

Prüfbericht-Nr.: <i>Test report no.:</i>	CN25XND7 001	Auftrags-Nr.: <i>Order no.:</i>	326119869	Seite 1 von 40 <i>Page 1 of 40</i>
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	1288983	Auftragsdatum: <i>Order date:</i>	2025-07-14	
Auftraggeber: <i>Client:</i>	IKEA of Sweden AB Box 702, SE-343 81 Älmhult, Sweden			
Prüfgegenstand: <i>Test item:</i>	Anti-fog Mirror			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	E2570			
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 ICES-003:2020			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2025-09-30	Refer to the EUT photos file		
Prüfmuster-Nr.: <i>Test sample no.:</i>	A004083291-002			
Prüfzeitraum: <i>Testing period:</i>	2025-09-09~2025-09-11			
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>	genehmigt von: <i>authorized by:</i>			
Datum: <i>Date:</i>	Ausstellungsdatum: <i>Issue date:</i>			
Stellung / Position:	Stellung / Position:			
Sonstiges / <i>Other:</i>				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>				
Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>				
* 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. <i>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.</i>				

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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> |
| 2 | <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: go.tuv.com/digital-signature</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: go.tuv.com/digital-signature</i></p> |
| 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 115:2023, 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 115:2023, 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
CN25XND7 001	2026-01-08	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 test equipment used are 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 anti-fog mirror with light for lighting and similar use. For further information, refer to the user's manual.

2.2 Ratings and System Details

Rated input : AC 120 V, 50/60 Hz

Rated power : 41 (7+7+27) W, 0.35 A

This product is anti-fog mirror with light, it powered by approved LED power supply HEC40-KARRSJON, input: AC 100-240 V, 50/60 Hz, 0.6 A, 45 W; output: DC 24 V, Max. 1.67 A, Max. 40 W

2.3 Independent Operation Modes

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

The test modes are as follows:

- Mode 1: Anti-fog by heating and lighting on with max cold lighting output.
- Mode 2: Anti-fog by heating and lighting on with min cold lighting output.
- Mode 3: Anti-fog by heating and lighting on with max neutral lighting output.
- Mode 4: Anti-fog by heating and lighting on with min neutral lighting output.
- Mode 5: Anti-fog by heating and lighting on with max warm lighting output.
- Mode 6: Anti-fog by heating and lighting on with min warm lighting output.

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 500 kHz.

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.

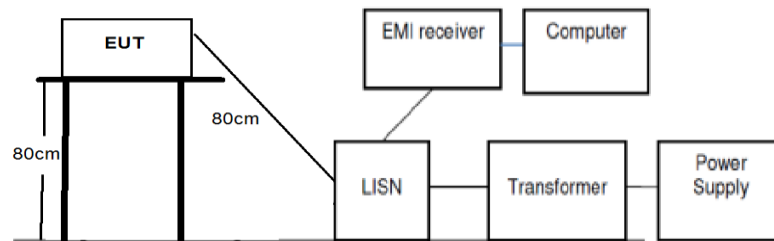
Refer to the related paragraph of this report.

The sequence of testing:

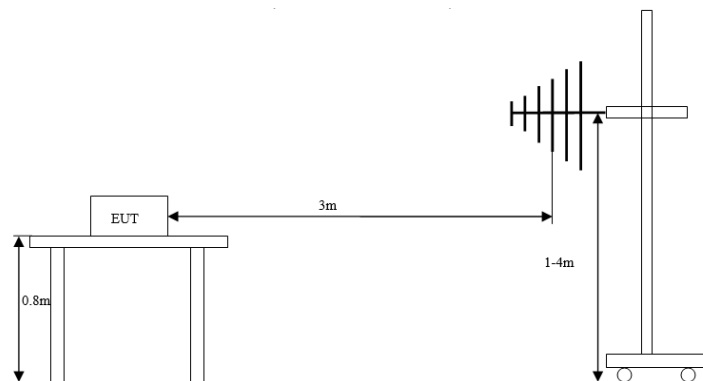
1. Conducted emission tests were performed on 2025-09-09.
2. Radiated emission tests were performed on 2025-09-09~2025-09-11.

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

During tests, no special countermeasure was 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	: 2025-09-09	
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	
Operational mode	: Mode 1 ~ Mode 6, defined in clause 2.3	
Ambient condition	: Temperature: 24.6 °C; Relative humidity: 64.7 %	
Expanded measurement uncertainty ($k=2$)	: 2.33 dB The minimum margin to the limit is 10.30 dB at 0.152250 MHz. The margin is higher than expanded measurement uncertainty.	
Test setup photo	: Photograph 1 of Attachment 3	

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 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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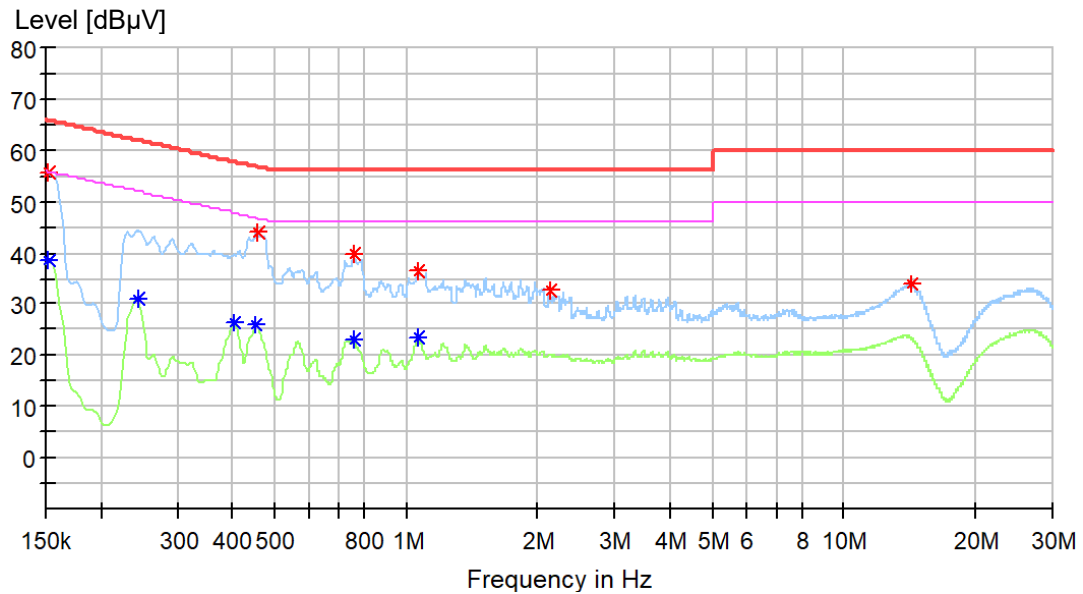
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Notes on following tables of conducted emission results and conversions:

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


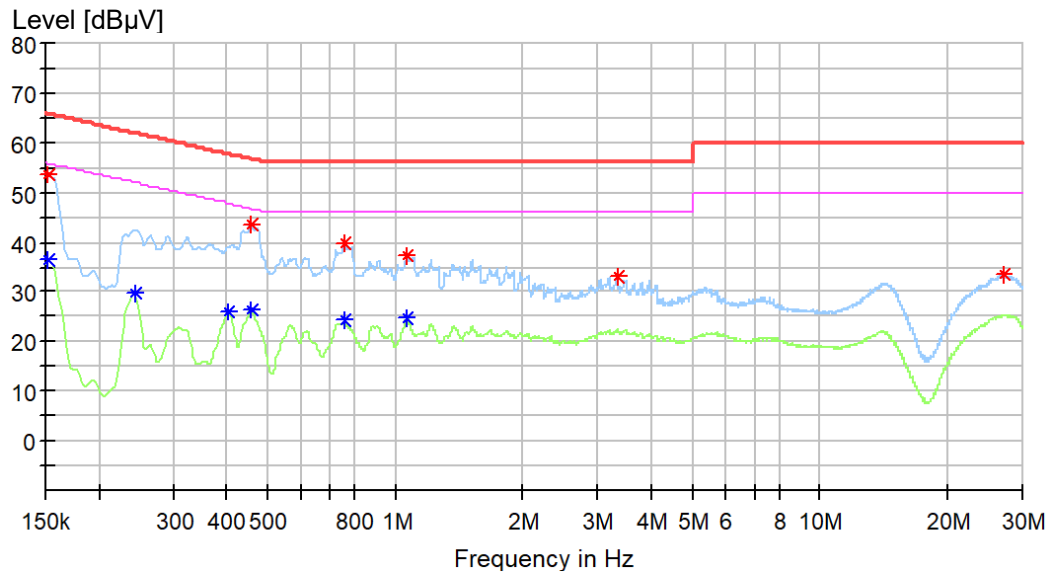
Final quasi-peak measurement result:

Frequency (MHz)	QuasiPeak (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
0.152250	55.58	65.88	10.30	L1	10.6
0.456000	44.01	56.77	12.76	L1	10.5
0.759750	39.61	56.00	16.39	L1	10.5
1.061250	36.55	56.00	19.45	L1	10.5
2.125500	32.50	56.00	23.50	L1	10.5
14.309250	33.82	60.00	26.18	L1	11.0

Final average measurement result:

Frequency (MHz)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
0.152250	38.63	55.88	17.24	L1	10.6
0.242250	31.04	52.02	20.98	L1	10.5
0.404250	26.27	47.77	21.49	L1	10.5
0.453750	26.14	46.81	20.66	L1	10.5
0.757500	23.15	46.00	22.85	L1	10.5
1.061250	23.48	46.00	22.52	L1	10.5

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

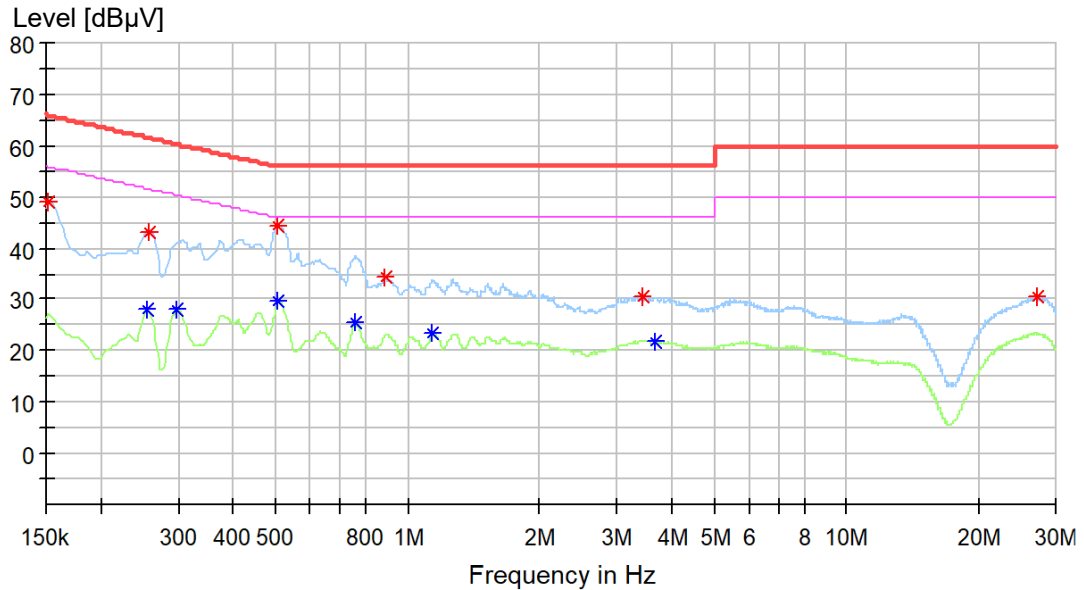


Final quasi-peak measurement result:

Frequency (MHz)	QuasiPeak (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.152250	53.68	65.88	12.19	N	10.3
0.456000	43.73	56.77	13.04	N	10.3
0.759750	39.95	56.00	16.05	N	10.3
1.063500	37.23	56.00	18.77	N	10.3
3.331500	33.27	56.00	22.73	N	10.4
27.082500	33.35	60.00	26.65	N	11.3

Final average measurement result:

Frequency (MHz)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.152250	36.59	55.88	19.29	N	10.3
0.242250	29.60	52.02	22.42	N	10.3
0.404250	26.03	47.77	21.74	N	10.3
0.456000	26.56	46.77	20.20	N	10.3
0.757500	24.28	46.00	21.72	N	10.3
1.063500	24.74	46.00	21.26	N	10.3

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


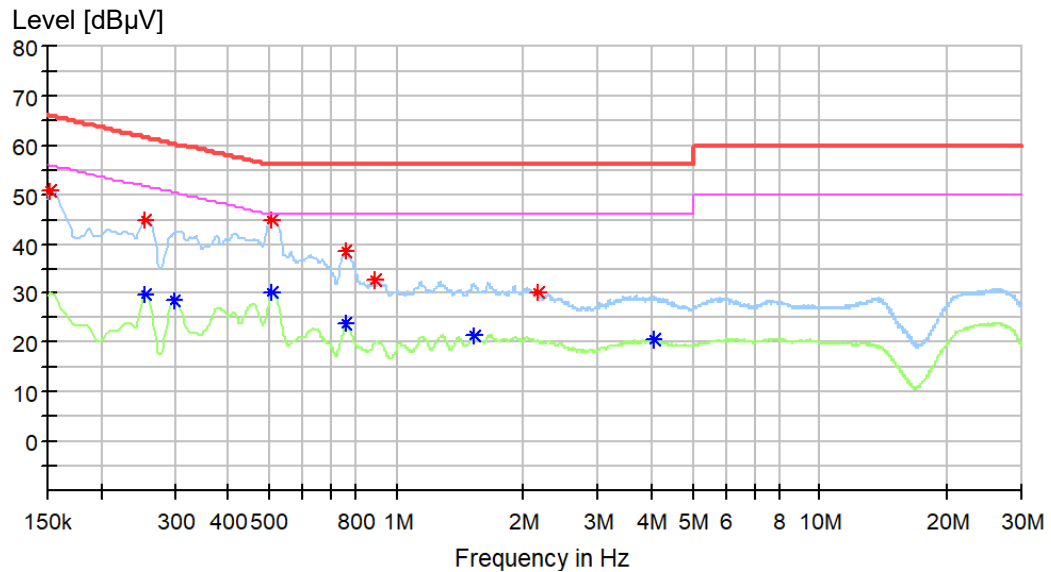
Final quasi-peak measurement result:

Frequency (MHz)	QuasiPeak (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
0.152250	48.94	65.88	16.93	L1	10.6
0.258000	43.14	61.50	18.36	L1	10.5
0.507750	44.55	56.00	11.45	L1	10.5
0.885750	34.57	56.00	21.43	L1	10.5
3.426000	30.64	56.00	25.36	L1	10.6
27.035250	30.47	60.00	29.53	L1	11.4

Final average measurement result:

Frequency (MHz)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
0.255750	28.21	51.57	23.35	L1	10.5
0.298500	27.90	50.28	22.38	L1	10.5
0.507750	29.89	46.00	16.11	L1	10.5
0.759750	25.38	46.00	20.62	L1	10.5
1.142250	23.33	46.00	22.67	L1	10.5
3.680250	21.96	46.00	24.04	L1	10.6

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



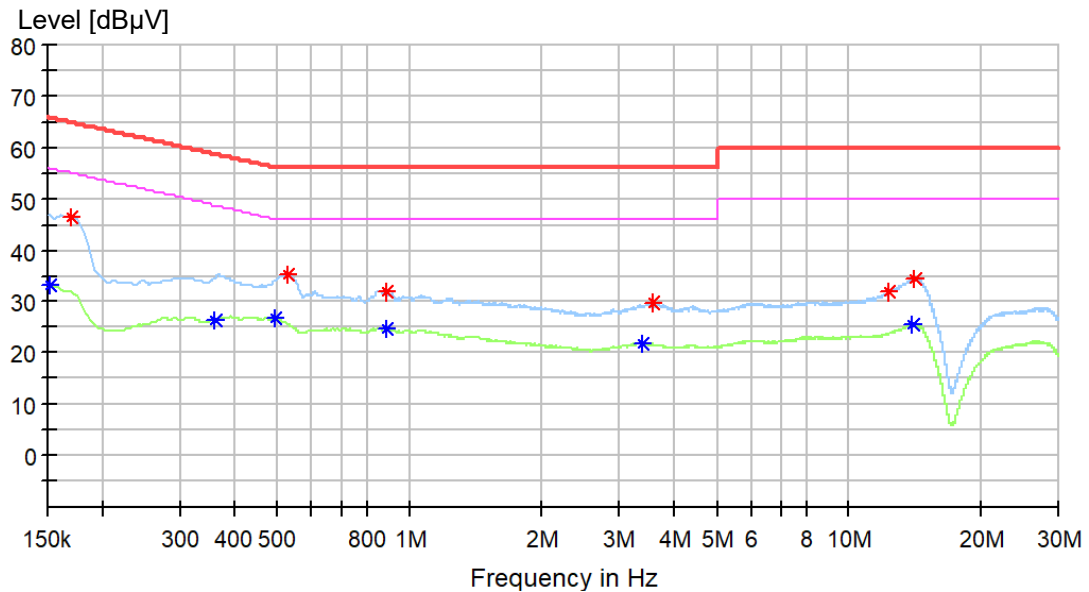
Final quasi-peak measurement result:

Frequency (MHz)	QuasiPeak (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
0.152250	50.83	65.88	15.04	N	10.3
0.255750	44.79	61.57	16.78	N	10.3
0.507750	44.93	56.00	11.07	N	10.3
0.759750	38.71	56.00	17.29	N	10.3
0.885750	32.70	56.00	23.30	N	10.3
2.148000	30.22	56.00	25.78	N	10.4

Final average measurement result:

Frequency (MHz)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
0.255750	29.67	51.57	21.90	N	10.3
0.298500	28.68	50.28	21.61	N	10.3
0.507750	30.01	46.00	15.99	N	10.3
0.759750	24.10	46.00	21.90	N	10.3
1.518000	21.38	46.00	24.62	N	10.4
4.042500	20.42	46.00	25.58	N	10.4

Figure 5: Spectral Diagrams, Conducted Emission, 150 kHz – 30 MHz, L, mode 3



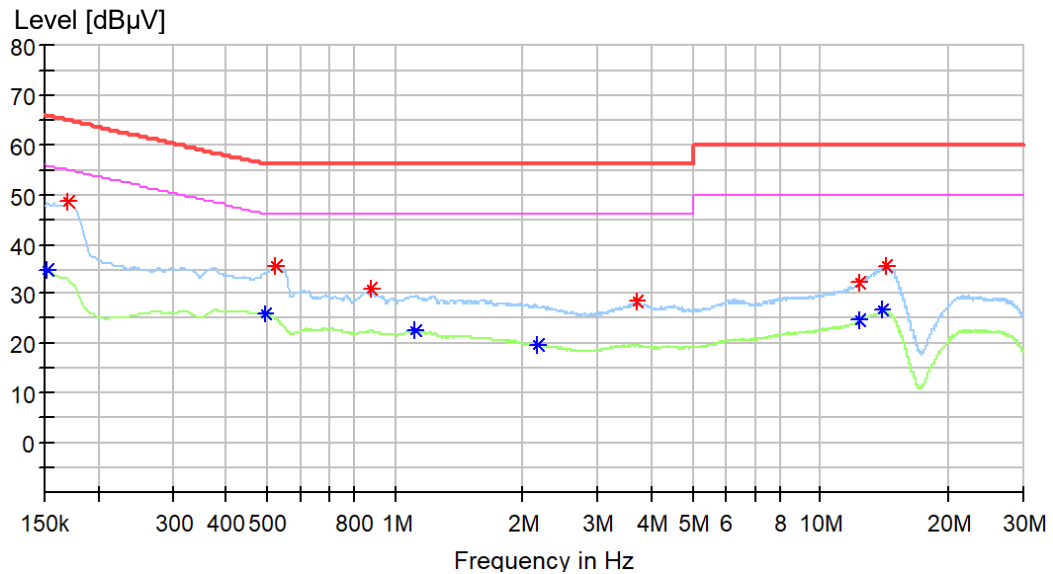
Final quasi-peak measurement result:

Frequency (MHz)	QuasiPeak (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
0.170250	46.57	64.95	18.38	L1	10.6
0.530250	35.35	56.00	20.65	L1	10.5
0.888000	31.93	56.00	24.08	L1	10.5
3.563250	29.82	56.00	26.18	L1	10.6
12.369750	31.74	60.00	28.26	L1	10.9
14.113500	34.31	60.00	25.69	L1	11.0

Final average measurement result:

Frequency (MHz)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
0.152250	33.17	55.88	22.71	L1	10.6
0.361500	26.50	48.69	22.20	L1	10.5
0.492000	26.80	46.13	19.33	L1	10.5
0.885750	24.70	46.00	21.30	L1	10.5
3.376500	21.83	46.00	24.17	L1	10.6
13.976250	25.48	50.00	24.52	L1	11.0

Figure 6: Spectral Diagrams, Conducted Emission, 150 kHz – 30 MHz, N, mode 3

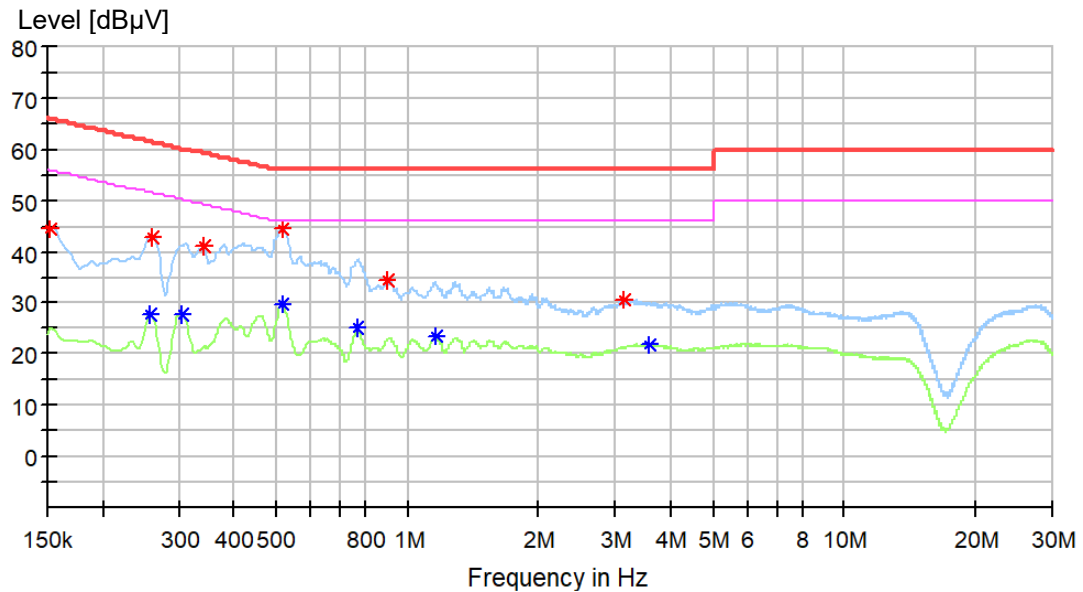


Final quasi-peak measurement result:

Frequency (MHz)	QuasiPeak (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.170250	48.43	64.95	16.52	N	10.3
0.525750	35.76	56.00	20.24	N	10.3
0.879000	31.10	56.00	24.90	N	10.3
3.682500	28.39	56.00	27.61	N	10.4
12.396750	32.29	60.00	27.71	N	10.8
14.327250	35.55	60.00	24.45	N	10.9

Final average measurement result:

Frequency (MHz)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.152250	34.75	55.88	21.13	N	10.3
0.496500	26.00	46.06	20.06	N	10.3
1.110750	22.56	46.00	23.44	N	10.3
2.152500	19.83	46.00	26.17	N	10.4
12.396750	24.63	50.00	25.37	N	10.8
14.030250	26.63	50.00	23.37	N	10.9

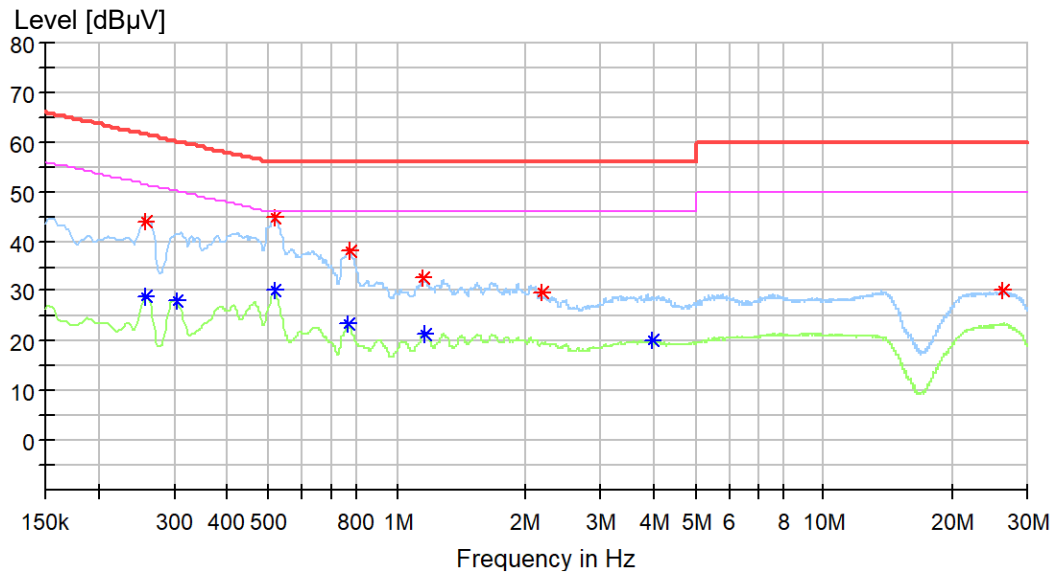
Figure 7: Spectral Diagrams, Conducted Emission, 150 kHz – 30 MHz, L, mode 4


Final quasi-peak measurement result:

Frequency (MHz)	QuasiPeak (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.152250	44.51	65.88	21.37	L1	10.6
0.260250	42.84	61.42	18.59	L1	10.5
0.341250	40.93	59.17	18.24	L1	10.5
0.514500	44.60	56.00	11.40	L1	10.5
0.897000	34.43	56.00	21.57	L1	10.5
3.133500	30.61	56.00	25.39	L1	10.6

Final average measurement result:

Frequency (MHz)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.258000	27.79	51.50	23.71	L1	10.5
0.303000	27.81	50.16	22.35	L1	10.5
0.514500	29.71	46.00	16.29	L1	10.5
0.766500	25.01	46.00	20.99	L1	10.5
1.162500	23.30	46.00	22.70	L1	10.5
3.588000	21.87	46.00	24.13	L1	10.6

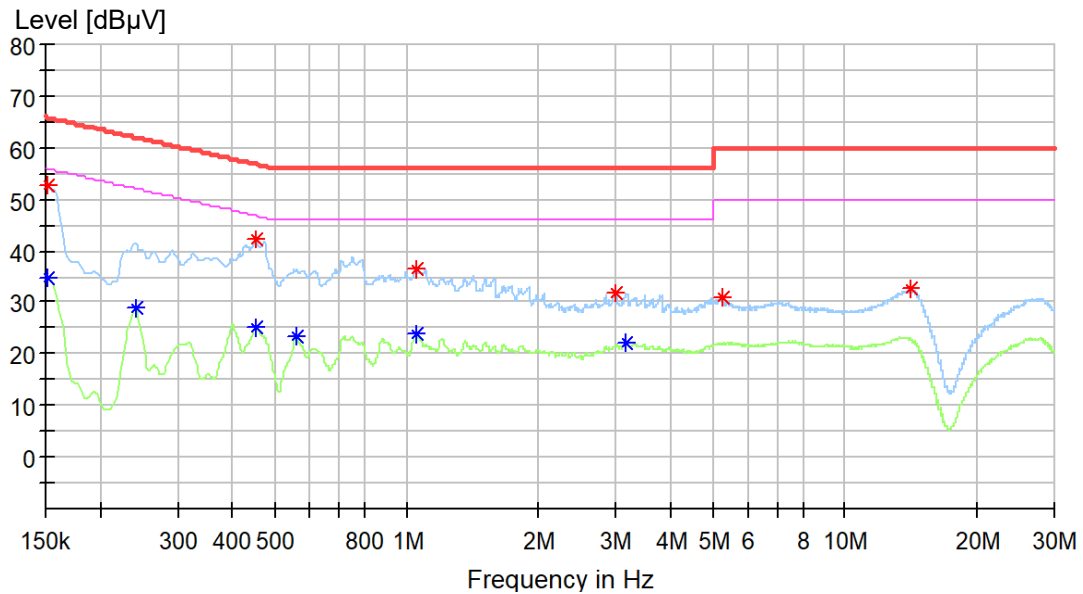
Figure 8: Spectral Diagrams, Conducted Emission, 150 kHz – 30 MHz, N, mode 4


Final quasi-peak measurement result:

Frequency (MHz)	QuasiPeak (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.258000	44.17	61.50	17.33	N	10.3
0.514500	44.79	56.00	11.21	N	10.3
0.771000	38.33	56.00	17.67	N	10.3
1.153500	32.56	56.00	23.44	N	10.3
2.172750	29.59	56.00	26.41	N	10.4
26.319750	30.08	60.00	29.92	N	11.3

Final average measurement result:

Frequency (MHz)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.258000	29.13	51.50	22.37	N	10.3
0.303000	27.95	50.16	22.21	N	10.3
0.514500	29.99	46.00	16.01	N	10.3
0.766500	23.68	46.00	22.32	N	10.3
1.164750	21.39	46.00	24.61	N	10.3
3.979500	20.21	46.00	25.79	N	10.4

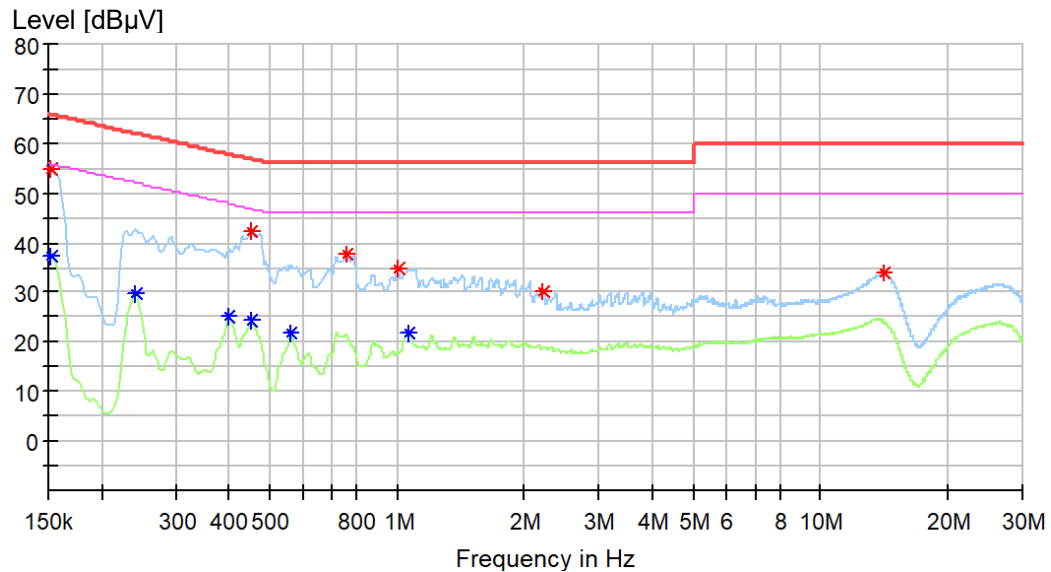
Figure 9: Spectral Diagrams, Conducted Emission, 150 kHz – 30 MHz, L, mode 5


Final quasi-peak measurement result:

Frequency (MHz)	QuasiPeak (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
0.152250	52.80	65.88	13.08	L1	10.6
0.453750	42.35	56.81	14.46	L1	10.5
1.052250	36.51	56.00	19.49	L1	10.5
2.996250	31.83	56.00	24.17	L1	10.6
5.246250	30.91	60.00	29.09	L1	10.6
14.048250	32.54	60.00	27.46	L1	11.0

Final average measurement result:

Frequency (MHz)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
0.152250	34.92	55.88	20.96	L1	10.6
0.240000	28.87	52.10	23.23	L1	10.5
0.453750	25.22	46.81	21.59	L1	10.5
0.559500	23.41	46.00	22.59	L1	10.5
1.052250	23.79	46.00	22.21	L1	10.5
3.158250	22.16	46.00	23.84	L1	10.6

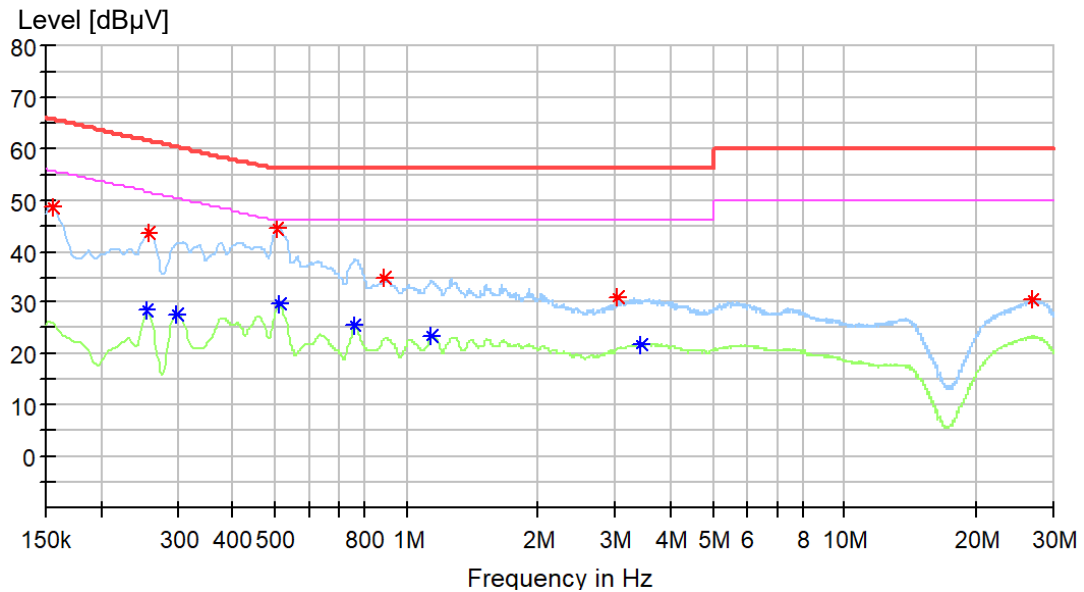
Figure 10: Spectral Diagrams, Conducted Emission, 150 kHz – 30 MHz, N, mode 5


Final quasi-peak measurement result:

Frequency (MHz)	QuasiPeak (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.152250	54.73	65.88	11.14	N	10.3
0.453750	42.26	56.81	14.54	N	10.3
0.757500	37.83	56.00	18.17	N	10.3
1.000500	34.95	56.00	21.05	N	10.3
2.208750	30.38	56.00	25.62	N	10.4
14.041500	34.04	60.00	25.96	N	10.9

Final average measurement result:

Frequency (MHz)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.152250	37.24	55.88	18.64	N	10.3
0.240000	29.72	52.10	22.38	N	10.3
0.399750	25.32	47.86	22.54	N	10.3
0.453750	24.29	46.81	22.51	N	10.3
0.559500	21.83	46.00	24.17	N	10.3
1.056750	21.94	46.00	24.06	N	10.3

Figure 11: Spectral Diagrams, Conducted Emission, 150 kHz – 30 MHz, L, mode 6


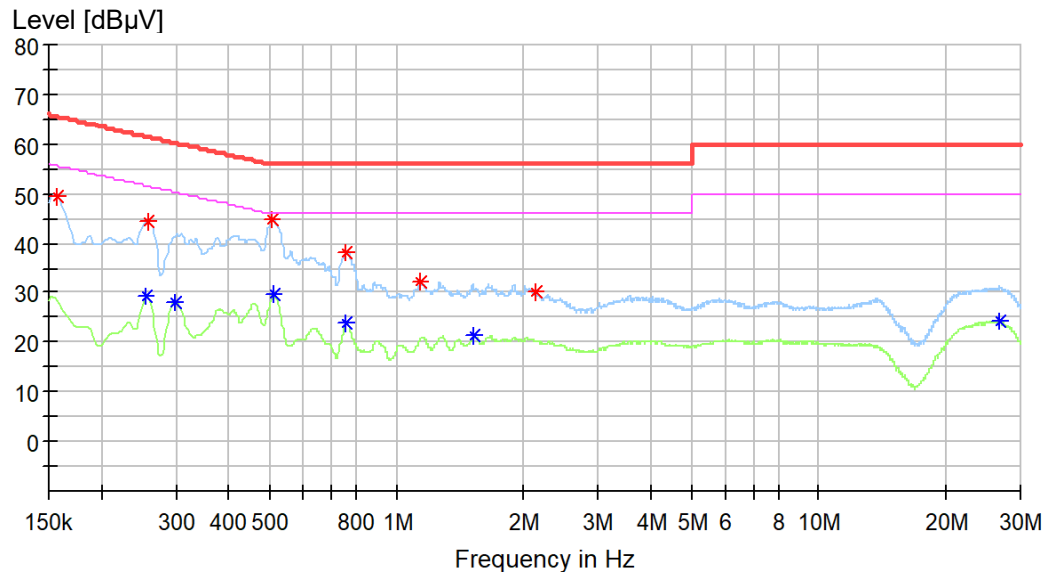
Final quasi-peak measurement result:

Frequency (MHz)	QuasiPeak (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
0.154500	48.46	65.75	17.29	L1	10.6
0.258000	43.43	61.50	18.06	L1	10.5
0.507750	44.54	56.00	11.46	L1	10.5
0.885750	34.94	56.00	21.06	L1	10.5
3.036750	30.91	56.00	25.09	L1	10.6
26.819250	30.44	60.00	29.56	L1	11.4

Final average measurement result:

Frequency (MHz)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
0.255750	28.31	51.57	23.26	L1	10.5
0.298500	27.84	50.28	22.45	L1	10.5
0.510000	29.91	46.00	16.09	L1	10.5
0.759750	25.38	46.00	20.62	L1	10.5
1.140000	23.29	46.00	22.71	L1	10.5
3.428250	21.97	46.00	24.03	L1	10.6

Figure 12: Spectral Diagrams, Conducted Emission, 150 kHz – 30 MHz, N, mode 6



Final quasi-peak measurement result:

Frequency (MHz)	QuasiPeak (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.156750	49.57	65.63	16.07	N	10.3
0.258000	44.32	61.50	17.18	N	10.3
0.507750	44.66	56.00	11.34	N	10.3
0.759750	38.29	56.00	17.71	N	10.3
1.137750	32.33	56.00	23.67	N	10.3
2.143500	30.23	56.00	25.77	N	10.4

Final average measurement result:

Frequency (MHz)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.255750	29.51	51.57	22.06	N	10.3
0.298500	28.13	50.28	22.15	N	10.3
0.510000	29.91	46.00	16.09	N	10.3
0.759750	23.96	46.00	22.04	N	10.3
1.518000	21.38	46.00	24.62	N	10.4
26.691000	24.32	50.00	25.68	N	11.3

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	: 2025-09-09~2025-09-11
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
Operational mode	: Mode 1 ~ Mode 6, defined in clause 2.3
Ambient condition	: Temperature: 24.5 °C; Relative humidity: 64.8 %
Expanded measurement uncertainty ($k=2$)	: 5.40 dB The minimum margin to the limit is 14.1 dB at 30.363750 MHz. The margin is higher than expanded measurement uncertainty.
Test setup photo	: Photograph 2 of Attachment 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 an 80 cm wooden support above the reference ground plane. The wooden support was rotated 360° around and the height of the antenna 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 measured by an automatic measurement system. A preview test was first 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.

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)

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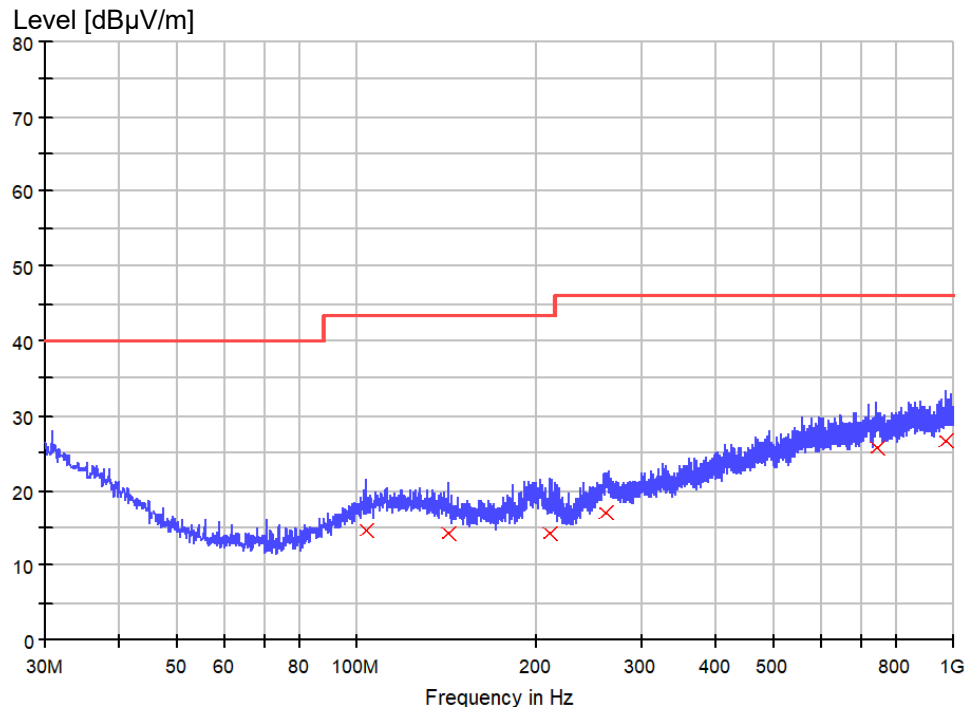
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Note 1: The highest frequency in the EUT is less than 108 MHz. According to FCC Part 15 subpart B §15.33 (b) (1), the upper frequency for radiated emission measurement is 1000 MHz.

Note 2: The class B limits of ICES-005:2018 are 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.

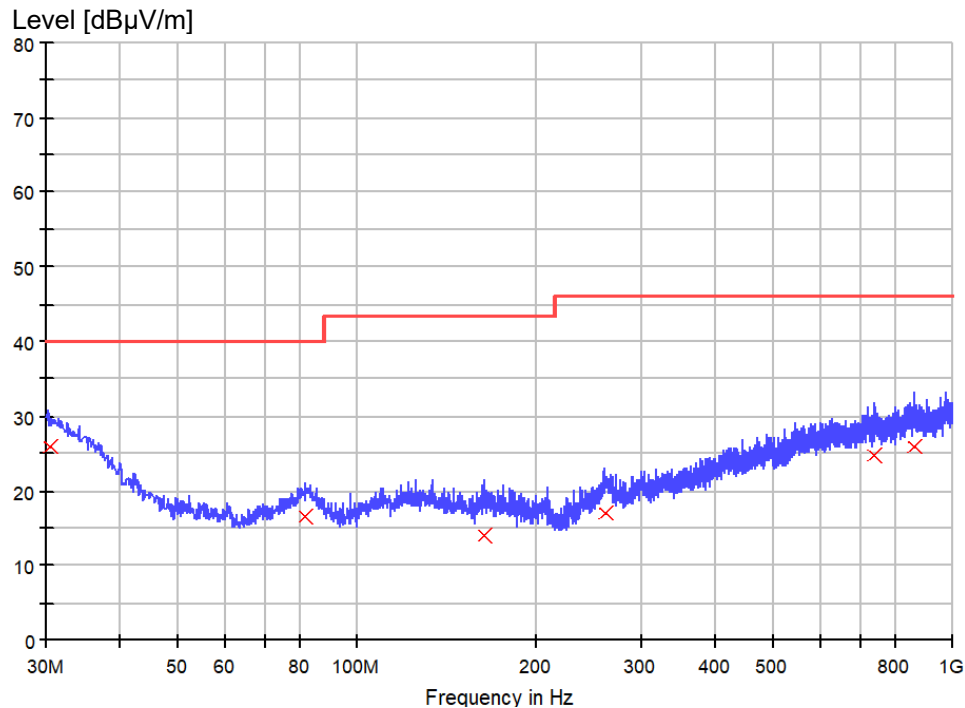
Figure 13: Spectral Diagrams, Radiated Emission, 30 MHz – 1000 MHz, Horizontal polarization, mode 1



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)
103.841250	14.6	1000.0	120.000	119	H	-53	17.9	28.9	43.5
142.156250	14.3	1000.0	120.000	212	H	-46	17.8	29.3	43.5
211.026250	14.4	1000.0	120.000	398	H	101	16.1	29.1	43.5
261.587500	17.1	1000.0	120.000	232	H	-99	21.7	28.9	46.0
743.435000	25.6	1000.0	120.000	261	H	-52	29.0	20.4	46.0
972.355000	26.7	1000.0	120.000	380	H	140	29.9	19.3	46.0

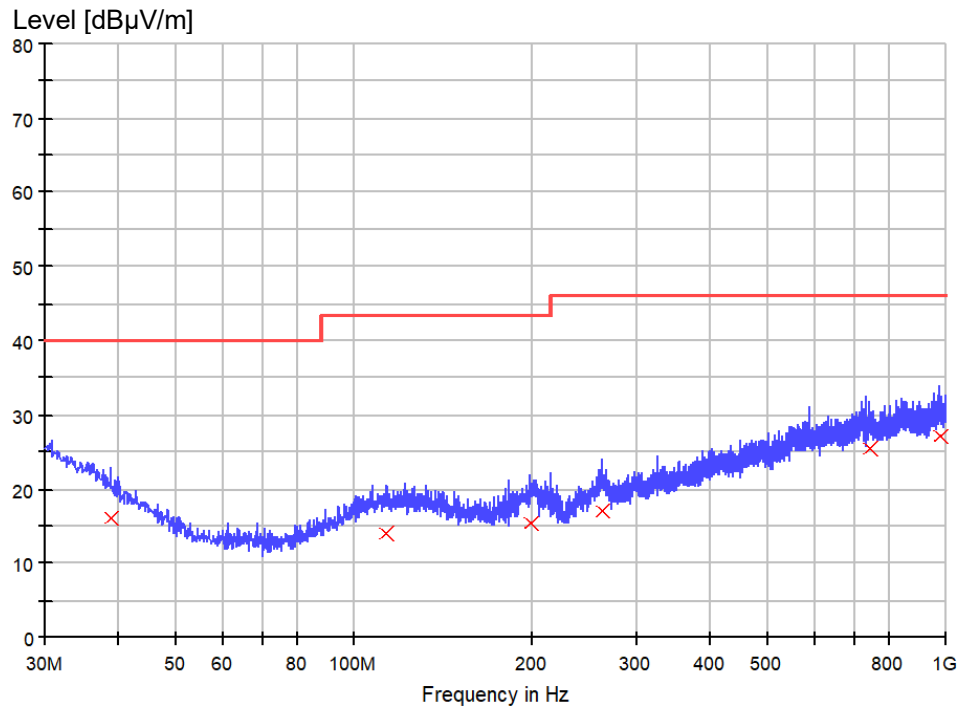
Figure 14: Spectral Diagrams, Radiated Emission, 30 MHz – 1000 MHz, Vertical polarization, mode 1



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)
30.363750	25.9	1000.0	120.000	359	V	76	25.2	14.1	40.0
81.773750	16.7	1000.0	120.000	221	V	-30	14.0	23.3	40.0
163.981250	14.0	1000.0	120.000	366	V	-59	16.7	29.5	43.5
261.345000	17.0	1000.0	120.000	357	V	-134	21.7	29.0	46.0
739.676250	24.8	1000.0	120.000	102	V	-171	28.0	21.2	46.0
860.926250	26.0	1000.0	120.000	250	V	22	29.1	20.1	46.0

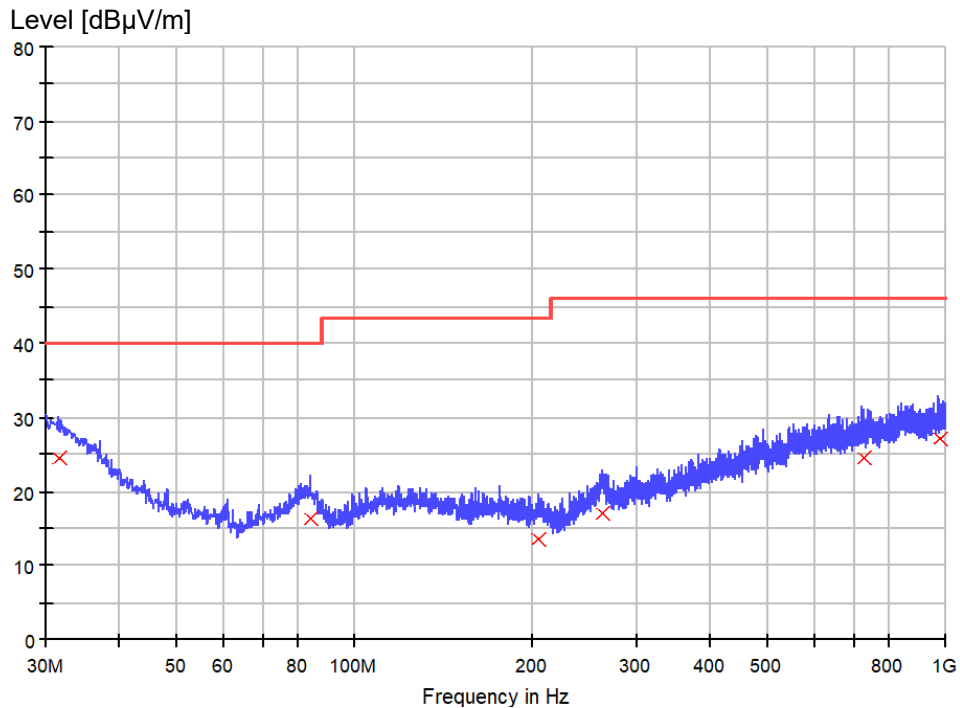
Figure 15: Spectral Diagrams, Radiated Emission, 30 MHz – 1000 MHz, Horizontal polarization, mode 2



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)
38.851250	16.2	1000.0	120.000	285	H	-35	20.4	23.8	40.0
113.662500	14.1	1000.0	120.000	128	H	-89	18.7	29.4	43.5
198.416250	15.4	1000.0	120.000	113	H	86	16.0	28.1	43.5
262.678750	17.2	1000.0	120.000	143	H	-81	21.6	28.9	46.0
745.860000	25.4	1000.0	120.000	265	H	139	28.9	20.6	46.0
975.507500	27.1	1000.0	120.000	332	H	-142	30.3	18.9	46.0

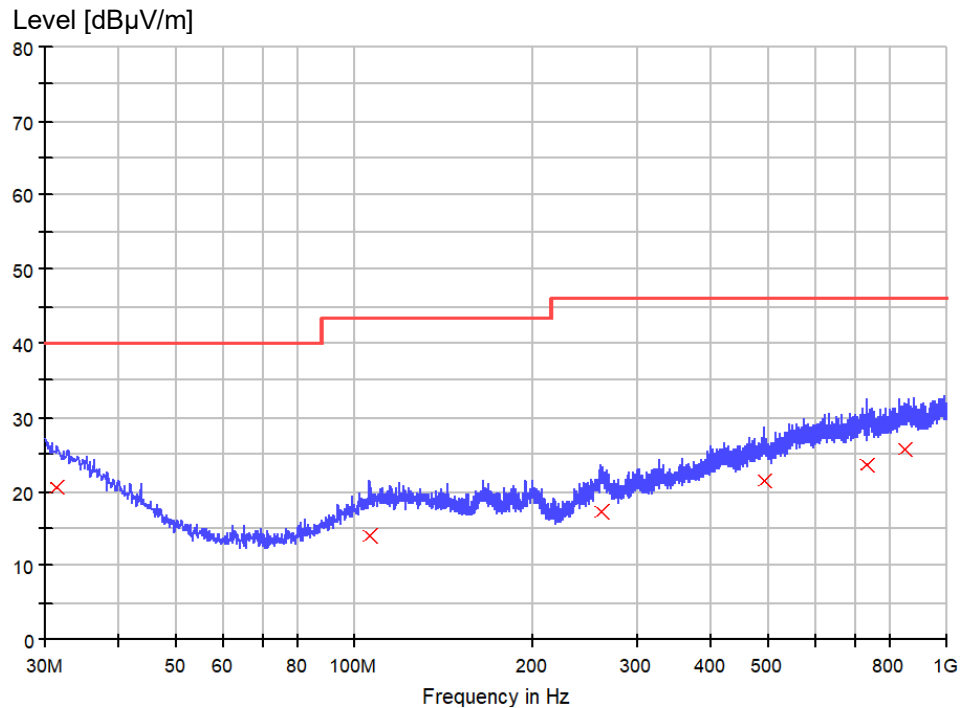
Figure 16: Spectral Diagrams, Radiated Emission, 30 MHz – 1000 MHz, Vertical polarization, mode 2



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)
31.576250	24.6	1000.0	120.000	165	V	56	24.5	15.4	40.0
84.441250	16.3	1000.0	120.000	382	V	138	14.4	23.7	40.0
204.963750	13.7	1000.0	120.000	339	V	-11	16.2	29.8	43.5
262.315000	17.1	1000.0	120.000	253	V	5	21.6	28.9	46.0
727.066250	24.6	1000.0	120.000	204	V	-63	27.8	21.4	46.0
974.537500	27.1	1000.0	120.000	105	V	-67	30.3	18.9	46.0

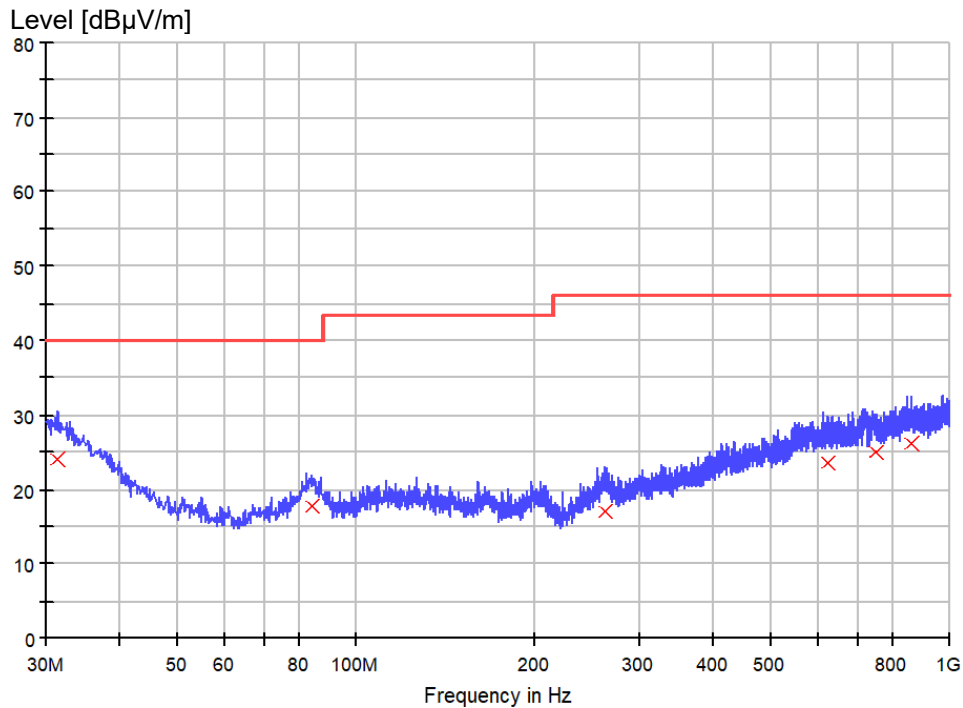
Figure 17: Spectral Diagrams, Radiated Emission, 30 MHz – 1000 MHz, Horizontal polarization, mode 3



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)
31.455000	20.7	1000.0	120.000	337	H	177	24.6	19.3	40.0
106.387500	14.0	1000.0	120.000	297	H	-142	18.2	29.5	43.5
261.708750	17.3	1000.0	120.000	218	H	30	21.7	28.7	46.0
490.871250	21.6	1000.0	120.000	182	H	168	25.6	24.4	46.0
732.401250	23.6	1000.0	120.000	109	H	151	27.0	22.4	46.0
850.983750	25.7	1000.0	120.000	385	H	-6	28.9	20.3	46.0

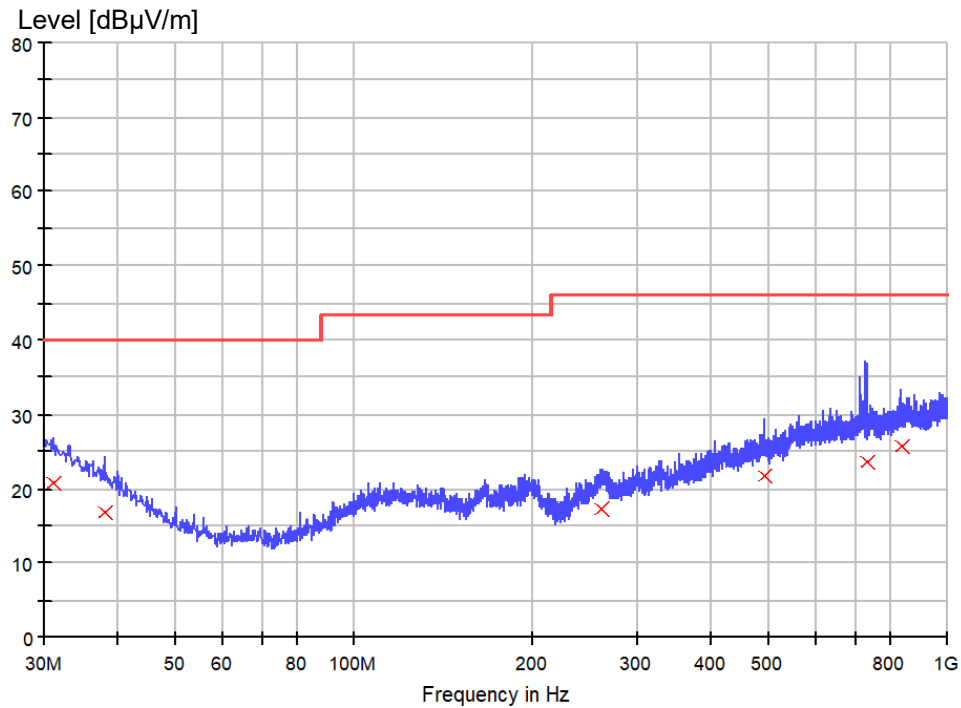
Figure 18: Spectral Diagrams, Radiated Emission, 30 MHz – 1000 MHz, Vertical polarization, mode 3



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)
31.455000	24.1	1000.0	120.000	381	V	128	24.6	15.9	40.0
84.198750	17.8	1000.0	120.000	111	V	-95	14.3	22.2	40.0
262.436250	17.1	1000.0	120.000	230	V	-98	21.6	28.9	46.0
625.701250	23.6	1000.0	120.000	169	V	-172	26.9	22.4	46.0
750.710000	25.1	1000.0	120.000	108	V	-29	28.4	20.9	46.0
862.381250	26.1	1000.0	120.000	346	V	-60	29.1	19.9	46.0

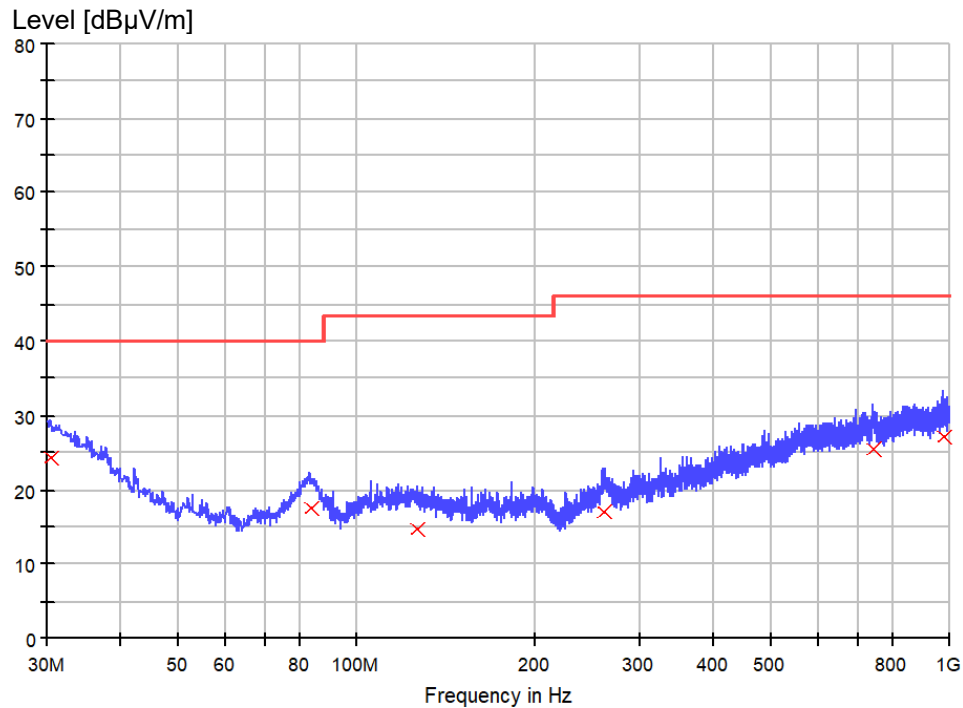
Figure 19: Spectral Diagrams, Radiated Emission, 30 MHz – 1000 MHz, Horizontal polarization, mode 4



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)
31.091250	20.9	1000.0	120.000	283	H	-155	24.8	19.1	40.0
37.881250	16.9	1000.0	120.000	316	H	66	21.0	23.1	40.0
261.830000	17.3	1000.0	120.000	146	H	-139	21.7	28.7	46.0
491.477500	21.7	1000.0	120.000	226	H	173	25.6	24.4	46.0
731.916250	23.7	1000.0	120.000	385	H	128	27.1	22.3	46.0
838.616250	25.6	1000.0	120.000	167	H	-108	28.8	20.4	46.0

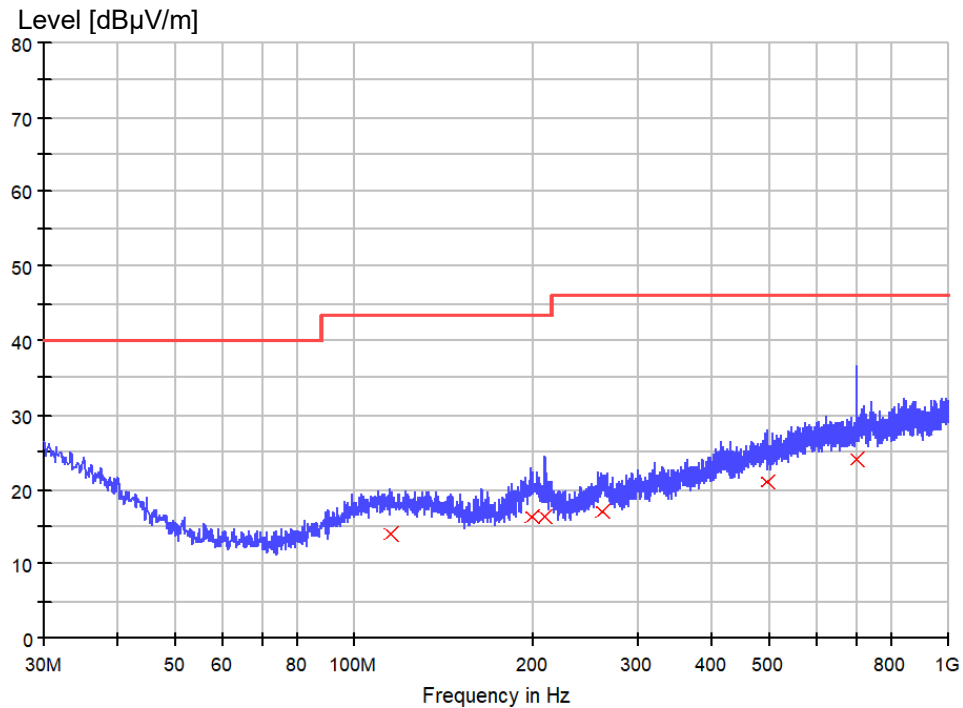
Figure 20: Spectral Diagrams, Radiated Emission, 30 MHz – 1000 MHz, Vertical polarization, mode 4



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)
30.485000	24.3	1000.0	120.000	106	V	7	25.2	15.7	40.0
83.835000	17.6	1000.0	120.000	390	V	164	14.3	22.4	40.0
126.757500	14.7	1000.0	120.000	121	V	-6	18.6	28.8	43.5
261.345000	17.0	1000.0	120.000	243	V	120	21.7	29.0	46.0
744.526250	25.6	1000.0	120.000	310	V	123	29.0	20.4	46.0
974.901250	27.2	1000.0	120.000	144	V	-131	30.3	18.8	46.0

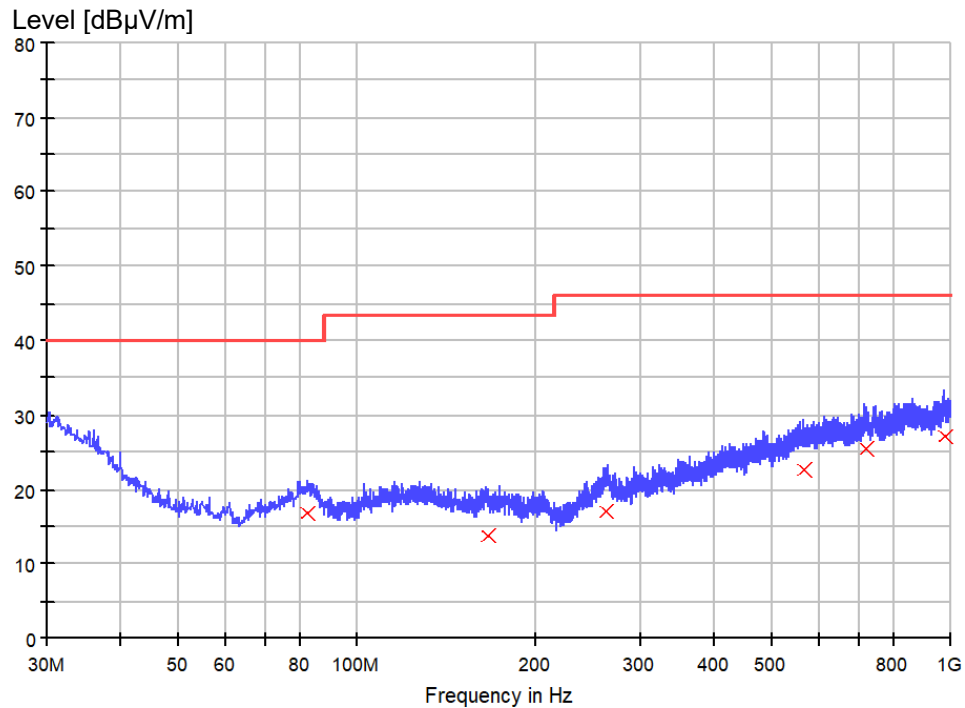
Figure 21: Spectral Diagrams, Radiated Emission, 30 MHz – 1000 MHz, Horizontal polarization, mode 5



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)
114.875000	14.1	1000.0	120.000	160	H	85	18.8	29.4	43.5
197.931250	16.5	1000.0	120.000	211	H	103	16.0	27.0	43.5
209.813750	16.4	1000.0	120.000	312	H	96	16.2	27.1	43.5
261.587500	17.2	1000.0	120.000	275	H	81	21.7	28.8	46.0
497.418750	21.0	1000.0	120.000	203	H	8	25.0	25.0	46.0
703.907500	24.0	1000.0	120.000	179	H	-44	27.2	22.0	46.0

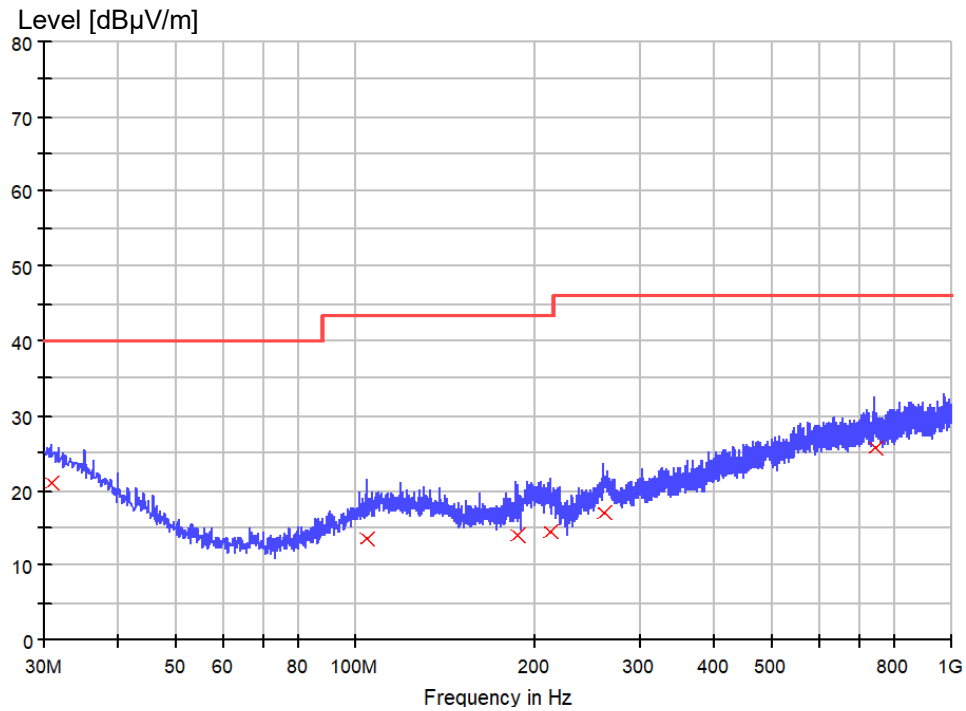
Figure 22: Spectral Diagrams, Radiated Emission, 30 MHz – 1000 MHz, Vertical polarization, mode 5



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)
82.380000	16.8	1000.0	120.000	274	V	-110	14.1	23.2	40.0
165.800000	13.8	1000.0	120.000	108	V	98	16.6	29.7	43.5
263.648750	17.0	1000.0	120.000	137	V	-73	21.5	29.0	46.0
566.288750	22.6	1000.0	120.000	256	V	-91	26.4	23.4	46.0
723.550000	25.5	1000.0	120.000	195	V	-129	28.7	20.5	46.0
975.750000	27.1	1000.0	120.000	256	V	-32	30.3	18.9	46.0

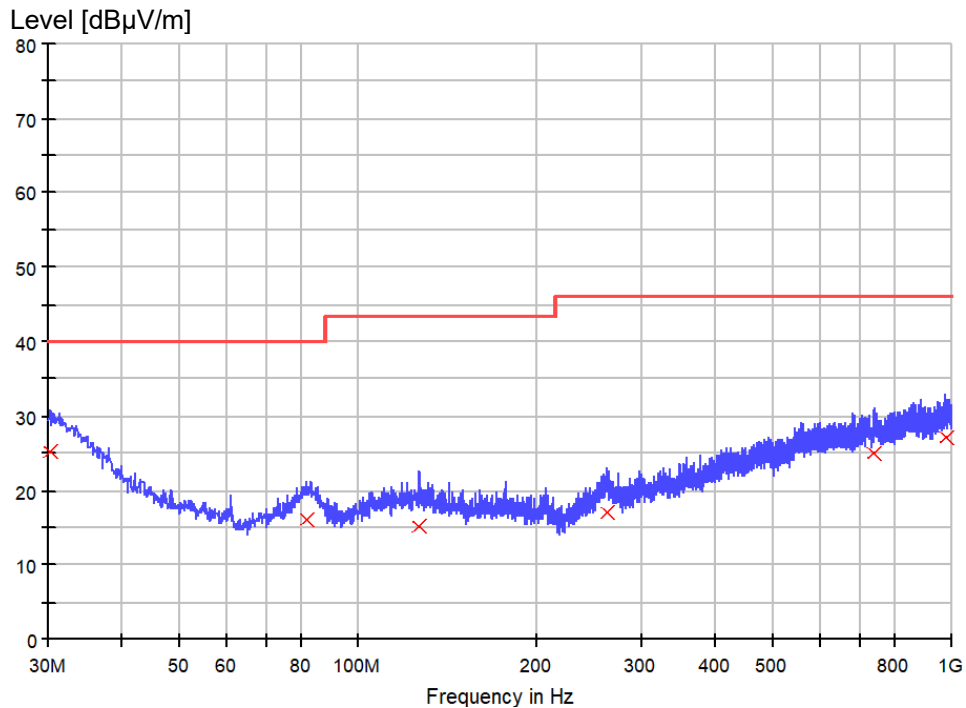
Figure 23: Spectral Diagrams, Radiated Emission, 30 MHz – 1000 MHz, Horizontal polarization, mode 6



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)
30.848750	21.0	1000.0	120.000	134	H	-116	25.0	19.0	40.0
104.083750	13.6	1000.0	120.000	346	H	39	18.0	29.9	43.5
186.897500	13.9	1000.0	120.000	233	H	-134	15.8	29.6	43.5
212.481250	14.5	1000.0	120.000	366	H	143	16.0	29.0	43.5
261.466250	17.1	1000.0	120.000	395	H	50	21.7	28.9	46.0
744.041250	25.7	1000.0	120.000	215	H	-114	29.1	20.3	46.0

Figure 24: Spectral Diagrams, Radiated Emission, 30 MHz – 1000 MHz, Vertical polarization, mode 6



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)
30.242500	25.3	1000.0	120.000	363	V	56	25.3	14.7	40.0
81.652500	16.1	1000.0	120.000	190	V	-17	14.0	23.9	40.0
127.000000	15.3	1000.0	120.000	263	V	-7	18.6	28.2	43.5
262.921250	17.0	1000.0	120.000	110	V	-55	21.6	29.0	46.0
740.525000	25.0	1000.0	120.000	166	V	-40	28.2	21.0	46.0
975.628750	27.1	1000.0	120.000	337	V	-148	30.3	18.9	46.0

6 Photographs of the Test Set-Up

Refer to the test setup file.

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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