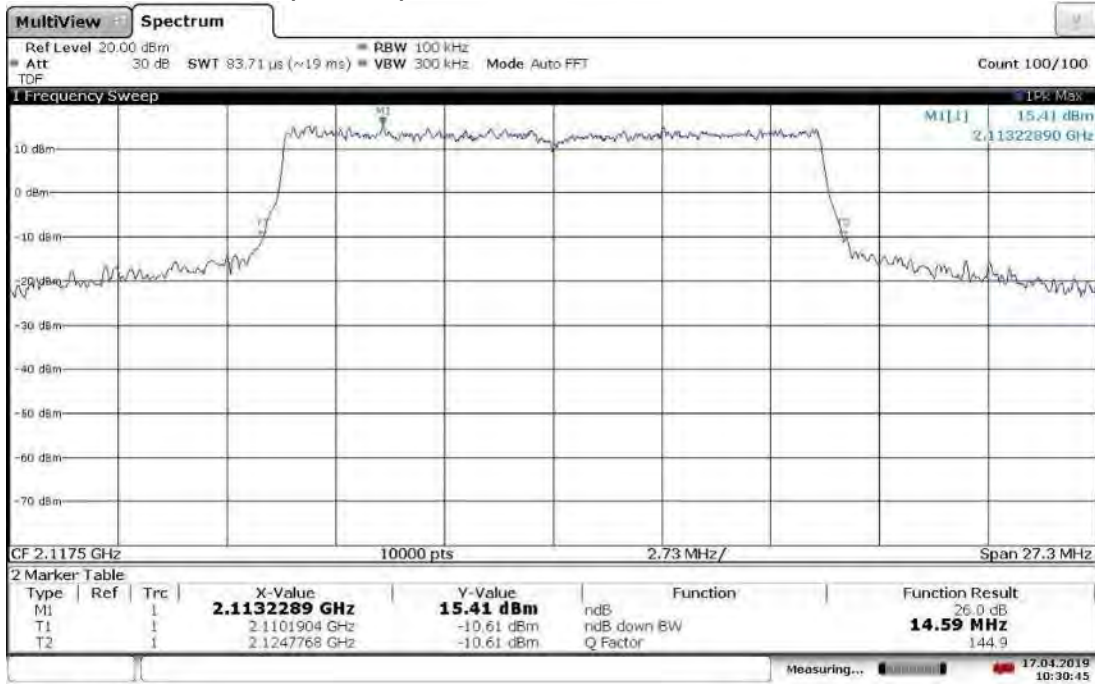


TM3.1-64QAM\_15 MHz Bandwidth

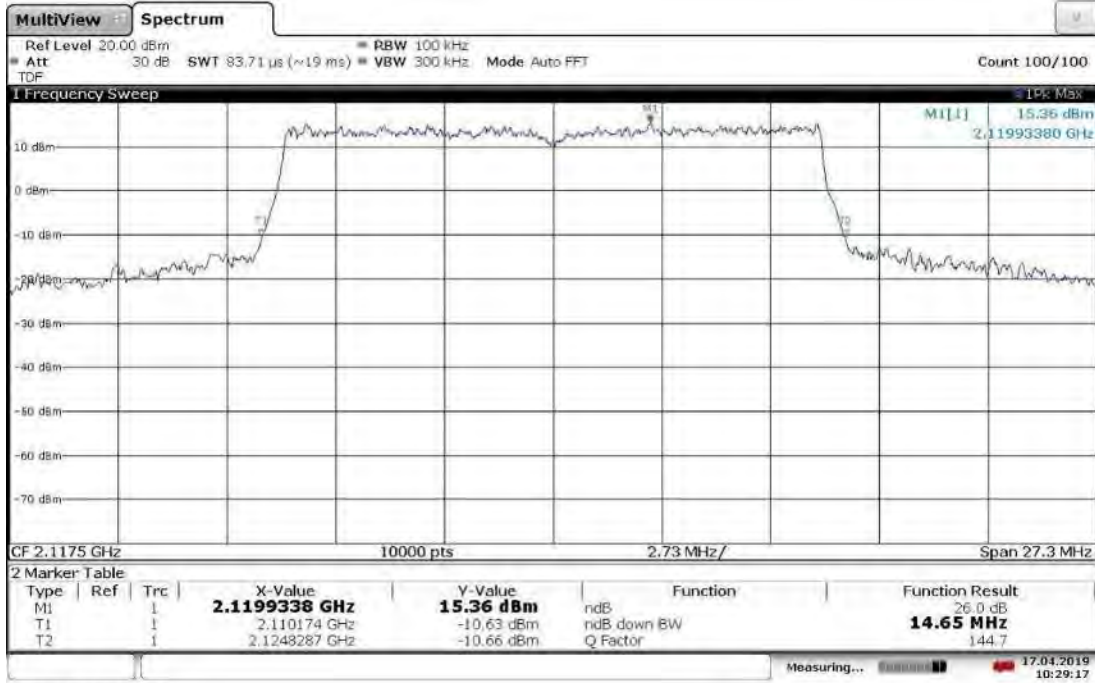
Slot 1 (Band 66), ANT0, Low Channel 26 dB Bandwidth



10:30:45 17.04.2019

TM3.1-64QAM\_15 MHz Bandwidth

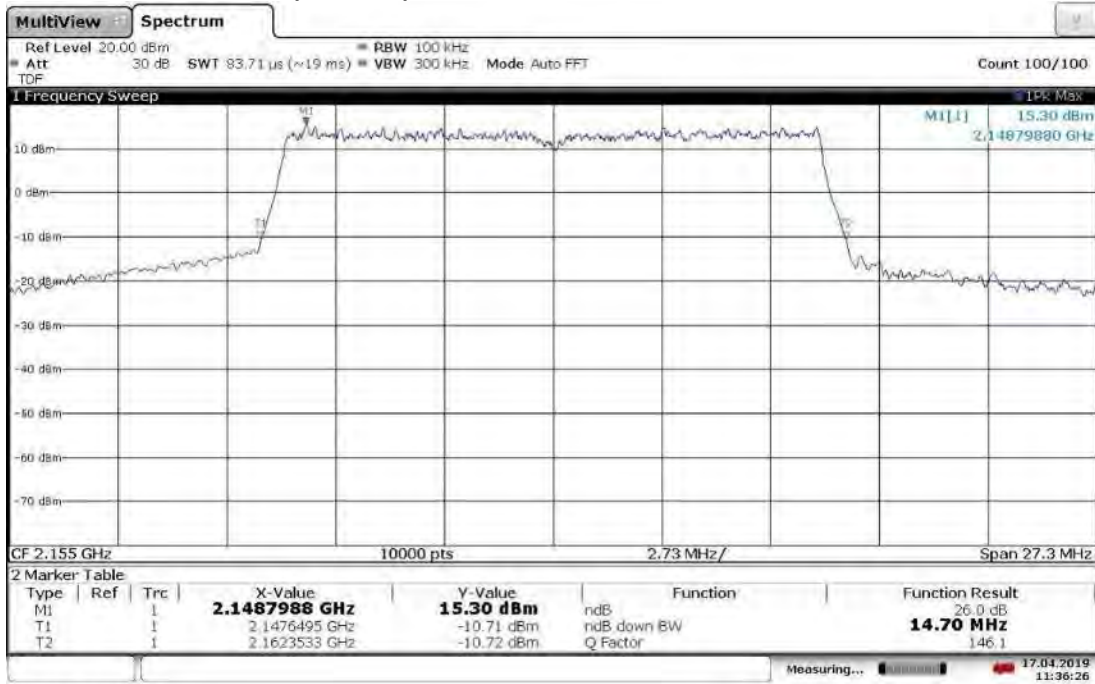
Slot 1 (Band 66), ANT1, Low Channel 26 dB Bandwidth



10:29:18 17.04.2019

TM3.1-64QAM\_15 MHz Bandwidth

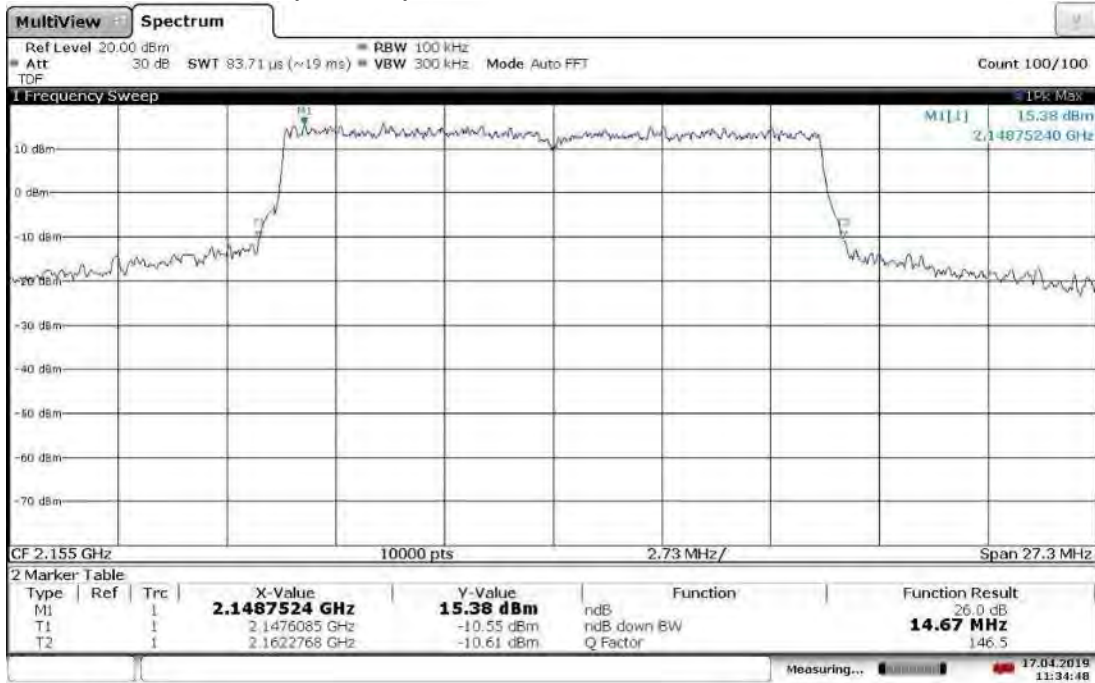
Slot 1 (Band 66), ANT0, Mid Channel 26 dB Bandwidth



11:36:26 17.04.2019

TM3.1-64QAM\_15 MHz Bandwidth

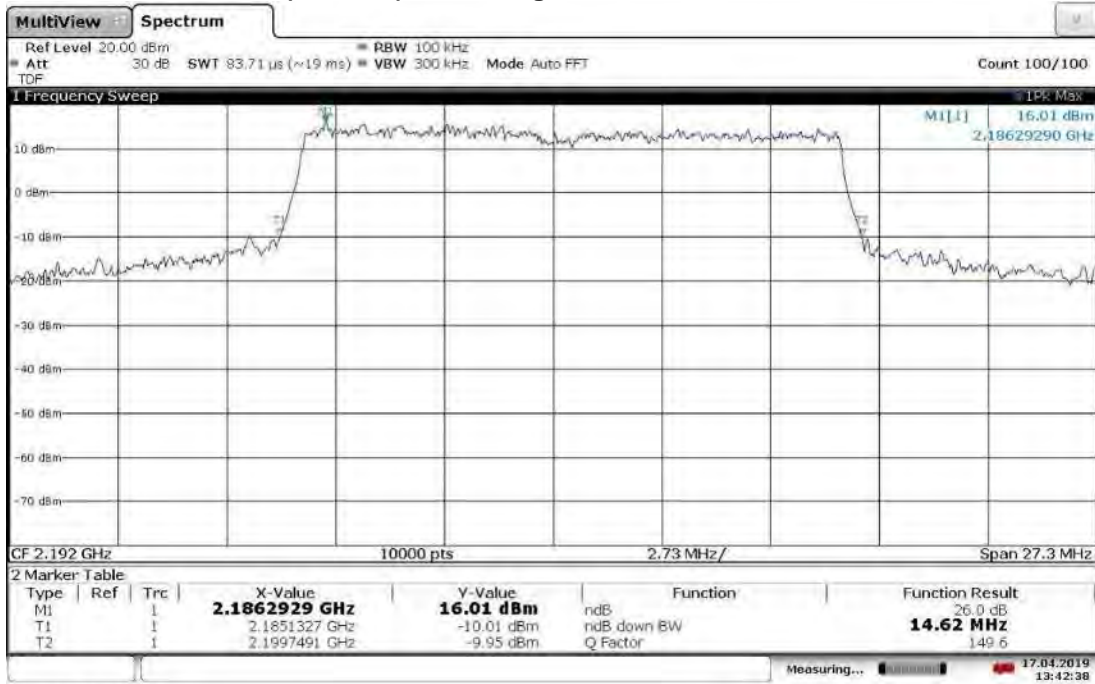
Slot 1 (Band 66), ANT1, Mid Channel 26 dB Bandwidth



11:34:48 17.04.2019

TM3.1-64QAM\_15 MHz Bandwidth

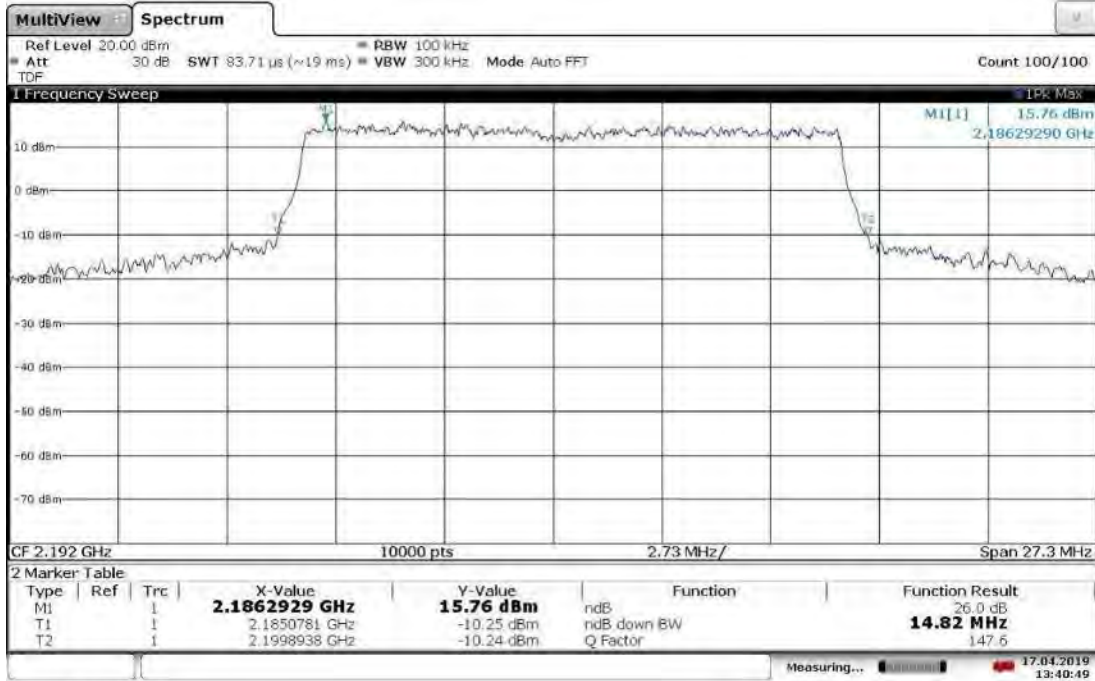
Slot 1 (Band 66), ANT0, High Channel 26 dB Bandwidth



13:42:38 17.04.2019

TM3.1-64QAM\_15 MHz Bandwidth

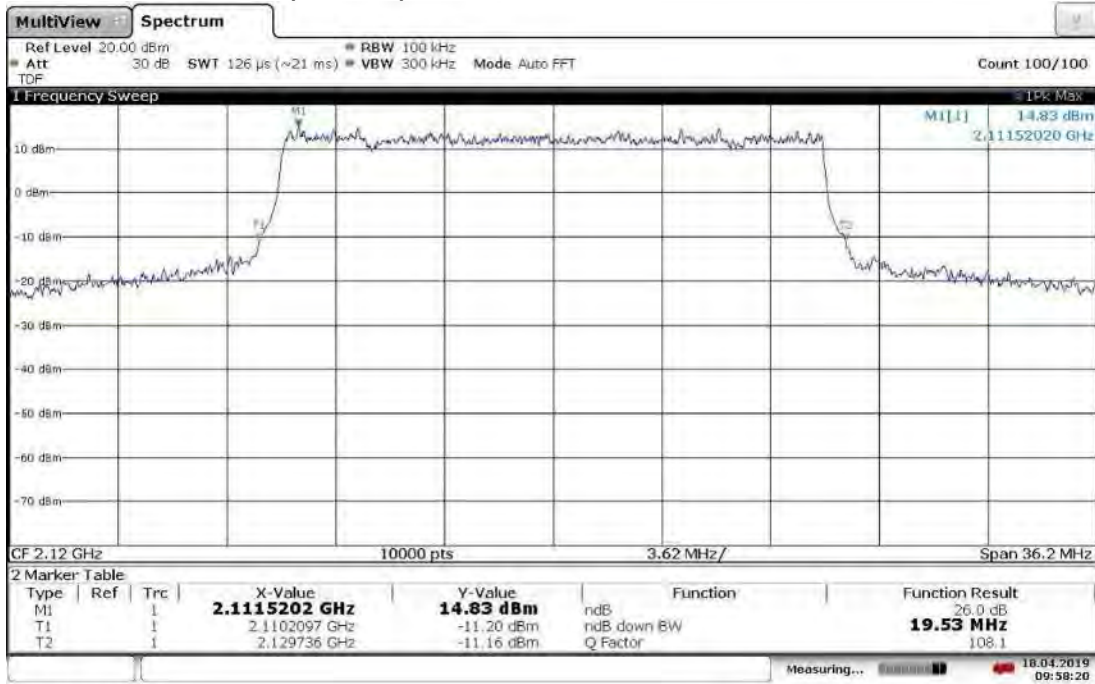
Slot 1 (Band 66), ANT1, High Channel 26 dB Bandwidth



13:40:50 17.04.2019

TM3.1-64QAM\_20 MHz Bandwidth

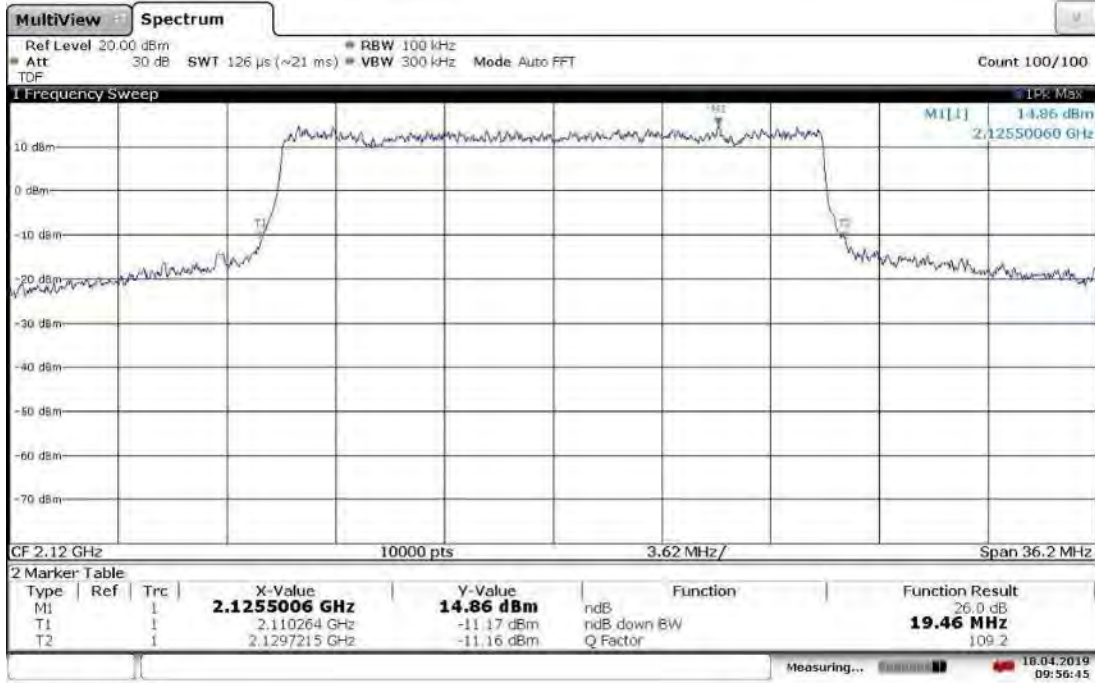
Slot 1 (Band 66), ANT0, Low Channel 26 dB Bandwidth



09:58:20 18.04.2019

TM3.1-64QAM\_20 MHz Bandwidth

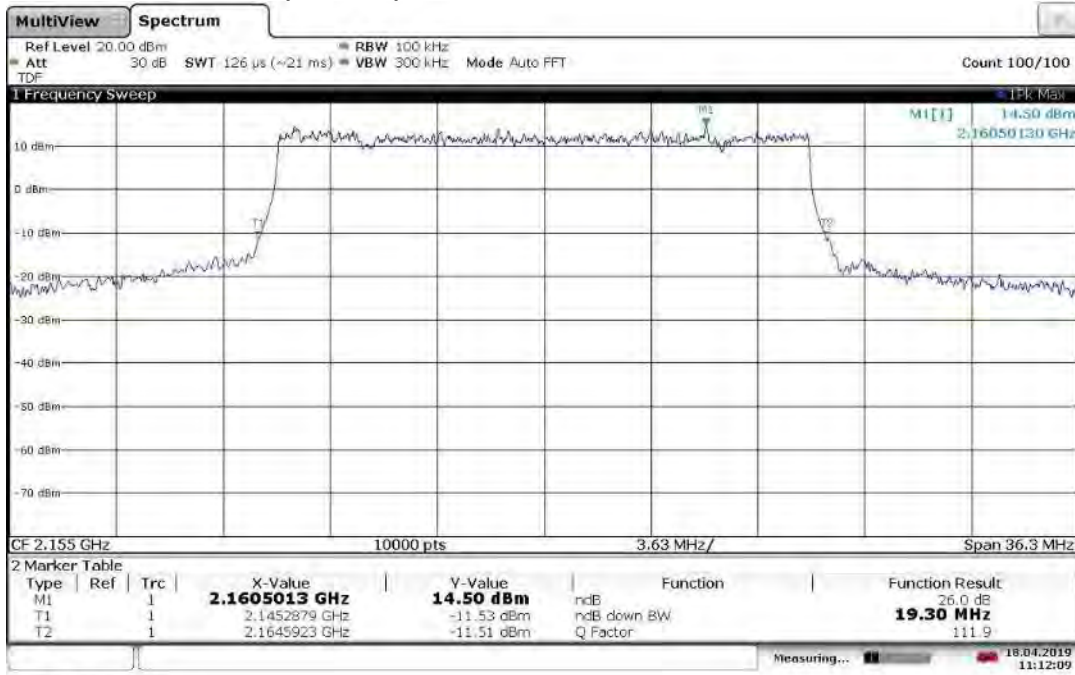
Slot 1 (Band 66), ANT1, Low Channel 26 dB Bandwidth



09:56:45 18.04.2019

TM3.1-64QAM\_20 MHz Bandwidth

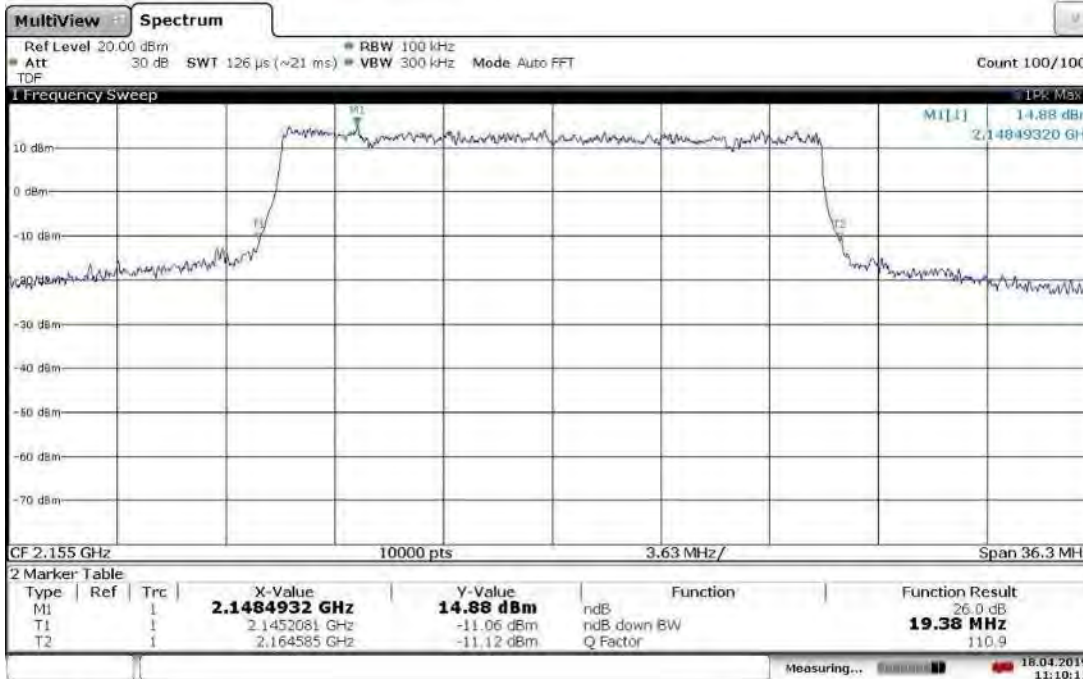
Slot 1 (Band 66), ANT0, Mid Channel 26 dB Bandwidth



11:12:09 18.04.2019

TM3.1-64QAM\_20 MHz Bandwidth

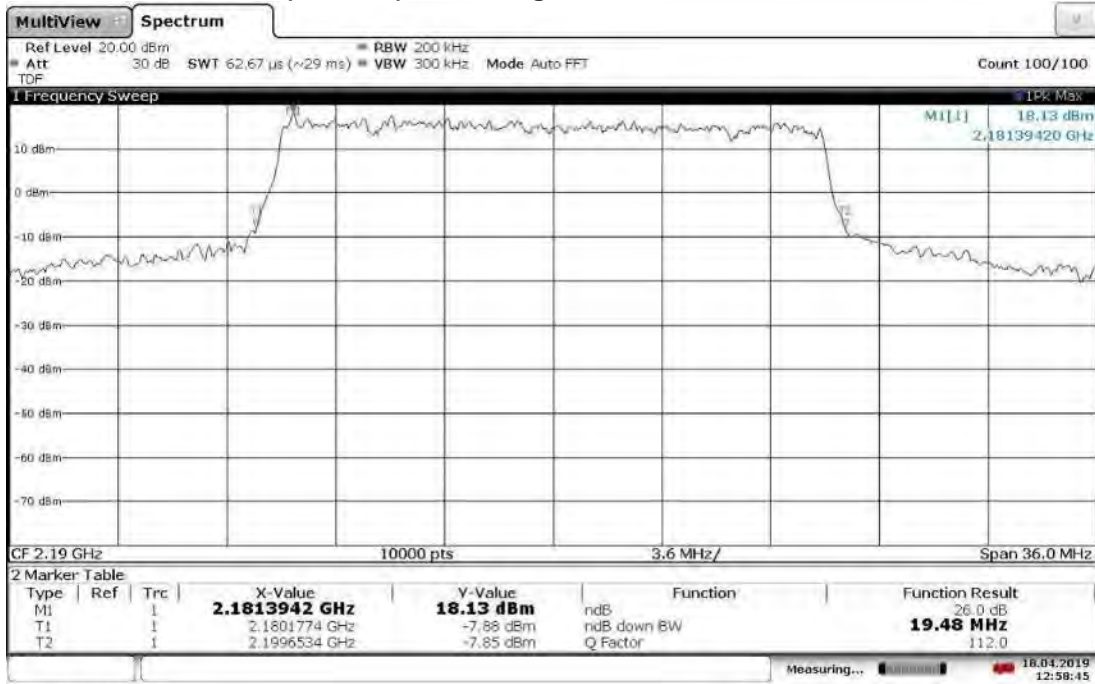
Slot 1 (Band 66), ANT1, Mid Channel 26 dB Bandwidth



11:10:12 18.04.2019

TM3.1-64QAM\_20 MHz Bandwidth

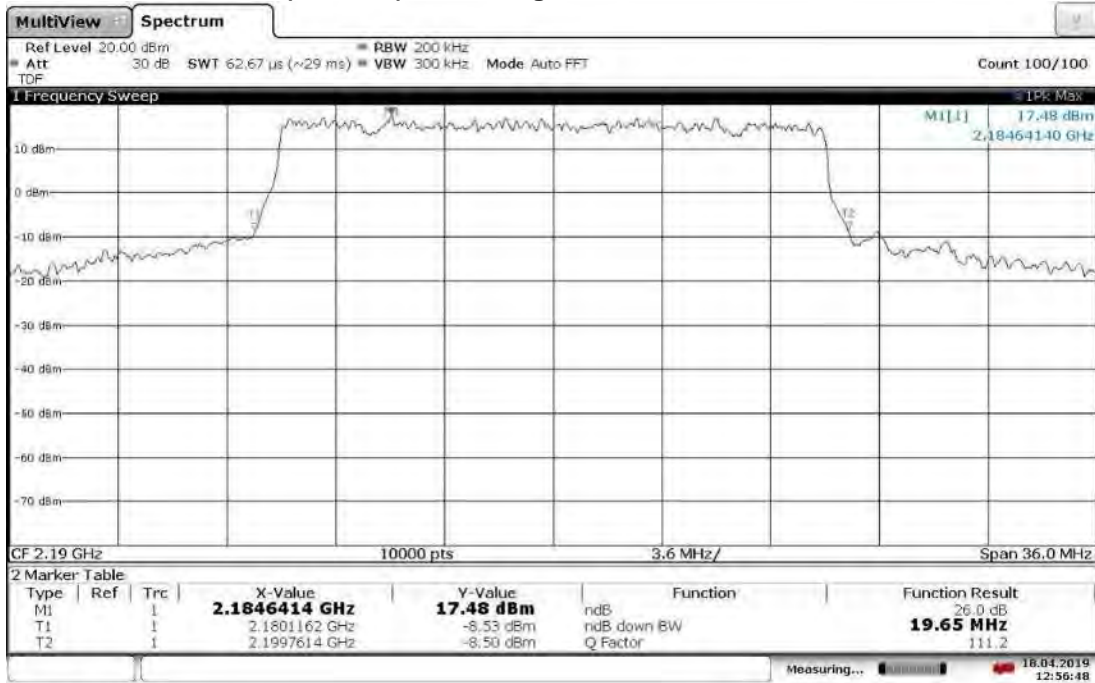
Slot 1 (Band 66), ANT0, High Channel 26 dB Bandwidth



12:58:45 18.04.2019

TM3.1-64QAM\_20 MHz Bandwidth

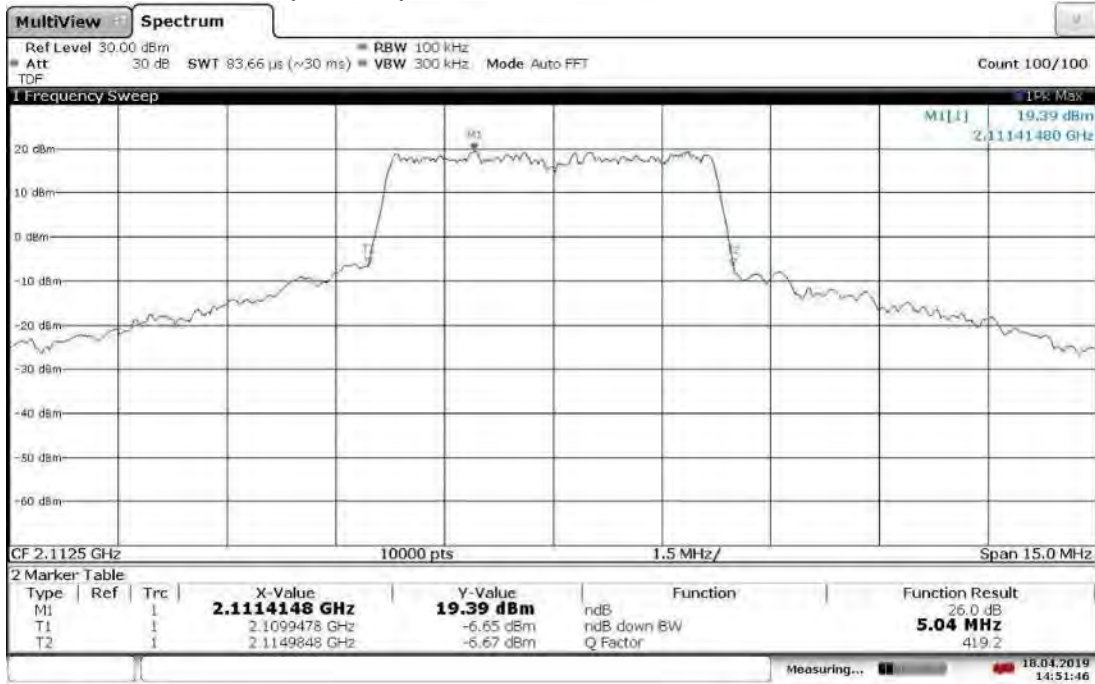
Slot 1 (Band 66), ANT1, High Channel 26 dB Bandwidth



12:56:48 18.04.2019

TM3.1a-256QAM\_5 MHz Bandwidth

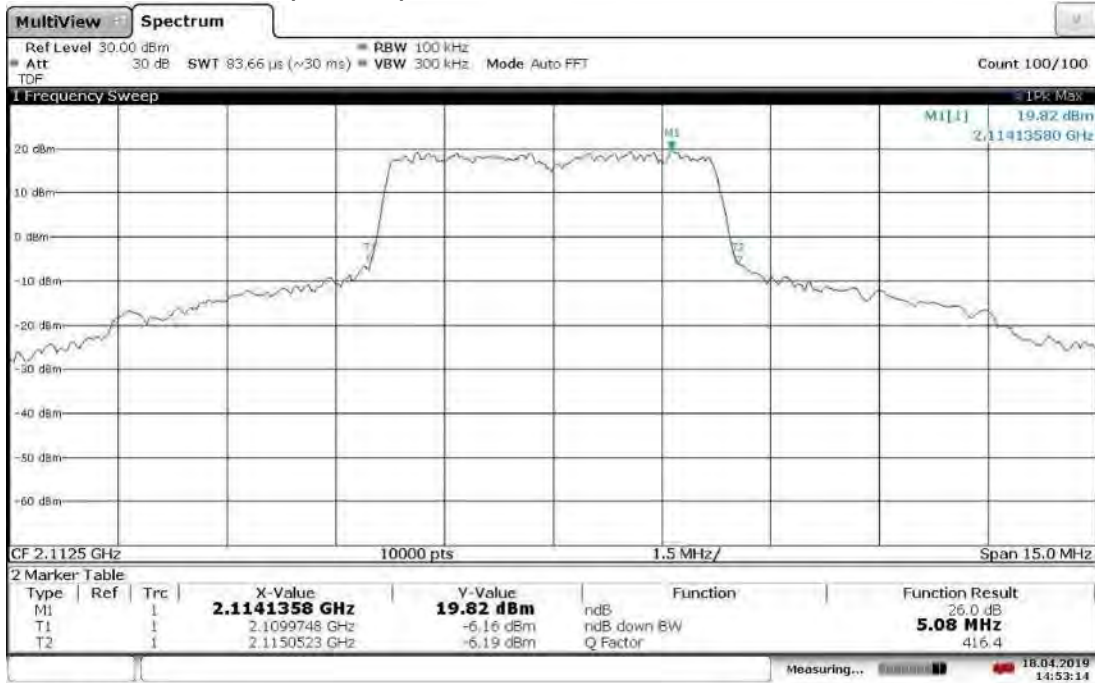
Slot 1 (Band 66), ANT0, Low Channel 26 dB Bandwidth



14:51:46 18.04.2019

TM3.1a-256QAM\_5 MHz Bandwidth

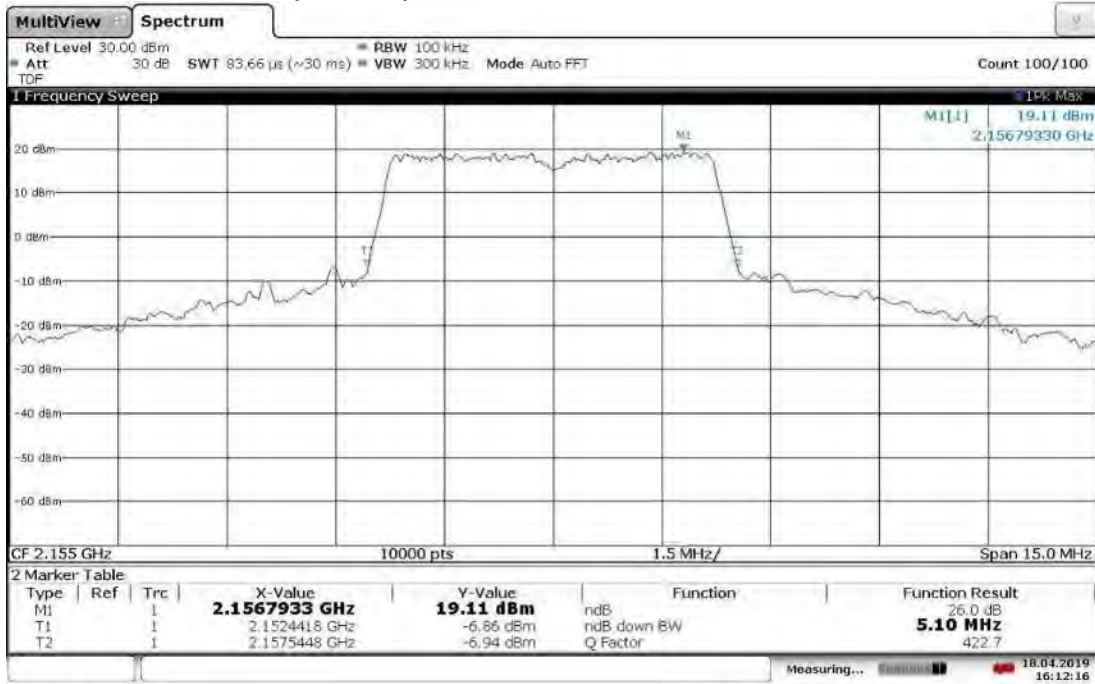
Slot 1 (Band 66), ANT1, Low Channel 26 dB Bandwidth



14:53:14 18.04.2019

TM3.1a-256QAM\_5 MHz Bandwidth

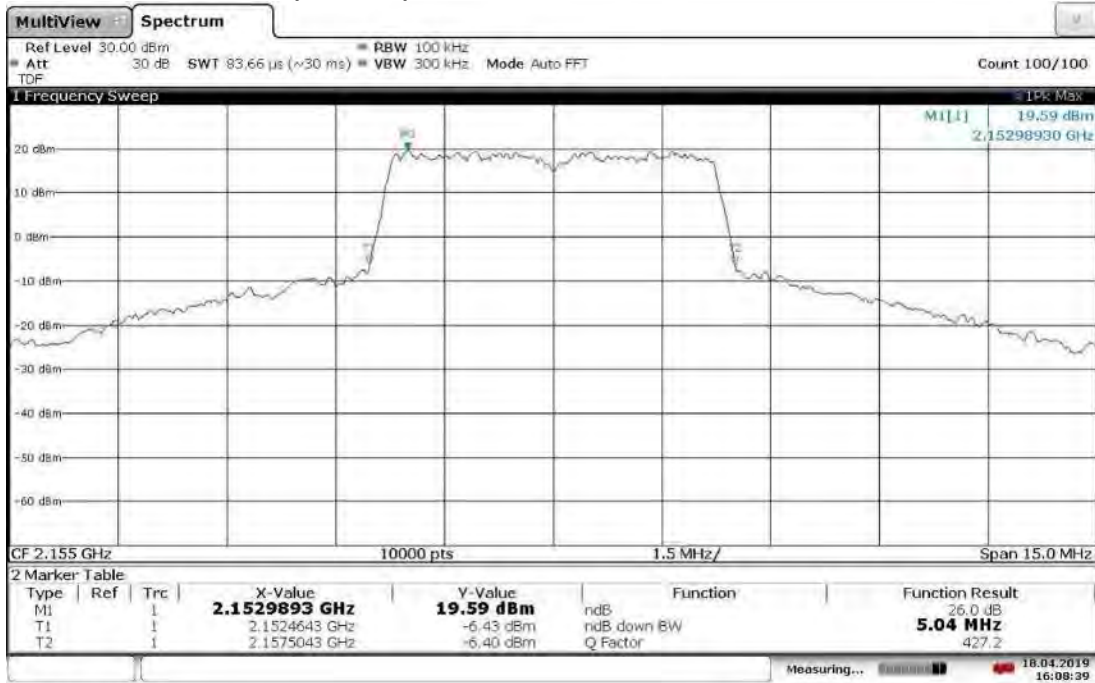
Slot 1 (Band 66), ANT0, Mid Channel 26 dB Bandwidth



16:12:16 18.04.2019

TM3.1a-256QAM\_5 MHz Bandwidth

Slot 1 (Band 66), ANT1, Mid Channel 26 dB Bandwidth

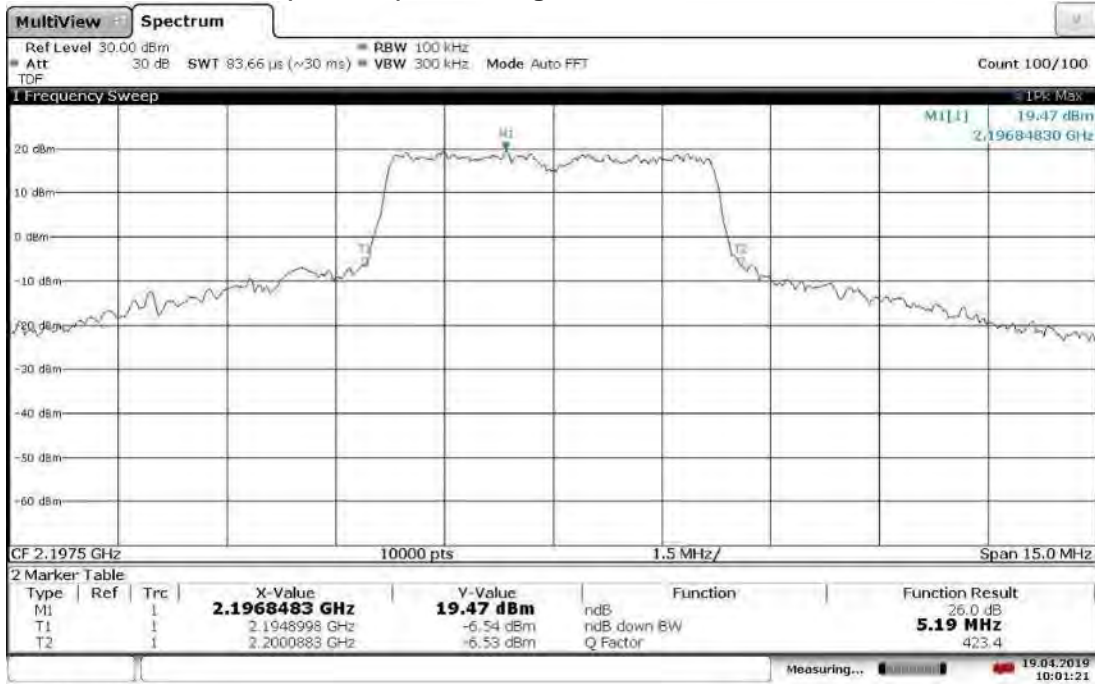


16:08:39 18.04.2019



TM3.1a-256QAM\_5 MHz Bandwidth

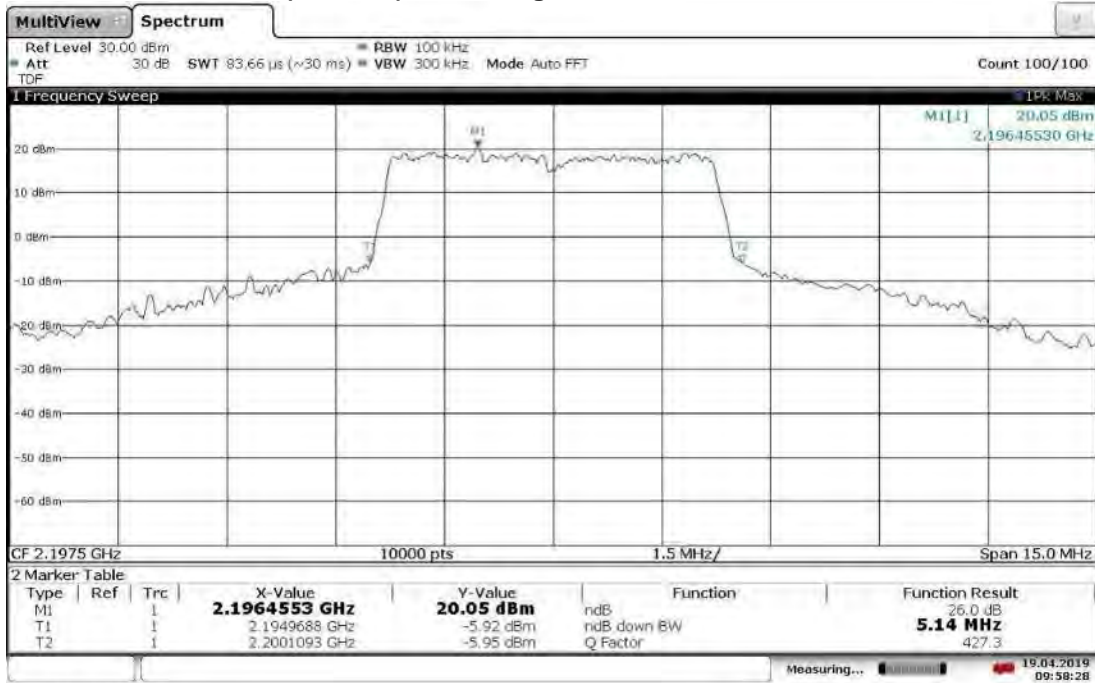
Slot 1 (Band 66), ANT0, High Channel 26 dB Bandwidth



10:01:21 19.04.2019

TM3.1a-256QAM\_5 MHz Bandwidth

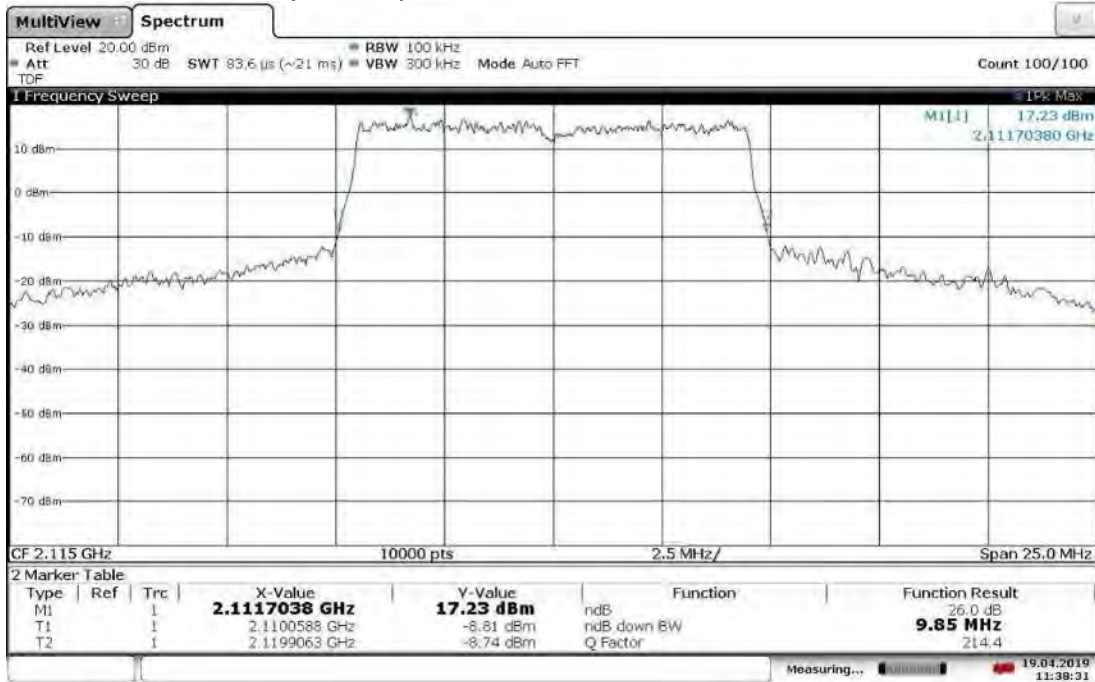
Slot 1 (Band 66), ANT1, High Channel 26 dB Bandwidth



09:58:29 19.04.2019

TM3.1a-256QAM\_10 MHz Bandwidth

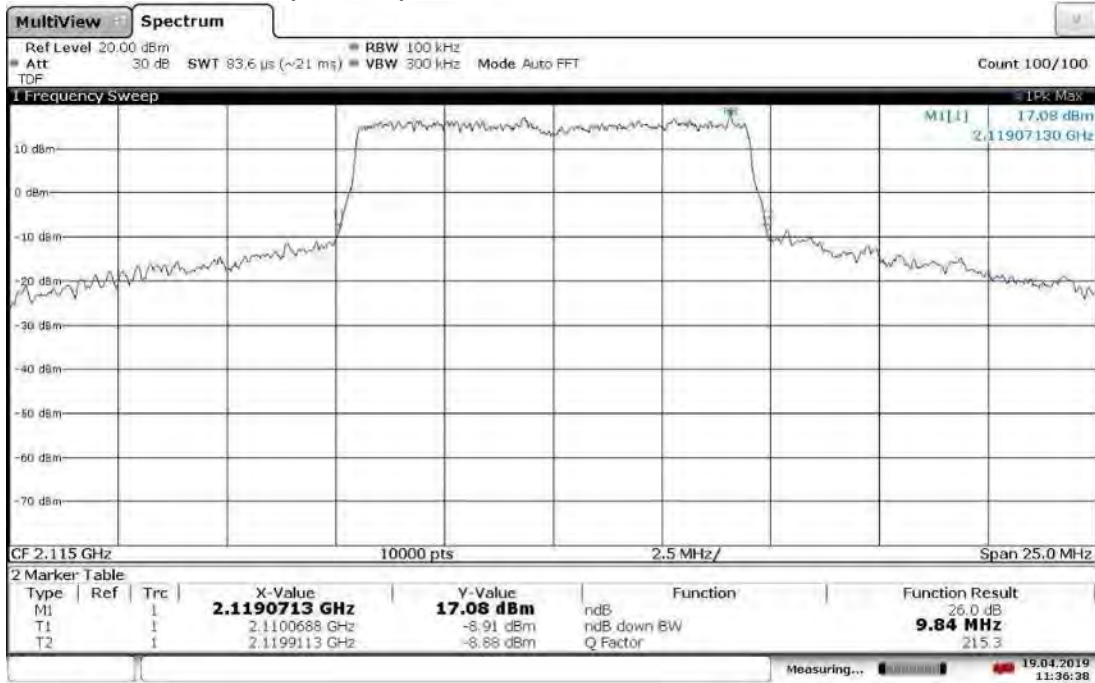
Slot 1 (Band 66), ANT0, Low Channel 26 dB Bandwidth



11:38:32 19.04.2019

TM3.1a-256QAM\_10 MHz Bandwidth

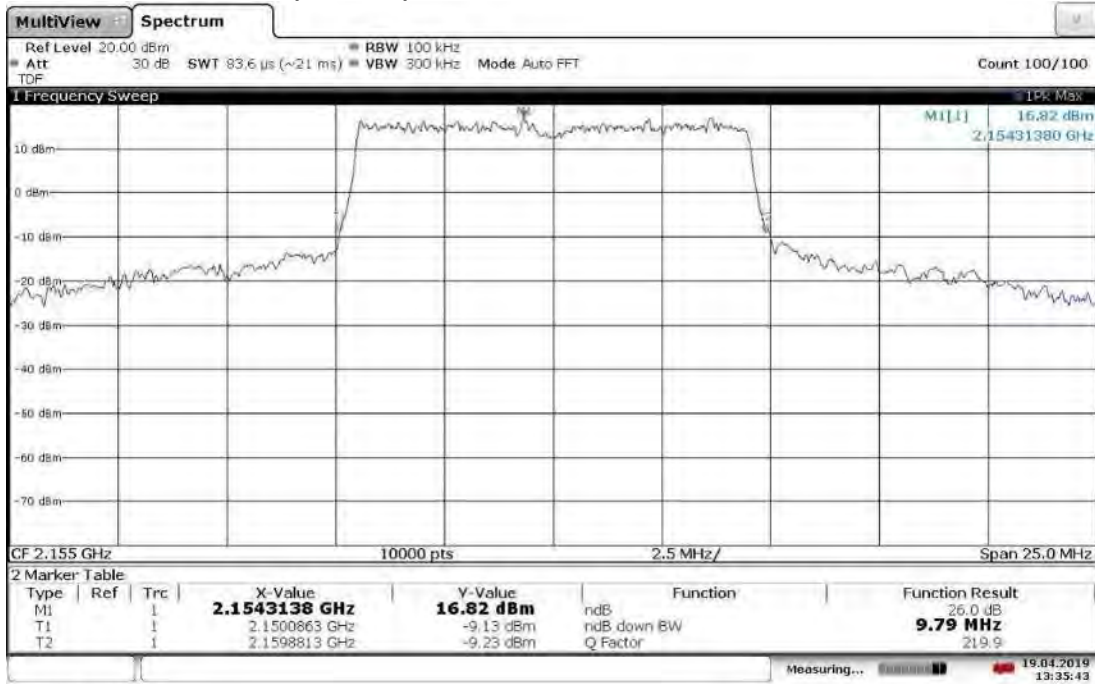
Slot 1 (Band 66), ANT1, Low Channel 26 dB Bandwidth



11:36:39 19.04.2019

TM3.1a-256QAM\_10 MHz Bandwidth

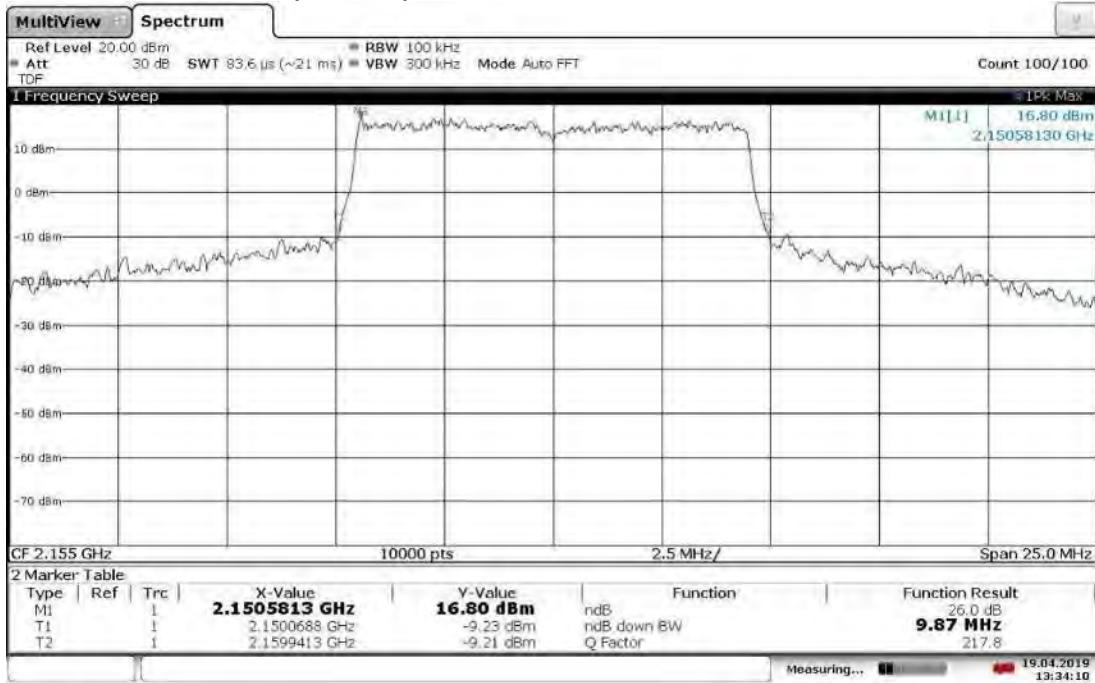
Slot 1 (Band 66), ANT0, Mid Channel 26 dB Bandwidth



13:35:44 19.04.2019

TM3.1a-256QAM\_10 MHz Bandwidth

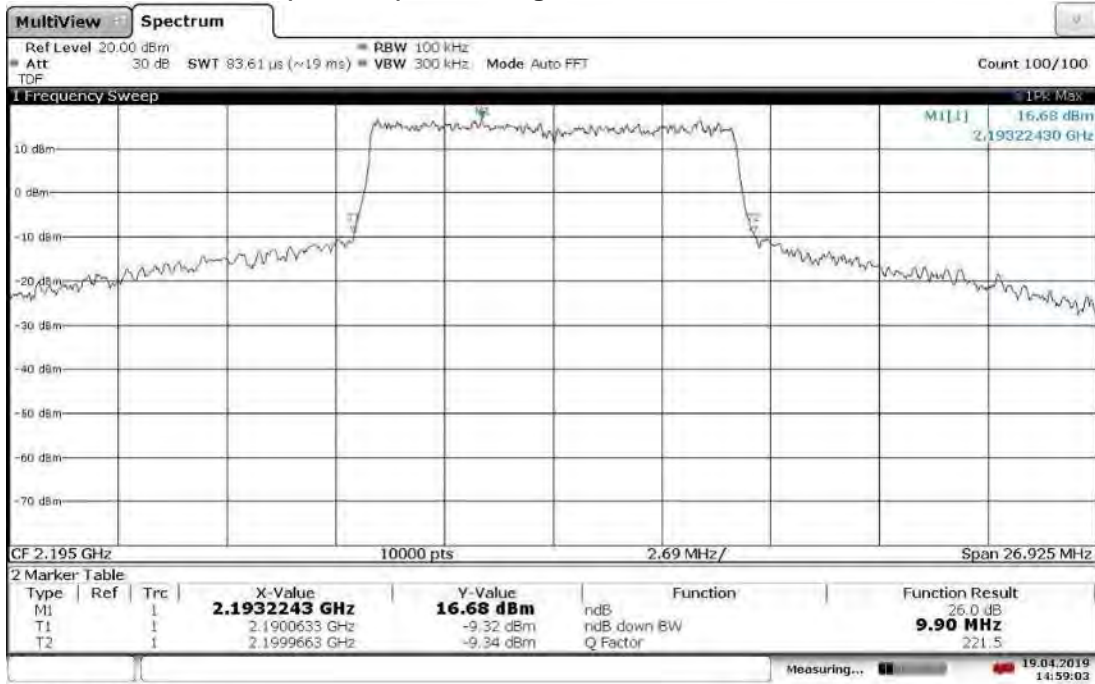
Slot 1 (Band 66), ANT1, Mid Channel 26 dB Bandwidth



13:34:10 19.04.2019

TM3.1a-256QAM\_10 MHz Bandwidth

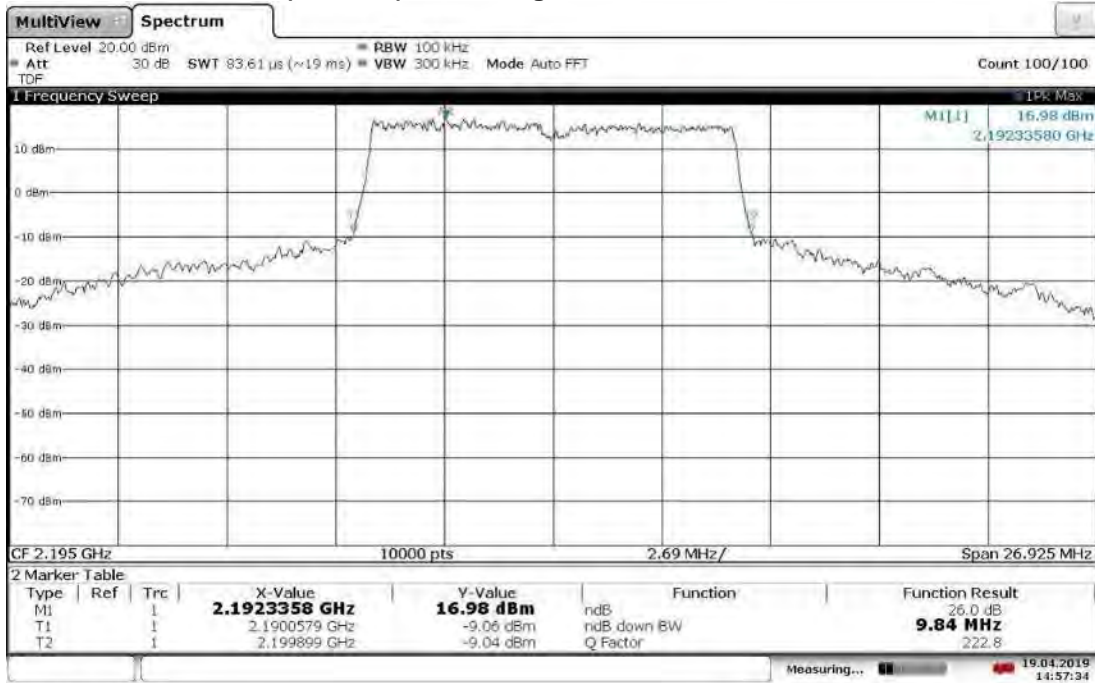
Slot 1 (Band 66), ANT0, High Channel 26 dB Bandwidth



14:59:04 19.04.2019

TM3.1a-256QAM\_10 MHz Bandwidth

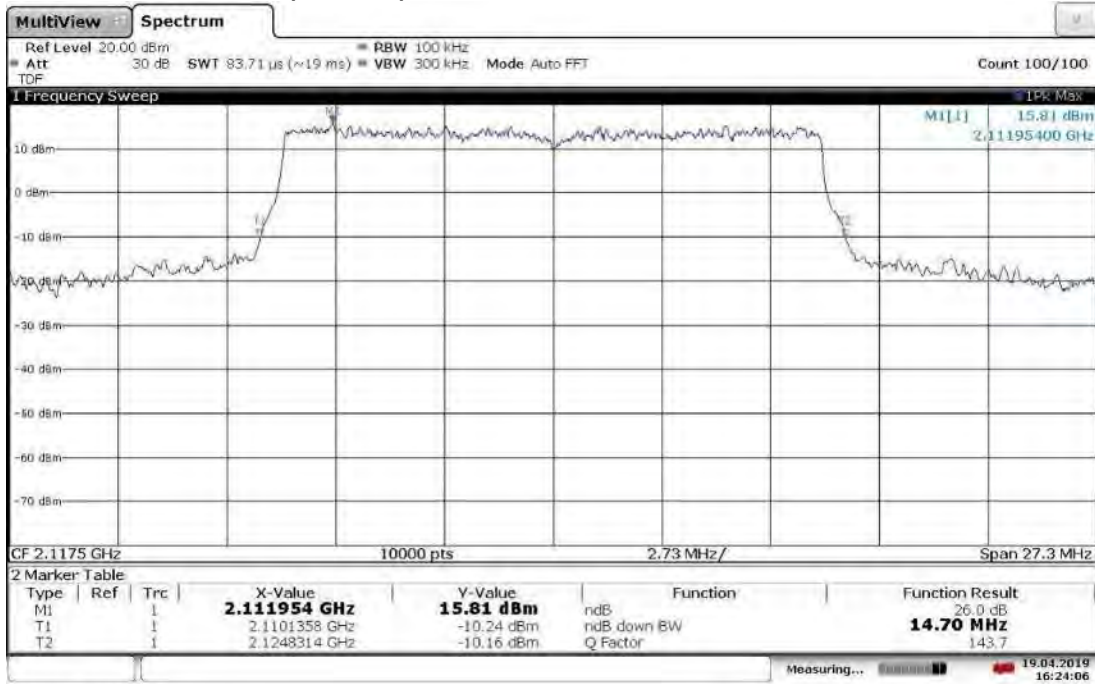
Slot 1 (Band 66), ANT1, High Channel 26 dB Bandwidth



14:57:35 19.04.2019

TM3.1a-256QAM\_15 MHz Bandwidth

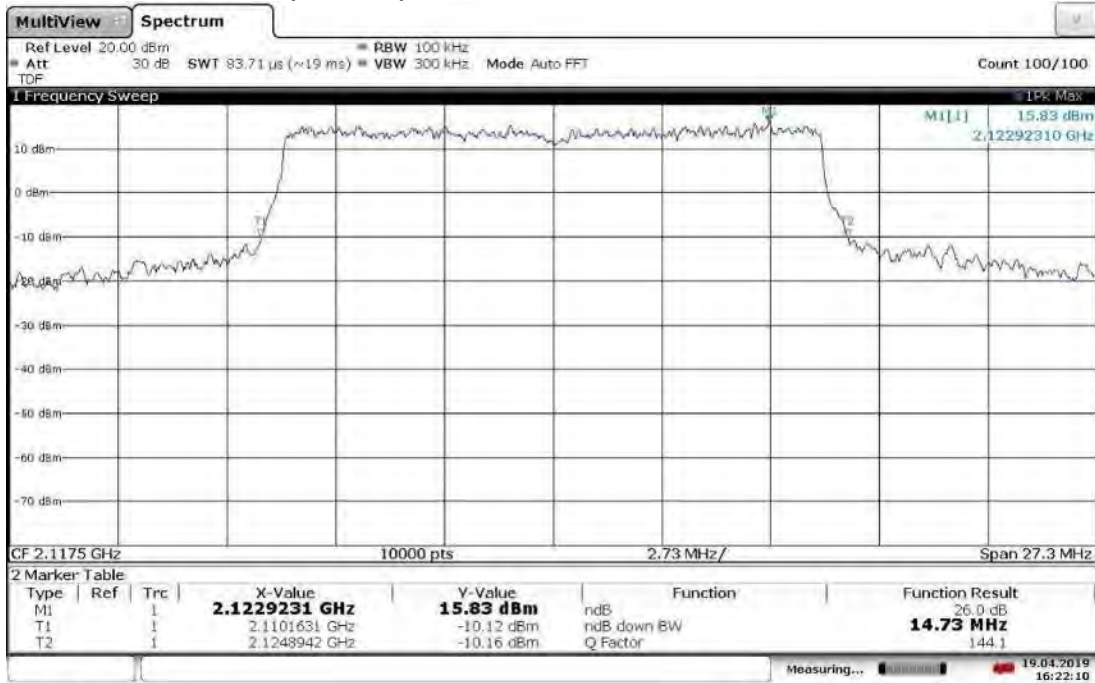
Slot 1 (Band 66), ANT0, Low Channel 26 dB Bandwidth



16:24:07 19.04.2019

TM3.1a-256QAM\_15 MHz Bandwidth

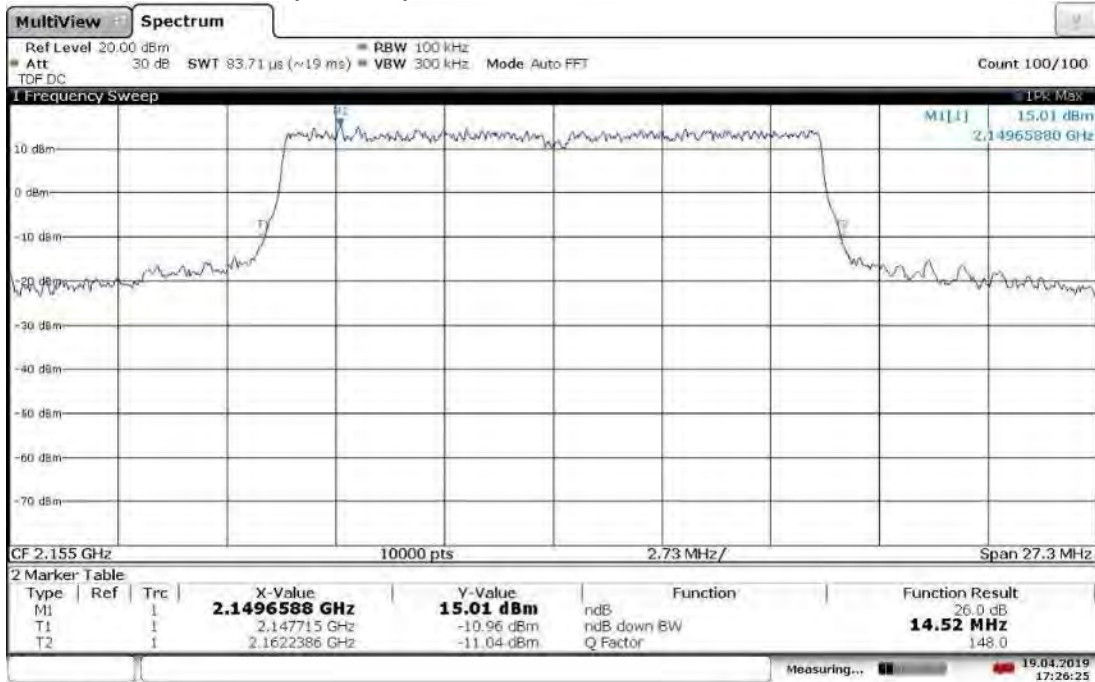
Slot 1 (Band 66), ANT1, Low Channel 26 dB Bandwidth



16:22:11 19.04.2019

TM3.1a-256QAM\_15 MHz Bandwidth

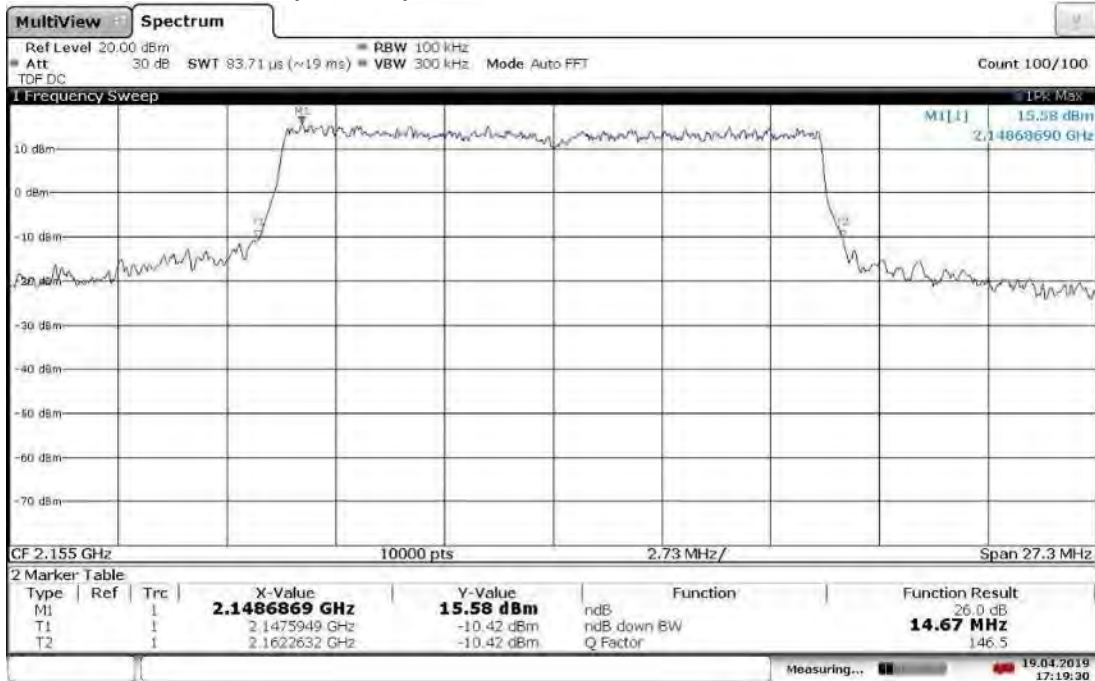
Slot 1 (Band 66), ANT0, Mid Channel 26 dB Bandwidth



17:26:26 19.04.2019

TM3.1a-256QAM\_15 MHz Bandwidth

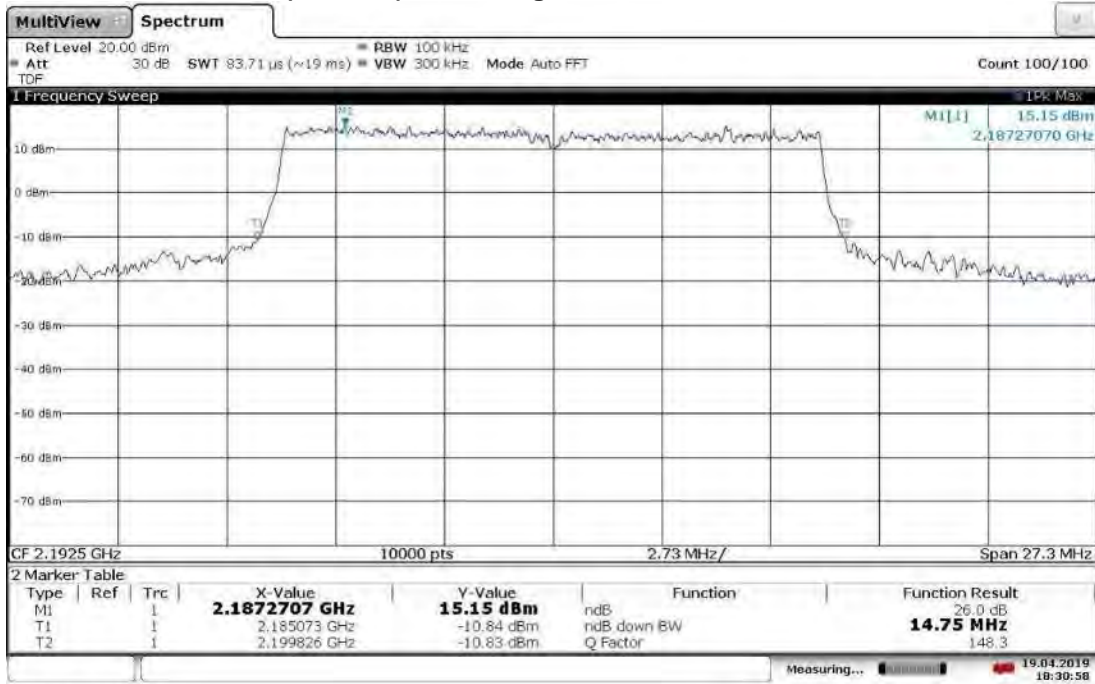
Slot 1 (Band 66), ANT1, Mid Channel 26 dB Bandwidth



17:19:30 19.04.2019

TM3.1a-256QAM\_15 MHz Bandwidth

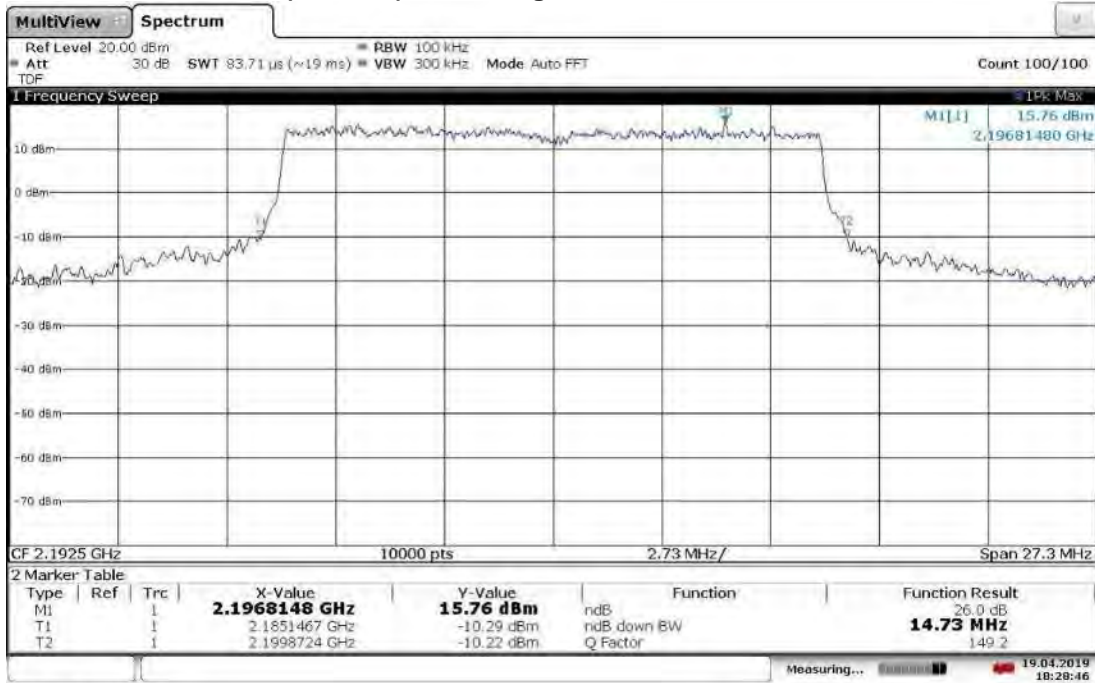
Slot 1 (Band 66), ANT0, High Channel 26 dB Bandwidth



18:30:59 19.04.2019

TM3.1a-256QAM\_15 MHz Bandwidth

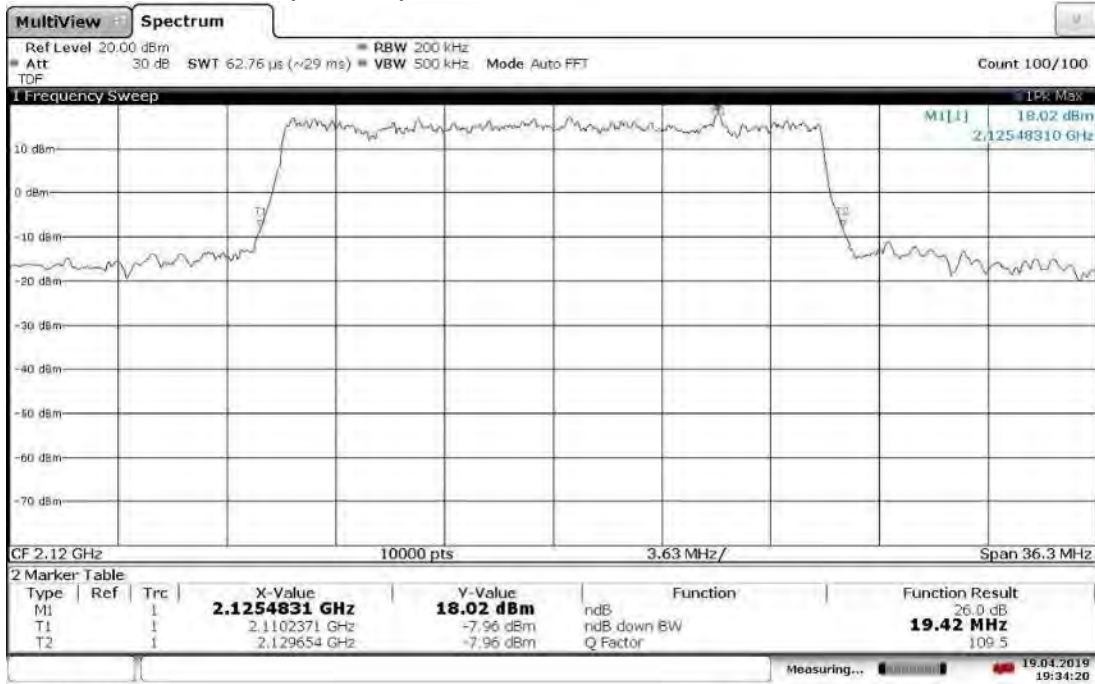
Slot 1 (Band 66), ANT1, High Channel 26 dB Bandwidth



18:28:47 19.04.2019

TM3.1a-256QAM\_20 MHz Bandwidth

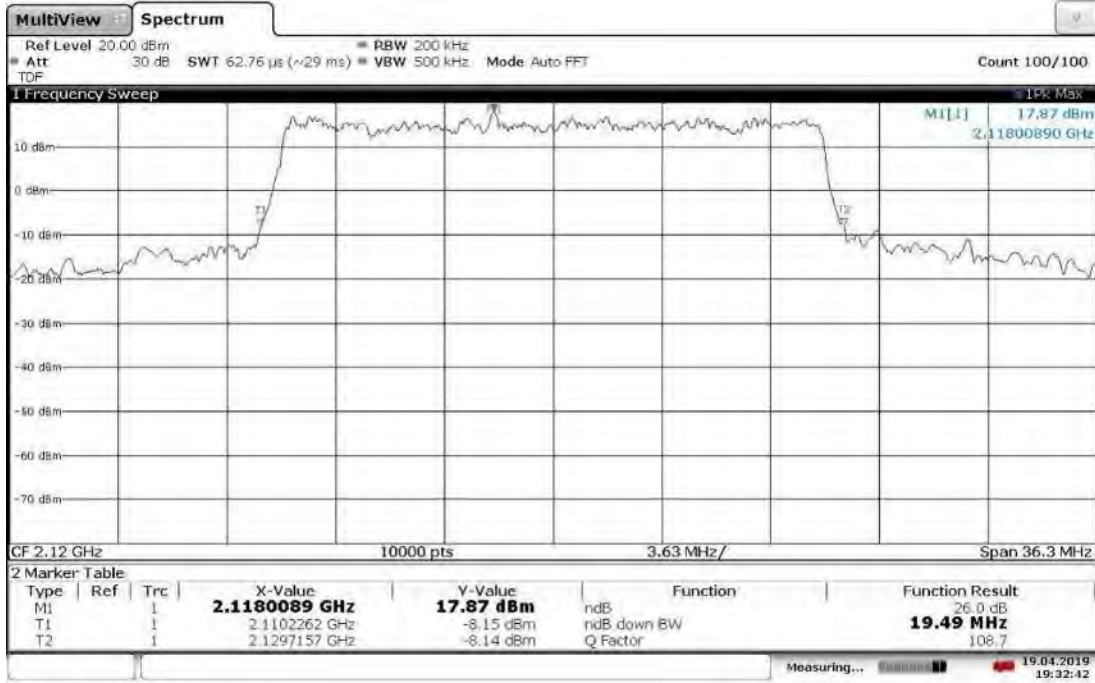
Slot 1 (Band 66), ANT0, Low Channel 26 dB Bandwidth



19:34:21 19.04.2019

TM3.1a-256QAM\_20 MHz Bandwidth

Slot 1 (Band 66), ANT1, Low Channel 26 dB Bandwidth

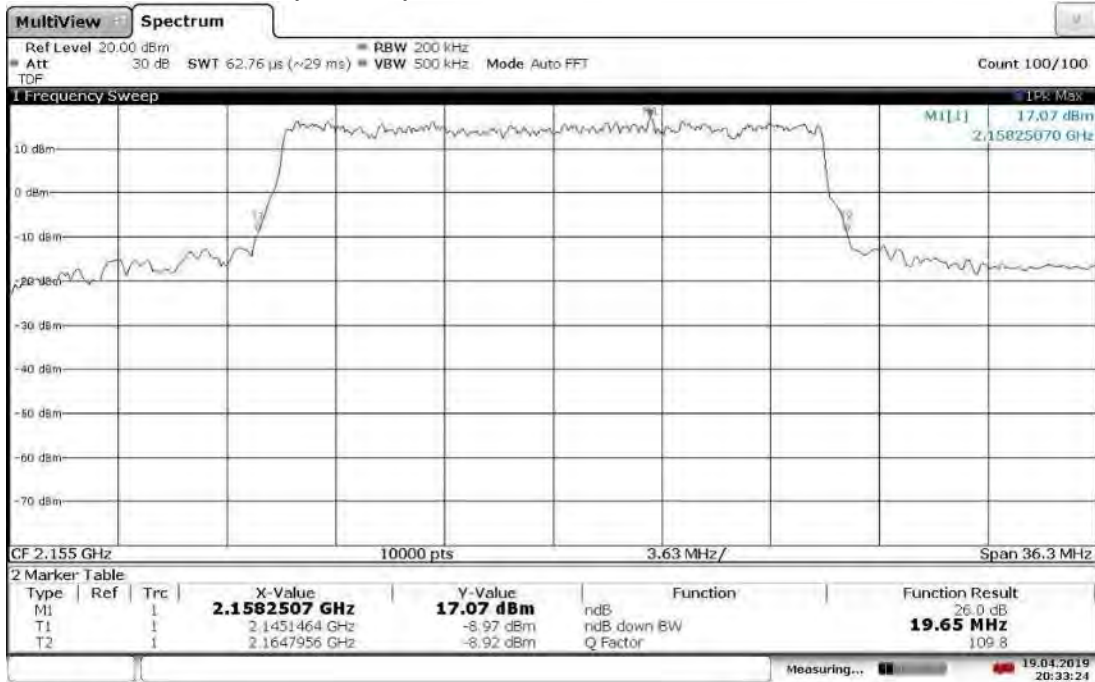


19:32:43 19.04.2019



TM3.1a-256QAM\_20 MHz Bandwidth

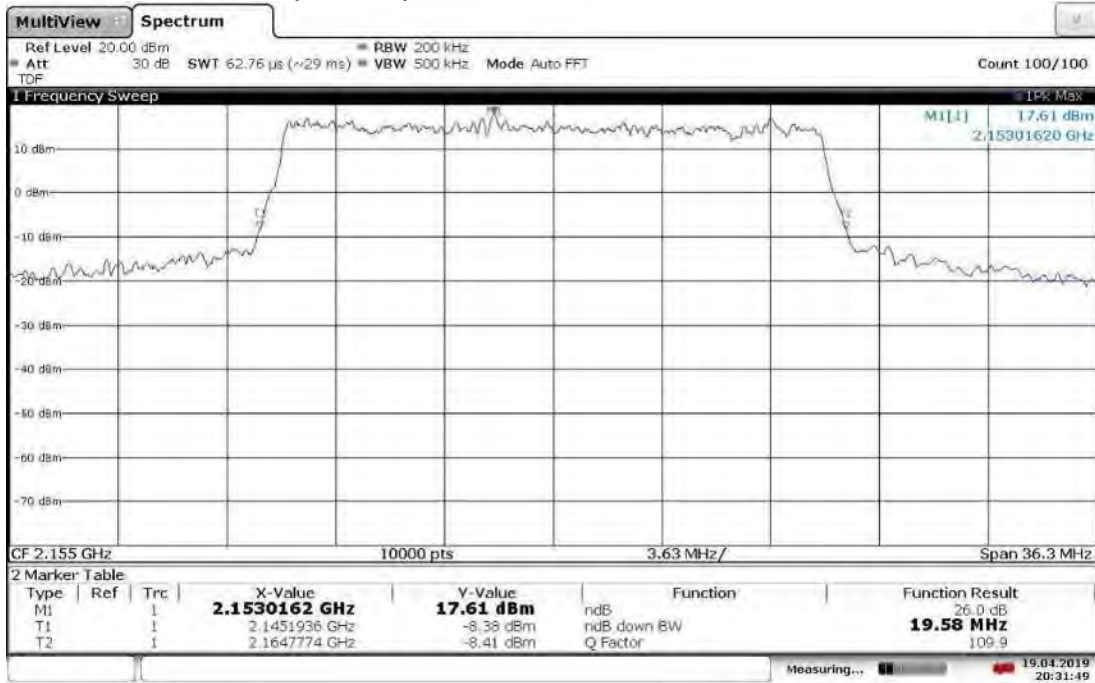
Slot 1 (Band 66), ANT0, Mid Channel 26 dB Bandwidth



20:33:25 19.04.2019

TM3.1a-256QAM\_20 MHz Bandwidth

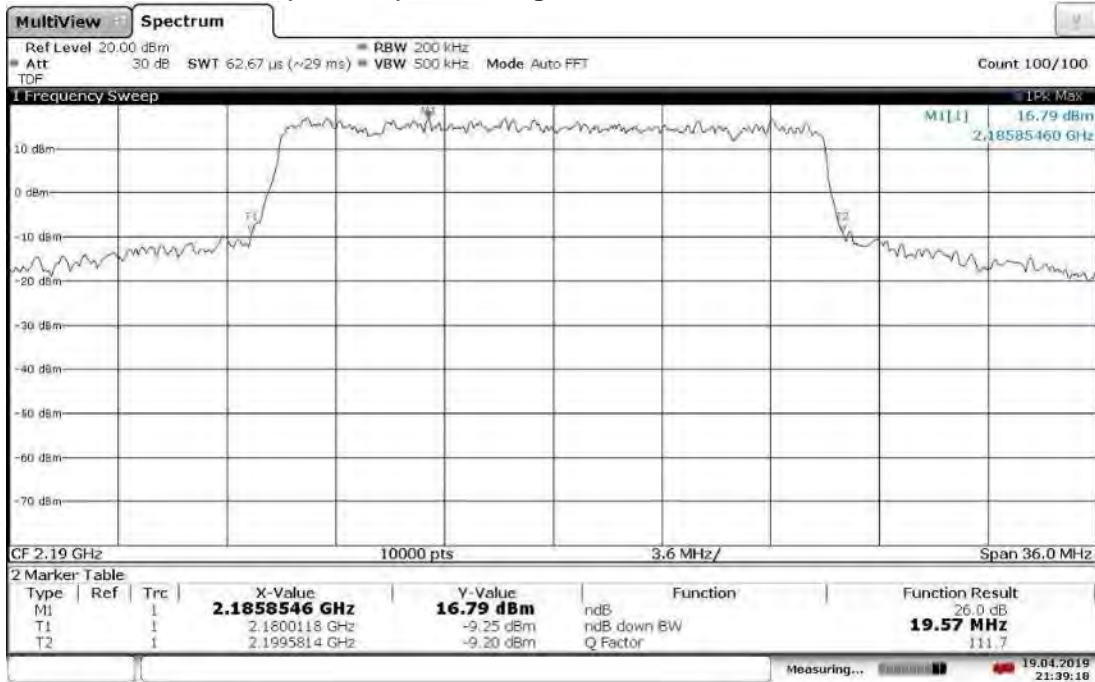
Slot 1 (Band 66), ANT1, Mid Channel 26 dB Bandwidth



20:31:49 19.04.2019

TM3.1a-256QAM\_20 MHz Bandwidth

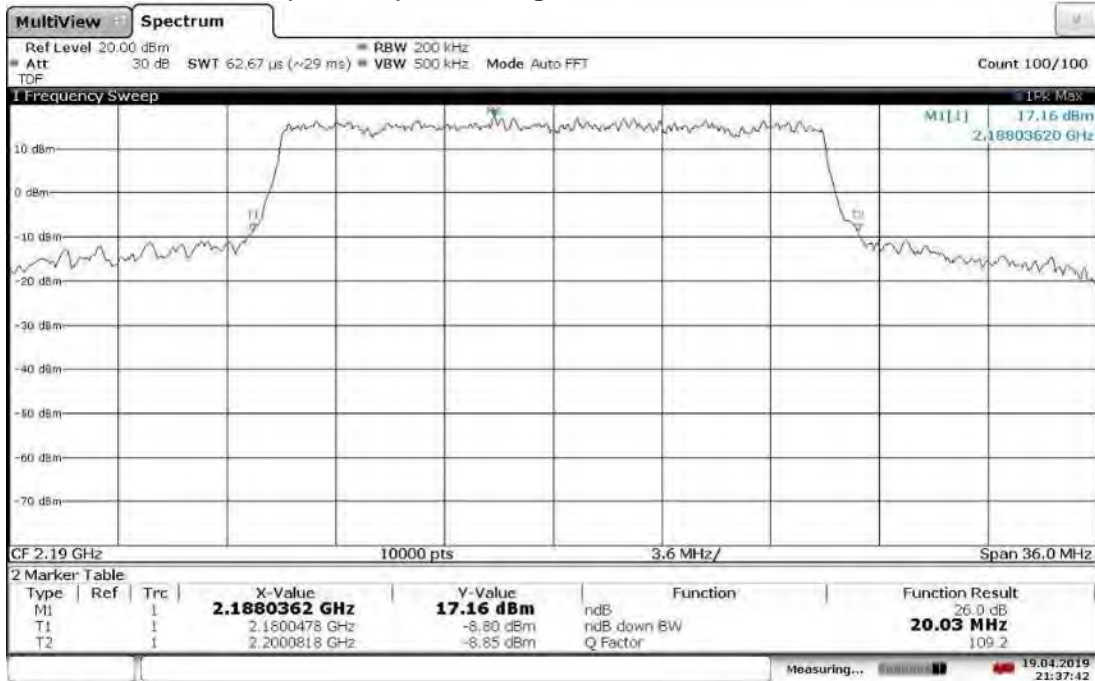
Slot 1 (Band 66), ANT0, High Channel 26 dB Bandwidth



21:39:19 19.04.2019

TM3.1a-256QAM\_20 MHz Bandwidth

Slot 1 (Band 66), ANT1, High Channel 26 dB Bandwidth



21:37:43 19.04.2019

Test Personnel: Kouma Sinn *KPS*

Test Date: 04/10/2019, 04/11/2019, 04/12/2019,  
04/15/2019, 04/16/2019, 04/17/2019,  
04/18/2019, 04/19/2019, 04/26/2019,  
04/30/2019, 07/18/2019

Supervising/Reviewing \_\_\_\_\_  
Engineer:  
(Where Applicable) N/A

Product Standard: FCC Part 27  
Input Voltage: 48 VDC (POE)

Limit Applied: See report section 7.3

Ambient Temperature: 22, 23, 23, 23, 23, 22, 22, 22, 20, 22,  
22 °C

Pretest Verification w/  
Ambient Signals or  
BB Source: N/A

Relative Humidity: 21, 15, 26, 47, 20, 22, 23, 47, 42, 35,  
64 %

Atmospheric Pressure: 1004, 1013, 1004, 980, 1001, 1011,  
1014, 1000, 996, 1017, 1007 mbars

## 9 Band Edge Compliance

### 9.1 Method

Tests are performed in accordance with ANSI C63.26 and CFR47 FCC Parts 2.1051, 2.1053, and 27.

**TEST SITE:** EMC Lab & 10m ALSE

**The EMC Lab** has one Semi-anechoic Chamber and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

### 9.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
CEN001'	DC-40GHz attenuator 20dB	Centric RF	C411-20	CEN001	02/01/2019	02/01/2020
CBLHF2012-2M-1'	2m 9kHz-40GHz Coaxial Cable - SET1	Huber & Suhner	SF102	252675001	02/01/2019	02/01/2020
ROS005-1'	Signal and Spectrum Analyzer	Rohde & Schwarz	FSW43	100646	10/15/2018	10/15/2019
DS40'	Temp, humidity, pressure gauge	Digi Sense	68000-49	181717625	11/06/2018	11/06/2019

#### Software Utilized:

Name	Manufacturer	Version
None	--	--

### 9.3 Results:

The sample tested was found to Comply.

§ 27.53(h): The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

# Intertek

Report Number: 103866582BOX-010b

Issued: 07/19/2019

### Slot 1 (Band 66), Bandwidth: 5 MHz, Modulation: TM1.1-QPSK

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	2112.50	ANT0	-14.72
		ANT1	-15.19
High	2197.50	ANT0	-15.17
		ANT1	-15.13

### Slot 1 (Band 66), Bandwidth: 10 MHz, Modulation: TM1.1-QPSK

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	2115.00	ANT0	-16.37
		ANT1	-15.33
High	2195.00	ANT0	-13.22
		ANT1	-13.96

### Slot 1 (Band 66), Bandwidth: 15 MHz, Modulation: TM1.1-QPSK

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	2117.50	ANT0	-16.85
		ANT1	-15.59
High	2192.50	ANT0	-15.60
		ANT1	-15.02

### Slot 1 (Band 66), Bandwidth: 20 MHz, Modulation: TM1.1-QPSK

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	2120.00	ANT0	-19.28
		ANT1	-17.74
High	2190.00	ANT0	-25.75
		ANT1	-16.99

### Slot 1 (Band 66), Bandwidth: 5 MHz, Modulation: TM3.2-16QAM

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	2112.50	ANT0	-15.33
		ANT1	-14.63
High	2197.50	ANT0	-15.50
		ANT1	-15.46

### Slot 1 (Band 66), Bandwidth: 10 MHz, Modulation: TM3.2-16QAM

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	2115.00	ANT0	-14.62
		ANT1	-14.79
High	2195.00	ANT0	-13.37
		ANT1	-13.78

### Slot 1 (Band 66), Bandwidth: 15 MHz, Modulation: TM3.2-16QAM

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	2117.50	ANT0	-16.62
		ANT1	-16.17
High	2192.00	ANT0	-13.89
		ANT1	-13.86

### Slot 1 (Band 66), Bandwidth: 20 MHz, Modulation: TM3.2-16QAM

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	2120.00	ANT0	-15.17
		ANT1	-16.38
High	2190.00	ANT0	-15.27
		ANT1	-14.24

# Intertek

Report Number: 103866582BOX-010b

Issued: 07/19/2019

### Slot 1 (Band 66), Bandwidth: 5 MHz, Modulation: TM3.1-64QAM

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	2112.50	ANT0	-14.99
		ANT1	-14.39
High	2197.50	ANT0	-15.28
		ANT1	-15.24

### Slot 1 (Band 66), Bandwidth: 10 MHz, Modulation: TM3.1-64QAM

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	2115.00	ANT0	-15.20
		ANT1	-14.29
High	2195.00	ANT0	-13.31
		ANT1	-13.84

### Slot 1 (Band 66), Bandwidth: 15 MHz, Modulation: TM3.1-64QAM

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	2117.50	ANT0	-16.41
		ANT1	-16.12
High	2192.50	ANT0	-14.71
		ANT1	-14.93

### Slot 1 (Band 66), Bandwidth: 20 MHz, Modulation: TM3.1-64QAM

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	2120.00	ANT0	-19.30
		ANT1	-16.25
High	2190.00	ANT0	-16.64
		ANT1	-15.43

### Slot 1 (Band 66), Bandwidth: 5 MHz, Modulation: TM3.1a-256QAM

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	2112.50	ANT0	-14.73
		ANT1	-14.17
High	2197.50	ANT0	-15.27
		ANT1	-13.91

### Slot 1 (Band 66), Bandwidth: 10 MHz, Modulation: TM3.1a-256QAM

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	2115.00	ANT0	-15.27
		ANT1	-14.37
High	2195.00	ANT0	-13.29
		ANT1	-13.91

### Slot 1 (Band 66), Bandwidth: 15 MHz, Modulation: TM3.1a-256QAM

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	2117.50	ANT0	-17.36
		ANT1	-17.07
High	2192.50	ANT0	-16.36
		ANT1	-15.57

### Slot 1 (Band 66), Bandwidth: 20 MHz, Modulation: TM3.1a-256QAM

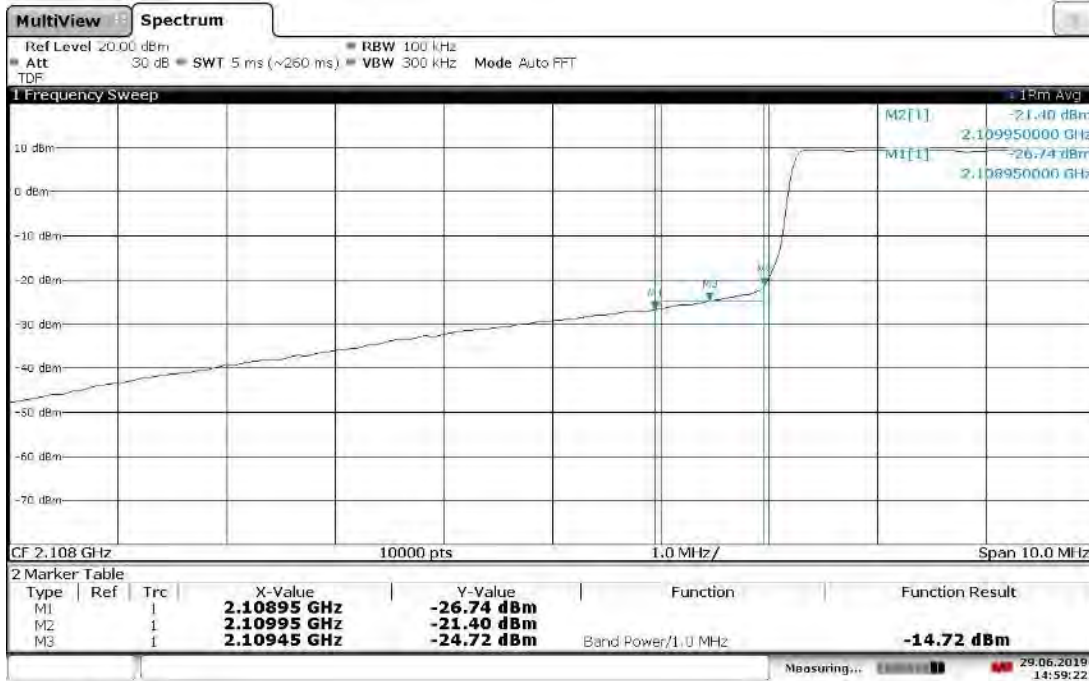
Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	2120.00	ANT0	-18.04
		ANT1	-17.42
High	2190.00	ANT0	-17.38
		ANT1	-16.08

9.4 Setup Photograph:



9.5 Plots/Data:

Band Edge Compliant, Lower Band Edge, 2112.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 5 MHz, Modulation: TM1.1-QPSK



14:59:23 29.06.2019

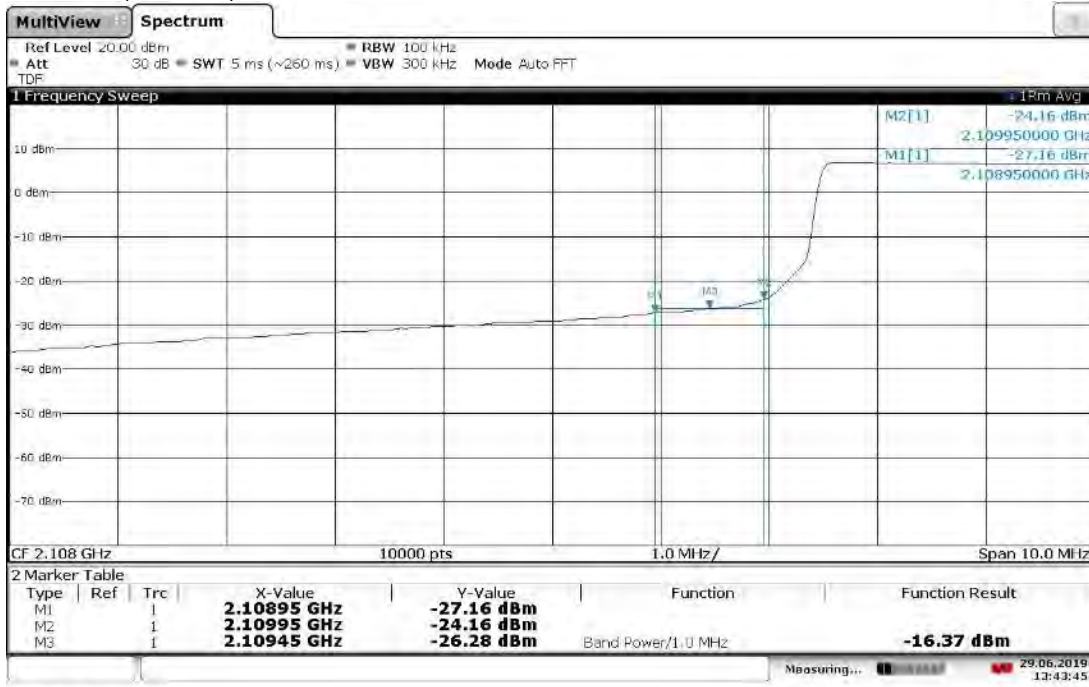
Band Edge Compliant, Upper Band Edge, 2197.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 5 MHz, Modulation: TM1.1-QPSK



15:21:54 29.06.2019



Band Edge Compliant, Lower Band Edge, 215 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 10 MHz, Modulation: TM1.1-QPSK



13:43:45 29.06.2019

Band Edge Compliant, Upper Band Edge, 2195 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 10 MHz, Modulation: TM1.1-QPSK



08:26:11 05.07.2019

Band Edge Compliant, Lower Band Edge, 2117.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 15 MHz, Modulation: TM1.1-QPSK



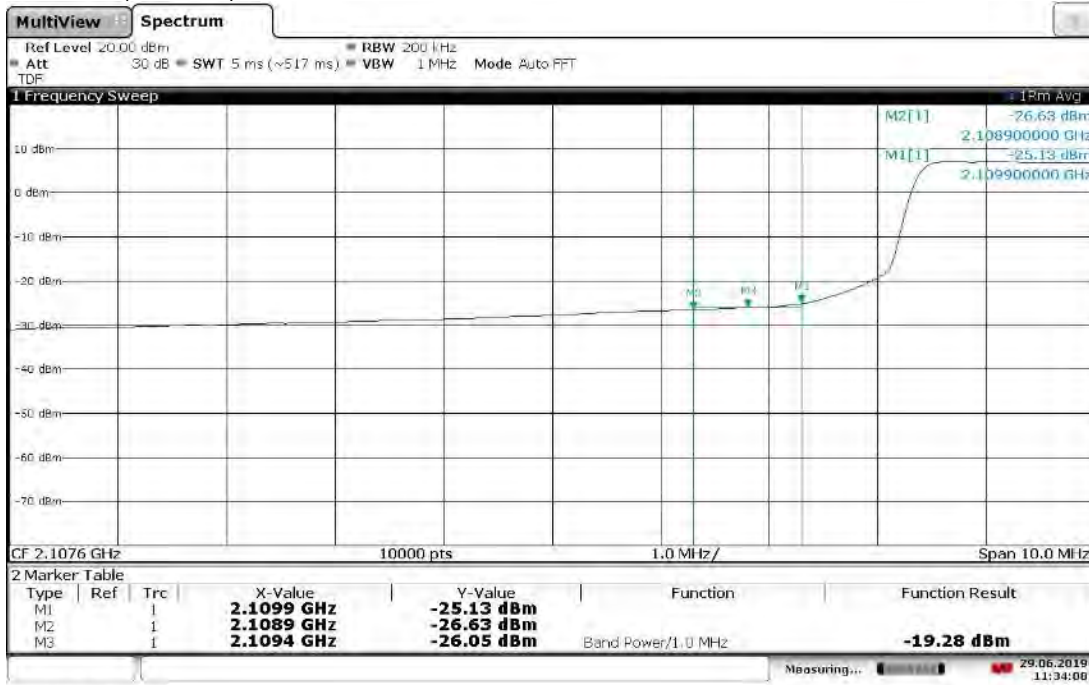
12:55:59 29.06.2019

Band Edge Compliant, Upper Band Edge, 2192.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 15 MHz, Modulation: TM1.1-QPSK



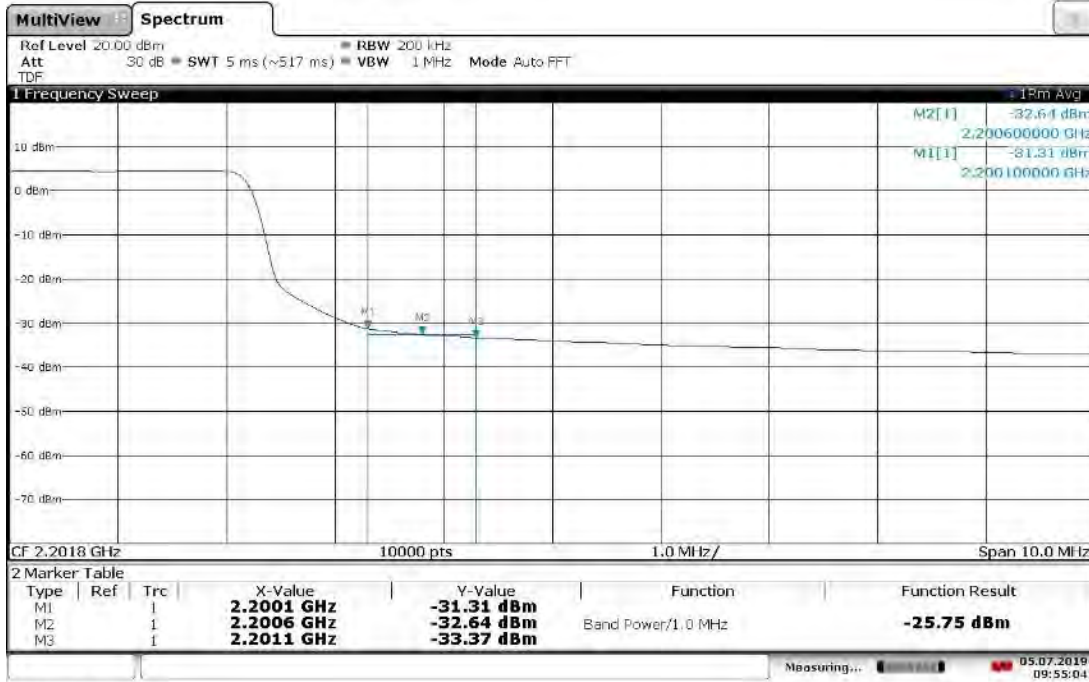
09:06:00 05.07.2019

Band Edge Compliant, Lower Band Edge, 2120 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 20 MHz, Modulation: TM1.1-QPSK



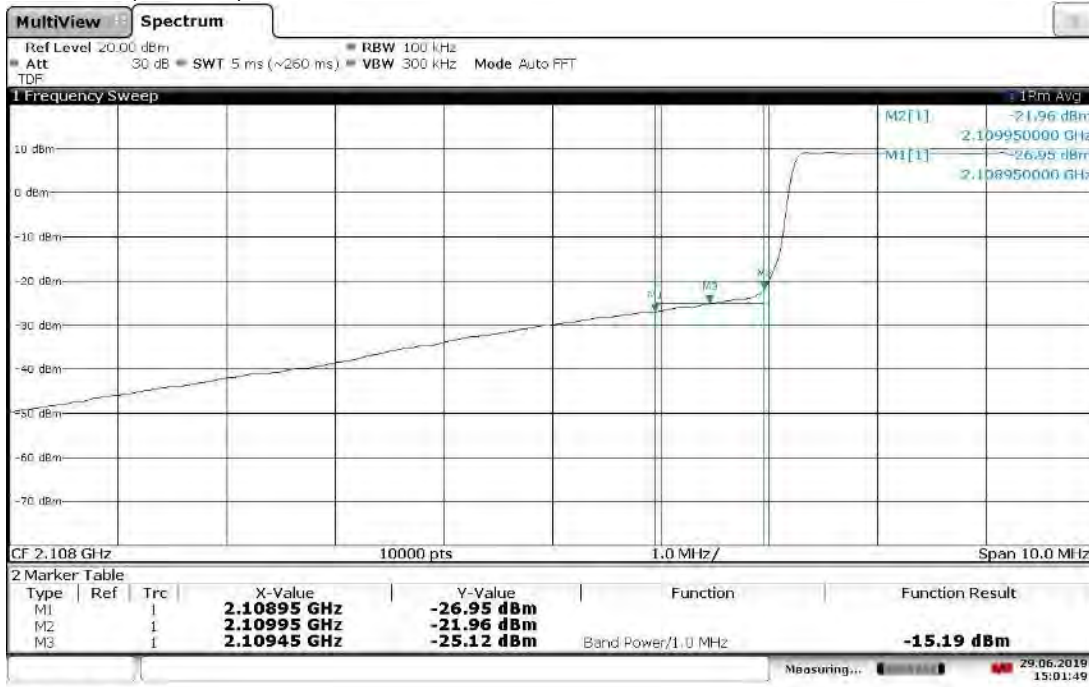
11:34:09 29.06.2019

Band Edge Compliant, Upper Band Edge, 2190 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 20 MHz, Modulation: TM1.1-QPSK



09:55:05 05.07.2019

Band Edge Compliant, Lower Band Edge, 2112.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 5 MHz, Modulation: TM1.1-QPSK



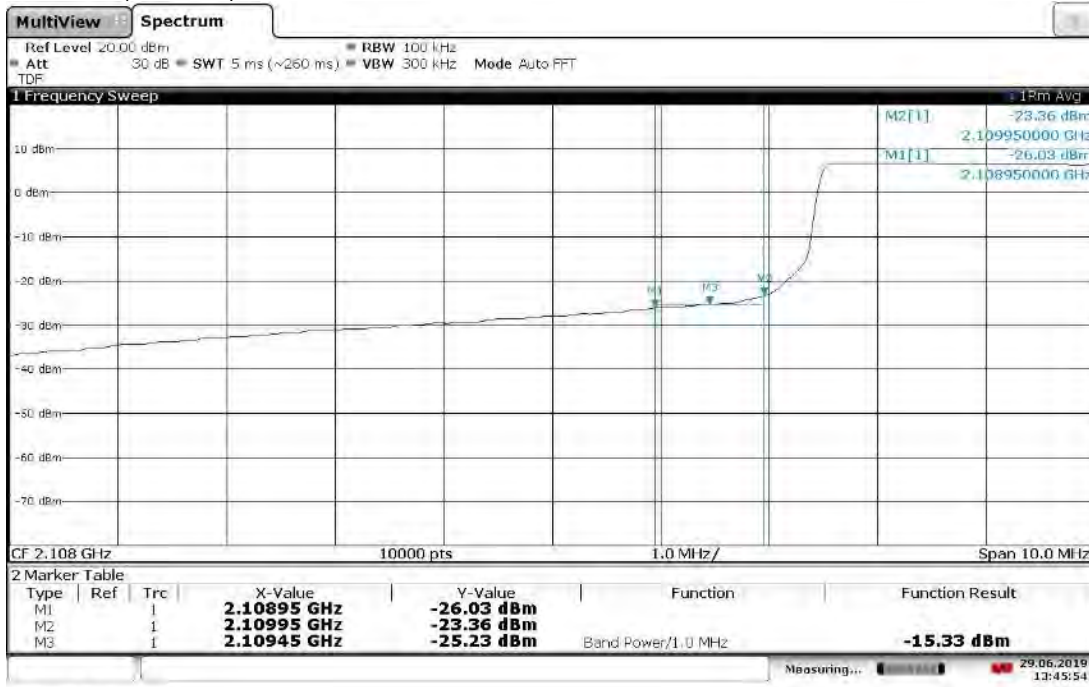
15:01:50 29.06.2019

Band Edge Compliant, Upper Band Edge, 2197.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 5 MHz, Modulation: TM1.1-QPSK



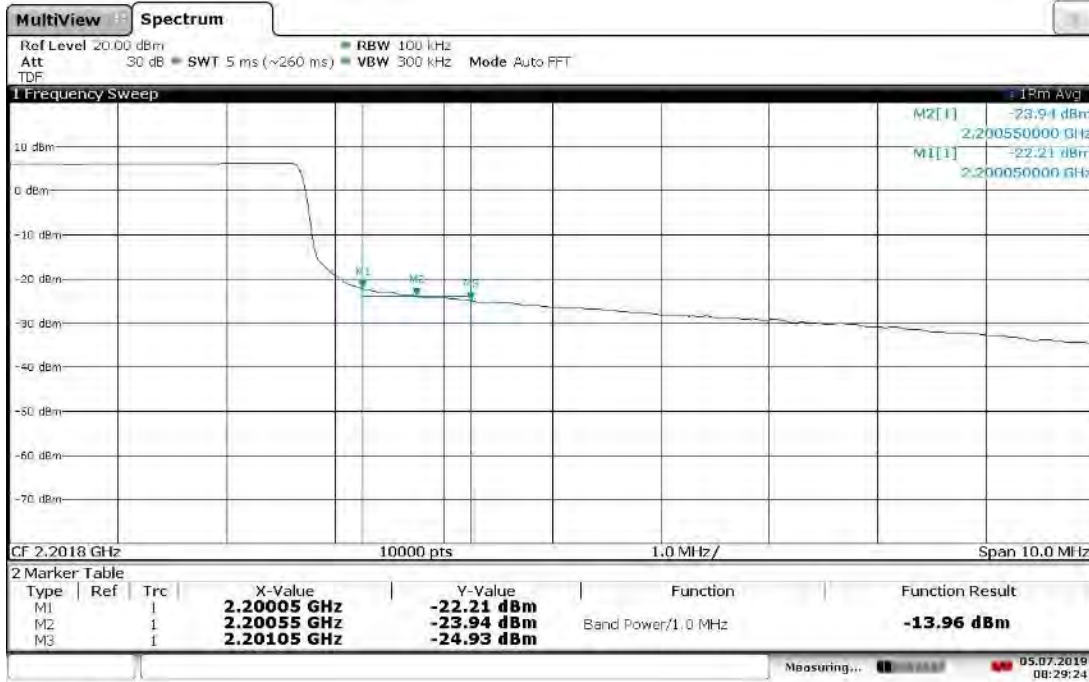
15:24:35 29.06.2019

Band Edge Compliant, Lower Band Edge, 2115 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 10 MHz, Modulation: TM1.1-QPSK



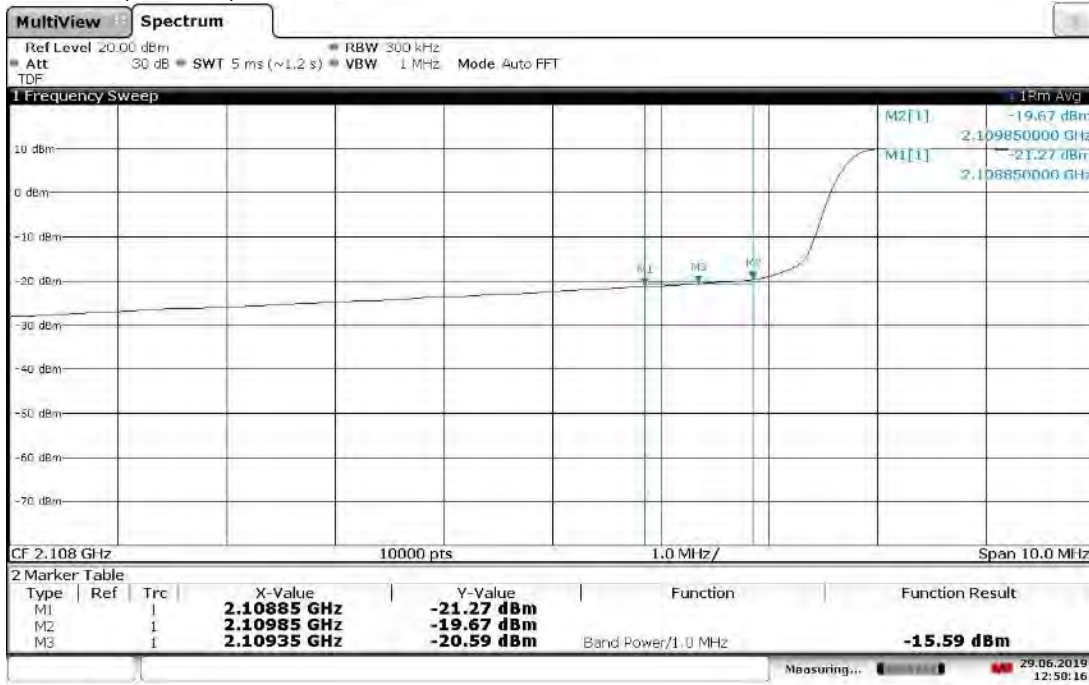
13:45:54 29.06.2019

Band Edge Compliant, Upper Band Edge, 2195 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 10 MHz, Modulation: TM1.1-QPSK



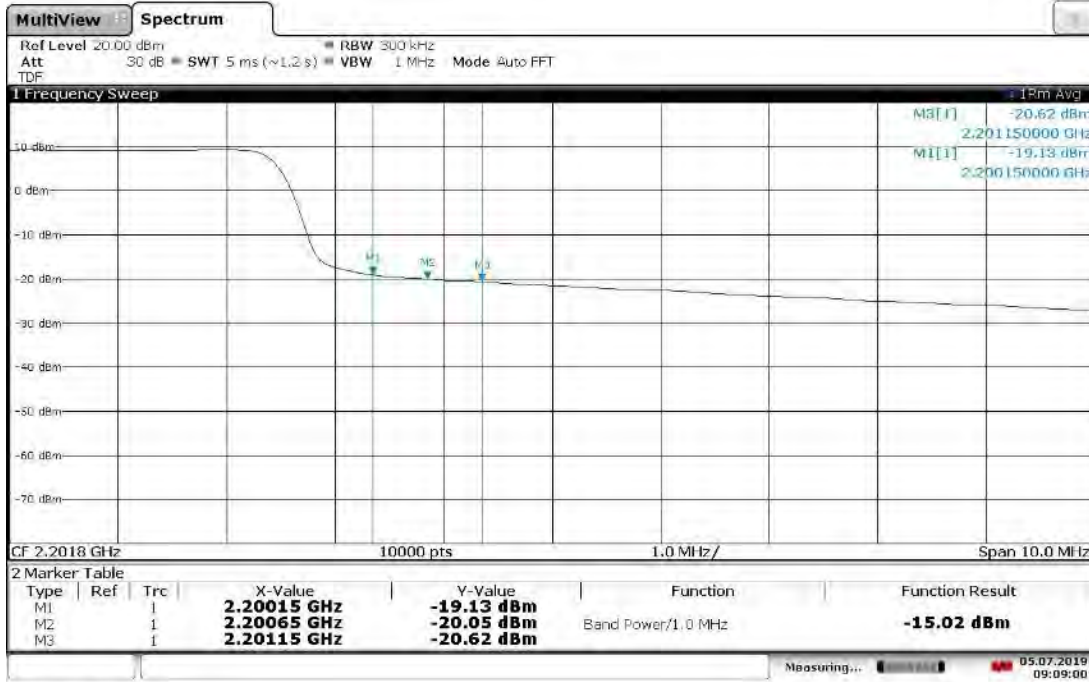
08:29:24 05.07.2019

Band Edge Compliant, Lower Band Edge, 2117.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 15 MHz, Modulation: TM1.1-QPSK



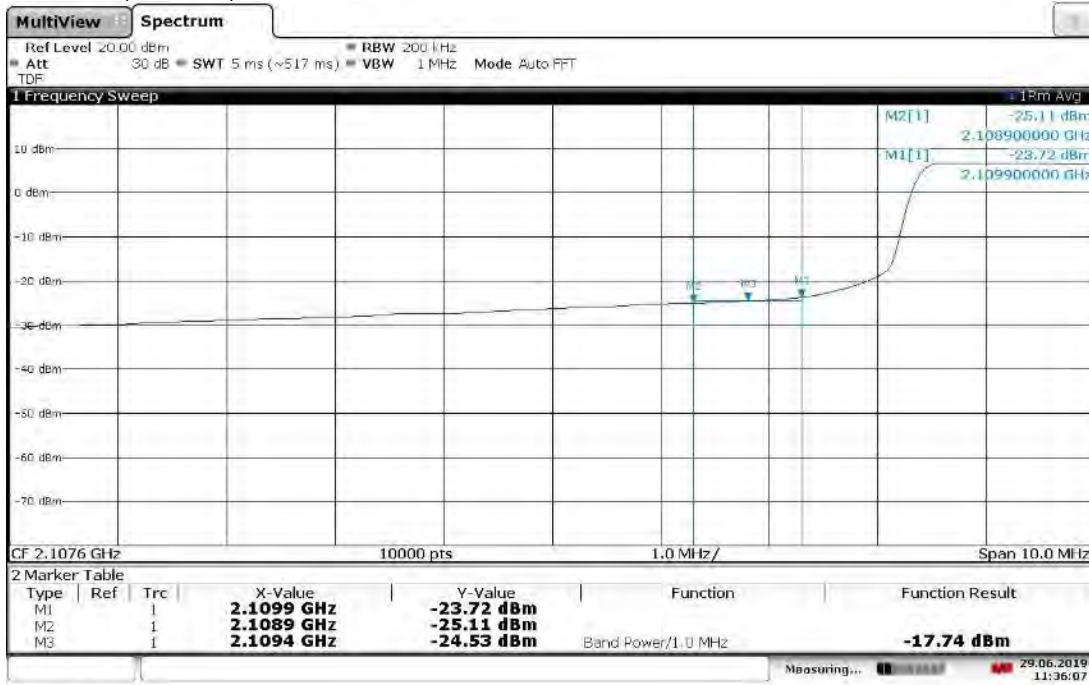
12:58:16 29.06.2019

Band Edge Compliant, Upper Band Edge, 2192.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 15 MHz, Modulation: TM1.1-QPSK



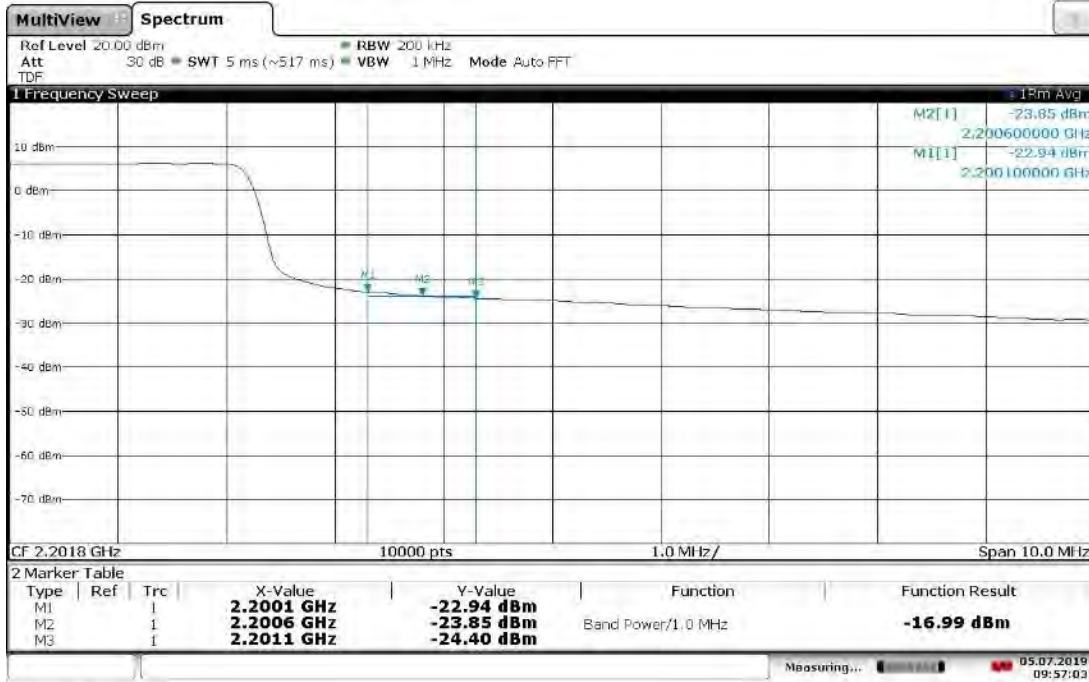
09:09:01 05.07.2019

Band Edge Compliant, Lower Band Edge, 2120 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 20 MHz, Modulation: TM1.1-QPSK



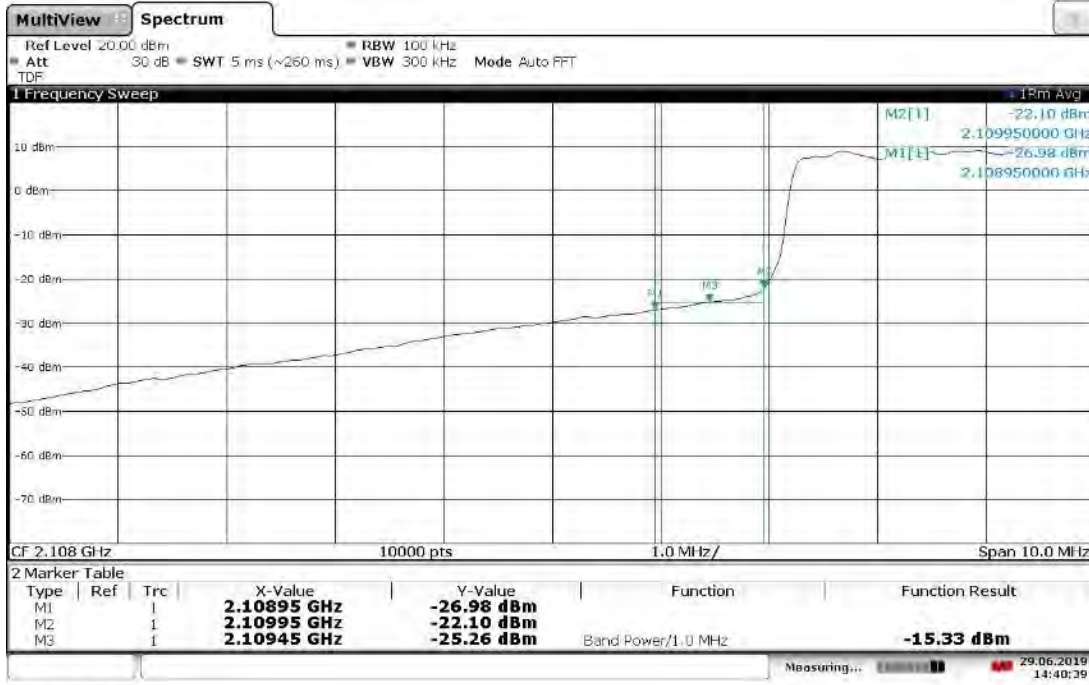
11:36:07 29.06.2019

Band Edge Compliant, Upper Band Edge, 2190 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 20 MHz, Modulation: TM1.1-QPSK



09:57:03 05.07.2019

Band Edge Compliant, Lower Band Edge, 2112.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 5 MHz, Modulation: TM3.2-16QAM



14:40:40 29.06.2019

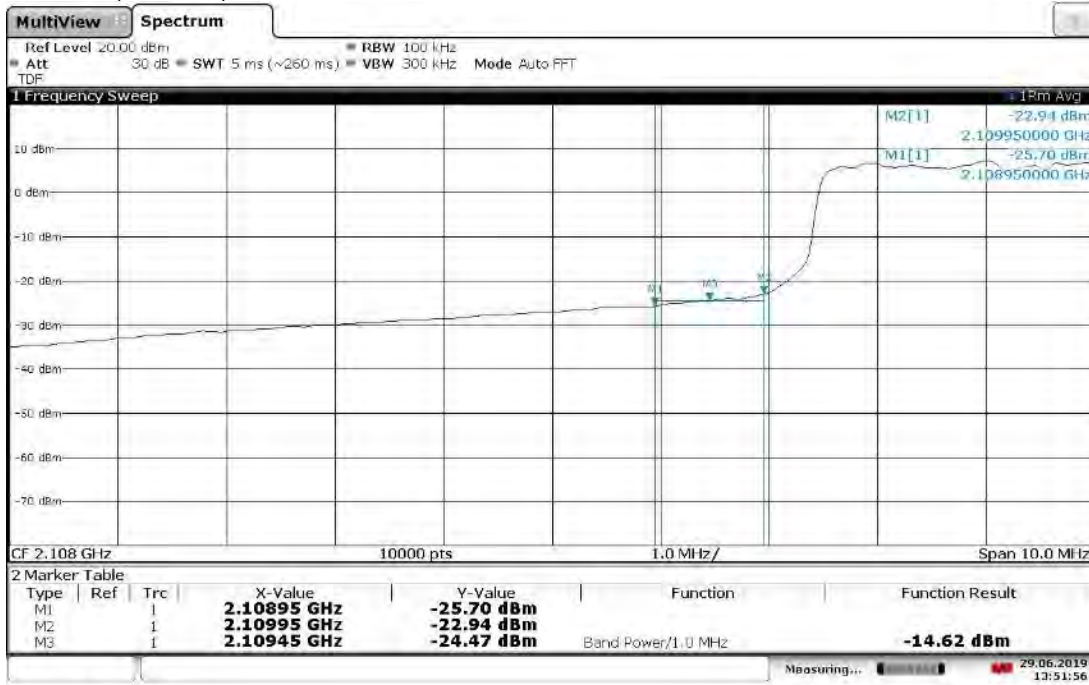
Band Edge Compliant, Upper Band Edge, 2197.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 5 MHz, Modulation: TM3.2-16QAM



15:32:01 29.06.2019



Band Edge Compliant, Lower Band Edge, 2115 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 10 MHz, Modulation: TM3.2-16QAM



13:51:56 29.06.2019

Band Edge Compliant, Upper Band Edge, 2195 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 10 MHz, Modulation: TM3.2-16QAM



08:35:05 05.07.2019

Band Edge Compliant, Lower Band Edge, 2117.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth:15 MHz, Modulation: TM3.2-16QAM



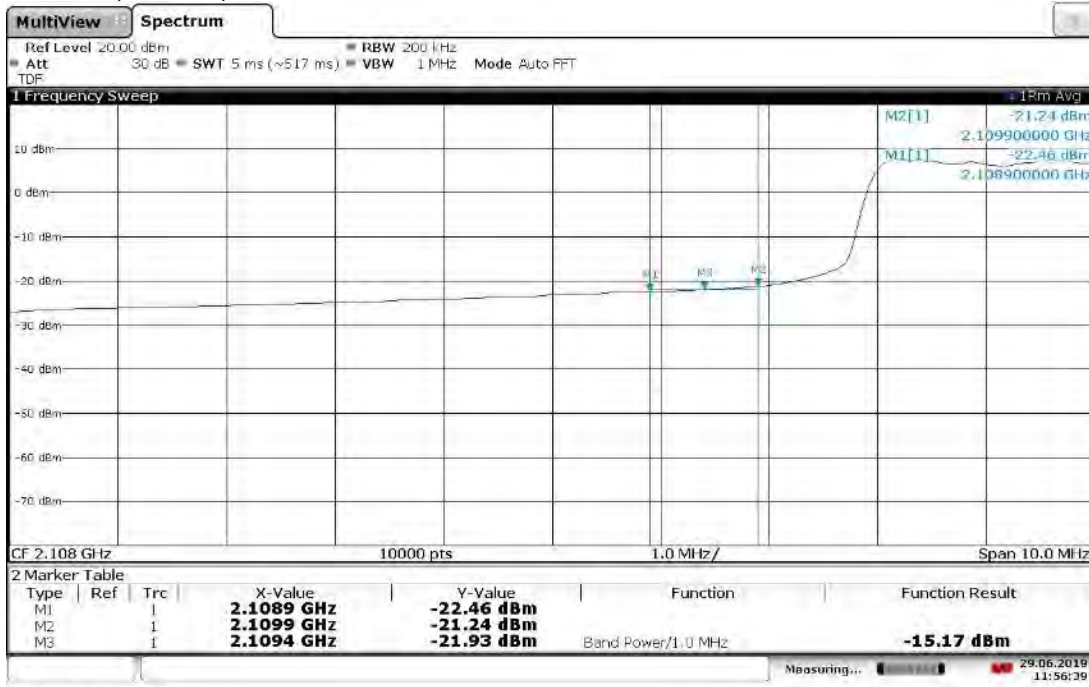
12:47:00 29.06.2019

Band Edge Compliant, Upper Band Edge, 2192.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 15 MHz, Modulation: TM3.2-16QAM



09:17:20 05.07.2019

Band Edge Compliant, Lower Band Edge, 2120 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 20 MHz, Modulation: TM3.2-16QAM



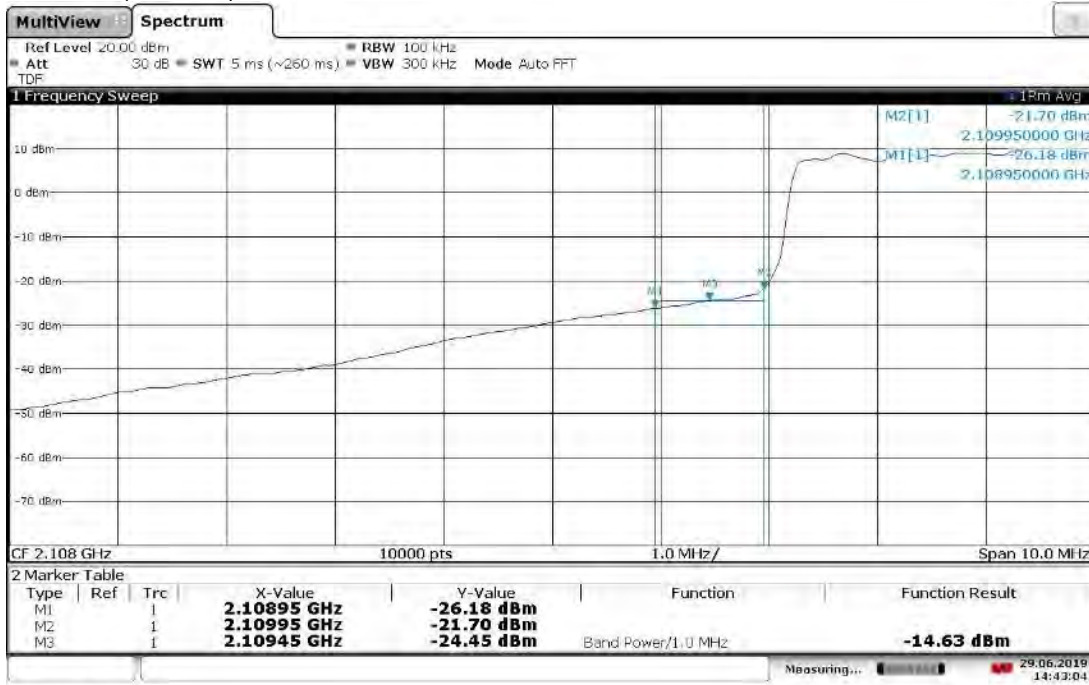
11:56:40 29.06.2019

Band Edge Compliant, Upper Band Edge, 2190 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 20 MHz, Modulation: TM3.2-16QAM



10:02:36 05.07.2019

Band Edge Compliant, Lower Band Edge, 2112.5MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 5 MHz, Modulation: TM3.2-16QAM



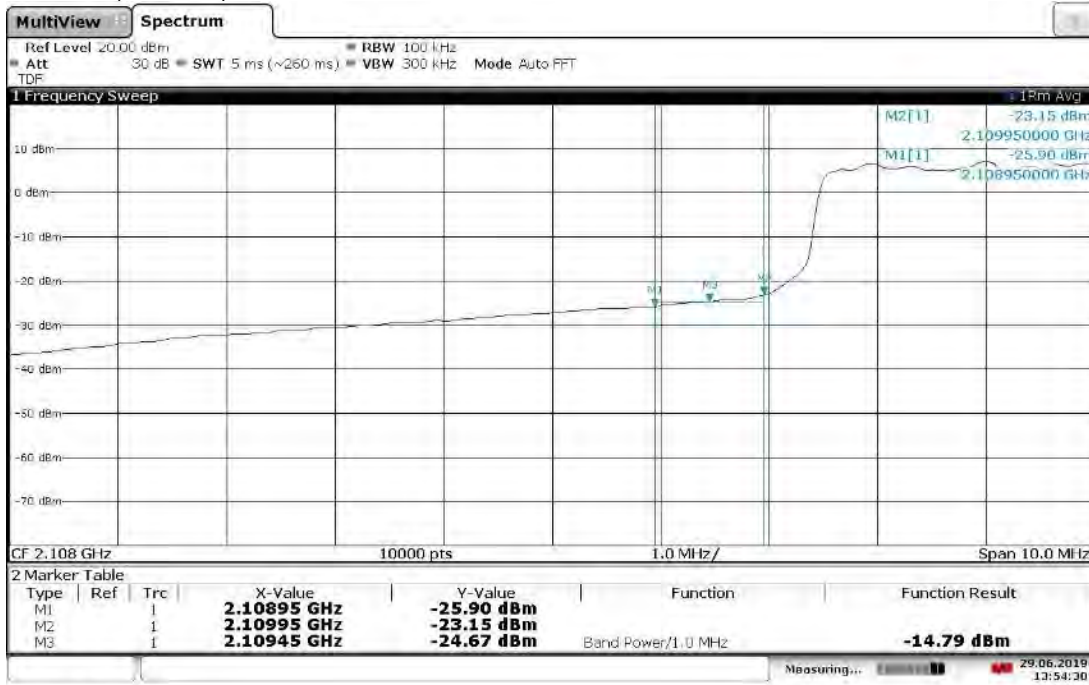
14:43:05 29.06.2019

Band Edge Compliant, Upper Band Edge, 2197.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 5 MHz, Modulation: TM3.2-16QAM



15:33:32 29.06.2019

Band Edge Compliant, Lower Band Edge, 2115 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 10 MHz, Modulation: TM3.2-16QAM



13:54:30 29.06.2019

Band Edge Compliant, Upper Band Edge, 2195 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 10 MHz, Modulation: TM3.2-16QAM



08:36:52 05.07.2019

Band Edge Compliant, Lower Band Edge, 2117.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 15 MHz, Modulation: TM3.2-16QAM



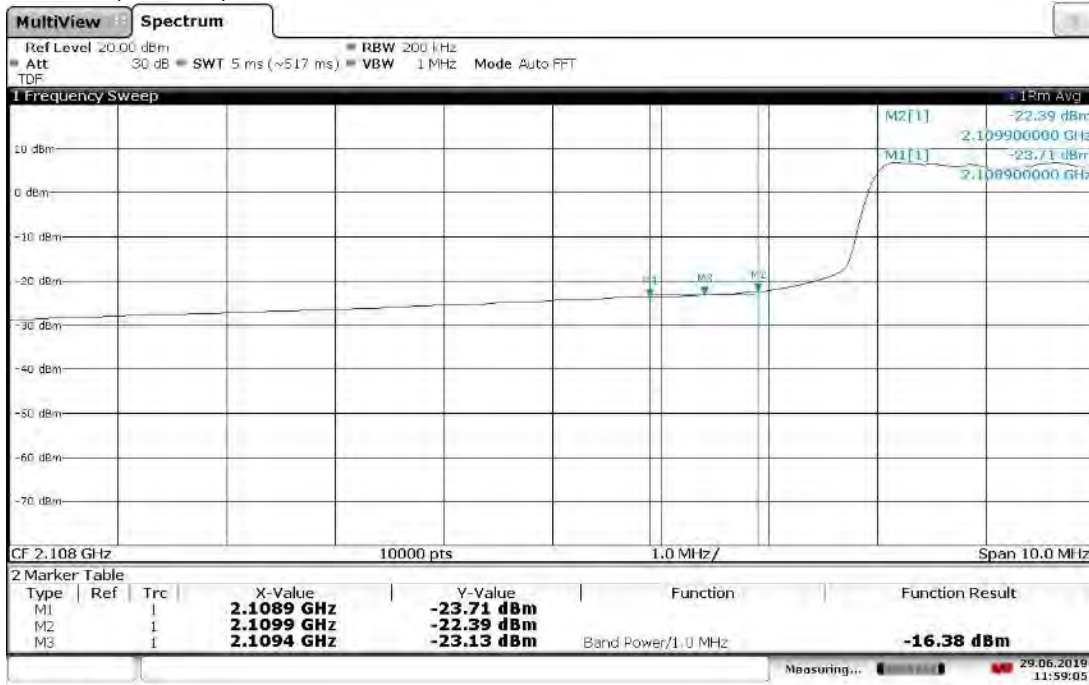
11:52:48 08.07.2019

Band Edge Compliant, Upper Band Edge, 2192.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 15 MHz, Modulation: TM3.2-16QAM



09:19:12 05.07.2019

Band Edge Compliant, Lower Band Edge, 2120 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 20 MHz, Modulation: TM3.2-16QAM



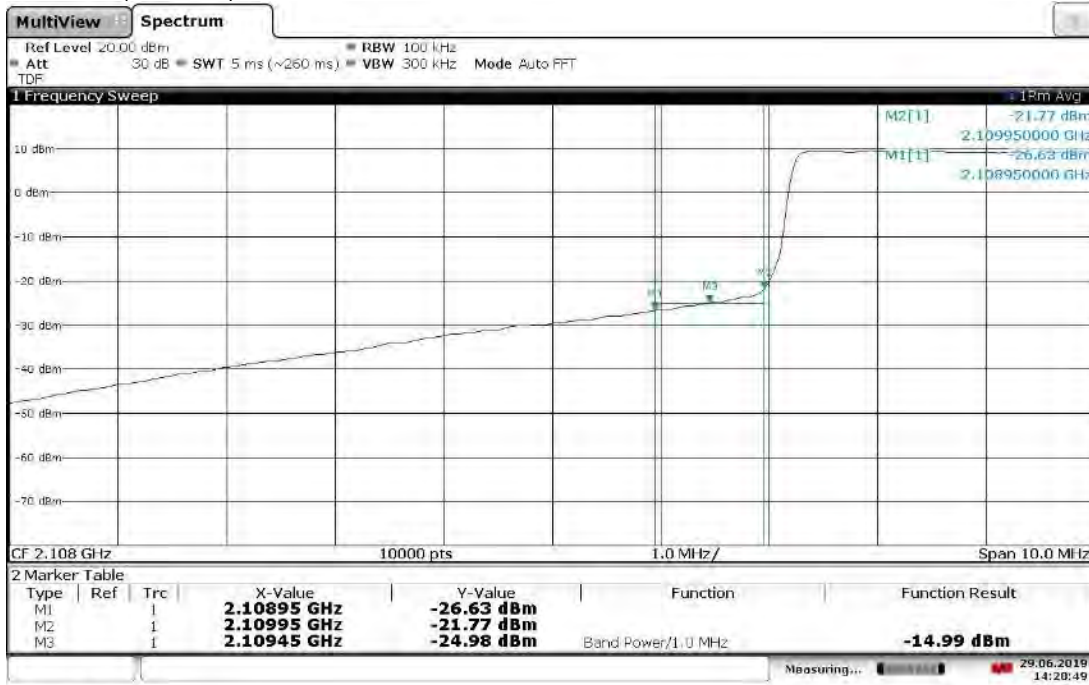
11:59:06 29.06.2019

Band Edge Compliant, Upper Band Edge, 2190 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 20 MHz, Modulation: TM3.2-16QAM



10:04:01 05.07.2019

Band Edge Compliant, Lower Band Edge, 2112.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 5 MHz, Modulation: TM3.1-64QAM



14:28:50 29.06.2019

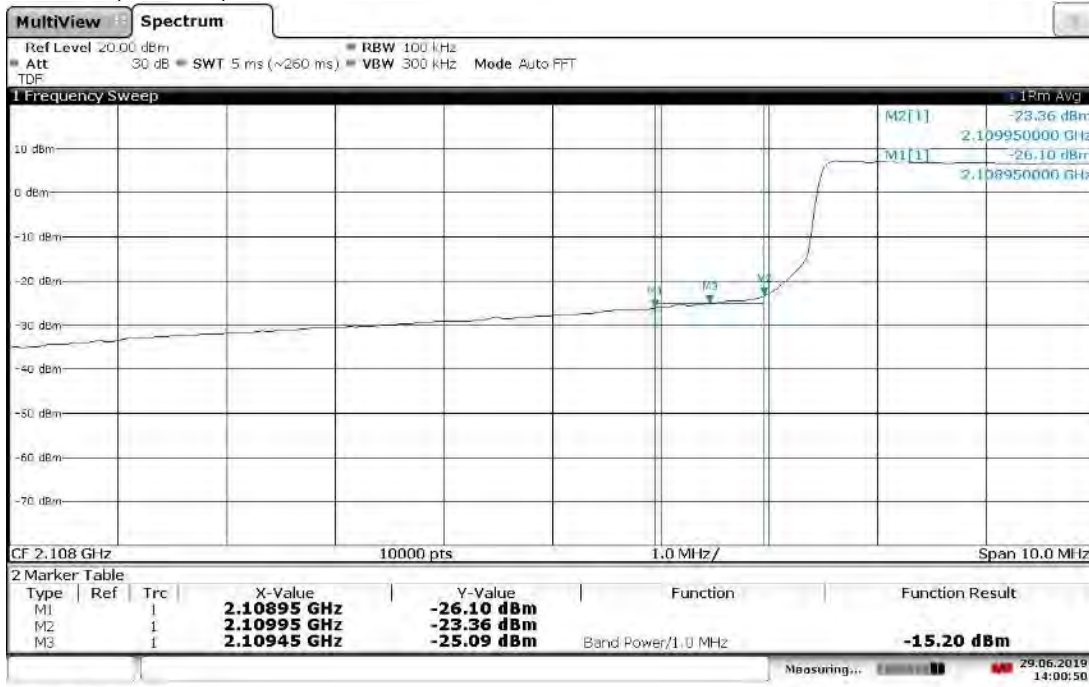
Band Edge Compliant, Upper Band Edge, 2197.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 5 MHz, Modulation: TM3.1-64QAM



15:38:14 29.06.2019



Band Edge Compliant, Lower Band Edge, 2115 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 10 MHz, Modulation: TM3.1-64QAM



14:00:50 29.06.2019

Band Edge Compliant, Upper Band Edge, 2195 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 10 MHz, Modulation: TM3.1-64QAM



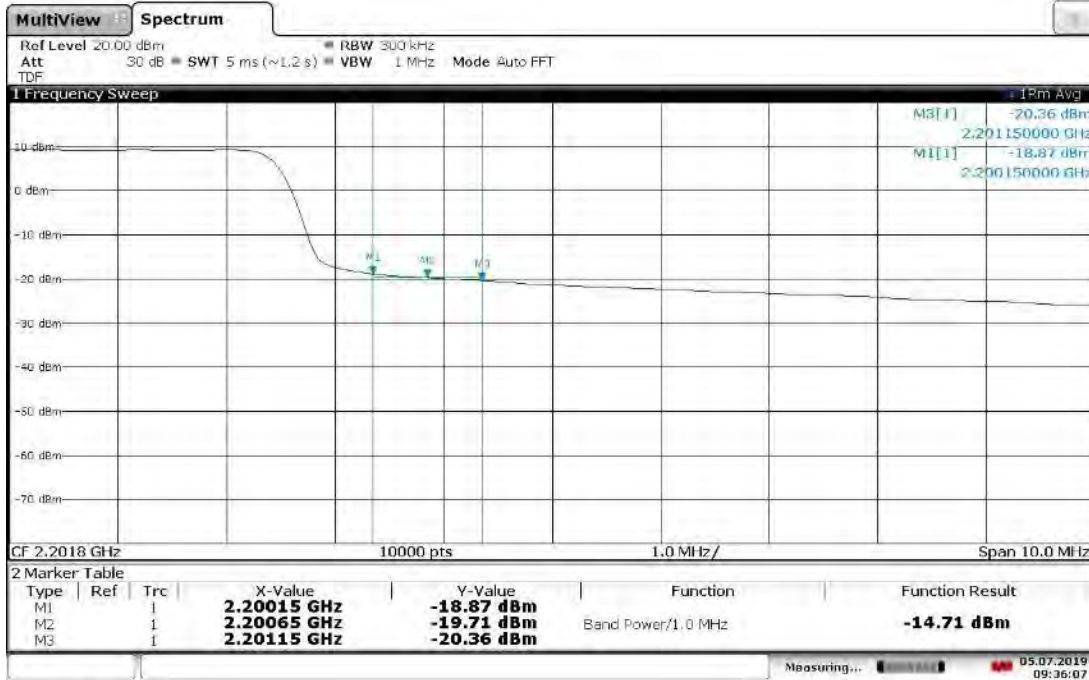
08:41:27 05.07.2019

Band Edge Compliant, Lower Band Edge, 2117.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 15 MHz, Modulation: TM3.1-64QAM



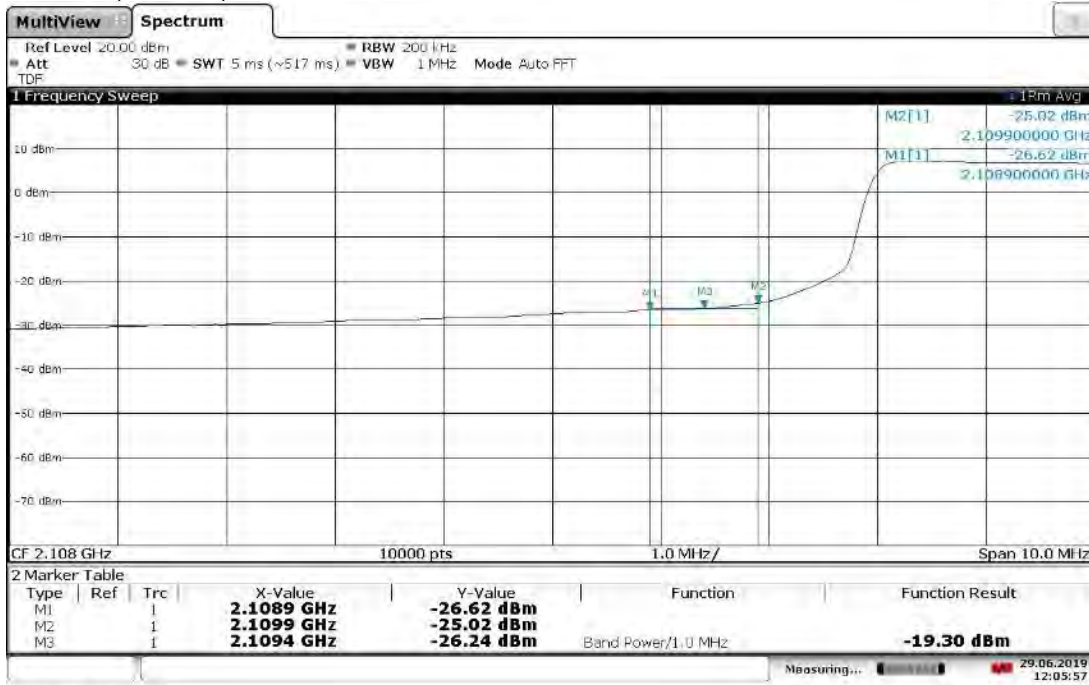
12:38:21 29.06.2019

Band Edge Compliant, Upper Band Edge, 2192.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 15 MHz, Modulation: TM3.1-64QAM



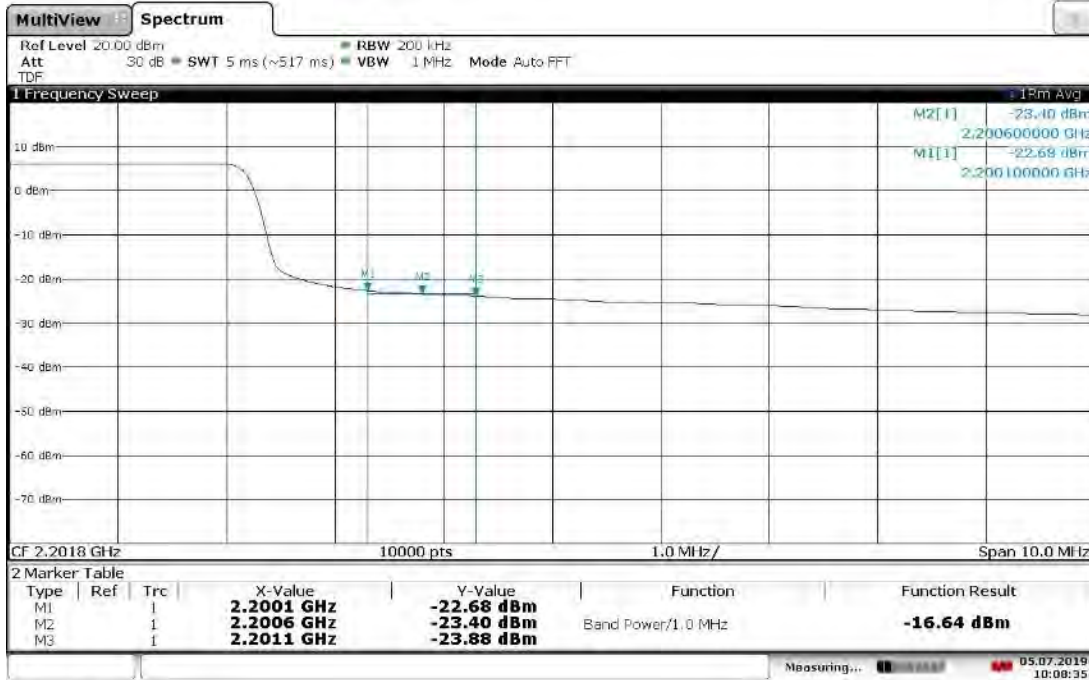
09:36:08 05.07.2019

Band Edge Compliant, Lower Band Edge, 2120 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 20 MHz, Modulation: TM3.1-64QAM



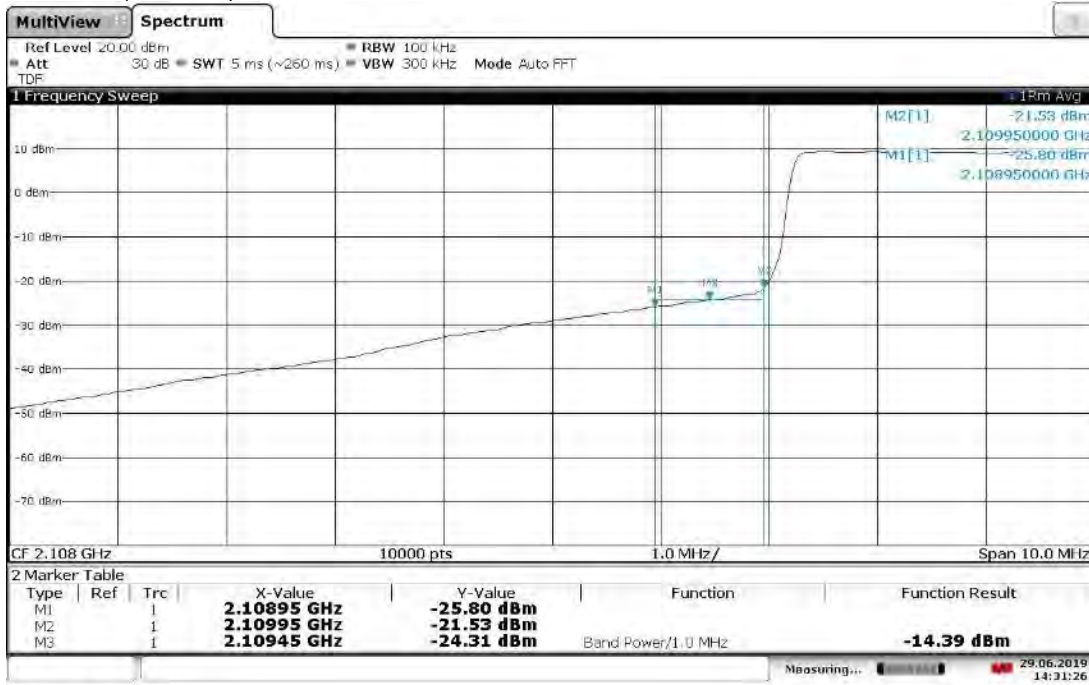
12:05:57 29.06.2019

Band Edge Compliant, Upper Band Edge, 2190 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 20 MHz, Modulation: TM3.1-64QAM



10:08:36 05.07.2019

Band Edge Compliant, Lower Band Edge, 2112.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 5 MHz, Modulation: TM3.1-64QAM



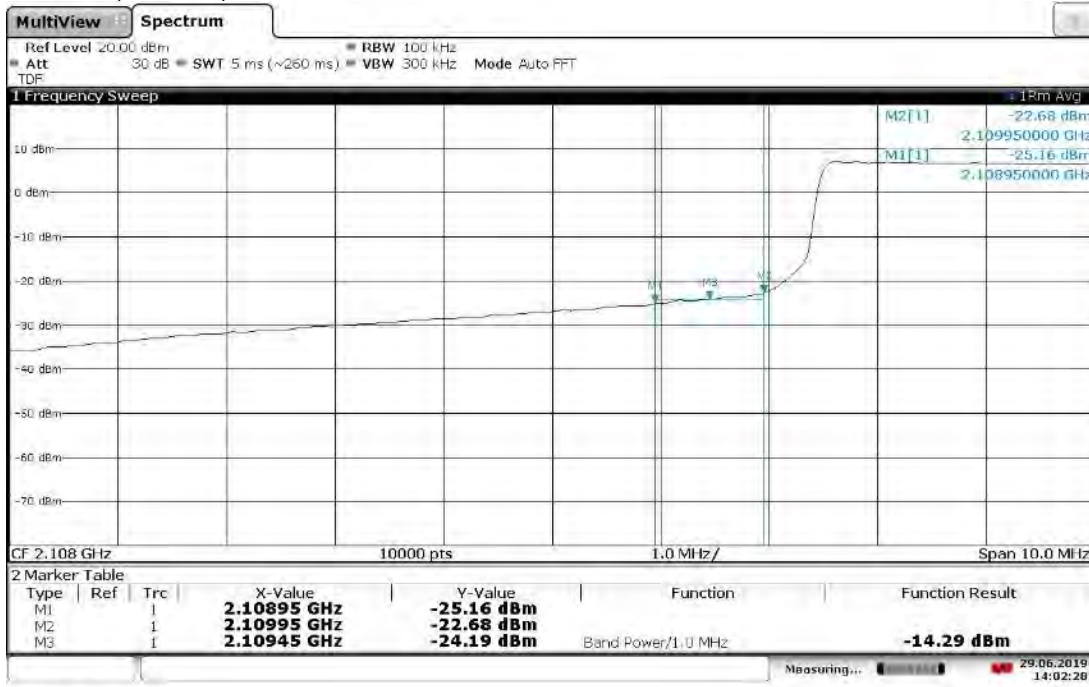
14:31:26 29.06.2019

Band Edge Compliant, Upper Band Edge, 2197.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 5 MHz, Modulation: TM3.1-64QAM



15:39:23 29.06.2019

Band Edge Compliant, Lower Band Edge, 2115 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 10 MHz, Modulation: TM3.1-64QAM



14:02:29 29.06.2019

Band Edge Compliant, Upper Band Edge, 2195 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 10 MHz, Modulation: TM3.1-64QAM



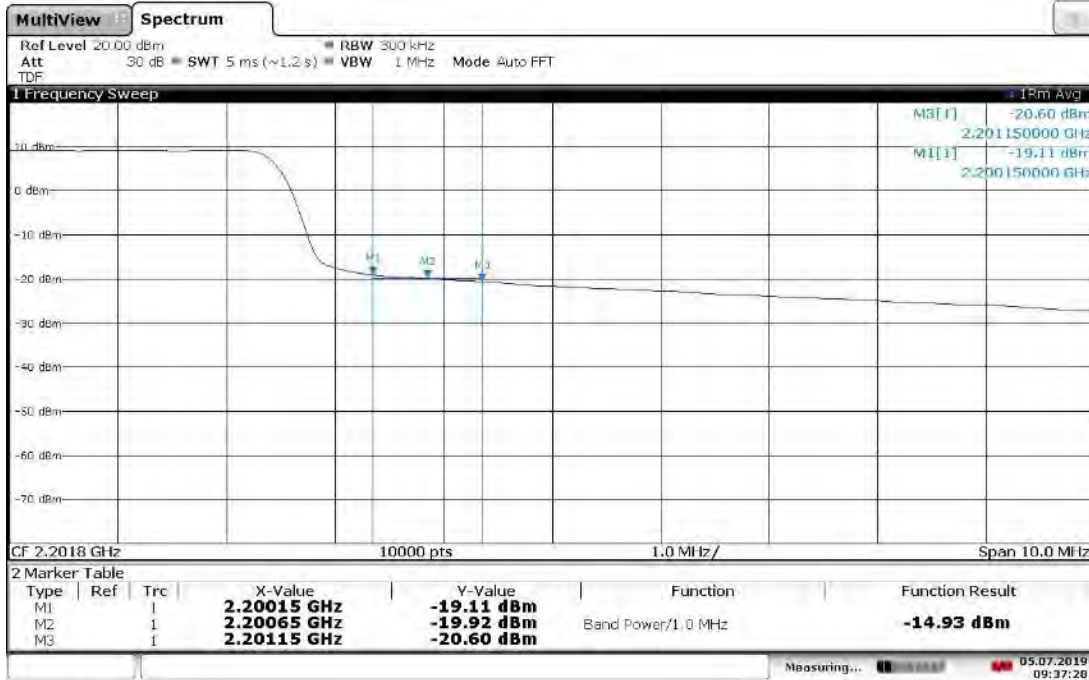
08:43:25 05.07.2019

Band Edge Compliant, Lower Band Edge, 2117.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 15 MHz, Modulation: TM3.1-64QAM



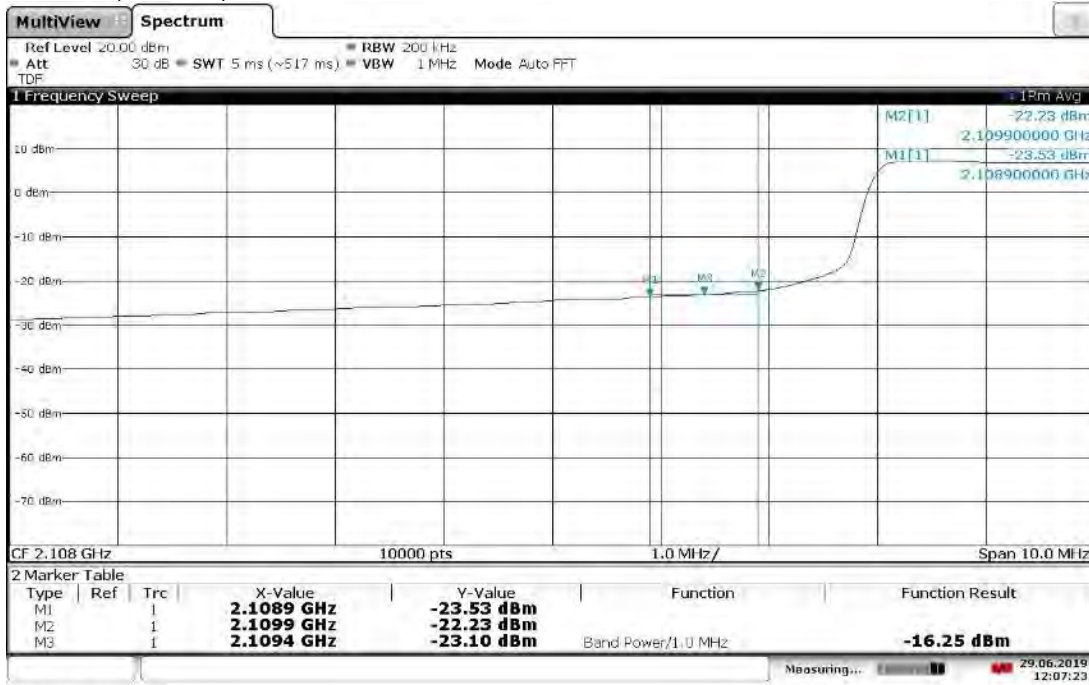
12:40:19 29.06.2019

Band Edge Compliant, Upper Band Edge, 2192.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 15 MHz, Modulation: TM3.1-64QAM



09:37:28 05.07.2019

Band Edge Compliant, Lower Band Edge, 2120 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 20 MHz, Modulation: TM3.1-64QAM



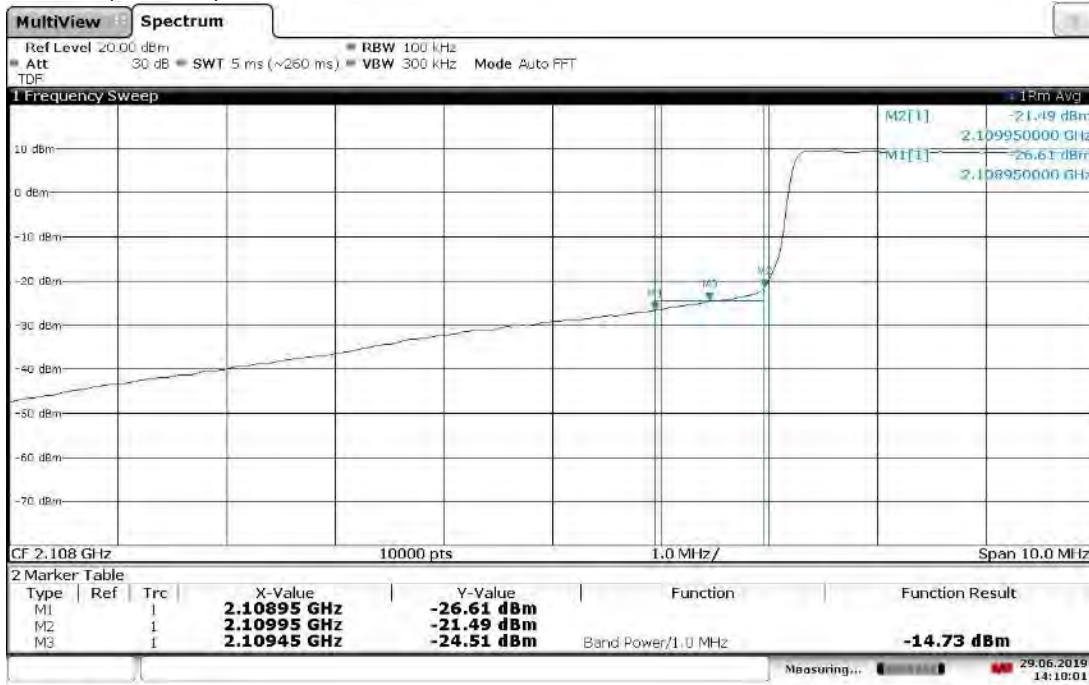
12:07:24 29.06.2019

Band Edge Compliant, Upper Band Edge, 2190 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 20 MHz, Modulation: TM3.1-64QAM



10:10:08 05.07.2019

Band Edge Compliant, Lower Band Edge, 2112.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 5 MHz, Modulation: TM3.1a-256QAM



14:18:02 29.06.2019

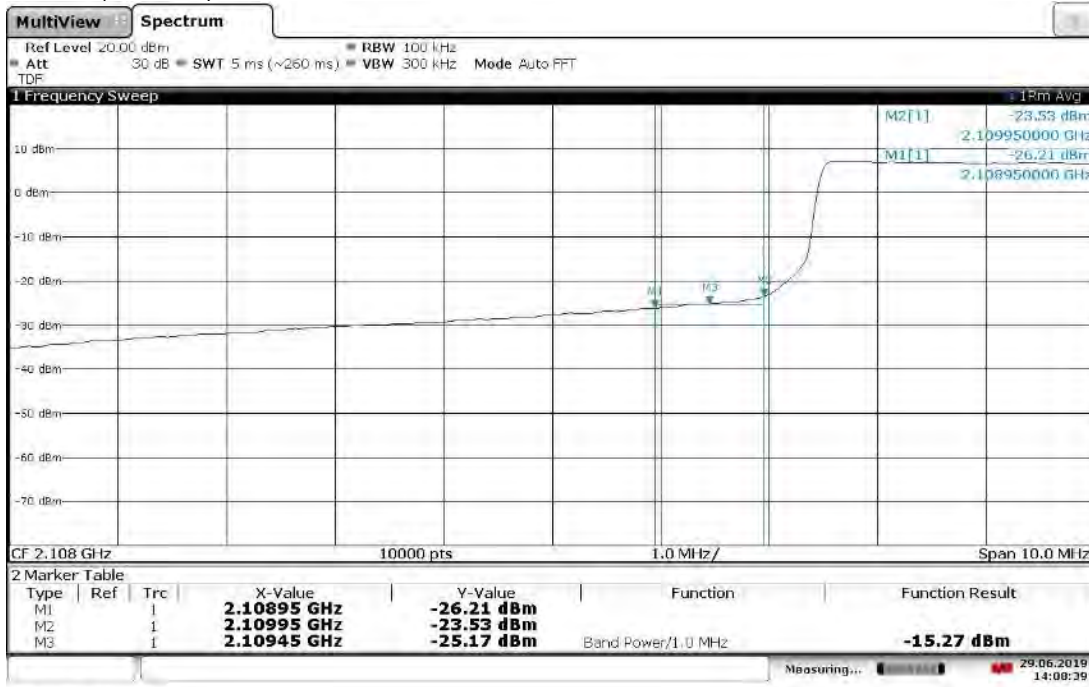
Band Edge Compliant, Upper Band Edge, 2197.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 5 MHz, Modulation: TM3.1a-256QAM



15:43:53 29.06.2019

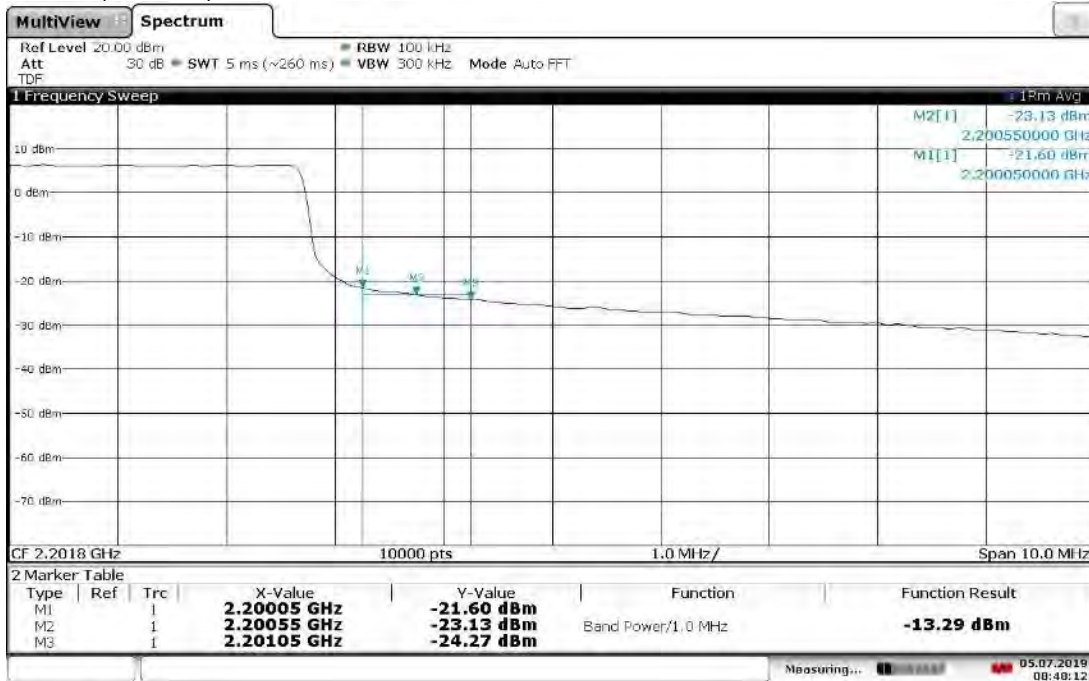


Band Edge Compliant, Lower Band Edge, 2115 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 10 MHz, Modulation: TM3.1a-256QAM



14:08:39 29.06.2019

Band Edge Compliant, Upper Band Edge, 2195 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 10 MHz, Modulation: TM3.1a-256QAM



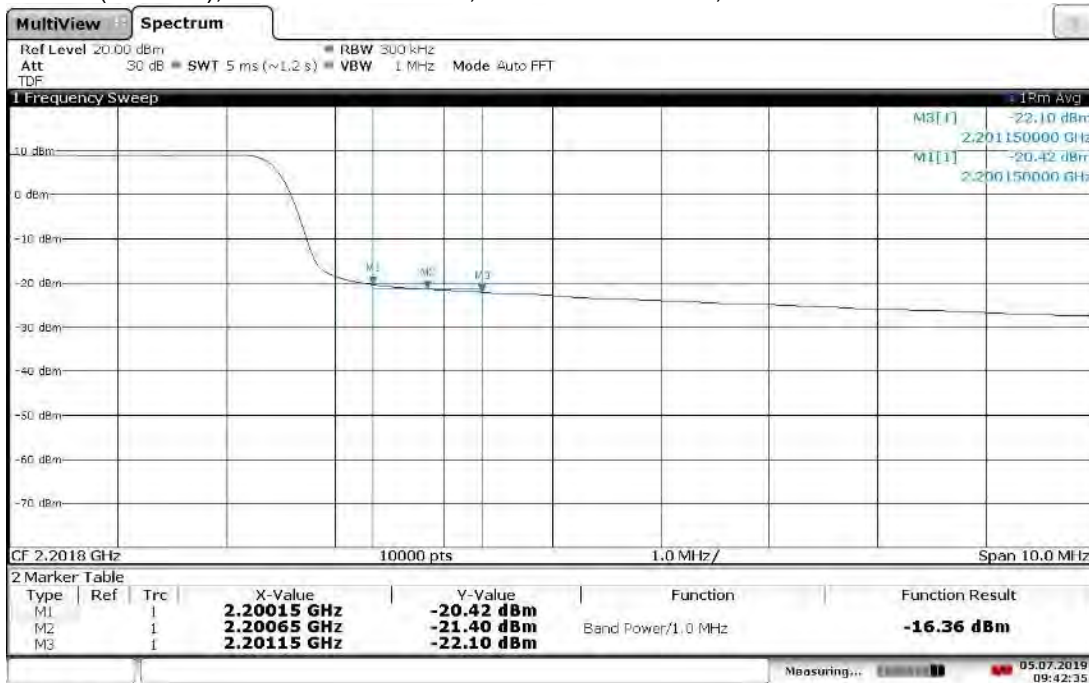
08:48:12 05.07.2019

Band Edge Compliant, Lower Band Edge, 2117.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 15 MHz, Modulation: TM3.1a-256QAM



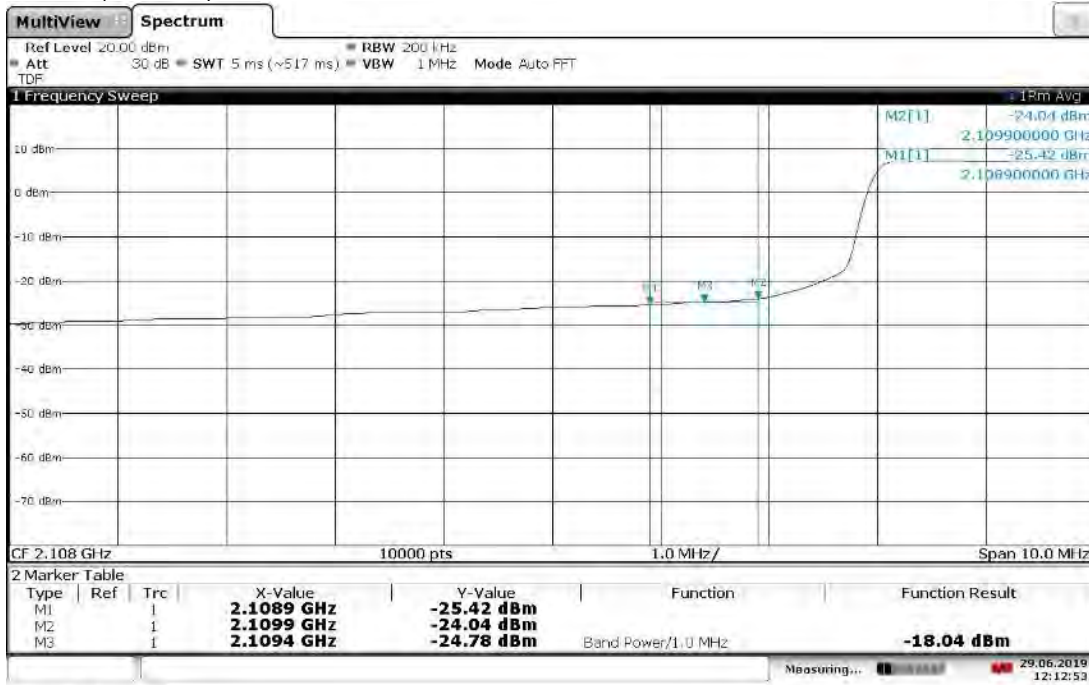
12:26:48 29.06.2019

Band Edge Compliant, Upper Band Edge, 2192.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 15 MHz, Modulation: TM3.1a-256QAM



09:42:35 05.07.2019

Band Edge Compliant, Lower Band Edge, 2120 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 20 MHz, Modulation: TM3.1a-256QAM



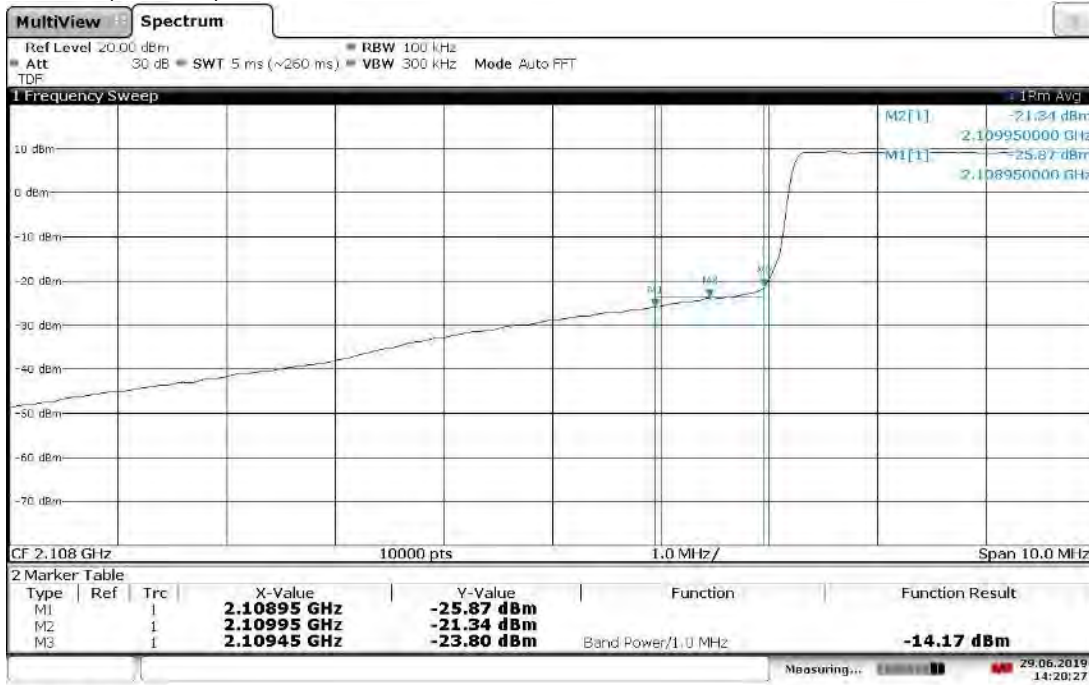
12:12:54 29.06.2019

Band Edge Compliant, Upper Band Edge, 2190 MHz  
 Slot 1 (Band 66), Antenna Port: ANT0, Bandwidth: 20 MHz, Modulation: TM3.1a-256QAM



10:14:48 05.07.2019

Band Edge Compliant, Lower Band Edge, 2112.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 5 MHz, Modulation: TM3.1a-256QAM



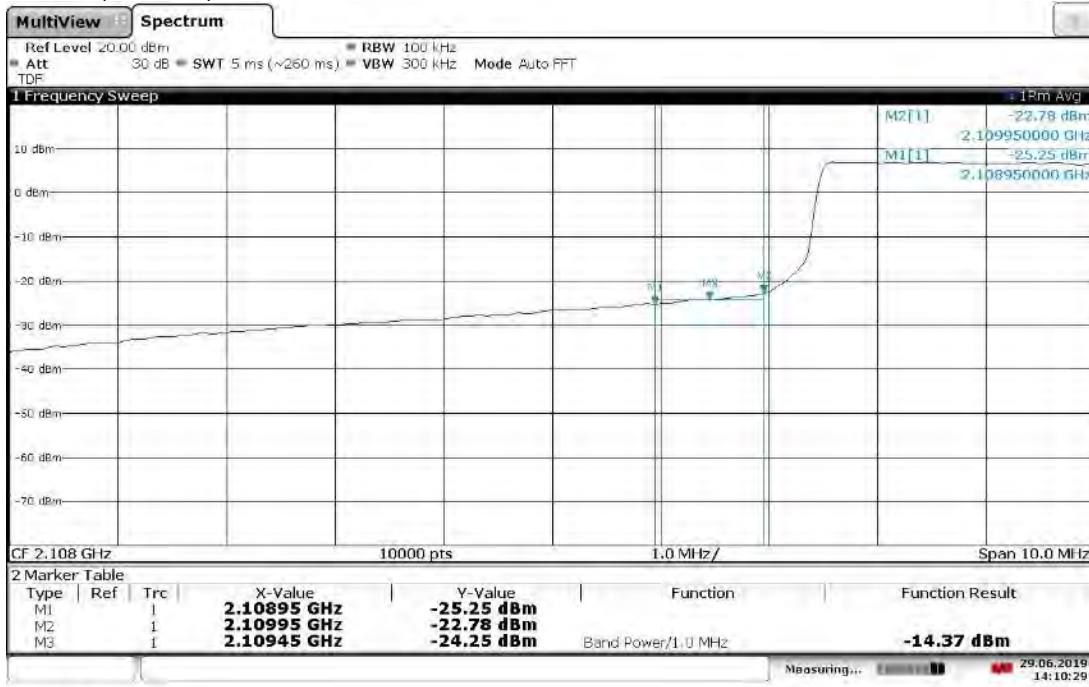
14:20:27 29.06.2019

Band Edge Compliant, Upper Band Edge, 2197.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 5 MHz, Modulation: TM3.1a-256QAM



08:49:57 05.07.2019

Band Edge Compliant, Lower Band Edge, 215 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 10 MHz, Modulation: TM3.1a-256QAM



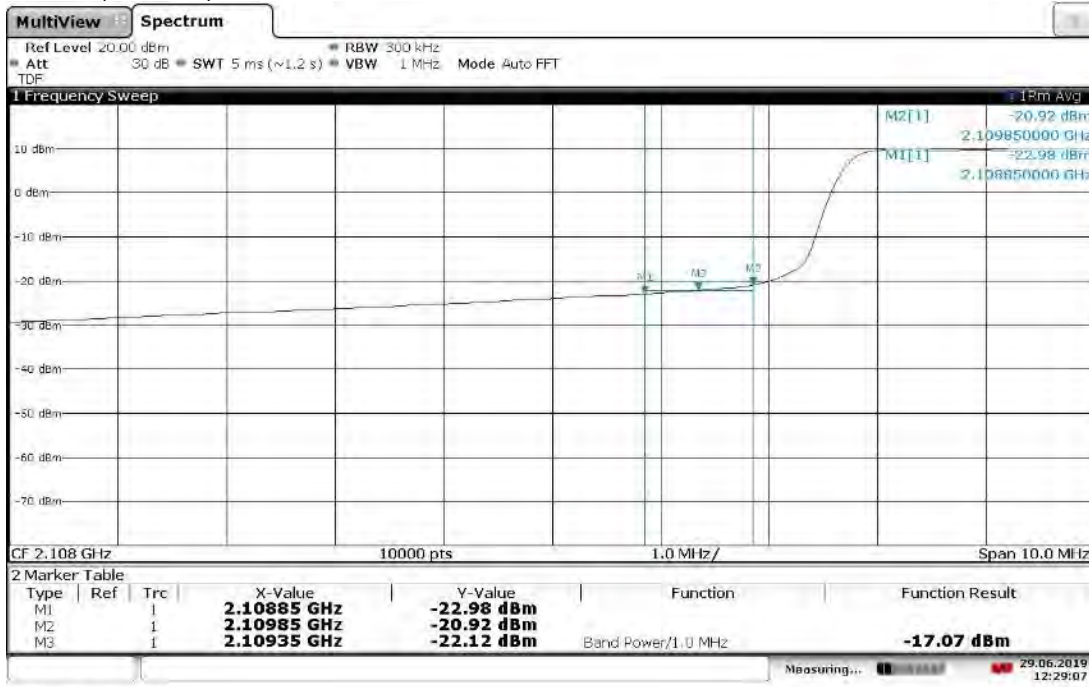
14:10:29 29.06.2019

Band Edge Compliant, Upper Band Edge, 2195 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 10 MHz, Modulation: TM3.1a-256QAM



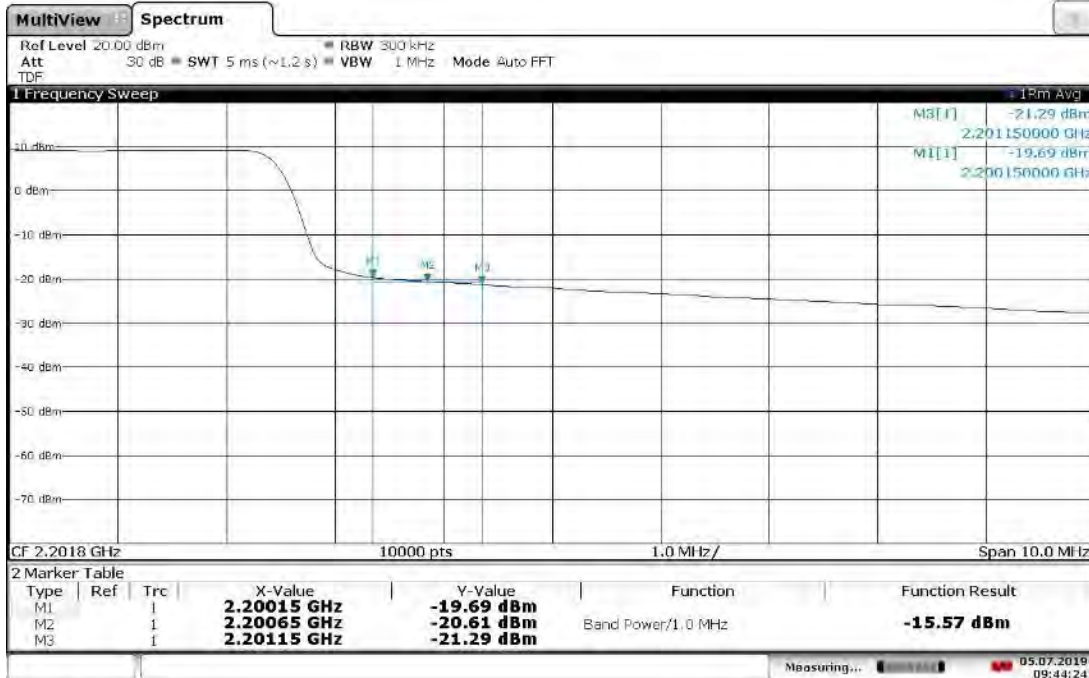
08:49:57 05.07.2019

Band Edge Compliant, Lower Band Edge, 2117.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 15 MHz, Modulation: TM3.1a-256QAM



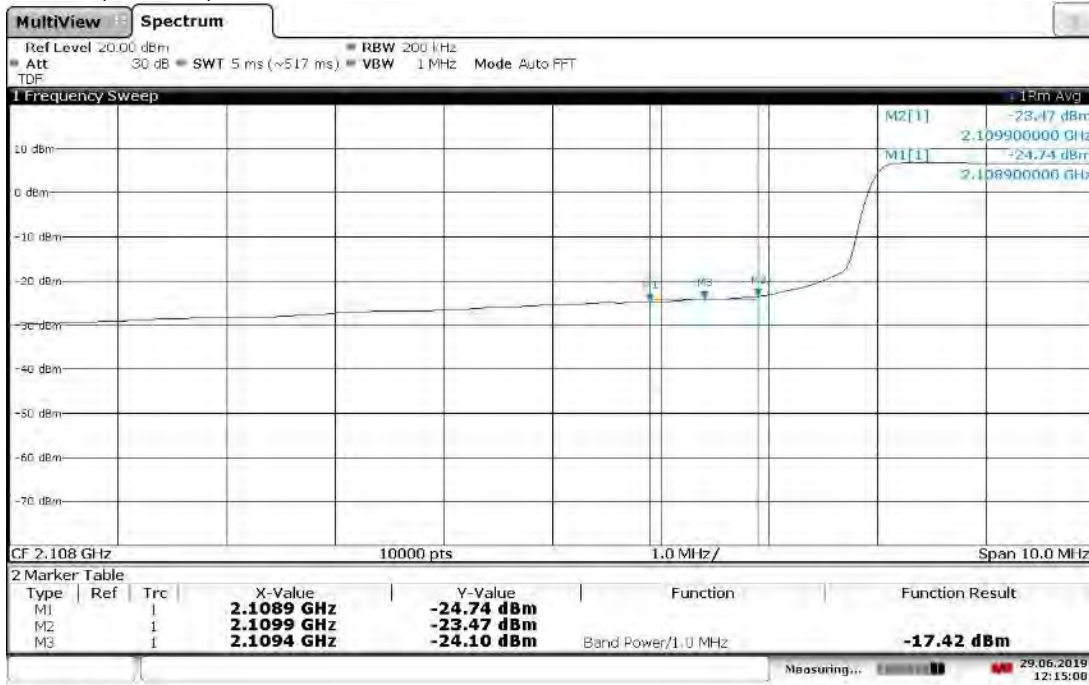
12:29:07 29.06.2019

Band Edge Compliant, Upper Band Edge, 2192.5 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 15 MHz, Modulation: TM3.1a-256QAM



09:44:25 05.07.2019

Band Edge Compliant, Lower Band Edge, 2120 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 20 MHz, Modulation: TM3.1a-256QAM



12:15:09 29.06.2019

Band Edge Compliant, Upper Band Edge, 2190 MHz  
 Slot 1 (Band 66), Antenna Port: ANT1, Bandwidth: 20 MHz, Modulation: TM3.1a-256QAM



10:16:39 05.07.2019

Test Personnel: Kouma Sinn *KPS*  
Supervising/Reviewing  
Engineer:  
(Where Applicable) N/A  
Product Standard: FCC Part 27  
Input Voltage: 48 VDC (POE)  
Pretest Verification w/  
Ambient Signals or  
BB Source: N/A

Test Date: 06/29/2019, 07/05/2019  
Limit Applied: See report section 9.3  
Ambient Temperature: 23, 22 °C  
Relative Humidity: 60, 73 %  
Atmospheric Pressure: 1000, 1013 mbars

Deviations, Additions, or Exclusions: None



## 10 Frequency Stability

### 10.1 Method

Tests are performed in accordance with ANSI C63.26 and CFR47 FCC Parts 2.1055 and 27.

**TEST SITE:** Safety Lab

### 10.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
CEN001'	DC-40GHz attenuator 20dB	Centric RF	C411-20	CEN001	02/01/2019	02/01/2020
CBLHF2012-2M-1'	2m 9kHz-40GHz Coaxial Cable - SET1	Huber & Suhner	SF102	252675001	02/01/2019	02/01/2020
ROS005-1'	Signal and Spectrum Analyzer	Rohde & Schwarz	FSW43	100646	10/15/2018	10/15/2019
DS40'	Temp, humidity, pressure gauge	Digi Sense	68000-49	181717625	11/06/2018	11/06/2019
148012'	Temp/Humidity Chamber	Envirotronics	SH27C	08015563S11263	11/21/2018	11/21/2019
148013'	Temp/Humidity Chamber	Envirotronics	SH27C	08015563S11264	09/26/2018	09/26/2019

### Software Utilized:

Name	Manufacturer	Version
None	--	--

### 10.3 Results:

The sample tested was found to Comply.

§27.54 Frequency stability – The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The occupied bandwidth measurement was used to make sure the lower and upper frequencies of the occupied bandwidth remains within the assigned band of 2110-2200 MHz.

# Intertek

Report Number: 103866582BOX-010b

Issued: 07/19/2019

<b>Frequency stability over temperature</b>					
Band 66, Modulation: QPSK, Bandwidth: 5MHz, Antenna Port: ANTO , Channel: Low 2112.5 MHz					
Low Edge of Occupied Bandwidth					
Temperature (Deg. C)	Low Edge (GHz)	Low Edge Deviation (GHz)	Low Edge (%)	PPM	Limit PPM
-30	2.11022395	-1.3E-07	-6.16048E-08	-0.001	2.5
-20	2.11020987	1.395E-05	6.61067E-06	0.066	2.5
-10	2.110221135	2.685E-06	1.27238E-06	0.013	2.5
0	2.11020495	-1.887E-05	-8.94218E-06	-0.089	2.5
10	2.11022012	-3.7E-06	-1.75337E-06	-0.018	2.5
20	2.11022382	0	0	0.000	--
30	2.11023141	7.59E-06	3.59677E-06	0.036	2.5
40	2.11023162	7.8E-06	3.69629E-06	0.037	2.5
50	2.11021941	-4.41E-06	-2.08983E-06	-0.021	2.5
Upper Edge of Occupied Bandwidth					
Temperature (Deg. C)	Upper Edge (GHz)	Upper Edge Deviation (GHz)	Upper Edge (%)	PPM	Limit PPM
-30	2.11476472	-1.198E-05	-5.66496E-06	-0.057	2.5
-20	2.11477104	-1.83E-05	-8.65349E-06	-0.087	2.5
-10	2.11476442	-1.168E-05	-5.5231E-06	-0.055	2.5
0	2.11475651	3.77E-06	1.78271E-06	0.018	2.5
10	2.11474772	-5.02E-06	-2.3738E-06	-0.024	2.5
20	2.11475274	0	0	0.000	--
30	2.11474839	-4.35E-06	-2.05698E-06	-0.021	2.5
40	2.11474277	-9.97E-06	-4.7145E-06	-0.047	2.5
50	2.11475095	-1.79E-06	-8.46435E-07	-0.008	2.5

# Intertek

Report Number: 103866582BOX-010b

Issued: 07/19/2019

<b>Frequency stability over temperature</b>					
Band 66, Modulation: QPSK, Bandwidth: 5MHz, Antenna Port: ANTO , Channel: High 2197.5 MHz					
Low Edge of Occupied Bandwidth					
Temperature (Deg. C)	Low Edge (GHz)	Low Edge Deviation (GHz)	Low Edge (%)	PPM	Limit PPM
-30	2.19519	7.95E-06	3.62154E-06	0.04	2.5
-20	2.19518142	1.653E-05	7.53007E-06	0.08	2.5
-10	2.19520128	-3.33E-06	-1.51695E-06	-0.02	2.5
0	2.19518386	-1.409E-05	-6.41849E-06	-0.06	2.5
10	2.19519978	1.83E-06	8.33638E-07	0.01	2.5
20	2.19519795	0	0	0.00	--
30	2.19521487	1.692E-05	7.70773E-06	0.08	2.5
40	2.19522124	2.329E-05	1.06095E-05	0.11	2.5
50	2.19521343	1.548E-05	7.05176E-06	0.07	2.5
Upper Edge of Occupied Bandwidth					
Temperature (Deg. C)	Upper Edge (GHz)	Upper Edge Deviation (GHz)	Upper Edge (%)	PPM	Limit PPM
-30	2.19977898	-1.99E-05	-9.04645E-06	-0.09	2.5
-20	2.19977507	-1.599E-05	-7.26898E-06	-0.07	2.5
-10	2.19977852	-1.944E-05	-8.83733E-06	-0.09	2.5
0	2.19976776	8.68E-06	3.94589E-06	0.04	2.5
10	2.1997595	4.2E-07	1.90932E-07	0.00	2.5
20	2.19975908	0	0	0.00	--
30	2.19975081	-8.27E-06	-3.7595E-06	-0.04	2.5
40	2.19973519	-2.389E-05	-1.08603E-05	-0.11	2.5
50	2.19973744	-2.164E-05	-9.83744E-06	-0.10	2.5

# Intertek

Report Number: 103866582BOX-010b

Issued: 07/19/2019

<b>Frequency stability over temperature</b>					
Band 66, Modulation: QPSK, Bandwidth: 20MHz, Antenna Port: ANTO , Channel: Low 2120 MHz					
Low Edge of Occupied Bandwidth					
Temperature (Deg. C)	Low Edge (GHz)	Low Edge Deviation (GHz)	Low Edge (%) --	PPM --	Limit PPM
-30	2.11103921	-1.261E-05	-5.9734E-06	-0.06	2.5
-20	2.11103434	-7.74E-06	-3.66646E-06	-0.04	2.5
-10	2.11101582	1.078E-05	5.10652E-06	0.05	2.5
0	2.11101778	-8.82E-06	-4.17806E-06	-0.04	2.5
10	2.11101906	-7.54E-06	-3.57172E-06	-0.04	2.5
20	2.1110266	0	0	0.00	--
30	2.11103017	3.57E-06	1.69112E-06	0.02	2.5
40	2.11100307	-2.353E-05	-1.11462E-05	-0.11	2.5
50	2.11104222	1.562E-05	7.39924E-06	0.07	2.5
Upper Edge of Occupied Bandwidth					
Temperature (Deg. C)	Upper Edge (GHz)	Upper Edge Deviation (GHz)	Upper Edge (%) --	PPM --	Limit PPM
-30	2.128966528	-2.298E-06	-1.0794E-06	-0.01	2.5
-20	2.12895493	9.3E-06	4.36832E-06	0.04	2.5
-10	2.12896158	2.65E-06	1.24474E-06	0.01	2.5
0	2.12894598	-1.825E-05	-8.57224E-06	-0.09	2.5
10	2.12897296	8.73E-06	4.10059E-06	0.04	2.5
20	2.12896423	0	0	0.00	--
30	2.1289039	-6.033E-05	-2.83377E-05	-0.28	2.5
40	2.12891087	-5.336E-05	-2.50638E-05	-0.25	2.5
50	2.12893826	-2.597E-05	-1.21984E-05	-0.12	2.5

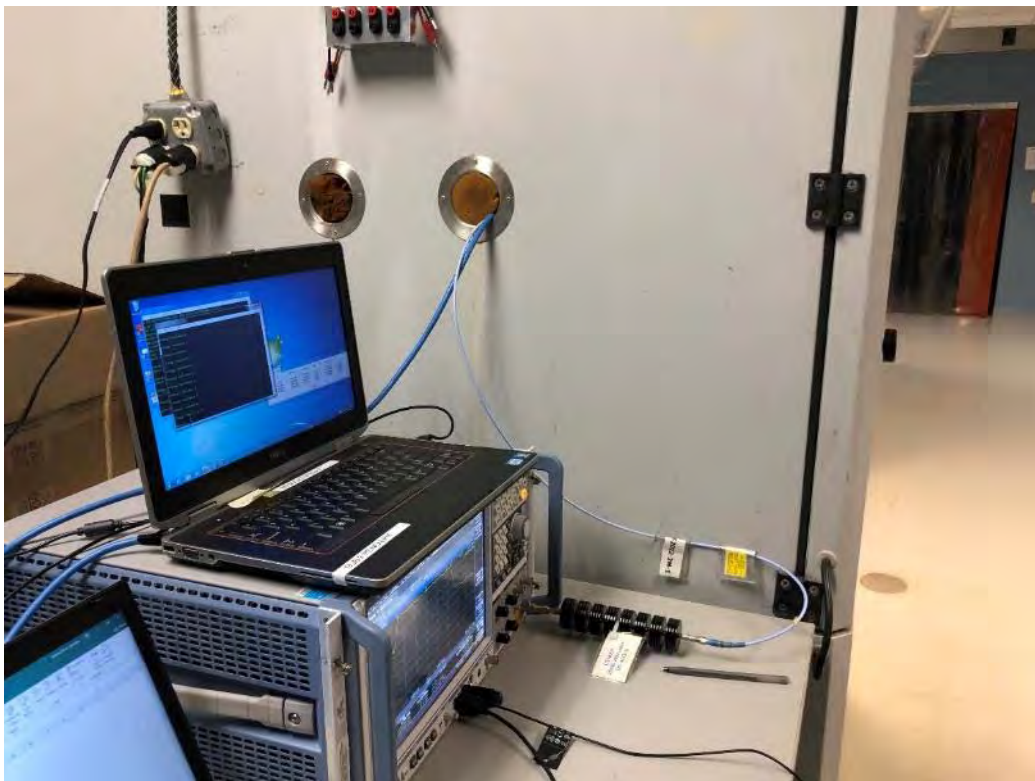
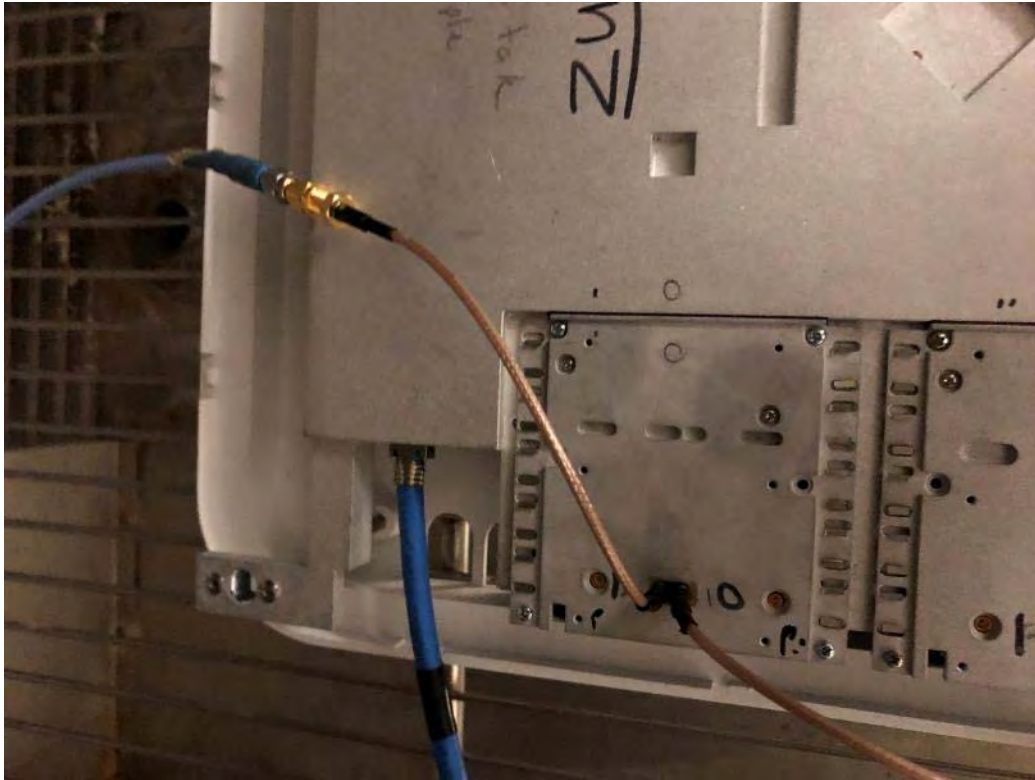
# Intertek

Report Number: 103866582BOX-010b

Issued: 07/19/2019

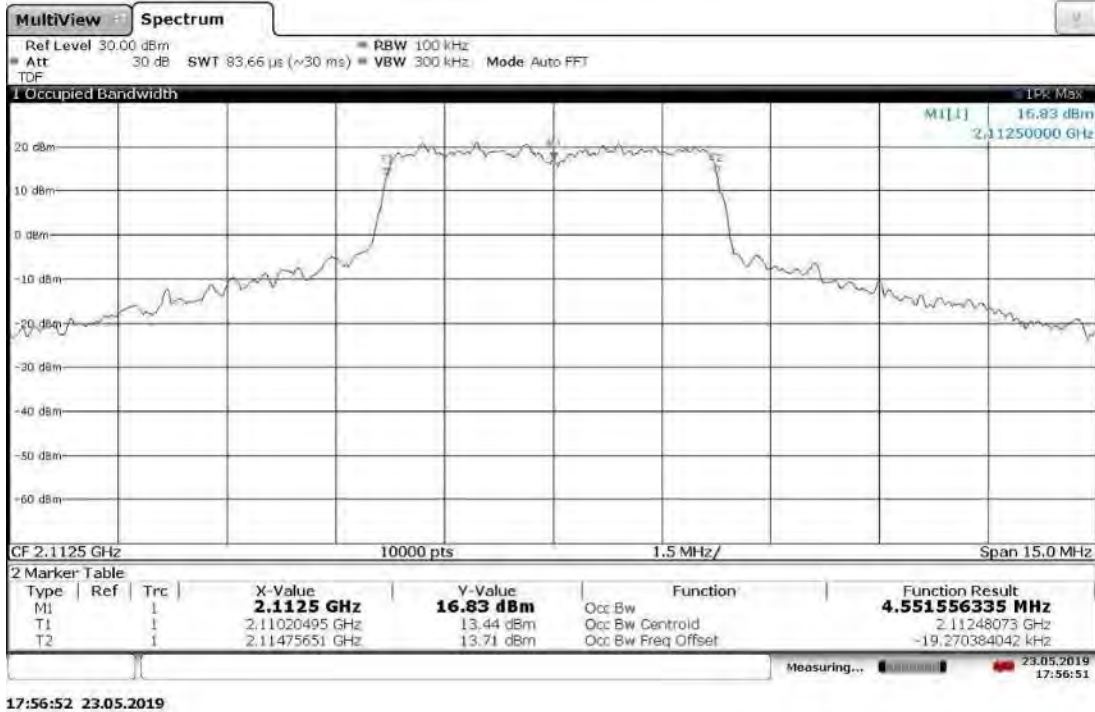
<b>Frequency stability over temperature</b>					
Band 66, Modulation: QPSK, Bandwidth: 20MHz, Antenna Port: ANTO , Channel: Low 2190 MHz					
Low Edge of Occupied Bandwidth					
Temperature (Deg. C)	Low Edge (GHz)	Low Edge Deviation (GHz)	Low Edge (%)	PPM	Limit PPM
-30	2.18098708	7.57E-06	3.47089E-06	0.03	2.5
-20	2.18098996	4.69E-06	2.1504E-06	0.02	2.5
-10	2.18100701	-1.236E-05	-5.66714E-06	-0.06	2.5
0	2.18099579	1.14E-06	5.22697E-07	0.01	2.5
10	2.18100701	1.236E-05	5.66714E-06	0.06	2.5
20	2.18099465	0	0	0.00	--
30	2.18100591	1.126E-05	5.16278E-06	0.05	2.5
40	2.1810023	7.65E-06	3.50757E-06	0.04	2.5
50	2.18099321	-1.44E-06	-6.60249E-07	-0.01	2.5
Upper Edge of Occupied Bandwidth					
Temperature (Deg. C)	Upper Edge (GHz)	Upper Edge Deviation (GHz)	Upper Edge (%)	PPM	Limit PPM
-30	2.19896098	-1.427E-05	-6.48947E-06	-0.06	2.5
-20	2.19894974	-3.03E-06	-1.37793E-06	-0.01	2.5
-10	2.19893494	1.177E-05	5.35256E-06	0.05	2.5
0	2.19891803	-2.868E-05	-1.30426E-05	-0.13	2.5
10	2.19893494	-1.177E-05	-5.35256E-06	-0.05	2.5
20	2.19894671	0	0	0.00	--
30	2.19894122	-5.49E-06	-2.49665E-06	-0.02	2.5
40	2.198892476	-5.4234E-05	-2.46636E-05	-0.25	2.5
50	2.19889268	-5.403E-05	-2.45709E-05	-0.25	2.5

10.4 Setup Photographs:

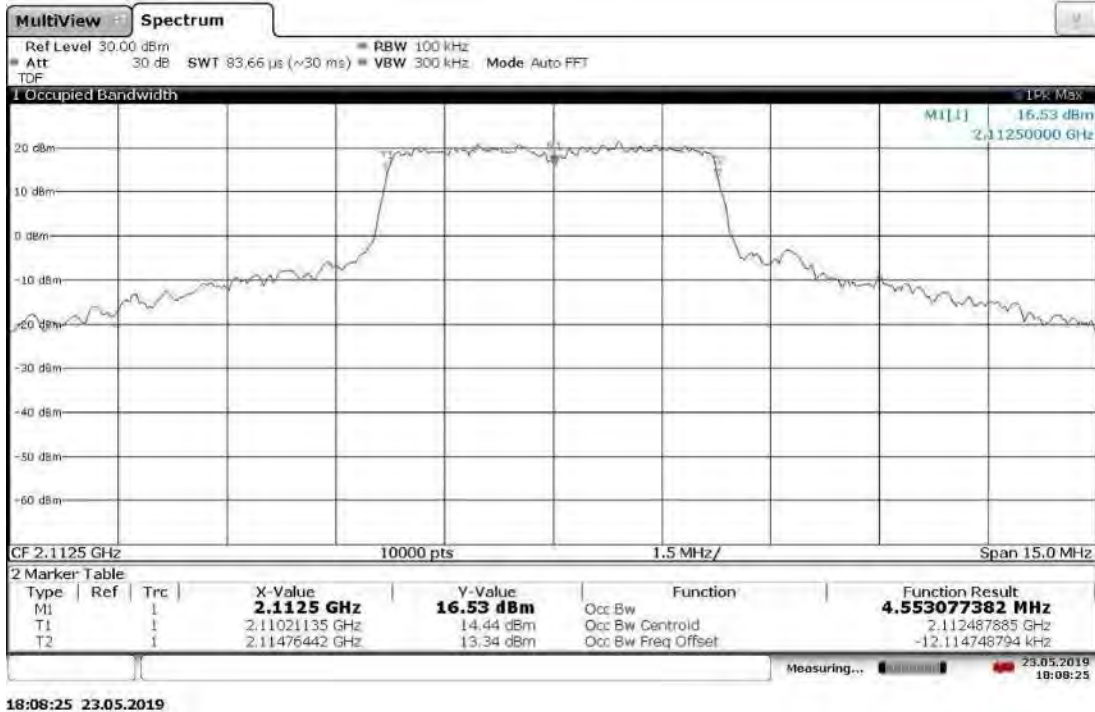


10.5 Plots/Data:

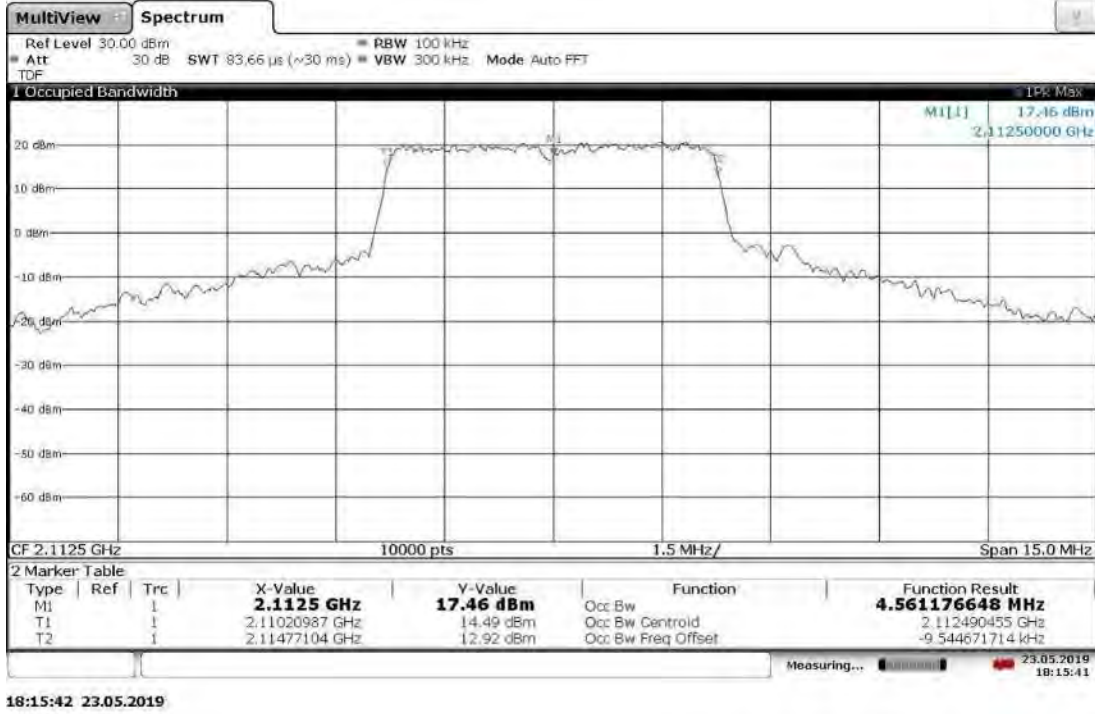
Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 5 MHz Low Channel 2112.5 MHz, 0 °C



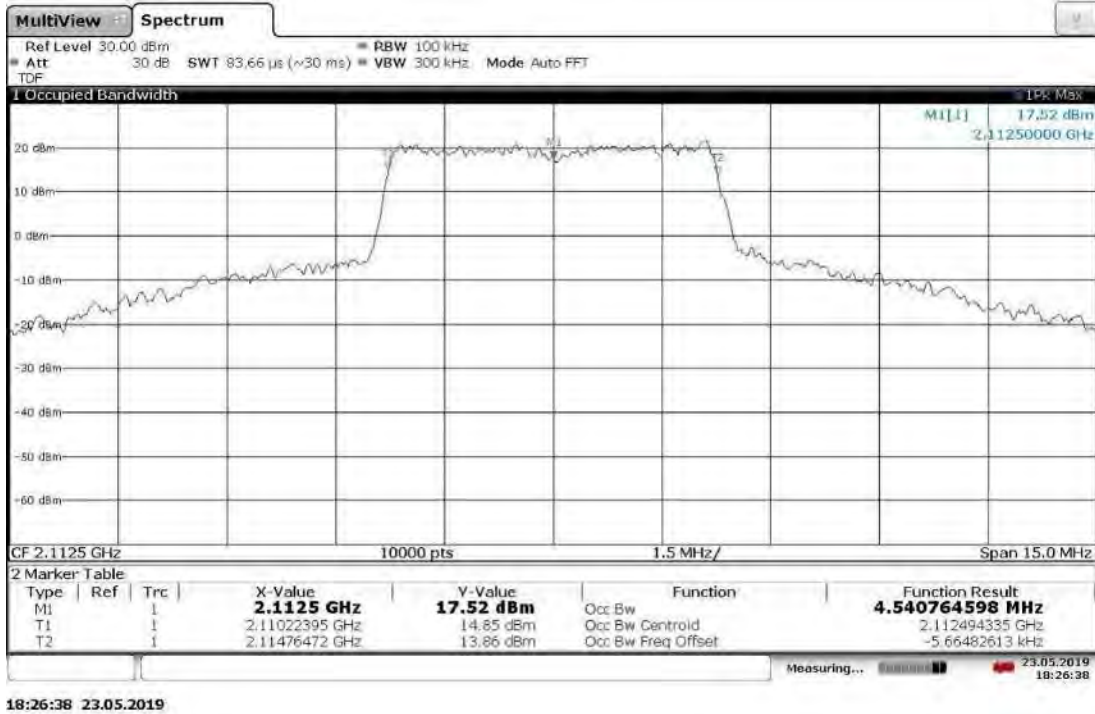
Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 5 MHz Low Channel 2112.5 MHz, -10 °C



Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 5 MHz Low Channel 2112.5 MHz, -20 °C

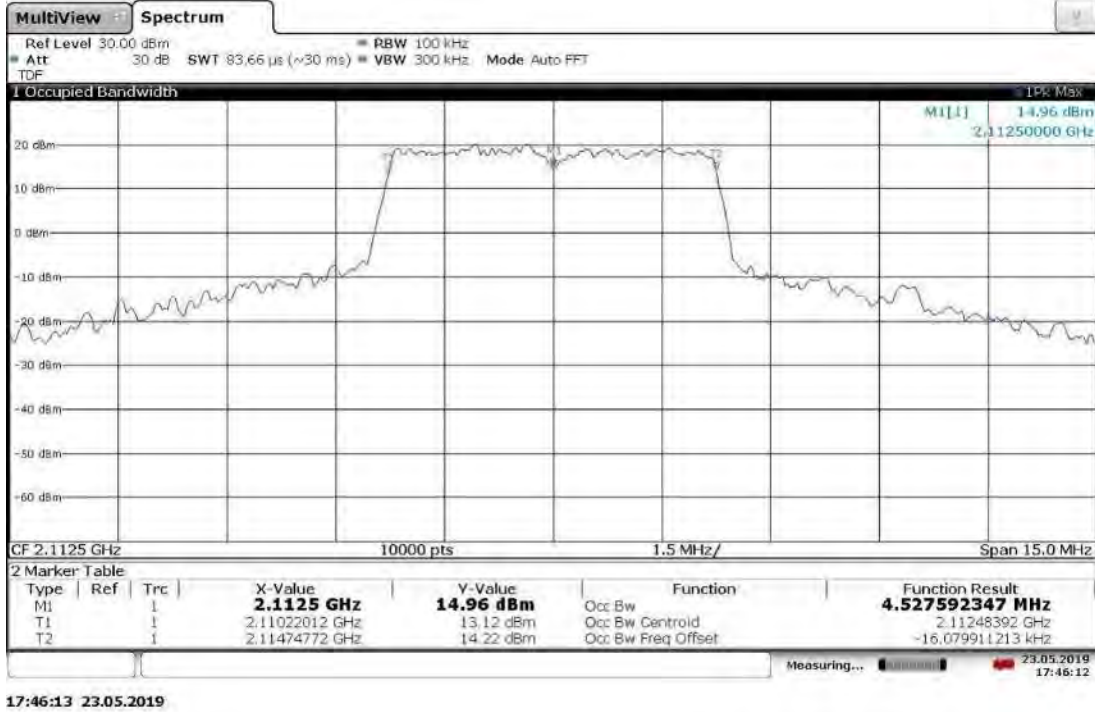


Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 5 MHz Low Channel 2112.5 MHz, -30 °C

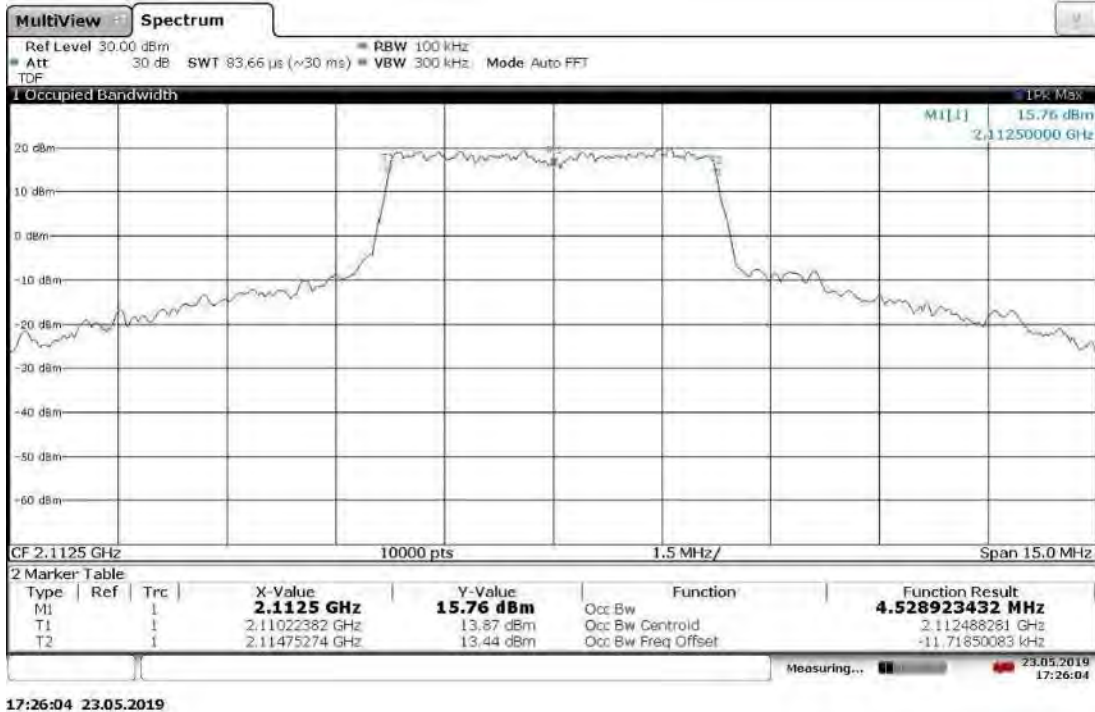




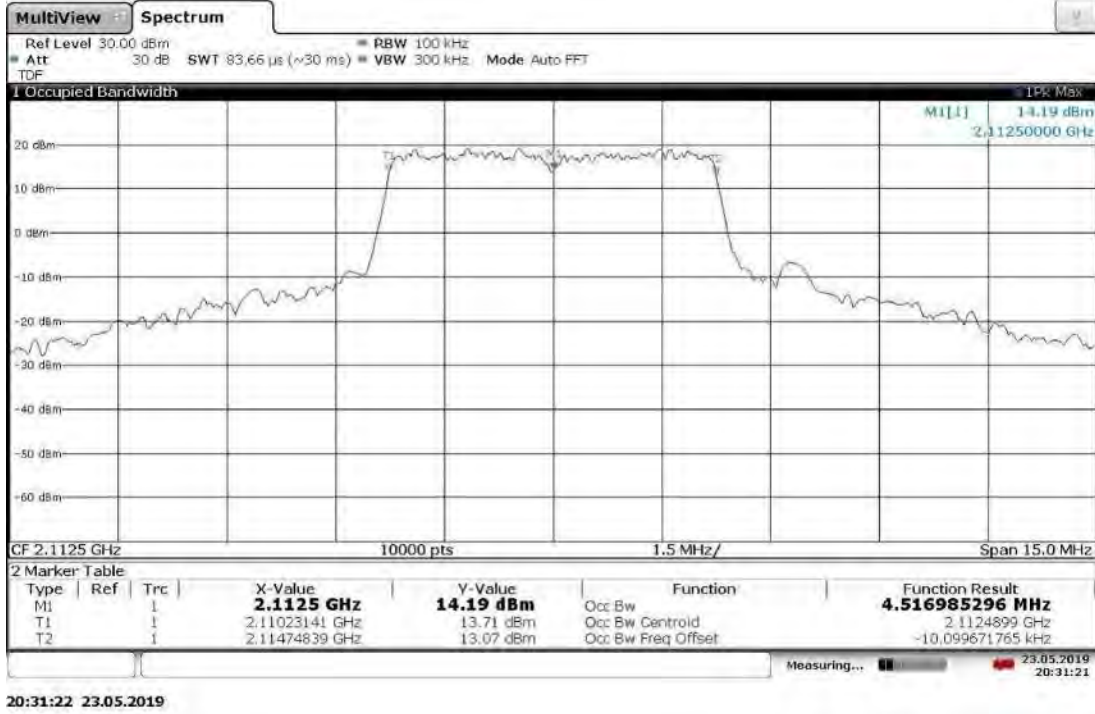
Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 5 MHz Low Channel 2112.5 MHz, 10 °C



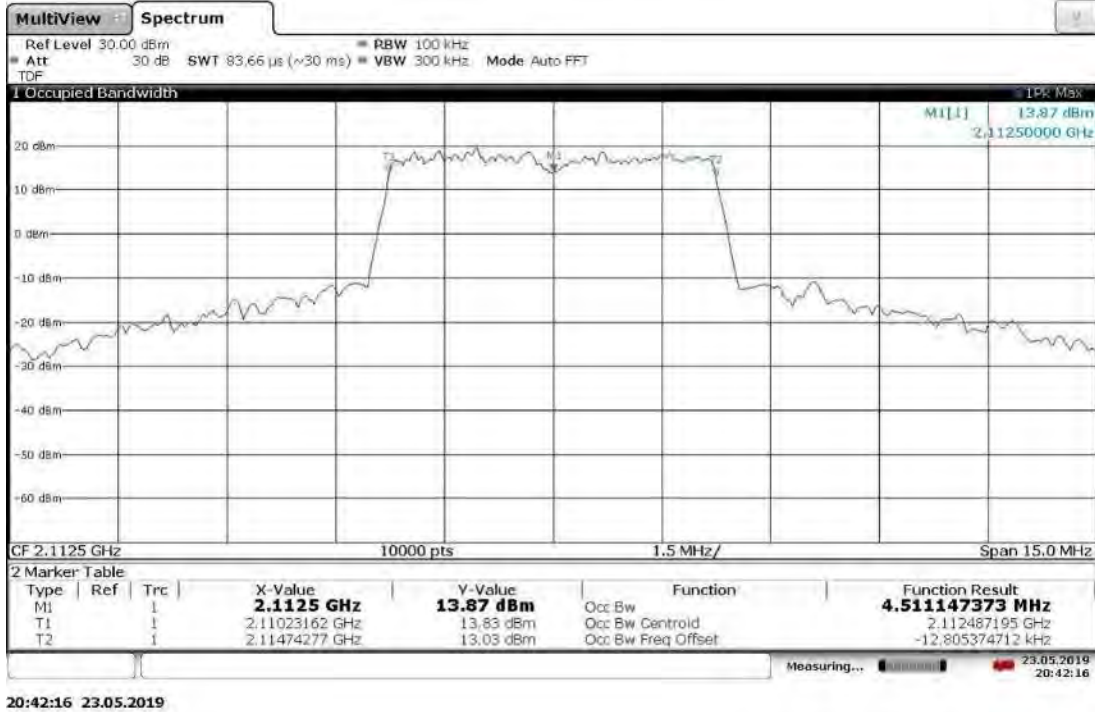
Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 5 MHz Low Channel 2112.5 MHz, 20 °C



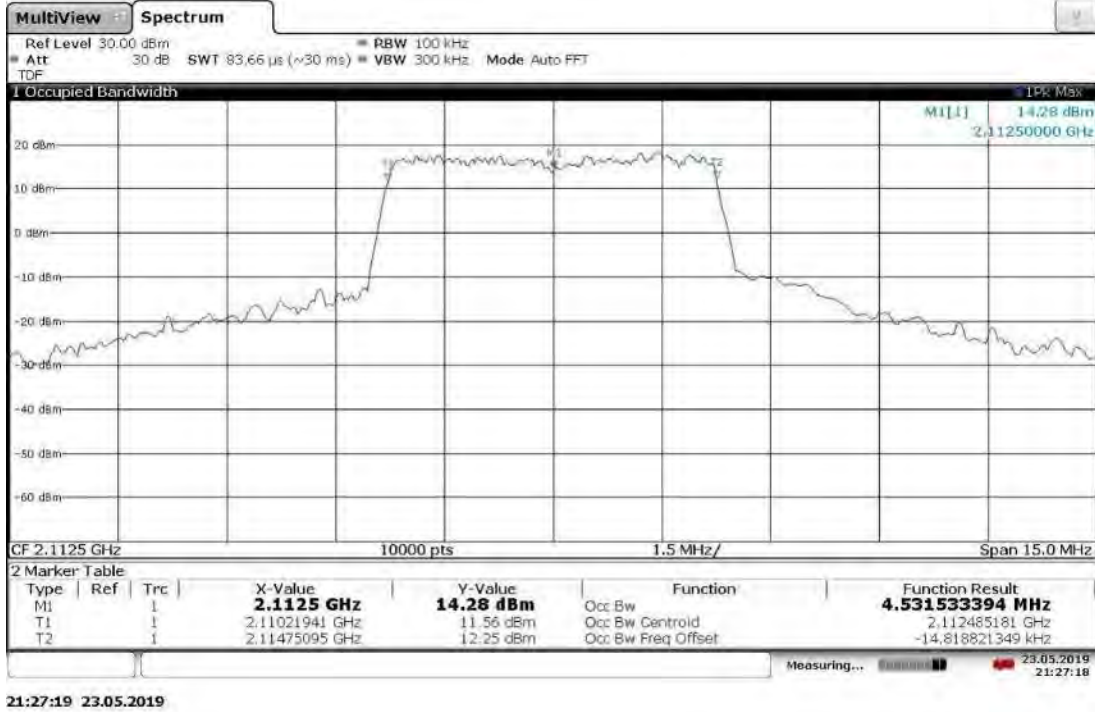
Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 5 MHz Low Channel 2112.5 MHz, 30 °C



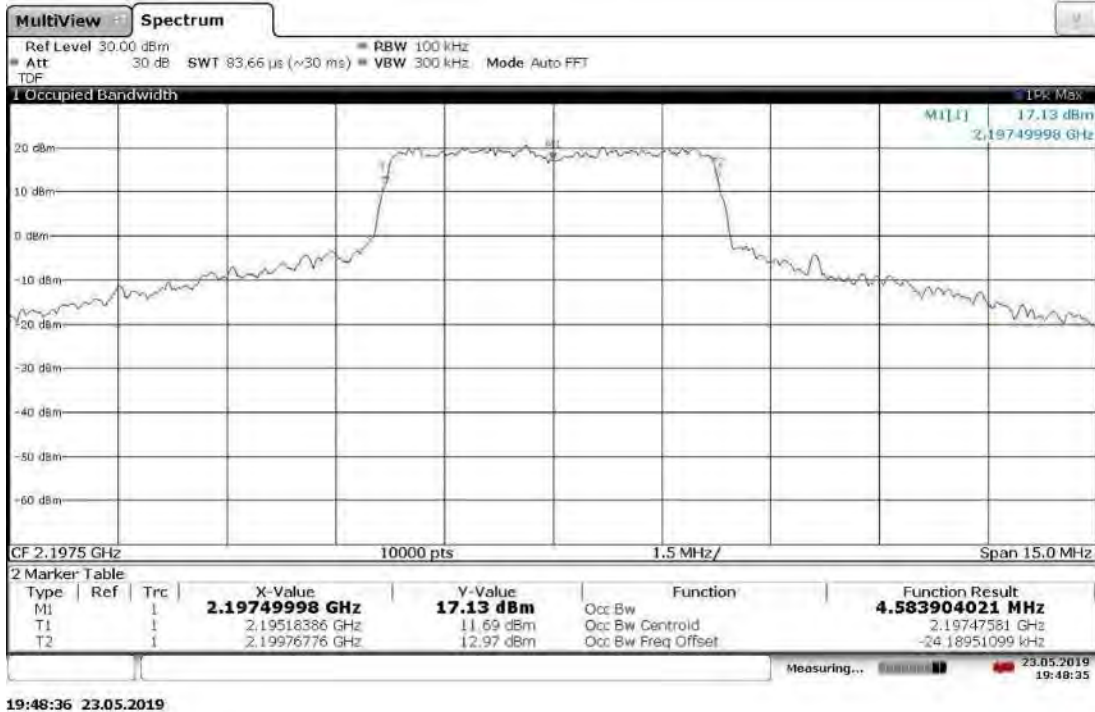
Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 5 MHz Low Chanel 2112.5 MHz, 40 °C



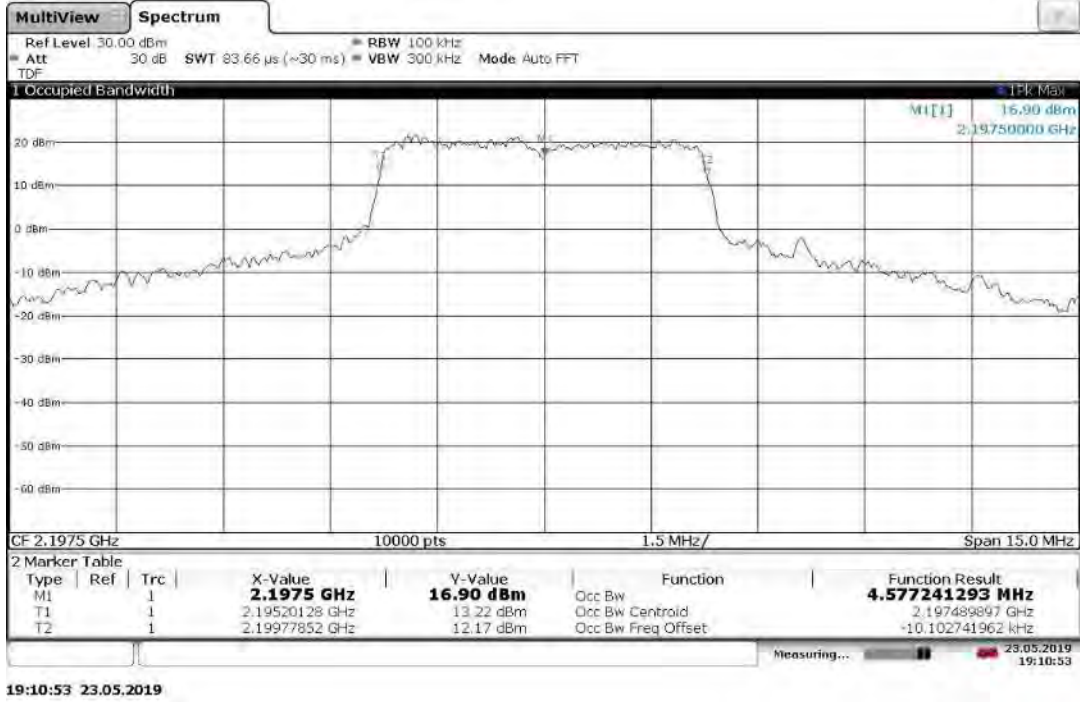
Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 5 MHz Low Channel 2112.5 MHz, 50 °C



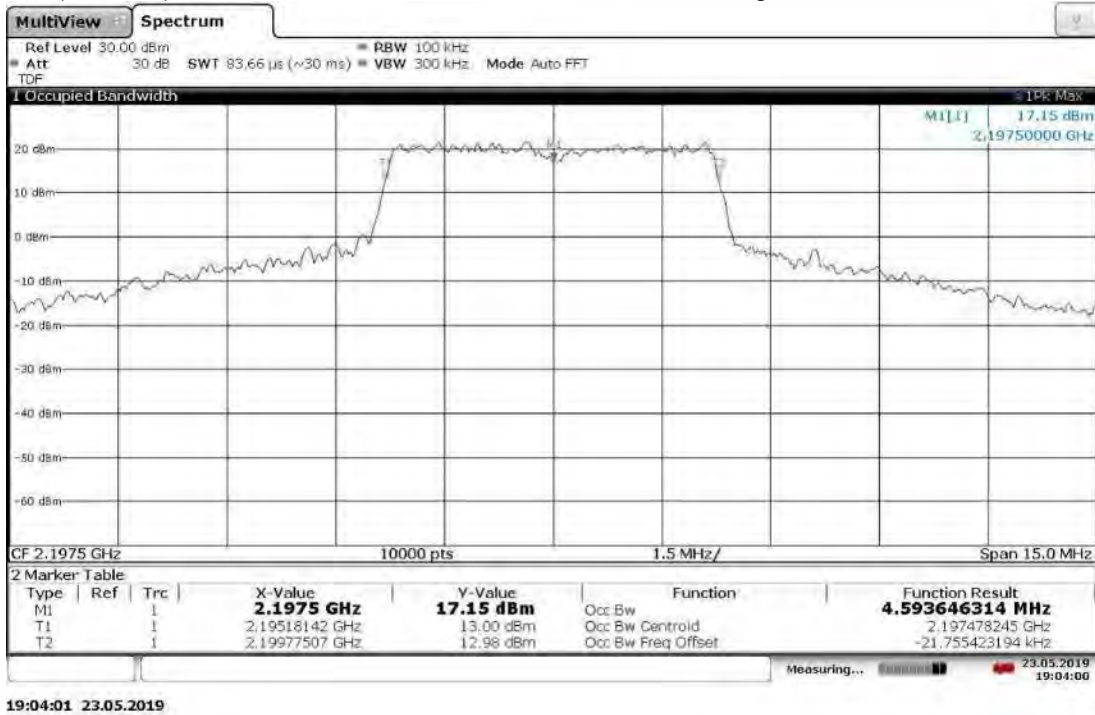
Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 5 MHz High Channel 2197.5MHz, 0 °C



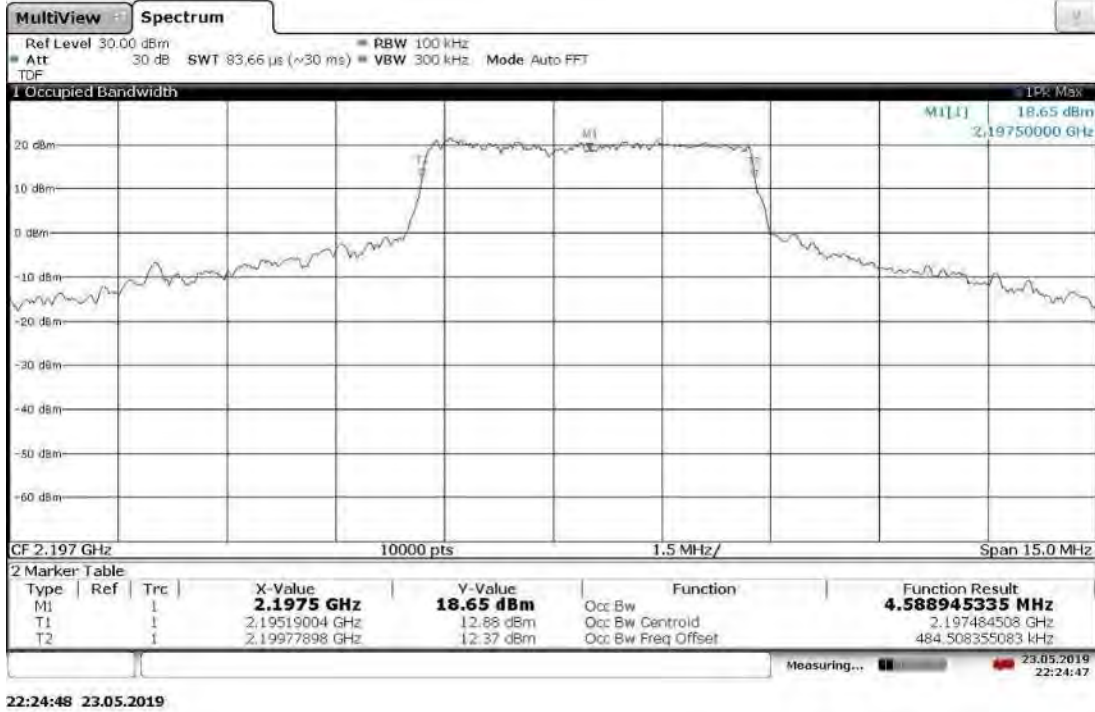
Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 5 MHz High Channel 2197.5MHz, -10 °C



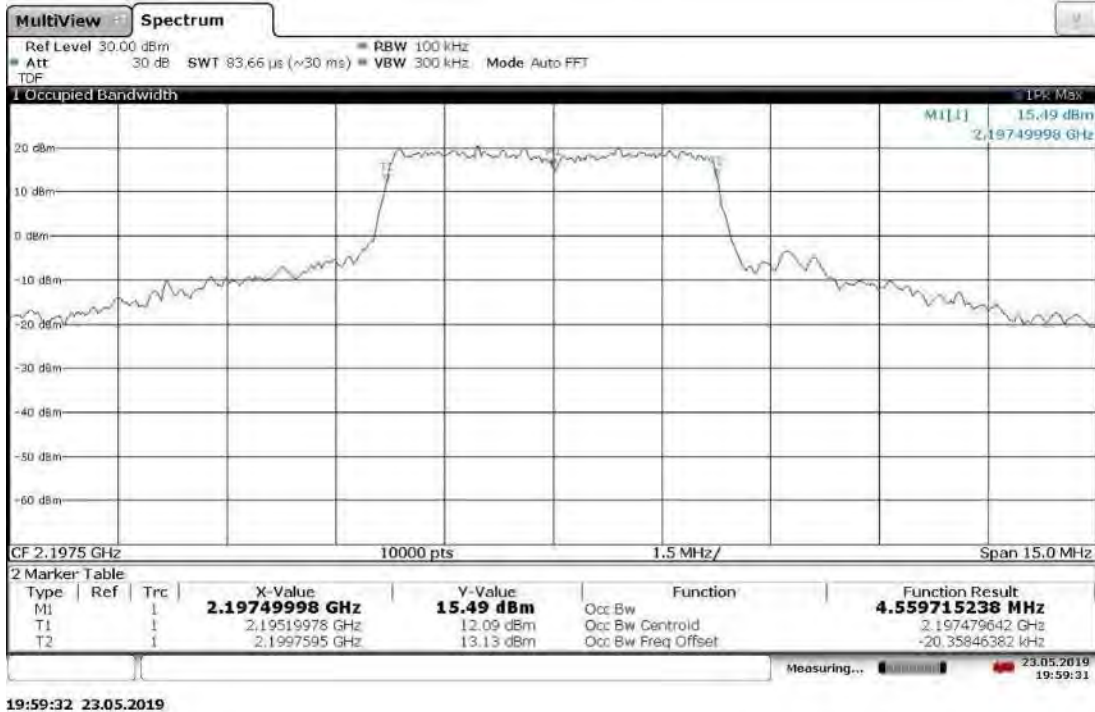
Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 5 MHz High Channel 2197.5MHz, -20 °C



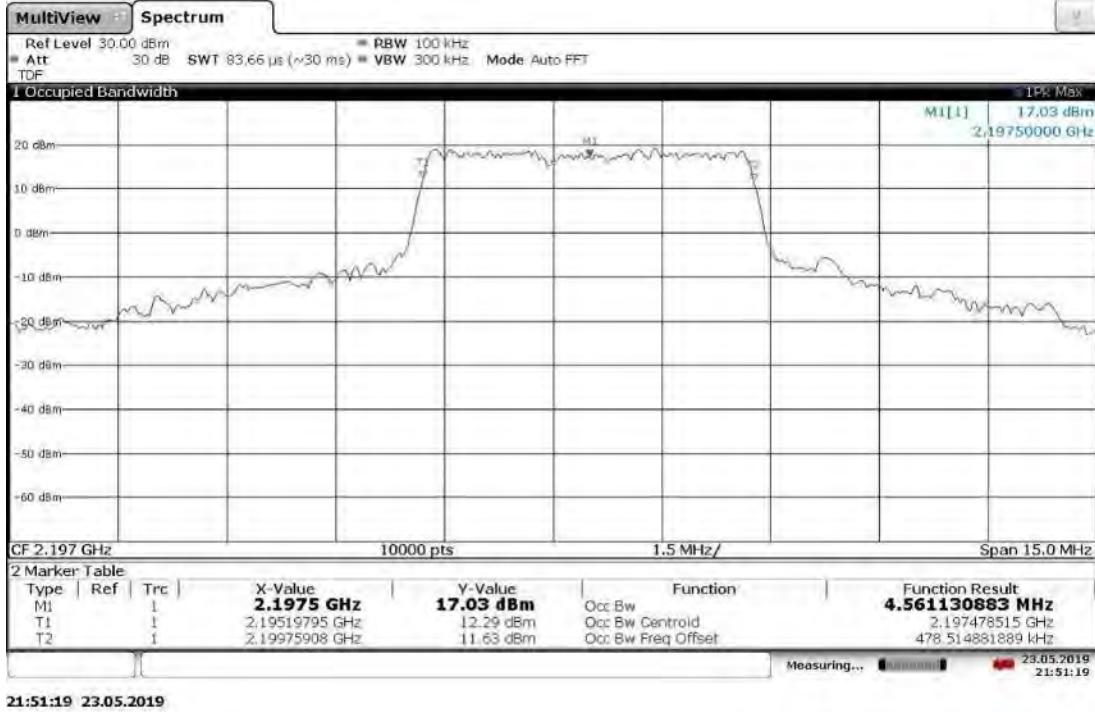
Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 5 MHz High Channel 2197.5MHz, -30 °C



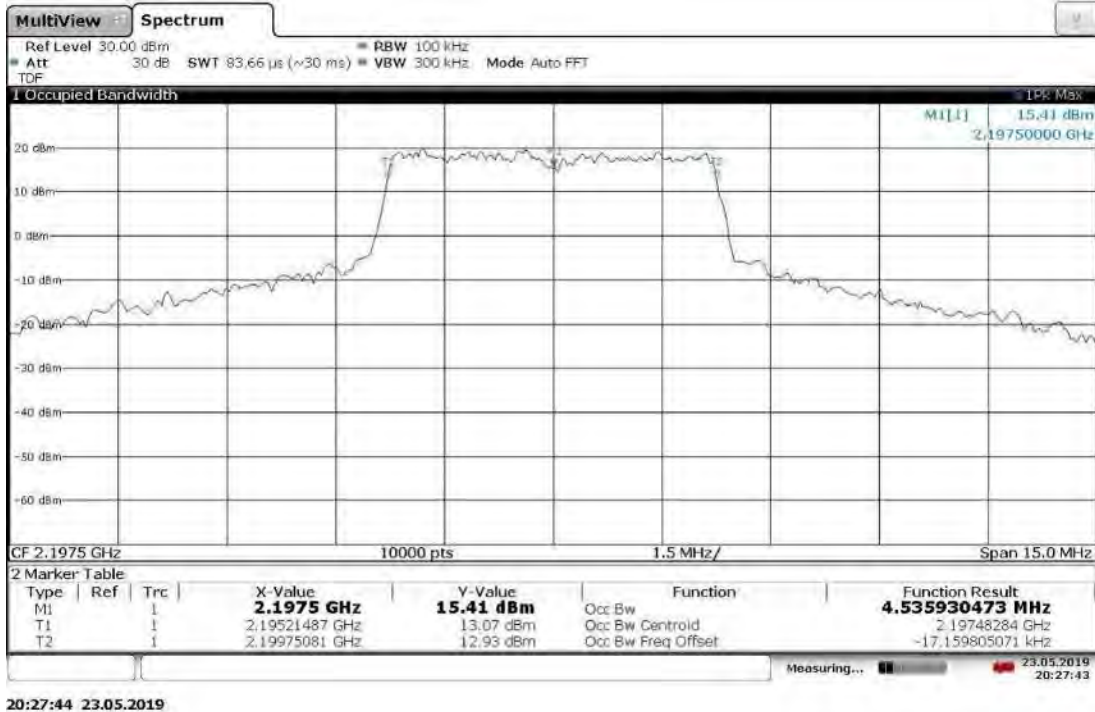
Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 5 MHz High Channel 2197.5MHz, 10 °C



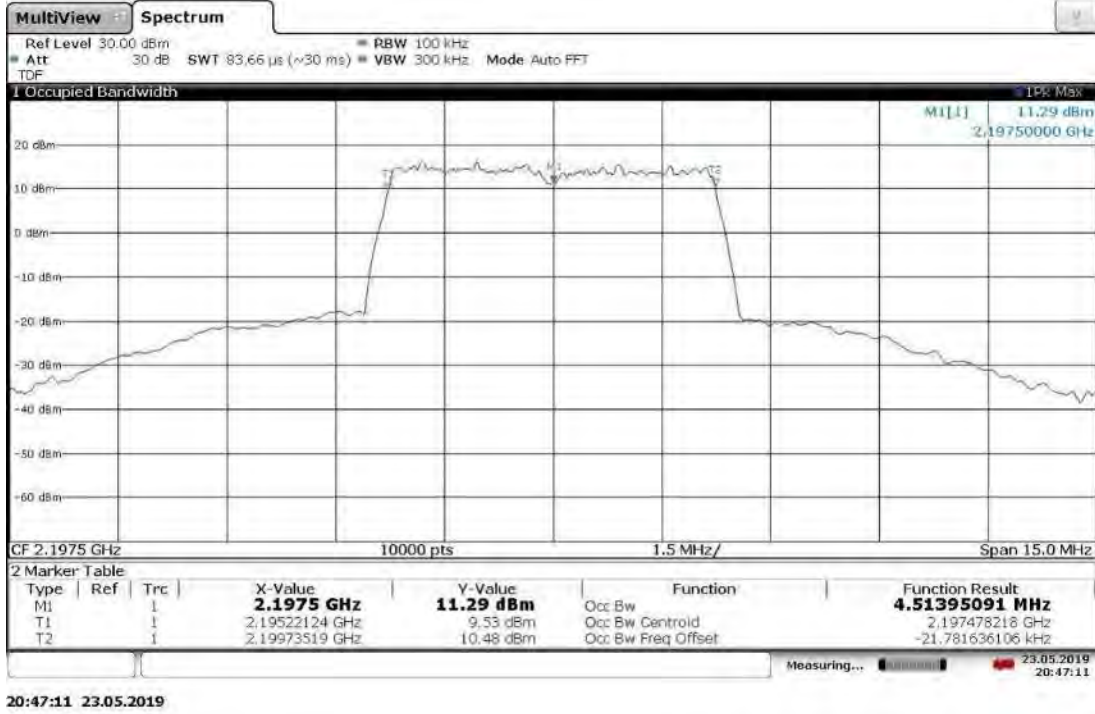
Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 5 MHz High Channel 2197.5MHz, 20 °C



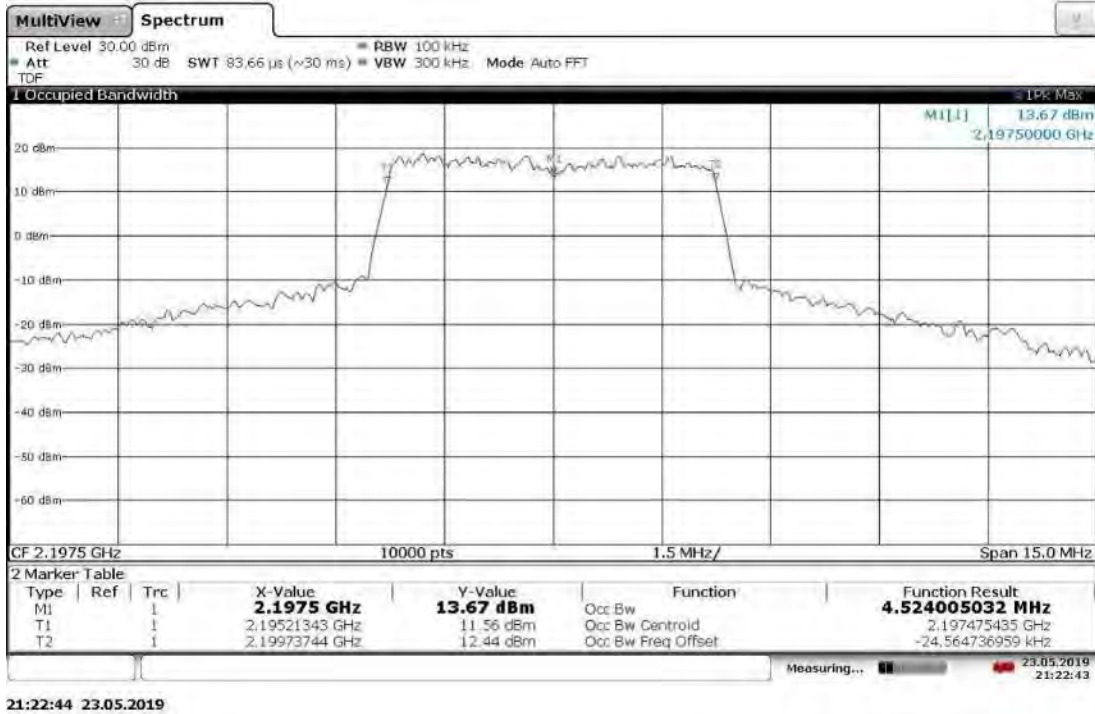
Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 5 MHz High Channel 2197.5MHz, 30 °C



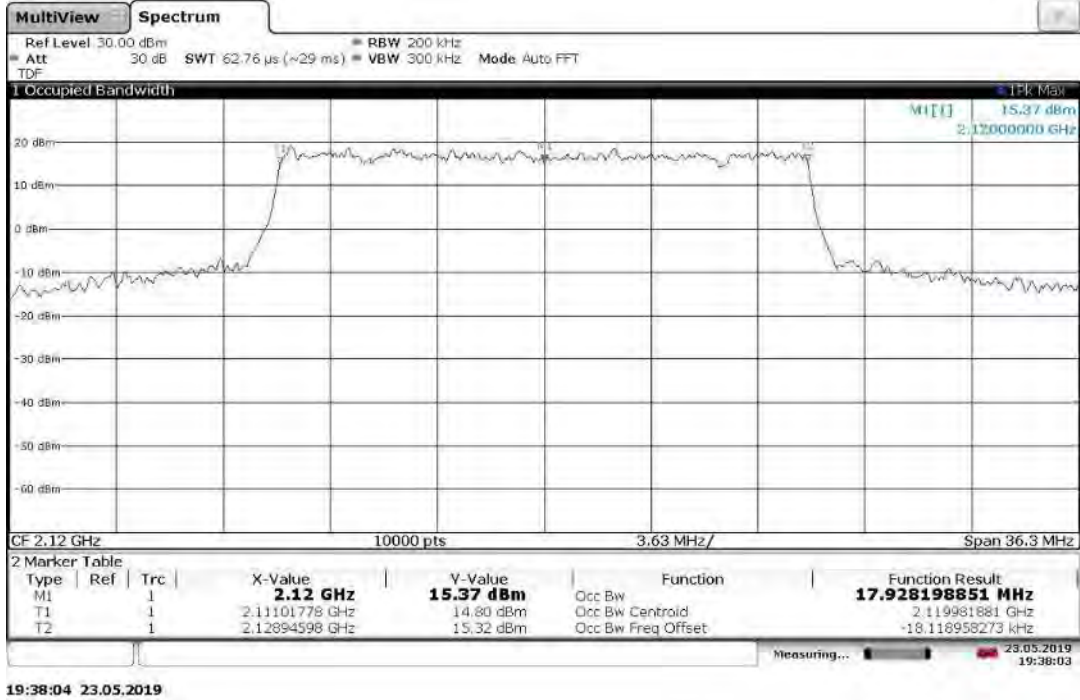
Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 5 MHz High Channel 2197.5MHz, 40 °C



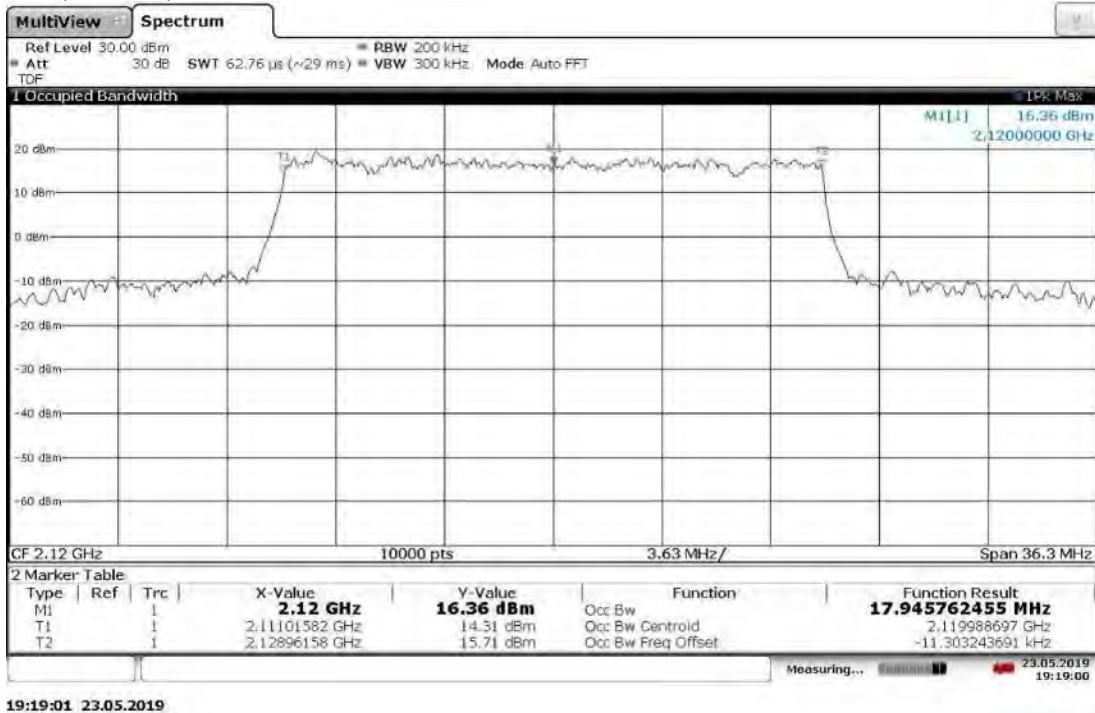
Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 5 MHz High Channel 2197.5MHz, 50 °C



Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 20 MHz Low Channel 2120 MHz, 0 °C

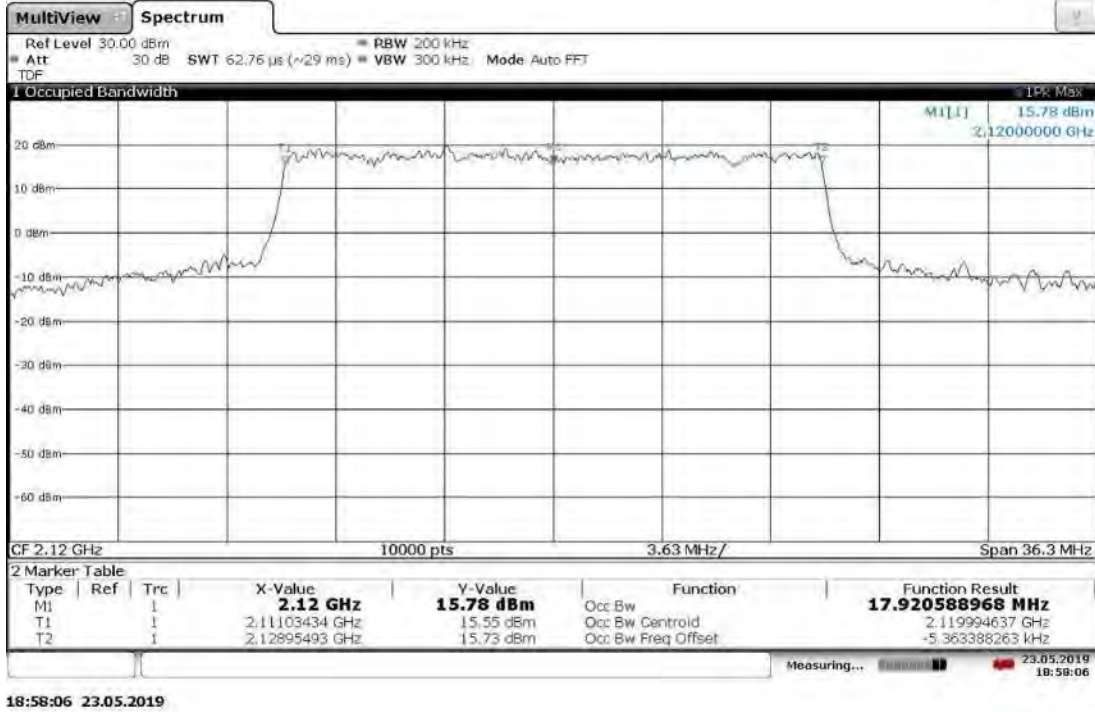


Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 20 MHz Low Channel 2120 MHz, -10 °C

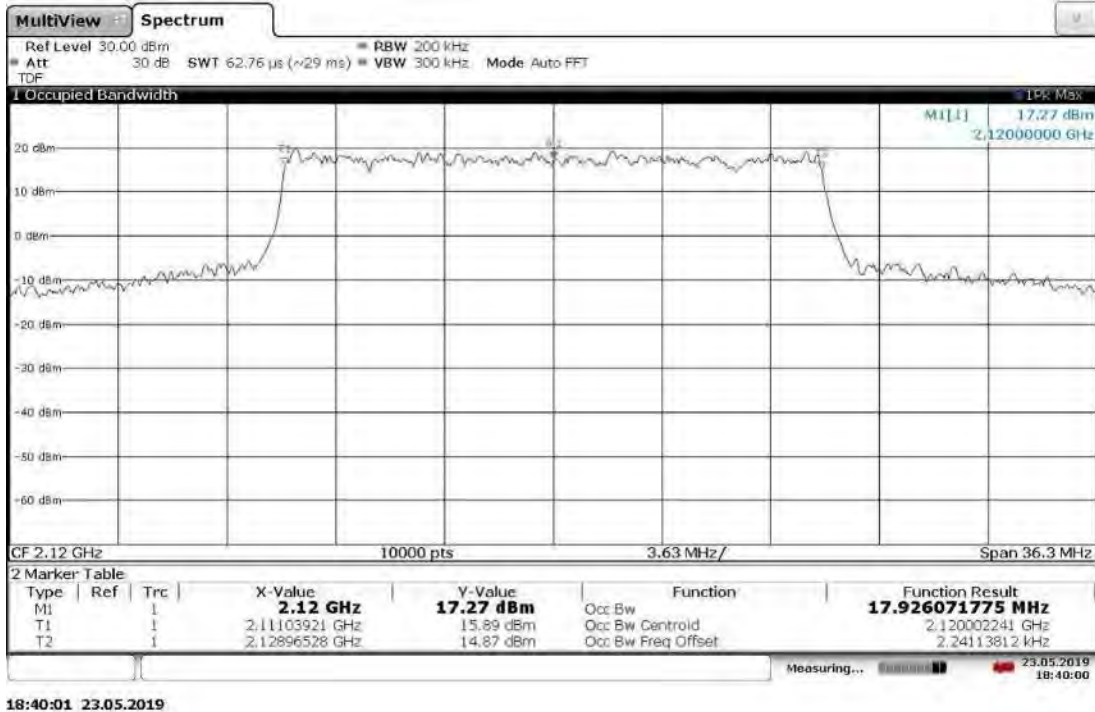




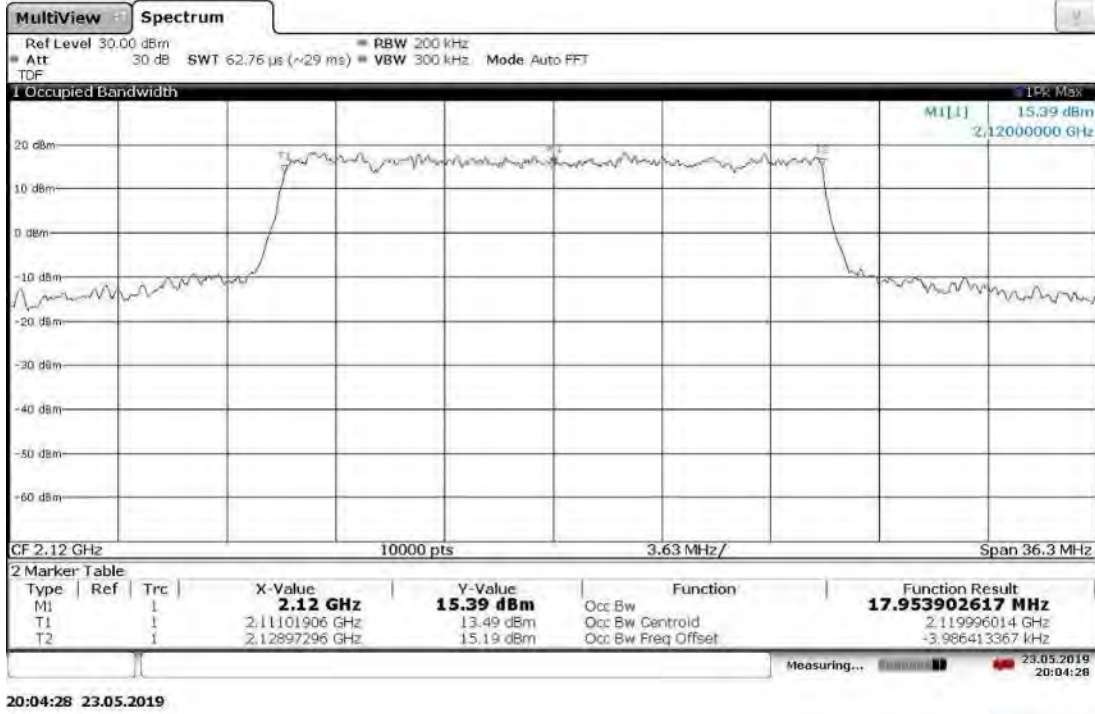
Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 20 MHz Low Channel 2120 MHz, -20 °C



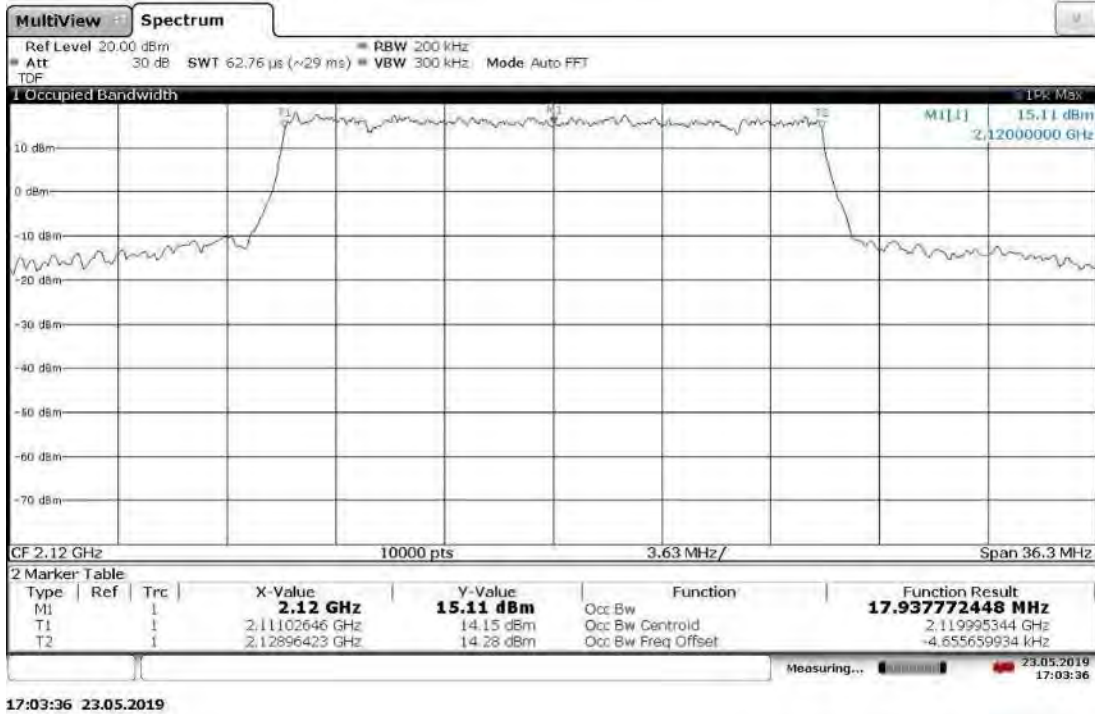
Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 20 MHz Low Channel 2120 MHz, -30 °C



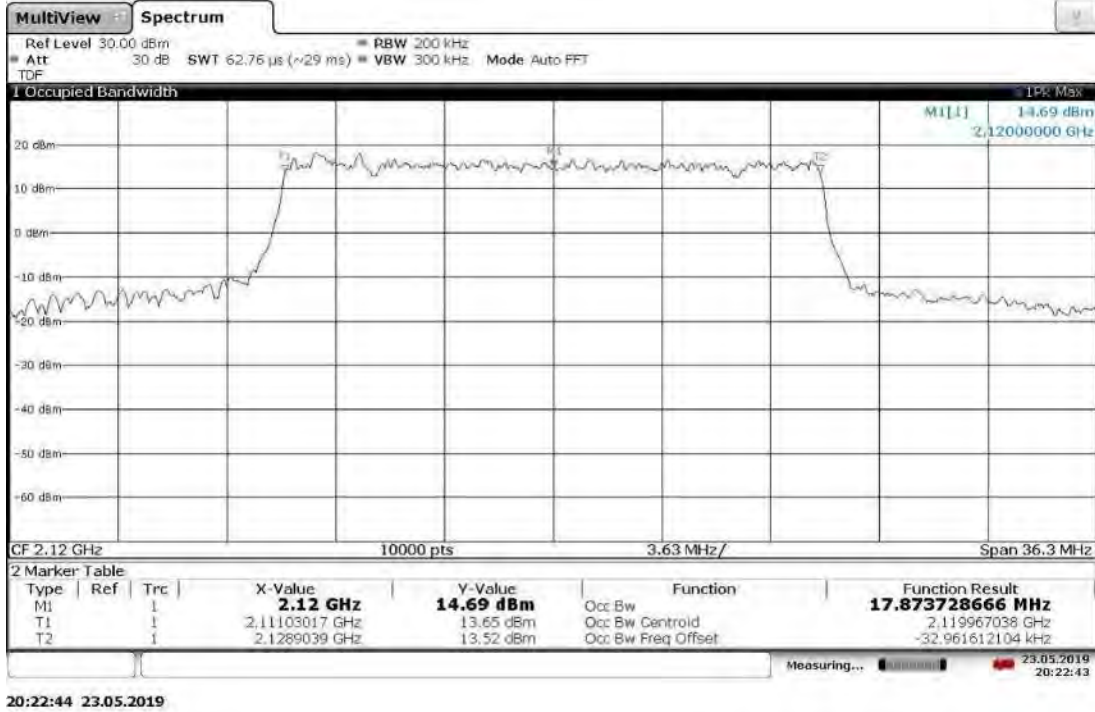
Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 20 MHz Low Channel 2120 MHz, 10 °C



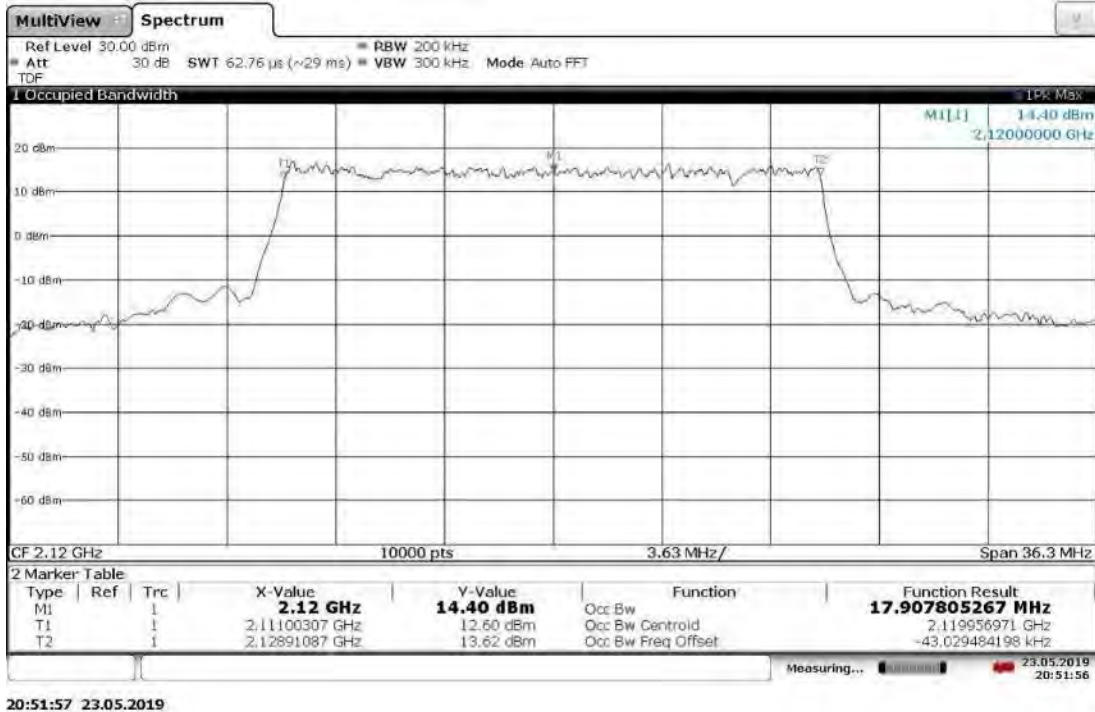
Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 20 MHz Low Channel 2120 MHz, 20 °C



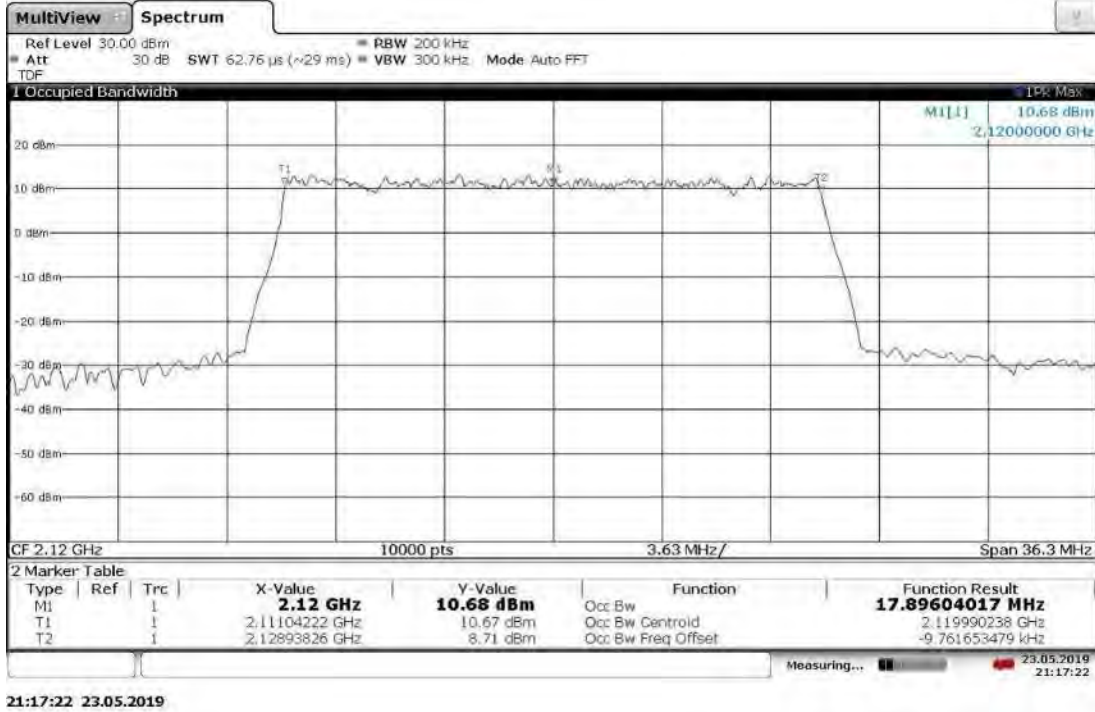
Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 20 MHz Low Channel 2120 MHz, 30 °C



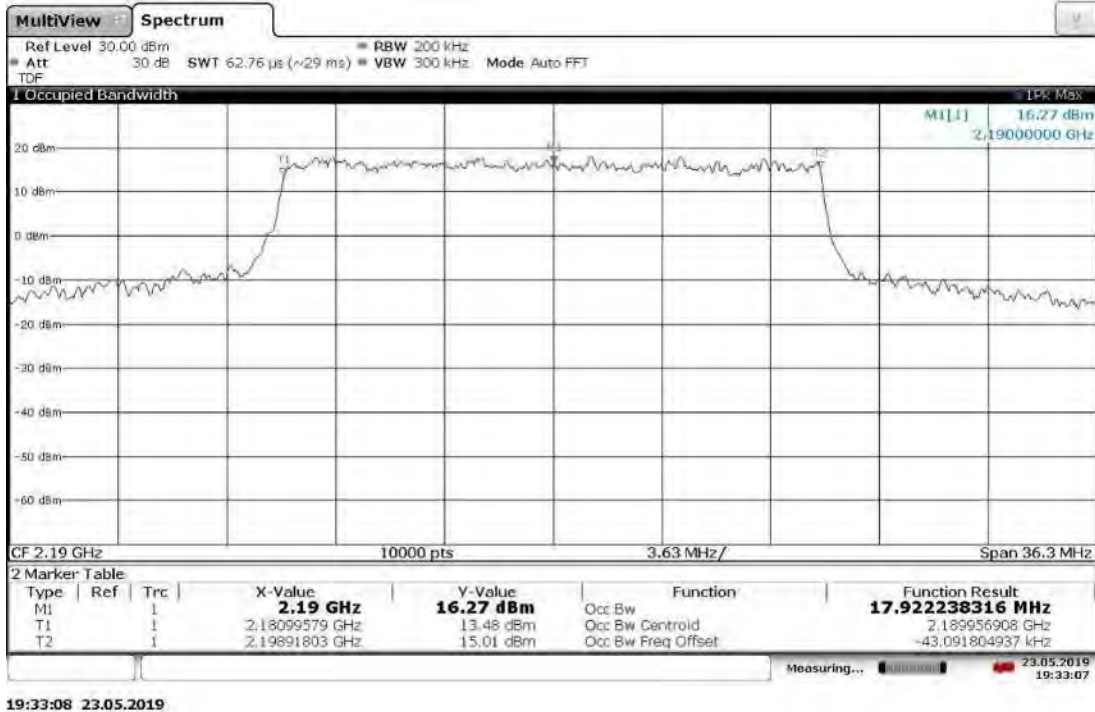
Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 20 MHz Low Channel 2120 MHz, 40 °C



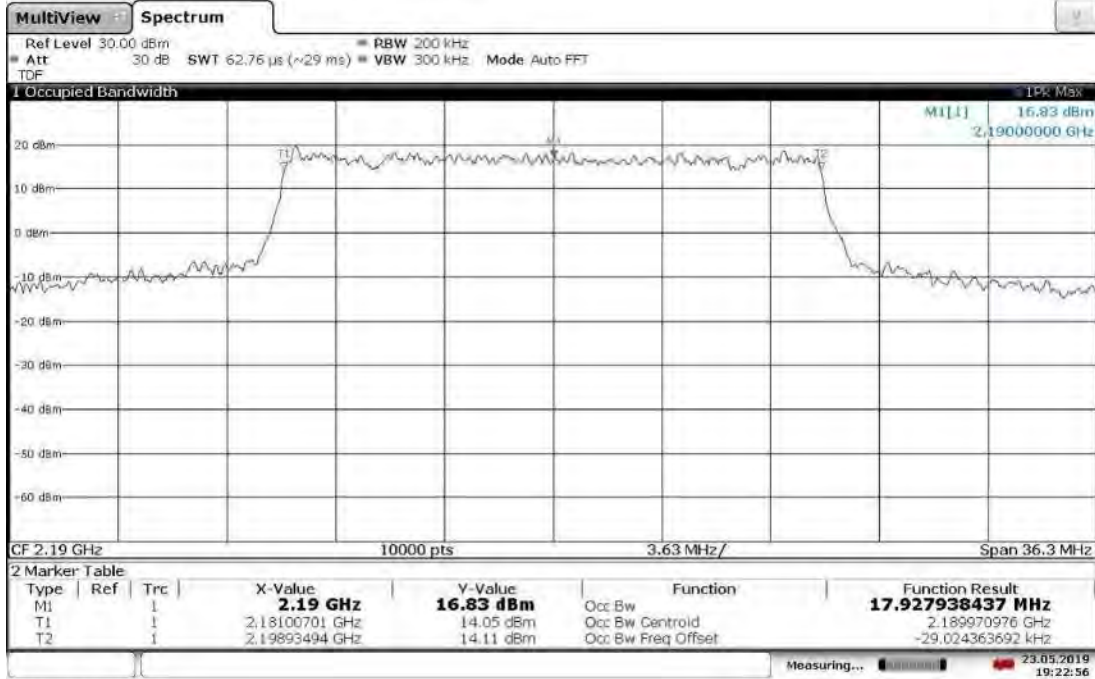
Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 20 MHz Low Channel 2120 MHz, 50 °C



Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 20 MHz High Channel 2190 MHz, 0 °C

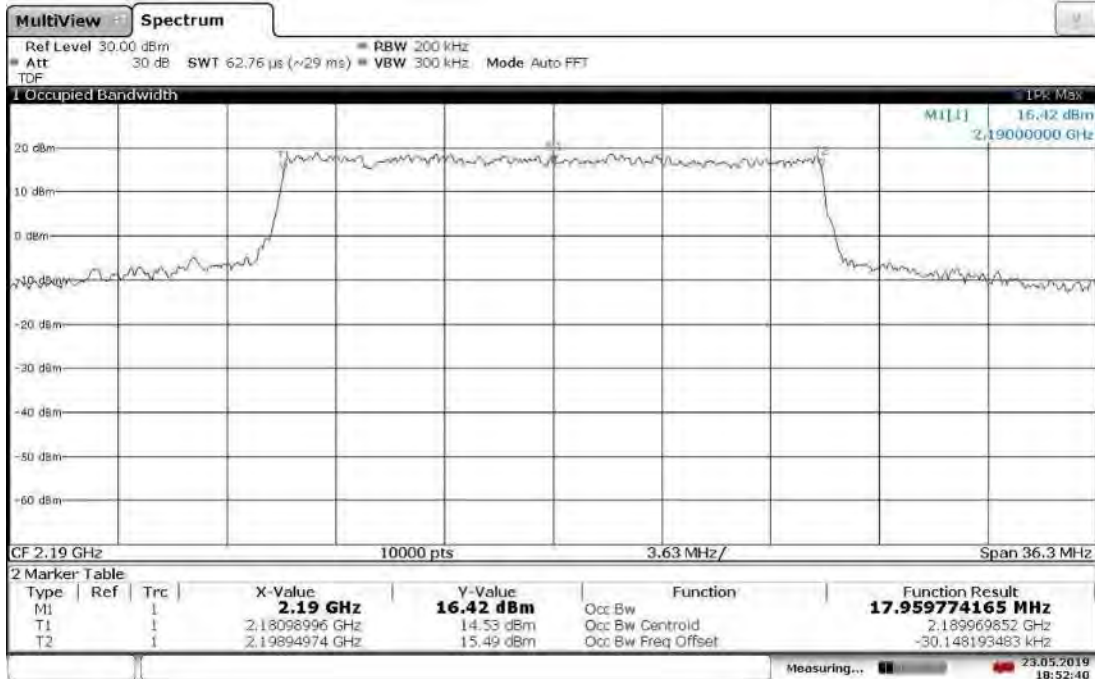


Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 20 MHz High Channel 2190 MHz, -10 °C



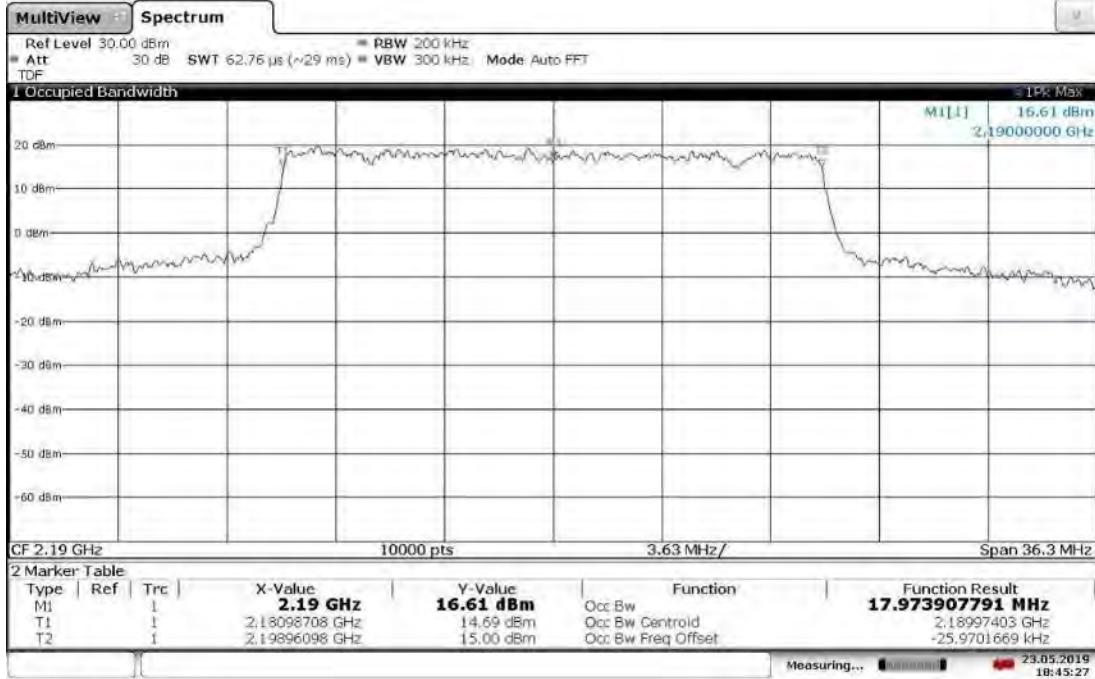
19:22:56 23.05.2019

Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 20 MHz High Channel 2190 MHz, -20 °C



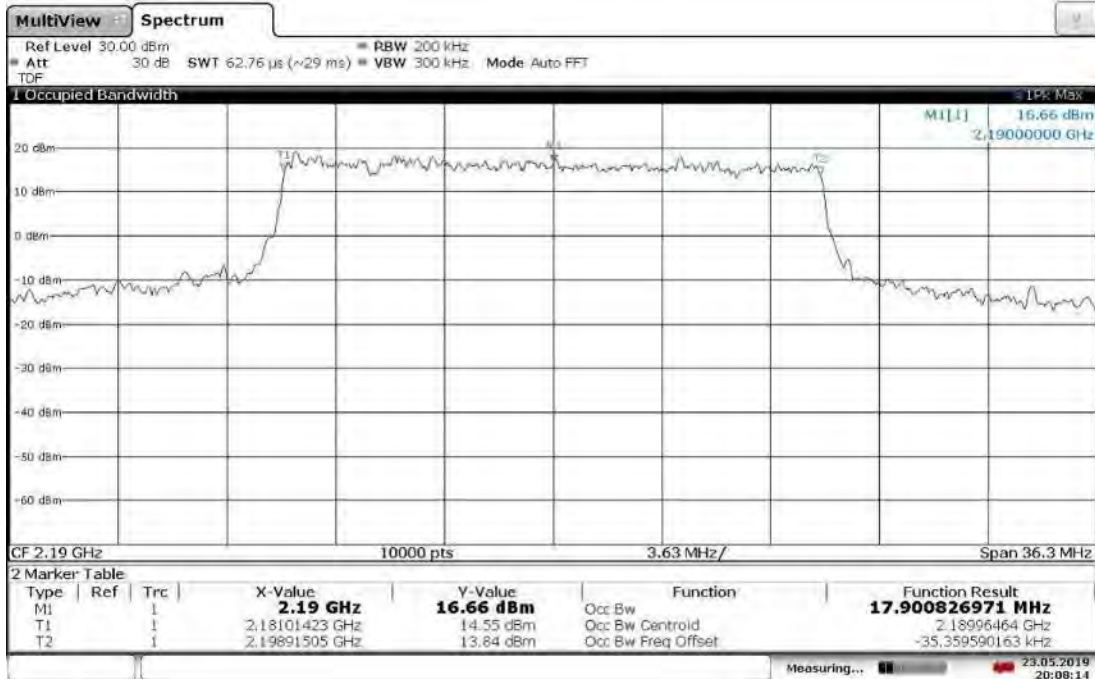
18:52:40 23.05.2019

Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 20 MHz High Channel 2190 MHz, -30 °C



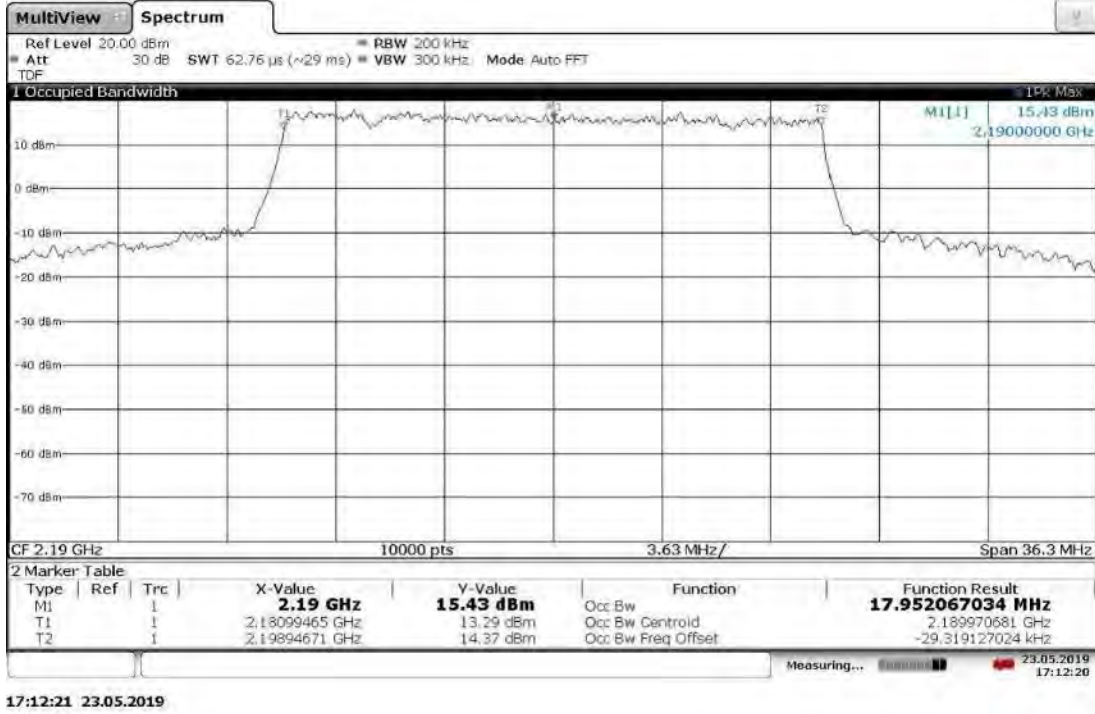
18:45:28 23.05.2019

Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 20 MHz High Channel 2190 MHz, 10 °C

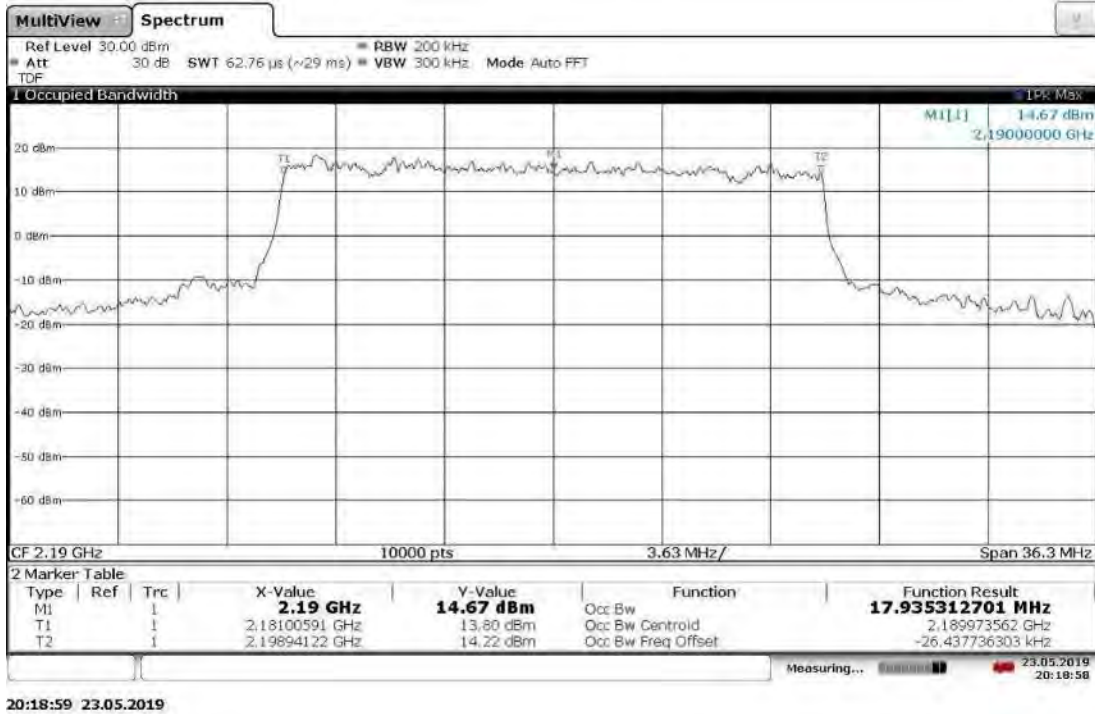


20:08:14 23.05.2019

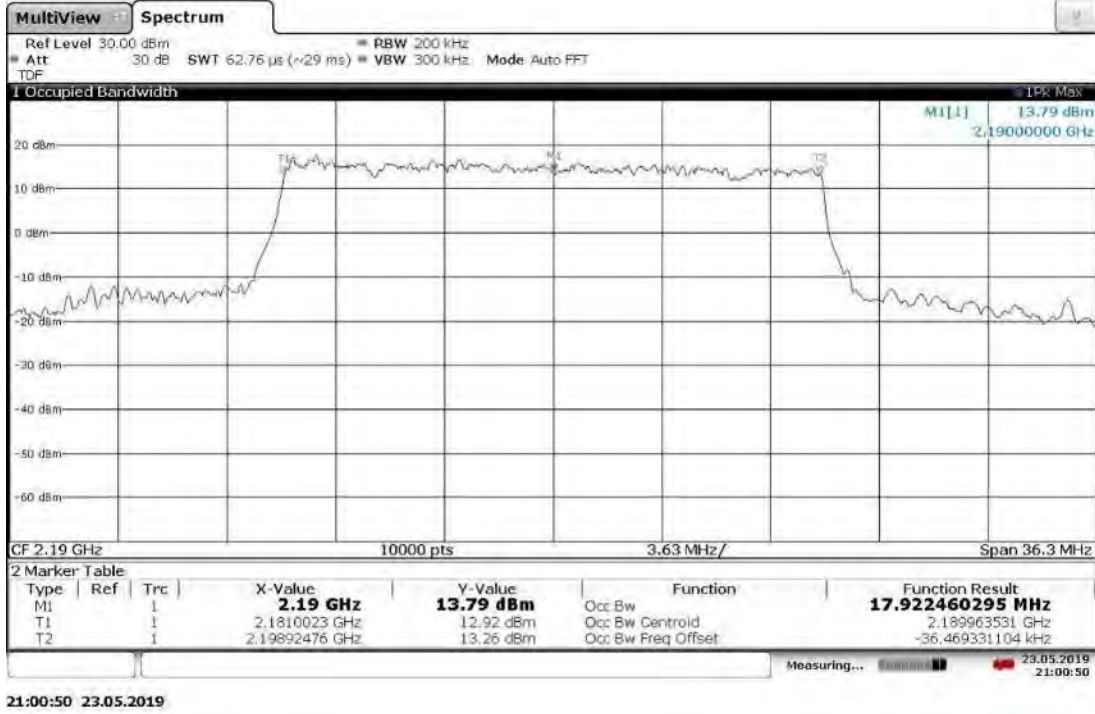
Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 20 MHz High Channel 2190 MHz, 20 °C



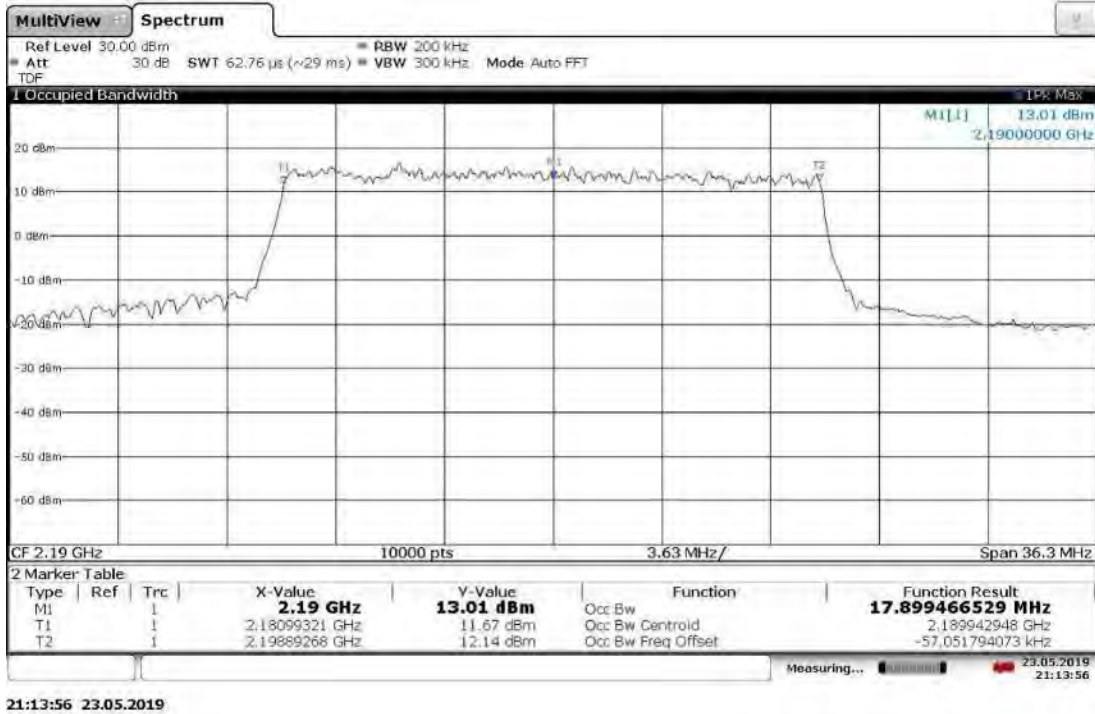
Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 20 MHz High Channel 2190 MHz, 30 °C



Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 20 MHz High Channel 2190 MHz, 40 °C

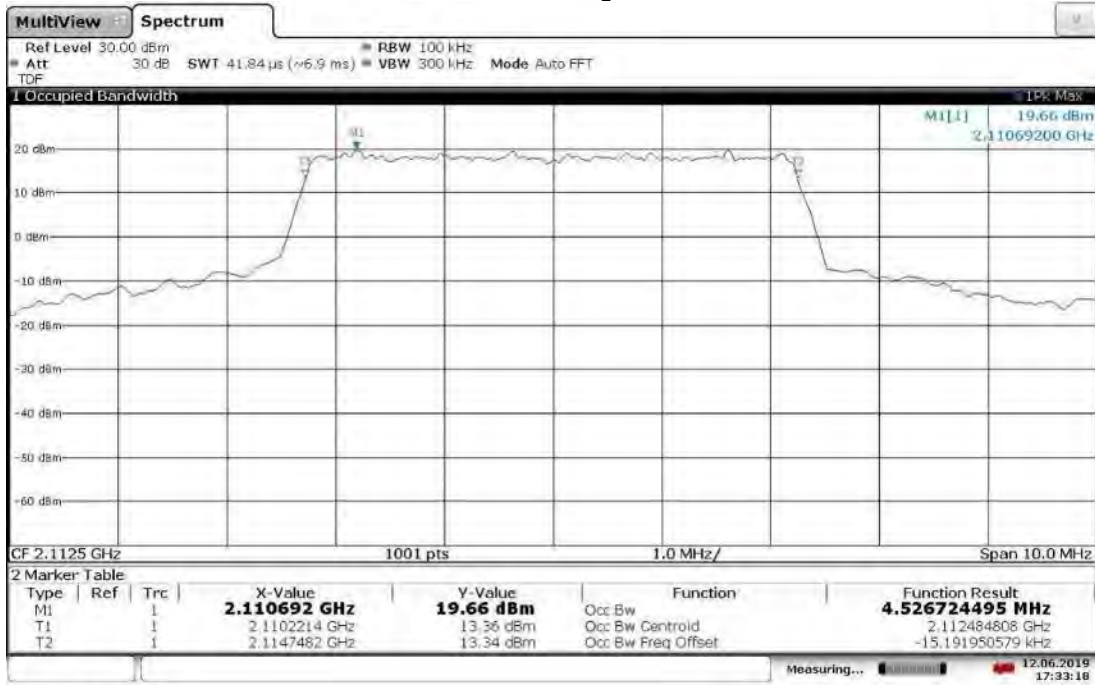


Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 20 MHz High Channel 2190 MHz, 50 °C



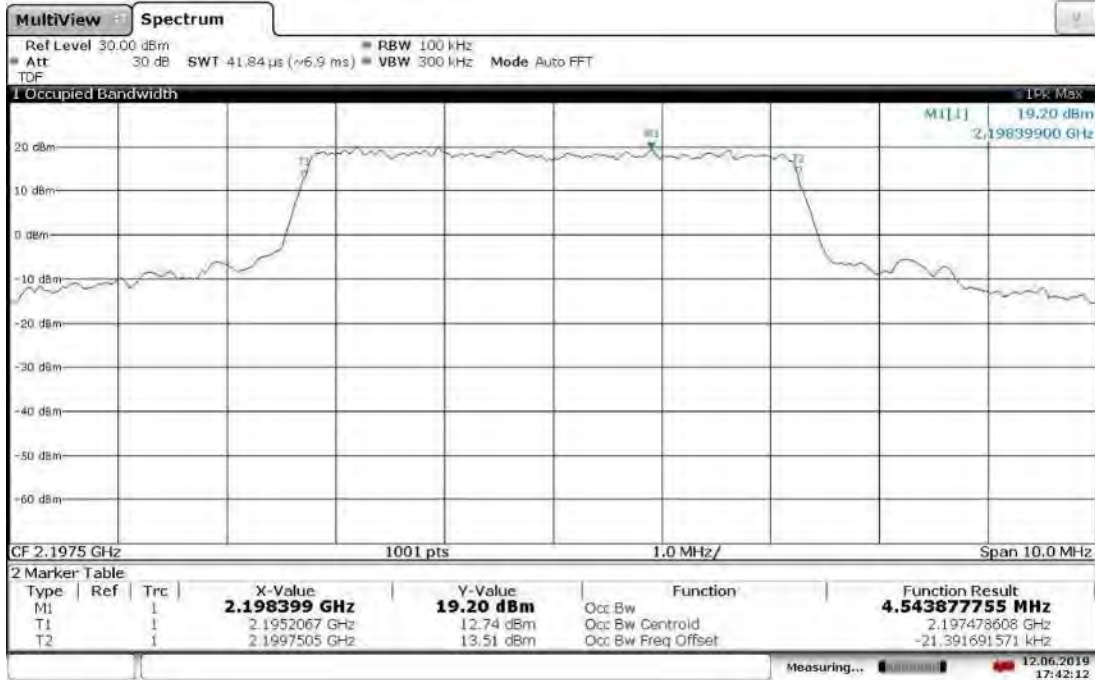


Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 5 MHz, Low Channel,  
Lower Extreme Voltage: 41.1VDC



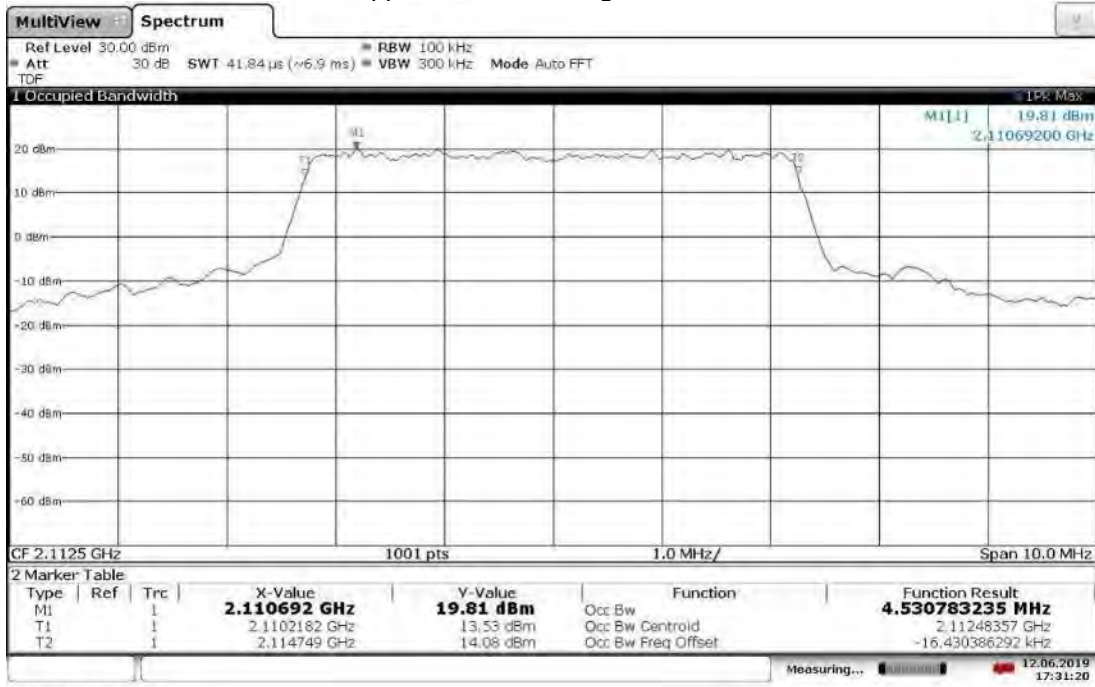
17:33:18 12.06.2019

Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 5 MHz, High Channel,  
Lower Extreme Voltage: 41.1VDC



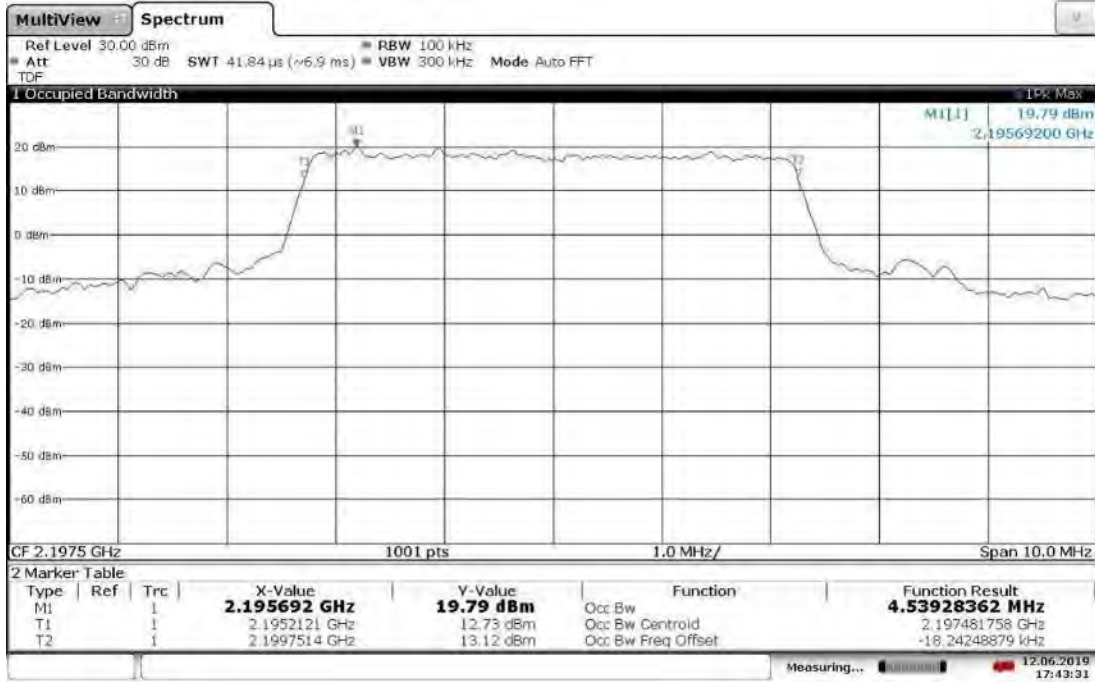
17:42:13 12.06.2019

Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 5 MHz, Low Channel,  
Upper Extreme Voltage: 57.0VDC



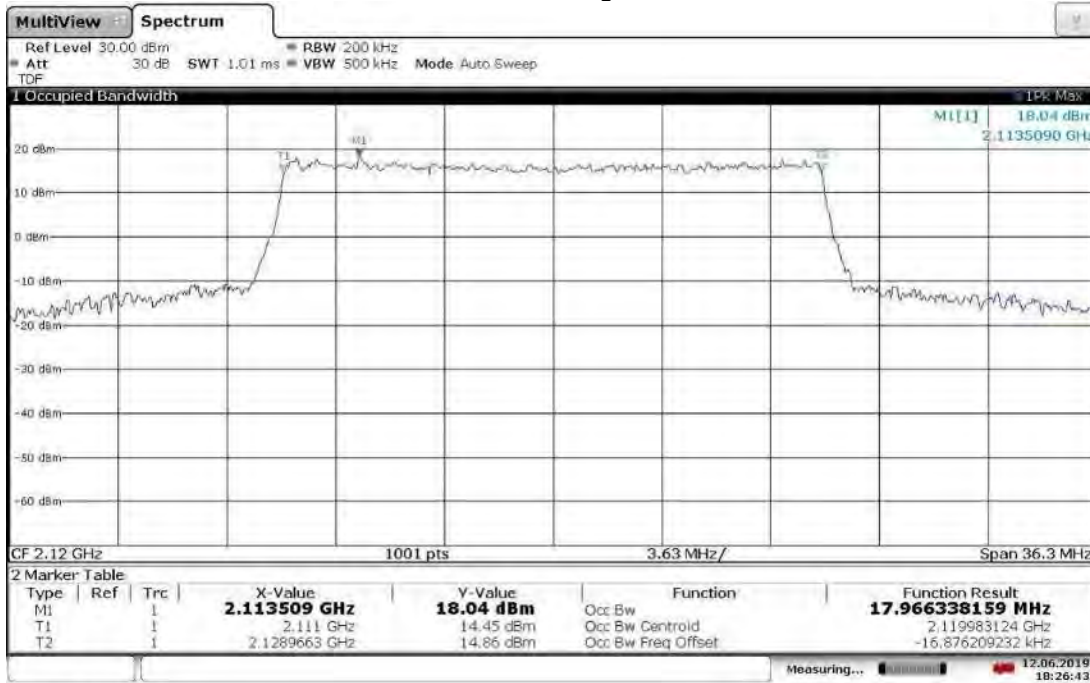
17:31:21 12.06.2019

Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 5 MHz, High Channel,  
Upper Extreme Voltage: 57.0VDC



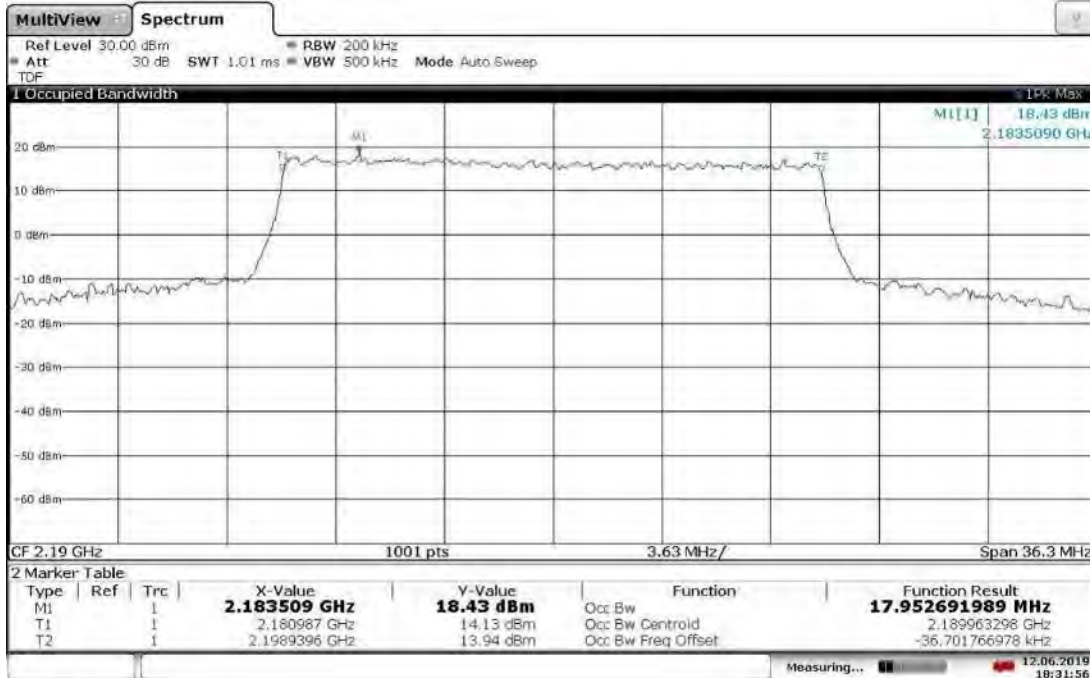
17:43:31 12.06.2019

Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 20 MHz, Low Channel,  
Lower Extreme Voltage: 41.4VDC



18:26:44 12.06.2019

Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 5 MHz, High Channel,  
Lower Extreme Voltage: 41.4VDC



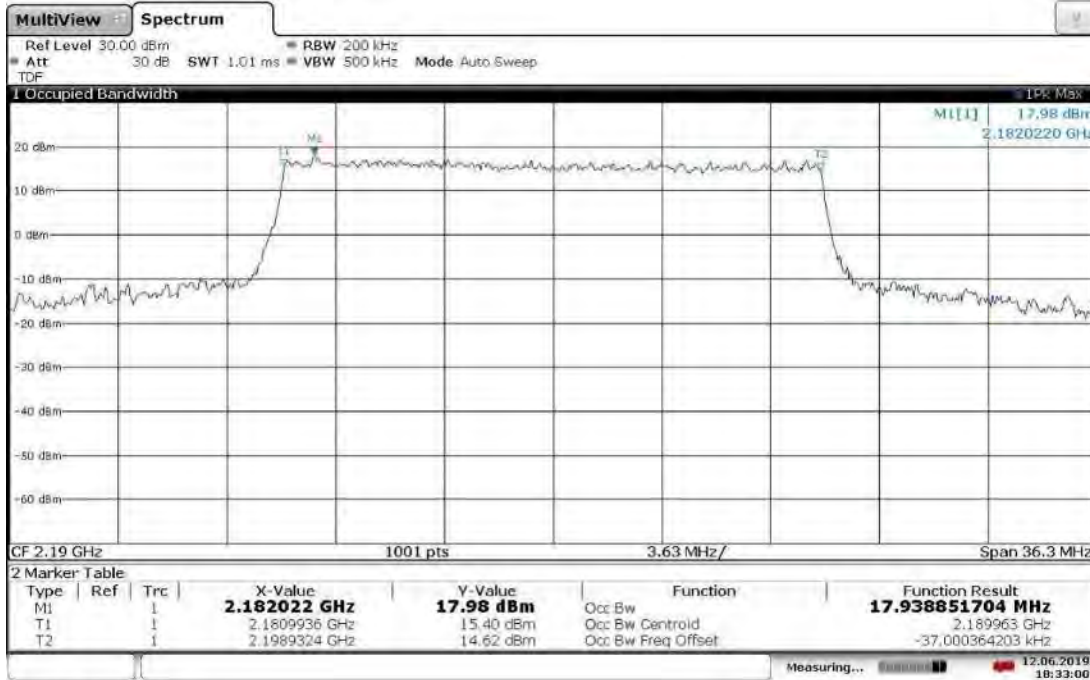
18:31:56 12.06.2019

Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 20 MHz, Low Channel,  
Upper Extreme Voltage: 57.0VDC



18:24:40 12.06.2019

Slot 1 (Band 66), ANT0, Modulation: QPSK, Bandwidth: 5 MHz, High Channel,  
Upper Extreme Voltage: 57.0VDC



18:33:01 12.06.2019

Test Personnel: Kouma Sinn *KPS*  
Supervising/Reviewing  
Engineer:  
(Where Applicable) N/A

Product Standard: FCC Part 27  
Input Voltage: Internal Battery Powered

Pretest Verification w/  
Ambient Signals or  
BB Source: N/A

Test Date: 05/23/2019, 06/04/2019,  
06/12/2019

Limit Applied: See report section 10.3

Ambient Temperature: 06/12/2019: 22 °C

Relative Humidity: 06/12/2019: 41 %

Atmospheric Pressure: 06/12/2019: 1011 mbars

Deviations, Additions, or Exclusions: None

## 11 Transmitter spurious emissions

### 11.1 Method

Tests are performed in accordance with ANSI C63.26, CFR47 FCC Parts 2.1051, 2.1053, 2.1057, and 27.

**TEST SITE:** EMC Lab & 10m ALSE

**The EMC Lab** has one Semi-anechoic Chamber and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

**The 10m ALSE** is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A Styrofoam table 80 cm high is used for table-top equipment.

### Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	U <sub>cispr</sub>
Radiated Emissions, 10m	30-1000 MHz	4.6dB	6.3 dB
Radiated Emissions, 3m	30-1000 MHz	5.3 dB	6.3 dB
Radiated Emissions, 3m	1-6 GHz	4.5 dB	5.2 dB
Radiated Emissions, 3m	6-15 GHz	5.2 dB	5.5 dB
Radiated Emissions, 3m	15-18 GHz	5.0 dB	5.5 dB
Radiated Emissions, 3m	18-40 GHz	5.0 dB	5.5 dB

As shown in the table above our radiated emissions  $U_{lab}$  is less than the corresponding  $U_{CISPR}$  reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

### Sample Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG$$

Where

- FS = Field Strength in dB $\mu$ V/m
- RA = Receiver Amplitude (including preamplifier) in dB $\mu$ V
- CF = Cable Attenuation Factor in dB
- AF = Antenna Factor in dB
- AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dB $\mu$ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dB $\mu$ V/m. This value in dB $\mu$ V/m was converted to its corresponding level in  $\mu$ V/m.

RA = 52.0 dB $\mu$ V  
 AF = 7.4 dB/m  
 CF = 1.6 dB  
 AG = 29.0 dB  
 FS = 32 dB $\mu$ V/m

To convert from dB $\mu$ V to  $\mu$ V or mV the following was used:

$UF = 10^{(NF / 20)}$  where UF = Net Reading in  $\mu$ V  
 NF = Net Reading in dB $\mu$ V

#### Example:

$FS = RA + AF + CF - AG = 52.0 + 7.4 + 1.6 - 29.0 = 32.0$   
 $UF = 10^{(32 \text{ dB}\mu\text{V} / 20)} = 39.8 \mu\text{V/m}$

Alternately, when BAT-EMC Emission Software is used, the "Level" includes all losses and gains and is compared directly in the "Margin" column to the "Limit". The "Correction" includes Antenna Factor, Preamp, and Cable Loss. These are already accounted for in the "Level" column.

**11.2 Test Equipment Used:**

Test equipment used for antenna port conducted test

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
CEN001'	DC-40GHz attenuator 20dB	Centric RF	C411-20	CEN001	02/01/2019	02/01/2020
CBLHF2012-2M-1'	2m 9kHz-40GHz Coaxial Cable - SET1	Huber & Suhner	SF102	252675001	02/01/2019	02/01/2020
ROS005-1'	Signal and Spectrum Analyzer	Rohde & Schwarz	FSW43	100646	10/15/2018	10/15/2019
DS40'	Temp, humidity, pressure gauge	Digi Sense	68000-49	181717625	11/06/2018	11/06/2019

**Software Utilized:**

Name	Manufacturer	Version
None	--	--

Test equipment used for Radiated emissions

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
CEN001'	DC-40GHz attenuator 20dB	Centric RF	C411-20	CEN001	02/01/2019	02/01/2020
PRE11'	50dB gain pre-amp	Keith H	PRE11	PRE11	10/27/2018	10/27/2019
145-410'	Cables 145-420 145-421 145-422 145-406	Huber + Suhner	10m Track A Cables	multiple	07/25/2018	07/25/2019
145128'	EMI Receiver (20 Hz - 40 Ghz)	Rohde & Schwarz	ESIB 40	839283/001	03/28/2019	03/28/2020
145-416'	Cables 145-420 145-423 145-425 145-408	Huber + Suhner	3m Track B cables	multiple	07/25/2018	07/25/2019
BON001'	METER, POWER	Boonton	4232A	55601	01/23/2019	01/23/2020
145106'	Bilog Antenna (30MHz - 5GHz)	Sunol Sciences	JB5	A111003	06/18/2018	06/18/2019
EMC04'	ANTENNA, RIDGED GUIDE, 18-40 GHZ	EMCO	3116	2090	10/26/2018	10/26/2019
CBLSHF102'	Cable, SMA - SMA, 9kHz-40GHz (Cable Kit 5)	Sucoflex (Huber Suhn	104PE	CBLSHF102	09/13/2018	09/13/2019
145108'	EMI Test Receiver (20Hz - 40GHz)	Rohde & Schwarz	ESIB40	100209	06/06/2019	06/06/2020
PRE8'	PREAMPLIFIER 1- 40 GHz	MITEQ	NSP4000-NF	507145	10/25/2018	10/25/2019

**Software Utilized:**

Name	Manufacturer	Version
BAT-EMC	Nexio	3.18.0.16

**11.3 Results:**

The sample tested was found to Comply. Where a resolution bandwidth of less than 1 MHz was used (in some cases, 120 kHz or 100 kHz), more than 10 dB margin to the limit is shown. Since the two antenna ports transmit uncorrelated data streams and use cross polarized antennas, no adjustments to the test results were applied due to MIMO operation, per KDB 662911.

§27.53(h): The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

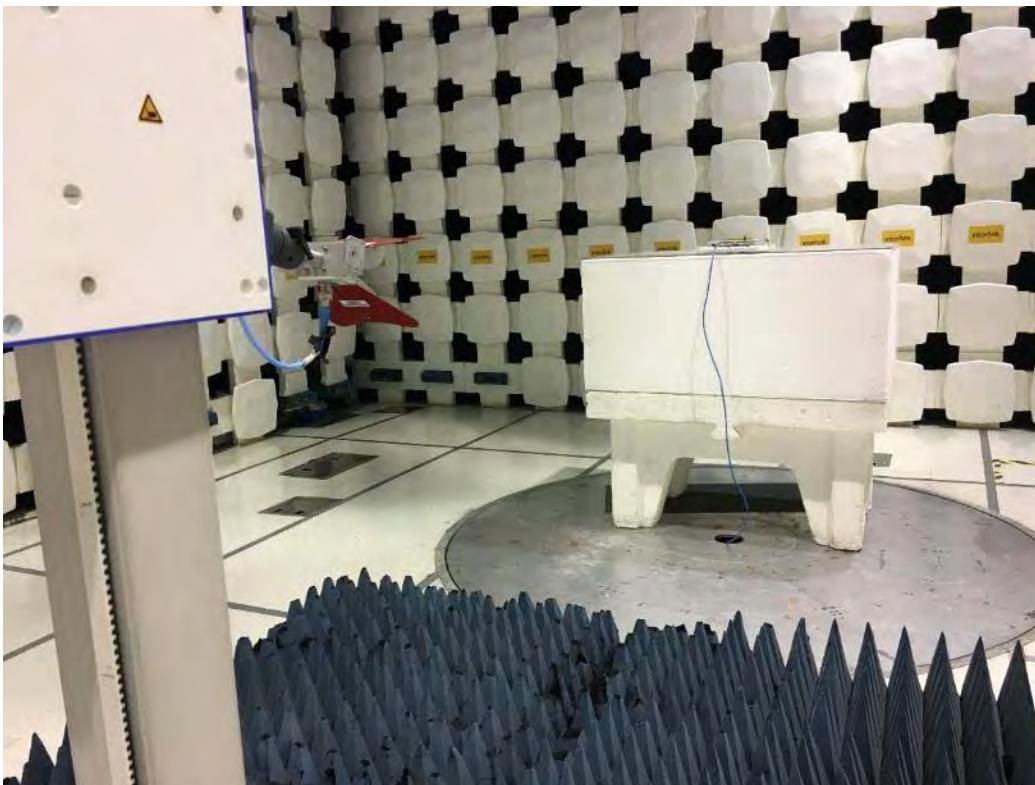
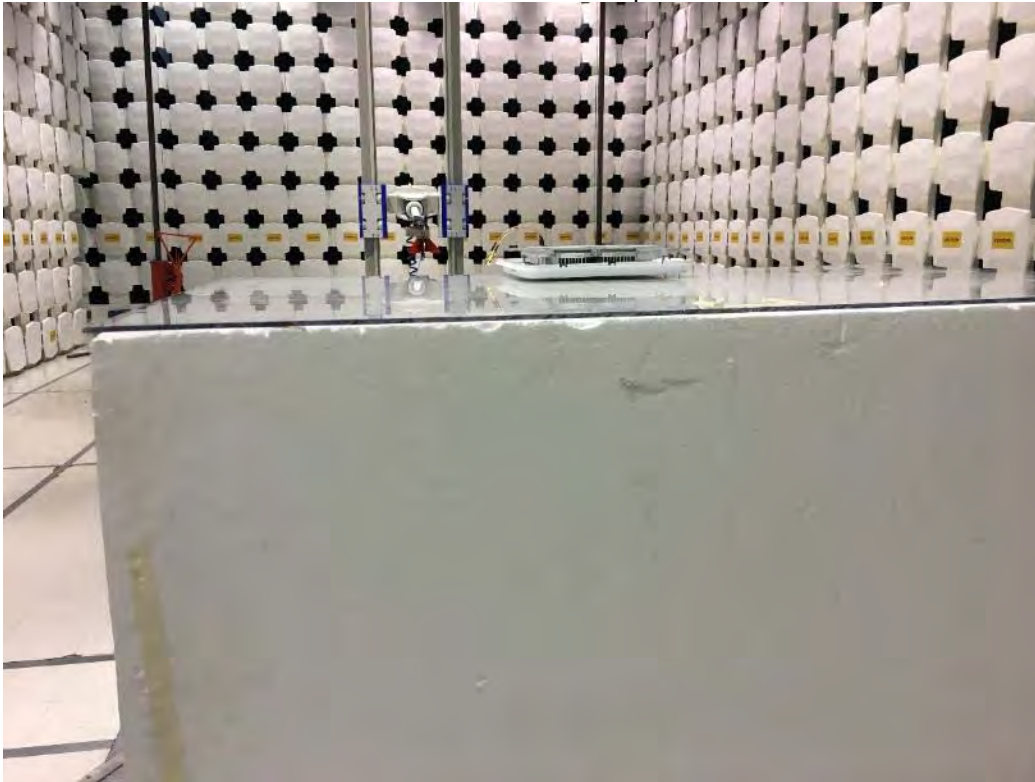


11.4 Setup Photographs:

30-1000 MHz Test Setup



1-18 GHz Test Setup



18-22 GHz

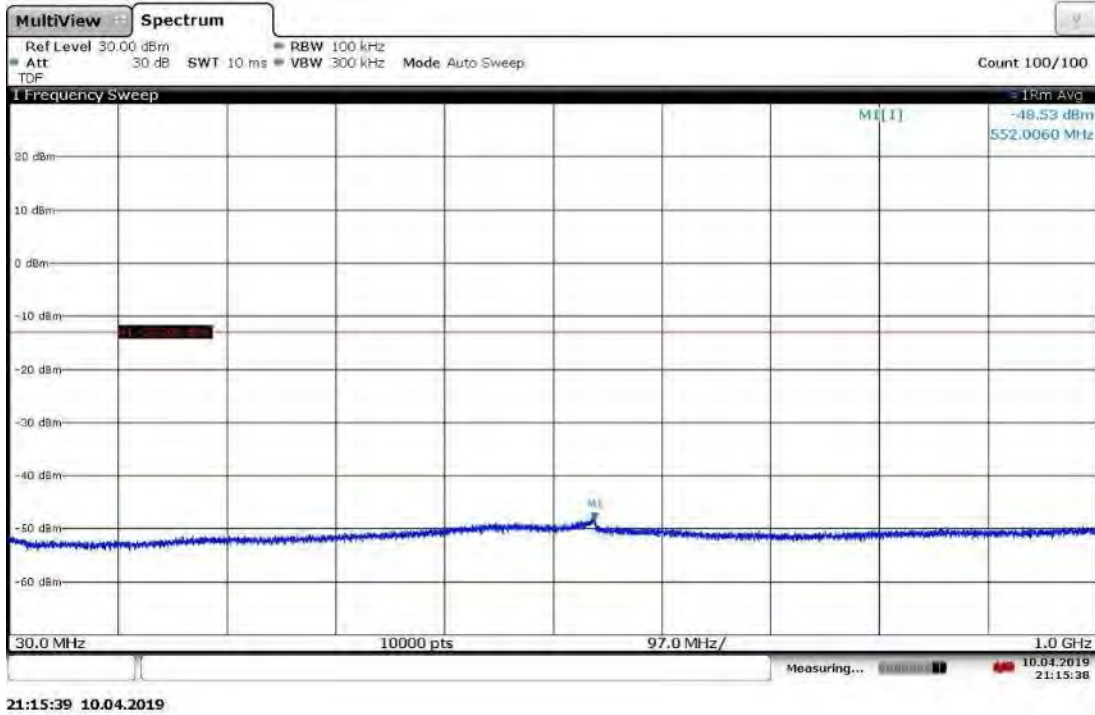


Antenna Port Conducted Test Setup

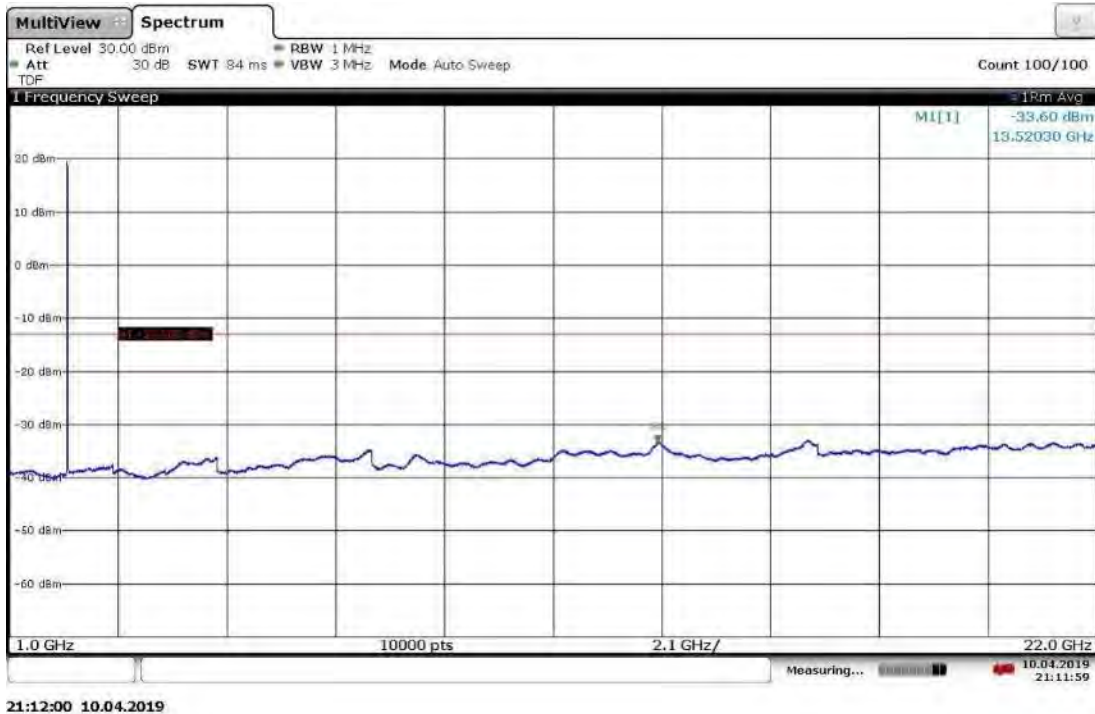


11.5 Plots/Data:

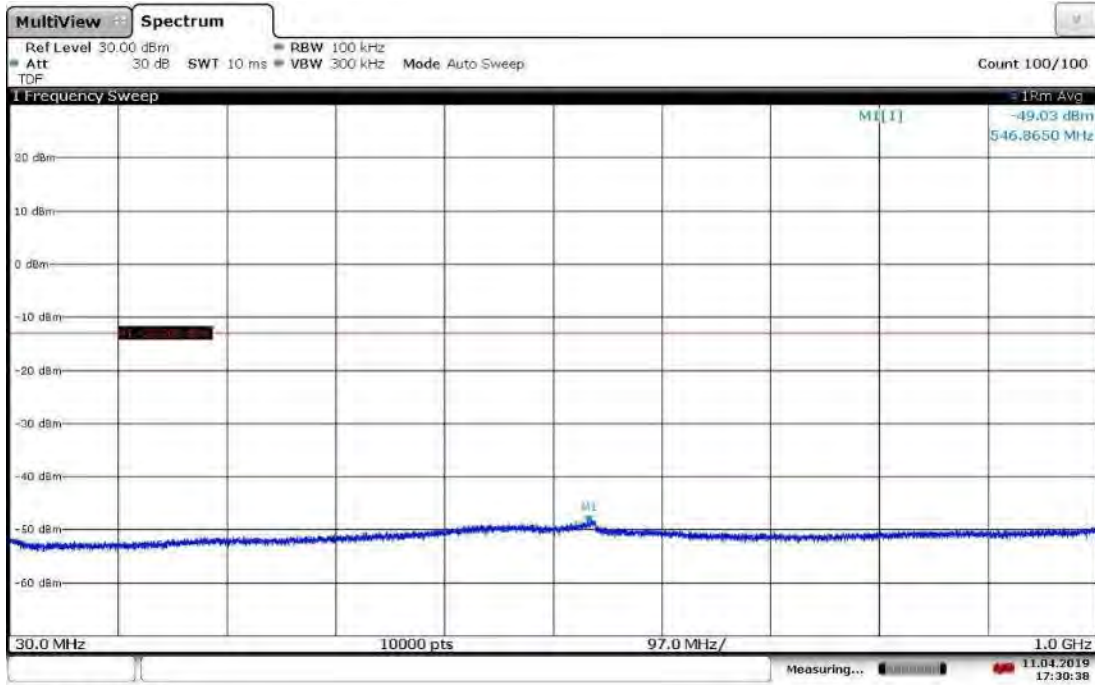
Slot 1 (Band 66), ANT0, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, Low Channel 30MHz-1GHz



Slot 1 (Band 66), ANT0, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, Low Channel 1-22GHz



Slot 1 (Band 66), ANT0, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, Mid Channel 30MHz-1GHz



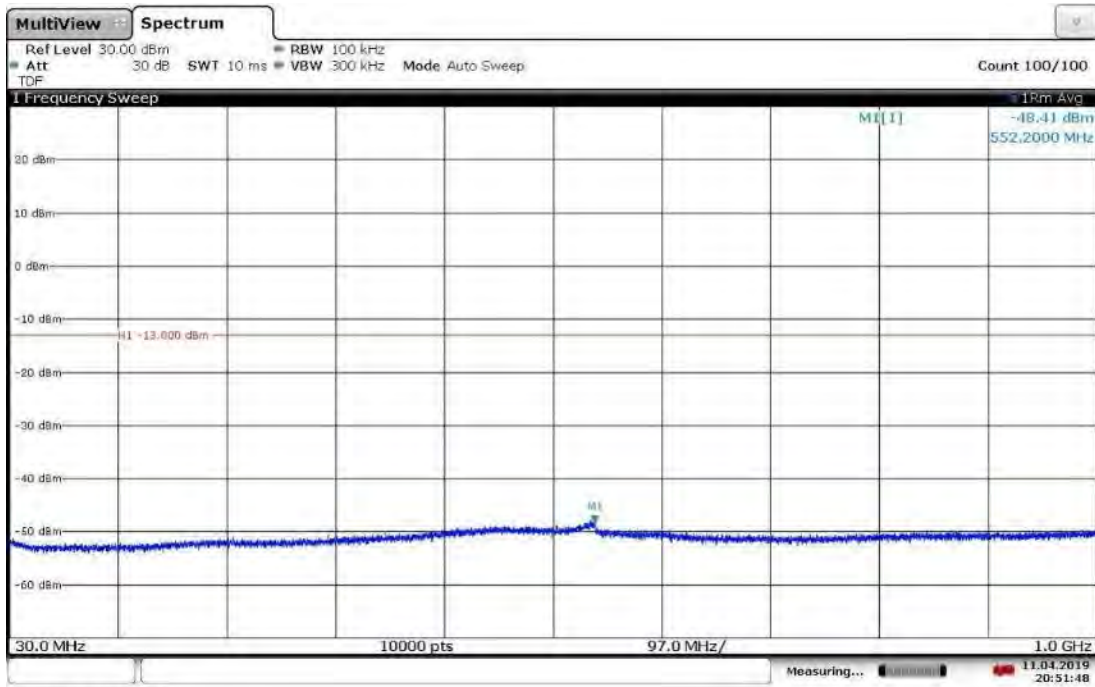
17:30:39 11.04.2019

Slot 1 (Band 66), ANT0, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, Mid Channel 1-22GHz



17:29:52 11.04.2019

Slot 1 (Band 66), ANT0, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, High Channel 30MHz-1GHz



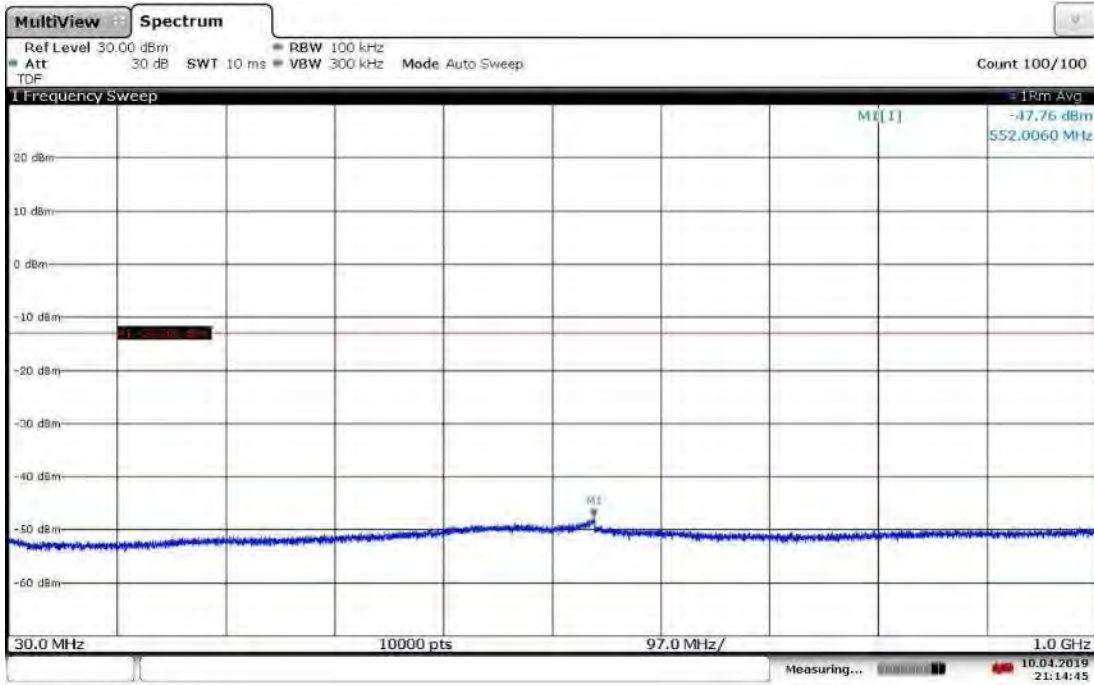
20:51:48 11.04.2019

Slot 1 (Band 66), ANT0, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, High Channel 1-22GHz



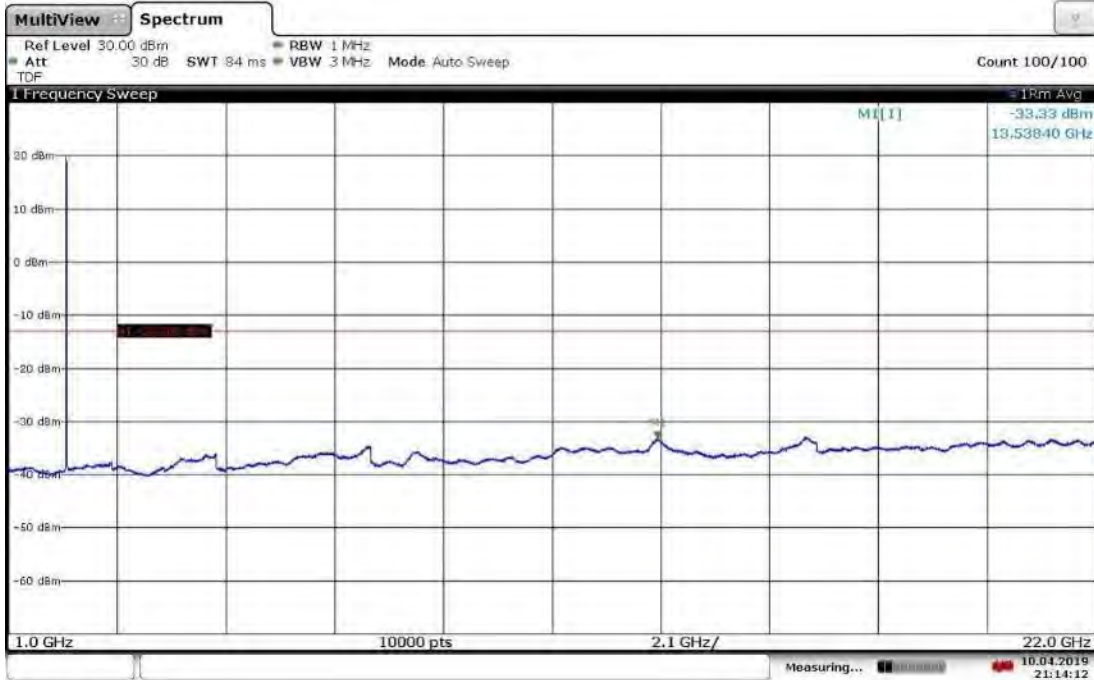
20:52:57 11.04.2019

Slot 1 (Band 66), ANT1, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, Low Channel 30MHz-1GHz



21:14:45 10.04.2019

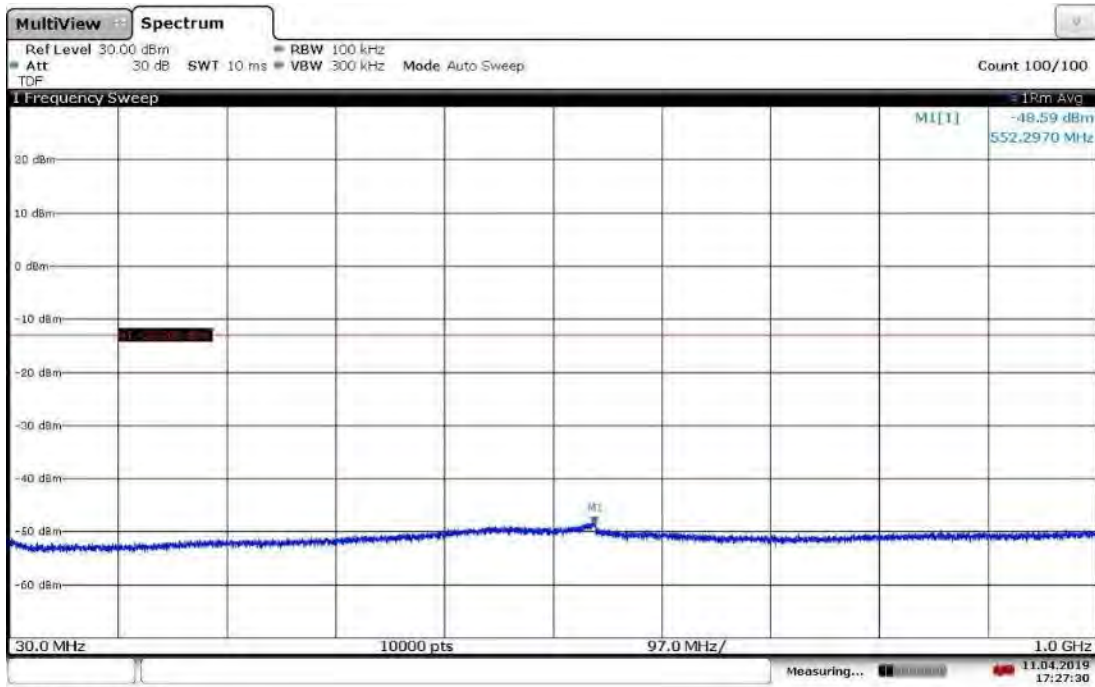
Slot 1 (Band 66), ANT1, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, Low Channel 1-22GHz



21:14:12 10.04.2019

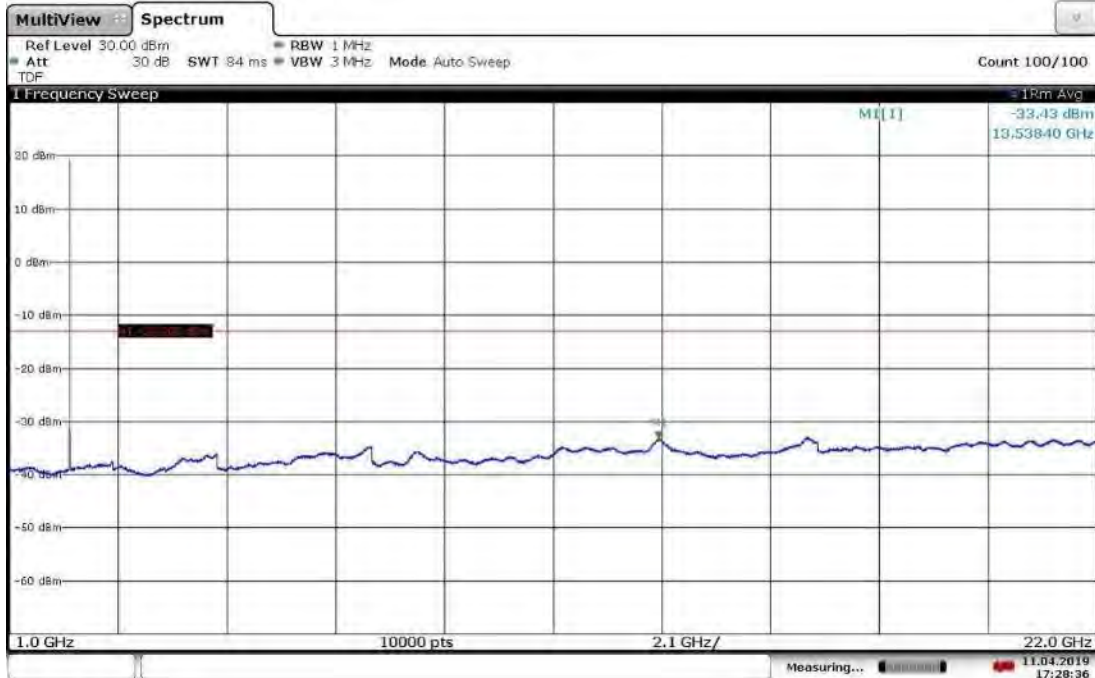


Slot 1 (Band 66), ANT1, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, Mid Channel 30MHz-1GHz



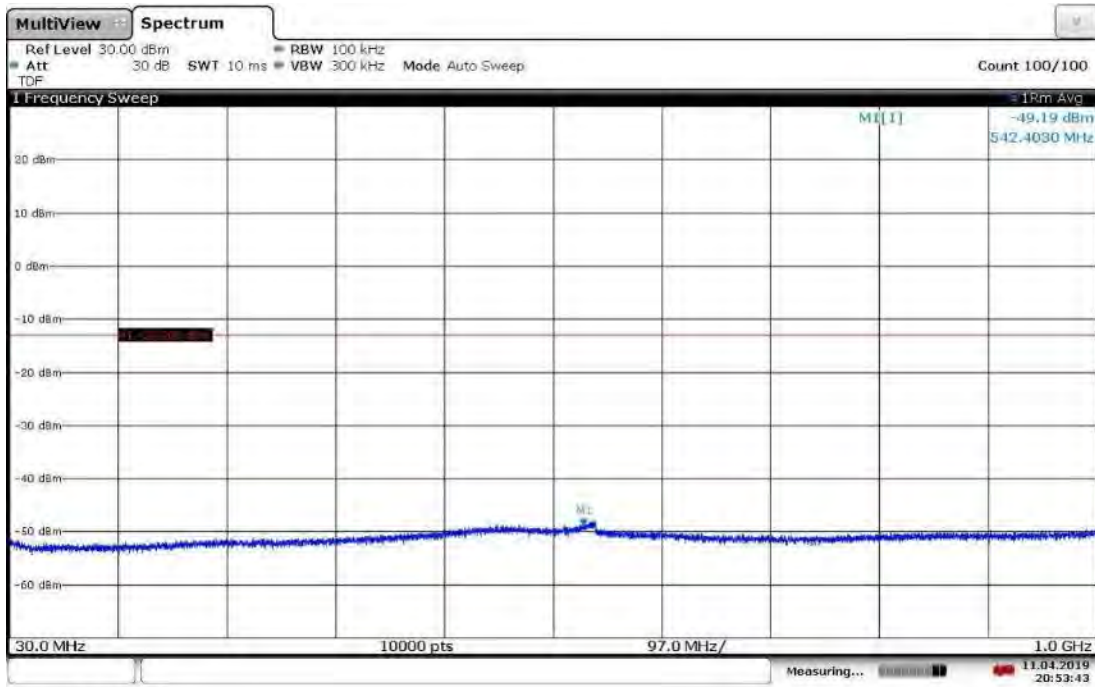
17:27:31 11.04.2019

Slot 1 (Band 66), ANT1, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, Mid Channel 1-22GHz



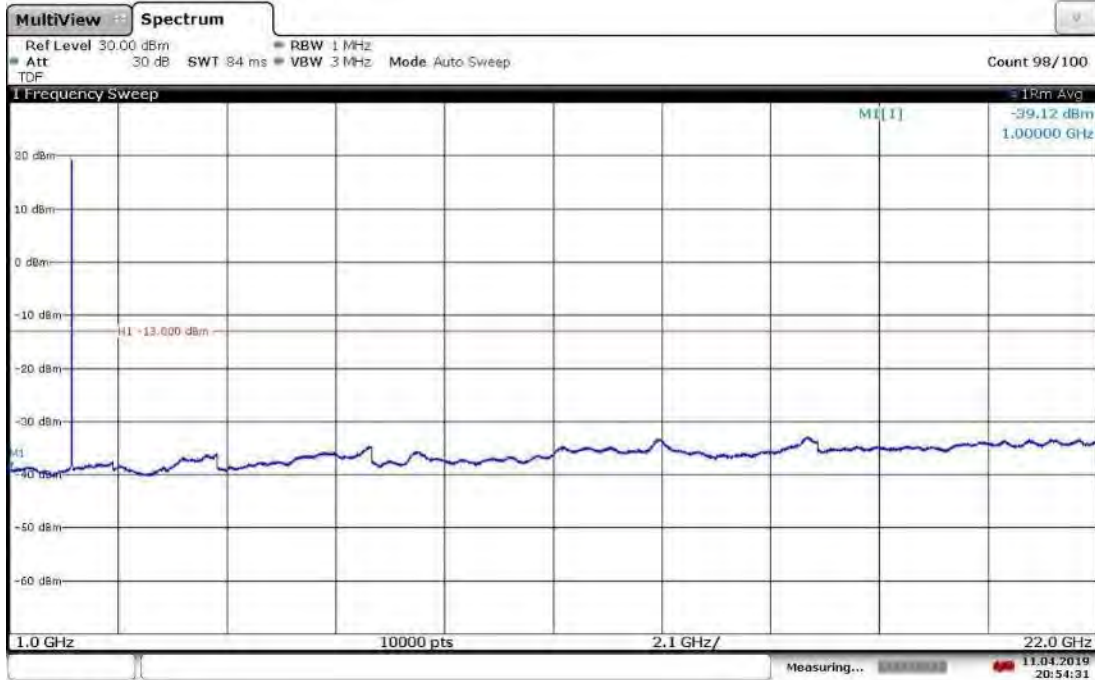
17:28:37 11.04.2019

Slot 1 (Band 66), ANT1, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, High Channel 30MHz-1GHz



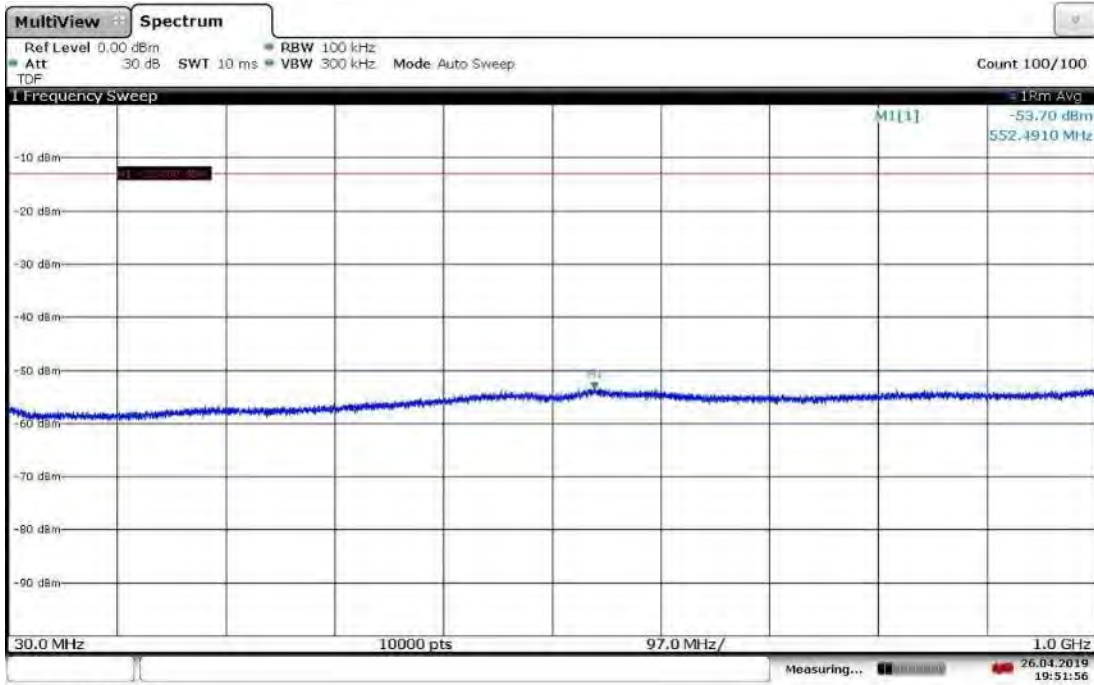
20:53:43 11.04.2019

Slot 1 (Band 66), ANT1, Modulation: TM1.1-QPSK, Bandwidth: 5 MHz, High Channel 1-22GHz



20:54:31 11.04.2019

Slot 1 (Band 66), ANT0, Modulation: TM3.2-16QAM, Bandwidth: 5 MHz, Low Channel 30MHz-1GHz



19:51:56 26.04.2019

Slot 1 (Band 66), ANT0, Modulation: TM3.2-16QAM, Bandwidth: 5 MHz, Low Channel 1-22GHz



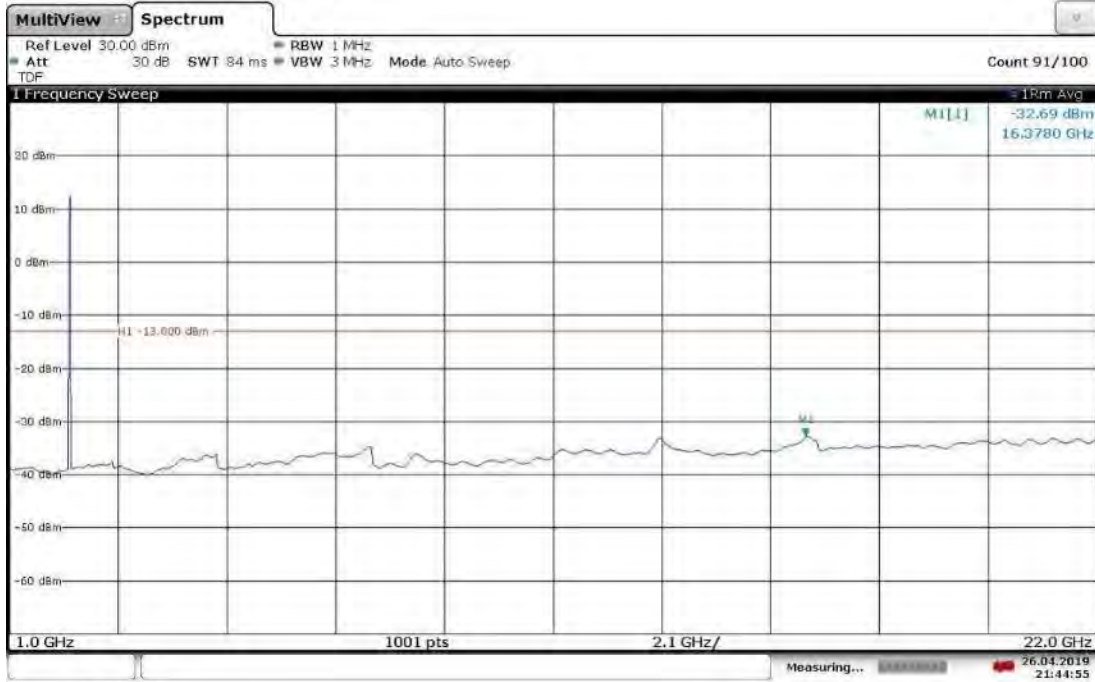
19:52:46 26.04.2019

Slot 1 (Band 66), ANT0, Modulation: TM3.2-16QAM, Bandwidth: 5 MHz, Mid Channel 30MHz-1GHz



21:47:04 26.04.2019

Slot 1 (Band 66), ANT0, Modulation: TM3.2-16QAM, Bandwidth: 5 MHz, Mid Channel 1-22GHz



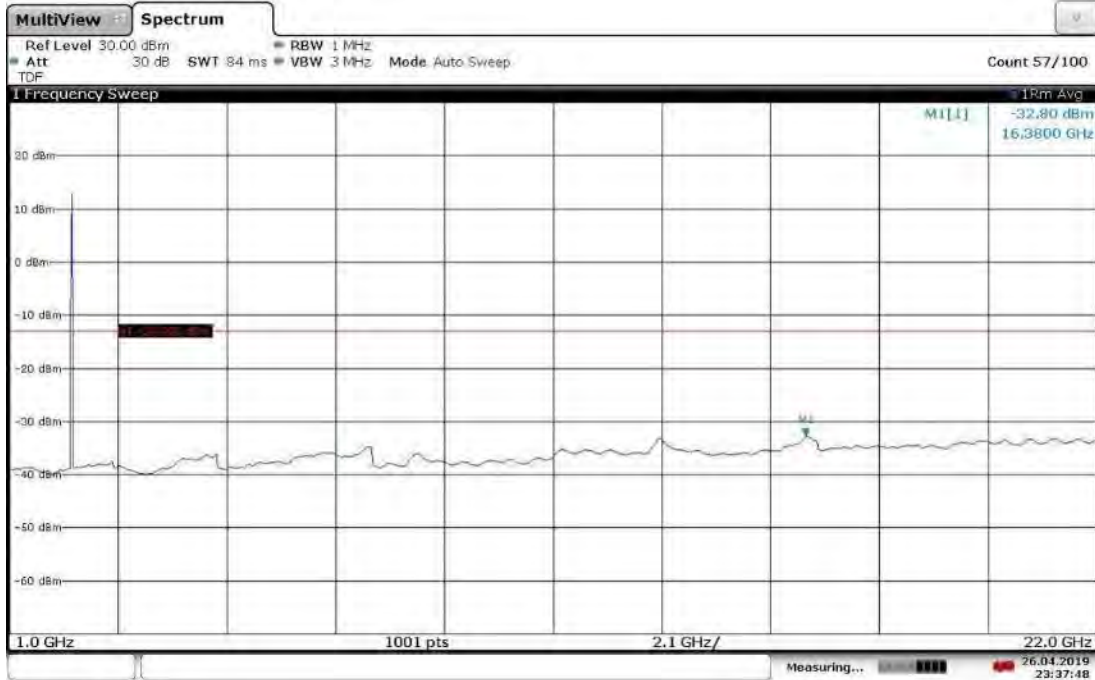
21:44:55 26.04.2019

Slot 1 (Band 66), ANT0, Modulation: TM3.2-16QAM, Bandwidth: 5 MHz, High Channel 30MHz-1GHz



23:38:38 26.04.2019

Slot 1 (Band 66), ANT0, Modulation: TM3.2-16QAM, Bandwidth: 5 MHz, High Channel 1-22GHz



23:37:48 26.04.2019

Slot 1 (Band 66), ANT1, Modulation: TM3.2-16QAM, Bandwidth: 5 MHz, Low Channel 30MHz-1GHz



20:50:17 26.04.2019

Slot 1 (Band 66), ANT1, Modulation: TM3.2-16QAM, Bandwidth: 5 MHz, Low Channel 1-22GHz



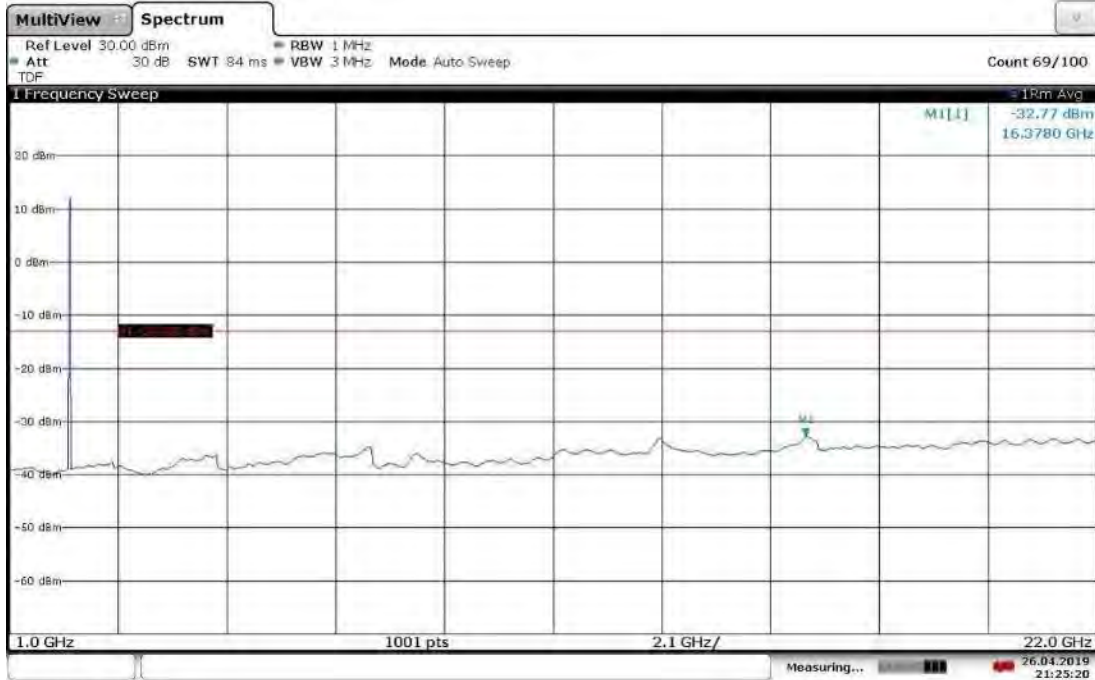
20:49:18 26.04.2019

Slot 1 (Band 66), ANT1, Modulation: TM3.2-16QAM, Bandwidth: 5 MHz, Mid Channel 30MHz-1GHz



21:26:17 26.04.2019

Slot 1 (Band 66), ANT1, Modulation: TM3.2-16QAM, Bandwidth: 5 MHz, Mid Channel 1-22GHz



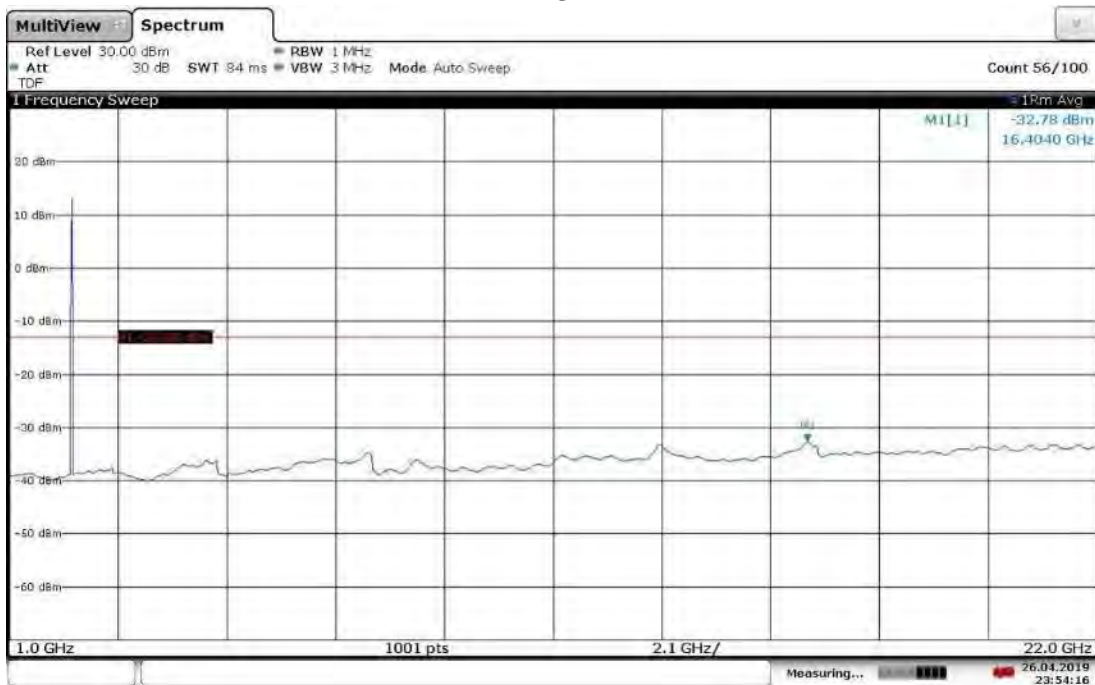
21:25:20 26.04.2019

Slot 1 (Band 66), ANT1, Modulation: TM3.2-16QAM, Bandwidth: 5 MHz, High Channel 30MHz-1GHz



23:54:50 26.04.2019

Slot 1 (Band 66), ANT1, Modulation: TM3.2-16QAM, Bandwidth: 5 MHz, High Channel 1-22GHz

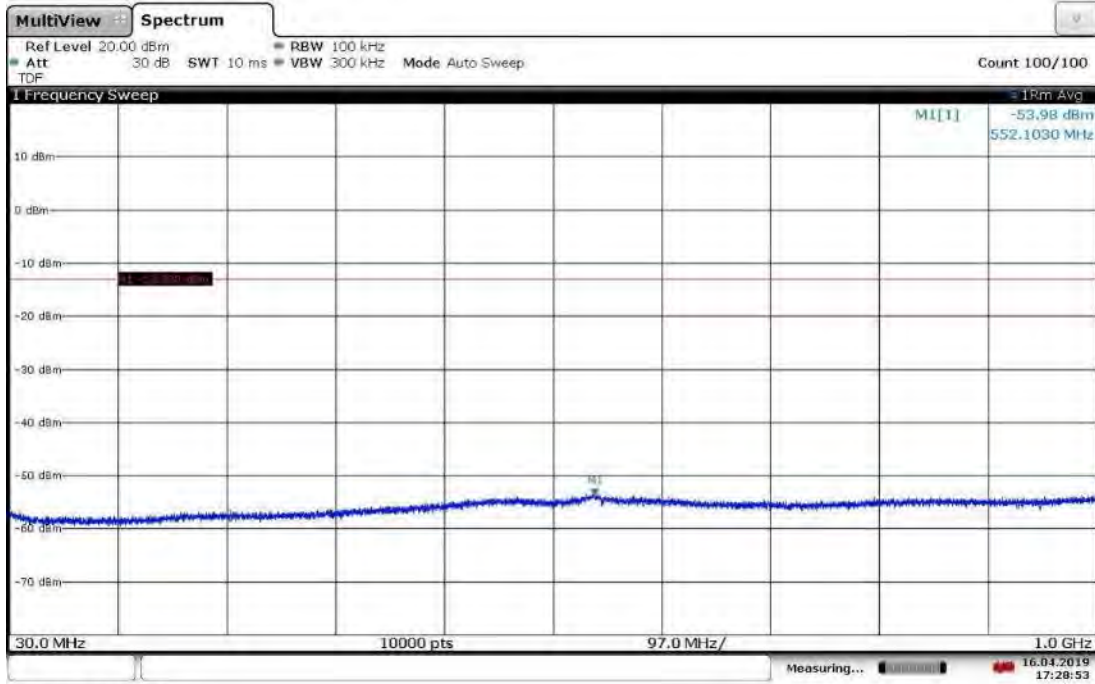


23:54:16 26.04.2019

Slot 1 (Band 66), ANT0, Modulation: TM3.1-64QAM, Bandwidth: 5 MHz, Low Channel

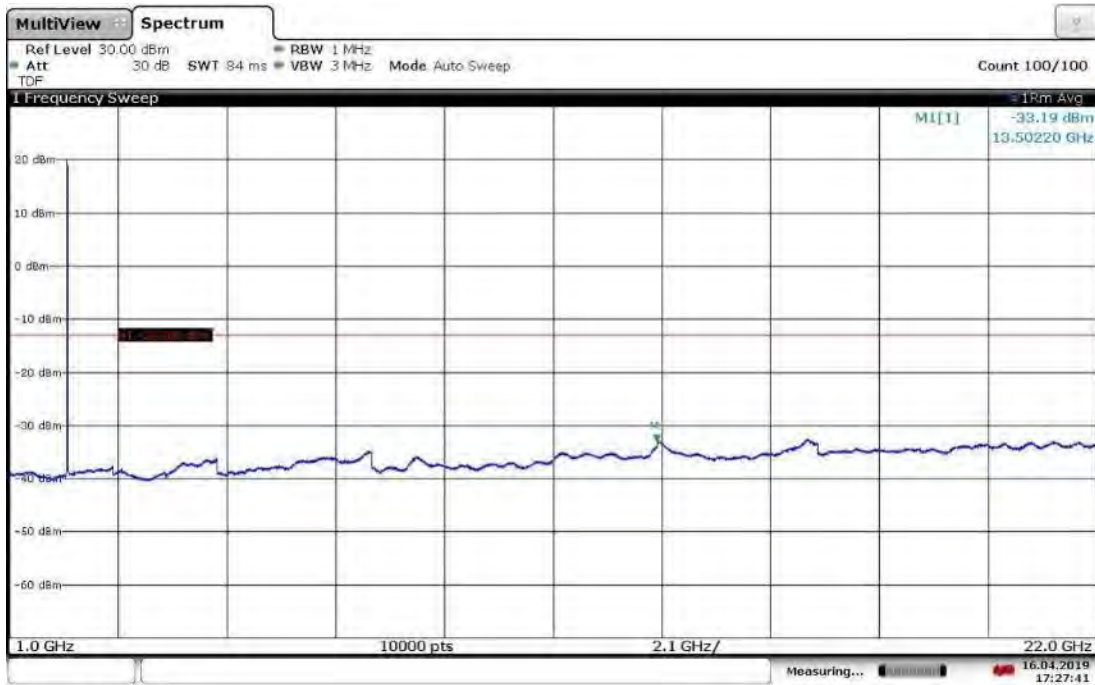


30MHz-1GHz



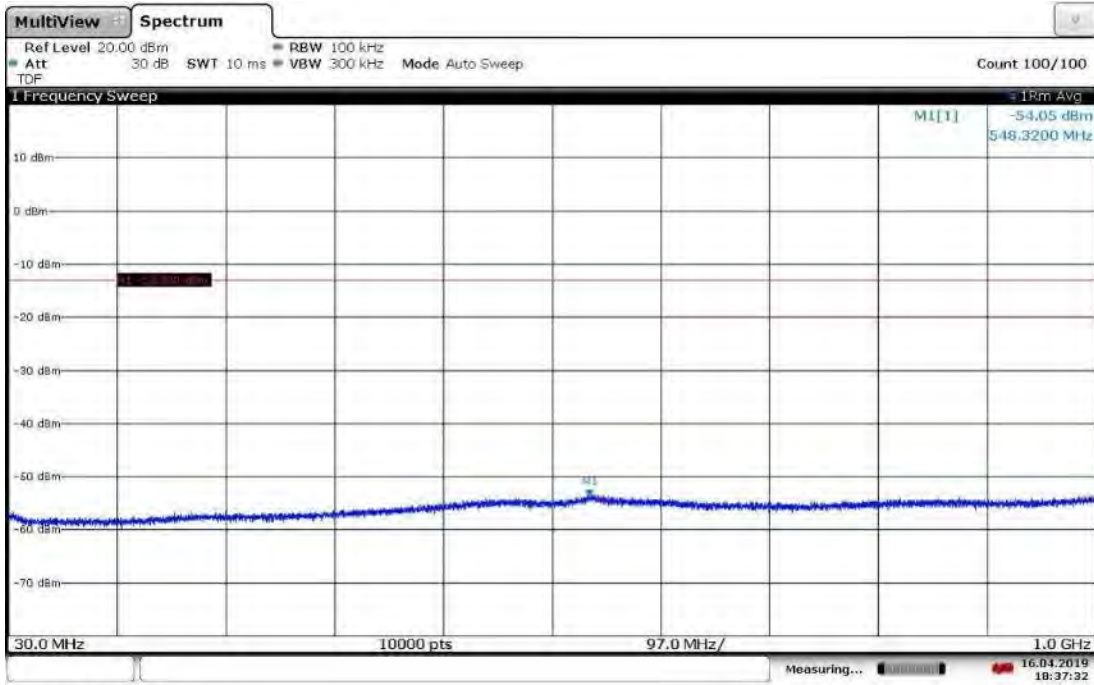
17:28:54 16.04.2019

Slot 1 (Band 66), ANT0, Modulation: TM3.1-64QAM, Bandwidth: 5 MHz, Low Channel 1-22GHz



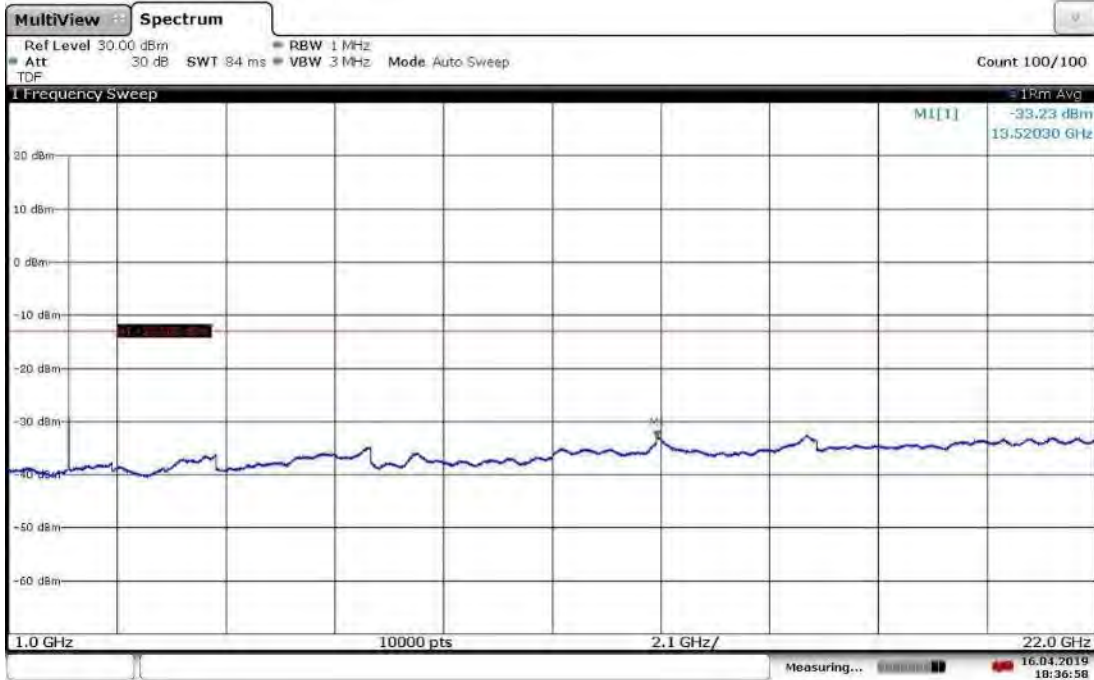
17:27:41 16.04.2019

Slot 1 (Band 66), ANT0, Modulation: TM3.1-64QAM, Bandwidth: 5 MHz, Mid Channel 30MHz-1GHz



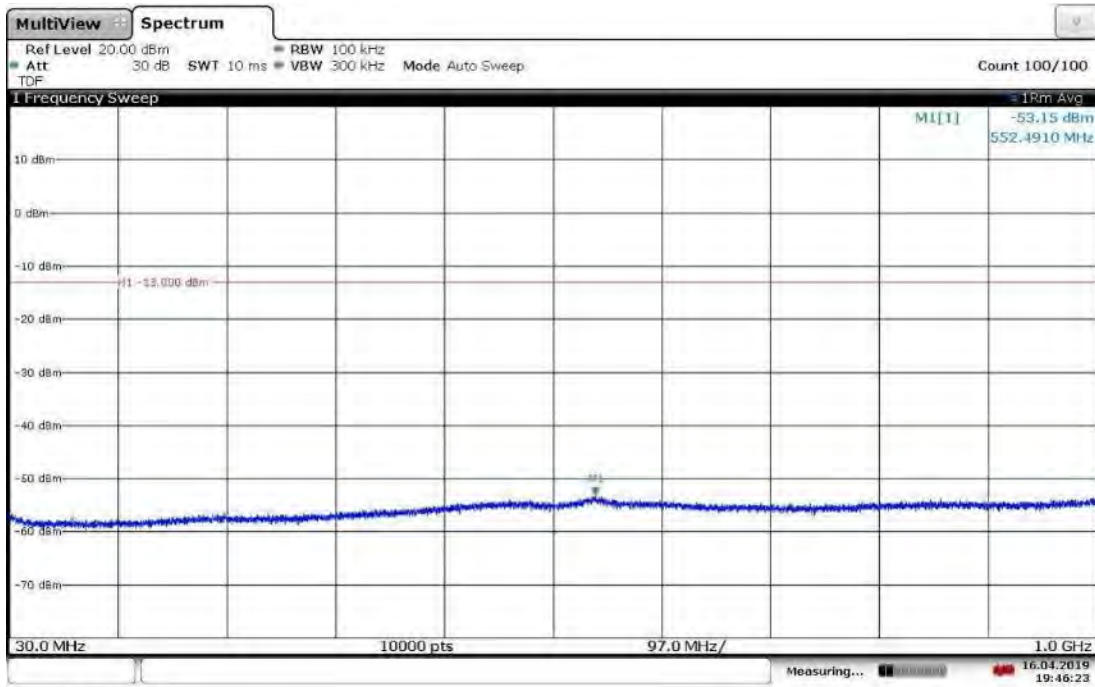
18:37:32 16.04.2019

Slot 1 (Band 66), ANT0, Modulation: TM3.1-64QAM, Bandwidth: 5 MHz, Mid Channel 1-22GHz



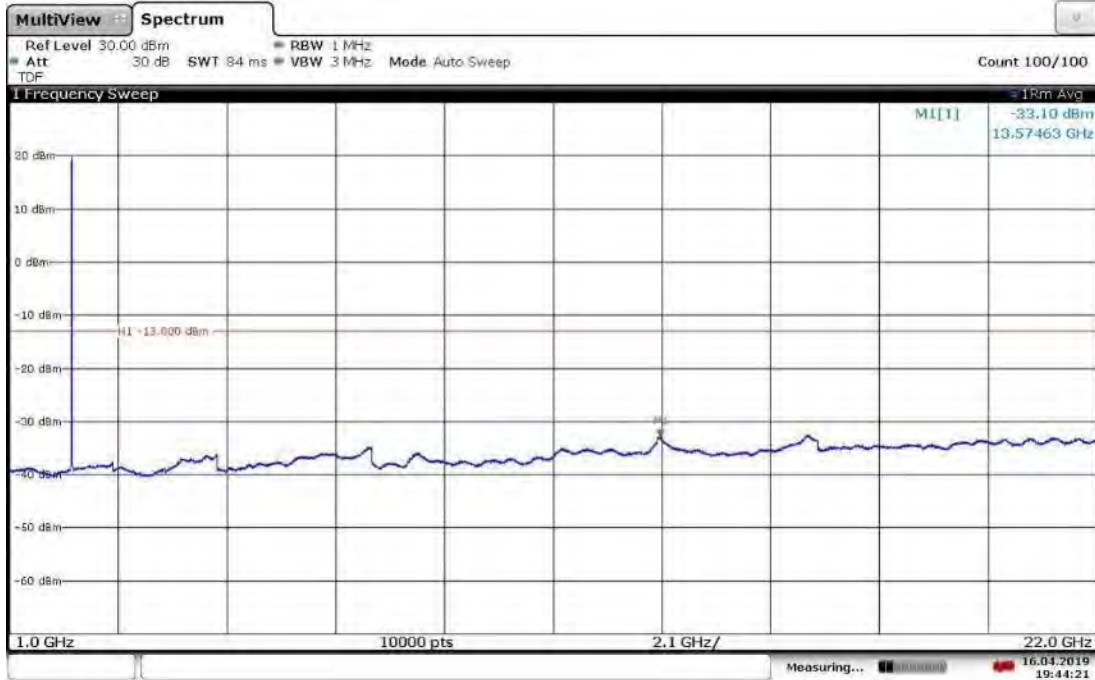
18:36:59 16.04.2019

Slot 1 (Band 66), ANT0, Modulation: TM3.1-64QAM, Bandwidth: 5 MHz, High Channel 30MHz-1GHz



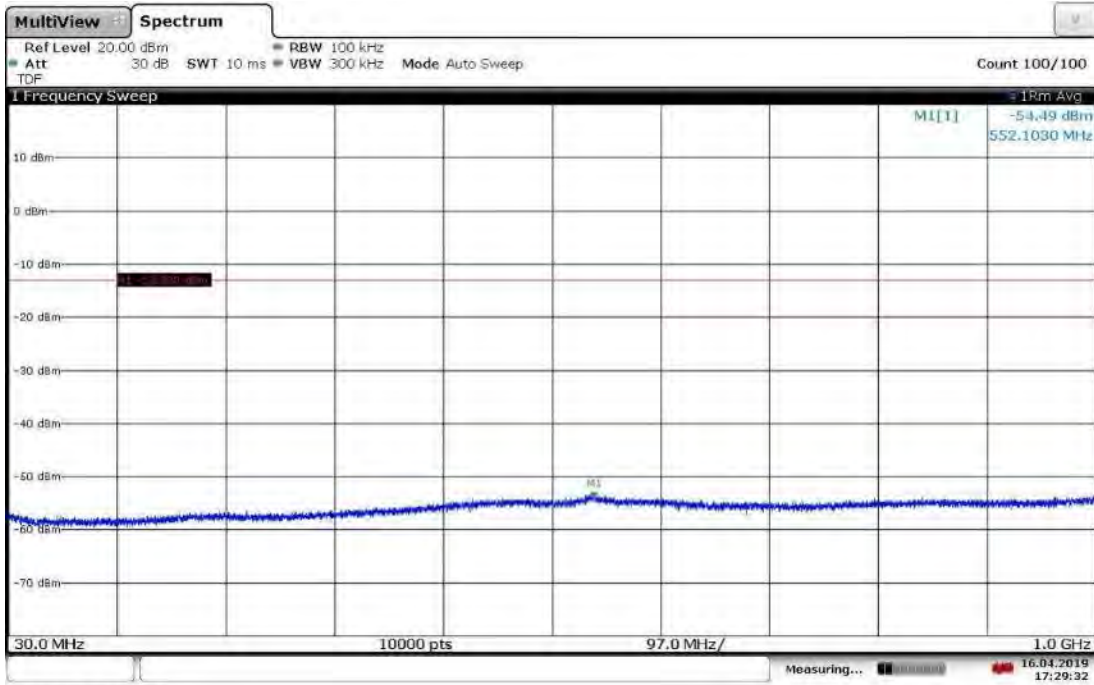
19:46:23 16.04.2019

Slot 1 (Band 66), ANT0, Modulation: TM3.1-64QAM, Bandwidth: 5 MHz, High Channel 1-22GHz



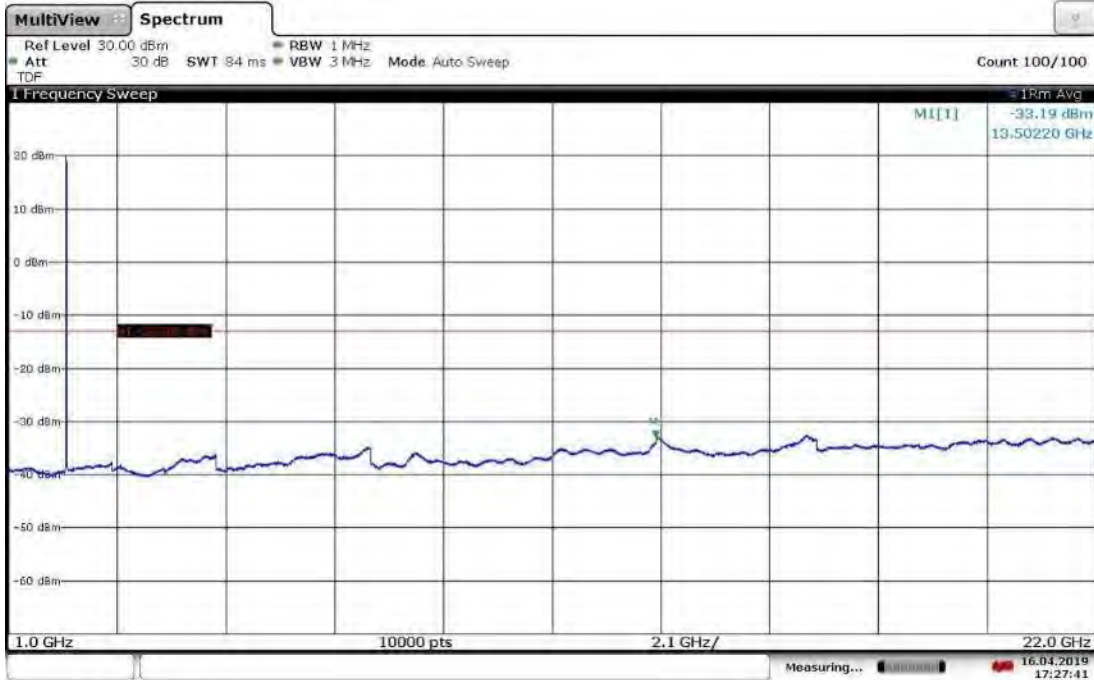
19:44:22 16.04.2019

Slot 1 (Band 66), ANT1, Modulation: TM3.1-64QAM, Bandwidth: 5 MHz, Low Channel 30MHz-1GHz



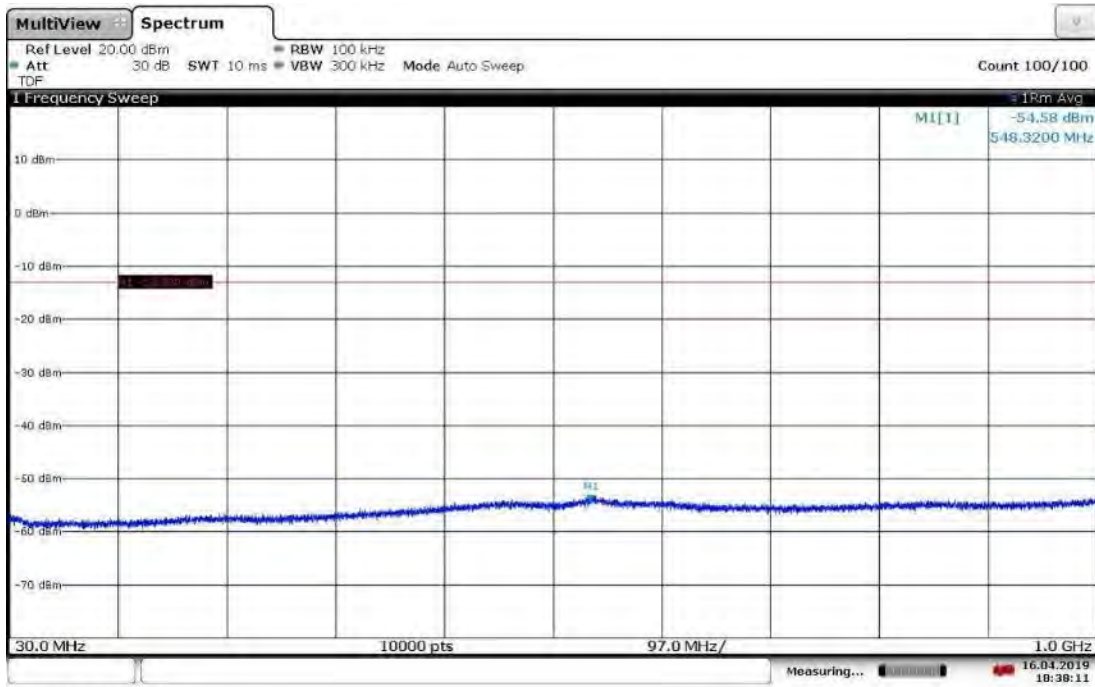
17:29:33 16.04.2019

Slot 1 (Band 66), ANT1, Modulation: TM3.1-64QAM, Bandwidth: 5 MHz, Low Channel 1-22GHz



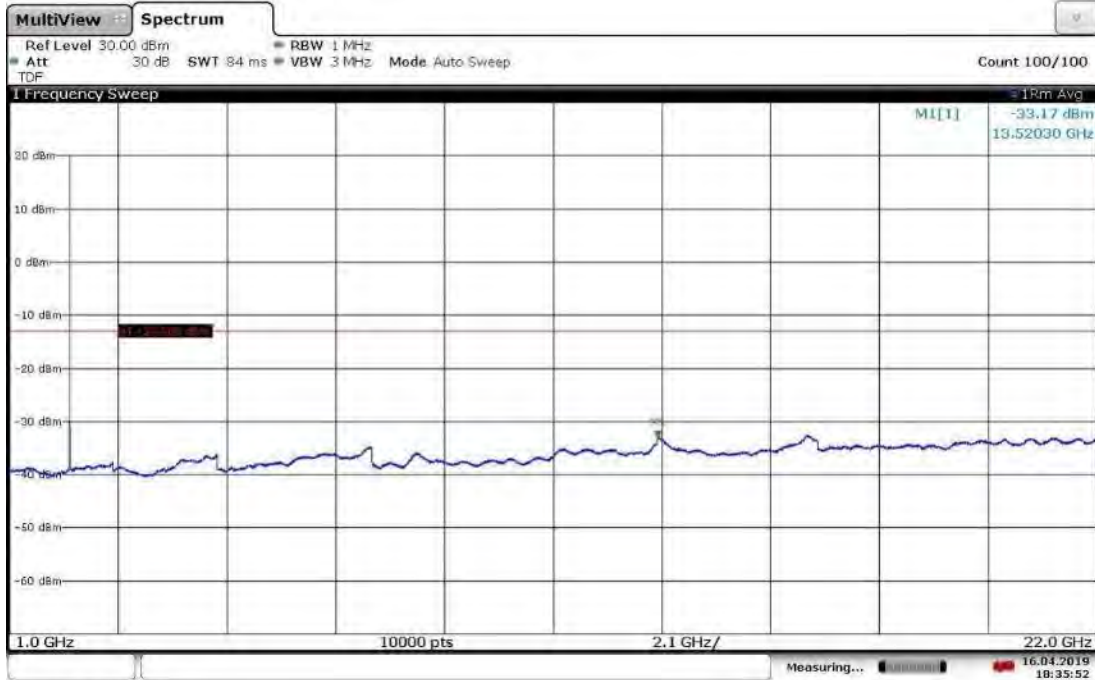
17:27:41 16.04.2019

Slot 1 (Band 66), ANT1, Modulation: TM3.1-64QAM, Bandwidth: 5 MHz, Mid Channel 30MHz-1GHz



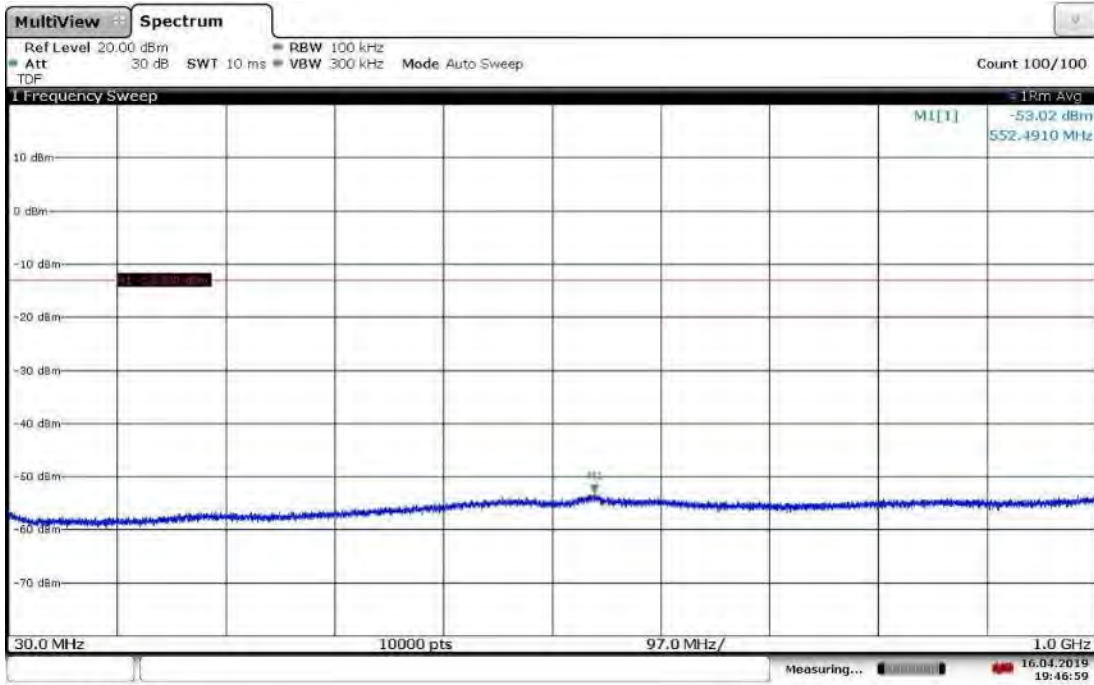
18:38:12 16.04.2019

Slot 1 (Band 66), ANT1, Modulation: TM3.1-64QAM, Bandwidth: 5 MHz, Mid Channel 1-22GHz



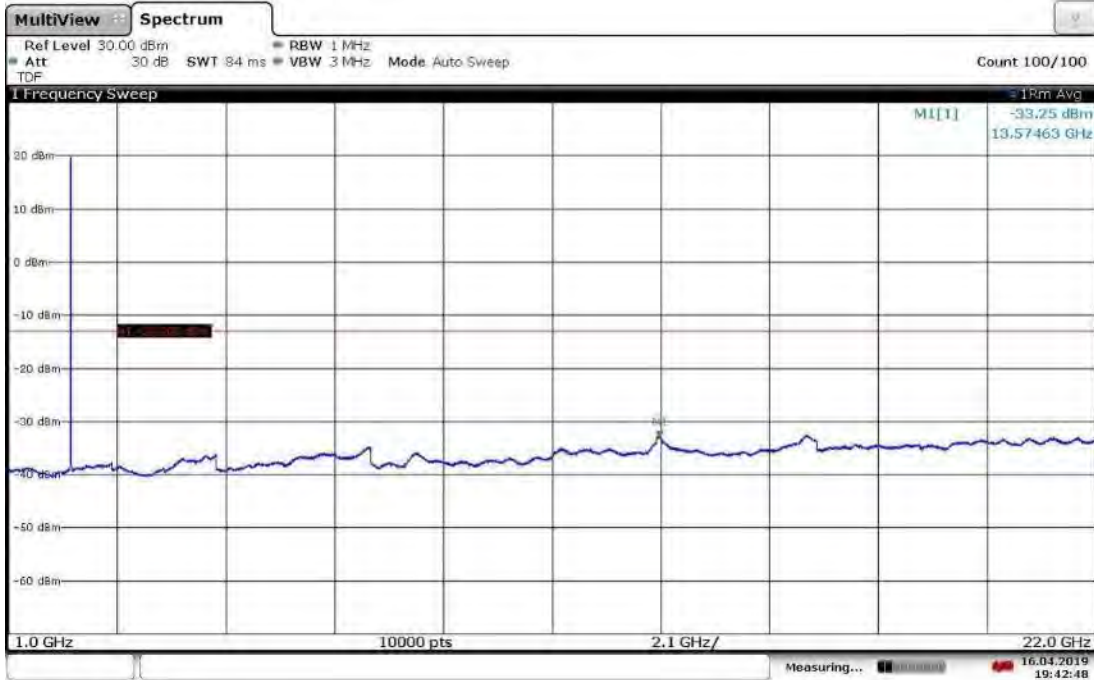
18:35:53 16.04.2019

Slot 1 (Band 66), ANT1, Modulation: TM3.1-64QAM, Bandwidth: 5 MHz, High Channel 30MHz-1GHz



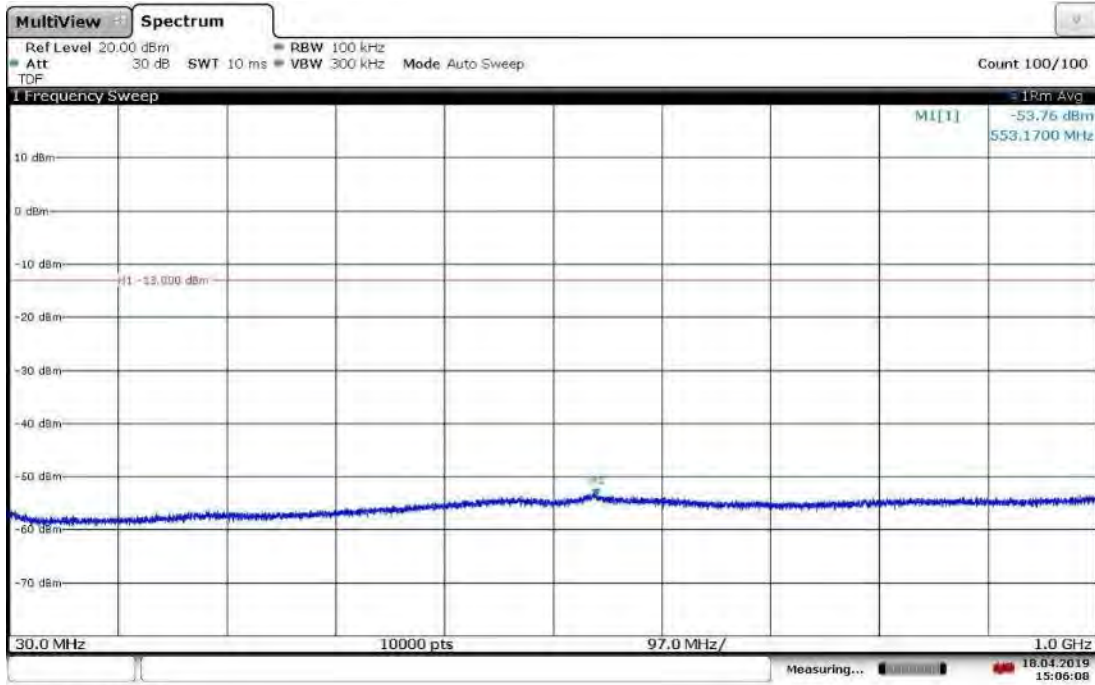
19:47:00 16.04.2019

Slot 1 (Band 66), ANT1, Modulation: TM3.1-64QAM, Bandwidth: 5 MHz, High Channel 1-22GHz



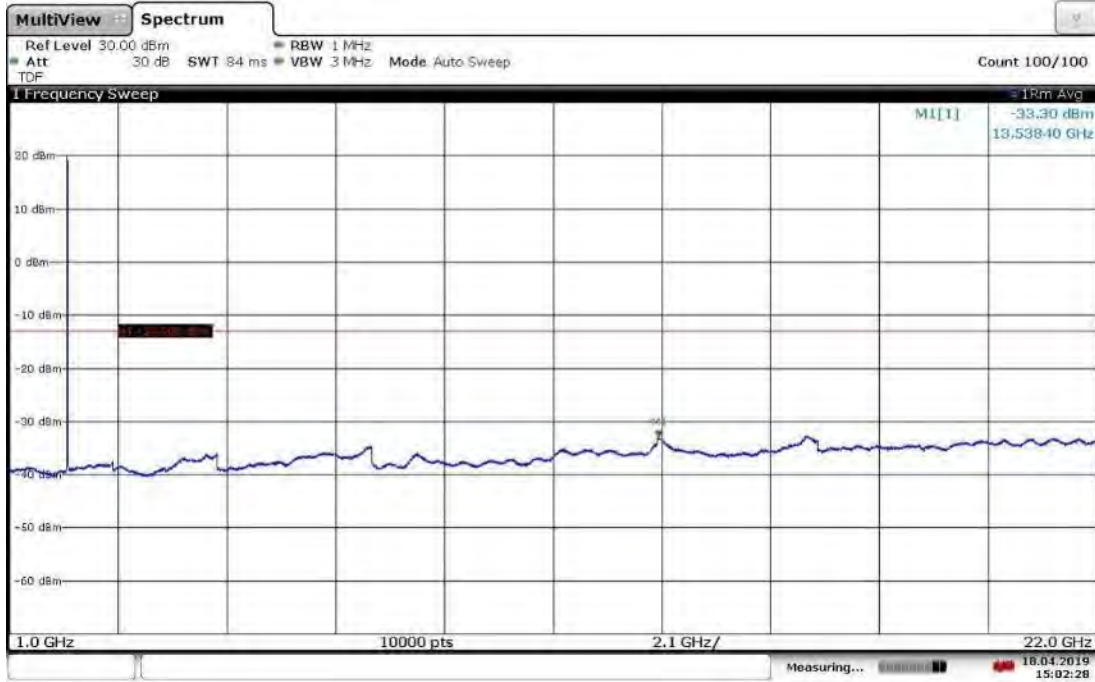
19:42:48 16.04.2019

Slot 1 (Band 66), ANT0, Modulation: TM3.1a-256QAM, Bandwidth: 5 MHz, Low Channel 30MHz-1GHz



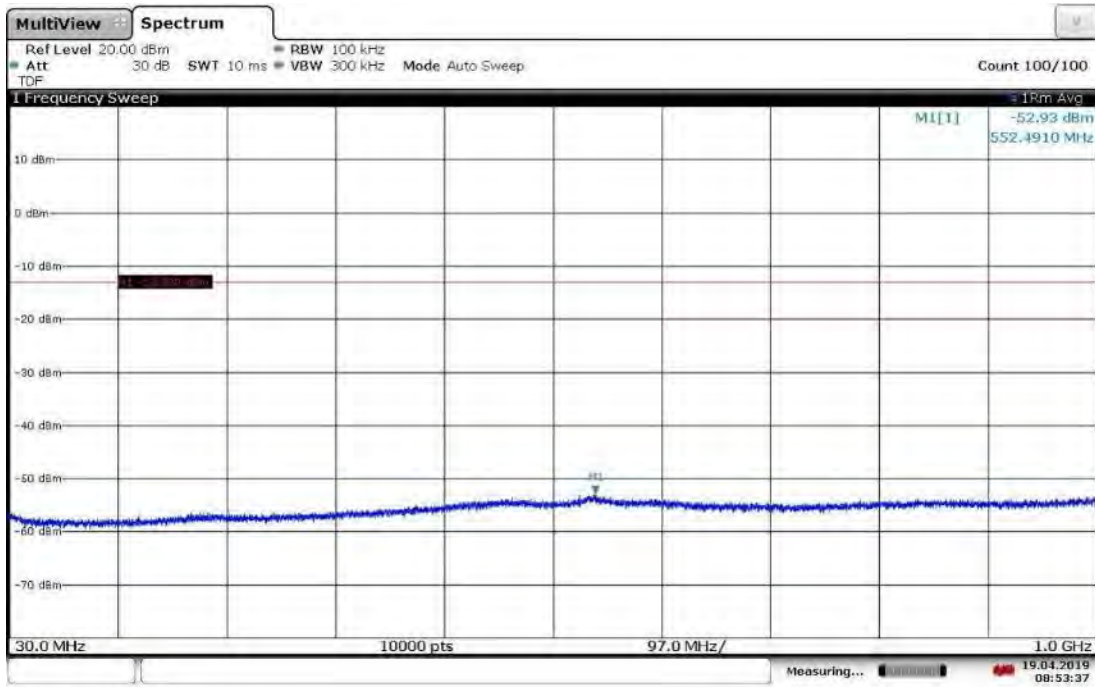
15:06:08 18.04.2019

Slot 1 (Band 66), ANT0, Modulation: TM3.1a-256QAM, Bandwidth: 5 MHz, Low Channel 1-22GHz



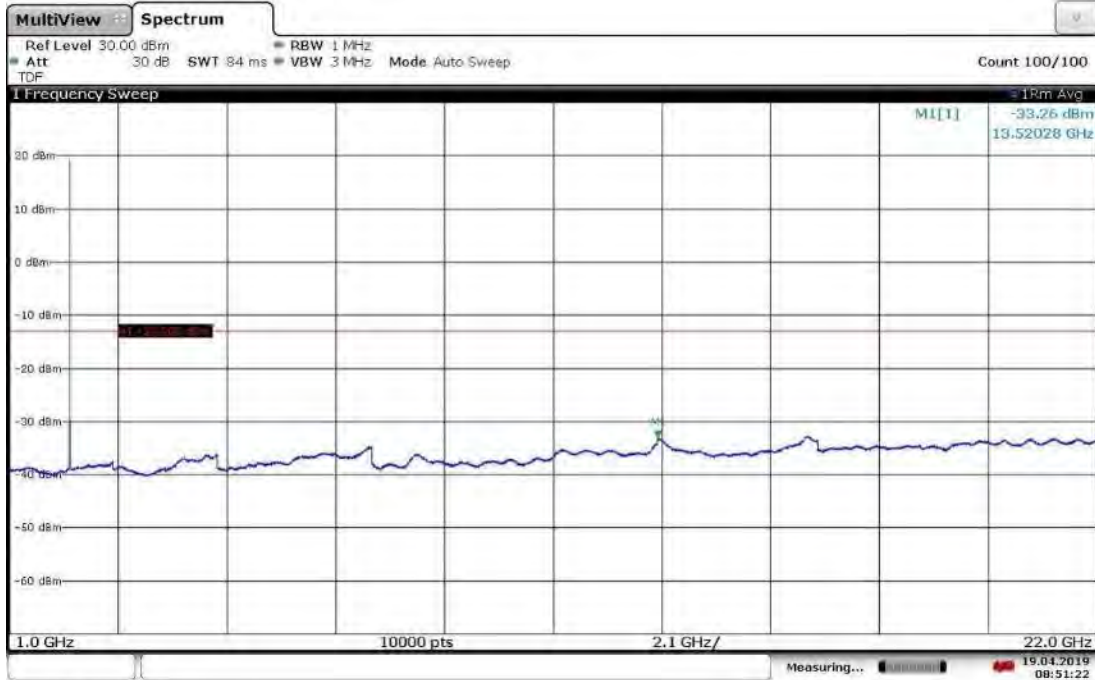
15:02:29 18.04.2019

Slot 1 (Band 66), ANT0, Modulation: TM3.1a-256QAM, Bandwidth: 5 MHz, Mid Channel 30MHz-1GHz



08:53:38 19.04.2019

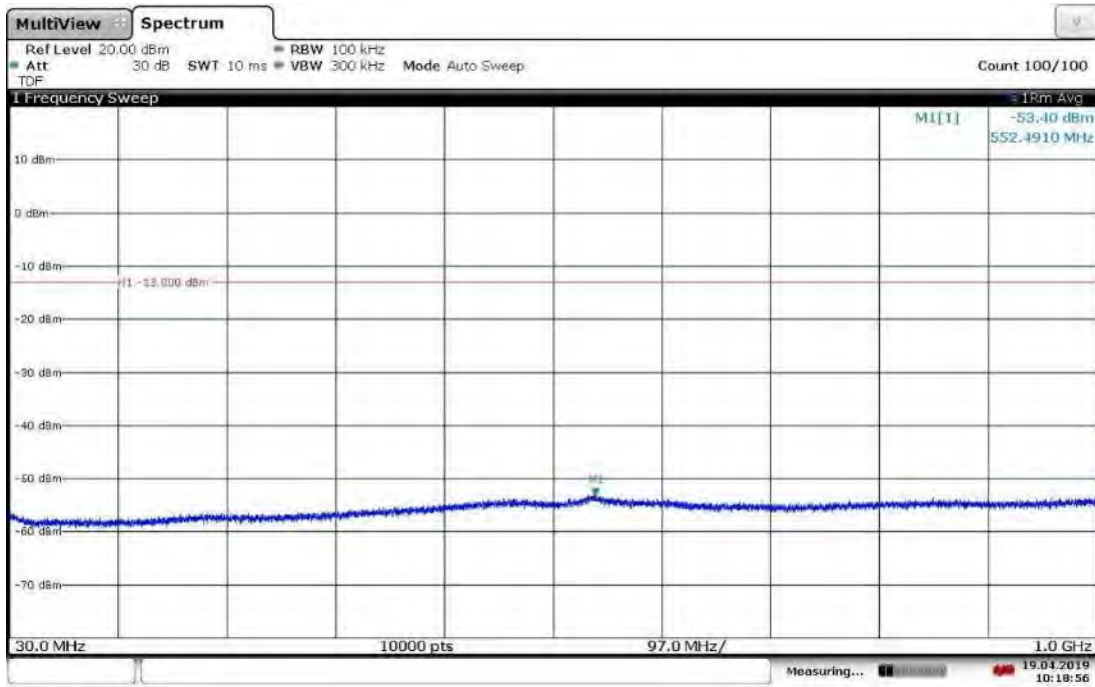
Slot 1 (Band 66), ANT0, Modulation: TM3.1a-256QAM, Bandwidth: 5 MHz, Mid Channel 1-22GHz



08:51:22 19.04.2019



Slot 1 (Band 66), ANT0, Modulation: TM3.1a-256QAM, Bandwidth: 5 MHz, High Channel 30MHz-1GHz



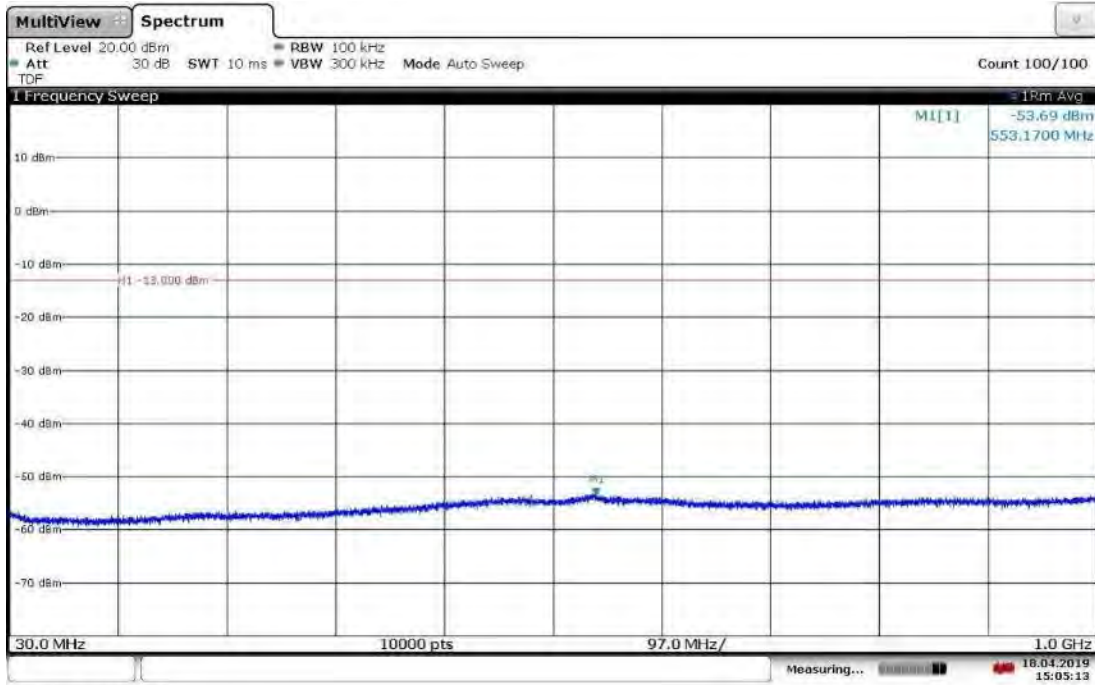
10:18:56 19.04.2019

Slot 1 (Band 66), ANT0, Modulation: TM3.1a-256QAM, Bandwidth: 5 MHz, High Channel 1-22GHz



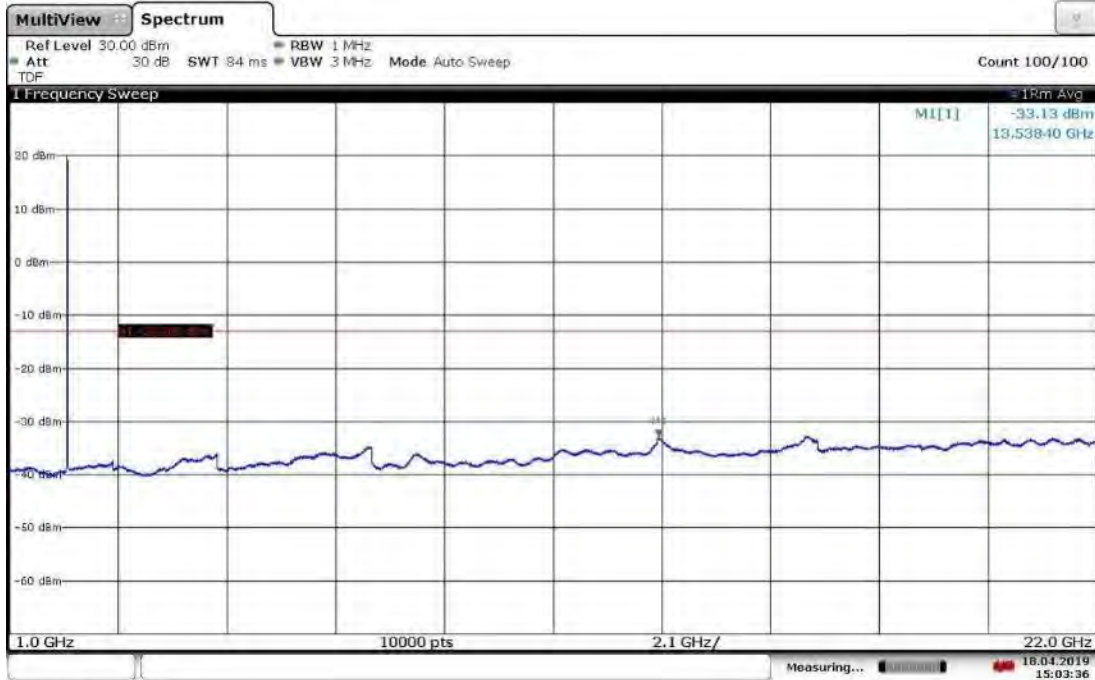
10:18:06 19.04.2019

Slot 1 (Band 66), ANT1, Modulation: TM3.1a-256QAM, Bandwidth: 5 MHz, Low Channel 30MHz-1GHz



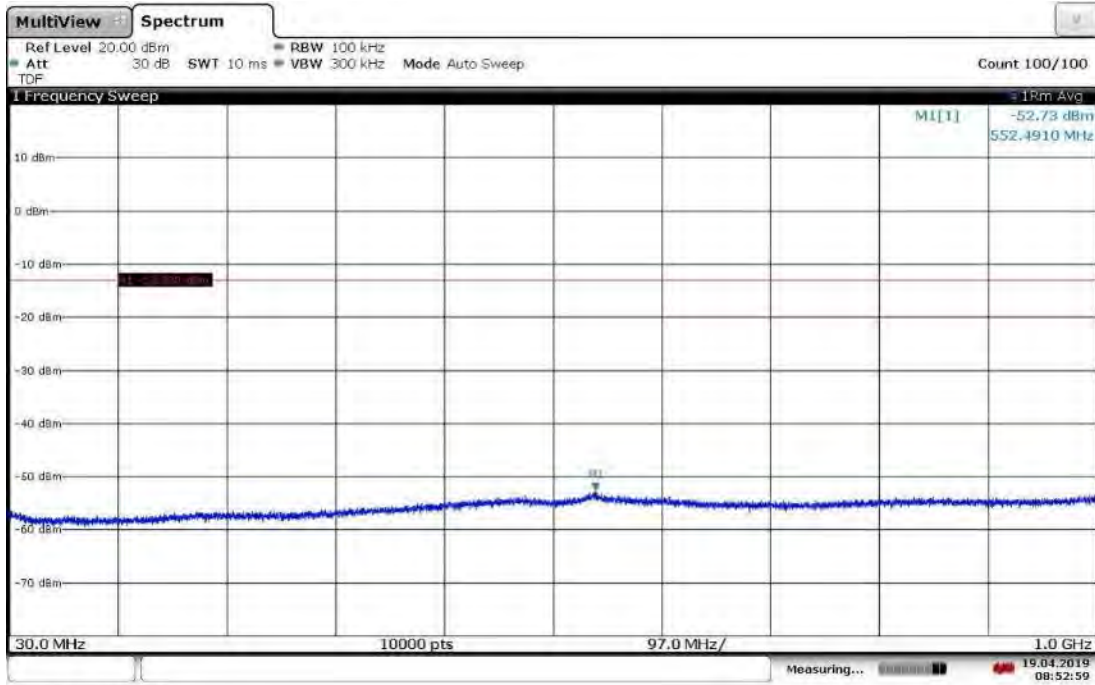
15:05:14 18.04.2019

Slot 1 (Band 66), ANT1, Modulation: TM3.1a-256QAM, Bandwidth: 5 MHz, Low Channel 1-22GHz



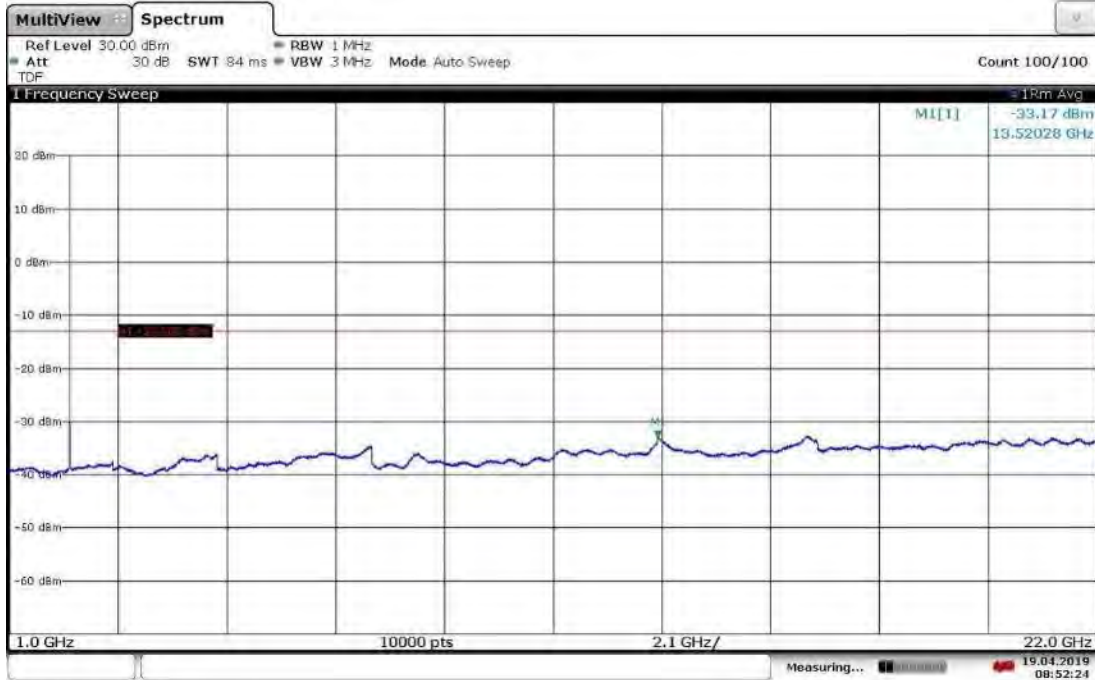
15:03:37 18.04.2019

Slot 1 (Band 66), ANT1, Modulation: TM3.1a-256QAM, Bandwidth: 5 MHz, Mid Channel 30MHz-1GHz



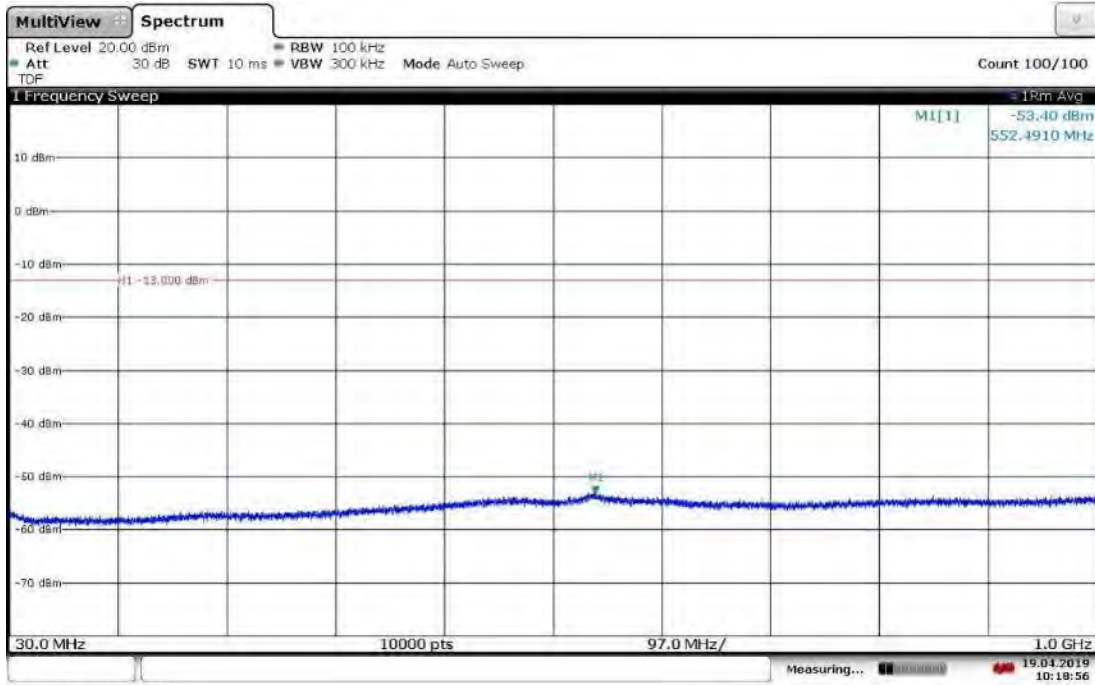
08:53:00 19.04.2019

Slot 1 (Band 66), ANT1, Modulation: TM3.1a-256QAM, Bandwidth: 5 MHz, Mid Channel 1-22GHz



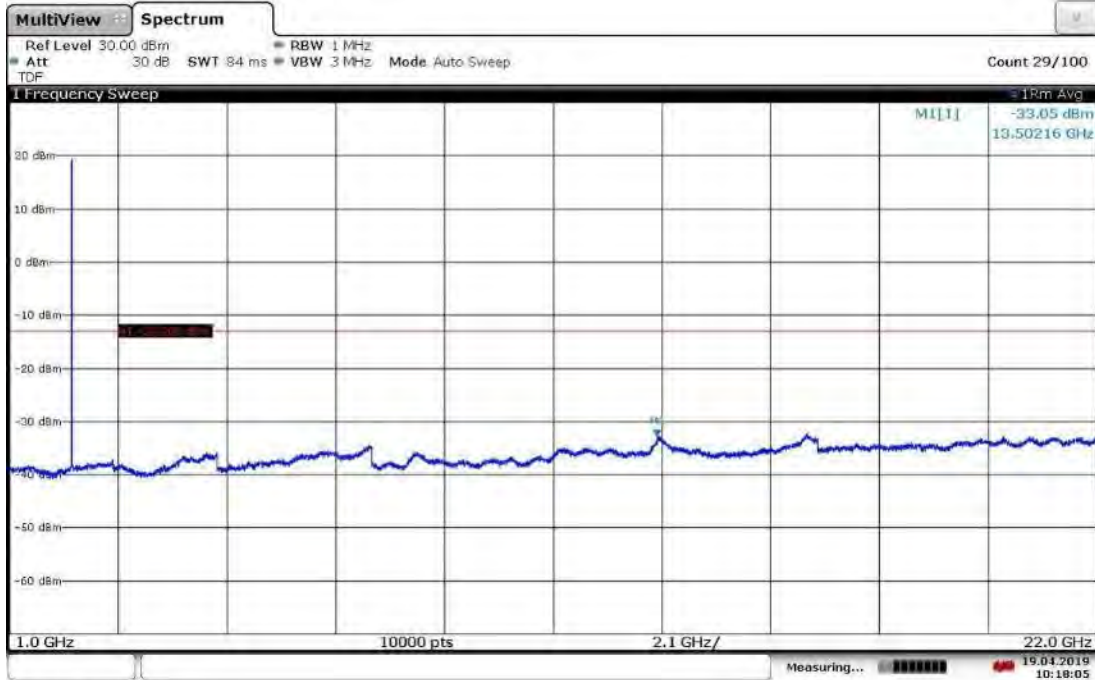
08:52:25 19.04.2019

**Slot 1 (Band 66), ANT1, Modulation: TM3.1a-256QAM, Bandwidth: 5 MHz, High Channel 30MHz-1GHz**



10:18:56 19.04.2019

**Slot 1 (Band 66), ANT1, Modulation: TM3.1a-256QAM, Bandwidth: 5 MHz, High Channel 1-22GHz**



10:18:06 19.04.2019

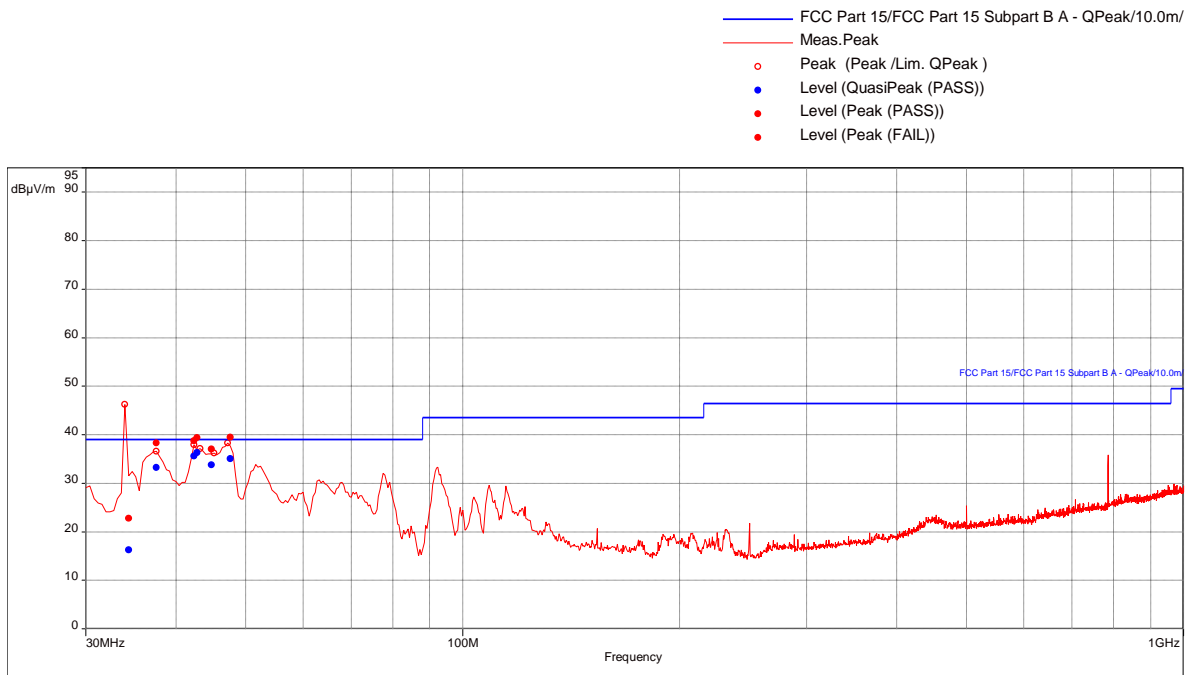
**Radiated Emissions, 30-1000 MHz**

**Slot 1 (Band 66), Modulation: TM1.1-QPSK, Bandwidth 5 MHz, Transmit @ Low Channel**

**Test Information:**

Date and Time	5/17/2019 7:39:39 PM
Client and Project Number	Commscope_G103866582
Engineer	Vathana Ven
Temperature	23 deg C
Humidity	50%
Atmospheric Pressure	995 mB
Comments	RE 30-1000MHz_Tx mode_TM1.1_5MHz BW_Low Channel_P=-5.7_Slot 1 Ant 0_Ant1

**Graph:**



**Results:**

Peak (PASS) (6)

Frequency (MHz)	Level (dBµV/m)	Level (dBm)	Limit (dB)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
34.37894737	22.75	-62.05	-13	-49.05	91.00	1.43	Horizontal	120000.00	-15.02
37.41052632	38.26	-46.54	-13	-33.54	350.00	1.74	Vertical	120000.00	-17.09
42.58947368	38.74	-46.06	-13	-33.06	351.00	3.06	Vertical	120000.00	-20.69
44.82105263	37.05	-47.75	-13	-35.75	351.00	1.00	Vertical	120000.00	-22.33
42.91578947	39.37	-45.43	-13	-32.43	351.00	1.00	Vertical	120000.00	-20.92
47.67368421	39.49	-45.31	-13	-32.31	335.00	1.74	Vertical	120000.00	-24.11

Level (dBm) calculated as follow:

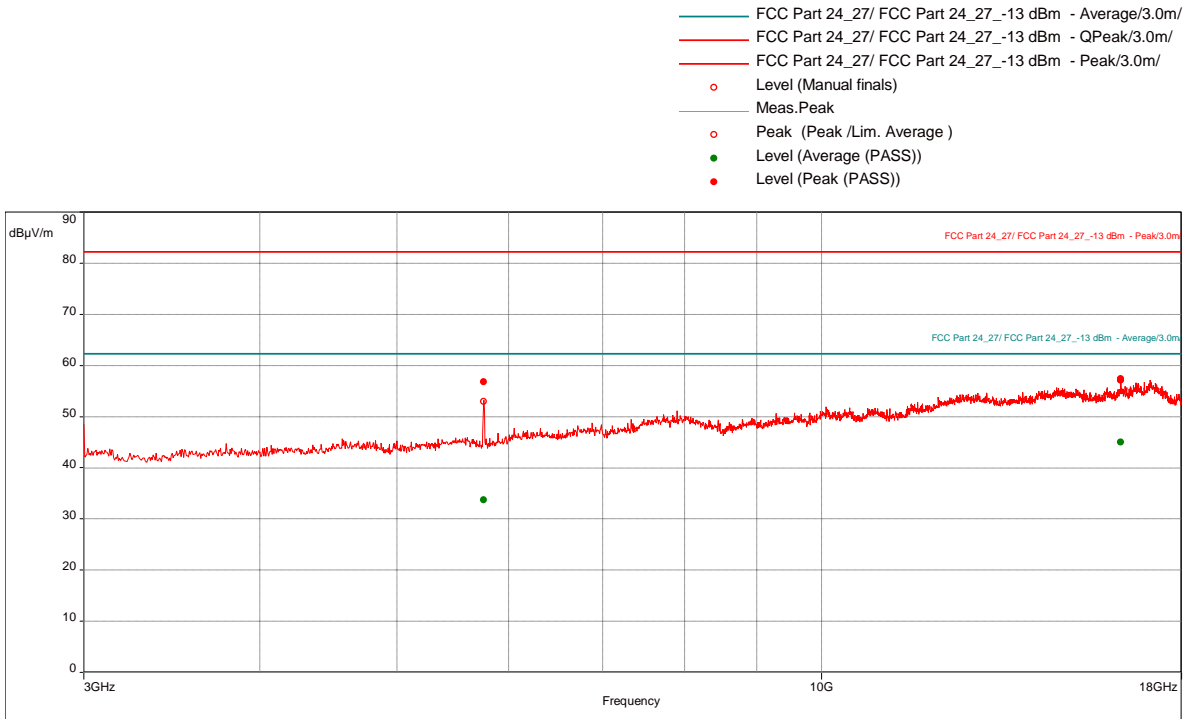
$$EIRP (dBm) = E (dB\mu V/m) + 20 \cdot \text{LOG}(D) - 104.8 ; \text{ where } D \text{ is the measurement distance (in the far field region) in m.}$$

**Radiated Emissions, 1-22 GHz**  
**Slot 1 (Band 66), Modulation: TM1.1-QPSK, Bandwidth 5 MHz, Transmit @ Low Channel**

**Test Information:**

Date and Time	5/24/2019 9:51:57 PM
Client and Project Number	CommScope_G103866582
Engineer	Vathana Ven
Temperature	23 deg C
Humidity	41%
Atmospheric Pressure	1007 mB
Comments	RE 3 to 18 GHz_TM1.1_Low Ch_5M BW_Slot 1_ANT0 & ANT1_P=-4.0

**Graph:**



**Results:**

Peak (PASS) (2)

Frequency (MHz)	Level (dBuV/m)	Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
5762.105263	56.84	-38.41	-13	-25.41	91.00	1.55	Vertical	1000000.00	8.90
16298.94737	57.44	-37.82	-13	-24.82	172.00	1.90	Vertical	1000000.00	21.50

Level (dBm) is calculated as follow:

$$EIRP \text{ (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20 \cdot \text{LOG}(D) - 104.8 ; \text{ where } D \text{ is the measurement distance (in the far field region) in m.}$$

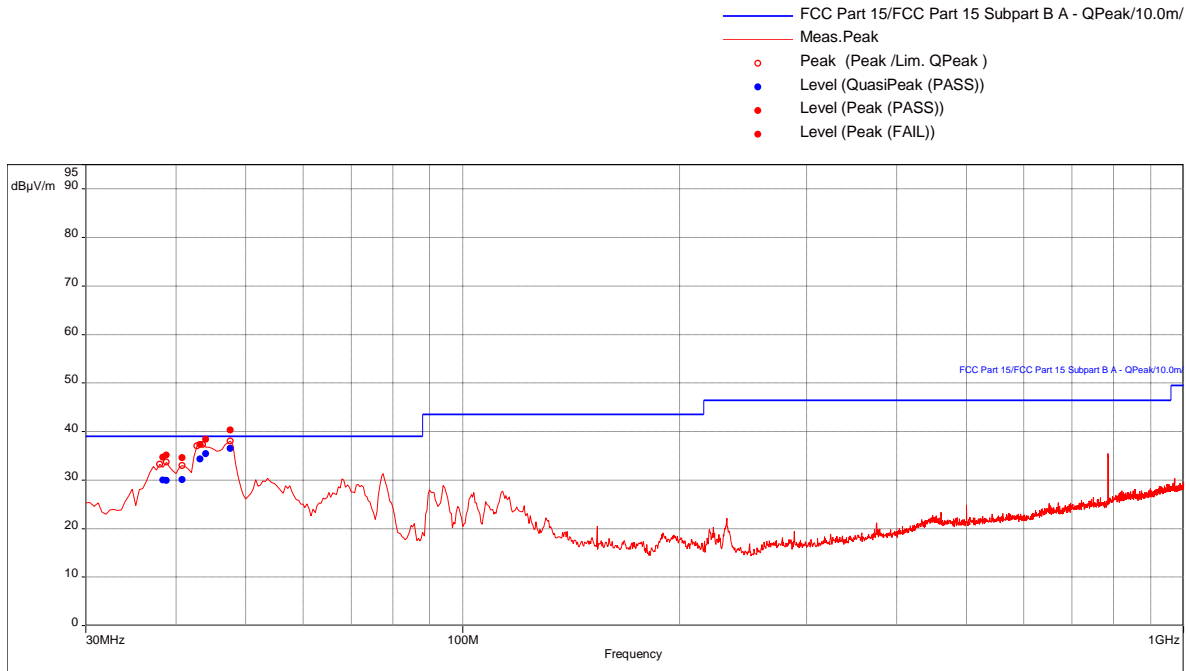
Notes: Testing was performed manually from 1-3 GHz and 18-22 GHz with no emissions were detected at a distance of 10 cm.

**Radiated Emissions, 30-1000 MHz**  
**Slot 1 (Band 66), Modulation: TM1.1-QPSK, Bandwidth 5 MHz, Transmit @ Mid Channel**

**Test Information:**

Date and Time	5/17/2019 9:22:10 PM
Client and Project Number	Commscope_G103866582
Engineer	Vathana Ven
Temperature	23 deg C
Humidity	50%
Atmospheric Pressure	995 mB
Comments	RE 30-1000MHz_Tx mode_TM1.1_5MHz BW_Mid Channel_P=-4.75_Slot 1 Ant 0_Ant1

**Graph:**



**Results:**

Peak (PASS) (6)

Frequency (MHz)	Level (dBµV/m)	Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
38.37894737	34.70	-50.10	-13	-37.10	356.00	2.69	Vertical	120000.00	-17.74
38.64210526	35.12	-49.68	-13	-36.68	359.00	1.00	Vertical	120000.00	-17.94
40.89473684	34.56	-50.24	-13	-37.24	350.00	3.81	Vertical	120000.00	-19.53
43.21052632	37.29	-47.51	-13	-34.51	107.00	3.06	Vertical	120000.00	-21.14
43.97894737	38.41	-46.39	-13	-33.39	349.00	1.00	Vertical	120000.00	-21.75
47.66315789	40.30	-44.50	-13	-31.51	359.00	1.00	Vertical	120000.00	-24.11

Level (dBm) calculated as follow:

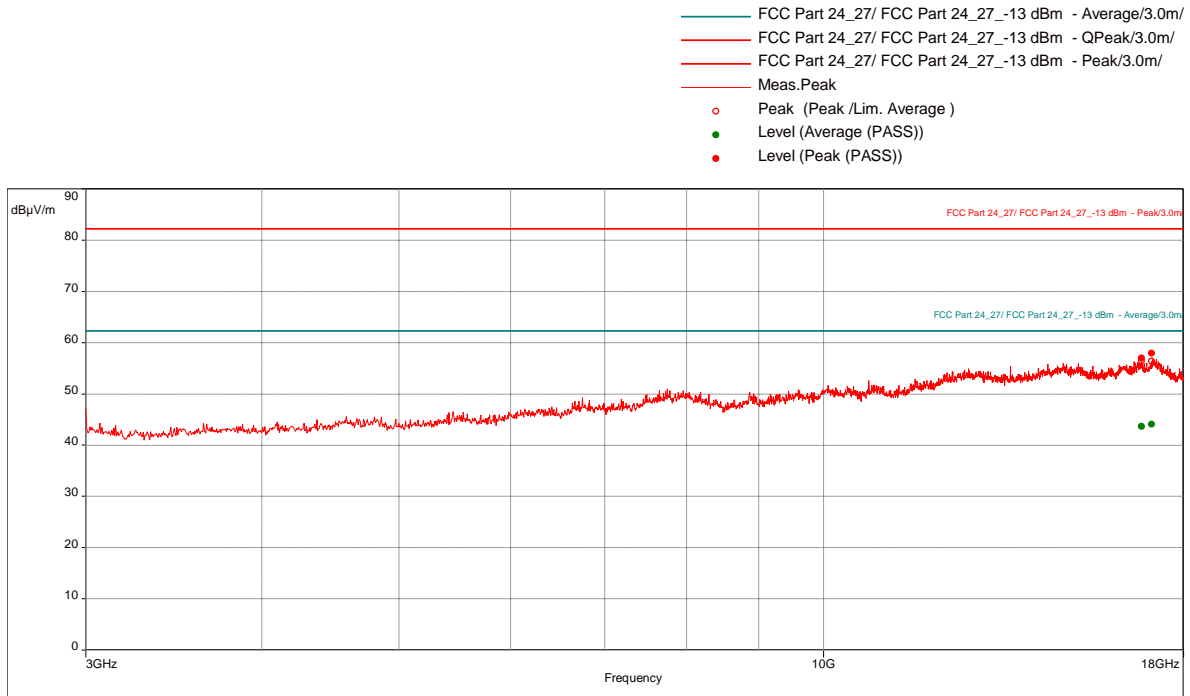
$$EIRP \text{ (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20 \cdot \text{LOG}(D) - 104.8 ; \text{ where } D \text{ is the measurement distance (in the far field region) in m.}$$

**Radiated Emissions, 1-22 GHz  
Slot 1 (Band 66), Modulation: TM1.1-QPSK, Bandwidth 5 MHz, Transmit @ Mid Channel**

**Test Information:**

Date and Time	5/24/2019 10:21:39 PM
Client and Project Number	CommScope_G103866582
Engineer	Vathana Ven
Temperature	21 deg C
Humidity	43%
Atmospheric Pressure	999 mB
Comments	RE 3 to 18 GHz_TM1.1_Mid Ch_5M BW_Slot 1_ANT0 & ANT1_P=-4.75

**Graph:**



**Results:**

**Peak (PASS) (2)**

Frequency (MHz)	Level (dBµV/m)	Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
16807.63158	56.99	-38.27	-13	-25.27	99.00	1.50	Horizontal	1000000.00	22.03
17079.73684	57.95	-37.31	-13	-24.31	342.00	1.00	Horizontal	1000000.00	21.87

Level (dBm) is calculated as follow:

$$EIRP (dBm) = E(dB\mu V/m) + 20 * LOG(D) - 104.8 ; \text{ where } D \text{ is the measurement distance (in the far field region) in m.}$$

Notes: Testing was performed manually from 1-3 GHz and 18-22 GHz with no emissions were detected at a distance of 10 cm.

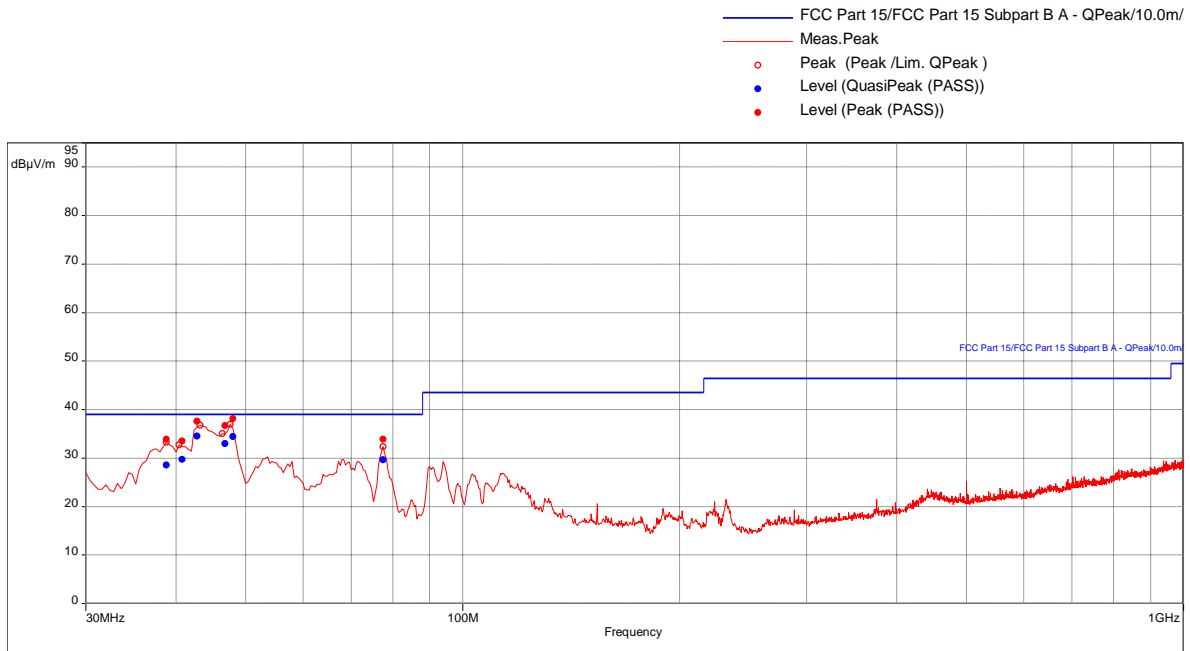


**Radiated Emissions, 30-1000 MHz**  
**Slot 1 (Band 66), Modulation: TM1.1-QPSK, Bandwidth 5 MHz, Transmit @ High Channel**

**Test Information:**

Date and Time	5/17/2019 11:04:54 PM
Client and Project Number	Commscope_G103866582
Engineer	Vathana Ven
Temperature	23 deg C
Humidity	50%
Atmospheric Pressure	995 mB
Comments	RE 30-1000MHz_Tx mode_TM1.1_5MHz BW_High Channel_P=-3.0_Slot 1_Ant 0_Ant1

**Graph:**



**Results:**

Peak (PASS) (6)

Frequency (MHz)	Level (dBµV/m)	Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
38.89473684	33.86	-50.94	-37.94	-5.14	26.00	1.00	Vertical	120000.00	-18.14
40.87368421	33.50	-51.30	-38.30	-5.50	135.00	2.27	Vertical	120000.00	-19.52
42.97894737	37.57	-47.23	-34.23	-1.43	136.00	1.00	Vertical	120000.00	-20.96
46.87368421	36.70	-48.10	-35.10	-2.30	99.00	1.00	Vertical	120000.00	-23.64
47.94736842	38.16	-46.64	-33.64	-0.84	187.00	1.00	Vertical	120000.00	-24.28
77.69473684	33.88	-50.92	-37.92	-5.12	173.00	2.88	Vertical	120000.00	-25.50

Level (dBm) calculated as follow:

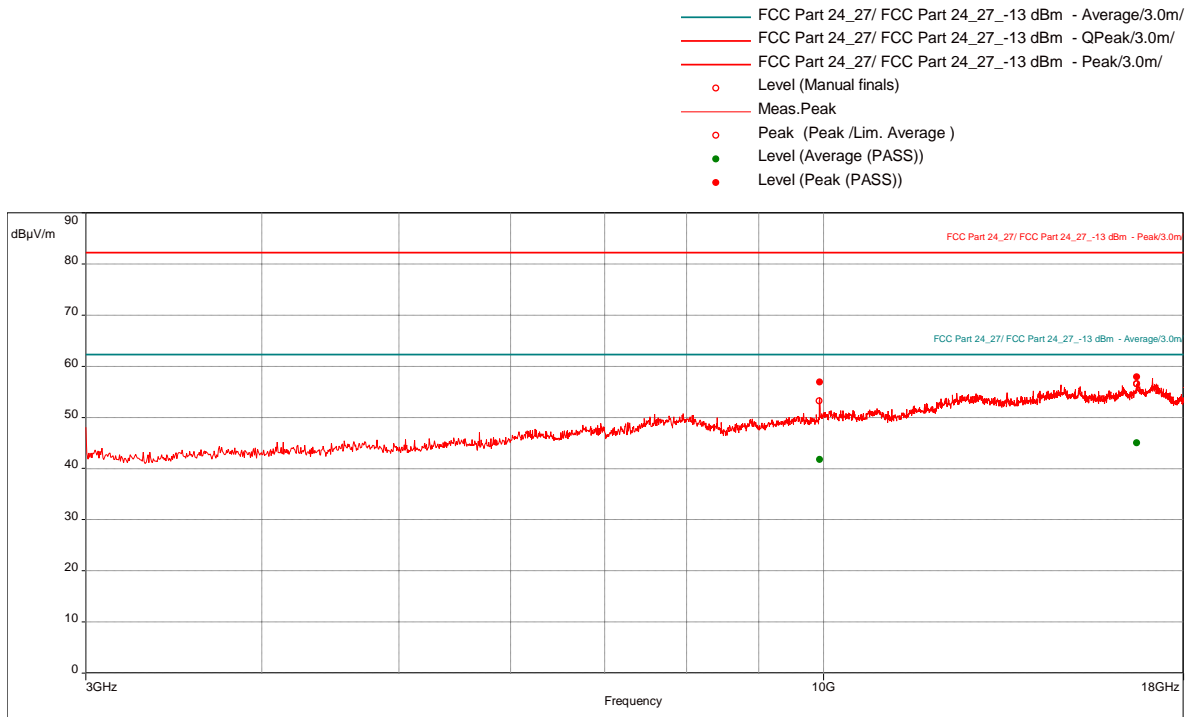
$EIRP (dBm) = E (dB\mu V/m) + 20 * LOG(D) - 104.8$  ; where D is the measurement distance (in the far field region) in m.

**Radiated Emissions, 1-22 GHz**  
**Slot 1 (Band 66), Modulation: TM1.1-QPSK, Bandwidth 5 MHz, Transmit @ High Channel**

**Test Information:**

Date and Time	5/24/2019 11:10:21 PM
Client and Project Number	CommScope_G103866582
Engineer	Vathana Ven
Temperature	23 deg C
Humidity	41%
Atmospheric Pressure	1007 mB
Comments	RE 3 to 18 GHz_TM1.1_High Ch_5M BW_Slot 1_ANT0 & ANT1_P=-3.0

**Graph:**



**Results:**

Peak (PASS) (2)

Frequency (MHz)	Level (dBµV/m)	Level (dBm)	Limit (dB/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
9938.684211	56.88	-38.38	-13	-25.38	329.00	1.60	Vertical	1000000.00	14.20
16677.63158	57.96	-37.30	-13	-24.30	39.00	1.15	Vertical	1000000.00	22.16

Level (dBm) is calculated as follow:

$$EIRP \text{ (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20 \cdot \text{LOG}(D) - 104.8; \text{ where } D \text{ is the measurement distance (in the far field region) in m.}$$

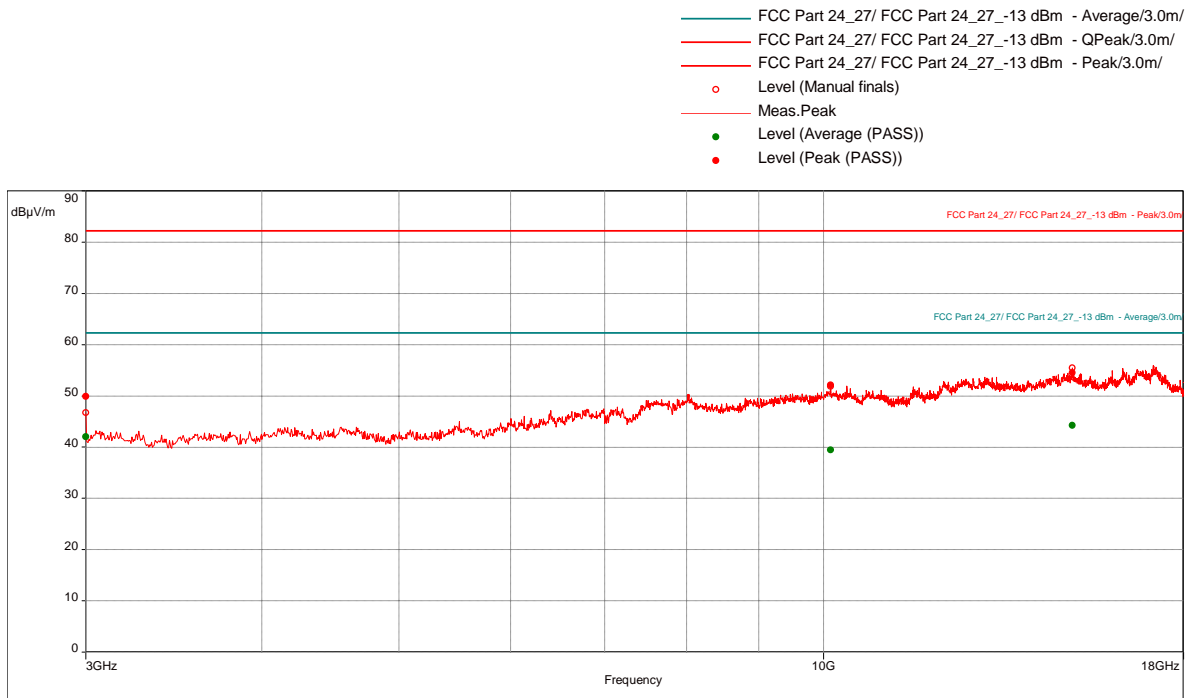
Notes: Testing was performed manually from 1-3 GHz and 18-22 GHz with no emissions were detected at a distance of 10 cm.

**Radiated Emissions, 1-22 GHz**  
**Slot 1 (Band 66), Modulation: TM3.2-16QAM, Bandwidth 5 MHz, Transmit @ Low Channel**

**Test Information:**

Date and Time	6/1/2019 11:03:47 AM
Client and Project Number	CommScope_G103866582
Engineer	Kouma Sinn
Temperature	22 deg C
Humidity	48%
Atmospheric Pressure	1001 mB
Comments	3 to 18 GHz_TM3.2_Low Ch_5M BW_Slot 1_ANT0 (-4.5) & ANT1 (-4.75)

**Graph:**



**Results:**

Peak (PASS) (3)

Frequency (MHz)	Level (dBµV/m)	Level (dBm)	Limit (dB/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
3000	49.91	-45.35	-13	-32.35	269.00	1.15	Vertical	1000000.00	2.42
10119.737	52.09	-43.17	-13	-30.17	173.00	1.70	Horizontal	1000000.00	15.13
15010.526	54.51	-40.75	-13	-27.75	0.00	3.94	Horizontal	1000000.00	21.45

Level (dBm) is calculated as follow:

$$EIRP (dBm) = E (dB\mu V/m) + 20 \cdot \text{LOG}(D) - 104.8; \text{ where } D \text{ is the measurement distance (in the far field region) in m.}$$

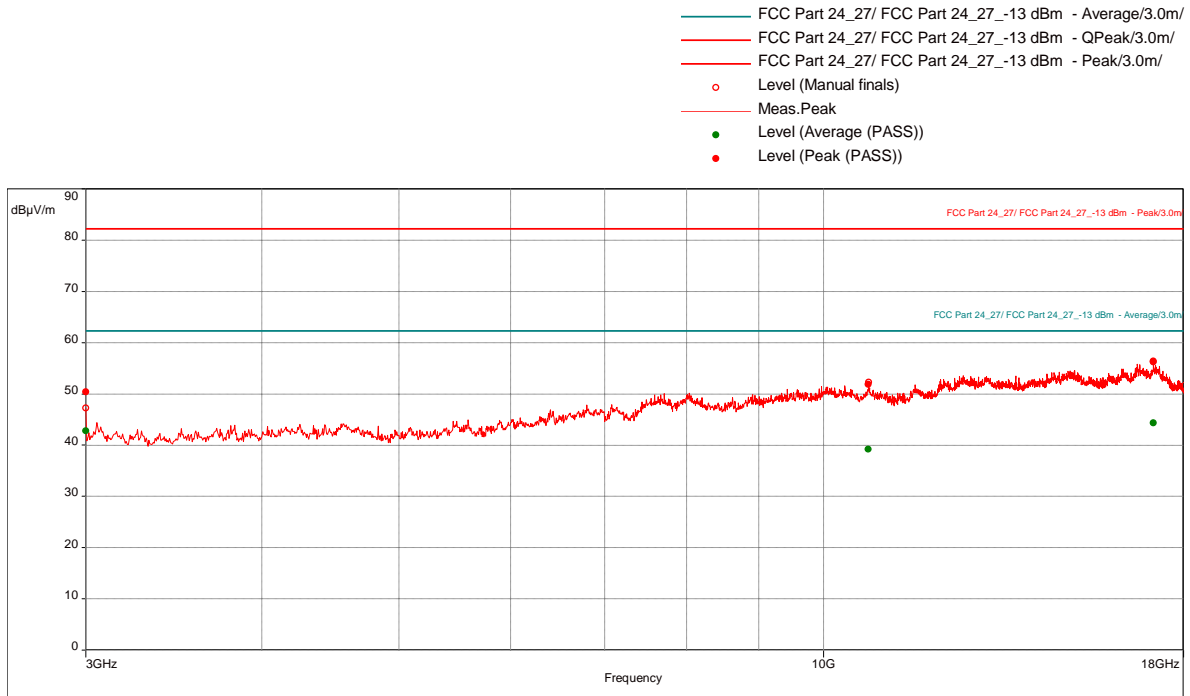
Notes: Testing was performed manually from 1-3 GHz and 18-22 GHz with no emissions were detected at a distance of 10 cm.

**Radiated Emissions, 1-22 GHz**  
**Slot 1 (Band 66), Modulation: TM3.2-16QAM, Bandwidth 5 MHz, Transmit @ Mid Channel**

**Test Information:**

Date and Time	6/1/2019 11:29:17 AM
Client and Project Number	CommScope_G103866582
Engineer	Kouma Sinn
Temperature	22 deg C
Humidity	48%
Atmospheric Pressure	1001 mB
Comments	3 to 18 GHz_TM3.2_Mid Ch_5M BW_Slot 1_ANT0 (-3.25) & ANT1 (-3.0)

**Graph:**



**Results:**

Peak (PASS) (3)

Frequency (MHz)	Level (dBµV/m)	Level (dBm)	Limit (dB/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
3000	50.42	-44.84	-13	-31.84	276.00	1.40	Vertical	1000000.00	2.42
10762.105	51.89	-43.37	-13	-30.37	350.00	2.30	Vertical	1000000.00	15.57
17136.579	56.42	-38.84	-13	-25.84	91.00	1.10	Vertical	1000000.00	21.91

Level (dBm) is calculated as follow:

$$EIRP (dBm) = E (dB\mu V/m) + 20 \cdot \log(D) - 104.8;$$

where D is the measurement distance (in the far field region) in m.

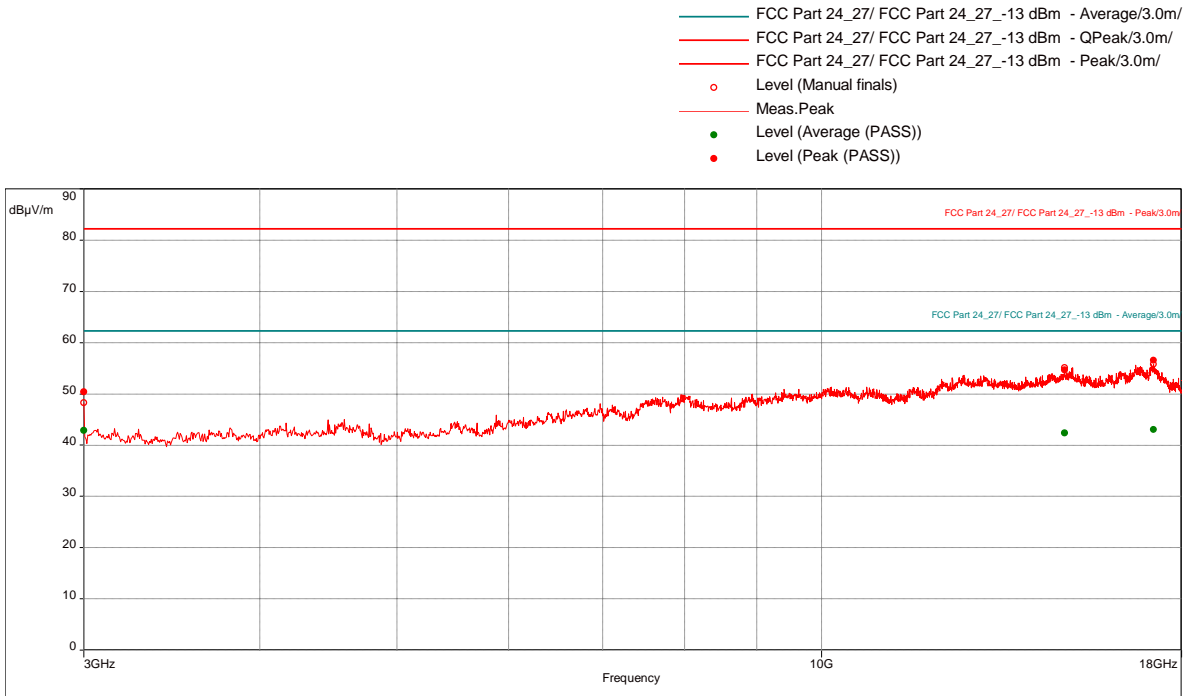
Notes: Testing was performed manually from 1-3 GHz and 18-22 GHz with no emissions were detected at a distance of 10 cm.

**Radiated Emissions, 1-22 GHz**  
**Slot 1 (Band 66), Modulation: TM3.2-16QAM, Bandwidth 5 MHz, Transmit @ High Channel**

**Test Information:**

Date and Time	6/1/2019 11:54:23 AM
Client and Project Number	CommScope_G103866582
Engineer	Kouma Sinn
Temperature	22 deg C
Humidity	48%
Atmospheric Pressure	1001 mB
Comments	3 to 18 GHz_TM3.2_High Ch_5M BW_Slot 1_ANT0 (-1.75) & ANT1 (-1.5)

**Graph:**



**Results:**

Peak (PASS) (3)

Frequency (MHz)	Level (dBµV/m)	Level (dBm)	Limit (dB/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
3000	50.42	-44.84	-13	-31.84	275.00	1.40	Vertical	1000000.00	2.42
14877.368	54.68	-40.58	-13	-27.58	166.00	3.49	Horizontal	1000000.00	21.37
17197.895	56.52	-38.74	-13	-25.74	359.00	3.25	Vertical	1000000.00	21.74

Level (dBm) is calculated as follow:

$$EIRP (dBm) = E (dB\mu V/m) + 20 \cdot \log(D) - 104.8; \text{ where } D \text{ is the measurement distance (in the far field region) in m.}$$

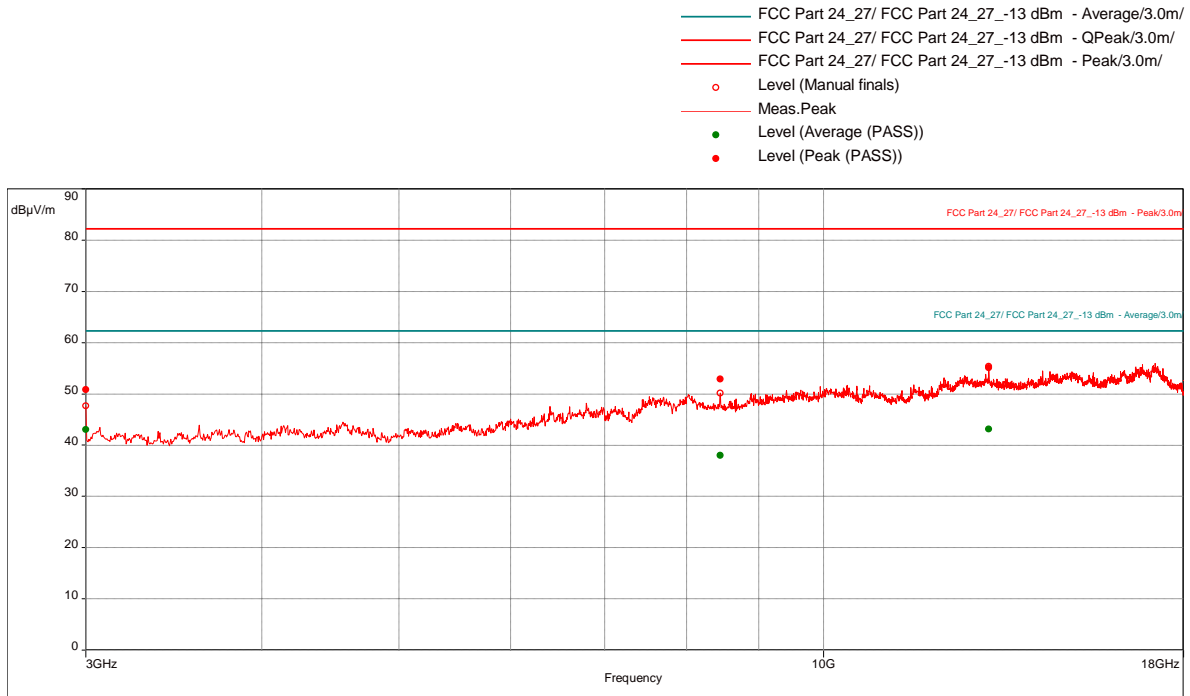
Notes: Testing was performed manually from 1-3 GHz and 18-22 GHz with no emissions were detected at a distance of 10 cm.

**Radiated Emissions, 1-22 GHz**  
**Slot 1 (Band 66), Modulation: TM3.1-64QAM, Bandwidth 5 MHz, Transmit @ Low Channel**

**Test Information:**

Date and Time	6/1/2019 12:23:48 PM
Client and Project Number	CommScope_G103866582
Engineer	Kouma Sinn
Temperature	22 deg C
Humidity	48%
Atmospheric Pressure	1001 mB
Comments	3 to 18 GHz_TM3.1_Low Ch_5M BW_Slot 1_ANT0 (-5.25) & ANT1 (-5.75)

**Graph:**



**Results:**

Peak (PASS) (3)

Frequency (MHz)	Level (dBµV/m)	Level (dBm)	Limit (dB/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
3000	50.81	-44.45	-13	-31.45	275.00	1.40	Vertical	1000000.00	2.42
8448.9474	52.85	-42.41	-13	-29.41	150.00	2.60	Vertical	1000000.00	11.62
13098.421	55.14	-40.12	-13	-27.12	159.00	1.55	Horizontal	1000000.00	20.23

Level (dBm) is calculated as follow:

$$EIRP \text{ (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20 \cdot \text{LOG}(D) - 104.8; \text{ where } D \text{ is the measurement distance (in the far field region) in m.}$$

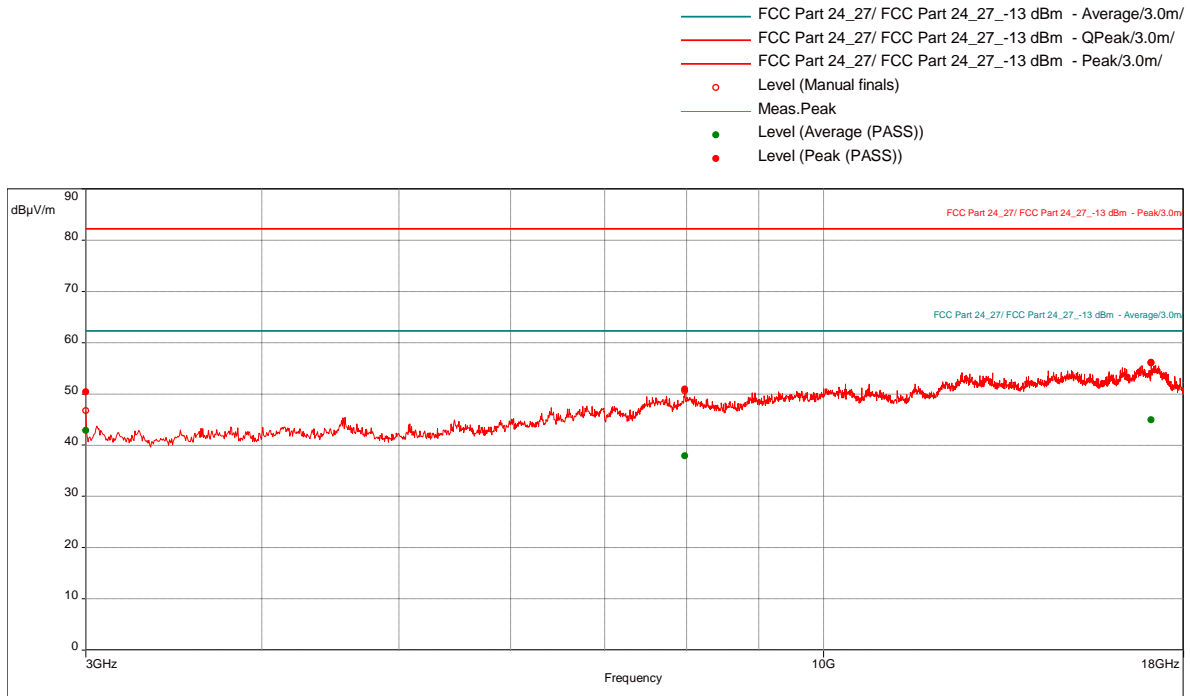
Notes: Testing was performed manually from 1-3 GHz and 18-22 GHz with no emissions were detected at a distance of 10 cm

**Radiated Emissions, 1-22 GHz**  
**Slot 1 (Band 66), Modulation: TM3.1-64QAM, Bandwidth 5 MHz, Transmit @ Mid Channel**

**Test Information:**

Date and Time	6/1/2019 12:47:32 PM
Client and Project Number	CommScope_G103866582
Engineer	Kouma Sinn
Temperature	22 deg C
Humidity	48%
Atmospheric Pressure	1001 mB
Comments	3 to 18 GHz_TM3.1_Mid Ch_5M BW_Slot 1_ANT0 (-4,25) & ANT1 (-3.75)

**Graph:**



**Results:**

Peak (PASS) (3)

Frequency (MHz)	Level (dBµV/m)	Level (dBm)	Limit (dB/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
3000	50.42	-44.84	-13	-31.84	276.00	1.40	Vertical	1000000.00	2.42
7977.3684	50.88	-44.38	-13	-31.38	105.00	3.94	Vertical	1000000.00	13.10
17072.632	56.06	-39.2	-13	-26.2	239.00	3.54	Horizontal	1000000.00	21.82

Level (dBm) is calculated as follow:

$EIRP (dBm) = E (dB\mu V/m) + 20 \cdot \log(D) - 104.8$ ; where D is the measurement distance (in the far field region) in m.

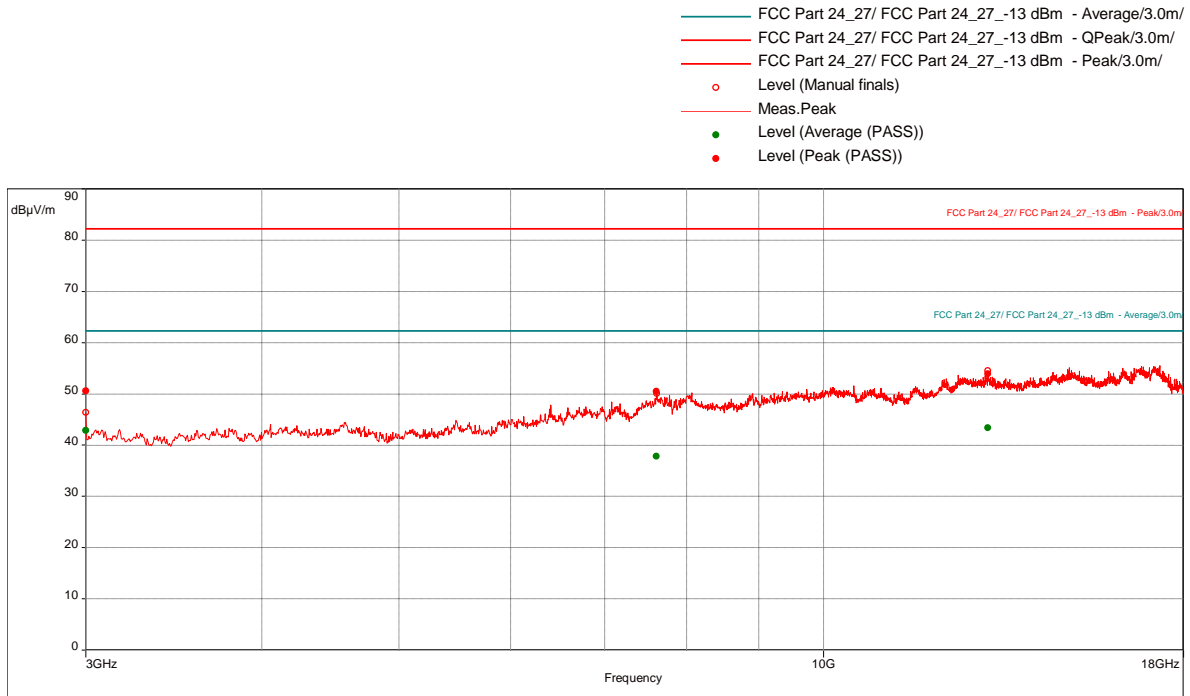
Notes: Testing was performed manually from 1-3 GHz and 18-22 GHz with no emissions were detected at a distance of 10 cm

**Radiated Emissions, 1-22 GHz**  
**Slot 1 (Band 66), Modulation: TM3.1-64QAM, Bandwidth 5 MHz, Transmit @ High Channel**

**Test Information:**

Date and Time	6/1/2019 1:10:06 PM
Client and Project Number	CommScope_G103866582
Engineer	Kouma Sinn
Temperature	22 deg C
Humidity	48%
Atmospheric Pressure	1001 mB
Comments	3 to 18 GHz_TM3.1_High Ch_5M BW_Slot 1_ANT0 (-2.5) & ANT1 (-2.5)

**Graph:**



**Results:**

Peak (PASS) (3)

Frequency (MHz)	Level (dBµV/m)	Level (dBm)	Limit (dB/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
3000	50.55	-44.71	-13	-31.71	276.00	1.40	Vertical	1000000.00	2.42
7615.5263	50.44	-44.82	-13	-31.82	180.00	2.30	Horizontal	1000000.00	12.79
13073.421	53.89	-41.37	-13	-28.37	246.00	2.35	Vertical	1000000.00	20.06

Level (dBm) is calculated as follow:

$EIRP (dBm) = E (dB\mu V/m) + 20 \cdot \log(D) - 104.8$ ; where D is the measurement distance (in the far field region) in m.

Notes: Testing was performed manually from 1-3 GHz and 18-22 GHz with no emissions were detected at a distance of 10 cm

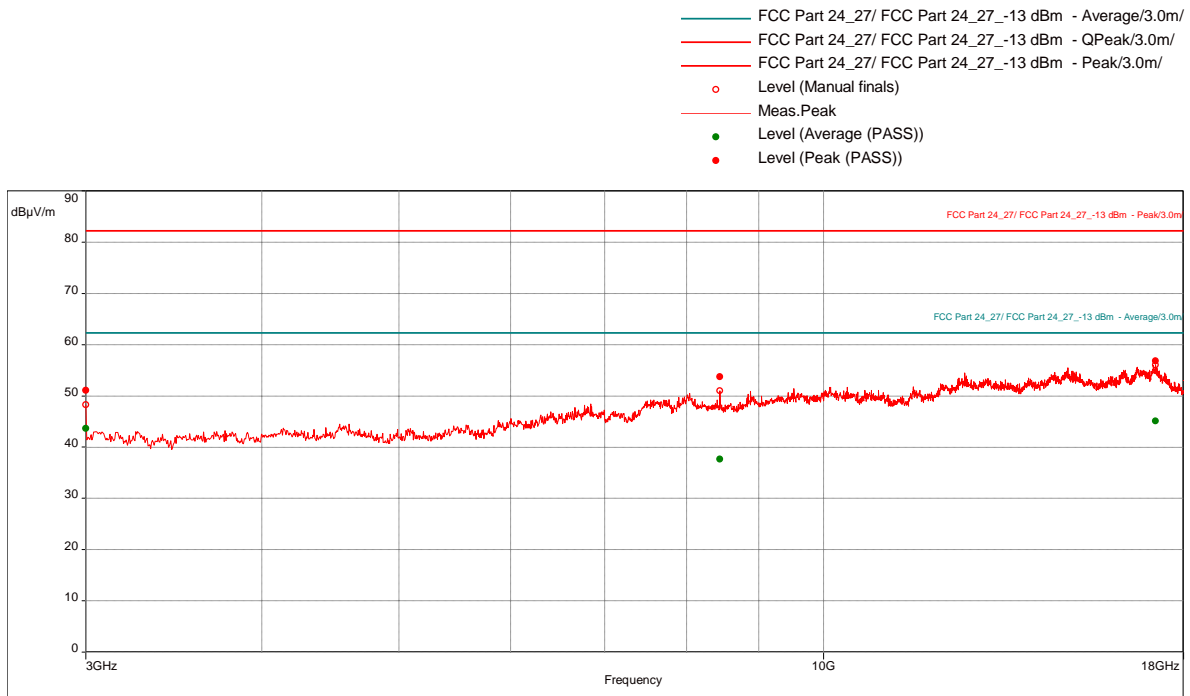


**Radiated Emissions, 1-22 GHz**  
**Slot 1 (Band 66), Modulation: TM3.1a-256QAM, Bandwidth 5 MHz, Transmit @ Low Channel**

**Test Information:**

Date and Time	6/2/2019 9:16:34 AM
Client and Project Number	CommScope_G103866582
Engineer	Kouma Sinn
Temperature	22 deg C
Humidity	51 %
Atmospheric Pressure	997 mB
Comments	RE 6-2-19_3 to 18 GHz_TM3.1a_Low Ch_5M BW_Slot 1_ANT0 (-5.5) & ANT1 (-6)

**Graph:**



**Results:**

Peak (PASS) (3)

Frequency (MHz)	Level (dBµV/m)	Level (dBm)	Limit (dB/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
3000	51.07	-44.19	-13	-31.19	275.00	1.40	Vertical	1000000.00	2.42
8446.5789	53.74	-41.52	-13	-28.52	150.00	1.35	Vertical	1000000.00	11.63
17195.789	56.79	-38.47	-13	-25.47	0.00	1.35	Vertical	1000000.00	21.75

Level (dBm) is calculated as follow:

$$EIRP (dBm) = E (dB\mu V/m) + 20 \cdot \log(D) - 104.8; \text{ where } D \text{ is the measurement distance (in the far field region) in m.}$$

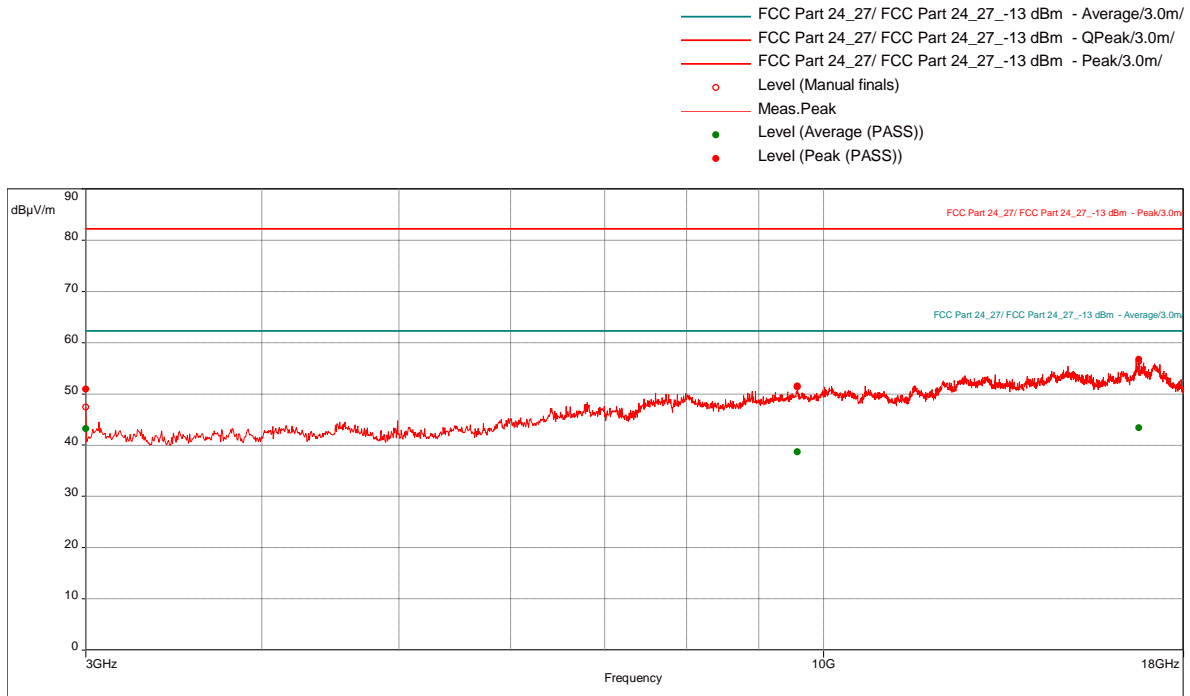
Notes: Testing was performed manually from 1-3 GHz and 18-22 GHz with no emissions were detected at a distance of 10 cm

**Radiated Emissions, 1-22 GHz**  
**Slot 1 (Band 66), Modulation: TM3.1a-256QAM, Bandwidth 5 MHz, Transmit @ Mid Channel**

**Test Information:**

Date and Time	6/2/2019 9:41:50 AM
Client and Project Number	CommScope_G103866582
Engineer	Kouma Sinn
Temperature	22 deg C
Humidity	51 %
Atmospheric Pressure	997 mB
Comments	3 to 18 GHz_TM3.1a_Mid Ch_5M BW_Slot 1_ANT0 (-4.5) & ANT1 (-3.75)

**Graph:**



**Results:**

Peak (PASS) (3)

Frequency (MHz)	Level (dBµV/m)	Level (dBm)	Limit (dB/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
3000	50.94	-44.32	-13	-31.32	276.00	1.40	Vertical	1000000.00	2.42
9585.5263	51.52	-43.74	-13	-30.74	188.00	3.79	Horizontal	1000000.00	13.74
16740.789	56.76	-38.5	-13	-25.5	55.00	1.50	Horizontal	1000000.00	22.25

Level (dBm) is calculated as follow:

$$EIRP (dBm) = E (dB\mu V/m) + 20 \cdot \log(D) - 104.8;$$

where D is the measurement distance (in the far field region) in m.

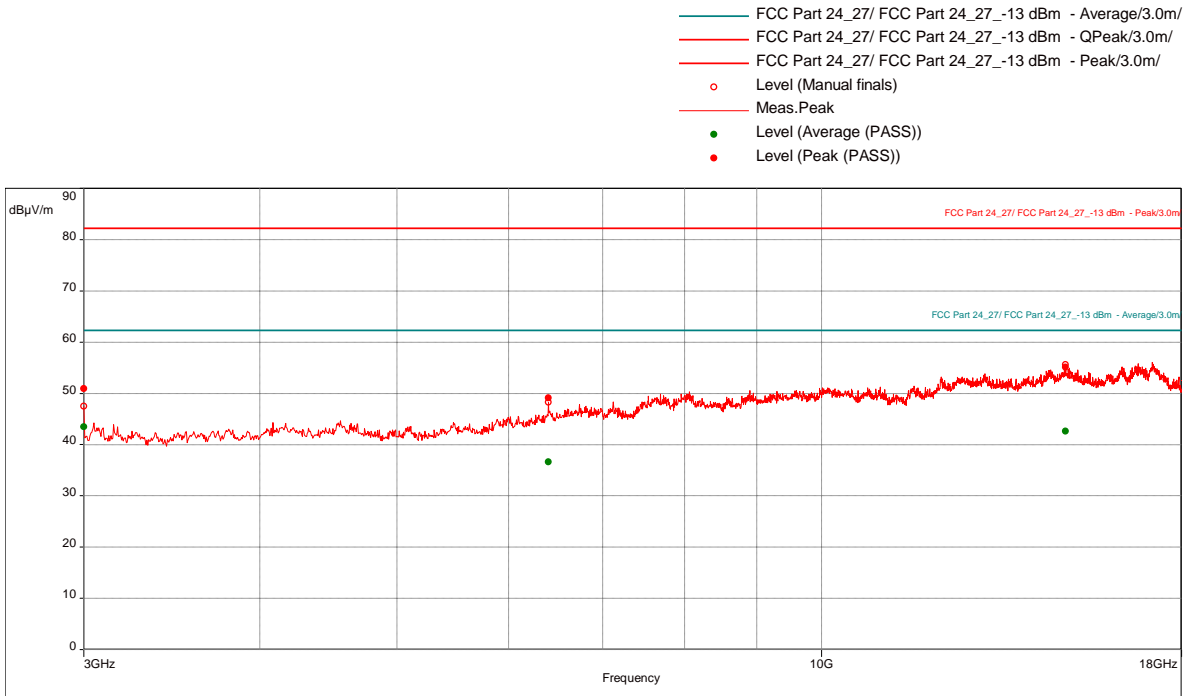
Notes: Testing was performed manually from 1-3 GHz and 18-22 GHz with no emissions were detected at a distance of 10 cm

**Radiated Emissions, 1-22 GHz**  
**Slot 1 (Band 66), Modulation: TM3.1a-256QAM, Bandwidth 5 MHz, Transmit @ High Channel**

**Test Information:**

Date and Time	6/2/2019 10:07:13 AM
Client and Project Number	CommScope_G103866582
Engineer	Kouma Sinn
Temperature	22 deg C
Humidity	51 %
Atmospheric Pressure	997 mB
Comments	RE 6-2-19 _3 to 18 GHz_TM3.1a_High Ch_5M BW_Slot 1_ANT0 (-2.5) & ANT1 (-2.75)

**Graph:**



**Results:**

Peak (PASS) (3)

Frequency (MHz)	Level (dBµV/m)	Level (dBm)	Limit (dB/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
3000	50.94	-44.32	-13	-31.32	276.00	3.98	Vertical	1000000.00	2.42
6405	49.09	-46.17	-13	-33.17	48.00	3.84	Vertical	1000000.00	10.35
14896.579	55.13	-40.13	-13	-27.13	357.00	3.34	Horizontal	1000000.00	21.30

Level (dBm) is calculated as follow:

$EIRP (dBm) = E (dB\mu V/m) + 20 \cdot \log(D) - 104.8$ ; where D is the measurement distance (in the far field region) in m.

Notes: Testing was performed manually from 1-3 GHz and 18-22 GHz with no emissions were detected at a distance of 10 cm

Test Personnel:	<u>Kouma Sinn <i>KPS</i></u>	Test Date:	<u>04/10/2019, 04/11/2019, 04/12/2019, 04/15/2019, 04/16/2019, 04/17/2019, 04/18/2019, 04/19/2019, 04/26/2019, 04/30/2019, 05/17/2019, 05/24/2019, 06/01/2019, 06/02/2019</u>
Supervising/Reviewing Engineer: (Where Applicable)	<u>N/A</u>	Limit Applied:	<u>See report section 11.3</u>
Product Standard:	<u>FCC Part 27</u>	Ambient Temperature:	<u>22, 23, 23, 23, 23, 22, 22, 22, 20, 22, 23, 23, 22, 22 °C</u>
Input Voltage:	<u>48 VDC (POE)</u>	Relative Humidity:	<u>21, 15, 26, 47, 20, 22, 23, 47, 42, 35, 5, 410, 40, 51 %</u>
Pretest Verification w/ Ambient Signals or BB Source:	<u>N/A</u>	Atmospheric Pressure:	<u>1004, 1013, 1004, 980, 1001, 1011, 1014, 1000, 996, 1017, 995, 1007, 1001, 997 mbars</u>

Deviations, Additions, or Exclusions: None

**12 Revision History**

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
0	07/09/2019	103866582BOX-010b	KPS <i>KPS</i>	NNA <i>NNA</i>	Original Issue
1	08/07/2019	103866582BOX-010b	KPS <i>KPS</i>	NNA <i>NNA</i>	Added tabular frequency stability data and a note about antenna gain not being measured