

Prüfbericht-Nr.: <i>Test report no.:</i>	CN25TG4B 001	Auftrags-Nr.: <i>Order no.:</i>	326126286	Seite 1 von 24 <i>Page 1 of 24</i>
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	1288983	Auftragsdatum: <i>Order date:</i>	2025-08-21	
Auftraggeber: <i>Client:</i>	IKEA of Sweden AB Box 702, SE-343 81 Älmhult, Sweden			
Prüfgegenstand: <i>Test item:</i>	LED Lighting Chain			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	J2557			
Auftrags-Inhalt: <i>Order content:</i>	TÜV Rheinland EMC service			
Prüfgrundlage: <i>Test specification:</i>	FCC 47 CFR Part 15, Subpart B:2023 Class B ICES-005:2018			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2025-09-16	Refer to the EUT photos file		
Prüfmuster-Nr.: <i>Test sample no:</i>	A004092107-018			
Prüfzeitraum: <i>Testing period:</i>	2025-09-22			
Ort der Prüfung: <i>Place of testing:</i>	Refer to clause 1.1			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shanghai) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	Jessie Xu		genehmigt von: <i>authorized by:</i>	JiaYi Zhou
Datum: <i>Date:</i>	2025-09-26		Ausstellungsdatum: <i>Issue date:</i>	2025-09-26
Stellung / Position:	Project engineer		Stellung / Position:	Authorizer
Sonstiges / Other:	FCC ID: FHO-J2557 Test Firm Name: TUV Rheinland (Shanghai) Co., Ltd. Designation Number: CN1396 Test Firm Registration Number: 930979			
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt 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 specification(s)	F(ail) = failed a.m. test specification(s)	N/A = not applicable	N/T = not tested
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. This test report only relates to the above mentioned 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

- | | |
|----------|--|
| 1 | <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.
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. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i></p> |
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| 3 | <p>Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben.
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>
<i>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i></p> |
| 4 | <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 bezüglich 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:

Report number	Issue date	Contents and reason for change if appropriate
CN25TG4B 001	2025-09-26	Initial release.

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1 Test Sites

1.1 Test Facilities

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

Address: Workshop14, 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 7 for test and measurement instruments.

2 General Product Information

2.1 Product Function and Intended Use

The EUT (equipment under test) is an ordinary LED lighting chain. For further information, refer to the user's manual.

2.2 Ratings and System Details

Rated input : AC 120 V, 60 Hz

Rated power : 4 W, 0.038 A

This product is LED lighting chain, it powered by approved LED power supply ICPSW24-3.6-IL-1, input: AC 100-240 V, 50/60 Hz Max. 0.05 A, output: DC 24 V, max. 0.15 A, 3.6 W

2.3 Independent Operation Modes

The basic operation modes are: "ON" and "OFF".

The test modes are as follows:

Mode 1: lighting on.

Mode 2: flashing.

2.4 Description of interconnecting cables

No.	Interface and name	Shielded or not	Specified length (m)
1	AC Power line	Unshielded	0.91 m
2	Signal line	Unshielded	5 m

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 24 MHz.

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.

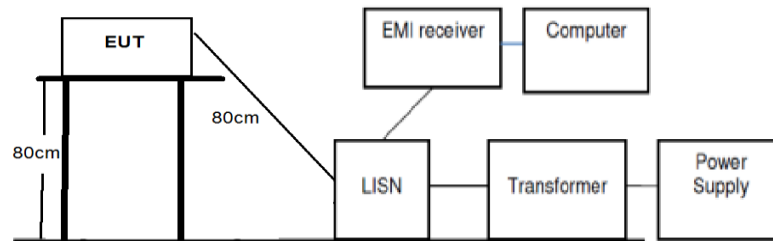
Refer to the related paragraph of this report.

The sequence of testing:

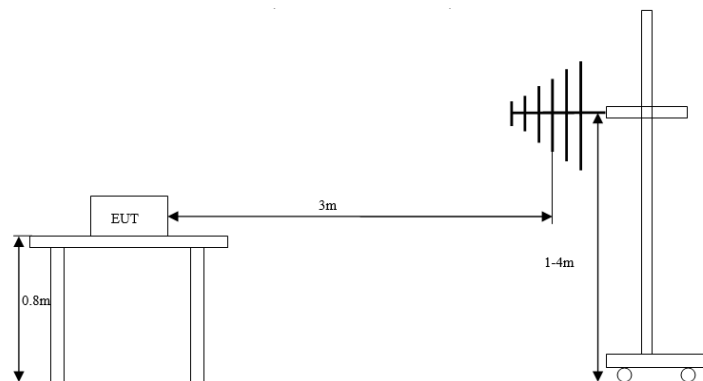
1. Conducted emission tests were performed on 2025-09-22.
2. Radiated emission tests were performed on 2025-09-22.

3.2 Equipment and cable arrangement

Block diagram for both conducted emission and radiated emission tests is as follows:



(Conducted emission)



(Radiated emission 30-1000 MHz)

Also refer to photographs on clause 6 for test setups for both conducted emission test and radiated emission tests.

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3.3 Test Software

Refer to the related paragraph of this report. No software was used.

3.4 Special Accessories and Auxiliary Equipment

None.

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_{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.

5 Test Results EMISSION

5.1 Emission in the Frequency Range up to 30 MHz

5.1.1 Conducted emission

Result:		Passed
Date of testing	: 2025-09-22	
Test procedure	: FCC 47 CFR Part 15, Subpart B:2023, ICES-005:2018, ANSI C63.4-2014 and CISPR 16-2-1	
Frequency range	: 0.15 – 30 MHz	
Limits	: Quasi-peak limit: 0.15 – 0.5 MHz, 66 to 56 dB μ V (decrease with the logarithm of frequency); 0.5 – 5 MHz, 56 dB μ V; 5 – 30 MHz, 60 dB μ V Average limit: 0.15 – 0.5 MHz, 56 to 46 dB μ V (decrease with the logarithm of frequency); 0.5 – 5 MHz, 46 dB μ V; 5 – 30 MHz, 50 dB μ V	
Bandwidth of EMI receiver for final measurement	: 9 kHz	
Measurement time for final measurement	: 1 s	
Kind of test site	: Shielded room	
Input voltage	: AC 120 V, 60 Hz for LED power supply	
Operational mode	: Mode 1, 2 defined in clause 2.3	
Ambient condition	: Temperature: 23.7 °C; Relative humidity: 56.5 %	
Expanded measurement uncertainty ($k=2$)	: 2.33 dB The minimum margin to the limit is 6.9 dB at 8.432250 MHz. The margin is higher than expanded measurement uncertainty.	

The measurement setup was made according to ANSI C63.4-2014 in a shielded room.

The measurement equipment like test receivers, quasi-peak detector and artificial mains network (AMN) are in compliance with CISPR 16-1 series standards.

The tested object was set-up on a wooden support. The EUT was set 0.8 m away from the AMN. The cord longer than necessary to be connected to the AMN was folded forth and back parallel so as to form a bundle with a length between 0.3 m and 0.4 m.

The disturbance voltage test was performed on the neutral line and phase line of the power supply of the EUT respectively.

The following figures and tables were those measured by an automatic measuring system. Both quasi-peak and average measurements were performed. In the following spectral diagram, “♦” means Quasi-Peak Value and “◆” means Average Value results.

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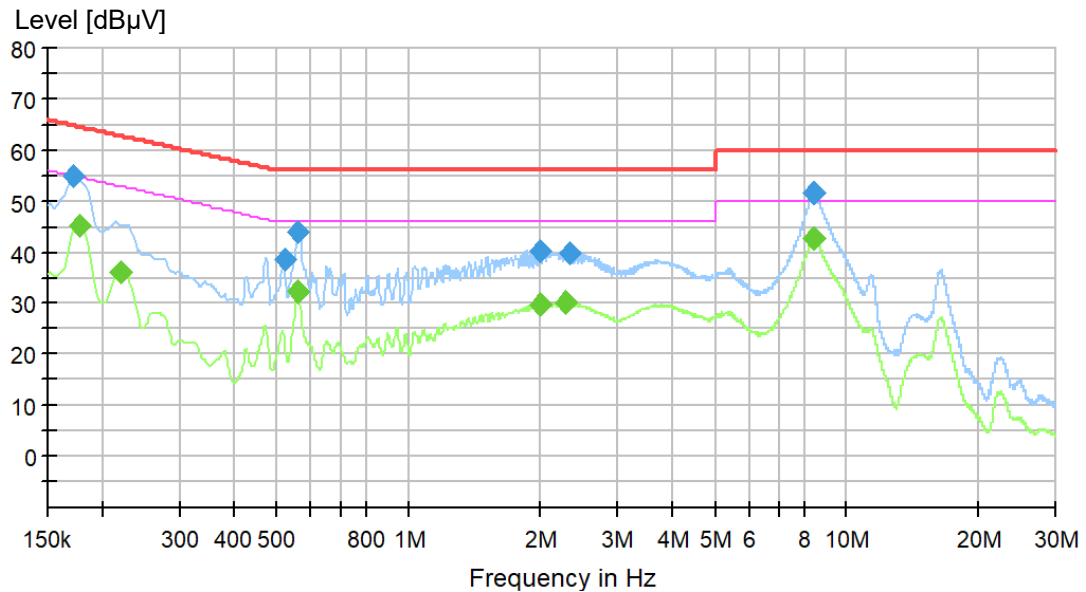
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Notes on following tables of conducted emission results and conversions:

Level (dB μ V): final measurement results by using quasi-peak detector and average detector

Transd (dB): transducer factor including cable loss, insertion loss of artificial mains network and gain of pre-amplifier (if used)

Margin: Limit (dB μ V) - Level (dB μ V)

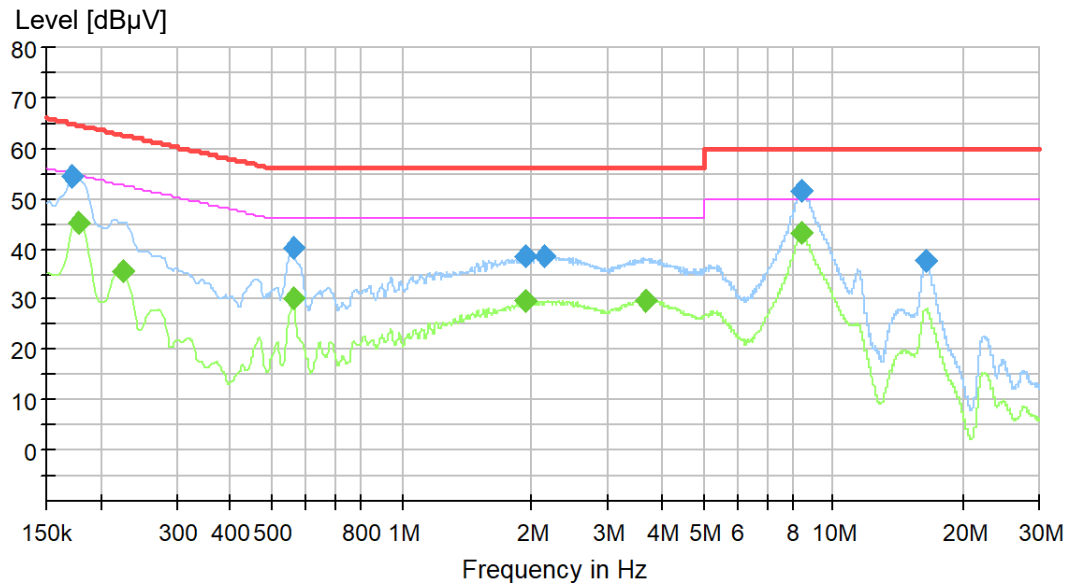
Figure 1: Spectral Diagrams, Conducted Emission, 150 kHz – 30 MHz, L, mode 1


Final quasi-peak measurement result:

Frequency (MHz)	QuasiPeak (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.172500	54.72	64.84	10.12	L1	10.4
0.521250	38.50	56.00	17.50	L1	10.4
0.561750	43.93	56.00	12.07	L1	10.4
1.988250	40.31	56.00	15.69	L1	10.4
2.332500	39.98	56.00	16.02	L1	10.4
8.454750	51.38	60.00	8.62	L1	10.7

Final average measurement result:

Frequency (MHz)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.177000	45.40	54.63	9.22	L1	10.4
0.219750	36.05	52.83	16.78	L1	10.4
0.559500	32.26	46.00	13.74	L1	10.4
1.986000	29.86	46.00	16.14	L1	10.4
2.287500	30.12	46.00	15.88	L1	10.4
8.452500	42.93	50.00	7.07	L1	10.7

Figure 2: Spectral Diagrams, Conducted Emission, 150 kHz – 30 MHz, N, mode 1


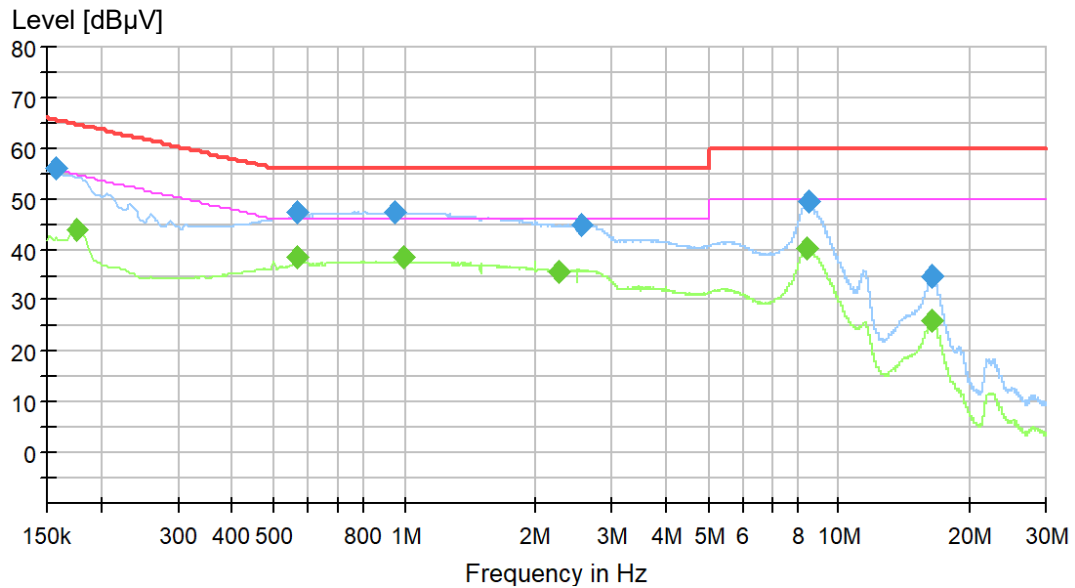
Final quasi-peak measurement result:

Frequency (MHz)	QuasiPeak (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.172500	54.63	64.84	10.21	N	10.3
0.557250	40.40	56.00	15.60	N	10.3
1.932000	38.67	56.00	17.33	N	10.4
2.139000	38.62	56.00	17.38	N	10.4
8.432250	51.67	60.00	8.33	N	10.7
16.379250	37.75	60.00	22.25	N	11.0

Final average measurement result:

Frequency (MHz)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.177000	45.31	54.63	9.32	N	10.3
0.224250	35.73	52.66	16.93	N	10.3
0.557250	30.38	46.00	15.62	N	10.3
1.932000	29.73	46.00	16.27	N	10.4
3.644250	29.97	46.00	16.03	N	10.4
8.432250	43.10	50.00	6.90	N	10.7

Figure 3: Spectral Diagrams, Conducted Emission, 150 kHz – 30 MHz, L, mode 2



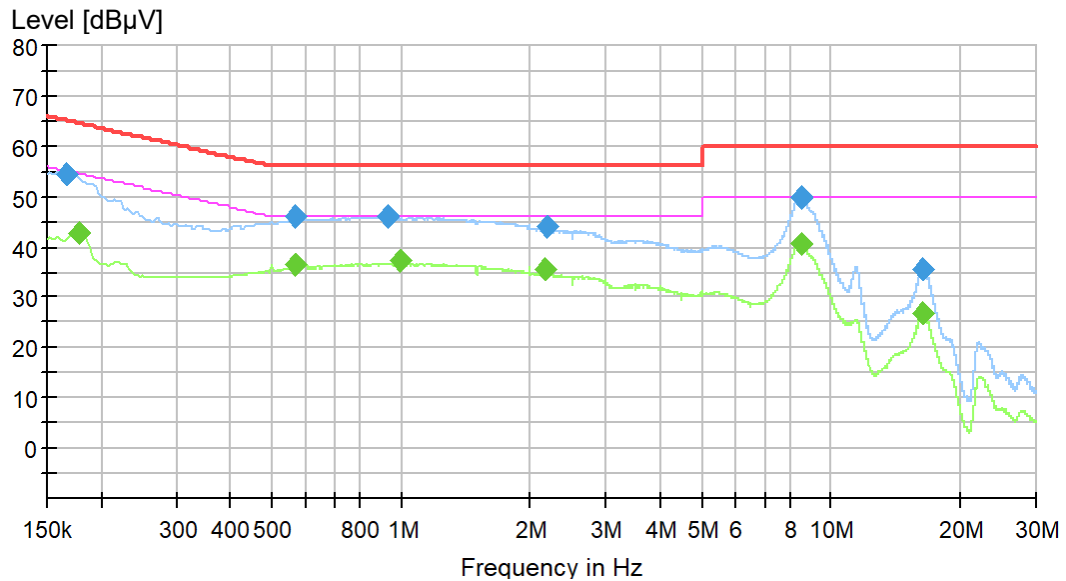
Final quasi-peak measurement result:

Frequency (MHz)	QuasiPeak (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.156750	56.03	65.63	9.60	L1	10.4
0.568500	47.51	56.00	8.49	L1	10.4
0.946500	47.23	56.00	8.77	L1	10.4
2.559750	44.74	56.00	11.26	L1	10.4
8.463750	49.36	60.00	10.64	L1	10.7
16.363500	34.63	60.00	25.37	L1	11.0

Final average measurement result:

Frequency (MHz)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.174750	43.95	54.73	10.78	L1	10.4
0.564000	38.50	46.00	7.50	L1	10.4
0.998250	38.38	46.00	7.62	L1	10.4
2.247000	35.75	46.00	10.25	L1	10.4
8.452500	40.24	50.00	9.76	L1	10.7
16.377000	25.97	50.00	24.03	L1	11.0

Figure 4: Spectral Diagrams, Conducted Emission, 150 kHz – 30 MHz, N, mode 2



Final quasi-peak measurement result:

Frequency (MHz)	QuasiPeak (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.165750	54.52	65.17	10.65	N	10.3
0.566250	45.94	56.00	10.06	N	10.3
0.930750	46.08	56.00	9.92	N	10.3
2.170500	43.92	56.00	12.08	N	10.4
8.481750	49.91	60.00	10.09	N	10.7
16.392750	35.64	60.00	24.36	N	11.0

Final average measurement result:

Frequency (MHz)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.177000	42.93	54.63	11.69	N	10.3
0.564000	36.49	46.00	9.51	N	10.3
0.998250	37.34	46.00	8.66	N	10.3
2.166000	35.66	46.00	10.34	N	10.4
8.481750	40.46	50.00	9.54	N	10.7
16.383750	26.72	50.00	23.28	N	11.0

5.2 Emission in the Frequency Range above 30 MHz

5.2.1 Radiated emission (30-1000 MHz)

Result:	Passed
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Date of testing	: 2025-09-22
Test procedure	: FCC 47 CFR Part 15, Subpart B:2023, ICES-005:2018, ANSI C63.4-2014 and CISPR 16-2-3
Product classification	: Class B
Frequency range	: 30 – 1000 MHz (see Note 1)
Limits	: Quasi-peak limits (3 m distance): 30 – 88 MHz, 40 dB μ V/m; 88 – 216 MHz, 43.5 dB μ V/m; 216 – 1000 MHz, 46 dB μ V/m (see Note 2)
Bandwidth of EMI receiver for final measurement	: 120 kHz
Measurement time for final measurement	: 1 s
Kind of test site	: Semi-anechoic chamber
Input voltage	: AC 120 V, 60 Hz for LED power supply
Operational mode	: Mode 1, 2 defined in clause 2.3
Ambient condition	: Temperature: 23.2 °C; Relative humidity: 58.9 %
Expanded measurement uncertainty ($k=2$)	: 5.40 dB The minimum margin to the limit is 6.1 dB at 44.550000 MHz. The margin is higher than expanded measurement uncertainty.

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 an 80 cm wooden support above the reference ground plane. The wooden support 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.

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Notes on following tables of radiated emission results and conversions:

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

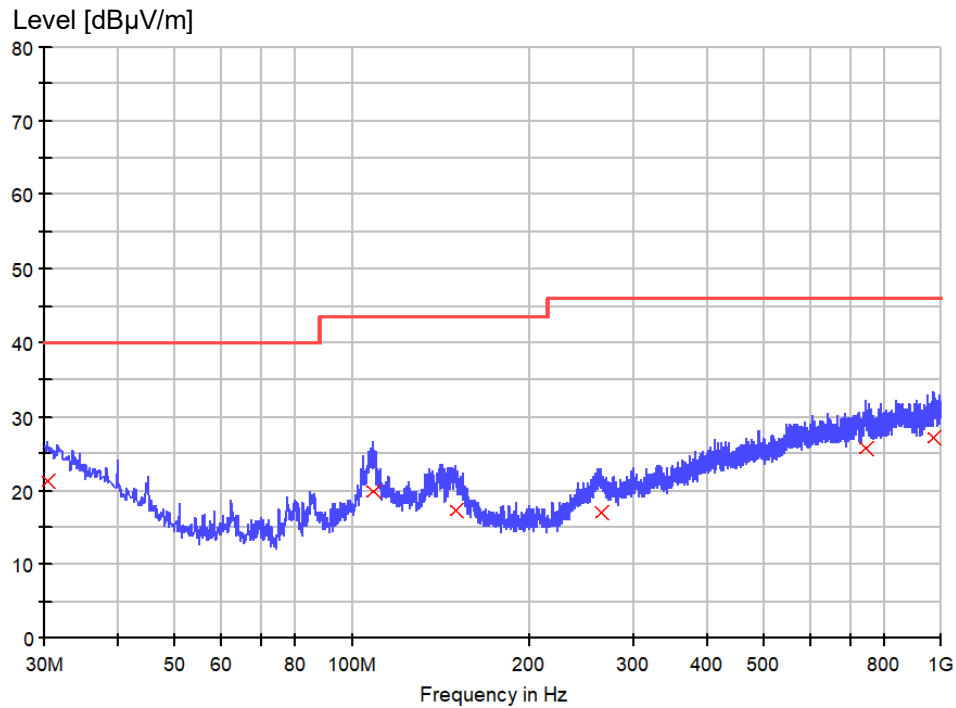
Corr. (dB): correction factor including: antenna factor, cable loss, and gain of pre-amplifier (if used)

Margin: Limit (dB μ V/m) - QuasiPeak (dB μ V/m)

Note 1: The highest frequency in the EUT is less than 108 MHz. According to FCC Part 15 subpart B §15.33 (b) (1), the upper frequency for radiated emission measurement is 1000 MHz.

Note 2: The class B limits of ICES-005:2018 is stricter than those FCC 47 CFR Part 15, Subpart B:2023 for 3 m test distance. Therefore, the former limits are used in following figures and tables.

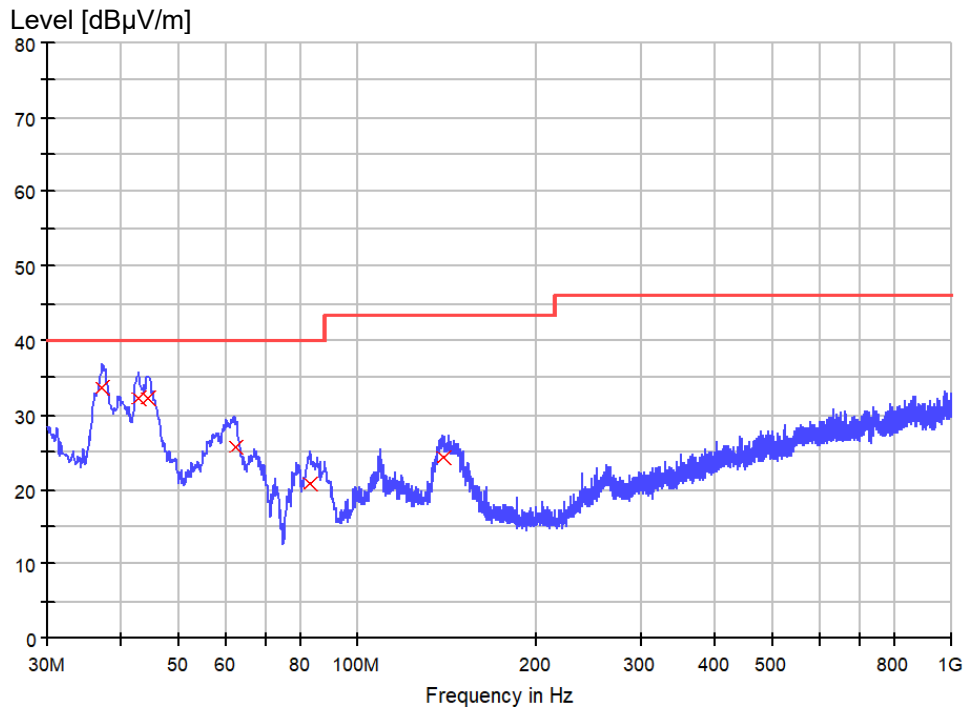
Figure 5: Spectral Diagrams, Radiated Emission, 30 MHz – 1000 MHz, Horizontal polarization, mode 1



Final quasi-peak measurement results:

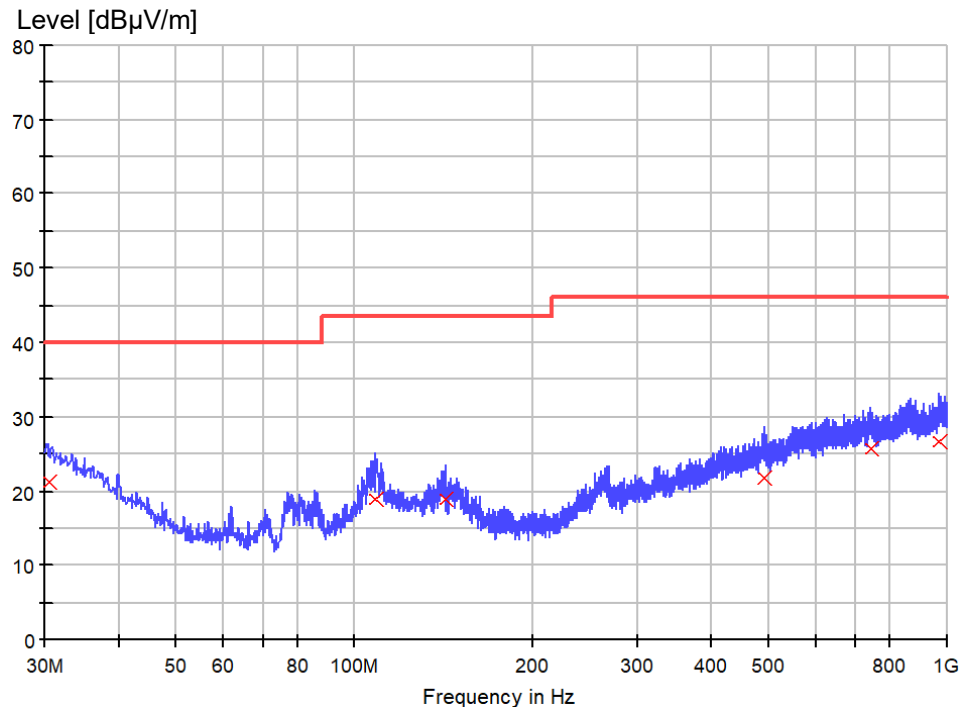
Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBμV/m)
30.363750	21.3	1000.0	120.000	185.0	H	80.0	25.2	18.7	40.0
108.327500	20.0	1000.0	120.000	111.0	H	152.0	18.5	23.5	43.5
149.916250	17.3	1000.0	120.000	100.0	H	-170.0	17.1	26.2	43.5
265.588750	17.0	1000.0	120.000	121.0	H	-119.0	21.2	29.0	46.0
743.435000	25.7	1000.0	120.000	103.0	H	-128.0	29.0	20.3	46.0
973.810000	27.0	1000.0	120.000	121.0	H	109.0	30.2	19.0	46.0

Figure 6: Spectral Diagrams, Radiated Emission, 30 MHz – 1000 MHz, Vertical polarization, mode 1



Final quasi-peak measurement results:

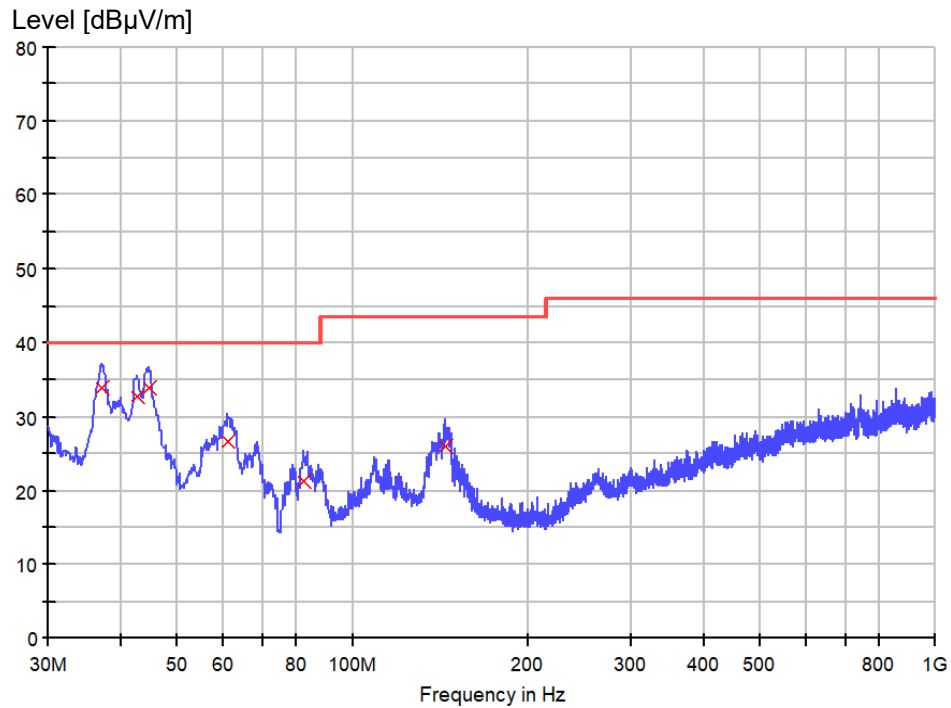
Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBμV/m)
37.275000	33.7	1000.0	120.000	192.0	V	17.0	21.3	6.3	40.0
42.731250	32.2	1000.0	120.000	167.0	V	-126.0	18.3	7.8	40.0
44.428750	32.2	1000.0	120.000	101.0	V	84.0	17.4	7.8	40.0
62.131250	25.8	1000.0	120.000	101.0	V	68.0	12.6	14.2	40.0
82.865000	20.9	1000.0	120.000	117.0	V	45.0	14.2	19.1	40.0
139.367500	24.2	1000.0	120.000	147.0	V	-171.0	18.1	19.3	43.5

Figure 7: Spectral Diagrams, Radiated Emission, 30 MHz – 1000 MHz, Horizontal polarization, mode 2


Final quasi-peak measurement results:

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30.363750	21.3	1000.0	120.000	101.0	H	-168.0	25.2	18.7	40.0
108.570000	18.8	1000.0	120.000	184.0	H	-6.0	18.5	24.7	43.5
142.035000	18.9	1000.0	120.000	127.0	H	-180.0	17.8	24.7	43.5
492.811250	21.7	1000.0	120.000	155.0	H	169.0	25.7	24.3	46.0
743.192500	25.7	1000.0	120.000	119.0	H	-65.0	29.0	20.3	46.0
971.142500	26.6	1000.0	120.000	142.0	H	74.0	29.7	19.4	46.0

Figure 8: Spectral Diagrams, Radiated Emission, 30 MHz – 1000 MHz, Vertical polarization, mode 2



Final quasi-peak measurement results:

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBμV/m)
37.275000	33.8	1000.0	120.000	107.0	V	91.0	21.3	6.2	40.0
42.610000	32.8	1000.0	120.000	118.0	V	-113.0	18.4	7.3	40.0
44.550000	33.9	1000.0	120.000	177.0	V	158.0	17.3	6.1	40.0
61.040000	26.8	1000.0	120.000	155.0	V	-104.0	12.6	13.2	40.0
82.622500	21.3	1000.0	120.000	120.0	V	-80.0	14.1	18.7	40.0
144.581250	26.1	1000.0	120.000	150.0	V	131.0	17.6	17.4	43.5

6 Photographs of the Test Set-Up

Refer to the test setup file.

7 List of Test and Measurement Instruments

Equip. no.	Equipment name	Model	Serial no.	Manufacturer	Cal. date	Due date
EMC-S-028	EMI measurement software	EMC32-E+ (10.60.20)	100150	Rohde & Schwarz	N/A	N/A
EMC-C-366	Thermohygrometer	608-H1	2485149174	testo	2025-07-11	2026-07-11
EMC-C-195	EMI test receiver	ESR3	102794	Rohde & Schwarz	2025-08-02	2026-08-02
EMC-C-190	Artificial mains network	ENV432	101514	Rohde & Schwarz	2025-09-02	2026-09-02
EMC-S-032	EMI measurement software	EMC32-MEB (10.60.20)	100697	Rohde & Schwarz	N/A	N/A
EMC-C-155	BiLog antenna	CBL 6112D	40530	Teseq	2025-03-24	2026-09-24
EMC-C-121	Thermohygrometer	608-H1	1241320265	testo	2025-06-05	2026-06-05
EMC-C-066	EMI test receiver	ESCI	100280	Rohde & Schwarz	2024-10-17	2025-10-17
EMC-C-001	3 m semi-anechoic chamber	SAC3	FJ129002	Frankonia	2023-12-03	2026-12-03

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End of test report