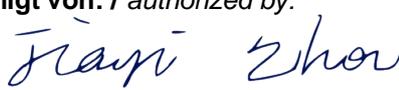


<b>Prüfbericht-Nr.:</b> Test Report No.:	<b>CN24EREP 001</b>	<b>Auftrags-Nr.:</b> Order No.:	<b>326066292</b>	<b>Seite 1 von 18</b> Page 1 of 18
<b>Kunden-Referenz-Nr.:</b> Client Reference No.:	<b>1288983</b>	<b>Auftragsdatum:</b> Order date.:	<b>2024-12-02</b>	
<b>Auftraggeber:</b> Client:	<b>IKEA of Sweden AB</b> Box 702, SE-343 81, Älmhult, Sweden			
<b>Prüfgegenstand:</b> Test item:	<b>Matter Motion sensor</b>			
<b>Bezeichnung / Typ-Nr.:</b> Identification / Type No.:	<b>E2494</b>			
<b>Auftrags-Inhalt:</b> Order content:	<b>TÜV Rheinland EMC service</b>			
<b>Prüfgrundlage:</b> Test specification:	<b>FCC 47 CFR Part 15, Subpart B:2023 Class B</b> <b>ICES-003:2020</b>			
<b>Wareneingangsdatum:</b> Date of receipt:	<b>2025-02-08</b>	Refer to the EUT photos file		
<b>Prüfmuster-Nr.:</b> Test sample No.:	<b>A003915965-002</b>			
<b>Prüfzeitraum:</b> Testing period:	<b>Refer to test report</b>			
<b>Ort der Prüfung:</b> Place of testing:	<b>Refer to clause 1.1</b>			
<b>Prüflaboratorium:</b> Testing laboratory:	<b>TÜV Rheinland (Shanghai) Co., Ltd.</b>			
<b>Prüfergebnis*:</b> Test result*:	<b>Pass</b>			
<b>geprüft von: / tested by:</b>	<b>genehmigt von: / authorized by:</b>			
				
<b>Datum: / Date:</b>	<b>2025-02-18</b>		<b>2025-02-18</b>	
<b>Stellung: / Position:</b>	<b>Jiuyu Huang/Project engineer</b>		<b>Jiayi Zhou/Authorizer</b>	
<b>Sonstiges / Other:</b>	FCC ID: FHO-E2494 Test Firm Name: TUV Rheinland (Shanghai) Co., Ltd. Designation Number: CN1396 Test Firm Registration Number: 930979			
<b>Zustand des Prüfgegenstandes bei Anlieferung:</b> Condition of the test item at delivery:	<b>Prüfmuster vollständig und unbeschädigt</b> Test item complete and undamaged			
* Legende: P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet Legend: P(ass) = passed a.m. test specifications(s) F(ail) = failed a.m. test specifications(s) N/A = not applicable N/T = not tested				
<b>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</b> This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.				

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**Anmerkungen**  
*Remarks*

- |          |  |
|----------|--|
| <b>1</b> | <p>Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben.<br/>Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.</p> <p><i>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system.</i></p> <p><i>Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i></p>   |
| <b>2</b> | <p>Wie vertraglich vereinbart, wurde dieses Dokument nur digital unterzeichnet. Der TÜV Rheinland hat nicht überprüft, welche rechtlichen oder sonstigen diesbezüglichen Anforderungen für dieses Dokument gelten. Diese Überprüfung liegt in der Verantwortung des Benutzers dieses Dokuments. Auf Verlangen des Kunden kann der TÜV Rheinland die Gültigkeit der digitalen Signatur durch ein gesondertes Dokument bestätigen. Diese Anfrage ist an unseren Vertrieb zu richten. Eine Umweltgebühr für einen solchen zusätzlichen Service wird erhoben. Informationen zur Verifizierung der Authentizität unserer Dokumente erhalten Sie auf folgender Webseite: <a href="http://go.tuv.com/digital-signature">go.tuv.com/digital-signature</a></p> <p><i>As contractually agreed, this document has been signed digitally only. TUV Rheinland has not verified and unable to verify which legal or other pertaining requirements are applicable for this document. Such verification is within the responsibility of the user of this document. Upon request by its client, TUV Rheinland can confirm the validity of the digital signature by a separate document. Such request shall be addressed to our Sales department. An environmental fee for such additional service will be charged. For information on verifying the authenticity of our documents, please visit the following website: <a href="http://go.tuv.com/digital-signature">go.tuv.com/digital-signature</a></i></p> |
| <b>3</b> | <p>Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben.<br/>Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.</p> <p><i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.</i></p> <p><i>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i></p>  |
| <b>4</b> | <p>Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezueglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019.</p> <p><i>The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.</i></p>  |

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**Revision history of test report:**

<b>Report number</b>	<b>Issue date</b>	<b>Contents and reason for change if appropriate</b>
CN24EREP 001	2025-02-18	Initial release.

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## **1 Test Sites**

### **1.1 Test Facilities**

**Laboratory: TÜV Rheinland (Shanghai) Co., Ltd.**

**Address: Workshop 14, North Half of Workshop 10 and Workshop 16, Pingqian (Taicang) Modern Industrial Park, No.525, Yuewang Lingang South Road, Shaxi, Taicang, Jiangsu, China**

The used test equipment is in accordance with CISPR 16-1 series standards for measurement of radio interference.

Refer to Clause 6 for test and measurement instruments.

## **2 General Product Information**

### **2.1 Product Function and Intended Use**

The EUT (equipment under test) is matter motion sensor. For the further information, refer to the user's manual.

### **2.2 Ratings and System Details**

Rated input : 3V dc, 2xAAA  
Protection class : III

### **2.3 Independent Operation Modess**

The basic operation mode is continuous working connected by Bluetooth, Zigbee and thread.

### **2.4 Description of interconnecting cables**

None.

### **2.5 Noise Generating and Noise Suppressing Parts**

Refer to the circuit diagram for further information.

### **2.6 Highest frequency generated or used in the device or on which the device operates or tunes**

The highest frequency used in the EUT is 2.4 GHz.

### **2.7 Submitted Documents**

Circuit diagram, user's manual and rating label.

### 3 Test Set-up and Operation Modes

#### 3.1 Principle of Configuration Selection

**Emission:** The equipment under test (EUT) was configured to measure its highest possible emission level. The test conditions were adapted accordingly in reference to the instructions for use.

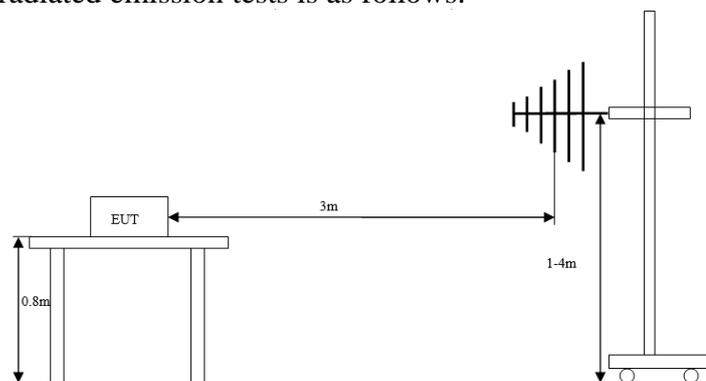
Refer to the related paragraph of this report.

The sequence of testing:

1. Radiated emission tests were performed on 2025-02-13.

#### 3.2 Equipment and cable arrangement

Block diagram for radiated emission tests is as follows:



#### 3.3 Test Software

During the tests, the app HOMEsmart was used.

#### 3.4 Special Accessories and Auxiliary Equipment

During the tests, the below equipment was used.

Equipment	Model	Manufacturer
Laptop	T450	lenovo
Mobile phone	iPhone 15	Apple

#### 3.5 Countermeasures to achieve EMC Compliance

No other special measure is employed to achieve the requirement.

## **4 Conformity Decision Rule**

For all EMI tests included in this report, as measurement uncertainties are less than the values  $U_{\text{CISPR}}$  given in CISPR 16-4-2, compliance with the limits is determined by comparing measurement results directly with corresponding limits without taking into consideration of measurement uncertainties.

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## 5 Test Results EMISSION

### 5.1 Emission in the Frequency Range up to 30 MHz

#### 5.1.1 Mains Terminal Continuous Disturbance Voltage

<b>Result:</b>	N/A
----------------	-----

## 5.2 Emission in the Frequency Range above 30 MHz

### 5.2.1 Radiated emission (30 MHz - 1 GHz)

<b>Result:</b>	<b>Passed</b>
----------------	---------------

Date of testing	: 2025-02-13
Test procedure	: FCC 47 CFR Part 15, Subpart B:2023, ICES-003:2020, ANSI C63.4-2014 and CISPR 16-2-3
Product classification	: Class B
Frequency range	: 30 – 1000 MHz
Limits	: Quasi-peak limits (3 m distance) (See Note 1) 30 – 88 MHz, 40 dB $\mu$ V/m; 88 – 216 MHz, 43.5 dB $\mu$ V/m; 216 – 960 MHz, 46 dB $\mu$ V/m; Above 960 MHz, 54 dB $\mu$ V/m.
Bandwidth of EMI receiver for final measurement	: 120 kHz
Measurement time for final measurement	: 1 s
Kind of test site	: Semi-anechoic chamber
Operational mode	: Mode as defined in clause 2.3
Input voltage	: 2xAAA battery
Ambient condition	: Temperature: 22.8 °C; Relative humidity: 45.3 %
Expanded measurement uncertainty ( $k=2$ )	: 5.40 dB

The radiated disturbance test was carried out in a semi-anechoic chamber. The test distance from the receiving antenna to the EUT is 3 m. The normalized site attenuation of the semi-anechoic chamber is regularly calibrated to ensure the radiated disturbance test results are valid. During the test, the EUT was placed on a 0.8 m high wooden table above the reference ground plane. The wooden table was rotated 360° around and the height of the antenna was varied from 1 m to 4 m to find the maximum disturbance. The test was performed with the antenna both in its horizontal and vertical polarizations.

The following figures and tables were those measured by an automatic measurement system. A preview test was firstly performed with peak detector. The final test was performed with quasi-peak at those critical frequencies during the preview test. In the following spectral diagram, “x” means quasi-peak test results.

*Note 1: The class B limits of FCC 47 CFR Part 15, Subpart B:2023 is stricter than those ICES-003:2020 Table 2 for 3 m test distance. Therefore, the former limits are used in following figures and tables.*

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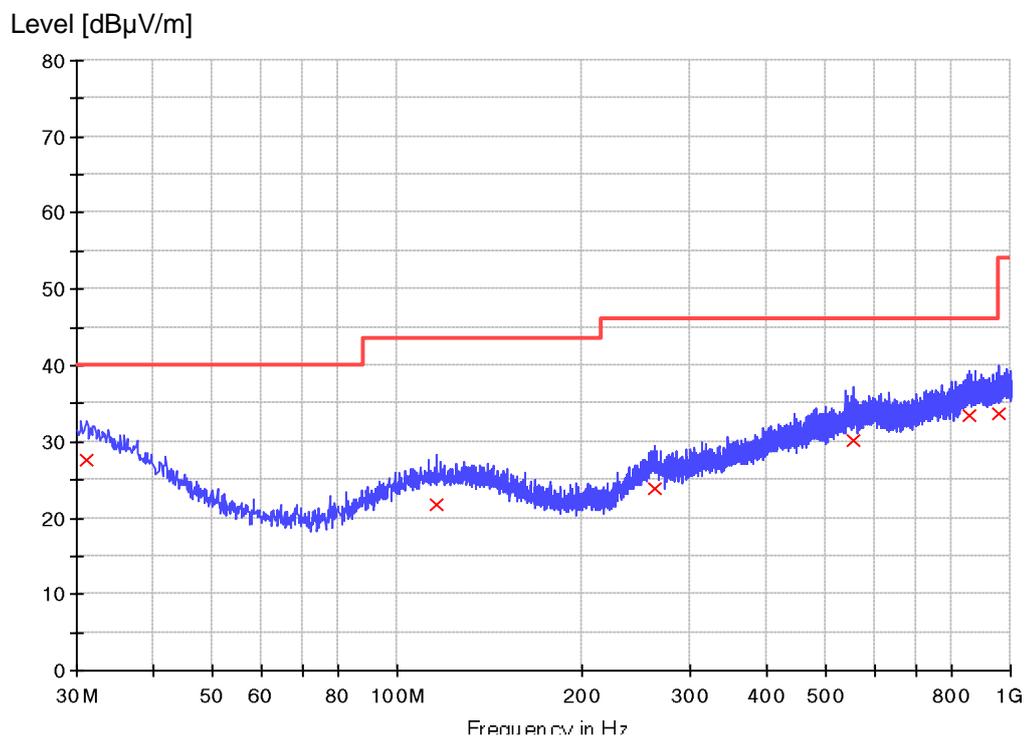
Notes on following tables of radiated emission results and conversions:

QuasiPeak (dB $\mu$ V/m): final measurement results by using quasi-peak detector

Corr. (dB): correction factor including: antenna factor, cable loss, and gain of pre-amplifier (if used)

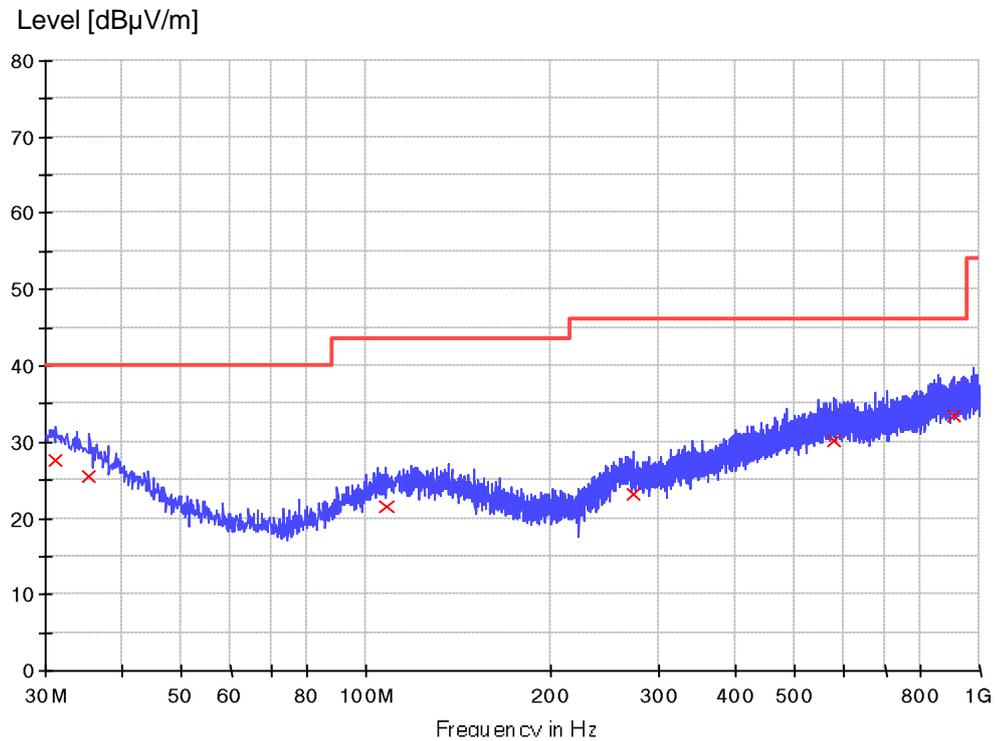
Margin: Limit (dB $\mu$ V/m) - QuasiPeak (dB $\mu$ V/m)

**Figure 1: Spectral Diagrams and measurement results, horizontal polarization (30 MHz to 1 GHz)**



Final quasi-peak measurement results:

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
31.212500	27.6	120.000	160.0	H	155.0	24.3	12.4	40.0
115.845000	21.8	120.000	200.0	H	100.0	18.8	21.7	43.5
262.678750	23.9	120.000	245.0	H	-86.0	20.9	22.1	46.0
555.618750	30.2	120.000	300.0	H	0.0	26.7	15.8	46.0
857.895000	33.4	120.000	250.0	H	-92.0	28.9	12.6	46.0
957.683750	33.6	120.000	300.0	H	-180.0	29.4	12.4	46.0

**Figure 2: Spectral Diagrams and measurement results, vertical polarization (30 MHz to 1 GHz)**


Final quasi-peak measurement results:

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
31.212500	27.6	120.000	100.0	V	-125.0	24.3	12.4	40.0
35.335000	25.6	120.000	200.0	V	62.0	22.3	14.5	40.0
107.721250	21.6	120.000	250.0	V	0.0	18.5	22.0	43.5
272.621250	23.1	120.000	300.0	V	-180.0	20.0	22.9	46.0
578.413750	30.2	120.000	150.0	V	53.0	26.5	15.8	46.0
905.182500	33.4	120.000	200.0	V	90.0	28.9	12.6	46.0

### 5.2.2 Radiated emission (Above 1 GHz)

<b>Result:</b>	<b>Passed</b>
----------------	---------------

Date of testing	: 2025-02-13
Port	: Enclosure
Test procedure	: FCC 47 CFR Part 15, Subpart B:2023, ANSI C63.4-2014 and CISPR 16-2-3 ICES-003:2020
Limit	: Above 1 GHz, Peak limit: 74 dB $\mu$ V/m; Average limit: 54 dB $\mu$ V/m
Frequency range	: 1-18 GHz Note: The highest frequency in the EUT is 2.4 GHz. According to FCC Part 15 subpart B §15.33 (b) (1), the upper frequency for radiated emission measurement is 12 GHz. The actual test frequency is up to 18 GHz.
Bandwidth of EMI receiver for final measurement	: 1000 kHz
Measurement time for final measurement	: 1 s
Test distance	: 3 m
Kind of test site	: Semi-anechoic chamber
Operational mode	: Mode as defined in clause 2.3
Input voltage	: AC 120 V; 60 Hz
Earthing	: No earthing
Ambient condition	: Temperature: 22.8°C; Relative humidity: 45.3 %

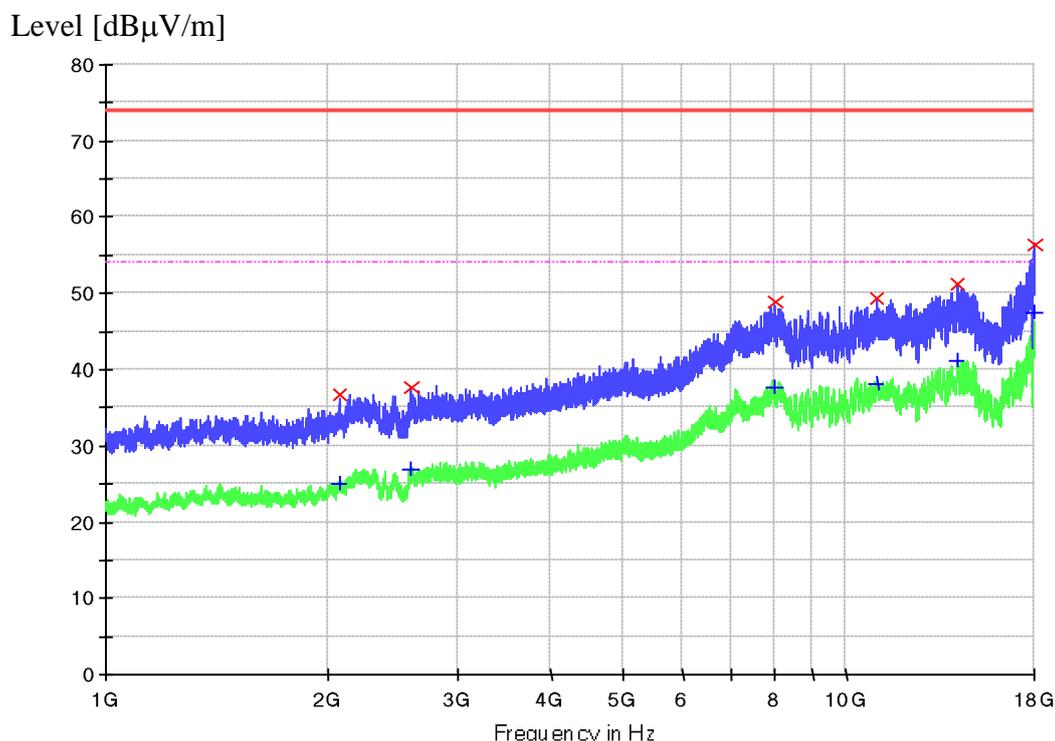
The radiated disturbance test was carried out in a semi-anechoic chamber. The test distance from the receiving antenna to the EUT is 3 m. The normalized site attenuation of the semi-anechoic chamber is regularly calibrated to ensure the radiated disturbance test results are valid. During the test, the EUT was placed on a poly table, which is 0.8 m high. The wooden table was rotated 360° around and the antenna was varied from 1 m to 4 m to find the maximum disturbance. The test was performed with the antenna both in its horizontal and vertical polarizations.

The following figures and tables were those measured by an automatic measurement system. The final test was performed with peak detector and average detector at those critical frequencies during the preview test. In the following figure, “x(red)” means measurement results with peak detector and “+ (blue)” means measurement results with average detector.

Notes on following tables of radiated emission results and conversions:

- Peak (dB $\mu$ V/m): final measurement results by using peak detector
- Average (dB $\mu$ V/m): final measurement results by using average detector
- Corr. (dB): correction factor including: antenna factor, cable loss, and gain of pre-amplifier (if used)
- Margin: Limit PK (dB $\mu$ V/m) - Peak (dB $\mu$ V/m)
- Limit CAV (dB $\mu$ V/m) – Average (dB $\mu$ V/m)

Figure 3: Spectral Diagrams and measurement results, 1-18 GHz, horizontal polarization



Final Peak measurement results:

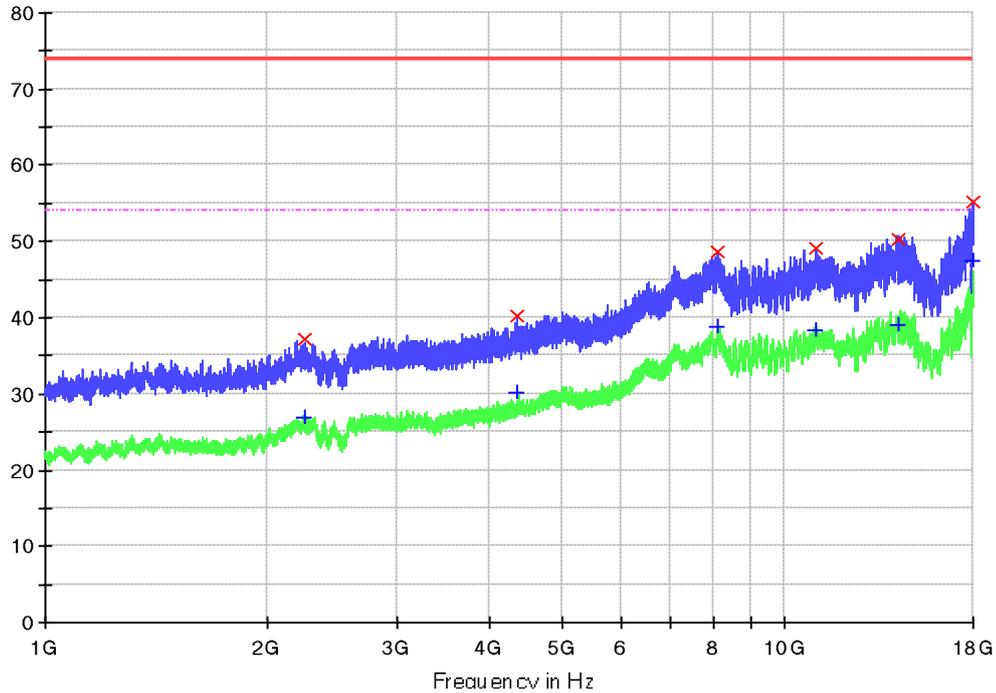
Frequency (MHz)	MaxPeak (dBµV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
2066.750000	36.6	1000.000	100.0	H	142.0	-17.3	37.4	74.0
2587.375000	37.7	1000.000	100.0	H	180.0	-15.9	36.3	74.0
7999.218750	48.9	1000.000	125.0	H	-155.0	-3.5	25.1	74.0
11040.625000	49.3	1000.000	150.0	H	0.0	-2.4	24.7	74.0
14210.062500	51.2	1000.000	100.0	H	132.0	1.6	22.8	74.0
17970.781250	56.3	1000.000	100.0	H	-58.0	11.9	17.7	74.0

Final Average measurement results:

Frequency (MHz)	Average (dBµV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
2066.750000	25.1	1000.000	100.0	H	142.0	-17.3	28.9	54.0
2587.375000	26.8	1000.000	100.0	H	180.0	-15.9	27.2	54.0
7999.218750	37.6	1000.000	125.0	H	-155.0	-3.5	16.4	54.0
11040.625000	38.1	1000.000	150.0	H	0.0	-2.4	15.9	54.0
14210.062500	41.2	1000.000	100.0	H	132.0	1.6	12.8	54.0
17970.781250	47.5	1000.000	100.0	H	-58.0	11.9	6.5	54.0

**Figure 4: Spectral Diagrams and measurement results, 1-18 GHz, vertical polarization**

Level [dBμV/m]



**Final Peak measurement results:**

Frequency (MHz)	MaxPeak (dBμV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - PK+ (dB)	Limit - PK+ (dBμV/m)
2244.718750	37.1	1000.000	100.0	V	180.0	-15.6	36.9	74.0
4358.562500	40.3	1000.000	150.0	V	105.0	-12.6	33.7	74.0
8143.187500	48.6	1000.000	150.0	V	-38.0	-4.3	25.4	74.0
11024.156250	49.1	1000.000	120.0	V	0.0	-2.2	24.9	74.0
14246.187500	50.3	1000.000	100.0	V	-180.0	1.7	23.7	74.0
17970.781250	55.1	1000.000	100.0	V	59.0	11.9	18.9	74.0

**Final Average measurement results:**

Frequency (MHz)	Average (dBμV/m)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - AVG (dB)	Limit - AVG (dBμV/m)
2244.718750	26.9	1000.000	100.0	V	180.0	-15.6	27.1	54.0
4358.562500	30.1	1000.000	150.0	V	105.0	-12.6	23.9	54.0
8143.187500	38.9	1000.000	150.0	V	-38.0	-4.3	15.1	54.0
11024.156250	38.4	1000.000	120.0	V	0.0	-2.2	15.6	54.0
14246.187500	39.1	1000.000	100.0	V	-180.0	1.7	14.9	54.0
17970.781250	47.5	1000.000	100.0	V	59.0	11.9	6.5	54.0

## 6 List of Test and Measurement Instruments

Equip.	Description	Model	Manufacturer	Last Date DD.MM.YYYY	Due Date DD.MM.YYYY
G1811378	3m semi-anechoic chamber	SAC3	Frankonia	03.12.2023	03.12.2026
G1811391	EMI test receiver	ESCI	Rohde&Schwarz	17.10.2024	17.10.2025
G1811425	Bilog antenna	CBL 6112D	Teseq	20.04.2023	20.04.2026
9062745	EMI measurement software	EMC32-MEB (10.60.20)	Rohde&Schwarz	NA*	NA*

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**End of test report**