

ISED CABid: ES1909
Lab. Company Number: 4621A

Test Report No:
77842RRF.003A2

Test Report

USA FCC Part 15.519, 15.521, 15.209

CANADA RSS-220, RSS-Gen

(*) Identification of item tested	Telematic Control Unit with GNSS, Wifi, UWB, BT classic, BLE, 4G LTE CAT
(*) Trademark	IDNEO
(*) Model and /or type reference	EBOX
(*) Other identification of the product	FCC ID: 2BGE31EBOX0524 IC: 32504-1EBOX0624
(*) Features	GNSS, Wifi, UWB, BT classic, BLE, 4G LTE CAT 4 HW version: 419100346 SW version: 414100493
Applicant	IDNEO TECHNOLOGIES, S.A.U. Carrer Rec de Dalt, 3, 08100, Mollet del Vallès, Barcelona, Spain
Test method requested, standard	USA FCC Part 15.519 (10-1-23 Edition): Technical requirements for hand held UWB systems. USA FCC Part 15.521 (10-1-23 Edition): Technical requirements applicable to all UWB devices. USA FCC Part 15.209 (10-1-23 Edition): Radiated emission limits; general requirements. CANADA RSS-220 Issue 1, amendment 1 (July 2018). CANADA RSS-Gen Issue 5, amendment 2 (February 2021). ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
Summary	IN COMPLIANCE
Approved by (name / position & signature)	José Manuel Gómez Galván EMC Consumer & RF Lab. Manager
Date of issue	2025-02-24
Report template No	FDT08_25 (*) "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 covers the performed tests in this report.

DEKRA Testing and Certification is an ISED-recognized accredited testing laboratory, CABid: ES1909, with the appropriate scope of accreditation that covers the performed tests in this 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.

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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 EBOX is a Telematic Control Unit with GNSS, Wi-Fi, UWB, BT Classic, BLE, 4G LTE CAT.

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.

Id	Control Number	Description	Model	Serial N°	Date Reception of	Application
S/01	77842_7.1	Telematic Control Unit with GNSS, Wifi, UWB, BT classic, BLE, 4G LTE CAT	EBOX	202403T 00202	2024-03-21	Element Under Test
S/01	77842_13.1	Harness	-	-	2024-03-21	Element Under Test
S/01	77842_1.1	Laptop	L560	MP-12YJX 16-03	2024-03-21	Auxiliary Element
S/01	77842_10.1	Powercord Laptop	-	-	2024-03-21	Auxiliary Element
S/01	77842_11.1	AC/DC Adapter Laptop	-	-	2024-03-21	Auxiliary Element

Notes referenced to samples during the project:

Id	Type
S/01	Radiated tests.

Test sample description

Ports.....:	Port name and description	Cable		
		Specified max length [m]	Attached during test	Shielded
	MAIN CONNECTOR	1m	☒	☐
Supplementary information to the ports.....:	Wiring Harness shipped by customer			
Rated power supply	Voltage and Frequency			
	☒	DC: 12.8V		
Rated Power.....:	1.92W			
Clock frequencies.....:	(32,7KHz, 16MHz, 16.66MHz, 25MHz and 55,2MHz)			
Other parameters	-			
Software version.....:	414100493			
Hardware version	419100346			
Dimensions in cm (W x H x D) ...:	70 (W) x 105 (L) x 26-32.9 (H) mm			
Mounting position	☐	Table top equipment		
	☐	Wall/Ceiling mounted equipment		
	☐	Floor standing equipment		
	☐	Hand-held equipment		
	☒	Other: In specific plastic bracket inside the vehicle (screwed)		
Modules/parts.....:	Module/parts of test item		Type	Manufacturer
	AG35 EU /AG35 NAM		Modem	Quectel
	AF20-Q4B		Wifi/BT	Quectel
	ANNA-B112		BLE	UBLOX
	NCJ29D5DHN/00201Y		UWB	NXP
Accessories (not part of the test item)	Description		Type	Manufacturer
	Wiring Harness		-	IDNEO
	Laptop		-	
	KVASER		-	KVASER
Documents as provided by the applicant.....:	Description		File name	Issue date
	EBOX_certif_lab_manual V10.0 21_02_2024		-	21_02_2024

(3) Only applicable to medical equipments.

Identification of the client

IDNEO TECHNOLOGIES, S.A.U.
Carrer Rec de Dalt, 3, 08100, Mollet del Vallès, Barcelona, Spain

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2024-07-05
Date (finish)	2024-09-10

Document history

Report number	Date	Description
77842RRF.003	2024-09-18	First release.
77842RRF.003A1	2025-02-05	Second release. Updated information. This modification test report cancels and replaces the test report 77842RRF.003s.
77842RRF.003A2	2025-02-24	Third release. Updated graphic information. This modification test report cancels and replaces the test report 77842RRF.003A1s.

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: Rafael Fernández.

Used instrumentation:

Control No.	Equipment	Model	Manufacturer	Next Calibration
06791	SEMIANECHOIC ABSORBER LINED CHAMBER IV	FACT 3 200 STP	ETS LINDGREN	N/A
06792	SHIELDED ROOM	S101	ETS LINDGREN	N/A
07817	EMI TEST RECEIVER 2 Hz - 44 GHz	ESW44	ROHDE AND SCHWARZ	2026-07-01
06143	HYBRID BILOG ANTENNA 30 MHz - 6 GHz	3142E	ETS LINDGREN	2027-01-22
06021	ATTENUATOR 3 dB, 2 W, DC-6 GHz	50HN-03	JFW	2025-02-07
03783	PRE-AMPLIFIER G>30 dB, 1-18 GHz	BLMA 0118-3A	BONN ELEKTRONIK	2025-02-07
08856	PRE-AMPLIFIER G>30dB 18-40 GHz	BLMA 1840-4A	BONN ELEKTRONIK	2025-02-27
06496	HORN ANTENNA 1-18 GHz	BBHA 9120 D	SCHWARZBECK MESS-ELEKTRONIK	2026-12-01
04657	HORN ANTENNA 18-40 GHz	BBHA 9170	SCHWARZBECK MESS-ELEKTRONIK	2026-06-12
04848	SOFTWARE FOR EMC/RF TESTING	EMC32	ROHDE AND SCHWARZ	N/A

Testing verdicts

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

Summary

Ultra-Wideband (UWB):

FCC PART 15 PARAGRAPH / RSS-220			
Requirement – Test case		Verdict	Remark
FCC 15.519 (a)(1) / RSS-220 5.3.1. (b)	UWB Transmission Cessation	P	
FCC 15.519 (b) / RSS-220 5.1. (a)	UWB Bandwidth	P	
FCC 15.519 (c),(d), 15.521 (c) / RSS-220 5.3.1. (c),(d),(e), Annex. Sect.4 (m)	Radiated Emissions	P	
FCC 15.519 (e) / RSS-220 5.3.1. (g)	UWB Peak Level	P	
<u>Supplementary information and remarks:</u>			
None.			

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TEST CONDITIONS

(*) Declared by the Applicant

POWER SUPPLY (*):

Vnominal:	12.8 Vdc
Type of Power Supply:	External DC.

ANTENNA (*):

Type of Antenna:	Internal.
Maximum Declared Antenna Gain:	+5.8 dBi

TEST FREQUENCY FOR FCC:

Single Channel:	7987.2 MHz
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TEST FREQUENCY FOR CANADA:

Single Channel:	7987.2 MHz
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RADIATED MEASUREMENTS:

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna is situated at a distance of 3 m for the frequency range 30 MHz-960 MHz (30 MHz-960 MHz Bilog Antenna) and at a distance of 1 m for the frequency range 960 MHz-40 GHz (960 MHz-17 GHz Double Ridge Horn Antenna and 17 GHz-40 GHz Horn Antenna).

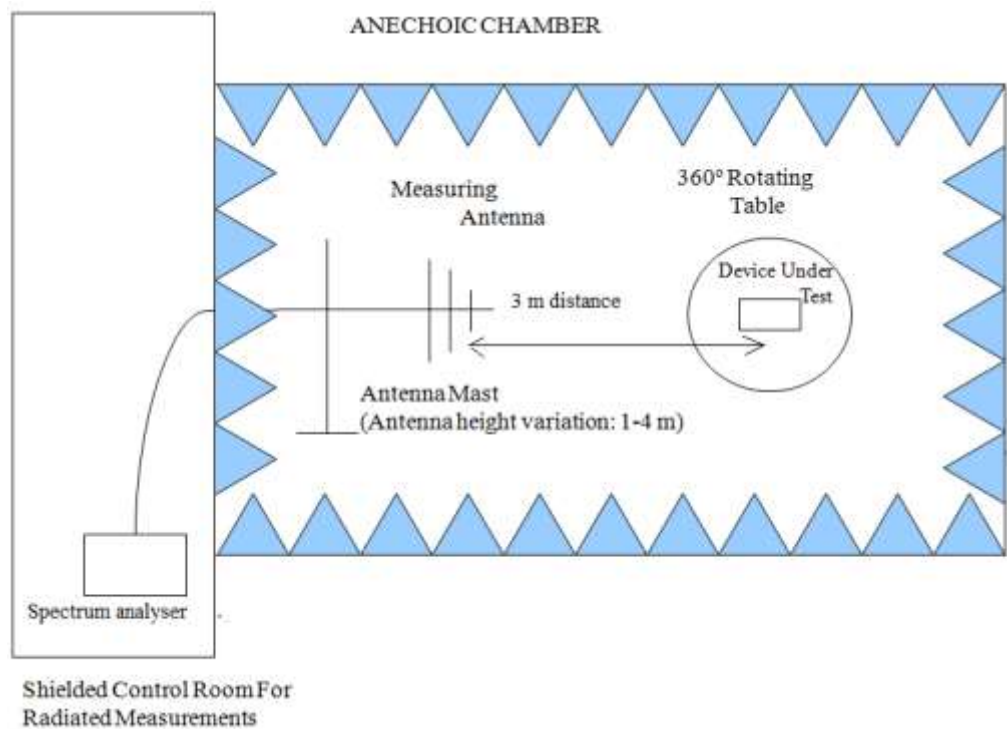
For radiated emissions in the range 960 MHz-40 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

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 360° and the antenna height (Bilog antenna and Double ridge horn antenna) was varied from 1 to 4 meters to find the maximum radiated emission.

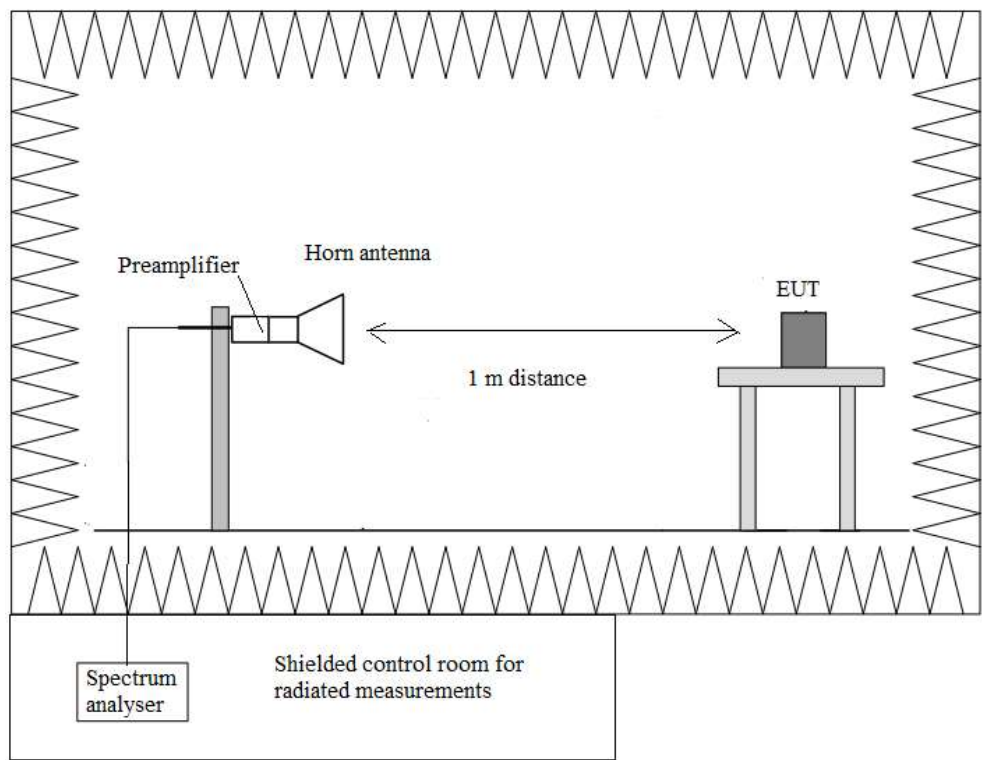
Measurements were made in both horizontal and vertical planes of polarization.

A resolution bandwidth/video bandwidth of 100kHz / 300 kHz was used for frequencies below 960MHz and 1 MHz / 3 MHz for frequencies above 960MHz.

Radiated measurements setup from 30 MHz to 1 GHz:



Radiated measurements above 960 MHz:



Occupied Channel Bandwidth 99%

SPECIFICATION:

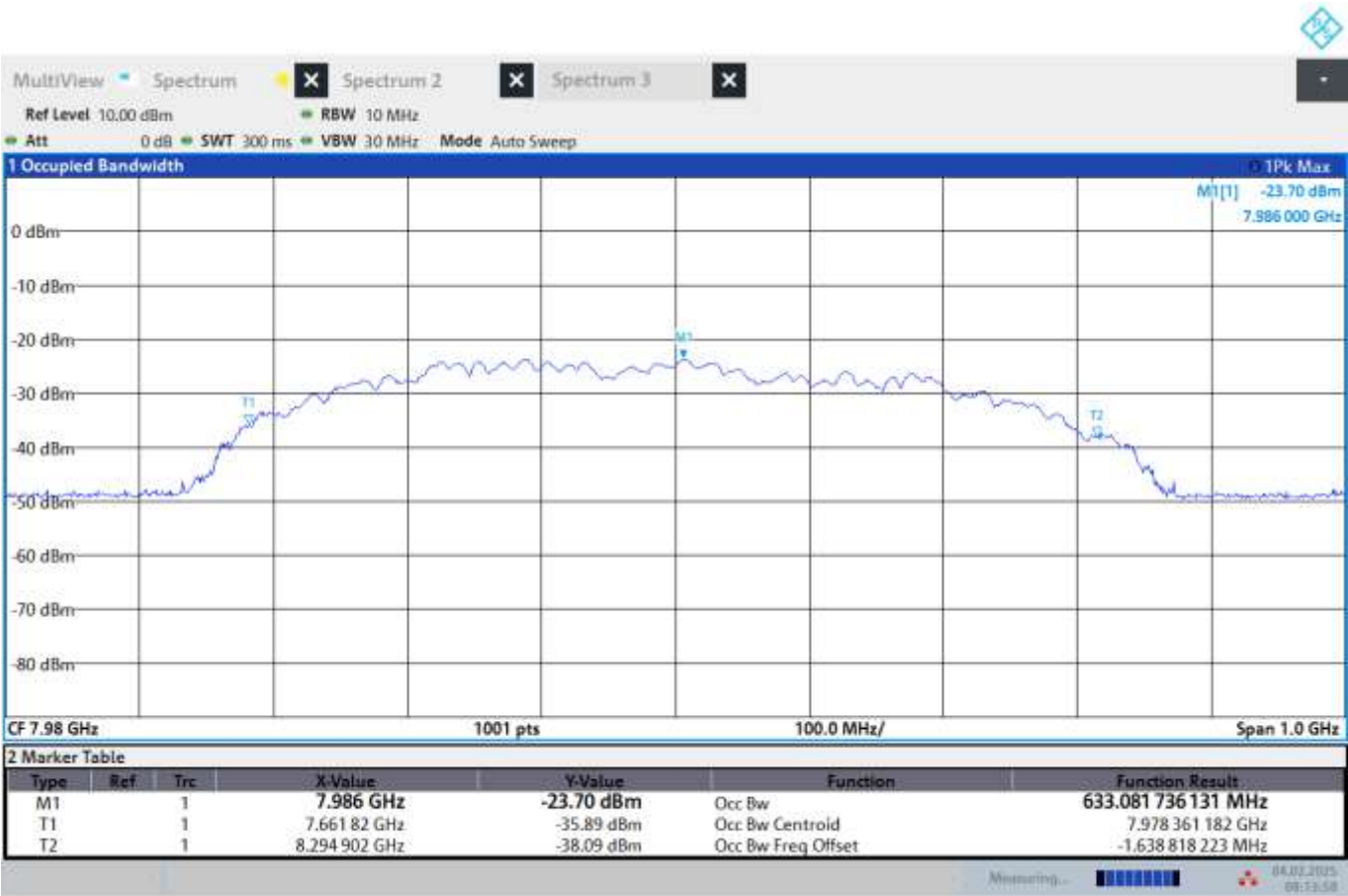
*The occupied bandwidth or the “99% emission bandwidth” is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained.

RESULTS:

Single Channel (MHz)	Occupied Bandwidth (MHz)
7987.2	633.081 MHz
Measurement uncertainty (%)	<± 1.41

VERDICT: Pass

• SINGLE CHANNEL (7987.2 MHz):



08:13:58 04.02.2025

FCC 15.519 (a)(1) / RSS-220 5.3.1. (b) UWB Transmission Cessation

SPECIFICATION:

* FCC §15.503 (d):

(d) Ultra-wideband (UWB) transmitter. An intentional radiator that, at any point in time, has a fractional bandwidth equal to or greater than 0.20 or has a UWB bandwidth equal to or greater than 500 MHz, regardless of the fractional bandwidth.

* FCC §15.519 (a)(1):

(a) UWB devices operating under the provisions of this section must be hand held, i.e., they are relatively small devices that are primarily hand held while being operated and do not employ a fixed infrastructure.

(1) A UWB device operating under the provisions of this section shall transmit only when it is sending information to an associated receiver. The UWB intentional radiator shall cease transmission within 10 seconds unless it receives an acknowledgement from the associated receiver that its transmission is being received. An acknowledgment of reception must continue to be received by the UWB intentional radiator at least every 10 seconds or the UWB device must cease transmitting.

* RSS-220 2:

2. Ultra-wideband is a short-range radiocommunication technology involving the intentional generation and transmission of radio frequency energy that spreads over a very large frequency range, which may overlap several frequency bands allocated to various radiocommunication services.

A UWB device is an intentional radiator that has either a -10 dB bandwidth of at least 500 MHz or a -10 dB fractional bandwidth greater than 0.2. There are eight distinct subclasses of UWB device.

* RSS-220 5.3.1. (b):

5.3.1 b. The device is to transmit only when it is sending information to an associated receiver. The device shall cease transmission of information within 10 seconds unless it receives an acknowledgement from the associated receiver that its transmission is being received. An acknowledgment of reception must continue to be received by the UWB device at least every 10 seconds or the UWB device shall cease transmitting any information other than periodic signals used for the establishment or re-establishment of a communication link with an associated receiver.

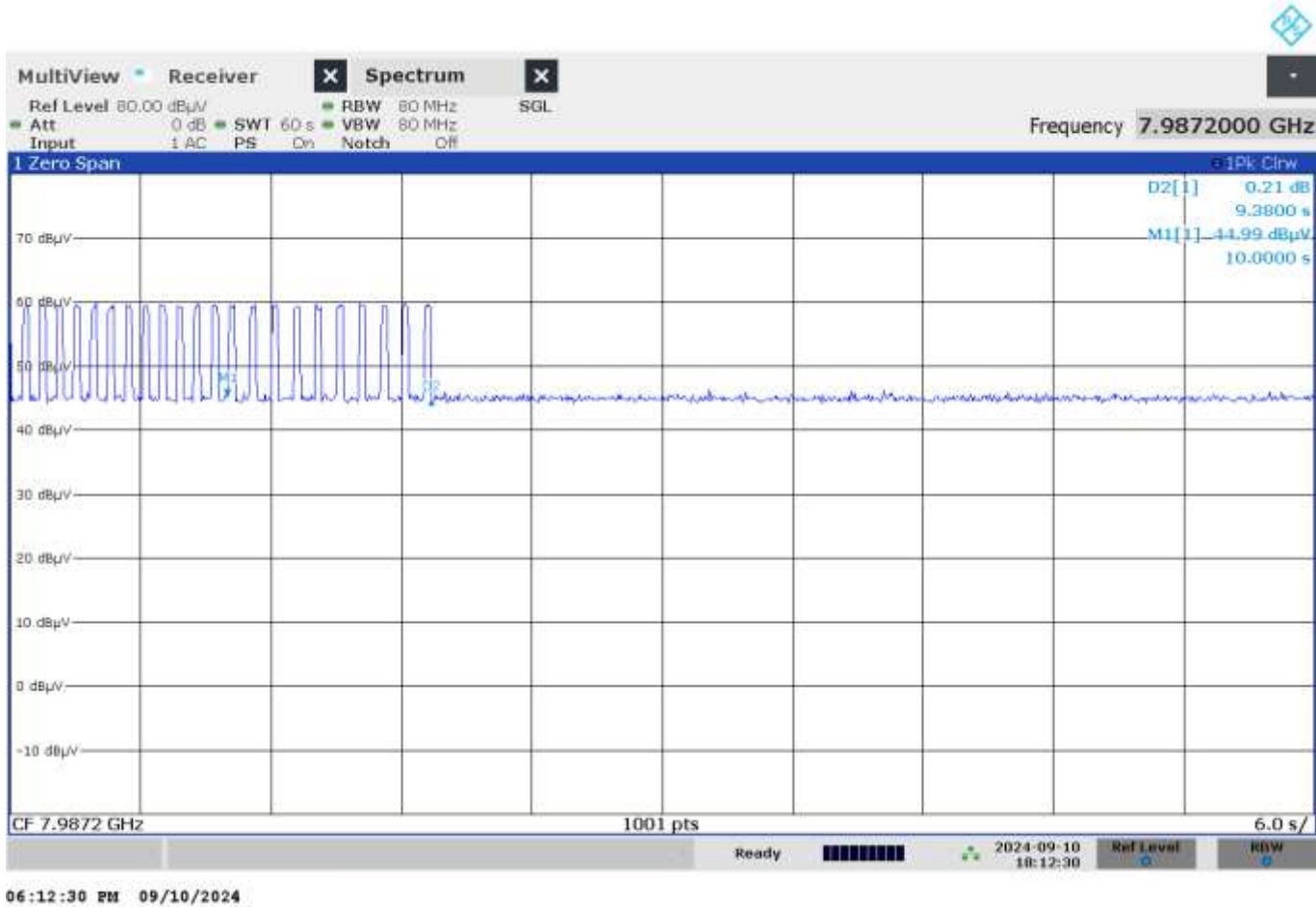
RESULTS:

Single Channel (MHz)	Cessation Time (s)	Limit (s)
7987.2	9.38	<10
Measurement uncertainty (kHz)	<± 130	

Verdict:

PASS

SINGLE CHANNEL (7987.2 MHz):



FCC 15.519 (b) / RSS-220 5.1. (a) UWB Bandwidth

SPECIFICATION:

* FCC §15.503 (a) UWB bandwidth: For the purpose of this subpart, the UWB bandwidth is the frequency band bounded by the points that are 10 dB below the highest radiated emission, as based on the complete transmission system including the antenna. The upper boundary is designated fH and the lower boundary is designated fL. The frequency at which the highest radiated emission occurs is designated fM.

* FCC §15.503 (b) Center frequency: The center frequency, fC, equals (fH + fL)/2.

* FCC §15.503 (c) Fractional bandwidth: The fractional bandwidth equals 2(fH-fL)/(fH + fL).

* FCC §15.503 (d) Ultra-wideband (UWB) transmitter: An intentional radiator that, at any point in time, has a fractional bandwidth equal to or greater than 0.20 or has a UWB bandwidth equal to or greater than 500 MHz, regardless of the fractional bandwidth.

* FCC §15.519 (b): The UWB bandwidth of a device operating under the provisions of this section must be contained between 3100 MHz and 10600 MHz.

* RSS-220 2: A UWB device is an intentional radiator that has either a -10 dB bandwidth of at least 500 MHz or a -10 dB fractional bandwidth greater than 0.2.

* RSS-220 5.1. (a): The -10 dB bandwidth of the device shall be totally contained in the band 3.1-10.6 GHz.

"-10 dB bandwidth B₋₁₀" and "-10 dB fractional bandwidth μ₋₁₀" are defined as follows:

$$B_{-10} = f_H - f_L$$

$$\mu_{-10} = B_{-10}/f_C$$

where:

fM is the frequency of maximum UWB transmission;

fH is the highest frequency at which the power spectral density of the UWB transmission is -10 dB relative to fM;

fL is the lowest frequency at which the power spectral density of the UWB transmission is -10 dB relative to fM; and

fC = (fH + fL)/2 is the centre frequency of the -10 dB bandwidth.

RESULTS:

Single Channel	FM (MHz)	FL (MHz)	FH (MHz)	FC (MHz)	B ₋₁₀ (MHz)	Min B ₋₁₀ (MHz)
7987.2 MHz	7832.050000	7706.250000	8251.950000	7979.1	545.7	500
Measurement uncertainty (kHz)	<± 130					

Verdict:

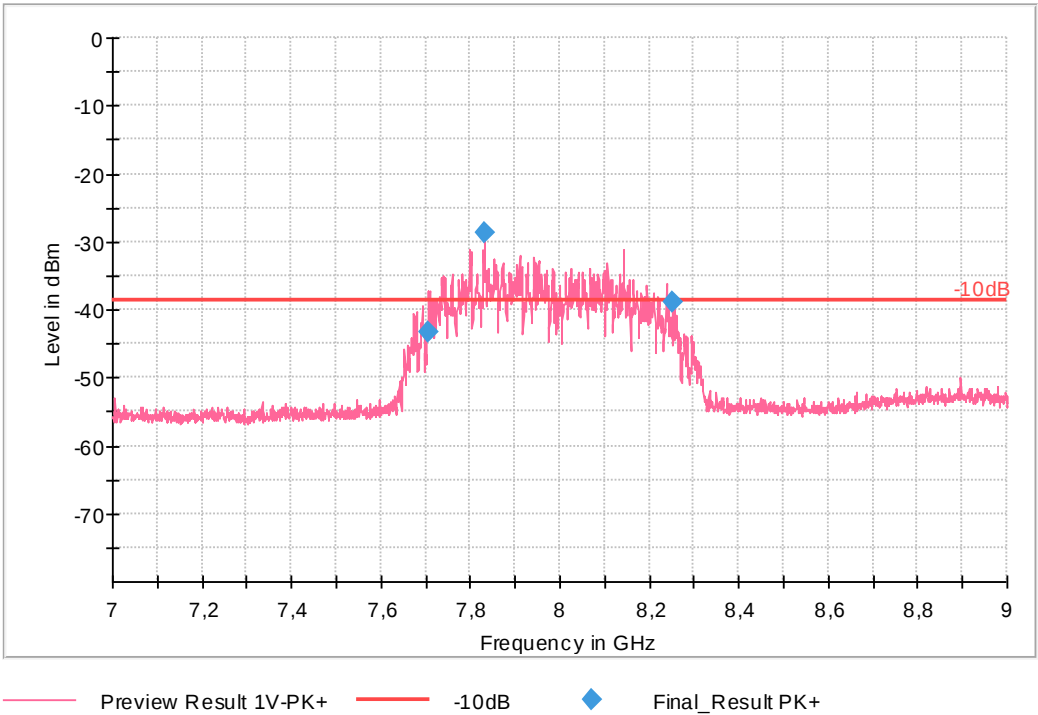
PASS

• SINGLE CHANNEL (7987.2 MHz):

Measurement settings:

Step Size	Detectors	Bandwidth	Sweep Time	Preamp
850 kHz	PK+	1 MHz	0,15 s	0 dB

Full Spectrum



FCC 15.519 (c),(d), 15.521 (c) / RSS-220 5.3.1. (c),(d),(e), Annex. Section 4 (m): Radiated Emissions

SPECIFICATION:

The radiated emissions at or below 960 MHz shall not exceed the emission levels in §15.209 & 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	-	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
Above 960	500	54	3

* §15.519 (c): The radiated emissions at or below 960 MHz from a device operating under the provisions of this section shall not exceed the emission levels in §15.209. The radiated emissions above 960 MHz from a device operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz:

Frequency Range (MHz)	EIRP (dBm)
960-1610	-75.3
1610-1990	-63.3
1990-3100	-61.3
3100-10600	-41.3
Above 10600	-61.3

* §15.519 (d): In addition to the radiated emission limits specified in the table above, UWB transmitters shall not exceed the following average limits when measured using a resolution bandwidth of no less than 1 kHz:

Frequency Range (MHz)	EIRP (dBm)
1164-1240	-85.3
1559-1610	-85.3

* §15.521 (c): Emissions from digital circuitry used to enable the operation of the UWB transmitter shall comply with the limits in §15.209, rather than the limits specified above for EIRP, provided it can be clearly demonstrated that those emissions from the UWB device are due solely to emissions from digital circuitry contained within the transmitter and that the emissions are not intended to be radiated from the transmitter's antenna.

* RSS-220 5.3.1. (c): Radiated emissions at or below 960 MHz from a device shall not exceed the limits. Measurements of radiated emissions at and below 960 MHz are to be made using a CISPR quasi-peak detector. CISPR measurement bandwidth specifications are to be used.

Frequency Range (MHz)	Field strength (µV/m)	Measurement distance (m)	E.i.r.p (dBmW)
0.009-0.490	2400/F(kHz)	300	10 log (17.28 / F ²) (F in KHz)
0.490-1.705	24000/F(kHz)	30	10 log (17.28 / F ²) (F in KHz)
1.705 - 30.0	30	30	-45.7
30 - 88	100	3	-55.2
88 - 216	150	3	-51.7
216 - 960	200	3	-49.2

Note: The emission limits for the bands 9-90 kHz and 110-490 kHz are based on measurements employing an average emissions detector.

* RSS-220 5.3.1. (d): Radiated emissions above 960 MHz from a device shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz.

Frequency Range (MHz)	EIRP (dBm) in a RBW of 1 MHz
960-1610	-75.3
1610-4750	-70.0
4750-10600	-41.3
Above 10600	-61.3

* RSS-220 5.3.1. (e): In addition to the radiated emission limits specified in the table above, radiated emissions shall not exceed the following average limits when measured using a resolution bandwidth greater than or equal to 1 kHz. The measurements shall demonstrate compliance with the stated limits at whatever resolution bandwidth is used.

Frequency Range (MHz)	EIRP (dBm)
1164-1240	-85.3
1559-1610	-85.3

* RSS-220 Annex. Section 4 (m): Emissions from digital circuitry (used only to enable the operation of the UWB transmitter and that does not control additional functions or capabilities) shall comply with the average and peak power limits applicable to the UWB transmitter. If it can be clearly demonstrated that an emission from a UWB transmitter is due solely to emissions from digital circuitry contained within the transmitter, and that the emission is not intended to be radiated from the transmitter's antenna, the limits for emissions from digital circuitry prescribed in RSS-Gen apply to that emission rather than the UWB limits.

Frequency range tested for Radiated emissions:

- Start frequency: no radiofrequency signal generated in the device found below 10th sub-harmonic, no further investigation required.
- Stop frequency: it has been performed the radiated spurious emissions until 40 GHz.

RESULTS:

1. UWB TRANSMITTER ON:

• SINGLE CHANNEL (7987.2 MHz):

Frequency range 30 MHz - 960 MHz:

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

Frequency range 960 MHz - 10.6 GHz:

Spurious frequencies at less than 20 dB of the limit:

Frequency (MHz)	RMS (dBm)	Limit 15.519/RSS-220 (dBm)	Limit 15.209/RSSGEN	Margin (dB)	Polarization
995.571600	-67.68	-75.30*	-41.25	-7.62*	V
1138.243600	-65.13	-75.30*	-41.25	-10.17*	V
1194.926800	-68.69	-75.30*	-41.25	-6.61*	V
1348.106400	-69.11	-75.30*	-41.25	-6.19*	V
1418.092800	-69.67	-75.30*	-41.25	-5.63*	V
1501.671600	-69.52	-75.30*	-41.25	-5.78*	V
1662.081200	-62.92	-70.00*	-41.25	-7.08*	V
1710.956000	-69.64	-70.00*	-41.25	-0.36*	V
1812.368800	-70.73	-70.00*	-41.25	0.73*	H
1937.399600	-68.16	-70.00*	-41.25	-1.84*	V
2062.526800	-66.54	-70.00*	-41.25	-3.46*	V
2124.994000	-73.03	-70.00*	-41.25	3.03*	V
2187.557600	-73.82	-70.00*	-41.25	3.82*	H
2499.893600	-75.05	-70.00*	-41.25	5.05*	V
2687.391600	-74.69	-70.00*	-41.25	4.69*	V
2749.955200	-74.37	-70.00*	-41.25	4.37*	V
2937.646000	-72.83	-70.00*	-41.25	2.83*	V
3062.484000	-71.00	-70.00*	-41.25	1.00*	V
3187.418400	-70.47	-70.00*	-41.25	0.47*	V
4312.406400	-70.05	-70.00*	-41.25	0.05*	V
4437.340800	-70.57	-70.00*	-41.25	0.57*	V
4562.660800	-70.61	-70.00*	-41.25	0.61*	V

*This limit only applies to the unwanted emissions obtain from operation the UWB transmitter. The emissions detected in this range come from the digital circuitry of the device. (See attached graph)

Frequency range 10.6 - 17 GHz:

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

Frequency range 17 - 26 GHz:

Spurious frequencies at less than 20 dB of the limit:

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Polarization
20880.08000	-66.00	-61.30	4.70	H

Frequency range 26 - 40 GHz:

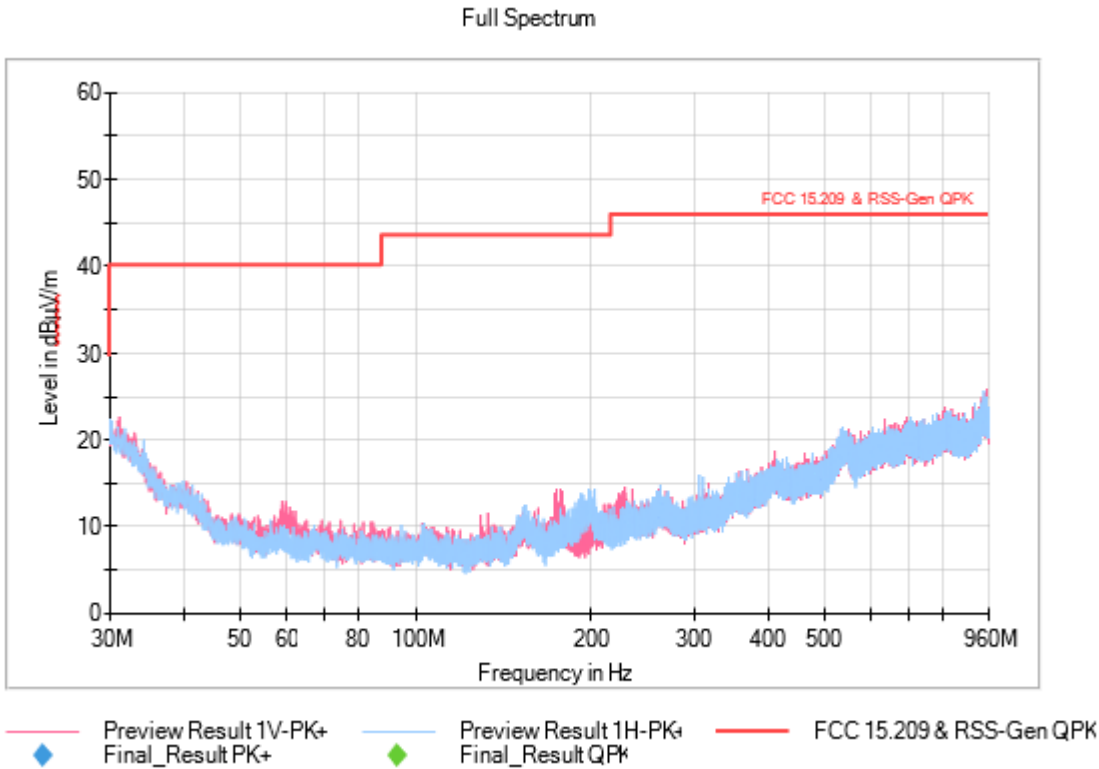
No spurious frequencies at less than 20 dB of the limit.

Measurement Uncertainty (dB): 30 MHz <± f < 1 GHz: <± 5.03
1 GHz <± f < 17 GHz: <± 4.32
17 GHz <± f <± 26.5 GHz: <± 4.58
26.5 GHz <± f <± 40 GHz: <± 4.75

Verdict:
PASS

SINGLE CHANNEL (7987.2 MHz):

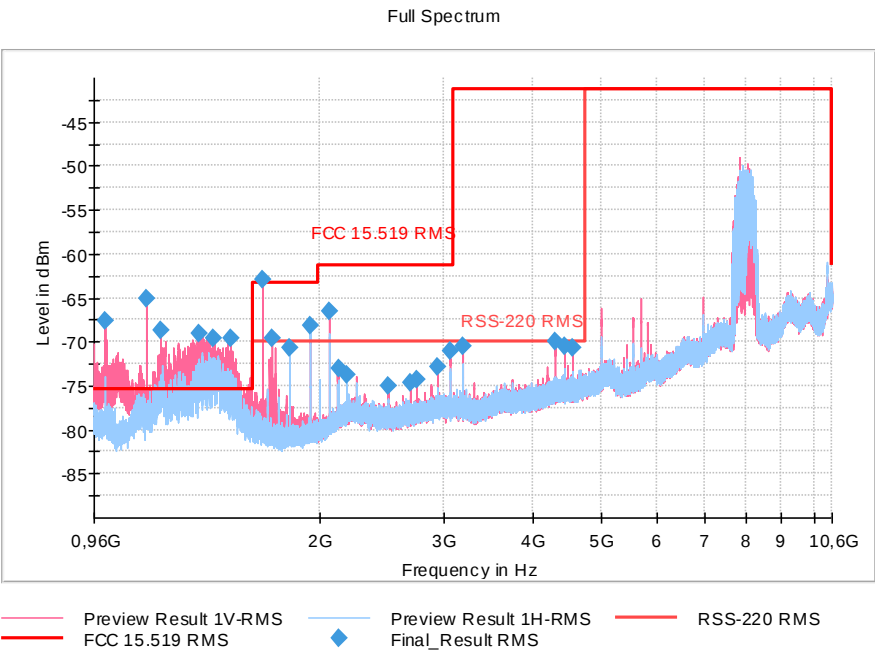
FREQUENCY RANGE 30 - 960 MHz:



Measurement settings:

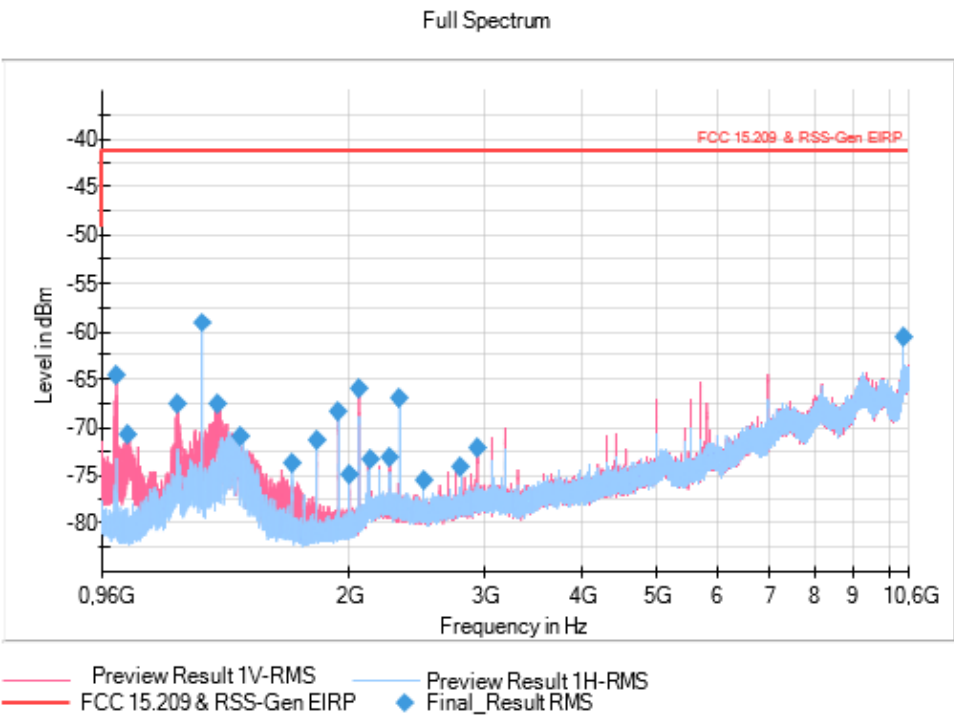
Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
30 MHz - 960 MHz	9.3 kHz	PK+	100 kHz	1 s	0 dB

FREQUENCY RANGE 960 MHz - 10.6 GHz:
UWB ON:



The peaks above the limit are due solely to emissions from digital circuitry contained within the transmitter, and that the emission is not intended to be radiated from the transmitter's antenna.

UWB OFF:



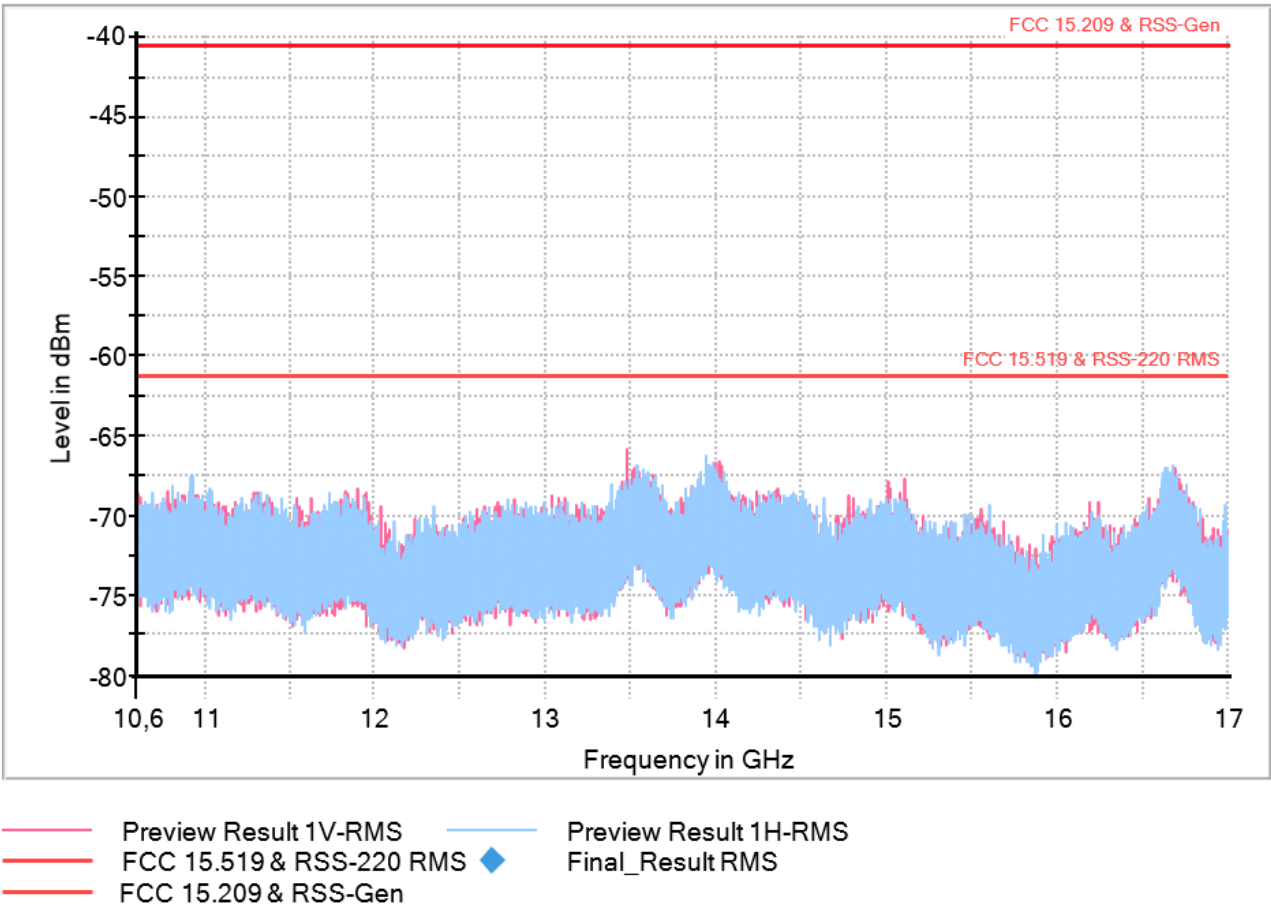
This graphic with UWB OFF demonstrates that the peaks in the range 0.96 GHz to 10.60 GHz are due to the emissions from the internal electronic circuitry of the device.

Measurement settings:

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
960 MHz - 10.6 GHz	96.4 kHz	RMS	1 MHz	1 s	0 dB

FREQUENCY RANGE 10.6 - 17 GHz:

Full Spectrum

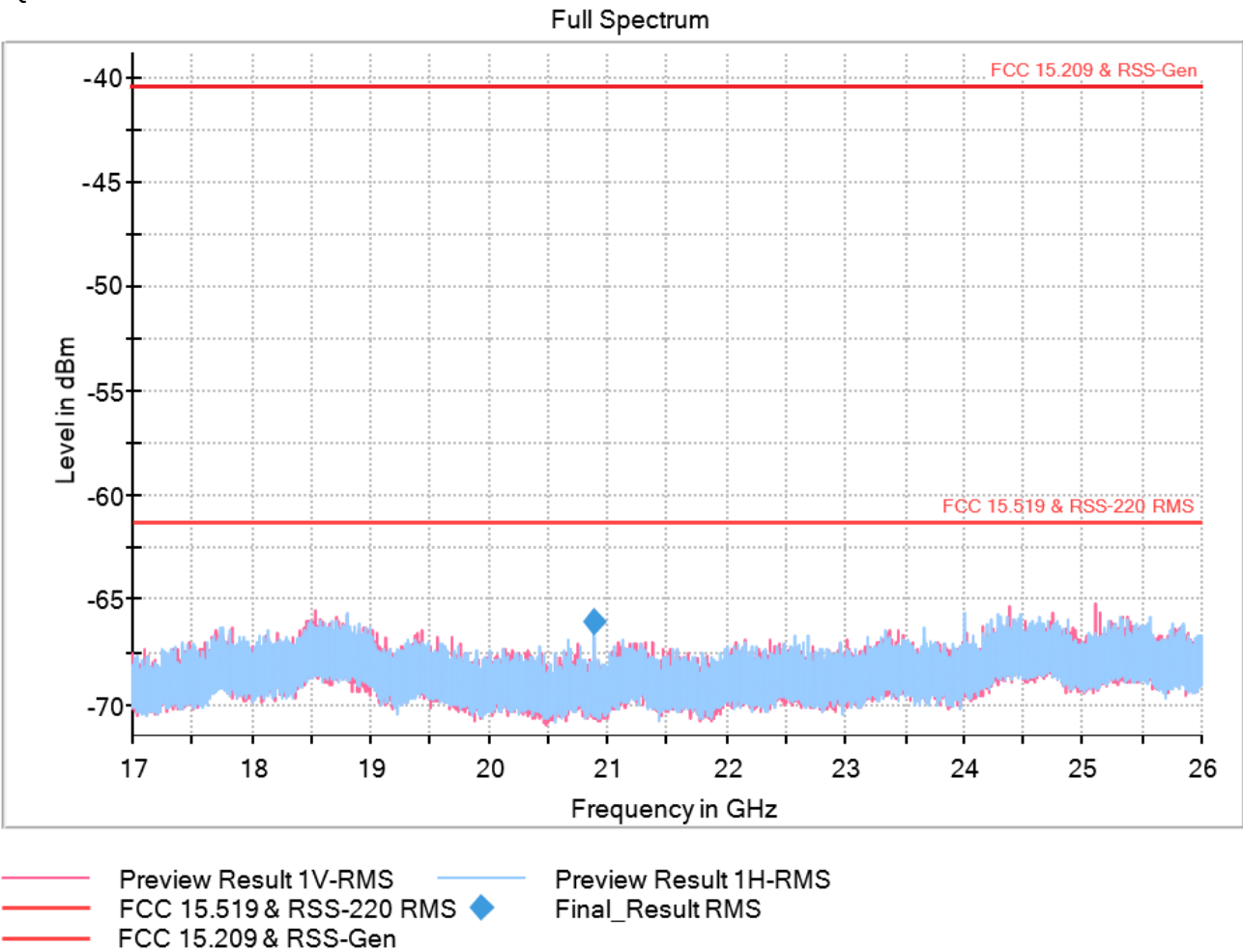


Note

Measurement settings:

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
10.6 GHz - 14 GHz	34 kHz	RMS	100 kHz	1 s	0 dB
14 GHz - 17 GHz	30 kHz	RMS	100 kHz	1 s	0 dB

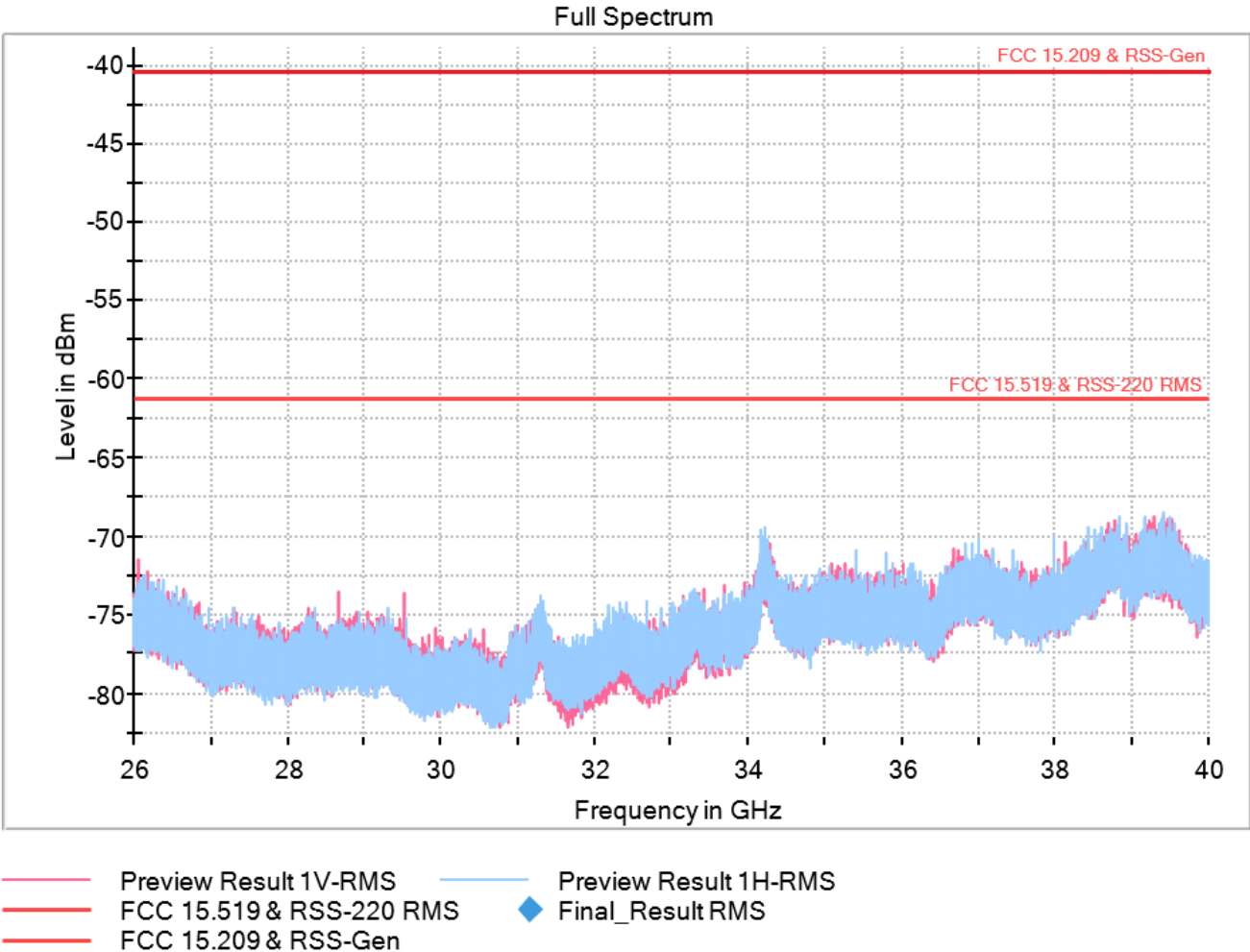
FREQUENCY RANGE 17 - 26 GHz:



Measurement settings:

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
17 GHz - 26 GHz	90 kHz	RMS	1 MHz	1 s	0 dB

FREQUENCY RANGE 26 - 40 GHz:

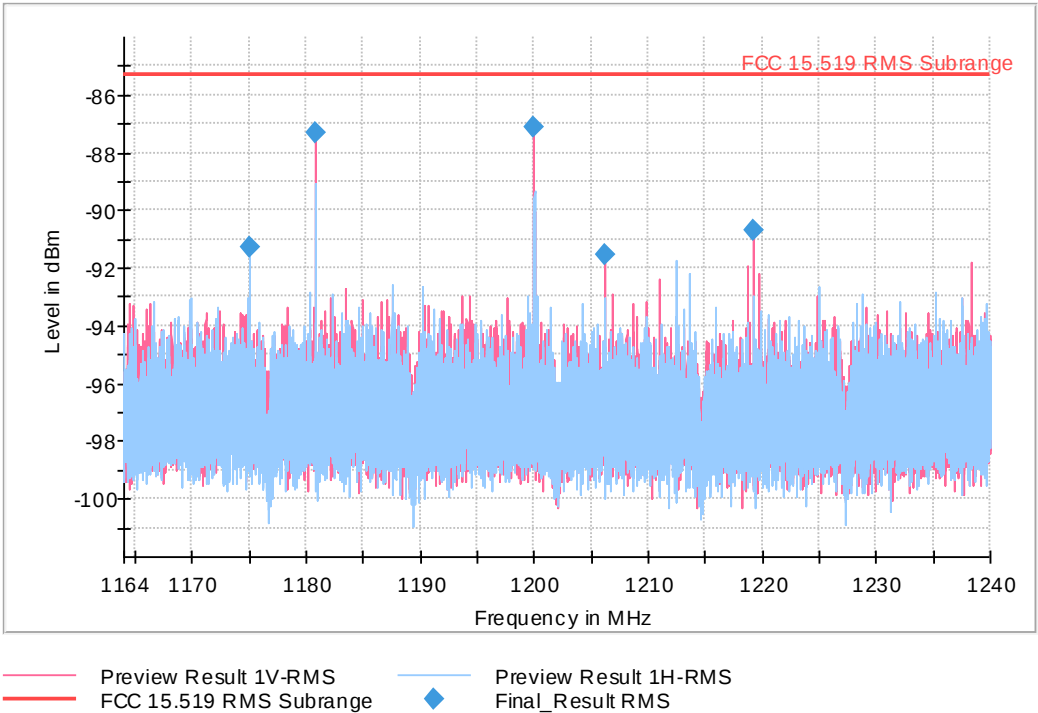


Measurement settings:

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
26 GHz - 40 GHz	140 kHz	RMS	300 kHz	1 s	0 dB

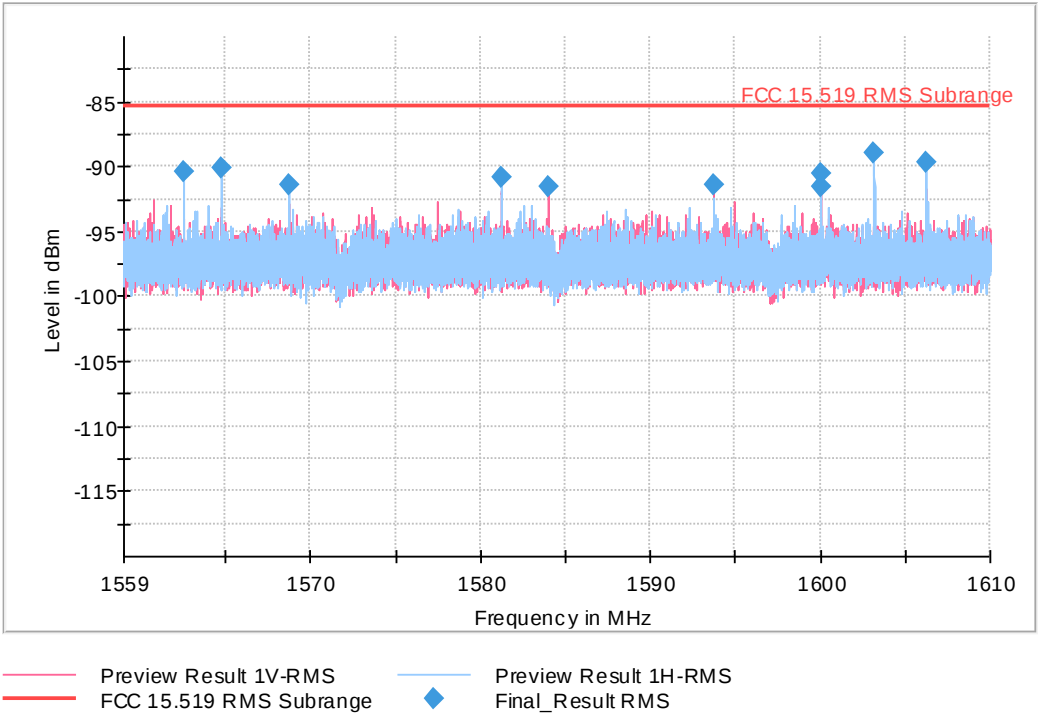
UWB Signal ON 1164 MHz-1240 MHz at RBW=10 KHz:

Full Spectrum



UWB Signal ON 1559 MHz-1610 MHz at RBW=10 KHz:

Full Spectrum



Measurement settings:

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
1.164 GHz - 1.24 GHz	760 Hz	RMS	10 kHz	Coupled	0 dB
1.559 GHz - 1.61 GHz	510 Hz	RMS	10 kHz	Coupled	0 dB

FCC 15.519 (e) / RSS-220 5.3.1. (g) UWB Peak Level

SPECIFICATION:

* §15.519 (e): There is a limit on the peak level of the emissions contained within a 50 MHz bandwidth centered on the frequency at which the highest radiated emission occurs, fM. That limit is 0 dBm EIRP. It is acceptable to employ a different resolution bandwidth, and a correspondingly different peak emission limit, following the procedures described in § 15.521.

Limit for a 1MHz resolution bandwidth at 3m: $20\log(RBW/50) = -33.98 \text{ dBm}$

* RSS-220 5.3.1. (g): The peak level of the transmissions shall not exceed the peak equivalent of the average limit contained within any 50 MHz bandwidth, as defined in section 4 of the Annex.

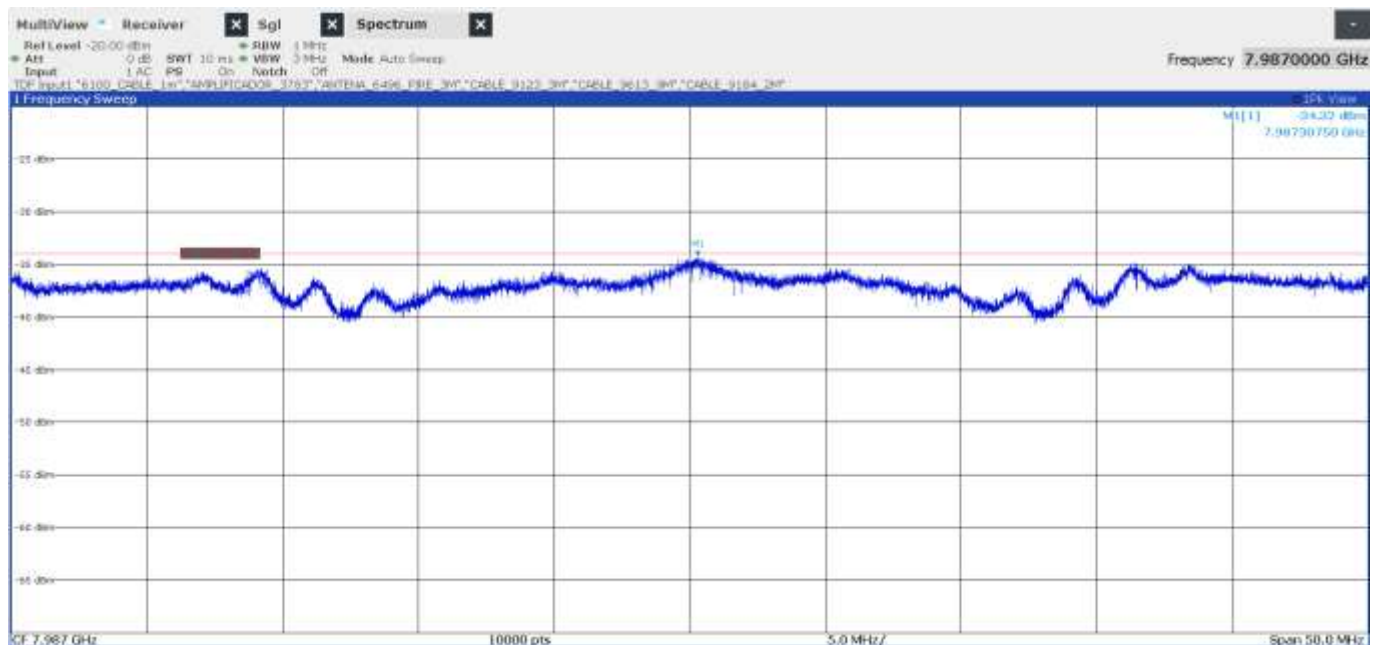
* Annex, Section 4 (c): Peak measurements shall be made in addition to average measurements. Transmissions shall not exceed 0 dBm e.i.r.p. in any 50 MHz bandwidth when the average limit is -41.3 dBm/MHz.

RESULTS:

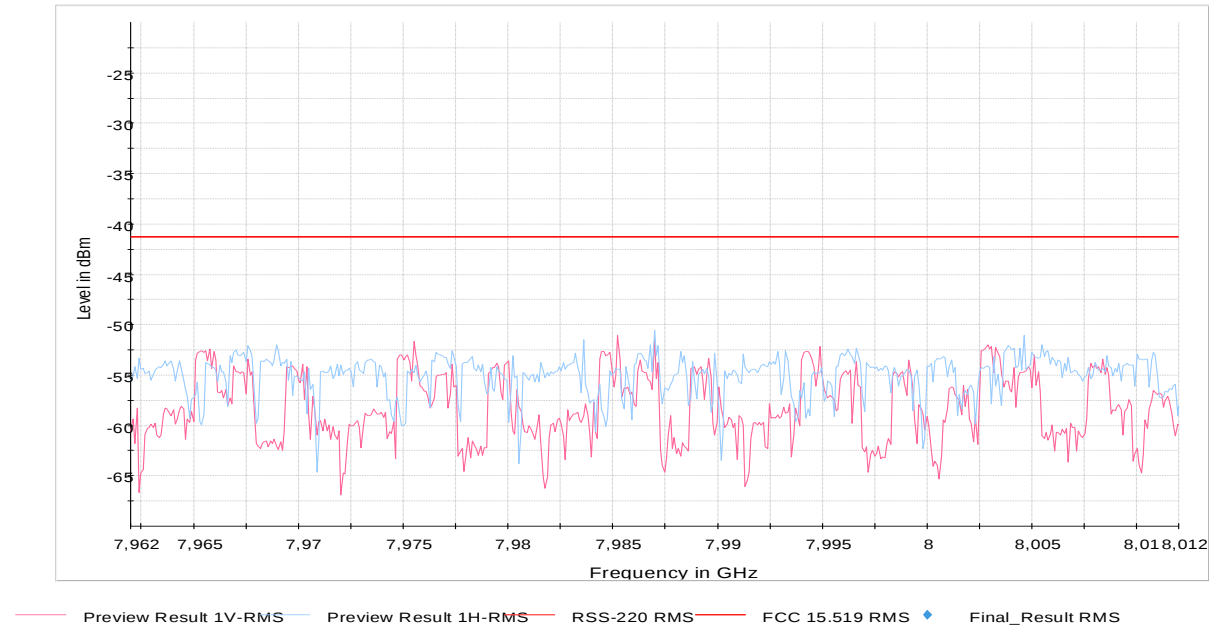
• SINGLE CHANNEL (7987.2 MHz):

Channel (MHz)	Frequency at which the highest radiated emission occurs (MHz)	Peak Level (dBm)	Average Level (dBm/MHz)
7987.2	7987.30750	-34.32	-50.54

Peak Measurement:



Average measurements



Measurement settings:

Step Size	Detectors	Bandwidth	Sweep Time	Preamp
96,4 kHz	RMS	1 MHz	1 s	0 dB

Verdict:
PASS