EMC
TEST REPORT

Report No. : **150600355TWN-001**
Model No. : **G10, G10us**
Issued Date : **Sep. 17, 2015**

Applicant: **ASRock Incorporation**
4F., No. 37, Sec. 2, Jhongyang S.Rd., Beitou District, Taipei City 112, Taiwan

Test Method/ Standard: **47 CFR FCC Part 15.247 & ANSI C63.10 2013**
KDB 558074 D01 v03r03
KDB 662911 D01 v02r01

Registration No.: **: 93910**
Test By: **Intertek Testing Services Taiwan Ltd.**
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Revision History

Report No.	Issue Date	Revision Summary
150600355TWN-001	Sep. 17, 2015	Original report

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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:	AC2600 Gaming Router
Model No:	G10
FCC ID:	2AFEB-G10
Manufacturer:	Edimax Technology Co., Ltd
Address:	6F., No. 3, Wu-Chuan 3rd Road, Wu-Gu, New Taipei City 24891, Taiwan
Operating Frequency:	1. 2412 MHz ~ 2462 MHz for 802.11b, 802.11g, 802.11n HT20 2. 2422 MHz ~ 2452 MHz for 802.11n HT40
Channel Number:	1. 11 channels for 2412 MHz ~ 2462 MHz 2. 7 channels for 2422 MHz ~ 2452 MHz
Frequency of Each Channel:	1. 2412+5 k, k＝0 ~ 10 for 802.11b, 802.11g, 802.11n HT20 2. 2422+5 k, k＝0~6 for 802.11n HT40
Access scheme:	DSSS, OFDM
Rated Power:	DC 12 V from adapter
Power Cord:	N/A
Sample Received:	Jun. 22, 2015
Test Date(s):	Jul. 08, 2015 ~ Aug. 21, 2015
Note 1:	This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.
Note 2:	When determining the test conclusion, the Measurement Uncertainty of test has been considered.

2.2 Adapter information

The EUT will be supplied with a power supply from below list:

No.	Model no.	Specification
Adapter	WA-36A12R	I/P: 100-240V~, 50-60Hz, 0.9A MAX O/P: 12Vdc, 3A

2.3 Description of EUT

The customer confirmed the models listed as below were series model to model G10 (EUT), the difference between main model and series model are listed as below.

Trade Name	Model Number	Different
ASRock	G10us	The different model numbers are served as marketing purpose.
	G10	

Modulation mode	**Transmit path**			
	Chain 0/Main	**Chain 1/AUX**	**Chain 2/AUX**	**Chain 3/AUX**
802.11b	V	V	V	V
802.11g	V	V	V	V
802.11 n (HT20)	V	V	V	V
802.11 n (HT40)	V	V	V	V

2.4 Antenna description

(1). Antenna 1, 2, 3, 4

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 : 2.0 dBi for 2.4GHz
Antenna Type : PIFA Antenna
Connector Type : I-PEX

2.5 Additional information of EUT

Product SW version : 1.8
Product HW version : 1.0A
Test SW Version : 3.0.54.0

2.6 Peripherals equipment

Peripherals	Brand	Model No.	Serial No.	Data cable
Notebook PC	DELL	Vostro 3350	7KFQNT1	RJ-45 STP Cat.5 1 meter × 1

2.7 Operation mode

The EUT was supplied with DC 12 V from adapter (Test voltage: 120 Vac, 60 Hz) and the TX mode is based on a specific test program "QDART.exe", 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, 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.

802.11b ch6 chain0		**802.11g ch6 chain0**		**802.11n HT20 ch6 chain0**		**802.11n HT40 ch6 chain0**	
Data rate (Mbps)	**AV (dBm)**	**Data rate (Mbps)**	**AV (dBm)**	**Data rate (Mbps)**	**AV (dBm)**	**Data rate (Mbps)**	**AV (dBm)**
1	17.19	6	16.52	MCS0	16.32	MCS0	12.81
2	17.13	9	16.51	MCS1	16.29	MCS1	12.78
5.5	17.08	12	16.45	MCS2	16.27	MCS2	12.75
11	17.02	18	16.44	MCS3	16.21	MCS3	12.7
		24	16.38	MCS4	16.18	MCS4	12.66
		36	16.35	MCS5	16.15	MCS5	12.61
		48	16.28	MCS6	16.04	MCS6	12.59
		54	16.21	MCS7	16.01	MCS7	12.53

802.11b ch6 chain1		802.11g ch6 chain1		802.11n HT20 ch6 chain1		802.11n HT40 ch6 chain1	
Data rate (Mbps)	AV (dBm)	Data rate (Mbps)	AV (dBm)	Data rate (Mbps)	AV (dBm)	Data rate (Mbps)	AV (dBm)
1	17.13	6	16.43	MCS0	16.21	MCS0	12.94
2	17.1	9	16.4	MCS1	16.18	MCS1	12.93
5.5	17.06	12	16.37	MCS2	16.16	MCS2	12.91
11	17.04	18	16.35	MCS3	16.12	MCS3	12.88
		24	16.32	MCS4	16.11	MCS4	12.86
		36	16.3	MCS5	16.09	MCS5	12.81
		48	16.28	MCS6	16.07	MCS6	12.75
		54	16.24	MCS7	16.05	MCS7	12.73

802.11b ch6 chain2		802.11g ch6 chain2		802.11n HT20 ch6 chain2		802.11n HT40 ch6 chain2	
Data rate (Mbps)	AV (dBm)	Data rate (Mbps)	AV (dBm)	Data rate (Mbps)	AV (dBm)	Data rate (Mbps)	AV (dBm)
1	17.12	6	16.64	MCS0	16.45	MCS0	13.35
2	17.1	9	16.62	MCS1	16.43	MCS1	13.32
5.5	17.08	12	16.59	MCS2	16.41	MCS2	13.27
11	17.05	18	16.56	MCS3	16.38	MCS3	13.25
		24	16.54	MCS4	16.35	MCS4	13.24
		36	16.51	MCS5	16.33	MCS5	13.21
		48	16.5	MCS6	16.31	MCS6	13.19
		54	16.47	MCS7	16.27	MCS7	13.17

802.11b ch6 chain3		802.11g ch6 chain3		802.11n HT20 ch6 chain3		802.11n HT40 ch6 chain3	
Data rate (Mbps)	**AV (dBm)**	**Data rate (Mbps)**	**AV (dBm)**	**Data rate (Mbps)**	**AV (dBm)**	**Data rate (Mbps)**	**AV (dBm)**
1	17.16	6	16.55	MCS0	16.45	MCS0	13.15
2	17.12	9	16.53	MCS1	16.41	MCS1	13.11
5.5	17.11	12	16.51	MCS2	16.39	MCS2	13.1
11	17.08	18	16.49	MCS3	16.37	MCS3	13.07
		24	16.45	MCS4	16.35	MCS4	13.06
		36	16.43	MCS5	16.31	MCS5	13.03
		48	16.41	MCS6	16.29	MCS6	13.01
		54	16.37	MCS7	16.27	MCS7	12.98

2.8 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/Chain1/Chain2/Chain3
	802.11 g	6	1, 6, 11	Chain0/Chain1/Chain2/Chain3
	802.11 n (HT20)	6.5	1, 6, 11	Chain0/Chain1/Chain2/Chain3
	802.11 n (HT40)	13.5	3, 6, 9	Chain0/Chain1/Chain2/Chain3
Maximum peak conducted output power	802.11 b	1	1, 6 , 11	Chain0/Chain1/Chain2/Chain3
	802.11 g	6	1, 6, 11	Chain0/Chain1/Chain2/Chain3
	802.11 n (HT20)	6.5	1, 6, 11	Chain0/Chain1/Chain2/Chain3
	802.11 n (HT40)	13.5	3, 6, 9	Chain0/Chain1/Chain2/Chain3
Power Spectral Density	802.11 b	1	1, 6 , 11	Chain0/Chain1/Chain2/Chain3
	802.11 g	6	1, 6, 11	Chain0/Chain1/Chain2/Chain3
	802.11 n (HT20)	6.5	1, 6, 11	Chain0/Chain1/Chain2/Chain3
	802.11 n (HT40)	13.5	3, 6, 9	Chain0/Chain1/Chain2/Chain3
RF Antenna Conducted Spurious	802.11 b	1	1, 6 , 11	Chain0/Chain1/Chain2/Chain3
	802.11 g	6	1, 6, 11	Chain0/Chain1/Chain2/Chain3
	802.11 n (HT20)	6.5	1, 6, 11	Chain0/Chain1/Chain2/Chain3
	802.11 n (HT40)	13.5	3, 6, 9	Chain0/Chain1/Chain2/Chain3
Radiated spurious Emission 9kHz~1GHz	Normal Link			
Radiated Spurious Emission 1GHz~10th Harmonic	802.11 b	1	1, 6 , 11	Chain0/Chain1/Chain2/Chain3
	802.11 g	6	1, 6, 11	Chain0/Chain1/Chain2/Chain3
	802.11 n (HT20)	6.5	1, 6, 11	Chain0/Chain1/Chain2/Chain3
	802.11 n (HT40)	13.5	3, 6, 9	Chain0/Chain1/Chain2/Chain3
Emission on the Band Edge	802.11 b	1	1, 6 , 11	Chain0/Chain1/Chain2/Chain3
	802.11 g	6	1, 6, 11	Chain0/Chain1/Chain2/Chain3
	802.11 n (HT20)	6.5	1, 6, 11	Chain0/Chain1/Chain2/Chain3
	802.11 n (HT40)	13.5	3, 6, 9	Chain0/Chain1/Chain2/Chain3
AC Power Line Conducted Emission	Normal Link			

2.9 Power setting of test software

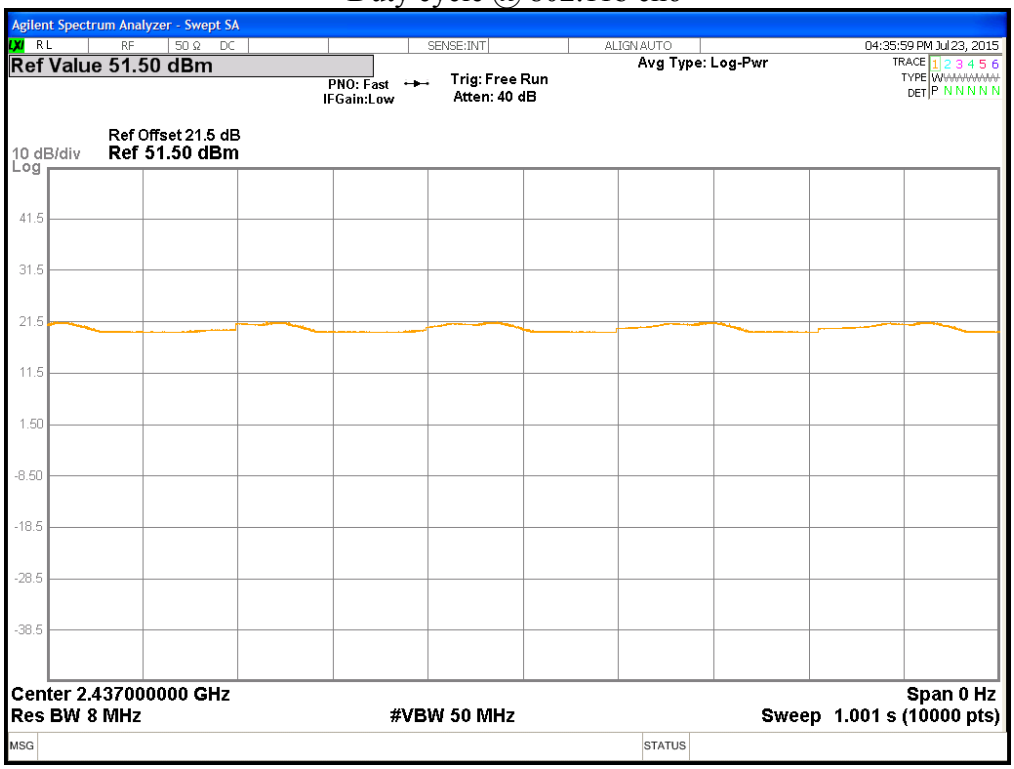
Channels & power setting software provided by the client was used to change the operating channels as well as the output power level and is going to be installed in the final end product.

Mode	Software Version: QDART.exe		
	Channel	Frequency	Power setting
802.11b (chain0)	1	2412	21
	6	2437	24
	11	2462	21
802.11b (chain1)	1	2412	21
	6	2437	24
	11	2462	21
802.11b (chain2)	1	2412	21
	6	2437	24
	11	2462	21
802.11b (chain3)	1	2412	21
	6	2437	24
	11	2462	21
802.11g (chain0)	1	2412	19
	6	2437	21
	11	2462	19
802.11g (chain1)	1	2412	19
	6	2437	21
	11	2462	19
802.11g (chain2)	1	2412	19
	6	2437	21
	11	2462	19
802.11g (chain3)	1	2412	19
	6	2437	21
	11	2462	19
802.11n (HT20) 4Mimo	1	2412	17
	6	2437	22
	11	2462	17
802.11n (HT40) 4Mimo	3	2422	13
	6	2437	21
	9	2452	13

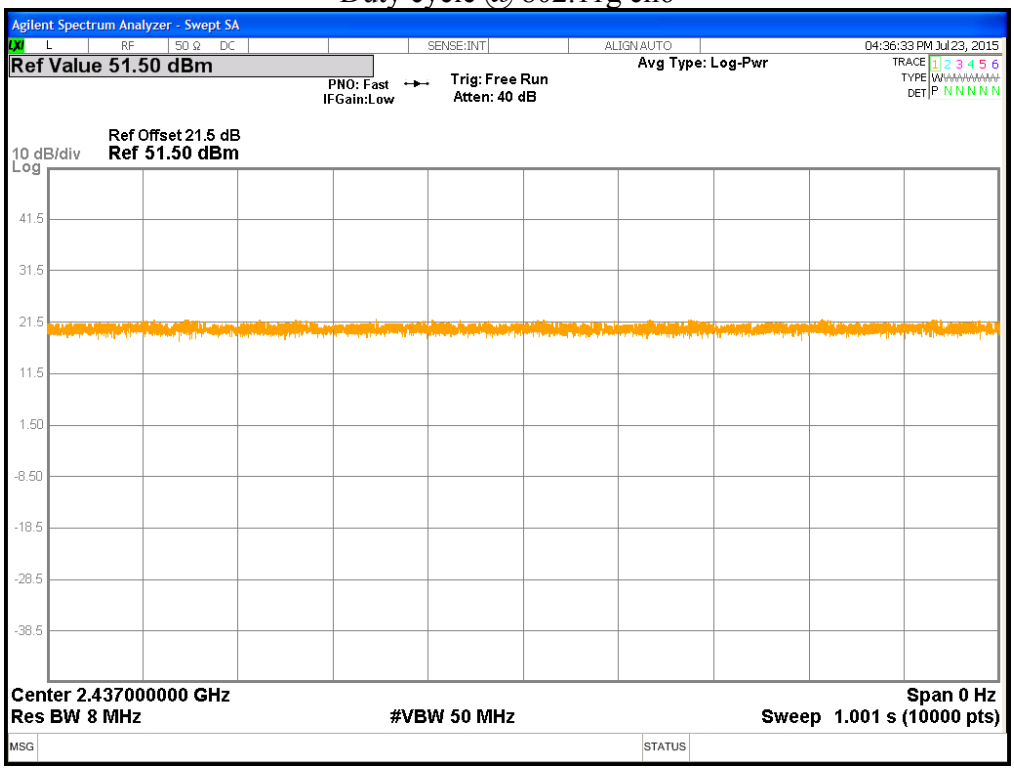
Note: The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

Mode	Channel	Frequency (MHz)	Data rate	Signal on time(s)	Total signal transmit time(s)	Duty cycle	Duty Cycle factor
802.11b	6	2437	1	1.001	1.001	1.000	0.000
802.11g	6	2437	6	1.001	1.001	1.000	0.000
802.11n HT20	6	2437	6.5	1.001	1.001	1.000	0.000
802.11n HT40	6	2437	13	1.001	1.001	1.000	0.000

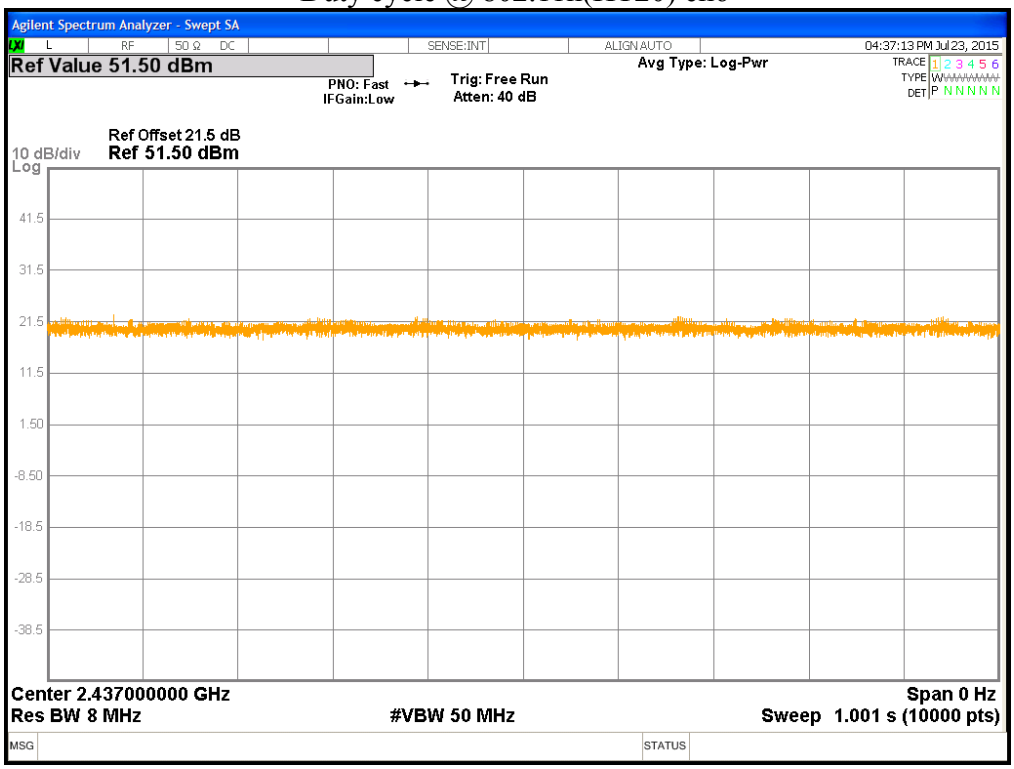
Duty cycle @ 802.11b ch6



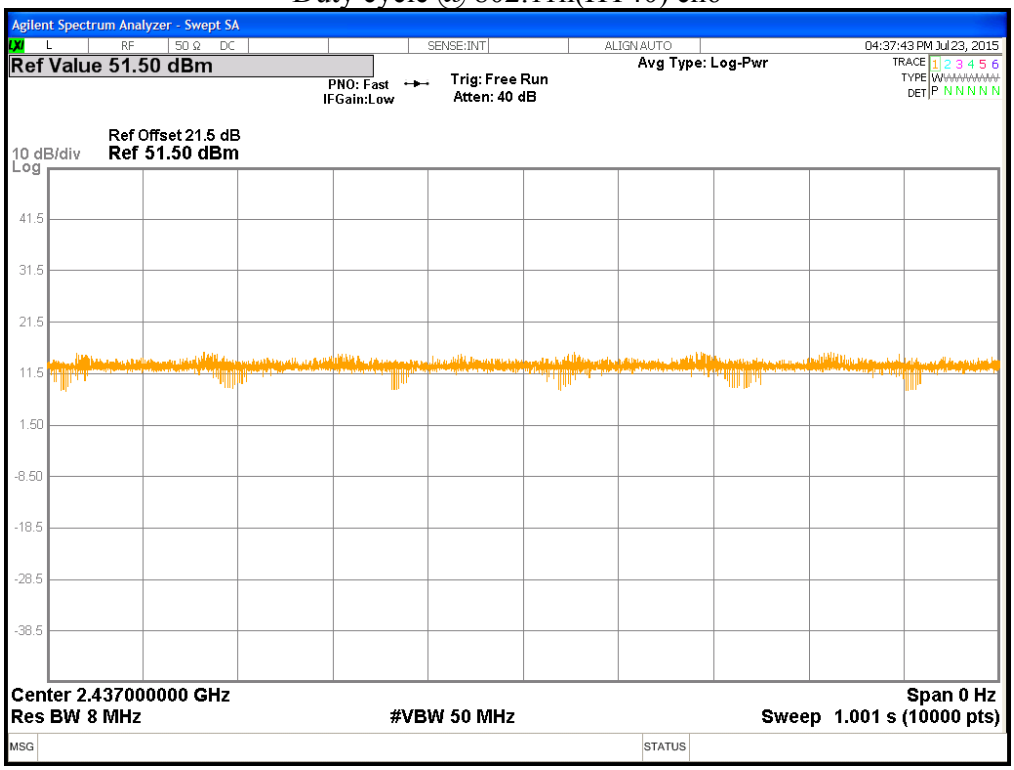
Duty cycle @ 802.11g ch6



Duty cycle @ 802.11n(HT20) ch6



Duty cycle @ 802.11n(HT40) ch6



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 v03r03	

3.2 Limit for minimum 6dB bandwidth

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

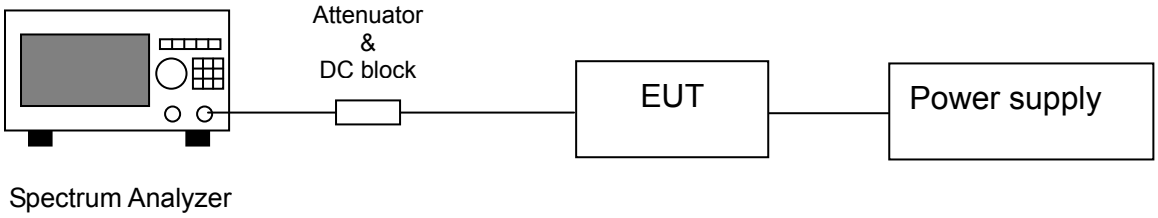
3.3 Measuring instrument setting

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

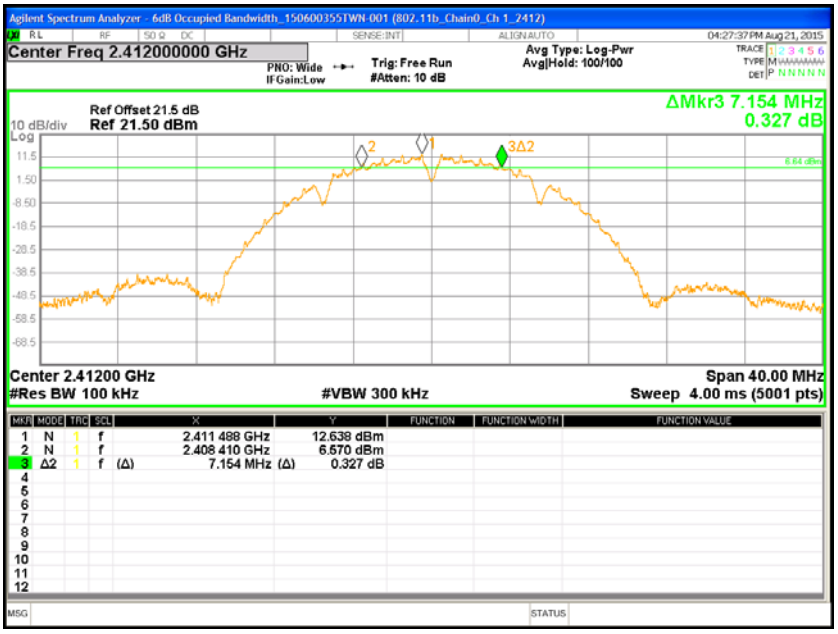
Single TX

Mode	Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Pass/Fail
802.11b (chain0)	1	2412	7.154	0.5	Pass
	6	2437	8.077	0.5	Pass
	11	2462	8.076	0.5	Pass
802.11b (chain1)	1	2412	8.076	0.5	Pass
	6	2437	7.535	0.5	Pass
	11	2462	8.075	0.5	Pass
802.11b (chain2)	1	2412	7.509	0.5	Pass
	6	2437	9.02	0.5	Pass
	11	2462	8.076	0.5	Pass
802.11b (chain3)	1	2412	8.076	0.5	Pass
	6	2437	8.079	0.5	Pass
	11	2462	7.526	0.5	Pass
802.11g (chain0)	1	2412	16.278	0.5	Pass
	6	2437	15.807	0.5	Pass
	11	2462	16.292	0.5	Pass
802.11g (chain1)	1	2412	16.322	0.5	Pass
	6	2437	16.312	0.5	Pass
	11	2462	16.311	0.5	Pass
802.11g (chain2)	1	2412	16.306	0.5	Pass
	6	2437	16.289	0.5	Pass
	11	2462	16.291	0.5	Pass
802.11g (chain3)	1	2412	16.013	0.5	Pass
	6	2437	16.068	0.5	Pass
	11	2462	16.327	0.5	Pass

4TX

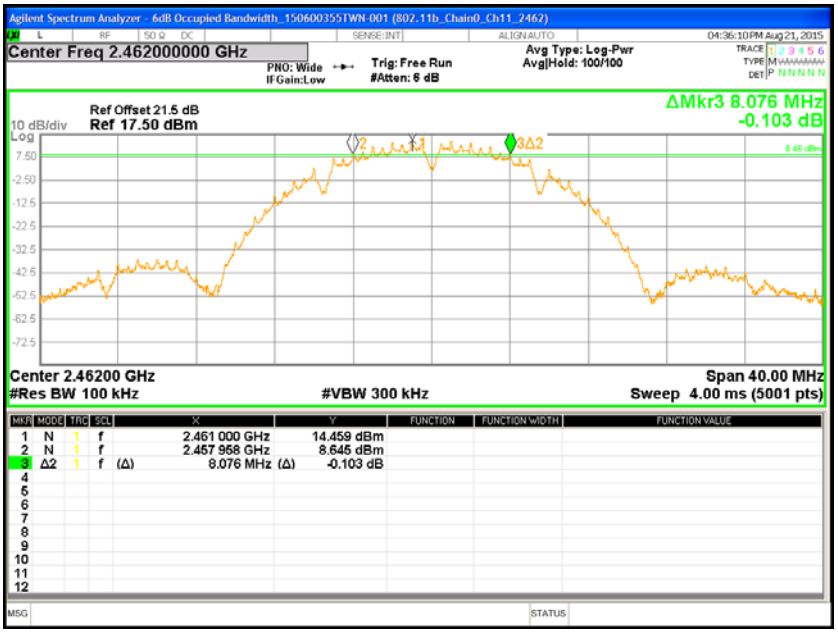
Mode	Channel	Freq. (MHz)	6dB Bandwidth (MHz)				Limit (MHz)	Pass/Fail
			chain0	chain1	chain2	chain3		
802.11n (HT20)	1	2412	16.596	14.458	15.667	17.625	0.5	Pass
	6	2437	16.616	16.925	17.57	17.543	0.5	Pass
	11	2462	17.643	17.597	17.558	17.566	0.5	Pass
802.11n (HT40)	3	2422	32.957	33.106	36.29	35.307	0.5	Pass
	6	2437	35.151	28.794	34.685	35.412	0.5	Pass
	9	2452	36.278	36.306	34.379	36.33	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

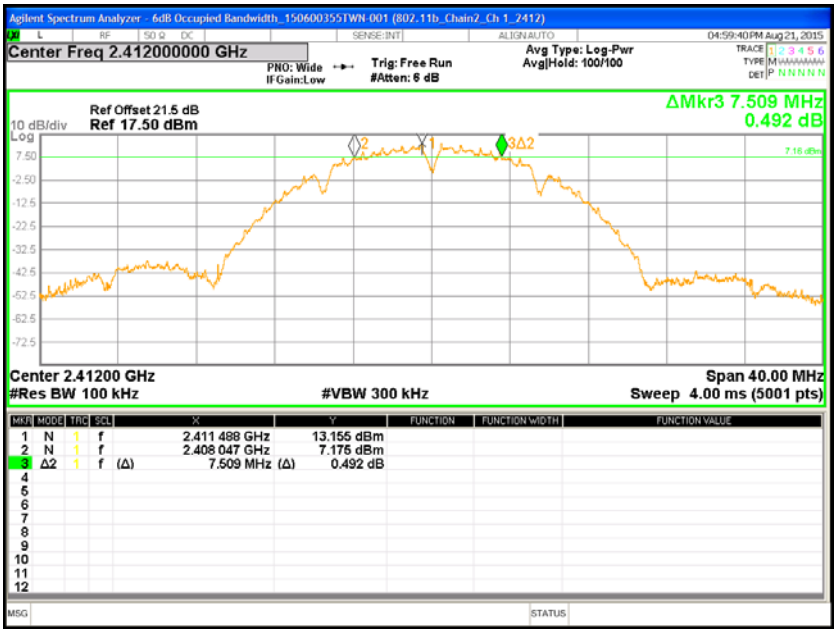


Chain1 : 6dB Bandwidth @ 802.11b mode Ch 1

Chain1 : 6dB Bandwidth @ 802.11b mode Ch 6

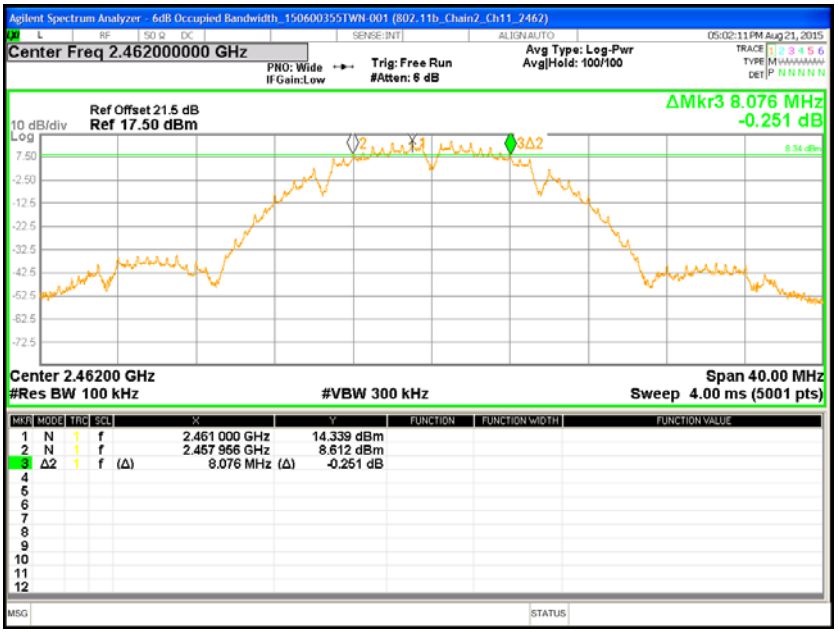
Chain1 : 6dB Bandwidth @ 802.11b mode Ch11

Chain2 : 6dB Bandwidth @ 802.11b mode Ch 1



Chain2 : 6dB Bandwidth @ 802.11b mode Ch 6

Chain2 : 6dB Bandwidth @ 802.11b mode Ch11

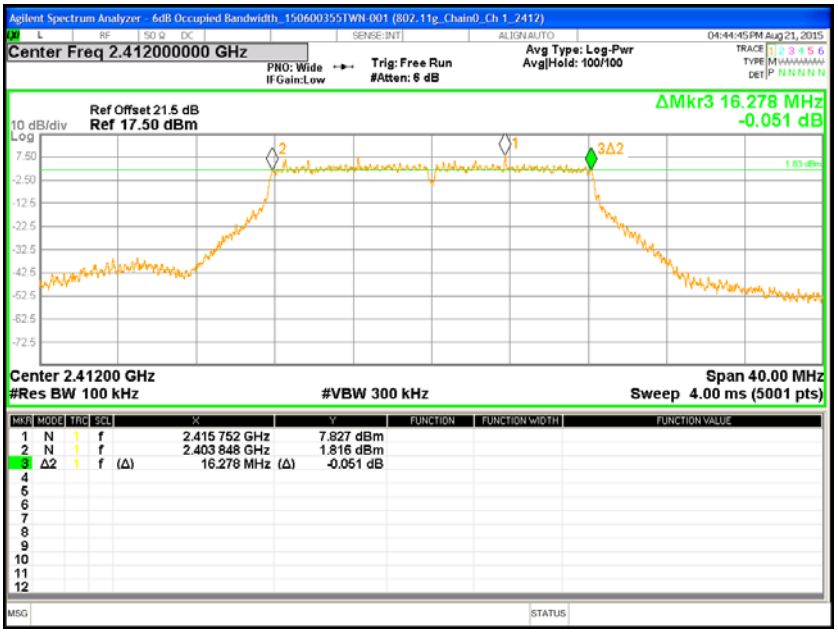


Chain3 : 6dB Bandwidth @ 802.11b mode Ch 1

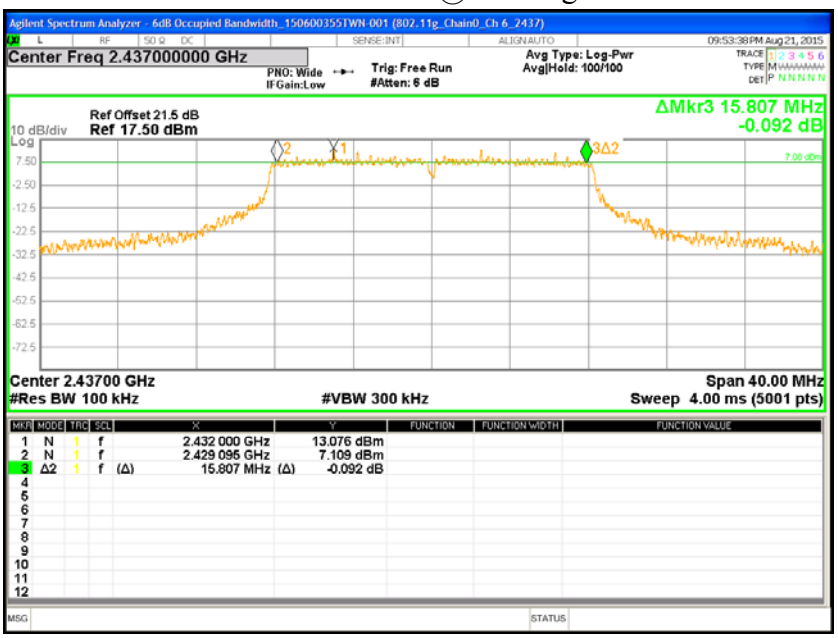
Chain3 : 6dB Bandwidth @ 802.11b mode Ch 6

Chain3 : 6dB Bandwidth @ 802.11b mode Ch11

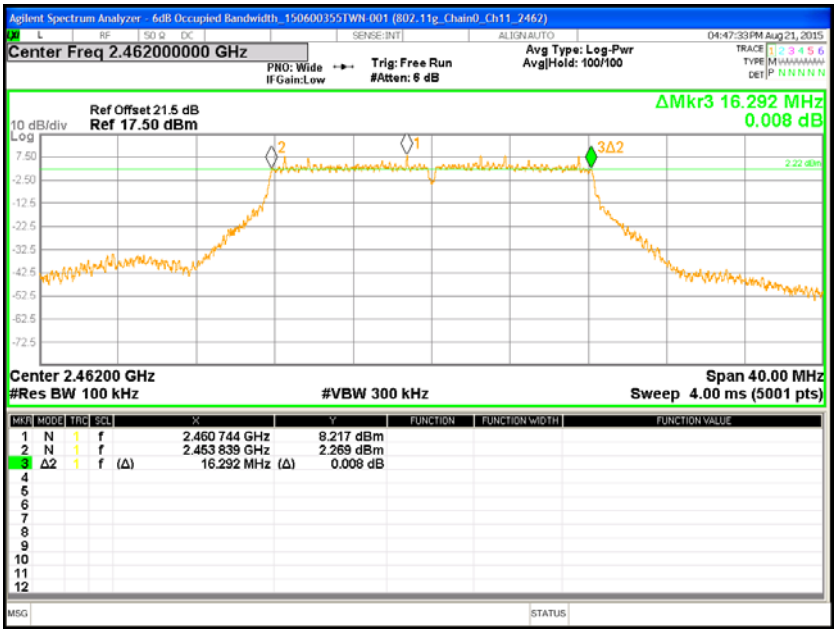
Chain0 : 6dB Bandwidth @ 802.11g mode Ch 1



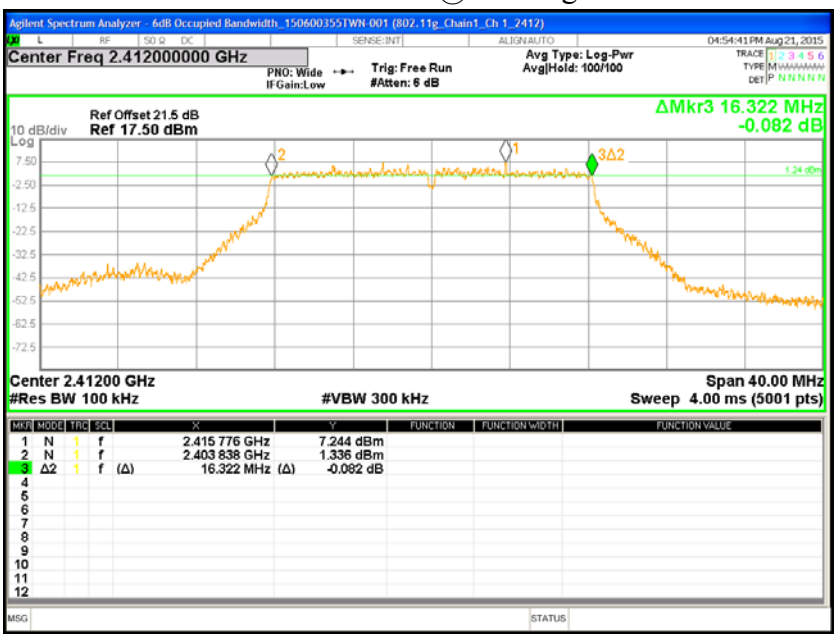
Chain0 : 6dB Bandwidth @ 802.11g mode Ch 6



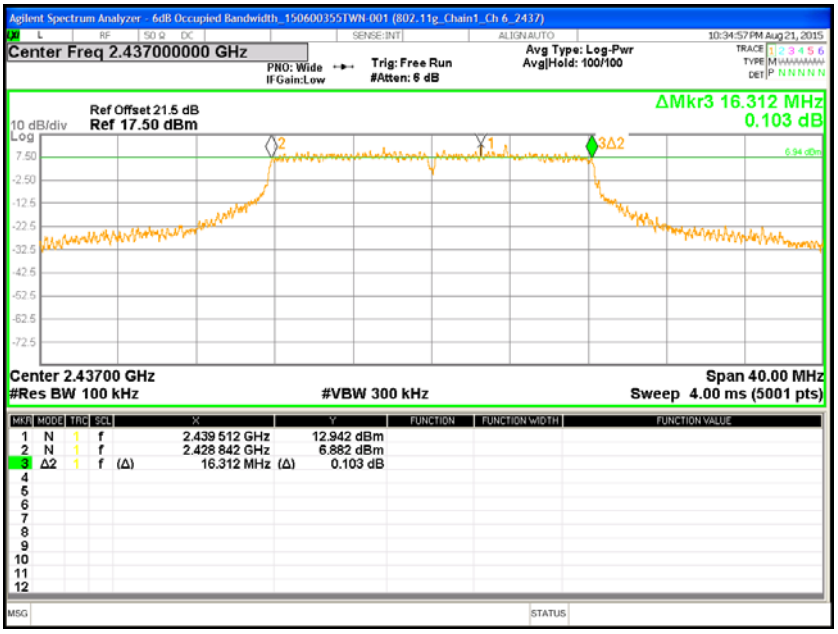
Chain0 : 6dB Bandwidth @ 802.11g mode Ch11



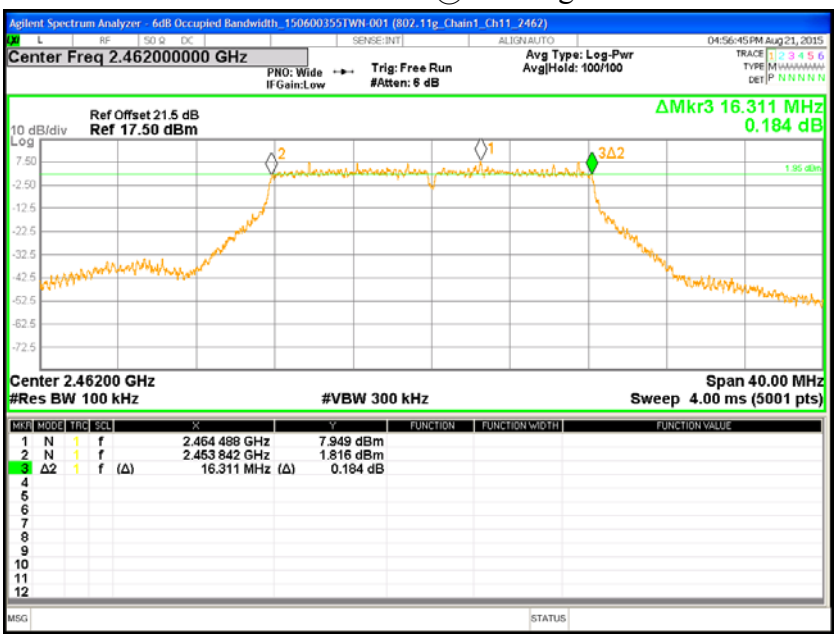
Chain1 : 6dB Bandwidth @ 802.11g mode Ch 1



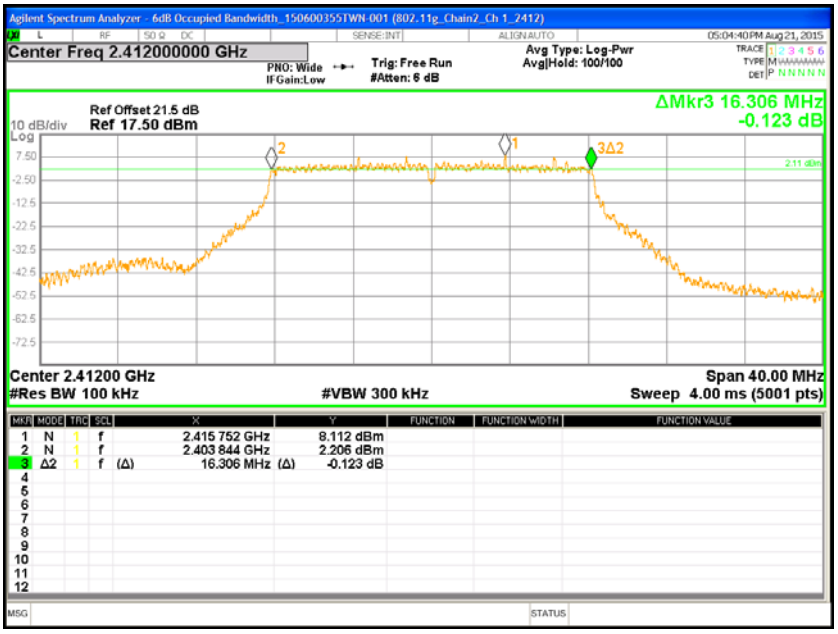
Chain1 : 6dB Bandwidth @ 802.11g mode Ch 6



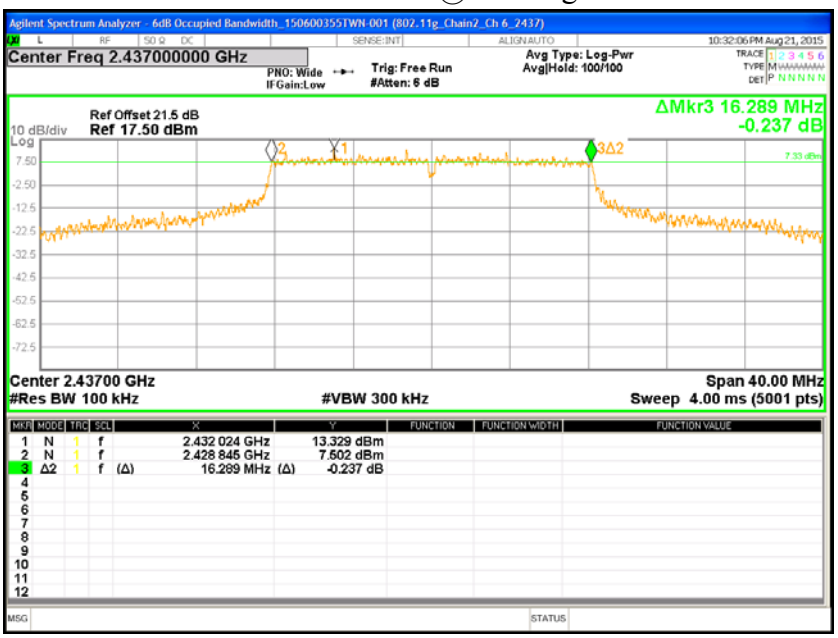
Chain1 : 6dB Bandwidth @ 802.11g mode Ch11



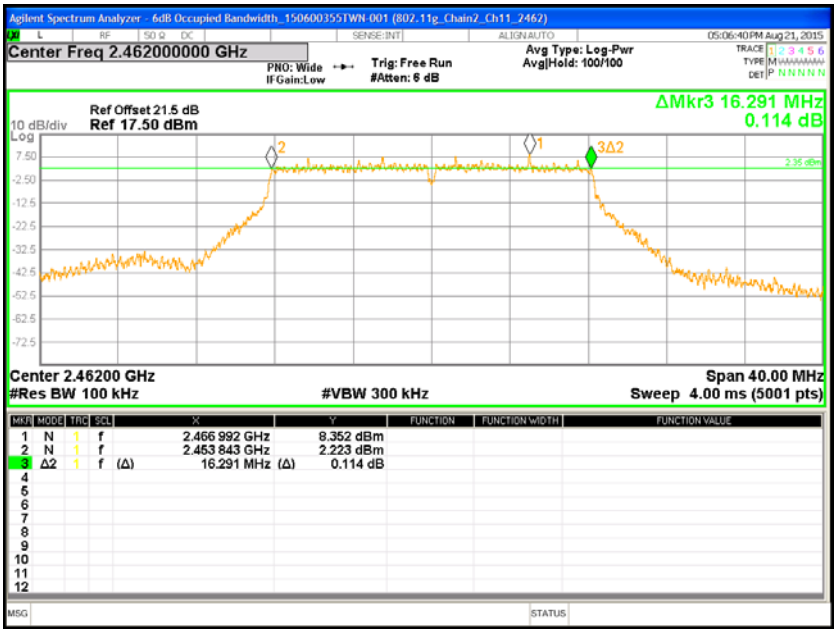
Chain2 : 6dB Bandwidth @ 802.11g mode Ch 1



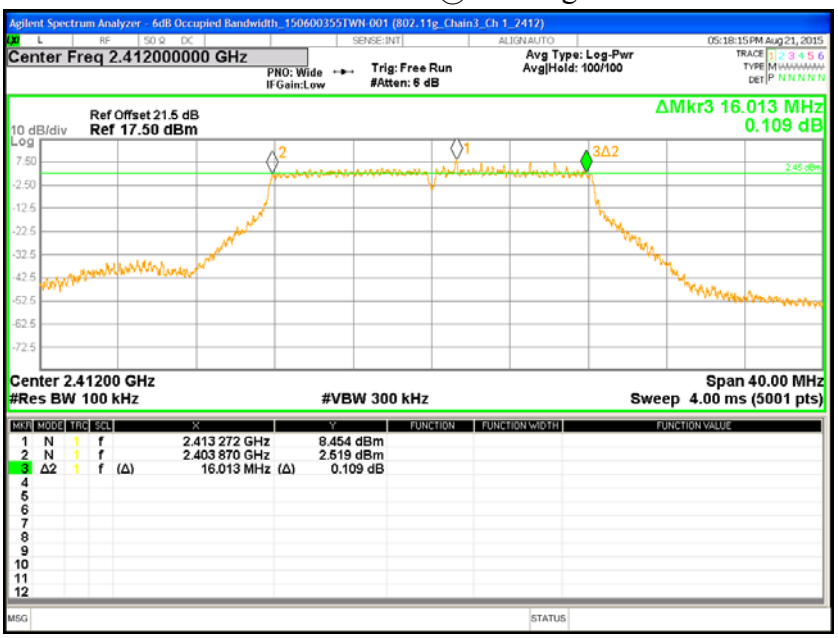
Chain2 : 6dB Bandwidth @ 802.11g mode Ch 6



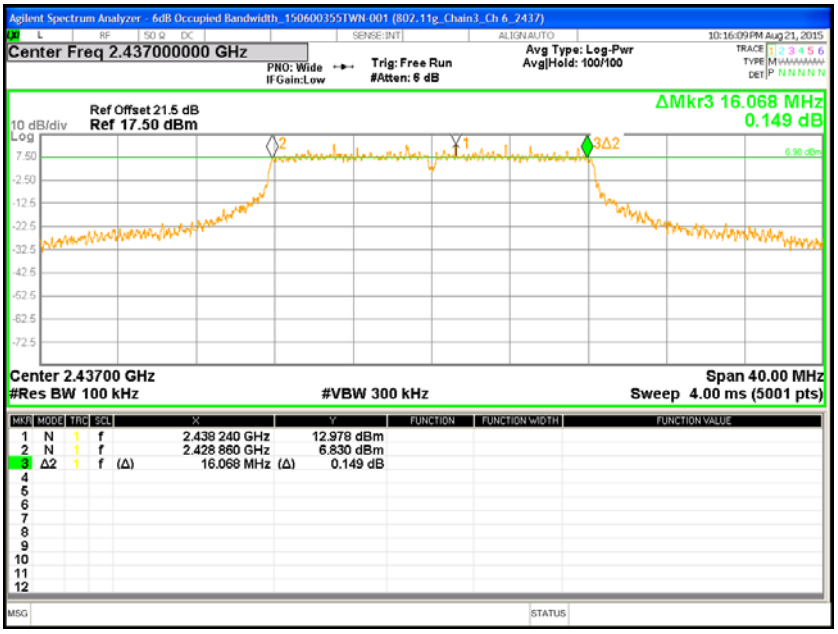
Chain2 : 6dB Bandwidth @ 802.11g mode Ch11



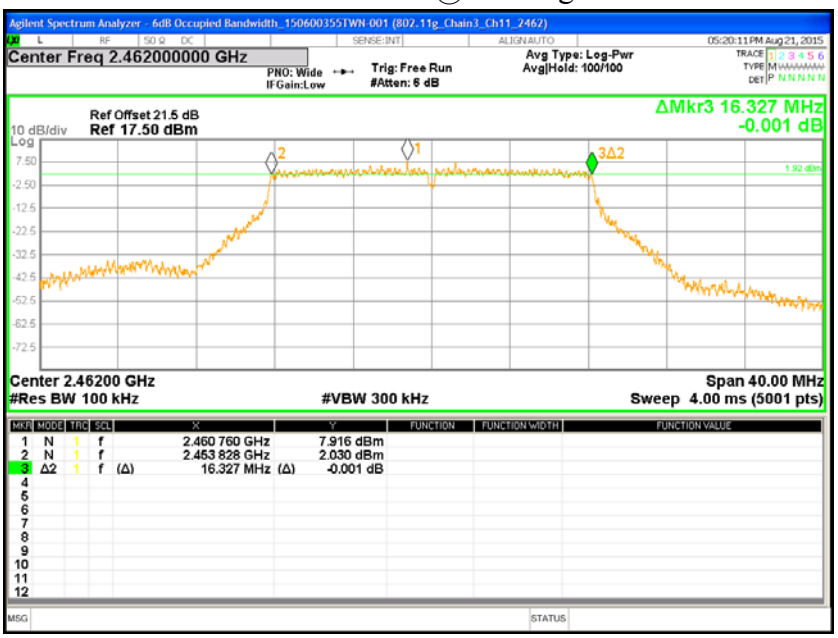
Chain3 : 6dB Bandwidth @ 802.11g mode Ch 1



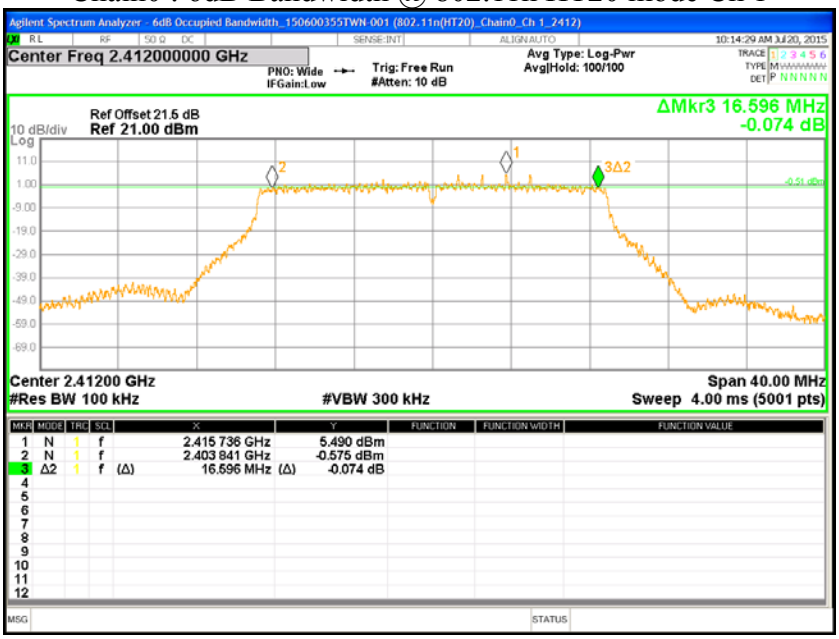
Chain3 : 6dB Bandwidth @ 802.11g mode Ch 6



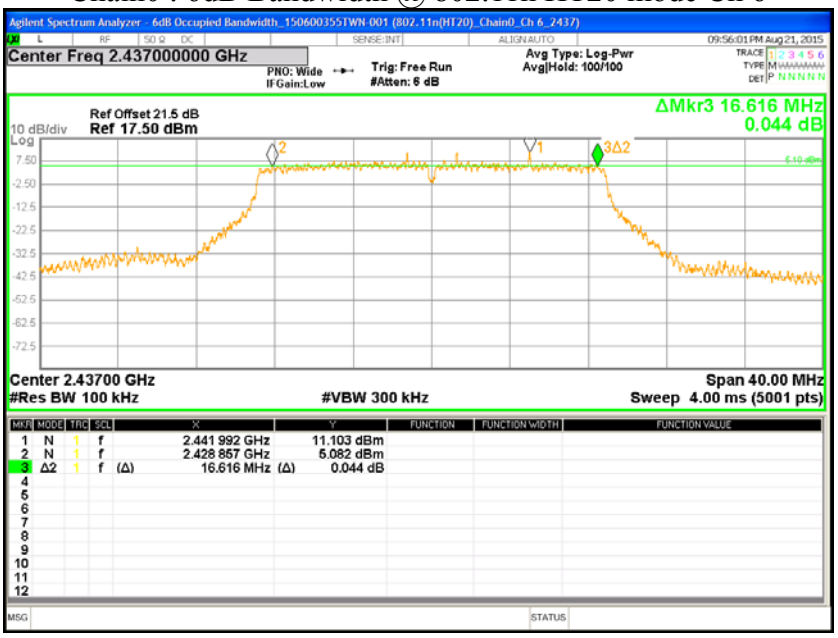
Chain3 : 6dB Bandwidth @ 802.11g mode Ch11



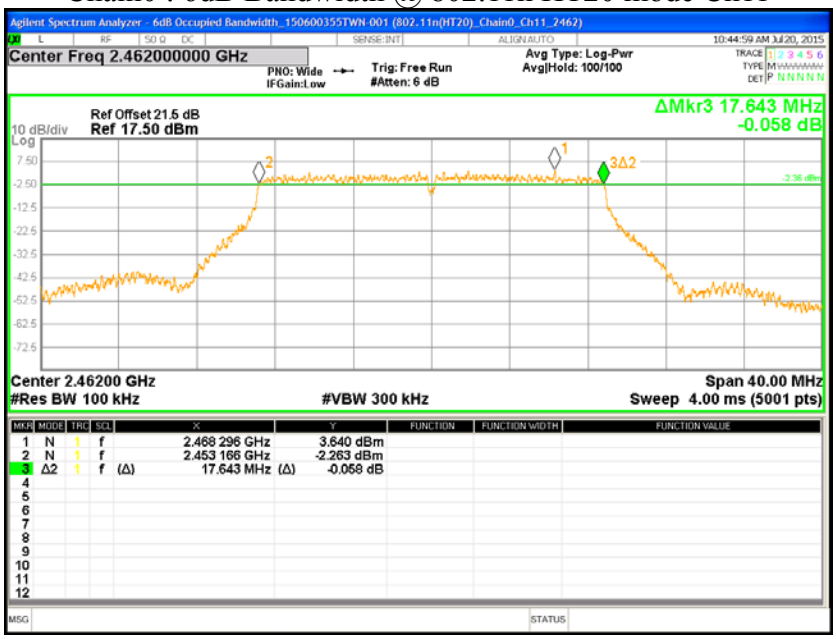
Chain0 : 6dB Bandwidth @ 802.11n HT20 mode Ch 1



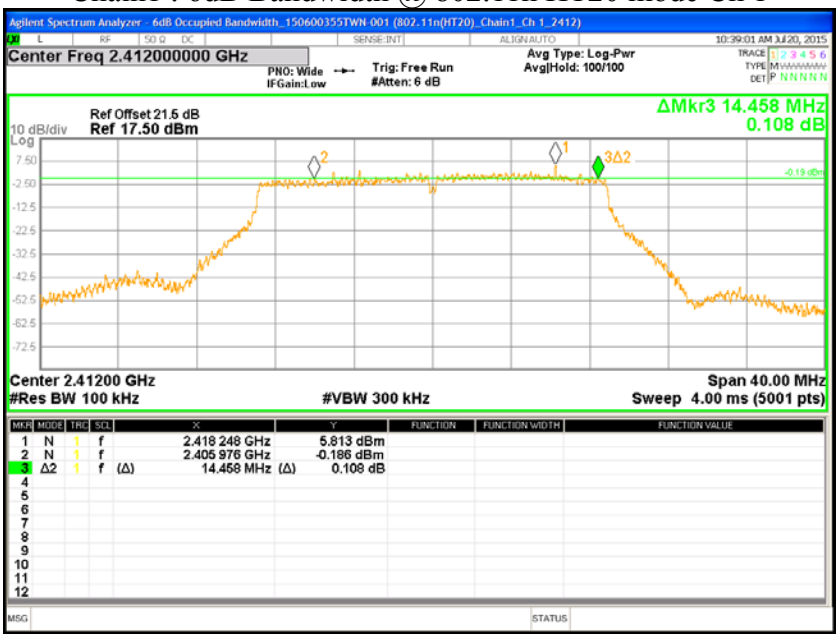
Chain0 : 6dB Bandwidth @ 802.11n HT20 mode Ch 6



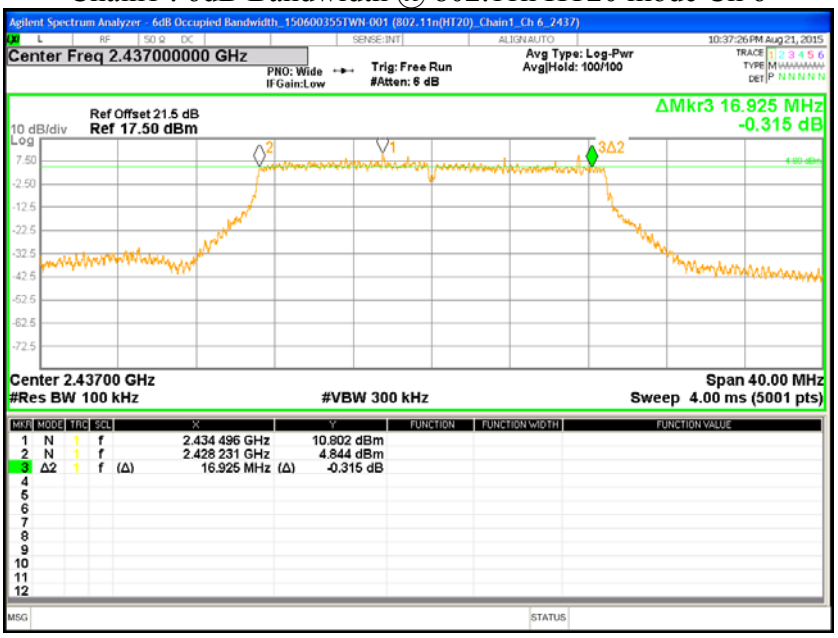
Chain0 : 6dB Bandwidth @ 802.11n HT20 mode Ch11



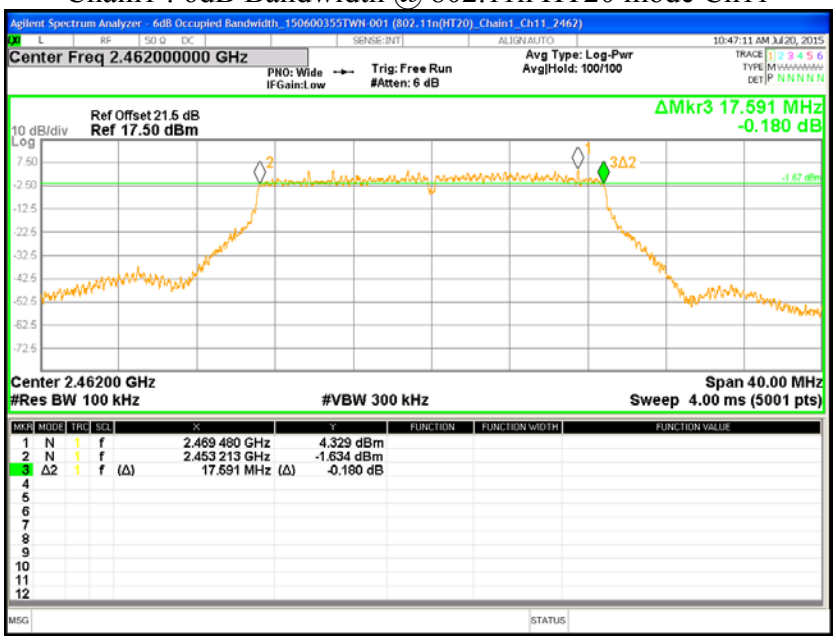
Chain1 : 6dB Bandwidth @ 802.11n HT20 mode Ch 1



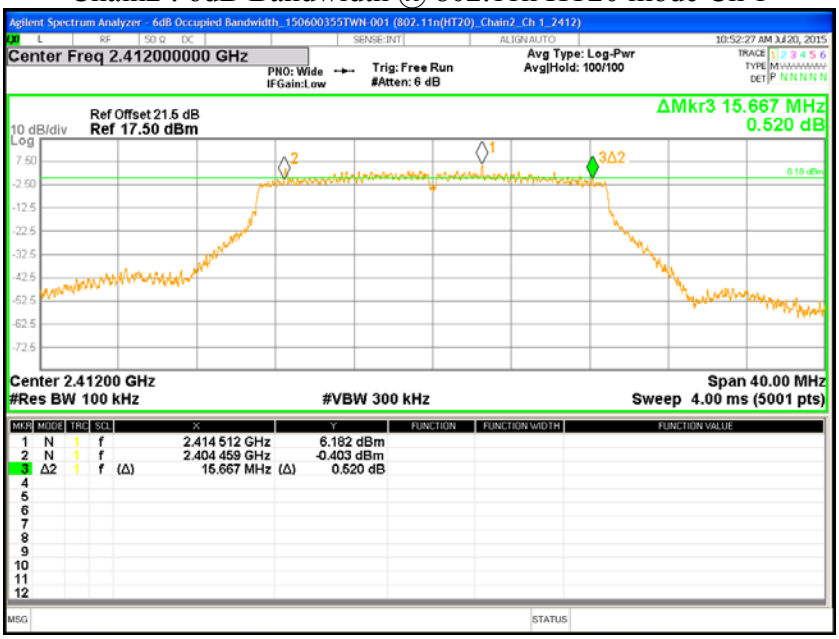
Chain1 : 6dB Bandwidth @ 802.11n HT20 mode Ch 6



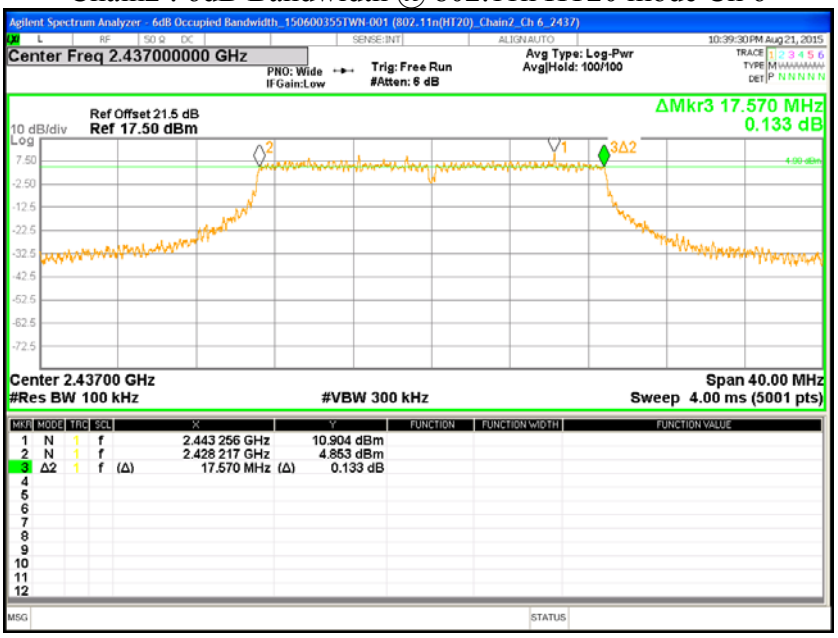
Chain1 : 6dB Bandwidth @ 802.11n HT20 mode Ch11



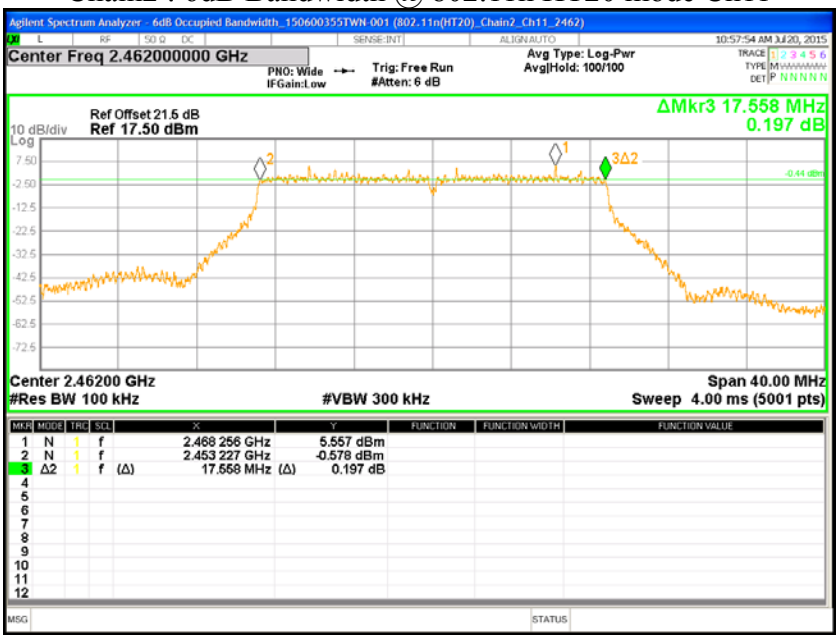
Chain2 : 6dB Bandwidth @ 802.11n HT20 mode Ch 1



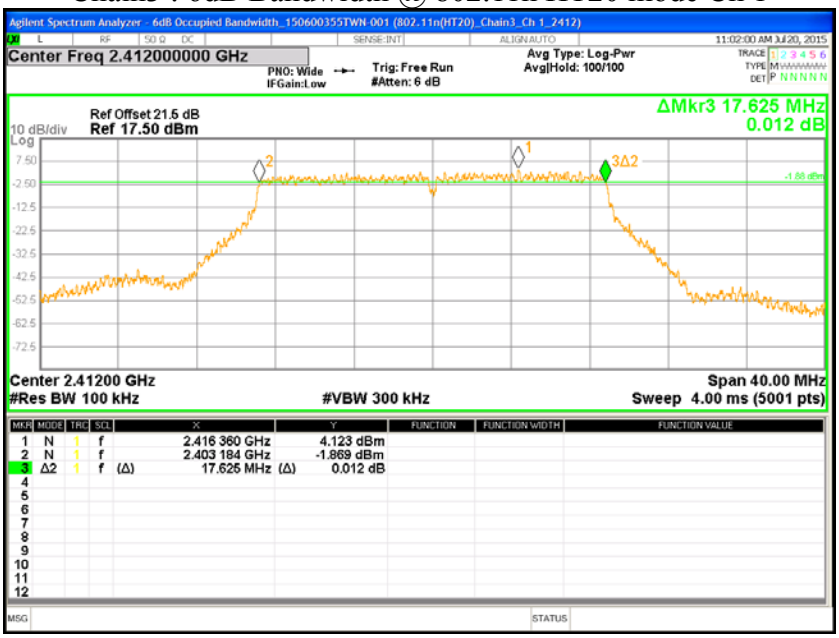
Chain2 : 6dB Bandwidth @ 802.11n HT20 mode Ch 6



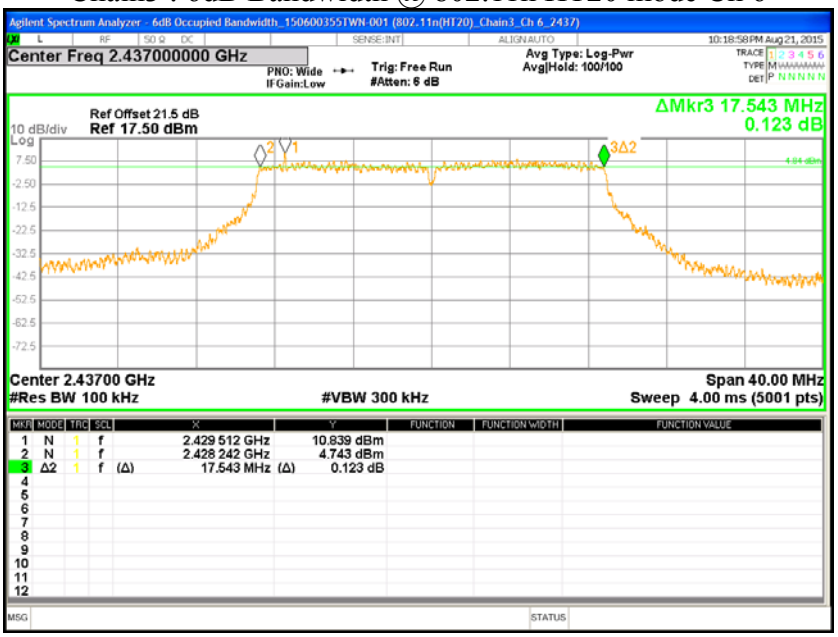
Chain2 : 6dB Bandwidth @ 802.11n HT20 mode Ch11



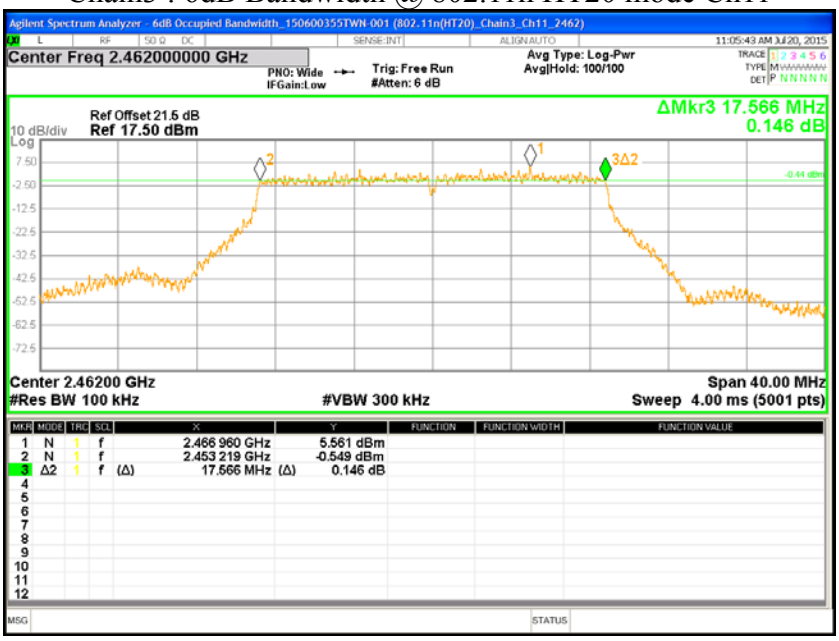
Chain3 : 6dB Bandwidth @ 802.11n HT20 mode Ch 1



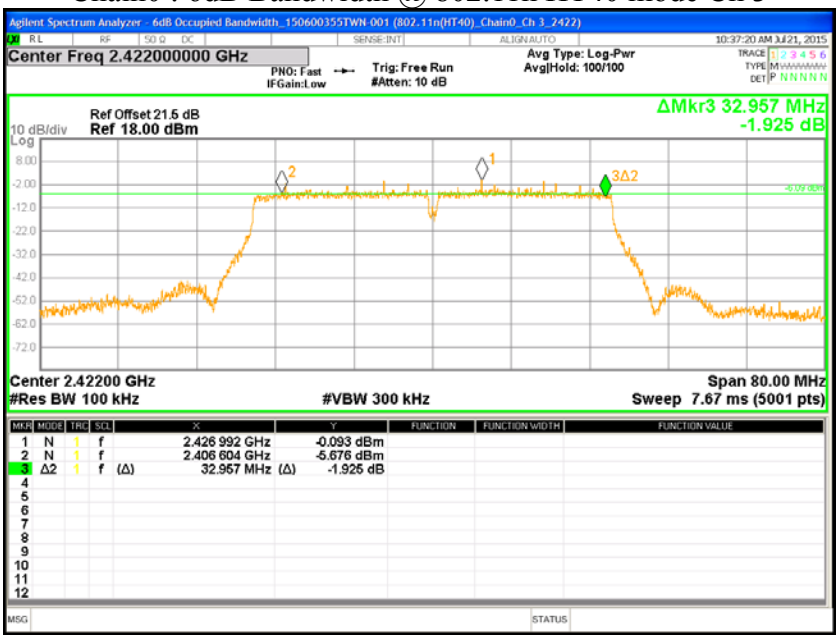
Chain3 : 6dB Bandwidth @ 802.11n HT20 mode Ch 6



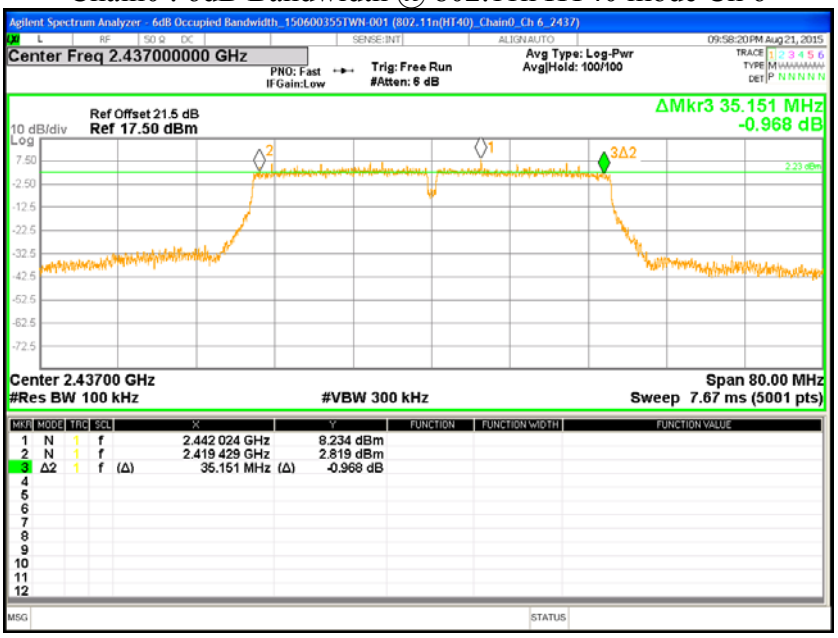
Chain3 : 6dB Bandwidth @ 802.11n HT20 mode Ch11



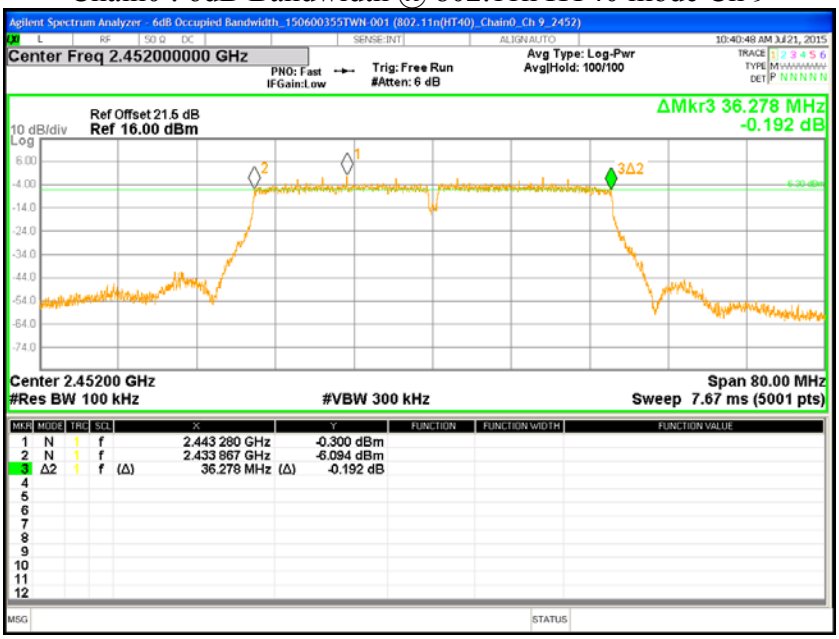
Chain0 : 6dB Bandwidth @ 802.11n HT40 mode Ch 3



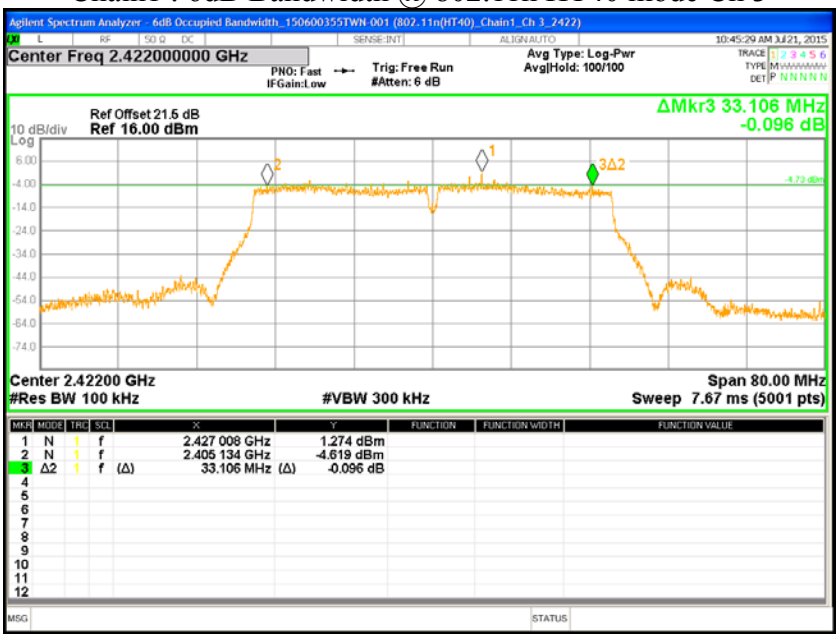
Chain0 : 6dB Bandwidth @ 802.11n HT40 mode Ch 6



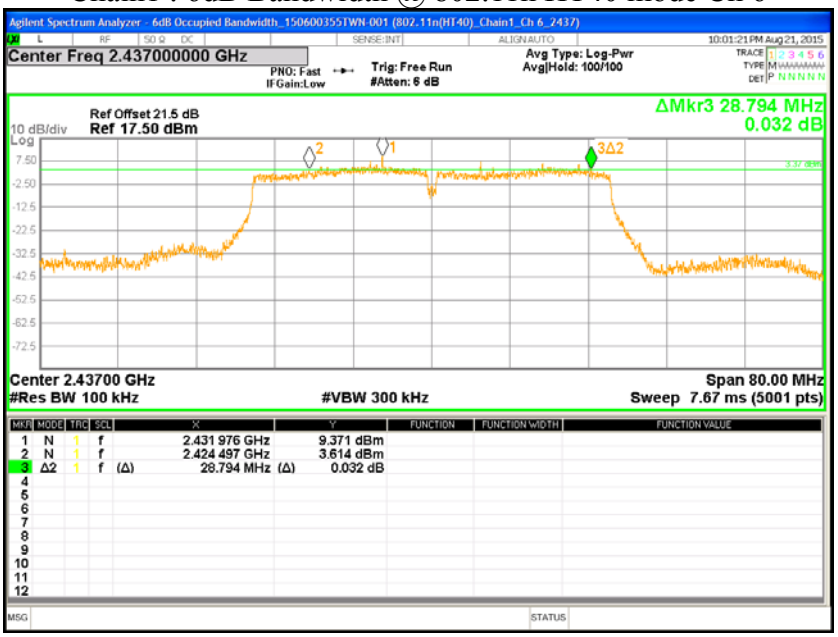
Chain0 : 6dB Bandwidth @ 802.11n HT40 mode Ch 9



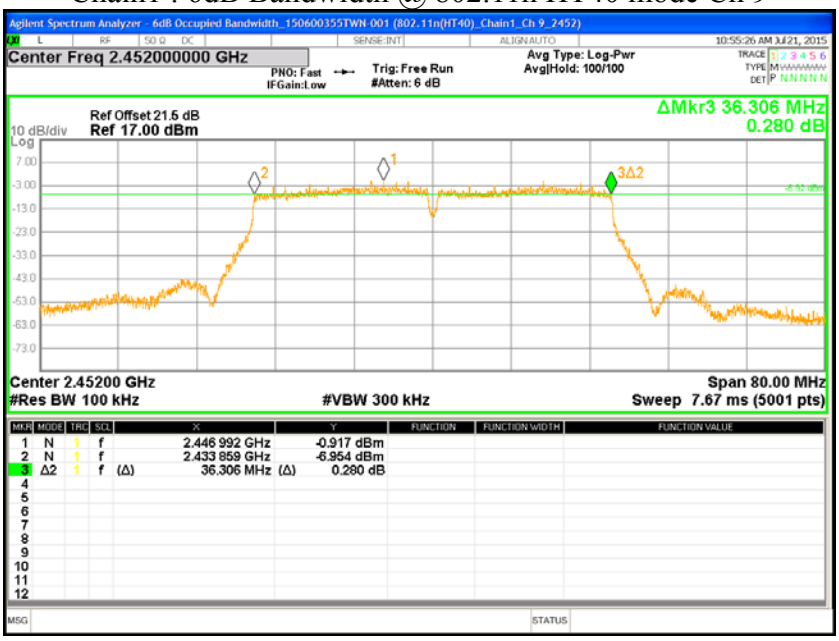
Chain1 : 6dB Bandwidth @ 802.11n HT40 mode Ch 3



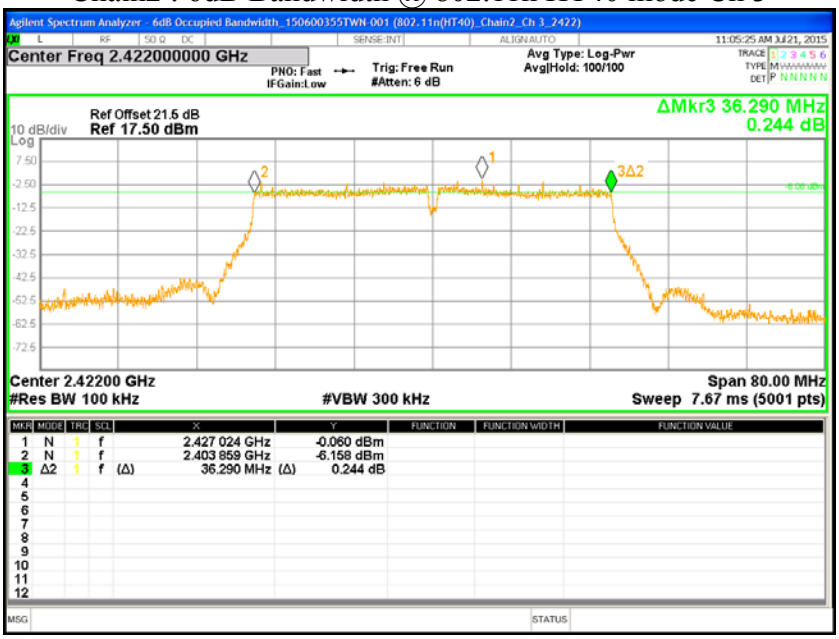
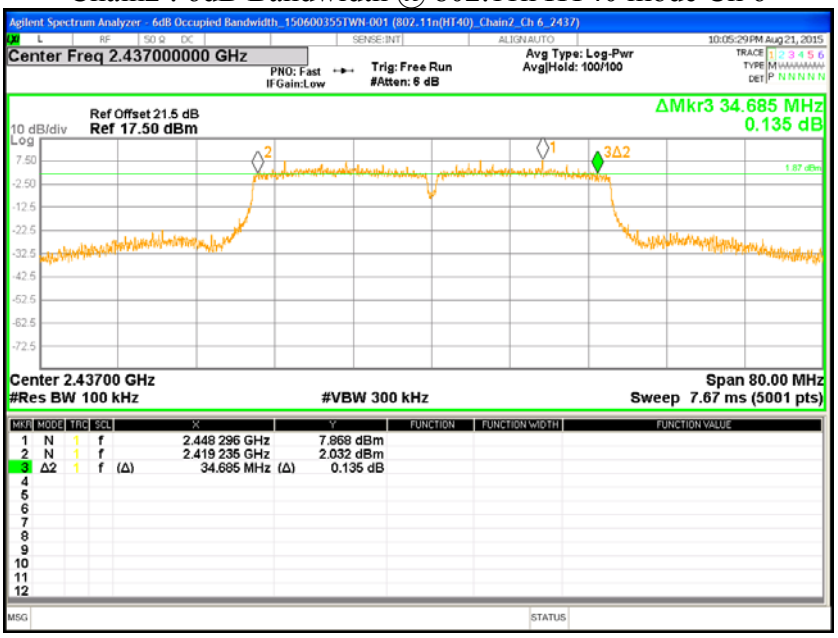
Chain1 : 6dB Bandwidth @ 802.11n HT40 mode Ch 6



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



Chain2 : 6dB Bandwidth @ 802.11n HT40 mode Ch 3



Chain2 : 6dB Bandwidth @ 802.11n HT40 mode Ch 6