

TEST REPORT

Test report no.: 1-9960-25-01-02_TR1-R02



Testing laboratory

cetecom advanced GmbH

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Accredited Testing Laboratory:

The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2018-03) by the Deutsche Akkreditierungsstelle GmbH (DAkkS).

The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number:

D-PL-12047-01-00.

ISED Testing Laboratory Recognized Listing Number: DE0001

FCC designation number: DE0002

Applicant

ContiTech USA, LLC

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44333 Fairlawn, Ohio, USA

Phone: --

Contact: Eugen Wagner

e-mail: eugen.wagner@continental.com

Manufacturer

ContiTech USA, LLC

703 S Cleveland Massillon Road

44333 Fairlawn, Ohio, USA

Test standard/s

FCC - Title 47 CFR Part 90 FCC - Title 47 of the Code of Federal Regulations; Chapter I; Subchapter D, Part 90, Subpart F, §90.103(b)(d) - Radiolocation Service

For further applied test standards please refer to section 3 of this test report.

Test Item

Kind of test item: Radar Sensor
Model name/Type name: LS26-RAD-01-US
FCC ID: 2BHWPLS26
Frequency: 76 – 77 GHz
Technology tested: RADAR
Antenna: Integrated antenna
Power supply: 24 V DC (nominal)
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:

CN = Martin Nunier email = Martin.Nunier@cetecomadvanced.com C = DE O = cetecom advanced GmbH OU = Radio Labs
2026.07.31 14:06:22 +02'00'

Martin Nunier
Coordinator Area
Radio Communications

Test performed:

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2026.07.31 13:54:32 +02'00'

Al-Amin Hossain
Lab Manager
Radio Communications

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2 General information

2.1 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. cetecom 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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In no case this test report can be considered as a Letter of Approval.

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.

2.2 Application details

Date of receipt of order:	2025-05-07
Date of receipt of test item:	2024-07-09
Start of test:*	2025-03-26
End of test:*	2025-06-30
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.

2.3 Involved test locations

Saarbruecken lab		Essen lab	
☐	Untertuerkheimer Str. 6-10 66117 Saarbruecken Germany	☒	Im Teelbruch 116 45219 Essen Germany

2.4 Test laboratories sub-contracted

None

2.5 Laboratory listings and recognitions

	Saarbruecken	Essen
FCC	DE0002	DE0003
ISED	DE0001 3462C	DE0001 3462D

3 Test standard/s, references and accreditations

Test standard	Date	Description
FCC - Title 47 CFR Part 90	--	FCC - Title 47 of the Code of Federal Regulations; Subchapter D, Part90, Subpart F, §90.103(b)+(d)

* Not included in the current accreditation certificate of cetecom advanced GmbH.

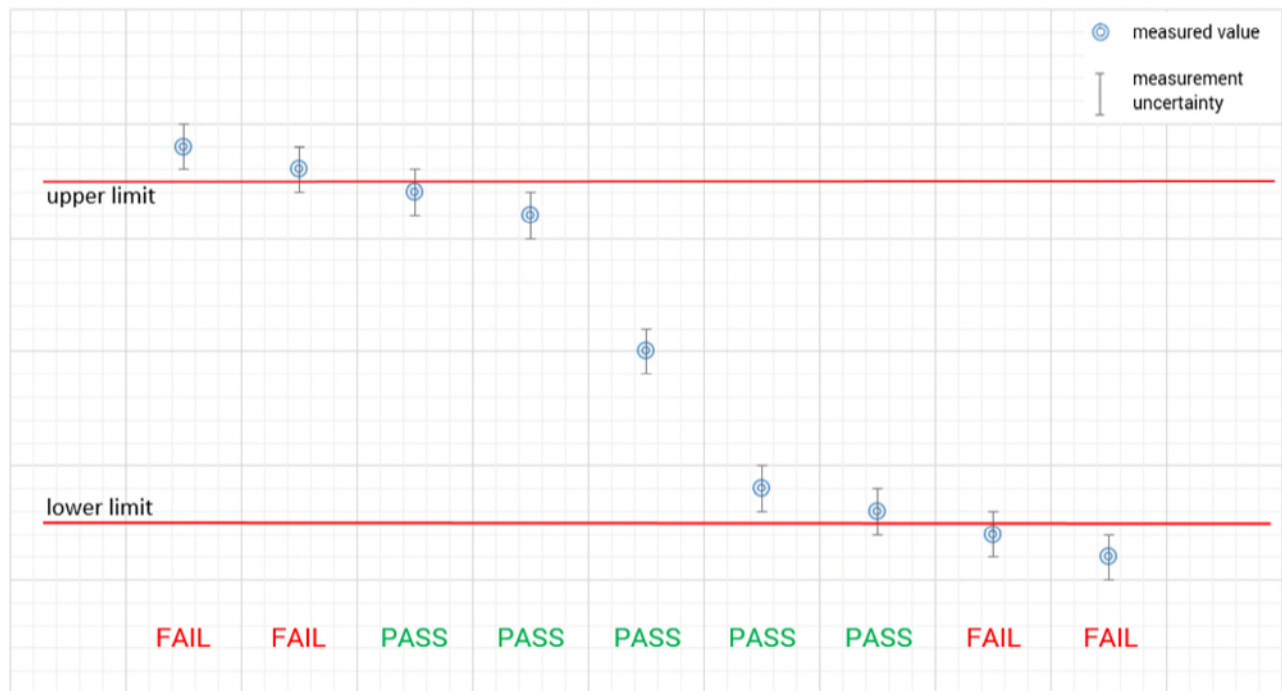
Guidance	Version	Description
ANSI C63.4-2014	-/-	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI C63.26-2015	-/-	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

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.

measured value, measurement uncertainty, verdict



5 Test environment

Temperature	:	T_{nom} T_{max} T_{min}	+22 °C during room temperature tests +50 °C during high temperature tests -20 °C during low temperature tests
Relative humidity content	:		49 %
Barometric pressure	:		990 hPa to 1010 hPa
Power supply	:	V_{nom} V_{max} V_{min}	24 V DC 27.6 V DC 20.4 V DC

6 Test item

6.1 General description

Kind of test item	:	Radar Sensor
Model name	:	LS26-RAD-01-US
Type name	:	LS26-RAD-01-US
S/N serial number	:	36.350 (Trackit number)
Hardware status	:	19/10
Software status	:	ARS 408LS
Firmware status	:	--
Frequency band	:	76 – 77 GHz
Type of modulation	:	FMCW
Number of modes	:	1
Antenna	:	Integrated antenna
Power supply	:	24 V DC
Temperature range	:	-40°C to +85°C

6.2 Additional information

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:

- 1-9960-25-01-02_TR1-A101-R01 (External photographs of EUT)
- To be provided by the applicant (Internal photographs of EUT)
- 1-9960-25-01-02_TR1-A103-R01 (Test set-up photographs)
- Note: The referenced photos show EUT delivered by the customer in this project, not necessarily the exact one used for the specific tests. EUT identification shown in the photos may differ.

Additional measurement reports:

- None

Additional declarations (manufacturer's declarations, declarations of conformity, etc.):

- Information Document "ContiTech USA, Inc. - Request for Waiver February 24 2022.pdf"

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/cal	calibration / calibrated
Ne/cnn	not required (k, ev, izw, zw not required)
Ev/chk	periodic self verification
Ve	long-term stability recognized
v/k!	Attention: extended calibration interval
NK!	Attention: not calibrated
cpu	check prior usage

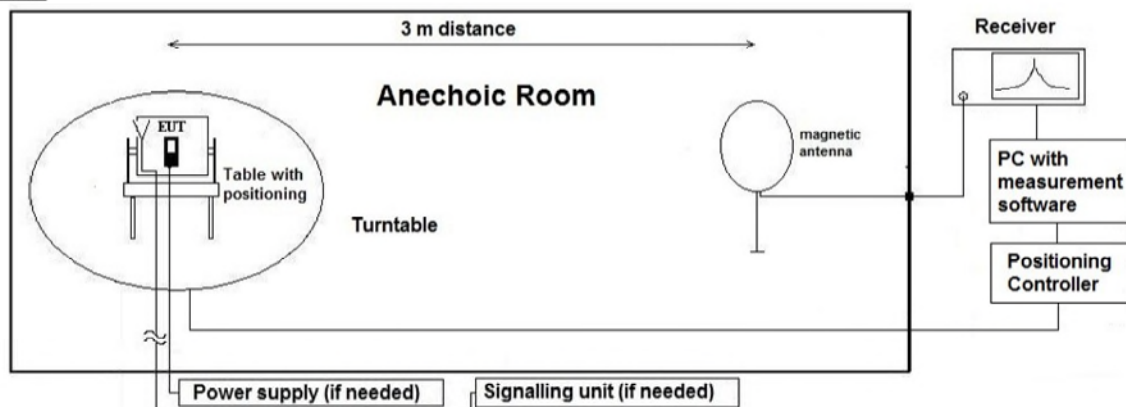
EK	limited calibration
zw	cyclical maintenance (external cyclical maintenance)
izw	internal cyclical maintenance
g	blocked for accredited testing
*)	next calibration ordered / currently in progress

7.1 Shielded semi anechoic chamber

Evaluating the radiated field emissions are done first by an exploratory emission measurement and a final measurement for most critical frequencies determined.

The loop antenna was placed at 1 m height above ground plane and 3 m measurement distance from set-up for investigations. Because of reduced measurement distance, correction data were applied, as stated in sub-chapter "correction factors". The tests are performed in the semi-anechoic room recognized by the regulatory commission and absorbers placed between EUT and measurement antenna.

Schematic:



Testing method:

The measurement is made according to relevant reference clauses:
(See Tables *Summary of Test Results* and *Summary of Test Methods* on page 5)

Exploratory, preliminary measurements

The EUT and its associated accessories are placed on a non-conductive position manipulator (tipping device) of 0.8 m height which is placed on the turntable. By rotating the turntable (step 90°, range 0° to 360°) and the EUT itself either on 3-orthogonal axis (portable equipment) or 2-orthogonal axis (defined operational position of EUT), the emission spectrum was recorded.

The loop antenna was moved at least to 2-perpendicular axes (antenna vector in direction of EUT and parallel to EUT) in order to maximize the emissions. The results are documented in a diagram. Critical frequencies (low margin to limit) are saved within a data reduction table for further investigations. If various operating modes are supported, further investigations are made to find the worst-case. Also the interconnection cables and equipment position were varied in order to maximize the emissions.

Final measurement on critical frequencies

Based on the exploratory measurements, the most critical frequencies are re-measured by maintaining the EUT's worst-case operation mode, cable position, etc.

First a frequency zoom around the critical frequency is done to locate the frequency more precisely. After this step, for all identified critical frequencies, the maximum peak was determined.

Following parameters were varied: the turntable angle continuously in the range 0 to 360 degree, the EUT itself either over 1 (defined usage position) or 2-orthogonal axis (not defined usage position for portable equipment).

On the determined worst-case position, a final measurement with necessary bandwidth and detector according standard has been carried out.

Formula:

$$E_C = E_R + AF + C_L + D_F - G_A$$

$$M = L_T - E_C$$

AF = Antenna factor

C_L = Cable loss

D_F = Distance correction factor (if used)

E_C = Electrical field – corrected value

E_R = Receiver reading

G_A = Gain of pre-amplifier (if used)

L_T = Limit

M = Margin

All units are dB-units, positive margin means value is below limit.

Sample calculation

Raw-Value [dBuV/m]	Antenna factor	Distance Correction [dB]	Cable Loss	Preamplifier	Resulting correction value [dB]	Final result [dBuV/m]	Remarks
19.83	18.9	-70.75	0.18	--	-51.67	-31.83	30 to 3 m correction used according ANSI C63.10-2020

Remark: This calculation is based on an example general value at 458 kHz, frequency not related to this project

Correction factors due to reduced meas. distance ($f < 30$ MHz):

The used correction factors when the measurement distance is reduced compared to regulatory measurement distance, are calculated according Extrapolation formulas valid for EUT's with maximum dimension of $0.625 \times \text{Lambda}$. Formula 2+3+4 as presented in ANSI C63.10, Chapter 6.4.4 are used for the calculations of proper extrapolation factors

Frequency Range	F [kHz/MHz]	Lambda [m]	Far-Field Point [m]	Distance Limit accord. 15.209 [m]	1st Condition (dmeas < Dnear-field)	2nd Condition (Limit distance bigger dnear-field)	Distance Correction accord. Formula
kHz	9	33333.33	5305.17	300	fulfilled	not fulfilled	-80.00
	10	30000.00	4774.65		fulfilled	not fulfilled	-80.00
	20	15000.00	2387.33		fulfilled	not fulfilled	-80.00
	30	10000.00	1591.55		fulfilled	not fulfilled	-80.00
	40	7500.00	1193.66		fulfilled	not fulfilled	-80.00
	50	6000.00	954.93		fulfilled	not fulfilled	-80.00
	60	5000.00	795.78		fulfilled	not fulfilled	-80.00
	70	4285.71	682.09		fulfilled	not fulfilled	-80.00
	80	3750.00	596.83		fulfilled	not fulfilled	-80.00
	90	3333.33	530.52		fulfilled	not fulfilled	-80.00
	100	3000.00	477.47		fulfilled	not fulfilled	-80.00
	125	2400.00	381.97		fulfilled	not fulfilled	-80.00
	200	1500.00	238.73		fulfilled	fulfilled	-78.02
	300	1000.00	159.16		fulfilled	fulfilled	-74.49
	400	750.00	119.37		fulfilled	fulfilled	-72.00
	490	612.24	97.44		fulfilled	fulfilled	-70.23
	500	600.00	95.49	30	fulfilled	not fulfilled	-40.00
	600	500.00	79.58		fulfilled	not fulfilled	-40.00
	700	428.57	68.21		fulfilled	not fulfilled	-40.00
	800	375.00	59.68		fulfilled	not fulfilled	-40.00
	900	333.33	53.05		fulfilled	not fulfilled	-40.00
MHz	1.00	300.00	47.75		fulfilled	not fulfilled	-40.00
	1.59	188.50	30.00		fulfilled	not fulfilled	-40.00
	2.00	150.00	23.87		fulfilled	fulfilled	-38.02
	3.00	100.00	15.92		fulfilled	fulfilled	-34.49
	4.00	75.00	11.94		fulfilled	fulfilled	-32.00
	5.00	60.00	9.55		fulfilled	fulfilled	-30.06
	6.00	50.00	7.96		fulfilled	fulfilled	-28.47
	7.00	42.86	6.82		fulfilled	fulfilled	-27.13
	8.00	37.50	5.97		fulfilled	fulfilled	-25.97
	9.00	33.33	5.31		fulfilled	fulfilled	-24.95
	10.00	30.00	4.77		fulfilled	fulfilled	-24.04
	10.60	28.30	4.50		fulfilled	fulfilled	-23.53
	11.00	27.27	4.34		fulfilled	fulfilled	-23.21
	12.00	25.00	3.98		fulfilled	fulfilled	-22.45
	13.56	22.12	3.52		fulfilled	fulfilled	-21.39
	15.00	20.00	3.18		fulfilled	fulfilled	-20.51
	15.92	18.85	3.00		fulfilled	fulfilled	-20.00
	17.00	17.65	2.81		not fulfilled	fulfilled	-20.00
	18.00	16.67	2.65		not fulfilled	fulfilled	-20.00
	20.00	15.00	2.39		not fulfilled	fulfilled	-20.00
	21.00	14.29	2.27		not fulfilled	fulfilled	-20.00
	23.00	13.04	2.08		not fulfilled	fulfilled	-20.00
	25.00	12.00	1.91		not fulfilled	fulfilled	-20.00

	27.00	11.11	1.77		not fulfilled	fulfilled	-20.00
	29.00	10.34	1.65		not fulfilled	fulfilled	-20.00
	30.00	10.00	1.59		not fulfilled	fulfilled	-20.00

Measurement Location

Test site	☐ SAC 1: #225911
	☒ SAC 3: #120901

Equipment table:

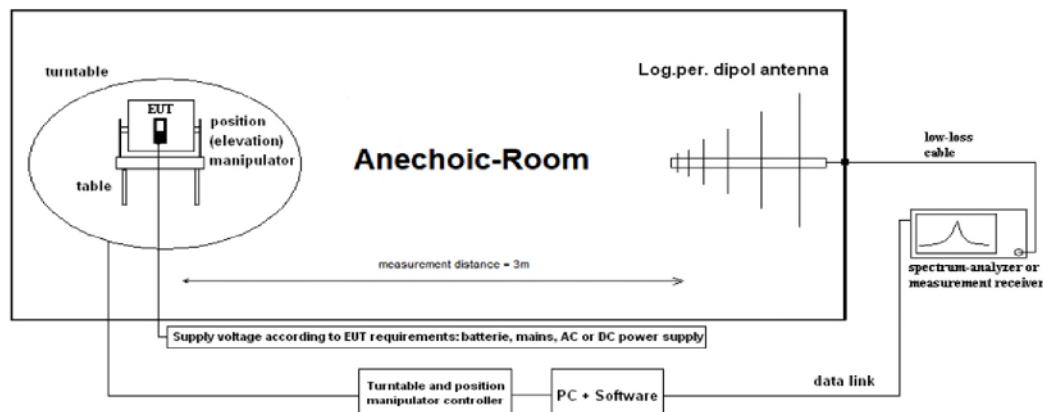
No.	Lab / Item	Equipment	Type	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
1	20341	Digital Multimeter	Digital Multimeter Fluke 112	Fluke Deutschland GmbH / Glottertal	81650455	--	cal	13.05.2024	13.05.2026
2	20482	Filter Matrix	Filter Matrix SAC3	cetecom advanced GmbH / Essen	without	--	cnn	-/-	-/-
3	20620	EMI Test Receiver	EMI Test Receiver ESU26	Rohde & Schwarz Messgerätebau GmbH / Memmingen	100362	--	cal	08.05.2025	08.05.2026
4	20016	Line Impedance Simulating Network Op. 24-D	Line Impedance Simulating Network	Spitzenberger & Spies GmbH & Co. KG	B6366	--	cal	19.05.2025	19.05.2028
5	25038	Loop Antenna	Loop Antenna HFH2- Z2	Rohde & Schwarz Messgerätebau GmbH / Memmingen	879824/13	--	cal	04.07.2022	04.07.2025

7.2 Radiated field strength emissions 30 MHz – 1000 MHz

Description of the general test setup and methodology, see below example:

Evaluating the emissions have to be done first by an exploratory emissions measurement and a final measurement for most critical frequencies. The tests are performed in a CISPR 16-1-4:2010 compliant Semi-Anechoic Chamber (SAC) recognized by the regulatory commission. The measurement distance was set to 3 meters for frequencies up to 1 GHz. A logarithmic periodic antenna is used for the frequency range 30 MHz to 1 GHz.

Schematic:



Measurement method/steps:

The measurement is made according to relevant reference clauses:
(See Tables *Summary of Test Results* and *Summary of Test Methods* on page 5)

Exploratory, preliminary measurements

The EUT and its associated accessories are placed on a non-conductive position manipulator (tipping device) of 0.8 m height which is placed on the turntable. By rotating the turntable (range 0° to 360°, step 90°) and the EUT itself either on 2-orthogonal axis (or 3-axis) the emission spectrum and its characteristics were recorded with an EMI-receiver, broadband antenna and software.

Measurement antenna: horizontal and vertical, heights: 1,0 m and 1,82 m as worst case determined by an exploratory emission measurement. The results are documented in a diagram. Critical frequencies (low margin to limit) are saved within a table for further investigations. If various operating modes are supported, further investigations are carried out to find the worst case of them. Also, the interconnection cables and equipment position were varied in order to maximize the emissions.

Final measurement on critical frequencies

Based on the exploratory measurements, the most critical frequencies are re-measured by maintaining the EUT's worst-case operation mode, cable position, etc. either on 10m OATS or 3m semi-anechoic room.

First a frequency zoom around the critical frequency is done to locate the frequency more precisely. After this step, for all identified critical frequencies, the maximum peak was determined.

Following parameters were varied: the turntable angle continuously in the range 0 to 360 degree, the EUT itself either over 1 (defined usage position) or 2-orthogonal axis (not defined usage position for portable equipment). The measurement antenna height is varied between 1 m and 4 m for maximum search. The measurements are performed for horizontal and vertical measurement antenna polarization.

On the determined worst-case position, a final measurement with necessary bandwidth and detector according the standard has been carried out.

Formula:

$$E_C = E_R + AF + C_L + D_F - G_A \quad (1)$$

$$M = L_T - E_C \quad (2)$$

AF = Antenna factor

C_L = Cable loss

D_F = Distance correction factor (if used)

E_C = Electrical field – corrected value

E_R = Receiver reading

G_A = Gain of pre-amplifier (if used)

L_T = Limit

M = Margin

All units are dB-units, positive margin means value is below limit.

Sample calculation

Raw-Value [dBuV/m]	Antenna factor	Distance Correction [dB]	Cable Loss	Preamplifier	Resulting correction value [dB]	Final result [dBuV/m]	Remarks
32.7	22.25	--	3.1	--	25.35	58.05	--

Remark: This calculation is based on an general example value at 800.4 MHz, not related to the concrete measurements within this project.

Measurement Location

Test site	☐ SAC 1: #225911
	☒ SAC 3: #120901

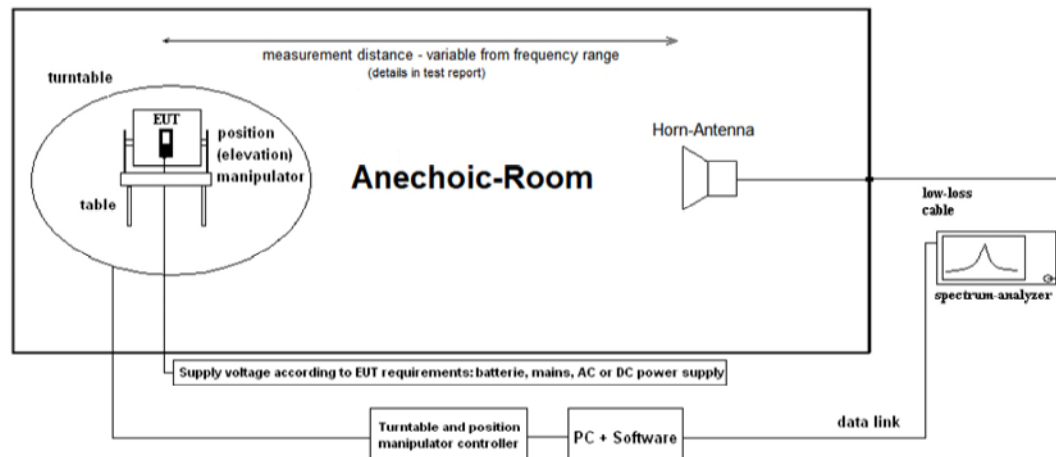
Equipment table:

No.	Lab / Item	Equipment	Type	Manufacturer	Serial No.	Kind of Calibration	Last Calibration	Next Calibration
1	20341	Digital Multimeter	Digital Multimeter Fluke 112	Fluke Deutschland GmbH / Glottertal	81650455	cal	13.05.2024	13.05.2026
2	20482	Filter Matrix	Filter Matrix SAC3	cetecom advanced GmbH / Essen	without	cnn	-/-	-/-
3	20574	Biconilog Hybrid Antenna	Biconilog Hybrid Antenna BTA-L	Frankonia GmbH / Heideck	980026L	cal	15.06.2022	15.06.2025
4	20620	EMI Test Receiver	EMI Test Receiver ESU26	Rohde & Schwarz Messgerätebau GmbH / Memmingen	100362	cal	08.05.2025	08.05.2026
5	20016	Line Impedance Simulating Network Op. 24-D	Line Impedance Simulating Network	Spizenberger & Spies GmbH & Co. KG	B6366	cal	19.05.2025	19.05.2028

7.3 Shielded fully anechoic chamber (1GHz to 18/40GHz - FAC 2)

Evaluating the emissions have to be done first by an exploratory emissions measurement and a final measurement for most critical frequencies. The tests are performed in a CISPR 18-1-4:2010 compliant fully anechoic room (FAR) recognized by the regulatory commission. Typical distances are set to 3 meter for frequencies up to 15 GHz, 2 meter up to 18 GHz and 1m up to 50GHz. Otherwise specified in the diagram. Horn antennas are used for frequency range 1 GHz to 50 GHz. The EUT is aligned within 3 dB beam width of the measurement antenna.

Schematic:



Measurement method/steps:

The measurement is made according to relevant reference clauses:
(See Tables *Summary of Test Results* and *Summary of Test Methods on page 5*)

Exploratory, preliminary measurements

The EUT and its associated accessories are placed on a non-conductive position manipulator (tipping device) of 1.55 m height which is placed on the turntable. By rotating the turntable (range 0° to 360°, step 15°) and the EUT itself either on 3-orthogonal axis (portable equipment) or 2-orthogonal axis (defined operational position of EUT) the emission spectrum and its characteristics was recorded with an EMI-receiver, broadband antenna and software.

The measurements are performed in horizontal and vertical polarization of the measurement antennas. The results are documented in a diagram. Critical frequencies (low margin to limit) are saved within a table for further investigations. If various operating modes are supported, further investigations are made to find the worst-case of them. Also the interconnection cables and equipment position were varied in order to maximize the emissions.

Final measurement on critical frequencies

Based on the exploratory measurements, the most critical frequencies are re-measured by maintaining the EUT's worst-case operation mode, cable position, etc.

First a frequency zoom around the critical frequency is done to locate the frequency more precisely. After this step, for all identified critical frequencies, the maximum peak was determined.

Following parameters were varied: the turntable angle continuously in the range 0 to 360 degree, the EUT itself over one or two axis for defined EUT position and the measurement antenna height for EUT with large dimensions or three axis scan for portable/small equipment. This is performed for both measurement antenna polarization: horizontal and vertical.

On the determined worst-case position, a final measurement with necessary bandwidth and detector according standard has been carried out.

FCC/ISED Sample calculation

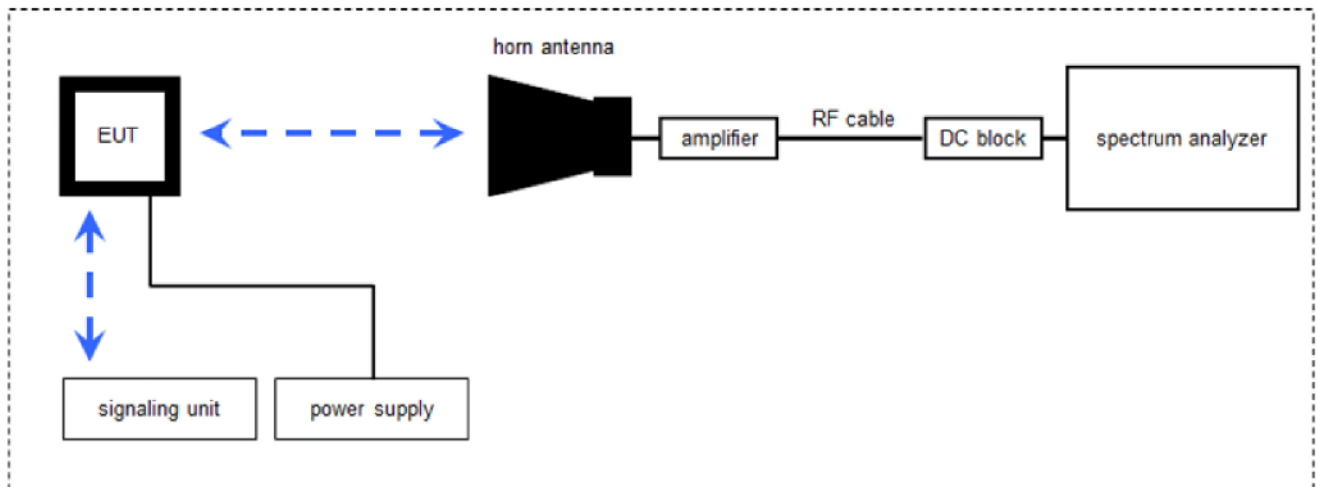
Raw-Value [dBuV/m]	Antenna factor	Distance Correction [dB]	Cable Loss + Preamplifier	Resulting correction value [dB]	Final result [dBuV/m]	Remarks
29.37	41.20	--	24.28	16.92	46.3	CableLoss and PreAmp data in one data correction file

Remark: This calculation is based on an general example value at 10 GHz, not related to the concrete measurements within this project.

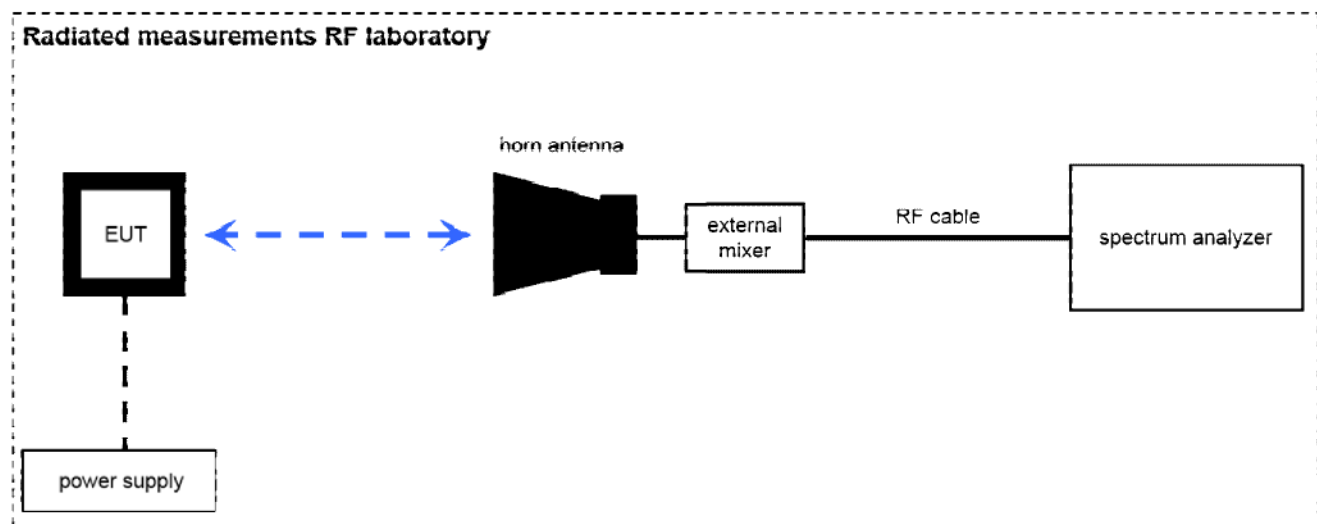
Equipment table (Essen Lab location)**Equipment table (Essen Lab location): FAC2**

No.	Lab / Item	Equipment	Type	Manufacturer	Serial No.	Kind of Calibration	Last Calibration	Next Calibration
1	20133	Double-Ridged Waveguide Horn Antenna	Double-Ridged Waveguide Horn Antenna 3115 (Meas 1)	EMCO Elektronik GmbH / Gilching	9012-3629	cal	22.05.2023	22.05.2026
2	20016	Line Impedance Simulating Network Op. 24-D	Line Impedance Simulating Network	Spizenberger & Spies GmbH & Co. KG	B6366	cal	19.05.2025	19.05.2028
3	20972	Signal- and Spectrum Analyzer	Signal- and Spectrum Analyzer FSW50	Rohde & Schwarz Messgerätebau GmbH / Memmingen	101929	cal	19.03.2025	19.03.2026
4	20811	Horn Antenna	Horn Antenna ASY-SGH-124-SMA	Antenna Systems Solutions S.L. / Santander	29F14182337	chk	20.10.2021	07.10.2025
5	20816	SGH Antenna	SGH Antenna SGH-26-WR10	Anteral S.L.	1144	cnn	-/-	-/-
6	20817	Waveguide Rectangular Horn Antenna	Waveguide Rectangular Horn Antenna SAR-2309-22-S2	ERAVANT / Torrance	13254-01	chk	16.10.2024	20.10.2026
7	20836	Amplifier	1-18 GHz Amplifier	Wright Technologies, Inc., Inc. / Roseville	0001	chk	18.10.2024	18.10.2026
8	20912	Low noise Amplifier Module 0.5-4GHz	Low noise Amplifier Module 0.5-4GHz	RF-Lambda Europe GmbH / Rüsselsheim	19041200083	cpu	18.10.2024	18.10.2025
9	20913	Phase Amplitude Stable Cable Assembly	Phase Amplitude Stable Cable Assembly DC-40GHz	RF-Lambda Europe GmbH	AC19040001	cnn	-/-	-/-
10	25457	DRG Horn Antenna	DRG Horn Antenna SAS-574	A.H. Systems, Inc. / Chatsworth	383	cal	28.03.2022	28.06.2025

7.4 Radiated measurements > 18 GHz



7.5 Radiated measurements > 50/85 GHz



Measurement distance: horn antenna e.g. 75 cm

$$FS = UR + CA + AF$$

(FS-field strength; UR-voltage at the receiver; CA-loss signal path & distance correction; AF-antenna factor)

Example calculation:

$$FS \text{ [dB}\mu\text{V/m]} = 40.0 \text{ [dB}\mu\text{V/m]} + (-60.1) \text{ [dB]} + 36.74 \text{ [dB/m]} = 16.64 \text{ [dB}\mu\text{V/m]} \text{ (6.79 } \mu\text{V/m)}$$

$$OP = AV + D - G + CA$$

(OP-radiated output power; AV-analyzer value; D-free field attenuation of measurement distance; G-antenna gain+amplifier gain; CA-loss signal path)

Example calculation:

$$OP \text{ [dBm]} = -59.0 \text{ [dBm]} + 44.0 \text{ [dB]} - 20.0 \text{ [dBi]} + 5.0 \text{ [dB]} = -30 \text{ [dBm]} \text{ (1 } \mu\text{W)}$$

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

Equipment table:

No.	Lab / Item	Equipment	Type	Manufacturer	Serial No.	Kind of Calibration	Last Calibration	Next Calibration
1	20133	Double-Ridged Waveguide Horn Antenna	Double-Ridged Waveguide Horn Antenna 3115 (Meas 1)	EMCO Elektronik GmbH / Gilching	9012-3629	cal	22.05.2023	22.05.2026
2	20354	DC - Power Supply 40A	DC - Power Supply 40A NGPE 40/40		448	cpu	05.03.2008	-/-
3	20412	Fully Anechoic Chamber	Fully Anechoic Chamber 2	ETS-Lindgren GmbH / Taufkirchen	without	chk	15.03.2024	28.06.2025
4	20729	Harmonic Mixer	FS-Z140	Rohde & Schwarz Messgerätebau GmbH / Memmingen	101004	cal	16.06.2023	16.06.2026
5	20730	Harmonic Mixer	FS-Z110	Rohde & Schwarz Messgerätebau GmbH / Memmingen	101468	cal	02.06.2023	02.06.2026
6	20731	Harmonic Mixer	FS-Z75	Rohde & Schwarz Messgerätebau GmbH / Memmingen	101022	cal	08.06.2022	08.06.2025
7	20732	Signal- and Spectrum Analyzer	Signal- and Spectrum Analyzer FSW67	Rohde & Schwarz Messgerätebau GmbH / Memmingen	104023	cal	30.07.2024	30.07.2025
8	20733	Harmonic Mixer	Harmonic Mixer FS-Z220	RPG-Radiometer Physics GmbH / Meckenheim	101009	cal	24.05.2024	24.05.2027
9	20734	Harmonic Mixer	Harmonic Mixer FS-Z325	RPG-Radiometer Physics GmbH / Meckenheim	101005	cal	24.05.2024	24.05.2027
10	20765	Pickett-Potter Horn Antenna	Pickett-Potter Horn Antenna FH-PP 40-60	RPG-Radiometer Physics GmbH / Meckenheim	010001	chk	16.10.2024	16.10.2026
11	20767	Pickett-Potter Horn Antenna	Pickett-Potter Horn Antenna FH-PP 140-220	RPG-Radiometer Physics GmbH / Meckenheim	010011	chk	09.10.2024	09.10.2026
12	20811	Horn Antenna	Horn Antenna ASY-SGH-124-SMA	Antenna Systems Solutions S.L / Santander	29F14182337	cal	08.10.2024	08.10.2027
13	20813	Pickett-Potter Horn Antenna	Pickett-Potter Horn Antenna FH-PP 075	RPG-Radiometer Physics GmbH / Meckenheim	10006	chk	16.10.2024	16.10.2026
14	20814	Pickett-Potter Horn Antenna	Pickett-Potter Horn Antenna FH-PP 140	RPG-Radiometer Physics GmbH / Meckenheim	10008	chk	09.10.2024	09.10.2026
15	20815	Pickett-Potter Horn Antenna	Pickett-Potter Horn Antenna FH-PP 110	RPG-Radiometer Physics GmbH / Meckenheim	10014	chk	22.03.2024	22.03.2026
16	20817	Waveguide Rectangular Horn Antenna	Waveguide Rectangular Horn Antenna SAR-2309-22-S2	ERAVANT / Torrance	13254-01	chk	16.10.2024	16.10.2026
17	20836	Amplifier	1-18 GHz Amplifier	Wright Technologies, Inc., Inc. / Roseville	0001	chk	18.10.2024	18.10.2026
18	20912	Low noise Amplifier Module 0.5-4GHz	Low noise Amplifier Module 0.5-4GHz	RF-Lambda Europe GmbH / Rüsselsheim	19041200083	cpu	18.10.2024	18.10.2025
19	20913	Phase Amplitude Stable Cable Assembly	Phase Amplitude Stable Cable Assembly DC-40GHz	RF-Lambda Europe GmbH	AC19040001	cnn	-/-	-/-
20	25457	DRG Horn Antenna	DRG Horn Antenna SAS-574	A.H. Systems, Inc. / Chatsworth	383	cal	28.03.2022	28.06.2025
21	20016	Line Impedance Simulating Network Op. 24-D	Line Impedance Simulating Network	Spitzenberger & Spies GmbH & Co. KG	B6366	cal	19.05.2025	19.05.2028

8 Sequence of testing

8.1 Sequence of testing radiated spurious 9 kHz to 30 MHz

Setup

Note: Check Chapter 7.1

Premeasurement*

Note: Check Chapter 7.1

Final measurement

Note: Check Chapter 7.1

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

8.2 Sequence of testing radiated spurious 30 MHz to 1 GHz

Setup

Note: Check Chapter 7.2

Premeasurement

Note: Check Chapter 7.2

Final measurement

Note: Check Chapter 7.2

8.3 Sequence of testing radiated spurious 1 GHz to 18 GHz

Setup

Note: Check Chapter 7.3

Premeasurement

Note: Check Chapter 7.3

Final measurement

Note: Check Chapter 7.3

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.

Final measurement

- 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 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.

Final measurement

- 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.

8.6 Sequence of testing efficient use of spectrum

Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- The EUT positioned at a distance of approx. 0.5m to the horn antenna used for the measurement.
- The associated receiver is positioned between the EUT the horn antenna to assure that the received signal level of the associated receiver at the spectrum analyzer is higher than the level of the EUT.

Measurement:

- Switch on EUT and associated receiver and wait until the connection is established.
- Start Analyzer sweep in Zerospan with a sweep time of 15 s.
- Switch of the associated receiver.
- When switching of the associated receiver, a drop in the received signal level at the spectrum analyzer can be observed. → position marker 1
- Position marker two at the point where the transmission of the EUT stops.
- Measure time difference between marker 1 and marker 2.

9 Measurement uncertainty (Essen Lab location)

Issue No.	Measurement type	References	Frequency range of measurement		Calculated Uncertainty based on confidence level of 95.54%	Remarks
			Start [MHz]	Stop [MHz]		
1	Magnetic field strength	EN/FCC/ISED/JP	0,009	30	4,86	Magnetic loop antenna, Pre-amp on
2	RF-Output power (eirp) Unwanted emissions (eirp) [dB]	EN,FCC/ISED, JP	30	100	4,57	without Pre-Amp
			30	100	4,91	with PreAmp
			100	1000	4,02	without Pre-Amp
			100	1000	4,26	with PreAmp
			1000	18000	4,36	without Pre-Amp
			1000	18000	5,23	with PreAmp
			18000	33000	4,92	Schwarzbeck BBHA9170 (#20302) Antenna set-up non-mixer set-up)
			33000	50000	4,17	Set-up for Q-Band (WR-22), non-mixer set-up
			40000	60000	4,69	Set-up U-Band (WR-19), non-mixer set-up
			50000	75000	4,06	External Mixer set-up V-Band (WR-15)
			75000	110000	4,17	External Mixer set-up W-Band (WR-6)
			90000	140000	5,49	External Mixer set-up F-Band (WR-8)
			140000	225000	6,22	External Mixer set-up G-Band (WR-5)
			225000	325000	7,04	External Mixer set-up (WR-3)
			325000	500000	6,84	External Mixer set-up (WR-2.2)
3	Radiated Blocking [dB]	EN	1000	18000	2,85	Typical set-up with microwave generator and antenna, value for 7GHz calculated
			18000	33000	4,66	Typical set-up with microwave generator and antenna
			33000	50000	3,48	WR-22 set-up
			50000	75000	3,73	WR-15 set-up
			75000	110000	4,26	WR-6 set-up
4	Frequency Error UWB/FMCW [kHz]	EN, FCC,JP, ISED	116000	123000	279,87	Calculated for 123GHz carrier (FMCW)
	40000		77000	276,19	calculated for 77 GHz (FMCW) carrier	
	6000		7000	33,92	calculated for 6.5GHz UWB Ch.5	
	11		14	20,76	calculated for 13.56MHz carrier	
6	Conducted emissions AC-mains	EN/FCC/ISED	0,009	30	3,57	general EMI-measurements on AC/DC ports

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:

Spurious emission measurements: OOB and Spurious area					
Antenna frequency range in GHz	Highest measured frequency in GHz	D in m	λ in m	D_{ff} in m	D_{MEAS} in m
f_{START}					
f_{STOP}					
18 40	40	0.045	0.0075	0.54	1.0
U-BAND					
40 50	50	0.0384	0.006	0.49	1.0
V-BAND					
50 60	60	0.03072	0.005	0.38	1.0
60 75	75	0.03072	0.004	0.47	1.0
W-BAND					
75 90	90	0.020757	0.003333333	0.26	1.0
90 110	110	0.020757	0.002727273	0.32	0.5
F-BAND					
110 140	140	0.016696	0.002142857	0.26	1.0
G-BAND (WR5/WG30/R1800)					
140 210	210	0.01066	0.001428571	0.159	1.3
210 220	220	0.01066	0.001363636	0.167	1.0
WR3/WG32/R2600					
220 240	240	0.007048	0.00125	0.079	1.0
240 243	243	0.007048	0.001234568	0.080	1.18

In-Band measurements:

IN-BAND measurements. OBW, Power					
Antenna frequency range in GHz	Highest measured frequency in GHz	D in m	λ in m	D_{ff} in m	D_{MEAS} in m
f_{START}					
f_{STOP}					
W-BAND					
75,5	77,5	0,020757	0,003870968	0,22	2,0
77,5					

11 Summary of measurement results

11.1 Summary

☒	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 90.103 (b)	see below	2026-07-31	-/-

Test specification clause	Test case	Temperature conditions	Power source voltages	Pass	Fail	NA	NP	Remark
§2.1046 §90.103 (b)	Radiated power (EIRP)	Nominal	Nominal	☒	☐	☐	☐	Complies, Remark 3
§2.1047	Modulation characteristics	-/-	-/-	☐	☐	☐	☒	Complies (customers declaration)
§2.1049	Occupied bandwidth (99% bandwidth)	Nominal	Nominal	☒	☐	☐	☐	Complies Remark 4
§2.1051	Spurious emissions at antenna terminals	Nominal	Nominal	☐	☐	☒	☐	see remark 2, DUT has integral antenna
§2.1053 §95.3379 (a)(1) §95.3379 (a)(2) §95.3379 (a)(3)	Unwanted emissions (radiated spurious)	Nominal	Nominal	☒	☐	☐	☐	Complies Remark 4
§2.1055 §95.3379 (b)	Frequency stability	Nominal and Extreme	Nominal and Extreme	☒	☐	☐	☐	Complies Remark 4

Note:

- 1) C = Compliant; NC = Not compliant; NA = Not applicable; NP = Not performed
- 2) ANSI C63.26-2015, chapter 5.5.1:
“...many contemporary portable transmitters utilize integral antennas, precluding access to an antenna output port from which to perform conducted compliance measurements. For these types of transmitters, all of the data necessary to demonstrate compliance must be measured in a radiated test configuration...”
- 3) WT Docket 22-260, Chapter A, Condition c. (EIRP may not exceed 30dBm)
- 4) Part/Chapter used to comply with basic measurement technical requirements

11.2 Additional comments

Reference documents: None

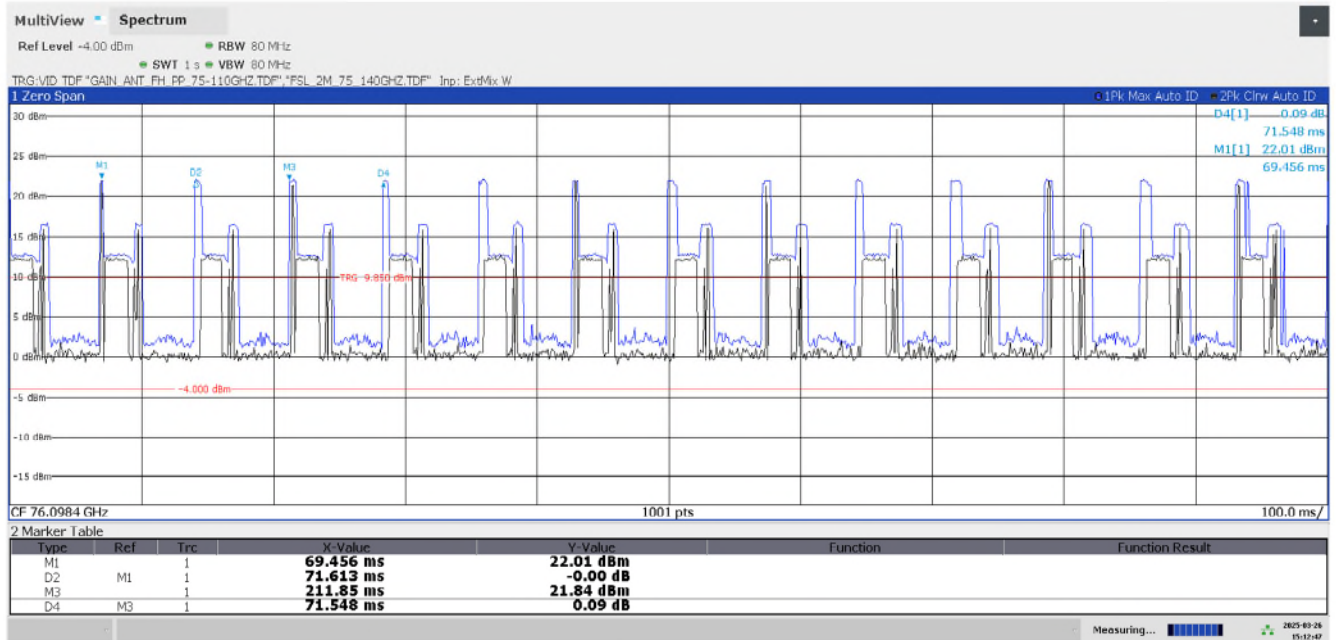
Special test descriptions: None

Configuration descriptions: None

12 Measurement results

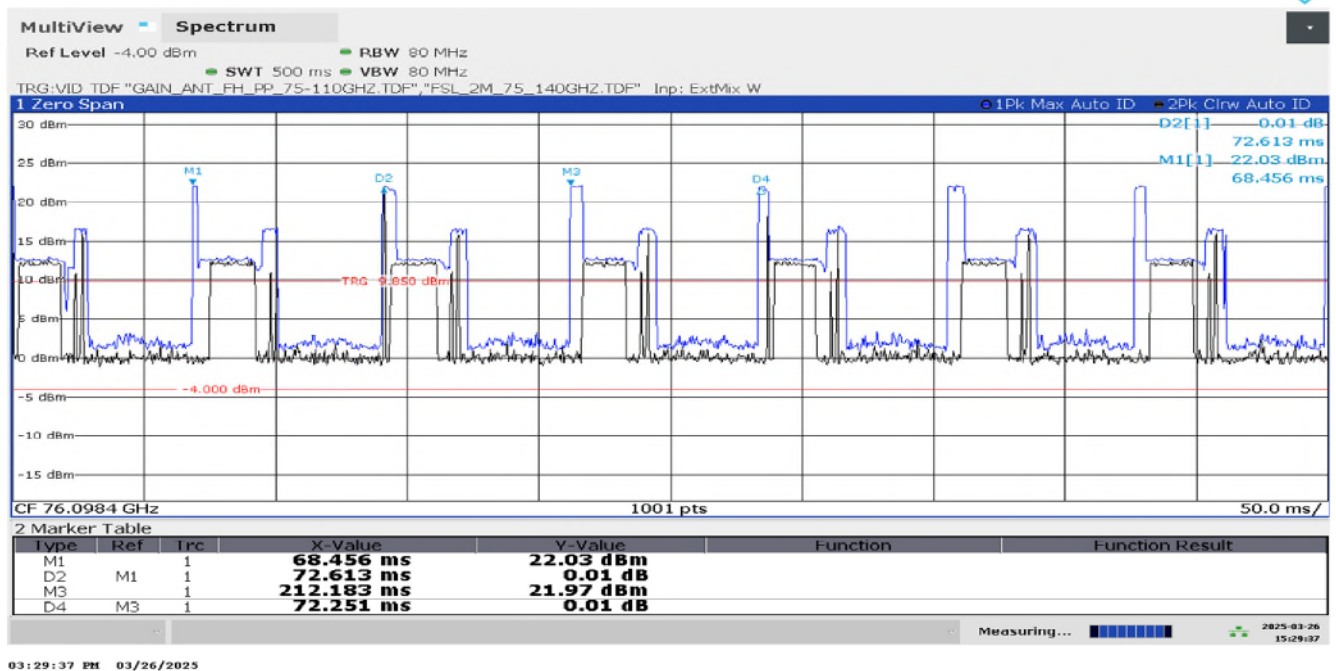
EUT's Signal repetition time / cycle time:

TID100-07_24-1-0046401T001_Cycle_Time_72ms



Note: EUT signal repetition time / cycle time is 72 ms.

TID100-08_24-1-0046401T001_Cycle_Time_72ms



Note: EUT signal repetition time / cycle time is 72 ms.

12.1 Radiated power

Description:

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:

Frequency	Limit (eirp)
76.0 - 81.0 GHz	≤ 30 dBm/MHz (PEAK)

Note: According to Waiver, the maximum peak power (eirp) should be ≤ 30 dBm

Measurement: Peak Power

Measurement parameter	
Detector:	Pos-Peak
Resolution bandwidth:	50 MHz
Video bandwidth:	80 MHz
Trace-Mode:	Max Hold

Note: KDB 653005 4.(c)(1)

Peak power measurements of swept frequency radar implementations (e.g., high sweep rate FMCW) may require a desensitization correction factor to be applied to the measurement results.

Consequence:

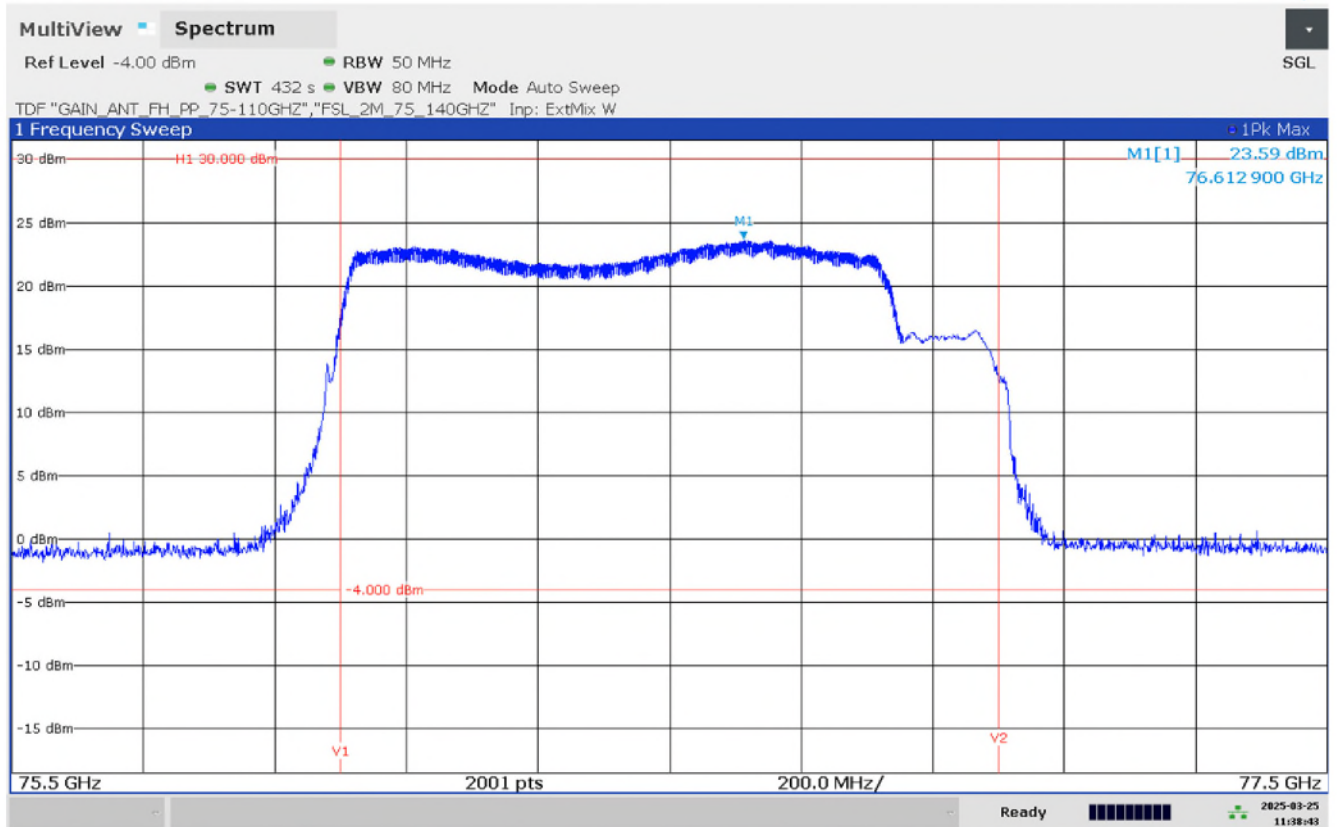
Worst case measurement, the peak power measurement is performed with a greater resolution bandwidth to solve the problem with the desensitization.

Measurement results:

Plot	EUT	Mode	Test condition	Radiated peak power (eirp)
TID104	1	1	T_{nom} / V_{nom}	23.59 dBm

Verdict: Complies

Peak power
TID104_24-1-0046401T001_Maximum peak power (EIRP)



11:38:44 AM 03/25/2025

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.

KDB 653005 D01 76-81 GHz Radars v01r02, section 3 (g)

Concerning the Section 2.1047 modulation characteristics requirement, the following information should be provided:

- 1) Pulsed radar: pulse width and pulse repetition frequency (if PRF is variable, then report maximum and minimum values).
- 2) Non-pulsed radar (e.g., FMCW): modulation type (i.e., sawtooth, sinusoid, triangle, or square wave) and sweep characteristics (sweep bandwidth, sweep rate, sweep time).

Information from manufacturer on modulation characteristics:

Modulation Type	FM chirp (sawtooth)
Modulation characteristics:	
Center frequency	76.5 GHz
Sweep bandwidth	≤ 0.75 GHz
Sweep rate	256 ramps in 17.6ms 15682 Sweeps/second
Sweep time/duration	83.2 µs short range 51.2 µs long range

According information given in document: "ContiTech USA, Inc. - Request for Waiver February 24 2022.pdf"

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
FCC §95.3379 (b)
The occupied bandwidth from intentional radiators operated within the specified frequency band shall comply with the following:
Frequency range
76 GHz – 81 GHz

Measurement:

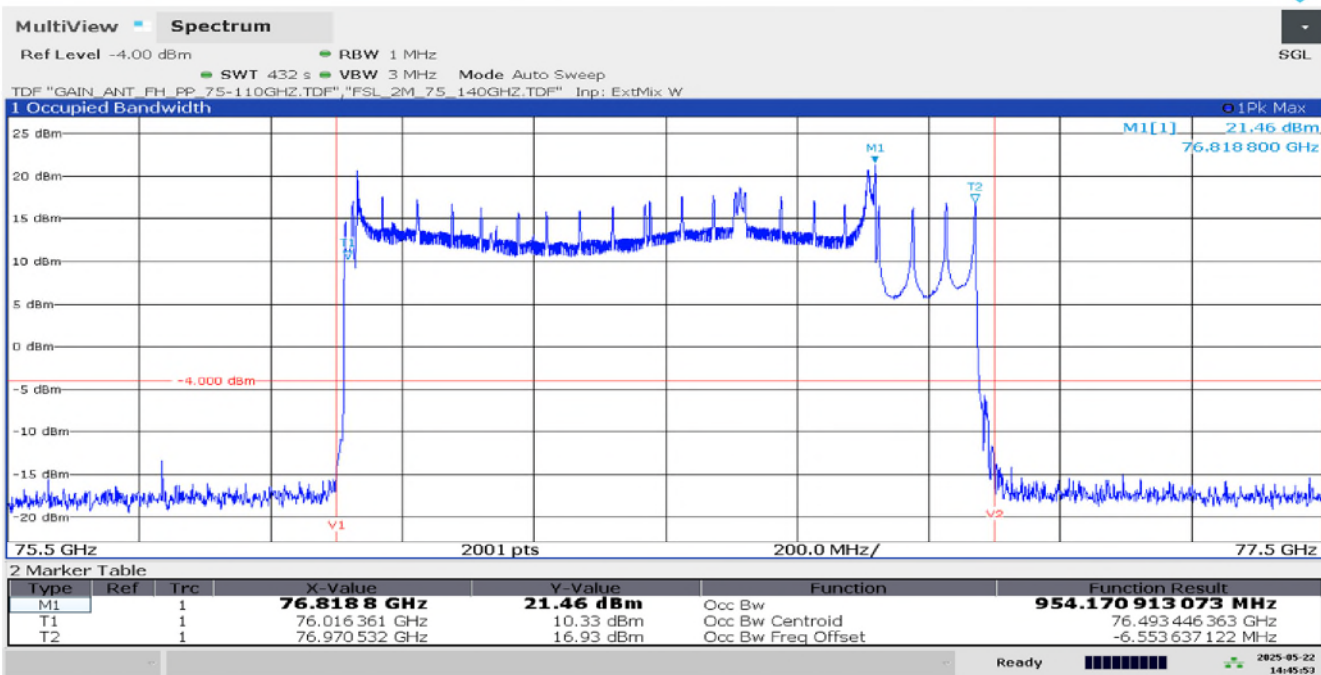
Parameters	
Detector:	Pos-Peak
Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Trace-Mode:	Max Hold

Results:

EUT	TEST CONDITIONS	f_L in GHz	f_H in GHz	Occupied Bandwidth (99%) in MHz	Plot
EUT 1	T_{nom} / V_{nom}	76.016	76.970	954.171	TID102-03

Verdict: Complies

TID102-03_24-1-0046401T001_99% Bandwidth (Operating Frequency Range)_Vnom_Tnom



02:45:53 PM 05/22/2025

12.4 Unwanted Emission (radiated spurious) / 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

Measurement:

Parameters	
Detector:	RMS
Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Trace-Mode:	Max Hold

Measurement results:

- Results are part of chapter 12.5

Verdict: Complies

12.5 Unwanted emissions (radiated spurious)

Description:

Measurement of the radiated unwanted emissions.

Limits:

FCC §95.3379

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

(1) Radiated emissions below 40 GHz shall not exceed the field strength as shown in the following emissions table.

FCC		
CFR Part 95.3379 (a) (1) / CFR Part 95.3379 (a) (3)		
Radiated unwanted emissions		
Frequency (MHz)	Field Strength (µV/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	3
88 – 216	150	3
216 – 960	200	3
960 – 40 000	500	3

- (i) In the emissions table in paragraph (a)(1) of this section, the tighter limit applies at the band edges.
 - (ii) The limits in the table in paragraph (a)(1) of this section are based on the frequency of the unwanted emissions and not the fundamental frequency. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
 - (iii) The emissions limits shown in the table in paragraph (a)(1) of this section are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9.0-90.0 kHz, 110.0-490.0 kHz, and above 1000 MHz. Radiated emissions limits in these three bands are based on measurements employing an average detector with a 1 MHz RBW
- (2) The power density of radiated emissions outside the 76-81 GHz band above 40.0 GHz shall not exceed the following, based on measurements employing an average detector with a 1 MHz RBW:
- (i) For radiated emissions outside the 76-81 GHz band between 40 GHz and 200 GHz from field disturbance sensors and radar systems operating in the 76-81 GHz band: 600 pW/cm² at a distance of 3 meters from the exterior surface of the radiating structure.

- (ii) For radiated emissions above 200 GHz from field disturbance sensors and radar systems operating in the 76-81 GHz band: 1000 pW/cm² at a distance of 3 meters from the exterior surface of the radiating structure.

Frequency Range (GHz)	Power Density	EIRP
40 – 76 81 – 200	600 pW/cm ² @ 3m	-1.7 dBm
200 – 243	1000 pW/cm ² @ 3m	+0.5 dBm

- (3) For field disturbance sensors and radar systems operating in the 76-81 GHz band, the spectrum shall be investigated up to 243.0 GHz.

Limit conversion (ANSI C63.10-2013 9.6):

$$\text{EIRP[dBm]} = 10 \times \log(4 \times \pi \times d^2 \times 1000 \times \text{PD[W/m}^2])$$

- Power density at the distance specified by the limit: PD [W/m²]
- Equivalent isotropically radiated power: EIRP [dBm]
- Distance at which the power density limit is specified: d [m]

According to this formula, an emission limit of PD = 600 pW/cm² at a distance of d = 3 m corresponds to an equivalent isotropically radiated power of EIRP = -1.7 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 results:

Plot	Frequency	Detector	Bandwidth	Level	Limit	Margin [dB]
TID105	9 k – 30 MHz	MaxPeak	0.200 kHz	-20.08 dB μ V	43.03 dB μ V	63.11
TID106	30 M – 1 GHz	QPK	120 kHz	34.52 dB μ V	46.00 dB μ V	11.48
TID107a	30 M – 12.4 GHz	PK Avg	1 MHz	61.36 dB μ V 47.61 dB μ V No critical emission, only noise level from spectrum analyzer	74 dB μ V 54 dB μ V	12.64 6.39
TID107b	30 M – 12.4 GHz	PK Avg	1 MHz	61.48 dB μ V 47.59 dB μ V No critical emission, only noise level from spectrum analyzer	74 dB μ V 54 dB μ V	12.52 6.41
TID108a	12.4 – 18 GHz	PK Avg	1 MHz	58.24 dB μ V 44.01 dB μ V No critical emission, only noise level from spectrum analyzer	74 dB μ V 54 dB μ V	15.76 9.99
TID108b	12.4 – 18 GHz	PK Avg	1 MHz	58.07 dB μ V 44.02 dB μ V No critical emission, only noise level from spectrum analyzer	74 dB μ V 54 dB μ V	15.93 9.98
TID109a	18 – 30 GHz	PK Avg	1 MHz	57.30 dB μ V 43.28 dB μ V No critical emission, only noise level from spectrum analyzer	74 dB μ V 54 dB μ V	16.70 10.72
TID109b	18 – 30 GHz	PK Avg	1 MHz	56.94 dB μ V 43.17 dB μ V No critical emission, only noise level from spectrum analyzer	74 dB μ V 54 dB μ V	17.06 10.83
TID110a	30 – 40 GHz	PK Avg	1 MHz	60.91 dB μ V 46.80 dB μ V	74 dB μ V 54 dB μ V	13.09 7.02
TID110b	30 – 40 GHz	PK Avg	1 MHz	60.54 dB μ V 46.57 dB μ V	74 dB μ V 54 dB μ V	13.46 7.43
TID111a	40 – 50 GHz	RMS	1 MHz	-44.62 dBm	-1.7 dBm	42.92
TID111b	40 – 50 GHz	RMS	1 MHz	-44.60 dBm	-1.7 dBm	42.90
TID112a	50 – 60 GHz	RMS	1 MHz	-24.84 dBm	-1.7 dBm	23.14
TID112b	50 – 60 GHz	RMS	1 MHz	-24.82 dBm	-1.7 dBm	23.12
TID113a	60 – 75 GHz	RMS	1 MHz	Maximum emission found @65.65 GHz, check TID113a-01	--	--
TID113a-01	@65.65 GHz	RMS	1 MHz	Image signal, no critical emission found	-1.7	--
TID113b	60 – 75 GHz	RMS	1 MHz	-38.78 dBm	-1.7	--

TID114a	75 – 90 GHz	RMS	1 MHz	Maximum emission found @87.355 GHz, check TID114a-01	--	--
TID114a-01	@87.355	RMS	1 MHz	Image signal, no critical emission found	-1.7	--
TID115a	90 – 110 GHz	RMS	1 MHz	Maximum emission found @102.129 GHz, check TID115a-01	--	--
TID115a-01	@102.129 GHz	RMS	1 MHz	Image signal, no critical emission found	-1.7	--
TID115-02	90 – 110 GHz	RMS	1 MHz	Continuous sweep to verify image signal, no critical emission found	-1.7	--
TID116a	110 – 120 GHz	RMS	1 MHz	Note-2	-1.7	--
TID116b	110 – 120 GHz	RMS	1 MHz	Note-2	-1.7	--
TID117a	120 – 130 GHz	RMS	1 MHz	Note-2	-1.7	--
TID117b	120 – 130 GHz	RMS	1 MHz	Note-2	-1.7	--
TID118a	130 – 140 GHz	RMS	1 MHz	Note-2	-1.7	--
TID118b	130 – 140 GHz	RMS	1 MHz	Note-2	-1.7	--
TID119a	140 – 150 GHz	RMS	1 MHz	-19.19	-1.7	17.49
TID119b	140 – 150 GHz	RMS	1 MHz	-19.10	-1.7	17.40
TID120a	150 – 160 GHz	RMS	1 MHz	Note-2	-1.7	--
TID120b	150 – 160 GHz	RMS	1 MHz	Note-2	-1.7	--
TID121a	160 – 170 GHz	RMS	1 MHz	Note-2	-1.7	--
TID121b	160 – 170 GHz	RMS	1 MHz	Note-2	-1.7	--
TID122a	170 – 180 GHz	RMS	1 MHz	Note-2	-1.7	--
TID122b	170 – 180 GHz	RMS	1 MHz	Note-2	-1.7	--
TID123a	180 – 190 GHz	RMS	1 MHz	-19.73	-1.7	18.03
TID123b	180 – 190 GHz	RMS	1 MHz	-19.71	-1.7	18.01
TID124a	190 – 200 GHz	RMS	1 MHz	-19.50	-1.7	17.80
TID124b	190 – 200 GHz	RMS	1 MHz	-19.49	-1.7	17.79
TID125a	200 – 210 GHz	RMS	1 MHz	Note-2	+0.5	--
TID125b	200 – 210 GHz	RMS	1 MHz	Note-2	+0.5	--
TID126a_02	210 – 220 GHz	RMS	1 MHz	Note-2	+0.5	--
TID126b	210 – 220 GHz	RMS	1 MHz	Note-2	+0.5	--
TID127a_02	220 – 240 GHz	RMS	1 MHz	No critical emission found	+0.5	10.2
TID127b_02	220 – 240 GHz	RMS	1 MHz	No critical emission found	+0.5	10.33
TID128a	240 – 243 GHz	RMS	1 MHz	No critical emission found	+0.5	13.48
TID128b	240 – 243 GHz	RMS	1 MHz	No critical emission found	+0.5	13.47
Please refer to the following plots for more information on the level of spurious emissions						

Note-1: only worst case scenario stated in this measurement result's table.

Note-2: Noise level of spectrum analyzer, more than 20 dB from limit line.

Verdict: Complies

9 kHz – 30 MHz

TID105

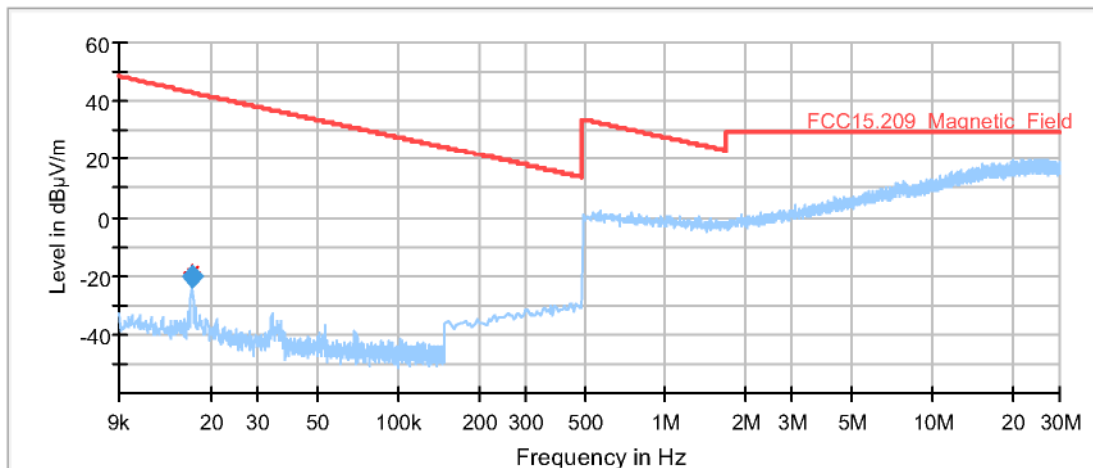
Common Information

Test description:	Magnetic Field Strength Measurement related to 30/300 m distance
Test Site Location:	Ref.-Nr. 441 Semi Anechoic Chamber (SAC1) with 3 m measurement distance
Version of Testsoftware:	EMC32 V10.60.20
Distance correction:	used accord. table, pls. see test report
Technical Data:	Please see page 2 for detailed data of measurement setup
Rec. antenna (pre-scan):	height 1.00 m, parallel and 90° to EUT polarisation
Used filter:	bypass
Test Standard:	FCC 15.205 § 15.209; RSS-Gen: Issue 5
Operator:	Leic
Operating Mode:	TX-on
Power during tests:	24 V DC
Environmental Conditions:	Humidity: 40 % rH; Temperature: 22.8 °C
EUT Setup:	EUT standing
Verdict:	Passed

EUT Information

QR Tag	36.350
	--

Full Spectrum



Final Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
0.016920	-20.08	43.03	63.11	0.200	V	152.0	-59.2	09:01:17 - 17.04.2025

30 MHz – 1GHz

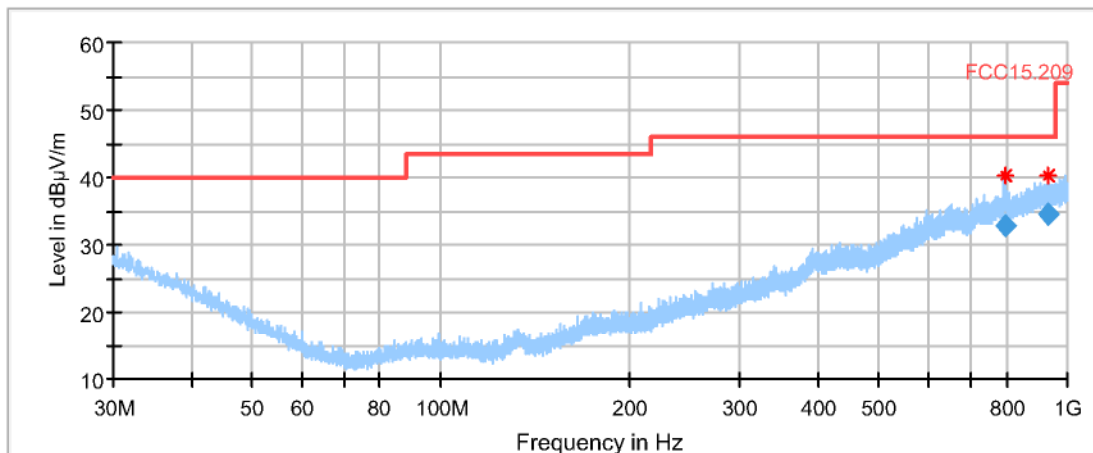
TID106

Common Information

Test Description:	Radiated field strength emission in 3m distance
Test Site:	cetecom advanced GmbH, location Essen
Test Standard:	FCC 15.205&15.209 & RSS Gen. Issue 5
Antenna polarisation:	horizontal/vertical
Environmental Conditions:	Humidity: 40%rH; Temperature: 22.8°C
Operator Name:	Leic
EUT Setup:	EUT standing
Operating Mode:	TX
Power supply:	24 V DC
Verdict:	Passed

EUT Information

QR Tag	36.350
	--

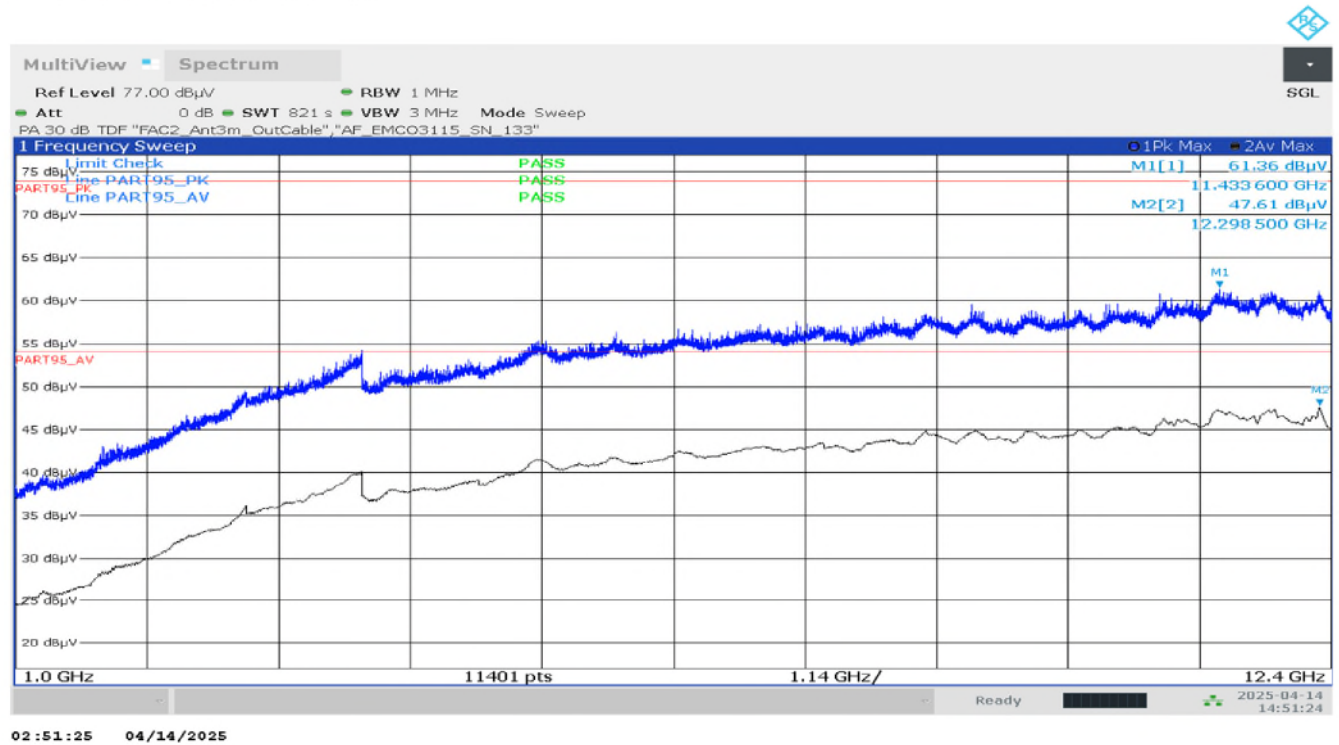


Final Result

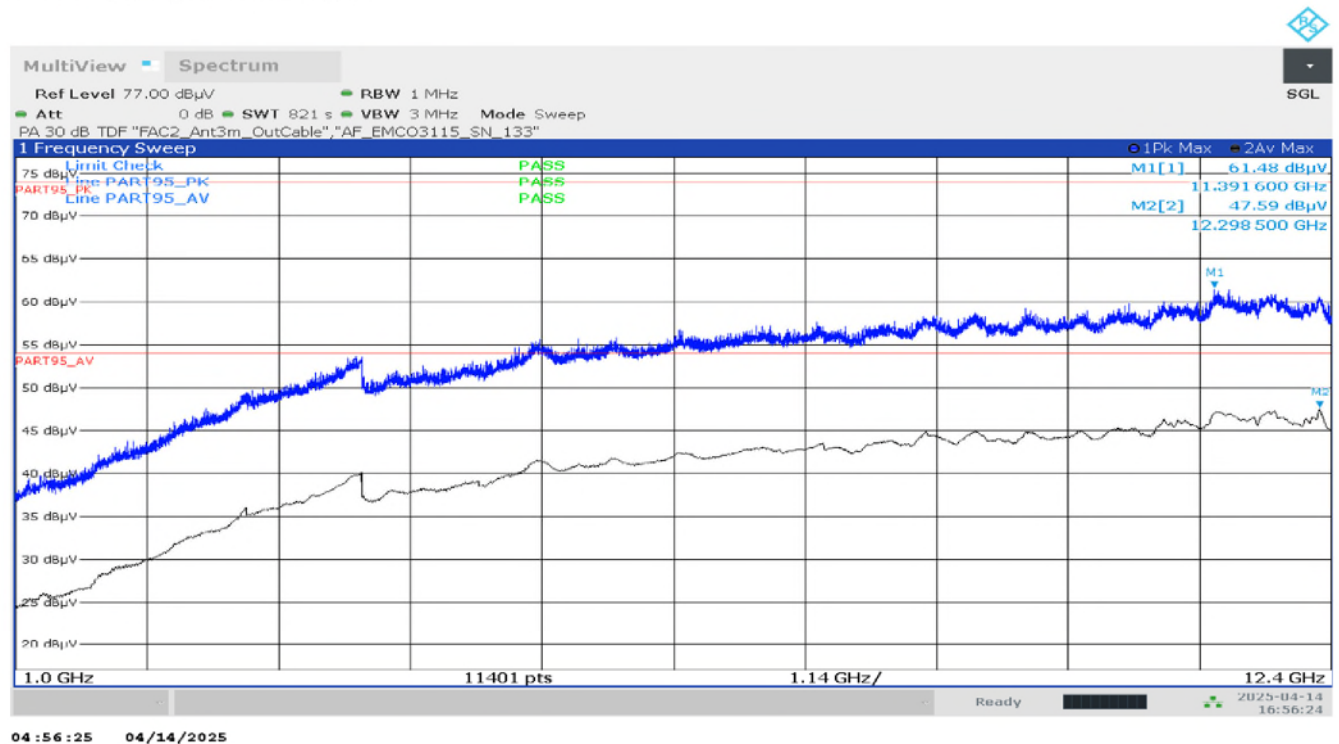
Frequency (MHz)	Quasi Peak (dBµV /m)	Limit (dBµV /m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Sig Path (dB)	Preamp (dB)
794.710000	32.82	46.00	13.18	120.000	162.0	V	145.0	25.6	0.0	3.1
934.810000	34.52	46.00	11.48	120.000	236.0	V	82.0	27.1	0.0	3.4

1 GHz – 12.4 GHz

TID107a_RSE_1G-12.4GHz_AntH

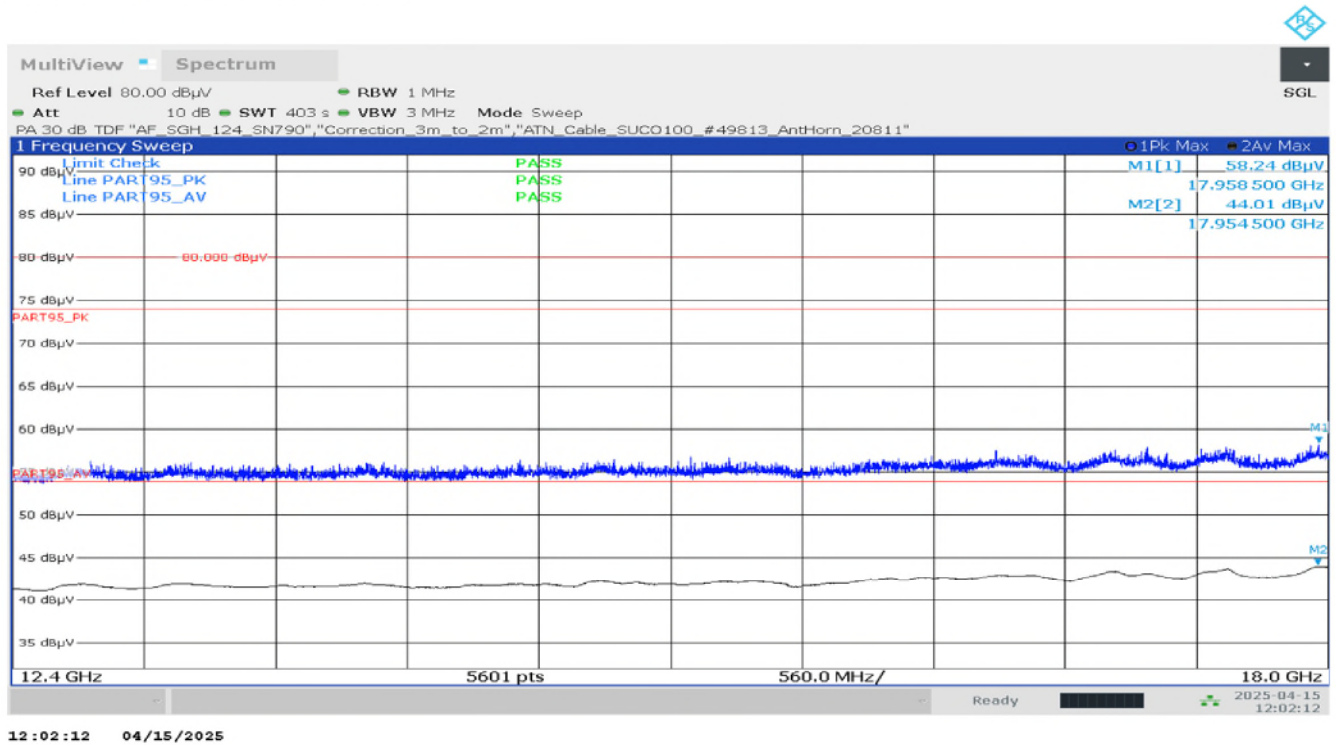


TID107b_RSE_1G-12.4GHz_AntV

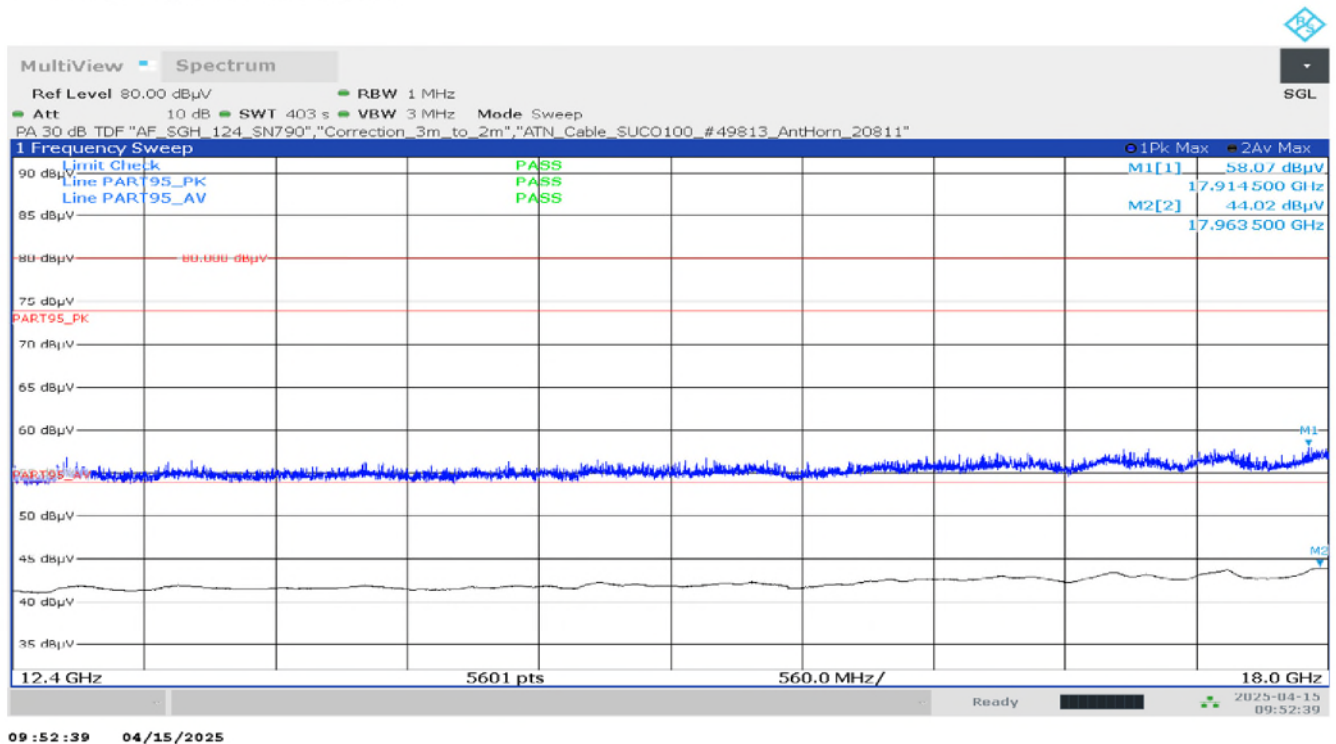


12.4 GHz – 18 GHz

TID108a_RSE_12.4G-18GHz_AntH

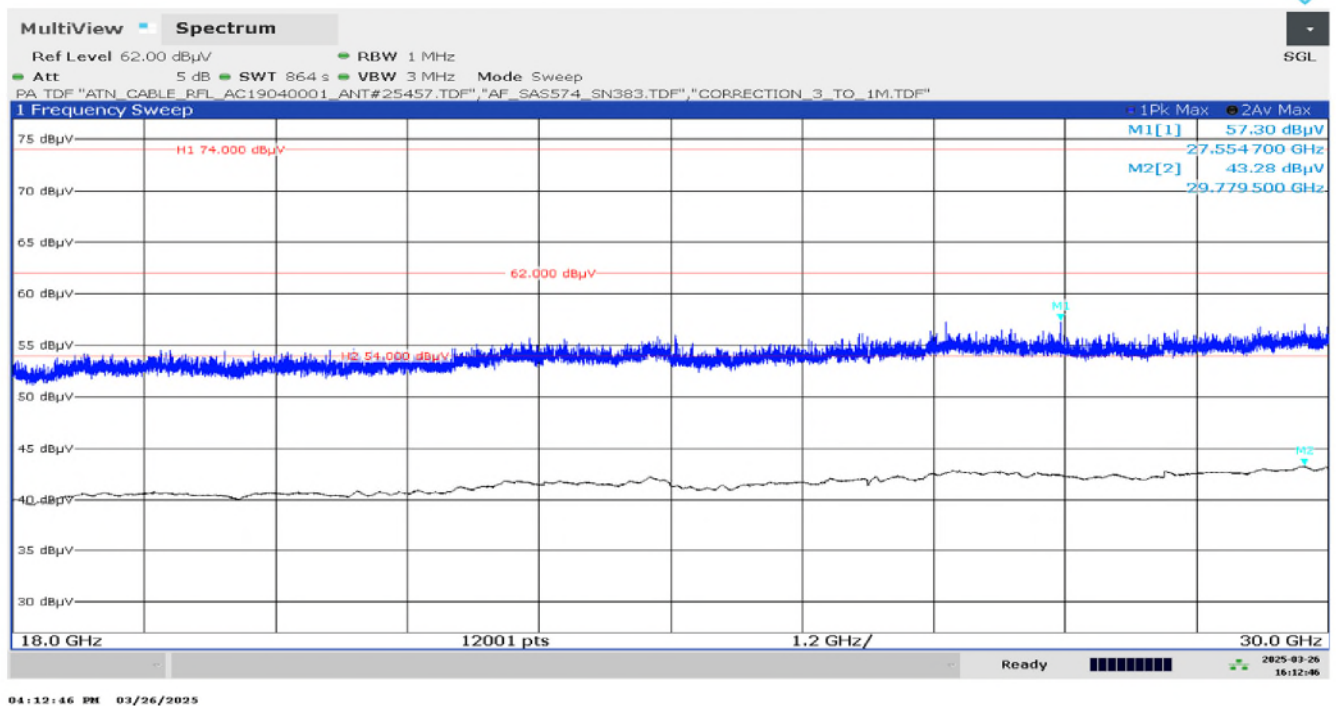


TID108b_RSE_12.4G-18GHz_AntV

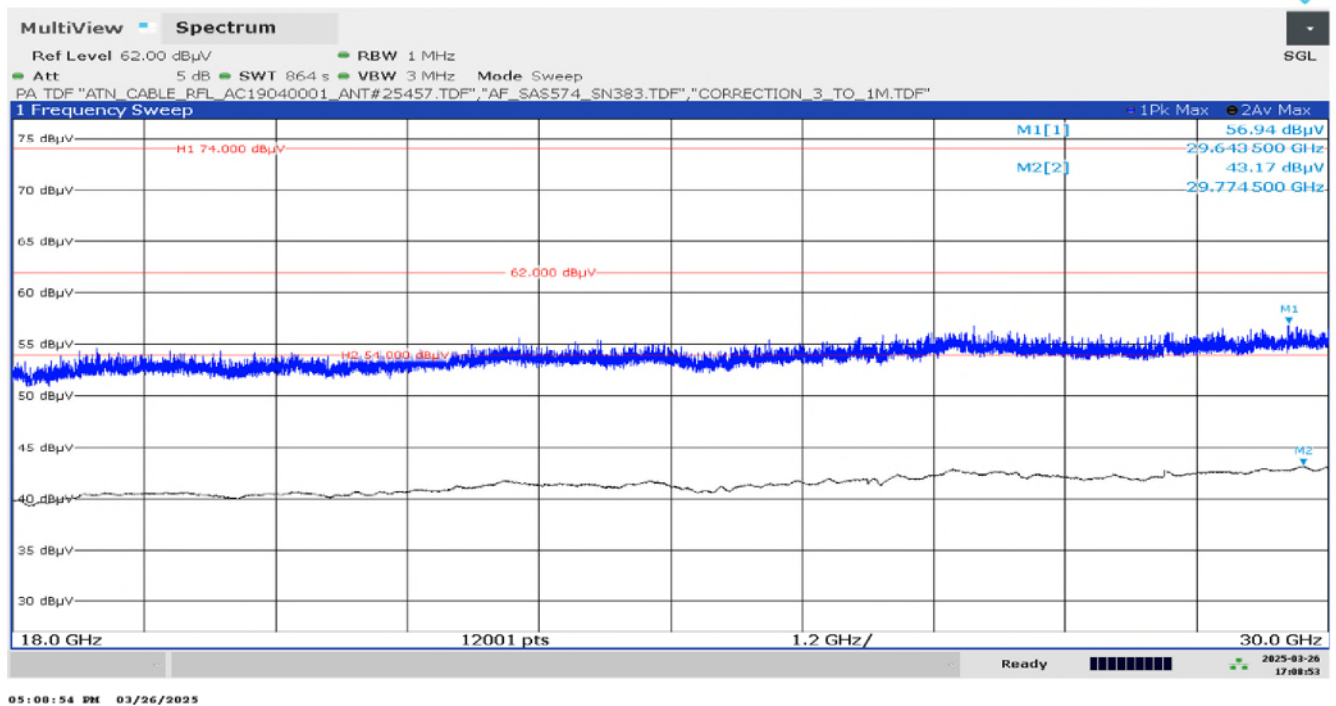


18 GHz – 30 GHz

TID109a_24-1-0046401T001_Spurios Emissions 18GHz - 30GHz

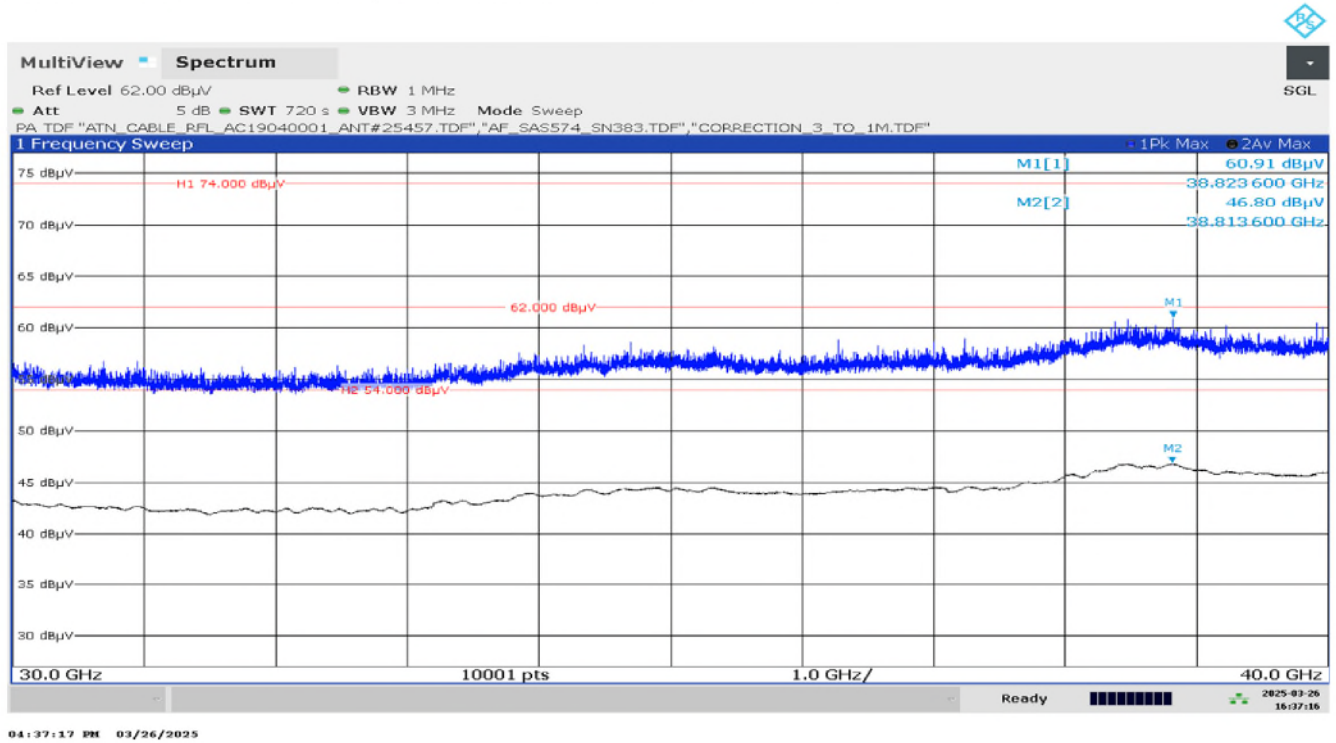


TID109b_24-1-0046401T001_Spurios Emissions 18GHz - 30GHz_AntV

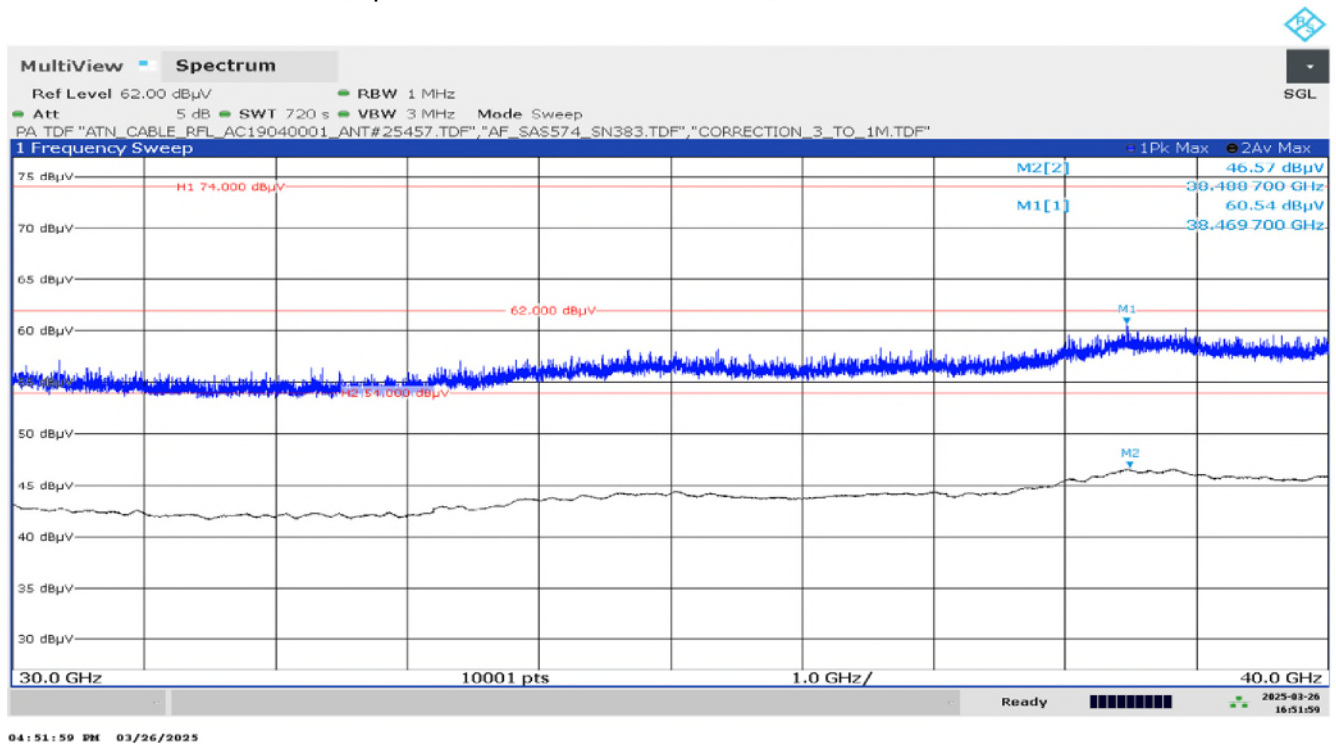


30 GHz – 40 GHz

TID110a_24-1-0046401T001_Spurios Emissions 30GHz - 40GHz_AntH

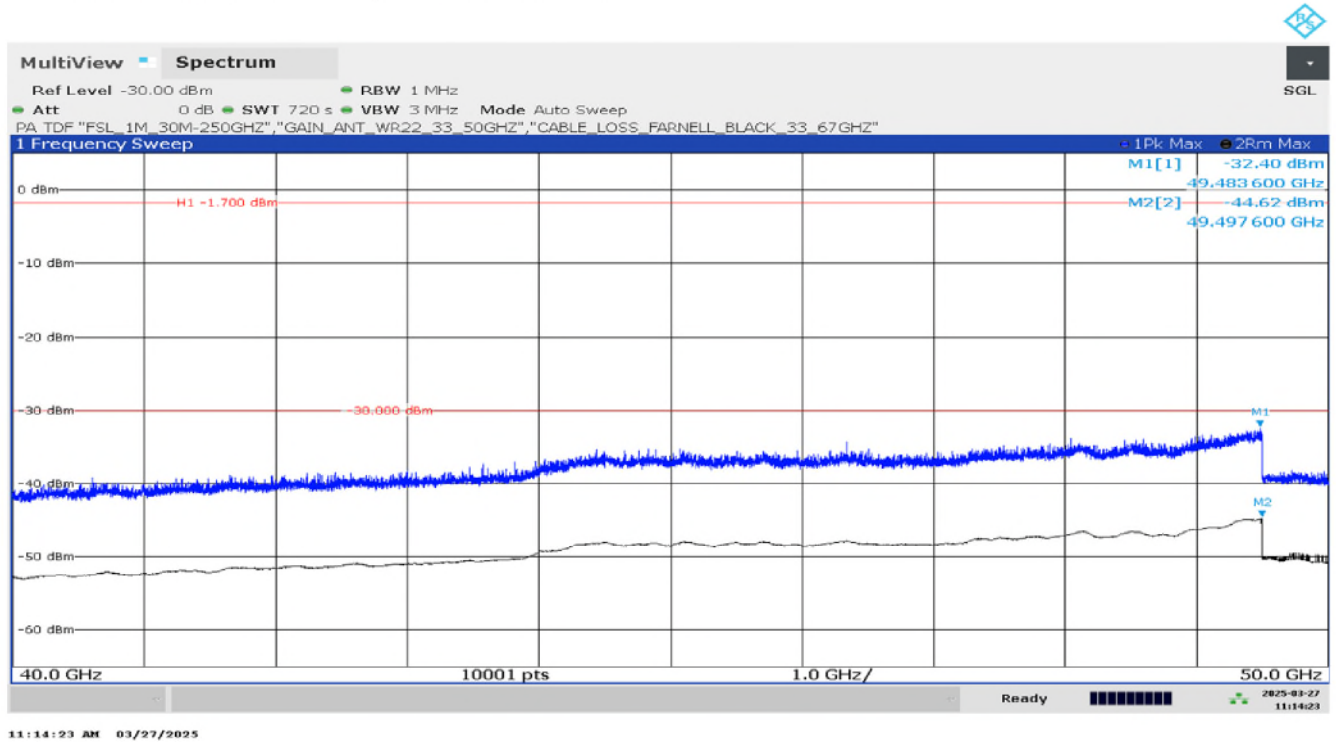


TID110b_24-1-0046401T001_Spurios Emissions 30GHz - 40GHz_AntV

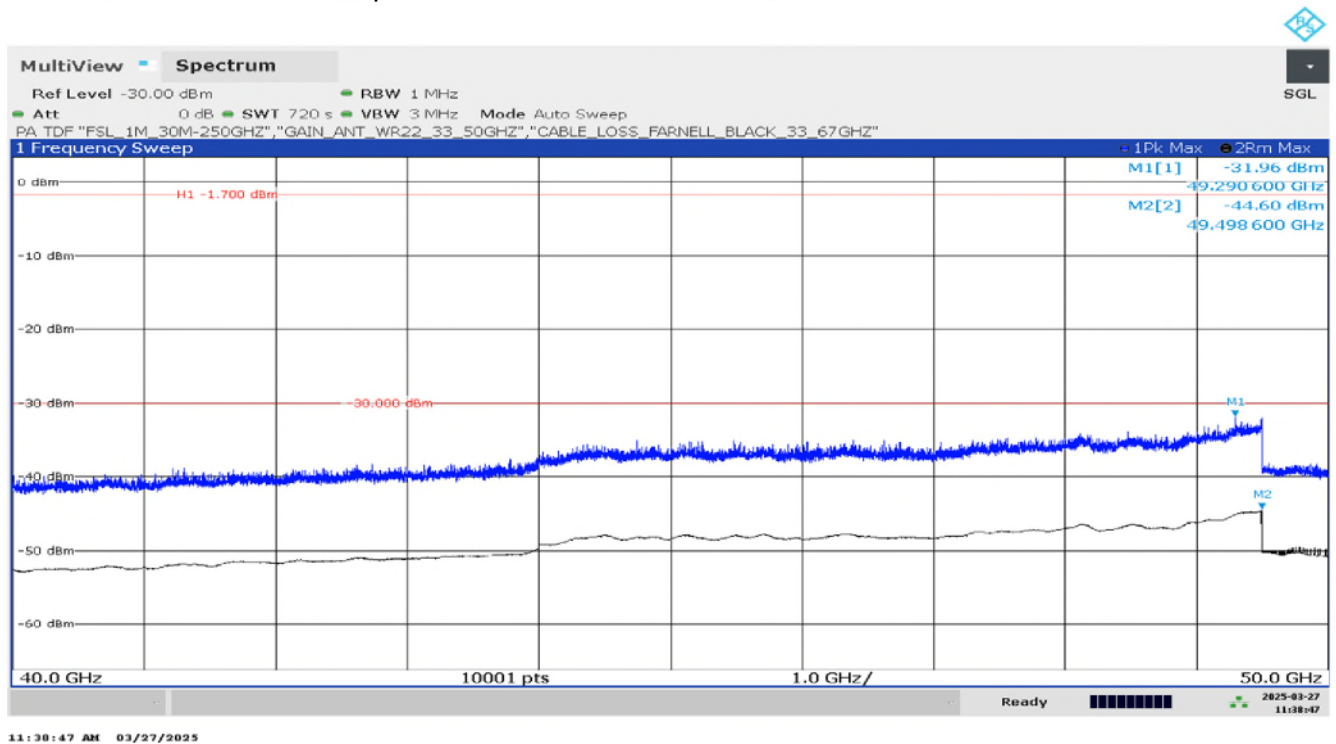


40 GHz – 50 GHz

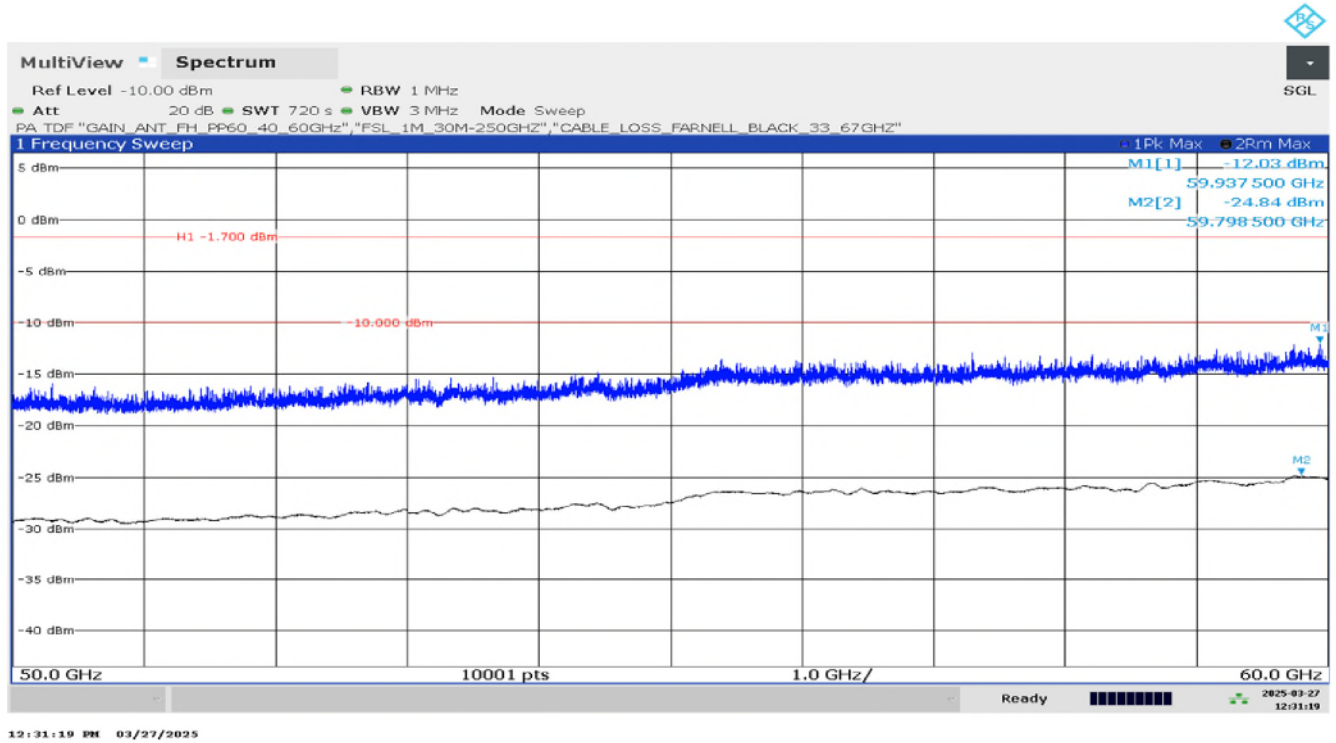
TID111a_24-1-0046401T001_Spurios Emissions 40GHz - 50GHz_AntH



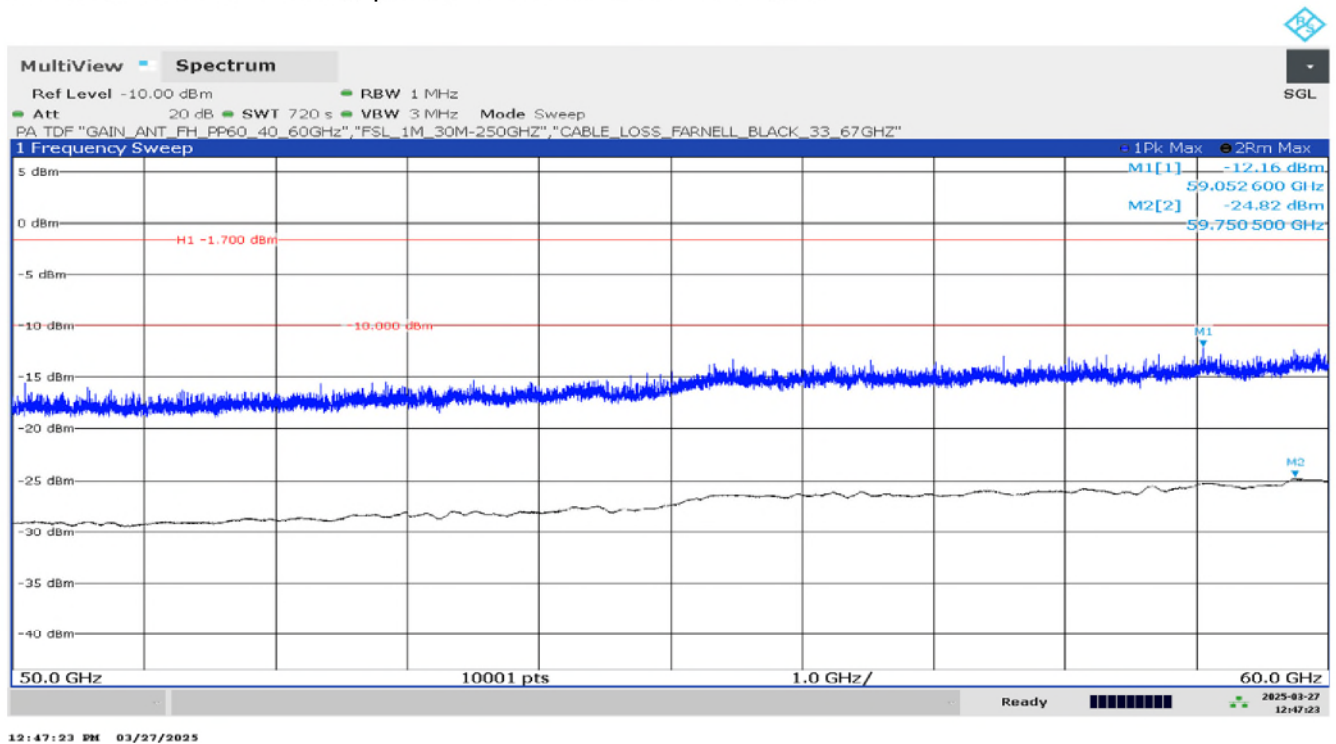
TID111b_24-1-0046401T001_Spurios Emissions 40GHz - 50GHz_AntV



TID112a_24-1-0046401T001_Spurios Emissions 50GHz - 60GHz_AntH

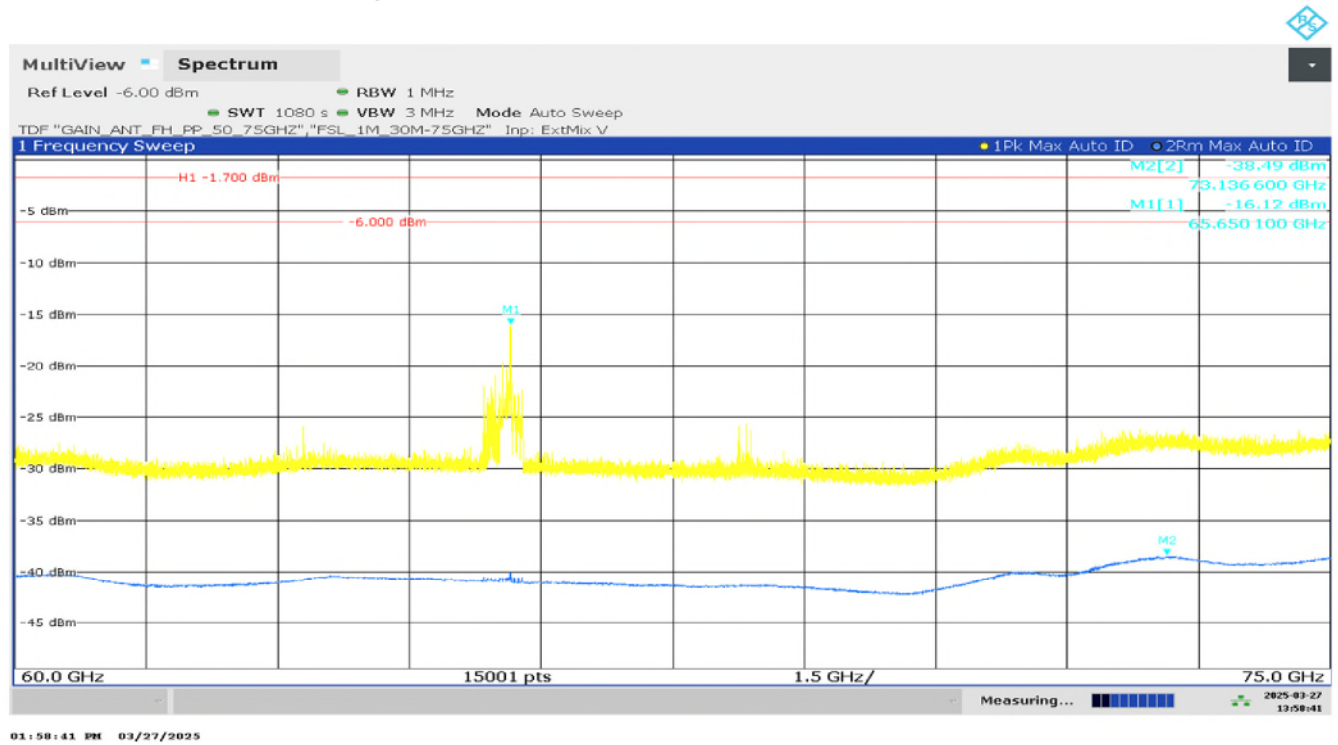


TID112b_24-1-0046401T001_Spurios Emissions 50GHz - 60GHz_AntV

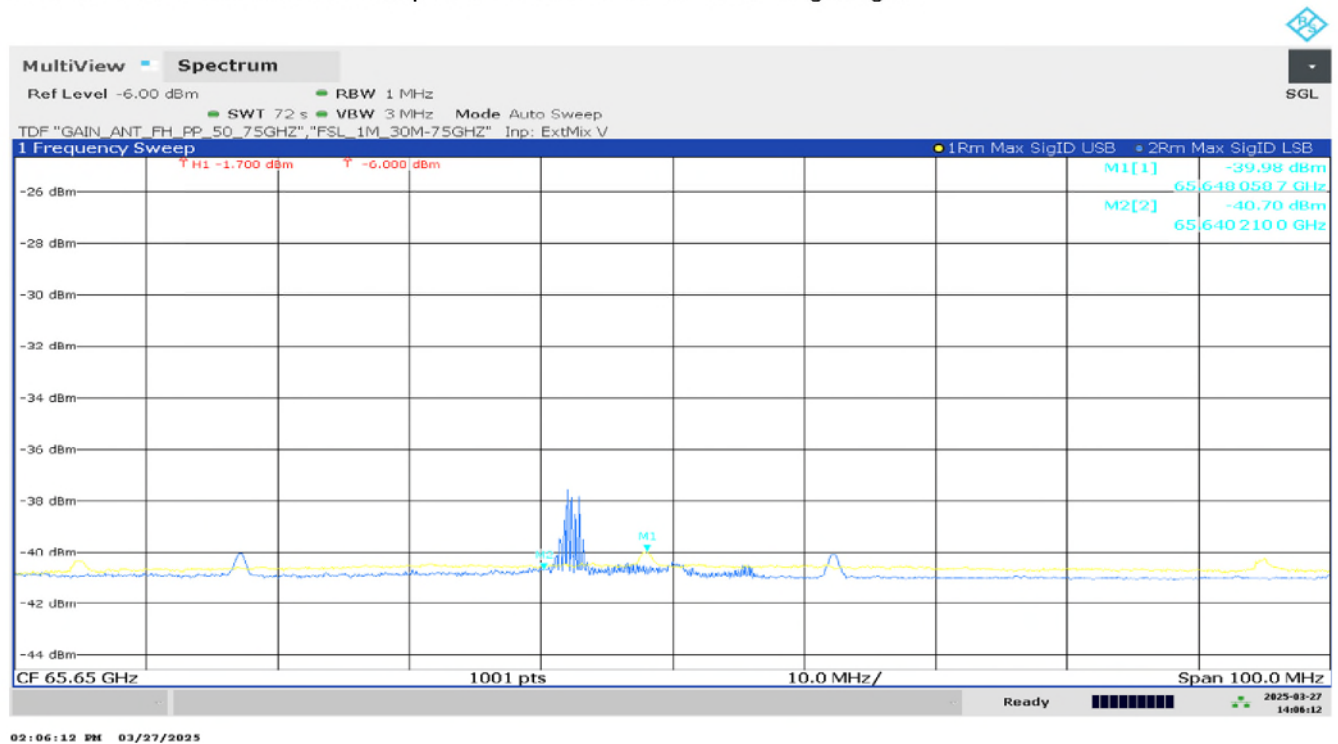


60 GHz – 75 GHz

TID113a_24-1-0046401T001_Spurios Emissions 60GHz - 75GHz_AntH



TID113a-01_24-1-0046401T001_Spurios Emissions 65.65 GHz_image_signal



TID113b_24-1-0046401T001_Spurios Emissions 60GHz - 75GHz_AntV

