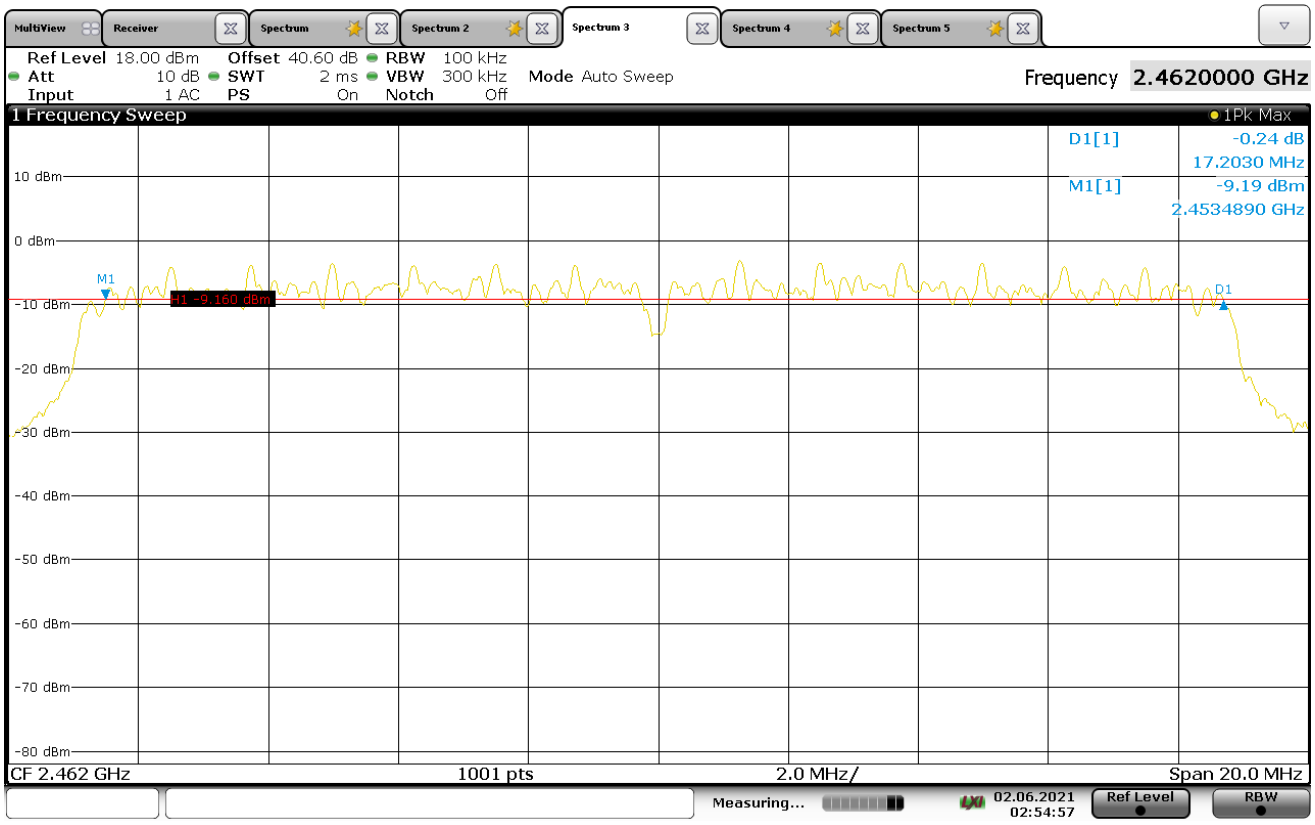
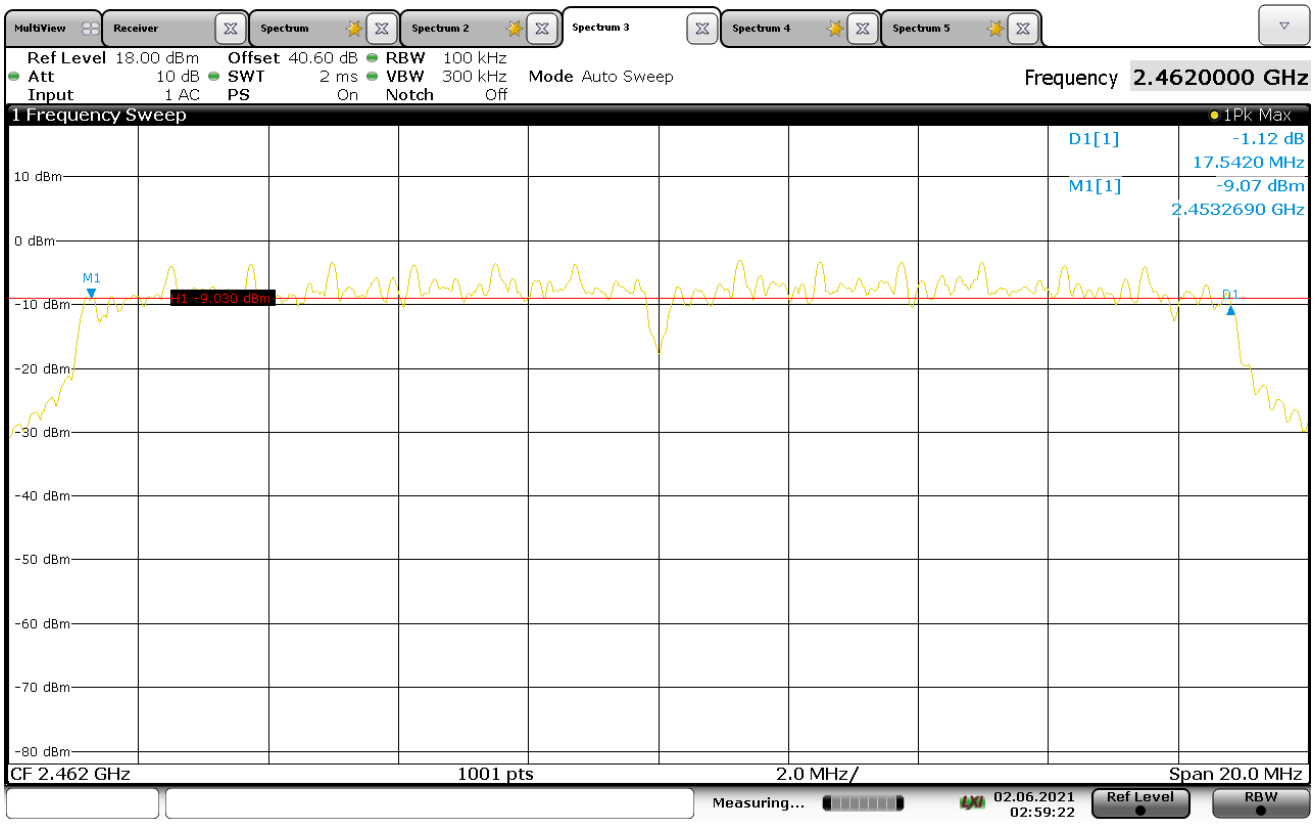
Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS6
Carrier Frequency	2462MHz
Parameters	6dB BW
Notes	6dB BW = 17.20MHz



02:54:57 02.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS7
Carrier Frequency	2462MHz
Parameters	6dB BW
Notes	6dB BW = 17.54MHz



02:59:22 02.06.2021

24. Occupied Bandwidth (99%)

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

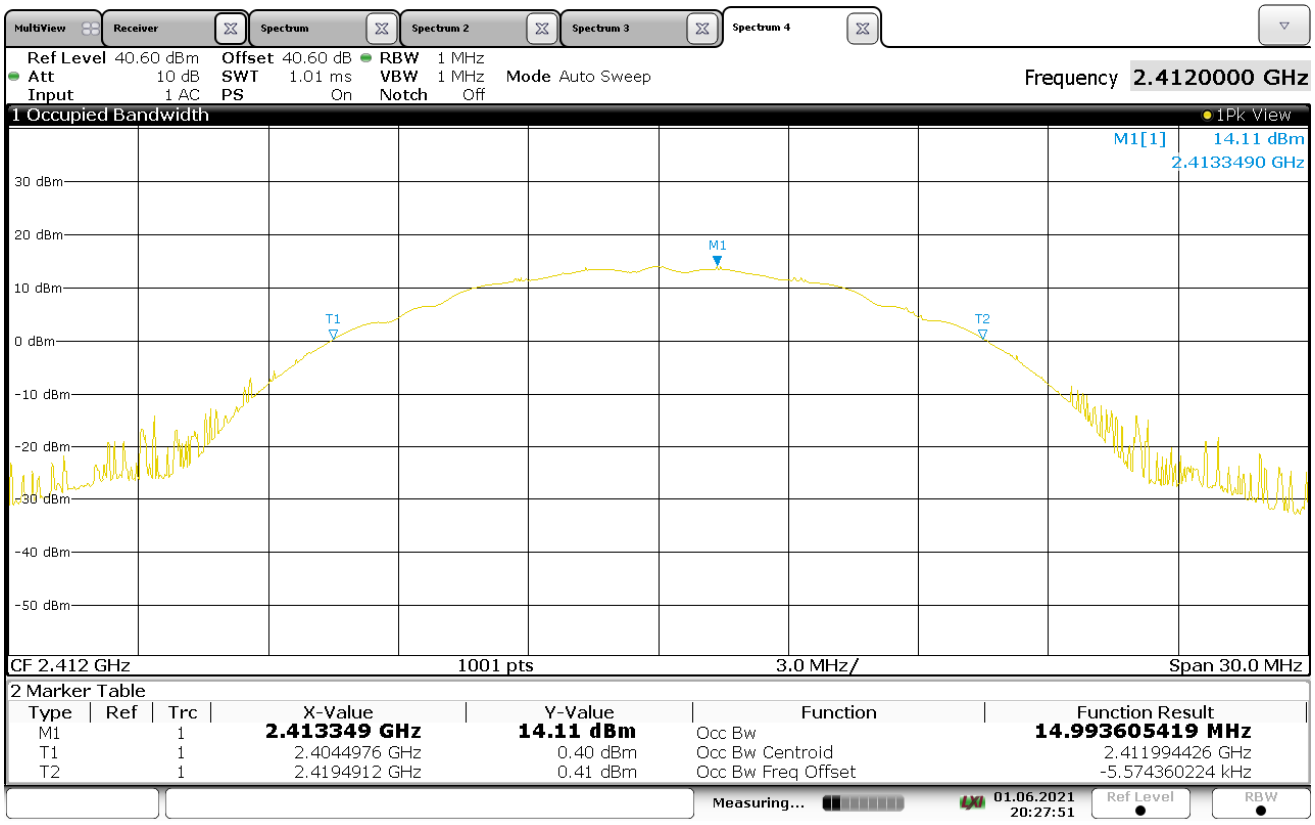
Test Setup Details	
Setup Format	Tabletop
Measurement Method	Antenna Conducted
Notes	N/A

Procedures
The antenna port of the EUT was connected to the spectrum analyzer through 40dB of attenuation. The EUT was allowed to transmit continuously. The transmit channel was set separately to low, middle, and high channels. The resolution bandwidth (RBW) was set to 1% to 5% of the actual occupied bandwidth, the video bandwidth (VBW) was set 3 times greater than the RBW, and the span was set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency. The 'Max-Hold' function was engaged. The analyzer was allowed to scan until the envelope of the transmitter bandwidth was defined. The analyzer's display was plotted using a 'screen dump' utility.

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b
Notes	N/A

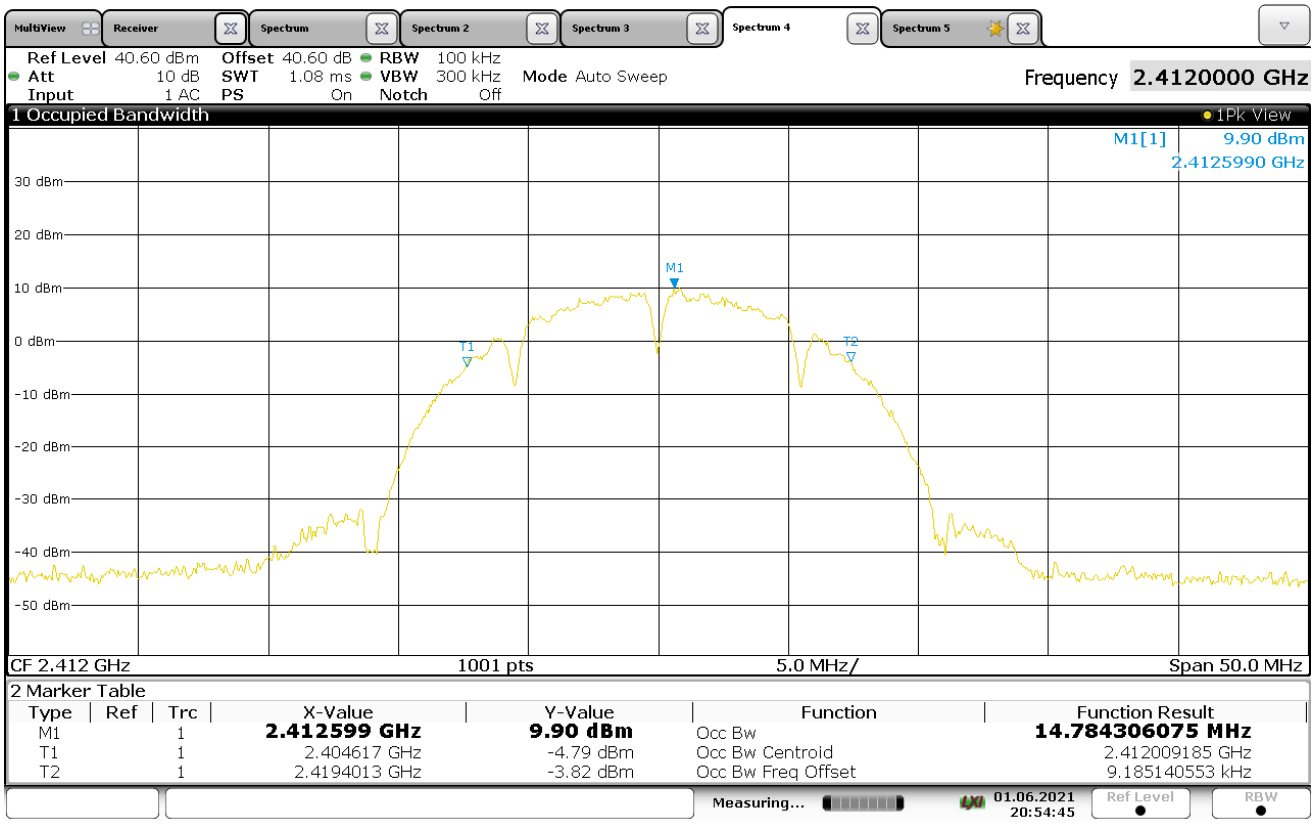
Protocol	Freq. (MHz)	Data Rate (Mbps)	99% BW (MHz)
802.11b	2412	1	14.99
	2437		14.87
	2462		14.86
	2412	2	14.78
	2437		14.74
	2462		14.72
	2412	5.5	14.53
	2437		14.59
	2462		14.51
	2412	11	14.58
	2437		14.57
	2462		14.59

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b – 1Mbps
Carrier Frequency	2412MHz
Parameters	99% BW
Notes	99% BW = 14.99MHz



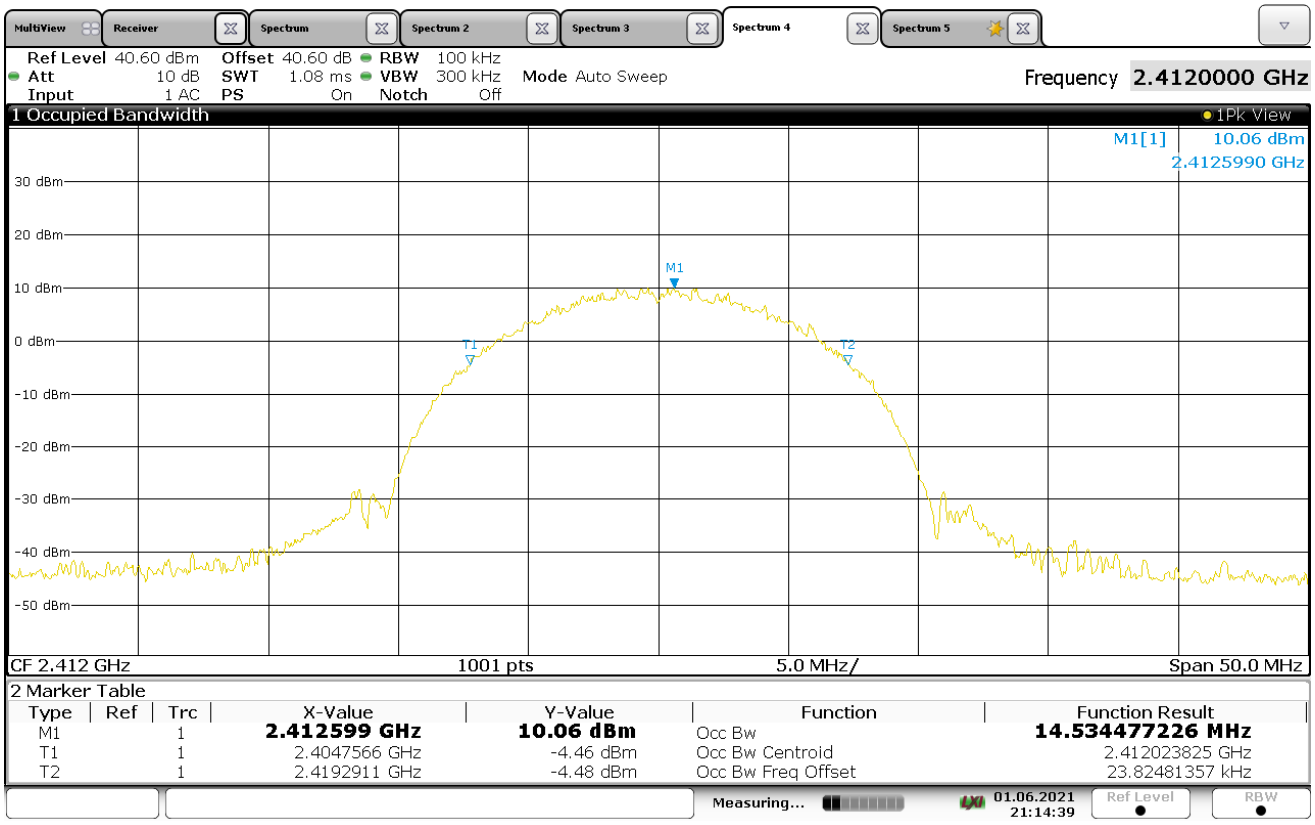
20:27:51 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b – 2Mbps
Carrier Frequency	2412MHz
Parameters	99% BW
Notes	99% BW = 14.78MHz



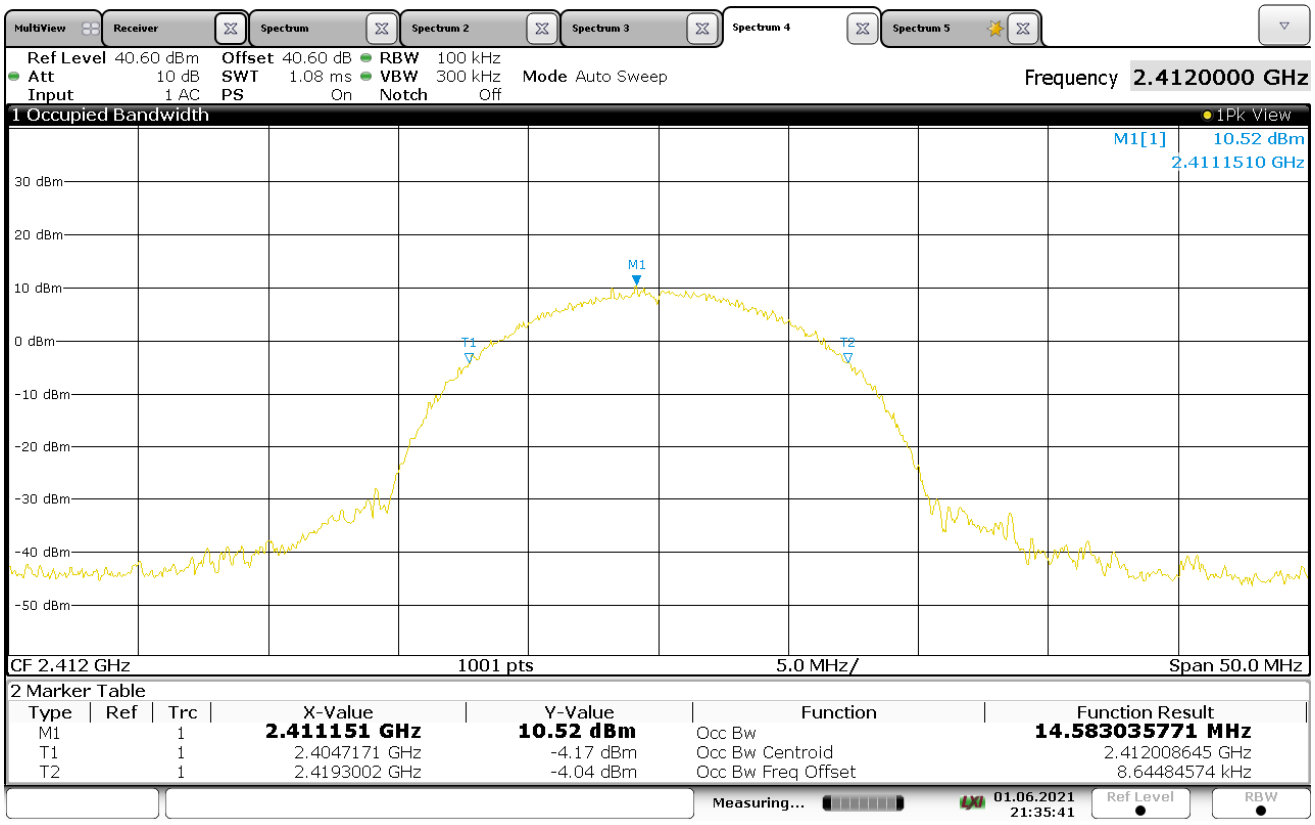
20:54:45 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b – 5.5Mbps
Carrier Frequency	2412MHz
Parameters	99% BW
Notes	99% BW = 14.53MHz



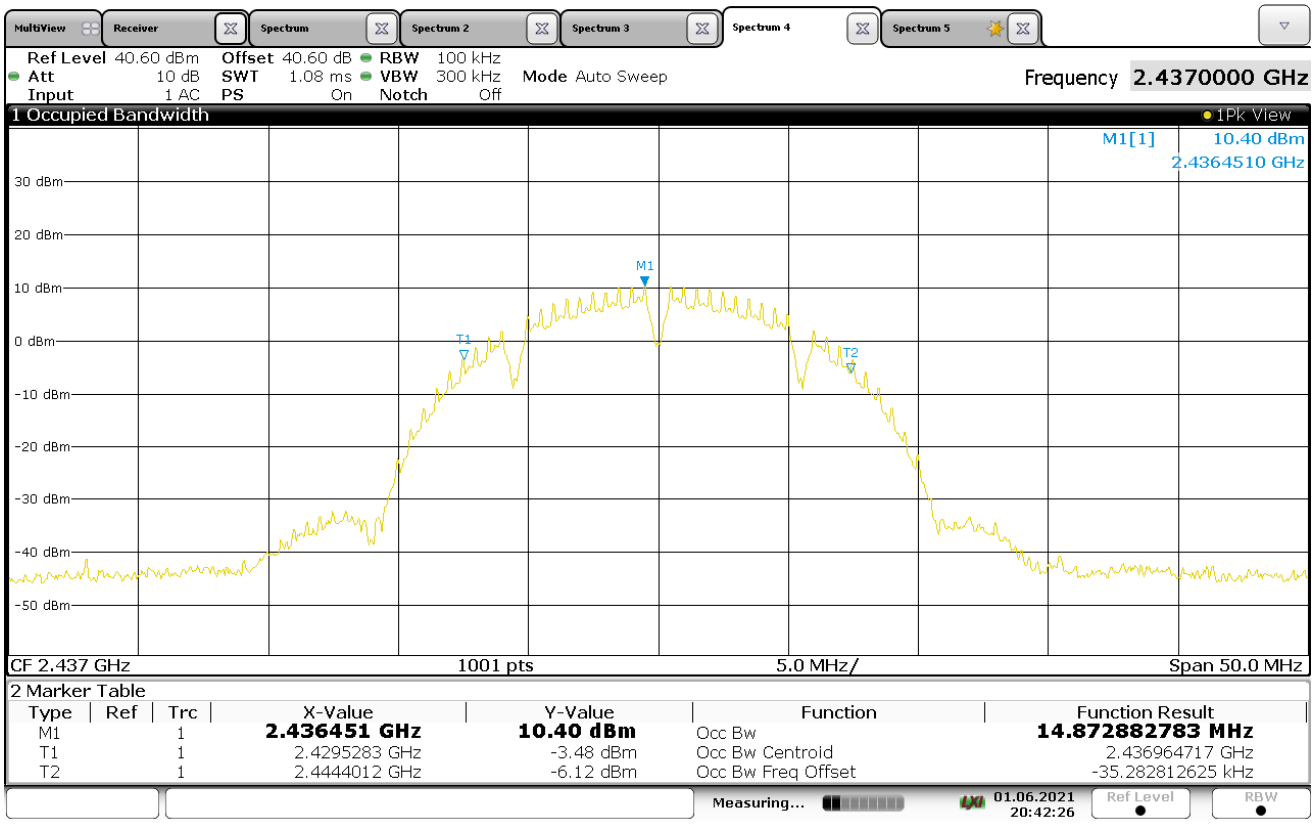
21:14:40 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b – 11Mbps
Carrier Frequency	2412MHz
Parameters	99% BW
Notes	99% BW = 14.58MHz



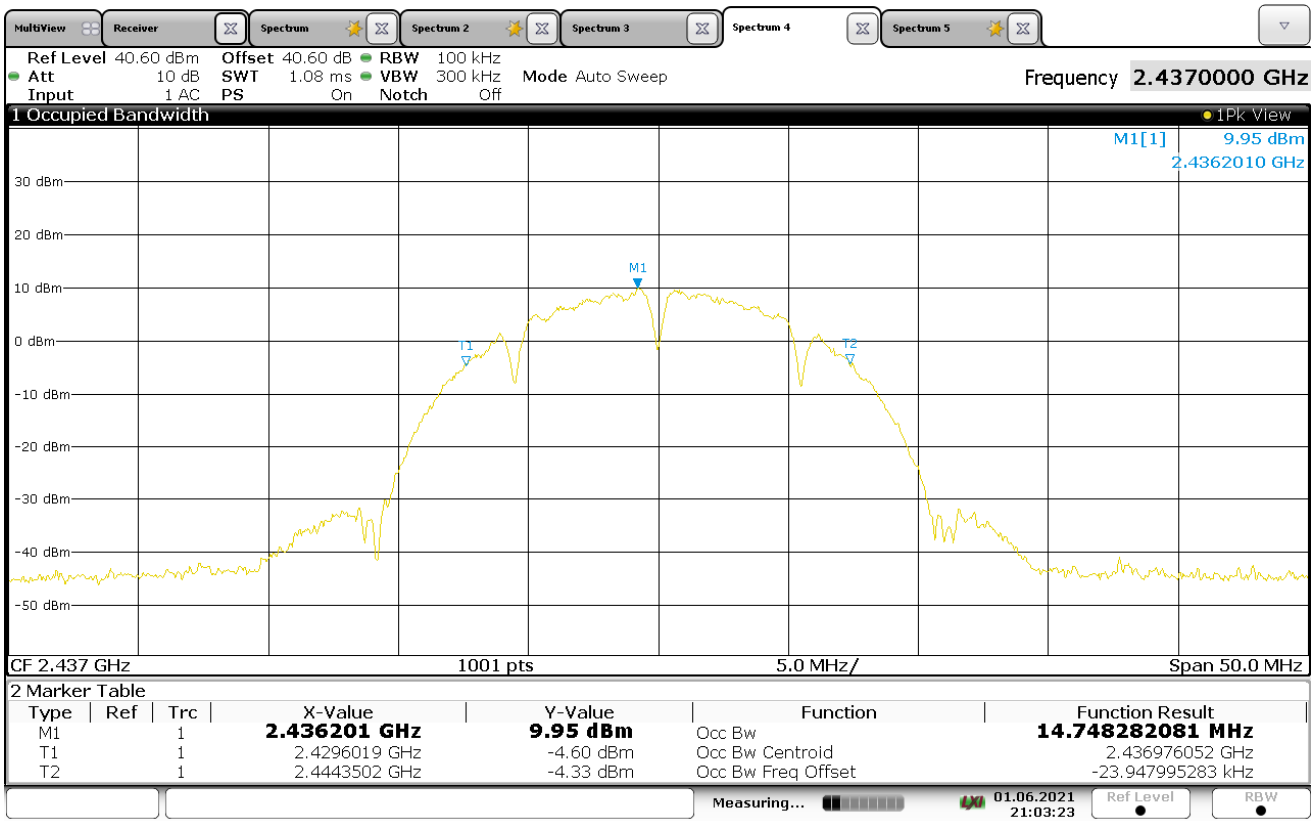
21:35:41 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b – 1Mbps
Carrier Frequency	2437MHz
Parameters	99% BW
Notes	99% BW = 14.87MHz



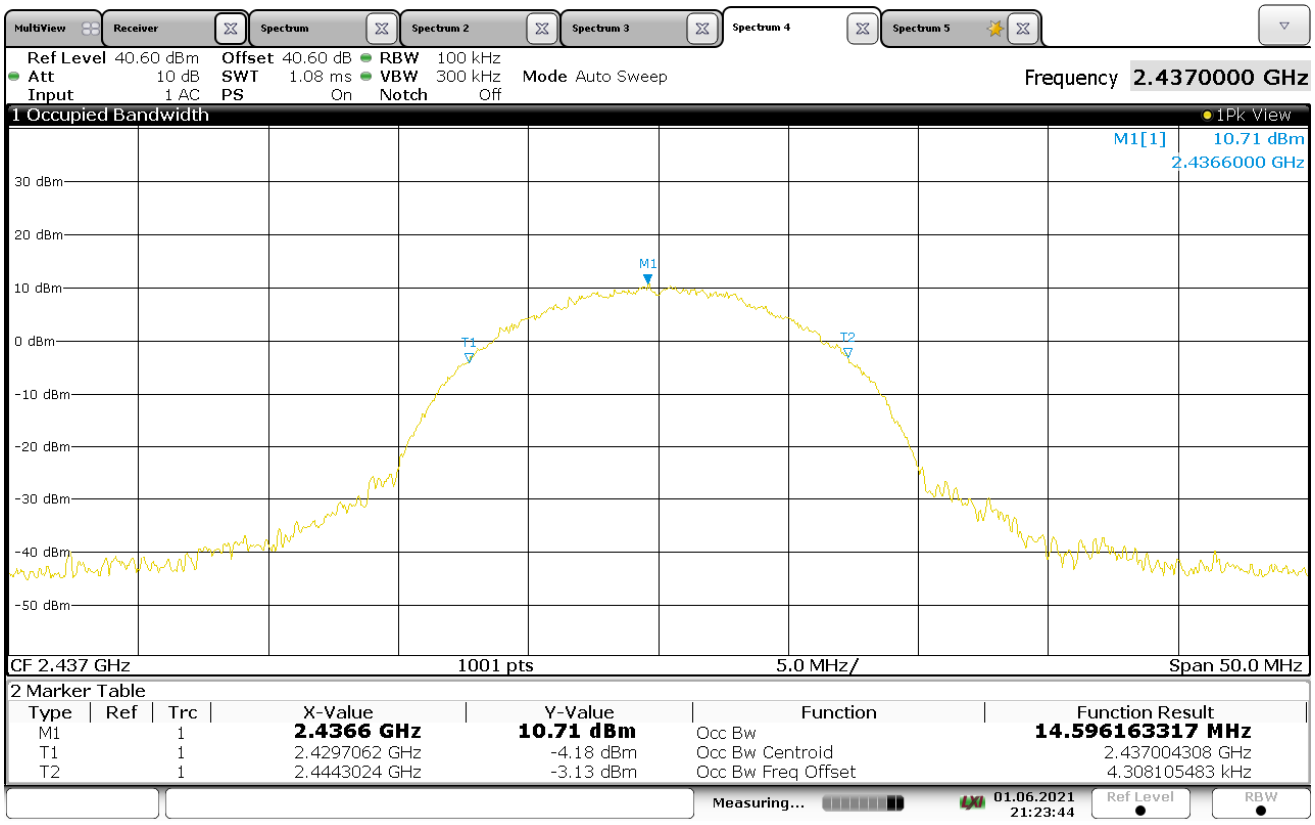
20:42:26 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b – 2Mbps
Carrier Frequency	2437MHz
Parameters	99% BW
Notes	99% BW = 14.74MHz



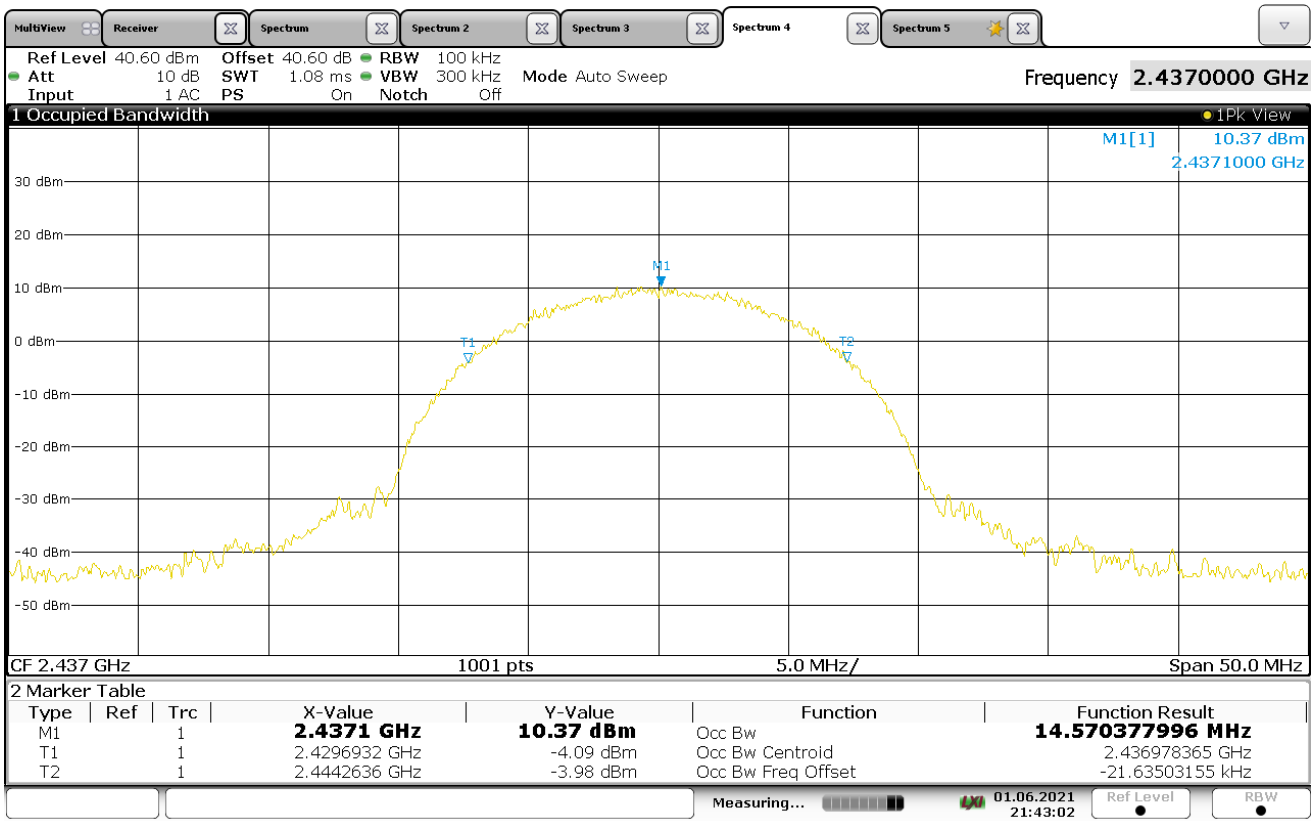
21:03:24 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b – 5.5Mbps
Carrier Frequency	2437MHz
Parameters	99% BW
Notes	99% BW = 14.59MHz



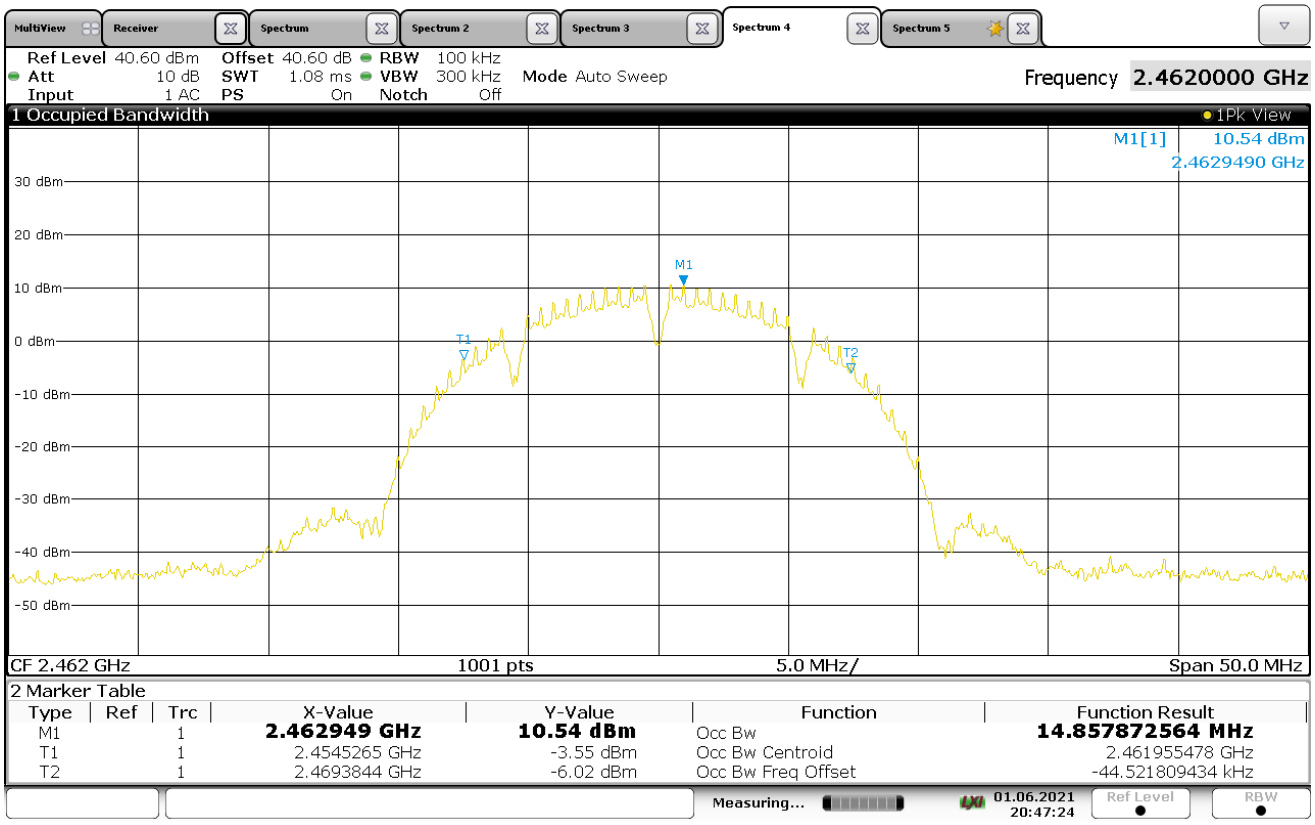
21:23:45 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b – 11Mbps
Carrier Frequency	2437MHz
Parameters	99% BW
Notes	99% BW = 14.57MHz



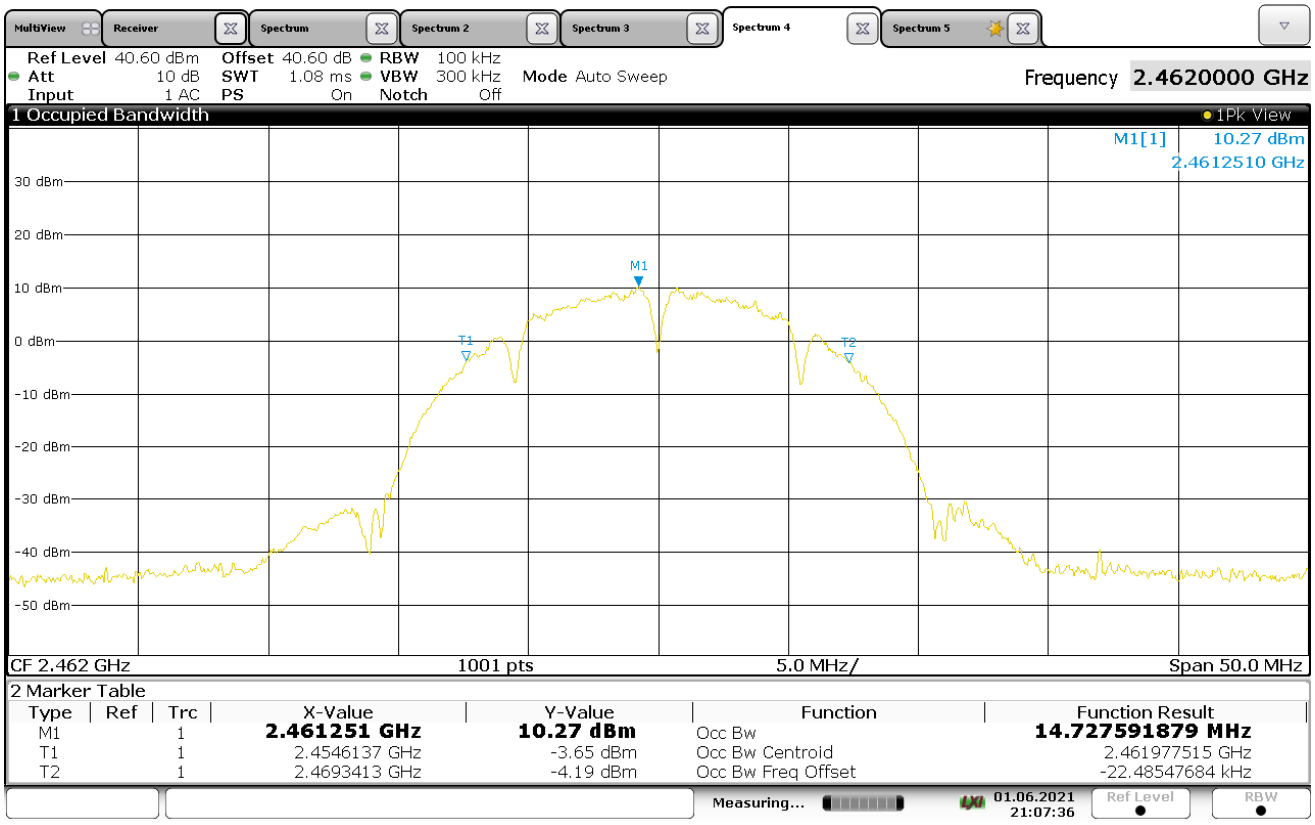
21:43:02 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b – 1Mbps
Carrier Frequency	2462MHz
Parameters	99% BW
Notes	99% BW = 14.85MHz



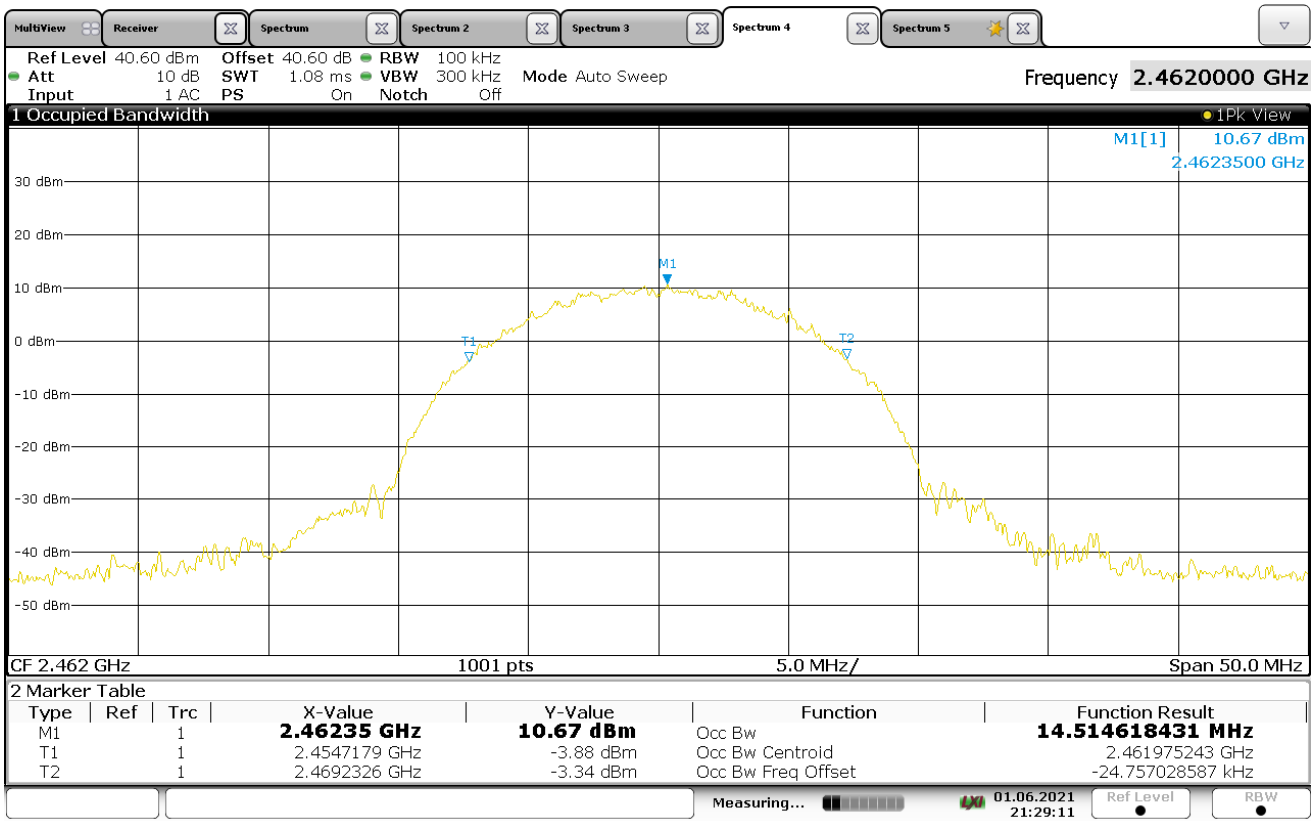
20:47:25 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b – 2Mbps
Carrier Frequency	2462MHz
Parameters	99% BW
Notes	99% BW = 14.72MHz



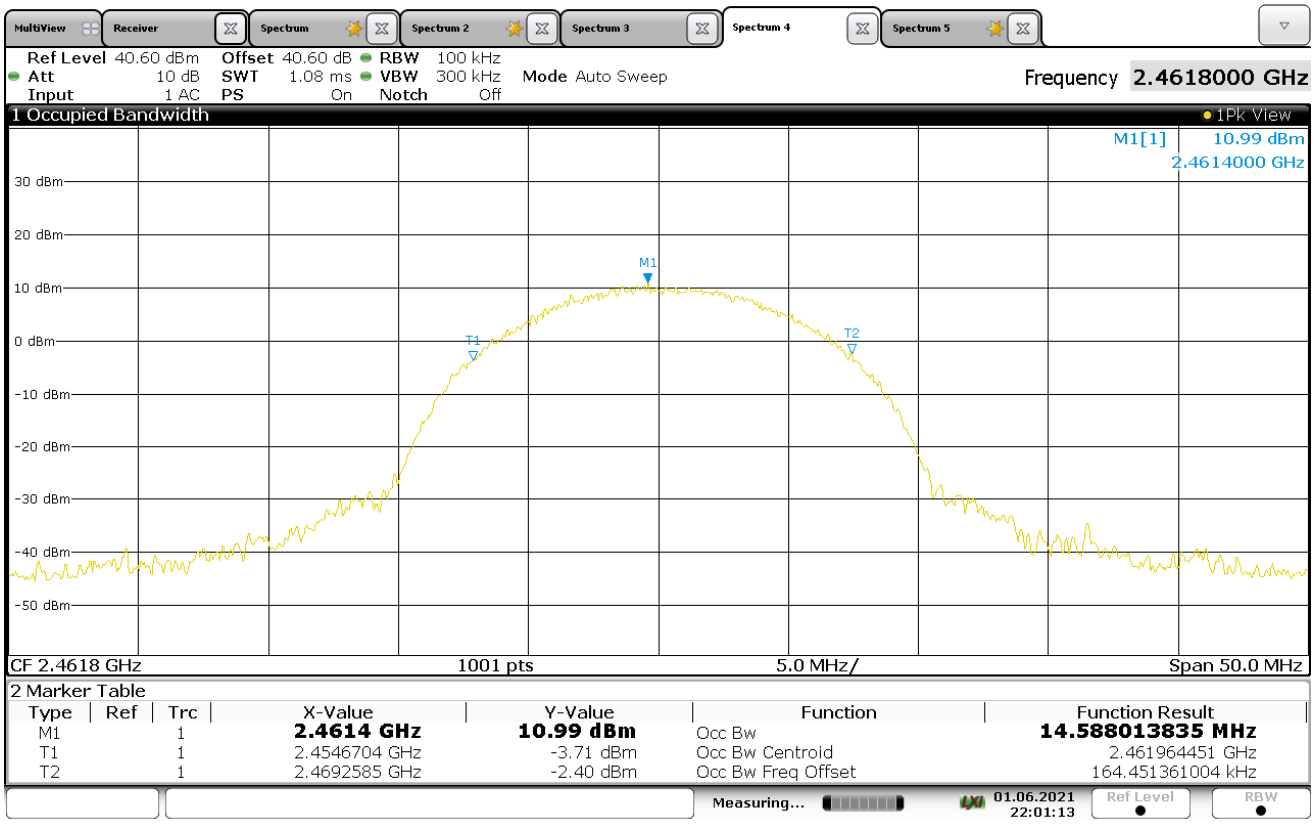
21:07:36 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b – 5.5Mbps
Carrier Frequency	2462MHz
Parameters	99% BW
Notes	99% BW = 14.51MHz



21:29:12 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b – 11Mbps
Carrier Frequency	2462MHz
Parameters	99% BW
Notes	99% BW = 14.58MHz

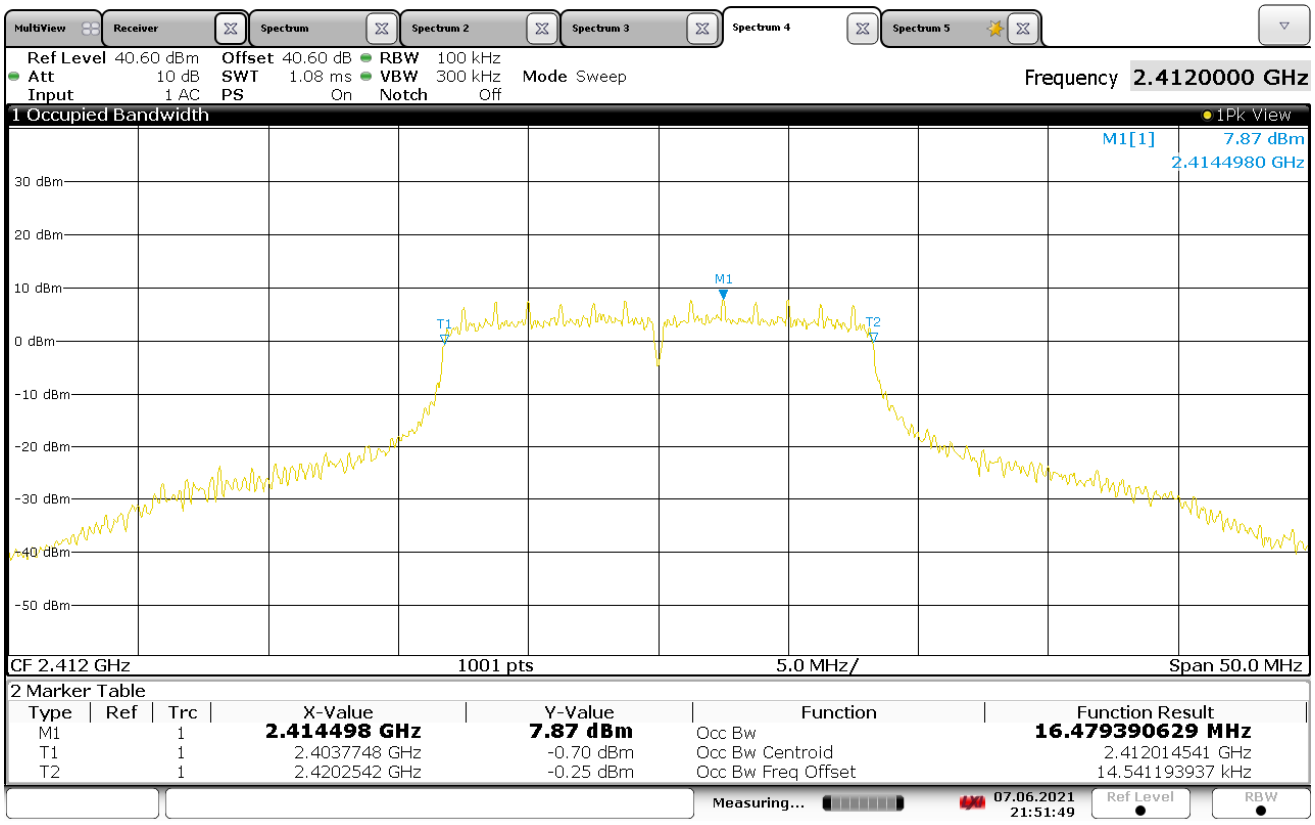


22:01:13 01.06.2021

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g
Notes	

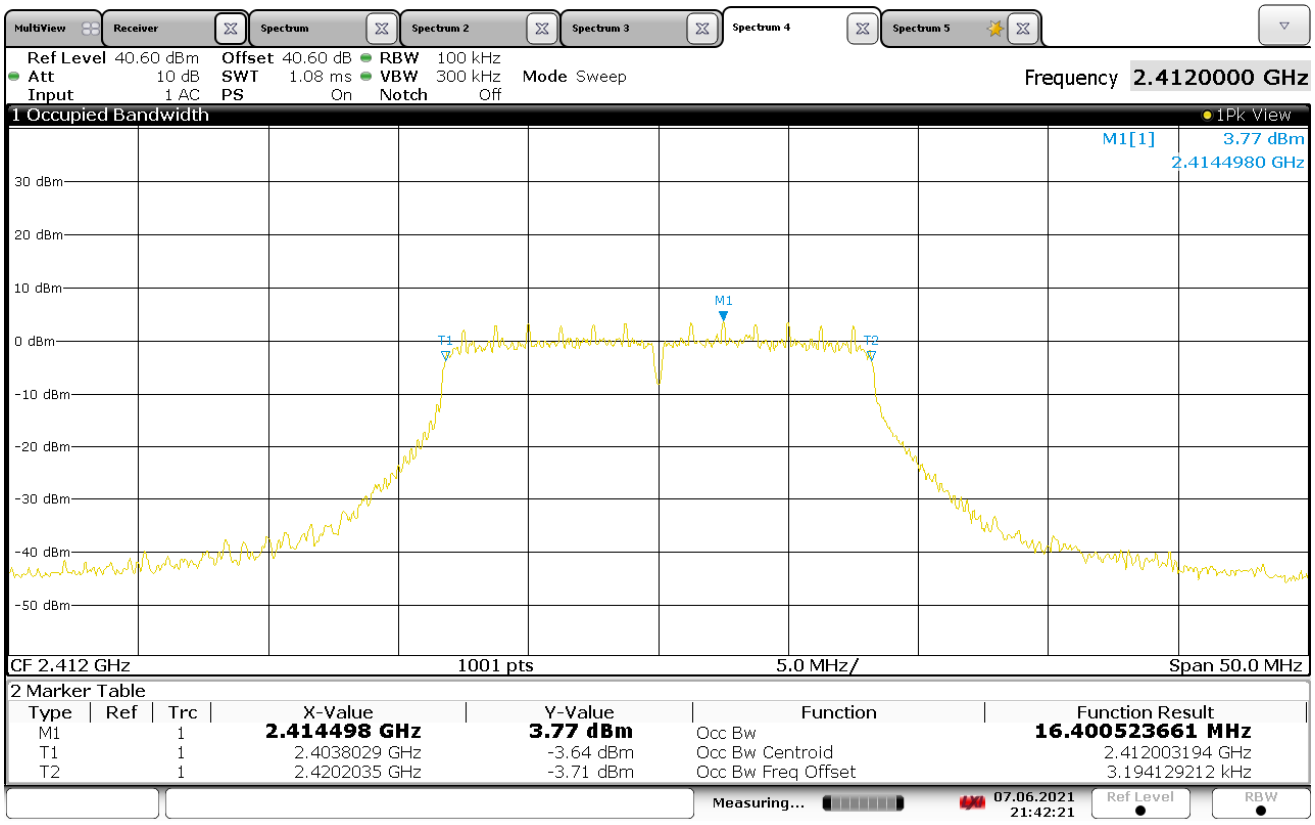
Protocol	Freq. (MHz)	Data Rate (Mbps)	99% BW (MHz)
802.11g	2412	6	16.48
	2437		16.51
	2462		16.5
	2412	9	16.4
	2437		16.4
	2462		16.4
	2412	12	16.44
	2437		16.44
	2462		16.44
	2412	18	16.44
	2437		16.45
	2462		16.45
	2412	24	16.43
	2437		16.43
	2462		16.44
	2412	36	16.41
	2437		16.45
	2462		16.43
	2412	48	16.43
	2437		16.42
	2462		16.4
	2412	54	16.44
	2437		16.39
	2462		16.39

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 6Mbps
Carrier Frequency	2412MHz
Parameters	99% BW
Notes	99% BW = 16.47MHz



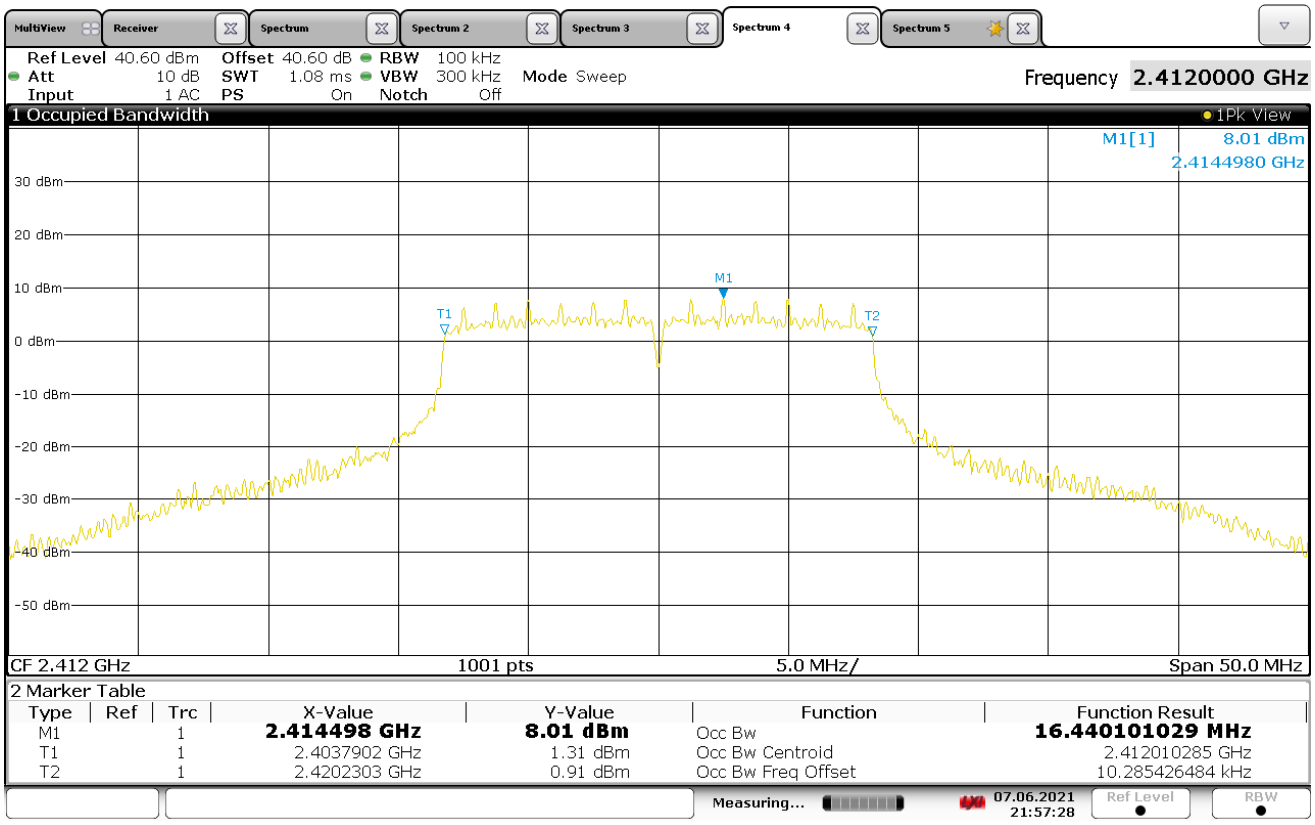
21:51:49 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 9Mbps
Carrier Frequency	2412MHz
Parameters	99% BW
Notes	99% BW = 16.40MHz



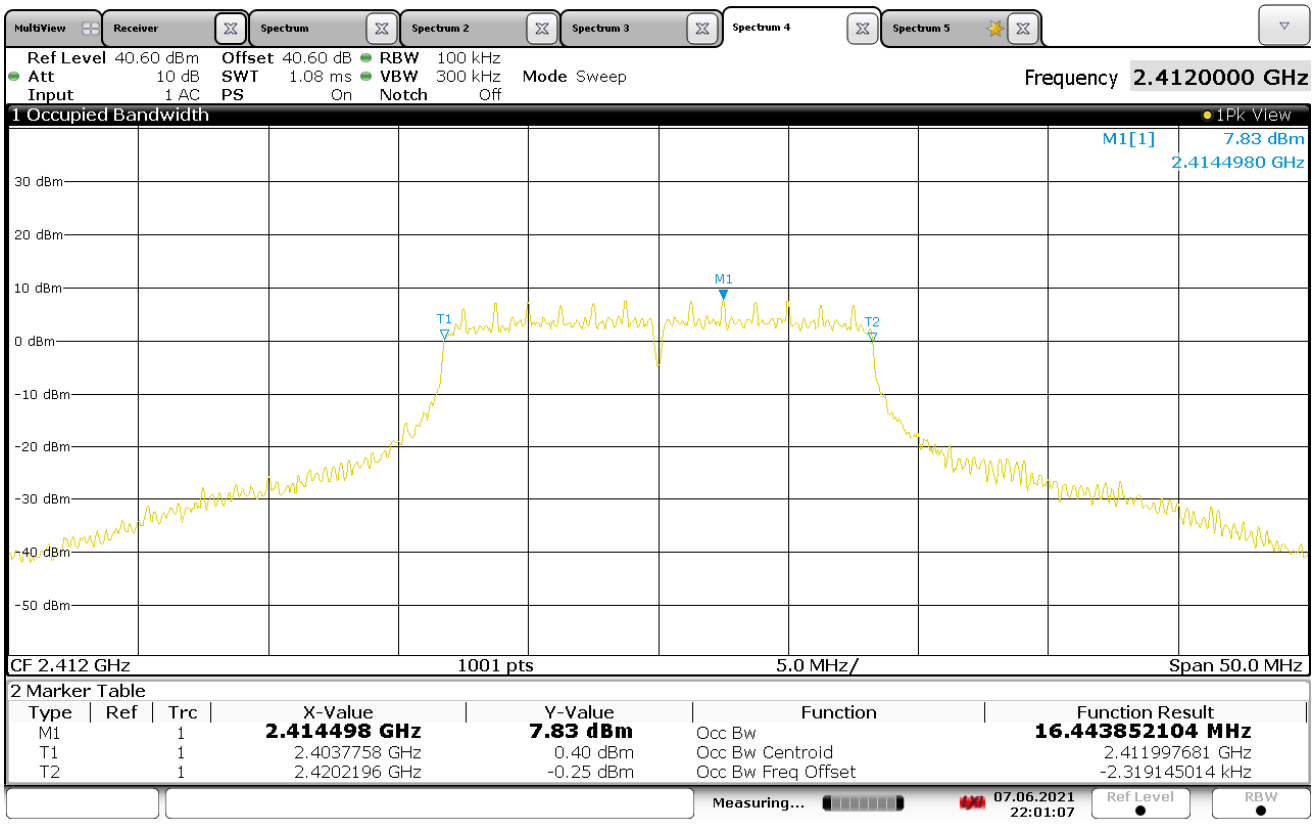
21:42:21 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 12Mbps
Carrier Frequency	2412MHz
Parameters	99% BW
Notes	99% BW = 16.44MHz



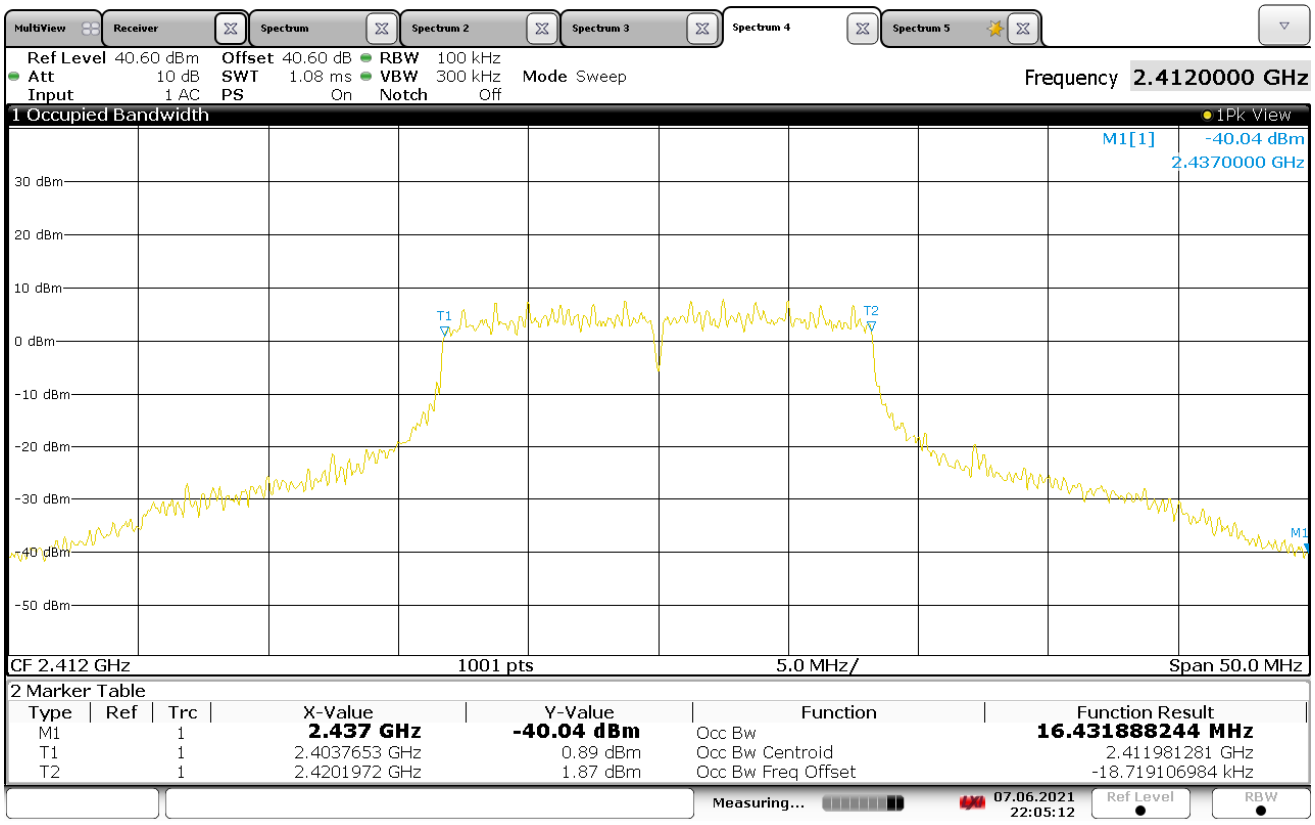
21:57:29 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 18Mbps
Carrier Frequency	2412MHz
Parameters	99% BW
Notes	99% BW = 16.44MHz



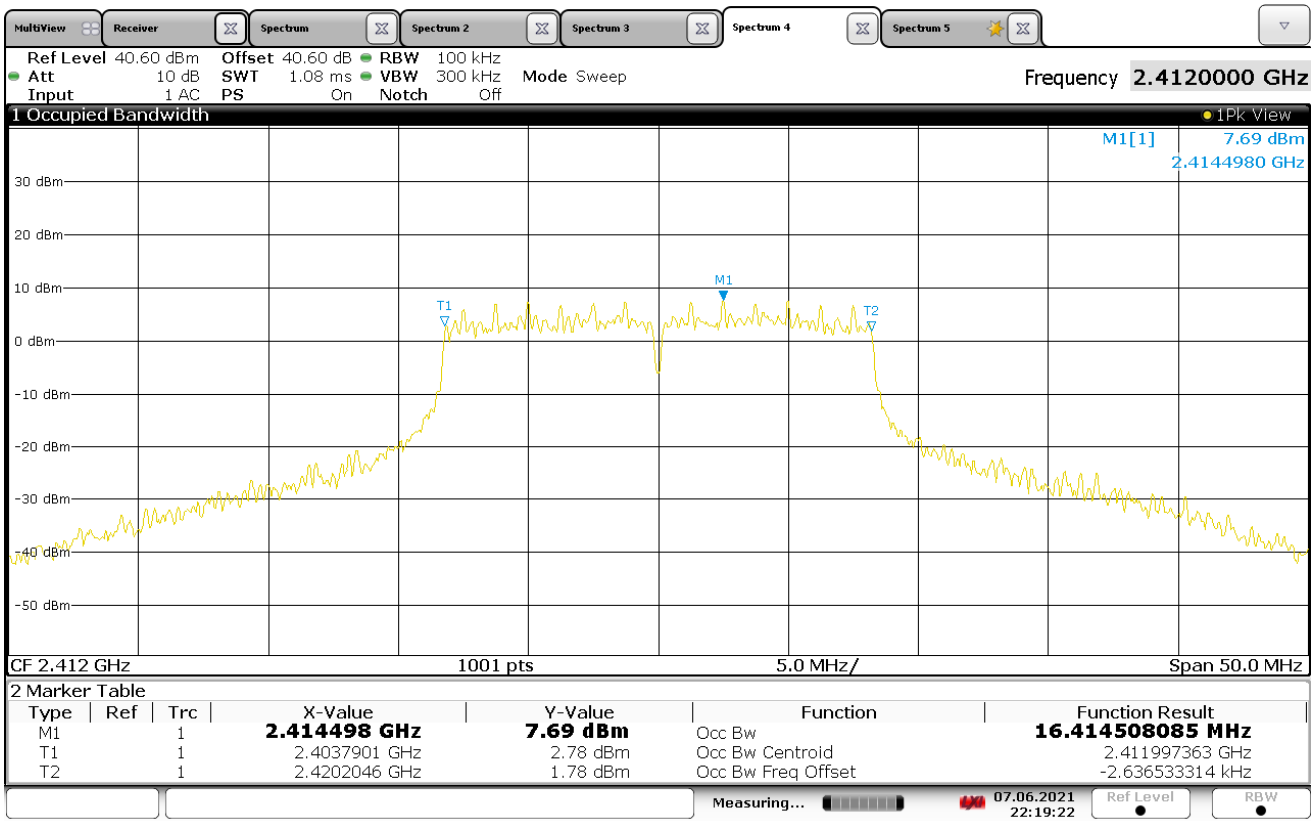
22:01:08 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 24Mbps
Carrier Frequency	2412MHz
Parameters	99% BW
Notes	99% BW = 16.43MHz



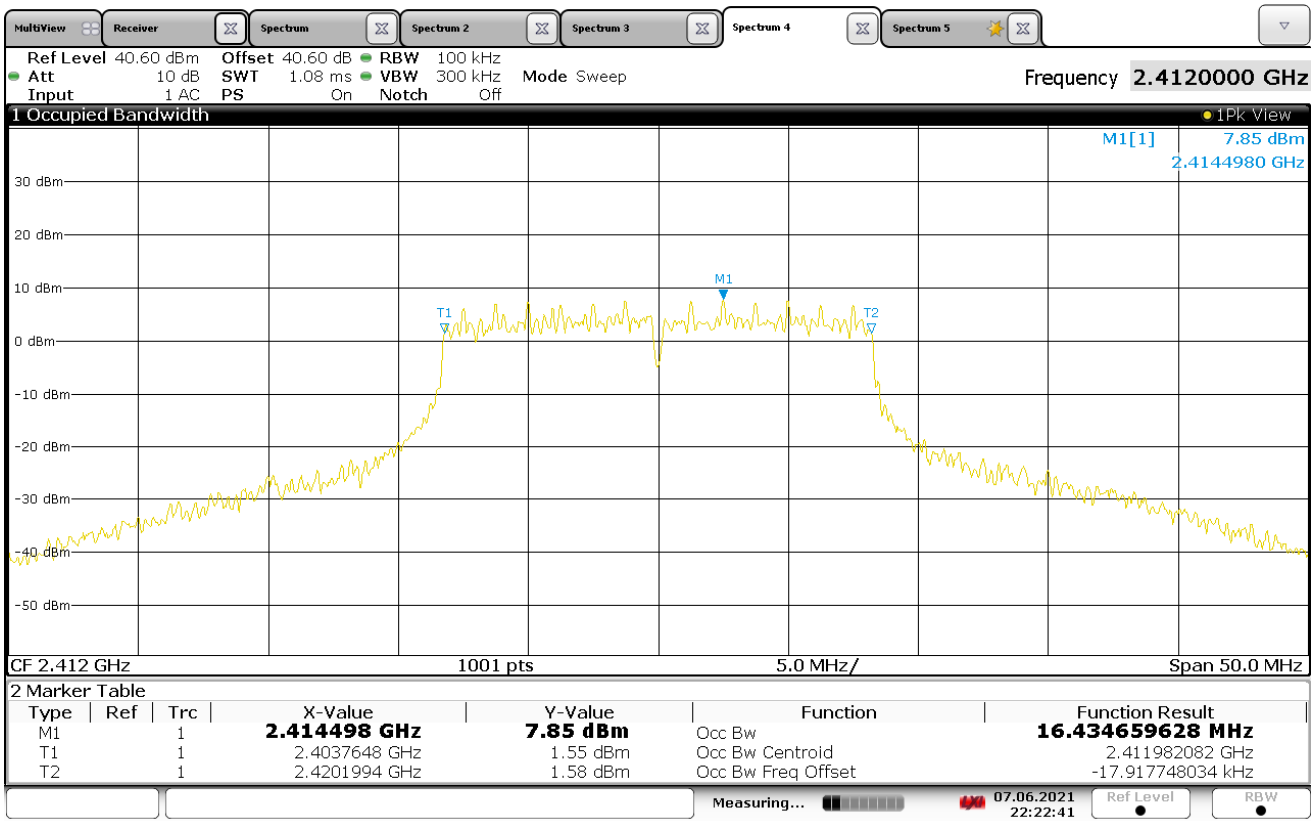
22:05:12 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 36Mbps
Carrier Frequency	2412MHz
Parameters	99% BW
Notes	99% BW = 16.41MHz



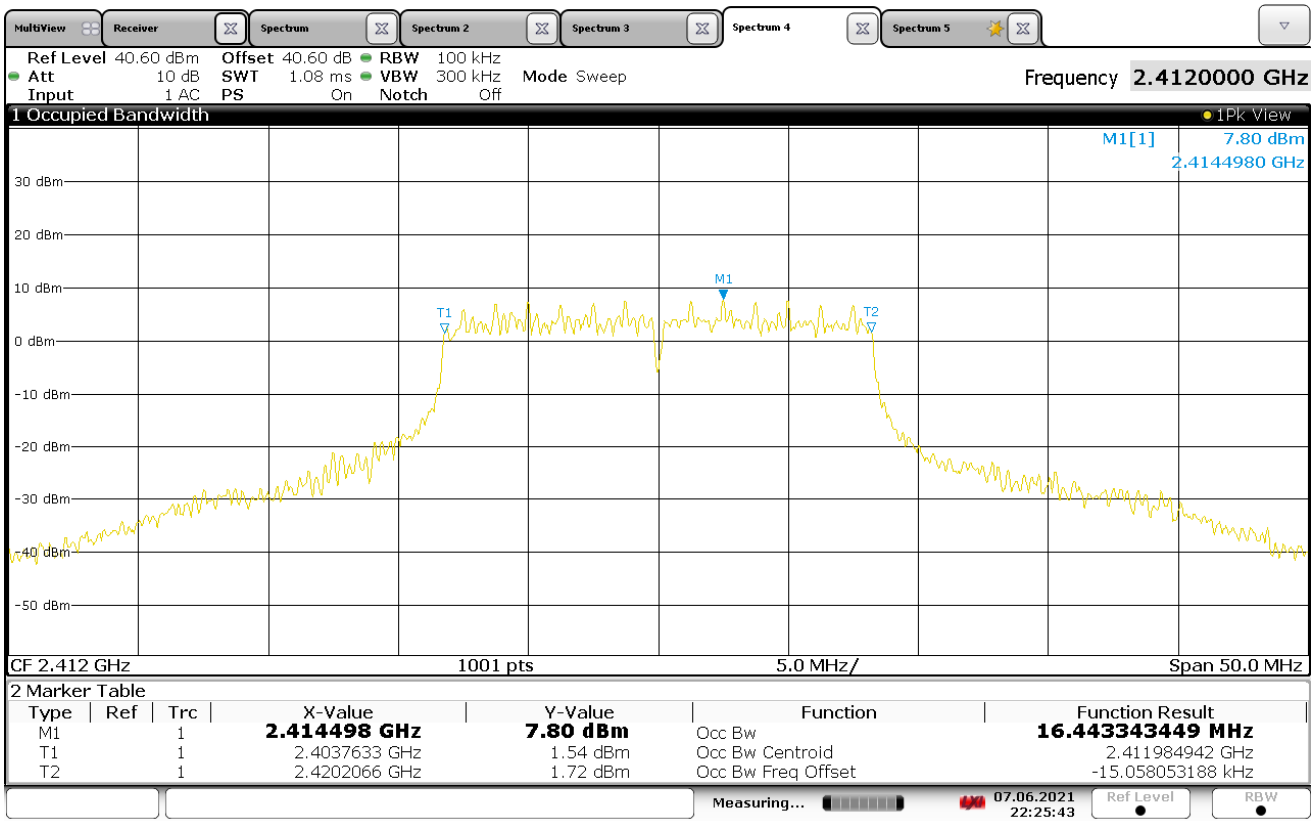
22:19:23 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 48Mbps
Carrier Frequency	2412MHz
Parameters	99% BW
Notes	99% BW = 16.43MHz



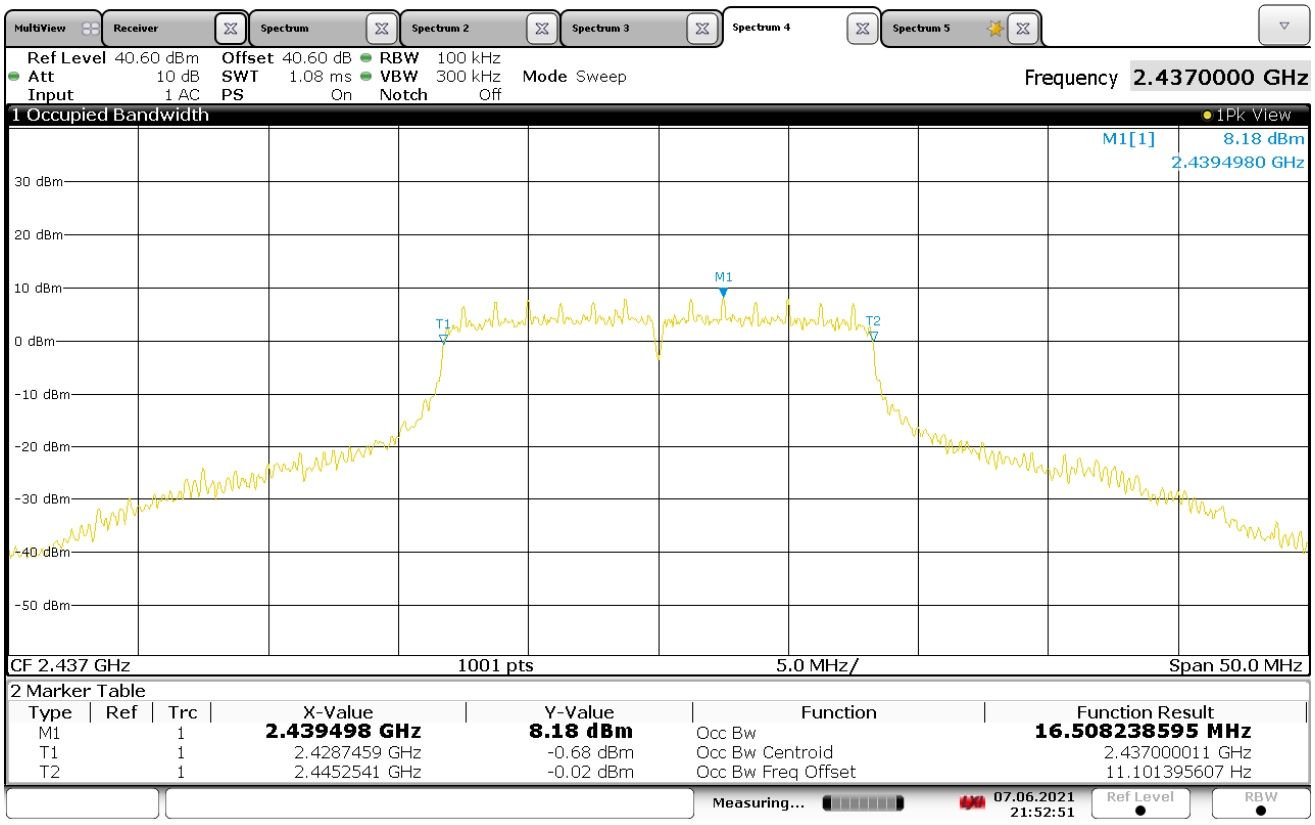
22:22:42 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 54Mbps
Carrier Frequency	2412MHz
Parameters	99% BW
Notes	99% BW = 16.44MHz



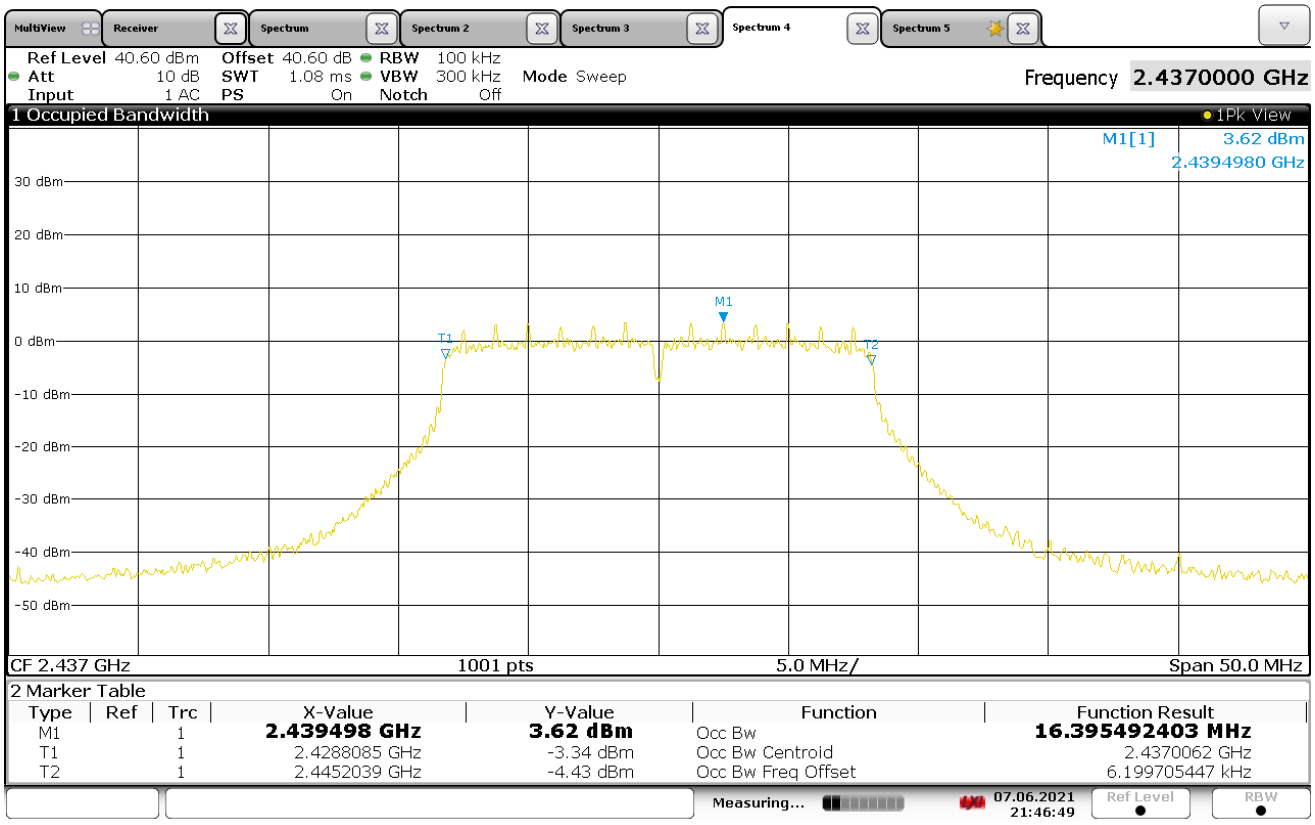
22:25:43 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 6Mbps
Carrier Frequency	2437MHz
Parameters	99% BW
Notes	99% BW = 16.50MHz



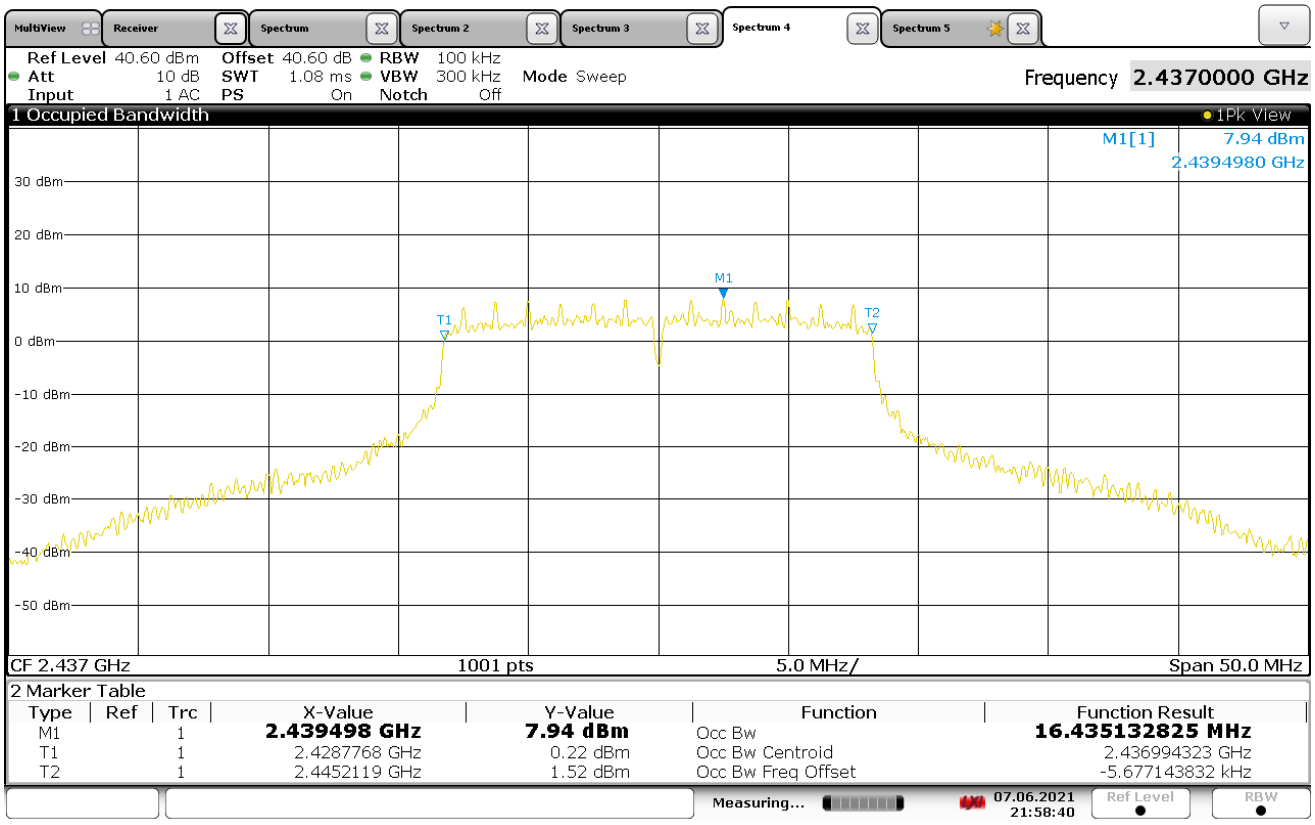
21:52:52 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 9Mbps
Carrier Frequency	2437MHz
Parameters	99% BW
Notes	99% BW = 16.39MHz



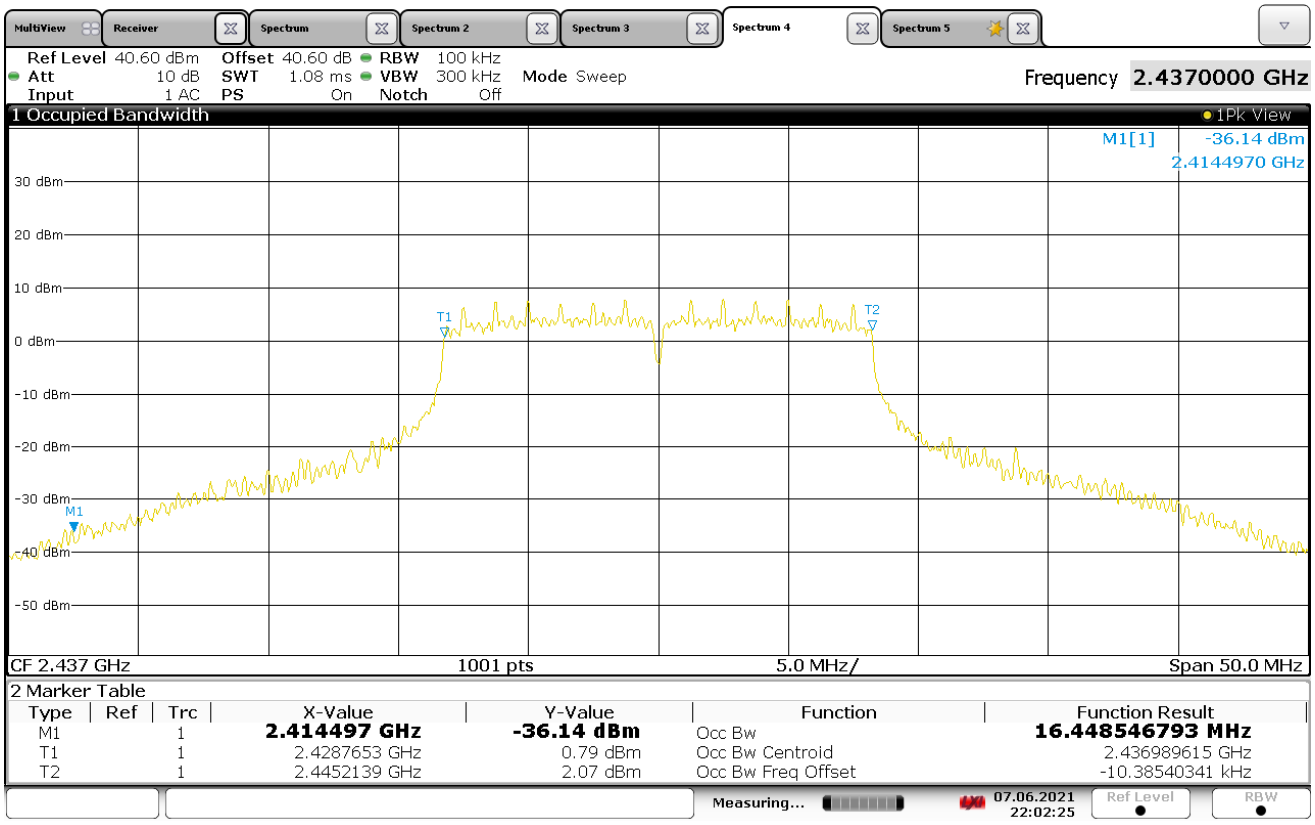
21:46:50 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 12Mbps
Carrier Frequency	2437MHz
Parameters	99% BW
Notes	99% BW = 16.43MHz



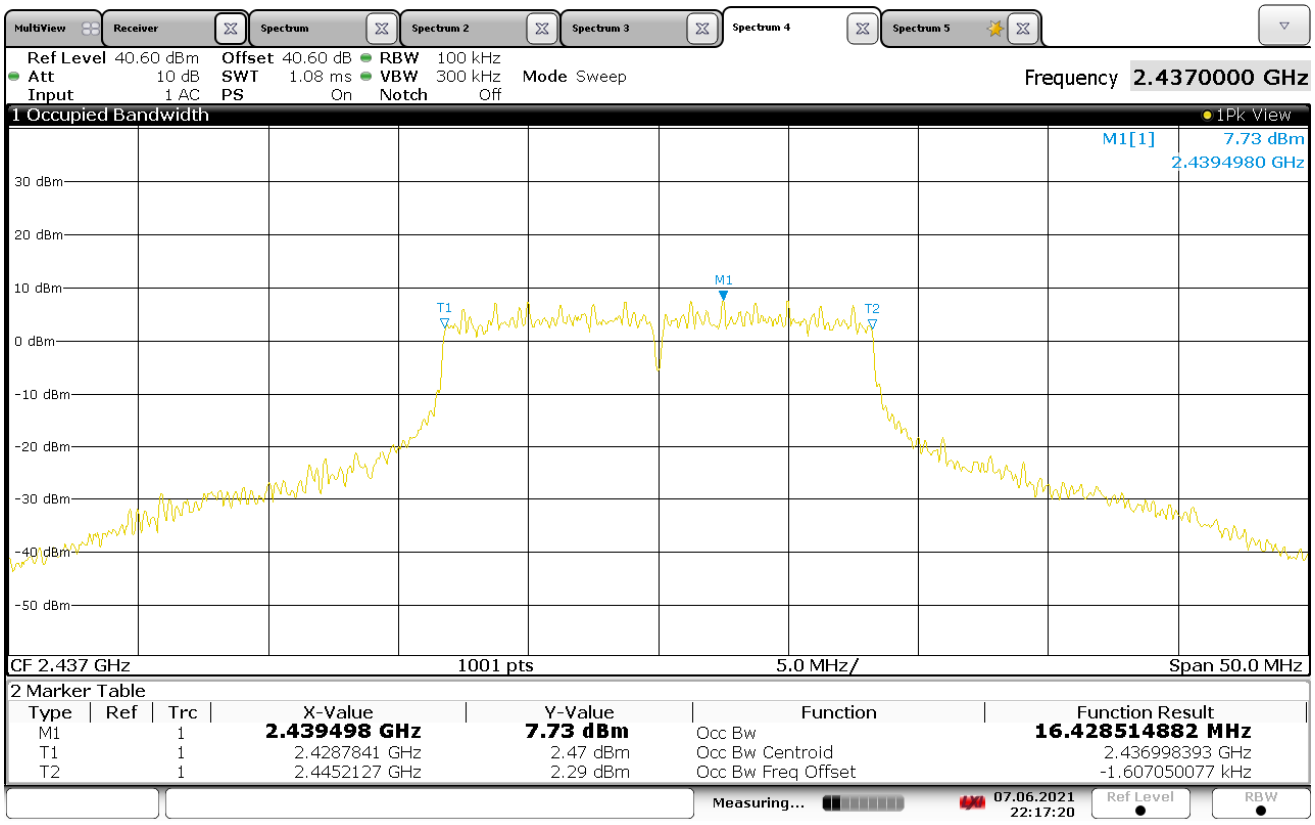
21:58:41 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 18Mbps
Carrier Frequency	2437MHz
Parameters	99% BW
Notes	99% BW = 16.44MHz



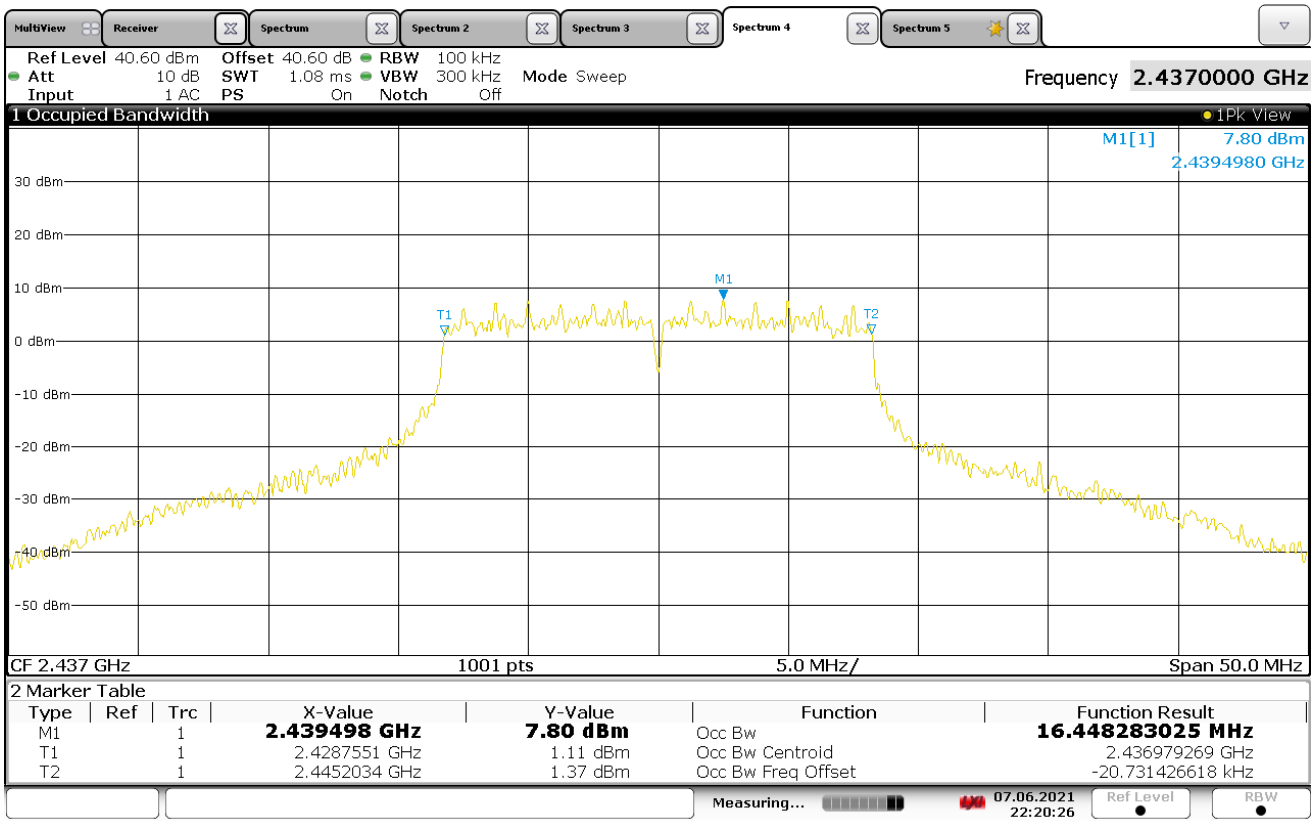
22:02:26 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 24Mbps
Carrier Frequency	2437MHz
Parameters	99% BW
Notes	99% BW = 16.44MHz



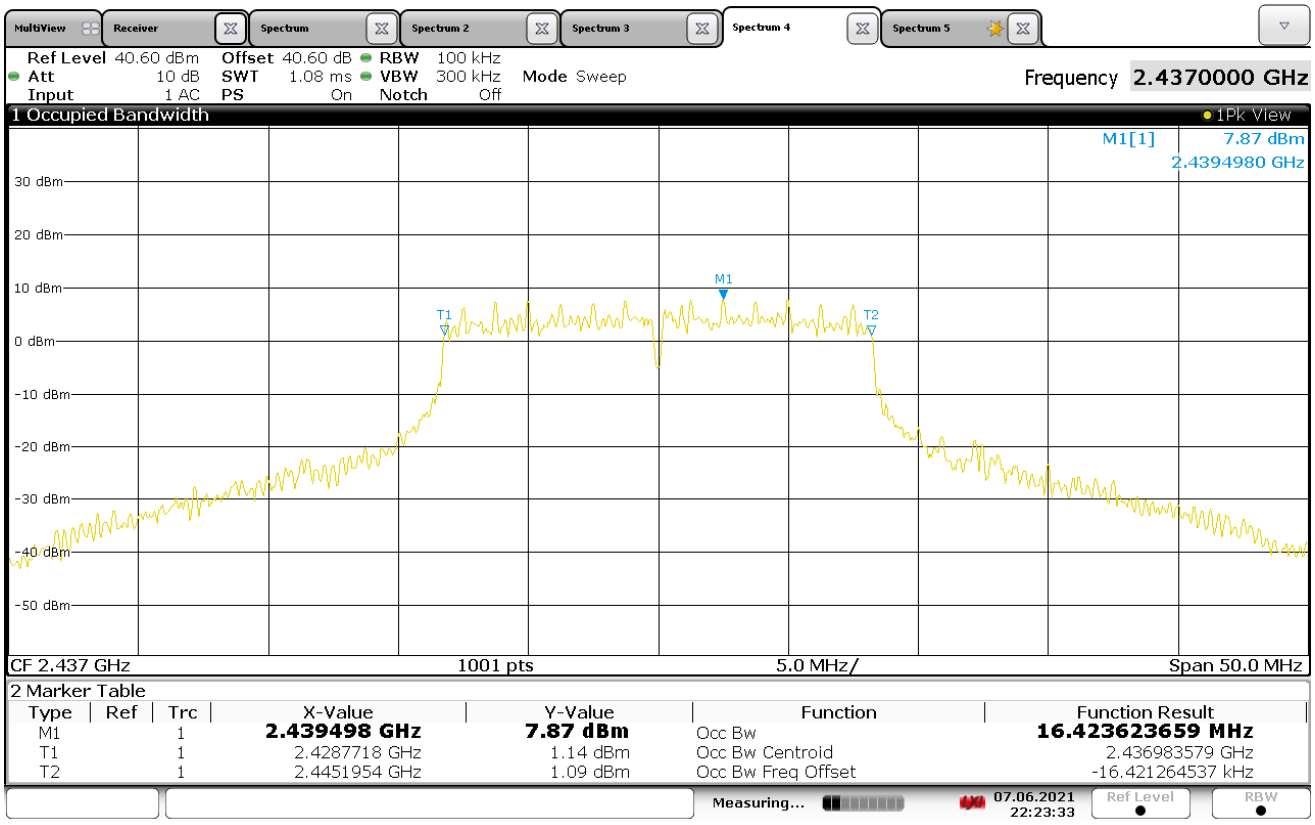
22:17:21 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 36Mbps
Carrier Frequency	2437MHz
Parameters	99% BW
Notes	99% BW = 16.44MHz



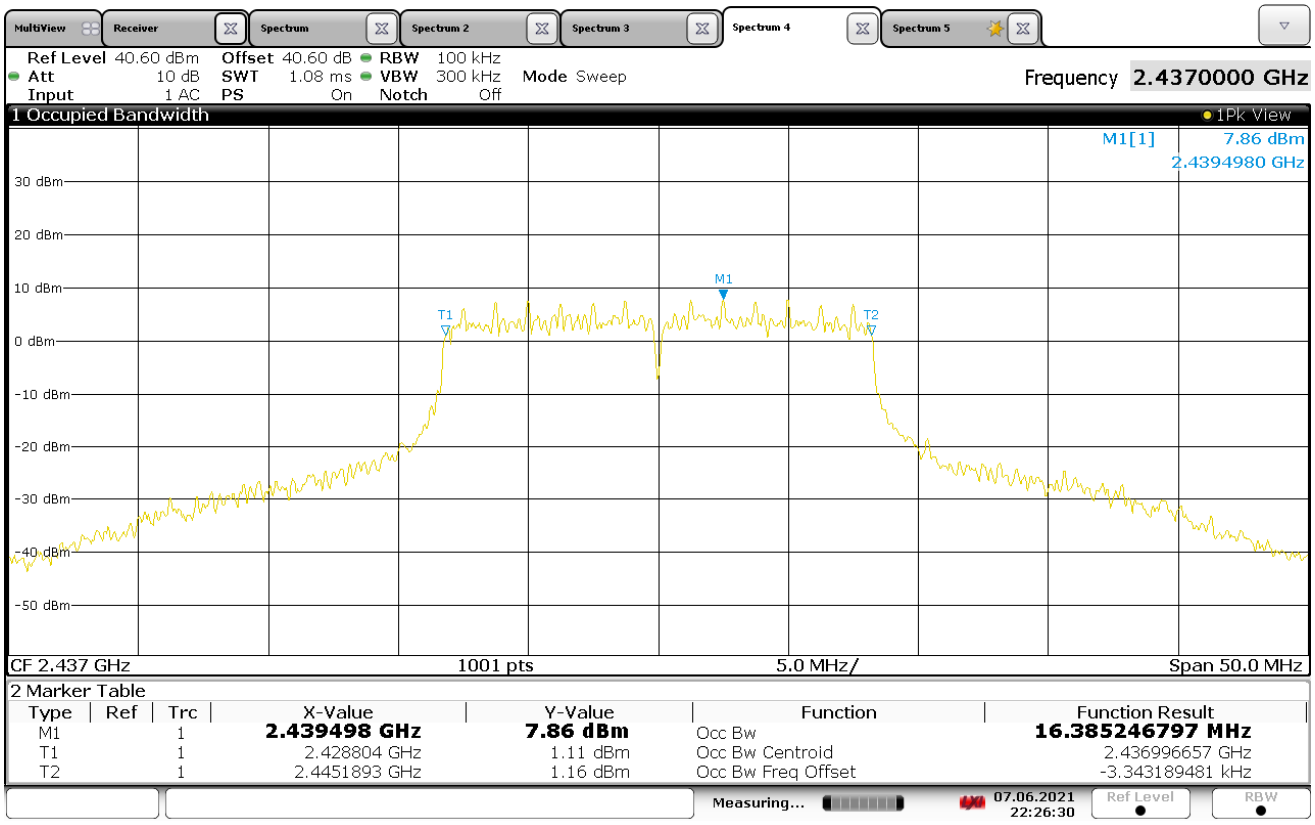
22:20:27 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 48Mbps
Carrier Frequency	2437MHz
Parameters	99% BW
Notes	99% BW = 16.42MHz



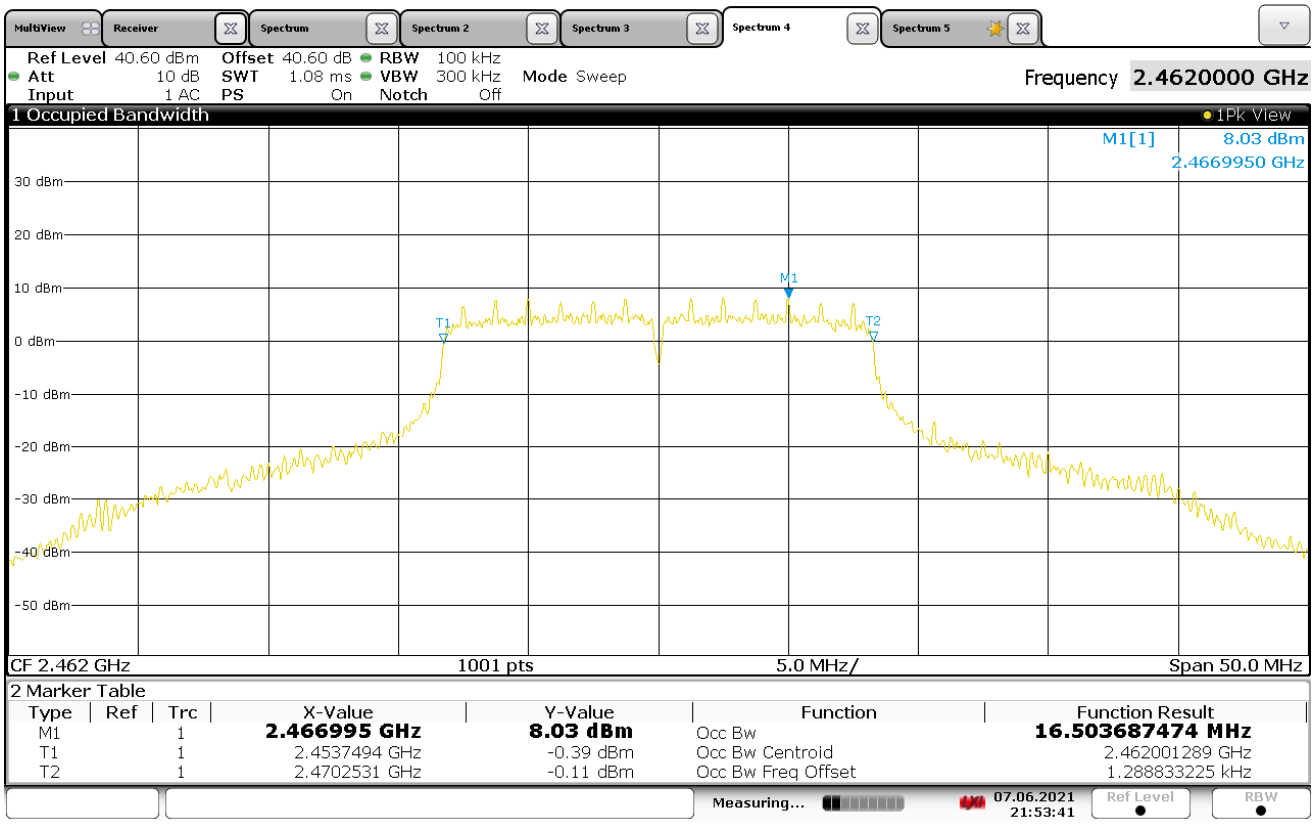
22:23:34 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 54Mbps
Carrier Frequency	2437MHz
Parameters	99% BW
Notes	99% BW = 16.38MHz



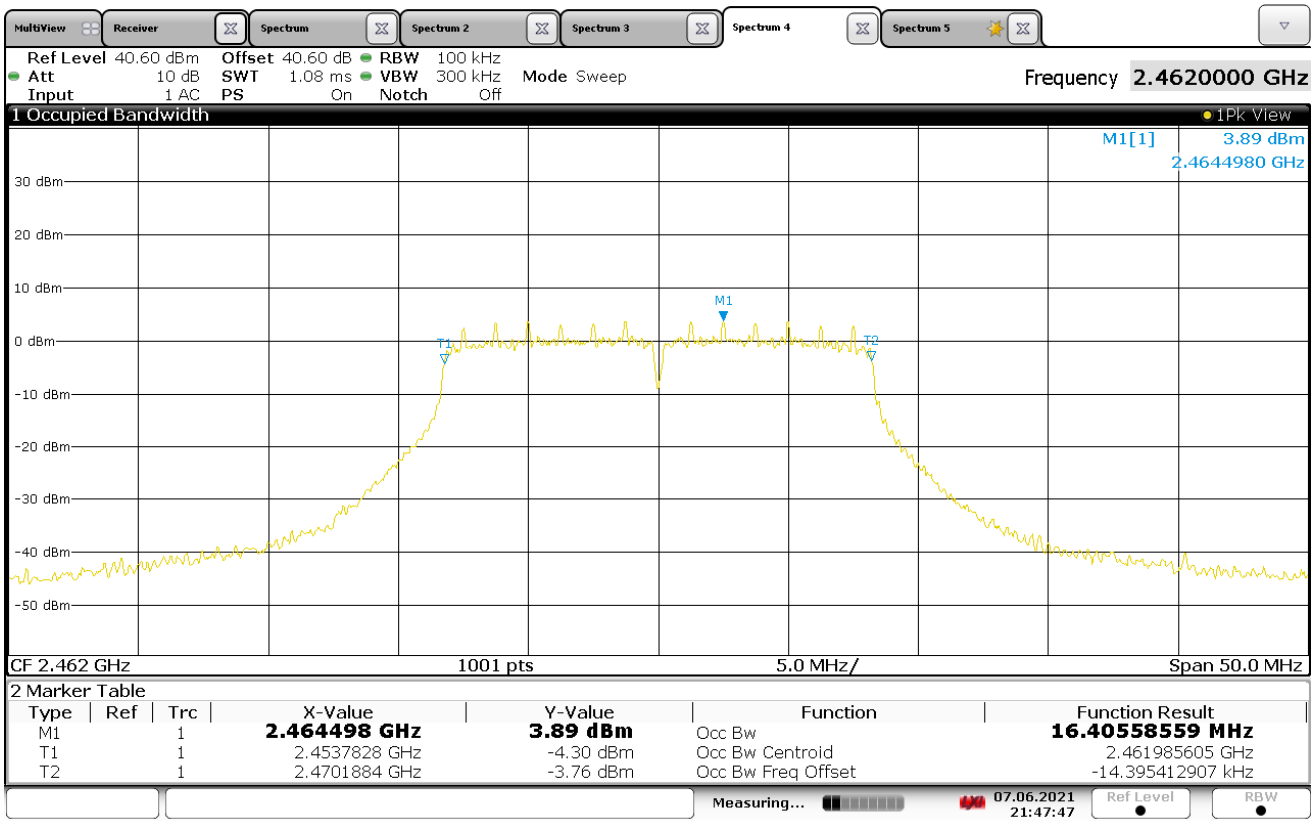
22:26:30 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 6Mbps
Carrier Frequency	2462MHz
Parameters	99% BW
Notes	99% BW = 16.50MHz



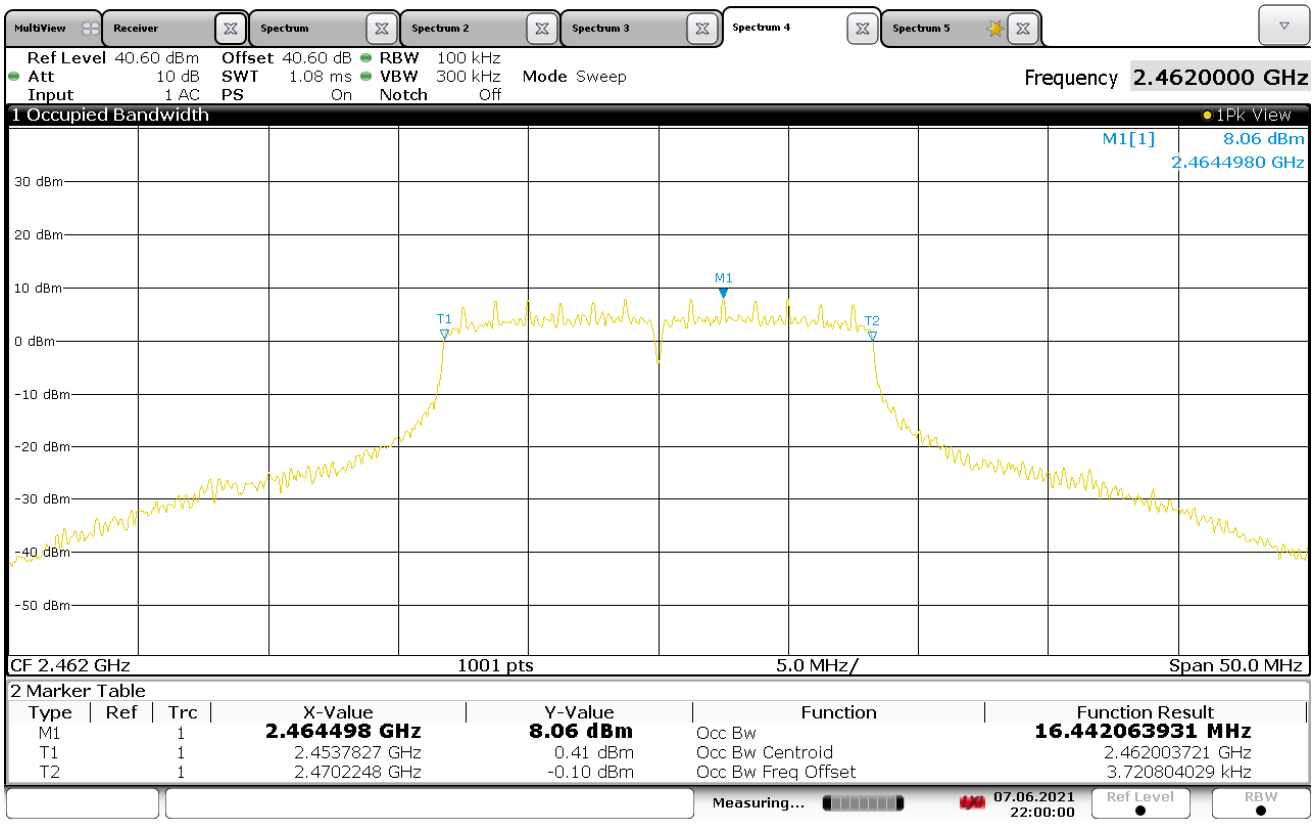
21:53:42 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 9Mbps
Carrier Frequency	2462MHz
Parameters	99% BW
Notes	99% BW = 16.40MHz



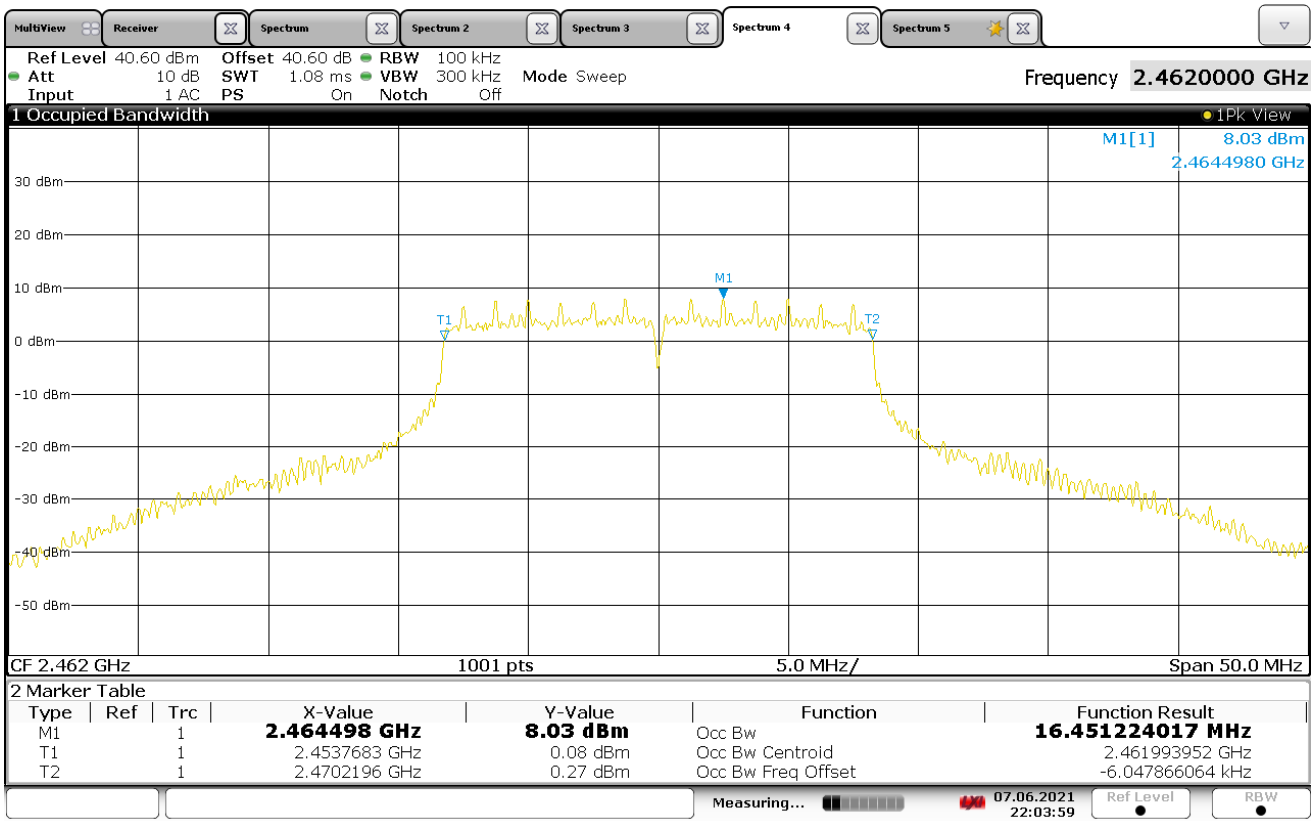
21:47:48 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 12Mbps
Carrier Frequency	2462MHz
Parameters	99% BW
Notes	99% BW = 16.44MHz



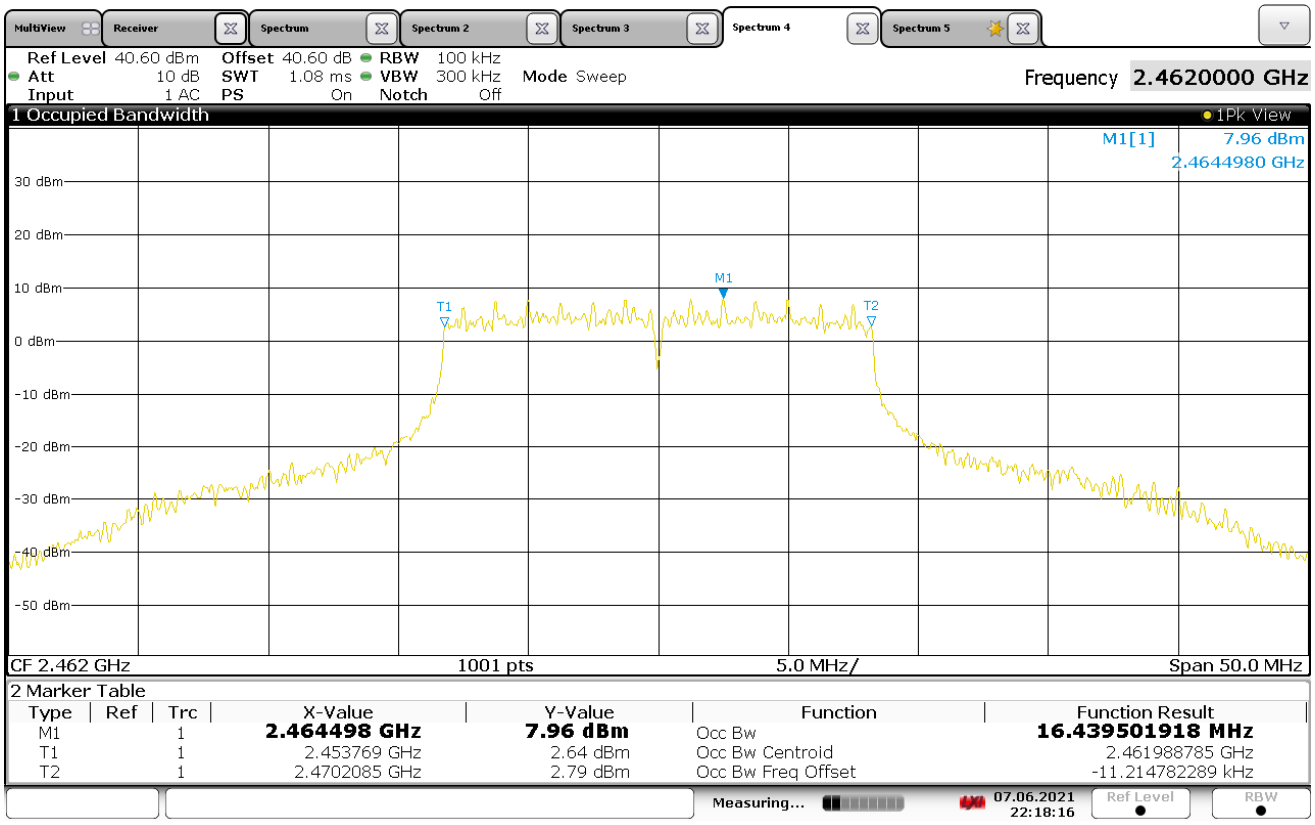
22:00:01 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 18Mbps
Carrier Frequency	2462MHz
Parameters	99% BW
Notes	99% BW = 16.45MHz



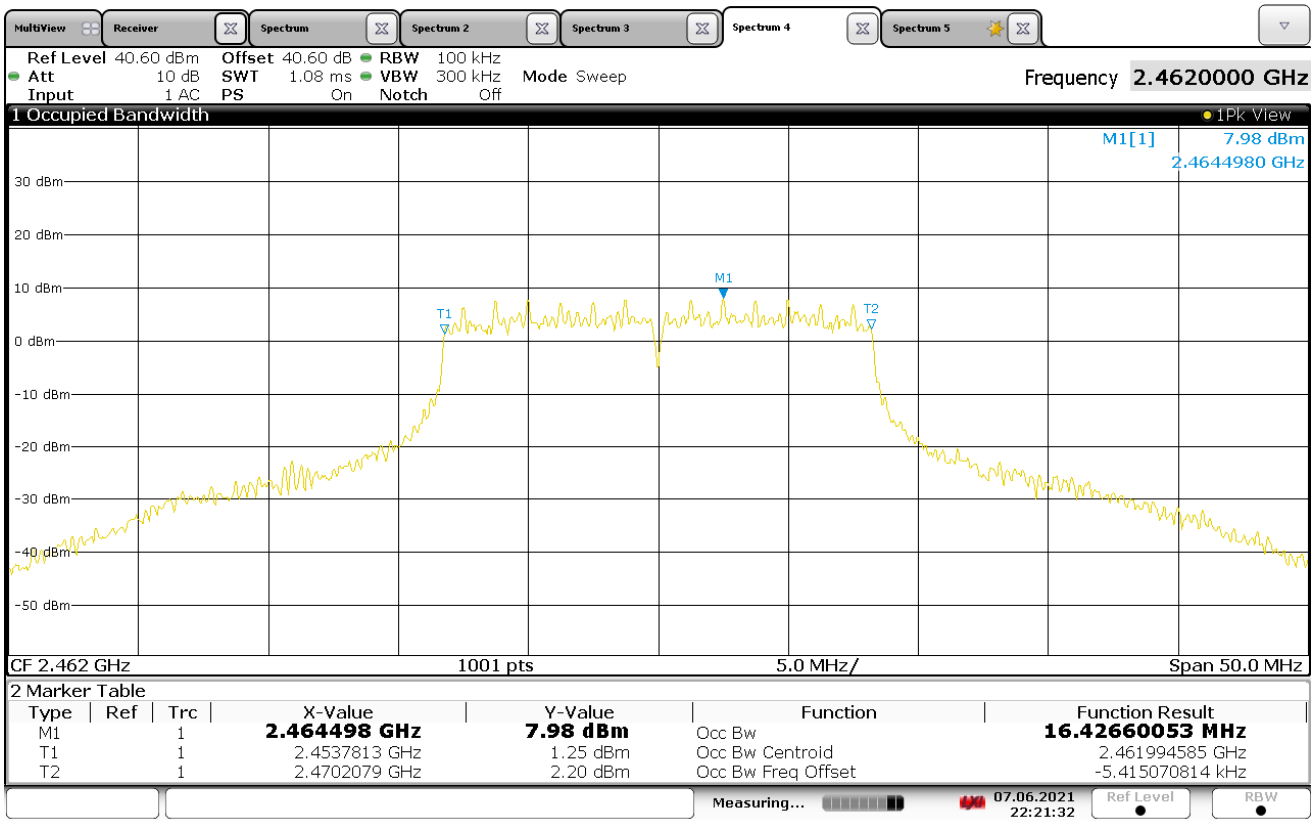
22:03:59 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 24Mbps
Carrier Frequency	2462MHz
Parameters	99% BW
Notes	99% BW = 16.43MHz



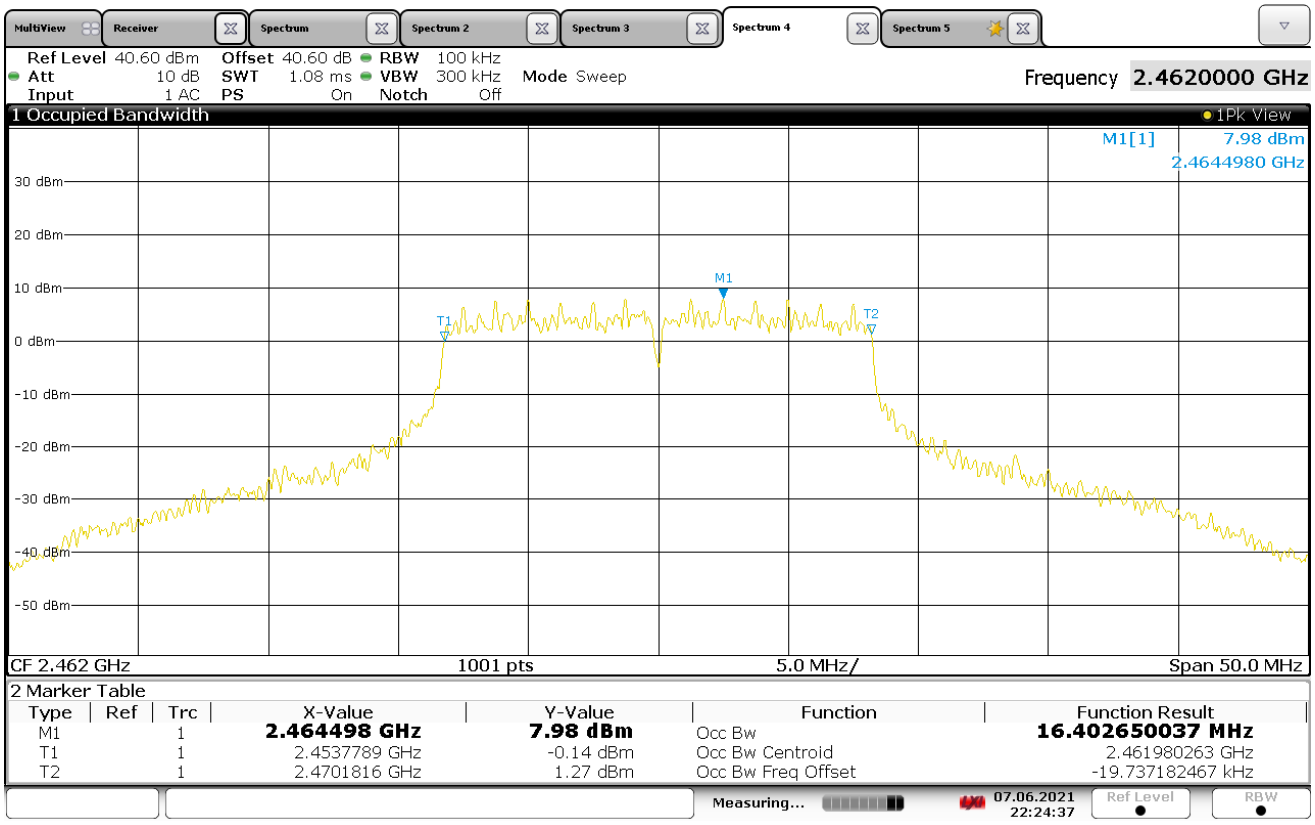
22:18:16 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 36Mbps
Carrier Frequency	2462MHz
Parameters	99% BW
Notes	99% BW = 16.42MHz



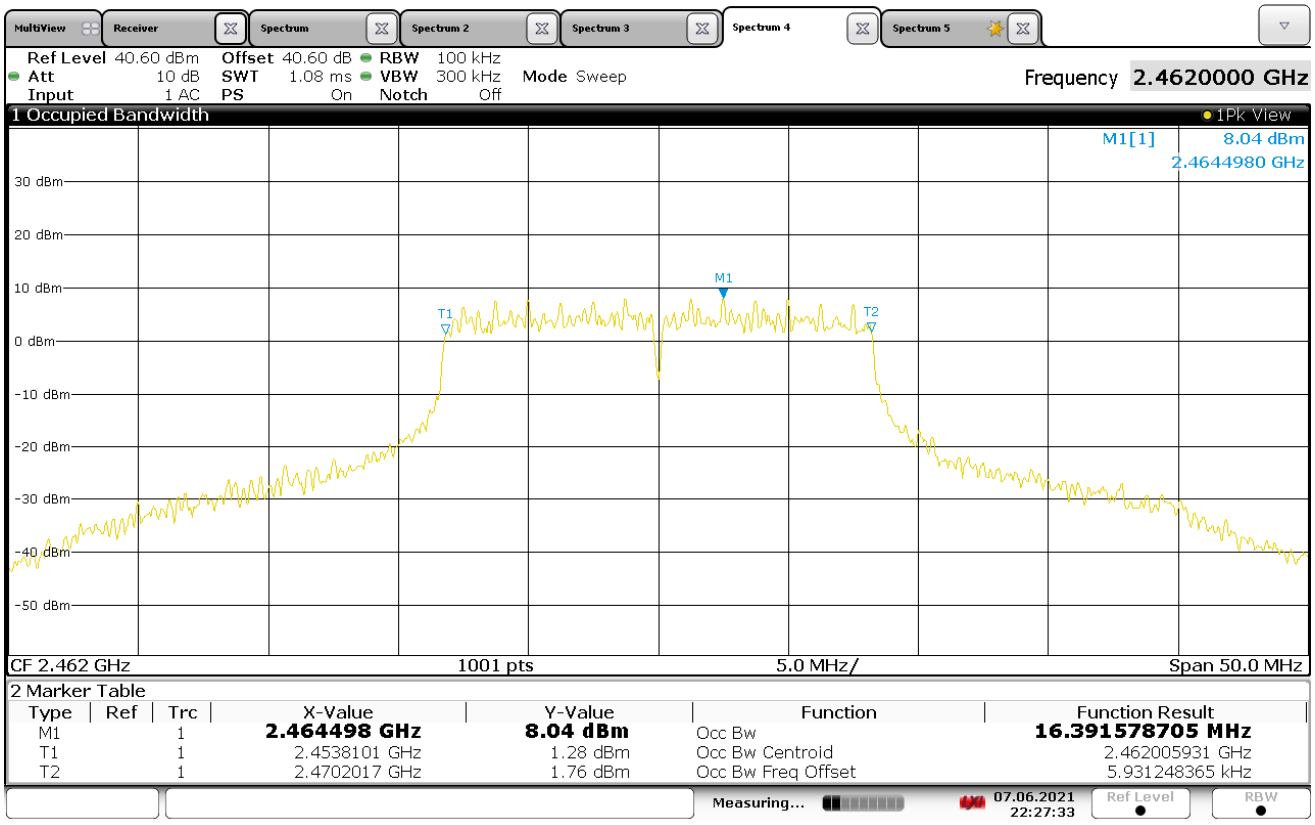
22:21:32 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 48Mbps
Carrier Frequency	2462MHz
Parameters	99% BW
Notes	99% BW = 16.40MHz



22:24:37 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 54Mbps
Carrier Frequency	2462MHz
Parameters	99% BW
Notes	99% BW = 16.39MHz

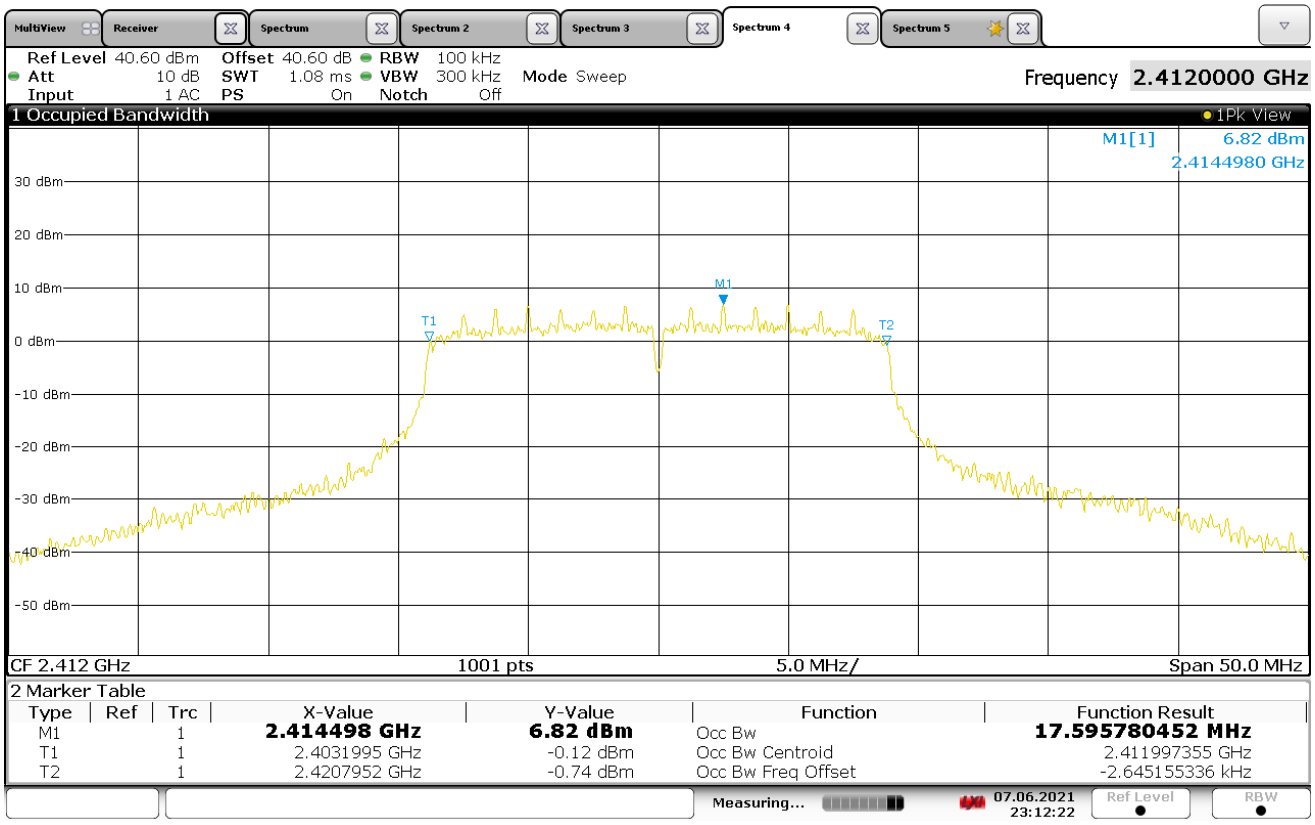


22:27:34 07.06.2021

Test Details	
Manufacturer	Astronics
EUT	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n
Notes	

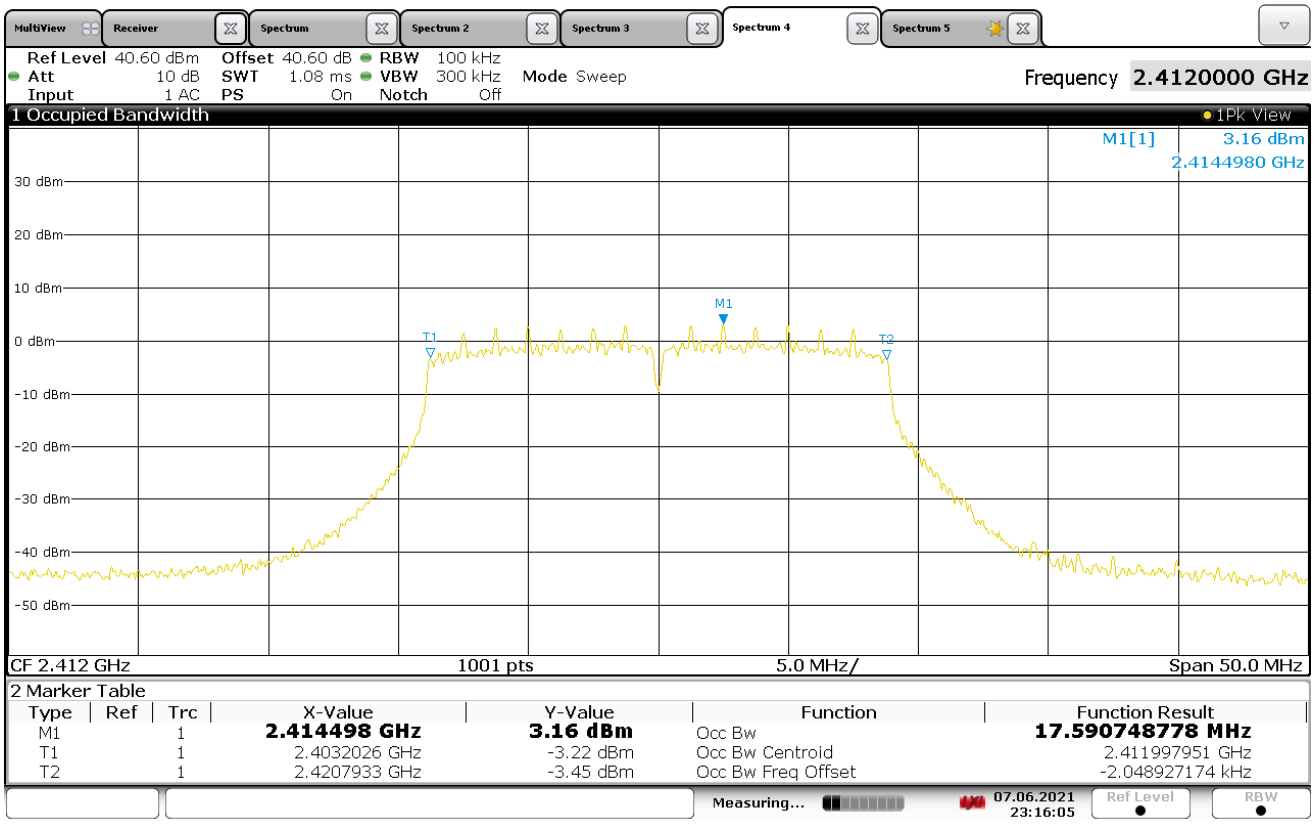
Protocol	Freq. (MHz)	Data Rate (Mbps)	99% BW (MHz)
802.11n	2412	MCS0	17.6
	2437		17.59
	2462		17.62
	2412	MCS1	17.59
	2437		17.58
	2462		17.57
	2412	MCS2	17.57
	2437		17.56
	2462		17.58
	2412	MCS3	17.56
	2437		17.54
	2462		17.6
	2412	MCS4	17.55
	2437		17.56
	2462		17.54
	2412	MCS5	17.58
	2437		17.57
	2462		17.61
	2412	MCS6	17.57
	2437		17.55
	2462		17.58
	2412	MCS7	17.59
	2437		17.56
	2462		17.55

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS0
Carrier Frequency	2412MHz
Parameters	99% BW
Notes	99% BW = 17.59MHz



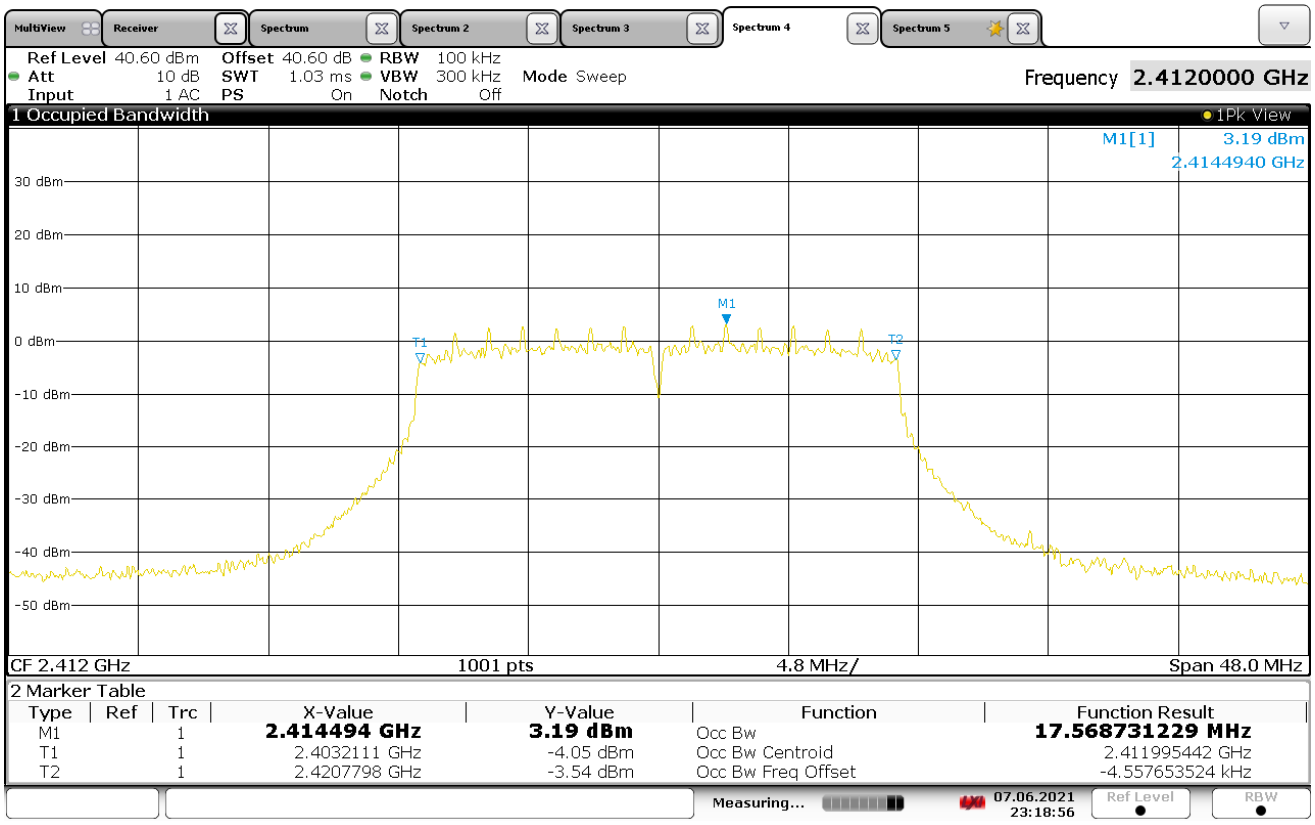
23:12:23 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS1
Carrier Frequency	2412MHz
Parameters	99% BW
Notes	99% BW = 17.59MHz



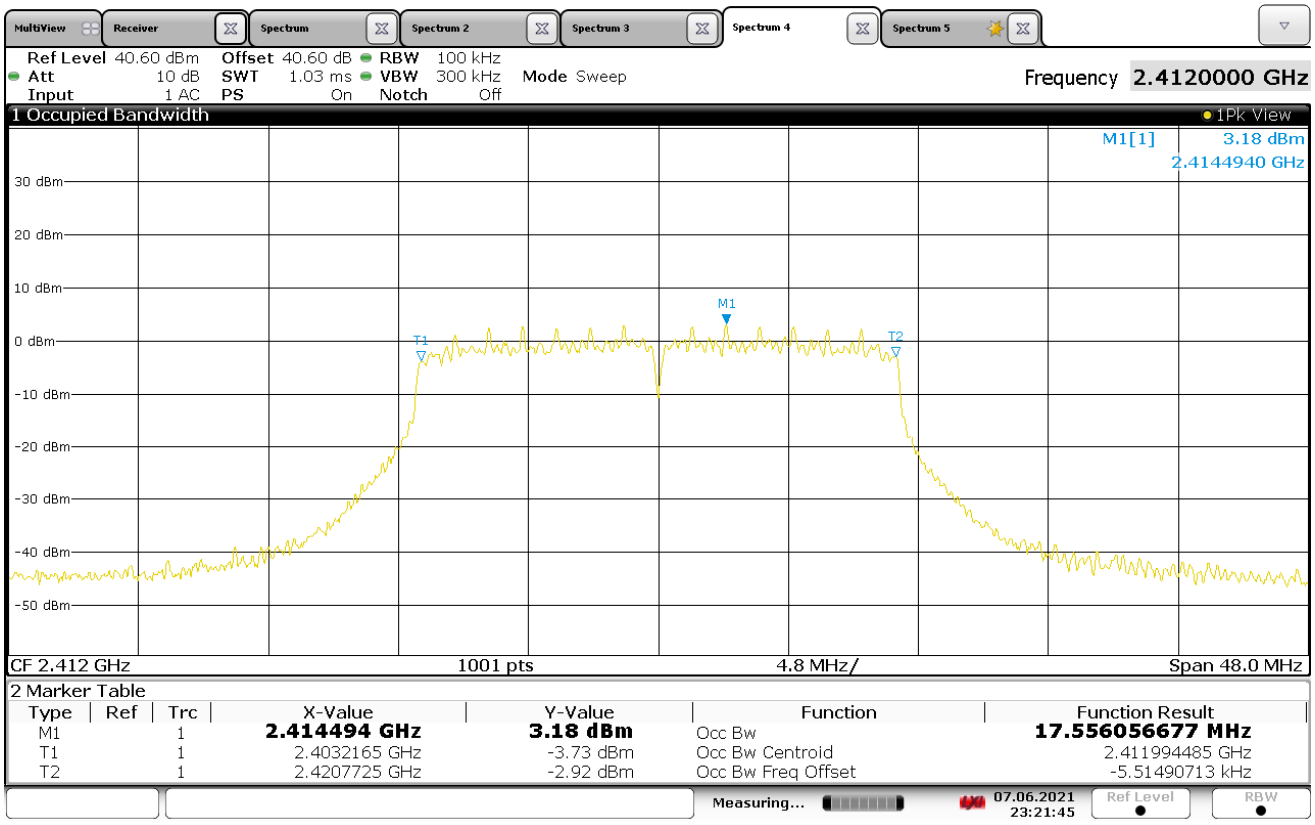
23:16:06 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS2
Carrier Frequency	2412MHz
Parameters	99% BW
Notes	99% BW = 17.56MHz



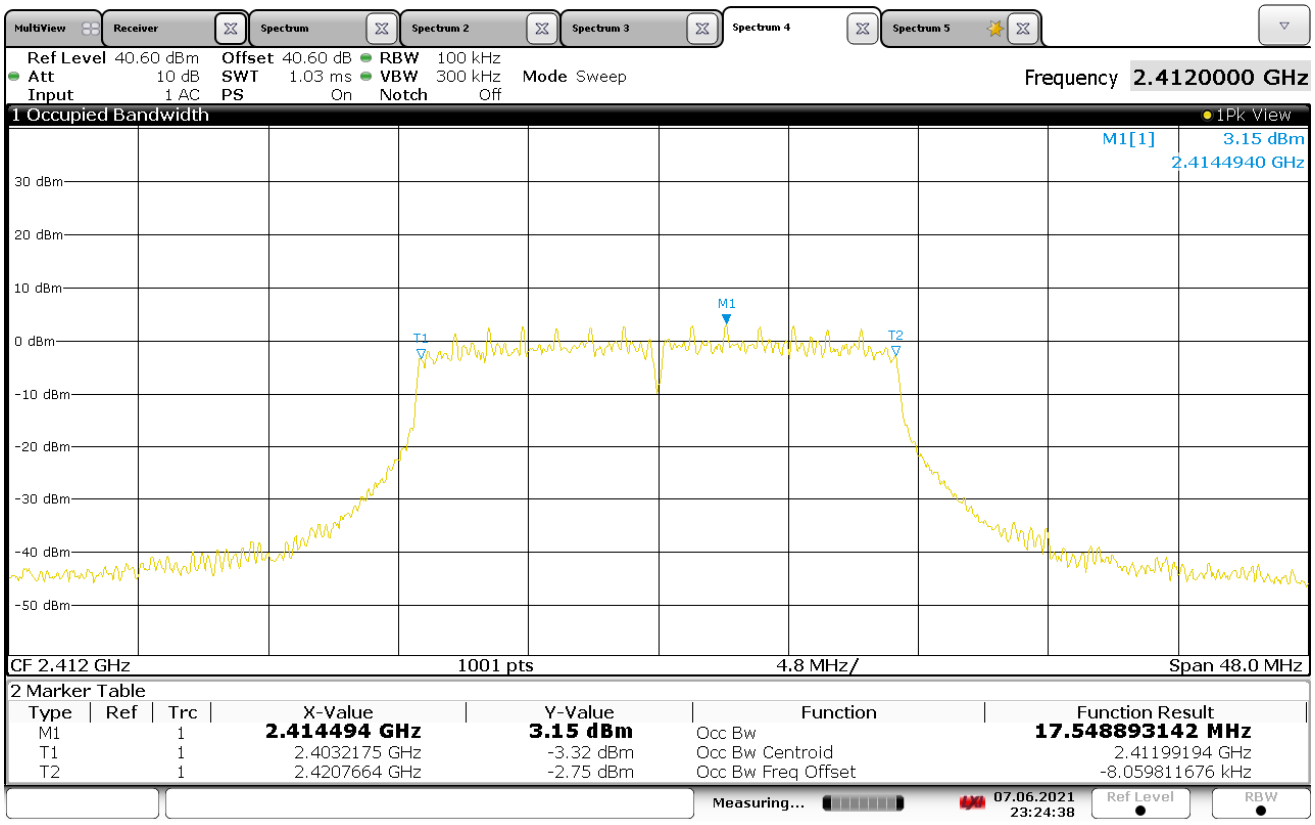
23:18:56 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS3
Carrier Frequency	2412MHz
Parameters	99% BW
Notes	99% BW = 17.55MHz



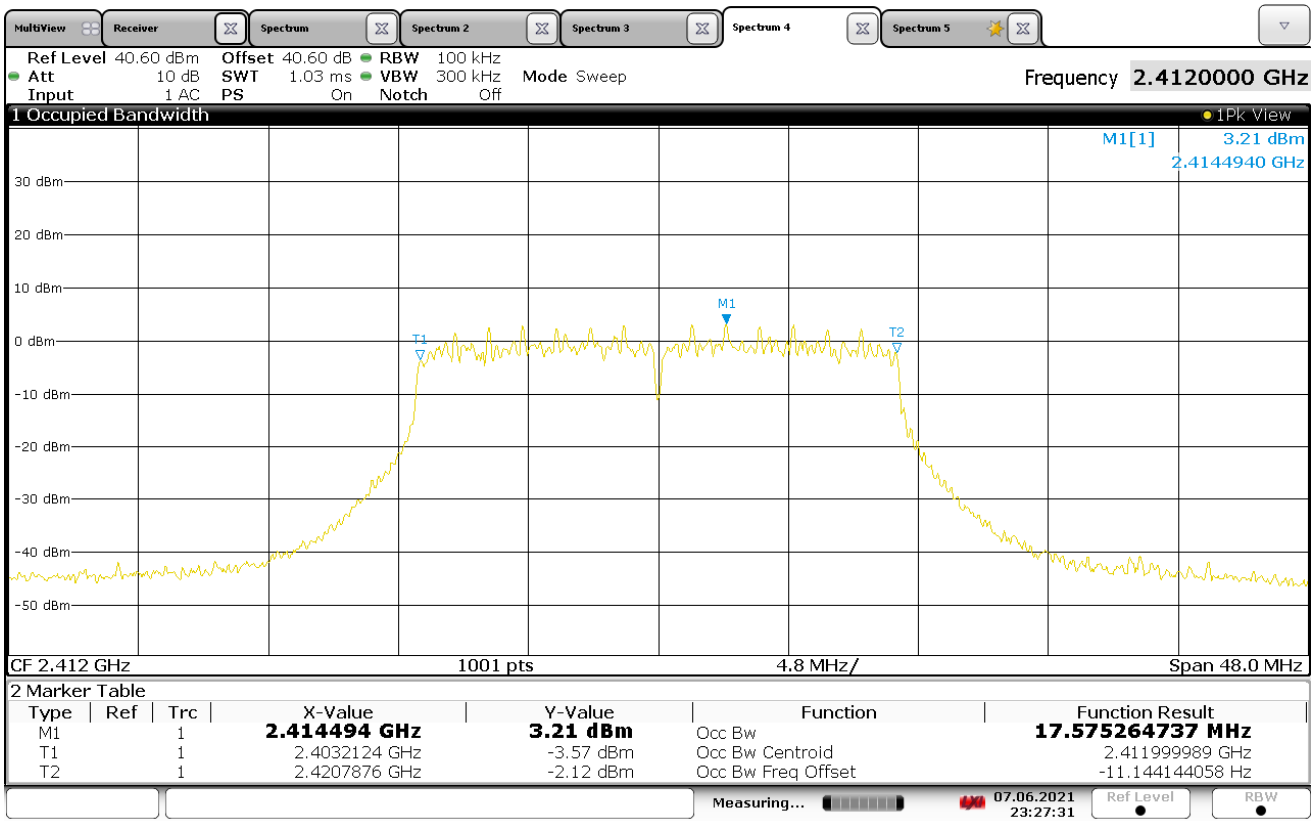
23:21:46 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS4
Carrier Frequency	2412MHz
Parameters	99% BW
Notes	99% BW = 17.54MHz



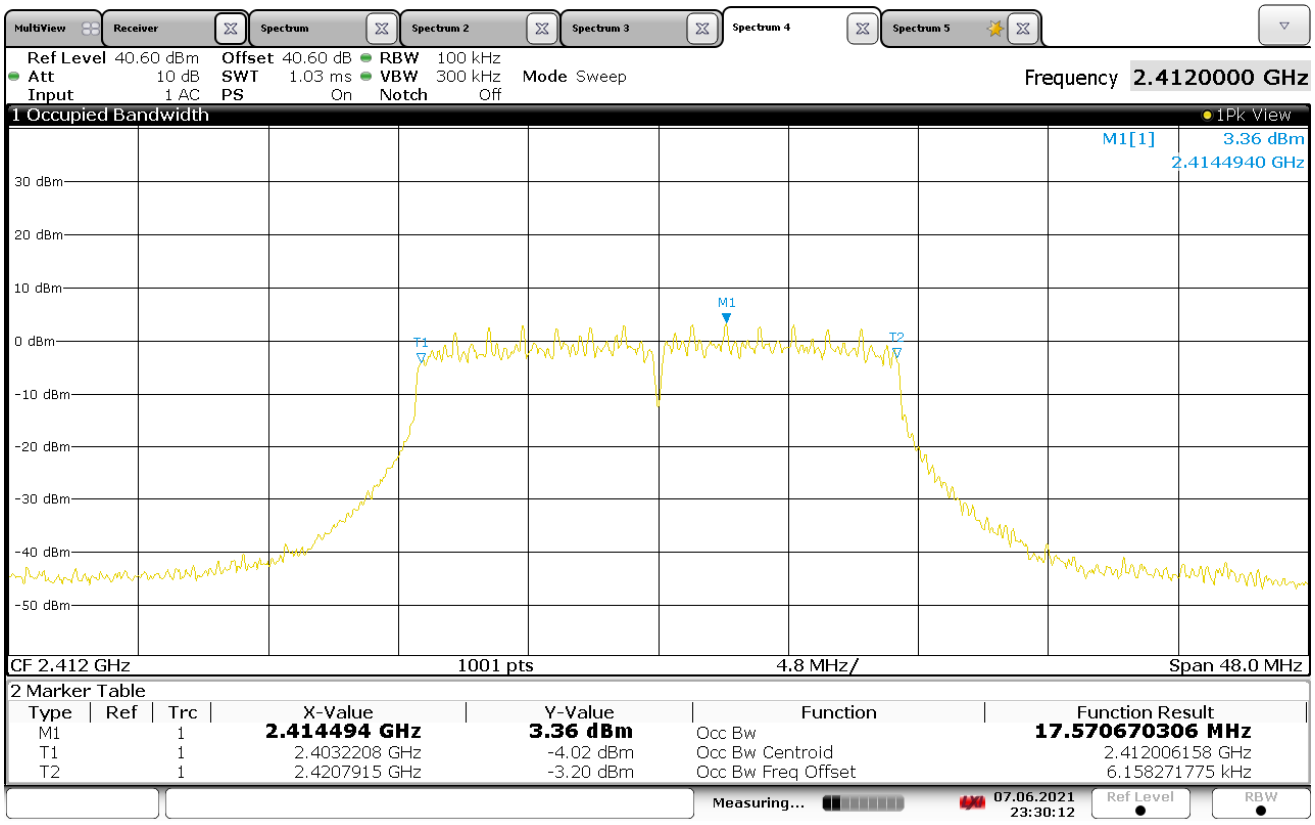
23:24:38 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS5
Carrier Frequency	2412MHz
Parameters	99% BW
Notes	99% BW = 17.57MHz



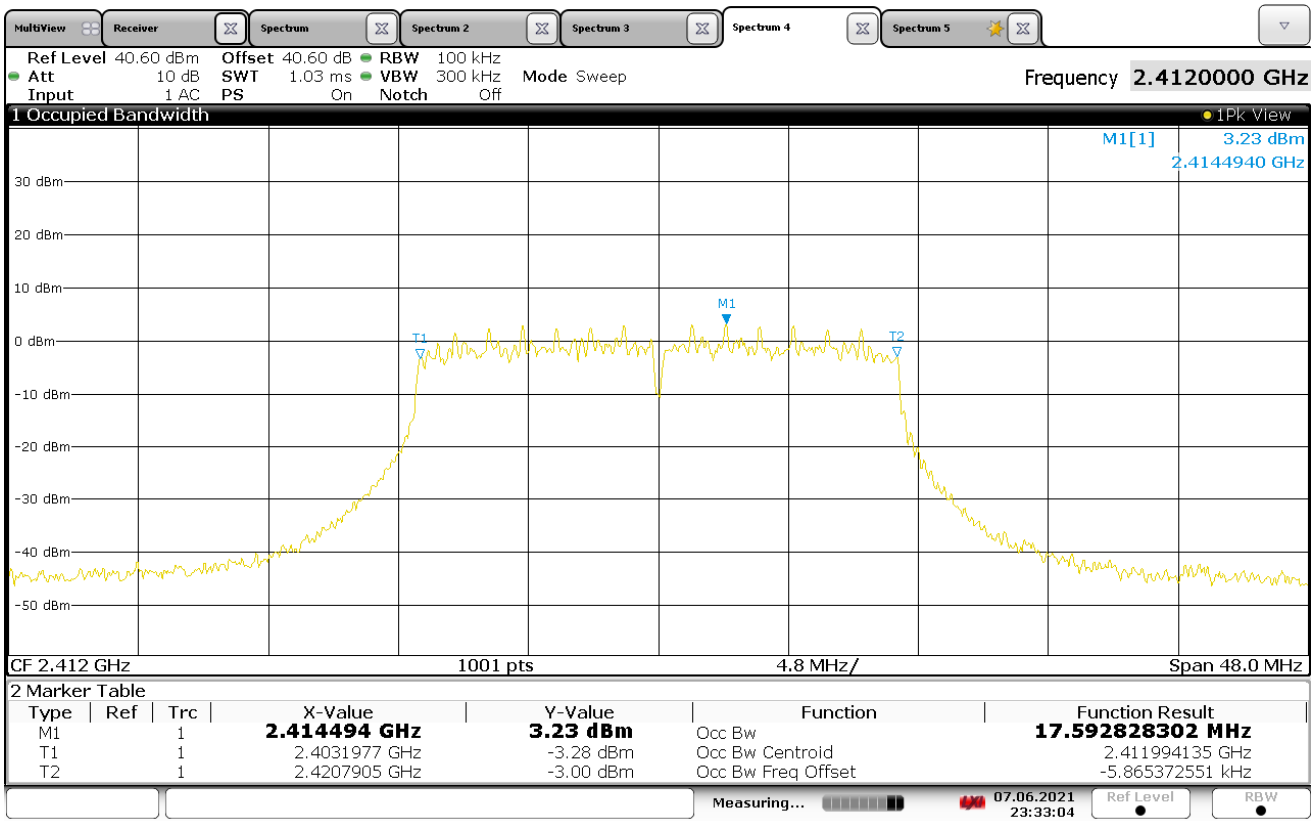
23:27:32 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS6
Carrier Frequency	2412MHz
Parameters	99% BW
Notes	99% BW = 17.57MHz



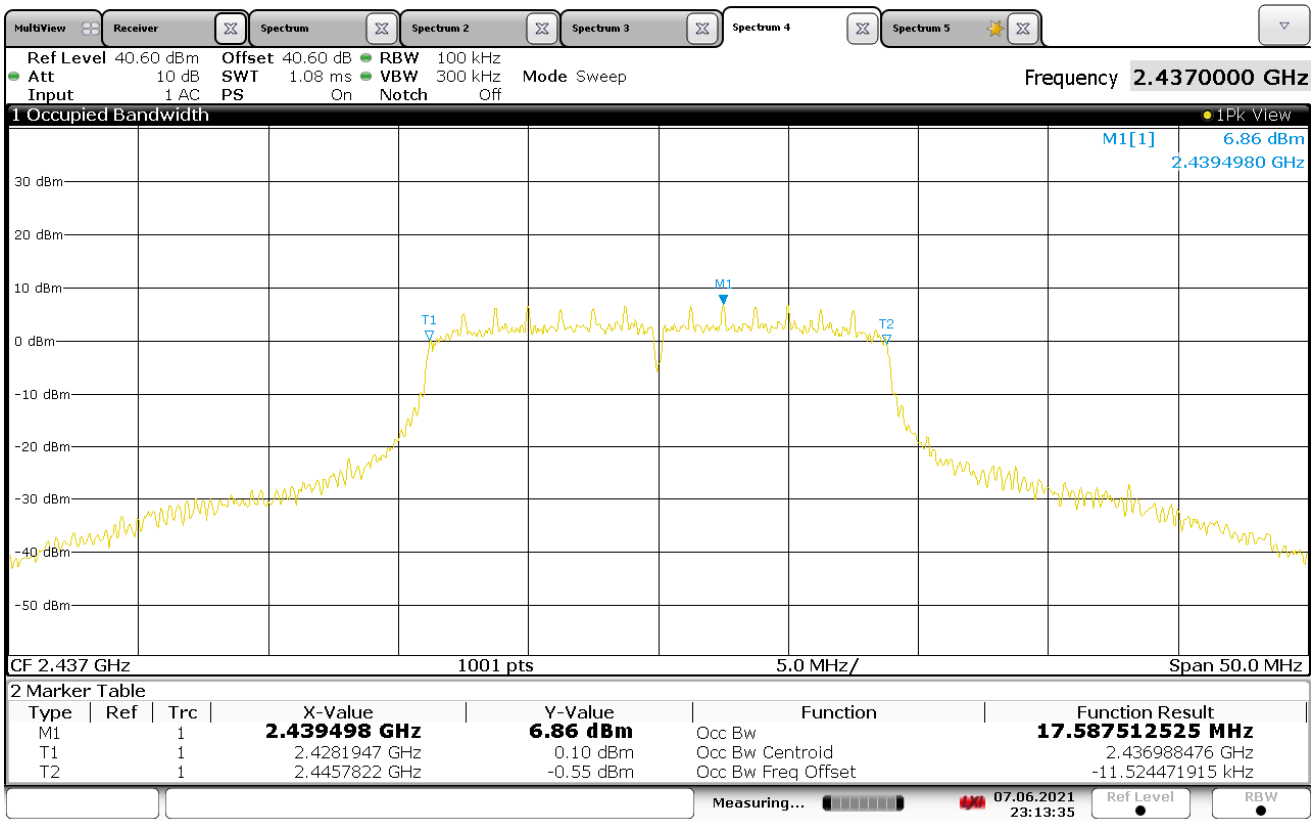
23:30:13 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS7
Carrier Frequency	2412MHz
Parameters	99% BW
Notes	99% BW = 17.59MHz



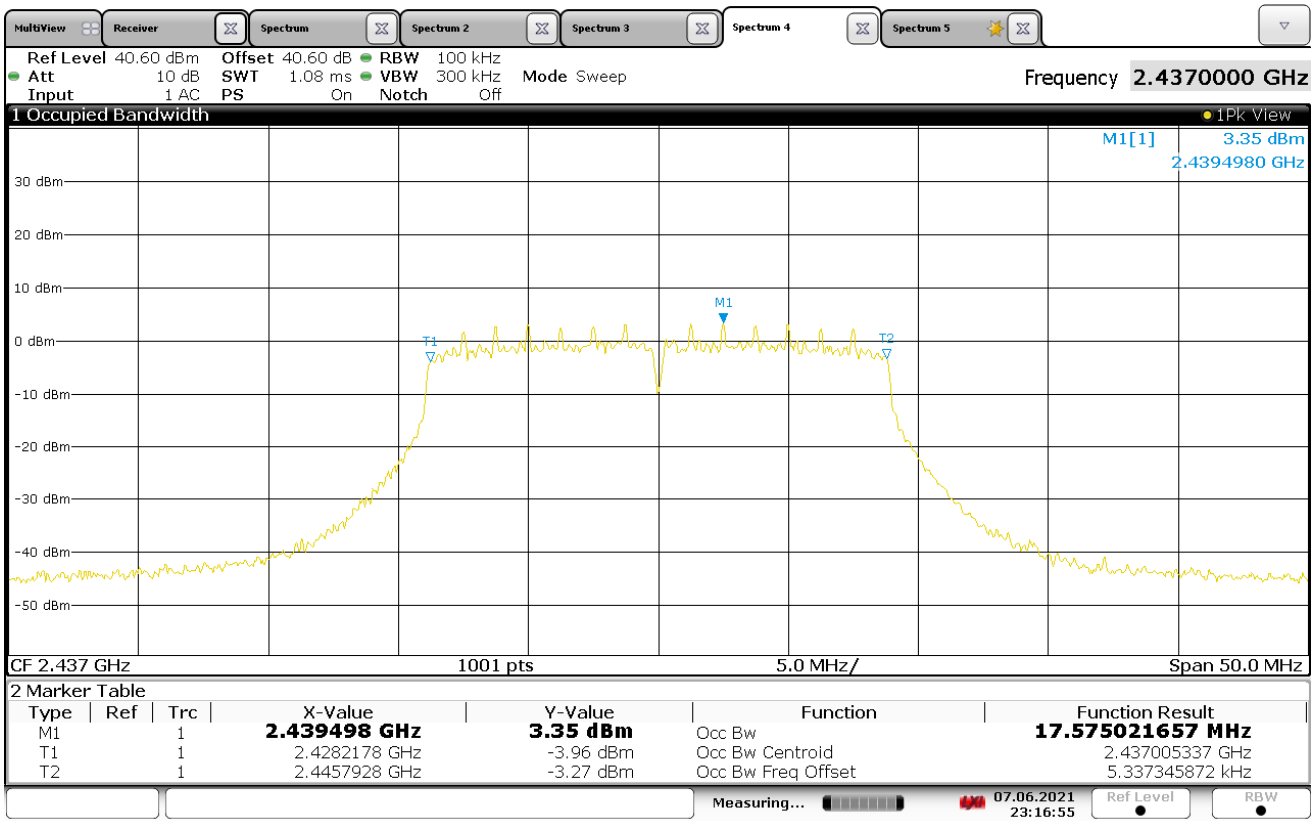
23:33:04 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS0
Carrier Frequency	2437MHz
Parameters	99% BW
Notes	99% BW = 17.58MHz



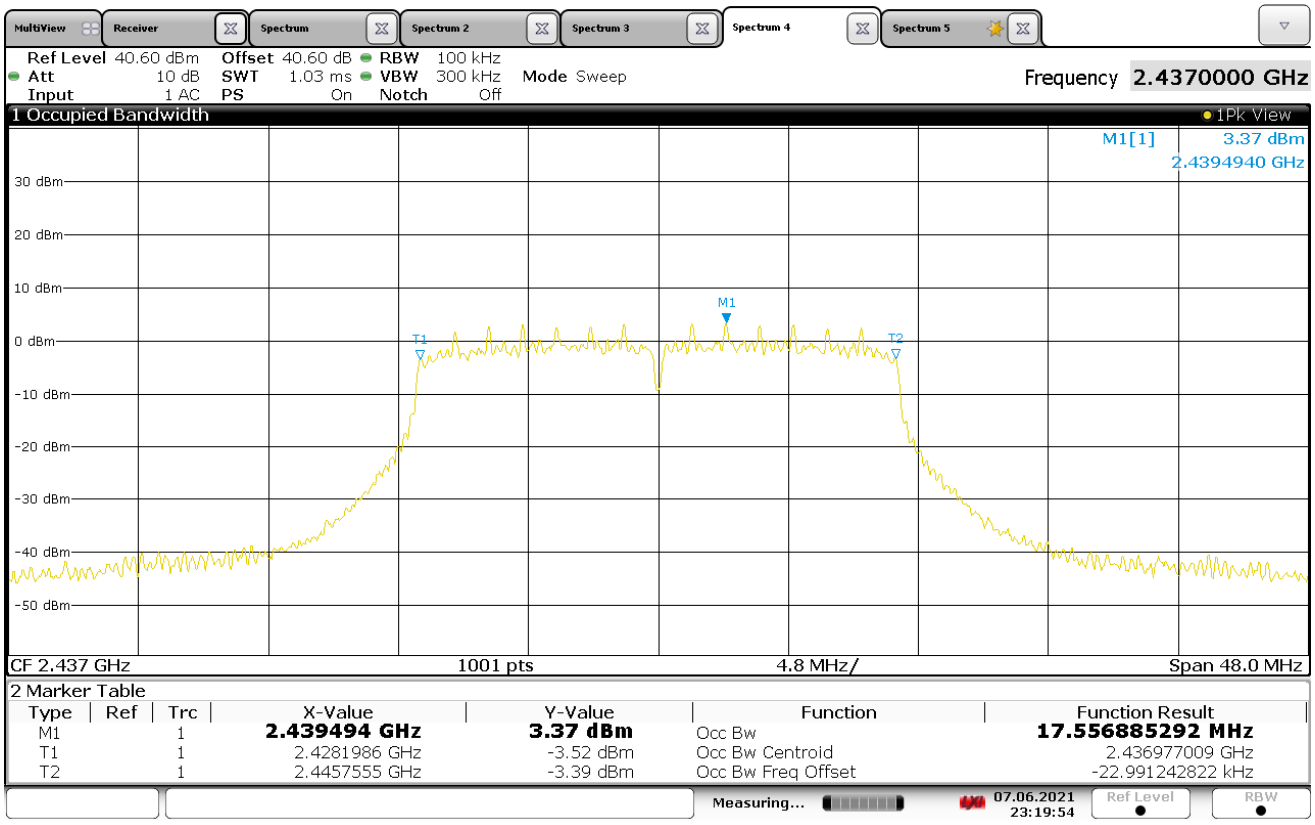
23:13:36 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS1
Carrier Frequency	2437MHz
Parameters	99% BW
Notes	99% BW = 17.57MHz



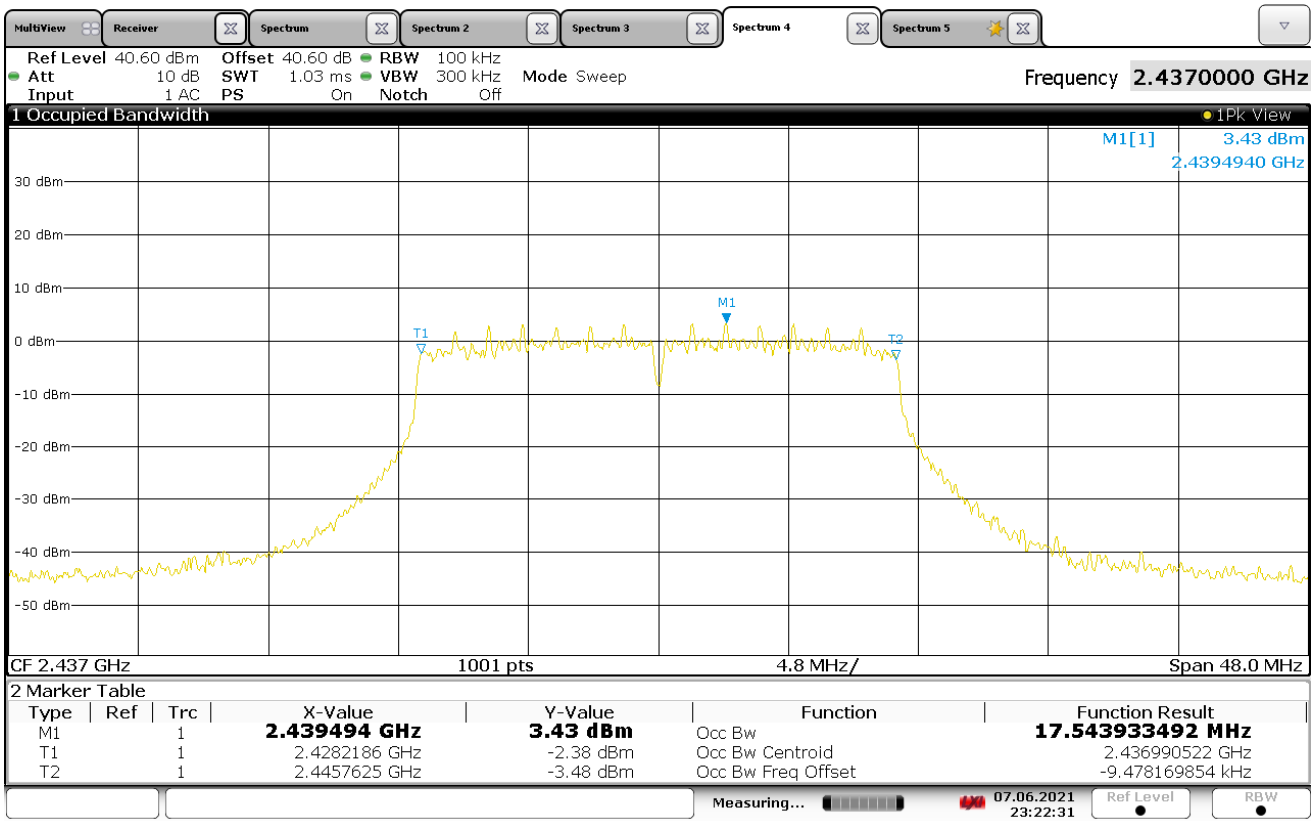
23:16:56 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS2
Carrier Frequency	2437MHz
Parameters	99% BW
Notes	99% BW = 17.55MHz



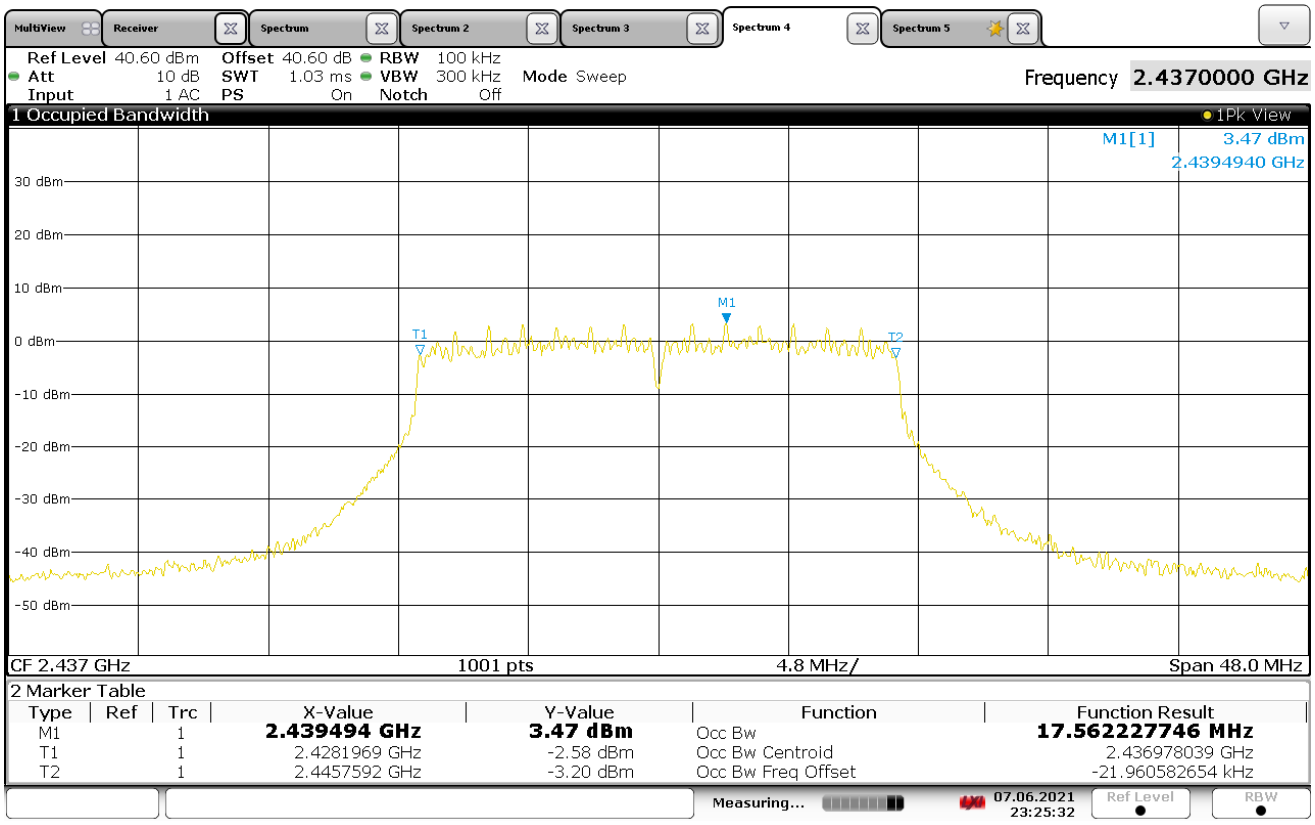
23:19:54 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS3
Carrier Frequency	2437MHz
Parameters	99% BW
Notes	99% BW = 17.54MHz



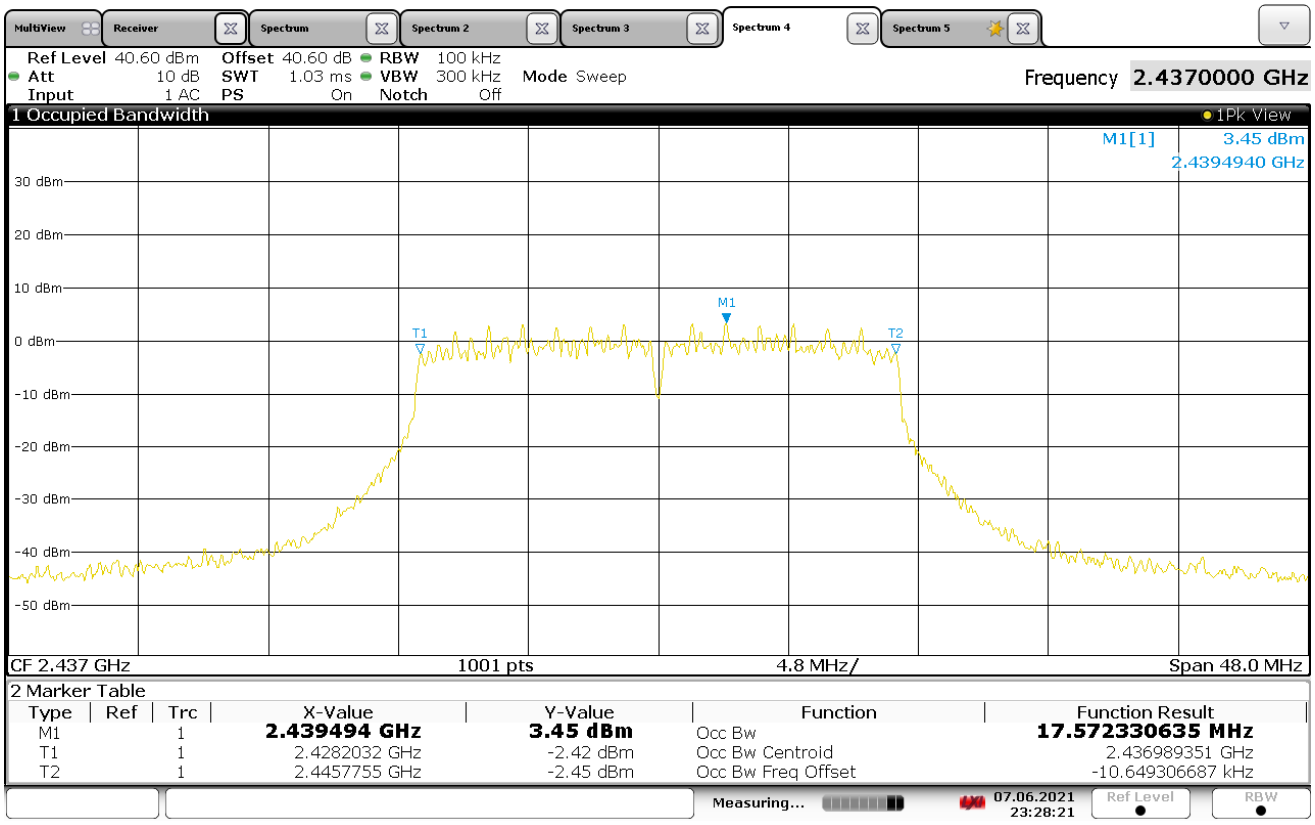
23:22:31 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS4
Carrier Frequency	2437MHz
Parameters	99% BW
Notes	99% BW = 17.56MHz



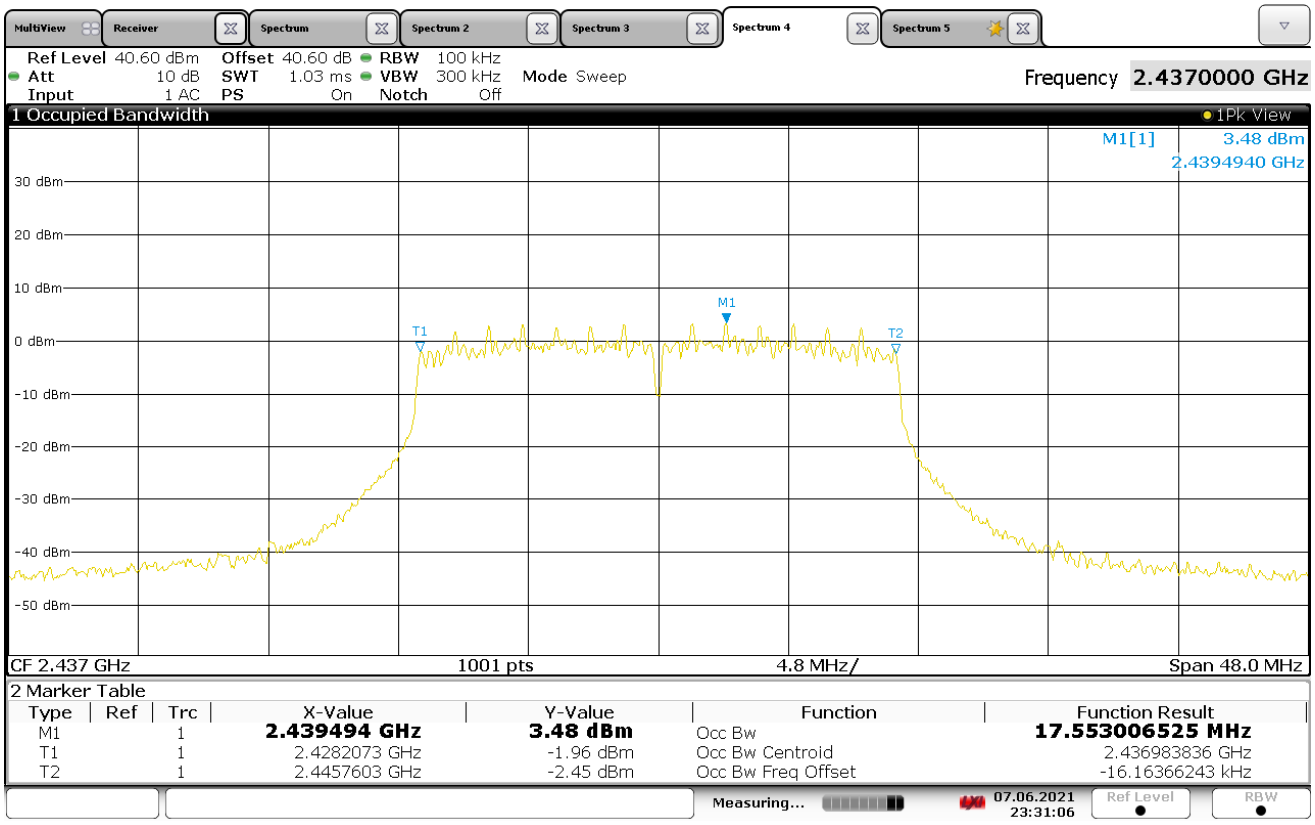
23:25:33 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS5
Carrier Frequency	2437MHz
Parameters	99% BW
Notes	99% BW = 17.57MHz



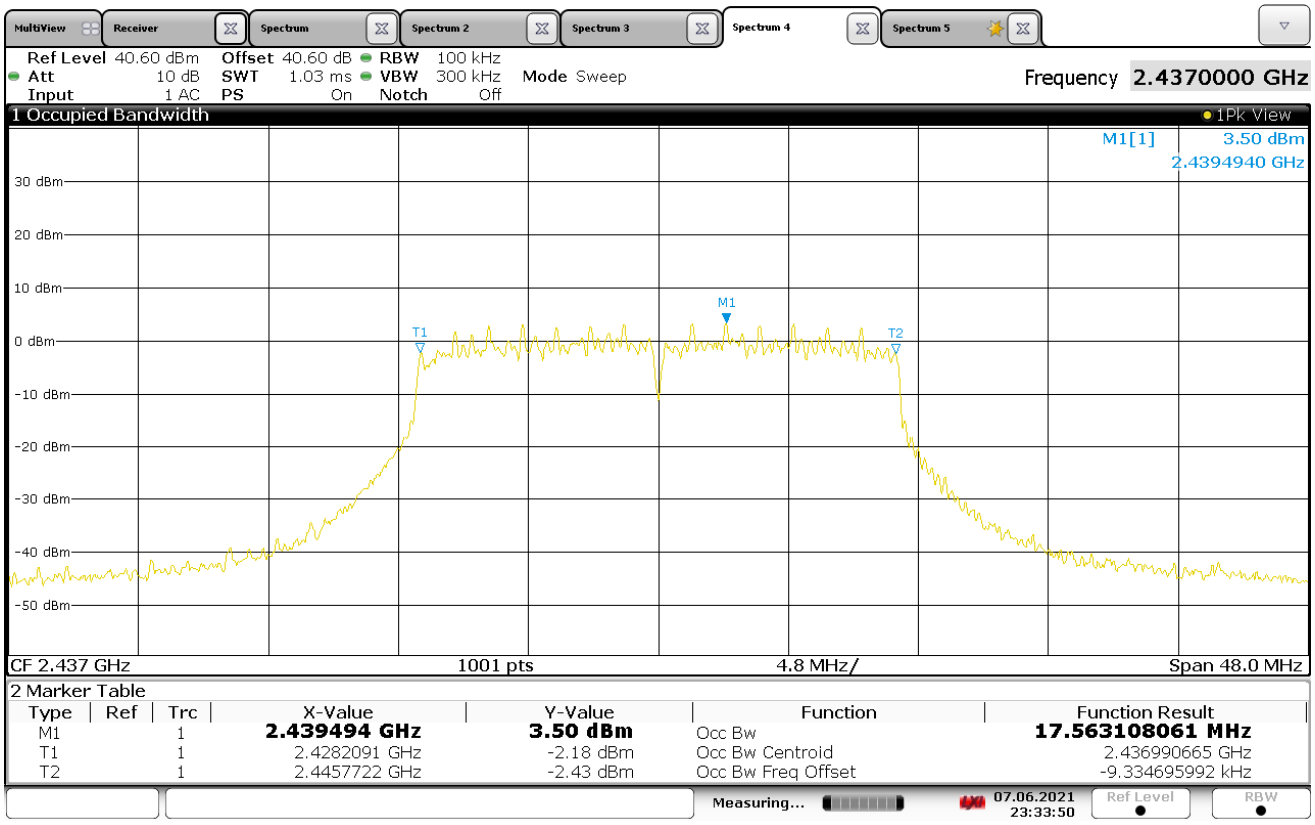
23:28:21 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS6
Carrier Frequency	2437MHz
Parameters	99% BW
Notes	99% BW = 17.55MHz



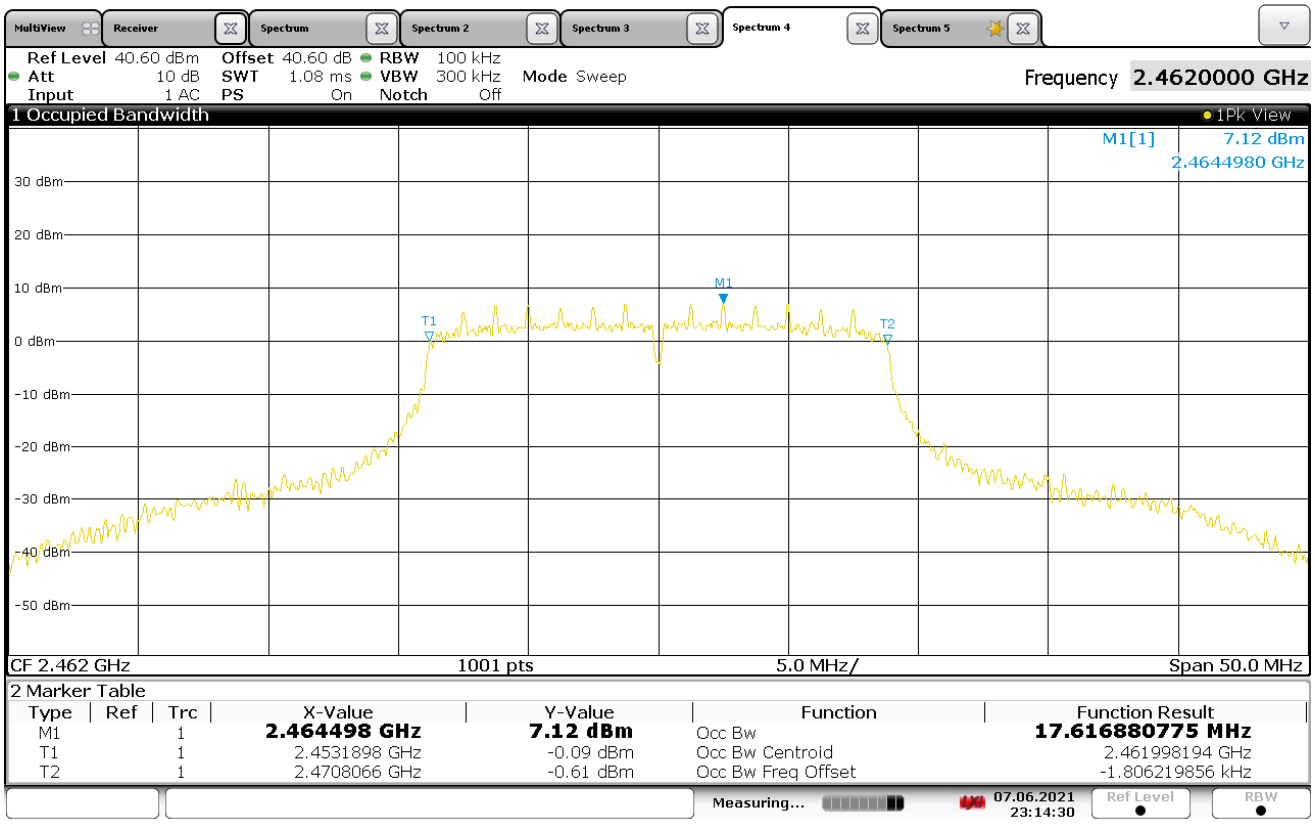
23:31:07 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS7
Carrier Frequency	2437MHz
Parameters	99% BW
Notes	99% BW = 17.56MHz



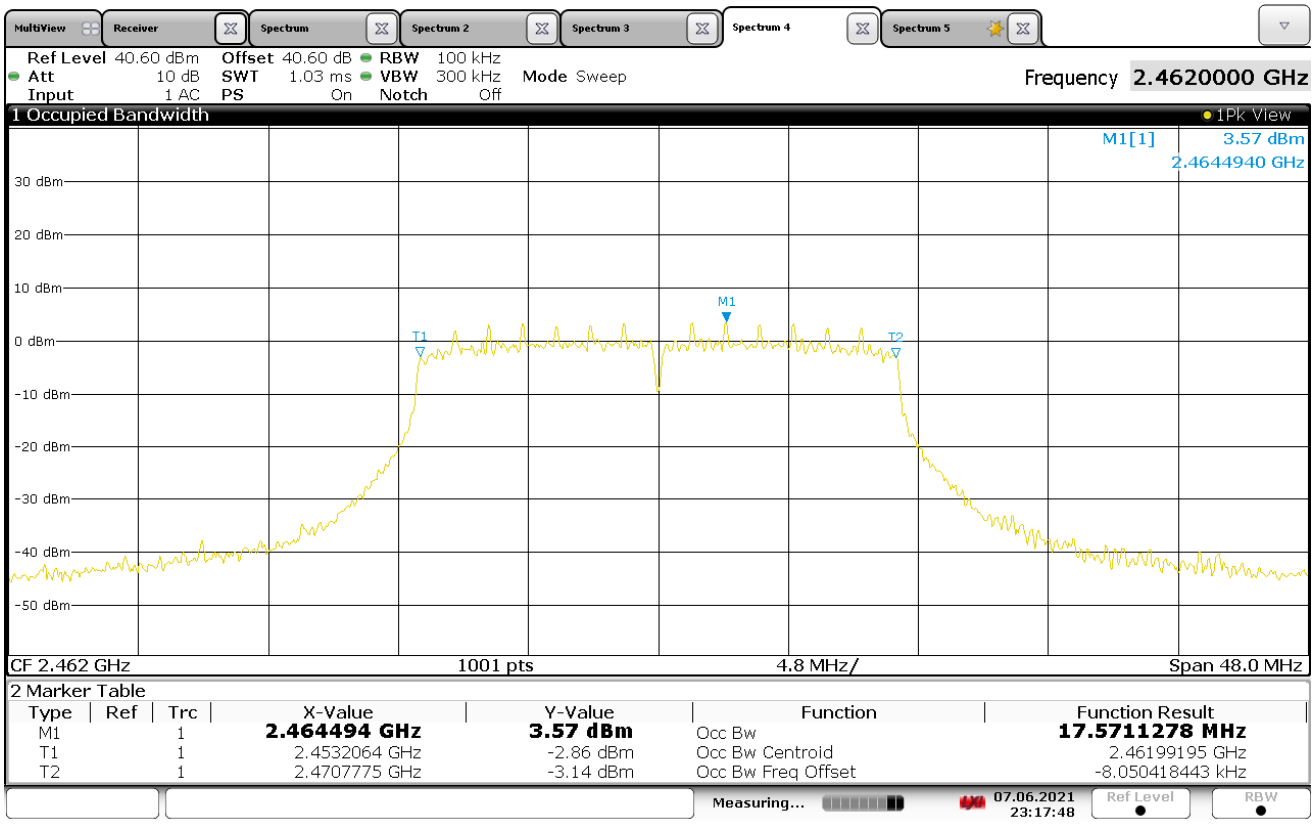
23:33:50 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS0
Carrier Frequency	2462MHz
Parameters	99% BW
Notes	99% BW = 17.61MHz



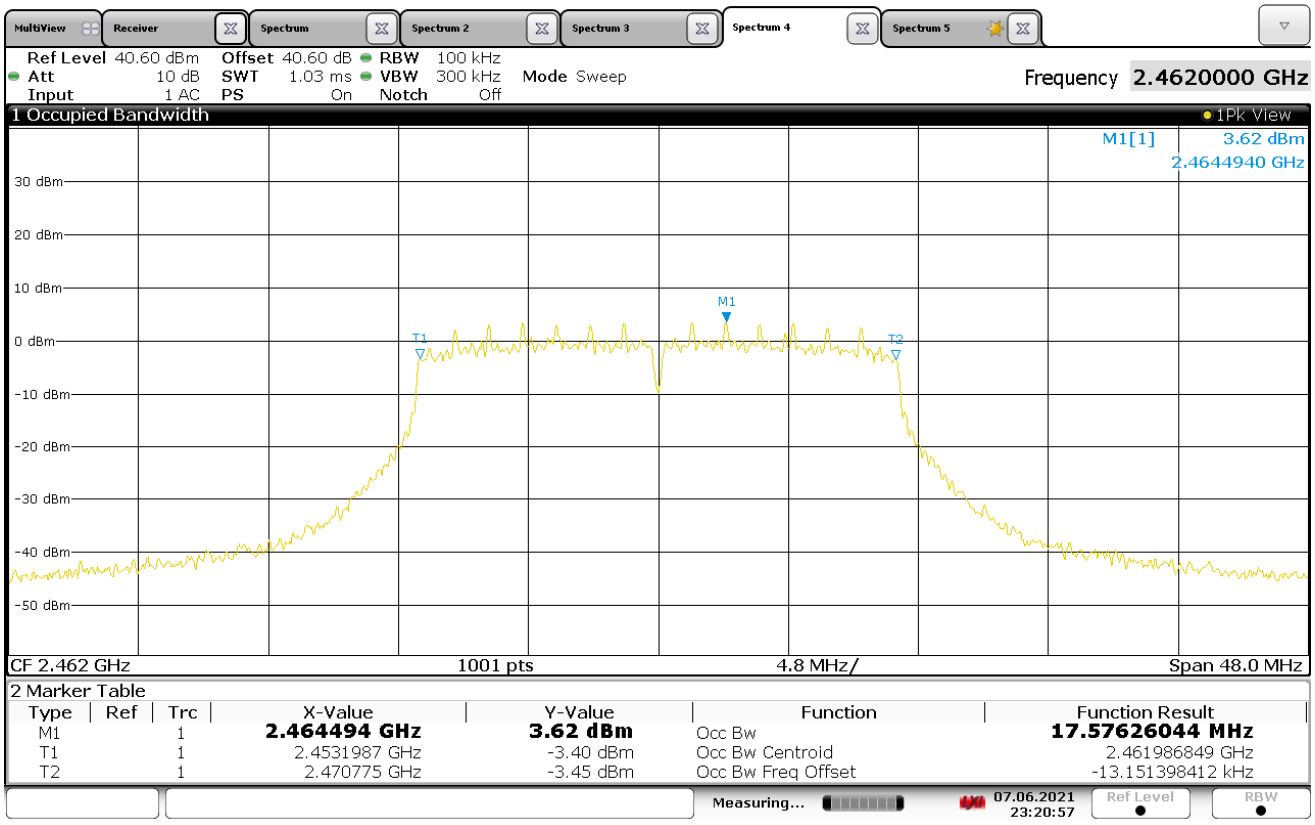
23:14:30 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS1
Carrier Frequency	2462MHz
Parameters	99% BW
Notes	99% BW = 17.57MHz



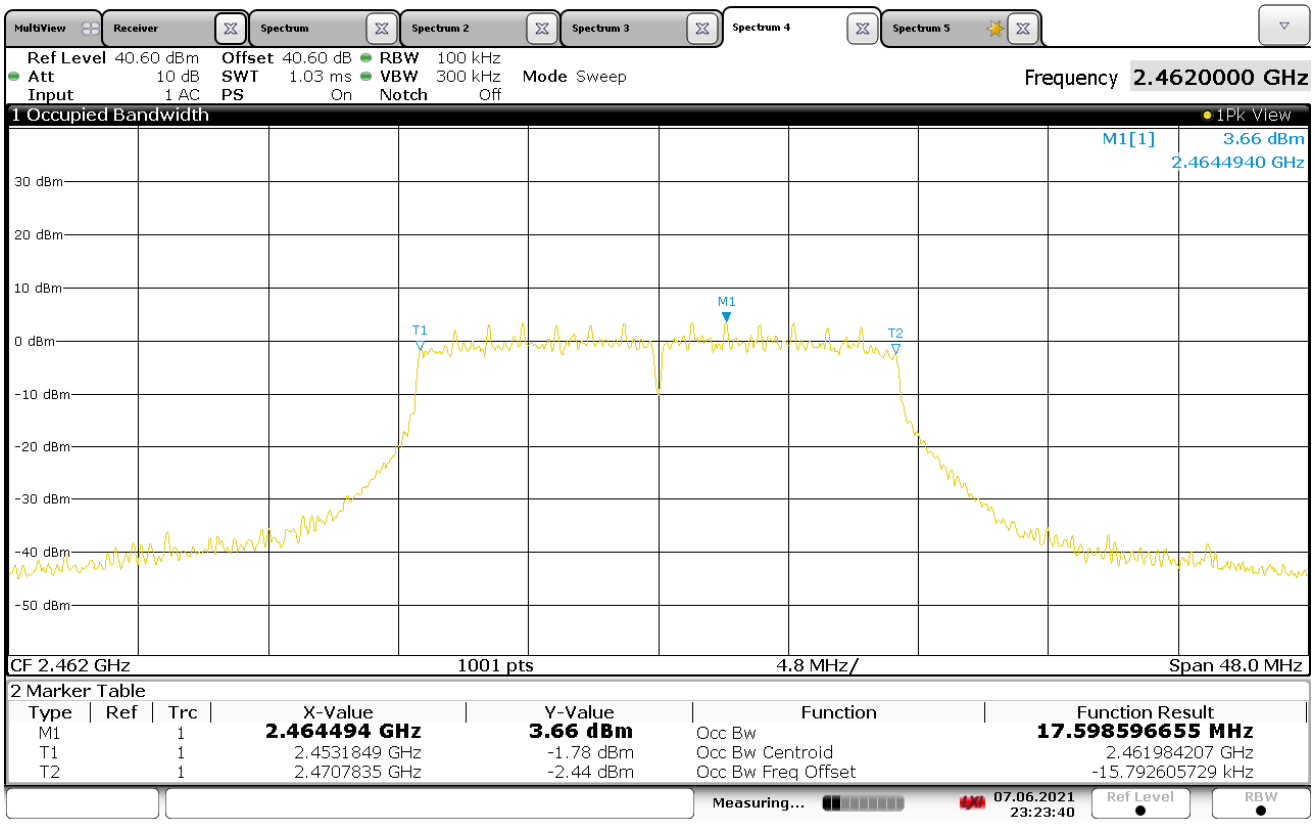
23:17:48 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS2
Carrier Frequency	2462MHz
Parameters	99% BW
Notes	99% BW = 17.57MHz



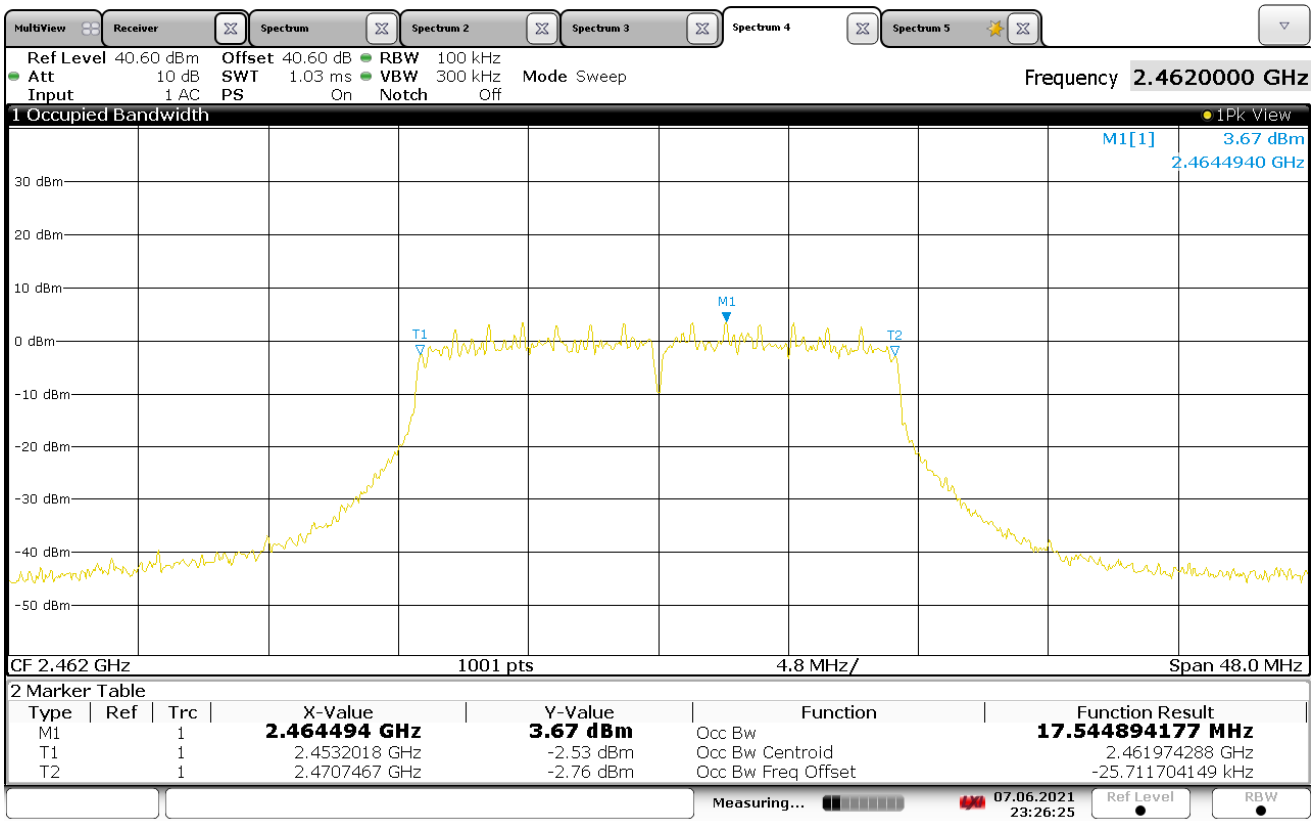
23:20:57 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS3
Carrier Frequency	2462MHz
Parameters	99% BW
Notes	99% BW = 17.59MHz



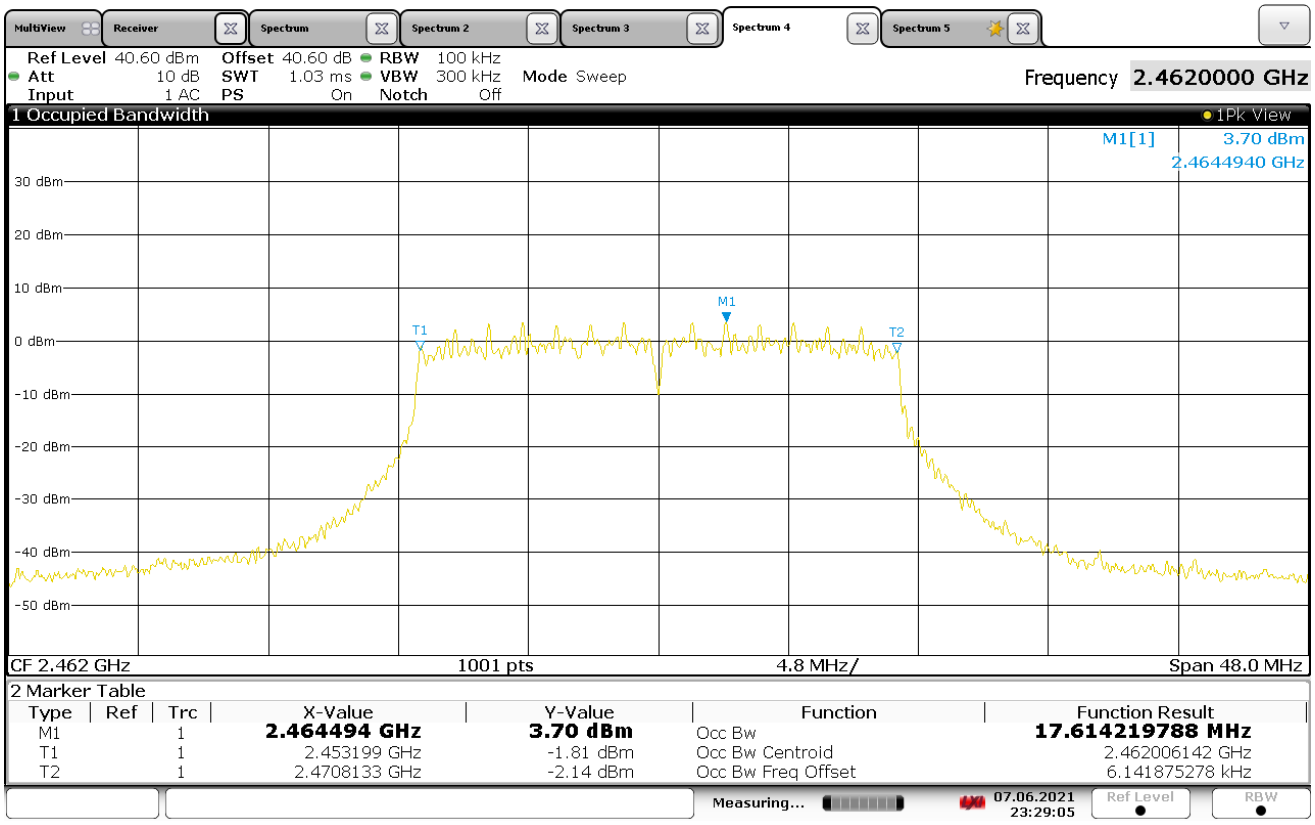
23:23:41 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS4
Carrier Frequency	2462MHz
Parameters	99% BW
Notes	99% BW = 17.54MHz



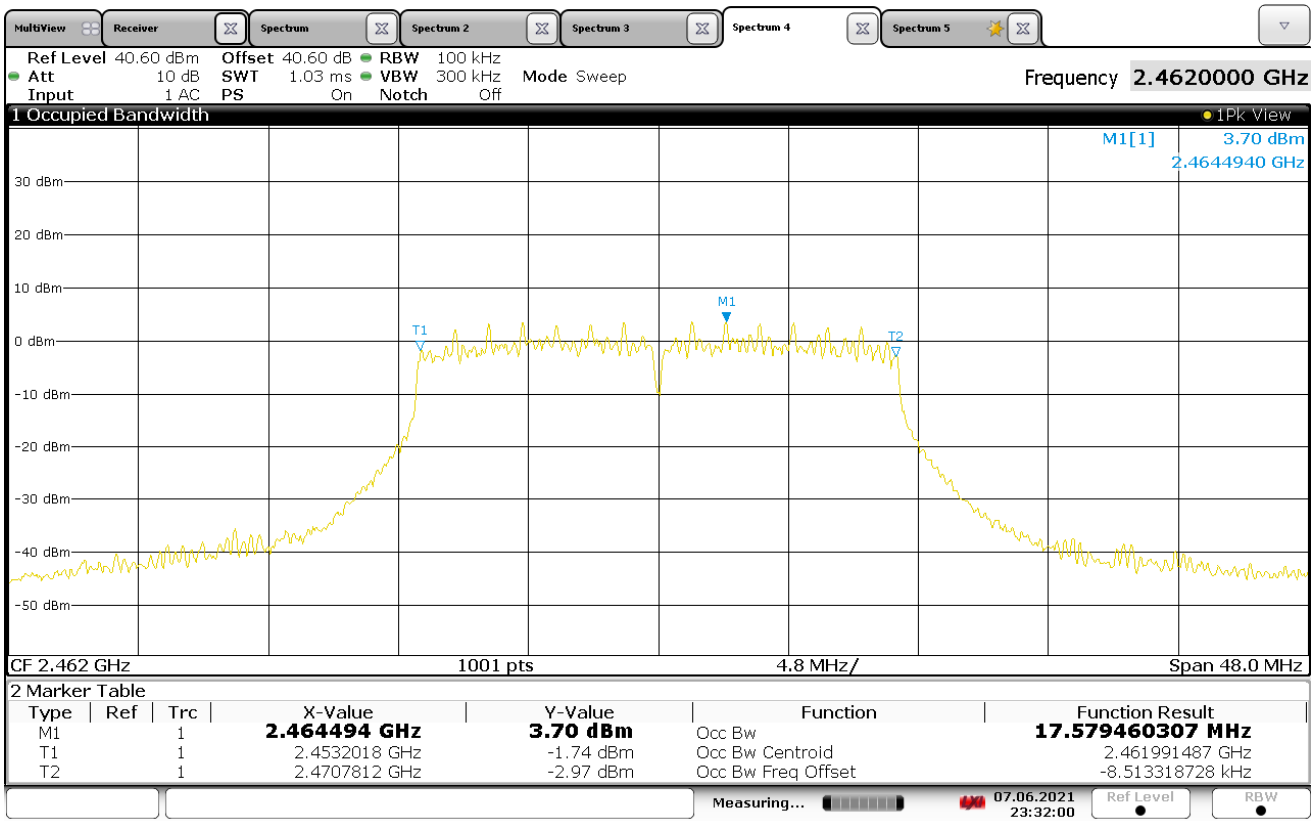
23:26:26 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS5
Carrier Frequency	2462MHz
Parameters	99% BW
Notes	99% BW = 17.61MHz



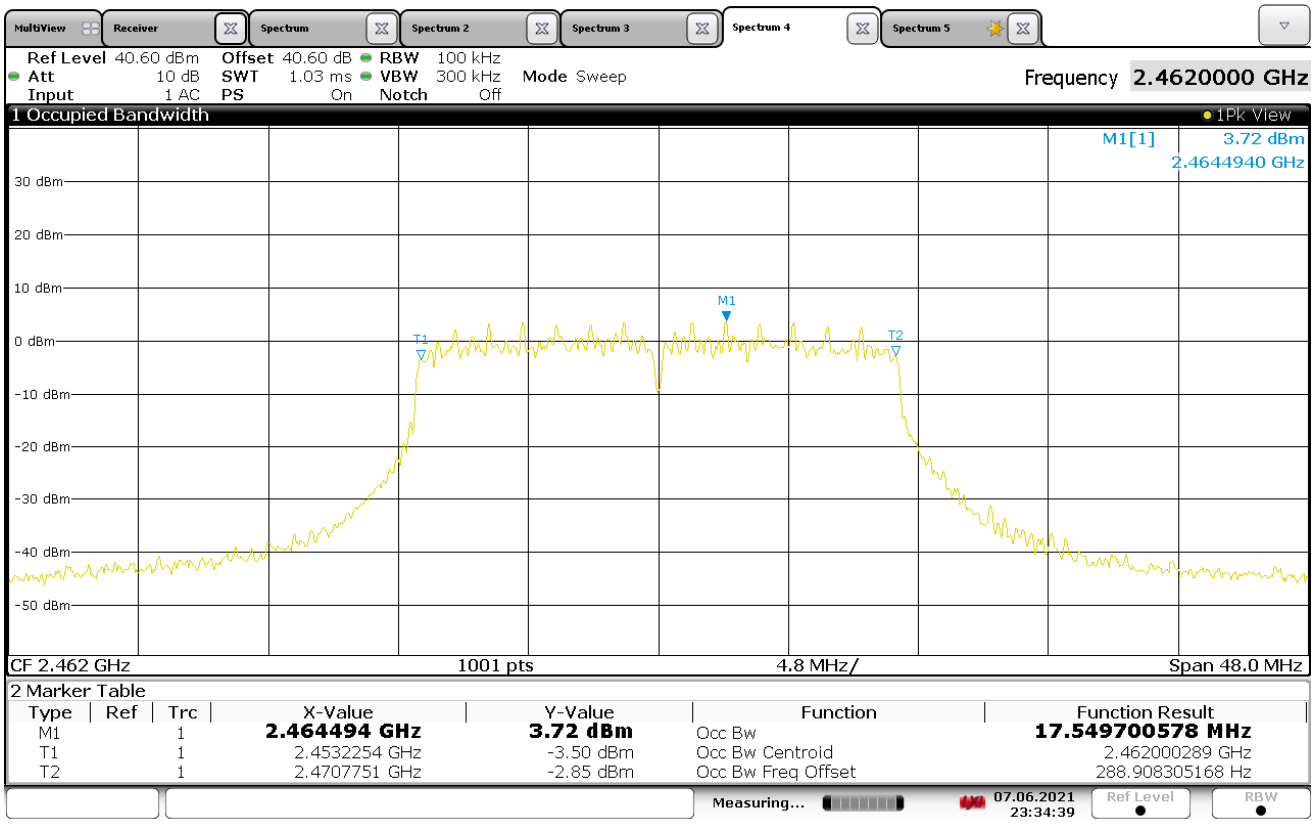
23:29:06 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS6
Carrier Frequency	2462MHz
Parameters	99% BW
Notes	99% BW = 17.57MHz



23:32:00 07.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS7
Carrier Frequency	2462MHz
Parameters	99% BW
Notes	99% BW = 17.54MHz



23:34:39 07.06.2021

25. Maximum Peak Conducted Output Power

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

Test Setup Details	
Setup Format	Tabletop
Measurement Method	Antenna Conducted
Notes	N/A

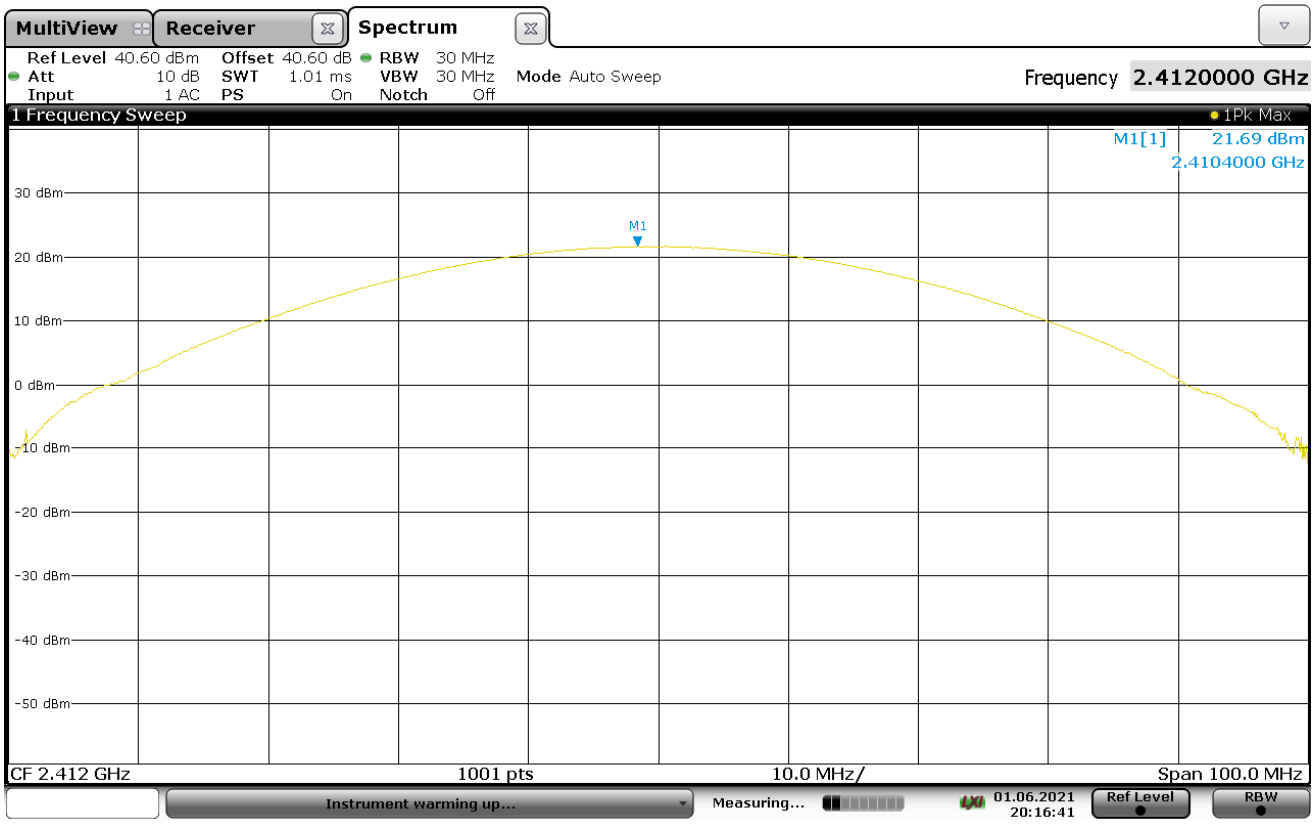
Requirements
The output power shall not exceed 1W (30dBm).

Procedures
The antenna port of the EUT was connected to the spectrum analyzer through 40dB of attenuation. The EUT was set to transmit separately at the low, middle, and high channels. The resolution bandwidth (RBW) was set to greater than the 6dB bandwidth. The span was set to greater than 3 times the RBW. The 'Max-Hold' function was engaged. The maximum meter reading was recorded. The peak power output was calculated for the low, middle, and high channels.

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b
Notes	N/A

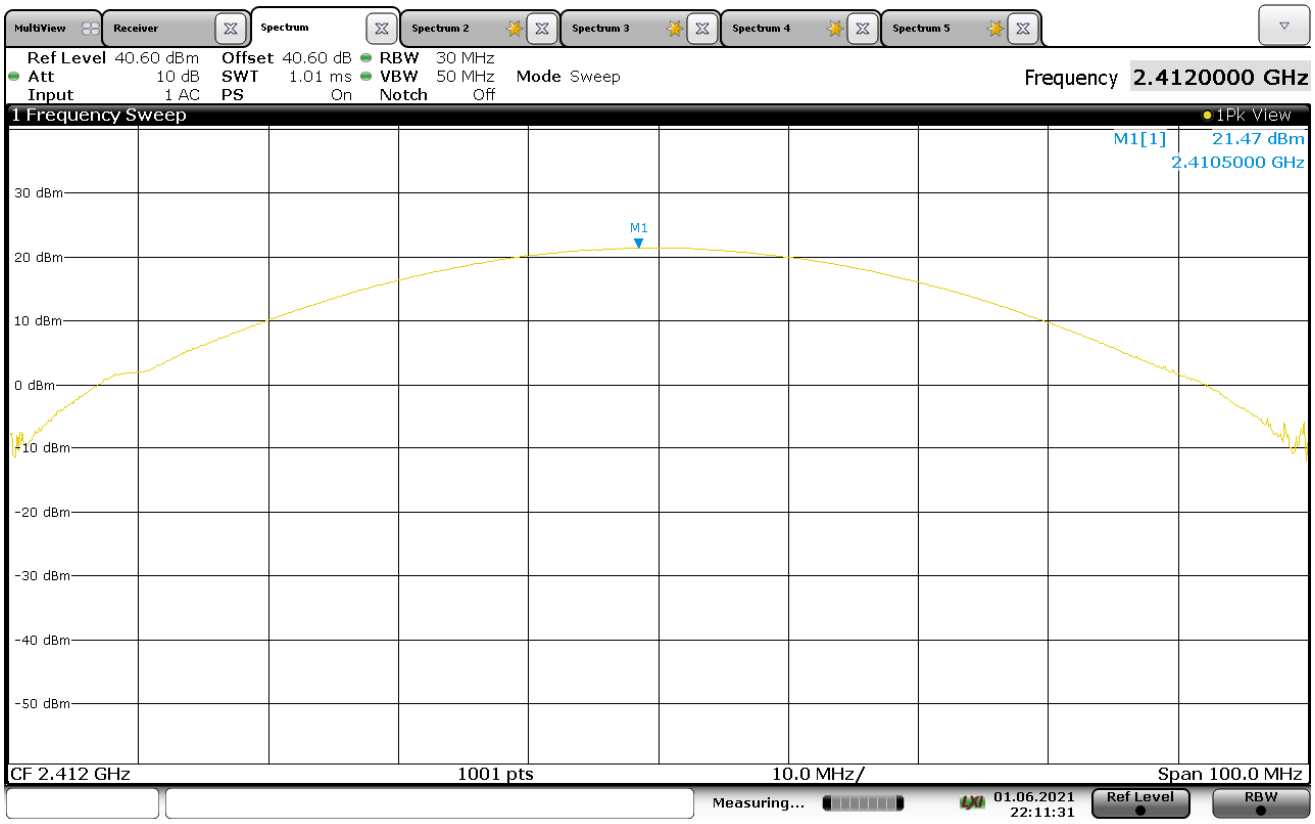
Protocol	Freq. (MHz)	Data Rate (Mbps)	Power (dBm)	Power (W)
802.11b	2412	1	21.7	0.1479
	2437		22.06	0.1606
	2462		22.07	0.1610
	2412	2	21.66	0.1465
	2437		21.79	0.1510
	2462		21.84	0.1527
	2412	5.5	21.67	0.1468
	2437		22.01	0.1588
	2462		22.09	0.1618
	2412	11	21.97	0.1573
	2437		22.42	0.1745
	2462		22.47	0.1766

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b – 1Mbps
Carrier Frequency	2412MHz
Parameters	Output Power = 0.1479W (21.69dBm)
Notes	N/A



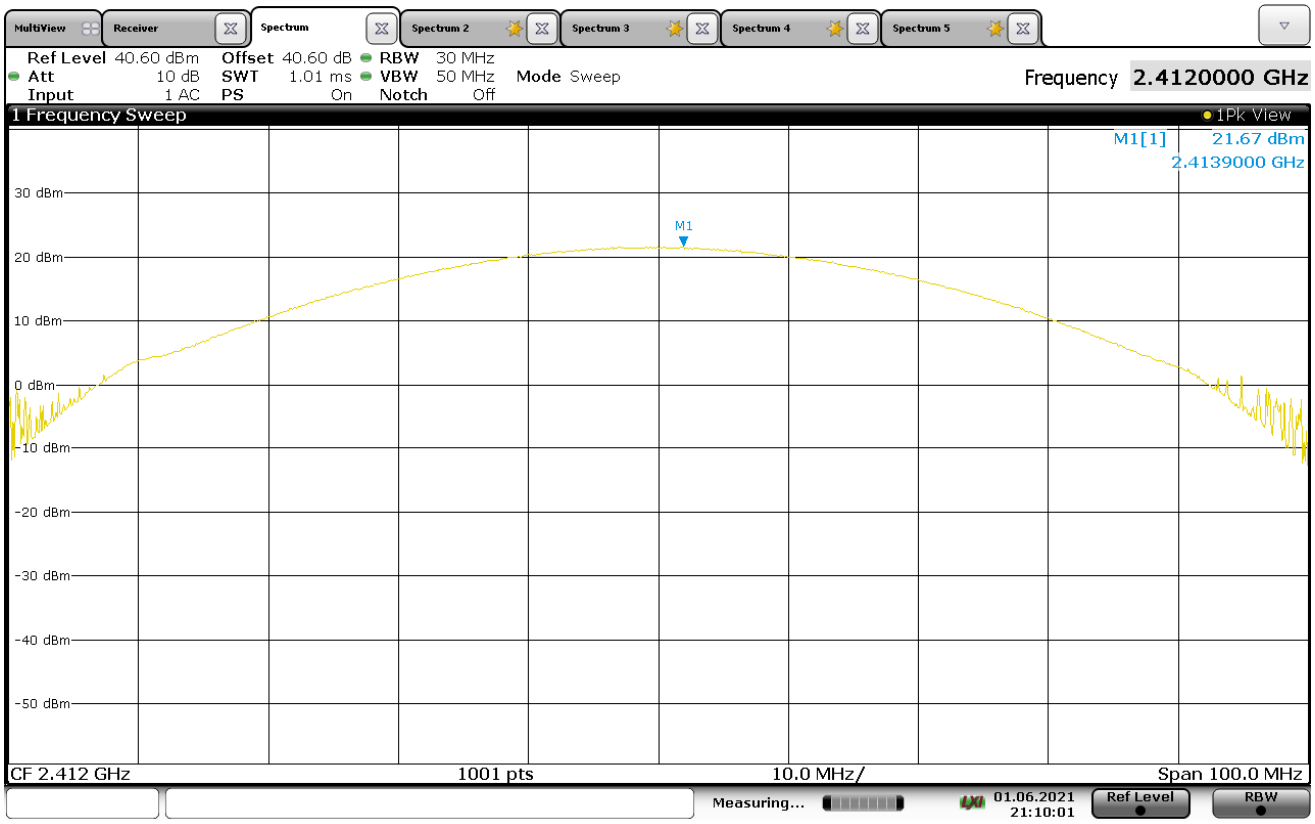
20:16:41 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b – 2Mbps
Carrier Frequency	2412MHz
Parameters	Output Power = 0.1465W (21.47dBm)
Notes	N/A



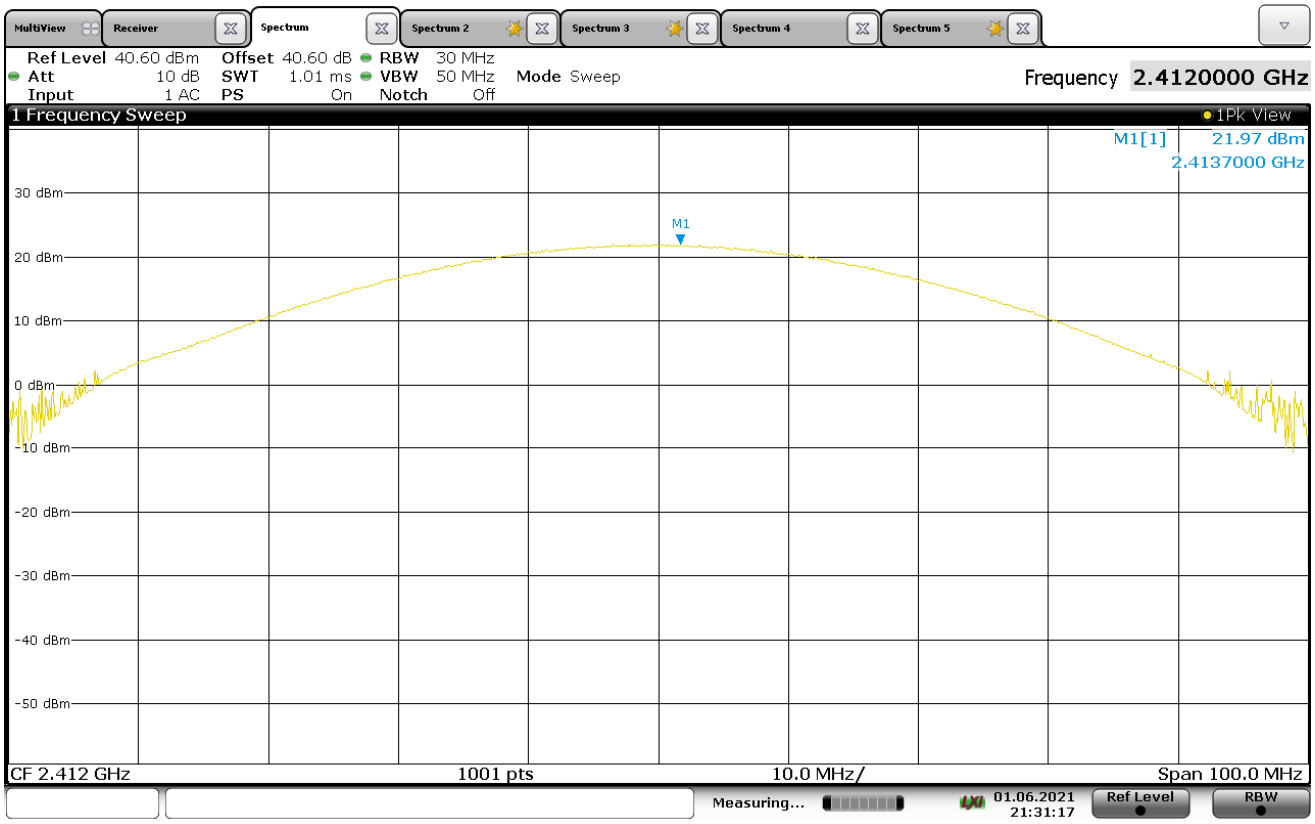
22:11:31 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b – 5.5Mbps
Carrier Frequency	2412MHz
Parameters	Output Power = 0.1468W (21.67dBm)
Notes	N/A



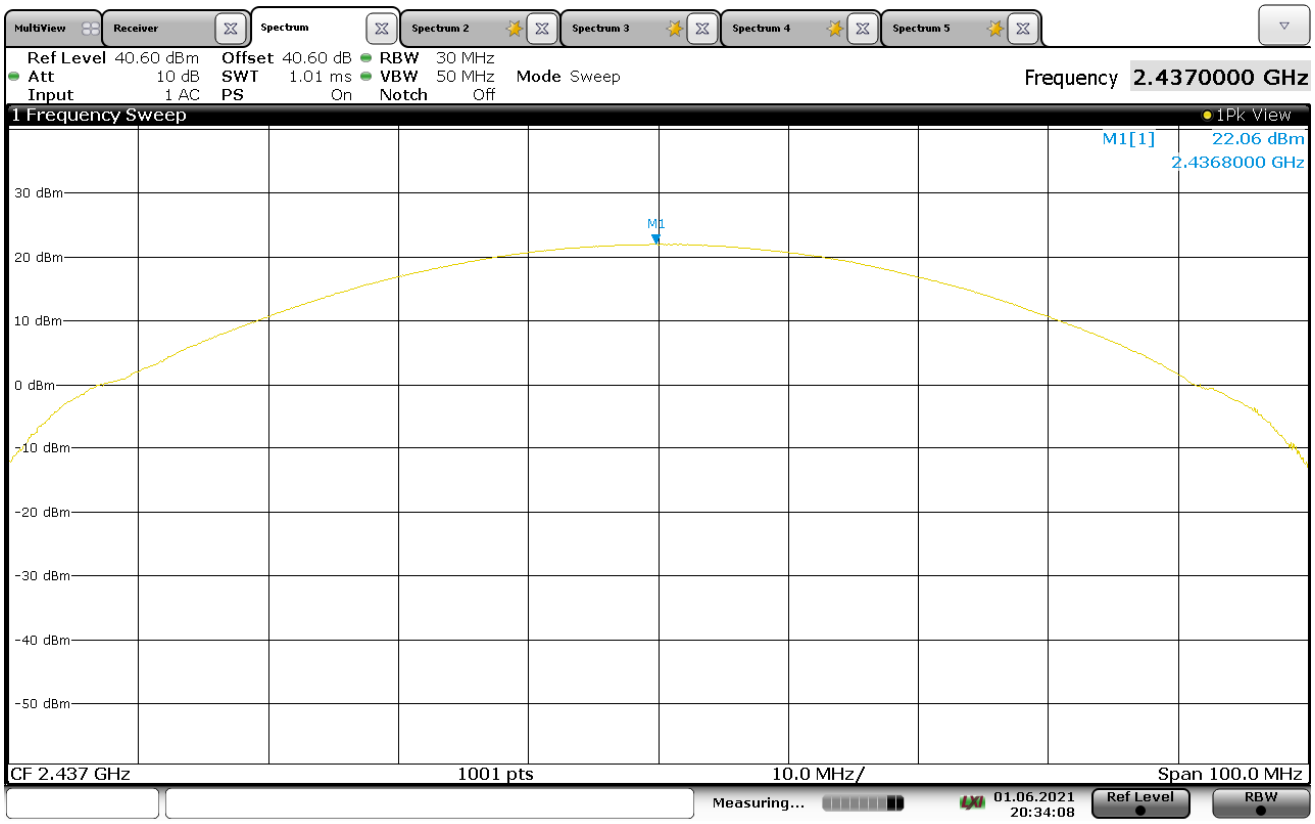
21:10:01 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b – 11Mbps
Carrier Frequency	2412MHz
Parameters	Output Power = 0.1573W (21.97dBm)
Notes	N/A



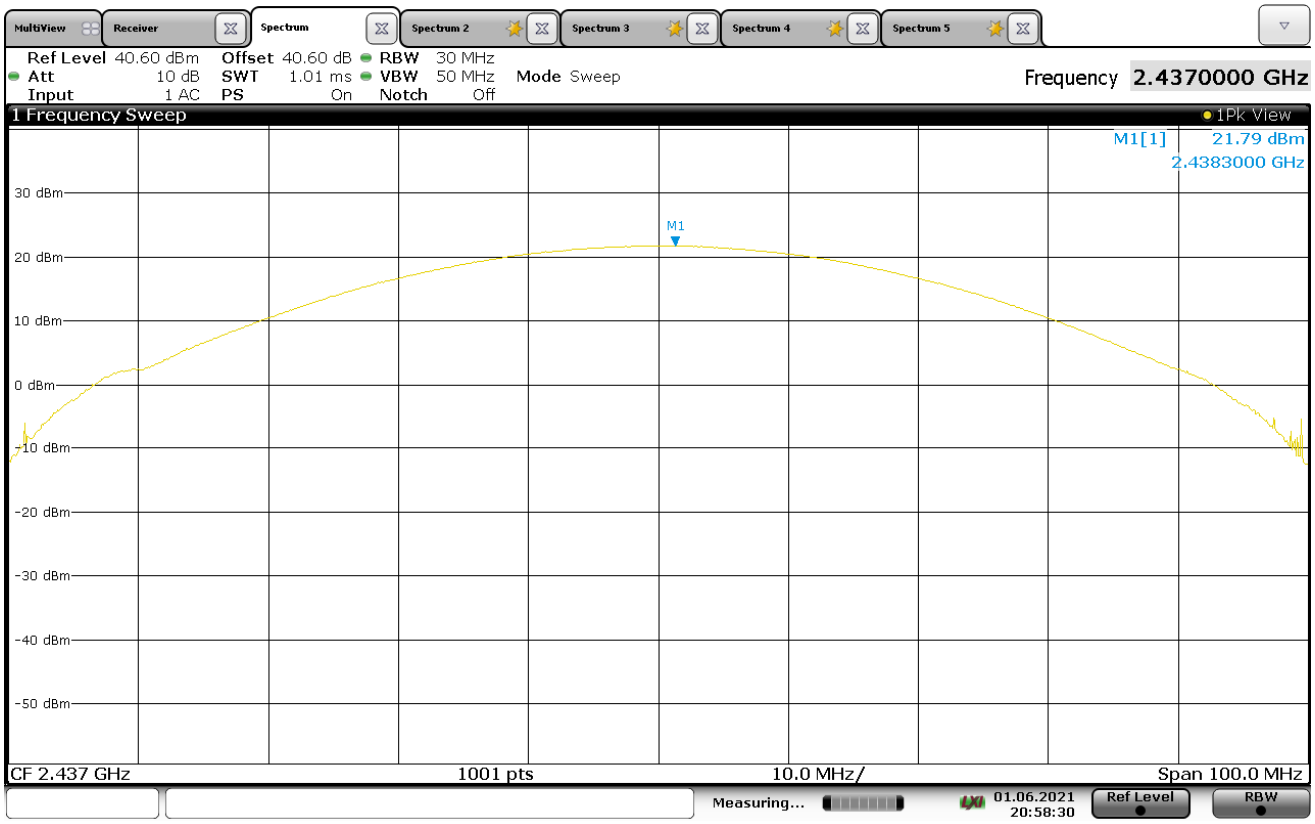
21:31:18 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b – 1Mbps
Carrier Frequency	2437MHz
Parameters	Output Power = 0.1606W (22.06dBm)
Notes	N/A



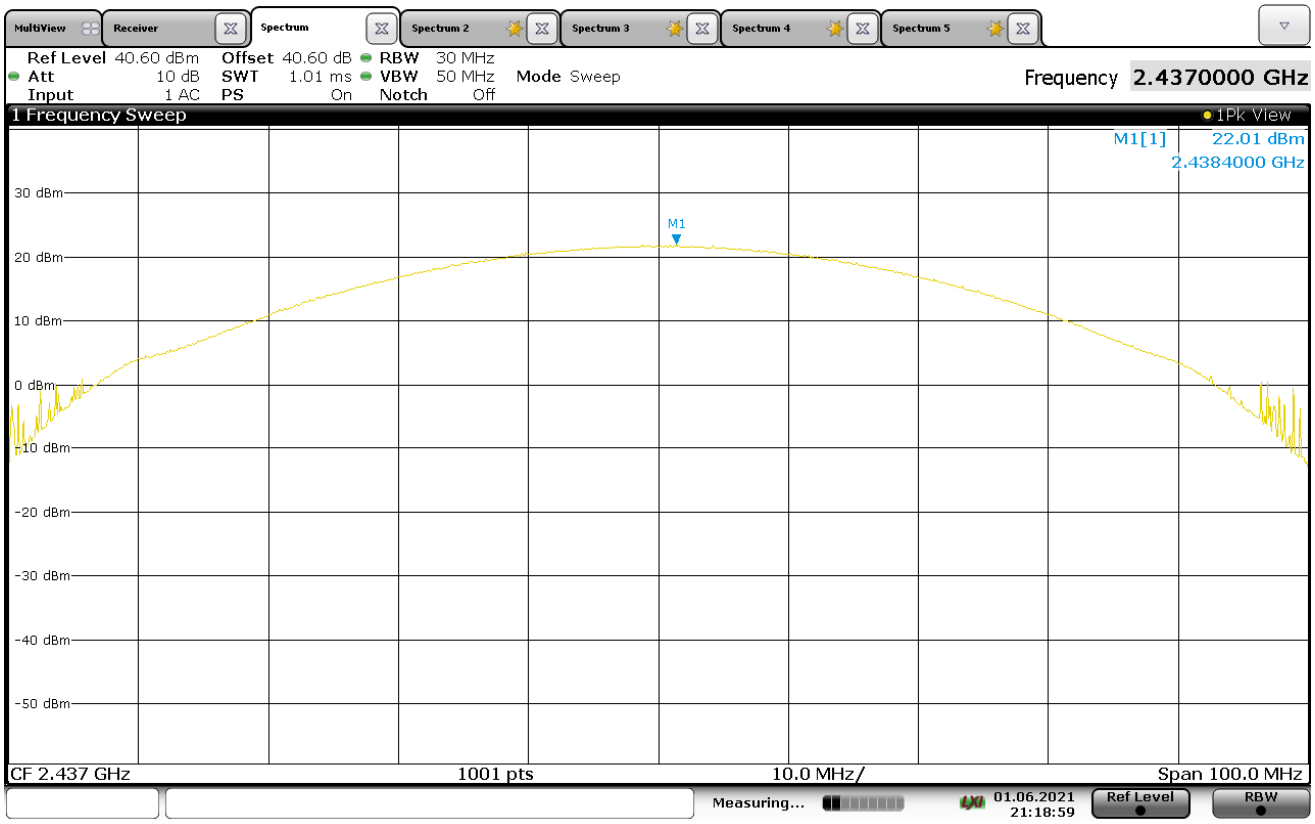
20:34:08 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b – 2Mbps
Carrier Frequency	2437MHz
Parameters	Output Power = 0.1510W (21.79dBm)
Notes	N/A



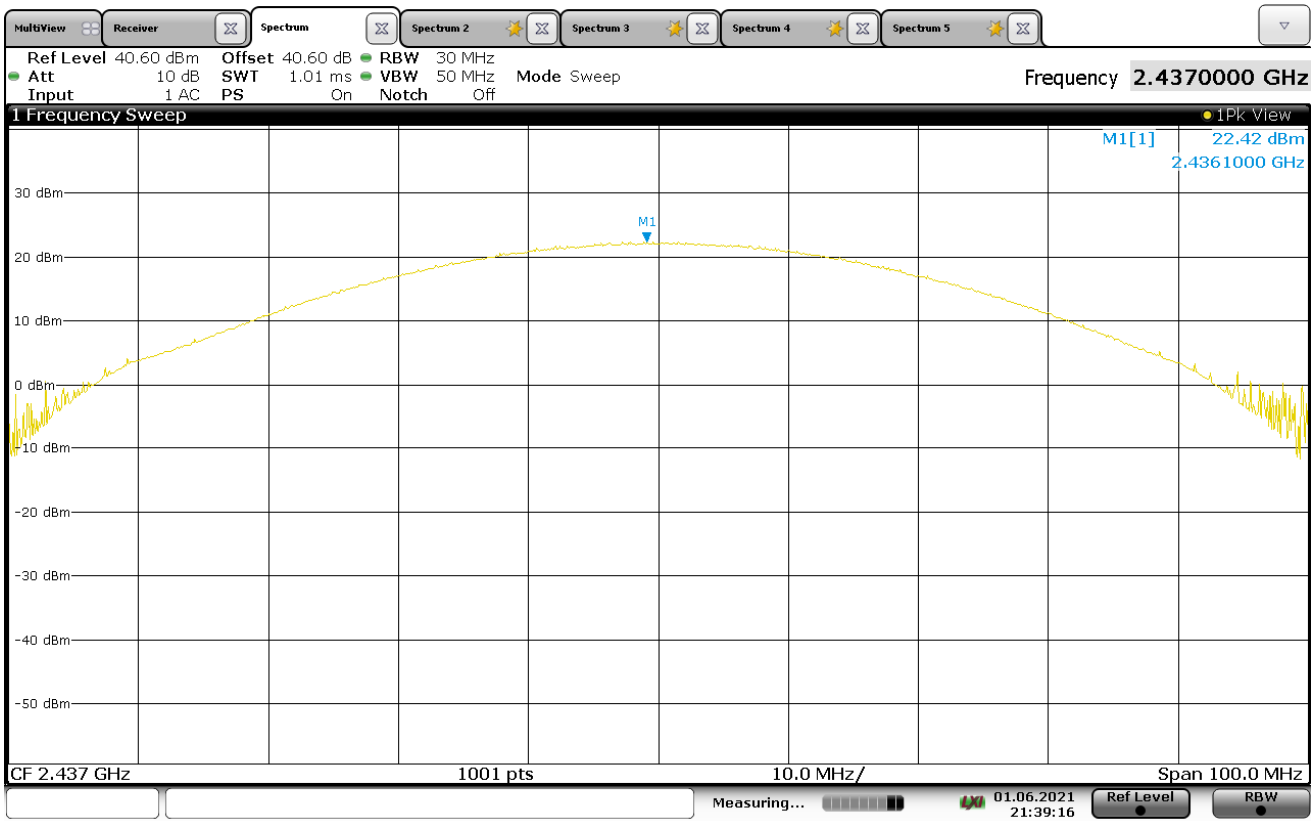
20:58:30 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b – 5.5Mbps
Carrier Frequency	2437MHz
Parameters	Output Power = 0.1588W (22.01dBm)
Notes	N/A



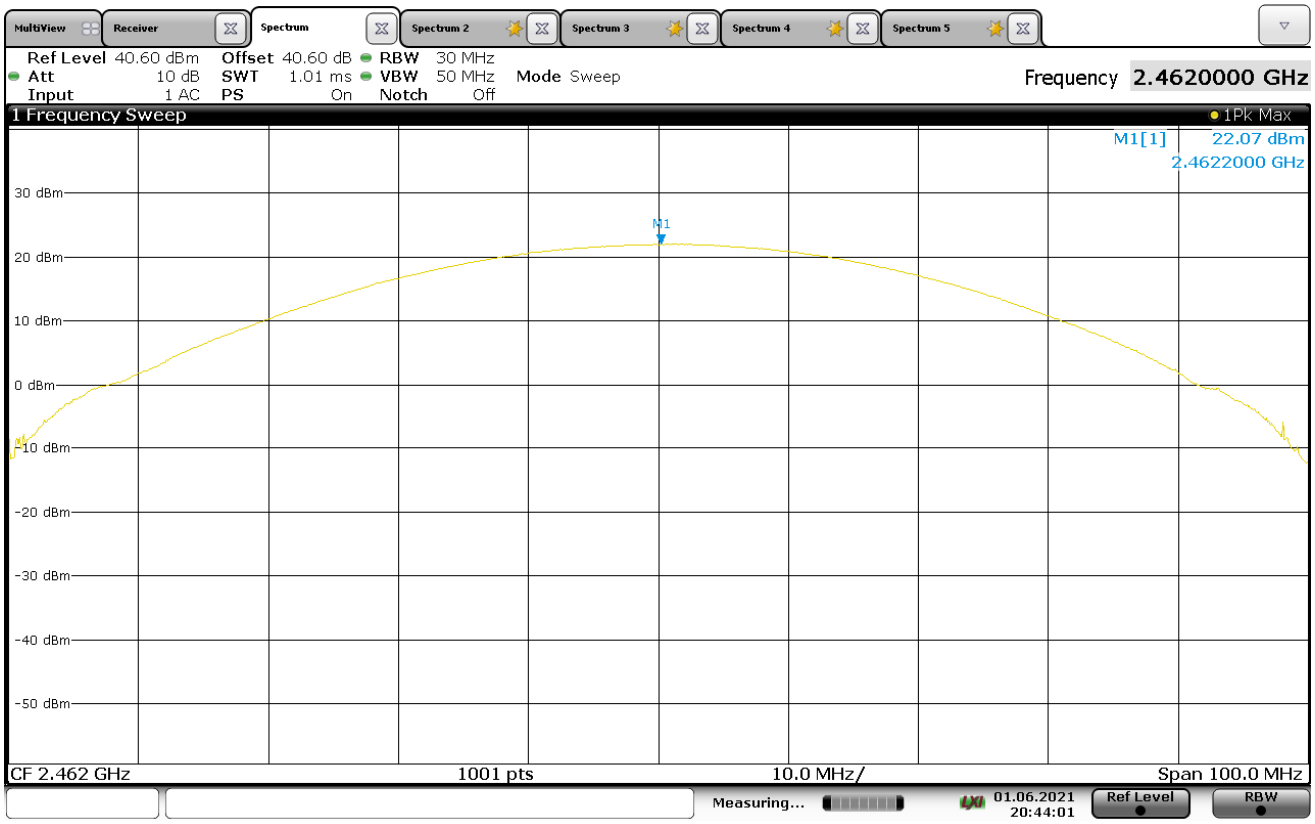
21:18:59 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b – 11Mbps
Carrier Frequency	2437MHz
Parameters	Output Power = 0.1745W (22.42dBm)
Notes	N/A



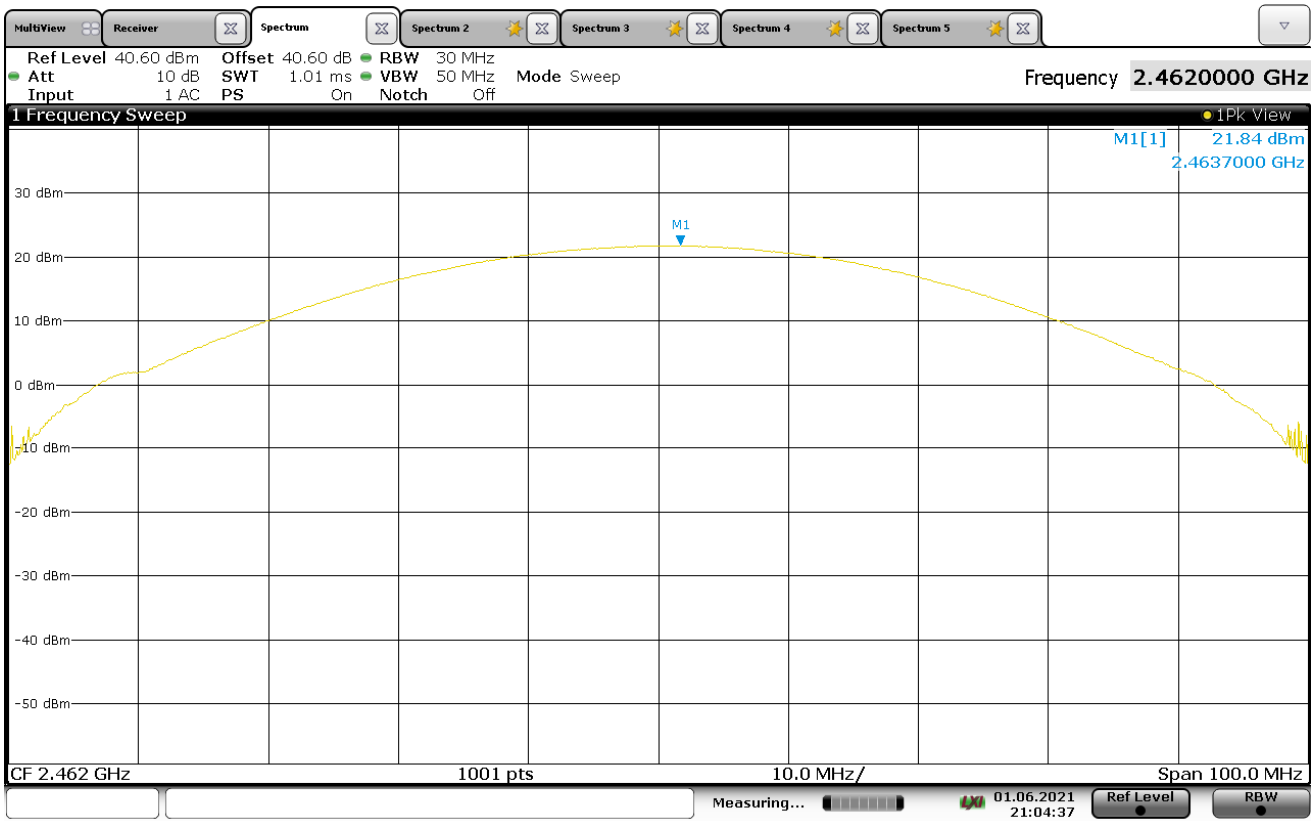
21:39:16 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b – 1Mbps
Carrier Frequency	2462MHz
Parameters	Output Power = 0.1610W (22.07dBm)
Notes	N/A



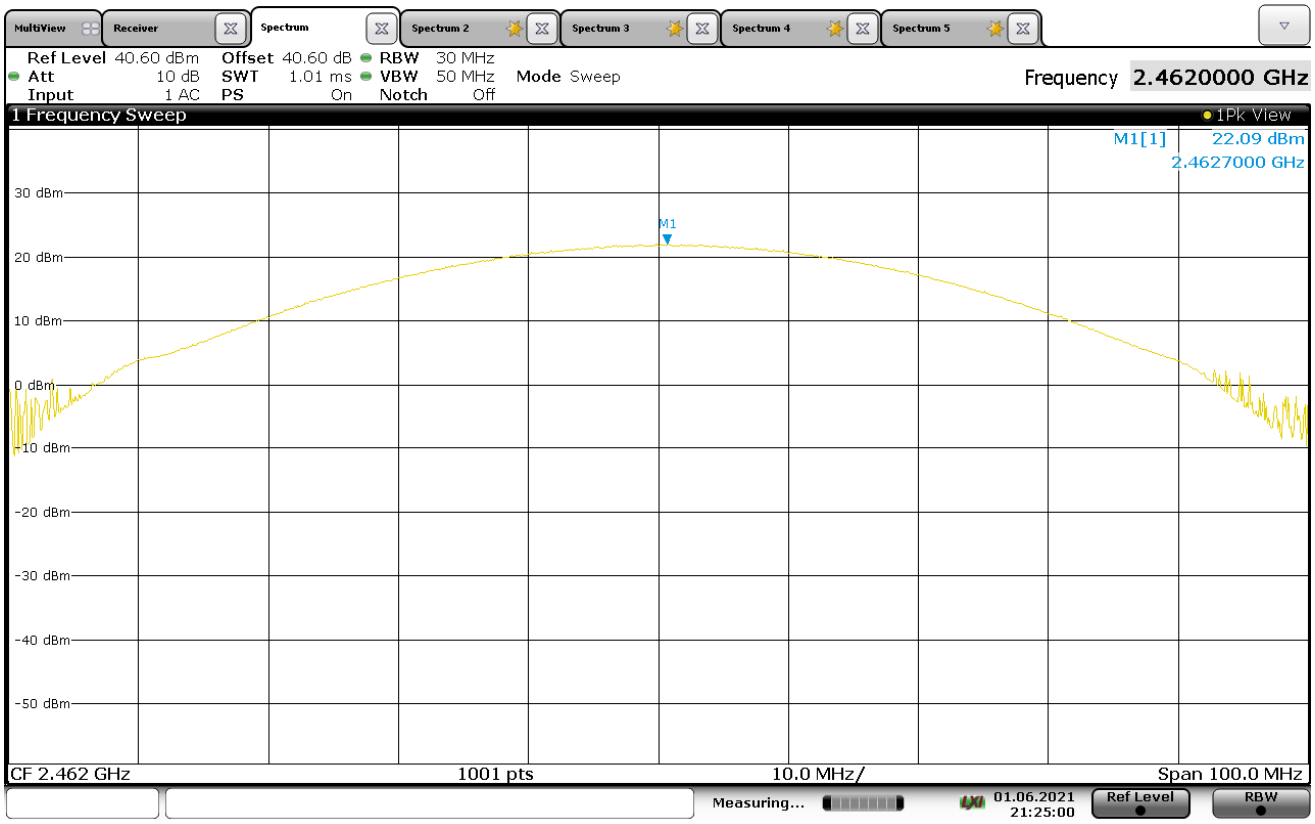
20:44:02 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b – 2Mbps
Carrier Frequency	2462MHz
Parameters	Output Power = 0.1527W (21.84dBm)
Notes	N/A



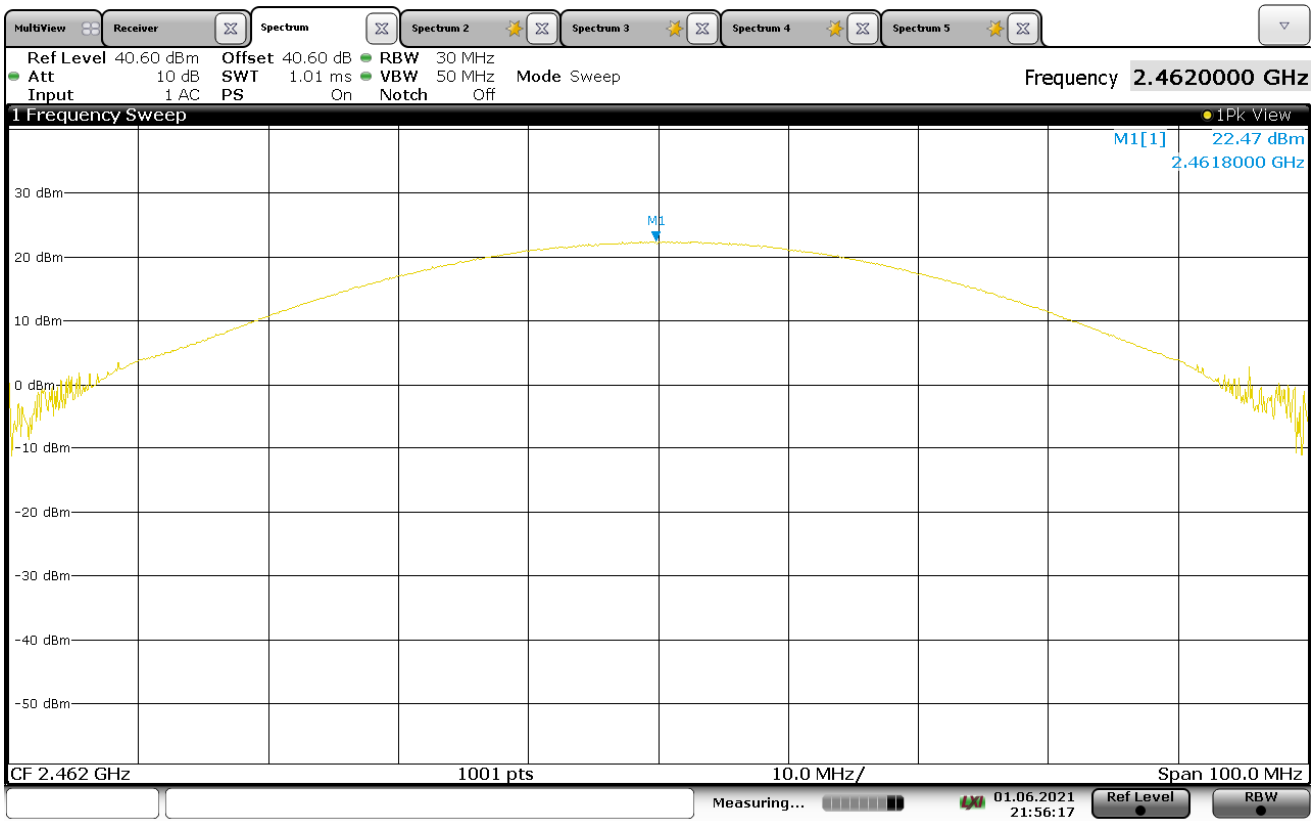
21:04:38 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b – 5.5Mbps
Carrier Frequency	2462MHz
Parameters	Output Power = 0.1618W (22.09dBm)
Notes	N/A



21:25:01 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11b – 11Mbps
Carrier Frequency	2462MHz
Parameters	Output Power = 0.1766W (22.47dBm)
Notes	N/A

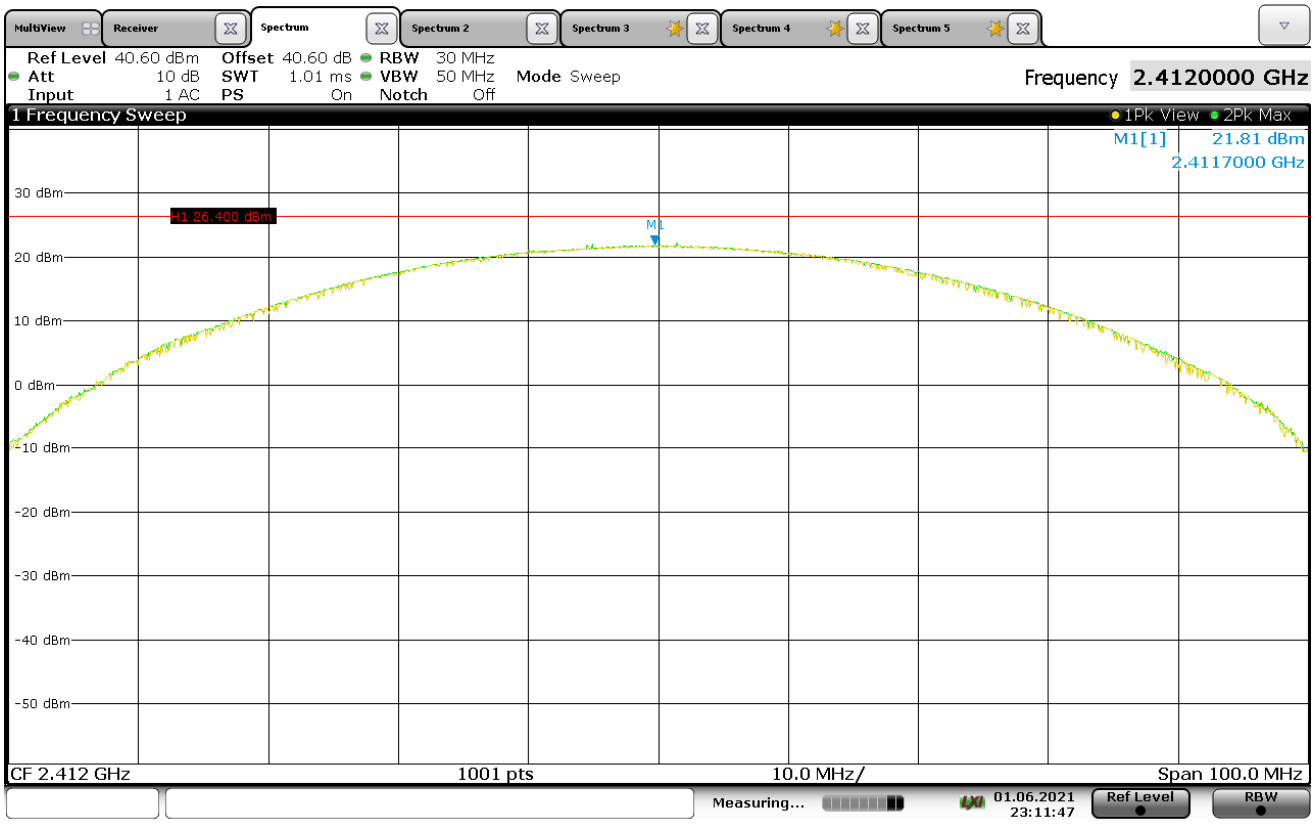


21:56:17 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g
Notes	N/A

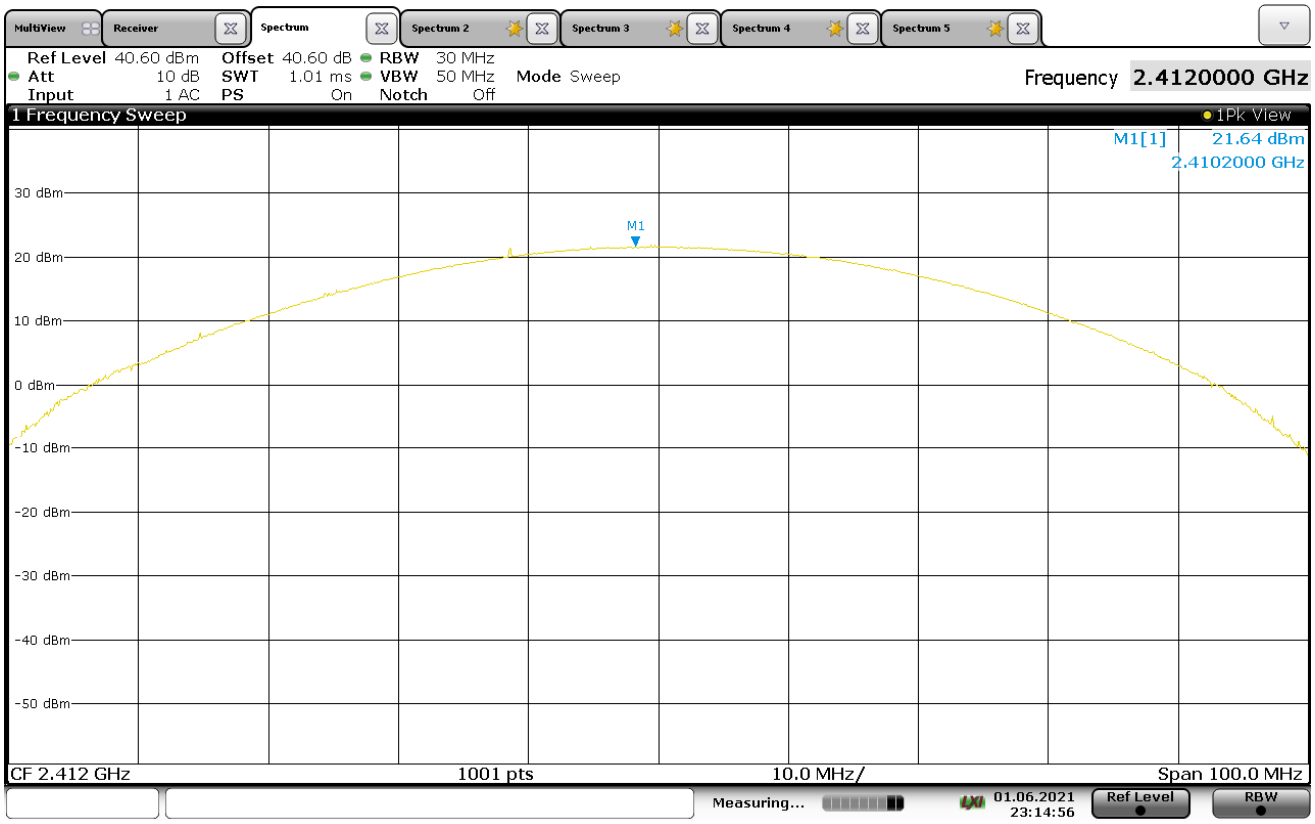
Protocol	Freq. (MHz)	Data Rate (Mbps)	Power (dBm)
802.11g	2412	6	21.8
	2437		21.97
	2462		22
	2412	9	21.64
	2437		22.37
	2462		22.24
	2412	12	21.69
	2437		21.98
	2462		21.75
	2412	18	21.9
	2437		21.57
	2462		22.14
	2412	24	21.59
	2437		22.11
	2462		22.15
	2412	36	21.38
	2437		21.87
	2462		21.7
	2412	48	22.34
	2437		22
	2462		21.88
	2412	54	17.8
	2437		18.13
	2462		19.26

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 6Mbps
Carrier Frequency	2412MHz
Parameters	Output Power = 0.1513W (21.81dBm)
Notes	N/A



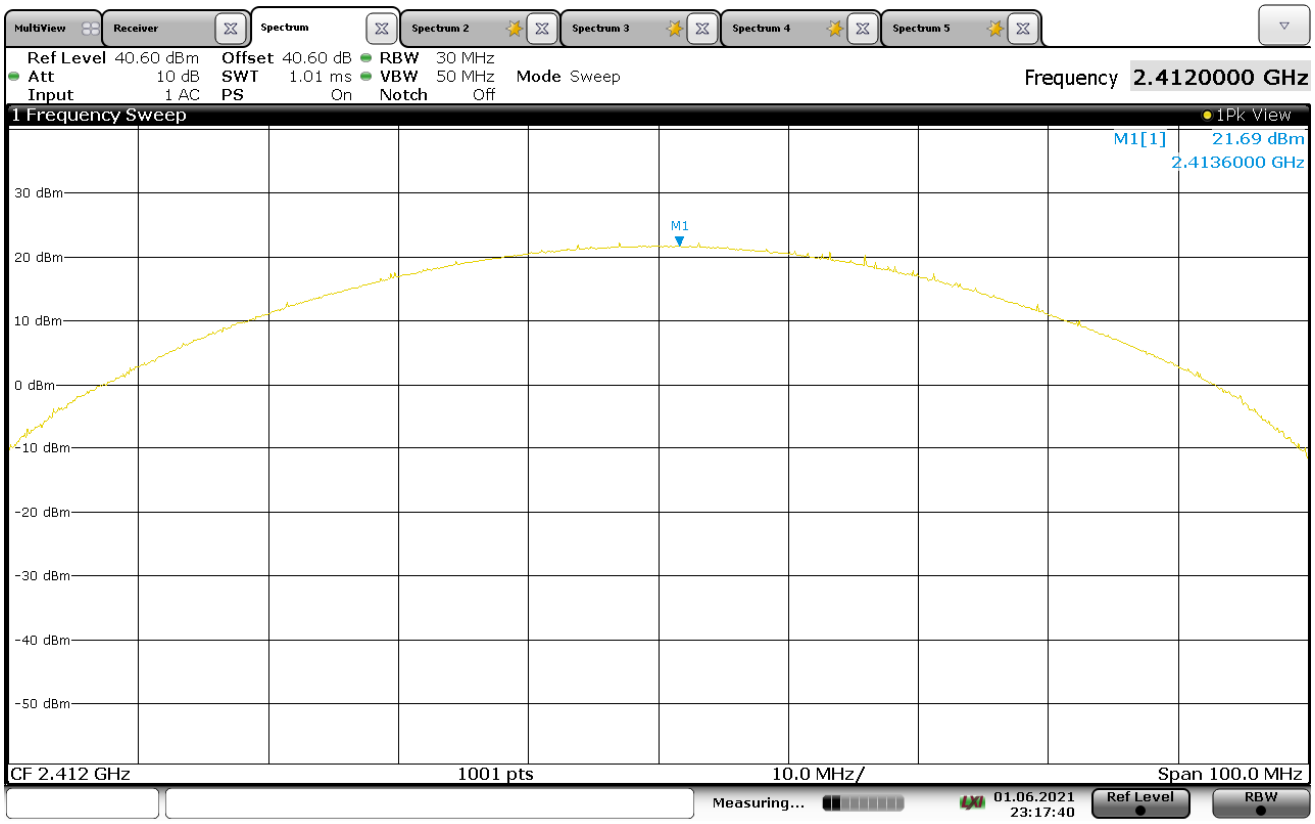
23:11:48 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 9Mbps
Carrier Frequency	2412MHz
Parameters	Output Power = 0.1458W (21.64dBm)
Notes	N/A



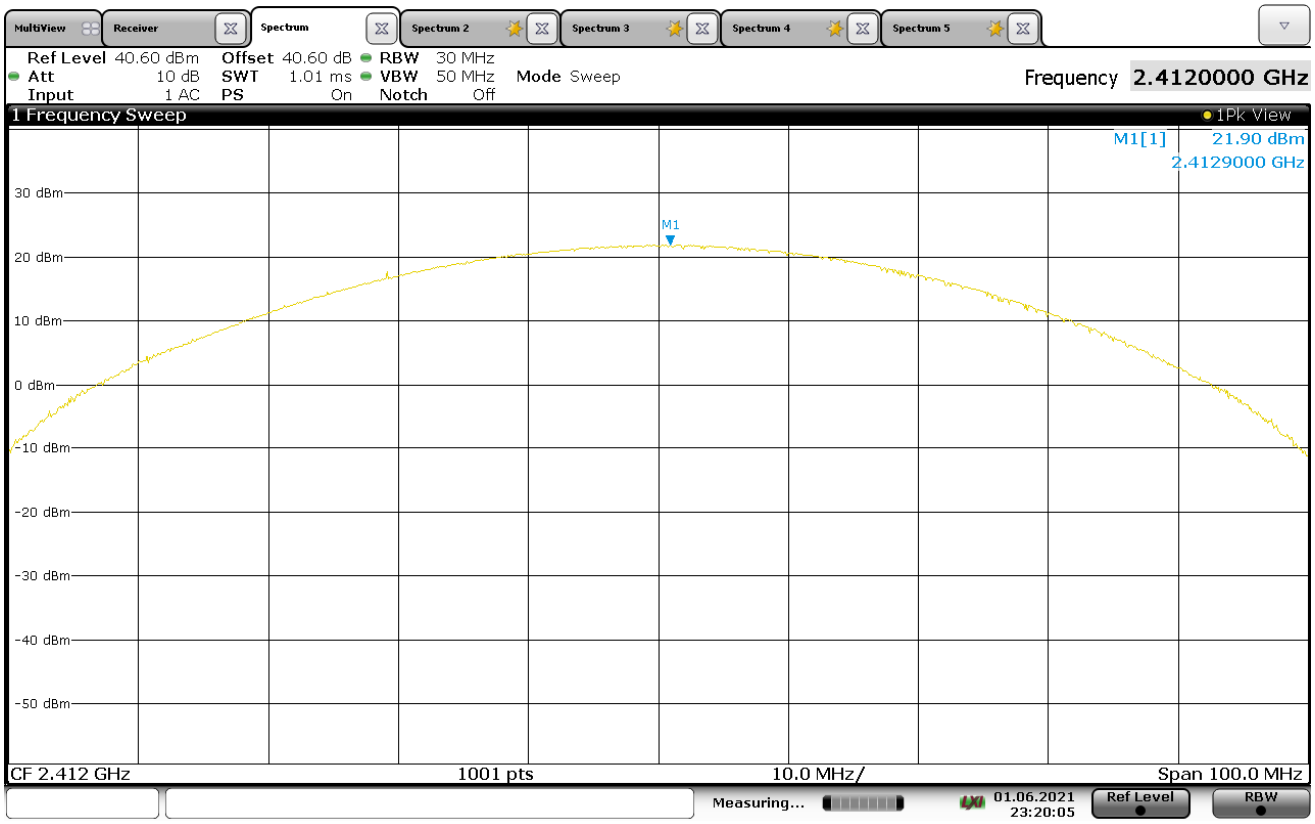
23:14:57 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 12Mbps
Carrier Frequency	2412MHz
Parameters	Output Power = 0.1475W (21.69dBm)
Notes	N/A



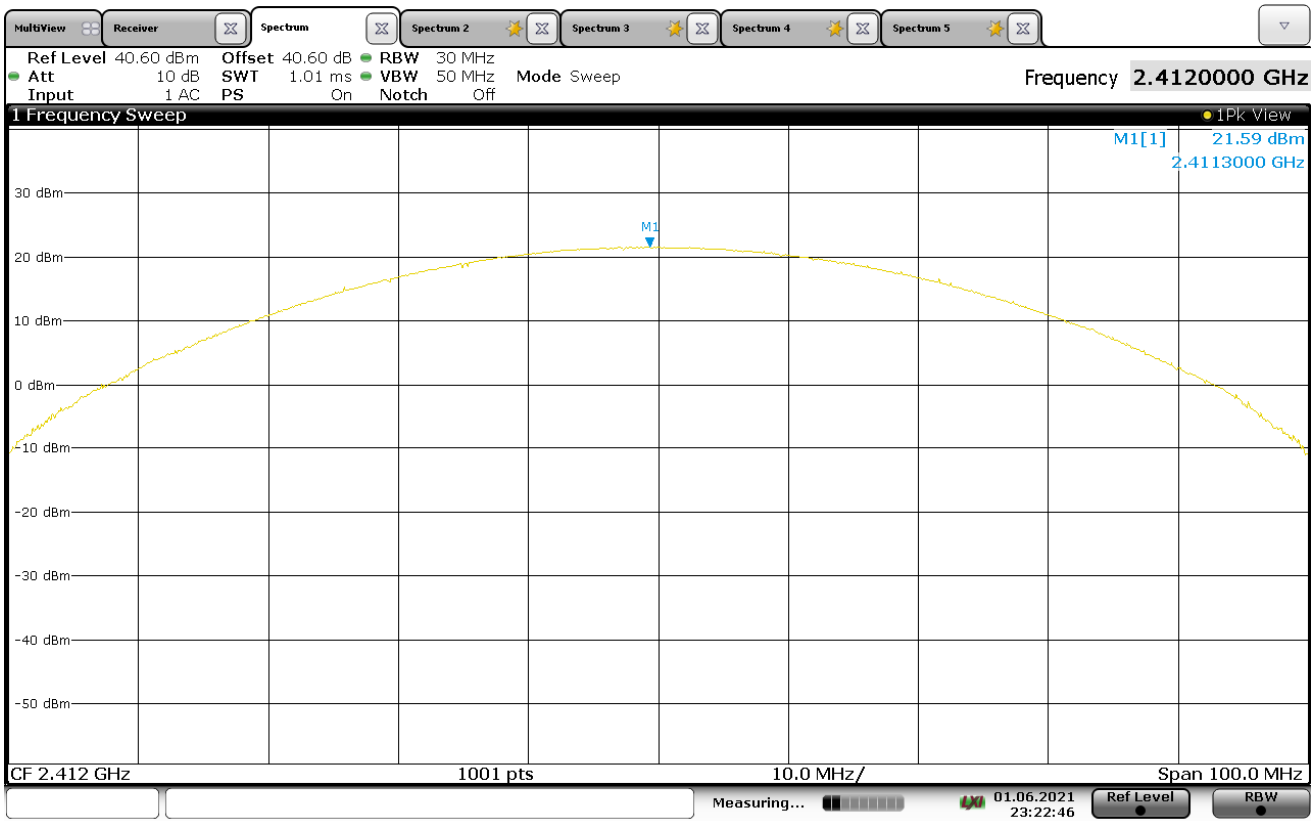
23:17:41 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 18Mbps
Carrier Frequency	2412MHz
Parameters	Output Power = 0.1548W (21.90dBm)
Notes	N/A



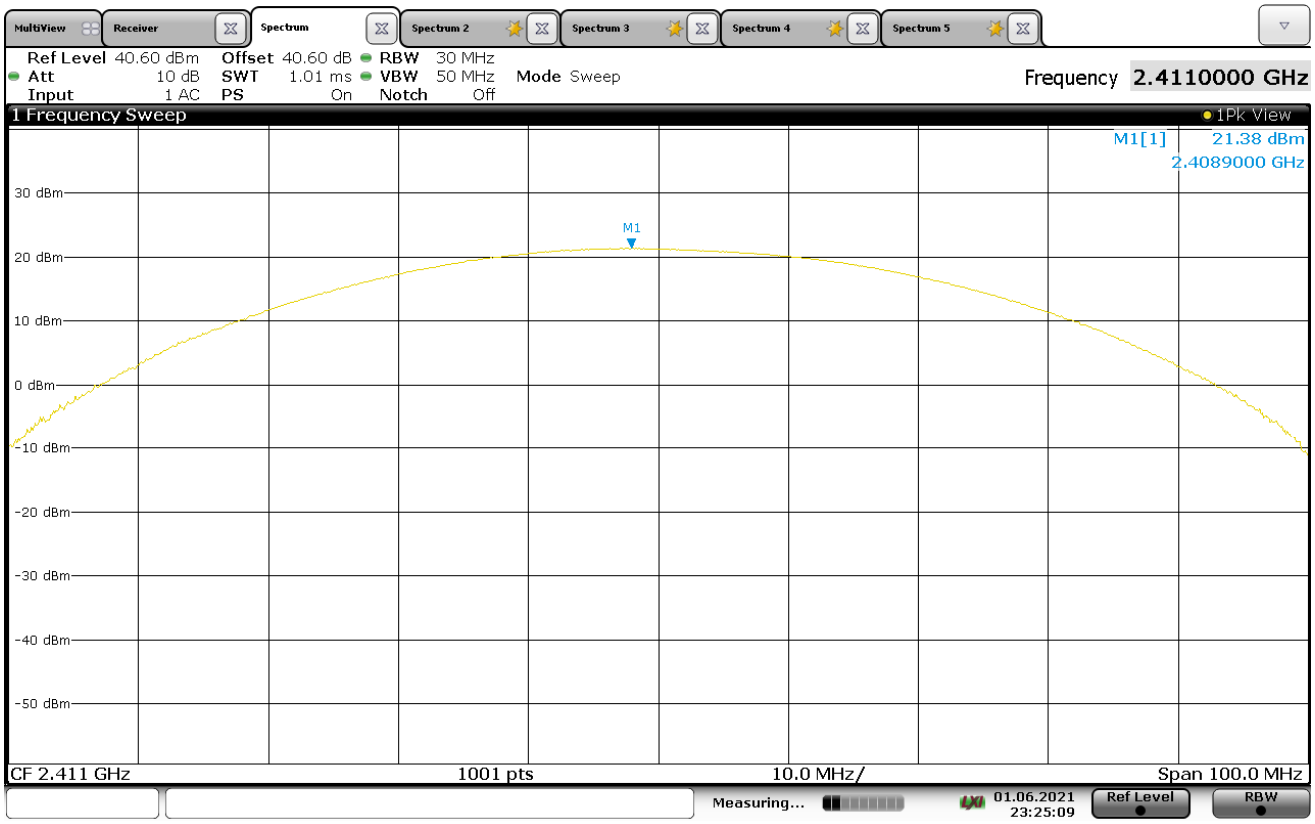
23:20:06 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 24Mbps
Carrier Frequency	2412MHz
Parameters	Output Power = 0.1442W (21.59dBm)
Notes	N/A



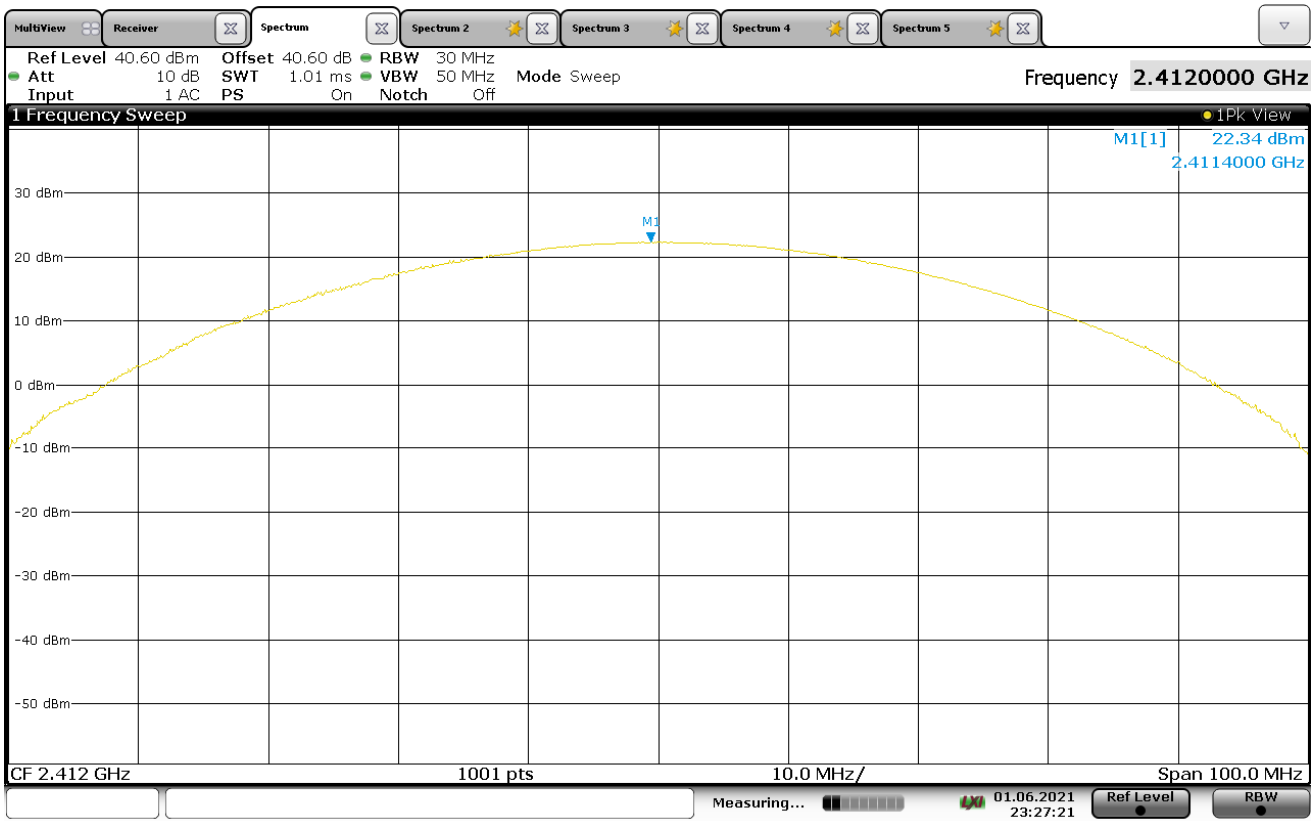
23:22:46 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 36Mbps
Carrier Frequency	2412MHz
Parameters	Output Power = 0.1374W (21.38dBm)
Notes	N/A



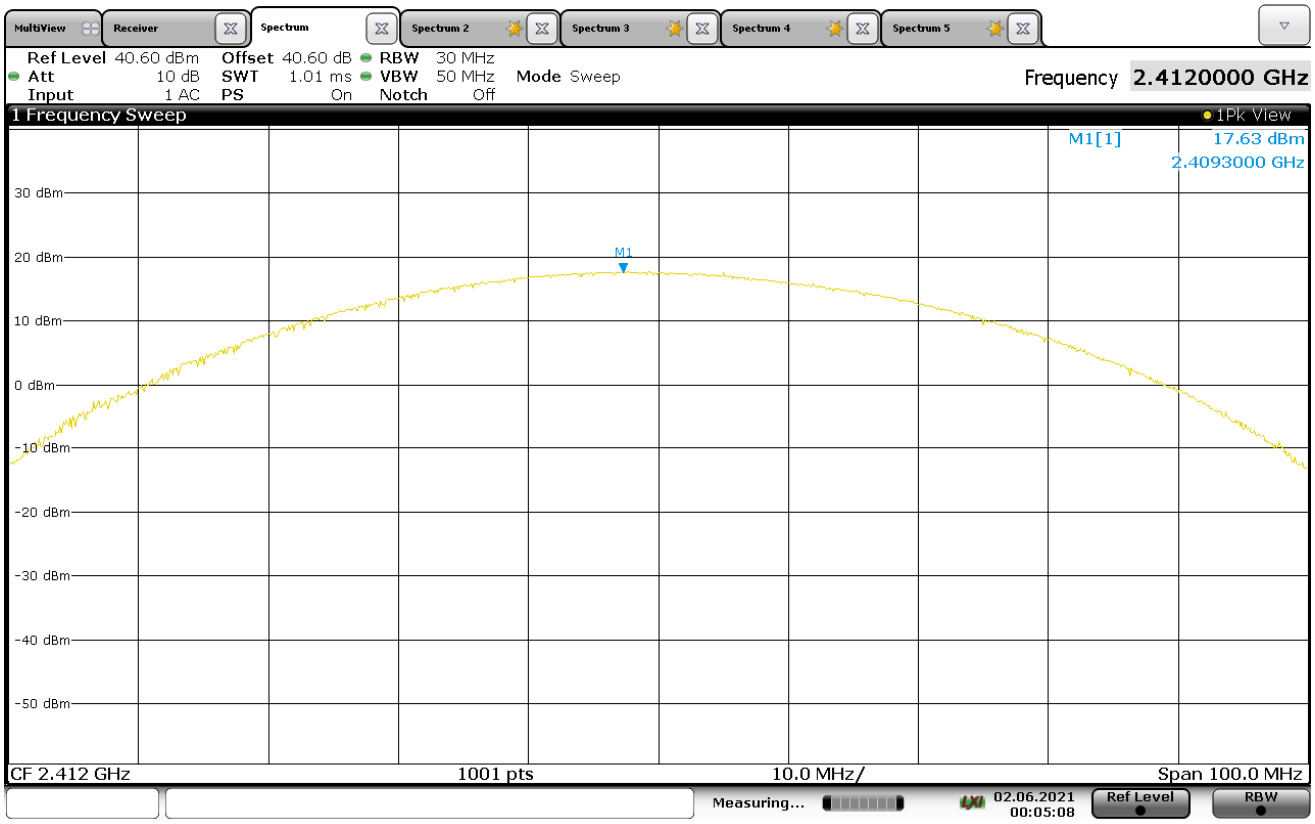
23:25:09 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 48Mbps
Carrier Frequency	2412MHz
Parameters	Output Power = 0.1713W (22.34dBm)
Notes	N/A



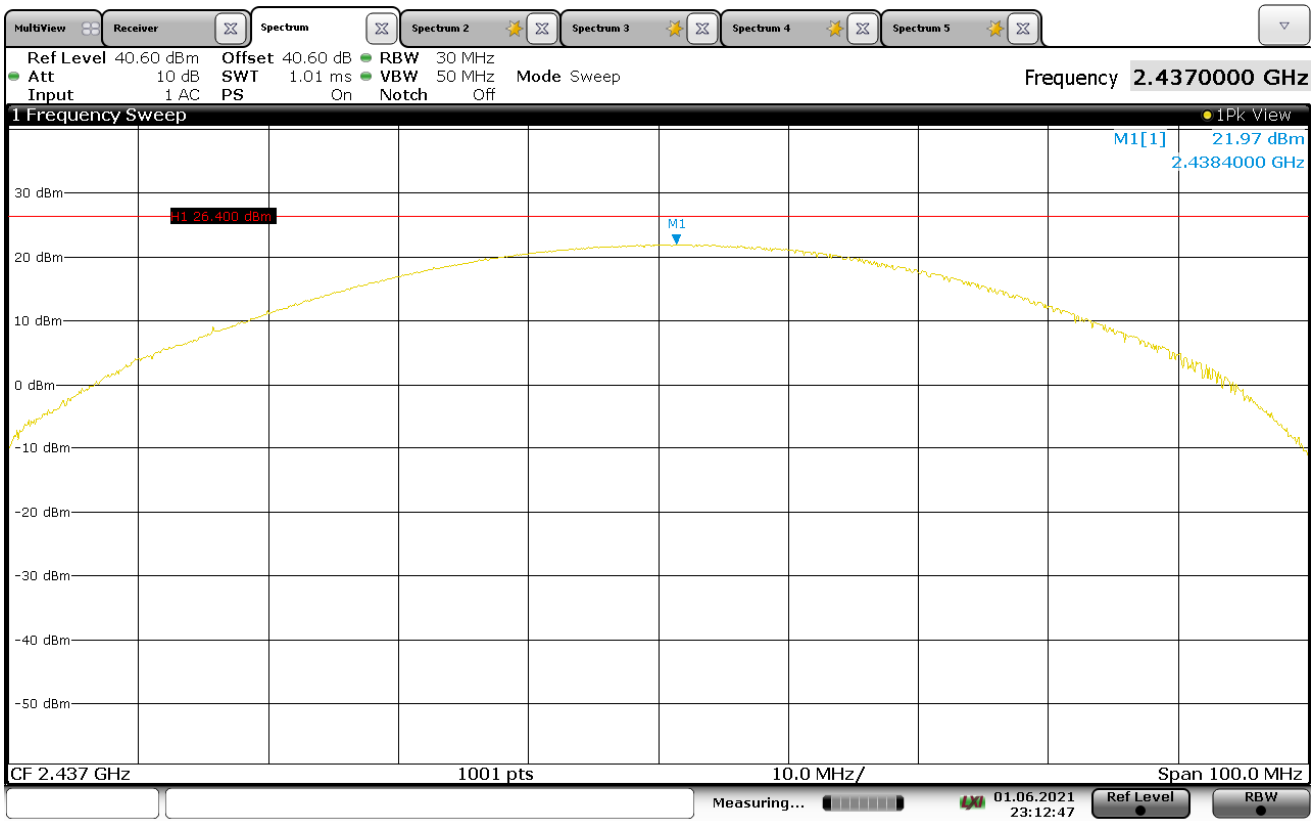
23:27:22 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 54Mbps
Carrier Frequency	2412MHz
Parameters	Output Power = 0.060W (17.63dBm)
Notes	N/A



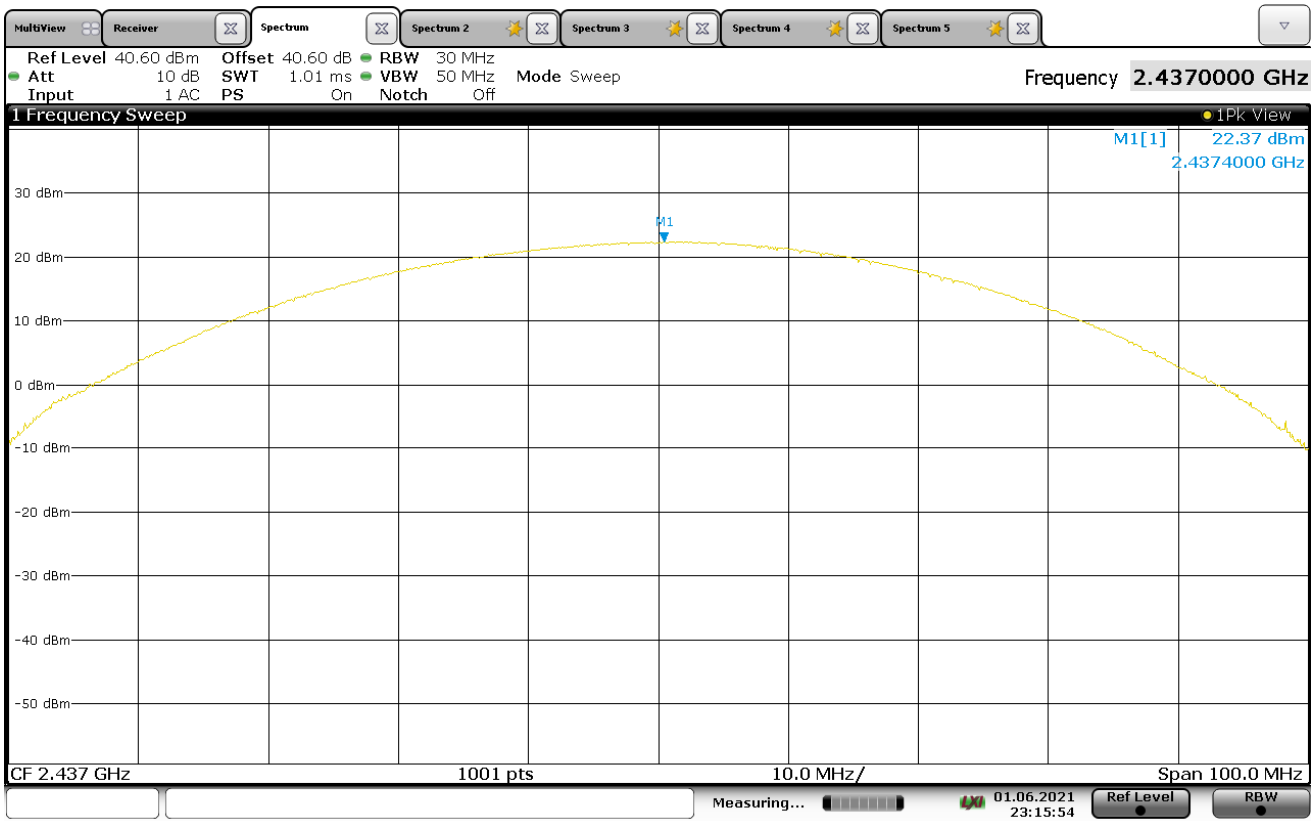
00:05:09 02.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 6Mbps
Carrier Frequency	2437MHz
Parameters	Output Power = 0.1573W (21.97dBm)
Notes	N/A



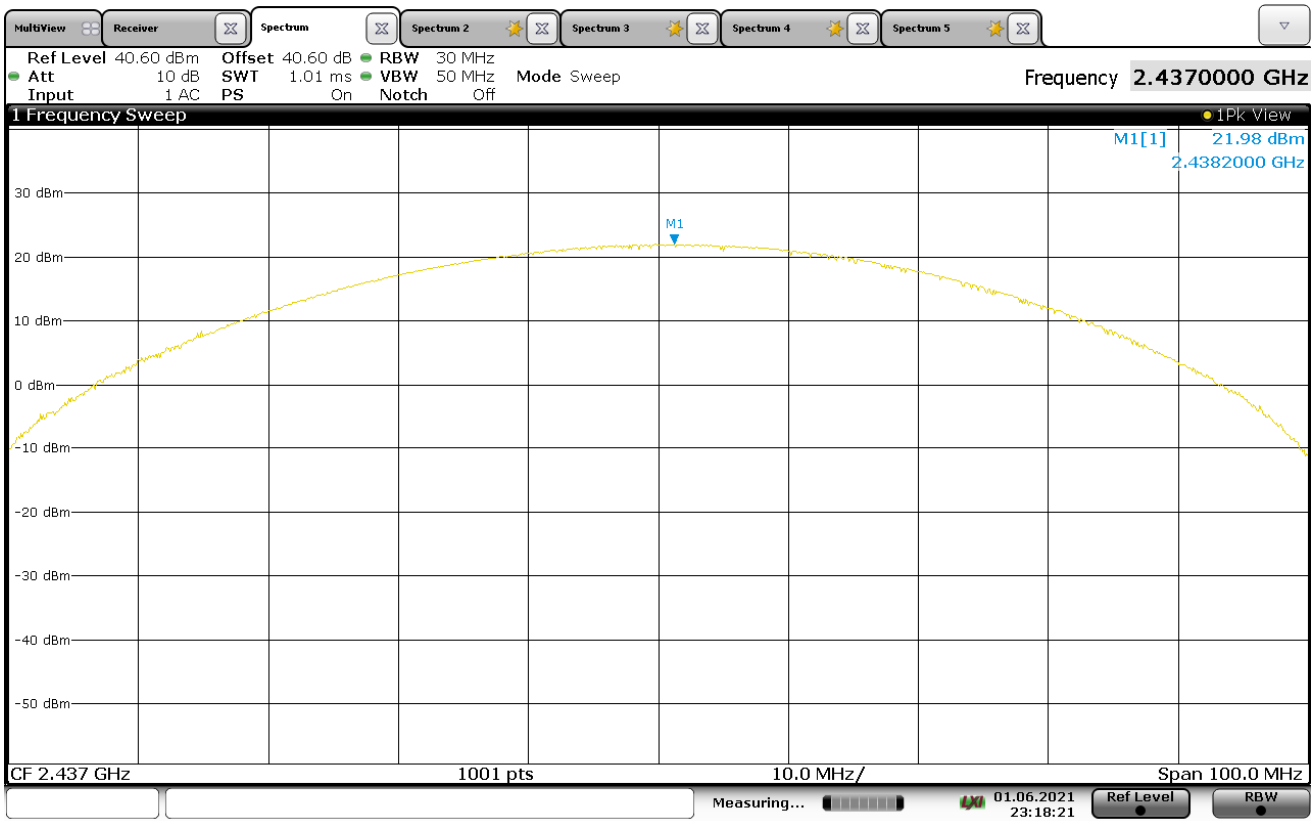
23:12:48 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 9Mbps
Carrier Frequency	2437MHz
Parameters	Output Power = 0.1725W (22.37dBm)
Notes	N/A



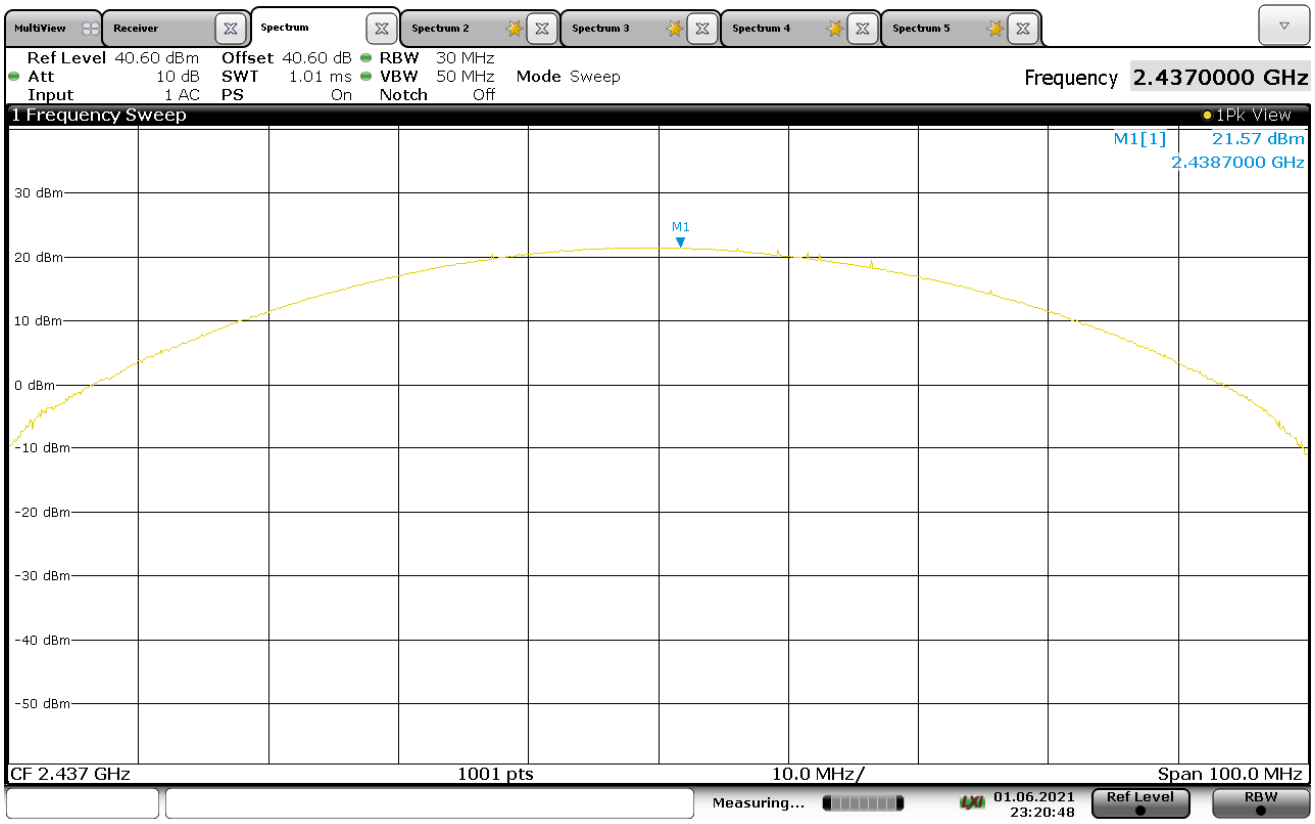
23:15:55 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 12Mbps
Carrier Frequency	2437MHz
Parameters	Output Power = 0.1577W (21.98dBm)
Notes	N/A



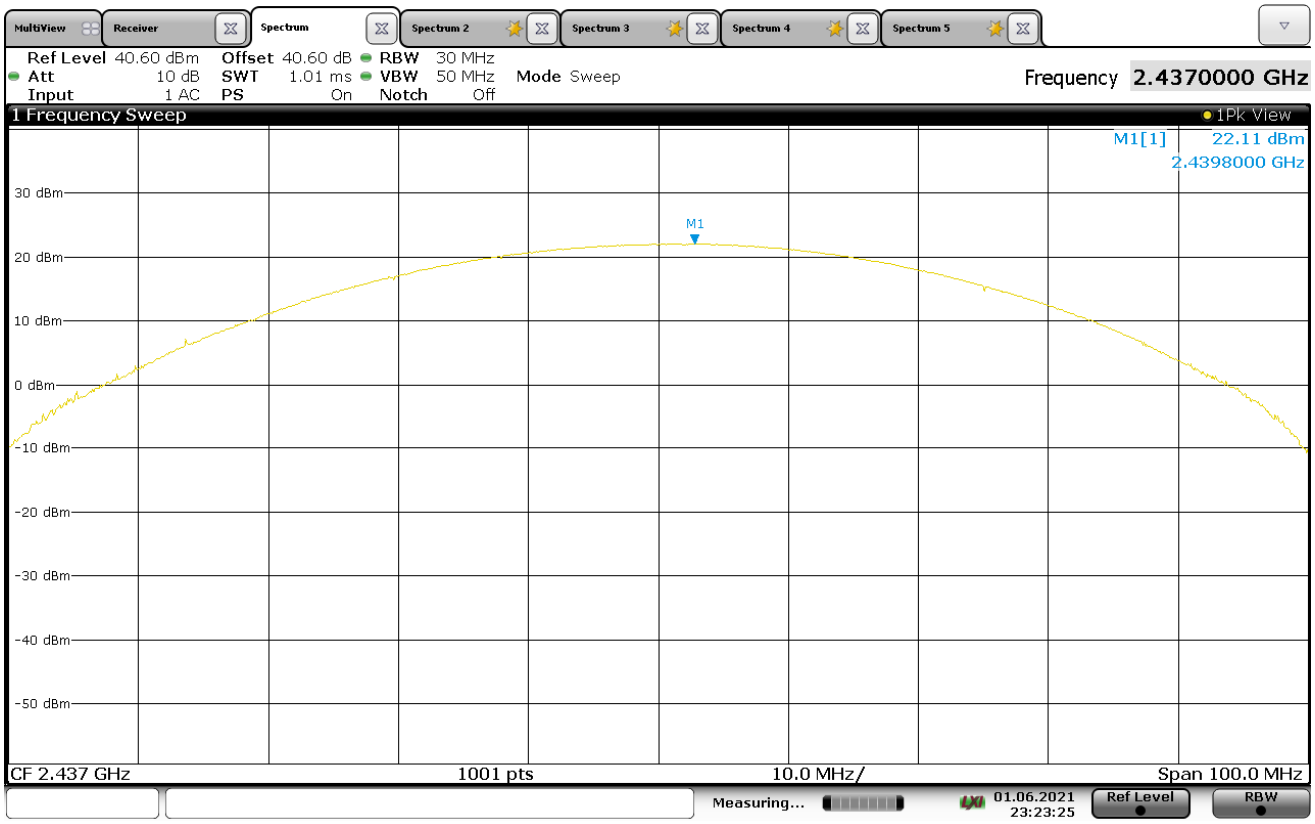
23:18:22 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 18Mbps
Carrier Frequency	2437MHz
Parameters	Output Power = 0.1435W (21.57dBm)
Notes	N/A



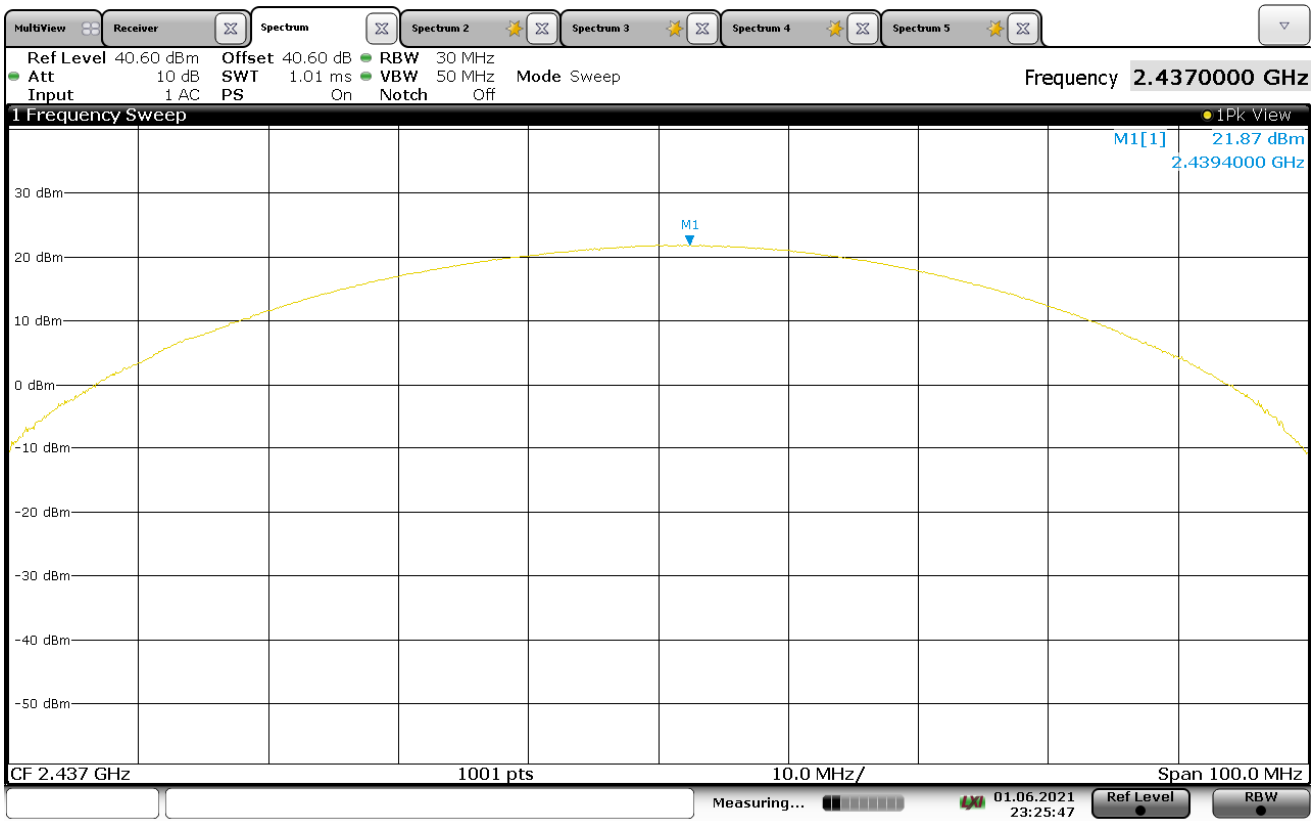
23:20:48 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 24Mbps
Carrier Frequency	2437MHz
Parameters	Output Power = 0.1625W (22.11dBm)
Notes	N/A



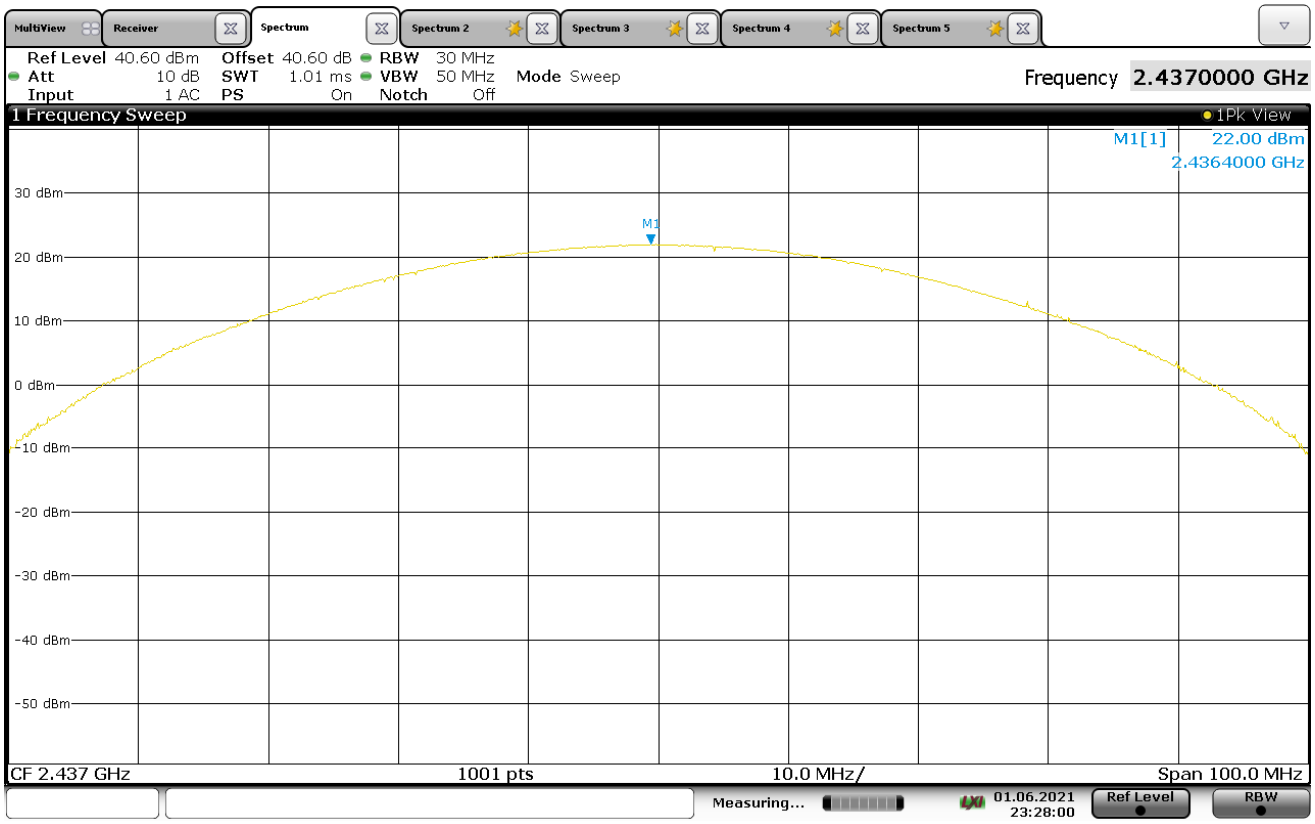
23:23:26 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 36Mbps
Carrier Frequency	2437MHz
Parameters	Output Power = 0.1538W (21.87dBm)
Notes	N/A



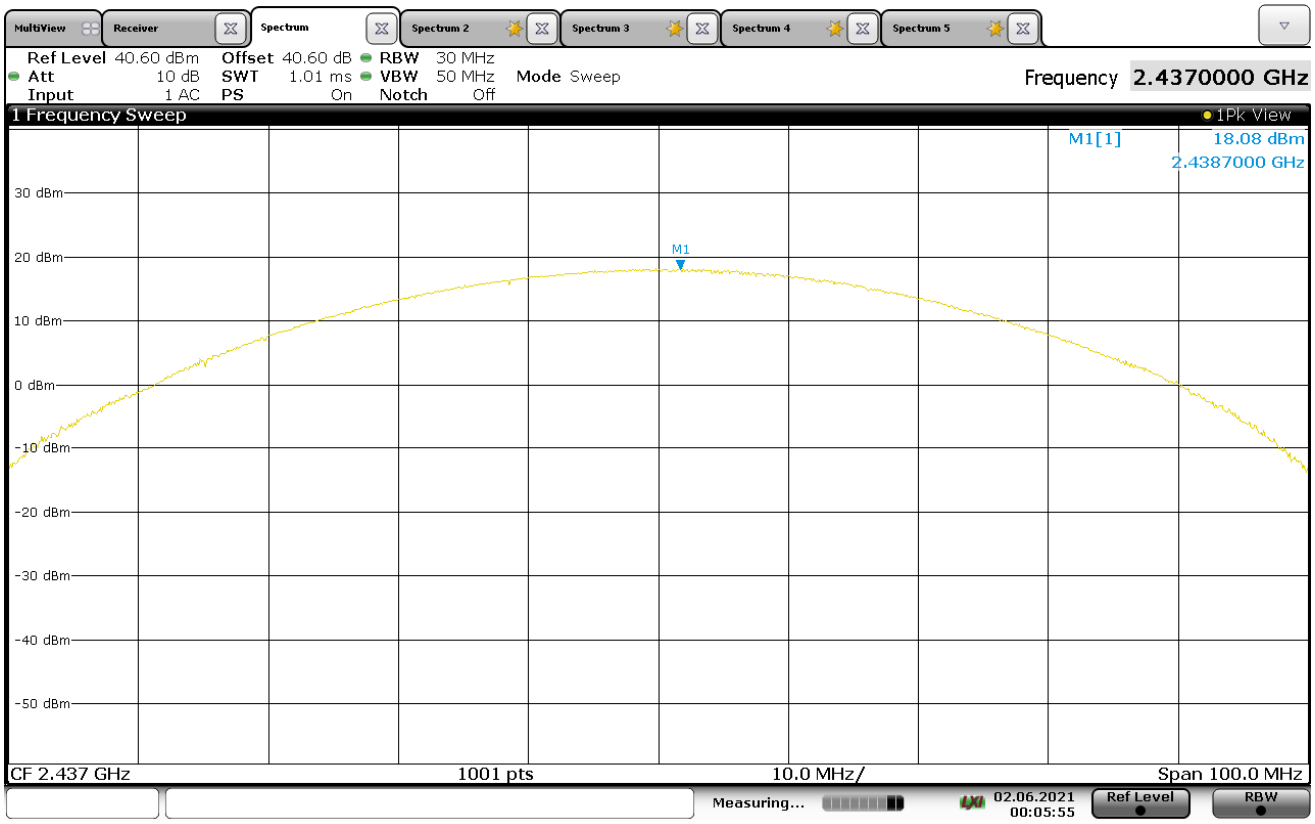
23:25:48 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 48Mbps
Carrier Frequency	2437MHz
Parameters	Output Power = 0.1584W (22.00dBm)
Notes	N/A



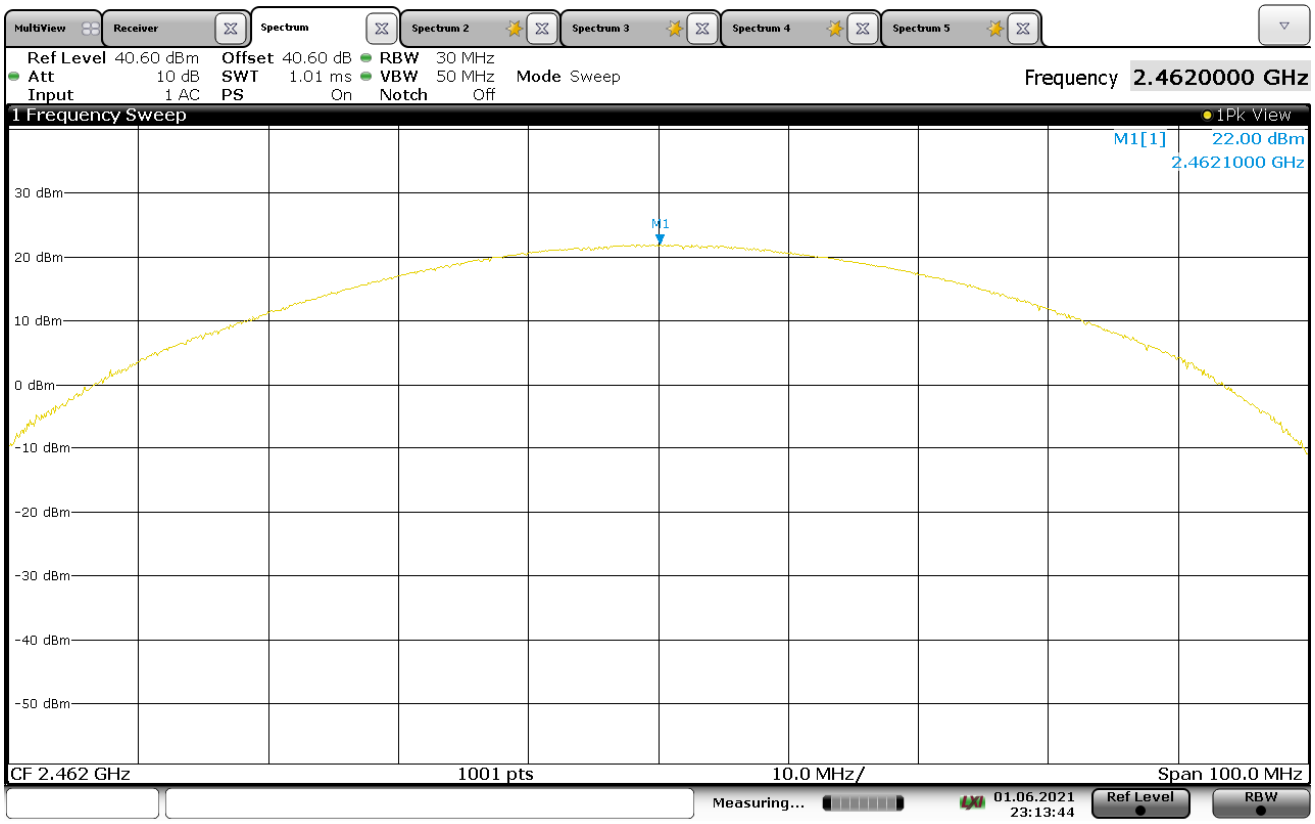
23:28:00 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 54Mbps
Carrier Frequency	2437MHz
Parameters	Output Power = 0.065W (18.08dBm)
Notes	N/A



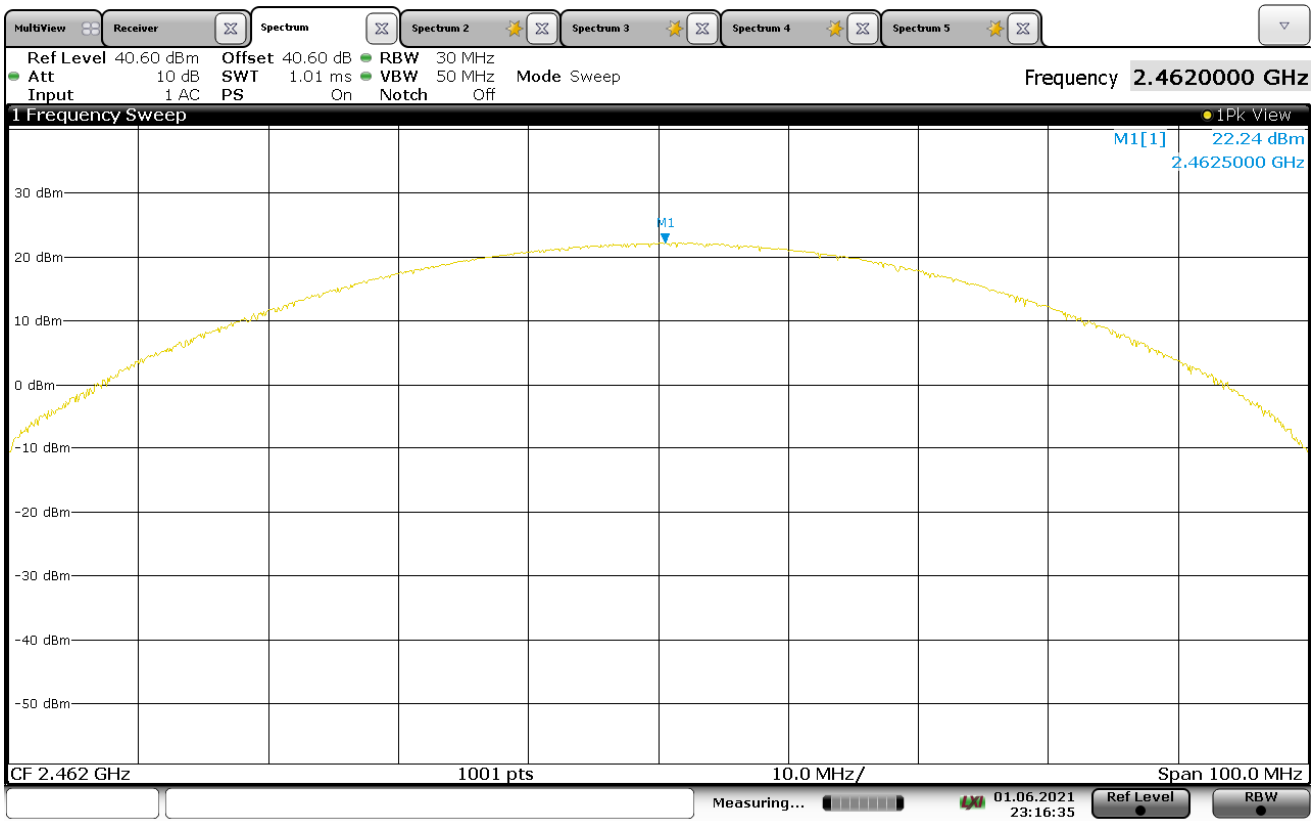
00:05:55 02.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 6Mbps
Carrier Frequency	2462MHz
Parameters	Output Power = 0.1584W (22.00dBm)
Notes	N/A



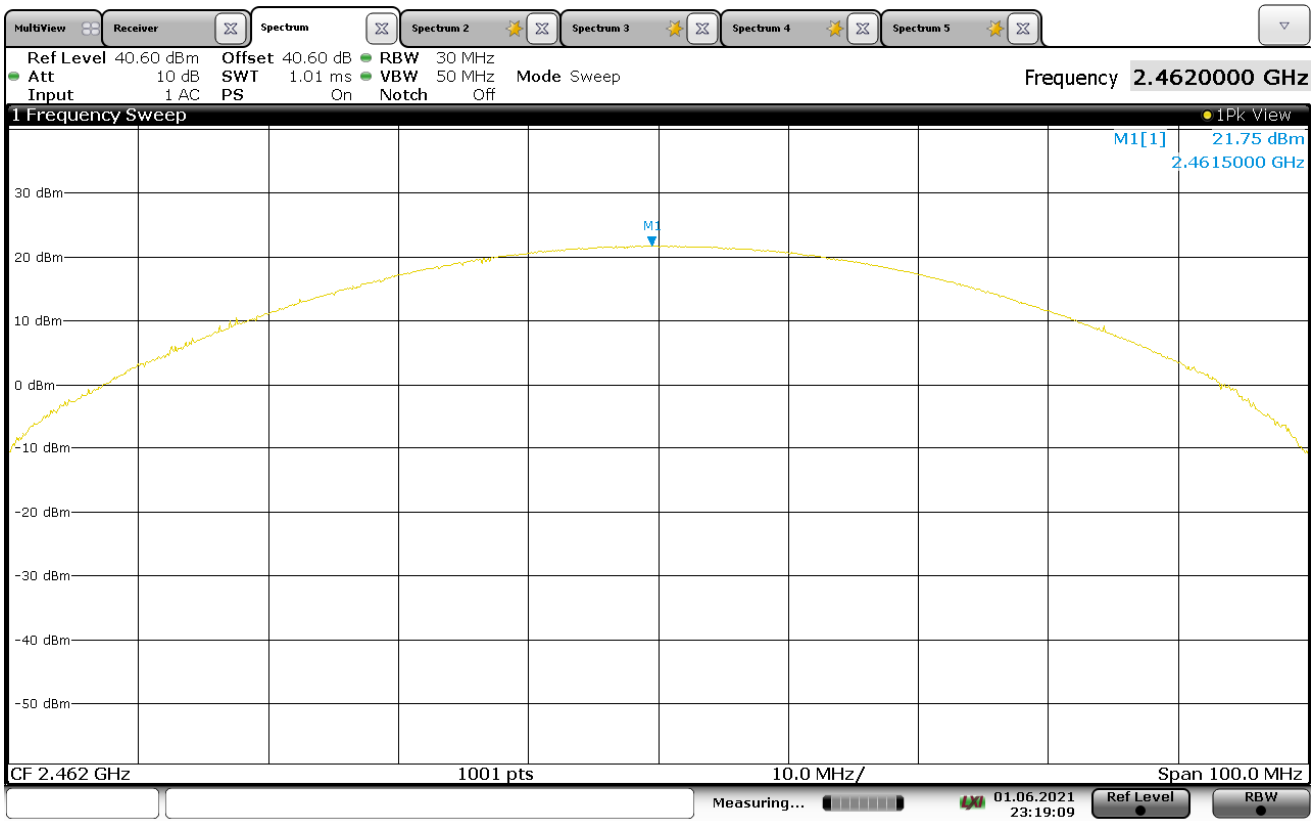
23:13:45 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 9Mbps
Carrier Frequency	2462MHz
Parameters	Output Power = 0.1674W (22.24dBm)
Notes	N/A



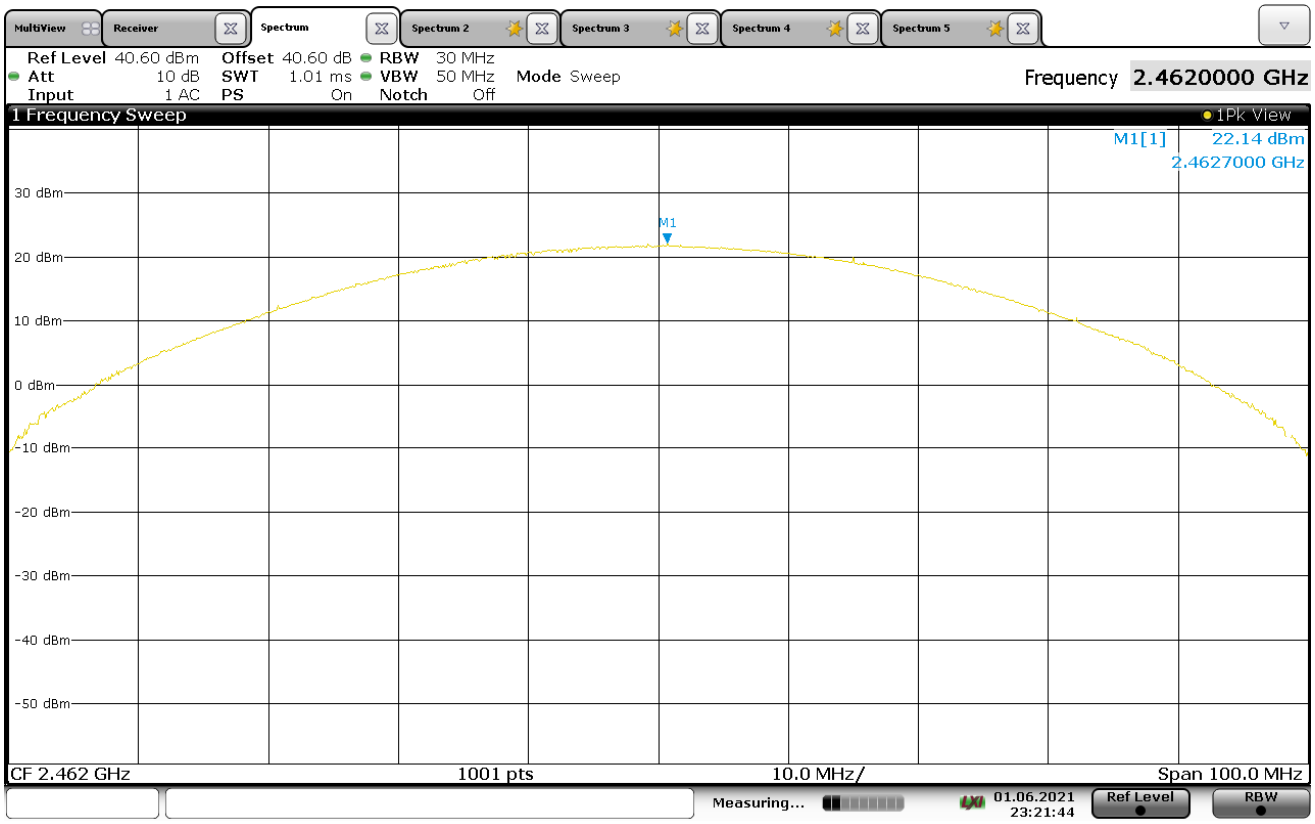
23:16:36 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 12Mbps
Carrier Frequency	2462MHz
Parameters	Output Power = 0.1496W (21.75dBm)
Notes	N/A



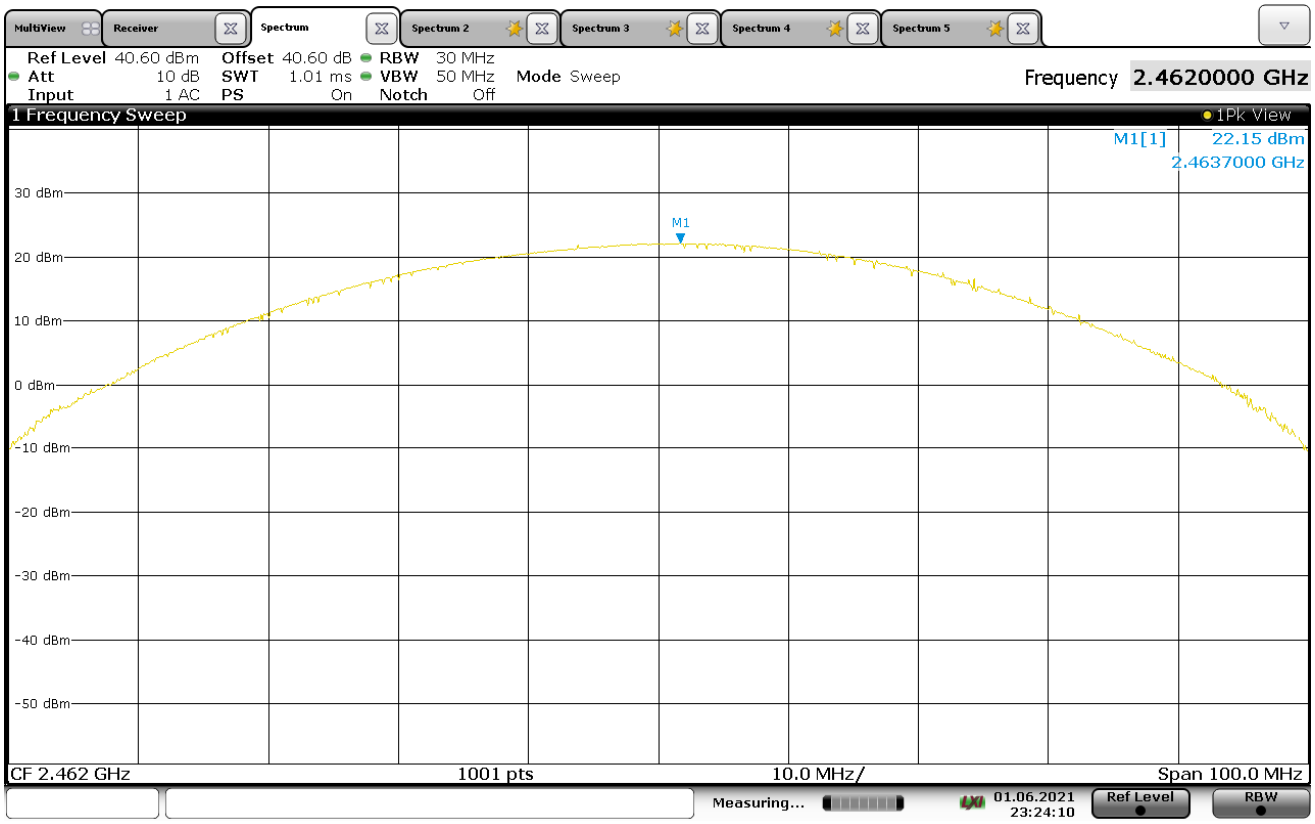
23:19:09 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 18Mbps
Carrier Frequency	2462MHz
Parameters	Output Power = 0.1636W (22.14dBm)
Notes	N/A



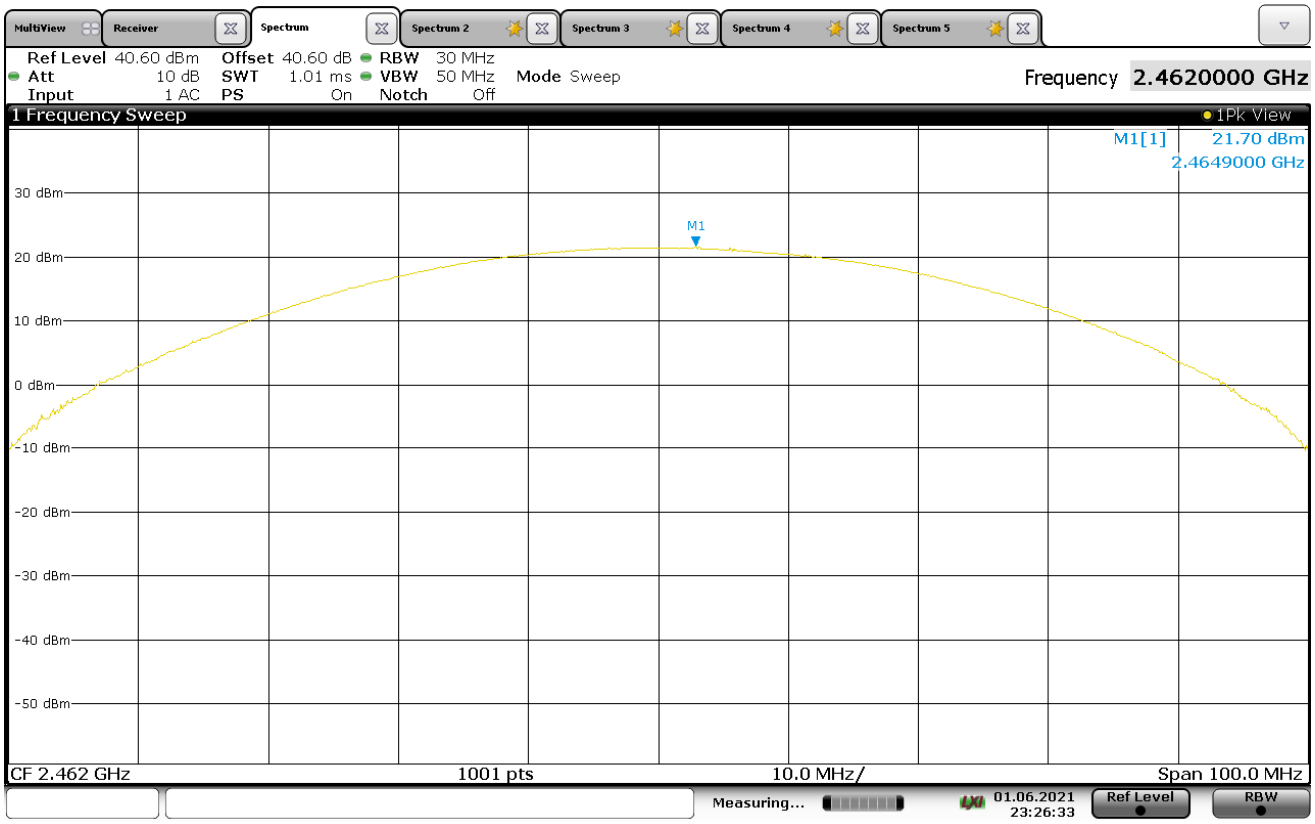
23:21:44 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 24Mbps
Carrier Frequency	2462MHz
Parameters	Output Power = 0.1640W (22.15dBm)
Notes	N/A



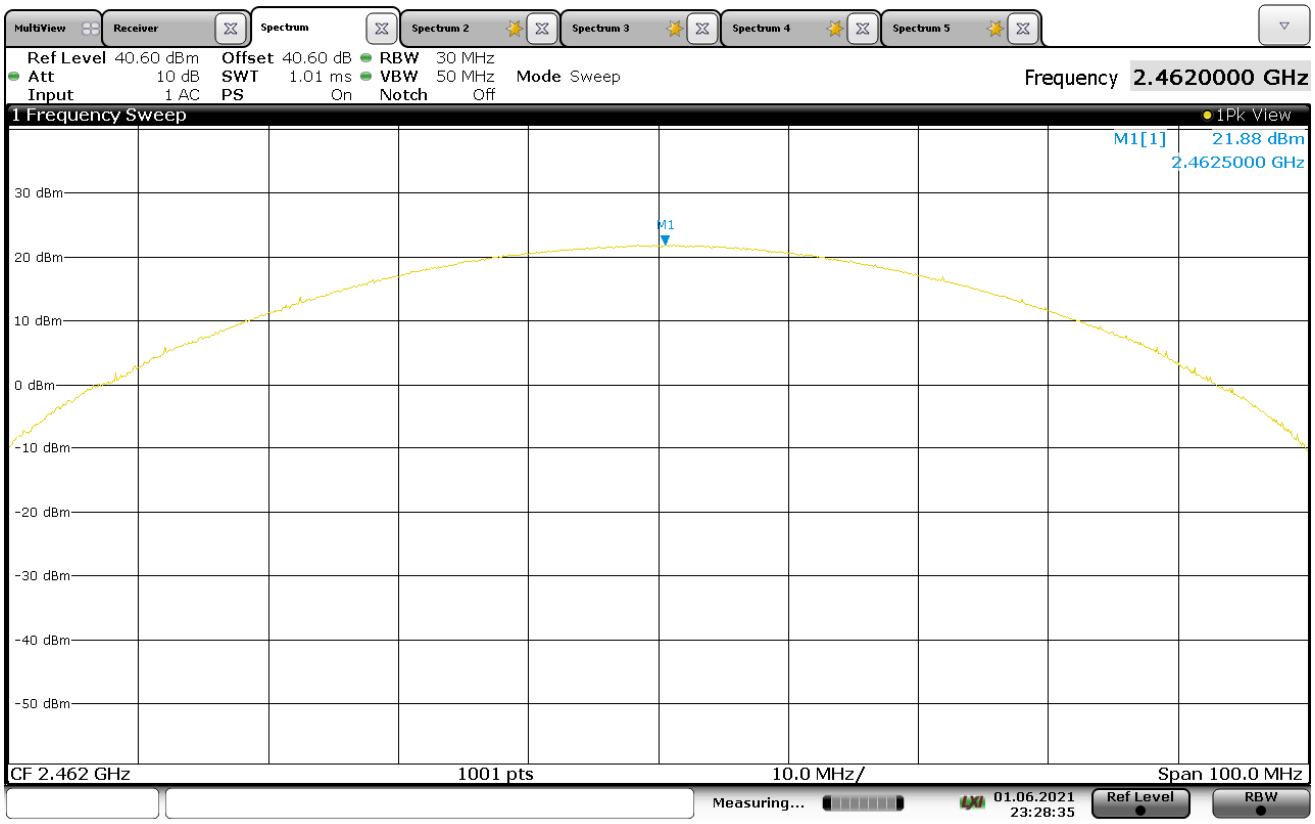
23:24:11 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 36Mbps
Carrier Frequency	2462MHz
Parameters	Output Power = 0.1479W (21.70dBm)
Notes	N/A



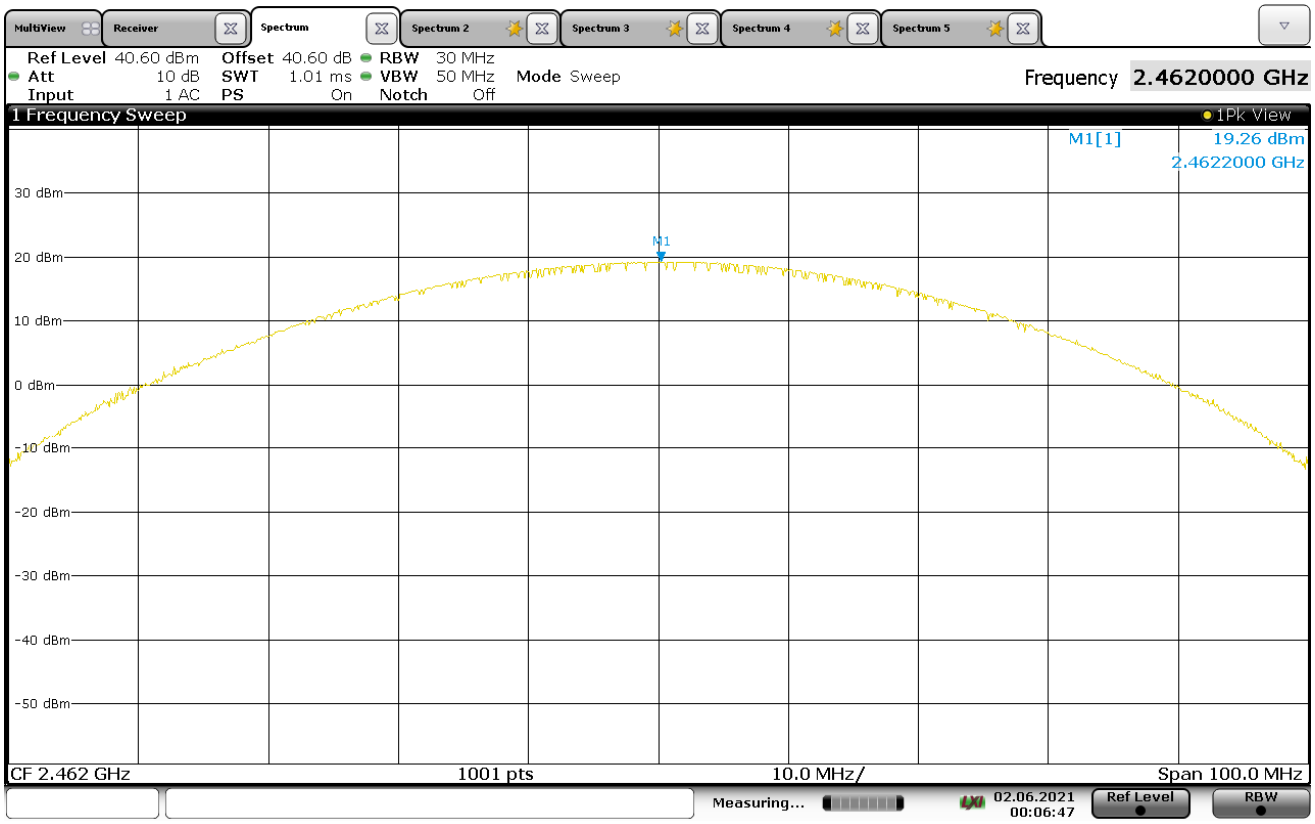
23:26:33 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 48Mbps
Carrier Frequency	2462MHz
Parameters	Output Power = 0.1541W (21.88dBm)
Notes	N/A



23:28:36 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11g – 54Mbps
Carrier Frequency	2462MHz
Parameters	Output Power = 0.084W (19.26dBm)
Notes	N/A

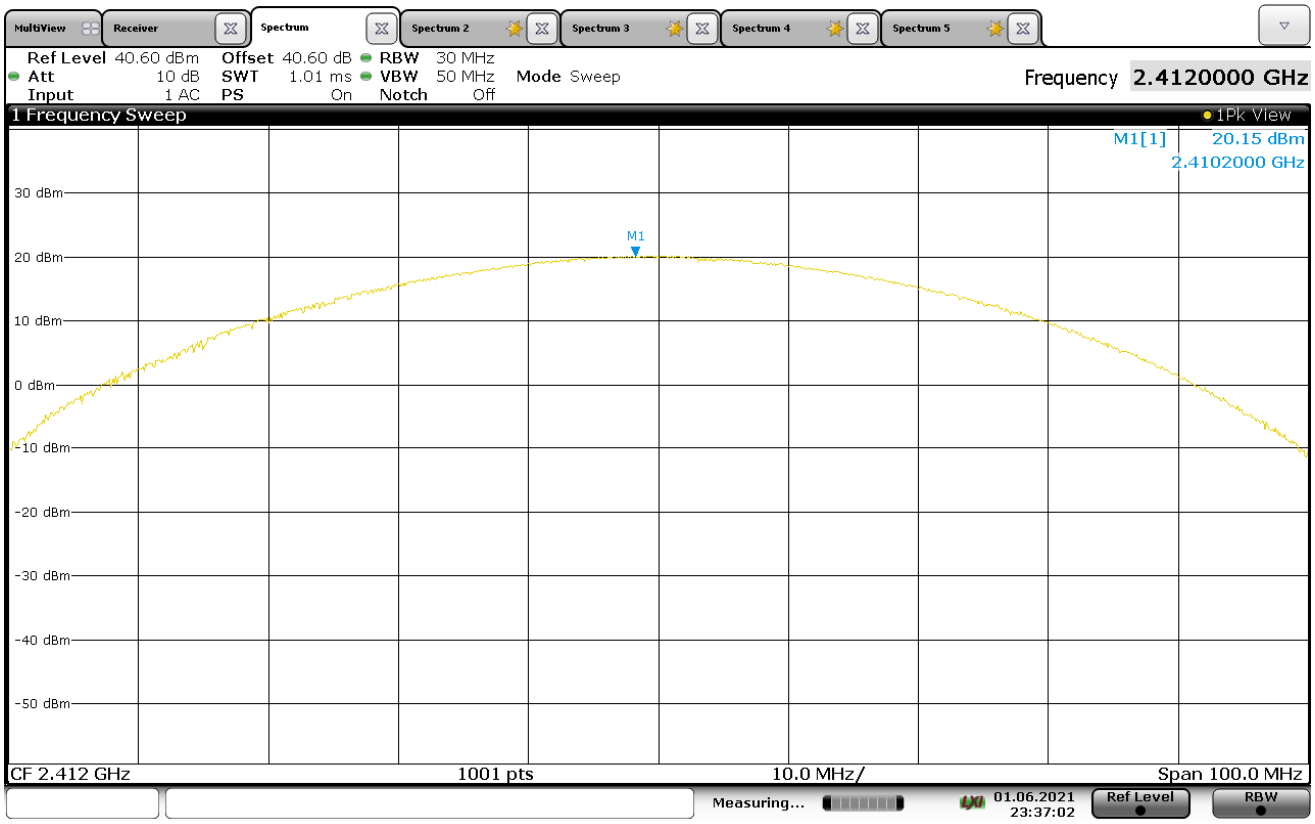


00:06:48 02.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n
Notes	N/A

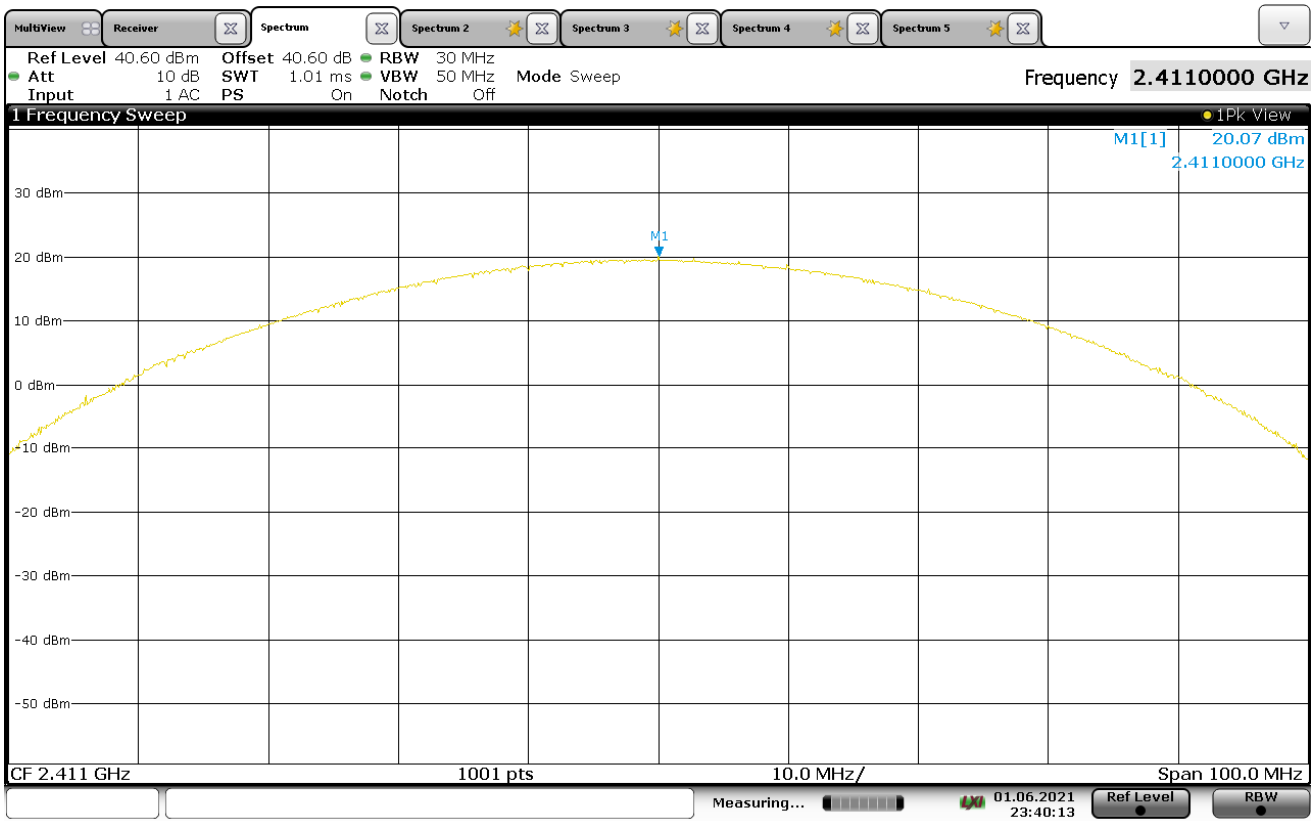
Protocol	Freq. (MHz)	Data Rate (Mbps)	Power (dBm)	Power (W)
802.11n	2412	MCS0	20.15	0.1035
	2437		20.56	0.1137
	2462		20.45	0.1109
	2412	MCS1	20.07	0.1016
	2437		20.35	0.1083
	2462		20.90	0.1230
	2412	MCS2	20.66	0.1164
	2437		20.33	0.1078
	2462		20.30	0.1071
	2412	MCS3	19.44	0.0879
	2437		19.95	0.0988
	2462		20.44	0.1106
	2412	MCS4	19.80	0.0954
	2437		19.02	0.0797
	2462		19.61	0.0914
	2412	MCS5	19.90	0.0977
	2437		20.00	0.1000
	2462		20.17	0.1039
	2412	MCS6	17.41	0.0550
	2437		17.33	0.0540
	2462		17.65	0.0582
	2412	MCS7	16.87	0.0486
	2437		18.14	0.0651
	2462		17.89	0.0615

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS0
Carrier Frequency	2412MHz
Parameters	Output Power = 0.1035W (20.15dBm)
Notes	N/A



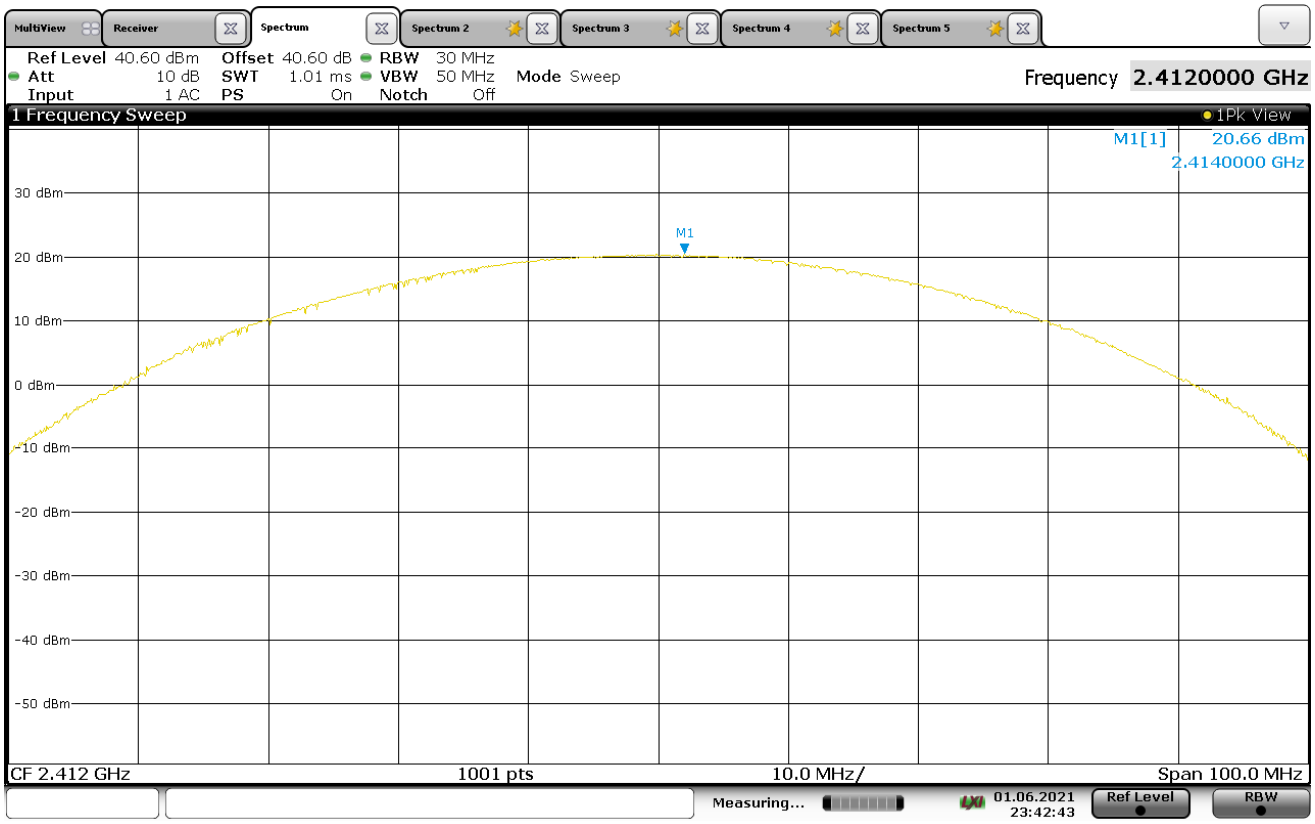
23:37:03 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS1
Carrier Frequency	2412MHz
Parameters	Output Power = 0.1016W (20.07dBm)
Notes	N/A



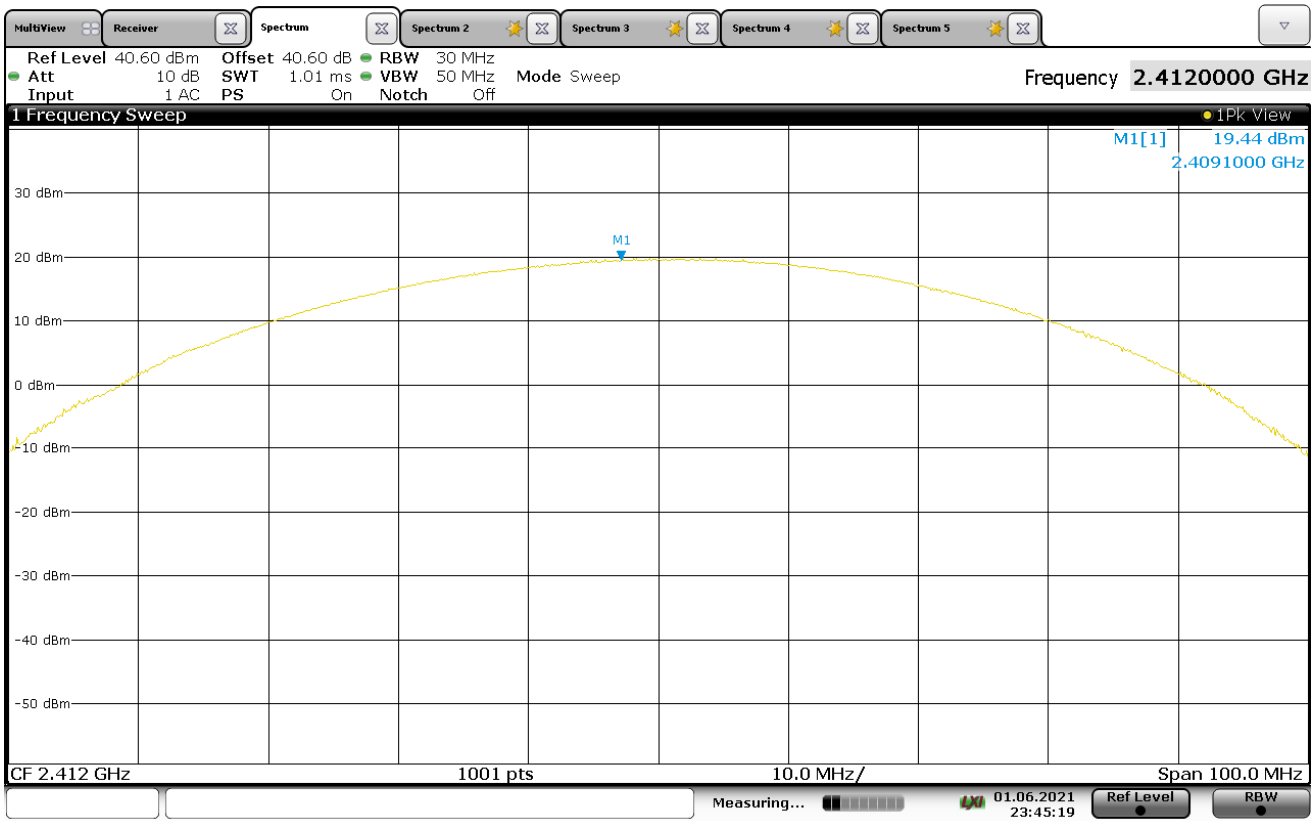
23:40:14 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS2
Carrier Frequency	2412MHz
Parameters	Output Power = 0.1164W (20.66dBm)
Notes	N/A



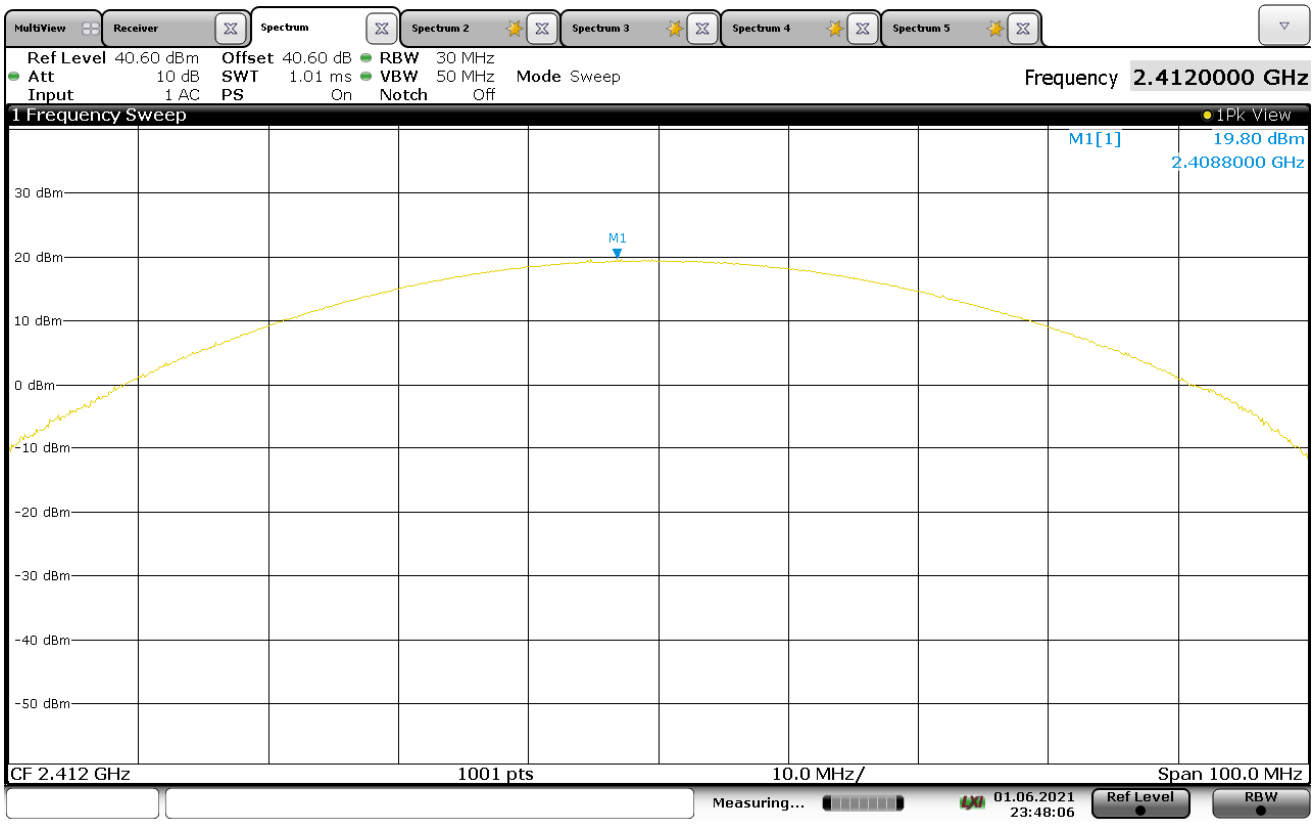
23:42:43 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS3
Carrier Frequency	2412MHz
Parameters	Output Power = 0.0879W (19.44dBm)
Notes	N/A



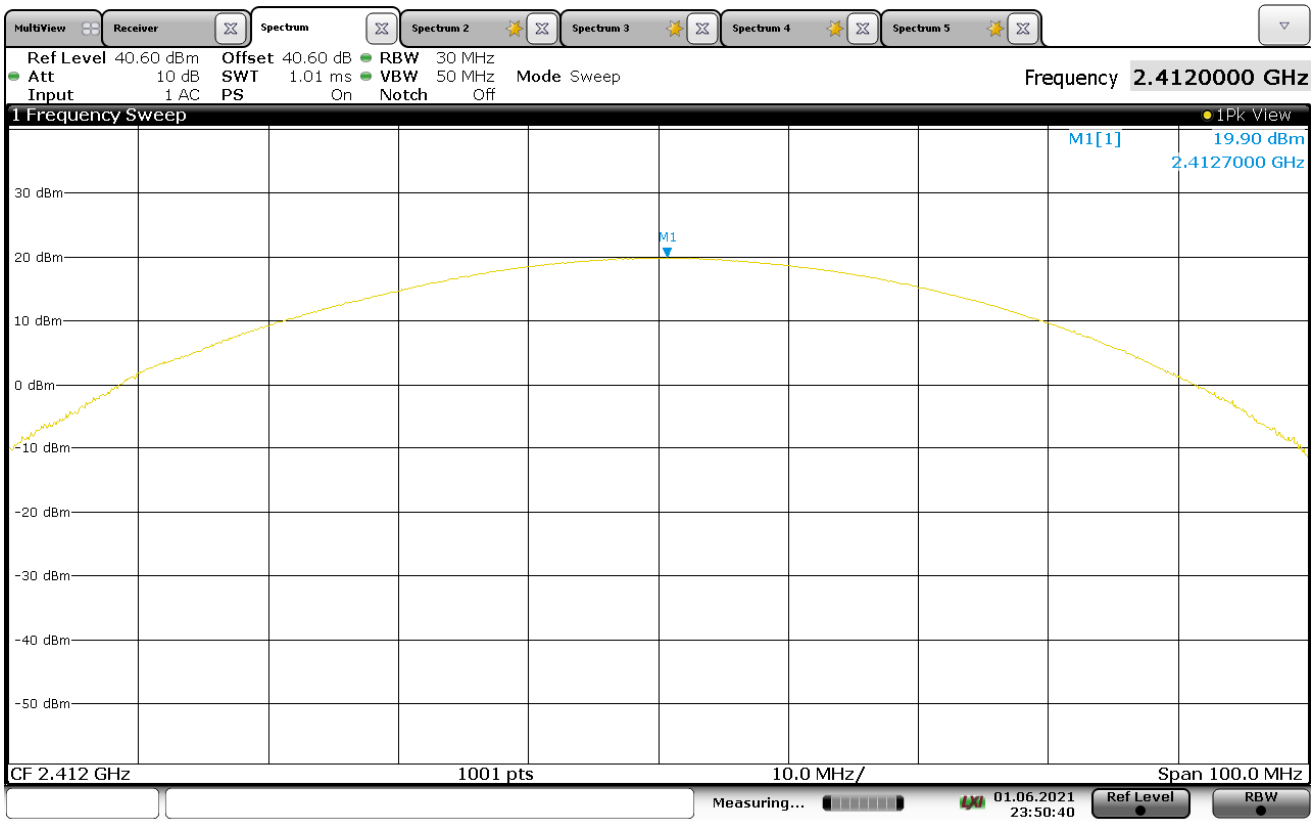
23:45:20 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS4
Carrier Frequency	2412MHz
Parameters	Output Power = 0.0954W (19.80dBm)
Notes	N/A



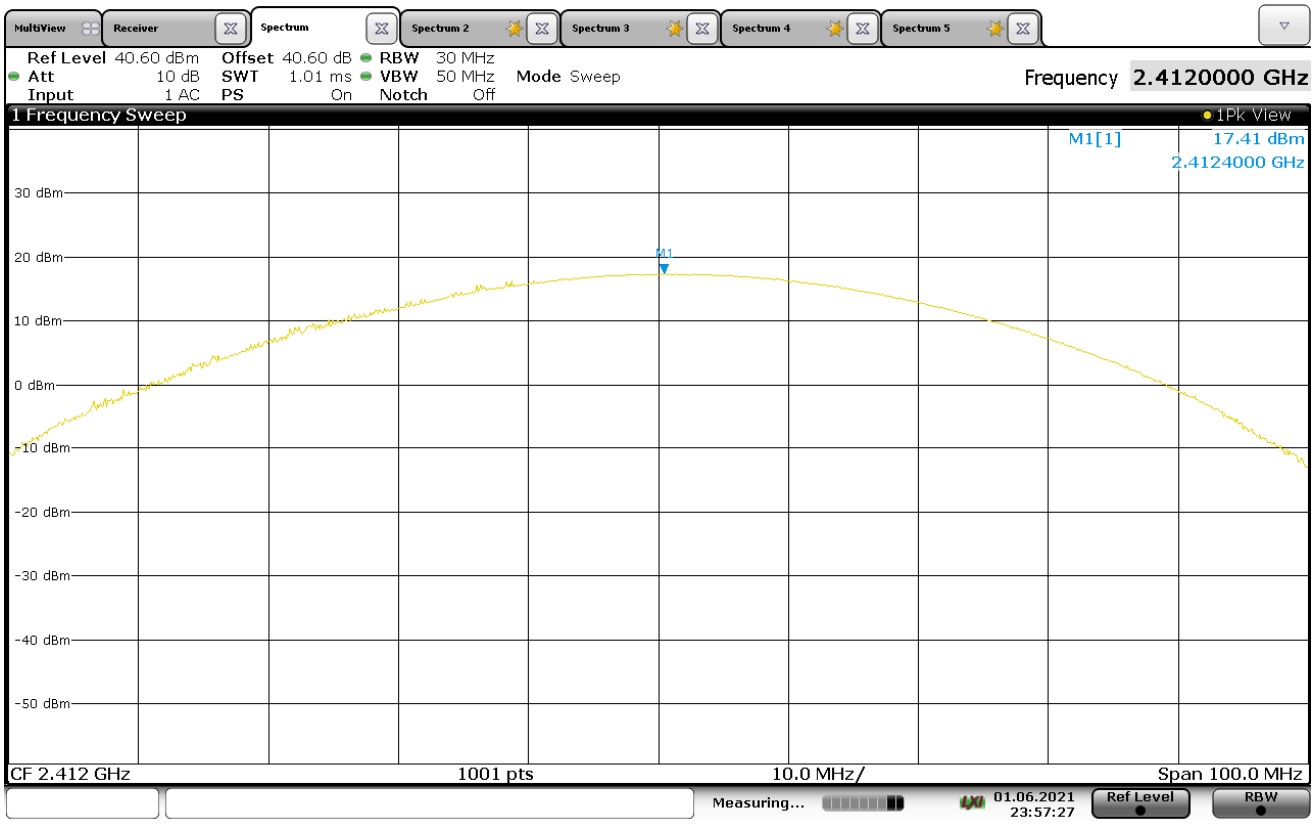
23:48:06 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS5
Carrier Frequency	2412MHz
Parameters	Output Power = 0.0977W (19.90dBm)
Notes	N/A



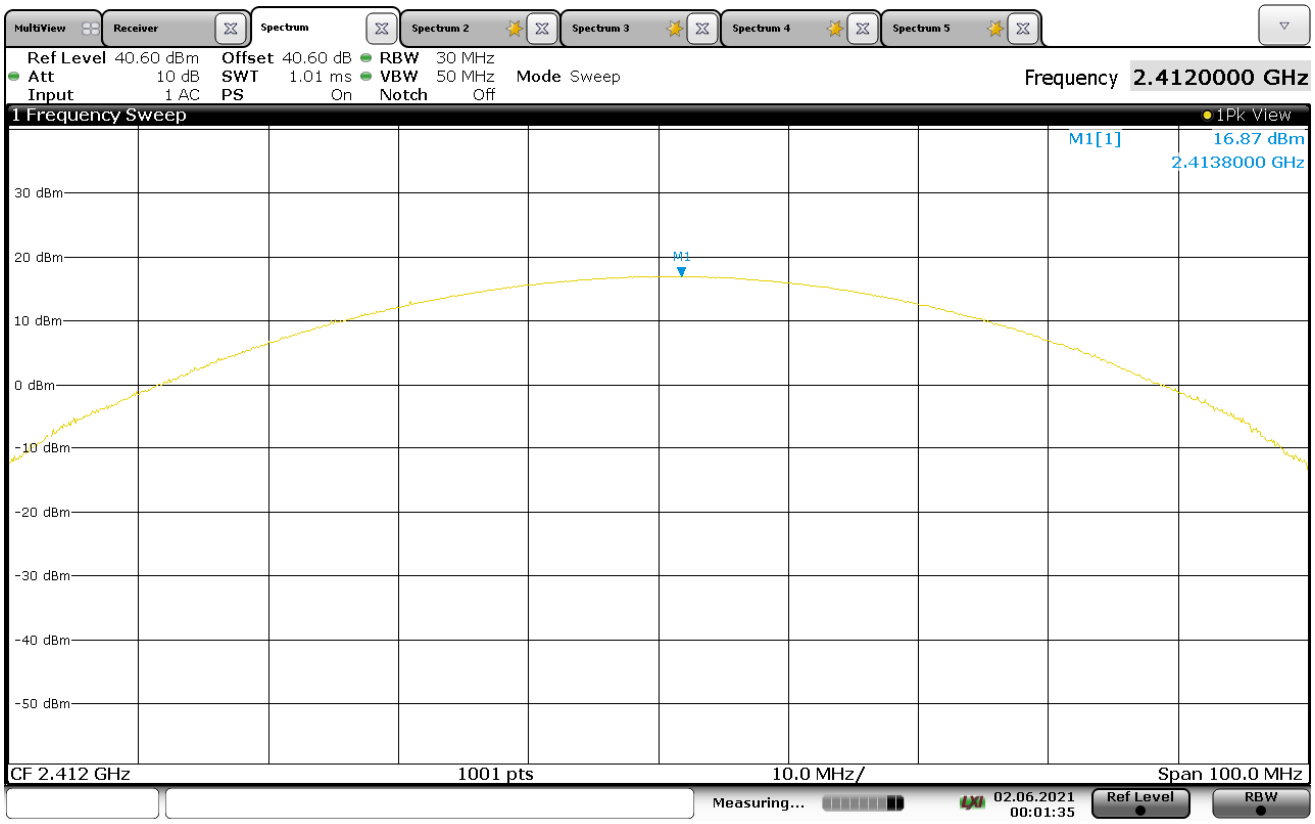
23:50:40 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS6
Carrier Frequency	2412MHz
Parameters	Output Power = 0.055W (17.41dBm)
Notes	N/A



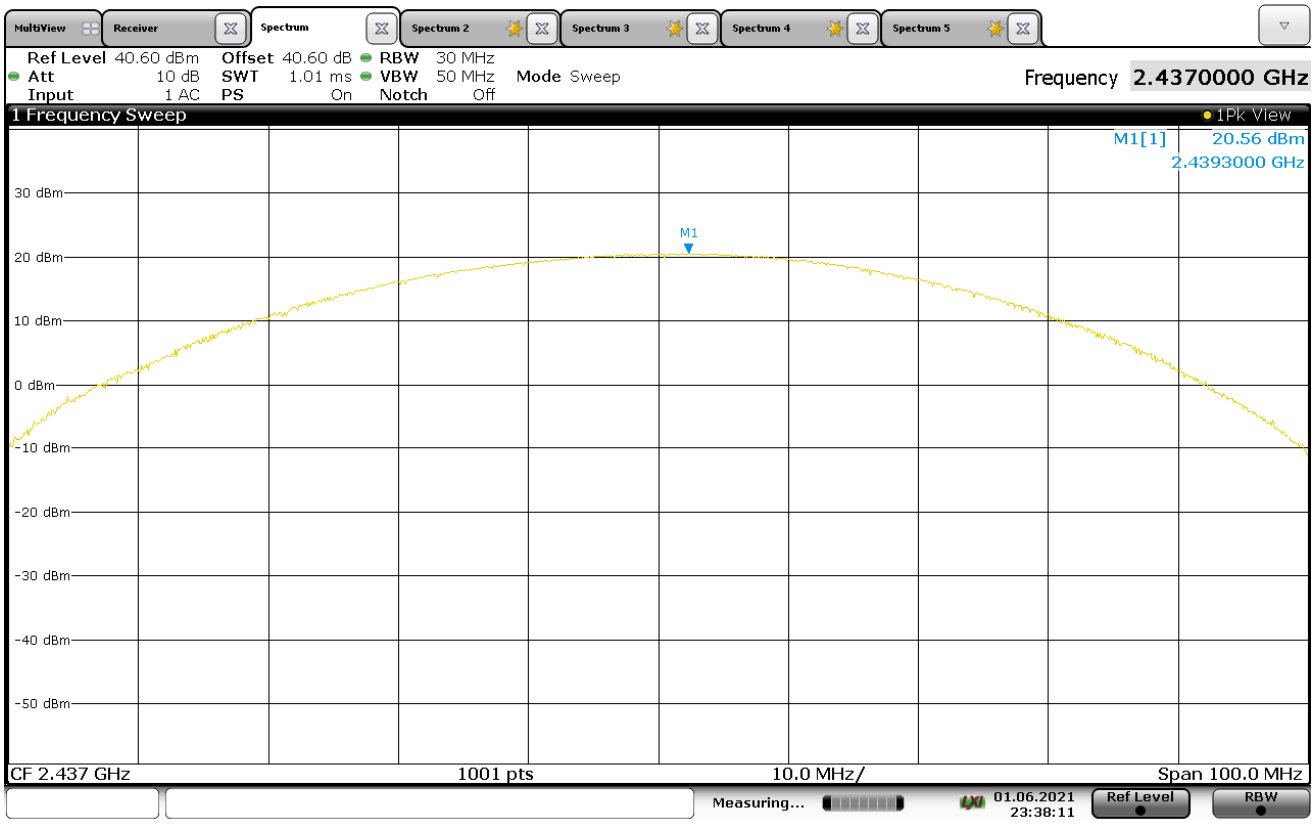
23:57:28 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS7
Carrier Frequency	2412MHz
Parameters	Output Power = 0.0486W (16.87dBm)
Notes	N/A



00:01:35 02.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS0
Carrier Frequency	2437MHz
Parameters	Output Power = 0.1137W (20.56dBm)
Notes	N/A



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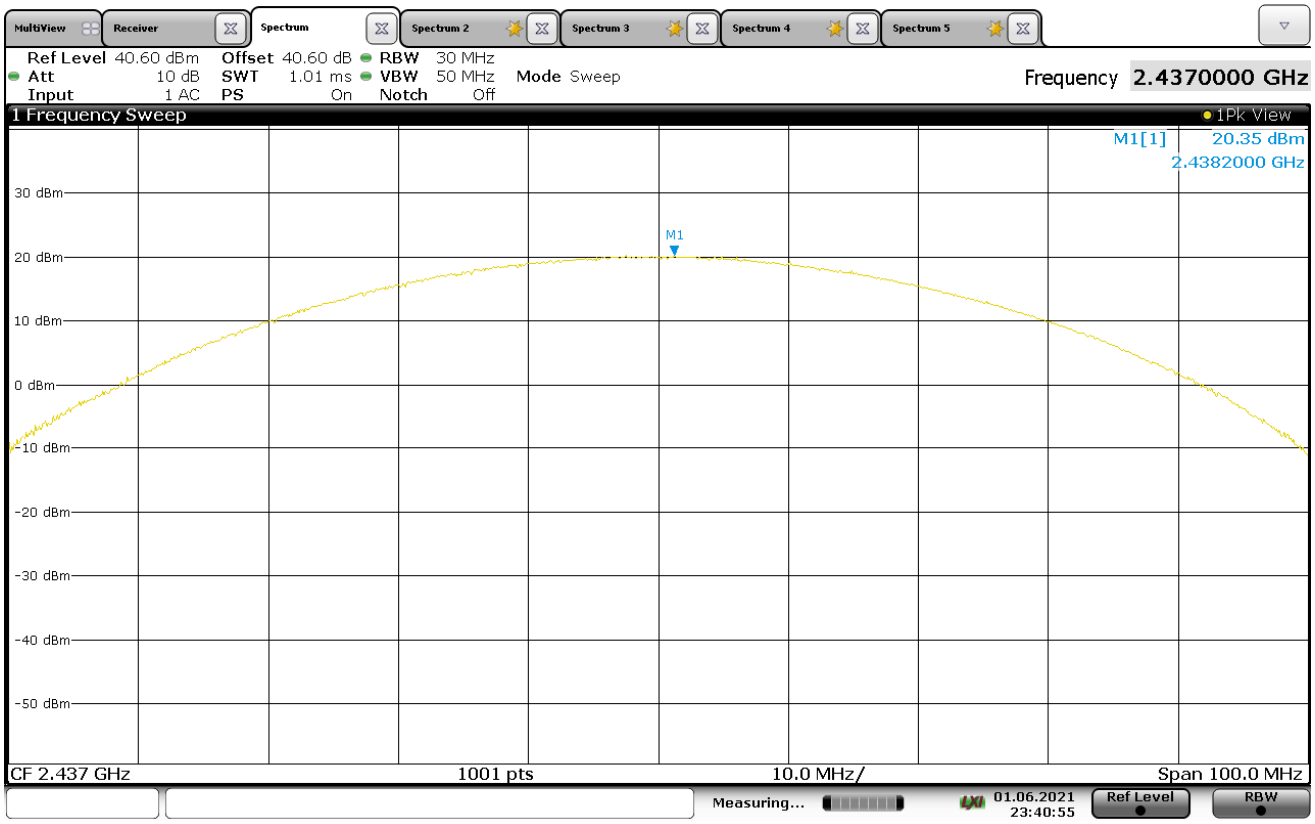
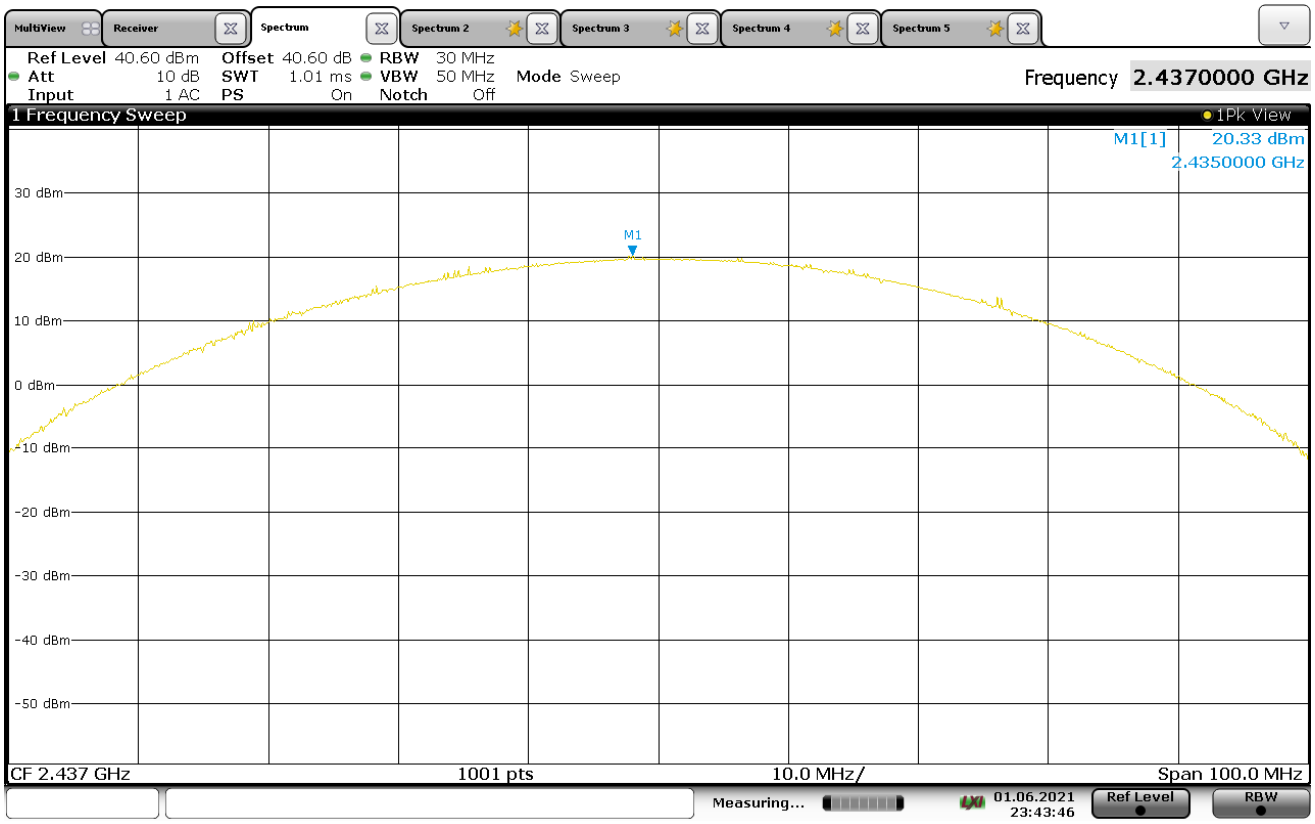
Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS1
Carrier Frequency	2437MHz
Parameters	Output Power = 0.1083W (20.35dBm)
Notes	N/A



23:40:55 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS2
Carrier Frequency	2437MHz
Parameters	Output Power = 0.1078W (20.33dBm)
Notes	N/A



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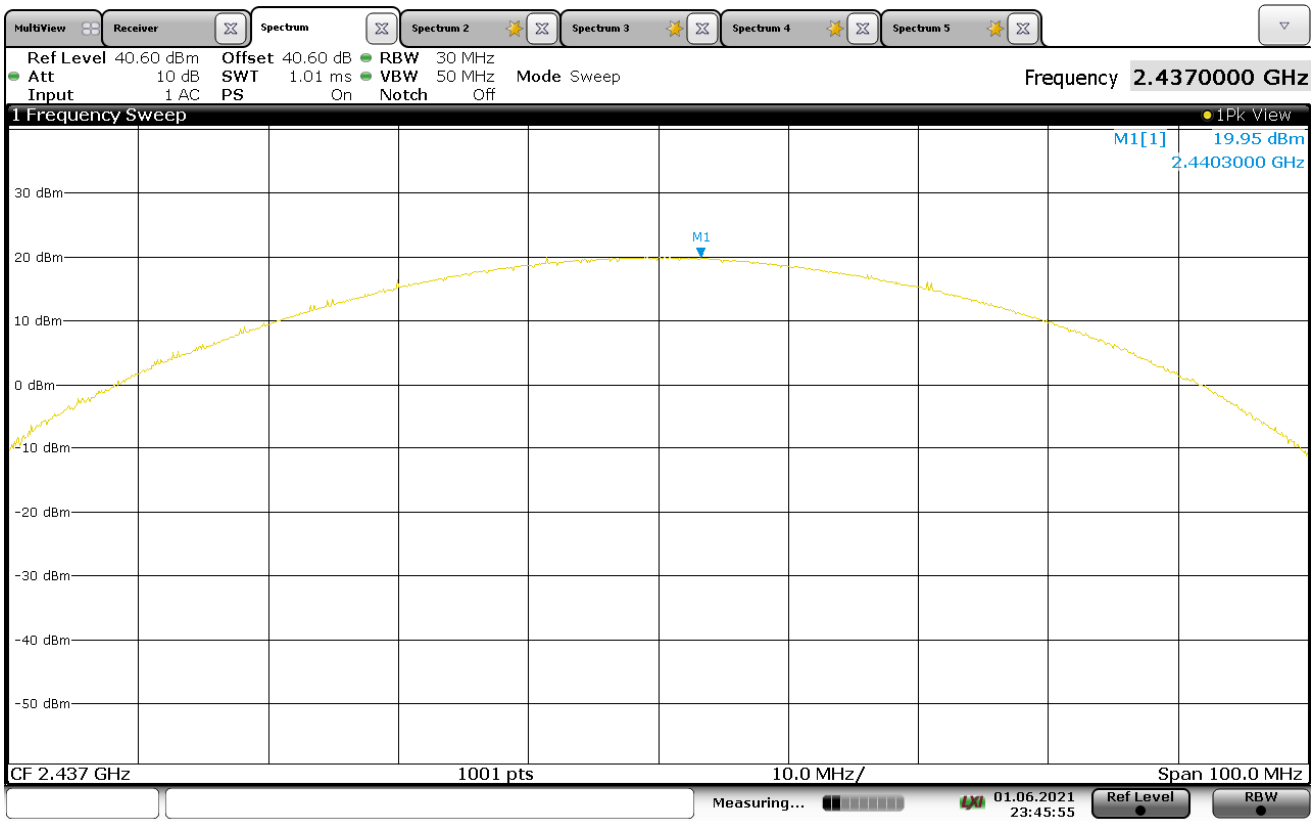
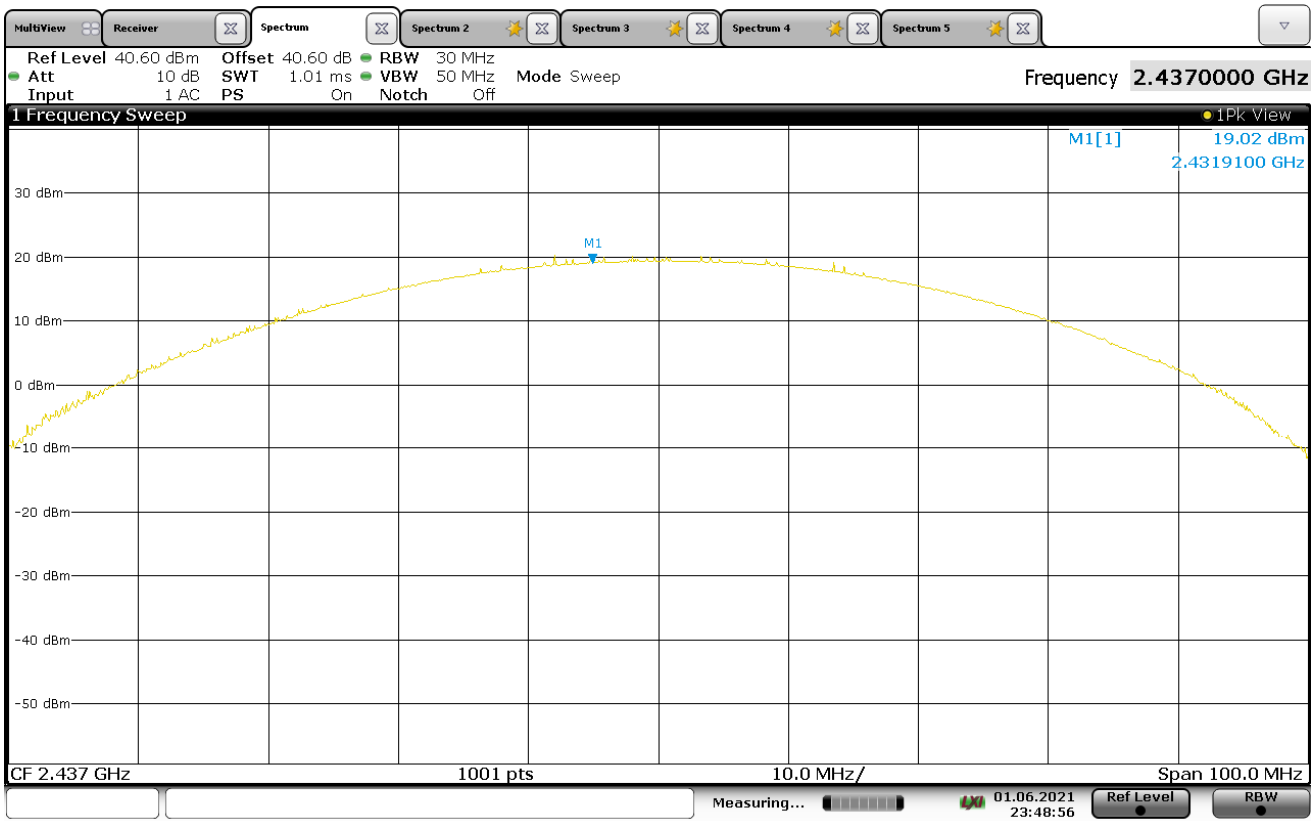
Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS3
Carrier Frequency	2437MHz
Parameters	Output Power = 0.0988W (19.95dBm)
Notes	N/A



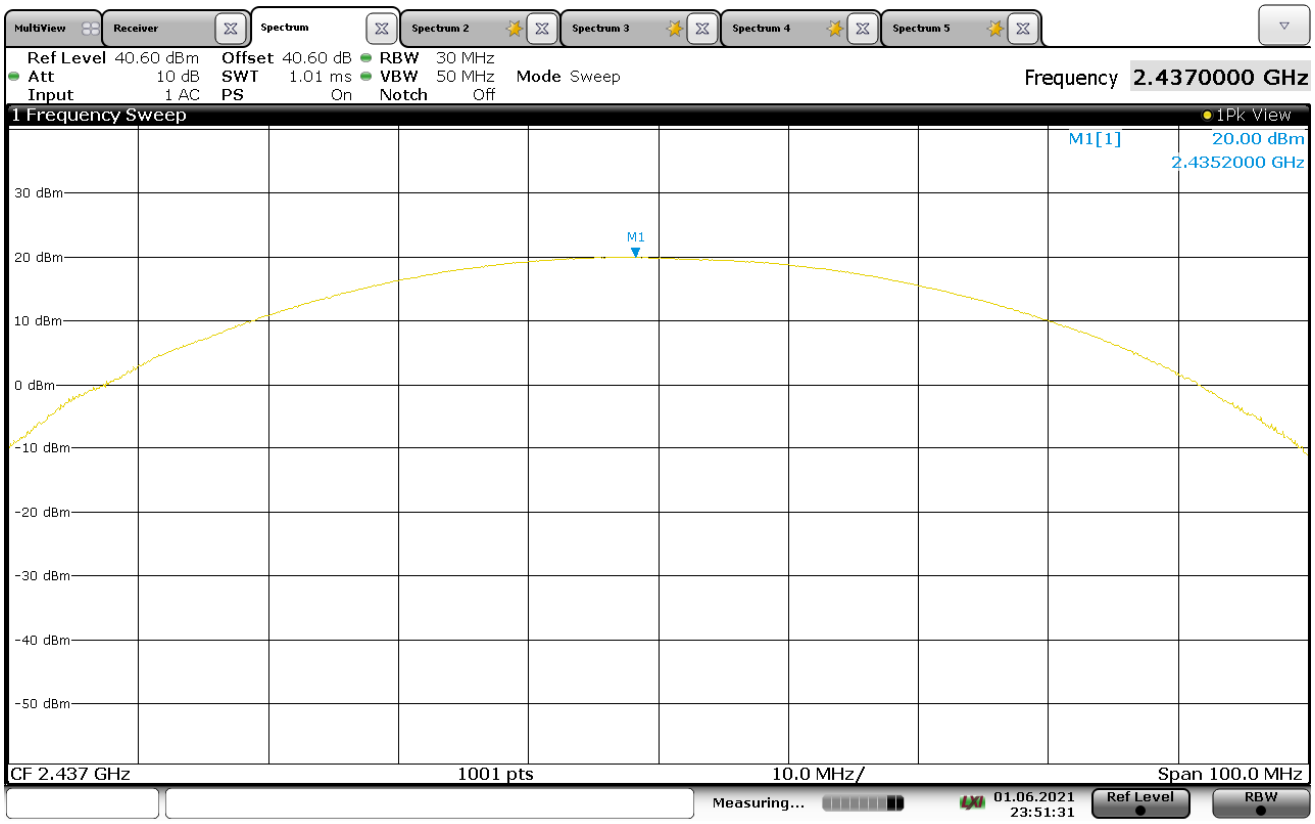
23:45:55 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS4
Carrier Frequency	2437MHz
Parameters	Output Power = 0.0797W (19.02dBm)
Notes	N/A



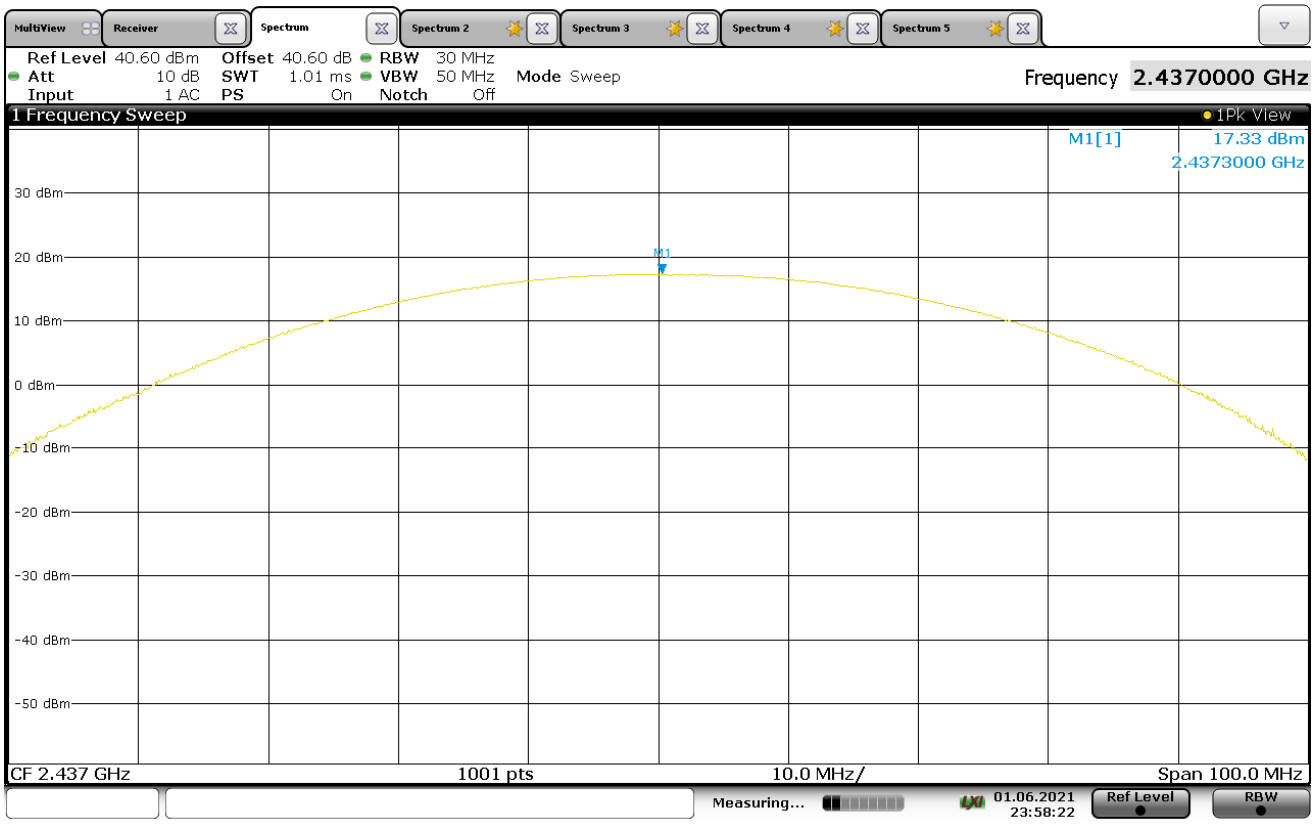
23:48:57 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS5
Carrier Frequency	2437MHz
Parameters	Output Power = 0.1W (20.00dBm)
Notes	N/A



23:51:32 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS6
Carrier Frequency	2437MHz
Parameters	Output Power = 0.054W (17.33dBm)
Notes	N/A



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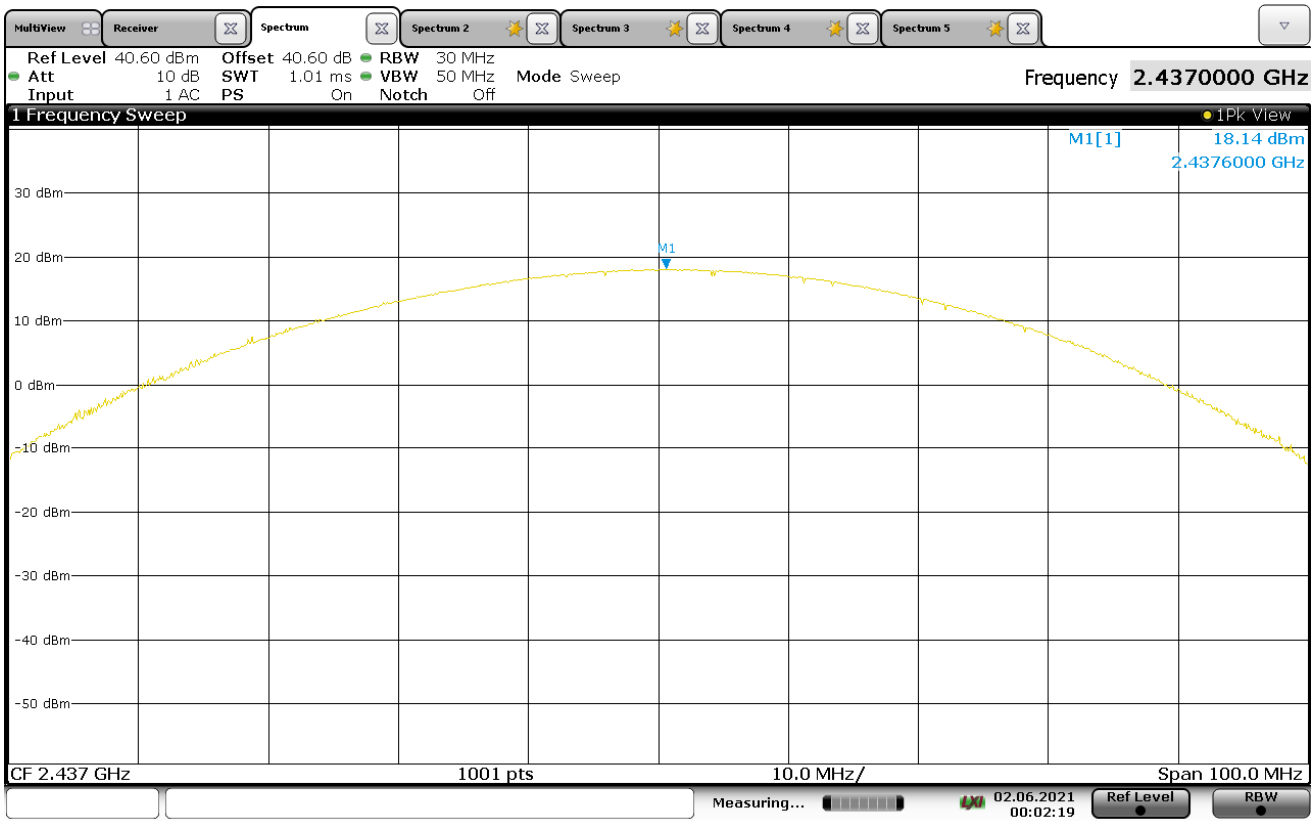
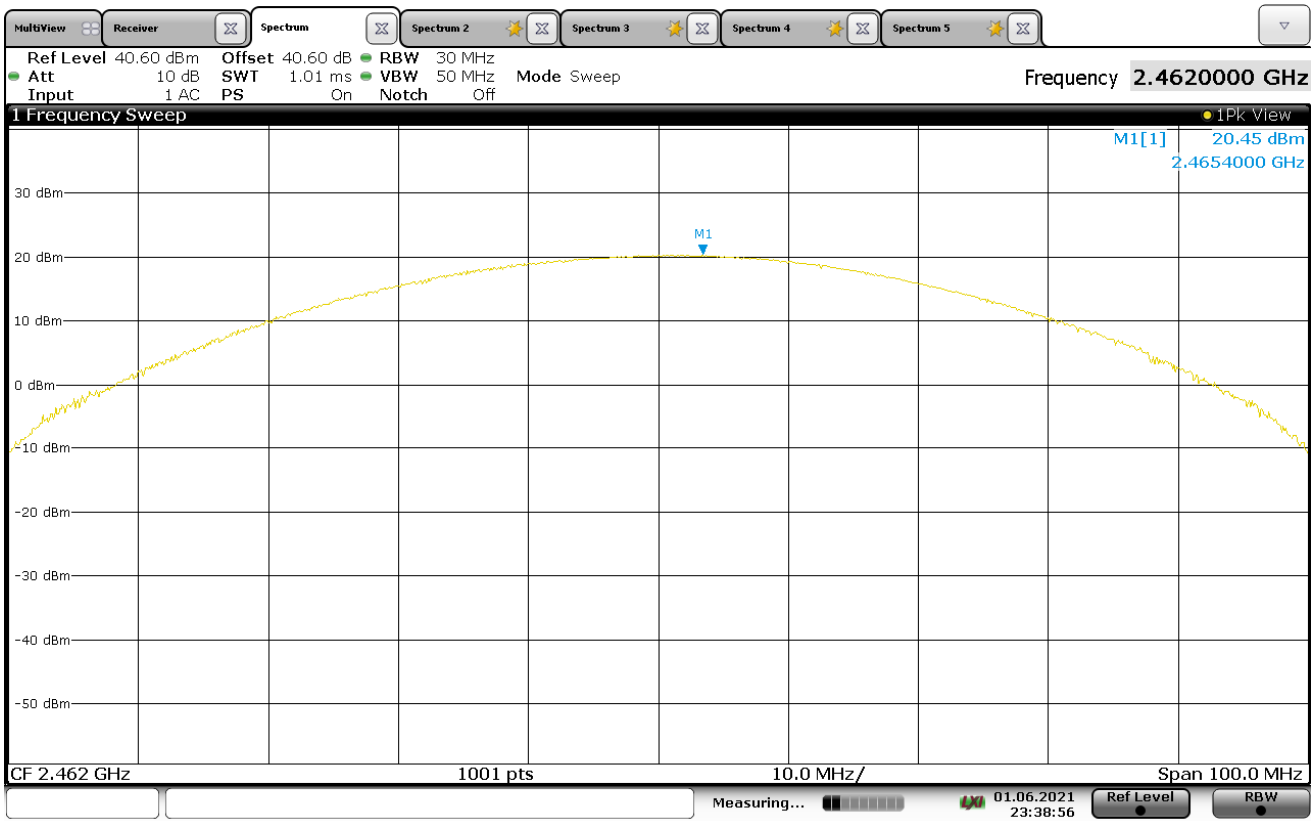
Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS7
Carrier Frequency	2437MHz
Parameters	Output Power = 0.0651W (18.14dBm)
Notes	N/A



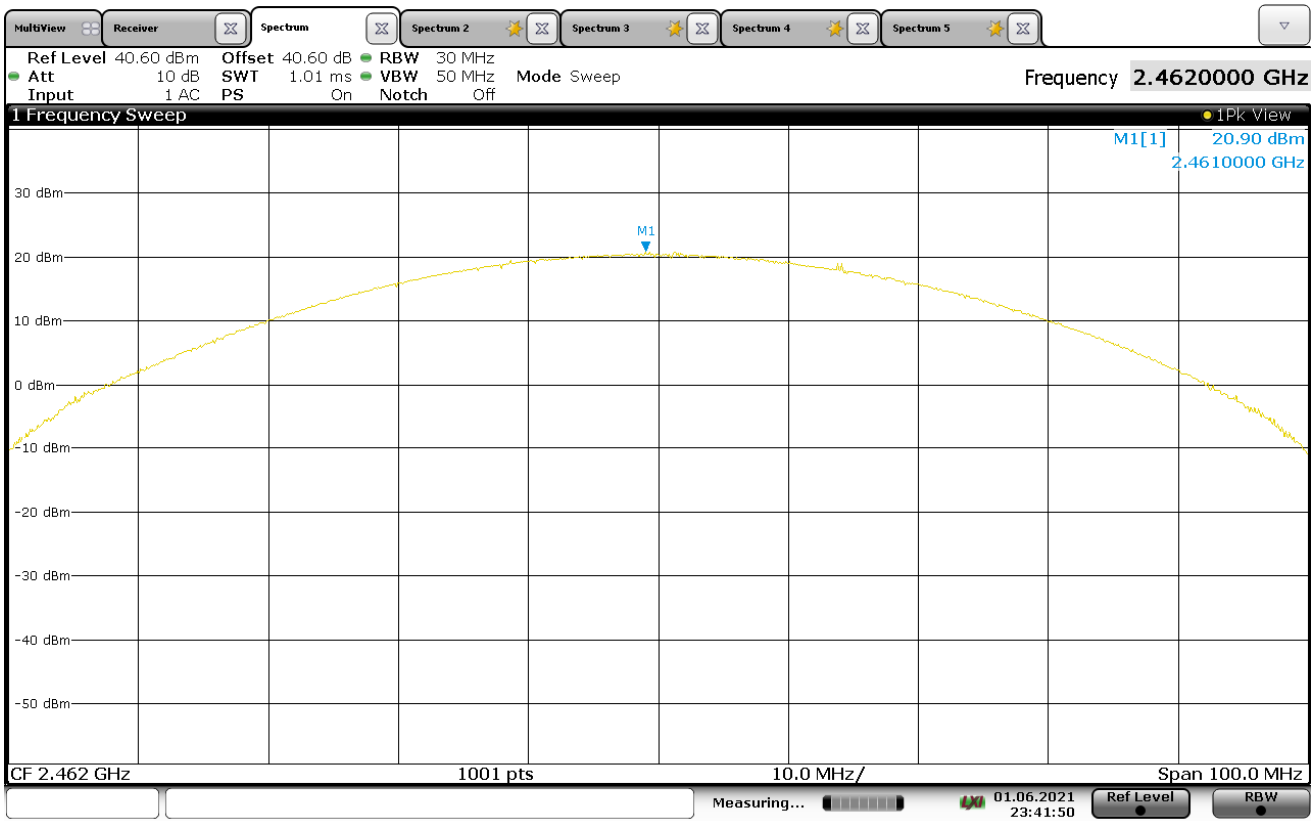
00:02:20 02.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS0
Carrier Frequency	2462MHz
Parameters	Output Power = 0.1109W (20.45dBm)
Notes	N/A



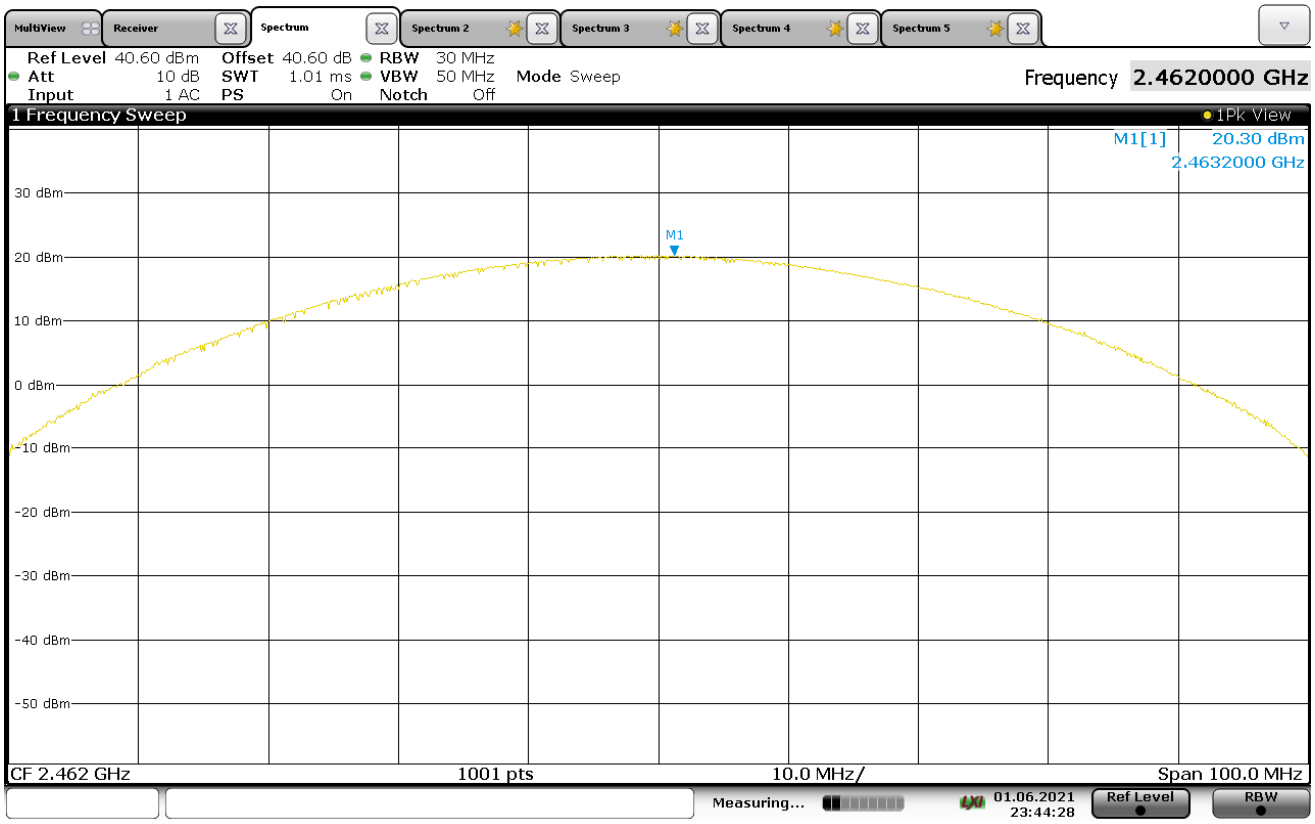
23:38:57 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS1
Carrier Frequency	2462MHz
Parameters	Output Power = 0.1230 (20.90dBm)
Notes	N/A



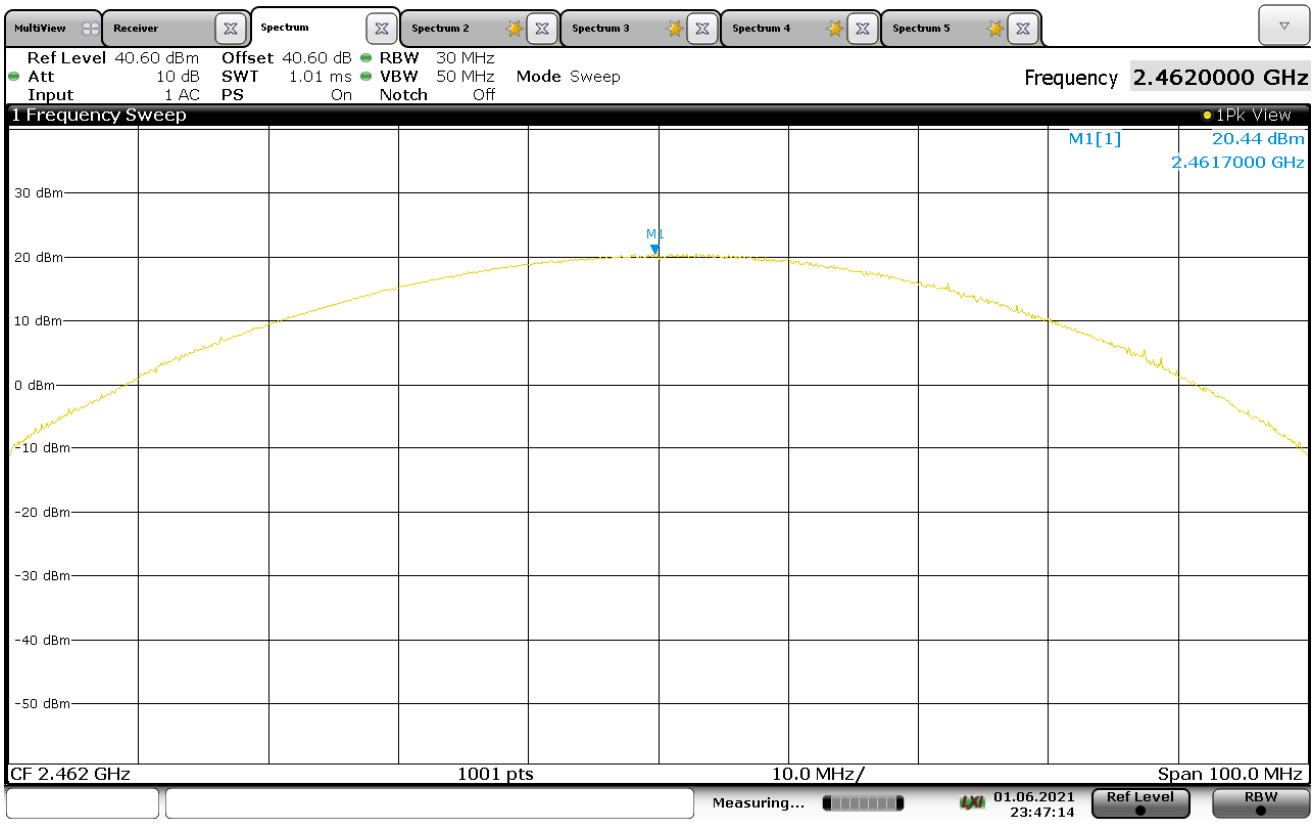
23:41:51 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS2
Carrier Frequency	2462MHz
Parameters	Output Power = 0.1071W (20.30dBm)
Notes	N/A



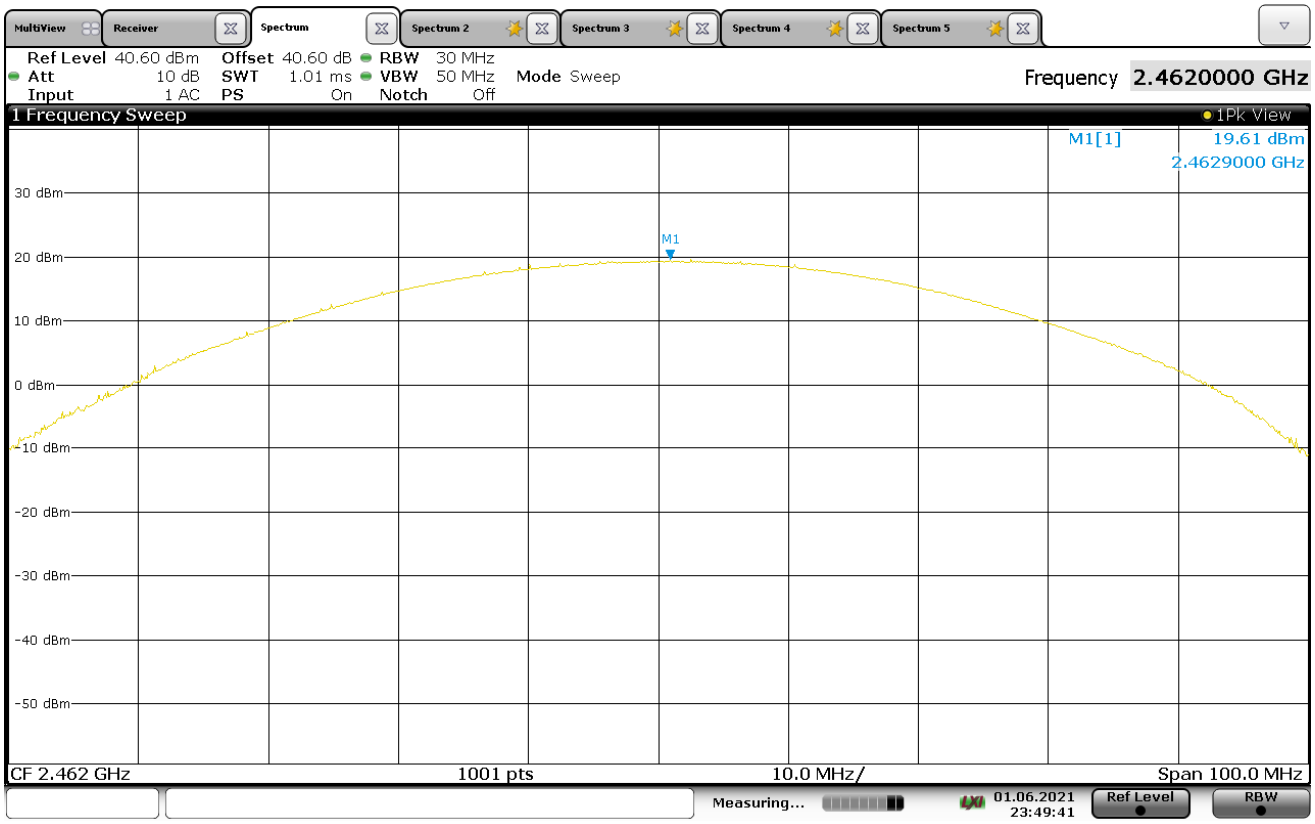
23:44:28 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS3
Carrier Frequency	2462MHz
Parameters	Output Power = 0.1106W (20.44dBm)
Notes	N/A



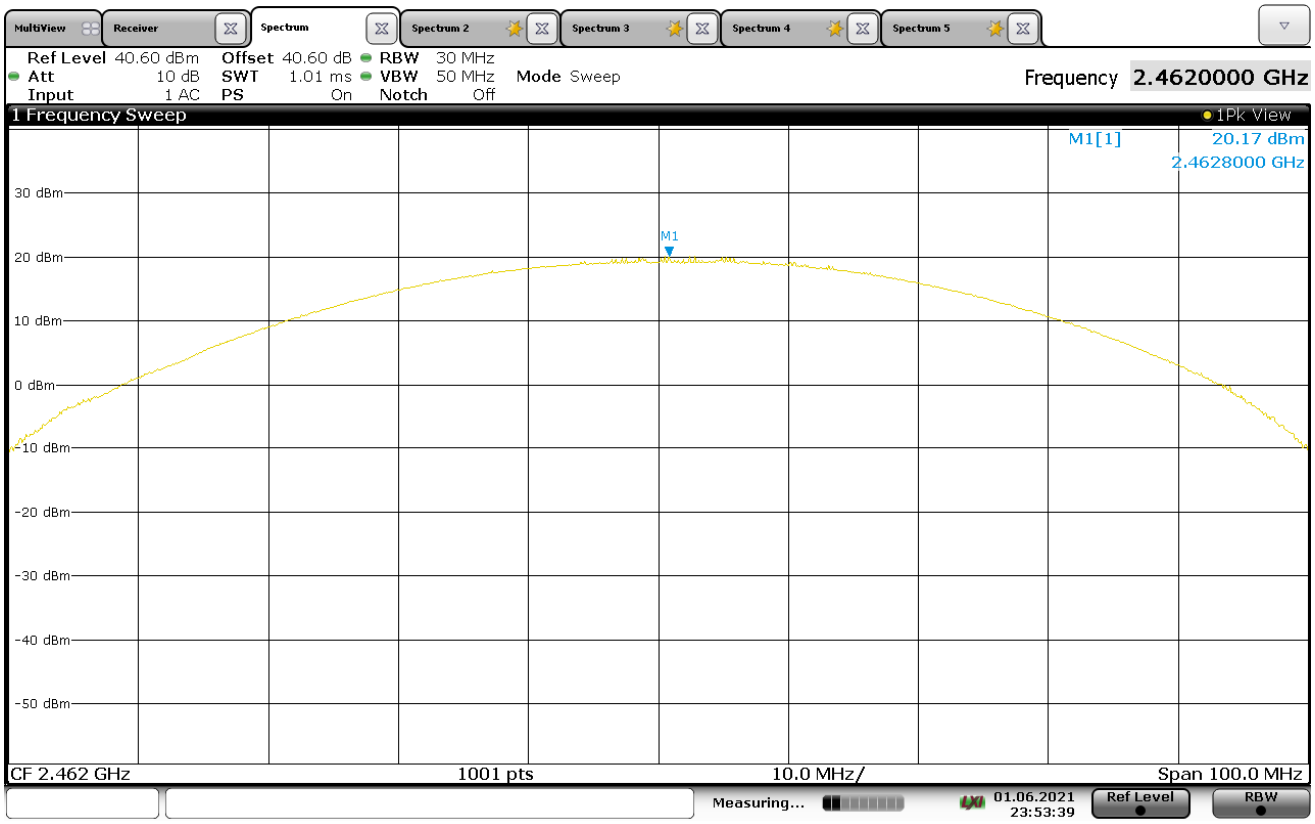
23:47:15 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS4
Carrier Frequency	2462MHz
Parameters	Output Power = 0.0914W (19.61dBm)
Notes	N/A



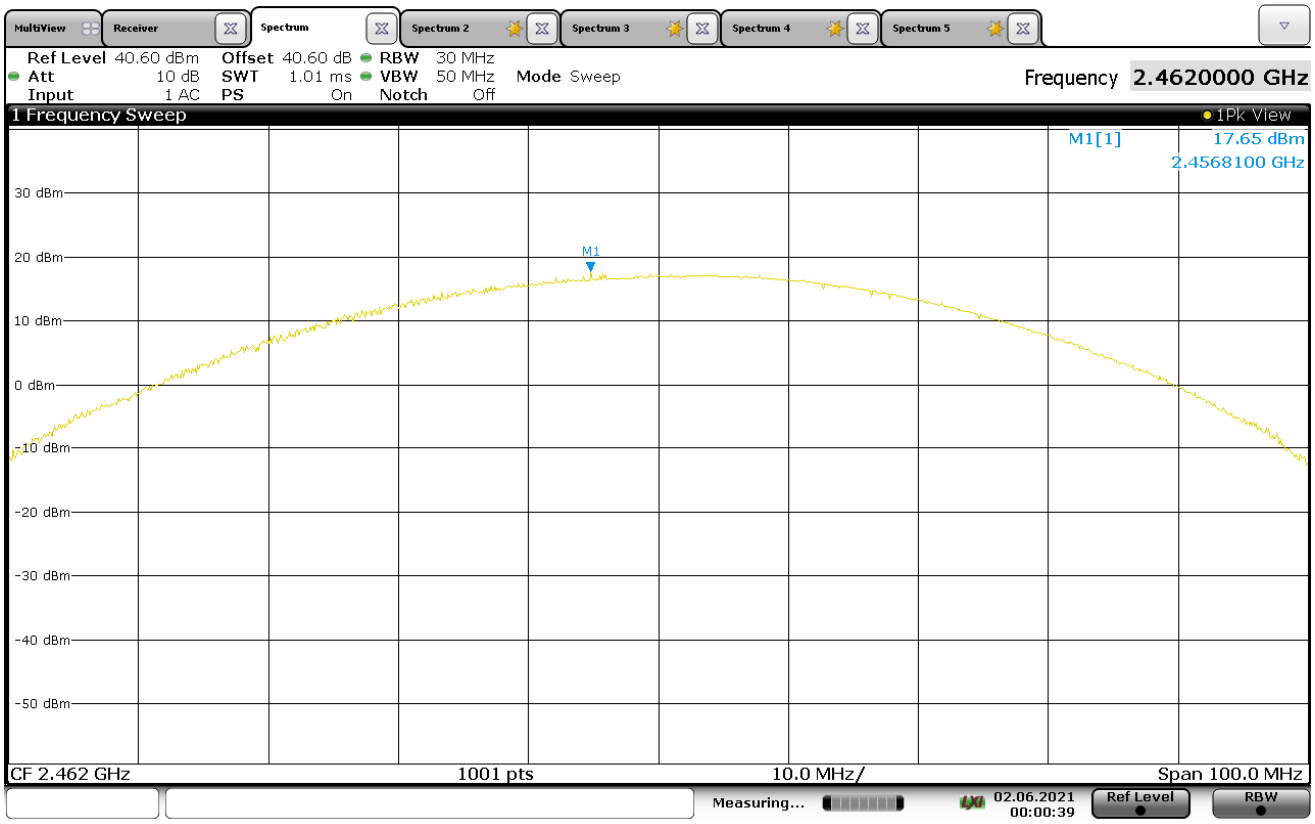
23:49:41 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS5
Carrier Frequency	2462MHz
Parameters	Output Power = 0.1039W (20.17dBm)
Notes	N/A

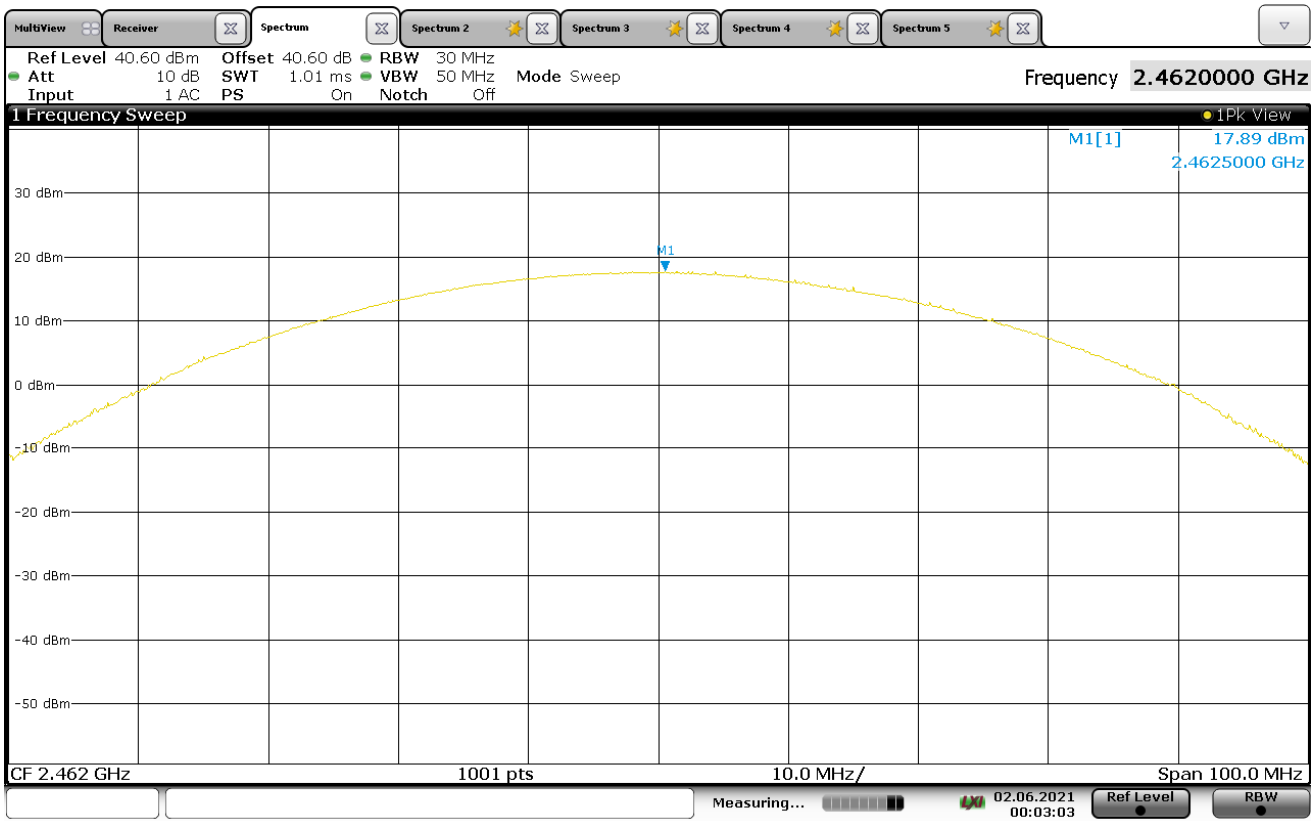


23:53:39 01.06.2021

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS6
Carrier Frequency	2462MHz
Parameters	Output Power = 0.0582W (17.65dBm)
Notes	N/A



Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378290
Mode	802.11n – MCS7
Carrier Frequency	2462MHz
Parameters	Output Power = 0.0615W (17.89dBm)
Notes	N/A



00:03:03 02.06.2021

26. Effective Isotropic Radiated Power (EIRP)

EUT Information	
Manufacturer	Astronics
Product	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378317
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
Type of Antenna Used	Double-ridged waveguide (or equivalent)
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

Requirements
The output power shall not exceed 4W (36dBm).

Procedures
The EUT was placed on the non-conductive stand and set to transmit. A double ridged waveguide antenna was placed at a test distance of 3 meters from the EUT. The resolution bandwidth (RBW) of the spectrum analyzer was set to greater than the 6dB bandwidth. The EUT was maximized for worst case emissions (or maximum output power) at the measuring antenna. The maximum meter reading was recorded. The peak power output was measured for the low, middle, and high channels. The equivalent power was determined from the field intensity levels measured at 3 meters using the substitution method. To determine the emission power, a dipole antenna (double ridged waveguide antenna for all measurements above 1GHz) was then set in place of the EUT and connected to a calibrated signal generator. The output of the signal generator was adjusted to match the received level at the spectrum analyzer. The signal level was recorded. The reading was then corrected to compensate for cable loss (and antenna gain for all measurements above 1GHz), as required. The peak power output was calculated for low, middle, and high hopping frequencies.

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378317
Mode	802.11b – 11Mbps
Notes	N/A

Freq. (MHz)	Ant Pol	Wide BW Meter Reading (dBuV)	Matched Sig. Gen. Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
2412.00	H	76.0	10.7	5.0	3.4	12.3	36.0	-23.7
2412.00	V	84.0	19.6	5.0	3.4	21.2	36.0	-14.8
2437.00	H	77.6	12.4	5.0	3.5	13.9	36.0	-22.1
2437.00	V	84.8	20.4	5.0	3.5	22.0	36.0	-14.0
2462.00	H	75.8	10.6	4.9	3.5	12.0	36.0	-24.0
2462.00	V	83.9	19.6	4.9	3.5	21.0	36.0	-15.0

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378317
Mode	802.11g – 9Mbps
Notes	N/A

Freq. (MHz)	Ant Pol	Wide BW Meter Reading (dBuV)	Matched Sig. Gen. Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
2412.00	H	79.1	13.8	5.0	3.4	15.4	36.0	-20.6
2412.00	V	86.5	22.1	5.0	3.4	23.7	36.0	-12.3
2437.00	H	79.4	14.2	5.0	3.5	15.7	36.0	-20.3
2437.00	V	87.8	23.4	5.0	3.5	25.0	36.0	-11.0
2462.00	H	77.0	11.8	4.9	3.5	13.2	36.0	-22.8
2462.00	V	83.4	19.1	4.9	3.5	20.5	36.0	-15.5

Test Details	
Manufacturer	Astronics
Model No.	Focus Pro
Serial No.	1378317
Mode	802.11n – MCS1
Notes	N/A

Freq. (MHz)	Ant Pol	Wide BW Meter Reading (dBuV)	Matched Sig. Gen. Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
2412.00	H	80.0	14.7	5.0	3.4	16.3	36.0	-19.7
2412.00	V	87.5	23.1	5.0	3.4	24.7	36.0	-11.3
2437.00	H	80.2	15.0	5.0	3.5	16.5	36.0	-19.5
2437.00	V	86.6	22.2	5.0	3.5	23.8	36.0	-12.2
2462.00	H	77.0	11.8	4.9	3.5	13.2	36.0	-22.8
2462.00	V	85.5	21.2	4.9	3.5	22.6	36.0	-13.4

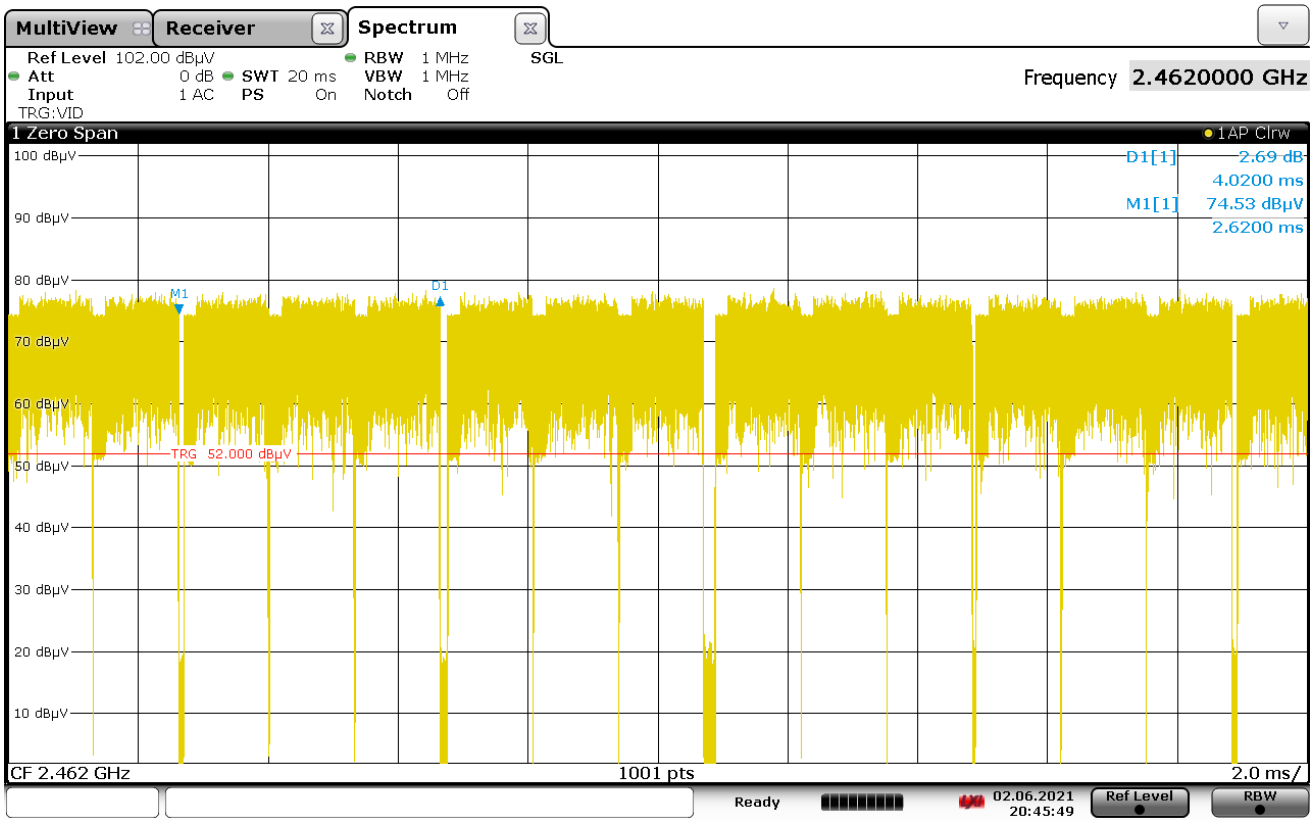
27. Duty Cycle Factor Measurements

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

Test Setup Details	
Setup Format	Tabletop
Measurement Method	Antenna Conducted
Notes	N/A

Procedures
The duty cycle factor is used to convert peak detected readings to average readings when pulsed modulation is employed. This factor is computed from the time domain trace of the pulse modulation signal. With the transmitter set up to transmit for maximum pulse density, the time domain trace is displayed on the spectrum analyzer. This trace is obtained by tuning center frequency to the transmitter frequency and then setting a zero span width with 2msec/div. The amplitude settings are adjusted so that the on/off transitions clear the 4th division from the bottom of the display. The markers are set at the beginning and end of the “on-time”. The trace is recorded. Next the spectrum analyzer center frequency is set to the transmitter frequency with a zero span width and 10msec/div. This shows if the word is longer than 100msec or shorter than 100msec. If the word period is less than 100msec, the display is set to show at least one word. The on-time and off-time are then measured. The on-time is total time signal level exceeds the 4th division. Off-time is time under for the word period. The duty cycle is then computed as the (On-time/ word period) where the word period = (On-time + Off-time).

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11b
Carrier Frequency	2462MHz
Parameters	Duty cycle repeats every 4.02msec. In each 4.02msec period, there are 2 short off-time periods of 13usec and 2 long off-time period of 125usec. The total on-time = 4.02msec – ((2 x 13 usec off-time)+ (2 x125usec off-time)) = 3.74msec
Notes	None



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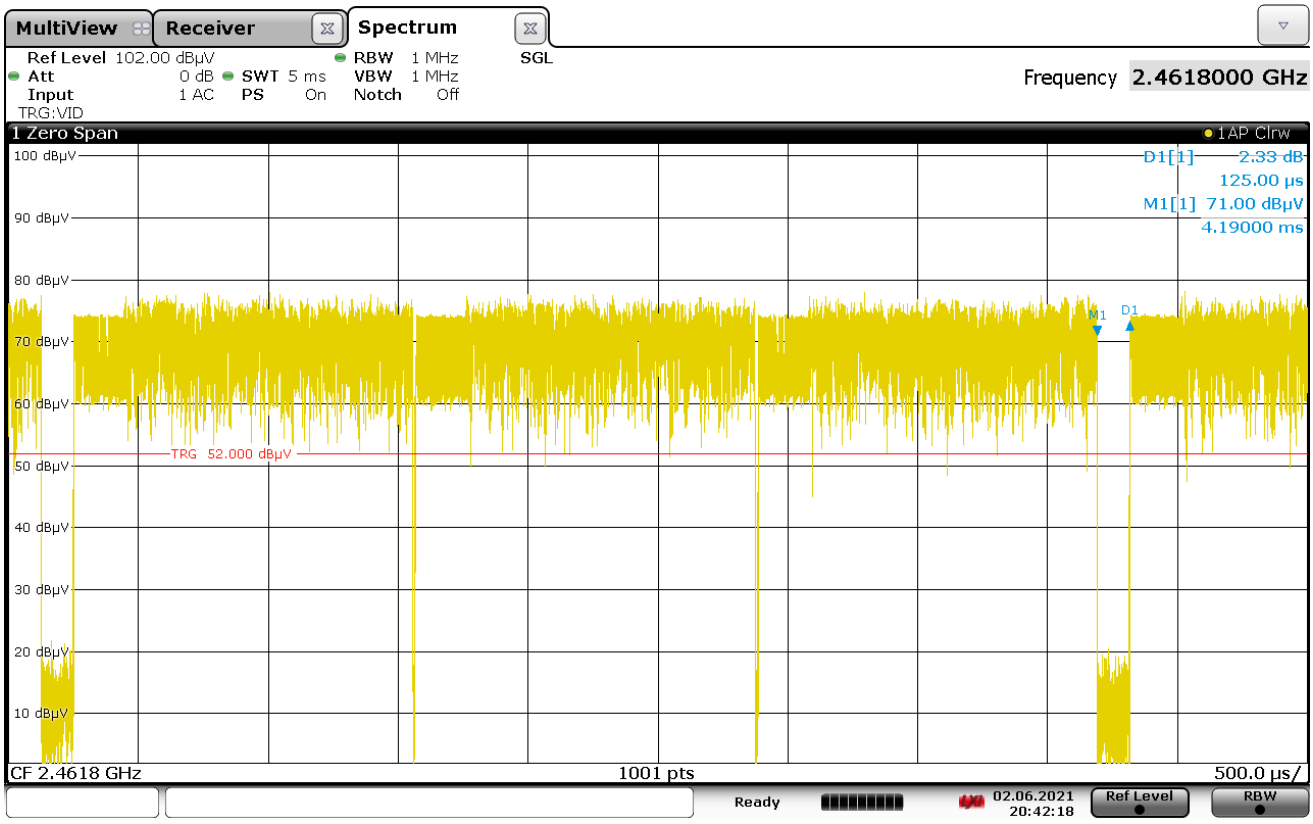
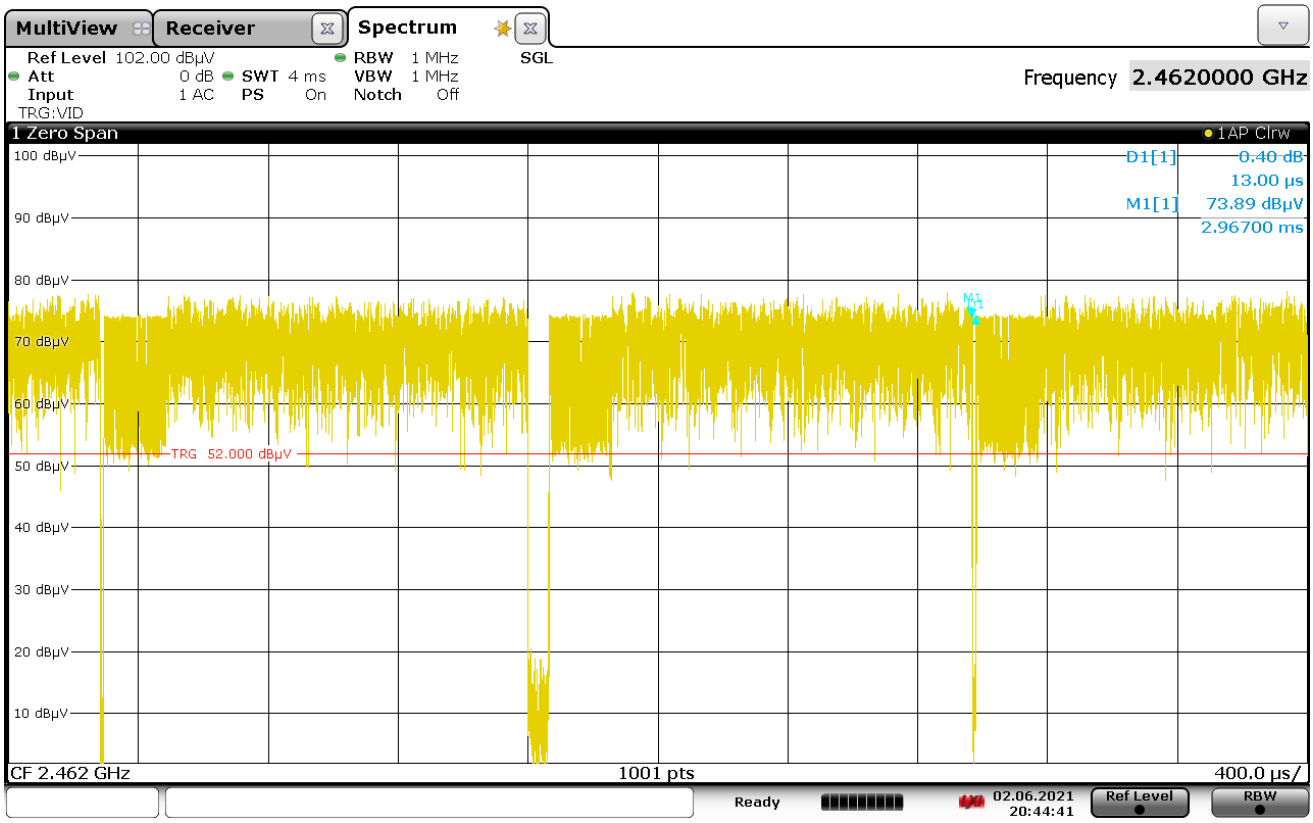
Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11b
Carrier Frequency	2462MHz
Parameters	Long Off time is 125usec
Notes	None



Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11b
Carrier Frequency	2462MHz
Parameters	Short Off time is 13usec
Notes	None



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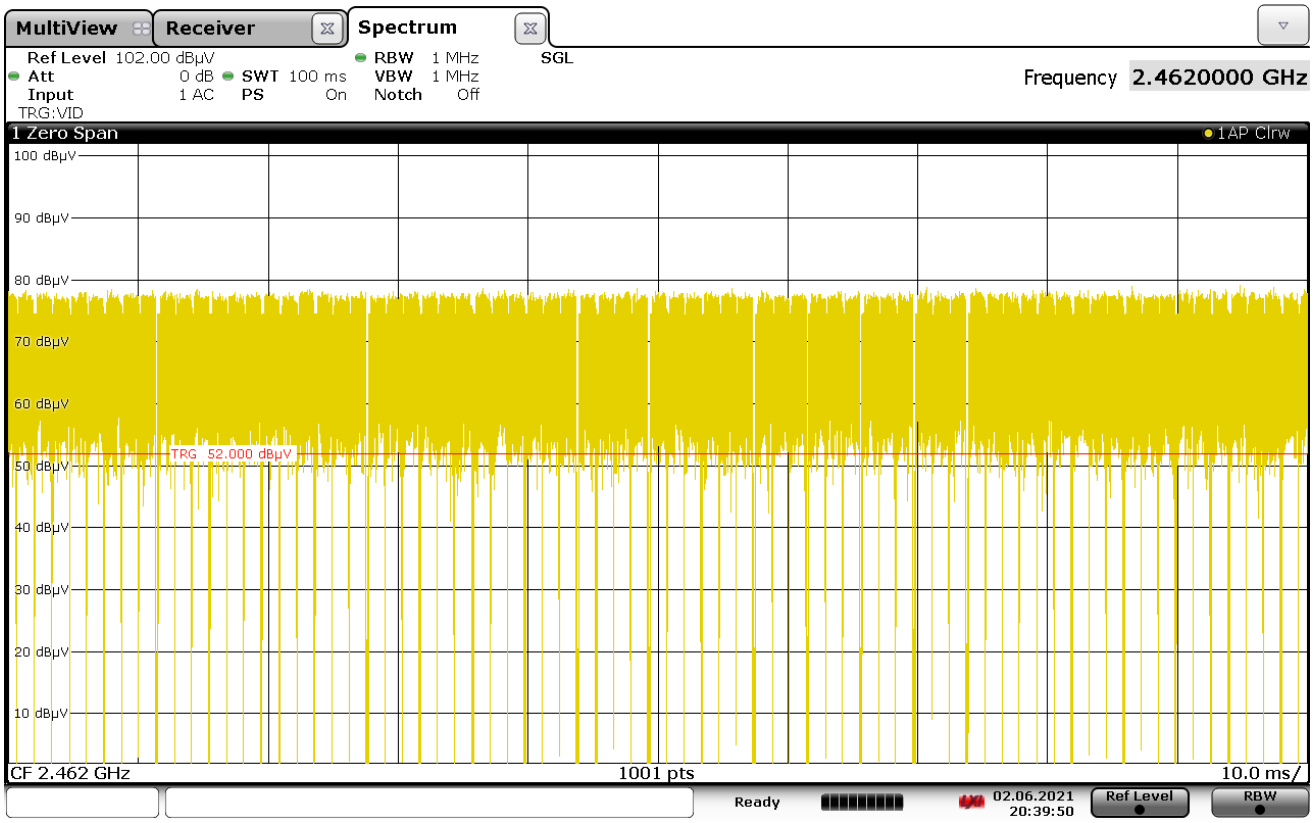
Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11b
Carrier Frequency	2462MHz
Parameters	100msec time period
Notes	None



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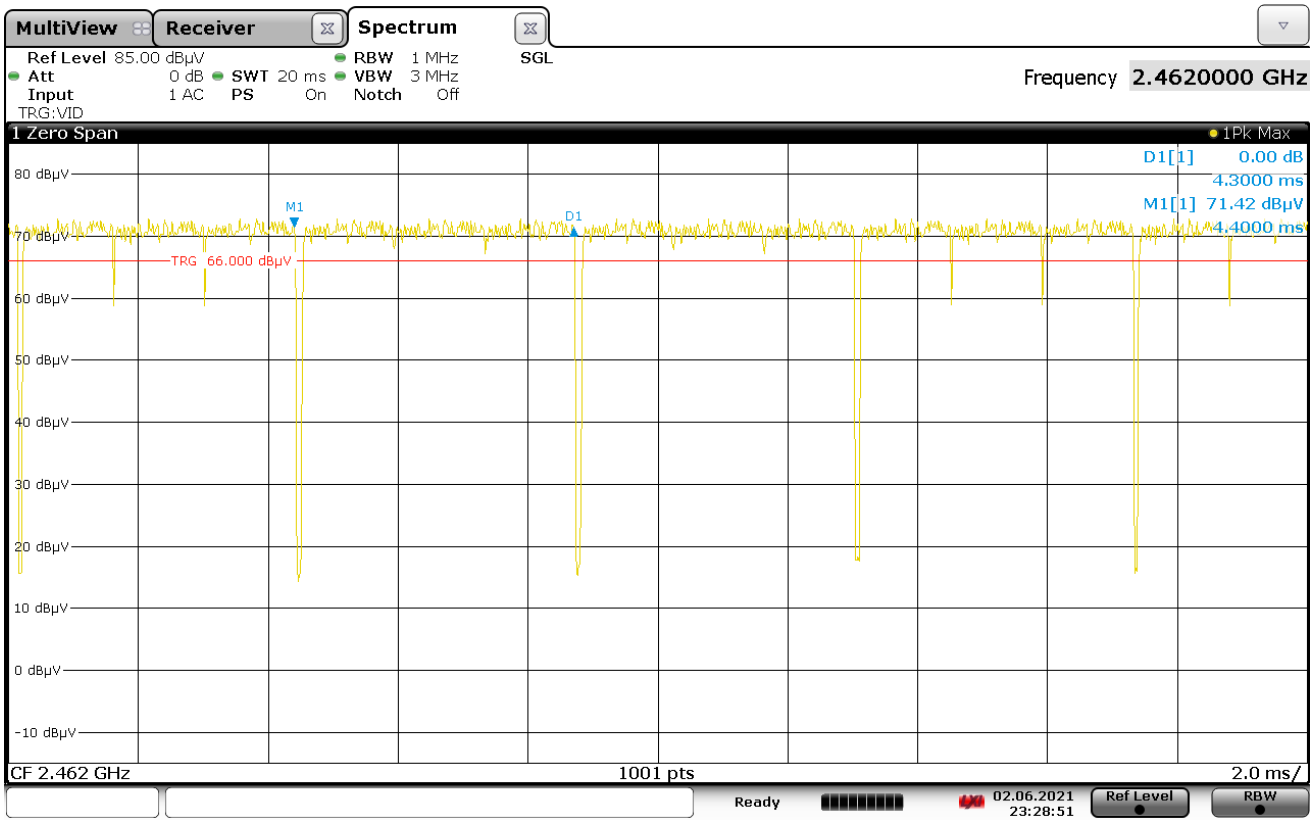
Duty Cycle= DC = 3.74msec on-time/4.02msec total word time) = 0.93

Duty Cycle Correction Factor = 20 log (1/DC) = 20 log (1/0.93) = 0.62dB

The Duty Cycle was the same for the low, middle, and high channels.

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g
Carrier Frequency	2462MHz
Parameters	Duty cycle repeats every 4.3msec. In each 4.3msec period, there is one 150usec off period. The total on-time = 4.3msec – 150usec off-time = 4.15msec
Notes	None



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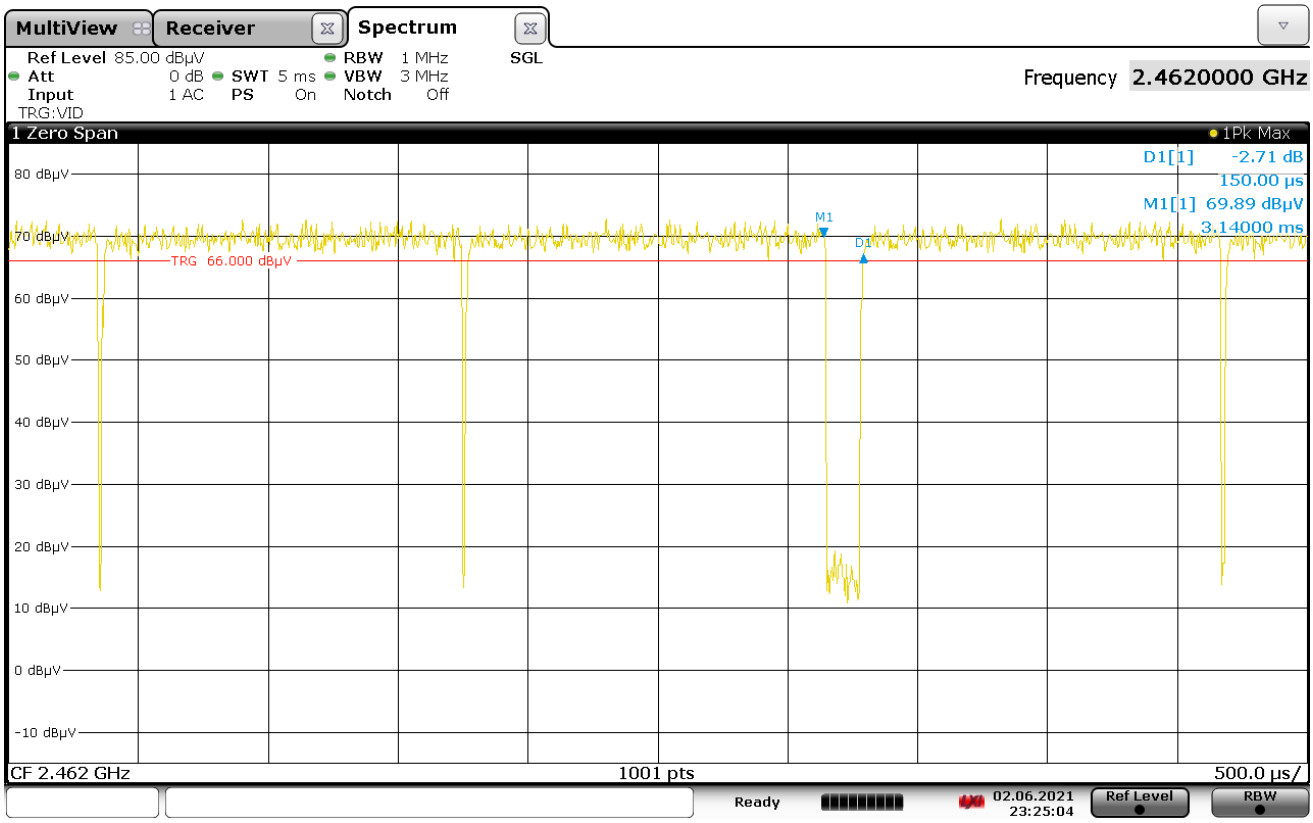
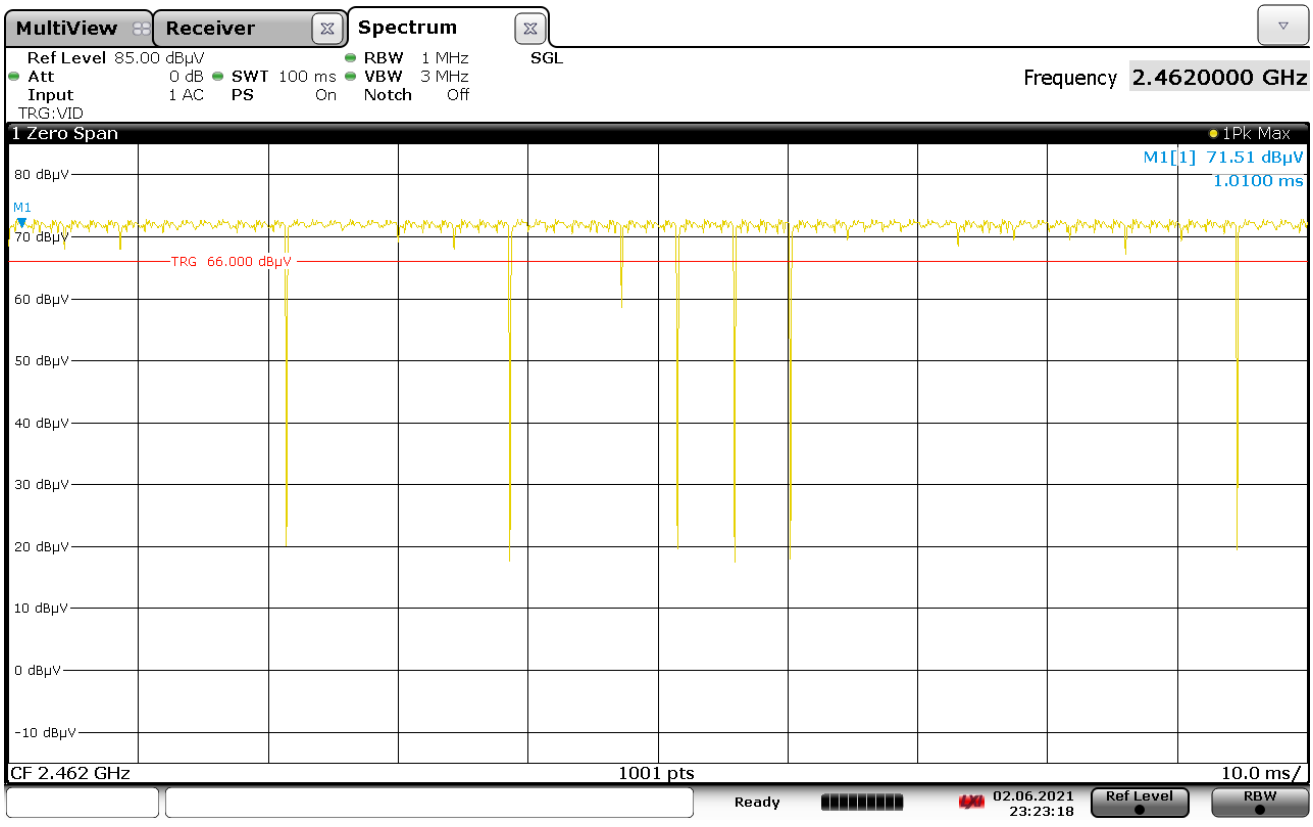
Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g
Carrier Frequency	2462MHz
Parameters	Long Off time is 150usec
Notes	None



23:25:04 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11g
Carrier Frequency	2462MHz
Parameters	100msec time period
Notes	None



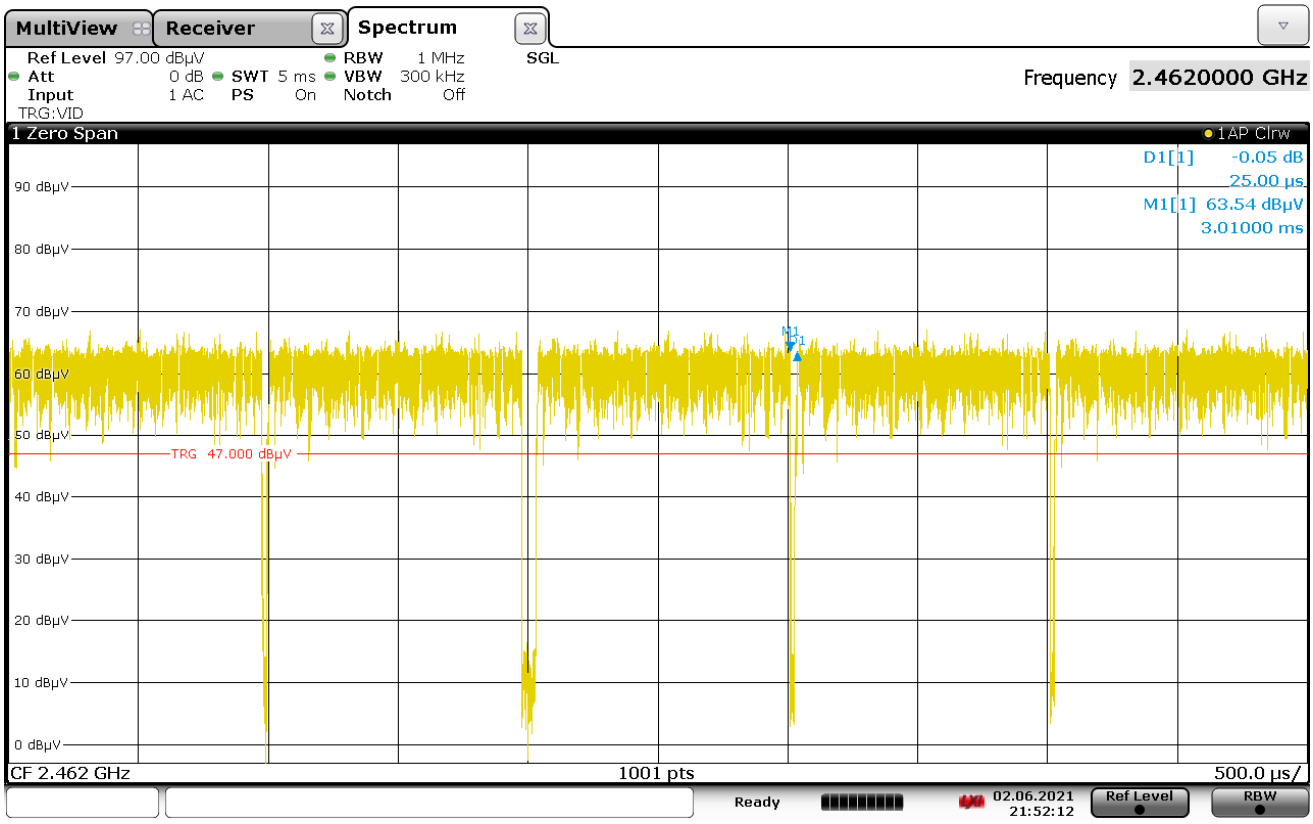
23:23:19 02.06.2021

Duty Cycle= DC = 4.15msec on-time/4.3msec total word time) = 0.965

Duty Cycle Correction Factor = 20 log (1/DC) = 20 log (1/0.965) = 0.31dB

The Duty Cycle was the same for the low, middle, and high channels.

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n
Carrier Frequency	2462MHz
Parameters	Short off period of 25usec
Notes	None

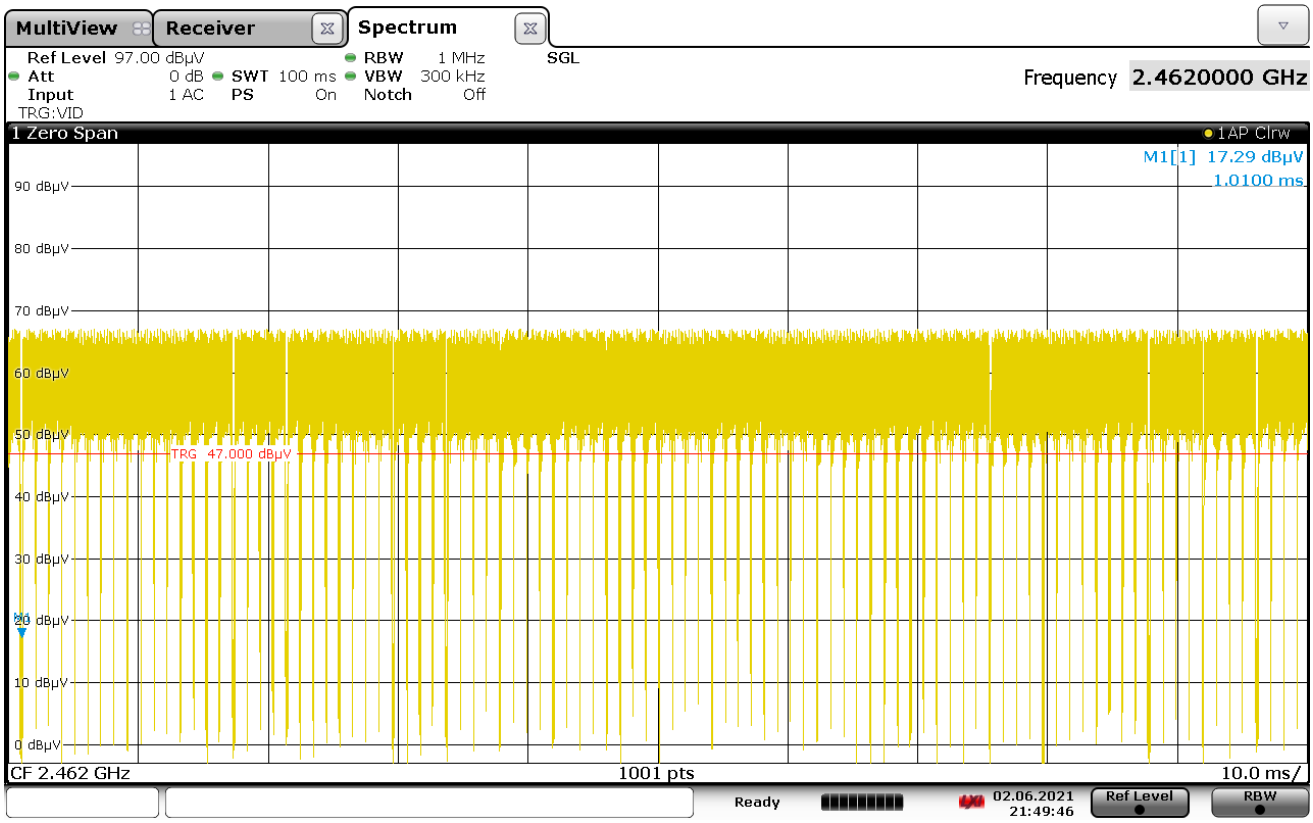


21:52:13 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n
Carrier Frequency	2462MHz
Parameters	Long off time of 140usec. Duty cycle repeats every 4.12msec. In each 4.12msec period, there are 3 short off-time periods of 25usec and 1 long off-time period of 140usec. The total on-time = 4.12msec – ((3 x 25 usec off-time)+ (1 x140usec off-time)) = 3.91msec
Notes	None

21:53:57 02.06.2021

Test Details	
Manufacturer	Astronics
Model	Focus Pro
S/N	1378290
Mode	802.11n
Carrier Frequency	2462MHz
Parameters	100msec time period
Notes	None



21:49:47 02.06.2021

Duty Cycle= DC = 3.91msec on-time/4.125msec total word time) = 0.948

Duty Cycle Correction Factor = 20 log (1/DC) = 20 log (1/0.948) = 0.46dB

The Duty Cycle was the same for the low, middle, and high channels.

28. Case Spurious Radiated Emissions

EUT Information	
Manufacturer	Astronics
Product	Resideo Thermostat
Model No.	Focus Pro
Serial No.	1378317
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
Type of Antennas Used	Double-ridged waveguide (or equivalent)
Notes	The cables were manually maximized during the preliminary emissions sweeps. The cable arrangement which resulted in the worst-case emissions was utilized.

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

Procedures

Radiated measurements were performed in a 32ft. x 20ft. x 14ft. high shielded enclosure. The shielded enclosure prevents emissions from other sources, such as radio and TV stations from interfering with the measurements. All powerlines and signal lines entering the enclosure pass through filters on the enclosure wall. The powerline filters prevent extraneous signals from entering the enclosure on these leads.

Preliminary radiated emissions tests were performed to determine the emission characteristics of the EUT. For the preliminary test, a broadband measuring antenna was positioned at a 3 meter distance from the EUT. The entire frequency range from 30MHz to 25GHz was investigated using a peak detector function.

The final open field emission tests were then manually performed over the frequency range of 30MHz to 25GHz.

1) For all harmonics not in the restricted bands, the following procedure was used:
   a) The field strength of the fundamental was measured using a double ridged waveguide antenna. The waveguide antenna was positioned at a 3 meter distance from the EUT. The EUT was placed on a non-conductive stand. A peak detector with a resolution bandwidth of 100kHz was used on the spectrum analyzer.
   b) The field strengths of all of the harmonics not in the restricted band were then measured using a double-ridged waveguide antenna. The waveguide antenna was positioned at a 3 meter distance from the EUT. The EUT was placed on a non-conductive stand. A peak detector with a resolution bandwidth of 100kHz was used on the spectrum analyzer.
   c) To ensure that maximum or worst case emission levels at the fundamental and harmonics were measured, the following steps were taken when measuring the fundamental emissions and the spurious emissions:
      i) The EUT was rotated so that all of its sides were exposed to the receiving antenna.
      ii) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
      iii) The measuring antenna was raised and lowered for each antenna polarization to maximize the readings.
      iv) In instances where it was necessary to use a shortened cable between the measuring antenna and the spectrum analyzer. The measuring antenna was not raised or lowered to ensure maximized readings, instead the EUT was rotated through all axis to ensure the maximum readings were recorded for the EUT.
   d) All harmonics not in the restricted bands must be at least 20dB below levels measured at the fundamental. However, attenuation below the general limits specified in §15.209(a) is not required.
2) For all emissions in the restricted bands, the following procedure was used:
   a) The field strengths of all emissions above 1GHz were measured using a double-ridged waveguide antenna. The waveguide antenna was positioned at a 3 meter distance from the EUT. The EUT was placed on a non-conductive stand. A peak detector with a resolution bandwidth of 1 MHz was used on the spectrum analyzer.
   b) To ensure that maximum or worst case emission levels were measured, the following steps were taken when taking all measurements:
      i) The EUT was rotated so that all of its sides were exposed to the receiving antenna.
      ii) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
      iii) The measuring antenna was raised and lowered for each antenna polarization to maximize the readings.
      iv) In instances where it was necessary to use a shortened cable between the measuring antenna

and the spectrum analyzer. The measuring antenna was not raised or lowered to ensure maximized readings, instead the EUT was rotated through all axis to ensure the maximum readings were recorded for the EUT.

c) For all radiated emissions measurements above 1GHz, the peak readings must comply with the 15.35(b) limits. 15.35(b) states that when average radiated emissions measurements are specified, there also is a limit on the peak level of the radiated emissions. The limit on the peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. Therefore, all peak readings above 1GHz must be no greater than 20dB above the limits specified in 15.209(a).

d) Next, for all radiated emissions measurements above 1GHz, the resolution bandwidth was set to 1MHz. The analyzer was set to linear mode with a 10Hz video bandwidth in order to simulate an average detector. An average reading was taken.