

# OCCUPIED BANDWIDTH



XMIT 2019.02.26

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

## TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Generator - Signal	Keysight	N5182B	TFX	22-Oct-18	22-Oct-21
Analyzer - Spectrum Analyzer	Keysight	N9010A (EXA)	AFQ	13-Dec-18	13-Dec-19
Block - DC	Fairview Microwave	SD3379	AMI	7-Sep-18	7-Sep-19
Attenuator	S.M. Electronics	SA26B-20	RFW	13-Feb-19	13-Feb-20
Cable	ESM Cable Corp.	TTBJ141 KMKM-72	MNU	11-Apr-19	11-Apr-20

## TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The EUT was set to the channels and modes listed in the datasheet.

The 6dB occupied bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The 99.0% occupied bandwidth was also measured at the same time which can be needed during Output Power depending on the applicable method.

A reference level offset was found by using a signal generator to inject a known signal into the cable, attenuator, and DC block system. The loss was measured on a spectrum analyzer and used to find the reference level offset.

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TbTx 2018.09.13 XMt 2019.02.28

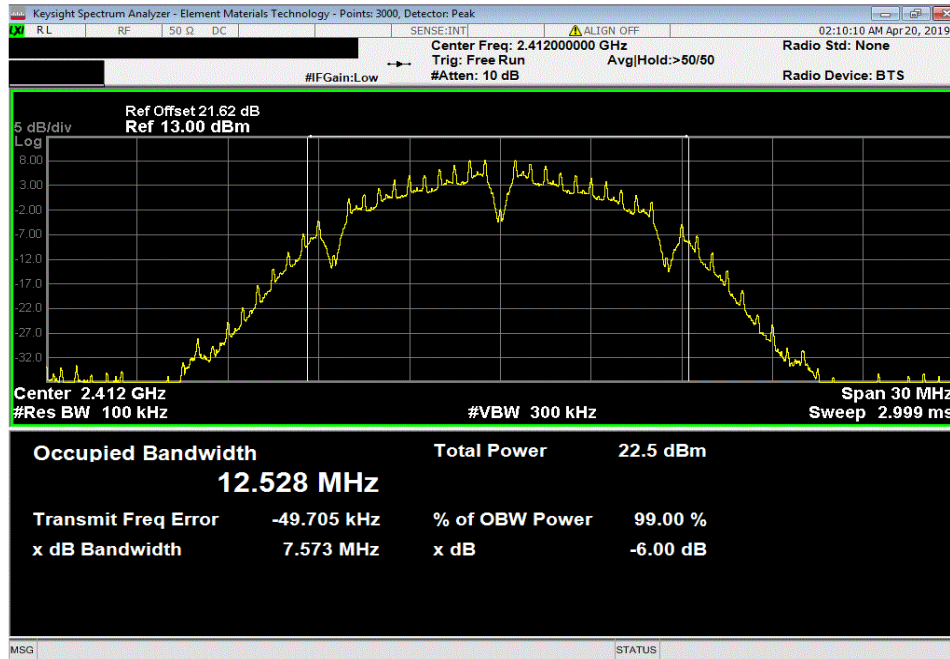
EUT: Duo WiFi		Work Order: ADEM0001	
Serial Number: 67588		Date: 19-Apr-19	
Customer: Ademco, Inc.		Temperature: 23.6 °C	
Attendees: None		Humidity: 30.3% RH	
Project: None		Barometric Pres.: 1019 mbar	
Tested by: Andrew Rogstad		Power: 110VAC/60Hz	
		Job Site: MN05	
TEST SPECIFICATIONS			
FCC 15.247:2019		Test Method	
		ANSI C63.10:2013	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	2	Signature	<i>Andrew Rogstad</i>
		Value	Limit (>)
			Result
Antenna 0			
802.11(b) 1 Mbps			
	Low Channel 1, 2412 MHz	7.573 MHz	500 kHz
	Mid Channel 6, 2437 MHz	8.055 MHz	500 kHz
	High Channel 11, 2462 MHz	8.062 MHz	500 kHz
			Pass
802.11(b) 11 Mbps			
	Low Channel 1, 2412 MHz	7.848 MHz	500 kHz
	Mid Channel 6, 2437 MHz	7.409 MHz	500 kHz
	High Channel 11, 2462 MHz	7.651 MHz	500 kHz
			Pass
802.11(g) 6 Mbps			
	Low Channel 1, 2412 MHz	15.343 MHz	500 kHz
	Mid Channel 6, 2437 MHz	15.322 MHz	500 kHz
	High Channel 11, 2462 MHz	15.334 MHz	500 kHz
			Pass
802.11(g) 36 Mbps			
	Low Channel 1, 2412 MHz	15.744 MHz	500 kHz
	Mid Channel 6, 2437 MHz	15.742 MHz	500 kHz
	High Channel 11, 2462 MHz	15.991 MHz	500 kHz
			Pass
802.11(g) 54 Mbps			
	Low Channel 1, 2412 MHz	16.085 MHz	500 kHz
	Mid Channel 6, 2437 MHz	16.059 MHz	500 kHz
	High Channel 11, 2462 MHz	16.045 MHz	500 kHz
			Pass
802.11(n) MCS0			
	Low Channel 1, 2412 MHz	15.967 MHz	500 kHz
	Mid Channel 6, 2437 MHz	16.082 MHz	500 kHz
	High Channel 11, 2462 MHz	15.128 MHz	500 kHz
			Pass
802.11(n) MCS7			
	Low Channel 1, 2412 MHz	17.553 MHz	500 kHz
	Mid Channel 6, 2437 MHz	17.311 MHz	500 kHz
	High Channel 11, 2462 MHz	17.307 MHz	500 kHz
			Pass
Antenna 1			
802.11(b) 1 Mbps			
	Low Channel 1, 2412 MHz	8.058 MHz	500 kHz
	Mid Channel 6, 2437 MHz	8.06 MHz	500 kHz
	High Channel 11, 2462 MHz	8.058 MHz	500 kHz
			Pass
802.11(b) 11 Mbps			
	Low Channel 1, 2412 MHz	7.959 MHz	500 kHz
	Mid Channel 6, 2437 MHz	7.732 MHz	500 kHz
	High Channel 11, 2462 MHz	7.499 MHz	500 kHz
			Pass
802.11(g) 6 Mbps			
	Low Channel 1, 2412 MHz	15.453 MHz	500 kHz
	Mid Channel 6, 2437 MHz	15.327 MHz	500 kHz
	High Channel 11, 2462 MHz	15.129 MHz	500 kHz
			Pass
802.11(g) 36 Mbps			
	Low Channel 1, 2412 MHz	15.74 MHz	500 kHz
	Mid Channel 6, 2437 MHz	15.724 MHz	500 kHz
	High Channel 11, 2462 MHz	15.734 MHz	500 kHz
			Pass
802.11(g) 54 Mbps			
	Low Channel 1, 2412 MHz	16.043 MHz	500 kHz
	Mid Channel 6, 2437 MHz	16.338 MHz	500 kHz
	High Channel 11, 2462 MHz	16.047 MHz	500 kHz
			Pass
802.11(n) MCS0			
	Low Channel 1, 2412 MHz	16.086 MHz	500 kHz
	Mid Channel 6, 2437 MHz	16.07 MHz	500 kHz
	High Channel 11, 2462 MHz	16.083 MHz	500 kHz
			Pass
802.11(n) MCS7			
	Low Channel 1, 2412 MHz	17.261 MHz	500 kHz
	Mid Channel 6, 2437 MHz	17.01 MHz	500 kHz
	High Channel 11, 2462 MHz	17.301 MHz	500 kHz
			Pass

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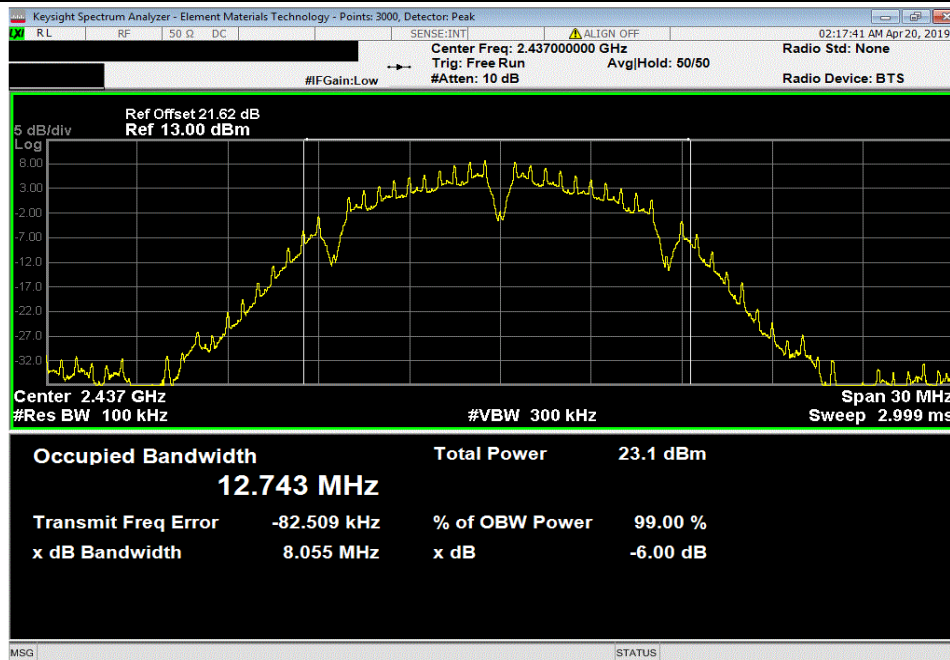


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Antenna 0, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz			Value	Limit	Result
				(>)	
			7.573 MHz	500 kHz	Pass



Antenna 0, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz			Value	Limit	Result
				(>)	
			8.055 MHz	500 kHz	Pass

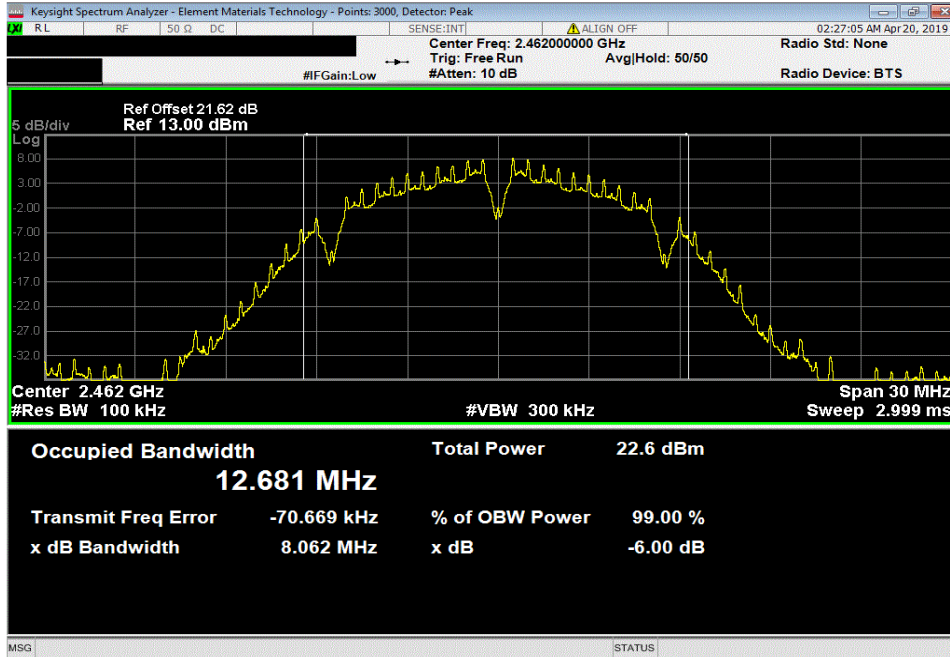


# OCCUPIED BANDWIDTH

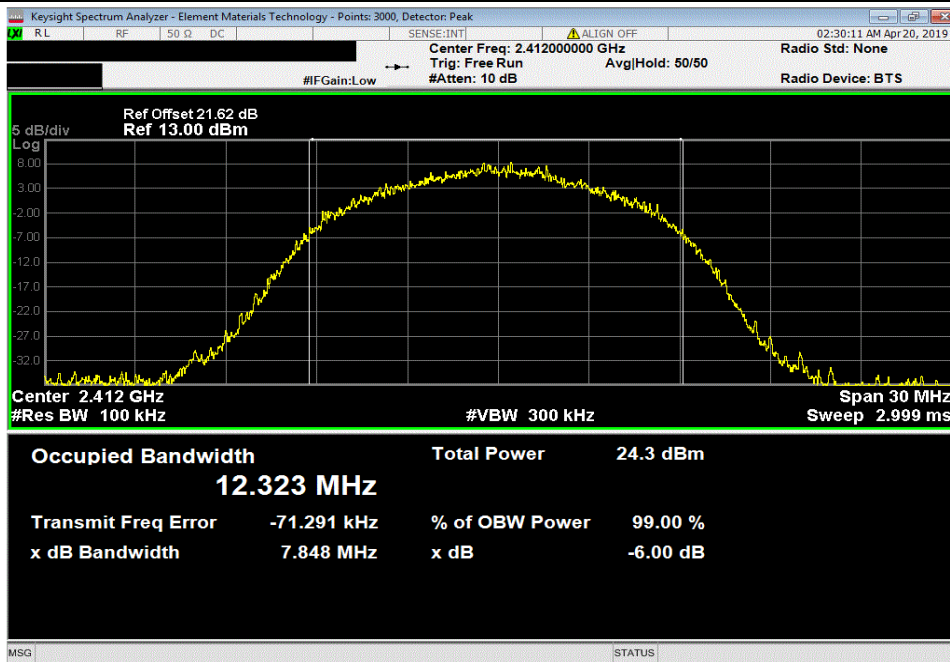


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Antenna 0, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz			
	Value	Limit	Result
	8.062 MHz	500 kHz	Pass



Antenna 0, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz			
	Value	Limit	Result
	7.848 MHz	500 kHz	Pass

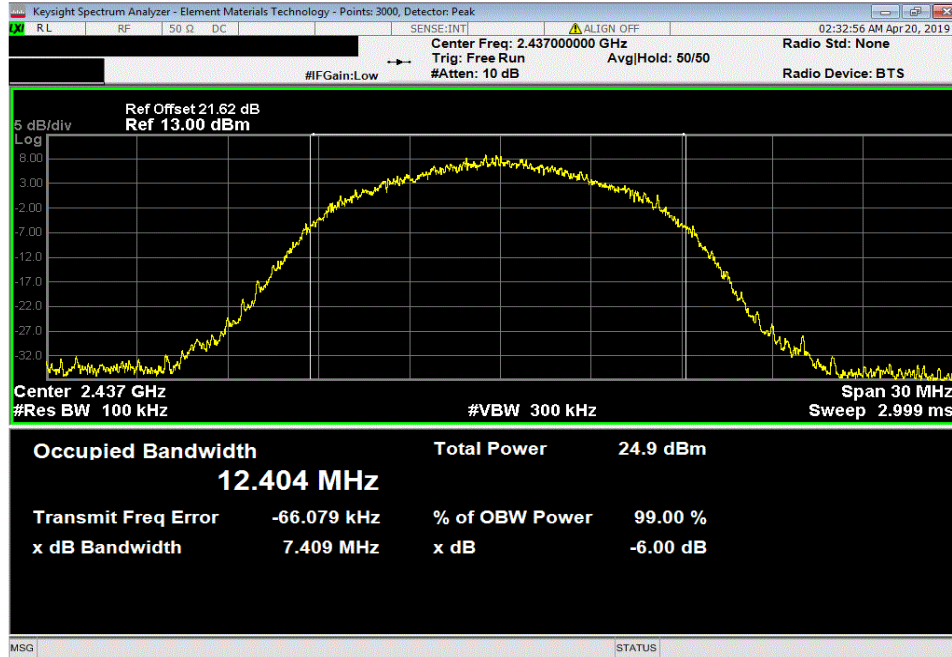


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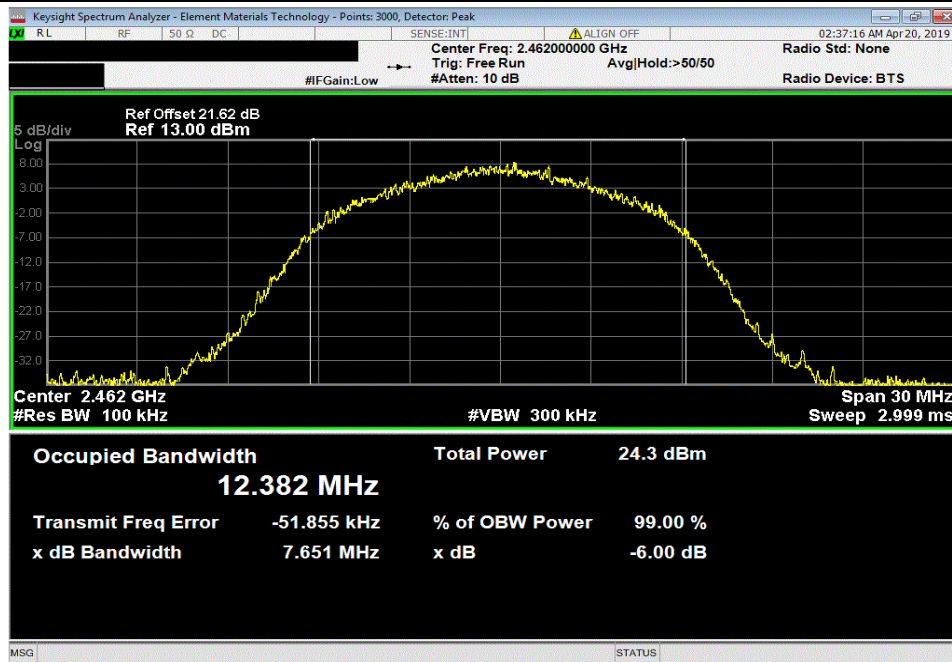


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Antenna 0, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz			Limit	Result
	Value		(>)	
	7.409 MHz		500 kHz	Pass



Antenna 0, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz			Limit	Result
	Value		(>)	
	7.651 MHz		500 kHz	Pass

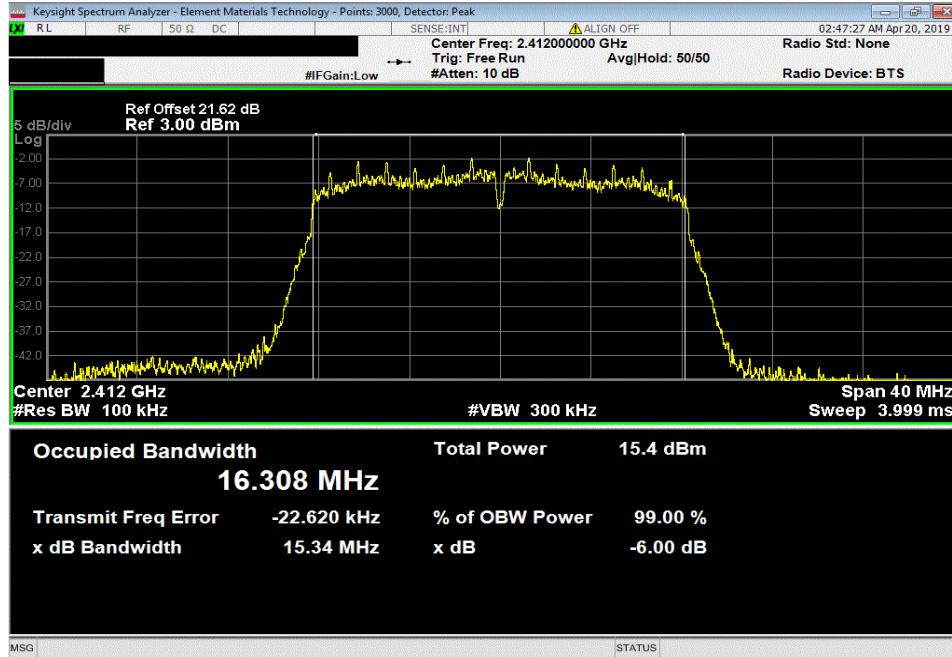


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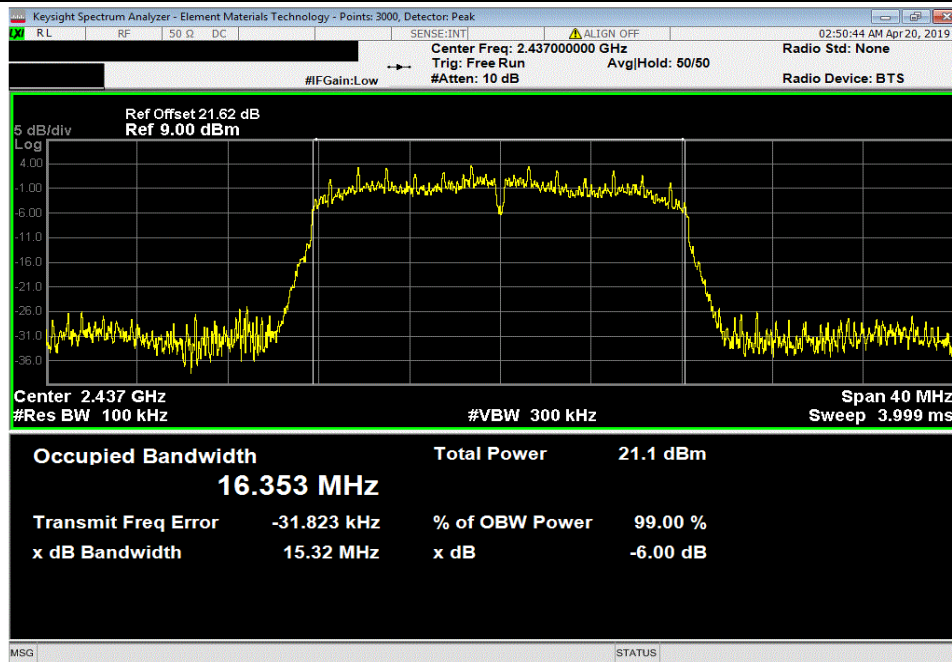


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Antenna 0, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
				Value	Limit	Result
				15.343 MHz	500 kHz	Pass



Antenna 0, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
				Value	Limit	Result
				15.322 MHz	500 kHz	Pass



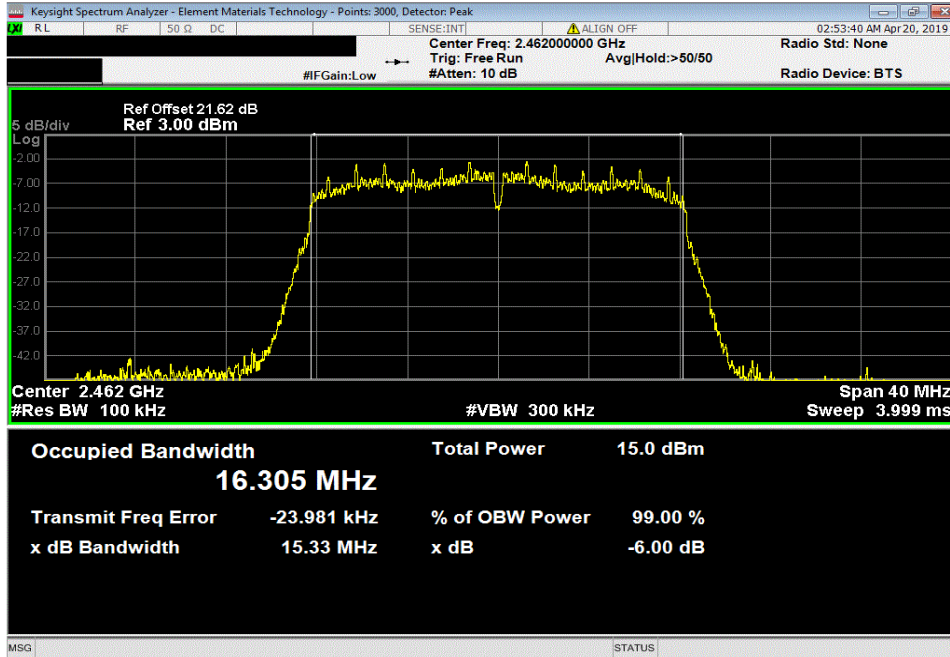


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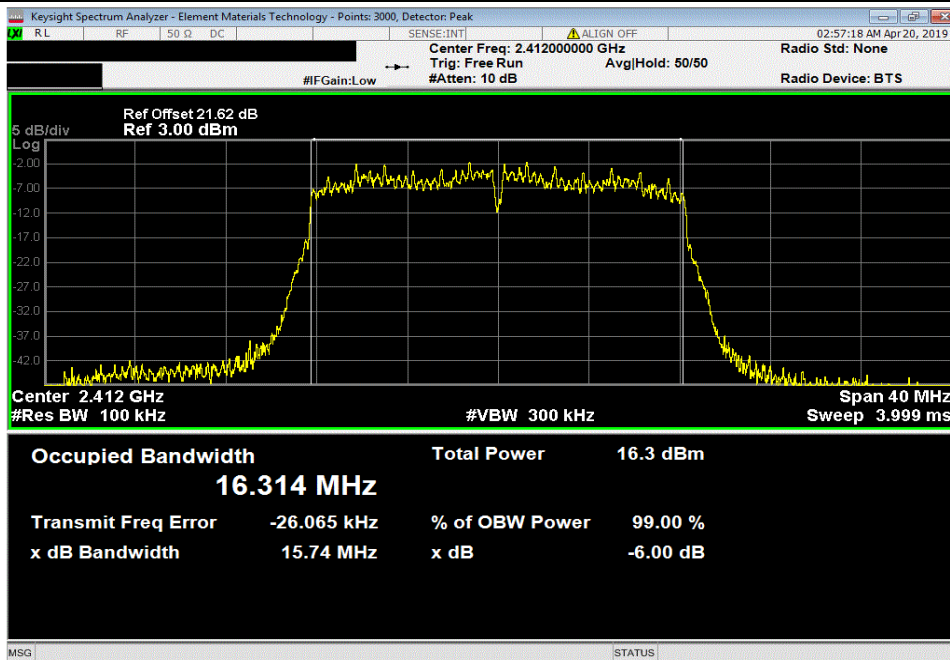


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Antenna 0, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz				Value	Limit	Result
					(>)	
				15.334 MHz	500 kHz	Pass



Antenna 0, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz				Value	Limit	Result
					(>)	
				15.744 MHz	500 kHz	Pass

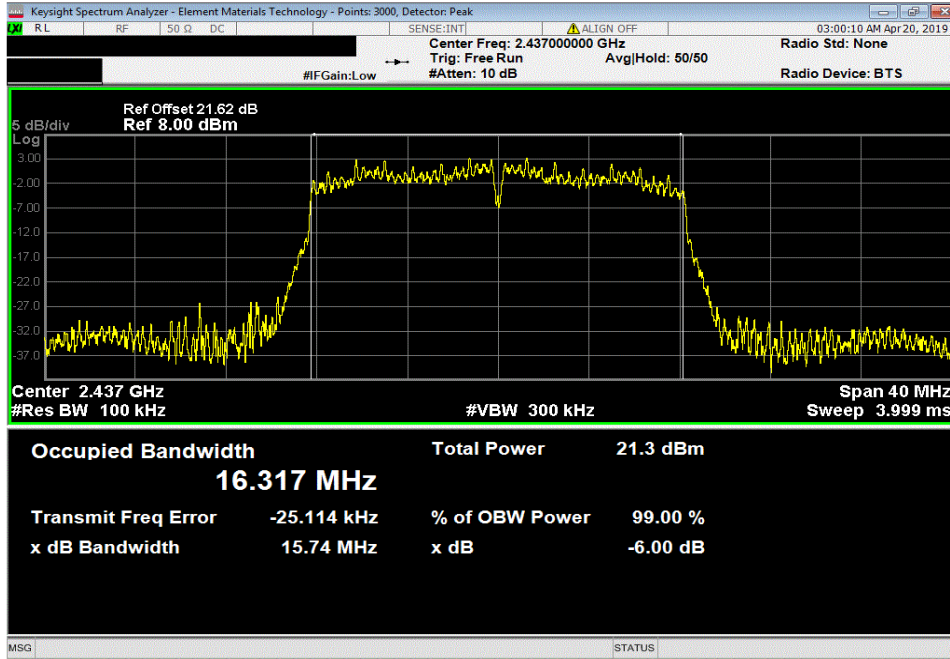


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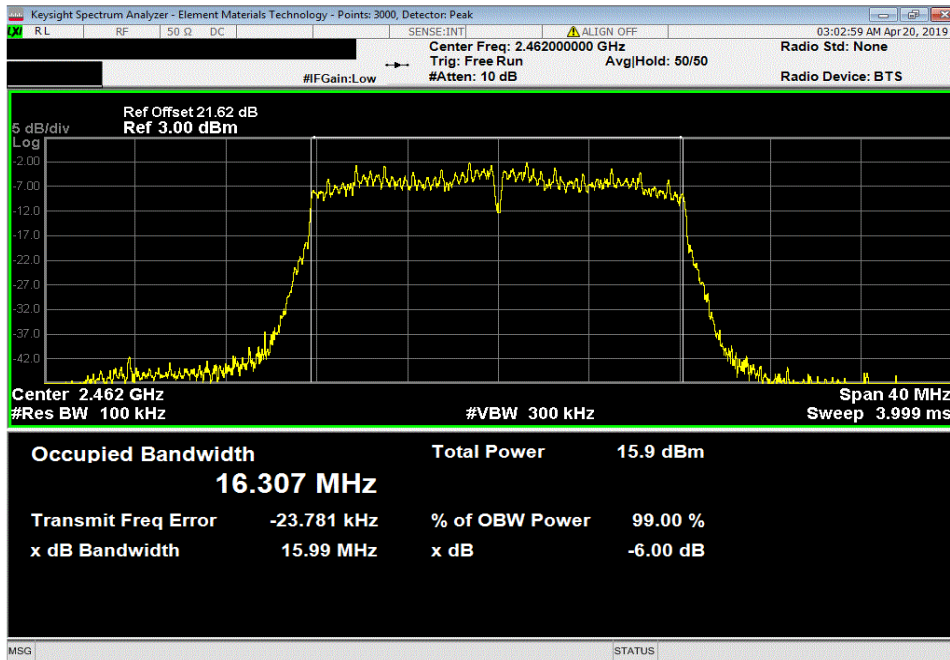


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Antenna 0, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz			Limit	Result
Value	(>)			
15.742 MHz	500 kHz			Pass



Antenna 0, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz			Limit	Result
Value	(>)			
15.991 MHz	500 kHz			Pass



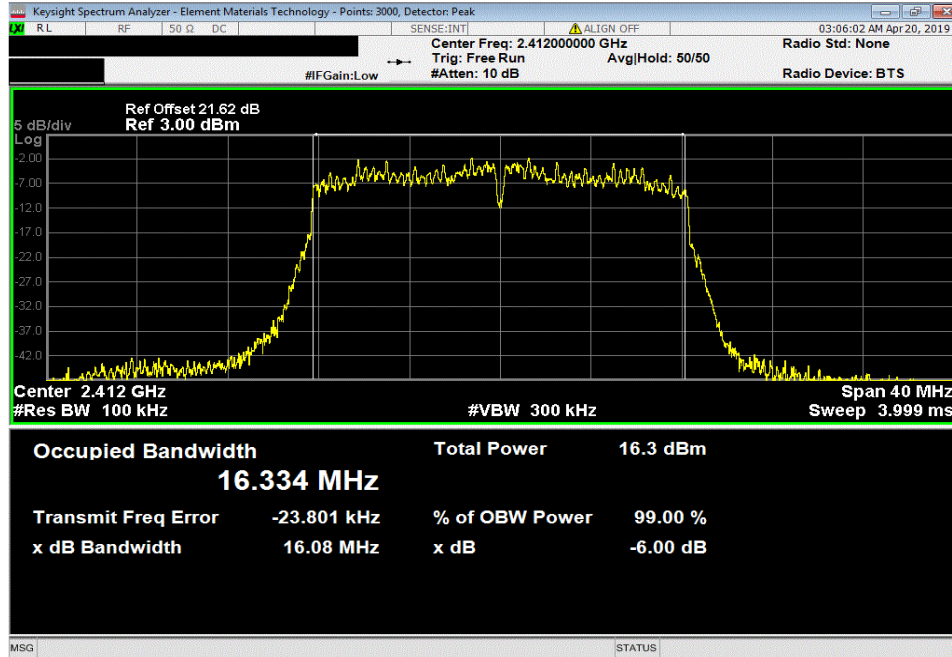


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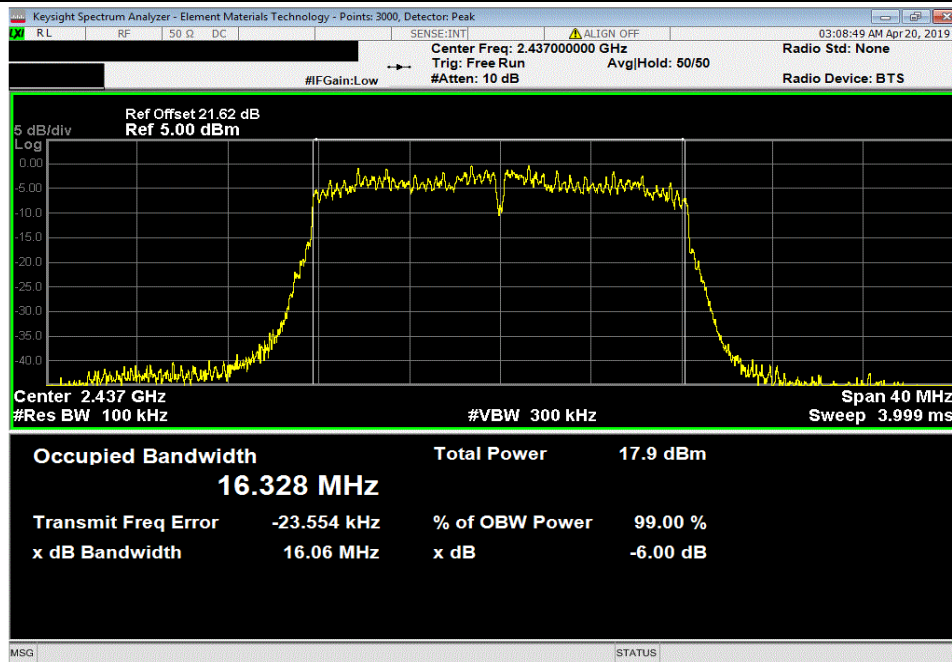


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Antenna 0, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz			Limit	Result
Value	(>)			
16.085 MHz	500 kHz			Pass



Antenna 0, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz			Limit	Result
Value	(>)			
16.059 MHz	500 kHz			Pass

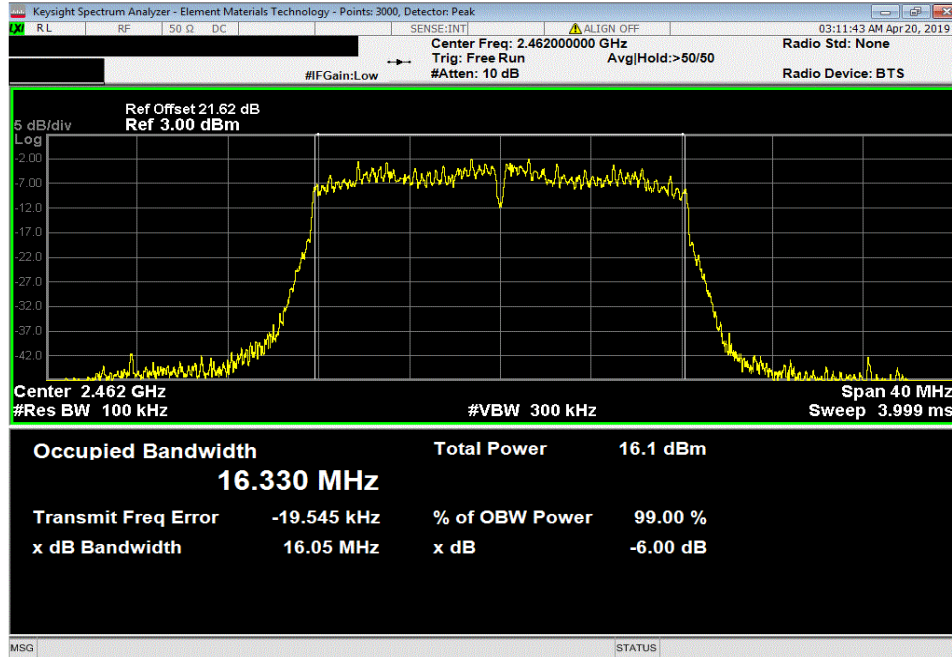


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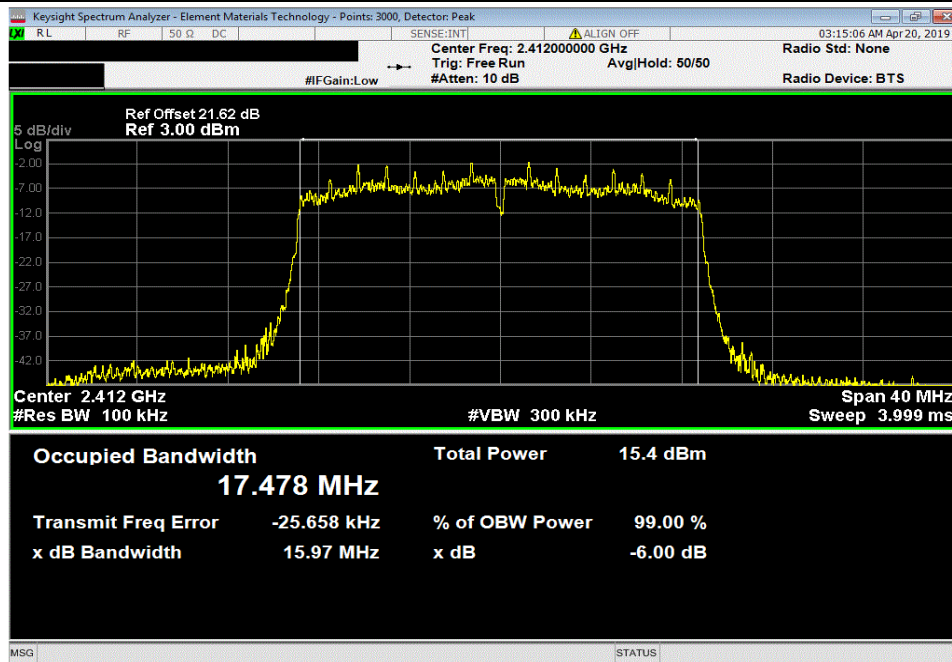


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Antenna 0, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
				Value	Limit	Result
					(>)	
				16.045 MHz	500 kHz	Pass



Antenna 0, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
				Value	Limit	Result
					(>)	
				15.967 MHz	500 kHz	Pass

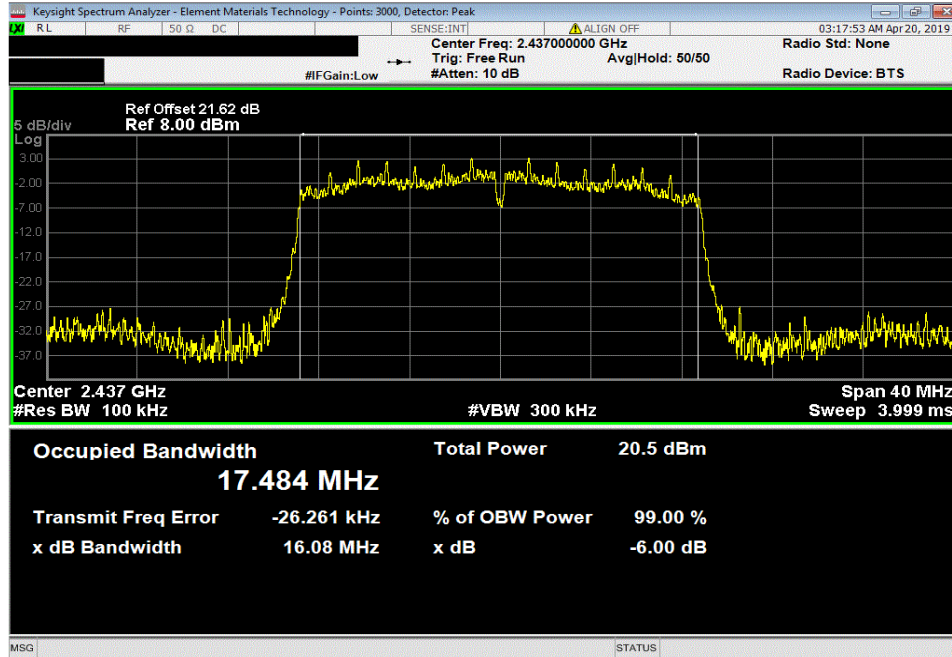


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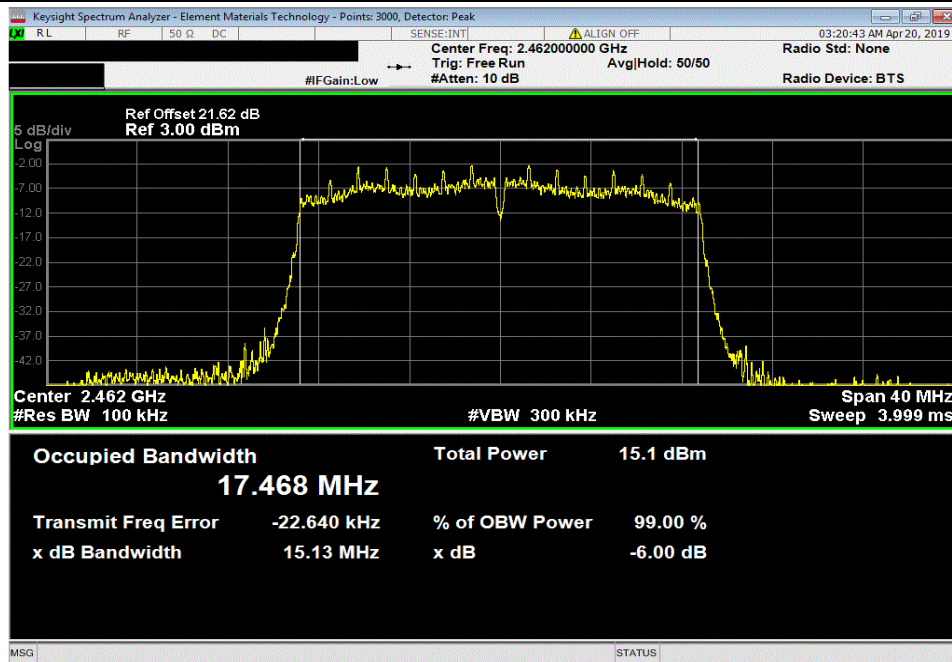


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Antenna 0, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
				Value	Limit	Result
				16.082 MHz	500 kHz	Pass



Antenna 0, 802.11(n) MCS0, High Channel 11, 2462 MHz						
				Value	Limit	Result
				15.128 MHz	500 kHz	Pass

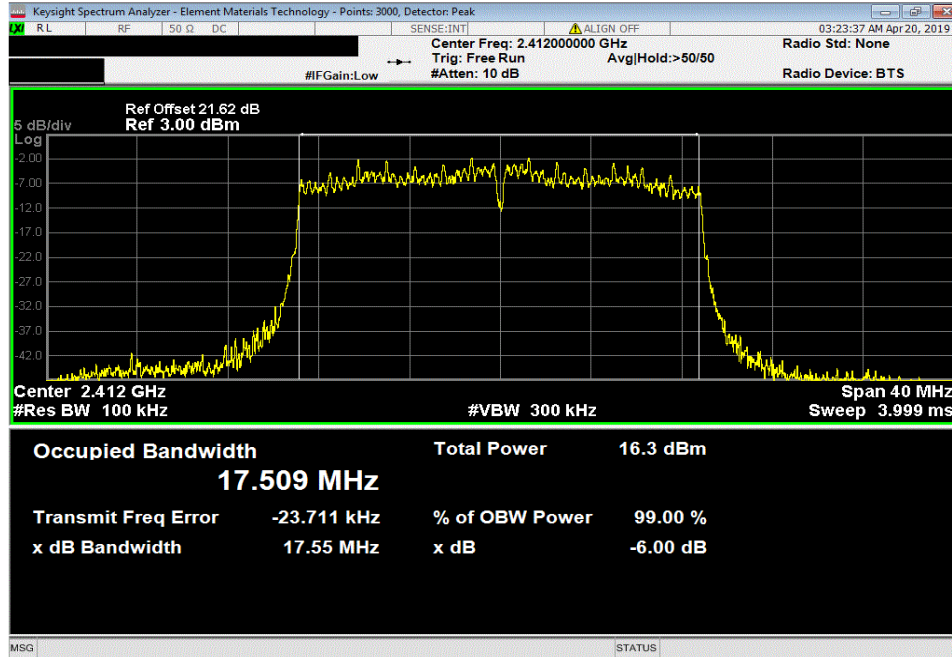


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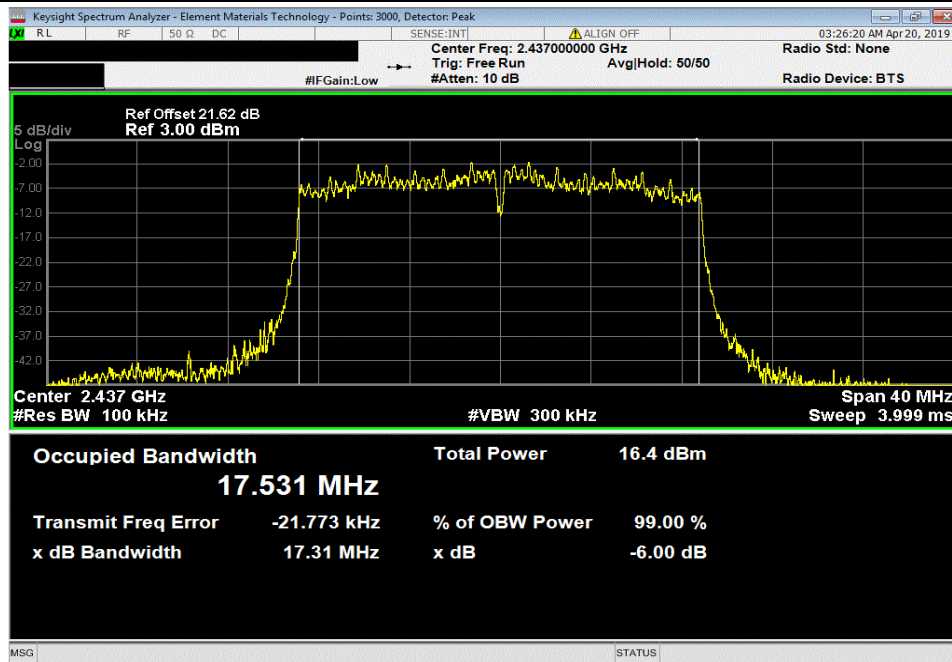


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Antenna 0, 802.11(n) MCS7, Low Channel 1, 2412 MHz				Value	Limit	Result
					(>)	
				17.553 MHz	500 kHz	Pass



Antenna 0, 802.11(n) MCS7, Mid Channel 6, 2437 MHz				Value	Limit	Result
					(>)	
				17.311 MHz	500 kHz	Pass

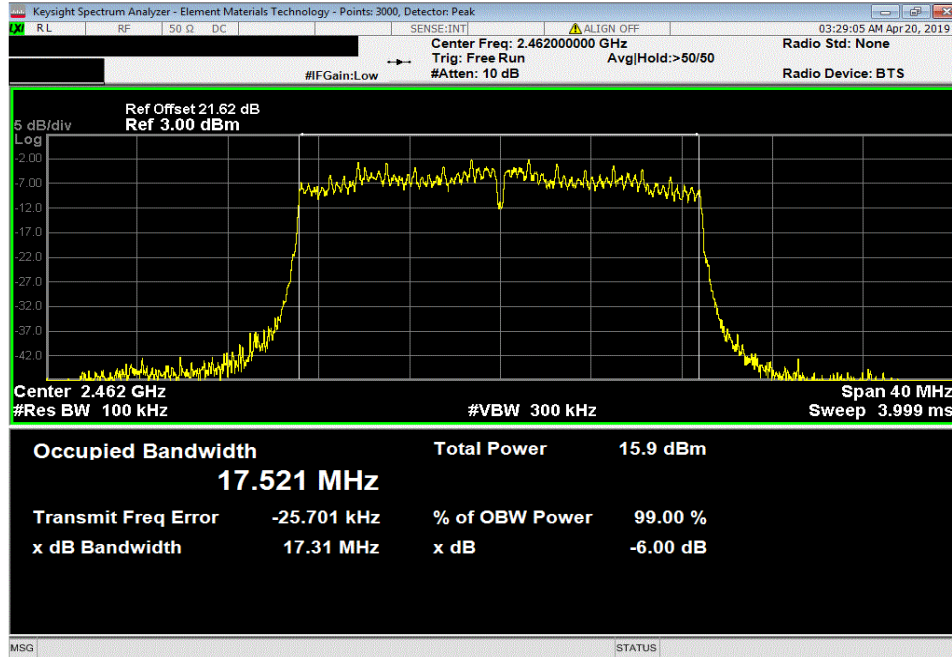


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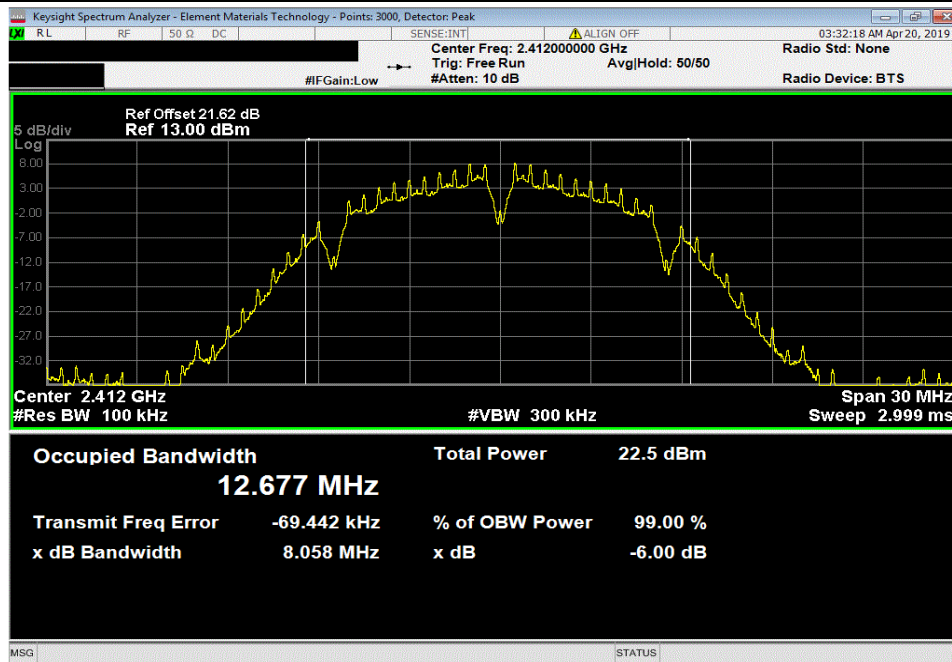


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Antenna 0, 802.11(n) MCS7, High Channel 11, 2462 MHz				Limit	Result
	Value	(>)			
	17.307 MHz	500 kHz		Pass	



Antenna 1, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz				Limit	Result
	Value	(>)			
	8.058 MHz	500 kHz		Pass	



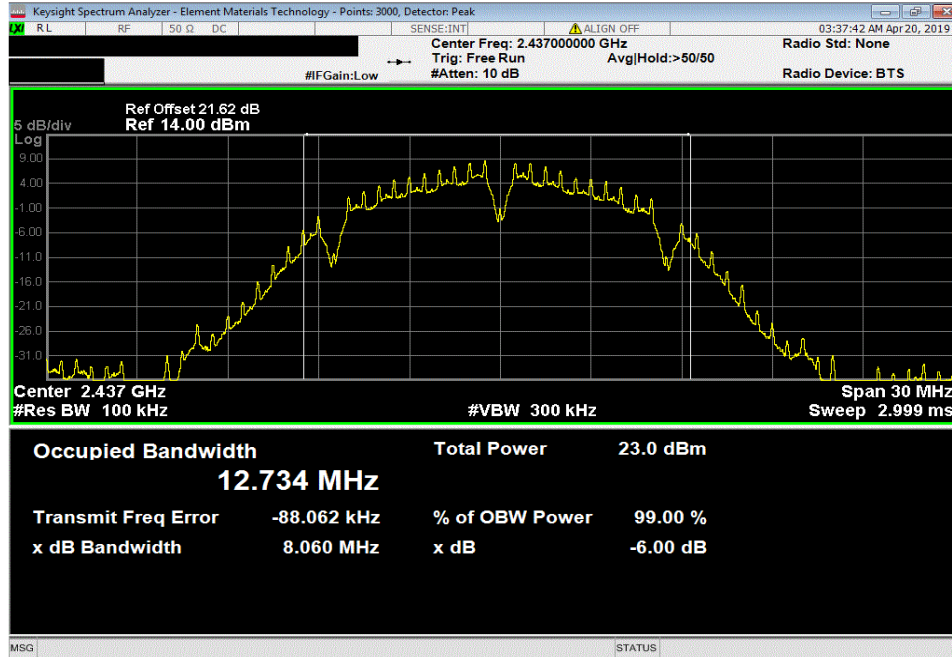


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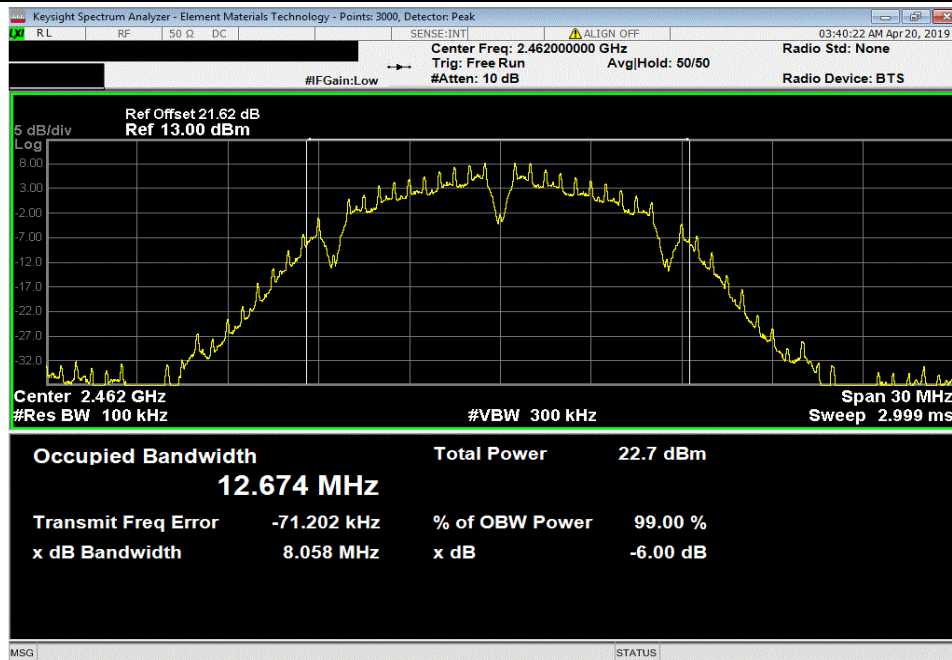


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Antenna 1, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz						
	Value	Limit	Result			
		(>)				
	8.06 MHz	500 kHz	Pass			



Antenna 1, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
	Value	Limit	Result			
		(>)				
	8.058 MHz	500 kHz	Pass			



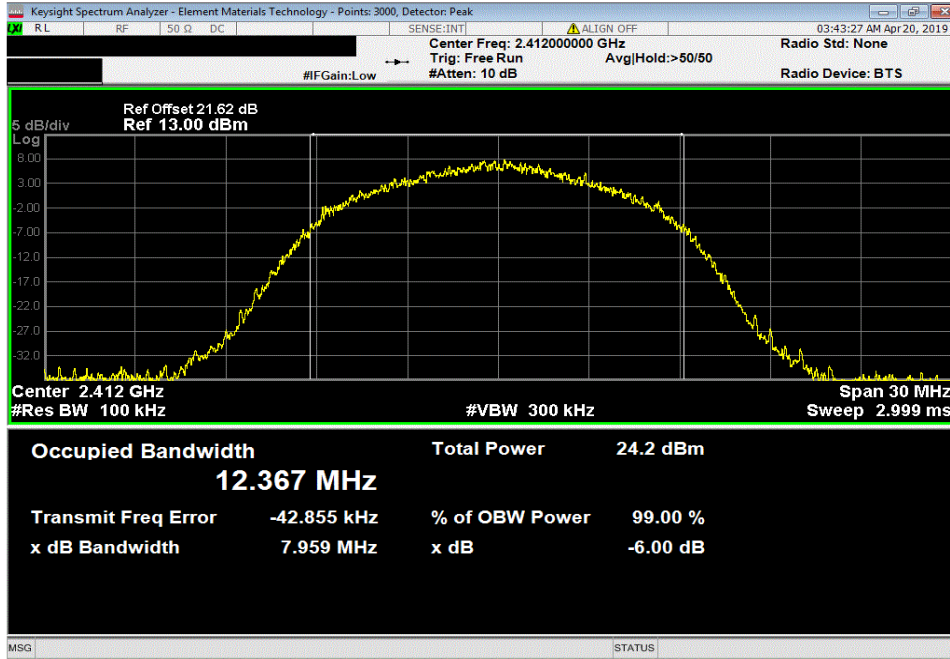


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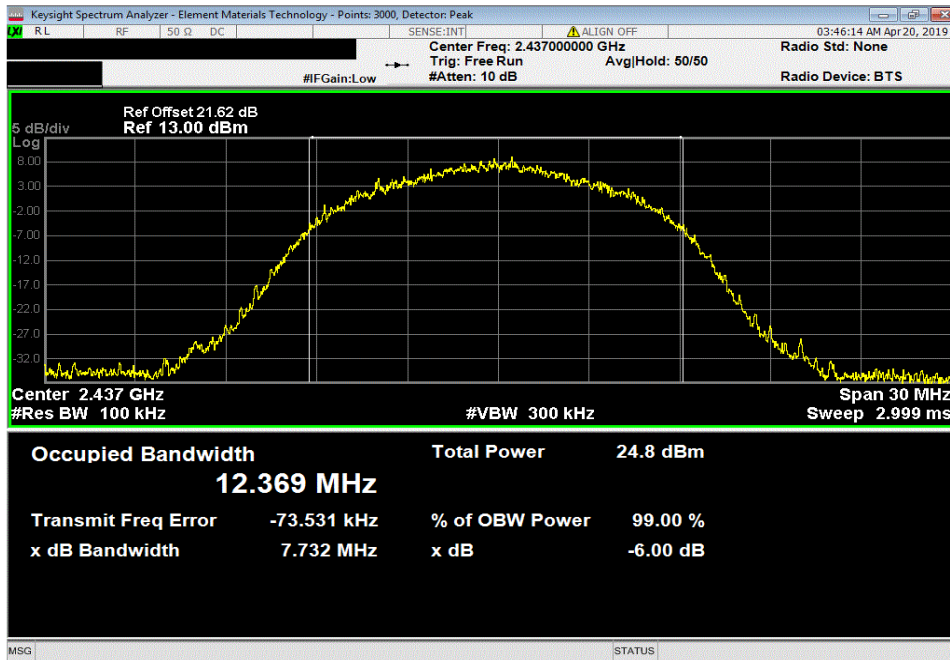


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Antenna 1, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz			Value	Limit	Result
			7.959 MHz	500 kHz	Pass



Antenna 1, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz			Value	Limit	Result
			7.732 MHz	500 kHz	Pass

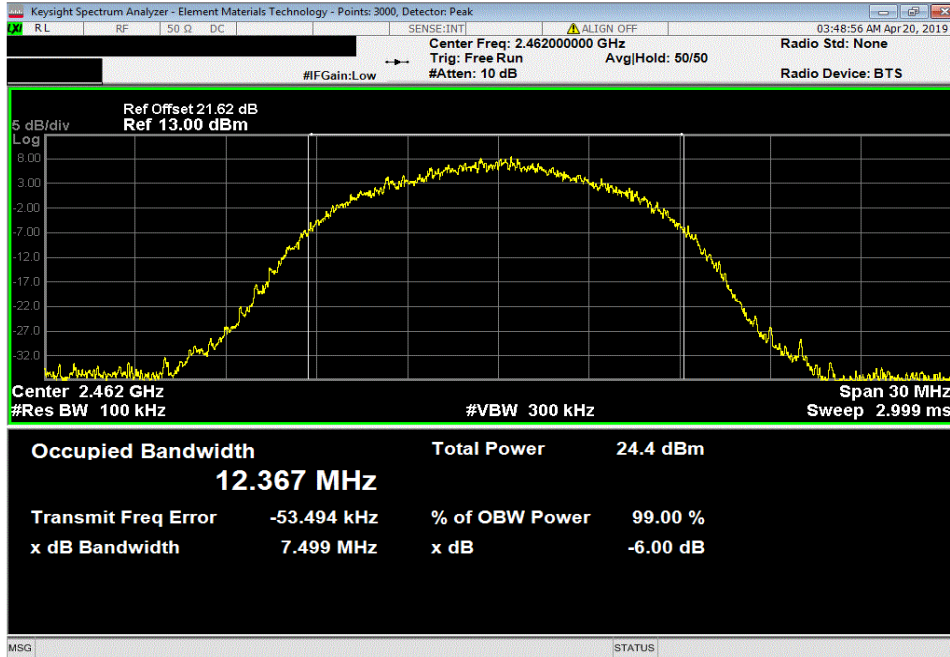


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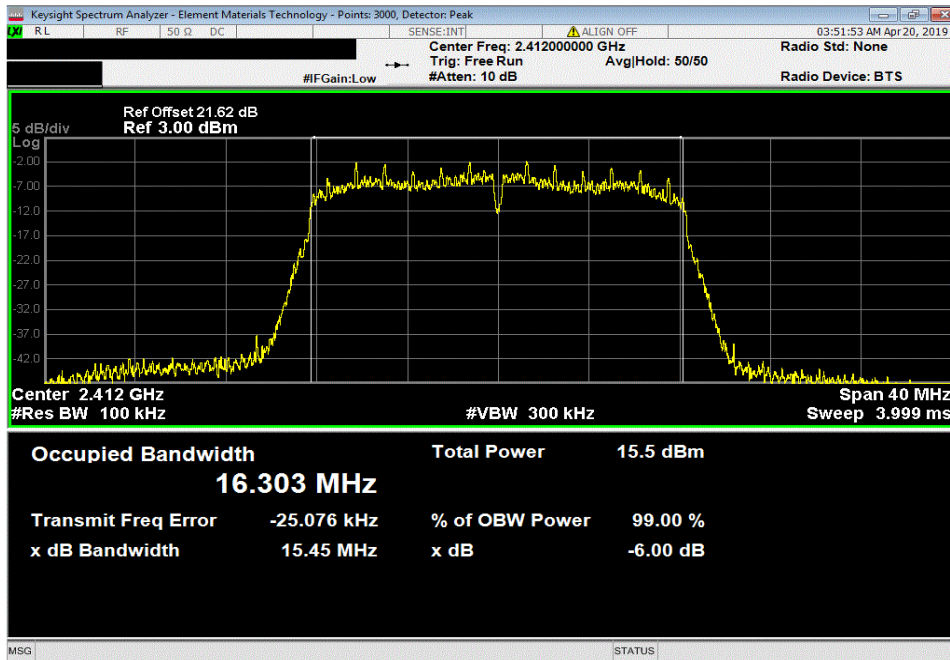


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Antenna 1, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz		
Value	Limit (>)	Result
7.499 MHz	500 kHz	Pass



Antenna 1, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz		
Value	Limit (>)	Result
15.453 MHz	500 kHz	Pass

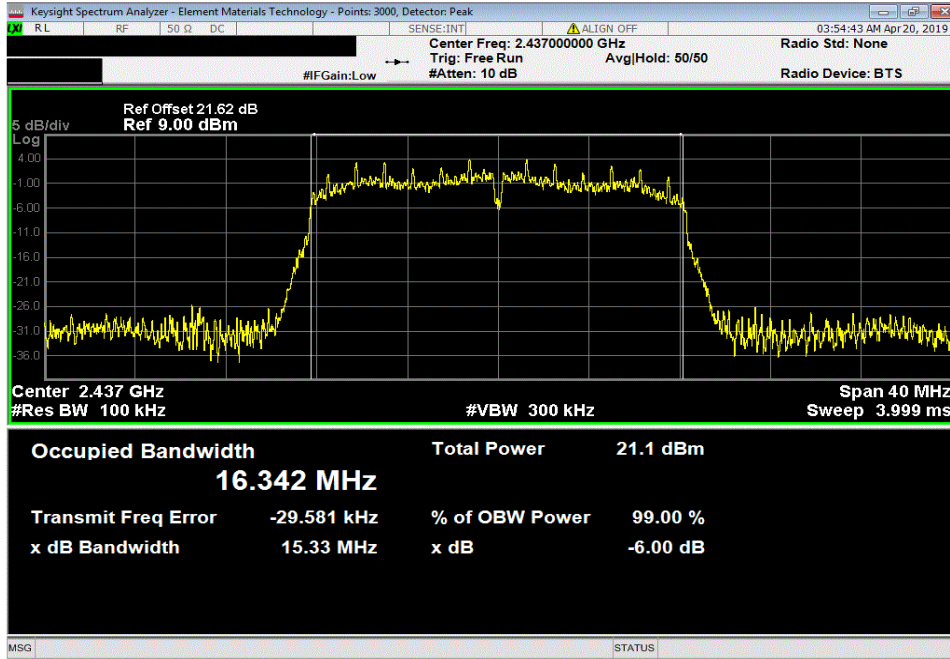


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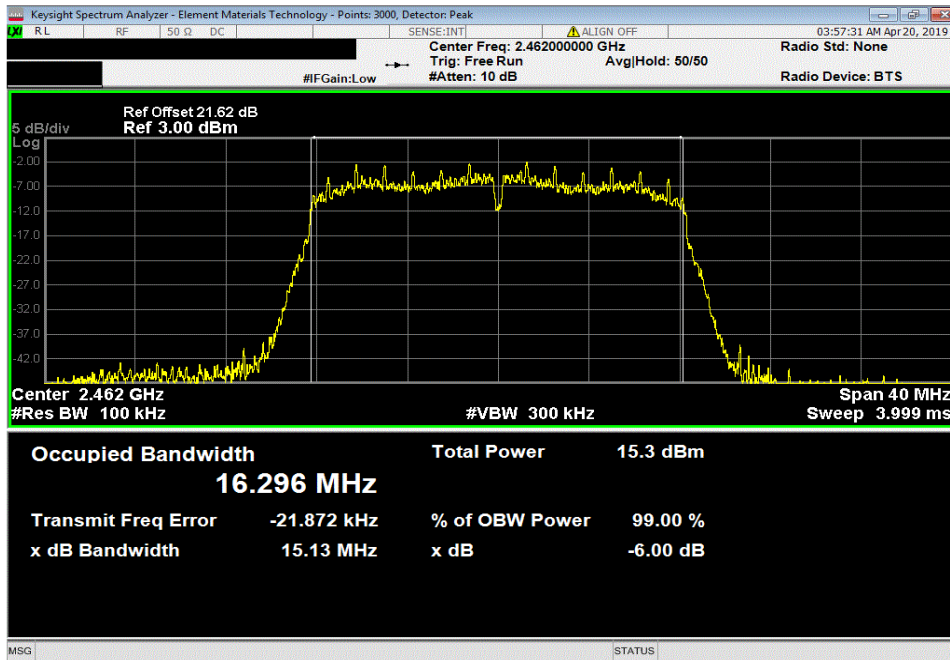


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Antenna 1, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz		
Value	Limit	Result
15.327 MHz	500 kHz	Pass



Antenna 1, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz		
Value	Limit	Result
15.129 MHz	500 kHz	Pass

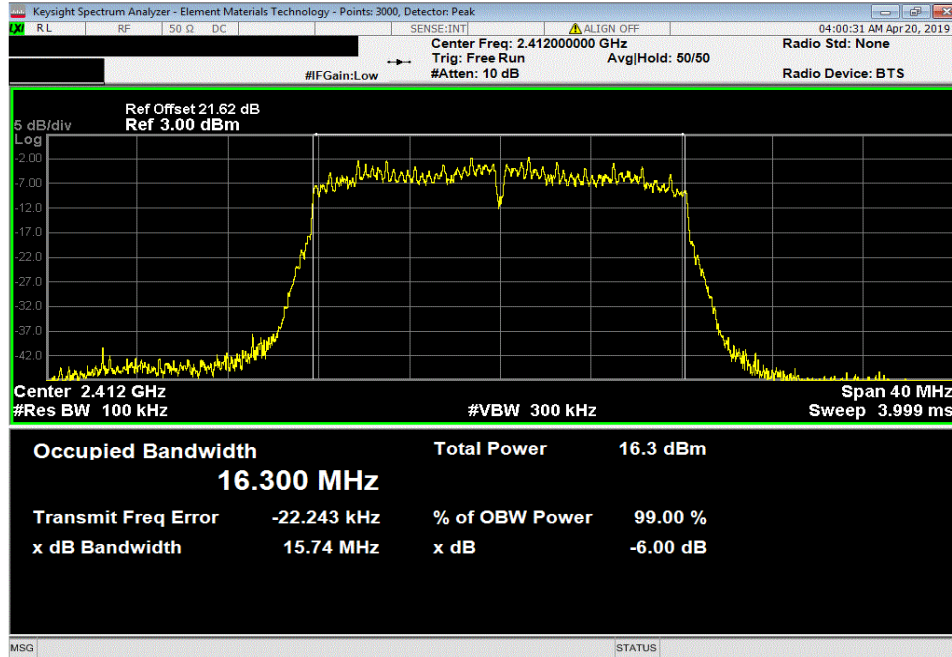


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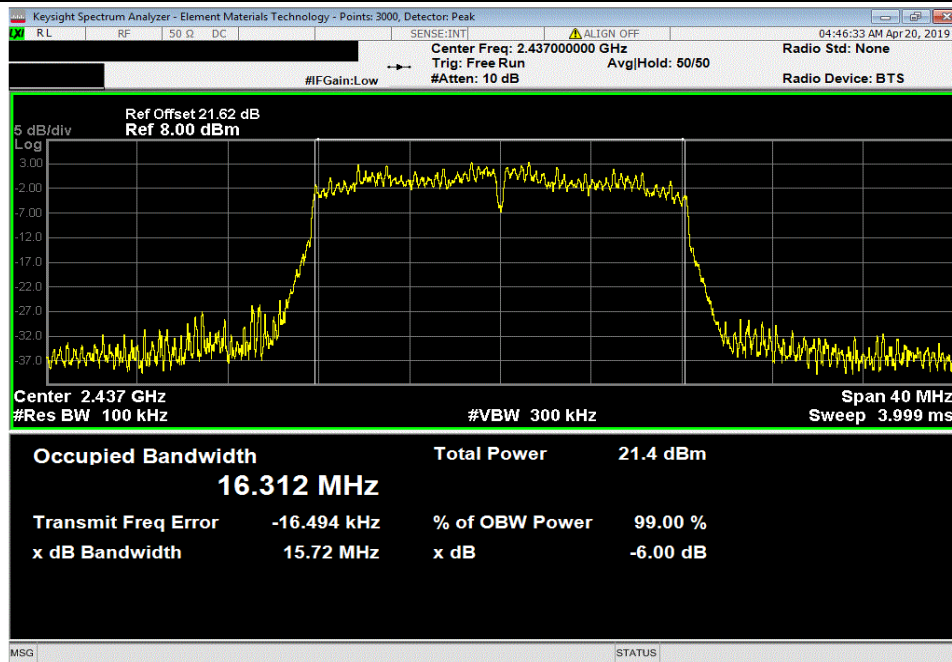


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Antenna 1, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz			Limit	Result
	Value		(>)	
	15.74 MHz		500 kHz	Pass



Antenna 1, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz			Limit	Result
	Value		(>)	
	15.724 MHz		500 kHz	Pass

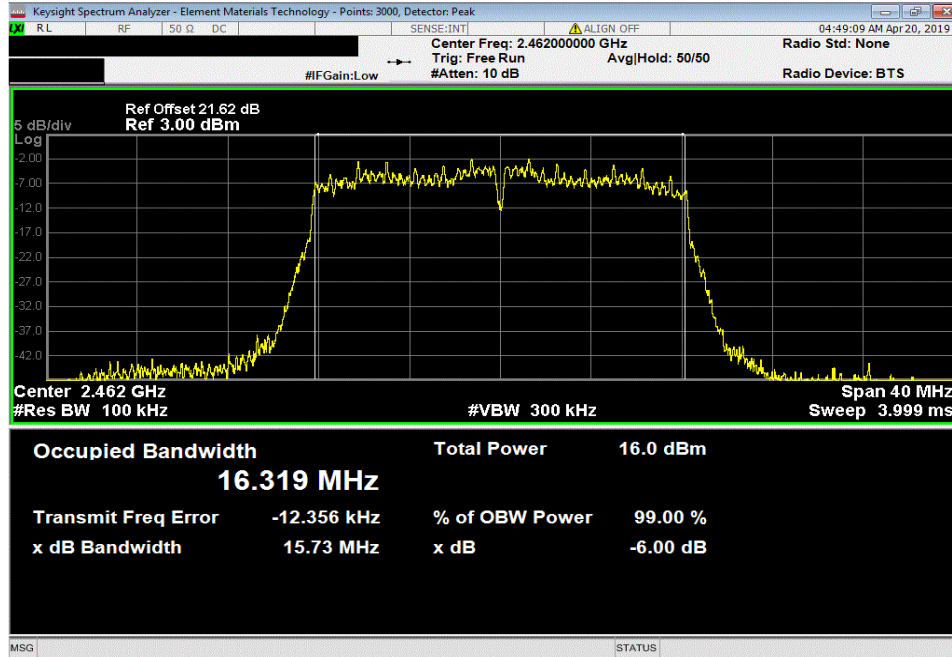


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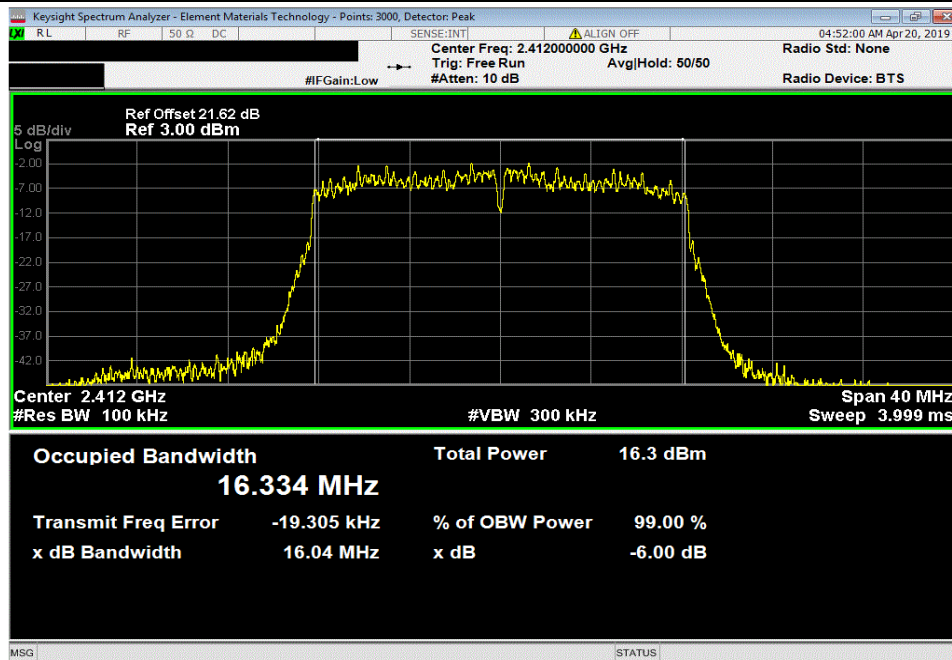


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Antenna 1, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
				Value	Limit	Result
				15.734 MHz	500 kHz	Pass



Antenna 1, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
				Value	Limit	Result
				16.043 MHz	500 kHz	Pass



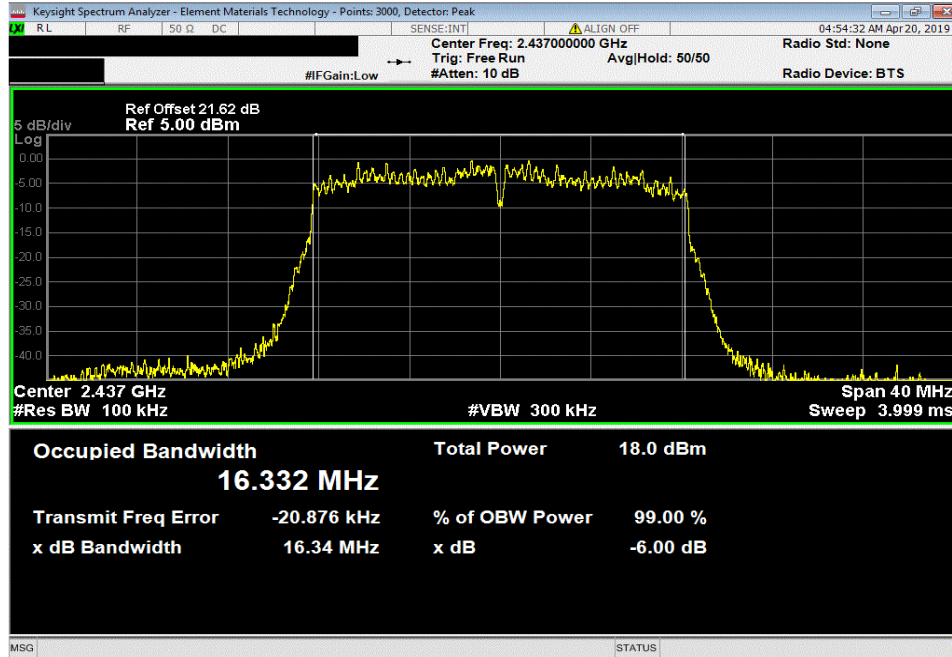


# OCCUPIED BANDWIDTH

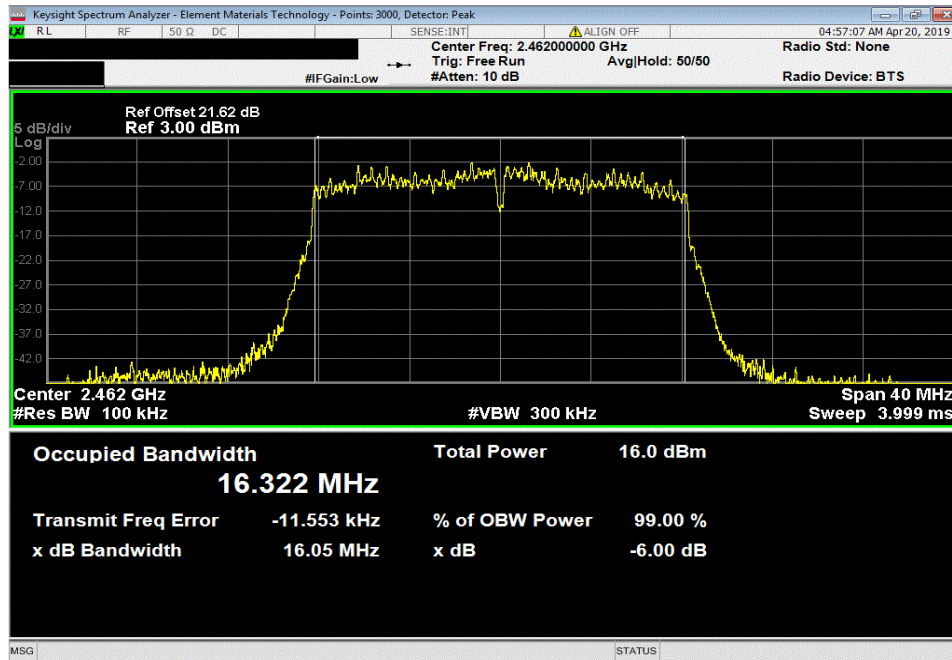


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Antenna 1, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz			Limit	Result
Value	(>)			
16.338 MHz	500 kHz			Pass



Antenna 1, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz			Limit	Result
Value	(>)			
16.047 MHz	500 kHz			Pass



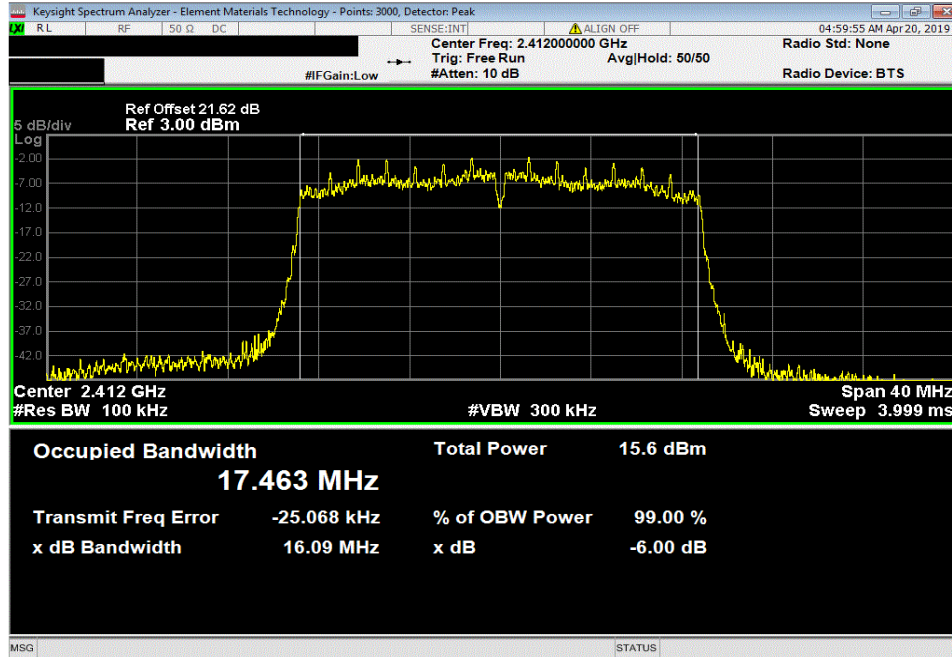


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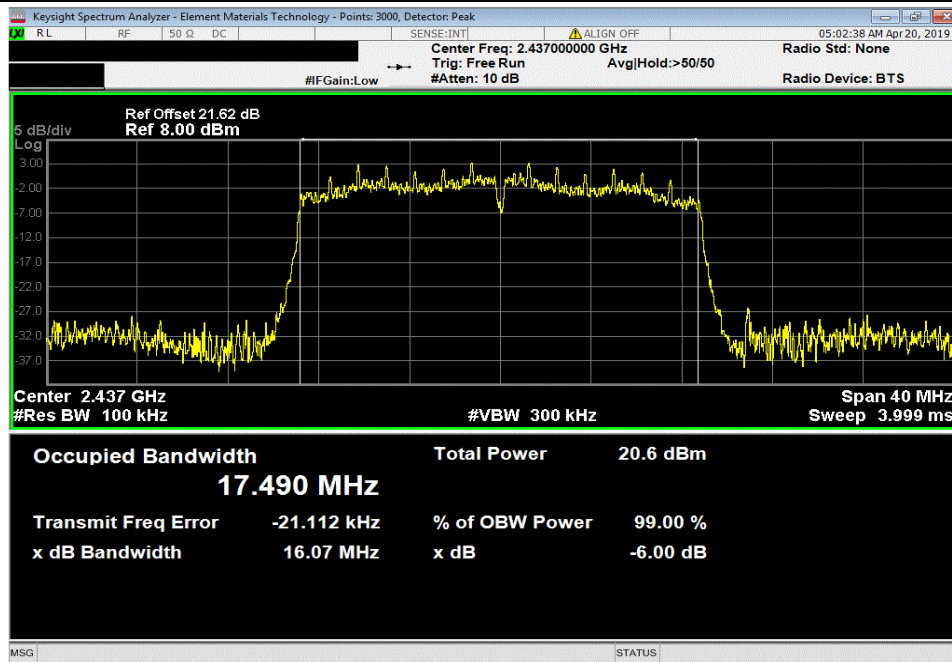


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Antenna 1, 802.11(n) MCS0, Low Channel 1, 2412 MHz				Value	Limit	Result
					(>)	
				16.086 MHz	500 kHz	Pass



Antenna 1, 802.11(n) MCS0, Mid Channel 6, 2437 MHz				Value	Limit	Result
					(>)	
				16.07 MHz	500 kHz	Pass

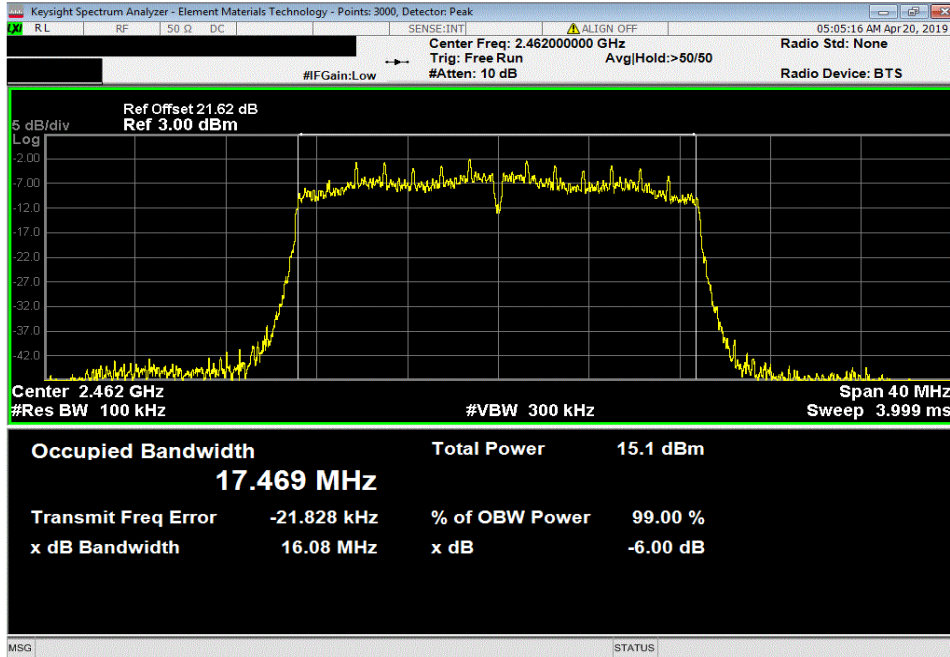


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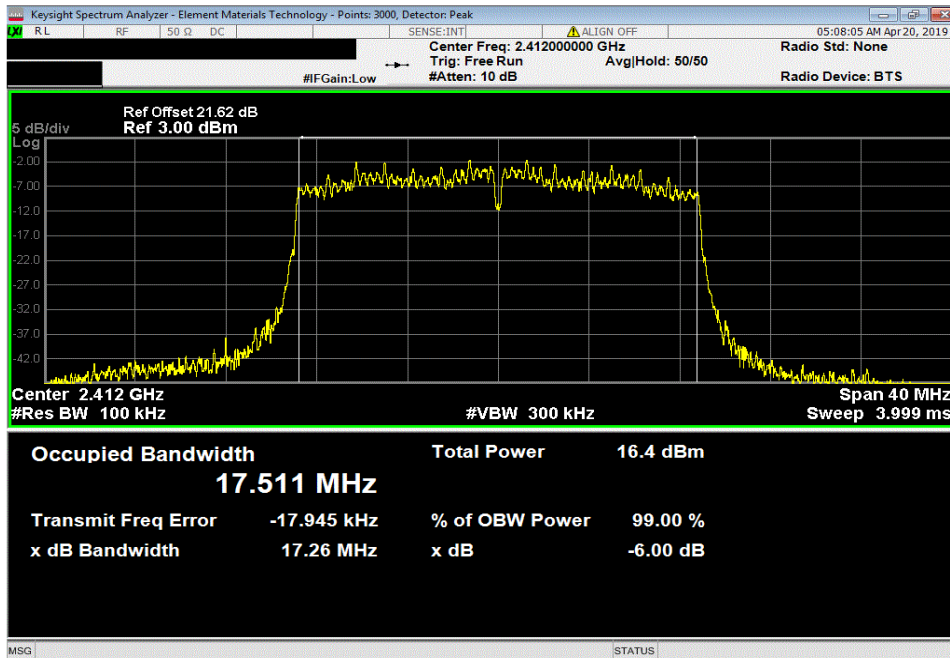


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Antenna 1, 802.11(n) MCS0, High Channel 11, 2462 MHz		
Value	Limit (>)	Result
16.083 MHz	500 kHz	Pass



Antenna 1, 802.11(n) MCS7, Low Channel 1, 2412 MHz		
Value	Limit (>)	Result
17.261 MHz	500 kHz	Pass

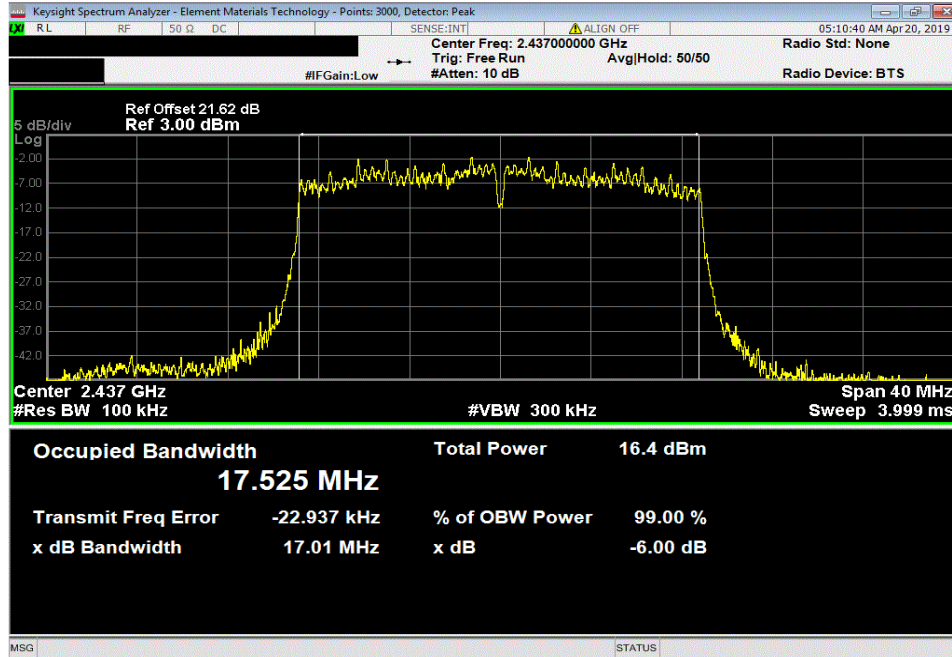


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TMTX 2018.09.13 XMI 2019.02.26

Antenna 1, 802.11(n) MCS7, Mid Channel 6, 2437 MHz						
				Value	Limit	Result
				17.01 MHz	500 kHz	Pass



Antenna 1, 802.11(n) MCS7, High Channel 11, 2462 MHz						
				Value	Limit	Result
				17.301 MHz	500 kHz	Pass

