



Test report No:
NIE: 65304RRF.003

Partial Test Report

Reference Standard:

USA FCC Part 27

CANADA RSS-130, RSS-139

(*) Identification of item tested	External wireless connectivity module for ventilators
(*) Trademark	ResMed
(*) Model and /or type reference	27206 ResMed Connectivity Module
Other identification of the product	HW version: BOM 27206 SW version: SX560 FCC ID: 2ACHL-RCM4G IC: 9103A-RCM4G
(*) Features	4G, 3G
Applicant	ResMed Ltd 1 Elizabeth Macarthur Drive, Bella Vista, NSW 2153, Australia
Test method requested, standard	USA FCC Part 27 (10-1-19 Edition) CANADA RSS-139 Issue 3, Jul. 2015 CANADA RSS-130 Issue 2, Feb. 2019 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	2020-11-26
Report template No	FDT08_22 (*) "Data provided by the client"

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Competences and guarantees

DEKRA Testing and Certification S.A.U. is a testing laboratory accredited by the National Accreditation Body (ENAC -Entidad Nacional de Acreditación), to perform the tests indicated in the Certificate No. 51/LE 147.

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

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

In order to assure the traceability to other national and international laboratories, DEKRA Testing and Certification S.A.U. has a calibration and maintenance program for its measurement equipment.

DEKRA Testing and Certification S.A.U. guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Testing and Certification S.A.U. at the time of performance of the test.

DEKRA Testing and Certification S.A.U. is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document. **IMPORTANT:** No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA Testing and Certification S.A.U.

General conditions

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 S.A.U.
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 S.A.U. and the Accreditation Bodies.

Uncertainty

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

Data provided by the client

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 27206 ResMed Connectivity Module (RCM) is an external wireless connectivity module used to transmit ventilator data from patient to cloud for online patient monitoring.

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

Samples undergoing test have been selected by: The client.

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

Control N°	Description	Model	Serial N°	Date of reception
65304C/016	External wireless connectivity module	27206 ResMed Connectivity Module	22201368154	2020/09/23
65304C/029	Bracket	--	--	2020/09/23
65304C/030	AC/DC Adaptor	--	YMRC520423000425900	2020/09/23

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

Test sample description

Ports..... :	Port name and description	Cable					
		Specified max length [m]	Attached during test	Shielded	Coupled to patient ⁽³⁾		
	Micro-USB	1.8m	☐	☒	☐		
			☐	☐	☐		
			☐	☐	☐		
			☐	☐	☐		
			☐	☐	☐		
Supplementary information to the ports..... :							
Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	☒	AC: 100-240V, 0.350.70A, 50-60Hz	☒	☐	☐	☒	☐
	☐	AC:	☐	☐	☐	☐	☐
	☐	DC:					
☐	DC:						
Rated Power	<3W						
Clock frequencies.....	N/A						
Other parameters	N/A						
Software version	SX560						
Hardware version	BOM 27206						
Dimensions in cm (W x H x D)	1.73" x 5.28" x 5.91"						
Mounting position	☒	Table top equipment					
	☐	Wall/Ceiling mounted equipment					
	☐	Floor standing equipment					
	☐	Hand-held equipment					

	☐	Other:	
Modules/parts.....:	Module/parts of test item	Type	Manufacturer
	Wireless Module	ELS61-US	Thales
Accessories (not part of the test item)	Description	Type	Manufacturer
	Power Supply Unit	N/A	ResMed
Documents as provided by the applicant	Description	File name	Issue date

Copy of marking plate:

[SN] 20152234555

[REF] 27206 RCM1

[LOT] 9876548







QC Sample
 IC: 9103A-RCM4G
 FCC ID: 2ACHL-RCM4G

C^{US}
 LR76410
R_x Only IP21
MADE IN AUSTRALIA

R272-406/1

Identification of the client

ResMed Pty Ltd.

1 Elizabeth Macarthur Drive, Bella Vista, NSW 2153, Australia

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2020-09-28
Date (finish)	2020-09-29

Document history

Report number	Date	Description
65304RRF.003	2020-11-26	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: Nicolás Salguero, Cristina Calle.

Used instrumentation:

Radiated Measurements

	Last Calibration	Due Calibration
1. Semianechoic Absorber Lined Chamber ETS LINDGREN FACT 3 200 STP	N.A.	N.A.
2. Wideband Radio Communication Tester ROHDE AND SCHWARZ CMW500	2020/07	2021/07
3. EMI Test Receiver ROHDE AND SCHWARZ ESR7	2019/10	2021/10
4. Biconical/Log Antenna 30MHz-6GHz ETS LINDGREN 3142E	2020/04	2023/04
5. Signal and Spectrum Analyzer ROHDE AND SCHWARZ FSW50	2020/07	2022/07
6. RF pre-amplifier 1-18 GHz Bonn Elektronik BLMA 0118-1M	2020/05	2021/05
7. Broadband Horn antenna 1-18 GHz SCHWARZBECK MESS-ELEKTRONIK BBHA 9120 D	2019/11	2022/11

Testing verdicts

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

Summary

FCC PART 27 / RSS-130, RSS-139 PARAGRAPH		
Requirement – Test case	Verdict	Remark
FCC 27.50 / RSS-130 4.6., RSS-139 6.5.: RF output power	N/M	(1)
FCC 2.1047 / RSS-130 4.2., RSS-139 6.2.: Modulation characteristics	N/M	(1)
FCC 27.54 / RSS-130 4.3., RSS-139 6.4.: Frequency stability	N/M	(1)
FCC 2.1049: Occupied Bandwidth	N/M	(1)
FCC 27.53 / RSS-130 4.7.1., RSS-139 6.6.: Spurious emissions at antenna terminals	N/M	(1)
FCC 27.53 / RSS-130 4.7.1., RSS-139 6.6.: Radiated emissions	P	
<u>Supplementary information and remarks:</u>		
(1) Test not requested. Radiated emissions test only requested.		

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

TEST CONDITIONS	12
Radiated emissions	13

TEST CONDITIONS

POWER SUPPLY (V):

Vn: 110 Vac

Type of Power Supply: AC/DC Adaptor.

ANTENNA:

LOW Band		ANTENNA TYPE
LTE Band 12	+1.71 dBi	LTE Ceramic SMT Antenna

HIGH Bands		ANTENNA TYPE
3G Band IV	+3.03 dBi	LTE Ceramic SMT Antenna
LTE Band 4	+3.03 dBi	LTE Ceramic SMT Antenna

TEST FREQUENCIES:

3G Band IV. WCDMA and HSUPA modulations:

Low Channel (1312):	1712.4 MHz
Middle Channel (1762):	1732.5 MHz
High Channel (1513):	1752.6 MHz

LTE Band 4. QPSK and 16QAM modulations:

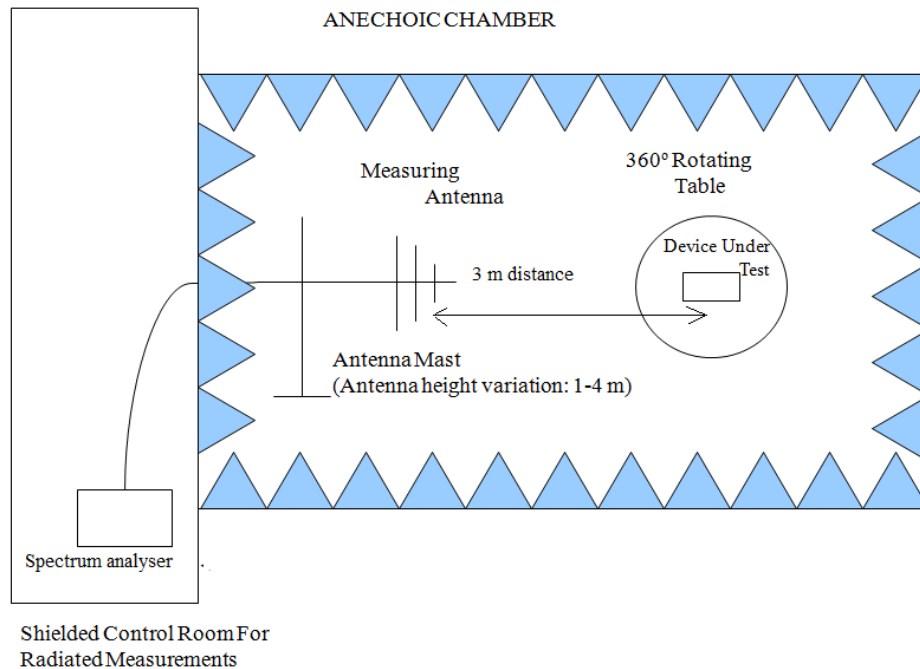
	Channel (Frequency)					
	BW = 1.4 MHz	BW = 3 MHz	BW = 5 MHz	BW = 10 MHz	BW = 15 MHz	BW = 20 MHz
Low	19957 (1710.7 MHz)	19965 (1711.5 MHz)	19975 (1712.5 MHz)	20000 (1715.0 MHz)	20025 (1717.5 MHz)	20050 (1720.0 MHz)
Middle	20175 (1732.5 MHz)	20175 (1732.5 MHz)	20175 (1732.5 MHz)	20175 (1732.5 MHz)	20175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

LTE Band 12. QPSK and 16QAM modulations:

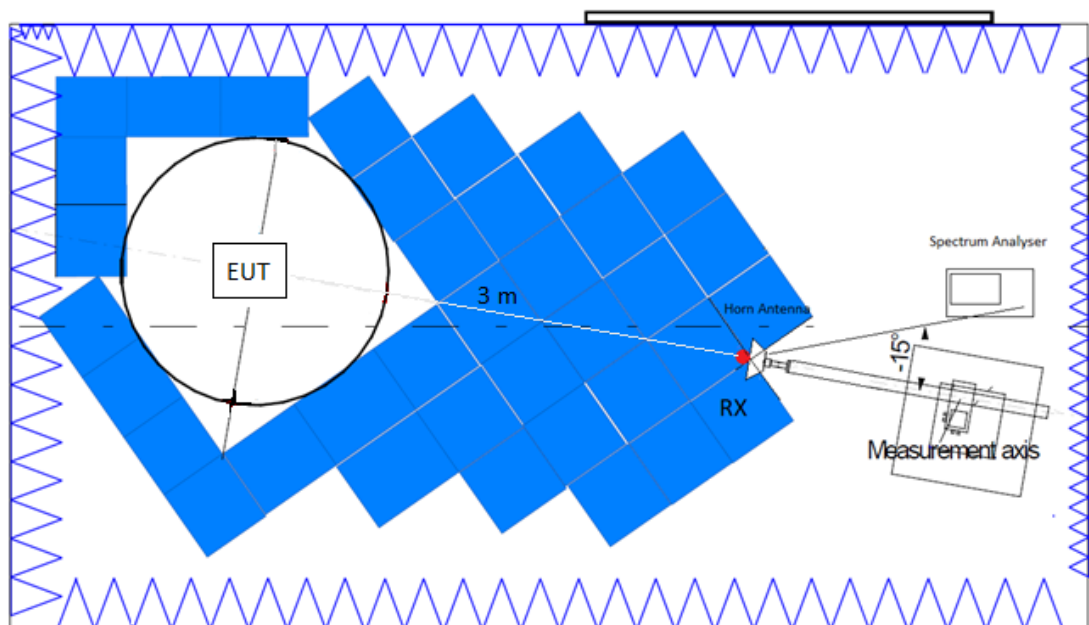
	Channel (Frequency)			
	BW = 1.4 MHz	BW = 3 MHz	BW = 5 MHz	BW = 10 MHz
Low	23017 (699.7 MHz)	23025 (700.5 MHz)	23035 (701.5 MHz)	23060 (704.0 MHz)
Middle	23095 (707.5 MHz)	23095 (707.5 MHz)	23095 (707.5 MHz)	23095 (707.5 MHz)
High	23173 (715.3 MHz)	23165 (714.5 MHz)	23155 (713.5 MHz)	23130 (711.0 MHz)

TEST SETUP:

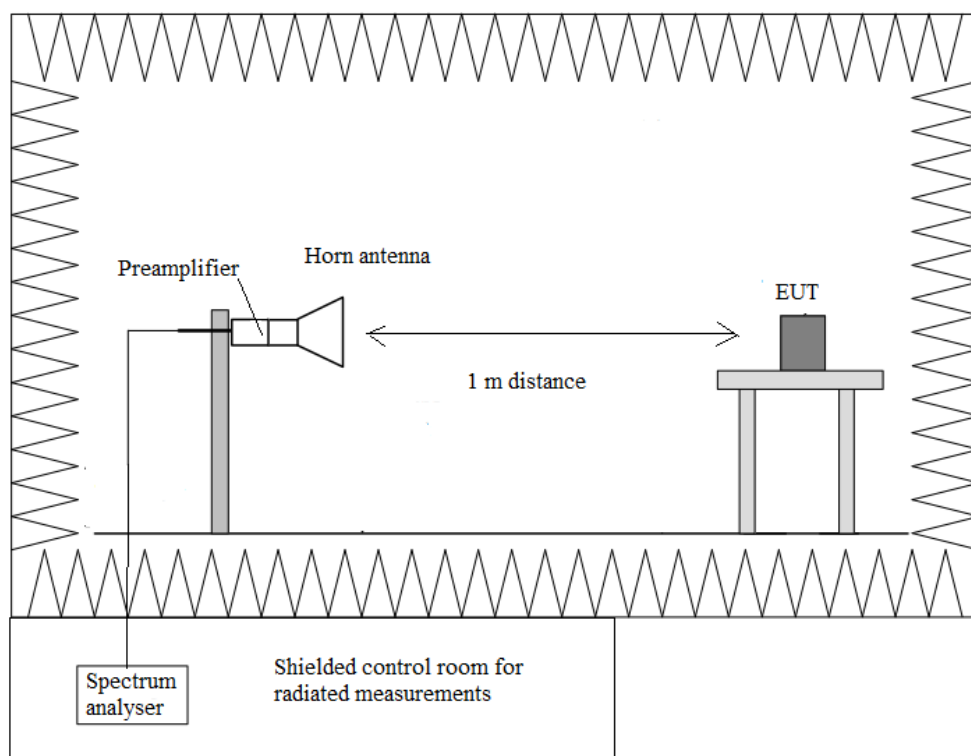
Radiated measurements setup from 30 MHz to 1 GHz:



Radiated measurements setup from 1 GHz to 18 GHz:



Radiated measurements setup $f > 18$ GHz:



Radiated emissions

SPECIFICATION:

LTE Band 4 and 3G Band IV. 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:

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

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

FCC §27.53 (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 Clause 4.7.1:

The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), 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 of the equipment's frequency block 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:

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

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 High 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 below 1 GHz up to 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.

Each detected emission at less than 20 dB respect to the limit is substituted by the Substitution method in accordance with the ANSI/TIA-603-E: 2016.

RESULTS:

3G Band IV:

WCDMA and HSUPA Modulations:

A preliminary scan determined the WCDMA modulation as the worst case.
The following tables and plots show the results for the worst case.

- Low Channel:

Frequency range 30 MHz - 1 GHz:

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

Frequency range 1 - 18 GHz:

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

- Middle Channel:

Frequency range 30 MHz - 1 GHz:

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

Frequency range 1 - 18 GHz:

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

- High Channel:

Frequency range 30 MHz - 1 GHz:

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

Frequency range 1 - 18 GHz:

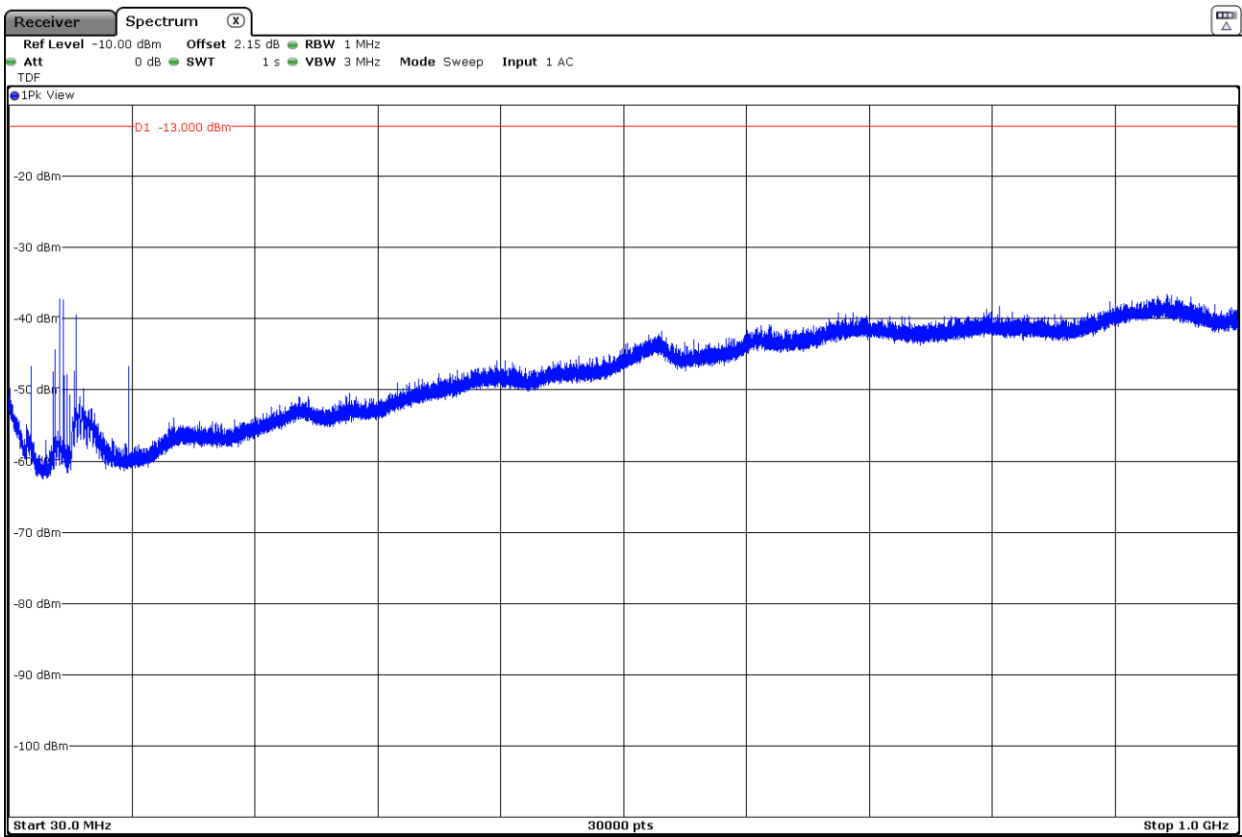
No spurious frequencies detected at less than 20 dB below the limit.

Measurement uncertainty (dB)	<± 4.99 for f < 1 GHz <± 4.98 for f ≥ 1 GHz up to 17 GHz <± 5.08 for f ≥ 17 GHz up to 18 GHz
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Verdict: PASS

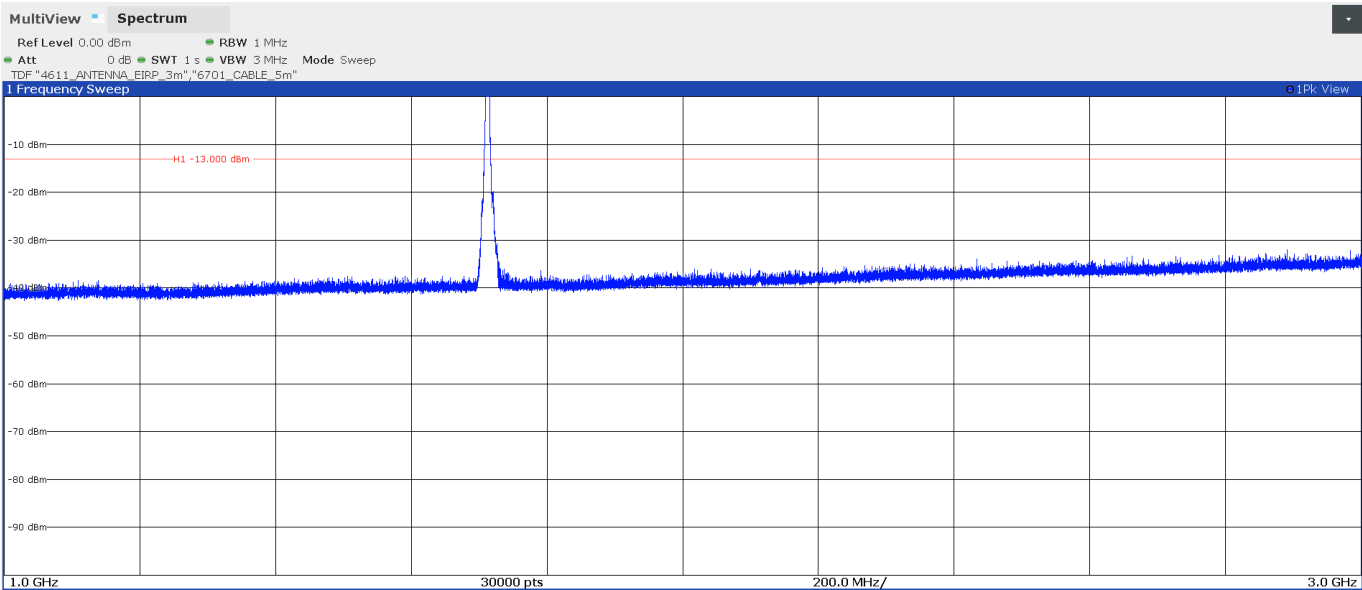
FREQUENCY RANGE 30 MHz - 1 GHz (worst mode):

This plot is valid for the Low, Middle and High Channels:



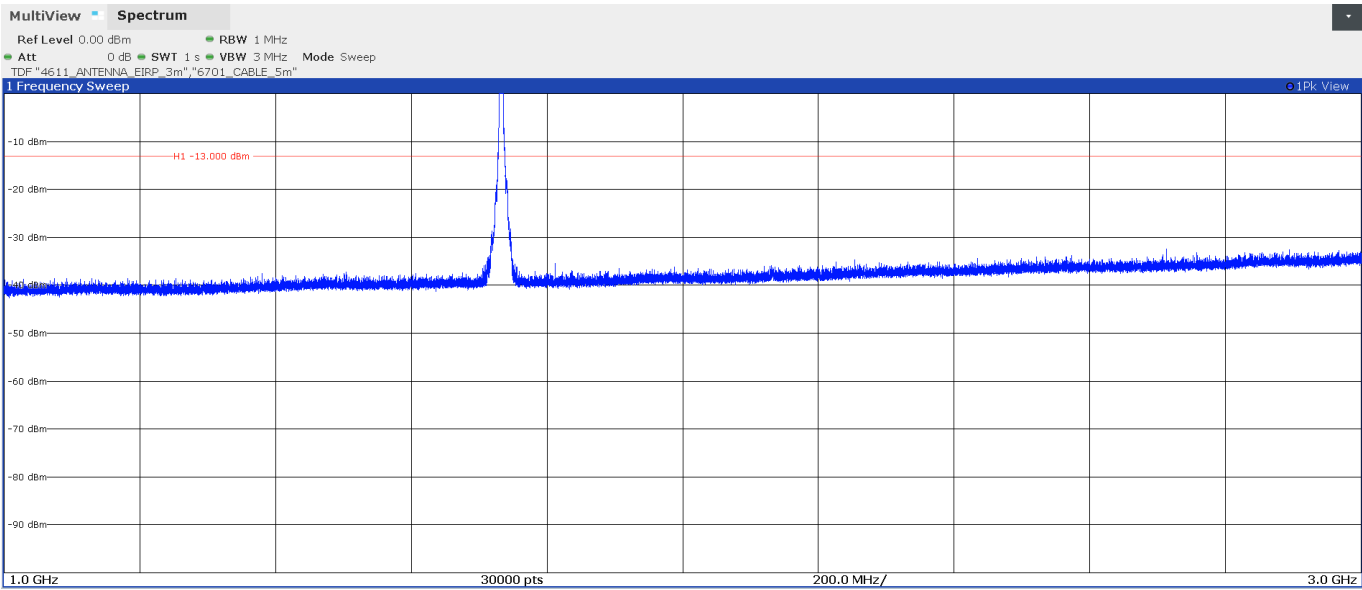
FREQUENCY RANGE 1 - 3 GHz (worst mode):

- Low Channel:



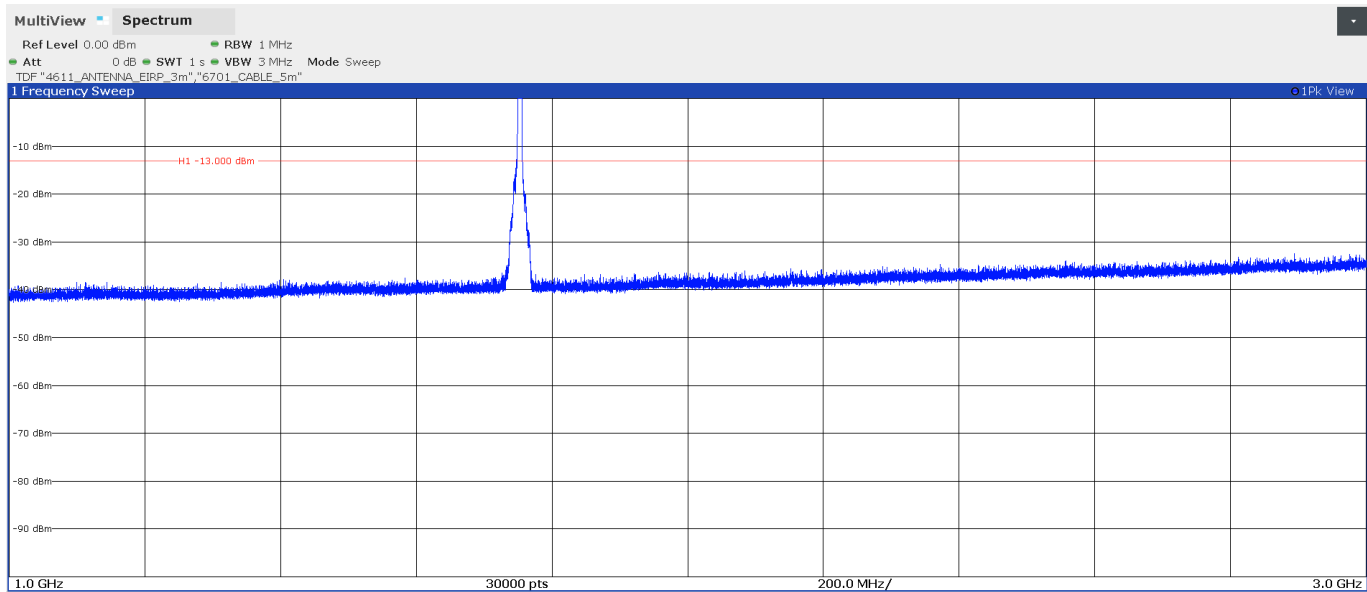
The peak above the limit is the carrier frequency.

- Middle Channel:



The peak above the limit is the carrier frequency

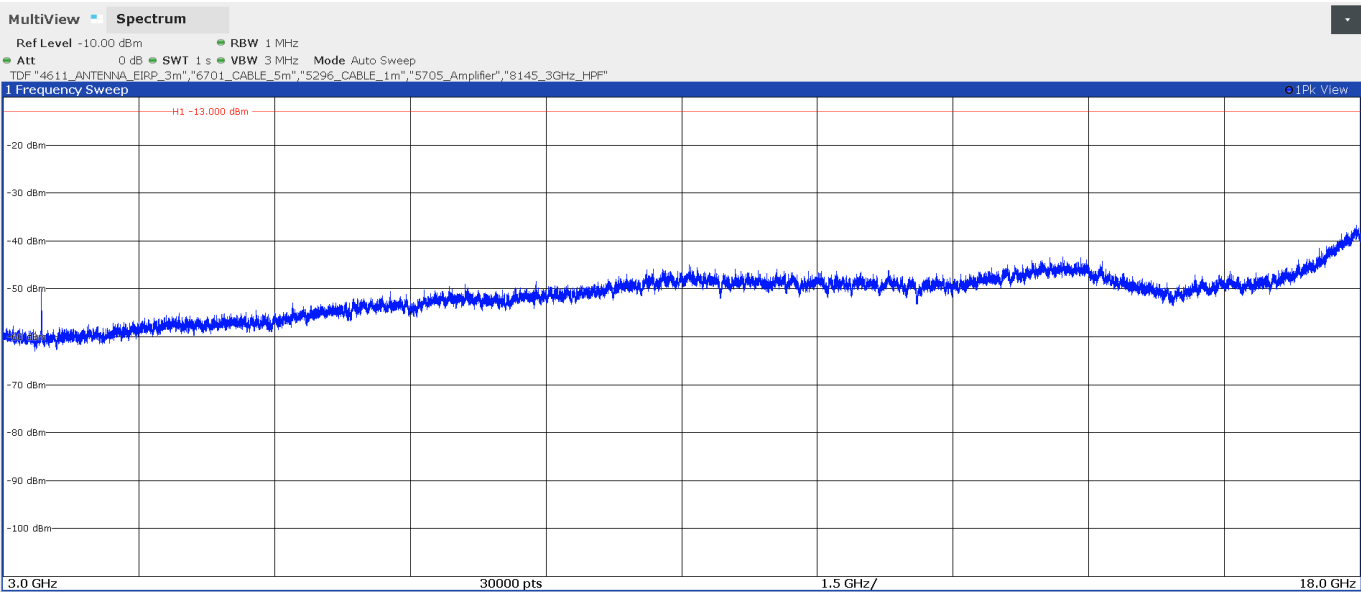
- High Channel:



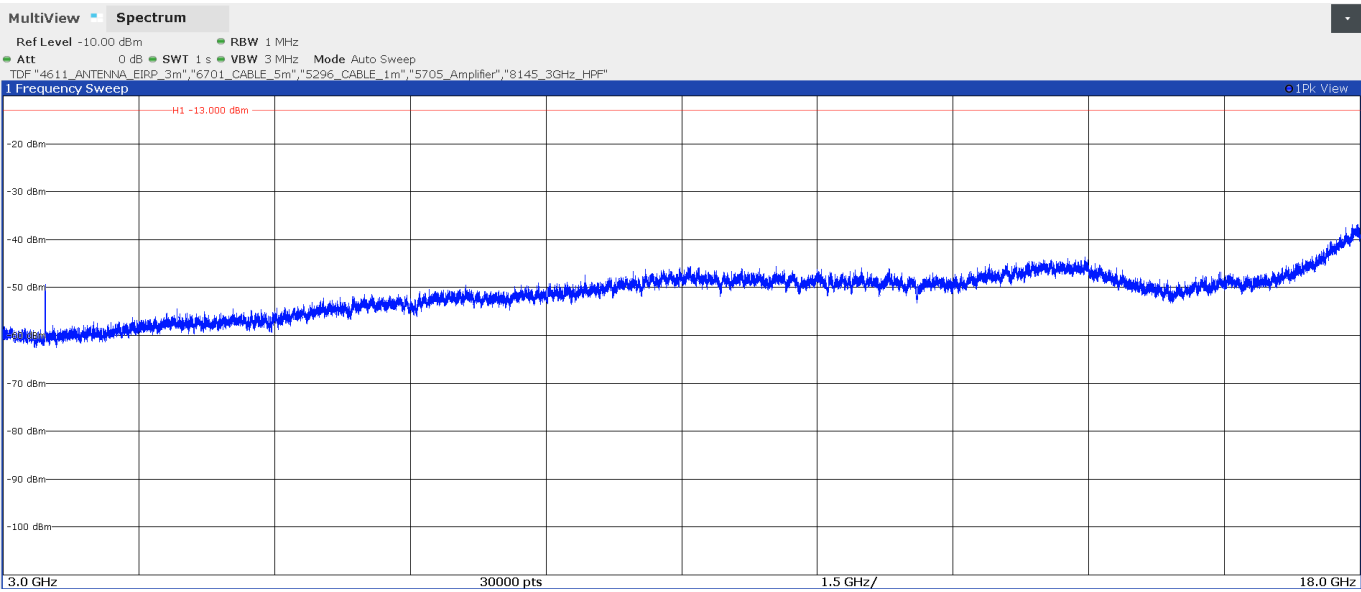
The peak above the limit is the carrier frequency

FREQUENCY RANGE 3 - 18 GHz (worst mode):

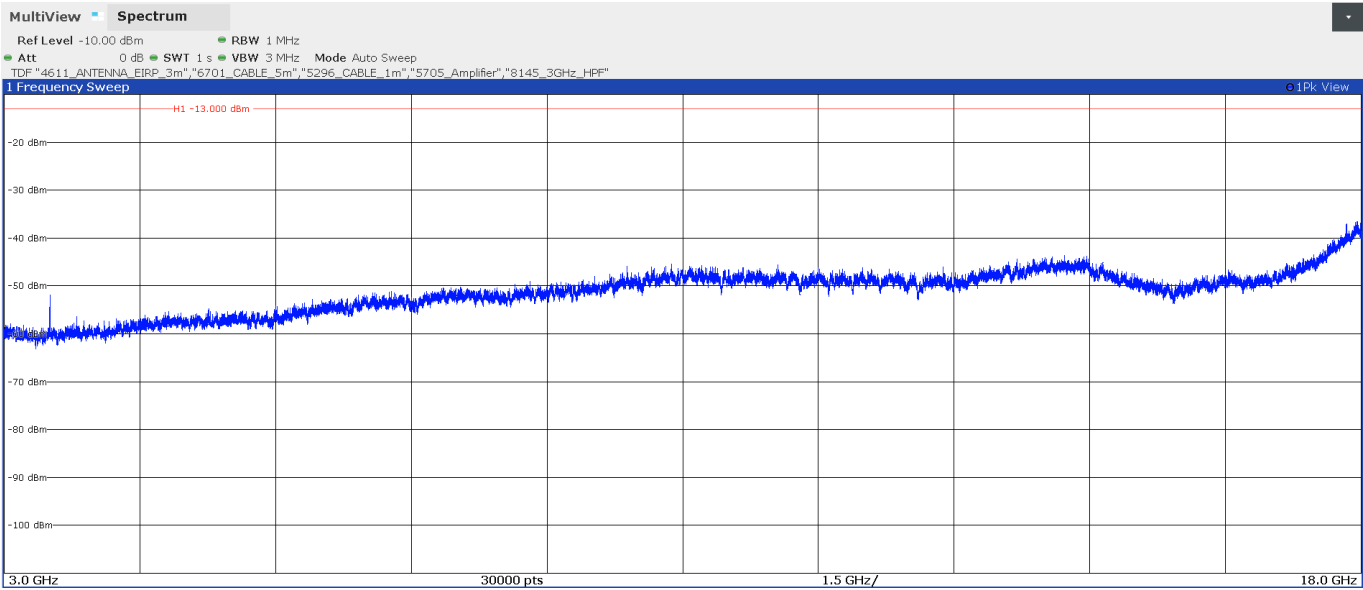
- Low Channel:



- Middle Channel:



- High Channel:



LTE Band 4:

QPSK and 16QAM Modulations:

A preliminary scan determined the QPSK modulation, BW=15 MHz, RB=1, Offset=0 as the worst case.

- Low Channel:

Frequency range 30 MHz - 1 GHz:

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

Frequency range 1 - 18 GHz:

Spurious frequencies at less than 20 dB below the limit:

Spurious frequency (GHz)	E.I.R.P (dBm)	Polarization	Detector	Measurement Uncertainty (dB)
1.7021	-30.53	H	RMS	<± 4.98
1.7059	-23.05	H	RMS	<± 4.98

- Middle Channel:

Frequency range 30 MHz - 1 GHz:

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

Frequency range 1 - 18 GHz:

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

- High Channel:

Frequency range 30 MHz - 1 GHz:

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

Frequency range 1 - 18 GHz:

Spurious frequencies at less than 20 dB below the limit:

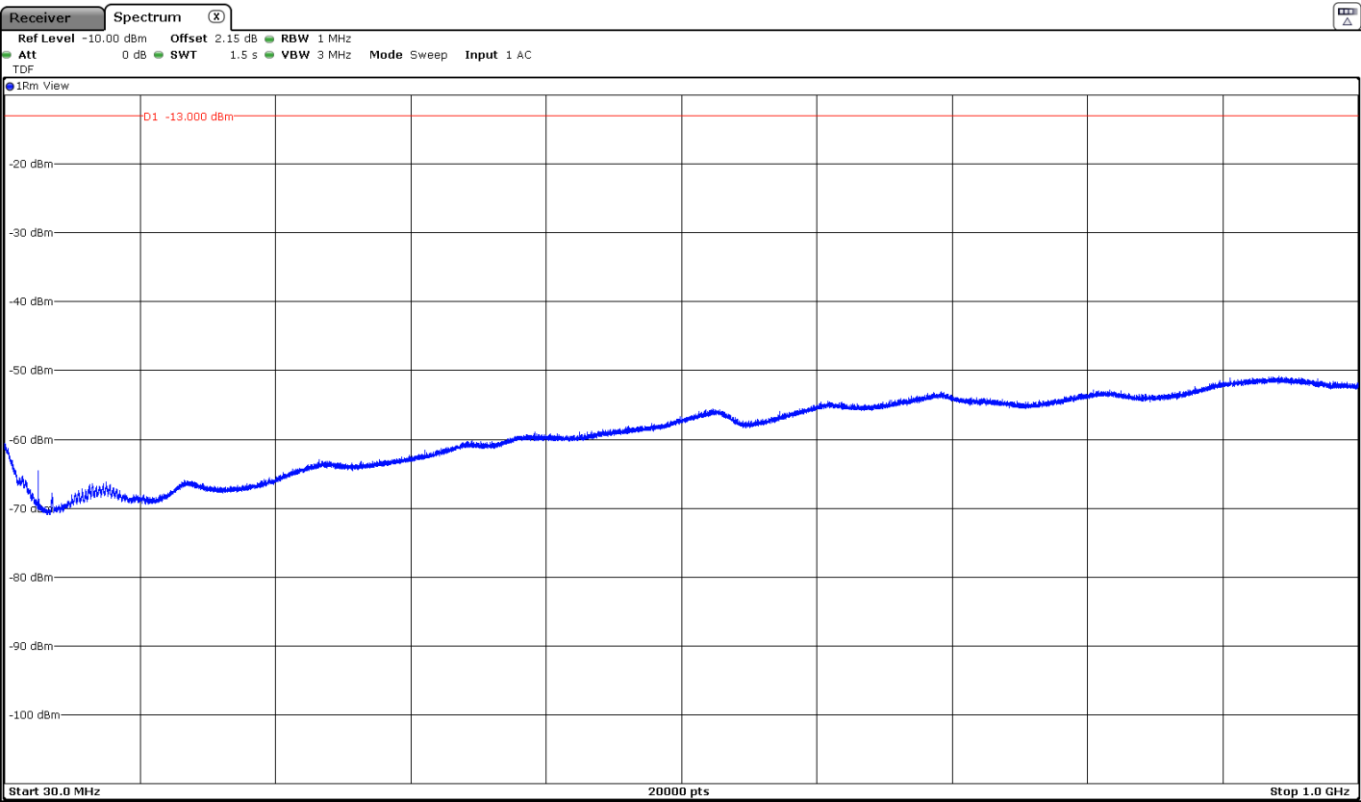
Spurious frequency (GHz)	E.I.R.P (dBm)	Polarization	Detector	Measurement Uncertainty (dB)
1.7677	-25.81	H	RMS	<± 4.98

Measurement uncertainty (dB)	<± 4.99 for f < 1 GHz <± 4.98 for f ≥ 1 GHz up to 17 GHz <± 5.08 for f ≥ 17 GHz up to 18 GHz
------------------------------	--

Verdict: PASS

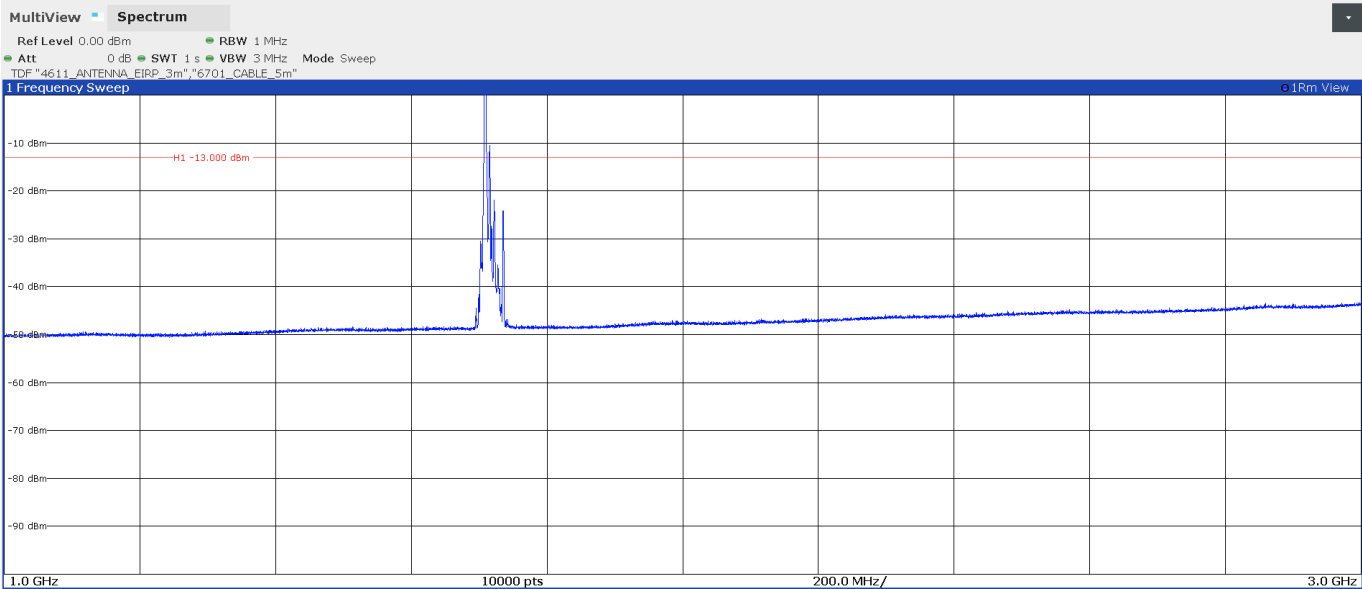
FREQUENCY RANGE 30 MHz - 1 GHz (worst mode):

This plot is valid for the Low, Middle and High Channels:



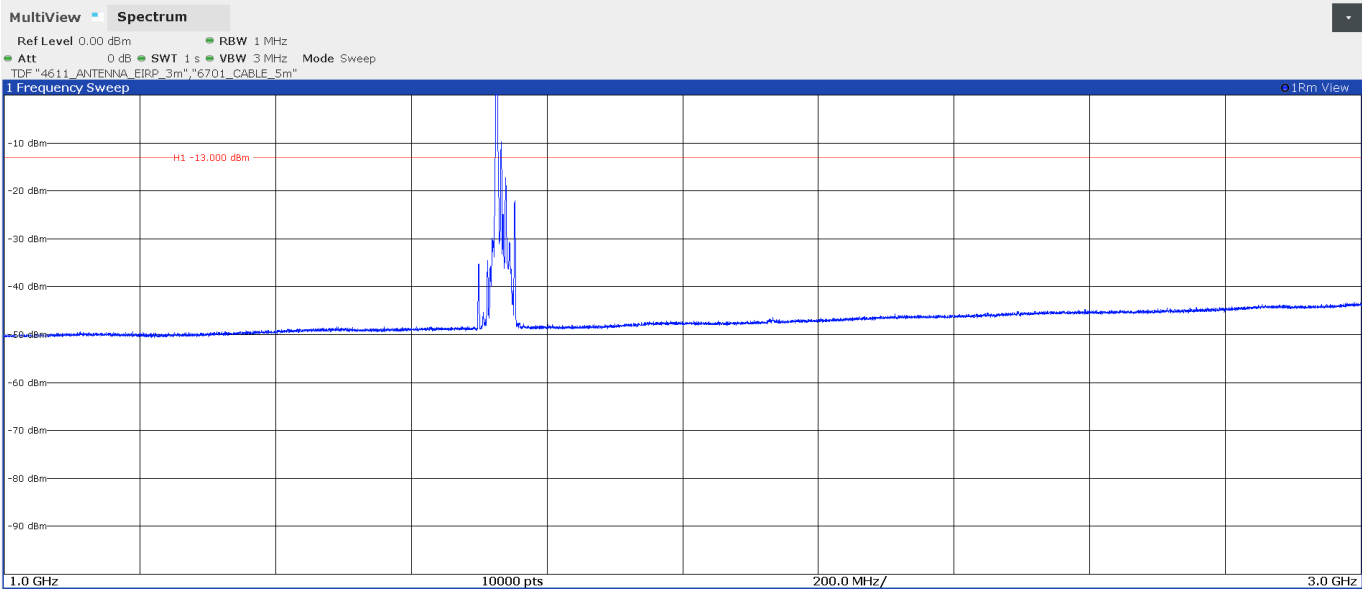
FREQUENCY RANGE 1 - 3 GHz (worst mode):

- Low Channel:



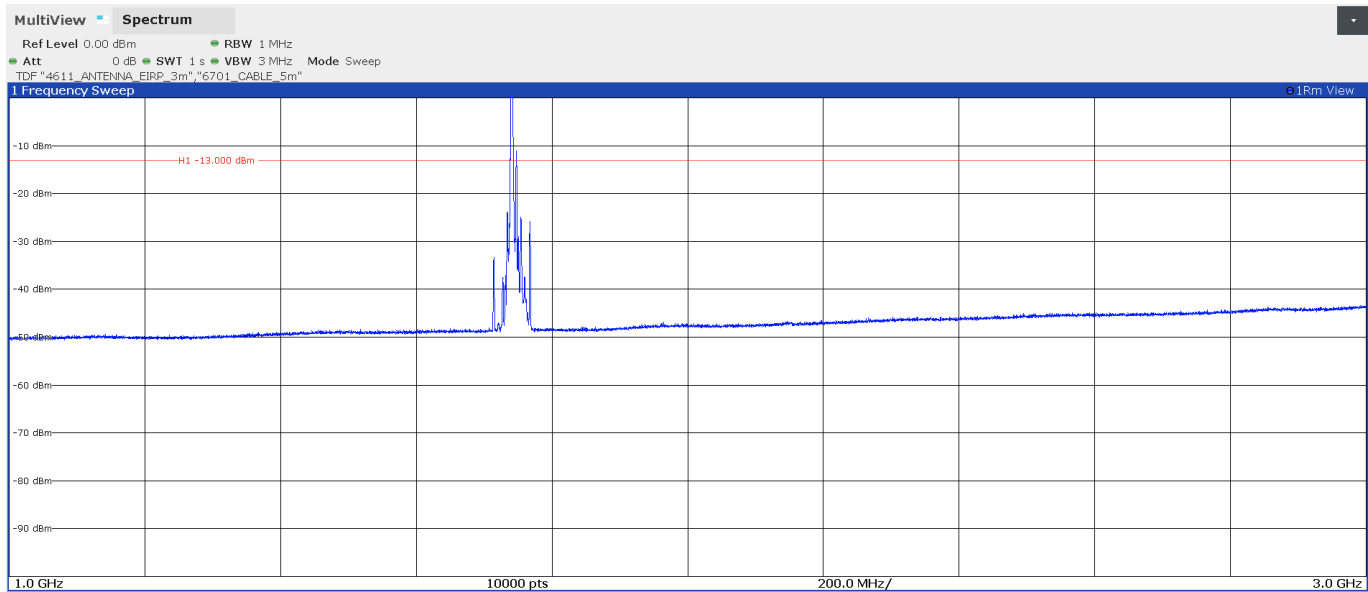
The peak above the limit is the carrier frequency:

- Middle Channel:



The peak above the limit is the carrier frequency:

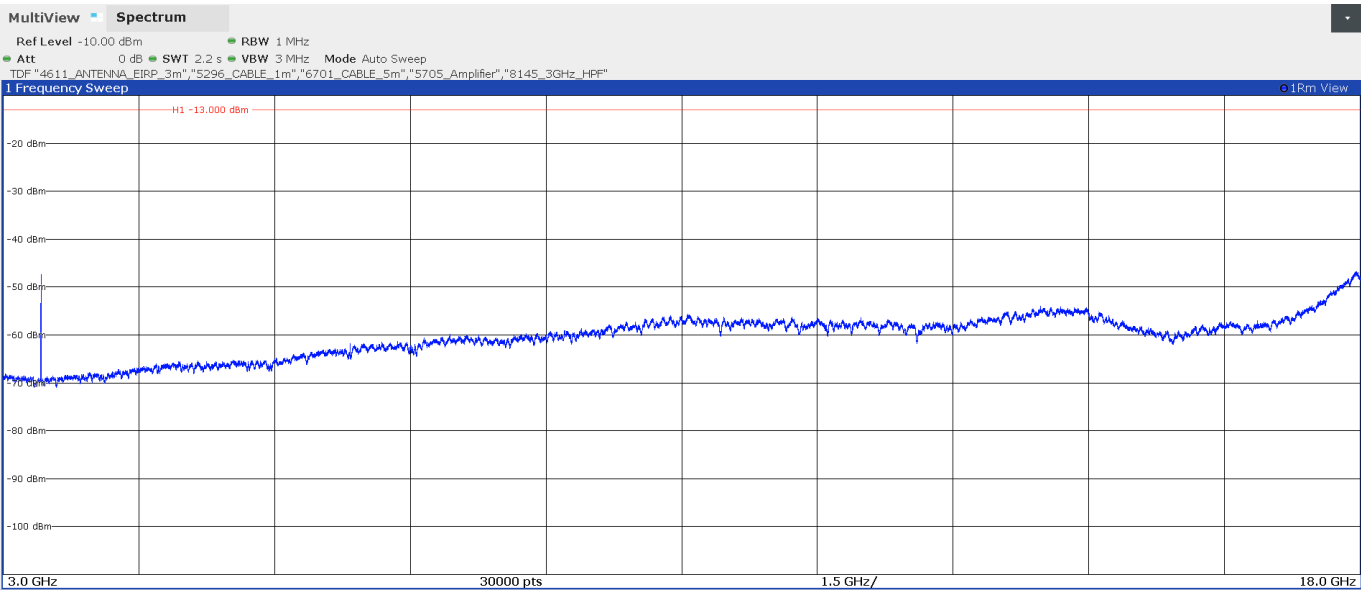
- High Channel:



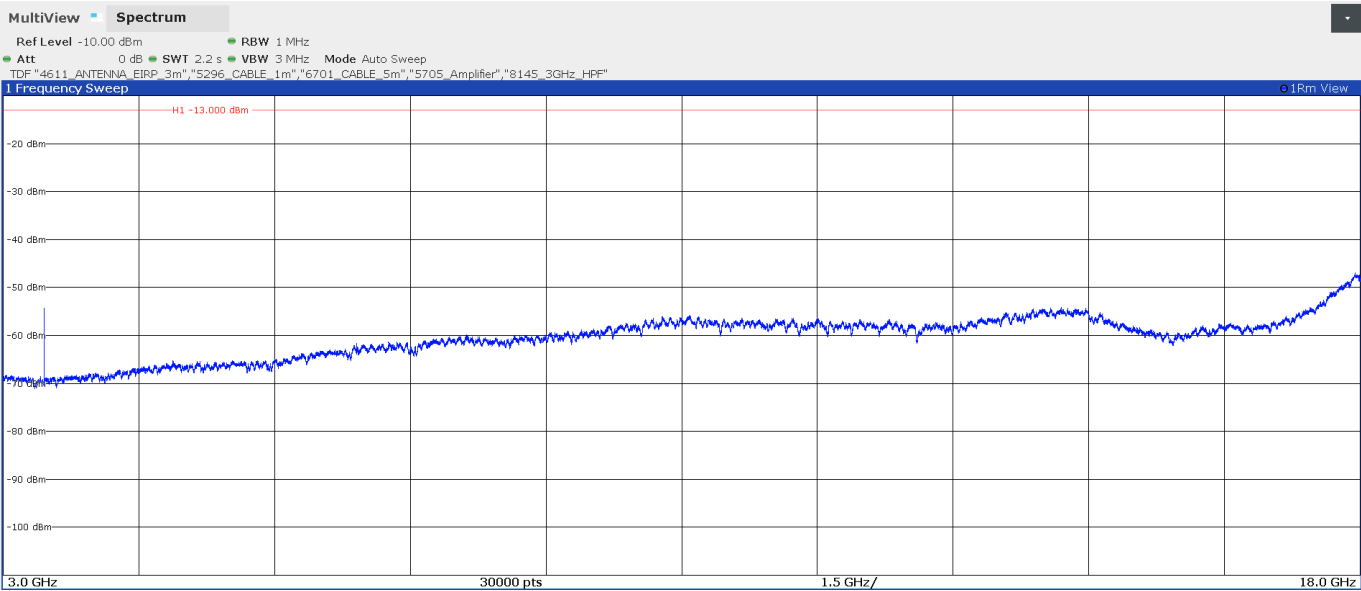
The peak above the limit is the carrier frequency:

FREQUENCY RANGE 3 – 18 GHz (worst mode):

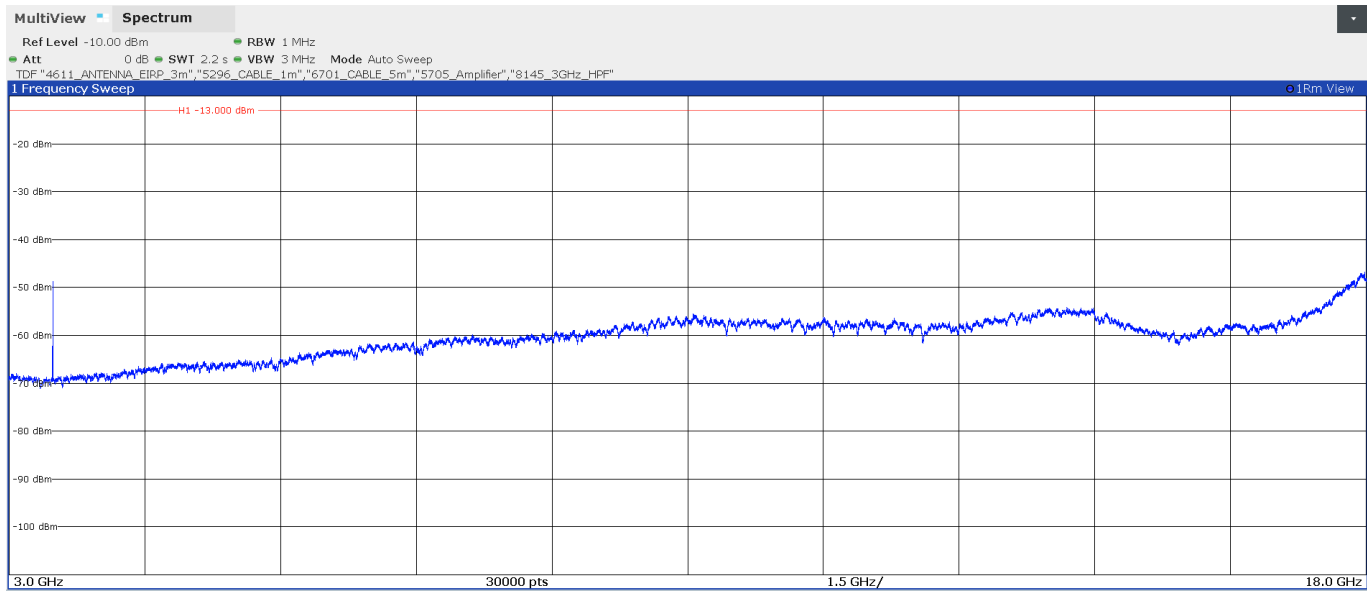
- Low Channel:



- Middle Channel:



- High Channel:



LTE Band 12:

QPSK and 16QAM Modulations:

A preliminary scan determined the QPSK modulation, BW=1.4 MHz, RB=1, Offset=0 as the worst case.

- Low 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.

- High Channel:

Frequency range 30 MHz - 1 GHz:

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

Frequency range 1 – 8 GHz:

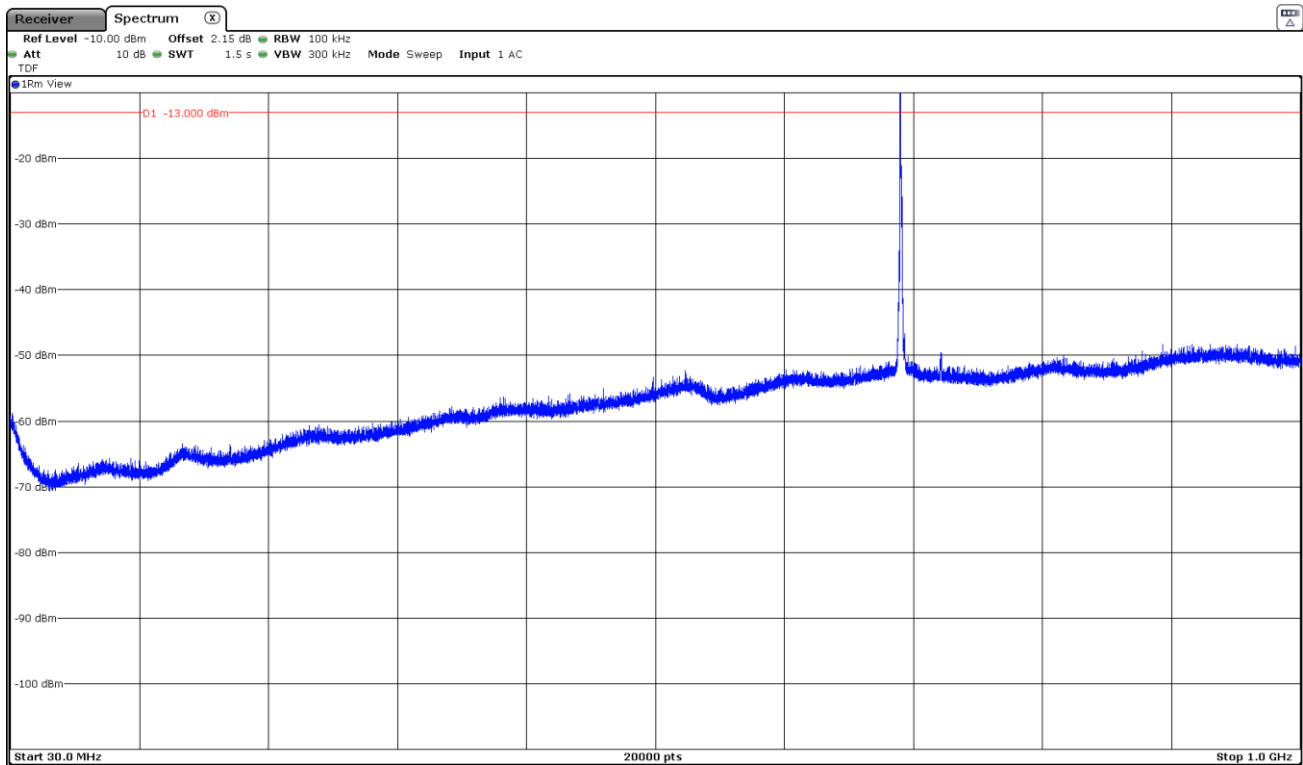
No spurious frequencies at less than 20 dB below the limit.

Measurement uncertainty (dB)	<± 4.99 for f < 1 GHz <± 4.98 for f ≥ 1 GHz up to 8 GHz
------------------------------	--

Verdict: PASS

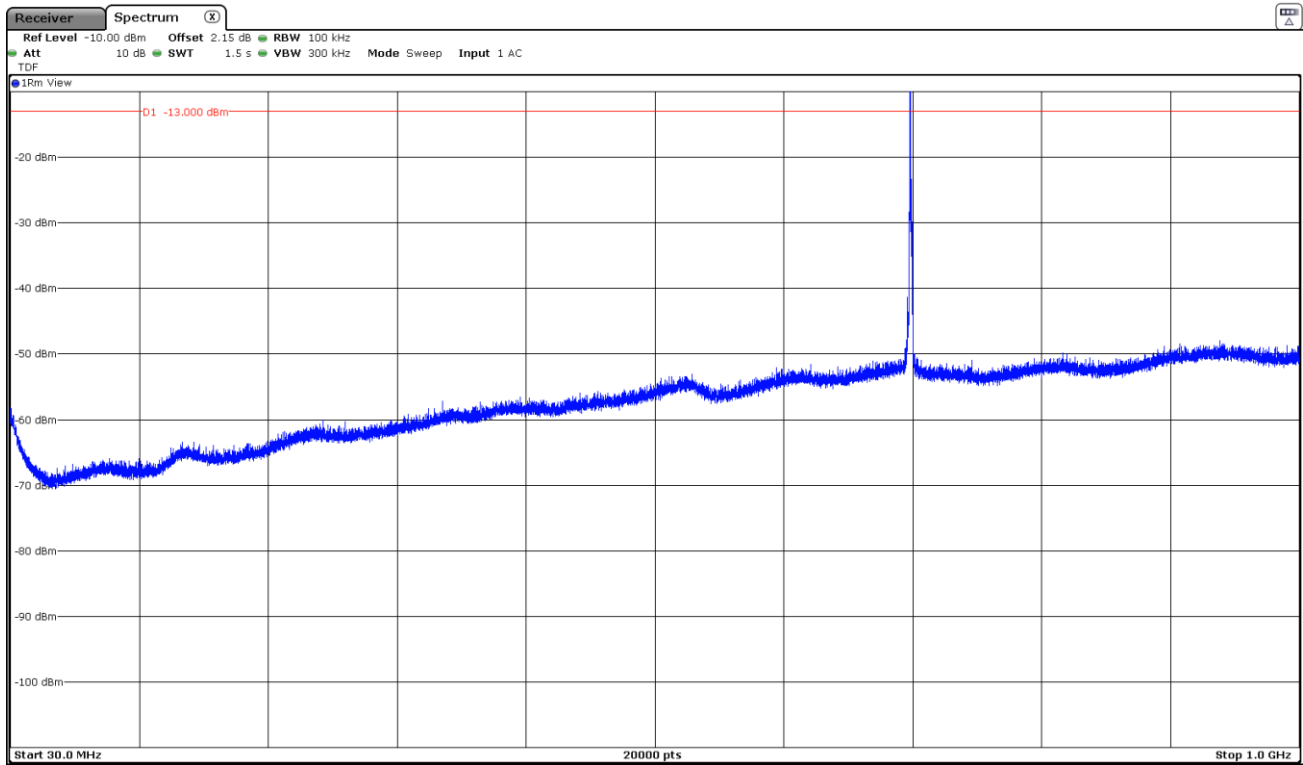
FREQUENCY RANGE 30 MHz - 1 GHz (worst mode):

- Low Channel:



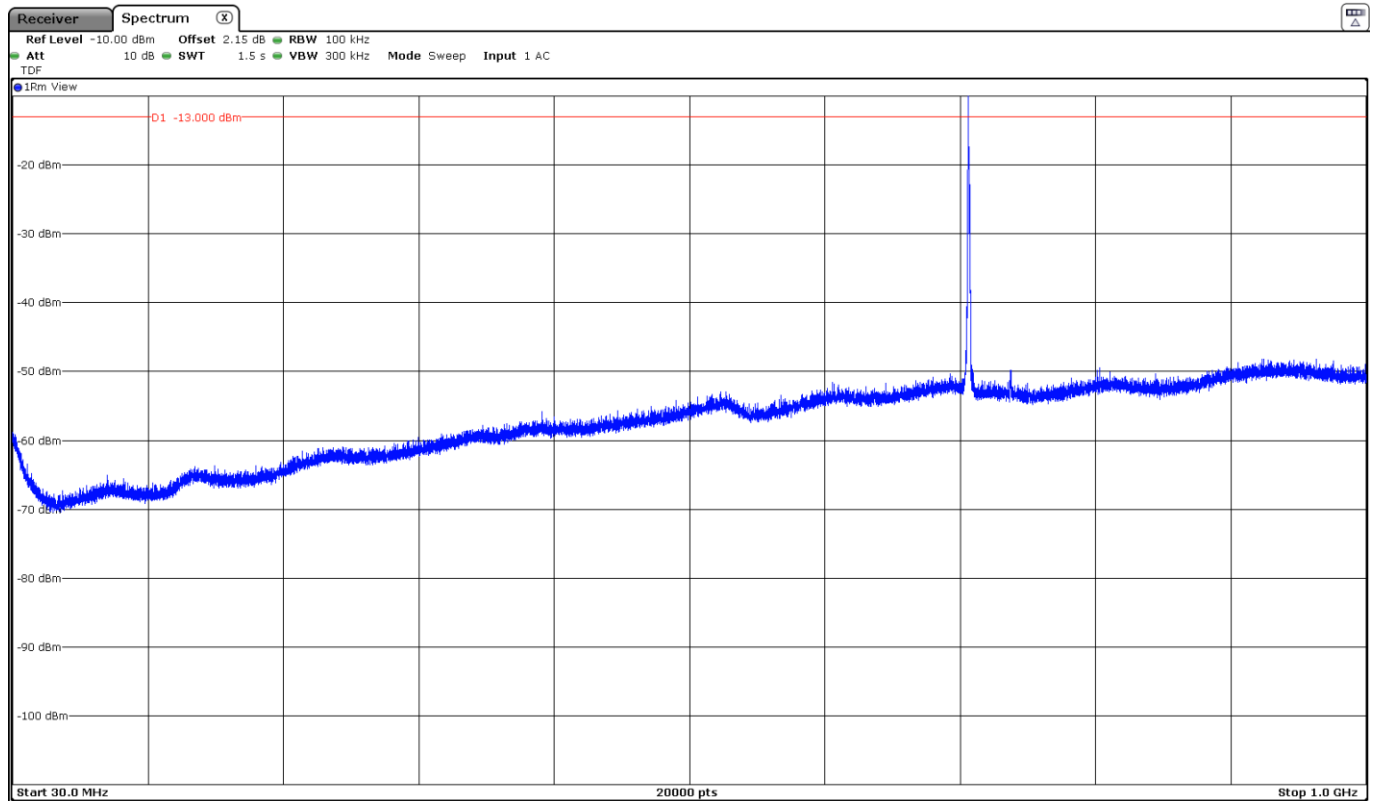
The peak above the limit is the carrier frequency.
The peak at 729.7 MHz corresponds to the downlink signal.

- Middle Channel:



The peak above the limit is the carrier frequency.
The peak at 737.5 MHz corresponds to the downlink signal.

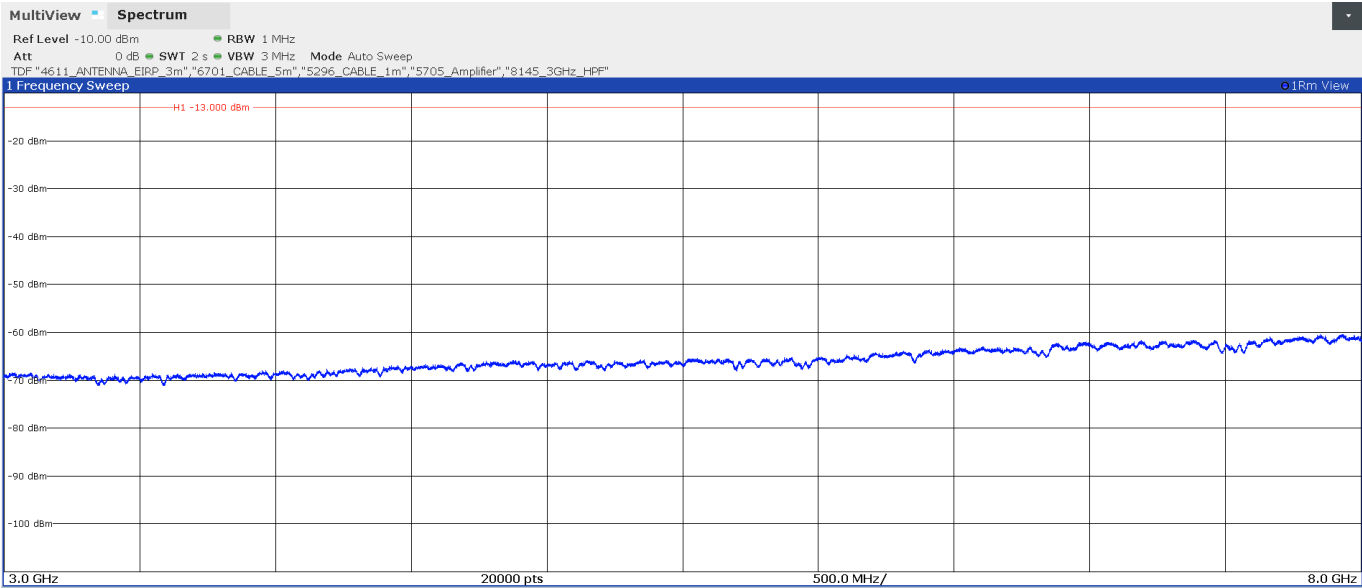
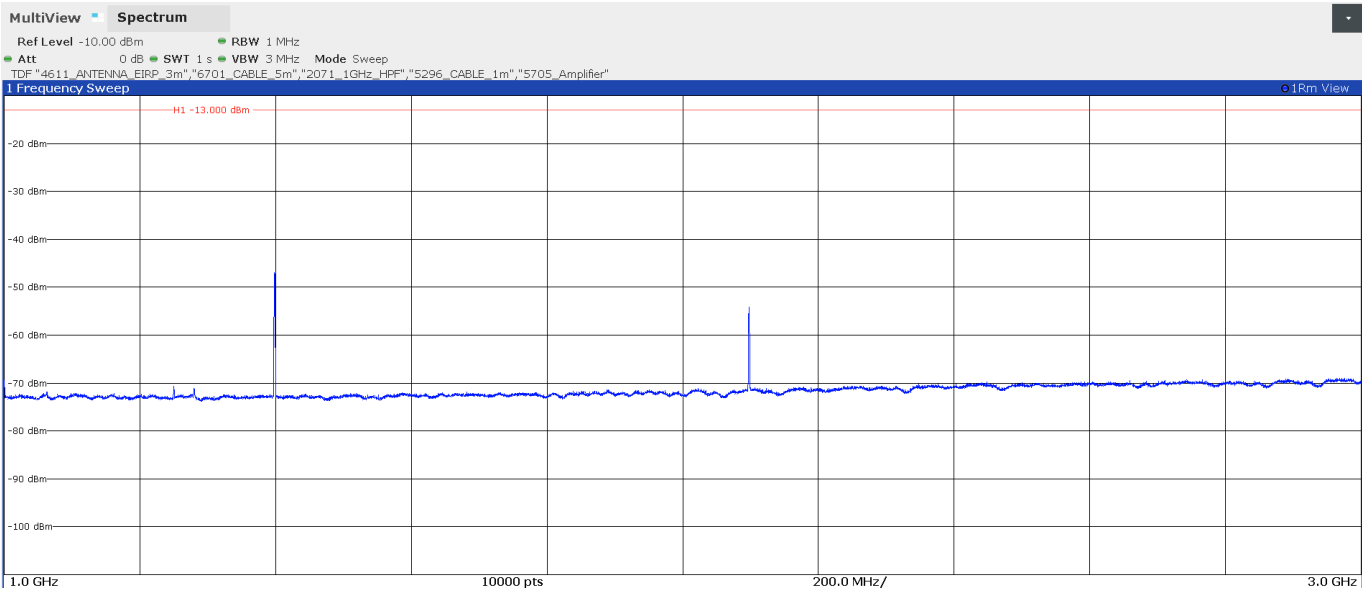
- High Channel:



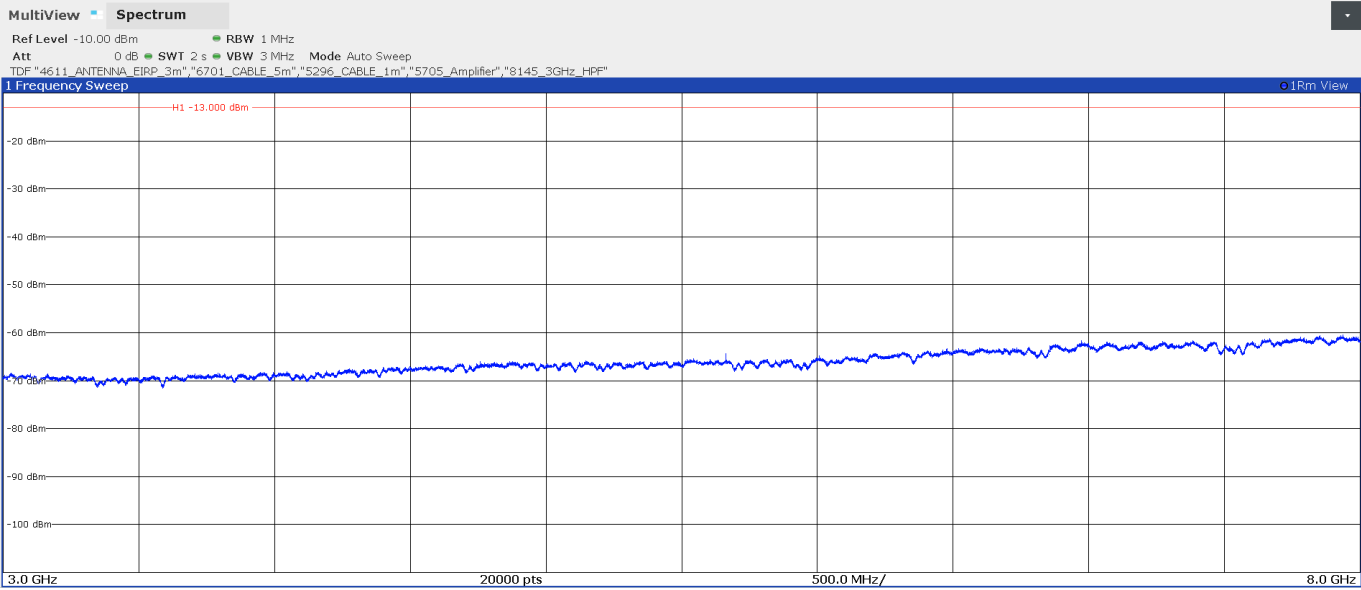
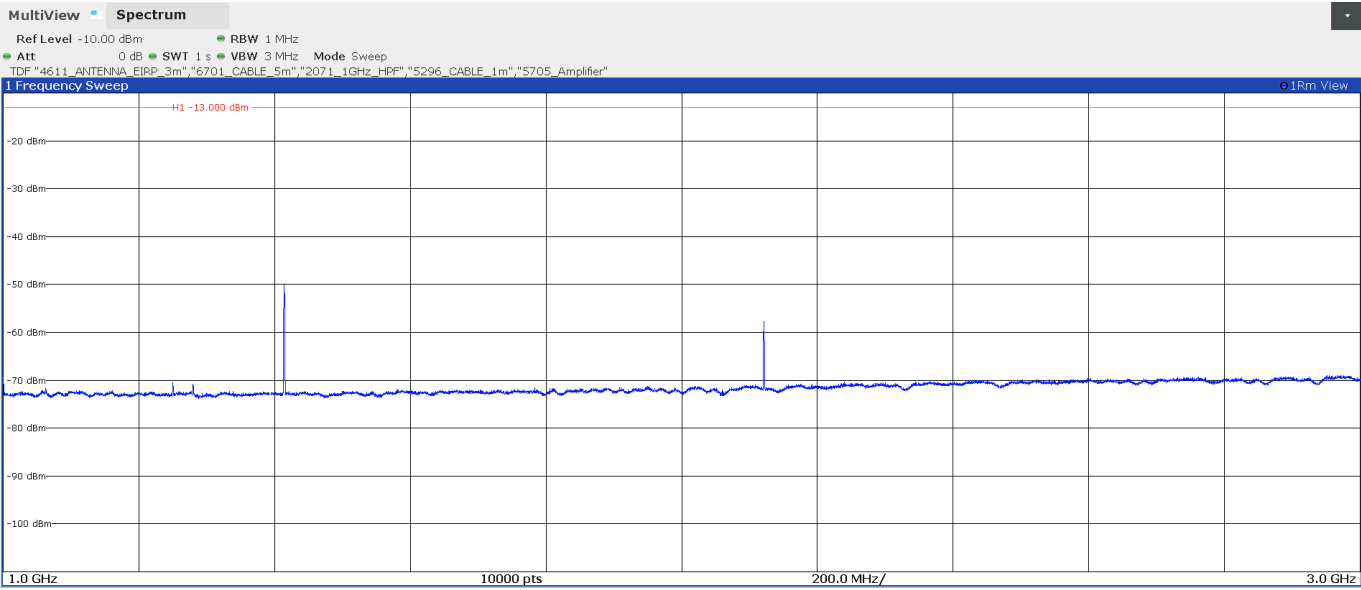
The peak above the limit is the carrier frequency.
 The peak at 745.3 MHz corresponds to the downlink signal.

FREQUENCY RANGE 1 - 8 GHz (worst mode):

- Low Channel:



- Middle Channel:



- High Channel:

