



TEST REPORT

Reference No...... : WTX21X03023977W-3
Manufacturer : Shenzhen Sunricher Technology Limited
Address : 3F & 5F, Building E, Qihang Innovation Industrial Park, No. 1008 Songbai Road, Nanshan District, Shenzhen, Guangdong 518055 China
Product : Controllers
Test Model : SR-ZV9101SAC-HP-Switch-B
Standards : **ETSI EN 301 489-1 V2.2.3 (2019-11)**
ETSI EN 301 489-3 V2.1.1 (2019-03)
EN IEC 61000-3-2:2019; EN 61000-3-3:2013+A1:2019
EN 60669-1:2018/AC:2020-02
EN 60669-2-1:2004/A12:2010,
Date of Receipt sample : Mar.24, 2021
Date of Test..... : Mar.24, 2021 to Apr.13, 2021
Date of Issue : Apr.13, 2021
Test Result..... : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:

Waltek Testing Group (Shenzhen) Co., Ltd.

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road,
Block 70 Bao'an District, Shenzhen, Guangdong, China

Tel.: +86-755-33663308

Fax.: +86-755-33663309

Tested by:

Jack Huang

Jack Huang / Project Engineer

Reviewed By:

Lion Cai

Lion Cai / RF Manager

Approved & Authorized By:

Silin Chen

Silin Chen / Manager



TABLE OF CONTENTS

1. GENERAL INFORMATION.....	5
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	5
1.2 TEST STANDARDS.....	6
1.3 TEST METHODOLOGY.....	6
1.4 TEST FACILITY.....	6
1.5 EUT SETUP AND OPERATION MODE.....	7
1.6 PERFORMANCE CRITERIA FOR EMS.....	8
1.7 MEASUREMENT UNCERTAINTY.....	9
1.8 TEST EQUIPMENT LIST AND DETAILS.....	10
2. SUMMARY OF TEST RESULTS.....	12
3. CONDUCTED EMISSIONS.....	13
3.1 TEST PROCEDURE.....	13
3.2 BASIC TEST SETUP BLOCK DIAGRAM.....	13
3.3 ENVIRONMENTAL CONDITIONS.....	13
3.4 CONDUCTED EMISSIONS TEST DATA.....	13
4. RADIATED EMISSIONS.....	18
4.2 TEST PROCEDURE.....	18
4.2 CORRECTED AMPLITUDE & MARGIN CALCULATION.....	18
4.3 ENVIRONMENTAL CONDITIONS.....	19
4.4 SUMMARY OF TEST RESULTS/PLOTS.....	19
5. HARMONIC CURRENT EMISSIONS.....	23
5.1 TEST PROCEDURE.....	23
5.2 TEST SETUP BLOCK DIAGRAM.....	23
5.3 TEST STANDARDS.....	23
5.4 ENVIRONMENTAL CONDITIONS.....	23
5.5 HARMONIC CURRENT EMISSIONS TEST DATA.....	23
6. VOLTAGE FLUCTUATION AND FLICKER.....	29
6.1 TEST PROCEDURE.....	29
6.2 TEST SETUP BLOCK DIAGRAM.....	29
6.3 TEST STANDARDS.....	29
6.4 ENVIRONMENTAL CONDITIONS.....	29
6.5 VOLTAGE FLUCTUATION AND FLICKER TEST DATA.....	29
7. ELECTROSTATIC DISCHARGE (ESD).....	31
7.1 TEST PROCEDURE.....	31
7.2 TEST SETUP BLOCK DIAGRAM.....	31
7.3 TEST PERFORMANCE.....	31
7.4 ENVIRONMENTAL CONDITIONS.....	31
7.5 ELECTROSTATIC DISCHARGE IMMUNITY TEST DATA.....	31
8. RADIO FREQUENCY ELECTROMAGNETIC FIELD (R/S).....	33
8.1 TEST PROCEDURE.....	33
8.2 TEST SETUP BLOCK DIAGRAM.....	33
8.3 TEST PERFORMANCE.....	33
8.4 ENVIRONMENTAL CONDITIONS.....	33
8.5 CONTINUOUS RADIATED DISTURBANCES TEST DATA.....	33
9. FAST TRANSIENTS, COMMON MODE (EFT).....	35
9.1 TEST PROCEDURE.....	35
9.2 TEST SETUP BLOCK DIAGRAM.....	35
9.3 TEST PERFORMANCE.....	35
9.4 ENVIRONMENTAL CONDITIONS.....	35
9.5 ELECTRICAL FAST TRANSIENTS TEST DATA.....	35



10. SURGES	37
10.1 TEST PROCEDURE.....	37
10.2 TEST SETUP BLOCK DIAGRAM.....	37
10.3 TEST PERFORMANCE.....	37
10.4 ENVIRONMENTAL CONDITIONS.....	37
10.5 SURGE TEST DATA.....	37
11. RADIO FREQUENCY, COMMON MODE (C/S)	39
11.1 TEST PROCEDURE.....	39
11.2 TEST SETUP BLOCK DIAGRAM.....	39
11.3 TEST PERFORMANCE.....	39
11.4 ENVIRONMENTAL CONDITIONS.....	39
11.5 CONTINUOUS CONDUCTED DISTURBANCES TEST DATA.....	39
12. VOLTAGE DIPS AND INTERRUPTIONS	41
12.1 TEST PROCEDURE.....	41
12.2 TEST SETUP BLOCK DIAGRAM.....	41
12.3 TEST PERFORMANCE.....	41
12.4 ENVIRONMENTAL CONDITIONS.....	41
12.5 VOLTAGE DIPS AND INTERRUPTIONS TEST DATA.....	41
EXHIBIT 1 - EUT PHOTOGRAPHS	42
EXHIBIT 2 - TEST SETUP PHOTOGRAPHS	43

WALTEK



Report version

Version No.	Date of issue	Description
Rev.00	Apr.13, 2021	Original
/	/	/

WALTEK



1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Manufacturer: Shenzhen Sunricher Technology Limited
 Address of manufacturer: 3F & 5F, Building E, Qihang Innovation Industrial Park, No. 1008 Songbai Road, Nanshan District, Shenzhen, Guangdong 518055 China

General Description of EUT	
Product Name:	Controllers
Trade Name:	/
Model No.:	SR-ZV9101SAC-HP-Switch-B
Adding Model(s):	SR-ZG9101SAC-HP-Switch-B, SR-SB9101SAC-HP-Switch-B, SR-BL9101SAC-HP-Switch-B, SR-9101SAC-HP-Switch-B, SR-ZV9080A, SR-ZG9080A, SR-SB9080A, SR-BL9080A, SR-9080A
Rated Voltage:	Input: AC 100-240 V Output: AC 100-240 V Output Current: 16A max.
Battery Capacity:	/
Power Adaptor Model:	/
Software Version:	V1.0
Hardware Version:	V1.0
<p><i>Note: The test data is gathered from a production sample, provided by the manufacturer. The appearance of others models listed in the report is different from main-test model SR-ZV9101SAC-HP-Switch-B, but the circuit and the electronic construction do not change, declared by the manufacturer.</i></p>	

Technical Characteristics of EUT	
Frequency Range:	868.42MHz
RF Output Power:	/
Type of Modulation:	FSK
Type of Antenna:	Internal Antenna
Antenna Gain:	0dBi
Receiver Categories:	2



1.2 Test Standards

The tests were performed according to following standards:

ETSI EN 301 489-1 V2.2.3 (2019-11): Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for Electromagnetic Compatibility.

ETSI EN 301 489-3 V2.1.1 (2019-03): Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product maybe which result in lowering the emission/immunity should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with the standard ETSI EN 301489-1, Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements.

1.4 Test Facility

FCC – Registration No.: 125990

Waltek Testing Group (Shenzhen) Co., Ltd. Laboratory has been recognized to perform compliance testing on equipment subject to the Commissions Declaration Of Conformity (DOC). The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.



1.5 EUT Setup and Operation Mode

The equipment under test (EUT) was configured to measure its highest possible emission/immunity level. The test modes were adapted according to the operation manual for use, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	Normal Working	Connect to the AC Plug; AC230V 50Hz for AC Plug, Connect the phone
TM2	868.42MHz	TR,CR for EMS testing

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
AC Cable	1.0	Unshielded	Without Ferrite

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Battery DC12V	/	/	/
light bulb	/	/	/
Lamp holder	/	/	/
Mobile phone	HUAWEI	VOG-AL00	/
Gateway	/	/	/



1.6 Performance Criteria for EMS

➤ EN 301 489-3, The performance criteria are:

In the table below:

- performance criterion A applies for immunity tests with phenomena of a continuous nature;
- performance criterion B applies for immunity tests with phenomena of a transient nature.

NOTE: Whether a phenomenon is considered transient, continuous or otherwise is indicated in the test procedures for the phenomenon in ETSI EN 301 489-1 [1], clause 9.

Table 2: Performance Requirements

Criterion	During test	After test
A	Operate as intended No loss of function No unintentional responses	Operate as intended No loss of function No degradation of performance No loss of stored data or user programmable functions
B	May show loss of function No unintentional responses	Operate as intended Lost function(s) shall be self-recoverable No degradation of performance No loss of stored data or user programmable functions

Where "operate as intended" or "no loss of function" is specified, the EUT shall demonstrate correct functioning as described in clause 5.

Where the EUT has more than one mode of operation (see clause 4.5.2), an unplanned transition from one mode to another is considered as an unintentional response. The EUT shall be tested in sufficient modes to confirm there are no such unintentional responses.



1.7 Measurement Uncertainty

Measurement uncertainty	
Parameter	Uncertainty
Uncertainty for Radiated Emission in 3m chamber	@30-200MHz $\pm 4.52\text{dB}$ @0.2-1GHz $\pm 5.56\text{dB}$ @1-6GHz $\pm 3.84\text{dB}$ @6-18GHz $\pm 3.92\text{dB}$
Uncertainty for Conducted Emission	@9-150kHz $\pm 3.74\text{dB}$ @0.15-30MHz $\pm 3.34\text{dB}$
Uncertainty for Harmonic test	3.26%
Uncertainty for Flicker test	4.76%
Uncertainty for RS test	21%, k=2
Uncertainty for CS test	29%, k=2
Uncertainty for ESD test	The immunity measurement system uncertainty is within standard requirement and is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.
Uncertainty for EFT test	
Uncertainty for Surges test	
Uncertainty for Voltage Dips, Voltage Variations and Short Interruptions Test	
Uncertainty for PFMF test	



1.8 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Spectrum Analyzer	Rohde & Schwarz	FSP	836079/035	2020-04-28	2021-04-27
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2020-04-28	2021-04-27
Amplifier	Agilent	8447F	3113A06717	2020-04-28	2021-04-27
Amplifier	C&D	PAP-1G18	2002	2020-04-28	2021-04-27
Broadband Antenna	Schwarz beck	VULB9163	9163-333	2019-05-05	2021-05-04
Horn Antenna	ETS	3117	00086197	2019-05-05	2021-05-04
Loop Antenna	Schwarz beck	FMZB 1516	9773	2019-05-05	2021-05-04
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2020-04-28	2021-04-27
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2020-04-28	2021-04-27
AC LISN	Schwarz beck	NSLK8126	8126-224	2020-04-28	2021-04-27
DC LISN	Schwarz beck	NNBM8126D	279	2020-04-28	2021-04-27
8-WIRE LISN	Schwarz beck	8158	CAT3-8158-0059	2020-04-28	2021-04-27
8-WIRE LISN	Schwarz beck	8158	CAT5-8158-0117	2020-04-28	2021-04-27
Digital Power Analyzer	California Instrument	PACS-1	72831	2020-04-28	2021-04-27
Power Source	California Instrument	500iX	25965	2020-04-28	2021-04-27
ESD Generator	LIOGCEL	ESD-203B	0170901	2020-04-28	2021-04-27
Signal Generator	Rohde & Schwarz	SMT03	100059	2020-04-28	2021-04-27
Voltage Probe	Rohde & Schwarz	URV5-Z2	100013	2020-04-28	2021-04-27
Power Amplifier	AR	150W1000	300999	2020-04-28	2021-04-27
Power Amplifier	AR	25S1G4AM1	305993	2020-04-28	2021-04-27
Transient 2000	EMC PARTNER	TRA2000	863	2020-04-28	2021-04-27
CW Simulator	EM Test	CWS 500C	0900-03	2020-04-28	2021-04-27
CONDUCTED IMMUNITY TEST SYSTEM	FRANKONIA	CIT-10/75	126B1247/2013	2021-01-08	2022-01-07
Attenuator	EMTEST	MA-5100/6BF2	1009	2020-04-28	2021-04-27
CDN	Luthi	L-801M2/M3	2665	2020-04-28	2021-04-27
EMC PRO	KEYTEK	EMCPro	0509124	2020-04-28	2021-04-27
Coil	KEYTEK	F-1000-4-8	0533	2020-04-28	2021-04-27
Anechoic chamber	Albatross Projects	MCDC	----	2020-04-28	2021-04-27
CS Generator	MARCONI	2024	112260/042	2020-04-28	2021-04-27
Attenuator	FRANKONIA	75-A-FFN-06	1001698	2020-04-28	2021-04-27
CDN	FRANKONIA	CDN M2+M3	A3027019	2020-04-28	2021-04-27
Signal Generator	HP	8688B	3438A00604	2020-04-28	2021-04-27
Power Meter	KEITHLEY	3500	1162591	2020-04-28	2021-04-27
Power Meter	KEITHLEY	3500	1121428	2020-04-28	2021-04-27
RF Power Amplifier	MicoTop	MPA-80-1000-250	MPA1906239	2020-04-28	2021-04-27



RF Power Amplifier	MicoTop	MPA-80-1000-100	MPA1906238	2020-04-28	2021-04-27
Antenna	SCHWARZBECK	STLP 9129	9129 114	N/A	N/A

Software List			
Description	Manufacturer	Model	Version
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission)*	Farad	EZ-EMC	RA-03A1

*Remark: indicates software version used in the compliance certification testing

WALTEK



2. SUMMARY OF TEST RESULTS

Standards	Reference	Description of Test Item	Result
ETSI EN 301 489-1	8.2	Radiated Emissions	Pass
	8.3	Conducted Emissions for DC Power Port	N/A
	8.4	Conducted Emissions for AC Power Port	Pass
	8.5	Harmonic Current Emissions	Pass
	8.6	Voltage Fluctuations and Flicker	Pass
	8.7	Telecommunication Ports	N/A
	9.2	Radio Frequency Electromagnetic Field	Pass
	9.3	Electrostatic Discharge	Pass
	9.4	Fast Transients, Common Mode	Pass
	9.5	Radio Frequency, Common Mode	Pass
	9.6	Transient and Surges in the Vehicular Environment	N/A
	9.7	Voltage Dips and Interruptions	Pass
	9.8	Surges	Pass

Pass: The EUT complies with the essential requirements in the standard.

Fail: The EUT does not comply with the essential requirements in the standard.

N/A: Not applicable.

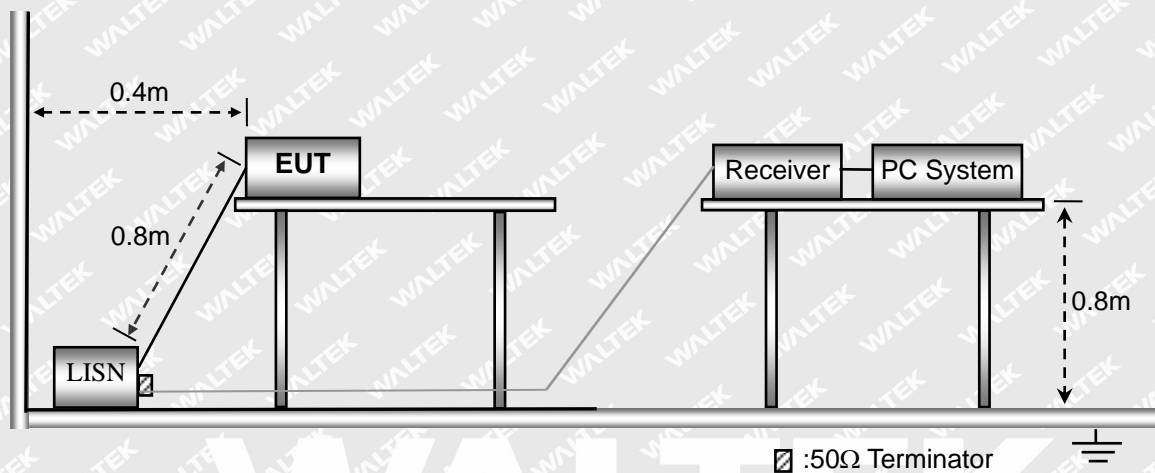


3. Conducted Emissions

3.1 Test Procedure

Test is conducting under the description of EN55032 Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement.

3.2 Basic Test Setup Block Diagram



3.3 Environmental Conditions

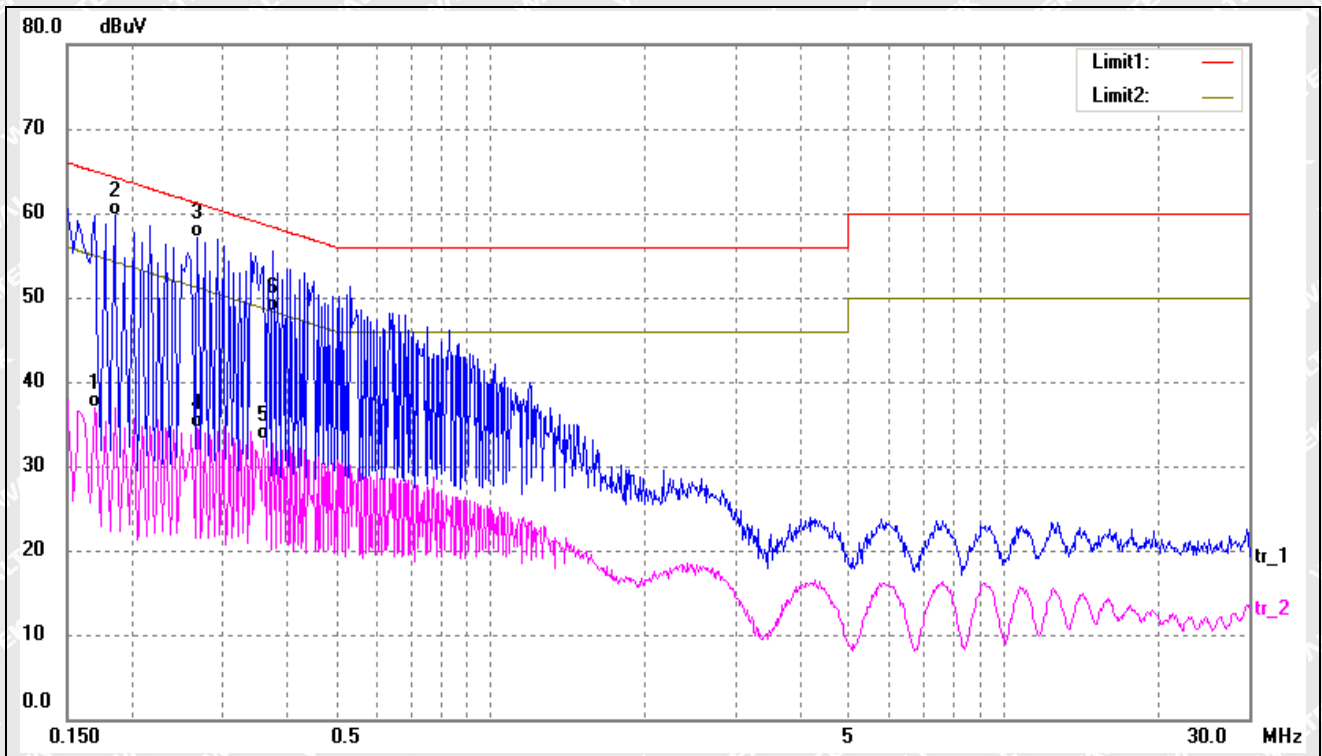
Temperature:	24.5 °C
Relative Humidity:	55 %
ATM Pressure:	1015 mbar

3.4 Conducted Emissions Test Data

Note: Only show the worst case in the test report



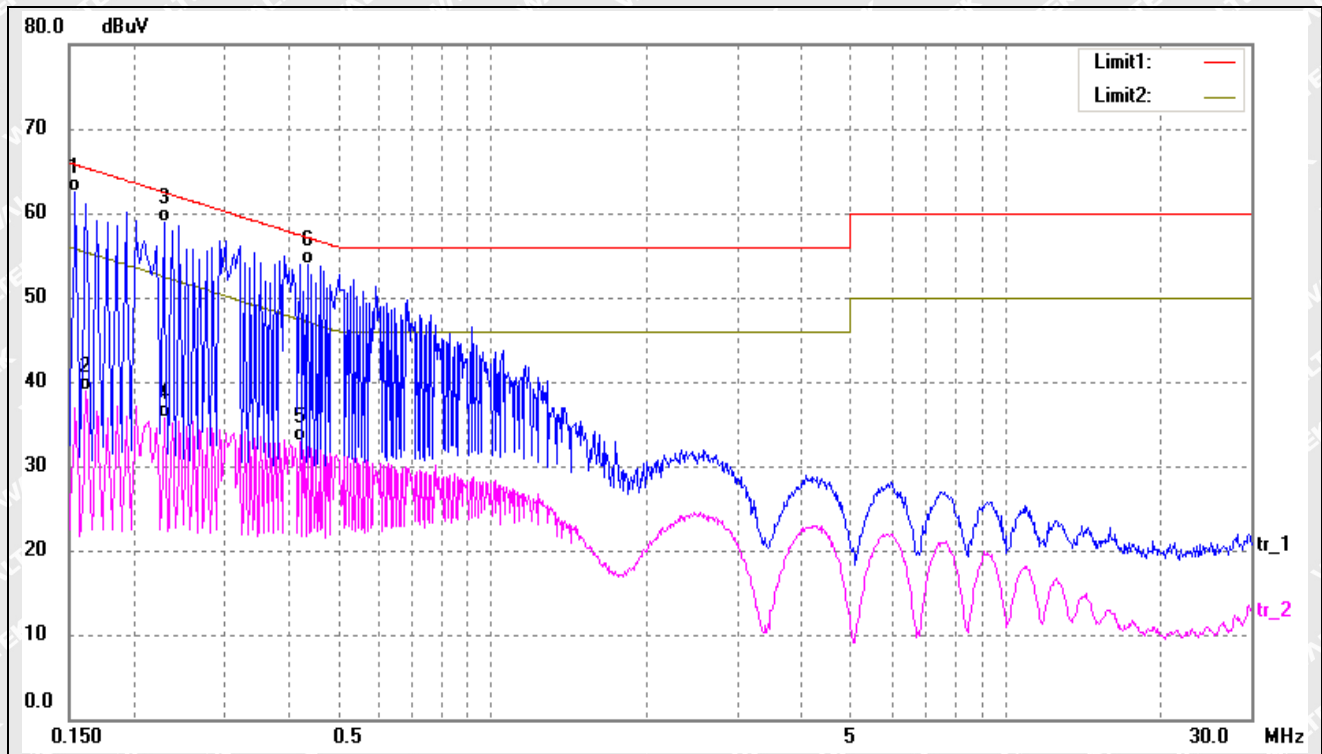
Test mode:	TM1	Polarity:	Neutral
------------	-----	-----------	---------



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1700	26.69	10.25	36.94	54.96	-18.02	AVG
2	0.1860	49.50	10.26	59.76	64.21	-4.45	QP
3*	0.2700	46.81	10.25	57.06	61.12	-4.06	QP
4	0.2700	24.34	10.25	34.59	51.12	-16.53	AVG
5	0.3620	22.92	10.25	33.17	48.68	-15.51	AVG
6	0.3780	38.13	10.24	48.37	58.32	-9.95	QP



Test mode:	TM1	Polarity:	Line
------------	-----	-----------	------

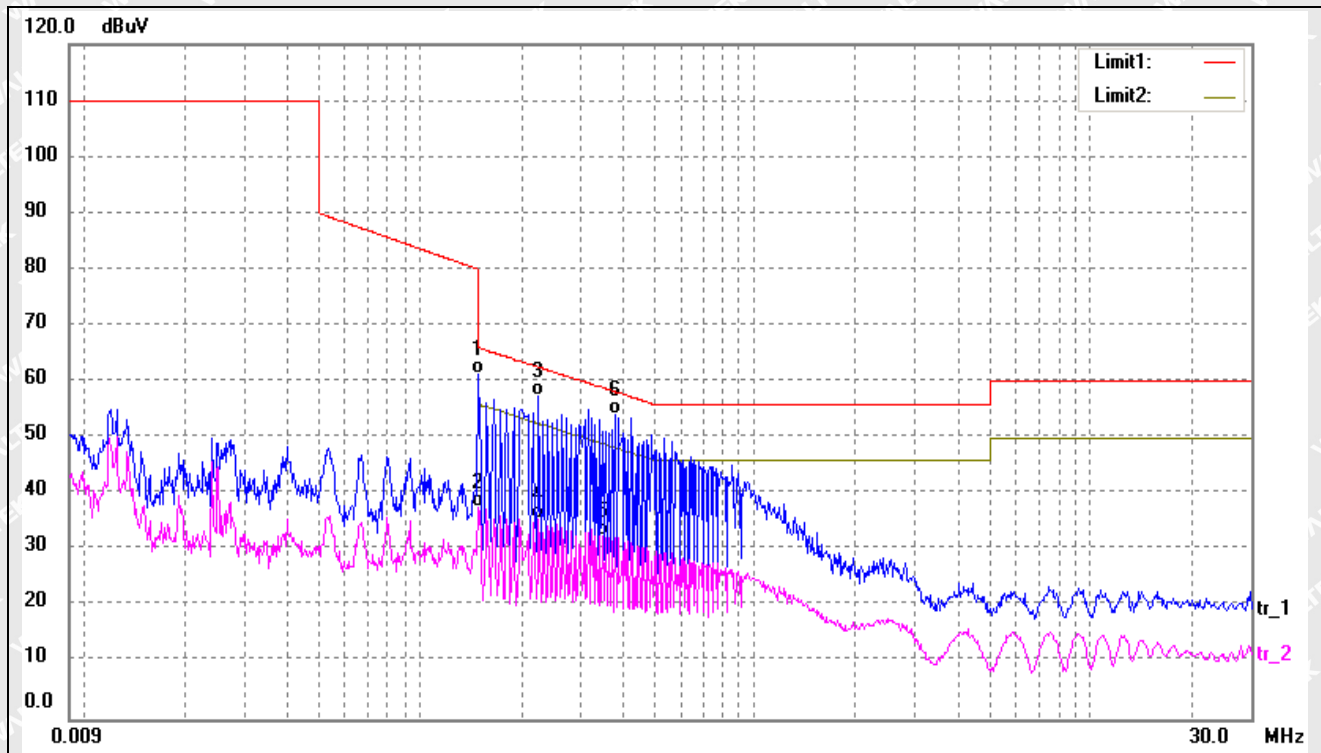


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1539	52.22	10.25	62.47	65.78	-3.31	QP
2	0.1620	28.57	10.26	38.83	55.36	-16.53	AVG
3	0.2300	48.58	10.26	58.84	62.45	-3.61	QP
4	0.2300	25.48	10.26	35.74	52.45	-16.71	AVG
5	0.4220	22.67	10.23	32.90	47.41	-14.51	AVG
6*	0.4380	43.62	10.22	53.84	57.10	-3.26	QP



With auxiliary equipment for EN 60669-1 test

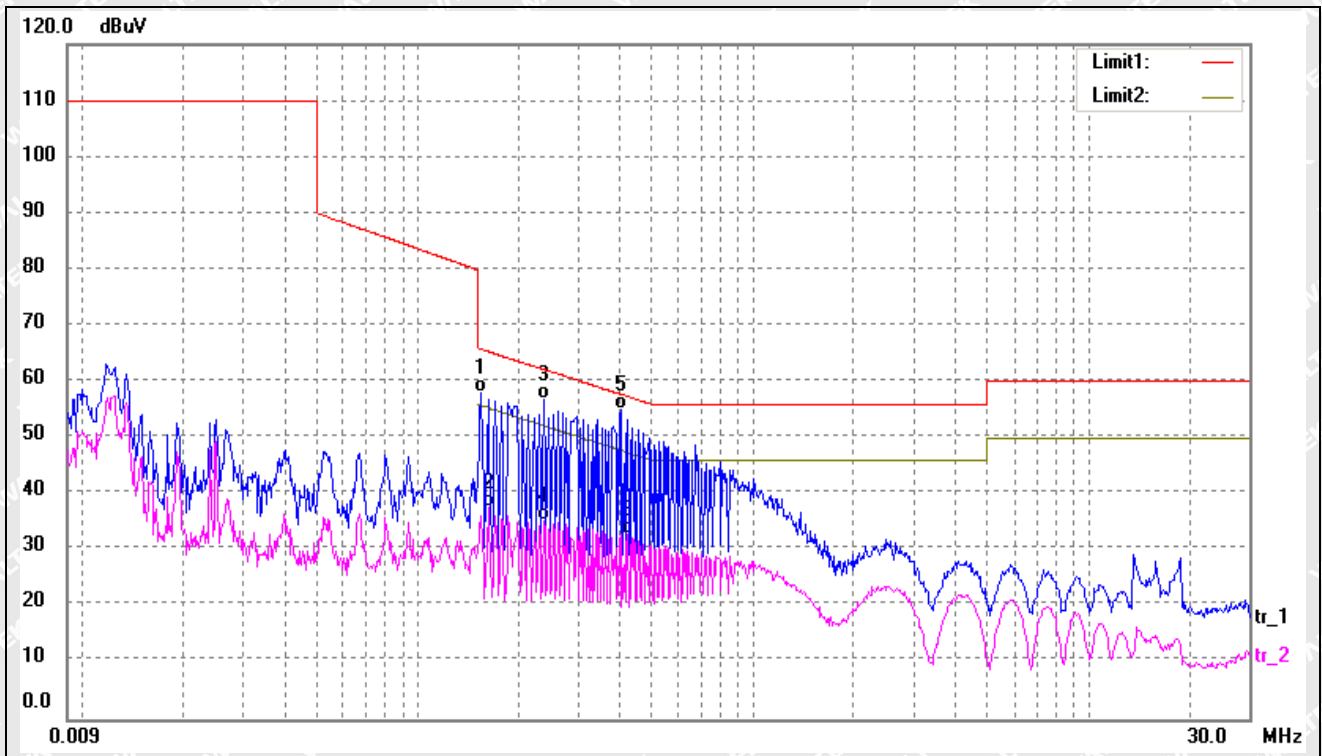
Test mode:	TM1	Polarity:	Neutral
------------	-----	-----------	---------



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1500	51.05	10.25	61.30	65.99	-4.69	QP
2	0.1500	27.45	10.25	37.70	55.99	-18.29	AVG
3	0.2260	47.11	10.26	57.37	62.59	-5.22	QP
4	0.2260	25.42	10.26	35.68	52.59	-16.91	AVG
5	0.3500	22.32	10.26	32.58	48.96	-16.38	AVG
6*	0.3820	43.87	10.23	54.10	58.23	-4.13	QP



Test mode:	TM1	Polarity:	Line
------------	-----	-----------	------



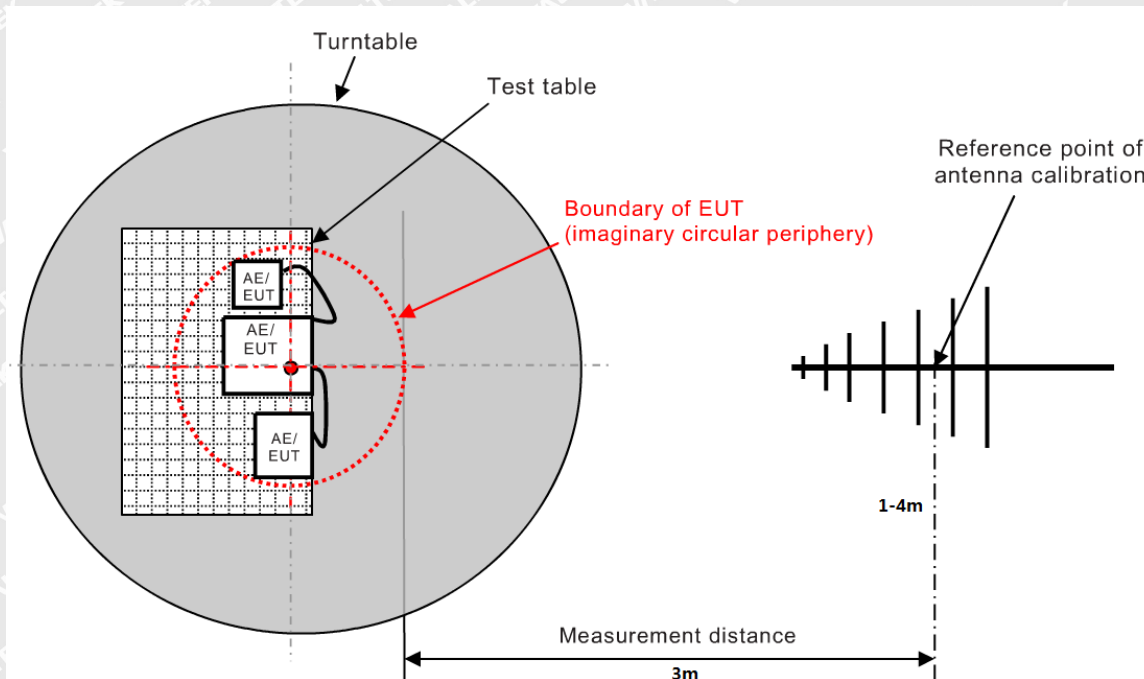
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1539	47.82	10.25	58.07	65.79	-7.72	QP
2	0.1620	27.27	10.26	37.53	55.36	-17.83	AVG
3	0.2380	46.48	10.26	56.74	62.17	-5.43	QP
4	0.2380	24.93	10.26	35.19	52.16	-16.97	AVG
5*	0.4060	44.79	10.23	55.02	57.73	-2.71	QP
6	0.4220	22.67	10.23	32.90	47.41	-14.51	AVG



4. Radiated Emissions

4.2 Test Procedure

Test is conducting under the description of EN55032 Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement.



4.2 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of $-6\text{dB}\mu\text{V}$ means the emission is $6\text{dB}\mu\text{V}$ below the maximum limit for Class B device. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{EN 301489 Class B Limit}$$



4.3 Environmental Conditions

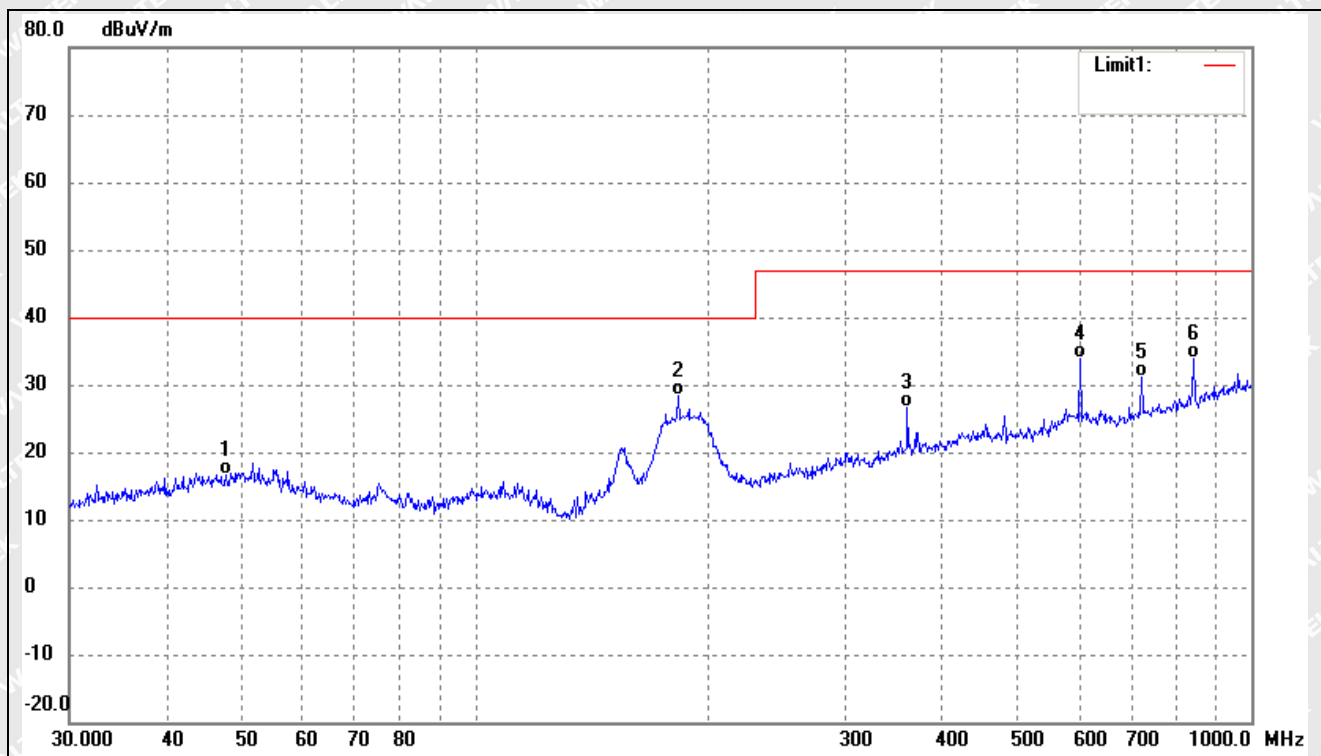
Temperature:	24.5° C
Relative Humidity:	55%
ATM Pressure:	1011 mbar

4.4 Summary of Test Results/Plots

Note: Only show the worst case in the test report

➤ 30MHz to 1GHz

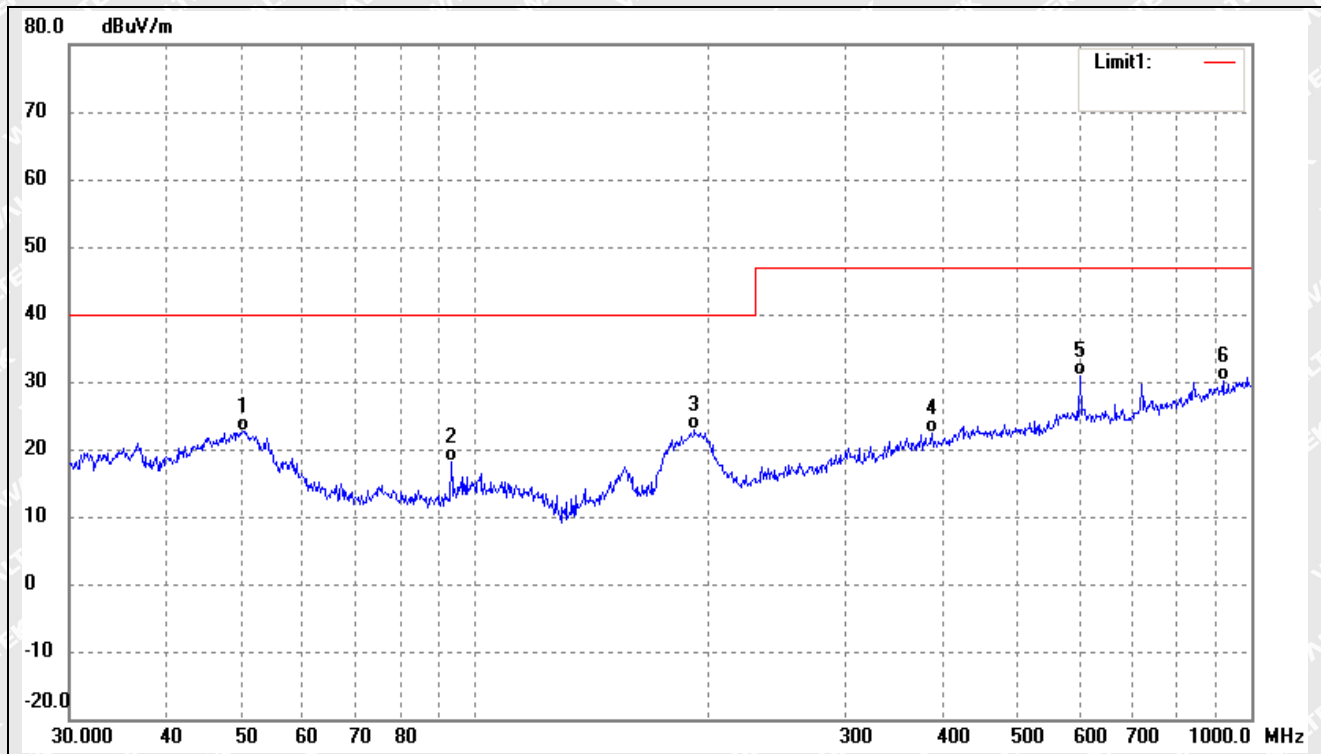
Test mode:	TM1	Polarity:	Horizontal
------------	-----	-----------	------------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	47.6584	27.09	-10.36	16.73	40.00	-23.27	-	-	QP
2	182.5592	41.30	-13.00	28.30	40.00	-11.70	-	-	QP
3	360.4476	32.47	-5.95	26.52	47.00	-20.48	-	-	QP
4	601.4265	36.20	-2.29	33.91	47.00	-13.09	-	-	QP
5	721.7259	32.44	-1.33	31.11	47.00	-15.89	-	-	QP
6	842.1295	33.39	0.55	33.94	47.00	-13.06	-	-	QP



Test mode:	TM1	Polarity:	Vertical
------------	-----	-----------	----------

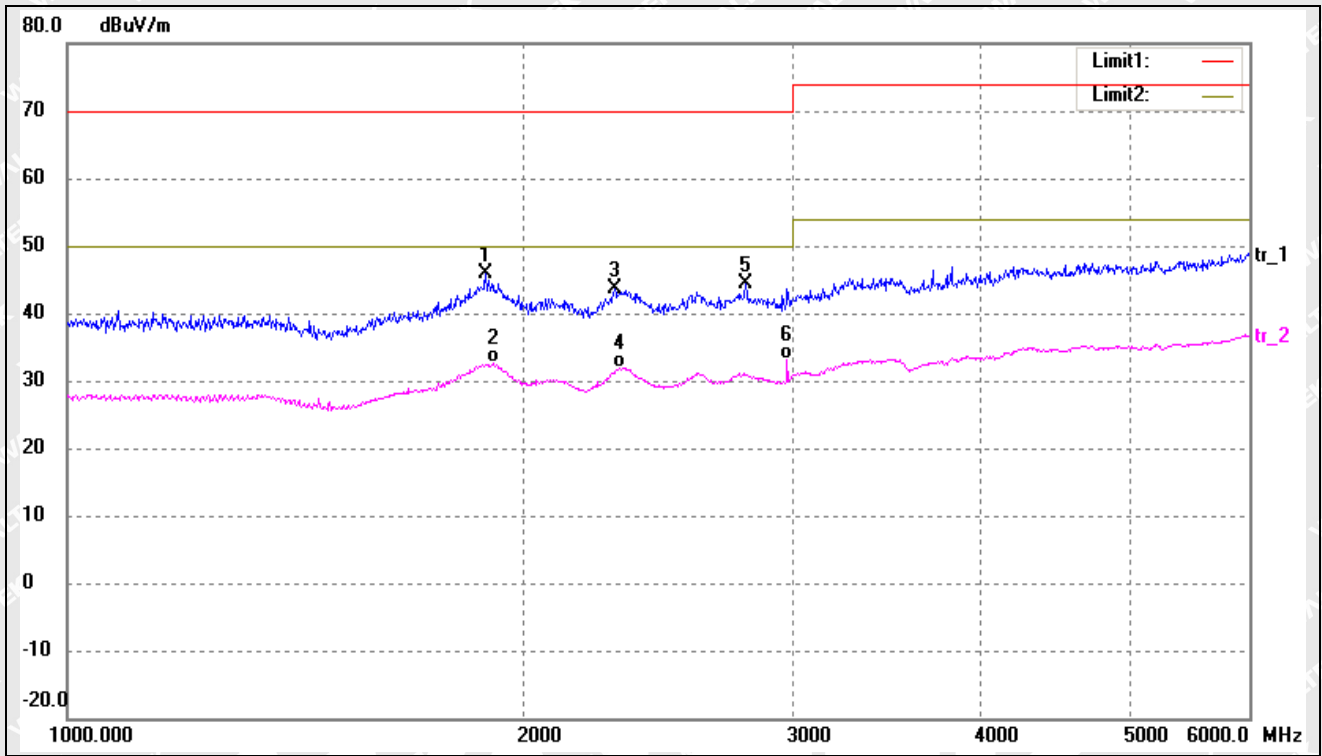


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	50.2324	32.95	-10.24	22.71	40.00	-17.29	-	-	QP
2	93.1132	31.92	-13.83	18.09	40.00	-21.91	-	-	QP
3	191.7450	34.72	-11.93	22.79	40.00	-17.21	-	-	QP
4	387.9920	28.11	-5.76	22.35	47.00	-24.65	-	-	QP
5	601.4265	33.28	-2.29	30.99	47.00	-16.01	-	-	QP
6	919.2866	28.08	1.94	30.02	47.00	-16.98	-	-	QP



➤ Above 1GHz

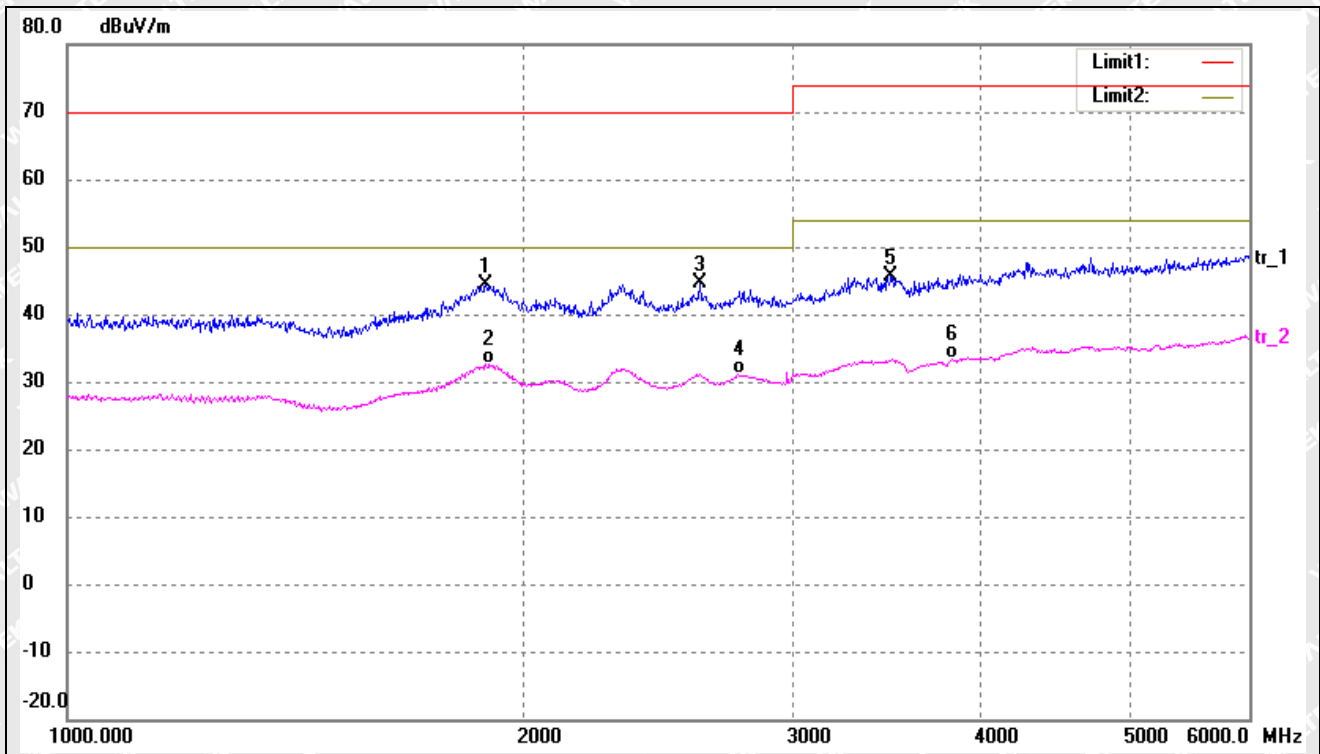
Test mode:	TM1	Polarity:	Horizontal
------------	-----	-----------	------------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	1885.669	54.49	-8.68	45.81	70.00	-24.19	-	-	peak
2	1906.051	41.18	-8.65	32.53	50.00	-17.47	-	-	AVG
3	2292.366	53.45	-9.70	43.75	70.00	-26.25	-	-	peak
4	2308.855	41.49	-9.67	31.82	50.00	-18.18	-	-	AVG
5	2796.783	53.34	-8.90	44.44	70.00	-25.56	-	-	peak
6	2977.790	41.87	-8.67	33.20	50.00	-16.80	-	-	AVG



Test mode:	TM1	Polarity:	Vertical
------------	-----	-----------	----------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	1885.669	53.12	-8.68	44.44	70.00	-25.56	-	-	peak
2	1895.833	41.21	-8.60	32.61	50.00	-17.39	-	-	AVG
3	2608.020	53.70	-9.14	44.56	70.00	-25.44	-	-	peak
4	2761.924	39.99	-8.94	31.05	50.00	-18.95	-	-	AVG
5	3486.354	52.89	-7.24	45.65	74.00	-28.35	-	-	peak
6	3826.796	40.27	-6.90	33.37	54.00	-20.63	-	-	AVG

Remark: '-' Means 'the test Degree and Height are not recorded by the test software and only show the worst case in the test report.'

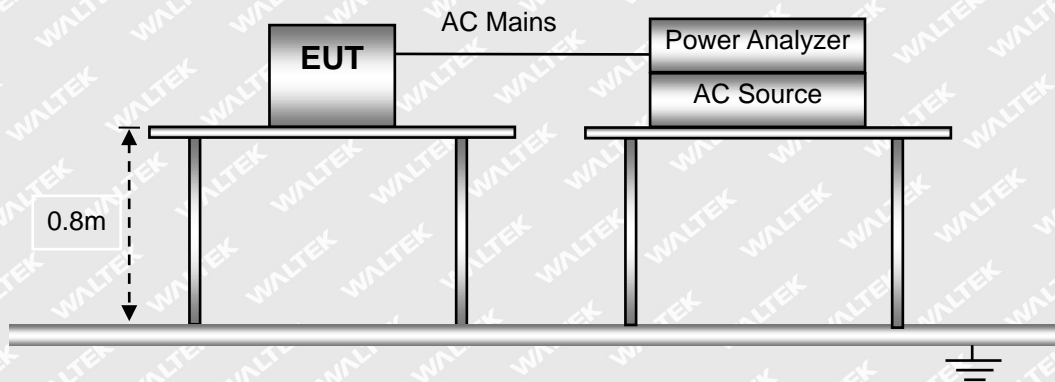


5. Harmonic Current Emissions

5.1 Test Procedure

Test is conducting under the description of EN 61000-3-2.

5.2 Test Setup Block Diagram



5.3 Test Standards

EN61000-3-2, Clause 7.1 Limits for Class A equipment.

5.4 Environmental Conditions

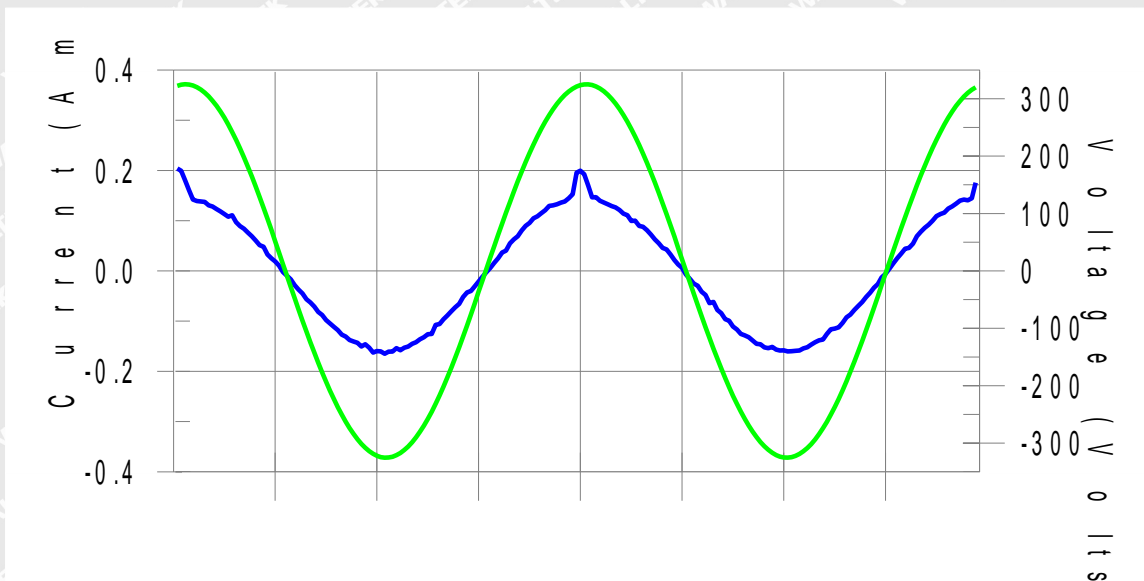
Temperature:	22 °C
Relative Humidity:	53%
ATM Pressure:	1015 mbar

5.5 Harmonic Current Emissions Test Data

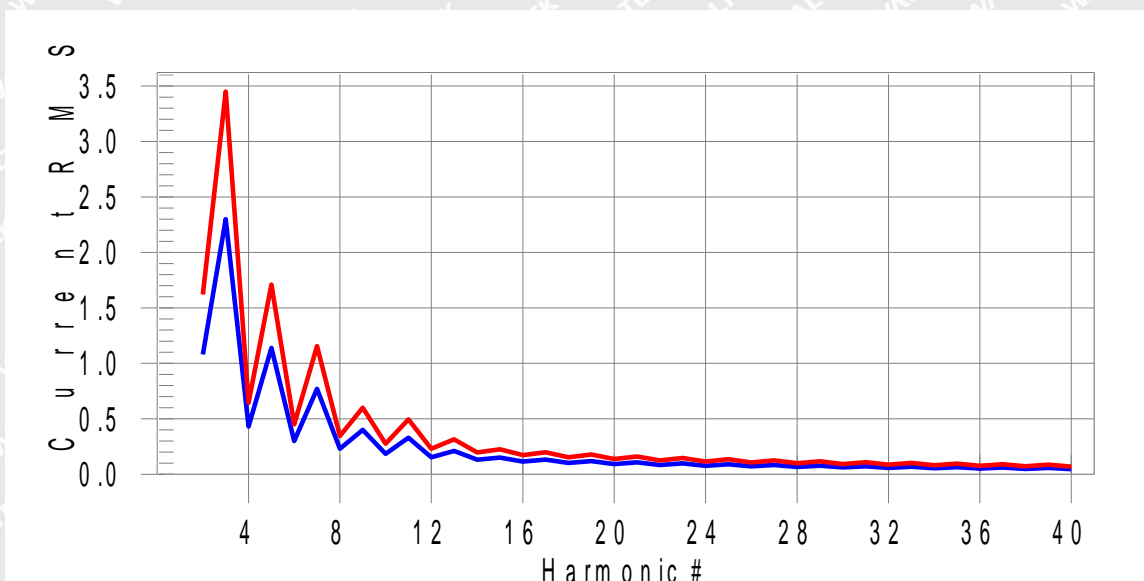


Harmonics – Class-A per Ed. Ed. 5.0 (2018)(Run time)

Test category: Class-A per Ed. 5.0 (2018) (European limits) **Test Margin:** 100
Test date: 2021-4-6 **Start time:** AM 10:03:24 **End time:** AM 10:06:05
Test duration (min): 2.5 **Data file name:** H-000019.cts_data
Comment: Comment
Customer: Customer information
Test Result: Pass **Source qualification:** Normal
Current & voltage waveforms -



Harmonics and Class A limit line European Limits



Test result: Pass **Worst harmonics** H0-0.0% of 150% limit, H0-0% of 100% limit



Current Test Result Summary (Run time)

Test category: Class-A per Ed. 5.0 (2018) (European limits) Test Margin: 100

Test date: 2021-4-6 Start time: AM 10:03:24 End time: AM 10:06:05

Test duration (min): 2.5 Data file name: H-000019.cts_data

Comment: Comment

Customer: Customer information

Test Result: Pass Source qualification: Normal

THC(A): 0.008 I-THD(%): 7.6 POHC(A): 0.001 POHC Limit(A): 0.251

Highest parameter values during test:

V_RMS (Volts):	230.07	Frequency(Hz):	50.00
I_Peak (Amps):	0.214	I_RMS (Amps):	0.112
I_Fund (Amps):	0.111	Crest Factor:	1.924
Power (Watts):	25.6	Power Factor:	0.996

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.003	1.080	N/A	0.003	1.620	N/A	Pass
3	0.003	2.300	N/A	0.004	3.450	N/A	Pass
4	0.002	0.430	N/A	0.003	0.645	N/A	Pass
5	0.002	1.140	N/A	0.002	1.710	N/A	Pass
6	0.002	0.300	N/A	0.003	0.450	N/A	Pass
7	0.002	0.770	N/A	0.002	1.155	N/A	Pass
8	0.002	0.230	N/A	0.002	0.345	N/A	Pass
9	0.002	0.400	N/A	0.002	0.600	N/A	Pass
10	0.002	0.184	N/A	0.002	0.276	N/A	Pass
11	0.002	0.330	N/A	0.002	0.495	N/A	Pass
12	0.002	0.153	N/A	0.002	0.230	N/A	Pass
13	0.002	0.210	N/A	0.002	0.315	N/A	Pass
14	0.002	0.131	N/A	0.002	0.197	N/A	Pass
15	0.001	0.150	N/A	0.001	0.225	N/A	Pass
16	0.001	0.115	N/A	0.001	0.173	N/A	Pass
17	0.001	0.132	N/A	0.001	0.198	N/A	Pass
18	0.001	0.102	N/A	0.001	0.153	N/A	Pass
19	0.001	0.118	N/A	0.001	0.178	N/A	Pass
20	0.001	0.092	N/A	0.001	0.138	N/A	Pass
21	0.001	0.107	N/A	0.001	0.161	N/A	Pass
22	0.001	0.084	N/A	0.001	0.125	N/A	Pass
23	0.000	0.098	N/A	0.001	0.147	N/A	Pass
24	0.000	0.077	N/A	0.000	0.115	N/A	Pass
25	0.000	0.090	N/A	0.000	0.135	N/A	Pass



26	0.000	0.071	N/A	0.000	0.107	N/A	Pass
27	0.000	0.083	N/A	0.000	0.125	N/A	Pass
28	0.000	0.066	N/A	0.000	0.099	N/A	Pass
29	0.000	0.078	N/A	0.000	0.116	N/A	Pass
30	0.000	0.061	N/A	0.000	0.092	N/A	Pass
31	0.000	0.073	N/A	0.000	0.109	N/A	Pass
32	0.000	0.058	N/A	0.000	0.086	N/A	Pass
33	0.000	0.068	N/A	0.000	0.102	N/A	Pass
34	0.000	0.054	N/A	0.000	0.081	N/A	Pass
35	0.000	0.064	N/A	0.000	0.096	N/A	Pass
36	0.000	0.051	N/A	0.000	0.077	N/A	Pass
37	0.000	0.061	N/A	0.000	0.091	N/A	Pass
38	0.000	0.048	N/A	0.000	0.073	N/A	Pass
39	0.000	0.058	N/A	0.000	0.087	N/A	Pass
40	0.000	0.046	N/A	0.000	0.069	N/A	Pass

WALTEK



Voltage Source Verification Data (Run time)

Test category: Class-A per Ed. 5.0 (2018) (European limits) Test Margin: 100

Test date: 2021-4-6 Start time: AM 10:03:24 End time: AM 10:06:05

Test duration (min): 2.5 Data file name: H-000019.cts_data

Comment: Comment

Customer: Customer information

Test Result: Pass

Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms):	230.07	Frequency(Hz):	50.00
I_Peak (Amps):	0.214	I_RMS (Amps):	0.112
I_Fund (Amps):	0.111	Crest Factor:	1.924
Power (Watts):	25.6	Power Factor:	0.996

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.051	0.460	11.07	OK
3	0.512	2.070	24.71	OK
4	0.066	0.460	14.29	OK
5	0.062	0.920	6.70	OK
6	0.038	0.460	8.18	OK
7	0.026	0.690	3.73	OK
8	0.014	0.460	2.95	OK
9	0.014	0.460	3.14	OK
10	0.012	0.460	2.55	OK
11	0.014	0.230	6.18	OK
12	0.011	0.230	4.69	OK
13	0.014	0.230	6.01	OK
14	0.004	0.230	1.90	OK
15	0.010	0.230	4.41	OK
16	0.007	0.230	3.12	OK
17	0.011	0.230	4.67	OK
18	0.011	0.230	4.86	OK
19	0.011	0.230	4.64	OK
20	0.014	0.230	5.89	OK
21	0.009	0.230	3.84	OK
22	0.004	0.230	1.64	OK
23	0.006	0.230	2.48	OK
24	0.003	0.230	1.37	OK
25	0.005	0.230	2.00	OK
26	0.002	0.230	0.99	OK



27	0.007	0.230	2.86	OK
28	0.003	0.230	1.46	OK
29	0.006	0.230	2.74	OK
30	0.003	0.230	1.18	OK
31	0.003	0.230	1.45	OK
32	0.002	0.230	1.04	OK
33	0.003	0.230	1.45	OK
34	0.002	0.230	0.76	OK
35	0.003	0.230	1.20	OK
36	0.002	0.230	1.03	OK
37	0.004	0.230	1.89	OK
38	0.002	0.230	0.76	OK
39	0.004	0.230	1.95	OK
40	0.008	0.230	3.32	OK

WALTEK

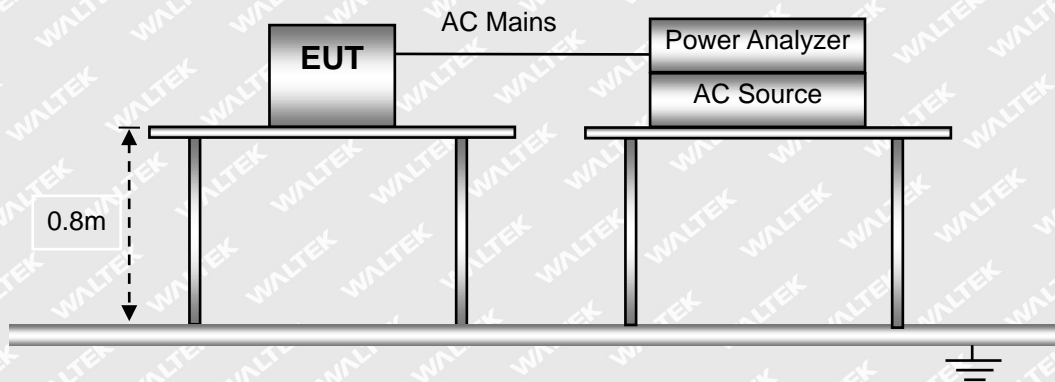


6. Voltage Fluctuation and Flicker

6.1 Test Procedure

Test is conducting under the description of EN 61000-3-3.

6.2 Test Setup Block Diagram



6.3 Test Standards

EN61000-3-3, Limit: Clause 5.

6.4 Environmental Conditions

Temperature:	22 °C
Relative Humidity:	53%
ATM Pressure:	1015 mbar

6.5 Voltage Fluctuation and Flicker Test Data

Result: The EUT is compliance with the requirements of this section.



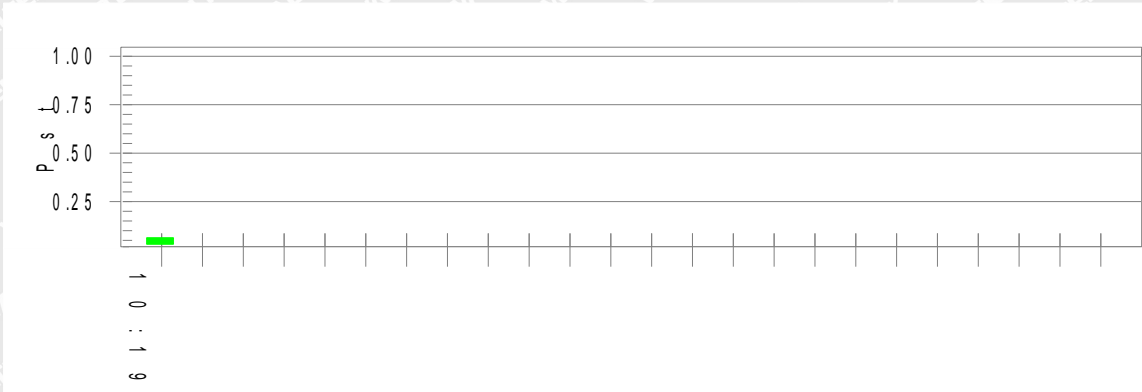
Test mode:	TM1
------------	-----

Test Result: Pass

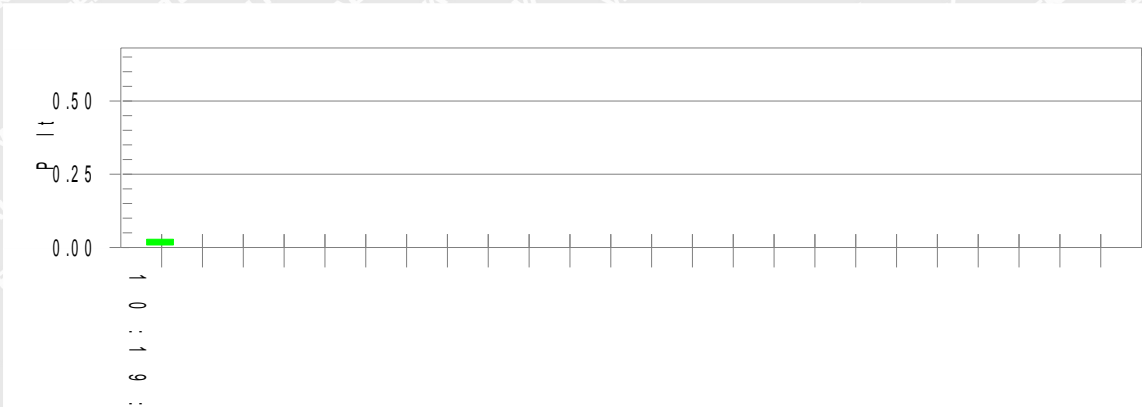
Status: Test Completed

Pst_i and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.94		
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):	0.064	Test limit:	1.000 Pass
Highest Plt (2 hr. period):	0.028	Test limit:	0.650 Pass

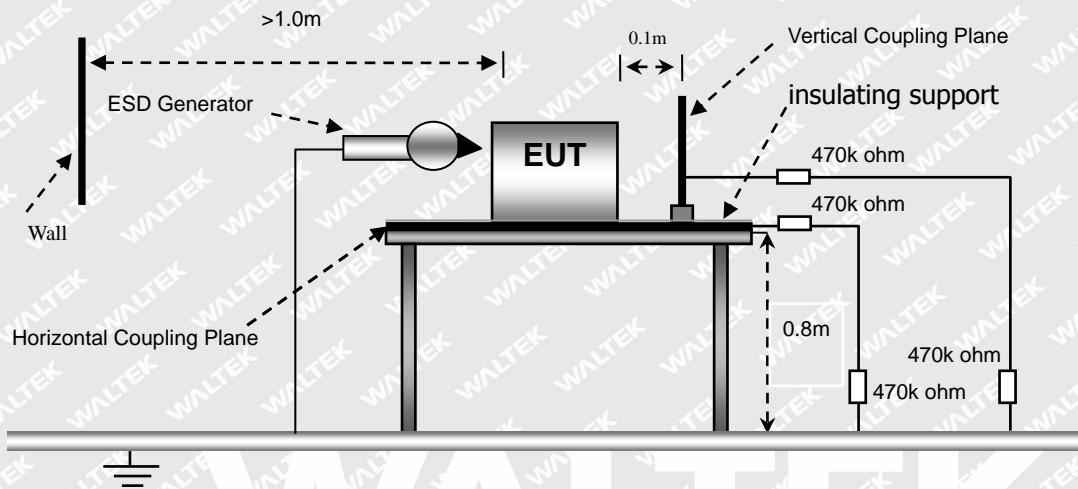


7. Electrostatic Discharge (ESD)

7.1 Test Procedure

Test is conducting under the description of EN 61000-4-2.

7.2 Test Setup Block Diagram



7.3 Test Performance

Performance Criterion:	Mode	Verdict
	TM1-TM2	B

Note: TM2 for TT,TR

7.4 Environmental Conditions

Temperature:	22 °C
Relative Humidity:	53%
ATM Pressure:	1015mbar

7.5 Electrostatic Discharge Immunity Test Data



Test mode	TM1-TM2							
EN 61000-4-2 Test Points	Test Levels (kV)							
	-2	+2	-4	+4	-6	+6	-8	+8
Air Discharge								
Button	A	A	A	A	A	A	A	A
Indicator Light	A	A	A	A	A	A	A	A
Shell Gap	A	A	A	A	A	A	A	A
Direct Contact Discharge								
Metal Screw	A	A	A	A	/	/	/	/
Indirect Contact Discharge								
HCP (6 Sides)	A	A	A	A	/	/	/	/
VCP (4 Sides)	A	A	A	A	/	/	/	/

Test Result: Pass

WALTEK

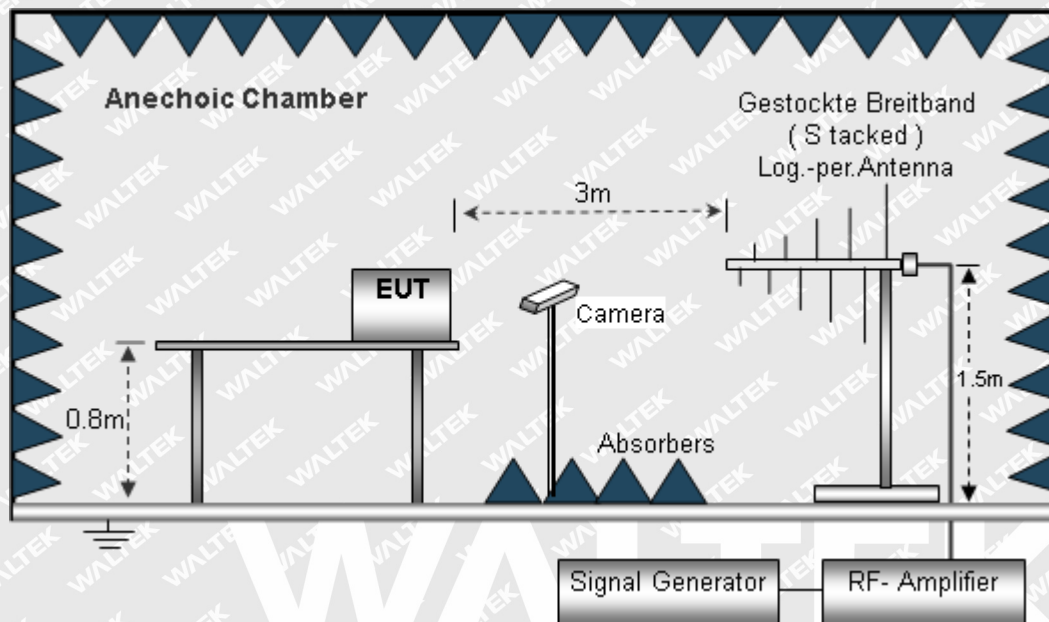


8. Radio Frequency Electromagnetic Field (R/S)

8.1 Test Procedure

Test is conducting under the description of EN 61000-4-3.

8.2 Test Setup Block Diagram



8.3 Test Performance

Performance Criterion:	Mode	Verdict
		TM1-TM2

Note: TM2 for CT,CR

8.4 Environmental Conditions

Temperature:	22 °C
Relative Humidity:	53%
ATM Pressure:	1015 mbar

8.5 Continuous Radiated Disturbances Test Data

Frequency step: 1% of fundamental

Dwell time: 1 second

Modulation: AM by 1kHz sine wave with 80% modulation depth



Test mode		TM1-TM2							
Frequency Range(MHz)	Field (V/m)	Front		Rear		Left Side		Right Side	
		VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	3	A	A	A	A	A	A	A	A
1000-3000	3	A	A	A	A	A	A	A	A
3000-6000	3	A	A	A	A	A	A	A	A

Test Result: Pass

WALTEK



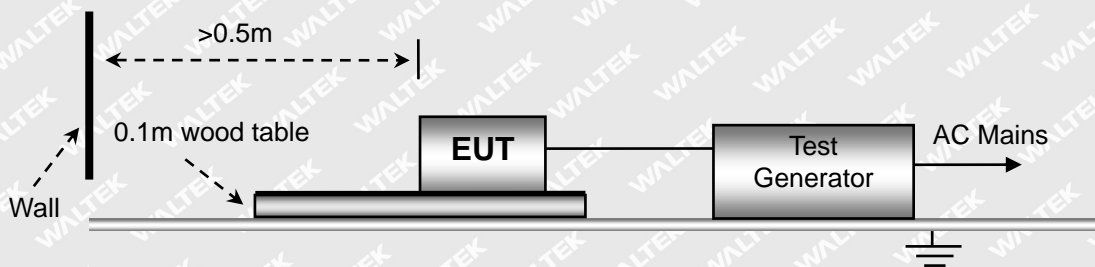
9. Fast Transients, Common Mode (EFT)

9.1 Test Procedure

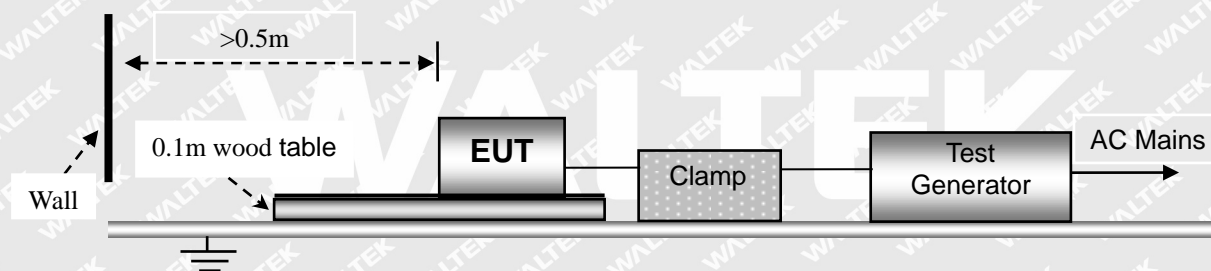
Test is conducting under the description of EN 61000-4-4.

9.2 Test Setup Block Diagram

For AC Mains or DC Ports:



For Signal or Telecommunication Ports:



9.3 Test Performance

Performance Criterion:	Mode	Verdict
		TM1-TM2

Note: TM2 for TT,TR

9.4 Environmental Conditions

Temperature:	22 °C
Relative Humidity:	53%
ATM Pressure:	1011 mbar

9.5 Electrical Fast Transients Test Data



Test Mode		TM1-TM2							
EN 61000-4-4 Test Line		Test Levels (kV)							
		+0.5	-0.5	+1.0	-1.0	+2.0	-2.0	+4.0	-4.0
AC Main Power port	L	A	A	A	A	/	/	/	/
	N	A	A	A	A	/	/	/	/
	PE	/	/	/	/	/	/	/	/
	L-N	A	A	A	A	/	/	/	/
	L-PE	/	/	/	/	/	/	/	/
	N-PE	/	/	/	/	/	/	/	/
	L-N-PE	/	/	/	/	/	/	/	/
Signal ports	/	/	/	/	/	/	/	/	

Test Result: Pass

WALTEK



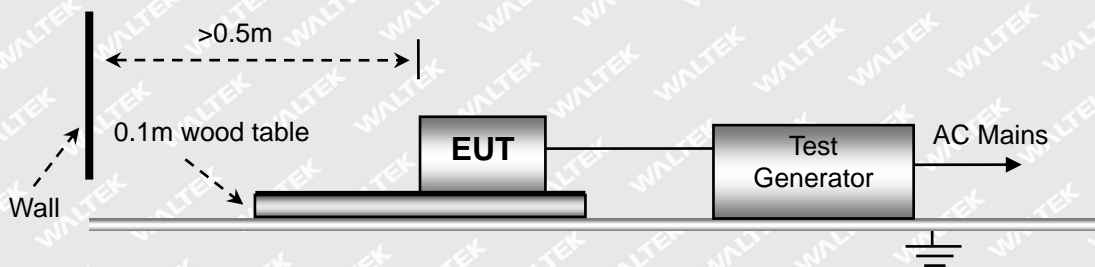
10. Surges

10.1 Test Procedure

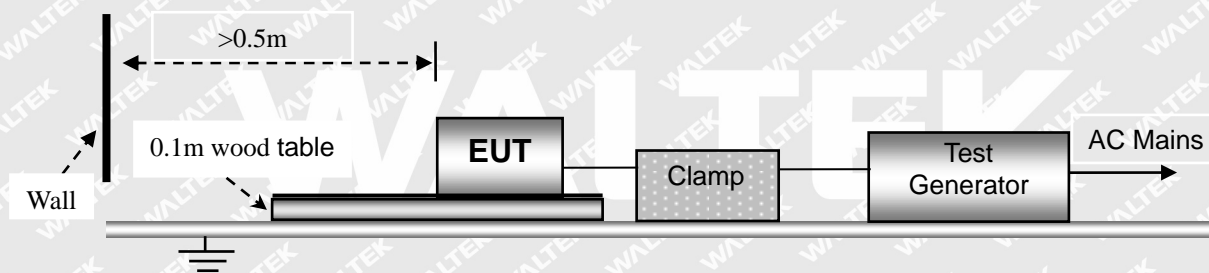
Test is conducting under the description of EN 61000-4-5.

10.2 Test Setup Block Diagram

For AC Mains or DC Ports:



For Signal or Telecommunication Ports:



10.3 Test Performance

Performance Criterion:	Mode	Verdict
		TM1-TM2

Note: TM2 for TT,TR

10.4 Environmental Conditions

Temperature:	22 °C
Relative Humidity:	53%
ATM Pressure:	1015 mbar

10.5 Surge Test Data



Test Mode	TM1-TM2			
Voltage	Poll	Path	Pass	Fail
0.5kV	±	L-N	A	/
1kV	±	L-N	A	/
2kV	±	L-N, L-PE, N-PE	/	/
4kV	±	L-N, L-PE, N-PE	/	/

Test Result: Pass

WALTEK



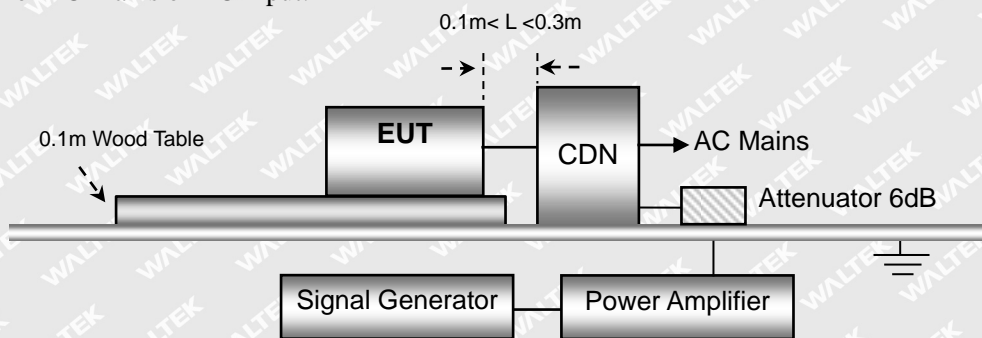
11. Radio Frequency, Common Mode (C/S)

11.1 Test Procedure

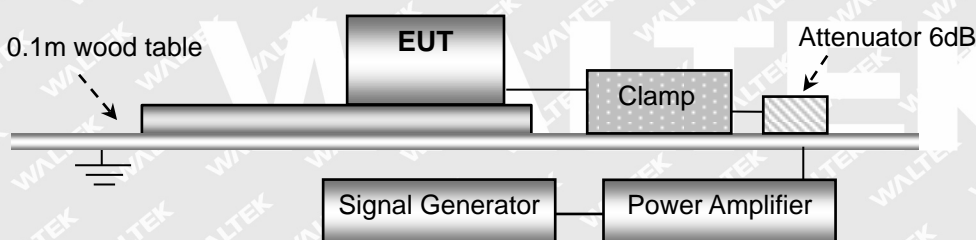
Test is conducting under the description of EN 61000-4-6.

11.2 Test Setup Block Diagram

For AC Mains or DC Input:



For Signal or Telecommunication Ports:



11.3 Test Performance

Performance Criterion:	Mode	Verdict
		TM1-TM2

Note: TM2 for CT,CR

11.4 Environmental Conditions

Temperature:	22 °C
Relative Humidity:	53%
ATM Pressure:	1015mbar

11.5 Continuous Conducted Disturbances Test Data

Sweep frequency range: 150kHz~80MHz

Frequency step: 1% of fundamental

Dwell time: 1 second

Waltek Testing Group (Shenzhen) Co., Ltd.

<http://www.semtest.com.cn>



Test Mode		TM1-TM2		
Level	Voltage (V) (rms, unmodulated)	Modulation:	Pass	Fail
1	1	AM 80%, 1kHz sinewave	/	/
2	3	AM 80%, 1kHz sinewave	A	/
3	10	AM 80%, 1kHz sinewave	/	/
X	Special	/	/	/

Test Result: Pass

WALTEK

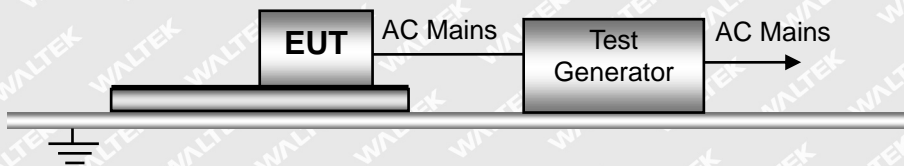


12. Voltage Dips and Interruptions

12.1 Test Procedure

Test is conducting under the description of EN 61000-4-11.

12.2 Test Setup Block Diagram



12.3 Test Performance

Performance Criterion:	Mode	Verdict
	TM1-TM2	B for voltage dip/ C for voltage interruption
Note: TM2 for TT,TR		

12.4 Environmental Conditions

Temperature:	22 °C
Relative Humidity:	53%
ATM Pressure:	1015 mbar

12.5 Voltage Dips And Interruptions Test Data

U: Voltage dips in % U_T (U_T is rated voltage for the EUT)

T: Test duration

Level	U	T	Phase Angle	N	Pass	Fail
1	100%	10ms	0/90/180/270	3	A	/
2	100%	20ms	0/90/180/270	3	B	/
3	30%	500ms	0/90/180/270	3	B	/
4	100%	5000ms	0/90/180/270	3	B	/

Test Result: Pass



EXHIBIT 1 - EUT PHOTOGRAPHS

Please refer to “ANNEX”.

WALTEK



EXHIBIT 2 - TEST SETUP PHOTOGRAPHS

**Conducted Emission
Test Setup**

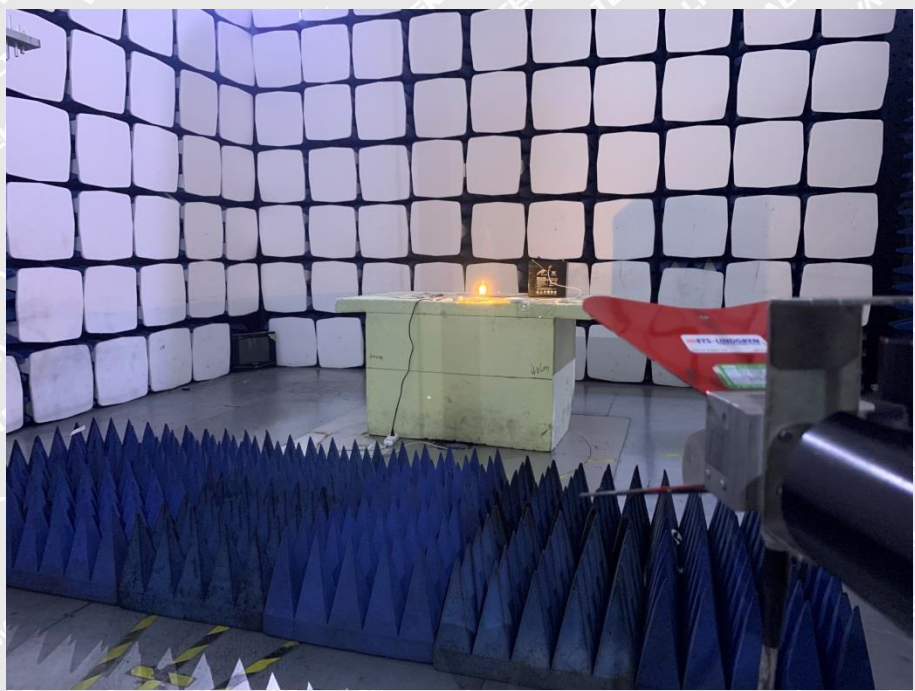


**Radiation Emission Test
View(30MHz to 1GHz)**

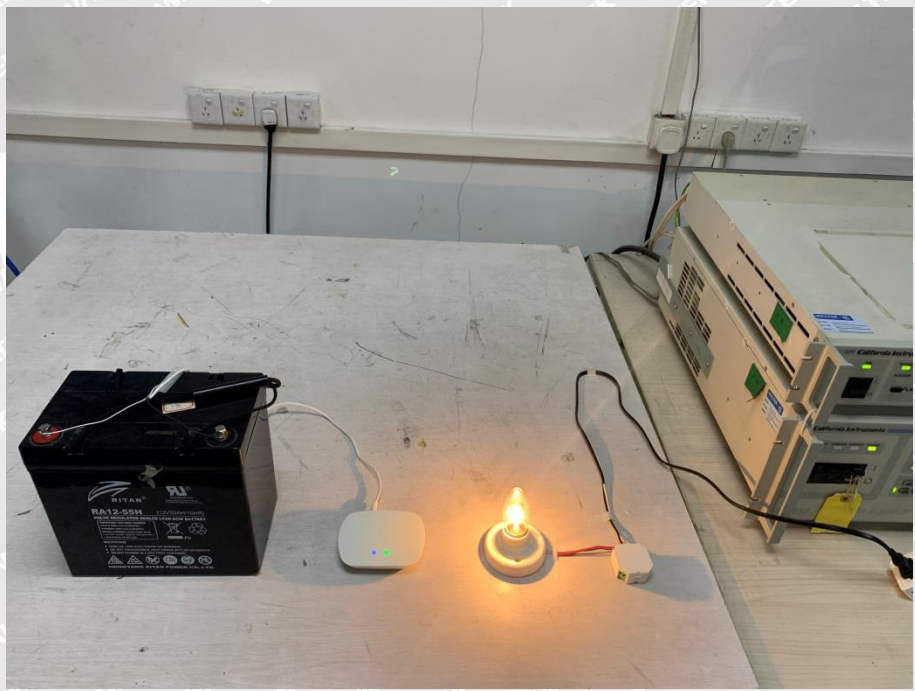




Radiation Emission Test Setup ((Above 1GHz)

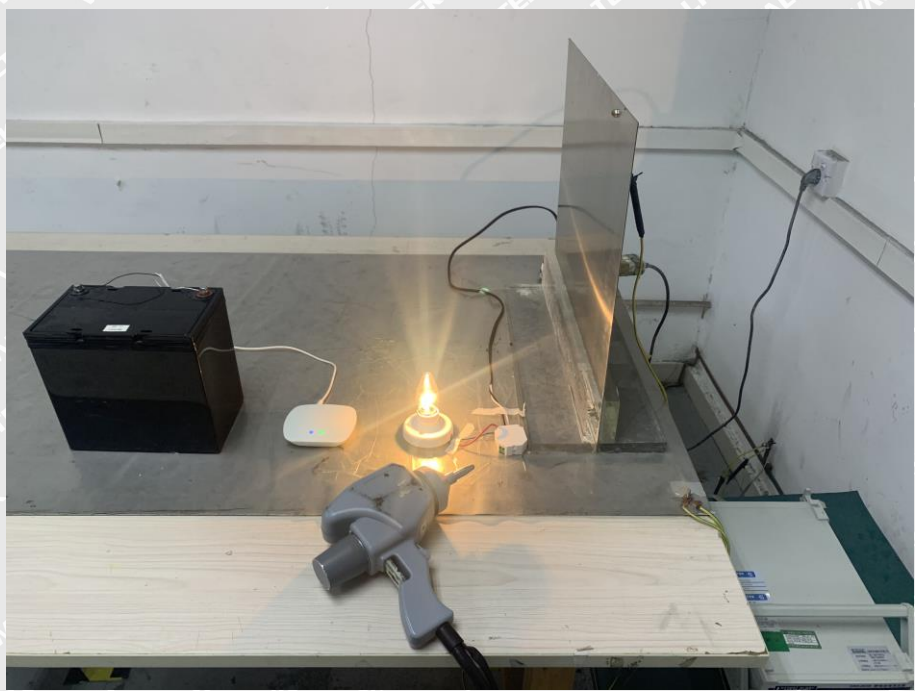


Harmonic/Flicker Test View

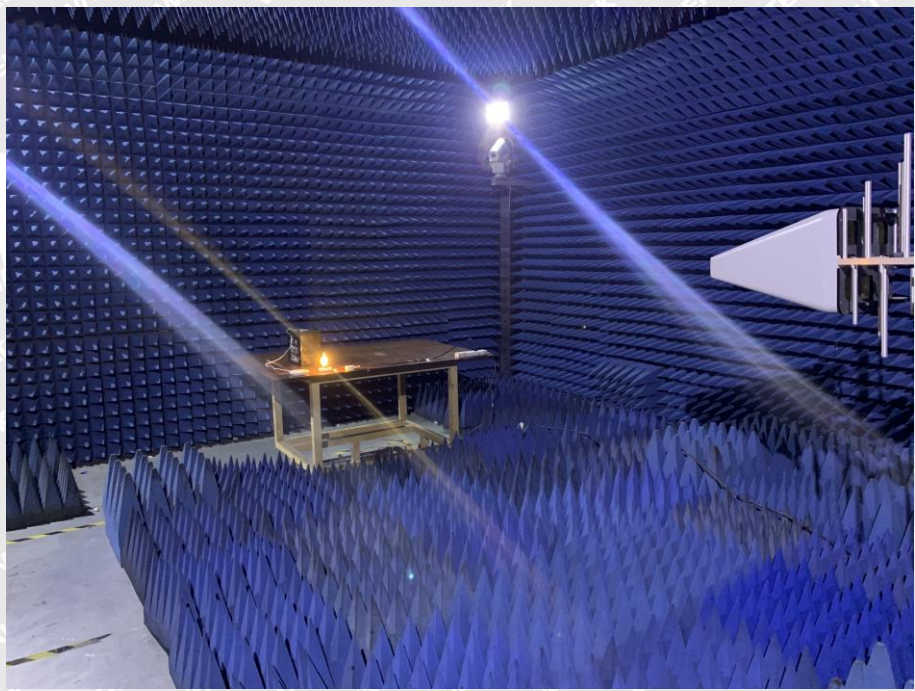




EN 61000-4-2 Test View



EN 61000-4-3 Test View

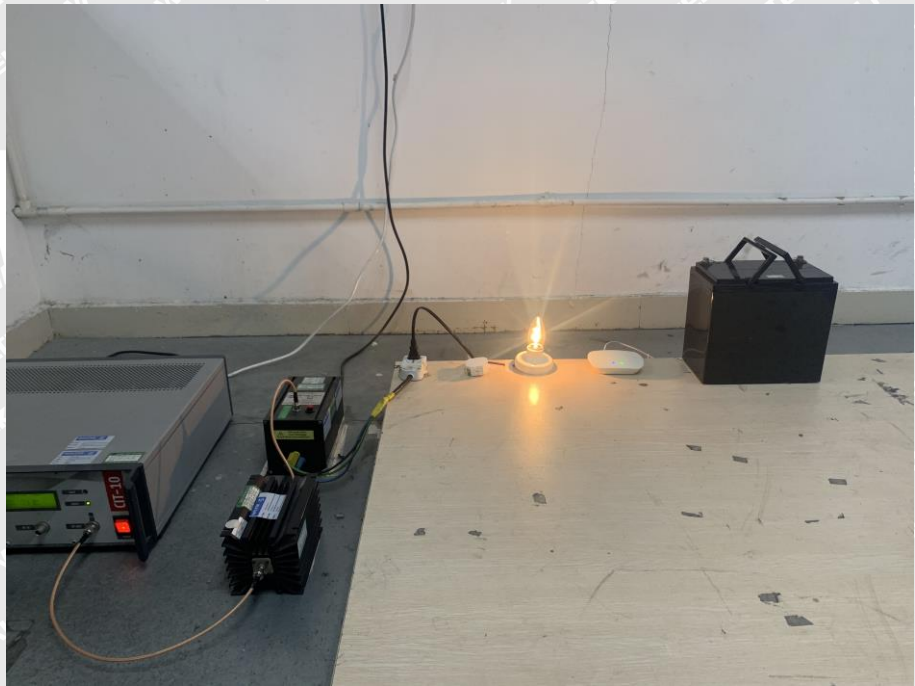




EN 61000-4-4/5/11 Test View



EN 61000-4-6 Test View



******* END OF REPORT *******