

Test report No:
6221563.50

TEST REPORT

Electromagnetic Compatibility (EMC)

Identification of item tested	Remote-Controlled Lamp
Trademark	/
Model and /or type reference	MY-82001, MY-82002, MY-82003, MY-82004, MY-82005, MY-82006, MY-82007, MY-82008, MY-82009, MY-82010, MY-82011, MY-82012, MY-82013, MY-82014, MY-82015, MY-82016, MY-82017, MY-82018, MY-82019, MY-82020, MY-82021, MY-82022, MY-82023, MY-82024, MY-82025, MY-82026, MY-82027, MY-82028, MY-82029
Ratings	Battery 4.5V
Test Laboratory	DEKRA Testing and Certification (Shanghai) Ltd. No.250, Jiangchangsan Road, Jing'an District, Shanghai, China
Applicant's name / address	NINGBO GAOLI ELECTRONIC TECHNOLOGY CO., LTD NO.8 XINYUAN 1ST ROAD, BINHAI INDUSTRIAL ZONE PHASE II, XIDIAN TOWN, NINGHAI, NINGBO, CHINA
Test method requested, standard	EN IEC 55015:2019+A11:2020 EN IEC 61547:2023
Verdict Summary	IN COMPLIANCE
Tested by (name / position & signature)	Kaiyuan Dai Test Engineer 
Approved by (name / position & signature)	Wency Yang Project Manager 
Date of issue	2025-04-02
Report template No	TRF_EN IEC 55015_EN IEC 61547_EMC V1.3

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COMPETENCES AND GUARANTEES

DEKRA is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

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GENERAL CONDITIONS

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA.
5. The information provided by the customer in this report may affect the validity of the results, the test lab is not responsible for it.
6. The test results presented in this report relate only to the object tested.
7. Samples undergoing test have been provided by: The client.

UNCERTAINTY

For all measurements where guidance for the calculation of the instrumentation uncertainty of a measurement is specified in EN 55016-4-2 (CISPR 16-4-2), EN/IEC 61000-4 series or a product standard, the measurement instrumentation uncertainty has been calculated and applied in accordance with these standards. For all other measurements where no guidance is available, the measurement instrumentation uncertainty has been calculated and applied in accordance with ISO/IEC Guide 98-3 document.

Uncertainties have been calculated according to the DEKRA internal document MU-EMC. The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%. Refer to the Annex 1 for further information.

The measurement result is considered in conformance with the requirement if it is within the prescribed limit. It is not necessary to calculate the uncertainty associated with the measurement result, unless the specification, standard or customer have special requirements

CONFORMITY ASSESSMENT

For all EMI (emission) tests (when included in this report), as measurement uncertainties (ULAB) are less than the values UCISPR given in CISPR 16-4-2 (EN 55016-4-2) (Table-1), compliance with the limits is determined by comparing measurement results directly with corresponding limits without taking into consideration of measurement uncertainties.

ENVIRONMENTAL CONDITIONS

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:

Ambient temperature	15 °C – 35 °C
Relative Humidity air	30% - 60%
Atmospheric pressure	86 kPa – 106 kPa

If explicitly required in the basic standard or applied product / product family standard the climatic values are recorded and documented separately in this test report.

POSSIBLE TEST CASE VERDICTS

Test case does not apply to test object	N/A
Test object does meet requirement	P (Pass) / PASS
Test object does not meet requirement	F (Fail) / FAIL
Not measured	N/M

DEFINITION OF SYMBOLS USED IN THIS TEST REPORT

☒ Indicates that the listed condition, standard or equipment is applicable for this report/test/EUT.			
☐ Indicates that the listed condition, standard or equipment is not applicable for this report/test/EUT.			
Decimal separator used in this report	☐	Comma (,)	☒ Point (.)

ABBREVIATIONS

For the purposes of the present document, the following abbreviations apply:

EUT	: Equipment Under Test
QP	: Quasi-Peak
CAV	: CISPR Average
AV	: Average
CDN	: Coupling Decoupling Network
SAC	: Semi-Anechoic Chamber
OATS	: Open Area Test Site
BW	: Bandwidth
AM	: Amplitude Modulation
PM	: Pulse Modulation
HCP	: Horizontal Coupling Plane
VCP	: Vertical Coupling Plane
U_N	: Nominal voltage
N/A	: Not Applicable
N/M	: Not Measured

DOCUMENT HISTORY

Report nr.	Date	Description
6221563.50	2025-04-02	First release.

DATA PROVIDED BY THE APPLICANT

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested", "Applicant's name / address", "Ratings" and "Derived model(s)").
2. Derived model not tested. These models have been declared by the applicant as being the same as the model under test.
3. The environment(s) in which the EUT is intended to be used. The environment(s) have been declared by the applicant.

DEKRA declines any responsibility with respect to the information provided by the applicant and that may affect the validity of results.

CONCLUSION, REMARKS AND COMMENTS

The equipment under test (EUT) meet the requirements of the stated standard(s)/test(s).

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The tests described in this report do not result in the right to use any approval mark as conferred by DEKRA. As far as the tests were based on certain specifications, these are mentioned in the report.

According to the manufacturer's specifications, they are identical except for different model name.

After review, all tests were carried out on the following model MY-82003.

1 GENERAL INFORMATION

1.1 General Description of the Item(s)

Description of the item	Remote-Controlled Lamp
Test model number 1	MY-82003
Serial number	N/A
Trademark	/
Manufacturer.....	NINGBO GAOLI ELECTRONIC TECHNOLOGY CO., LTD NO.8 XINYUAN 1ST ROAD, BINHAI INDUSTRIAL ZONE PHASE II, XIDIAN TOWN, NINGHAI, NINGBO, CHINA
Factory	NINGBO GAOLI ELECTRONIC TECHNOLOGY CO., LTD NO.8 XINYUAN 1ST ROAD, BINHAI INDUSTRIAL ZONE PHASE II, XIDIAN TOWN, NINGHAI, NINGBO, CHINA

Type of the EUT.....	☒	Luminaire
	☐	Rope light (6.3)
	☐	Internal Module (6.4.3)
	☐	External module (6.4.4)
	☐	Module having multiple applications (6.4.2)
	☐	Single capped self-ballasted lamp (6.4.5)
	☐	Double-capped self-ballasted lamps, double-capped lamp adapters, double-capped semi-luminaires and double-capped retrofit lamps used in fluorescent lamp luminaires (6.4.6)
	☐	ELV lamps (6.4.7)
	☐	Single-capped semi-luminaires (6.4.8)
	☐	Independent igniter (6.4.9)
	☐	Replaceable starters for fluorescent lamps (6.4.10)
Control Gear used.....	☐	Magnetic control gear / transformer
	☒	Electronic control gear
	☐	Others:
Lamp technology used	☒	Light emitting diode (LED/OLED)
	☐	High pressure discharge lamp (HID)
	☐	Fluorescent lamp
	☐	Tungsten halogen lamp
	☐	Incandescent lamp
	☐	Others:
Dimming	☐	Test item has NO dimming functions
	☒	Test item includes dimming functions other than phase control
	☐	Test item includes phase control dimming functions

Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	☐	AC: 220 – 240 V, 50/60 Hz	☐	☐	☐	☐	☐
	☐	AC: 100 – 277 V, 50/60 Hz	☐	☐	☐	☐	☐
	☐	DC: 12 V, 24 V, 12 / 24 V					
	☒	Battery: 4.5 V					
Rated Power	N/A						
Clock frequencies	<30 MHz						
Other parameters.....	N/A						
Software version	Not provided						
Hardware version.....	Not provided						
Dimensions in cm (W x H x D).....	< 300 x 100 x 100						
Mounting position.....	☒	Table top equipment					
	☐	Wall/Ceiling mounted equipment					
	☐	Floor standing equipment					
	☐	Hand-held equipment					
	☐	Pole mounted equipment					
	☐	Other:					

Intended use of the Equipment Under Test (EUT)

The products are Remote-Controlled Lamp and the light sources are classified as non-user replaceable.

No	Module/parts of test item	Type	Manufacturer
	N/A		

No	Documents as provided by the applicant - Description	File name	Issue date
	N/A		

No.	Test model	Features
1	MY-82003	/
2		
3		
4		
5		
6		

1.2 **The environment(s) in which the EUT is intended to be used**

The equipment under test (EUT) is intended to be used in the following environment(s):

☒	Residential (domestic) environment.
☒	Commercial and light-industrial environment.
☐	Industrial environment.
☐	Vehicular environment

1.3 **Test data**

Location	DEKRA Testing and Certification (Shanghai) Ltd.
Address	No.250, Jiangchangsan Road, Jing'an District, Shanghai, China
Date of receipt of test item	2025-03-19
Date(s) of performance of tests	2025-03-19 to 2025-03-25

2 DESCRIPTION OF TEST SETUP

2.1 Operating mode(s) used for tests

During the tests the following operating mode(s) has(have) been used.

Operating mode	Operating mode description	Used for testing	
		Emission	Immunity
1	Smooth mode	☒	☒
2	Fade mode	☒	☒
3	Dimming: Max light output	☒	☒
4	Dimming: Min light output	☒	☒
5	Dimming: Mid light output	☒	☒
6	Color shifting: Red	☒	☒
7	Color shifting: Yellow	☒	☒
8	Color shifting: Blue	☒	☒
9	Handling mode	☐	☒
Supplemental information: 1) The RF disturbance level was investigated at all operating modes listed. Mode 2 was the worst mode radiated disturbance respectively. The worst case results were reported.			

2.2 Port(s) of the EUT

Port name and description	Port name / description	Cable		
		Length used during test [m]	Attached during test	Shielded
N/A			☐	☐
			☐	☐
			☐	☐
			☐	☐
			☐	☐
Supplemental information: ---				

2.3 Support / Auxiliary equipment / unit / software for the EUT

The EUT has been tested with the following auxiliary equipment / unit / software:

Auxiliary equipment / unit / software	Type / Version	Manufacturer	Supplied by
N/A			
Supplemental information: ---			

3 VERDICT SUMMARY SECTION

This chapter presents an overview of standards and results. Refer to the next chapters for details of measured test results and applied test levels.

3.1 Standards

Standard	Year	Description
EN IEC 55015 +A11	2019 2020	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment
EN 55016-2-1 +A1	2014 2017	Methods of measurement of disturbances and immunity - Conducted disturbance measurements.
EN 55016-2-3	2017	Methods of measurement of disturbances and immunity - Radiated disturbance measurements.
EN 55032	2015	Electromagnetic compatibility of multimedia equipment – Emission requirements.
EN IEC 61547	2023	Equipment for general lighting purposes – EMC immunity requirements.
EN 61000-4-2	2009	Electrostatic discharge immunity test.
EN 61000-4-3 +A1 +A2	2006 2008 2010	Radiated, radio-frequency, electromagnetic field immunity test.
EN 61000-4-4	2012	Electrical fast transient/burst immunity test.
EN 61000-4-5 +A1	2014 2017	Surge immunity test.
EN 61000-4-6	2014	Immunity to conducted disturbances, induced by radio-frequency fields.
EN 61000-4-8	2010	Power frequency magnetic field immunity test.
EN 61000-4-11 +A1	2004 2017	Voltage dips, short interruptions and voltage variations immunity tests.

3.2 Deviation(s) from the Standard(s) / Test Specification(s)

The following deviation(s) was / were made from the published requirements of the listed standards:

No deviation(s)

3.3 Overview of results

EMISSION TESTS – EN IEC 55015			
Requirement – Test case	Basic Standard(s)	Verdict	Remark
Conducted disturbance at electric power supply interface	EN 55016-2-1	N/A	See 1)
Conducted disturbance at wired network interfaces other than power supply		N/A	See 1)
Conducted disturbance at electric power supply interface of non-restricted ELV lamps		N/A	See 1)
Conducted disturbance at local wired ports other than electric power supply interface of ELV lamp		N/A	See 1)
Radiated disturbance (9 kHz to 30 MHz)	EN IEC 55015 EN 55032 EN 55016-2-3	PASS	---
Radiated disturbance (30 MHz to 1 GHz)		PASS	---
<u>Supplementary information:</u>			
1) The EUT does not have an AC mains power input / output port.			

IMMUNITY TESTS – EN IEC 61547			
Requirement – Test case	Basic Standard(s)	Verdict	Remark
Electrostatic discharge	EN 61000-4-2	PASS	---
Radio-frequency electromagnetic fields	EN 61000-4-3	PASS	---
Fast transients	EN 61000-4-4	N/A	See 1)
Surge transient	EN 61000-4-5	N/A	See 1)
Injected currents (radio-frequency common mode)	EN 61000-4-6	N/A	See 1)
Power frequency magnetic fields	EN 61000-4-8	N/A	See 2)
Voltage dips and short interruptions	EN 61000-4-11	N/A	See 1)
<u>Supplementary information:</u>			
1) Not applicable because no test requirements have been specified for DC/battery powered apparatus.			
2) The apparatus does not contain any components susceptible to this low-frequency magnetic fields.			

4 EMISSION TEST RESULTS

4.1 Radiated disturbances (9 KHz – 30 MHz)	VERDICT: PASS
--	---------------

Standard	EN IEC 55015
Basic standard	EN 55016-2-3
Test method	Large Loop Antenna (LLA) or Loop antenna

Limits LLA- D ≤ 1.6m

Frequency range [MHz]	Limit: QP [dB(μV/m) ¹⁾	IF BW	Detector(s)
0.009 - 0.07	88	200 Hz	Quasi-Peak (QP)
0.07 - 0.15	88 – 58 ²⁾	200 Hz	Quasi-Peak (QP)
0.15 - 2.2	58 – 22 ²⁾	9 KHz	Quasi-Peak (QP)
2.2 - 3.0	58 ³⁾	9 KHz	Quasi-Peak (QP)
3.0 - 30	22	9 KHz	Quasi-Peak (QP)
¹⁾ At the transition frequency, the lower limit applies. ²⁾ The limit decreases linearly with the logarithm of the frequency. ³⁾ For lighting equipment incorporating exclusively electrodeless lamps, the limit applies.			

Performed measurements

Port under test	Enclosure	
Voltage – Mains [V]	Battery 4.5V	
Frequency – Mains [Hz]	/	
Applied Limit for antenna measurement (Table 9)	☐	Loop antenna radiated disturbance limit 9 kHz – 30 MHz for equipment with a dimension > 1.6 m
Applied limit according to LLAS diameter (Table 8)	☒	2 m for equipment length not exceeding 1.6m
	☐	3 m for equipment length between 1.6 m and 2.6 m
	☐	4 m for equipment length between 2.6 m and 3.6 m
Test setup	☒	Equipment placed in the centre of the LLAS
	☐	Equipment on a table 80 cm height
	☐	Equipment on the floor (isolated from ground plane)
	☐	Other: --
	Refer to the Annex 3 for test setup photo(s).	
Operating mode(s) used	Mode 1~8	
Remark	The RF disturbance level was investigated at all operating modes listed at chapter 2.1 respectively. The worst case results were reported.	

See next page.

Measurement data	☒	X-axis	☒	Y-axis	☒	Z-axis								
Operating mode / voltage / frequency used during the test		Mode 3 / Battery 4.5V												
Model: 1														
<table><tr><td rowspan="2">Frequency [MHz]</td><td colspan="2">QP [dB(μV)]</td></tr><tr><td>Level</td><td>Limit</td></tr><tr><td>0.009 - 30</td><td colspan="2">More than 20 dB below the limit</td></tr></table>							Frequency [MHz]	QP [dB(μV)]		Level	Limit	0.009 - 30	More than 20 dB below the limit	
Frequency [MHz]	QP [dB(μV)]													
	Level	Limit												
0.009 - 30	More than 20 dB below the limit													
No significant emissions were recorded at the frequency range of interest employing the QP detectors.														
Remark	The given graph is the combination of max-hold function													

4.2	Radiated disturbances (30 MHz – 1000 MHz)	VERDICT: PASS
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Standard	EN IEC 55015
Basic standard(s)	EN 55016-2-3, EN 61000-4-20
Test method	Antenna method

Limits-OATS or SAC

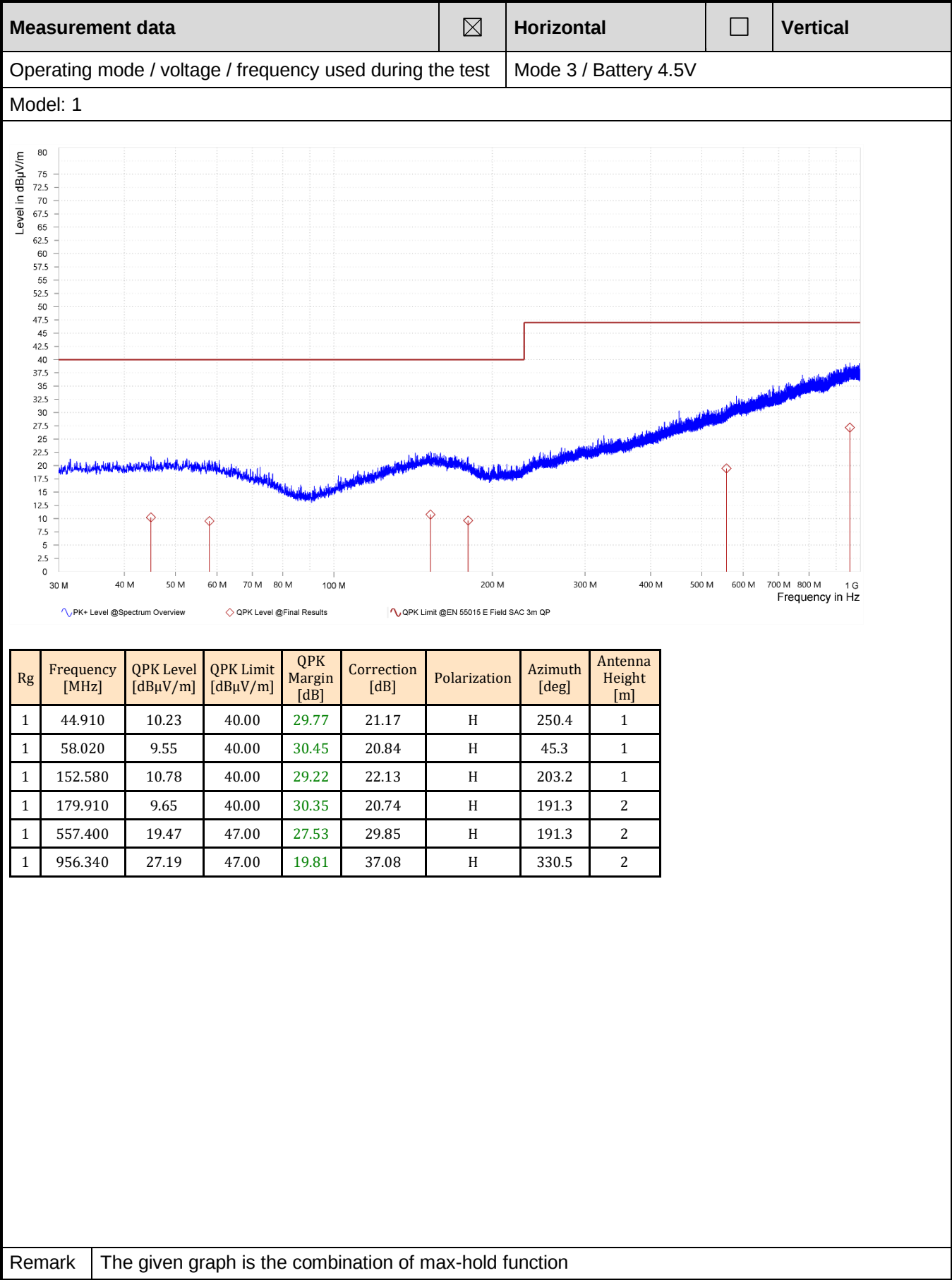
Frequency [MHz]	Limit: QP [dB(μV/m) ¹⁾]			IF BW	Detector
	@3 m.	@5 m.	@10 m.		
30 - 230	40	36	30	120 KHz	QP
230 - 1000	47	43	37	120 KHz	QP

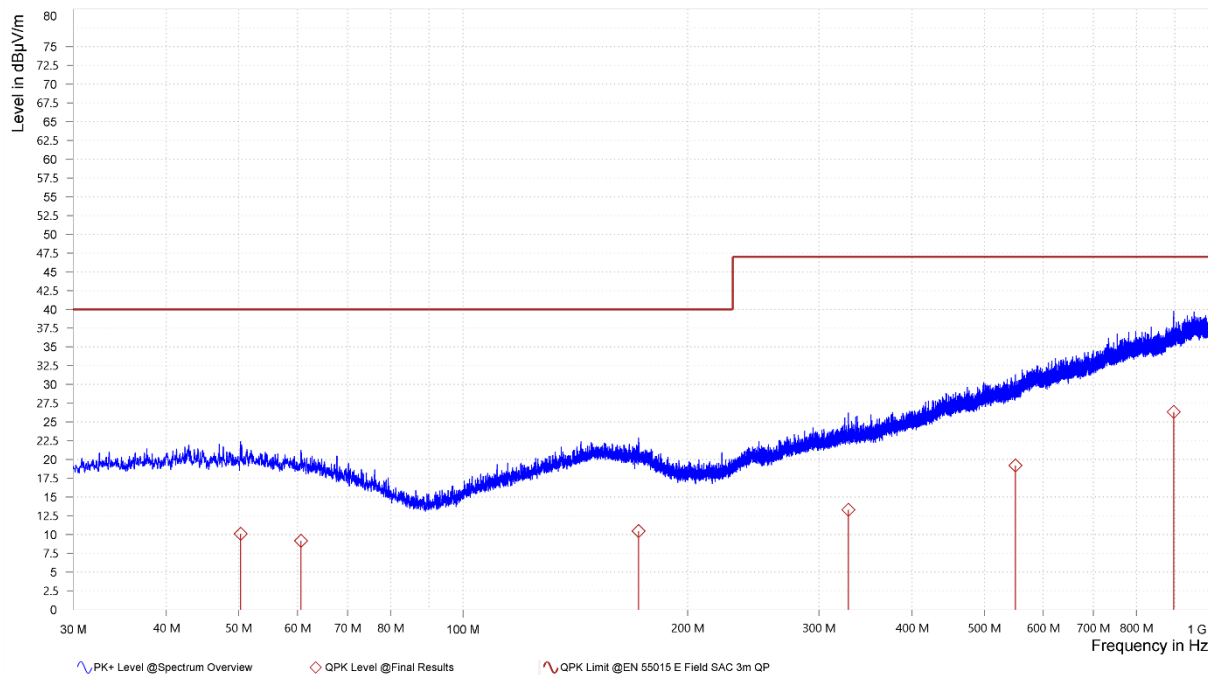
¹⁾ At the transition frequency, the lower limit applies.

Performed measurements

Port under test	Enclosure	
Voltage – Mains [V]	Battery 4.5V	
Frequency – Mains [Hz]	/	
Test method	☒	Semi Anechoic Chamber (SAC) with measurement distance [m]: 3 m.
	☐	Open Area Test Site (OATS)
	☐	FAR with measurement distance [m]: 3 m
	☐	TEM Waveguide (test item without cables and max. 300 mm dimension)
Test setup	☒	Equipment on a table of 80 cm height
	☐	Equipment on the floor (insulated from ground plane)
	☐	Equipment located approximately in the middle of the validated test volume (FAR)
	☐	Other:
Refer to the Annex 3 for test setup photo(s).		
Operating mode(s) used	Mode 1~8	
Remark	The RF disturbance level was investigated at all operating modes listed at chapter 2.1 respectively. The worst case results were reported.	

See next page.



Measurement data		☐	Horizontal	☒	Vertical			
Operating mode / voltage / frequency used during the test			Mode 3 / Battery 4.5V					
Model: 1								
								
Rg	Frequency [MHz]	QPK Level [dBµV/m]	QPK Limit [dBµV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	50.310	10.10	40.00	29.90	21.30	V	314.8	1.5
1	60.630	9.16	40.00	30.84	20.59	V	25.8	1.5
1	171.930	10.47	40.00	29.53	21.55	V	322.8	1
1	328.650	13.29	47.00	33.71	24.30	V	0	1
1	550.320	19.20	47.00	27.80	29.58	V	220.6	1
1	897.090	26.35	47.00	20.65	36.04	V	204.9	1.5
Remark	The given graph is the combination of max-hold function							

5 IMMUNITY TEST RESULTS

5.1 Classification according to EN IEC 61547

The immunity test requirements apply to the following lighting equipment:

☐	Self-ballasted lamps
☒	Lighting equipment (excluding self-ballasted lamps) and module in host
☐	Lighting equipment for emergency lighting

5.2 Performance (Compliance) criteria

[According to EN IEC 61547]

Performance criteria A : During the test no change of the luminous intensity shall be observed and the regulating control, if any, shall operate during the test as intended. The luminous intensity shall be deemed to be unchanged if the measured intensities do not deviate by more than 15 %.

Performance criteria B : During the test the luminous intensity may change to any value. After the test the luminous intensity shall be restored to its initial value within 1 min. Regulating controls need not function during the test, but after the test the mode of the control shall be the same as before the test provided that during the test no mode changing commands were given.

Performance criteria C : During and after the test any change of luminous intensity is allowed and the lamp(s) may be extinguished. After the test, within 30 min, all functions shall return to normal if necessary by temporary interruption of the mains supply and/or operating the regulating control.

Product		Test (subclause – of this document) and performance criteria							
		5.4 (ESD)	5.5 (RI)	5.6 (EFT)	5.7 (Surge)	5.8 (RF-CI)	5.9 (MI)	5.10 (Dips&Interruptions)	
								Dips	Interruption
☐	Self-ballasted lamps	B	A	B	C	A	A	B	B
☒	Lighting equipment (excluding self-ballasted lamps) and module in host	B ⁶⁾	A	B	C	A	A	B	B ¹⁾
☐	Luminaire for emergency lighting ⁵⁾	B ²⁾	A	B ²⁾	B ²⁾	A	A	See ³⁾	See ³⁾

Supplementary information:

¹⁾ For ballasts where the lamp is not able to restart within 1 min, due to the physical constraints of the lamp, performance criterion C applies.

²⁾ For emergency luminaires designed to operate in high-risk task areas, after the test, the luminous intensity shall be restored to its initial value within 0.5 s.

³⁾ These tests do not apply as they are covered by the test in IEC 60598-2-22.

⁴⁾ These tests apply for built-in auxiliaries which set for independent auxiliaries

⁵⁾ Luminaires for emergency lighting shall be tested in both the normal and emergency mode of operation.

⁶⁾ Criterion C applies to lighting equipment (and/or modules) for road and street lighting.

5.2.1 Manufacturer defined performance criteria

Not provided.

5.3 Monitored – Checked Functions / Parameters

During the immunity tests the following functions of the EUT has/have been monitored/checked.

☐	Motor speed	☐	Display data
☐	Switching	☐	Data storage
☒	Standby mode	☐	Sensor functions
☐	Temperature	☐	Audible signals
☐	Power consumption	☒	Others : LED's
☐	AC mains input current	☐	Others :
☐	Timing	☐	Others :
☒	Illumination	☐	Others :
<u>Supplementary information :</u>			
--			

Immunity test	Monitored - Checked function(s)/parameter(s) during / after the test	Method
Electrostatic discharge	Illumination Standby mode	Visual observation
Radio-frequency electromagnetic fields	Illumination Standby mode	Visual observation / Camera
Fast transients	Illumination Standby mode	Visual observation
Surge transient	Illumination Standby mode	Visual observation
Injected currents (radio-frequency common mode)	Illumination Standby mode	Visual observation
Voltage dips and short interruptions	Illumination Standby mode	Visual observation
<u>Supplementary information :</u>		
In case of doubt, the luminous intensity shall be deemed to be unchanged if the measured intensities do not deviate by more than 15 %.		

5.4	Electrostatic discharge immunity	VERDICT: PASS
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Electrostatic discharges (ESD) are the result of persons or objects that accumulate static electricity due to for instance walking on synthetic carpets. The ESD can influence the operation of equipment or damage its electronics, either by a direct discharge or indirectly by coupling or radiation. Both effects are simulated during the tests.

Requirements

Standard	EN IEC 61547							
Basic standard	EN 61000-4-2							
Port under test	Enclosure							
Air discharges	☒	±2 kV	☒	±4 kV	☒	±8 kV	☐	±15 kV
Contact discharges	☐	±2 kV	☒	±4 kV	☐	±8 kV	☐	kV
Number of discharges	≥ 10 per polarity with ≥ 1 sec interval.							

Performed tests

Set-up	☒	Table-top	☐	Floor standing
Ambient temperature [°C]	22.0		Relative Humidity air [%]	45.9
Voltage – Mains [V]	Battery 4.5V			
Frequency – Mains [Hz]	/			
Operating mode(s) used	Mode 1~9			

Test Point (Location of discharge)		Test Voltage [kV] & Polarity	Coupling type	# of applied discharges / polarity	Discharge interval [s]
☒	Points on conductive surface touchable by hand	±2, ±4	Contact	10	1
☒	Points on non-conductive surface touchable by hand	±2, ±4, ±8	Air	10	1
☒	HCP top side.	±4	Contact	10	1
☒	HCP bottom side.	±4	Contact	10	1
☒	VCP right side.	±4	Contact	10	1
☒	VCP left side.	±4	Contact	10	1
☒	VCP front side.	±4	Contact	10	1
☒	VCP rear side.	±4	Contact	10	1
Observation(s)		During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance or data was observed.			
Supplementary information:					

5.5	Radio-frequency electromagnetic fields immunity	VERDICT: PASS
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During the test it is verified if the equipment under test (EUT) has sufficient immunity against radiated electromagnetic fields. Industrial electromagnetic sources, walkie-talkies, radio transmitters, television transmitters and telecommunication equipment including cellular telephones and other emitting devices can generate these fields.

Requirements

Standard	EN IEC 61547			
Basic standard	EN 61000-4-3			
Port under test	Enclosure			
Frequency range	Test level	Modulation	Dwell time	Step size
80 MHz – 1000 MHz	3 V/m	80% AM (1kHz)	≥ 0.5 s	≤ 1%
Supplementary information:				
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Performed tests

Test method	☒	EN 61000-4-3	☐	EN 61000-4-20		
Test set-up	☒	Equipment on the table (0.8 m height)				
(see annex 3 for photo)	☐	Equipment standing on floor (0.05 – 0.15 m height)				
Voltage – Mains [V]	Battery 4.5V					
Frequency – Mains [Hz]	/					
Operating mode(s) used	Mode 1~9					
Frequency range (applied)	Antenna Polarization	Test level (applied)	Modulation (applied)	Dwell time (applied)	Remark	
80 MHz – 1000 MHz (step size 1%)	H	3 V/m	80% AM (1kHz)	3 s	1%	
	V	3 V/m	80% AM (1kHz)	3 s	1%	
Exposed side of the EUT	☒	Front (0°)	☒	Right (90°)	☒	Top
	☒	Rear (180°)	☒	Left (270°)	☒	Bottom
Observation(s)	During the test no loss of performance was observed. After the test the EUT functioned as intended. No unacceptable loss of performance was observed.					
<u>Supplementary information:</u>						

6 IDENTIFICATION OF THE EQUIPMENT UNDER TEST

The photographs show the tested device.



7 ANNEX 1 - MEASUREMENT UNCERTAINTIES

The table(s) below show(s) measurement uncertainties of the EMC test set-ups. The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

Emission tests		U_{LAB}	U_{CISPR}
Conducted disturbance using AMN 9 kHz – 150 kHz	Shielded Room No.1 AMN: R&S ENV216	3.1 dB	3.8 dB
Conducted disturbance using AMN 150 kHz – 30 MHz		2.6 dB	3.4 dB
Conducted disturbance using AMN 9 kHz – 150 kHz	Shielded Room No.2 AMN: R&S ENV216	3.0 dB	3.8 dB
Conducted disturbance using AMN 150 kHz – 30 MHz		2.5 dB	3.4 dB
Conducted disturbance using AMN 9 kHz – 150 kHz	Shielded Room No.2 AMN: R&S ENV432	3.2 dB	3.8 dB
Conducted disturbance using AMN 150 kHz – 30 MHz		2.7 dB	3.4 dB
Conducted disturbance using AAN 150 kHz – 30 MHz	AAN: ENV81-CA6- Cat 6	2.7 dB	5.0 dB
	AAN: ENV81- Cat 5	2.7 dB	
	AAN: ENV81- Cat 3	2.9 dB	
	AAN: NTFM8131	4.0 dB	
Conducted disturbance using CP 150 kHz – 30 MHz	CP: 91550-1L	2.3 dB	2.9 dB
Conducted disturbance using CVP 150 kHz – 30 MHz	CVP: CVP 9222 C	2.5 dB	3.9 dB
Conducted disturbance using VP 150 kHz – 30 MHz	Voltage Probe: TK9421	1.9 dB	2.9 dB
Conducted disturbance using CDNE 30 MHz – 300 MHz	CDNE: CDNE M2	3.0 dB	3.8 dB
	CDNE: CDNE M3	3.0 dB	
Disturbance power using Absorbing clamp 30 MHz – 300 MHz	Absorbing clamp: MDS 21B	4.0 dB	4.5 dB
Radiated disturbance using Large Loop Antennas 9 kHz – 30 MHz	LLAS: HXYZ 9170	3.1 dB	3.3 dB
Radiated disturbance using Active Loop Antenna 9 kHz – 30 MHz	ALA: HFH2-Z2E	2.3 dB	N/A
Radiated disturbance in a SAC 30 MHz – 1000 MHz	Horizontal polarization	4.8 dB	6.3 dB
	Vertical polarization	5.4 dB	
Radiated disturbance in a FAR 1000 MHz – 6000 MHz		4.8 dB	5.2 dB
Radiated disturbance in a FAR 6000 MHz – 18000 MHz		4.9 dB	5.5 dB
Radiated disturbance in a FAR 18000 MHz – 40000 MHz		3.5 dB	N/A
Harmonic current emissions		0.6 %	N/A
Voltage changes, Voltage fluctuations and Flicker		2.8 %	N/A

Immunity tests		U_{LAB}	U_{IEC} (Recommendation)
Electrostatic discharge	Rise time (t_r)	12.4 %	≤ 15 %
	Peak current (I_p)	6.4 %	≤ 7 %
	Current at 30 ns (I_{30})	6.4 %	≤ 7 %
	Current at 60 ns (I_{60})	6.4 %	≤ 7 %
Electrical fast transients/burst	Rise time (t_r)	7.2 %	N/A
	Peak voltage (V_p)	6.8 %	
	Pulse width (t_w)	5.4 %	
Surge	Front time (t_f)	4.3 %	N/A
	Peak voltage (V_p)	6.7 %	
	Voltage duration (T_d)	1.3 %	
Conducted disturbances, induced by radio-frequency fields	CDN (v)	1.6 dB	N/A
	EM clamp (v)	3.6 dB	
Power frequency magnetic field	Test level: 1 A/m (I_1)	0.1 A/m	N/A
	Test level: 3 A/m (I_3)	0.3 A/m	
	Test level: 10 A/m (I_{10})	0.8 A/m	
	Test level: 30 A/m (I_{30})	2.1 A/m	
Voltage dips, short interruptions and voltage variations	Time at reduced voltage (t_s)	3.0 %	N/A
	Voltage rising time (t_r)	3.0 %	
	Voltage fall time (t_f)	3.0 %	
	Voltage dips (v)	0.4 %	
Radiated radio-frequency electromagnetic field 80 MHz – 1000 MHz		1.9 dB	N/A
Radiated radio -frequency electromagnetic field 1000 MHz – 6000 MHz		2.0 dB	N/A

8 ANNEX 2 – USED EQUIPMENT

Radiated disturbance (9 kHz to 30 MHz)				
Equipment	Manufacturer	Model No.	Serial No.	Cal. due date
EMI test receiver	R&S	ESCI	101351	2025/06/13
3-dimensional large loop antenna	SCHWARZBECK	HXYZ 9170	HXYZ9170-245	2025/06/13
Software	AUDIX	e3	V8.130528a	N/A
Radiated disturbance (30 MHz to 1000 MHz) -Anechoic Chamber No.1				
Equipment	Manufacturer	Model No.	Serial No.	Cal. due date
EMI test receiver	R&S	ESR7	102433	2025/11/05
Trilog broadband antenna+Attenuator	SCHWARZBECK	VULB9163/6dB	01514	2026/02/28
Open Switch and control unit	R&S	OSP220	102232	N/A
Coupling/Decoupling Network	SCHWARZBECK	CDNE M2	00194	2025/06/13
Coupling/Decoupling Network	SCHWARZBECK	CDNE M3	00204	2025/11/13
CMAD	SCHWARZBECK	CMAD1614	00538	2025/11/05
Software	R&S	ELEKTRA	4.20.2	N/A
Electrostatic discharge immunity				
Equipment	Manufacturer	Model No.	Serial No.	Cal. due date
ESD generator	TESEQ	NSG 438	6716	2025/08/22
Radio-frequency electromagnetic fields immunity (80 MHz~1000 MHz) -Anechoic Chamber No.2				
Equipment	Manufacturer	Model No.	Serial No.	Cal. due date
Signal generator	R&S	SMB100B	103114	2025/11/28
Broadband Amplifier	R&S	BBA150 BC250	104841	2025/11/28
High Gain Log-periodic antenna	R&S	HL046E	100355	N/A
Open Switch and control unit	R&S	OSP220	102233	N/A
NRP6AN average power sensor	R&S	NRP6AN	101697	2025/11/28
NRP6AN average power sensor	R&S	NRP6AN	101698	2025/11/28
Field probe	LUMILOOP	LSProbe 1.2	531	2025/10/10
Software	R&S	ELEKTRA	4.20.2	N/A

9 ANNEX 3 – TEST PHOTOS

Radiated disturbances (9 kHz to 30 MHz)



Radiated disturbances (30 MHz to 1000 MHz)



Radiated EM Field Immunity



Electrostatic discharge immunity



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