



IBL/A-CAD-01/01-01

# Test Report

**Test report no.:** 23038521-32375-0

**Date of issue:** 2023-07-27

**Test result:** The test item - **passed** - and complies with the listed standards.

## Applicant

*Mitsubishi Electric Corporation Sanda Works*

## Manufacturer

*Mitsubishi Electric Corporation*

## Test Item

R1LOW-R

## Electromagnetic Compatibility Testing according to:

### 47 CFR Part 15

Radio frequency devices,  
Subpart B – Unintentional Radiators  
(§15.107, §15.109)

### ICES-003 Issue 7

Information Technology Equipment  
(including Digital Apparatus)  
(3.1.1, 3.2.2)

Tested by  
(name, function, signature)

*Frank von Ehren*  
*Lab Manager EMC*

Approved by  
(name, function, signature)

*Florian Schmidt*  
*Head of Department EMC*

<b>Applicant and Test item details</b>	
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<b>Manufacturer</b>	<i>Mitsubishi Electric Corporation 2-3-33, Miwa, Sanda-city, Hyogo 669-1513 Japan Design-A Section, Multimedia Design Dept. , Sanda Works Phone: +81 79 559 3505 Fax: ---</i>
<b>Test item description</b>	Automotive Display Audio
<b>Model/Type reference</b>	R1LOW-R

### **Disclaimer and Notes**

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Within this test report, a  point /  comma is used as a decimal separator.  
If otherwise, a detailed note is added adjoined to its use.

Decision rule based on simple acceptance without guard bands, binary statement, based on mutually agreed uncertainty tolerances with expansion factor  $k=2$ .

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## 2 GENERAL INFORMATION

### 2.1 Administrative details

Testing laboratory	<b>IBL-Lab GmbH</b> Heinrich-Hertz-Allee 7 66386 Sankt Ingbert / Germany Fon: +49 6894 38938-0 Fax: +49 6894 38938-99 URL: <a href="http://www.ib-lenhardt.de">www.ib-lenhardt.de</a> E-Mail: <a href="mailto:info@ib-lenhardt.de">info@ib-lenhardt.de</a>
Accreditation	The testing laboratory is accredited by Deutsche Akkreditierungsstelle GmbH (DAkks) in compliance with DIN EN ISO/IEC 17025:2018.  Scope of testing and registration number: <ul style="list-style-type: none"> <li>Electronics, EMC, Radio <a href="#">D-PL-21375-01-01</a></li> <li>Electromagnetic Compatibility and Telecommunication (FCC requirements) Testing Laboratory Designation Number <a href="#">D-PL-21375-01-02</a> DE0024</li> <li>Telecommunication (TC) and Electromagnetic Compatibility (EMC) for Canadian Standards ISED Company Number <a href="#">D-PL-21375-01-03</a> 27156 Testing Laboratory CAB Identifier DE0020</li> </ul> Website DAkks: <a href="https://www.dakks.de/">https://www.dakks.de/</a>  The Deutsche Akkreditierungsstelle GmbH (DAkks) is also a signatory to the <a href="#">ILAC Mutual Recognition Arrangement</a>
Testing location	<b>IBL-Lab GmbH</b> Heinrich-Hertz-Allee 7 66386 St. Ingbert / Germany
Date of receipt of test samples	2023-06-29
Start – End of tests	2023-06-30 – 2023-07-11

### 2.2 Possible test case verdicts

Test sample meets the requirements	passed
Test sample does not meet the requirements	failed
Test case does not apply to the test sample	n/a (not applicable)
Test case not performed	n/p (not performed)

### 2.3 Observations

No additional observations other than the reported observations within this test report have been made.

## 2.4 Opinions and interpretations

No appropriate opinions or interpretations according ISO/IEC 17025:2017.

## 2.5 Revision History

-0 Initial Version

## 3 ENVIRONMENTAL & TEST CONDITIONS

	<i>Environmental condition</i>	<i>Test condition</i>
Temperature	20°C ± 5°C	22°C
Relative humidity	25-75% r.H.	58 % r.H.
Barometric Pressure	860-1060 mbar	1017 mbar

## 4 TEST STANDARDS AND REFERENCES

Test standard (accredited)	Description
47 CFR Part 15	Radio frequency devices, Subpart B – Unintentional Radiators (§15.107, §15.109)
ICES-003 Issue 7	Information Technology Equipment (including Digital Apparatus) (3.1.1, 3.2.2)

Reference	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 C63.10-2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

## 5 EQUIPMENT UNDER TEST (EUT)

### 5.1 EUT A

#### 5.1.1 Product description\*

**Test item\*** Automotive Display Audio

**Function overview\***

Ele-Variant	Mecha-Variant	ID #	Model Name	DDR*1)			UFS*2)			SXM*3)	DAB	FM2	2nd USB	Ethernet	Digital RVCs	Analog RVC*4)	B CAN Term.	C CAN Term.
16	8F	79	R1LOW-R	4GB	95	SK Hynix	32GB	95	Samsung	X	-	-	X	2	2	X	X	

- \*1) Main Memory
- \*2) Universal Flash Storage
- \*3) SiriusXM
- \*4) Rear View Camera

\*: as declared by applicant

#### 5.1.2 Description of test item

<b>Model name*</b>	R1LOW-R
<b>EUT status*</b>	25MY PV
<b>Serial number*</b>	R0095
<b>Control number*</b>	79
<b>PCB identifier*</b>	N211J71621
<b>Hardware status*</b>	NR-0C-R-25MY-PV
<b>Software status*</b>	Android 10

\*: as declared by applicant

#### 5.1.3 Additional information

---

#### 5.1.1 Operation Modes during test

<b>Operation mode 1 (op.1)</b>	Active RVC and continuous reception of a 400 Hz sine wave tone over FM radio; CAN- Bus and Ethernet port running
<b>Operation mode 2 (op.2)</b>	Continuous reception of a 400 Hz sine wave tone sent by a plugged mediaplayer over USB; CAN- Bus and Ethernet port running; unused ports terminated; WLAN, BT idle

5.1.2 Technical data of test item			
<b>Operational frequency band*</b>	Bluetooth and Bluetooth LE: 2402 - 2480 MHz		
	Car radio: AM: 530~1710 kHz FM: 87.7~107.9 MHz		
	GPS/GLONASS/BeiDou/Galileo: GPS: 1575.42 MHz GLONASS: 1597.5515~1605.886 MHz BeiDou: 1559.052~1563.144 MHz Galileo: 1575.42 MHz		
	WLAN 2.4 GHz band: 2412 - 2472 MHz		
	WLAN 5 GHz band: 5180 - 5240 MHz 5260 - 5320 MHz 5500 - 5720 MHz 5745 - 5825 MHz		
<b>Power supply*</b>	battery powered (9 V – 16.5 V)		
<b>Nominal supply voltage*</b>	DC 12.6 V		
<b>Ports*</b>	<b>Classification*</b>	<b>Direction*</b>	<b>Length*</b>
	DC mains	input	> 3m
	Signal/control (vehicle cable harness)	in/output	> 3m
	Signal/control (digital RVC)	in/output	> 3m
	Signal/control (analog RVC)	in/output	> 3m
	Signal/control (USB)	input	> 3m
	Antenna (FM/AM)	input	> 3m
	Antenna (GNSS)	in/output	> 3m

\*: as declared by applicant

## 5.2 EUT B

### 5.2.1 Product description\*

**Test item\*** Automotive Display Audio

**Function overview\***

Ele-Variant	Mecha-Variant	ID #	Model Name	DDR*1)			UFS*2)			SXM*3)	DAB	FM2	2nd USB	Ethernet	Digital RVCs	Analog RVC*4)	B CAN Term.	C CAN Term.
26	8F	80	R1LOW-R	4GB	95	SK Hynix	32GB	95	Samsung	-	-	-	X	2	2	X	X	

- \*1) Main Memory
- \*2) Universal Flash Storage
- \*3) SiriusXM
- \*4) Rear View Camera

\*: as declared by applicant

### 5.2.2 Description of test item

<b>Model name*</b>	R1LOW-R
<b>EUT status*</b>	25MY PV
<b>Serial number*</b>	R0085
<b>Control number*</b>	80
<b>PCB identifier*</b>	N211J71621
<b>Hardware status*</b>	NR-0C-R-25MY-PV
<b>Software status*</b>	Android 10

\*: as declared by applicant

### 5.2.3 Additional information

---

### 5.2.4 Operation Modes during test

<b>Operation mode 1 (op.1)</b>	Active RVC and continuous reception of a 400 Hz sine wave tone over FM radio; CAN- Bus and Ethernet port running
<b>Operation mode 2 (op.2)</b>	Active RVC; continuous reception of a 400 Hz sine wave tone sent by a plugged mediaplayer over USB; CAN- Bus and Ethernet port running; unused ports terminated; WLAN, BT idle



5.2.5 Technical data of test item			
<b>Operational frequency band*</b>	Bluetooth and Bluetooth LE: 2402 - 2480 MHz  Car radio:  AM: 530~1710 kHz FM: 87.7~107.9 MHz  GPS/GLONASS/BeiDou/Galileo: GPS: 1575.42 MHz GLONASS: 1597.5515~1605.886 MHz BeiDou: 1559.052~1563.144 MHz Galileo: 1575.42 MHz  WLAN 2.4 GHz band: 2412 - 2472 MHz  WLAN 5 GHz band: 5180 - 5240 MHz 5260 - 5320 MHz 5500 - 5720 MHz 5745 - 5825 MHz		
<b>Power supply*</b>	battery powered (9 V – 16.5 V)		
<b>Nominal supply voltage*</b>	DC 12.6 V		
<b>Ports*</b>	<b>Classification*</b>	<b>Direction*</b>	<b>Length*</b>
	DC mains	input	> 3m
	Signal/control (vehicle cable harness)	in/output	> 3m
	Signal/control (digital RVC)	in/output	> 3m
	Signal/control (analog RVC)	in/output	> 3m
	Signal/control (USB)	input	> 3m
	Antenna (FM/AM)	input	> 3m
	Antenna (GNSS)	in/output	> 3m

\*: as declared by applicant

## 6 Associated equipment (AE)

### 6.1 AE 1

**Product description\***

GPS antenna

**Description\***

**Frequency:** 1575.42 MHz

**Voltage:** 3 V – 5 V

**Hardware status** ---

**Software status** ---

### 6.2 AE 2

**Product description\***

Digital camera (RVC)

**Description\***

**Model name:** ---

**Serial number:** C110001921601887

**Hardware status** 170100

**Software status** 182500 E179127 A

### 6.3 AE 3

**Product description\***

USB HUB

**Description\***

**Model name:** ---

**Serial number:** ---

**Hardware status** ---

**Software status** ---

### 6.4 AE 4

**Product description\***

CAN Tool 2

**Description\***

**Model name:** CT2E1001-5HNLT

**Serial number:** 15G1368B

**Hardware status** ---

**Software status** ---

<b>6.5 AE 5</b>	
<b>Product description*</b>	
Ethernet jig	
<b>Description*</b>	
<b>Model name:</b>	---
<b>Serial number:</b>	---
<b>Hardware status</b>	---
<b>Software status</b>	---

<b>6.6 AE 6</b>	
<b>Product description*</b>	
Terminal jig	
<b>Description*</b>	
<b>Model name:</b>	---
<b>Serial number:</b>	---
<b>Hardware status</b>	---
<b>Software status</b>	---

## 7 SUMMARY OF TEST RESULTS

### Test specification

FCC 47 CFR Part 15  
ICES-003 Issue 7

Clause	Requirement / Test case	Chapter	Test Conditions	Result / Remark	Verdict
§15.107	Conducted limits	8.1	normal	Class B	n/a
§15.109	Radiated emission limits	8.2	normal	Class B	passed

### Comments and observations

---

## 8 TEST RESULTS

### 8.1 Conducted emission (§15.107)

*Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power*

## 8.2 Radiated emission (§15.109)

### 8.2.1 Test plan

<b>Test setup</b>	EUT A + AE 1 + AE 2 + AE 3 + AE 4 + AE 5 + AE 6 EUT B + AE 1 + AE 2 + AE 3 + AE 4 + AE 5 + AE 6
<b>Operating mode</b>	OP 1
<b>Limit</b>	§15.109 Class B
<b>Verdict</b>	passed*

\* see measurement results in section 8.2.5

<b>Test setup</b>	EUT A + AE 1 + AE 2 + AE 3 + AE 4 + AE 5 + AE 6 EUT B + AE 1 + AE 2 + AE 3 + AE 4 + AE 5 + AE 6
<b>Operating mode</b>	OP 2
<b>Limit</b>	§15.109 Class B
<b>Verdict</b>	passed*

<b>Comment:</b>	---
-----------------	-----

### 8.2.2 Frequency range of radiated measurements (§15.33)

Highest frequency generated or used in the device or on which the device operates or tunes	Upper frequency of measurement range (MHz)
Below 1.705 MHz	30 MHz
1.705 – 108 MHz	1000 MHz
108 – 500 MHz	2000 MHz
500 – 1000 MHz	5000 MHz
Above 1000 MHz	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

**8.2.3 Radiated emission limits (§15.109)**

**Description & Limits**

§ 15.109 Radiated emission limits.

(a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency [MHz]	Field Strength [ $\mu\text{V/m}$ ] / [dB $\mu\text{V/m}$ ]	Measurement distance [m]
30 – 88	100 / 40.0	3
88 – 216	150 / 43.5	3
216 – 960	200 / 46.0	3
960 – 40 000	500 / 54.0	3

(b) The field strength of radiated emissions from a Class A digital device, as determined at a distance of 10 meters, shall not exceed the following:

Frequency [MHz]	Field Strength [ $\mu\text{V/m}$ ] / [dB $\mu\text{V/m}$ ]	Measurement distance [m]
30 – 88	90 / 39.1	3
88 – 216	150 / 43.5	3
216 – 960	210 / 46.4	3
960 – 40 000	300 / 49.5	3

**Note**

Measurements with the peak detector are also suitable to demonstrate compliance of an EUT, as long as the required resolution bandwidth is used, because peak detection will yield amplitudes equal to or greater than amplitudes measured with RMS detector. The measurement data from a spectrum analyser peak detector will represent the worst-case results (see ANSI C63.10).

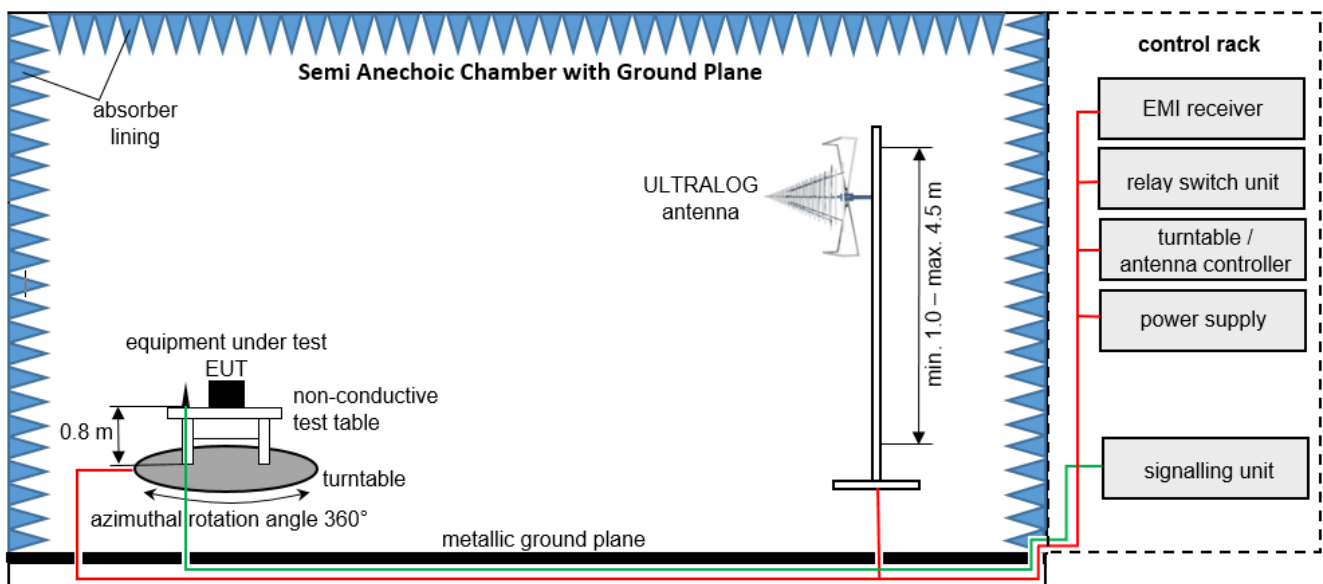
**Typical test distances**

Up to 18 GHz: 3.00 m  
 18 – 40 GHz: 0.50 m

**8.2.4 Test Setup Description**

*8.2.4.1 Semi Anechoic Chamber with Ground Plane*

Radiated measurements are performed in vertical and horizontal plane in the frequency range 30 MHz to 1 GHz in a Semi Anechoic Chamber with a metallic ground plane. The EUT is positioned on a non-conductive test table with a height of 0.80 m above the metallic ground plane that covers the whole chamber. The receiving antennas conform to specification ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices. These antennas can be moved over the height range between 1.0 m and 4.5 m in order to search for maximum field strength emitted from the 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 a spectrum analyzer where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63.



Measurement distance: ULTRALOG antenna 3 meter  
 ELEKTRA software version: 4.60

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

Example calculation:

$$FS [dB\mu V/m] = 12.35 [dB\mu V/m] + 1.90 [dB] + 16.80 [dB/m] = 31.05 [dB\mu V/m] (35.69 \mu V/m)$$

**List of test equipment used:**

#	Equipment	Type	Serial number	Internal number	Calibrated until	Used for test
1	EMI Test Receiver	Rohde & Schwarz ESW 26	101481	LAB000236	2024-07-04	<input checked="" type="checkbox"/>
2	Open Switch and Control Platform	Rohde & Schwarz OSP-B200S2	101443	LAB000239	n/a	<input checked="" type="checkbox"/>
3	Antenna	Rohde & Schwarz HL562E	102001	LAB000123	2026-04-05	<input checked="" type="checkbox"/>



## 8.2.5 Test Setup Description

### 8.2.5.1 Radiated spurious emissions from 30 MHz to 1 GHz

#### Test setup

- The EUT is set up according to its intended use, as described in the user manual or as defined by the manufacturer.
- In case of floor standing equipment, it is placed in the middle of the turn table.  
In case of tabletop equipment it is placed on a non-conductive table with a height of 80 cm.
- Additional equipment, cables, ... necessary for testing, are positioned like under normal operation.
- Interface cables, e.g. power supply, network, ... are connected to the connection box in the turn table.
- EUT is powered on and set into operation.

#### Pre-scan

- Turntable performs an azimuthal rotation from 0° to 315° in 45° steps.
- Antenna polarisation is changed (H-V / V-H) and antenna height is changed from 1 meter to 4 meters.
- For each turntable step / antenna polarisation / antenna height the EMI-receiver/spectrum analyser performs a positive-peak/max-hold sweep (=worst-case). Data is transferred to EMI-software and recorded. EMI-software will show the maximum level of all single sweeps as the final result for the pre-scan.

#### Final measurement

- Significant emissions found during the pre-scan will be maximized by the EMI-software based on evaluated data during the pre-scan by rotating the turntable and changing antenna height and polarisation.
- Final measurement will be performed with measuring equipment settings as defined in the applicable test standards (e.g. ANSI C63.4).
- Plot of the pre-scan with frequencies of identified emissions including levels, correction factors, turn table position, antenna polarisation and settings of measuring equipment is recorded.

Detailed requirements can be found in e.g. ANSI C63.4

### 8.2.5.2 Radiated spurious emissions from 1 GHz to 18 GHz

#### Test setup

- The EUT is set up according to its intended use, as described in the user manual or as defined by the manufacturer.
- In case of floor standing equipment, it is placed in the middle of the turn table.  
In case of tabletop equipment it is placed on a non-conductive table with a height of 80 cm.
- Additional equipment, cables, ... necessary for testing, are positioned like under normal operation.
- Interface cables, e.g. power supply, network, ... are connected to the connection box in the turn table.
- EUT is powered on and set into operation.

#### Pre-scan

- Turntable performs an azimuthal rotation from 0° to 315° in 45° steps.
- Antenna polarisation is changed (H-V / V-H) and antenna height is changed from 1 meter to 4 meters.
- For each turntable step / antenna polarisation / antenna height the EMI-receiver/spectrum analyser performs a positive-peak/max-hold sweep (=worst-case). Data is transferred to EMI-software and recorded. EMI-software will show the maximum level of all single sweeps as the final result for the pre-scan.

#### Final measurement

- Significant emissions found during the pre-scan will be maximized by the EMI-software based on evaluated data during the pre-scan by rotating the turntable and changing antenna height and polarisation.
- Final measurement will be performed with measuring equipment settings as defined in the applicable test standards (e.g. ANSI C63.4).
- Plot of the pre-scan with frequencies of identified emissions including levels, correction factors, turn table position, antenna polarisation and settings of measuring equipment is recorded.

Detailed requirements can be found in e.g. ANSI C63.4

### 8.2.5.3 Radiated spurious emissions above 18 GHz

#### Test setup

- The EUT is set up according to its intended use, as described in the user manual or as defined by the manufacturer.
- Additional equipment, cables, ... necessary for testing, are positioned like under normal operation.
- EUT is powered on and set into operation.
- Test distance depends on EUT size and test antenna size (farfield conditions shall be met).

#### Pre-scan

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

#### Final measurement

- Significant emissions found during the pre-scan will be maximized, i.e. position and antenna orientation causing the highest emissions with Peak and RMS detector
- Final measurement will be performed with measuring equipment settings as defined in the applicable test standards (e.g. ANSI C63.4).
- Final plot showing measurement data, levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit is recorded.

#### Note

- In case of measurements with external harmonic mixers (e.g. above 50 GHz) special care is taken to avoid possible overloading of the external mixer's input.
- As external harmonic mixers may generate false images, care is taken to ensure that any emission measured by the spectrum analyzer is indeed radiated from the EUT and not internally generated by the external harmonic mixer. Signal identification feature of spectrum analyzer is used to eliminate/reduce images of the external harmonic mixer.

Detailed requirements can be found in e.g. ANSI C63.4

## 8.2.6 Measurement results

Refer to *Annex A*  
*Annex B*

## 9 MEASUREMENT UNCERTAINTY

#	Test	Measurement uncertainty
1	Conducted emissions CISPR 16-4-2	2.21 dB
2	Radiated emissions CISPR 16-4-2	30 ... 1000 MHz 3.68dB 1 ... 18 GHz 3.64 dB
3	Harmonics / Flicker EN / IEC 61000-4-15	Current AC 350uA-320mA / 50Hz-5kHz 0.24 % Current AC 350mA-2.2A / 50Hz-5kHz 0.40 % Current AC 2.5A-10A / 50Hz-1kHz 0.27 % Current AC 2A-80A / 50Hz-1kHz 0.20 % Resistor DC 0.23 % Inductance 0.23 % Short-term flicker severity 0.24 % Maximum steady state voltage 0.24 % Maximum absolute voltage change 0.24 % Maximum time duration during observation 0.24 % Voltage AC 1V-1000V / 16Hz-10kHz 0.20 %
4	Radio frequency electromagnetic field EN / IEC 61000-4-3	1.98 dB
5	Electrical fast transients / Burst EN / IEC 61000-4-4	Peak Voltage 6.05 % Rise time 186 ps Duration 1602 ps Frequency oscilloscope 0.014 %
6	Surges EN / IEC 61000-4-5	Peak current 3.67 % Front & Rise time 76000 ps Duration 76000 ps Frequency oscilloscope 0.014 % Peak voltage 4.87 % Front & Rise time 4600 ps Duration 4600 ps
7	Conducted disturbances EN / IEC 61000-4-6	3.47 dB
8	Voltage dips and interruptions EN / IEC 61000-4-11	Voltage AC 1mV-1000V 4.95 % Current AC 3.82 % Inrush Current 3.71 % Rise / Fall time 18.4 ns Duration 46000 ps

**END OF TEST REPORT**

# Annex A

Measurement results of EUT A

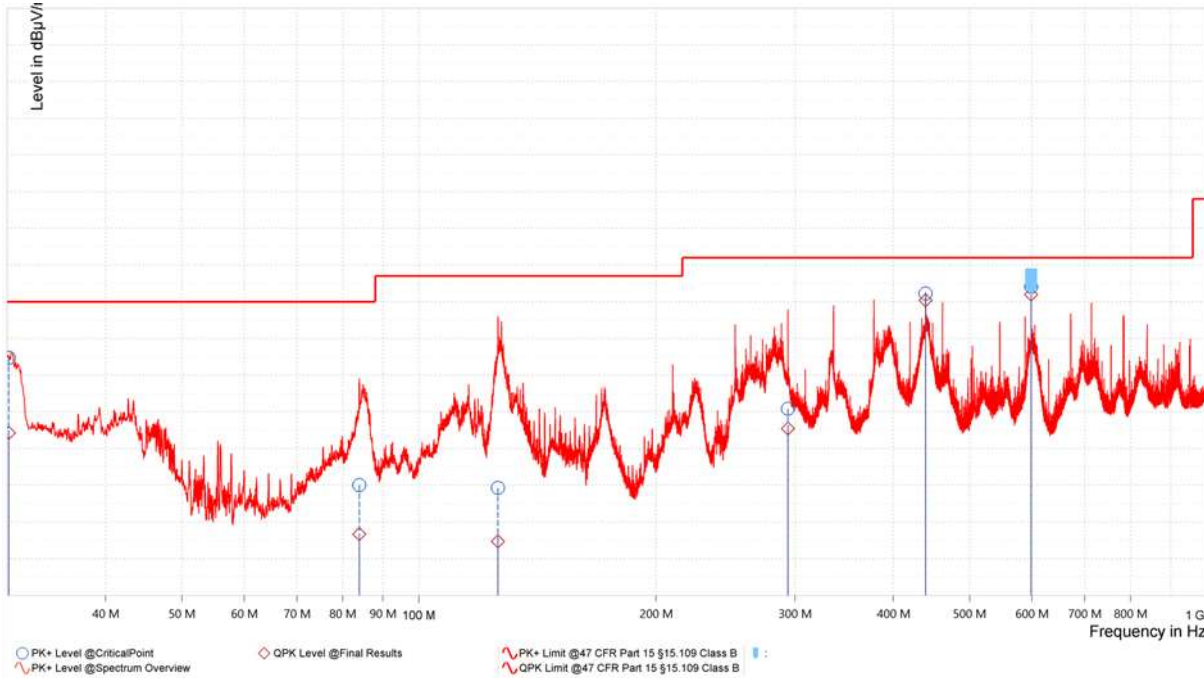
part of / in addition to

***Test report no.:*** 23038521-32375-0

***Date of issue:*** 2023-07-27

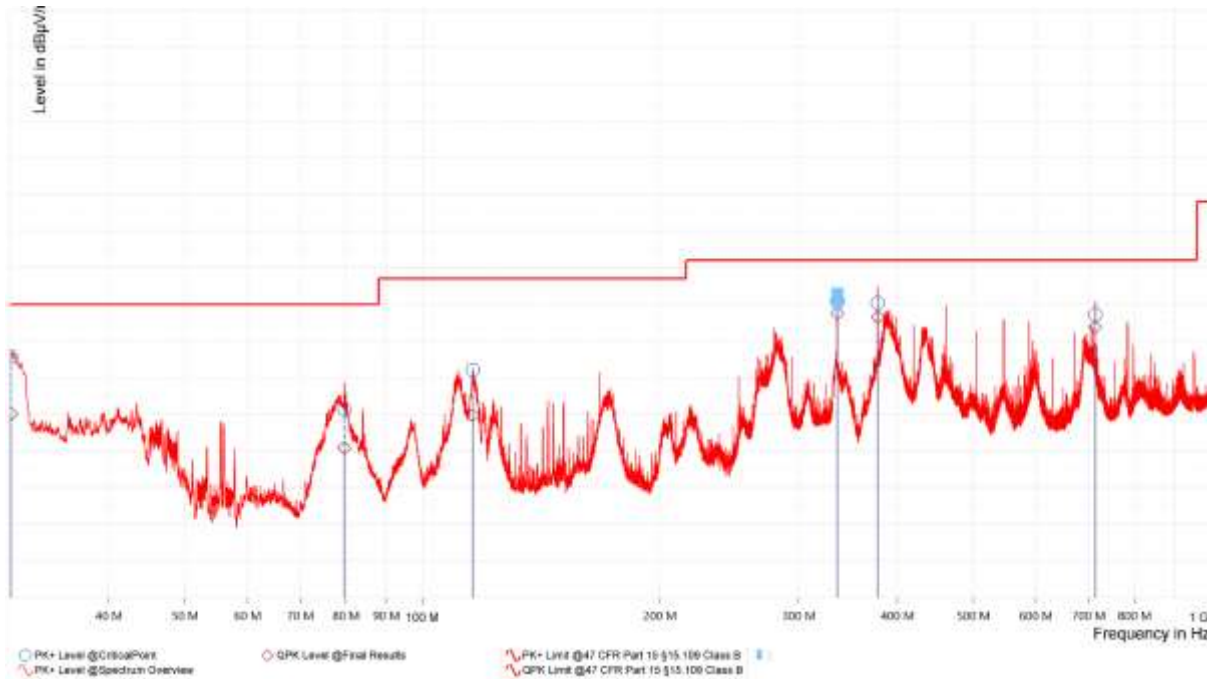
## 1.1 Electromagnetic radiated emission (30 ... 1000 MHz)

EUT A (Operations Mode 1)



Rg	Frequency [MHz]	QPK Level [dBµV/m]	QPK Limit [dBµV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Meas. Time [ms]
1	30,150	22,14	40,00	17,86	20,49	V	17,1	1,14	120,000	15.000,000
1	84,000	8,34	40,00	31,66	11,43	V	-0,41	1,08	120,000	15.000,000
1	125,970	7,34	43,50	36,16	12,14	V	165,49	1	120,000	15.000,000
1	294,000	22,72	46,00	23,28	13,20	V	71,47298	1	120,000	15.000,000
1	439,710	40,20	46,00	5,80	16,85	H	50,61	1	120,000	15.000,000
1	598,350	40,96	46,00	5,04	19,56	V	32,39	1,15	120,000	15.000,000

EUT A (Operations Mode 2)

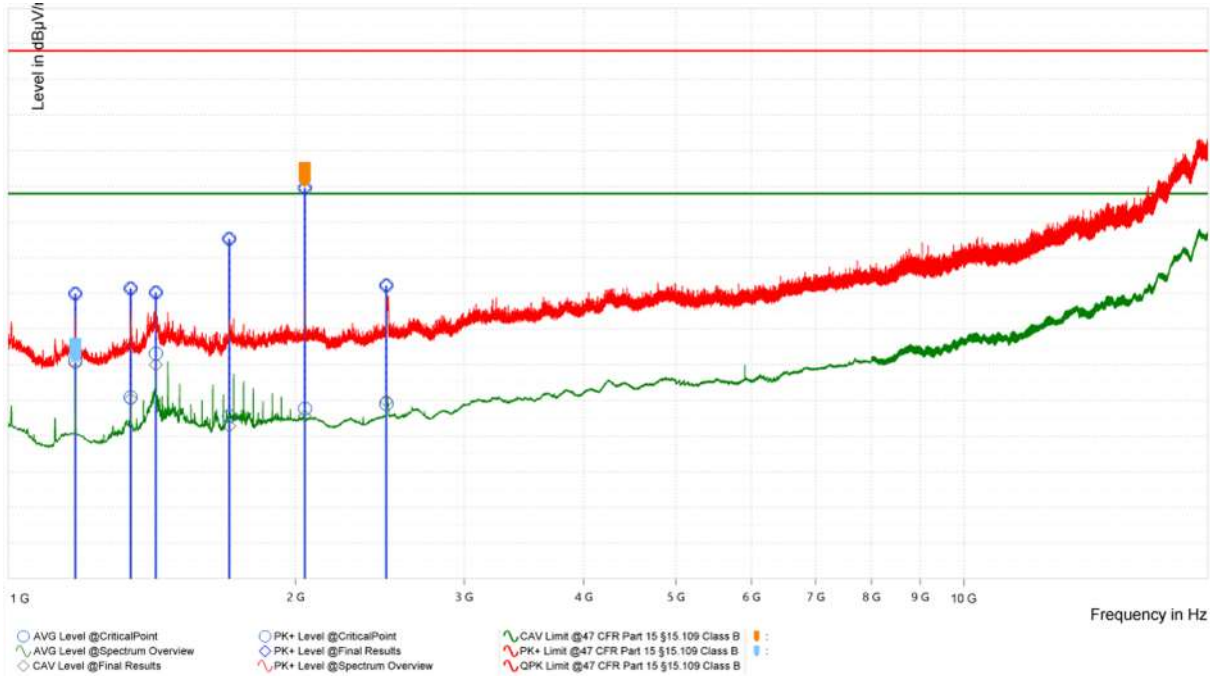


Rg	Frequency [MHz]	QPK Level [dBµV/m]	QPK Limit [dBµV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Meas. Time [ms]
1	30,090	25,02	40,00	14,98	20,52	V	370	1,04	120,000	15.000,000
1	79,650	20,38	40,00	19,62	11,04	V	73,45	1,15	120,000	15.000,000
1	115,860	24,85	43,50	18,65	12,58	V	168,4	1,15	120,000	15.000,000
1	336,000	38,70	46,00	7,30	14,22	H	89,35	1,04	120,000	15.000,000
1	378,000	38,24	46,00	7,76	15,35	V	48,03	1	120,000	15.000,000
1	714,000	36,92	46,00	9,08	21,06	V	316,4	1	120,000	15.000,000



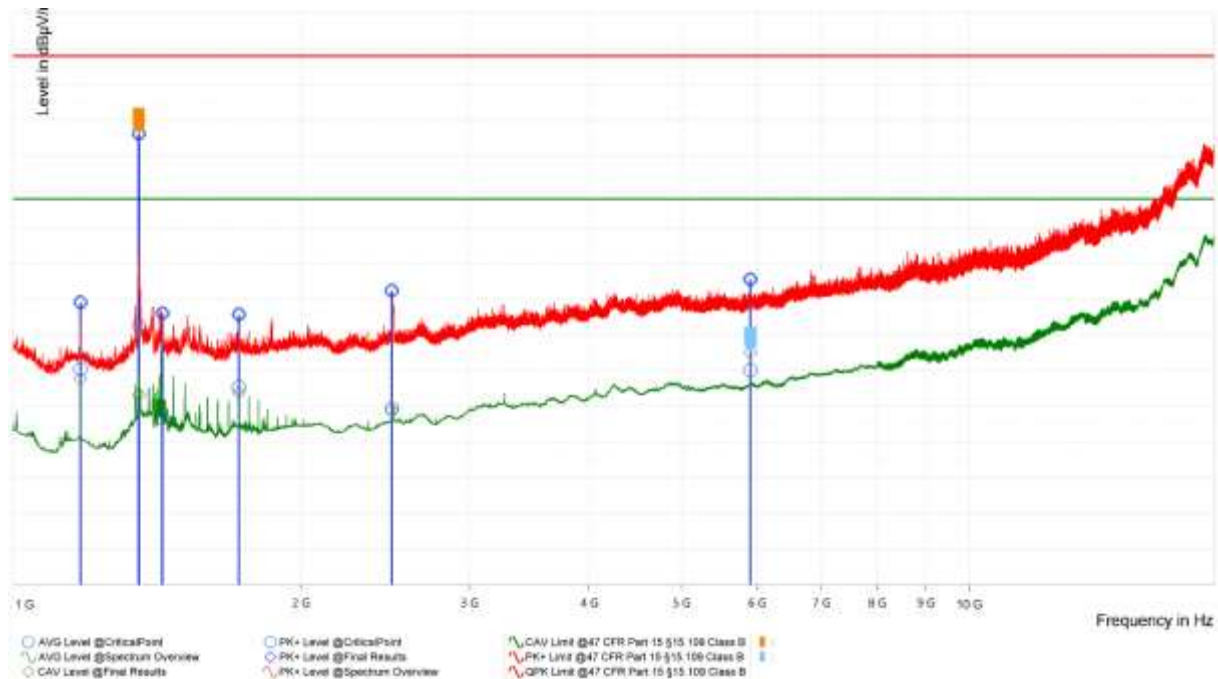
## 1.2 Electromagnetic radiated emission (1 ... 18 GHz)

EUT A (Operations Mode 1)



Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	CAV Level [dBµV/m]	CAV Limit [dBµV/m]	CAV Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]
1	1.176,000	39,96	74,00	34,04	30,07	54,00	23,93	-7,90	V	214,4012	1	1.000,000
1	1.343,750	40,69	74,00	33,31	25,13	54,00	28,87	-6,55	H	154,4	1	1.000,000
1	1.428,250	40,13	74,00	33,87	29,99	54,00	24,01	-5,80	H	342,04	1	1.000,000
1	1.703,750	47,62	74,00	26,38	21,42	54,00	32,58	-4,44	H	167,3	1	1.000,000
1	2.044,500	54,78	74,00	19,22	22,78	54,00	31,22	-1,44	V	215,3	1	1.000,000
1	2.487,750	41,09	74,00	32,91	24,93	54,00	29,07	-0,51	H	156,14	1	1.000,000

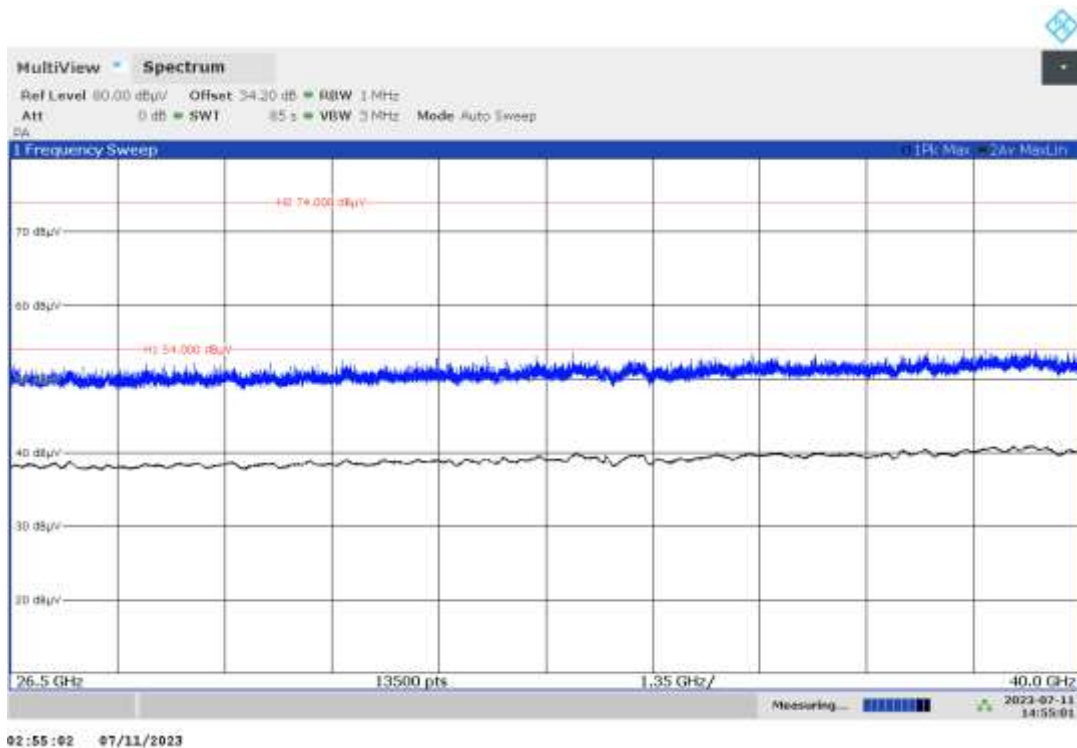
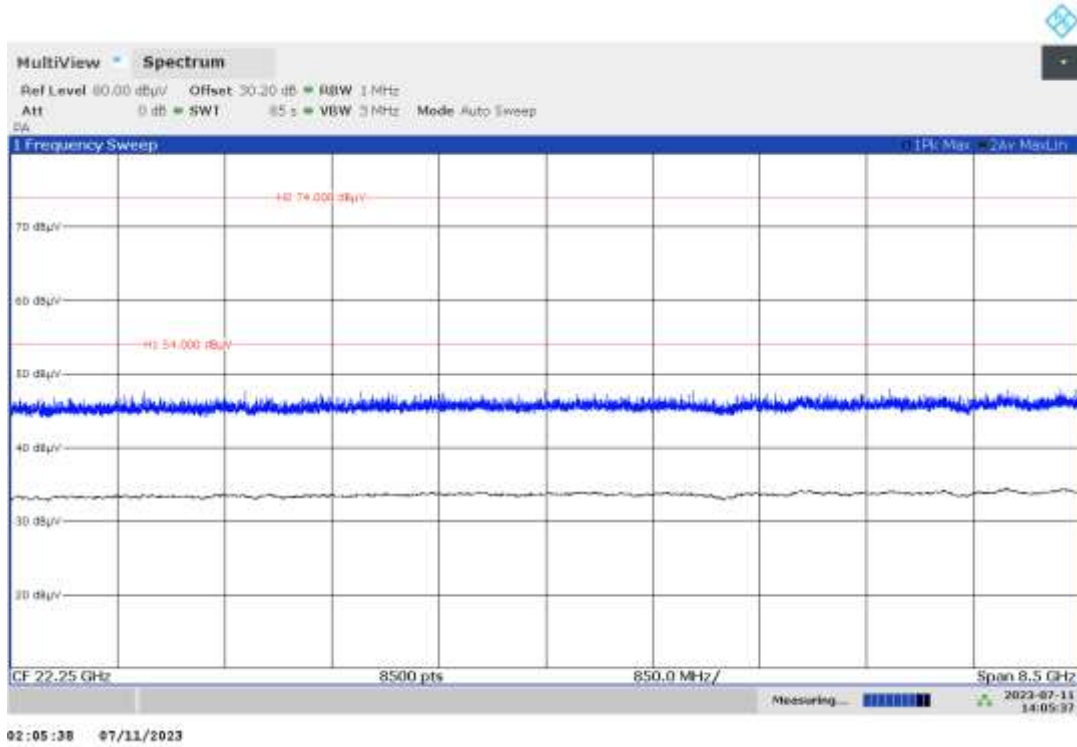
EUT A (Operations Mode 2)



Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	CAV Level [dBµV/m]	CAV Limit [dBµV/m]	CAV Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]
1	1.176,000	39,49	74,00	34,51	28,77	54,00	25,23	-7,90	V	187,2	1	1.000,000
1	1.353,500	63,11	74,00	10,89	26,58	54,00	27,42	-6,47	H	151,5	1	1.000,000
1	1.432,500	37,97	74,00	36,03	24,23	54,00	29,77	-5,78	H	349,5	1	1.000,000
1	1.722,000	37,80	74,00	36,20	26,88	54,00	27,12	-4,32	H	251,9579	1	1.000,000
1	2.487,500	41,13	74,00	32,87	24,43	54,00	29,57	-0,51	H	180,3	1	1.000,000
1	5.899,250	42,72	74,00	31,28	32,46	54,00	21,54	9,28	V	228,34	1	1.000,000

## 1.2 Electromagnetic radiated emission (18 ... 40 GHz)

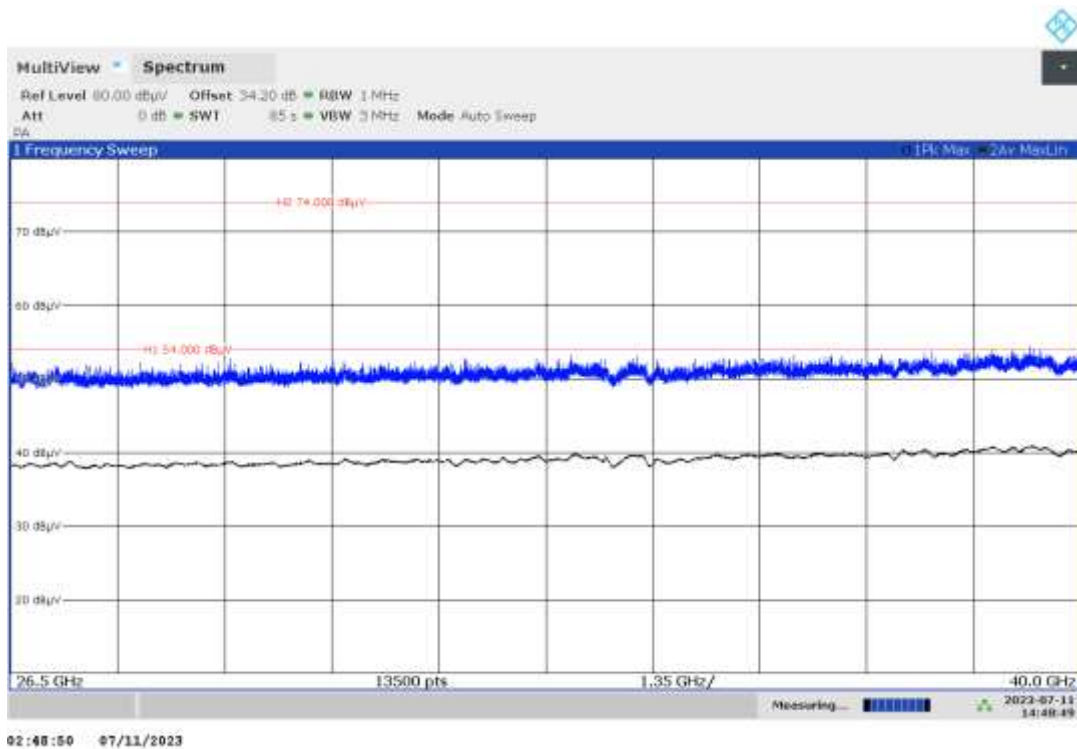
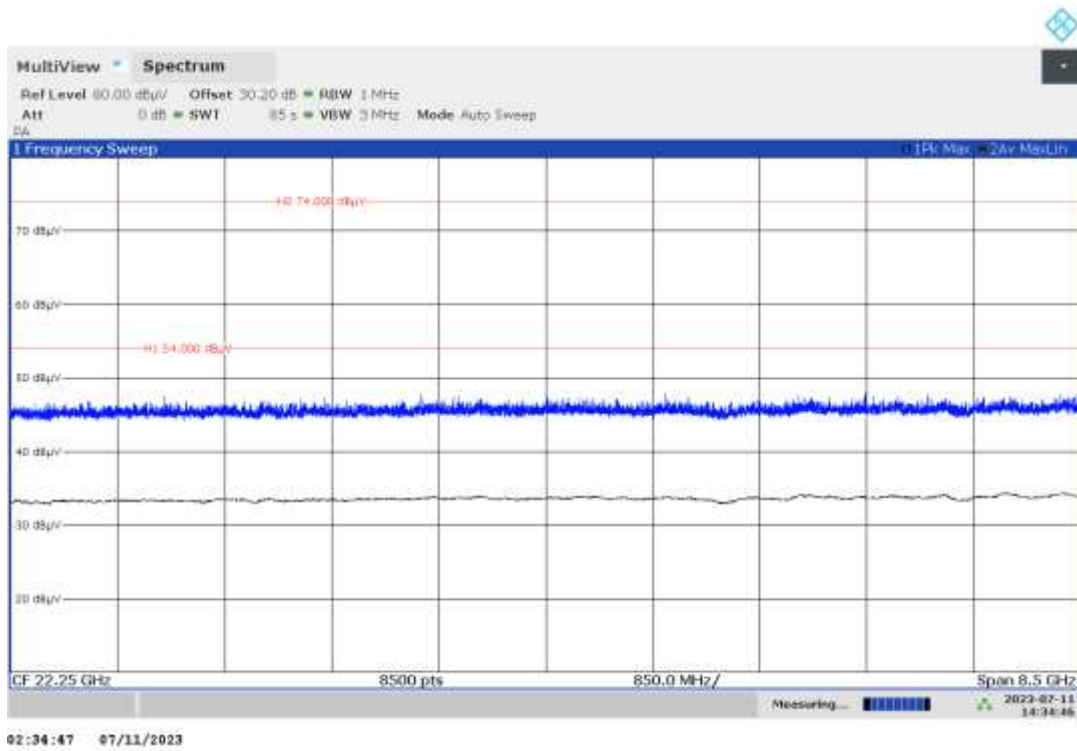
EUT A (Operations Mode 1)



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EUT A (Operations Mode 2)



# Annex B

Measurement results of EUT B

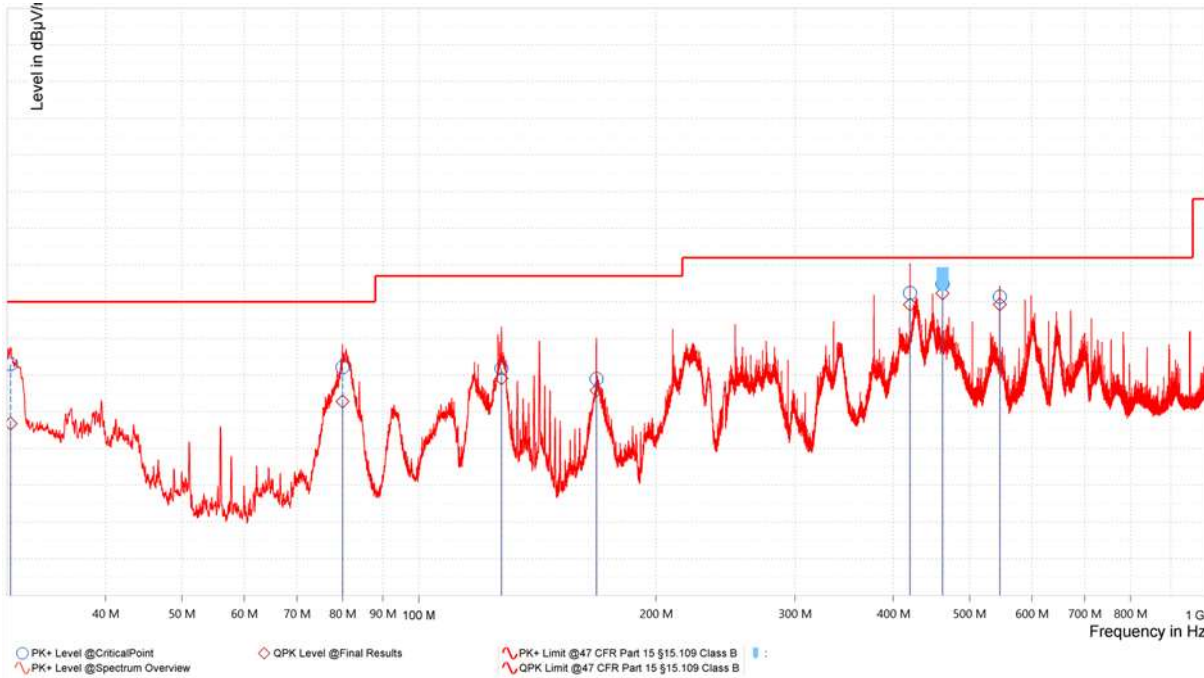
part of / in addition to

***Test report no.:*** 23038521-32375-0

***Date of issue:*** 2023-07-27

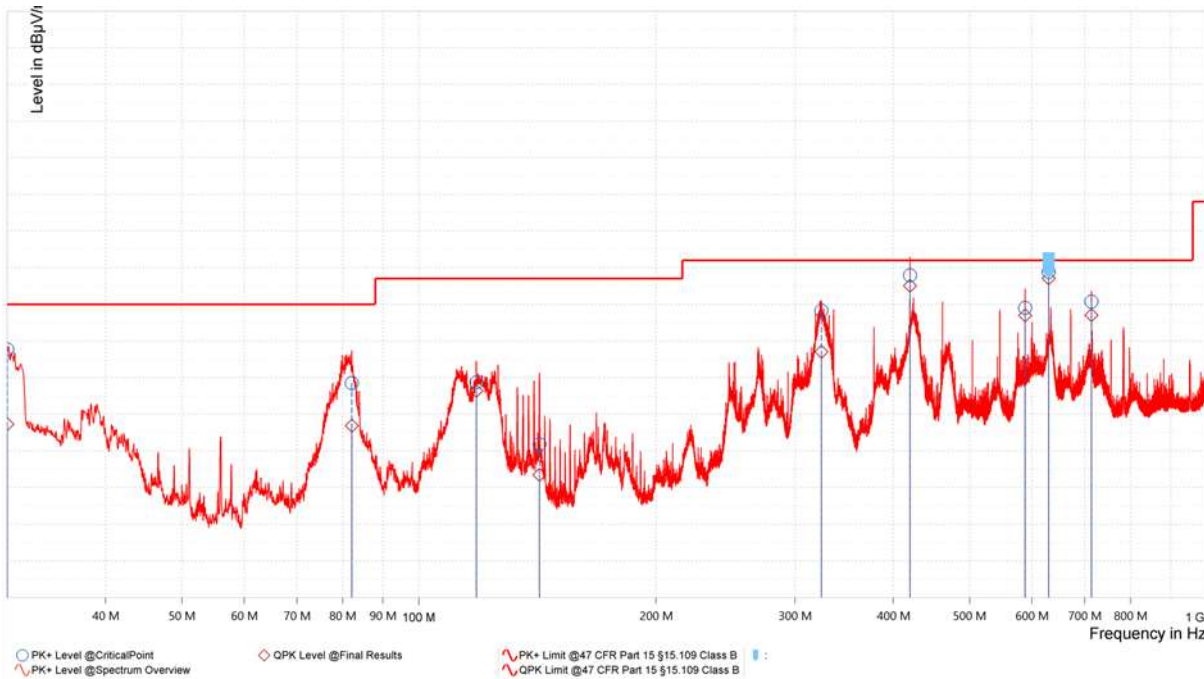
## 1.1 Electromagnetic radiated emission (30 ... 1000 MHz)

EUT B (Operations Mode 1)



Rg	Frequency [MHz]	QPK Level [dBµV/m]	QPK Limit [dBµV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Meas. Time [ms]
1	30,300	23,39	40,00	16,61	20,40	V	370	1,04	120,000	15.000,000
1	79,980	26,41	40,00	13,59	11,08	V	-11,8665	1,08	120,000	15.000,000
1	127,290	29,56	43,50	13,94	12,07	V	170,13	1	120,000	15.000,000
1	168,000	27,92	43,50	15,58	10,32	V	333,9	1,08	120,000	15.000,000
1	420,000	39,62	46,00	6,38	16,41	V	286,72	1	120,000	15.000,000
1	462,000	41,14	46,00	4,86	17,41	H	252,4	1	120,000	15.000,000
1	546,000	39,65	46,00	6,35	18,60	H	193,42	1	120,000	15.000,000

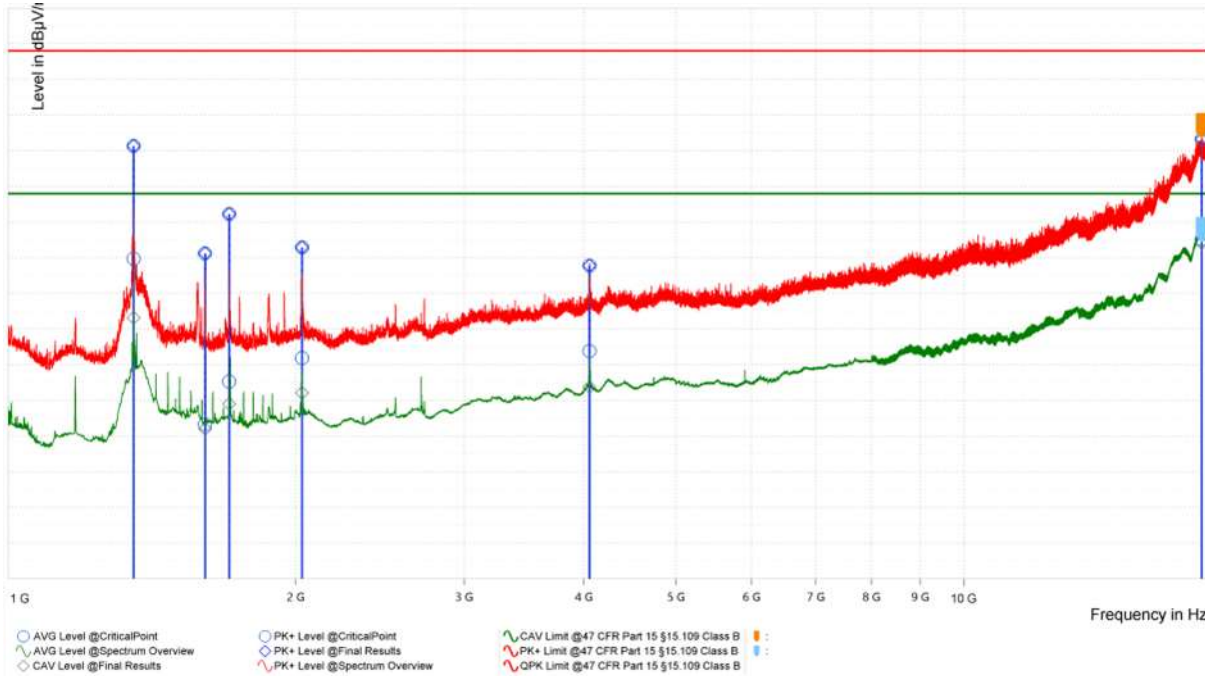
EUT B (Operations Mode 2)



Rg	Frequency [MHz]	QPK Level [dBµV/m]	QPK Limit [dBµV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Meas. Time [ms]
1	30,030	23,64	40,00	16,36	20,56	V	370	4	120,000	15.000,000
1	82,170	23,42	40,00	16,58	11,30	V	4,65	1,15	120,000	15.000,000
1	118,260	28,19	43,50	15,31	12,52	V	108,2005	1,04	120,000	15.000,000
1	142,200	16,73	43,50	26,77	10,77	V	98,58	1,09	120,000	15.000,000
1	324,240	33,52	46,00	12,48	14,01	V	363,1	1,09	120,000	15.000,000
1	420,000	42,50	46,00	3,50	16,41	H	238,99	1	120,000	15.000,000
1	588,000	38,47	46,00	7,53	19,48	H	274,18	1	120,000	15.000,000
1	630,000	43,54	46,00	2,46	19,88	H	38,32	1,14	120,000	15.000,000
1	714,000	38,50	46,00	7,50	21,06	H	282,99	1	120,000	15.000,000

## 1.2 Electromagnetic radiated emission (1 ... 18 GHz)

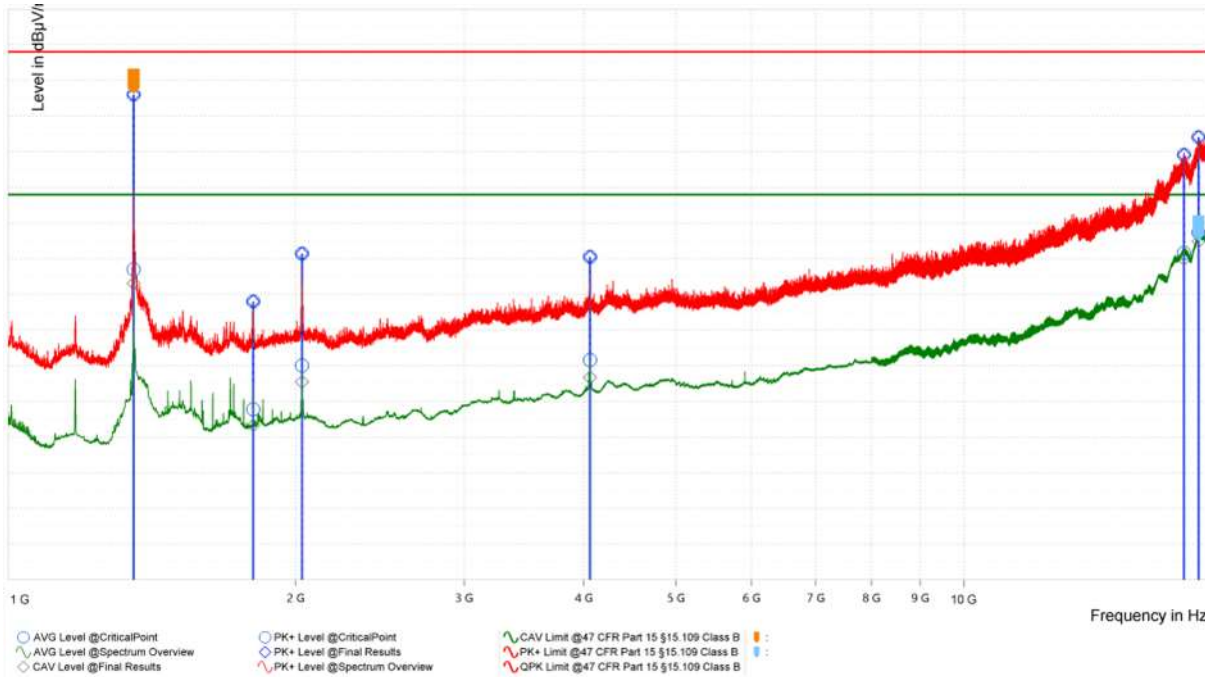
EUT B (Operations Mode 1)



Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	CAV Level [dBµV/m]	CAV Limit [dBµV/m]	CAV Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]
1	1.353,500	60,67	74,00	13,33	36,56	54,00	17,44	-6,47	V	184,6138	1	1.000,000
1	1.607,750	45,61	74,00	28,39	20,99	54,00	33,01	-4,35	H	341,84	1	1.000,000
1	1.704,250	51,12	74,00	22,88	24,52	54,00	29,48	-4,44	H	103,5766	1	1.000,000
1	2.030,500	46,44	74,00	27,56	26,04	54,00	27,96	-1,44	V	269,5437	1	1.000,000
1	4.058,500	43,87	74,00	30,13	26,84	54,00	27,16	5,52	V	63,16	1	1.000,000
1	17.738,500	61,60	74,00	12,40	47,05	54,00	6,95	30,91	H	84,1	1	1.000,000



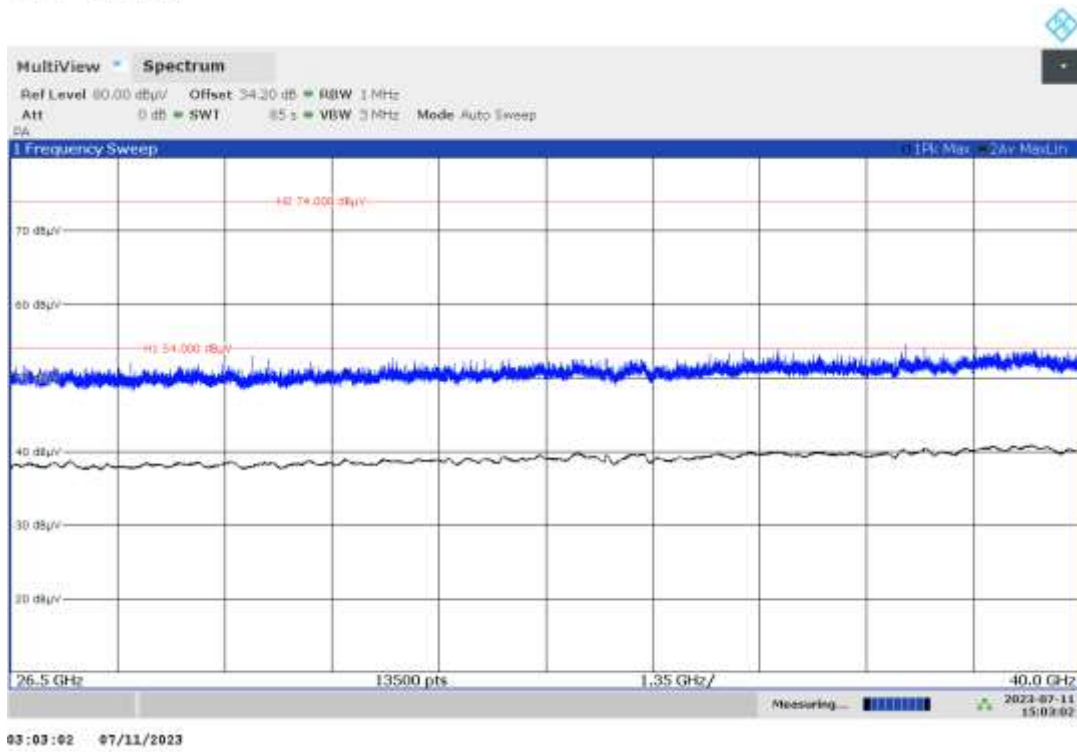
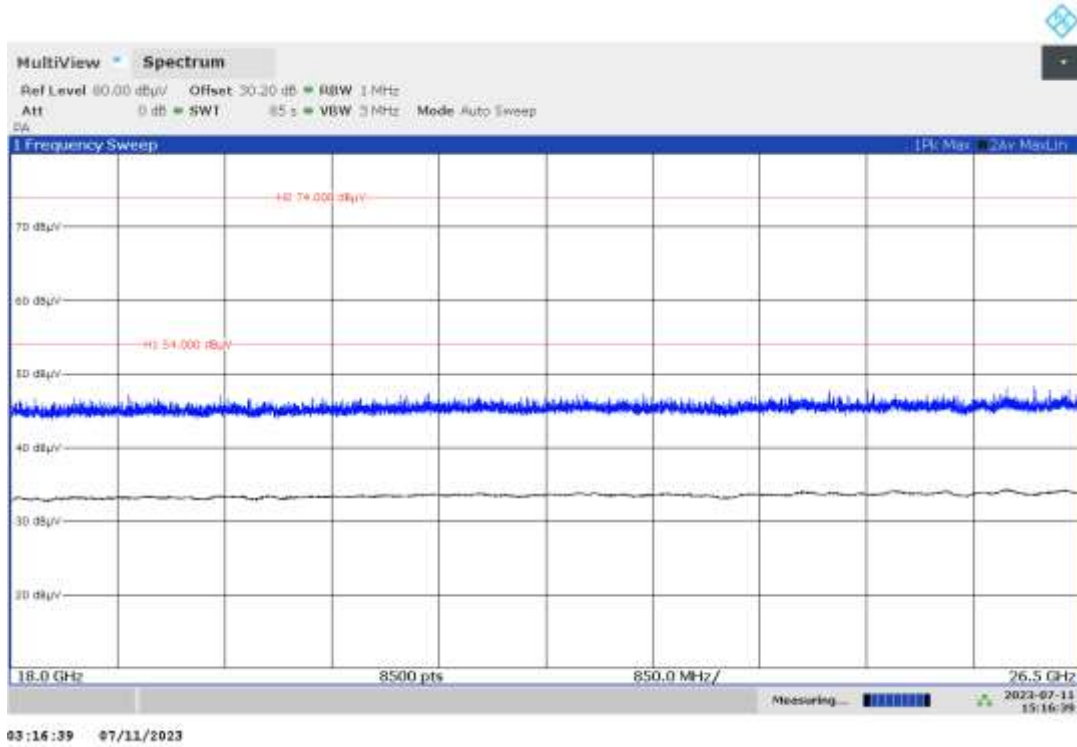
EUT B (Operations Mode 2)



Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	CAV Level [dBµV/m]	CAV Limit [dBµV/m]	CAV Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]
1	1.353,500	67,99	74,00	6,01	41,53	54,00	12,47	-6,47	V	228,66	1	1.000,000
1	1.805,000	39,01	74,00	34,99	21,63	54,00	32,37	-3,46	H	90,74	1	1.000,000
1	2.030,500	45,72	74,00	28,28	27,72	54,00	26,28	-1,44	V	272,24	1	1.000,000
1	4.063,250	45,25	74,00	28,75	28,33	54,00	25,67	5,54	H	129,56	1	1.000,000
1	16.999,000	59,58	74,00	14,42	44,97	54,00	9,03	27,91	H	-16	1	1.000,000
1	17.601,000	62,01	74,00	11,99	47,41	54,00	6,59	30,77	H	41,44	1	1.000,000

## 1.2 Electromagnetic radiated emission (18 ... 40 GHz)

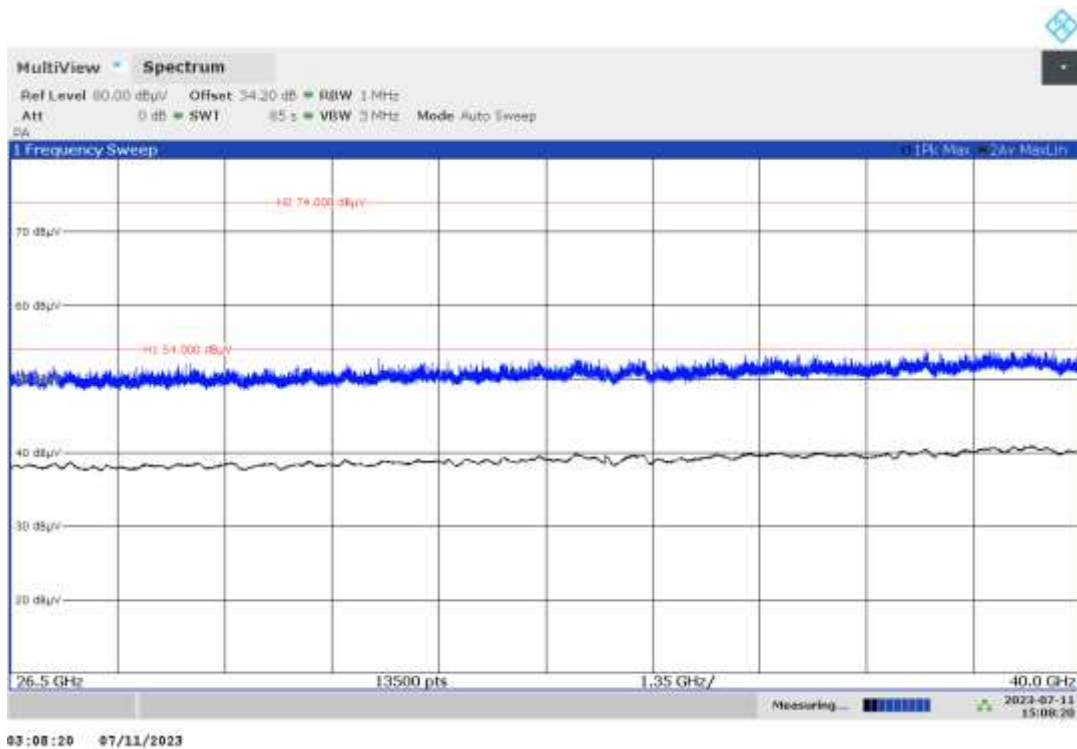
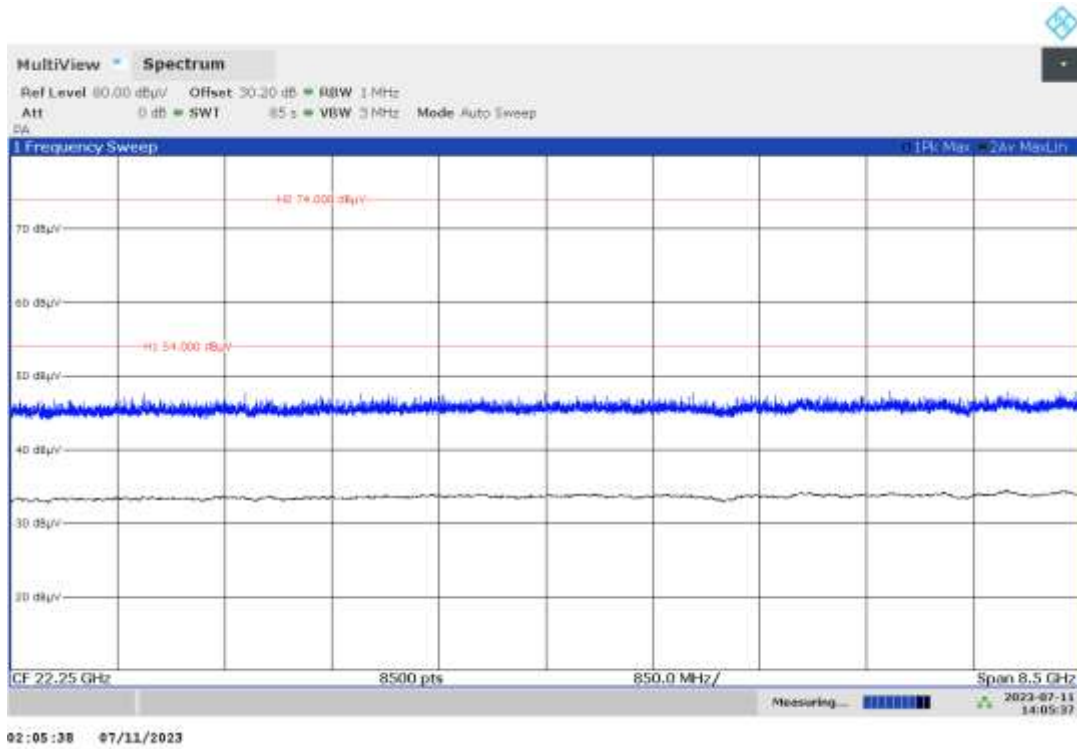
EUT A (Operations Mode 1)



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**END OF TEST REPORT**