

	Test standard/s
FCC - Title 47 CFR Part 95	FCC - Title 47 of the Code of Federal Regulations; Chapter I; Part 95 - Personal Radio Services
FCC - Title 47 CFR Part 2	Frequency allocations and radio treaty matters; general rules and regulations
For further applied test standa	rds please refer to section 3 of this test report.

Test Item					
Kind of test item: SRD for RTTT and other vehicle or fixed installation					
Model name:	SRR6-A				
FCC ID:	OAYSRR6A				
Frequency:	76.0 – 77.0 GHz				
Antenna:	Integrated 3D antenna				
Power supply:	6.5 V to 19.0 V DC by external power supply				
Temperature range:	-40°C to +85°C				

This test report is electronically signed and valid without handwritten signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

Test report authorized:

Meheza Walla		
Lab Manager		
Radio Labs		

Test performed:

Thomas Vogler Lab Manager Radio Labs

Test report no.: 1-4593_22-02-10



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General information 2

2.1 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. CTC advanced GmbH does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item.

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2.2 Application details

Date of receipt of order:	2023-05-23
Date of receipt of test item:	2023-06-19
Start of test:*	2023-06-19
End of test:*	2023-07-25
Person(s) present during the test:	-/-

Person(s) present during the test:

*Date of each measurement, if not shown in the plot, can be requested. Dates are stored in the measurement software.

Test laboratories sub-contracted 2.3

None



3 Test standard/s, references and accreditations

Test standard	Date	Description
FCC - Title 47 CFR Part 95	-/-	FCC - Title 47 of the Code of Federal Regulations; Chapter I; Part 95 - Personal Radio Services
FCC - Title 47 CFR Part 2	-/-	Frequency allocations and radio treaty matters; general rules and regulations

Guidance	Version	Description			
		American National Standard for Methods of Measurement of			
ANSI C63.4-2014	-/-	Radio-Noise Emissions from Low-Voltage Electrical and Electronic			
		Equipment in the Range of 9 kHz to 40 GHz			
	,	American National Standard of Procedures for Compliance Testing			
ANSI C63.10-2013	-/-	of Unlicensed Wireless Devices			
ANSI C63.26-2015	-/-	American National Standard for Compliance Testing of			
		Transmitters Used in Licensed Radio Services			
KDB 653005 D01	v01r01	Equipment Authorization Guidance for 76-81 GHz Radar Devices			
	2019-04				

Accreditation	Description	
D-PL-12076-01-05	Telecommunication FCC requirements https://www.dakks.de/as/ast/d/D-PL-12076-01-05e.pdf	DALKS Deutsche Akkreditierungsstelle D-PL-12076-01-05

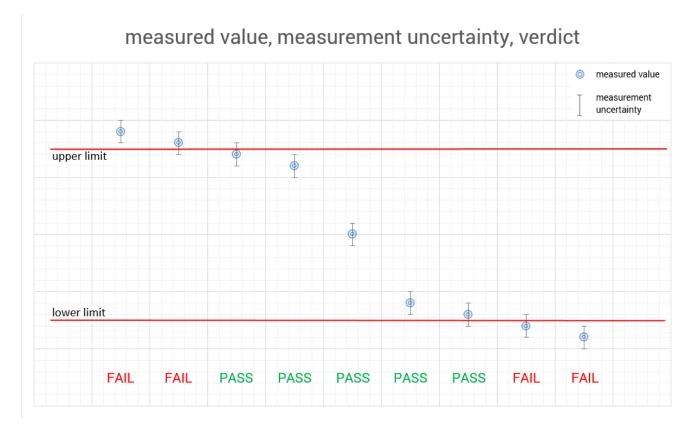
FCC designation number: DE0002



4 Reporting statements of conformity – decision rule

Only the measured values related to their corresponding limits will be used to decide whether the equipment under test meets the requirements of the test standards listed in chapter 3.

The measurement uncertainty is mentioned in this test report, see chapter 9, but is not taken into account - neither to the limits nor to the measurement results. Measurement results with a smaller margin to the corresponding limits than the measurement uncertainty have a potential risk of more than 5% that the decision might be wrong."





5 Test environment

Temperature	:	T _{nom} T _{max} T _{min}	 +22 °C during room temperature tests +85 °C during high temperature tests -40 °C during low temperature tests 	
Relative humidity content	:		55 %	
Barometric pressure	:		1016 hpa	
Power supply	:	V _{nom} V _{max} V _{min}	12.0 V DC by external power supply 19.0 V 6.5 V	



6 Test item

6.1 General description

Kind of test item : SRD for RTTT and other vehicle or fixed installation		SRD for RTTT and other vehicle or fixed installation
Model name :		SRR6-A
S/N serial number	:	A2C78668301000022333000014 (DUT_30)
Hardware status	•	B5
Software status	•	04.01.00
Frequency band :		76.0 – 77.0 GHz
Type of modulation	:	FMCW
Antenna	•	Integrated 3D antenna
Power supply : 6.5 to 19.0 V DC by external power supply		6.5 to 19.0 V DC by external power supply
Temperature range:-40°C to +85°C		-40°C to +85°C

6.2 Additional information

Operating modes as declared by the manufacturer:

HVM_mode_ID	Fcenter [GHz]	Info	Bandwidth [MHz]
03		Operation	938.4
09	76.492	Operation	926.7
15		Operation	934.8
21		Operation	938.4
33		Operation	926.7
45		Operation	934.8
68		EoL/Service	816.9

Tests were performed on all modulations

The content of the following annexes is defined in the QA. It may be that not all of the listed annexes are necessary for this report, thus some values in between may be missing.

Test setup and EUT photos are included in test report:

1-4593/22-02-01_AnnexA 1-4593/22-02-01_AnnexB 1-4593/22-02-01_AnnexD



7 Description of the test setup

Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Weekly chamber inspections and range calibrations are performed. Where possible, RF generating and signaling equipment as well as measuring receivers and analyzers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Lab/Item).

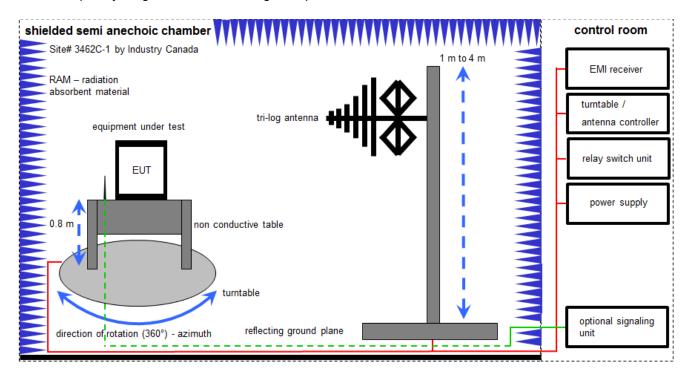
Agenda: Kind of Calibration

k	calibration / calibrated		ΕK	limited calibration
ne	ne not required (k, ev, izw, zw not required)		zw	cyclical maintenance (external cyclical
				maintenance)
ev	periodic self verification		izw	internal cyclical maintenance
Ve	long-term stability recognized		g	blocked for accredited testing
vlkl!	Attention: extended calibration interval			
NK!	Attention: not calibrated		*)	next calibration ordered / currently in progress



7.1 Shielded semi anechoic chamber

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 30 MHz to 1 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are conform to specifications ANSI C63. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received. The wanted and unwanted emissions are received by spectrum analyzers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63.



Measurement distance: tri-log antenna 10 meter

FS = UR + CL + AF (FS-field strength; UR-voltage at the receiver; CL-loss of the cable; AF-antenna factor)

Example calculation:

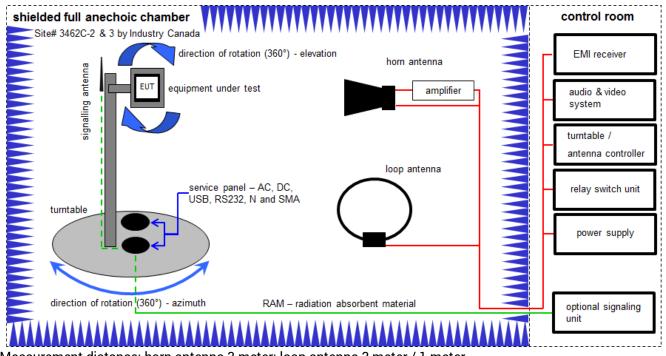
FS [dBµV/m] = 12.35 [dBµV/m] + 1.90 [dB] + 16.80 [dB/m] = 31.05 [dBµV/m] (35.69 µV/m)



Equipment table:

No.	Lab / Item	Equipment	Туре	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
1	n. a.	Switch-Unit	3488A	HP	2719A14505	300000368	ev	-/-	-/-
2	n. a.	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP	2920A04466	300000580	ne	-/-	-/-
3	n. a.	Meßkabine 1	HF-Absorberhalle	MWB AG 300023		300000551	ne	-/-	-/-
4	n. a.	EMI Test Receiver	ESCI 3	R&S	101240	300003312	k	14.12.2022	31.12.2023
5	n. a.	Antenna Tower	Model 2175	ETS-Lindgren	64762	300003745	izw	-/-	-/-
6	n. a.	Positioning Controller	Model 2090	ETS-Lindgren	64672	300003746	izw	-/-	-/-
7	n. a.	Turntable Interface- Box	Model 105637	ETS-Lindgren	44583	300003747	izw	-/-	-/-
8	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck Mess - Elektronik	318	300003696	vlKl!	30.09.2019	29.09.2023
9	n. a.	Switch-Unit	3488A	HP	2719A14505	300000368	ev	-/-	-/-
10	n. a.	EMI Test Receiver	ESR3	Rohde & Schwarz	102587	300005771	k	20.05.2022	31.05.2023

Shielded fully anechoic chamber 7.2



Measurement distance: horn antenna 3 meter; loop antenna 3 meter / 1 meter

FS = UR + CA + AF (FS-field strength; UR-voltage at the receiver; CA-loss of the signal path; AF-antenna factor)

Example calculation: FS $[dB\mu V/m] = 40.0 [dB\mu V/m] + (-35.8) [dB] + 32.9 [dB/m] = 37.1 [dB\mu V/m] (71.61 \mu V/m)$

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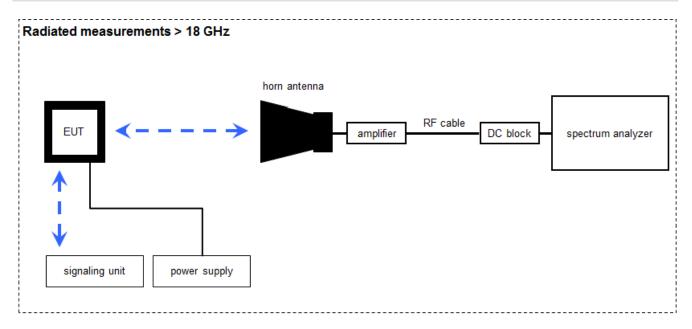


Equipment table:

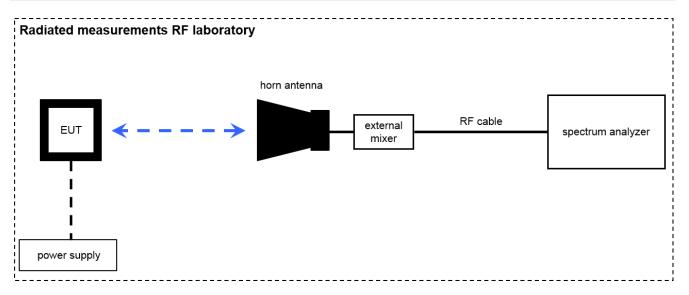
No.	Lab / Item	Equipment	Туре	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
1	n. a.	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP	2818A03450	300001040	vlKI!	09.12.2020	08.12.2023
2	n. a.	Active Loop Antenna 9 kHz to 30 MHz	6502	EMCO	2210	300001015	vlKl!	01.07.2021	31.07.2023
3	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996	ev	-/-	-/-
4	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck Mess - Elektronik	318	300003696	vlKl!	30.09.2021	29.09.2023
5	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	9709-5289	300000213	vlKl!	26.07.2022	25.07.2024
6	n. a.	Switch / Control Unit	3488A	HP	*	300000199	ne	-/-	-/-
7	n. a.	Variable isolating transformer	MPL IEC625 Bus Variable isolating transformer	Erfi	91350	300001155	ne	-/-	-/-
8	n. a.	EMI Test Receiver 20Hz- 26,5GHz	ESU26	R&S	100037	300003555	k	07.12.2022	31.12.2023
9	n. a.	Highpass Filter	WHKX7.0/18G-8SS	Wainwright	19	300003790	ne	-/-	-/-
10	n. a.	Broadband Amplifier 0.5-18 GHz	CBLU5184540	CERNEX	22049	300004481	ev	-/-	-/-
11	n. a.	Broadband Amplifier 5-13 GHz	CBLU5135235	CERNEX	22010	300004491	ev	-/-	-/-
12	n. a.	4U RF Switch Platform	L4491A	Agilent Technologies	MY50000037	300004509	ne	-/-	-/-
13	n. a.	NEXIO EMV- Software	BAT EMC V3.16.0.49	EMCO		300004682	ne	-/-	-/-
14	n. a.	PC	ExOne	F+W		300004703	ne	-/-	-/-
15	n. a.	RF-Amplifier	AMF-6F06001800- 30-10P-R	NARDA-MITEQ Inc	2011572	300005241	ev	-/-	-/-



7.3 Radiated measurements > 18 GHz



7.4 Radiated measurements > 50/85 GHz



0P = AV + D - G

(OP-rad. output power; AV-analyzer value; D-free field attenuation of measurement distance; G-antenna gain)

Example calculation:

OP [dBm] = -54.0 [dBm] + 64.0 [dB] - 20.0 [dBi] = -10 [dBm] (100 μW)

Note: conversion loss of mixer is already included in analyzer value.



Equipment table:

No.	Lab / Item	Equipment	Туре	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
1	n.a.	Horn Antenna 18,0- 40,0 GHz	LHAF180	Microw.Devel	39180-103-021	300001747	vlKI!	17.01.2022	31.01.2024
2	n. a.	Std. Gain Horn Antenna 18.0-26.5 GHz	638	Narda		300000486	vIKI!	17.01.2022	31.01.2024
3	n. a.	Std. Gain Horn Antenna 26.5-40.0 GHz	V637	Narda	82-16	300000510	vlKl!	17.01.2022	31.01.2024
4	n.a.	Std. Gain Horn Antenna 40-60 GHz	2424-20	Flann	76	400001981	ne	-/-	-/-
5	n. a.	Std. Gain Horn Antenna 49.9-75.8 GHz	2524-20	Flann	*	300001983	ne	-/-	-/-
6	n. a.	Std. Gain Horn Antenna 60-90 GHz	COR 60_90	Thomson CSF		300000814	ev	-/-	-/-
7	n. a.	Std. Gain Horn Antenna 73.8-112 GHz	2724-20	Flann	*	300001988	ne	-/-	-/-
8	n.a.	Std. Gain Horn Antenna 92.3-140 GHz	2824-20	Flann		300001993	ne	-/-	-/-
9	n. a.	Std. Gain Horn Antenna 114-173 GHz	2924-20	Flann	*	300001999	ne	-/-	-/-
10	n. a.	Std. Gain Horn Antenna 145-220 GHz	3024-20	Flann	*	300002000	ne	-/-	-/-
11	n. a.	Std. Gain Horn Antenna 217-330 GHz	32240-20	Flann	233278	300004960	ne	-/-	-/-
12	n. a.	Broadband LNA 18-50 GHz	CBL18503070PN	CERNEX	25240	300004948	ev	09.03.2022	08.03.2024
13	n. a.	Harmonic Mixer 3- Port, 50-75 GHz	FS-Z75	Rohde & Schwarz	101578	300005788	k	07.07.2022	31.07.2023
14	n. a.	Harmonic Mixer 3- Port, 60-90 GHz	FS-Z90	R&S	101555	300004691	k	21.07.2022	31.07.2023
15	n. a.	Harmonic Mixer 3- Port, 75-110 GHz	FS-Z110	R&S	101411	300004959	k	07.07.2022	31.07.2023
16	n.a.	Harmonic Mixer 3- port, 90-140 GHz	FS-Z140	Rohde & Schwarz	101119	300005581	k	20.07.2022	31.07.2023
17	n. a.	Harmonic Mixer 3- Port, 110-170 GHz	FS-Z170	Radiometer Physics GmbH	100014	300004156	k	01.07.2022	31.07.2023
18	n. a.	Harmonic Mixer 3- Port, 140-220 GHz	SAM-220	Radiometer Physics GmbH	200001	300004157	k	21.07.2022	31.07.2023
19	n. a.	Harmonic Mixer 3- Port, 220-325 GHz	SAM-325	Radiometer Physics GmbH	100002	300004158	k	25.07.2022	31.07.2023
20	n. a.	Spectrum Analyzer 2 Hz - 85 GHz	FSW85	R&S	101333	300005568	k	11.07.2022	31.07.2023
21	n.a.	Power Supply	E3632A	Agilent Technologies	MY40001320	400000396	ev	-/-	-/-
22	n. a.	Temperature Test Chamber	T-40/50	CTS GmbH	064023	300003540	ev	09.05.2022	08.05.2024



8 Sequence of testing

8.1 Sequence of testing radiated spurious 9 kHz to 30 MHz

Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- If the EUT is a tabletop system, it is placed on a table with 0.8 m height.
- If the EUT is a floor standing device, it is placed directly on the turn table.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- Measurement distance is 3 m (see ANSI C 63.4) see test details.
- EUT is set into operation.

Premeasurement*

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna height is 1 m.
- At each turntable position the analyzer sweeps with positive-peak detector to find the maximum of all emissions.

Final measurement

- Identified emissions during the pre-measurement are maximized by the software by rotating the turntable from 0° to 360°.
- Loop antenna is rotated about its vertical axis for maximum response at each azimuth about the EUT. (For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT)
- The final measurement is done in the position (turntable and elevation) causing the highest emissions with quasi-peak (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. A plot with the graph of the premeasurement and the limit is stored.

*)Note: The sequence will be repeated three times with different EUT orientations.



8.2 Sequence of testing radiated spurious 30 MHz to 1 GHz

Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- Measurement distance is 10 m or 3 m (see ANSI C 63.4) see test details.
- EUT is set into operation.

Premeasurement

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height changes from 1 m to 3 m.
- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

- The final measurement is performed for at least six highest peaks according to the requirements of the ANSI C63.4.
- Based on antenna and turntable positions at which the peak values are measured the software maximize the peaks by changing turntable position ± 45° and antenna height between 1 and 4 m.
- The final measurement is done with quasi-peak detector (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement with marked maximum final results and the limit is stored.



8.3 Sequence of testing radiated spurious 1 GHz to 18 GHz

Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- If the EUT is a tabletop system, a 2-axis positioner with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed directly on the turn table.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- Measurement distance is 3 m (see ANSI C 63.4) see test details.
- EUT is set into operation.

Premeasurement

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height is 1.5 m.
- At each turntable position and antenna polarization the analyzer sweeps with positive peak detector to find the maximum of all emissions.

- The final measurement is performed for at least six highest peaks according to the requirements of the ANSI C63.4.
- Based on antenna and turntable positions at which the peak values are measured the software maximizes the peaks by rotating the turntable from 0° to 360°. This measurement is repeated for different EUT-table positions (0° to 150° in 30°-steps) and for both antenna polarizations.
- The final measurement is done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and RMS detector (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement with marked maximum final results and the limit is stored.



8.4 Sequence of testing radiated spurious above 18 GHz

Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet.
- The measurement distance is as appropriate (e.g. 0.5 m).
- The EUT is set into operation.

Premeasurement

• The test antenna is handheld and moved carefully over the EUT to cover the EUT's whole sphere and different polarizations of the antenna.

- The final measurement is performed at the position and antenna orientation causing the highest emissions with Peak and RMS detector (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement and the limit is stored.



8.5 Sequence of testing radiated spurious above 50/85 GHz with external mixers

Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet.
- The measurement distance is as appropriate for far field (e.g. 0.25 m).
- The EUT is set into operation.

Premeasurement

- The test antenna with external mixer is handheld and moved carefully over the EUT to cover the EUT's whole sphere and different polarizations of the antenna.
- Caution is taken to reduce the possible overloading of the external mixer.

- The final measurement is performed at the position and antenna orientation causing the highest emissions with Peak and RMS detector (as described in ANSI C 63.4).
- As external mixers may generate false images care is taken to ensure that any emission measured by the spectrum analyzer does indeed originate in the EUT. Signal identification feature of spectrum analyzer is used to eliminate false mixer images (i.e., it is not the fundamental emission or a harmonic falling precisely at the measured frequency).
- Final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement and the limit is stored.



9 Measurement uncertainty

Test case	Uncertainty
Equivalent isotropically radiated power (e.i.r.p.)	Conducted value ± 1 dB Radiated value ± 3 dB
Permitted range of operating frequencies	± 100 kHz
Conducted unwanted emissions in the spurious domain (up to 40	± 1 dB
Radiated unwanted emissions in the spurious domain (up to 40	± 3 dB
Conducted unwanted emissions in the spurious domain (40 to 50	± 4 dB
Radiated unwanted emissions in the spurious domain (40 to 50	± 4 dB
Conducted unwanted emissions in the spurious domain (50 to	± 5 dB
Radiated unwanted emissions in the spurious domain (50 to 300	± 5 dB
DC and low frequency voltages	± 3 %
Temperature	± 1 °C
Humidity	± 3 %

10 Far field consideration for measurements above 18 GHz

Far field distance calculation:

 $D_{ff} = 2 \times D^2 / \lambda$

with

- D_{ff} Far field distance
- D Antenna dimension
- λ wavelength

Spurious emission measurements:

Antenna frequency Range in GHz	Highest measured frequency in GHz	D in cm	λ in cm	D _{ff} in cm
18-26	26	3.4	1.15	20.04
26-40	40	2.2	0.75	12.91
40-50	50	2.77	0.60	25.58
50-75	75	1.85	0.40	17.11
75-110	110	1.24	0.27	11.28
90-140	140	1.02	0.22	9.72
110-170	170	0.85	0.18	8.19
140-220	220	0.68	0.14	6.78
220-325	325	0.43	0.09	4.01
325-500	500	0.26	0.06	2.22



11 Summary of measurement results

11.1 Summary

\boxtimes	No deviations from the technical specifications were ascertained
	There were deviations from the technical specifications ascertained
	This test report is only a partial test report. The content and verdict of the performed test cases are listed below.

TC Identifier	Description	Verdict	Date	Remark
RF-Testing	47 CFR Part 95 Subpart M	see below	2023-07-28	-/-

Test specification clause	Test case	Temperature conditions	Power source voltages	Pass	Fail	NA	NP	Remark
§2.1046 §95.3367 (a) / (b)	Radiated power	Nominal	Nominal	\boxtimes				complies
§2.1047	Modulation characteristics	-/-	-/-	\boxtimes				complies
§2.1049	Occupied bandwidth (99% bandwidth)	Nominal	Nominal	\boxtimes				complies
§2.1051	Spurious emissions at antenna terminals	Nominal	Nominal	\boxtimes				See note
§2.1053 §95.3379 (a)(1) §95.3379 (a)(2) §95.3379 (a)(3)	Field strength of emissions (radiated spurious)	Nominal	Nominal	X				complies
§2.1055 §95.3379 (b)	Frequency stability	Nominal and Extreme	Nominal and Extreme	\boxtimes				complies

Note: C = Compliant; NC = Not compliant; NA = Not applicable; NP = Not performed

See FCC's Millimeter Wave Test Procedures:

I. A radiated method of measurements in order to demonstrate compliance with the various regulatory requirements has been chosen in consideration of test equipment availability and the limitations of many external harmonic mixers. A conducted method of measurement could be employed if EUT and mixer waveguides both are accessible and of the same type (WG number) and if waveguide sections and transitions can be found. Another potential problem is that the peak power output of devices operating under Sections 15.253 and 15.255 may exceed the +20 dBm input power limit of many commercially available mixers. For these reasons a radiated method is preferred.



12 Measurement results

12.1 Radiated power

Description:

<u>§95.3367:</u>

The fundamental radiated emission limits within the 76-81 GHz band are expressed in terms of Equivalent Isotropically Radiated Power (EIRP) and are as shown below.

Limits:

FCC §95.3367 (a) (b)/ RSS-251 (5.2.2)

Frequency	Limit (eirp)
76.0. 91.0.0117	50 dBm (Average)
76.0 - 81.0 GHz	55 dBm/MHz (PEAK)

Measurement: Average Power

Measurement parameter				
Detector:	RMS			
Sweep time:	120 s			
Resolution bandwidth:	1 MHz			
Video bandwidth:	3 MHz			
Trace-Mode:	Clear Write			
Measurement distance:	2 m			



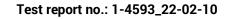
Measurement: Peak Power

Measurement parameter				
Detector:	Pos-Peak			
Sweep time:	120 s			
Resolution bandwidth:	1 MHz			
Video bandwidth:	3 MHz			
Trace-Mode:	Max Hold			
Measurement distance:	2 m			

Measurement results:

Modulations / ⁻	Test conditions	Radiated Peak Power (eirp) [dBm]	Radiated Mean Power (eirp) / Channel power [dBm]
03	T _{nom} / V _{nom}	30.12	21.98
09	T _{nom} / V _{nom}	31.02	21.95
15	T _{nom} / V _{nom}	31.02	21.95
21	T _{nom} / V _{nom}	25.96	17.90
33	T _{nom} / V _{nom}	26.81	18.02
45	T _{nom} / V _{nom}	26.96	17.93
68	T _{nom} / V _{nom}	24.80	17.82

Verdict: Compliant



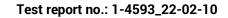


Plot 1: OBW, Mode 03, Tnom / Vnom

Madding	Spectrum	X Sp	t	Y Carach	um 3	/			~
MultiView	•		ectrum 2	× Spectr	um 3	×			Ľ
Ref Level 48.00	dBm Offse	t 55.00 dB • RE							
Inp: ExtMix E	= SW1	120 s 🖷 VB	WY 3 MIHZ WI	ode Auto Sweep					
1 Occupied Band	dwidth							o1Pk M	ax 🛛 2Rm Max
								M1[1]	30.12 dBm
40 dBm									6.408 100 GH
				M1				M2[2]	-5.36 dBm
30 dBm	T1 XAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	when when when the second second	A WARRAN WARRANT	www.managanagan	And the of the second second	nikindroukakida kan	and when an and	MAR MARANA MAKE	6.394 100 GH
	M				an the states a	and the second of the			
20 dBm									
10 dBm									
									N
0 dBm				M2					
l V									1
-10 dBm									H.
. When	- And - Contraction - Contract								Mapphonether
-20 dBm	1								Linear Mail and Anno
	1							,	
-30 dBm	1								k
-40 dBm									
-50 dBm									
CF 76.5 GHz			1201 p	ots	12	0.0 MHz/			Span 1.2 GHz
2 Marker Table									
Type Ref	Trc	X-Value 76.4081 G	U 7	Y-Value 30.12 dBm	Occ Bw	Function	03	Function R 2.258 434 9	
M1 T1	1	76.044053 G		27.75 dBm	Occ Bw Cer	atroid	92.		702 MNZ 31 843 GHz
T2	1	76.966 311 0	θHz	25.05 dBm	Occ Bw Fre				12843 MHz
M2	2	76.3941 G	Hz	-5.36 dBm					
~							Measuring		2023-06-19
								<u> </u>	12:05:28
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Plot 2: OBW, Mode 09, Tnom / Vnom

MultiView	Spectrum	× Spe	ectrum 2	× Spectr	um 3 🔹	×			
Ref Level 48.00 d	dBm Offset	t 55.00 dB 🖷 RE	W 1 MHz		_				_
	● SWT	120 s 👄 VB	W 3 MHz Me	ode Auto Sweep					
Inp: ExtMix E 1 Occupied Bandy	width								ax e 2Rm Max
T Occupied Bandy	widur							M2[2]	-5,47 dBm
40 dBm									6,290 200 GHz
		M1						M1[1]	31.02 dBm
30 dBm	T1		ور باروبواجم کې د کې کې د کې ور کې	10000000000000000000000000000000000000	and the second second second			T2 7	6.242200 GHz
· · · · · · · · · · · · · · · · · · ·	V							1 N	
20 dBm								W	
10 dBm									
								1	
0 dBm			M2					1	
I 🖌									1
-10 dBm	aller offer							Mushing	\
man de Will	particular and the second seco							All the second second	way and any way have
-20 dBm 🚽	¥								1
								M.	
-30 dBm									•
-40 dBm									
-50 dBm CF 76.5 GHz			1201 p	te	12	0.0 MHz/			Span 1.2 GHz
2 Marker Table			1201 p	ta	12				5pan 1,2 GHZ
Type Ref	Trc	X-Value		Y-Value		Function		Function Re	esult
M1	1	76.242 2 G		31.02 dBm	Occ Bw		91	3.928 349 7	43 MHz
T1	1	76.045 597 G		28.87 dBm	Occ Bw Cer				1128 GHz
T2 M2	2	76.959 525 G	HZ	28.47 dBm -5.47 dBm	Occ Bw Fre	iq urrset		2.561 1	27.61 MHz
	-						- Measuring		2023-06-19 13:06:33
									13:06:33
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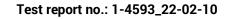
<u>^</u>

Plot 3: OBW, Mode 15, T_{nom} / V_{nom}

MultiView	- Spectrum	N X Spe	ectrum 2	× Spectr	um 3	×			
Ref Level 48	.00 dBm Offse	t 55.00 dB 🖷 RE	3W 1 MHz			_			
	● SWT	120 s 👄 VB	W 3 MHz Mo	de Auto Sweep					
Inp: ExtMix E 1 Occupied Ba	andwidth								ax e 2Rm Max
1 Occupied Ba								M1[1]	31.02 dBm
40 dBm									76,253 200 GHz
10 0.011		M						M2[2]	-5.20 dBm
30 dBm	1 1	www.www.www.		-	-	ANNO TO STORE	and the second states of the second states and the second states and the second states are second states and the	Town when the start	6.317 200 GHz
						here i northe di		[· · · · · ·]	
20 dBm									
								1	
10 dBm	++								
	11								
0 dBm	1		M2						
	1		⁷ 11'						
-10 dBm-								******	Maria
-20 dBm	- Marine - M							WWWWW.	Manproperture
-20 dBm	l lí							l W	
-30 dBm								η	N
-30 ubii									
-40 dBm									
-50 dBm									
CF 76.5 GHz	•		1201 pt	s	12	0.0 MHz/			Span 1.2 GHz
2 Marker Tab									
Type Re M1	f Trc	X-Value 76.253 2 G	H7 7	Y-Value 31.02 dBm	Occ Bw	Function	91	Function R 6.966 500 8	esult R39 MH7
T1	1	76.043 692 0		28.53 dBm	Occ Bw Ce	ntroid			74941 GHz
T2	1	76,960 658 0	GHz	30.12 dBm	Occ Bw Fre				41 406 MHz
M2	2	76.317 2 G	HZ	-5.20 dBm					
							- Measuring.		2023-06-19 13:13:24
	/2022								
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Plot 4: OBW, Mode 21, T_{nom} / V_{nom}





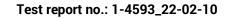


Plot 5: OBW, Mode 33, Tnom / Vnom

				_		_			<u> </u>
MultiView 📑	Spectrum	🗆 🗙 Spe	ectrum 2	× Spect	rum 3 🔰	×			-
Ref Level 48.00	dBm Offse	t 55.00 dB 🖷 RE	W 1 MHz		_				
	● SWT	120 s 👄 VB	W 3 MHz Mo	de Auto Sweep					
Inp: ExtMix E 1 Occupied Band	dwidth							o 1 Pk M	ax e 2Rm Max
								M1[1]	26.81 dBm
40 dBm									6.304 200 GH
								M2[2]	-9.59 dBn
30 dBm	T1		M1						6.380 100 GH
	Bur he washing	and all house and there a	he was here the second	and a second state of the second state of the second states of the secon	Marrison and a second	dree who we have a second	M. Walnus and a second second	www.harman.wer.Wert	
20 dBm	1							l,	
10 dBm									
10 0.011								ľ	
0 dBm	1								ľ
l l				M2					h
-10 dBm		whith	~~~~~~			-46-99			
-20 dBm								All the second s	Muchannan
-20 dBm-	8 million and a second								
-30 dBm	}								β
30 ubiii									
-40 dBm									
-50 dBm			1001	-	-				
CF 76.5 GHz 2 Marker Table			1201 p	ts	12	0.0 MHz/			Span 1.2 GHz
Z Marker Table Type Ref	Trc	X-Value		Y-Value		Function		Function Re	esult
M1	1	76.304 2 G		26.81 dBm	Occ Bw		91	5.460 228 5	581 MHz
T1 T2	1	76.044063 0 76.959523 0		23.34 dBm 24.69 dBm	Occ Bw Cer Occ Bw Fre				93 355 GHz 54 806 MHz
M2	2	76.3801 G		-9.59 dBm	OCC DWITE	q onset		1.79000	
~							- Measuring		2023-06-19
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Plot 6: OBW, Mode 45, T_{nom} / V_{nom}

									Solution
MultiView	Spectrum	X Sp	ectrum 2	× Spectr	um 3	×			
RefLevel 48.0	0 dBm Offse	t 55.00 dB 🖷 RE	W 1 MHz			-			
	● SWT	120 s 👄 VE		de Auto Sweep					
Inp: ExtMix E									
1 Occupied Bar	ndwidth								ax 🛛 2Rm Max
								M2[2]	-9.62 dBm
40 dBm								M1[1]	6.266 200 GHz 26.96 dBm
			M1						26.96 dBm 76.302 200 GHz
30 dBm	T1			walken water and and and				12	0.302 200 012
	- Handred and a start	and the first of the state of the	and the second second second	rhadaa as kontris Addonas A	LO & MARCHING MARCHING	howeners	the water of the second	an an astrony add	
20 dBm									6
10 dBm-								1	
10 dBm-									
0 dBm	1								
o abiii]								
-10 dBm			42 •						
								When when	Ν.
-20 dBm	- Carrow -							~~~nin	Kundunhormulium
	pr -							W _W	6
-30 dBm								1	¥
-40 dBm									
-50 dBm									
CF 76.5 GHz			1201 pt	ts	12	0.0 MHz/			Span 1.2 GHz
2 Marker Table					_	_			
Type Ref	Trc 1	X-Value 76.302 2 G	H7	Y-Value 26.96 dBm	Occ Bw	Function	91	Function R 19.792 267 6	esult
T1	1	76.042 487 0		24.09 dBm	OCC BW Cel	ntroid			33 21 3 GHz
T2	1	76.962279 0	iHz	25.27 dBm	Occ Bw Fre				2727 MHz
M2	2	76.266 2 G	Hz	-9.62 dBm					
							- Measuring.		2023-06-19 13:43:50
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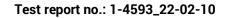
Plot 7: OBW, Mode 68, Tnom / Vnom



Plot 8: EIRP Mean Power (Channel Power), Mode 03, RMS detector, Tnom / Vnom



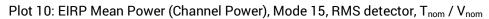
Plot 9: EIRP Mean Power (Channel Power), Mode 09, RMS detector, Tnom / Vnom

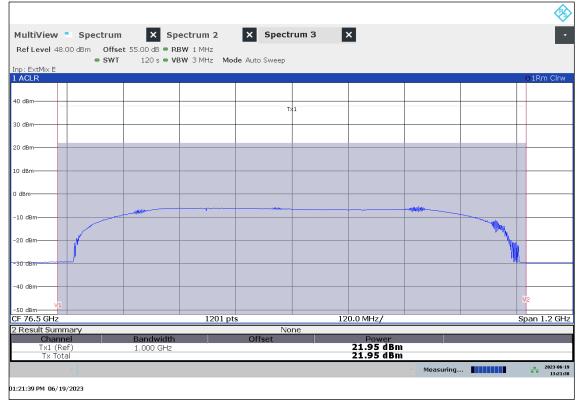




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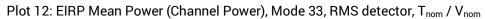


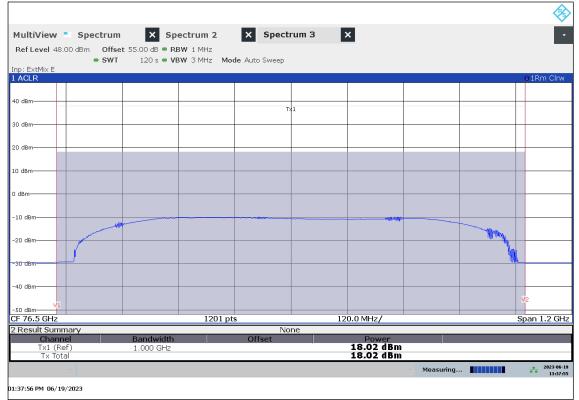


Plot 11: EIRP Mean Power (Channel Power), Mode 21, RMS detector, Tnom / Vnom



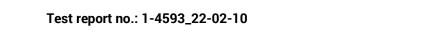






Plot 13: EIRP Mean Power (Channel Power), Mode 45, RMS detector, Tnom / Vnom







Plot 14: EIRP Mean Power (Channel Power), Mode 68, RMS detector, Tnom / Vnom





12.2 Modulation characteristics

Description:

§2.1047 (d) Other types of equipment. A curve or equivalent data which shows that the equipment will meet the modulation requirements of the rules under which the equipment is to be licensed.

Comments from manufacturer on modulation characteristics according to KDB 65300	5 3.(q):

Parameter	SRR6-A
Duty Cycle	Typical 41%
Timing	Typical Cycle Time: 50ms
	RF on 20.3 ms (256 Ramps + Monitoring).
Modulation	FM- chirps, negative Sawtooth with linear change of center frequency over
	sweep bandwidth or single chirps
Sweep Bandwidth	Mode dependent: 816 / 926 / 934 / 938 MHz
Sweep rate	Max 13 MHz/ µs
Power	Power constant during RF on
Steepness of Ramps	Steepness varies for scans and monitoring
Calibration	No calibration routines applied
Antenna Beam Steering (Tx) No beam steering	

12.3 Occupied bandwidth

Description:

§2.1049 The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.

Limits:

FCC §95.3379 (b)

The occupied bandwidth from intentional radiators operated within the specified frequency band shall comply with the following: 76 GHz – 81 GHz

Measurement:

Parameters				
Detector:	Pos. Peak			
Sweep time:	120 s			
Resolution bandwidth:	1 MHz			
Video bandwidth:	3 MHz			
Trace-Mode:	Max Hold			
Measurement distance:	2 m			



Measurement results:

Modulations /	Modulations / Test conditions		Operating Frequency Range				
		f∟[GHz]	f _H [GHz]	OBW [MHz]			
03	T _{nom} / V _{nom}	76.044 053	76.966 311	922.3			
09	T _{nom} / V _{nom}	76.045 597	76.959 525	913.9			
15	T _{nom} / V _{nom}	76.043 692	76.960 658	917.0			
21	T _{nom} / V _{nom}	76.043 003	76.968 804	925.8			
33	T _{nom} / V _{nom}	76.044 063	76.959 523	915.5			
45	T _{nom} / V _{nom}	76.042 487	76.962 279	919.8			
68	T _{nom} / V _{nom}	76.056 955	76.974 898	917.9			

Verdict: Compliant



12.4 Band edge compliance

Description:

Investigation of the emission limits at the band edge.

Limits:

FCC §95.3379 (a) (2) (i) + (ii) / ANSI C63.10-2013 / 6.10

Frequency Range [GHz]	Measurement distance	Power Density
40 – 76 and 81 – 200	3.0 m	600 pW/cm ² → -1.7 dBm

<u>Limits:</u>

FCC §95.3367 (a) (b)

Frequency Range [GHz]	Power Density
76 - 81	50 dBm/MHz (e.i.r.p)

Measurement:

Parameters				
Detector:	RMS			
Sweep time:	See plots			
Resolution bandwidth:	1 MHz			
Video bandwidth:	3 MHz			
Trace-Mode:	Max Hold			

Measurement results:

• Results are part of chapter 12.5

Verdict: Compliant



12.5 Field strength of spurious emissions

Description:

The power density of any emissions outside the 76-81 GHz band shall consist solely of spurious emissions and shall not exceed the following:

<u>Limits:</u>

FCC						
CFR Part 95.3379 (a) (1) / CFR Part 95.3379 (a) (3)						
Radiated Spurious Emissions						
Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.						
Frequency [MHz]	Field Strength [dBµV/m]	Measurement distance				
0.009 - 0.490	2400/F[kHz]	300				
0.490 - 1.705	24000/F[kHz]	30				
1.705 – 30.0	30	30				
30 88	30.0	10				
88 – 216	33.5	10				
216 - 960	36.0	10				
960 - 40 000	960 - 40 000 54.0					

Limits:

FCC §95.3379 (a) (2) (i) + (ii)

Frequency Range [GHz]	Measurement distance	Power Density
40 - 200	3.0 m	600 pW/cm ² → -1.7 dBm
200 – 231	3.0 m	1000 pW/cm ² \rightarrow +0.5 dBm

Measurement:

Measurement parameter				
Detector:	Quasi Peak / Pos-Peak / LinAV / RMS			
Resolution bandwidth:	F < 1 GHz: 100 kHz			
	F > 1 GHz: 1 MHz			
Video bandwidth:	F < 1 GHz: 300 kHz			
	F > 1 GHz: 3 MHz			
Trace-Mode:	Max Hold			



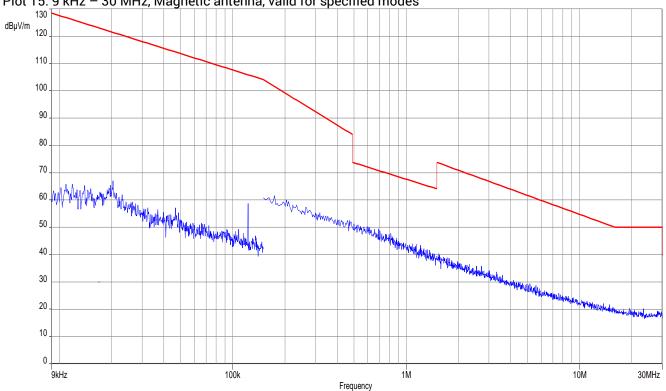
Measurement:

Measurement parameter				
Detector:	Quasi Peak / Pos-Peak / LinAV / RMS			
Resolution bandwidth:	F < 1 GHz: 100 kHz			
	F > 1 GHz: 1 MHz			
Video bandwidth:	F < 1 GHz: 300 kHz			
	F > 1 GHz: 3 MHz			
Trace-Mode:	Max Hold			

Measurement results:

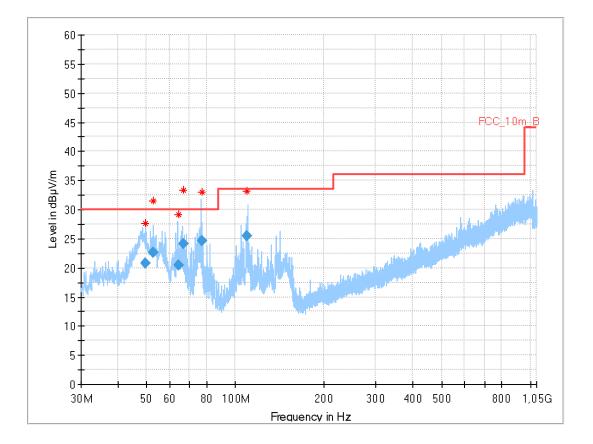
Frequency [GHz]	Detector	Bandwidth [MHz]	Level	Limit	Margin [dB]		
-/-	-/-	-/-	-/-	-/-	-/-		
No critical spurious emission levels							

Verdict: Compliant



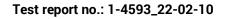
Plot 15: 9 kHz - 30 MHz, Magnetic antenna, valid for specified modes



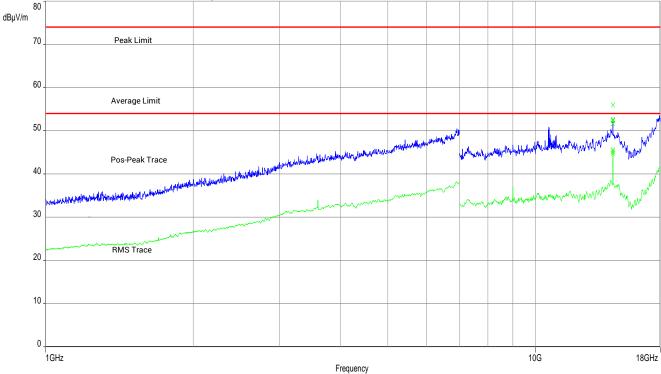




Frequency (MHz)	QuasiPe ak	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimut h	Corr. (dB/m
()	(dBµV/m	(()	(((0)		(deg))
49.491	20.81	30.0	9.2	1000	120.0	116.0	V	55	16
52.747	22.59	30.0	7.4	1000	120.0	117.0	V	271	15
63.999	20.41	30.0	9.6	1000	120.0	352.0	V	109	13
66.779	24.19	30.0	5.8	1000	120.0	253.0	V	95	11
76.838	24.65	30.0	5.4	1000	120.0	303.0	V	41	8
109.671	25.48	33.5	8.0	1000	120.0	179.0	V	284	13

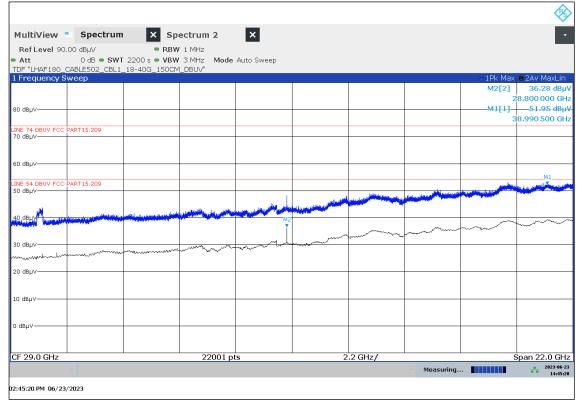


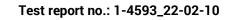




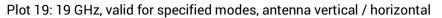
Plot 17: 1 GHz - 18 GHz, valid for specified modes, antenna vertical / horizontal

Plot 18: 18 GHz - 40 GHz, valid for specified modes, antenna vertical / horizontal









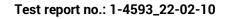
									
MultiView	Spectrum	× s	pectrum 2	×					
Ref Level 90.0	00 dBµV	RBW	1 MHz						
 Att 			3 MHz Mode	Auto Sweep					
TDF "LHAF180_C 1 Frequency Sv		18-40G_150C	4_DBUV"					o 1Pk Max	●2Av MaxLin
								M2[2]	
									9.012 100 GHz
80 dBµV									50,13 dBµV 9.040 100 GHz
LINE 74 DBUV FCC P	APT15 200								9.040 I00 GHz
70 dBµV	ART 13.205								
60 dBµV									
LINE 54 DBUV FCC P 50 dBµV	PART15.209			M1					
·						M			
40 dBuV				V		<u> </u>			
the approximation	mon and a second	montrahan	montonaroud			"yhn	www.whowwww.	Mar harmonia	milanterman
30 dBµV				M2					
30 UBHV				Ĭ		mul			
20 dBµV									
10 dBµ∨									
0 dBµV									
CF 19.1 GHz			1001 p	l ts	10	0.0 MHz/			Span 1.0 GHz
	-		1001 0		10		- Measuring		2023-06-23
									15:06:26
03:06:26 PM 06/23/	2023								

Peak Value: 50.13 dBµV/m (Limit 74 dBµV/m) / Average 27.89 dBµV/m (Limit 54 dBµV/m)

Plot 20: 28.8 GHz, valid for specified modes, antenna vertical / horizontal

MultiView 📒 Spectrum	× Spectrum 2	<mark>∗</mark> ×				
Ref Level 90.00 dBµV	• RBW 1 MHz					
	00 s ● VBW 3 MHz Mode A	uto Sweep				
TDF "LHAF180_CABLE502_CBL1_18	3-40G_150CM_DBUV"					
1 Frequency Sweep					⊙1Pk Max ⊜2Av Ma:	
					M1[1] 50.67 28,799.000	
80 dBµV					28,800 000	
LINE 74 DBUV FCC PART15.209					20.000 000	5 0112
70 dBµV						
60 dBµV						
00 08hA						
LINE 54 DBUV FCC PART15.209		M1				
50 dBµV						
manusan manager and a second		S. M. S.	handerson			
40 dBµV	And many many many many many many	A fraction damage and a start at	and the second	he have all her when her	which we we have	Masan
30 dBµV						
20 dBµV						
10 dBµV						
0 dBµV						
CF 28.8 GHz	1001 pts	;	100.0 MHz/	· · · ·	Span 1.0	GHz
				- Measuring		23-06-23 15:02:21
12-02-22 DM 05/22/2022						
03:02:22 PM 06/23/2023						

Peak Value: 50.67 dBµV/m (Limit 74 dBµV/m) / Average 43.79 dBµV/m (Limit 54 dBµV/m)





	valid for a	posified modes	, antenna vertical ,	/ harizontal
FIUL Z L. 30 GHZ,	valiu iui s	pecineu moues,	, antenna vertical,	inonzontai

MultiView 🎫 Spectrum	× Spectrum 2	×					_
Ref Level 90.00 dBµV	• RBW 1 MHz						
	os ⊜VBW 3 MHz Mode Au	uto Sweep					
DF "LHAF180_CABLE502_CBL1_18-« Frequency Sweep	40G_150CM_DBUV"					o tDk Mex	●2Av MaxLi
Frequency sweep						M2[2]	38.35 dB
							8.477 800 G
10 dBµV							53.80 dB
							8.477 800 G
NE 74 DBUV FCC PART15.209							
о dвµv							
0 dBµV							
				м	1		
NE 54 DBUY FCC PART15.209	undersame the dependence	in which the	mannam	mumumm	mondered margine	Man Walk March	
0.98hA	Mar The World State of the Contract of the Con						
0 dвµV				M	2		
0 dBµV							
0 dBµV							
0 dBµV							
dBµV							
F 38.28 GHz	1001 pts	· · ·	100	0.0 MHz/			Span 1.0 G
					- Measuring		2023-0

Peak Value: 53.80 dBµV/m (Limit 74 dBµV/m) / Average 38.35 dBµV/m (Limit 54 dBµV/m)

Plot 22: 40 GHz – 50 GHz, valid for specified modes, antenna vertical / horizontal

									\$
MultiView	Spectrum	×	Spectrum 2	<mark>∗</mark> ×					-
Ref Level 0.0 Att			WIIMHz WI3MHz Mode/	Auto Sweep					
TDF "FLANN2324	4_CABLE502_CBI								
1 Frequency S						1		o ipk Ma	ax 🛛 2Rm Max
77G FCC PART95M	RMS								
-10 dBm									
-20 dBm									
-30 dBm									
30 dbiii									
10 10 11									
-40 dBm	Martin Martin Martin	History I.S.							and models of the
and the second s			A DESCRIPTION OF DESCRIPTION	ومقرر والعنداء فحرم ورود القاد	and the state of t	الم	مستخلف بالم المستعد الم المستغلقات	فللخليقة والمسترجلية والمتكفية	
-50 dBm	~								
	$\sim\sim\sim$						~ ~~		
-60 dBm				+					
-70 dBm									
-80 dBm									
-90 dBm									
40.0 GHz			10001 p	te	1	0 GHz/			50.0 GHz
	-		10001 p		1	.10 0112/	Measuring.		2023-06-26
							incustaring.		* 12:15:14
12:15:14 PM 06/26/	/2023								

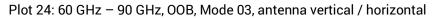




Plot 23:	50 GHz -	60 GHz,	valid for	r specified	modes,	antenna v	ertical /	horizontal

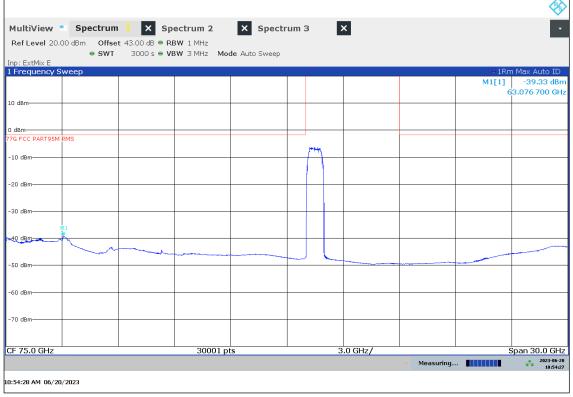
MultiView Spectrum Spectrum 2 X Ref Level 9.00 dBm Offset 51.70 dB * RBW 1 MHz * SWT 1000 s * VBW 3 MHz Mode Auto Sweep In:: ExtMix V SVT 1000 s * VBW 3 MHz Mode Auto Sweep In:: ExtMix V Standard S									\$
• SWT 1000 s • VBW 3 MHz Mode Auto Sweep Inv: ExtMix V OIRm Max Auto M1[1] -40.97 0 dbm 0 dbm S4.867 00C S4.867 00C 0 dbm 0 dbm S4.867 00C S4.867 00C -10 dbm -10 dbm -10 dbm -10 dbm -10 dbm -10 dbm -20 dbm -10 dbm <t< th=""><th></th><th></th><th></th><th><mark>.</mark>★ ×</th><th></th><th></th><th></th><th></th><th>•</th></t<>				<mark>.</mark> ★ ×					•
1 Frequency Sweep 0 18m Max Auto 0 dBm M1[1] -40.97 0 dBm S4.867 000 70 FCC PART9SM RMS Image: state sta				e Auto Sweep					
0 dbm -40.97 0 dbm -10 dbm -10 dbm -10 dbm -20 dbm -10 dbm -20 dbm -10 dbm -20 dbm -10 dbm -30 dbm -10 dbm -40 dbm -10 dbm -10 d		10						o t Des M	ov Auto TD
0 dBm 0 dBm 54.867 000 -10 dBm -10 dBm -10 dBm -10 dBm -20 dBm -10 dBm -10 dBm -10 dBm -30 dBm -10 dBm -10 dBm -10 dBm -30 dBm -10 dBm -10 dBm -10 dBm -30 dBm -10 dBm -10 dBm -10 dBm -40 dBm -10 dBm -10 dBm -10 dBm -50 dBm -10 dBm -10 dBm -10 dBm -50 dBm -10 dBm -10 dBm -10 dBm -60 dBm -10 dBm -10 dBm -10 dBm -70 dBm -10 dBm -10 dBm -10 dBm -10 dBm	I frequency swee	-p					M1[1]		-40.97 dBm
-10 dBm									
$\begin{array}{c c c c c c c c c c c c c c c c c c c $									
20 dBm 20 dBm2	7G FCC PART95M RMS								
20 dBm 20 dBm2	-10 dBm								
30 d8m M1 M1 M1 M1 M1 40 d8m M1 M1 M1 M1 M1 50 d8m M1 M1 M1 M1 M1 60 d8m M1 M1 M1 M1 M1 60 d8m M1 M1 M1 M1 M1									
30 d8m M1 M1 M1 M1 M1 40 d8m M1 M1 M1 M1 M1 50 d8m M1 M1 M1 M1 M1 60 d8m M1 M1 M1 M1 M1 60 d8m M1 M1 M1 M1 M1									
A0 dBm	-20 dBm-								
A0 dBm									
40 dBm	-30 dBm								
40 dBm									
-50 dBm	-40 dBm								
-60 dBm					······				
-60 dBm									
-70 dBm	-50 dBm-								
-70 dBm									
	-60 dBm								
-80 dBm	-70 dBm								
-80 dBm									
-80 dBm									
	-80 dBm-								
	F0.0.CU =		10001 p			0.011-7			60.0 GHz
	50.0 GHZ		10001 p	is	1.				2023-06-26
→ Measuring → 222	~						Measuring		13:05:13



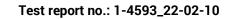


MultiView - Spectru	um X Spectrum 2	× Spectrum	з Х		-
Ref Level 20.00 dBm Off	fset 43.00 dB = RBW 1 MHz		_		
● SW	/T 3000 s ● VBW 3 MHz M	ode Auto Sweep			
inp: ExtMix E L Frequency Sweep					o 1 Rm Max Auto ID
					M1[1] -8.08 dBn 76.241 200 GH
LO dBm					, , , , , , , , , , , , , , , , , , , ,
) dBm					
7G FCC PART95M RMS			MI		
-10 dBm-					
-20 dBm					
-30 dBm					
40 dBm					
	~~~~~				
-50 dBm					
-60 dBm					
-70 dBm					
CF 75.0 GHz	30001	pts	3.0 GHz/	- Measuring	Span 30.0 GH:

Plot 25: 60 GHz - 90 GHz, OOB, Mode 09, antenna vertical / horizontal



Markers show mixer products produced by harmonic mixer

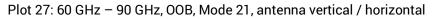




# Plot 26: 60 GHz – 90 GHz, OOB, Mode 15, antenna vertical / horizontal

											(*)
MultiView	Spectrum	× Spe	ectrum 2	× Spect	rum 3	3	×				-
Ref Level 20.00											
Inp: ExtMix E	● SWT	3000 s 🖷 VB	WF3 MHz Mo	de Auto Sweep							
1 Frequency Sw	/eep									0 1 Rn	n Max Auto ID
										M1[1]	
										6	3.076 700 GHz
10 dBm											
0 dBm 77G FCC PART95M RM	40										
77G FCC PART95M R	45					ethad.					
-10 dBm						$\vdash$					
-20 dBm											
-30 dBm											
MI	L										
-40 dBm	η										
~~~	~~~~										
-50 dBm					\sim	- h					
-60 dBm											
-70 dBm											
CF 75.0 GHz			30001 p	ots			3.	0 GHz/			Span 30.0 GHz
-	~								 Measuring. 	••	2023-06-20 13:21:12
01:21:12 PM 06/20/2	2023										

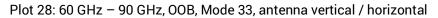
Markers show mixer products produced by harmonic mixer



									\$
MultiView	Spectrum	×	Spectrum 2	× Spectr	um 3	×			•
Ref Level 20.0	0 dBm Offset SWT		●RBW 1MHz ●VBW 3MHz Mot	de Auto Sweep					
Inp: ExtMix E									
1 Frequency Sv	veep								m Max Auto ID
								M1[1]	-39.65 dBm
									63.130 400 GHz
10 dBm									
0 dBm 77G FCC PART95M R	MC								
ANG FOC PART95M R	ma								
-10 dBm									
					\sim				
					1 - 1 = 1				
-20 dBm									
-30 dBm-									
	1								
-40 dBm	1								
40 dbiii									
-50 dBm									
-60 dBm				+					
70.45									
-70 dBm									
CF 75.0 GHz			30001 p	ots		3.0 GHz/			Span 30.0 GHz
							 Measuring 		2023-06-20
3:36:56 PM 06/20/	2023								

Marker shows mixer products produced by harmonic mixer





				_		_			*
MultiView	Spectrum	🗆 🗙 Spe	ectrum 2	× Spectr	um 3	×			•
Ref Level 20.0	00 dBm Offse								
Inc. Euchding E	● SWT	3000 s 🖷 VB	W 3 MHz Mo	de Auto Sweep					
Inp: ExtMix E 1 Frequency S	weep							0 1 Rn	n Max Auto ID
								M1[1]	
								6	3.056 400 GHz
10 dBm									
0 dBm- 77G FCC PART95M									
77G FCC PART95M	RMS								
-10 dBm									
-20 dBm									
-30 dBm									
-40 dBm	V1								
	~~~~								
-50 dBm									
-50 0611									
-60 dBm									
-70 dBm									
CF 75.0 GHz	1		30001 pt	ts		3.0 GHz/	1	:	Span 30.0 GHz
	~						- Measuring.		2023-06-20
									17.50123
05:30:23 PM 06/20,	/2023								

Marker shows mixer products produced by harmonic mixer

Plot 29: 60 GHz - 90 GHz, OOB, Mode 45, antenna vertical / horizontal



Marker shows mixer products produced by harmonic mixer

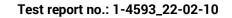
I	est repor	t no.: 1-459	3_22-02	-10			<u> </u>	cet	idvance
30: 60 GHz	– 90 GH	z, 00B, Moo			tical / ho	rizontal			
MultiView 📍	Spectrum	× Spectrum	12 X	Spectrum 3	×s	pectrum 4	×		•
Ref Level 20.0		et 43.00 dB 🖷 RB							
Inp: ExtMix E	● SW1	3000 s 🖷 VB	WY 3™IHZ MU	ode Auto Swee	p				
1 Frequency Sv	weep							01R M1[1]	m Max Auto ID -43.79 dBr
									61.997 400 GH
								M2[1]	
10 dBm									70.173 200 GH
0 dBm									
77G FCC PART95M	RMS								
-10 dBm									
-20 dBm									
-30 dBm									
-40 dBm									
MI T			M2						
		+		+					
-50 dBm									
60.0 GHz			30001	pts		3.0 GHz/			90.0 GH
110 0112	77		55501			010 01127	Monsuring		09.02.202 09:30:4

Markers show mixer products produced by harmonic mixer

Plot 31: 90 GHz - 140 GHz, valid for specified modes, antenna vertical / horizontal

MultiView	Spectrum	X Sp	ectrum 2	× Specti	rum 3	×			-
Ref Level 10.60	dBm Offset					-			_
Inp: ExtMix F	● SWT	5000 s 🖷 VE	3W 3 MHz Mo	de Auto Sweep					
1 Frequency Sw	еер							O1Rr	n Max Auto ID
								M1[1]	-39.93 dBm 2.643 400 GHz
0 dBm									
77G FCC PART95M RM	1S								
-10 dBm									
-20 dBm									
-30 dBm									
MI									
-40 dBm									
	۸ I								
-50 dBm	h								
-60 dBm									
-70 dBm									
- ro ubm									
-80 dBm									
oo abiii									
					<u>-</u>				140.0 5
90.0 GHz			50001 p	ts	5	.0 GHz/	- Measuring.		140.0 GHz
~							measuring.		15:39:19

Marker shows mixer products produced by harmonic mixer





MultiView Spec	trum 🗙	Spectrum 2	× Spect	rum 3	×			
RefLevel 10.00 dBm								
Inp: ExtMix G	SWT 8000 s =	VBW 3 MHz Mo	de Auto Sweep					
1 Frequency Sweep								n Max Auto
							M1[1]	-43.61
0 dBm							22	0.000 000
7G FCC PART95M RMS								
-10 dBm								
-20 dBm								
-30 dBm								
40 dBm								
himme								
-50 dBm								
-60 dBm								
-70 dBm								
-80 dBm								
140.0 GHz		80001 p	ts	8	8.0 GHz/			220.0
						<ul> <li>Measuring.</li> </ul>		202

# Plot 32: 140 GHz - 220 GHz, valid for specified modes, antenna vertical / horizontal

Plot 33: 220 GHz - 231 GHz, valid for specified modes, antenna vertical / horizontal

MultiView 📑 S	pectrum	X Spe	ectrum 2	× Spectr	um 3	×			-
Ref Level 20.00 dB					_				
Inp: ExtMix J	● SWT	1100 s 👄 VB	W 3 MHz Mo	de Auto Sweep					
I Frequency Swee	0							01Rn	n Max Auto ID
								M1[1]	-25.76 dBm
								3	25.000 00 GHz
10 dBm									
76 FCC PART95M RMS									
-10 dBm									
-20 dBm									
									M
-30 dBm									
-40 dBm									
50 d0									
-50 dBm									
-60 dBm									
-70 dBm									
220.0 GHz			11001 p	ts	11	0.5 GHz/			325.0 GHz
-			11001 p				Measuring		2023-06-21
									* 16:34:10



# **12.6 Frequency stability**

## **Description:**

§95.3379 (b) Fundamental emissions must be contained within the frequency bands specified in this section during all conditions of operation. Equipment is presumed to operate over the temperature range -20 to +50 degrees Celsius with an input voltage variation of 85% to 115% of rated input voltage, unless justification is presented to demonstrate otherwise.

## <u>Limits:</u>

## FCC §95.3379 (b)

The occupied bandwidth from intentional radiators operated within the specified frequency band shall	1
comply with the following: 76 GHz – 81 GHz	

#### Measurement results:

#### **Temperature variation**

Mode	Temperature in °C	f∟in GHz	f _H in GHz	Bandwidth [MHz]
	-40 °C / V _{nom}	76.048 436	76.964 380	915.9
	-20 °C / V _{nom}	76.050 036	76.964 498	914.5
	-10 °C / V _{nom}	76.047 626	76.964 839	917.2
	0 °C / V _{nom}	76.047 712	76.965 236	917.5
Mode 09	10 °C / V _{nom}	76.048 946	76.963 438	914.5
(Worst case)	20 °C / V _{nom}	76.046 396	76.962 659	916.3
	30 °C / V _{nom}	76.046 690	76.965 705	919.0
	40 °C / V _{nom}	76.046 063	76.961 957	915.9
	50 °C / V _{nom}	76.044 555	76.962 787	918.2
	85 °C / V _{nom}	76.047 940	76.962 958	915.0

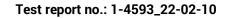
#### Voltage variation

Voltage variation of rated input voltage	f∟in GHz	f _H in GHz				
< 85 % of U	Valtara variation daga n	at affect the redicted signal				
> 115 % of U	Voltage variation does not affect the radiated signal					

Note:

- The EUT is measured in the temperature range from -20°C to 50°C specified by §95.3379 (b) and RSS Gen 6.11.
- If the customer declared a wider temperature range, the customer take care about the proper functionality of the EUT.

### Verdict: Compliant





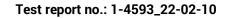
Plot 34: Mode 09, OBW, -40 °C / V_{min-max}

MultiView	Spectrum	X Spe	ectrum 2	×					
Ref Level 48.00	dBm Offse	t 55.00 dB 🖷 RE	3W 1 MHz	_					_
	● SWT	120 s 👄 VB	W 3 MHz Mo	de Auto Sweep					
Inp: ExtMix E	1. 1.14							- 10L M	
1 Occupied Ban	awiath							01PK M M2[2]	ax e 2Rm Max -4,45 dBm
10 10 1									76,584 900 GHz
40 dBm								M1 M1[1]	32,34 dBm
30 dBm	T1				and a second and a second and	an Marinabada ang	anno anno anno		
30 ubin	Wannaharmon	whether a server should be	man the second days	distance of the other				Y	
20 dBm								Y	
20 00.0									
10 dBm									
0 dBm					M2				
	1								
-10 dBm				-				man and a second se	- <u>-</u>
	And a state of the							MW.	Murrarally
-20 dBm									
	1							7	M.
-30 dBm	1							ſ	<u> </u>
-40 dBm									
									V2
-50 dBm			1001						
CF 76.5 GHz			1201 pt	s	12	0.0 MHz/			Span 1.2 GHz
2 Marker Table Type Ref	Trc	X-Value		Y-Value		Function		Function Re	ocult
M1	1	76.8777 G	Hz 3	32.34 dBm	Occ Bw	Function	91	5.944 199 7	
Τ1	î	76.048 436 0	GHz	28.11 dBm	Occ Bw Cer			76.50640	08 069 GHz
T2 M2	2	76.96438 0 76.584 9 G	Hz	27.88 dBm -4.45 dBm	Occ Bw Fre	q Offset		6.408.06	58.616 MHz
	2	70.58490	Π <u>ζ</u>	-4.45 UDIII					2023-07-25
-	~						<ul> <li>Measuring</li> </ul>		15:41:21
03:41:22 PM 07/25/2	0022								
D3.71.22 FM 07/23/2	.02.5								

Plot 35: Mode 09, OBW, -20 °C / V_{min-max}

MultiView	Spectrum	× Spe	ectrum 2	×					•
Ref Level 48.00	• LdBm Offset	t 55.00 dB = RB		_					
	● SWT		WI3 MHz Mo	de Auto Sweep					
Inp: ExtMix E									
1 Occupied Band	dwidth			1				1	ix ● 2Rm Max
								M1[1]	31.93 dBm 6.817 700 GHz
40 dBm							M1	M2[2]2	-4.46 dBm
	т1				and the state of t	natura a dinana ana aki sa si s	A Are as support of the second	n MP4ha w#MMwkwkwka70	
30 dBm	Winnerson	ter abandera	he how and a second	and we are an	history and the second second	the second second	ad and and a second		
20 dBm-	("							1	
20 0811									
10 dBm									
10 dbiii									
0 dBm						M2-			
o dom	1					MIZ Make			
-10 dBm									
								Million C.	the monthly when
-20 dBm	Normalian Contraction							<u>'\</u>	Marken
	ſ							Y	l I
-30-dBm	J							ļi I	1
-40 dBm									
									V2
-50 dBm									
CF 76.5 GHz			1201 pt	s	12	0.0 MHz/			Span 1.2 GHz
2 Marker Table									
Type Ref	Trc	X-Value 76.8177 GI	u	Y-Value 31.93 dBm		Function	01	Function Re 14.462 245 5	
M1 T1	1	76.050 036 G		27.25 dBm	Occ Bw Occ Bw Cer	otroid	91	76.507.26	
T2	1	76.964498 G	Hz	30.79 dBm	Occ Bw Fre				3 225 MHz
M2	2	76.651 9 G	Hz ·	-4.46 dBm					
-							Measuring.		2023-07-25
03:22:03 PM 07/25/20	023								

_



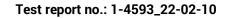


Plot 36: Mode 09, OBW, -10 °C / V_{min-max}

MultiView Spectr	um 🔸 🗙 Spectrum 2	×		
Ref Level 48.00 dBm O	ffset 55.00 dB • RBW 1 MHz	_		
• S	WT 120 s 🗢 VBW 3 MHz	Mode Auto Sweep		
Inp: ExtMix E 1 Occupied Bandwidth				o1Pk Max e2Rm Max
				M2[2] -4.47 dBr
40 dBm				76.647 900 GF
				M1 M1[1] 32.02 dBr
30 dBm		and the second	and the second	
Alana	and a second and a second and a second dates			· · · · · · · · · · · · · · · · · · ·
20 dBm				
10 dBm				
0 dBm			M2	
-10 dBm	W			
men and and and				and here and the second
-20 dBm				
-30 dBm				
-40 dBm				
-40 aBm				V2
-50 dBm				¥2
CF 76.5 GHz	120	)1 pts	120.0 MHz/	Span 1.2 GH
2 Marker Table			· · · · · · · · · · · · · · · · · · ·	
Type Ref Trc	X-Value	Y-Value	Function	Function Result
M1 1 T1 1	76.881 7 GHz 76.047 626 GHz	32.02 dBm 29.20 dBm	Occ Bw Occ Bw Centroid	917.212 482 359 MHz 76.506 232 282 GHz
T2 1	76.964839 GHz	26.55 dBm	Occ Bw Freq Offset	6.232 281 592 MHz
M2 2	76.6479 GHz	-4.47 dBm		
~				- Measuring
				13:06:2
03:08:30 PM 07/25/2023				

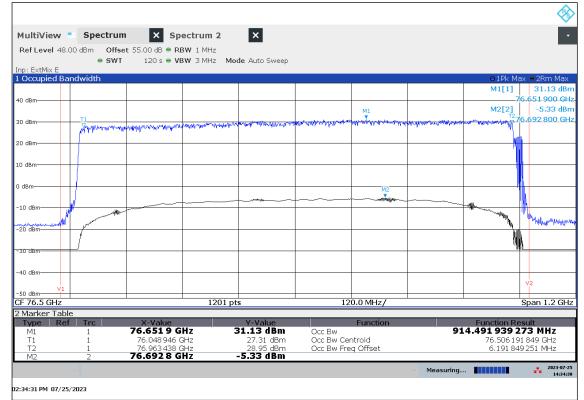
Plot 37: Mode 09, OBW, 0 °C / V_{min-max}

MultiView	Spectrum	x Sp	ectrum 2	×					•
Ref Level 48.0	0 dBm Offse	t 55.00 dB 🖷 RI	BW 1 MHz	_					_
	● SWT	120 s 👄 🛛	3W 3 MHz Mo	de Auto Sweep					
Inp: ExtMix E									
1 Occupied Bar	ndwidth								x 😐 2Rm Max
								M1[1]	31.26 dBm
40 dBm									5.884 700 GHz -5.06 dBm
	т1							M1 M2[2]	
30 dBm	Mar marine marine	ngugaporenne	and and a second second	Marth agreed and the state of t		The Marine manufactory and a	and the second	en Trunne weeking 76	5.557 000 GHZ.
	ſ							1	
20 dBm	-								
10 dBm									
	1								
0 dBm					M2				
	1			w.			and the set of the set		
-10 dBm		Warner						- Aller and -	
run warm	and a start and a start							<u></u>	Mutallanaryan
-20 dBm	1								
	1							L IN	
-30 dBm									<u> </u>
-40 dBm									
¥1									V2
-50 dBm									
CF 76.5 GHz			1201 pt	s	12	0.0 MHz/			Span 1.2 GHz
2 Marker Table									
Type Ref	Trc	X-Value 76.8847 G	H7 3	Y-Value 31.26 dBm	Occ Bw	Function	61	Function Res 7.524 179 3	
T1	1	76.0477120		27.45 dBm	Occ Bw Cer	ntroid	91	76.506473	
T2	i	76.9652360	GHz	25.60 dBm	Occ Bw Fre			6.473833	
M2	2	76.557 G	Hz	-5.06 dBm					
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Plot 38: Mode 09, OBW, 10 °C / Vmin-max



Plot 39: Mode 09, OBW, 20 °C / Vmin-max

MultiView - S	pectrum X Sp	ectrum 2 ×					-
Ref Level 48.00 dBm	■ Offset 55.00 dB ● RI						
		3W 3 MHz Mode Autos	Sweep				
Inp: ExtMix E							20.14
1 Occupied Bandwic	ith			1		●1Pk Max ● M2[2]	
							-5.41 dBm 49 900 GHz-
40 dBm							31.12 dBm
T1							31.12 dbm 32 700 GHz
30 dBm	water and the second second second	and marker and marker and an and and all	ward for a construction of the second states	And a state of a second state of the second st	and a second a second secon	WWWWWWWWWWWWW	52 7 00 OH2.
						kin.	
20 dBm							
10 dBm						Ι.	
10 dBm							
0 dBm							
				M2			
-10 dBm-							
-20 dBm						m n	Magna Waldel
						Mi	
-30 dBm							
30 dbin							
-40 dBm							
10 dbiii						V2	
-50 dBm							
CF 76.5 GHz		1201 pts	12	20.0 MHz/	11	Spa	an 1.2 GHz
2 Marker Table							
Type Ref Tr		Y-Val		Function		Function Result	
M1 1 T1 1	76.8827 G			etroid	916.	263 849 776. 76.504 527 50	
T2 1	76.962.659 (					4.527 501 41	
M2 2		Hz -5.41 (	IBm	5q 0.000			5 1 m m
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## Test report no.: 1-4593_22-02-10



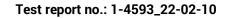
Plot 40: Mode 09, OBW, 30 °C / V_{min-max}

MultiView - Sp	pectrum X Spe	ectrum 2	×					
Ref Level 48.00 dBm	n Offset 55.00 dB ● RE	W 1 MHz						
	● SWT 120 s ● VB		e Auto Sweep					
Inp: ExtMix E								
1 Occupied Bandwid	lth							x e 2Rm Max
							M2[2]	-6.01 dBm 5.623 900 GHz
40 dBm-								30.40 dBm
							M1 M1[1]	30,40 dBm 5.881 700 GHz
30 dBm	and the second second second second	www.www.www.www.	wyther and the second	e-laced approximate and	New Contraction of the Reserved	alle control and a second	an Real Allow A	5.881700 GHZ
	a summer as a main						<u>"</u>	
20 dBm								
10 dBm								
0 dBm					12			
-10 dBm								<u>k</u>
							- Mining	Hand Martin Station of Station
-20 dBm							- Auto	
							'W	
-30 dBm							114	
-40 dBm								
								V2
-50 dBm								_
CF 76.5 GHz		1201 pts		12	0.0 MHz/			Span 1.2 GHz
2 Marker Table								
Type Ref Tr			Y-Value		Function		Function Re	sult
M1 1 T1 1	76.881 7 G		0.40 dBm 25.11 dBm	Occ Bw Occ Bw Cer	atrald	919	0.014 288 4 76,506 197	
T2 1	76.965705 0		25.11 dBm 21.68 dBm	Occ Bw Cer Occ Bw Fre			6.197362	
M2 2	76.623 9 G	Hz -	6.01 dBm	SCC DWITE	iq onoot		0.197 302	221011112
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Plot 41: Mode 09, OBW, 40 °C / V_{min-max}

									<b>\$</b>
MultiView	<ul> <li>Spectrun</li> </ul>	1 X Sp	ectrum 2	×					•
Ref Level 48	.00 dBm Offse	et 55.00 dB • RE	3W 1 MHz	_					
	● SWT	120 s 👄 VE	3W 3 MHz Mo	ode Auto Sweep					
Inp: ExtMix E	1.1.1.1								
1 Occupied Ba	andwidth		1			1	1		ax e 2Rm Max
								M1[1]	31.02 dBm 6.882 700 GHz
40 dBm								LIOTO1	-6.01 dBm
	T1							M1 M2[2]	-6.01 dBm
30 dBm	New management	an mar	Margaret Margaret	Mary ward pour and the	and a subscription of the	Way was warded	an a fan an a star fan	da azar a a a a a a a a a a a a a a a a a	0.770 800 GHZ.
	I M Star							1	
20 dBm	1								
10 dBm									
	11								
0 dBm	+						M2		
	1								
-10 dBm	<b>*</b>						11110	and the state of t	
	- Annual -								Manuhowene
-20 dBm	-/								1. 1. W. I
	11							l M	
-30 dBm	$\mathbb{P}$							I	
-40 dBm									
									V2
-50 dBm									
CF 76.5 GHz	•		1201 p	ts	12	0.0 MHz/			Span 1.2 GHz
2 Marker Tab	le								
Type Re		X-Value		Y-Value		Function		Function R	
M1	1	76.8827 G		31.02 dBm	Occ Bw	a kana tal	91	.5.893 978 6	
T1 T2	1	76.046 063 0 76.961 957 0		28.26 dBm 29.21 dBm	Occ Bw Cer Occ Bw Fre				01007 GHz 59614 MHz
M2	2	76.7768 G		-6.01 dBm	OLC DW FIE	iq onset		4.01000	9 01 4 MILZ
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Plot 42: Mode 09, OBW, 50 °C / Vmin-max

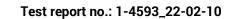
MultiView	Spectrum	n X Sp	ectrum 2	×					•
Ref Level 48.0	0 dBm Offse	t 55.00 dB 🖷 RE	3W 1 MHz						
	● SWT	120 s 👄 VE	W 3 MHz Mo	le Auto Sweep					
Inp: ExtMix E	1.1.1.1								
1 Occupied Ban	nawiath								ax e 2Rm Max
								M2[2]	-6.38 dBm 6.552 000 GHz
40 dBm								N41517	30.84 dBm
								····· · · · · · · · · · · · · · · · ·	6.879 700 GHz
30 dBm	T1 Koletel/Manualts/Hurs	Man a markin when when	A MARINA MARINA MARINA	an marken markers	man plane where and	Mr. Mary marta	Manus management	Markenen ander Markenen	0.879700 GHZ
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20 dBm									
10 dBm-									
	1								
0 dBm	<del>}</del>				M2				
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A CONTRACTOR OF THE OWNER	and the second s							Man and a second se	"http://white
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	1							Ŵ	
-30 dBm									¶L
-40 dBm									
									V2
-50 dBm									
CF 76.5 GHz			1201 pt	s	12	0.0 MHz/			Span 1.2 GHz
2 Marker Table									
Type Ref	Trc	X-Value 76.8797 G	U-7 7	Y-Value 0.84 dBm	O an Burr	Function	010	Function Re 3.232 016 0	
M1 T1	1	76.044 555 C		25.91 dBm	Occ Bw Occ Bw Cer	otroid	910		20 MITZ 0945 GHz
T2	1	76.962 787 0	θHz	29.51 dBm	Occ Bw Cer				5 427 MHz
M2	2	76.552 G	Hz	-6.38 dBm					
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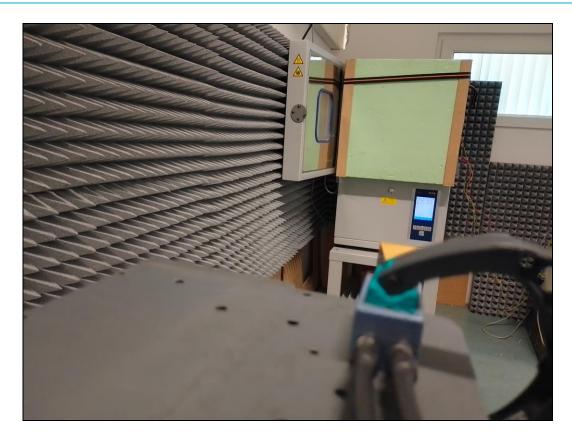
Plot 43: Mode 09, OBW, 85 °C / V_{min-max}

MultiView	- Spectrun	n X Spe	ectrum 2	×					
Ref Level 48	.00 dBm Offse	t 55.00 dB • RE	SW 1 MHz	_					_
	● SWT	120 s 👄 VB	W 3 MHz Mo	de Auto Sweep					
Inp: ExtMix E	1.1.1.1								
1 Occupied Ba	andwidth				I	1			ax e 2Rm Max 29.93 dB
								M1[1]	29.93 dB
40 dBm								M2[2]	-6.83 dB
	T1							MT -	6.554 000 GF
30 dBm	Jan American All Maria	and the second second second second	undoon when the market	water water way way	W. M. Canderstational Antipation	man man man man	Mendersprender	wanter sugar	0.5540000
	A	a adda dha a a a	and the second second		-			<u>\</u>	
20 dBm									
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10 dBm									
0 dBm	11				M2				
	11								14.
-10 dBm		11111						1111	1
manner	Mar Mar Martin							allow maller	Marth Marth Martin
-20 dBm	1							ີພ	4
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-30 dBm	<b>F</b>								
-40 dBm									
V1									V2
-50 dBm			1001		-				
CF 76.5 GHz	•		1201 p	ts	12	0.0 MHz/			Span 1.2 G⊢
2 Marker Tab Type Re		X-Value		Y-Value		Function		Function Re	and the
Type Re M1	f   Trc   1	76.922 6 G	Hz	29.93 dBm	Occ Bw	Function	9	15.018 644 9	
T1	1	76.047 94 0	Hz	27.63 dBm	Occ Bw Ce	ntroid	-	76.505 449	
T2	1	76.962958 0	Hz	22.34 dBm	Occ Bw Fre	eq Offset		5.449145	5002 MHz
M2	2	76.554 G	HZ	-6.83 dBm					
							<ul> <li>Measuring</li> </ul>		2023-07-
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# 13 Glossary

C/N ₀	Carrier to noise-density ratio, expressed in dB-Hz
GNSS	Global Navigation Satellite System
FHSS	Frequency hopping spread spectrum
OFDM	Orthogonal frequency division multiplexing
DSSS	Dynamic sequence spread spectrum
RLAN	Radio local area network
WLAN	Wireless local area network
MC	Modulated carrier
CW	Clean wave
PER	Packet error rate
DC	Duty cycle
NOP	Non occupancy period
OP	Occupancy period
CAC	Channel availability check
DFS	Dynamic frequency selection
OOB	Out of band
OBW	Occupied bandwidth
OCW	Operating channel bandwidth
00	Operating channel
AVG	Average
QP	Quasi peak
PP	Positive peak
NP	Not performed
NA	Not applicable
NC	Not compliant
C	Compliant
S/N or SN	Serial number
Inv. No.	Inventory number
SW	Software
HW	Hardware
EMC	Electromagnetic Compatibility
FVIN	Firmware version identification number
HVIN	Hardware version identification number
HMN	Host marketing name
PMN	Product marketing name
IC	Industry Canada
FCC ID	Company Identifier at FCC
FCC	Federal Communications Commission
EN	European Standard
ETSI	European Telecommunications Standards Institute
GUE	GNSS User Equipment
UUT	Unit under test
DUT	Device under test
EUT	Equipment under test



# 14 Document history

Version	Applied changes	Date of release
-/-	Initial release - DRAFT	2023-07-27
-/-	Initial release	

# 15 Accreditation Certificate – D-PL-12076-01-05

first page	last page
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The accreditation certificate shall only apply in connection with the notice of accreditation of 09.06.2020 with the accreditation number D-PL-12076-01. It comprises the over sheet, the reverse side of the cover sheet and the following annex with a total of 05 pages. Registration number of the certificate: D-PL-12076-01.05 Frankfurt am Main, 09.06.2020 The certificate together with its annex reflects the status at the time of the date of suse. The current status of the scope of accreditation can be Jourd in the database of accredited bodies dates. Intercriticate can be Jourd in the database of accredited bodies of Dousche Akkreditorouggstelle Gmiss.	The accreditation was granted pursuant to the Act on the Accreditation Body (AkkStelleG) of 31.192 2009 (Federal Law Gazette J. 2-253) and the Regulation (EQ No 755/2008 of the furopean Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products (Official Journal of the European Loropean co-operation for Accreditation (EA). International Accreditation Forum (AF) and International Laboratory Accreditation Cooperation (LAC). The signatories to these agreements recognise each other's accreditations. The up-to-date state of membership can be retrieved from the following websites: EA: www.european-accreditation.org LAC: www.lac.org LAC: www.lac.org

## Note: The current certificate annex is published on the websites (link see below).

https://www.dakks.de/files/data/as/pdf/D-PL-12076-01-05e.pdf or

https://cetecomadvanced.com/files/pdfs/d-pl-12076-01-05_tcb_usa.pdf