

Test report No:  
 NIE: 67313RRF.003

**Partial Test report**  
**REFERENCE STANDARD:**  
**USA FCC Part 27**  
**CANADA RSS-130, RSS-139, RSS-199**

(*) Identification of item tested	Vaisala Beacon Station BWS500
(*) Trademark	BSW500
(*) Model and /or type reference	EGW501
Other identification of the product	SW version: V0708_01.002.01.002 HW version: D FCC ID: 2AO39-EGW501 IC: 23830-EGW501
(*) Features	GSM, WCDMA, LTE
Applicant	Vaisala Oyj Vanha Nurmijärventie 21, 01670 Vantaa FINLAND
Test method requested, standard	USA FCC Part 27 (10-1-19 Edition). CANADA RSS-130 Issue 2, Feb. 2019. CANADA RSS-139 Issue 3, Jul. 2015. CANADA RSS-199 Issue 3, Dec. 2016. ANSI C63.26-2015. KDB 971168 D01 Power Meas License Digital Systems v03r01, April. 2018.
Approved by (name / position & signature)	Rafael López Martín EMC Consumer & RF Lab. Manager
Date of issue	2021-03-22
Report template No	FDT08_23 (*) "Data provided by the client"

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## Competences and guarantees

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DEKRA Testing and Certification is a FCC-recognized accredited testing laboratory with appropriate scope of accreditation that include testing performed in this test report.

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## General conditions

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1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Testing and Certification.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Testing and Certification and the Accreditation Bodies.

## Uncertainty

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Uncertainty (factor  $k=2$ ) was calculated according to the DEKRA Testing and Certification internal document PODT000.

## Data provided by the client

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The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested").
2. The sample of the model EGW501 is a compact weather station for environmental monitoring. The complete solution provides measurements, data collection, and data visualization in one package. Vaisala Beacon Station includes Vaisala Beacon Edge Gateway EGW501, a multi parameter Vaisala Weather Transmitter WXT536, powering equipment, and mounting accessories. To maximize ease-of-use, the station comes with a data plan and a variety of service packages to choose from.

DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

## Usage of samples

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Samples undergoing test have been selected by: The client.

- Sample S/01 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
67313/002	Vaisala Beacon Station BWS500	EGW501	S5053426	2021/02/02
65531/006	Weather Transmitter	WXT536	S3240235	2020/10/01
65531/038	Power Supply Unit	PSU501	S3926080	2020/10/14

Auxiliary elements used with the Sample S/01:

Control Nº	Description	Model	Serial Nº	Date of reception
65531/013	Load	--	--	2020/10/01
65531/015	WXT cable	--	--	2020/10/01
65531/017	DC out cable	--	--	2020/10/01
65531/021	DC in cable	--	--	2020/10/01
65531/039	Power Cable	--	--	2020/10/14

Sample S/01 has undergone the following test(s): All radiated tests indicated in Appendix A.

## Test sample description

Ports..... :	Port name and description		Cable				
			Specified length [m]	Attached during test	Shielded		
	PSU501		2	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
	PSU502		2	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
WXT		10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Supplementary information to the ports..... :	Connecting power cable to gateway turns station automatically on if power is available from battery or other power source. Other ports reserved future use.						
Rated power supply .....	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	<input checked="" type="checkbox"/>	AC: 100 – 240 V	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	DC: 9 – 32 V						
Rated Power .....	--						
Clock frequencies.....	max. 2GHz						
Other parameters .....	--						
Software version .....	V0708_01.002.01.002						
Hardware version .....	D						
Dimensions in cm (L x W x D).....	306 x 184 x 156						
Mounting position .....	<input type="checkbox"/>	Table top equipment					
	<input checked="" type="checkbox"/>	Wall/Ceiling mounted equipment					
	<input type="checkbox"/>	Floor standing equipment					
	<input type="checkbox"/>	Hand-held equipment					
	<input type="checkbox"/>	Other:					
Modules/parts.....	Module/parts of test item		Type	Manufacturer			
	--						
Accessories (not part of the test item) .....	Description		Type	Manufacturer			
	PSU501, AC power supply		PSU501	Vaisala Oyj			
	PSU502, DC solar power supply		PSU502	Vaisala Oyj			
	WXT536, Weather transmitter		WXT536	Vaisala Oyj			
Documents as provided by the applicant .....	Description		File name	Issue date			
	--						

## Identification of the client

Vaisala Oyj  
Vanha Nurmijärventie 21, 01670 Vantaa FINLAND

## Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2021-02-03
Date (finish)	2021-02-08

## Document history

Report number	Date	Description
67313RRF.003	2021-03-22	First release

## Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 75 %

In the semianechoic chamber, the following limits were not exceeded during the test.

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 75 %

## Remarks and comments

The tests have been performed by the technical personnel: José Manuel Jimenez, Pablo Redondo, Alfonso Gutiérrez and Nicolás Salguero.

Used instrumentation:

### Radiated Measurements

		Last Cal. date	Cal. due date
1.	Semianechoic Absorber Lined Chamber ETS LINDGREN FACT 3 200 STP	N.A.	N.A.
2.	Shielded Room ETS LINDGREN S101	N.A.	N.A.
3.	Biconical/Log Antenna ETS LINDGREN 3142E	2020/04	2023/04
4.	EMI Test Receiver 7 GHz ROHDE AND SCHWARZ ESR7	2019/10	2021/10
5.	Broadband Horn antenna 1-18 GHz SCHWARZBECK MESS-ELEKTRONIK BBHA 9120 D	2019/11	2022/11
6.	RF Pre-amplifier 1-18 GHz BONN ELEKTRONIK BLMA 0118-1M	2020/05	2021/05
7.	Signal and Spectrum Analyzer ROHDE AND SCHWARZ FSW 50	2020/07	2022/07
8.	HORN ANTENNA 18-40GHz SCHWARZBECK BBHA 9170	2020/05	2023/05
9.	PRE-AMPLIFIER G>30dB 18-40GHz BONN ELEKTRONIK BLMA 1840-1M	2019/02	2021/02
10.	Digital Multimeter FLUKE 175	2020/11	2021/11
11.	WIDEBAND RADIO COMMUNICATION TESTER ROHDE AND SCHWARZ CMW500	2021/02	2022/02

## Testing verdicts

Not applicable:	N/A
Pass:	P
Fail:	F
Not measured:	N/M

## Summary

FCC PART 27/IC RSS-130 / RSS-139, RSS-199 PARAGRAPH		
Requirement – Test case	Verdict	Remark
Clause 27.50 / RSS-139 Clause 6.5. / RSS-130 Clause 4.6 / RSS-199 Clause 4.4: RF output power	N/M	(1)
Clause 2.1047 / RSS-139 Clause 6.2. / RSS-130 Clause 4.2 / RSS-199 Clause 4.1: Modulation characteristics	N/M	(1)
Clause 27.54 / RSS-139 Clause 6.4. / RSS-130 Clause 4.5. / RSS-199 Clause 4.3: Frequency stability	N/M	(1)
Clause 2.1049: Occupied Bandwidth	N/M	(1)
Clause 27.53 / RSS-139 Clause 6.6. / RSS-130 Clause 4.7. / RSS-199 Clause 4.5: Spurious emissions at antenna terminals	N/M	(1)
Clause 27.53 / RSS-139 Clause 6.6. / RSS-130 Clause 4.7. / RSS-199 Clause 4.5: Radiated emissions	P	(2)
<u>Supplementary information and remarks:</u>		
(1) Test not requested.		
(2) Radiated spurious emissions tests were tested in the worst case		



## Appendix A: Test results for FCC PART 27 / RSS-130, RSS-139, RSS-199

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## TEST CONDITIONS

### POWER SUPPLY (V):

Vnominal = 110 Vac

Type of power supply = AC voltage

### ANTENNA:

Type of antenna = Integral antenna.

Declared Gain for antenna.

LOW Bands	
LTE Band 12	0.40 dBi
LTE Band 13	0.40 dBi

MIDDLE Band	
LTE Band 4	3.5 dBi

HIGH Band	
LTE Band 41	2.1 dBi

### TEST FREQUENCIES:

#### LTE Band 4. QPSK AND 16QAM MODULATION:

	Channel (Frequency. MHz)					
	BW = 1.4 MHz	BW = 3 MHz	BW = 5 MHz	BW = 10 MHz	BW = 15 MHz	BW = 20 MHz
Lowest	19957 (1710.7)	19965 (1711.5)	19975 (1712.5)	20000 (1715.0)	20025 (1717.5)	20050 (1720.0)
Middle	20175 (1732.5)	20175 (1732.5)	20175 (1732.5)	20175 (1732.5)	20175 (1732.5)	20175 (1732.5)
Highest	20393 (1754.3)	20385 (1753.5)	20375 (1752.5)	20350 (1750.0)	20325 (1747.5)	20300 (1745.0)

LTE Band 12. QPSK AND 16QAM MODULATION:

	Channel (Frequency. MHz)			
	BW = 1.4 MHz	BW = 3 MHz	BW = 5 MHz	BW = 10 MHz
Lowest	23017 (699.7)	23025 (700.5)	23035 (701.5)	23060 (704.0)
Middle	23095 (707.5)	23095 (707.5)	23095 (707.5)	23095 (707.5)
Highest	23173 (715.3)	23165 (714.5)	23155 (713.5)	23130 (711.0)

LTE Band 13. QPSK AND 16QAM MODULATION:

	Channel (Frequency, MHz)	
	BW = 5 MHz	BW = 10 MHz
Lowest	23205 (779.5)	N/A
Middle	23230 (782.0)	23230 (782.0)
Highest	23255 (784.5)	N/A

LTE Band 41. QPSK AND 16QAM MODULATION:

	Channel (Frequency. MHz)			
	BW = 5 MHz	BW = 10 MHz	BW = 15 MHz	BW = 20 MHz
Lowest	39675 (2498.5)	39700 (2501.0)	39725 (2503.5)	39750 (2506.0)
Middle	40620 (2593.0)	40620 (2593.0)	40620 (2593.0)	40620 (2593.0)
Highest	41565 (2687.5)	41540 (2685.0)	41515 (2682.5)	41490 (2680.0)

Results show below were performed in the worst case of modulation, and combination between bandwidth and Resource Blocks through a preliminary scan.

## Radiated emissions

### SPECIFICATION:

#### **1. LTE Band 4.** FCC §2.1053 & §27.53 (h) / RSS-139 Issue 3 Clause 6.6.

##### FCC §27.53 (h):

(h) Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB.

##### RSS-139 Clause 6.6:

i. In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least  $43 + 10 \log_{10} p$  (watts) dB.

ii. After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least  $43 + 10 \log_{10} P$  (watts) dB.

##### LTE Band 4 MEASUREMENT LIMIT:

At  $P_o$  transmitting power, the specified minimum attenuation becomes  $43 + 10 \log(P_o)$ , and the level in dBm relative  $P_o$  becomes:

$$P_o \text{ (dBm)} - [43 + 10 \log(P_o \text{ in mwatts}) - 30] = -13 \text{ dBm}$$

#### **2. LTE Band 12.** FCC §2.1053 & §27.53 (g) / RSS-130 Issue 2 Clause 4.7.1.

##### FCC §27.53 (g):

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log(P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

##### RSS-130 Issue 2 Clause 4.7.1:

4.7.1. The power of any unwanted emissions in any 100 kHz bandwidth on any frequency outside the frequency range(s) within which the equipment is designed to operate shall be attenuated below the transmitter power, P (dBW), by at least  $43 + 10 \log_{10} p$  (watts), dB. However, in the 100 kHz band immediately outside the equipment's operating frequency range, a resolution bandwidth of 30 kHz may be employed.

##### LTE Band 12 MEASUREMENT LIMIT:

At  $P_o$  transmitting power, the specified minimum attenuation becomes  $43 + 10 \log(P_o)$ , and the level in dBm relative  $P_o$  becomes:

$$P_o \text{ (dBm)} - [43 + 10 \log(P_o \text{ in mwatts}) - 30] = -13 \text{ dBm}$$

### 3. LTE Band 13. FCC §2.1053 & §27.53 (c) (2) (4) & (f) / RSS-130 Issue 2 Clause 4.7.1.

FCC §27.53 (c) (2) (4) & (f):

(c) (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB.

(c) (4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $65 + 10 \log (P)$  dB in a 6.25 kHz band segment, for mobile and portable stations.

(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to  $-70$  dBW ( $-40$  dBm)/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and  $-80$  dBW ( $-50$  dBm) EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

RSS-130 Issue 2 Clause 4.7.1:

4.7.1. The power of any unwanted emissions in any 100 kHz bandwidth on any frequency outside the frequency range(s) within which the equipment is designed to operate shall be attenuated below the transmitter power, P (dBW), by at least  $43 + 10 \log_{10} p$  (watts), dB. However, in the 100 kHz band immediately outside the equipment's operating frequency range, a resolution bandwidth of 30 kHz may be employed.

LTE Band 13 MEASUREMENT LIMIT:

At  $P_o$  transmitting power, the specified minimum attenuation becomes  $43 + 10 \log (P_o)$ , and the level in dBm relative  $P_o$  becomes:

$$P_o \text{ (dBm)} - [43 + 10 \log (P_o \text{ in mwatts}) - 30] = -13 \text{ dBm}$$

### 4. LTE Band 41. FCC §2.1053 & §27.53 (m) (4) / RSS-199 Issue 3 Clause 4.5 (a).

FCC §27.53 (m) (4)

(m) For BRS and EBS stations, the power of any emissions outside the licensee's frequency bands of operation shall be attenuated below the transmitter power (P) measured in watts in accordance with the standards below. If a licensee has multiple contiguous channels, out-of-band emissions shall be measured from the upper and lower edges of the contiguous channels.

(4) For mobile digital stations, the attenuation factor shall be not less than  $40 + 10 \log (P)$  dB on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log (P)$  dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and  $55 + 10 \log (P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than  $43 + 10 \log (P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log (P)$  dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

RSS-199 Clause 4.5 (a)

(a) for base station and fixed subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least  $43 + 10 \log_{10} p$  (watts)

LTE Band 41 MEASUREMENT LIMIT:

At  $P_o$  transmitting power, the specified minimum attenuation becomes  $43 + 10 \log (P_o)$ , and the level in dBm relative  $P_o$  becomes:

$$P_o \text{ (dBm)} - [43 + 10 \log (P_o \text{ in mwatts}) - 30] = -13 \text{ dBm}$$

**METHOD:**

The measurement was performed with the EUT inside an anechoic chamber. The spectrum was scanned from 30 MHz to at least the 10th harmonic of the highest frequency generated within the equipment.

The EUT was placed on a non-conductive stand at a 3 meter distance from the measuring antenna for measurements from 30 MHz up to 18 GHz and at 1 m distance for measurements above 18 GHz.

Detected emissions were maximized at each frequency by rotating the EUT and adjusting the measuring antenna height and polarization. The maximum meter reading was recorded.

**Measurement Limit:**

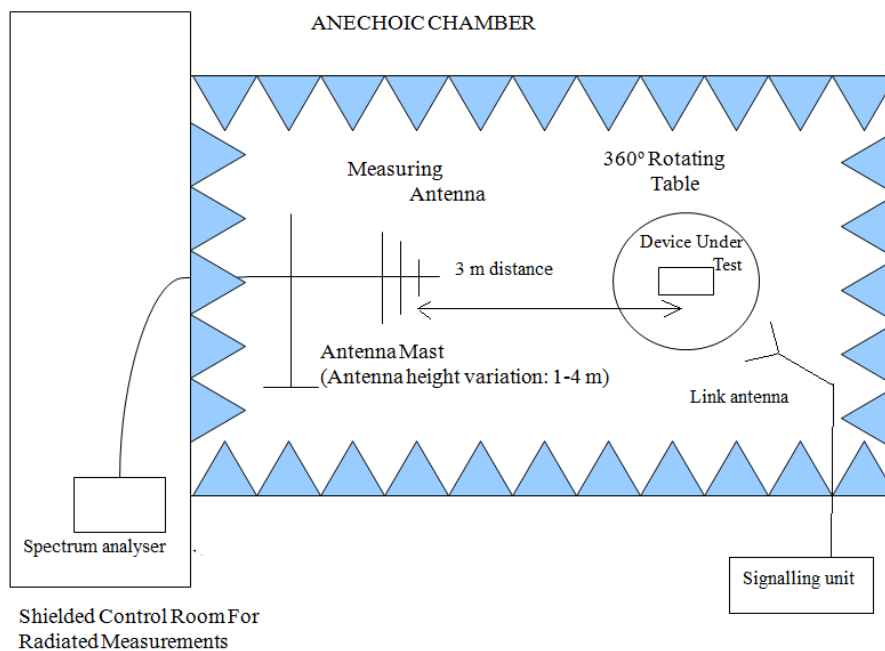
According to specification, the power of emissions shall be attenuated below the transmitter power (P) by a factor of at least  $43 + 10 \log (P)$  dB. P in watts.

At  $P_o$  transmitting power, the specified minimum attenuation becomes  $43+10\log (P_o)$  and the level in dBm relative  $P_o$  becomes:

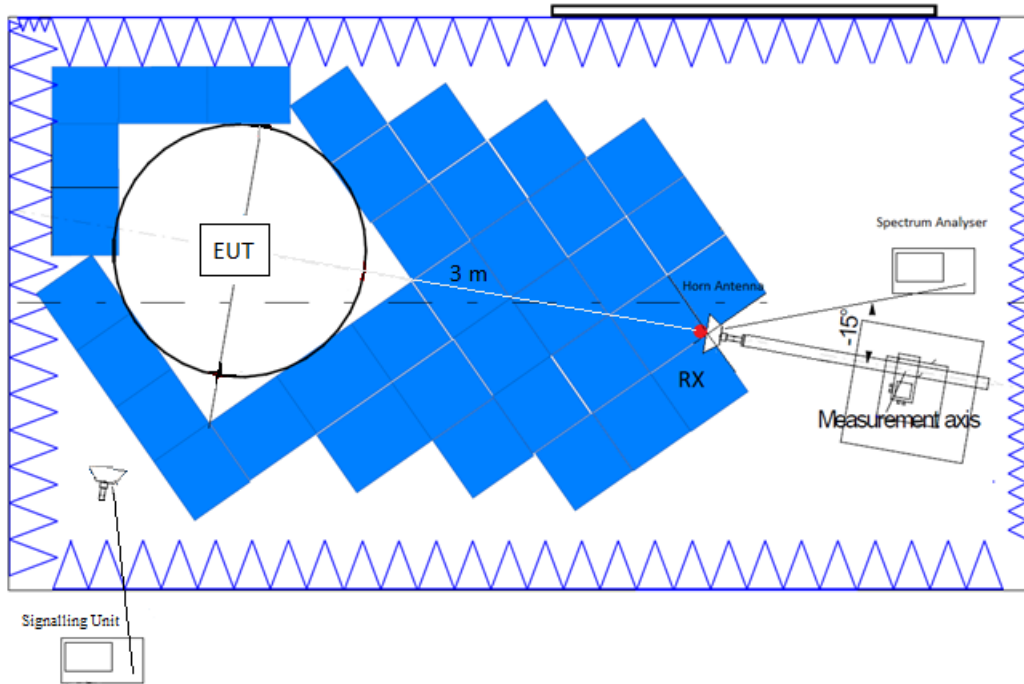
$$P_o \text{ (dBm)} - [43 + 10 \log (P_o \text{ in mwatts}) - 30] = - 13 \text{ dBm}$$

**TEST SETUP:**

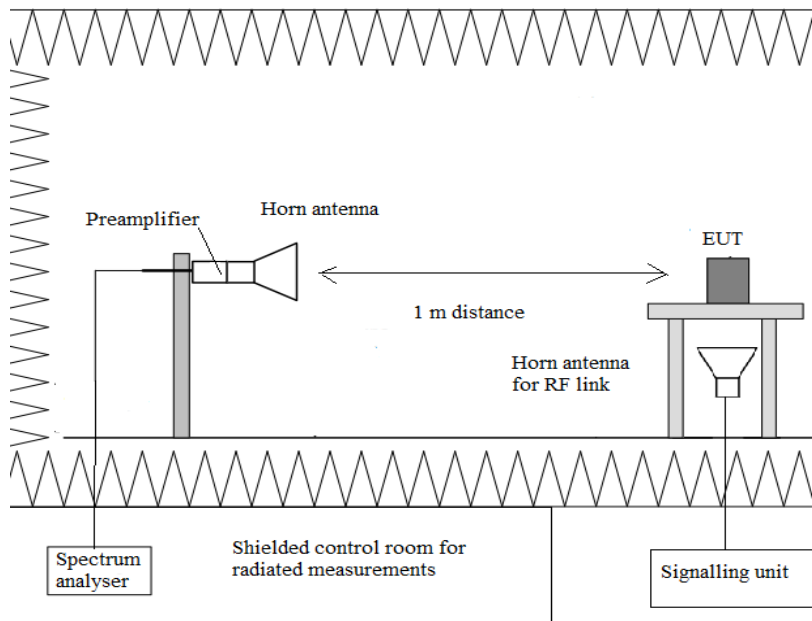
Radiated measurements below 1 GHz.



Radiated measurements between 1 GHz and 18 GHz.



Radiated measurements above 18 GHz.





**RESULTS:**

**LTE Band 4:**

**QPSK:**

A preliminary scan determined BW=15 MHz, RB Size=1, RB Offset=38 as the worst case. The following tables and plots show the results for the worst case modulation.

**- Lowest Channel:**

**Frequency range 30 MHz - 1 GHz**

Spurious frequencies detected at less than 20 dB below the limit:

Spurious frequency (MHz)	Detector	E.I.R.P (dBm)	Polarization
49.0930	Peak	-30.95	V
73.2780	Peak	-24.27	V

**Frequency range 1 - 18 GHz**

No spurious frequencies at less than 20 dB below the limit.

**- Middle Channel:**

**Frequency range 30 MHz - 1 GHz**

No spurious frequencies at less than 20 dB below the limit.

**Frequency range 1 - 18 GHz**

No spurious frequencies at less than 20 dB below the limit.

**- Highest Channel:**

**Frequency range 30 MHz - 1 GHz**

Spurious frequencies detected at less than 20 dB below the limit:

Spurious frequency (MHz)	Detector	E.I.R.P (dBm)	Polarization
35.6750	Peak	-17.80	V
45.0510	Peak	-19.36	V
49.2220	Peak	-19.88	V
62.7700	Peak	-18.72	V
72.2110	Peak	-26.26	V
89.3480	Peak	-24.73	V
116.7340	Peak	-26.28	V
269.8330	Peak	-25.41	V

### Frequency range 1 - 18 GHz

No spurious frequencies at less than 20 dB below the limit.

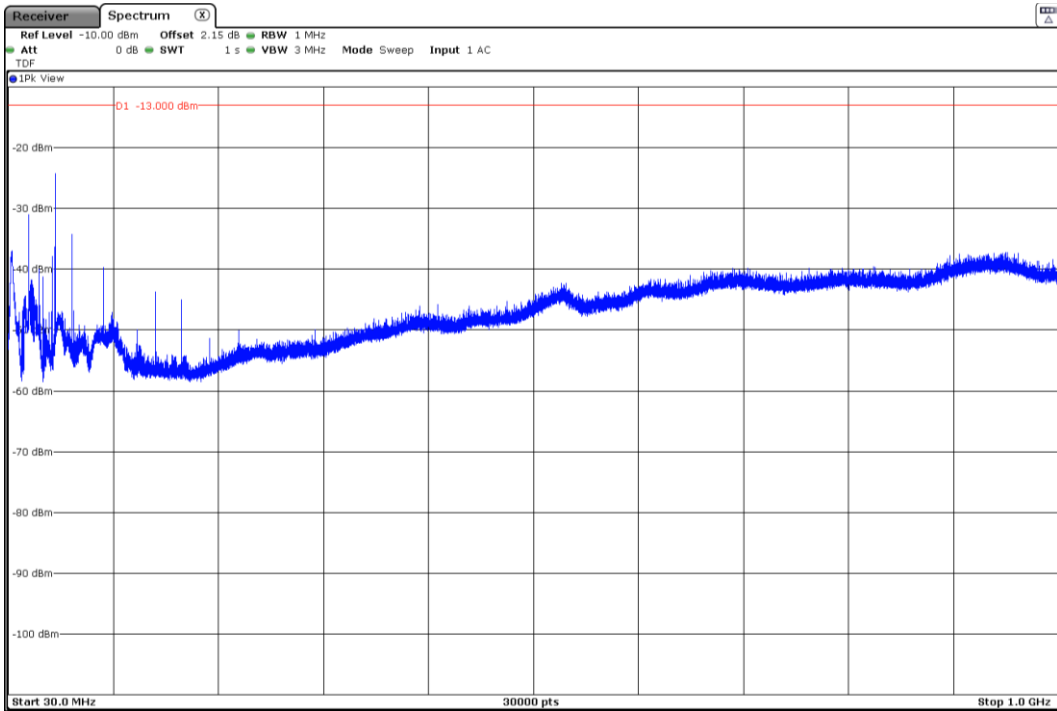
Measurement Uncertainty (dB):  
<math>\pm 4.68</math> for  $f \geq 30$  MHz up to 1 GHz  
<math>\pm 4.00</math> for  $f \geq 1$  GHz up to 3 GHz  
<math>\pm 4.99</math> for  $f \geq 3$  GHz up to 18 GHz

Verdict: PASS

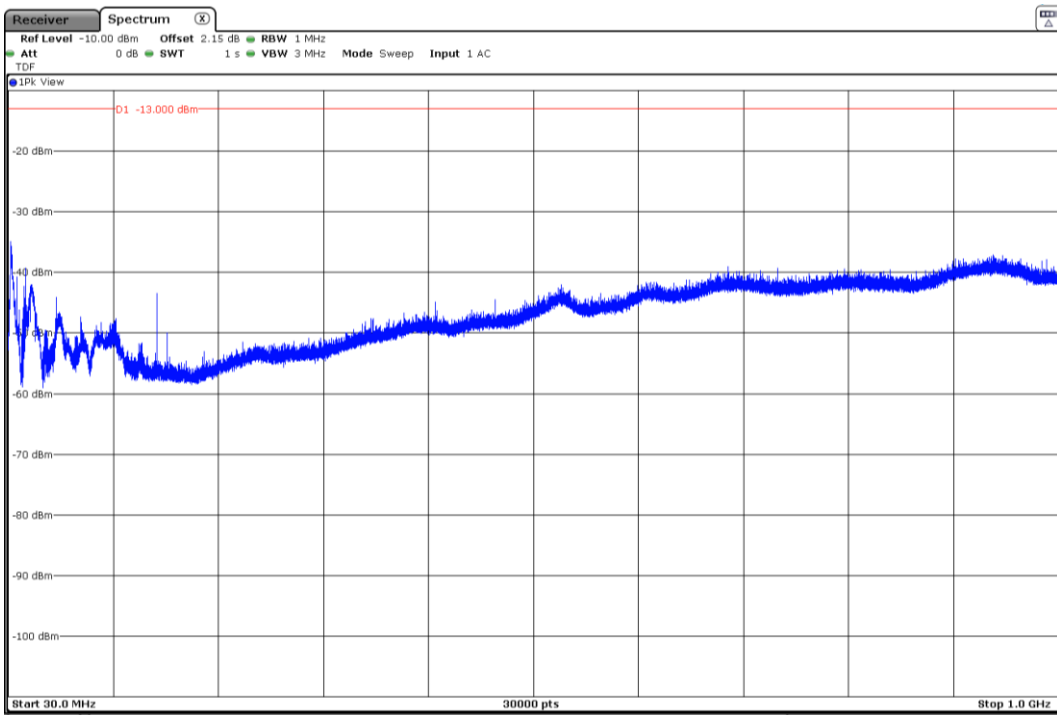
### FREQUENCY RANGE 30 MHz - 1 GHz

### QPSK MODULATION

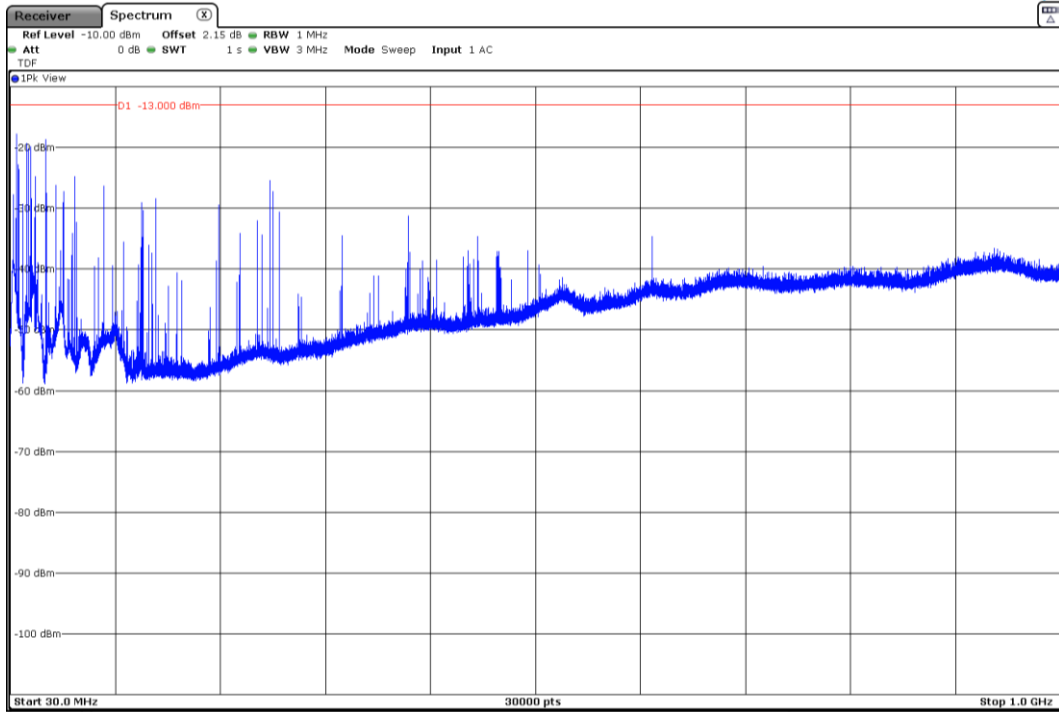
- Lowest Channel:



- Middle Channel:



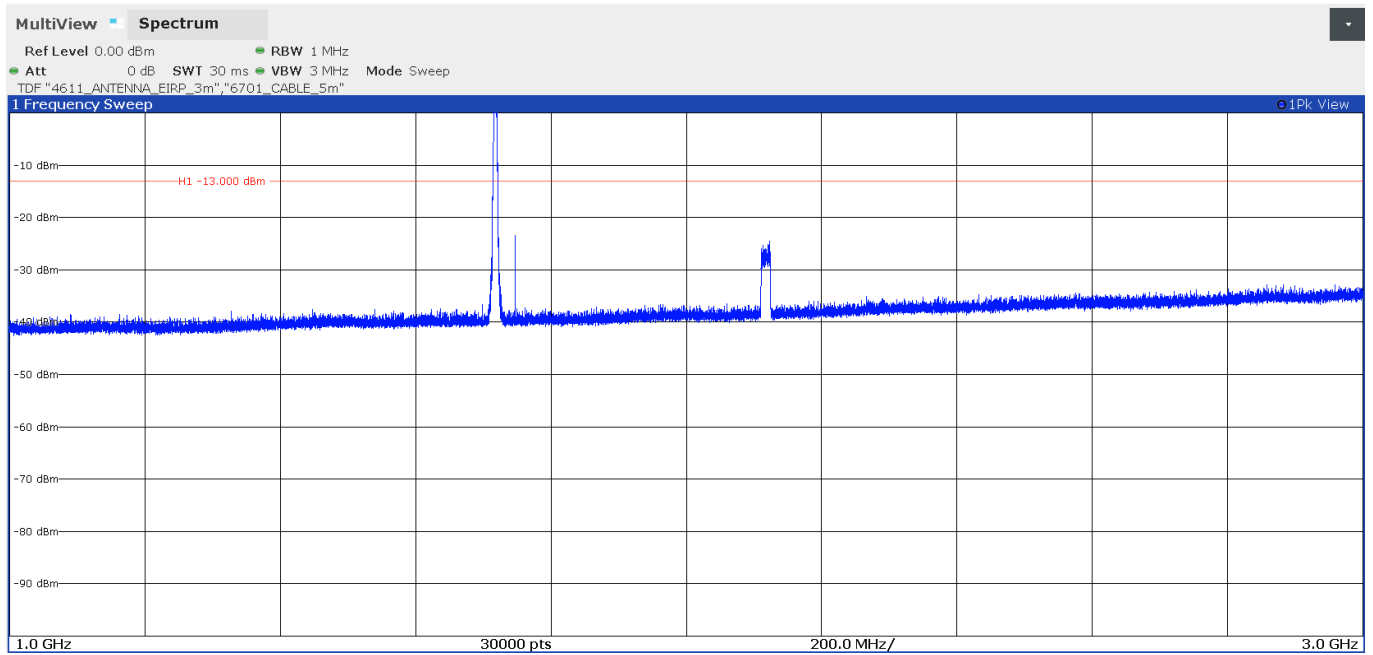
- Highest Channel:



### FREQUENCY RANGE 1 - 3 GHz

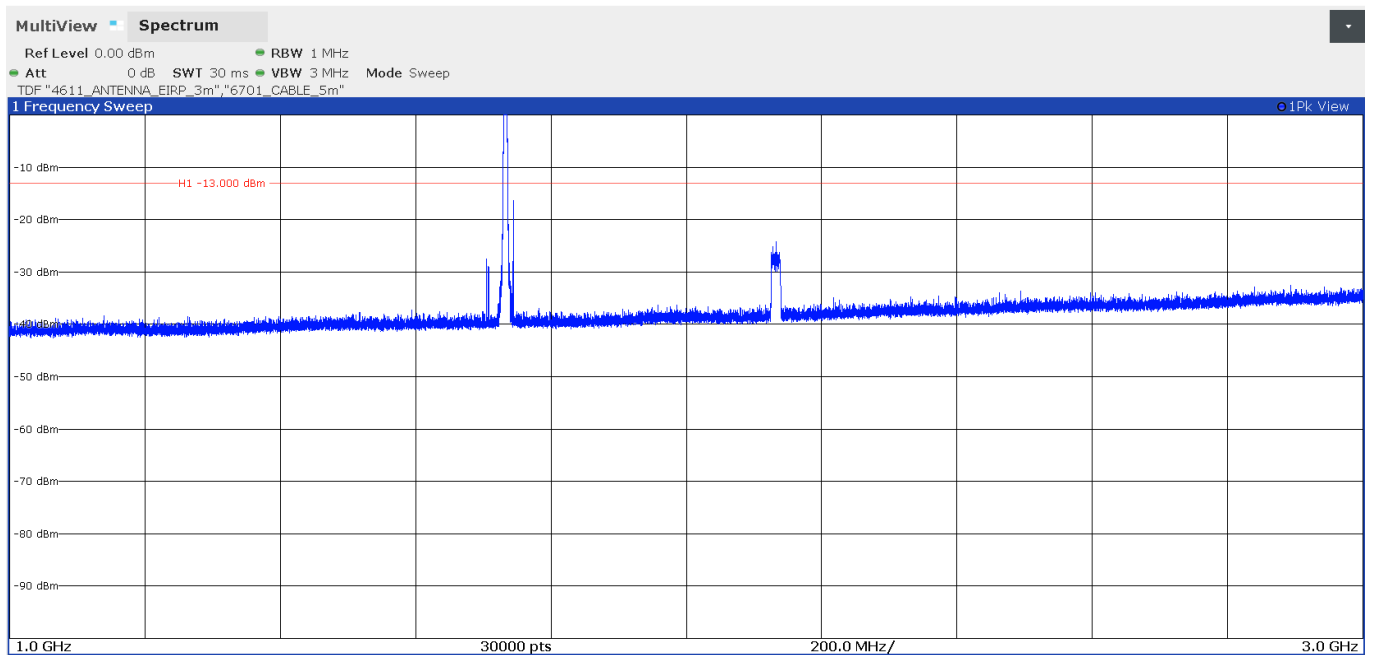
### QPSK MODULATION

- Lowest Channel:



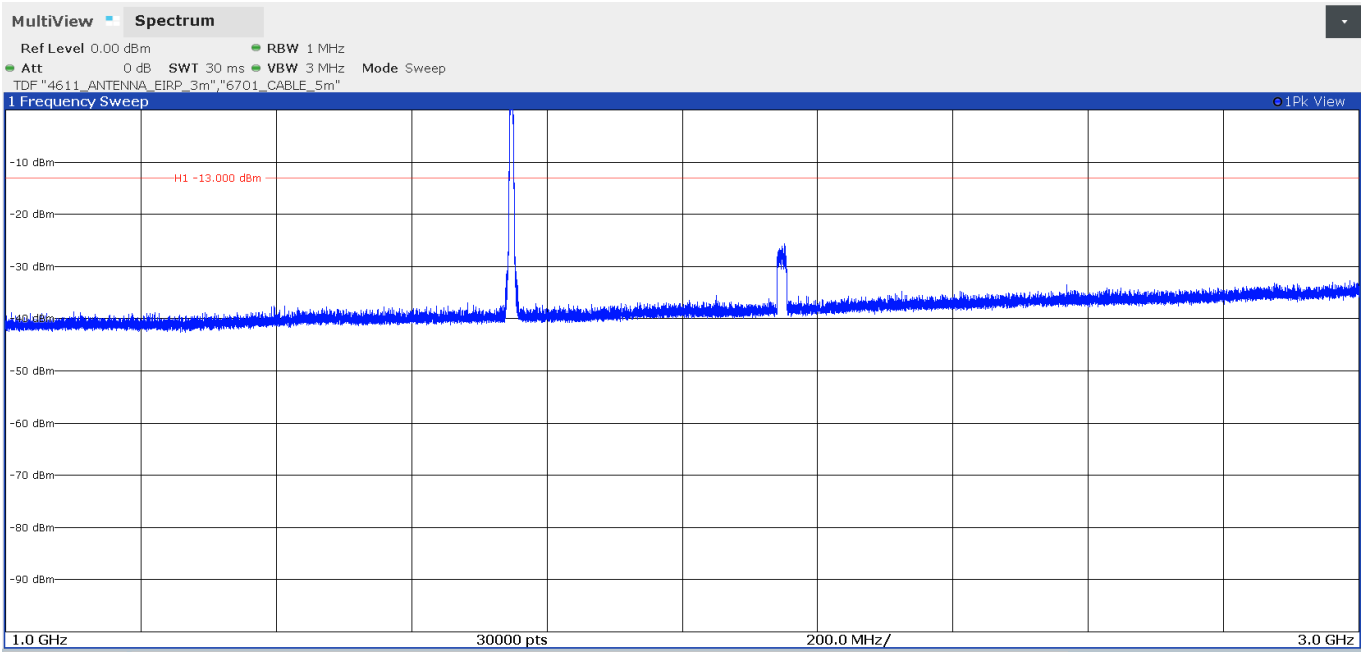
The peak above the limit is the carrier frequency:

- Middle Channel:



The peak above the limit is the carrier frequency:

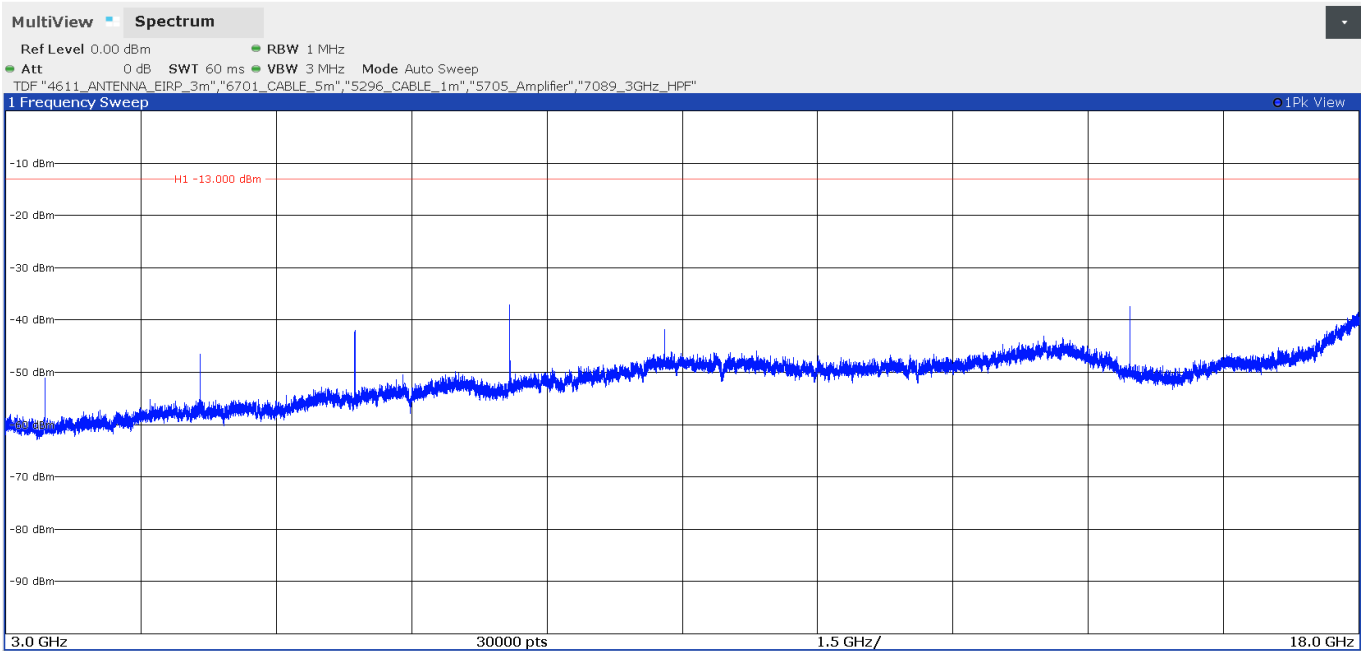
- Highest Channel:



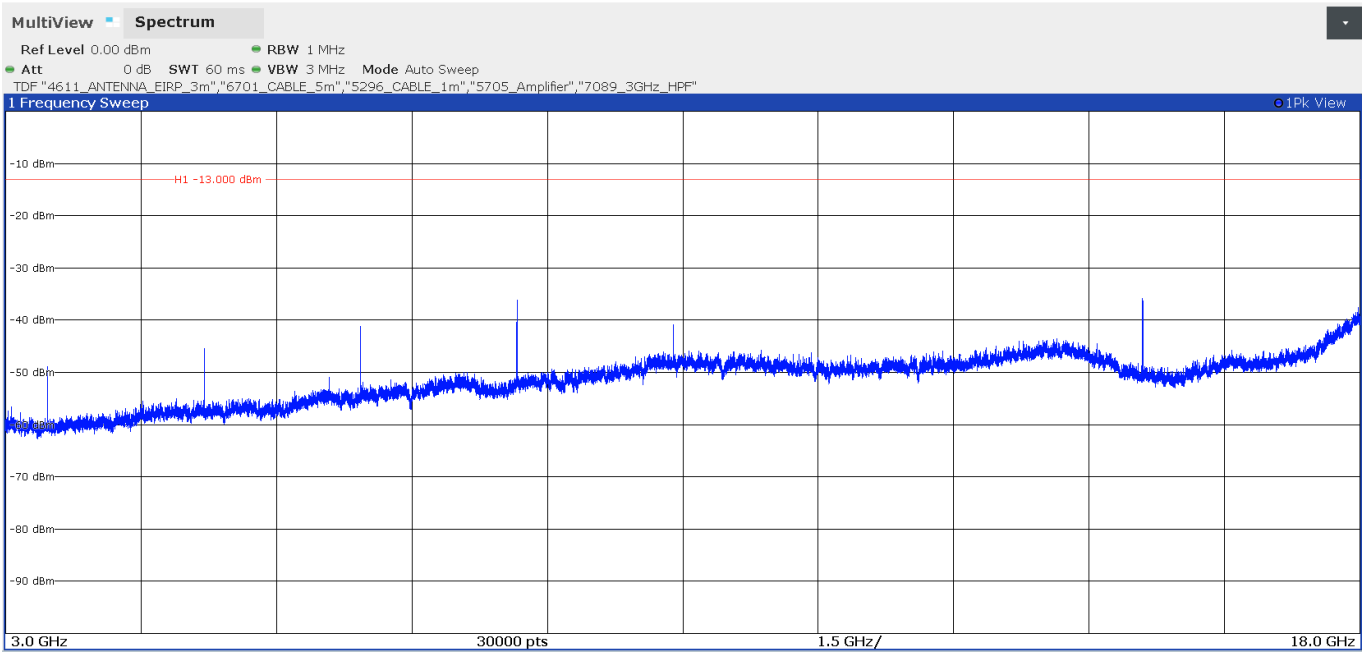
The peak above the limit is the carrier frequency

FREQUENCY RANGE 3 – 18 GHz

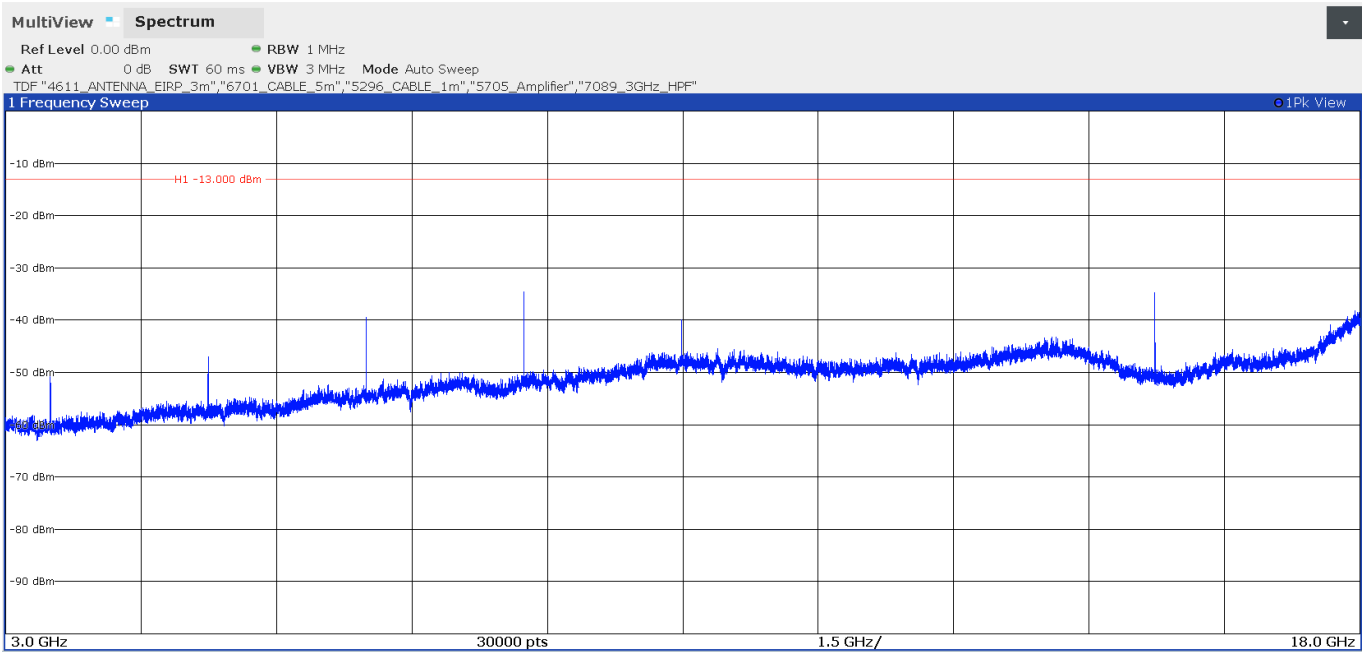
- Lowest Channel:



- Middle Channel:



- Highest Channel:



16QAM:

A preliminary scan determined BW=1.4 MHz, RB Size=3, RB Offset=1 as the worst case. The following tables and plots show the results for the worst case modulation.

**- Lowest Channel:**

**Frequency range 30 MHz - 1 GHz**

No spurious frequencies at less than 20 dB below the limit.

**Frequency range 1 - 18 GHz**

No spurious frequencies at less than 20 dB below the limit.

**- Middle Channel:**

**Frequency range 30 MHz - 1 GHz**

No spurious frequencies at less than 20 dB below the limit.

**Frequency range 1 - 18 GHz**

No spurious frequencies at less than 20 dB below the limit.

**- Highest Channel:**

**Frequency range 30 MHz - 1 GHz**

No spurious frequencies at less than 20 dB below the limit.

**Frequency range 1 - 18 GHz**

No spurious frequencies at less than 20 dB below the limit.

Measurement Uncertainty (dB):            <math>\pm 4.68</math> for  $f \geq 30$  MHz up to 1 GHz  
                                                         <math>\pm 4.00</math> for  $f \geq 1$  GHz up to 3 GHz  
                                                         <math>\pm 4.99</math> for  $f \geq 3$  GHz up to 18 GHz

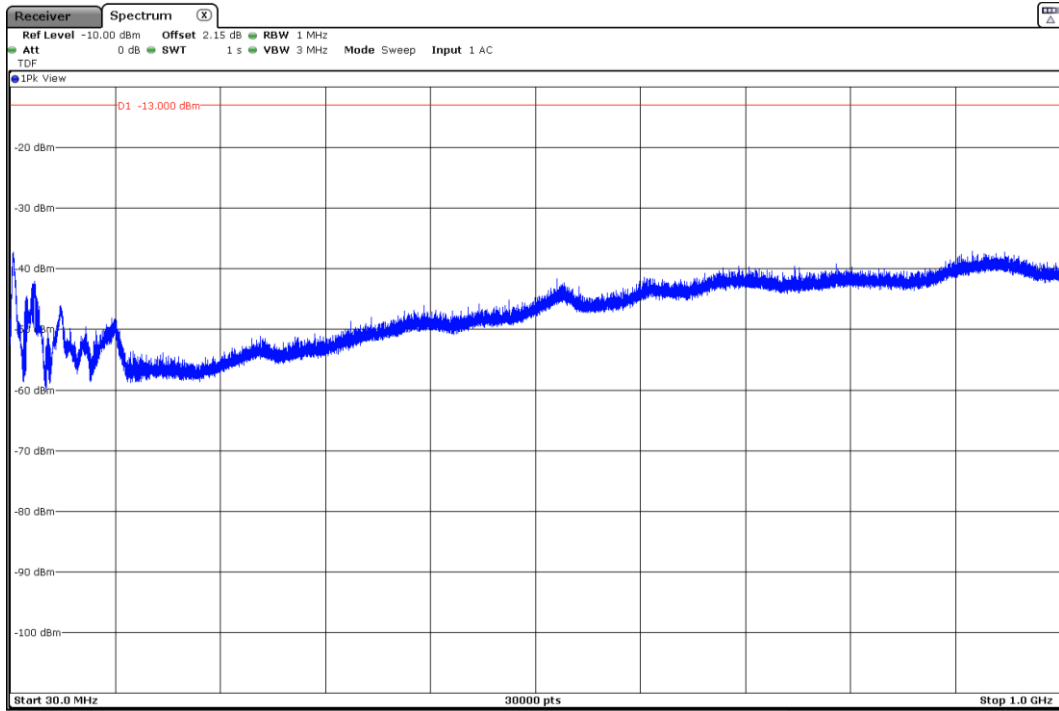
Verdict: PASS



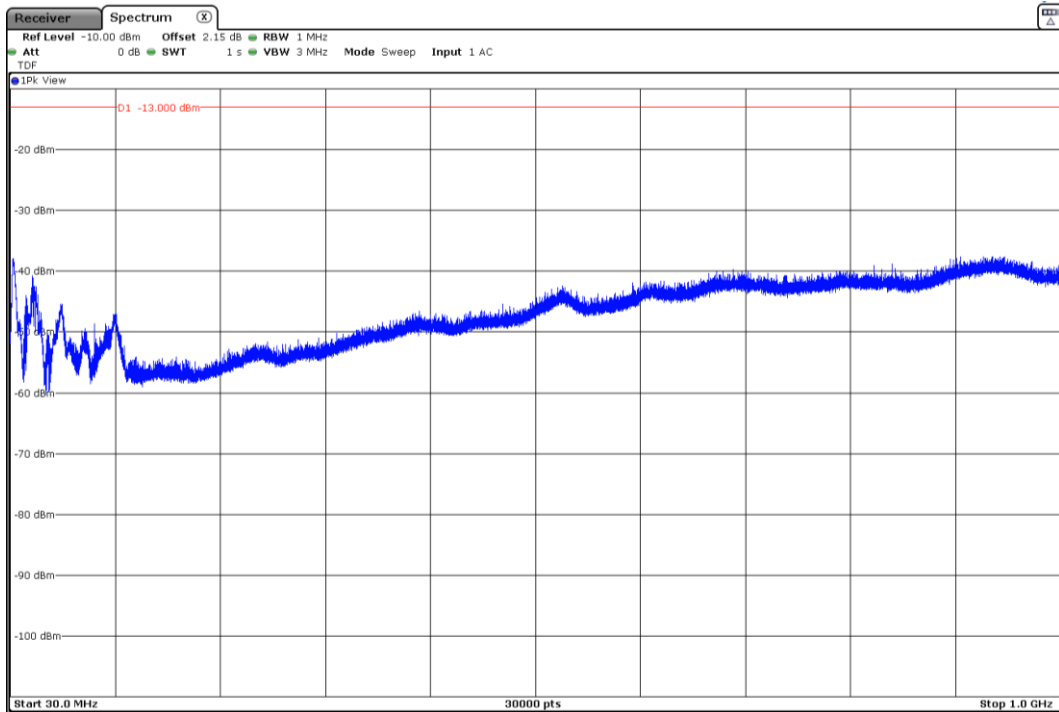
### FREQUENCY RANGE 30 MHz - 1 GHz

### 16QAM MODULATION

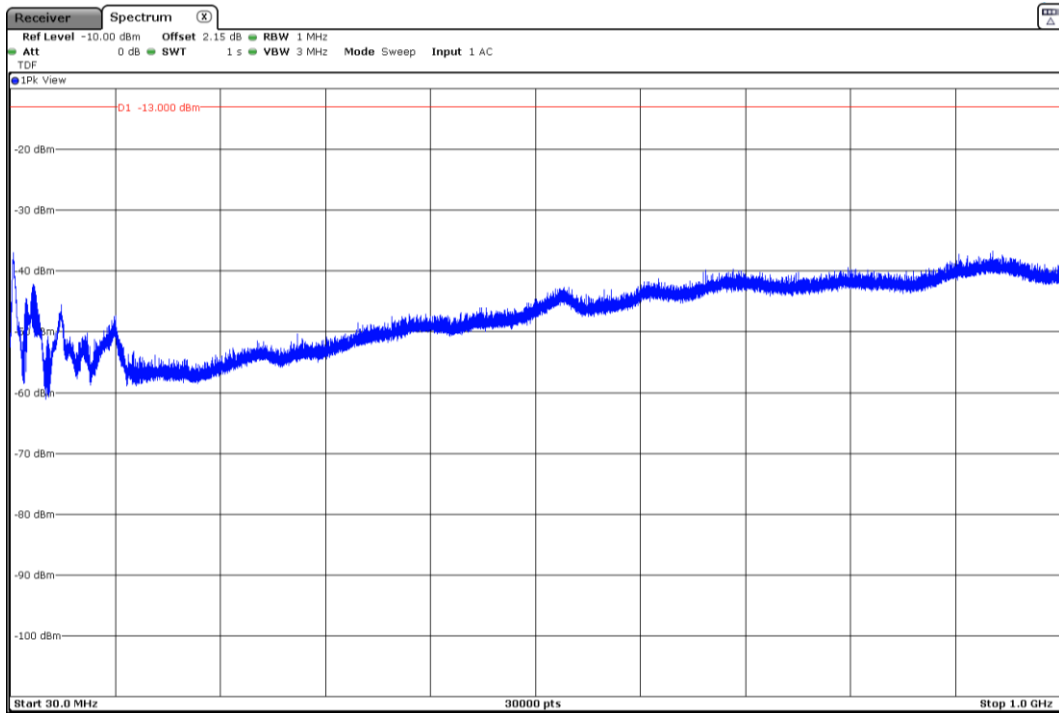
- Lowest Channel:



- Middle Channel:



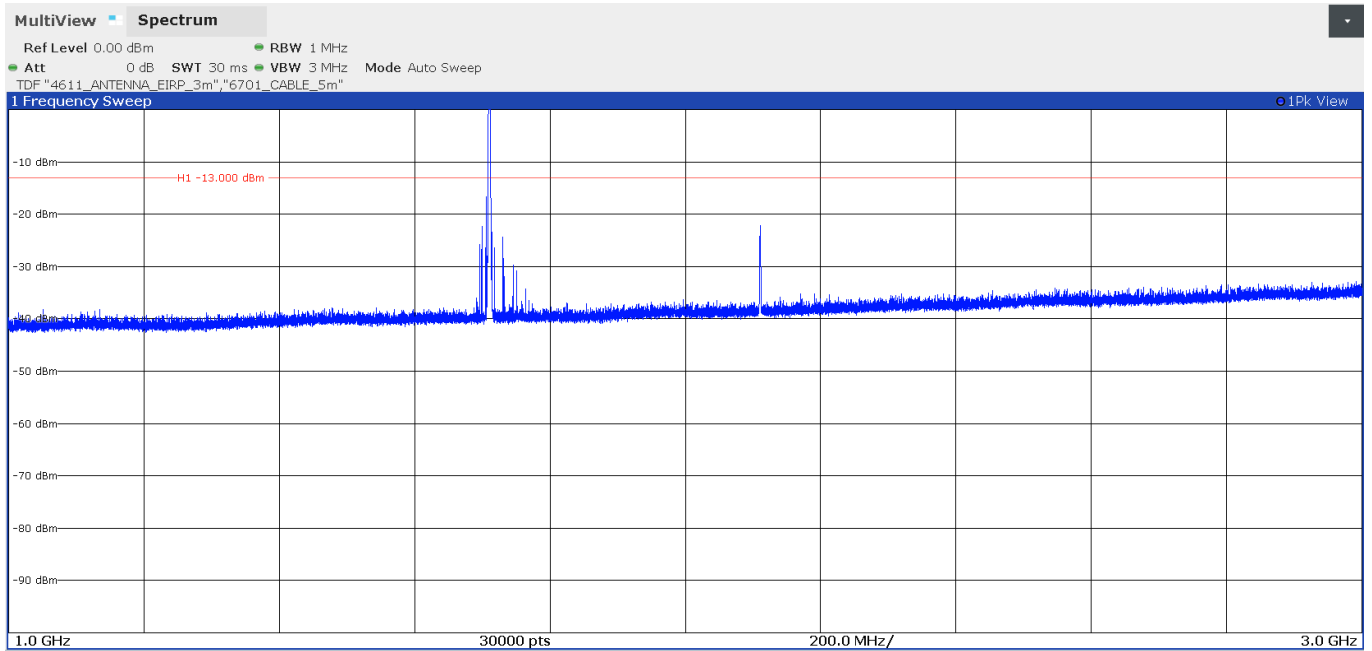
- Highest Channel:



**FREQUENCY RANGE 1 - 3 GHz**

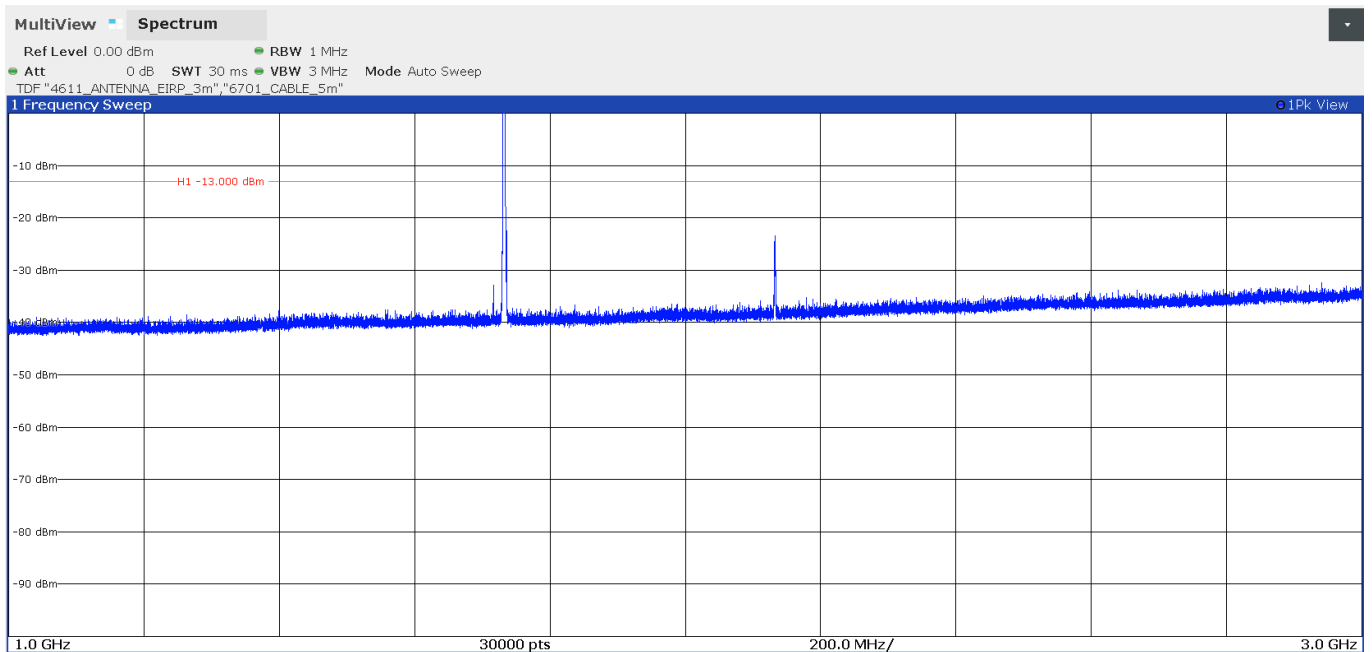
**16QAM MODULATION**

- Lowest Channel:



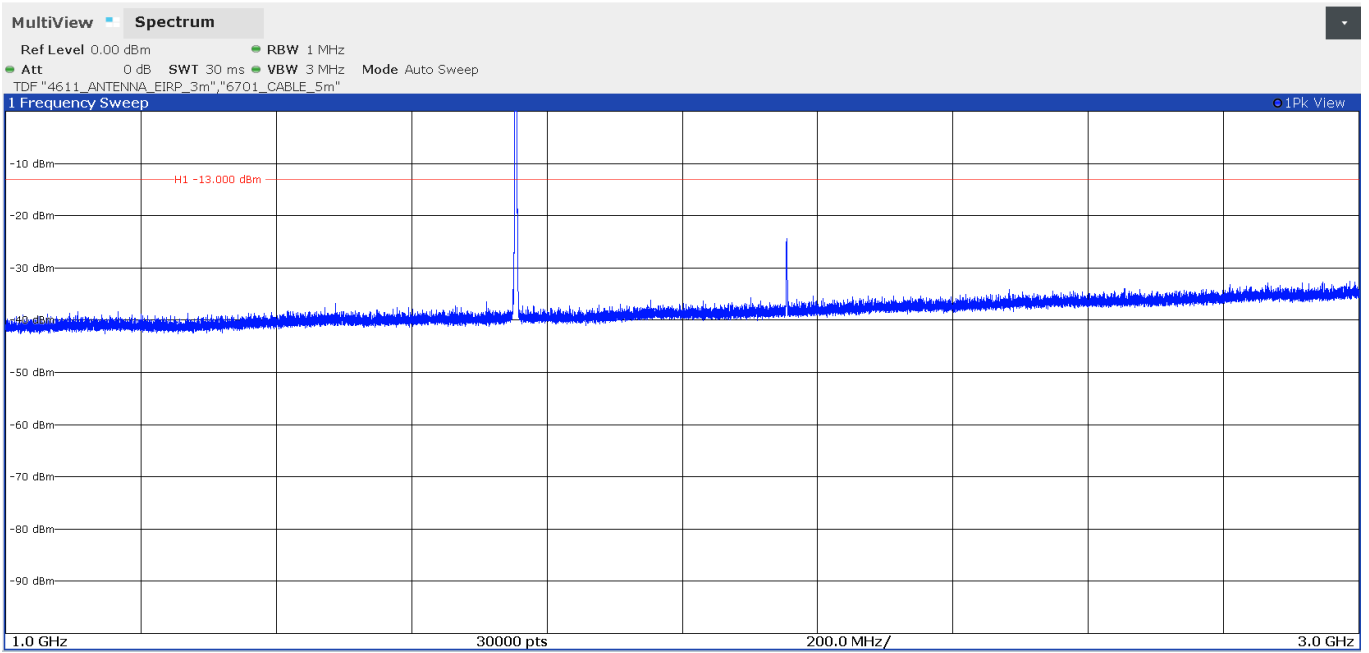
The peak above the limit is the carrier frequency:

- Middle Channel:



The peak above the limit is the carrier frequency:

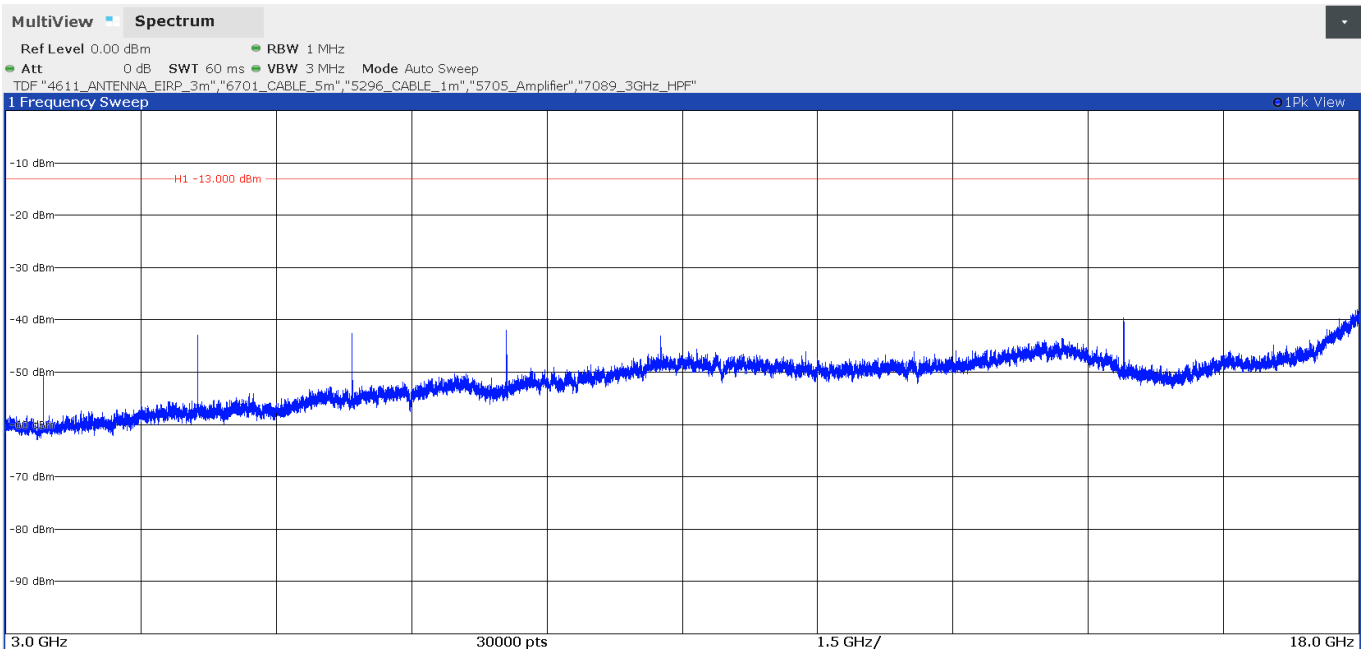
- Highest Channel:



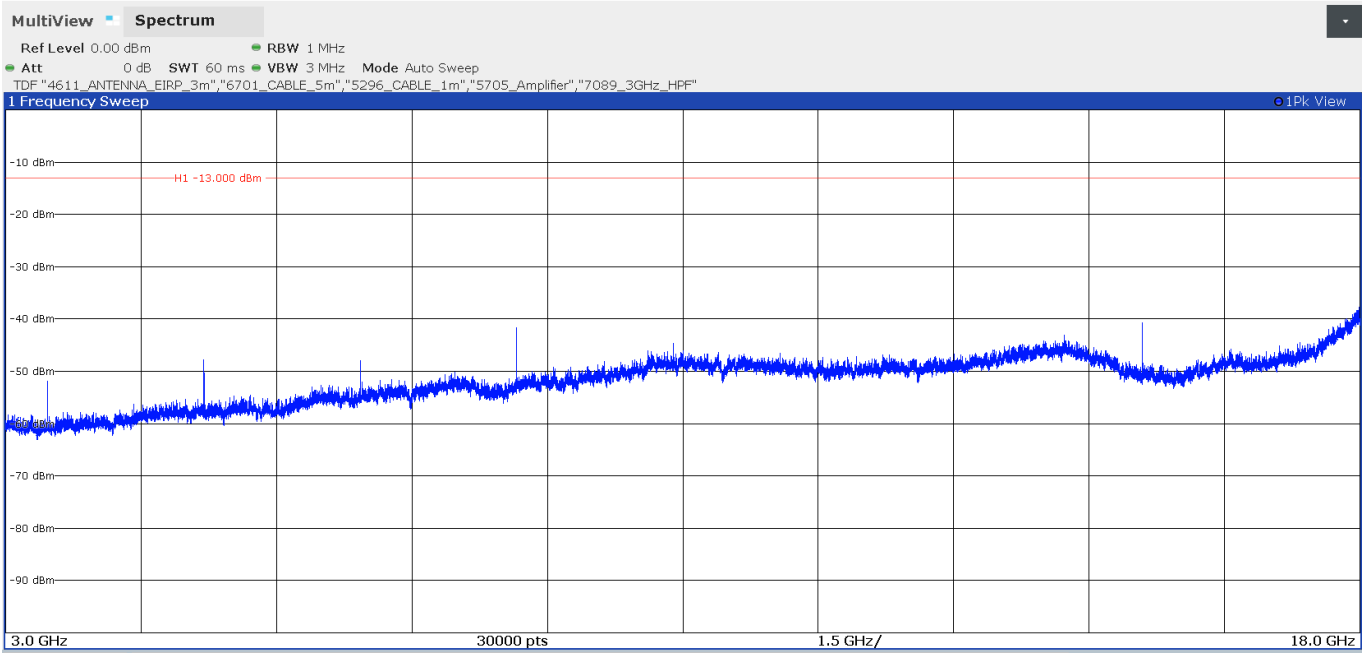
The peak above the limit is the carrier frequency:

### FREQUENCY RANGE 3 – 18 GHz

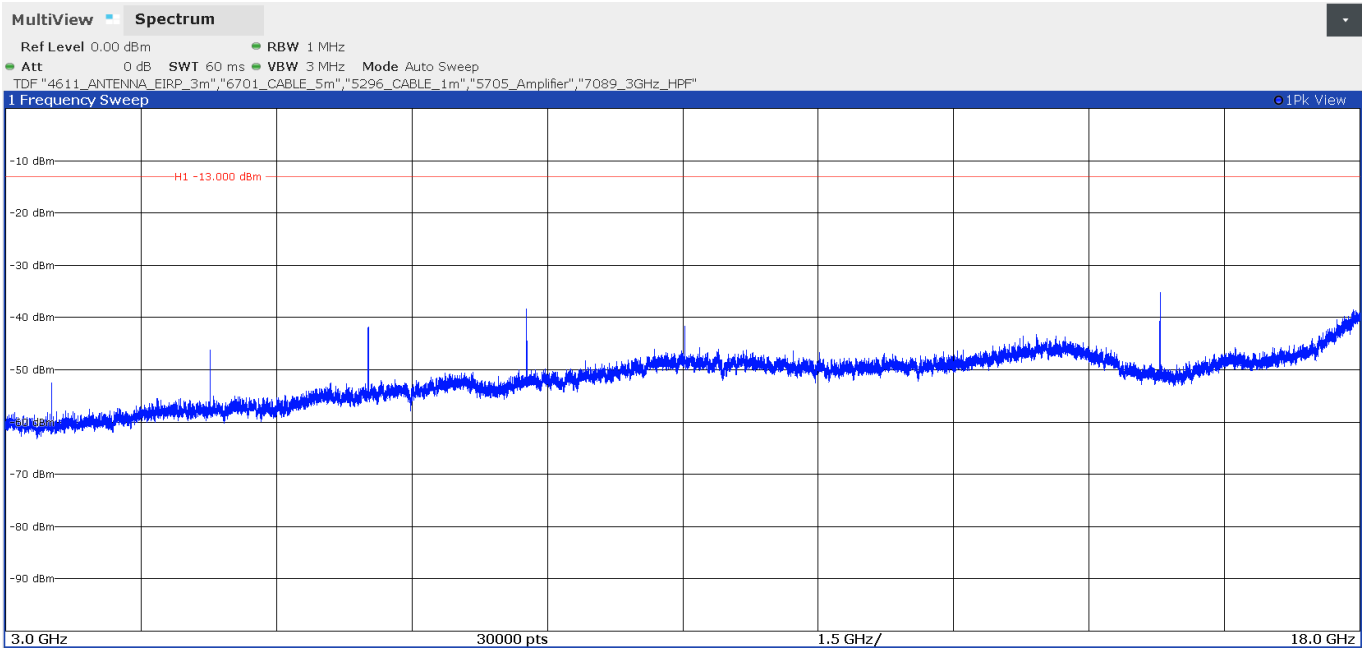
- Lowest Channel:



- Middle Channel:



- Highest Channel:

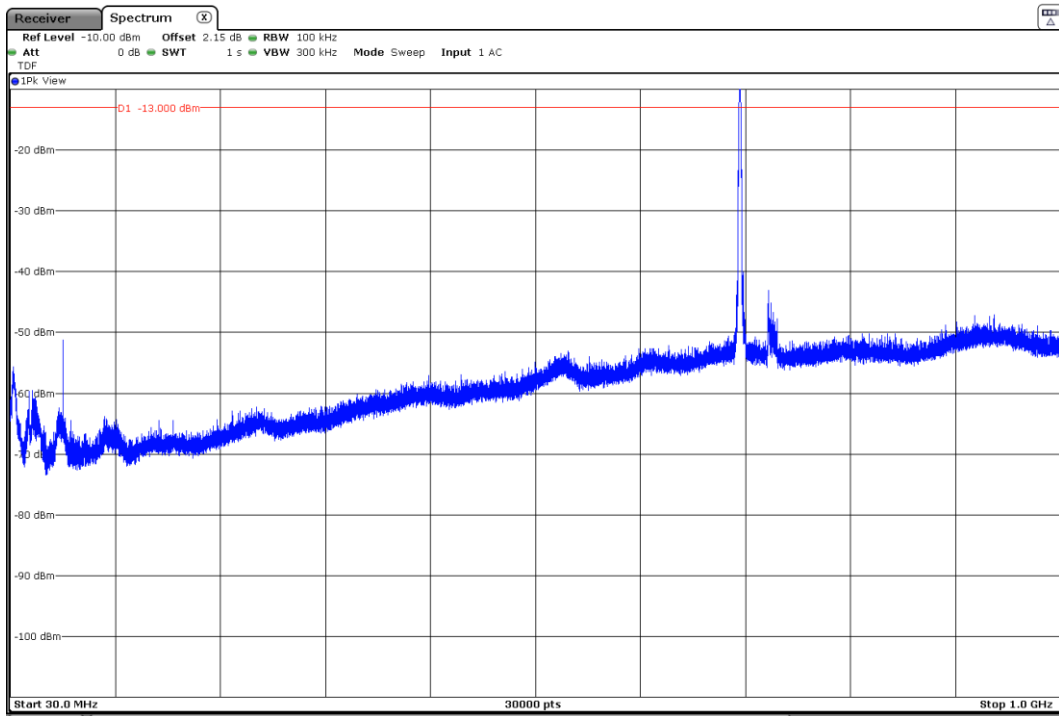




### FREQUENCY RANGE 30 MHz - 1 GHz

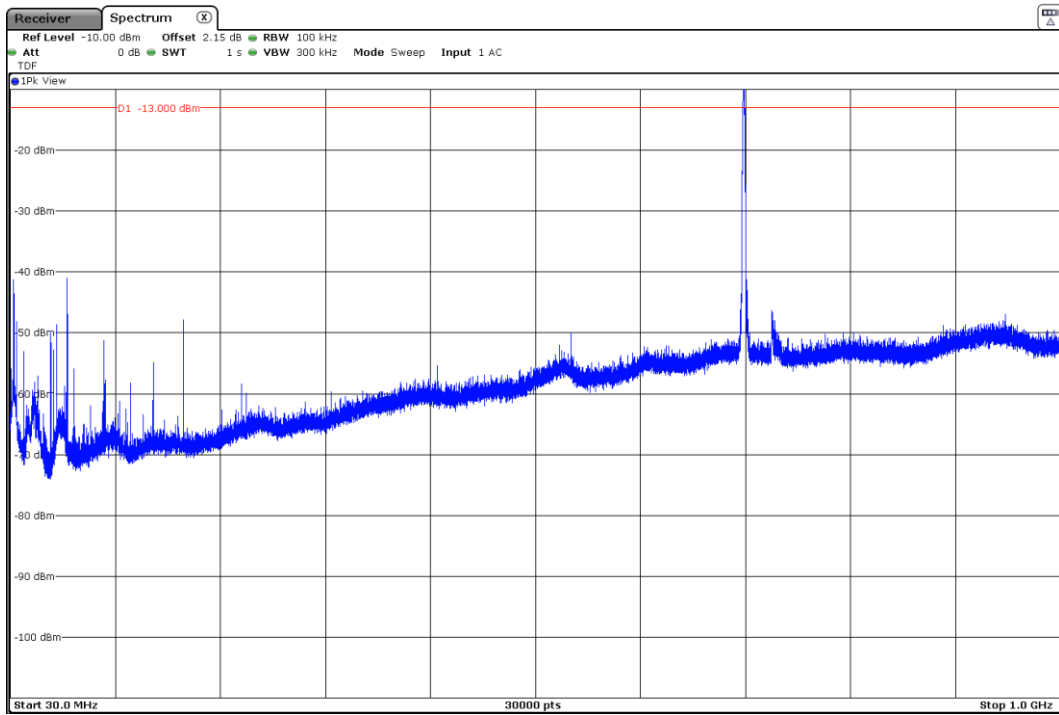
### QPSK MODULATION

- Lowest Channel:



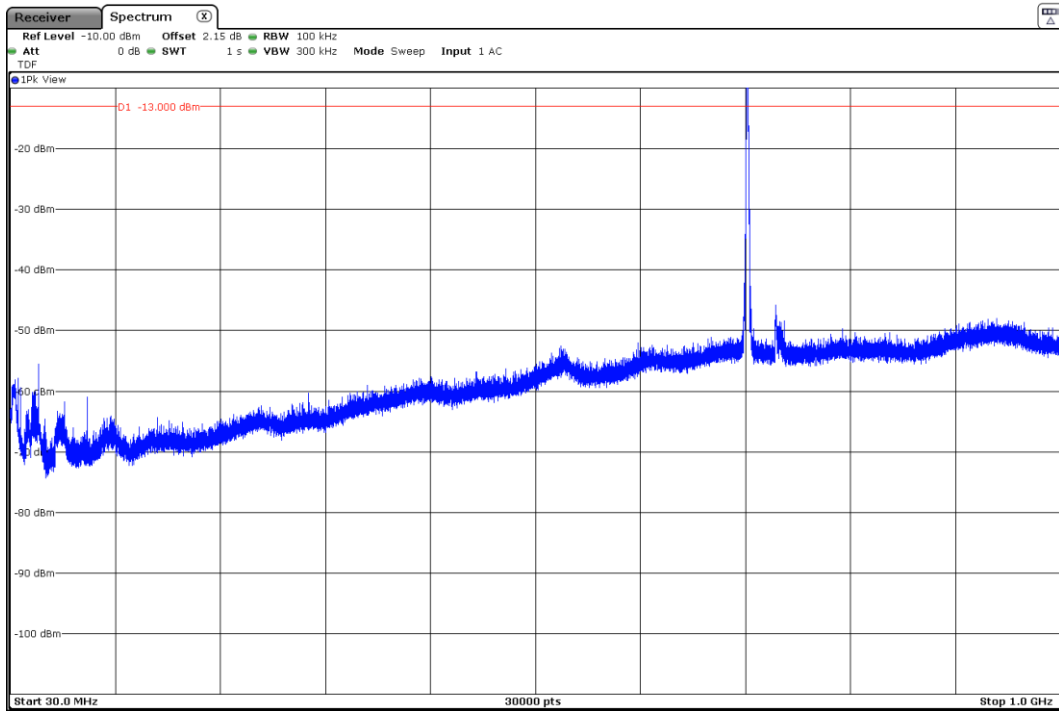
The peak above the limit is the carrier frequency:

- Middle Channel:



The peak above the limit is the carrier frequency:

- Highest Channel:



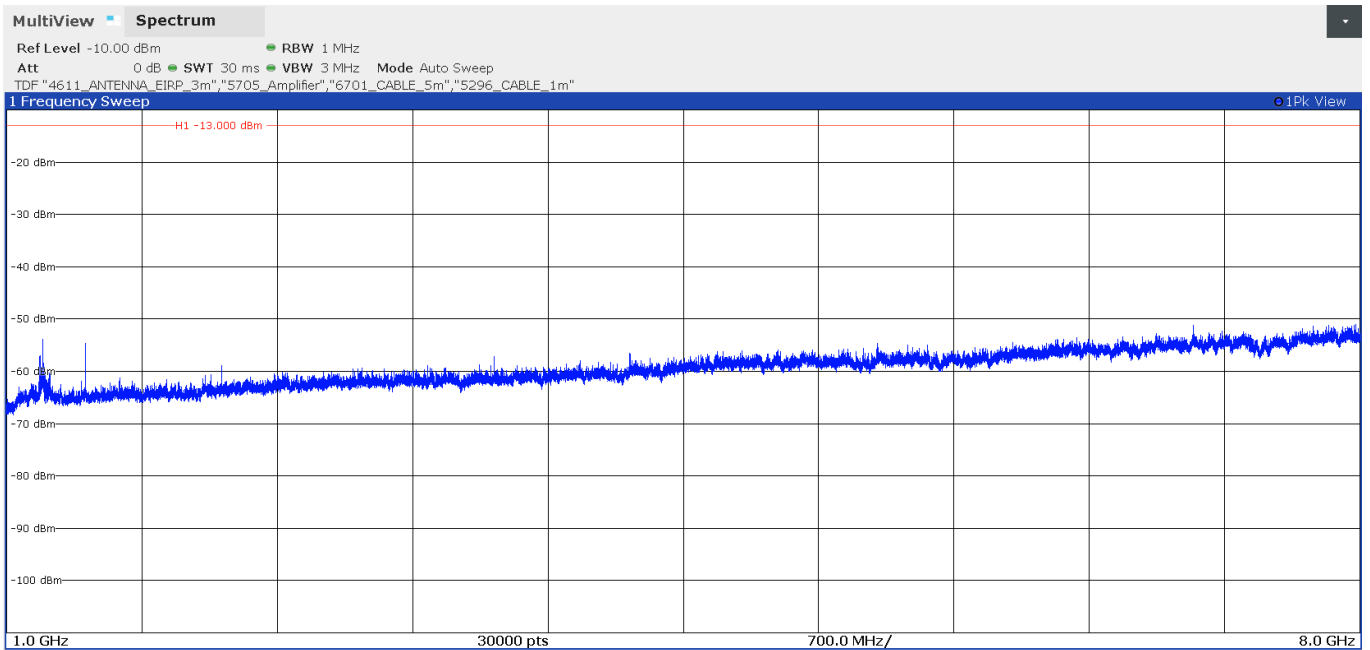
The peak above the limit is the carrier frequency:



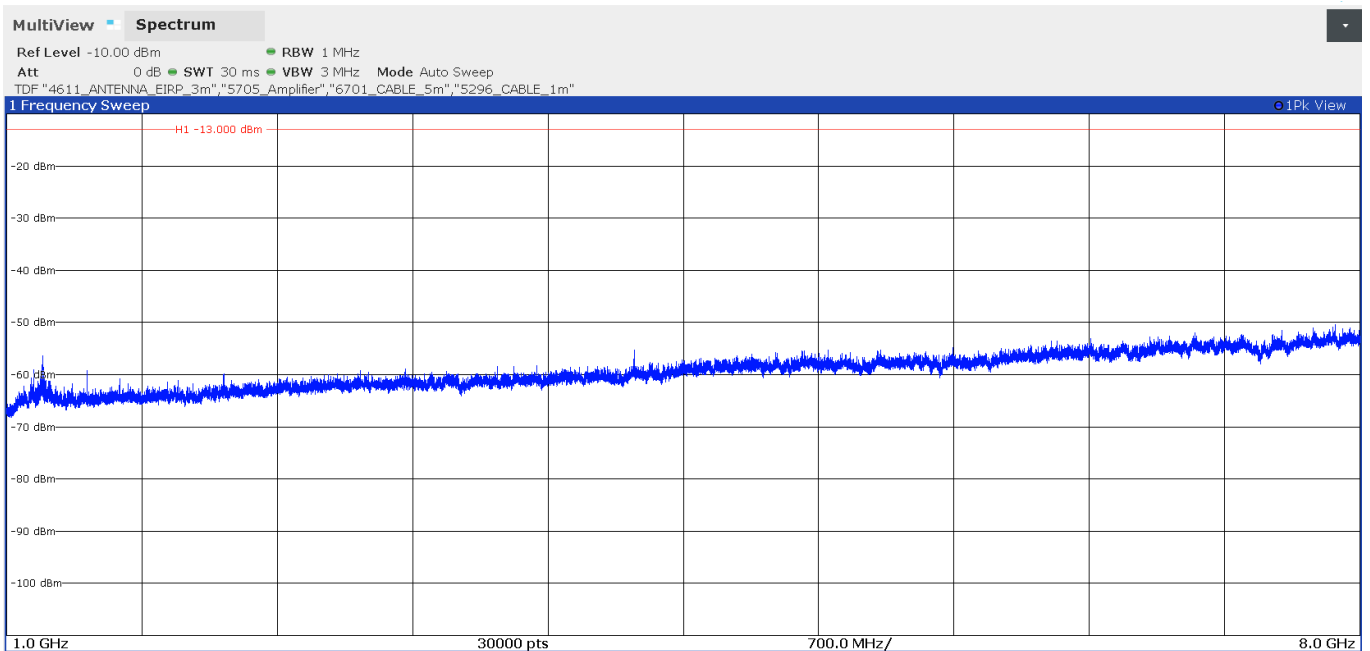
## FREQUENCY RANGE 1 - 8 GHz

## QPSK MODULATION

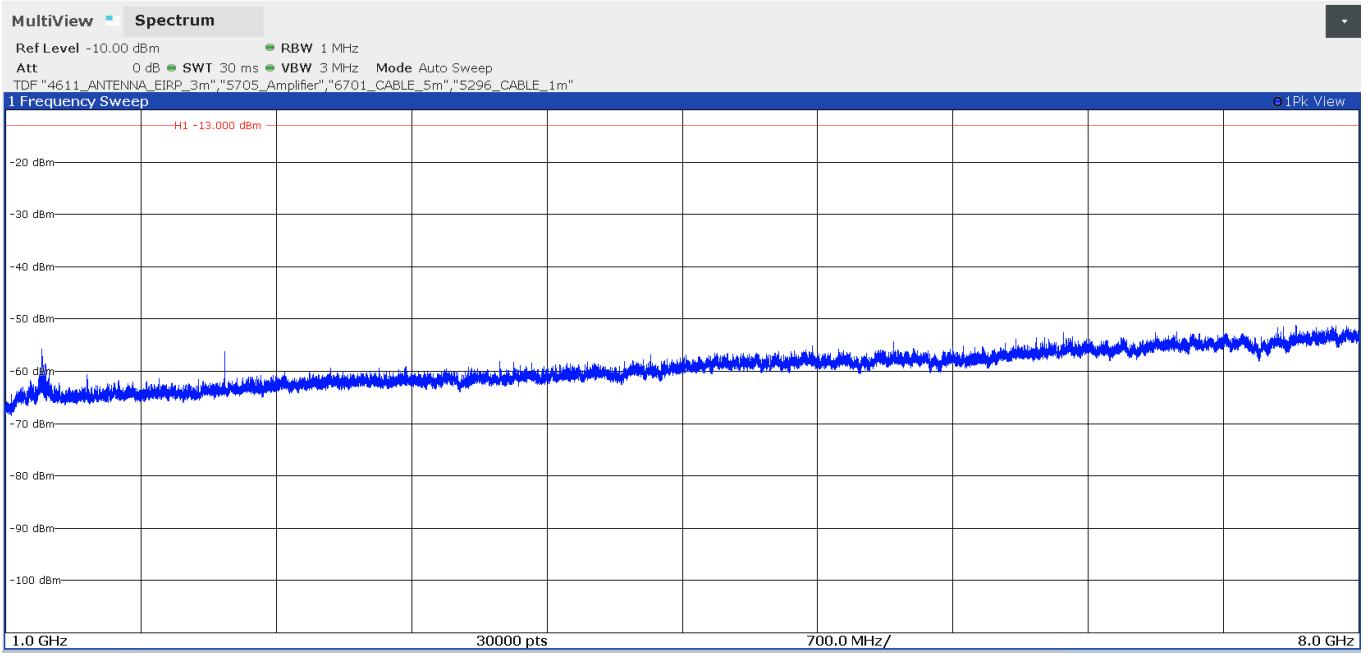
- Lowest Channel:



- Middle Channel:



- Highest Channel:



16QAM:

A preliminary scan determined BW=1.4 MHz, RB Size=3, RB Offset=0 as the worst case. The following tables and plots show the results for the worst case modulation

**- Lowest Channel:**

**Frequency range 30 MHz - 1 GHz**

Spurious frequencies detected at less than 20 dB below the limit:

Spurious frequency (MHz)	Detector	E.I.R.P (dBm)	Polarization
698.702	Peak	-17.07	V

**Frequency range 1 - 8 GHz**

No spurious frequencies at less than 20 dB below the limit.

**- Middle Channel:**

**Frequency range 30 MHz - 1 GHz**

Spurious frequencies detected at less than 20 dB below the limit:

Spurious frequency (MHz)	Detector	E.I.R.P (dBm)	Polarization
716.485	Peak	-27.19	H

**Frequency range 1 - 8 GHz**

No spurious frequencies at less than 20 dB below the limit.

**- Highest Channel:**

**Frequency range 30 MHz - 1 GHz**

Spurious frequencies detected at less than 20 dB below the limit:

Spurious frequency (MHz)	Detector	E.I.R.P (dBm)	Polarization
716.162	Peak	-17.3	H

**Frequency range 1 - 8 GHz**

No spurious frequencies at less than 20 dB below the limit.

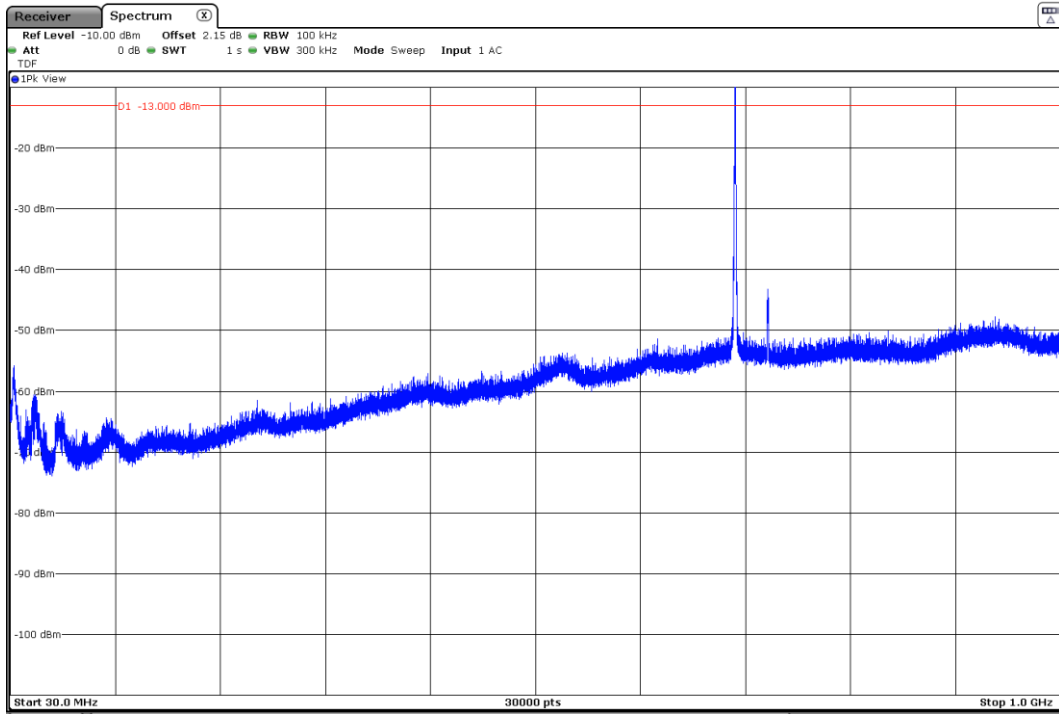
Measurement Uncertainty (dB):            <± 4.68 for f ≥ 30 MHz up to 1 GHz  
                                                         <± 4.99 for f ≥ 1 GHz up to 8 GHz

Verdict: PASS

### FREQUENCY RANGE 30 MHz - 1 GHz

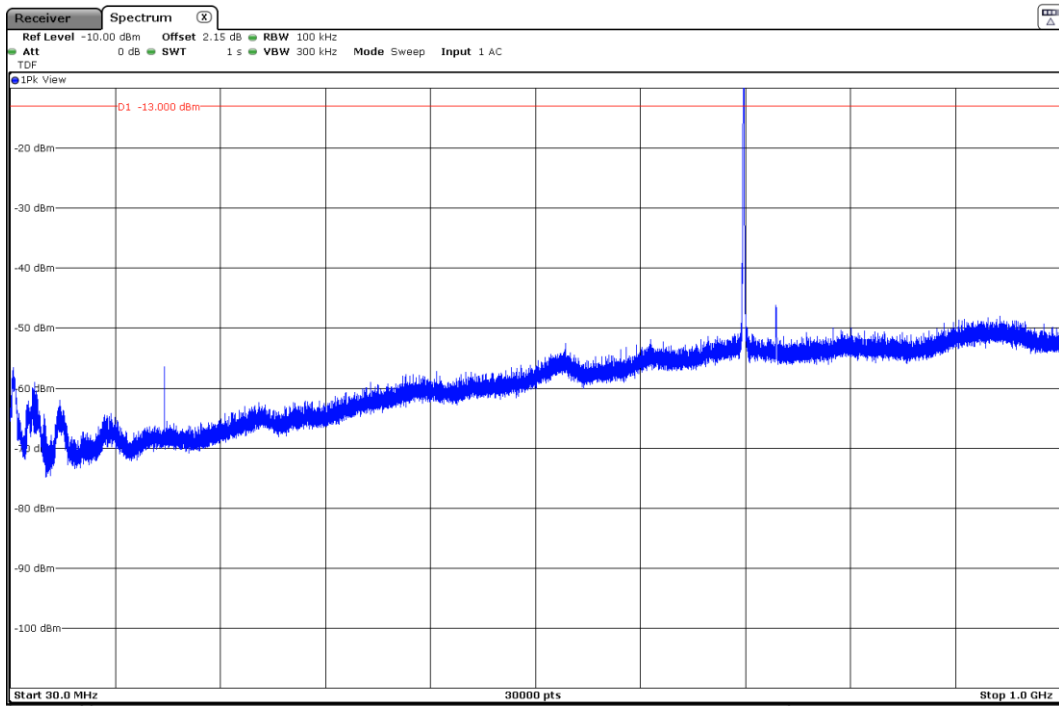
### 16QAM MODULATION

- Lowest Channel:



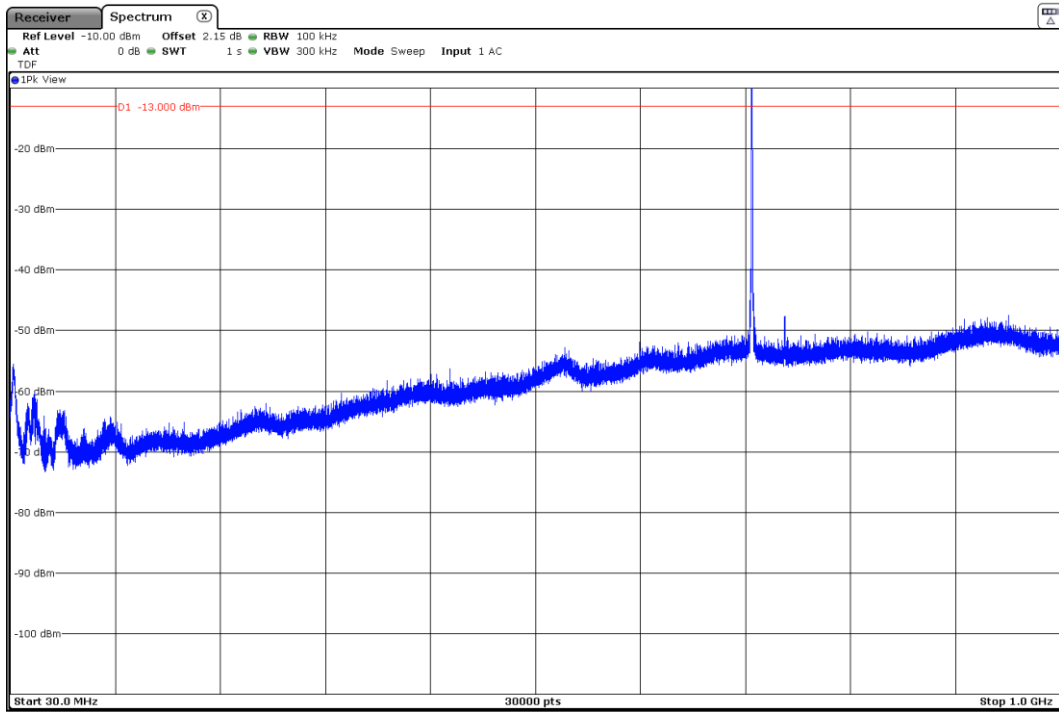
The peak above the limit is the carrier frequency:

- Middle Channel:



The peak above the limit is the carrier frequency:

- Highest Channel:

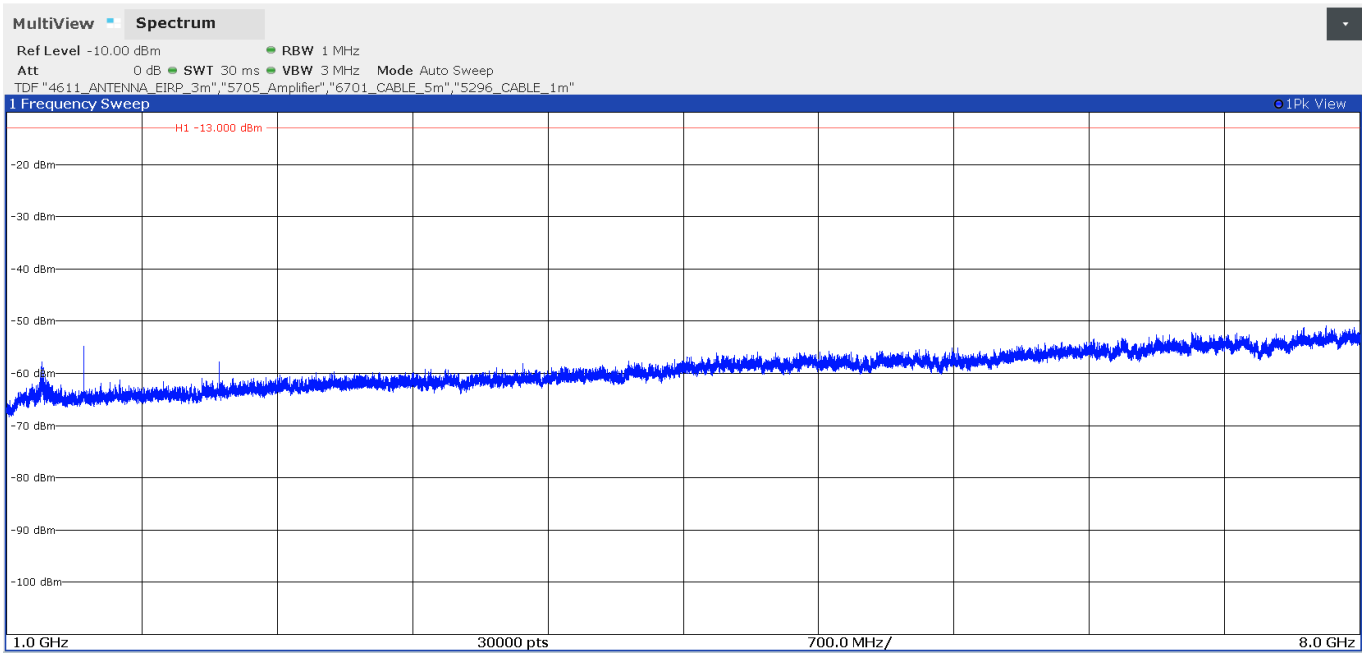


The peak above the limit is the carrier frequency:

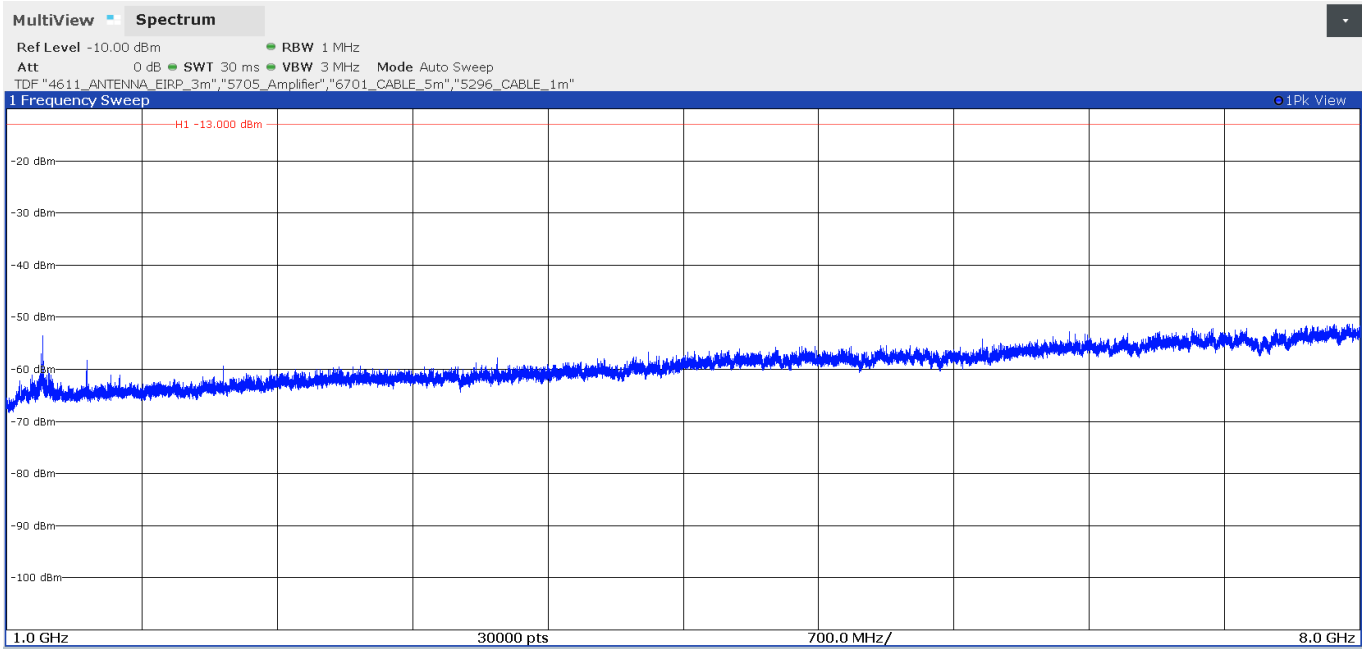
### FREQUENCY RANGE 1 - 8 GHz

### 16QAM MODULATION

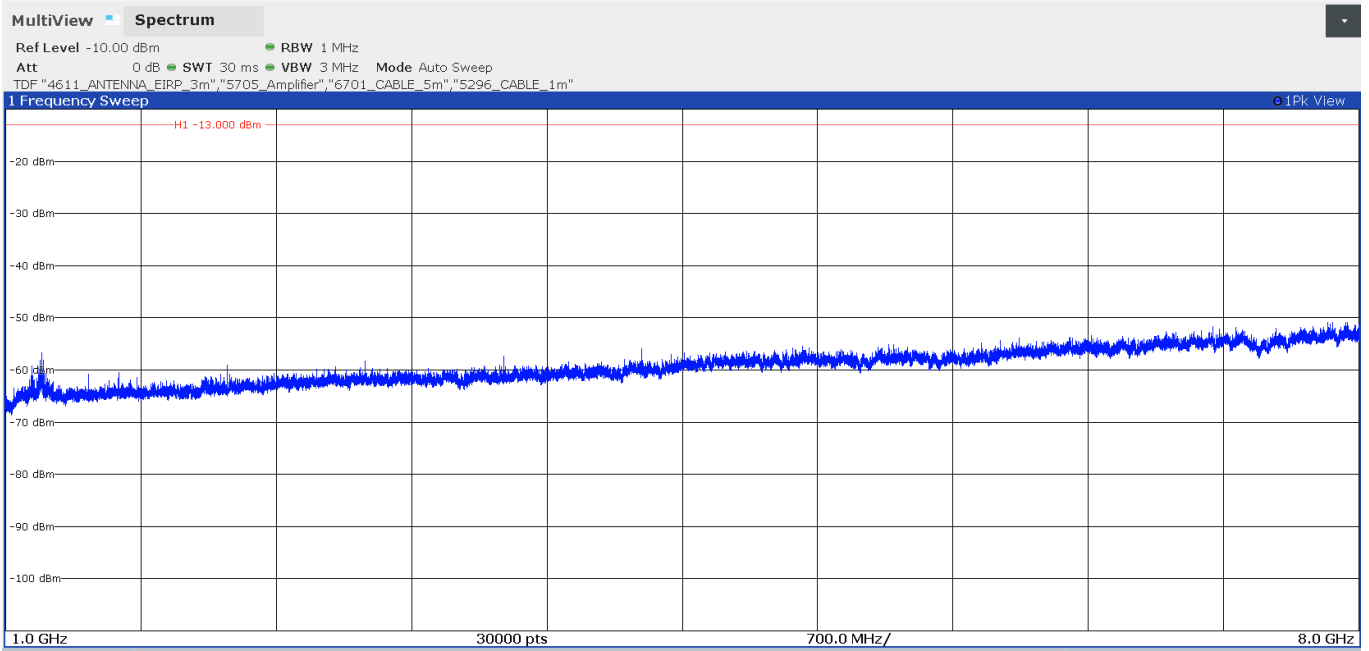
- Lowest Channel:



- Middle Channel:



- Highest Channel:



**LTE Band 13:**

**QPSK:**

A preliminary scan determined BW=5 MHz, RB Size=1, RB Offset=12 as the worst case. The following tables and plots show the results for the worst case modulation

**- Lowest Channel:**

**Frequency range 30 MHz - 1 GHz**

No spurious frequencies at less than 20 dB below the limit.

**Frequency range 1 - 8 GHz**

No spurious frequencies at less than 20 dB below the limit.

**- Middle Channel:**

**Frequency range 30 MHz - 1 GHz**

No spurious frequencies at less than 20 dB below the limit.

**Frequency range 1 - 8 GHz**

No spurious frequencies at less than 20 dB below the limit.

**- Highest Channel:**

**Frequency range 30 MHz - 1 GHz**

No spurious frequencies at less than 20 dB below the limit.

**Frequency range 1 - 8 GHz**

No spurious frequencies at less than 20 dB below the limit.

Measurement Uncertainty (dB):                    <± 4.68 for f ≥ 30 MHz up to 1 GHz  
                                                                 <± 4.99 for f ≥ 1 GHz up to 8 GHz

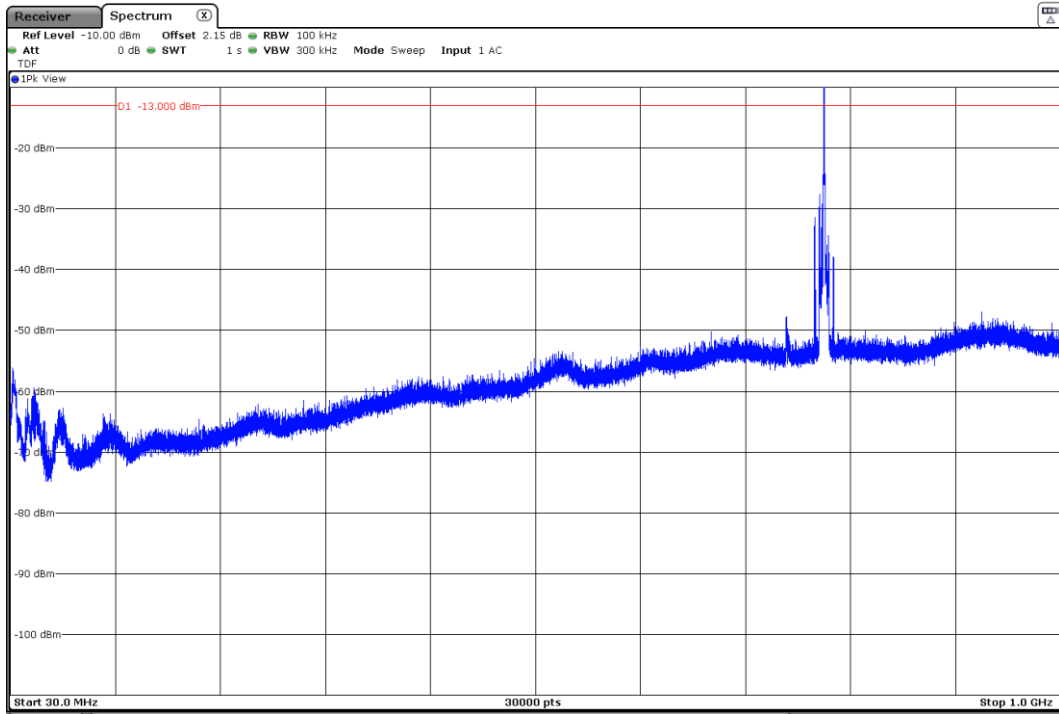
Verdict: PASS



### FREQUENCY RANGE 30 MHz - 1 GHz

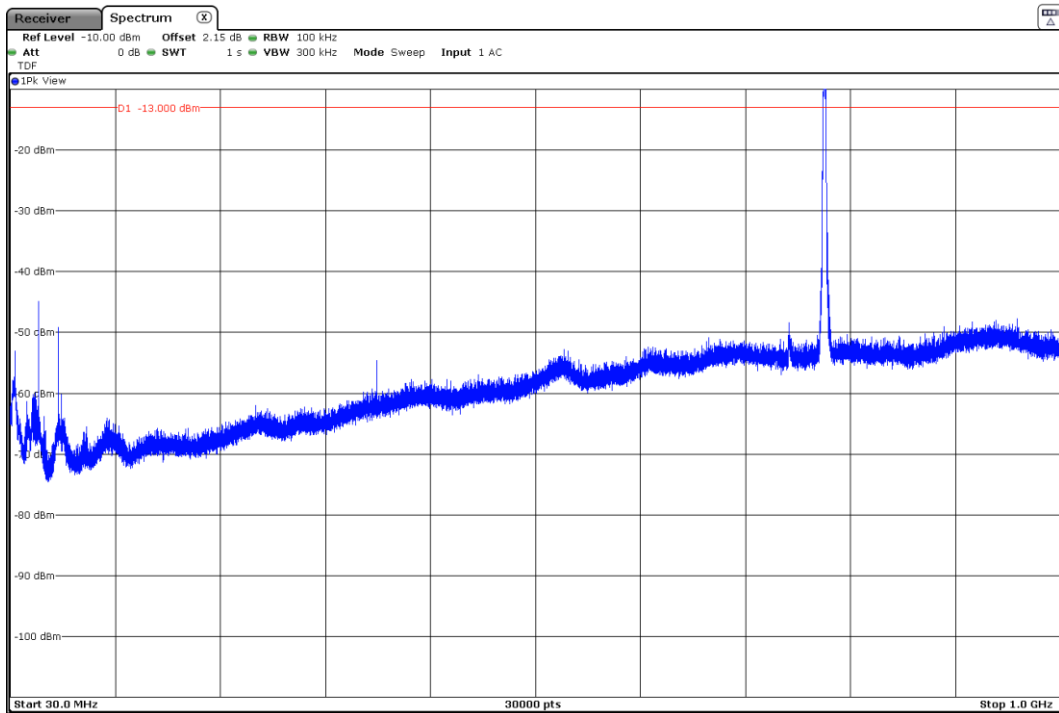
### QPSK MODULATION

- Lowest Channel:



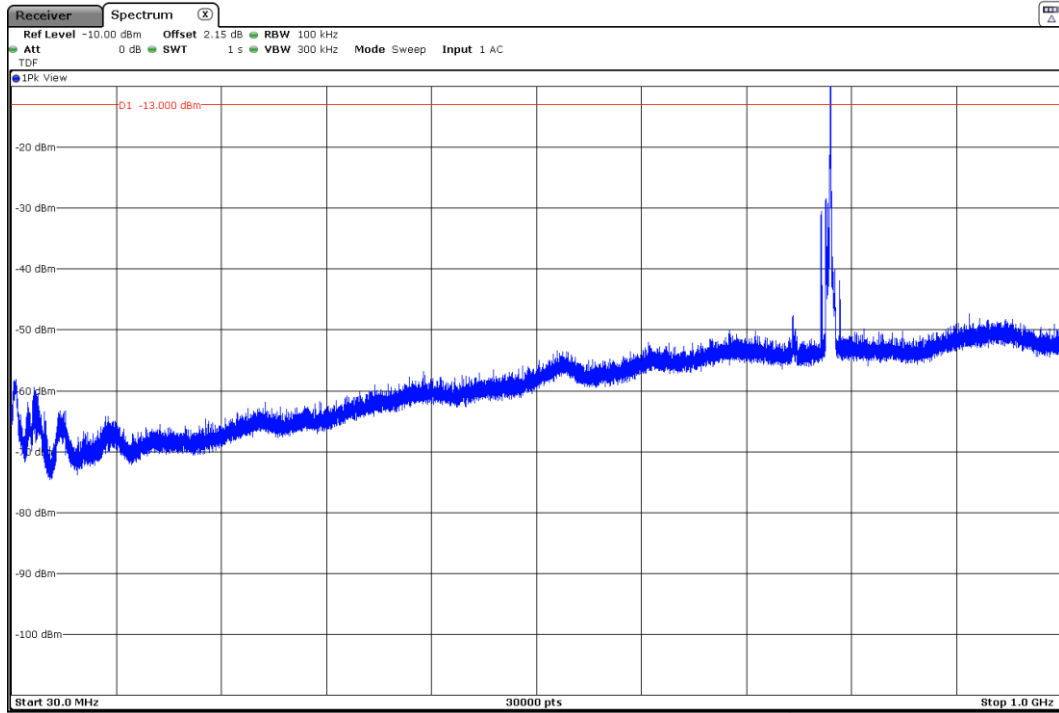
The peak above the limit is the carrier frequency:

- Middle Channel:



The peak above the limit is the carrier frequency:

- Highest Channel:

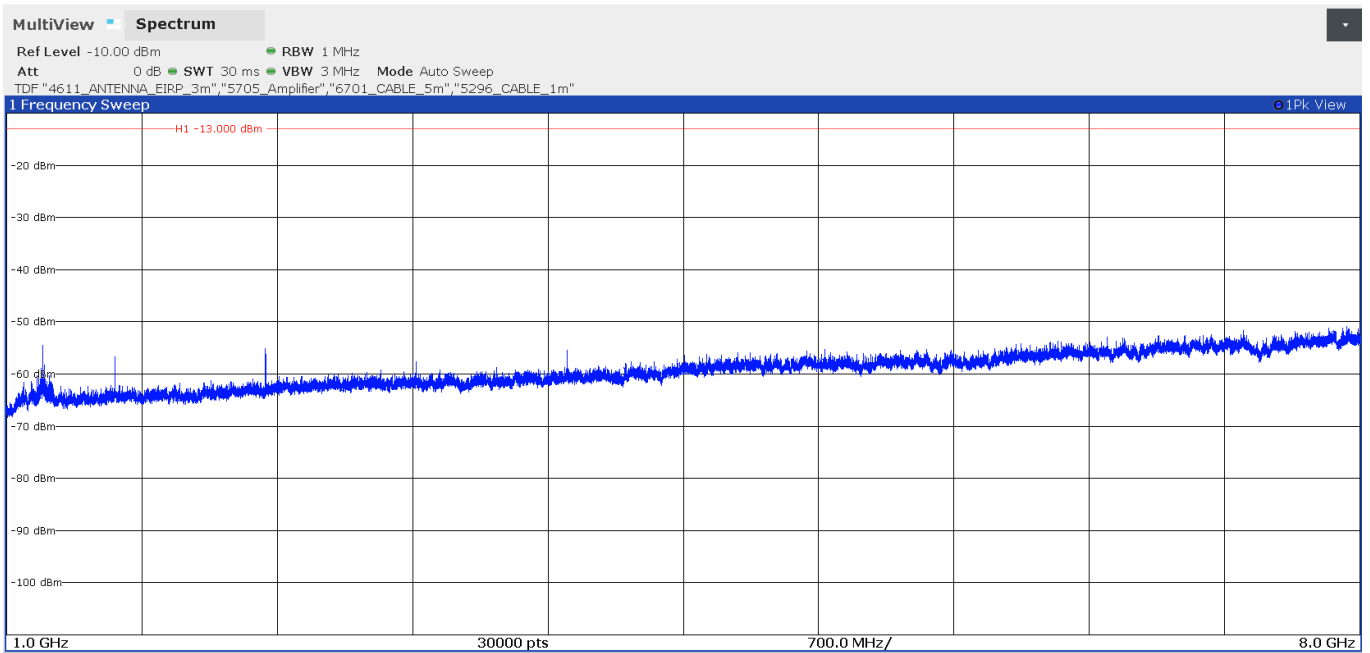


The peak above the limit is the carrier frequency:

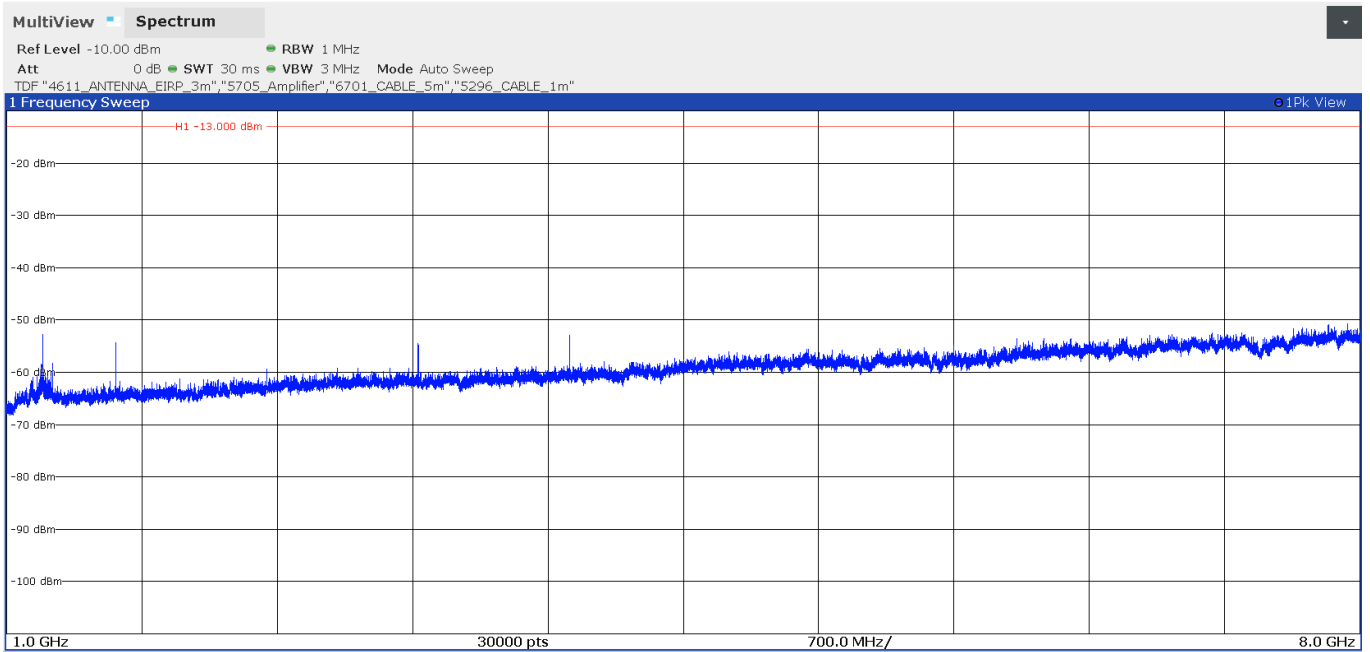
## FREQUENCY RANGE 1 - 8 GHz

## QPSK MODULATION

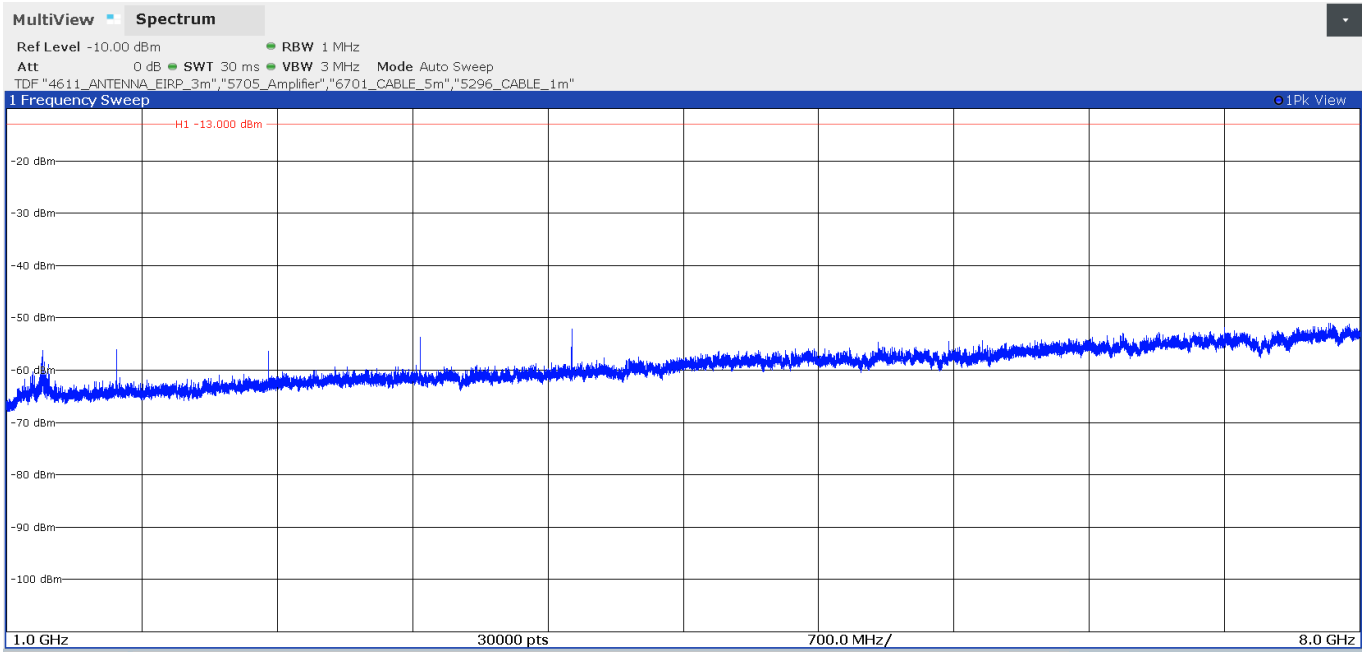
- Lowest Channel:



- Middle Channel:



- Highest Channel:



16QAM:

A preliminary scan determined BW=5 MHz, RB Size=1, RB Offset=12 as the worst case. The following tables and plots show the results for the worst case modulation

**- Lowest Channel:**

**Frequency range 30 MHz - 1 GHz**

No spurious frequencies at less than 20 dB below the limit.

**Frequency range 1 - 8 GHz**

No spurious frequencies at less than 20 dB below the limit.

**- Middle Channel:**

**Frequency range 30 MHz - 1 GHz**

No spurious frequencies at less than 20 dB below the limit.

**Frequency range 1 - 8 GHz**

No spurious frequencies at less than 20 dB below the limit.

**- Highest Channel:**

**Frequency range 30 MHz - 1 GHz**

No spurious frequencies at less than 20 dB below the limit.

**Frequency range 1 - 8 GHz**

No spurious frequencies at less than 20 dB below the limit.

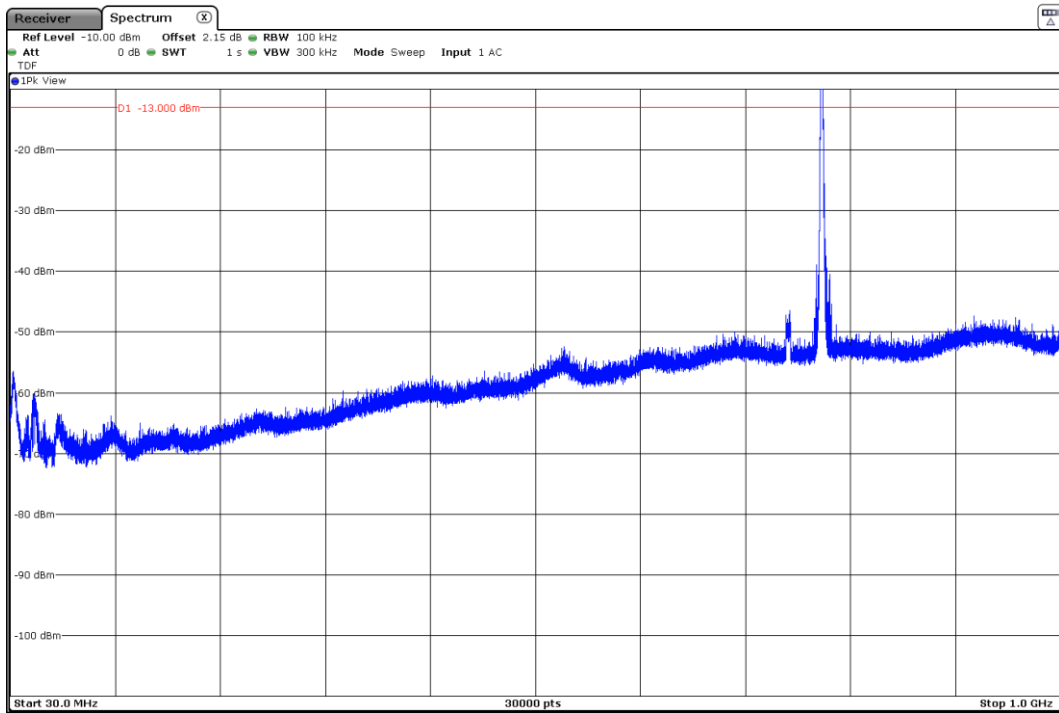
Measurement Uncertainty (dB):                      <math>\pm 4.68</math> for  $f \geq 30$  MHz up to 1 GHz  
                                                                         <math>\pm 4.99</math> for  $f \geq 1$  GHz up to 8 GHz

Verdict: PASS

### FREQUENCY RANGE 30 MHz - 1 GHz

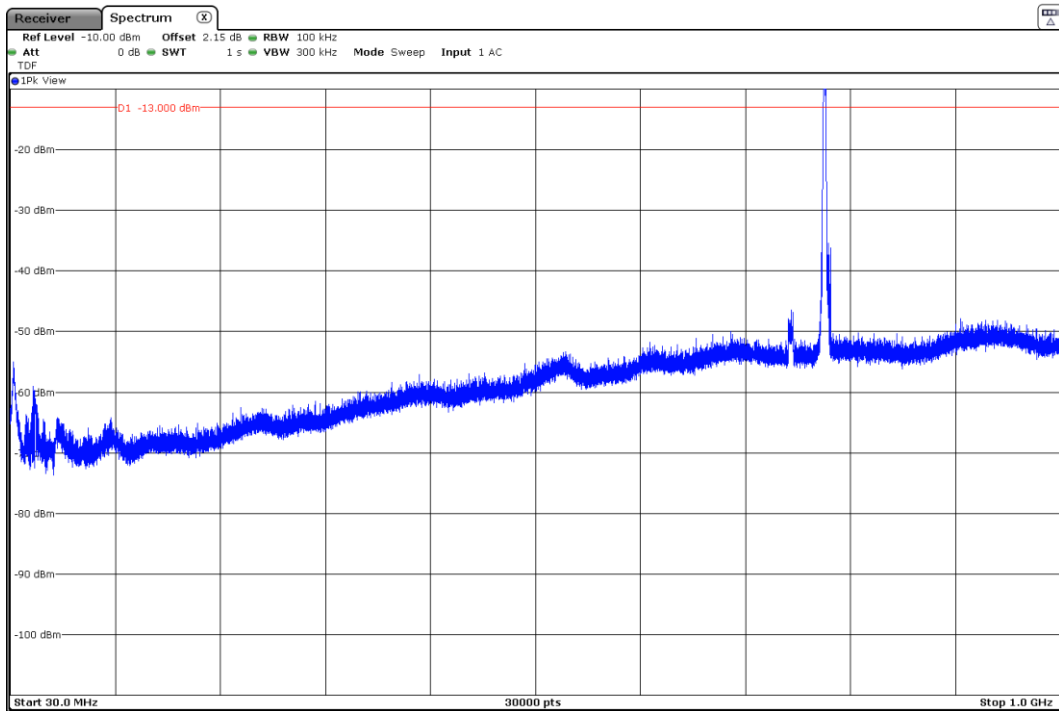
### 16QAM MODULATION

- Lowest Channel:



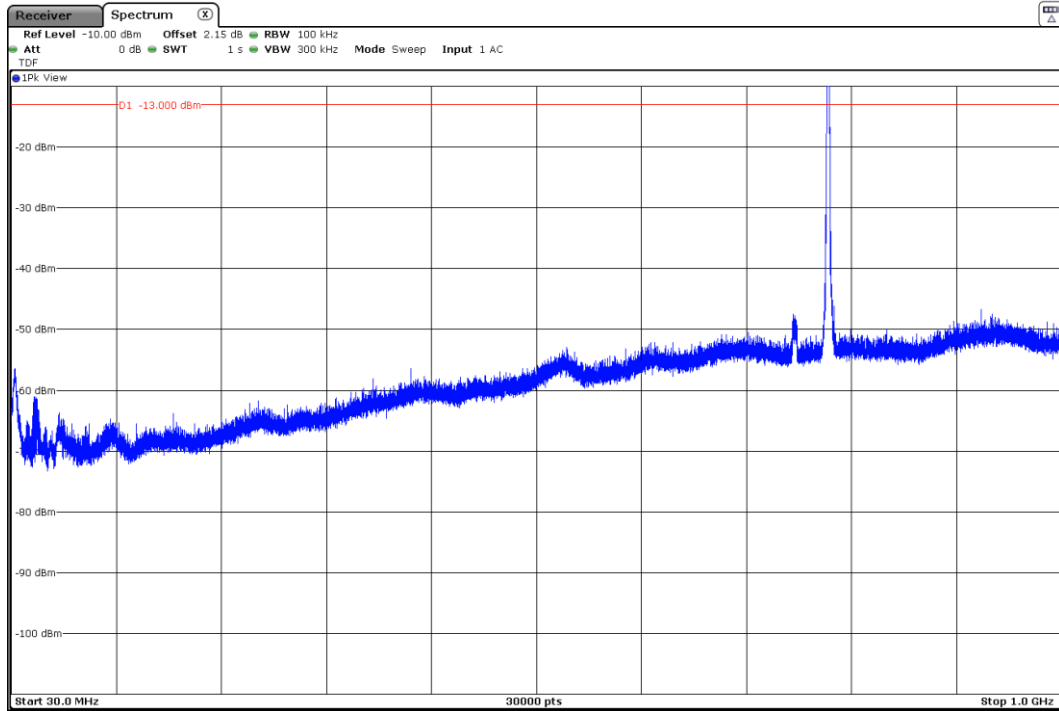
The peak above the limit is the carrier frequency:

- Middle Channel:



The peak above the limit is the carrier frequency:

- Highest Channel:

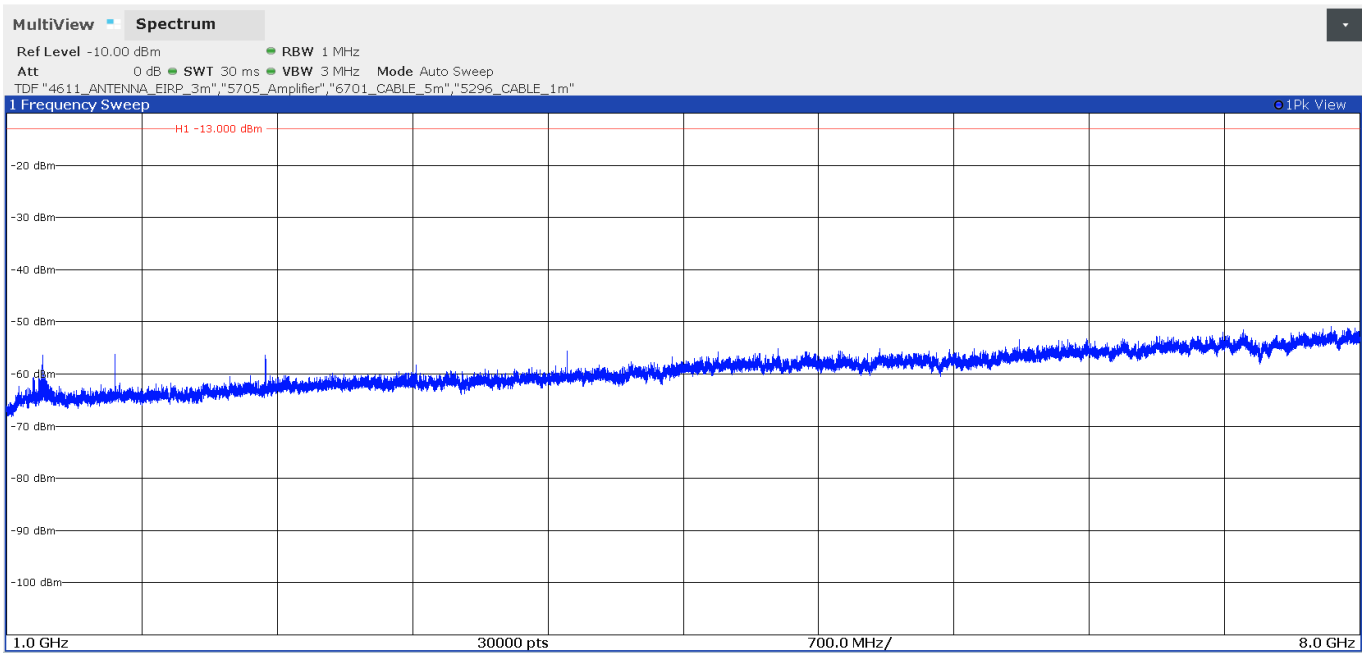


The peak above the limit is the carrier frequency:

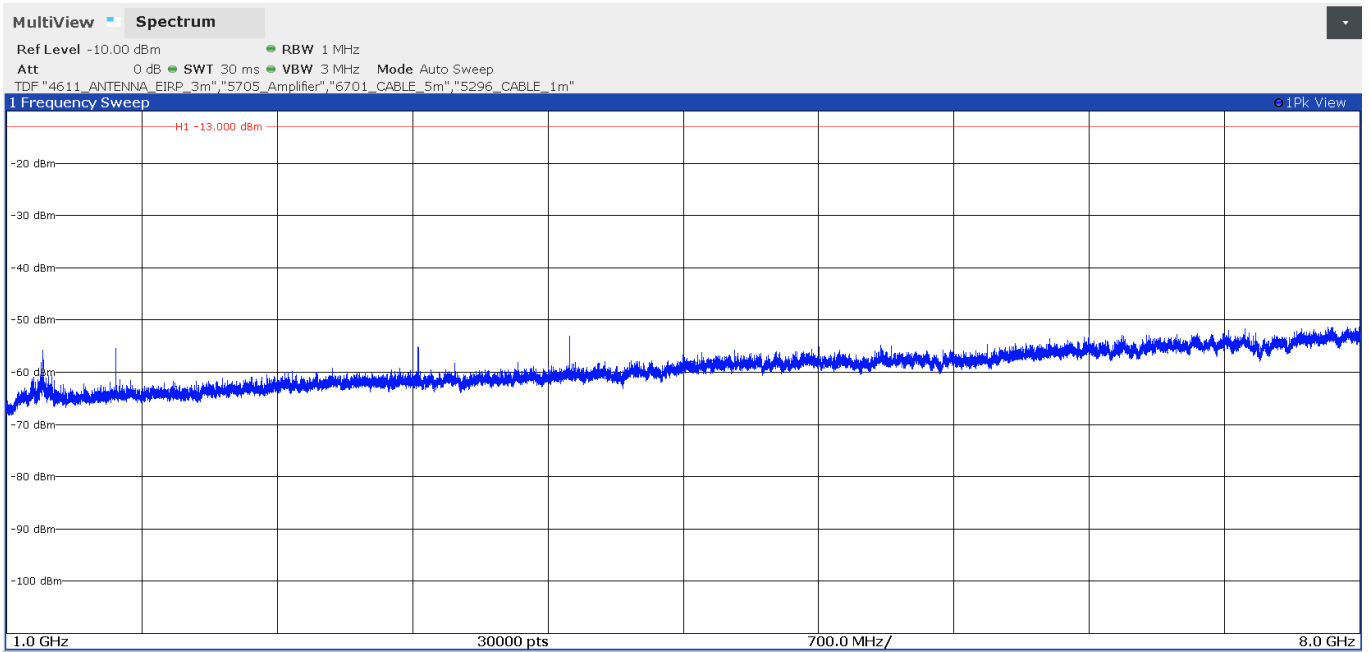
## FREQUENCY RANGE 1 - 8 GHz

### 16QAM MODULATION

- Lowest Channel:

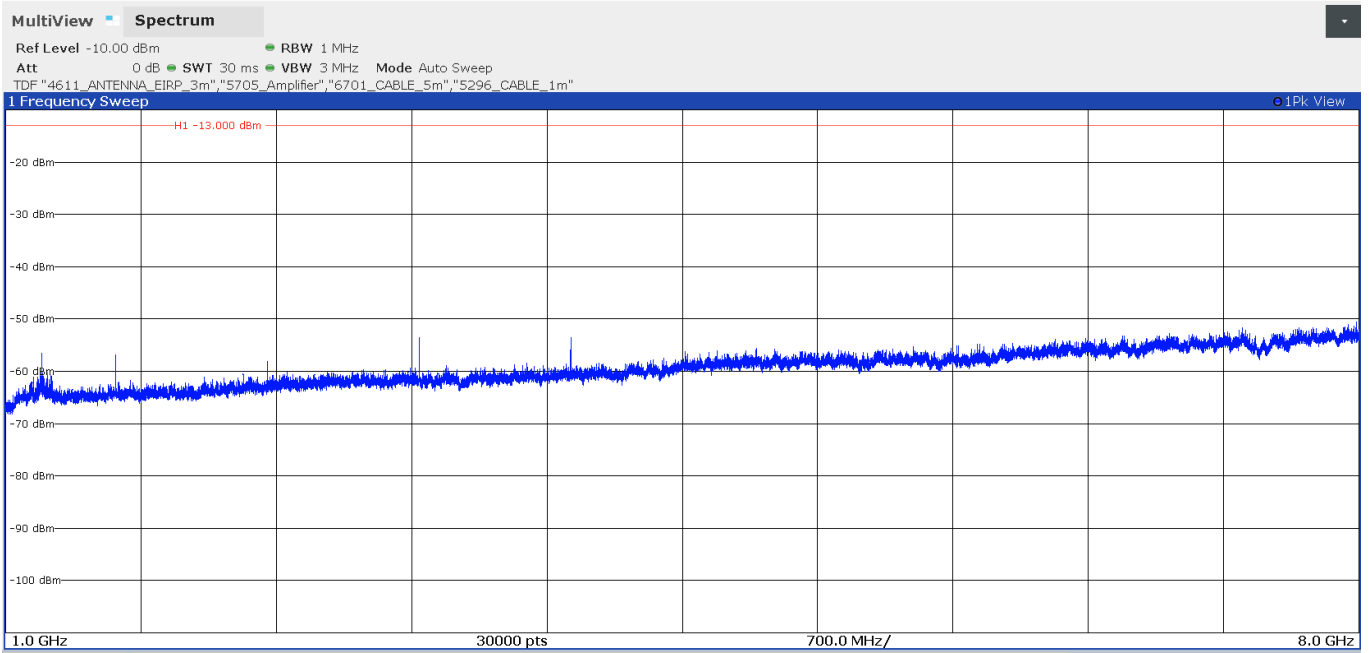


- Middle Channel:





- Highest Channel:



## **LTE Band 41:**

### **QPSK:**

A preliminary scan determined BW=5 MHz, RB Size=1, RB Offset=12 as the worst case. The following tables and plots show the results for the worst case modulation

### **- Lowest Channel:**

#### **Frequency range 30 MHz - 1 GHz**

No spurious frequencies at less than 20 dB below the limit.

#### **Frequency range 1 - 26 GHz**

Spurious frequencies detected at less than 20 dB below the limit:

Spurious frequency (MHz)	Detector	E.I.R.P (dBm)	Polarization
4997.25	RMS	-60.87	V
7496.25	RMS	-55.09	V
9994.75	RMS	-41.39	V

#### **Frequency range 2490.5 - 2496 MHz**

No spurious frequencies at less than 20 dB below the limit.

### **- Middle Channel:**

#### **Frequency range 30 MHz - 1 GHz**

No spurious frequencies at less than 20 dB below the limit.

#### **Frequency range 1 - 26 GHz**

Spurious frequencies detected at less than 20 dB below the limit:

Spurious frequency (MHz)	Detector	E.I.R.P (dBm)	Polarization
5186.25	RMS	-56.53	V
7779.75	RMS	-54.29	V
10372.75	RMS	-38.85	V

#### **Frequency range 2490.5 - 2496 MHz**

No spurious frequencies at less than 20 dB below the limit.

**- Highest Channel:**

**Frequency range 30 MHz - 1 GHz**

No spurious frequencies at less than 20 dB below the limit.

**Frequency range 1 - 26 GHz**

Spurious frequencies detected at less than 20 dB below the limit:

Spurious frequency (MHz)	Detector	E.I.R.P (dBm)	Polarization
5375.25	RMS	-52.61	V
8062.75	RMS	-47.44	V
10750.75	RMS	-25.93	V

**Frequency range 2490.5 - 2496 MHz**

No spurious frequencies at less than 20 dB below the limit.

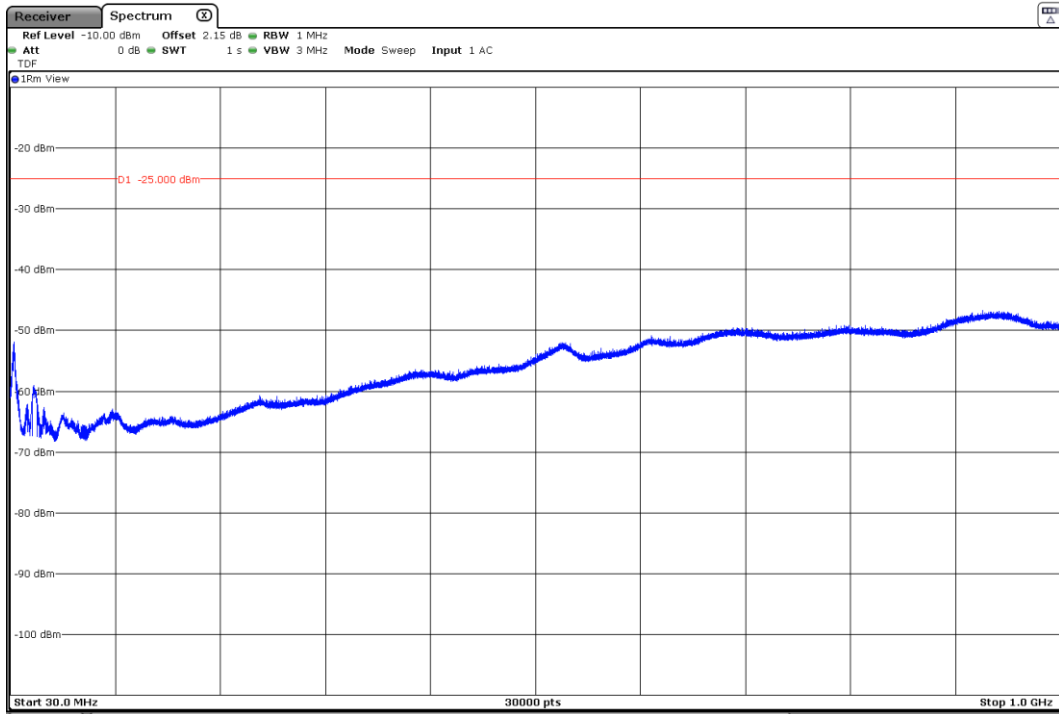
Measurement Uncertainty (dB):  
<± 4.68 for f ≥ 30 MHz up to 1 GHz  
<± 4.00 for f ≥ 1 GHz up to 3 GHz  
<± 4.99 for f ≥ 3 GHz up to 18 GHz  
<± 5.08 for f ≥ 18 GHz up to 27 GHz

Verdict: PASS

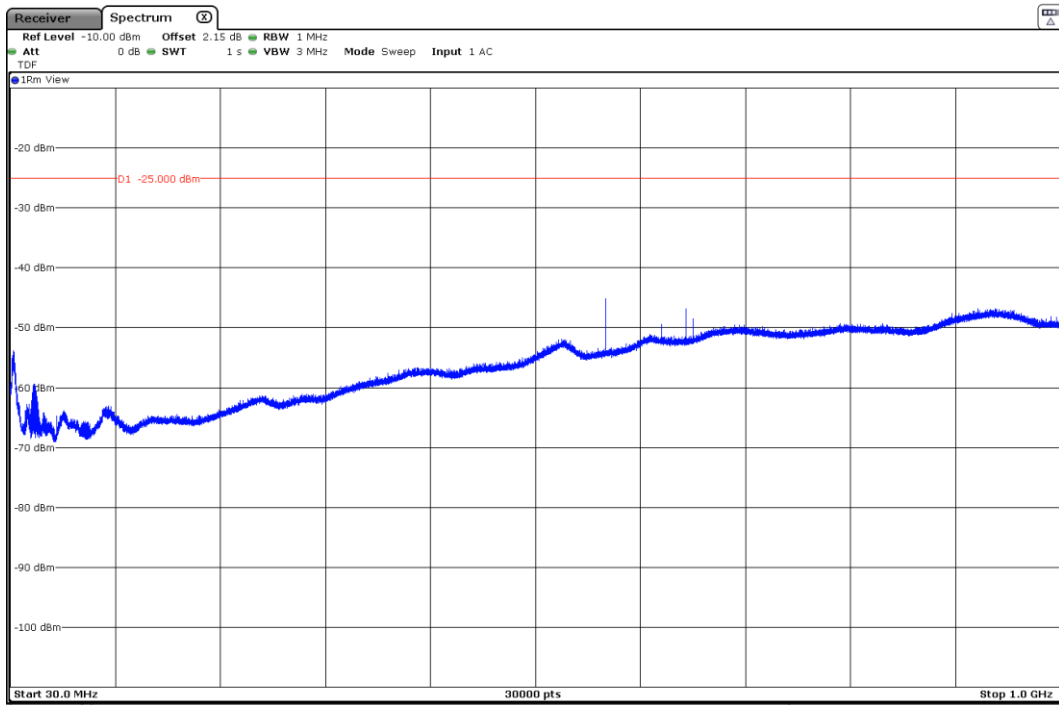
### FREQUENCY RANGE 30 MHz - 1 GHz

### QPSK MODULATION

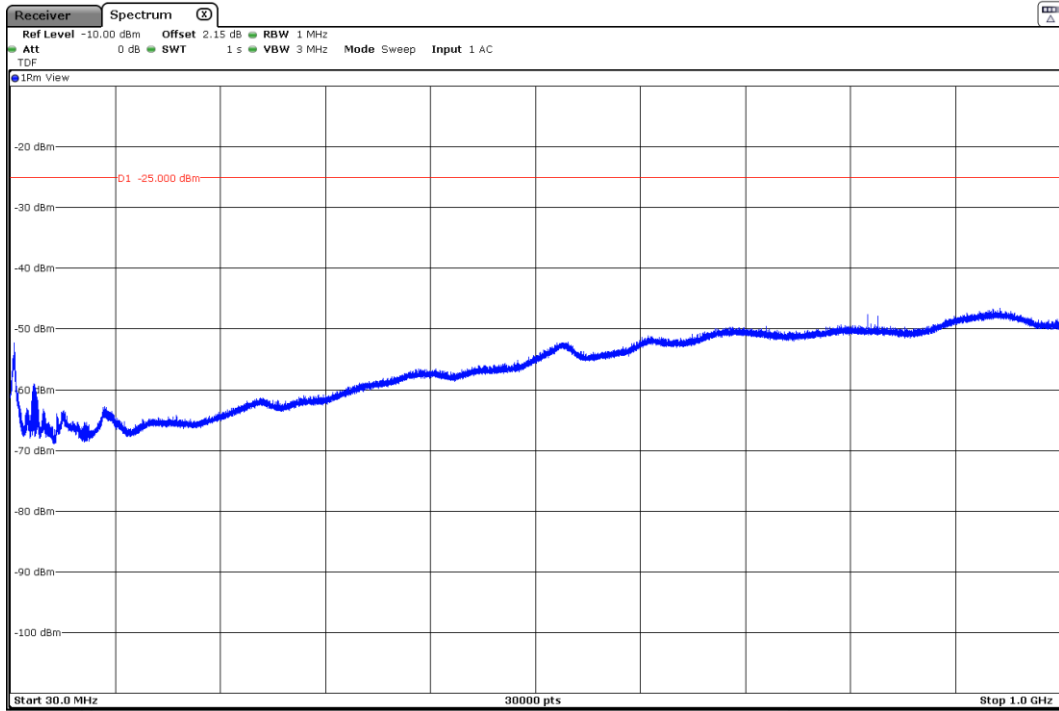
- Lowest Channel:



- Middle Channel:



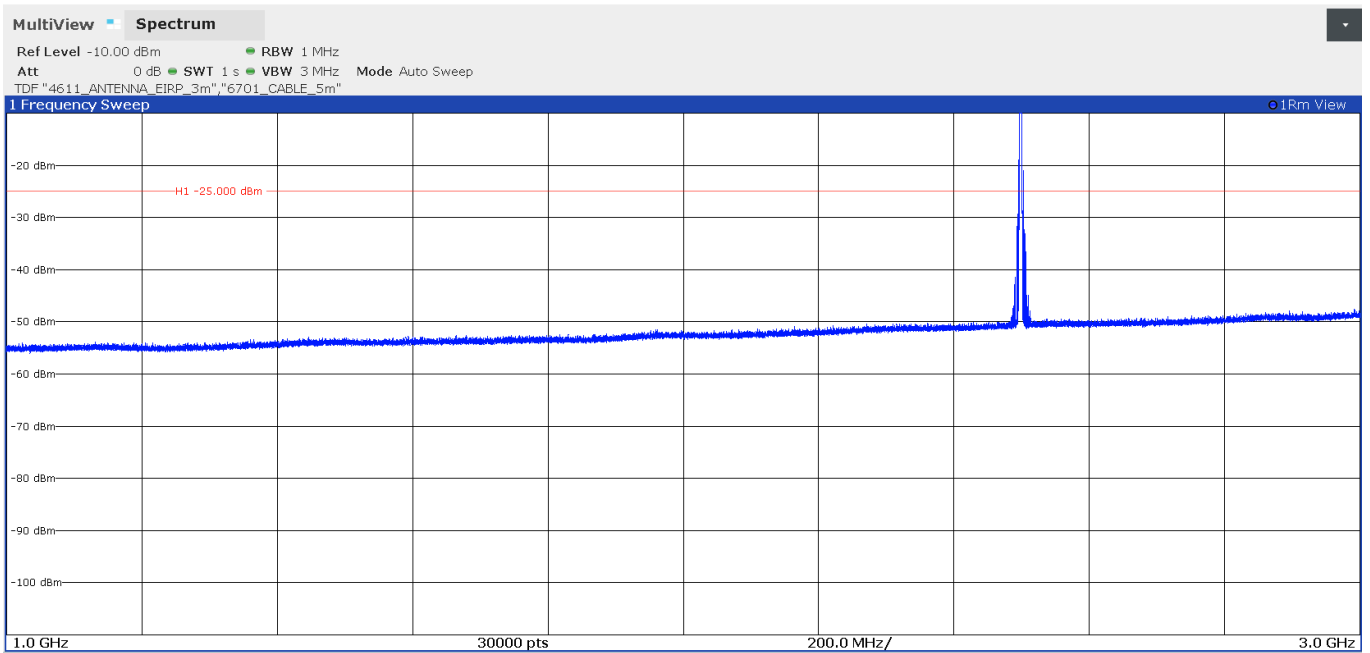
- Highest Channel:



### FREQUENCY RANGE 1 - 3 GHz

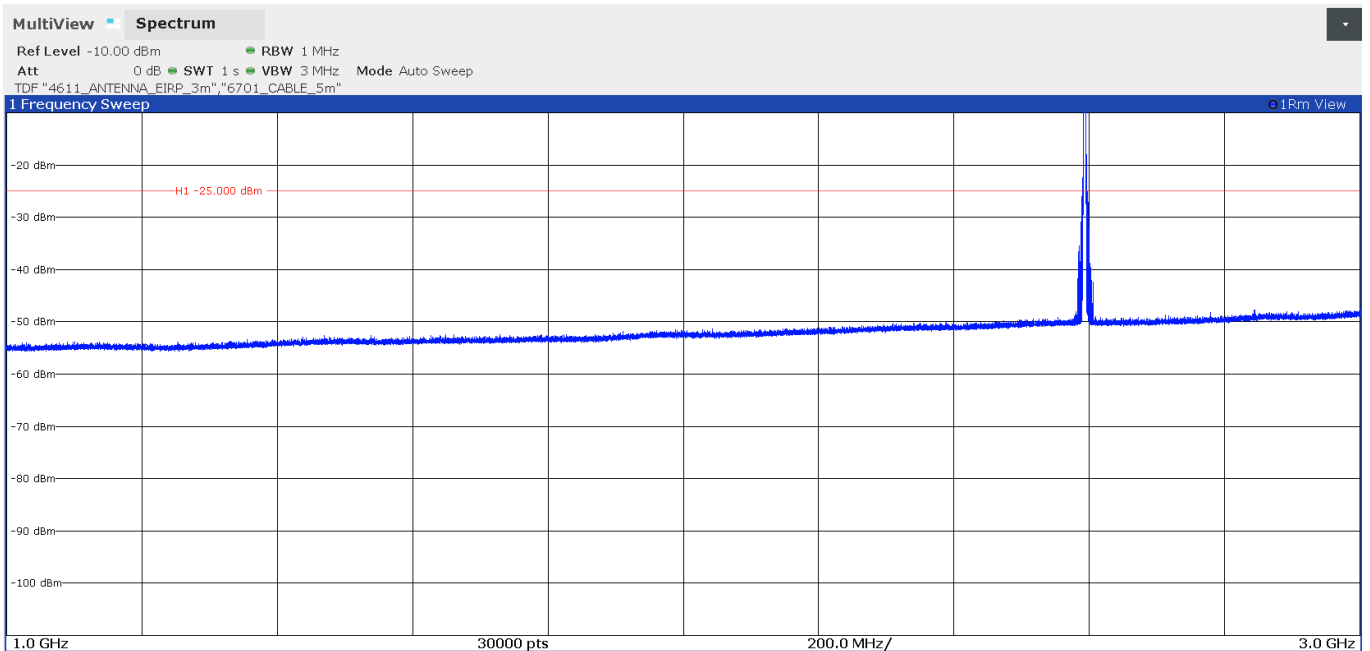
### QPSK MODULATION

- Lowest Channel:



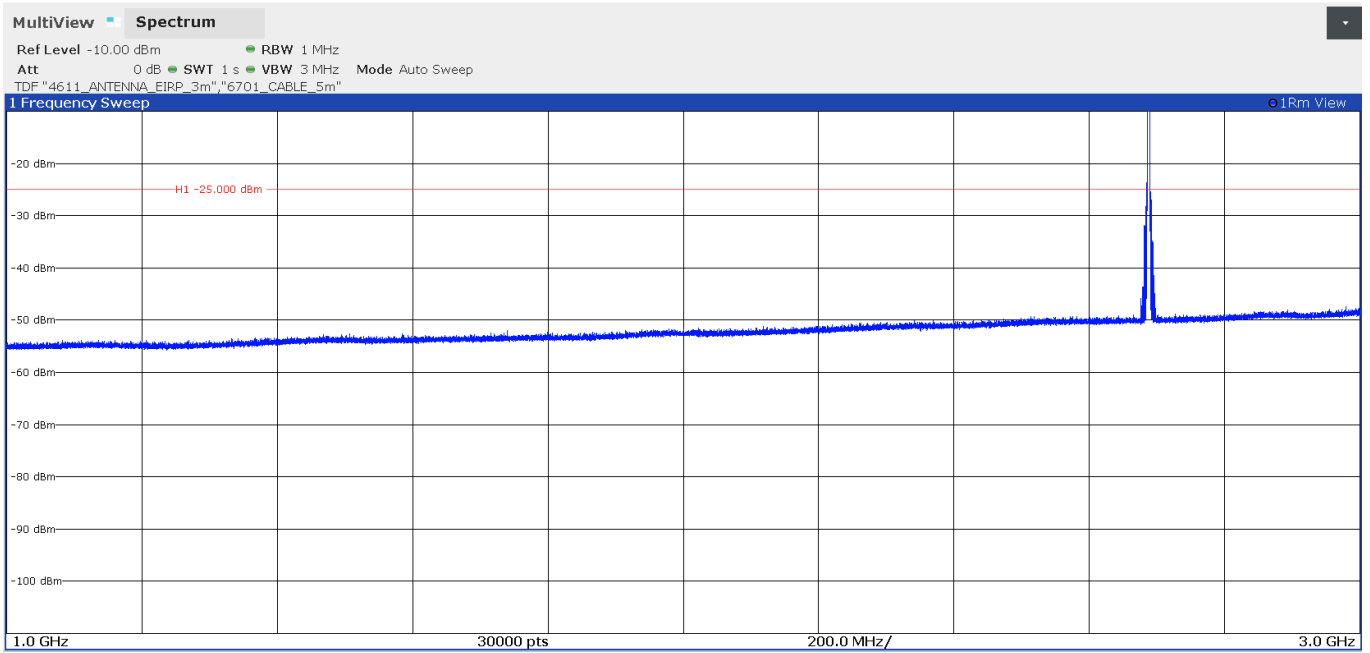
The peak above the limit is the carrier frequency:

- Middle Channel:



The peak above the limit is the carrier frequency:

- Highest Channel:

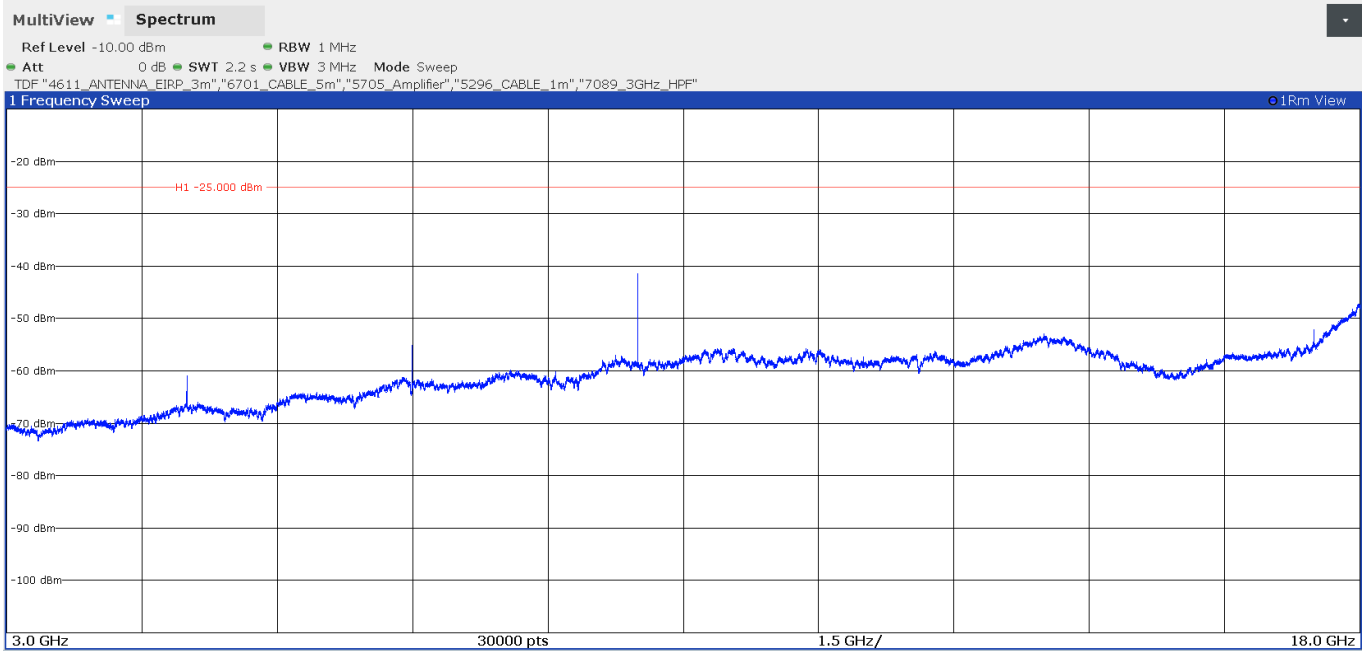


The peak above the limit is the carrier frequency:

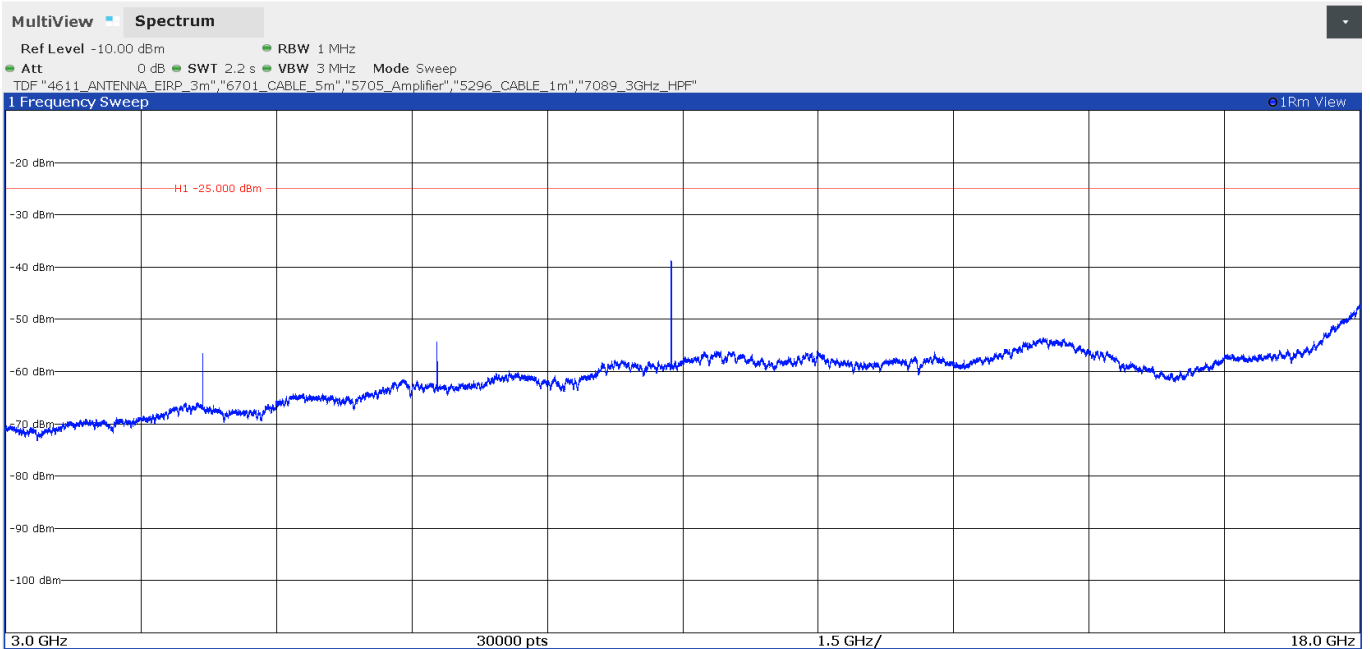
### FREQUENCY RANGE 3 – 18 GHz

### QPSK MODULATION

- Lowest Channel:

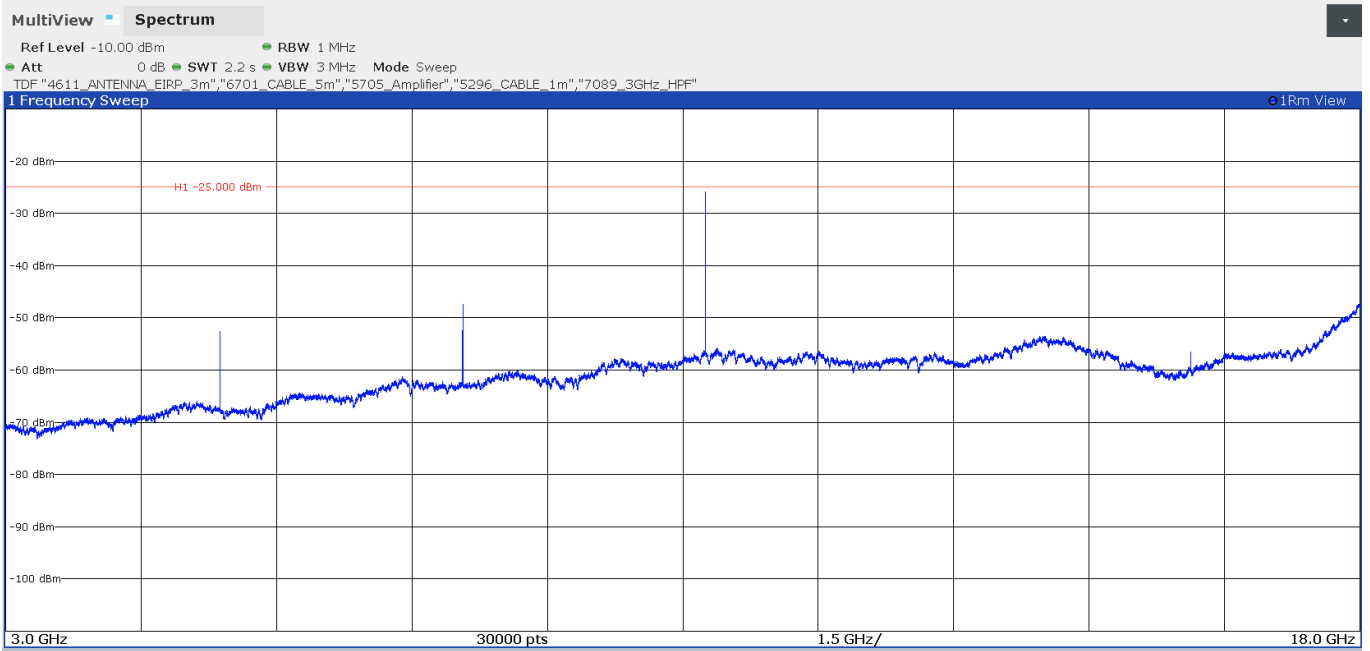


- Middle Channel:





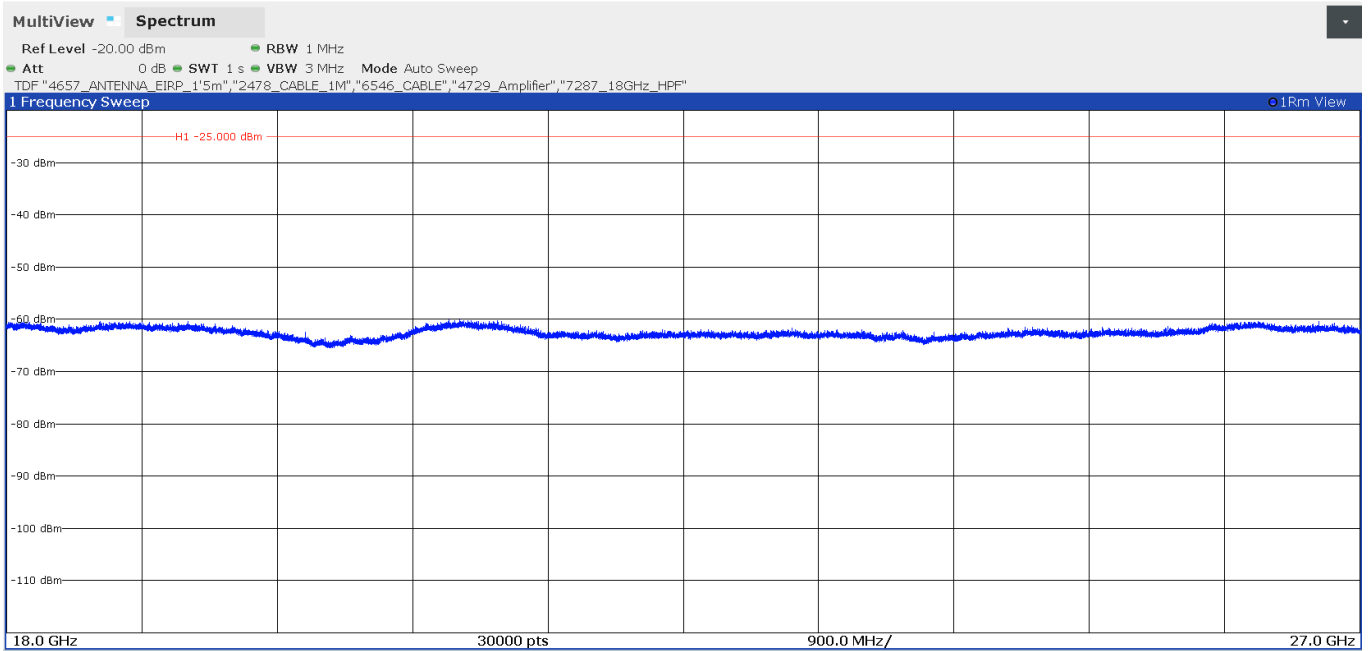
- Highest Channel:



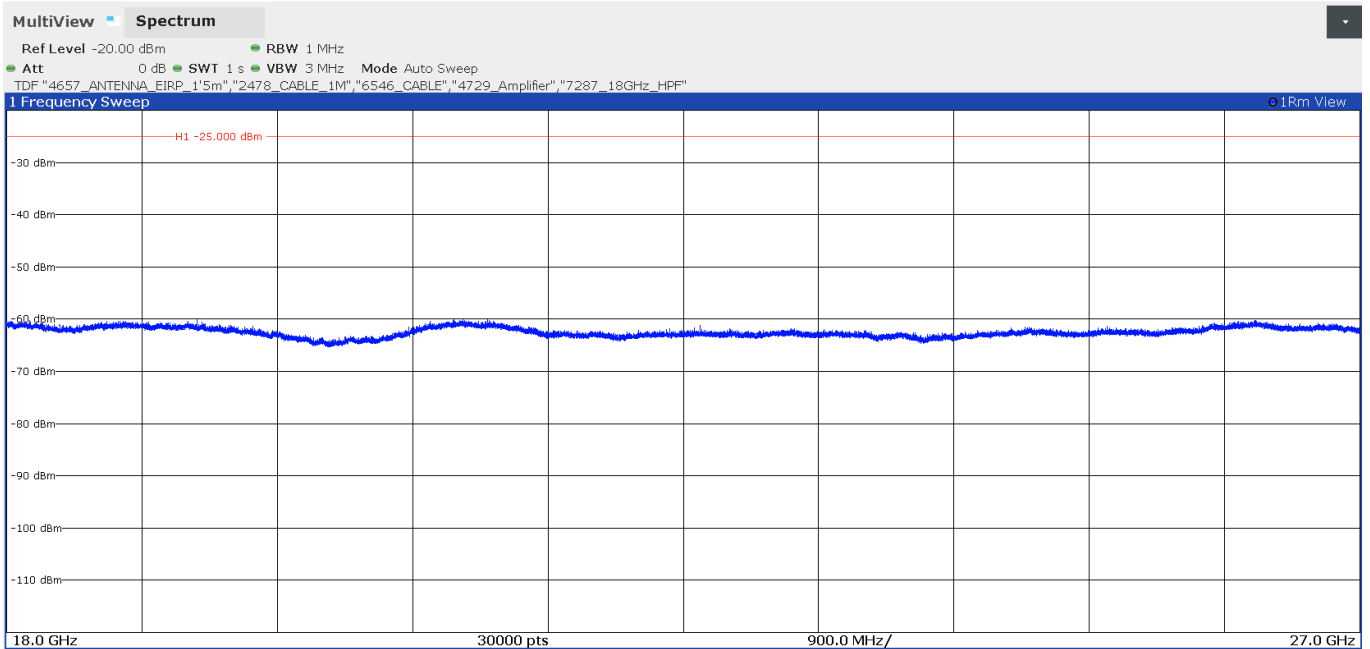
## FREQUENCY RANGE 18 - 27 GHz

## QPSK MODULATION

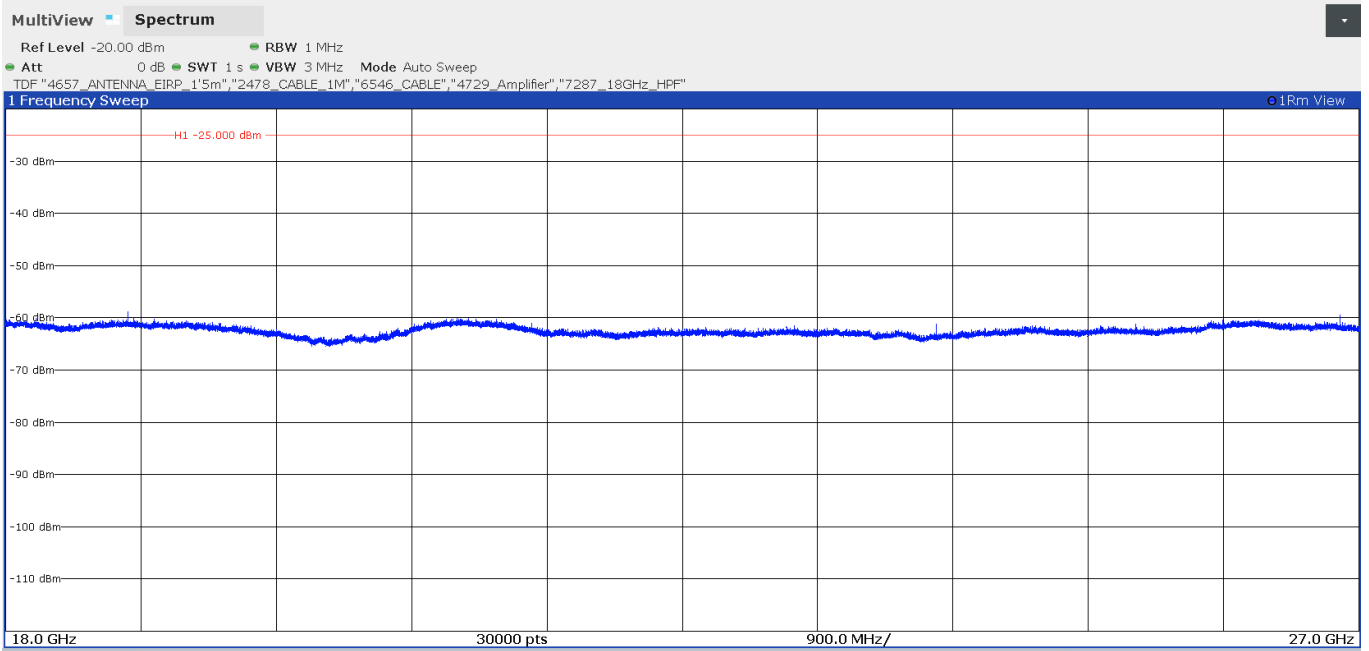
- Lowest Channel:



- Middle Channel:



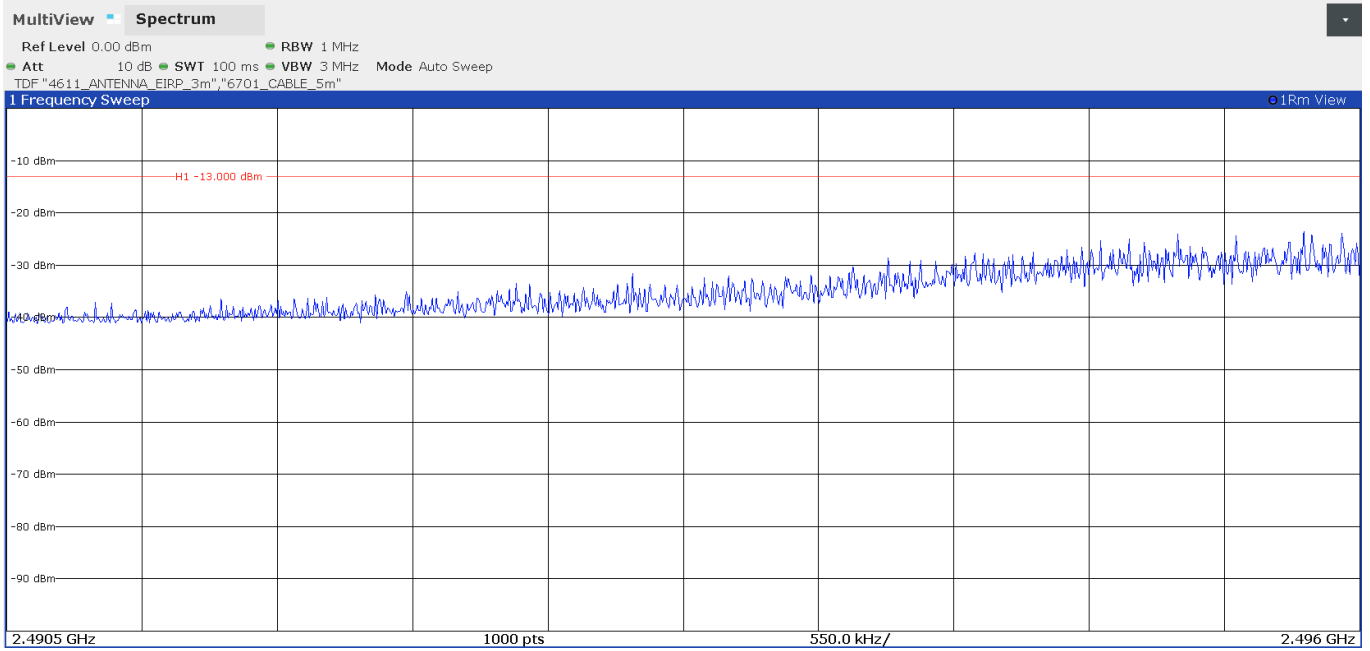
- Highest Channel:



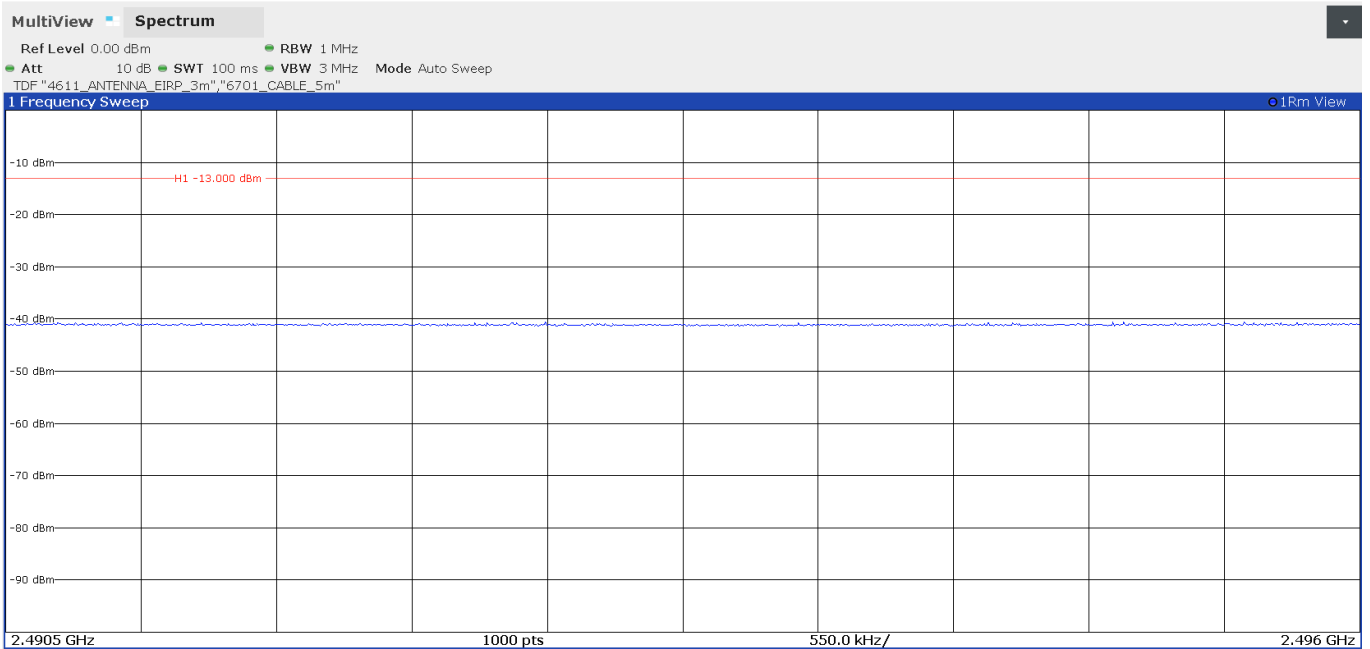
## FREQUENCY RANGE 2490.5 - 2496 MHz

## QPSK MODULATION

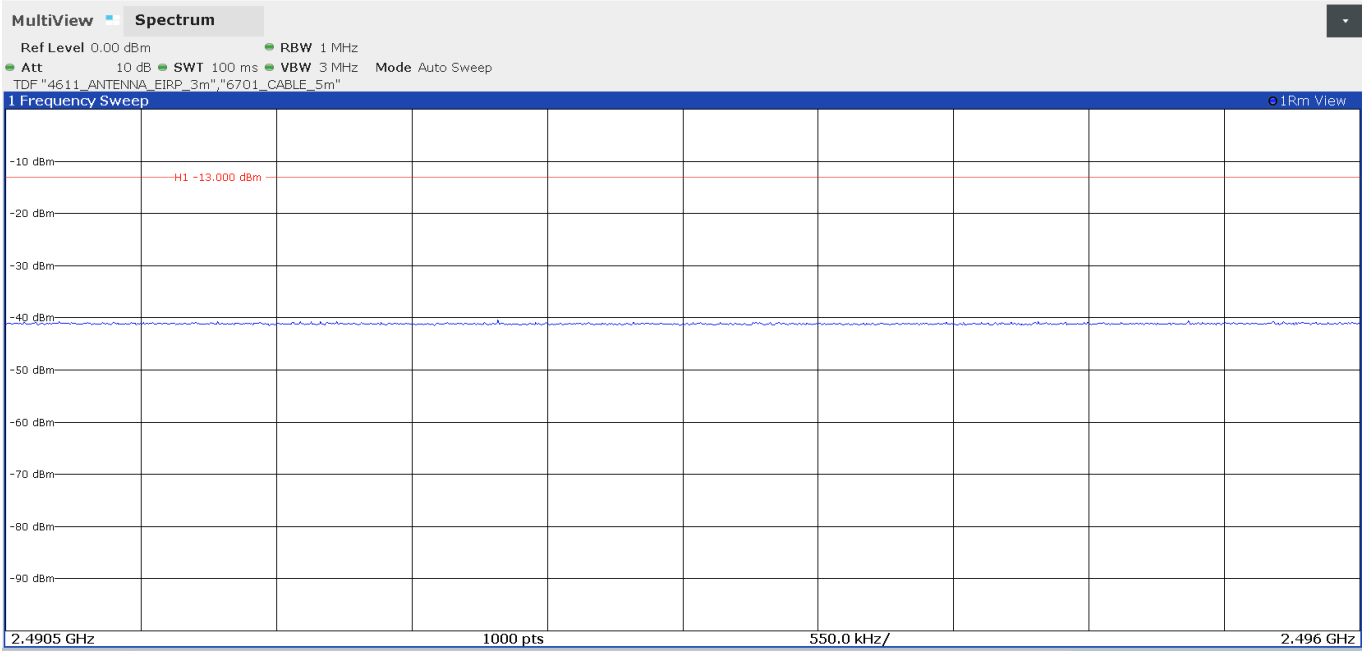
- Lowest Channel:



- Middle Channel:



- Highest Channel:



16QAM:

A preliminary scan determined BW=5 MHz, RB Size=1, RB Offset=12 as the worst case. The following tables and plots show the results for the worst case modulation

**- Lowest Channel:**

**Frequency range 30 MHz - 1 GHz**

No spurious frequencies at less than 20 dB below the limit.

**Frequency range 1 - 26 GHz**

Spurious frequencies detected at less than 20 dB below the limit:

Spurious frequency (MHz)	Detector	E.I.R.P (dBm)	Polarization
4997.25	RMS	-60.84	V
7495.75	RMS	-55.99	V
9994.75	RMS	-42.31	V

**Frequency range 2490.5 - 2496 MHz**

No spurious frequencies at less than 20 dB below the limit.

**- Middle Channel:**

**Frequency range 30 MHz - 1 GHz**

No spurious frequencies at less than 20 dB below the limit.

**Frequency range 1 - 26 GHz**

Spurious frequencies detected at less than 20 dB below the limit:

Spurious frequency (MHz)	Detector	E.I.R.P (dBm)	Polarization
5186.25	RMS	-57.78	V
7779.75	RMS	-54.52	V
10372.75	RMS	-39.87	V

**Frequency range 2490.5 - 2496 MHz**

No spurious frequencies at less than 20 dB below the limit.

**- Highest Channel:**

**Frequency range 30 MHz - 1 GHz**

No spurious frequencies at less than 20 dB below the limit.

**Frequency range 1 - 26 GHz**

Spurious frequencies detected at less than 20 dB below the limit:

Spurious frequency (MHz)	Detector	E.I.R.P (dBm)	Polarization
5375.25	RMS	-51.99	V
8062.75	RMS	-48.30	V
10750.75	RMS	-26.33	V

**Frequency range 2490.5 - 2496 MHz**

No spurious frequencies at less than 20 dB below the limit.

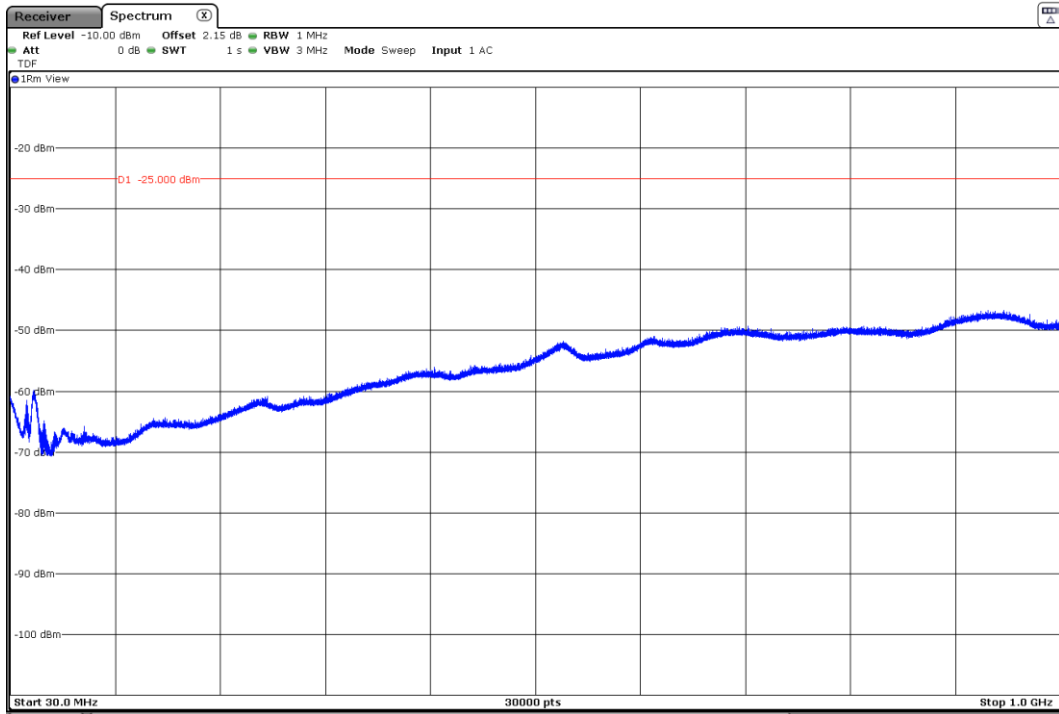
Measurement Uncertainty (dB):            <± 4.68 for f ≥ 30 MHz up to 1 GHz  
                                                         <± 4.00 for f ≥ 1 GHz up to 3 GHz  
                                                         <± 4.99 for f ≥ 3 GHz up to 18 GHz  
                                                         <± 5.08 for f ≥ 18 GHz up to 27 GHz

Verdict: PASS

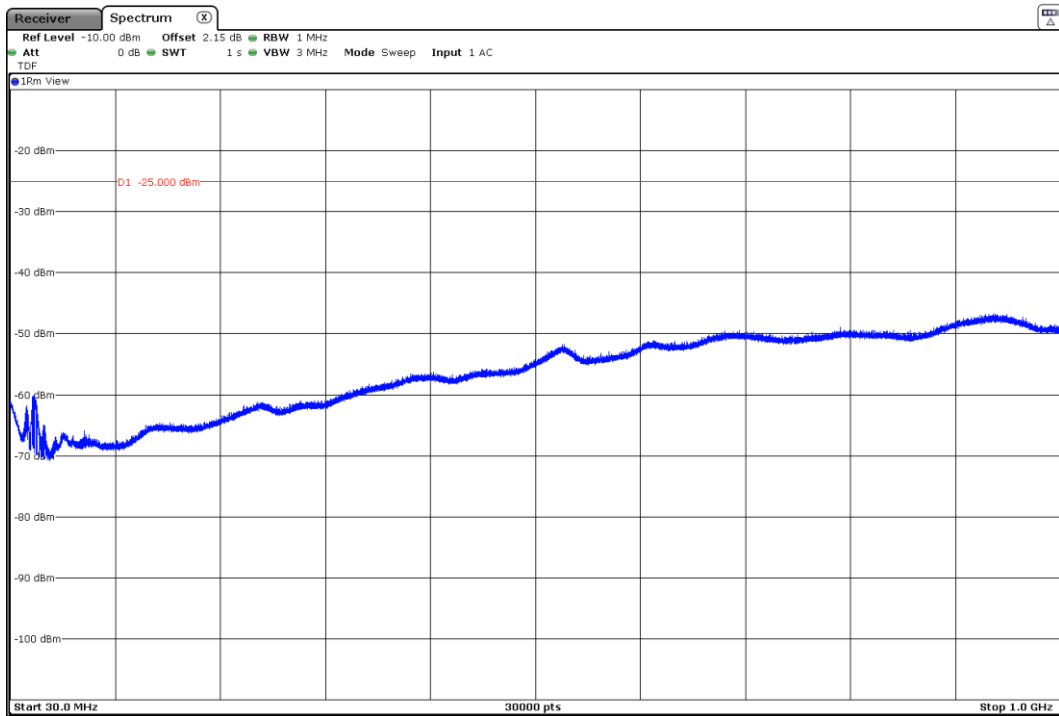
### FREQUENCY RANGE 30 MHz - 1 GHz

### 16QAM MODULATION

- Lowest Channel:

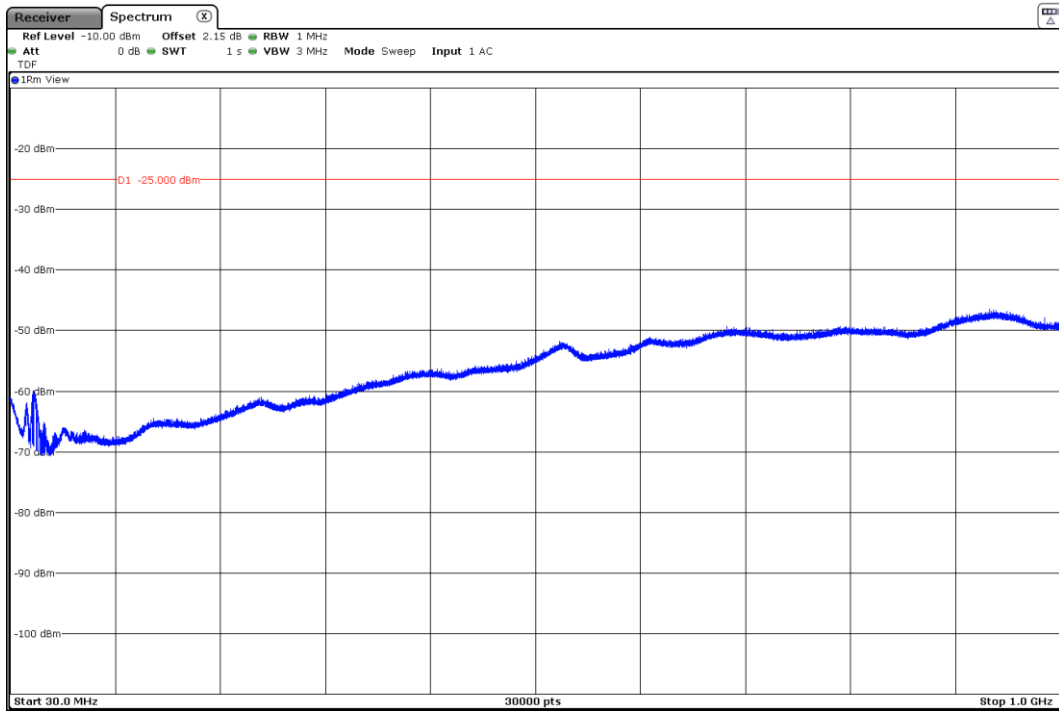


- Middle Channel:





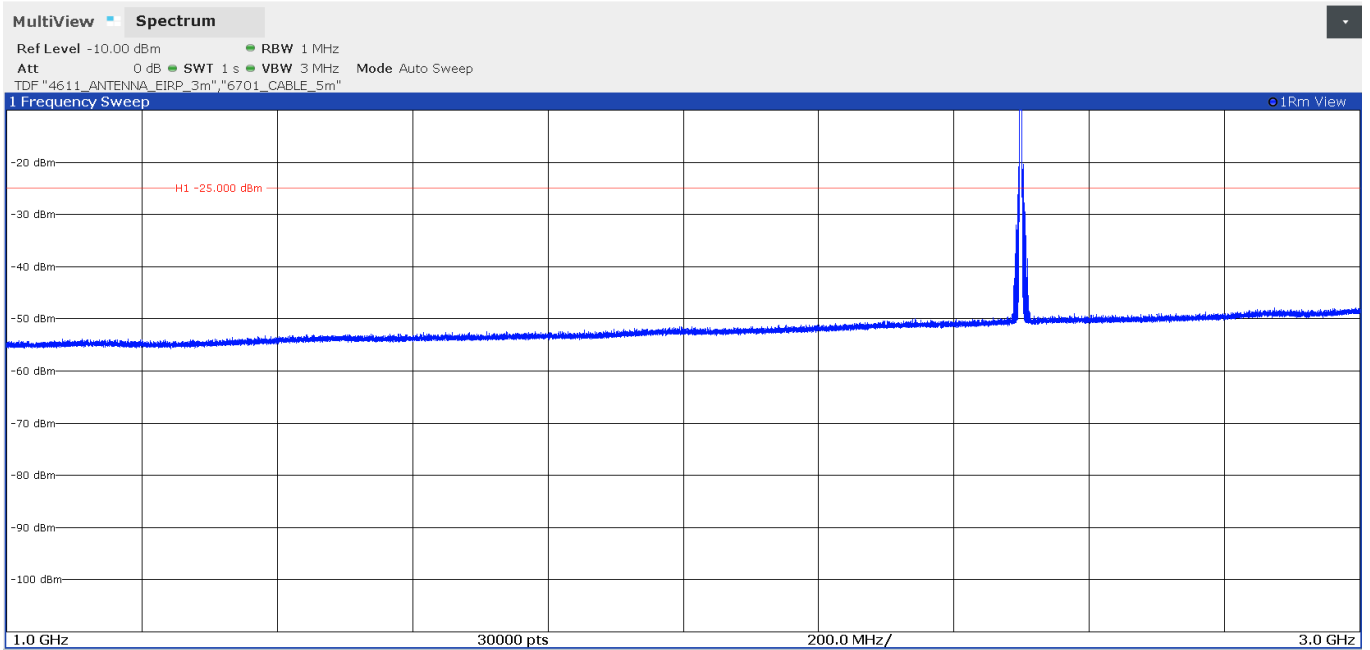
- Highest Channel:



### FREQUENCY RANGE 1 - 3 GHz

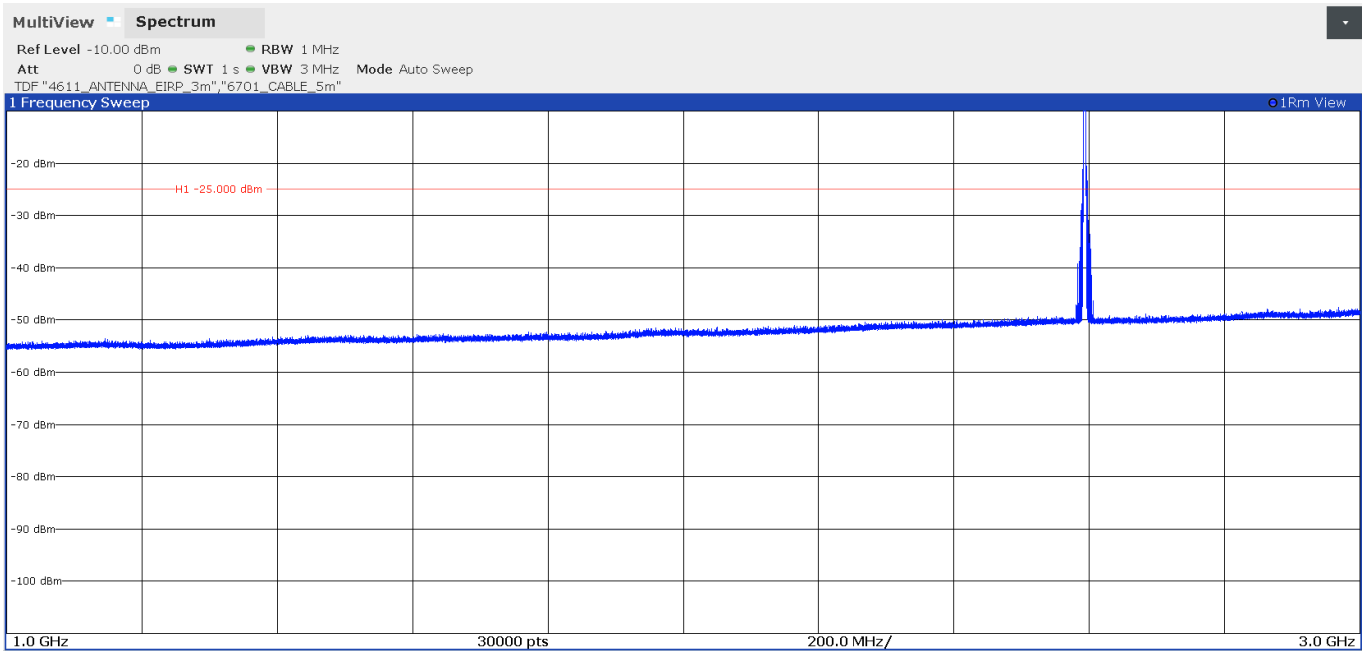
### 16QAM MODULATION

- Lowest Channel:



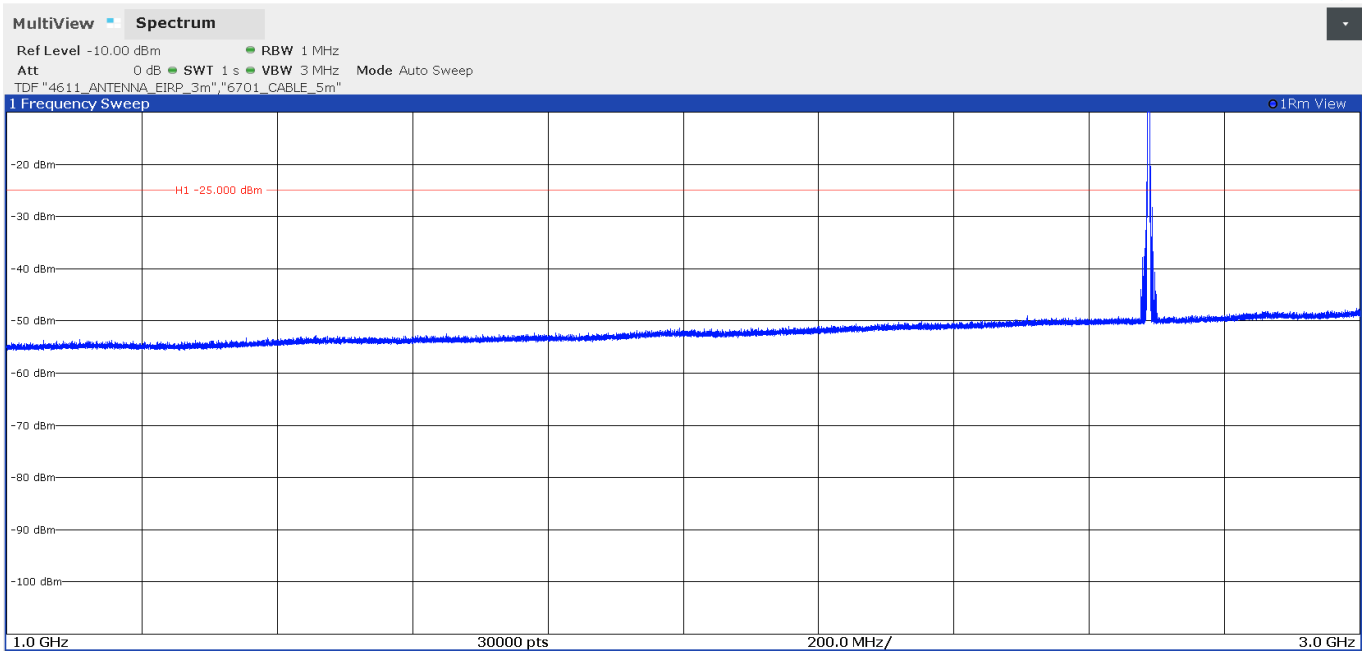
The peak above the limit is the carrier frequency:

- Middle Channel:



The peak above the limit is the carrier frequency:

- Highest Channel:

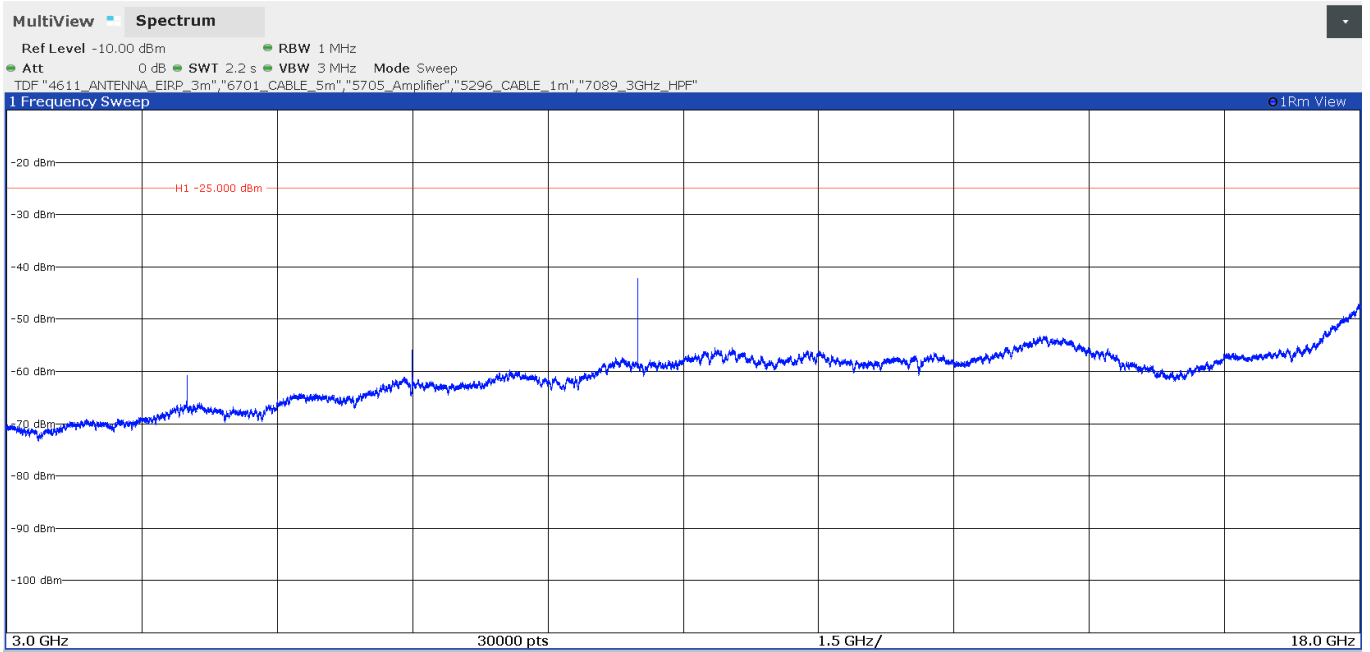


The peak above the limit is the carrier frequency:

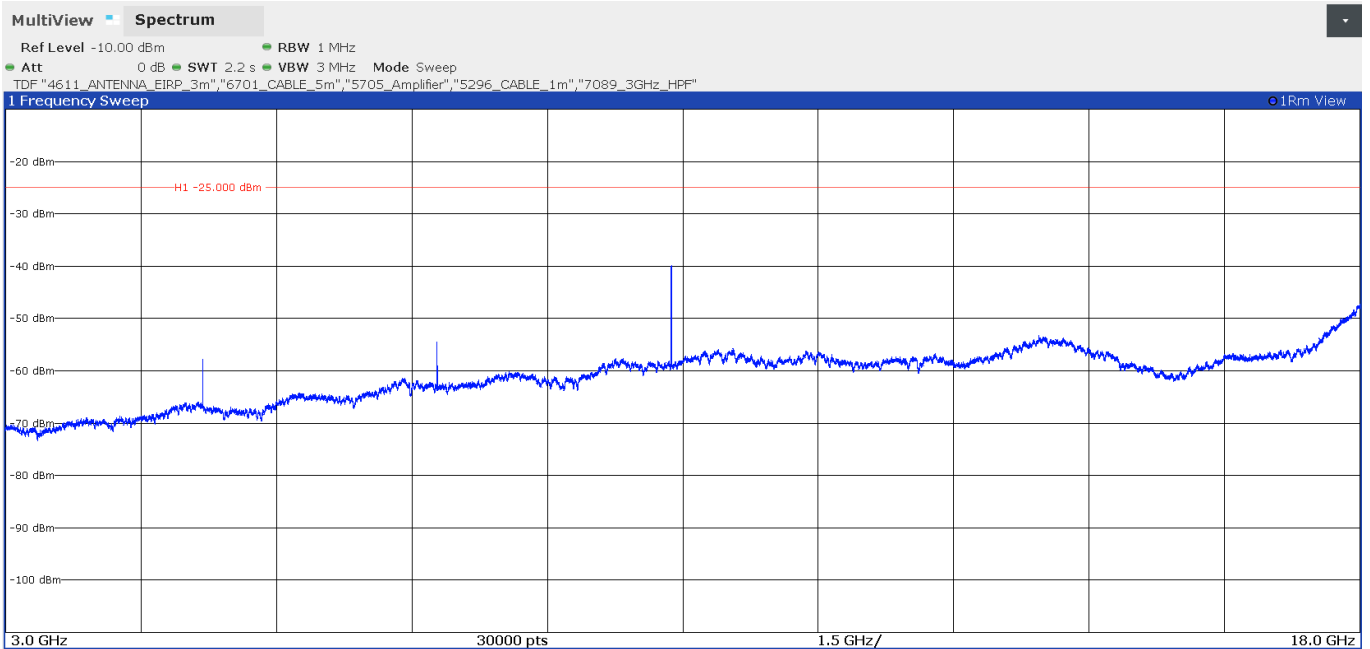
### FREQUENCY RANGE 3 – 18 GHz

### 16QAM MODULATION

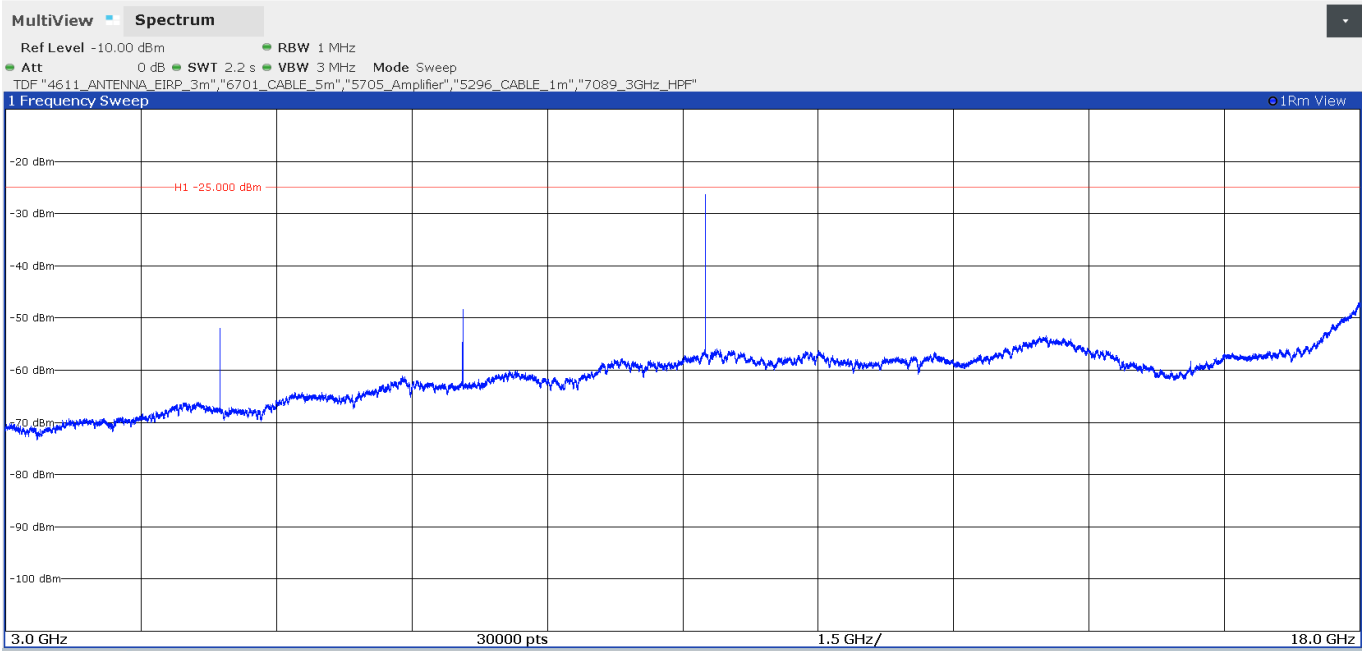
- Lowest Channel:



- Middle Channel:



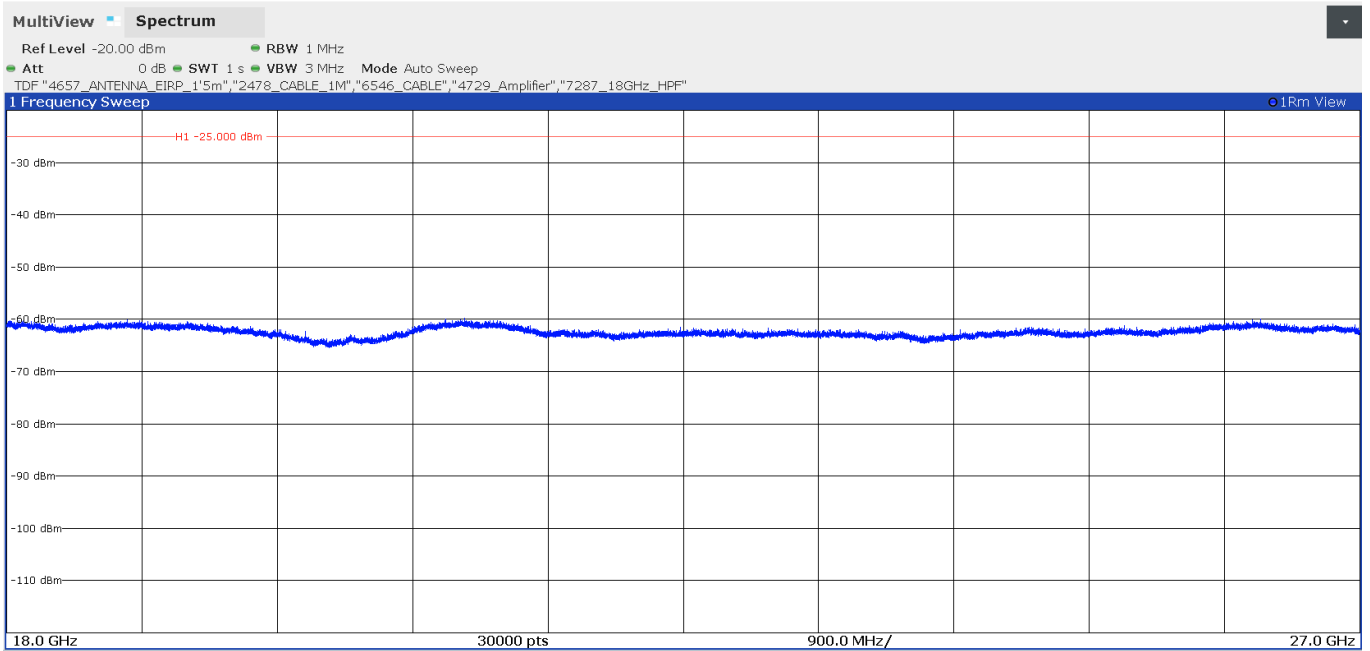
- Highest Channel:



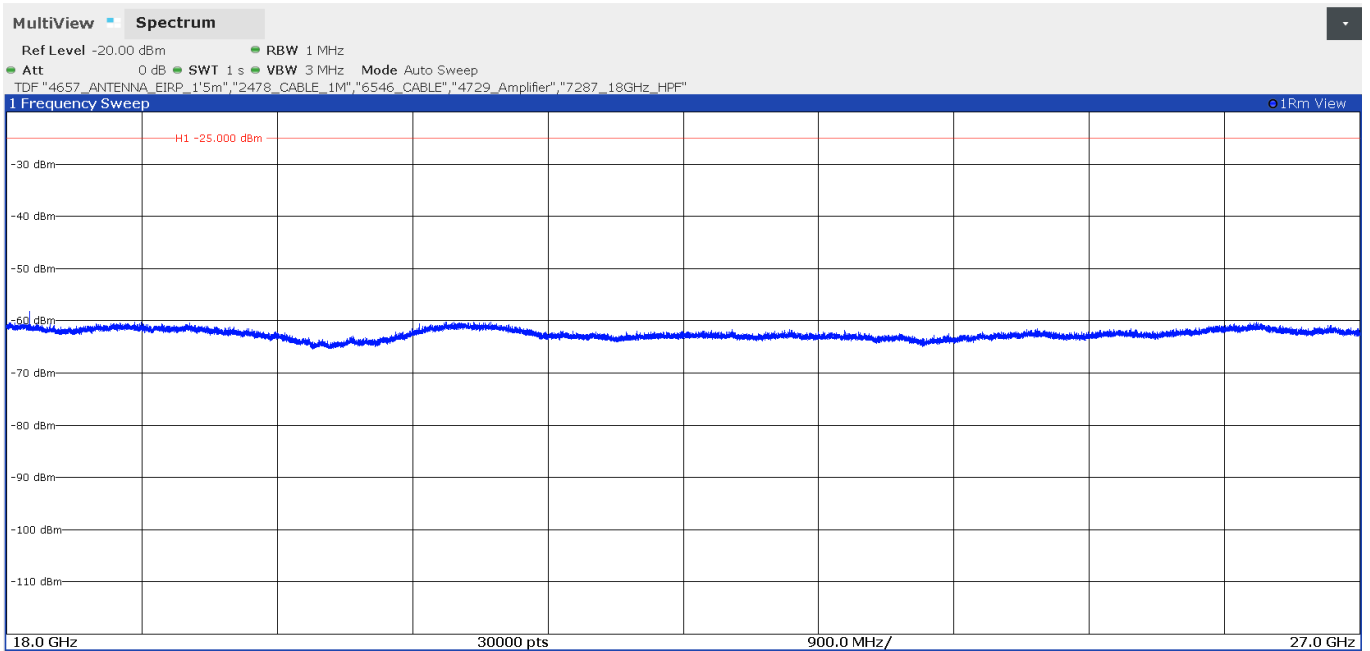
## FREQUENCY RANGE 18 - 27 GHz

## 16QAM MODULATION

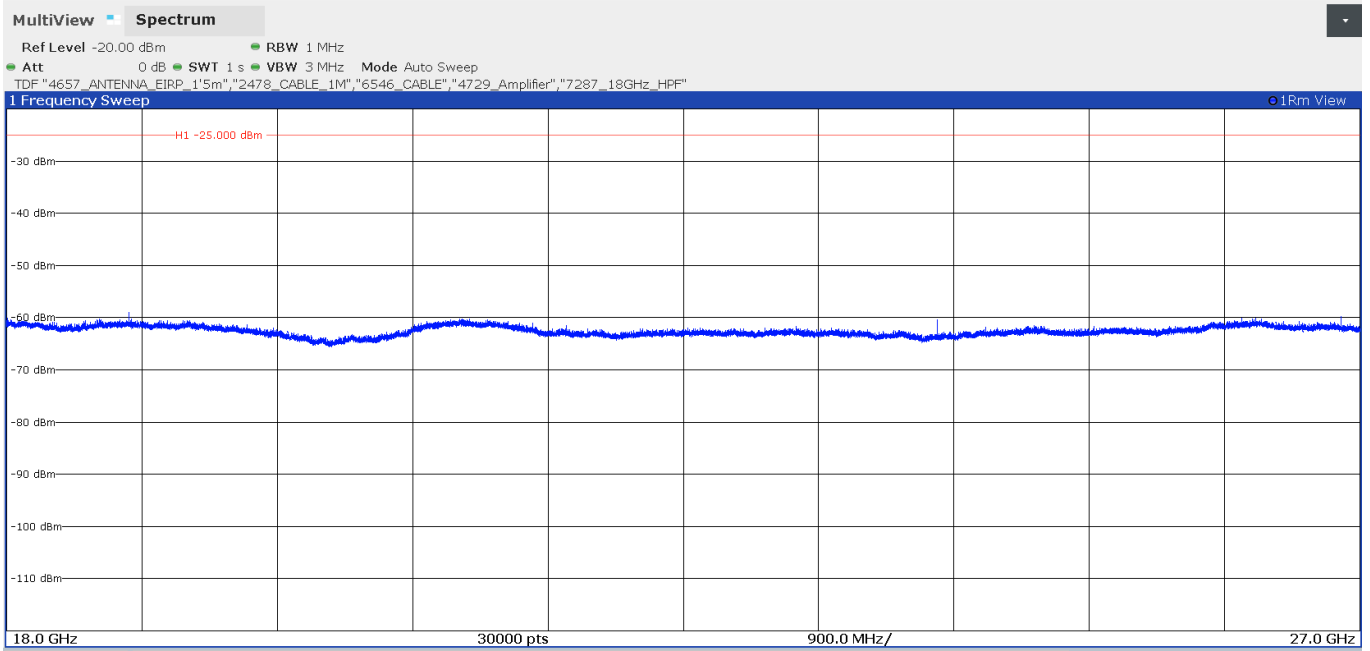
- Lowest Channel:



- Middle Channel:



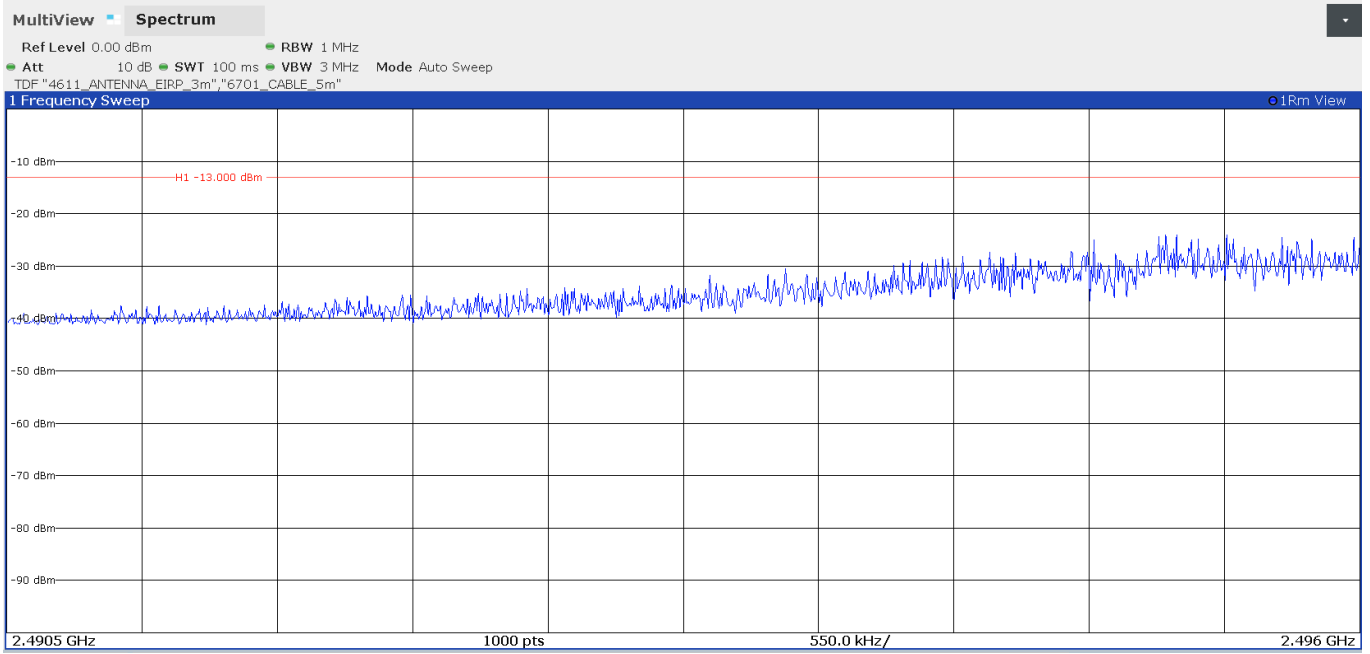
- Highest Channel:



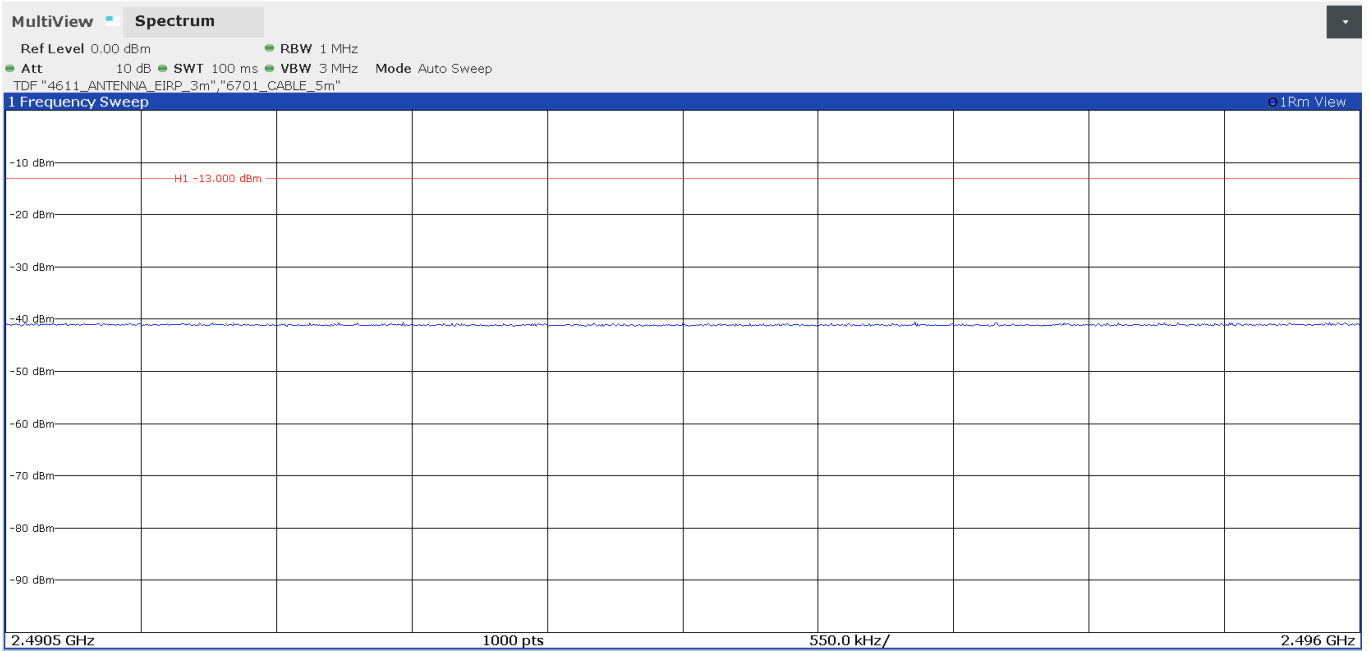
### FREQUENCY RANGE 2490.5 - 2496 MHz

### 16QAM MODULATION

- Lowest Channel:



- Middle Channel:





- Highest Channel:

