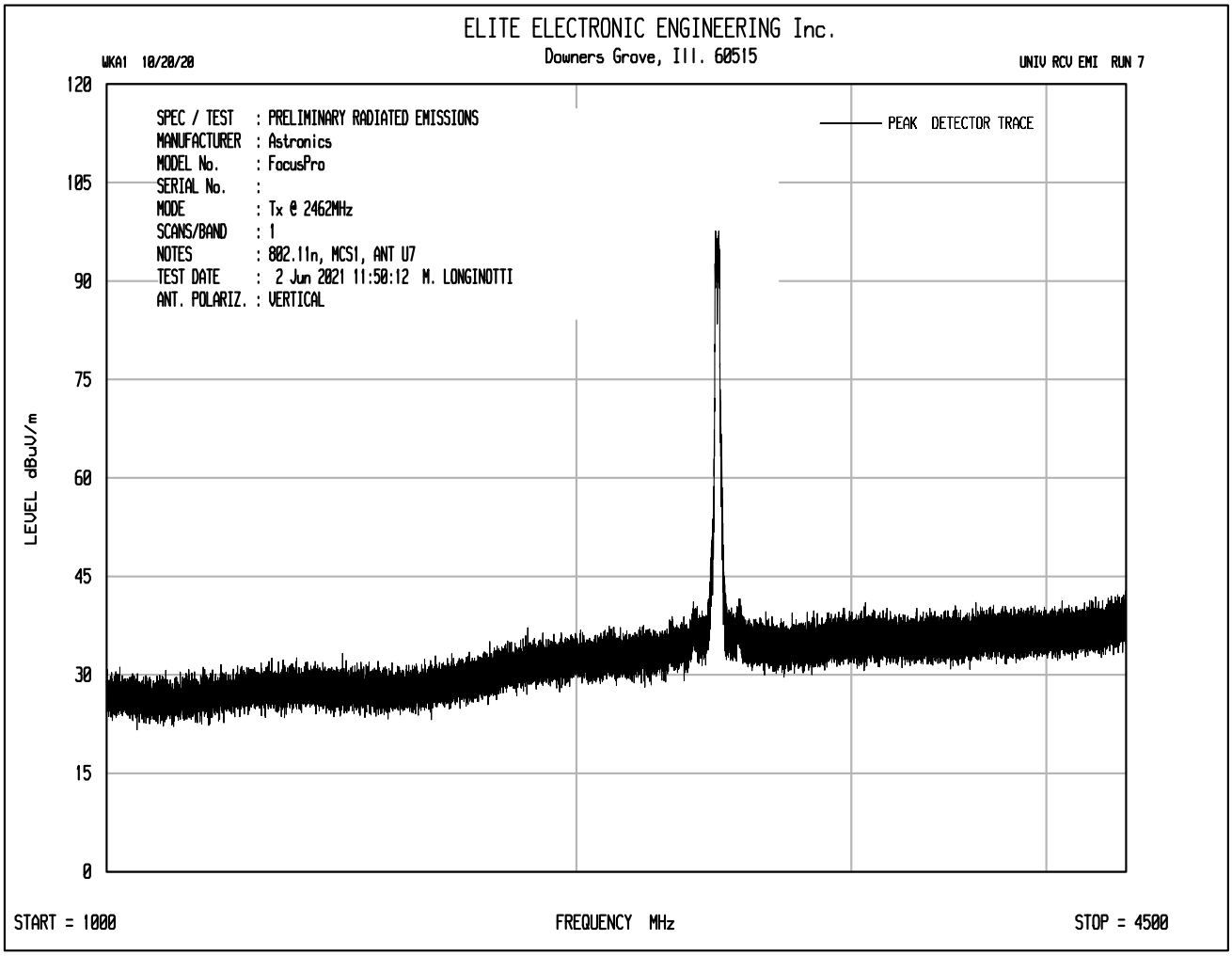
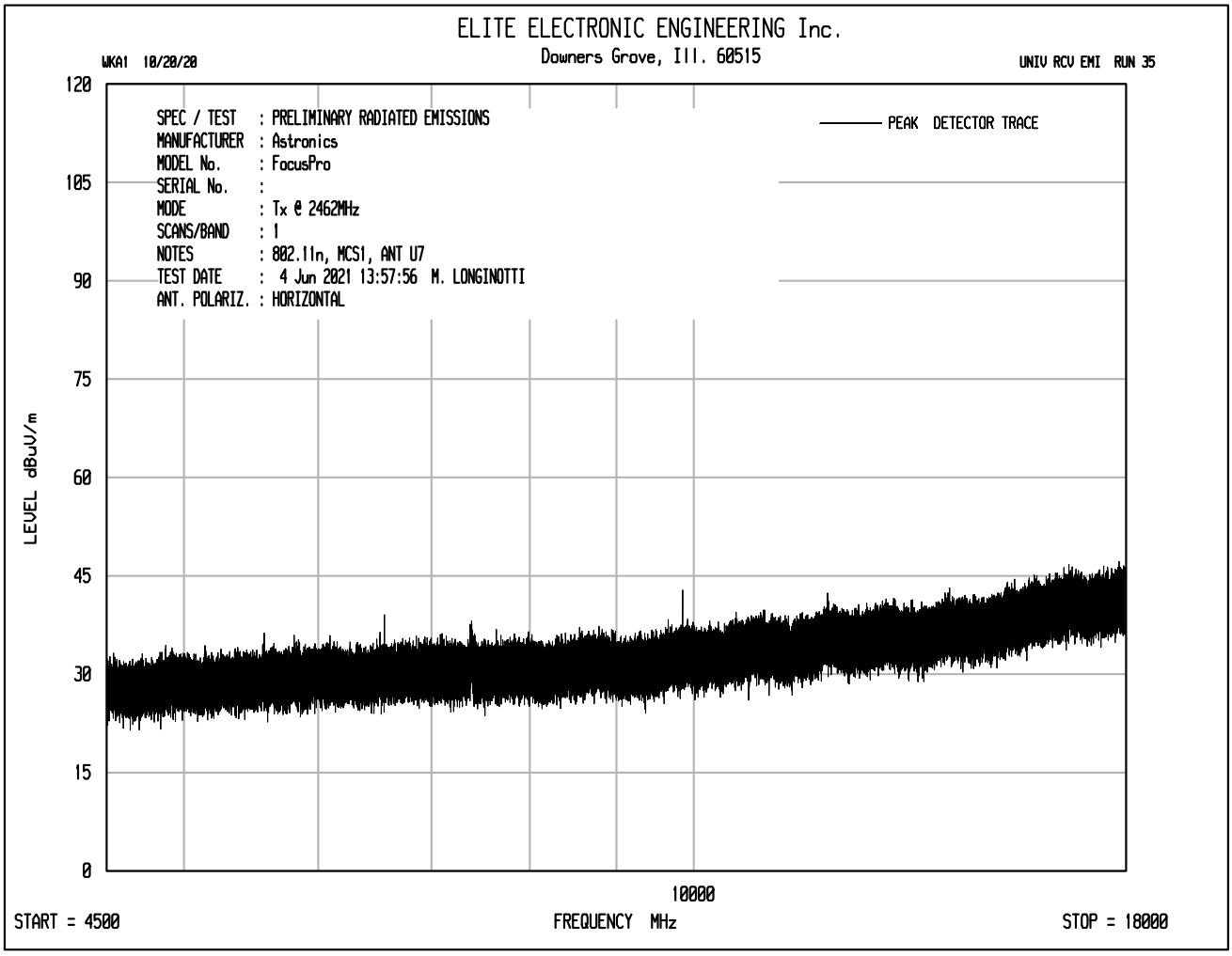
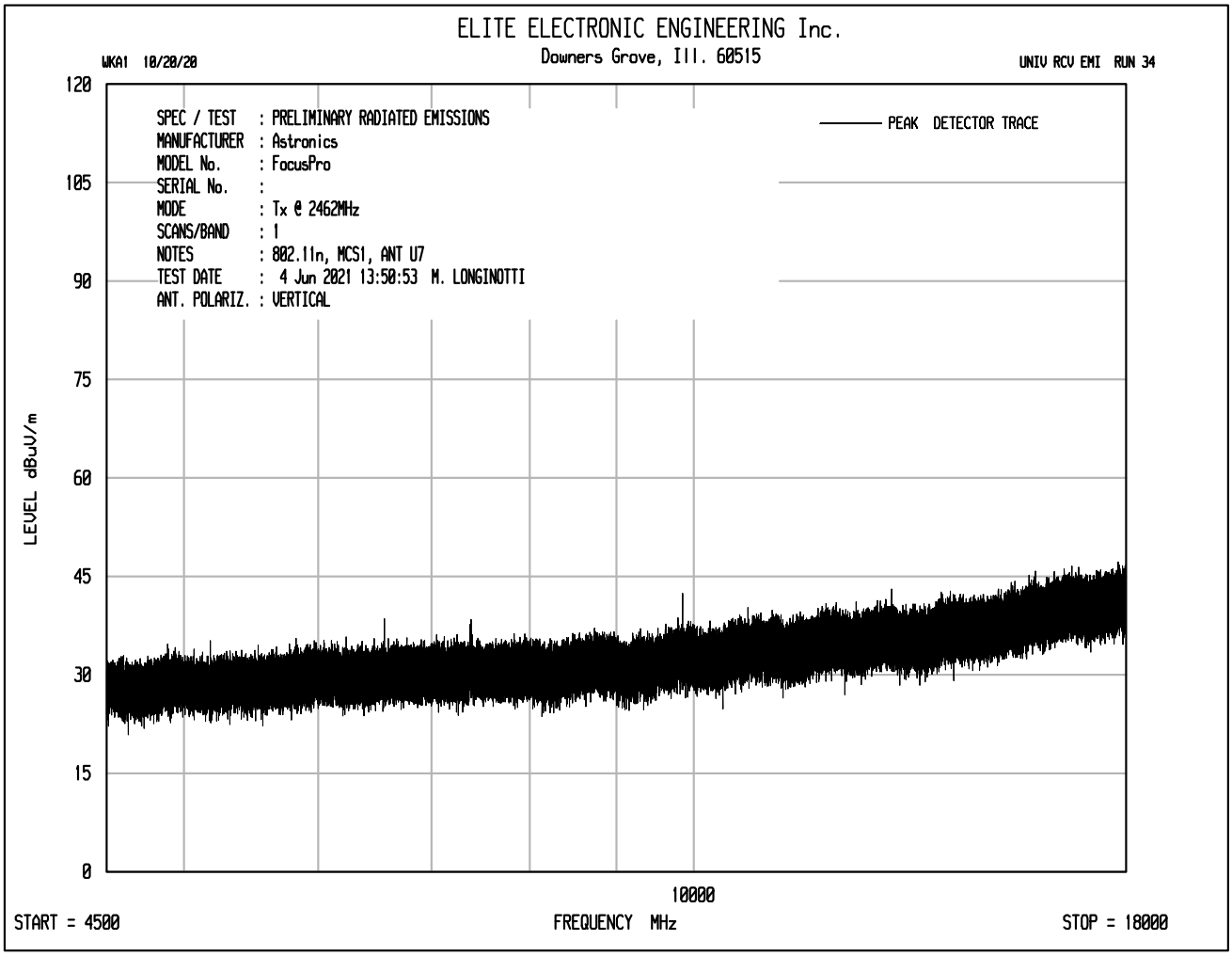
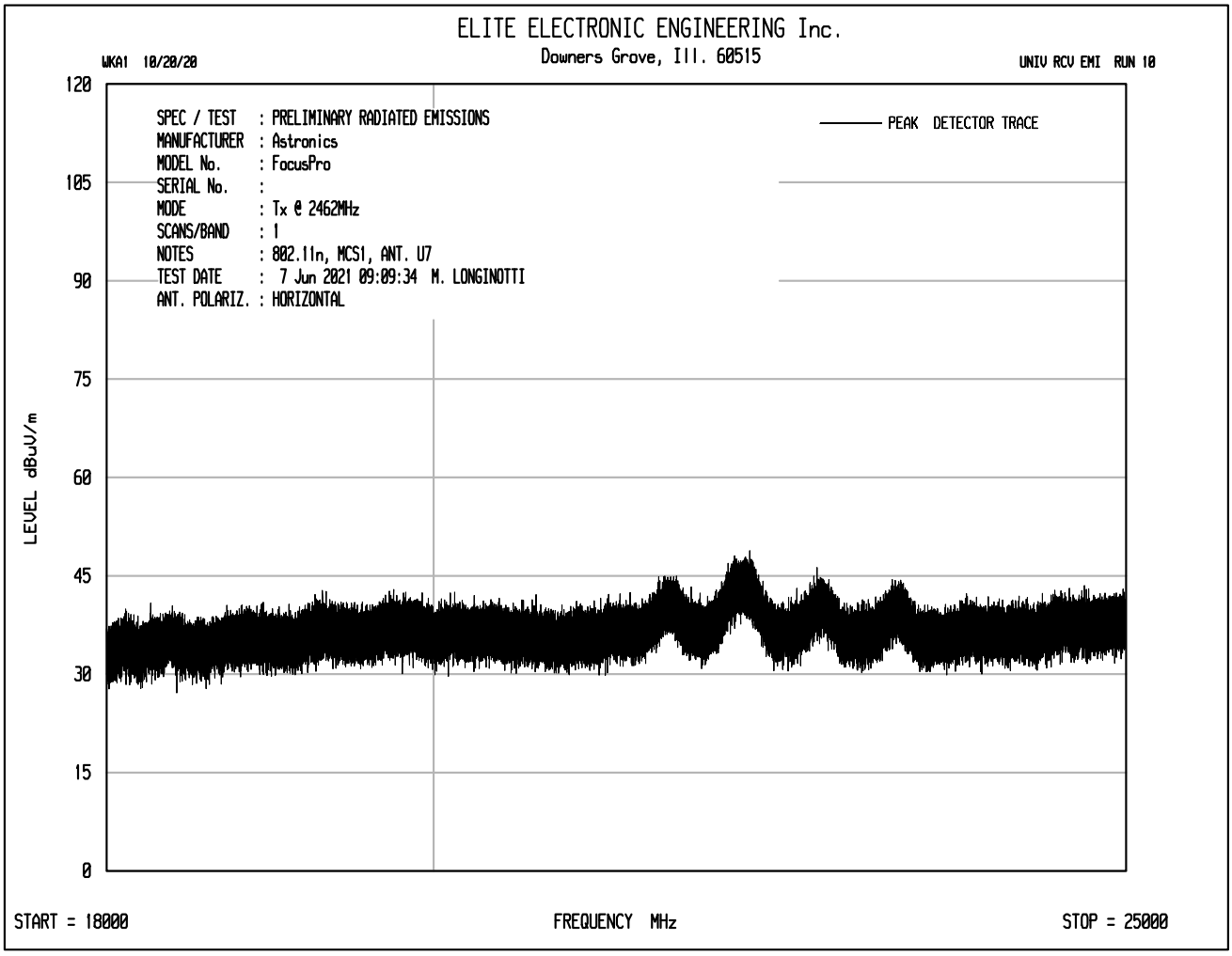
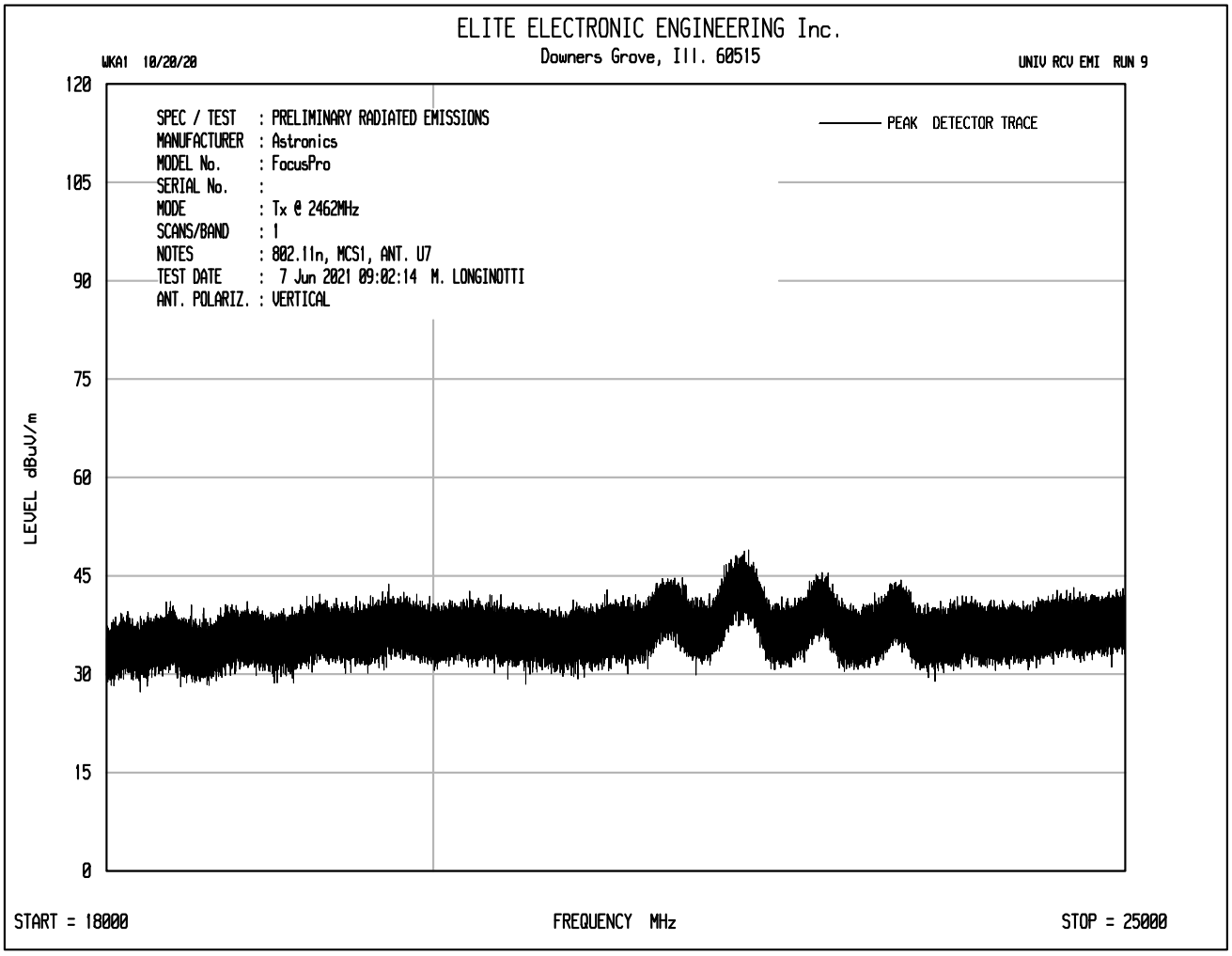

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 10/20/20
UNIV RCV EMI RUN 7
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : Astronics
MODEL No. : FocusPro
SERIAL No. :
MODE : Tx @ 2462MHz
SCANS/BAND : 1
NOTES : 802.11n, MCS1, ANT U7
TEST DATE : 2 Jun 2021 11:50:12 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 10/20/20
UNIV RCV EMI RUN 35
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : Astronics
MODEL No. : FocusPro
SERIAL No. :
MODE : Tx @ 2462MHz
SCANS/BAND : 1
NOTES : 802.11n, MCS1, ANT U7
TEST DATE : 4 Jun 2021 13:57:56 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 10/20/20
UNIV RCV EMI RUN 34
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : Astronics
MODEL No. : FocusPro
SERIAL No. :
MODE : Tx @ 2462MHz
SCANS/BAND : 1
NOTES : 802.11n, MCS1, ANT U7
TEST DATE : 4 Jun 2021 13:50:53 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 10/20/20
UNIV RCV EMI RUN 10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : Astronics
MODEL No. : FocusPro
SERIAL No. :
MODE : Tx @ 2462MHz
SCANS/BAND : 1
NOTES : 802.11n, MCS1, ANT. U7
TEST DATE : 7 Jun 2021 09:09:34 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 10/20/20
UNIV RCV EMI RUN 9
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : Astronics
MODEL No. : FocusPro
SERIAL No. :
MODE : Tx @ 2462MHz
SCANS/BAND : 1
NOTES : 802.11n, MCS1, ANT. U7
TEST DATE : 7 Jun 2021 09:02:14 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378317
Mode	802.11n – MCS1
Carrier Frequency	2462MHz
Parameters	Peak Measurements in the Restricted Bands
Notes	Antenna U7; Power Setting = 87 Duty Cycle Factor = 0.46

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
4924.00	H	49.1	Ambient	3.7	36.2	-39.6	49.4	295.7	5000.0	-24.6
4924.00	V	49.9	Ambient	3.7	36.2	-39.6	50.2	324.2	5000.0	-23.8
7386.00	H	43.9		5.3	39.3	-39.2	49.3	290.2	10158.9	-30.9
7386.00	V	41.6		5.3	39.3	-39.2	47.0	222.7	10158.9	-33.2
12310.00	H	36.6	Ambient	6.8	42.2	-38.6	46.9	222.6	10158.9	-33.2
12310.00	V	36.1	Ambient	6.8	42.2	-38.6	46.4	210.1	10158.9	-33.7
19696.00	H	36.3	Ambient	7.3	44.1	-37.4	50.4	329.8	10158.9	-29.8
19696.00	V	36.4	Ambient	7.3	44.1	-37.4	50.5	333.6	10158.9	-29.7
22158.00	H	22.2		2.2	40.6	-29.0	36.0	63.4	10158.9	-44.1
22158.00	V	21.9	Ambient	2.2	40.6	-29.0	35.7	61.3	10158.9	-44.4

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378317
Mode	802.11n – MCS1
Carrier Frequency	2462MHz
Parameters	Average Measurements in the Restricted Bands
Notes	Antenna U7; Power Setting = 87 Duty Cycle Factor = 0.46

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
4924.00	H	34.9	Ambient	3.7	36.2	-39.6	0.5	35.7	60.8	500.0	-18.3
4924.00	V	34.8	Ambient	3.7	36.2	-39.6	0.5	35.6	60.1	500.0	-18.4
7386.00	H	36.50		4.7	38.0	-39.6	0.5	40.1	101.5	500.0	-13.8
7386.00	V	38.9		4.7	38.0	-39.6	0.5	42.5	133.9	500.0	-11.4
12310.00	H	32.6	Ambient	6.1	41.6	-38.8	0.5	41.9	124.8	500.0	-12.1
12310.00	V	32.6	Ambient	6.1	41.6	-38.8	0.5	41.9	124.8	500.0	-12.1
19696.00	H	16.9	Ambient	2.2	40.4	-28.0	0.5	31.9	39.6	500.0	-22.0
19696.00	V	16.9	Ambient	2.2	40.4	-28.0	0.5	31.9	39.6	500.0	-22.0
22158.00	H	22.2	Ambient	2.2	40.6	-28.7	0.5	36.7	68.6	500.0	-17.3
22158.00	V	22.2	Ambient	2.2	40.6	-28.7	0.5	36.7	68.6	500.0	-17.3

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378317
Mode	802.11n – MCS1
Carrier Frequency	2462MHz
Parameters	Peak Measurements in the Non-Restricted Bands
Notes	Antenna U7; Power Setting = 87 Duty Cycle Factor = 0.46

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2462.00	H	57.3		2.6	33.0	0.0	92.9	44345.2		
2462.00	V	64.5		2.6	33.0	0.0	100.1	101589.0		
9848.00	H	43.9		5.3	39.3	-39.2	49.3	290.2	10158.9	-30.9
9848.00	V	41.6		5.3	39.3	-39.2	47.0	222.7	10158.9	-33.2
14772.00	H	36.6	Ambient	6.8	42.2	-38.6	46.9	222.6	10158.9	-33.2
14772.00	V	36.1	Ambient	6.8	42.2	-38.6	46.4	210.1	10158.9	-33.7
17234.00	H	36.3	Ambient	7.3	44.1	-37.4	50.4	329.8	10158.9	-29.8
17234.00	V	36.4	Ambient	7.3	44.1	-37.4	50.5	333.6	10158.9	-29.7
24620.00	H	22.2		2.2	40.6	-29.0	36.0	63.4	10158.9	-44.1
24620.00	V	21.9	Ambient	2.2	40.6	-29.0	35.7	61.3	10158.9	-44.4

29. Band-Edge Compliance

EUT Information	
Manufacturer	Astronics
Product	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378317 and 1378290
Mode	802.11b, 802.11g, 802.11n

Test Setup Details	
Setup Format	Tabletop
Measurement Method	Radiated
Type of Test Site	Semi-Anechoic Chamber
Test Site Used	Room 29
Notes	N/A

Measurement Uncertainty	
Measurement Type	Expanded Measurement Uncertainty
Radiated disturbance (electric field strength on an open area test site or alternative test site) (30 MHz – 1000 MHz)	4.3
Radiated disturbance (electric field strength on an open area test site or alternative test site) (1 GHz – 6 GHz)	3.1
Radiated disturbance (electric field strength on an open area test site or alternative test site) (6 GHz – 18 GHz)	3.2
Radiated disturbance (electric field strength on an open area test site or alternative test site) (18 GHz – 26.5 GHz)	3.3
Radiated disturbance (electric field strength on an open area test site or alternative test site) (26.5 GHz – 40 GHz)	3.4

Procedure

1) Low Band Edge:

a) The antenna port of the EUT was connected to the spectrum analyzer through 40dB of attenuation.

b) The EUT was set to transmit continuously at the channel closest to the low band-edge.

c) To determine the band edge compliance, the following spectrum analyzer settings were used:

- Center Frequency = 2400MHz (low band-edge frequency).
- Span = Wide enough to capture the peak level of the emission operating on the channel closest to the band-edge, as well as any modulation products which fall outside of the authorized band of operation.
- Resolution Bandwidth (RBW) = ≥ 1% of the span.
- 'Max-Hold' function was engaged.

d) The analyzer was allowed to scan until the envelope of the transmitter bandwidth was defined.

e) The marker was set on the peak of the in-band emissions. A display line was placed 20dB down from the peak of the in-band emissions. All emissions which fall outside of the authorized band of operation must be below the 20dB down display line. (All emissions to the left of the center frequency (band-edge) must be below the display line.)

f) The analyzer's display was then screenshot and saved.

2) High Band Edge

a) The EUT was setup inside the test chamber on a non-conductive stand and set to transmit continuously at the channel closest to the high band-edge.

b) A broadband measuring antenna was placed at a test distance of 3 meters from the EUT. The antenna was connected to the input of a spectrum analyzer.

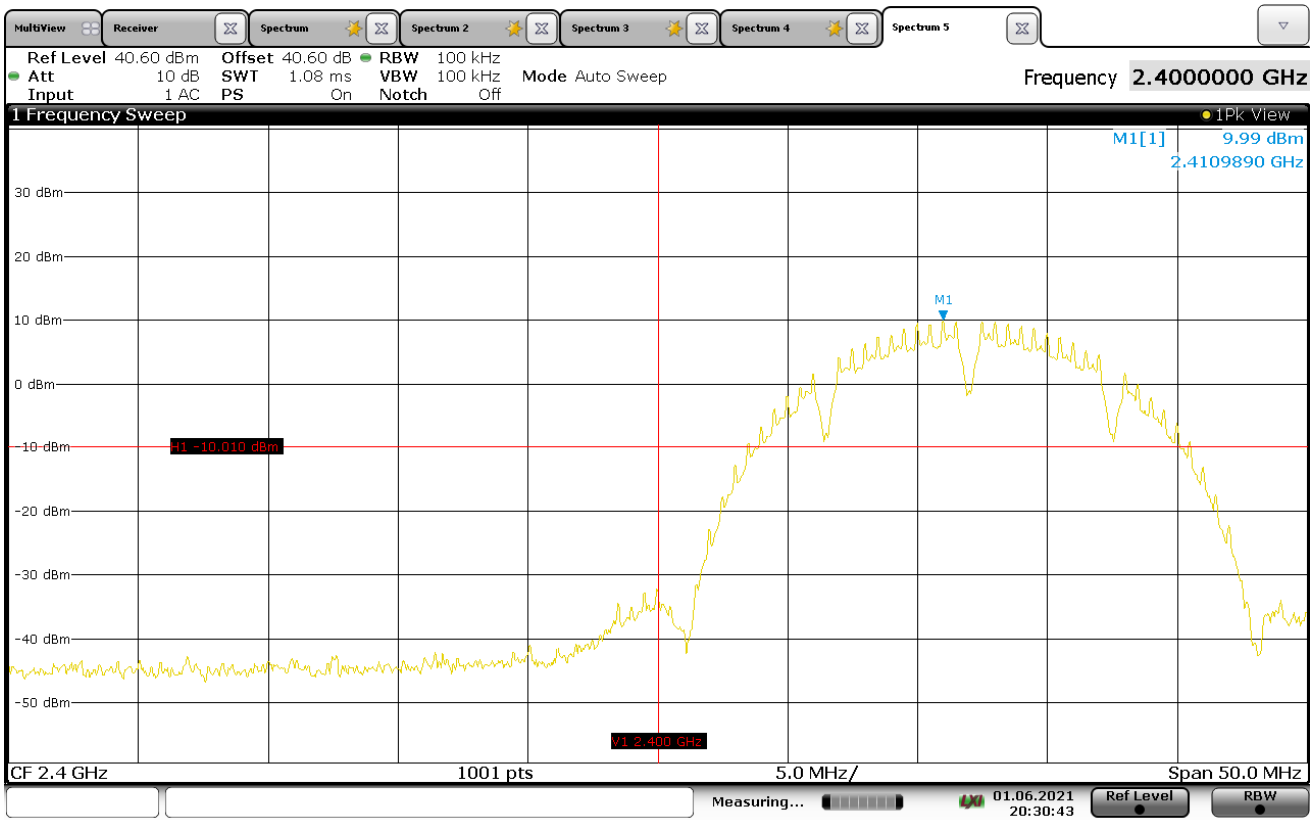
c) The center frequency of the analyzer was set to the high band edge (2483.5MHz).

d) The Resolution Bandwidth was set to 1MHz.

e) To ensure that the maximum or worst case emission level was measured, the following steps were taken:

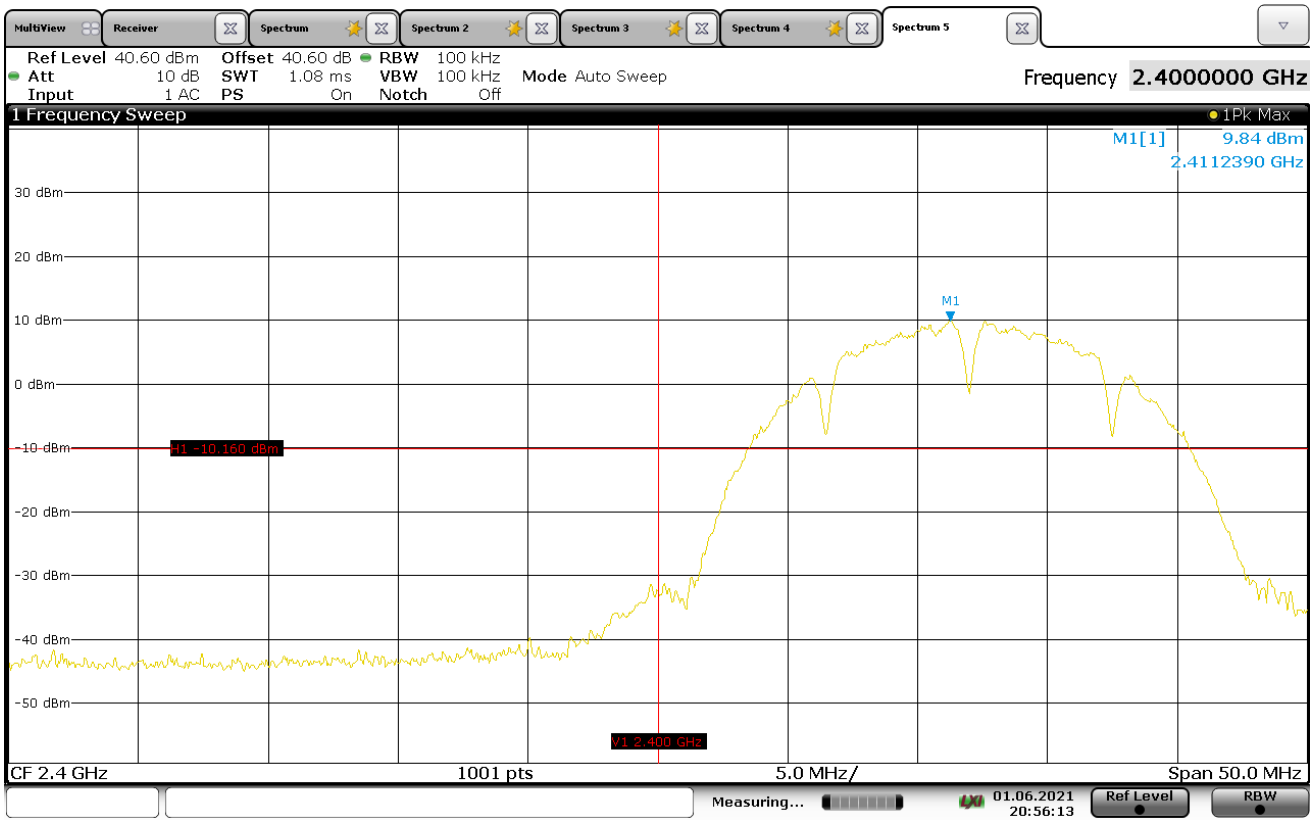
- The EUT was rotated so that all of its sides were exposed to the receiving antenna.
- Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
- The EUT was rotated so that all of its sides were exposed to the receiving antenna.
- The measuring antenna was raised and lowered from 1 to 4 meters for each antenna polarization to maximize the readings.
- The highest measured peak reading and the highest measured average reading were recorded.

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b
Frequency Tested	2402MHz, 1MBPS
Notes	Low Band Edge



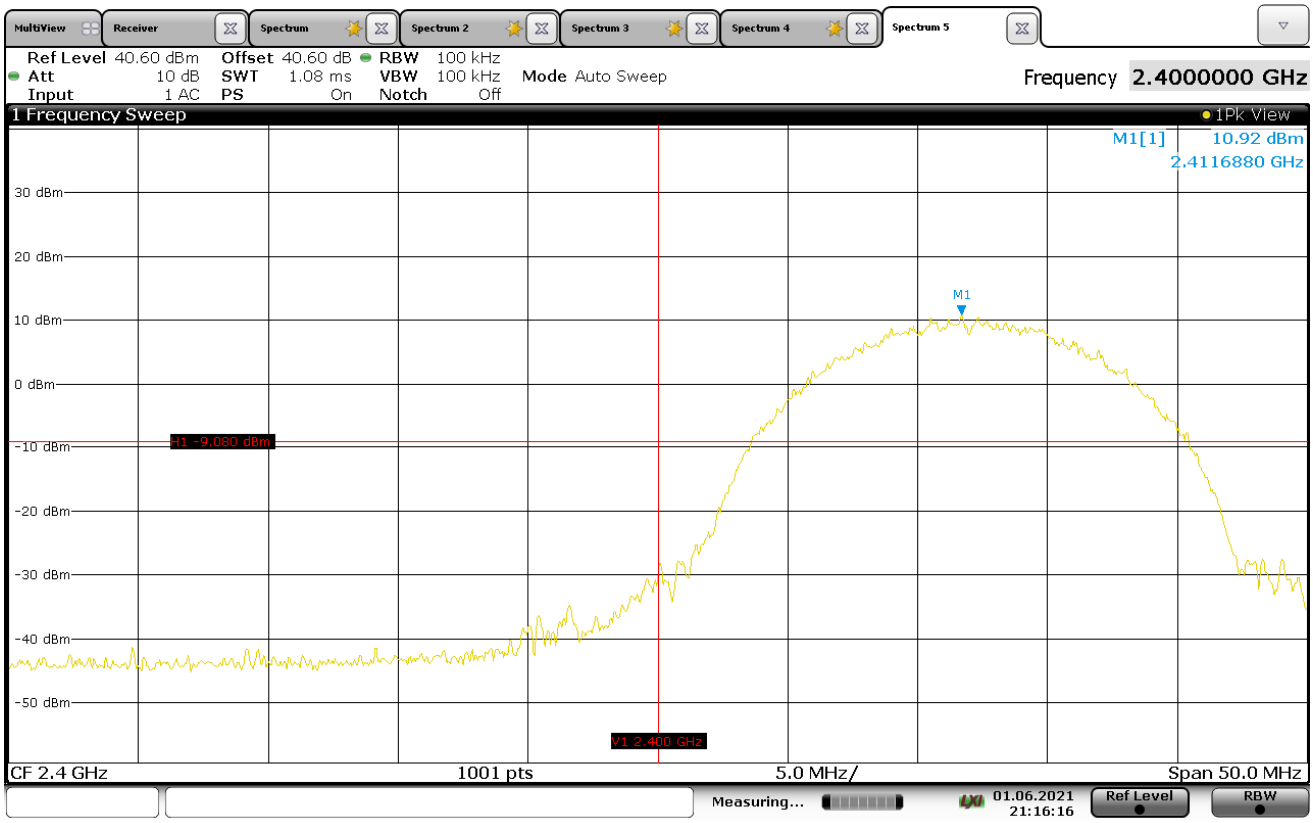
20:30:43 01.06.2021

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b
Frequency Tested	2402MHz, 2MBPS
Notes	Low Band Edge



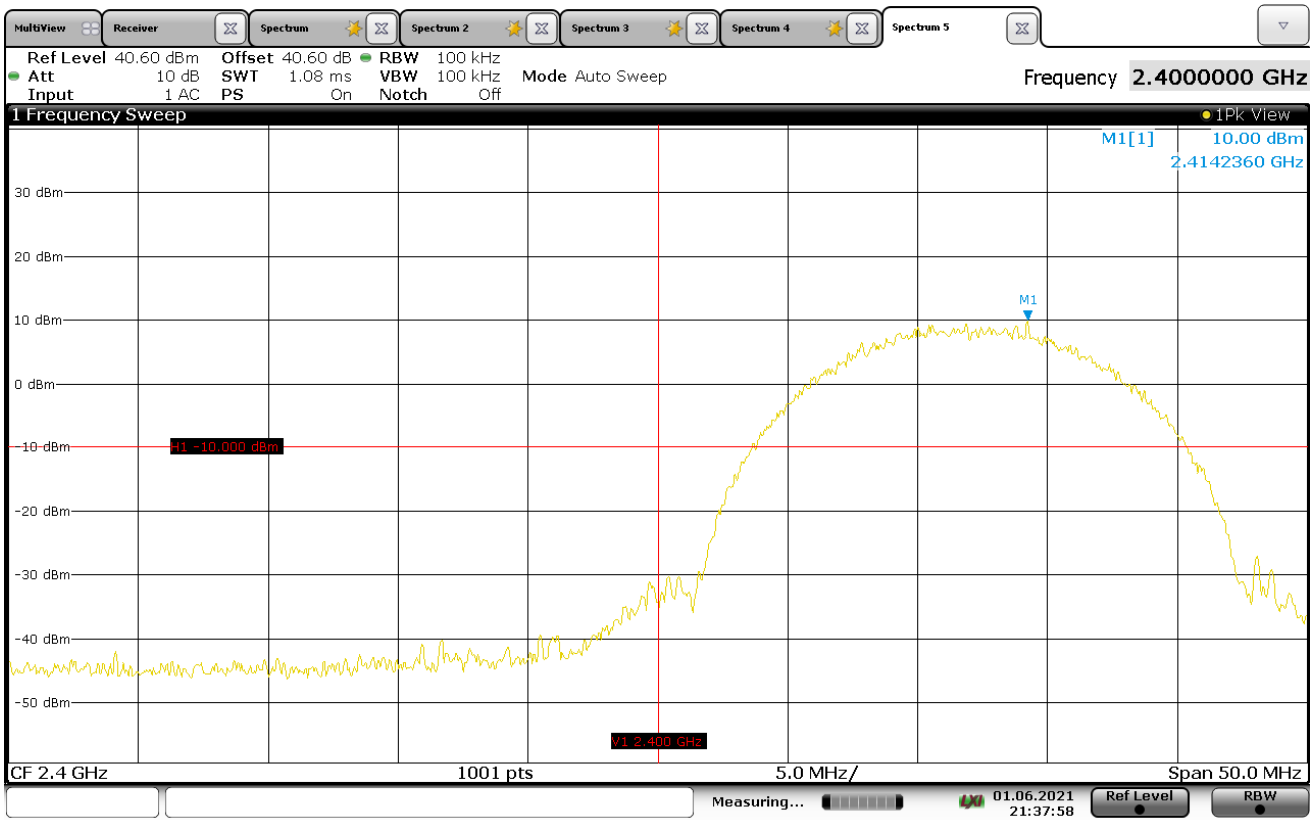
20:56:14 01.06.2021

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b
Frequency Tested	2402MHz, 5.5MBPS
Notes	Low Band Edge



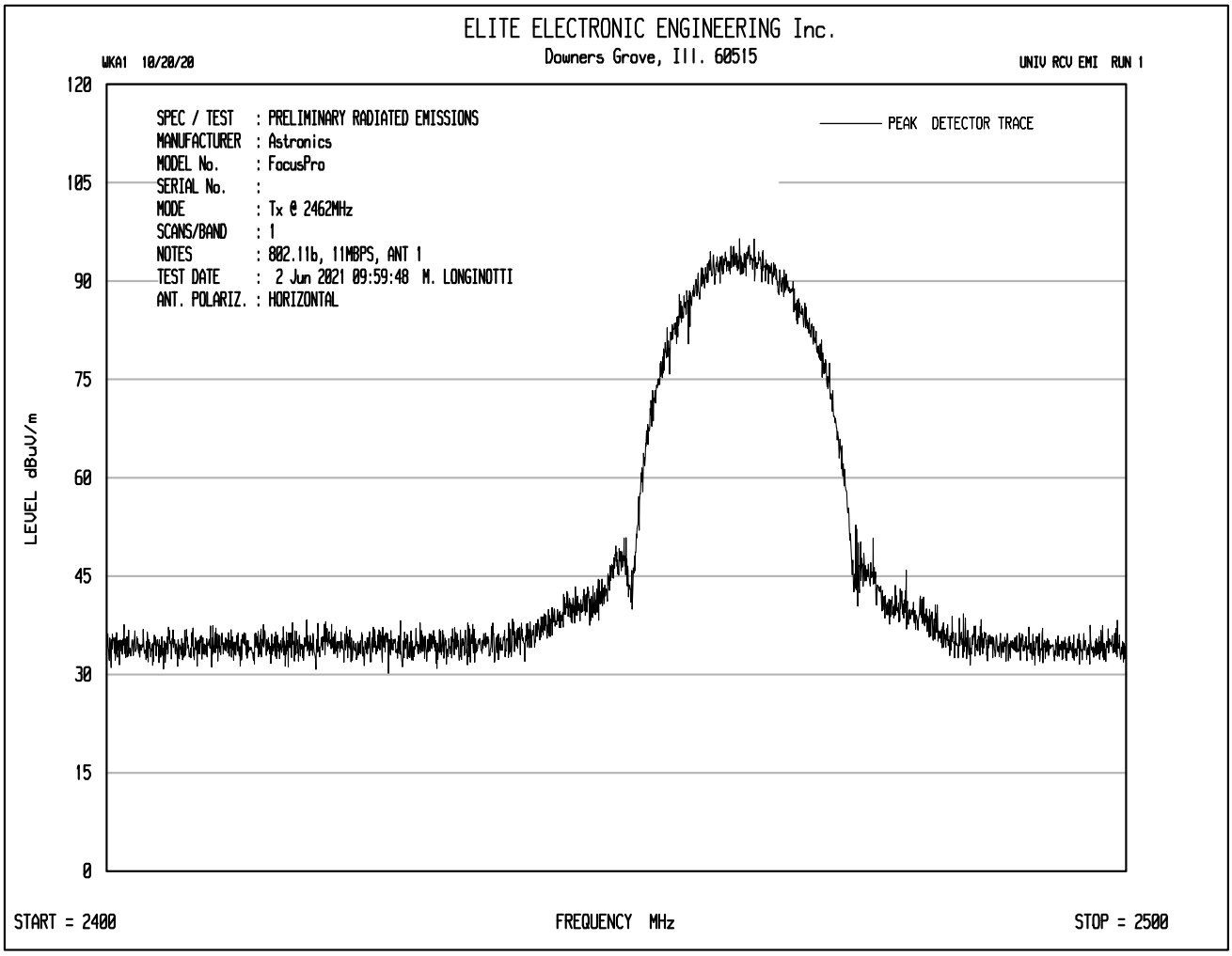
21:16:16 01.06.2021

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b
Frequency Tested	2402MHz, 11MBPS
Notes	Low Band Edge

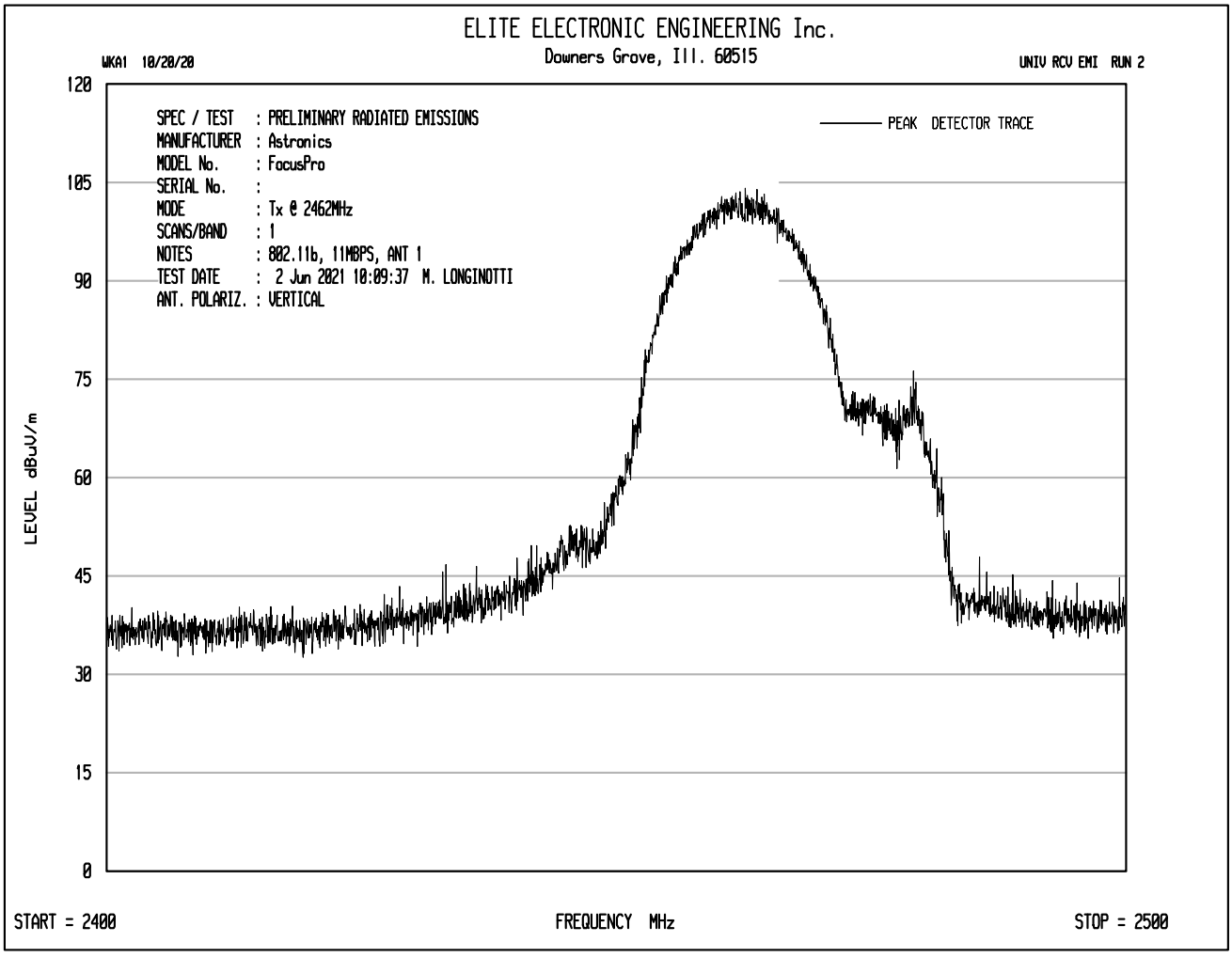


21:37:58 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378317
Mode	802.11b
Carrier Frequency	2462MHz
Parameters	High Band-Edge
Notes	None



Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378317
Mode	802.11b
Carrier Frequency	
Parameters	High Band-Edge
Notes	None



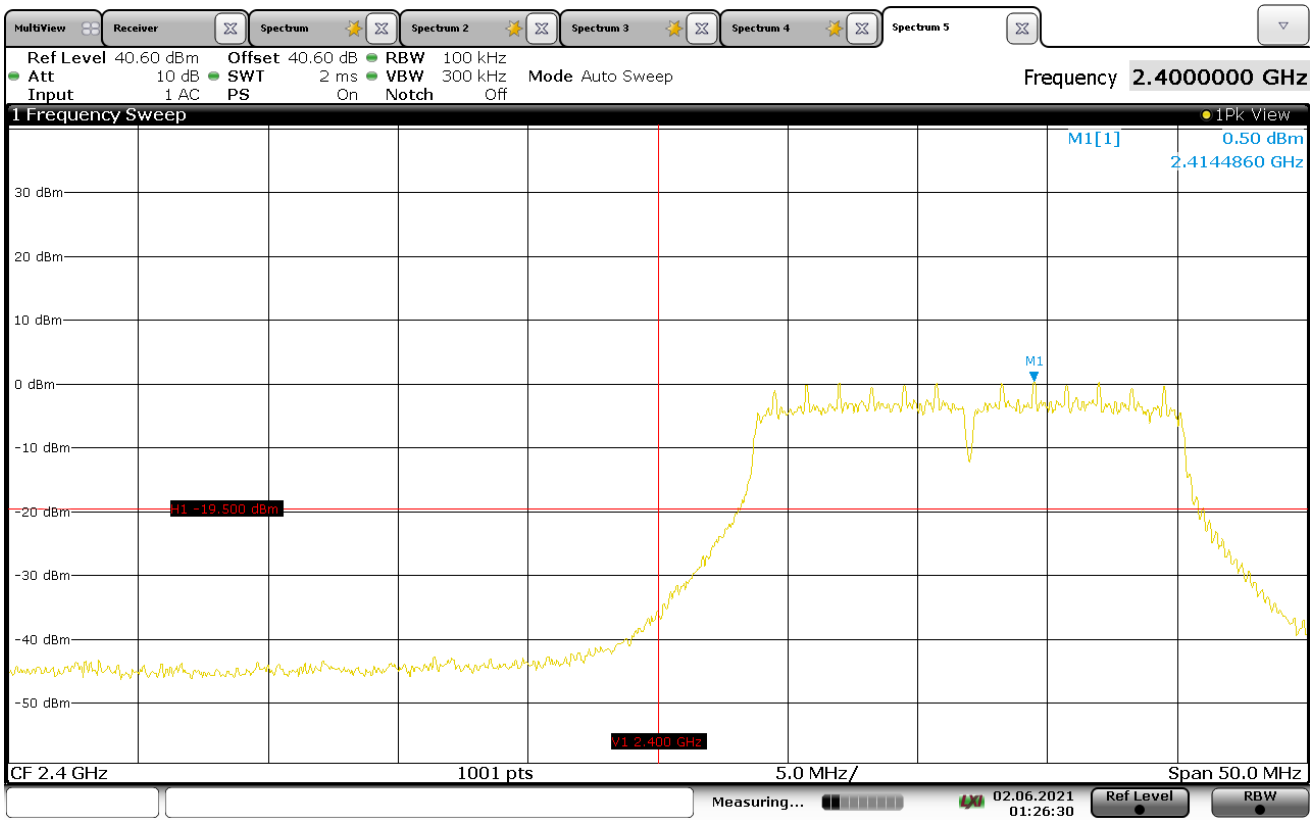
Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378317
Mode	802.11b– 11MBPS
Carrier Frequency	2462MHz
Parameters	Peak Measurements at the High Band Edge
Notes	Antenna U7; Power Setting = 107 Duty Cycle Factor = 0.62

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2485.29	H	28.0		2.7	33.1	0.0	63.8	1542.7	5000.0	-10.2
2484.50	V	36.6		2.7	33.1	0.0	72.4	4150.2	5000.0	-1.6

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378317
Mode	802.11b
Carrier Frequency	2462MHz
Parameters	Average Measurements at the High Band Edge
Notes	Antenna U7; Power Setting = 107 Duty Cycle Factor = 0.62

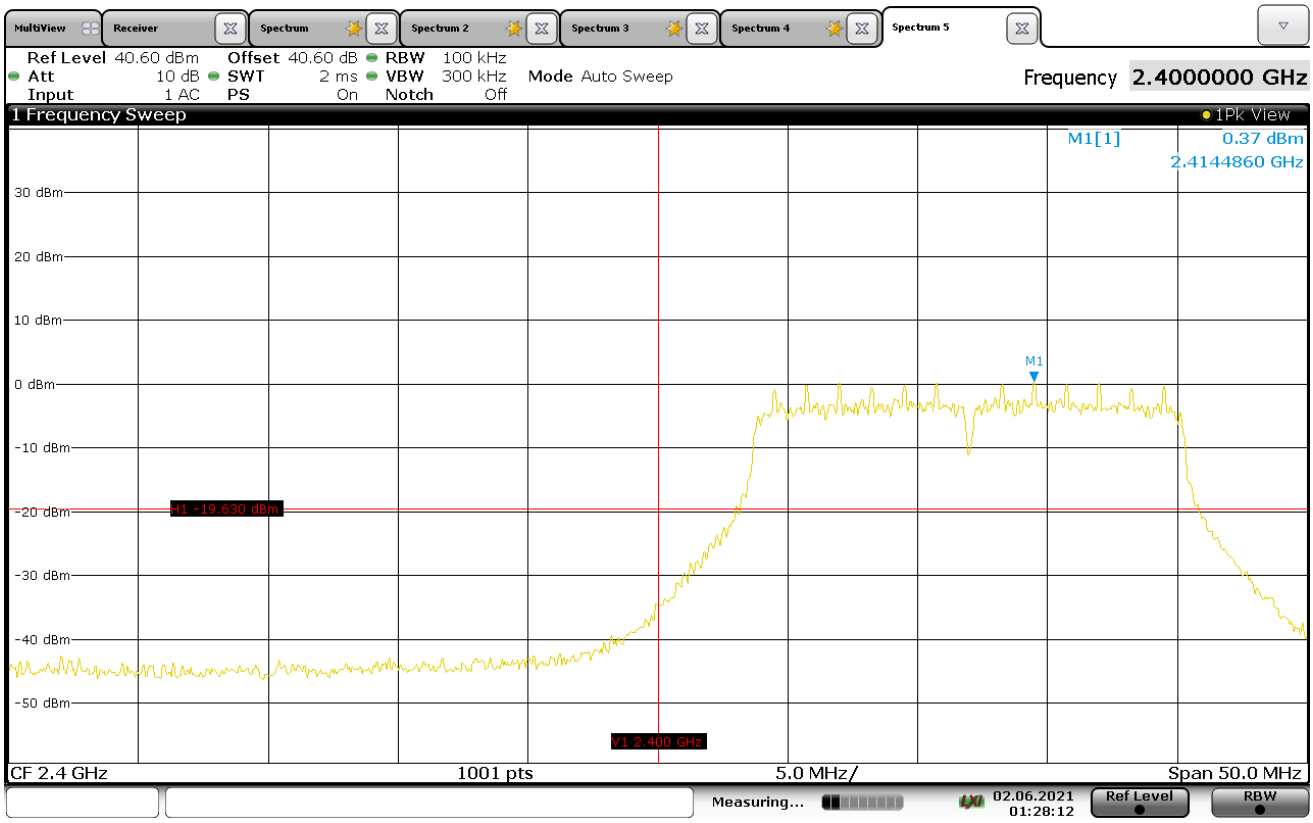
Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
2485.29	H	8.4	Ambient	2.7	33.1	0.0	0.6	44.8	173.5	500.0	-9.2
2484.50	V	11.2	Ambient	2.7	33.1	0.0	0.6	47.6	239.4	500.0	-6.4

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g
Frequency Tested	2402MHz, 6MBPS
Notes	Low Band Edge



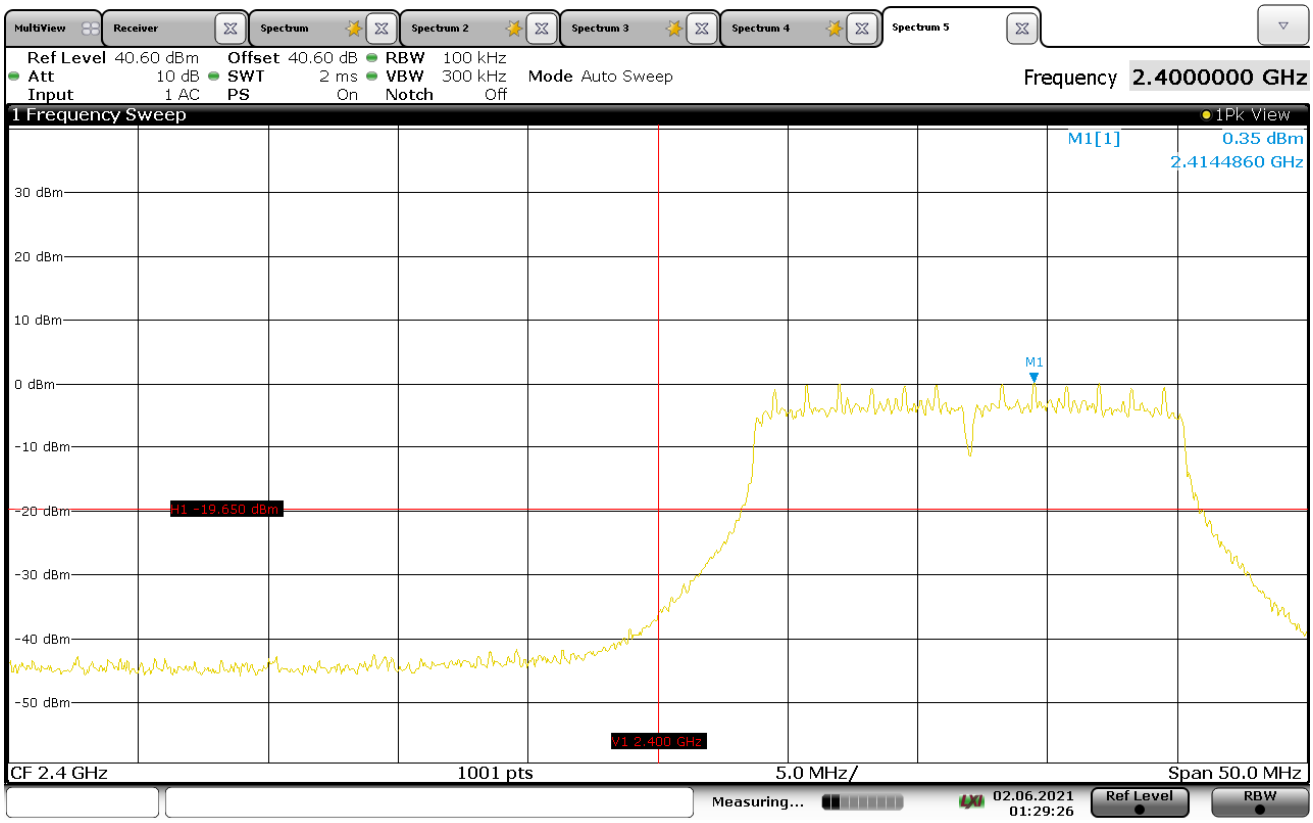
01:26:31 02.06.2021

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g
Frequency Tested	2402MHz, 9MBPS
Notes	Low Band Edge



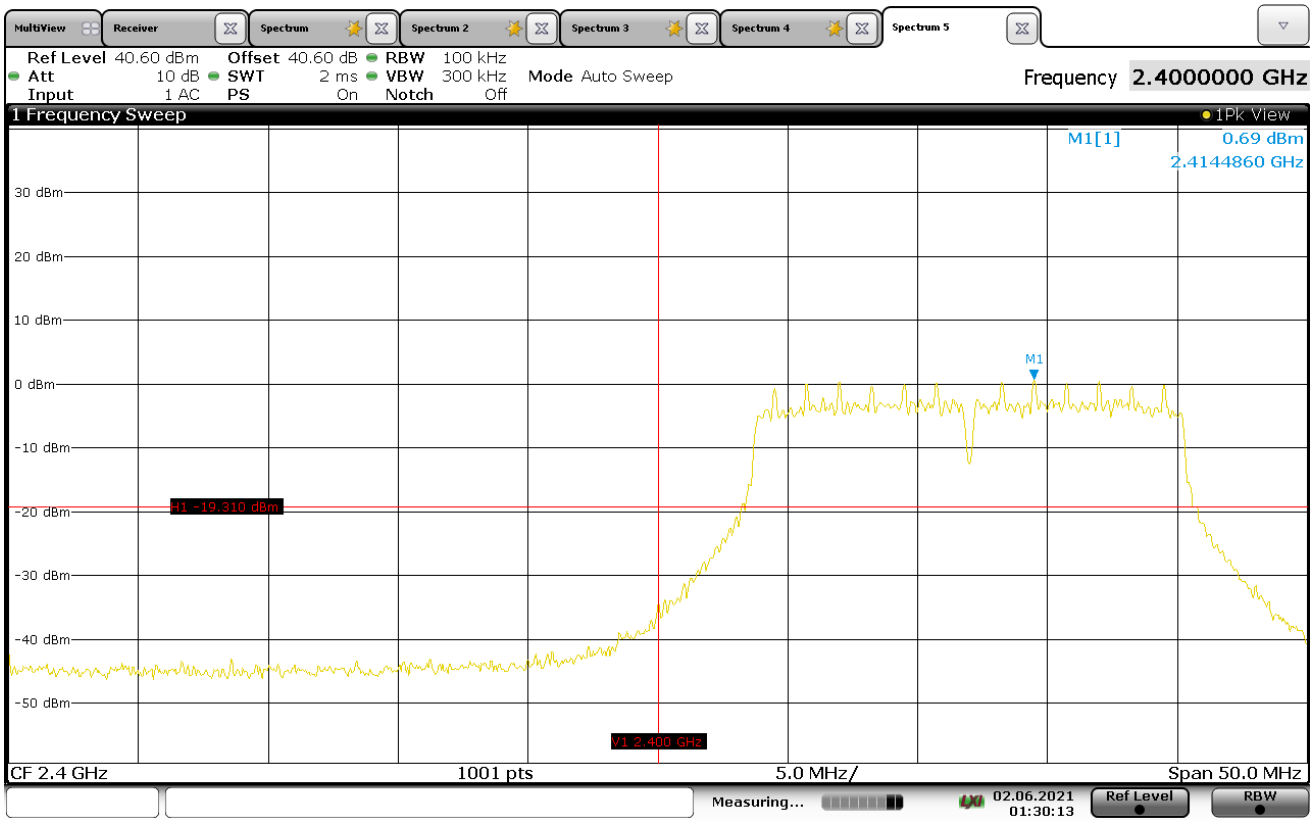
01:28:12 02.06.2021

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g
Frequency Tested	2402MHz, 12MBPS
Notes	Low Band Edge



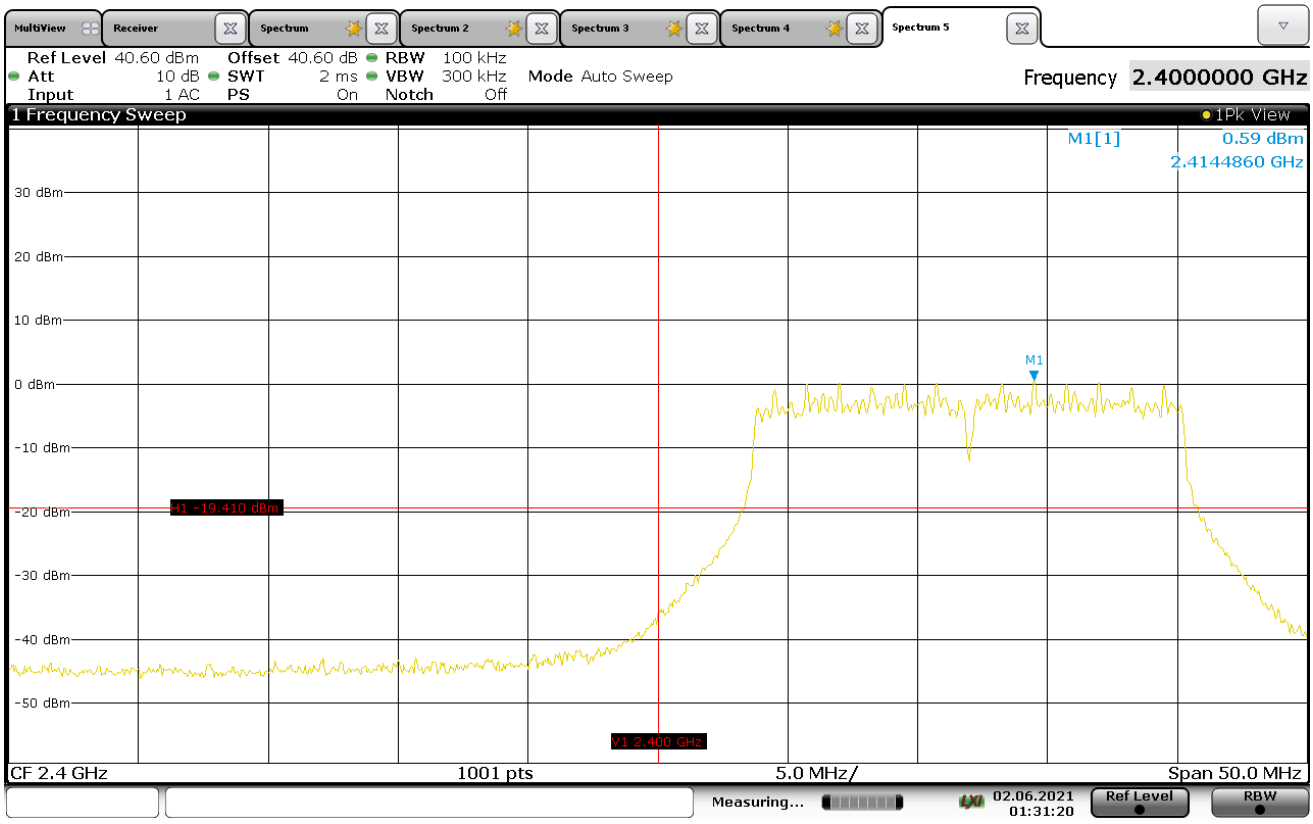
01:29:27 02.06.2021

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g
Frequency Tested	2402MHz, 18MBPS
Notes	Low Band Edge



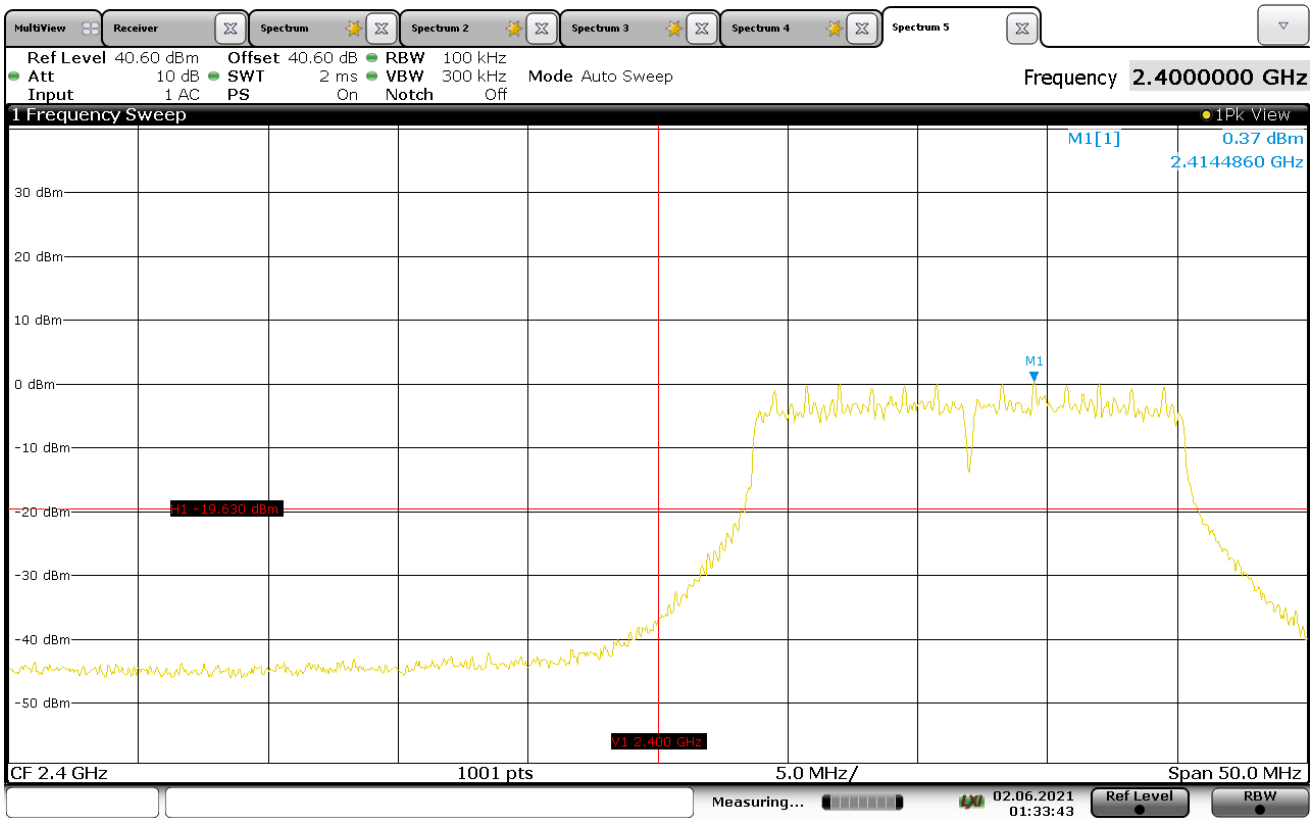
01:30:14 02.06.2021

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g
Frequency Tested	2402MHz, 24MBPS
Notes	Low Band Edge



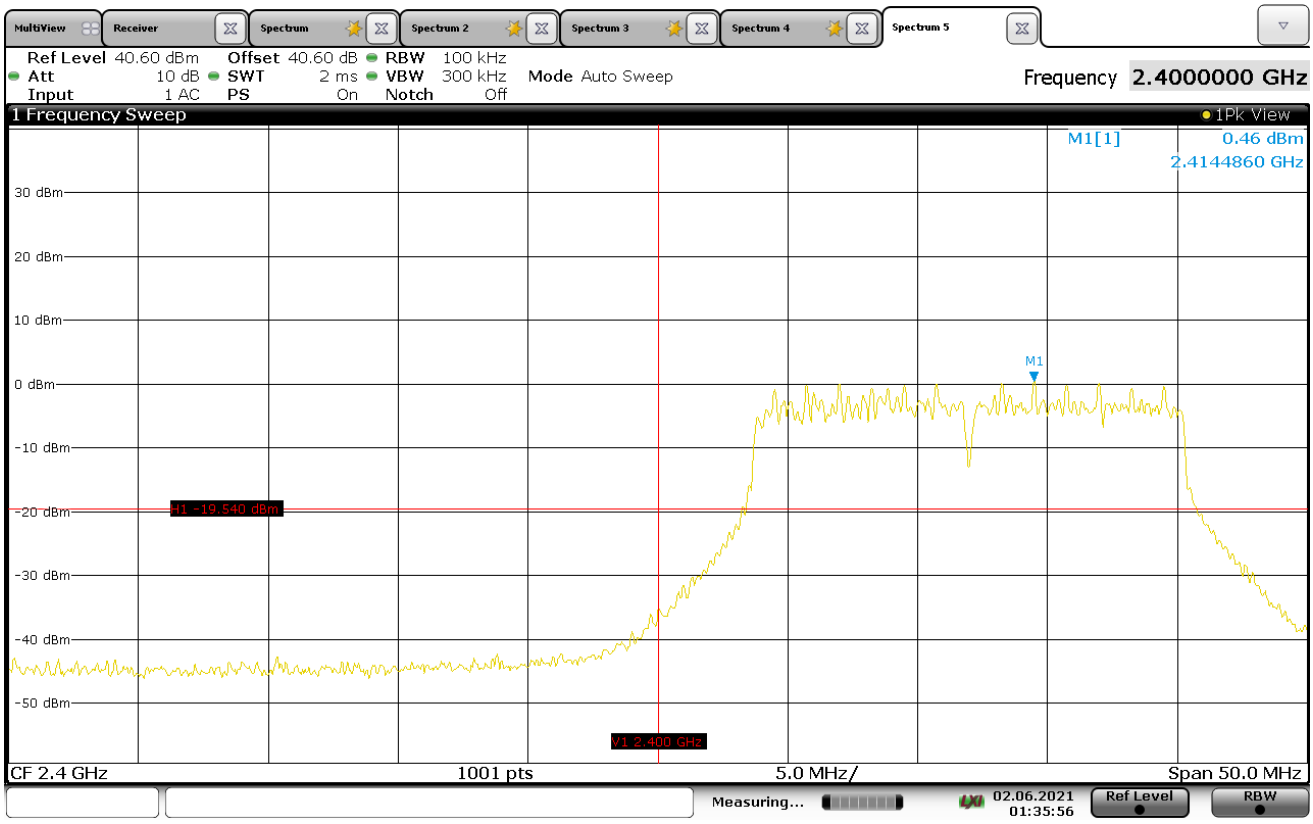
01:31:21 02.06.2021

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g
Frequency Tested	2402MHz, 36MBPS
Notes	Low Band Edge



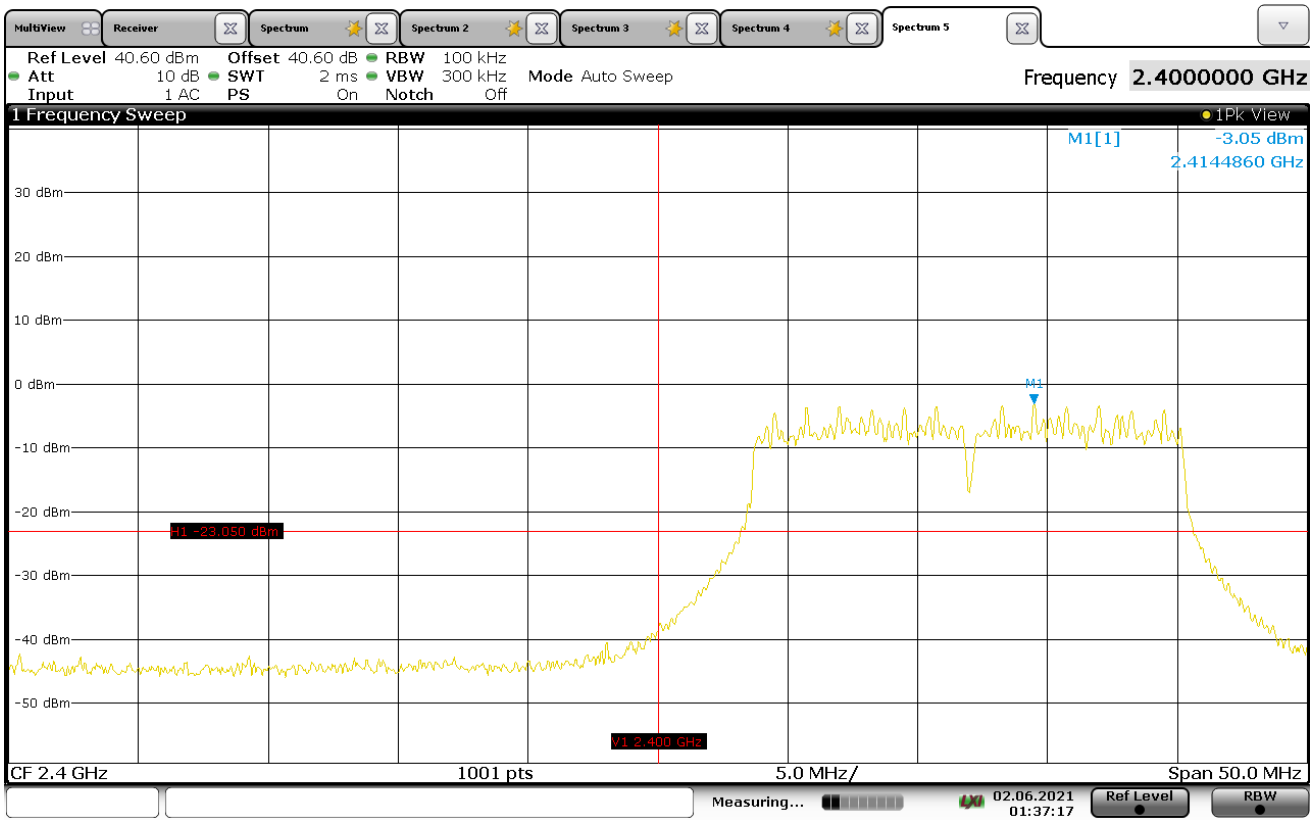
01:33:43 02.06.2021

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g
Frequency Tested	2402MHz, 48MBPS
Notes	Low Band Edge



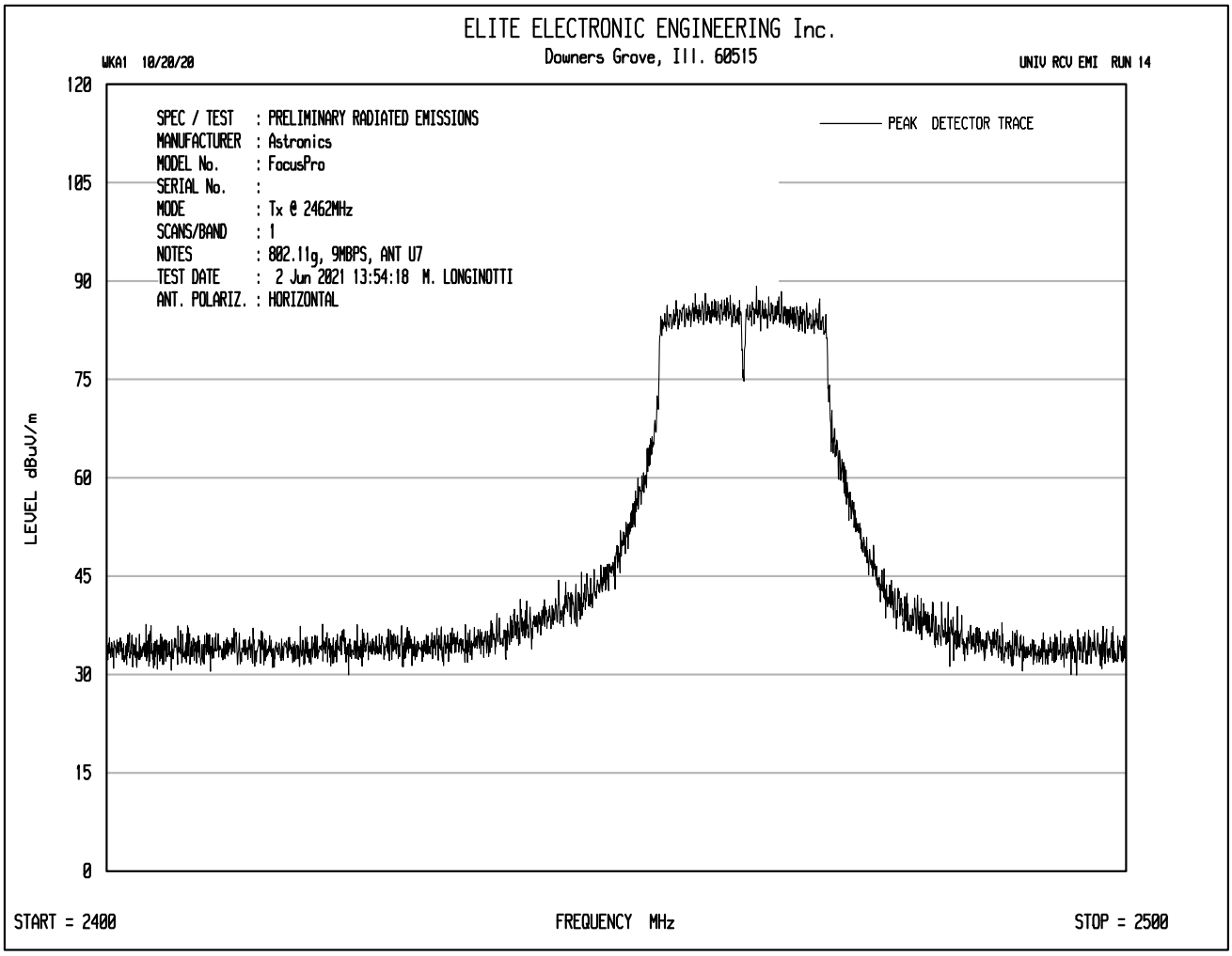
01:35:56 02.06.2021

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g
Frequency Tested	2402MHz, 54MBPS
Notes	Low Band Edge

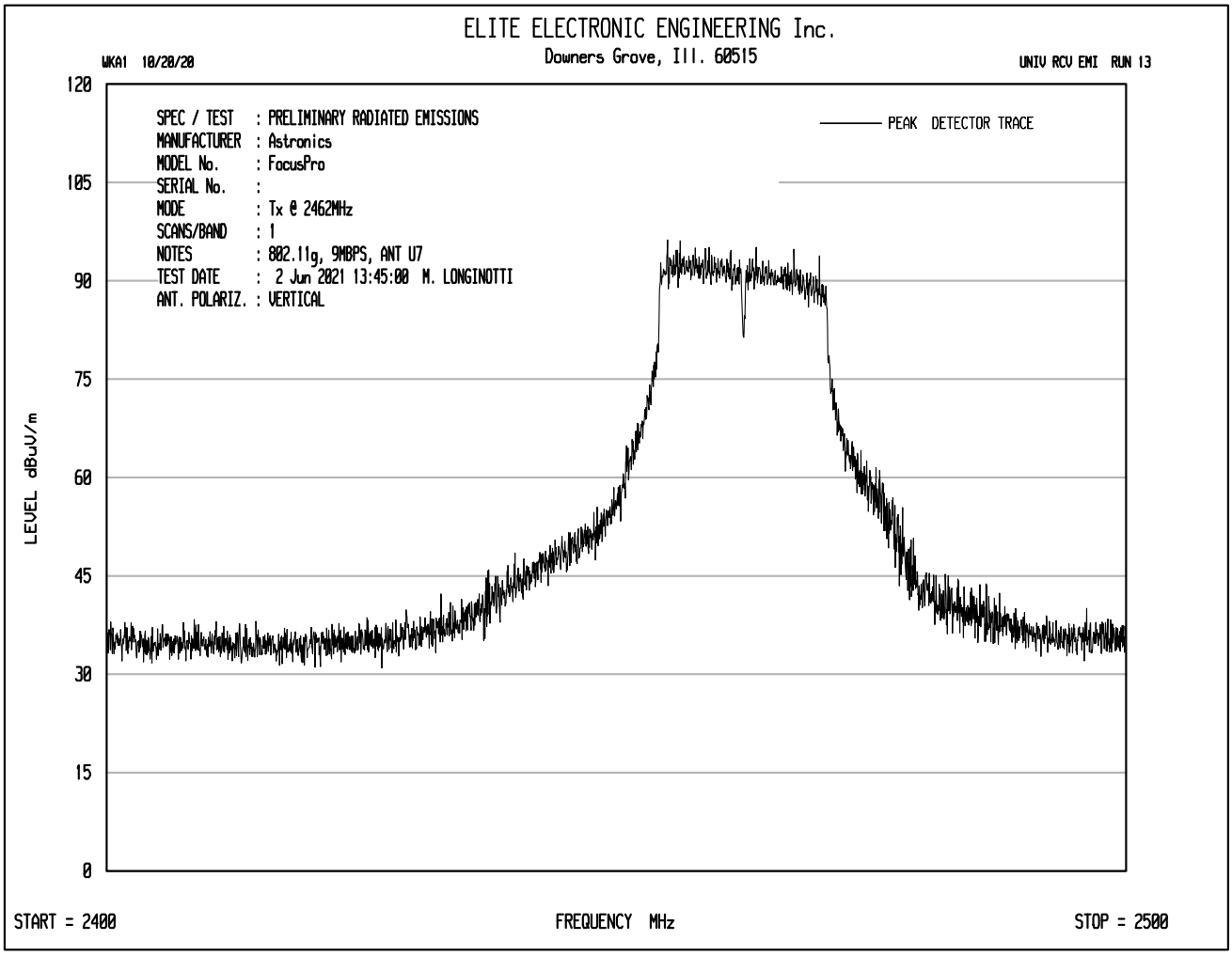


01:37:17 02.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378317
Mode	802.11g– 9MBPS
Carrier Frequency	2462MHz
Parameters	Peak Measurements at the High Band Edge
Notes	Antenna U7; Power Setting = 87 Duty Cycle Factor = 0.308



Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378317
Mode	802.11g– 9MBPS
Carrier Frequency	2462MHz
Parameters	Peak Measurements at the High Band Edge
Notes	Antenna U7; Power Setting = 87 Duty Cycle Factor = 0.308



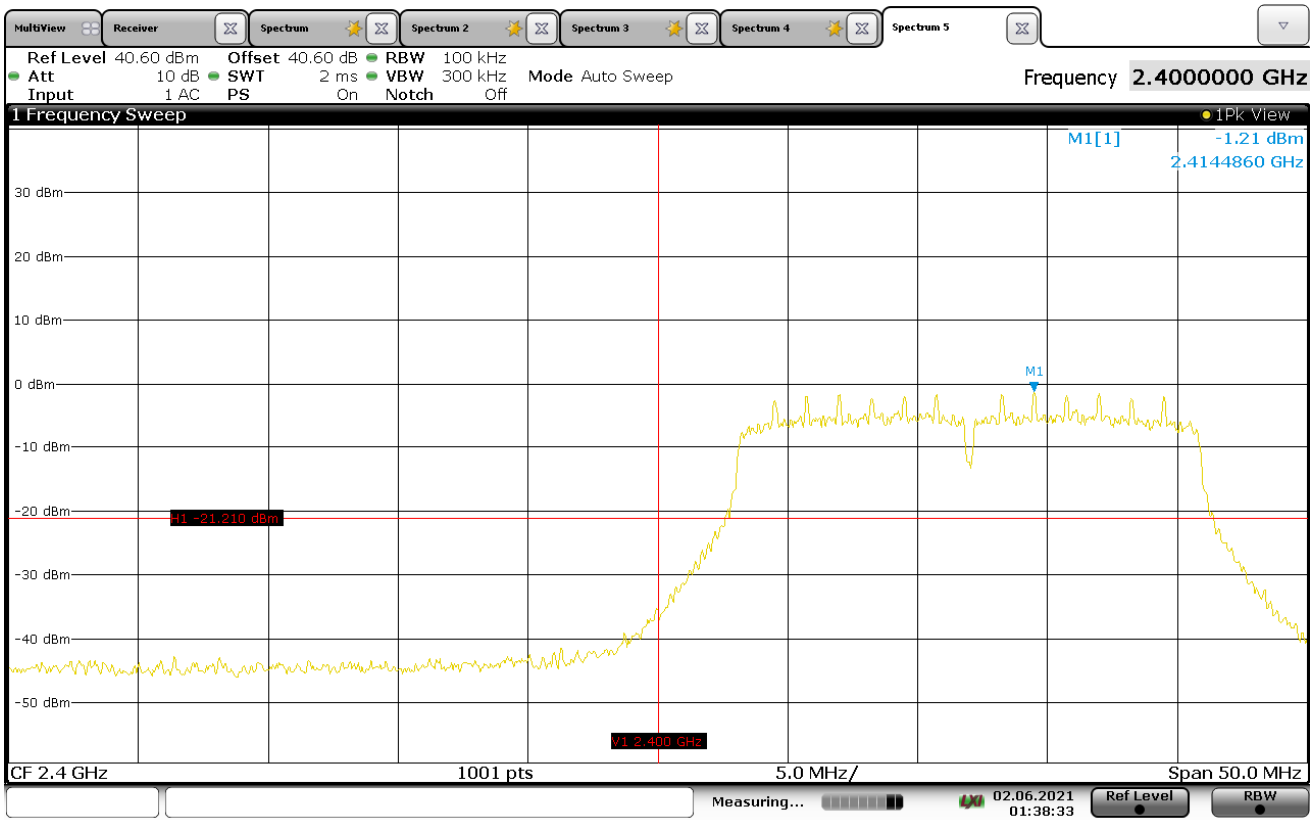
Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378317
Mode	802.11g– 9MBPS
Carrier Frequency	2462MHz
Parameters	Peak Measurements at the High Band Edge
Notes	Antenna U7; Power Setting = 87 Duty Cycle Factor = 0.308

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2485.04	H	24.0		2.7	33.1	0.0	59.8	973.2	5000.0	-14.2
2483.72	V	29.7		2.7	33.1	0.0	65.5	1874.4	5000.0	-8.5

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378317
Mode	802.11g – 9MBPS
Carrier Frequency	2462MHz
Parameters	Average Measurements at the High Band Edge
Notes	Antenna U7; Power Setting = 87 Duty Cycle Factor = 0.308

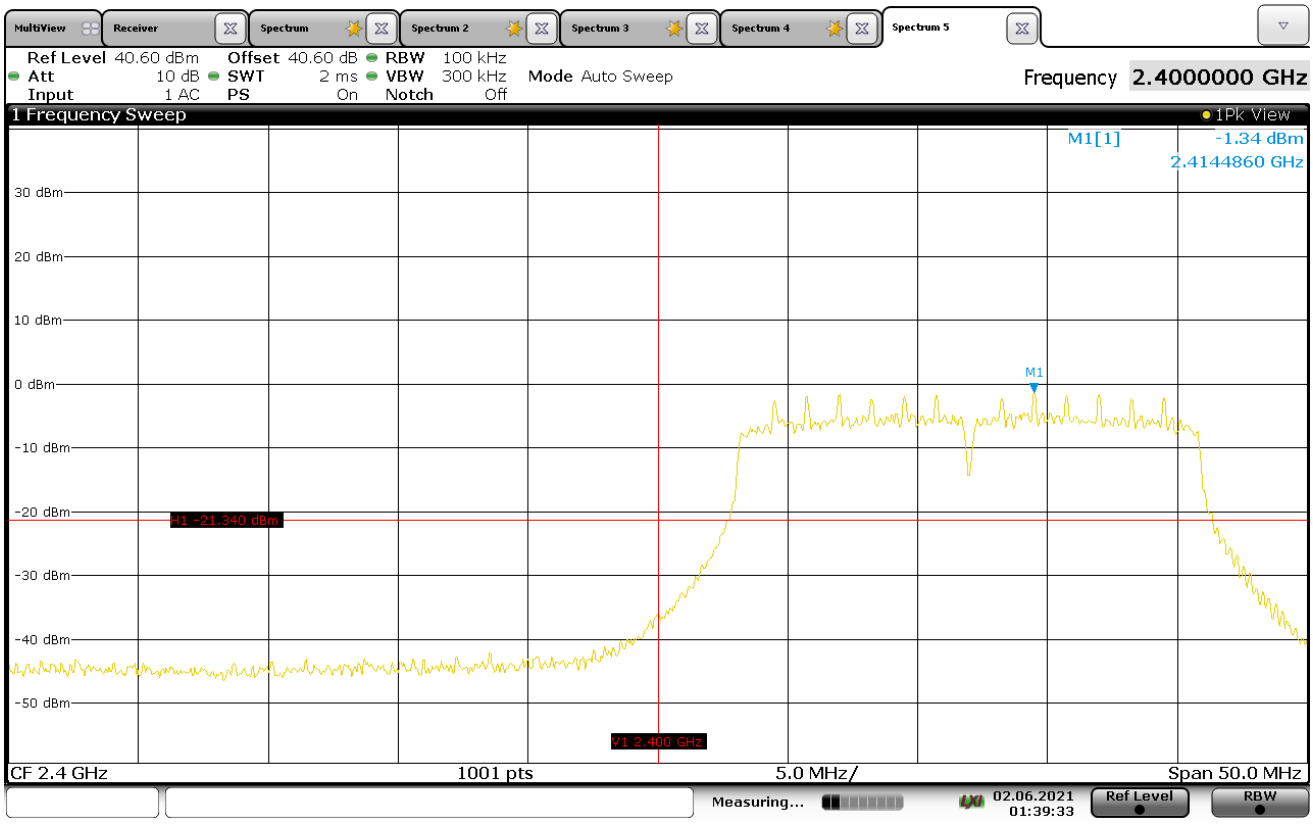
Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
2485.04	H	8.4	Ambient	2.7	33.1	0.0	0.3	44.5	167.3	500.0	-9.5
2483.72	V	9.9	Ambient	2.7	33.1	0.0	0.3	46.0	198.7	500.0	-8.0

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n
Frequency Tested	2402MHz, MCS0
Notes	Low Band Edge



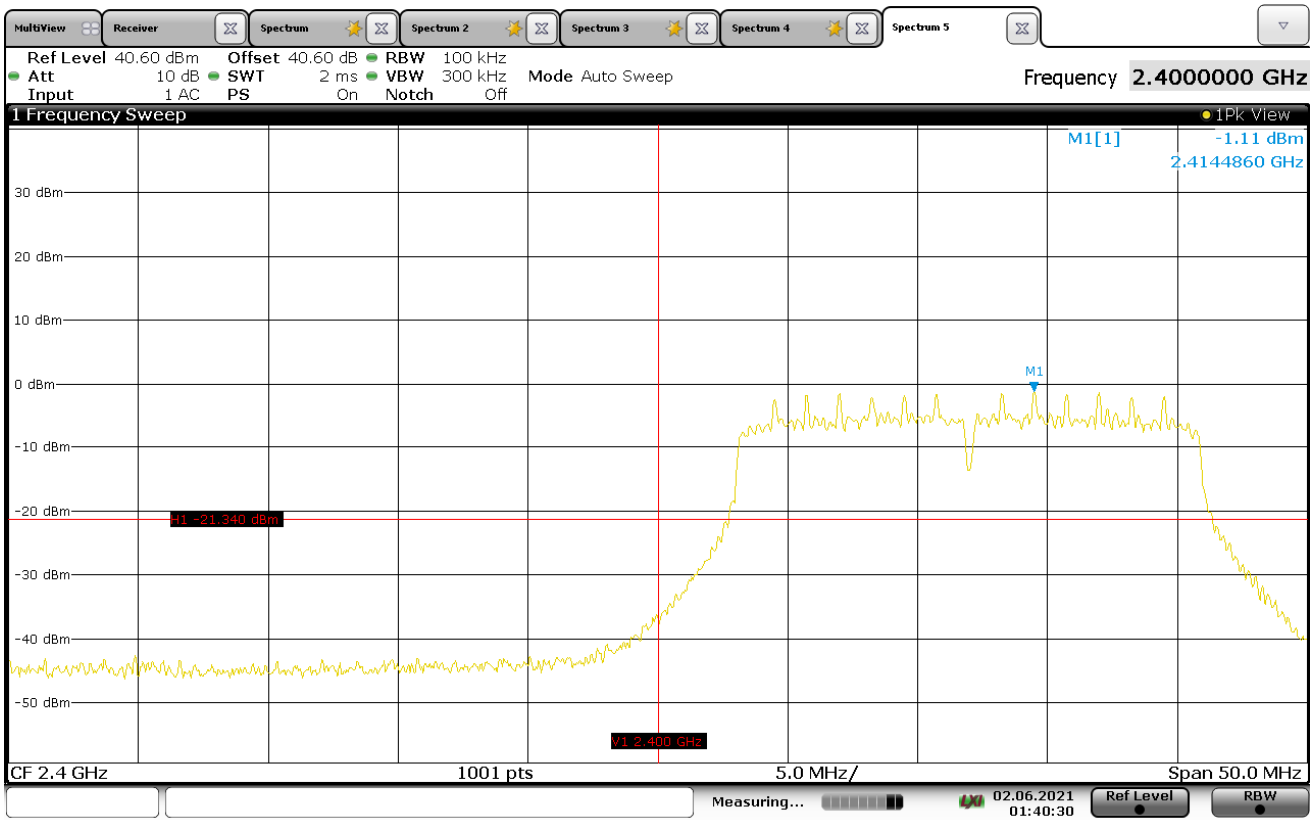
01:38:33 02.06.2021

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n
Frequency Tested	2402MHz, MCS1
Notes	Low Band Edge



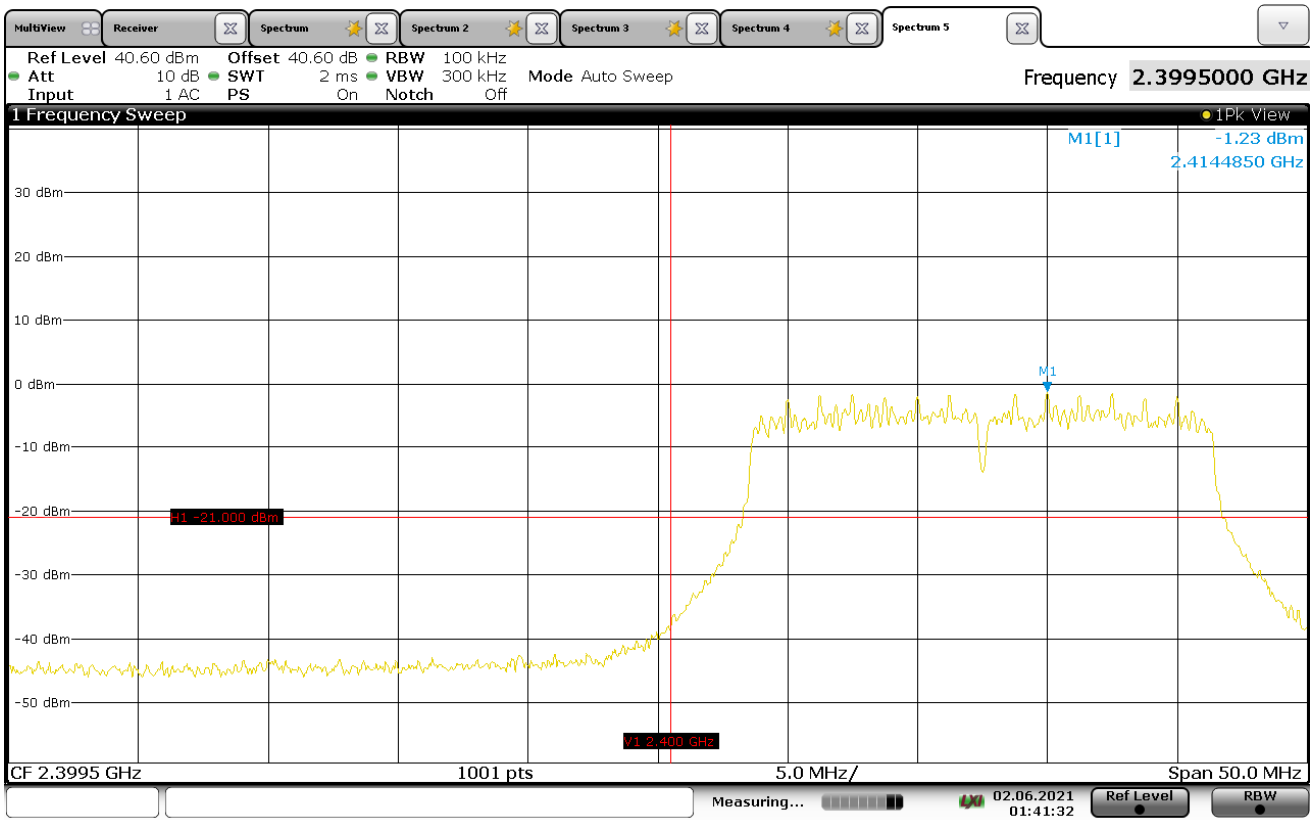
01:39:34 02.06.2021

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n
Frequency Tested	2402MHz, MCS2
Notes	Low Band Edge



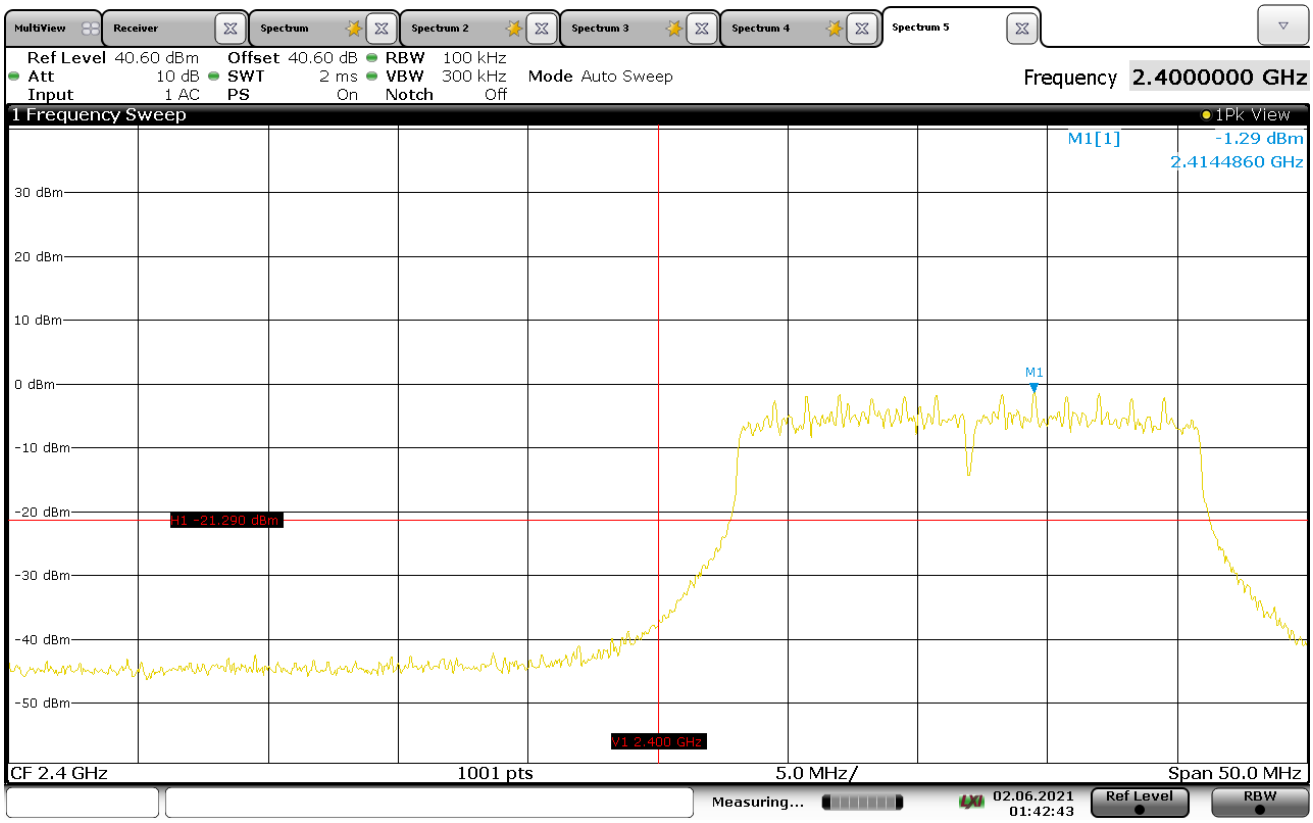
01:40:30 02.06.2021

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n
Frequency Tested	2402MHz, MCS3
Notes	Low Band Edge



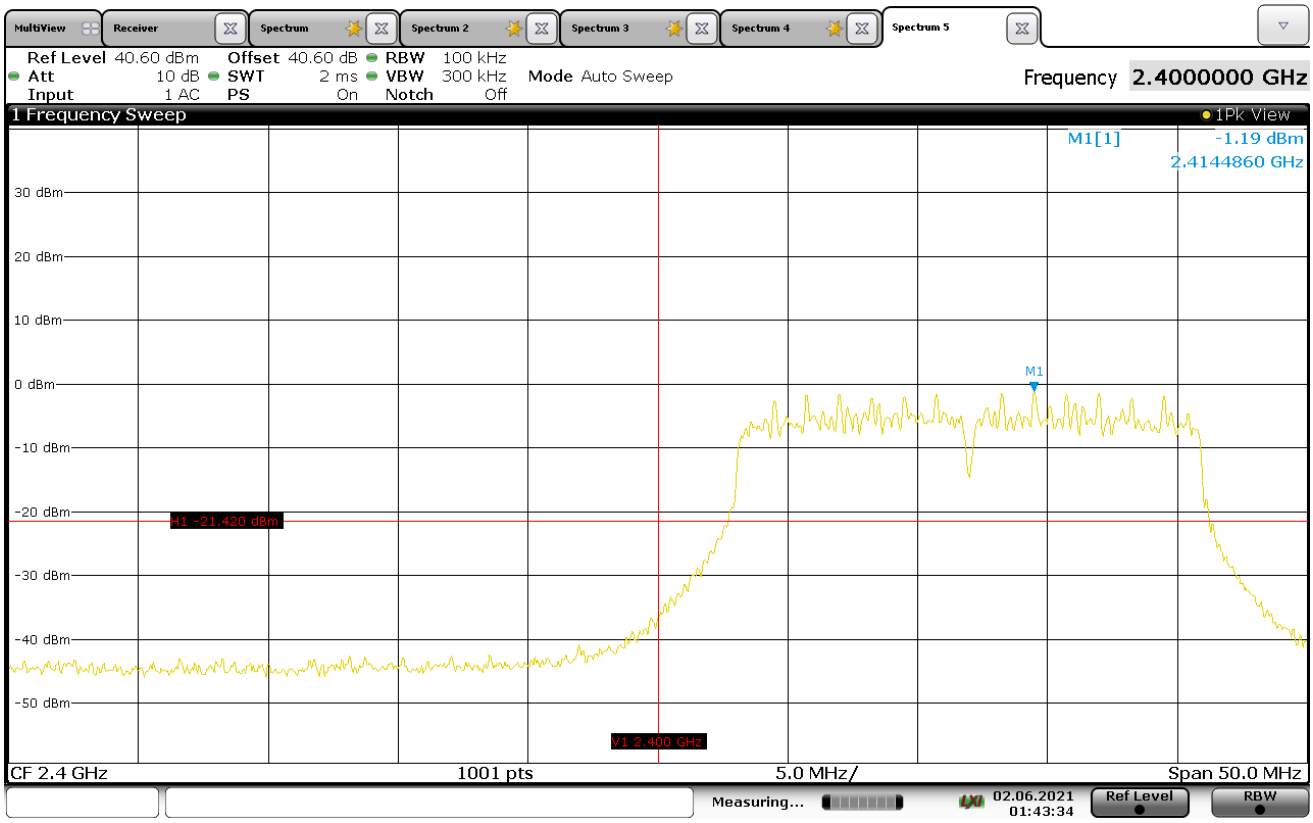
01:41:32 02.06.2021

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n
Frequency Tested	2402MHz, MCS4
Notes	Low Band Edge



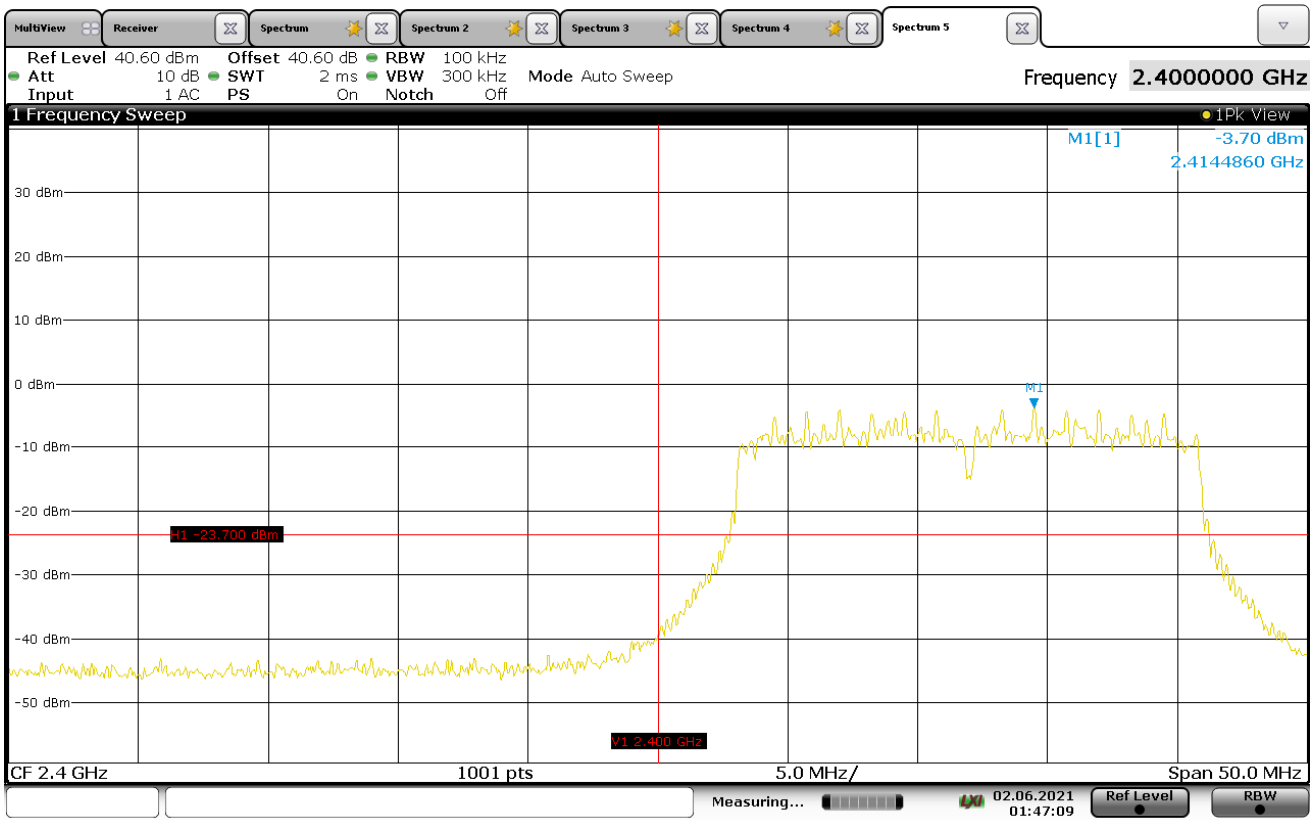
01:42:43 02.06.2021

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n
Frequency Tested	2402MHz, MCS5
Notes	Low Band Edge



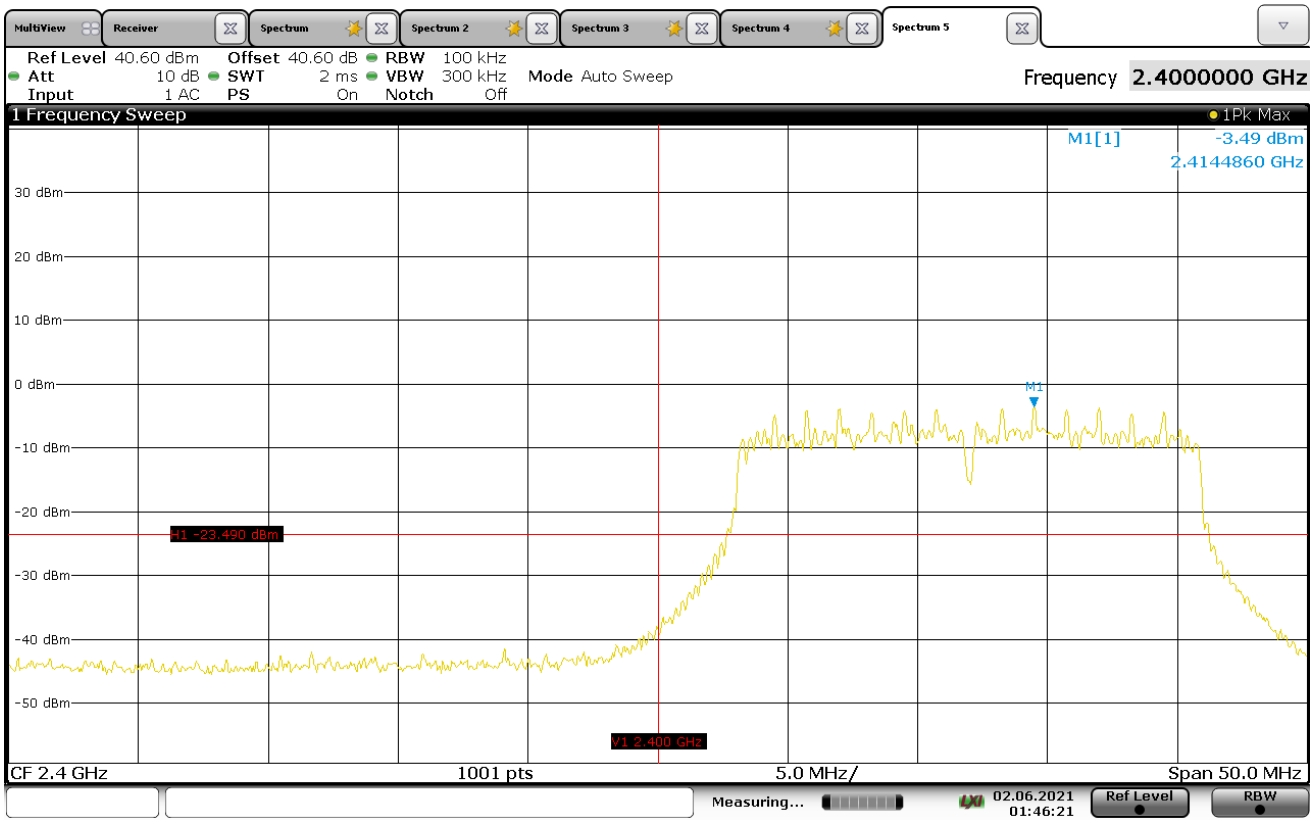
01:43:35 02.06.2021

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n
Frequency Tested	2402MHz, MCS6
Notes	Low Band Edge



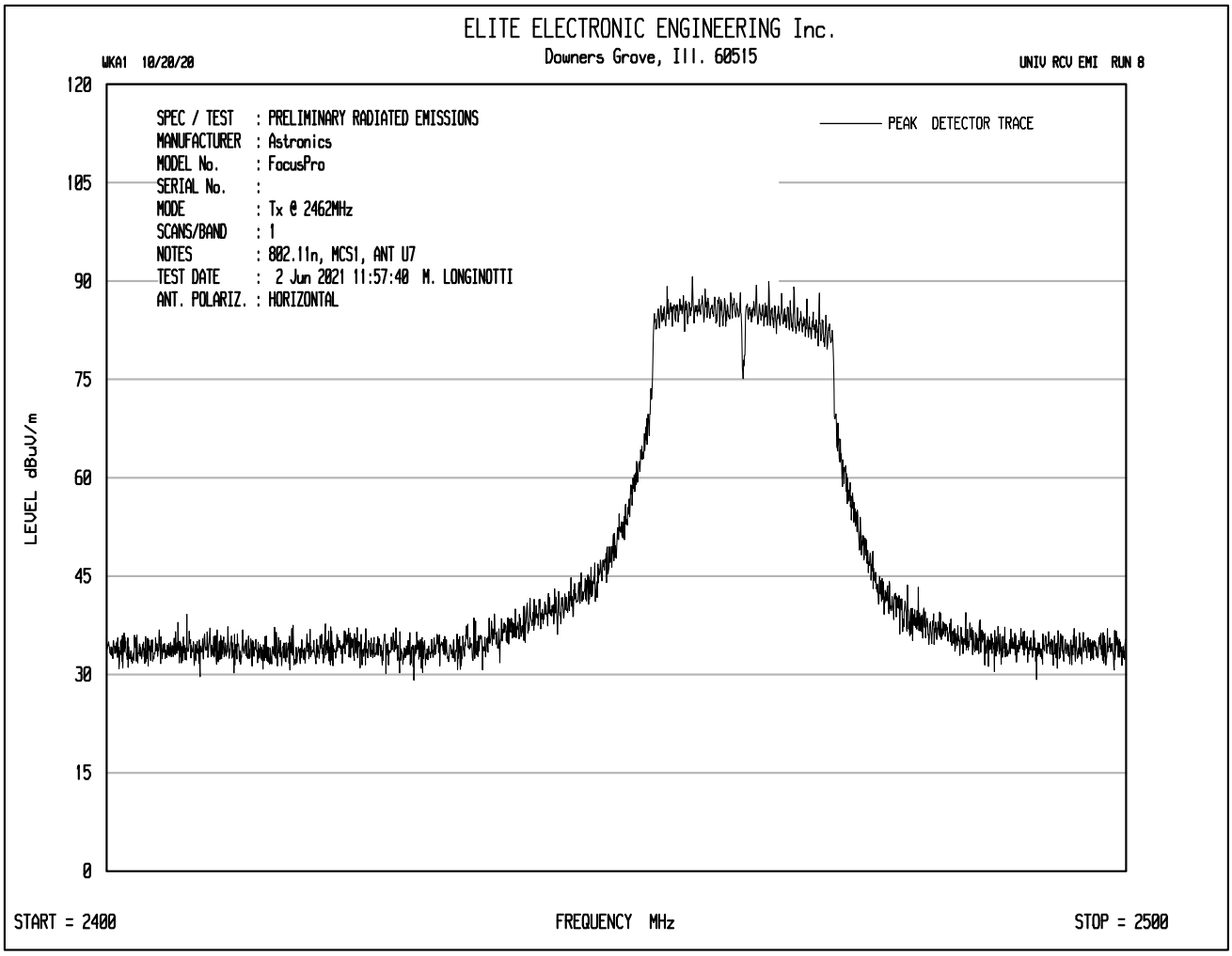
01:47:10 02.06.2021

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n
Frequency Tested	2402MHz, MCS7
Notes	Low Band Edge

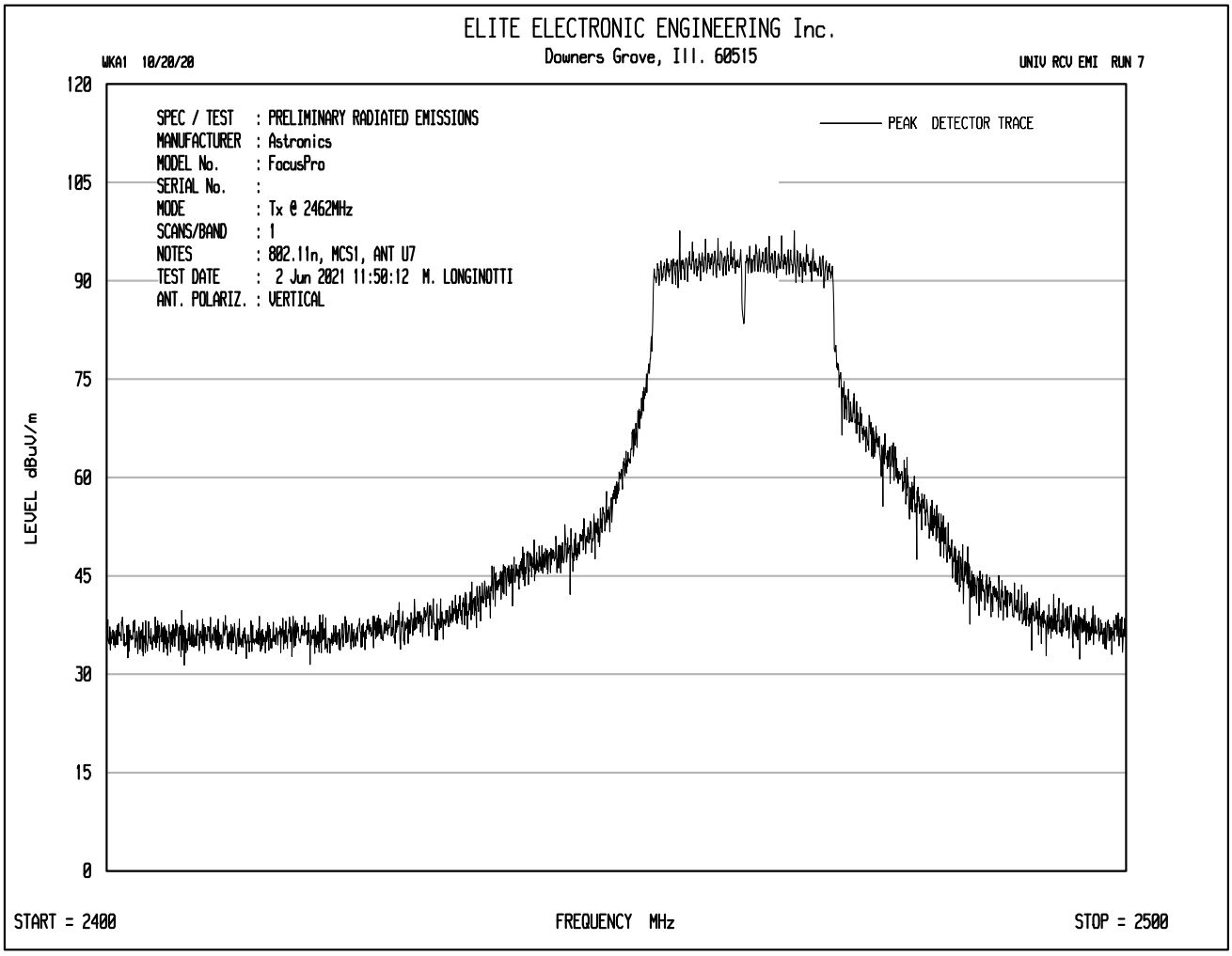


01:46:21 02.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378317
Mode	802.11n– MCS1
Carrier Frequency	2462MHz
Parameters	Peak Measurements at the High Band Edge
Notes	Antenna U7; Power Setting = 87 Duty Cycle Factor = 0.46



Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378317
Mode	802.11n– MCS1
Carrier Frequency	2462MHz
Parameters	Peak Measurements at the High Band Edge
Notes	Antenna U7; Power Setting = 87 Duty Cycle Factor = 0.46



Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378317
Mode	802.11n– MCS1
Carrier Frequency	2462MHz
Parameters	Peak Measurements at the High Band Edge
Notes	Antenna U7; Power Setting = 87 Duty Cycle Factor = 0.46

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2484.30	H	23.3		2.7	33.1	0.0	59.1	897.5	5000.0	-14.9
2483.90	V	31.0		2.7	33.1	0.0	66.8	2177.2	5000.0	-7.2

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378317
Mode	802.11n – MCS1
Carrier Frequency	2462MHz
Parameters	Average Measurements at the High Band Edge
Notes	Antenna U7; Power Setting = 87 Duty Cycle Factor = 0.46

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
2484.30	H	8.5	Ambient	2.7	33.1	0.0	0.5	44.7	172.2	500.0	-9.3
2483.90	V	12.6	Ambient	2.7	33.1	0.0	0.5	48.8	276.0	500.0	-5.2

30. Power Spectral Density

EUT Information	
Manufacturer	Astronics
Product	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b, 802.11g, 802.11n

Test Information	
Setup Format	Tabletop
Measurement Method	Antenna Conducted
Notes	None

Requirements
The power spectral density from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

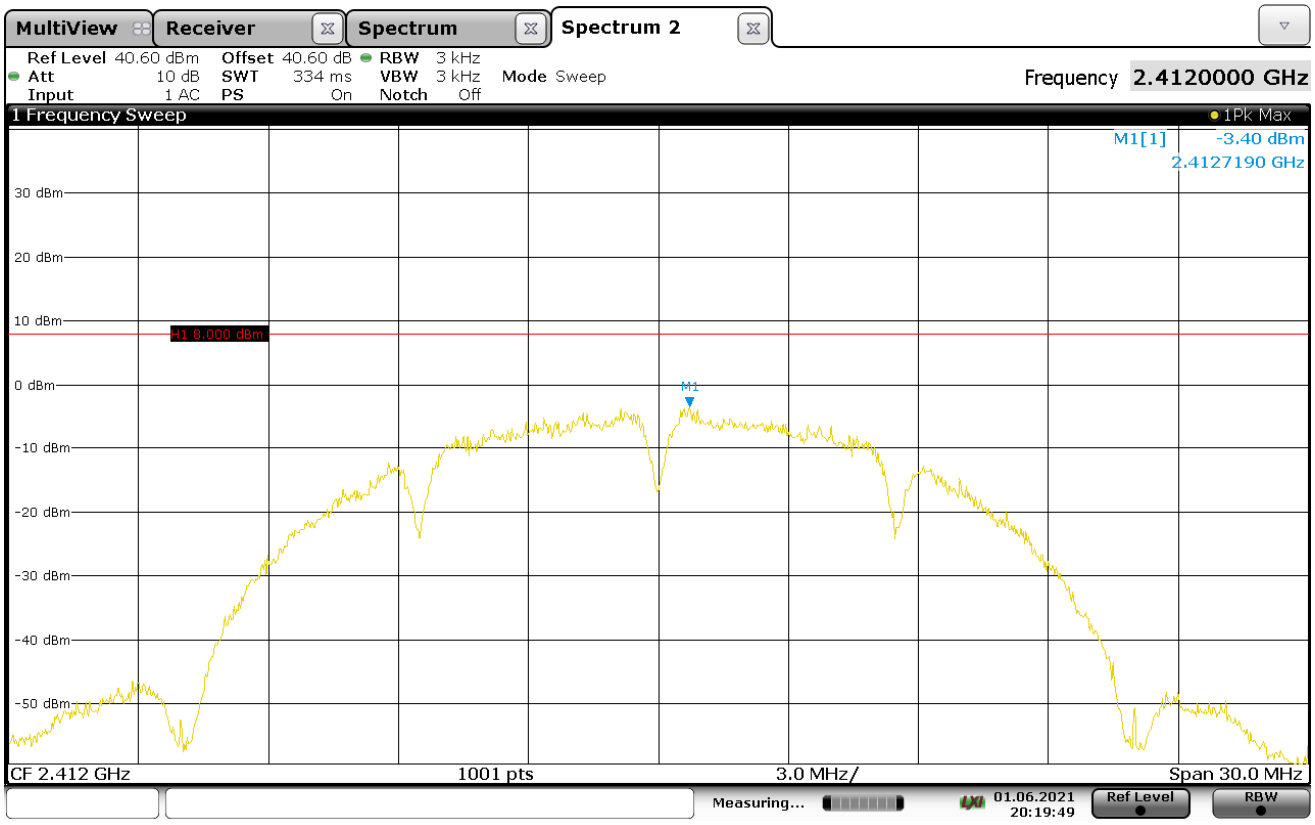
Procedures

1) The antenna port of the EUT was connected to the spectrum analyzer through a 20dB pad.
2) The EUT was then placed in the normal operation mode.
3) To determine the power spectral density, the following spectrum analyzer settings were used:
    a) Center Frequency = Transmit Frequency
    b) Span = 1.5× the DTS (6dB) bandwidth
    c) Resolution Bandwidth (RBW) = 3kHz ≤ RBW ≤ 100kHz
    d) Sweep time = Auto
    e) Detector = Peak
    f) Trace Function = Max-Hold
4) A display line was then placed on the corresponding +8dBm level.
5) The analyzers display was then screenshot and saved.

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b
Notes	Measured in a 3kHz bandwidth

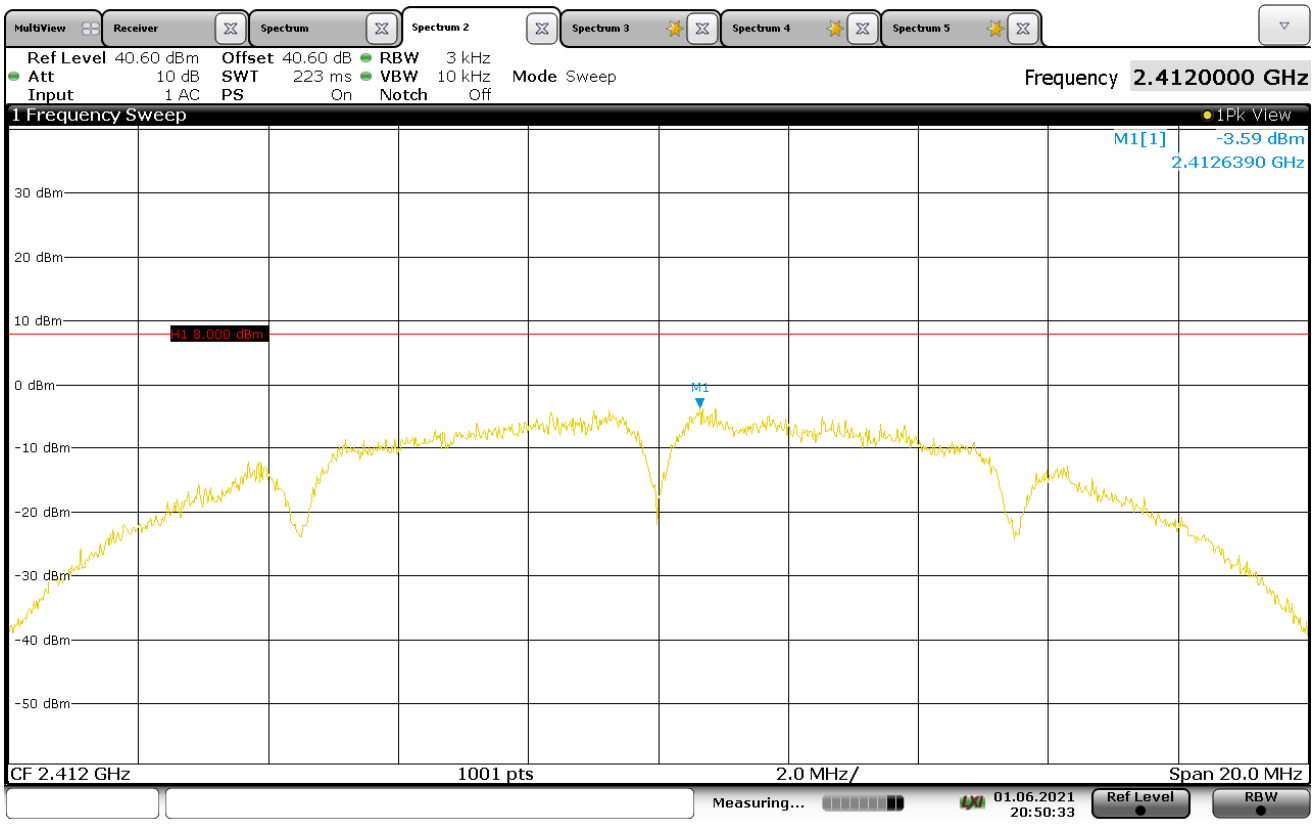
Protocol	Freq. (MHz)	Data Rate (Mbps)	Power (dBm)
802.11b	2412	1	-3.4
	2437		-3.56
	2462		-3.35
	2412	2	-3.59
	2437		-3.74
	2462		-3.78
	2412	5.5	-4.63
	2437		-3.32
	2462		-2.87
	2412	11	-4.44
	2437		-3.94
	2462		-4.01

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11b – 1Mbps
Carrier Frequency	2412MHz
Parameters	PSD = -3.4dBm
Notes	N/A



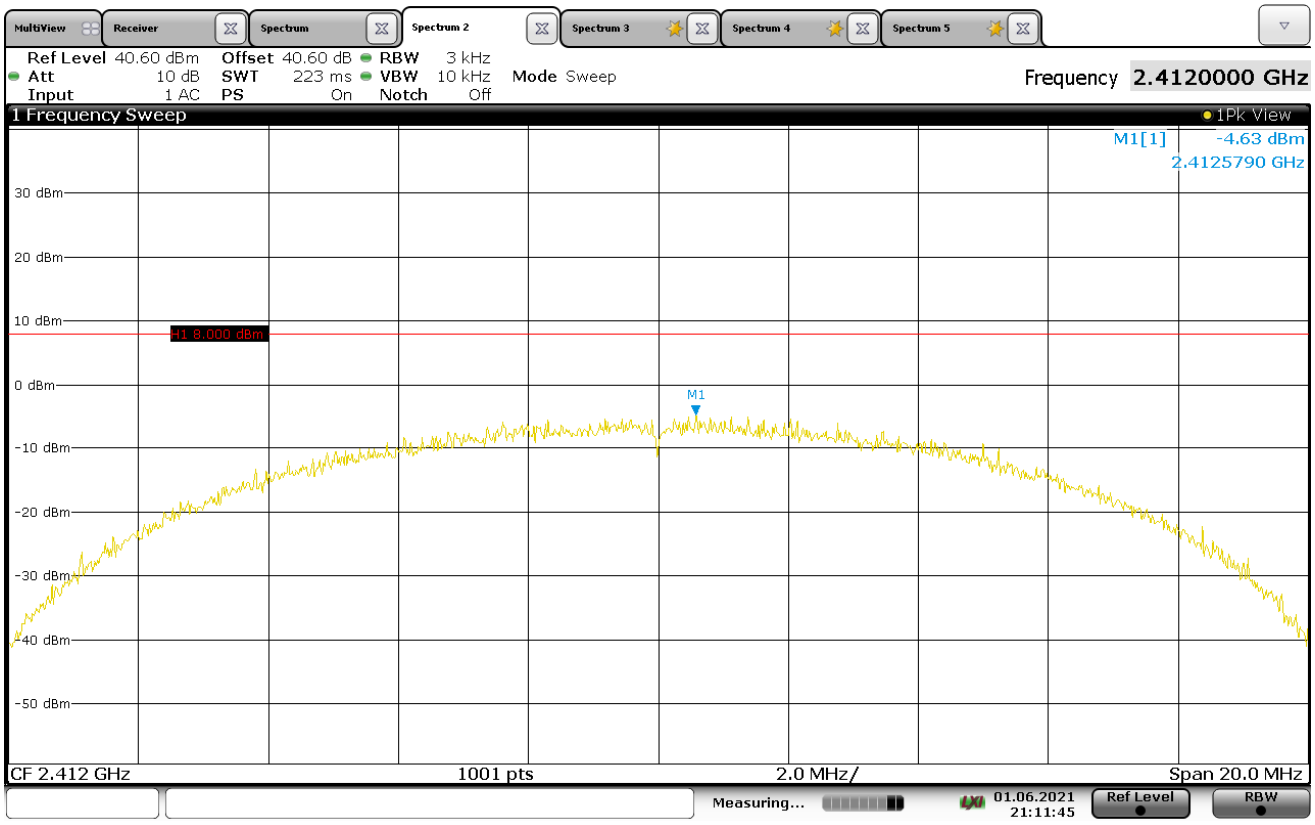
20:19:50 01.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11b – 2Mbps
Carrier Frequency	2412MHz
Parameters	PSD = -3.59dBm
Notes	N/A



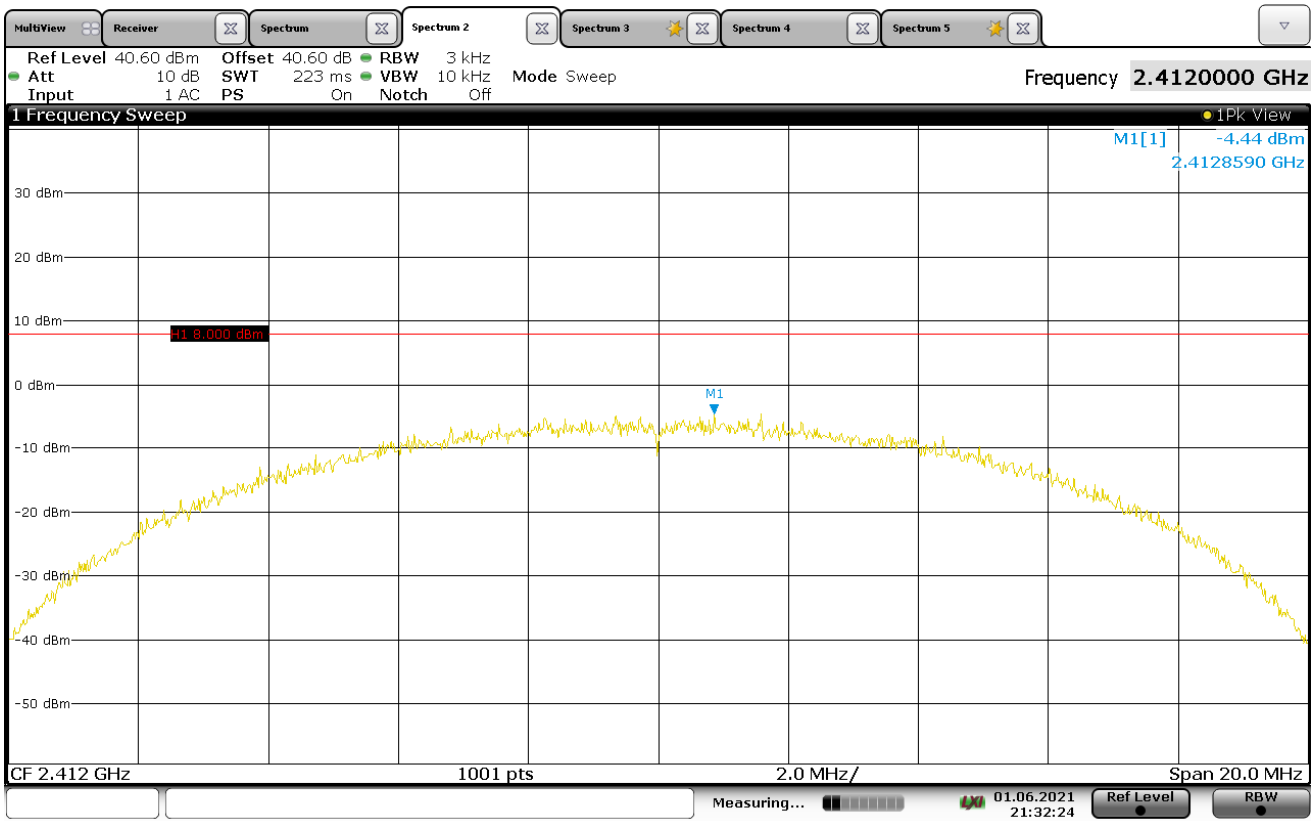
20:50:34 01.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11b – 5.5Mbps
Carrier Frequency	2412MHz
Parameters	PSD = -4.63dBm
Notes	N/A



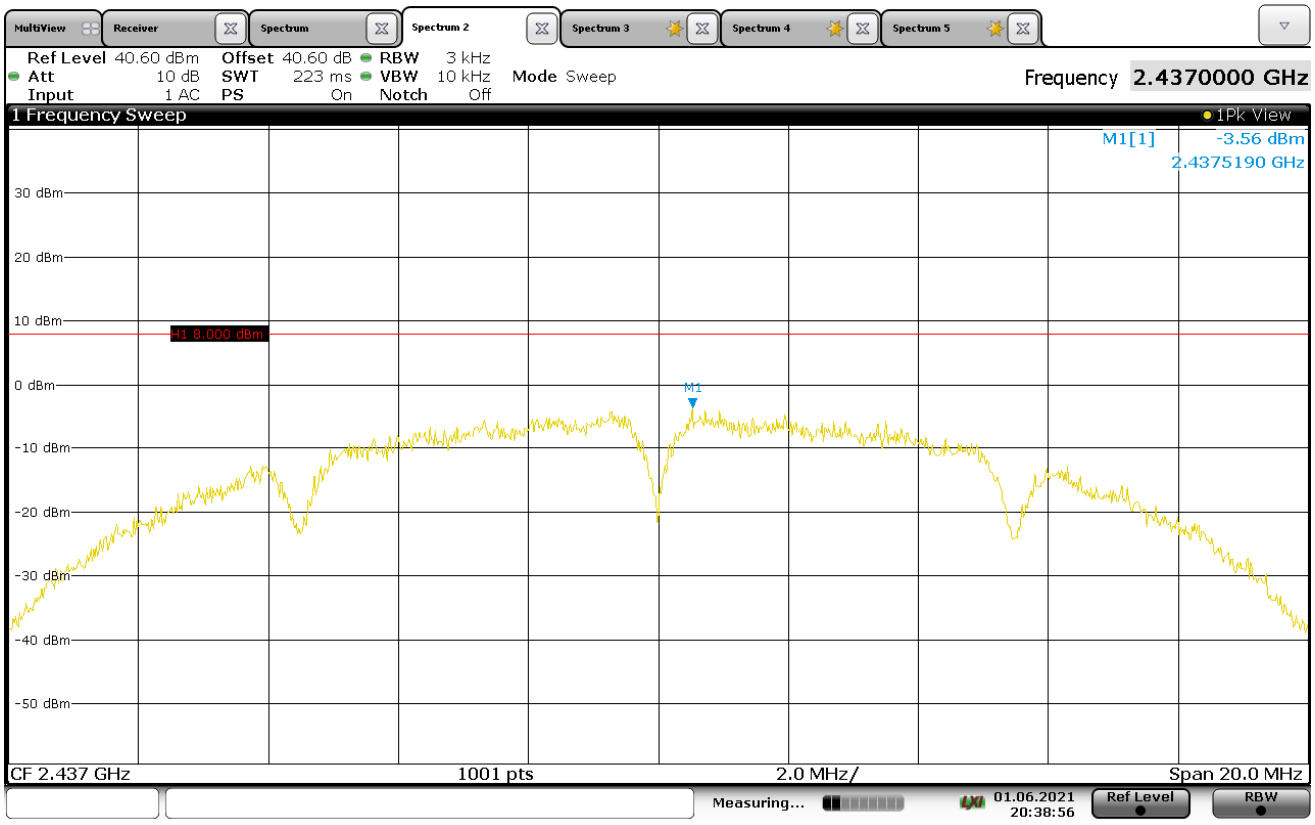
21:11:45 01.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11b – 11Mbps
Carrier Frequency	2412MHz
Parameters	PSD = -4.44dBm
Notes	N/A



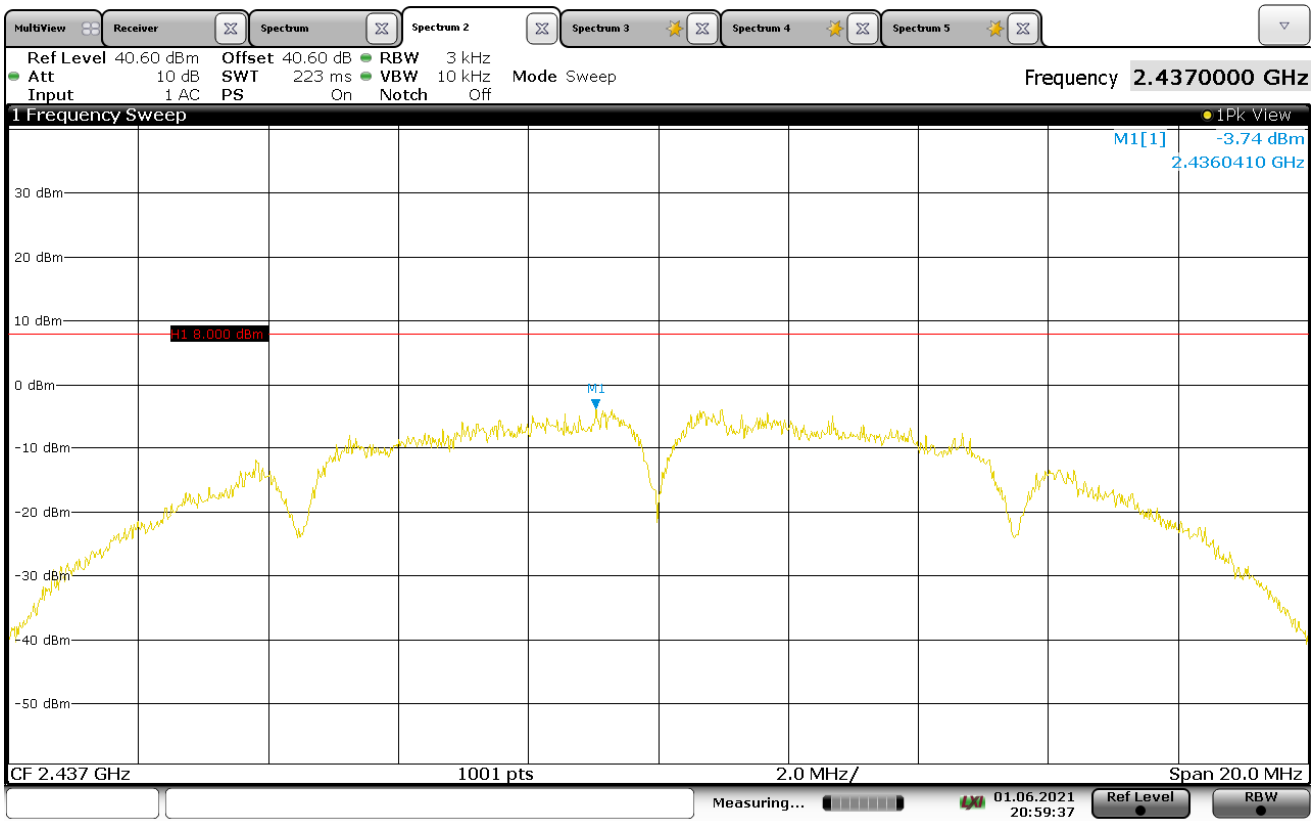
21:32:25 01.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11b – 1Mbps
Carrier Frequency	2437MHz
Parameters	PSD = -3.56dBm
Notes	N/A



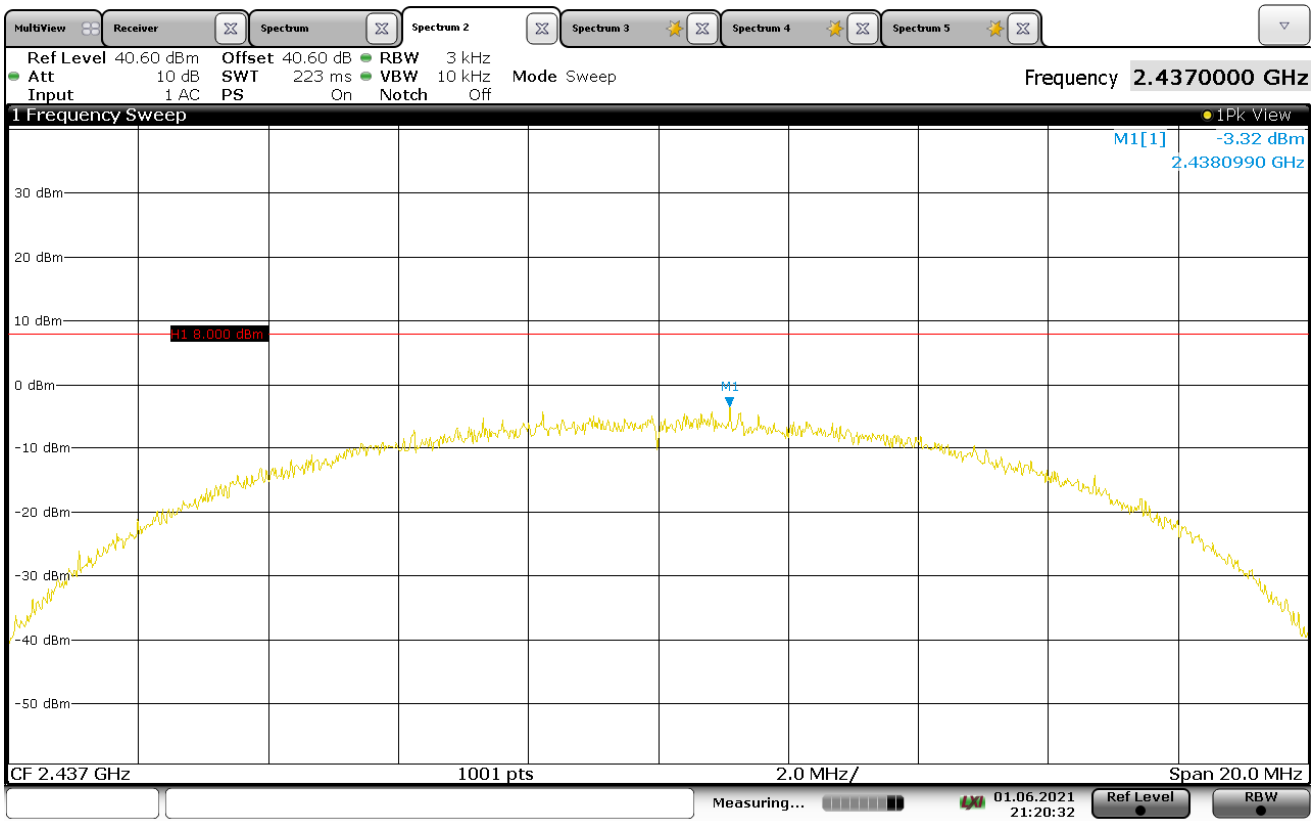
20:38:57 01.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11b – 2Mbps
Carrier Frequency	2437MHz
Parameters	PSD = -3.74dBm
Notes	N/A



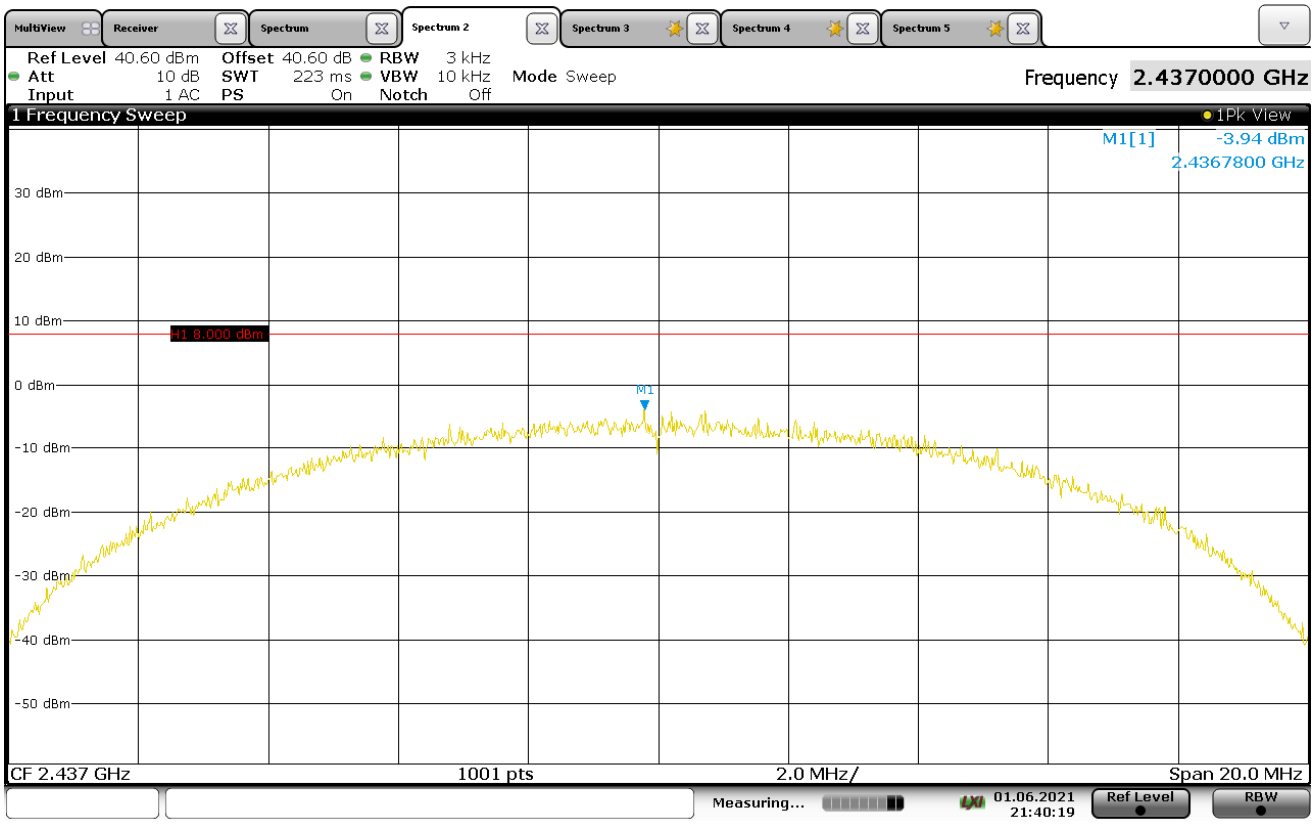
20:59:37 01.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11b – 5.5Mbps
Carrier Frequency	2437MHz
Parameters	PSD = -3.32dBm
Notes	N/A



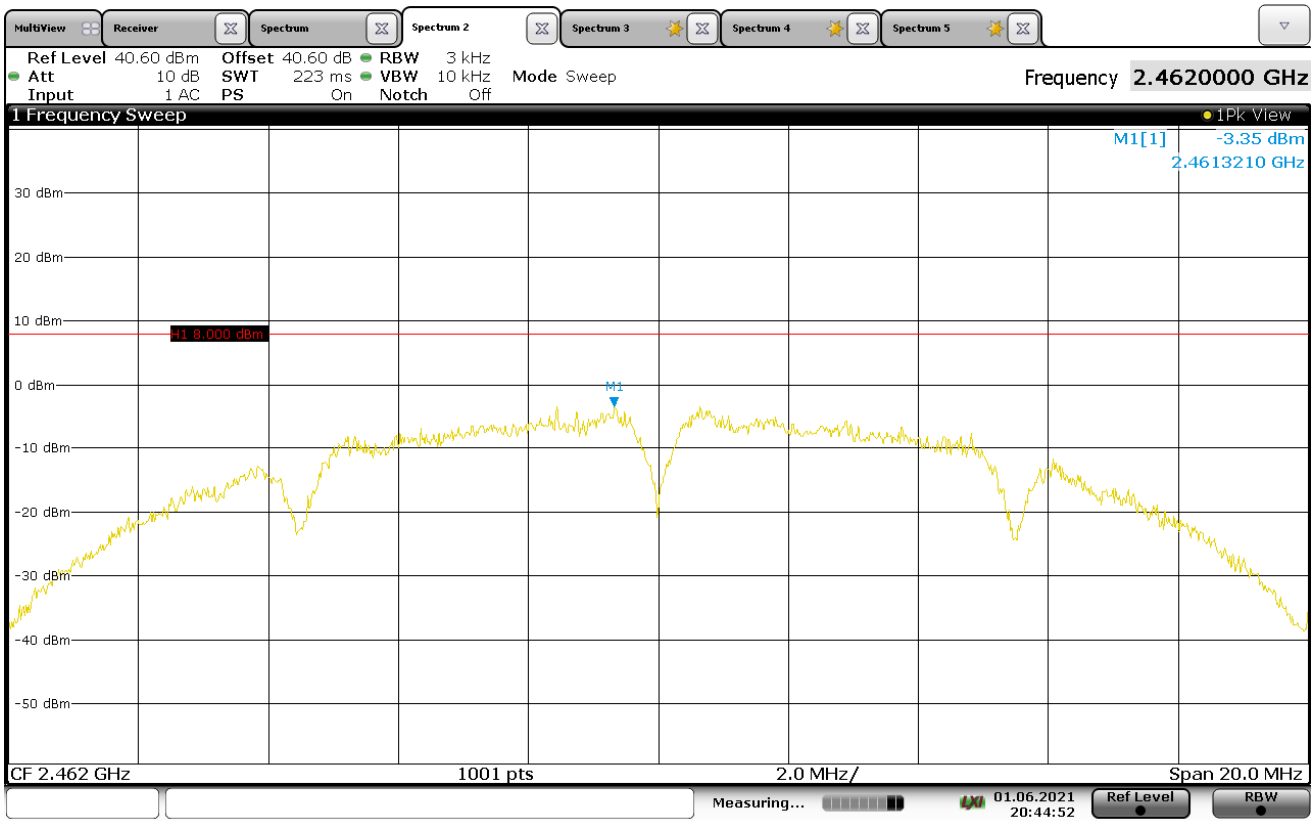
21:20:33 01.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11b – 11Mbps
Carrier Frequency	2437MHz
Parameters	PSD = -3.94dBm
Notes	N/A



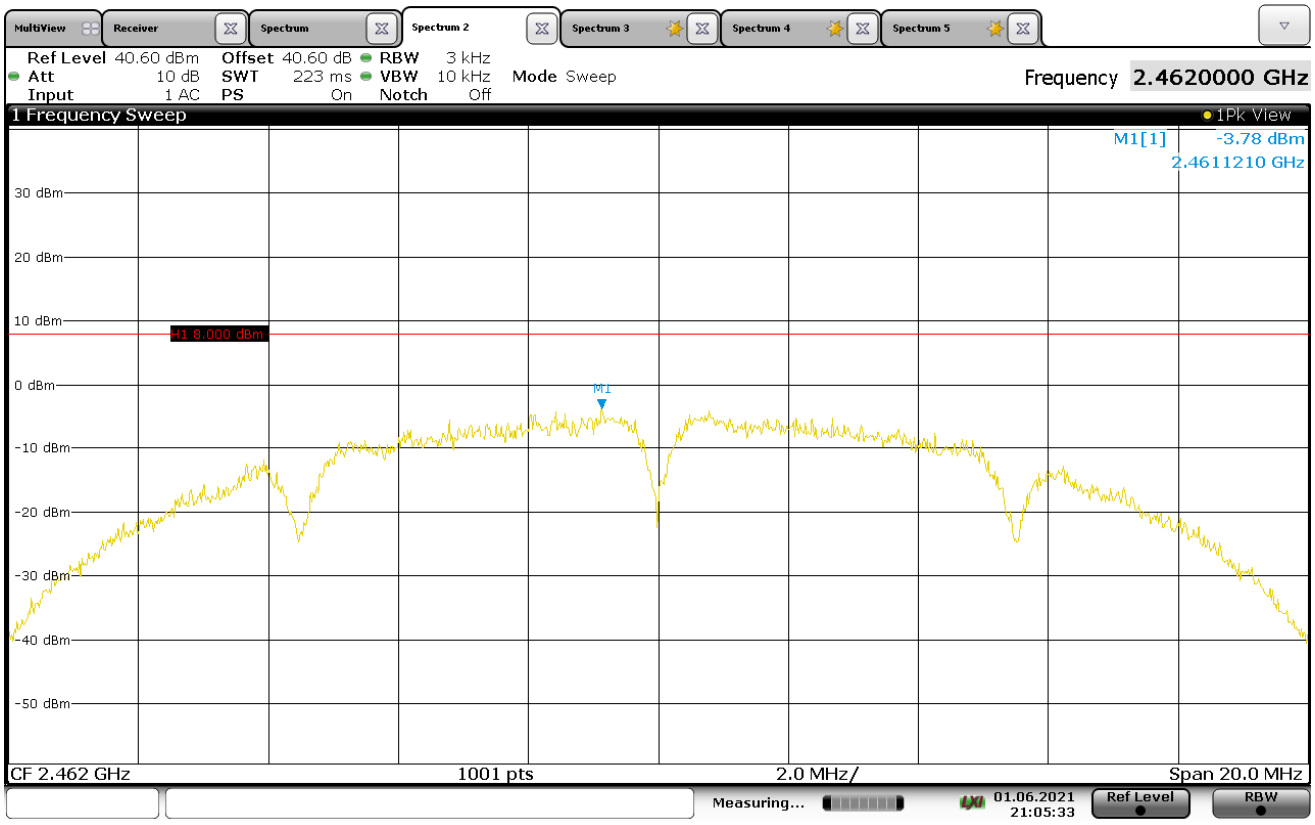
21:40:19 01.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11b – 1Mbps
Carrier Frequency	2462MHz
Parameters	PSD = -3.35dBm
Notes	N/A



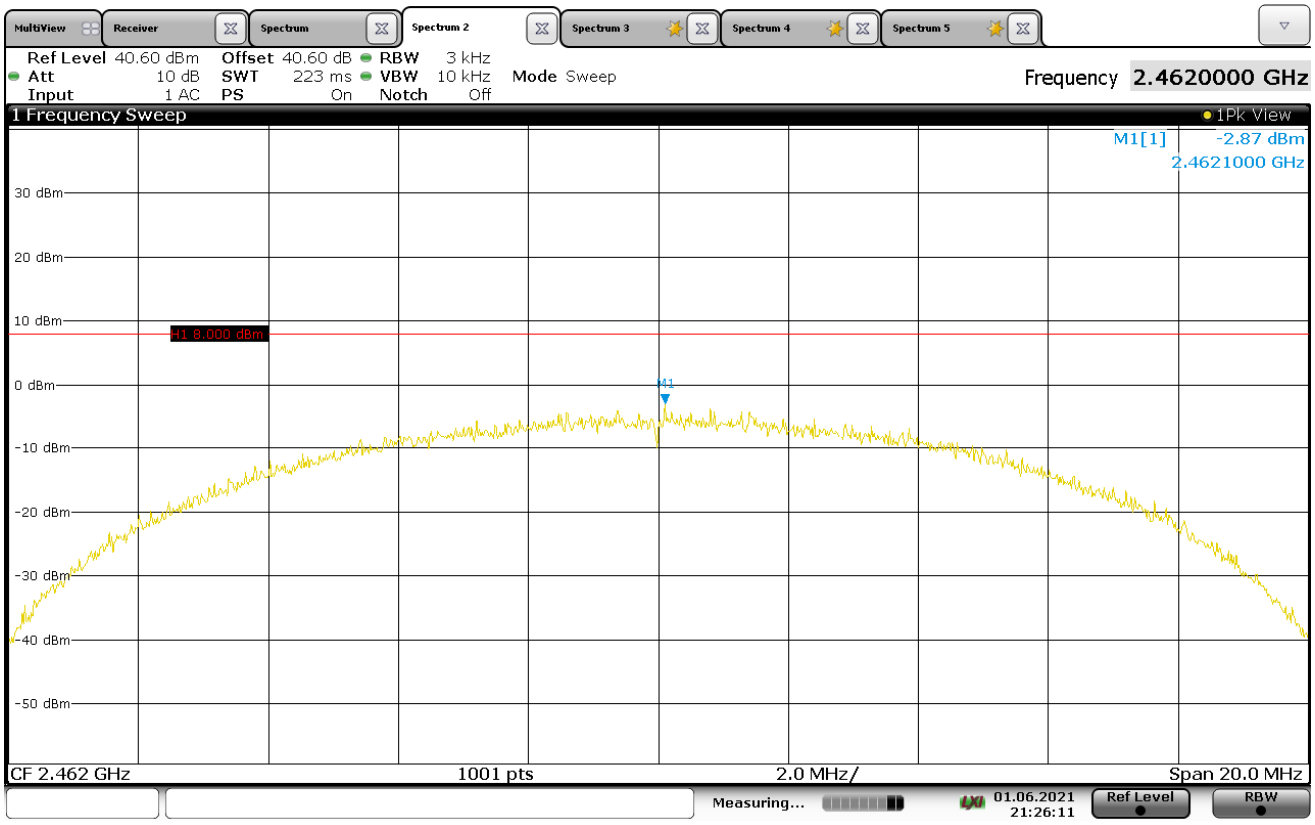
20:44:53 01.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11b – 2Mbps
Carrier Frequency	2462MHz
Parameters	PSD = -3.78dBm
Notes	N/A



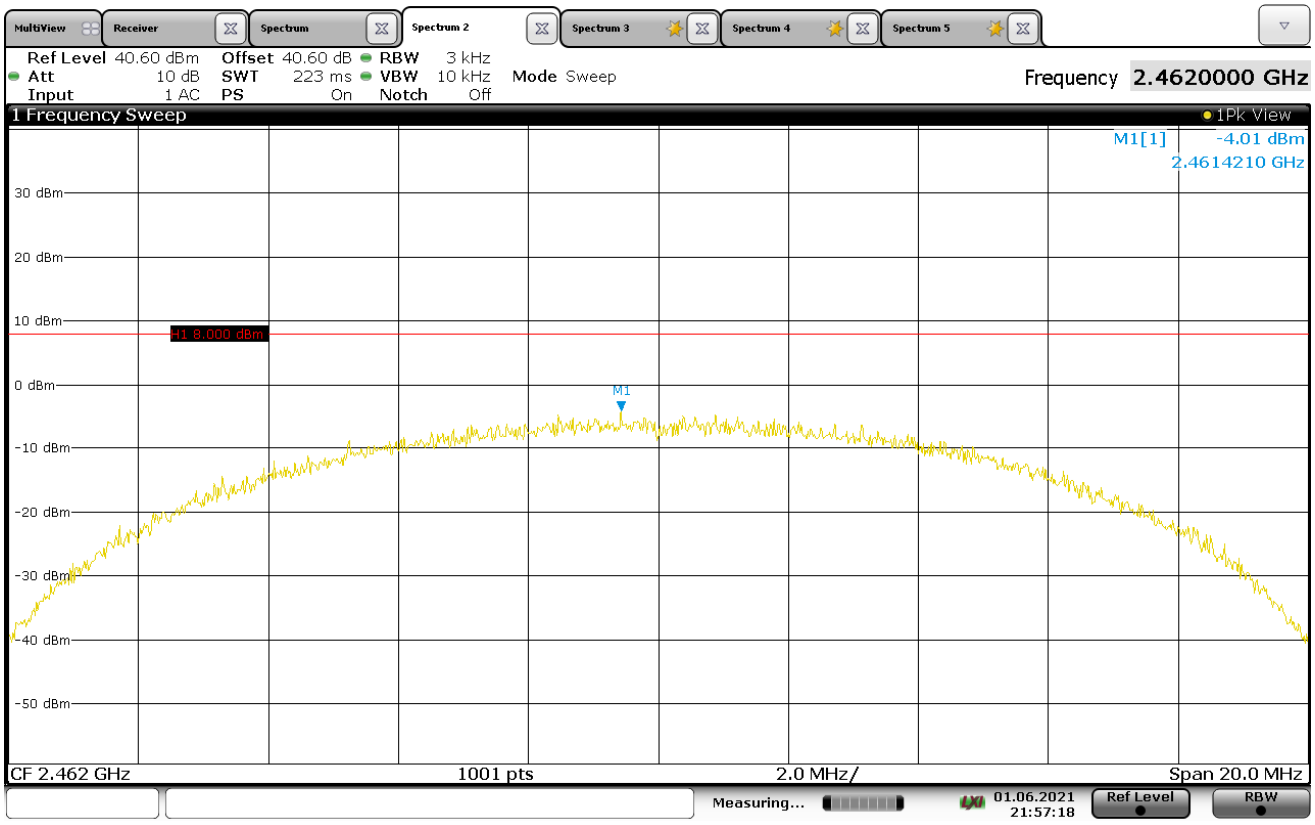
21:05:33 01.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11b – 5.5Mbps
Carrier Frequency	2462MHz
Parameters	PSD = -2.87dBm
Notes	N/A



21:26:12 01.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11b – 11Mbps
Carrier Frequency	2462MHz
Parameters	PSD = -4.01dBm
Notes	N/A

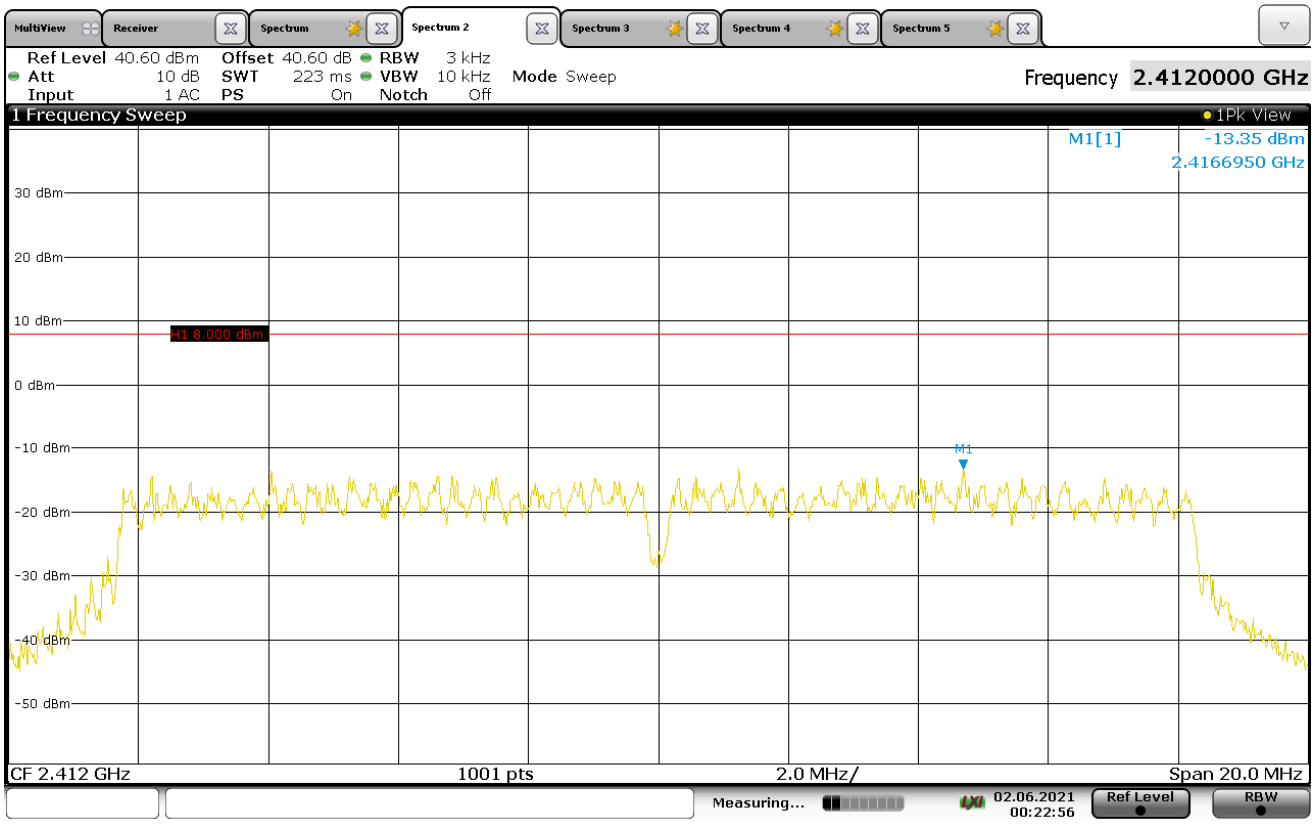


21:57:19 01.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g
Notes	Measured in a 3kHz bandwidth

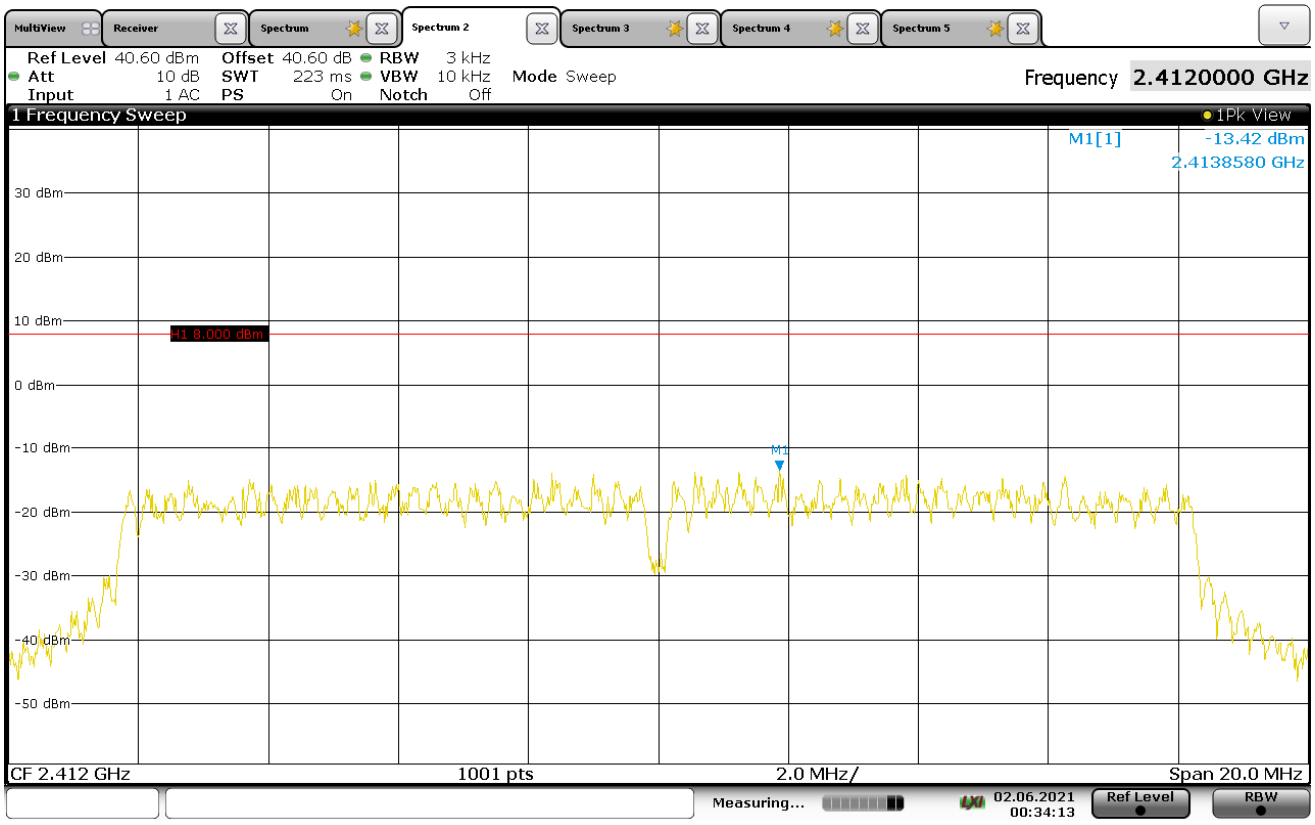
Protocol	Freq. (MHz)	Data Rate (Mbps)	Power (dBm)
802.11g	2412	6	-13.35
	2437		-12.88
	2462		-13.44
	2412	9	-13.42
	2437		-12.15
	2462		-13.19
	2412	12	-14.52
	2437		-13.57
	2462		-12.96
	2412	18	-13.46
	2437		-14.11
	2462		-12.52
	2412	24	-13.32
	2437		-12.45
	2462		-13.19
	2412	36	-12.89
	2437		-13.06
	2462		-12.32
	2412	48	-13.24
	2437		-12.04
	2462		-13.51
	2412	54	-17.01
	2437		-17.29
	2462		-16.72

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g – 6Mbps
Carrier Frequency	2412MHz
Parameters	PSD = -13.35dBm
Notes	N/A



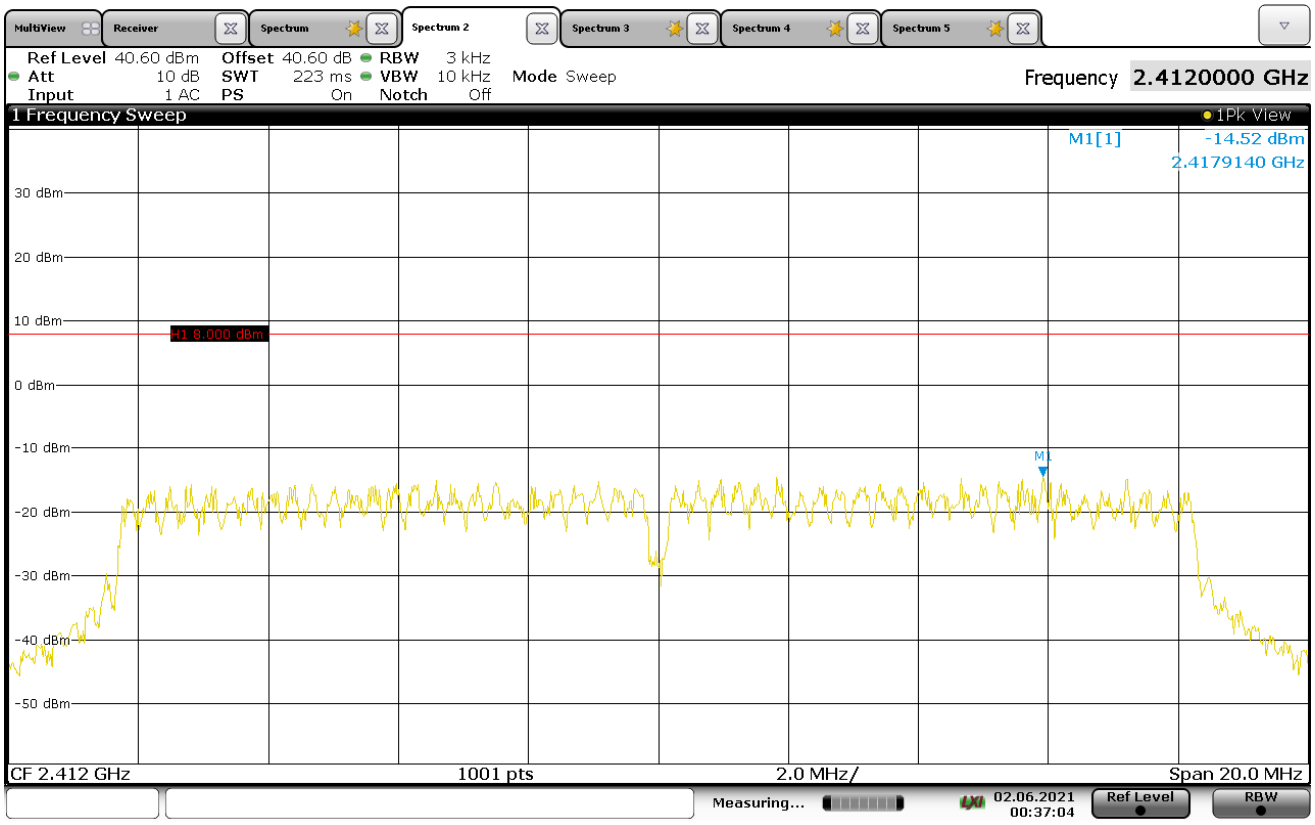
00:22:57 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g – 9Mbps
Carrier Frequency	2412MHz
Parameters	PSD = -13.42dBm
Notes	N/A



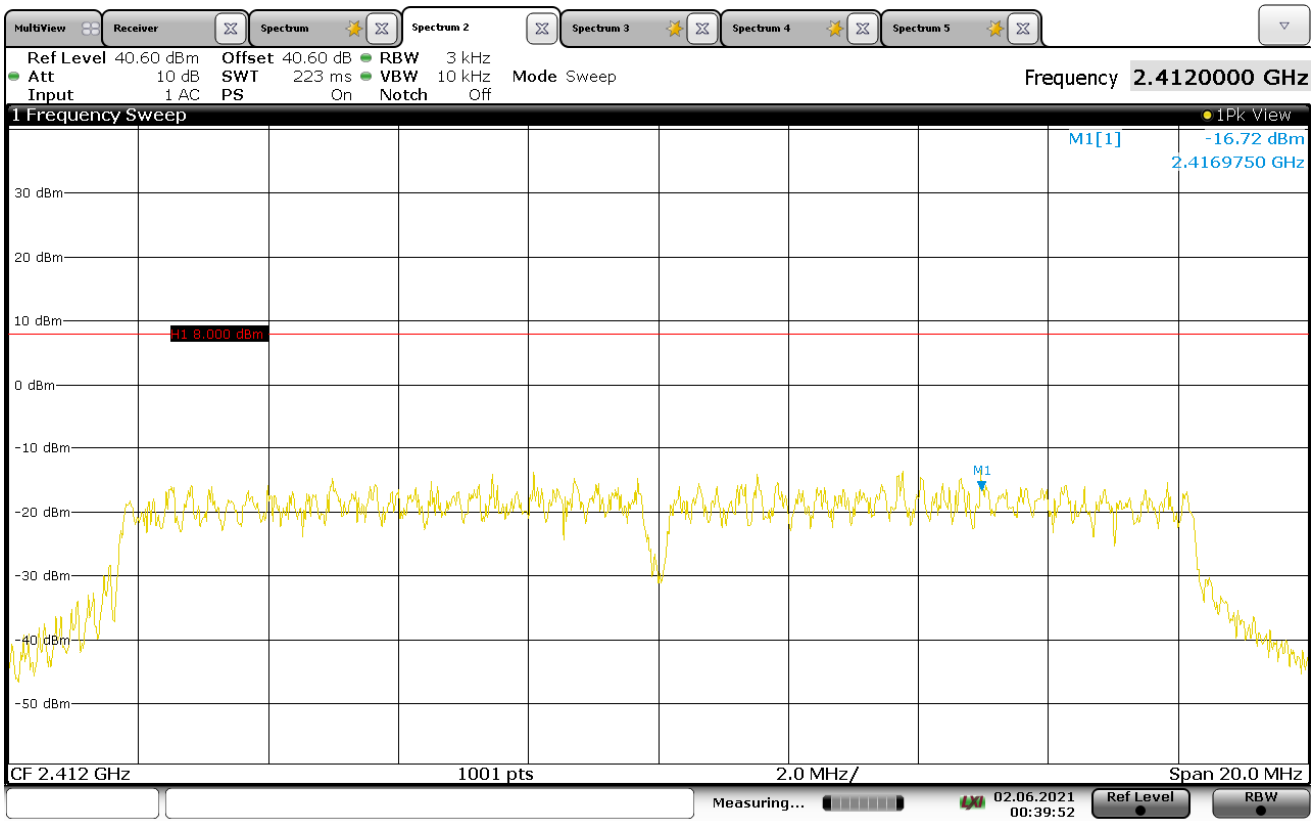
00:34:13 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g – 12Mbps
Carrier Frequency	2412MHz
Parameters	PSD = -14.52dBm
Notes	N/A



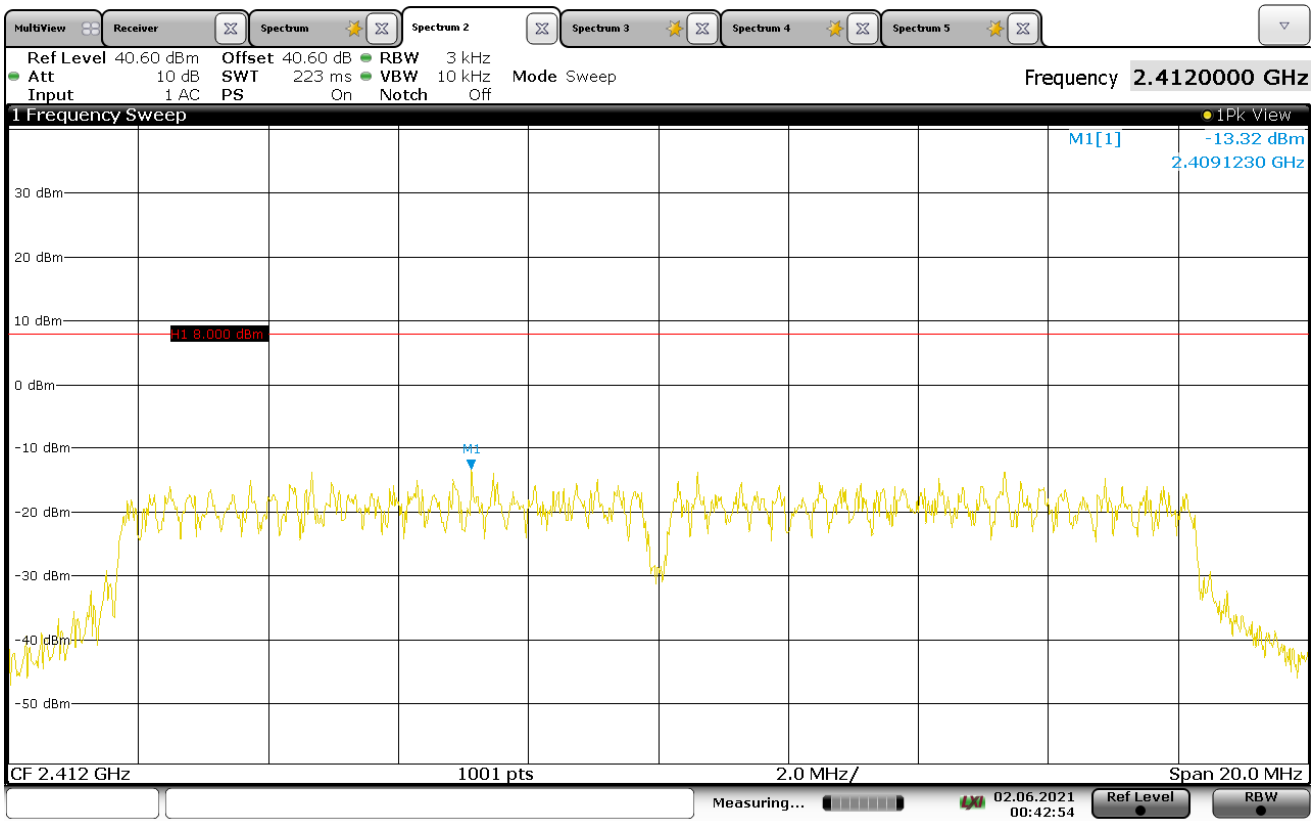
00:37:05 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g – 18Mbps
Carrier Frequency	2412MHz
Parameters	PSD = -16.72dBm
Notes	N/A



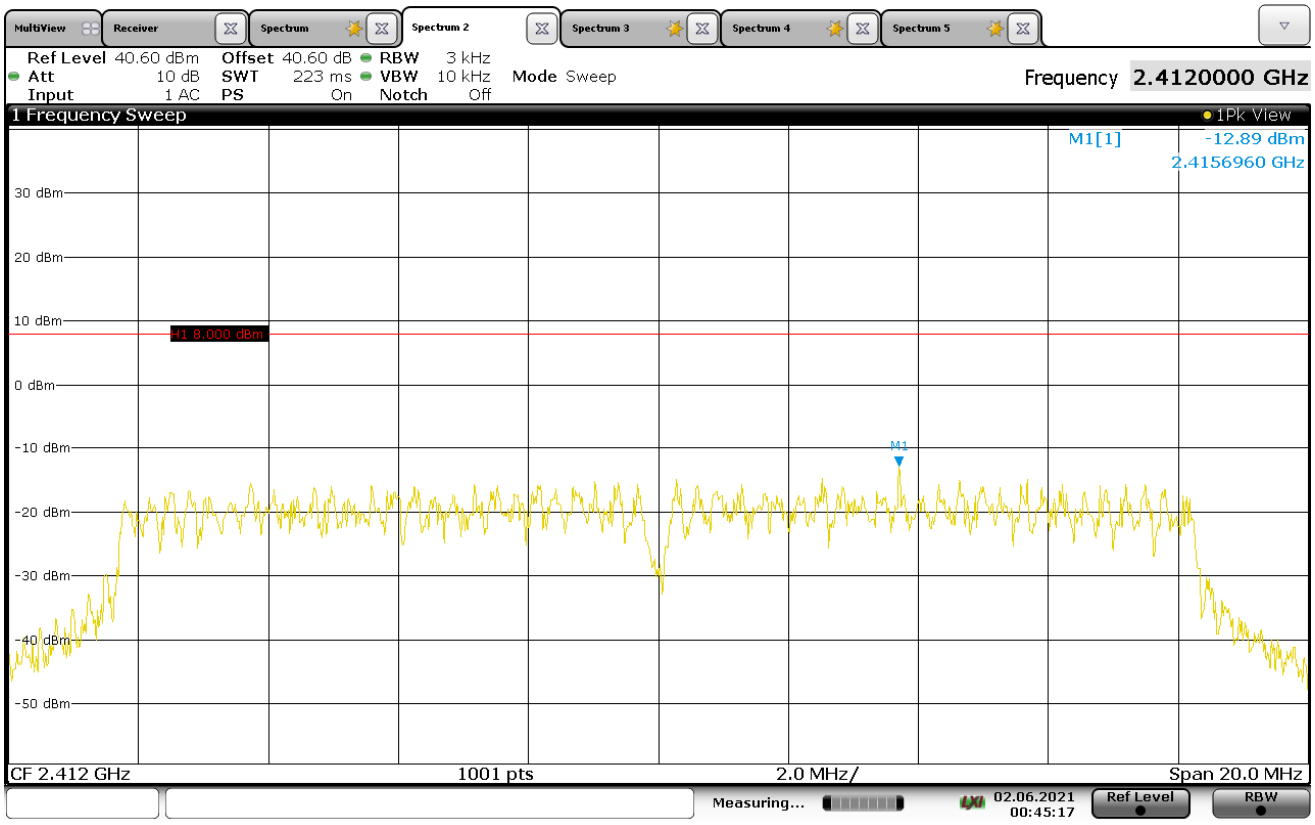
00:39:52 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g – 24Mbps
Carrier Frequency	2412MHz
Parameters	PSD = -13.32dBm
Notes	N/A



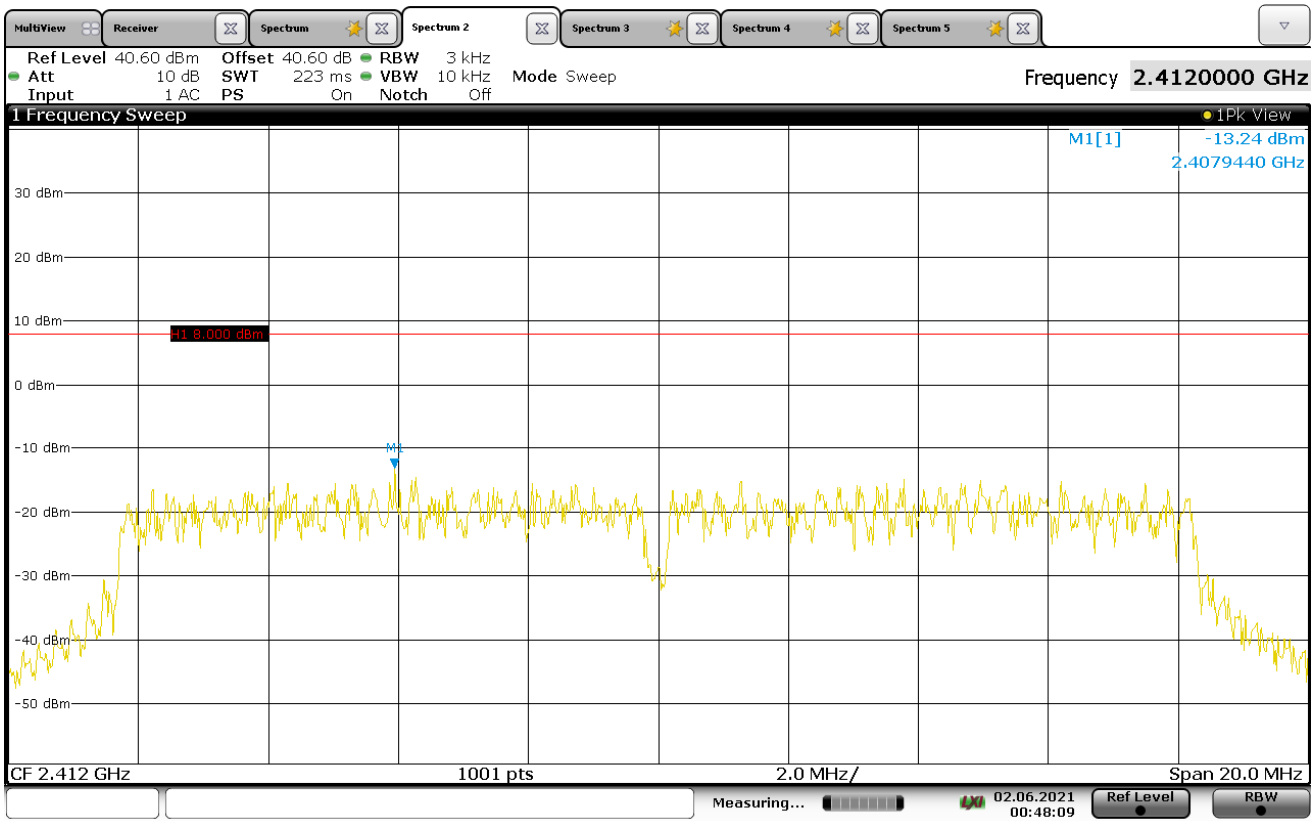
00:42:55 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g – 36Mbps
Carrier Frequency	2412MHz
Parameters	PSD = -12.89dBm
Notes	N/A



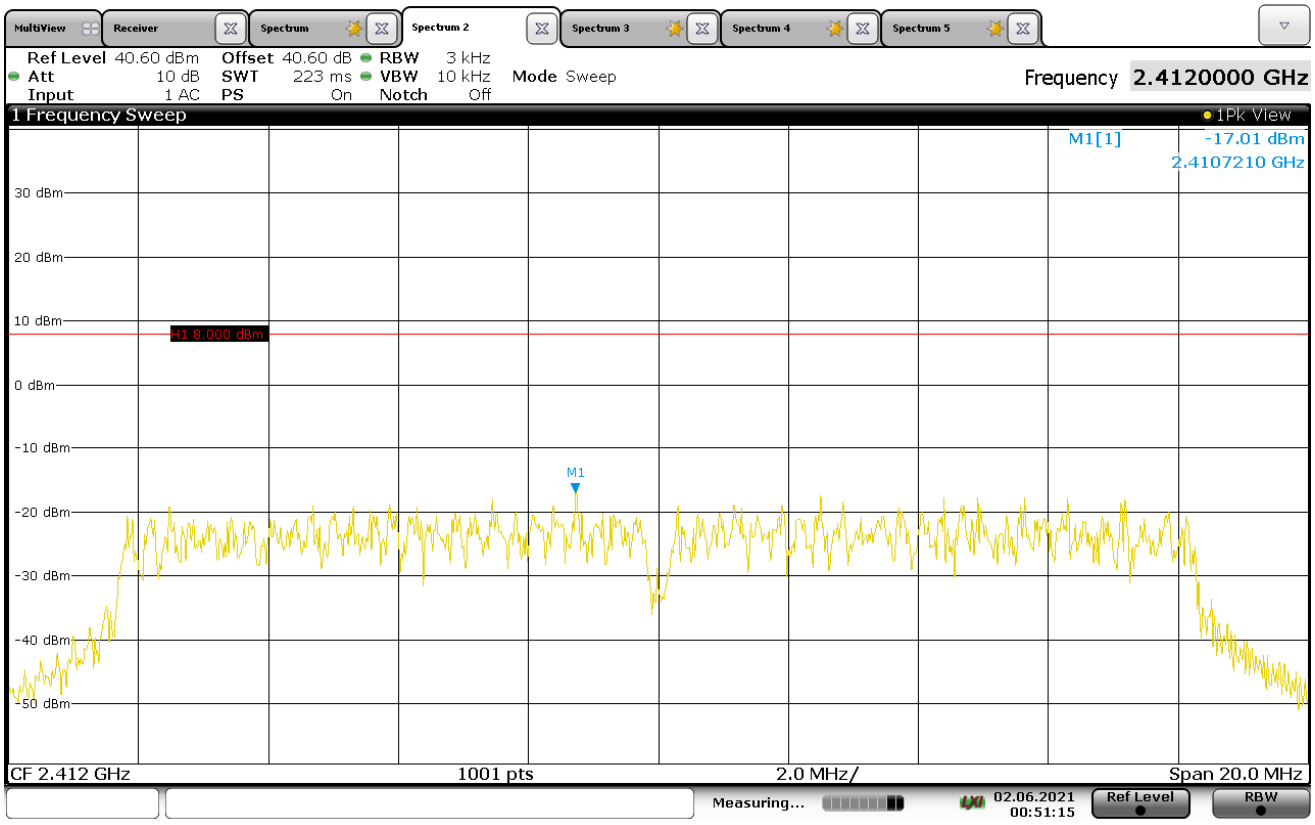
00:45:18 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g – 48Mbps
Carrier Frequency	2412MHz
Parameters	PSD = -13.24dBm
Notes	N/A



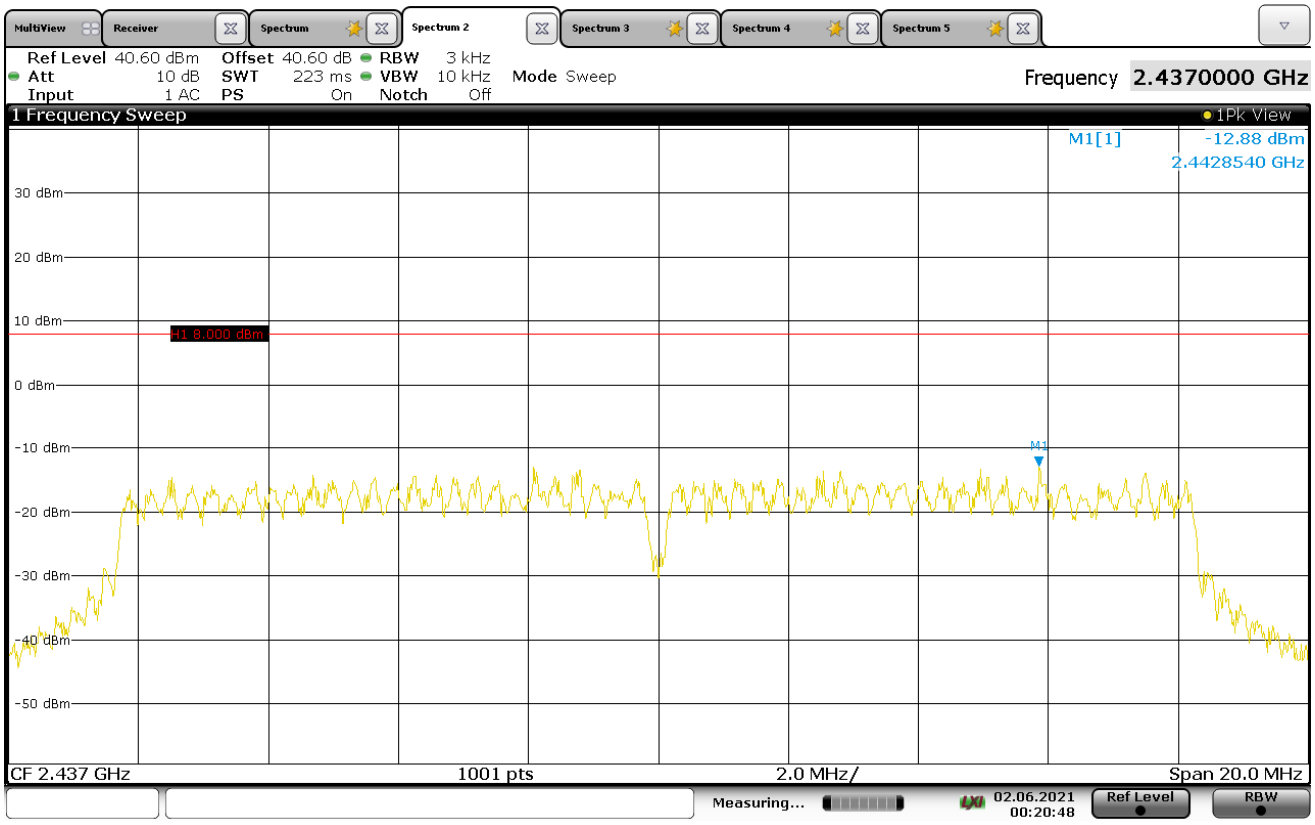
00:48:10 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g – 54Mbps
Carrier Frequency	2412MHz
Parameters	PSD = -17.01dBm
Notes	N/A



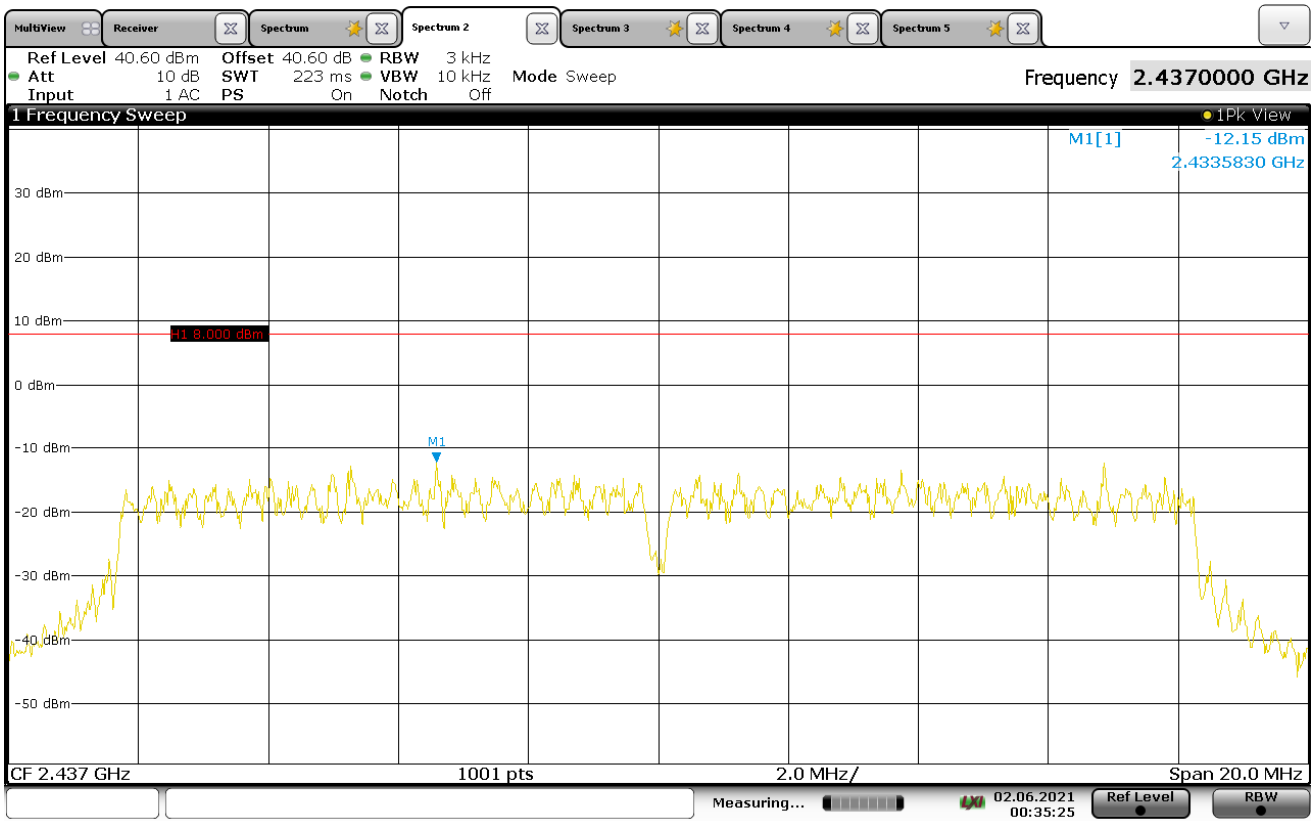
00:51:16 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g – 6Mbps
Carrier Frequency	2437MHz
Parameters	PSD = -12.88dBm
Notes	N/A



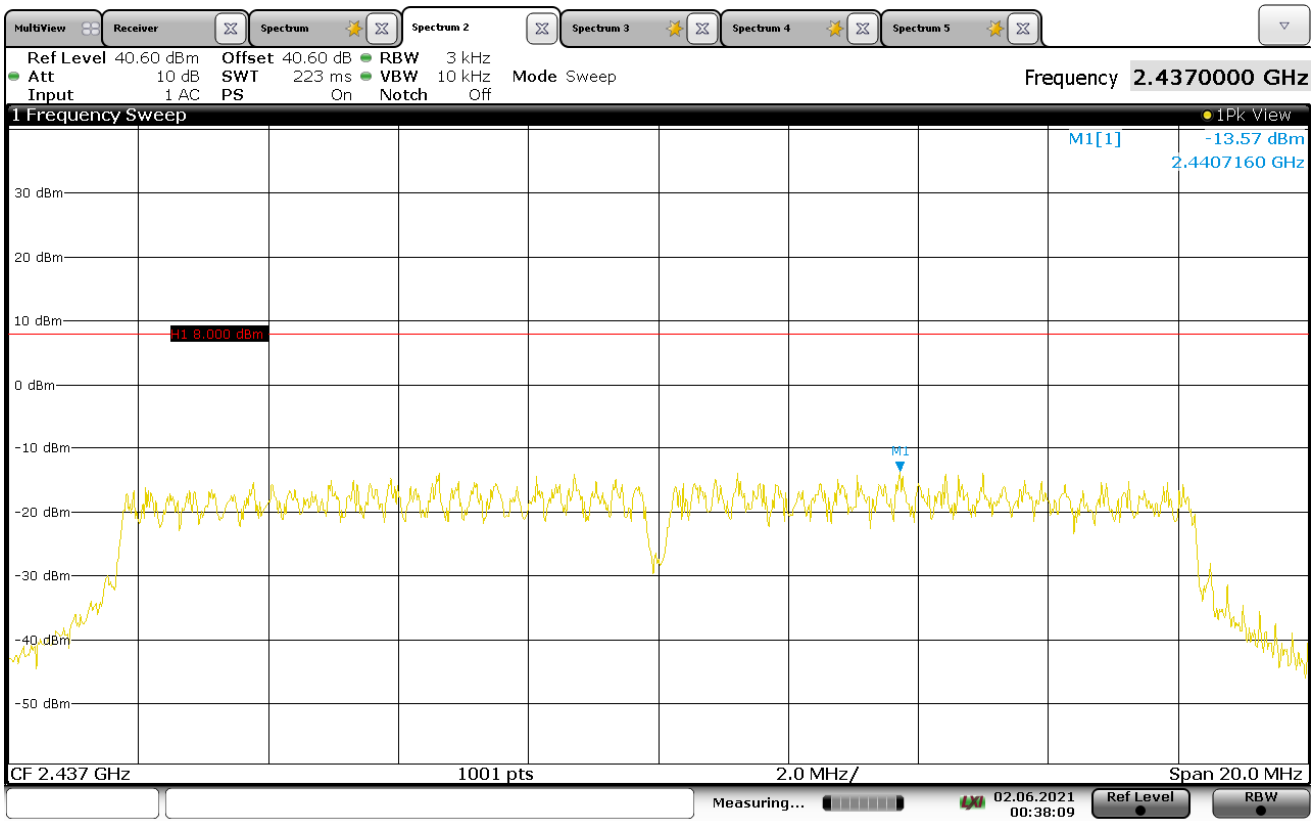
00:20:48 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g – 9Mbps
Carrier Frequency	2437MHz
Parameters	PSD = -12.15dBm
Notes	N/A



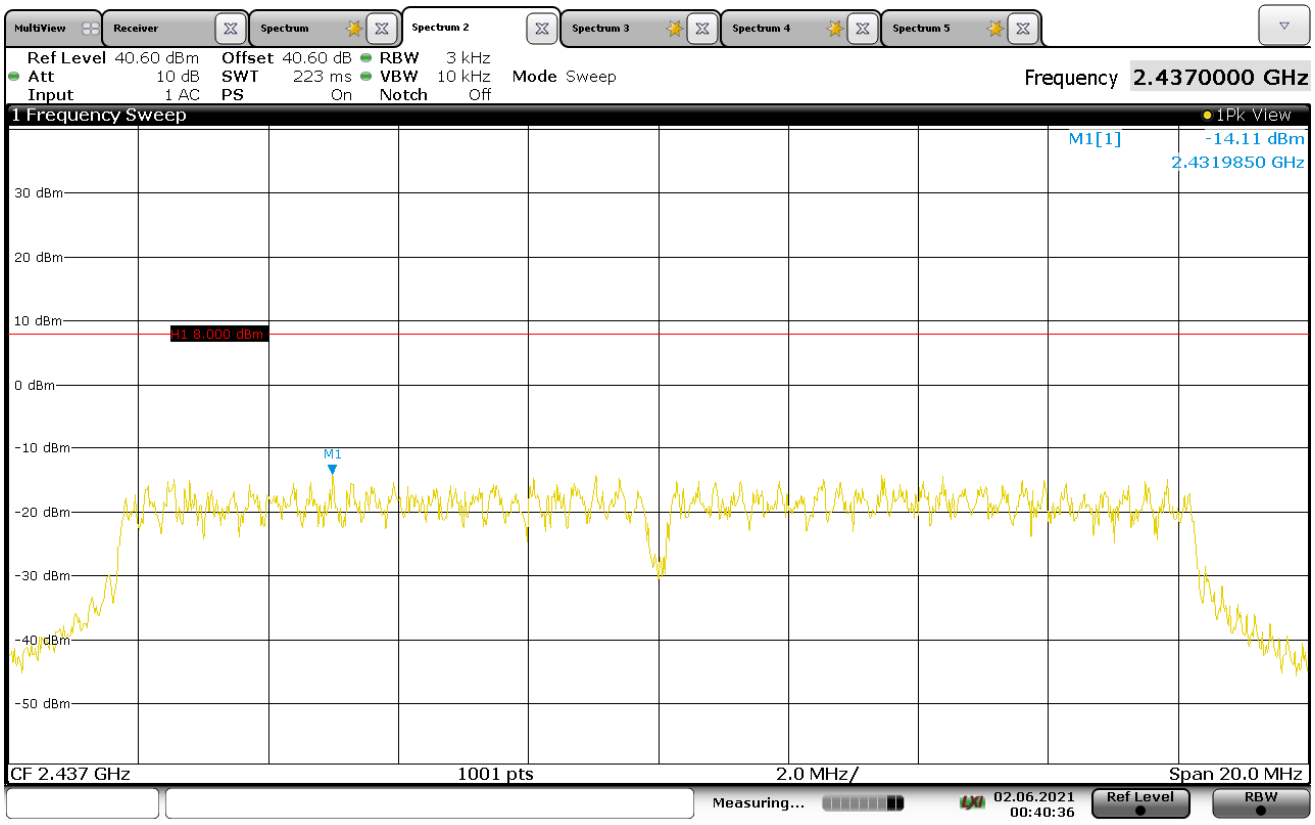
00:35:26 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g – 12Mbps
Carrier Frequency	2437MHz
Parameters	PSD = -13.57dBm
Notes	N/A



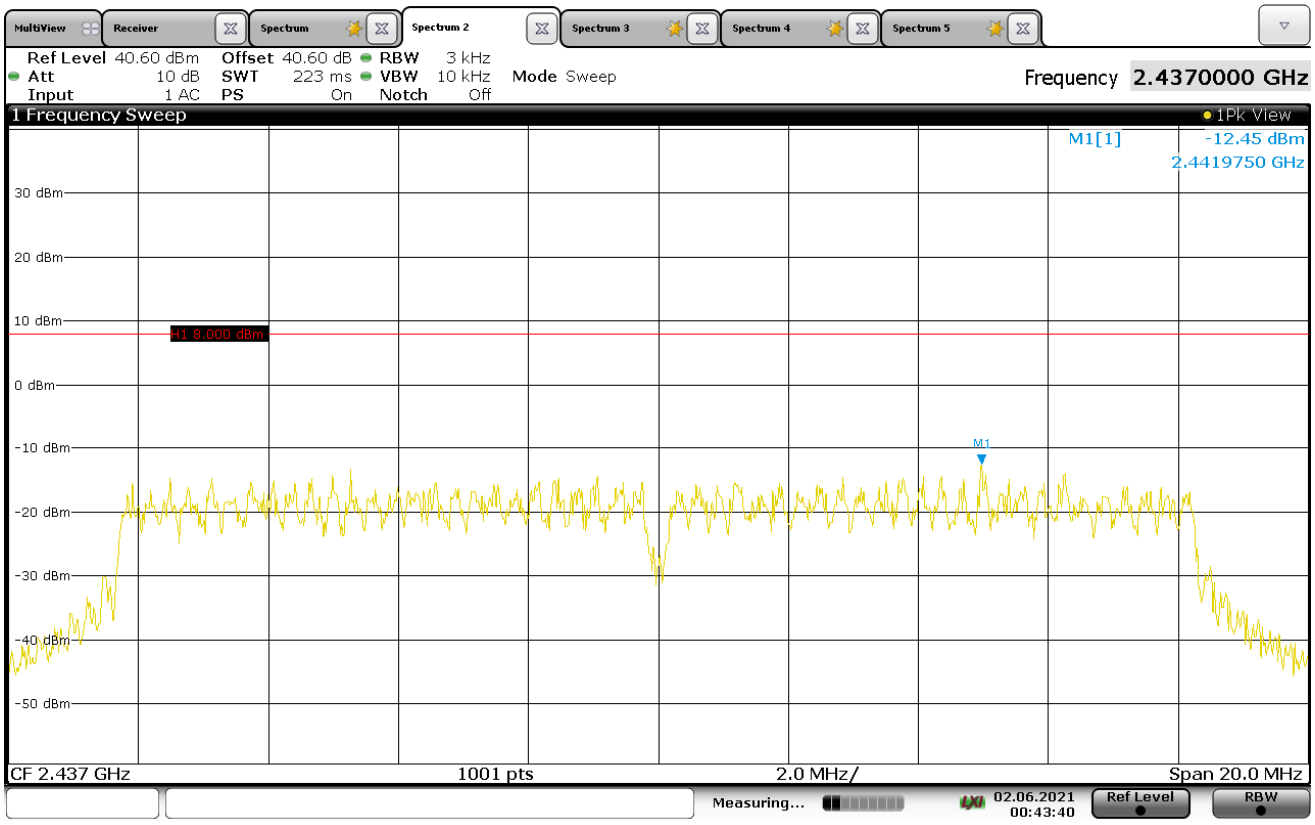
00:38:09 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g – 18Mbps
Carrier Frequency	2437MHz
Parameters	PSD = -14.11dBm
Notes	N/A



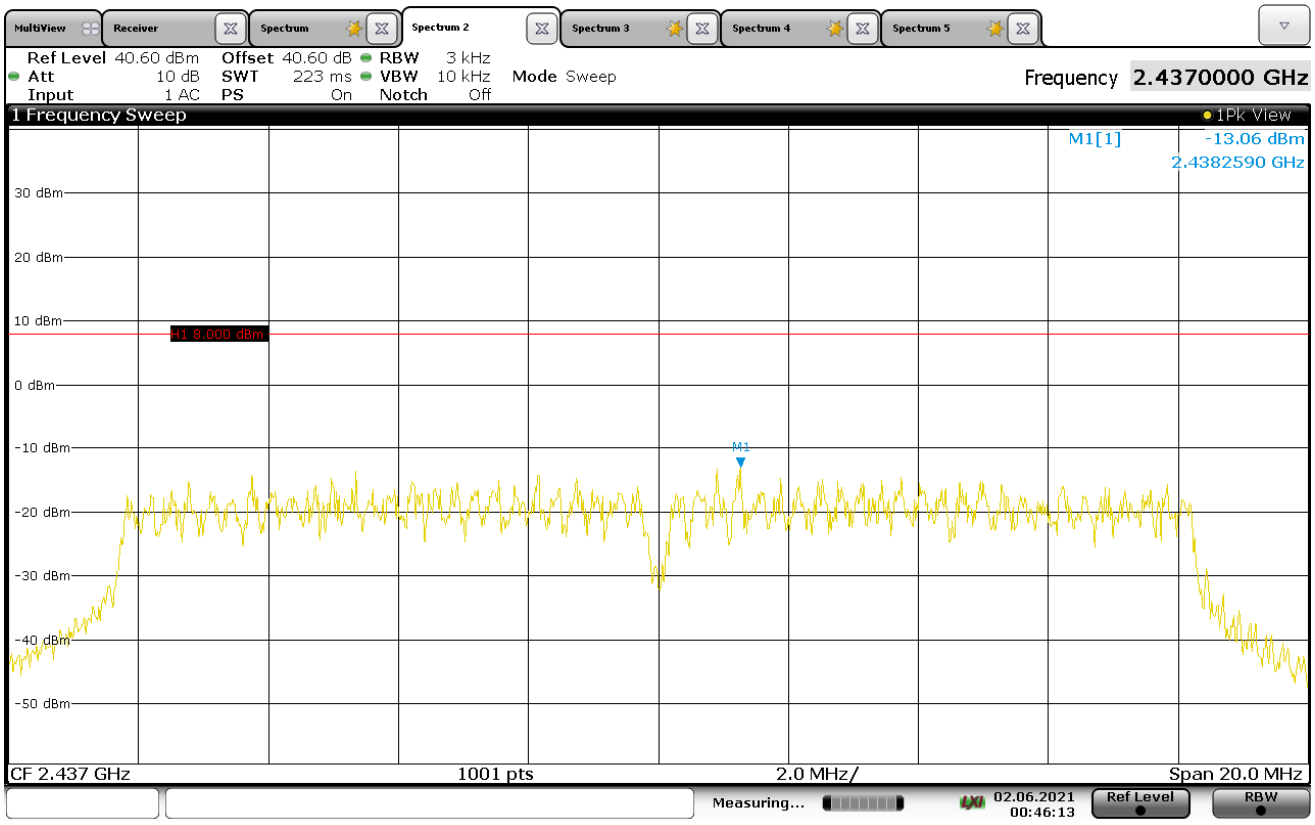
00:40:36 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g – 24Mbps
Carrier Frequency	2437MHz
Parameters	PSD = -12.45dBm
Notes	N/A



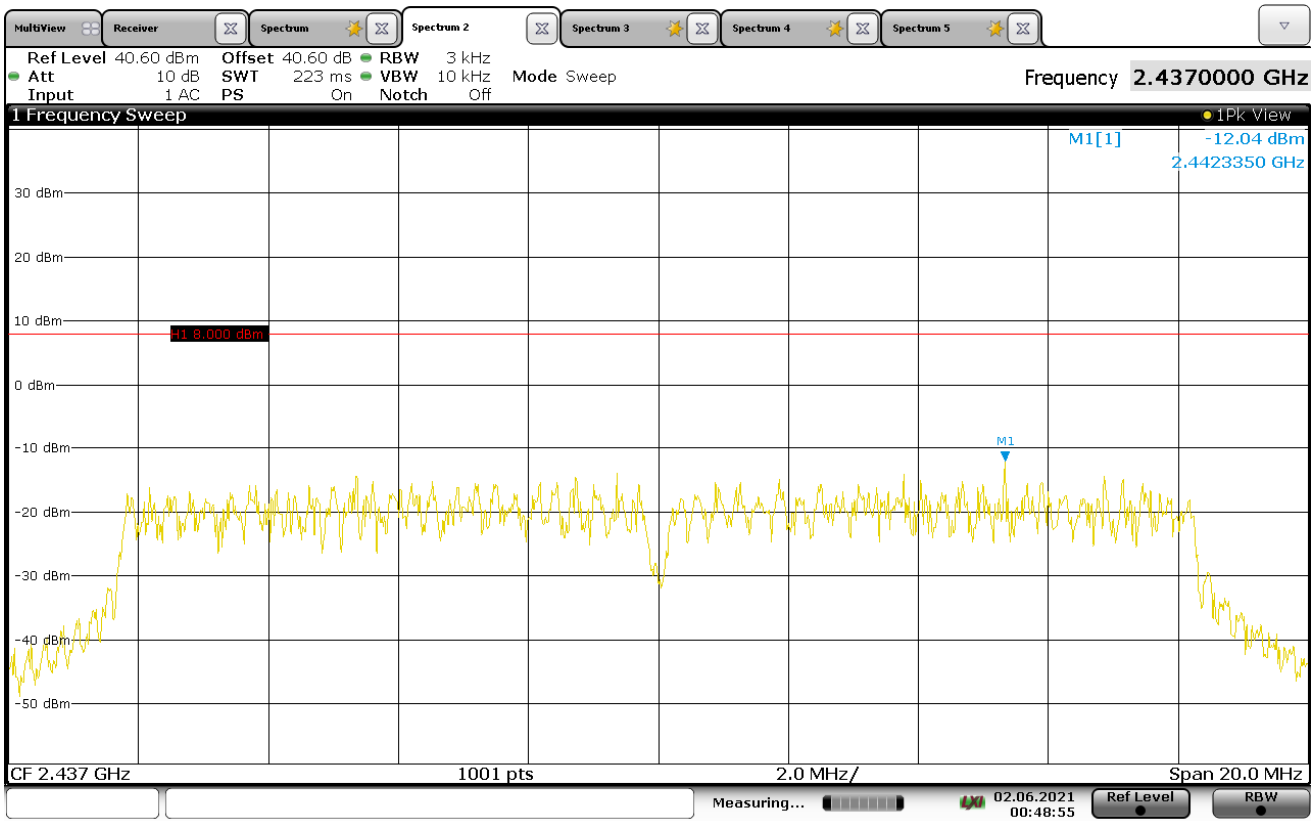
00:43:40 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g – 36Mbps
Carrier Frequency	2437MHz
Parameters	PSD = -13.06dBm
Notes	N/A



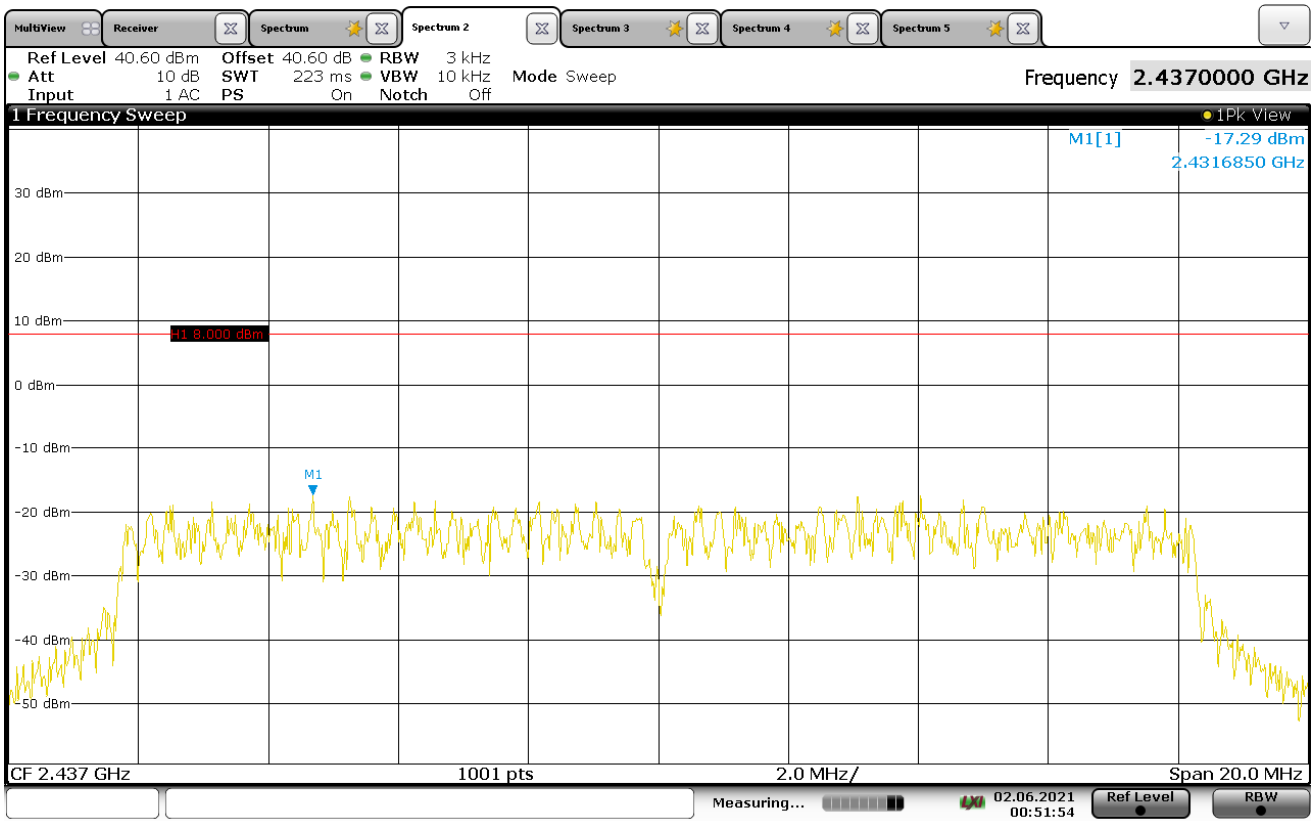
00:46:13 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g – 48Mbps
Carrier Frequency	2437MHz
Parameters	PSD = -12.04dBm
Notes	N/A



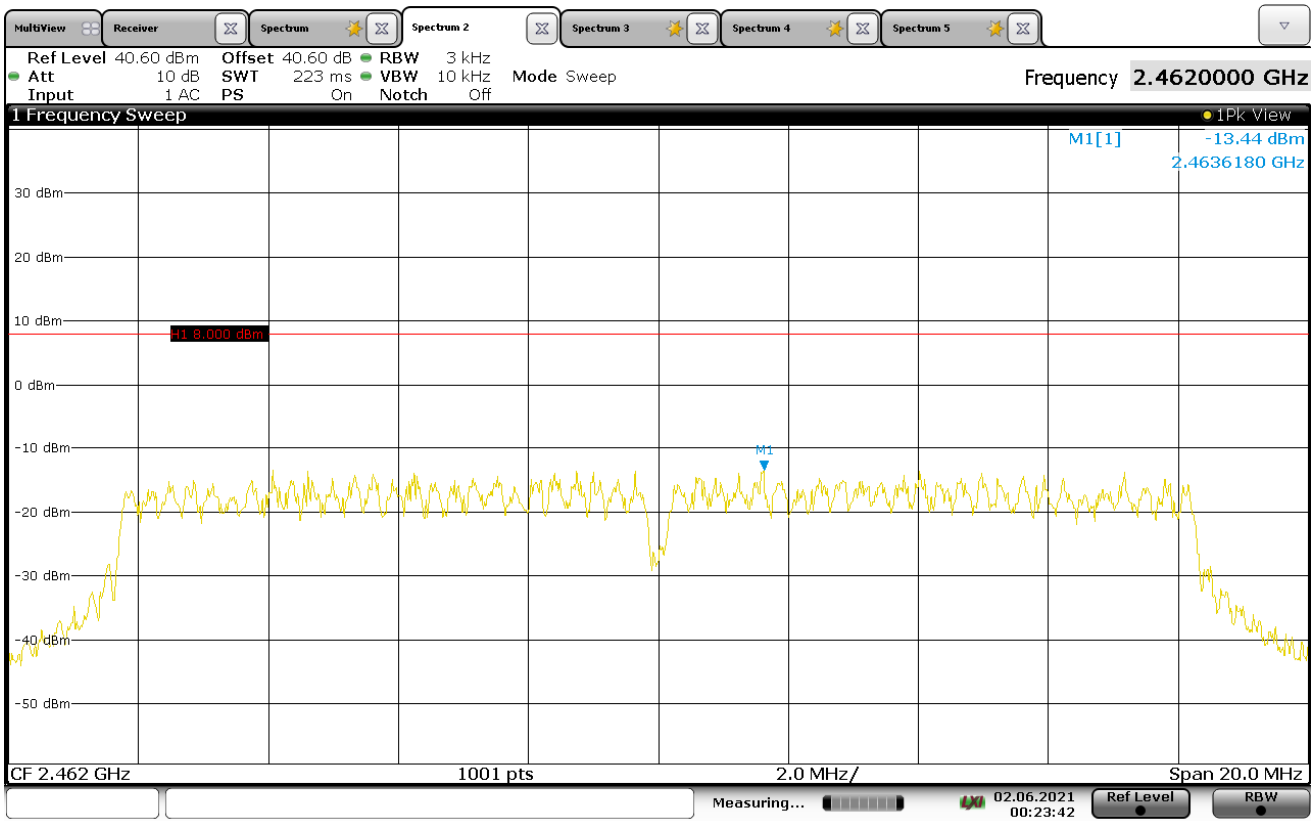
00:48:55 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g – 54Mbps
Carrier Frequency	2437MHz
Parameters	PSD = -12.88dBm
Notes	N/A



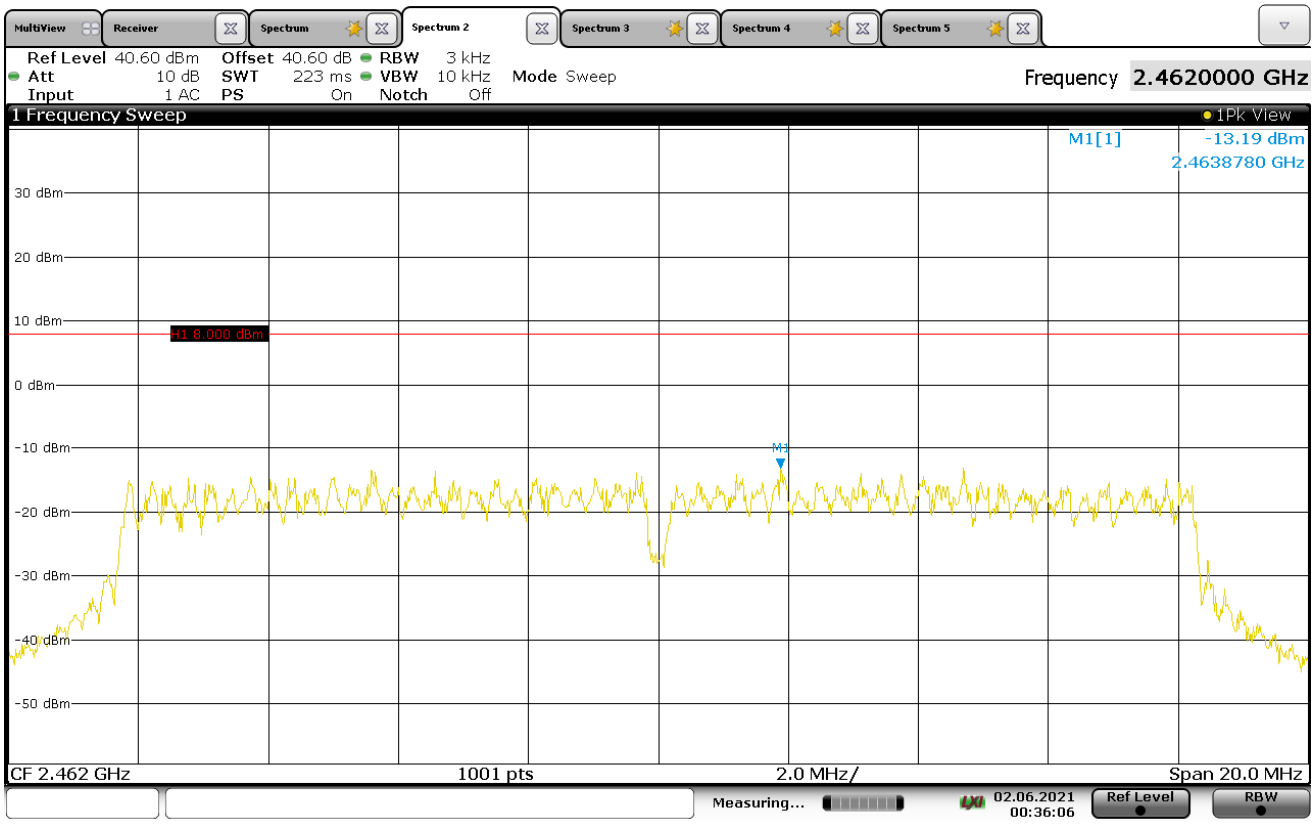
00:51:55 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g – 6Mbps
Carrier Frequency	2462MHz
Parameters	PSD = -12.88dBm
Notes	N/A



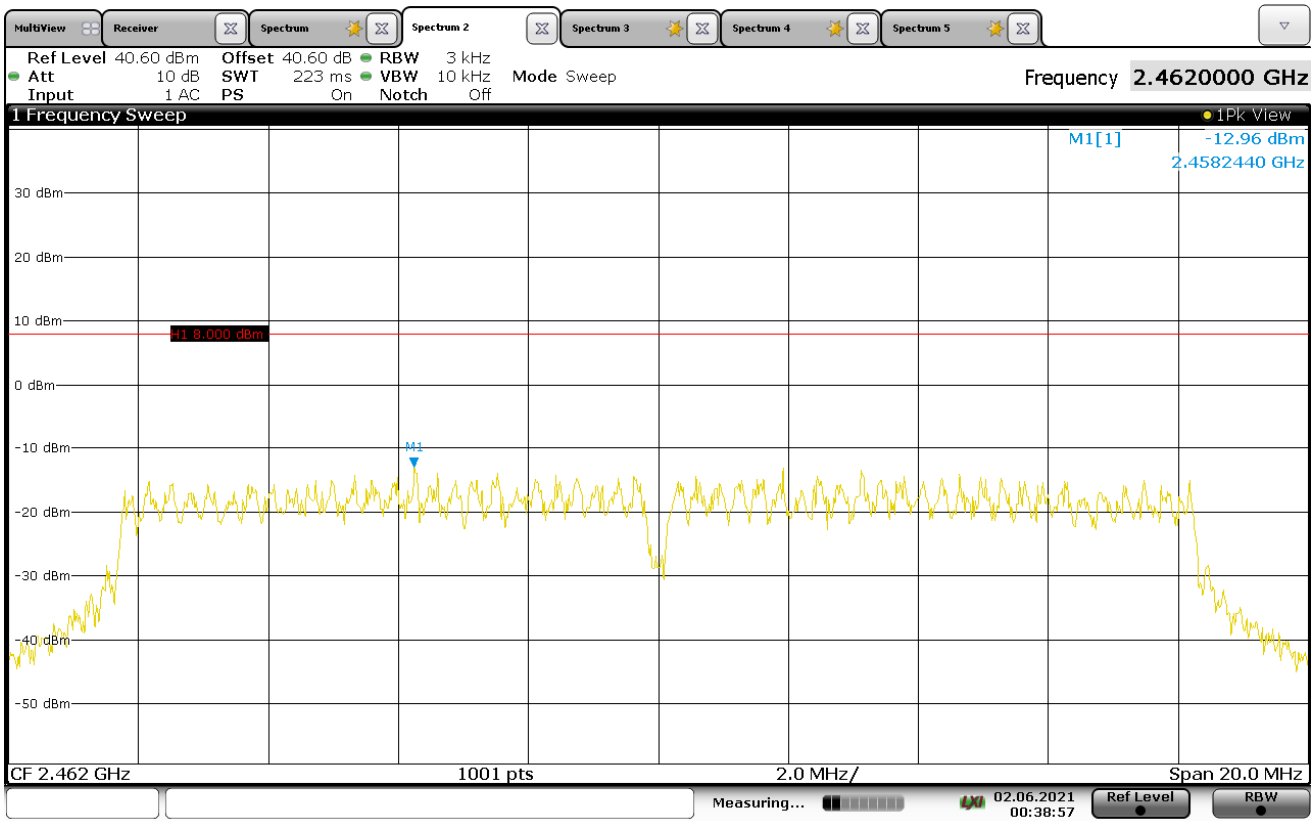
00:23:43 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g – 9Mbps
Carrier Frequency	2462MHz
Parameters	PSD = -13.19dBm
Notes	N/A



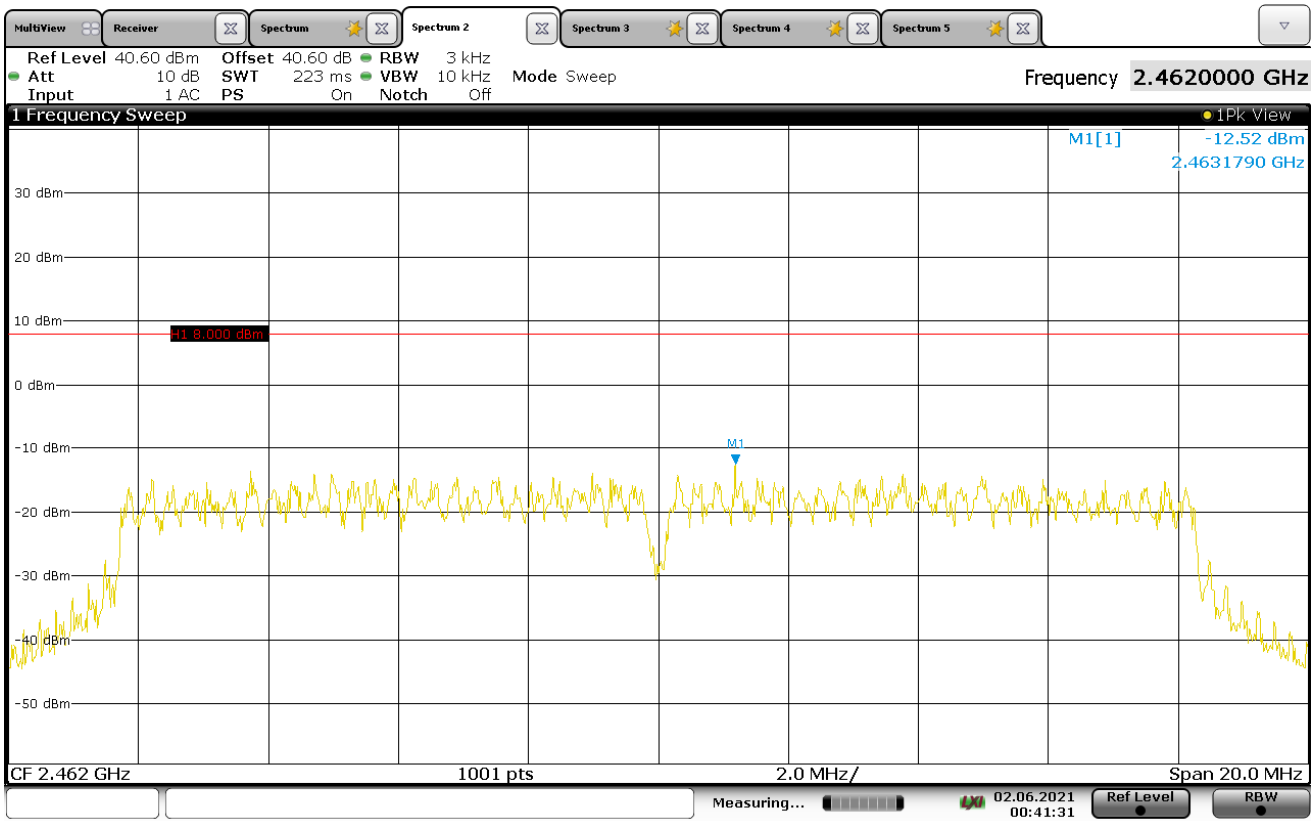
00:36:07 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g – 12Mbps
Carrier Frequency	2462MHz
Parameters	PSD = -12.96dBm
Notes	N/A



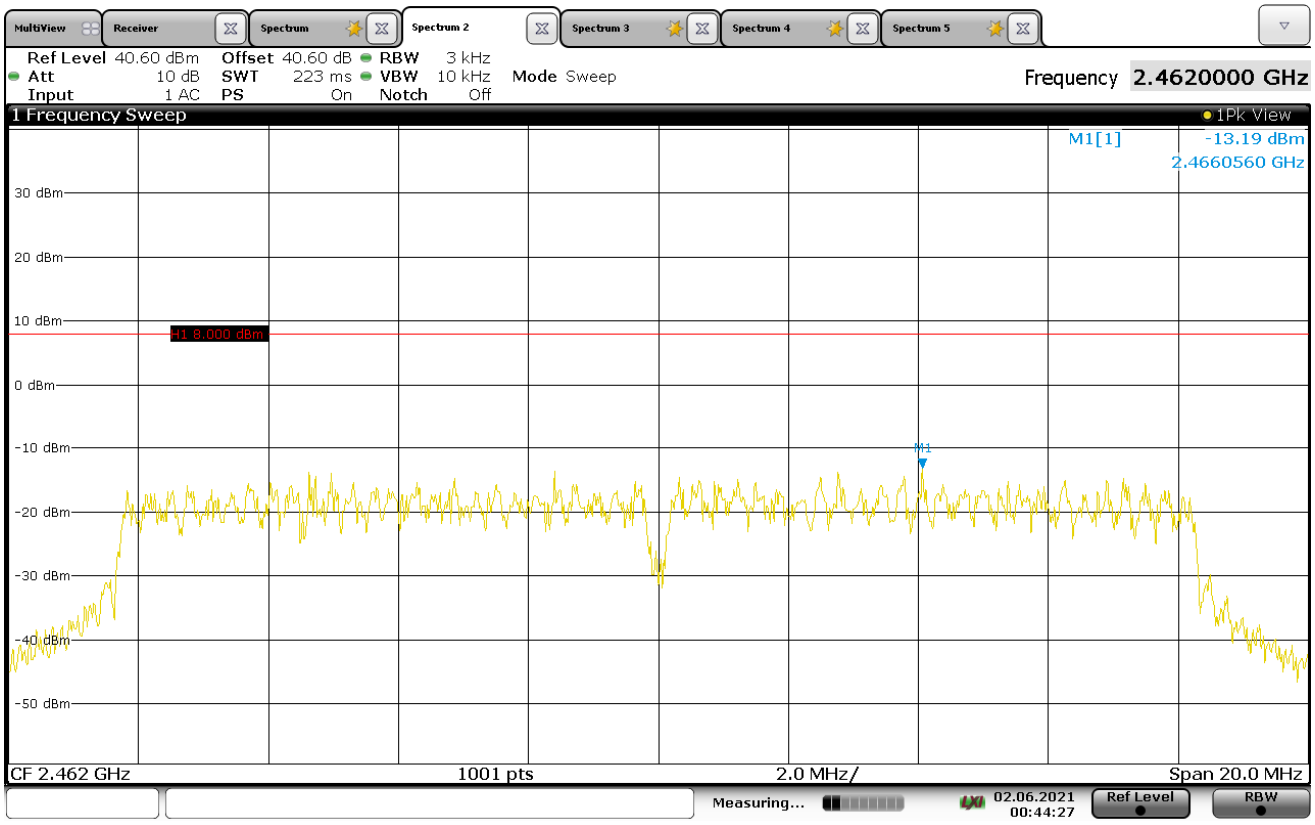
00:38:58 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g – 18Mbps
Carrier Frequency	2462MHz
Parameters	PSD = -12.52dBm
Notes	N/A



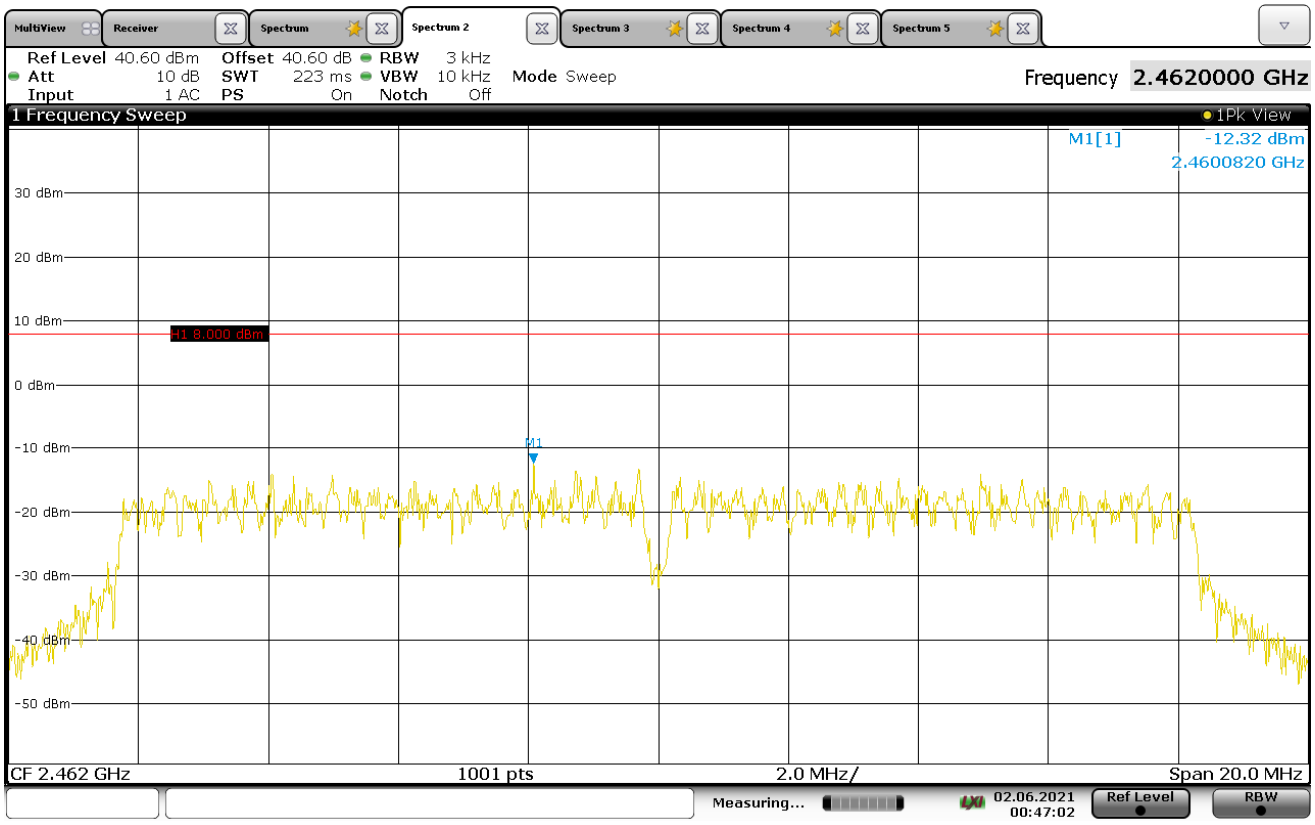
00:41:31 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g – 24Mbps
Carrier Frequency	2462MHz
Parameters	PSD = -13.19dBm
Notes	N/A



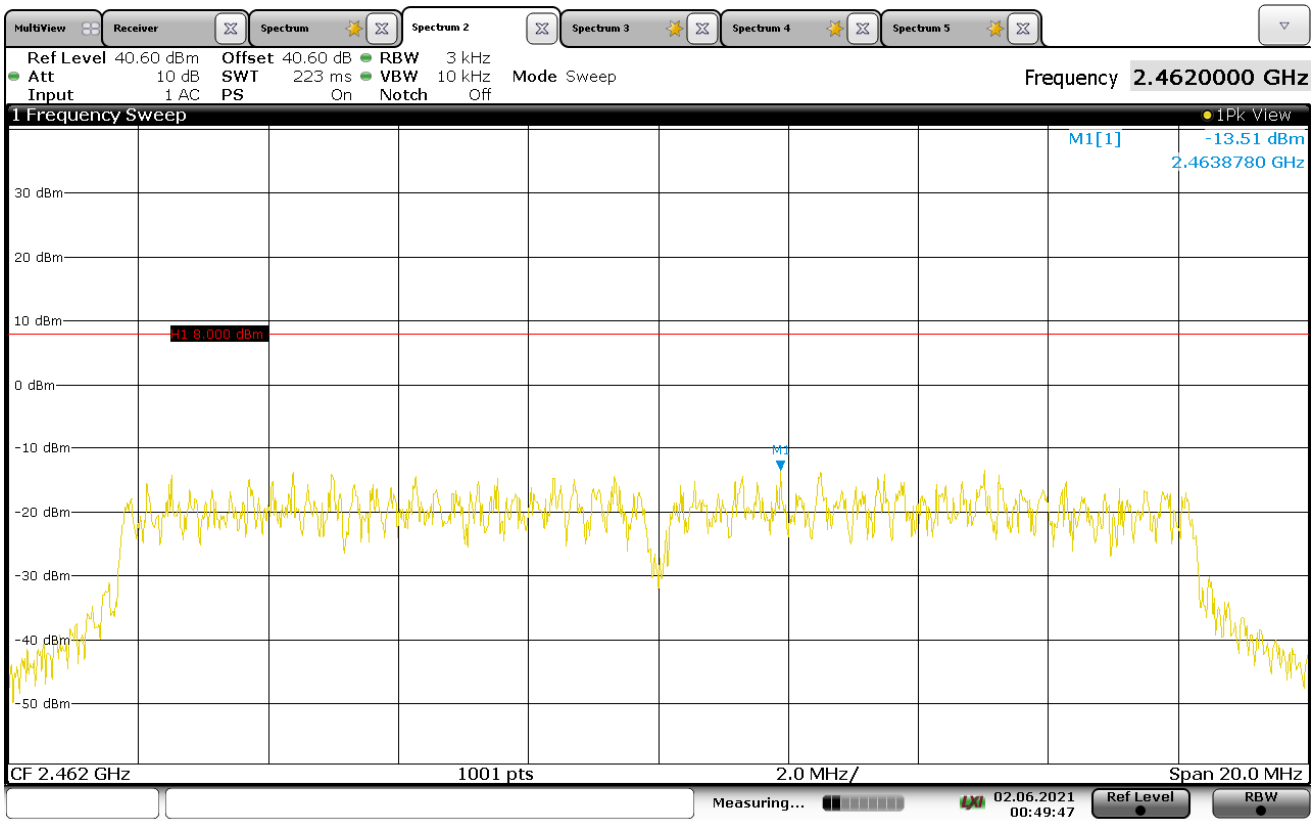
00:44:28 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g – 36Mbps
Carrier Frequency	2462MHz
Parameters	PSD = -12.32dBm
Notes	N/A



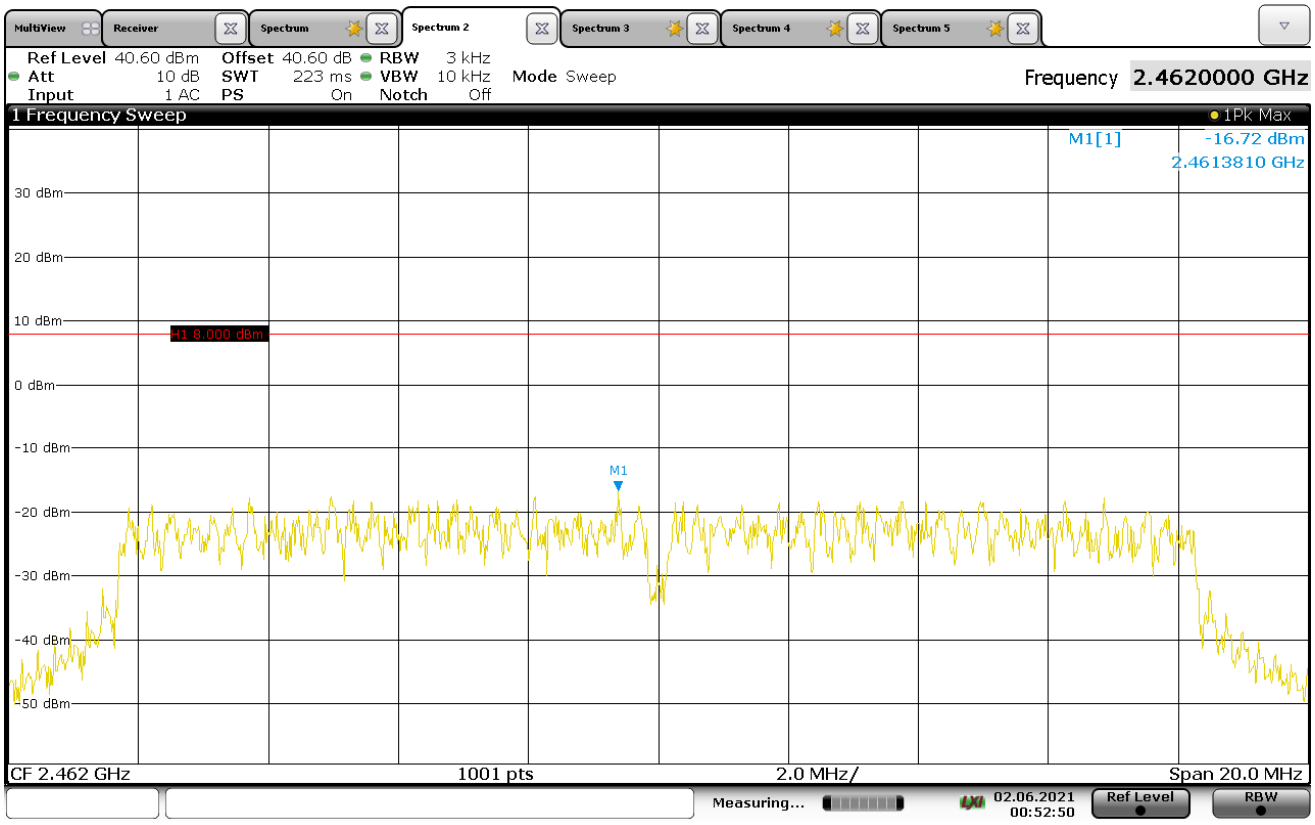
00:47:03 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g – 48Mbps
Carrier Frequency	2462MHz
Parameters	PSD = -13.51dBm
Notes	N/A



00:49:47 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g – 54Mbps
Carrier Frequency	2462MHz
Parameters	PSD = -16.72dBm
Notes	N/A

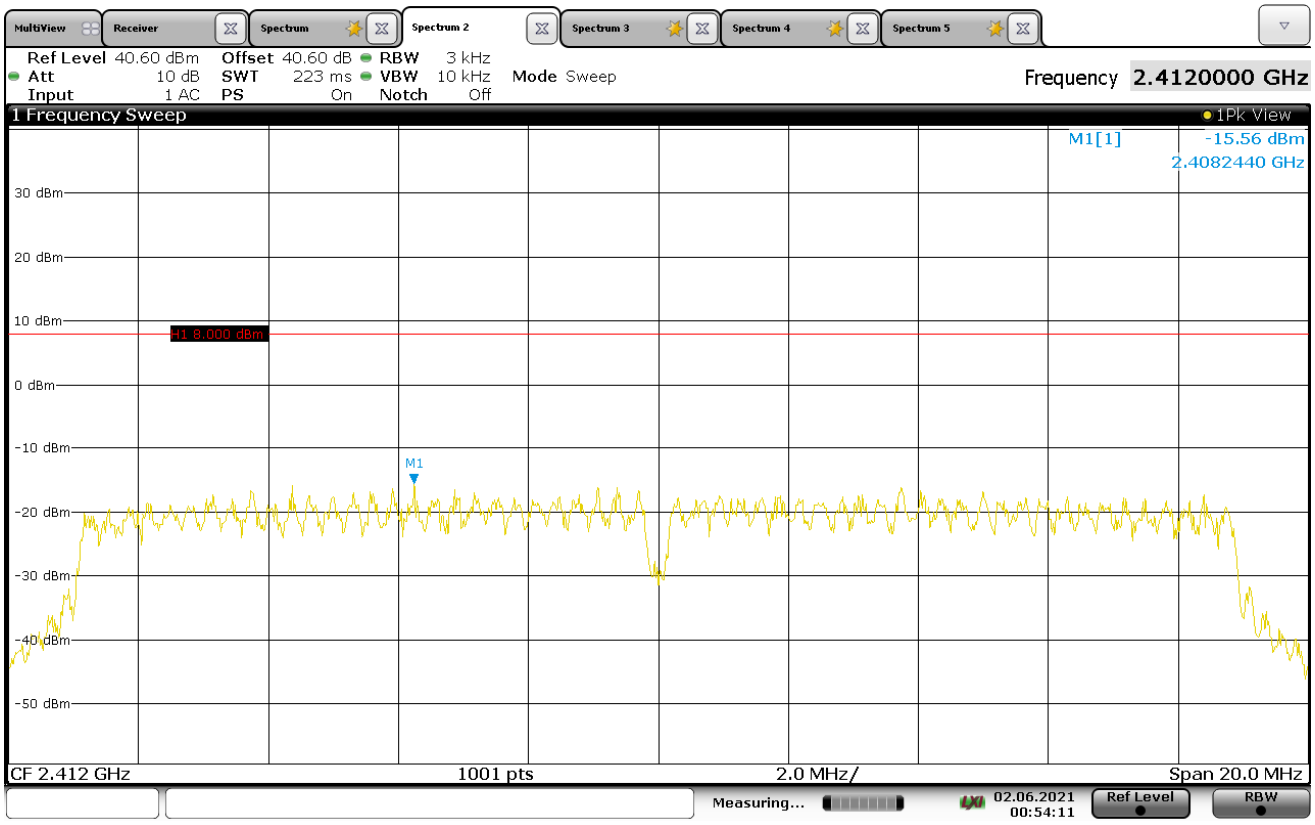


00:52:51 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n
Notes	Measured in a 3kHz bandwidth

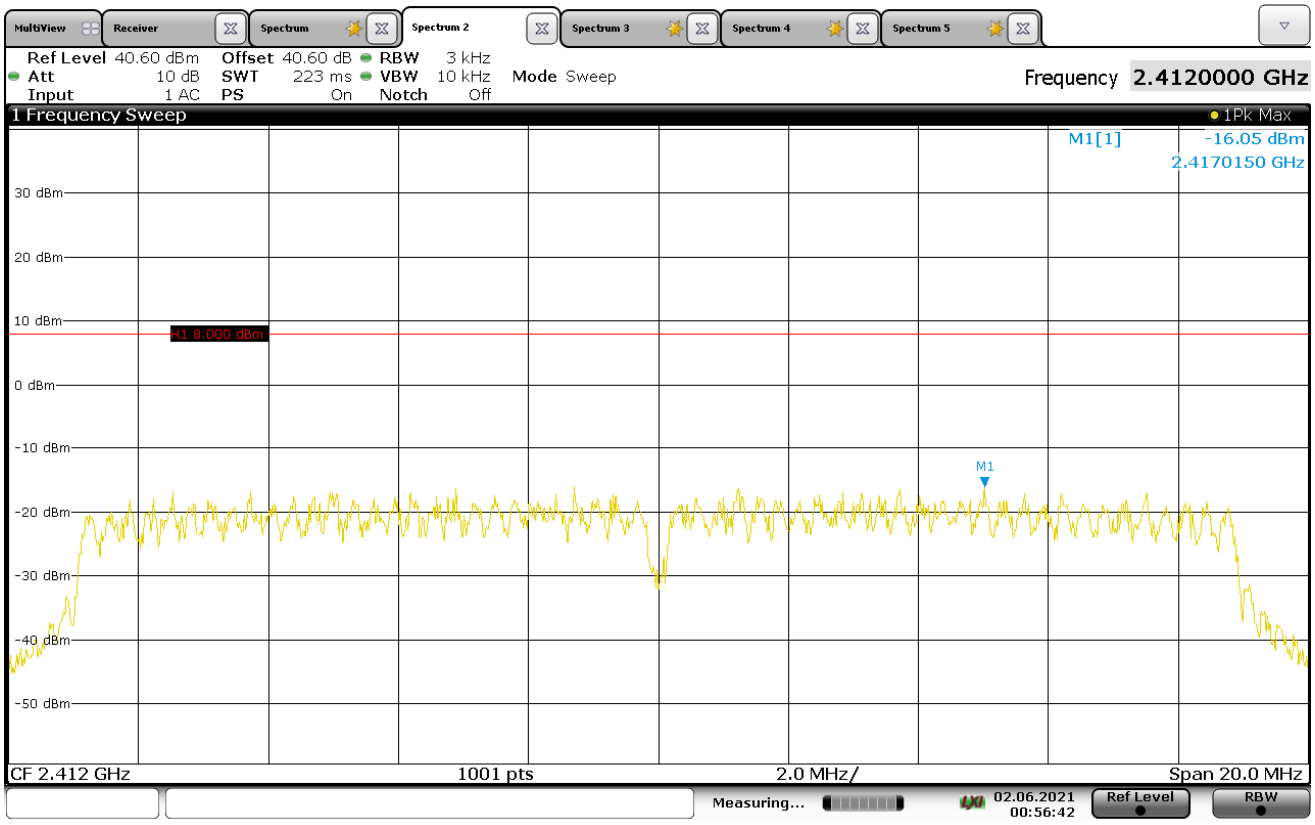
Protocol	Freq. (MHz)	Data Rate (Mbps)	Power (dBm)
802.11n	2412	MCS0	-15.56
	2437		-15.26
	2462		-15.87
	2412	MCS1	-16.05
	2437		-15.45
	2462		-15.73
	2412	MCS2	-14.89
	2437		-15.09
	2462		-14.75
	2412	MCS3	-14.68
	2437		-13.37
	2462		-14.54
	2412	MCS4	-16.6
	2437		-16.31
	2462		-15.23
	2412	MCS5	-15.6
	2437		-15.5
	2462		-15.61
	2412	MCS6	-16.64
	2437		-17.64
	2462		-17.83
	2412	MCS7	-16.99
	2437		-17.23
	2462		-15.82

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n – MSC0
Carrier Frequency	2412MHz
Parameters	PSD = -15.56dBm
Notes	N/A



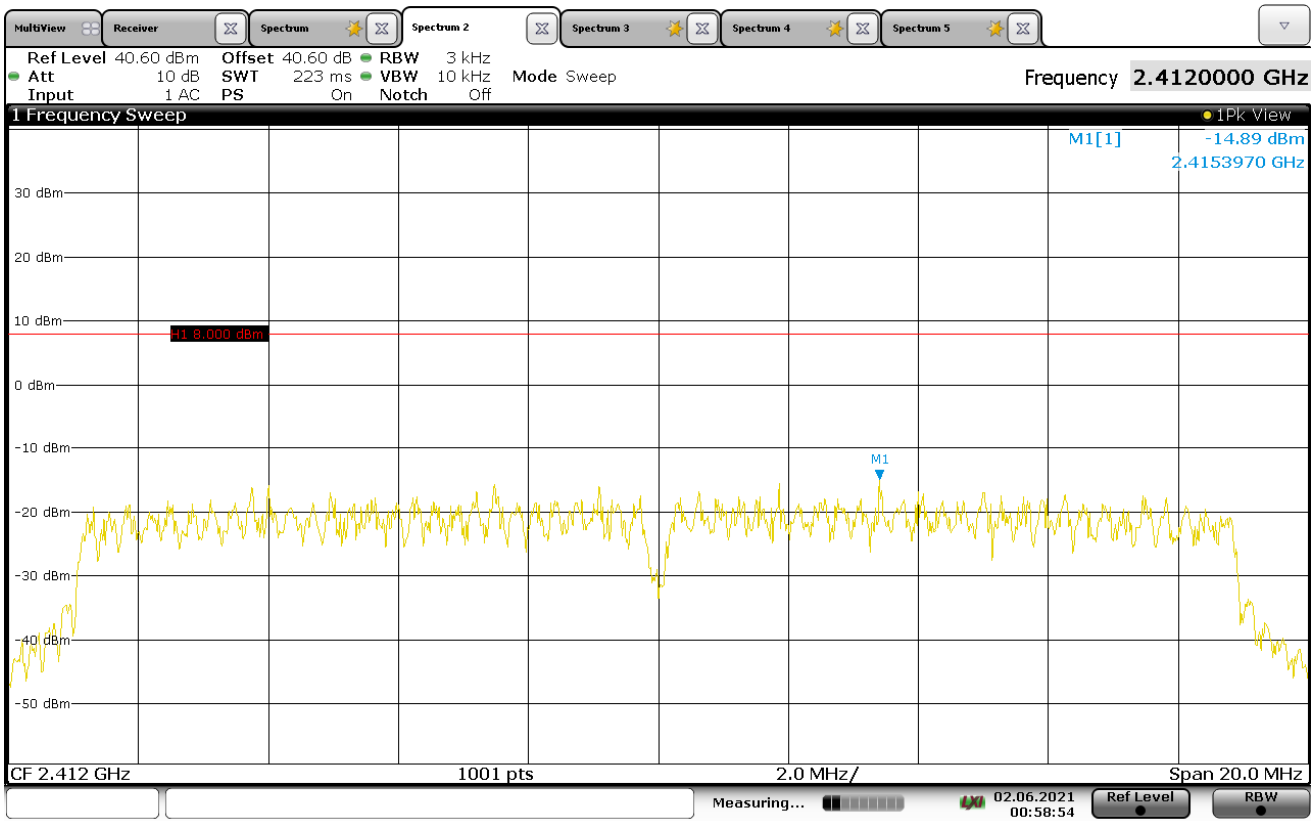
00:54:12 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n – MSC1
Carrier Frequency	2412MHz
Parameters	PSD = -16.05dBm
Notes	N/A



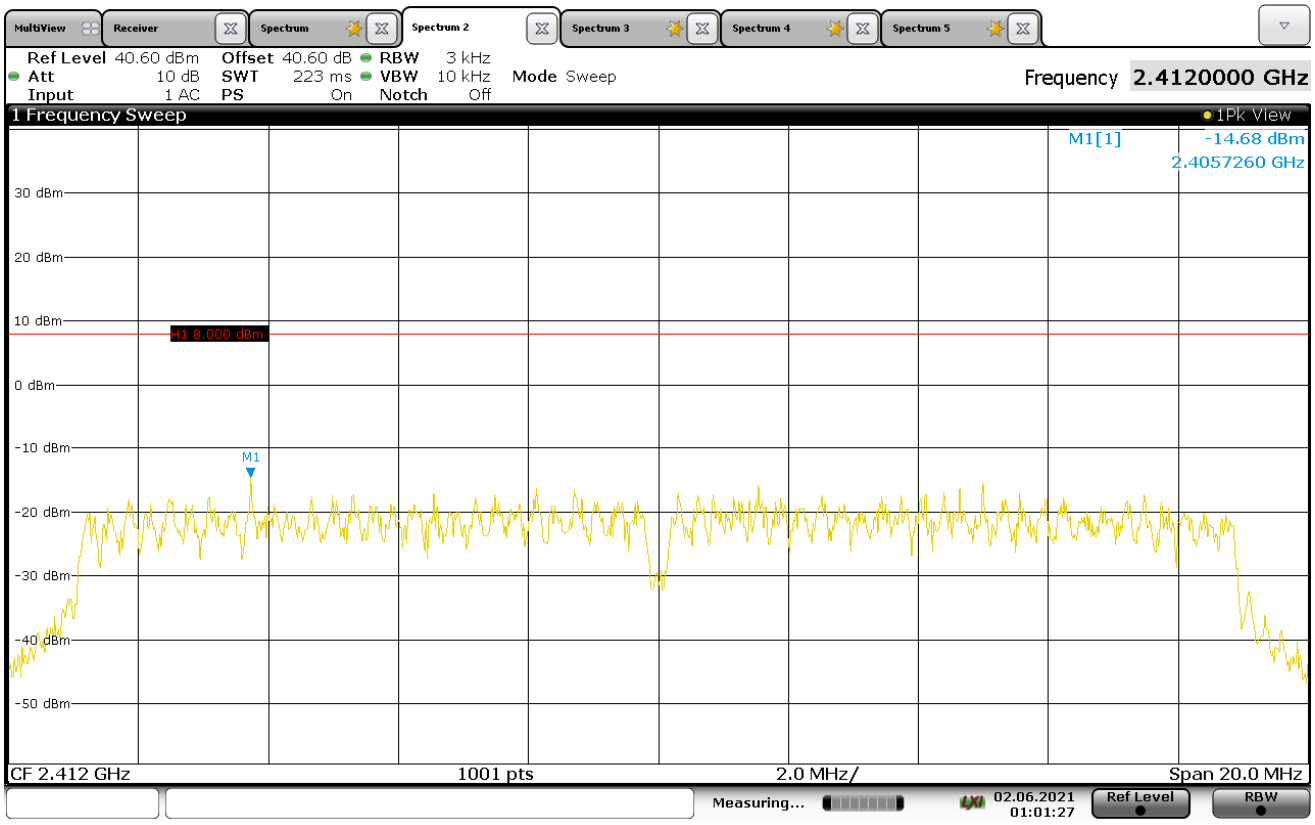
00:56:43 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n – MSC2
Carrier Frequency	2412MHz
Parameters	PSD = -14.89dBm
Notes	N/A



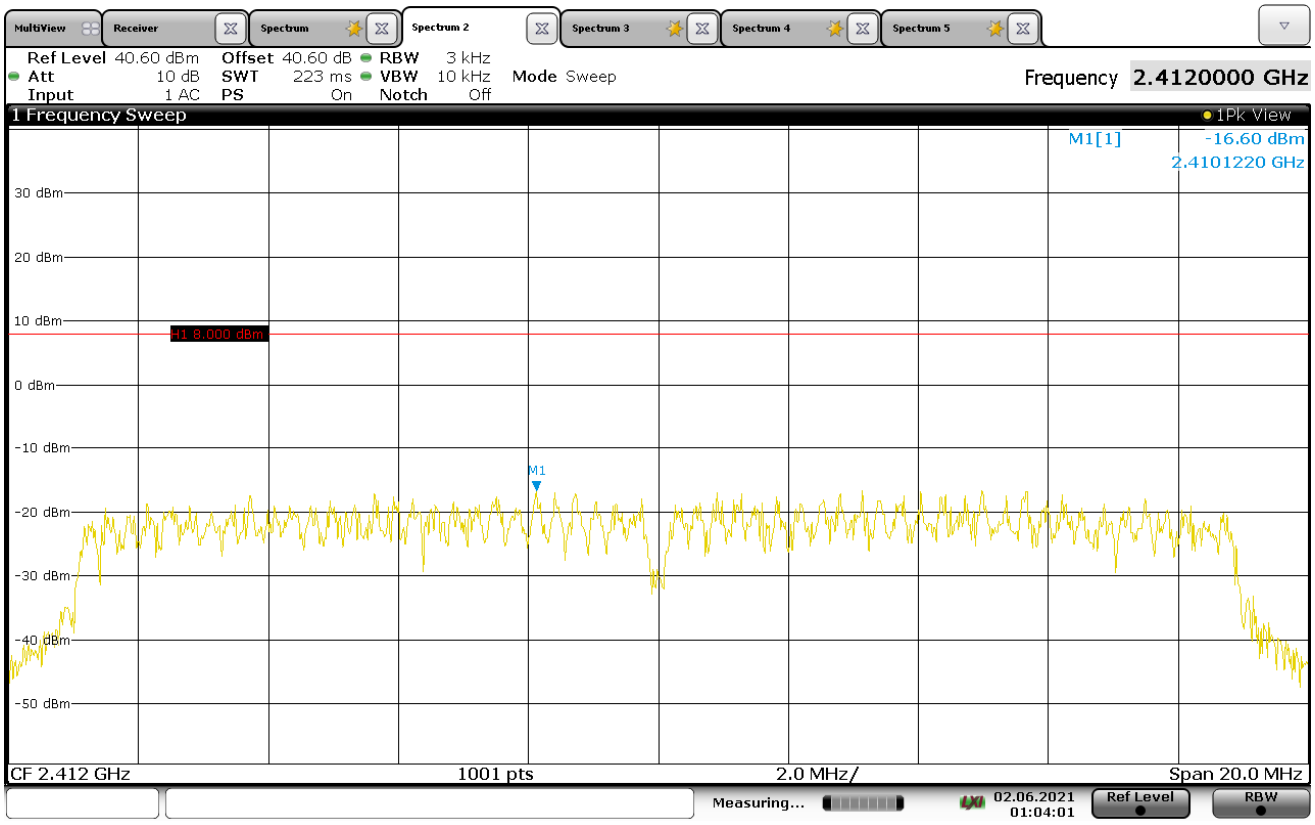
00:58:55 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n – MSC3
Carrier Frequency	2412MHz
Parameters	PSD = -14.68dBm
Notes	N/A



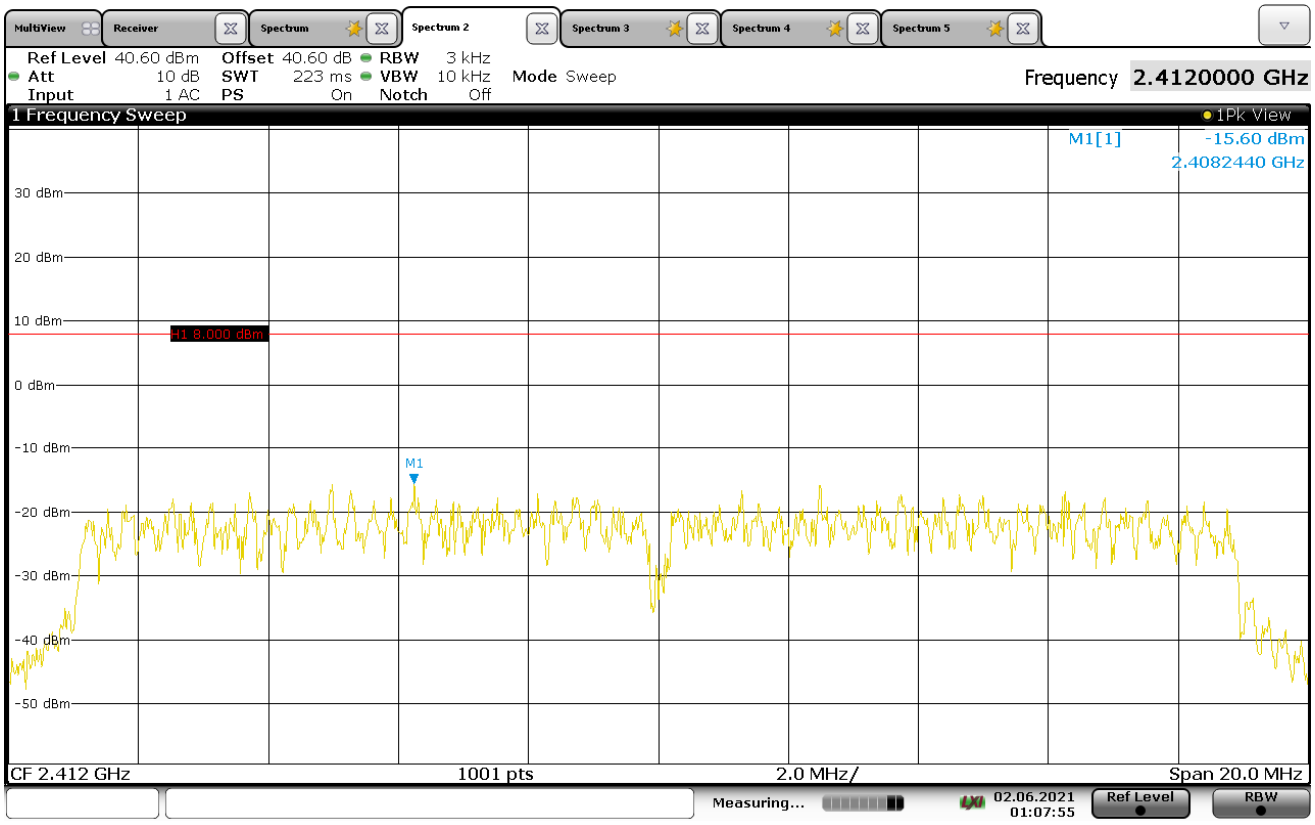
01:01:28 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n – MSC4
Carrier Frequency	2412MHz
Parameters	PSD = -16.60dBm
Notes	N/A



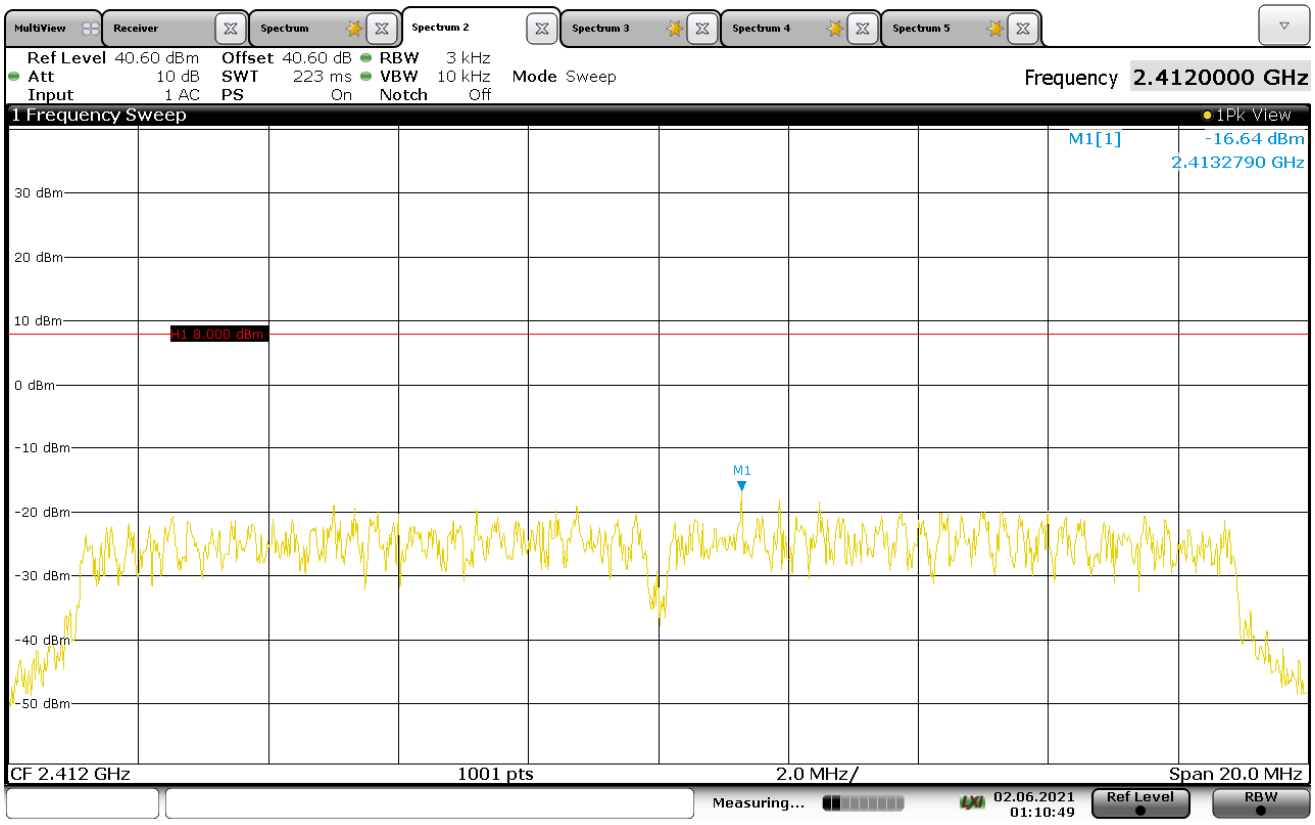
01:04:01 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n – MSC5
Carrier Frequency	2412MHz
Parameters	PSD = -15.60dBm
Notes	N/A



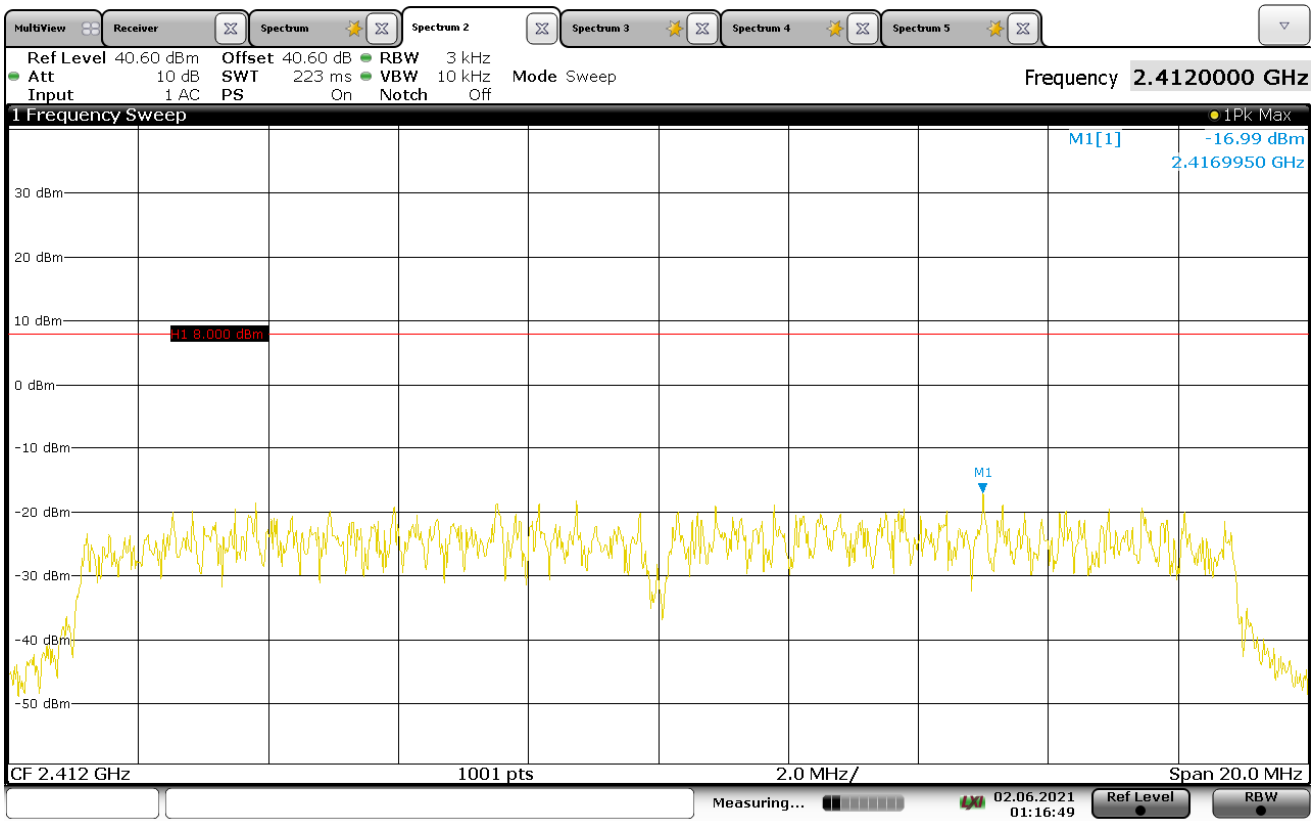
01:07:56 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n – MSC6
Carrier Frequency	2412MHz
Parameters	PSD = -16.64dBm
Notes	N/A



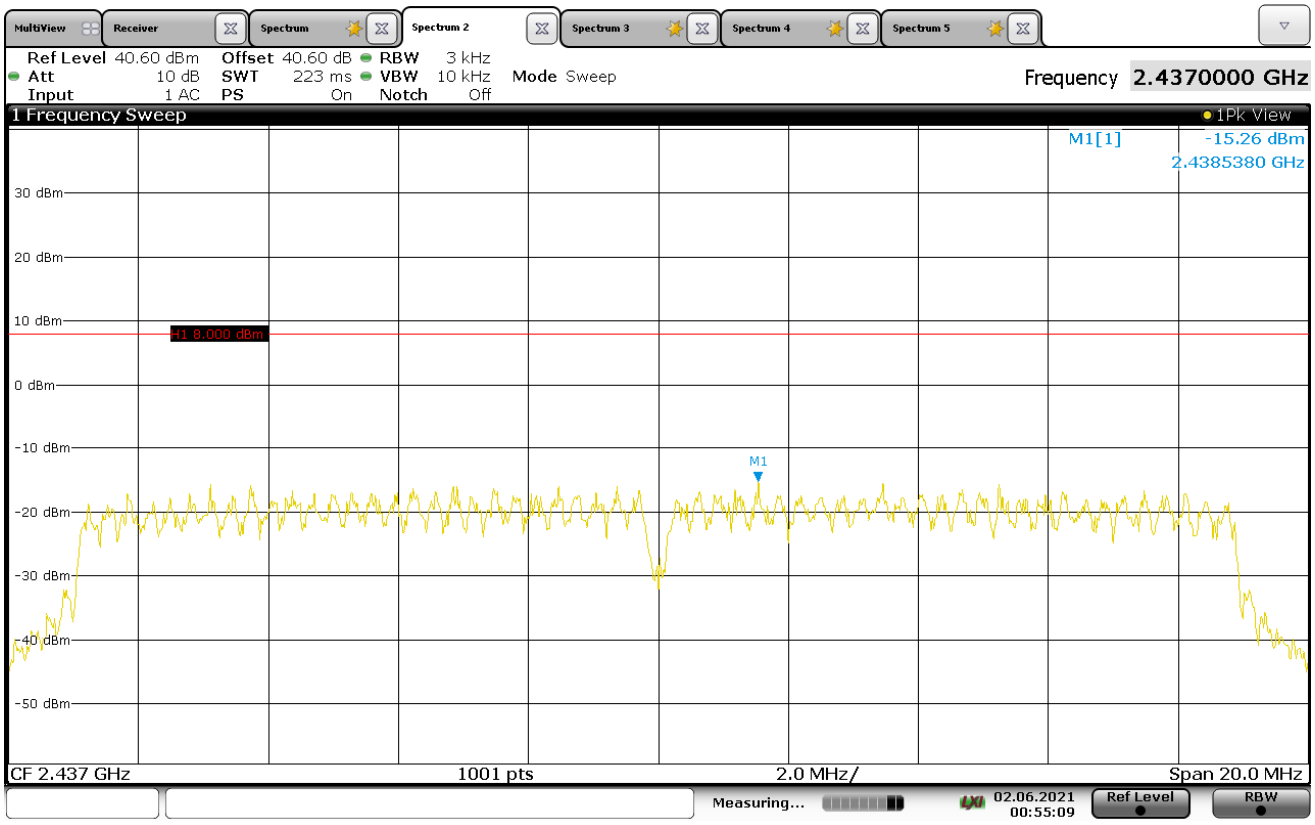
01:10:49 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n – MSC7
Carrier Frequency	2412MHz
Parameters	PSD = -16.99dBm
Notes	N/A



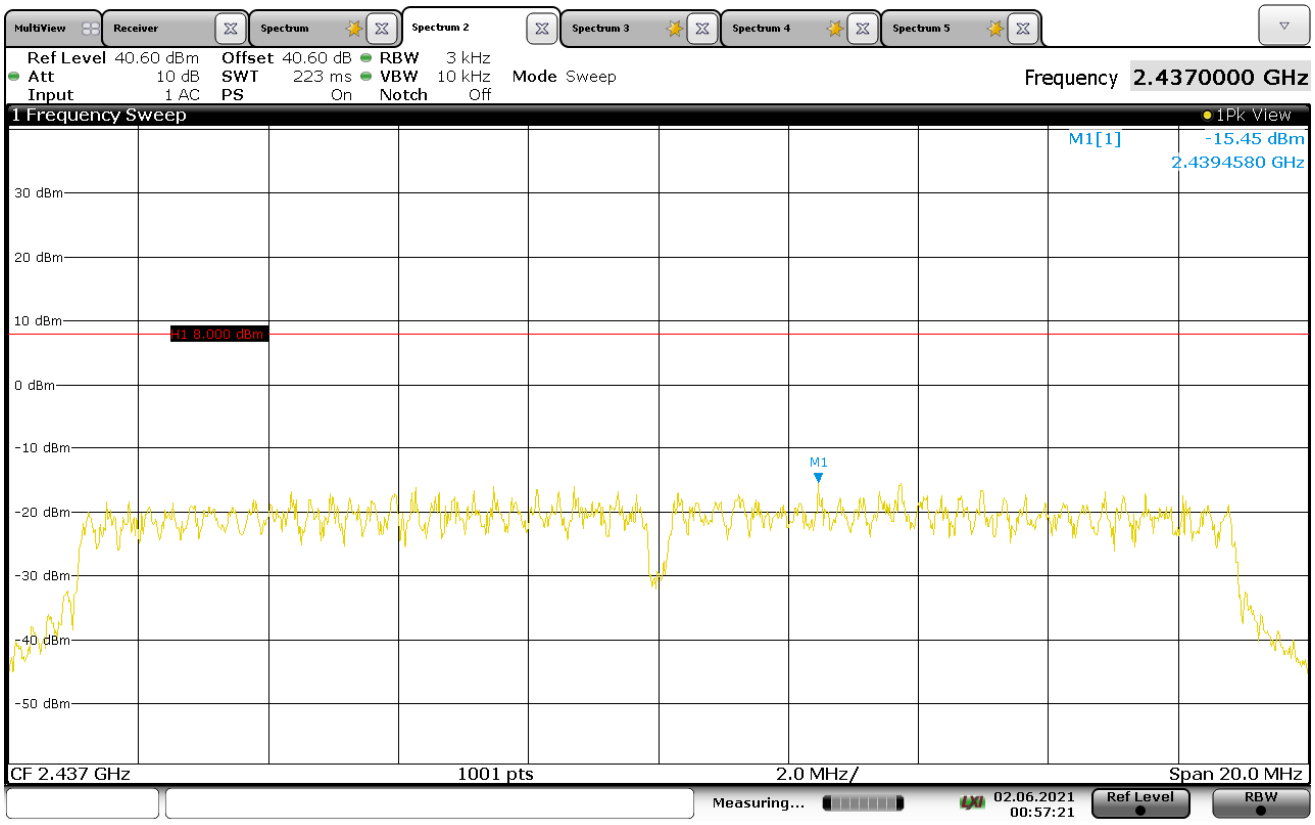
01:16:50 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n – MSC0
Carrier Frequency	2437MHz
Parameters	PSD = -15.26dBm
Notes	N/A



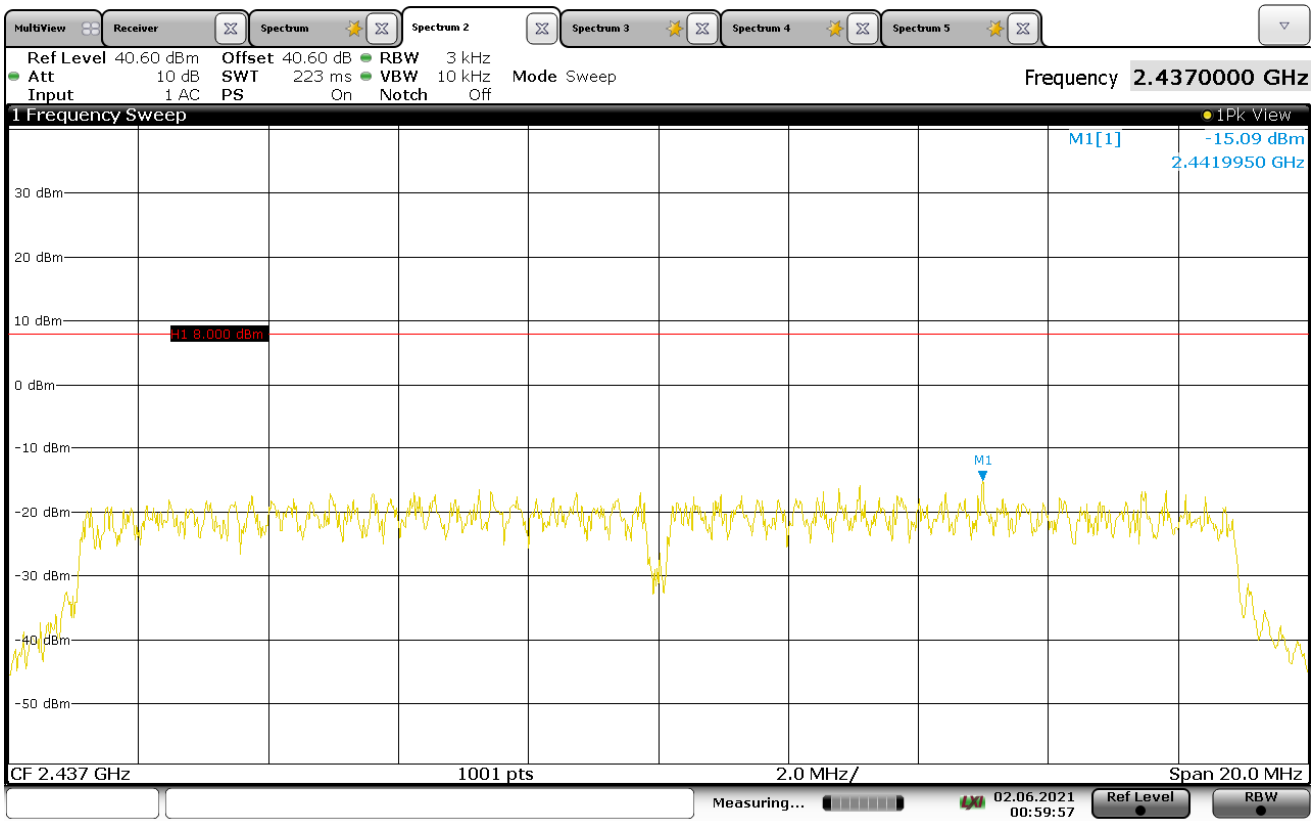
00:55:10 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n – MSC1
Carrier Frequency	2437MHz
Parameters	PSD = -15.45dBm
Notes	N/A



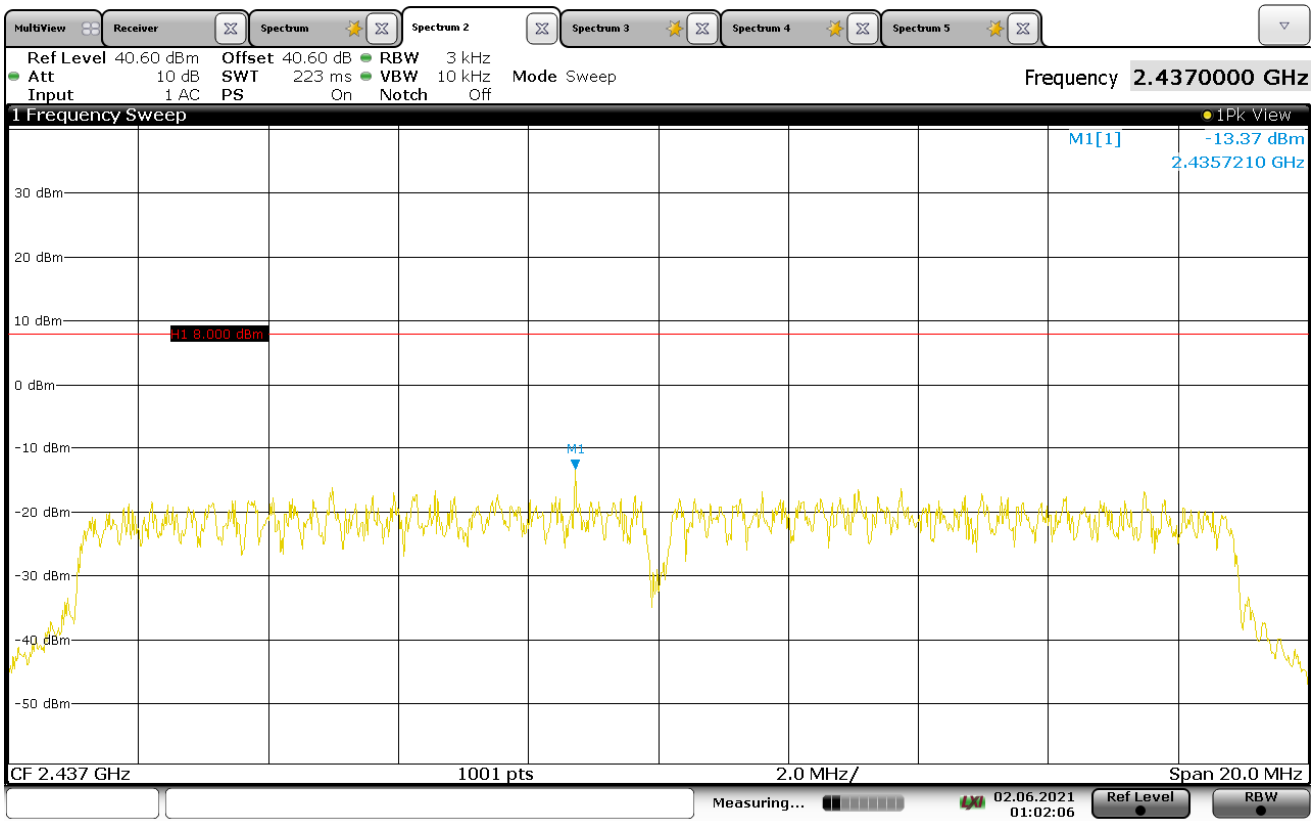
00:57:22 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n – MSC2
Carrier Frequency	2437MHz
Parameters	PSD = -15.09dBm
Notes	N/A



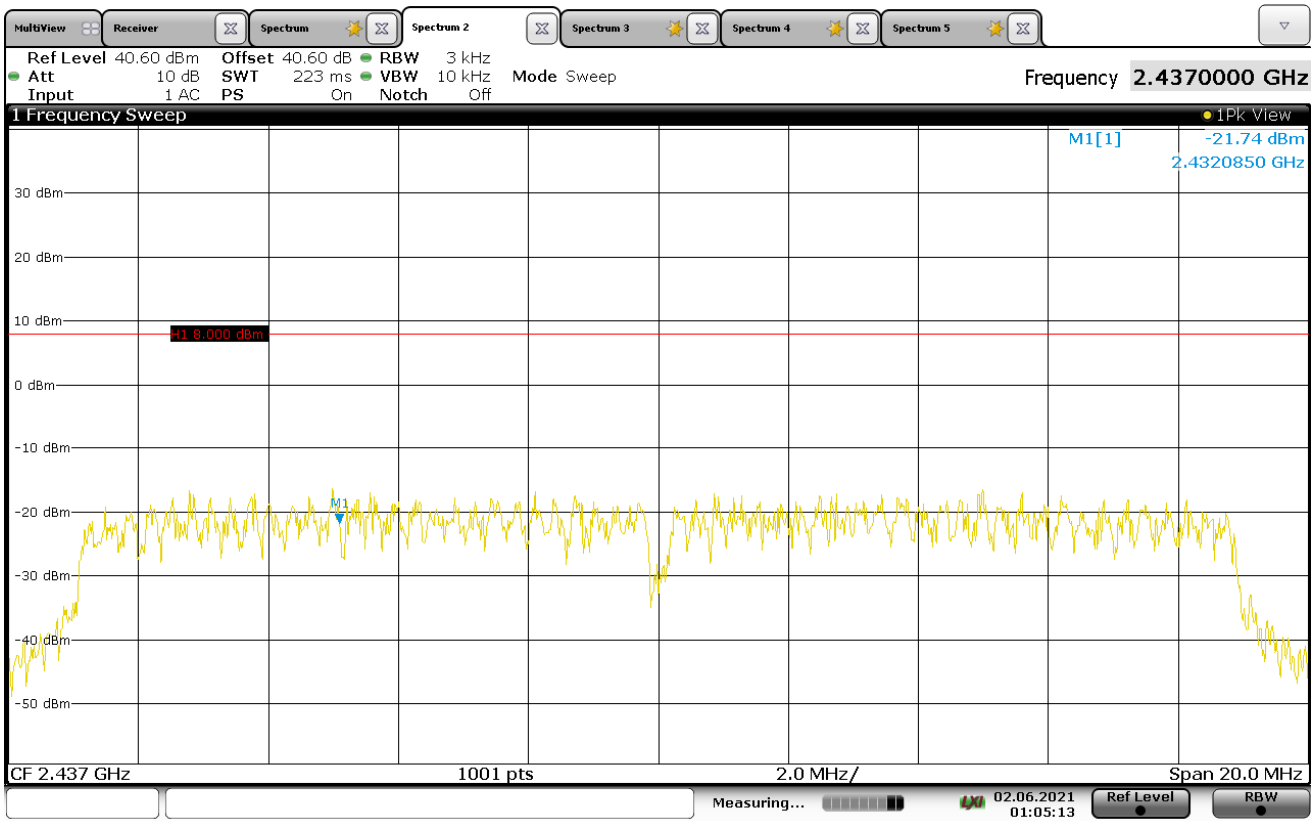
00:59:58 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n – MSC3
Carrier Frequency	2437MHz
Parameters	PSD = -13.37dBm
Notes	N/A



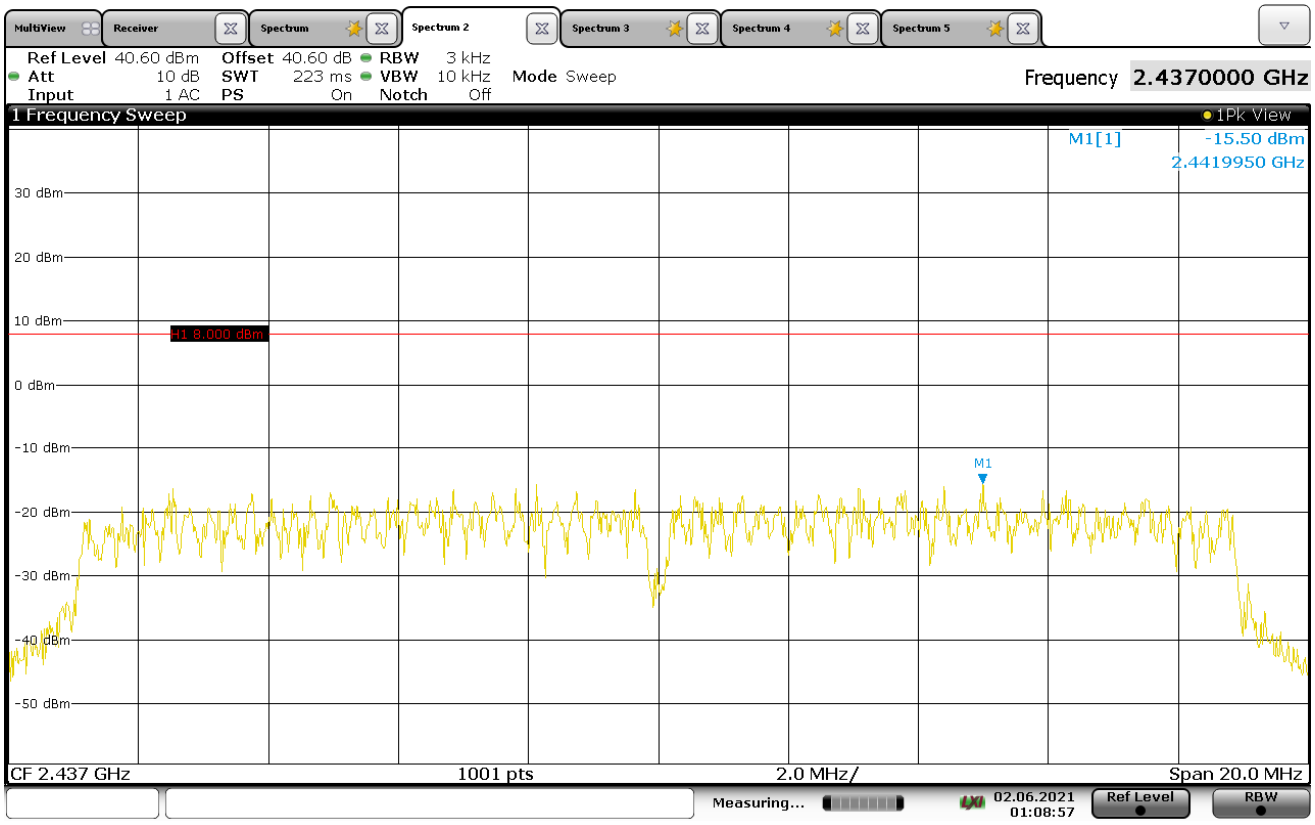
01:02:07 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n – MSC4
Carrier Frequency	2437MHz
Parameters	PSD = -21.74dBm
Notes	N/A



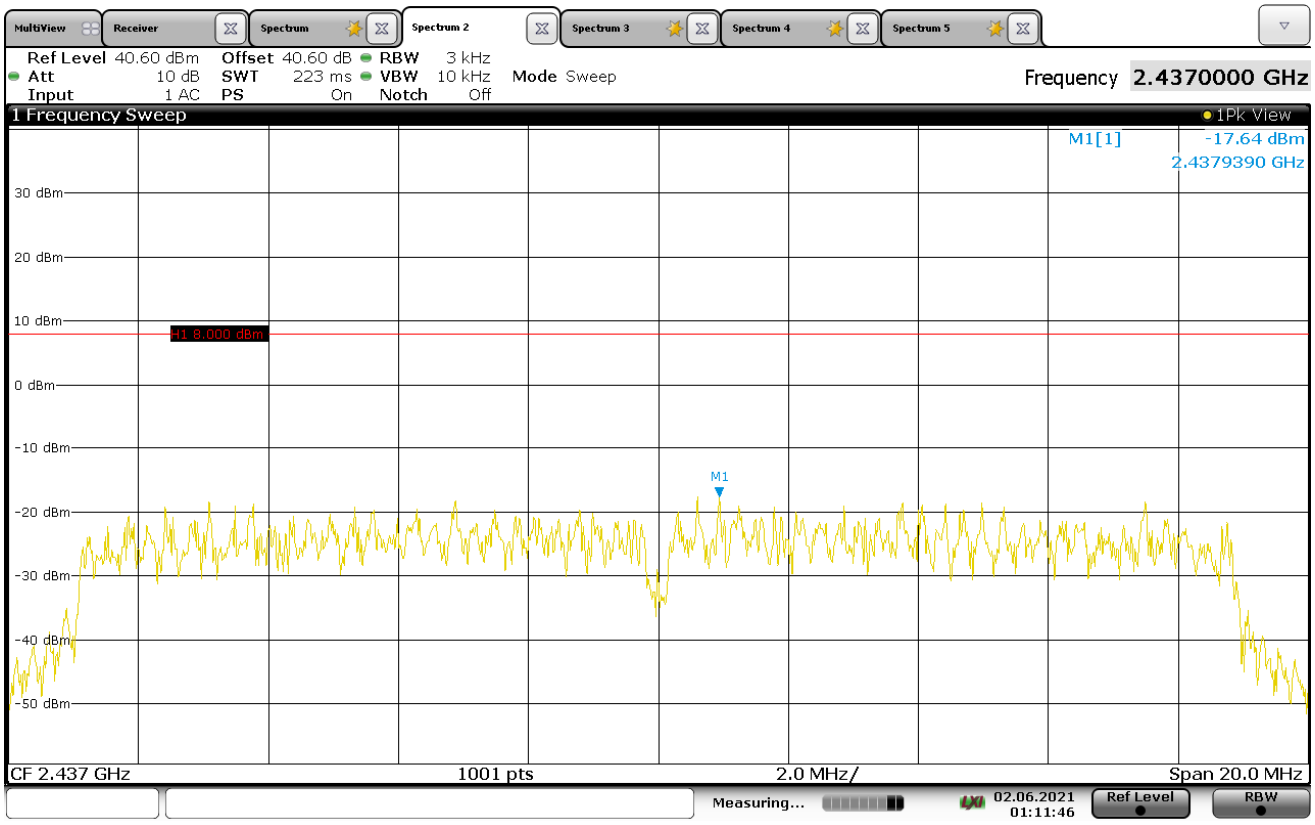
01:05:13 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n – MSC5
Carrier Frequency	2437MHz
Parameters	PSD = -15.50dBm
Notes	N/A



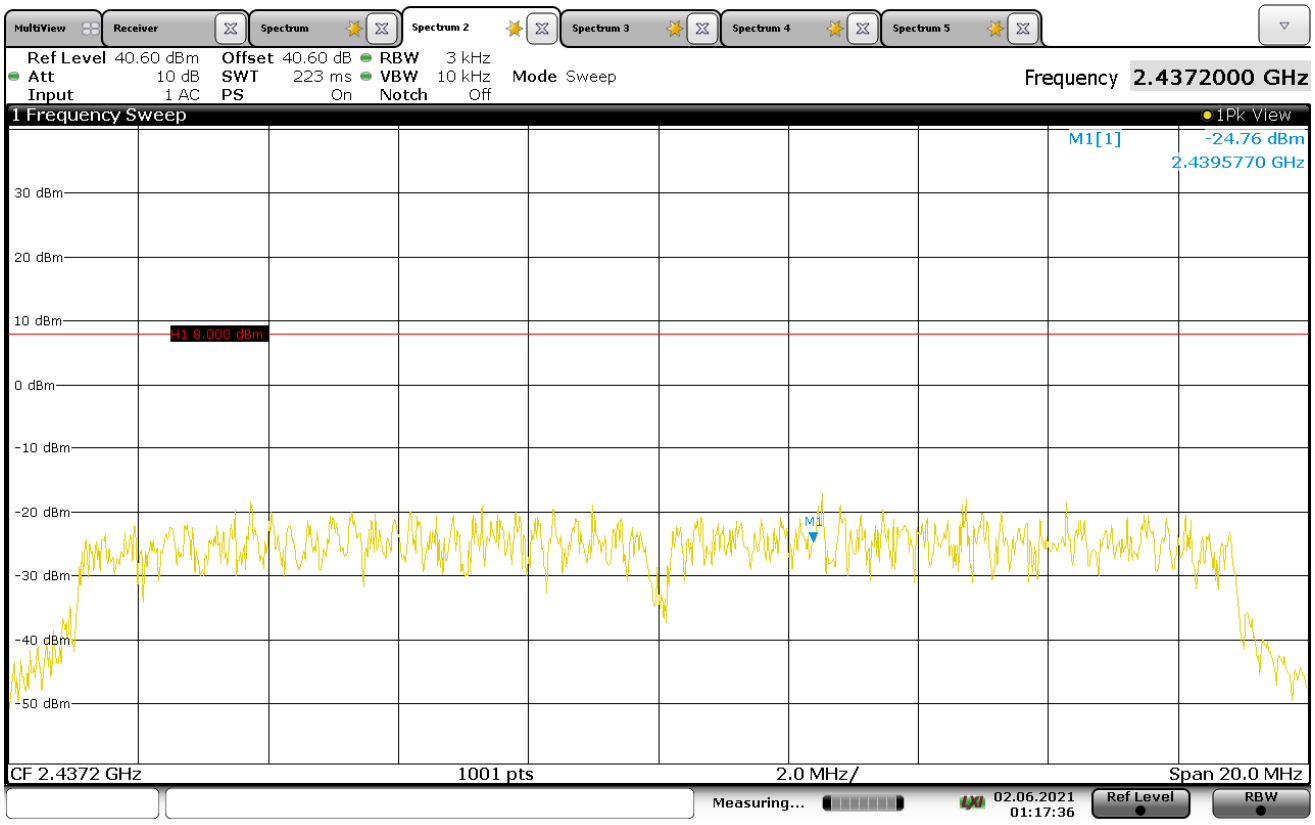
01:08:57 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n – MSC6
Carrier Frequency	2437MHz
Parameters	PSD = -17.64dBm
Notes	N/A



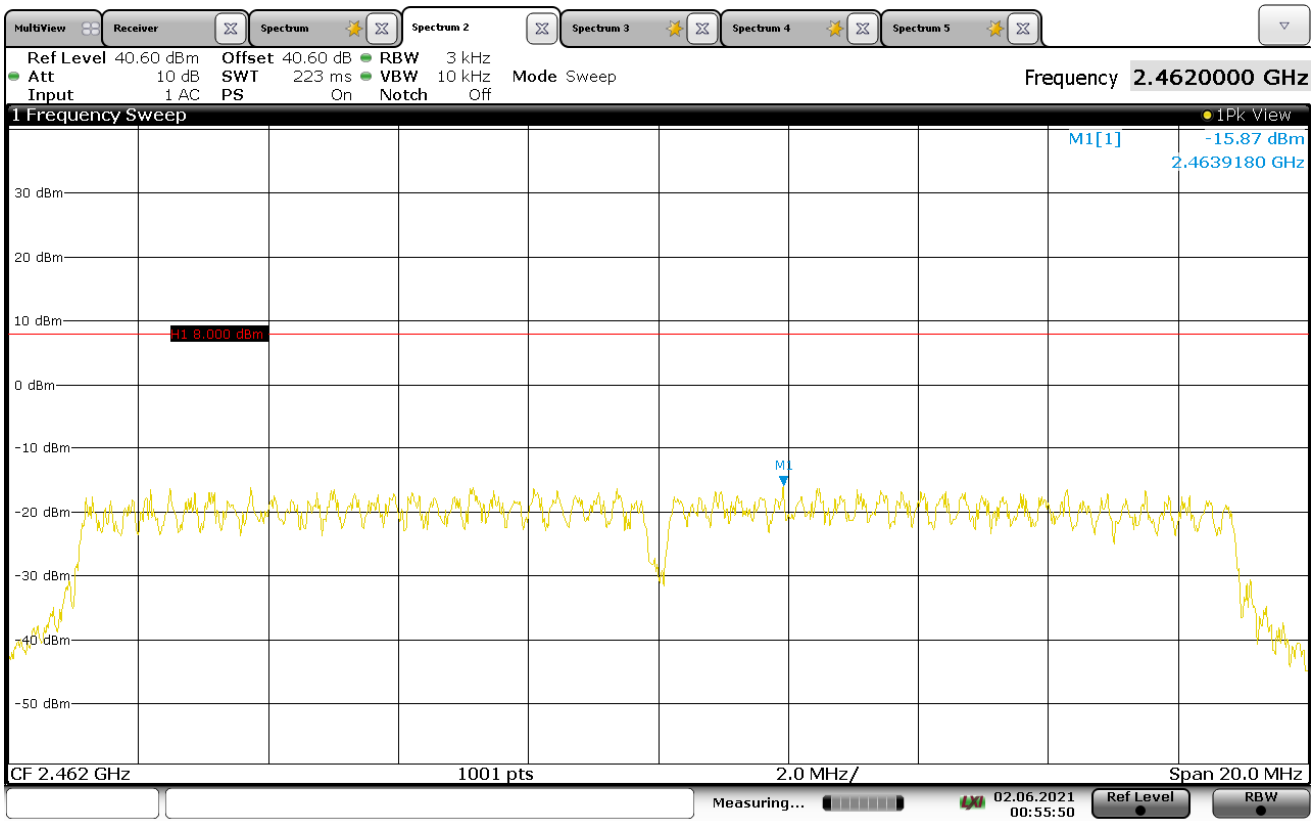
01:11:46 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n – MSC7
Carrier Frequency	2437MHz
Parameters	PSD = -24.76dBm
Notes	N/A



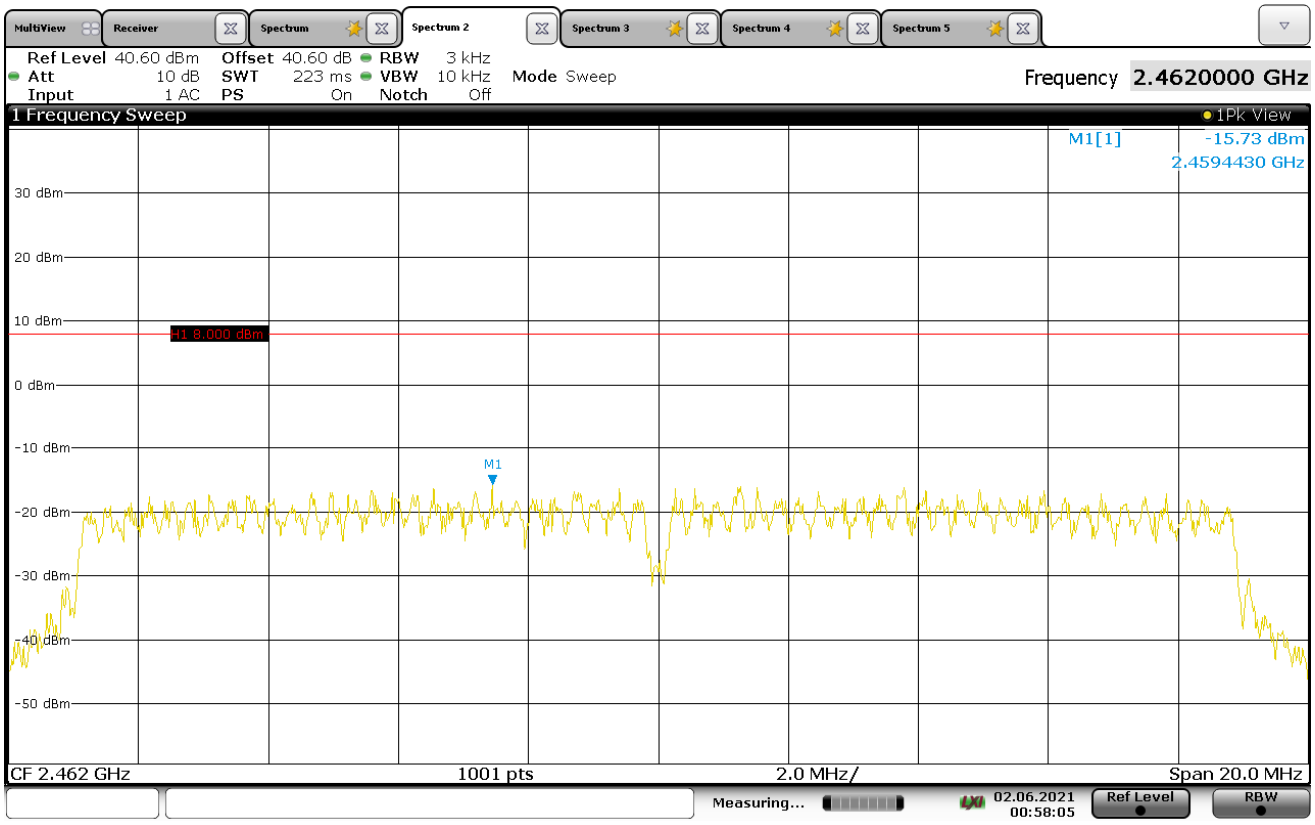
01:17:36 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n – MSC0
Carrier Frequency	2462MHz
Parameters	PSD = -15.87dBm
Notes	N/A



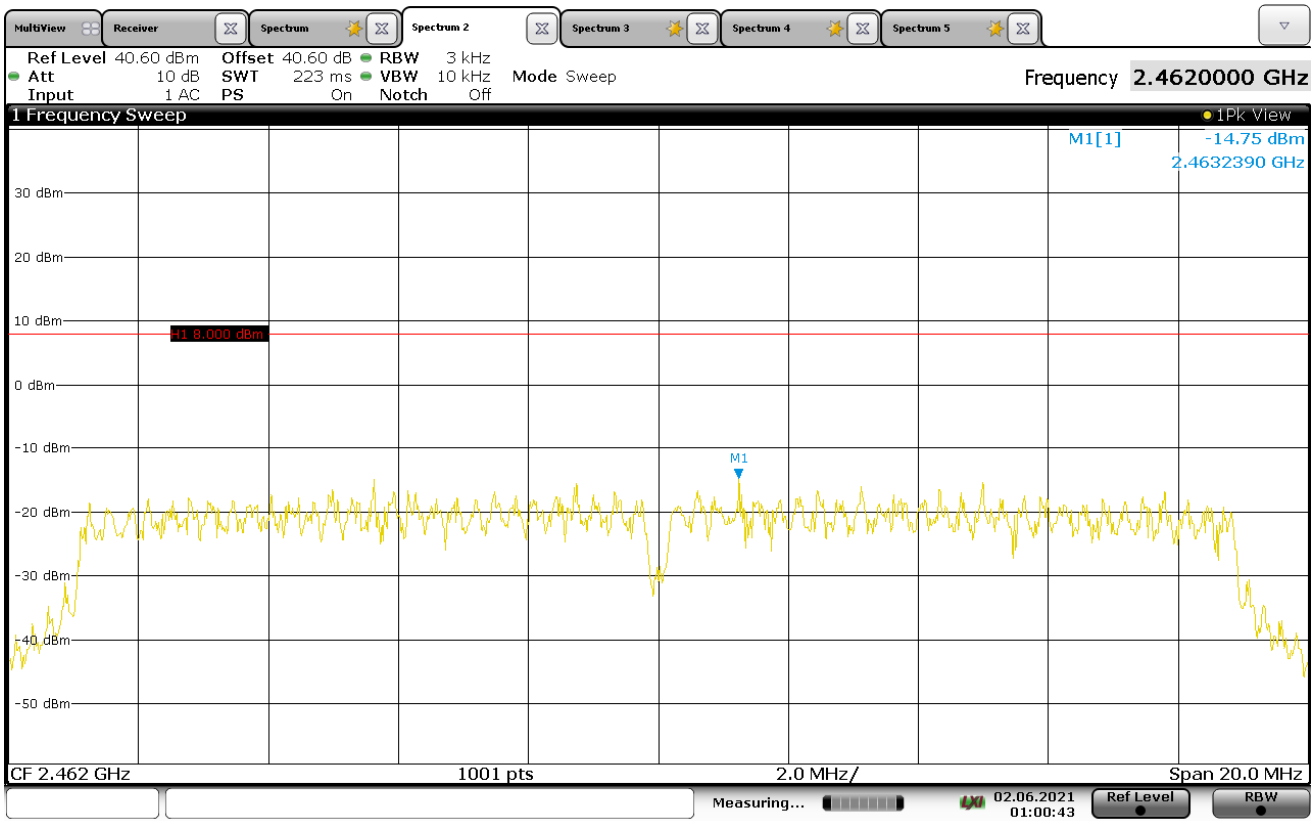
00:55:50 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n – MSC1
Carrier Frequency	2462MHz
Parameters	PSD = -15.73dBm
Notes	N/A



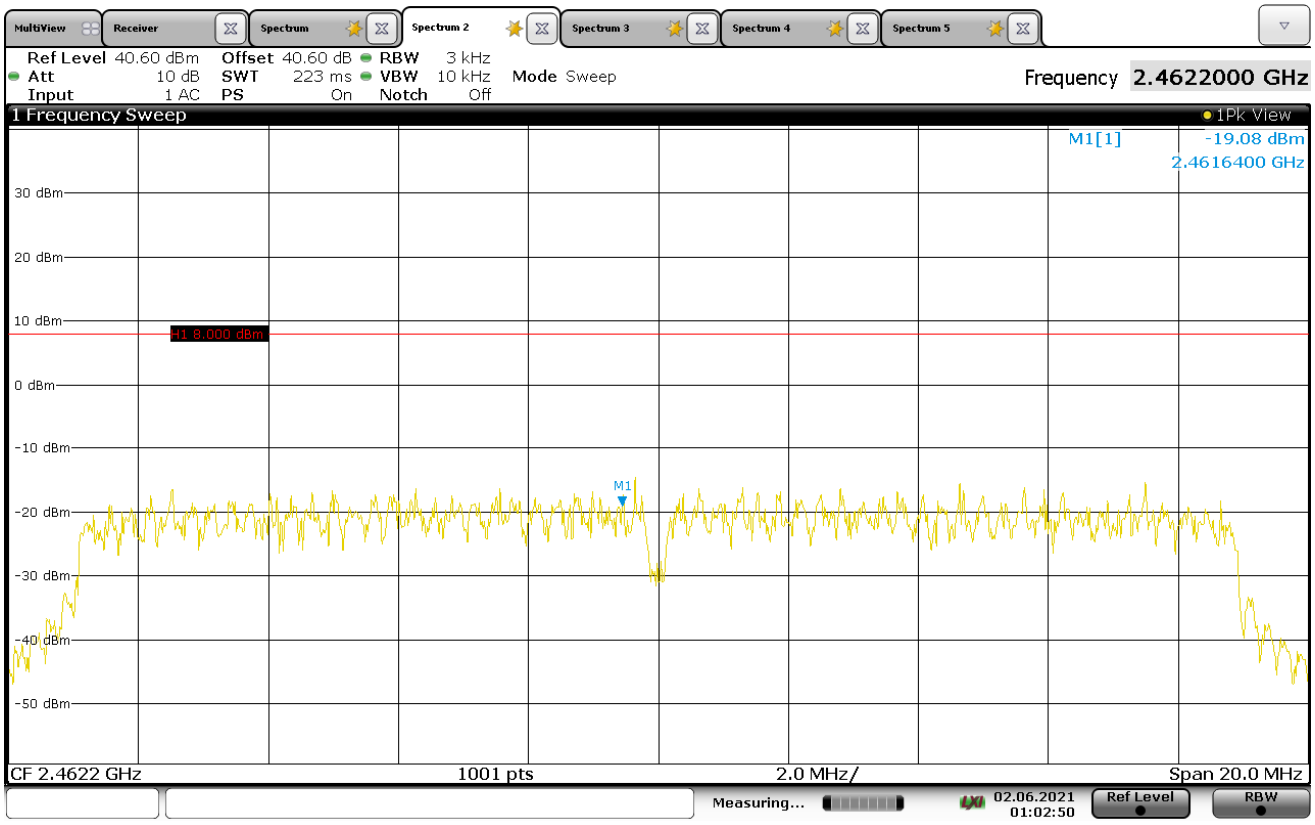
00:58:05 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n – MSC2
Carrier Frequency	2462MHz
Parameters	PSD = -14.75dBm
Notes	N/A



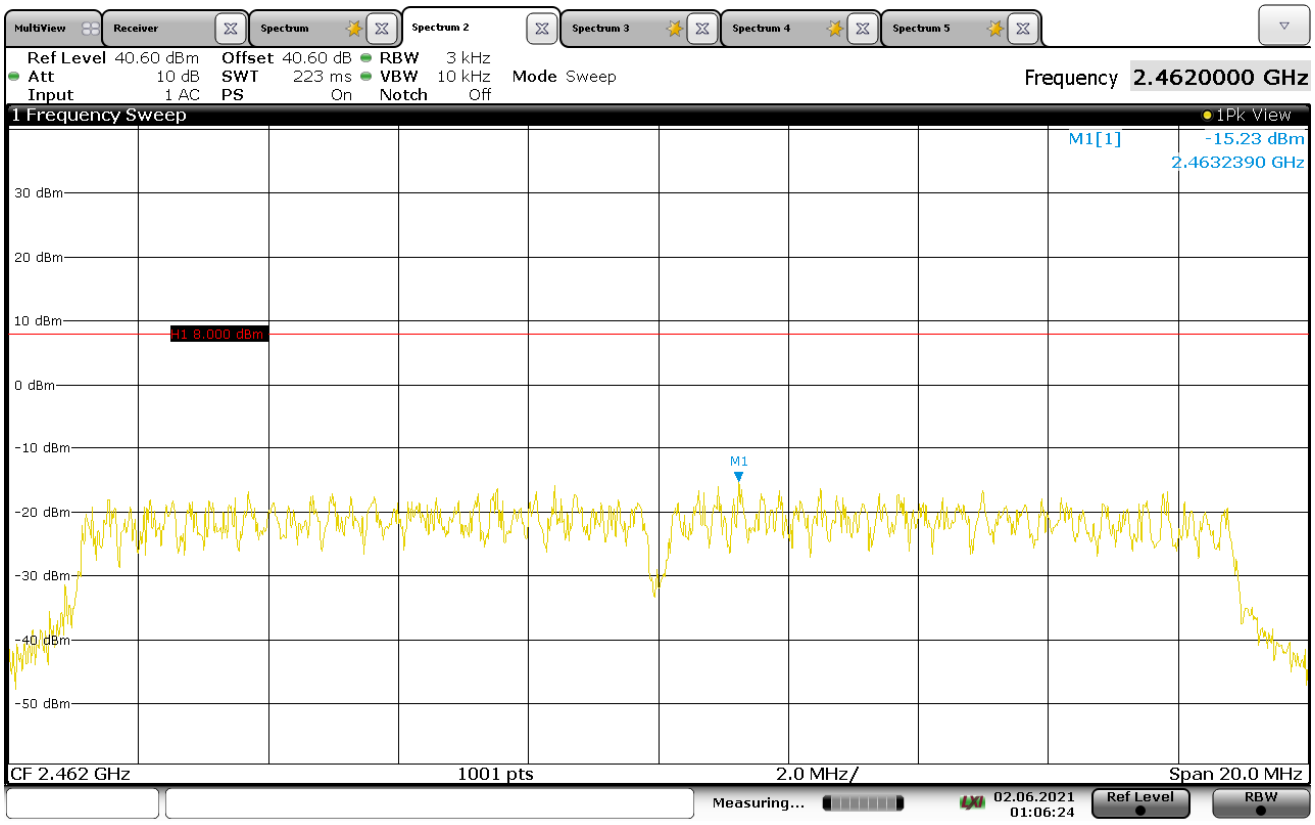
01:00:43 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n – MSC3
Carrier Frequency	2462MHz
Parameters	PSD = -19.08dBm
Notes	N/A



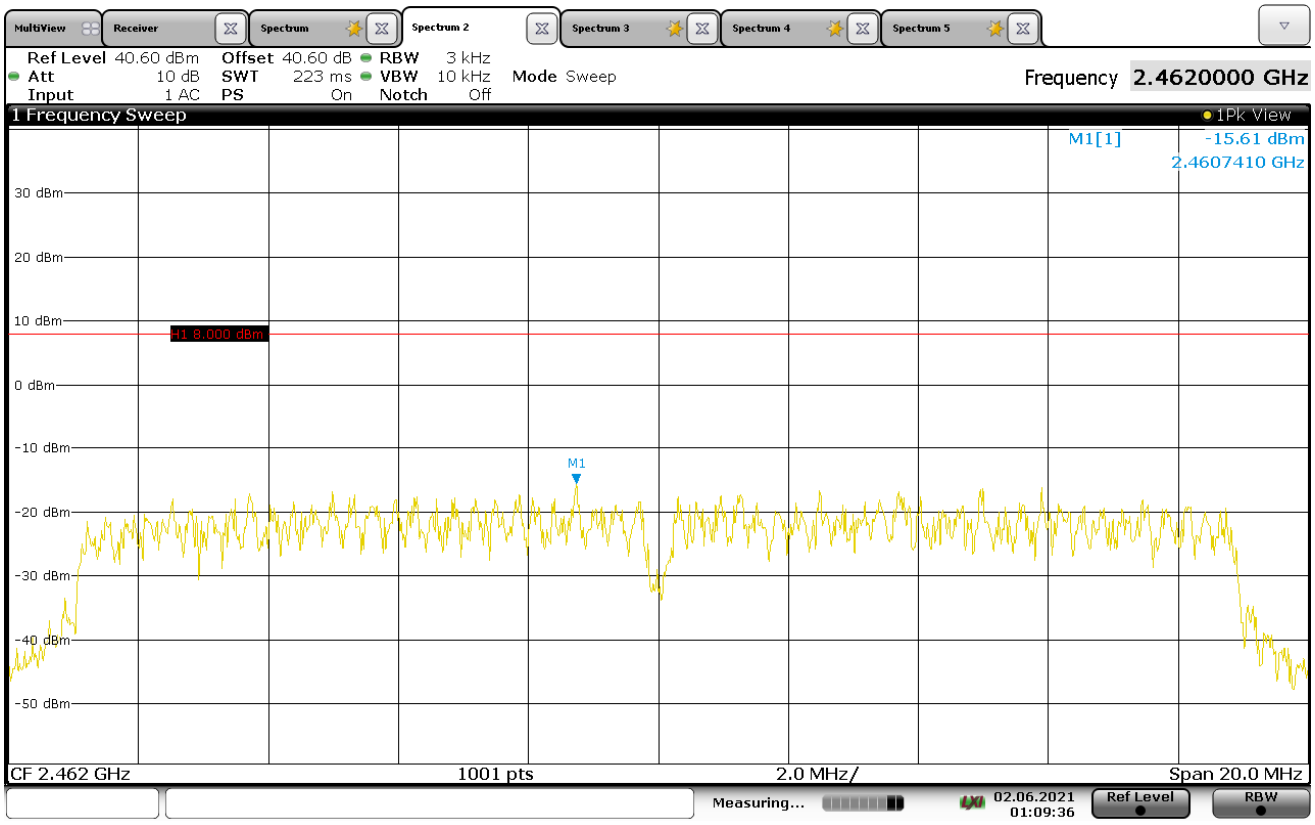
01:02:50 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n – MSC4
Carrier Frequency	2462MHz
Parameters	PSD = -15.23dBm
Notes	N/A



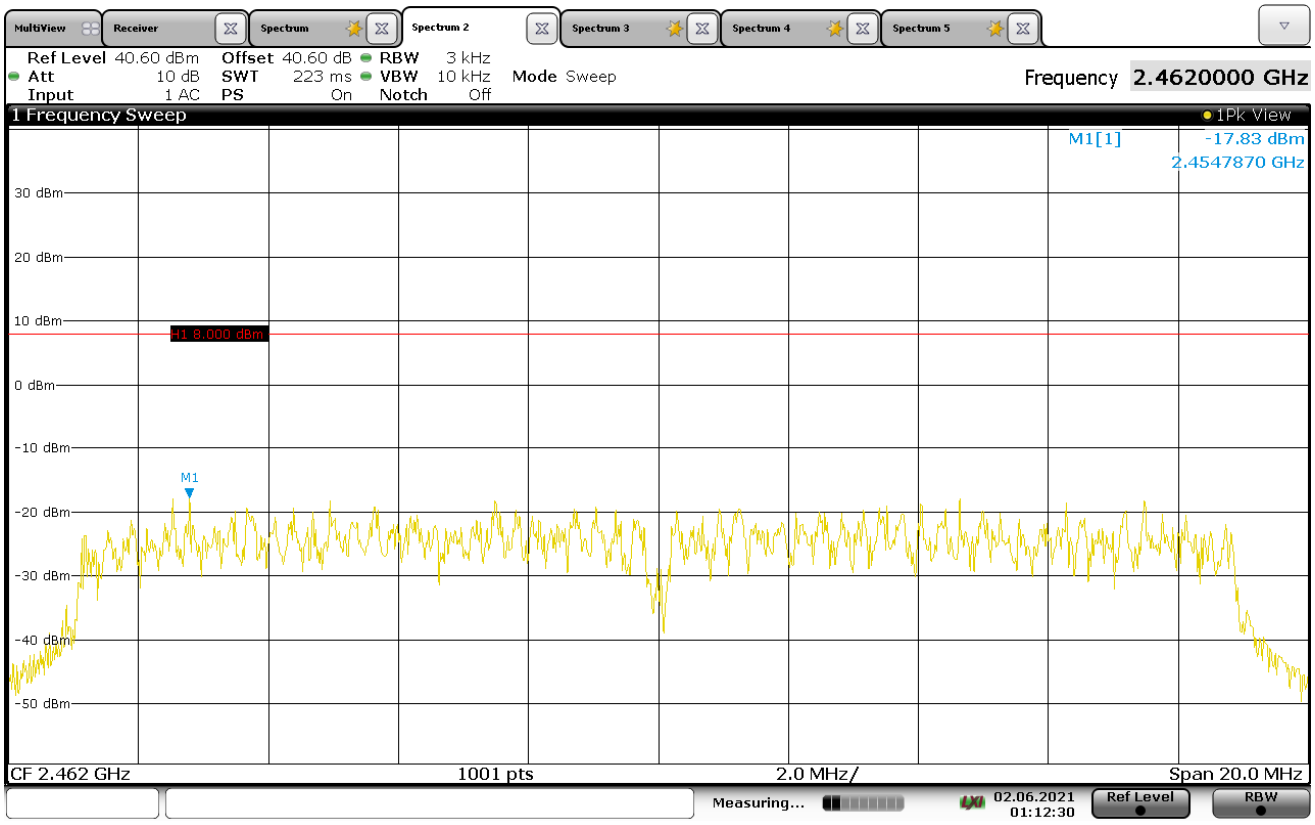
01:06:24 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n – MSC5
Carrier Frequency	2462MHz
Parameters	PSD = -15.61dBm
Notes	N/A



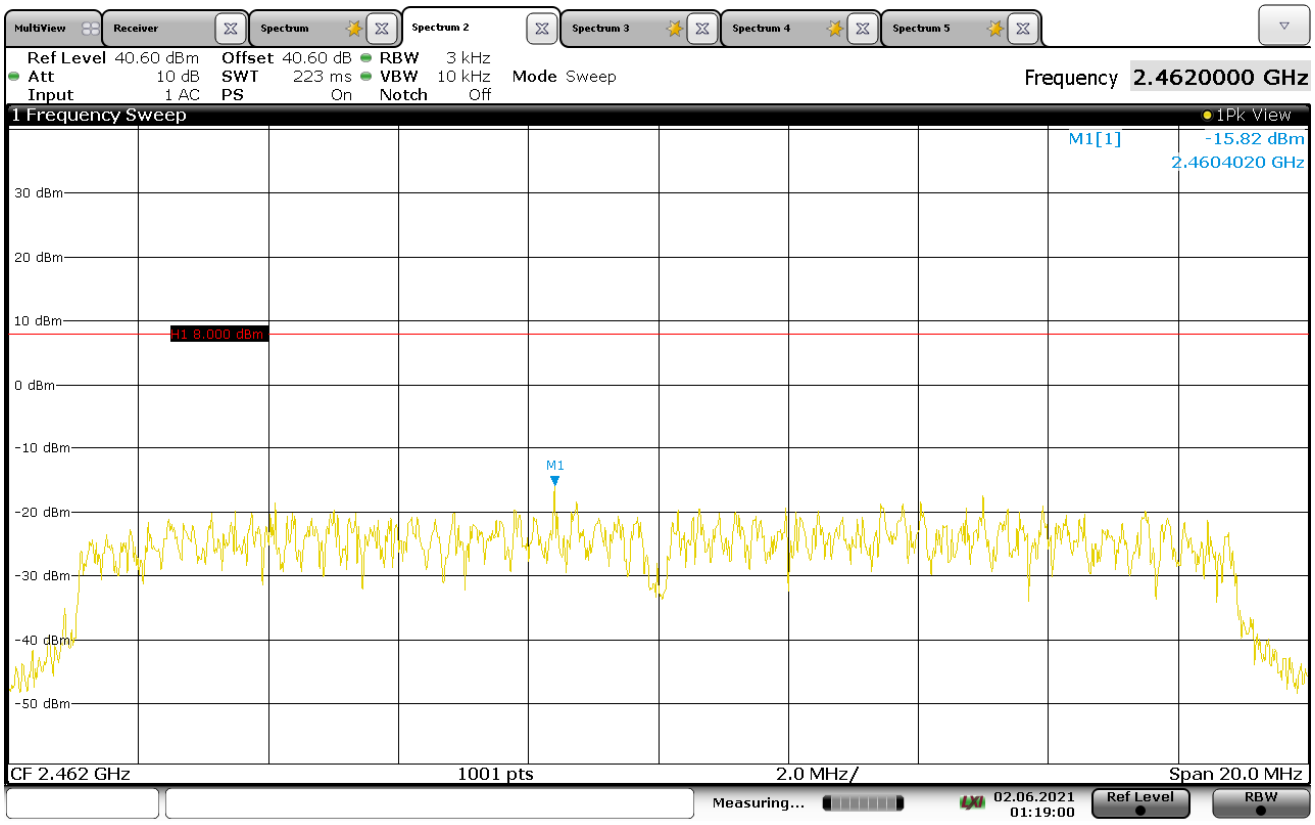
01:09:37 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n – MSC6
Carrier Frequency	2462MHz
Parameters	PSD = -17.83dBm
Notes	N/A



01:12:31 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n – MSC7
Carrier Frequency	2462MHz
Parameters	PSD = -15.82dBm
Notes	N/A



01:19:01 02.06.2021

31. Scope of Accreditation

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

ELITE ELECTRONIC ENGINEERING, INC.
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ELECTRICAL

Valid to: June 30, 2021 Certificate Number: 1786.01

In recognition of the successful completion of the A2LA Accreditation Program evaluation process, accreditation is granted to this laboratory to perform the following automotive electromagnetic compatibility and other electrical tests:

Test Technology:	Test Method(s) [1]:
Transient Immunity	ISO 7637-2 (including emissions); ISO 7637-3; ISO 16750-2:2012, Sections 4.6.3 and 4.6.4; CS-11979, Section 6.4; CS.00054, Section 5.9; EMC-CS-2009.1 (CI220); FMC1278 (CI220, CI221, CI222); GMW 3097, Section 3.5; SAE J1113-11; SAE J1113-12; ECE Regulation 10.06 Annex 10
Electrostatic Discharge (ESD)	ISO 10605 (2001, 2008); CS-11979 Section 7.0; CS.00054, Section 5.10; EMC-CS-2009.1 (CI 280); FMC1278 (CI280); SAE J1113-13; GMW 3097 Section 3.6
Conducted Emissions	CISPR 25 (2002, 2008), Sections 6.2 and 6.3; CISPR 25 (2016), Sections 6.3 and 6.4; CS-11979, Section 5.1; CS.00054, Sections 5.6.1 and 5.6.2; GMW 3097, Section 3.3.2; EMC-CS-2009.1 (CE 420); FMC1278 (CE420, CE421)

5202 Presidents Court, Suite 220 | Frederick, MD 21703-8515 | Phone: 301 644 3248 | Fax: 240 454 9449 | www.A2LA.org

Test Technology:	Test Method(s) [1]:
Radiated Emissions Anechoic	CISPR 25 (2002, 2008), Section 6.4; CISPR 25 (2016), Section 6.5; CS-11979, Section 5.3; CS.00054, Section 5.6.3; GMW 3097, Section 3.3.1; EMC-CS-2009.1 (RE 310); FMC1278 (RE310); ECE Regulation 10.06 Annex 7 (Broadband) ECE Regulation 10.06 Annex 8 (Narrowband)
Vehicle Radiated Emissions	CISPR 12; ICES-002; ECE Regulation 10.06 Annex 5
Bulk Current Injection (BCI)	ISO 11452-4; CS-11979, Section 6.1; CS.00054, Section 5.8.1; GMW 3097, Section 3.4.1; SAE J1113-4; EMC-CS-2009.1 (RI112); FMC1278 (RI112); ECE Regulation 10.06 Annex 9
Bulk Current Injections (BCI) *(Closed Loop Method)*	ISO 11452-4; SAE J1113-4
Radiated Immunity Anechoic *(Including Radar Pulse)*	ISO 11452-2; ISO 11452-5; CS-11979, Section 6.2; CS.00054, Section 5.8.2; GMW 3097, Section 3.4.2; EMC-CS-2009.1 (RI114); FMC1278 (RI114); SAE J1113-21; ECE Regulation 10.06 Annex 9
Radiated Immunity Magnetic Field	ISO 11452-8
Radiated Immunity Reverb	ISO/IEC 61000-4-21; GMW 3097, Section 3.4.3; EMC-CS-2009.1 (RI114); FMC1278 (RI114); ISO 11452-11
Radiated Immunity *(Portable Transmitters)*	ISO 11452-9; EMC-CS-2009.1 (RI115); FMC1278 (RI115)
Vehicle Radiated Immunity (ALSE)	ISO 11451-2; ECE Regulation 10.06 Annex 6
Electrical Loads	ISO 16750-2, Sections 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.11, and 4.12
Dielectric Withstand Voltage	MIL-STD-202, Method 301; EIA-364-20D
Insulation Resistance	MIL-STD-202, Method 302; SAE/USCAR-2, Revision 6, Section 5.5.1; EIA-364-21D
Contact Resistance	MIL-STD-202, Method 307; SAE/USCAR-2, Revision 6, Section 5.3.1; EIA-364-23C; USCAR21-3 Section 4.5.3

Test Technology:	Test Method(s) [1]:
DC Resistance	MIL-STD-202, Method 303
Contact Chatter	MIL-STD-202, Method 310; SAE/USCAR-2, Revision 6, Section 5.1.9
Voltage Drop	SAE/USCAR-2, Revision 6, Section 5.3.2; USCAR21-3 Section 4.5.6
Emissions	
Radiated and Conducted (3m Semi-anechoic chamber, up to 40 GHz)	47 CFR, FCC Part 15 B (using ANSI C63.4:2014); 47 CFR, FCC Part 18 (using FCC MP-5:1986); ICES-001; ICES-003; ICES-005; IEC/CISPR 11, Ed. 4.1 (2004-06); AS/NZS CISPR 11 (2004); IEC/CISPR 11 Ed 5 (2009-05) + A1 (2010); KN 11 (2008-5) with RRL Notice No. 2008-3 (May 20, 2008); CISPR 11; EN 55011; KN 11; CNS 13803 (1997, 2003); CISPR 14-1; EN 55014-1; AS/NZS CISPR 14.1; KN 14-1; IEC/CISPR 22 (1997); EN 55022 (1998) + A1(2000); EN 55022 (1998) + A1(2000) + A2(2003); EN 55022 (2006); IEC/CISPR 22 (2008-09); AS/NZS CISPR 22 (2004); AS/NZS CISPR 22, 3rd Edition (2006); KN 22 (up to 6 GHz); CNS 13438 (up to 6 GHz); VCCI V-3 (up to 6 GHz); CISPR 32; EN 55032; KN 32; ECE Regulation 10.06 Annex 14
Current Harmonics	IEC 61000-3-2; EN 61000-3-2; KN 61000-3-2; ECE Regulation 10.06 Annex 11
Flicker and Fluctuations	IEC 61000-3-3; EN 61000-3-3; KN 61000-3-3; ECE Regulation 10.06 Annex 12
Immunity	
Electrostatic Discharge	IEC 61000-4-2, Ed. 1.2 (2001); IEC 61000-4-2 (1995) + A1(1998) + A2(2000); EN 61000-4-2 (1995); EN 61000-4-2 (2009-05); KN 61000-4-2 (2008-5); RRL Notice No. 2008-4 (May 20, 2008); IEC 61000-4-2; EN 61000-4-2; KN 61000-4-2; IEEE C37.90.3 2001
Radiated Immunity	IEC 61000-4-3 (1995) + A1(1998) + A2(2000); IEC 61000-4-3, Ed. 3.0 (2006-02); IEC 61000-4-3, Ed. 3.2 (2010); KN 61000-4-3 (2008-5); RRL Notice No. 2008-4 (May 20, 2008); IEC 61000-4-3; EN 61000-4-3; KN 61000-4-3; IEEE C37.90.2 2004
Electrical Fast Transient/Burst	IEC 61000-4-4, Ed. 2.0 (2004-07); IEC 61000-4-4, Ed. 2.1 (2011); IEC 61000-4-4 (1995) + A1(2000) + A2(2001); KN 61000-4-4 (2008-5); RRL Notice No. 2008-5 (May 20, 2008); IEC 61000-4-4; EN 61000-4-4; KN 61000-4-4; ECE Regulation 10.06 Annex 15

Test Technology:	Test Method(s) [1]:
Immunity (cont'd)	
Surge	IEC 61000-4-5 (1995) + A1(2000); IEC 61000-4-5, Ed 1.1 (2005-11); EN 61000-4-5 (1995) + A1(2001); KN 61000-4-5 (2008-5); RRL Notice No. 2008-4 (May 20, 2008); IEC 61000-4-5; EN 61000-4-5; KN 61000-4-5; IEEE C37.90.1 2012; IEEE STD C62.41.2 2002; ECE Regulation 10.06 Annex 16
Conducted Immunity	IEC 61000-4-6 (1996) + A1(2000); IEC 61000-4-6, Ed 2.0 (2006-05); IEC 61000-4-6 Ed. 3.0 (2008); KN 61000-4-6 (2008-5); RRL Notice No. 2008-4 (May 20, 2008); EN 61000-4-6 (1996) + A1(2001); IEC 61000-4-6; EN 61000-4-6; KN 61000-4-6
Power Frequency Magnetic Field Immunity	IEC 61000-4-8 (1993) + A1(2000); IEC 61000-4-8 (2009); EN 61000-4-8 (1994) + A1(2000); KN 61000-4-8 (2008-5); RRL Notice No. 2008-4 (May 20, 2008); IEC 61000-4-8; EN 61000-4-8; KN 61000-4-8
Voltage Dips, Short Interrupts, and Line Voltage Variations	IEC 61000-4-11, Ed. 2 (2004-03); KN 61000-4-11 (2008-5); RRL Notice No. 2008-4 (May 20, 2008); IEC 61000-4-11; EN 61000-4-11; KN 61000-4-11
Ring Wave	IEC 61000-4-12, Ed. 2 (2006-09); EN 61000-4-12:2006; IEC 61000-4-12; EN 61000-4-12; KN 61000-4-12; IEEE STD C62.41.2 2002
Generic and Product Specific EMC Standards	IEC/EN 61000-6-1; AS/NZS 61000-6-1; KN 61000-6-1; IEC/EN 61000-6-2; AS/NZS 61000-6-2; KN 61000-6-2; IEC/EN 61000-6-3; AS/NZS 61000-6-3; KN 61000-6-3; IEC/EN 61000-6-4; AS/NZS 61000-6-4; KN 61000-6-4; EN 50130-4; EN 61326-1; IEC/CISPR 14-2; EN 55014-2; AS/NZS CISPR 14.2; KN 14-2; IEC/CISPR 24; AS/NZS CISPR 24; EN 55024; KN 24; IEC 60601-1-2; JIS T0601-1-2
TxRx EMC Requirements	EN 301 489-1; EN 301 489-3; EN 301 489-9; EN 301 489-17; EN 301 489-19
European Radio Test Standards	ETSI EN 300 086-1; ETSI EN 300 086-2; ETSI EN 300 113-1; ETSI EN 300 113-2; ETSI EN 300 220-1; ETSI EN 300 220-2; ETSI EN 300 330-1; ETSI EN 300 330-2; ETSI EN 300 440-1; ETSI EN 300 440-2; ETSI EN 300 422-1; ETSI EN 300 422-2;

Test Technology:	Test Method(s) [1]:
European Radio Test Standards (cont'd)	ETSI EN 300 328; ETSI EN 301 893; ETSI EN 301 511; ETSI EN 301 908-1; ETSI EN 908-2; ETSI EN 908-13; ETSI EN 303 413; ETSI EN 302 502
Canadian Radio Tests	RSS-102 (RF Exposure Evaluation only); RSS-111; RSS-112; RSS-117; RSS-119; RSS-123; RSS-125; RSS-127; RSS-130; RSS-131; RSS-132; RSS-133; RSS-134; RSS-135; RSS-137; RSS-139; RSS-140; RSS-141; RSS-142; RSS-170; RSS-181; RSS-182; RSS-191; RSS-192; RSS-194; RSS-195; RSS-196; RSS-197; RSS-199; RSS-210; RSS-211; RSS-213; RSS-215; RSS-216; RSS-220; RSS-222; RSS-236; RSS-238; RSS-243; RSS-244; RSS-247; RSS-251; RSS-252; RSS-287; RSS-288; RSS-310; RSS-GEN
Mexico Radio Tests	IFT-008-2015; NOM-208-SCFI-2016
Japan Radio Tests	Radio Law No. 131, Ordinance of MPT No. 37, 1981, MIC Notification No. 88:2004, Table No. 22-11; ARIB STD-T66, Regulation 18
Taiwan Radio Tests	LP-0002
Australia/New Zealand Radio Tests	AS/NZS 4268; Radiocommunications (Short Range Devices) Standard (2014)
Hong Kong Radio Tests	HKCA 1039 Issue 6; HKCA 1042; HKCA 1033 Issue 7; HKCA 1061; HKCA 1008; HKCA 1043; HKCA 1057; HKCA 1073
Korean Radio Test Standards	KN 301 489-1; KN 301 489-3; KN 301 489-9; KN 301 489-17; KN 301 489-52
Unlicensed Radio Frequency Devices *(3 Meter Semi-Anechoic Room)*	47 CFR FCC Part 15C, 15D, 15E, 15F, 15G, 15H (using ANSI C63.10:2013, ANSI C63.17:2013 and FCC KDB 905462 D02 (v02))
Licensed Radio Service Equipment	47 CFR FCC Parts 20, 22, 24, 25, 27, 30, 73, 74, 80, 87, 90, 95, 96, 97, 101; ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015;
OTA (Over the Air) Performance GSM, GPRS, EGPRS UMTS (W-CDMA) LTE including CAT M1 A-GPS for UMTS/GSM LTS A-GPS, A-GLONASS, SIB8/SIB16 Large Device/Laptop/Tablet Testing Integrated Device Testing WiFi 802.11 a/b/g/n/a	CTIA Test Plan for Wireless Device Over-the-Air Performance (Method for Measurement for Radiated Power and Receiver Performance) V3.8.2; CTIA Test Plan for RF Performance Evaluation of WiFi Mobile Converged Devices V2.1.0

Test Technology:	Test Method(s) [1]:
Electrical Measurements and Simulation	
AC Voltage / Current	FAA AC 150/5345-10H
(1mV to 5kV) 60 Hz	FAA AC 150/5345-43J
(0.1V to 250V) up to 500 MHz	FAA AC 150/5345-44K
(1µA to 150A) 60 Hz	FAA AC 150/5345-46E
DC Voltage / Current	FAA AC 150/5345-47C
(1mV to 15kV) / (1µA to 10A)	FAA EB 67D
Power Factor / Efficiency / Crest Factor	
(Power to 30kW)	
Resistance	
(1mΩ to 4000MΩ)	
Surge	
(Up to 10 kV / 5 kA) (Combination Wave and Ring Wave)	

On the following products and materials:
Telecommunications Terminal Equipment (TTE), Radio Equipment, Network Equipment, Information Technology Equipment (ITE), Automotive Electronic Equipment, Automotive Hybrid Electronic Devices, Maritime Navigation and Radio Communication Equipment and Systems, Vehicles, Boats and Internal Combustion Engine Driven Devices, Automotive, Aviation, and General Lighting Products, Medical Electrical Equipment, Motors, Industrial, Scientific and Medical (ISM) Radio-Frequency Equipment, Household Appliances, Electric Tools, Low-voltage Switchgear and Control gear, Programmable Controllers, Electrical Equipment for Measurement, Control and Laboratory Use, Base Materials, Power and Data Transmission Cables and Connectors

[1] When the date, revision or edition of a test method standard is not identified on the scope of accreditation, the laboratory is expected to be using the current version within one year of the date of publication, per part C., Section 1 of A2LA *R101 - General Requirements - Accreditation of ISO-IEC 17025 Laboratories*.

Testing Activities Performed in Support of FCC Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1[2]

Rule Subpart/Technology	Test Method	Maximum Frequency (MHz)
Unintentional Radiators Part 15B	ANSI C63.4:2014	40000
Industrial, Scientific, and Medical Equipment Part 18	FCC MP-5 (February 1986)	40000
Intentional Radiators Part 15C	ANSI C63.10:2013	40000
Unlicensed Personal Communication Systems Devices Part 15D	ANSI C63.17:2013	40000

Testing Activities Performed in Support of FCC Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1[2]

Rule Subpart/Technology	Test Method	Maximum Frequency (MHz)
U-NII without DFS Intentional Radiators Part 15E	ANSI C63.10:2013	40000
U-NII with DFS Intentional Radiators Part 15E	FCC KDB 905462 D02 (v02)	40000
UWB Intentional Radiators Part 15F	ANSI C63.10:2013	40000
BPL Intentional Radiators Part 15G	ANSI C63.10:2013	40000
White Space Device Intentional Radiators Part 15H	ANSI C63.10:2013	40000
Commercial Mobile Services (FCC Licensed Radio Service Equipment) Parts 22 (cellular), 24, 25 (below 3 GHz), and 27	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
General Mobile Radio Services (FCC Licensed Radio Service Equipment) Parts 22 (non-cellular), 90 (below 3 GHz), 95, 97, and 101 (below 3 GHz)	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
Citizens Broadband Radio Services (FCC Licensed Radio Service Equipment) Part 96	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
Maritime and Aviation Radio Services Parts 80 and 87	ANSI/TIA-603-E; ANSI C63.26:2015	40000
Microwave and Millimeter Bands Radio Services Parts 25, 30, 74, 90 (above 3 GHz), 97 (above 3 GHz), and 101	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
Broadcast Radio Services Parts 73 and 74 (below 3 GHz)	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000

Testing Activities Performed in Support of FCC Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1[2]

Rule Subpart/Technology	Test Method	Maximum Frequency (MHz)
Signal Boosters Part 20 (Wideband Consumer Signal Boosters, Provider-specific signal boosters, and Industrial Signal Boosters) Section 90.219	ANSI C63.26:2015	40000

[2]Accreditation does not imply acceptance to the FCC equipment authorization program. Please see the FCC website (https://apps.fcc.gov/oetcf/eas/) for a listing of FCC approved laboratories.

Accredited Laboratory

A2LA has accredited

ELITE ELECTRONIC ENGINEERING INC.

Downers Grove, IL

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories.* This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).

Presented this 8th day of August 2019.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 1786.01
Valid to June 30, 2021

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.