

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



XMH 2020.12.30.0

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
Attenuator	Coaxicom	3910-20	AXY	2020-09-14	2021-09-14
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2021-04-16	2022-04-16
Amplifier - Pre-Amplifier	Miteq	F-3D-00100800-32	AVX	2021-02-01	2022-02-01
Cable	Element	Ridge Guide Horn	MNV	2021-02-01	2022-02-01
Antenna - Double Ridge	ETS Lindgren	3115	AIB	2020-09-03	2022-09-03

TEST DESCRIPTION

The fundamental emission output power (maximum average conducted output power) was measured using the channels and modes as called out on the following data sheets. The transmit power was set to its default maximum.

Prior to measuring output power; the emission bandwidth (B) and the transmission pulse duration (T) were measured. Both are required to determine the method of measuring Maximum Conducted Output Power. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain.

The method AVGSA-2 in section 11.9.2.2.4 of ANSI C63.10:2013 was used to make the measurement. This method uses trace averaging across ON and OFF times of the EUT transmissions in the spectrum analyzer channel power function using an RMS detector. Following the measurement a duty cycle correction was applied by adding $[10 \log (1 / D)]$, where D is the duty cycle, to the measured power to compute the average power during the actual transmission times.

Equivalent Isotropic Radiated Power (EIRP) = Max Measured Power + Antenna gain (dBi)

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



TSTx 2021.03.19.1 XMR 2020.12.30.0

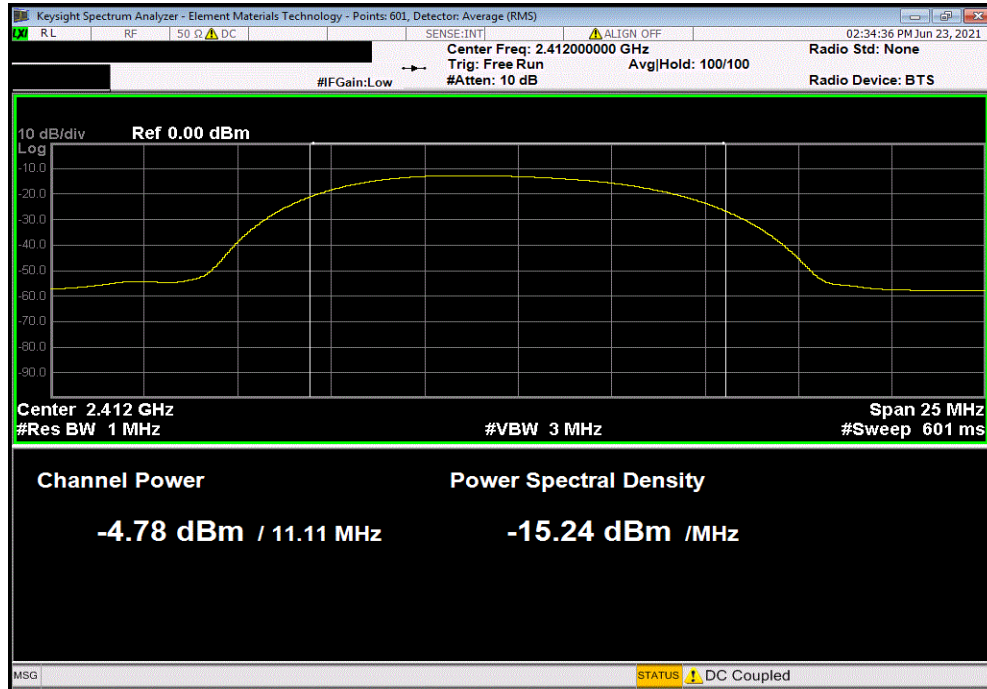
EUT: Smart Tracking Collar		Work Order: PAON0011	
Serial Number: 6797400036		Date: 23-Jun-21	
Customer: Paragon Innovations, Inc.		Temperature: 22.1 °C	
Attendees: None		Humidity: 44.2% RH	
Project: None		Barometric Pres.: 1012 mbar	
Tested by: Andrew Rogstad		Power: 3.3 VDC via USB Cable	
		Job Site: MN09	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2021		ANSI C63.10:2013	
COMMENTS			
Tested in a radiated configuration with the EUT maximized in the single worst-case EUT orientation/receive antenna polarity combination. Reference level offset accounts for cables, transducer, preamp, and 20 dB attenuator. Antenna gain is 2.5 dBi.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	6	Signature <i>Andrew Rogstad</i>	
		Avg Cond Pwr (dBm)	Correction Factor
		Duty Cycle Factor (dB)	EIRP (dBm)
		EIRP Limit (dBm)	Result
2400 MHz - 2483.5 MHz Band			
802.11(b) 1 Mbps			
	Low Channel 1, 2412 MHz	-4.8	11.77
	Mid Channel 6, 2437 MHz	-11.7	11.77
	High Channel 11, 2462 MHz	-1.5	11.77
802.11(b) 11 Mbps			
	Low Channel 1, 2412 MHz	-5.2	11.77
	Mid Channel 6, 2437 MHz	-11.9	11.77
	High Channel 11, 2462 MHz	-1.6	11.77
802.11(g) 6 Mbps			
	Low Channel 1, 2412 MHz	-4.8	11.77
	Mid Channel 6, 2437 MHz	-11.3	11.77
	High Channel 11, 2462 MHz	-2.9	11.77
802.11(g) 36 Mbps			
	Low Channel 1, 2412 MHz	-7.0	11.77
	Mid Channel 6, 2437 MHz	-14.0	11.77
	High Channel 11, 2462 MHz	-3.8	11.77
802.11(g) 54 Mbps			
	Low Channel 1, 2412 MHz	-9.1	11.77
	Mid Channel 6, 2437 MHz	-16.4	11.77
	High Channel 11, 2462 MHz	-6.0	11.77
802.11(n) MCS0			
	Low Channel 1, 2412 MHz	-5.6	11.77
	Mid Channel 6, 2437 MHz	-12.3	11.77
	High Channel 11, 2462 MHz	-2.5	11.77
802.11(n) MCS7			
	Low Channel 1, 2412 MHz	-10.8	11.77
	Mid Channel 6, 2437 MHz	-17.8	11.77
	High Channel 11, 2462 MHz	-7.7	11.77

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

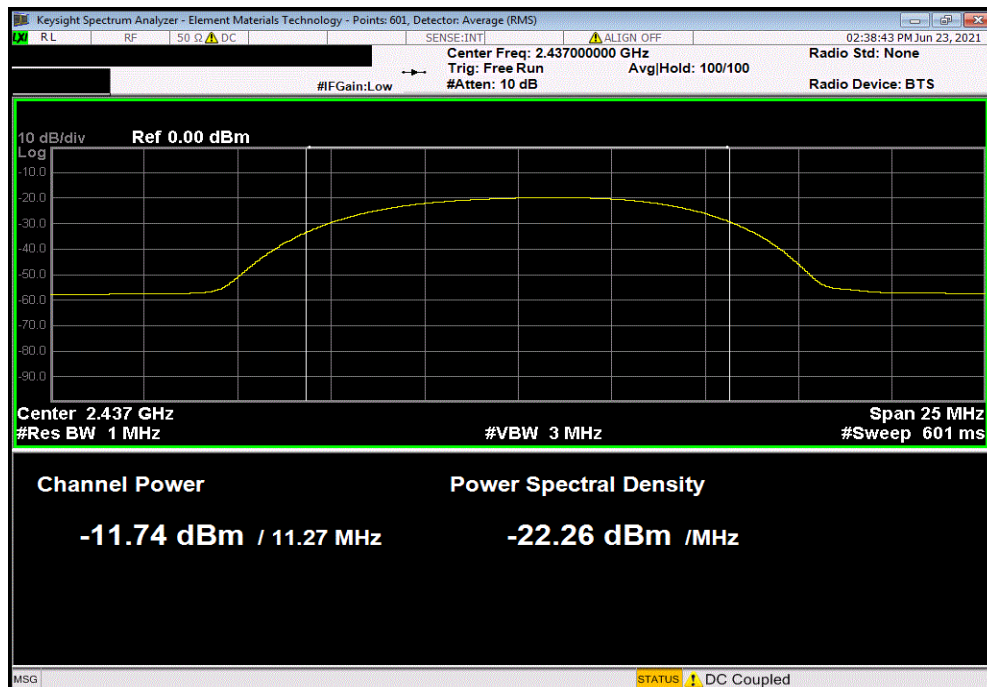


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
Avg Cond Pwr (dBm)	Correction Factor	Duty Cycle Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)	Result	
-4.784	11.77	0	7.0	36	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz						
Avg Cond Pwr (dBm)	Correction Factor	Duty Cycle Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)	Result	
-11.738	11.77	0	0.0	36	Pass	

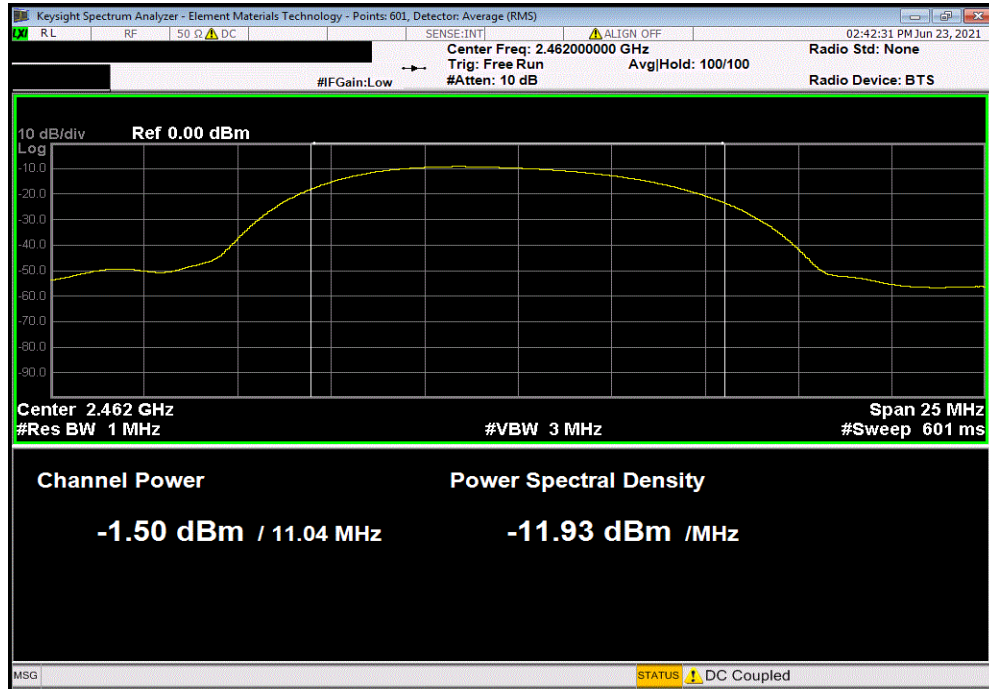


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

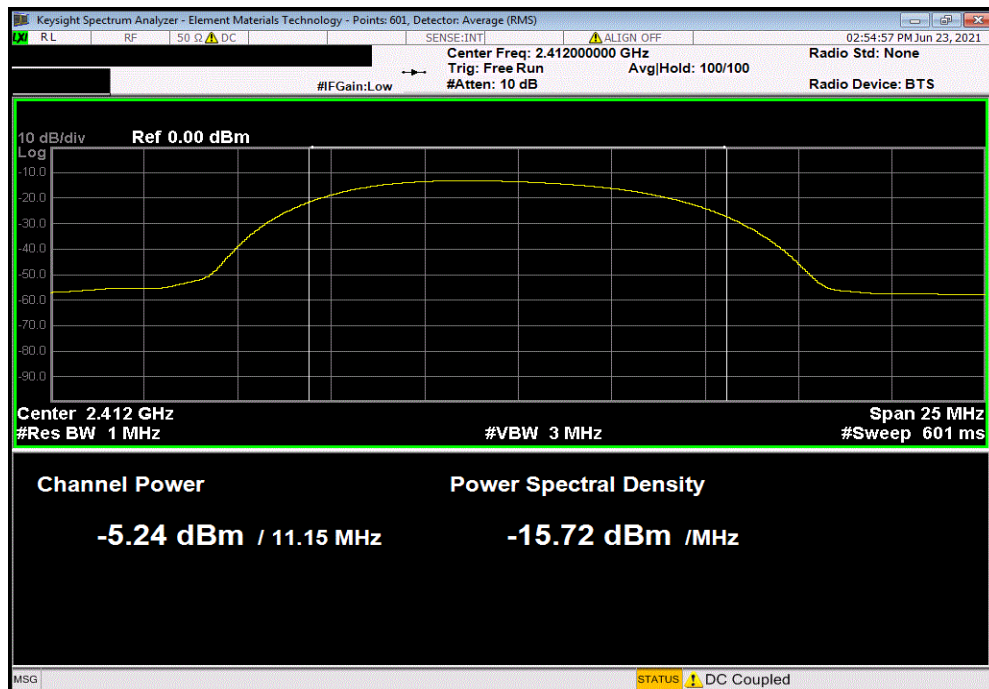


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
Avg Cond Pwr (dBm)	Correction Factor	Duty Cycle Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)	Result	
-1.499	11.77	0	10.3	36	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
Avg Cond Pwr (dBm)	Correction Factor	Duty Cycle Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)	Result	
-5.243	11.77	0	6.5	36	Pass	

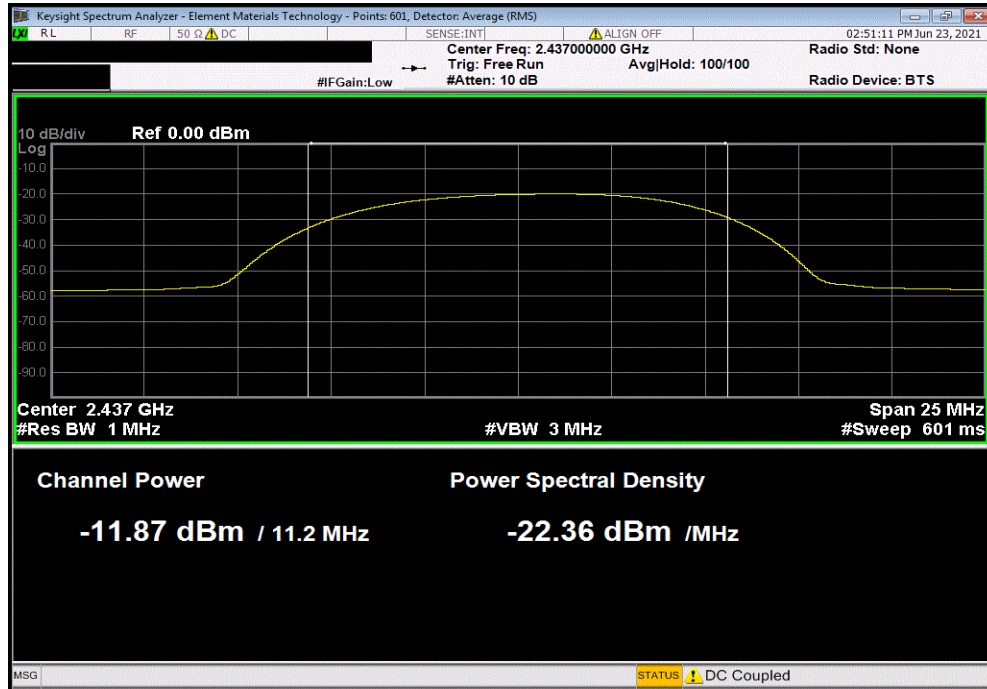


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

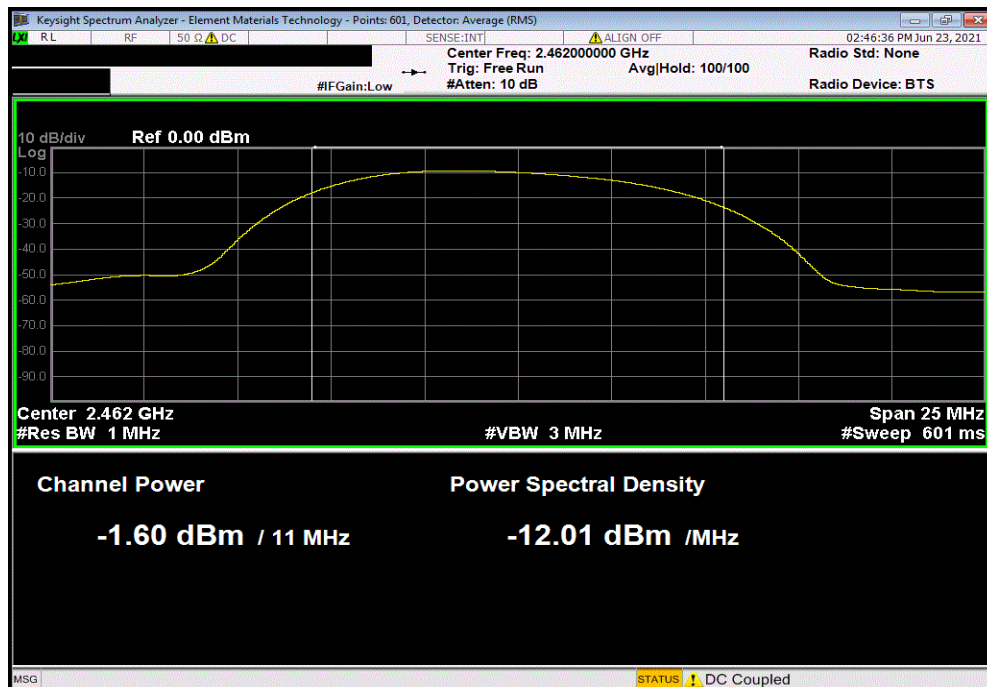


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz						
Avg Cond Pwr (dBm)	Correction Factor	Duty Cycle Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)	Result	
-11.872	11.77	0	-0.1	36	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
Avg Cond Pwr (dBm)	Correction Factor	Duty Cycle Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)	Result	
-1.596	11.77	0	10.2	36	Pass	

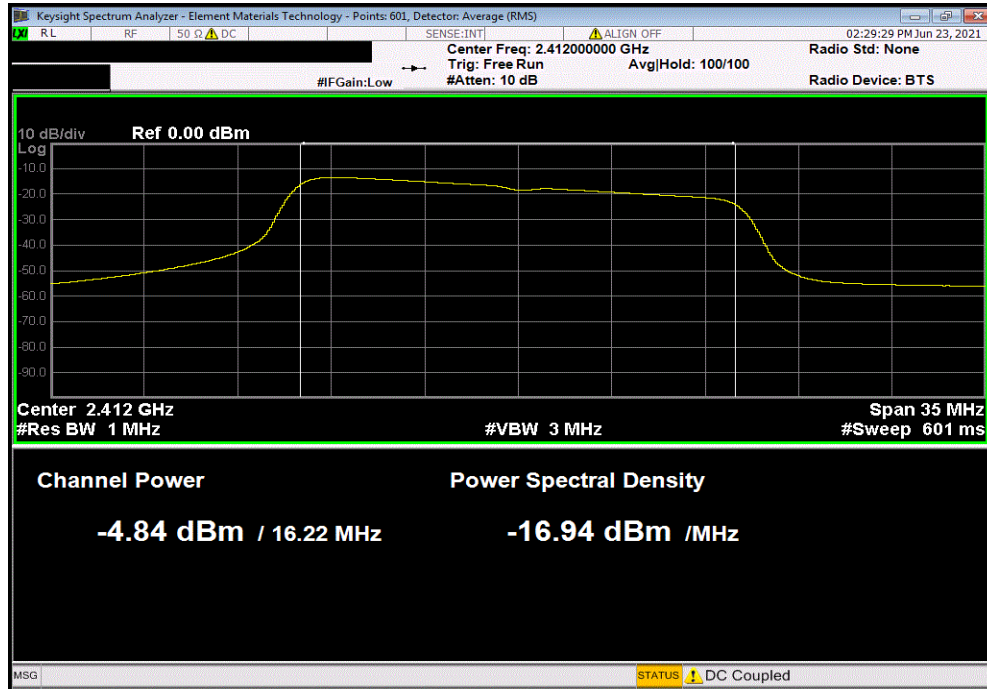


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

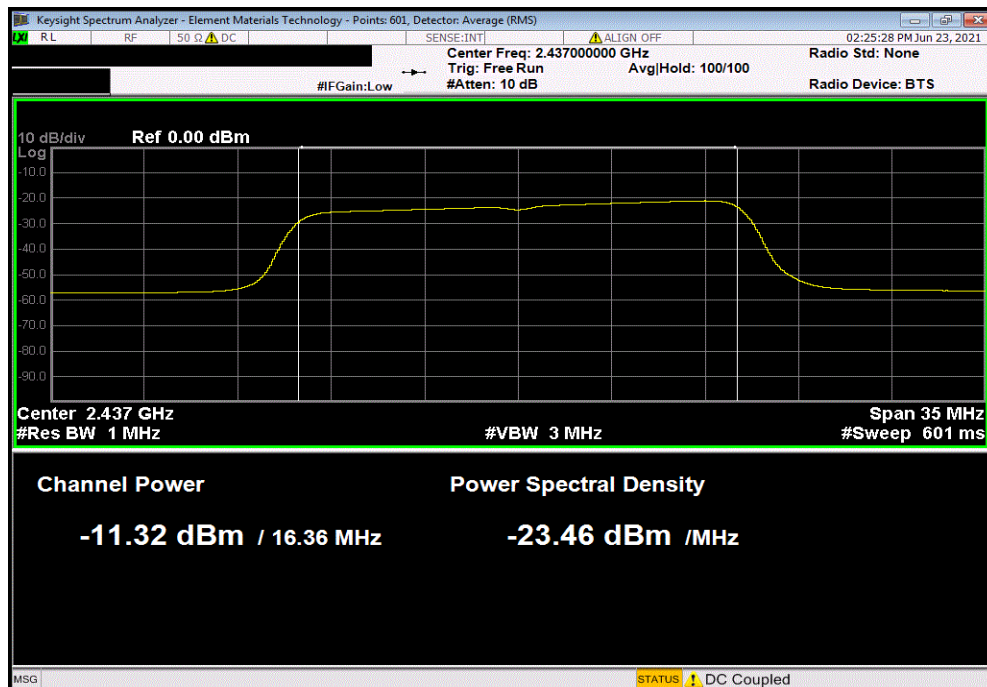


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
Avg Cond Pwr (dBm)	Correction Factor	Duty Cycle Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)	Result	
-4.84	11.77	0	6.9	36	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
Avg Cond Pwr (dBm)	Correction Factor	Duty Cycle Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)	Result	
-11.324	11.77	0	0.4	36	Pass	

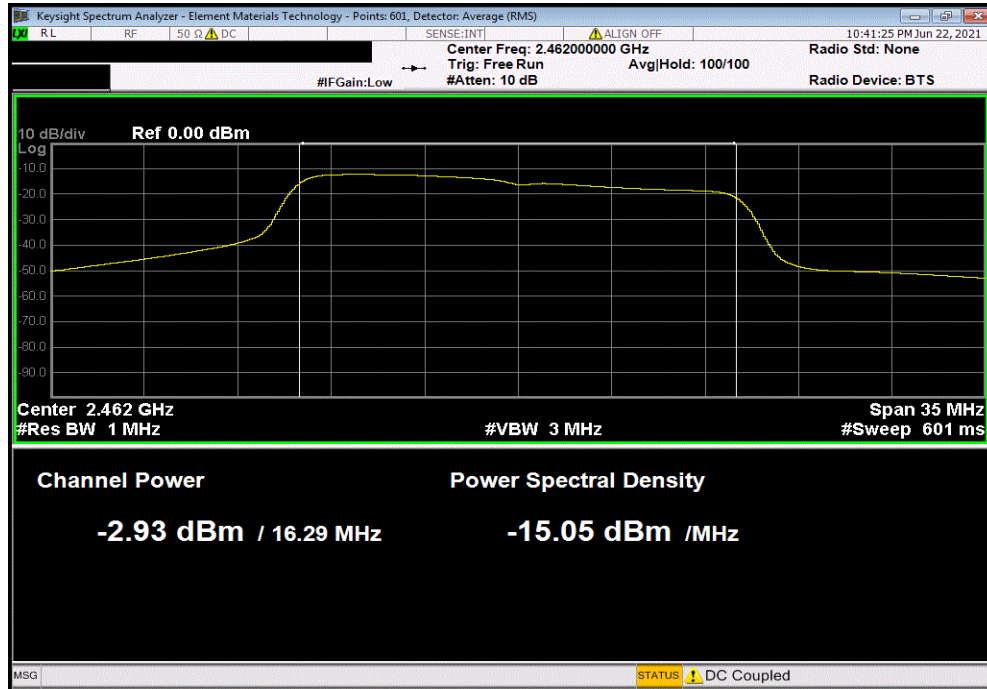


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

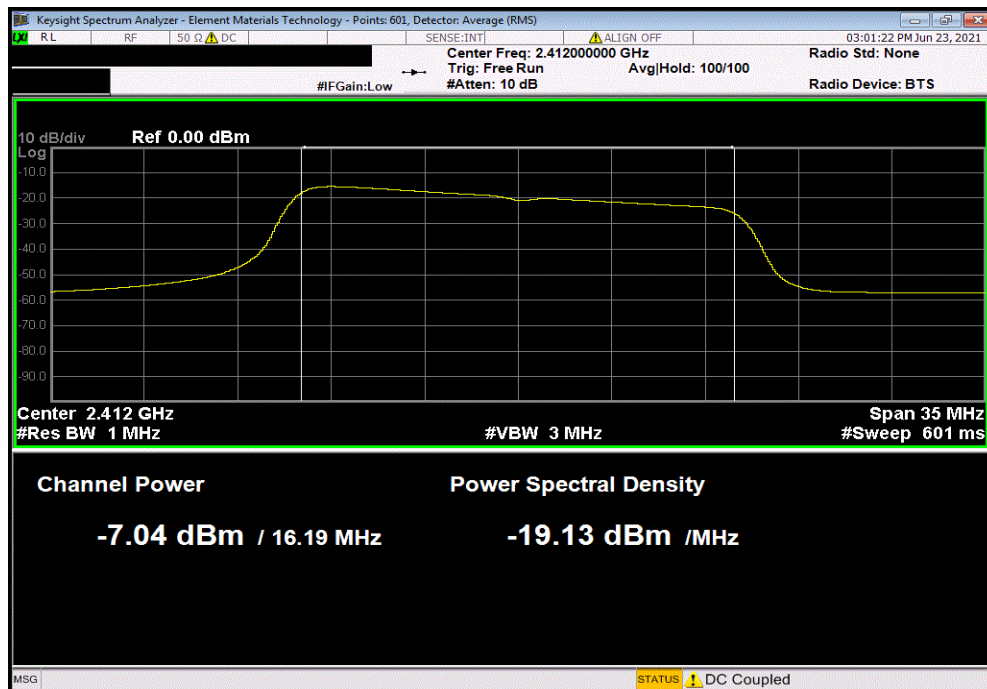


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
Avg Cond Pwr (dBm)	Correction Factor	Duty Cycle Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)	Result	
-2.931	11.77	0	8.8	36	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
Avg Cond Pwr (dBm)	Correction Factor	Duty Cycle Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)	Result	
-7.039	11.77	0	4.7	36	Pass	

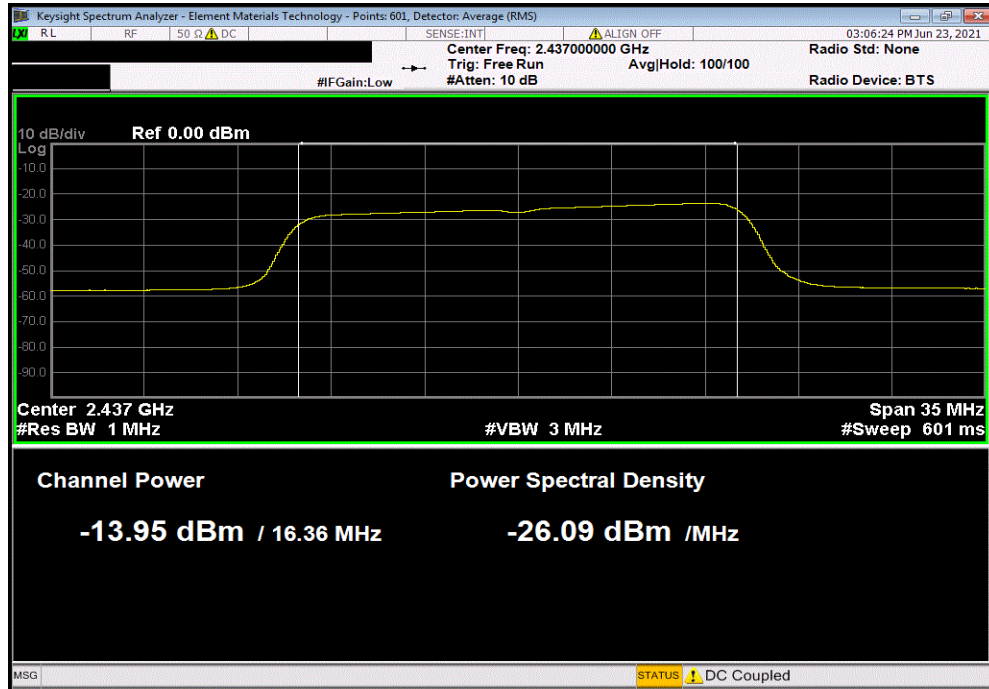


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

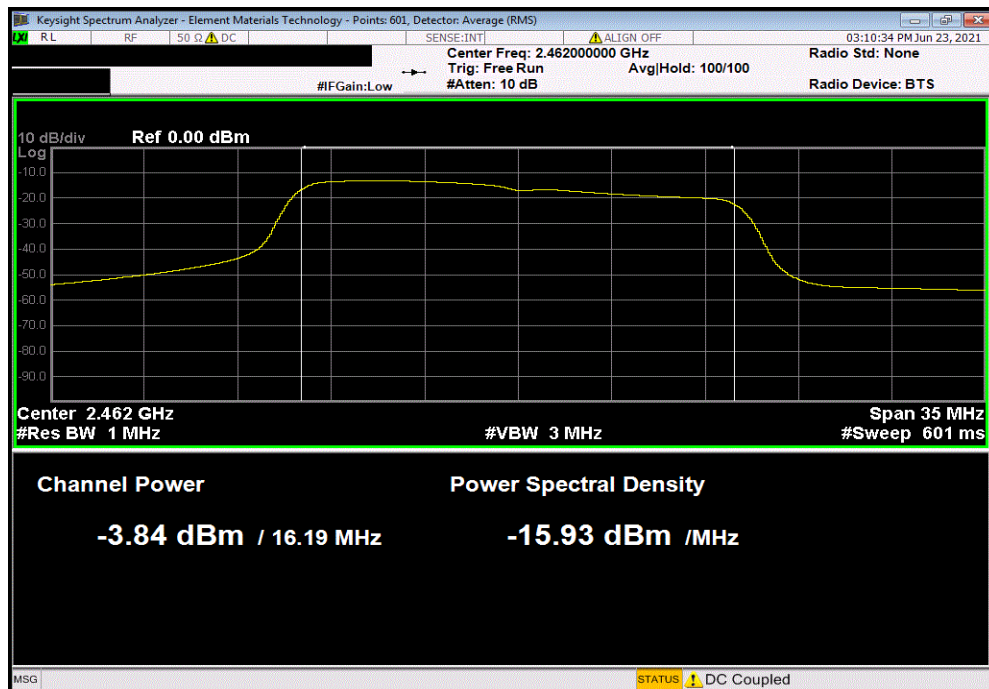


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz						
Avg Cond Pwr (dBm)	Correction Factor	Duty Cycle Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)	Result	
-13.953	11.77	0	-2.2	36	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
Avg Cond Pwr (dBm)	Correction Factor	Duty Cycle Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)	Result	
-3.838	11.77	0	7.9	36	Pass	

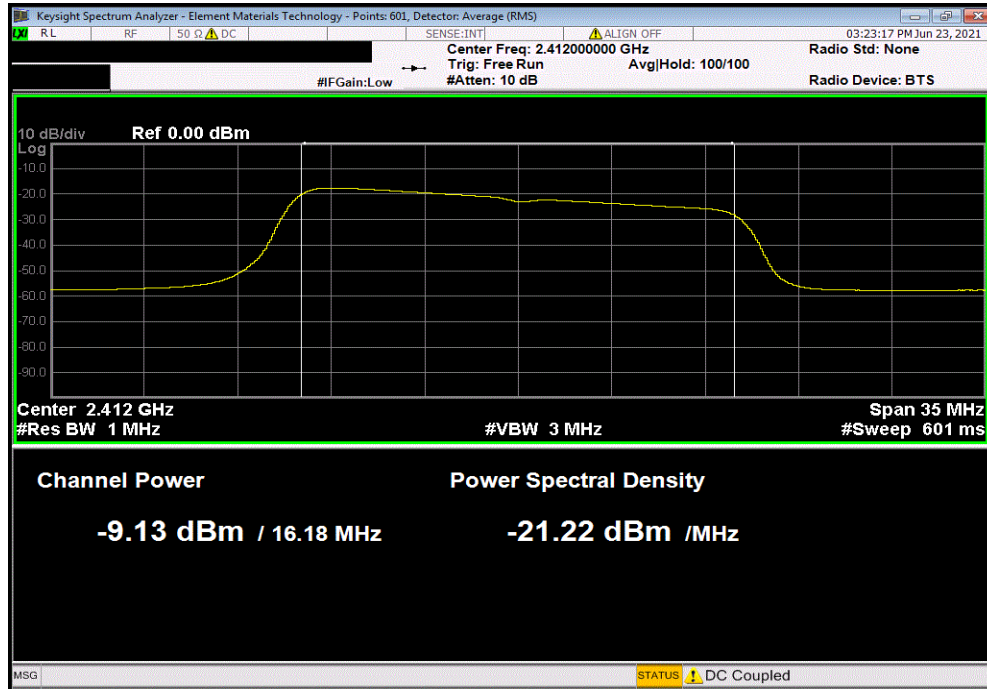


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

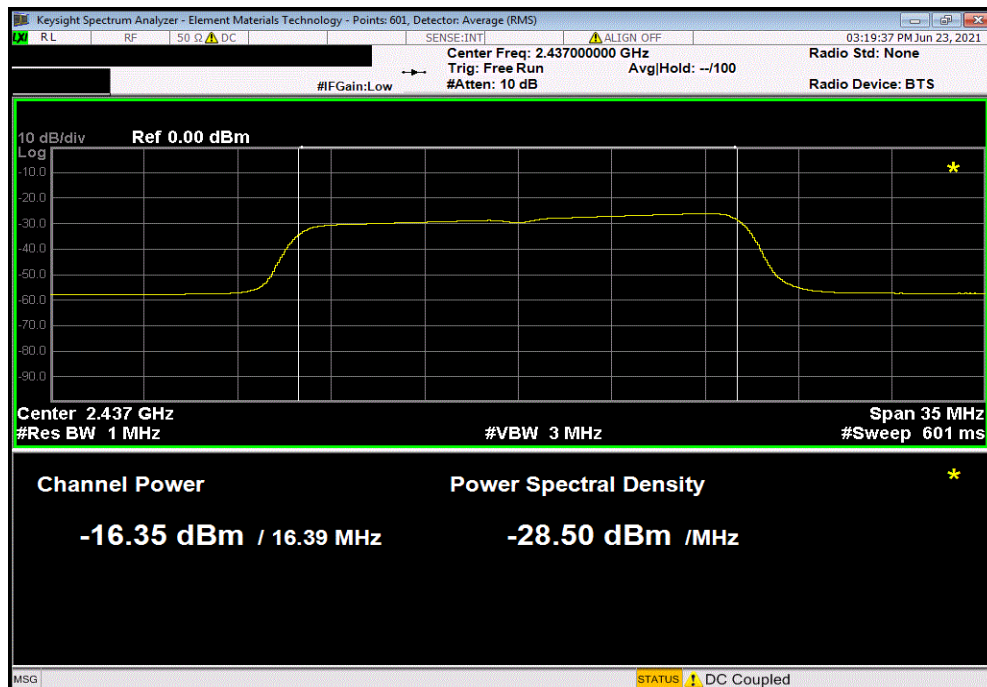


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
Avg Cond Pwr (dBm)	Correction Factor	Duty Cycle Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)	Result	
-9.132	11.77	0	2.6	36	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz						
Avg Cond Pwr (dBm)	Correction Factor	Duty Cycle Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)	Result	
-16.351	11.77	0	-4.6	36	Pass	

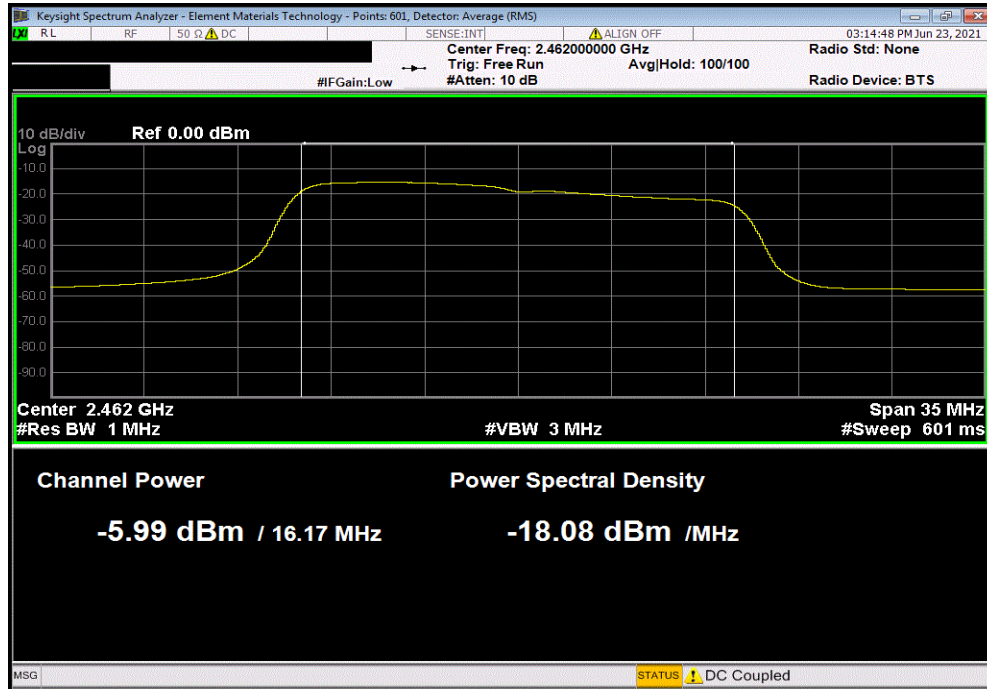


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

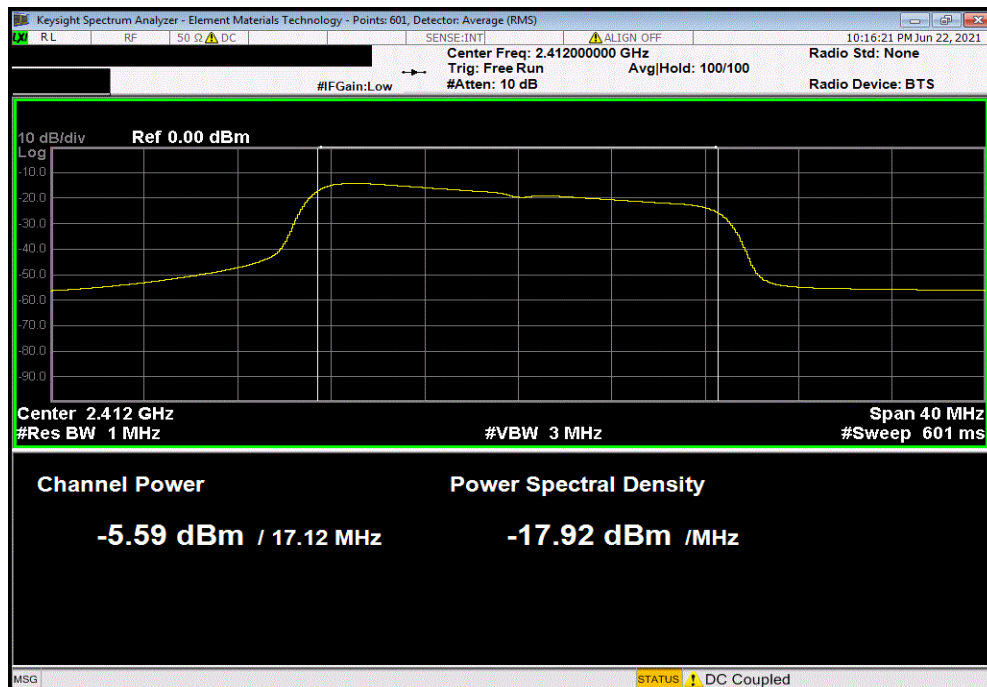


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
Avg Cond Pwr (dBm)	Correction Factor	Duty Cycle Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)	Result	
-5.993	11.77	0	5.8	36	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
Avg Cond Pwr (dBm)	Correction Factor	Duty Cycle Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)	Result	
-5.585	11.77	0	6.2	36	Pass	

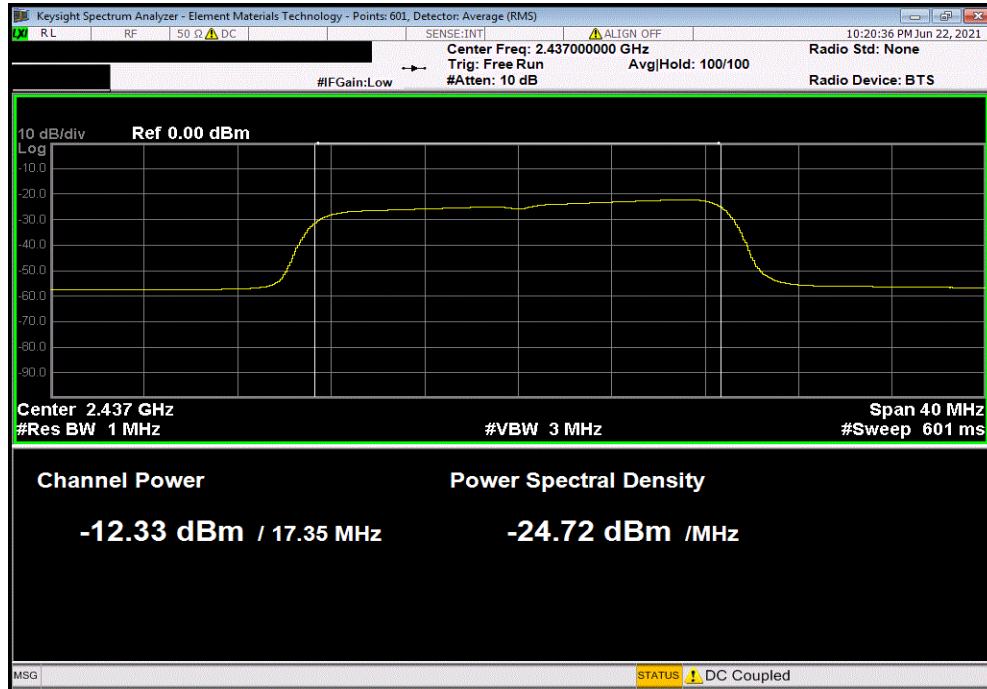


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

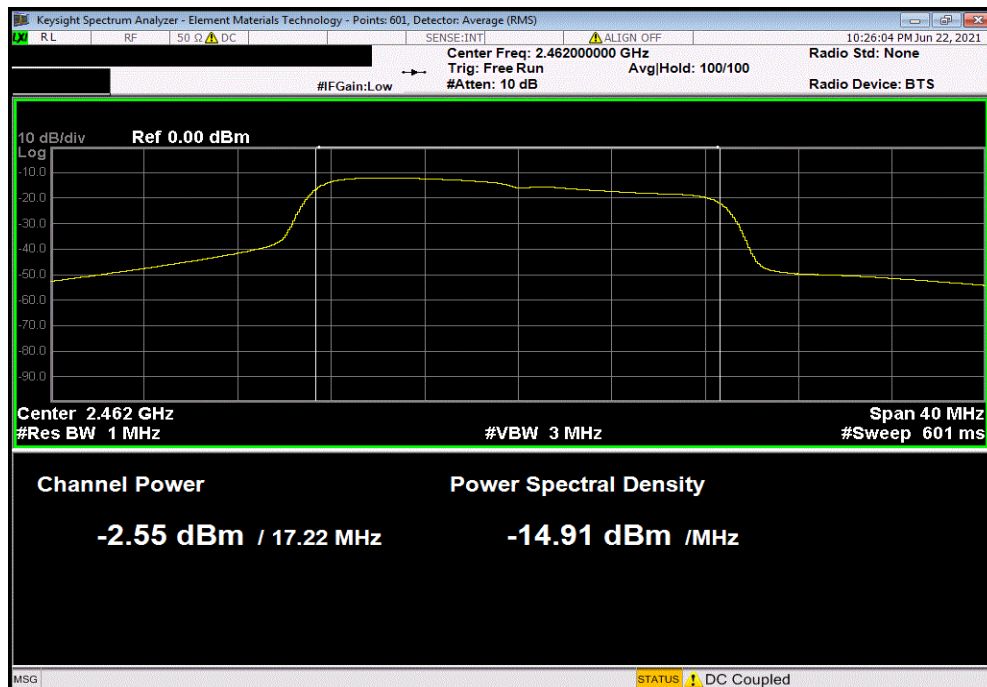


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
Avg Cond Pwr (dBm)	Correction Factor	Duty Cycle Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)	Result	
-12.326	11.77	0	-0.6	36	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz						
Avg Cond Pwr (dBm)	Correction Factor	Duty Cycle Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)	Result	
-2.548	11.77	0	9.2	36	Pass	

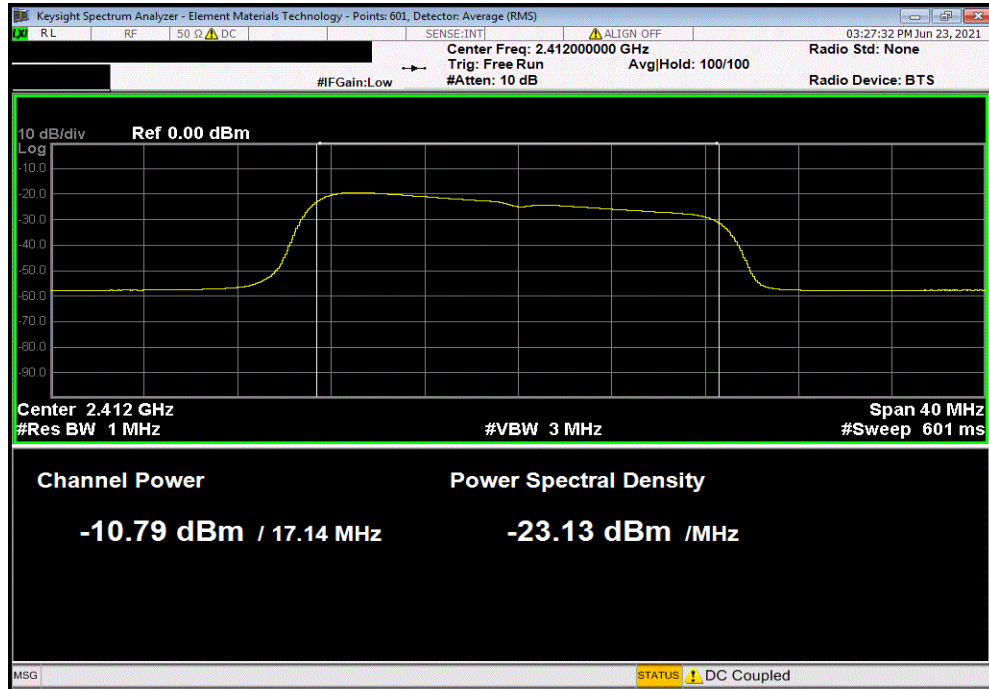


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)

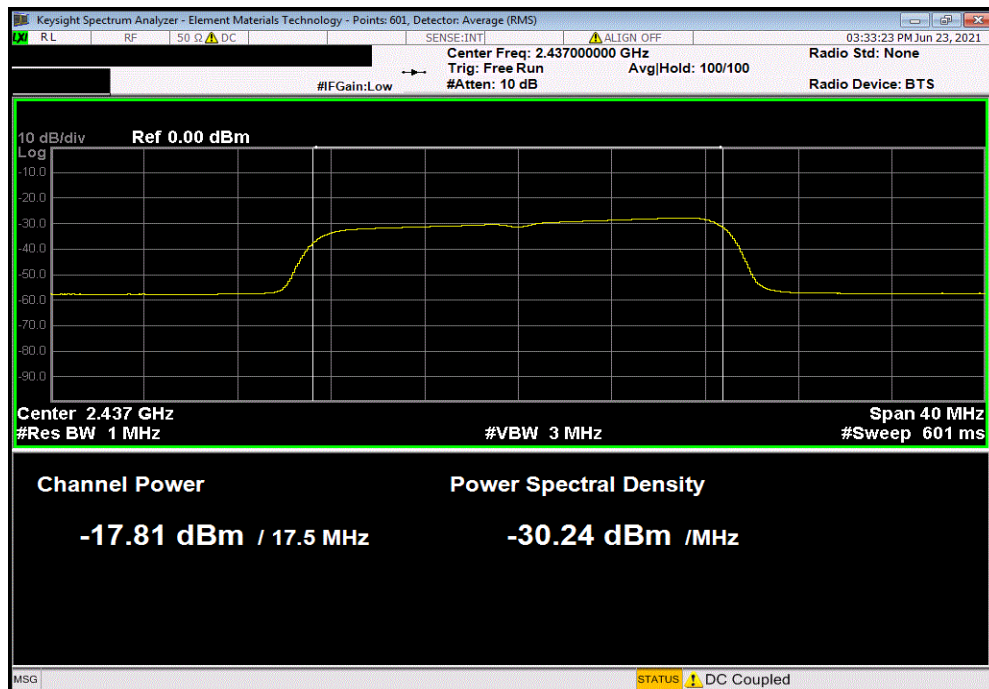


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
Avg Cond Pwr (dBm)	Correction Factor	Duty Cycle Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)	Result	
-10.786	11.77	0	1.0	36	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz						
Avg Cond Pwr (dBm)	Correction Factor	Duty Cycle Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)	Result	
-17.809	11.77	0	-6.0	36	Pass	

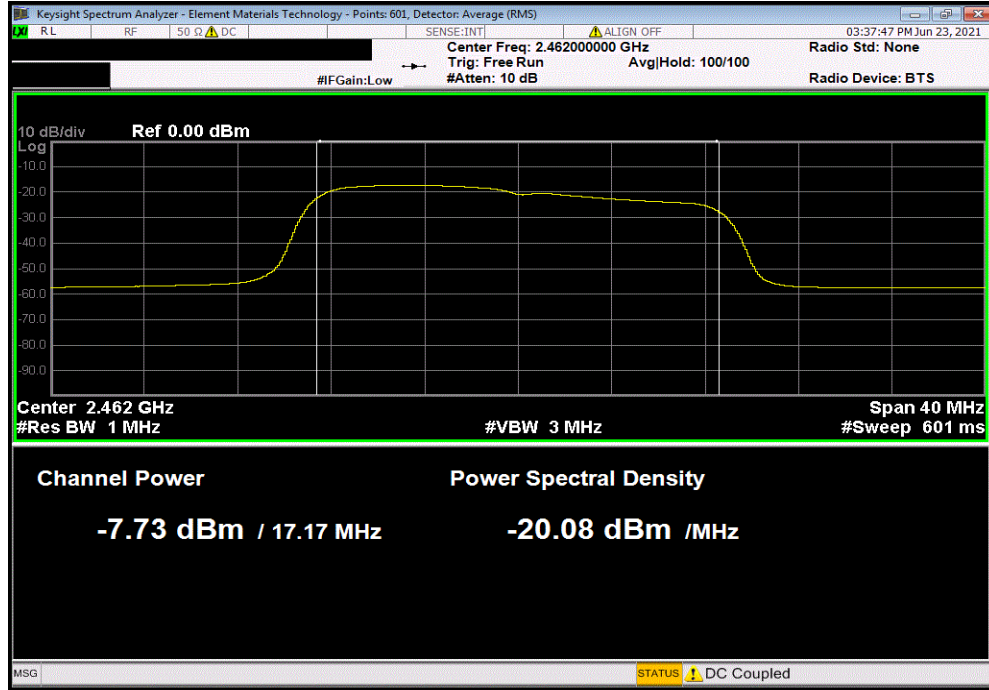


EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz						
Avg Cond Pwr (dBm)	Correction Factor	Duty Cycle Factor (dB)	EIRP (dBm)	EIRP Limit (dBm)	Result	
-7.729	11.77	0	4.0	36	Pass	



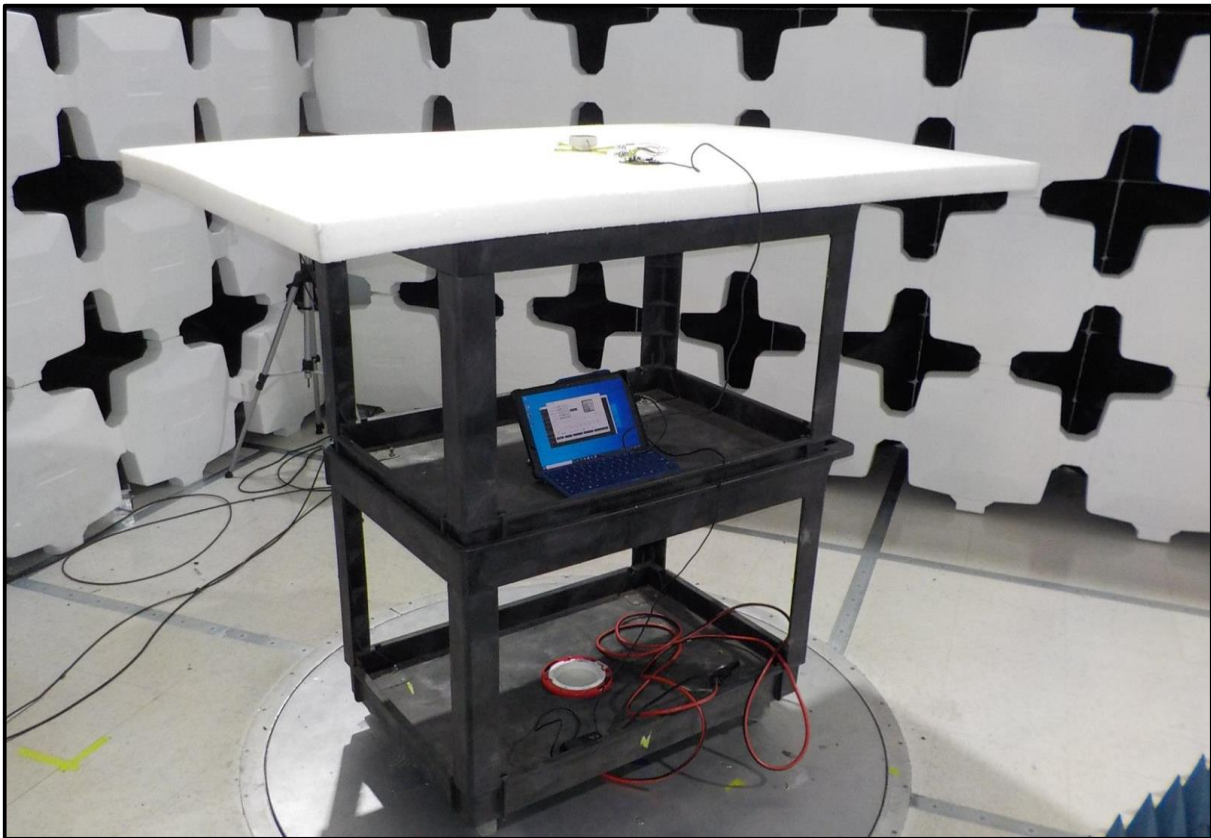
11.77

11.8

EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



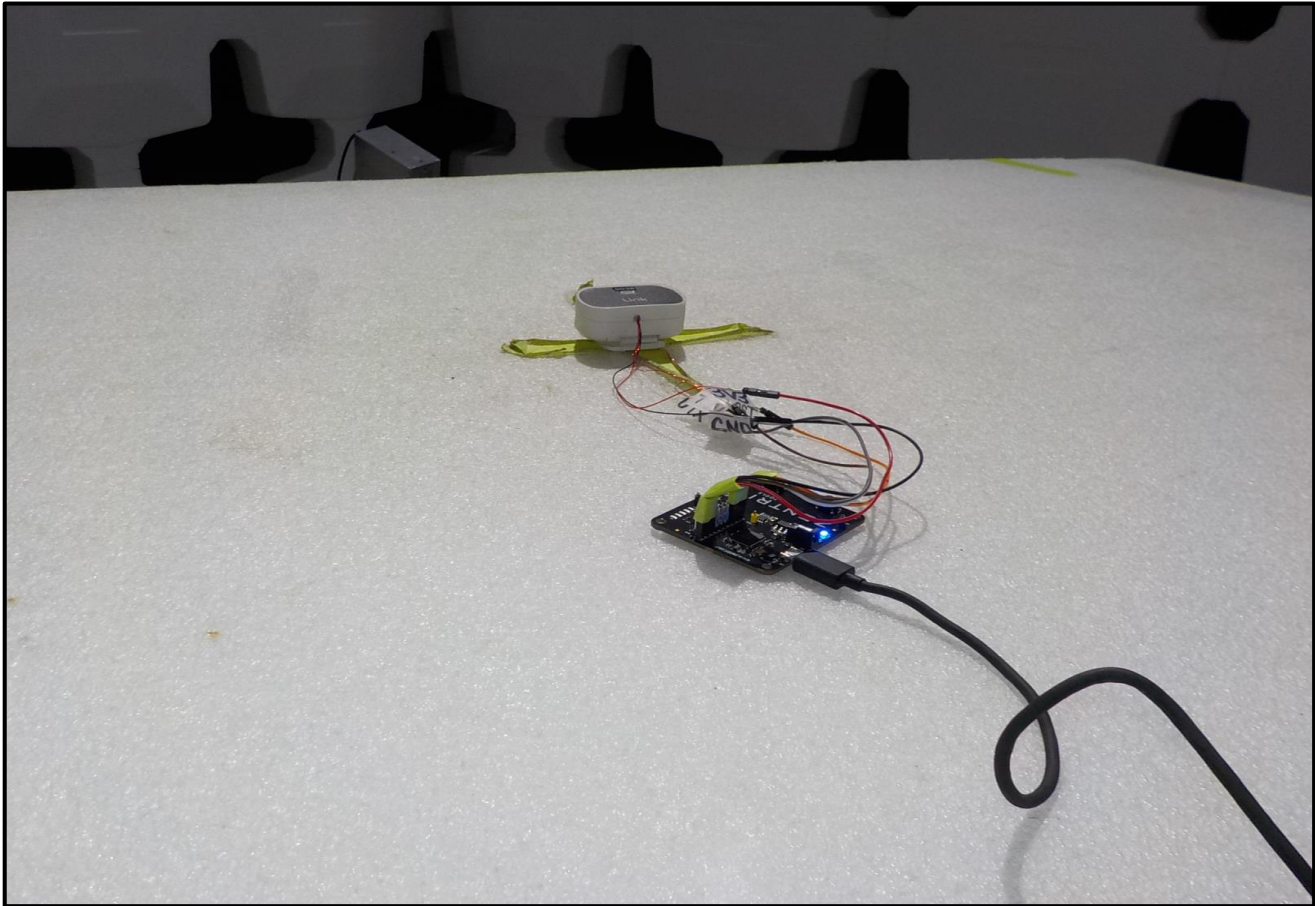
XMit 2020.12.30.0



EQUIVALENT ISOTROPIC RADIATED POWER (EIRP)



XMit 2020.12.30.0



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
Attenuator	Coaxicom	3910-20	AXY	2020-09-14	2021-09-14
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2021-04-16	2022-04-16
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	2021-02-01	2022-02-01
Cable	Element	Double Ridge Guide Horn Cables	MNV	2021-02-01	2022-02-01
Antenna - Double Ridge	ETS Lindgren	3115	AIB	2020-09-03	2022-09-03

TEST DESCRIPTION

The measurement was made in a radiated configuration of the fundamental with the carrier fully maximized for its highest radiated power.

The maximum power spectral density measurements were measured with the EUT set to the required transmit frequencies in each band. The EUT was transmitting at the lowest, middle, and maximum data rate for each modulation type available.

Per the procedure outlined in ANSI C63.10:2013 Section 11.10.2, the peak power spectral density was measured.

The final data was converted from a field strength to a radiated power value by applying the following relationship:

$$P=(4 * \pi * d^2 * E^2)/Z_0$$

Where the power, P, is determined by the measurement distance, d = 3m, the impedance of free space in air, Z₀, and the measured field strength, E. The amplitude offset in the spectrum analyzer includes the antenna factor and cable loss. A factor of 11.77 dB is added to the marker amplitude to convert from field strength to EIRP. The antenna gain was subtracted from the EIRP value in the datasheet

POWER SPECTRAL DENSITY



TSTx 2021.03.19.1 XMR 2020.12.30.0

EUT: Smart Tracking Collar

Serial Number: 6797400036

Customer: Paragon Innovations, Inc.

Attendees: None

Project: None

Tested by: Andrew Rogstad

Power: 3.3 VDC via USB Cable

Work Order: PAON0011

Date: 23-Jun-21

Temperature: 22.2 °C

Humidity: 44.3% RH

Barometric Pres.: 1012 mbar

Job Site: MN09

TEST SPECIFICATIONS

FCC 15.247:2021

ANSI C63.10:2013

COMMENTS

Tested in a radiated configuration with the EUT maximized in the single worst-case EUT orientation/receive antenna polarity combination. Reference level offset accounts for cables, transducer, preamp, and 20 dB attenuator.

DEVIATIONS FROM TEST STANDARD

None

Configuration #

6

Signature 

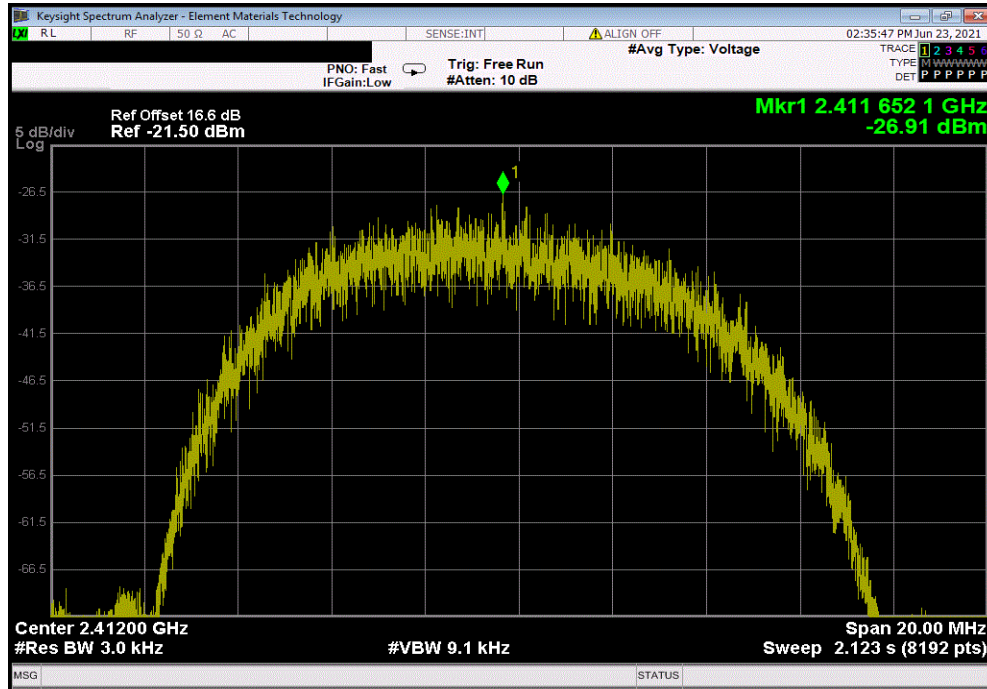
	Value dBm/3kHz	Correction Factor	Antenna Gain (dBi)	PSD dBm/3kHz	Limit < dBm/3kHz	Results
2400 MHz - 2483.5 MHz Band						
802.11(b) 1 Mbps						
Low Channel 1, 2412 MHz	-26.91	11.77	2.5	-17.6	8	Pass
Mid Channel 6, 2437 MHz	-33.949	11.77	2.5	-24.7	8	Pass
High Channel 11, 2462 MHz	-23.465	11.77	2.5	-14.2	8	Pass
802.11(b) 11 Mbps						
Low Channel 1, 2412 MHz	-28.287	11.77	2.5	-19.0	8	Pass
Mid Channel 6, 2437 MHz	-34.957	11.77	2.5	-25.7	8	Pass
High Channel 11, 2462 MHz	-23.446	11.77	2.5	-14.2	8	Pass
802.11(g) 6 Mbps						
Low Channel 1, 2412 MHz	-28.545	11.77	2.5	-19.3	8	Pass
Mid Channel 6, 2437 MHz	-33.844	11.77	2.5	-24.6	8	Pass
High Channel 11, 2462 MHz	-26.476	11.77	2.5	-17.2	8	Pass
802.11(g) 36 Mbps						
Low Channel 1, 2412 MHz	-28.791	11.77	2.5	-19.5	8	Pass
Mid Channel 6, 2437 MHz	-36.098	11.77	2.5	-26.8	8	Pass
High Channel 11, 2462 MHz	-26.225	11.77	2.5	-17.0	8	Pass
802.11(g) 54 Mbps						
Low Channel 1, 2412 MHz	-29.95	11.77	2.5	-20.7	8	Pass
Mid Channel 6, 2437 MHz	-39.388	11.77	2.5	-30.1	8	Pass
High Channel 11, 2462 MHz	-29.626	11.77	2.5	-20.4	8	Pass
802.11(n) MCS0						
Low Channel 1, 2412 MHz	-28.107	11.77	2.5	-18.8	8	Pass
Mid Channel 6, 2437 MHz	-36.012	11.77	2.5	-26.7	8	Pass
High Channel 11, 2462 MHz	-26.587	11.77	2.5	-17.3	8	Pass
802.11(n) MCS7						
Low Channel 1, 2412 MHz	-33.237	11.77	2.5	-24.0	8	Pass
Mid Channel 6, 2437 MHz	-41.414	11.77	2.5	-32.1	8	Pass
High Channel 11, 2462 MHz	-30.269	11.77	2.5	-21.0	8	Pass

POWER SPECTRAL DENSITY

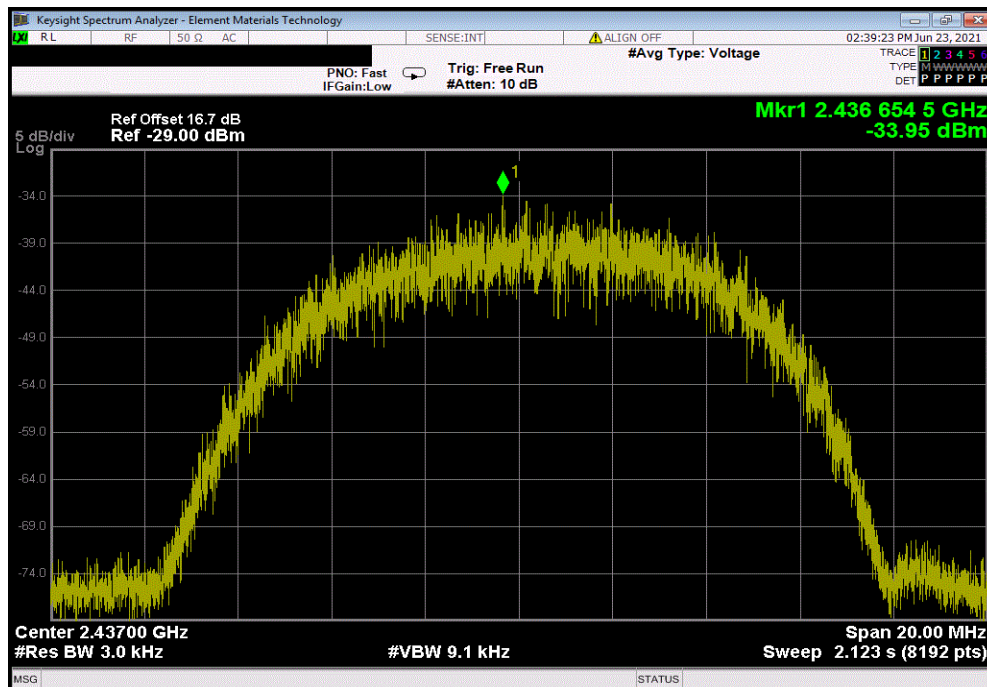


TbTx 2021.03.19.1 XM8 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
Value	Correction	Antenna	PSD	Limit	Results	
dBm/3kHz	Factor	Gain (dBi)	dBm/3kHz	< dBm/3kHz		
-26.91	11.77	2.5	-17.6	8	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Mid Channel 6, 2437 MHz						
Value	Correction	Antenna	PSD	Limit	Results	
dBm/3kHz	Factor	Gain (dBi)	dBm/3kHz	< dBm/3kHz		
-33.949	11.77	2.5	-24.7	8	Pass	

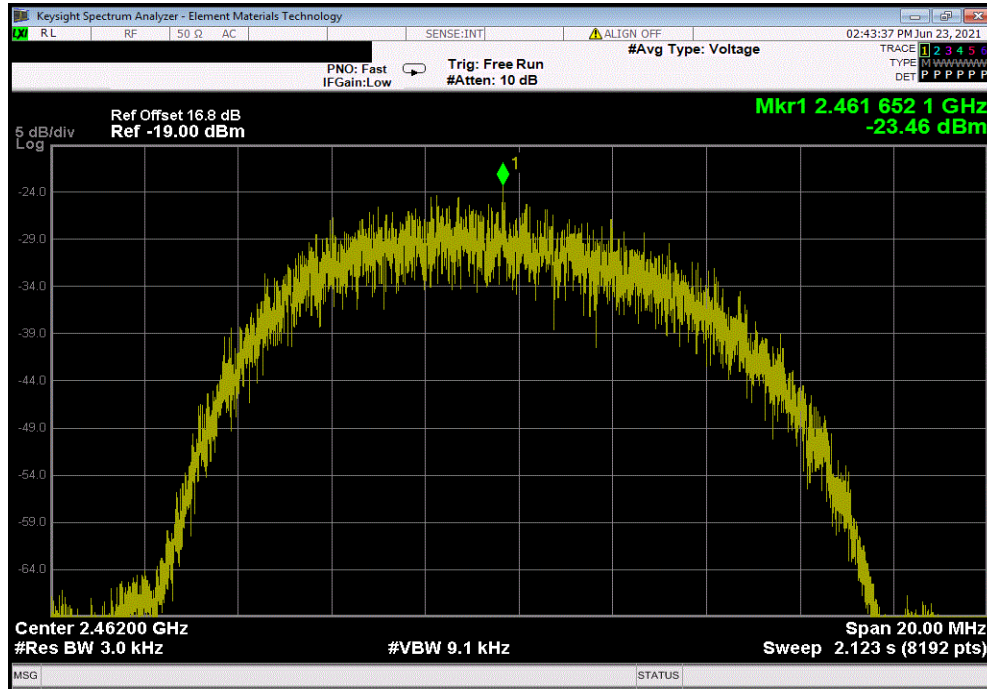


POWER SPECTRAL DENSITY

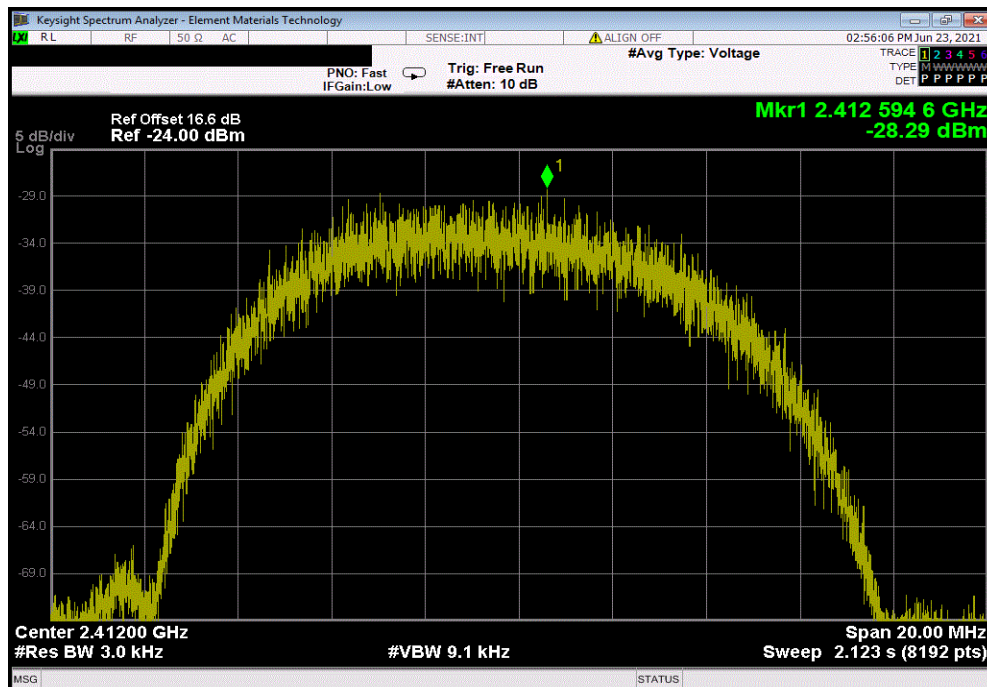


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
Value	Correction	Antenna	PSD	Limit	Results	
dBm/3kHz	Factor	Gain (dBi)	dBm/3kHz	< dBm/3kHz		
-23.465	11.77	2.5	-14.2	8	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
Value	Correction	Antenna	PSD	Limit	Results	
dBm/3kHz	Factor	Gain (dBi)	dBm/3kHz	< dBm/3kHz		
-28.287	11.77	2.5	-19.0	8	Pass	

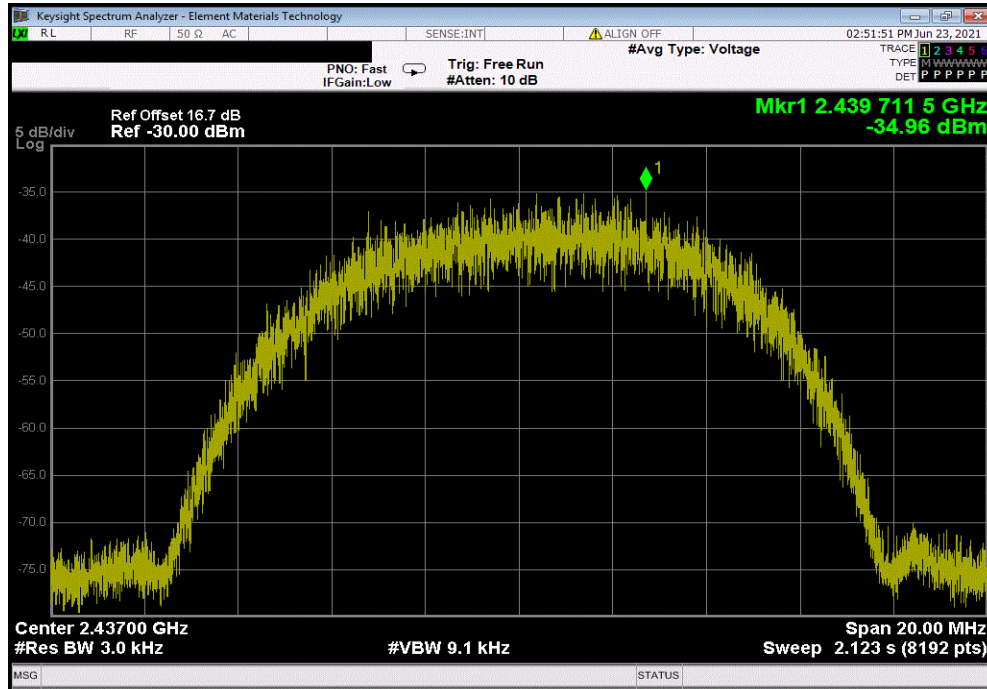


POWER SPECTRAL DENSITY

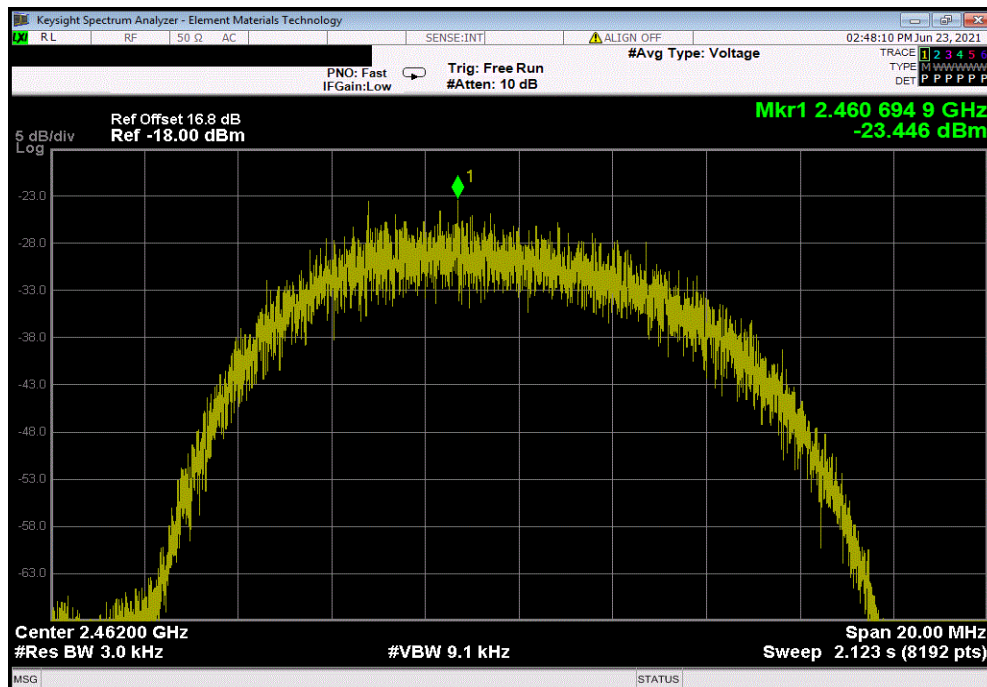


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Mid Channel 6, 2437 MHz						
Value	Correction	Antenna	PSD	Limit	Results	
dBm/3kHz	Factor	Gain (dBi)	dBm/3kHz	< dBm/3kHz		
-34.957	11.77	2.5	-25.7	8	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
Value	Correction	Antenna	PSD	Limit	Results	
dBm/3kHz	Factor	Gain (dBi)	dBm/3kHz	< dBm/3kHz		
-23.446	11.77	2.5	-14.2	8	Pass	

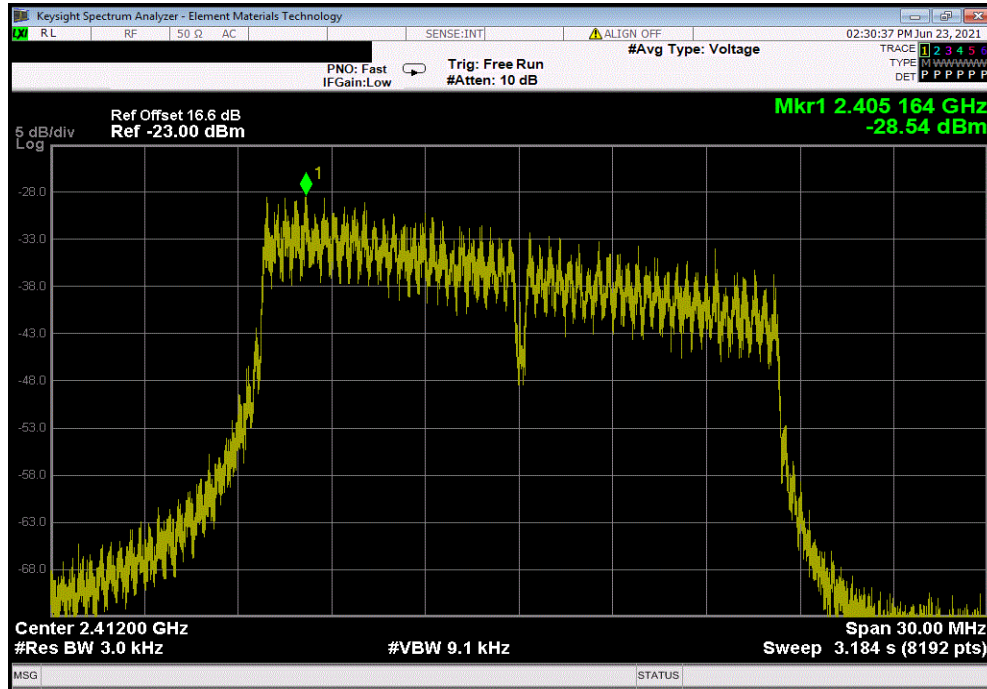


POWER SPECTRAL DENSITY

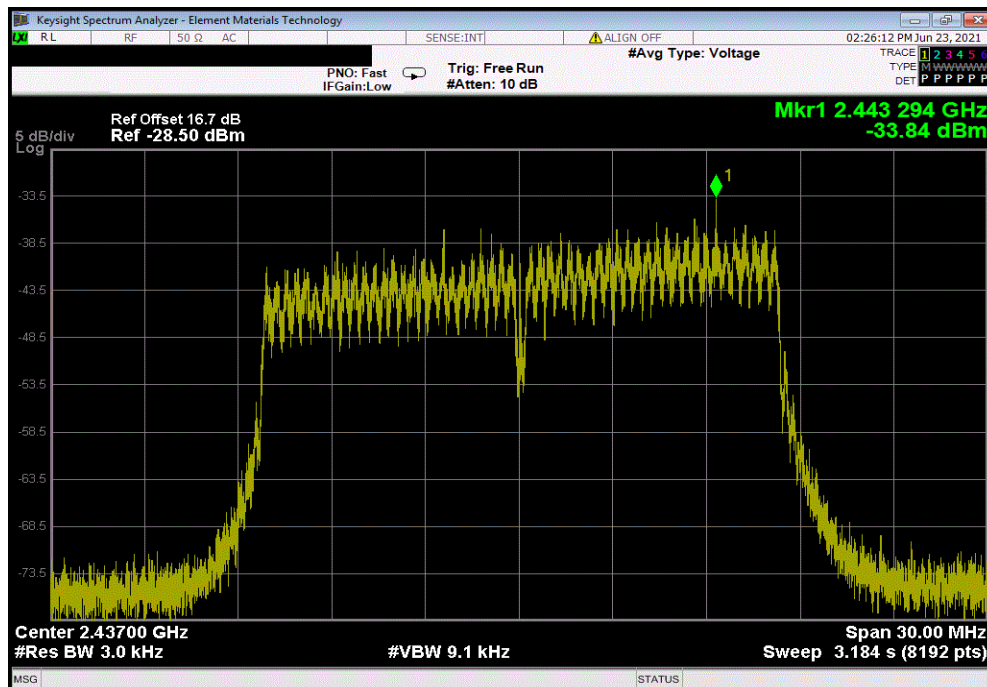


TbTx 2021.03.19.1 XM8 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
Value	Correction	Antenna	PSD	Limit	Results	
dBm/3kHz	Factor	Gain (dBi)	dBm/3kHz	< dBm/3kHz		
-28.545	11.77	2.5	-19.3	8	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Mid Channel 6, 2437 MHz						
Value	Correction	Antenna	PSD	Limit	Results	
dBm/3kHz	Factor	Gain (dBi)	dBm/3kHz	< dBm/3kHz		
-33.844	11.77	2.5	-24.6	8	Pass	

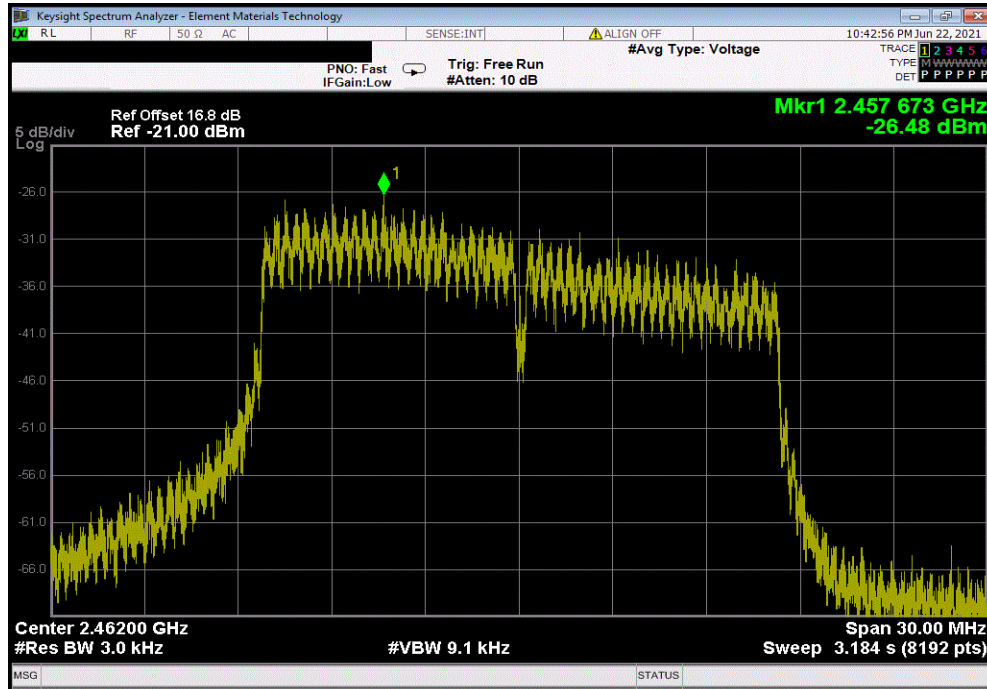


POWER SPECTRAL DENSITY

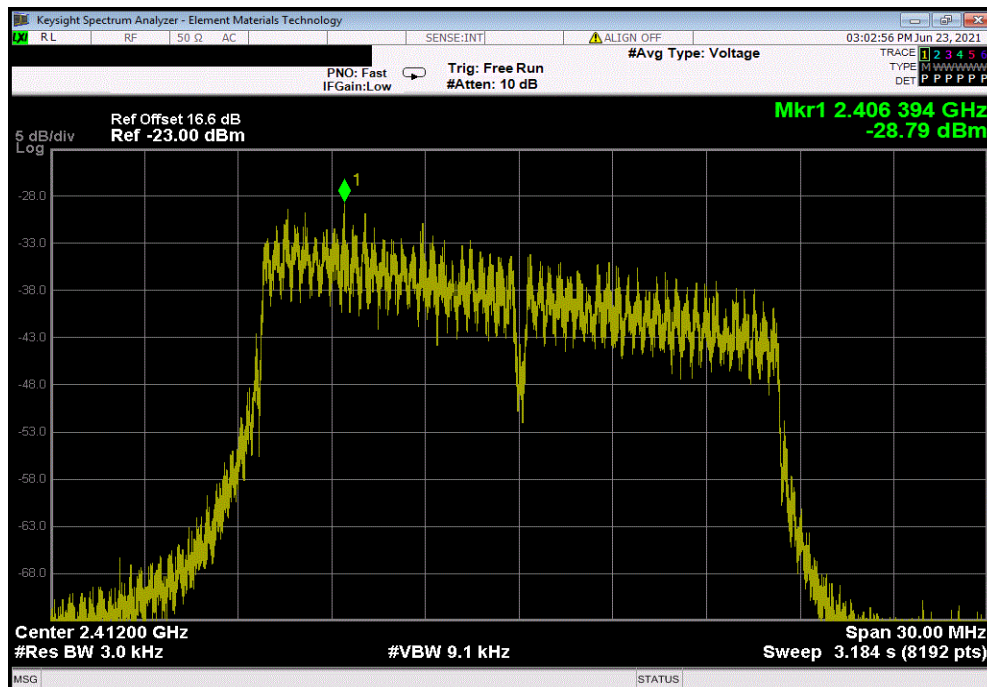


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
Value	Correction	Antenna	PSD	Limit	Results	
dBm/3kHz	Factor	Gain (dBi)	dBm/3kHz	< dBm/3kHz		
-26.476	11.77	2.5	-17.2	8	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
Value	Correction	Antenna	PSD	Limit	Results	
dBm/3kHz	Factor	Gain (dBi)	dBm/3kHz	< dBm/3kHz		
-28.791	11.77	2.5	-19.5	8	Pass	

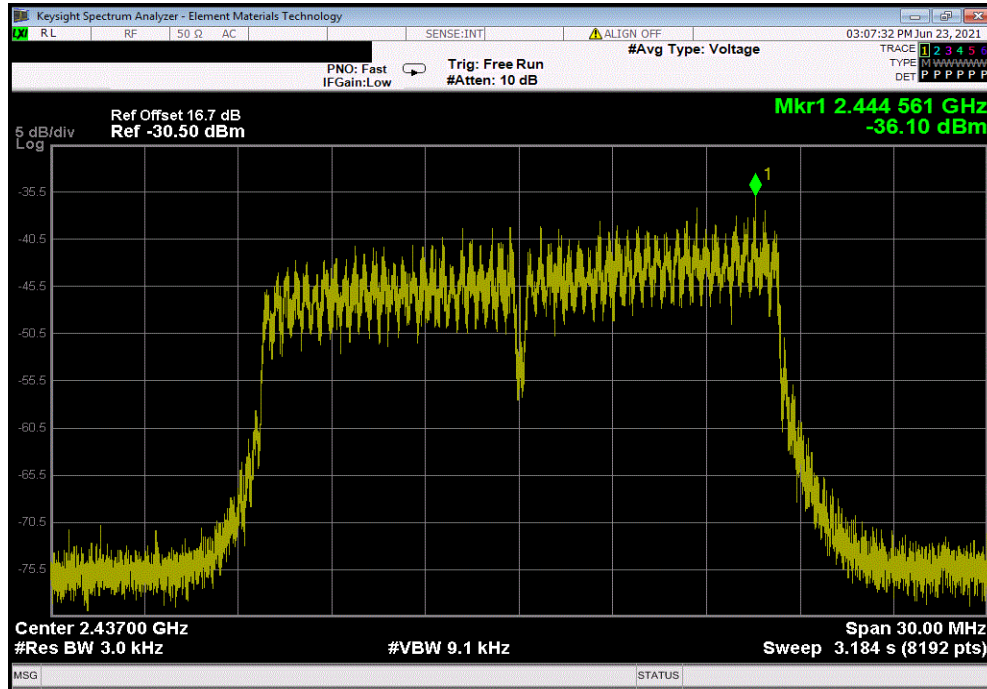


POWER SPECTRAL DENSITY

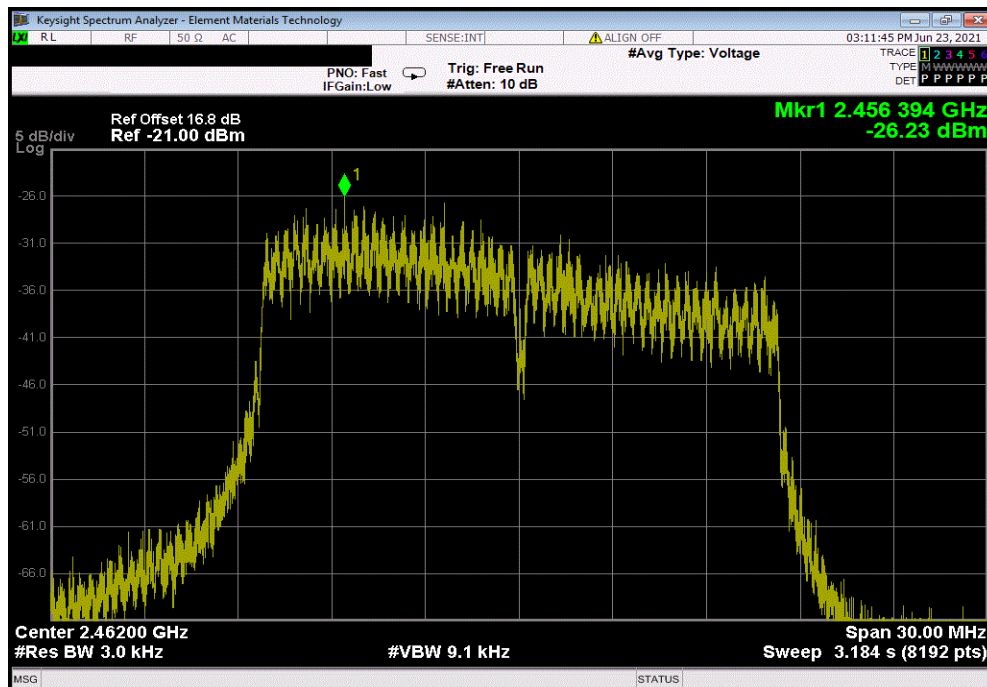


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Mid Channel 6, 2437 MHz						
Value	Correction	Antenna	PSD	Limit	Results	
dBm/3kHz	Factor	Gain (dBi)	dBm/3kHz	< dBm/3kHz		
-36.098	11.77	2.5	-26.8	8	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
Value	Correction	Antenna	PSD	Limit	Results	
dBm/3kHz	Factor	Gain (dBi)	dBm/3kHz	< dBm/3kHz		
-26.225	11.77	2.5	-17.0	8	Pass	

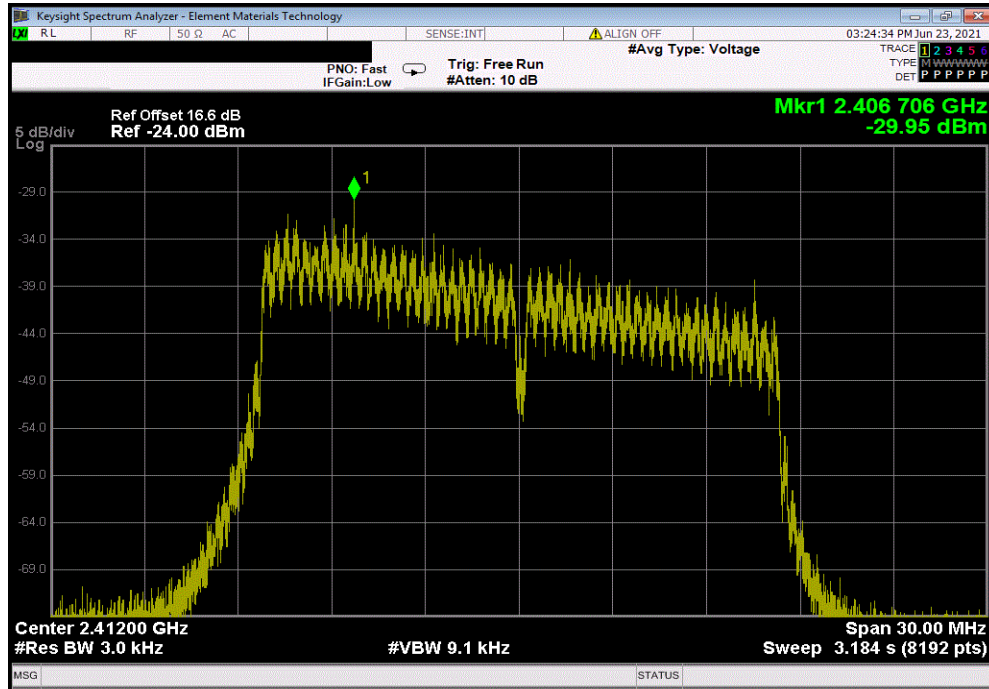


POWER SPECTRAL DENSITY

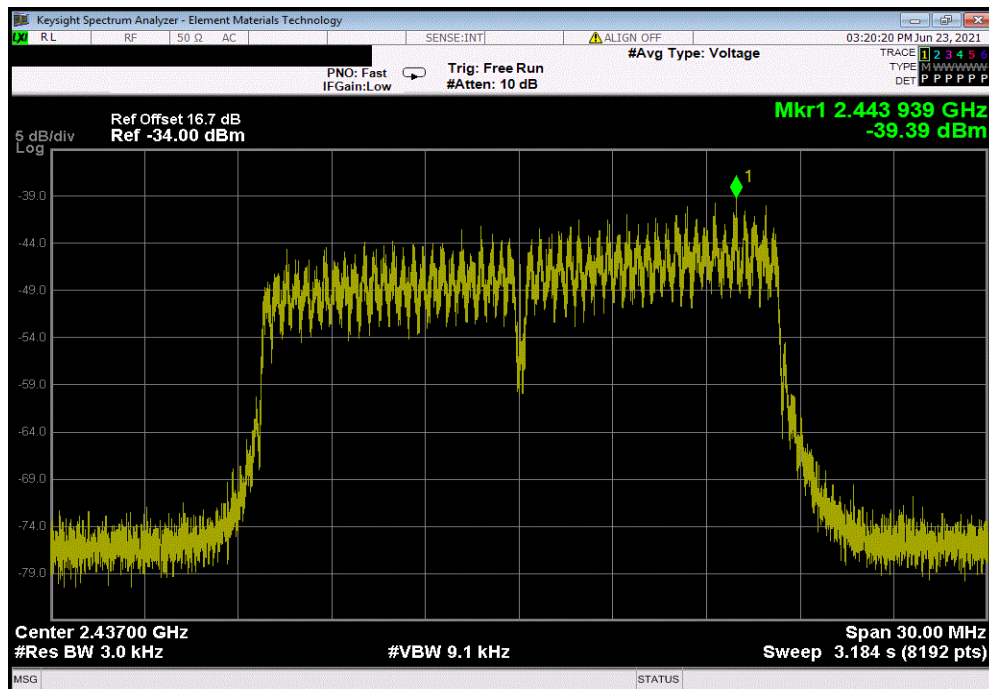


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
Value	Correction	Antenna	PSD	Limit	Results	
dBm/3kHz	Factor	Gain (dBi)	dBm/3kHz	< dBm/3kHz		
-29.95	11.77	2.5	-20.7	8	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Mid Channel 6, 2437 MHz						
Value	Correction	Antenna	PSD	Limit	Results	
dBm/3kHz	Factor	Gain (dBi)	dBm/3kHz	< dBm/3kHz		
-39.388	11.77	2.5	-30.1	8	Pass	

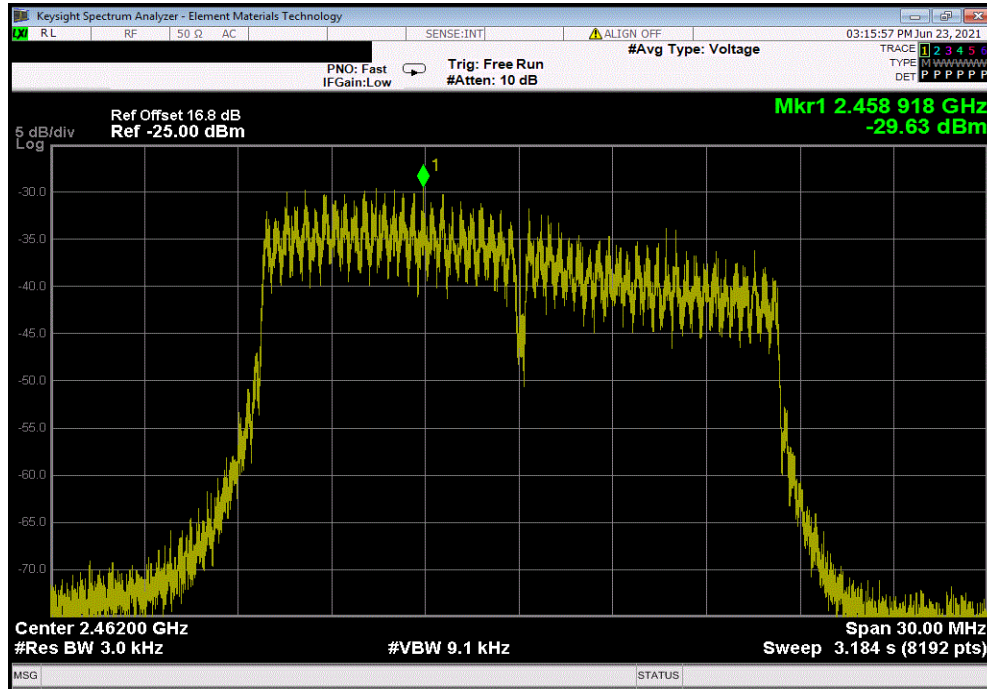


POWER SPECTRAL DENSITY

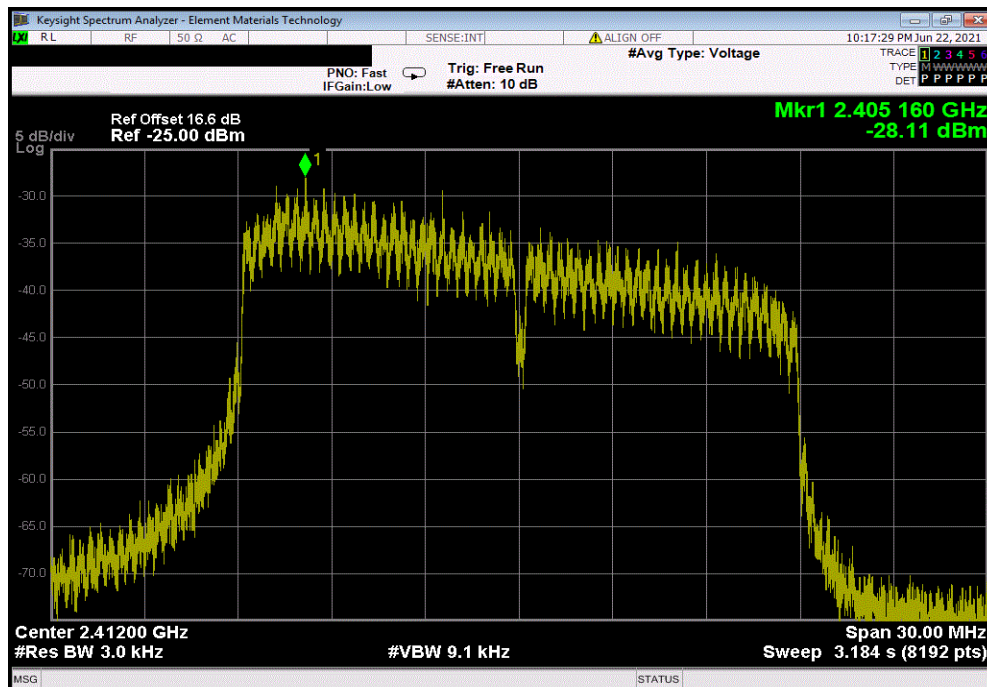


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
Value	Correction	Antenna	PSD	Limit	Results	
dBm/3kHz	Factor	Gain (dBi)	dBm/3kHz	< dBm/3kHz		
-29.626	11.77	2.5	-20.4	8	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
Value	Correction	Antenna	PSD	Limit	Results	
dBm/3kHz	Factor	Gain (dBi)	dBm/3kHz	< dBm/3kHz		
-28.107	11.77	2.5	-18.8	8	Pass	

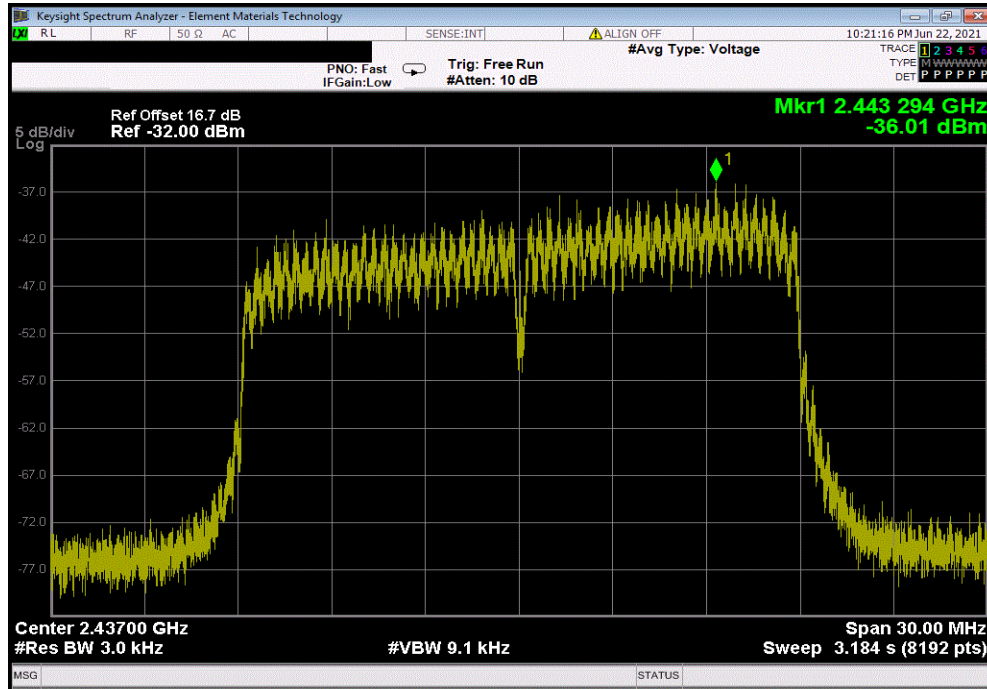


POWER SPECTRAL DENSITY

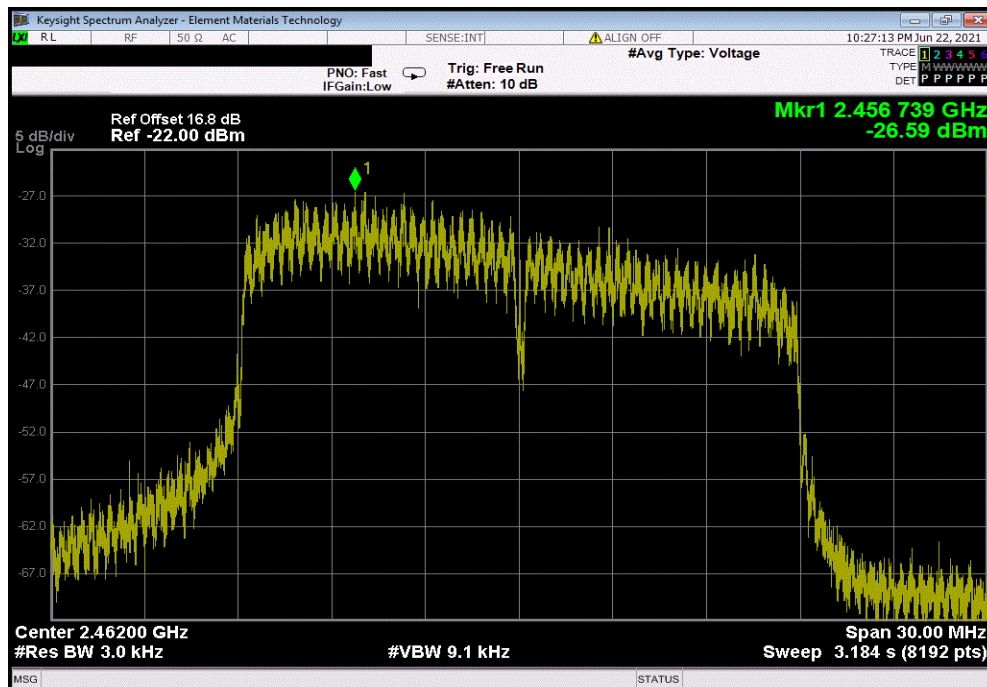


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Mid Channel 6, 2437 MHz						
Value	Correction	Antenna	PSD	Limit	Results	
dBm/3kHz	Factor	Gain (dBi)	dBm/3kHz	< dBm/3kHz		
-36.012	11.77	2.5	-26.7	8	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz						
Value	Correction	Antenna	PSD	Limit	Results	
dBm/3kHz	Factor	Gain (dBi)	dBm/3kHz	< dBm/3kHz		
-26.587	11.77	2.5	-17.3	8	Pass	

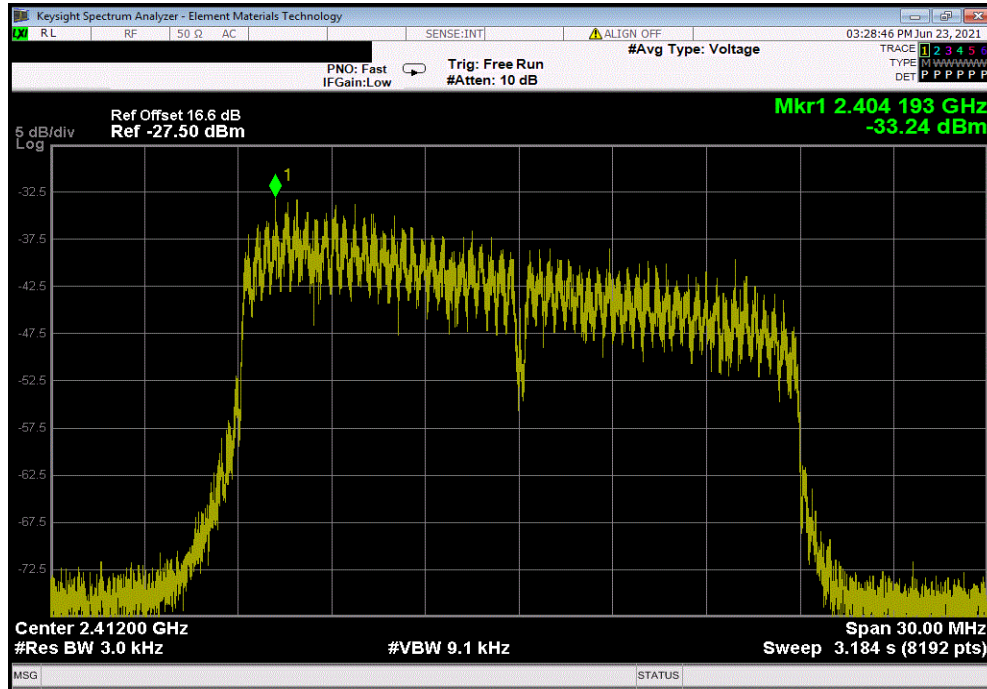


POWER SPECTRAL DENSITY

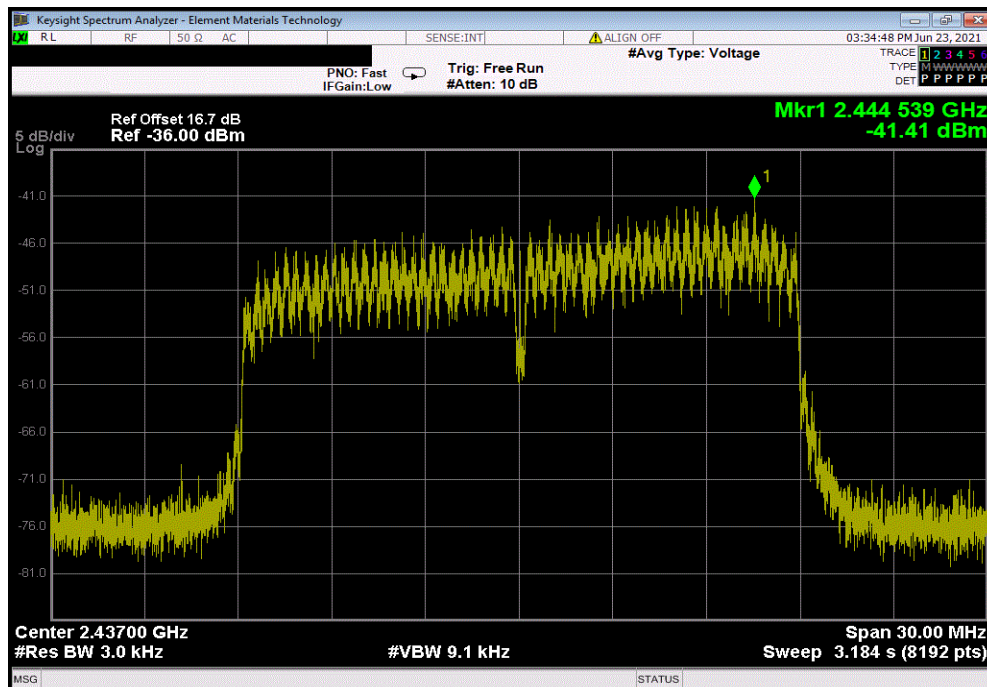


TbTx 2021.03.19.1 XMt 2020.12.30.0

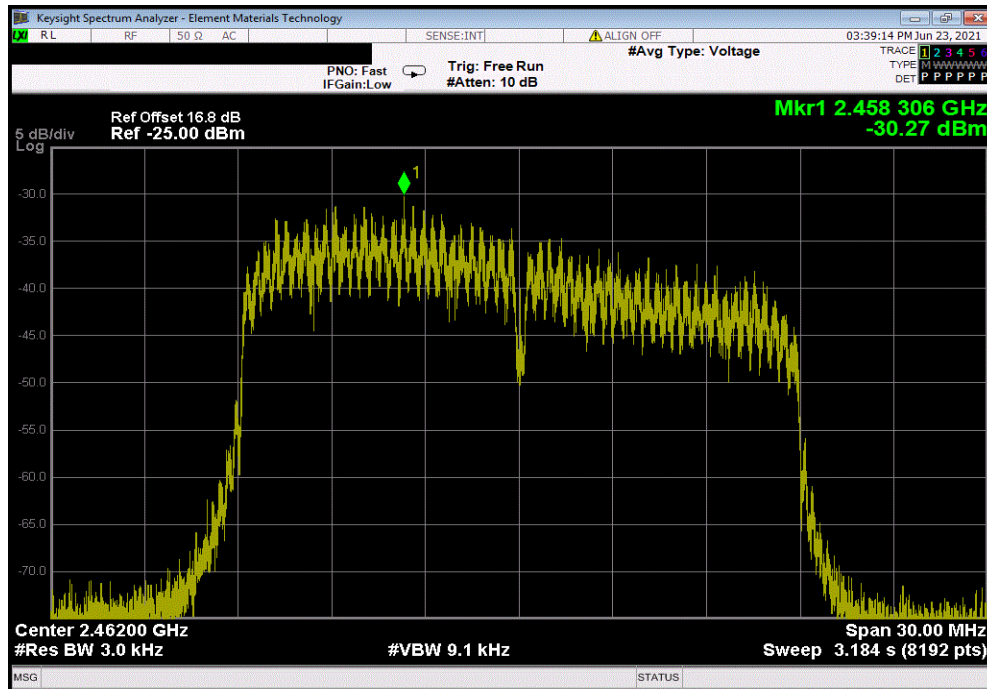
2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
Value	Correction	Antenna	PSD	Limit	Results	
dBm/3kHz	Factor	Gain (dBi)	dBm/3kHz	< dBm/3kHz		
-33.237	11.77	2.5	-24.0	8	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Mid Channel 6, 2437 MHz						
Value	Correction	Antenna	PSD	Limit	Results	
dBm/3kHz	Factor	Gain (dBi)	dBm/3kHz	< dBm/3kHz		
-41.414	11.77	2.5	-32.1	8	Pass	



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz						
Value	Correction	Antenna	PSD	Limit		
dBm/3kHz	Factor	Gain (dBi)	dBm/3kHz	< dBm/3kHz	Results	
-30.269	11.77	2.5	-21.0	8	Pass	



11.77	2.5	9.3
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BAND EDGE COMPLIANCE



XMIT 2020.12.30.0

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
Attenuator	Coaxicom	3910-20	AXY	2020-09-14	2021-09-14
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2021-04-16	2022-04-16
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	2021-02-01	2022-02-01
Cable	Element	Double Ridge Guide Horn Cables	MNV	2021-02-01	2022-02-01
Antenna - Double Ridge	ETS Lindgren	3115	AIB	2020-09-03	2022-09-03

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



TSTx 2021.03.19.1 XMR 2020.12.30.0

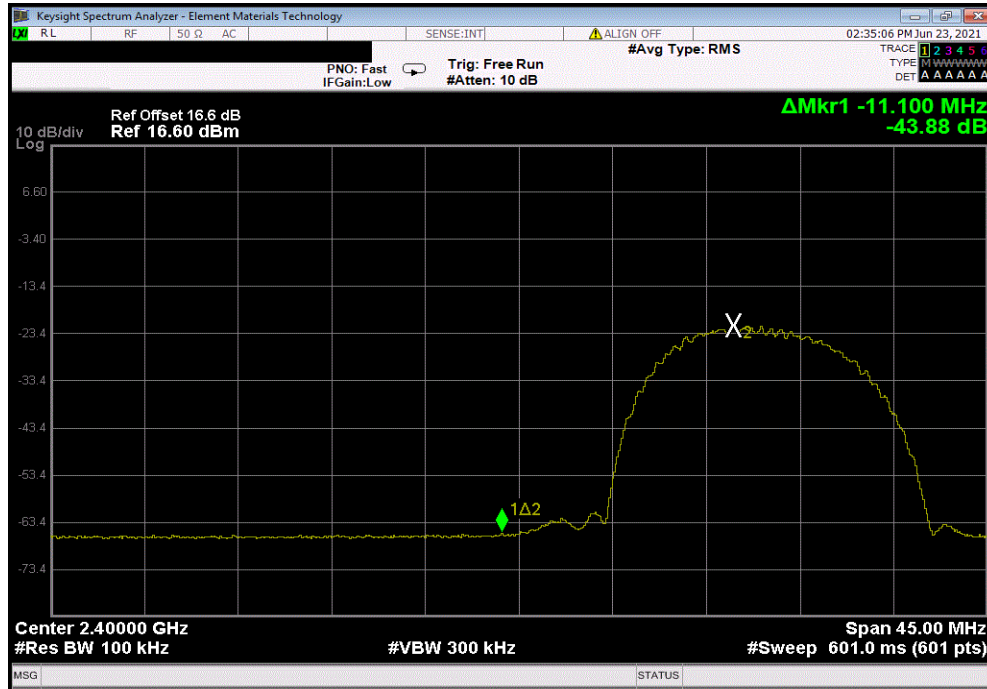
EUT: Smart Tracking Collar		Work Order: PAON0011	
Serial Number: 6797400036		Date: 23-Jun-21	
Customer: Paragon Innovations, Inc.		Temperature: 22.1 °C	
Attendees: None		Humidity: 44.3% RH	
Project: None		Barometric Pres.: 1012 mbar	
Tested by: Andrew Rogstad		Power: 3.3 VDC via USB Cable	
		Job Site: MN09	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2021		ANSI C63.10:2013	
COMMENTS			
Tested in a radiated configuration with the EUT maximized in the single worst-case EUT orientation/receive antenna polarity combination. Reference level offset accounts for cables, transducer, preamp, and 20 dB attenuator.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	6	Signature <i>Andrew Rogstad</i>	
		Value (dBc)	Limit ≤ (dBc) Result
2400 MHz - 2483.5 MHz Band			
802.11(b) 1 Mbps			
	Low Channel 1, 2412 MHz	-43.88	-30 Pass
	High Channel 11, 2462 MHz	-47.91	-30 Pass
802.11(b) 11 Mbps			
	Low Channel 1, 2412 MHz	-42.94	-30 Pass
	High Channel 11, 2462 MHz	-47.66	-30 Pass
802.11(g) 6 Mbps			
	Low Channel 1, 2412 MHz	-34.12	-30 Pass
	High Channel 11, 2462 MHz	-43.58	-30 Pass
802.11(g) 36 Mbps			
	Low Channel 1, 2412 MHz	-36.95	-30 Pass
	High Channel 11, 2462 MHz	-43.95	-30 Pass
802.11(g) 54 Mbps			
	Low Channel 1, 2412 MHz	-38.53	-30 Pass
	High Channel 11, 2462 MHz	-42	-30 Pass
802.11(n) MCS0			
	Low Channel 1, 2412 MHz	-33.45	-30 Pass
	High Channel 11, 2462 MHz	-43.47	-30 Pass
802.11(n) MCS7			
	Low Channel 1, 2412 MHz	-37.84	-30 Pass
	High Channel 11, 2462 MHz	-40.42	-30 Pass

BAND EDGE COMPLIANCE

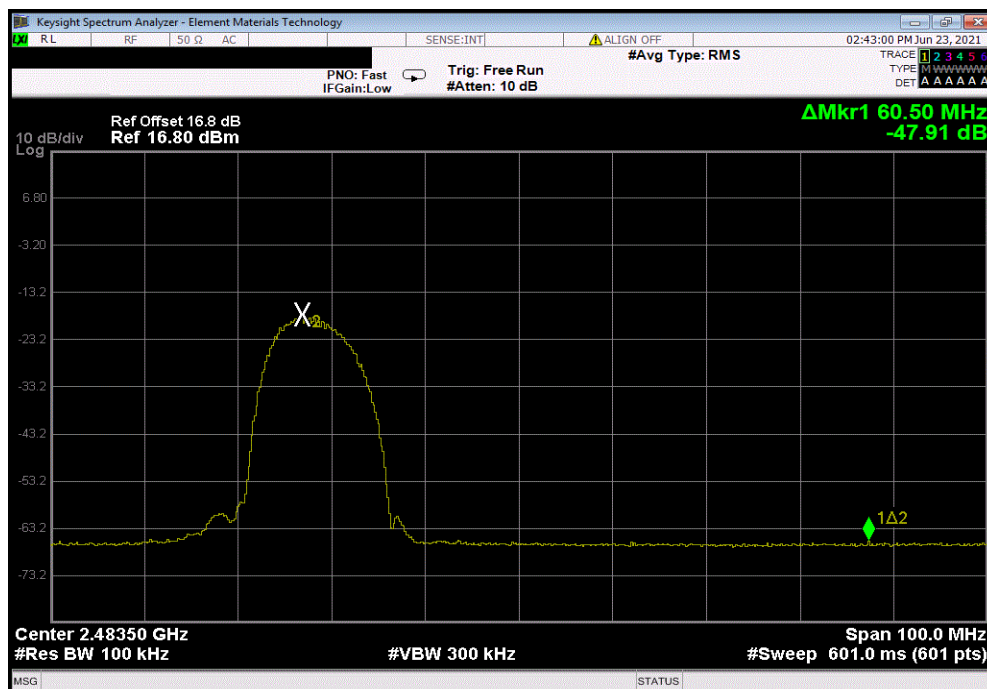


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, Low Channel 1, 2412 MHz						
	Value	Limit	Result			
	(dBc)	≤ (dBc)				
	-43.88	-30	Pass			



2400 MHz - 2483.5 MHz Band, 802.11(b) 1 Mbps, High Channel 11, 2462 MHz						
	Value	Limit	Result			
	(dBc)	≤ (dBc)				
	-47.91	-30	Pass			

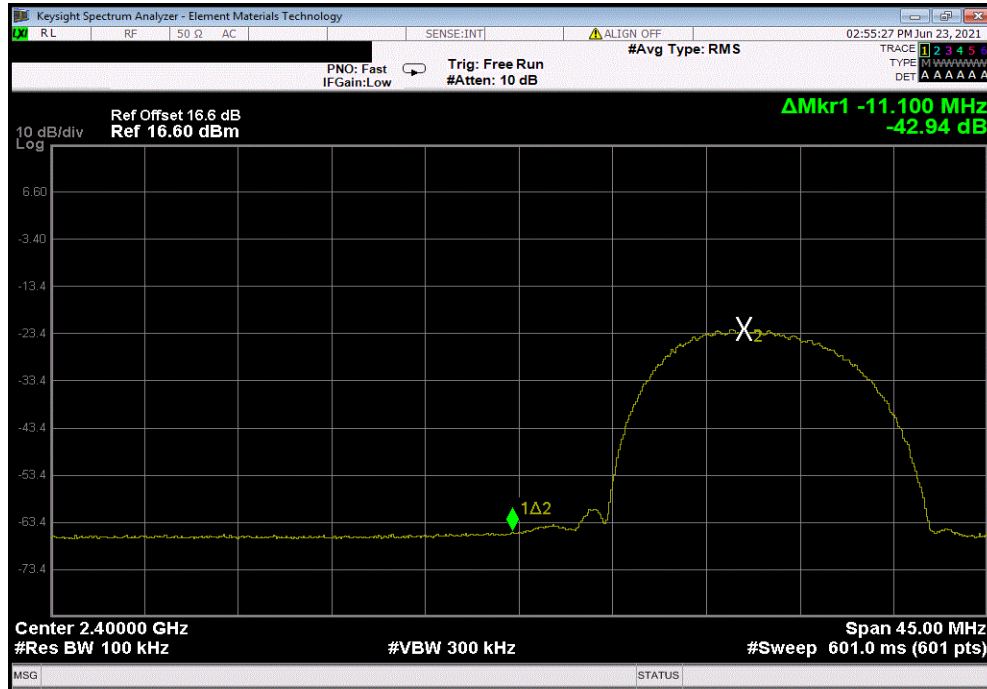


BAND EDGE COMPLIANCE

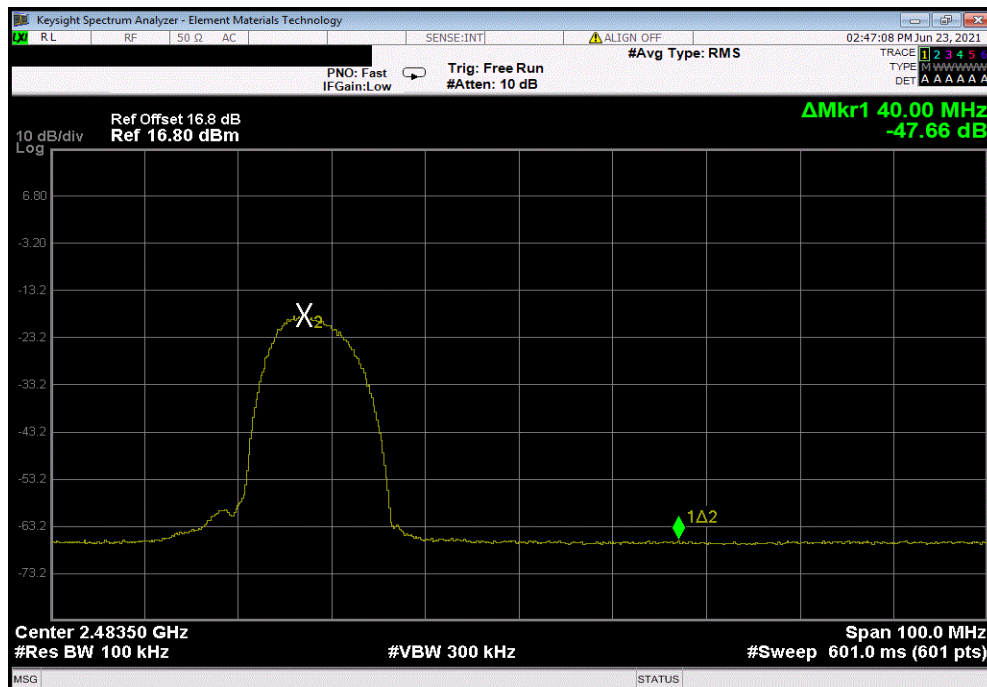


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-42.94	-30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(b) 11 Mbps, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-47.66	-30	Pass

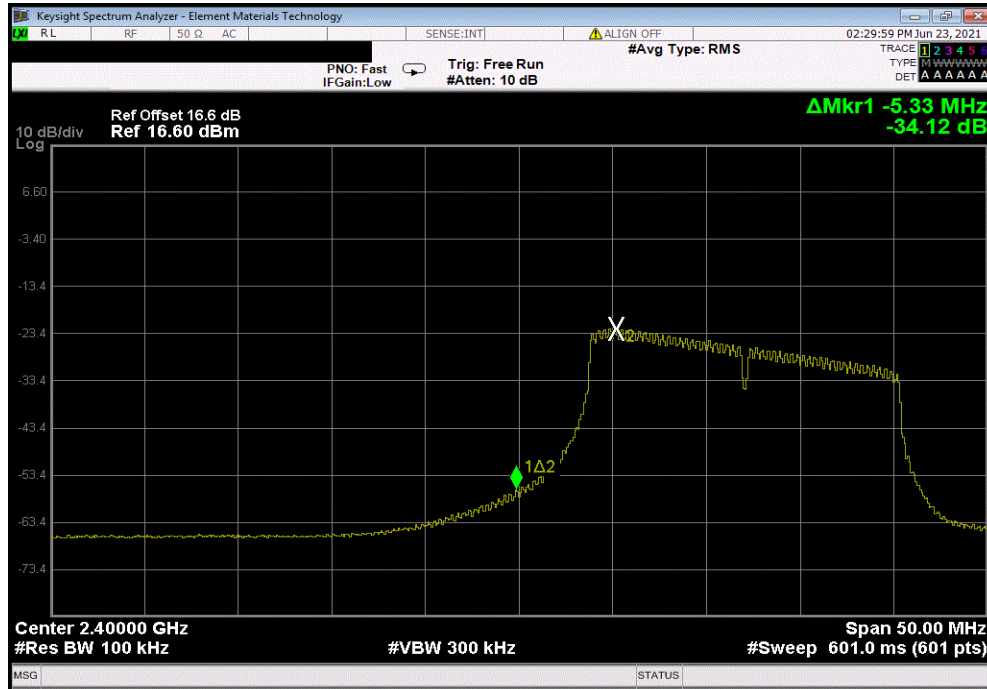


BAND EDGE COMPLIANCE

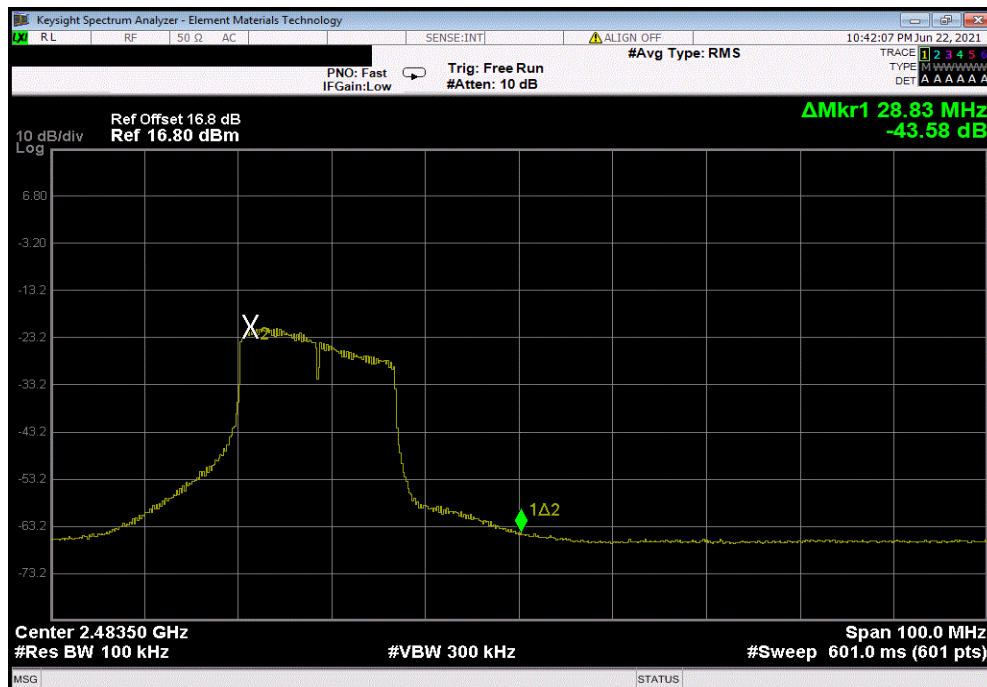


TbTtx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-34.12	-30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(g) 6 Mbps, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-43.58	-30	Pass

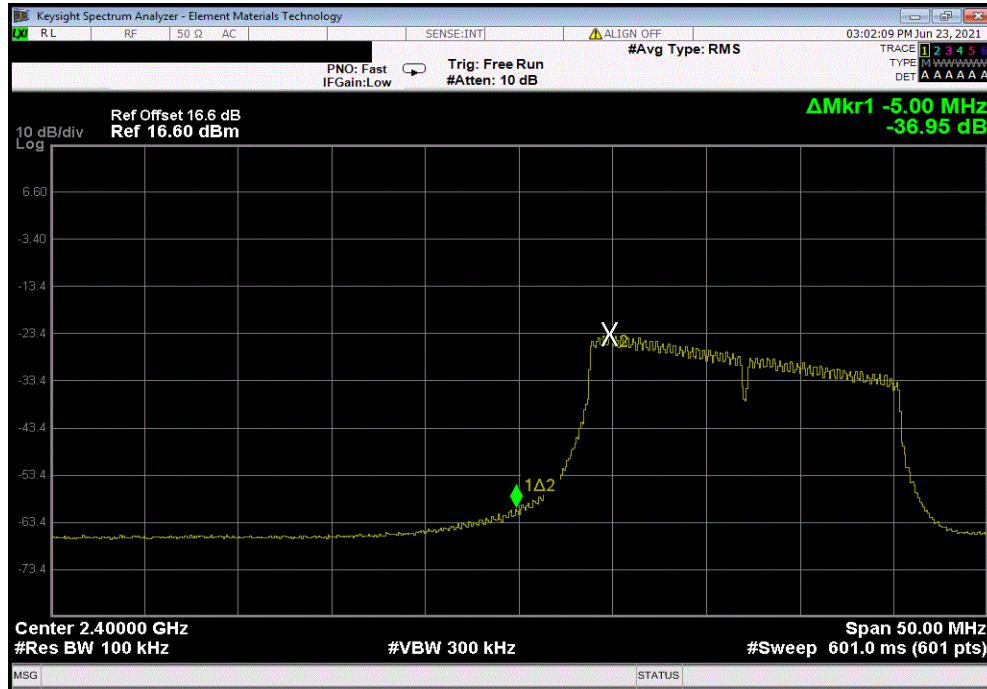


BAND EDGE COMPLIANCE

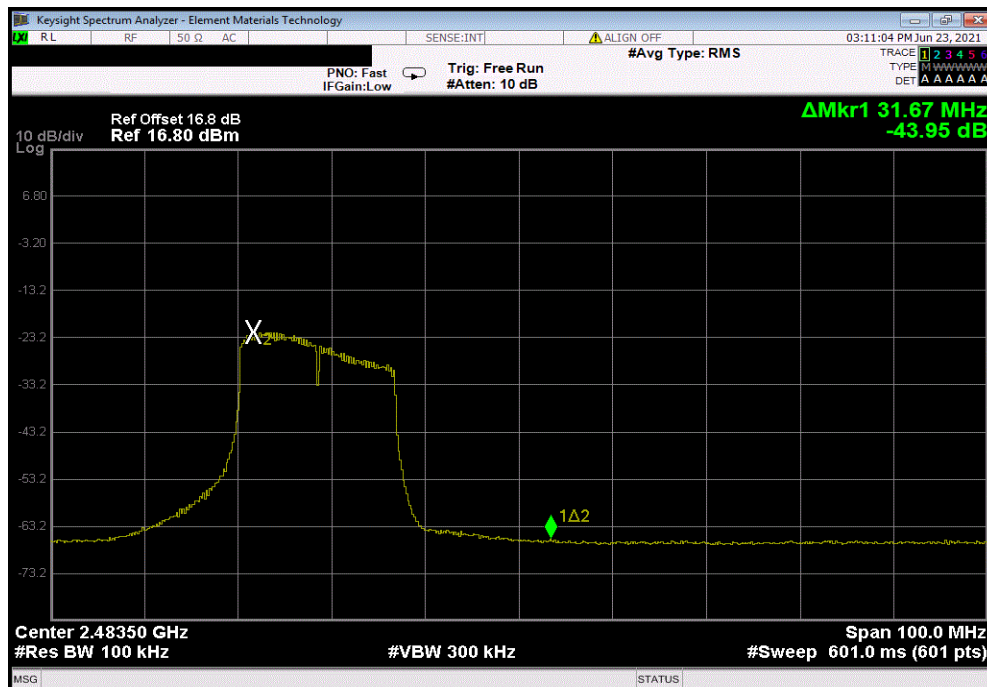


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, Low Channel 1, 2412 MHz						
	Value (dBc)	Limit ≤ (dBc)	Result			
	-36.95	-30	Pass			



2400 MHz - 2483.5 MHz Band, 802.11(g) 36 Mbps, High Channel 11, 2462 MHz						
	Value (dBc)	Limit ≤ (dBc)	Result			
	-43.95	-30	Pass			

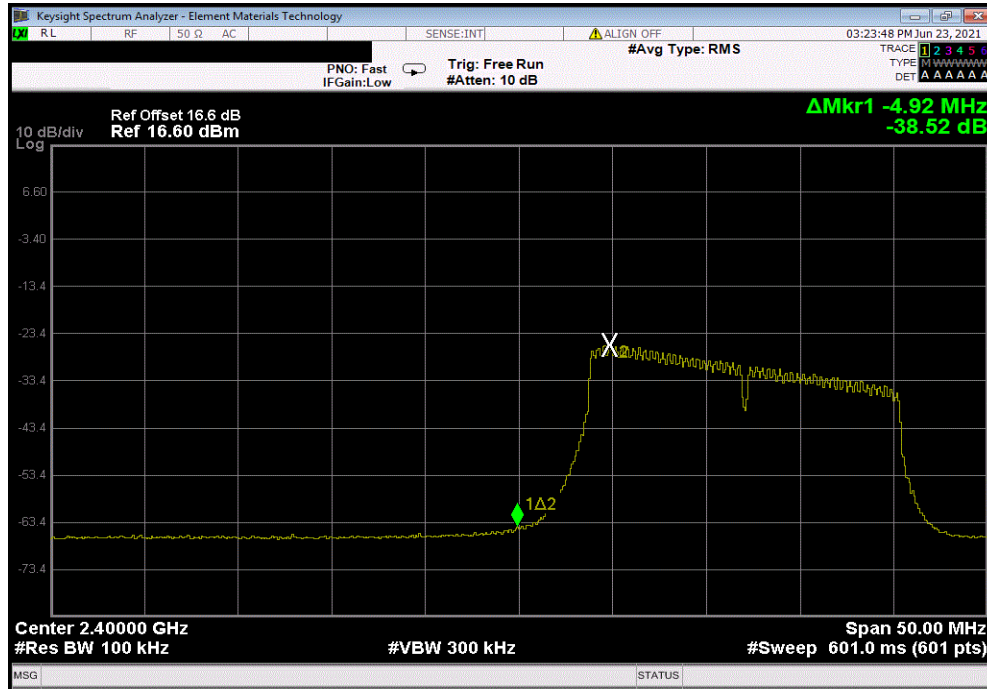


BAND EDGE COMPLIANCE

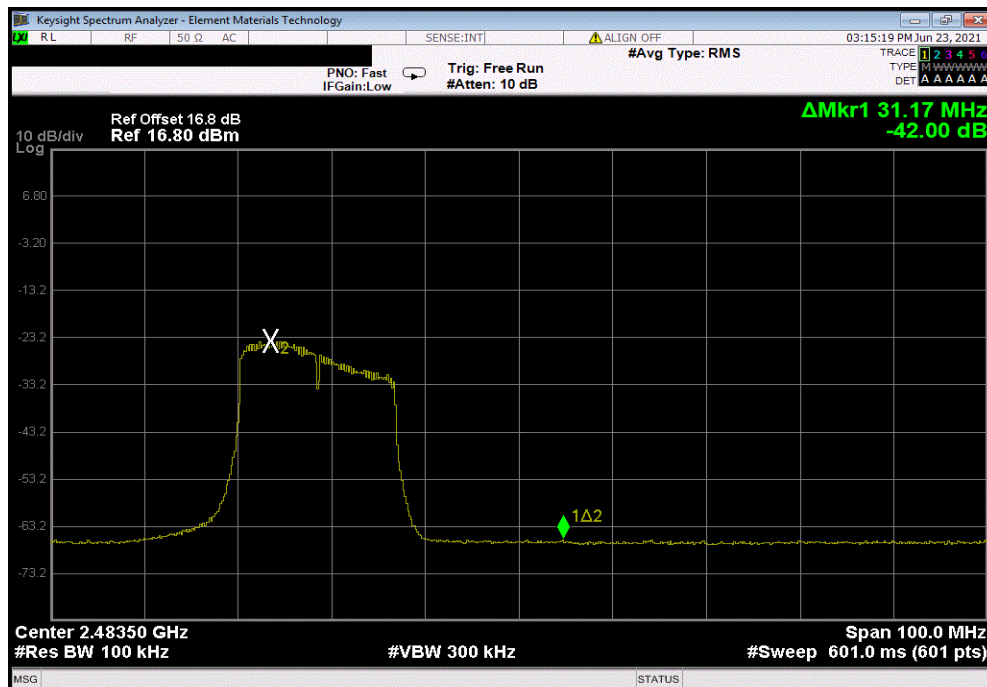


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, Low Channel 1, 2412 MHz						
	Value	Limit	Result			
	(dBc)	≤ (dBc)				
	-38.53	-30	Pass			



2400 MHz - 2483.5 MHz Band, 802.11(g) 54 Mbps, High Channel 11, 2462 MHz						
	Value	Limit	Result			
	(dBc)	≤ (dBc)				
	-42	-30	Pass			

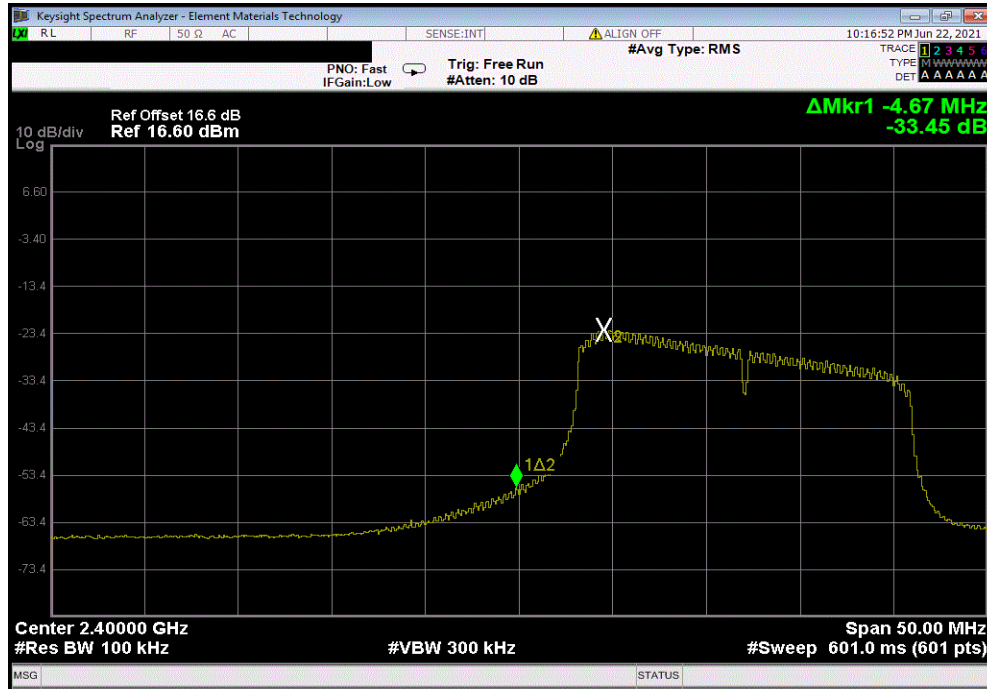


BAND EDGE COMPLIANCE

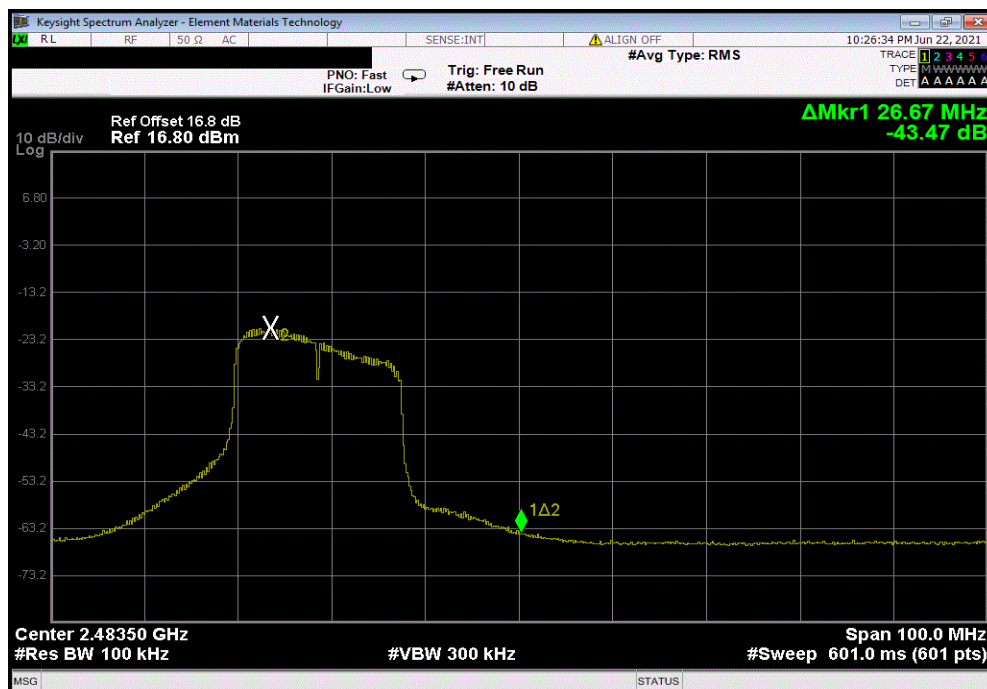


TbTx 2021.03.19.1 XM8 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-33.45	-30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS0, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-43.47	-30	Pass

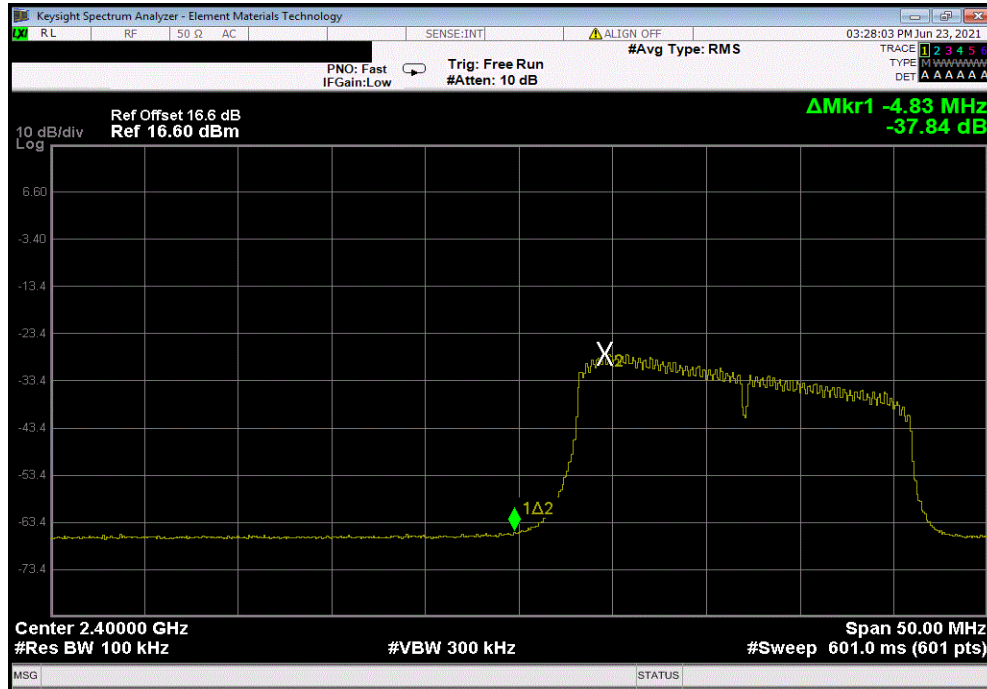


BAND EDGE COMPLIANCE

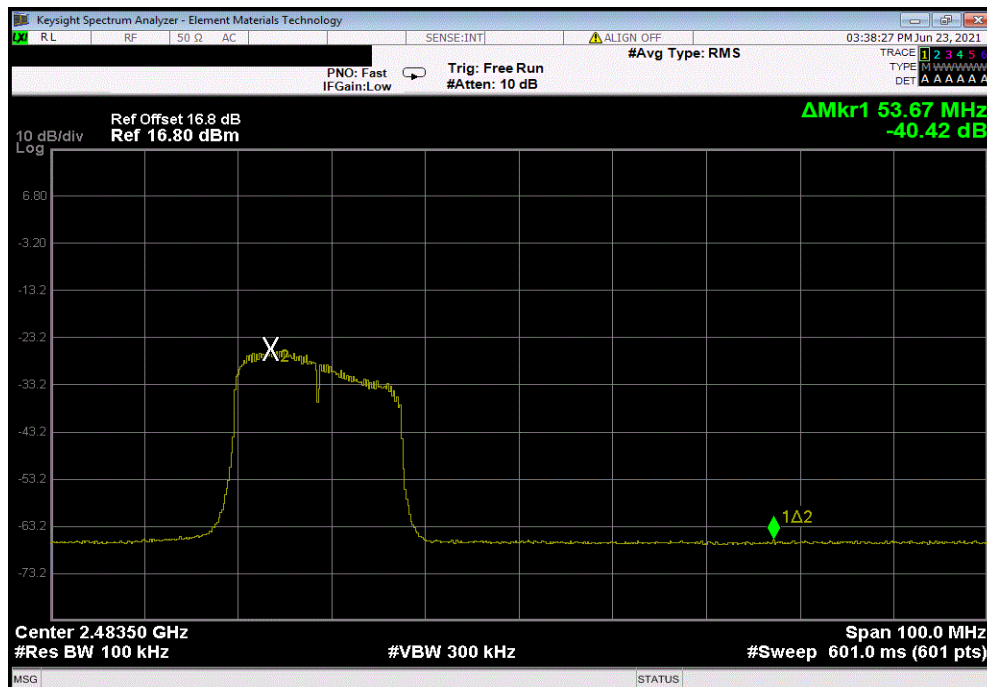


TbTx 2021.03.19.1 XMt 2020.12.30.0

2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, Low Channel 1, 2412 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-37.84	-30	Pass



2400 MHz - 2483.5 MHz Band, 802.11(n) MCS7, High Channel 11, 2462 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-40.42	-30	Pass



SPURIOUS CONDUCTED EMISSIONS



PSA-ESCI 2021.03.17.0

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. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Transmitting Wi Fi 802.11(b), 1 Mbps, Low channel 1 (2412 MHz), 20 MHz bandwidth

POWER SETTINGS INVESTIGATED

3.3 VDC via USB Cable

CONFIGURATIONS INVESTIGATED

PAON0011 - 6

FREQUENCY RANGE INVESTIGATED

Start Frequency	1000 MHz	Stop Frequency	8200 MHz
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SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Filter - High Pass	Micro-Tronics	HPM50111	HFM	2020-09-14	2021-09-14
Attenuator	Coaxicom	3910-20	AXY	2020-09-14	2021-09-14
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFM	2021-04-16	2022-04-16
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	2021-02-01	2022-02-01
Cable	Element	Double Ridge Guide Horn Cables	MNV	2021-02-01	2022-02-01
Antenna - Double Ridge	ETS Lindgren	3115	AIB	2020-09-03	2022-09-03

TEST DESCRIPTION

The measurement was made in a radiated configuration of the fundamental with the carrier fully maximized for its highest radiated power.

The spurious RF conducted emissions were measured with the EUT set to low, mid, and high transmit frequencies. The EUT was transmitting at the data rate(s) listed in the datasheet. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.

SPURIOUS CONDUCTED EMISSIONS



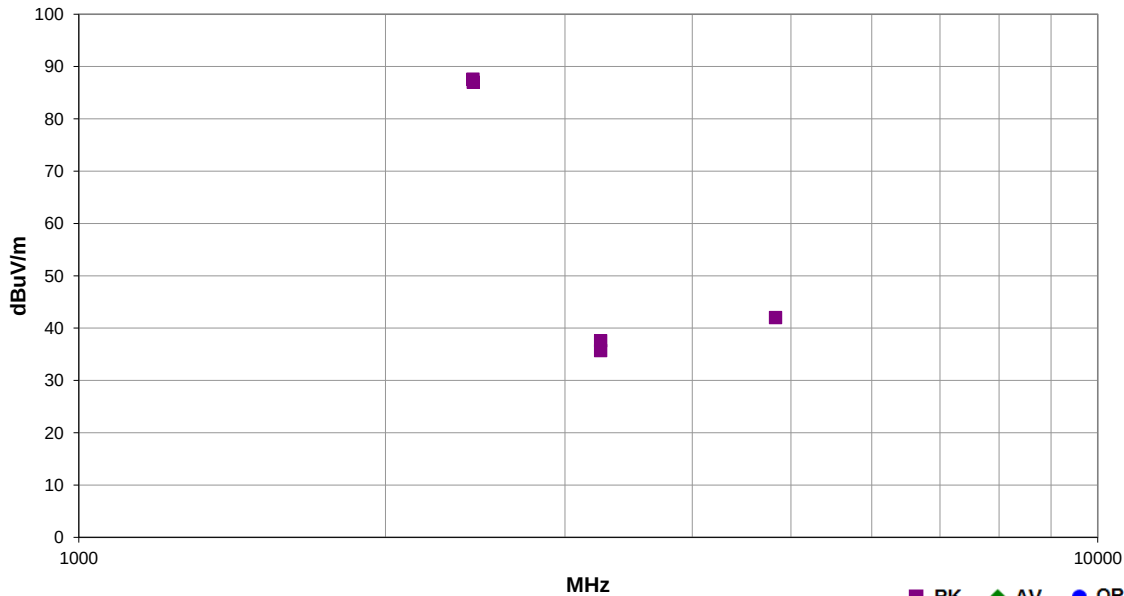
EmiRS 2021.05.14.0

PSA-ESCI 2021.03.17.0

Work Order:	PAON0011	Date:	2021-06-23	
Project:	None	Temperature:	22.3 °C	
Job Site:	MN09	Humidity:	45.4% RH	
Serial Number:	6797400036	Barometric Pres.:	1012 mbar	
Tested by: Andrew Rogstad				
EUT:	Smart Tracking Collar			
Configuration:	6			
Customer:	Paragon Innovations, Inc.			
Attendees:	None			
EUT Power:	3.3 VDC via USB Cable			
Operating Mode:	Transmitting Wi Fi 802.11(b), 1 Mbps, Low channel 1 (2412 MHz), 20 MHz bandwidth			
Deviations:	None			
Comments:	Measurements were taken with 100 kHz RBW. EUT horizontal.			

Test Specifications	FCC 15.247:2021	Test Method	ANSI C63.10:2013
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Run #	16	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec (dB)	Comments
2411.625	77.8	-3.4	3.4	219.0	3.0	20.0	Horz	PK	0.0	94.4	N/A	N/A	Low ch, 1 Mbps, Fundamental
4828.667	37.2	4.8	1.5	168.0	3.0	0.0	Horz	PK	0.0	42.0	-30.0	-52.4	Low ch, 1 Mbps
2436.625	70.9	-3.3	3.1	197.0	3.0	20.0	Horz	PK	0.0	87.6	N/A	N/A	Mid ch, 1 Mbps, Fundamental
3251.333	39.0	-1.4	1.2	96.0	3.0	0.0	Horz	PK	0.0	37.6	-30.0	-50.0	Mid ch, 1 Mbps
2438.458	70.3	-3.3	3.7	206.0	3.0	20.0	Horz	PK	0.0	87.0	N/A	N/A	Mid ch, 11 Mbps, Fundamental
3251.333	37.1	-1.4	1.0	103.0	3.0	0.0	Horz	PK	0.0	35.7	-30.0	-51.3	Mid ch, 11 Mbps