

Test Report

Report Number:

F221817E6

Equipment under Test (EUT):

CTP3NA

Applicant:

Robert Bosch GmbH

Manufacturer:

Robert Bosch GmbH



Deutsche
Akkreditierungsstelle
D-PL-17186-01-00

References

- [1] **ANSI C63.10: 2013** American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
- [2] **FCC CFR 47 Part 15** Radio Frequency Devices
- [3] **RSS-210 Issue 10 (December 2019)**
Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment
- [4] **RSS-Gen, Issue 5 Amendment 2 (2021-02)**
General Requirements for Compliance of Radio Apparatus
- [5] **CFR 47 Part 22** Public mobile services, Subpart H – Cellular Radiotelephone service
- [6] **CFR 47 Part 24** Public mobile services, Subpart E – Broadband PCS
- [7] **CFR 47 Part 27** Miscellaneous wireless communications services
- [8] **RSS-132 Issue 3** Cellular Telephone Systems Operating in the Bands 824 - 849 MHz and 869 - 894 MHz
- [9] **RSS-133 Issue 6** 2 GHz Personal Communication Services
- [10] **RSS-199 Issue 4** Broadband Radio Service (BRS) Equipment Operating in the Band 2500-2690 MHz

Test Result

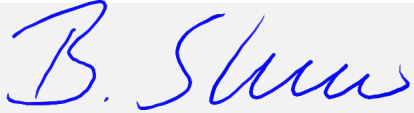
The requirements of the tests performed as shown in the overview (clause 4) were fulfilled by the equipment under test. The complete test results are presented in the following.

“Passed” indicates that the equipment under test conforms with the relevant limits of the testing standard without taking any measurement uncertainty into account as stated in clause 1.3 of ANSI C63.10 (2013). However, the measurement uncertainty is calculated and shown in this test report.

Tested and written
by:

 Manuel BASTERT
05.03.2024
Signature

Reviewed and
approved by:

 Bernd STEINER
05.03.2024
Signature

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The test results herein refer only to the tested sample. PHOENIX TESTLAB GmbH is not responsible for any generalisations or conclusions drawn from these test results concerning further samples. Any modification of the tested samples is prohibited and leads to the invalidity of this test report. Each page necessarily contains the PHOENIX TESTLAB Logo and the TEST REPORT NUMBER.

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1 Identification

1.1 Applicant

Name:	Robert Bosch GmbH
Address:	Robert-Bosch-Str. 200, 31139 Hildesheim
Country:	Germany
Name for contact purposes:	Karin Silberhorn
Phone:	+49 5121-49-7662
eMail address:	karin.silberhorn@de.bosch.com
Applicant represented during the test by the following person:	-

1.2 Manufacturer

Name:	Robert Bosch GmbH
Address:	Robert-Bosch-Str. 200, 31139 Hildesheim
Country:	Germany
Name for contact purposes:	Karin Silberhorn
Phone:	+49 5121-49-7662
eMail address:	karin.silberhorn@de.bosch.com
Manufacturer represented during the test by the following person:	-

1.3 Factory

Name:	Bosch Car Multimedia Portugal, S.A.
Address:	Rua Max Grundig, 35-Lomar, 4705-820 Braga
Country:	Portugal
Name for contact purposes:	-
Phone:	-
eMail address:	-
Manufacturer represented during the test by the following person:	-

1.4 Test Laboratory

The tests were carried out by: **PHOENIX TESTLAB GmbH**
Königswinkel 10
32825 Blomberg
Germany

Accredited by Deutsche Akkreditierungsstelle GmbH (DAkkS) in compliance with DIN EN ISO/IEC 17025 under Reg. No. D-PL-17186-01-05 and D-PL-17186-01-06, FCC Test Firm Designation Number DE0004, FCC Test Firm Registration Number 469623, CAB Identifier DE0003 and ISED# 3469A.

1.5 EUT (Equipment under Test)

Test object: *	Telematic Control Unit
Model name: *	CTP3NA
Model number: *	CTP3NA Ext
Order number: *	-
FCC ID: *	2AUXS-CTP3NA
IC certification number: *	25847-CTP3NA
PMN: *	CTP3NA
HVIN: *	CTP3NA
FVIN: *	NA
Type Plate	 

	EUT number		
	1	2	3
Serial number: *	1150003350	-	-
PCB identifier: *	NA	-	-
Hardware version: *	HW2	-	-
Software version: *	SW3	-	-

* Declared by the applicant

One EUT was used for all tests.

Note: PHOENIX TESTLAB GmbH does not take samples. The samples used for tests are provided exclusively by the applicant.

1.6 Technical Data of Equipment

General EUT data			
Power supply EUT: *	DC		
Supply voltage EUT: *	$U_{Nom} = 12 V_{DC} + 24 V_{DC}$	$U_{Min} = 8.0 V_{DC}$	$U_{Max} = 32.0 V_{DC}$
Temperature range: *	-40 °C to +85 °C		
Lowest / highest internal radio frequency: *	LTE Band 12: 738 MHz / WiFi 5GHz: 5825 MHz		
Lowest / highest internal clock frequency: *	32.768 kHz (Real time clock oscillator) / 125 MHz		

* Declared by the applicant

Ports / Connectors				
Identification	Connector		Length during test	Shielding (Yes / No)
	EUT	Ancillary		
Main Connector	54 Pin Connector	Customized	Appr. 3 m	No
GNSS	Fakra HFM single coding C	Fakra (Antenna)	Appr. 2 m	Yes
CN1 / CN2	Fakra HFM double coding D	2 x Fakra (Antenna)	Appr. 2 m	Yes
BT/WiFi1 / BT/WiFi2	Fakra HFM double coding F	2 x Fakra (Antenna)	Appr. 2 m	Yes
USB	HSD+2 coding C	USB	Appr. 2 m	Yes
100 base T1 / 1000 Base T1	H-MTD	Customized	Not connected	Yes

Equipment used for testing	
Bluetooth USB Stick* ¹	EDUP
WLAN Router * ²	Phoenix contact WLAN 5100
Power supply* ¹	Phoenix contact 24V
USB Hub* ²	D Link
Laptop* ¹	Fujitsu CELSIUS H770

*¹ Provided by the applicant

*² Provided by the laboratory

Ancillary equipment	
-	-
-	-
-	-

*¹ Provided by the applicant

1.7 Dates

Date of receipt of test sample:	11.09.2023
Start of test:	14.09.2023
End of test:	18.09.2023

2 Operational States

Description of function of the EUT:

The EUT is a telematic Unit to provide fleet management services & remote diagnostics, allows for remote measurement and also serves as AP-Server for Internet via WiFi.

This test report includes results to show compliance for simultaneous transmission of the RF modules integrated in the EUT.

The following states were defined as the operating conditions:

The EUT was supplied by 24 V DC during all tests.

During all tests, the EUT was connected over WLAN 5 GHz to a CMW500 and an iperf client/server was established to simulate a continuous data load.

The EUT was also connected via WLAN 2.4 GHz to a WLAN router via a test laptop and an iperf server/client connection was established to simulate a continuous data load.

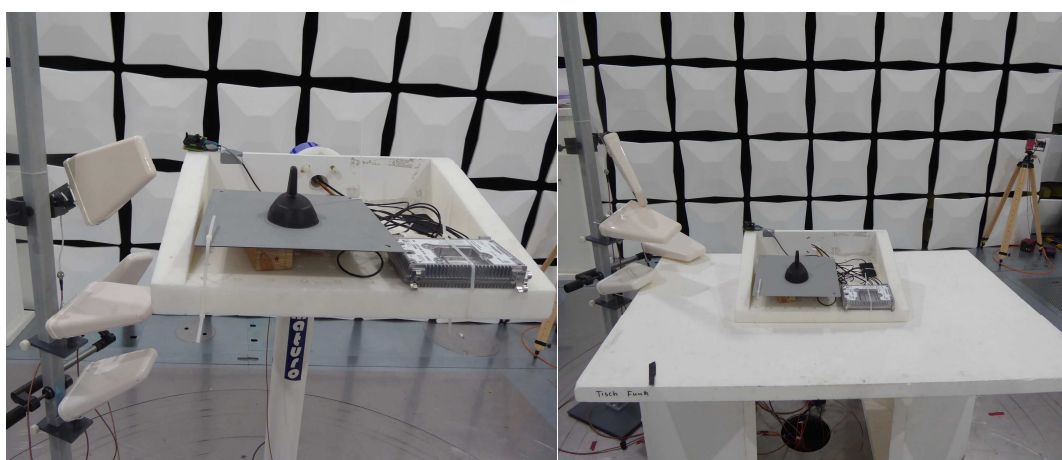
For the Bluetooth operation a Bluetooth USB dongle provided by the applicant has been used to connect to the EUT and a load has been simulated between the Dongle and the EUT.

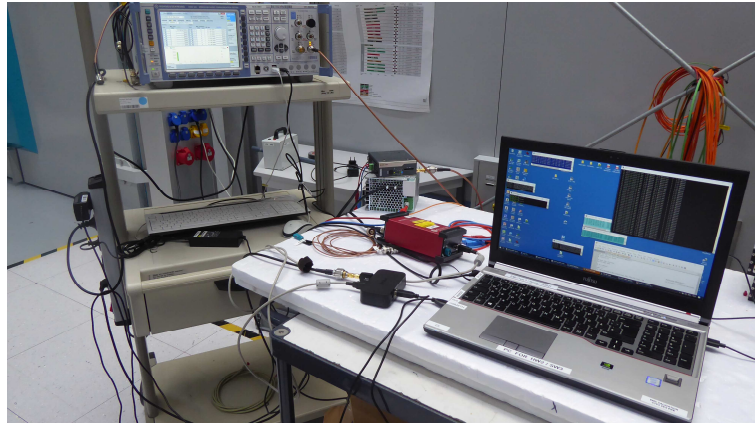
For the cellular part, a connection over the air has been established between the EUT and an additional CMW500.

The following modes have been defined by the applicant to represent the worst-case scenarios for simultaneous transmission:

Mode 1	GSM850 + WLAN 5GHz (5785MHz) + WLAN2.4G mode b + BT classic (hopping) + GNSS
Mode 2	PCS1900 + WLAN 5GHz (5785M) + WLAN2.4G mode b + BT classic (hopping) + GNSS
Mode 3	LTE Bd7 + WLAN 5GHz (5785M) + WLAN2.4G mode b + BT classic (hopping) + GNSS

The system was setup as follows:





3 Additional Information

The EUT was not labeled as required by FCC / IC.

4 Overview

Application	Frequency range [MHz]	FCC 47 CFR Part 15 section [2]	RSS-Gen, Issue 5 [4] and RSS-210, Issue 10 [3]	Tested EUT	Status
Radiated emissions	30 – 18,000**	15.205 (a) 15.209 (a)1	8.9 and 8.10 [4] 7.1 and 7.3 [3]	-	Passed

** : As required by the applicant the radiated emission measurement has been carried out up to 18 GHz.

5 Results

5.1 Test setups

5.1.1 Radiated: 30 MHz to 1 GHz

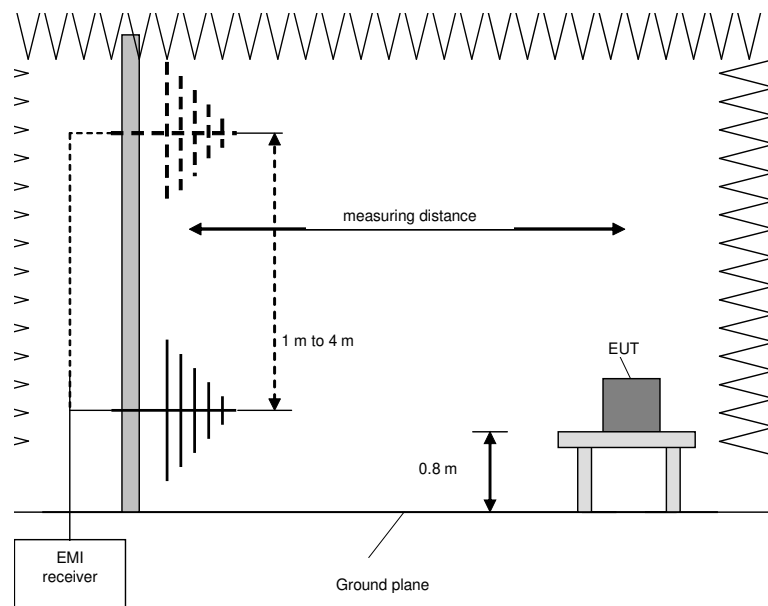
5.1.1.1 Preliminary and final measurement 30 MHz to 1 GHz

The preliminary and final measurements are performed in a semi-anechoic chamber with a metal ground plane at a measuring distance of 3 meters. Table-top devices are set up on a non-conducting support with a size of 1 m by 1.5 m and a height of 80 cm. Floor-standing devices are placed directly on the turntable / ground plane. The setup of the equipment under test is in accordance with [1].

During the tests the EUT is rotated in the range of 0 ° to 360 °, the measuring antenna is set to horizontal and vertical polarization and raised and lowered in the range from 1 m to 4 m to find the maximum level of emissions.

The resolution bandwidth of the EMI receiver is set to the following values:

Test	Frequency range	Step-size	Resolution bandwidth	Measuring time	Detector
Preliminary measurement	30 MHz to 1 GHz	30 kHz	120 kHz	-	Peak Average
Frequency peak search	± 120 kHz	10 kHz	120 kHz	1 s	Peak
Final measurement	30 MHz to 1 GHz	-	120 kHz	1 s	QuasiPeak



Procedure preliminary measurement:

The following procedure is used:

- 1) Set the measuring antenna to 1 m height.
- 2) Monitor the frequency range at horizontal polarization of the measuring antenna and an EUT / turntable azimuth of 0 °.
- 3) Rotate the EUT by 360° to maximize the detected signals.
- 4) Repeat steps 2 to 3 with the vertical polarization of the measuring antenna.
- 5) Increase the height of the measuring antenna for 0.5 m and repeat steps 2 to 4 until the final height of 4 m is reached.
- 6) The highest values for each frequency are saved by the software, including the measuring antenna height and polarization and the turntable azimuth for that value.

Procedure final measurement:

The following procedure is used:

- 1) Select the highest frequency peaks (lowest margin to the limit) for the final measurement.
- 2) The software determines the exact peak frequencies by doing a partial scan with reduced step size of the pre-scan of the selected peaks.
- 3) If the EUT is portable or ceiling mounted, find the worst-case EUT orientation (x, y, z) for the final test.
- 4) The worst-case measuring antenna height is found via varying the height by ± 0.5 m from the value obtained in the preliminary measurement while monitoring the emission level.
- 5) The worst-case turntable position is found via varying the turntable azimuth by $\pm 30^\circ$ from the value obtained in the preliminary measurement while monitoring the emission level.
- 6) The final measurement is performed at the worst-case measuring antenna height and the worst-case turntable azimuth.
- 7) Steps 2 to 6 are repeated for each frequency peak selected in step 1.

5.1.2 Radiated: 1 GHz to 40 GHz

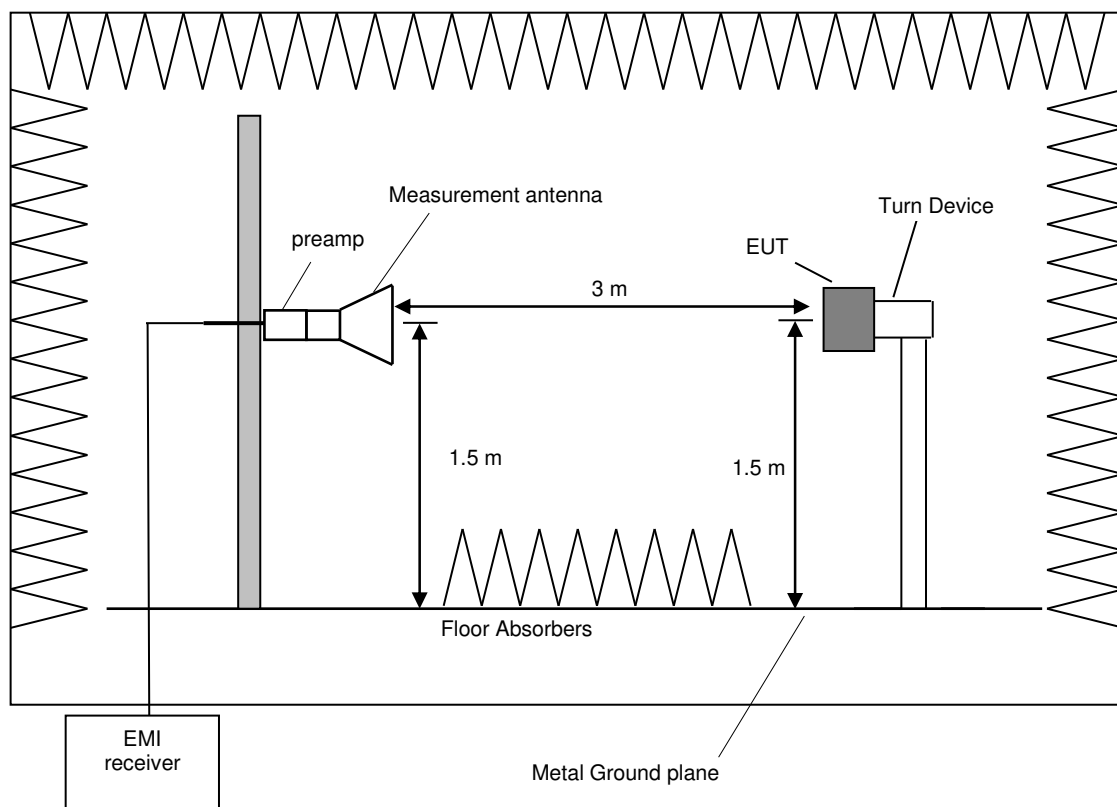
5.1.2.1 Preliminary and final measurement 1 to 40 GHz

The preliminary and final measurements are performed in a semi-anechoic chamber at a measuring distance of 3 meters, with floor absorbers between EUT and measuring antenna. Table-top devices are set up on a non-conducting support with a size of 1 m by 1.5 m and a height of 80 cm. Floor-standing devices are placed directly on the turntable / ground plane. The setup of the equipment under test is in accordance with [1].

During the tests the EUT is rotated in the range of 0 ° to 360 °, the measuring antenna is set to horizontal and vertical polarization and raised and lowered in the range from 1 m to 4 m to find the maximum level of emissions. While changing the height, the measuring antenna gets tilted so that it is always aiming at the EUT.

The resolution bandwidth of the EMI receiver is set to the following values:

Test	Frequency range	Step-size	Resolution bandwidth	Measuring time	Detector
Preliminary measurement	1 - 40 GHz	250 kHz	1 MHz	-	Peak Average
Frequency peak search	+ / - 1 MHz	50 kHz	1 MHz	100 ms	Peak
Final measurement	1 - 40 GHz	-	1 MHz	100 ms	Peak Average



Procedure preliminary measurement:

The following procedure is used:

- 1) Set the measuring antenna to 1 m height.
- 2) Monitor the frequency range at horizontal polarization of the measuring antenna and an EUT / turntable azimuth of 0 °.
- 3) Rotate the EUT by 360° to maximize the detected signals.
- 4) Repeat steps 2 to 3 with the vertical polarization of the measuring antenna.
- 5) Increase the height of the measuring antenna for 0.5 m and repeat steps 2 to 4 until the final height of 4 m is reached.
- 6) The highest values for each frequency are saved by the software, including the measuring antenna height and polarization and the turntable azimuth for that value.

Procedure final measurement:

The following procedure is used:

- 1) Select the highest frequency peaks (lowest margin to the limit) for the final measurement.
- 2) The software determines the exact peak frequencies by doing a partial scan with reduced step size of the pre-scan of the selected peaks.
- 3) If the EUT is portable or ceiling mounted, find the worst-case EUT orientation (x, y, z) for the final test.
- 4) The worst-case measuring antenna height is found via varying the height by ± 0.5 m from the value obtained in the preliminary measurement while monitoring the emission level.
- 5) The worst-case turntable position is found via varying the turntable azimuth by $\pm 30^\circ$ from the value obtained in the preliminary measurement while monitoring the emission level.
- 6) The final measurement is performed at the worst-case measuring antenna height and the worst-case turntable azimuth.
- 7) Steps 2 to 6 are repeated for each frequency peak selected in step 1.

5.2 Test results (radiated)

5.2.1 Test results (30 MHz – 1 GHz)

Ambient temperature:	23 °C
Relative humidity:	69 %

Date:	18.09.2023
Tested by:	Y. KHALEK

Position of EUT: For tests for f between 30 MHz to 1 GHz, the EUT was set-up on a table with a height of 80 cm. The distance between EUT and antenna was 3 m.

Cable guide: For detail information of test set-up and the cable guide refer to the pictures in the annex A in the test report.

Test record: Plots for each frequency range are submitted below.

Remark: None.

Calculations:

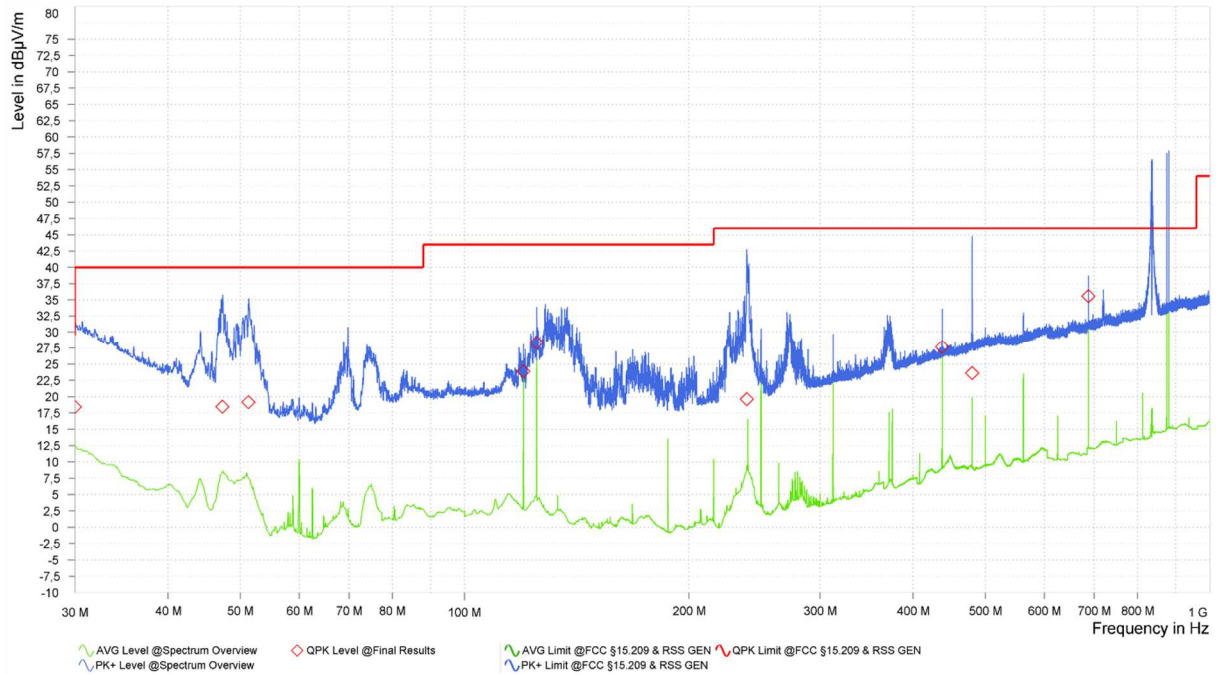
Result [dBμV/m] = Reading [dBμV] + Correction [dBμV/m]

Correction [dBμV/m] = AF [dB/m] + Cable attenuation [dB] + optional preamp gain [dB]

Margin [dB] = Limit [dBμV/m] - Result [dBμV/m]

The measured points and the limit line in the following diagrams refer to the standard measurement of the emitted interference in compliance with the above-mentioned standard. The measured points marked with “◇” are the measured results of the standard subsequent measurement in a semi-anechoic chamber.

Spurious emissions results from 30 MHz to 1 GHz (operation mode 1):

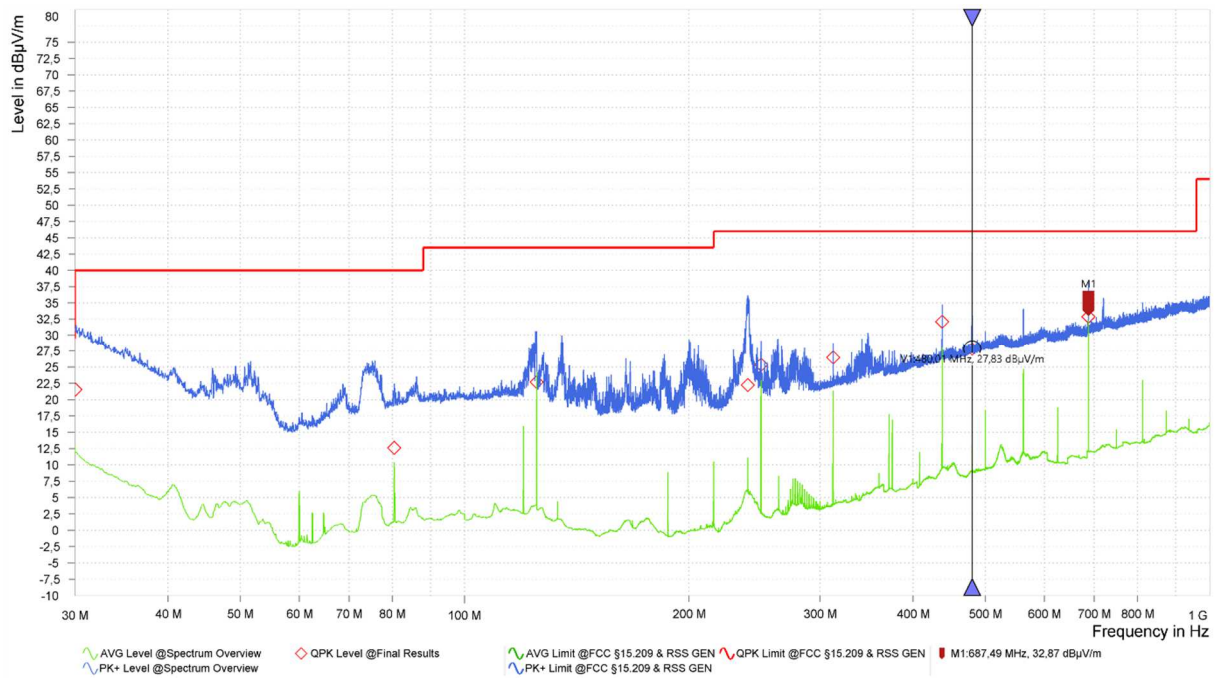


Result tables:

(Operation mode 1):

Frequency [MHz]	Result (QP) [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Correction [dB/m]	Height [cm]	Azimuth [deg]	Pol. (H/V)	Meas. BW [kHz]
30.00	18.43	29.5	11.07	25.98	2.95	199	H	120.0
47.32	18.47	40.0	21.53	15.46	1.00	34	V	120.0
51.28	19.17	40.0	20.83	13.22	1.00	49	V	120.0
120.01	23.90	43.5	19.60	17.61	1.01	52	V	120.0
124.99	28.36	43.5	15.14	17.24	2.01	62	H	120.0
239.32	19.65	46.0	26.35	17.23	1.37	82	H	120.0
437.50	27.68	46.0	18.32	22.74	1.25	140	V	120.0
480.01	23.61	46.0	22.39	23.98	2.62	62	H	120.0
687.49	35.56	46.0	10.44	27.07	1.00	169	V	120.0

Spurious emissions results from 30 MHz to 1 GHz (operation mode 2):

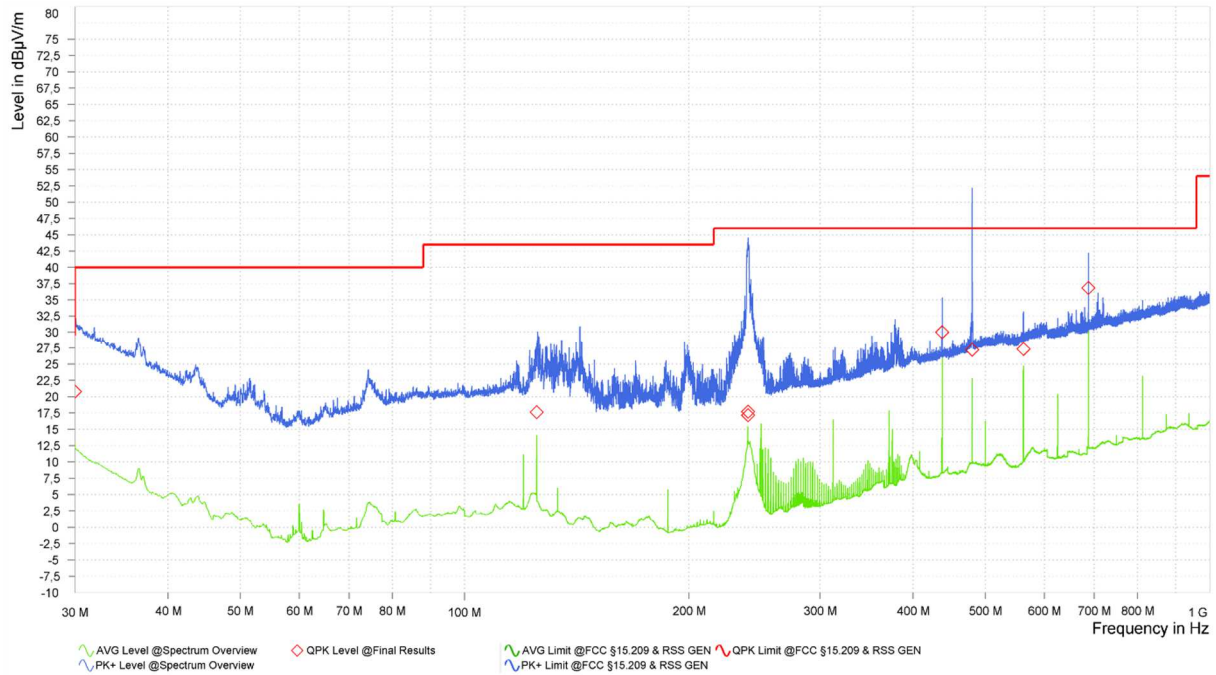


Result tables:

(Operation mode 2):

Frequency [MHz]	Result (QP) [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Correction [dB/m]	Height [cm]	Azimuth [deg]	Pol. (H/V)	Meas. BW [kHz]
30.05	21.55	40.0	18.45	25.95	1.01	232	H	120.0
80.47	12.61	40.0	27.39	16.46	1.06	262	V	120.0
124.99	22.72	43.5	20.78	17.24	2.98	255	H	120.0
240.01	22.25	46.0	23.75	17.24	1.59	92	V	120.0
250.00	25.37	46.0	20.63	17.32	1.00	251	H	120.0
312.49	26.48	46.0	19.52	19.43	1.00	82	H	120.0
437.50	32.09	46.0	13.91	22.74	1.00	194	V	120.0
480.01	27.83	46.0	18.17	23.98	2.62	39	H	120.0
687.49	32.87	46.0	13.13	27.07	1.75	14	H	120.0

Spurious emissions results from 30 MHz to 1 GHz (operation mode 3):



Result tables:

(Operation mode 3):

Frequency [MHz]	Result (QP) [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Correction [dB/m]	Height [cm]	Azimuth [deg]	Pol. (H/V)	Meas. BW [kHz]
30.00	20.79	29.5	8.71	25.95	3.51	152	V	120.0
124.98	17.61	43.5	25.89	16.46	1.00	182	V	120.0
240.15	17.16	46.0	28.84	17.24	1.25	311	H	120.0
240.27	17.72	46.0	28.28	17.24	1.21	315	H	120.0
437.49	30.02	46.0	15.98	17.32	1.00	213	V	120.0
480.00	27.22	46.0	18.78	19.43	1.90	69	V	120.0
562.50	27.33	46.0	18.67	22.74	1.25	52	V	120.0
687.49	36.81	46.0	9.19	23.98	1.00	82	V	120.0

Test result: Passed

Test equipment (please refer to chapter 7 for details)
1-8, 13-14, 17, 19-21

5.2.2 Test results (1 to 40 GHz)

Ambient temperature:	23 °C
Relative humidity:	41 %

Date:	14-15.09.2023
Tested by:	Y. KHALEK

Position of EUT: For tests for f between 1 GHz and the 10th harmonic, the EUT was set-up on a positioner device with a height of 150 cm. The distance between EUT and antenna was 3 m.

Cable guide: For detail information of test set-up and the cable guide refer to the pictures in the annex A in the test report.

Test record: Plots for each frequency range are submitted below.

Remark: None

Calculation:

Max Peak [dBμV/m] = Reading [dBμV] + Correction [dBμV/m]

Average [dBμV/m] = Reading [dBμV] + Correction [dBμV/m]

Correction [dBμV/m] = AF [dB/m] + Cable attenuation [dB] + optional preamp gain [dB] + DCCF* [dB]
* (if applicable – only for Average values, that are fundamental related)

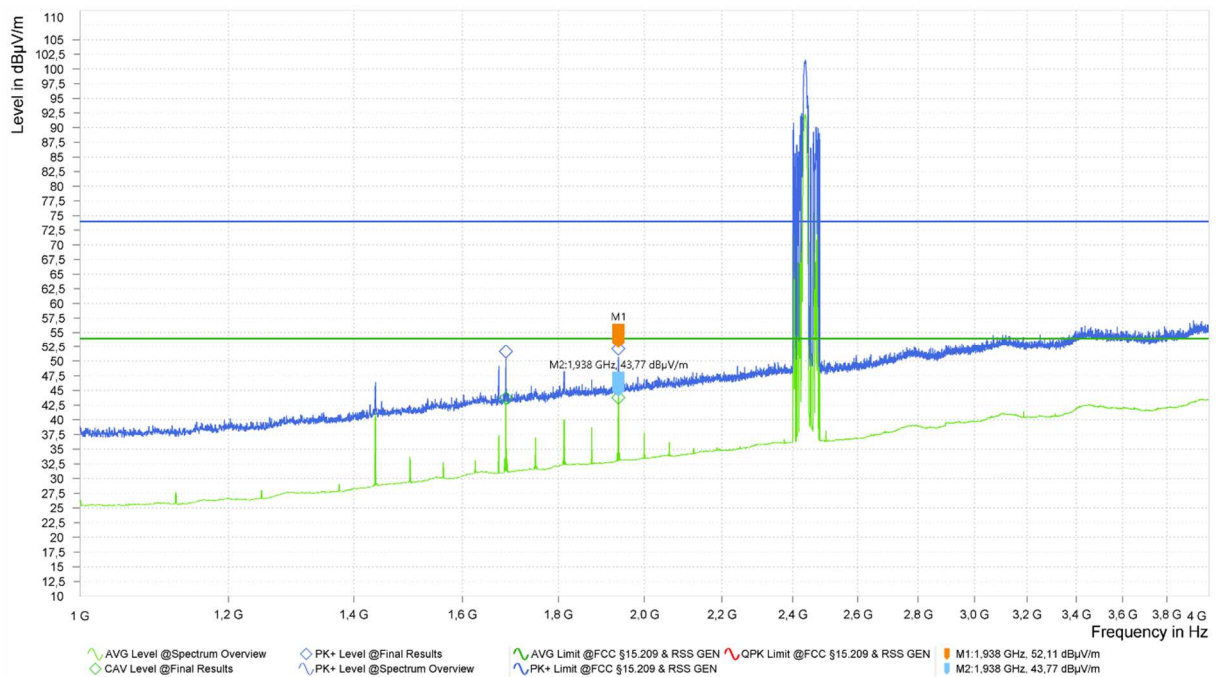
Margin [dB] = Limit [dBμV/m] – Max Peak | Average [dBμV/m]

The curves in the diagrams only represent the maximum measured value for each frequency point of all preliminary measurements, which were carried out with various EUT and antenna positions.

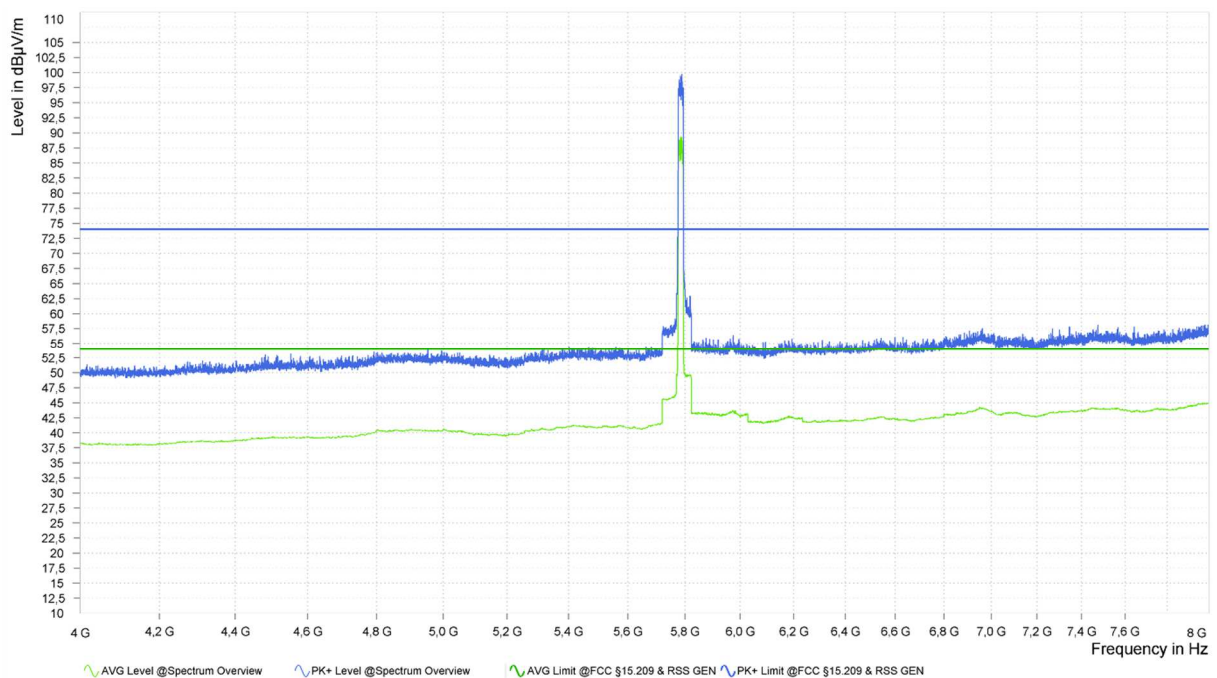
The top measured curve represents the peak measurement. The measured points marked with "◇" are frequency points for the final peak detector measurement. These values are indicated in the following table. The bottom measured curve represents the average measurement. The measured points marked with "◇" are frequency points for the final average detector measurement.

Results plots:

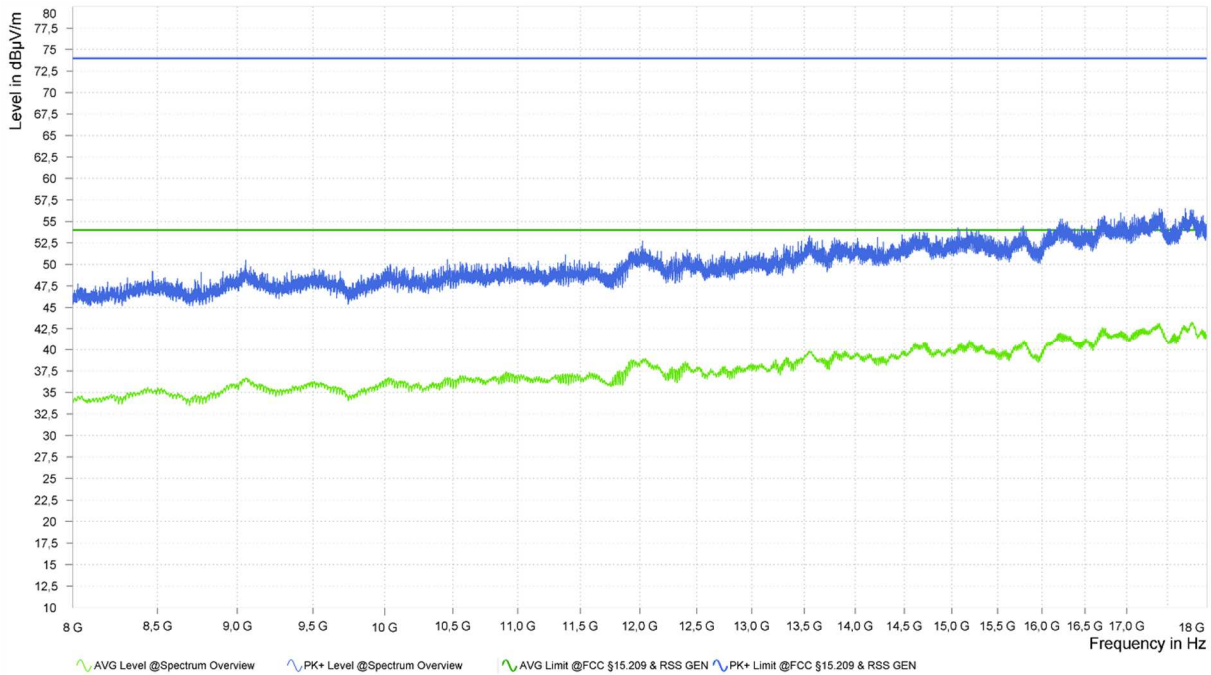
Spurious emissions from 1 GHz to 4 GHz (operation mode 1):



Spurious emissions from 4 GHz to 8 GHz (operation mode 1):



Spurious emissions from 12 GHz to 18 GHz (operation mode 1):

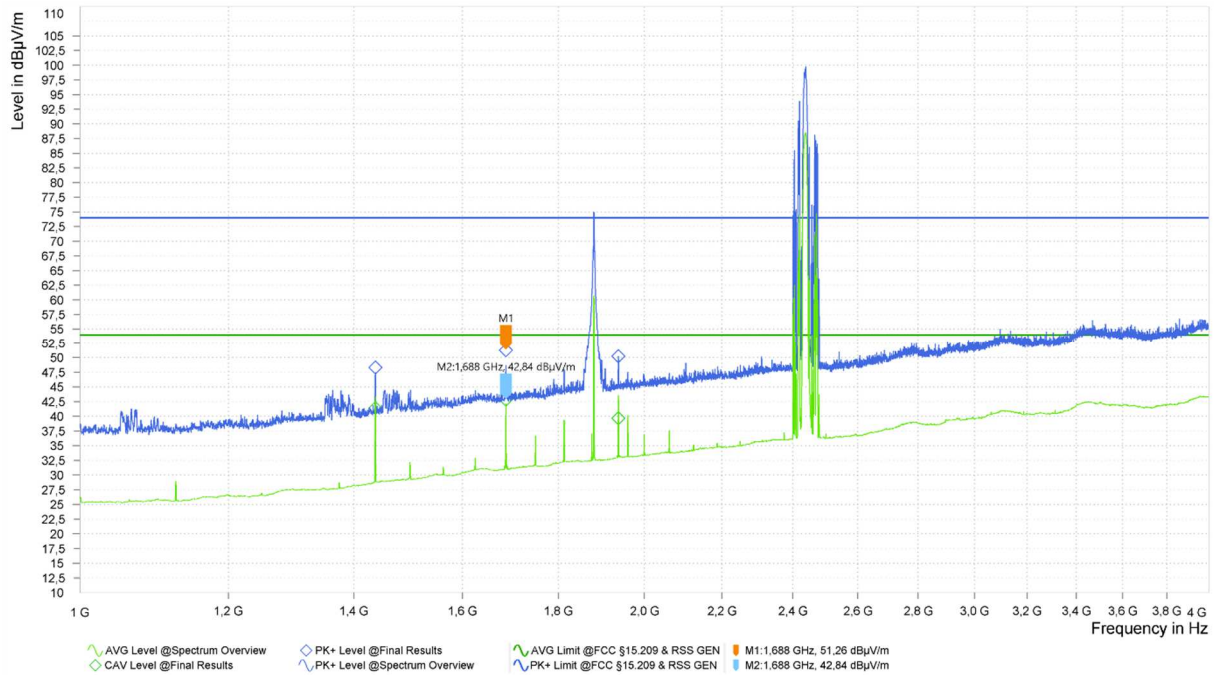


Result table:

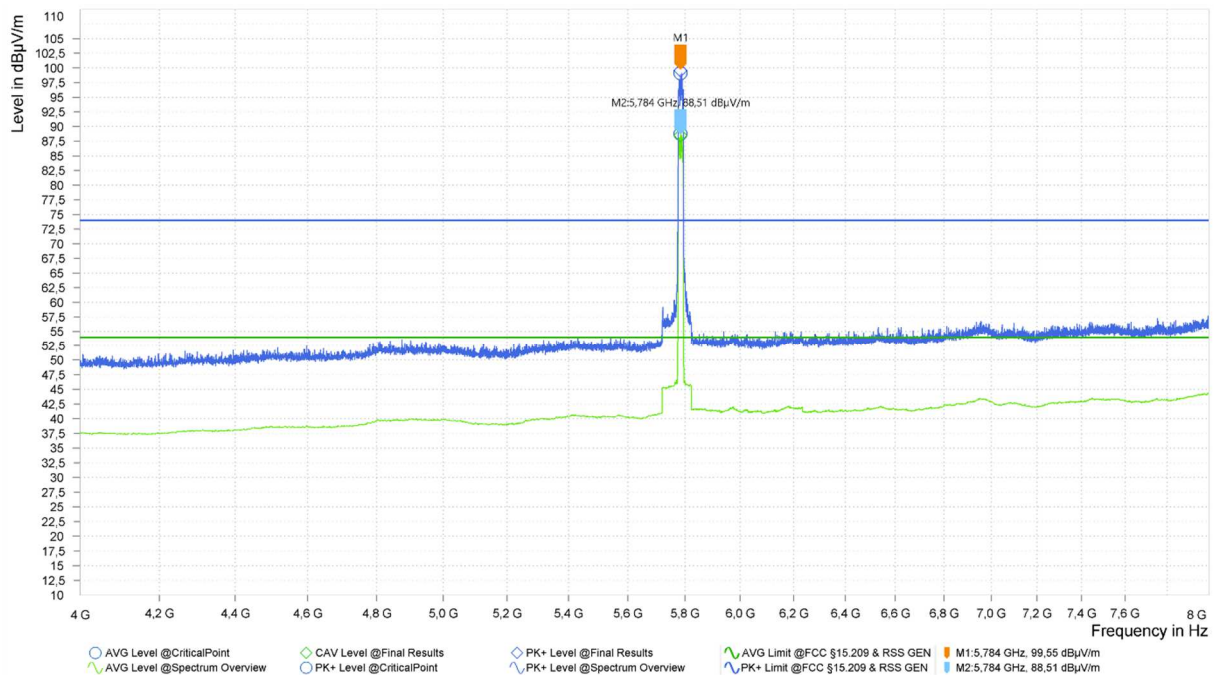
Operation mode 1:

Frequency [MHz]	MaxPeak [dB(µV/m)]	PK Limit [dB(µV/m)]	AV Limit [dB(µV/m)]	Average [dB(µV/m)]	AV Limit [dB(µV/m)]	AV Margin [dB(µV/m)]	Height [cm]	Elevation [deg]	Azimuth [deg]	Corr. [dB]
1,687.5	51.62	74.0	22.38	43.68	54.0	10.32	150	150	161	31.31
1,937.5	52.11	74.0	21.89	43.77	54.0	10.23	150	120	99	32.41

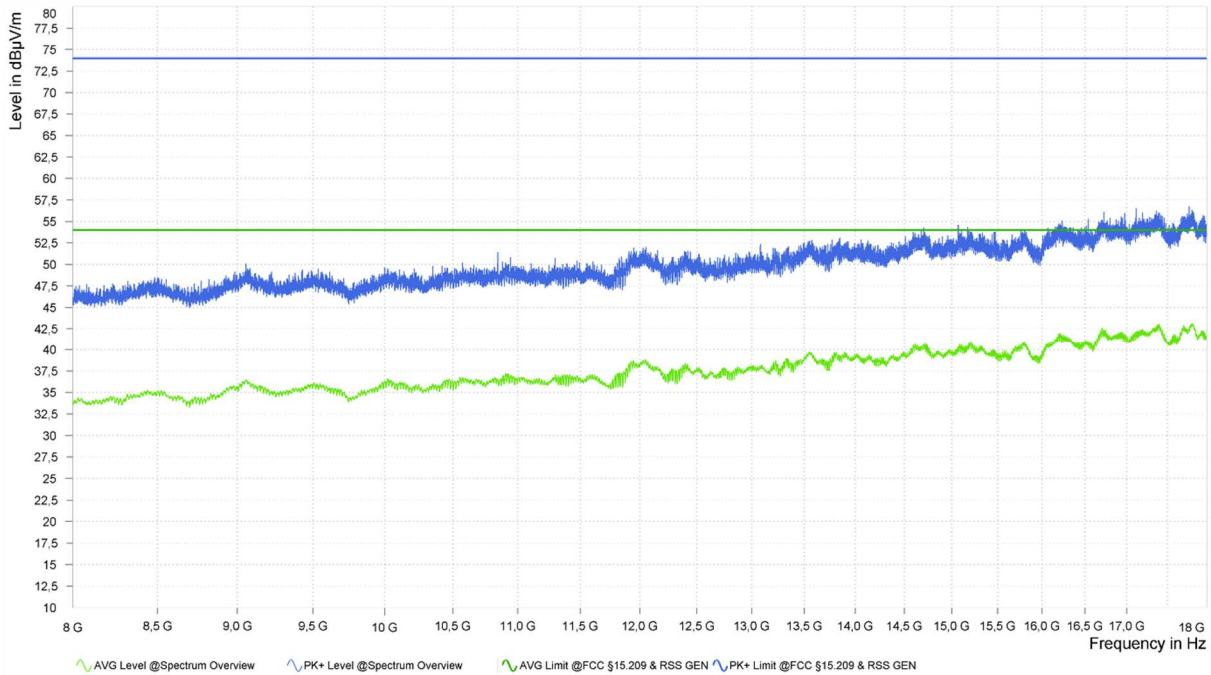
Spurious emissions from 1 GHz to 4 GHz (operation mode 2):



Spurious emissions from 4 GHz to 8 GHz (operation mode 2):



Spurious emissions from 12 GHz to 18 GHz (operation mode 2):

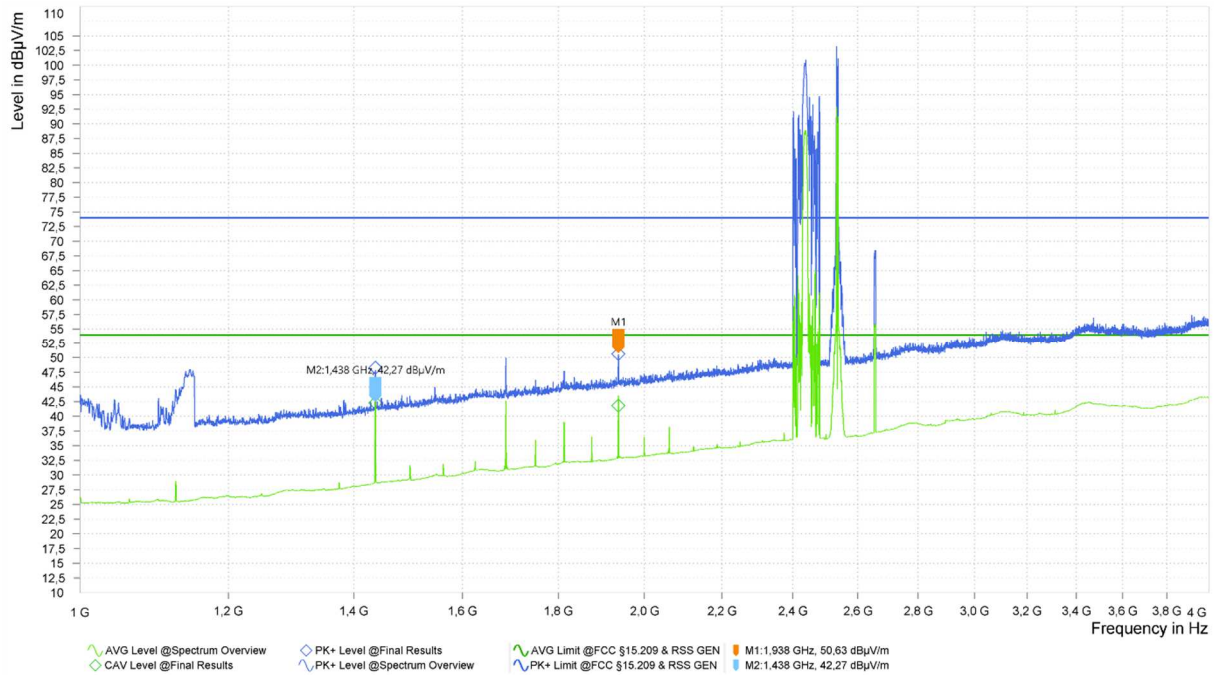


Result table:

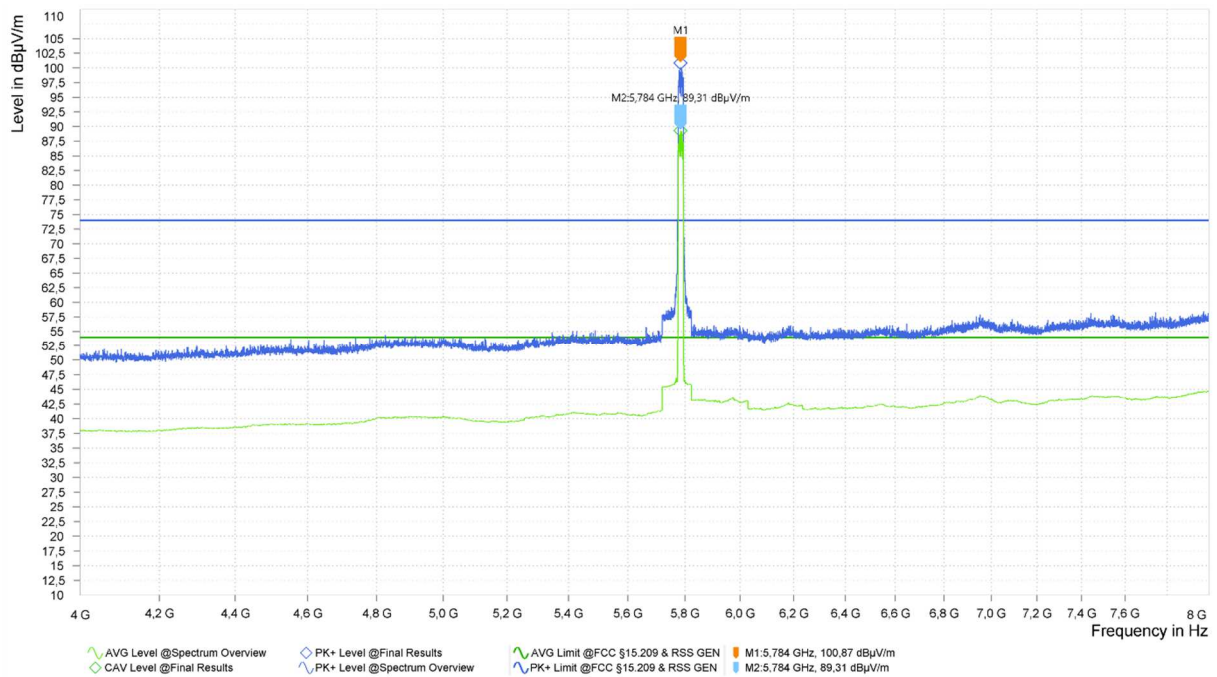
Operation mode 2:

Frequency [MHz]	MaxPeak [dB(µV/m)]	PK Limit [dB(µV/m)]	PK Margin [dB(µV/m)]	Average [dB(µV/m)]	AV Limit [dB(µV/m)]	AV Margin [dB(µV/m)]	Height [cm]	Elevation [deg]	Azimuth [deg]	Corr. [dB]
1,437.50	48.29	74.0	25.71	41.39	54.0	12.61	150	150	100	29.30
1,687.50	51.26	74.0	22.74	42.84	54.0	11.16	60	60	161	31.31
1,937.25	50.22	74.0	23.78	39.65	54.0	14.35	150	150	161	32.41

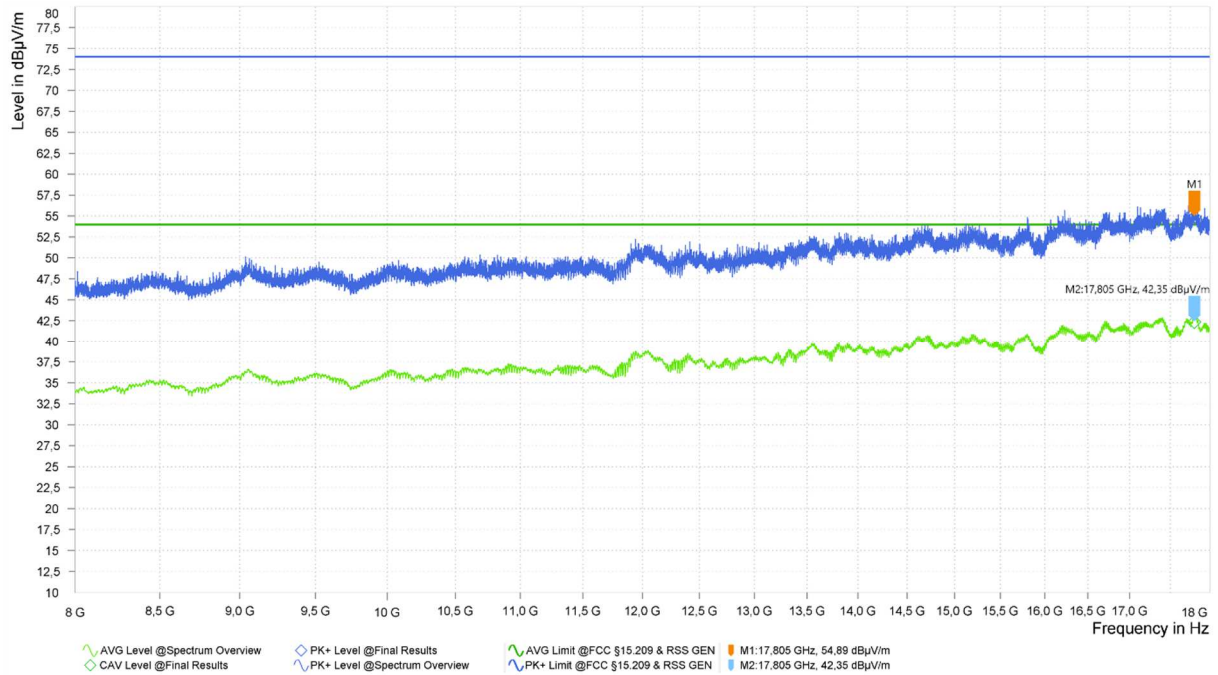
Spurious emissions from 1 GHz to 4 GHz (operation mode 3):



Spurious emissions from 4 GHz to 8 GHz (operation mode 3):



Spurious emissions from 12 GHz to 18 GHz (operation mode 3):



Result table:

Operation mode 3:

Frequency [MHz]	MaxPeak [dB(μV/m)]	PK Limit [dB(μV/m)]	PK Margin [dB(μV/m)]	Average [dB(μV/m)]	AV Limit [dB(μV/m)]	AV Margin [dB(μV/m)]	Height [cm]	Elevation [deg]	Azimuth [deg]	Corr. [dB]
1,437.5	48.28	74.0	25.72	42.27	54.0	11.73	150	0	93	29.30
1,937.5	50.63	74.0	23.37	41.79	54.0	12.21	150	120	94	32.41

Test result: Passed

Test equipment (please refer to chapter 7 for details)
2-18, 22

6 Measurement Uncertainties

Conducted measurements		
Measurement method	Standard used for calculating measurement uncertainty	Expanded measurement uncertainty (95 %) U_{lab}
Frequency error	ETSI TR 100 028	4.5×10^{-8}
Bandwidth measurements	-	9.0×10^{-8}
Conducted emissions from 150 kHz to 30 MHz with LISN	CISPR 16-4-2	2.8 dB

Radiated measurements		
Frequency error		
(Semi-) Anechoic chamber	ETSI TR 100 028	4.5×10^{-8}
OATS	ETSI TR 100 028	4.5×10^{-8}
Test fixture	ETSI TR 100 028	4.5×10^{-8}
Bandwidth measurements		
(Semi-) Anechoic chamber	-	9.0×10^{-8}
OATS	-	9.0×10^{-8}
Test fixture	-	9.1×10^{-8}
Radiated field strength M20		
CBL6112B @ 3 m 30 MHz – 1 GHz	CISPR 16-4-2	5.3 dB
R&S HL050 @ 3 m		
1 – 6 GHz	CISPR 16-4-2	5.1 dB
6 – 18 GHz	CISPR 16-4-2	5.4 dB
Flann Standard Gain Horns 18 – 40 GHz	-	5.9 dB
Radiated field strength M276		
R&S HL562E @ 3 m 30 MHz – 1 GHz	CISPR 16-4-2	4.8 dB
R&S HL050 @ 3 m	-	
1 – 6 GHz	CISPR 16-4-2	5.1 dB
6 – 18 GHz	CISPR 16-4-2	5.4 dB
Flann Standard Gain Horns 18 – 40 GHz	-	5.9 dB
OATS		
Field strength measurements below 30 MHz on OATS without ground plane	-	4.4 dB

7 Test Equipment used for Tests

No.	Test equipment	Type	Manufacturer	Serial No.	PM. No.	Cal. Date	Cal Due
1	Ultralog Antenna	HL562E	Rohde & Schwarz	101079	482978	18.03.2021	03.2024
2	Testsoftware M276	Elektra V5.01	Rohde & Schwarz	-	483755	Calibration not necessary	
3	RF Switch Matrix	OSP220	Rohde & Schwarz	101391	482976	Calibration not necessary	
4	Turntable	TT3.0-3t	Maturo	825/2612/.01	483224	Calibration not necessary	
5	Antenna support	BAM 4.5-P-10kg	Maturo	222/2612.01	483225	Calibration not necessary	
6	Controller	NCD	Maturo	474/2612.01	483226	Calibration not necessary	
7	Anechoic chamber M276	SAC5-2	Albatross Projects	C62128-A540-A138-10-0006	483227	Calibration not necessary	
8	EMI Test receiver ESW	ESW44	Rohde & Schwarz	101828	482979	08.12.2021	12.2023
9	Log Per Antenna	HL050	Rohde & Schwarz	4062.4063.02-100908	482977	22.09.2022	09.2025
10	Highpass Filter	WHKX4.0/18G-8SS	Wainwright Instruments	1	480587	Calibration not necessary	
11	Highpass Filter	WHKX12-935-1000-15000-40ST	Wainwright Instruments	1	482908	Calibration not necessary	
12	Highpass Filter	WHKX8.0/18G-8SS	Wainwright Instruments	4	480586	Calibration not necessary	
13	Wideband Radio Communication Tester	CMW500 WLAN BT	Rohde & Schwarz	1201.0002K50-170975-FD	483657	03.03.2022	03.2024
14	Wideband Radio Communication Tester	CMW500	Rohde & Schwarz	167339	483023	21.06.2023	06.2024
15	Tunable Band Reject Filter	WRCT 2300/2650-5/40-10EEK	Wainwright Instruments	1	480446	Calibration not necessary	
16	Tuneable Notch Filter	WRCD1700/2000-0.2/40-10EEK	Wainwright Instruments	14	480415	Calibration not necessary	
17	Tuneable Notch Filter	WRCA 800/960-0.2/40-6EEK	Wainwright Instruments	15	480414	Calibration not necessary	
18	Preamplifier	LNA-30-00101800-25-10P	Narda-Miteq	2110917	482967	Calibration not necessary	
19	Cable	C417	H+S	-	-	Calibration not necessary	
20	Cable	C416	H+S	-	-	Calibration not necessary	
21	Cable	C416.1	H+S	-	-	Calibration not necessary	
22	Cable	C419	H+S	-	-	Calibration not necessary	

8 Test site Verification

Test equipment	PM. No.	Frequency range	Type of validation	According to	Val. Date	Val Due
Semi anechoic chamber M276	483227	30 – 1000 MHz	NSA/RSM	CISPR 16-1-4 + Cor1:2010 + A1:2012 +A2:2017	01.03.2023	28.02.2026
Semi anechoic chamber M276	483227	1 -18 GHz	SVSWR	CISPR 16-1-4 + Cor1:2010 + A1:2012 +A2:2017	28.02.2023	27.02.2026

9 Report History

Report Number	Date	Comment
F221817E6	05.03.2024	Initial Test Report
-	-	-
-	-	-

10 List of Annexes

Annex A Test Setup Photos

4 pages