FCC 47 CFR PART 15 SUBPART C
ISED RSS-247 ISSUE 2

CERTIFICATION TEST REPORT

For

Wireless Speaker

MODEL NUMBER: LSX

FCC ID: UXD18001
IC: 21561-18001

REPORT NUMBER: 4788430402-3

ISSUE DATE: July 08, 2018

Prepared for

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9/F, Building 12W, 12 Science Park West Avenue, Hong Kong Science Park,Pak Shek Kok New Territories - Hong Kong

Prepared by

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Revision History

Rev.	Issue Date	Revisions	Revised By
--	7/8/2018	Initial Issue	

Summary of Test Results			
Clause	**Test Items**	FCC/IC Rules	Test Results
1	6dB Bandwidth and 99% Bandwidth	FCC 15.247 (a) (2) RSS-247 Clause 5.2 (a)	PASS
2	Peak Conducted Output Power	FCC 15.247 (b) (3) RSS-247 Clause 5.4 (e)	PASS
3	Power Spectral Density	FCC 15.247 (e) RSS-247 Clause 5.2 (b)	PASS
4	Conducted Bandedge and Spurious Emission	FCC 15.247 (d) RSS-247 Clause 5.5	PASS
5	Radiated Bandedge and Spurious Emission	FCC 15.247 (d) FCC 15.209 FCC 15.205 RSS-247 Clause 5.5 RSS-GEN Clause 8.9	PASS
6	Conducted Emission Test For AC Power Port	FCC 15.207 RSS-GEN Clause 8.8	PASS
7	Antenna Requirement	FCC 15.203 RSS-GEN Clause 8.3	PASS

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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name:	GP Electronics (HK) Ltd.
Address:	9/F, Building 12W, 12 Science Park West Avenue, Hong Kong Science Park,Pak Shek Kok New Territories - Hong Kong

Manufacturer Information

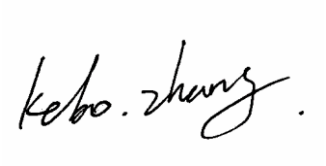
Company Name:	GP Electronics (HK) Ltd.
Address:	9/F, Building 12W, 12 Science Park West Avenue, Hong Kong Science Park,Pak Shek Kok New Territories - Hong Kong

EUT Description

Product Name	Wireless Speaker
Model Name	LSX
Sample Status	Good
Sample Received date	April 23, 2018
Date Tested	April 23~July 6, 2018

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	PASS
ISED RSS-247 Issue 2	PASS
ISED RSS-GEN Issue 5	PASS

Tested By:



Kebo Zhang
Engineer

Checked By:

Shawn Wen
Laboratory Leader

Approved By:

Stephen Guo

Laboratory Manager

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, KDB558074 D01 DTS Meas Guidance v04, KDB414788 D01 Radiated Test Site v01, ANSI C63.10-2013, RSS-247 Issue 2 and RSS-GEN Issue 5.

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	**A2LA (Certificate No.: 4102.01)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA. **IAS (Lab Code: TL-702)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has demonstrated compliance with ISO/IEC Standard 17025:2005, General requirements for the competence of testing and calibration laboratories **FCC (FCC Designation No.: CN1187)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Delcaration of Conformity (DoC) and Certification rules **IC(Company No.: 21320)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with ISED. The Company Number is 21320. **VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793. Facility Name: Chamber D, the VCCI registration No. is G-20019 and R-20004 Shielding Room B , the VCCI registration No. is C-20012 and T-20011

Note 1: All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China

Note 2: The test anechoic chamber in UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognize national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Uncertainty
Uncertainty for Conduction emission test	2.90dB
Uncertainty for Radiation Emission test(include Fundamental emission) (9KHz-30MHz)	2.2dB
Uncertainty for Radiation Emission test(include Fundamental emission) (30MHz-1GHz)	4.52dB
Uncertainty for Radiation Emission test (1GHz to 26GHz)(include Fundamental emission)	5.04dB(1-6GHz)
	5.30dB (6GHz-18Gz)
	5.23dB (18GHz-26Gz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

Equipment	Wireless Speaker
Model Name	LSX
Radio Technology	IEEE802.11b/g/n HT20/n HT40
Operation frequency	IEEE 802.11b: 2412MHz—2462MHz IEEE 802.11g: 2412MHz—2462MHz IEEE 802.11n HT20: 2412MHz—2462MHz IEEE 802.11n HT40: 2422MHz—2462MHz
Modulation	IEEE 802.11b: DSSS(CCK) IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK,BPSK) IEEE 802.11n HT40: OFDM (64QAM, 16QAM, QPSK,BPSK)
Power Supply	AC120V/60Hz

5.2. MAXIMUM OUTPUT POWER

Frequency Range (MHz)	Number of Transmit ANTs (NTX)	IEE Std. 802.11	Channel Number	Max Output Power (dBm)
2412-2462	1	b	1-11[11]	18.83
2412-2462	1	g	1-11[11]	19.64
2412-2462	1	n HT20	1-11[11]	18.92
2422-2452	1	n HT40	3-9[7]	18.01

5.3. CHANNEL LIST

Channel List for 802.11b/g/n (20 MHz)					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	5	2432	9	2452
2	2417	6	2437	10	2457
3	2422	7	2442	11	2462
4	2427	8	2447		

Channel List for 802.11n (40 MHz)					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
3	2422	7	2442	11	2462
4	2427	8	2447		
5	2432	9	2452		
6	2437	10	2457		

5.4. TEST CHANNEL CONFIGURATION

Test Mode	Test Channel	Frequency
WiFi TX(802.11b)	CH 1, CH 6, CH 11	2412MHz, 2437MHz, 2462MHz
WiFi TX(802.11g)	CH 1, CH 6, CH 11	2412MHz, 2437MHz, 2462MHz
WiFi TX(802.11n HT20)	CH 1, CH 6, CH 11	2412MHz, 2437MHz, 2462MHz
WiFi TX(802.11n HT40)	CH 3, CH 6, CH 9	2422MHz, 2437MHz, 2452MHz

5.5. THE WORSE CASE CONFIGURATIONS

The Worse Case Power Setting Parameter under 2400 ~ 2483.5MHz Band							
Test Software		Tera Term					
Modulation Mode	Transmit Antenna Number	Test Channel					
		NCB: 20MHz			NCB: 40MHz		
		CH 1	CH 7	CH 13	CH 3	CH 7	CH 11
802.11b	1	18	18	8	N/A		
802.11g	1	40	36	25			
802.11n HT20	1	35	35	25			
802.11n HT40	1	N/A	N/A	N/A	44	44	22
802.11b	2	18	18	10	N/A		
802.11g	2	40	38	25			
802.11n HT20	2	35	35	23			
802.11n HT40	2	N/A	N/A	N/A	44	44	20

5.6. TEST ENVIRONMENT

Environment Parameter	Selected Values During Tests	
Relative Humidity	55 ~ 65%	
Atmospheric Pressure:	1025Pa	
Temperature	TN	23 ~ 28°C
Voltage :	VL	N/A
	VN	AC 120V/60Hz
	VH	N/A

Note: VL= Lower Extreme Test Voltage
VN= Nominal Voltage
VH= Upper Extreme Test Voltage
TN= Normal Temperature

5.7. DESCRIPTION OF AVAILABLE ANTENNAS

Antenna No.	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
Antenna 1 (Front)	2412-2462	Internal Antenna	4.4

Antenna	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
Antenna 2 (Side)	2412-2462	Internal Antenna	2.4

IEE Std. 802.11	Transmit and Receive Mode
802.11b	1TX
802.11g	1TX
802.11n HT20	1TX
802.11n HT40	1TX
Note: 1. 1TX: The EUT supports Antenna 1 and Antenna 2. 2. The equipment has two antennas but only one antenna active at any moment in time 3. WIFI & BT can't transmit simultaneously. (declared by client) 4. WIFI and 2.4G can transmit simultaneously. (declared by client)	

5.8. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	P/N
1	Laptop	ThinkPad	T460S	SL10K24796 JS
2	USB TO UART	N/A	N/A	N/A

I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	USB	N/A	N/A	0.5	N/A

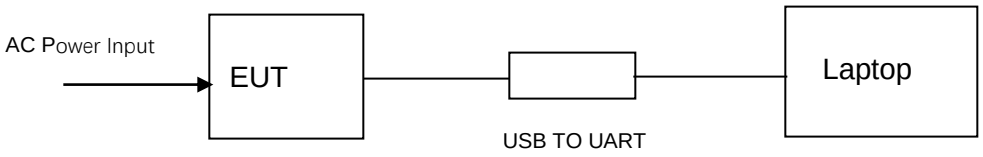
ACCESSORY

Item	Accessory	Brand Name	Model Name	Description
1	N/A	N/A	N/A	N/A

TEST SETUP

The EUT can work in engineering mode with a software through a Laptop.

SETUP DIAGRAM FOR TESTS



5.9. WORST-CASE CONFIGURATIONS

IEE Std. 802.11	Modulation Technology	Modulation Type	Data Rate (Mbps)	Worst Case (Mbps)
b	DSSS	CCK	11/5.5/2/1	1
g	OFDM	BPSK, QPSK, 16QAM, 64QAM	54/48/36/24/18/12/9/6	6
n HT20	OFDM	BPSK, QPSK, 16QAM, 64QAM	(MCS0~MCS7)	MCS0
n HT40	OFDM	BPSK, QPSK, 16QAM, 64QAM	(MCS0~MCS7)	MCS0

Note:
The equipment has two antennas but only one antenna active at any moment in time. All antenna ports have the same power setting.

5.10. MEASURING INSTRUMENT AND SOFTWARE USED

Conducted Emissions						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☑	EMI Test Receiver	R&S	ESR3	101961	Dec.12, 2017	Dec.11, 2018
☑	Two-Line V-Network	R&S	ENV216	101983	Dec.12, 2017	Dec.11, 2018
☑	Artificial Mains Networks	Schwarzbeck	NSLK 8126	8126465	Dec.12, 2017	Dec.11, 2018
Software						
Used	Description		Manufacturer	Name	Version	
☑	Test Software for Conducted disturbance		UL	Antenna port	Ver. 7.2	
Radiated Emissions						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☑	MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Dec.12, 2017	Dec.11, 2018
☑	Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Jan.09, 2016	Jan.09, 2019
☑	Preamplifier	HP	8447D	2944A09099	Dec.12, 2017	Dec.11, 2018
☑	EMI Measurement Receiver	R&S	ESR26	101377	Dec.12, 2017	Dec.11, 2018
☑	Horn Antenna	TDK	HRN-0118	130939	Jan. 09, 2016	Jan. 09, 2019
☑	High Gain Horn Antenna	Schwarzbeck	BBHA-9170	691	Jan.06, 2016	Jan.06, 2019
☑	Preamplifier	TDK	PA-02-0118	TRS-305-00066	Dec.12, 2017	Dec.11, 2018
☑	Preamplifier	TDK	PA-02-2	TRS-307-00003	Dec.12, 2017	Dec.11, 2018
☑	Loop antenna	Schwarzbeck	1519B	00008	Mar. 26, 2016	Mar. 26, 2019
Software						
Used	Description		Manufacturer	Name	Version	
☑	Test Software for Radiated disturbance		Farad	EZ-EMC	Ver. UL-3A1	
Other instruments						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☑	Spectrum Analyzer	Keysight	N9030A	MY55410512	Dec.12, 2017	Dec.11, 2018
☑	Power Meter	Keysight	N9031A	MY55416024	Dec.12, 2017	Dec.11, 2018
☑	Power Sensor	Keysight	N9323A	MY55440013	Dec.12, 2017	Dec.11, 2018
☑	Power Sensor	Keysight	U2021XA	MY57030004	Dec.12, 2017	Dec.11, 2018

6. MEASUREMENT METHODS

No.	Test Item	KDB Name	Section
1	6dB Bandwidth and 99% Bandwidth	KDB 558074 D01 DTS Meas Guidance v04	8.0
2	Peak Output Power	KDB 558074 D01 DTS Meas Guidance v04	9.1.2/9.2
3	Power Spectral Density	KDB 558074 D01 DTS Meas Guidance v04	10.2
4	Out-of-band emissions in non-restricted bands	KDB 558074 D01 DTS Meas Guidance v04	11.0
5	Out-of-band emissions in restricted bands	KDB 558074 D01 DTS Meas Guidance v04	12.1
6	Band-edge	KDB 558074 D01 DTS Meas Guidance v04	13.3.2
7	Conducted Emission Test For AC Power Port	ANSI C63.10-2013	6.2

7. ANTENNA PORT TEST RESULTS

7.1. ON TIME AND DUTY CYCLE

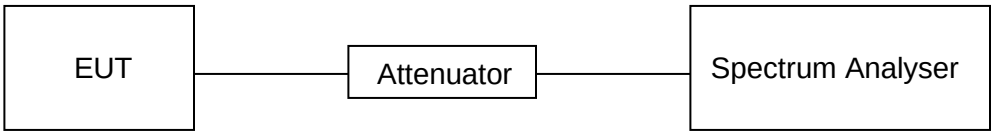
LIMITS

None; for reporting purposes only

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method

TEST SETUP



TEST ENVIRONMENT

Temperature	24.2°C	Relative Humidity	58%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V

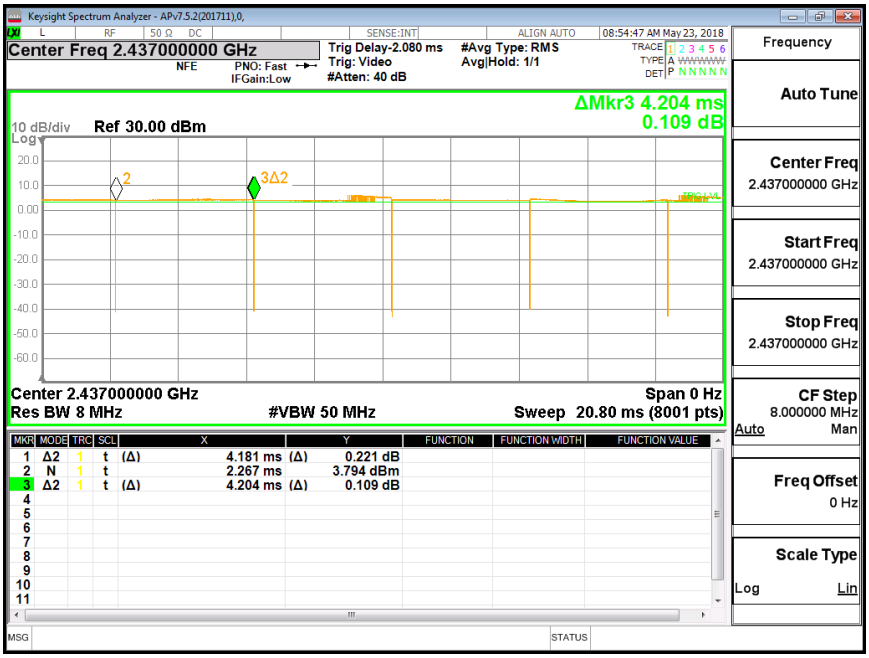
RESULTS

ANTENNA1

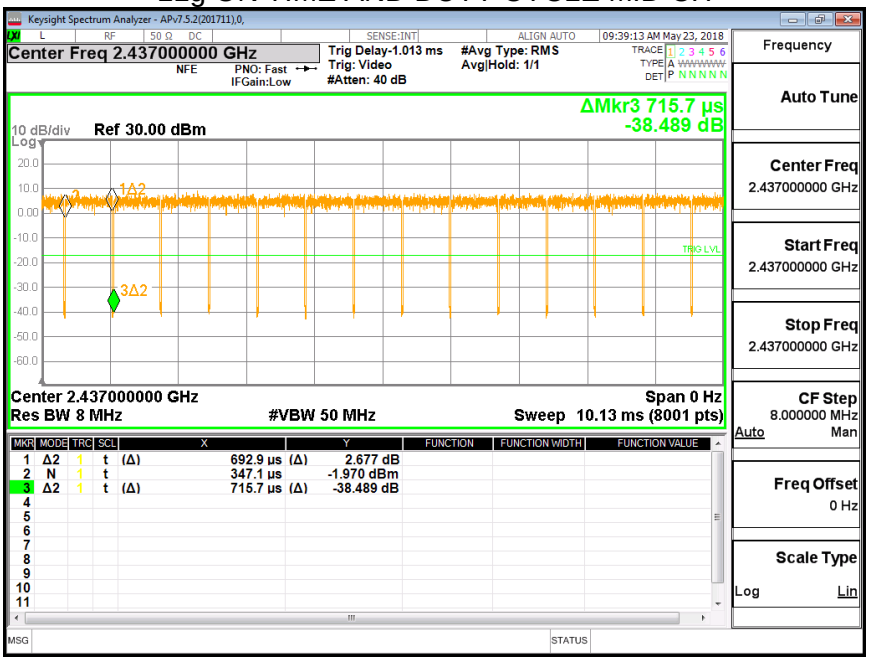
Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (db)	1/B Minimum VBW (KHz)
11b	4.181	4.204	0.9945	99.45	0.024	0.239
11g	0.6929	0.7157	0.9681	96.81	0.141	1.443
11n20	0.6561	0.6789	0.9664	96.64	0.148	1.524
11n40	0.3357	0.3585	0.9364	93.64	0.285	2.979

Note: Duty Cycle Correction Factor=10log(1/x).
Where: x is Duty Cycle (Linear)
Where: B is On Time
Antenna 1 and Antenna 2 has the same duty cycle, only Antenna 1 data show here.

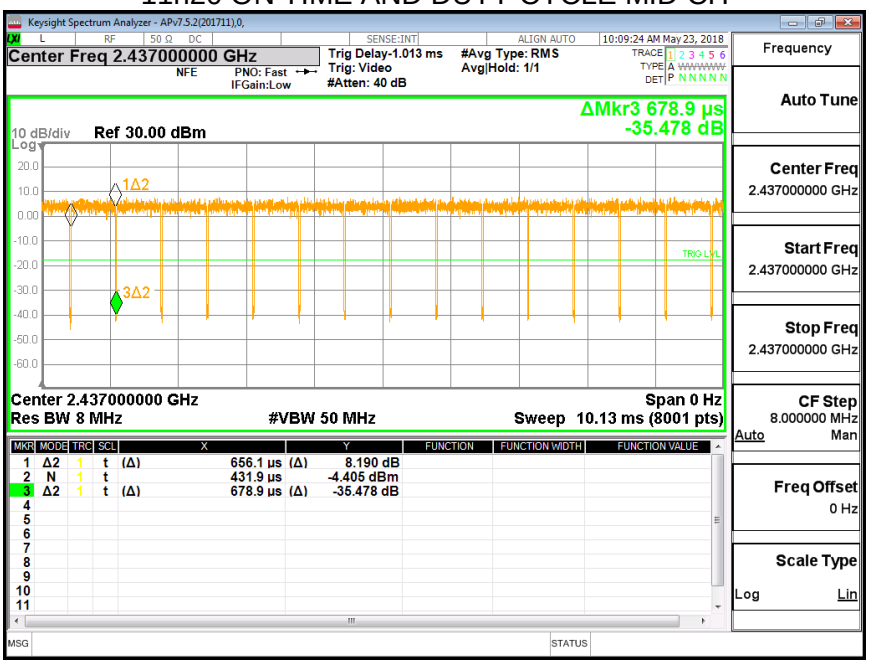
11b ON TIME AND DUTY CYCLE MID CH



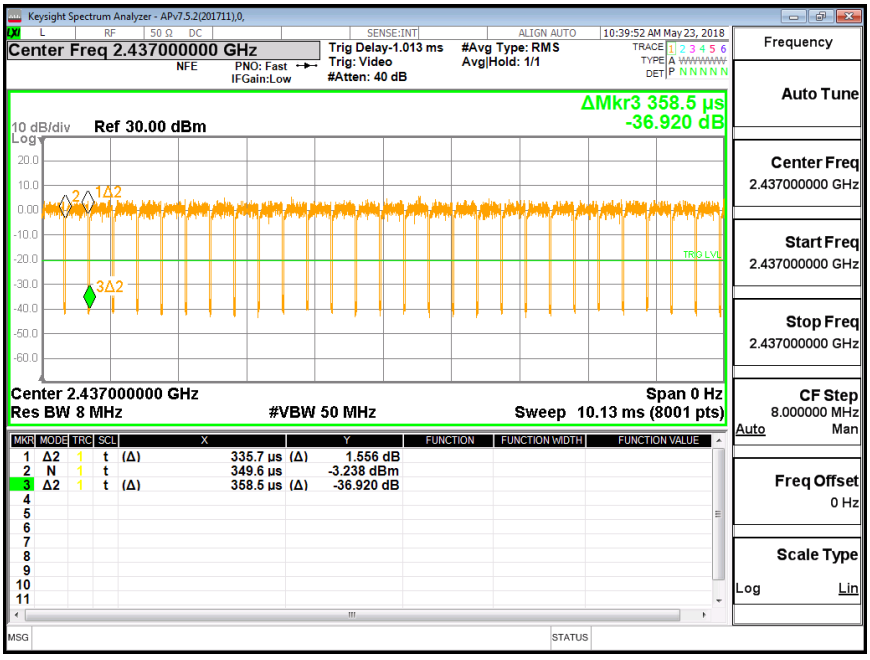
11g ON TIME AND DUTY CYCLE MID CH



11n20 ON TIME AND DUTY CYCLE MID CH



11n40 ON TIME AND DUTY CYCLE MID CH



7.2. 6 dB DTS BANDWIDTH AND 99% BANDWIDTH

LIMITS

FCC Part15 (15.247) Subpart C RSS-247 ISSUE 2			
Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.247(a)(2) RSS-247 5.1 (a)	6 dB Bandwidth	>= 500KHz	2400-2483.5
RSS-Gen Clause 6.6	99% Bandwidth	For reporting purposes only.	2400-2483.5

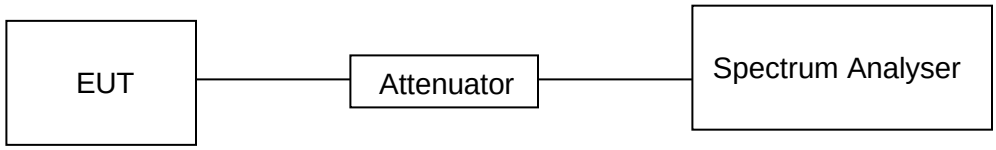
TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	For 6dB Bandwidth :100K For 99% Bandwidth :1% to 5% of the occupied bandwidth
VBW	For 6dB Bandwidth : ≥3 × RBW For 99% Bandwidth : approximately 3×RBW
Trace	Max hold
Sweep	Auto couple

Allow the trace to stabilize and 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 and 99% relative to the maximum level measured in the fundamental emission.

TEST SETUP



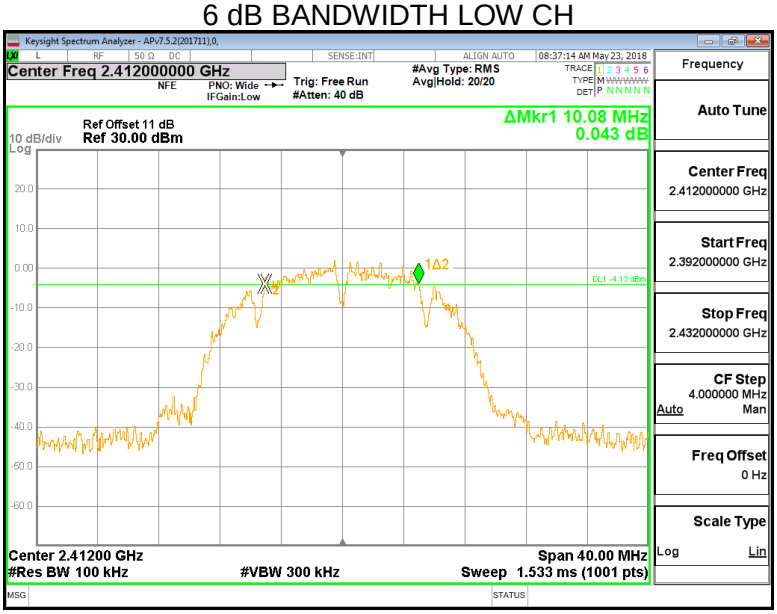
RESULTS

7.2.1. 802.11b MODE

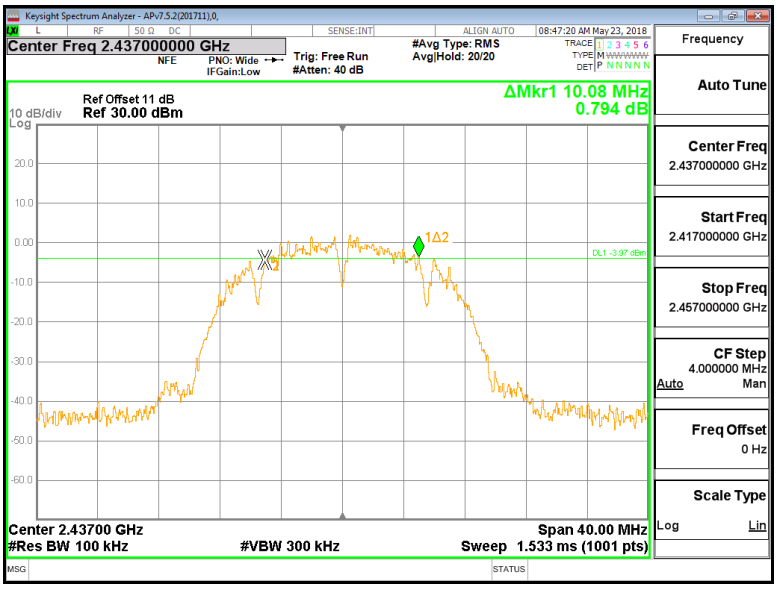
ANTENNA1

Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit For 6dB (kHz)	Result
2412	10.08	15.123	500	Pass
2437	10.08	15.109	500	Pass
2462	9.92	15.117	500	Pass

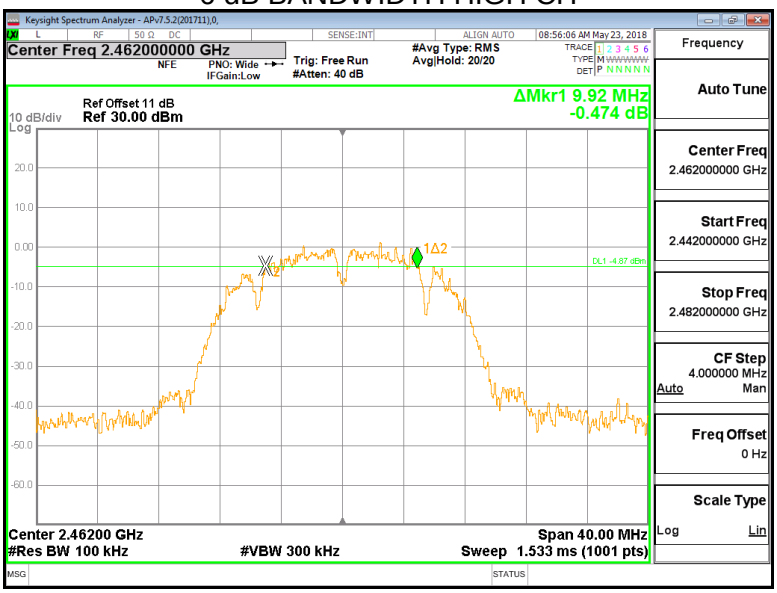
6 dB BANDWIDTH LOW CH



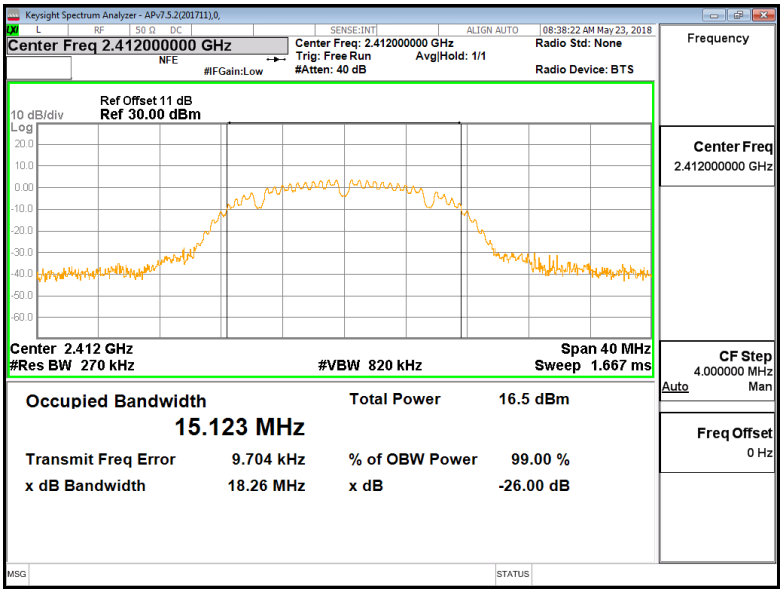
6 dB BANDWIDTH MID CH



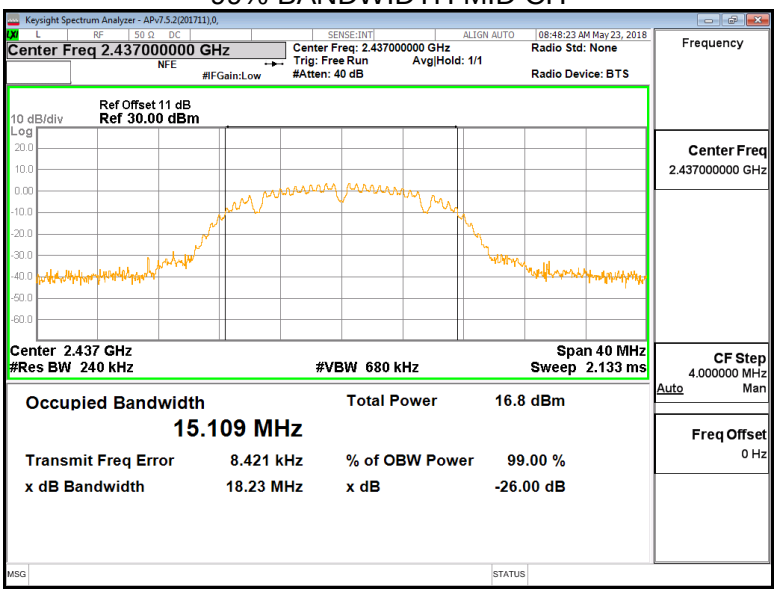
6 dB BANDWIDTH HIGH CH



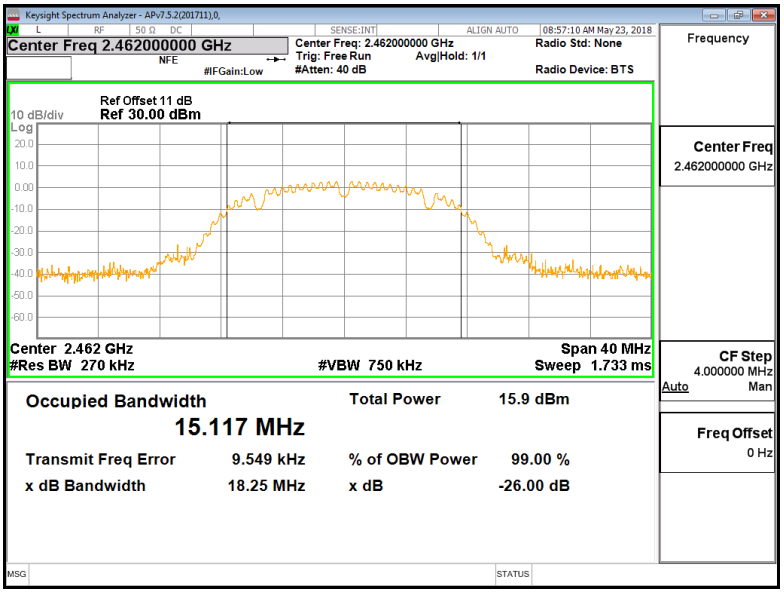
99% BANDWIDTH LOW CH



99% BANDWIDTH MID CH



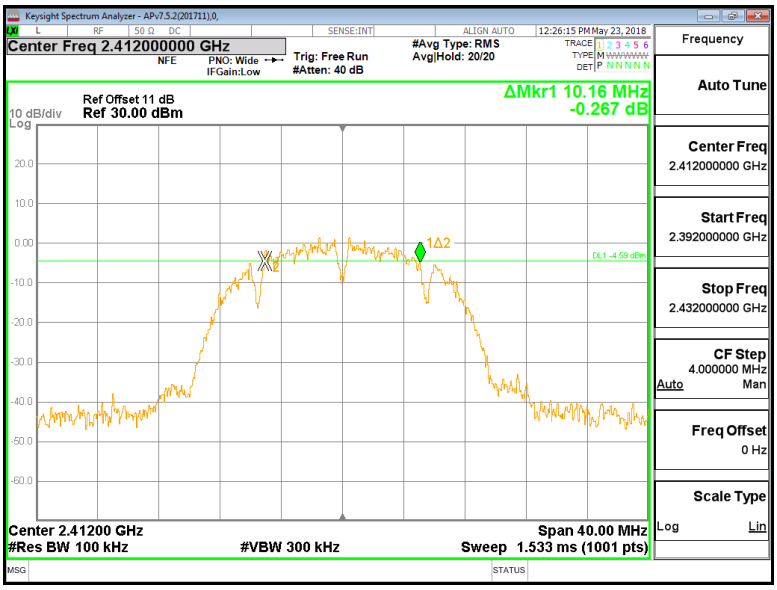
99% BANDWIDTH HIGH CH



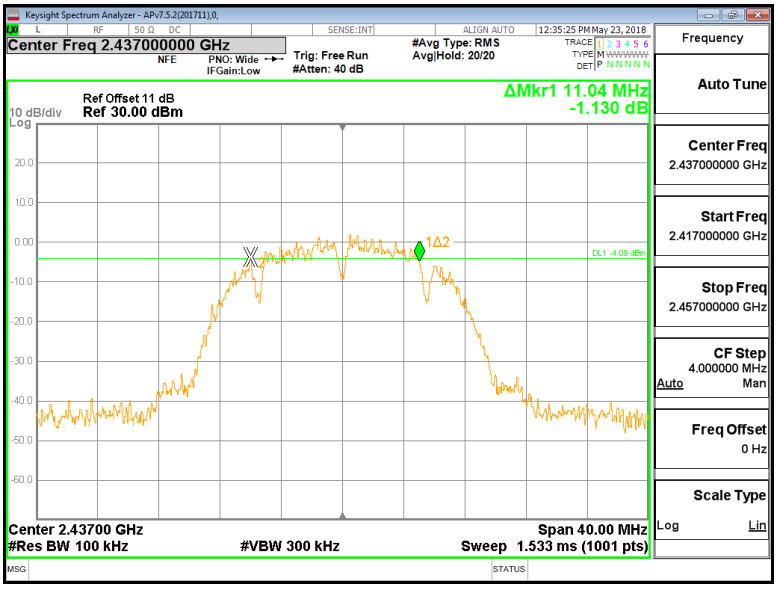
ANTENNA2

Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit For 6dB (kHz)	Result
2412	10.16	15.120	500	Pass
2437	11.04	15.126	500	Pass
2462	10.08	15.121	500	Pass

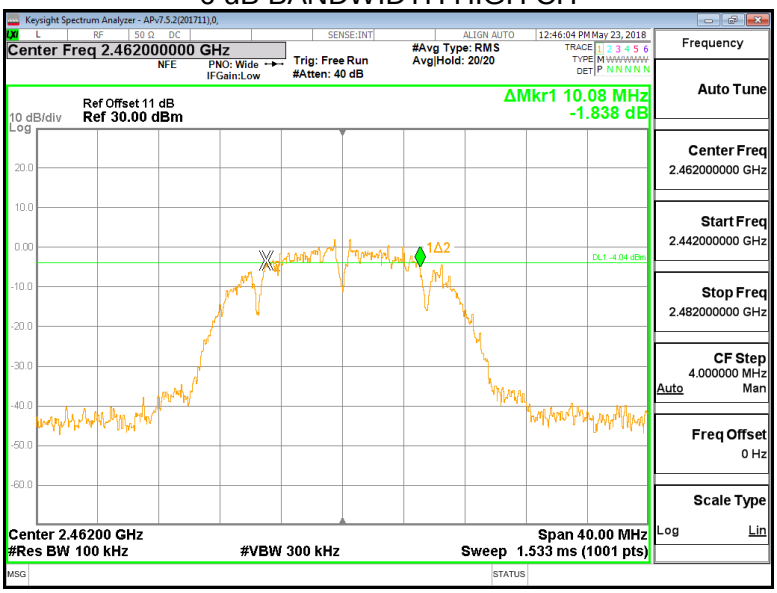
6 dB BANDWIDTH LOW CH



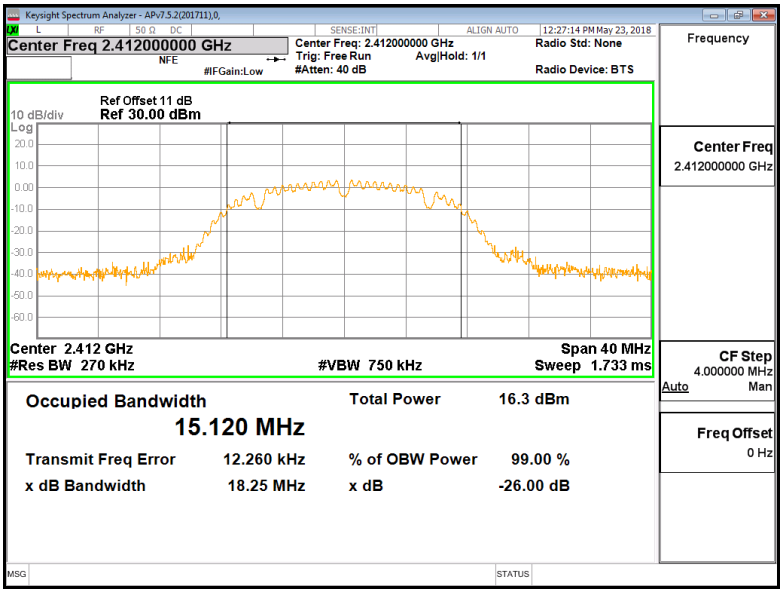
6 dB BANDWIDTH MID CH



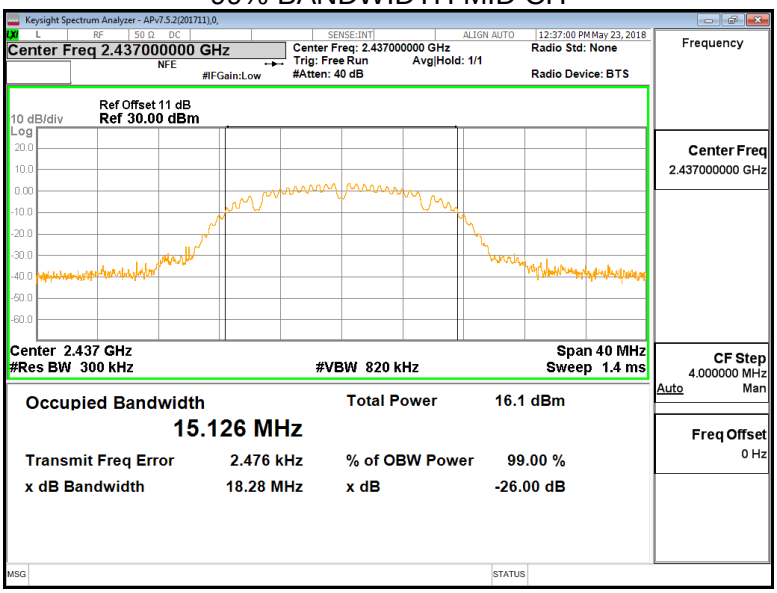
6 dB BANDWIDTH HIGH CH



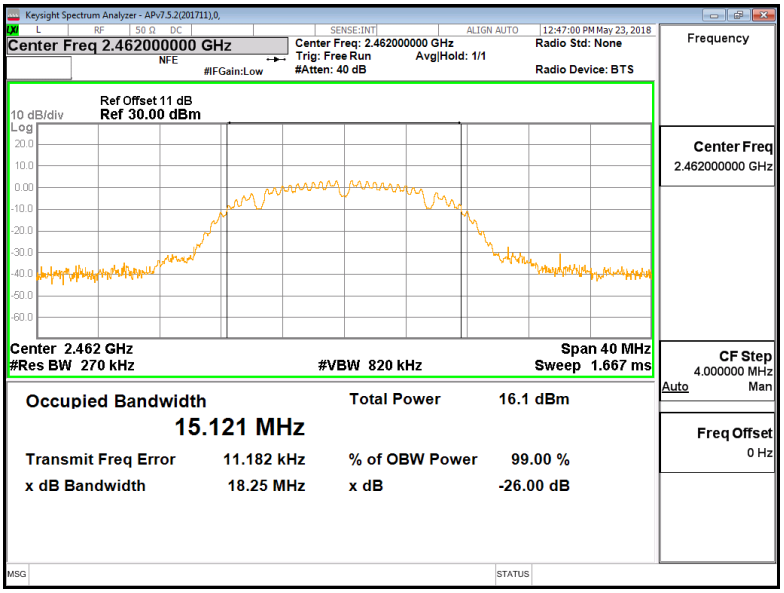
99% BANDWIDTH LOW CH



99% BANDWIDTH MID CH



99% BANDWIDTH HIGH CH

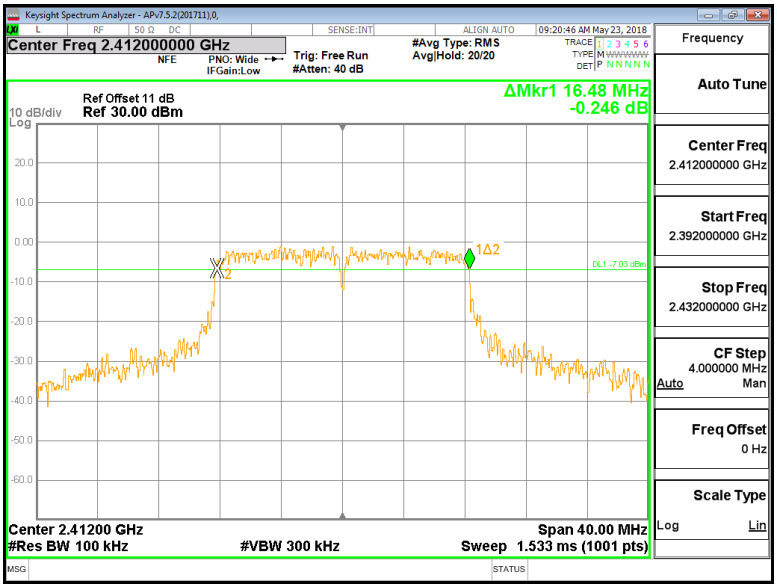


7.2.2. 802.11g MODE

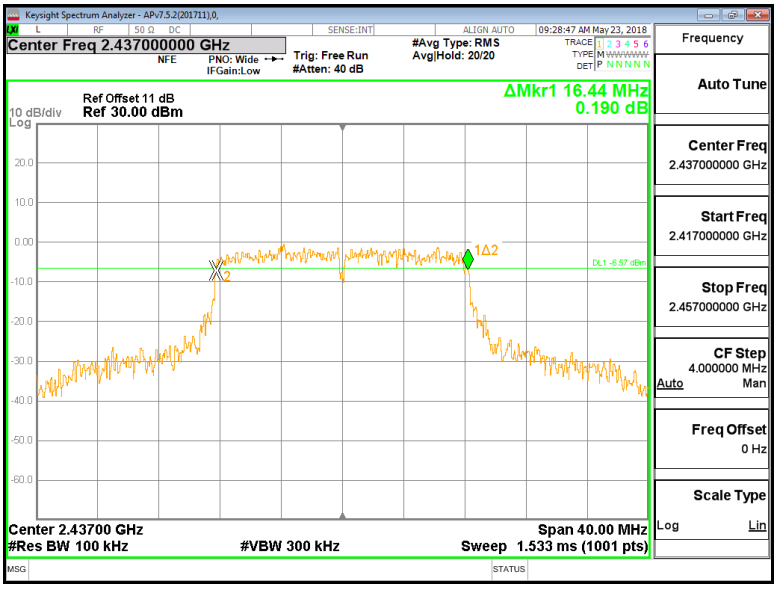
ANTENNA1

Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit For 6dB (kHz)	Result
2412	16.48	16.965	500	Pass
2437	16.44	17.001	500	Pass
2462	16.08	16.930	500	Pass

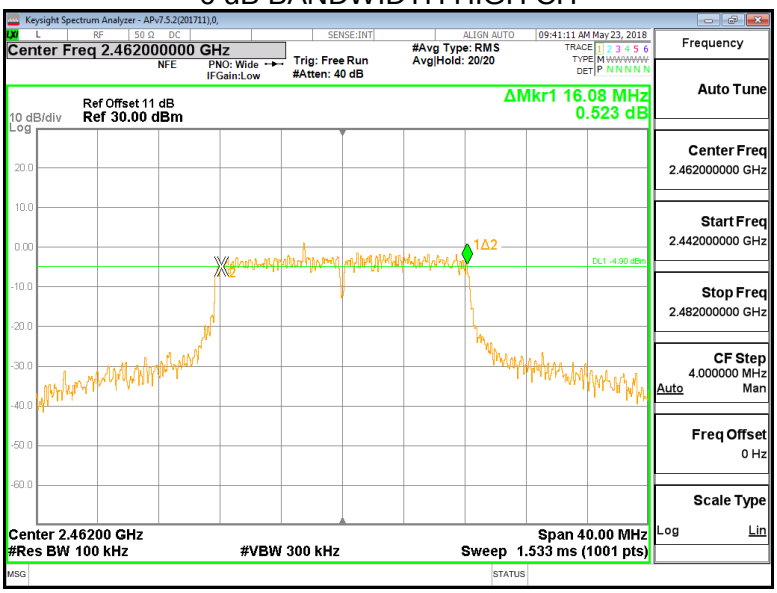
6 dB BANDWIDTH LOW CH



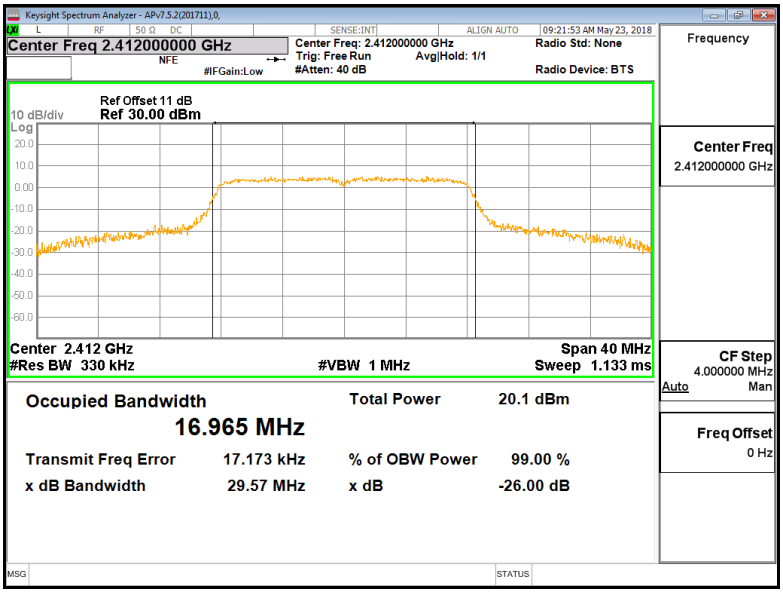
6 dB BANDWIDTH MID CH



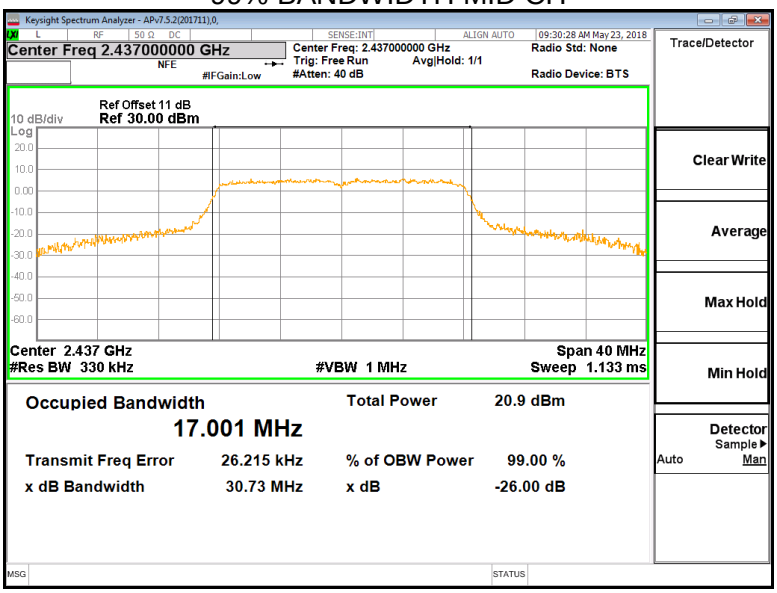
6 dB BANDWIDTH HIGH CH



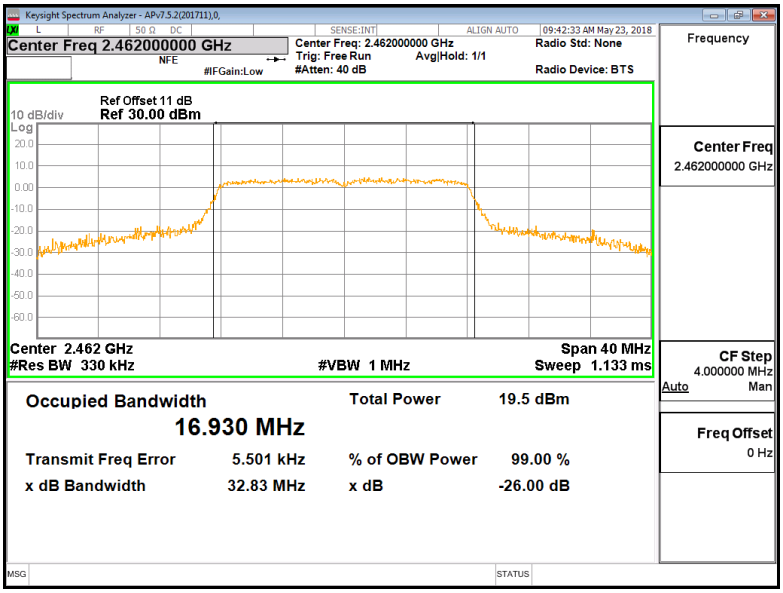
99% BANDWIDTH LOW CH



99% BANDWIDTH MID CH



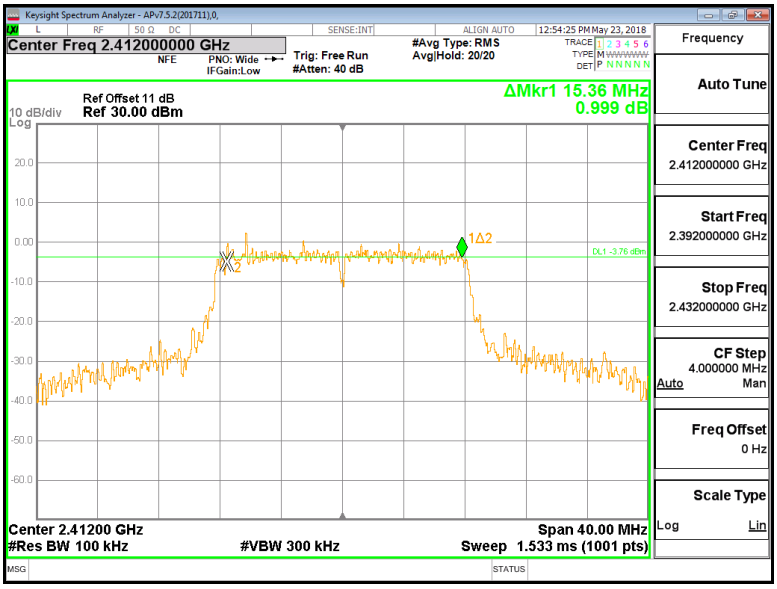
99% BANDWIDTH HIGH CH



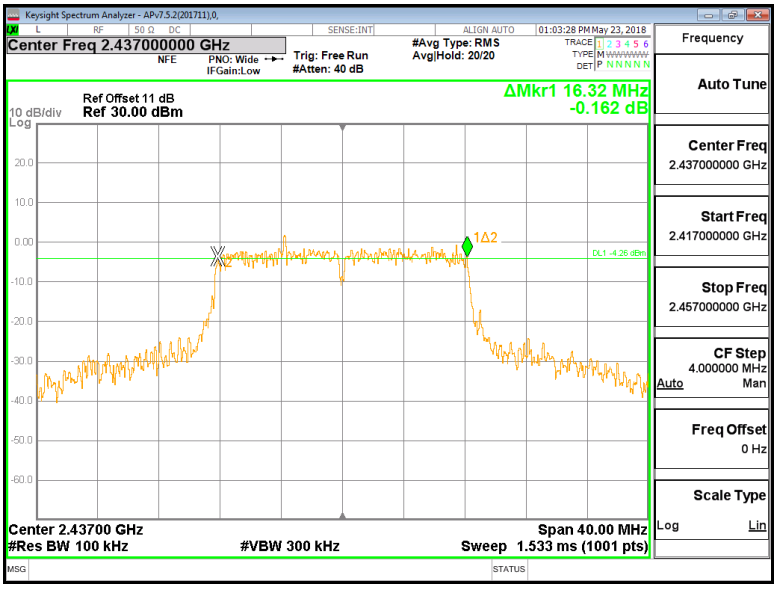
ANTENNA2

Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit For 6dB (kHz)	Result
2412	15.36	16.911	500	Pass
2437	16.32	16.029	500	Pass
2462	16.40	16.014	500	Pass

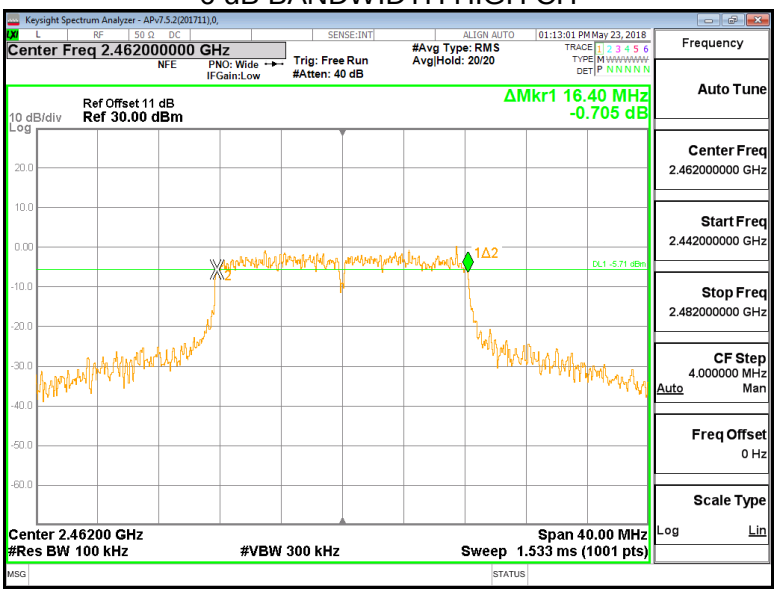
6 dB BANDWIDTH LOW CH



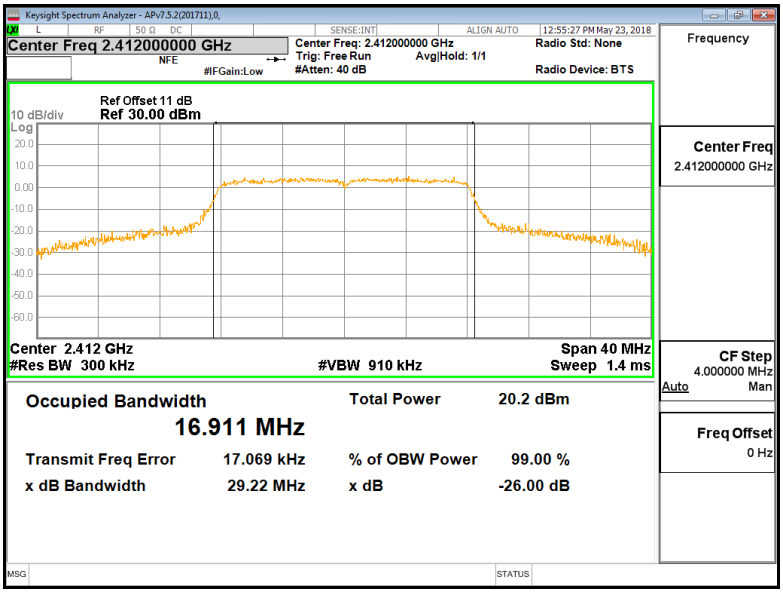
6 dB BANDWIDTH MID CH



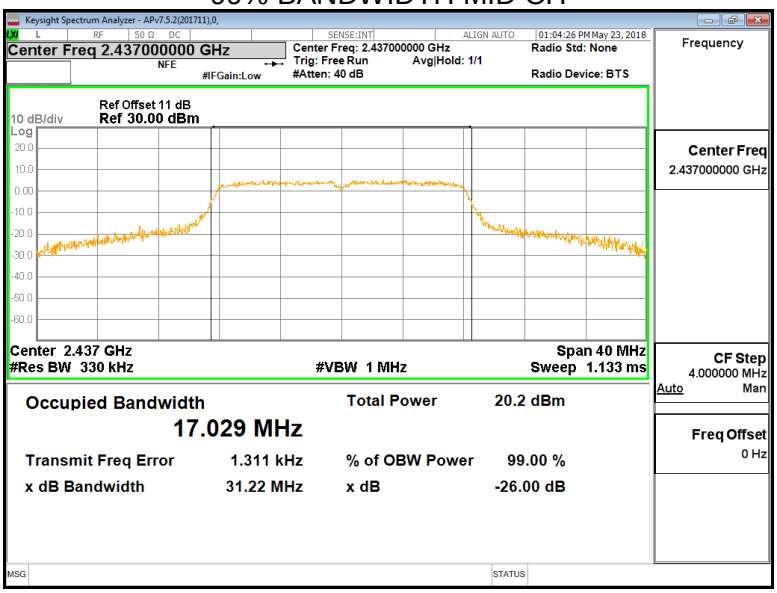
6 dB BANDWIDTH HIGH CH



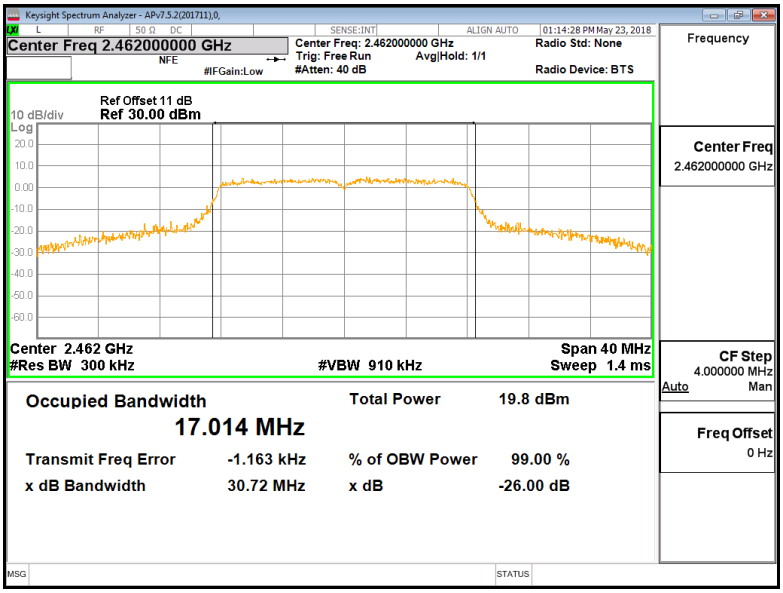
99% BANDWIDTH LOW CH



99% BANDWIDTH MID CH



99% BANDWIDTH HIGH CH

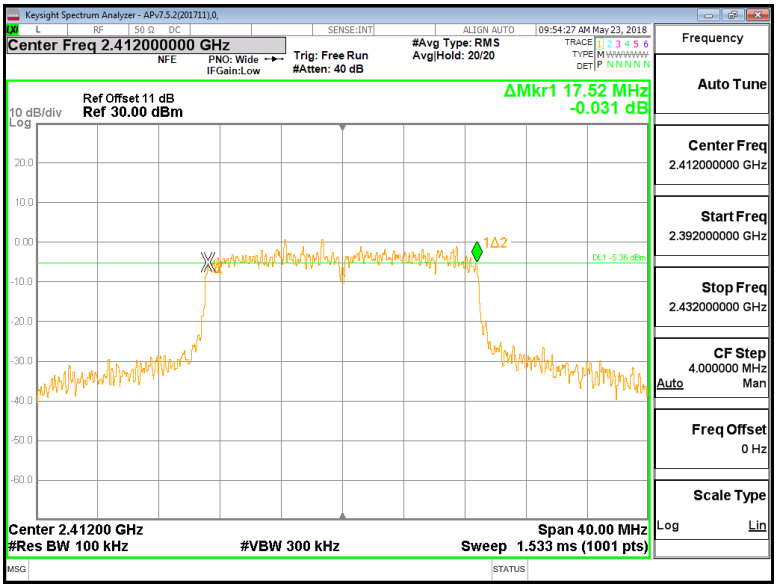


7.2.3. 802.11n20 MODE

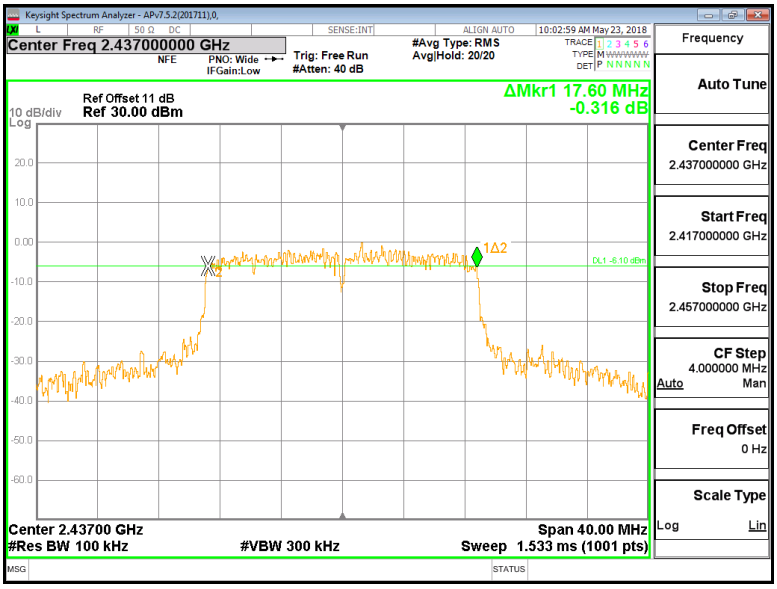
ANTENNA1

Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit For 6dB (kHz)	Result
2412	17.52	17.789	500	Pass
2437	17.60	17.770	500	Pass
2462	17.44	17.774	500	Pass

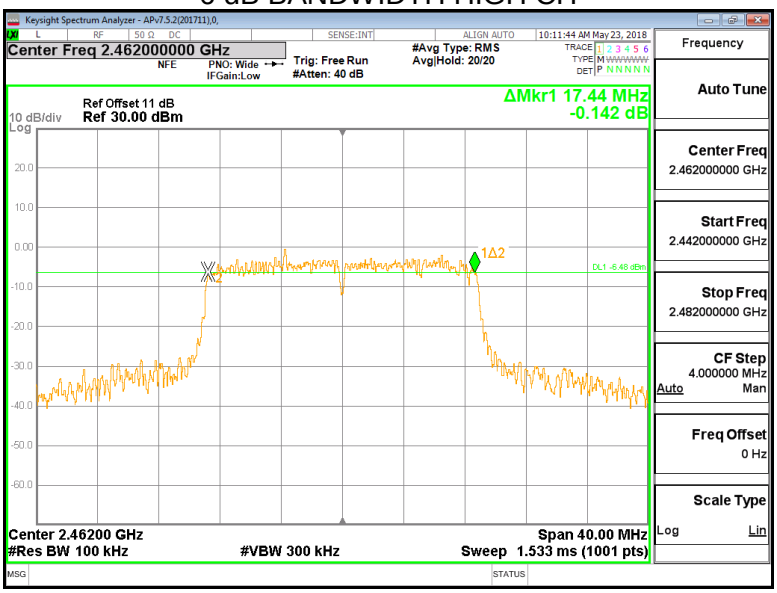
6 dB BANDWIDTH LOW CH



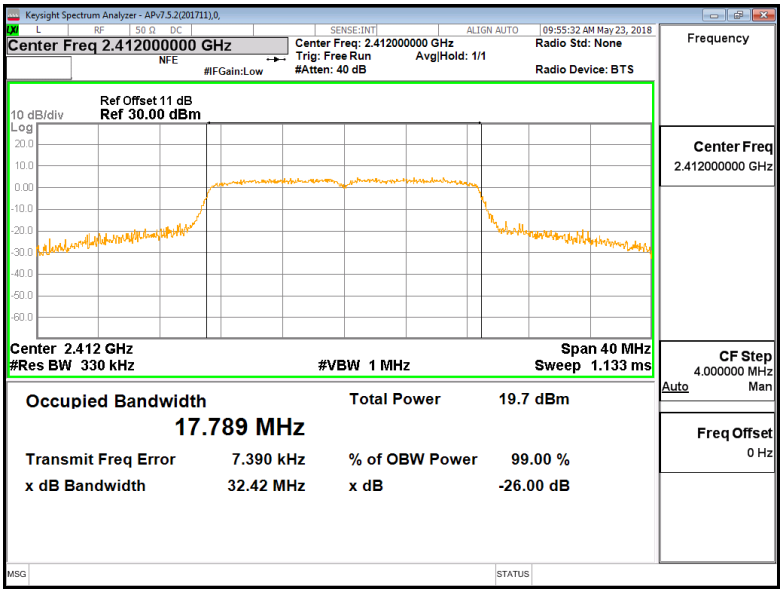
6 dB BANDWIDTH MID CH



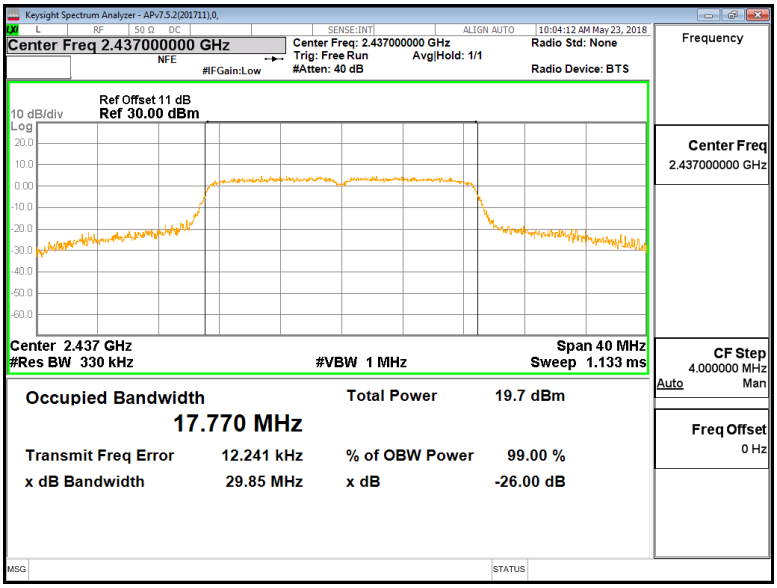
6 dB BANDWIDTH HIGH CH



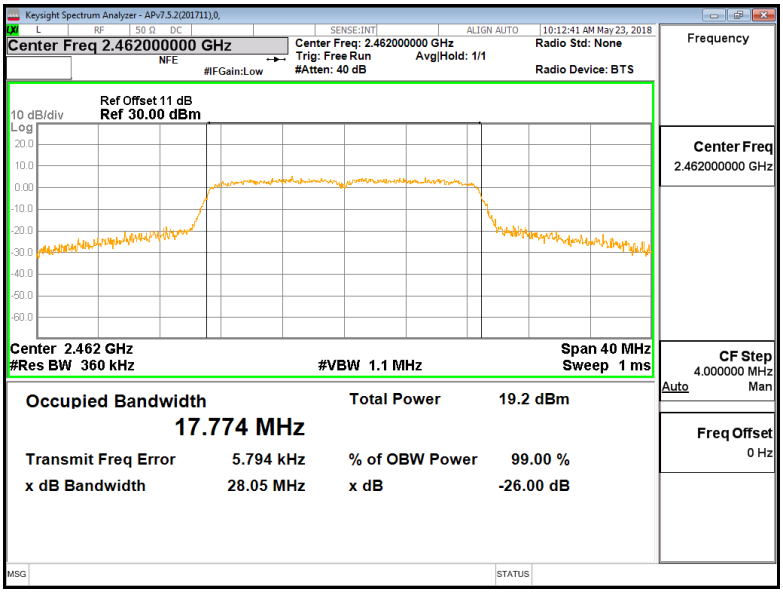
99% BANDWIDTH LOW CH



99% BANDWIDTH MID CH



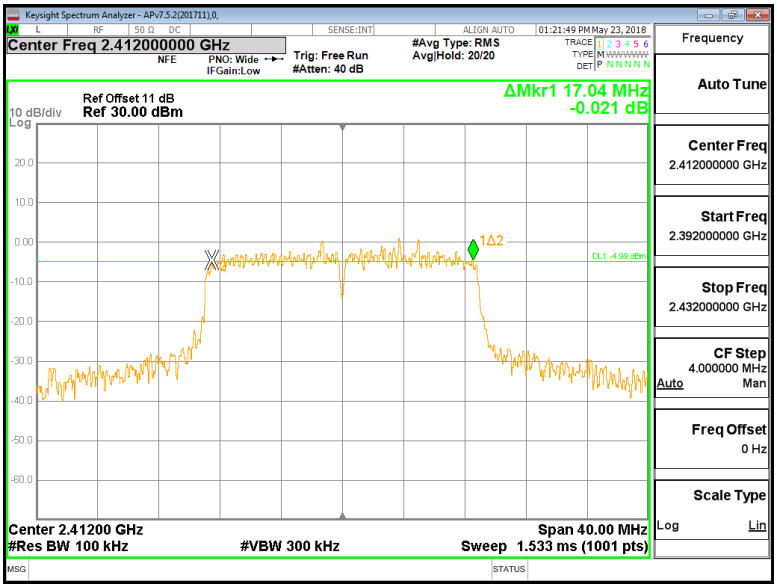
99% BANDWIDTH HIGH CH



ANTENNA2

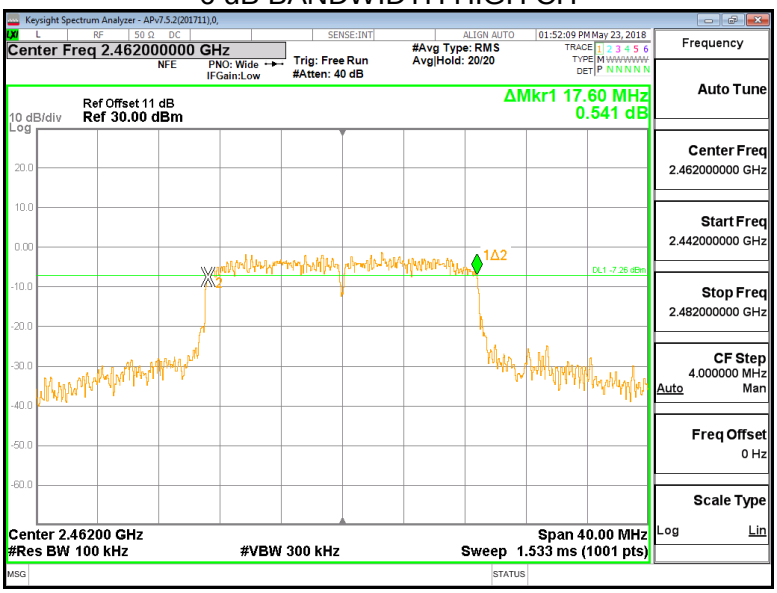
Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit For 6dB (kHz)	Result
2412	17.04	17.810	500	Pass
2437	17.16	17.839	500	Pass
2462	17.60	17.878	500	Pass

6 dB BANDWIDTH LOW CH

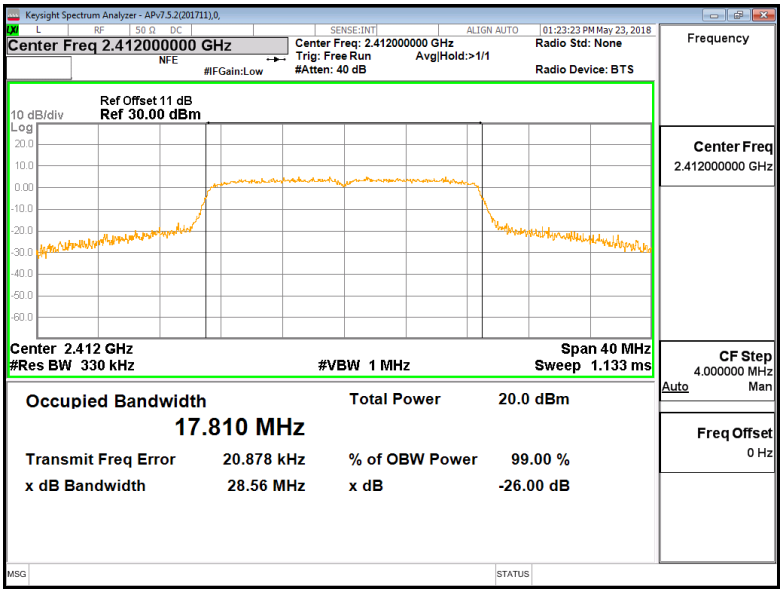


6 dB BANDWIDTH MID CH

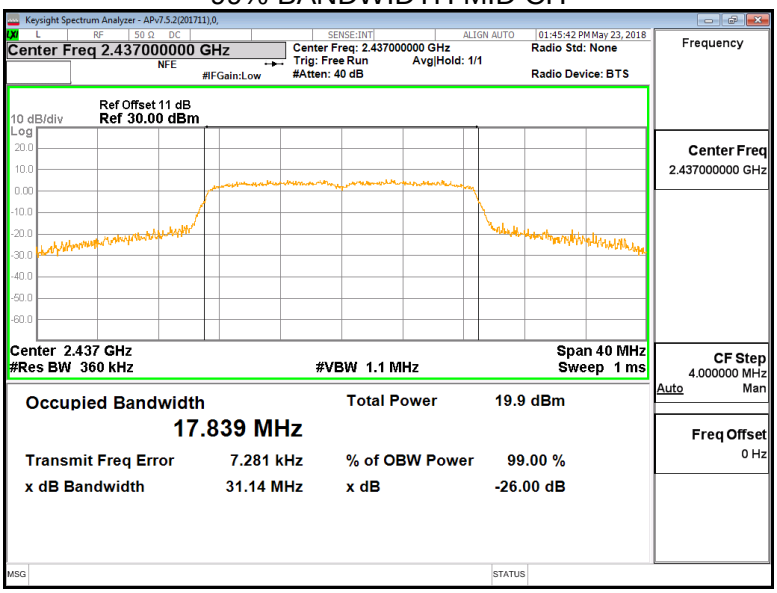
6 dB BANDWIDTH HIGH CH



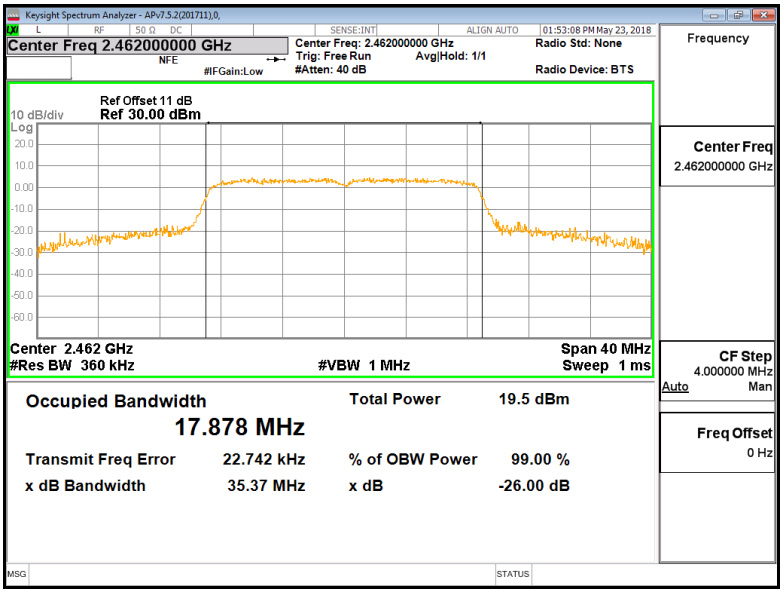
99% BANDWIDTH LOW CH



99% BANDWIDTH MID CH



99% BANDWIDTH HIGH CH

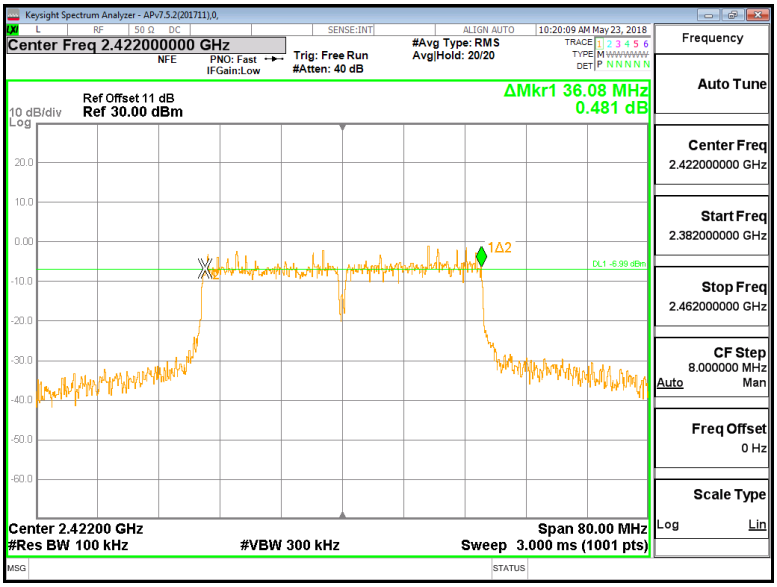


7.2.4. 802.11n40 MODE

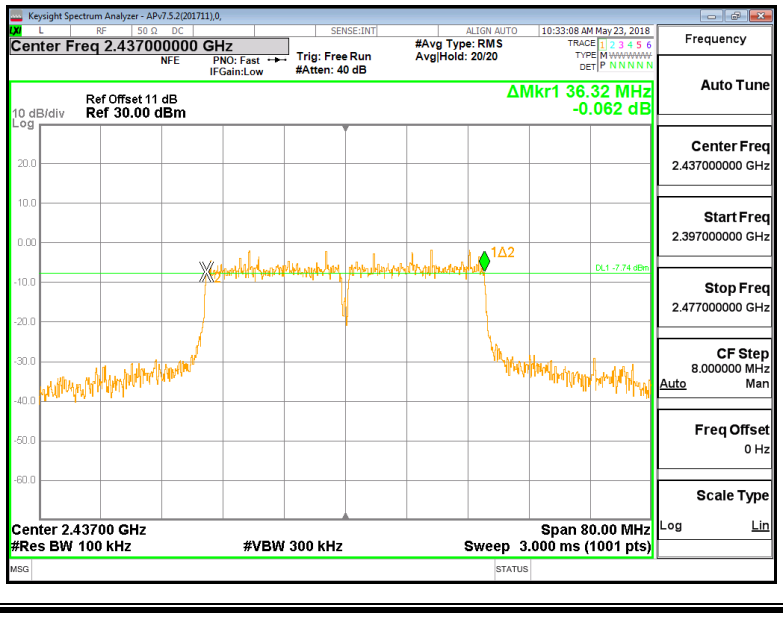
ANTENNA1

Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit For 6dB (kHz)	Result
2422	36.08	36.886	500	Pass
2437	36.32	36.881	500	Pass
2452	36.32	36.291	500	Pass

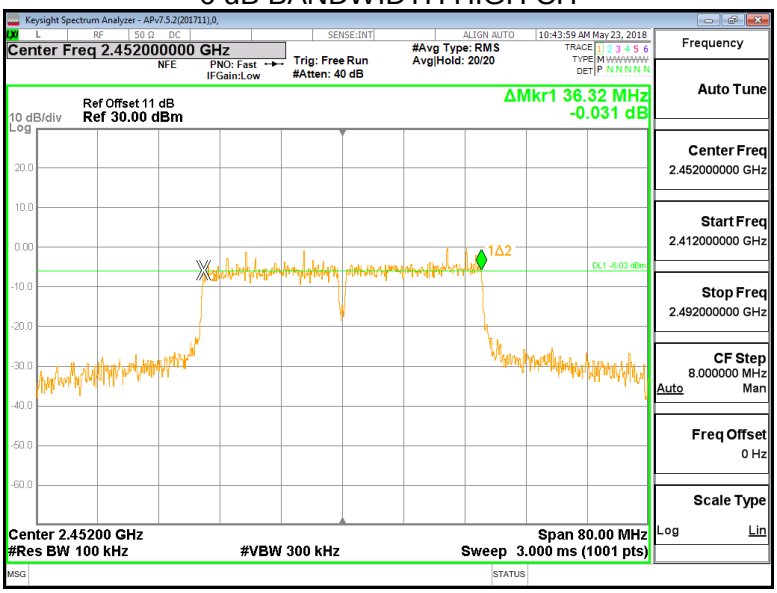
6 dB BANDWIDTH LOW CH



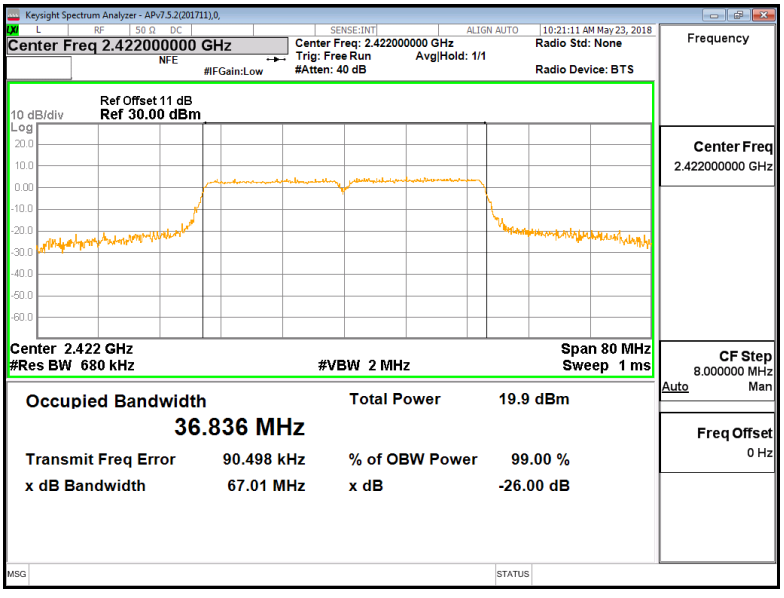
6 dB BANDWIDTH MID CH



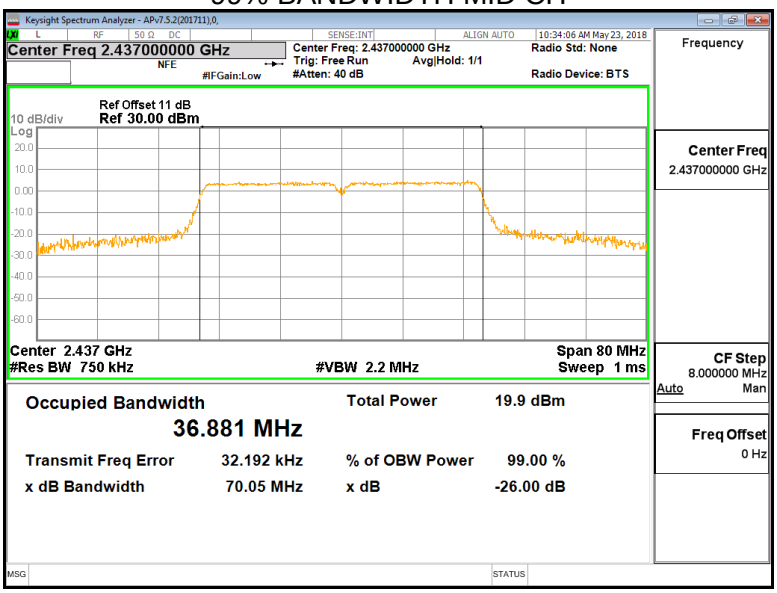
6 dB BANDWIDTH HIGH CH



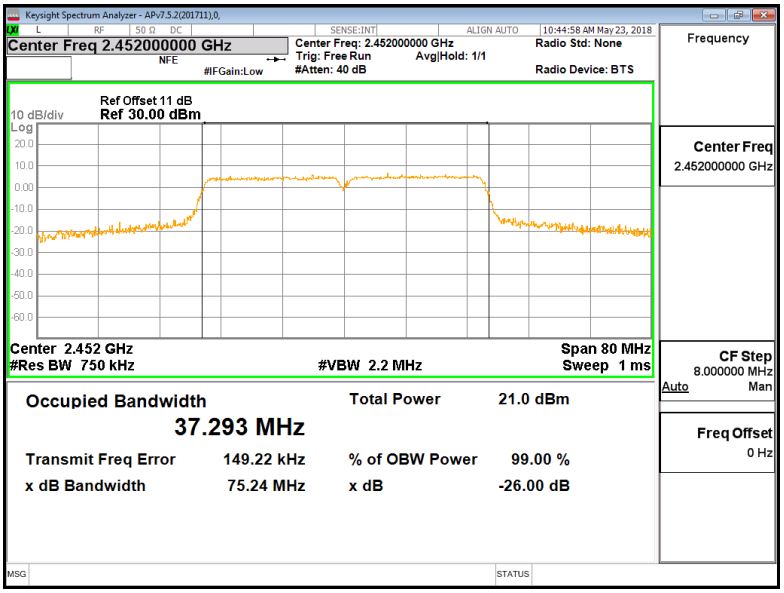
99% BANDWIDTH LOW CH



99% BANDWIDTH MID CH



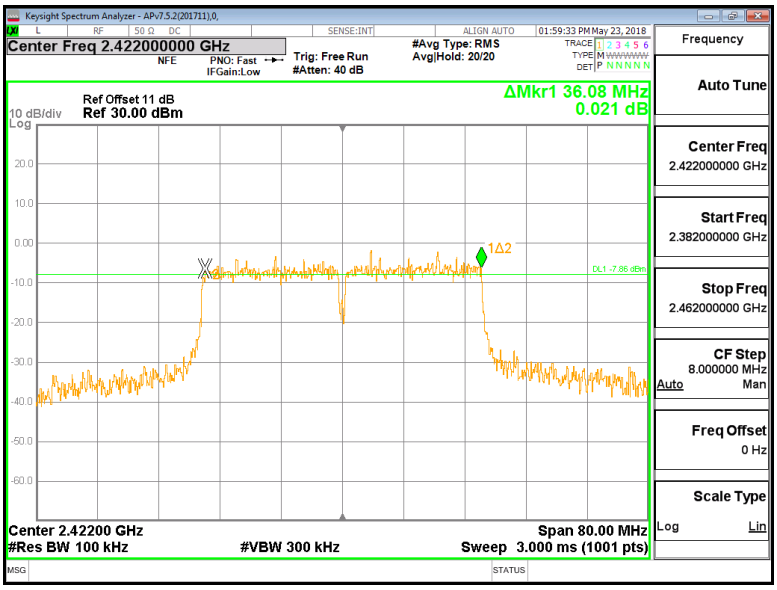
99% BANDWIDTH HIGH CH



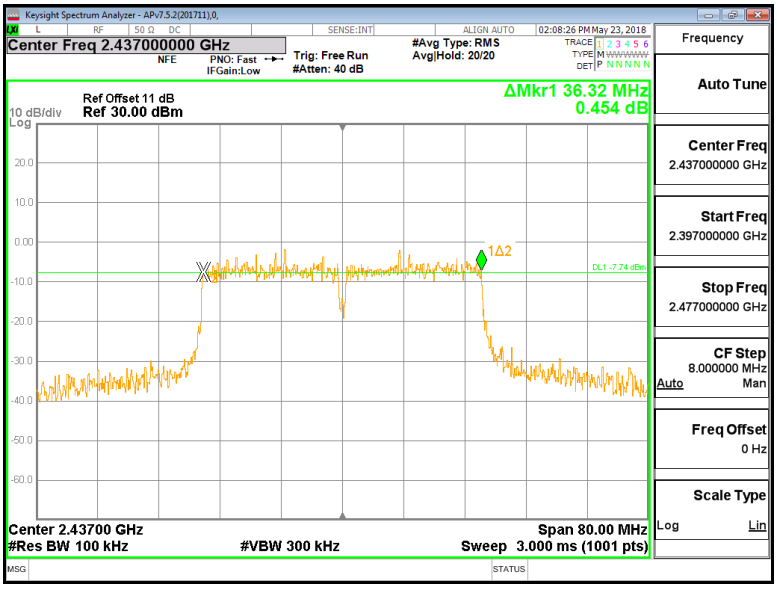
ANTENNA2

Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit For 6dB (kHz)	Result
2422	36.08	36.750	500	Pass
2437	36.32	36.821	500	Pass
2452	36.32	36.448	500	Pass

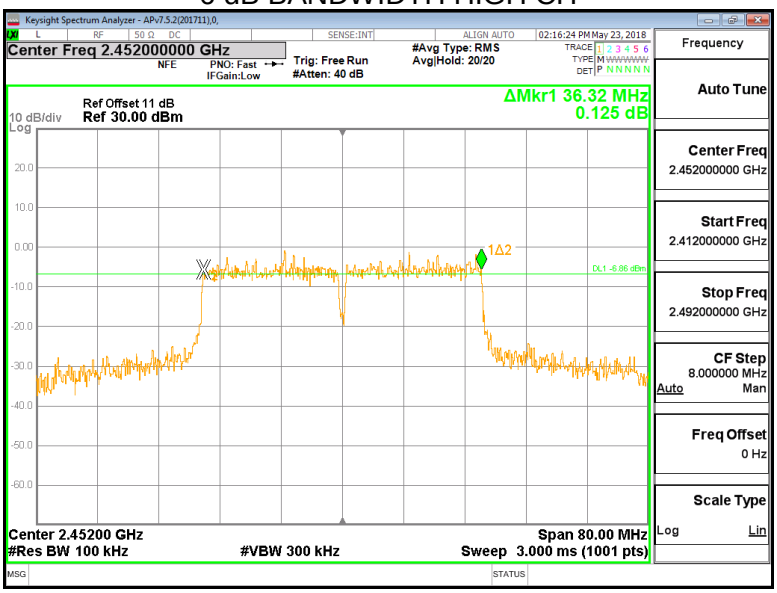
6 dB BANDWIDTH LOW CH



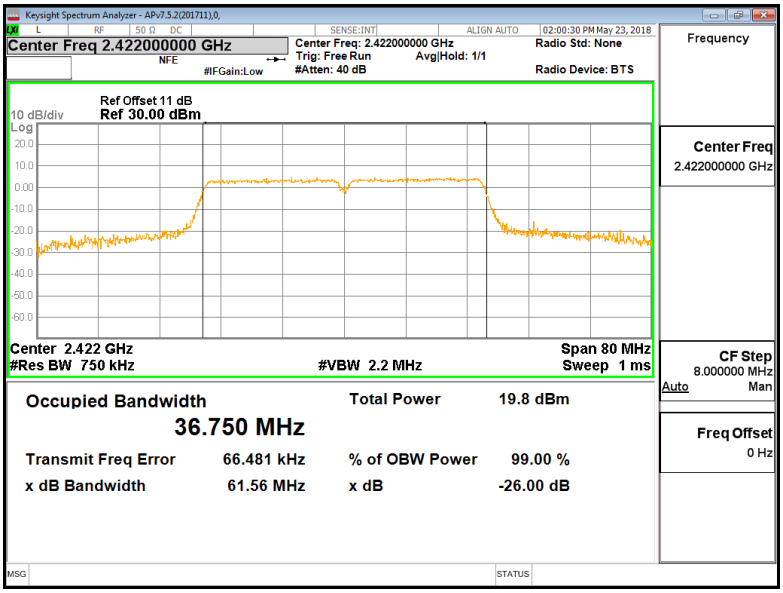
6 dB BANDWIDTH MID CH



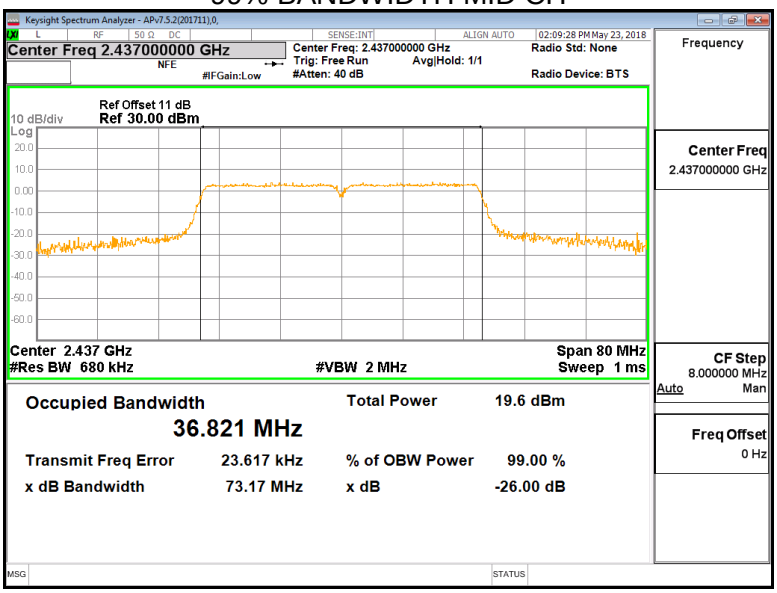
6 dB BANDWIDTH HIGH CH



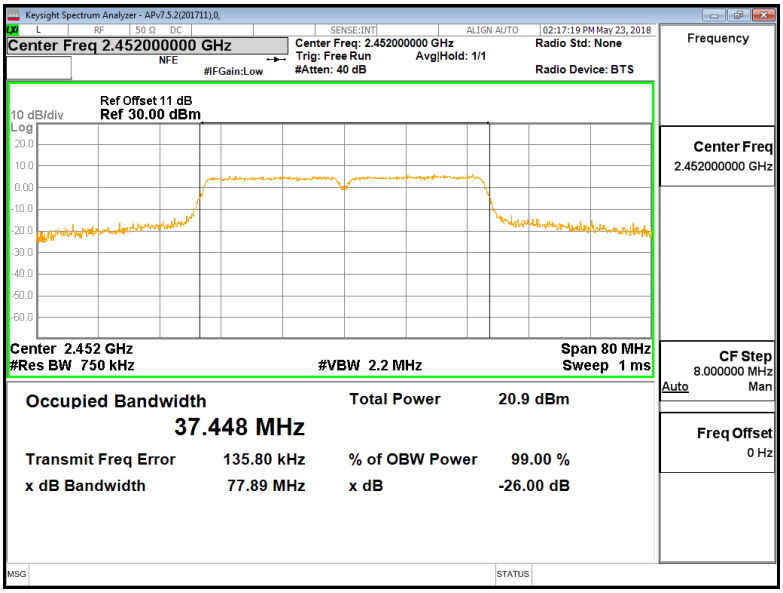
99% BANDWIDTH LOW CH



99% BANDWIDTH MID CH



99% BANDWIDTH HIGH CH



7.3. PEAK CONDUCTED OUTPUT POWER

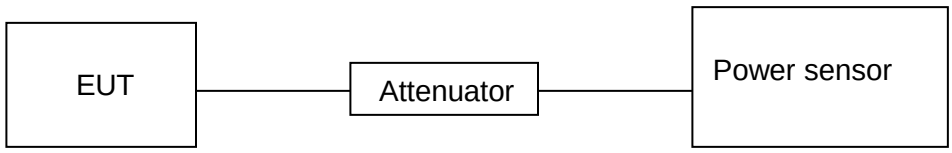
LIMITS

FCC Part15 (15.247) Subpart C RSS-247 ISSUE 2			
Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.247(b)(3) RSS-247 5.4 (e)	Peak Output Power	1 watt or 30dBm	2400-2483.5

TEST PROCEDURE

Place the EUT on the table and set it in the transmitting mode.
Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Power sensor.
Measure peak power each channel.

TEST SETUP



RESULTS

7.3.1. 802.11b MODE

Mode	Frequency (MHz)	ANT	Maximum PK Conducted Output Power (dBm)		Result
			Single	Total	
802.11b	2412	1	15.67	N/A	PASS
		2	15.69		
	2437	1	15.83		
		2	15.83		
	2462	1	15.49		
		2	15.54		

Mode	Frequency (MHz)	ANT	Maximum AV Conducted Output Power (dBm)		Result
			Single	Total	
802.11b	2412	1	12.65	N/A	PASS
		2	12.64		
	2437	1	12.77		
		2	12.79		
	2462	1	12.43		
		2	12.48		

7.3.2. 802.11g MODE

Mode	Frequency (MHz)	ANT	Maximum PK Conducted Output Power (dBm)		Result
			Single	Total	
802.11g	2412	1	19.26	N/A	PASS
		2	19.30		
	2437	1	19.15		
		2	19.64		
	2462	1	18.66		
		2	18.67		

Mode	Frequency (MHz)	ANT	Maximum AV Conducted Output Power (dBm)		Result
			Single	Total	
802.11g	2412	1	10.97	N/A	PASS
		2	11.01		
	2437	1	10.81		
		2	11.28		
	2462	1	10.11		
		2	10.36		

7.3.1. 802.11n HT20 MODE

Mode	Frequency (MHz)	ANT	Maximum PK Conducted Output Power (dBm)		Result
			Single	Total	
802.11n20	2412	1	18.22	NA	PASS
		2	18.17		
	2437	1	18.81		
		2	18.92		
	2462	1	18.32		
		2	18.05		

Mode	Frequency (MHz)	ANT	Maximum AV Conducted Output Power (dBm)		Result
			Single	Total	
802.11n20	2412	1	9.91	NA	PASS
		2	9.96		
	2437	1	10.52		
		2	10.61		
	2462	1	10.06		
		2	9.82		

7.3.1. 802.11n HT40 MODE

Mode	Frequency (MHz)	ANT	Maximum PK Conducted Output Power (dBm)		Result
			Single	Total	
802.11n40	2422	1	17.97	NA	PASS
		2	18.01		
	2437	1	17.81		
		2	17.98		
	2452	1	17.34		
		2	17.16		

Mode	Frequency (MHz)	ANT	Maximum AV Conducted Output Power (dBm)		Result
			Single	Total	
802.11n40	2422	1	9.46	NA	PASS
		2	9.51		
	2437	1	9.30		
		2	9.44		
	2452	1	8.88		
		2	8.72		

7.4. POWER SPECTRAL DENSITY

LIMITS

FCC Part15 (15.247) Subpart C RSS-247 ISSUE 2			
Section	Test Item	Limit	Frequency Range (MHz)
FCC §15.247 (e) RSS-247 5.2 (b)	Power Spectral Density	8 dBm in any 3 kHz band	2400-2483.5

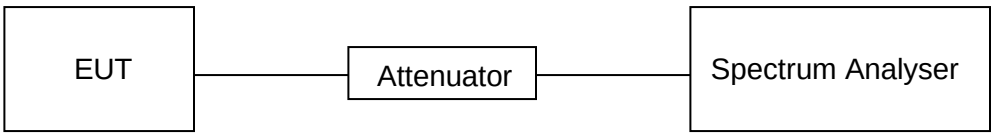
TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	3 kHz ≤ RBW ≤ 100 kHz.
VBW	≥3 × RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

Allow trace to fully stabilize and use the peak marker function to determine the maximum amplitude level within the RBW.
If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

TEST SETUP



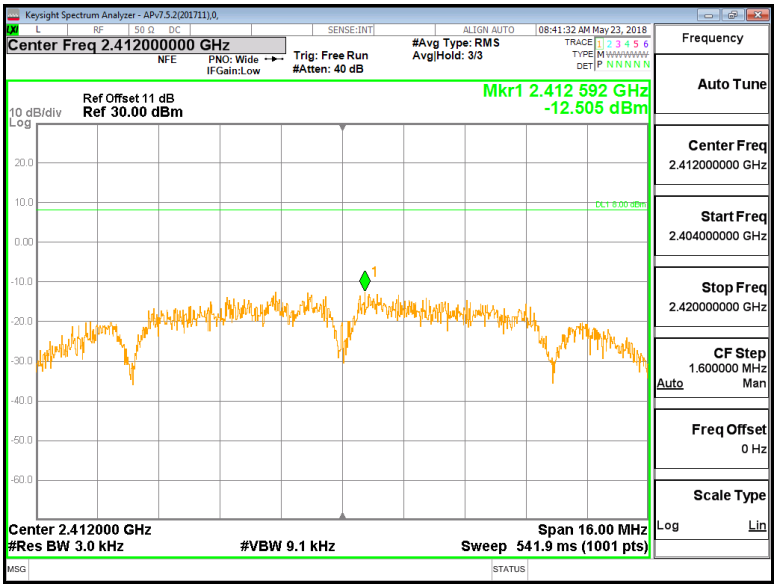
RESULTS

7.4.1. 802.11b MODE

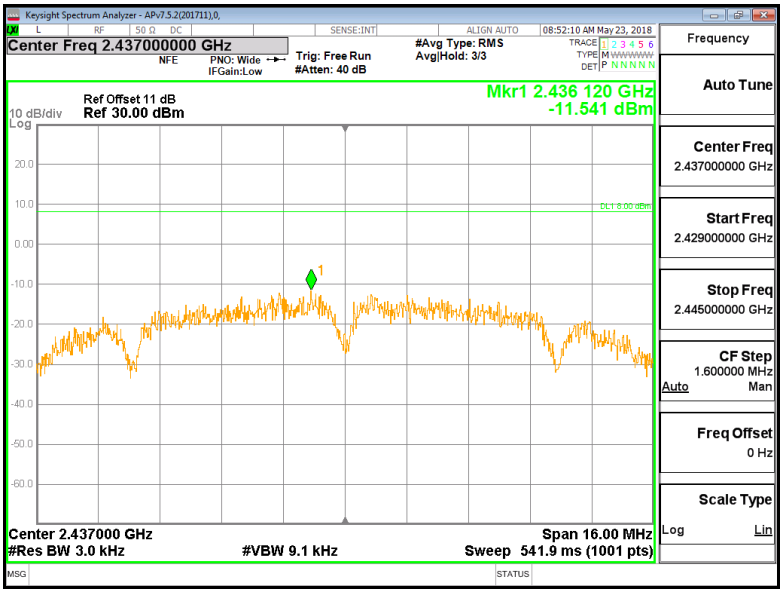
Frequency (MHz)	ANT	Power Spectral Density (dBm/3kHz)		Limit (dBm/3kHz)
		Single	Total	
2412	1	-12.505	N/A	8
	2	-11.804		
2437	1	-11.541		
	2	-11.917		
2462	1	-13.200		
	2	-11.732		

ANTENNA1

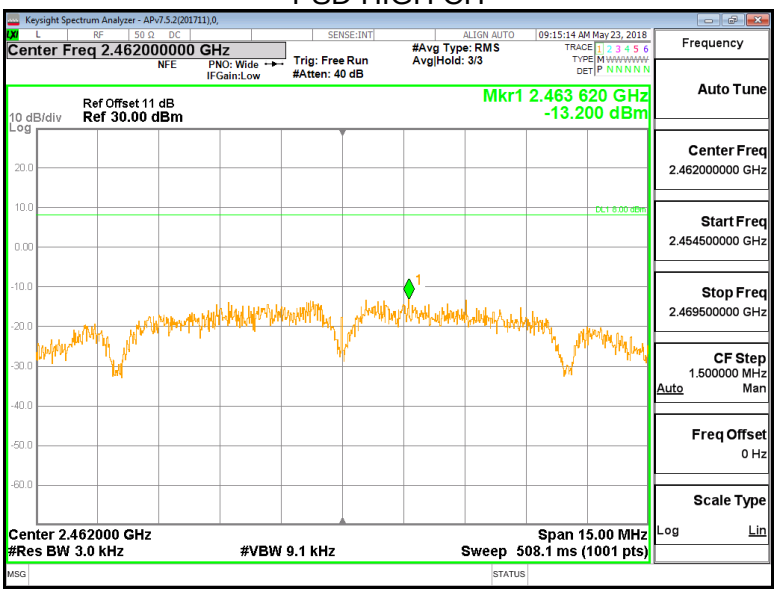
PSD LOW CH



PSD MID CH

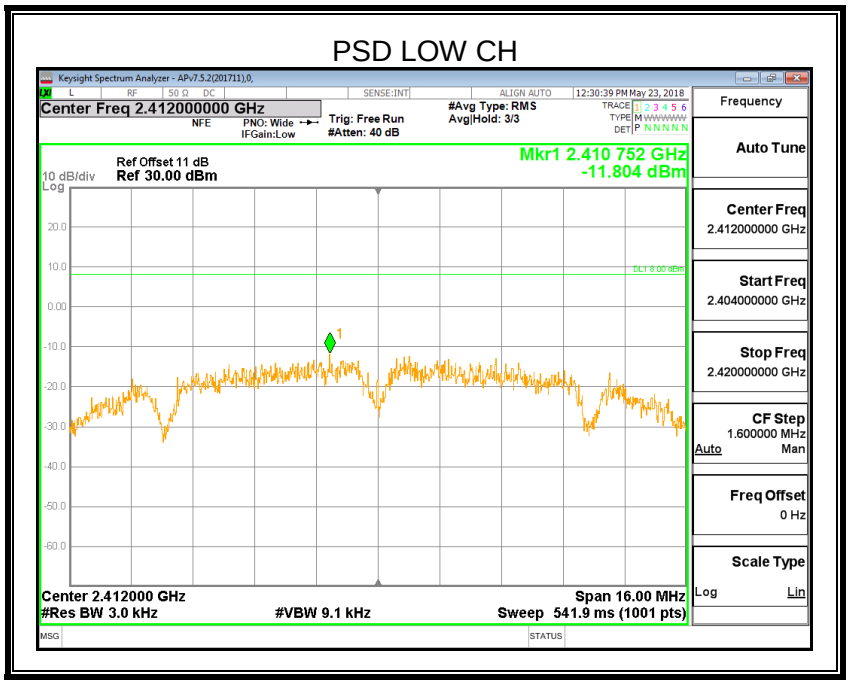


PSD HIGH CH

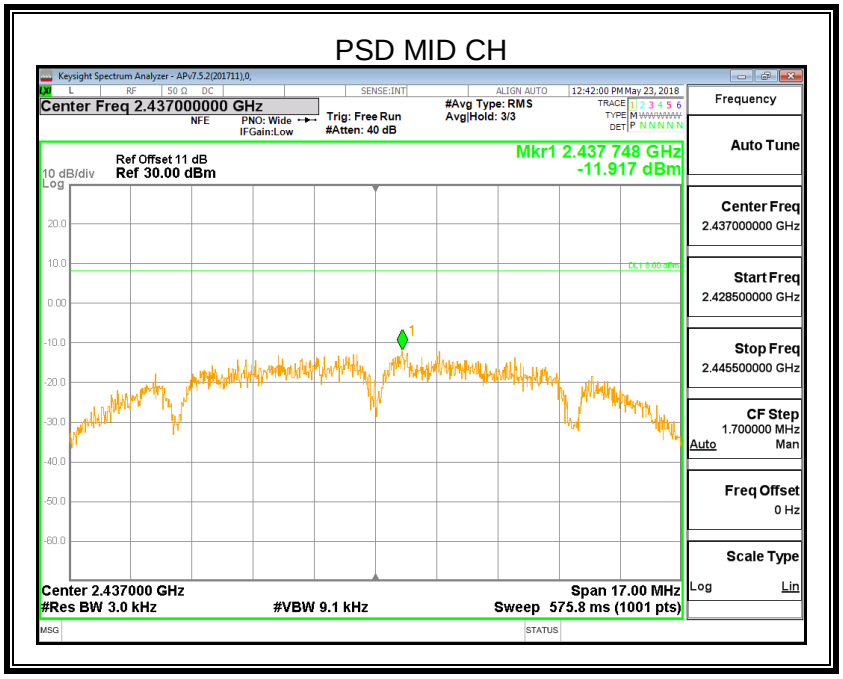


ANTENNA2

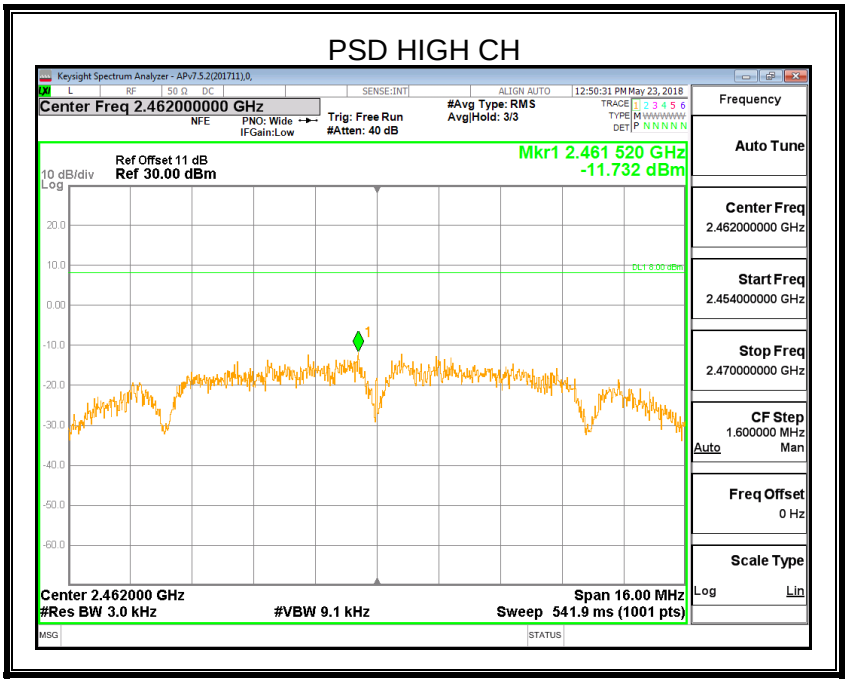
PSD LOW CH



PSD MID CH



PSD HIGH CH

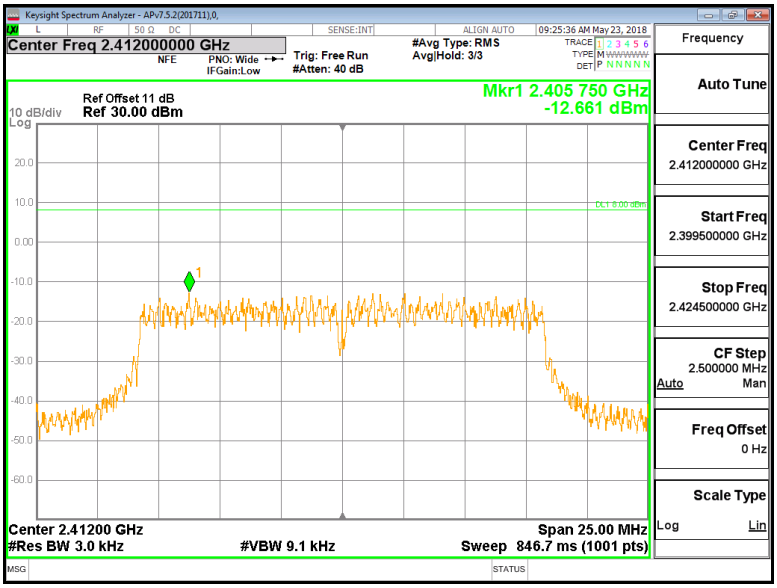


7.4.2. 802.11g MODE

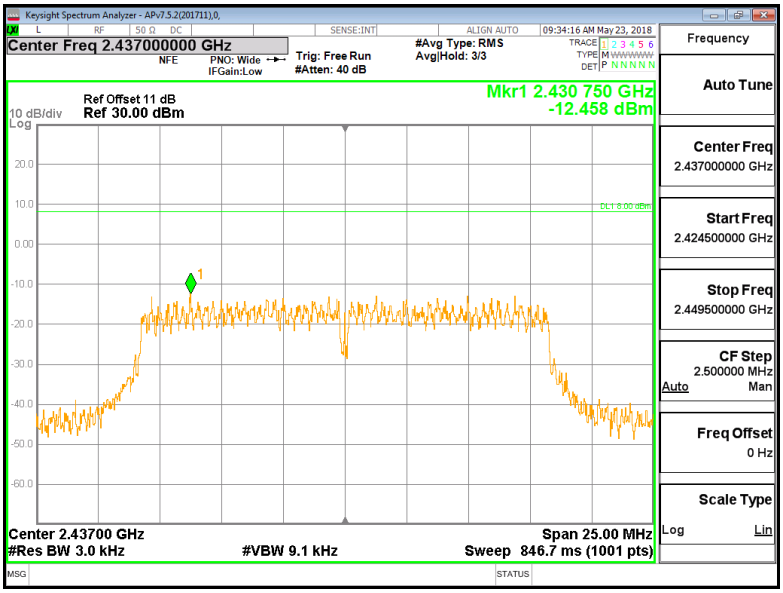
Frequency (MHz)	ANT	Power Spectral Density (dBm/3kHz)		Limit (dBm/3kHz)
		Single	Total	
2412	1	-12.661	N/A	8
	2	-12.954		
2437	1	-12.458		
	2	-12.293		
2462	1	-13.634		
	2	-12.803		

ANTENNA1

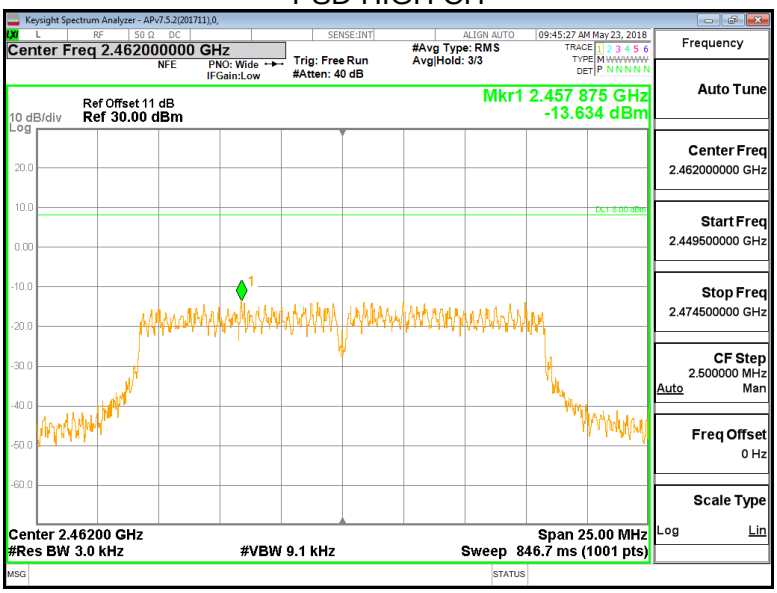
PSD LOW CH



PSD MID CH

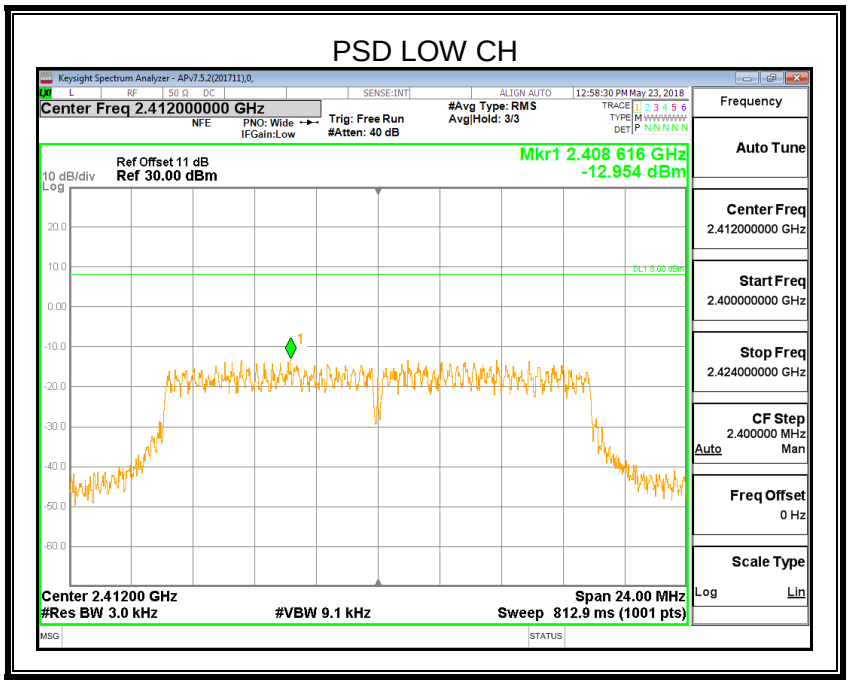


PSD HIGH CH

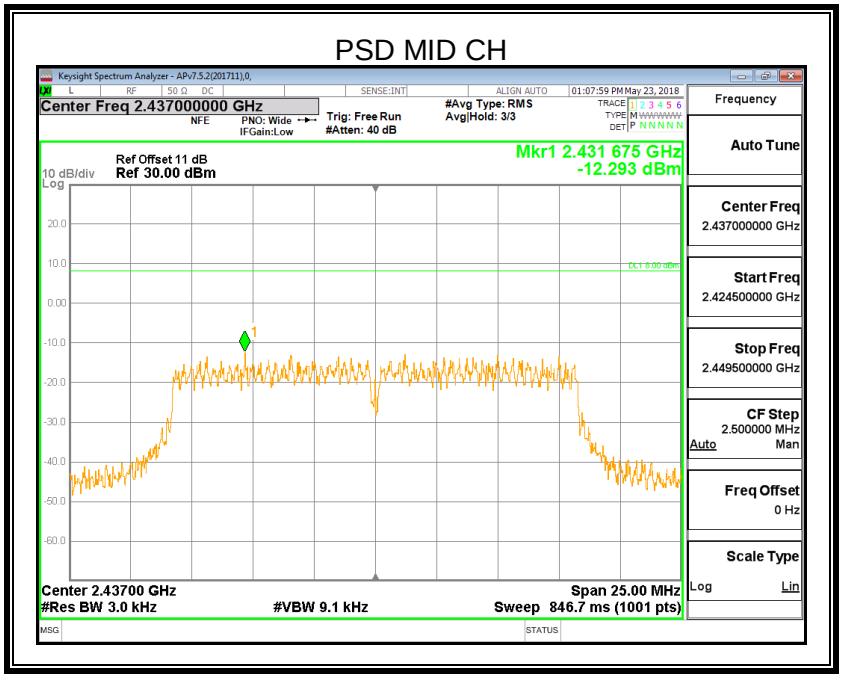


ANTENNA2

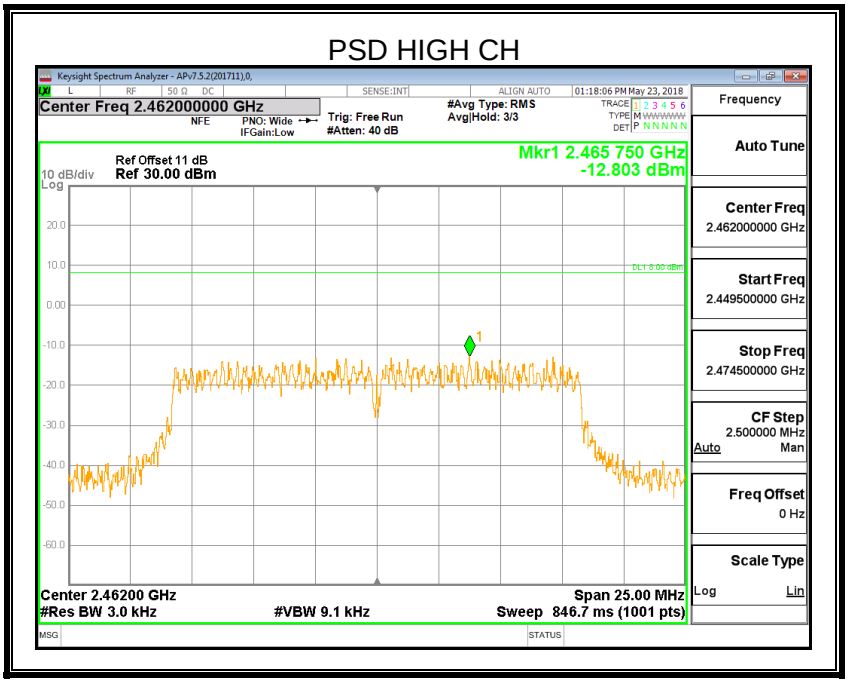
PSD LOW CH



PSD MID CH



PSD HIGH CH

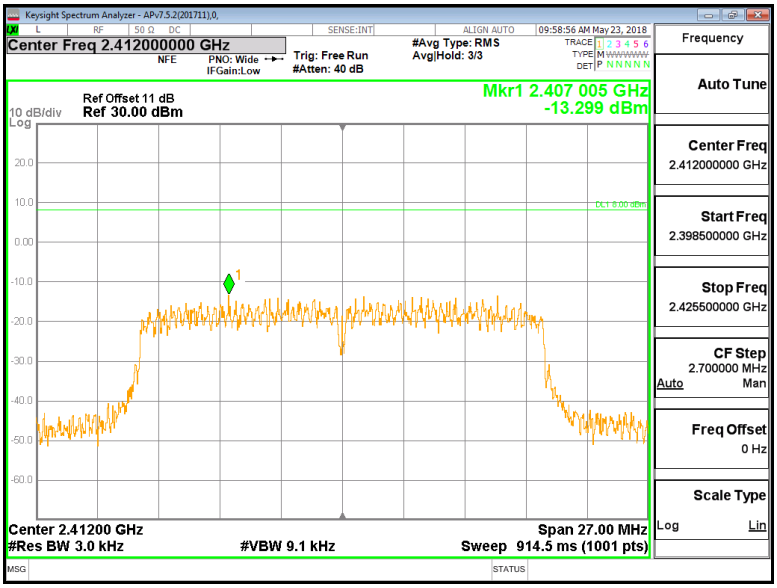


7.4.3. 802.11n20 MODE

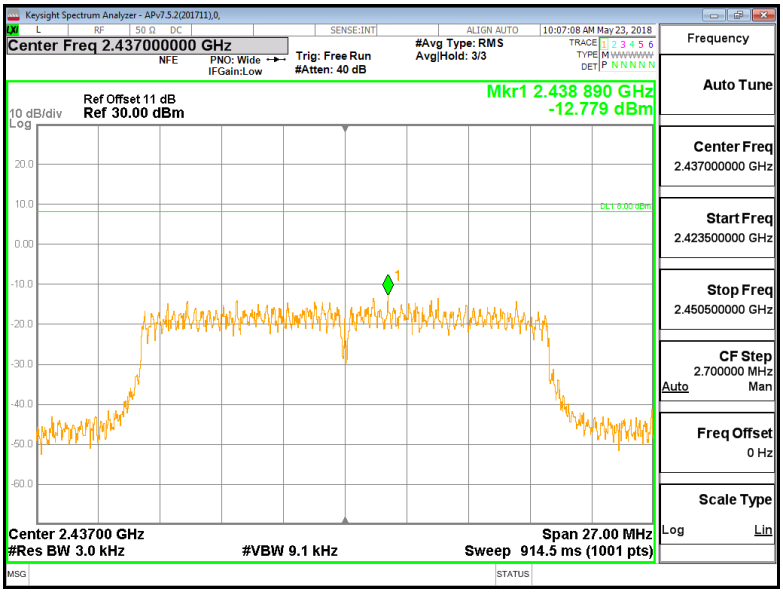
Frequency (MHz)	ANT	Power Spectral Density (dBm/3kHz)		Limit (dBm/3kHz)
		Single	Total	
2412	1	-13.299	NA	8
	2	-11.281		
2437	1	-12.779		
	2	-13.428		
2462	1	-13.488		
	2	-13.285		

ANTENNA1

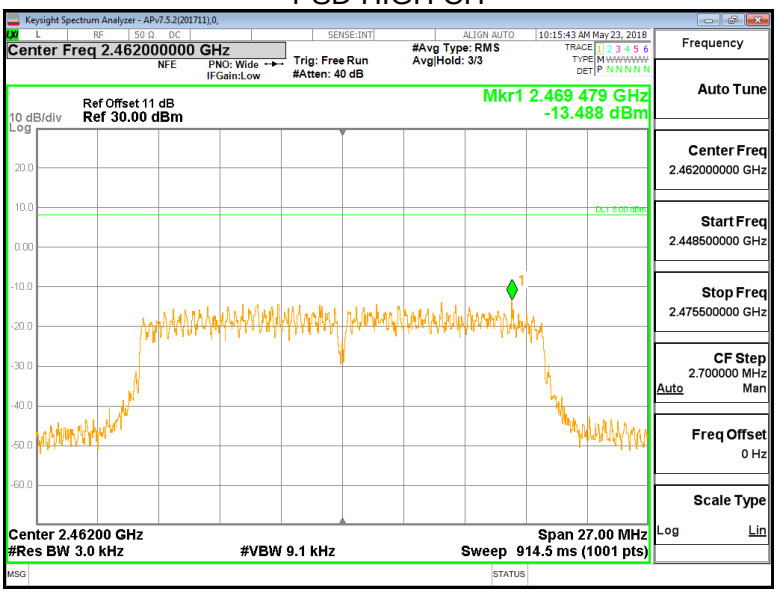
PSD LOW CH



PSD MID CH

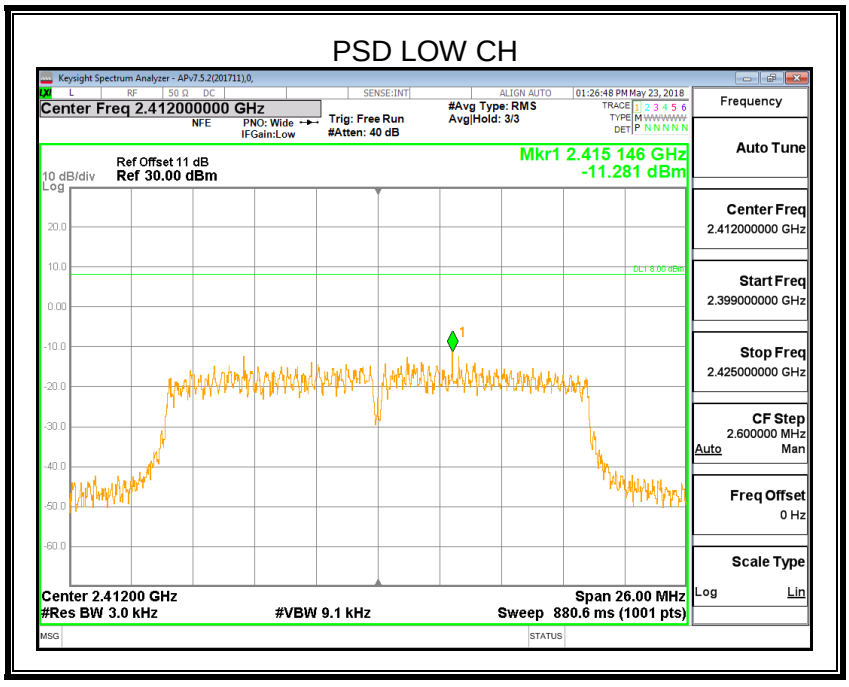


PSD HIGH CH

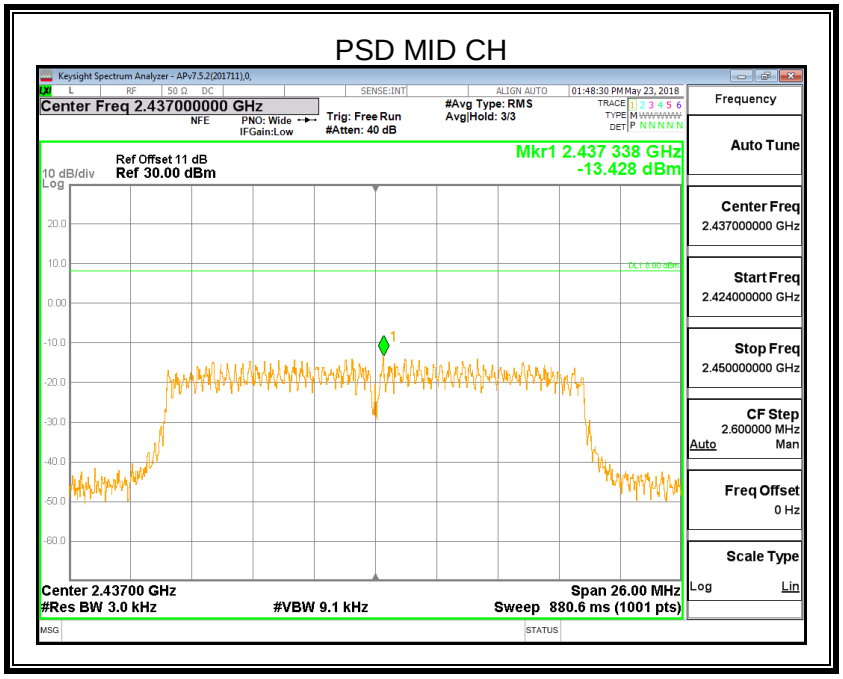


ANTENNA2

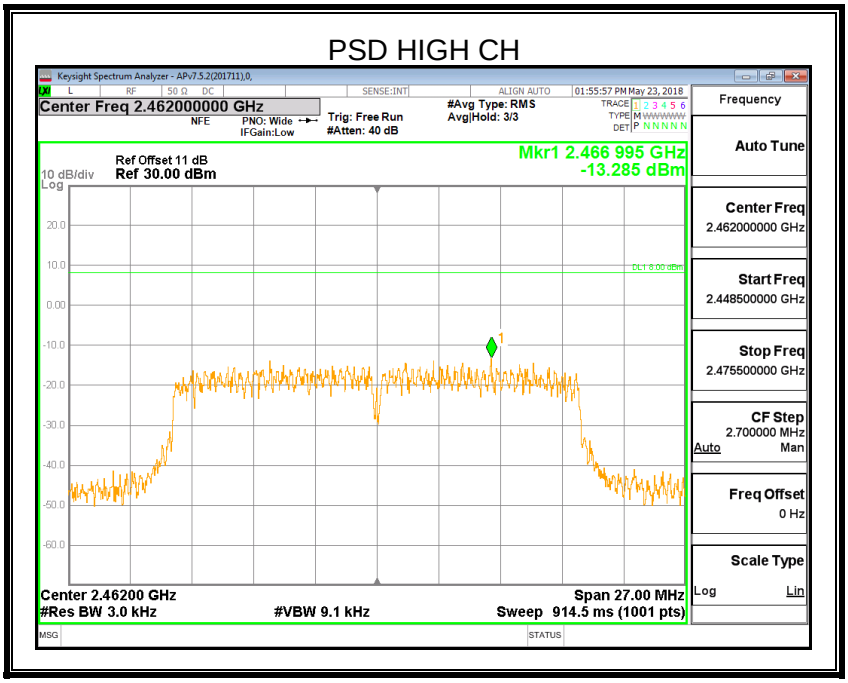
PSD LOW CH



PSD MID CH



PSD HIGH CH

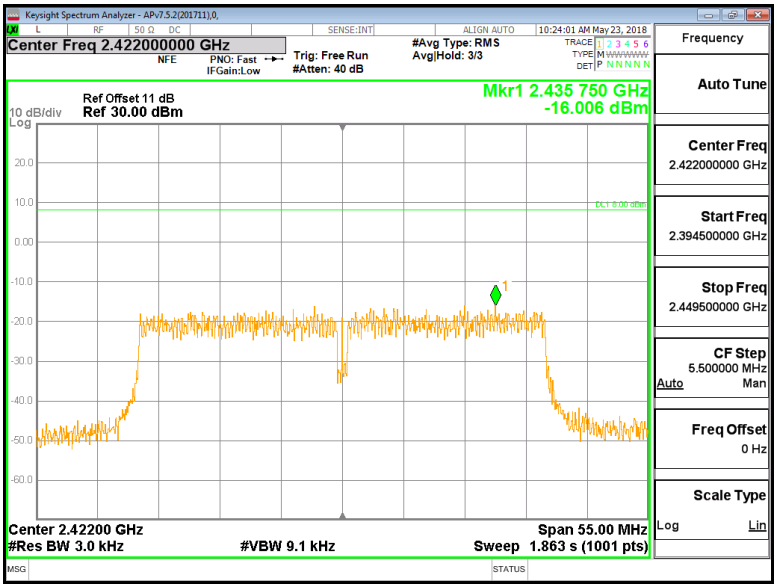


7.4.4. 802.11n40 MODE

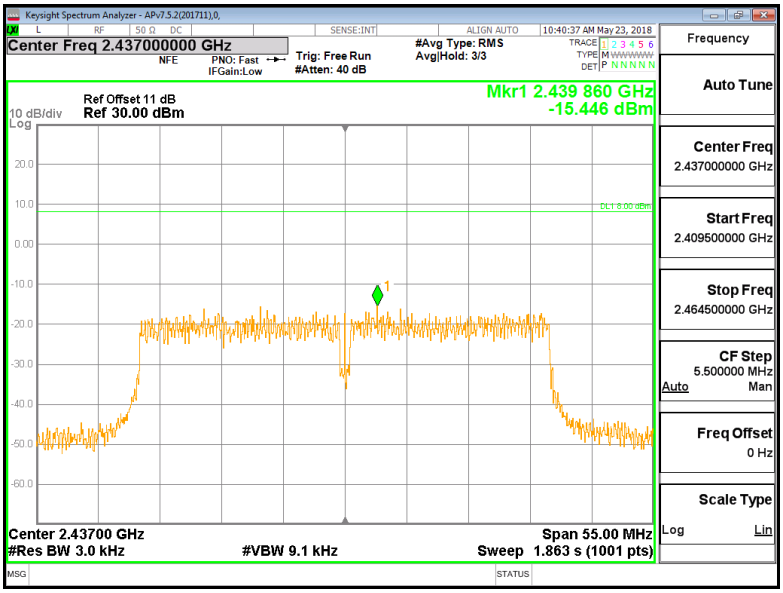
Frequency (MHz)	ANT	Power Spectral Density (dBm/3kHz)		Limit (dBm/3kHz)
		Single	Total	
2422	1	-16.006	NA	8
	2	-15.491		
2437	1	-15.446		
	2	-15.287		
2452	1	-14.893		
	2	-15.453		

ANTENNA1

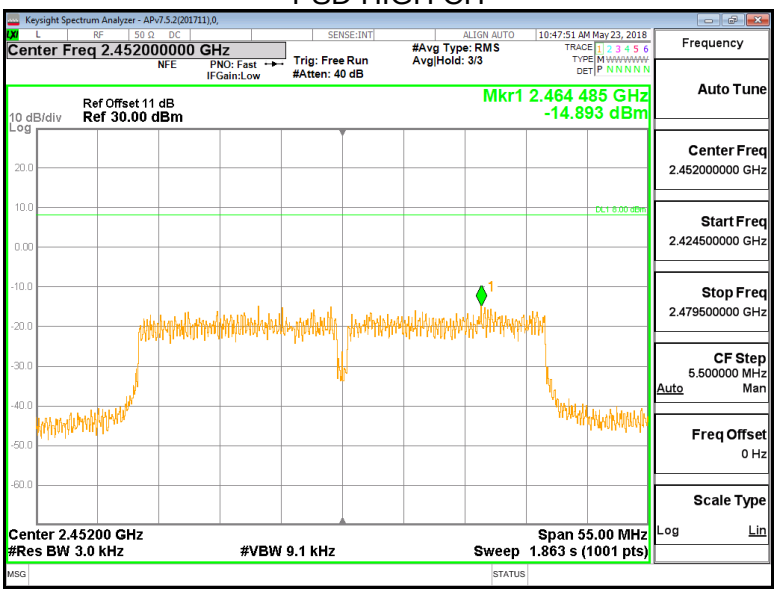
PSD LOW CH



PSD MID CH

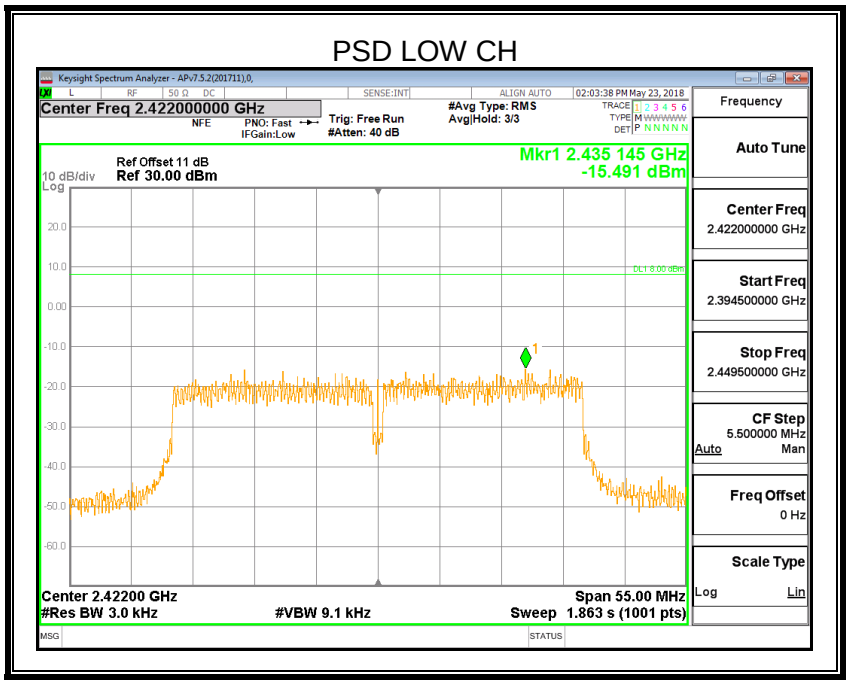


PSD HIGH CH

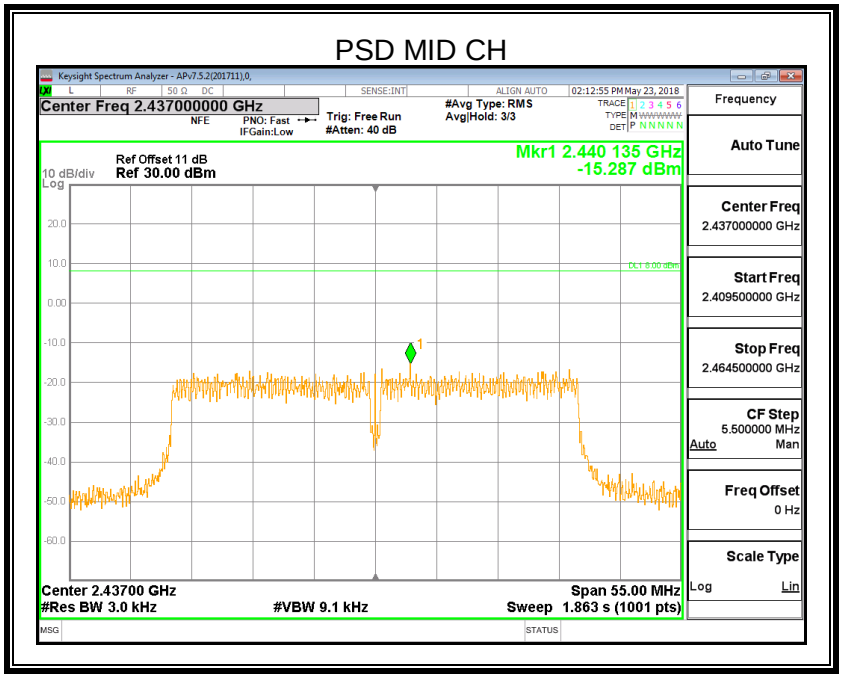


ANTENNA2

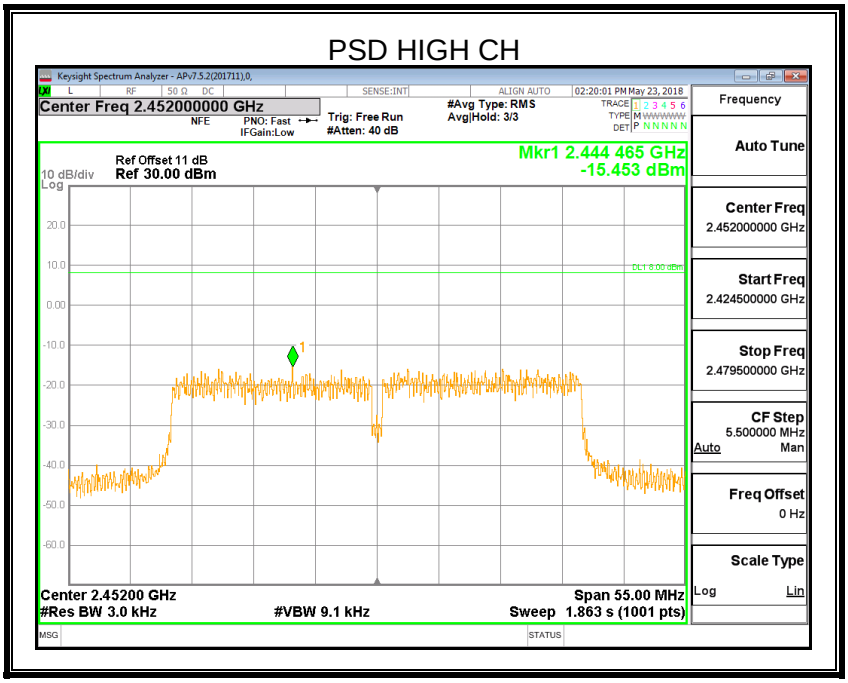
PSD LOW CH



PSD MID CH



PSD HIGH CH



7.5. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

LIMITS

FCC Part15 (15.247) Subpart C RSS-247 ISSUE 2		
Section	Test Item	Limit
FCC §15.247 (d) RSS-247 5.5	Conducted Bandedge and Spurious Emissions	at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

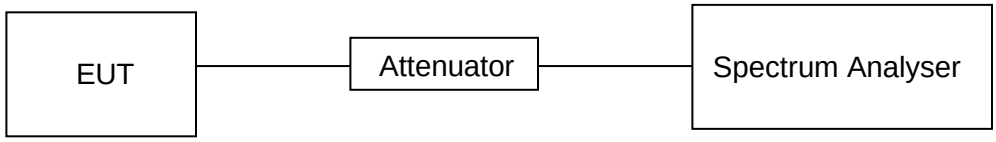
Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	100K
VBW	≥3 × RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

Use the peak marker function to determine the maximum PSD level.

Span	Set the center frequency and span to encompass frequency range to be measured
Detector	Peak
RBW	100K
VBW	≥3 × RBW
measurement points	≥span/RBW
Trace	Max hold
Sweep time	Auto couple.

Use the peak marker function to determine the maximum amplitude level**.**

TEST SETUP

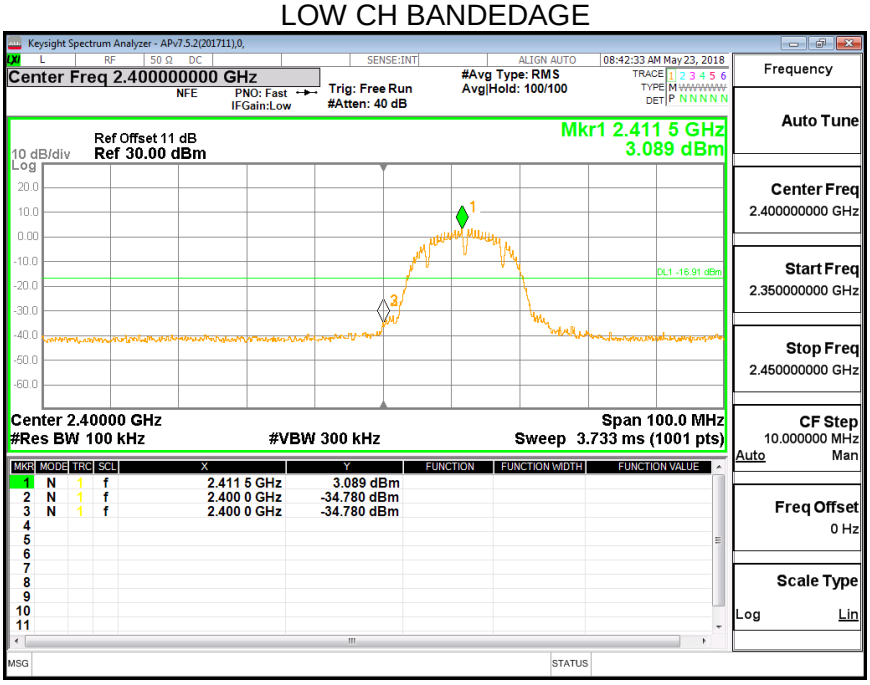


RESULTS

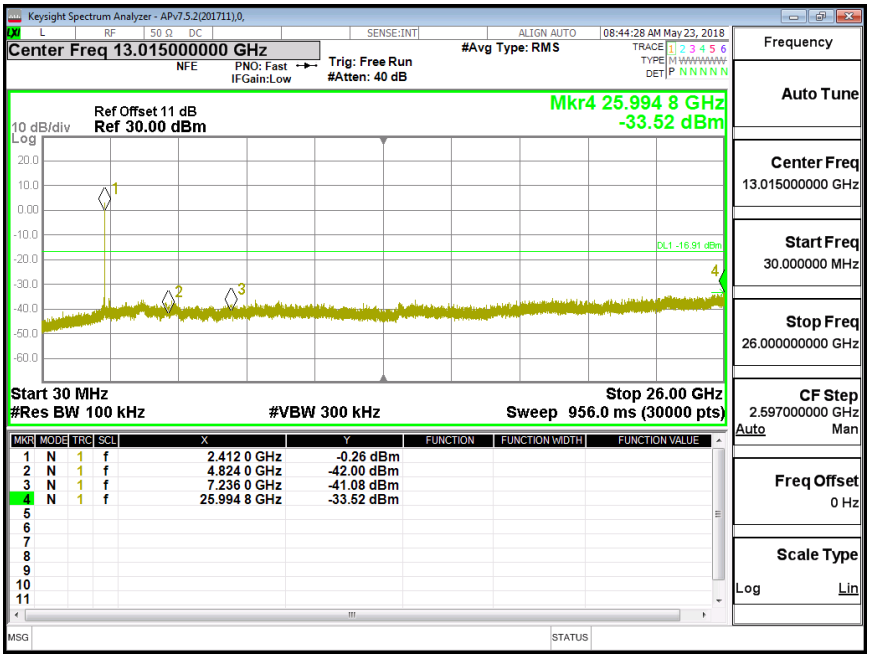
7.5.1. 802.11b MODE

ANTENNA1

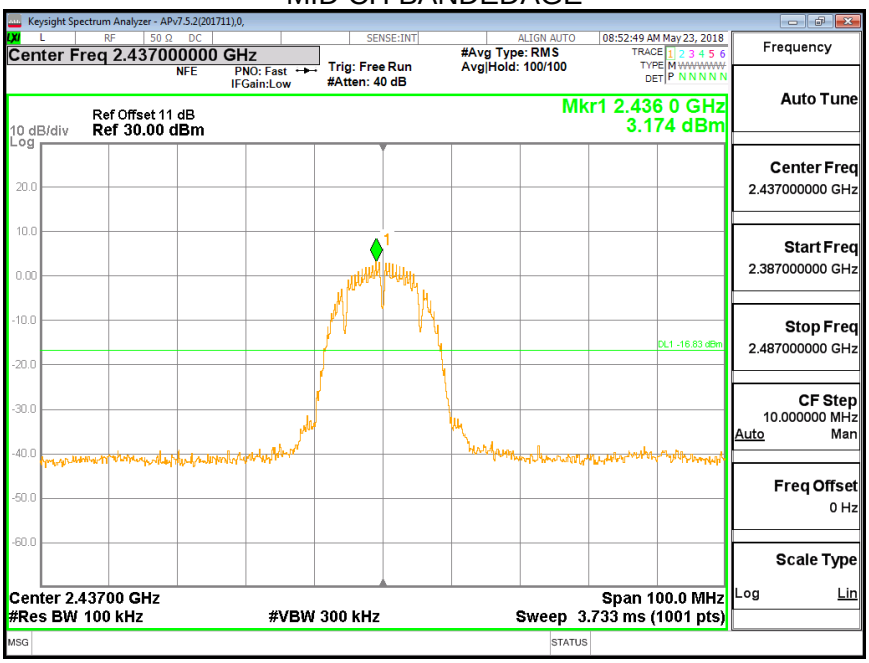
LOW CH BANDEDAGE



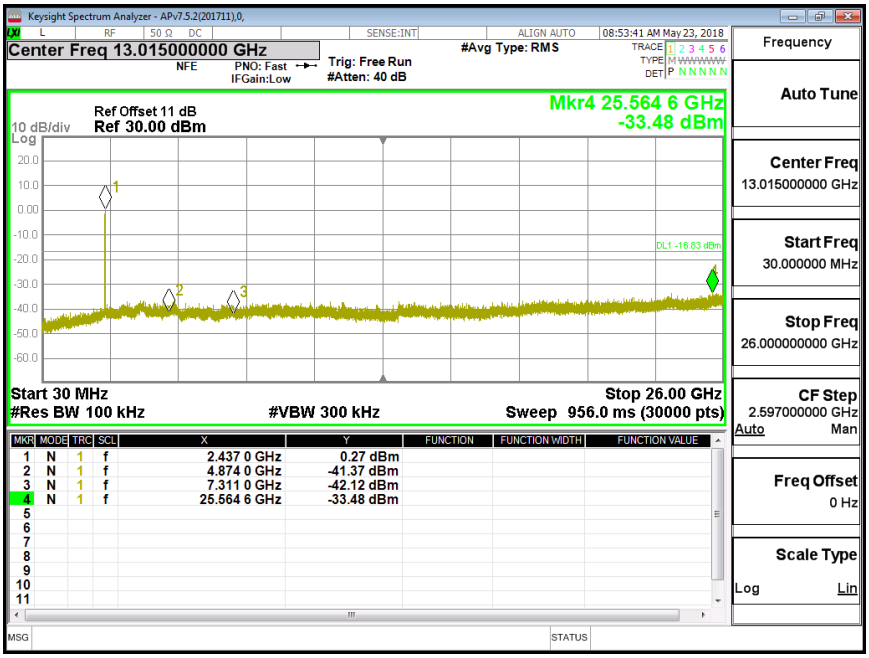
LOW CH SPURIOUS EMISSIONS 30M-26G



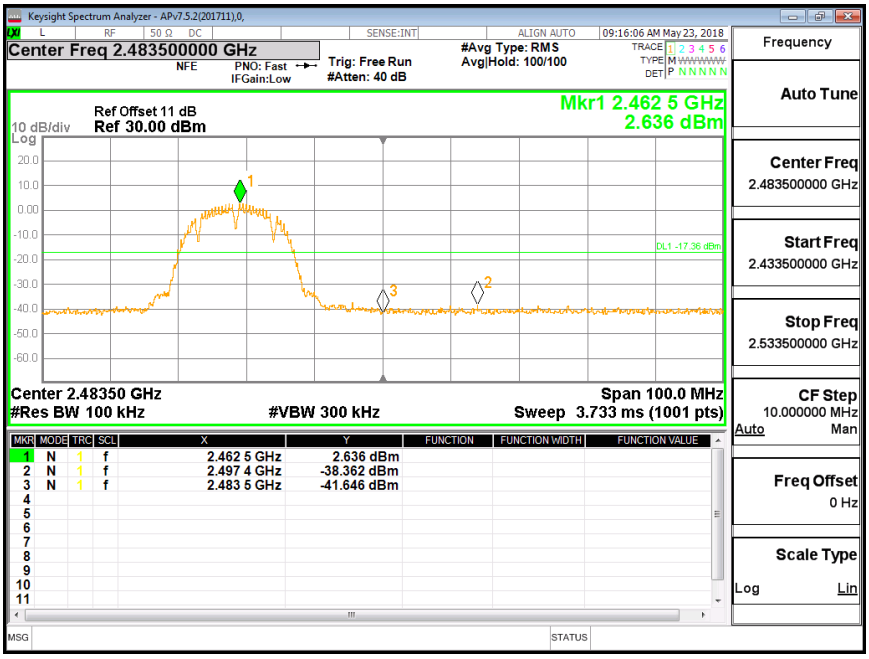
MID CH BANDEDAGE



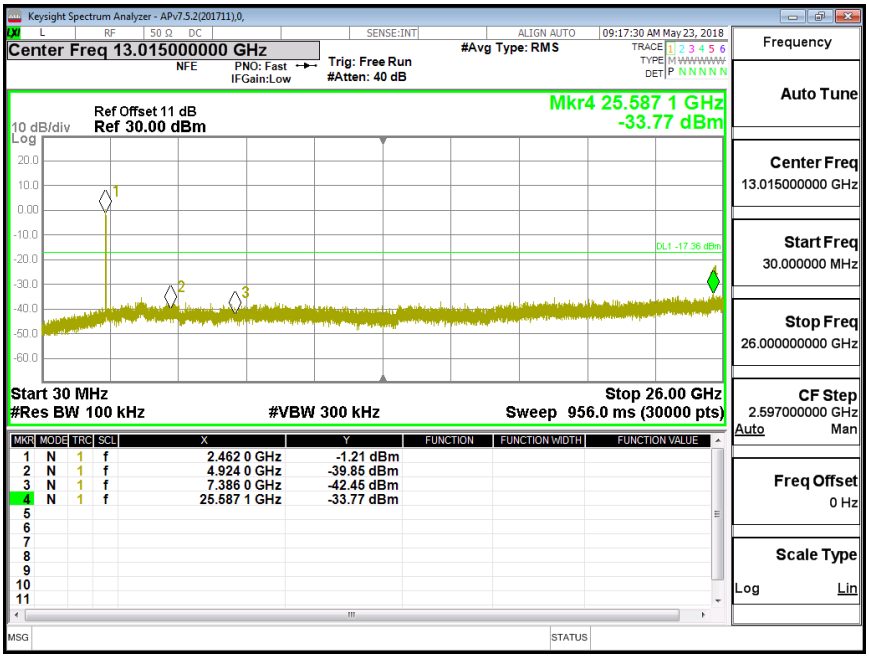
MID CH SPURIOUS EMISSIONS 30M-26G



HIGH CH BANDEDAGE

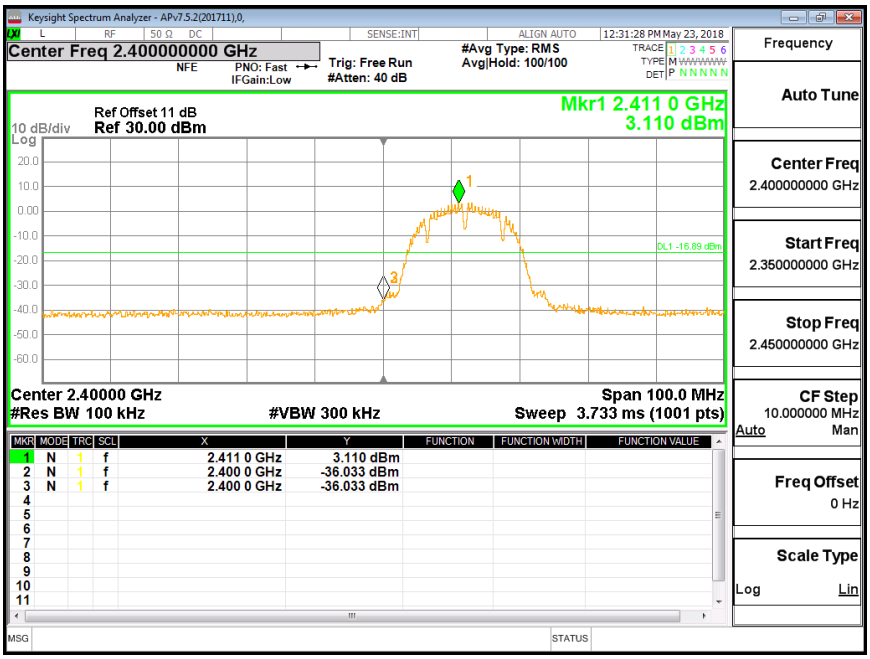


HIGH CH SPURIOUS EMISSIONS 30M-26G

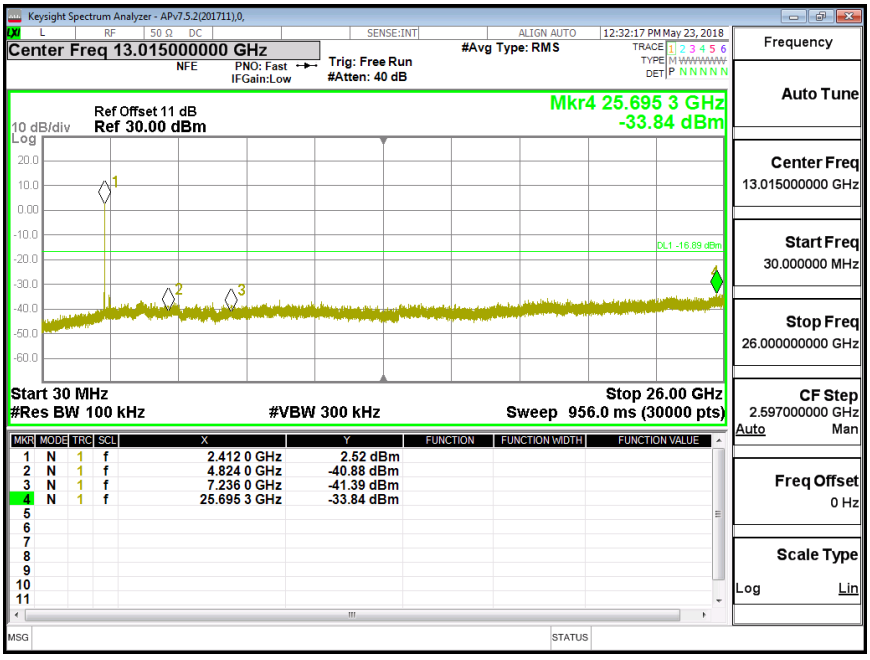


ANTENNA2

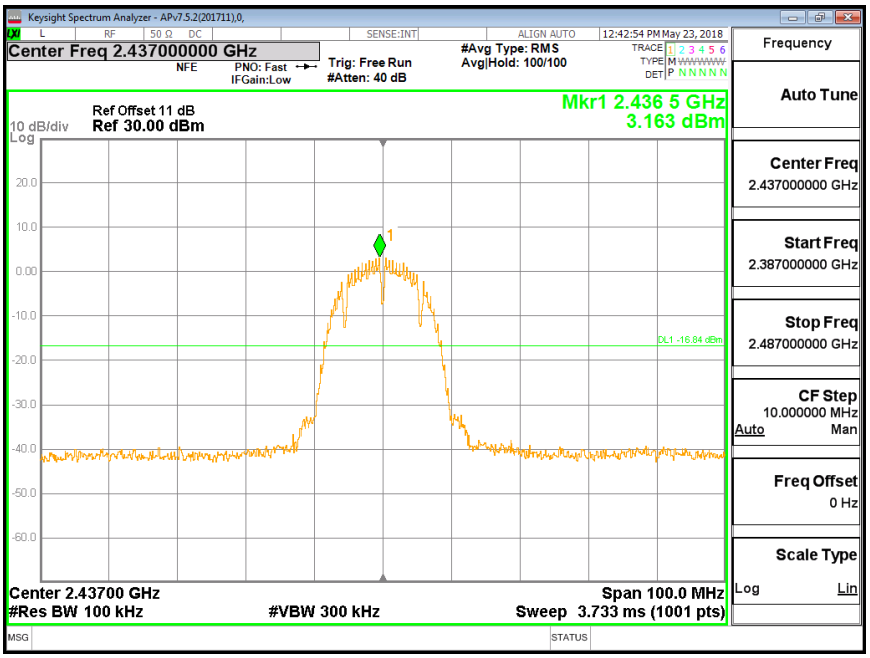
LOW CH BANDEDAGE



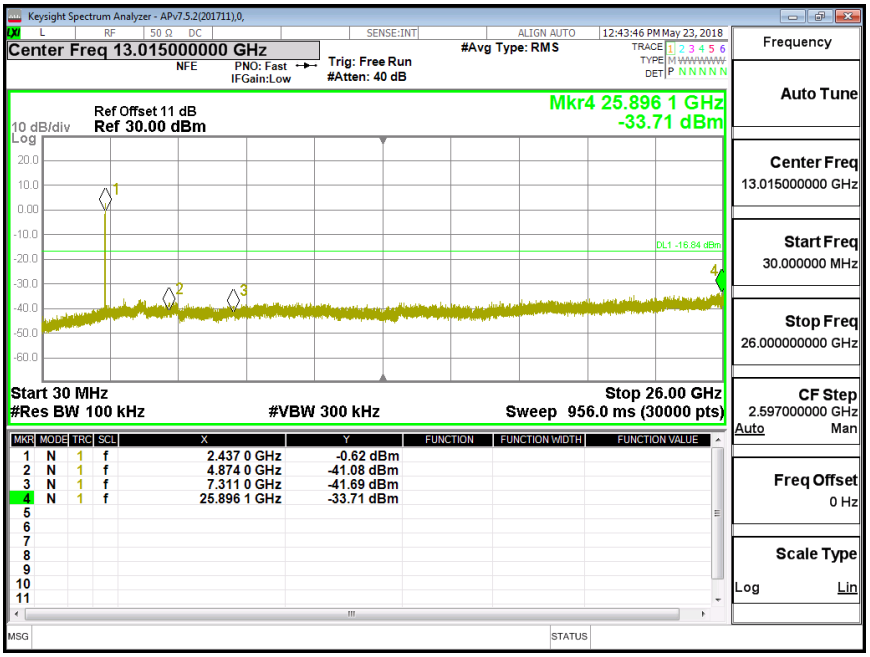
LOW CH SPURIOUS EMISSIONS 30M-26G



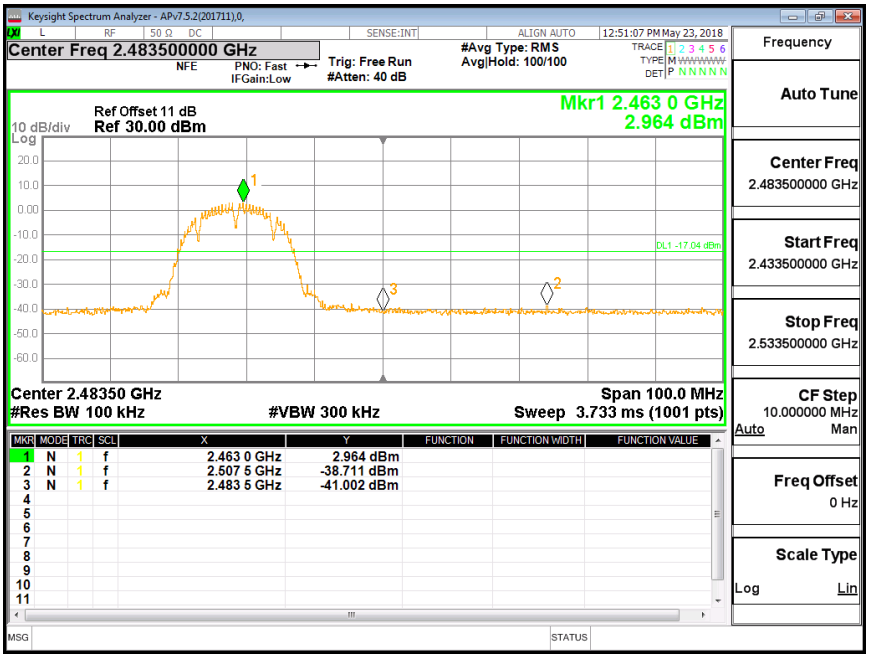
MID CH BANDEDAGE



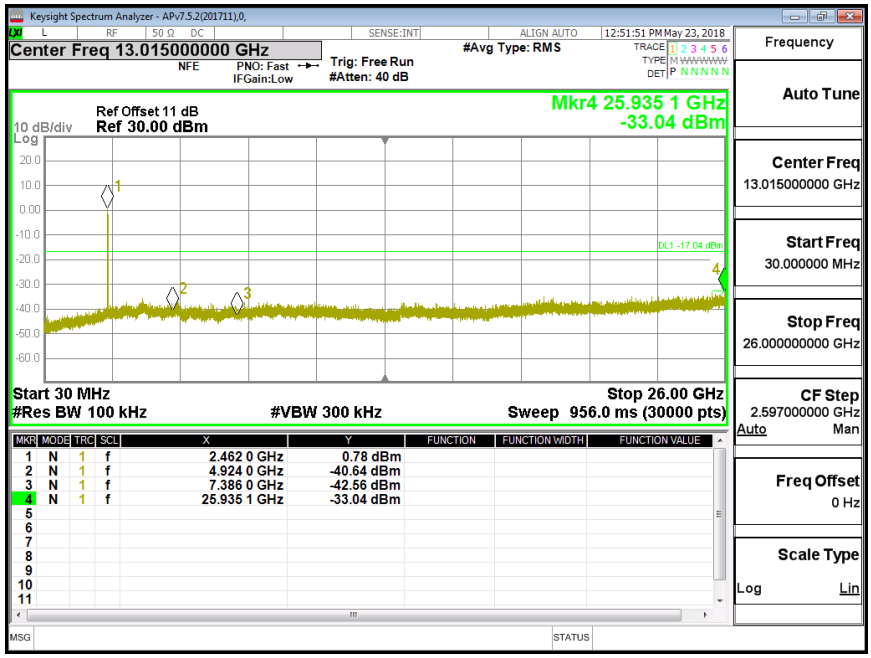
MID CH SPURIOUS EMISSIONS 30M-26G



HIGH CH BANDEDAGE



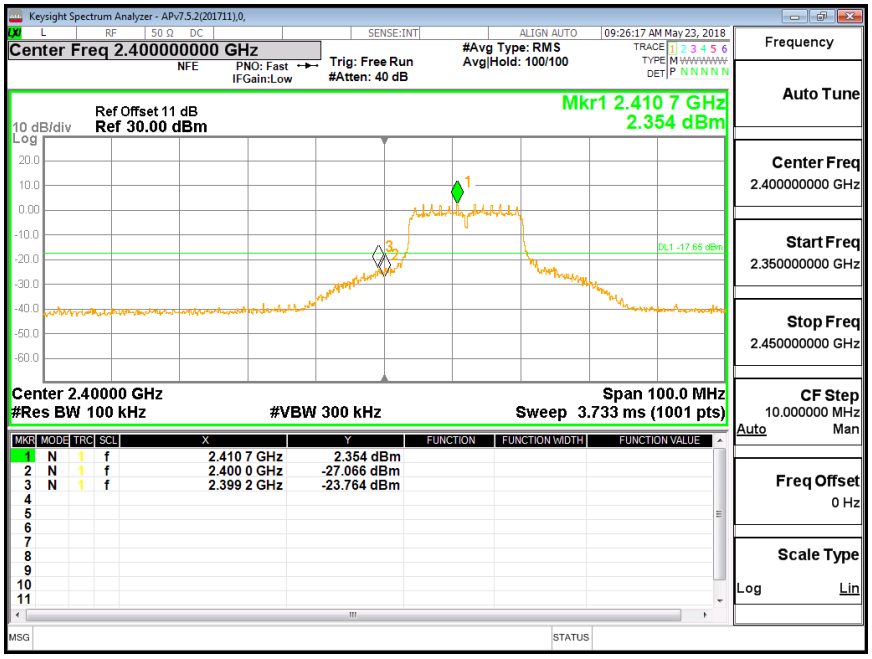
HIGH CH SPURIOUS EMISSIONS 30M-26G



7.5.2. 802.11g MODE

ANTENNA1

LOW CH BANDEDAGE



LOW CH SPURIOUS EMISSIONS 30M-26G