DEKRA Testing and Certification, S.A.U.
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DEKRA

ENAC ENSAYOS Nº 51/LE147

Test report No:
NIE: 62129RRF.008A1

Test report
USA FCC Part 15.209
CANADA RSS-Gen, RSS-210

(*) Identification of item tested	Wireless hearing instrument
(*) Trademark	ReSound, Beltone, Interton, GN Hearing
(*) Model and /or type reference	CAR13A
Other identification of the product	HW version: PCBA, CAMBR RIE13 PB, V1.A, rev. B SW version: Dooku 2 FCC ID: X26CAR13A IC: 6941C-CAR13A
(*) Features	Audio amplification, proprietary 2.4 GHz wireless functionality (Proximity), Bluetooth 5.0 and 10.667 MHz wireless magnetic induction functionality
Applicant	GN HEARING A/S Lautrupbjerg 7, 2750 Ballerup, Denmark
Test method requested, standard	USA FCC Part 15.209 (10–1–19 Edition): Radiated emission limits, general requirements. CANADA RSS-Gen Issue 5 (March 2019) Amendment 1. General Requirements for Compliance of Radio Apparatus. CANADA RSS-210 Issue 10 (December 2019). Licence-Exempt Radio Apparatus: Category I Equipment ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
Summary	IN COMPLIANCE
Approved by (name / position & signature)	José Carlos Luque RF Lab. Supervisor 74841983Y JOSE CARLOS LUQUE (C:A29507456) Firmado digitalmente por 74841983Y JOSE CARLOS LUQUE (C:A29507456) Fecha: 2020.07.24 12:10:59 +02'00'
Date of issue	2020-07-24
Report template No	FDT08_22 (*) "Data provided by the client"

Index

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

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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 CAR13A is a wireless hearing aid.

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 result.

Usage of samples

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
62129C/268	Wireless hearing instrument	CAR13A	2000801584	2020/04/16

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

Test sample description

Ports..... :	Port name and description	Cable					
		Specified max length [m]	Attached during test	Shielded	Coupled to patient(3)		
			☐	☐	☐		
			☐	☐	☐		
			☐	☐	☐		
			☐	☐	☐		
			☐	☐	☐		
			☐	☐	☐		
Supplementary information to the ports..... :							
Rated power supply .....:	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	☐	AC:	☐	☐	☐	☐	☐
	☐	AC:	☐	☐	☐	☐	☐
	☒	DC: Internal non-rechargeable battery.					
	☐	DC:					
Rated Power .....:	1.45 V						
Clock frequencies .....:	2.48 GHz and 10.667 MHz						
Other parameters.....:							

Software version .....:	Dooku 2			
Hardware version.....:	PCBA, CAMBR RIE13 PB, V1.A, rev. B			
Dimensions in cm (W x H x D)....:				
Mounting position.....:	☐	Table top equipment		
	☐	Wall/Ceiling mounted equipment		
	☐	Floor standing equipment		
	☐	Hand-held equipment		
	☒	Other: Placed behind ear		
Modules/parts .....:	Module/parts of test item		Type	Manufacturer
Accessories (not part of the test item) .....:	Description		Type	Manufacturer
	Computer		Certified according to IEC 60950-1, IEC 62368-1 or equivalent standard	
Documents as provided by the applicant.....:	Description		File name	Issue date

(3) Only for Medical Equipment

Identification of the client

GN HEARING A/S

Lautrupbjerg 7, 2750 Ballerup, Denmark

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2020-04-22
Date (finish)	2020-05-13

Document history

Report number	Date	Description
62129RRF.008	2020-06-11	First release
62129RRF.008A1	2020-07-24	First modification: inclusion of field strength measurement according to RSS-210 Issue 10, Appendix 7.2 General field strength limits. This modification test report cancels and replaces the test report 62129RRF.008.

Environmental conditions

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

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 20 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

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

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 20 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

In the chamber for conducted measurements, the following limits were not exceeded during the test:

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 20 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

Remarks and comments

The tests have been performed by the technical personnel: José Manuel Jiménez.

Used instrumentation:

Conducted Measurements:

		Last Calibration	Due Calibration
1.	Signal and Spectrum Analyzer ROHDE AND SCHWARZ FSV40	2020/03	2022/03
2.	DC Power Supply 30V/5A KEYSIGHT TECHNOLOGIES, U8002A	N.A.	N.A.
3.	Digital Multimeter FLUKE 179	2019/09	2020/09

Radiated Measurements:

		Last Calibration	Due Calibration
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.	Active Loop Antenna HEWLETT PACKARD 11966A	2018/06	2020/06
4.	EMI Test Receiver 7 GHz ROHDE AND SCHWARZ ESR7	2018/10	2020/10
5.	Biconical/Log Antenna 30MHz - 6GHz ETS LINDGREN 3142E	2017/09	2020/09
6.	RF Pre-amplifier 40 dB, 10 MHz - 6 GHz BONN ELEKTRONIK BLNA 0160-01N	2019/02	2020/08

Testing verdicts

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

Summary

1. SRD 10.667 MHz.

FCC PART 15.209 / RSS-Gen,RSS-210 PARAGRAPH Requirement – Test case	Verdict	Remark
Occupied bandwidth	P	
FCC 15.209 (a) / RSS-Gen 8.9., RSS-210 7.2. : General field strength and Trasmitter emission limits.	P	
Supplementary information and remarks: None.		

Appendix A: Test results

INDEX

TEST CONDITIONS

POWER SUPPLY (V):

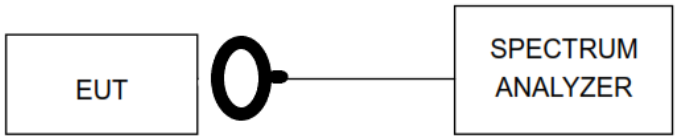
Vnominal:	1.45 Vdc
Type of Power Supply:	Battery.
Type of Antenna:	Integral (inductive coil).

TEST FREQUENCIES:

Nominal Operating Frequency: 10.667 MHz

CONDUCTED MEASUREMENTS

The equipment under test EUT was set up in a shielded room and it is connected to the spectrum analyzer through a RF cable and a coupling device.



Coupling device

RADIATED MEASUREMENTS

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna is situated at a distance of 3 m (Loop antenna for the range between 9 kHz to 30 MHz and Bilog antenna for 30 MHz to 200 MHz).

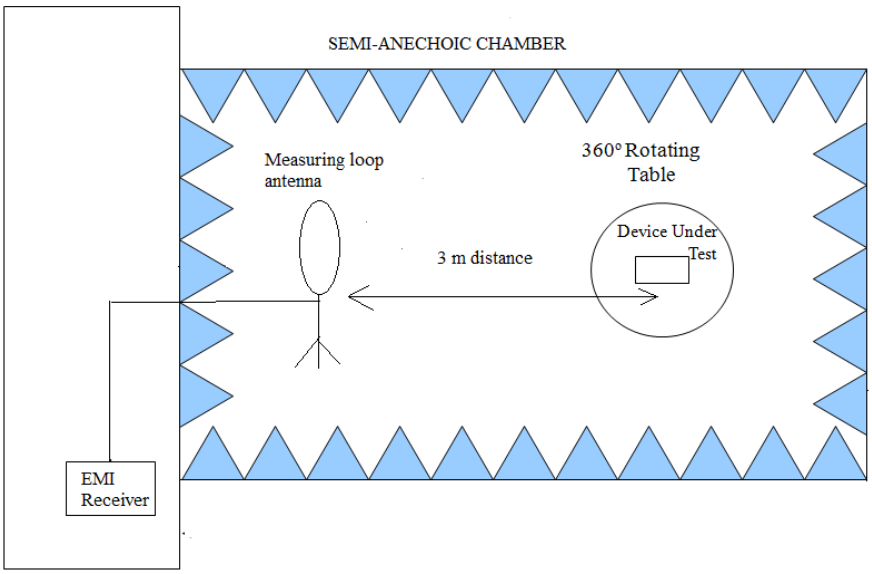
For radiated emissions in the range 9 kHz to 30 MHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 40 dB per decade is used to normalize the measured data for determining compliance.

The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360º and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

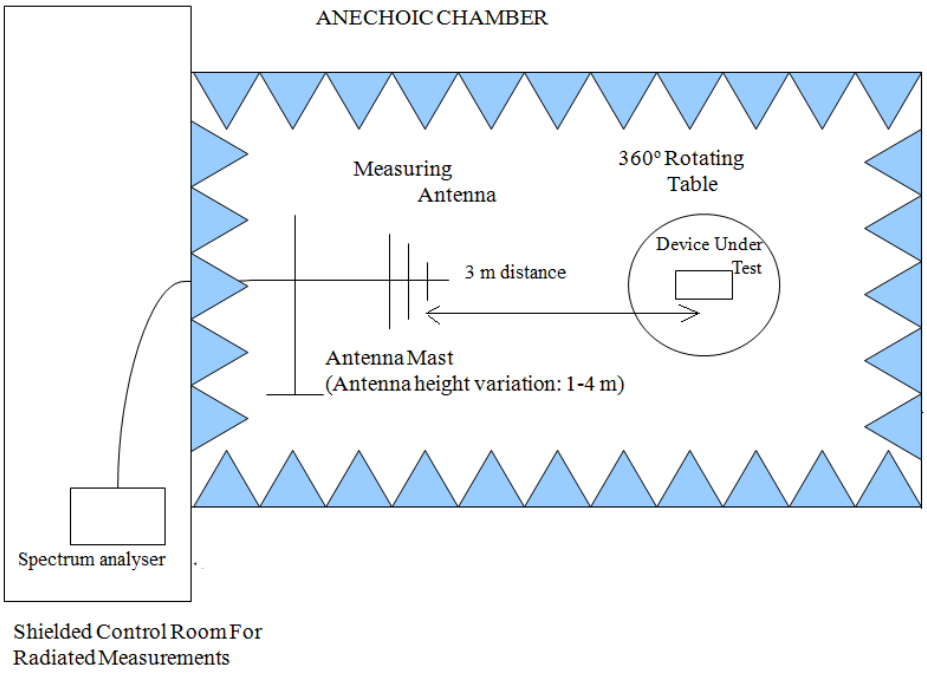
In the range between 9 kHz and 30 MHz the measurements were made in the three different orientation planes of the loop antenna to determine the maximum received field. Measurements above 30 MHz up to 200 MHz were made in both horizontal and vertical planes of polarization.

The test was performed with the equipment transmitting first with only the 10.667 MHz radio and repeated with the Bluetooth Low Energy 2.4 GHz radio and then the Proprietary protocol 2.4 GHz radio transmitting simultaneously to check the impact of the co-location of the other radio interfaces. The results and plots below show the worst results obtained.

Radiated measurements setup f < 30 MHz:



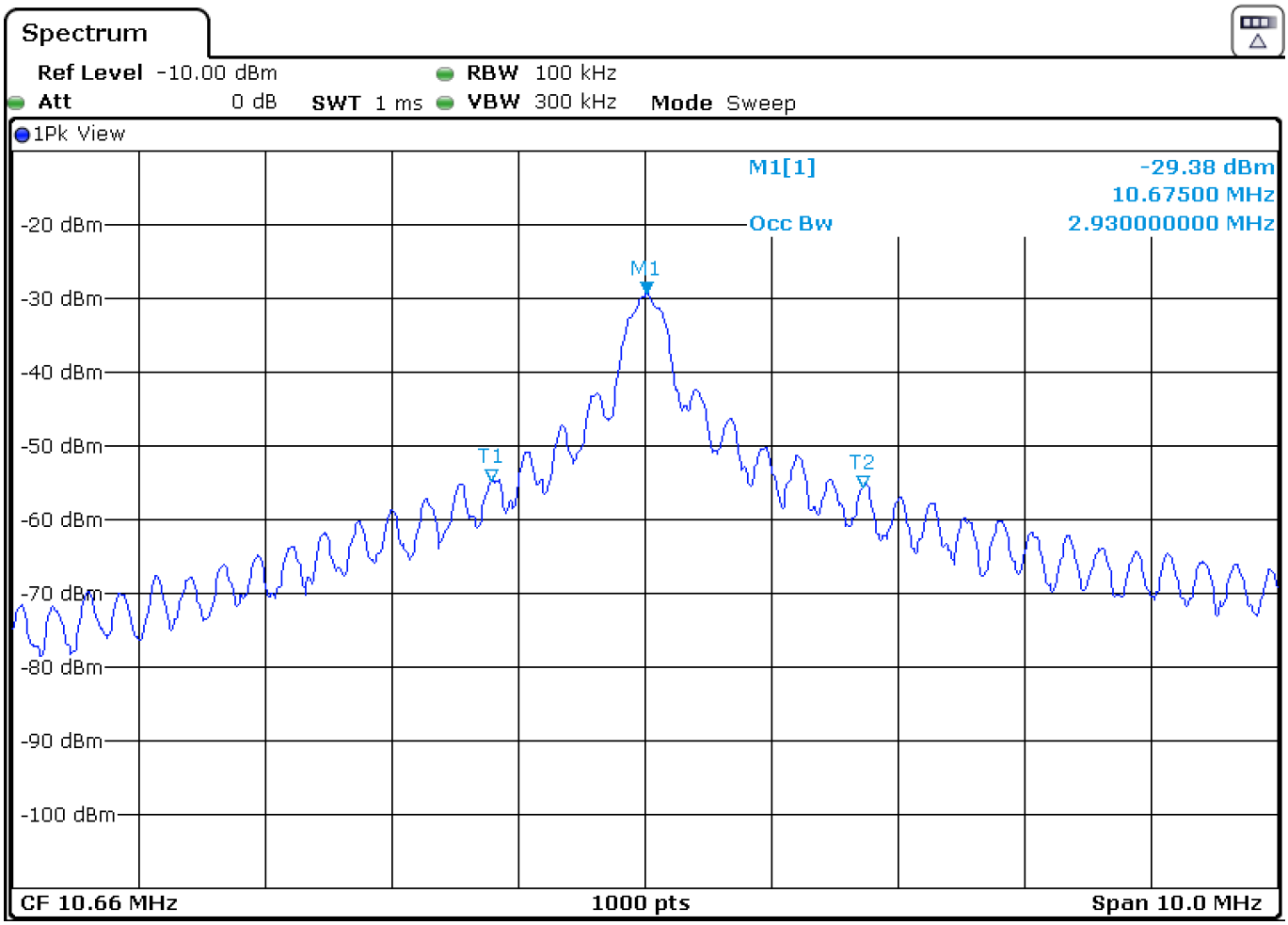
Radiated measurements setup f > 30 MHz up to 60 MHz:



Occupied Bandwidth

RESULTS:

99% Bandwidth (MHz)	2.930
Measurement uncertainty (kHz)	<±0.50



15.209 (a) / RSS-Gen 8.9., RSS-210 7.2. General field strength and Transmitter emission limits

SPECIFICATION:

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table (see §15.205(c) / RSS-Gen):

Frequency Range (MHz)	Field strength (µV/m)	Field strength (dBµV/m)	Measurement distance (m)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	30
1.705 - 30.0	30	29.54	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
Above 960	500	54	3

Additionally, the level of any transmitter unwanted emission shall not exceed the level of the transmitter's fundamental emission.

RESULTS:

All tests were performed in a semi-anechoic chamber at a distance of 3 m, except for the measurement of the fundamental emission that was performed at a distance of 1 m due to its extremely low emission level. The maximum peak value of the fundamental emission was measured as the worst case.

The spectrum was inspected from 9 kHz to 200 MHz searching for spurious signals.

The field strength is calculated by adding correction factor to the measured level from the spectrum analyser. This correction factor includes antenna factor and cable loss.

Fundamental emission:

Measured E(dBµV/m) at 1m (Peak value)	34.60
E(dBµV/m) extrapolated to 30 m (40 dB/decade)	-24.48
Equivalent level in dB dBµA/m) at 30 m	-75.98
Measurement uncertainty (dB)	<±2.99

Verdict: PASS

Frequency range 9 kHz - 30 MHz:

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

Measurement uncertainty (dB)	<±2.99

Verdict: PASS

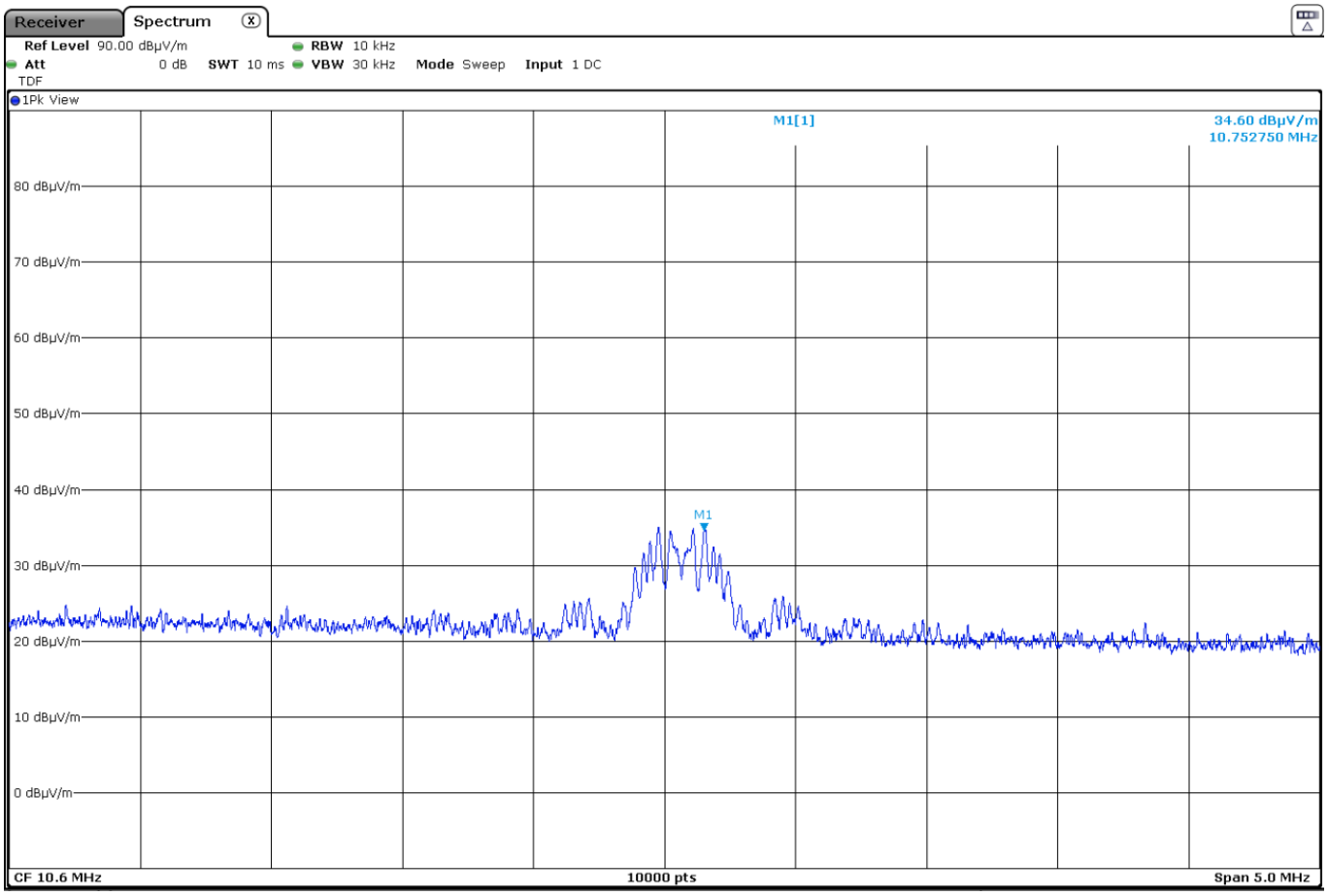
Frequency range 30 - 200 MHz:

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

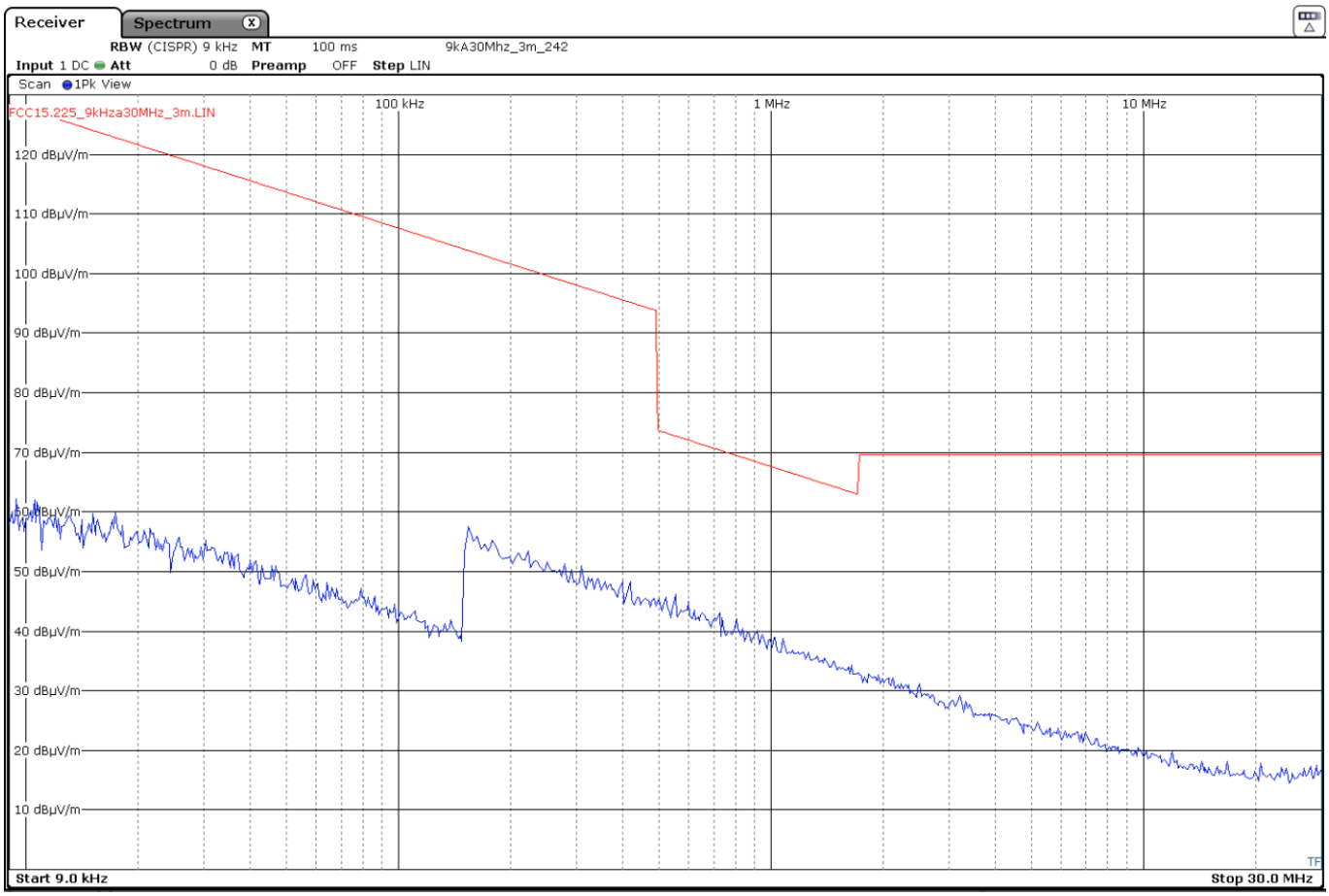
Measurement uncertainty (dB)	<±5.08

Verdict: PASS

FUNDAMENTAL EMISSION:



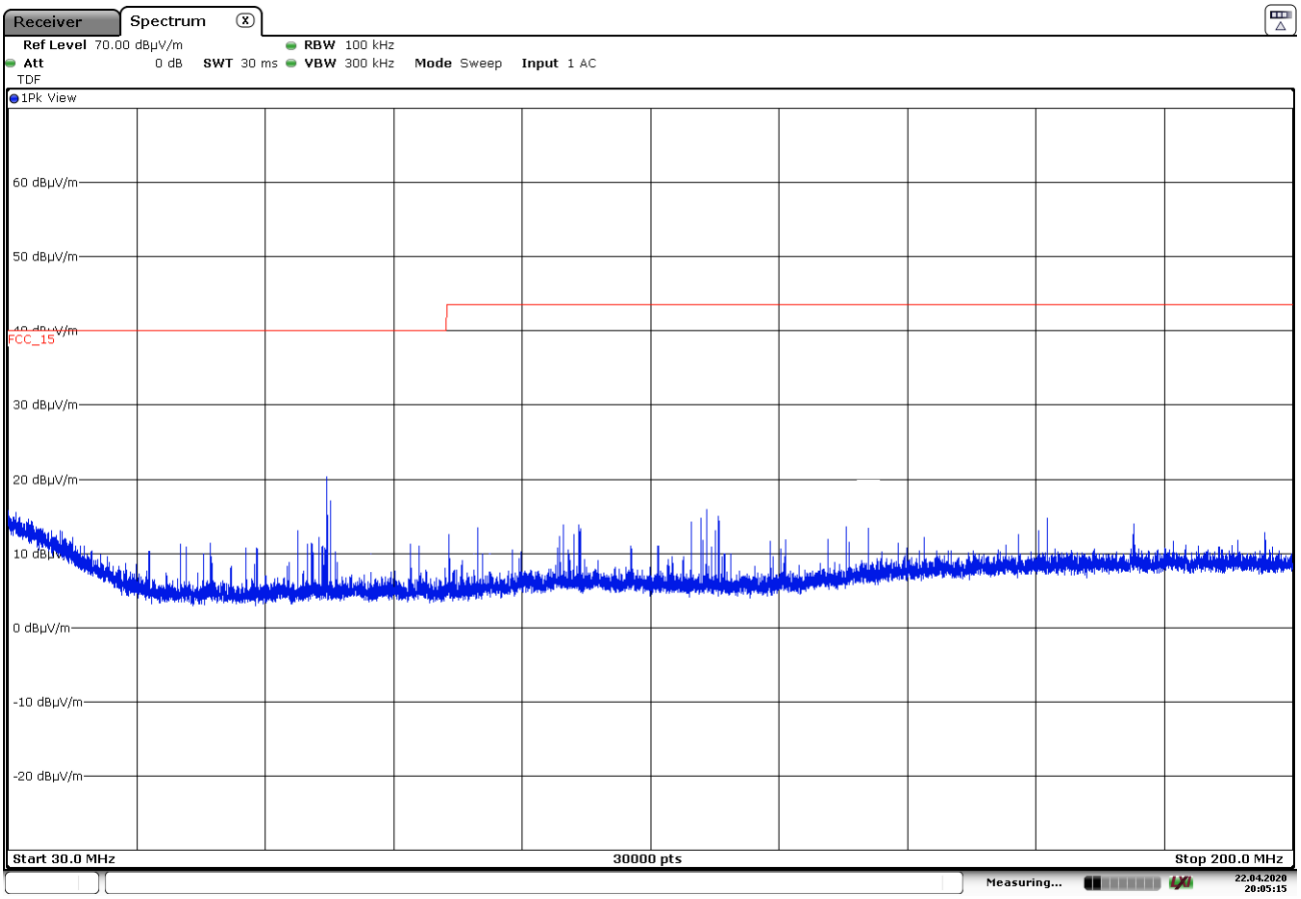
FREQUENCY RANGE 9 kHz - 30 MHz:



Resolution bandwidth:
200 Hz for 9 kHz ≤ f ≤ 150 kHz
9 kHz for 150 kHz ≤ f ≤ 30 MHz

Note: The scan is performed with a peak detector.
The limits shown in the above plot are extrapolated to 3 meters.

FREQUENCY RANGE 30 - 200 MHz:



Note: The scan is performed with a peak detector.