Microtest
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Test Report

Report No.: MTi220606005-01E1

Date of issue: 2022-06-14

Applicant: Xindao B.V.

Product name: Telescopic light with magnet

Model(s): P513.651

Shenzhen Microtest Co., Ltd.
http://www.mtitest.com

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Table of Contents

TEST RESULT CERTIFICATION	
Applicant's name:	Xindao B.V.
Address :	Lange Kleiweg 6, 2288 GK Rijswijk The Netherlands.
Manufacturer's Name:	Xindao B.V.
Address :	Lange Kleiweg 6, 2288 GK Rijswijk The Netherlands.
Factory's Name :	Xindao B.V.
Address :	Lange Kleiweg 6, 2288 GK Rijswijk The Netherlands.
Product description	
Product name..... :	Telescopic light with magnet
Trademark ..... :	N/A
Model Name ..... :	P513.651
Serial Model.....	N/A
Standards..... :	EN IEC 55015:2019+A11:2020 EN 61547:2009
Date of Test	
Date (s) of performance of tests… :	2022-06-08 ~ 2022-06-14
Test Result..... :	Pass
This device described above has been tested by Shenzhen Microtest Co., Ltd. and the test results show that the equipment under test (EUT) is in compliance with the EMC requirements. And it is applicable only to the tested sample identified in the report.	

Testing Engineer : Maleah Deng

(Maleah Deng)

Technical Manager : Leon Chen

(Leon Chen)

Authorized Signatory : Tom Xue

(Tom Xue)

Summary of Test Result

Item	Description of Test	Result
EN 55015		
1	Conducted emission	N/A
2	Radiated emission	Pass
3	Magnetic Field Emission	Pass
EN 61547		
1	Electrostatic discharge immunity (ESD)	Pass
2	Radiated electromagnetic field immunity (RS)	Pass
3	Fast transients / burst immunity (EFT)	N/A
4	Surge immunity	N/A
5	Conducted disturbance immunity (CS)	N/A
6	Voltage interruptions & voltage Dips	N/A
EN 61000-3-2 & EN61000-3-3		
1	Harmonic current emission	N/A
2	Voltage fluctuations & flicker	N/A

Note: N/A mean not applicable.

1 General description

1.1 Feature of equipment under test (EUT)

Product name:	Telescopic light with magnet
Model name:	P513.651
Series Model：	N/A
Different of series model:	N/A
Power supply:	Input: 6V Powered by button cell
Battery:	DC 1.5V 160mAh(LR44)
Adapter information:	N/A

1.2 Test mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Test mode	Description
Mode 1	Lighting

Note: The test modes were carried out for all operation modes. The final test mode of the EUT was the worst test mode for EMI, and its test data was showed.

1.3 Test conditions

During the measurement the environmental conditions were within the listed ranges:

- Temperature: 20ºC~30ºC
- Humidity: 30%~70%
- Atmospheric pressure: 98kPa~101kPa

1.4 EUT test setup

See photographs of the test setup in the report for the actual setup and connections between EUT and support equipment.

1.5 Ancillary equipment and line list

Equipment	Model	S/N	Manufacturer
/	/	/	/

1.6 Measurement Uncertainty

Measurement Uncertainty for a Level of Confidence of 95 %, U=2xUc(y)

Conducted disturbance (150kHz ~ 30MHz)	± 2.5 dB
Radiated disturbance (30MHz ~ 1GHz)	± 4.2 dB
Disturbance power (30MHz ~ 300MHz)	± 2.8 dB
Temperature	±1 degree
Humidity	± 5 %

1.7 Test software

Software name	Manufacturer	Model	Version
EMI Measurement Software	Farad	EZ-EMC	V1.1.4.2
Conducted immunity test system	Scholder	EN61000-4-6.exe	V1.3.0
Harmonics and flicker test system	TTI	HA-PC Link	V2.02
DIPS Test Firmware	Prima	DRP61011AG	V4.1.2
EFT Test Firmware	HTEC	HCOMPACT	V1.0.1
Surge Test Firmware	HTEC+	HCOMPACT	V1.0.1

2 Testing site

Test Site	Shenzhen Microtest Co., Ltd.
Test Site Location	101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao' an District, Shenzhen, Guangdong, China.
Telephone:	(86-755)88850135
Fax:	(86-755)88850136
CNAS Registration No.:	CNAS L5868

3 List of test equipment

Radiation emission							
Item	Equipment name	Equipment No.	Manufacturer	Model	Serial No.	Calibration date	Due date
1	EMI Test Receiver	MTI-E043	Rohde&schwarz	ESPI7	101166	2022/05/05	2023/05/04
2	Broadband antenna	MTI-E044	schwarabeck	VULB9163	9163-1338	2021/05/30	2023/05/29
3	Horn antenna	MTI-E045	schwarabeck	BBHA9120D	9120D-2278	2021/05/30	2023/05/29
4	amplifier	MTI-E047	Hewlett-Packard	8447D	3113A06150	2022/05/05	2023/05/04
5	1GHz-26.5GHz Amplifier	MTI-E048	Agilent	8449B	3008A02400	2022/05/05	2023/05/04

Electrostatic discharge immunity							
Item	Equipment name	Equipment No.	Manufacturer	Model	Serial No.	Calibration date	Due date
1	Electrical Discharge Simulator	MTi-E113	3CTEST	EDS 30V	ES031000420021	2022/05/05	2023/05/04

RS equipment						
Item	Equipment	Manufacturer	Model	Serial No.	Calibration Due	Due date
1	Power Amplifier	micotop	MPA-80-1000-250	MPA1903081	2022/05/05	2023/05/04
2	Power Amplifier	micotop	MPA-1000-6000-75	MPA1903082	2022/05/05	2023/05/04
3	MXG RF Signal Generator	Agilent	N5181A	MY47420567	2022/05/05	2023/05/04
4	Stacked Log. Per. Broadband Antenna	Schwarzbeck	STLP 9129	9129 113	2022/05/05	2023/05/04
5	Three-phase Frequency Conversion Power Supply	shenzhen tongyuan	TY-8330	201710130 2651	2022/05/05	2023/05/04
6	DC Power Source	shenzhen tongyuan	TY-500V 100A	201710190 325689	2022/05/05	2023/05/04
7	Gauss Meter	TRIAXIAL ELF	TES-1393	190200579	2022/05/05	2023/05/04

Magnetic Field Emission							
Item	Equipment name	Equipment No.	Manufacturer	Model	Serial No.	Calibration Due	Due date
1	Loop antenna	MTi-E028	Laplace Instruments LTD	RF 300	9156	2022/05/05	2023/05/04
2	Artificial power network	MTI-E023	Schwarzbeck	NSLK8127	NSLK8127#841	2022/05/05	2023/05/04
3	EMI Test Receiver	MTI-E021	Rohde&schwarz	ESCS30	100210	2022/05/05	2023/05/04
4	8-wire Impedance Stabilization Network	MTI-E026	Schwarzbeck	NTFM 8158	NTFM 8158 #199	2022/05/05	2023/05/04
5	Artificial power network	MTI-E025	Schwarzbeck	NSLK8127	8127183	2022/05/05	2023/05/04

Note: the calibration interval of the above test instruments is 12 or 24 months and the calibrations are traceable to international system unit (SI).

4 EMC emission test

4.1 Conducted emission

4.1.1 Limits

Frequency (MHz)	At mains terminals (dBμV)	
	Quasi-peak	Average
0.009 - 0.05	110	/
0.05 - 0.15	90~80	/
0.15 - 0.5	66~56	56~46
0.5 - 5	56	46
5 - 30	60	50

4.1.2 Test procedures

The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

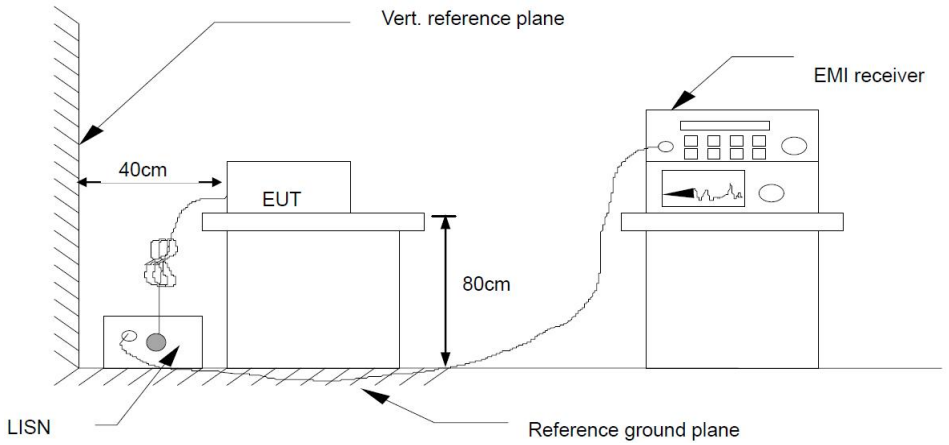
Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

LISN is at least 80 cm from nearest part of EUT chassis.

For the actual test configuration, please refer to the related Item – photographs of the test setup.

4.1.3 Test setup



4.1.4 Test result

Note: The device is a DC power supply and does not apply to conducted emissions.

4.2 Radiated emission

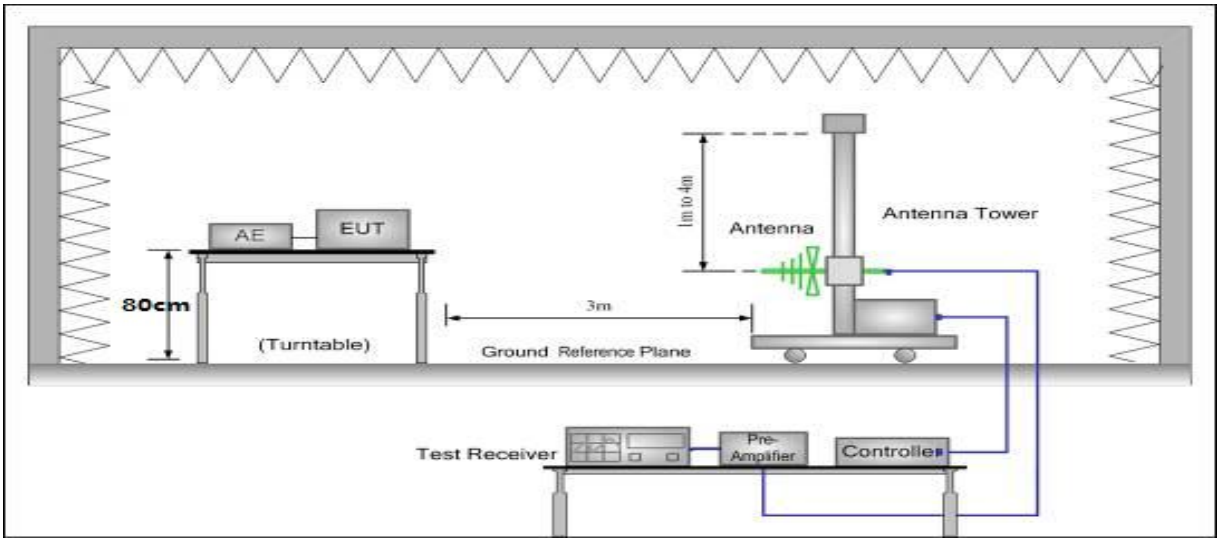
4.2.1 Limits

Frequency (MHz)	Class B (at 3m) dBμV/m
	Quasi-peak
30-230	40
230-1000	47

4.2.2 Test Procedures

The radiated emission tests were performed in the 3 meters.
The EUT was placed on the top of a rotating table 0.8 meters above the ground. The table was rotated 360 degrees to determine the position of the highest radiation.
The height of the test antenna shall vary between 1m to 4m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
If the peak mode measured value compliance with and lower than quasi peak mode limit, the EUT shall be deemed to meet QP limits and then no additional QP mode measurement performed.
If the peak mode measured value compliance with and lower than average mode limit, the EUT shall be deemed to meet average limits and then no additional average mode measurement performed.
For the actual test configuration, please refer to the related item – EUT test photos.

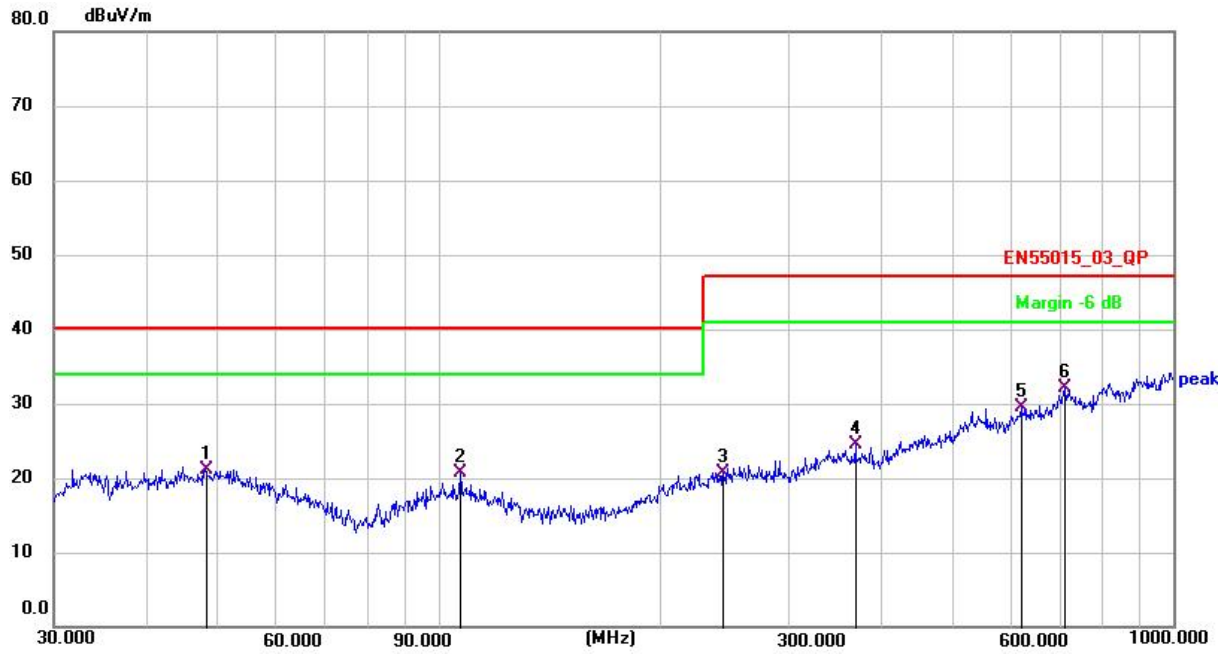
4.2.3 Test Setup



4.2.4 Test Result

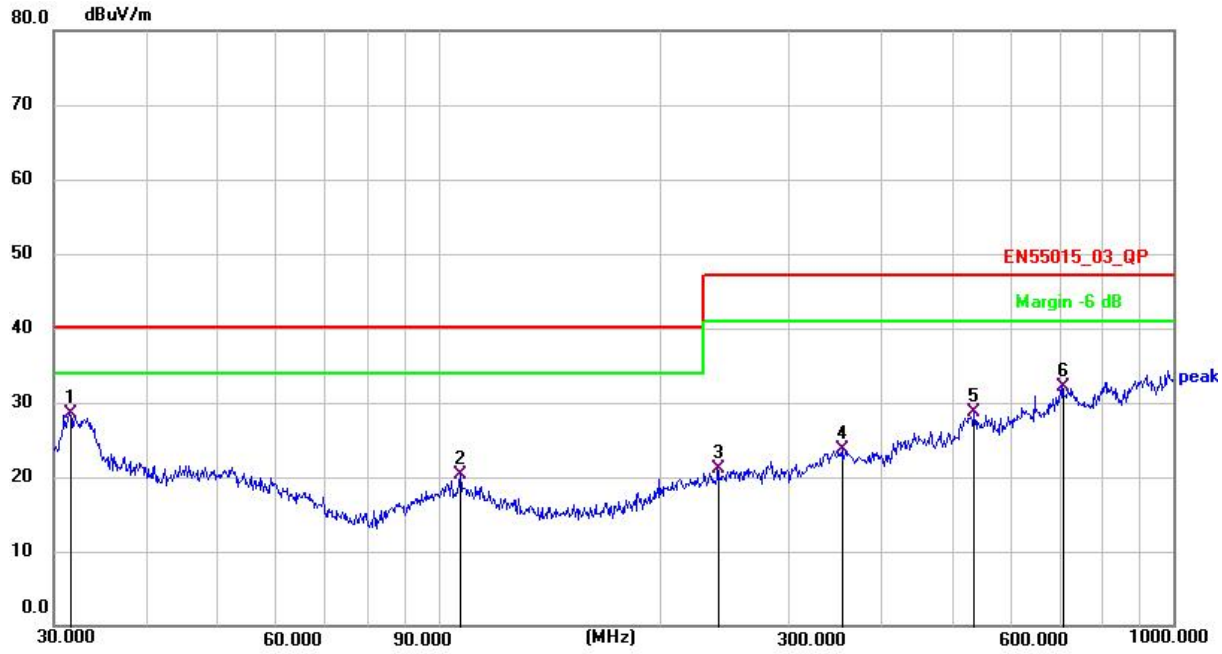
Formula:
Measurement Level (dBuV/m) = Reading Level (dBuV/m) + Correct Factor (dBuV/m)
Margin Level (dBuV/m) = Measurement Level (dBuV/m) – Limit Level (dBuV/m)

EUT:	Telescopic light with magnet	Model Name:	P513.651
Pressure:	101kPa	Test Line	Horizontal
Test voltage:	Powered by button cell	Test mode:	Mode 1



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		48.1626	26.73	-5.70	21.03	40.00	-18.97	QP
2		107.1337	27.63	-6.92	20.71	40.00	-19.29	QP
3		244.2321	25.36	-4.59	20.77	47.00	-26.23	QP
4		369.4047	26.47	-2.06	24.41	47.00	-22.59	QP
5		620.7096	26.39	3.20	29.59	47.00	-17.41	QP
6	*	711.6734	27.49	4.59	32.08	47.00	-14.92	QP

EUT:	Telescopic light with magnet	Model Name:	P513.651
Pressure:	101kPa	Test Line	Vertical
Test voltage:	Powered by button cell	Test mode:	Mode 1



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	31.5095	37.34	-8.92	28.42	40.00	-11.58	QP
2		107.1337	27.16	-6.84	20.32	40.00	-19.68	QP
3		239.9874	25.49	-4.32	21.17	47.00	-25.83	QP
4		354.1831	26.32	-2.53	23.79	47.00	-23.21	QP
5		535.7073	27.37	1.27	28.64	47.00	-18.36	QP
6		706.6999	27.46	4.74	32.20	47.00	-14.80	QP

4.3 Magnetic Field Emission

4.3.1 Limits

Frequency (MHz)	Measurement distance 2m
	Quasi-Peak(dBμA)
0.009 ~ 0.07	88
0.07 ~ 0.15	88~58
0.15 ~ 3	58~22
3.0 ~ 30	22

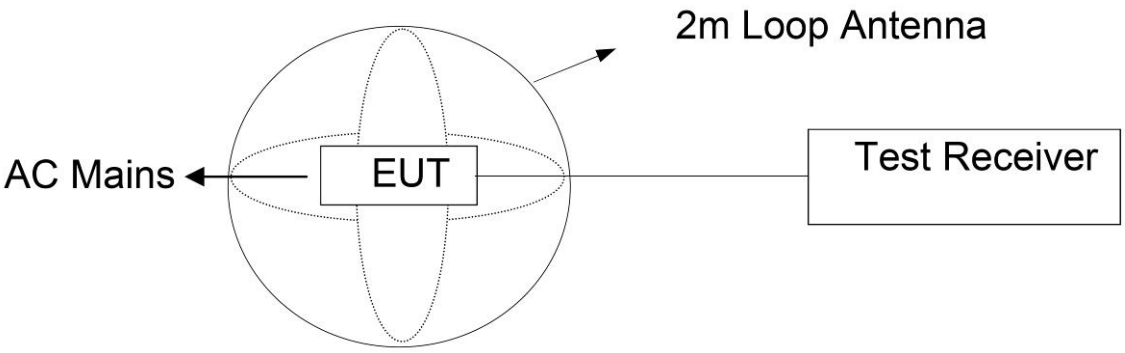
4.3.2 Test procedures

The EUT is placed on a wood table in the center of a loop antenna. The induced current in the loop antenna is measured by means of a current probe and the test receiver. Three field components are checked by means of a coaxial switch.

The frequency range from 9 kHz to 30MHz is investigated. The receiver is measured with the quasi-peak detector. For frequency band 9 kHz to 150 kHz, the bandwidth of the field strength meter (test receiver) is set at 200Hz. For frequency band 150 kHz to 30MHz, the bandwidth is set at 9 kHz.

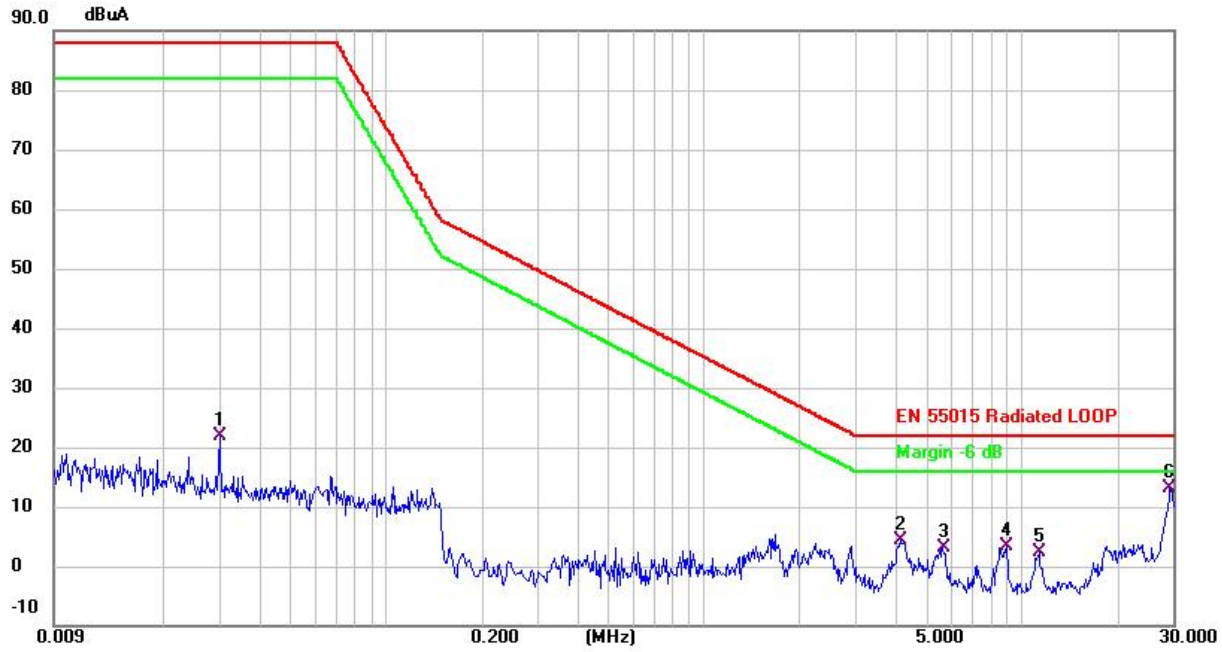
For the actual test configuration, please refer to the related item – EUT test photos.

4.3.3 Test setup



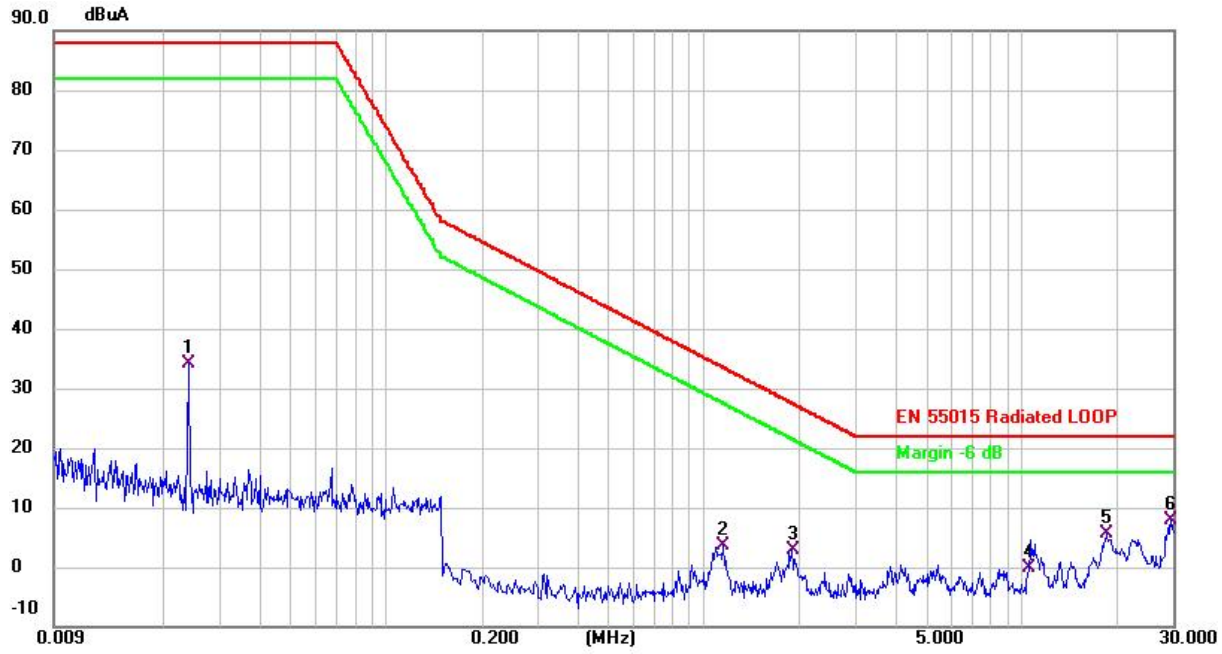
4.3.4 Test result

EUT:	Telescopic light with magnet	Model Name:	P513.651
Pressure:	101kPa	Polarization:	X Line
Test voltage:	Powered by button cell	Test mode:	Mode 1



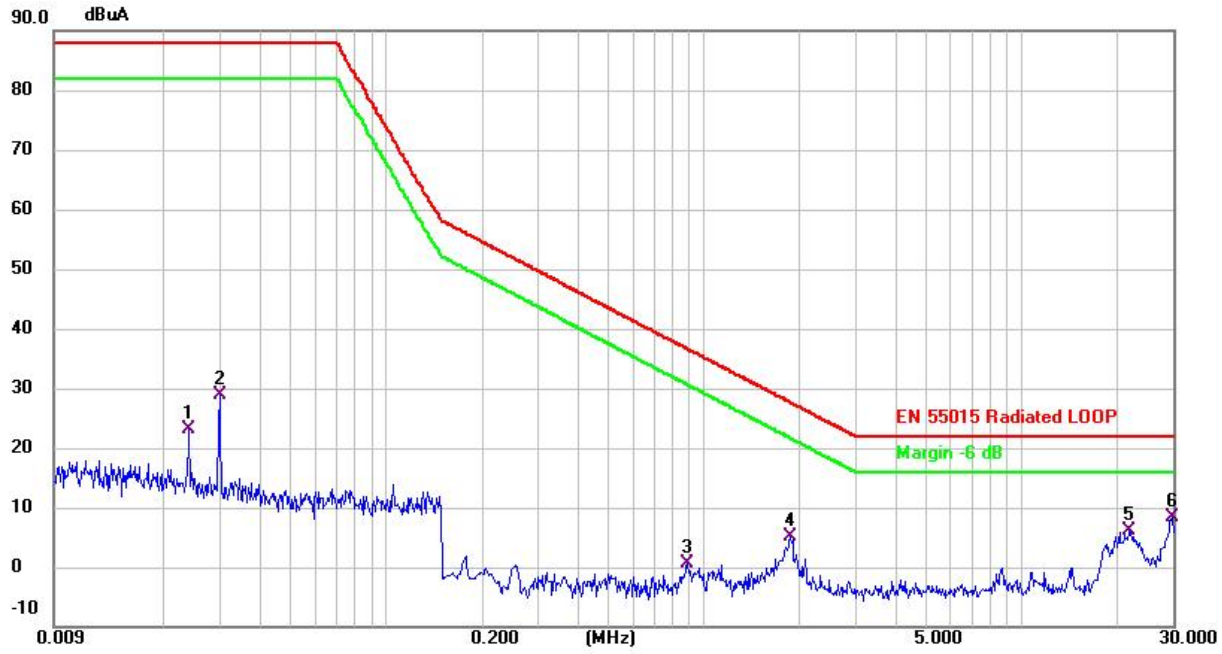
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.0300	20.95	0.87	21.82	88.00	-66.18	QP
2		4.1740	3.51	0.90	4.41	22.00	-17.59	QP
3		5.6540	2.30	0.86	3.16	22.00	-18.84	QP
4		9.0060	2.65	0.79	3.44	22.00	-18.56	QP
5		11.3540	1.63	0.83	2.46	22.00	-19.54	QP
6	*	29.4340	12.32	0.80	13.12	22.00	-8.88	QP

EUT:	Telescopic light with magnet	Model Name:	P513.651
Pressure:	101kPa	Polarization:	Y Line
Test voltage:	Powered by button cell	Test mode:	Mode 1



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.0240	33.24	0.87	34.11	88.00	-53.89	QP
2		1.1539	0.45	3.30	3.75	33.48	-29.73	QP
3		1.9020	-2.02	4.78	2.76	27.48	-24.72	QP
4		10.6100	-0.80	0.80	0.00	22.00	-22.00	QP
5		18.5100	4.36	1.16	5.52	22.00	-16.48	QP
6	*	29.6660	7.02	0.79	7.81	22.00	-14.19	QP

EUT:	Telescopic light with magnet	Model Name:	P513.651
Pressure:	101kPa	Polarization:	Z Line
Test voltage:	Powered by button cell	Test mode:	Mode 1



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.0240	22.15	0.87	23.02	88.00	-64.98	QP
2		0.0300	27.93	0.87	28.80	88.00	-59.20	QP
3		0.8900	-2.22	2.73	0.51	36.60	-36.09	QP
4		1.8780	0.45	4.74	5.19	27.63	-22.44	QP
5		21.8860	5.02	1.14	6.16	22.00	-15.84	QP
6	*	29.9820	7.72	0.77	8.49	22.00	-13.51	QP

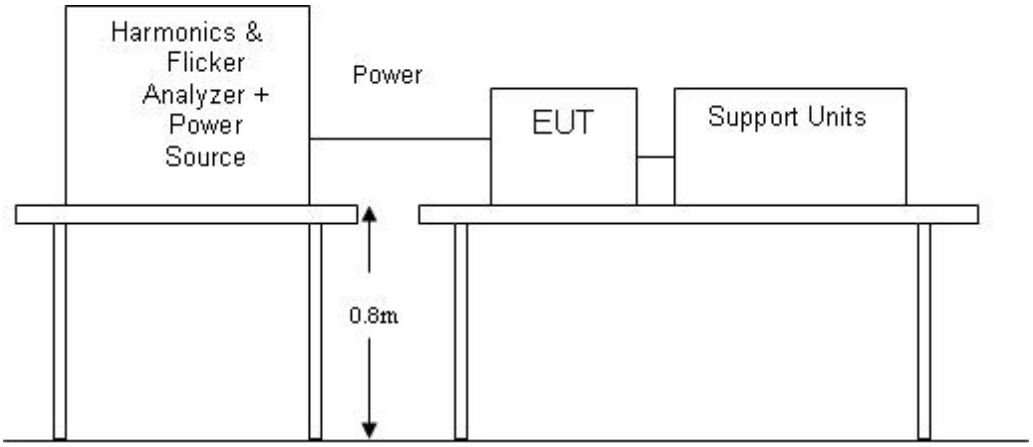
4.4 Harmonic current emission / Voltage fluctuations & flicker

4.4.1 Test Procedures

The EUT was installed and placed on a non-conductive table and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.

The correspondent test program of test instrument to measure the current harmonics / voltage fluctuations & flicker emanated from EUT. The measure time shall be not less than the time necessary for the EUT to be exercised.

4.4.2 Test Setup



4.4.3 Test Result

EUT:	Telescopic light with magnet	Model Name:	P513.651
Pressure:	101kPa	Test mode:	Mode 1

Harmonic current emission:

There is no need for harmonics test to be performed on the EUT (rated power is less than 5W).

Voltage fluctuations & flicker:

Note: This device is not suitable for flicker.

5 Immunity test

5.1 Performance criteria

5.1.1 A functional description of performance criteria, during or as a consequence of the immunity testing, shall be provided by the manufacturer and noted in the test report

The performance of lighting equipment shall be assessed by monitoring:

– the luminous intensity of the luminaire or of the lamp(s);

– the functioning of the control in the case of equipment which includes a regulating control or concerns the regulating control itself;

– the functioning of the starting device, if any.

5.1.2 The performance criteria given hereafter apply to lighting equipment.

Performance criterion 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.

Performance criterion 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 criterion C:

During and after the test, any change of the 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.

Additional requirement for lighting equipment incorporating a starting device: After the test, the lighting equipment is switched off. After half an hour, it is switched on again. The lighting equipment shall start and operate as intended.

5.1.3 A change of luminous intensity may be checked by visual observation but, in case of doubt, the following applies.

The luminous intensity of a luminaire or of the lamp(s) shall be measured by means of a illuminance (lux) meter which is positioned in an axis perpendicular to the main plane of the luminaire or lamp(s), in its centre and at a distance for proper operation of the lux meter. The luminous intensity shall be deemed to be unchanged if the measured intensities do not deviate by more than 15 %.

Care shall be taken to ensure the ambient light level does not influence the measurement results.

Precautions to achieve reproducible results given in the relevant lamp performance standards shall be observed.

5.2 Electrostatic discharge immunity (ESD)

5.2.1 Test Procedures

The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

Contact discharge was applied to conductive surfaces and coupling planes of the EUT. During the test, it was performed with single discharges. For the single discharge time between successive single discharges was at least 1 second.

Vertical Coupling Plane (VCP):

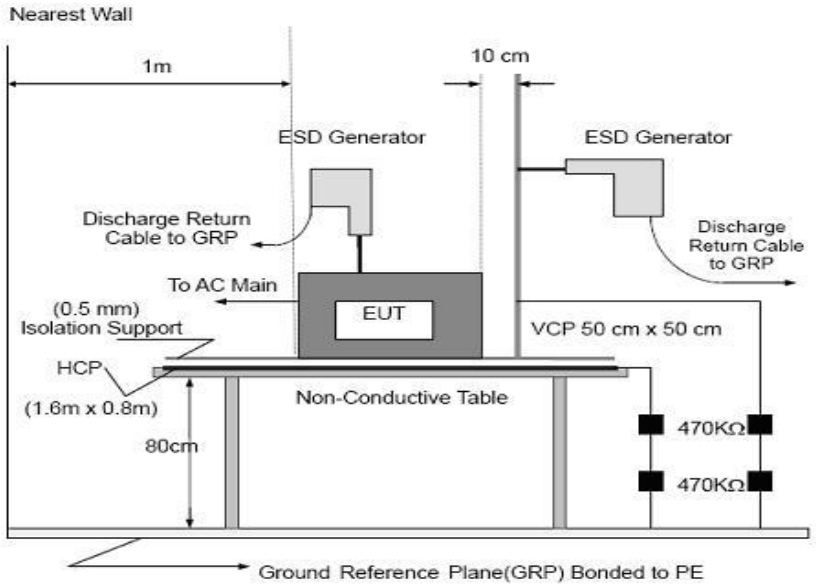
The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Discharge Electrode touching the coupling plane. The four faces of the EUT will be performed with electrostatic discharge.

Horizontal Coupling Plane (HCP):

The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane. The four faces of the EUT will be performed with electrostatic discharge.

Air discharges at insulation surfaces of the EUT. It was at least ten single discharges with positive and negative at the same selected point. For the actual test configuration, please refer to the related Item –EUT Test Photos.

5.2.2 Test Setup



5.2.3 Test Result

EUT:	Telescopic light with magnet	Model Name:	P513.651
Pressure:	101kPa	Test mode:	Mode 1

Indirect discharge

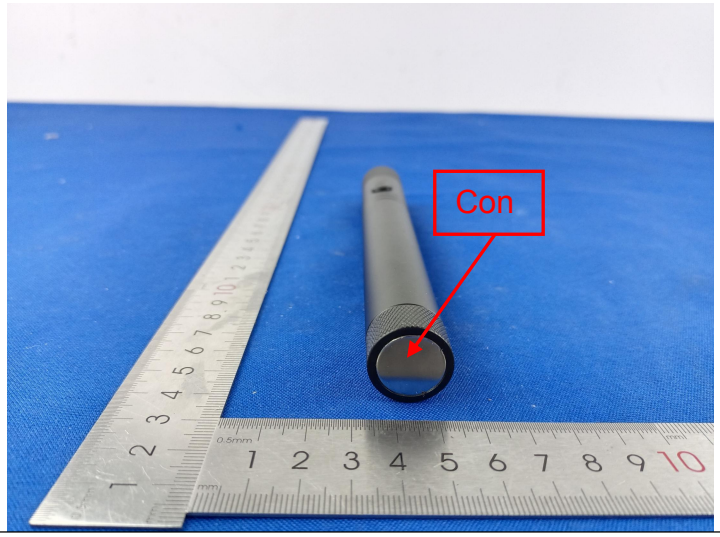
Test Point	Contact discharge level (kV)	Number and polarity	Criterion met	Criterion Required
1. VCP-Front side	☐..2 ☒..4 ☐..6 ☐..8	25 (+)	A	B
		25 (-)	A	
2.VCP-Rear side	☐..2 ☒..4 ☐..6 ☐..8	25 (+)	A	
		25 (-)	A	
3.VCP-Left side	☐..2 ☒..4 ☐..6 ☐..8	25 (+)	A	
		25 (-)	A	
4. VCP-Right side	☐..2 ☒..4 ☐..6 ☐..8	25 (+)	A	
		25 (-)	A	
5. HCP	☐..2 ☒..4 ☐..6 ☐..8	25 (+)	A	
		25 (-)	A	

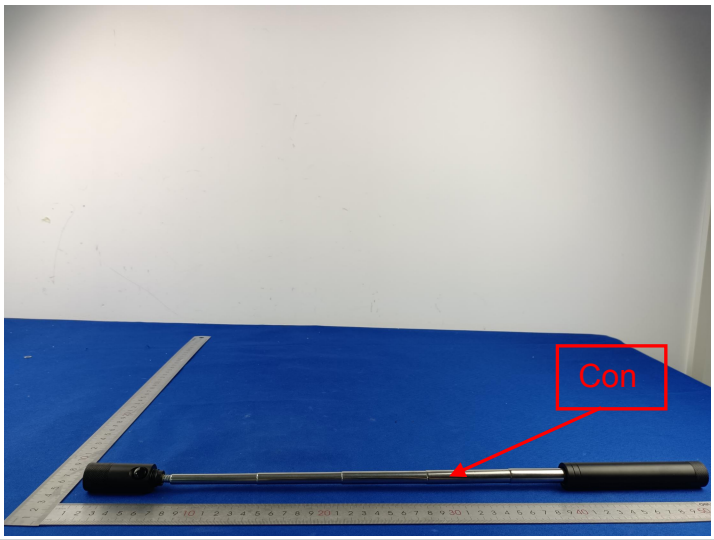
Result: Compliance.

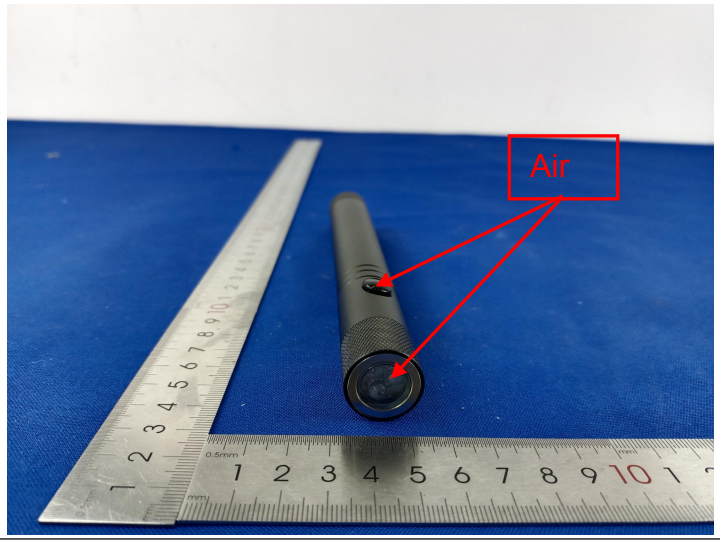
Direct discharge

Test Point	Contact discharge level (kV)	Air discharge level (kV)	Number and polarity	Criterion met	Criterion Required
1. Each nonconductive location touchable by hand	☐..2 ☐..4 ☐..6 ☐..8	☒..2 ☒..4 ☐..6 ☒..8	25 (+)	A	B
			25 (-)	A	
2. Each conductive location touchable by hand	☒..2 ☒..4 ☐..6 ☐..8	☐..2 ☐..4 ☐..6 ☐..8	25 (+)	A	
			25 (-)	A	

Result: compliance.







Note: Air is air discharge and Con is contact discharge.

5.3 Radiated electromagnetic field immunity (RS)

5.3.1 Test Procedures

The EUT and support equipment, which are placed on a table that is 0.8 meter above ground and the testing was performed in a fully-anechoic chamber.

The testing distance from antenna to the EUT was 3 meters.

The other condition as following manner:

The field strength level was 3V/m.

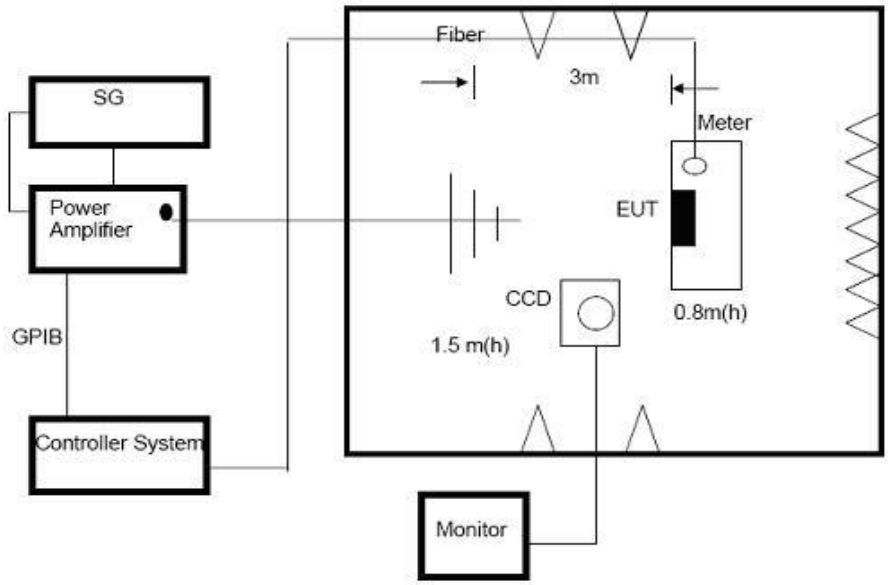
The frequency range is swept from 80 MHz to 1000 MHz with the signal 80%amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed 1.5x 10-3 decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.

The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.

The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

For the actual test configuration, please refer to the related Item –EUT Test Photos.

5.3.2 Test setup

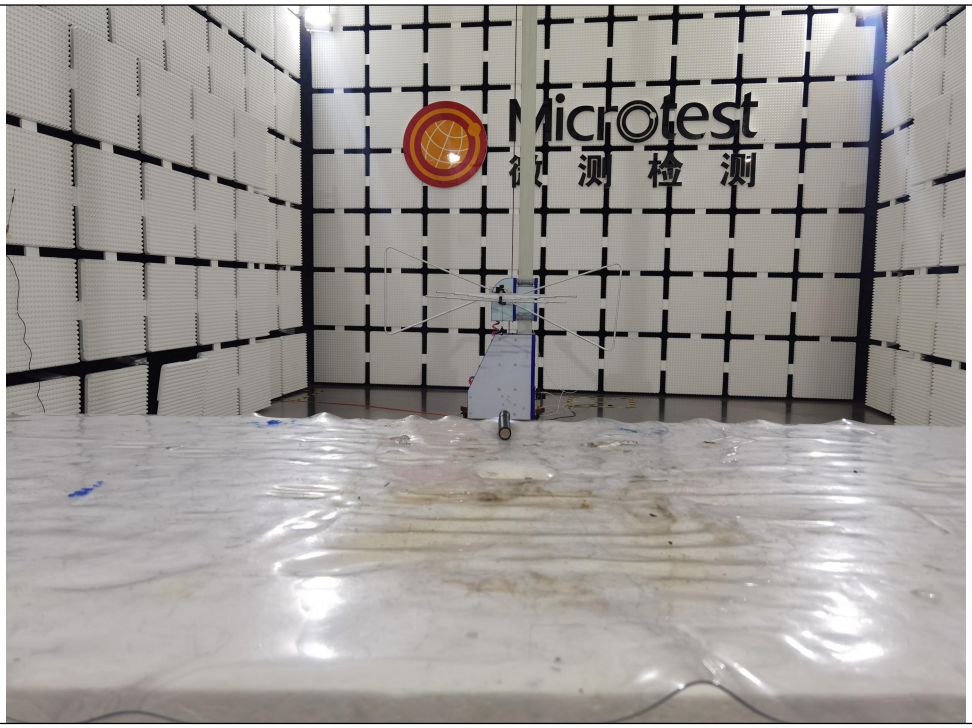


5.3.3 Test Result

EUT:	Telescopic light with magnet	Model Name:	P513.651
Pressure:	101kPa	Test mode:	Mode 1

Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Azimuth	Perform. Criteria	Results	Judgment
80~1000	H / V	3 V/m (rms) AM Modulated 1000Hz, 80%	Front	A	A	Pass
			Rear			
			Left			
			Right			

Photographs of the Test Setup

Radiated emission

Magnetic Field Emission


ESD

RS


Photographs of the EUT

See the Appendix 1- EUT Photos.

----END OF REPORT----