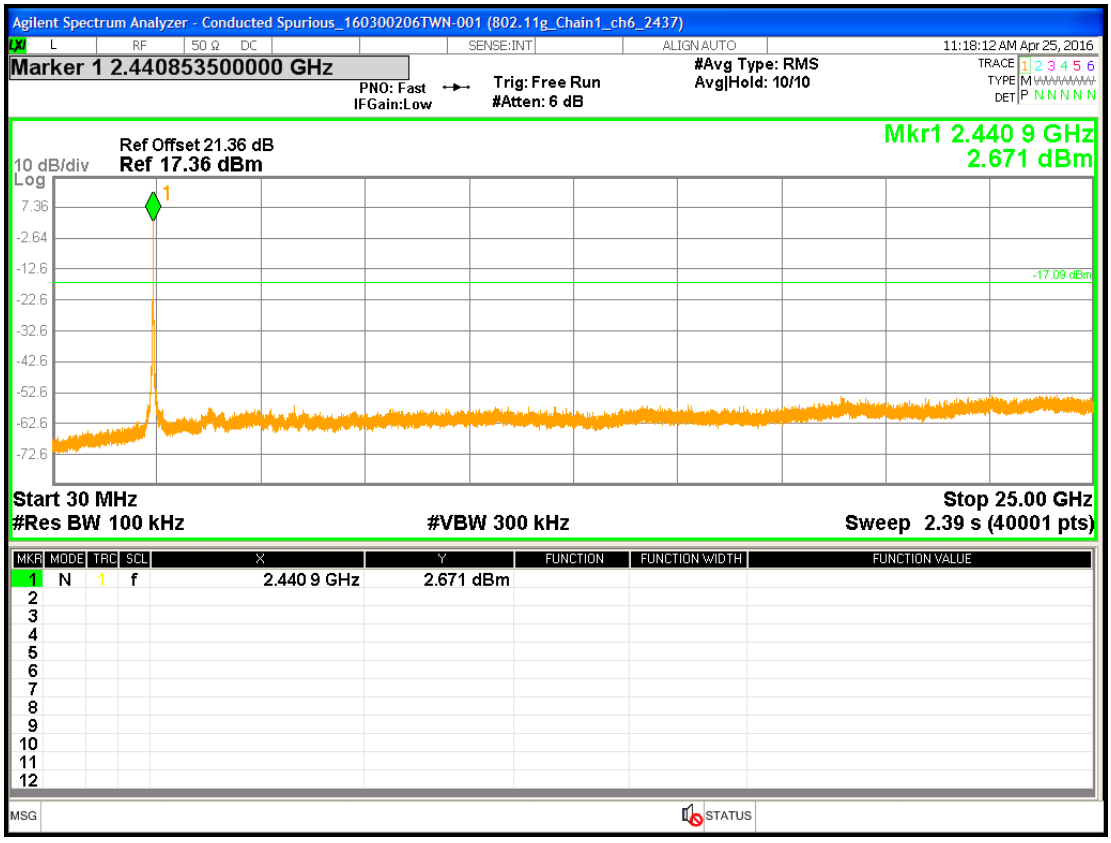
Chain1 : Conducted Spurious @ 802.11g mode Ch 1



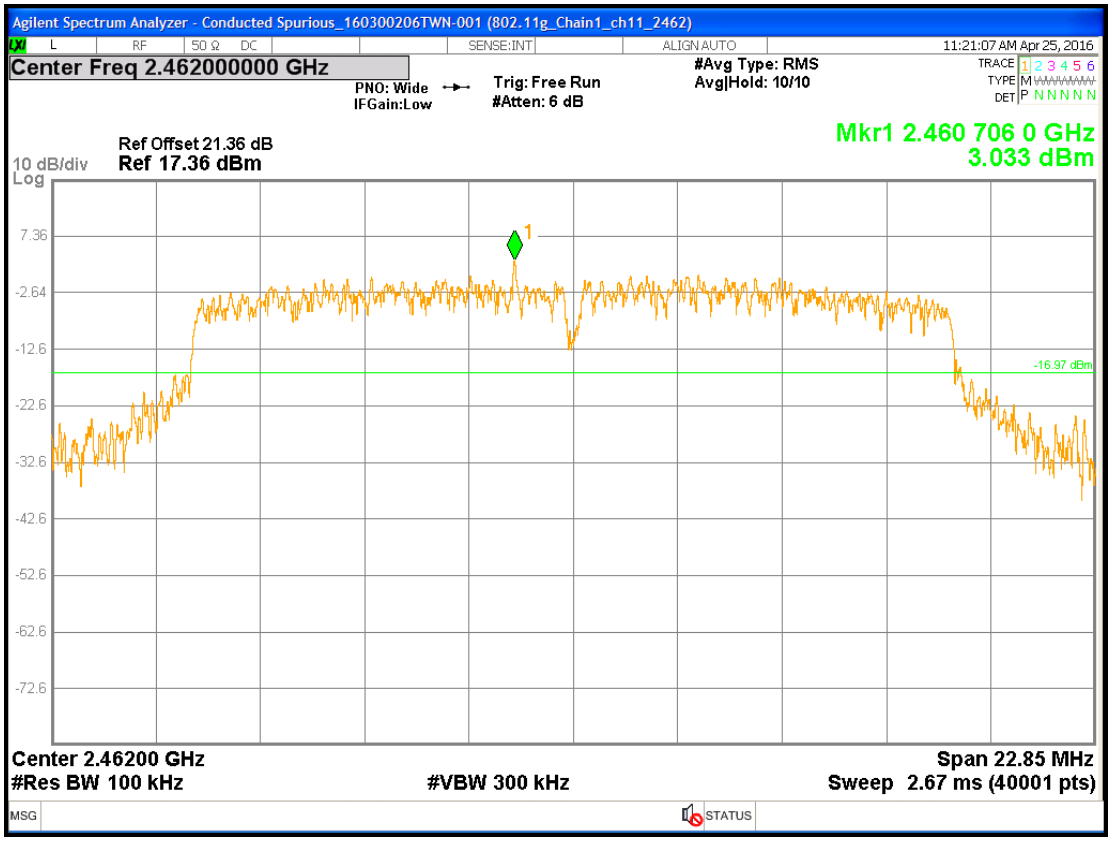
Chain1 : Conducted Spurious @ 802.11g mode Ch 6



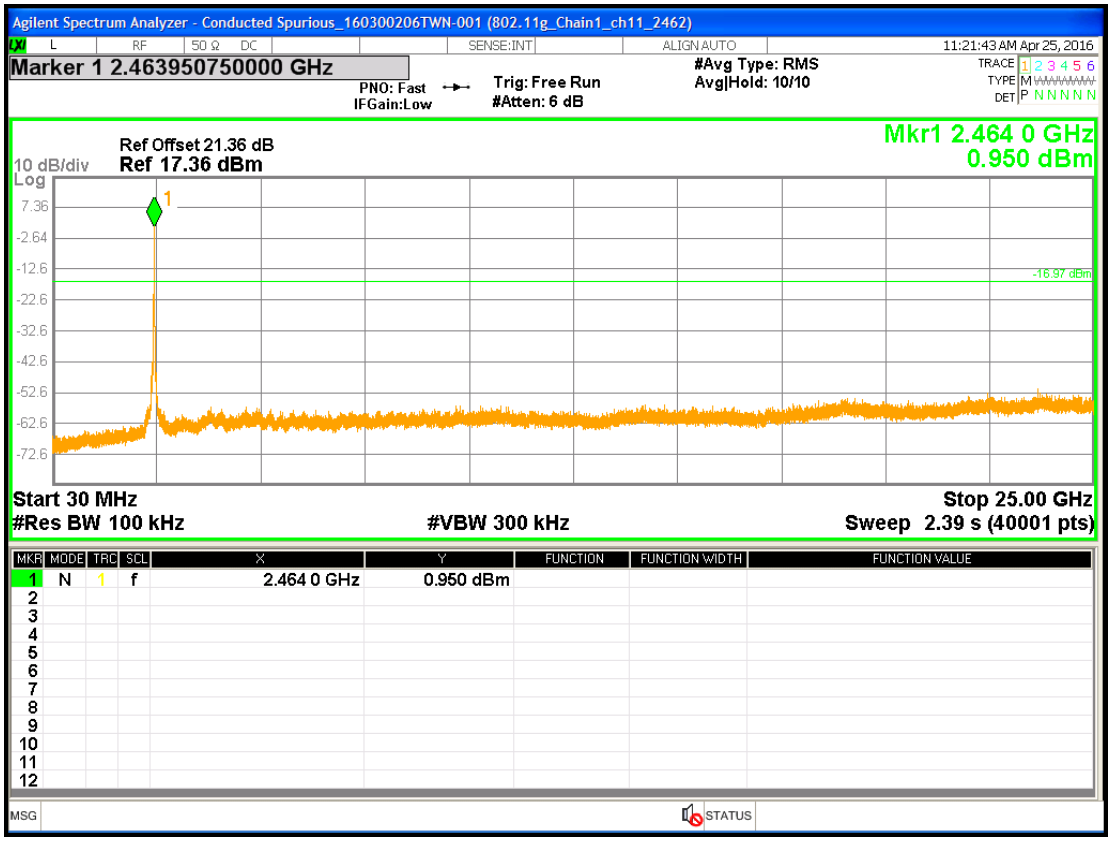
Chain1 : Conducted Spurious @ 802.11g mode Ch 6



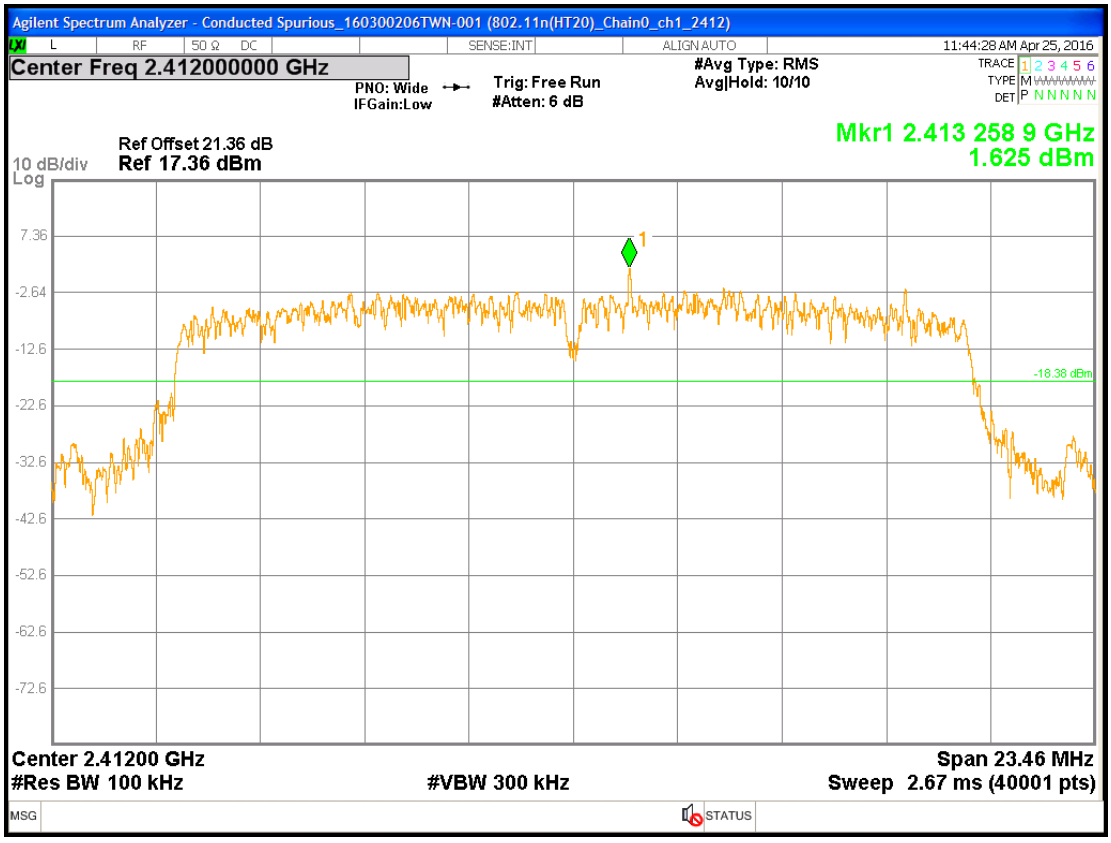
Chain1 : Conducted Spurious @ 802.11g mode Ch11



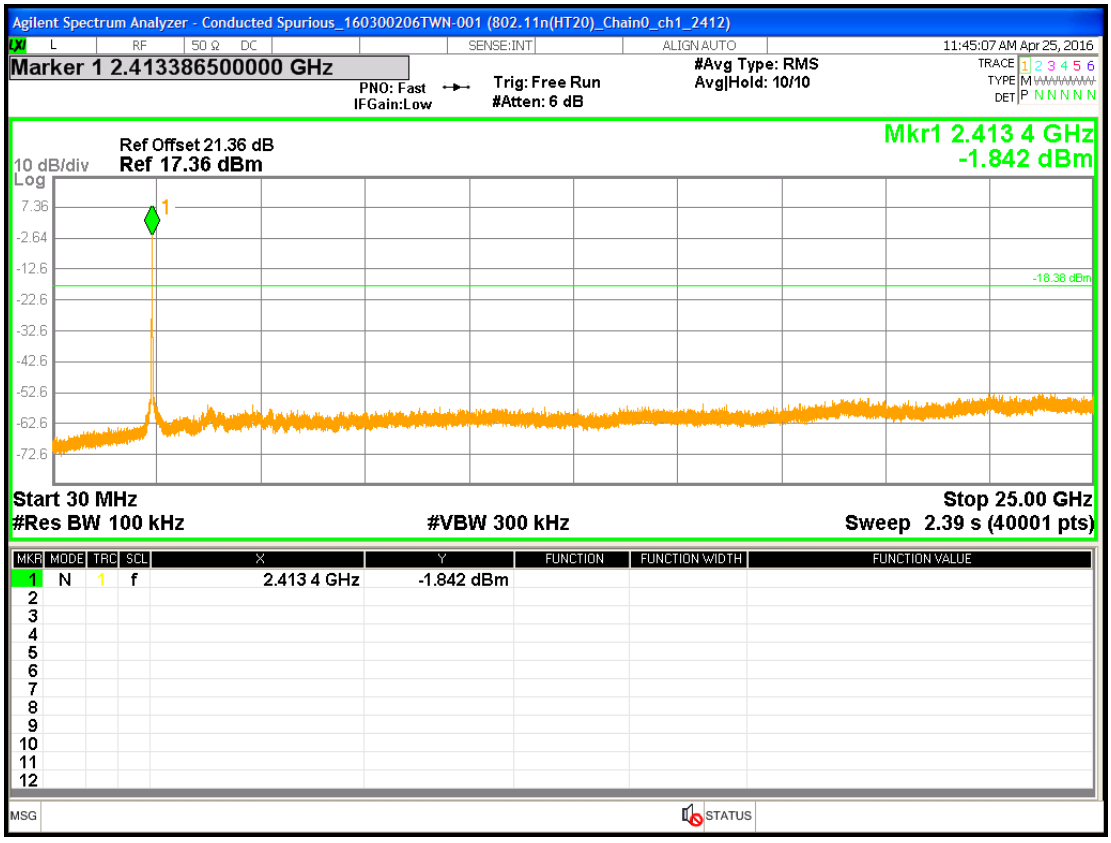
Chain1 : Conducted Spurious @ 802.11g mode Ch11



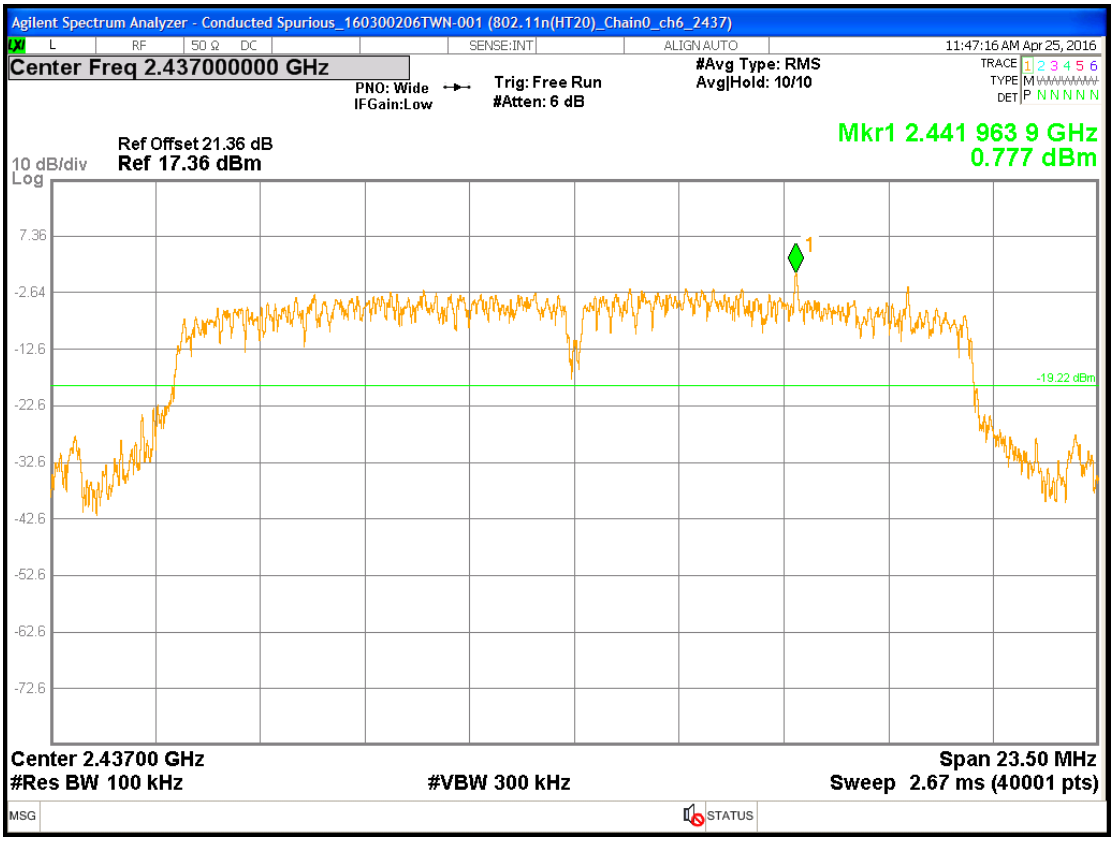
Chain0 : Conducted Spurious @ 802.11n(HT20) mode Ch 1



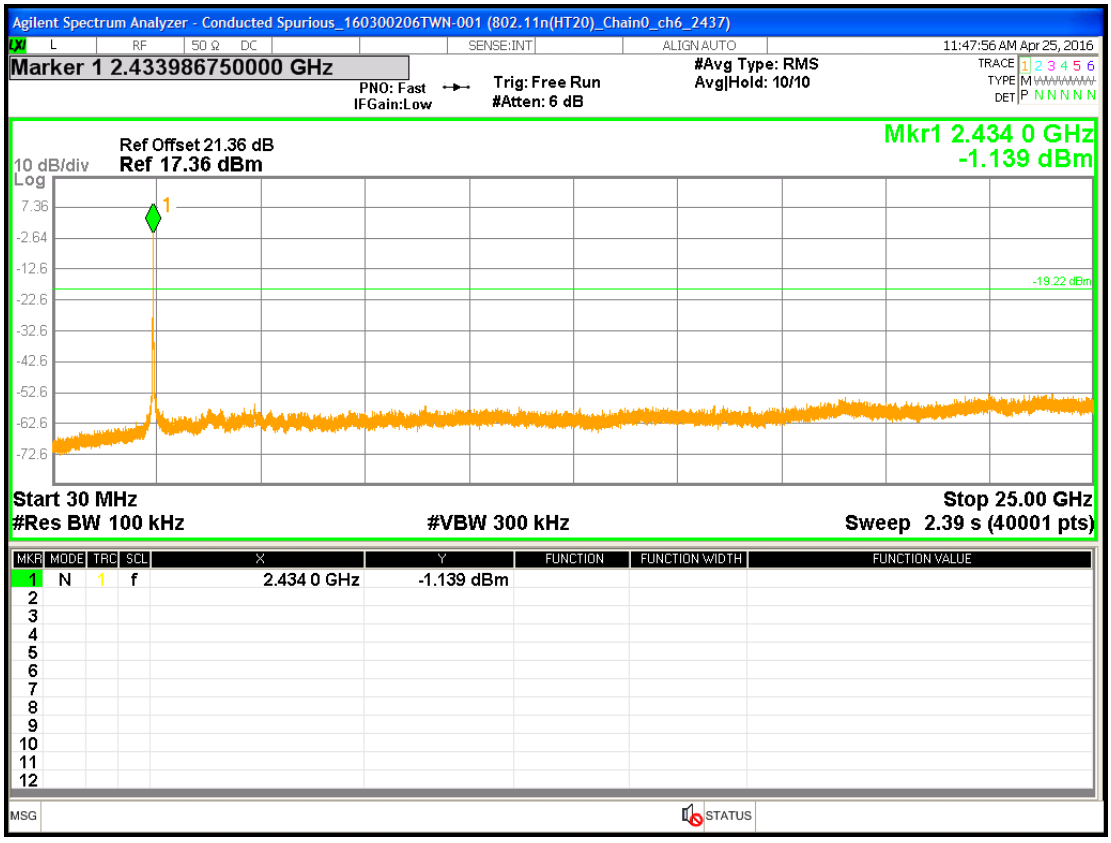
Chain0 : Conducted Spurious @ 802.11n(HT20) mode Ch 1



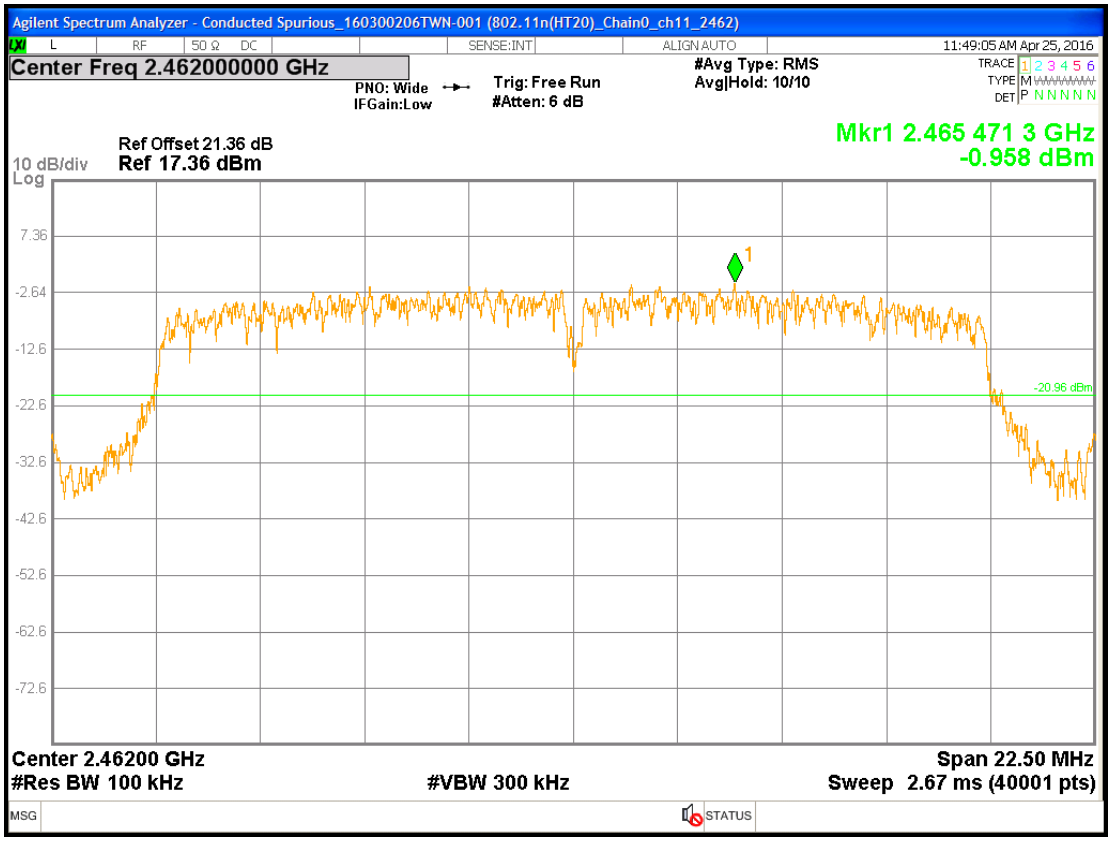
Chain0 : Conducted Spurious @ 802.11n(HT20) mode Ch 6



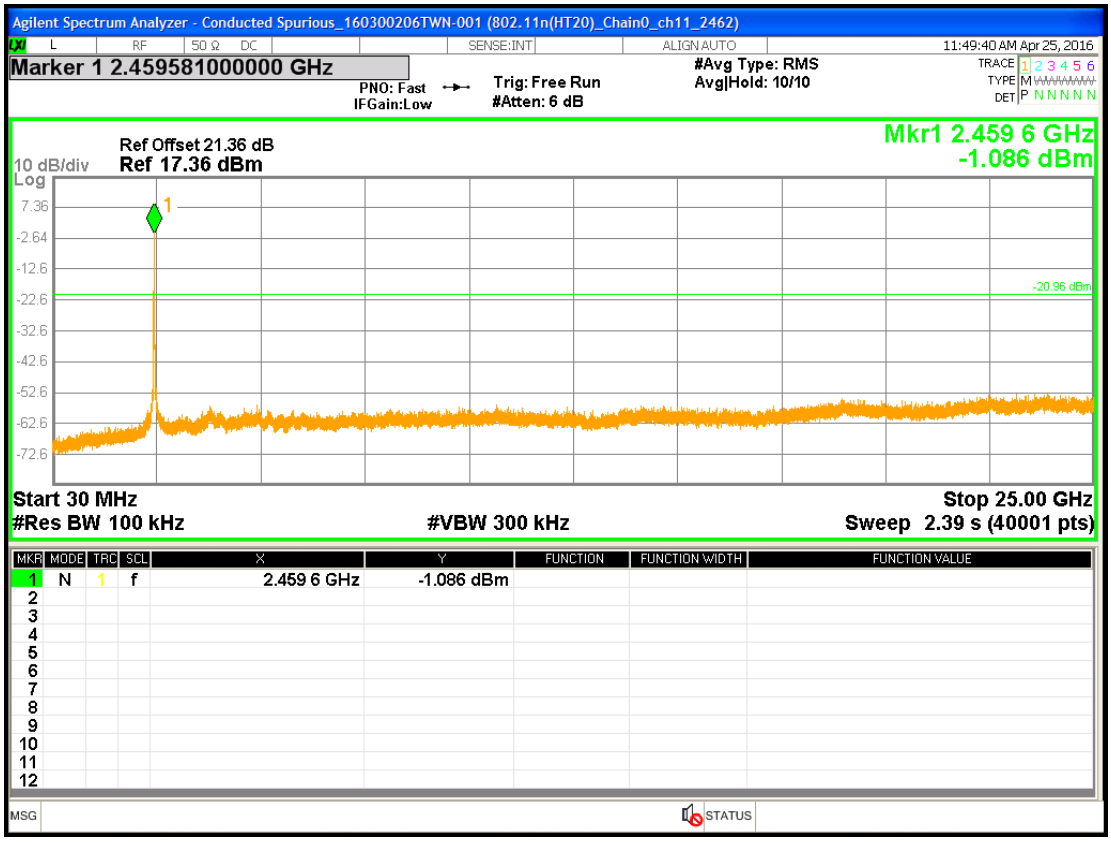
Chain0 : Conducted Spurious @ 802.11n(HT20) mode Ch 6



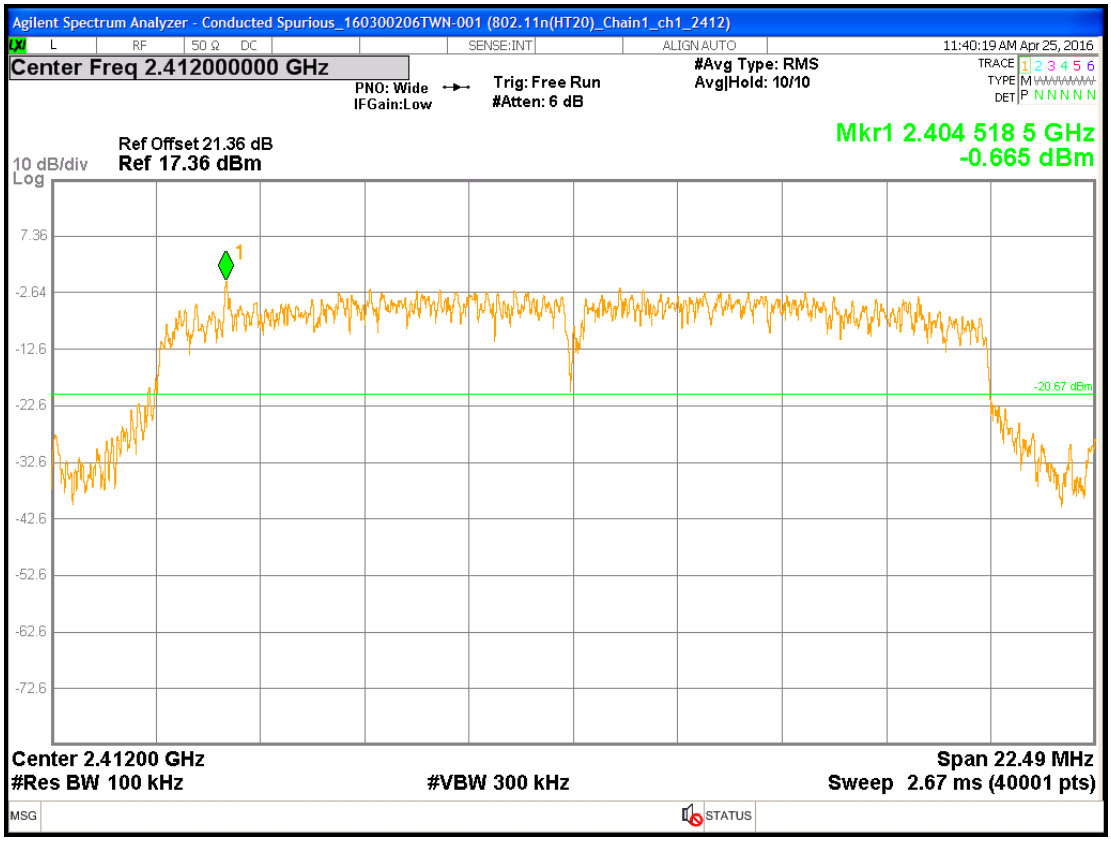
Chain0 : Conducted Spurious @ 802.11n(HT20) mode Ch11



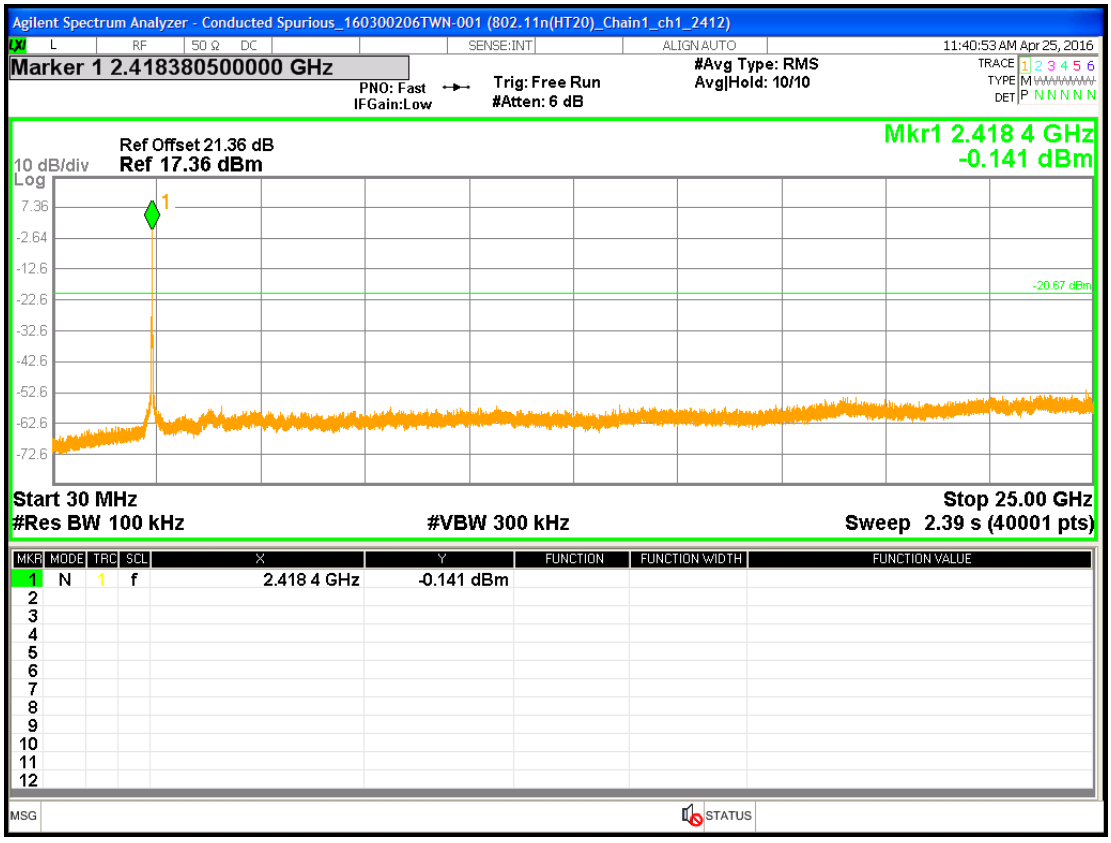
Chain0 : Conducted Spurious @ 802.11n(HT20) mode Ch11



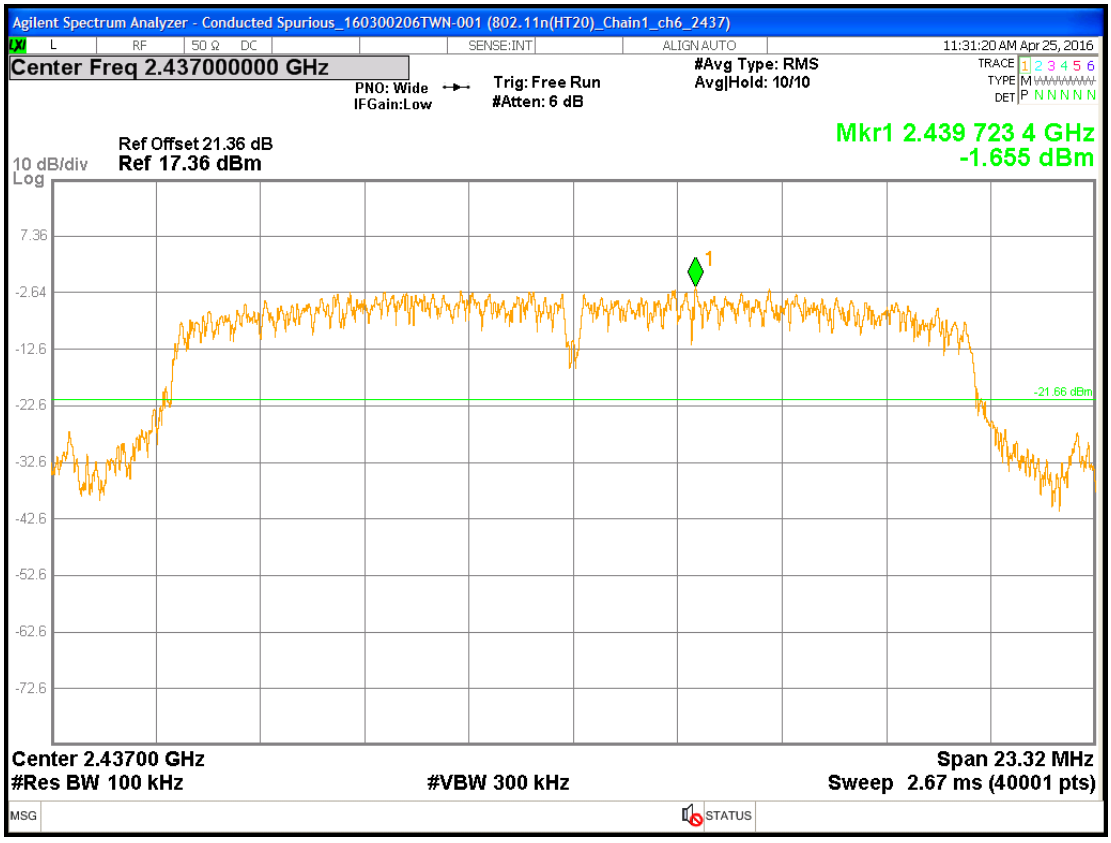
Chain1 : Conducted Spurious @ 802.11n(HT20) mode Ch 1



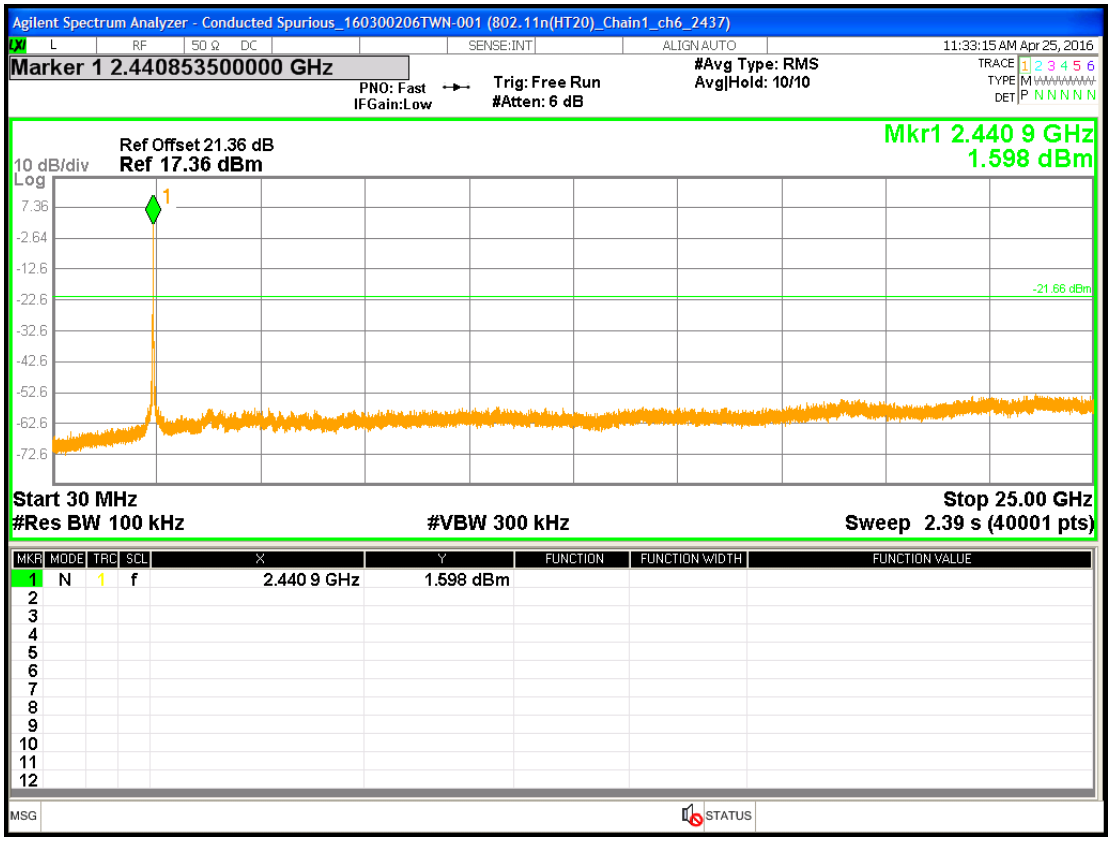
Chain1 : Conducted Spurious @ 802.11n(HT20) mode Ch 1



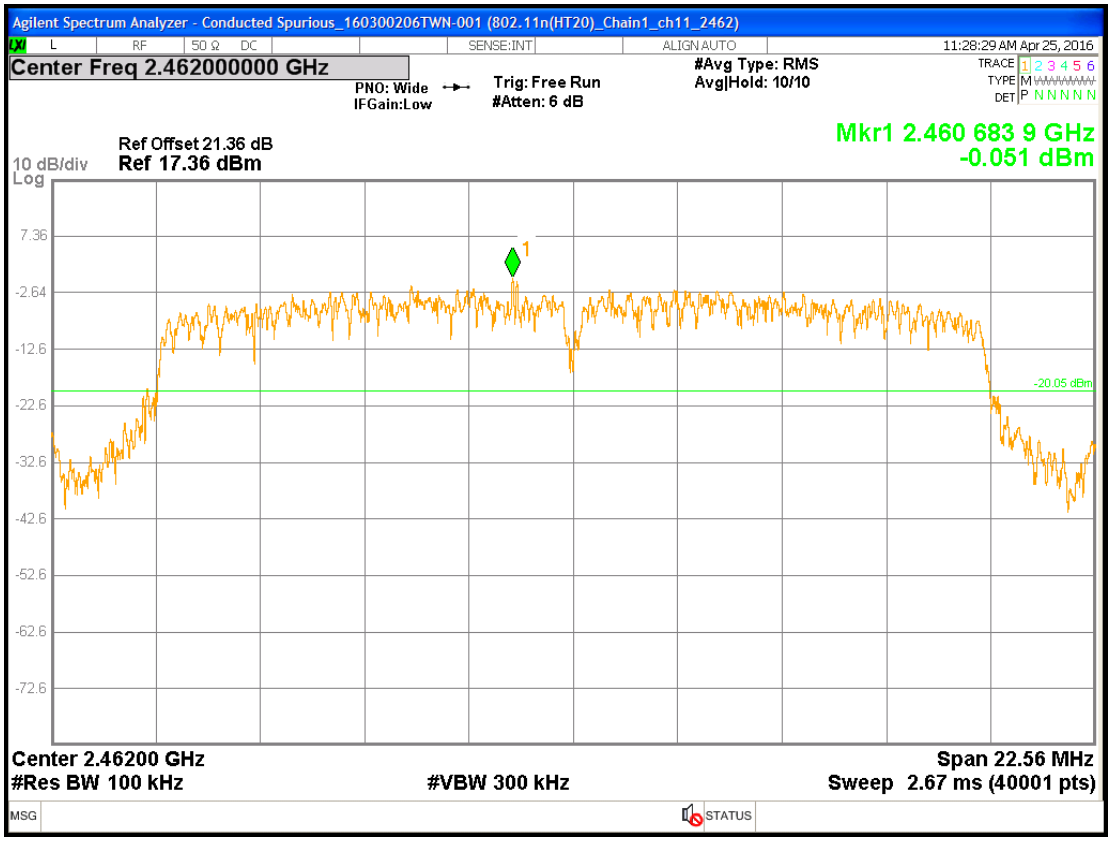
Chain1 : Conducted Spurious @ 802.11n(HT20) mode Ch 6



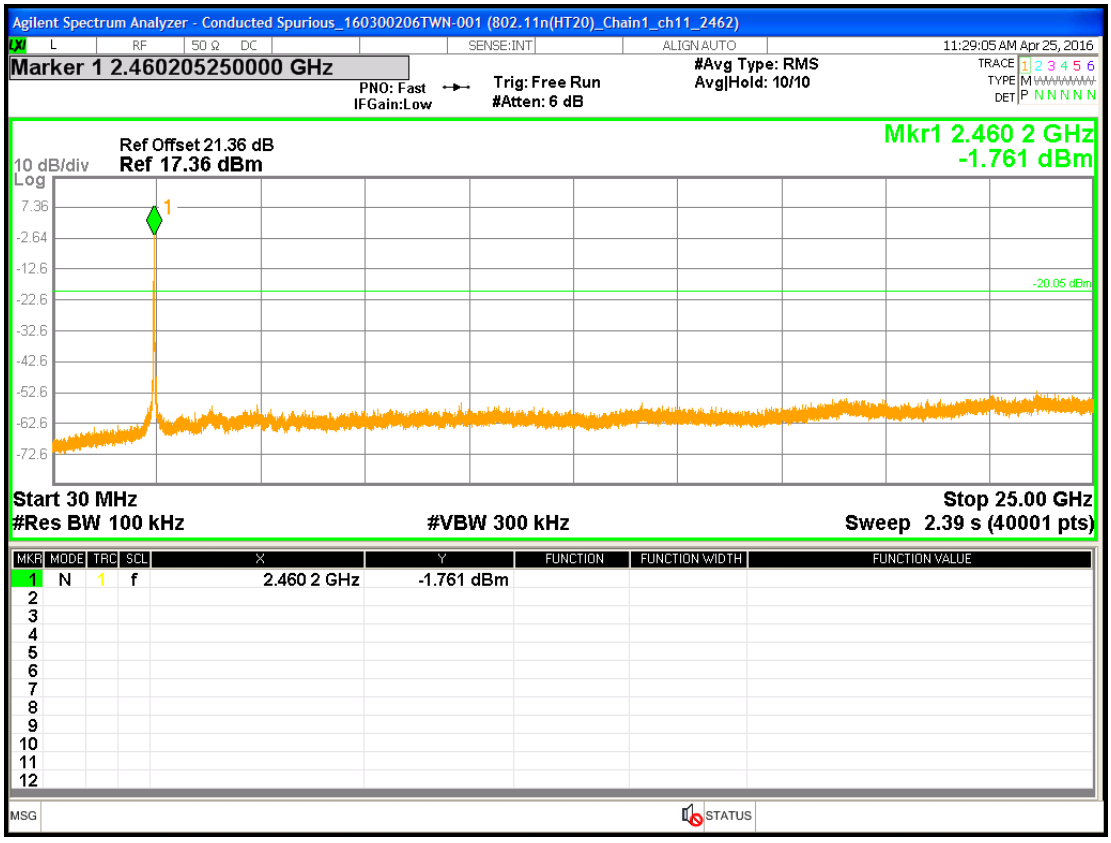
Chain1 : Conducted Spurious @ 802.11n(HT20) mode Ch 6



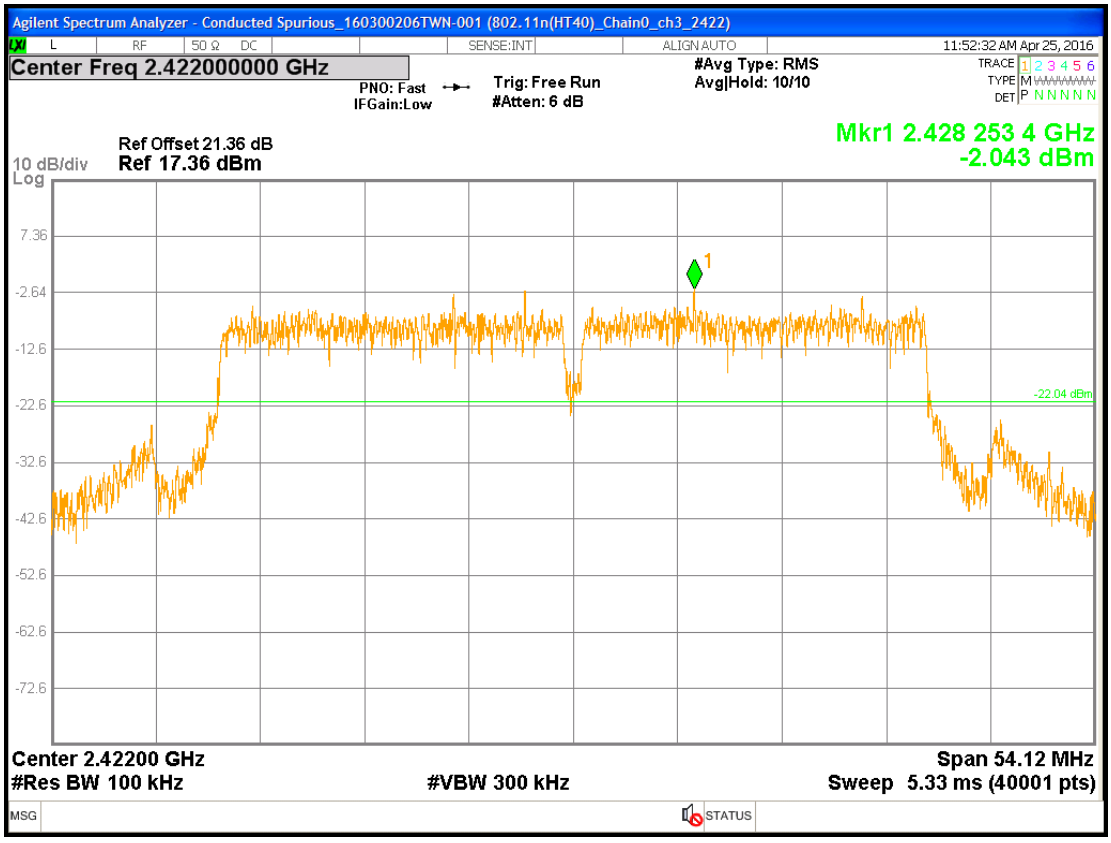
Chain1 : Conducted Spurious @ 802.11n(HT20) mode Ch11



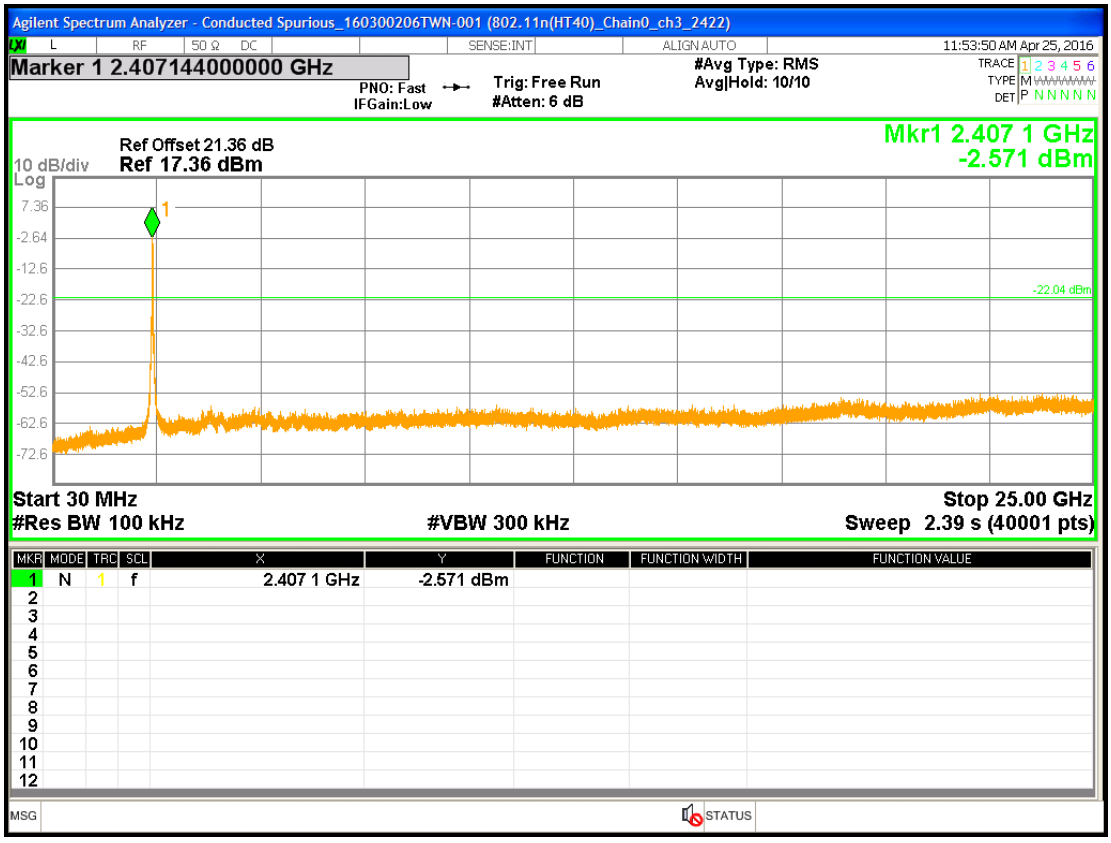
Chain1 : Conducted Spurious @ 802.11n(HT20) mode Ch11



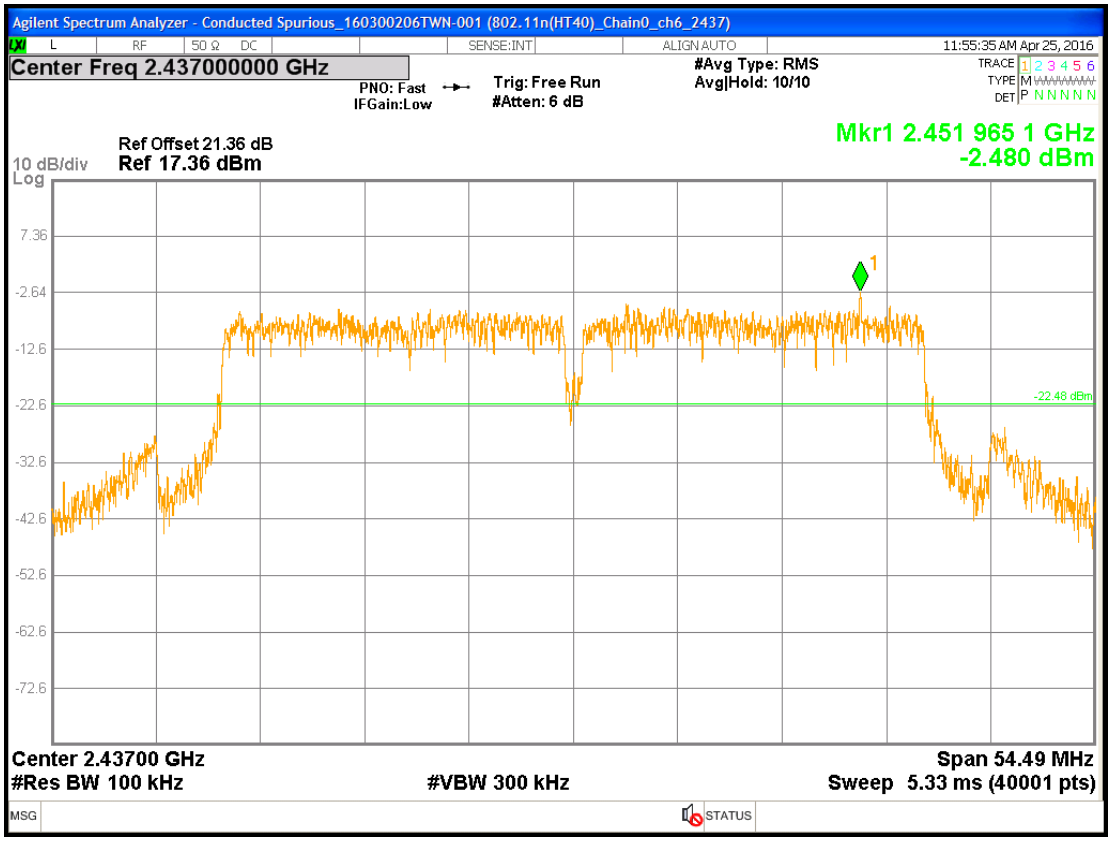
Chain0 : Conducted Spurious @ 802.11n(HT40mode Ch 3



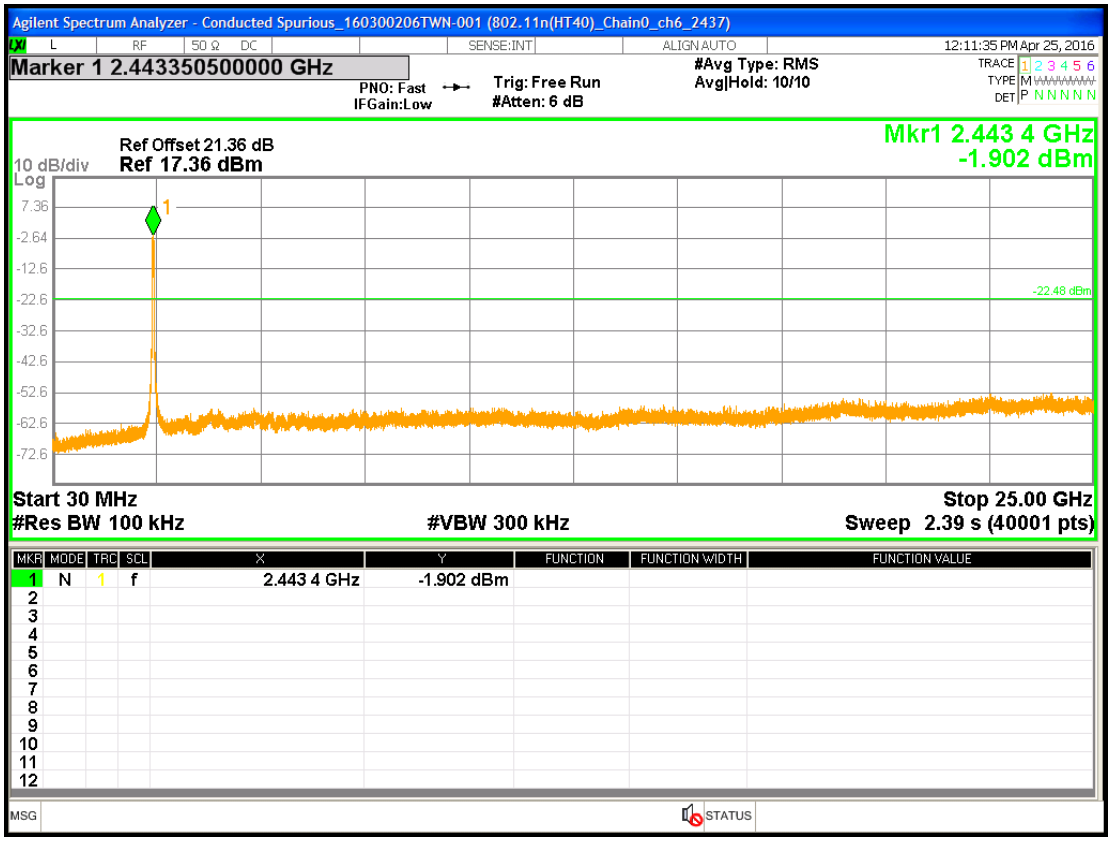
Chain0 : Conducted Spurious @ 802.11n(HT40) mode Ch 3



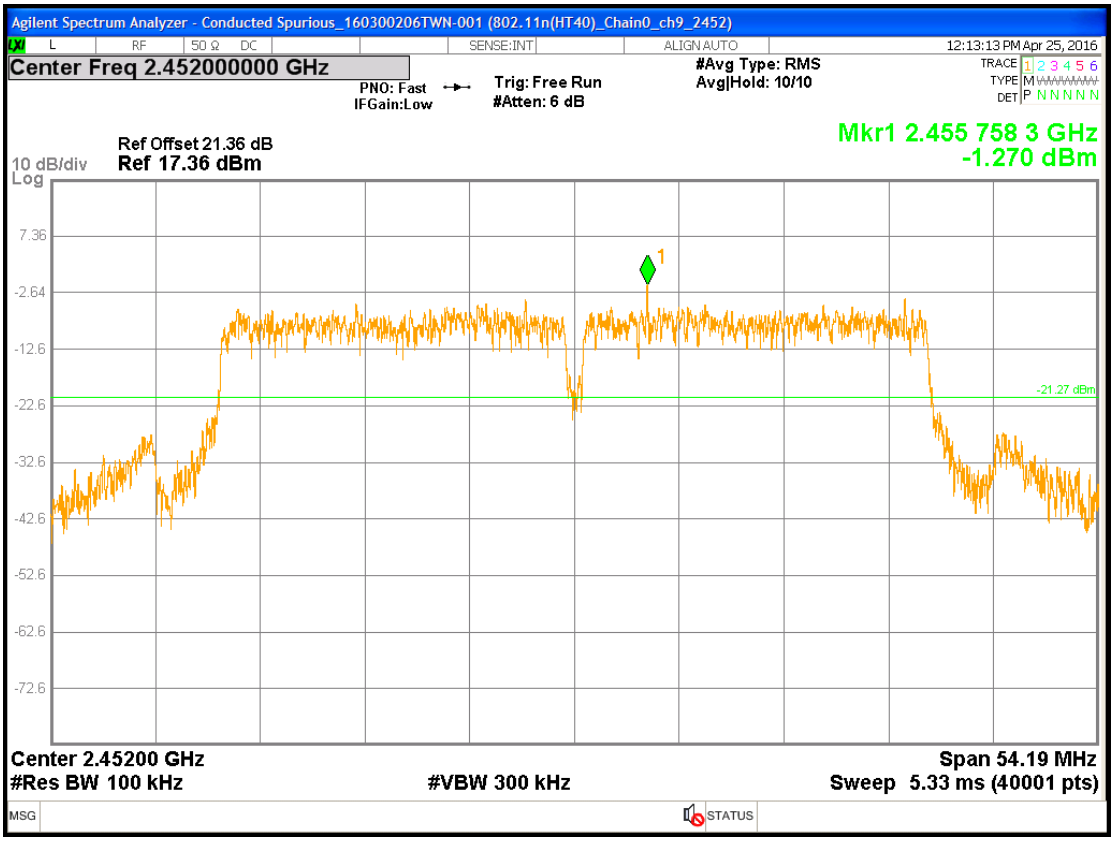
Chain0 : Conducted Spurious @ 802.11n(HT40) mode Ch 6



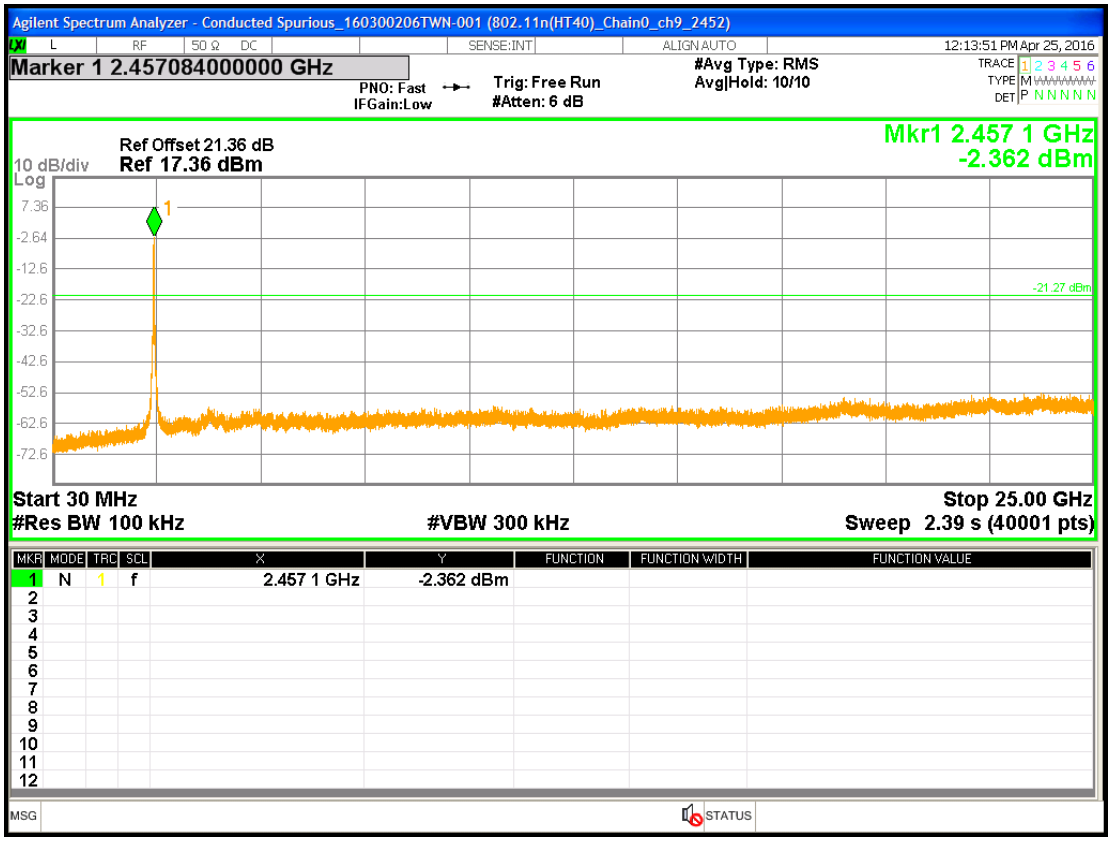
Chain0 : Conducted Spurious @ 802.11n(HT40) mode Ch 6



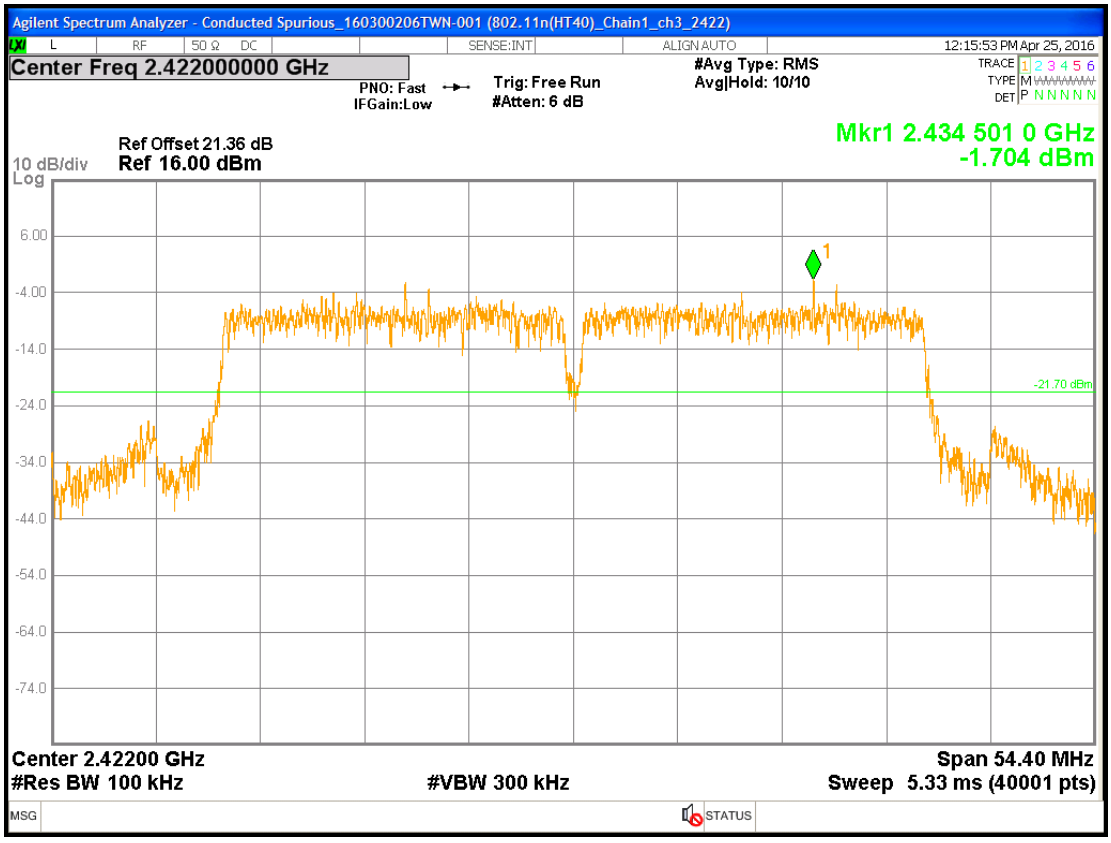
Chain0 : Conducted Spurious @ 802.11n(HT40) mode Ch9



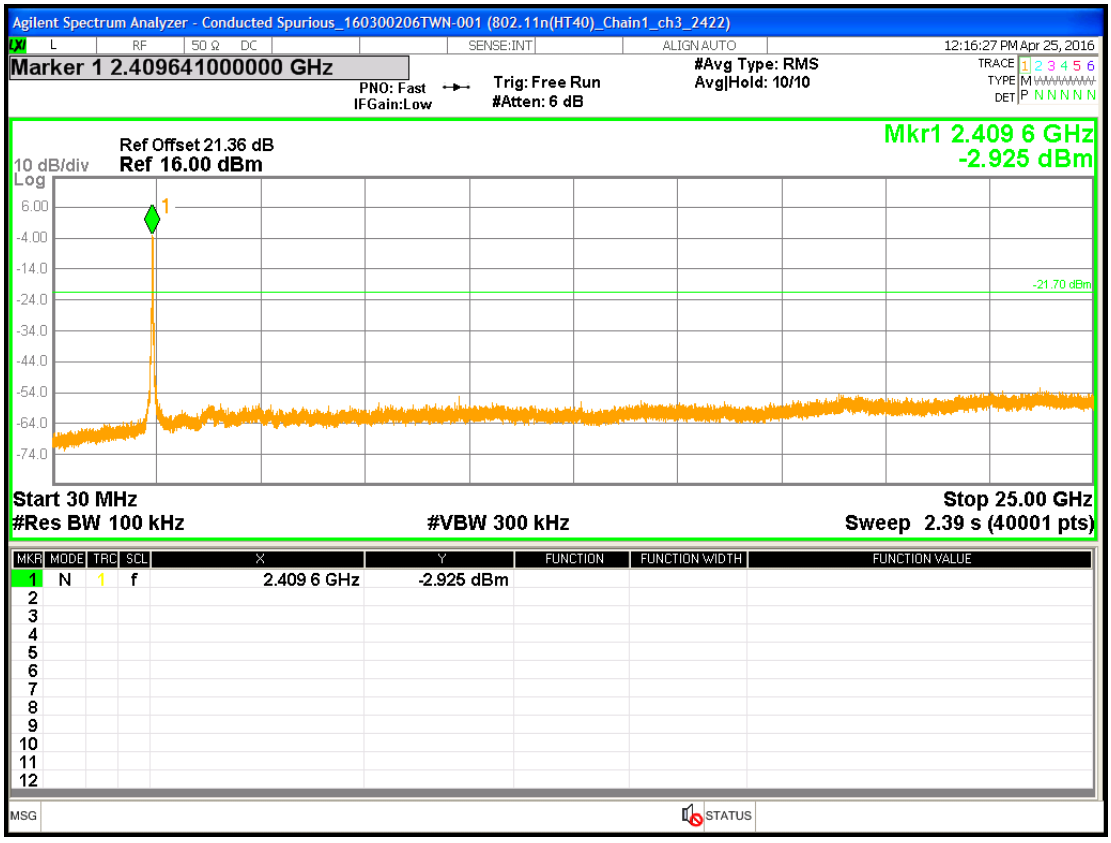
Chain0 : Conducted Spurious @ 802.11n(HT40) mode Ch9



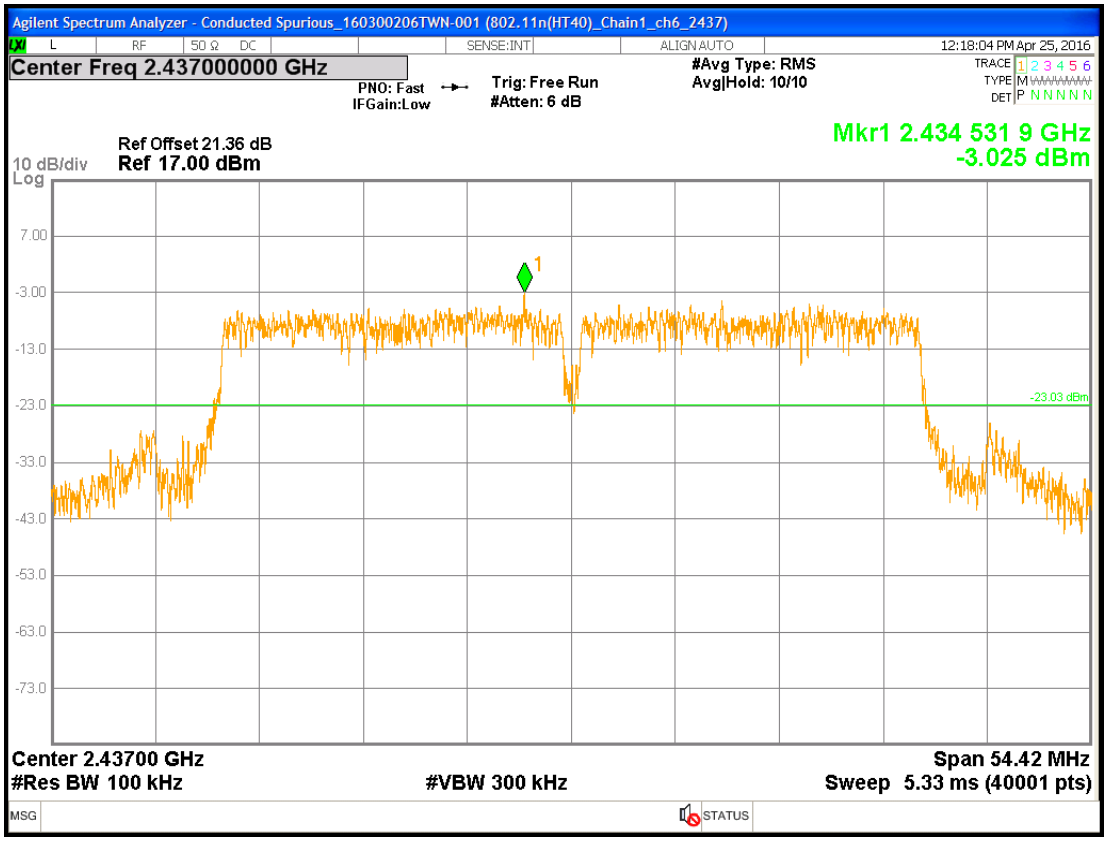
Chain1 : Conducted Spurious @ 802.11n(HT40) mode Ch 3



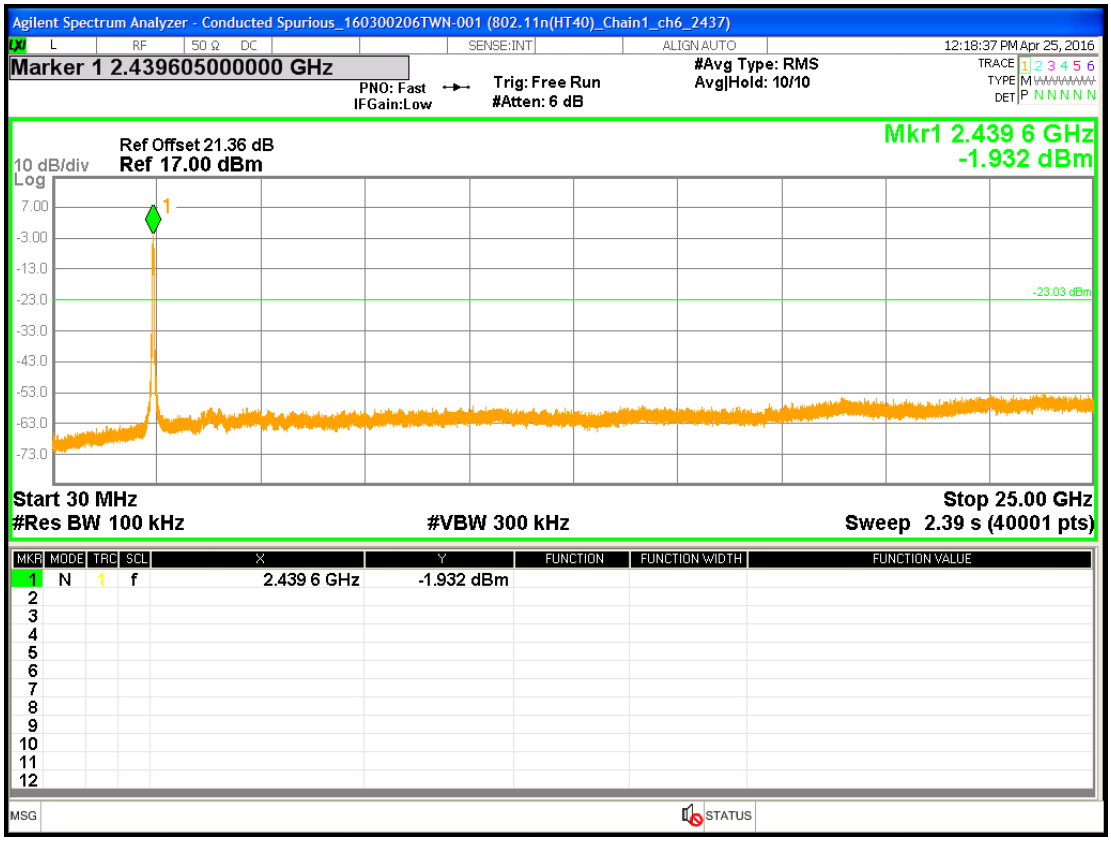
Chain1 : Conducted Spurious @ 802.11n(HT40) mode Ch 3



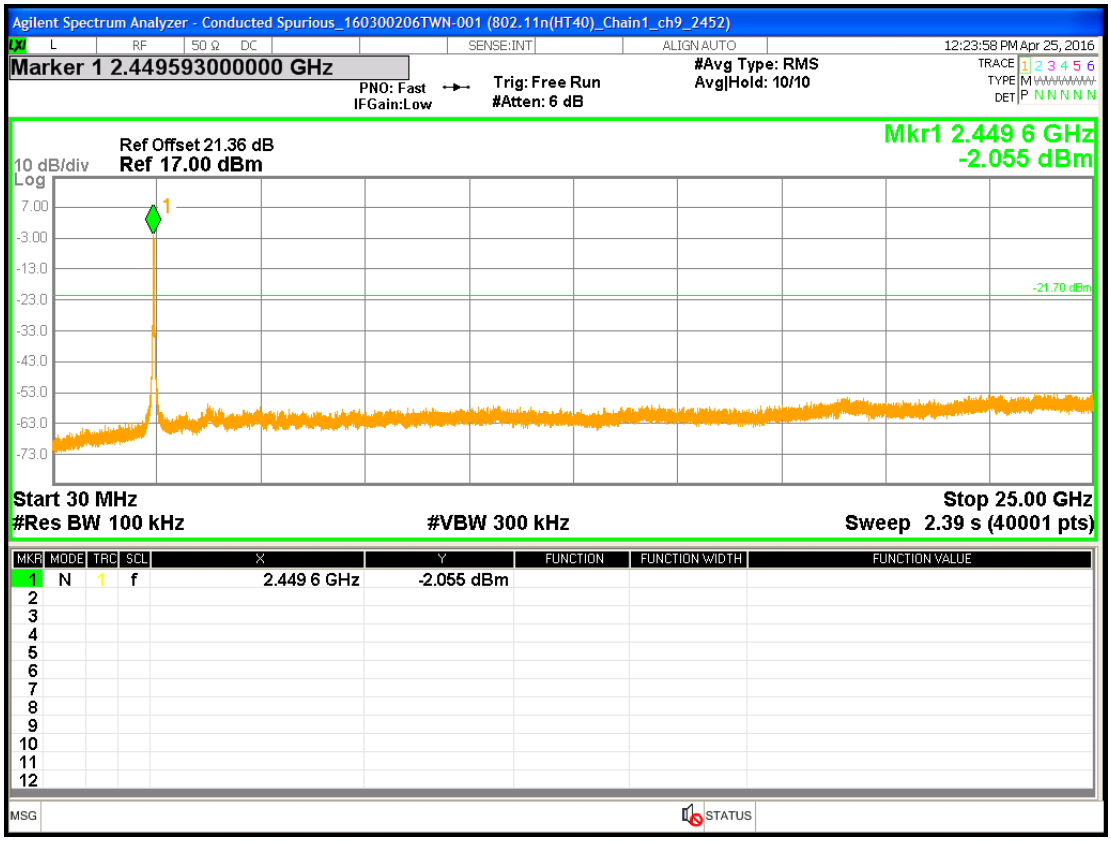
Chain1 : Conducted Spurious @ 802.11n(HT40) mode Ch 6



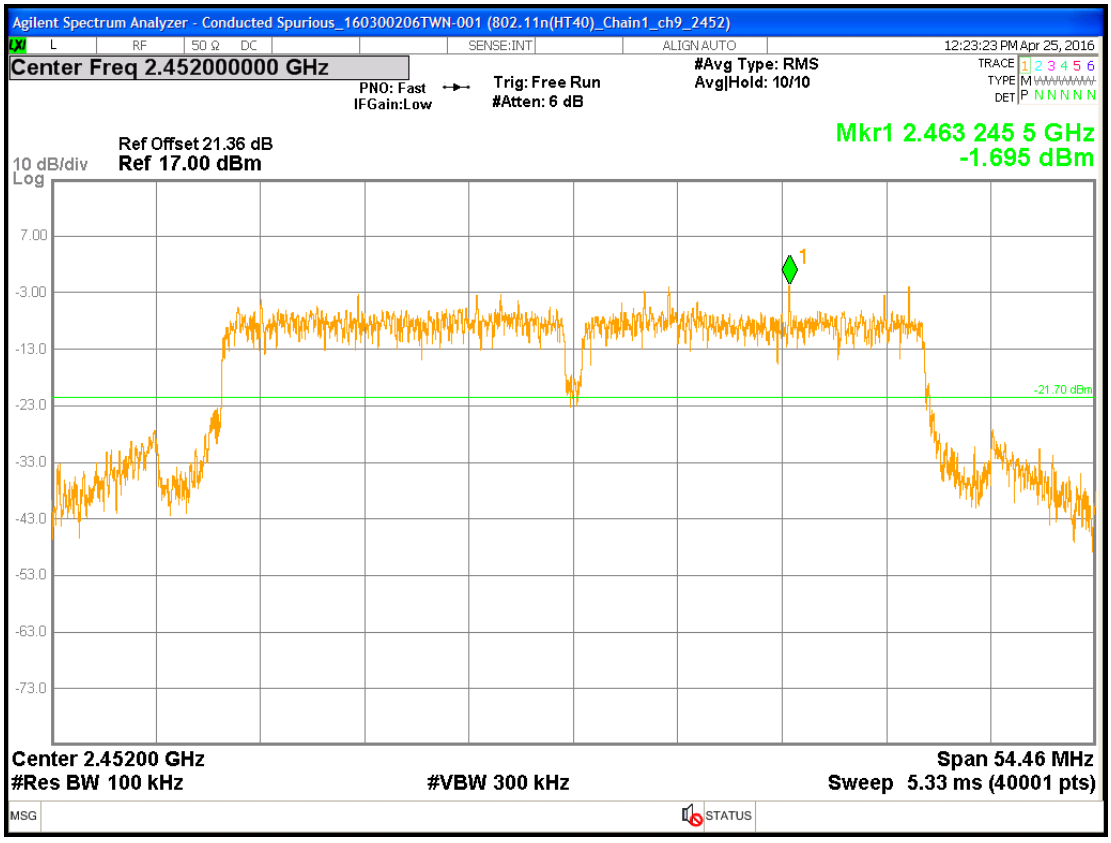
Chain1 : Conducted Spurious @ 802.11n(HT40) mode Ch 6



Chain1 : Conducted Spurious @ 802.11n(HT40) mode Ch9



Chain1 : Conducted Spurious @ 802.11n(HT40) mode Ch9



7. Emissions In Restricted Frequency Bands (Radiated emission measurements)

7.1 Operating environment

Temperature:	25	℃
Relative Humidity:	50	%
Atmospheric Pressure	1008	hPa
Requirement	15.247(d), 15.205, 15.209	

7.2 Limit for emission in restricted frequency bands (Radiated emission measurement)

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	2400/F(kHz)	30
1.705~30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark:

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

7.3 Measuring instrument setting

Below 1GHz measurement

Receiver settings	
Receiver function	**Setting**
Detector	QP
RBW	9-150 kHz ; 200-300 Hz 0.15-30 MHz; 9-10 kHz 30-1000 MHz; 100-120 kHz
VBW	≧3 x RBW
Sweep	Auto couple
Attenuation	Auto

Above 1GHz measurement

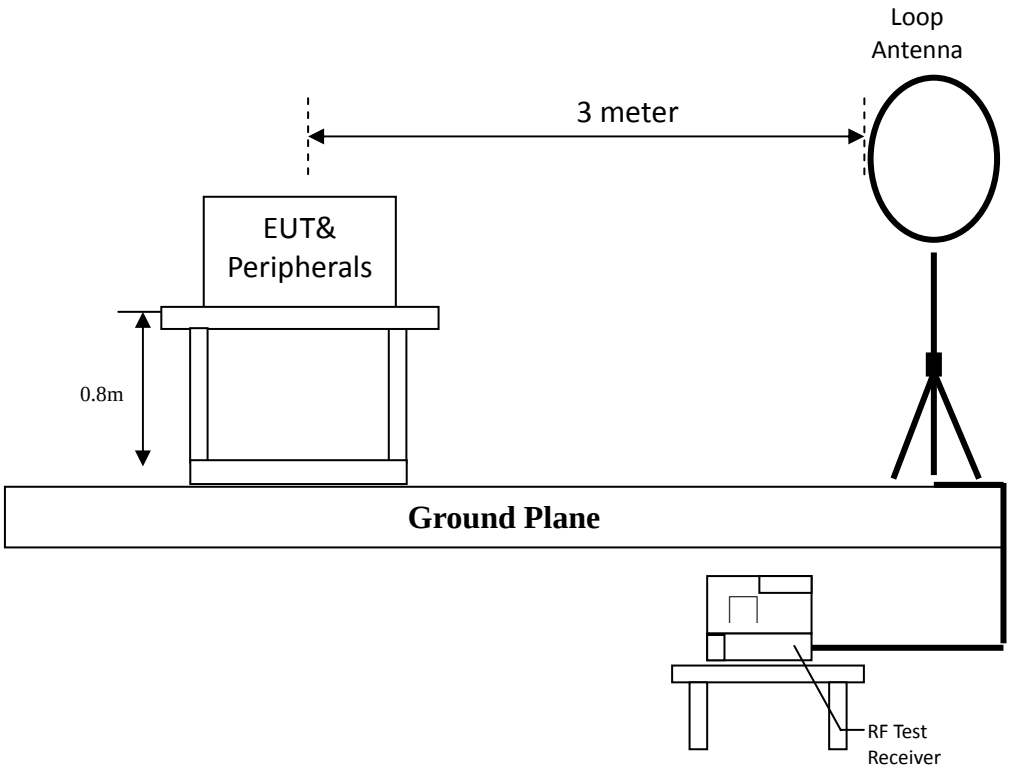
Spectrum analyzer settings	
Spectrum Analyzer function	**Setting**
Detector	Peak
RBW	1MHz
VBW	3MHz for Peak; 10Hz for Average
Sweep	Auto couple
Start Frequency	1GHz
Stop Frequency	Tenth harmonic
Attenuation	Auto

7.4 Test procedure

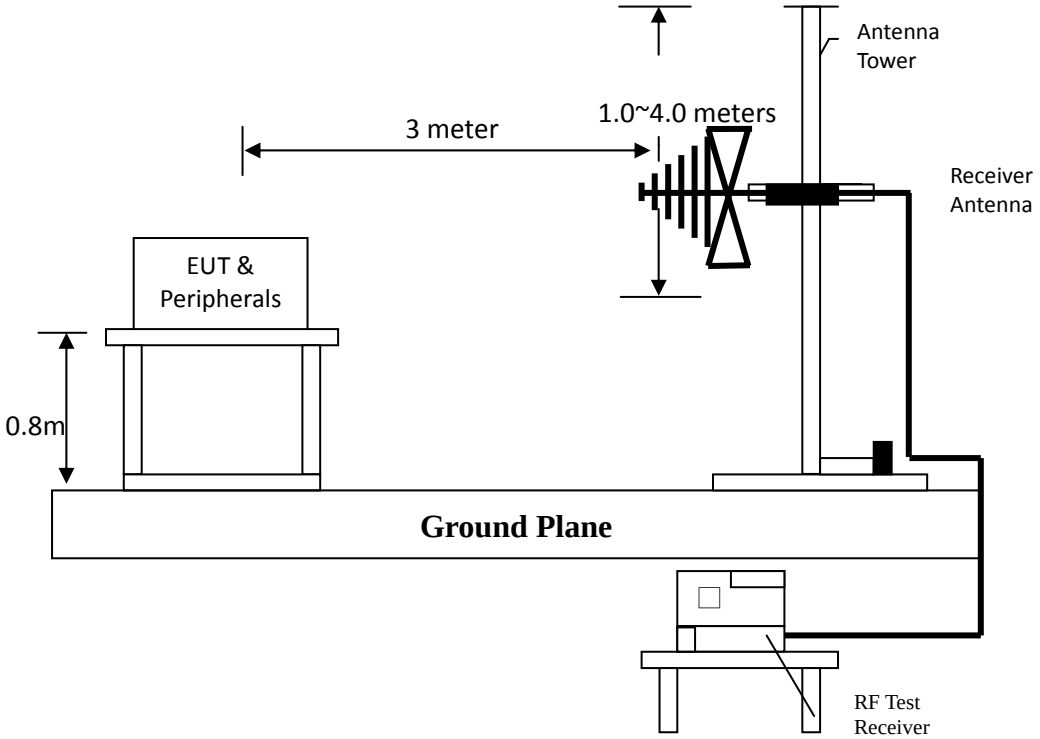
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the companion devices. The turntable was rotated by 360 degree to find the position of the maximum emission level.
3. The height of the receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of the both horizontal and vertical polarization
4. If find the frequencies above the limit or below within 3dB, the antenna tower was scan (from 1m to 4m) and then the turntable was rotated to find the maximum reading.
5. Set the test-receiver system to peak or CISPR quasi-peak detector with specified bandwidth under maximum hold mode.
6. For emissions above 1GHz, use 1MHz VBW and 3MHz RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
   Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.
7. If the emissions level of the EUT in peak mode was 3dB lower than the average limit specified then testing will be stopped and peak values of the EUT will be reported. Otherwise, the emissions which do not have 3dB margin will be measured using the quasi-peak method for below 1GHz.
8. For testing above 1GHz, The emissions level of the EUT in peak mode was lower than average limit, then testing will be stopped and peak values of the EUT will be reported, otherwise, the emission will be measured in average mode again and reported.
9. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be quasi-peak measured by receiver.

7.5 Test configuration

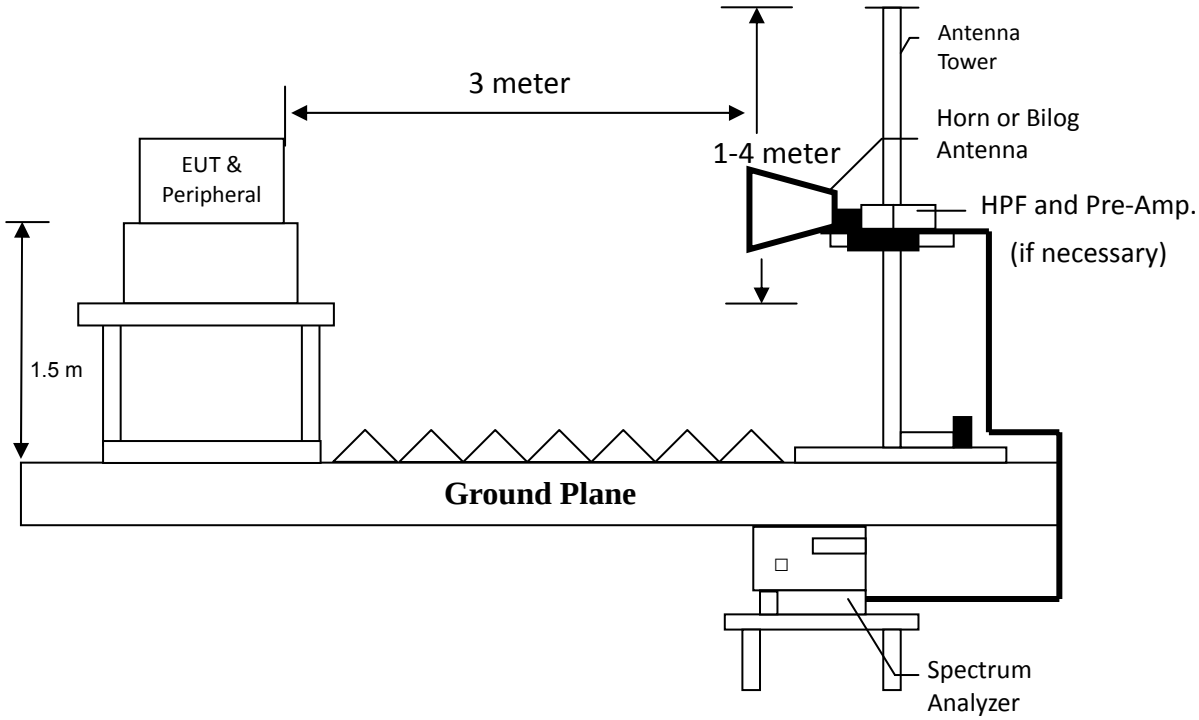
7.5.1 Radiated emission from 9kHz to 30MHz uses Loop Antenna:



7.5.2 Radiated emission below 1GHz using Bilog Antenna



7.5.3 Radiated emission above 1GHz using Horn Antenna



7.6 Test result

7.6.1 Measurement results: frequencies 9kHz to 30MHz

EUT : HURESAC-3XE-C
Test mode : TX Mode

Frequency (MHz)	Detection value	Factor (dB/m)	Reading (dBµV)	Value (dBµV/m)	Limit @ 3m (dBµV/m)	Tolerance (dB)
0.02	QP	20.92	15.44	36.36	200.00	-163.65
0.03	QP	20.86	19.04	39.90	160.00	-120.10
0.04	QP	20.85	13.28	34.13	140.00	-105.88
0.06	QP	20.82	15.74	36.56	120.00	-83.44
0.07	QP	20.81	15.35	36.16	114.29	-78.13
0.11	QP	20.77	15.55	36.32	101.82	-65.50

Remark: Corr. Factor = Antenna Factor + Cable Loss - PreAmplifier Gain

7.6.2 Measurement results: frequencies below 1 GHz

The test was performed on EUT under 802.11n (HT20) continuously transmitting mode. The worst case occurred at 802.11n (HT20) Tx ch High.

EUT : HURESAC-3XE-C
Worst Case : 802.11n(HT20) Tx ch High

Antenna Polariz. (V/H)	Freq. (MHz)	Receiver Detector	Corr. Factor (dB/m)	Reading (dBµV)	Corrected Level (dBµV/m)	Limit @ 3 m (dBµV/m)	Margin (dB)
Vertical	47.46	QP	16.97	12.93	29.90	40.00	-10.10
Vertical	191.02	QP	13.98	15.50	29.48	43.50	-14.02
Vertical	262.80	QP	16.18	15.78	31.96	46.00	-14.04
Vertical	288.02	QP	17.06	20.63	37.69	46.00	-8.31
Vertical	334.58	QP	18.33	15.73	34.06	46.00	-11.94
Vertical	528.58	QP	22.60	14.43	37.03	46.00	-8.97
Horizontal	95.96	QP	11.05	18.53	29.58	43.50	-13.92
Horizontal	142.52	QP	16.16	16.28	32.44	43.50	-11.06
Horizontal	192.96	QP	13.94	20.51	34.45	43.50	-9.05
Horizontal	288.02	QP	17.06	21.27	38.33	46.00	-7.67
Horizontal	336.52	QP	18.38	13.97	32.35	46.00	-13.65
Horizontal	528.58	QP	22.60	11.27	33.87	46.00	-12.13

Remark: Corr. Factor = Antenna Factor + Cable Loss

7.6.3 Measurement results: frequency above 1GHz to 25GHz

EUT : HURESAC-3XE-C

Mode	Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBµV)	Corrected Reading (dBµV/m)	Limit @ 3 m (dBµV/m)	Margin (dB)
802.11b Ch 1	3150	PK	V	39.85	-3.73	47.23	43.50	74.00	-30.50
	4824	PK	V	40.10	-0.04	49.64	49.60	74.00	-24.40
	7236	PK	V	38.08	8.19	45.15	53.34	74.00	-20.66
	3150	PK	H	39.85	-3.73	45.20	41.47	74.00	-32.53
	4824	PK	H	40.10	-0.04	49.19	49.15	74.00	-24.85
	7236	PK	H	38.08	8.19	39.79	47.98	74.00	-26.02
802.11b Ch 6	3150	PK	V	39.85	-3.73	48.24	44.51	74.00	-29.49
	4874	PK	V	40.00	0.13	50.28	50.41	74.00	-23.59
	7311	PK	V	38.02	8.42	34.71	43.13	74.00	-30.87
	9748	PK	V	38.33	11.24	44.22	55.46	74.00	-18.54
	9748	AV	V	38.33	11.24	39.67	50.91	54.00	-3.09
	3150	PK	H	39.85	-3.73	45.44	41.71	74.00	-32.29
	4874	PK	H	40.00	0.13	50.39	50.52	74.00	-23.48
	7311	PK	H	38.02	8.42	40.22	48.64	74.00	-25.36
	9748	PK	H	38.33	11.24	43.05	54.29	74.00	-19.71
	9748	AV	H	38.33	11.24	38.39	49.63	54.00	-4.37
802.11b Ch 11	3150	PK	V	39.85	-3.73	47.93	44.20	74.00	-29.80
	4924	PK	V	39.91	0.30	52.38	52.68	74.00	-21.32
	7386	PK	V	37.96	8.66	43.05	51.71	74.00	-22.29
	9848	PK	V	38.47	11.14	43.59	54.73	74.00	-19.27
	9848	AV	V	38.47	11.14	39.19	50.33	54.00	-3.67
	3150	PK	H	39.85	-3.73	46.88	43.15	74.00	-30.85
	4924	PK	H	39.91	0.30	51.46	51.76	74.00	-22.24
	7386	PK	H	37.96	8.66	38.78	47.44	74.00	-26.56

Remark: Correction Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Pre_Amplifier Gain

Mode	Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBµV)	Corrected Reading (dBµV/m)	Limit @ 3 m (dBµV/m)	Margin (dB)
802.11g Ch 1 Chain0	3150	PK	V	39.85	-3.73	46.59	42.86	74.00	-31.14
	4824	PK	V	40.10	-0.04	45.19	45.15	74.00	-28.85
	7236	PK	V	38.08	8.19	44.48	52.67	74.00	-21.33
	3150	PK	H	39.85	-3.73	46.63	42.90	74.00	-31.10
	4824	PK	H	40.10	-0.04	44.84	44.80	74.00	-29.20
	7236	PK	H	38.08	8.19	39.66	47.85	74.00	-26.15
802.11g Ch 6 Chain0	3150	PK	V	39.85	-3.73	45.99	42.26	74.00	-31.74
	4874	PK	V	40.00	0.13	46.11	46.24	74.00	-27.76
	7311	PK	V	38.02	8.42	39.64	48.06	74.00	-25.94
	3150	PK	H	39.85	-3.73	44.96	41.23	74.00	-32.77
	4874	PK	H	40.00	0.13	46.07	46.20	74.00	-27.80
	7311	PK	H	38.02	8.42	39.88	48.30	74.00	-25.70
802.11g Ch 11 Chain0	3150	PK	V	39.85	-3.73	47.17	43.44	74.00	-30.56
	4924	PK	V	39.91	0.30	49.22	49.52	74.00	-24.48
	7386	PK	V	37.96	8.66	41.46	50.12	74.00	-23.88
	3150	PK	H	39.85	-3.73	45.18	41.45	74.00	-32.55
	4924	PK	H	39.91	0.30	45.62	45.92	74.00	-28.08
	7386	PK	H	37.96	8.66	38.81	47.47	74.00	-26.53

Remark: Correction Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Pre_Amplifier Gain

Mode	Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBµV)	Corrected Reading (dBµV/m)	Limit @ 3 m (dBµV/m)	Margin (dB)
802.11g Ch 1 Chain1	3150	PK	V	39.85	-3.73	47.51	43.78	74.00	-30.22
	4824	PK	V	40.10	-0.04	47.84	47.80	74.00	-26.20
	7236	PK	V	38.08	8.19	44.45	52.64	74.00	-21.36
	9648	PK	V	38.19	11.34	42.09	53.43	74.00	-20.57
	3150	PK	H	39.85	-3.73	45.89	42.16	74.00	-31.84
	4824	PK	H	40.10	-0.04	46.74	46.70	74.00	-27.30
	7236	PK	H	38.08	8.19	41.64	49.83	74.00	-24.17
802.11g Ch 6 Chain1	3150	PK	V	39.85	-3.73	47.61	43.88	74.00	-30.12
	4874	PK	V	40.00	0.13	47.91	48.04	74.00	-25.96
	7311	PK	V	38.02	8.42	42.05	50.47	74.00	-23.53
	3150	AV	V	39.85	-3.73	46.55	42.82	54.00	-11.18
	4874	PK	H	40.00	0.13	46.84	46.97	74.00	-27.03
	7311	PK	H	38.02	8.42	41.74	50.16	74.00	-23.84
802.11g Ch 11 Chain1	3150	PK	V	39.85	-3.73	46.85	43.12	74.00	-30.88
	4924	PK	V	39.91	0.30	46.99	47.29	74.00	-26.71
	7386	PK	V	37.96	8.66	43.82	52.48	74.00	-21.52
	3150	PK	H	39.85	-3.73	45.89	42.16	74.00	-31.84
	4924	PK	H	39.91	0.30	45.27	45.57	74.00	-28.43
	7386	PK	H	37.96	8.66	39.58	48.24	74.00	-25.76
802.11n(HT20) Ch 1	3150	PK	V	39.85	-3.73	46.73	43.00	74.00	-31.00
	4824	PK	V	40.10	-0.04	46.76	46.72	74.00	-27.28
	7236	PK	V	38.08	8.19	42.78	50.97	74.00	-23.03
	3150	PK	H	39.85	-3.73	46.73	43.00	74.00	-31.00
	4824	PK	H	40.10	-0.04	47.12	47.08	74.00	-26.92
	7236	PK	H	38.08	8.19	41.83	50.02	74.00	-23.98
802.11n(HT20) Ch 6	3150	PK	V	39.85	-3.73	47.43	43.70	74.00	-30.30
	4874	PK	V	40.00	0.13	46.33	46.46	74.00	-27.54
	7311	PK	V	38.02	8.42	42.07	50.49	74.00	-23.51
	3150	PK	H	39.85	-3.73	45.42	41.69	74.00	-32.31
	4874	PK	H	40.00	0.13	46.55	46.68	74.00	-27.32
	7311	PK	H	38.02	8.42	41.30	49.72	74.00	-24.28
802.11n(HT20) Ch 11	3150	PK	V	39.85	-3.73	46.94	43.21	74.00	-30.79
	4924	PK	V	39.91	0.30	49.17	49.47	74.00	-24.53
	7386	PK	V	37.96	8.66	40.59	49.25	74.00	-24.75
	3150	PK	H	39.85	-3.73	45.53	41.80	74.00	-32.20
	4924	PK	H	39.91	0.30	48.59	48.89	74.00	-25.11
	7386	PK	H	37.96	8.66	38.61	47.27	74.00	-26.73

Remark 1: Correction Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Pre_Amplifier Gain

Mode	Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBµV)	Corrected Reading (dBµV/m)	Limit @ 3 m (dBµV/m)	Margin (dB)
802.11n (HT40) Ch 3	3150	PK	V	39.85	-3.73	47.74	44.01	74.00	-29.99
	4844	PK	V	40.06	0.03	45.68	45.71	74.00	-28.29
	7266	PK	V	38.06	8.28	41.85	50.13	74.00	-23.87
	3150	PK	H	39.85	-3.73	46.18	42.45	74.00	-31.55
	4844	PK	H	40.06	0.03	45.69	45.72	74.00	-28.28
	7266	PK	H	38.06	8.28	39.32	47.60	74.00	-26.40
802.11n (HT40) Ch 6	3150	PK	V	39.85	-3.73	48.08	44.35	74.00	-29.65
	4874	PK	V	40.00	0.13	44.95	45.08	74.00	-28.92
	7311	PK	V	38.02	8.42	40.22	48.64	74.00	-25.36
	3150	PK	H	39.85	-3.73	45.82	42.09	74.00	-31.91
	4874	PK	H	40.00	0.13	46.89	47.02	74.00	-26.98
	7311	PK	H	38.02	8.42	39.40	47.82	74.00	-26.18
802.11n (HT40) Ch 9	3150	PK	V	39.85	-3.73	47.48	43.75	74.00	-30.25
	4904	PK	V	39.95	0.23	45.57	45.80	74.00	-28.20
	7356	PK	V	37.98	8.56	39.54	48.10	74.00	-25.90
	3150	PK	H	39.85	-3.73	45.88	42.15	74.00	-31.85
	4904	PK	H	39.95	0.23	45.86	46.09	74.00	-27.91
	7356	PK	H	37.98	8.56	39.65	48.21	74.00	-25.79

Remark 1: Correction Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Pre_Amplifier Gain

8. Emission On Band Edge

8.1 Operating environment

Temperature:	25	℃
Relative Humidity:	50	%
Atmospheric Pressure	1008	hPa
Requirement	15.247(d), 15.205,	

8.2 Measuring instrument setting

Spectrum analyzer settings	
Spectrum Analyzer function	**Setting**
Detector	Peak
RBW	1MHz
VBW	3MHz for Peak; 10Hz for Average
Sweep	Auto couple
Restrict bands	2310~2390MHz
	2483.5 ~2500MHz
Attenuation	Auto

8.3 Test procedure

The test procedure is the same as clause 7.4

8.4 Test results

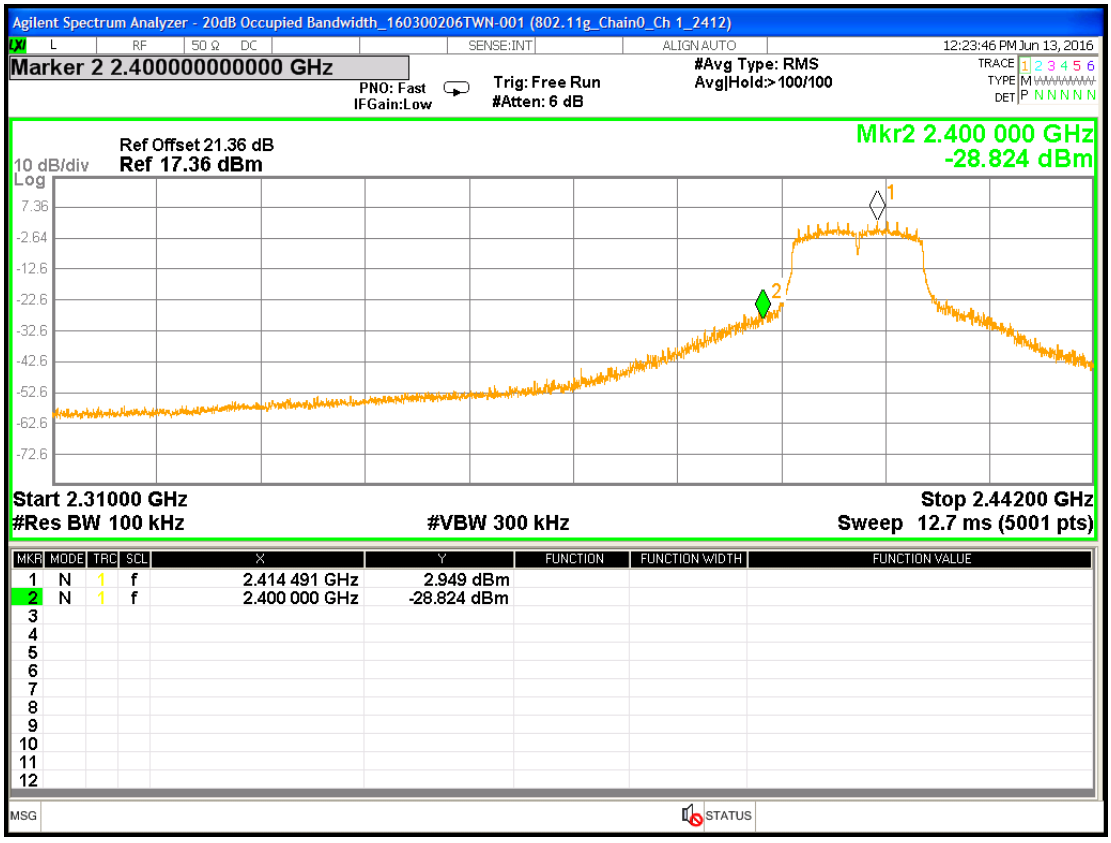
Mode	Freq. (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)	Restricted band (MHz)
802.11b Chain0	2387.01	PK	V	33.84	23.08	56.92	74	-17.08	2310~2390
	2390.00	AV	V	33.85	15.41	49.26	54	-4.74	
	2484.38	PK	V	34.31	23.84	58.15	74	-15.85	2483.5~2500
	2483.58	AV	V	34.30	14.08	48.38	54	-5.62	
802.11g Chain0	2390.00	PK	V	33.85	38.09	71.94	74	-2.06	2310~2390
	2390.00	AV	V	33.85	19.05	52.90	54	-1.10	
	2483.50	PK	V	34.30	37.46	71.76	74	-2.24	2483.5~2500
	2483.50	AV	V	34.30	18.97	53.27	54	-0.73	
802.11g Chain1	2390.00	PK	V	33.85	37.91	71.76	74	-2.24	2310~2390
	2390.00	AV	V	33.85	18.28	52.13	54	-1.87	
	2483.50	PK	V	34.30	36.99	71.29	74	-2.71	2483.5~2500
	2483.50	AV	V	34.30	18.51	52.81	54	-1.19	
802.11n (HT20) Chain 0+1	2390.00	PK	V	33.85	36.18	70.03	74	-3.97	2310~2390
	2390.00	AV	V	33.85	19.30	53.15	54	-0.85	
	2483.62	PK	V	34.30	35.23	69.53	74	-4.47	2483.5~2500
	2483.50	AV	V	34.30	18.27	52.57	54	-1.43	
802.11n (HT40) Chain 0+1	2389.04	PK	V	33.85	34.85	68.70	74	-5.30	2310~2390
	2390.00	AV	V	33.85	19.12	52.97	54	-1.03	
	2486.03	PK	V	34.31	32.92	67.23	74	-6.77	2483.5~2500
	2483.50	AV	V	34.30	13.22	47.52	54	-6.48	

Remark 1:The test mode of 802.11nHT20 is both “Chain 0 & Chain 1” on.

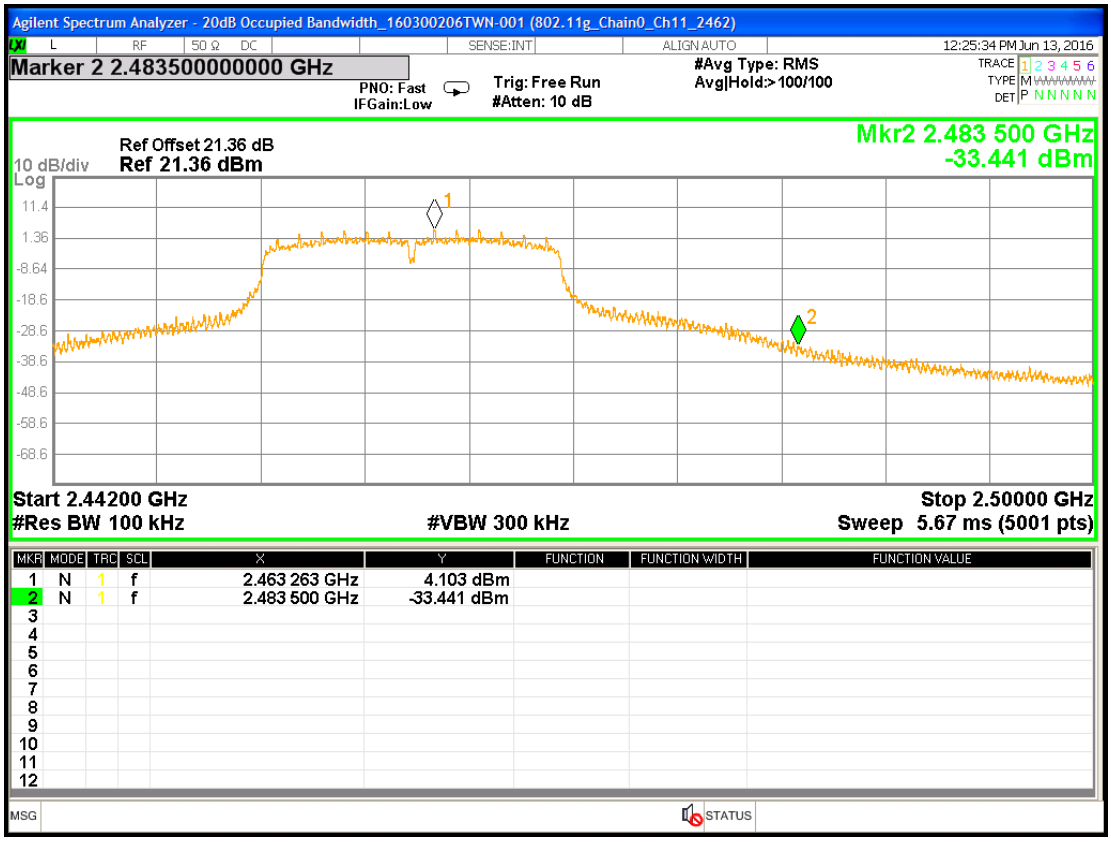
Chain0 : 20dB Occupied Bandwidth @ 802.11b mode Ch 1

Chain0 : 20dB Occupied Bandwidth @ 802.11b mode Ch11

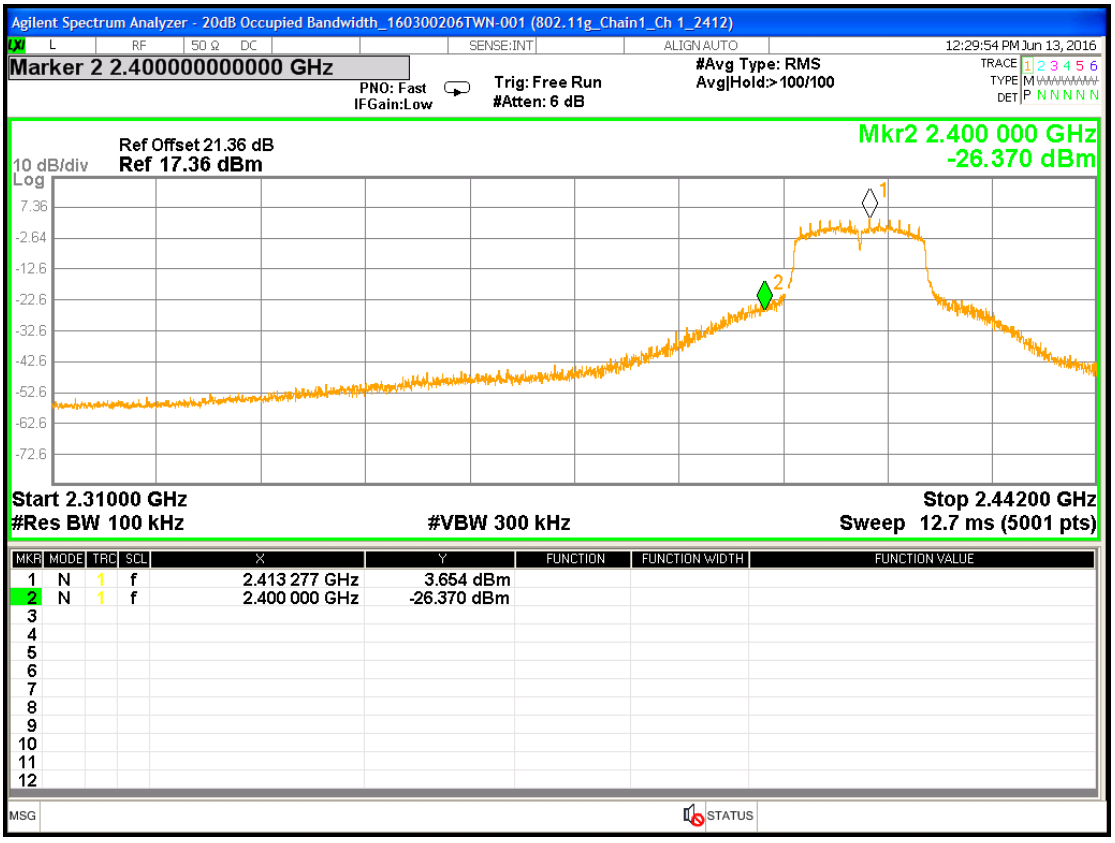
Chain0 : 20dBc @ 802.11g mode Ch 1



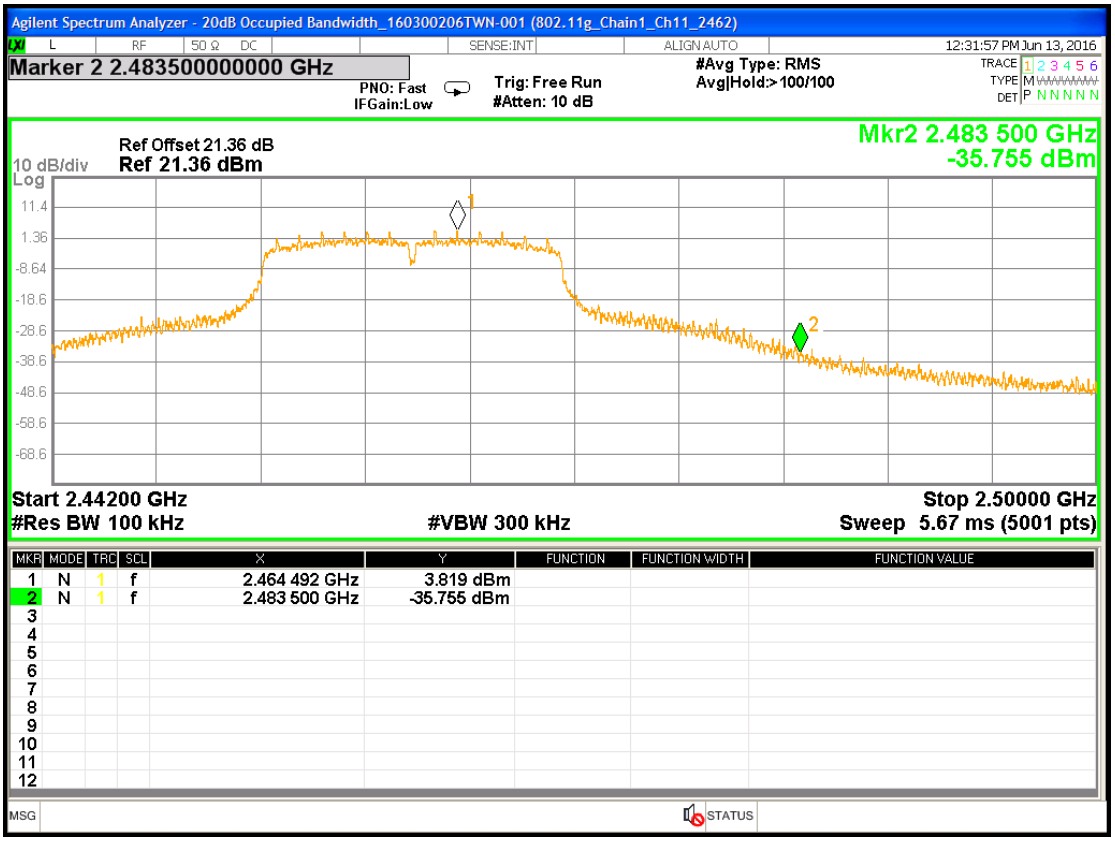
Chain0 : 20dBc @ 802.11g mode Ch11



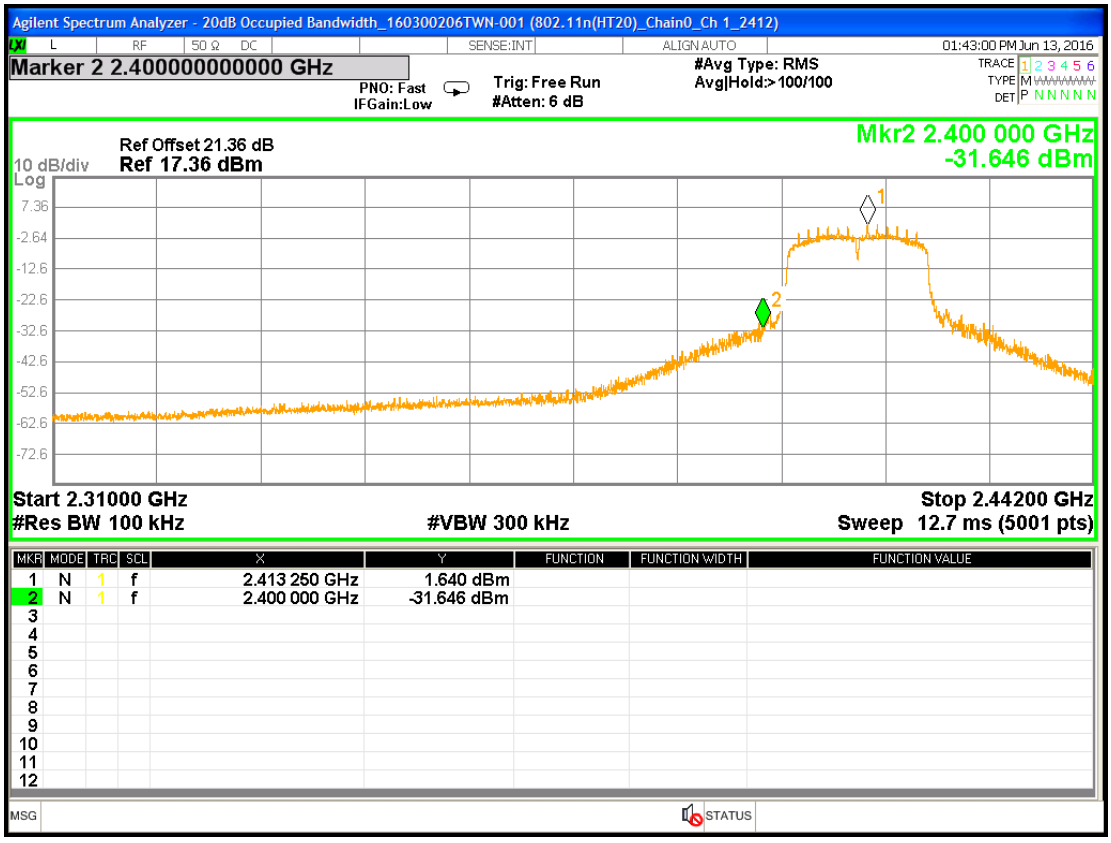
Chain1 : 20dBc @ 802.11g mode Ch 1



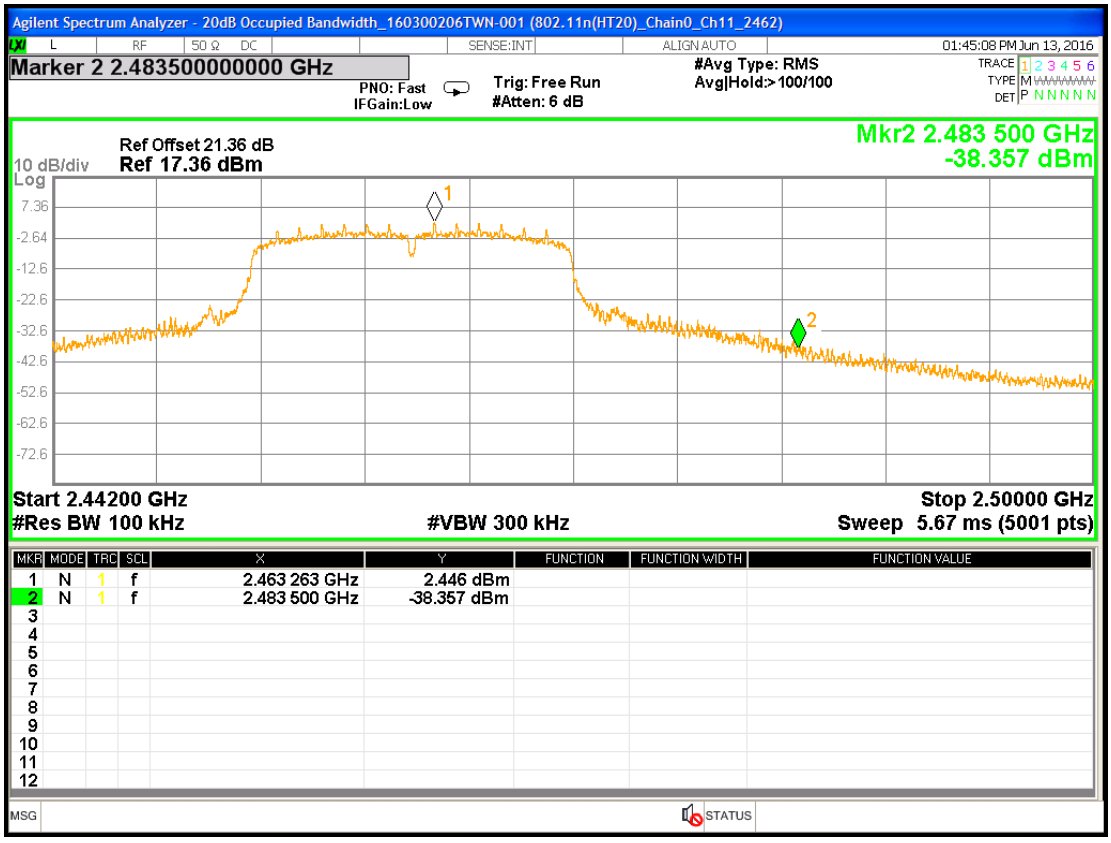
Chain1 : 20dBc @ 802.11g mode Ch11



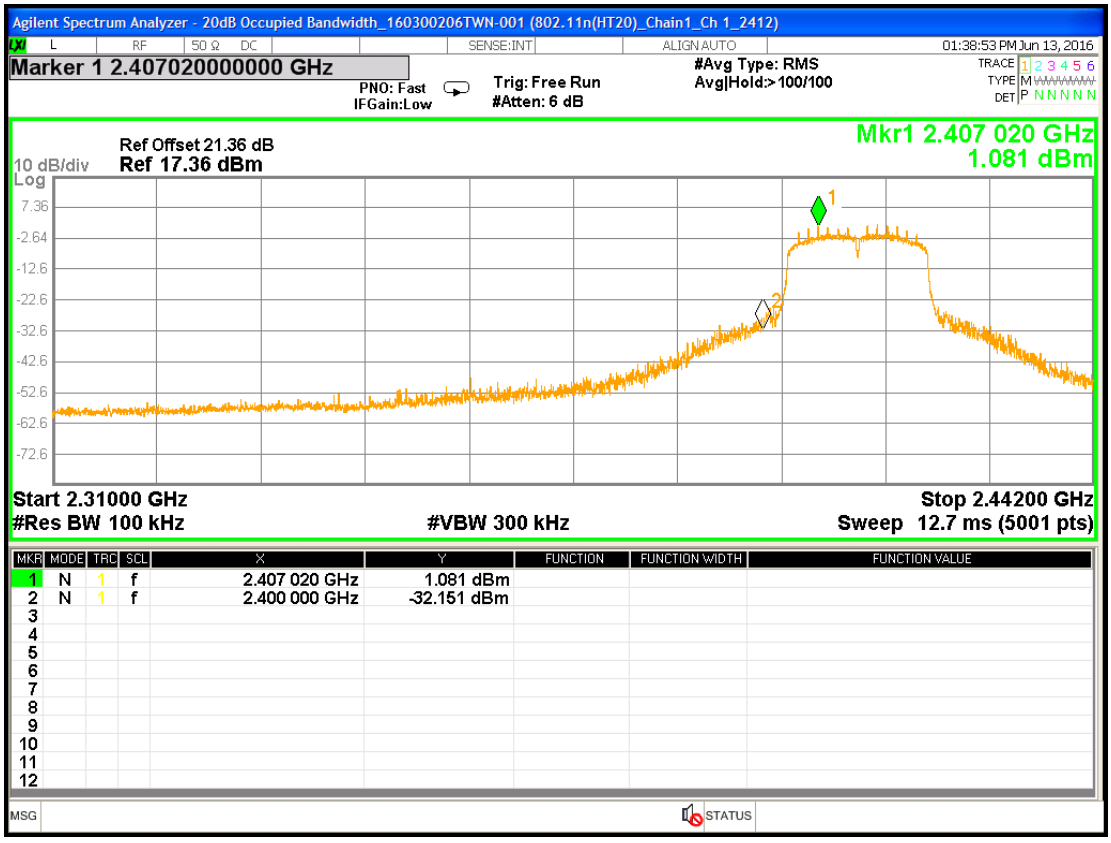
Chain0 : 20dBc @ 802.11n(HT20) mode Ch 1



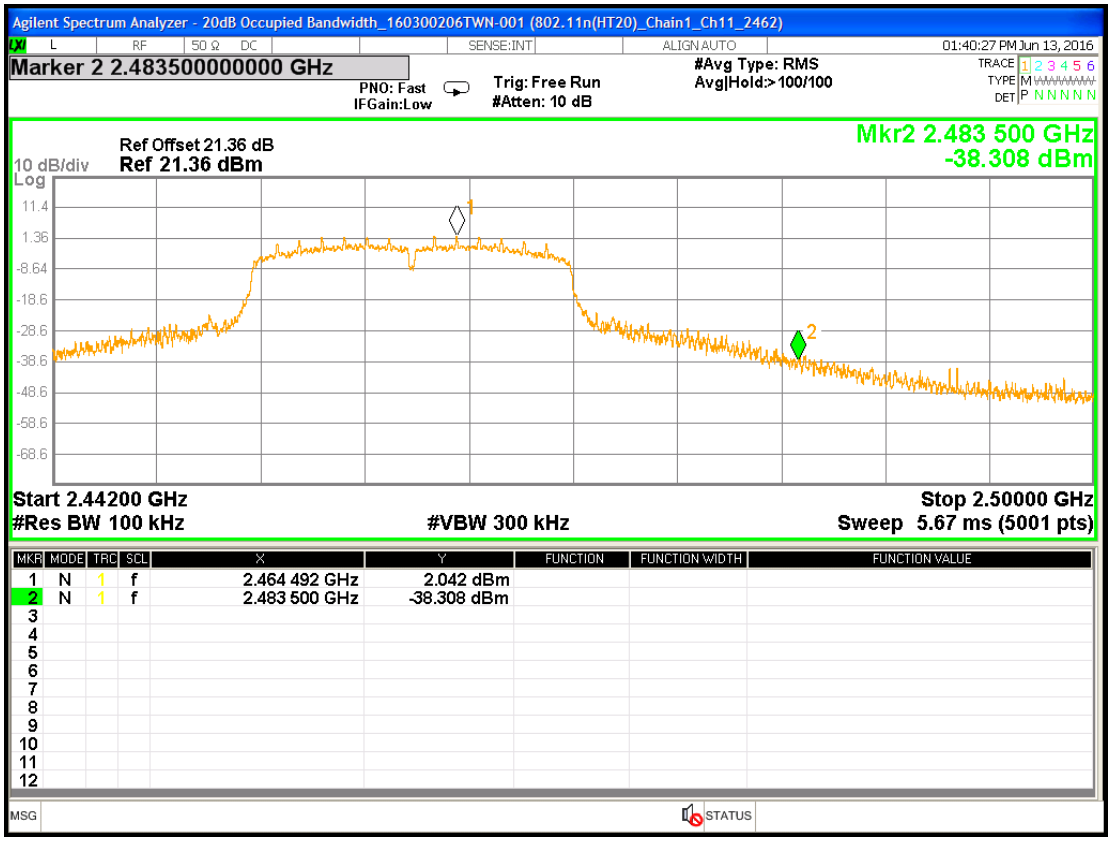
Chain0 : 20dBc @ 802.11n(HT20) mode Ch11



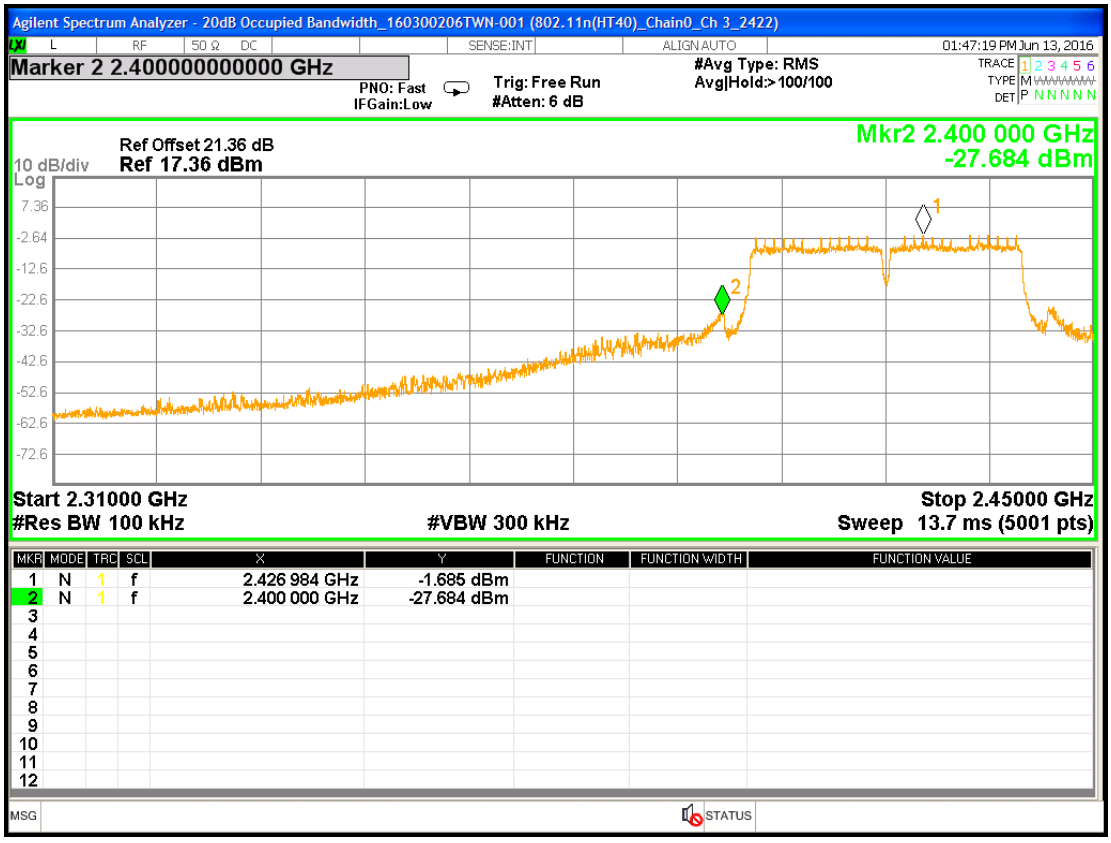
Chain1 : 20dBc @ 802.11n(HT20) mode Ch 1



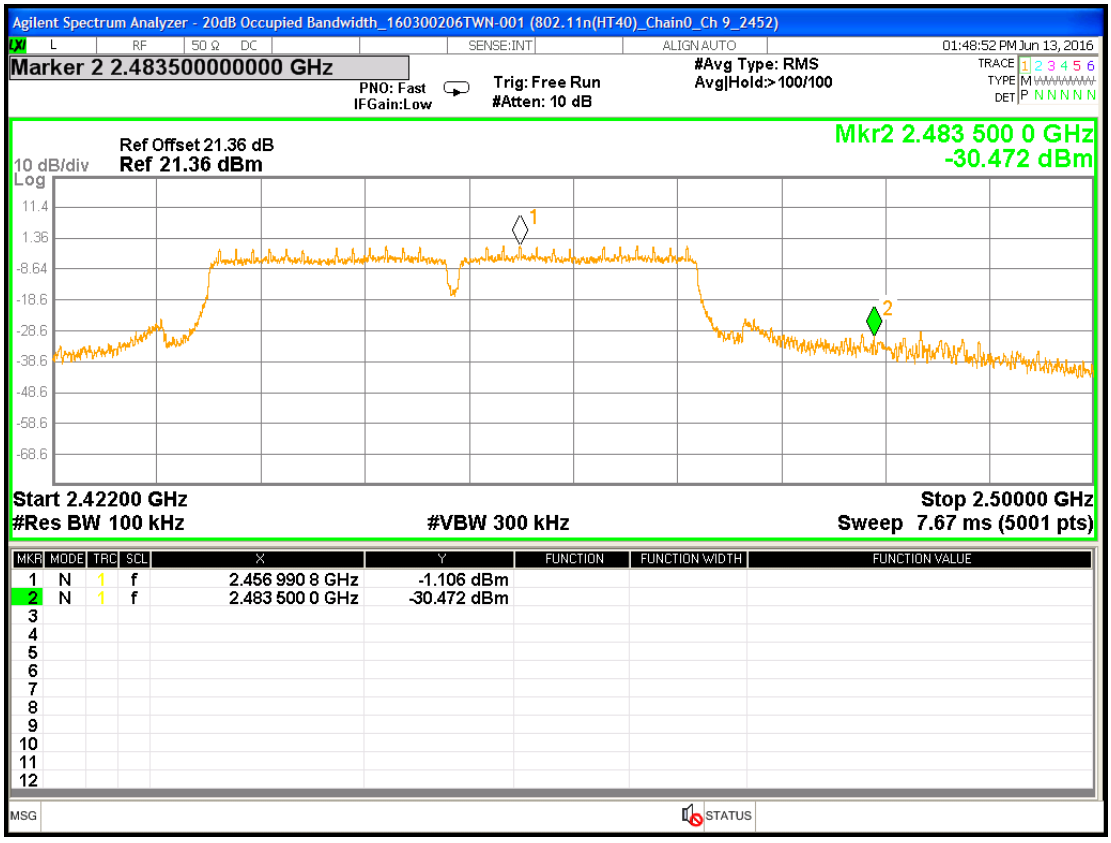
Chain1 : 20dBc @ 802.11n(HT20) mode Ch11



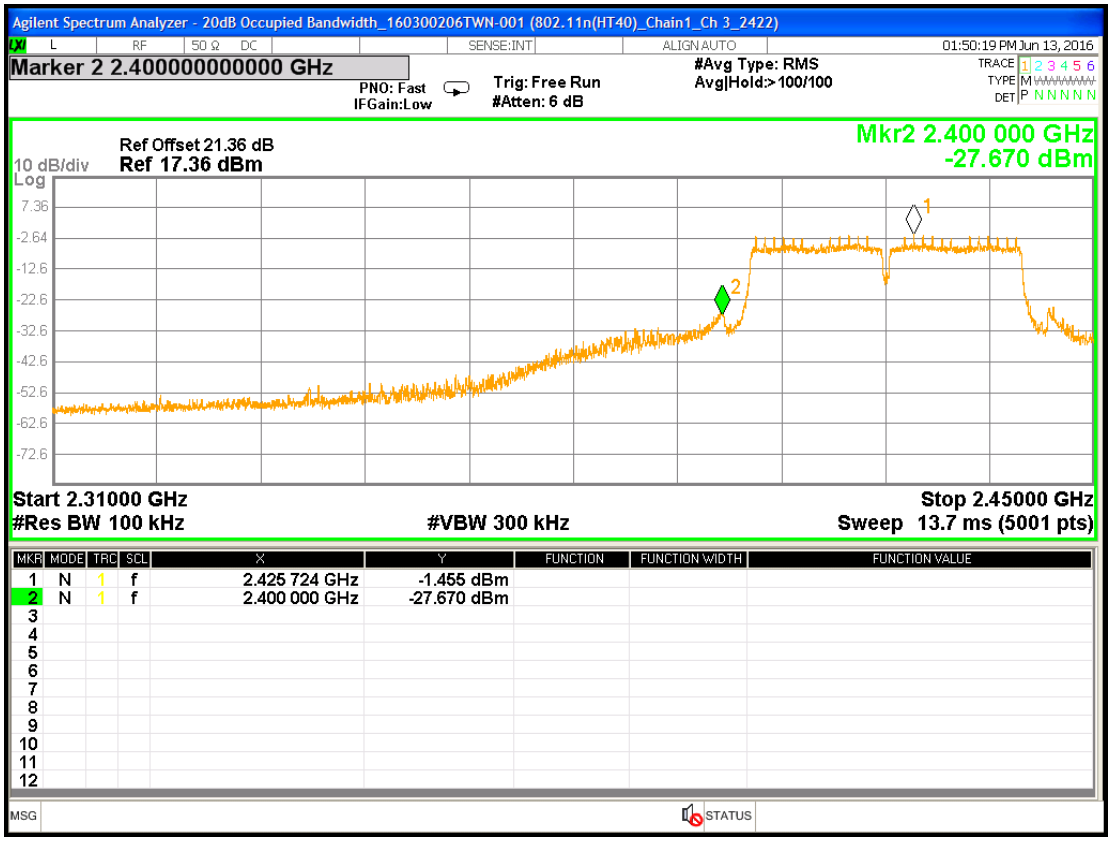
Chain0 : 20dBc @ 802.11n(HT40) mode Ch3



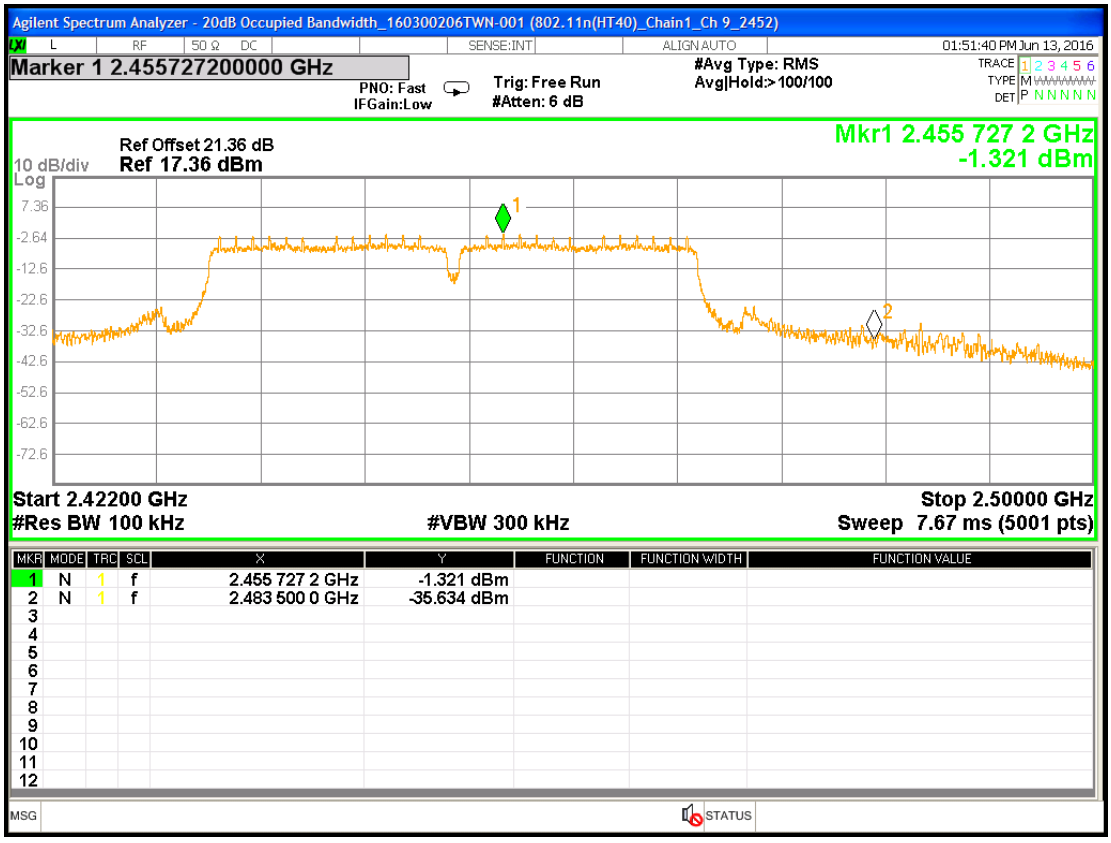
Chain0 : 20dBc @ 802.11n(HT40) mode Ch9



Chain1 : 20dBc @ 802.11n(HT40) mode Ch3



Chain1 : 20dBc @ 802.11n(HT40) mode Ch9



9. AC Power Line Conducted Emission

9.1 Operating environment

Temperature:	25	℃
Relative Humidity:	50	%
Atmospheric Pressure	1008	hPa
Test Voltage	120V, 60Hz	
Requirement	15.207	

9.2 Limit for AC power line conducted emission

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

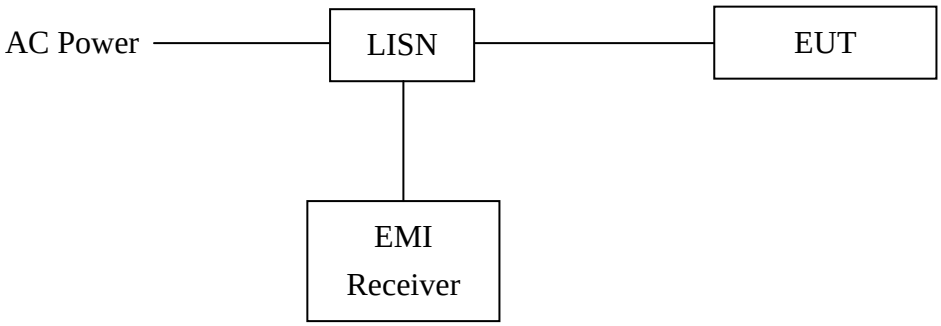
9.3 Measuring instrument setting

Receiver settings	
Receiver function	**Setting**
Detector	QP
Start frequency	0.15MHz
Stop frequency	30MHz
IF bandwidth	9 kHz
Attenuation	10dB

9.4 Test procedure

1. Configure the EUT according to ANSI C63.10. The EUT or host of EHT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network.
3. All the companion devices are connected to the other LISN. The LISN should provide 50Uh/50ohms coupling impedance.
4. The frequency range from 150 kHz to 30MHz was searched
5. Set the test-receiver system to peak detector and specified bandwidth with maximum hold mode.
6. The measurement has to be done between each power line and ground at the power terminal.

9.5 Test diagram



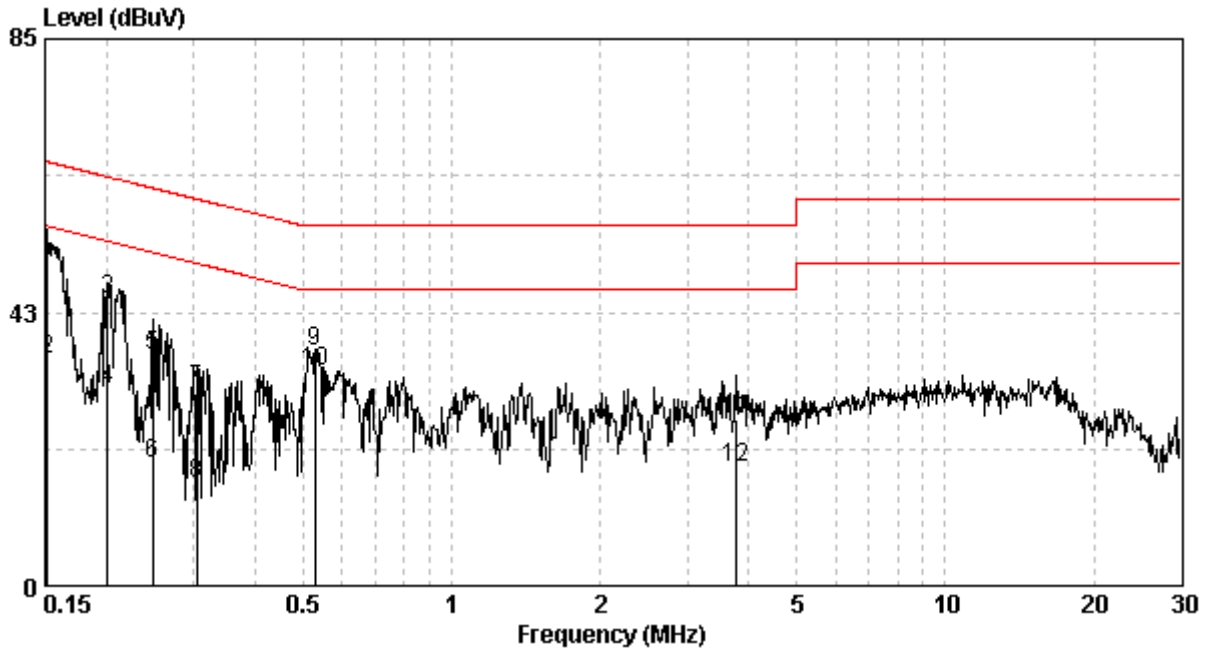
Note: The EUT was tested while in normal communication mode.

9.6 Test results

Phase : Line
EUT : HURESAC-3XE-C
Test Condition : TX mode

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level AV (dBuV)	Limit Av (dBuV)	Margin (dB) Qp	Av
0.152	9.74	51.59	65.91	35.28	55.91	-14.32	-20.63
0.201	9.74	44.60	63.58	30.46	53.58	-18.98	-23.12
0.248	9.74	35.73	61.82	19.11	51.82	-26.09	-32.71
0.305	9.73	30.63	60.10	15.89	50.10	-29.47	-34.21
0.529	9.74	36.29	56.00	33.33	46.00	-19.71	-12.67
3.759	9.86	25.97	56.00	18.48	46.00	-30.03	-27.52

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

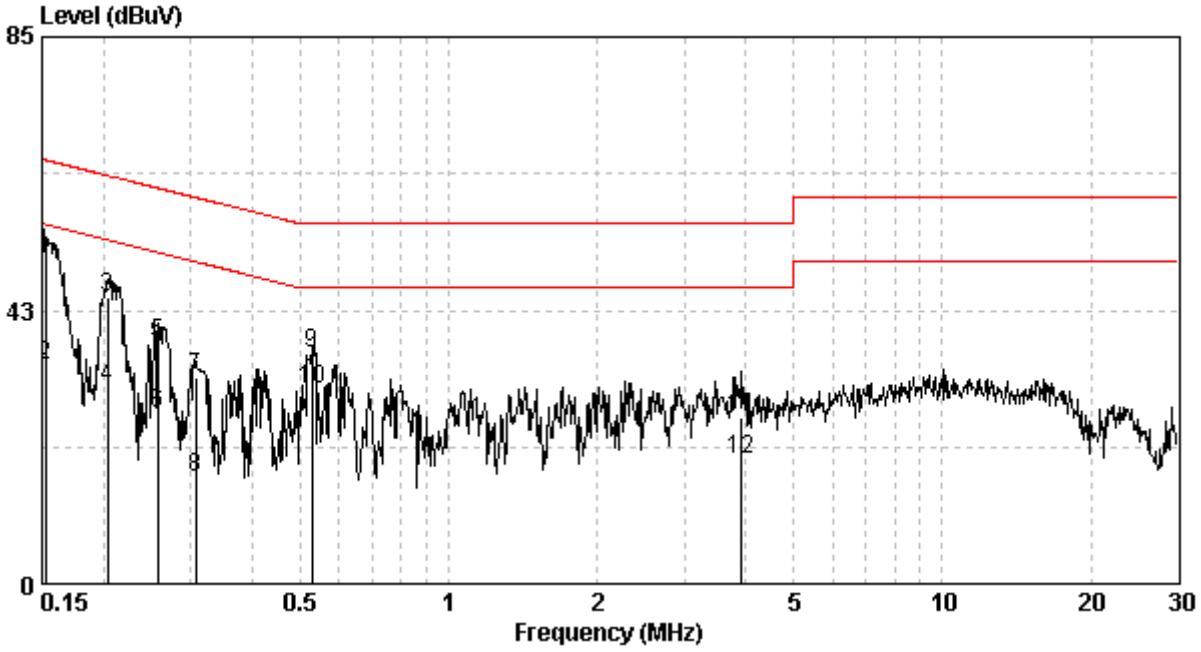


Phase	: Neutral
EUT	: HURESAC-3XE-C
Test Condition	: TX mode

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level AV (dBuV)	Limit Av (dBuV)	Margin (dB) Qp	Av
0.152	9.74	51.42	65.87	33.82	55.87	-14.45	-22.04
0.204	9.74	44.60	63.45	30.60	53.45	-18.84	-22.85
0.258	9.74	37.30	61.51	26.47	51.51	-24.22	-25.04
0.307	9.73	32.13	60.06	16.59	50.06	-27.93	-33.47
0.529	9.74	35.74	56.00	30.30	46.00	-20.26	-15.70
3.922	9.86	25.88	56.00	19.23	46.00	-30.12	-26.77

Remark:

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



Appendix A: Test equipment list

Equipment	Brand	Model No.	Serial No.	Calibration Date	Next Calibration Date
ESCI EMI Test Receiver	Rohde & Schwarz	ESCI	100018	2015/12/02	2016/11/30
Spectrum Analyzer	Rohde & Schwarz	FSP30	100137	2015/08/18	2016/08/16
Horn Antenna (1-18G)	SHWARZBECK	BBHA 9120 D	9120D-456	2014/08/29	2017/08/27
Horn Antenna (14-42G)	SHWARZBECK	BBHA 9170	BBHA9170159	2014/09/16	2017/09/14
Broadband Antenna	SHWARZBECK	VULB 9168	9168-172	2013/08/08	2016/08/06
Pre-Amplifier	EMC Co.	EMC12635SE	980205	2015/10/7	2016/10/05
Pre-Amplifier	MITEQ	JS4-26004000--27-8A	828825	2015/09/15	2016/09/13
Power Meter	Anritsu	ML2495A	0844001	2015/11/11	2016/11/09
Power Sensor	Anritsu	MA2411B	0738452	2015/11/11	2016/11/09
Two-Line V-Network	Rohde & Schwarz	ENV216	101159	2015/06/08	2016/06/06
Artificial Mains Network (LISN)	Schaffner	MN2050D	1586	2015/05/27	2016/05/25
CON-1 Cable	SUHNER	BNC / RG-58	1521946	2015/05/09	2016/05/07
Test software	Audix	e3	4.2004-1-12k	NCR	NCR
Signal Analyzer	Agilent	N9030A	MY51380492	2015/09/21	2016/09/19
966-2(A) Cable 9kHz~26.5GHz	SUHNER	SMA / EX 100	N/A	2015/05/06	2016/05/05
966-2(B) Cable 9kHz~26.5GHz	SUHNER	SMA / SUCOFLEX 104P	CB0005	2015/05/06	2016/05/04

Equipment	Brand	Model No.	Serial No.	Calibration Date	Next Calibration Date
RF Cable 9kHz~26.5GHz	SUHNER	SUCOFLEX 102	CB0006	2015/05/06	2016/05/05
966-2_3m Semi-Anechoic Chamber	966_2	CEM-966_2	N/A	2016/02/24	2017/02/22
High Pass Filter	Reactel	7HS-3G/18G-S11	N/A	2015/06/06	2016/06/04
Active Loop Antenna	SCHWARZBECK MESS-ELEKTRONIC	FMZB1519	1519-067	2016/03/03	2017/03/02
EMI Test Receiver	Rohde & Schwarz	ESR-7	101232	2015/12/02	2016/11/30
Test software	ADT	Radiated test system	7.5.14	NCR	NCR

Note: No Calibration Required (NCR).

Appendix B: Measurement Uncertainty

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

Item	Uncertainty
Vertically polarized radiated disturbances from 30MHz~1GHz in a semi-anechoic chamber at a distance of 3m	5.14 dB
Horizontally polarized radiated disturbances from 30MHz~1GHz in a semi-anechoic chamber at a distance of 3m	5.22 dB
Vertically polarized Radiated disturbances from 1GHz~18GHz in a semi-anechoic chamber at a distance of 3m	3.64 dB
Horizontally polarized Radiated disturbances from 1GHz~18GHz in a semi-anechoic chamber at a distance of 3m	3.64 dB
Vertically polarized Radiated disturbances from 18GHz~40GHz in a semi-anechoic chamber at a distance of 3m	2.7 dB
Horizontally polarized Radiated disturbances from 18GHz~40GHz in a semi-anechoic chamber at a distance of 3m	2.7 dB
Radiated disturbances from 9kHz~30MHz in a semi-anechoic chamber at a distance of 3m	3.53 dB
Emission on the Band Edge Test	3.64 dB
Minimum 6 dB Bandwidth	0.85 dB
Maximum Peak Conducted Output Power	0.42 dB
Power Spectral Density	0.85 dB
Emissions In Non-Restricted Frequency Bands	0.85 dB
AC Power Line Conducted Emission	2.47 dB