

POWER SPECTRAL DENSITY



XMIT 2019.09.05

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
Attenuator	Fairview Microwave	SA4018-20	TYE	18-Sep-19	18-Sep-20
Block - DC	Fairview Microwave	SD3379	AMT	18-Sep-19	18-Sep-20
Cable	Micro-Coax	UFD150A-1-0720-200200	TXG	18-Sep-19	18-Sep-20
Generator - Signal	Keysight	N5171B-506	TEW	2-May-18	2-May-21
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	5-May-19	5-May-20

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The maximum power spectral density measurements was measured using the channels and modes as called out on the following data sheets.

Per the procedure outlined in ANSI C63.10 the peak power spectral density was measured in a 3 kHz RBW.

POWER SPECTRAL DENSITY



TSTx 2019.08.30.0 XMI 2019.09.05

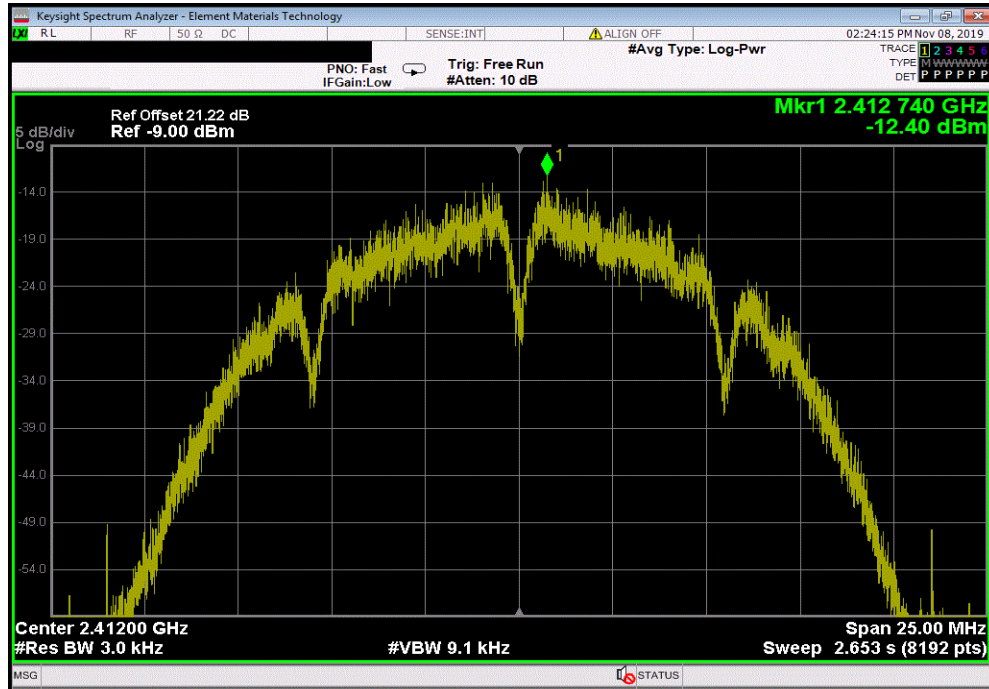
EUT: V300		Work Order: WTV0027	
Serial Number: 63		Date: 8-Nov-19	
Customer: WatchGuard Video		Temperature: 23.2 °C	
Attendees: Navaid Karimi		Humidity: 26.2% RH	
Project: None		Barometric Pres.: 1035 mbar	
Tested by: Jonathan Kiefer		Power: Battery	
		Job Site: TX09	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2019		ANSI C63.10:2013	
COMMENTS			
Reference Offset 21.22 dB (20dB attenuator+dc block+cable).			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	3	Signature <i>Jonathan Kiefer</i>	
		Value dBm/3kHz	Limit < dBm/3kHz
2400 MHz - 2483.5 MHz Band			
802.11(b) 1 Mbps			
	Low Channel 1, 2412 MHz	-12.397	8
	Mid Channel 6, 2437 MHz	-13.086	8
	High Channel 11, 2462 MHz	-13.08	8
802.11(b) 11 Mbps			
	Low Channel 1, 2412 MHz	-13.062	8
	Mid Channel 6, 2437 MHz	-13.915	8
	High Channel 11, 2462 MHz	-14.372	8
802.11(g) 6 Mbps			
	Low Channel 1, 2412 MHz	-19.054	8
	Mid Channel 6, 2437 MHz	-19.18	8
	High Channel 11, 2462 MHz	-19.914	8
802.11(g) 36 Mbps			
	Low Channel 1, 2412 MHz	-19.227	8
	Mid Channel 6, 2437 MHz	-19.358	8
	High Channel 11, 2462 MHz	-18.49	8
802.11(g) 54 Mbps			
	Low Channel 1, 2412 MHz	-17.999	8
	Mid Channel 6, 2437 MHz	-19.728	8
	High Channel 11, 2462 MHz	-20.206	8
802.11(n) MCS0			
	Low Channel 1, 2412 MHz	-20.102	8
	Mid Channel 6, 2437 MHz	-19.818	8
	High Channel 11, 2462 MHz	-21.137	8
802.11(n) MCS7			
	Low Channel 1, 2412 MHz	-20.151	8
	Mid Channel 6, 2437 MHz	-19.984	8
	High Channel 11, 2462 MHz	-21.128	8

POWER SPECTRAL DENSITY

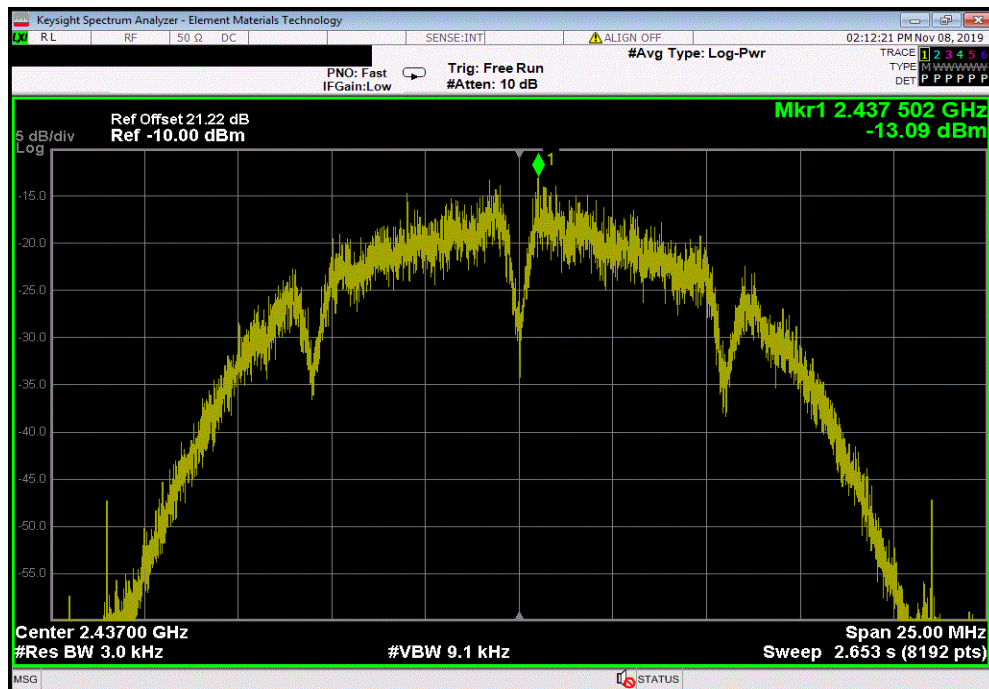


TbTx 2019.08.30.0 XMI 2019.09.05

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-12.397	8	Pass			



2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-13.086	8	Pass			

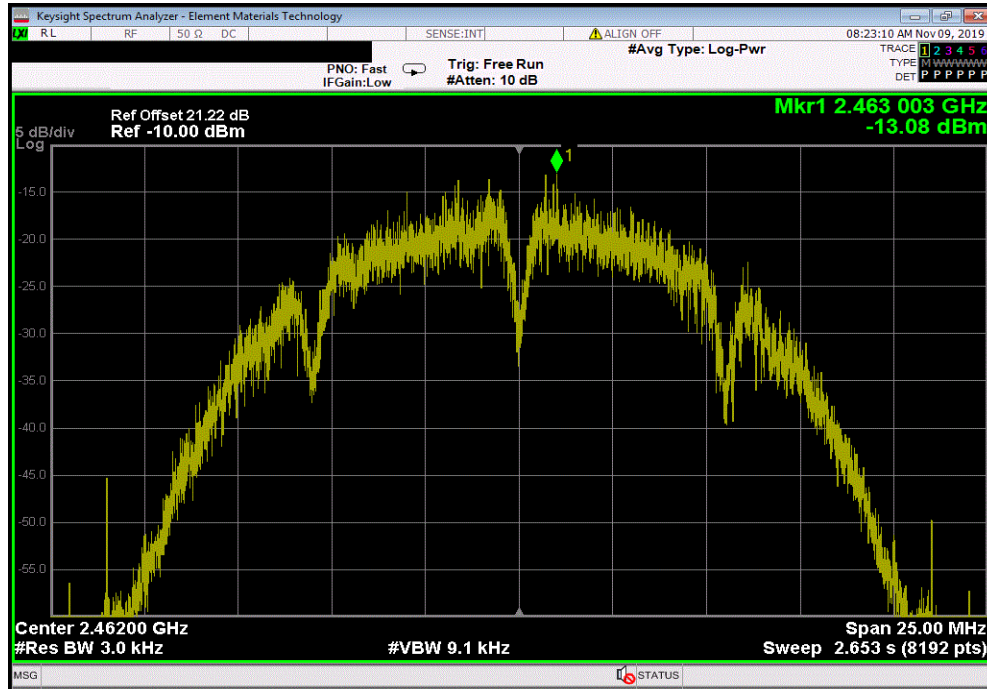


POWER SPECTRAL DENSITY

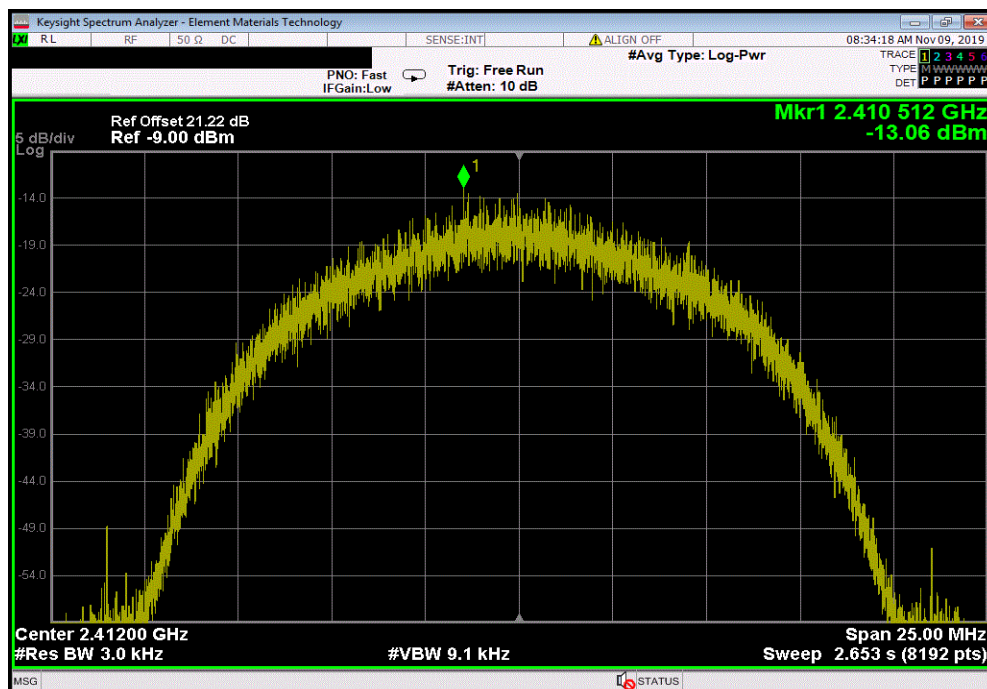


TbTx 2019.08.30.0 XMI 2019.09.05

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
Value				Limit	Results	
dBm/3kHz				< dBm/3kHz		
				-13.08	8	Pass



2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
Value				Limit	Results	
dBm/3kHz				< dBm/3kHz		
				-13.062	8	Pass

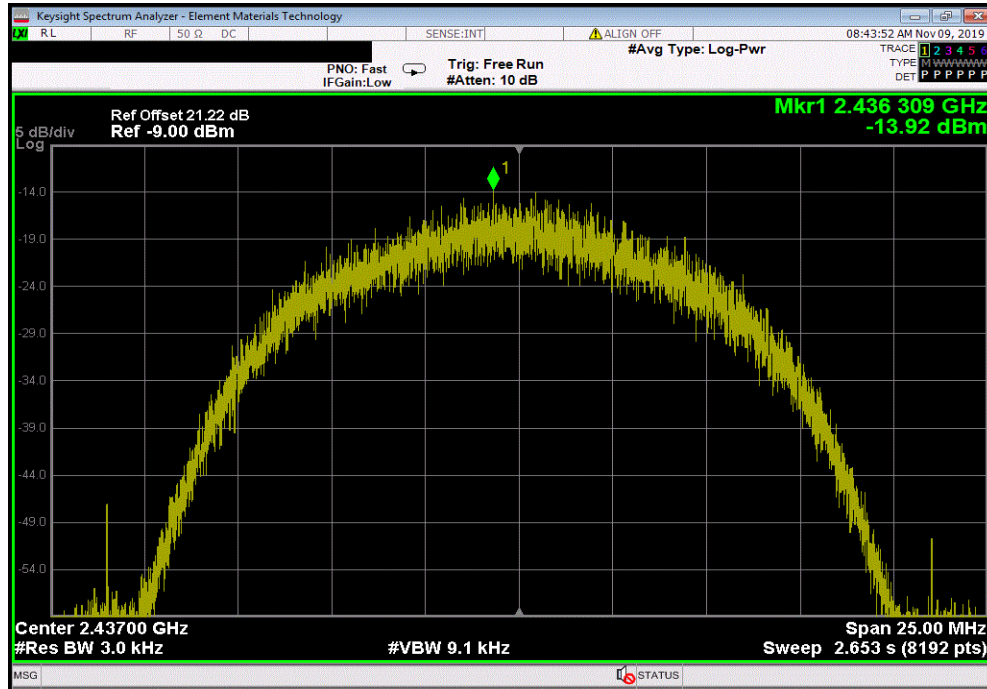


POWER SPECTRAL DENSITY

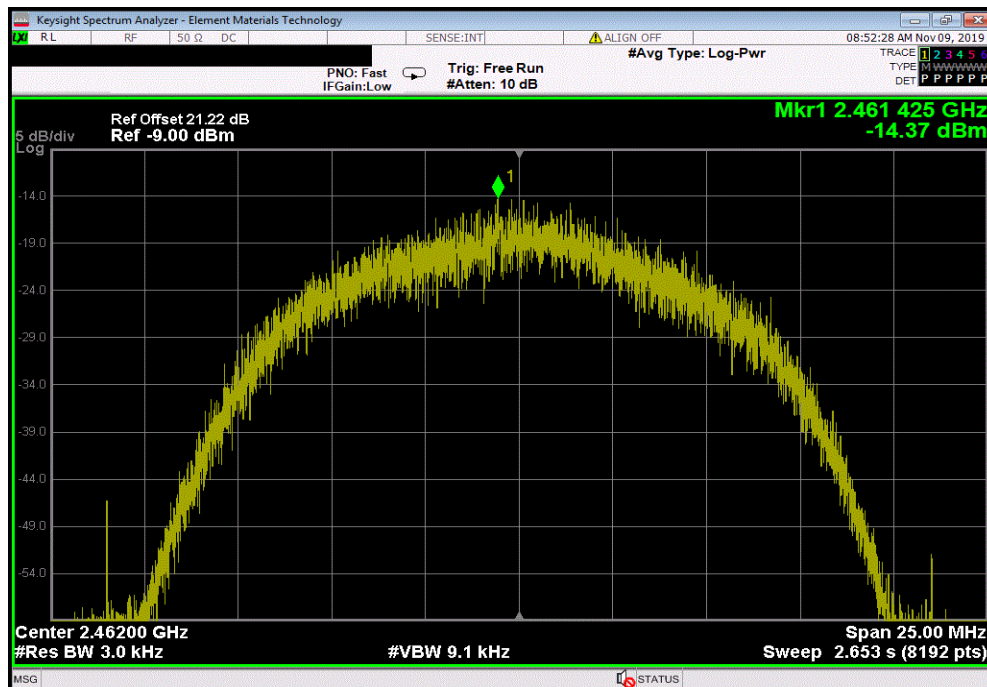


TbTx 2019.08.30.0 XMI 2019.09.05

2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz						
Value				Limit	Results	
dBm/3kHz				< dBm/3kHz		
				-13.915	8	Pass



2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
Value				Limit	Results	
dBm/3kHz				< dBm/3kHz		
				-14.372	8	Pass

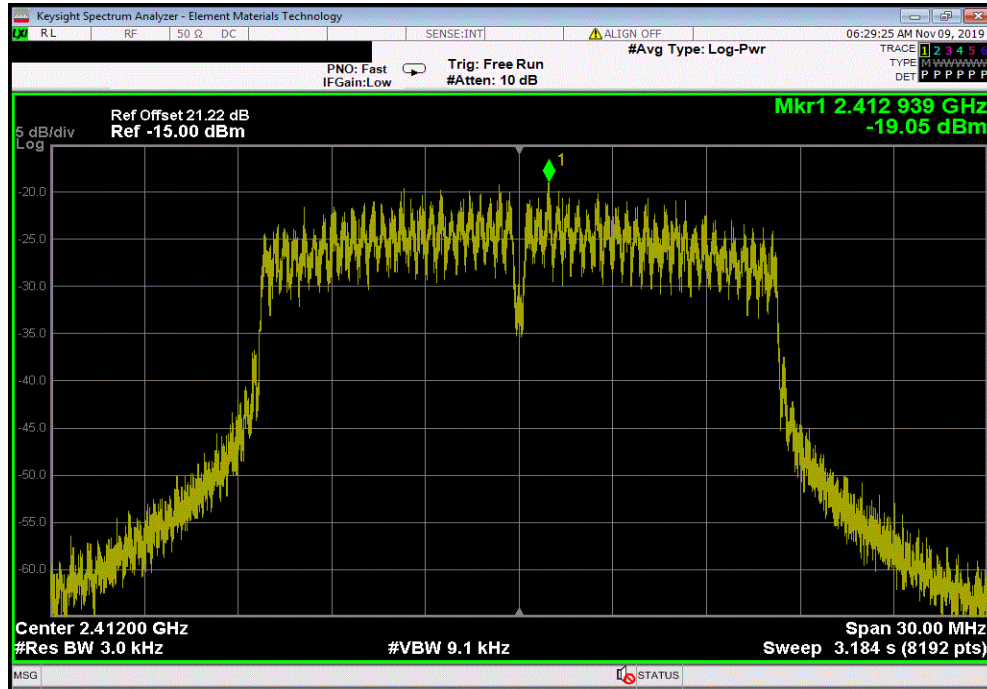


POWER SPECTRAL DENSITY

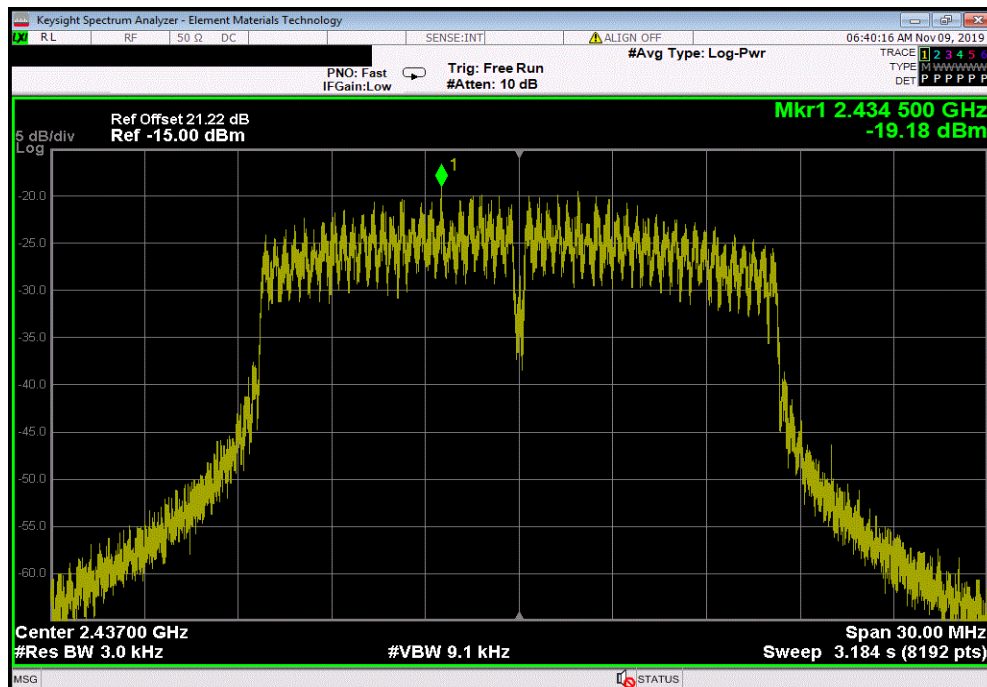


TbTx 2019.08.30.0 XMI 2019.09.05

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
Value				Limit	Results	
dBm/3kHz				< dBm/3kHz		
				-19.054	8	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
Value				Limit	Results	
dBm/3kHz				< dBm/3kHz		
				-19.18	8	Pass

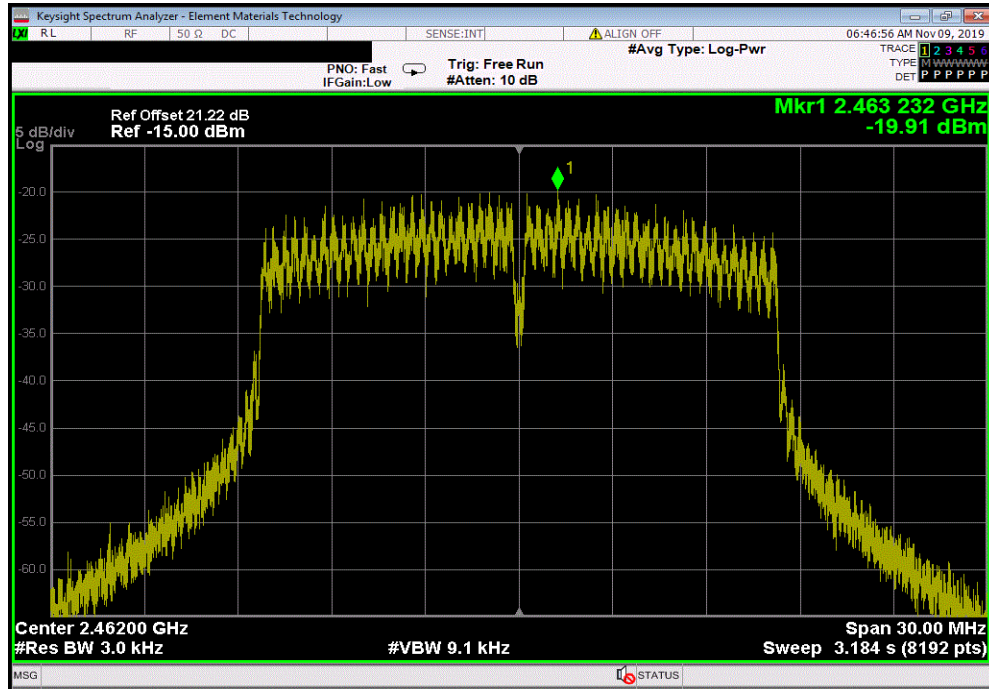


POWER SPECTRAL DENSITY

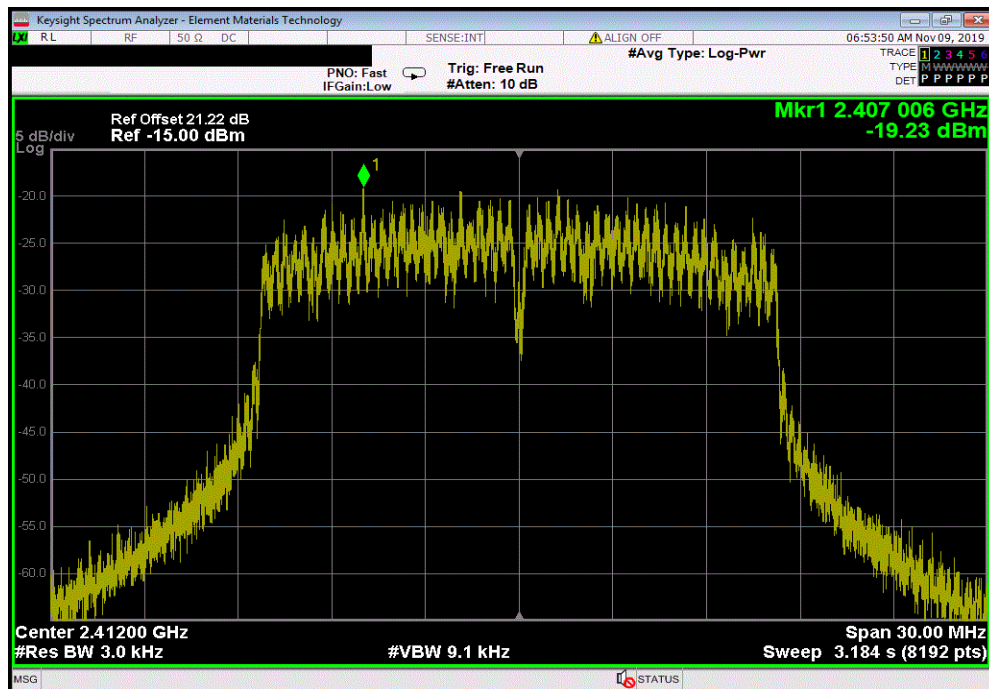


TbTx 2019.08.30.0 XMI 2019.09.05

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-19.914	8	Pass			



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-19.227	8	Pass			



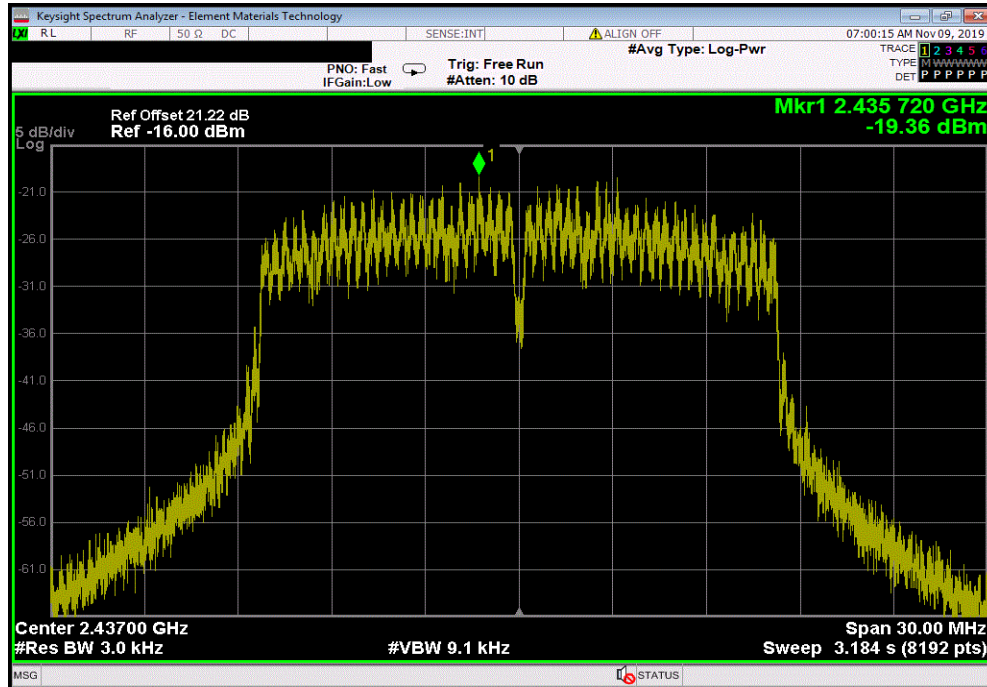
POWER SPECTRAL DENSITY



TbTx 2019.08.30.0 XMI 2019.09.05

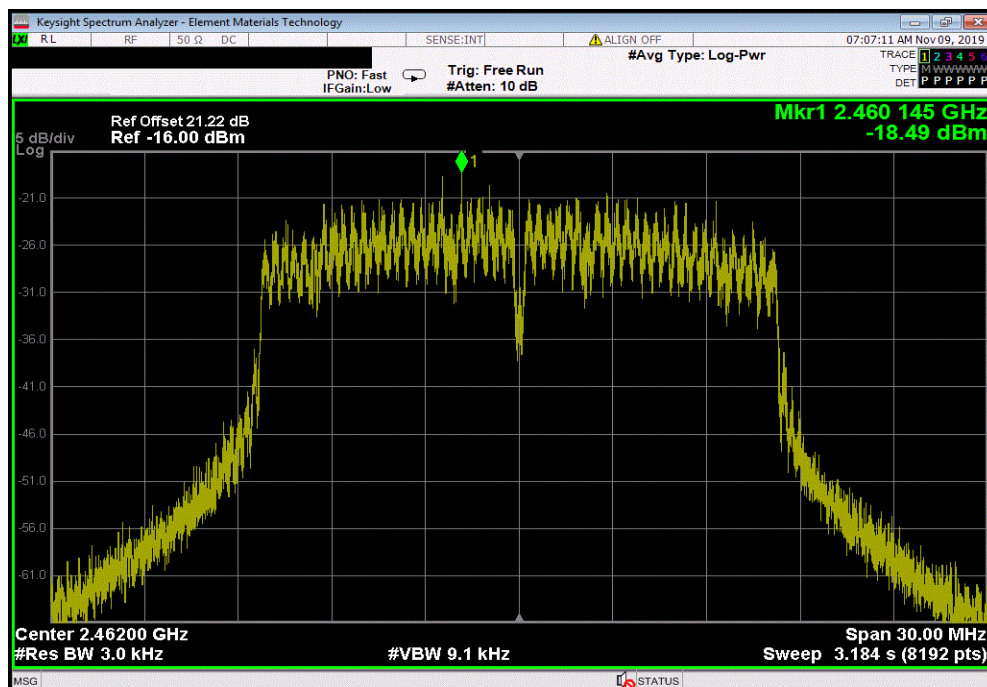
2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz

	Value	Limit	Results
	dBm/3kHz	< dBm/3kHz	
	-19.358	8	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz

	Value	Limit	Results
	dBm/3kHz	< dBm/3kHz	
	-18.49	8	Pass

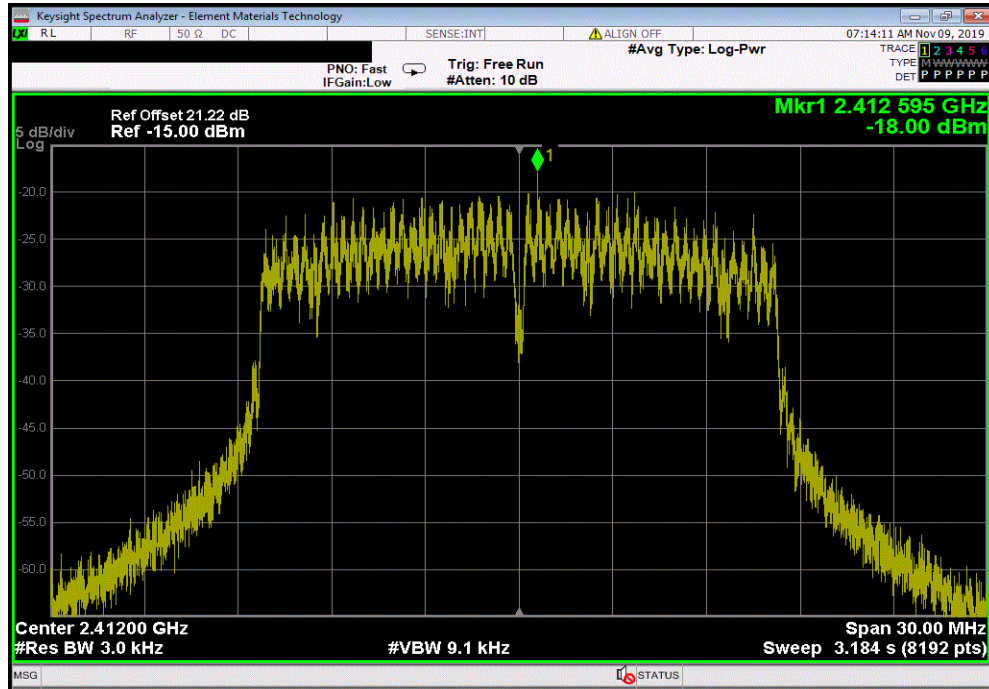


POWER SPECTRAL DENSITY

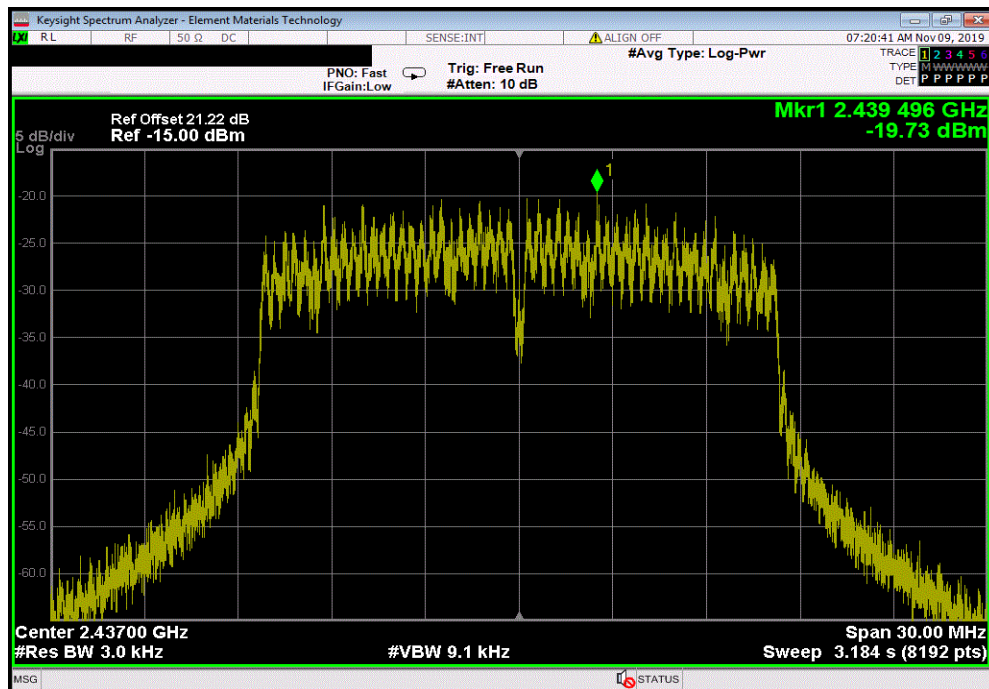


TbTx 2019.08.30.0 XMI 2019.09.05

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-17.999	8	Pass			



2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-19.728	8	Pass			

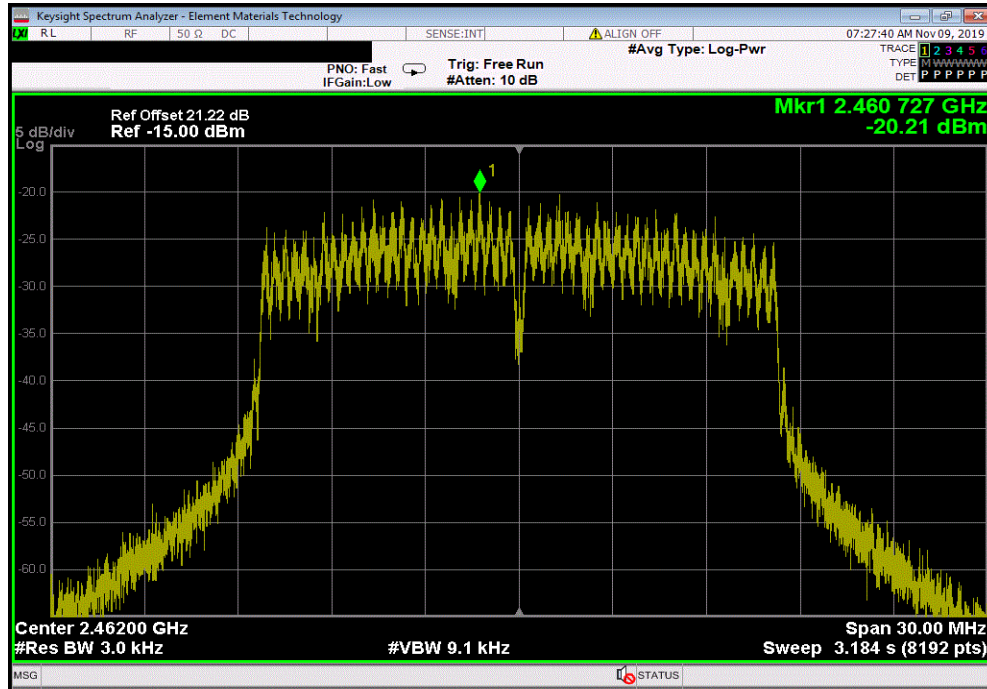


POWER SPECTRAL DENSITY

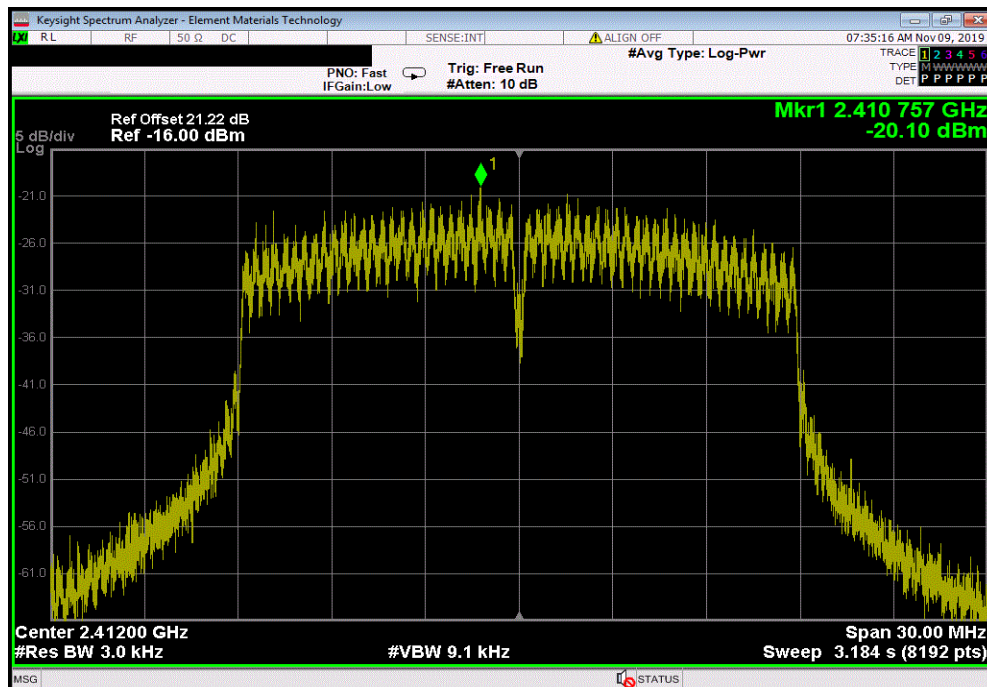


TbTx 2019.08.30.0 XMI 2019.09.05

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-20.206	8	Pass			



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-20.102	8	Pass			

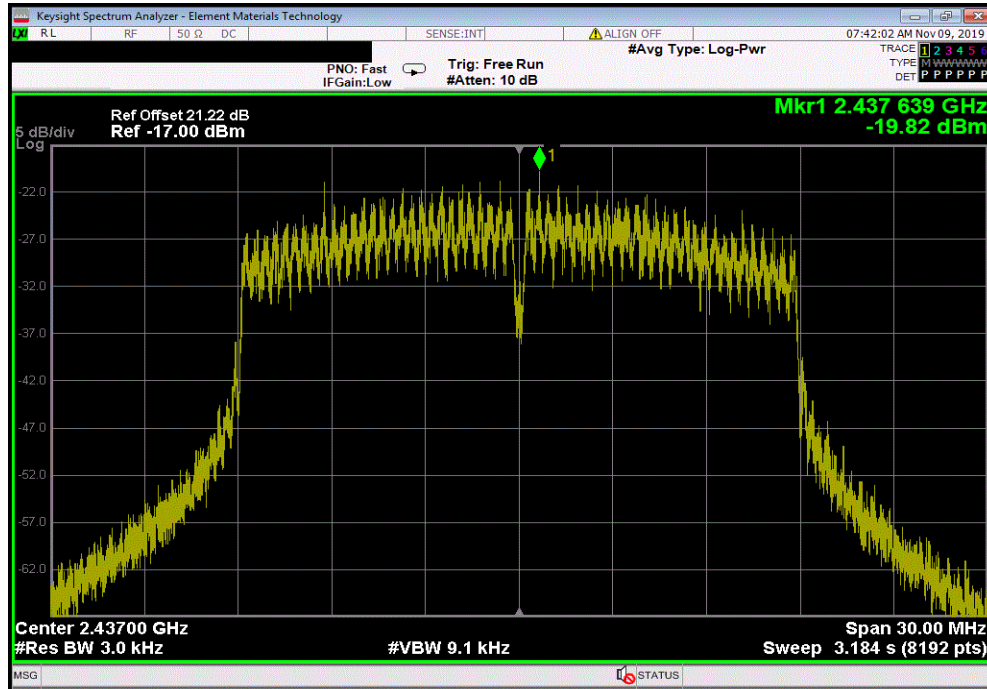


POWER SPECTRAL DENSITY

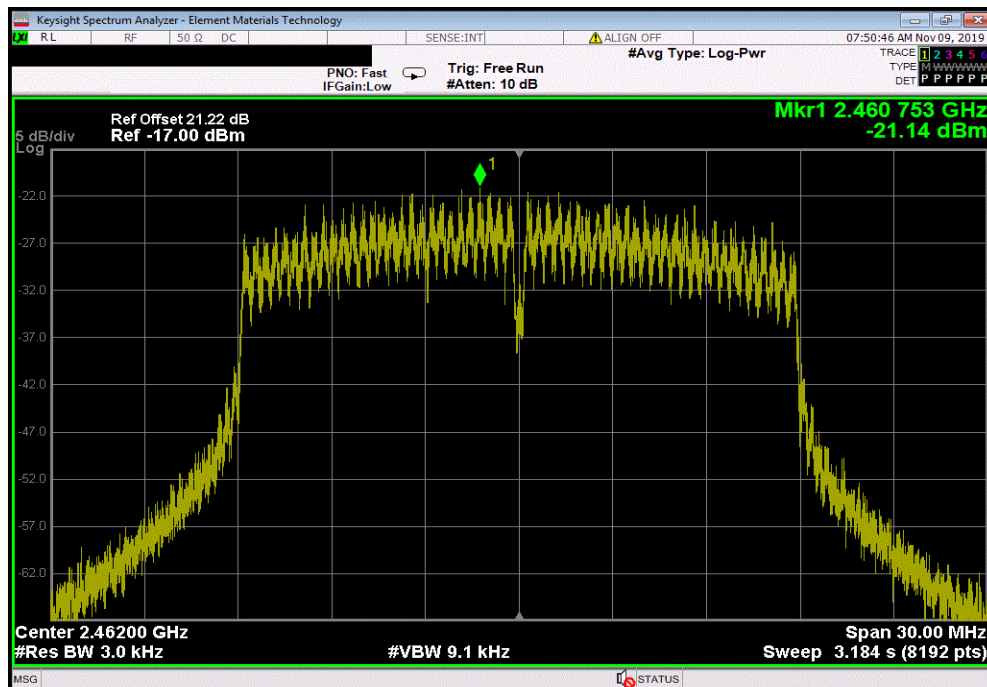


TbTx 2019.08.30.0 XMI 2019.09.05

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
Value				Limit	Results	
dBm/3kHz				< dBm/3kHz		
				-19.818	8	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz						
Value				Limit	Results	
dBm/3kHz				< dBm/3kHz		
				-21.137	8	Pass

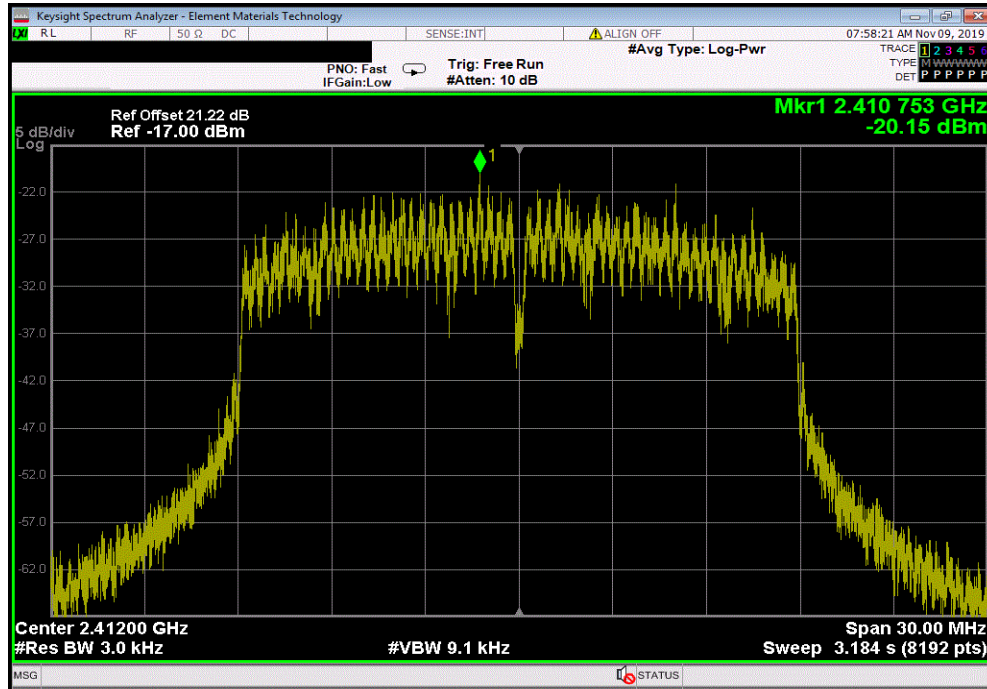


POWER SPECTRAL DENSITY

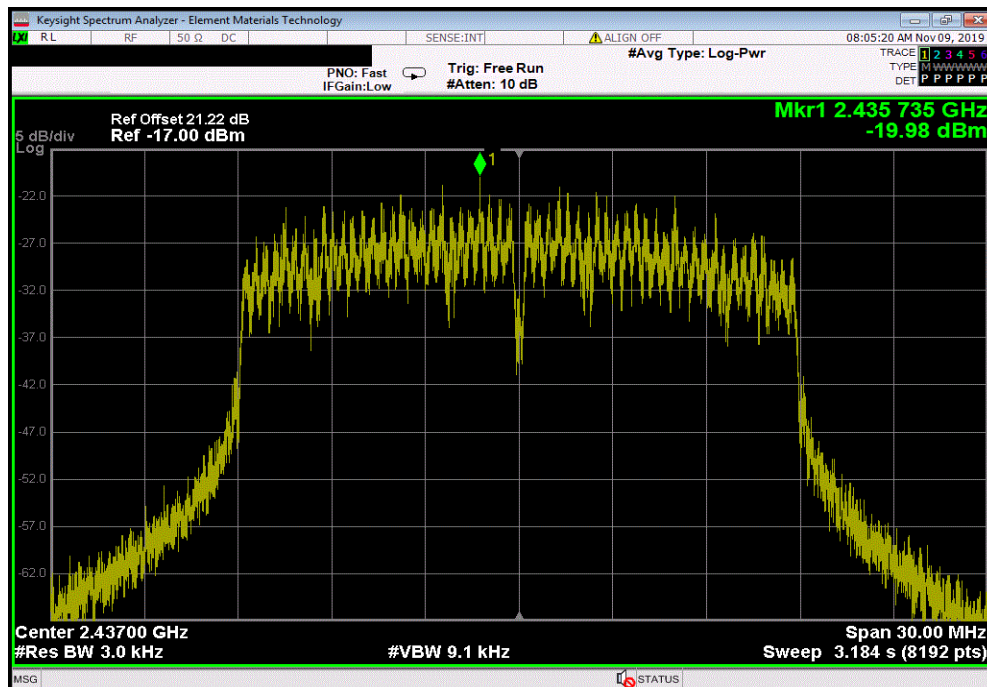


TMbTx 2019.08.30.0 XMI 2019.09.05

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-20.151	8	Pass			



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-19.984	8	Pass			

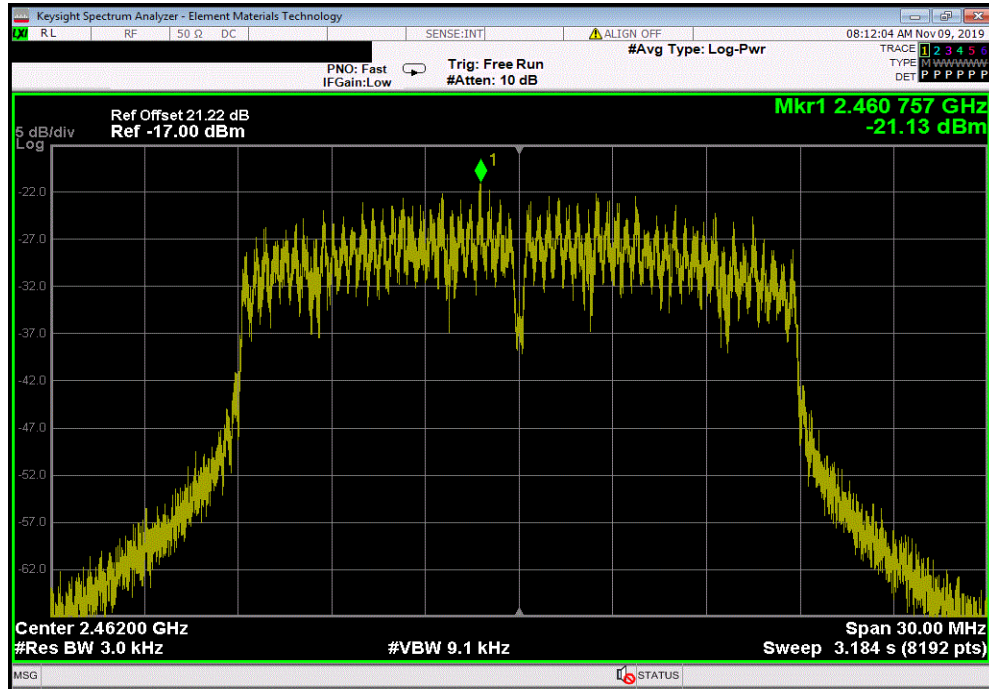


POWER SPECTRAL DENSITY



TbTx 2019.08.30.0 XMI 2019.09.05

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz						
Value			Limit		Results	
dBm/3kHz			< dBm/3kHz			
-21.128			8		Pass	



BAND EDGE COMPLIANCE



XMIT 2019.09.05

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
Attenuator	Fairview Microwave	SA4018-20	TYE	18-Sep-19	18-Sep-20
Block - DC	Fairview Microwave	SD3379	AMT	18-Sep-19	18-Sep-20
Cable	Micro-Coax	UFD150A-1-0720-200200	TXG	18-Sep-19	18-Sep-20
Generator - Signal	Keysight	N5171B-506	TEW	2-May-18	2-May-21
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	5-May-19	5-May-20

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in each available band. The channels closest to the band edges were selected. The EUT was transmitting at the data rate(s) listed in the datasheet.

The spectrum was scanned below the lower band edge and above the higher band edge.

An RMS detector was used to match the method called out for Output Power. Because the reference level was taken with an RMS detector, the attenuation requirement is -30 dBc.

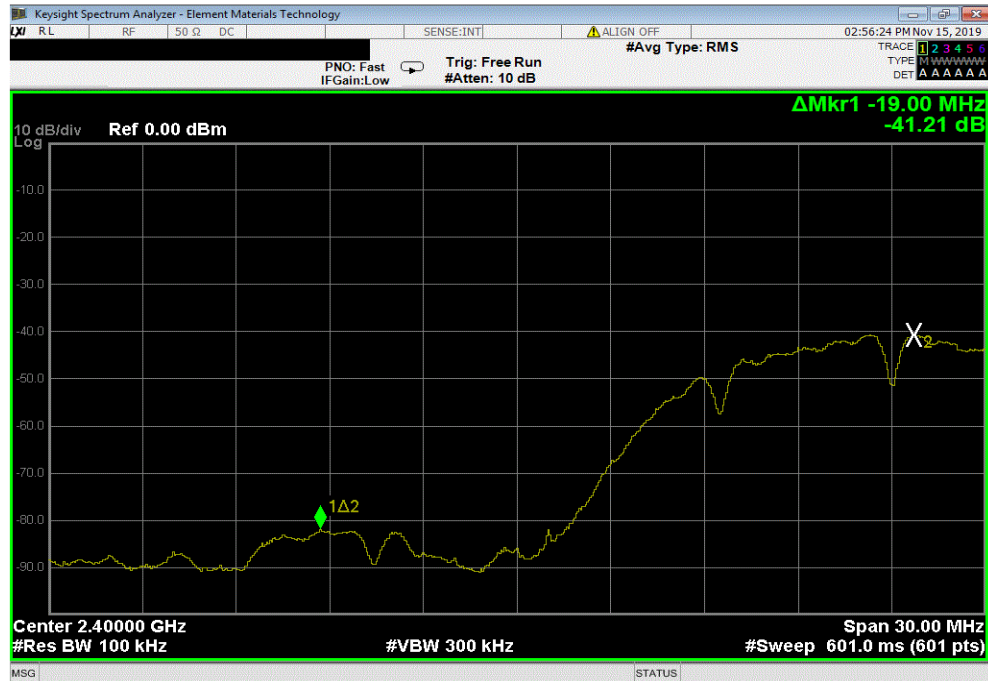
BAND EDGE COMPLIANCE



TMTx 2019.08.30.0 XMI 2019.09.05

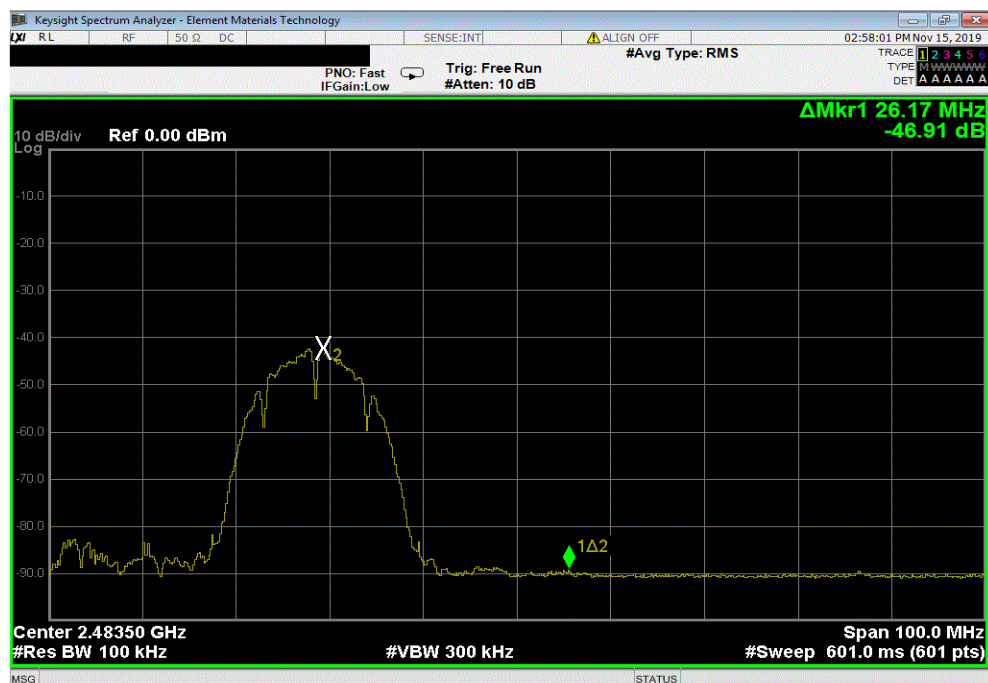
EUT: V300		Work Order: WTV0027	
Serial Number: 63		Date: 15-Nov-19	
Customer: WatchGuard Video		Temperature: 22.8 °C	
Attendees: Navaid Karimi		Humidity: 37.7% RH	
Project: None		Barometric Pres.: 1030 mbar	
Tested by: Marty Martin		Power: Battery	
		Job Site: TX02	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2019		ANSI C63.10:2013	
COMMENTS			
None			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	3	Signature <i>Marty Martin</i>	
		Value (dBc)	Limit ≤ (dBc) Result
2400 MHz - 2483.5 MHz Band			
802.11(b) 1 Mbps			
Low Channel 1, 2412 MHz		-41.21	-30 Pass
High Channel 11, 2462 MHz		-46.91	-30 Pass
802.11(b) 11 Mbps			
Low Channel 1, 2412 MHz		-43.47	-30 Pass
High Channel 11, 2462 MHz		-46.02	-30 Pass
802.11(g) 6 Mbps			
Low Channel 1, 2412 MHz		-33.35	-30 Pass
High Channel 11, 2462 MHz		-40.39	-30 Pass
802.11(g) 36 Mbps			
Low Channel 1, 2412 MHz		-34.32	-30 Pass
High Channel 11, 2462 MHz		-39.82	-30 Pass
802.11(g) 54 Mbps			
Low Channel 1, 2412 MHz		-34.55	-30 Pass
High Channel 11, 2462 MHz		-39.99	-30 Pass
802.11(n) MCS0			
Low Channel 1, 2412 MHz		-33.72	-30 Pass
High Channel 11, 2462 MHz		-38.77	-30 Pass
802.11(n) MCS7			
Low Channel 1, 2412 MHz		-35.73	-30 Pass
High Channel 11, 2462 MHz		-38.23	-30 Pass

Value (dBc)	Limit ≤ (dBc)	Result
-41.21	-30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz

Value (dBc)	Limit ≤ (dBc)	Result
-46.91	-30	Pass

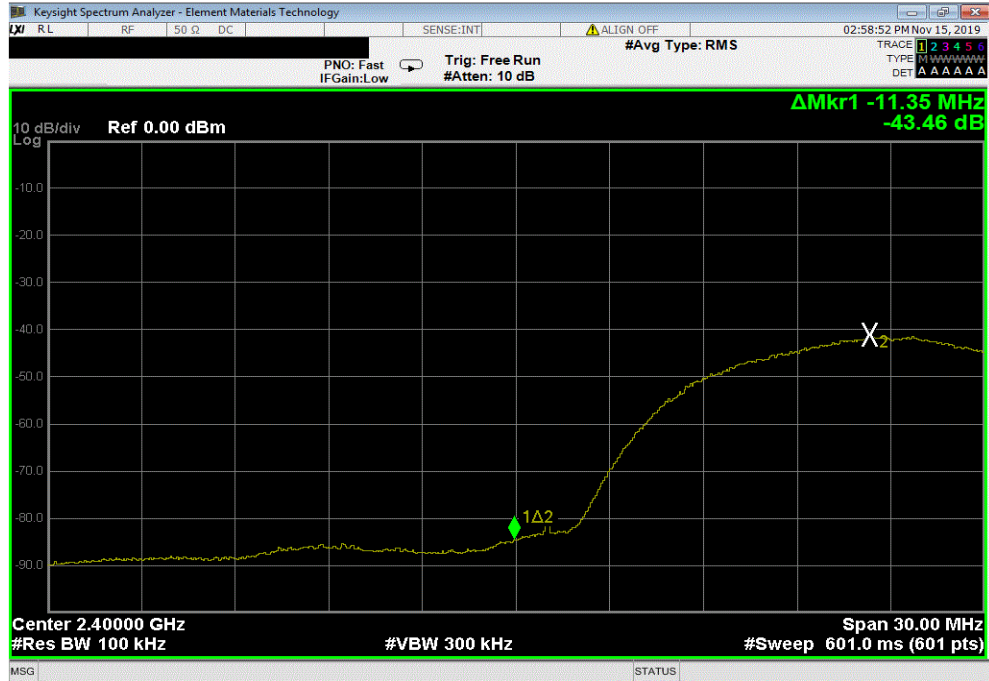


BAND EDGE COMPLIANCE

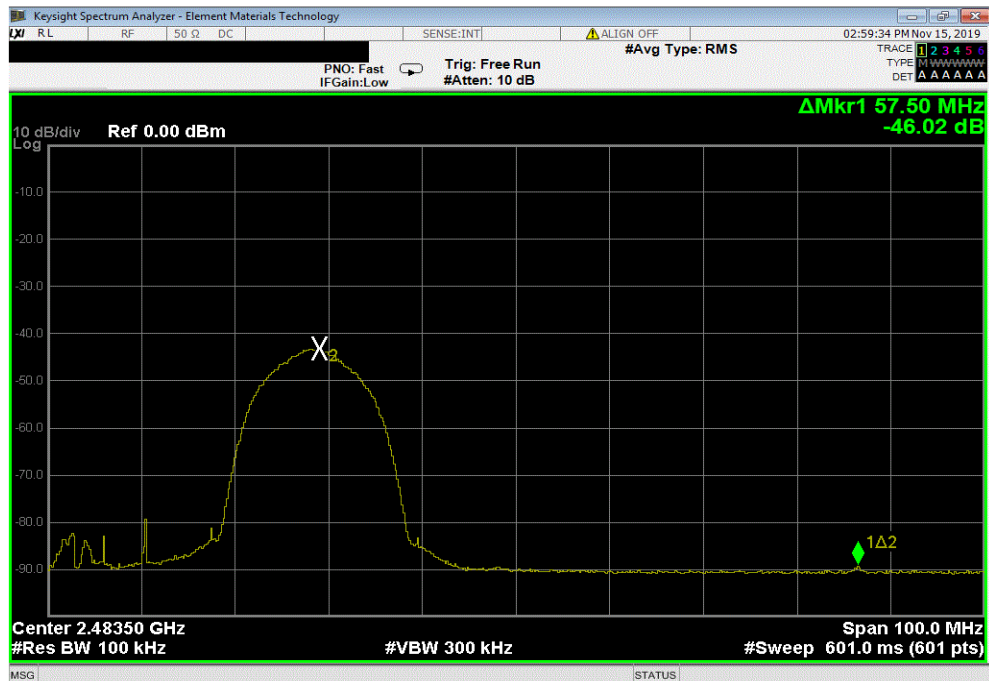


TbTx 2019.08.30.0 XMI 2019.09.05

2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-43.47	-30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-46.02	-30	Pass



ThyTx 2019.08.20.0 YMit 2019.09.01

Keysight Spectrum Analyzer - Element Materials Technology

RL 50 Ω DC SENSE:INT ALIGN OFF 03:00:15 PM Nov 15, 2019

PNO: Fast IFGain: Low Trig: Free Run #AvG Type: RMS

Trig: Free Run #Atten: 10 dB

TRACE 1 2 3 4 5 6
TYPE 1 1 1 1 1 1 1 1 1 1
DET A A A A A A A A

10 dB/div Log Ref 0.00 dBm

Δ Mkr1 -13.50 MHz
-33.35 dB

Center 2.40000 GHz
#Res BW 100 kHz

#VBW 300 kHz

Span 30.00 MHz
#Sweep 601.0 ms (601 pts)

MSG STATUS

Keysight Spectrum Analyzer - Element Materials Technology

03:00:58 PM Nov 15, 2019

RL 50 Ω DC SENSE:INT ALIGN OFF #Avg Type: RMS

PNO: Fast IFGain:Low Trig: Free Run #Atten: 10 dB

TRACE 1 2 3 4 5 6
TYPE M W W W W W W W
DET A A A A A A A

10 dB/div Log Ref 0.00 dBm

Δ Mkr1 60.50 MHz
-40.39 dB

Center 2.48350 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 100.0 MHz
#Sweep 601.0 ms (601 pts)

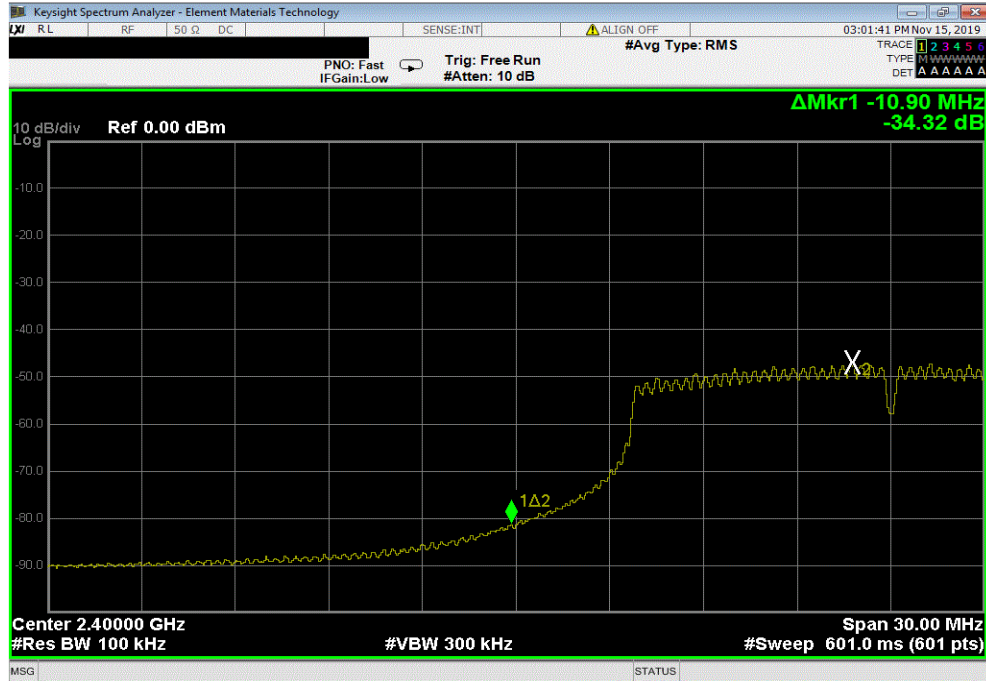
The figure shows a Keysight Spectrum Analyzer display. The main plot area is a grid with a yellow signal trace. The signal is centered at 2.48350 GHz. The peak of the signal is marked with a white 'X' and a measurement of 10.00 dBm. The signal is centered at 2.48350 GHz with a resolution bandwidth of 100 kHz and a video bandwidth of 300 kHz. The span is 100.0 MHz. The sweep time is 601.0 ms (601 pts). The peak is labeled with a white 'X' and a measurement of 10.00 dBm. The signal is centered at 2.48350 GHz with a resolution bandwidth of 100 kHz and a video bandwidth of 300 kHz. The span is 100.0 MHz. The sweep time is 601.0 ms (601 pts).

BAND EDGE COMPLIANCE

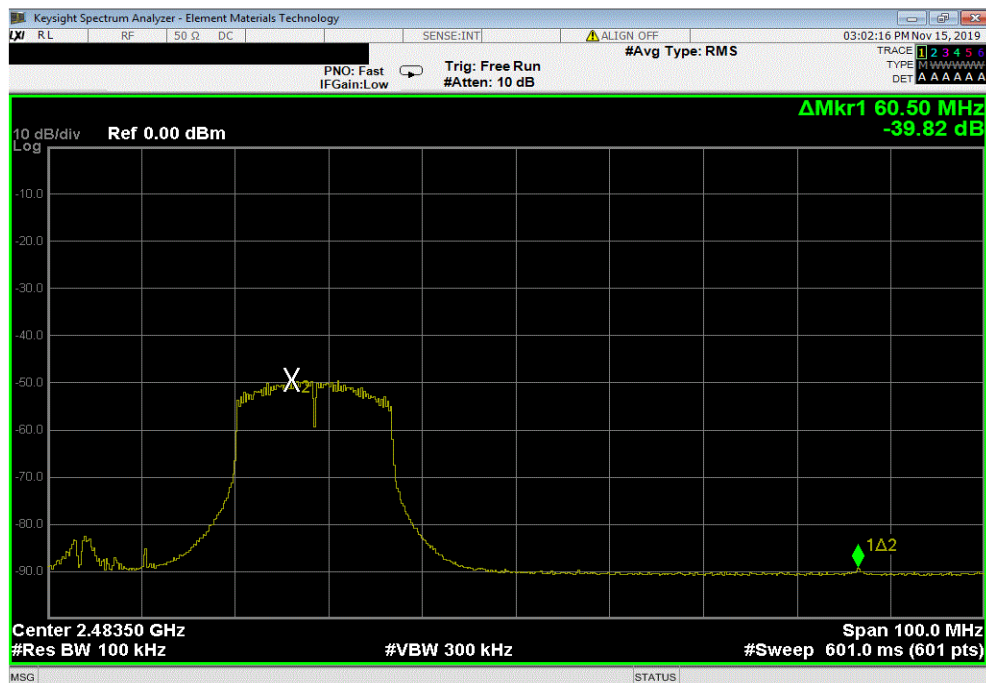


TbTx 2019.08.30.0 XMI 2019.09.05

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
	Value	Limit	Result			
	(dBc)	≤ (dBc)				
	-34.32	-30	Pass			



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
	Value	Limit	Result			
	(dBc)	≤ (dBc)				
	-39.82	-30	Pass			

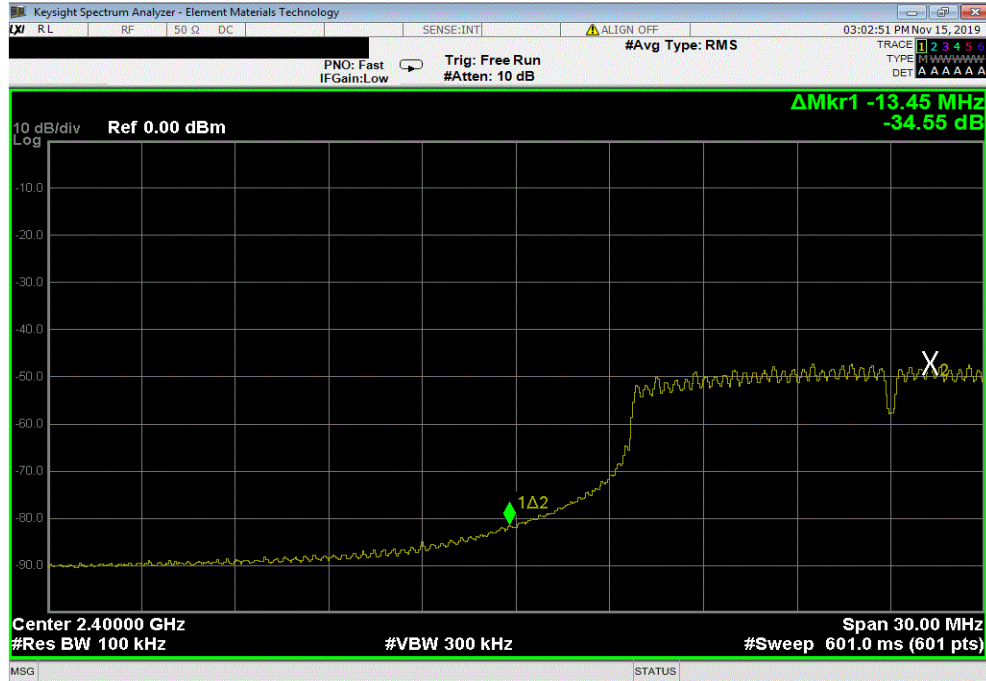


BAND EDGE COMPLIANCE

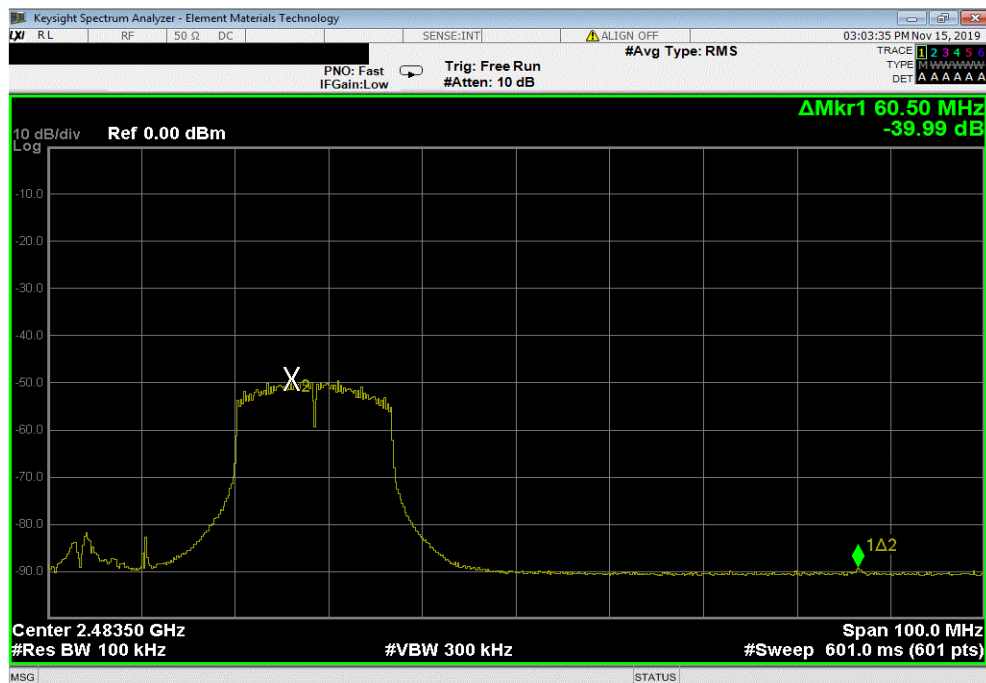


TbTtx 2019.08.30.0 XMI 2019.09.05

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-34.55	-30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-39.99	-30	Pass

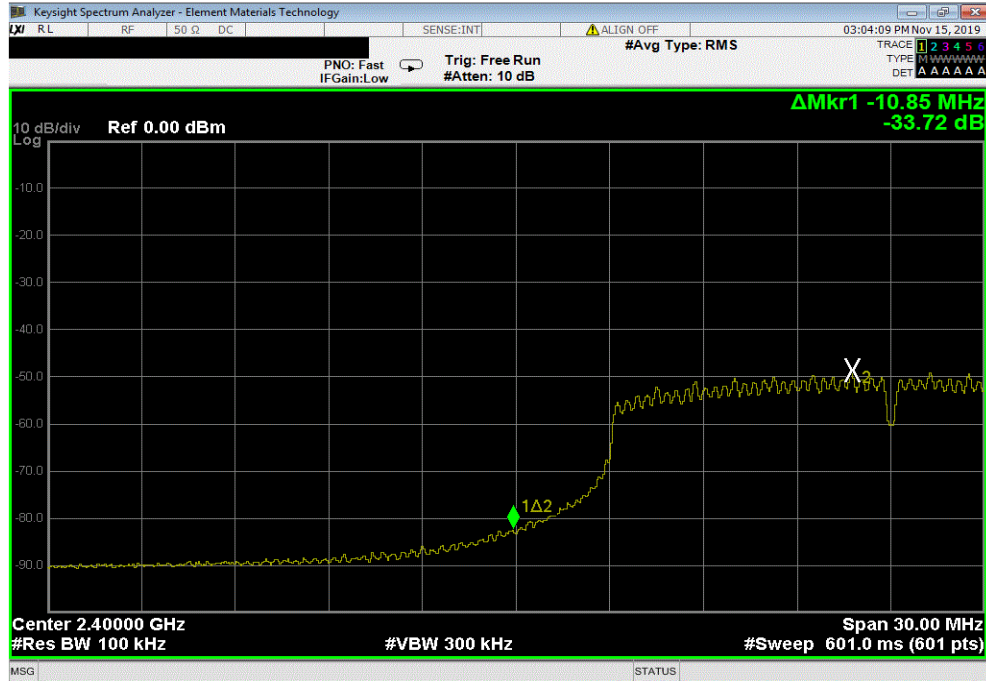


BAND EDGE COMPLIANCE

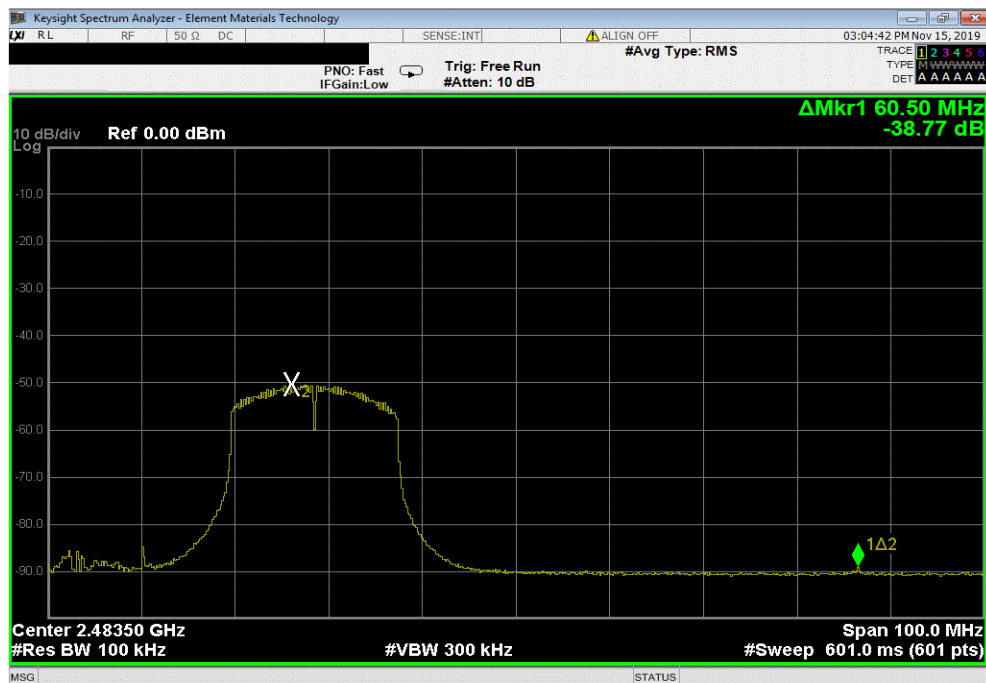


TbTx 2019.08.30.0 XMI 2019.09.05

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-33.72	-30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-38.77	-30	Pass

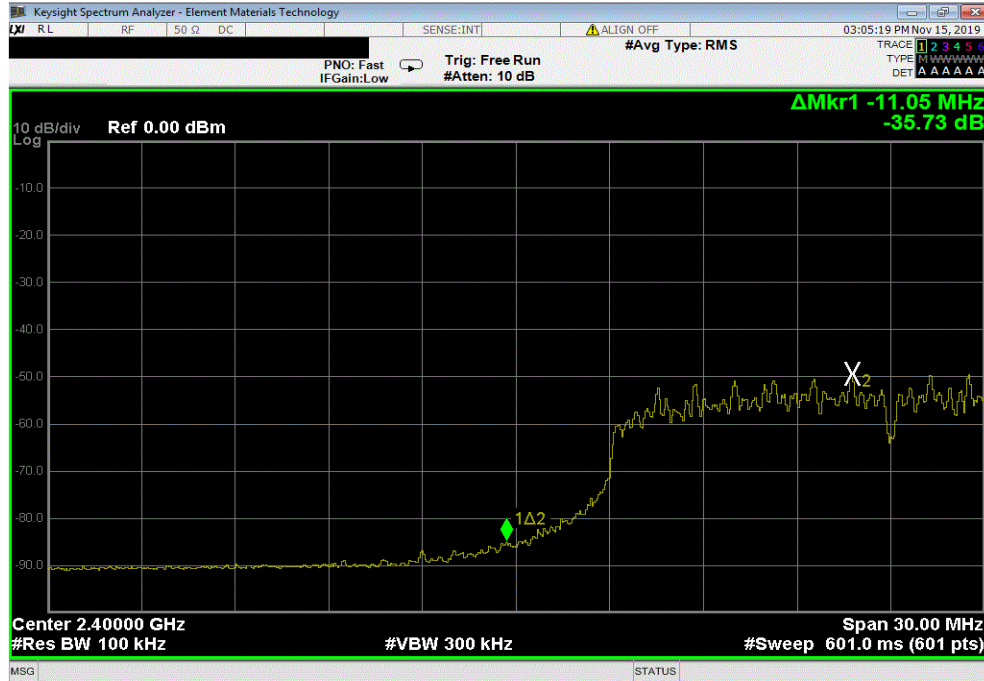


BAND EDGE COMPLIANCE



TbTx 2019.08.30.0 XMI 2019.09.05

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-35.73	-30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-38.23	-30	Pass

