



Test report No:
NIE: 65304RRF.001

Partial Test Report

Reference Standard:
USA FCC Part 22
CANADA RSS-132

(*) 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 22 (10-1-19 Edition). CANADA RSS-132 Issue 3, Jan. 2013. 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

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General conditions

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2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
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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:



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.001	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: Cristina Calle, Nicolás Salguero.

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 22 / RSS-132 PARAGRAPH		
Requirement – Test case	Verdict	Remark
FCC 22.913 / RSS-132 5.4: RF output power	N/M	(1)
FCC 2.1047 / RSS-132 5.2: Modulation characteristics	N/M	(1)
FCC 22.355 / RSS-132 5.3: Frequency stability	N/M	(1)
FCC 2.1049: Occupied Bandwidth	N/M	(1)
FCC 22.917 / RSS-132 5.5: Spurious emissions at antenna terminals	N/M	(1)
FCC 22.917 / RSS-132 5.5: Radiated emissions	P	
<u>Supplementary information and remarks:</u>		
(1) Test not requested. Radiated emissions test only requested.		

Appendix A: Test results for FCC 22 / RSS-132

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TEST CONDITIONS

POWER SUPPLY (V):

Vn: 110 Vac

Type of Power Supply: AC Voltage

ANTENNA:

LOW Bands	GAIN	ANTENNA TYPE
3G Band V	+1.71 dBi	LTE Ceramic SMT Antenna
LTE Band 5	+1.71 dBi	LTE Ceramic SMT Antenna

TEST FREQUENCIES:

3G Band V:

WCDMA and HSUPA Modulations:

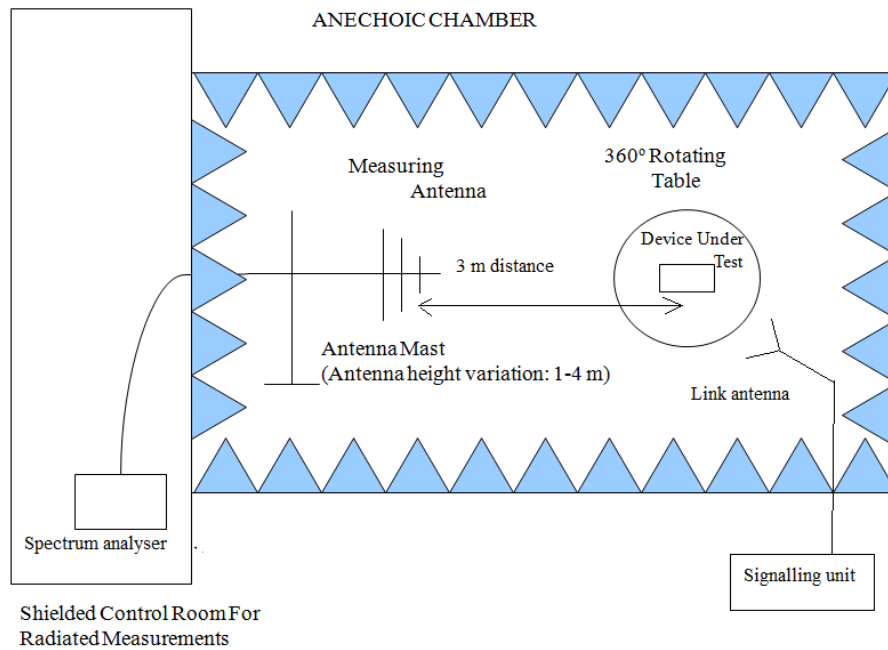
Low Channel (4132): 826.4 MHz
Middle Channel (4182): 836.4 MHz
High Channel (4233): 846.6 MHz

LTE Band 5. QPSK and 16QAM Modulations:

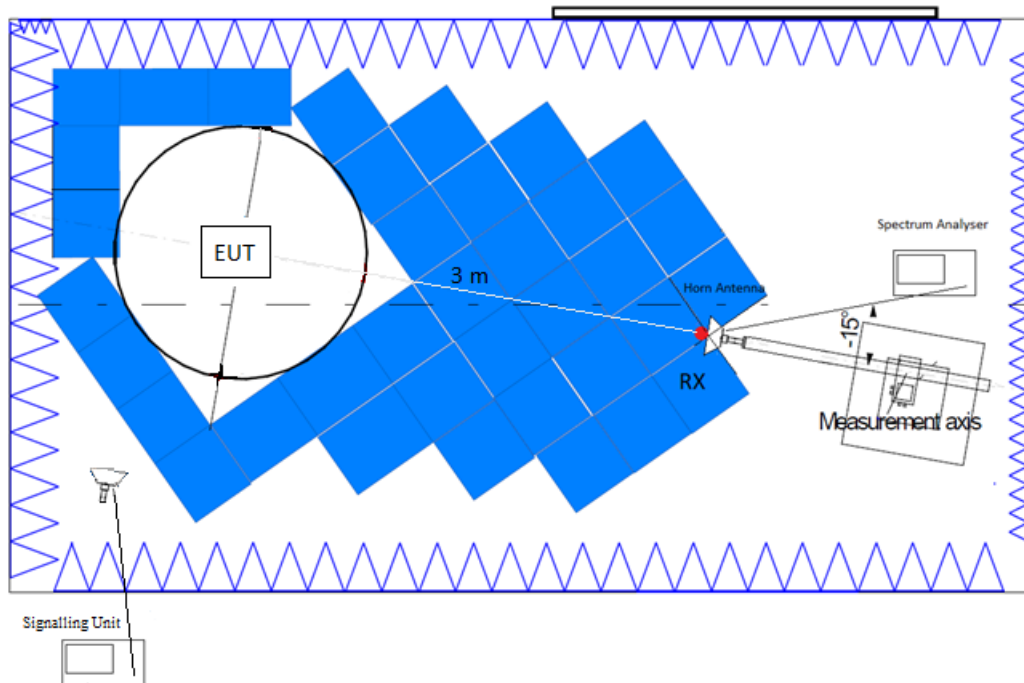
	Channel (Frequency, MHz)			
	BW = 1.4 MHz	BW = 3 MHz	BW=5 MHz	BW=10 MHz
Lowest	20407 (824.70)	20415 (825.50)	20425 (826.50)	20450 (829.00)
Middle	20525 (836.50)	20525 (836.50)	20525 (836.50)	20525 (836.50)
Highest	20643 (848.30)	20635 (847.50)	20625 (846.50)	20600 (844.00)

TEST SETUP:

Radiated measurements below 1 GHz:



Radiated measurements above 1 GHz and up to 10 GHz:



Radiated emissions

SPECIFICATION:

FCC §22.917:

RSS-132. Clause 5.5:

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.

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 1 meter high non-conductive stand at a 3 meter distance from the measuring antenna. Detected emissions were maximized at each frequency by rotating the EUT and adjusting the measuring antenna height and polarization. The maximum field strength (dBμV/m) is measured and 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:

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

RESULTS:

3G Band V:

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 modulation.

- LOW CHANNEL:

Frequency range 30 MHz - 1 GHz

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

Frequency range 1 - 10 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 - 10 GHz

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

- HIGH CHANNEL:

Frequency range 30 MHz - 1 GHz

Spurious frequencies at less than 20 dB below the limit:

Spurious frequency (MHz)	E.I.R.P (dBm)	Polarization	Detector	Measurement Uncertainty (dB)
852.415	-27.18	H	Peak	<± 4.65

Frequency range 1 - 10 GHz

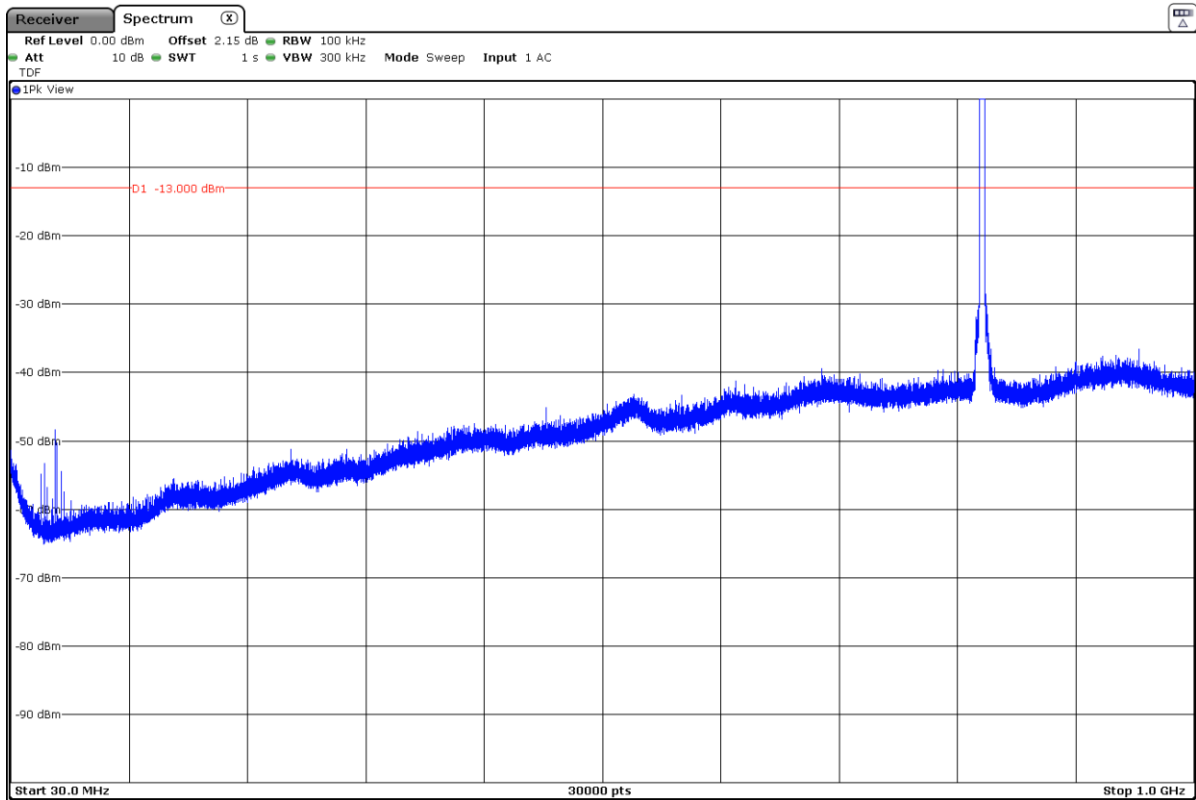
No spurious frequencies at less than 20 dB below the limit.

Measurement uncertainty (dB): <± 4.99 for f ≥ 30 MHz up to 1 GHz
<± 4.98 for f ≥ 1 GHz up to 10 GHz

Verdict: PASS

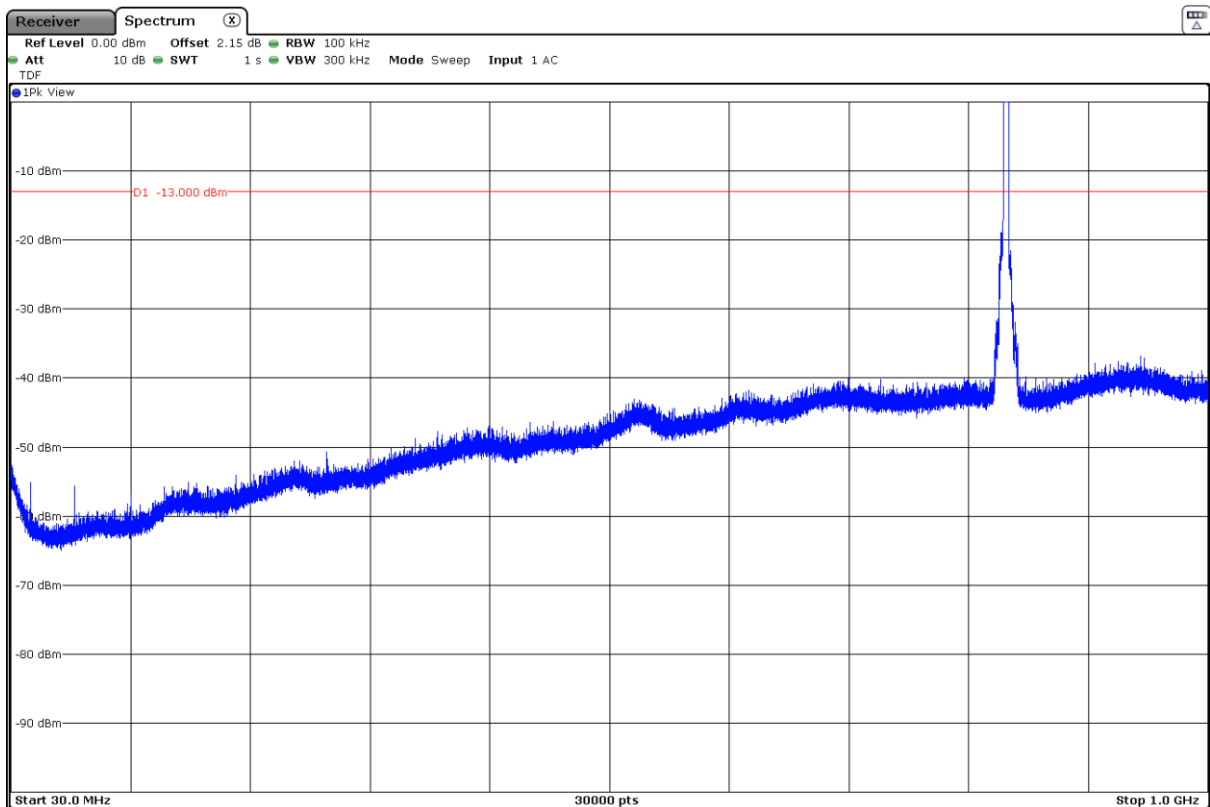
FREQUENCY RANGE 30 MHz - 1 GHz (worst case):

- Low Channel:



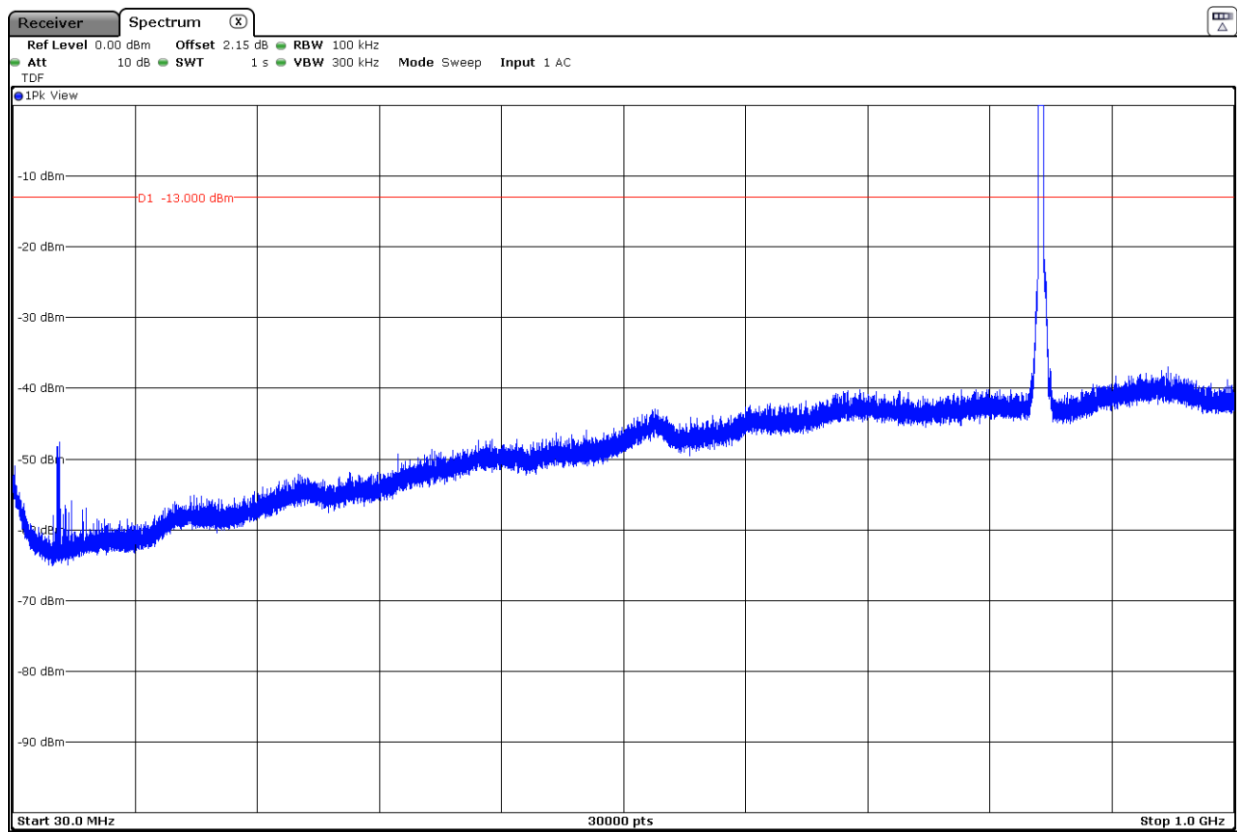
The peak above the limit is the carrier frequency.

- Middle Channel:



The peak above the limit is the carrier frequency.

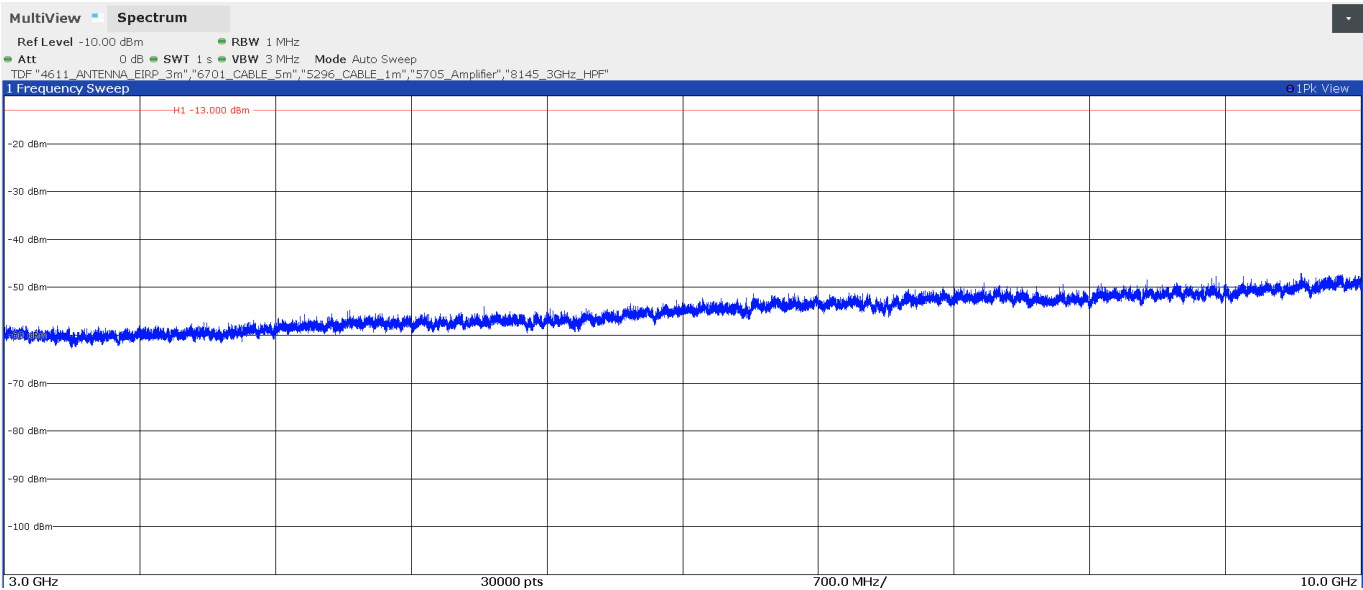
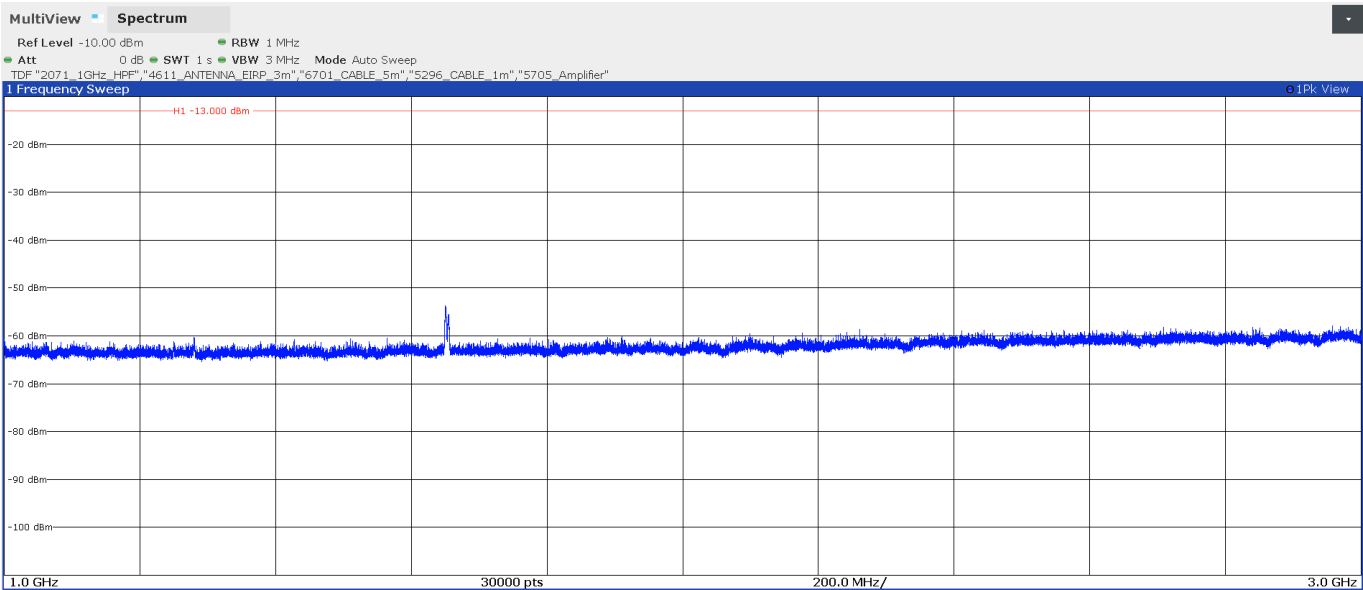
- High Channel:



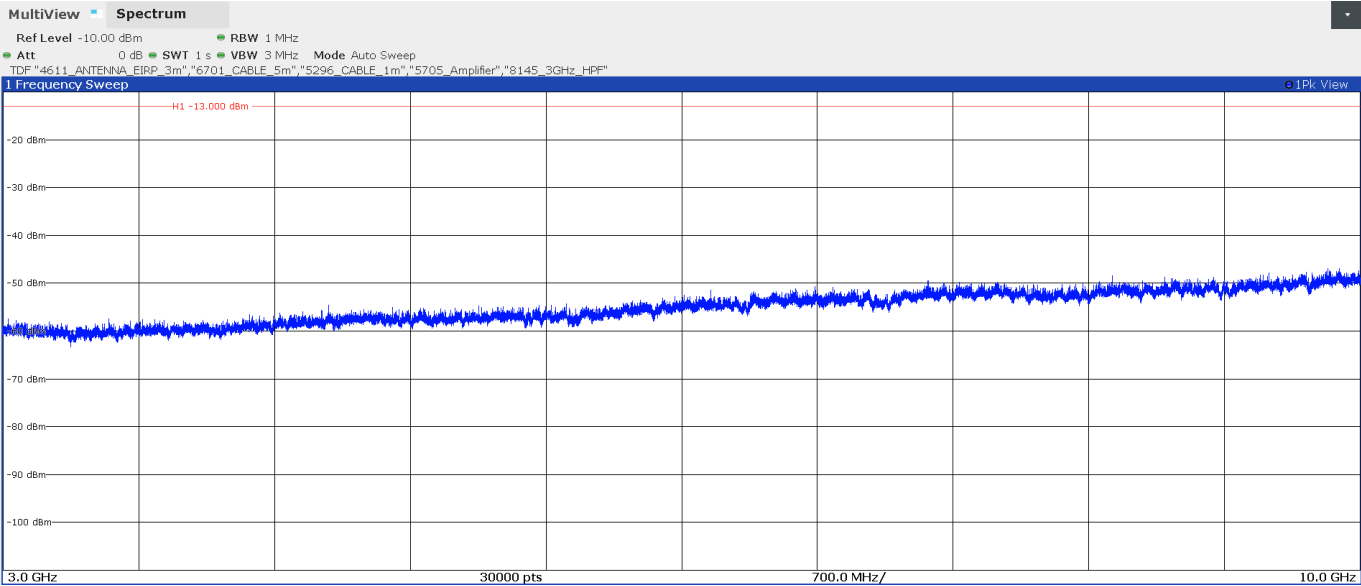
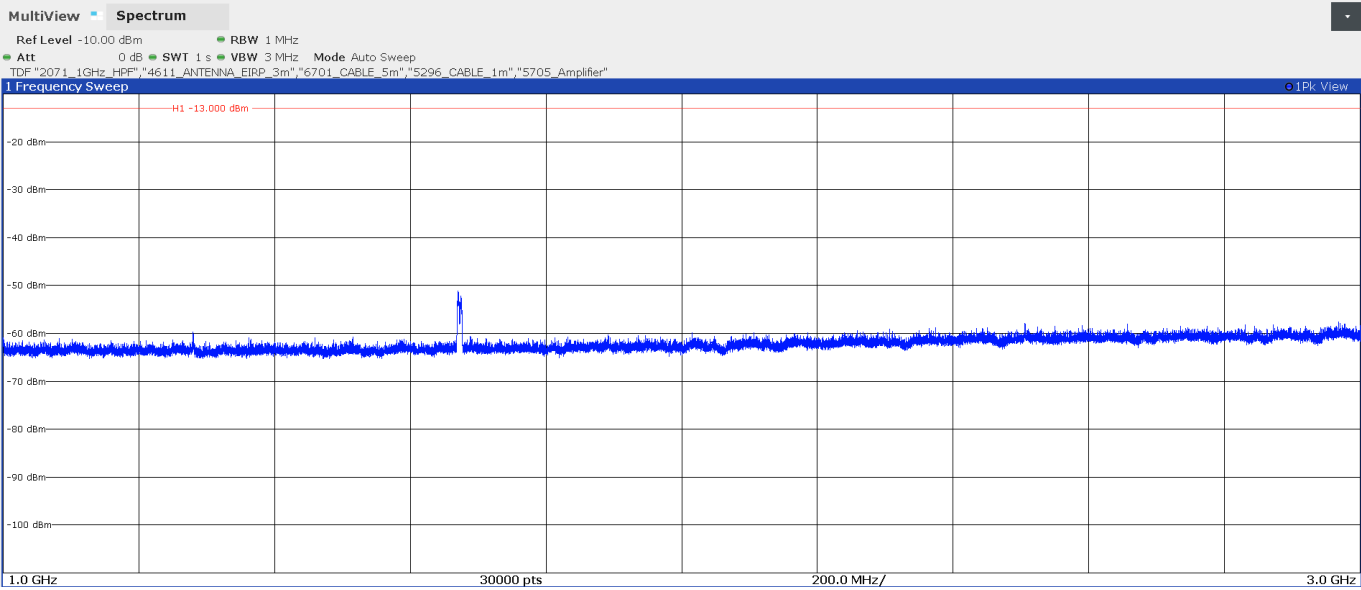
The peak above the limit is the carrier frequency.

FREQUENCY RANGE 1 - 10 GHz (worst case):

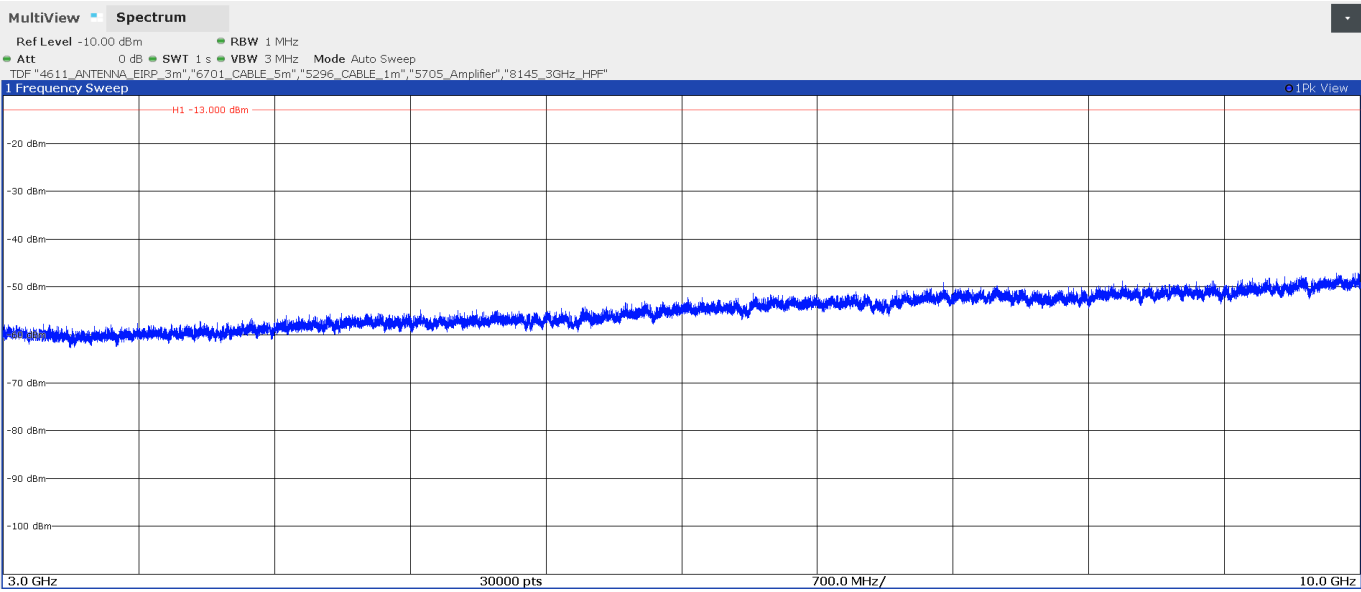
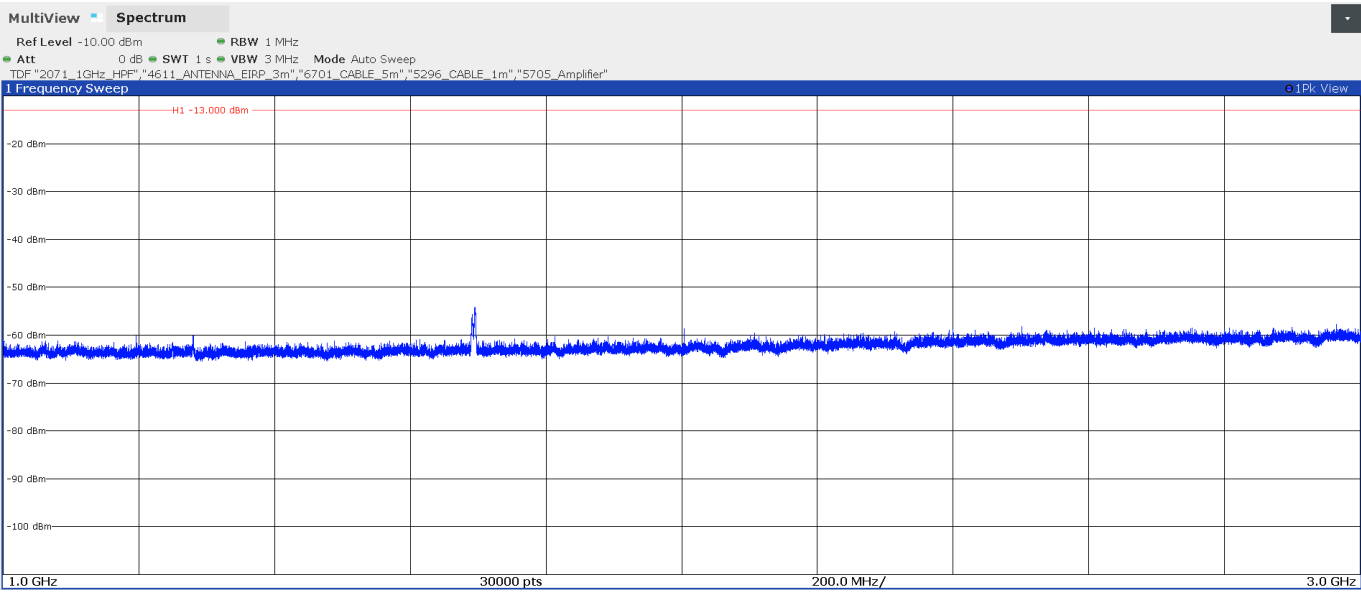
- Low Channel:



- Middle Channel:



- High Channel:



LTE Band 5:

QPSK and 16QAM Modulations:

A preliminary scan determined the QPSK modulation, BW=1.4 MHz, RB Size=1, RB Offset=0 as the worst case. The following tables and plots show the results for the worst case modulation.

- LOW CHANNEL:

Frequency range 30 MHz - 1 GHz

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

Frequency range 1 - 10 GHz

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

- MIDDLE CHANNEL:

Frequency range 30 MHz - 1 GHz

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

Frequency range 1 - 10 GHz

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

- HIGH CHANNEL:

Frequency range 30 MHz - 1 GHz

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

Frequency range 1 - 10 GHz

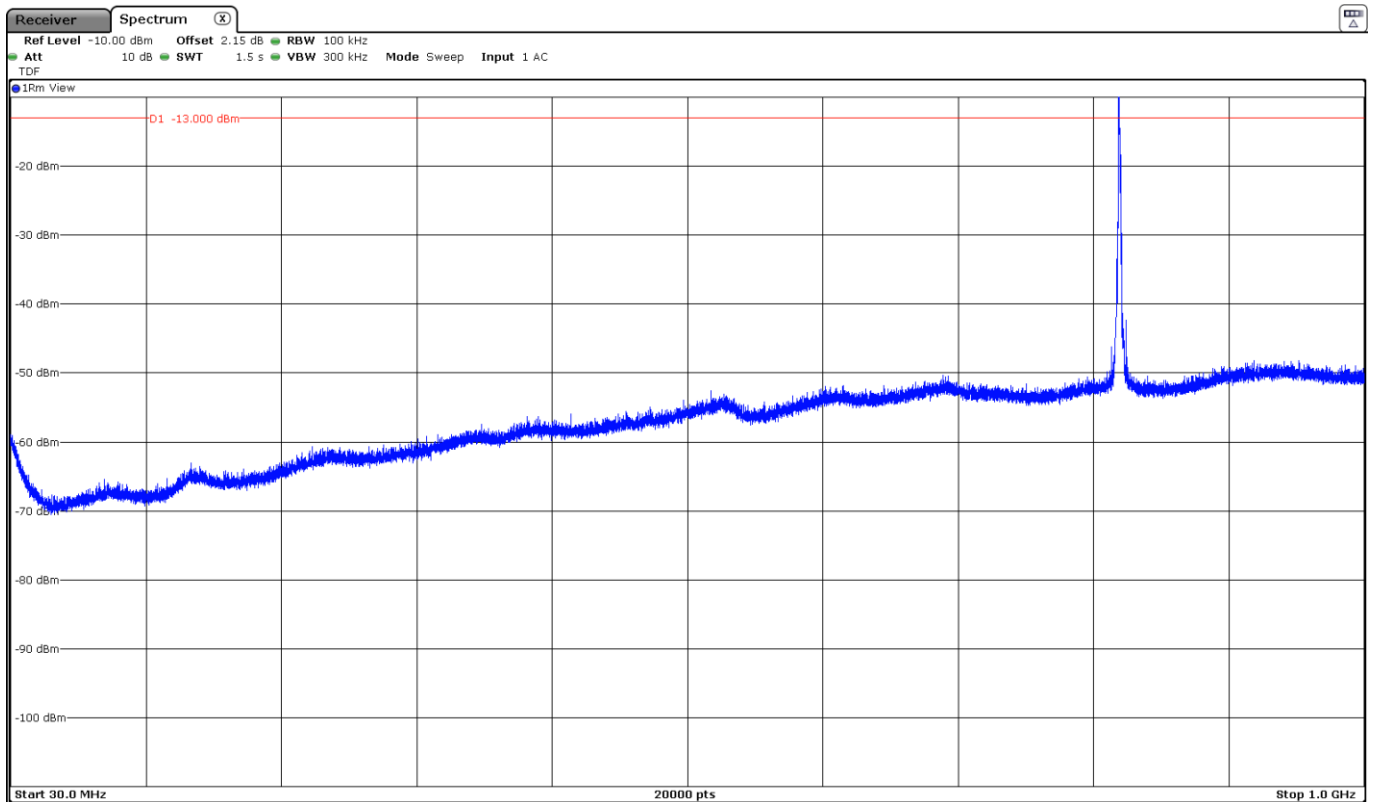
No spurious frequencies were found at less than 20 dB below the limit.

Measurement uncertainty (dB): $\leq \pm 4.99$ for $f \geq 30$ MHz up to 1 GHz
 $\leq \pm 4.98$ for $f \geq 1$ GHz up to 10 GHz

Verdict: PASS

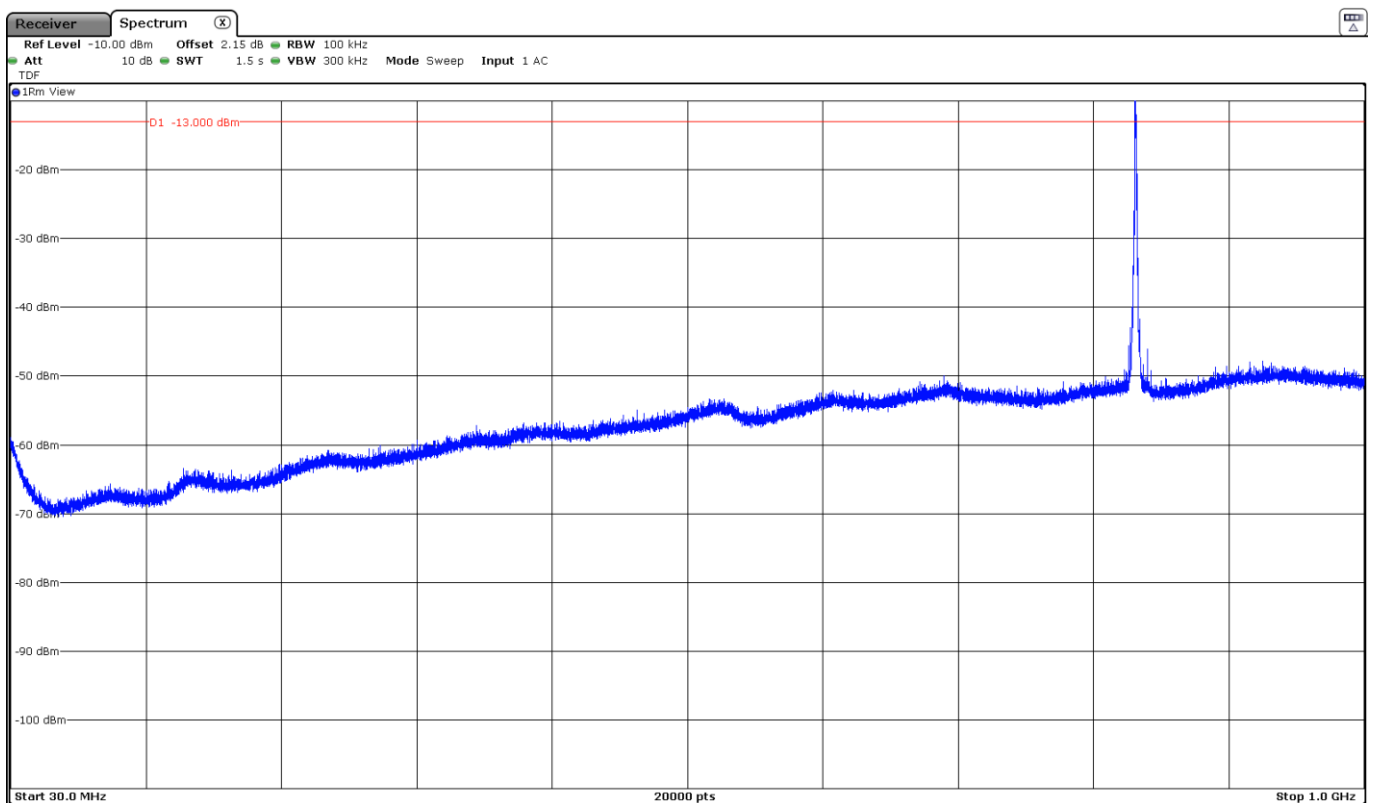
FREQUENCY RANGE 30 MHz - 1 GHz (worst case):

- Low Channel:



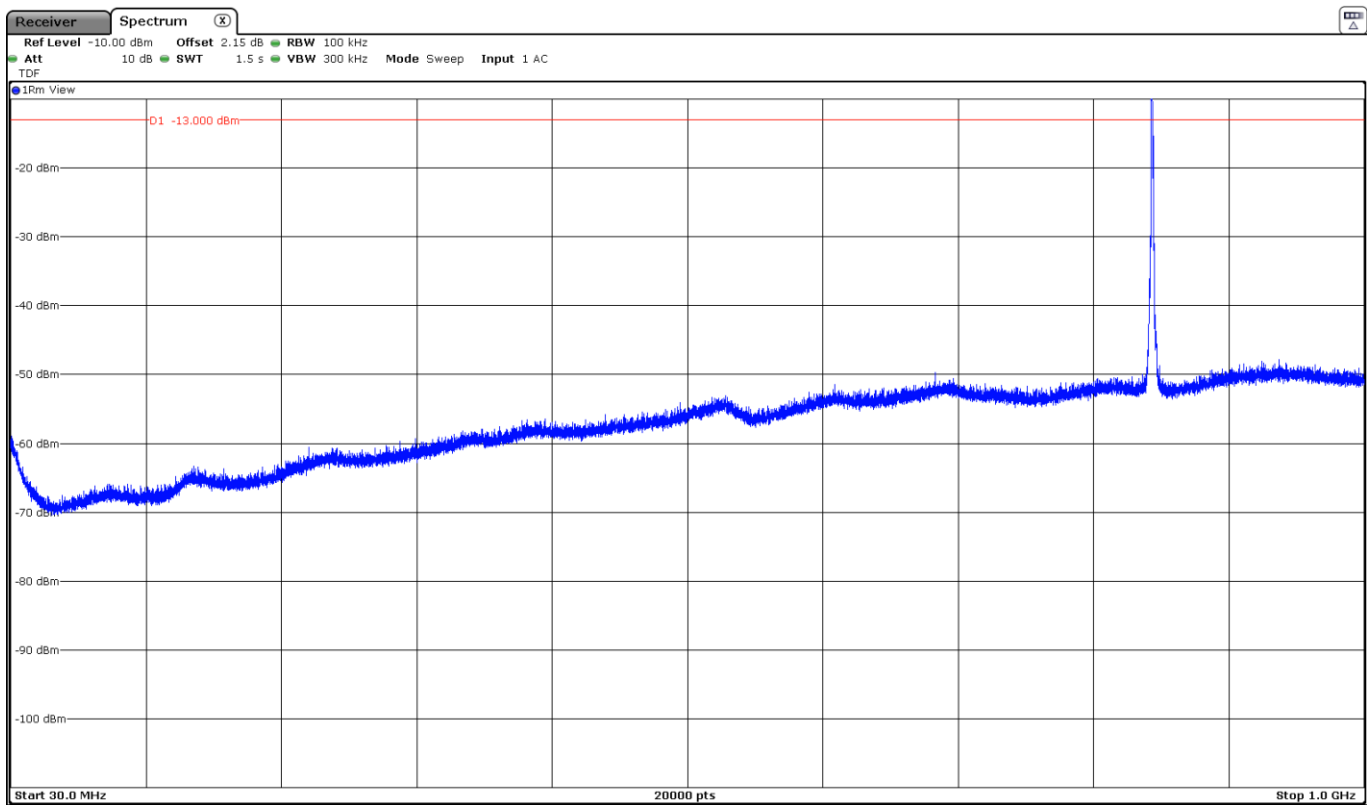
The peak above the limit is the carrier frequency.

- Middle Channel:



The peak above the limit is the carrier frequency.

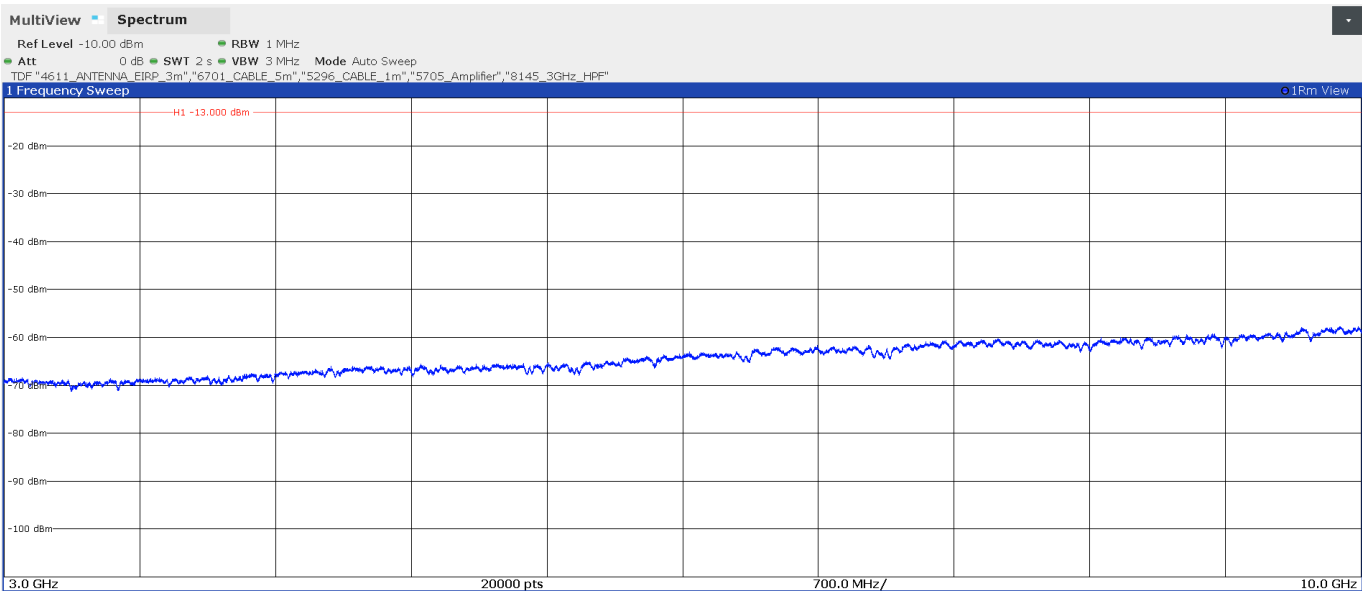
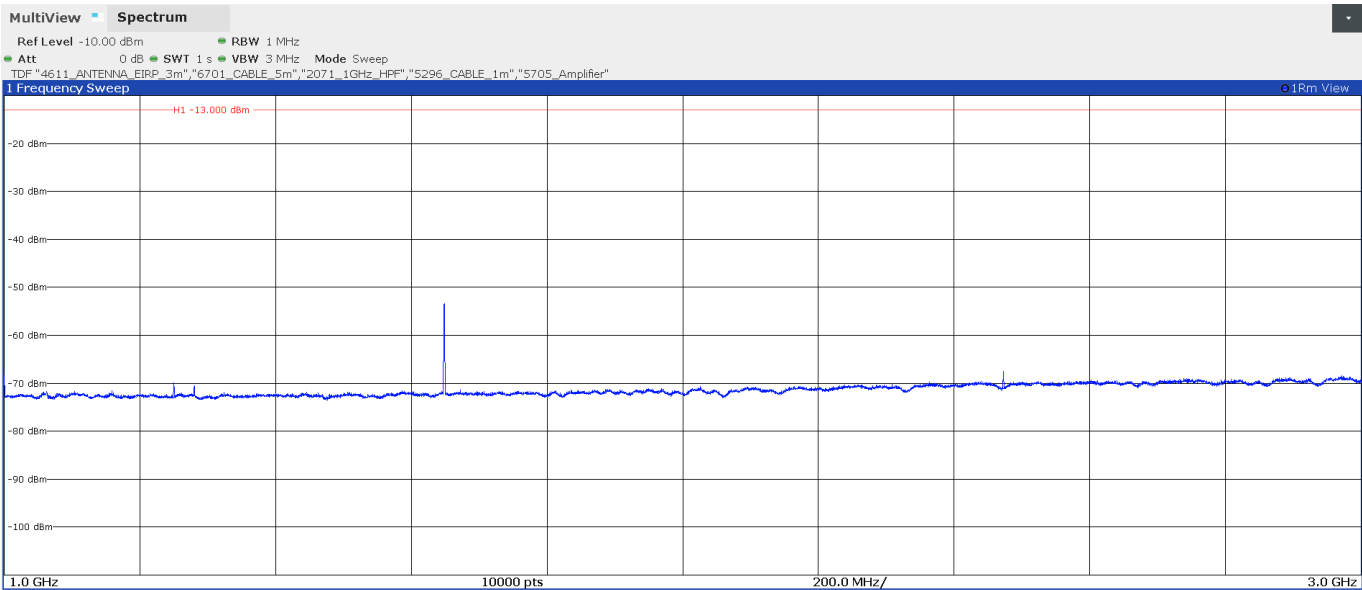
- High Channel:



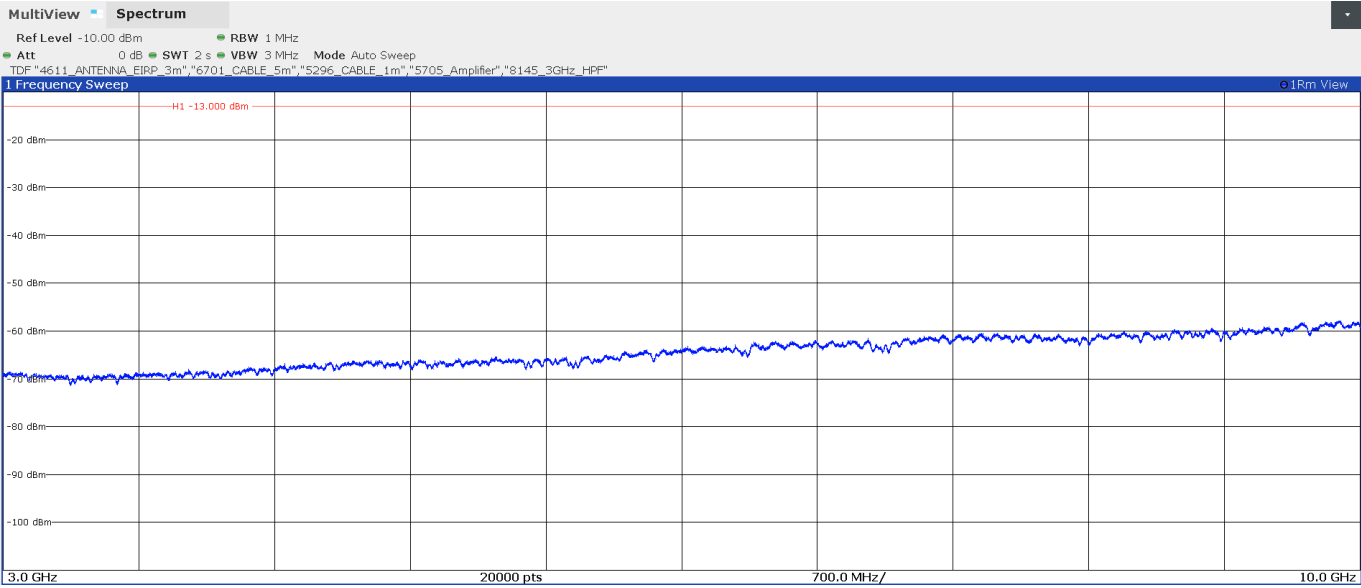
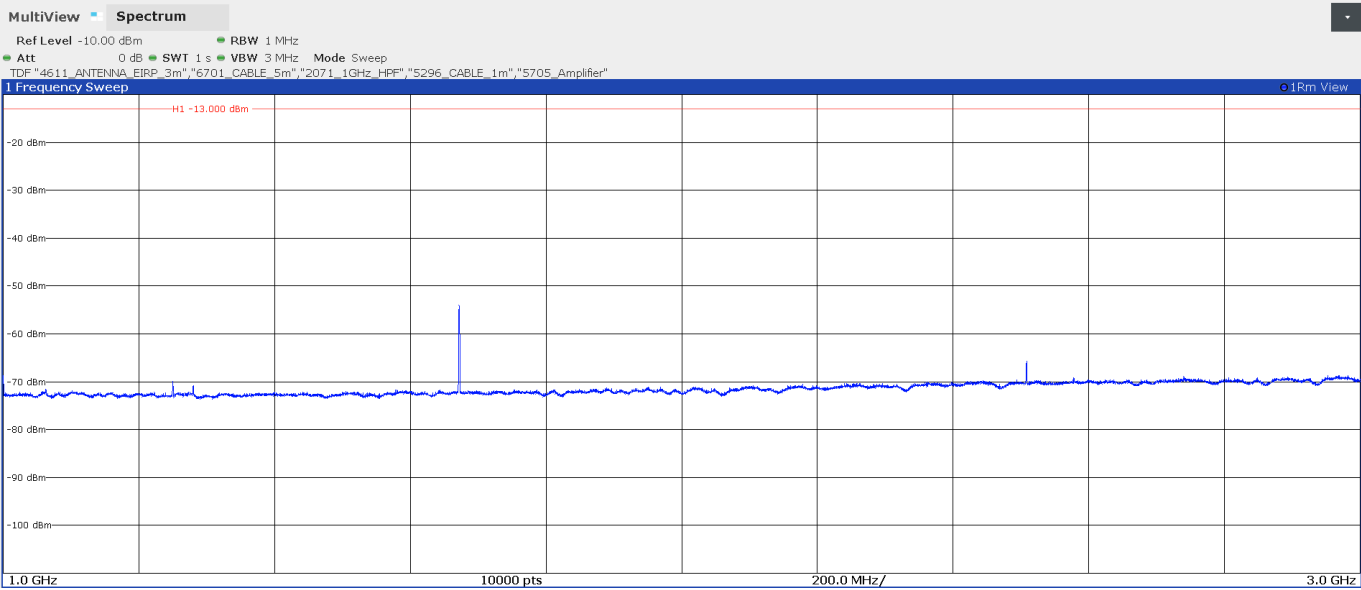
The peak above the limit is the carrier frequency.

FREQUENCY RANGE 1 - 10 GHz (worst case):

- Low Channel:



- Middle Channel:



- High Channel:

