EMC MEASUREMENT REPORT

Applicant:	Ninebot (Changzhou) Tech Co., Ltd.
Address:	16F-17F, Block A, Building 3, Changwu Mid Road 18#, Wujin Dist., Changzhou, Jiangsu, China
Product:	Segway eKickScooter ZT3 Pro
Model No.:	051801E, 051801D, 051801A
Brand Name:	Segway
Standards:	EN 301 489 - 1 V2.2.3 (2019-11) EN 301 489 - 17 V3.2.4 (2020-09) EN IEC 61000-6-1: 2019 / BS EN IEC 61000-6-1: 2019 EN IEC 61000-6-3: 2021 / BS EN IEC 61000-6-3: 2021 AS/NZS CISPR 32:2015 AMD 1:2020
Result:	Complies
Received Date:	2024-07-08
Test Date:	2024-07-11 ~ 2024-07-25

Reviewed By: Vincent Yu

Approved By: Robin Wu

ACCREDITED
TESTING LABORATORY
CERTIFICATE #3628.01

Revision History

Report No.	Version	Description	Issue Date	Note
2407RSU022-E1	V01	Initial Report	2024-08-02	Valid

CONTENTS

1. General Information

1.1. Applicant

Ninebot (Changzhou) Tech Co., Ltd.

16F-17F, Block A, Building 3, Changwu Mid Road 18#, Wujin Dist., Changzhou, Jiangsu, China

1.2. Manufacturer

Ninebot (Changzhou) Tech Co., Ltd.

16F-17F, Block A, Building 3, Changwu Mid Road 18#, Wujin Dist., Changzhou, Jiangsu, China

1.3. Testing Facility

☒	**Test Site – MRT Suzhou Laboratory**				
	Laboratory Location (Suzhou - Wuzhong) D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China **Laboratory Location (Suzhou - SIP)** 4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China				
	Laboratory Accreditations				
	A2LA: 3628.01		CNAS: L10551		
	FCC: CN1166		ISED: CN0001		
	VCCI:	☐R-20025	☐G-20034	☐C-20020	☐T-20020
		☐R-20141	☐G-20134	☐C-20103	☐T-20104
☐	**Test Site – MRT Shenzhen Laboratory**				
	Laboratory Location (Shenzhen) 1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China				
	Laboratory Accreditations				
	A2LA: 3628.02		CNAS: L10551		
	FCC: CN1284		ISED: CN0105		
☐	**Test Site – MRT Taiwan Laboratory**				
	Laboratory Location (Taiwan) No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)				
	Laboratory Accreditations				
	TAF: 3261				
	FCC: 291082, TW3261		ISED: TW3261		

1.4. Product Information

Product Name	Segway eKickScooter ZT3 Pro
Model No.	051801E, 051801D, 051801A
Serial No.	1K1EA2427P0058
Brand Name	Segway
Rated Input	53.6VDC, 1.3A
Bluetooth Specification	BR/EDR/BLE(1M/2M)
Accessory	
AC Adapter	Model: NBW54D601D3D01 Input: 100-240V ~ 50-60Hz 2.5A MAX Output: 53.6VDC 3.9A MAX

Notes:

1. The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.
2. The models are only the running speed different. As required by the manufacturer, we select Model No.: 051801E for testing in this report.

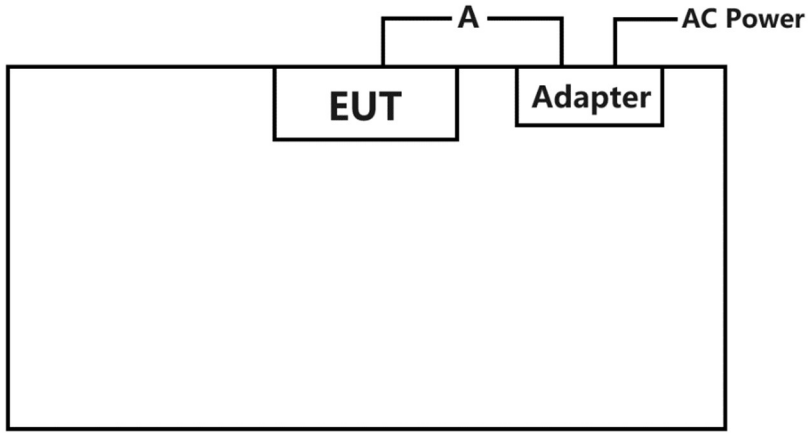
2. Test Configuration

2.1. Test Mode

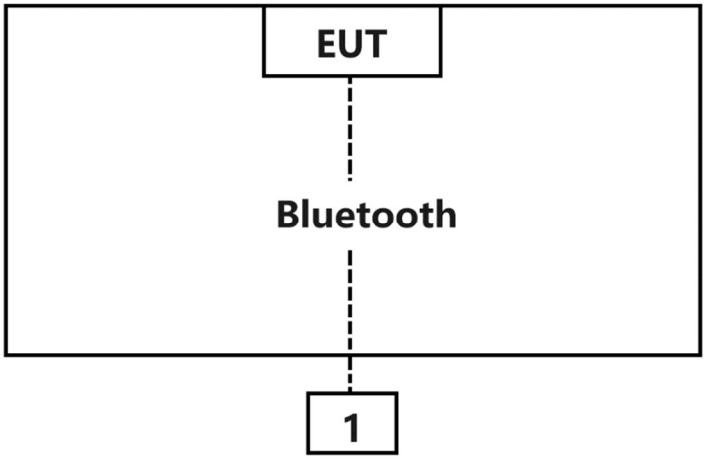
Mode 1: Charging.
Mode 2: Running at max speed + Bluetooth connected with Phone.

2.2. Test System Connection Diagram

Mode 1



Mode 2



Cable Type		Cable Spec.	Length
A	Power Cable	Non-Shielding	1.2m
Product		**Manufacturer**	**Model No.**
1	Phone	Apple	XS

2.3. Performance Criteria

General Requirements (EN IEC 61000-6-1):

A functional description and a definition of the equipment under test's (EUT) specific performance criteria, during or as a consequence of immunity testing, shall be provided by the manufacturer and noted in the test report. They shall be consistent with one of the following general criteria for each test as specified in Table 1 to Table 4 of EN 61000-6-1: 2019

Performance criterion A: The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

Performance criterion B: The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

Performance criterion C: Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

If, as a result of the application of the tests defined in this standard, the apparatus becomes dangerous or unsafe, the apparatus shall be deemed to have failed the test.

General Requirements (EN 301489-1):

The performance criteria are used to take a decision on whether radio equipment passes or fails immunity tests.

For the purpose of the present document two categories of performance criteria apply:

- Performance criteria for continuous phenomena.
- Performance criteria for transient phenomena.

Normally, the performance criteria depend upon the type of radio equipment and/or its intended application. Thus, the present document only contains general performance criteria commonly used for the assessment of radio equipment.

Performance criteria for continuous phenomena

During the test, the equipment shall:

- continue to operate as intended;
- not unintentionally transmit;
- not unintentionally change its operating state;
- not unintentionally change critical stored data.

Performance criteria for transient phenomena

For all ports and transient phenomena with the exception described below, the following applies:

- The application of the transient phenomena shall not result in a change of the mode of operation (e.g. unintended transmission) or the loss of critical stored data.
- After application of the transient phenomena, the equipment shall operate as intended.

For surges applied to symmetrically operated wired network ports intended to be connected directly to outdoor lines the following criteria applies:

- For products with only one symmetrical port intended for connection to outdoor lines, loss of function is allowed, provided the function is self-recoverable, or can be otherwise restored. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.
- For products with more than one symmetrical port intended for connection to outdoor lines, loss of function on the port under test is allowed, provided the function is self-recoverable. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

Special Performance Requirements (EN 301489-17):

The performance criteria are:

- performance criteria A for immunity tests with phenomena of a continuous nature;
- performance criteria B for immunity tests with phenomena of a transient nature;
- performance criteria C for immunity tests with power interruptions exceeding a certain time.

The equipment shall meet the minimum performance criteria as specified in the following clauses.

Criteria	During test	After test (i.e. as a result of the application of the test)
A	Shall operate as intended. (see note). Shall be no loss of function. Shall be no unintentional transmissions.	Shall operate as intended. Shall be no degradation of performance Shall be no loss of function. Shall be no loss of critical stored data.
B	May be loss of function	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no loss of critical stored data.
C	May be loss of function	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no loss of critical stored data.
Note: Operate as intended during the test allows a level of degradation in accordance with clause 6.2.2.		

Minimum performance level

For equipment that supports a PER or FER, the minimum performance level shall be a PER or FER less than or equal to 10 %.

For equipment that does not support a PER or a FER, the minimum performance level shall be no loss of the wireless transmission function needed for the intended use of the equipment.

Performance criteria for Continuous phenomena

The performance criteria A shall apply.

Where the EUT is a transmitter in standby mode, unintentional transmission shall not occur during the test.

Where the EUT is a transceiver in receive mode, unintentional transmission shall not occur during the test.

Performance criteria for Transient phenomena

The performance criteria B shall apply, except for voltage dips greater than or equal to 100 ms and voltage interruptions of 5 000 ms duration, for which performance criteria C shall apply.

Where the EUT is a transmitter in standby mode, unintentional transmission shall not occur as a result of the application of the test.

Where the EUT is a transceiver in receive mode, unintentional transmission shall not occur as a result of the application of the test.

3. Measuring Instrument

Instrument	Manufacturer	Model No.	Asset No.	Cali. Interval	Cali. Due Date	Test Site
Anechoic Chamber	RIKEN	SIP-AC1	MRTSUE06554	1 year	2024-12-21	SIP-AC1
Signal Analyzer	Keysight	N9010B	MRTSUE06559	1 year	2025-05-08	SIP-AC1
Horn Antenna	R&S	HF907	MRTSUE06610	1 year	2025-06-12	SIP-AC1
Thermohygrometer	testo	608-H1	MRTSUE06616	1 year	2024-10-28	SIP-AC1
Preamplifier	MRT	AMP-AC1	MRTSUE11265	1 year	2024-11-03	SIP-AC1
EMI Test Receiver	R&S	ESR3	MRTSUE06185	1 year	2024-12-17	SIP-AC2
Thermohygrometer	testo	608-H1	MRTSUE06622	1 year	2024-11-03	SIP-AC2
TRILOG Antenna	Schwarzbeck	VULB 9168	MRTSUE06647	1 year	2025-06-15	SIP-AC2
Anechoic Chamber	RIKEN	SIP-AC2	MRTSUE06781	1 year	2024-12-21	SIP-AC2
MXG Analog Signal Generator	Keysight	N5181A	MRTSUE06370	1 year	2025-05-08	SIP-AC4
EPM Series Power Meter	Agilent	E4418B	MRTSUE06204	1 year	2025-05-08	SIP-AC4
Power Sensor	Agilent	E9301H	MRTSUE06205	1 year	2025-05-08	SIP-AC4
Amplifier	AR	150W1000M1	MRTSUE06146	N/A	N/A	SIP-AC4
Amplifier	rflight	NTWPAS-1025100	MRTSUE06363	N/A	N/A	SIP-AC4
Amplifier	rflight	NTWPAS-2560100	MRTSUE06364	N/A	N/A	SIP-AC4
Dual Directional Coupler	AR	DC6080A	MRTSUE06148	N/A	N/A	SIP-AC4
Log-Periodic Antenna	AR	ATR80M6G	MRTSUE06145	N/A	N/A	SIP-AC4
Temperature Humidity Meter	Testo	608-H1	MRTSUE06618	1 year	2024-11-03	SIP-AC4
Temperature Humidity Meter	Testo	608-H1	MRTSUE11264	1 year	2024-11-19	SIP-AC4
Anechoic Chamber	RIKEN	SIP-AC4	MRTSUE06806	1 year	2025-04-01	SIP-AC4
Power Analyzer	California Instruments	PACS-1	MRTSUE06010	1 year	2025-04-16	SIP-SR2
AC Power Source	California Instruments	3001IX-208-CTS	MRTSUE06011	1 year	2025-04-16	SIP-SR2
Two-Line V-Network	R&S	ENV216	MRTSUE06003	1 year	2025-05-08	SIP-SR2
EMI Test Receiver	R&S	ESR3	MRTSUE06612	1 year	2025-05-08	SIP-SR2
Thermohygrometer	testo	608-H1	MRTSUE06621	1 year	2024-11-03	SIP-SR2
Shielding Room	MIX-BEP	SIP-SR2	MRTSUE06949	5 years	2024-10-23	SIP-SR2
ESD Simulator	HAEFELY	ONYX 30	MRTSUE06388	1 year	2024-12-20	SIP-SR3
Thermohygrometer	testo	622	MRTSUE06628	1 year	2024-12-21	SIP-SR3
Shielding Room	MIX-BEP	SIP-SR3	MRTSUE06950	5 years	2024-10-23	SIP-SR3
Compact Immunity Test System	TESEQ	NSG 4070-35	MRTSUE06237	1 year	2024-09-27	SIP-SR4
6dB Attenuator	3cTest	DTC75-6	MRTSUE06043	1 year	2025-05-08	SIP-SR4
CDN	TESEQ	CDN M016	MRTSUE06238	1 year	2025-05-08	SIP-SR4
Temperature Humidity Meter	Testo	608-H1	MRTSUE11021	1 year	2024-10-28	SIP-SR4
Shielding Room	MIX-BEP	SIP-SR4	MRTSUE06951	5 years	2024-10-23	SIP-SR4

Instrument	Manufacturer	Model No.	Asset No.	Cali. Interval	Cali. Due Date	Test Site
Compact Immunity Test System	3ctest	CCS 500	MRTSUE06832	1 year	2024-12-17	SIP-SR5
Voltage Drop Module	3ctest	VVT 2216SV	MRTSUE06833	1 year	2025-04-17	SIP-SR5
Oscilloscope	Agilent	DSO-X 6002A	MRTSUE06107	1 year	2025-02-03	SIP-SR5
Temperature Humidity Meter	Testo	608-H1	MRTSUE06617	1 year	2024-10-29	SIP-SR5
Power Frequency Magnetic Field Transformer	3ctest	MFT 400	MRTSUE06835	1 year	2025-04-17	SIP-SR5
Magnetic Field Coil	3ctest	TCXS111	MRTSUE06844	1 year	2025-04-17	SIP-SR5
Temperature Humidity Meter	Testo	608-H1	MRTSUE06617	1 year	2024-10-29	SIP-SR5
Shielding Room	MIX-BEP	SIP-SR5	MRTSUE06952	5 years	2024-10-23	SIP-SR5

Software	Version	Function
e3	230711	EMI Test Software
Controller_MF 7802BS	1.02	RE Antenna & Turntable
CTS4 （H-F）	V 4.29	Harmonic & Flicker
TS+-RS	4.0.0.0	RS
TS+-CS	4.0.0.0	CS
CoreLab	V 1.9.6.0	EFT & Surge & PFM & Dips

4. Decision Rules and Measurement Uncertainty

4.1. Decision Rules

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4: 2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

4.2. Measurement Uncertainty

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Conducted Emission Measurement
Measurement Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 9kHz~150kHz: 3.58dB 150kHz~30MHz: 3.20dB
Radiated Emission Measurement
Measurement Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): Horizontal: 30MHz~200MHz: 3.79dB 200MHz~1GHz: 3.91dB 1GHz~6GHz: 4.99dB Vertical: 30MHz~200MHz: 4.06dB 200MHz~1GHz: 5.21dB 1GHz~6GHz: 4.90dB
Harmonic Current Emissions
The maximum measurement uncertainty is evaluated as 0.5%.
Voltage Fluctuation and Flicker
The maximum measurement uncertainty is evaluated as d_c and d_{max}: 0.095%, P_{st} and P_{lt}: 4.6%, $d_{(t)}$: 1.0%.

5. Test Result

5.1. Summary

Test Item	Reference Standard	Result
EN 301 489-1 & EN 301 489-17		
Conducted Emission	EN 55032:2015	Pass
Radiated Emission	EN 55032:2015	Pass
Harmonic Current Emissions	EN 61000-3-2:2014	Pass
Voltage Fluctuations and Flicker	EN 61000-3-3:2013	Pass
Electrostatic Discharge	EN 61000-4-2:2009	Complies
Radio Frequency Electromagnetic Field	EN 61000-4-3:2006+A1:2008+A2:2010	Complies
Fast Transients, Common Mode	EN 61000-4-4:2012	Complies
Surges	EN 61000-4-5:2014+A1:2017	Complies
Radio Frequency Common Mode	EN 61000-4-6:2014	Complies
Voltage Dips and Interruptions	EN 61000-4-11:2004	Complies
EN IEC 61000-6-1 & EN IEC 61000-6-3		
Conducted Emission	EN 61000-6-3:2021	Pass
Radiated Emission	EN 61000-6-3:2021	Pass
Harmonic Current Emissions	IEC 61000-3-2:2018	Pass
Voltage Fluctuations and Flicker	IEC 61000-3-3:2013/A1:2017	Pass
Electrostatic Discharge	IEC 61000-4-2:2008	Complies
Radio Frequency Electromagnetic Field	IEC 61000-4-3:2006+A1:2007+A2:2010	Complies
Fast Transients, Common Mode	IEC 61000-4-4:2012	Complies
Surges	IEC 61000-4-5:2014	Complies
Radio Frequency Common Mode	IEC 61000-4-6:2013	Complies
Power Frequency Magnetic Field	IEC 61000-4-8:2009	Complies
Voltage Dips and Interruptions	IEC 61000-4-11:2004	Complies
Note: The test item with different standard versions was only evaluated the standard of the latest version. There is no difference in testing method with different standard versions.		

5.2. Conducted Emission

5.2.1. Test Limit

EN 301 489 -1/-17 (Ref to EN 55032)

Limits for AC Mains Power input/output Ports				
Frequency Range (MHz)	Class A Limits		Class B Limits	
	QP dB(μV)	AV dB(μV)	QP dB(μV)	AV dB(μV)
0.15 ~ 0.5	79	66	66 to 56	56 to 46
0.5 ~ 5	73	60	56	46
5 ~ 30	73	60	60	50

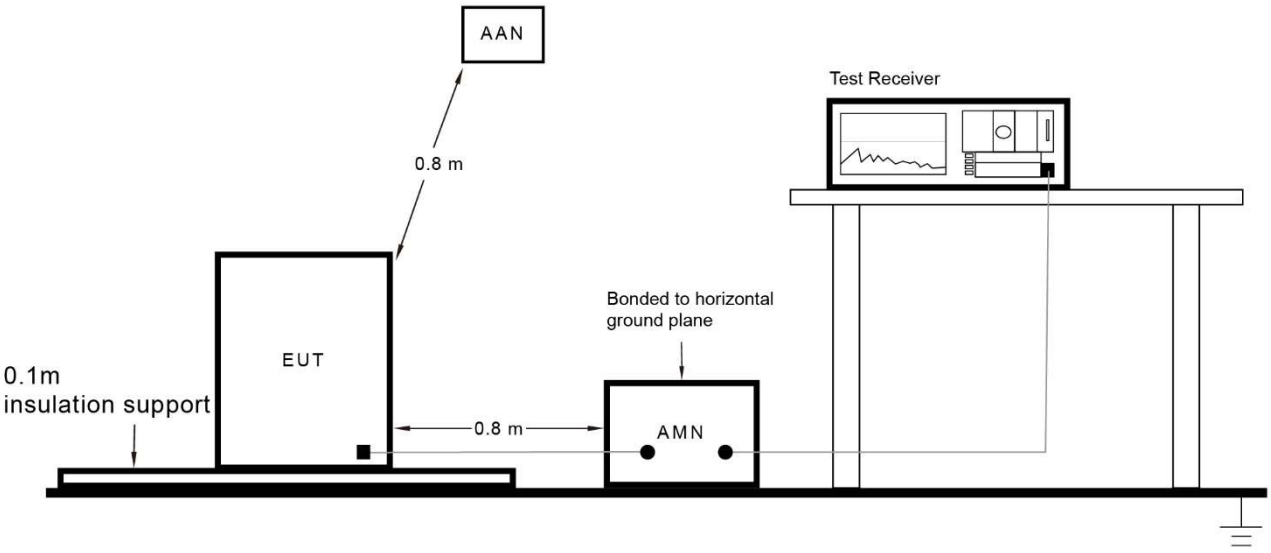
Limits for Asymmetric Mode								
Frequency Range (MHz)	Class A Limits				Class B Limits			
	Voltage Limits dB(μV)		Current limits dB(μA)		Voltage Limits dB(μV)		Current limits dB(μA)	
	QP	AV	QP	AV	QP	AV	QP	AV
0.15 ~ 0.5	97 ~ 87	84 ~ 74	53 ~ 43	40 ~ 30	84 ~ 74	74 ~ 64	40 ~ 30	30 ~ 20
0.5 ~ 30	87	74	43	30	74	64	30	20

Limits for DC Power input/output Ports for EN 301 489 -1		
Frequency Range (MHz)	Quasi-peak dB(μV)	Average dB(μV)
0.15 ~ 0.5	79	66
0.5 ~ 30	73	60

EN IEC 61000-6-3

Limits for Low voltage AC mains port		
Frequency Range (MHz)	Quasi-peak dB(μV)	Average dB(μV)
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

5.2.2. Test Setup



5.2.3. Test Procedure

The receiver or associated equipment under measurement and the artificial mains network are disposed as shown in 5.2.2. Measurements shall be carried out using a selective voltmeter having a quasi-peak detector for broadband measurements and an average detector for arrow-band measurements in accordance with CISPR 16-1.

The mains lead shall be arranged to follow the shortest possible path between the receiver and artificial mains network on the ground. The mains lead in excess of 0,8 m separating the equipment under test from the artificial mains network shall be folded back and forth parallel to the lead so as to form a bundle with a length of 0,3 m to 0,4 m.

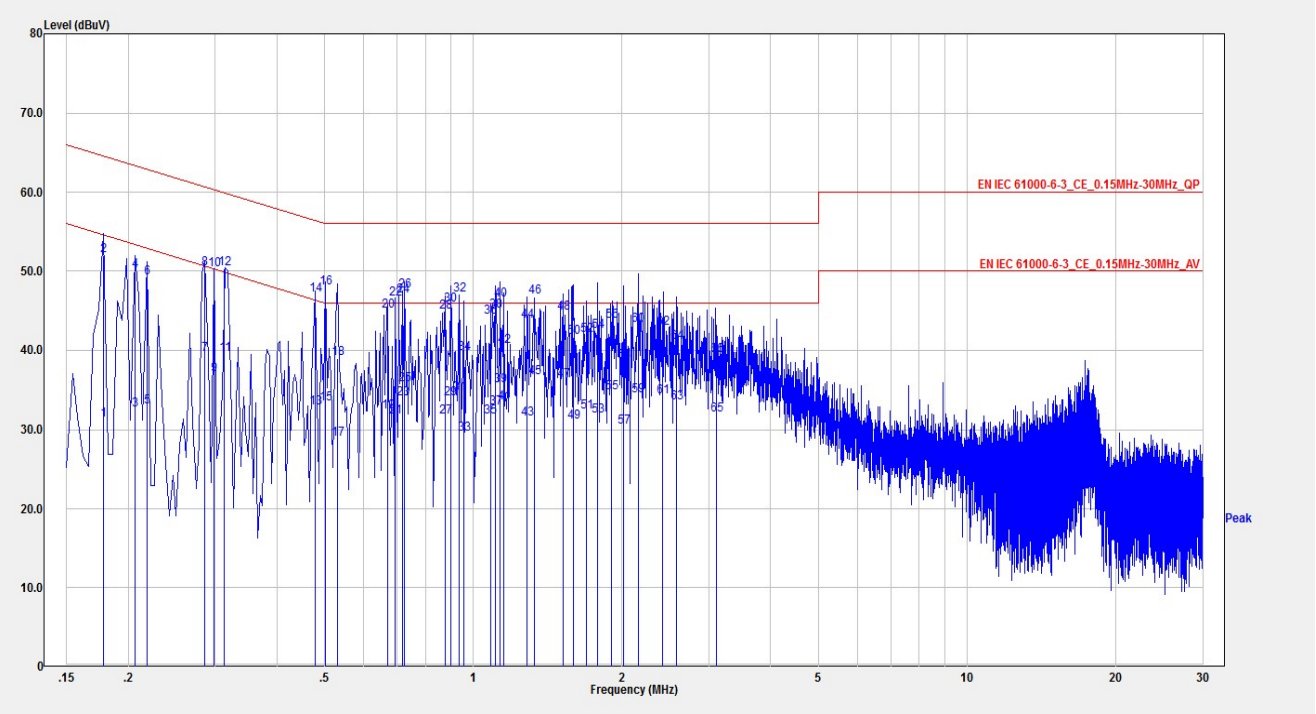
Earthing of the equipment under test if provided with a safety earth connection, shall be made to the earth terminal provided on the artificial mains network with the shortest possible lead.

If the equipment under test has a coaxial RF input connector, tests shall be performed with and without an earth connection made to the outer conductor screen of the coaxial RF input connector. When these tests are being carried out, no other earth connections shall be made to any additional earth terminal whatever.

If the equipment under test has no coaxial RF input connector and if it has an earth terminal, tests shall be performed with this terminal earthed.

5.2.4. Test Result

Site	SIP-SR2	Test Date	2024-07-15
Test Engineer	Arvin Ding	Temp./Humidity	25.1°C/59.6%
Factor	SIP-SR2-ENV216_101684_Fitter off	Polarity	Line
EUT	Segway eKickScooter ZT3 Pro	Test Voltage	AC 230V/50Hz
Test Mode	Mode 1, Power Port		



No	Mark	Frequency (MHz)	Reading (dBµV)	C.F (dB)	Measurement (dBµV)	Margin (dB)	Limit (dBµV)	Detector
1		0.178	21.51	9.66	31.17	-23.41	54.58	Average
2		0.178	42.36	9.66	52.01	-12.56	64.58	QP
3		0.206	22.79	9.70	32.49	-20.88	53.37	Average
4		0.206	40.39	9.70	50.08	-13.29	63.37	QP
5		0.218	23.14	9.71	32.84	-20.05	52.89	Average
6		0.218	39.53	9.71	49.23	-13.66	62.89	QP
7		0.286	29.71	9.73	39.43	-11.21	50.64	Average
8		0.286	40.55	9.73	50.28	-10.36	60.64	QP
9		0.298	27.25	9.73	36.98	-13.32	50.30	Average
10		0.298	40.50	9.73	50.23	-10.07	60.30	QP
11		0.313	29.73	9.73	39.46	-10.42	49.88	Average
12		0.313	40.58	9.73	50.31	-9.57	59.88	QP
13		0.478	23.03	9.74	32.77	-13.60	46.37	Average
14		0.478	37.31	9.74	47.05	-9.33	56.37	QP

15		0.502	23.48	9.74	33.22	-12.78	46.00	Average
16	*	0.502	38.17	9.74	47.91	-8.09	56.00	QP
17		0.530	19.09	9.74	28.83	-17.17	46.00	Average
18		0.530	29.27	9.74	39.01	-16.99	56.00	QP
19		0.670	22.55	9.75	32.29	-13.71	46.00	Average
20		0.670	35.17	9.75	44.92	-11.08	56.00	QP
21		0.694	21.81	9.75	31.56	-14.44	46.00	Average
22		0.694	36.74	9.75	46.49	-9.51	56.00	QP
23		0.718	24.11	9.75	33.86	-12.14	46.00	Average
24		0.718	37.15	9.75	46.90	-9.10	56.00	QP
25		0.726	25.94	9.75	35.69	-10.31	46.00	Average
26		0.726	37.75	9.75	47.50	-8.50	56.00	QP
27		0.878	21.89	9.75	31.63	-14.37	46.00	Average
28		0.878	35.05	9.75	44.80	-11.20	56.00	QP
29		0.898	24.14	9.74	33.88	-12.12	46.00	Average
30		0.898	35.95	9.74	45.69	-10.31	56.00	QP
31		0.934	24.84	9.74	34.58	-11.42	46.00	Average
32		0.934	37.21	9.74	46.95	-9.05	56.00	QP
33		0.958	19.71	9.74	29.45	-16.55	46.00	Average
34		0.958	29.86	9.74	39.60	-16.40	56.00	QP
35		1.082	21.92	9.74	31.66	-14.34	46.00	Average
36		1.082	34.50	9.74	44.24	-11.76	56.00	QP
37		1.106	23.02	9.74	32.76	-13.24	46.00	Average
38		1.106	35.17	9.74	44.91	-11.09	56.00	QP
39		1.134	25.76	9.75	35.51	-10.49	46.00	Average
40		1.134	36.56	9.75	46.31	-9.69	56.00	QP
41		1.150	23.59	9.75	33.34	-12.66	46.00	Average
42		1.150	30.76	9.75	40.51	-15.49	56.00	QP
43		1.286	21.59	9.75	31.34	-14.66	46.00	Average
44		1.286	33.90	9.75	43.65	-12.35	56.00	QP
45		1.330	26.85	9.75	36.60	-9.40	46.00	Average
46		1.330	36.94	9.75	46.69	-9.31	56.00	QP
47		1.522	26.42	9.76	36.18	-9.82	46.00	Average
48		1.522	35.01	9.76	44.77	-11.23	56.00	QP
49		1.594	21.23	9.76	30.99	-15.01	46.00	Average
50		1.594	31.90	9.76	41.67	-14.33	56.00	QP
51		1.694	22.52	9.76	32.28	-13.72	46.00	Average
52		1.694	32.15	9.76	41.92	-14.08	56.00	QP

53		1.786	21.95	9.77	31.72	-14.28	46.00	Average
54		1.786	32.69	9.77	42.46	-13.54	56.00	QP
55		1.901	24.84	9.77	34.61	-11.39	46.00	Average
56		1.901	33.86	9.77	43.63	-12.37	56.00	QP
57		2.014	20.54	9.77	30.32	-15.68	46.00	Average
58		2.014	28.83	9.77	38.61	-17.39	56.00	QP
59		2.154	24.49	9.77	34.26	-11.74	46.00	Average
60		2.154	33.44	9.77	43.21	-12.79	56.00	QP
61		2.420	24.33	9.78	34.11	-11.89	46.00	Average
62		2.420	33.00	9.78	42.78	-13.22	56.00	QP
63		2.578	23.65	9.77	33.42	-12.58	46.00	Average
64		2.578	31.23	9.77	41.01	-14.99	56.00	QP
65		3.109	22.03	9.81	31.84	-14.16	46.00	Average
66		3.109	29.60	9.81	39.41	-16.59	56.00	QP

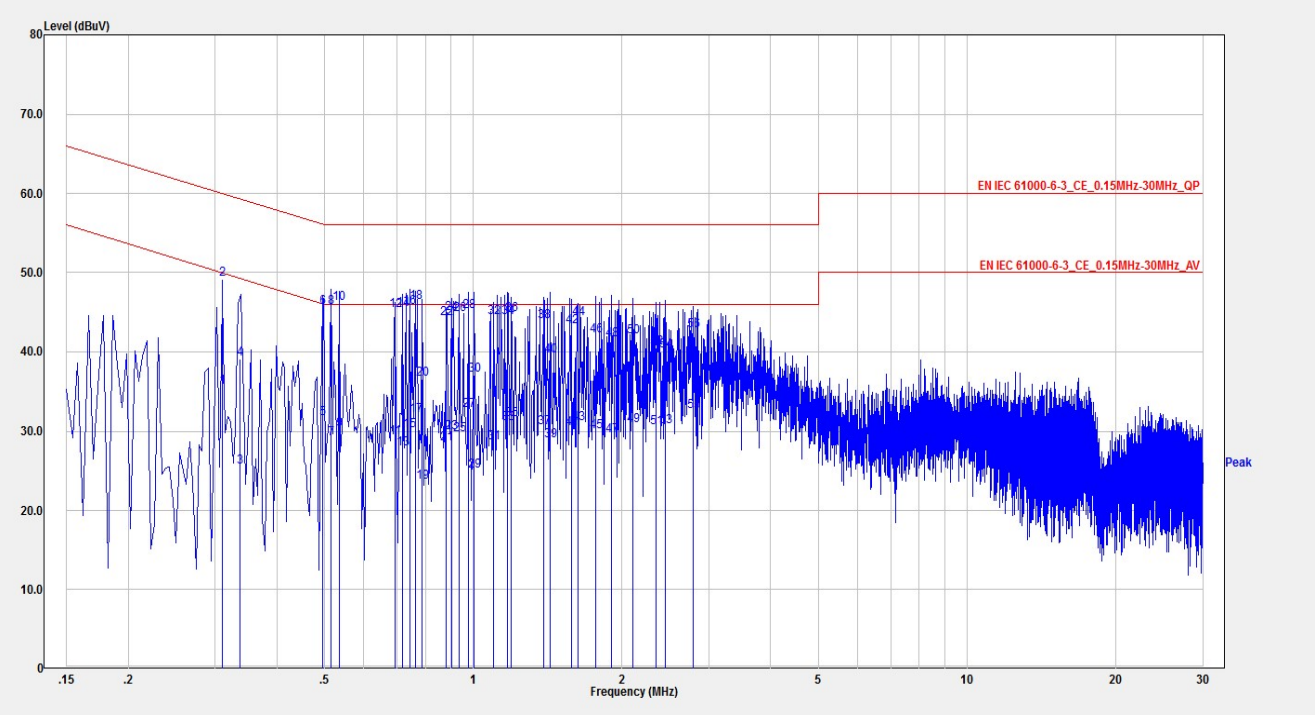
Notes:

1. " *", means this data is the worst emission level.

2. C.F (dB) = LISN Factor (dB)+ Cable Loss (dB).

3. Measurement(dBμV) = Reading(dBμV) + C.F (dB).

Site	SIP-SR2	Test Date	2024-07-15
Test Engineer	Arvin Ding	Temp./Humidity	25.1°C /59.6%
Factor	SIP-SR2-ENV216_101684_Fitter off	Polarity	Neutral
EUT	Segway eKickScooter ZT3 Pro	Test Voltage	AC 230V/50Hz
Test Mode	Mode 1, Power Port		



No	Mark	Frequency (MHz)	Reading (dBµV)	C.F (dB)	Measurement (dBµV)	Margin (dB)	Limit (dBµV)	Detector
1		0.310	25.82	9.75	35.57	-14.40	49.97	Average
2		0.310	39.44	9.75	49.20	-10.77	59.97	QP
3		0.337	15.67	9.76	25.43	-23.85	49.27	Average
4		0.337	29.30	9.76	39.06	-20.21	59.27	QP
5		0.494	21.84	9.76	31.60	-14.50	46.10	Average
6		0.494	35.82	9.76	45.58	-10.53	56.10	QP
7		0.514	19.27	9.76	29.03	-16.97	46.00	Average
8		0.514	35.88	9.76	45.64	-10.36	56.00	QP
9		0.534	20.43	9.76	30.19	-15.81	46.00	Average
10		0.534	36.31	9.76	46.07	-9.93	56.00	QP
11		0.694	19.36	9.76	29.12	-16.88	46.00	Average
12		0.694	35.42	9.76	45.18	-10.82	56.00	QP
13		0.718	18.00	9.76	27.76	-18.24	46.00	Average
14		0.718	35.54	9.76	45.30	-10.70	56.00	QP
15		0.742	20.29	9.76	30.05	-15.95	46.00	Average

16		0.742	35.90	9.76	45.66	-10.34	56.00	QP
17		0.762	22.17	9.76	31.93	-14.07	46.00	Average
18	*	0.762	36.45	9.76	46.21	-9.79	56.00	QP
19		0.786	13.87	9.76	23.63	-22.37	46.00	Average
20		0.786	26.77	9.76	36.53	-19.47	56.00	QP
21		0.882	18.64	9.75	28.40	-17.60	46.00	Average
22		0.882	34.39	9.75	44.14	-11.86	56.00	QP
23		0.902	20.01	9.75	29.76	-16.24	46.00	Average
24		0.902	35.11	9.75	44.86	-11.14	56.00	QP
25		0.934	19.82	9.75	29.57	-16.43	46.00	Average
26		0.934	35.01	9.75	44.76	-11.24	56.00	QP
27		0.978	22.81	9.75	32.56	-13.44	46.00	Average
28		0.978	35.30	9.75	45.05	-10.95	56.00	QP
29		1.002	15.20	9.75	24.95	-21.05	46.00	Average
30		1.002	27.33	9.75	37.08	-18.92	56.00	QP
31		1.098	18.81	9.75	28.56	-17.44	46.00	Average
32		1.098	34.52	9.75	44.27	-11.73	56.00	QP
33		1.170	21.14	9.76	30.90	-15.10	46.00	Average
34		1.170	34.60	9.76	44.36	-11.64	56.00	QP
35		1.194	21.70	9.76	31.46	-14.54	46.00	Average
36		1.194	34.91	9.76	44.67	-11.33	56.00	QP
37		1.386	20.68	9.76	30.44	-15.56	46.00	Average
38		1.386	34.02	9.76	43.78	-12.22	56.00	QP
39		1.430	19.04	9.77	28.81	-17.19	46.00	Average
40		1.430	29.78	9.77	39.55	-16.45	56.00	QP
41		1.578	20.59	9.77	30.36	-15.64	46.00	Average
42		1.578	33.36	9.77	43.14	-12.86	56.00	QP
43		1.630	21.19	9.77	30.96	-15.04	46.00	Average
44		1.630	34.40	9.77	44.17	-11.83	56.00	QP
45		1.770	20.12	9.78	29.89	-16.11	46.00	Average
46		1.770	32.25	9.78	42.02	-13.98	56.00	QP
47		1.906	19.60	9.78	29.38	-16.62	46.00	Average
48		1.906	31.78	9.78	41.55	-14.45	56.00	QP
49		2.102	20.90	9.78	30.68	-15.32	46.00	Average
50		2.102	32.17	9.78	41.96	-14.04	56.00	QP
51		2.342	20.61	9.80	30.41	-15.59	46.00	Average
52		2.342	30.71	9.80	40.50	-15.50	56.00	QP
53		2.446	20.74	9.80	30.54	-15.46	46.00	Average

54		2.446	30.31	9.80	40.11	-15.89	56.00	QP
55		2.790	22.66	9.79	32.45	-13.55	46.00	Average
56		2.790	32.94	9.79	42.73	-13.27	56.00	QP

Notes:

1. " *", means this data is the worst emission level.

2. C.F (dB) = LISN Factor (dB)+ Cable Loss (dB).

3. Measurement(dBμV) = Reading(dBμV) + C.F (dB).

5.3. Radiated Emission

5.3.1. Test Limit

EN 301 489 -1/-17 (Ref to EN 55032)

Frequency range (MHz)	Class A	Class B
	Quasi-peak limits dB(μV/m)	Quasi-peak limits dB(μV/m)
30 to 230	50	40
230 to 1000	57	47
Note 1: The lower limit shall apply at the transition frequency. Note 2: Additional provisions may be required for cases where interference occurs.		

Frequency range (GHz)	Class A		Class B	
	Average limit dB(μV/m)	Peak limit dB(μV/m)	Average limit dB(μV/m)	Peak limit dB(μV/m)
1 to 3	56	76	50	70
3 to 6	60	80	54	74
Note: The lower limit applies at the transition frequency.				

EN IEC 61000-6-3

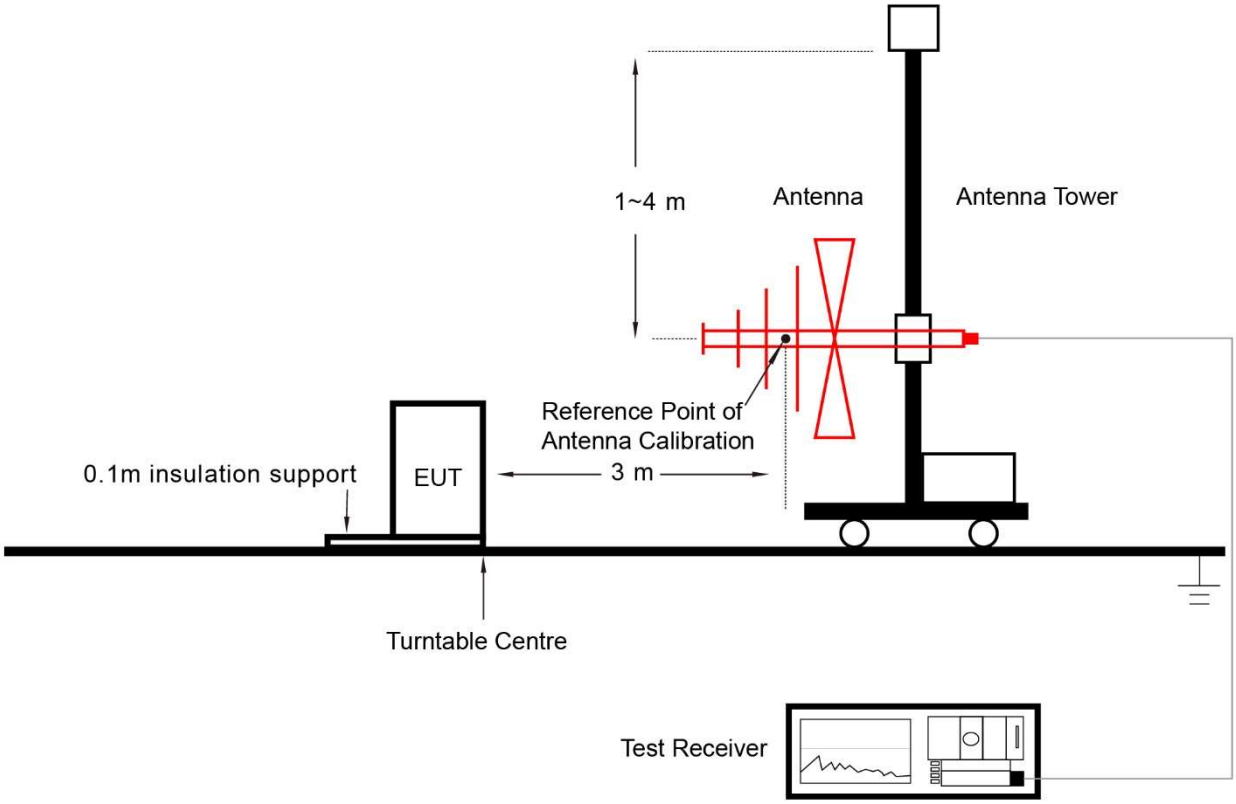
Frequency range (MHz)	Limits for 3m
	Quasi-peak limits dB(μV/m)
30 to 230	40
230 to 1000	47
Note 1: The lower limit shall apply at the transition frequency. Note 2: Additional provisions may be required for cases where interference occurs.	

Frequency range (GHz)	Limits for 3m	
	Average limit dB(μV/m)	Peak limit dB(μV/m)
1 to 3	50	70
3 to 6	54	74
Note: Note: The lower limit applies at the transition frequency.		

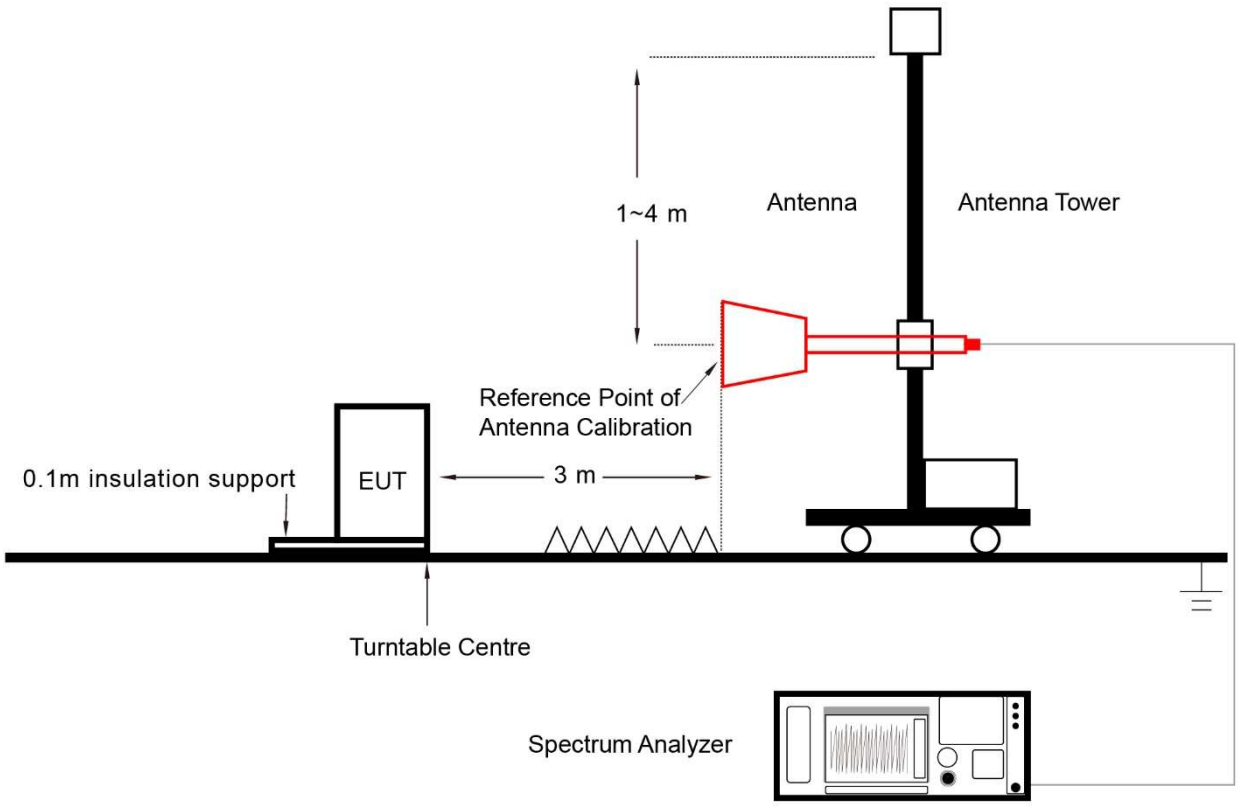
Note: The EN 301 489 -1/-17 Class B and EN IEC 61000-6-3 have the same limit, so the limits in EN IEC 61000-6-3 is used in this test report.

5.3.2. Test Setup

30 ~ 1000 MHz



1000 ~ 6000 MHz



Note: About the radiated test setup, the EUT and local AE shall be arranged in the most compact practical arrangement within the test volume, while respecting typical spacing and the requirements defined in EN55032 Annex D. The central point of the arrangement shall be positioned at the centre of the turntable. The measurement distance is the shortest horizontal distance between an imaginary circular periphery just encompassing this arrangement and the calibration point of the antenna. See below Figure 1 and Figure 2.

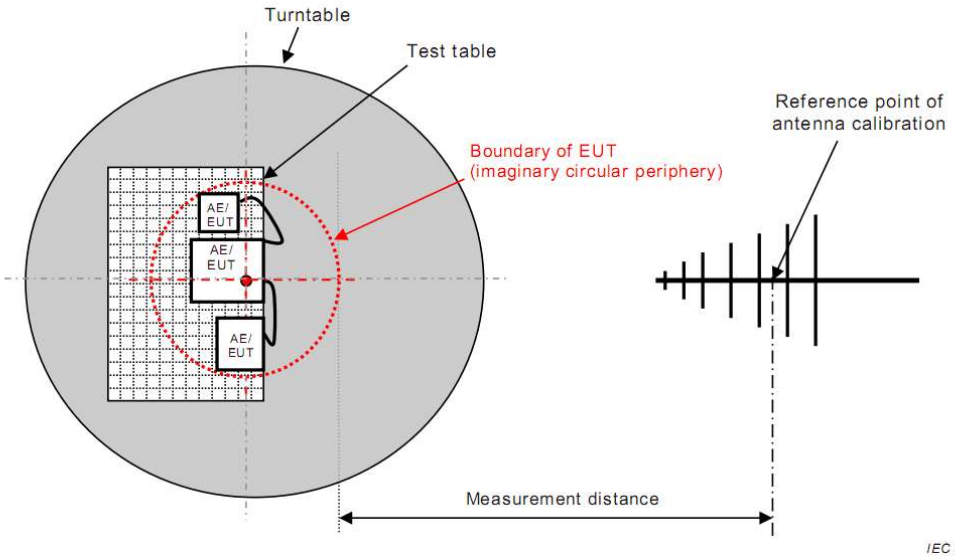


Figure 1

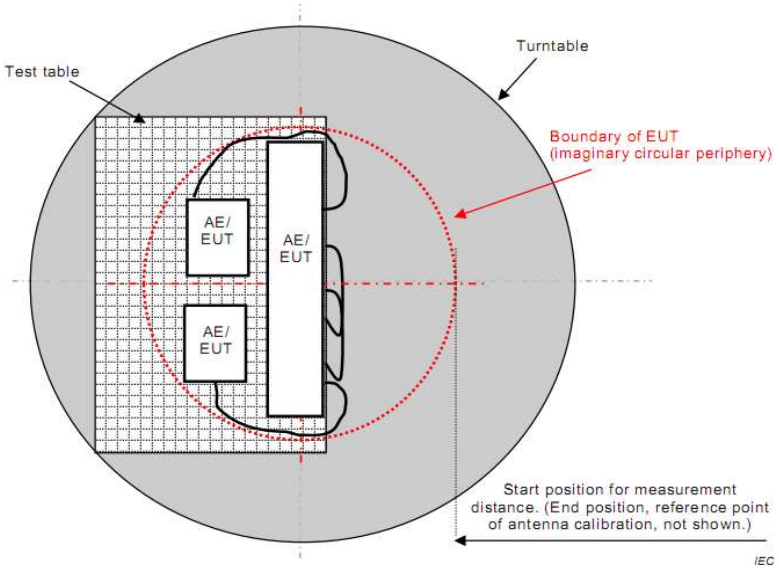


Figure 2

5.3.3. Test Procedure

Starting with the front of the receiver under test facing the measuring antenna, the measuring antenna is adjusted for horizontal polarization measurement and its height varied between 1 m and 4 m until the maximum reading is obtained.

The receiver under test is then rotated about its centre until the maximum meter reading is obtained, after which the measuring antenna height is again varied between 1 m and 4 m and the maximum reading noted.

The procedure is repeated for vertical polarization of the measuring antenna.

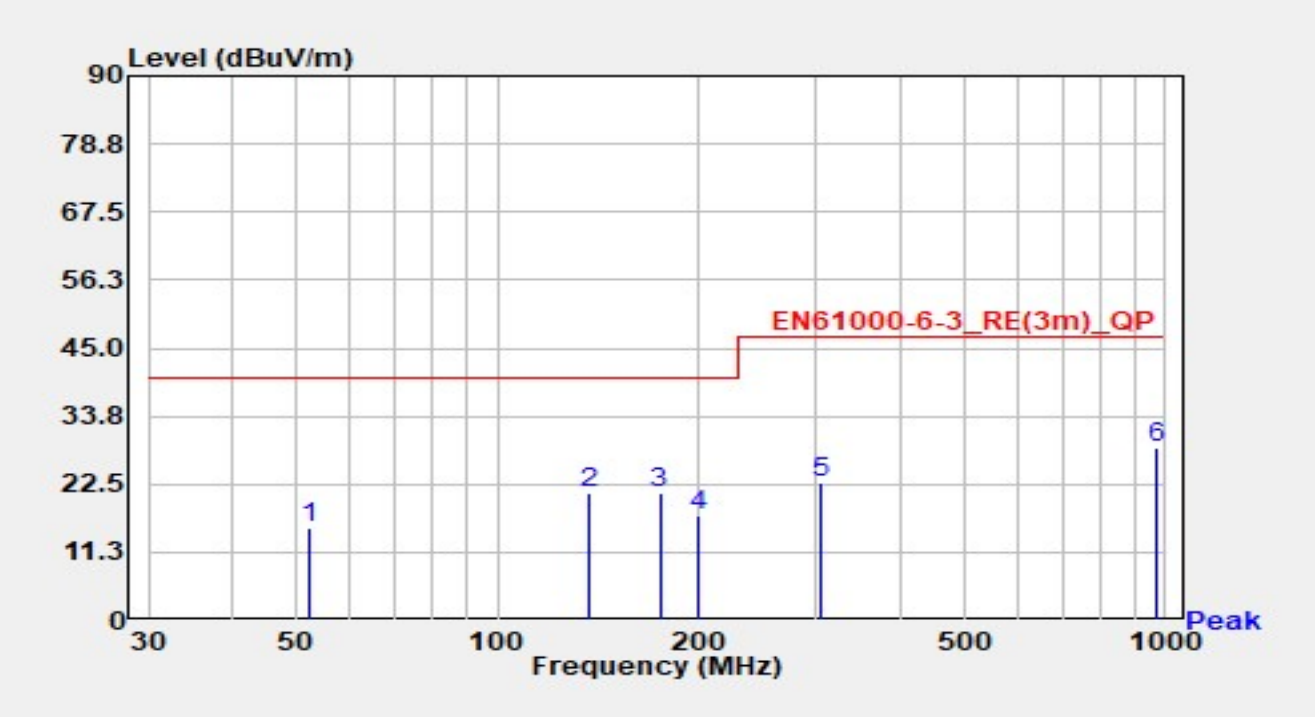
The highest value found, following this procedure, is defined as the radiation figure of the receiver.

If at certain frequencies the ambient signal field strength is high at the position of the receiving antenna, one of the following methods may be used to show compliance of the equipment under test.

For small frequency bands with high ambient signals, the disturbance value may be interpolated from the adjacent values. The interpolated value shall lie on the curve describing a continuous function of the disturbance values adjacent to the ambient noise.

5.3.4 Test Result

Site	SIP-AC1	Test Date	2024-07-24
Test Engineer	Barry Wu	Temp./Humidity	26.2°C/68.9%
Factor	VULB 9168_00998_25-2000MHz	Polarity	Horizontal
EUT	Segway eKickScooter ZT3 Pro	Test Voltage	AC 230V/50Hz
Test Mode	Mode 1		



No	Mark	Frequency (MHz)	Reading (dBµV)	C.F (dB/m)	Measurement (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Detector
1		52.135	-3.00	18.27	15.27	-24.73	40.00	QP
2		137.180	3.60	17.46	21.06	-18.94	40.00	QP
3		174.853	3.90	17.10	21.00	-19.00	40.00	QP
4		200.196	2.90	14.55	17.45	-22.55	40.00	QP
5		306.002	4.00	18.60	22.60	-24.40	47.00	QP
6	*	969.954	-2.00	30.54	28.54	-18.46	47.00	QP

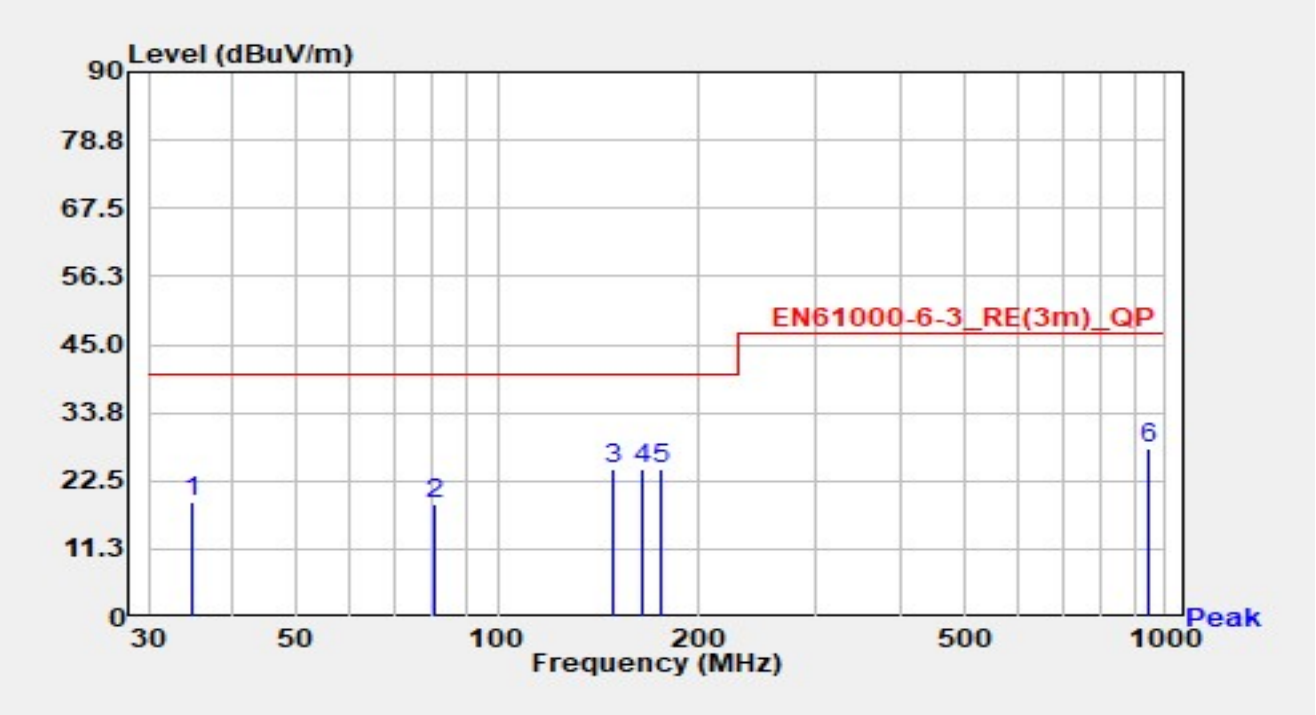
Notes:

1. " *", means this data is the worst emission level.

2. C.F (dB/m) = Antenna Factor (dB/m)+ Cable Loss (dB).

3. Measurement(dBµV/m) = Reading(dBµV) + C.F (dB/m).

Site	SIP-AC1	Test Date	2024-07-24
Test Engineer	Barry Wu	Temp./Humidity	26.2°C/68.9%
Factor	VULB 9168_00998_25-2000MHz	Polarity	Vertical
EUT	Segway eKickScooter ZT3 Pro	Test Voltage	AC 230V/50Hz
Test Mode	Mode 1		



No	Mark	Frequency (MHz)	Reading (dBμV)	C.F (dB/m)	Measurement (dBμV/m)	Margin (dB)	Limit (dBμV/m)	Detector
1		34.895	2.00	17.13	19.13	-20.87	40.00	QP
2		80.588	5.00	13.56	18.56	-21.44	40.00	QP
3		149.329	6.10	18.38	24.48	-15.52	40.00	QP
4		164.100	6.50	17.79	24.29	-15.71	40.00	QP
5	*	175.098	7.40	17.11	24.51	-15.49	40.00	QP
6		943.784	-2.00	29.72	27.72	-19.28	47.00	QP

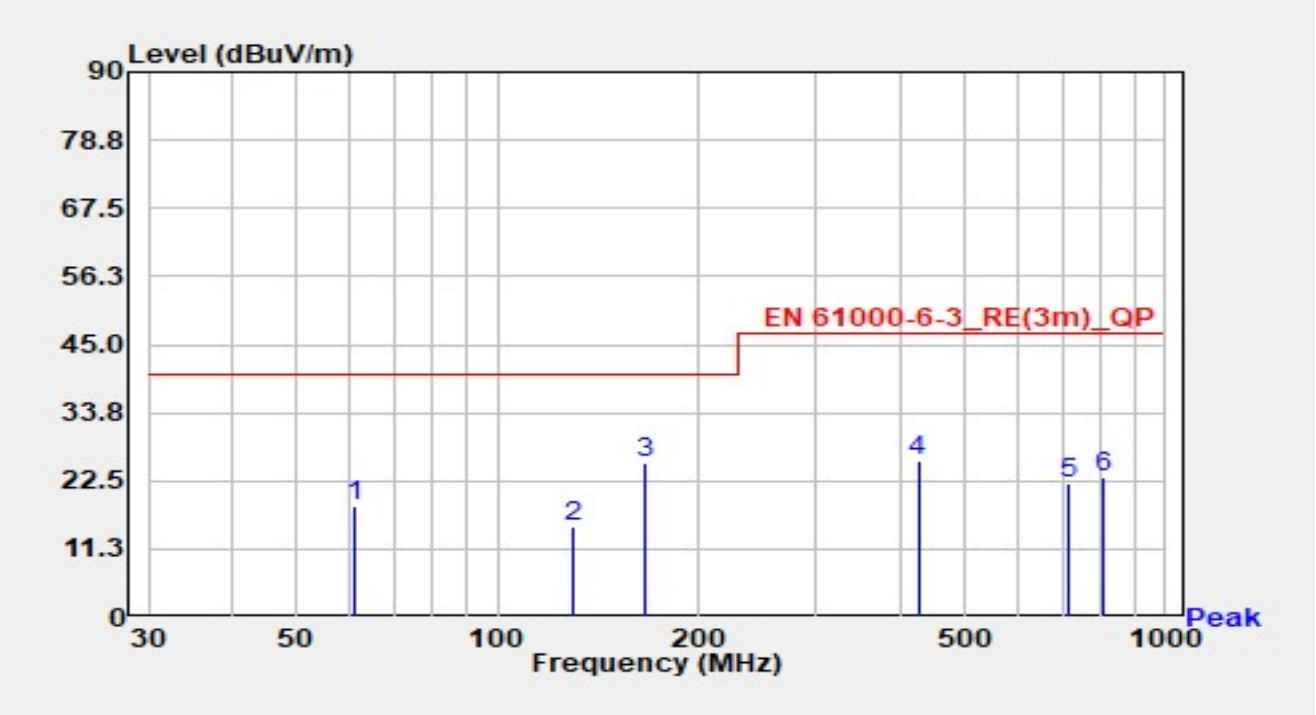
Notes:

1. " *", means this data is the worst emission level.

2. C.F (dB/m) = Antenna Factor (dB/m)+ Cable Loss (dB).

3. Measurement(dBμV/m) = Reading(dBμV) + C.F (dB/m).

Site	SIP-AC2	Test Date	2024-07-25
Test Engineer	Fusco Pan	Temp./Humidity	24.3°C /65.2%
Factor	VULB 9168_00999_25-2000MHz	Polarity	Horizontal
EUT	Segway eKickScooter ZT3 Pro	Test Voltage	By Battery
Test Mode	Mode 2		



No	Mark	Frequency (MHz)	Reading (dBµV)	C.F (dB/m)	Measurement (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Detector
1		60.939	-1.20	19.59	18.39	-21.61	40.00	QP
2		129.241	-4.10	18.89	14.79	-25.21	40.00	QP
3	*	166.710	5.47	20.11	25.58	-14.42	40.00	QP
4		426.222	1.76	24.08	25.84	-21.16	47.00	QP
5		714.925	-8.10	30.02	21.92	-25.08	47.00	QP
6		809.697	-7.90	31.03	23.13	-23.87	47.00	QP

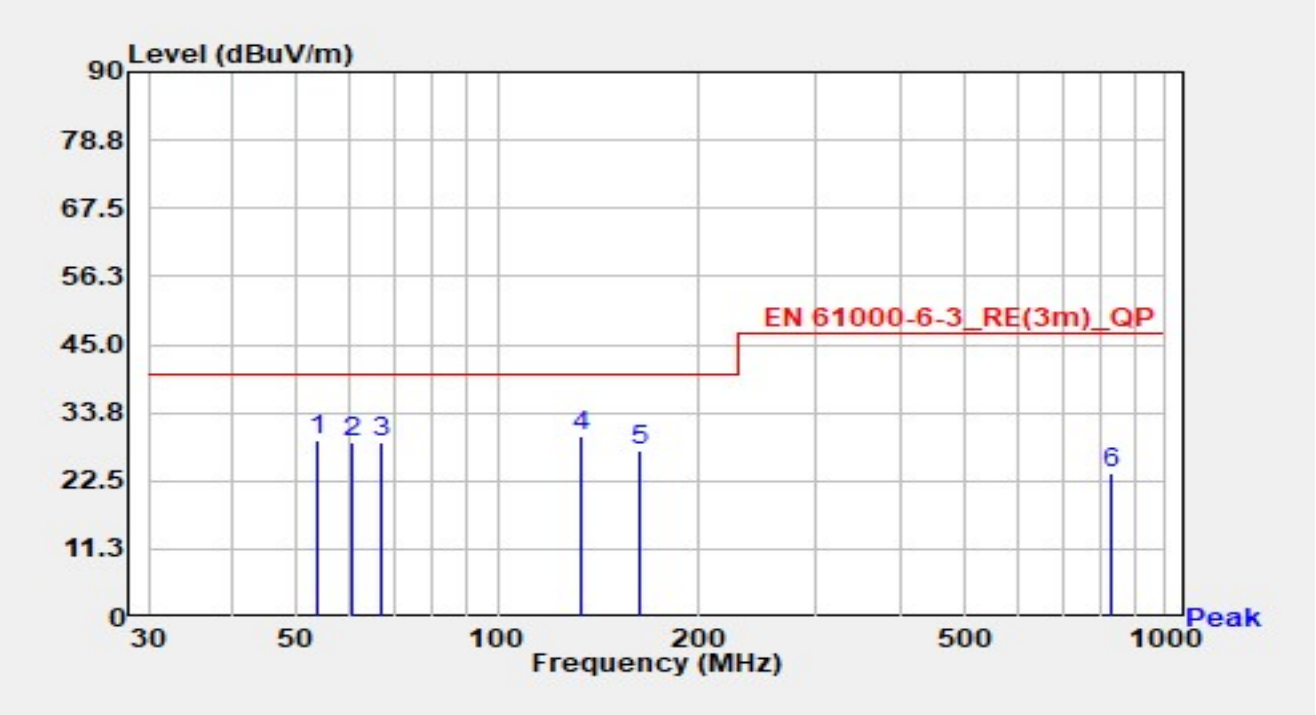
Notes:

1. " * ", means this data is the worst emission level.

2. C.F (dB/m) = Antenna Factor (dB/m)+ Cable Loss (dB).

3. Measurement(dBµV/m) = Reading(dBµV) + C.F (dB/m).

Site	SIP-AC2	Test Date	2024-07-25
Test Engineer	Fusco Pan	Temp./Humidity	24.3°C /65.2%
Factor	VULB 9168_00999_25-2000MHz	Polarity	Vertical
EUT	Segway eKickScooter ZT3 Pro	Test Voltage	By Battery
Test Mode	Mode 2		



No	Mark	Frequency (MHz)	Reading (dBμV)	C.F (dB/m)	Measurement (dBμV/m)	Margin (dB)	Limit (dBμV/m)	Detector
1		53.731	8.80	20.31	29.11	-10.89	40.00	QP
2		60.471	9.30	19.66	28.96	-11.04	40.00	QP
3		66.686	10.30	18.65	28.95	-11.05	40.00	QP
4	*	133.900	10.40	19.33	29.73	-10.27	40.00	QP
5		162.668	7.20	20.28	27.48	-12.52	40.00	QP
6		831.857	-7.80	31.58	23.78	-23.22	47.00	QP

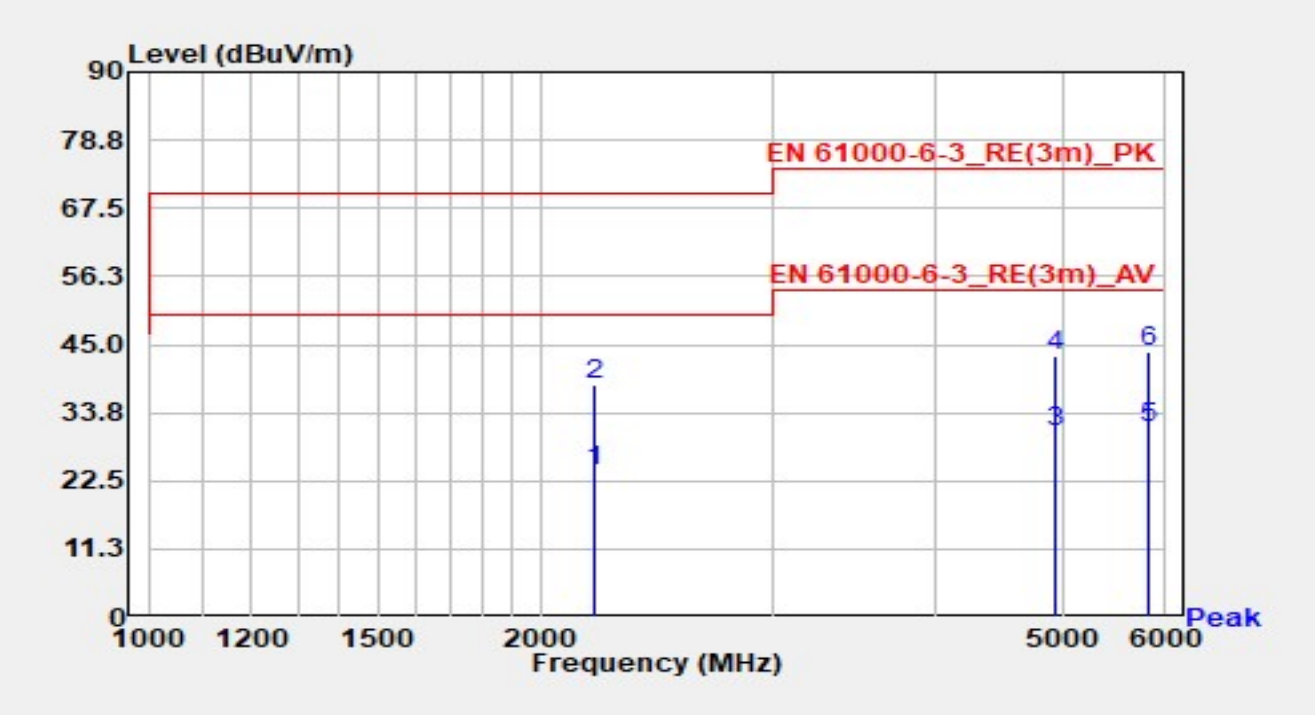
Notes:

1. " * ", means this data is the worst emission level.

2. C.F (dB/m) = Antenna Factor (dB/m)+ Cable Loss (dB).

3. Measurement(dBμV/m) = Reading(dBμV) + C.F (dB/m).

Site	SIP-AC1	Test Date	2024-07-24
Test Engineer	Barry Wu	Temp./Humidity	26.2°C/68.9%
Factor	HF907_102862_1-18GHz	Polarity	Horizontal
EUT	Segway eKickScooter ZT3 Pro	Test Voltage	AC 230V/50Hz
Test Mode	Mode 1		



No	Mark	Frequency (MHz)	Reading (dBμV)	C.F (dB/m)	Measurement (dBμV/m)	Margin (dB)	Limit (dBμV/m)	Detector
1		2196.000	28.99	-4.93	24.06	-25.94	50.00	Average
2		2196.000	43.47	-4.93	38.54	-31.46	70.00	Peak
3		4943.000	25.41	5.14	30.55	-23.45	54.00	Average
4		4943.000	37.93	5.14	43.07	-30.93	74.00	Peak
5	*	5834.000	25.24	6.16	31.40	-22.60	54.00	Average
6		5834.000	37.64	6.16	43.81	-30.19	74.00	Peak

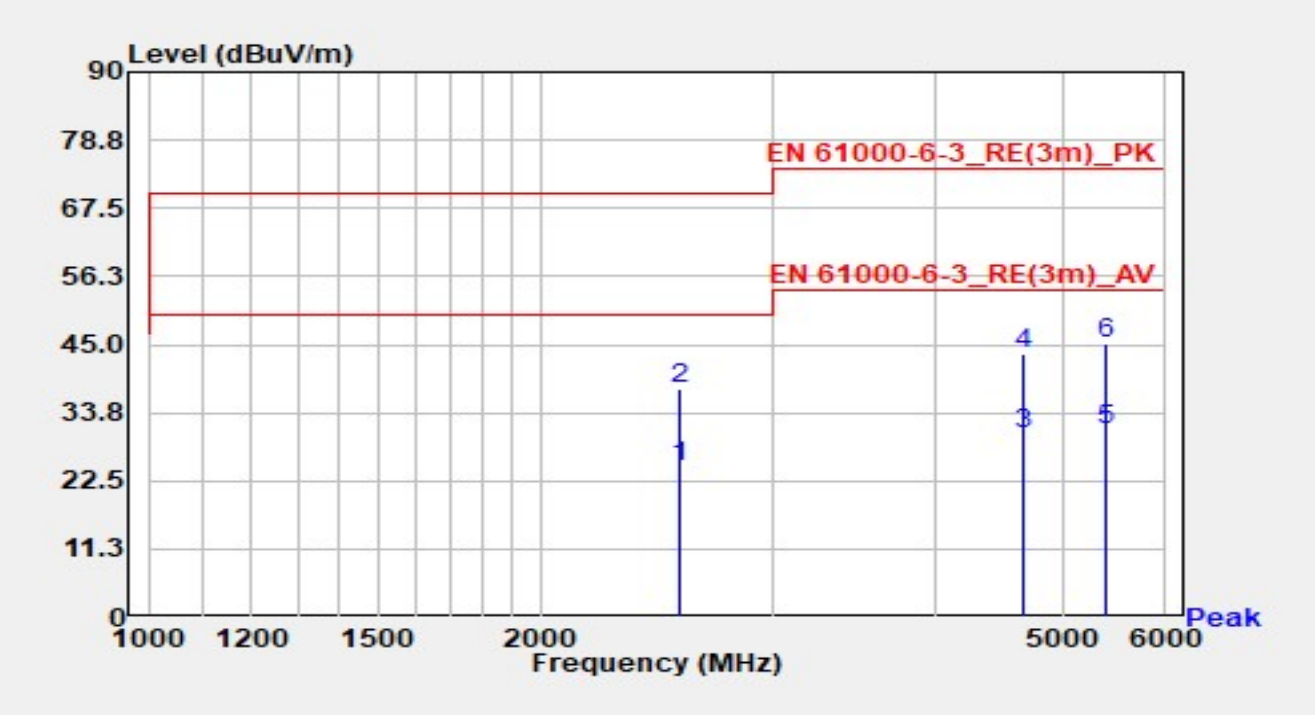
Notes:

1. " *", means this data is the worst emission level.

2. C.F (dB/m) = Antenna Factor (dB/m)+ Cable Loss (dB).

3. Measurement(dBμV/m) = Reading(dBμV) + C.F (dB/m).

Site	SIP-AC1	Test Date	2024-07-24
Test Engineer	Barry Wu	Temp./Humidity	26.2°C/68.9%
Factor	HF907_102862_1-18GHz	Polarity	Vertical
EUT	Segway eKickScooter ZT3 Pro	Test Voltage	AC 230V/50Hz
Test Mode	Mode 1		



No	Mark	Frequency (MHz)	Reading (dBμV)	C.F (dB/m)	Measurement (dBμV/m)	Margin (dB)	Limit (dBμV/m)	Detector
1		2550.500	28.10	-3.19	24.91	-25.09	50.00	Average
2		2550.500	40.95	-3.19	37.76	-32.24	70.00	Peak
3		4681.500	26.13	4.21	30.34	-23.66	54.00	Average
4		4681.500	39.43	4.21	43.63	-30.37	74.00	Peak
5	*	5407.000	24.90	5.94	30.84	-23.16	54.00	Average
6		5407.000	39.09	5.94	45.03	-28.97	74.00	Peak

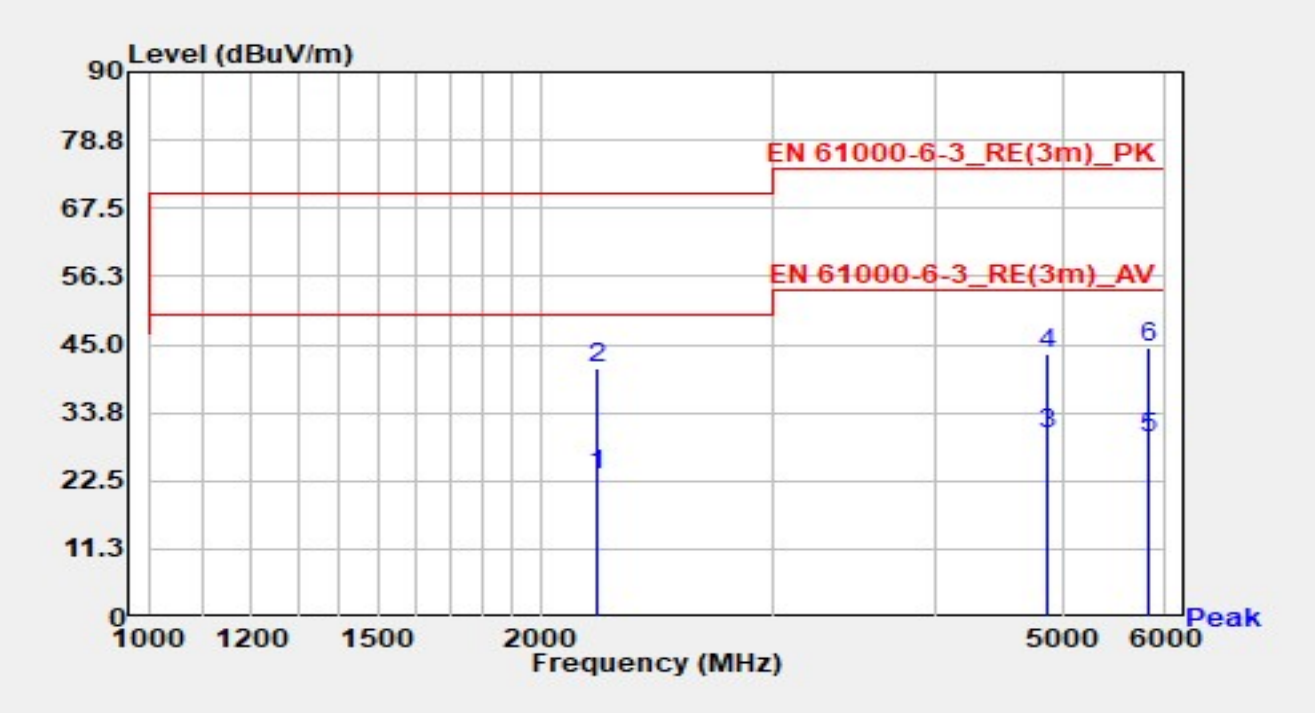
Notes:

1. " *", means this data is the worst emission level.

2. C.F (dB/m) = Antenna Factor (dB/m)+ Cable Loss (dB).

3. Measurement(dBμV/m) = Reading(dBμV) + C.F (dB/m).

Site	SIP-AC1	Test Date	2024-07-24
Test Engineer	Barry Wu	Temp./Humidity	26.2°C/68.9%
Factor	HF907_102862_1-18GHz	Polarity	Horizontal
EUT	Segway eKickScooter ZT3 Pro	Test Voltage	By Battery
Test Mode	Mode 2		



No	Mark	Frequency (MHz)	Reading (dBμV)	C.F (dB/m)	Measurement (dBμV/m)	Margin (dB)	Limit (dBμV/m)	Detector
1		2201.000	28.37	-4.96	23.41	-26.59	50.00	Average
2		2201.000	46.08	-4.96	41.12	-28.88	70.00	Peak
3	*	4869.000	25.60	4.69	30.29	-23.71	54.00	Average
4		4869.000	38.66	4.69	43.34	-30.66	74.00	Peak
5		5831.500	23.40	6.16	29.56	-24.44	54.00	Average
6		5831.500	38.27	6.16	44.43	-29.57	74.00	Peak

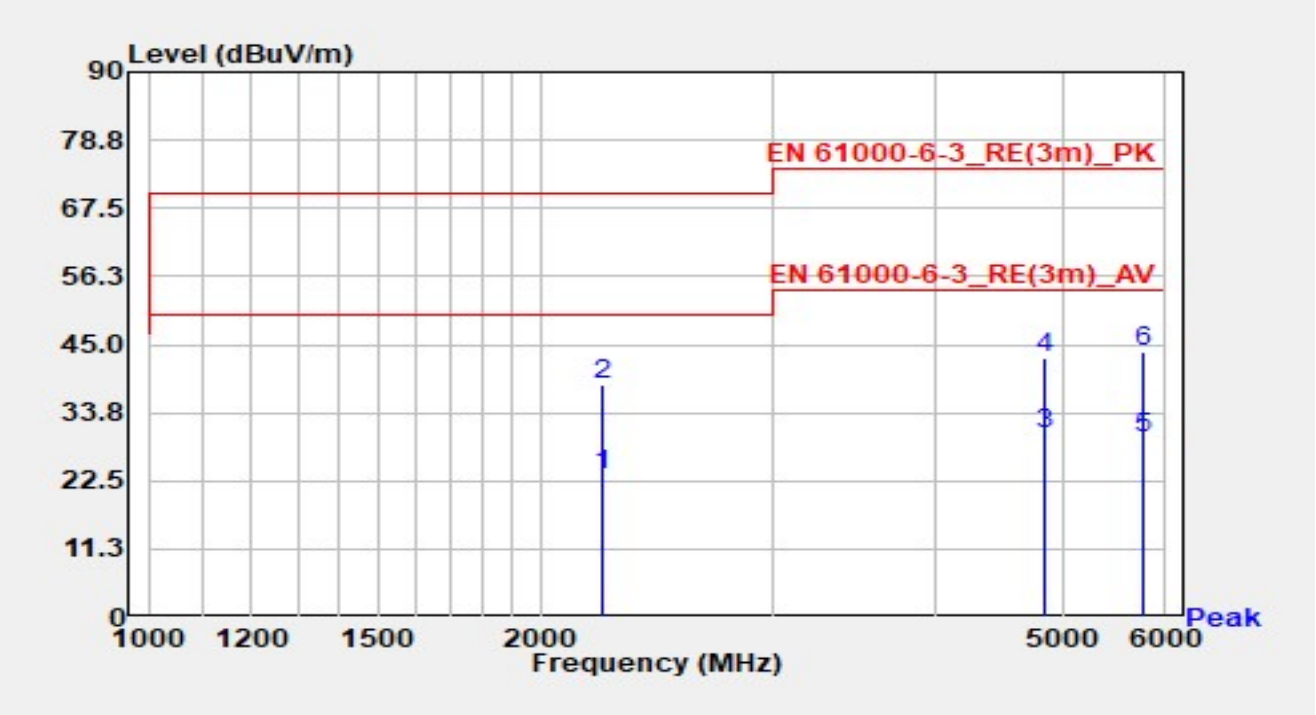
Notes:

1. " *", means this data is the worst emission level.

2. C.F (dB/m) = Antenna Factor (dB/m)+ Cable Loss (dB).

3. Measurement(dBμV/m) = Reading(dBμV) + C.F (dB/m).

Site	SIP-AC1	Test Date	2024-07-24
Test Engineer	Barry Wu	Temp./Humidity	26.2°C/68.9%
Factor	HF907_102862_1-18GHz	Polarity	Vertical
EUT	Segway eKickScooter ZT3 Pro	Test Voltage	By Battery
Test Mode	Mode 2		



No	Mark	Frequency (MHz)	Reading (dBμV)	C.F (dB/m)	Measurement (dBμV/m)	Margin (dB)	Limit (dBμV/m)	Detector
1		2228.500	28.32	-4.84	23.48	-26.52	50.00	Average
2		2228.500	43.14	-4.84	38.30	-31.70	70.00	Peak
3	*	4855.500	25.55	4.62	30.17	-23.83	54.00	Average
4		4855.500	38.09	4.62	42.71	-31.29	74.00	Peak
5		5770.500	23.66	5.98	29.64	-24.36	54.00	Average
6		5770.500	37.91	5.98	43.89	-30.11	74.00	Peak

Notes:

1. " *", means this data is the worst emission level.

2. C.F (dB/m) = Antenna Factor (dB/m)+ Cable Loss (dB).

3. Measurement(dBμV/m) = Reading(dBμV) + C.F (dB/m).

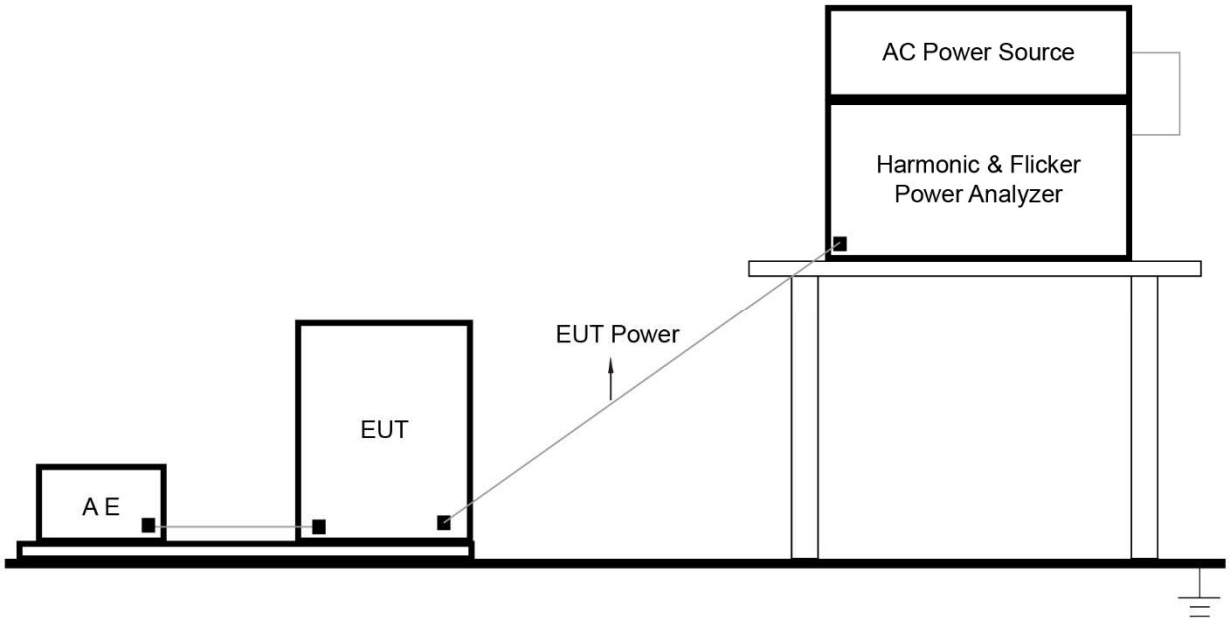
5.4. Harmonic Current Emissions

5.4.1. Test Limit

Limits of Class A Harmonics Currents

Harmonics Order n	Maximum Permissible harmonic current A	Harmonics Order n	Maximum Permissible harmonic current A
Odd harmonics		Even harmonics	
3	2.30	2	1.08
5	1.14	4	0.43
7	0.77	6	0.30
9	0.40	8 ≤ n ≤ 40	0.23 * 8/n
11	0.33	--	--
13	0.21	--	--
15 ≤ n ≤ 39	0.15 * 15/n	--	--

5.4.2. Test Setup



5.4.3. Test Procedure

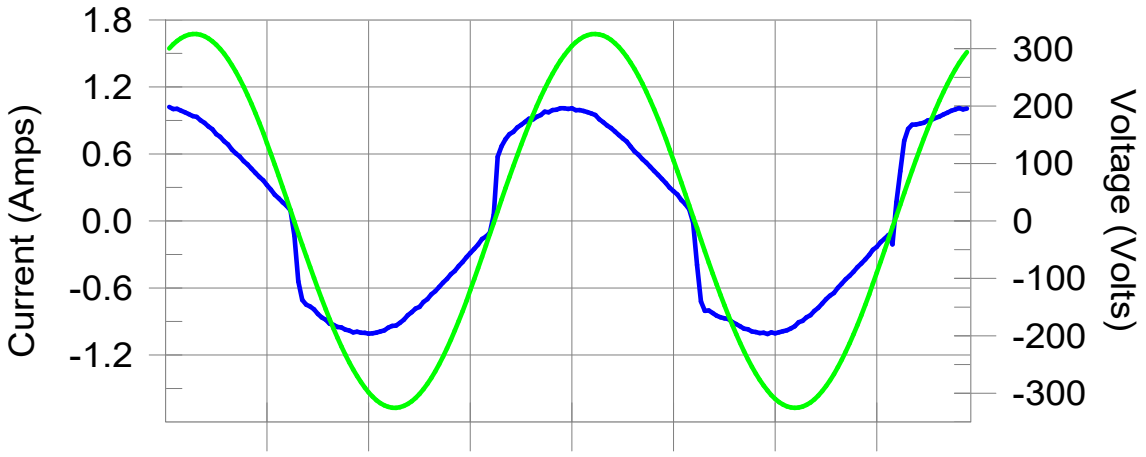
The EUT is supplied in series with power analyzer from a power source having the same normal voltage and frequency as the rated supply voltage and the equipment under test. And the rated voltage at the supply voltage of EUT of 0.98 times and 1.02 times shall be performed.

5.4.4 Test Result

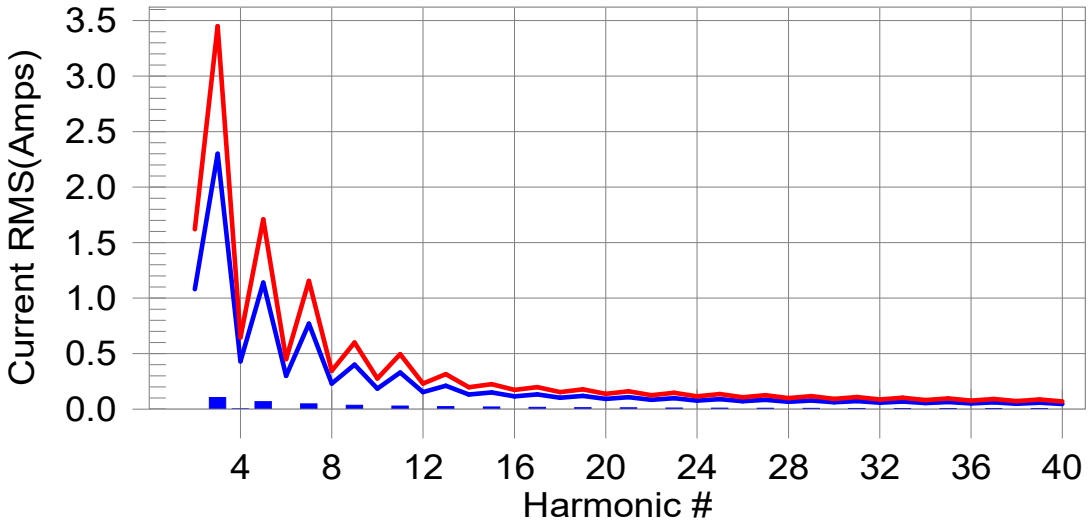
Test Site	SIP-SR2	Temperature	25.1°C
Test Engineer	Arvin Ding	Relative Humidity	59.6%
Test Mode	Mode 1	Test Date	2024-07-15

Test Result: Pass **Source qualification: Normal**

Current & voltage waveforms



Harmonics and Class A limit line **European Limits**



Test result: Pass **Worst harmonics H15-8.5% of 150% limit, H15-12.6% of 100% limit**

Test Result: Pass **Source qualification: Normal**
THC(A): 0.146 **I-THD(%): 19.4** **POHC(A): 0.023** **POHC Limit(A): 0.251**

Highest parameter values during test:

V_RMS (Volts):	**230.24**	**Frequency(Hz):**	**50.00**
I_Peak (Amps):	**1.033**	**I_RMS (Amps):**	**0.766**
I_Fund (Amps):	**0.752**	**Crest Factor:**	**1.360**
Power (Watts):	**166.6**	**Power Factor:**	**0.945**

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.002	1.080	N/A	0.002	1.620	N/A	Pass
3	0.104	2.300	4.5	0.106	3.450	3.1	Pass
4	0.002	0.430	N/A	0.003	0.645	N/A	Pass
5	0.067	1.140	5.9	0.067	1.710	3.9	Pass
6	0.002	0.300	N/A	0.002	0.450	N/A	Pass
7	0.047	0.770	6.1	0.047	1.155	4.1	Pass
8	0.002	0.230	N/A	0.003	0.345	N/A	Pass
9	0.035	0.400	8.8	0.035	0.600	5.9	Pass
10	0.002	0.184	N/A	0.002	0.276	N/A	Pass
11	0.028	0.330	8.5	0.028	0.495	5.7	Pass
12	0.002	0.153	N/A	0.002	0.230	N/A	Pass
13	0.023	0.210	10.8	0.023	0.315	7.3	Pass
14	0.002	0.131	N/A	0.002	0.197	N/A	Pass
15	0.019	0.150	12.6	0.019	0.225	8.5	Pass
16	0.002	0.115	N/A	0.002	0.173	N/A	Pass
17	0.016	0.132	12.0	0.016	0.198	8.1	Pass
18	0.002	0.102	N/A	0.002	0.153	N/A	Pass
19	0.013	0.118	11.4	0.014	0.178	7.7	Pass
20	0.002	0.092	N/A	0.002	0.138	N/A	Pass
21	0.012	0.107	10.8	0.012	0.161	7.4	Pass
22	0.002	0.084	N/A	0.002	0.125	N/A	Pass
23	0.010	0.098	10.2	0.010	0.147	7.0	Pass
24	0.001	0.077	N/A	0.002	0.115	N/A	Pass
25	0.009	0.090	9.6	0.009	0.135	6.6	Pass
26	0.001	0.071	N/A	0.002	0.107	N/A	Pass
27	0.007	0.083	9.0	0.008	0.125	6.4	Pass
28	0.001	0.066	N/A	0.002	0.099	N/A	Pass
29	0.007	0.078	8.4	0.007	0.116	5.8	Pass
30	0.001	0.061	N/A	0.002	0.092	N/A	Pass
31	0.006	0.073	7.9	0.006	0.109	5.6	Pass
32	0.001	0.058	N/A	0.002	0.086	N/A	Pass
33	0.005	0.068	7.3	0.006	0.102	5.4	Pass
34	0.001	0.054	N/A	0.001	0.081	N/A	Pass
35	0.005	0.064	N/A	0.005	0.096	N/A	Pass
36	0.001	0.051	N/A	0.001	0.077	N/A	Pass
37	0.004	0.061	N/A	0.004	0.091	N/A	Pass
38	0.001	0.048	N/A	0.001	0.073	N/A	Pass
39	0.004	0.058	N/A	0.004	0.087	N/A	Pass
40	0.001	0.046	N/A	0.001	0.069	N/A	Pass

5.5. Voltage Fluctuations and Flicker

5.5.1. Test Limit

The following limits apply:

- the value of P_{st} shall not be greater than 1.0;
- the value of P_{lt} shall not be greater than 0.65;
- the value of $d_{(t)}$ during a voltage change shall not exceed 3.3% for more than 500ms;
- the relative steady-state voltage change, dc, shall not exceed 3.3%;
- the maximum relative voltage change, d_{max}, shall not exceed;

a) 4% without additional conditions;

b) 6% for equipment which is:

- switched manually, or
- switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.

Note: The cycling frequency will be further limited by the P_{st} and P_{lt} limit.

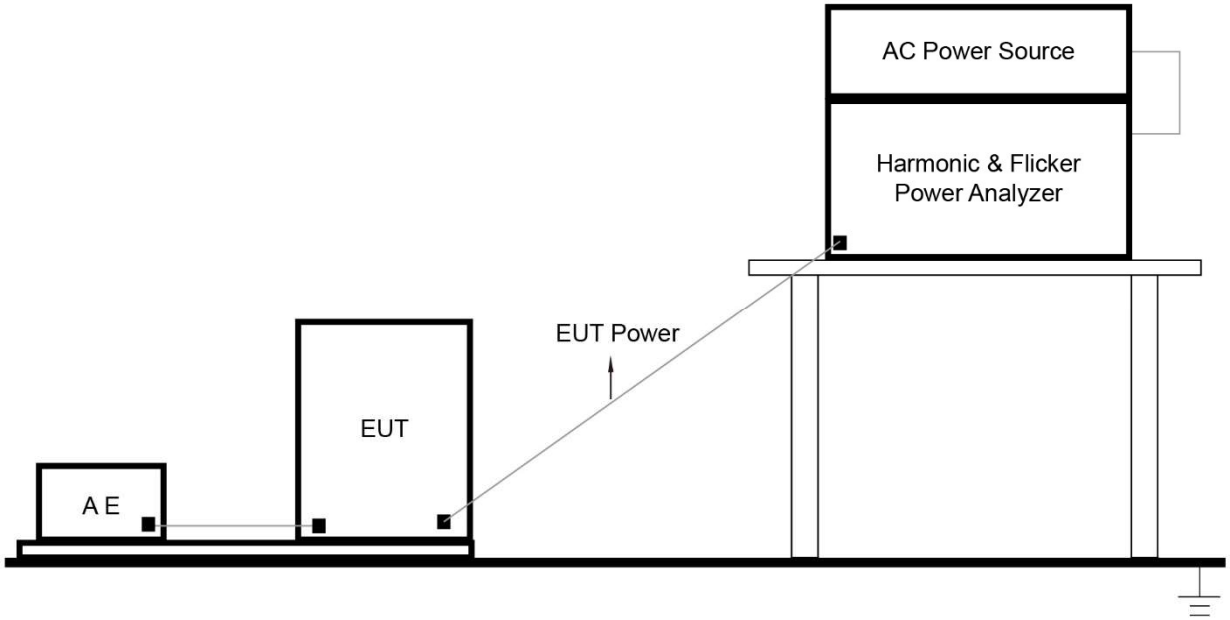
For example: a d_{max} of 6% producing a rectangular voltage change characteristic twice per hour will give a P_{lt} of about 0.65.

c) 7% for equipment which is:

- attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or
- switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.

P_{st} and P_{lt} requirements shall not be applied to voltage changes caused by manual switching.

5.5.2. Test Setup



5.5.3. Test Procedure

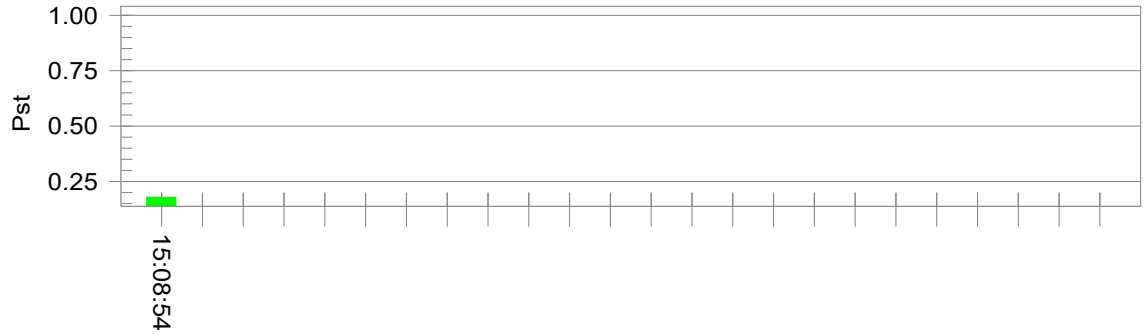
The EUT is supplied in series with power analyzer from a power source having the same normal voltage and frequency as the rated supply voltage and the equipment under test. And the rated voltage at the supply voltage of EUT of 0.98 times and 1.02 times shall be performed.

5.5.4 Test Result

Test Site	SIP-SR2	Temperature	25.1°C
Test Engineer	Arvin Ding	Relative Humidity	59.6%
Test Mode	Mode 1	Test Date	2024-07-15

Test Result: Pass **Status: Test Completed**

Pst_t and limit line **European Limits**



Plt and limit line

Parameter values recorded during the test:

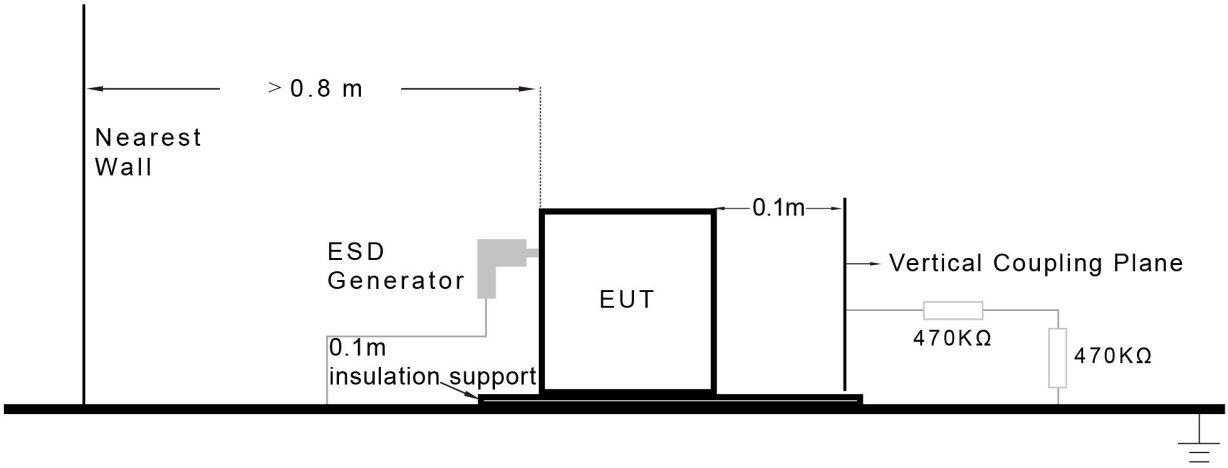
Vrms at the end of test (Volt):	**230.23**			
Highest dt (%):		**Test limit (%):**		
T-max (mS):	**0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**0.00**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.179**	**Test limit:**	**1.000**	**Pass**
Highest Plt (2 hr. period):	**0.078**	**Test limit:**	**0.650**	**Pass**

5.6. Electrostatic Discharge

5.6.1. Test Limit

Environmental Phenomenon	Test Specification	Units	Performance Criterion
EN 301 489 -1			
Electrostatic Discharge	±4 (Contact discharge) ±2, ±4, ±8 (Air discharge)	kV (Test voltage) kV (Test voltage)	Transient phenomena
EN 301 489-17			
Electrostatic discharge	±4 (Contact discharge) ±2, ±4, ±8 (Air discharge)	kV (Charge voltage) kV (Charge voltage)	B
EN IEC 61000-6-1			
Electrostatic Discharge	±4 (Contact discharge) ±2, ±4, ±8 (Air discharge)	kV (Test voltage) kV (Test voltage)	B

5.6.2. Test Setup



5.6.3. Test Procedure

Direct Application of Discharges to the EUT:

Contact discharge was applied only to conductive surfaces of the EUT.

Air discharges were applied only to non-conductive surfaces of the EUT.

During the test, it was performed with single discharges. For the single discharge time between successive single discharges will be keep longer 1 second. It was at least ten single discharges with positive and negative at the same selected point.

The selected point, which was performed with electrostatic discharge, was marked on the red label of the EUT.

Indirect Application of Discharges to the EUT:

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. It was at least ten single discharges with positive and negative at the same selected point.

5.6.4 Test Result

Test Site	SIP-SR3	Temperature/ Humidity	25.7°C/51.3%
Test Engineer	Violet Tao	Barometric	100.2kPa
Test Mode	Mode 1	Test Date	2024-07-23

Direct Application		Performance Criterion Result
Test Location	Test Level	Contact Discharge
1 ~ 52	±4kV	Complies Note
Test Location	Test Level	Air Discharge
53 ~ 100	±2kV, ±4kV, ±8kV	Complies Note

Indirect Application		Performance Criterion Result
Test Location	Test Level	Vertical Coupling
Front, Rear Left, Right	±4kV	Complies Note

Note: During and after the test, the EUT performance complied with performance criteria and there is not any degradation of performance or function.

Test Site	SIP-SR3	Temperature/ Humidity	25.7°C/51.3%
Test Engineer	Violet Tao	Barometric	100.2kPa
Test Mode	Mode 2	Test Date	2024-07-23

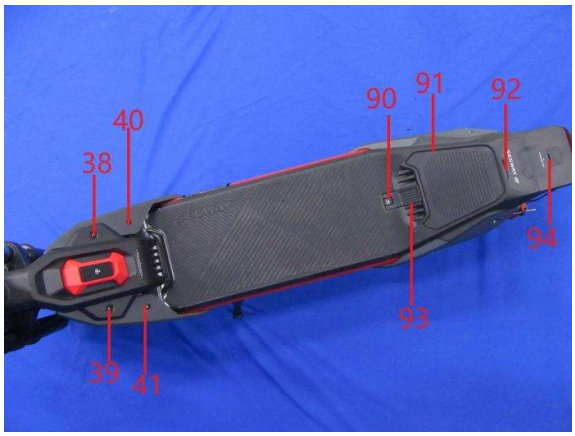
Direct Application		Performance Criterion Result
Test Location	Test Level	Contact Discharge
1 ~ 15	±4kV	Complies Note
Test Location	Test Level	Air Discharge
53 ~ 73	±2kV, ±4kV, ±8kV	Complies Note

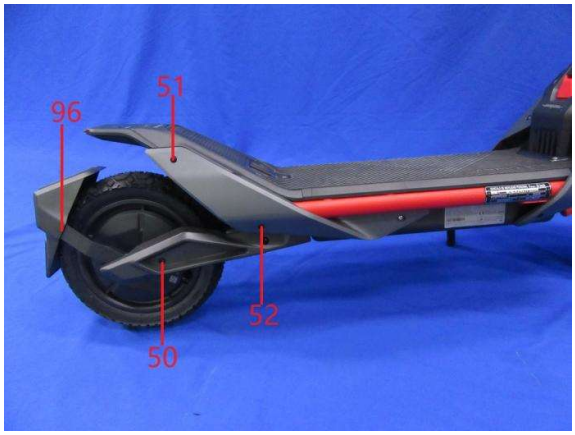
Indirect Application		Performance Criterion Result
Test Location	Test Level	Vertical Coupling
Front, Rear Left, Right	±4kV	Complies Note

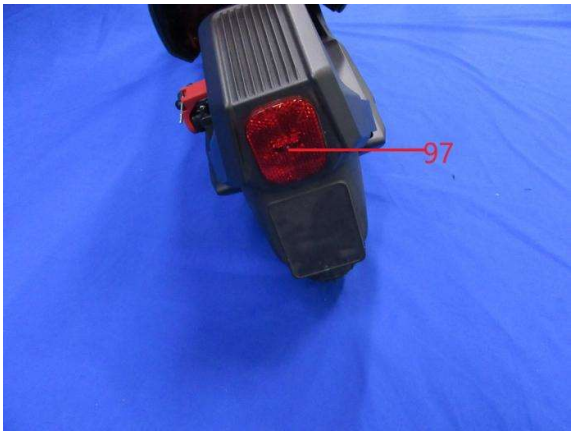
Note: During and after the test, the EUT performance complied with performance criteria and there is not any degradation of performance or function.

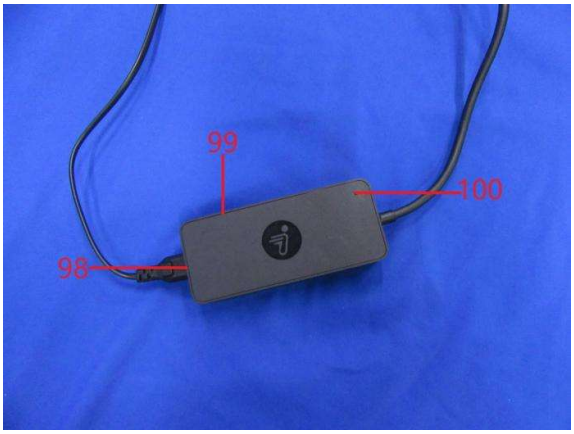
Electrostatic Discharge Test Location

Electrostatic Discharge Test Location







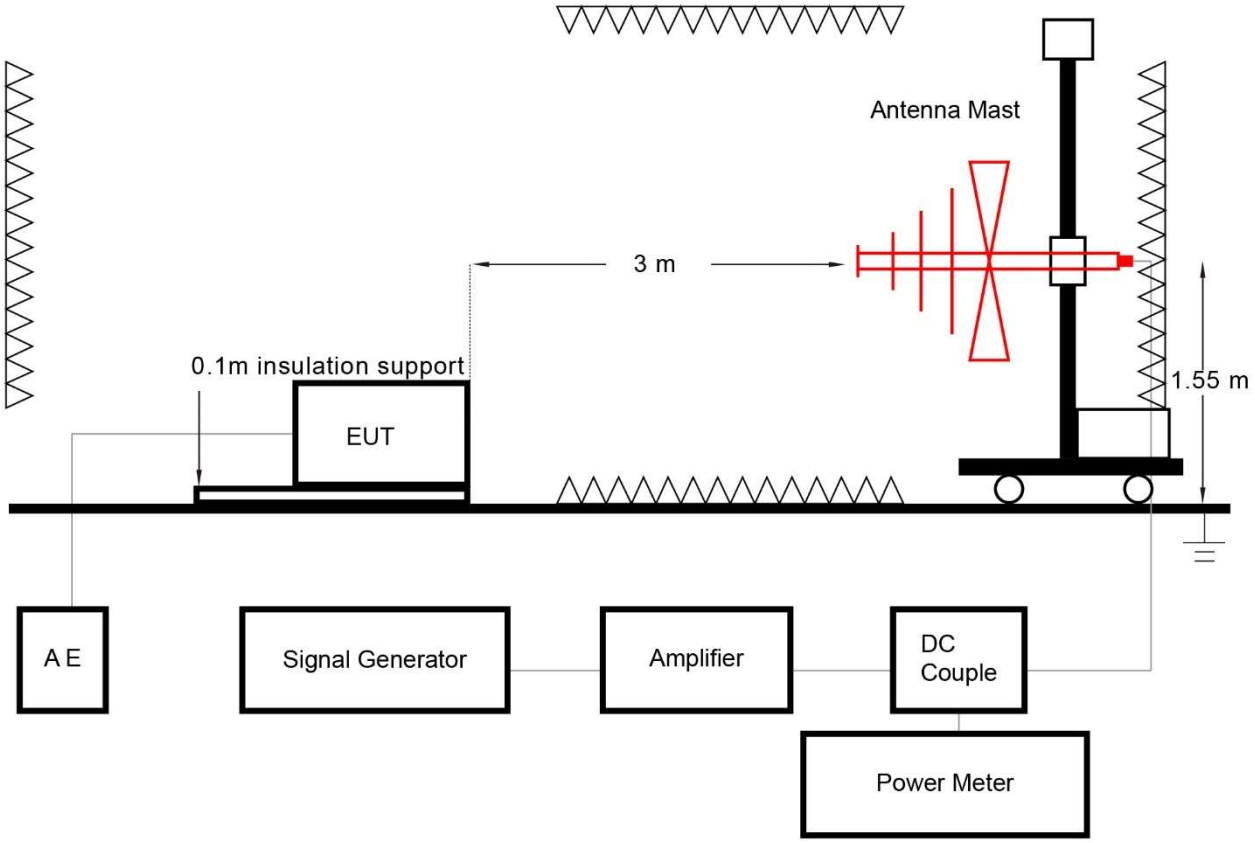


5.7. Radio Frequency Electromagnetic Field

5.7.1. Test Limit

Environmental Phenomenon	Test Specification	Units	Performance Criterion
EN 301 489 -1 (Note 1, 2)			
Enclosure port			
Radio-Frequency Electromagnetic field	80 - 6000 3 80	MHz V/m (unmodulated, r.m.s) % AM (1kHz)	Continuous phenomena
EN 301 489 -17 (Note 1, 2)			
Enclosure port			
Radio Frequency Electromagnetic field, sweep test	80 - 6000 3 80	MHz V/m (unmodulated, r.m.s) % AM (1kHz)	A
EN IEC 61000-6-1			
Enclosure port			
Radio-Frequency Electromagnetic field	80 - 1000, 1400 - 6000 3 80	MHz V/m (unmodulated, r.m.s) % AM (1kHz)	A
Note 1: If the wanted signal is modulated at 1000Hz, then an audio signal of 400Hz shall be used. Note 2: The test shall be performed over the frequency range 80MHz to 6000MHz with the exception of the exclusion band for transmitters, receivers and duplex transceivers of EN 301 489-1, as appropriate.			

5.7.2. Test Setup



5.7.3. Test Procedure

The EUT and load, which are placed on a table that is 0.8 meter above ground, are placed with one coincident with the calibration plane such that the distance from antenna to the EUT was 3 meters.
The test shall normally be performed with the generating antenna facing each side of the EUT. When equipment can be used in different orientations (i.e. vertical or horizontal) all sides shall be exposed to the field during the test. When technically justified, some EUTs can be tested by exposing fewer faces to the generating antenna. In other cases, as determined for example by the type and size of EUT or the frequencies of test, more than four azimuths may need to be exposed.

All the scanning conditions are as follows:

	Condition of Test	Remarks
1.	Field Strength	3V/m
2.	RF Signal	AM 80% Modulated with 1kHz
3.	Scanning Frequency	80MHz ~ 6000MHz
4.	Dwell Time	1 Second
5.	Frequency Step Size $\triangle f$	1%

5.7.4 Test Result

Test Site	SIP-AC4	Temperature	25.1°C
Test Engineer	Miron Ding	Relative Humidity	51.2%
Test Mode	Mode 1 ~ 2	Test Date	2024-07-21

Frequency (MHz)	Polarity	Test Position	Field Strength (V/m)	Performance Criterion Result
80 - 1000	Horizontal/Vertical	Left	3	Complies Note 1
		Right		Complies Note 1
1000 - 1400	Horizontal/Vertical	Left	3	Complies Note 1
		Right		Complies Note 1
1400 – 6000Note 3	Horizontal/Vertical	Left	3	Complies Note 1
		Right		Complies Note 1

Note 1: During and after the test, the EUT performance complied with performance criteria and there was not any degradation of performance or function.

Note 2: Two sides of the EUT are chosen for testing after evaluation.

Note 3: The exclusion bands which defined in EN301489 series standards were excluded during the test.

5.8. Fast Transients, Common Mode

5.8.1. Test Limit

Environmental Phenomenon	Test Specification	Units	Performance Criterion
EN 301 489 -1			
Input AC power ports			
Electrical fast transients	±1 5/50 5	kV (open circuit test voltage) Tr/Th (ns) Repetition frequency (kHz)	Transient phenomena
Signal ports, telecommunication ports, and control ports (See Note 1 / 2 / 3)			
Fast transients common mode	±0.5 5/50 5	kV (peak) Tr/Th ns Repetition frequency (kHz)	Transient phenomena
EN 301 489 -17			
Input AC power ports			
Electrical Fast Transients	±1 5/50 5	kV (open circuit test voltage) Tr/Th (ns) Repetition frequency (kHz)	B
Input DC power ports (See Note 4)			
Electrical Fast Transients	±0.5 5/50 5	kV (peak) Tr/Th ns Repetition frequency (kHz)	B
Signal ports, wired network ports (excluding xDSL), and control ports			
Electrical Fast Transients	±0.5 5/50 5	kV (peak) Tr/Th ns Repetition frequency (kHz)	B

EN IEC 61000-6-1			
Input AC power ports			
Electrical fast transients / burst	±1 5/50 5	kV (open circuit test voltage) Tr/Th (ns) Repetition frequency (kHz)	B
Input DC power ports (See Note 4)			
Electrical fast transients / burst	±0.5 5/50 5	kV (peak) Tr/Th ns Repetition frequency (kHz)	B
Ports for control/signal ports (See Note 5)			
Electrical fast transients / burst	±0.5 5/50 5	kV (peak) Tr/Th ns Repetition frequency (kHz)	B

Note 1: This test shall be additionally performed on signal ports, telecommunication ports, control ports, and DC power ports, of radio equipment and associated ancillary equipment, if the cables may be longer than 3m.

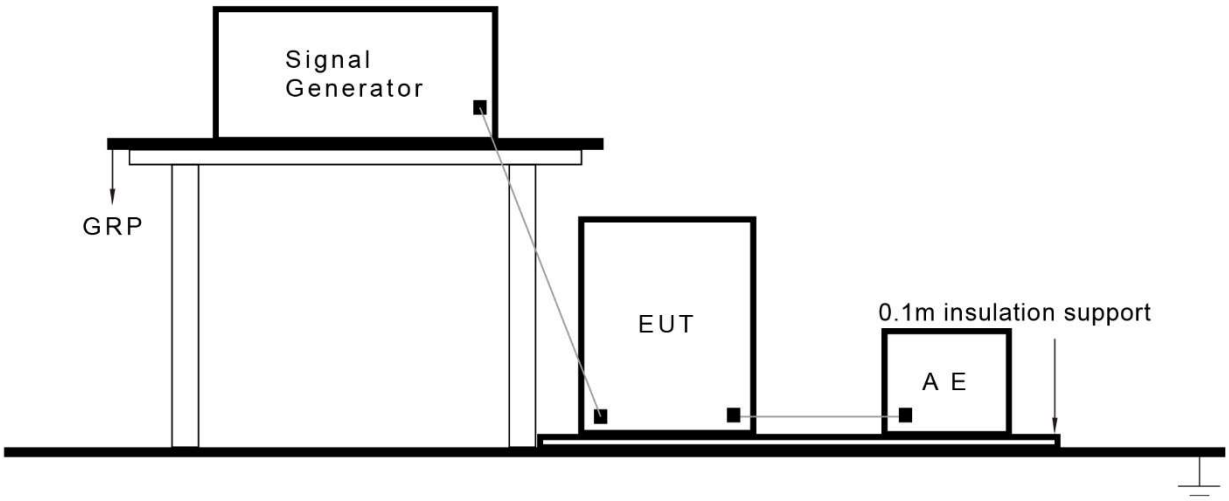
Note 2: The test level for signal ports, wired network ports (excluding xDSL), and control ports shall be 0.5 kV open circuit voltage at a repetition rate of 5 kHz.

Note 3: The test level for xDSL wired network ports shall be 0,5 kV open circuit voltage at a repetition rate of 100 kHz.

Note 4: Not applicable to input ports intended for connection to a battery or a rechargeable battery which must be removed or disconnected from the apparatus for recharging. Apparatus with a DC power input port intended for use with an AC - DC power adaptor shall be tested on the AC power input of the AC- DC power adaptor specified by the manufacturer or, where none is so specified, using a typical AC - DC power adaptor. The test is applicable to DC power input ports intended to be connected permanently to cables longer than 3 m.

Note 5: Applicable only to ports interfacing with cables whose total length according to the manufacturer's functional specification may exceed 3 m.

5.8.2. Test Setup



5.8.3. Test Procedure

The EUT is placed on a insulating support that is 0.1 meter height.

The minimum area of the ground reference plane is 1m*1m, and 0.65mm thick min, and projected beyond the EUT by at least 0.1m on all sides.

For Input AC Power Ports:

The EUT is connected to the power mains through a coupling device that directly couples the EFT/B interference signal.

Each of the line conductors is impressed with burst noise for 1 minute.

The length of the power lines between the coupling device and the EUT is 0.5m.

For Signal Ports, Telecommunication Ports, and Control Ports:

The EFT interference signal is through a coupling clamp device couples to the signal of the EUT with burst noise for 1 minute.

The length of the signal lines between the coupling device and the EUT is 0.5m.

5.8.4 Test Result

Test Site	SIP-SR5	Temperature	25.5°C
Test Engineer	Lily Zhang	Relative Humidity	45.5%
Test Mode	Mode 1	Test Date	2024-07-12

Inject Line	Polarity	Test Level (kV)	Test Duration (second)	Inject Method	Performance Criteria Result
Input a.c. power port (Tr/Th: 5/50ns, Repetition Frequency: 5kHz)					
L + N	+	1	60	CDN	Complies Note
L + N	-	1	60	CDN	Complies Note

Note: During and after the test, the EUT performance complied with performance criteria and there is not any degradation of performance or function.

5.9. Surges

5.9.1. Test Limit

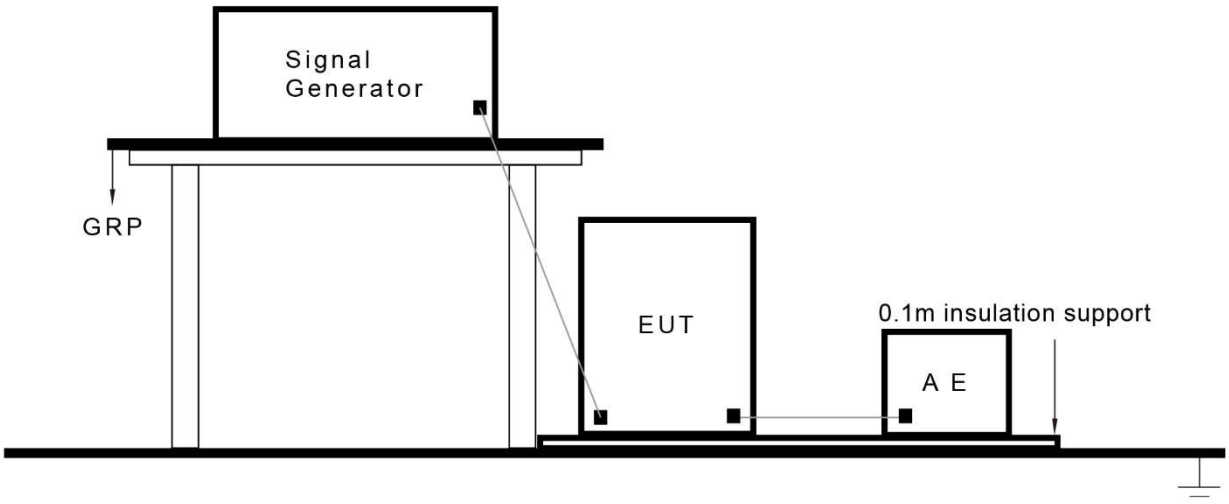
Environmental Phenomenon	Test Specification	Units	Performance Criterion
EN 301 489 -1			
AC mains power ports			
Surges	1.2/50 (8/20) ±1 line to line ±2 line to earth	Tr/Th (us) kV (open circuit test voltage) kV (open circuit test voltage)	Transient phenomena
Telecommunication ports directly connected to indoor cables (See Note 1)			
Surges	1.2/50 ±0.5 line to ground	Tr/Th (us) kV (peak)	Transient phenomena
EN 301 489-17			
Input AC power ports			
Surges	1.2/50 (8/20) ±1 line to line ±2 line to earth	Tr/Th (us) kV kV	B
Wired network ports directly connected to outdoor cables			
Surges (Symmetrically operated)	10/700 ±1 line to earth	Tr/Th (us) kV	B
Surges (Non-symmetrically operated)	1.2/50 (8/20) ±0.5 line to line ±1 line to earth, shield to earth	Tr/Th (us) kV kV	B
Wired network ports directly connected to indoor cables (Note)			
Surges	1.2/50 (8/20) ±0.5 line to ground, shield to earth	Tr/Th us kV	B

EN IEC 61000-6-1			
AC mains power ports			
Surges	1.2/50 (8/20) ±1 line to line	Tr/Th (us) kV (open circuit test voltage)	B
	1.2/50 (8/20) ±2 lines to earth	Tr/Th (us) kV (open circuit test voltage)	
DC network power ports (See Note 2)			
Surges	1.2/50 (8/20) ±0.5 line to line ±1 line to earth	Tr/Th (us) kV (open circuit test voltage)	B

Note:

1. The test level for wired network ports, intended to be connected to indoor cables (longer than 30 m) shall be 0,5 kV (applied line to ground, or shield to ground)
2. Not applicable to input ports intended for connection to a battery or a rechargeable battery which must be removed or disconnected from the apparatus for recharging. Apparatus with a DC power input port intended for use with an AC - DC power adaptor shall be tested on the AC power input of the AC- DC power adaptor specified by the manufacturer or, where none is so specified, using a typical AC - DC power adaptor. DC ports which are not intended to be connected to a DC distribution network are treated as signal ports.

5.9.2. Test Setup



5.9.3. Test Procedure

The EUT is placed on a insulating support that is 0.1 meter above a metal ground plane measured 1m*1m minimum and 0.65mm thick minimum and projected beyond the EUT by at least 0.1m on all sides. The length of power cord between the coupling device and the EUT shall be 2m or less.

For Input AC Power Ports:

The EUT is connected to the power mains through a coupling device that directly couples the surge interference signal.

The surge noise shall be applied synchronized to the voltage phase at 0^0, 90^0, 180^0, 270^0 and the peak value of the AC voltage wave. (Positive and negative)

Each of Line to Earth and Line to Line is impressed with a sequence of five surge voltages with interval of 1 minute.

For Telecommunication Ports:

The signal line of EUT is connected to coupling and decoupling network that directly couples the surge interference signal.

Only Line to ground is impressed with a sequence of five surge voltages with interval of 1 minute.

5.9.4 Test Result

Test Site	SIP-SR5	Temperature	25.5°C
Test Engineer	Lily Zhang	Relative Humidity	45.5%
Test Mode	Mode 1	Test Date	2024-07-12

Inject Line	Polarity	Angle (degree)	Test Level (kV)	Waveform Tr/Th (us)	Test Interval (second)	Performance Criteria Result
Power Ports [Tr/Th: 1.2/50us (8/20us)]						
L to N	+	0	0.5 & 1	1.2/50	60	Complies Note
L to N	-	0	0.5 & 1	1.2/50	60	Complies Note
L to N	+	90	0.5 & 1	1.2/50	60	Complies Note
L to N	-	90	0.5 & 1	1.2/50	60	Complies Note
L to N	+	180	0.5 & 1	1.2/50	60	Complies Note
L to N	-	180	0.5 & 1	1.2/50	60	Complies Note
L to N	+	270	0.5 & 1	1.2/50	60	Complies Note
L to N	-	270	0.5 & 1	1.2/50	60	Complies Note

Note: During and after the test, the EUT performance complied with performance criteria and there is not any degradation of performance or function.

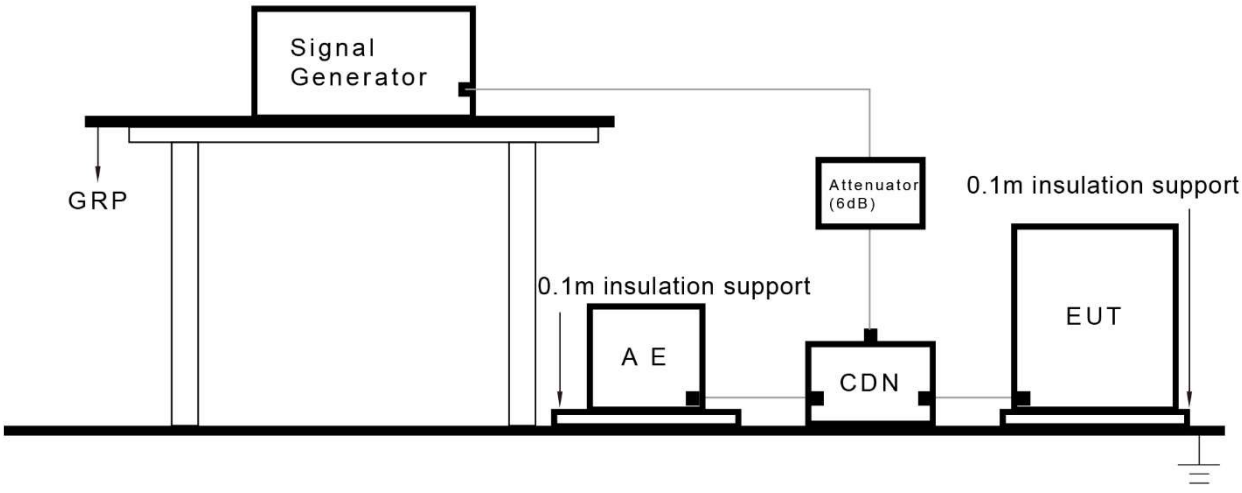
5.10. Radio Frequency Common Mode

5.10.1. Test Limit

Environmental phenomenon	Test specification	Units	Performance criterion
EN 301 489 -1			
Input AC power ports (See Note 1 / 2)			
Radio-frequency common mode	0.15 - 80 3 80	MHz V (unmodulated, r.m.s) % AM (1kHz)	Continuous phenomena
Signal ports, telecommunication ports, and control ports (See Note 1 / 2 / 3)			
Radio frequency common mode	0.15 - 80 3 80	MHz V (unmodulated, r.m.s) % AM (1kHz)	Continuous phenomena
EN 301 489-17			
Input AC power ports (Note 1)			
Radio Frequency Common Mode	0.15 - 80 3 80	MHz V (unmodulated, r.m.s) % AM (1kHz)	A
Signal ports, wired network ports, control ports, and DC power ports (Note 1/ 5)			
Radio Frequency Common Mode	0.15 - 80 3 80	MHz V (unmodulated, r.m.s) % AM (1kHz)	A

EN IEC 61000-6-1			
Input AC power ports (See Note 4)			
Radio-frequency common mode	0.15 - 80 3 80	MHz V (unmodulated, r.m.s) % AM (1kHz)	A
Input DC power ports (See Note 4 / 5)			
Radio-frequency common mode	0.15 - 80 3 80	MHz V (unmodulated, r.m.s) % AM (1kHz)	A
Signal ports (See Note 4 / 5)			
Radio frequency common mode	0.15 - 80 3 80	MHz V (unmodulated, r.m.s) % AM (1kHz)	A
Note 1: If the wanted signal is modulated at 1000Hz, then an audio signal of 400Hz shall be used. Note 2: The test shall be performed over the frequency range 150kHz to 80MHz with the exception of the exclusion band for transmitters, and for receivers and duplex transceivers [see clause 4 of EN 301 489-1. Note 3: This test shall be additionally performed on signal ports, telecommunication ports, control ports, and DC power ports, of radio equipment and associated ancillary equipment, if the cables may be longer than 3m. Note 4: The test level can also be defined as the equivalent current into a 150 Ω load. Note 5: Applicable only to ports interfacing with cables whose total length according to the manufacturer's functional specification may exceed 3 m.			

5.10.2. Test Setup



5.10.3. Test Procedure

The EUT is placed on a insulating support that is 0.1 meter height.

For Input AC Power Ports:

The EUT is connected to the power mains through a coupling and decoupling networks for power supply lines. And directly couples the disturbances signal into EUT.

For Signal Ports, Telecommunication Ports, and Control Ports:

The disturbance signal is through a coupling and decoupling networks (CDN) or EM-clamp device couples to the signal and telecommunication lines of the EUT.

	Condition of Test	Remarks
1.	Voltage Strength	3V
2.	RF Signal	AM 80% Modulated with 1kHz
3.	Scanning Frequency	0.15MHz - 80MHz
4.	Dwell Time	1 Second
5.	Frequency Step Size $\triangle f$	1%

5.10.4. Test Result

Test Site	SIP-SR4	Temperature	27.1°C
Test Engineer	Miron Ding	Relative Humidity	54.7%
Test Mode	Mode 1	Test Date	2024-07-11

Frequency (MHz)	Inject Voltage (V)	Inject Ports	Inject Method	Performance Criteria Result
0.15 ~ 80	3	AC Mains	CDN	Complies Note

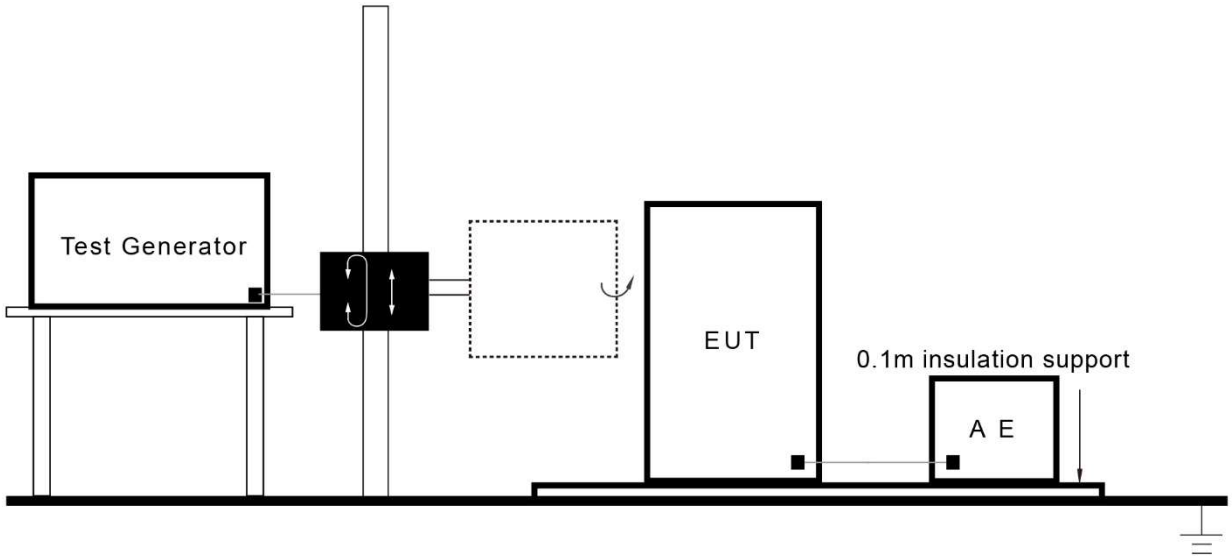
Note: During and after the test, the EUT performance complied with performance criteria and there is not any degradation of performance or function.

5.11. Power Frequency Magnetic Field

5.11.1. Test Limit

Environmental phenomenon	Test specification	Units	Performance criterion
EN IEC 61000-6-1			
Enclosure port (See Note)			
Power-Frequency Magnetic Field	50 or 60 3	Hz A/m	A
Note: Applicable only to apparatus containing devices susceptible to magnetic fields			

5.11.2. Test Setup



5.11.3. Test Procedure

The EUT is placed on a insulating support which is 0.1 meter above a metal ground plane measured at least 1m*1m minimum. The test magnetic field shall be placed at central of the induction coil.

The test magnetic Field shall be applied 10 minutes by the immersion method to the EUT, and the induction coil shall be rotated by 90° in order to expose the EUT to the test field with different orientation (X, Y, Z Orientations).

5.11.4 Test Result

Test Site	SIP-SR5	Temperature	25.5°C
Test Engineer	Lily Zhang	Relative Humidity	45.5%
Test Mode	Mode 1 ~ 2	Test Date	2024-07-12

Test Coil Position	Frequency (Hz)	Magnetic Strength (A/m)	Performance Criteria Result
X Axis	50	3	Complies Note
Y Axis	50	3	Complies Note
Z Axis	50	3	Complies Note

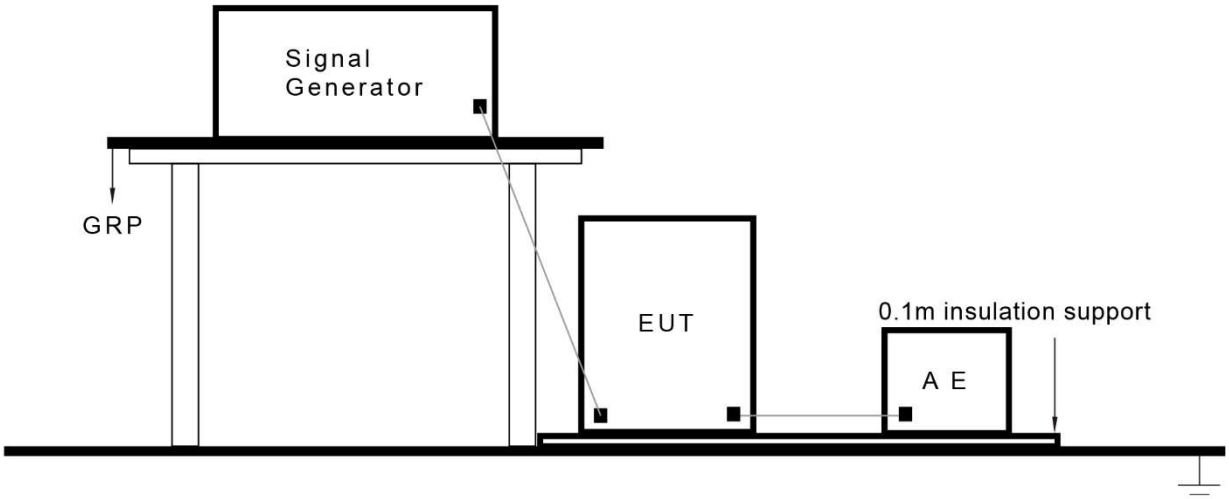
Note: During and after the test, the EUT performance complied with performance criteria and there was not any degradation of performance or function.

5.12. Voltage Dips and Interruptions

5.12.1. Test Limit

Environmental Phenomenon	Test Specification	Units	Performance Criterion
EN 301 489 -1			
Input AC power ports (See Note 1)			
Voltage dips	0 0.5	% residual cycle	Transient Phenomena
	0 1	% residual cycle	Transient Phenomena
	70 25 (50Hz)	% residual cycle	Transient Phenomena
Voltage interruptions	0 250 (50Hz)	% residual cycle	Transient Phenomena
EN 301 489 -17			
Voltage dips	0 0.5	% residual cycle	B
	0 1	% residual cycle	B
	70 25	% residual cycle	C
Voltage interruptions	0 250	% residual cycle	C
EN IEC 61000-6-1			
AC mains power ports (See Note 2)			
Voltage dips	0 0.5	% residual voltage Numbers of cycles	B
	0 1	% residual voltage Numbers of cycles	B
	70 25 for 50 Hz 30 for 60 Hz	% residual voltage Numbers of cycles Numbers of cycles	C
Voltage interruptions	0 250 for 50 Hz 300 for 60 Hz	% residual voltage Numbers of cycles Numbers of cycles	C
Note 1: This test shall be performed on the AC mains power port (if any) of radio equipment and associated ancillary equipment. Note 2: Applicable only to input ports.			

5.12.2. Test Setup



5.12.3. Test Procedure

The EUT is placed on a insulating support which is 0.1 meter above a metal ground plane measured 1m*1m minimum, and 0.65mm thick minimum, and projected beyond the EUT by at least 0.1m on all sides. The power cord shall be used the shortest power cord as specified by the manufacturer.

For Voltage dips and interruptions test:

The selection of test voltage is based on the rated power range. If the operation range is large than 20% of lower power range, both end of specified voltage shall be tested. Otherwise, the typical voltage specification is selected as test voltage.

The EUT is connected to the power mains through a coupling device that directly couples to the voltage dips and interruption generator.

5.12.4 Test Result

Test Site	SIP-SR5	Temperature	25.5°C
Test Engineer	Lily Zhang	Relative Humidity	45.5%
Test Mode	Mode 1	Test Date	2024-07-12

Test Item	Voltage % Residual	Test Duration (periods)	Result
Input a.c. Power Ports (AC 240V/50Hz)			
Voltage Dips	0	0.5	Complies Note 1
	0	1	Complies Note 1
	70	25	Complies Note 1
Voltage Interruption	0	250	Complies Note 2
Input a.c. Power Ports (AC 100V/50Hz)			
Voltage Dips	0	0.5	Complies Note 1
	0	1	Complies Note 1
	70	25	Complies Note 1
Voltage Interruption	0	250	Complies Note 2

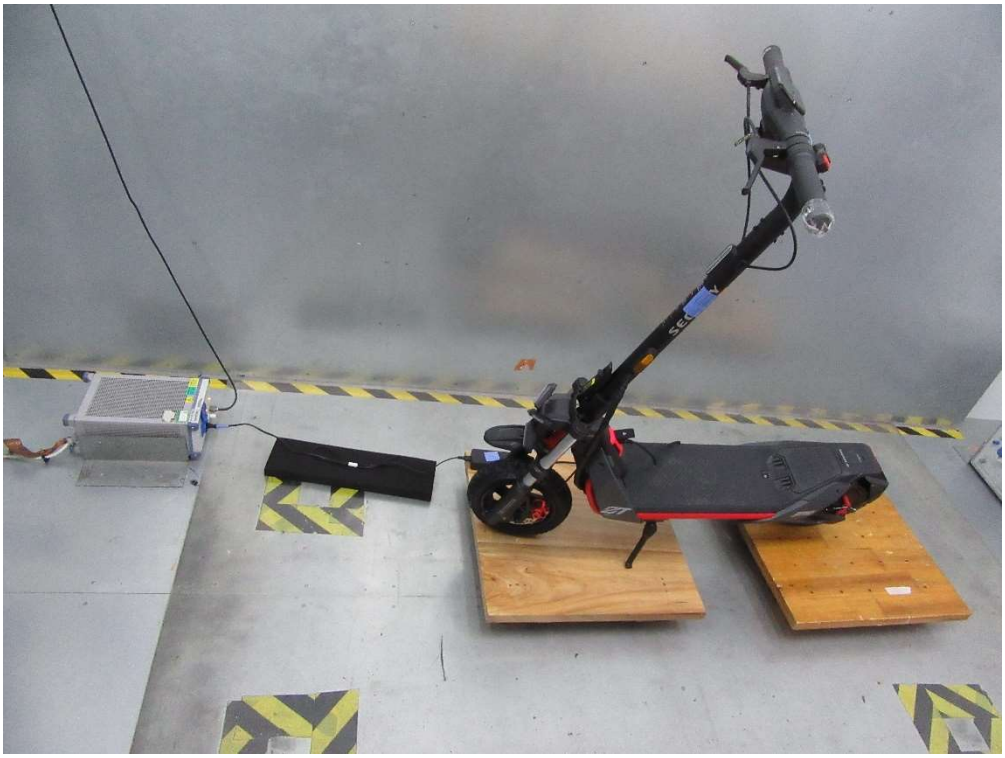
Note 1: During and after the test, the EUT performance complied with performance criteria and there is not any degradation of performance or function.

Note 2: During the test, the EUT had temporary lost the function of charging, but it recovered by itself without operator Intervention after the test.

Appendix A - Test Setup Photograph

Test Mode 1

Description: Front View of Conducted Emission Test Setup for Power Port



Test Mode 1

Description: Side View of Conducted Emission Test Setup for Power Port

Test Mode 1

Description: Front View of Radiated Emission Test Setup (Below 1GHz)

Test Mode 1

Description: Rear View of Radiated Emission Test Setup (Below 1GHz)

Test Mode 2

Description: Front View of Radiated Emission Test Setup (Below 1GHz)

Test Mode 2

Description: Rear View of Radiated Emission Test Setup (Below 1GHz)

Test Mode 1

Description: Front View of Radiated Emission Test Setup (Above 1GHz)

Test Mode 1

Description: Rear View of Radiated Emission Test Setup (Above 1GHz)

Test Mode 2

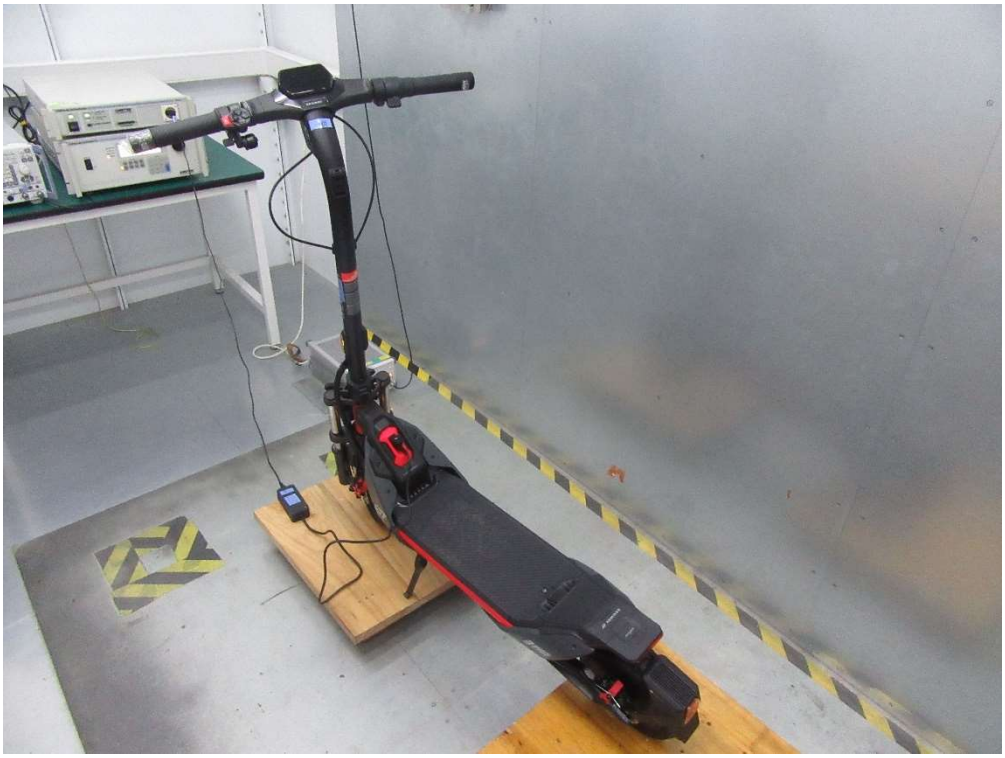
Description: Front View of Radiated Emission Test Setup (Above 1GHz)

Test Mode 2

Description: Rear View of Radiated Emission Test Setup (Above 1GHz)

Test Mode 1

Description: Harmonic Current Emissions & Voltage Fluctuations and Flicker Test Setup



Test Mode 1

Description: Electrostatic Discharge Test Setup

Test Mode 2

Description: Electrostatic Discharge Test Setup

Test Mode 1

Description: Radio-Frequency Electromagnetic Field Test Setup

Test Mode 2

Description: Radio-Frequency Electromagnetic Field Test Setup

Test Mode 1

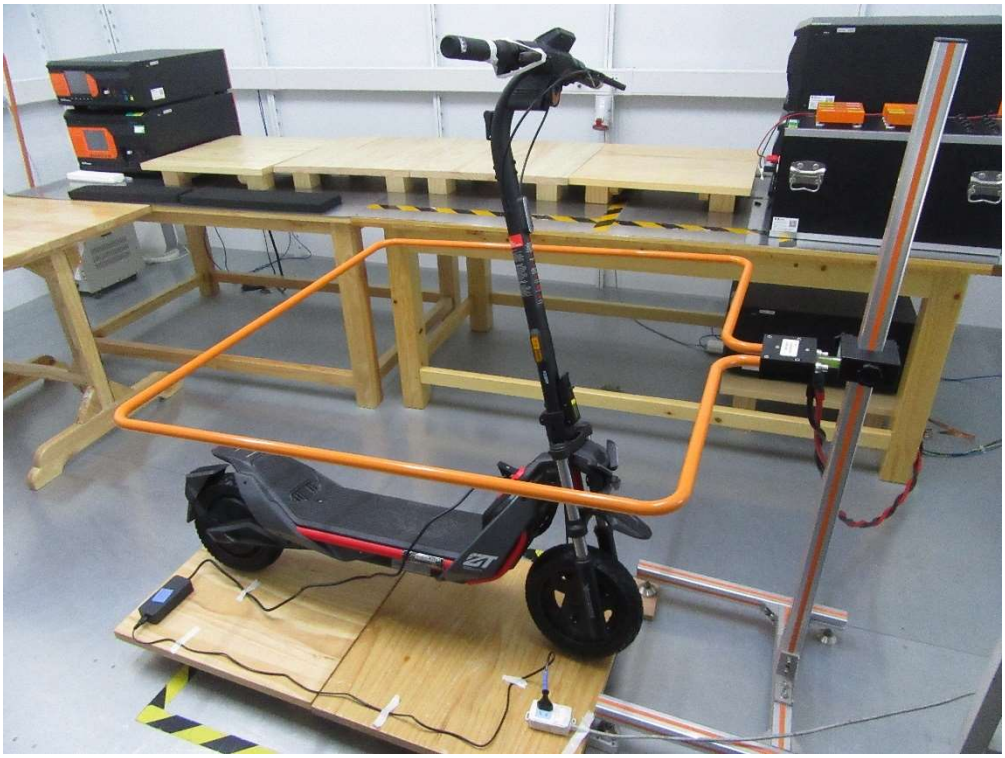
Description: Electrical Fast Transients & Surges & Voltage Dips and Interruptions Test Setup for Power Port

Test Mode 1

Description: Radio-Frequency Common Mode Test Setup for Power Port

Test Mode 1

Description: Power Frequency Magnetic Field Test Setup



Test Mode 2

Description: Power Frequency Magnetic Field Test Setup

Appendix B - EUT Photograph

(1) EUT Photo - Front View

(2) EUT Photo - Rear View

(3) EUT Photo - Left View

(4) EUT Photo - Right View

(5) EUT Photo - Top View

(6) EUT Photo - Bottom View

(7) EUT Photo

(8) EUT Photo

(9) EUT Photo

(10) EUT Photo

The End