

POWER SPECTRAL DENSITY

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	28-Apr-20	28-Apr-23
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	15-Sep-19	15-Sep-20
Attenuator	S.M. Electronics	SA26B-20	RFW	10-Feb-20	10-Feb-21
Block - DC	Fairview Microwave	SD3379	AMI	5-Aug-20	5-Aug-21
Analyzer - Spectrum Analyzer	Keysight	N9010A (EXA)	AFQ	21-Dec-19	21-Dec-20

TEST DESCRIPTION

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 XMR 2020.03.25.0

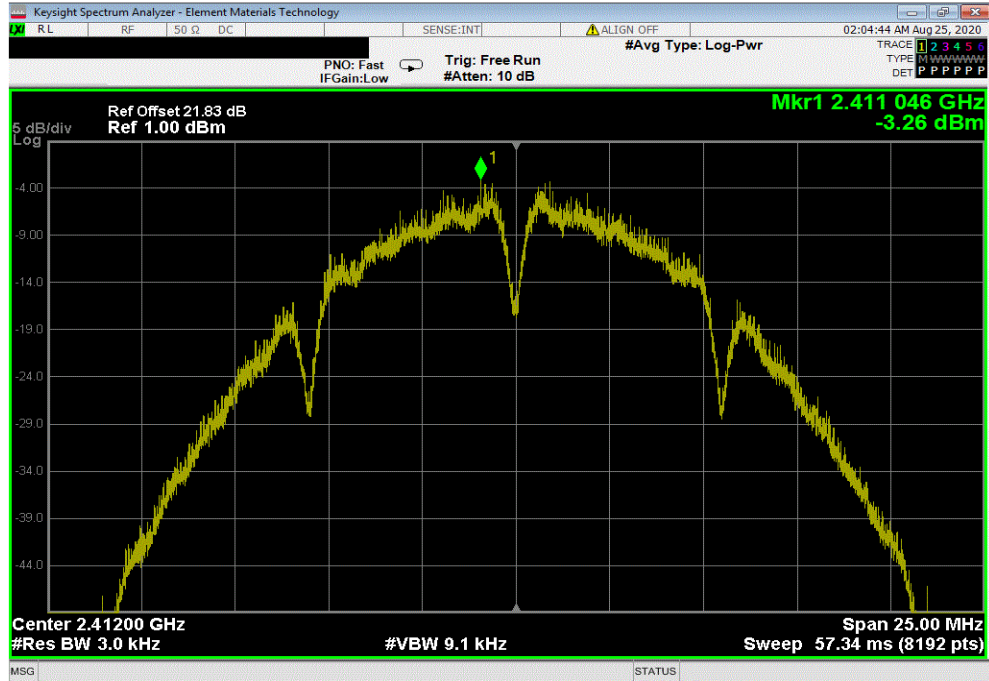
EUT: USB to WiFi Adapter		Work Order: TRNE0022	
Serial Number: 0022A301FF5D		Date: 24-Aug-20	
Customer: Trane		Temperature: 21.9 °C	
Attendees: Chris Vanderkoy		Humidity: 57.4% RH	
Project: None		Barometric Pres.: 1017 mbar	
Tested by: Dustin Sparks		Power: 5VDC via USB	
		Job Site: MN08	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2020		ANSI C63.10:2013	
COMMENTS			
Measurement cable, DC block, and 20 dB attenuator included in reference level offset.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	3	Signature <i>Dustin Sparks</i>	
		Value dBm/3kHz	Limit < dBm/3kHz
2400 MHz - 2483.5 MHz Band			
802.11(b) 1 Mbps			
	Low Channel 1, 2412 MHz	-3.257	8
	Mid Channel 6, 2437 MHz	-3.77	8
	High Channel 11, 2462 MHz	-4.201	8
802.11(b) 11 Mbps			
	Low Channel 1, 2412 MHz	2.097	8
	Mid Channel 6, 2437 MHz	1.854	8
	High Channel 11, 2462 MHz	-2.641	8
802.11(g) 6 Mbps			
	Low Channel 1, 2412 MHz	-7.312	8
	Mid Channel 6, 2437 MHz	-7.214	8
	High Channel 11, 2462 MHz	-11.9	8
802.11(g) 36 Mbps			
	Low Channel 1, 2412 MHz	-9.786	8
	Mid Channel 6, 2437 MHz	-9.745	8
	High Channel 11, 2462 MHz	-13.82	8
802.11(g) 54 Mbps			
	Low Channel 1, 2412 MHz	-12.737	8
	Mid Channel 6, 2437 MHz	-10.89	8
	High Channel 11, 2462 MHz	-13.943	8
802.11(n) MCS0			
	Low Channel 1, 2412 MHz	-7.964	8
	Mid Channel 6, 2437 MHz	-8.028	8
	High Channel 11, 2462 MHz	-13.901	8
802.11(n) MCS7			
	Low Channel 1, 2412 MHz	-10.721	8
	Mid Channel 6, 2437 MHz	-11.003	8
	High Channel 11, 2462 MHz	-15.506	8
			Results

POWER SPECTRAL DENSITY

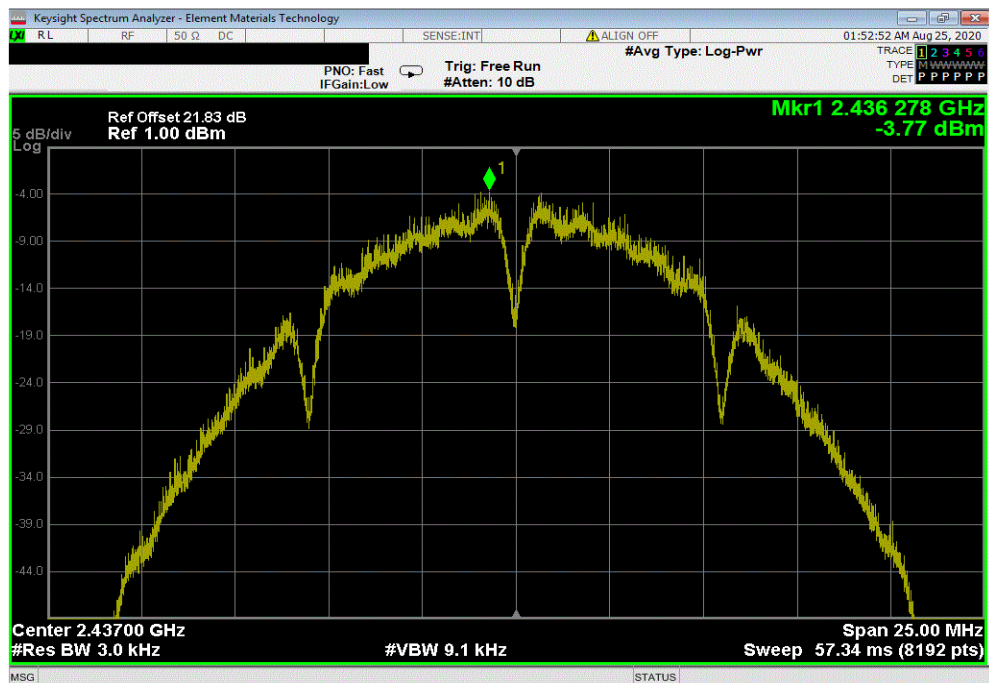


TMX 2019.08.30.0 XMR 2020.03.25.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-3.257	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			
	-3.77	8	Pass			

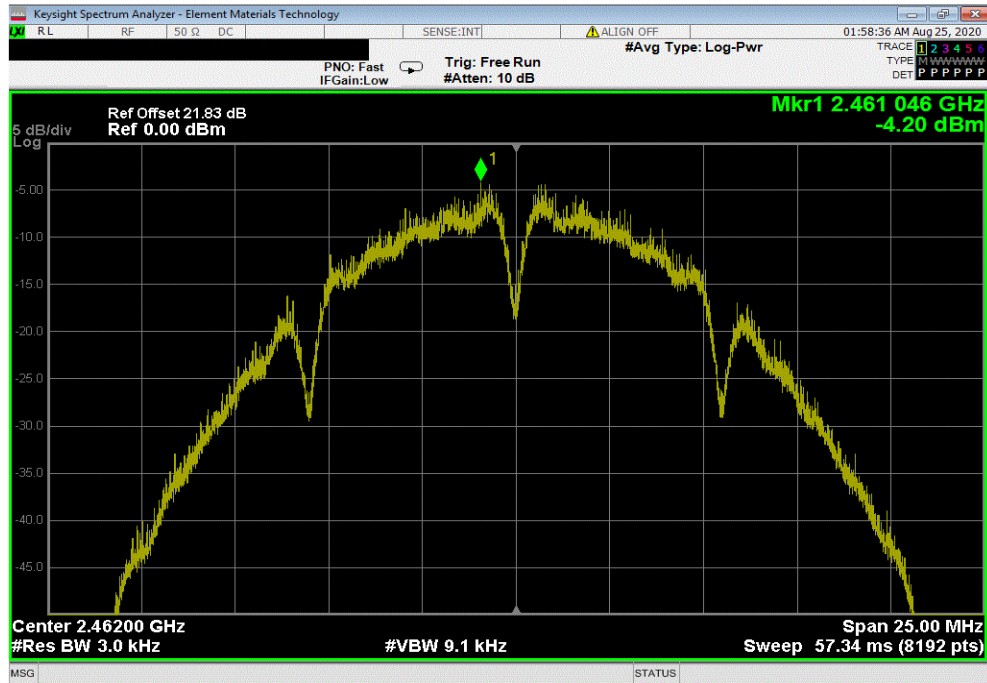


POWER SPECTRAL DENSITY

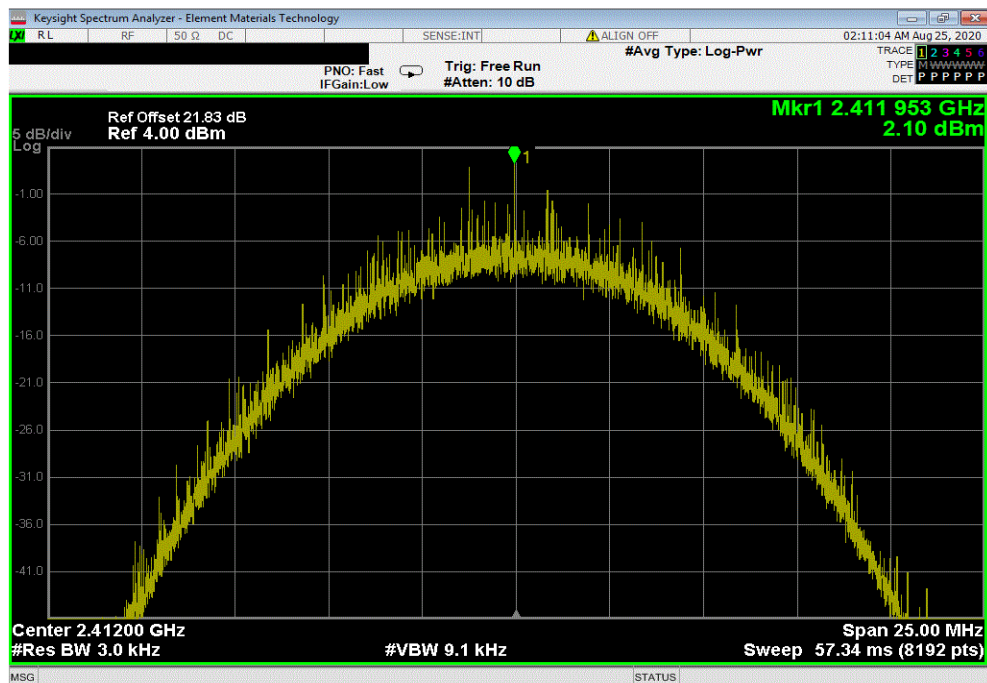


TbTx 2019.08.30.0 XMt 2020.03.25.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
Value				Limit	Results	
dBm/3kHz				< dBm/3kHz		
-4.201				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		
2.097				8	Pass	

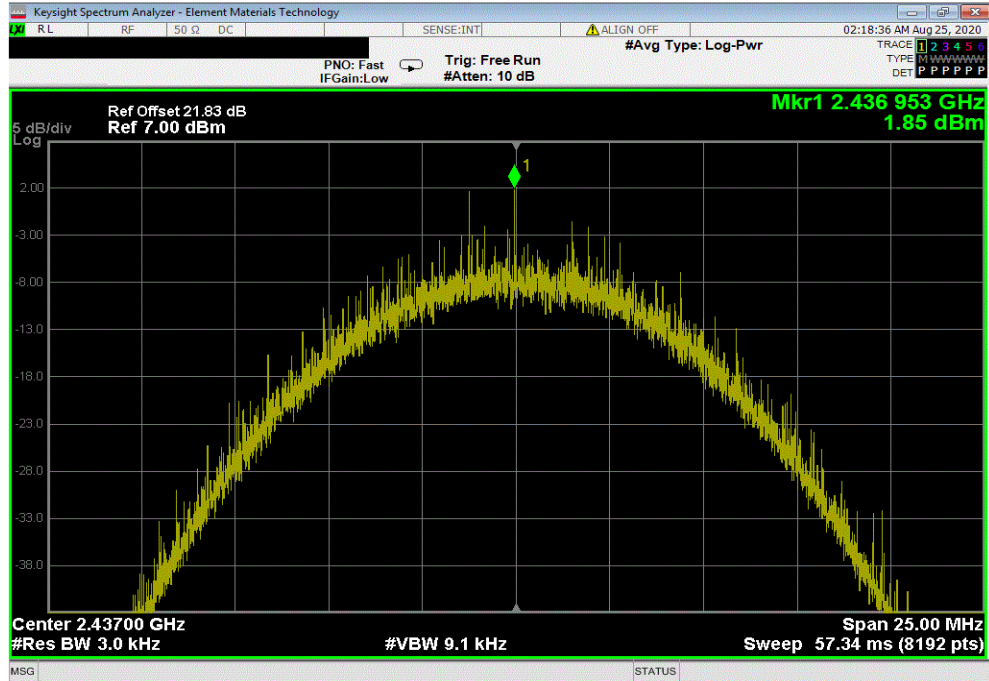


POWER SPECTRAL DENSITY

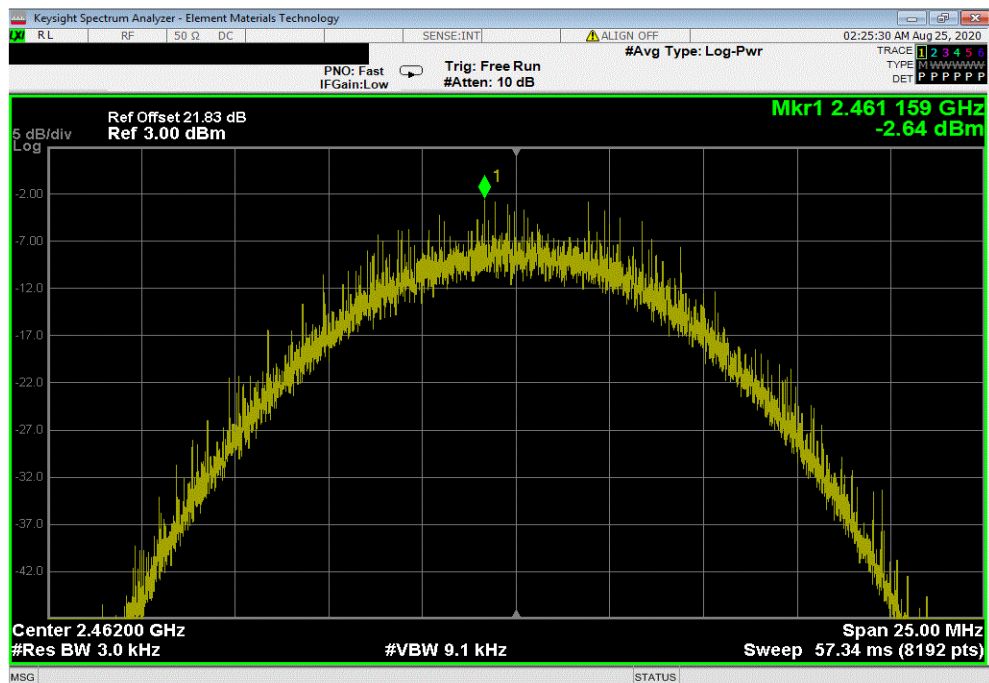


TM1Tx 2019.08.30.0 XM1 2020.03.25.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	1.854	8	Pass			



2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-2.641	8	Pass			

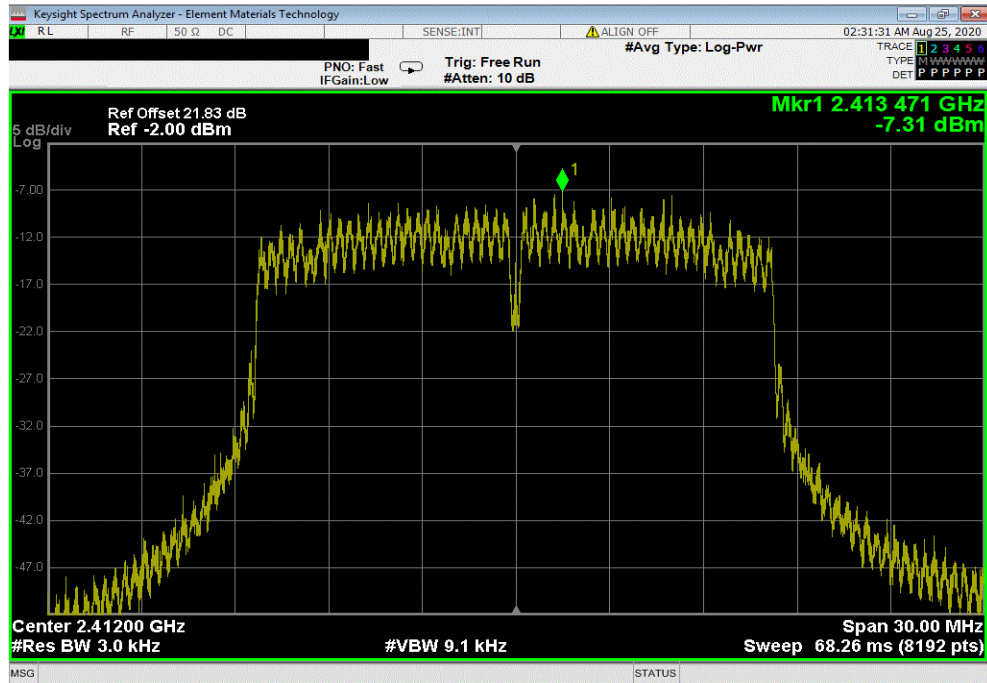


POWER SPECTRAL DENSITY

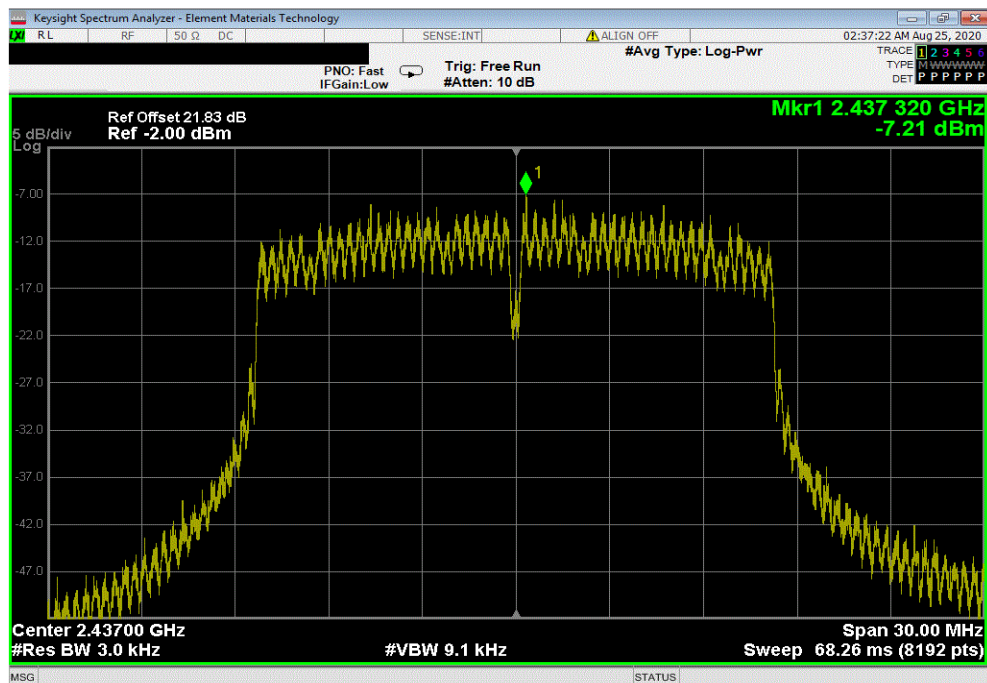


TMTx 2019.08.30.0 XMR 2020.03.25.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-7.312	8	Pass			



2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-7.214	8	Pass			

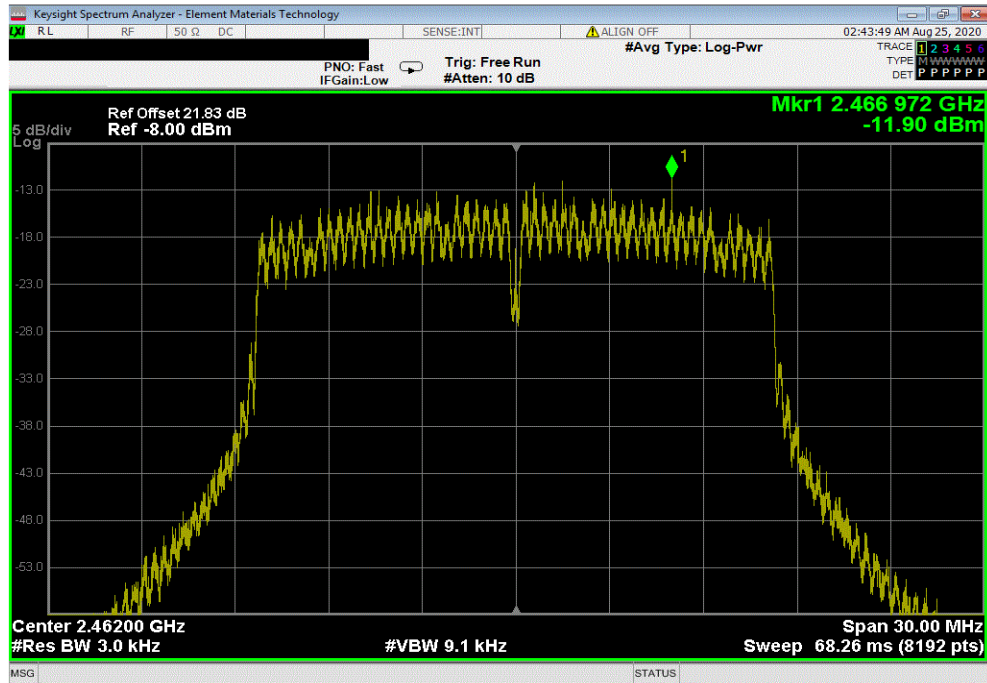


POWER SPECTRAL DENSITY

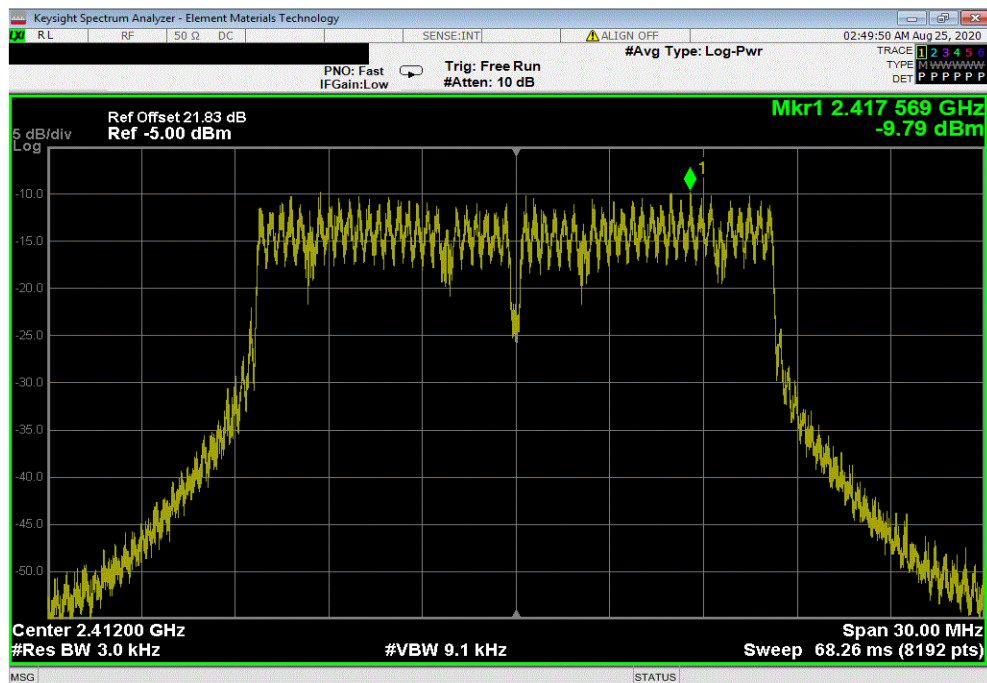


TMTx 2019.08.30.0 XMR 2020.03.25.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-11.9	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			
	-9.786	8	Pass			



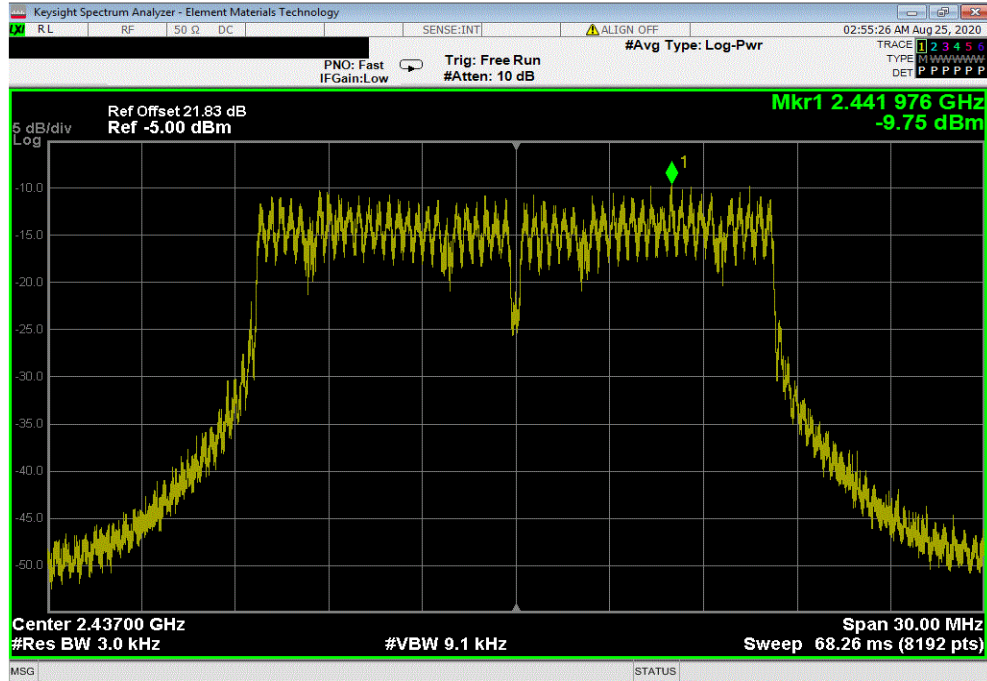
POWER SPECTRAL DENSITY



TbTx 2019.08.30.0 XMt 2020.03.25.0

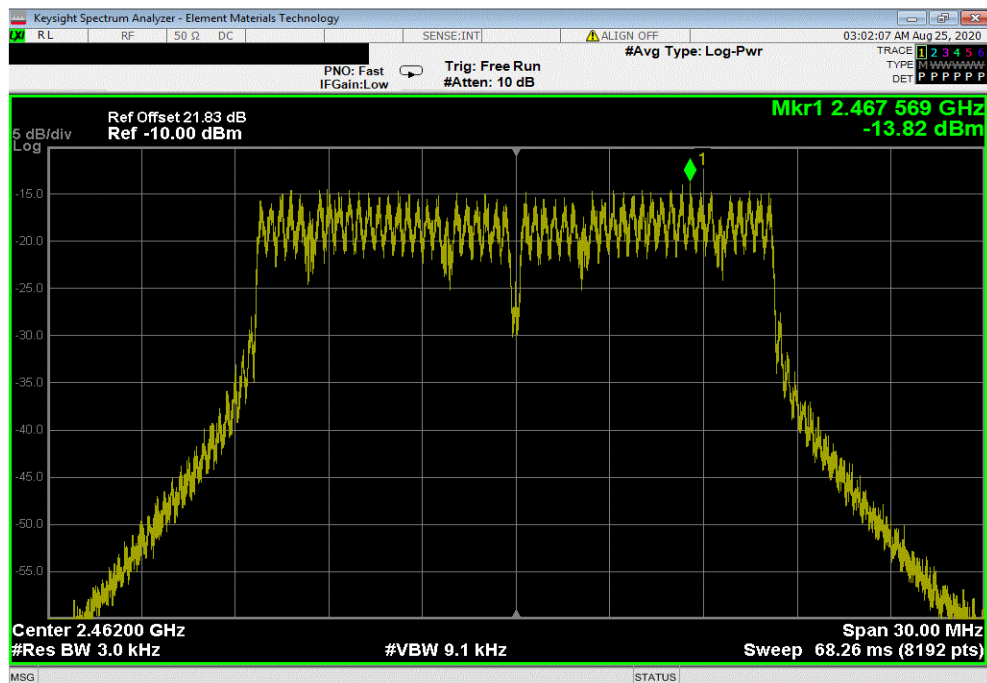
2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz

				Value	Limit	Results
				dBm/3kHz	< dBm/3kHz	
				-9.745	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	
				-13.82	8	Pass

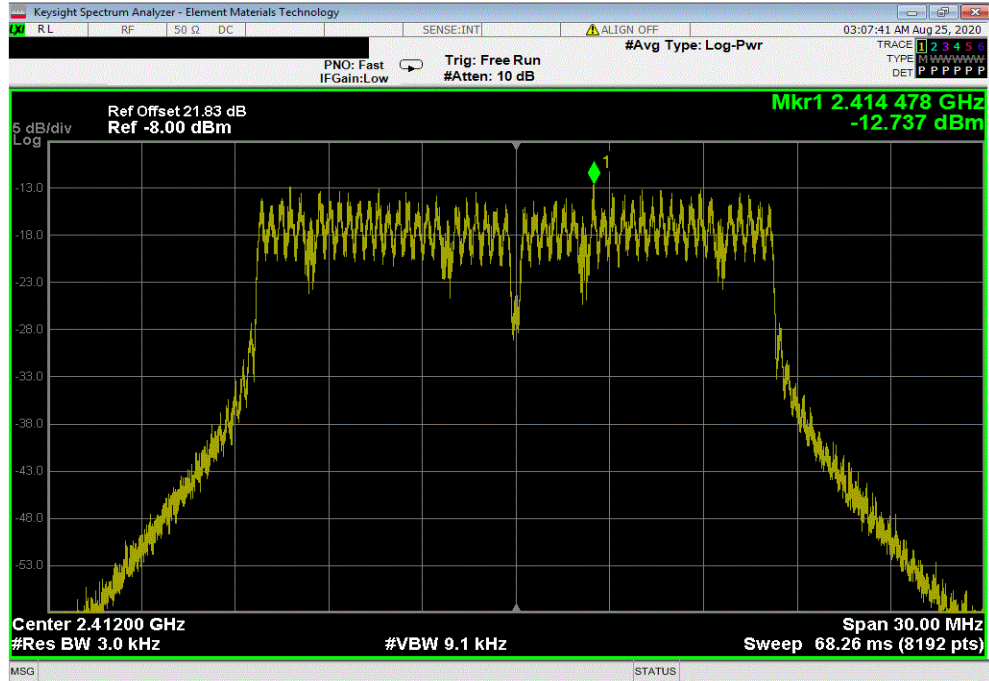


POWER SPECTRAL DENSITY

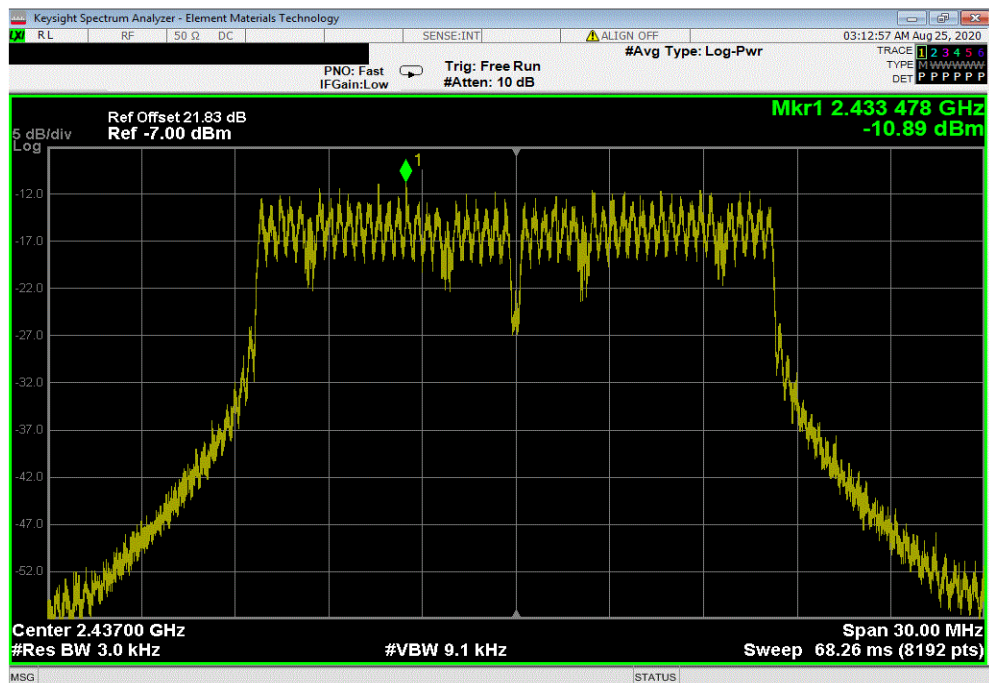


TbTx 2019.08.30.0 XMt 2020.03.25.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-12.737	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			
	-10.89	8	Pass			

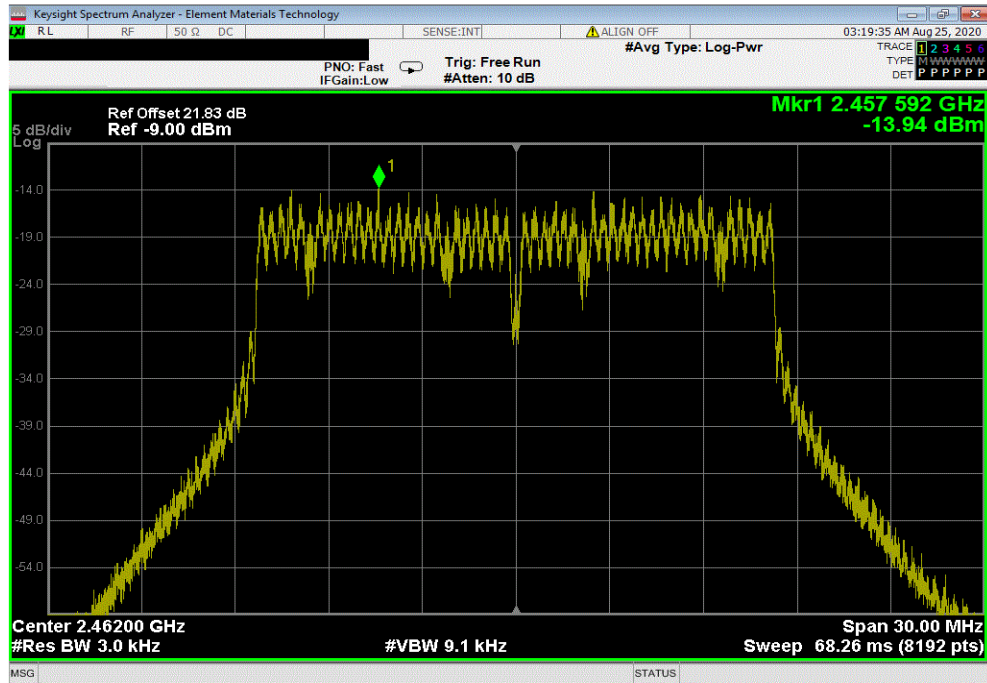


POWER SPECTRAL DENSITY

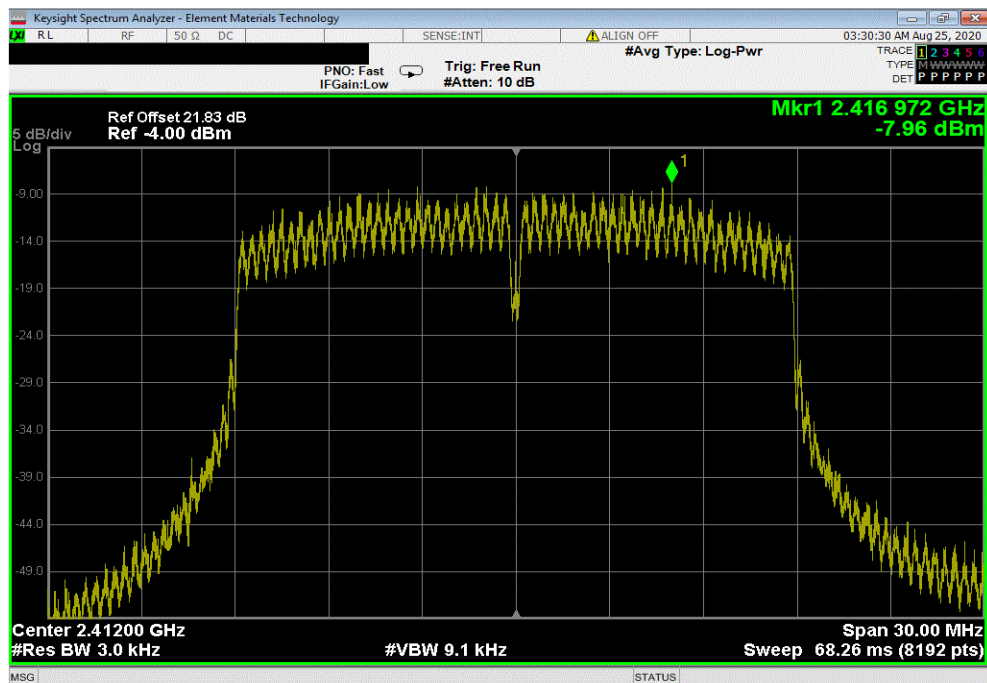


TbTtx 2019.08.30.0 XMt 2020.03.25.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-13.943	8	Pass			



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-7.964	8	Pass			

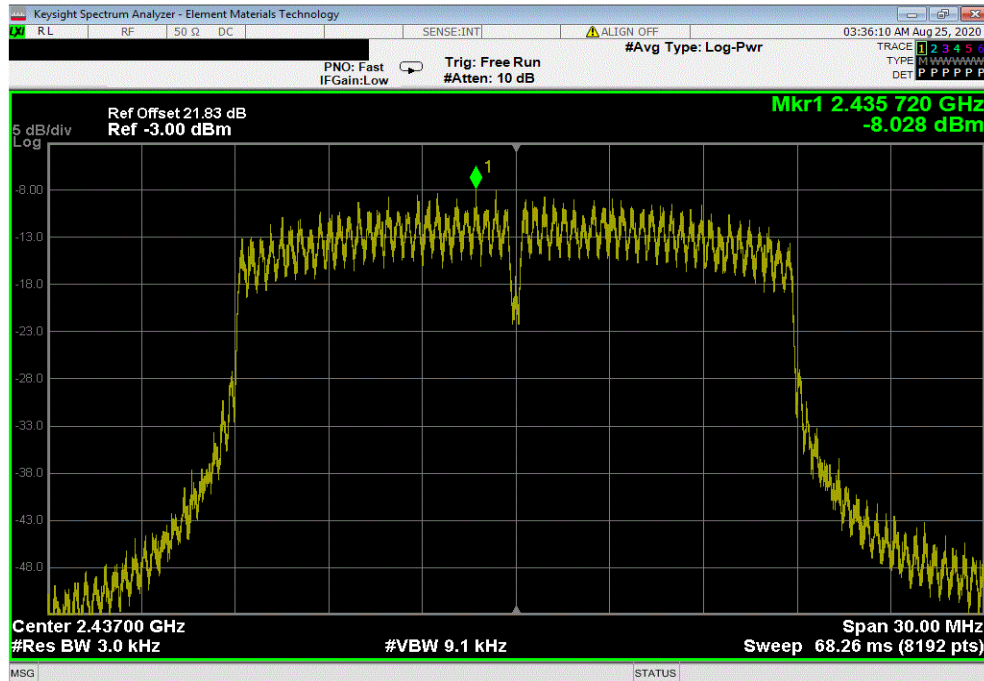


POWER SPECTRAL DENSITY

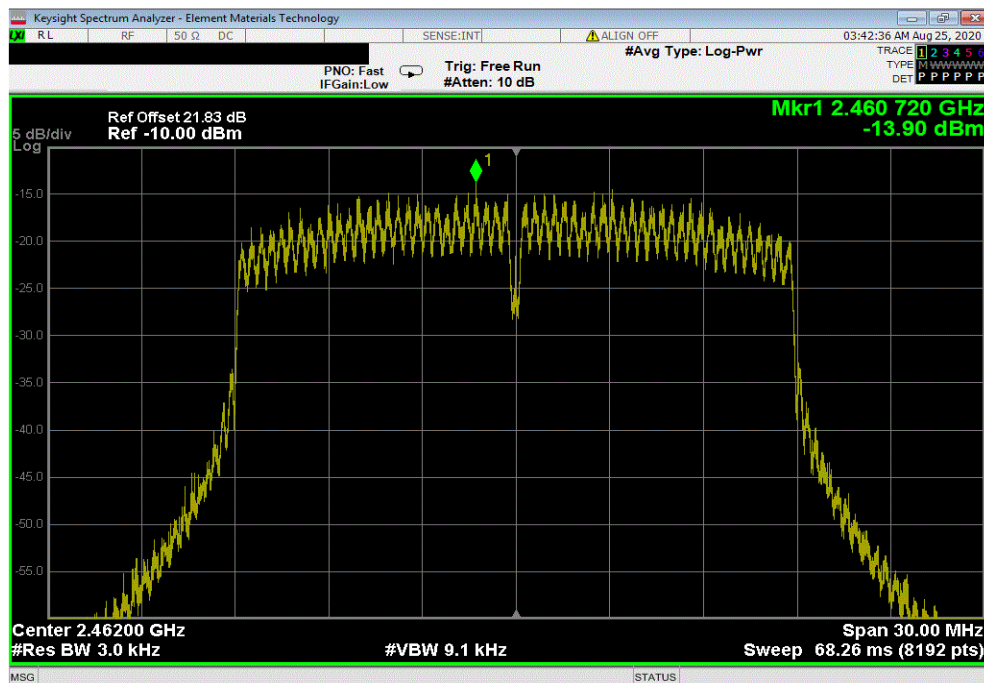


TbTx 2019.08.30.0 XMt 2020.03.25.0

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
				Value	Limit	Results
				dBm/3kHz	< dBm/3kHz	
				-8.028	8	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz						
				Value	Limit	Results
				dBm/3kHz	< dBm/3kHz	
				-13.901	8	Pass

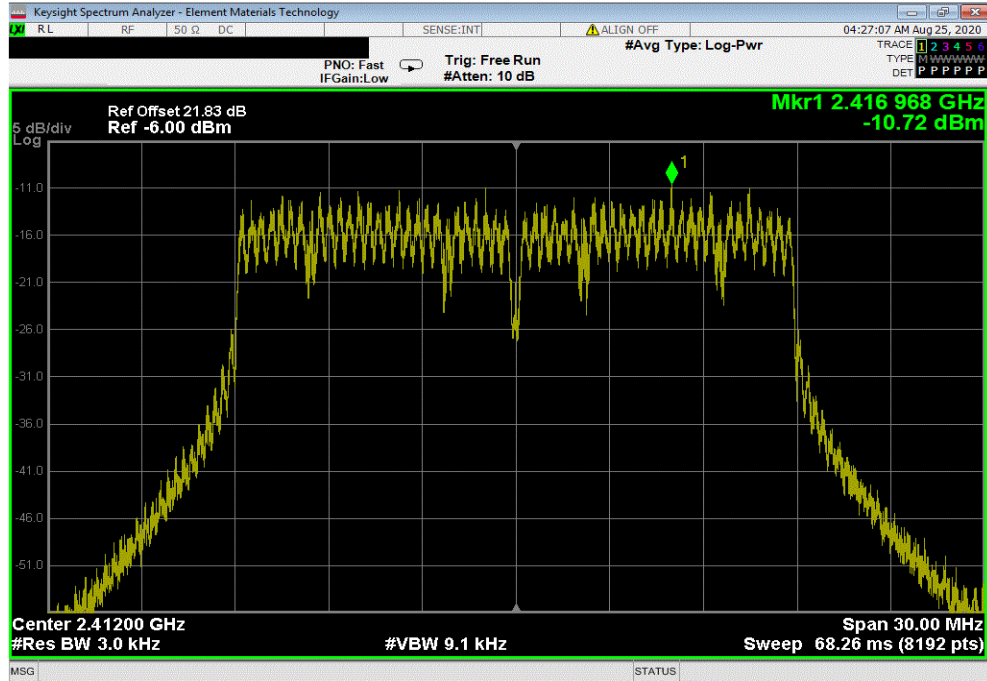


POWER SPECTRAL DENSITY

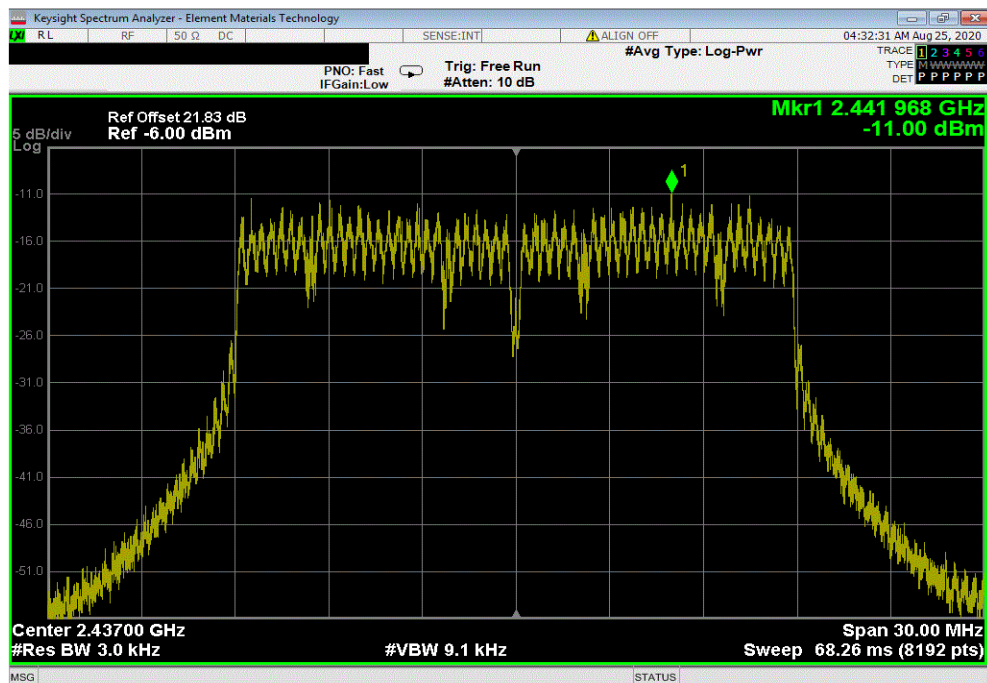


TbTtx 2019.08.30.0 XMR 2020.03.25.0

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-10.721	8	Pass			



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz						
	Value	Limit				
	dBm/3kHz	< dBm/3kHz	Results			
	-11.003	8	Pass			

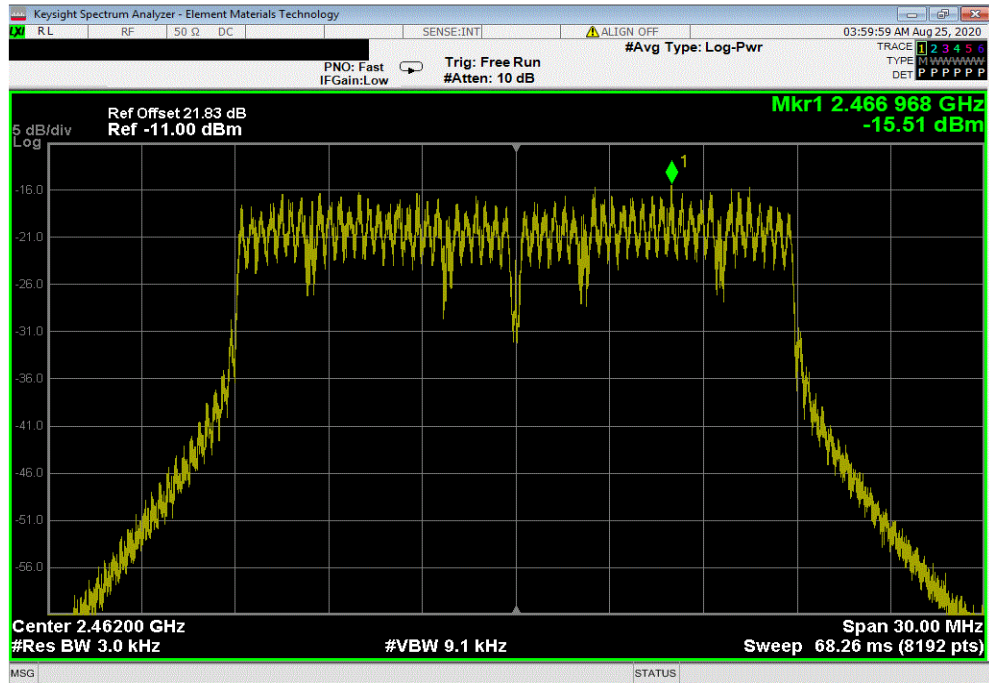


POWER SPECTRAL DENSITY



TM1Tx 2019.08.30.0 XM1 2020.03.25.0

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz						
Value			Limit		Results	
dBm/3kHz			< dBm/3kHz			
-15.506			8		Pass	



BAND EDGE COMPLIANCE



XMIT 2020.03.25.0

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	28-Apr-20	28-Apr-23
Cable	Micro-Coax	UFD150A-1-0720-200200	MNL	15-Sep-19	15-Sep-20
Attenuator	S.M. Electronics	SA26B-20	RFW	10-Feb-20	10-Feb-21
Block - DC	Fairview Microwave	SD3379	AMI	5-Aug-20	5-Aug-21
Analyzer - Spectrum Analyzer	Keysight	N9010A (EXA)	AFQ	21-Dec-19	21-Dec-20

TEST DESCRIPTION

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.

BAND EDGE COMPLIANCE



TMTx 2019.08.30.0 XMt 2020.03.25.0

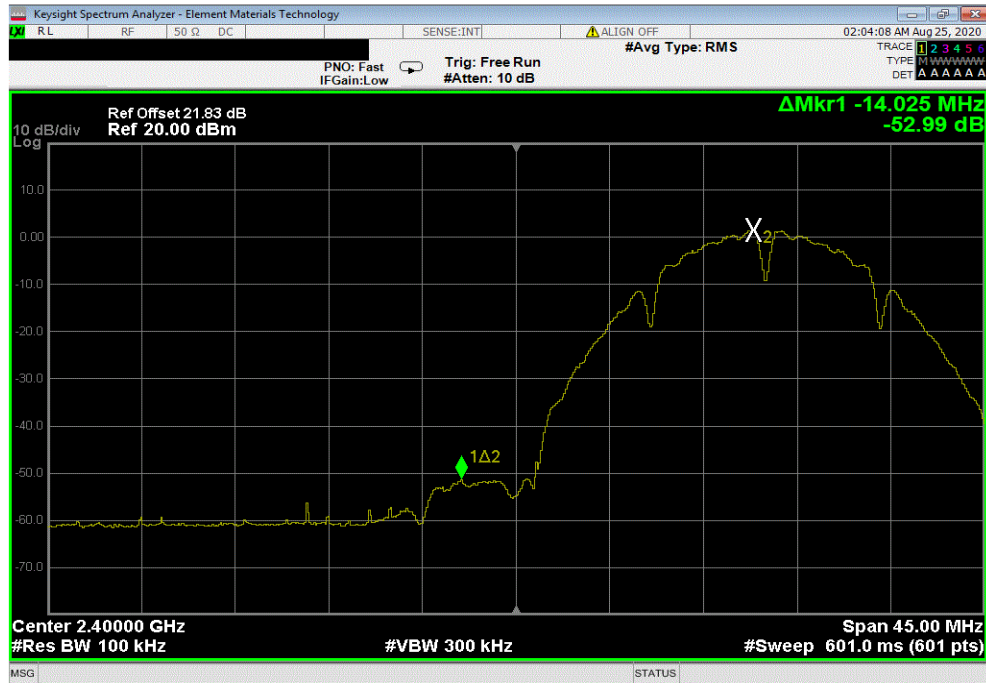
EUT: USB to WiFi Adapter		Work Order: TRNE0022	
Serial Number: 0022A301FF5D		Date: 24-Aug-20	
Customer: Trane		Temperature: 21.9 °C	
Attendees: Chris Vanderkoy		Humidity: 57.2% RH	
Project: None		Barometric Pres.: 1017 mbar	
Tested by: Dustin Sparks		Power: 5VDC via USB	
		Job Site: MN08	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2020		ANSI C63.10:2013	
COMMENTS			
Measurement cable, DC block, and 20 dB attenuator included in reference level offset.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	3	Signature <i>Dustin Sparks</i>	
		Value (dBc)	Limit ≤ (dBc) Result
2400 MHz - 2483.5 MHz Band			
802.11(b) 1 Mbps			
Low Channel 1, 2412 MHz		-52.99	-30 Pass
High Channel 11, 2462 MHz		-59.14	-30 Pass
802.11(b) 11 Mbps			
Low Channel 1, 2412 MHz		-54.17	-30 Pass
High Channel 11, 2462 MHz		-60.92	-30 Pass
802.11(g) 6 Mbps			
Low Channel 1, 2412 MHz		-37.28	-30 Pass
High Channel 11, 2462 MHz		-50.74	-30 Pass
802.11(g) 36 Mbps			
Low Channel 1, 2412 MHz		-35.26	-30 Pass
High Channel 11, 2462 MHz		-48.84	-30 Pass
802.11(g) 54 Mbps			
Low Channel 1, 2412 MHz		-36.51	-30 Pass
High Channel 11, 2462 MHz		-48.28	-30 Pass
802.11(n) MCS0			
Low Channel 1, 2412 MHz		-37.29	-30 Pass
High Channel 11, 2462 MHz		-49.33	-30 Pass
802.11(n) MCS7			
Low Channel 1, 2412 MHz		-34.9	-30 Pass
High Channel 11, 2462 MHz		-47.93	-30 Pass

BAND EDGE COMPLIANCE

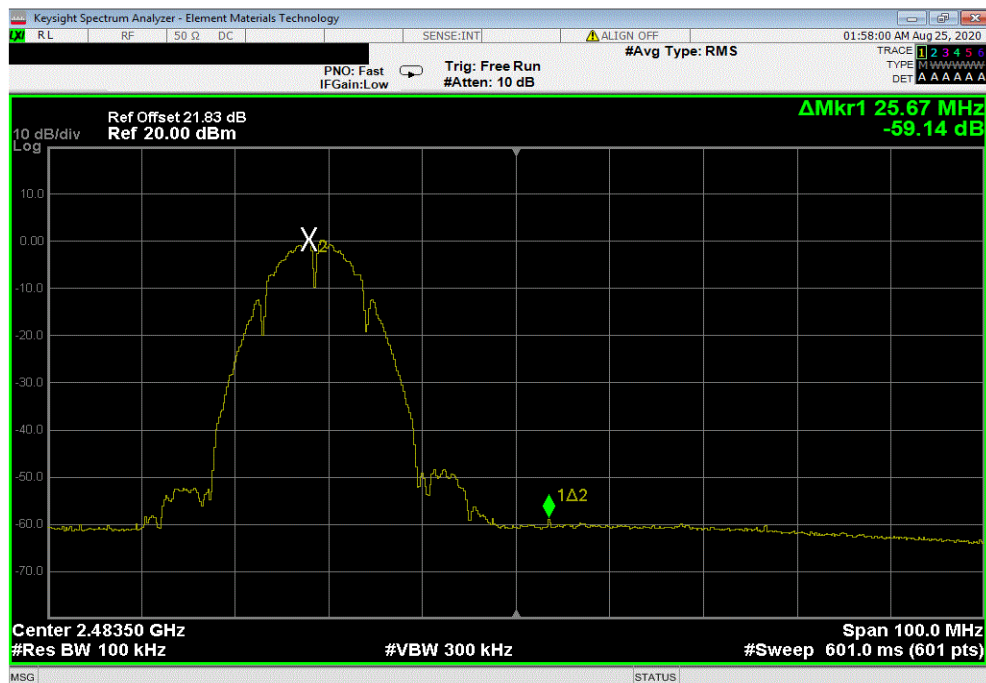


TM1Tx 2019.08.30.0 XM1 2020.03.25.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-52.99	-30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-59.14	-30	Pass

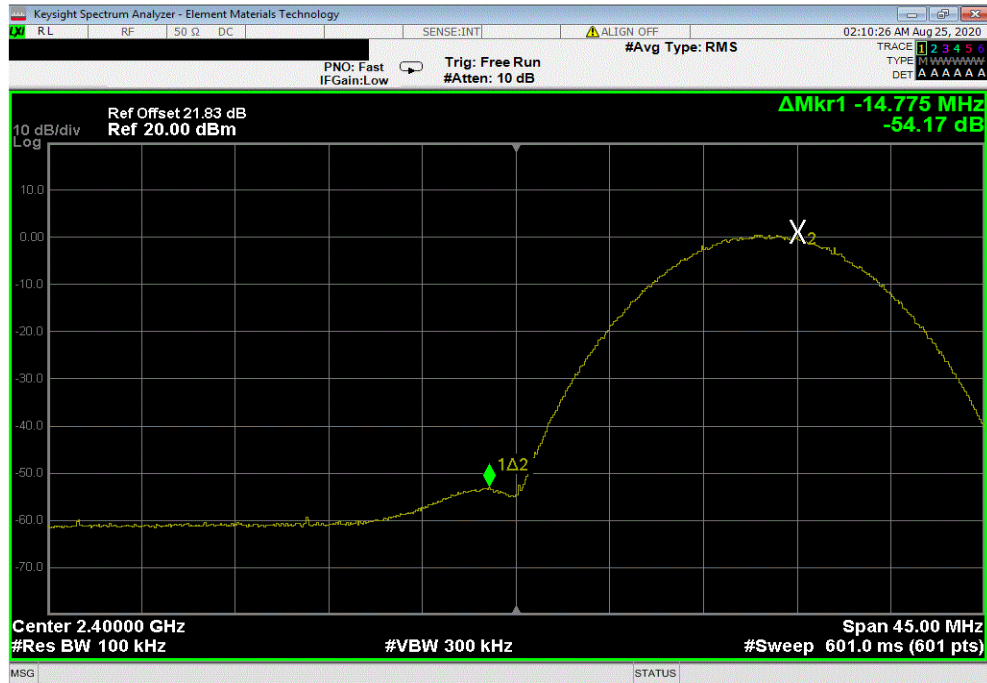


BAND EDGE COMPLIANCE

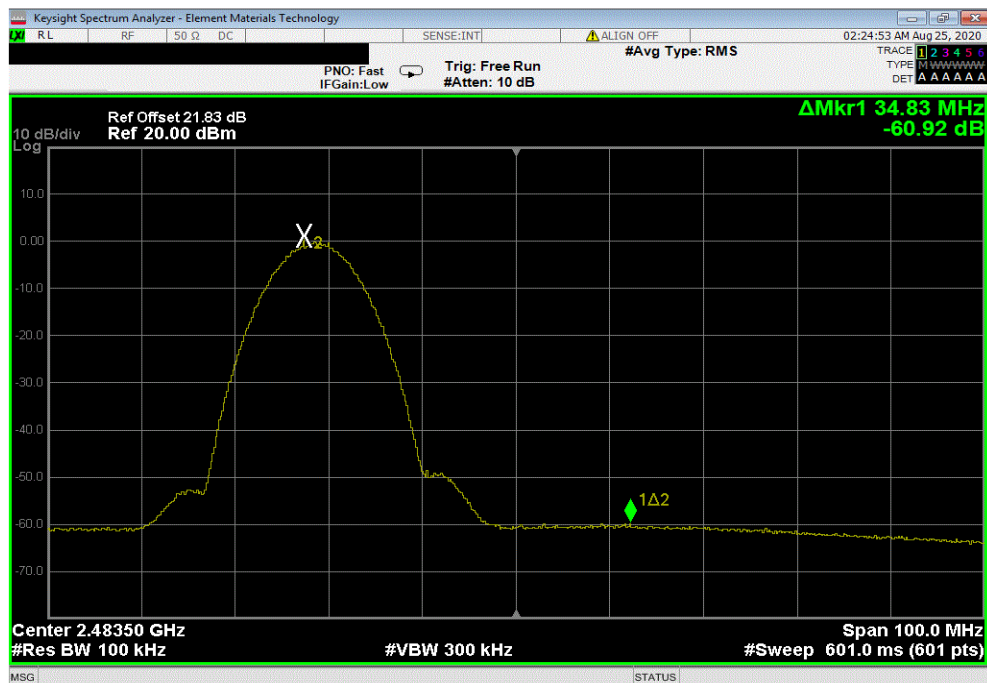


TM1Tx 2019.08.30.0 XM1 2020.03.25.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-54.17	-30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-60.92	-30	Pass

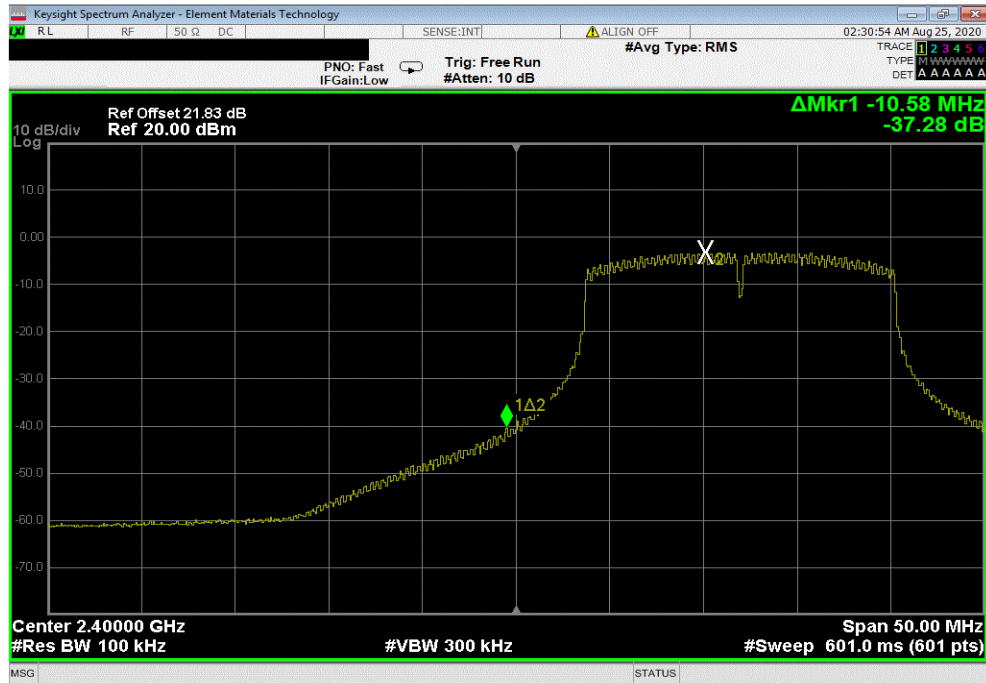


BAND EDGE COMPLIANCE

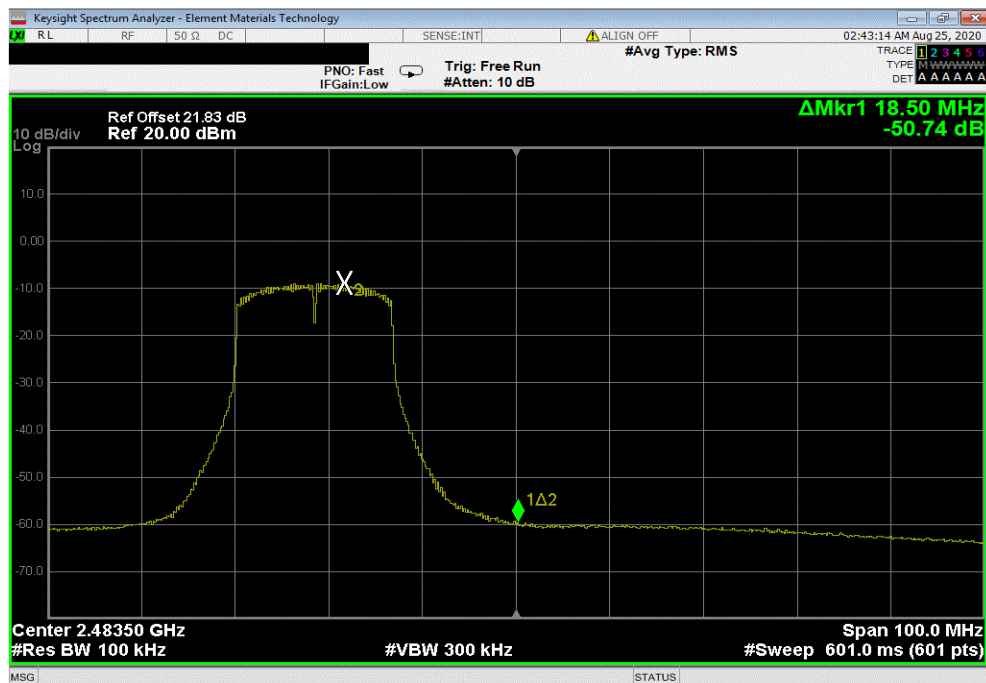


TMTx 2019.08.30.0 XMR 2020.03.25.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-37.28	-30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-50.74	-30	Pass

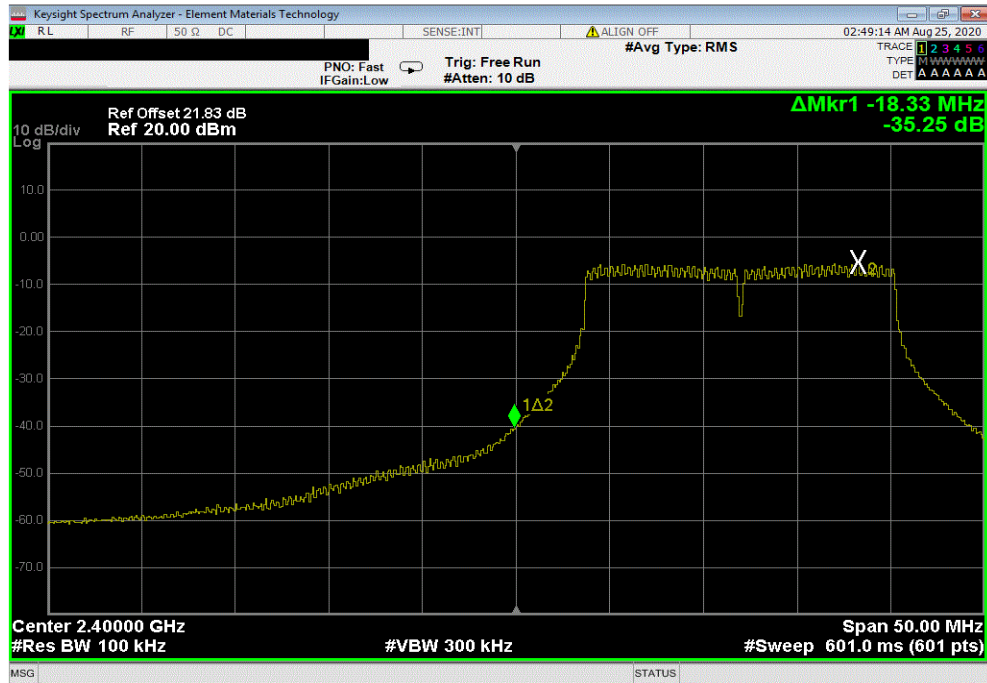


BAND EDGE COMPLIANCE

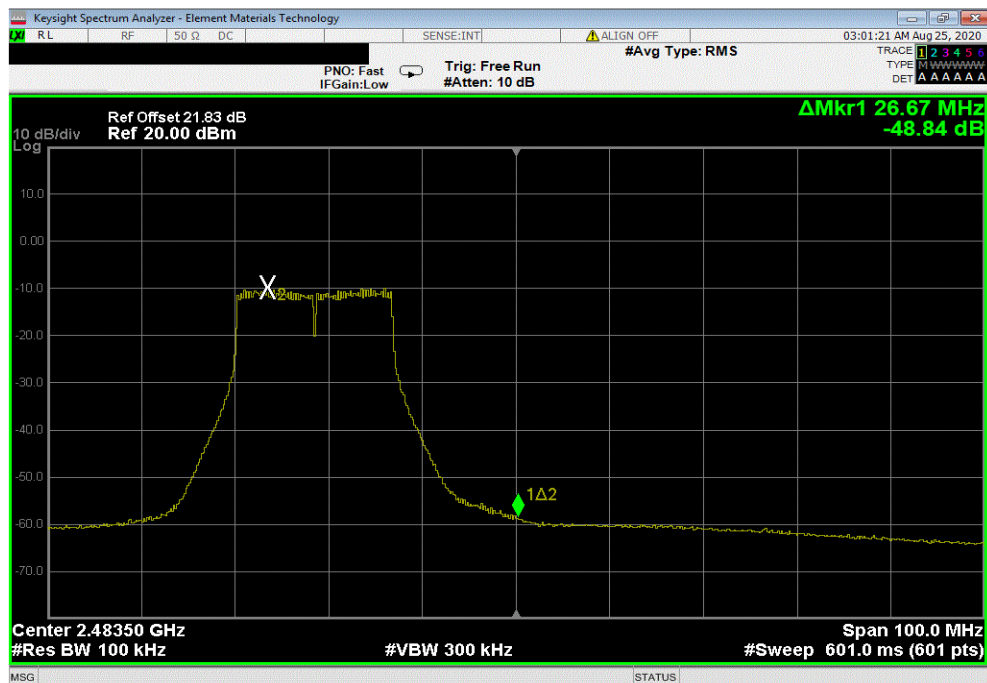


TbTx 2019.08.30.0 XMt 2020.03.25.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
	Value (dBc)	Limit ≤ (dBc)	Result			
	-35.26	-30	Pass			



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
	Value (dBc)	Limit ≤ (dBc)	Result			
	-48.84	-30	Pass			

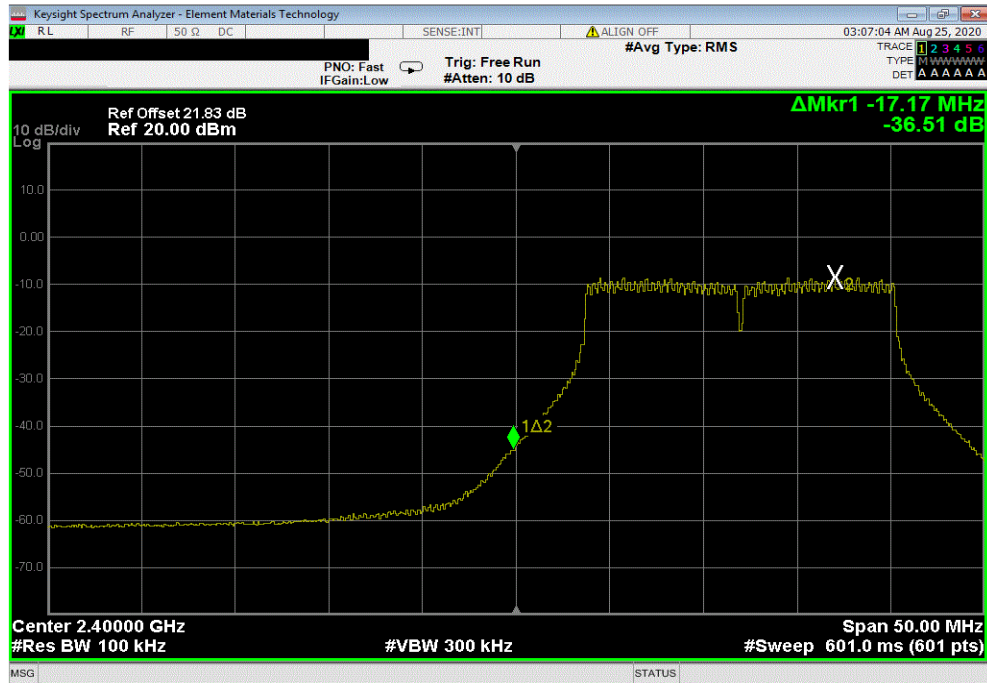


BAND EDGE COMPLIANCE

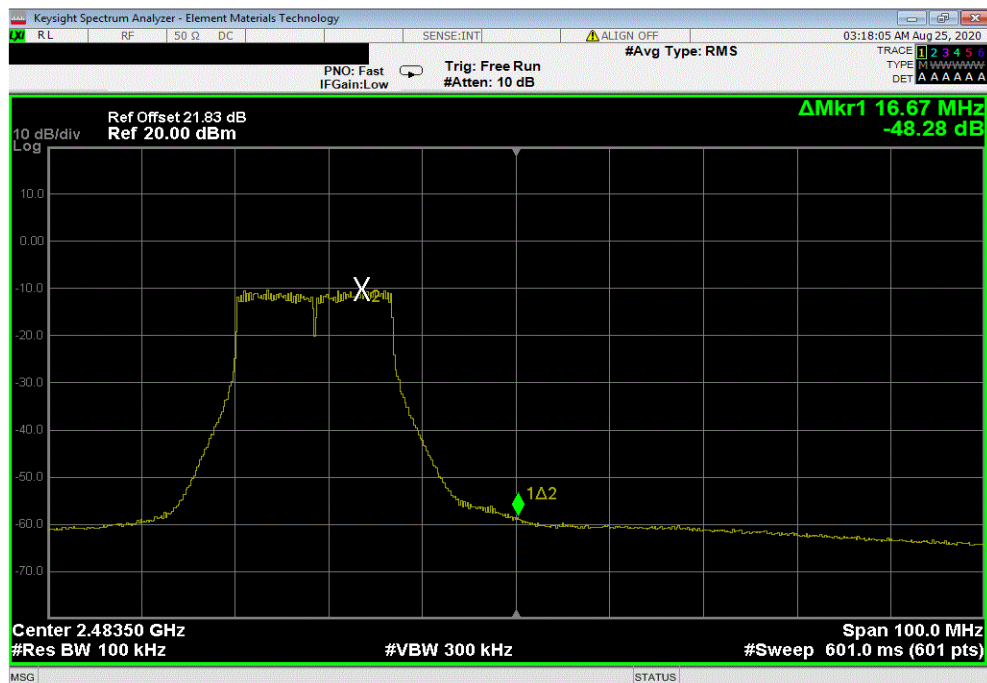


TM1Tx 2019.08.30.0 XM1 2020.03.25.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-36.51	-30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-48.28	-30	Pass

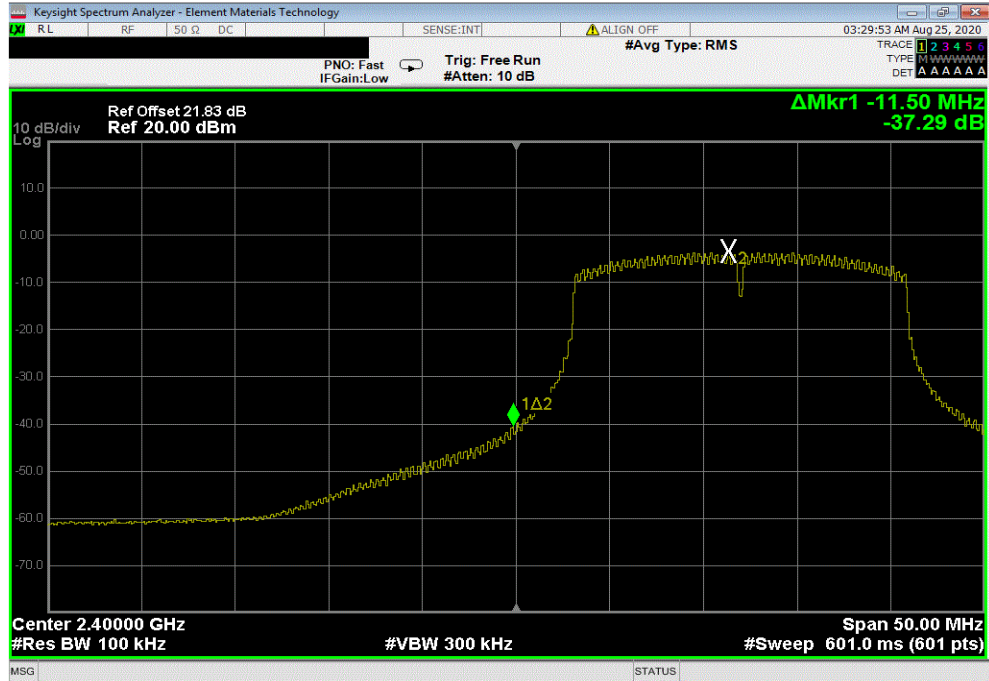


BAND EDGE COMPLIANCE

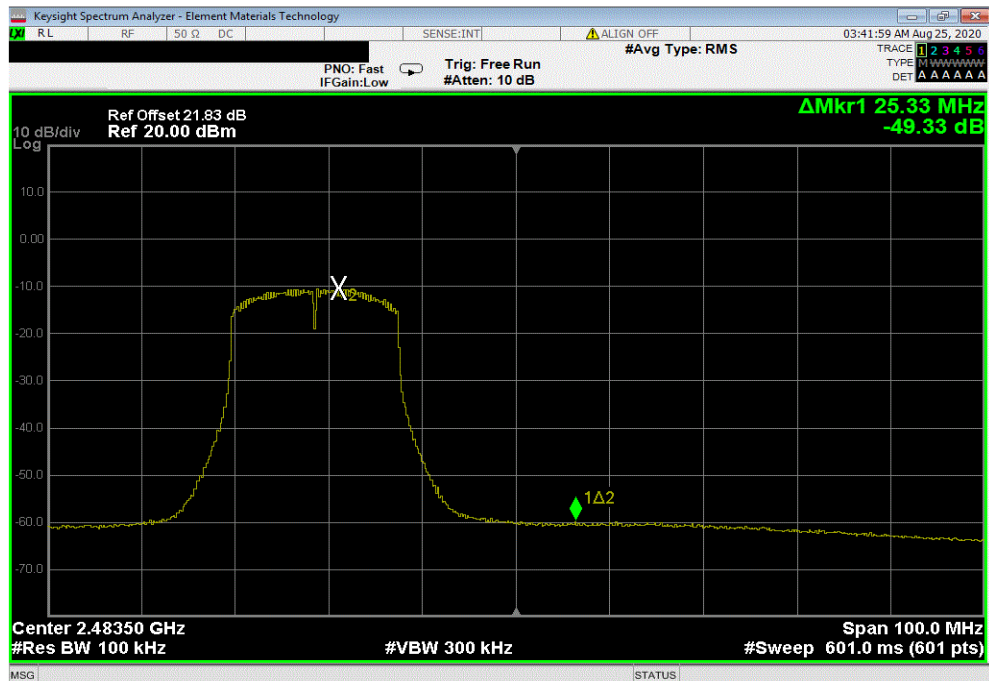


TMTx 2019.08.30.0 XMR 2020.03.25.0

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-37.29	-30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-49.33	-30	Pass

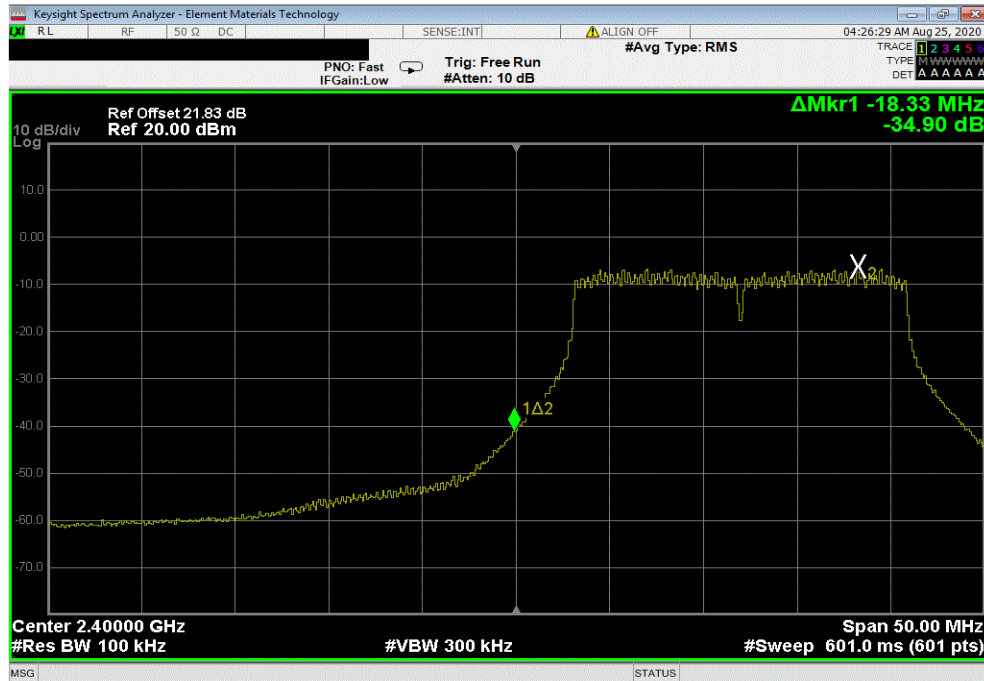


BAND EDGE COMPLIANCE



TMTx 2019.08.30.0 XMt 2020.03.25.0

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-34.9	-30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-47.93	-30	Pass

