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TESTING
CNAS L4062

TEST REPORT

Reference No.	:	WTF23X01006941W003
Manufacturer	:	Mid Ocean Brands B.V.
Address	:	7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Factory	:	109328
Product Name	:	Sports and health smart watch
Model No.	:	MO6166
Standards	:	**EN 55032:2015+A1:2020; EN 55035:2017+A11:2020** **EN IEC 61000-3-2:2019+A1:2021; EN 61000-3-3:2013+A2:2021** **ETSI EN 301 489-1 V2.2.3 (2019-11)** **Draft ETSI EN 301 489-17 V3.2.5 (2022-08)**
Date of Receipt sample	:	2023-01-12
Date of Test	:	2023-01-12 to 2023-04-24
Date of Issue	:	2023-04-24
Test Report Form No.	:	WTX_ETSI EN 301 489_1_2019W
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 approver.

Prepared By:

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Version No.	Date of issue	Description
Rev.00	2023-04-24	Original
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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	Sports and health smart watch
Trade Name:	/
Model No.:	MO6166
Adding Model(s):	/
Rated Voltage:	DC 5V Battery DC 3.7V
Battery Capacity:	90mAh
Power Adaptor Model:	/
Software Version:	Apollo_SDK_R2_RX14TX15
Hardware Version:	pcb-Q1C0-V1.4
Note: The test data is gathered from a production sample, provided by the manufacturer.	

Technical Characteristics of EUT	
Bluetooth	
Bluetooth Version:	Bluetooth V5.0(BLE Mode)
Frequency Range:	2402-2480MHz
Max.RF Output Power:	1Mbps: -3.11dBm 2Mbps: -3.02dBm
Type of Modulation:	GFSK
Data Rate:	1Mbps, 2Mbps
Quantity of Channels	40
Channel Separation:	2MHz
Type of Antenna:	PCB Antenna
Antenna Gain:	2dBi
Note: The Antenna Gain is provided by the customer and can affect the validity of results.	

1.2 Test Standards

The tests were performed according to following standards:

EN 55032:2015+A1:2020: Electromagnetic compatibility of multimedia equipment - Emission requirements

EN 55035:2017+A11:2020: Electromagnetic compatibility of multimedia equipment - Immunity requirements.

EN IEC 61000-3-2:2019+A1:2021: Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase).

EN 61000-3-3:2013+A2:2021: Electromagnetic compatibility (EMC) -- Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <= 16 A per phase and not subject to conditional connection.

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.

Draft ETSI EN 301 489-17 V3.2.5 (2022-08): ElectroMagnetic Compatibility (EMC) standard for radio equipment and services;Part 17: Specific conditions for Broadband Data Transmission Systems; Harmonised Standard for ElectroMagnetic Compatibility.

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

Address of the test laboratory

Laboratory: 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

FCC – Registration No.: 125990

Waltek Testing Group (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. 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	Charging	Connect to the Adapter; AC230V 50Hz for Adapter
TM2	2.4GHz Bluetooth Connect	Connect the phone
TM3	2.4GHz Bluetooth	TR, CR, TT, CT for EMS testing

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

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

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Mobile phone	HUAWEI	VOG-AL00	/
Notebook	Lenovo	E445	EB12648265
Adapter	Xiaomi	MDY-08-ES	/

1.6 Performance Criteria for EMS

➢ **EN 301 489-17, 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.

Table 1: Performance criteria

Criteria	During test	After test
A	Shall operate as intended. (see note 1). Shall be no loss of function. Shall be no unintentional transmissions.	Shall operate as intended. Shall be no degradation of performance (see note 3). Shall be no loss of function. Shall be no loss of stored data or user programmable
B	May show loss of function (one or more). May show degradation of performance (see note 2). Shall be no unintentional transmissions.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no degradation of performance (see note 3). Shall be no loss of stored data or user programmable functions.
C	May be loss of function (one or more).	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no degradation of performance (see note 3).

NOTE 1: Operate as intended during the test allows a level of degradation not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

NOTE 2: Degradation of performance during the test is understood as a degradation to a level not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

NOTE 3: No degradation of performance after the test is understood as no degradation below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. After the test no change of actual operating data or user retrievable data is allowed. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

- **EN 55035, The performance criteria are:**

A. The apparatus shall continue to operate as intended during and after the test. The manufacturer specifies some minimum performance level. The performance level may be specified by the manufacturer as a permissible loss of performance.

B. The apparatus shall continue to operate as intended after the test. This indicates that the EUT does not need to function at normal performance levels during the test, but must recover. Again some minimal performance is defined by the manufacture. No change in operating state or loss or data is permitted.

C. Temporary loss of function is allowed. Operation of the EUT may stop as long as it is either automatically reset or can be manually restored by operation of the controls.

1.7 Measurement Uncertainty

Measurement uncertainty	
Parameter	**Uncertainty**
Uncertainty for Radiated Emission in 3m chamber	@30-200MHz ±4.52dB @0.2-1GHz ±5.56dB @1-6GHz ±3.84dB @6-18GHz ±3.92dB
Uncertainty for Conducted Emission	@9-150kHz ±3.74dB @0.15-30MHz ±3.34dB
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
☒Chamber A: Below 1GHz					
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2023-02-25	2024-02-24
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2023-02-25	2024-02-24
Amplifier	HP	8447F	2805A03475	2023-02-25	2024-02-24
Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
Trilog Broadband Antenna	Schwarz beck	VULB9163	9163-333	2023-03-20	2026-03-19
☒Chamber A: Above 1GHz					
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2023-02-25	2024-02-24
Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2023-02-25	2024-02-24
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2023-02-25	2024-02-24
Amplifier	C&D	PAP-1G18	14918	2023-02-25	2024-02-24
Horn Antenna	ETS	3117	00086197	2021-03-19	2024-03-18
DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2021-03-19	2024-03-18
Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2023-02-25	2024-02-24
☐Chamber B:Below 1GHz					
Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2021-04-09	2024-04-08
Amplifier	Agilent	8447D	2944A10179	2023-02-25	2024-02-24
EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2023-02-25	2024-02-24
☐Chamber C:Below 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2021-05-28	2024-05-27
Amplifier	HP	8447F	2944A03869	2023-02-25	2024-02-24
☐Chamber C: Above 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
Horn Antenna	POAM	RTF-11A	LP228060221	2023-03-10	2026-03-09
Amplifier	Tonscend	TAP01018050	AP22E806235	2023-02-25	2024-02-24
☒Conducted Room 1#					
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2023-02-25	2024-02-24
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2023-02-25	2024-02-24
AC LISN	Schwarz beck	NSLK8126	8126-224	2023-02-25	2024-02-24
8-WIRE LISN	Schwarz beck	8158	CAT3-8158-0059	2023-02-25	2024-02-24
8-WIRE LISN	Schwarz beck	8158	CAT5-8158-0117	2023-02-25	2024-02-24
☐Conducted Room 2#					
EMI Test Receiver	Rohde & Schwarz	ESPI	10129	2023-02-25	2024-02-24
LISN	Rohde & Schwarz	ENV 216	100097	2023-02-25	2024-02-24

EMF					
VDH Test Head	AFJ	VDH 30	SC022Z	2023-02-25	2024-02-24
3 Loop Antenna					
Loop Antenna	ZHINAN	ZN30401	19037	2023-02-25	2025-02-24
Clamp					
Clamp	Luthi	MDS21	3809	2023-02-27	2024-02-26
PFMF					
PMF Generator	LIONCEL	PMF-801C-C	0171101	2023-02-25	2024-02-24
PMF Antenna	LIONCEL	PMF-801C-A	0180302	2023-02-25	2024-02-24
Instantaneous PMF Generator Module	LIONCEL	PMF-801C-T	0171001	2023-02-25	2024-02-24
H/F					
Digital Power Analyzer	California Instrument	CTS	72831	2023-02-25	2024-02-24
Power Source	California Instrument	5001IX-CTS-400	25965	2023-02-25	2024-02-24
ESD					
ESD Generator	LIONCEL	ESD-203B	0170901	2023-03-14	2024-03-13
EFT/SURGE/DIPS					
Transient 2000	EMC PARTNER	TRA2000	863	2023-02-25	2024-02-24
Couple Clamp	EMC PARTNER	CN-EFT1000	513	2023-02-25	2024-02-24
CS					
CONDUCTED IMMUNITY TEST SYSTEM	FRANKONIA	CIT-10/75	126B1247/2013	2023-02-25	2024-02-24
Attenuator	EMTEST	MA-5100/6BF2	1009	2023-02-25	2024-02-24
CDN	Luthi	L-801M2/M3	2665	2023-02-25	2024-02-24
CDN	LIONCEL	CDN-T8	0210401	2023-02-25	2024-02-24
EM Clamp	TESEQ	KEMZ801A	45028	2023-02-25	2024-02-24
RS					
Signal Generator	HP	8688B	3438A00604	2023-02-25	2024-02-24
Power Meter	KEITHLEY	3500	1162591	2023-02-25	2024-02-24
Power Meter	KEITHLEY	3500	1121428	2023-02-25	2024-02-24
RF Power Amplifier	MicoTop	MPA-80-1000-250	MPA1906239	2023-02-25	2024-02-24
RF Power Amplifier	MicoTop	MPA-80-6000-100	MPA1906238	2023-02-25	2024-02-24
Antenna	SCHWARZBECK	STLP 9129	9129 114	N/A	N/A
Power Meter	Agilent	E4419B	GB42420578	2023-02-25	2024-02-24

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.

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

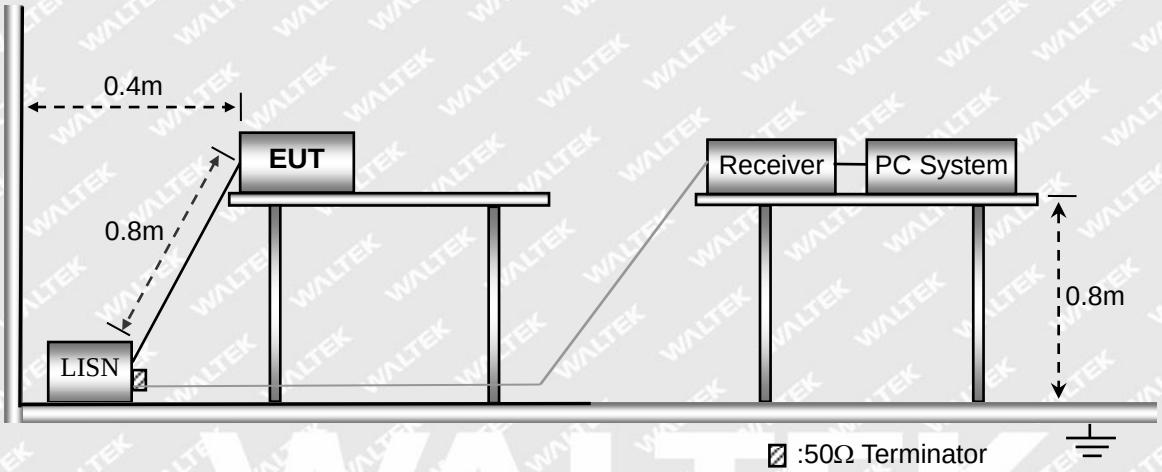
Pass: The EUT complies with the essential requirements in the standard.
Fail: The EUT does not comply with the essential requirements in the standard.
N/A: Not applicable.

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



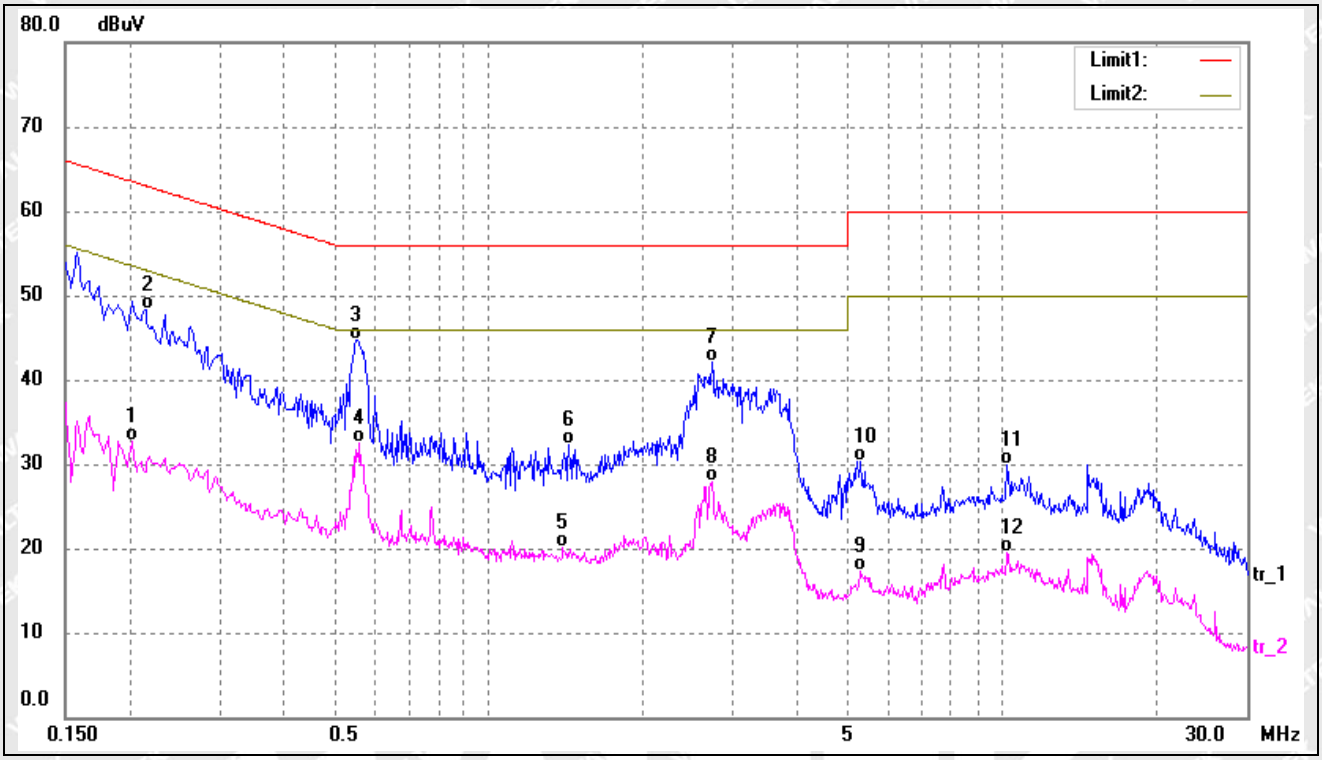
3.3 Environmental Conditions

Temperature:	23.5 ° C
Relative Humidity:	54 %
ATM Pressure:	1015 mbar

3.4 Conducted Emissions Test Data

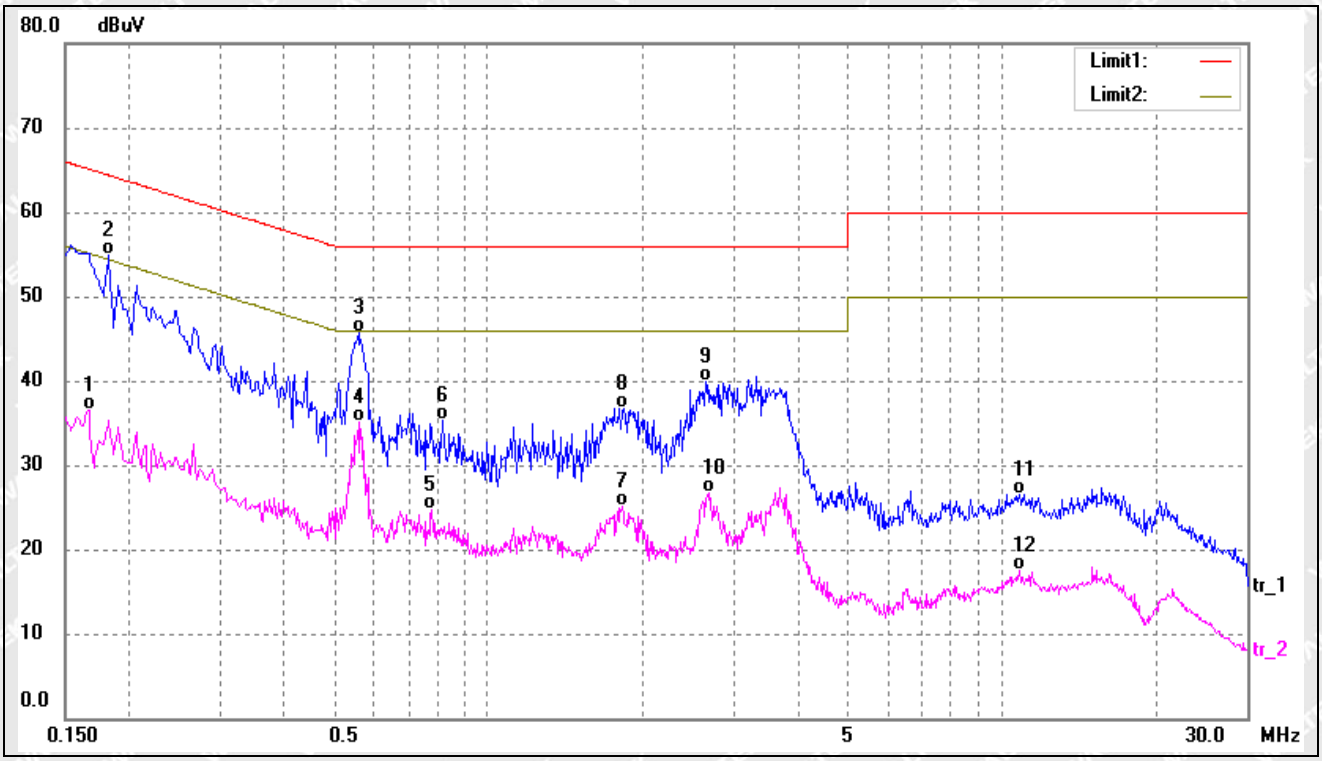
Note: Only show the worst case in the test report

Test mode:	TM1	Polarity:	Neutral



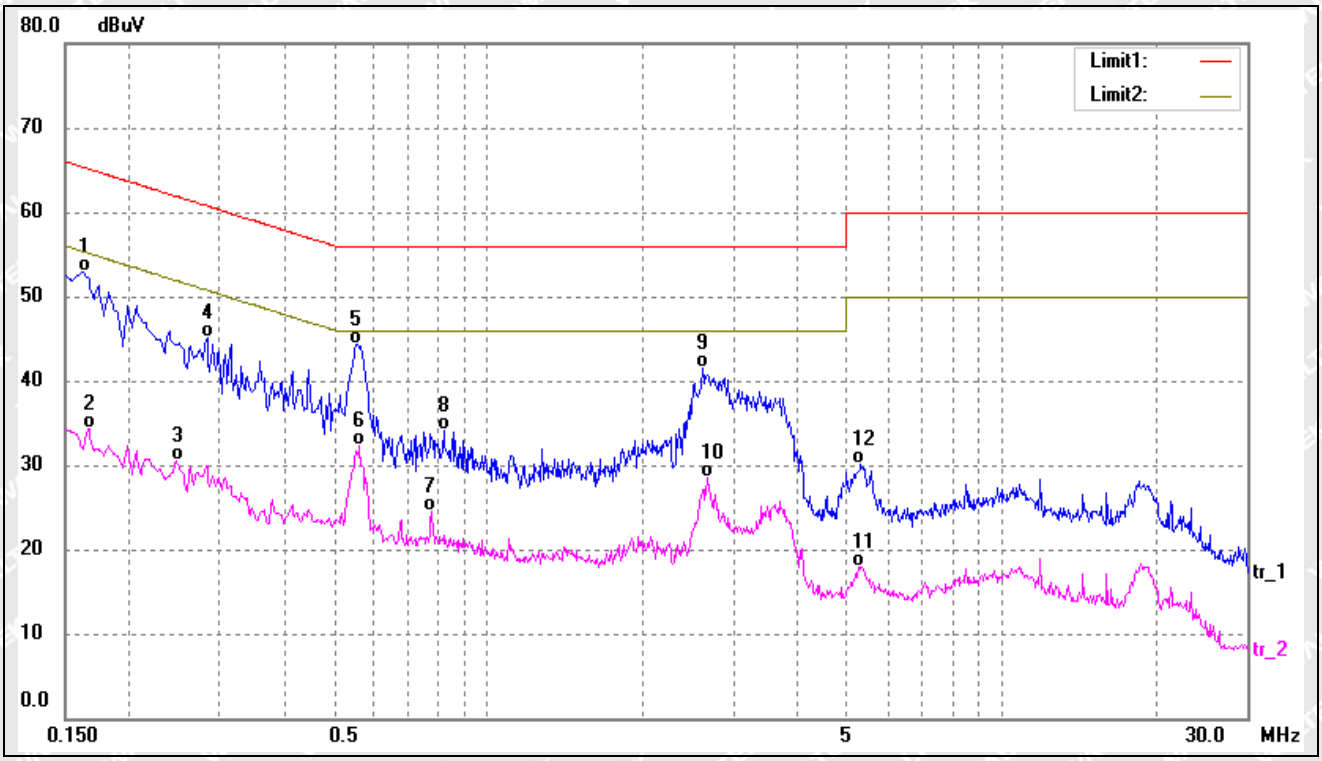
No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.2020	22.41	10.30	32.71	53.52	-20.81	AVG
2	0.2140	38.00	10.29	48.29	63.04	-14.75	QP
3*	0.5540	34.51	10.21	44.72	56.00	-11.28	QP
4	0.5620	22.23	10.21	32.44	46.00	-13.56	AVG
5	1.4020	9.85	10.18	20.03	46.00	-25.97	AVG
6	1.4380	22.14	10.18	32.32	56.00	-23.68	QP
7	2.7220	31.80	10.27	42.07	56.00	-13.93	QP
8	2.7220	17.64	10.27	27.91	46.00	-18.09	AVG
9	5.2819	7.03	10.33	17.36	50.00	-32.64	AVG
10	5.3060	19.95	10.33	30.28	60.00	-29.72	QP
11	10.2060	19.61	10.35	29.96	60.00	-30.04	QP
12	10.2820	9.25	10.34	19.59	50.00	-30.41	AVG

Test mode:	TM1	Polarity:	Line



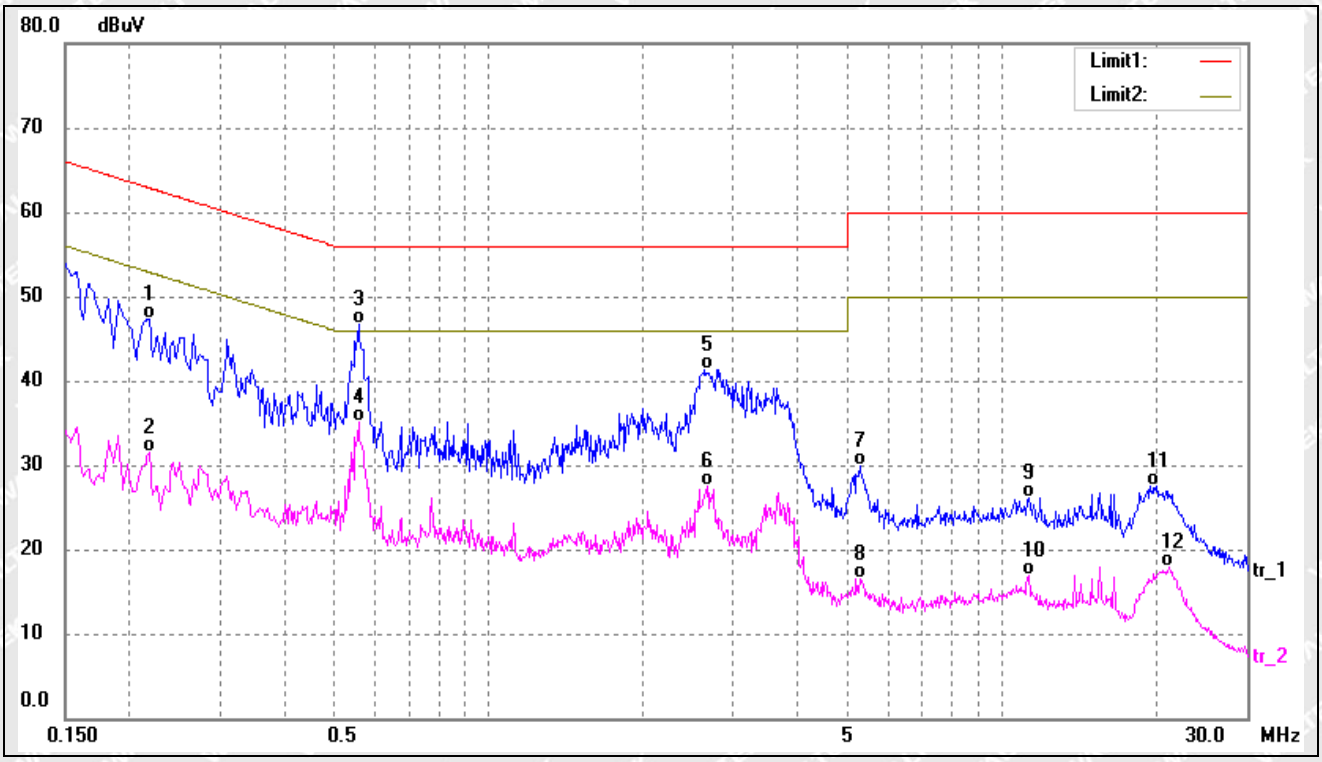
No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.1660	26.23	10.31	36.54	55.15	-18.61	AVG
2*	0.1819	44.50	10.31	54.81	64.39	-9.58	QP
3	0.5580	35.51	10.21	45.72	56.00	-10.28	QP
4	0.5580	24.95	10.21	35.16	46.00	-10.84	AVG
5	0.7780	14.61	10.17	24.78	46.00	-21.22	AVG
6	0.8139	25.06	10.17	35.23	56.00	-20.77	QP
7	1.8220	14.91	10.23	25.14	46.00	-20.86	AVG
8	1.8460	26.40	10.23	36.63	56.00	-19.37	QP
9	2.6619	29.61	10.27	39.88	56.00	-16.12	QP
10	2.7020	16.39	10.27	26.66	46.00	-19.34	AVG
11	10.8100	16.24	10.33	26.57	60.00	-33.43	QP
12	10.8100	7.25	10.33	17.58	50.00	-32.42	AVG

Test mode:	TM2	Polarity:	Neutral



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.1620	42.59	10.31	52.90	65.36	-12.46	QP
2	0.1660	24.01	10.31	34.32	55.15	-20.83	AVG
3	0.2460	20.16	10.27	30.43	51.89	-21.46	AVG
4	0.2819	34.84	10.25	45.09	60.76	-15.67	QP
5*	0.5540	34.18	10.21	44.39	56.00	-11.61	QP
6	0.5620	22.05	10.21	32.26	46.00	-13.74	AVG
7	0.7780	14.42	10.17	24.59	46.00	-21.41	AVG
8	0.8180	23.89	10.17	34.06	56.00	-21.94	QP
9	2.6180	31.19	10.27	41.46	56.00	-14.54	QP
10	2.6780	18.18	10.27	28.45	46.00	-17.55	AVG
11	5.2700	7.58	10.33	17.91	50.00	-32.09	AVG
12	5.3300	19.81	10.33	30.14	60.00	-29.86	QP

Test mode:	TM2	Polarity:	Line

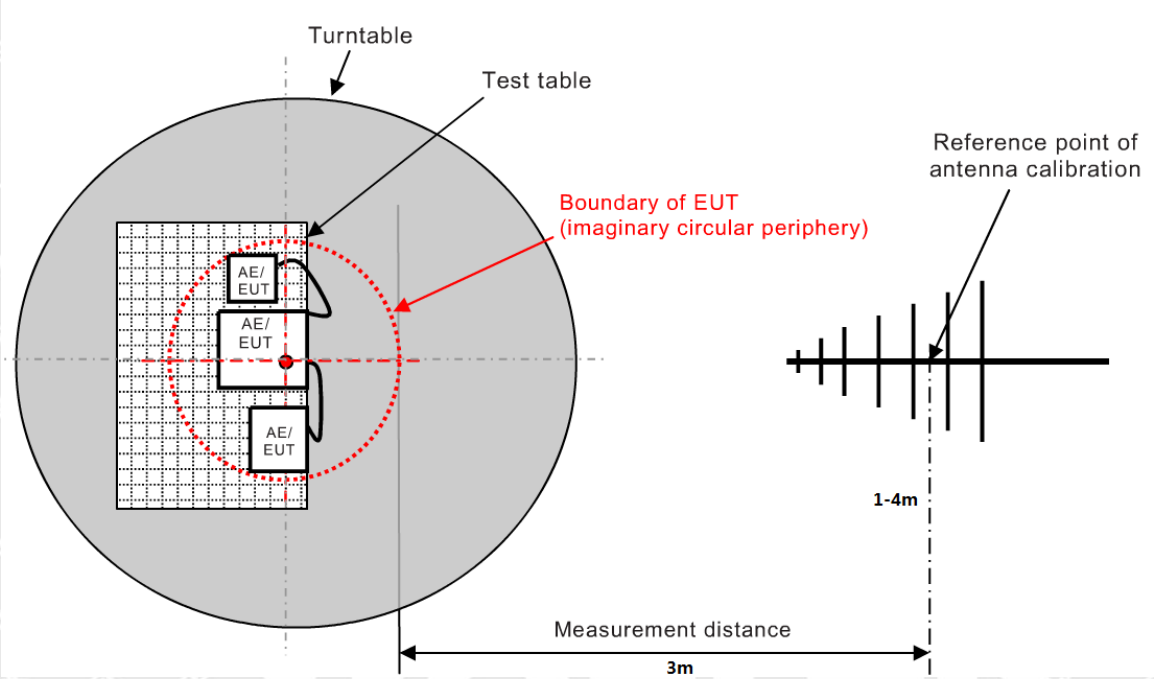


No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.2180	37.02	10.28	47.30	62.89	-15.59	QP
2	0.2180	21.14	10.28	31.42	52.89	-21.47	AVG
3*	0.5580	36.56	10.21	46.77	56.00	-9.23	QP
4	0.5580	24.93	10.21	35.14	46.00	-10.86	AVG
5	2.6380	31.08	10.27	41.35	56.00	-14.65	QP
6	2.6700	17.29	10.27	27.56	46.00	-18.44	AVG
7	5.2980	19.59	10.33	29.92	60.00	-30.08	QP
8	5.3060	6.24	10.33	16.57	50.00	-33.43	AVG
9	11.3060	15.77	10.32	26.09	60.00	-33.91	QP
10	11.3060	6.57	10.32	16.89	50.00	-33.11	AVG
11	19.4540	17.21	10.36	27.57	60.00	-32.43	QP
12	21.2060	7.55	10.37	17.92	50.00	-32.08	AVG

4. Radiated Emissions

4.1 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:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit for Class B device. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – EN 301489 Class B Limit

4.3 Environmental Conditions

Temperature:	25° C
Relative Humidity:	55%
ATM Pressure:	1011 mbar

4.4 Summary of Test Results/Plots

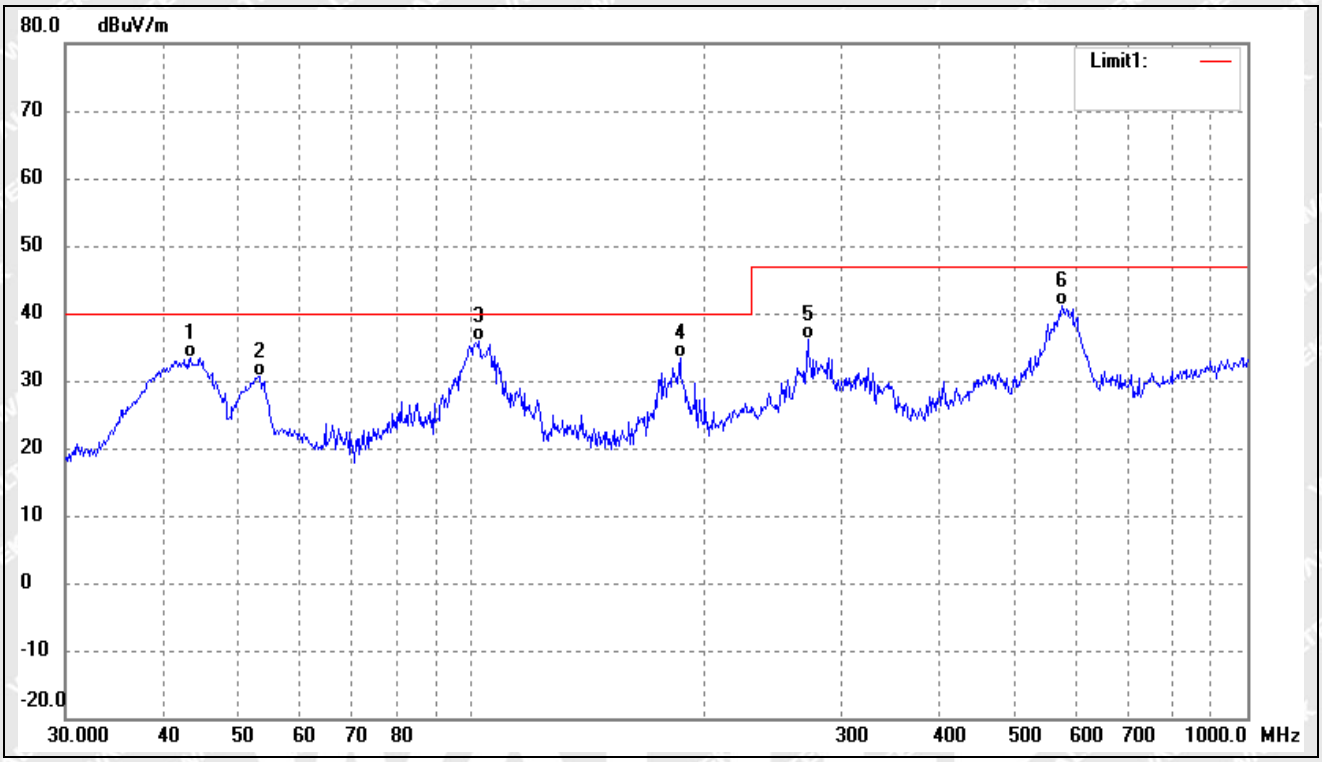
Note: Only show the worst case in the test report

➢ 30MHz to 1GHz

Test mode:	TM1	Polarity:	Horizontal

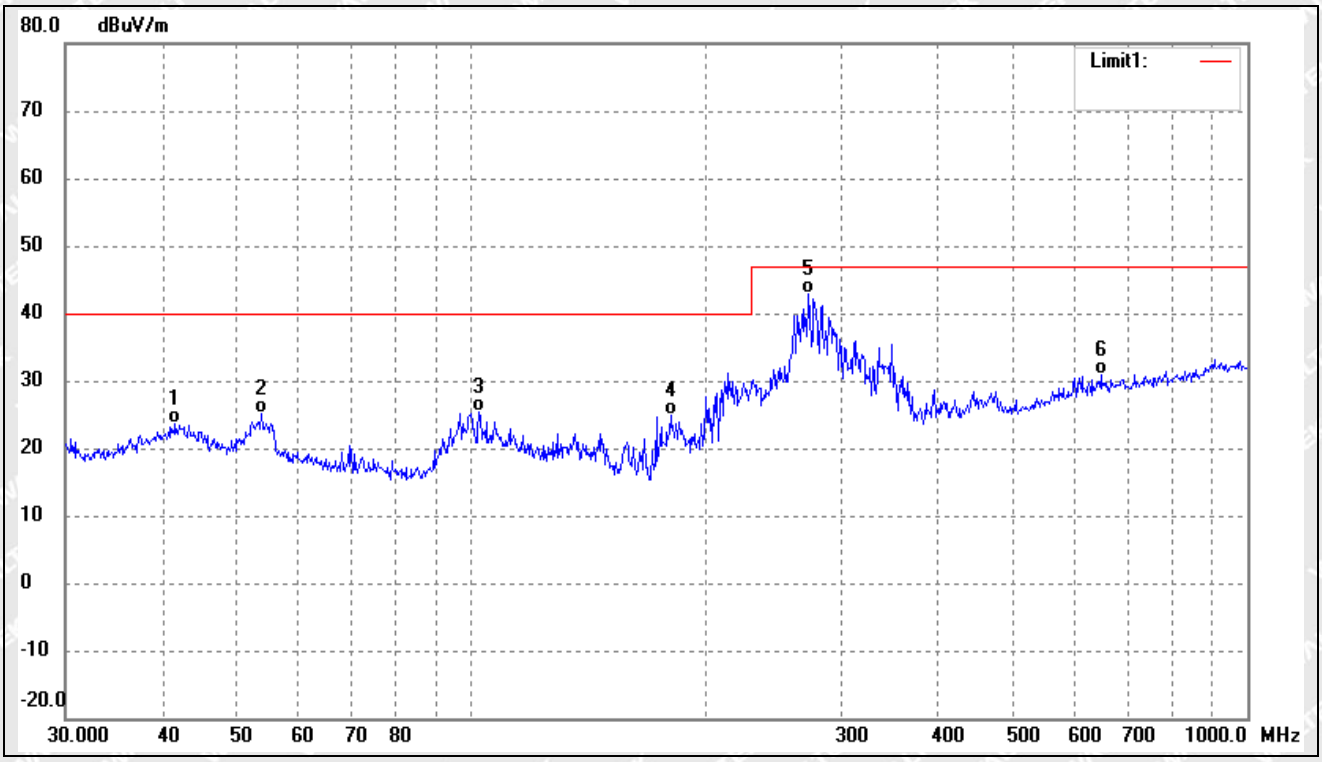
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	43.5057	30.89	-7.19	23.70	40.00	-16.30	-	-	QP
2	52.9453	32.19	-7.83	24.36	40.00	-15.64	-	-	QP
3	103.0800	34.63	-8.08	26.55	40.00	-13.45	-	-	QP
4	223.7334	39.98	-7.60	32.38	40.00	-7.62	-	-	QP
5	281.9946	48.04	-5.61	42.43	47.00	-4.57	-	-	QP
6	568.6127	32.17	-0.75	31.42	47.00	-15.58	-	-	QP

Test mode:	TM1	Polarity:	Vertical



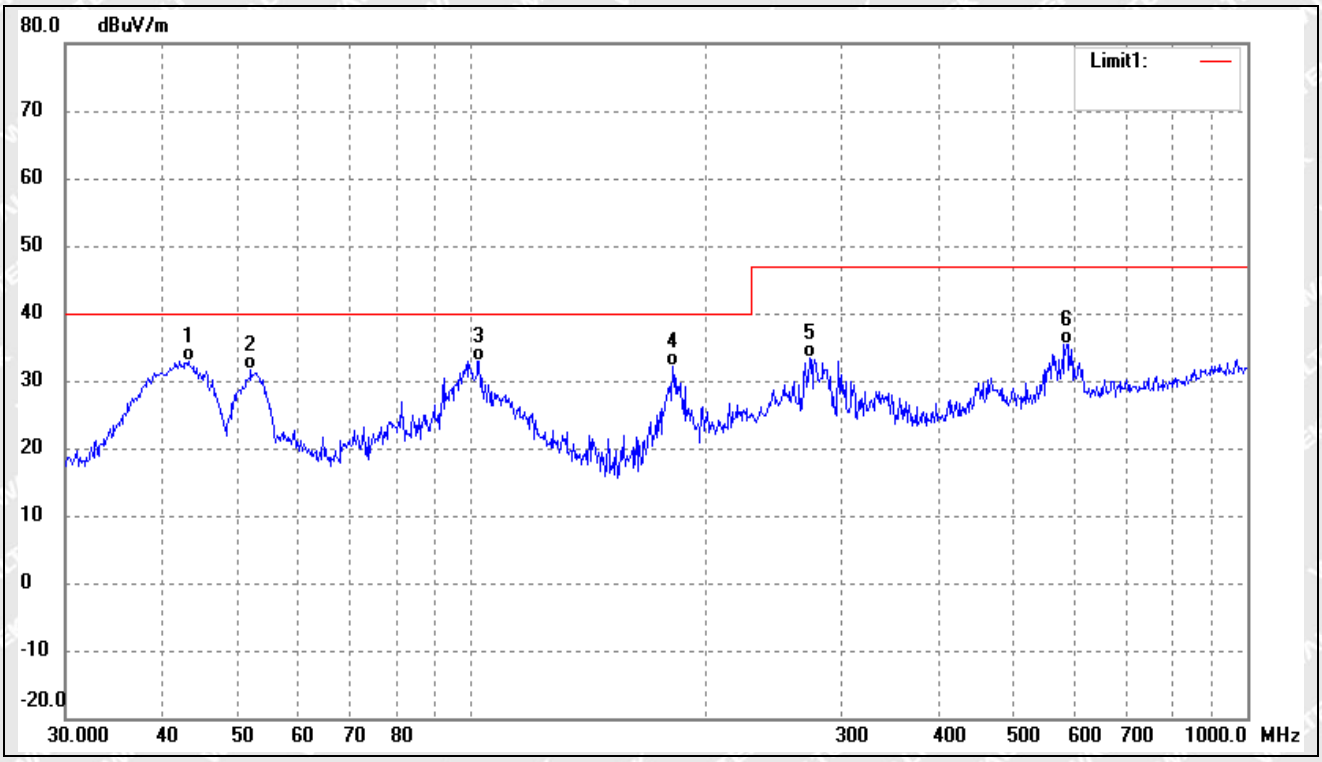
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	43.5057	40.45	-7.19	33.26	40.00	-6.74	-	-	QP
2	53.3179	38.63	-7.90	30.73	40.00	-9.27	-	-	QP
3	102.3597	43.99	-8.08	35.91	40.00	-4.09	-	-	QP
4	185.7882	42.75	-9.39	33.36	40.00	-6.64	-	-	QP
5	271.3246	41.99	-5.98	36.01	47.00	-10.99	-	-	QP
6	576.6443	41.64	-0.60	41.04	47.00	-5.96	-	-	QP

Test mode:	TM2	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	41.5670	30.89	-7.15	23.74	40.00	-16.26	-	-	QP
2	53.6932	33.03	-7.95	25.08	40.00	-14.92	-	-	QP
3	102.3597	33.54	-8.08	25.46	40.00	-14.54	-	-	QP
4	180.6488	35.00	-10.06	24.94	40.00	-15.06	-	-	QP
5	272.2776	48.87	-5.95	42.92	47.00	-4.08	-	-	QP
6	647.3856	30.47	0.53	31.00	47.00	-16.00	-	-	QP

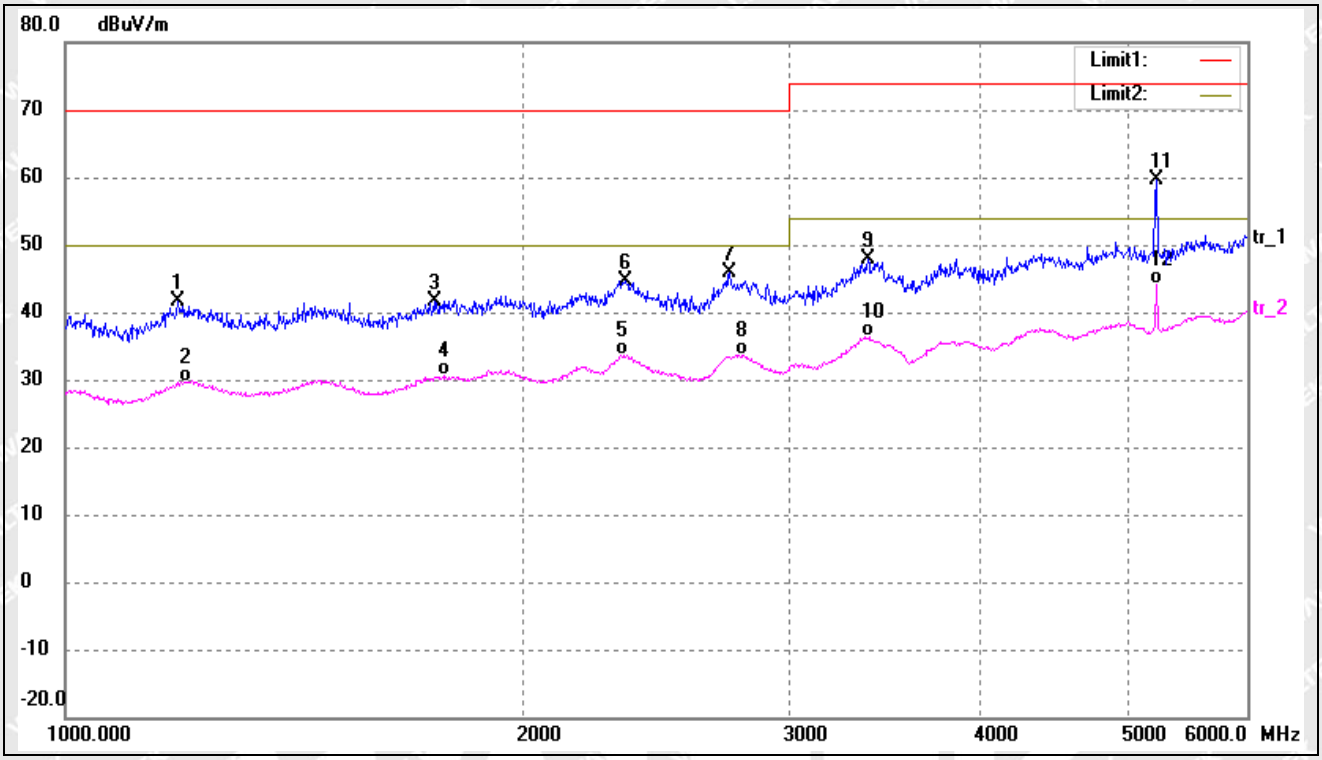
Test mode:	TM2	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	43.2017	40.00	-7.18	32.82	40.00	-7.18	-	-	QP
2	52.0251	39.38	-7.67	31.71	40.00	-8.29	-	-	QP
3	102.3597	40.96	-8.08	32.88	40.00	-7.12	-	-	QP
4	181.9202	41.95	-9.89	32.06	40.00	-7.94	-	-	QP
5	273.2341	39.41	-5.91	33.50	47.00	-13.50	-	-	QP
6	584.7895	35.91	-0.44	35.47	47.00	-11.53	-	-	QP

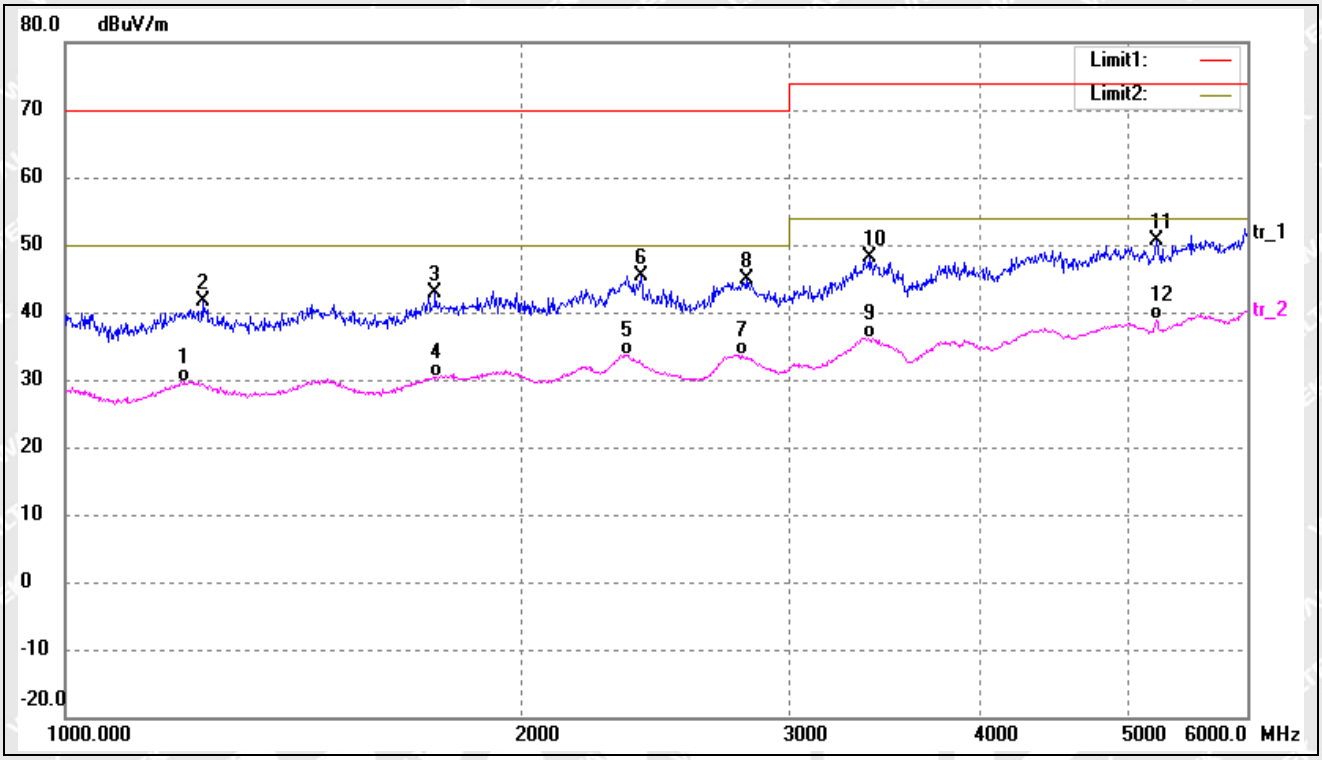
➢ Above 1GHz

Test mode:	TM1(worst case)	Polarity:	Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	1185.562	54.70	-12.95	41.75	70.00	-28.25	-	-	peak
2	1200.526	42.63	-12.90	29.73	50.00	-20.27	-	-	AVG
3	1748.973	52.44	-10.75	41.69	70.00	-28.31	-	-	peak
4	1774.224	41.23	-10.67	30.56	50.00	-19.44	-	-	AVG
5	2329.632	42.25	-8.70	33.55	50.00	-16.45	-	-	AVG
6	2337.996	53.36	-8.67	44.69	70.00	-25.31	-	-	peak
7	2737.291	53.59	-7.80	45.79	70.00	-24.21	-	-	peak
8	2786.779	41.33	-7.73	33.60	50.00	-16.40	-	-	AVG
9	3375.707	53.97	-6.10	47.87	74.00	-26.13	-	-	peak
10	3381.760	42.41	-6.09	36.32	54.00	-17.68	-	-	AVG
11	5226.773	61.77	-2.09	59.68	74.00	-14.32	-	-	peak
12	5226.773	46.27	-2.09	44.18	54.00	-9.82	-	-	AVG

Test mode:	TM1(worst case)	Polarity:	Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( )	Height (cm)	Remark
1	1198.377	42.66	-12.91	29.75	50.00	-20.25	-	-	AVG
2	1231.021	54.34	-12.76	41.58	70.00	-28.42	-	-	peak
3	1752.110	53.65	-10.74	42.91	70.00	-27.09	-	-	peak
4	1755.252	41.22	-10.72	30.50	50.00	-19.50	-	-	AVG
5	2342.189	42.41	-8.66	33.75	50.00	-16.25	-	-	AVG
6	2393.093	53.81	-8.47	45.34	70.00	-24.66	-	-	peak
7	2786.779	41.30	-7.73	33.57	50.00	-16.43	-	-	AVG
8	2806.824	52.53	-7.70	44.83	70.00	-25.17	-	-	peak
9	3375.707	42.29	-6.10	36.19	54.00	-17.81	-	-	AVG
10	3381.760	54.15	-6.09	48.06	74.00	-25.94	-	-	peak
11	5226.773	52.81	-2.09	50.72	74.00	-23.28	-	-	peak
12	5226.773	40.89	-2.09	38.80	54.00	-15.20	-	-	AVG

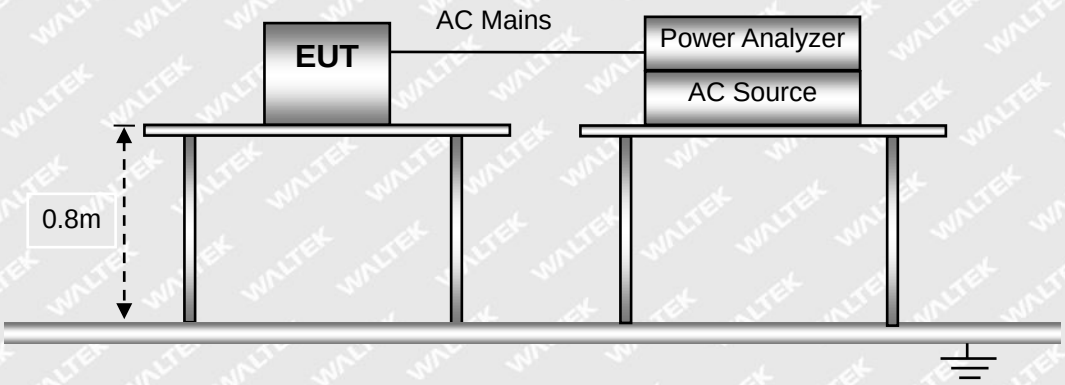
Remark:'-'Means' the test Degree and Height are not recorded by the test software and only show the worst case in the test report.

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

Test category: Class-A (European limits) **Test Margin: 100**

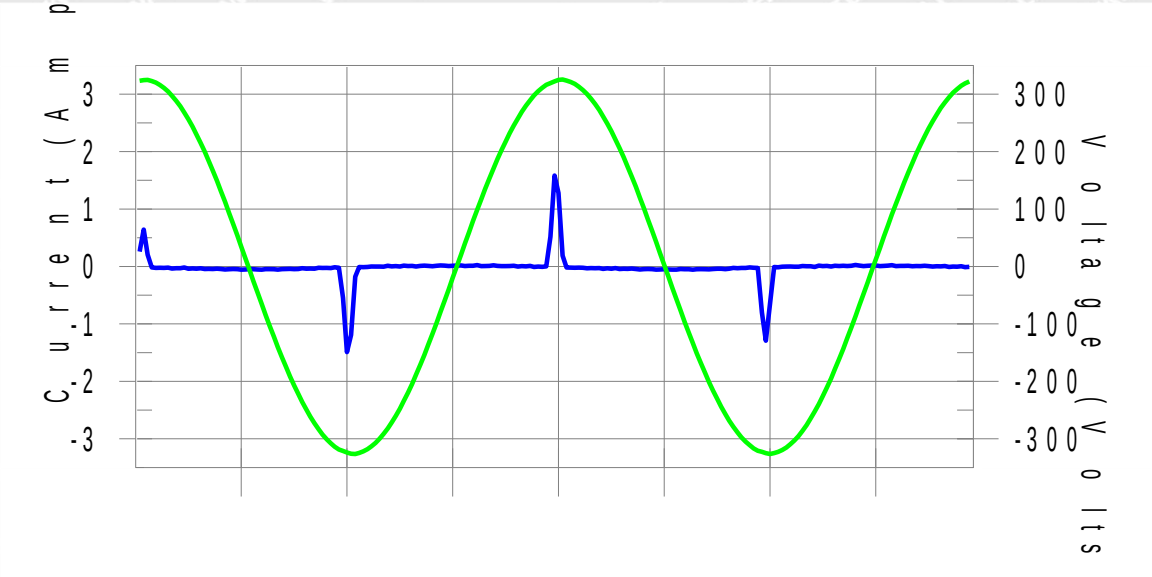
Test date: 2023/2/6 **Start time: 14:40:00** **End time: 14:42:41**

Test duration (min): 2.5 **Data file name: H-000287.cts_data**

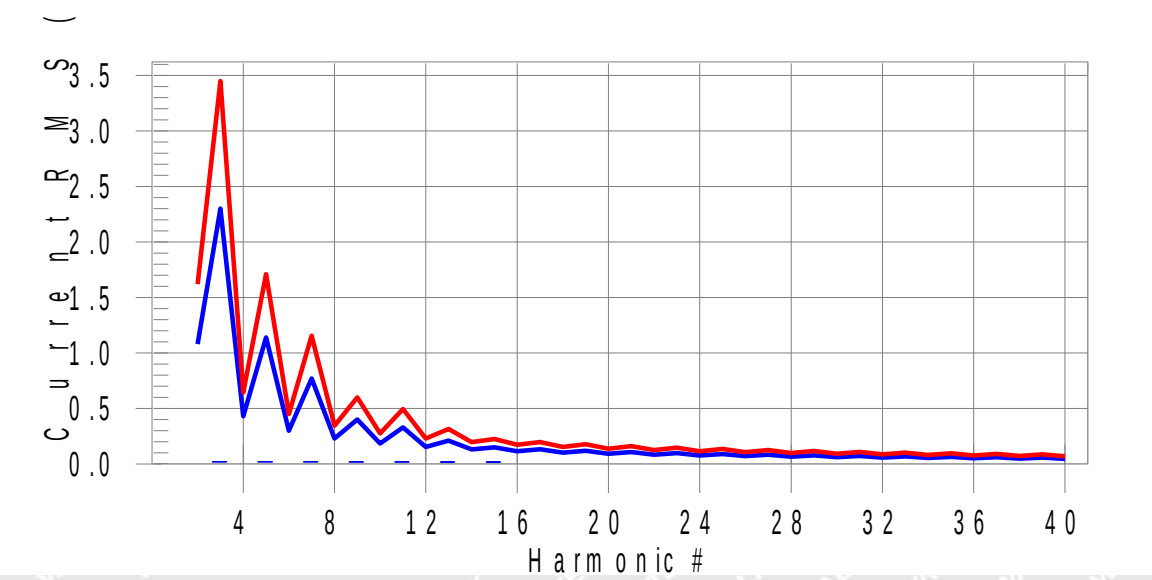
Comment: TM1

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

Current & voltage waveforms



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



Test result: Pass **Worst harmonics H23-15.0% of 150% limit, H27-15.6% of 100% limit**

Current Test Result Summary (Run time)

Test category: Class-A (European limits) **Test Margin: 100**
Test date: 2023/2/6 **Start time: 14:40:00** **End time: 14:42:41**
Test duration (min): 2.5 **Data file name: H-000287.cts_data**
Comment: TM1

Test Result: Pass **Source qualification: Normal**
THC(A): 0.068 **I-THD(%): 151.9** **POHC(A): 0.038** **POHC Limit(A): 0.251**

Highest parameter values during test:

V_RMS (Volts):	230.10	Frequency(Hz):	50.00
I_Peak (Amps):	1.645	I_RMS (Amps):	0.267
I_Fund (Amps):	0.045	Crest Factor:	14.364
Power (Watts):	8.5	Power Factor:	0.332

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.002	1.080	N/A	0.004	1.620	N/A	Pass
3	0.021	2.300	0.9	0.035	3.450	1.0	Pass
4	0.002	0.430	N/A	0.004	0.645	N/A	Pass
5	0.020	1.140	1.8	0.035	1.710	2.0	Pass
6	0.002	0.300	N/A	0.004	0.450	N/A	Pass
7	0.020	0.770	2.6	0.034	1.155	2.9	Pass
8	0.002	0.230	N/A	0.004	0.345	N/A	Pass
9	0.020	0.400	4.9	0.033	0.600	5.5	Pass
10	0.002	0.184	N/A	0.004	0.276	N/A	Pass
11	0.019	0.330	5.8	0.032	0.495	6.4	Pass
12	0.002	0.153	N/A	0.004	0.230	N/A	Pass
13	0.019	0.210	8.8	0.030	0.315	9.7	Pass
14	0.002	0.131	N/A	0.003	0.197	N/A	Pass
15	0.018	0.150	11.9	0.029	0.225	12.9	Pass
16	0.002	0.115	N/A	0.003	0.173	N/A	Pass
17	0.017	0.132	13.0	0.027	0.198	13.8	Pass
18	0.002	0.102	N/A	0.003	0.153	N/A	Pass
19	0.016	0.118	13.9	0.026	0.178	14.4	Pass
20	0.002	0.092	N/A	0.003	0.138	N/A	Pass
21	0.016	0.107	14.6	0.024	0.161	14.9	Pass
22	0.002	0.084	N/A	0.003	0.125	N/A	Pass
23	0.015	0.098	15.1	0.022	0.147	15.0	Pass
24	0.002	0.077	N/A	0.003	0.115	N/A	Pass
25	0.014	0.090	15.5	0.020	0.135	14.9	Pass
26	0.001	0.071	N/A	0.003	0.107	N/A	Pass

27	0.013	0.083	15.6	0.018	0.125	14.6	Pass
28	0.001	0.066	N/A	0.002	0.099	N/A	Pass
29	0.012	0.078	15.6	0.016	0.116	14.1	Pass
30	0.001	0.061	N/A	0.002	0.092	N/A	Pass
31	0.011	0.073	15.4	0.015	0.109	13.4	Pass
32	0.001	0.058	N/A	0.002	0.086	N/A	Pass
33	0.010	0.068	15.0	0.013	0.102	12.5	Pass
34	0.001	0.054	N/A	0.002	0.081	N/A	Pass
35	0.009	0.064	14.5	0.011	0.096	11.5	Pass
36	0.001	0.051	N/A	0.002	0.077	N/A	Pass
37	0.008	0.061	13.9	0.009	0.091	10.4	Pass
38	0.001	0.048	N/A	0.002	0.073	N/A	Pass
39	0.008	0.058	13.1	0.008	0.087	9.2	Pass
40	0.001	0.046	N/A	0.001	0.069	N/A	Pass

Voltage Source Verification Data (Run time)

Test category: Class-A (European limits) **Test Margin: 100**
Test date: 2023/2/6 **Start time: 14:40:00** **End time: 14:42:41**
Test duration (min): 2.5 **Data file name: H-000287.cts_data**
Comment: TM1

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

Highest parameter values during test:

Voltage (Vrms):	**230.10**	**Frequency(Hz):**	**50.00**
I_Peak (Amps):	**1.645**	**I_RMS (Amps):**	**0.267**
I_Fund (Amps):	**0.045**	**Crest Factor:**	**14.364**
Power (Watts):	**8.5**	**Power Factor:**	**0.332**

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.053	0.460	11.51	OK
3	0.499	2.071	24.11	OK
4	0.083	0.460	18.13	OK
5	0.058	0.920	6.32	OK
6	0.035	0.460	7.53	OK
7	0.021	0.690	3.07	OK
8	0.018	0.460	3.97	OK
9	0.026	0.460	5.67	OK
10	0.008	0.460	1.78	OK
11	0.023	0.230	9.96	OK
12	0.011	0.230	4.66	OK
13	0.030	0.230	12.85	OK
14	0.005	0.230	2.31	OK
15	0.023	0.230	9.90	OK
16	0.009	0.230	3.86	OK
17	0.034	0.230	14.77	OK
18	0.010	0.230	4.52	OK
19	0.032	0.230	13.79	OK
20	0.015	0.230	6.66	OK
21	0.033	0.230	14.16	OK
22	0.006	0.230	2.44	OK
23	0.030	0.230	12.83	OK
24	0.005	0.230	2.19	OK
25	0.029	0.230	12.54	OK
26	0.004	0.230	1.86	OK
27	0.026	0.230	11.33	OK

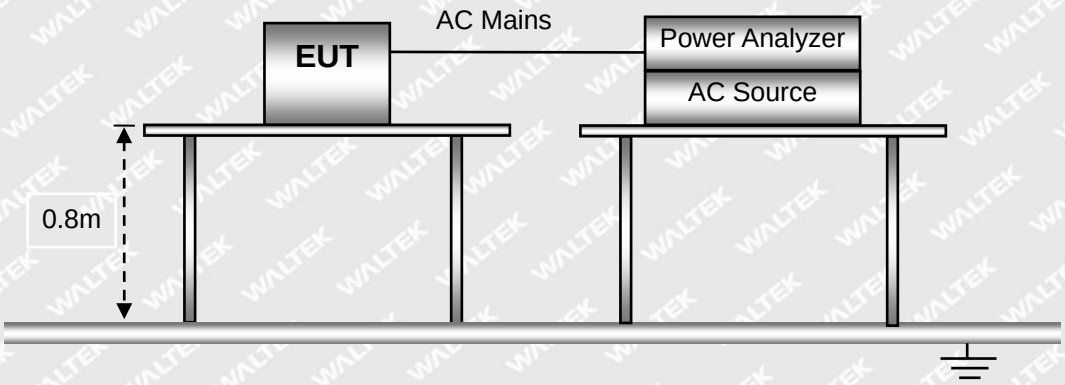
28	**0.006**	**0.230**	**2.57**	**OK**
29	**0.027**	**0.230**	**11.60**	**OK**
30	**0.005**	**0.230**	**2.07**	**OK**
31	**0.025**	**0.230**	**10.65**	**OK**
32	**0.004**	**0.230**	**1.92**	**OK**
33	**0.022**	**0.230**	**9.38**	**OK**
34	**0.004**	**0.230**	**1.89**	**OK**
35	**0.020**	**0.230**	**8.56**	**OK**
36	**0.004**	**0.230**	**1.72**	**OK**
37	**0.017**	**0.230**	**7.39**	**OK**
38	**0.004**	**0.230**	**1.84**	**OK**
39	**0.015**	**0.230**	**6.65**	**OK**
40	**0.009**	**0.230**	**3.94**	**OK**

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

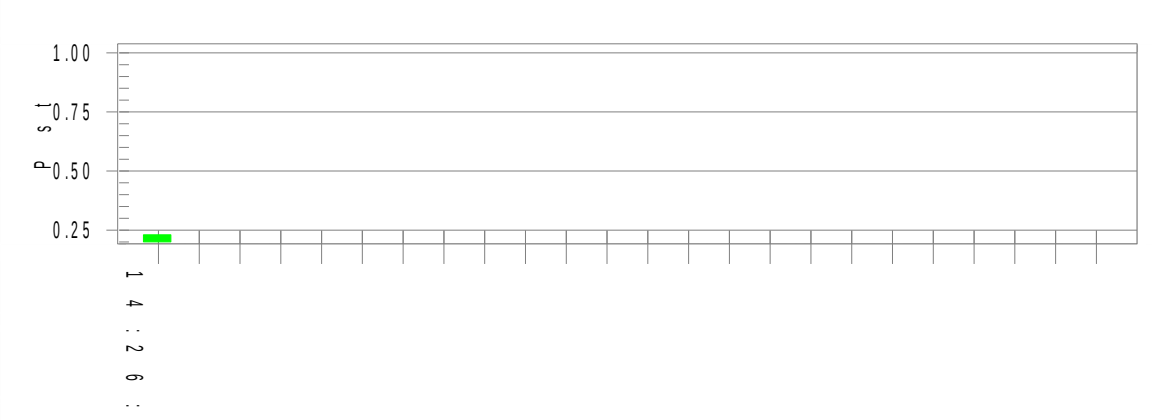
Temperature:	22 °C
Relative Humidity:	53%
ATM Pressure:	1015 mbar

6.5 Voltage Fluctuation and Flicker Test Data

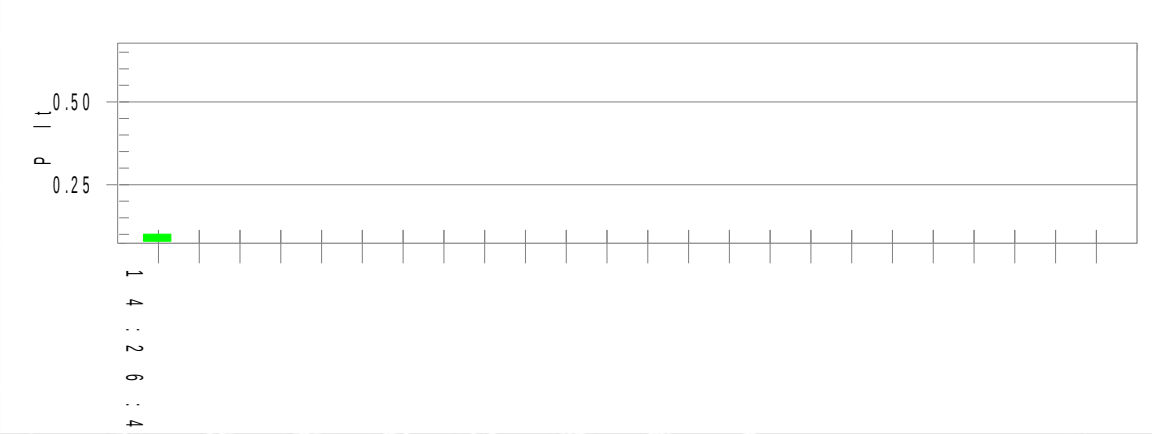
Test mode:	TM1(worst case)

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

Pst_1 and limit line **European Limits**



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt): 230.03

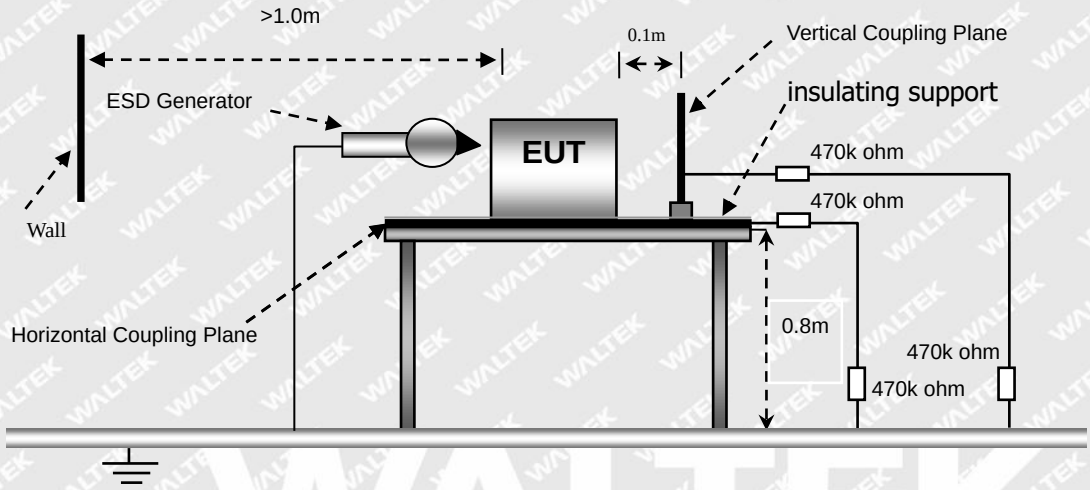
Highest dt (%):		**Test limit (%):**		
T-max (mS):	**0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**0.00**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.230**	**Test limit:**	**1.000**	**Pass**
Highest Plt (2 hr. period):	**0.101**	**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-TM3	B
Note:TM3 for TT,TR		

7.4 Environmental Conditions

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

7.5 Electrostatic Discharge Immunity Test Data

Test mode	TM1-TM3							
EN 61000-4-2	Test Levels (kV)							
Test Points	-2	+2	-4	+4	-6	+6	-8	+8
Air Discharge								
Screen	A	A	A	A	A	A	B	B
Enclosure	A	A	A	A	A	A	B	B
Direct Contact Discharge								
Enclosure	A	A	A	A	/	/	/	/
Indirect Contact Discharge								
HCP (6 Sides)	A	A	A	A	/	/	/	/
VCP (4 Sides)	A	A	A	A	/	/	/	/

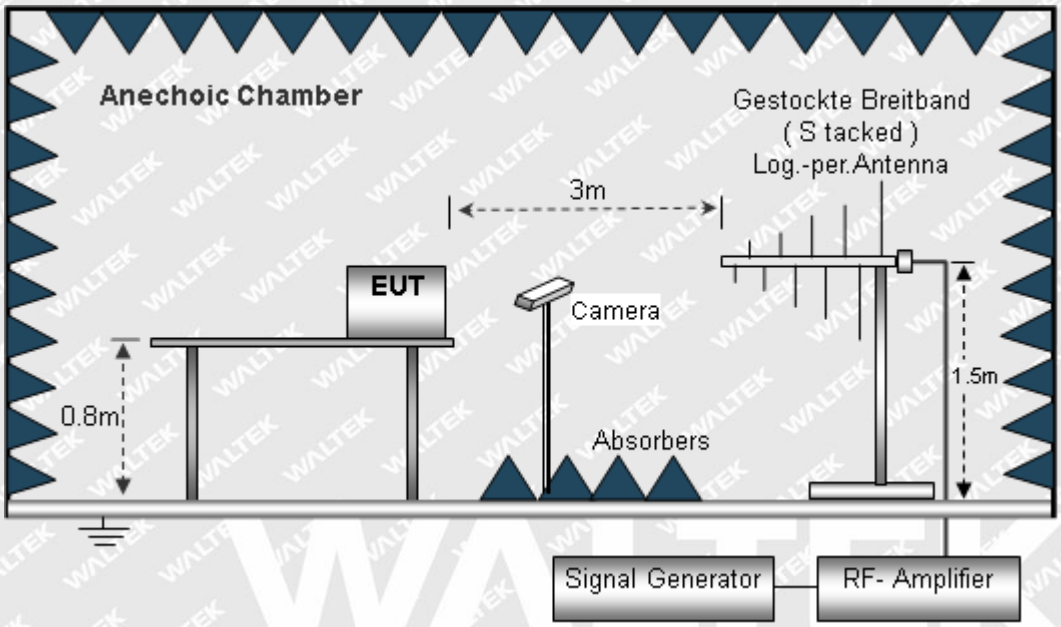
Test Result: Pass

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-TM3	A
Note:TM3 for CT,CR		

8.4 Environmental Conditions

Temperature:	22 °C
Relative Humidity:	53%
ATM Pressure:	1011 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-TM3							
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

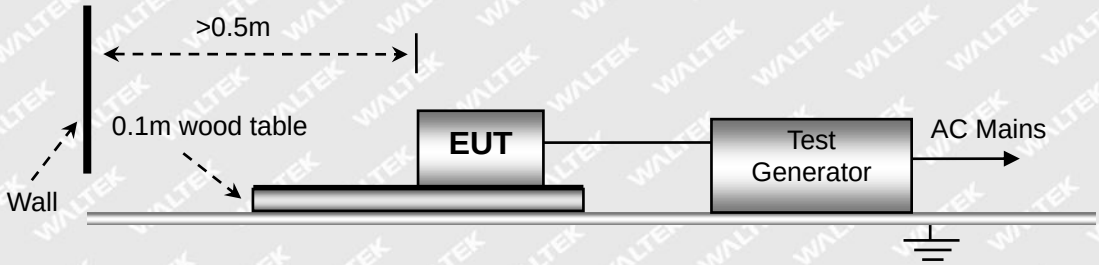
9. Fast Transients, Common Mode (EFT)

9.1 Test Procedure

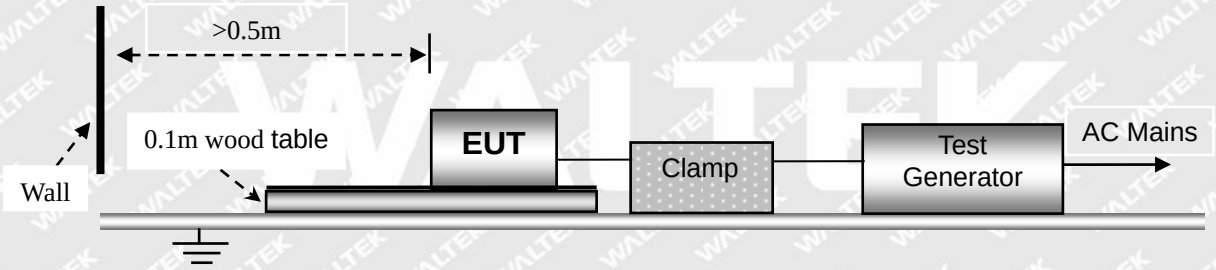
Test is conducting under the description of EN 61000-4-4.

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-TM3	B
Note:TM3 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-TM3							
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	A	A	A	A	/	/	/	/
	L-N	A	A	A	A	/	/	/	/
	L-PE	A	A	A	A	/	/	/	/
	N-PE	A	A	A	A	/	/	/	/
	L-N-PE	A	A	A	A	/	/	/	/
Signal ports	/	/	/	/	/	/	/	/	/

Test Result: Pass

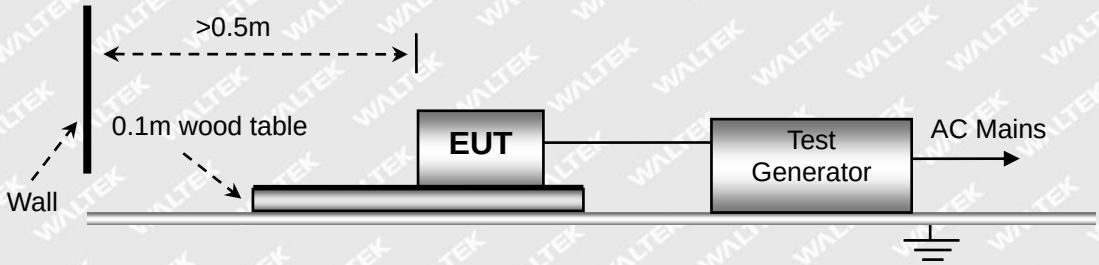
10. Surges

10.1 Test Procedure

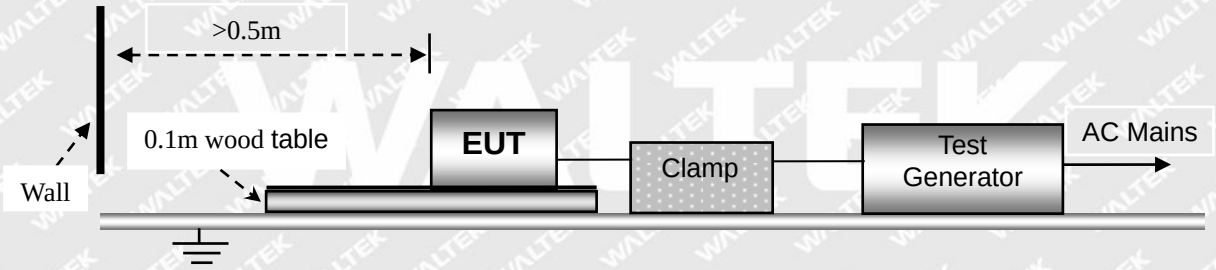
Test is conducting under the description of EN 61000-4-5.

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-TM3	B
Note:TM3 for TT,TR		

10.4 Environmental Conditions

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

10.5 Surge Test Data

Test Mode	TM1-TM3			
Voltage	**Poll**	**Path**	**Pass**	**Fail**
0.5kV	±	L-N	/	/
1kV	±	L-N	A	/
2kV	±	L-N, L-PE, N-PE	A	/
4kV	±	L-N, L-PE, N-PE	/	/

Test Result: Pass

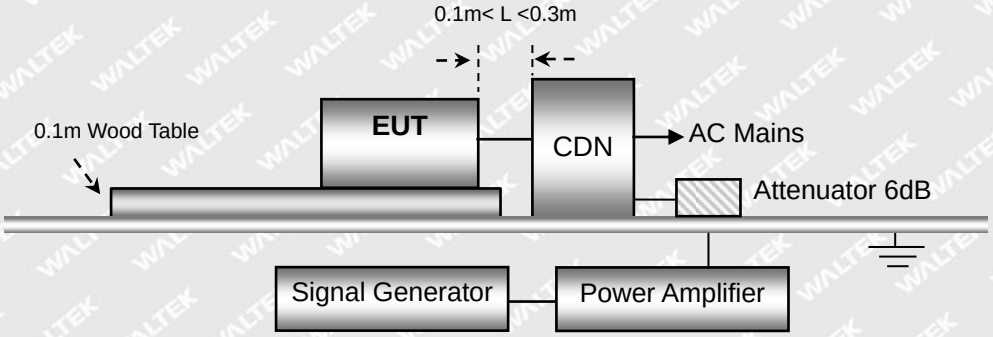
11. Radio Frequency, Common Mode (C/S)

11.1 Test Procedure

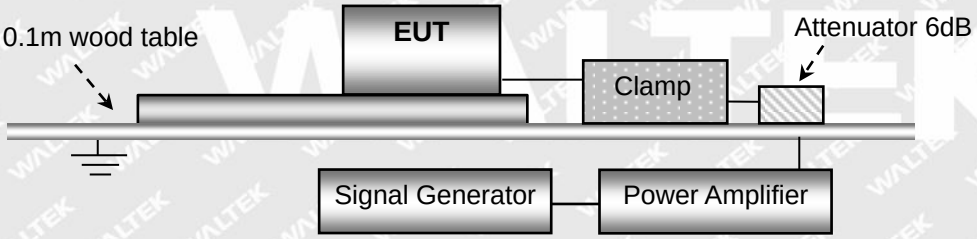
Test is conducting under the description of EN 61000-4-6.

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-TM3	A
Note:TM3 for CT,CR		

11.4 Environmental Conditions

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

11.5 Continuous Conducted Disturbances Test Data

Sweep frequency range: 150kHz~80MHz

Frequency step: 1% of fundamental

Dwell time: 1 second

Test Mode		TM1-TM3		
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	/	/	/

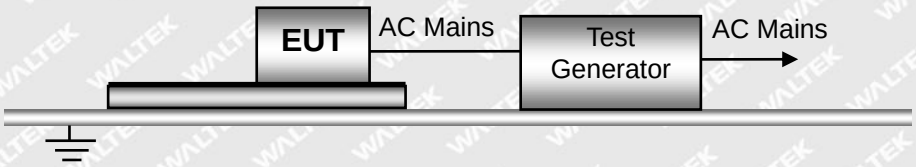
Test Result: Pass

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-TM3	B for voltage dip/ C for voltage interruption
Note:TM3 for TT,TR		

12.4 Environmental Conditions

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

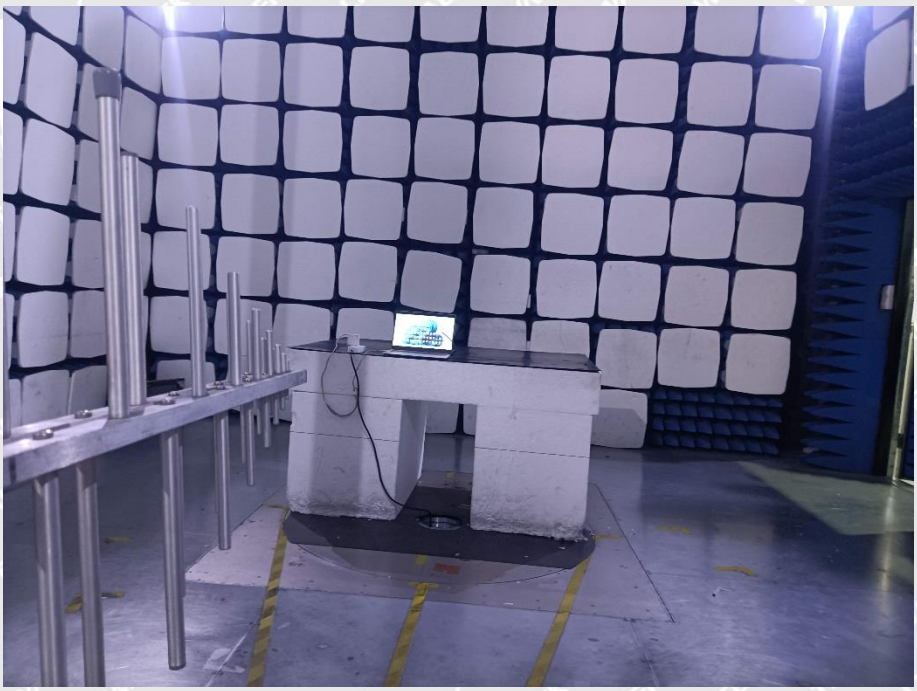
Level	U	T	Phase Angle	N	Pass	Fail
1	100%	10ms	0/90/180/270	3	A	/
2	100%	20ms	0/90/180/270	3	B	/
3	30%	500ms	0/90/180/270	3	B	/
4	100%	5000ms	0/90/180/270	3	B	/

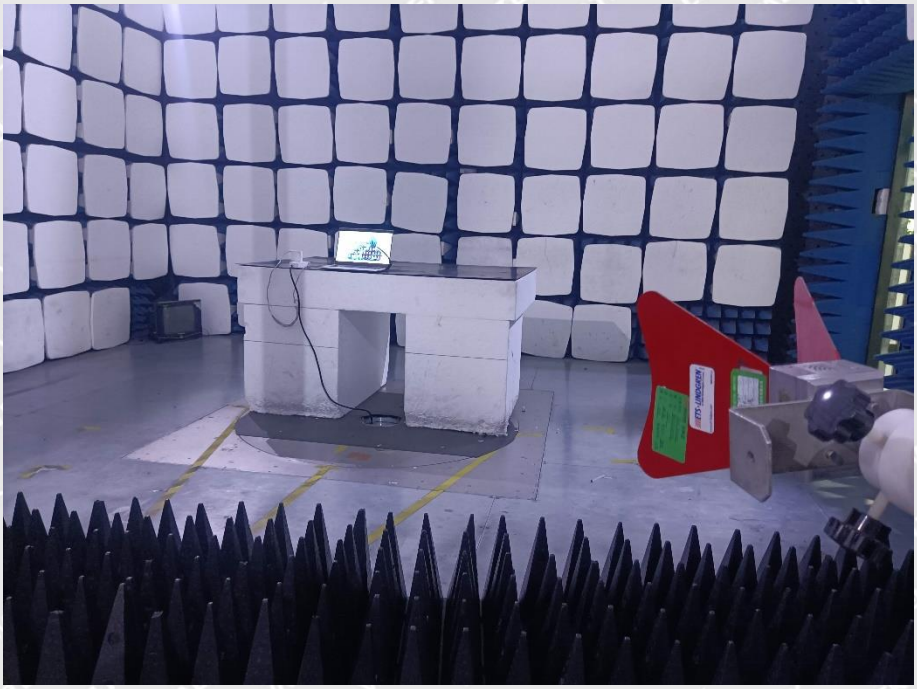
Test Result: Pass

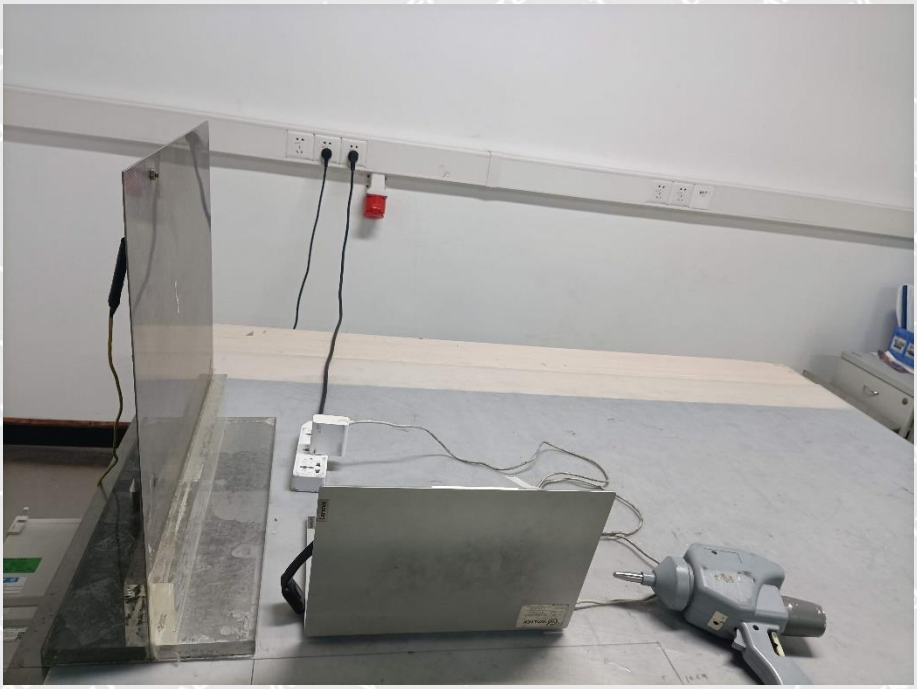
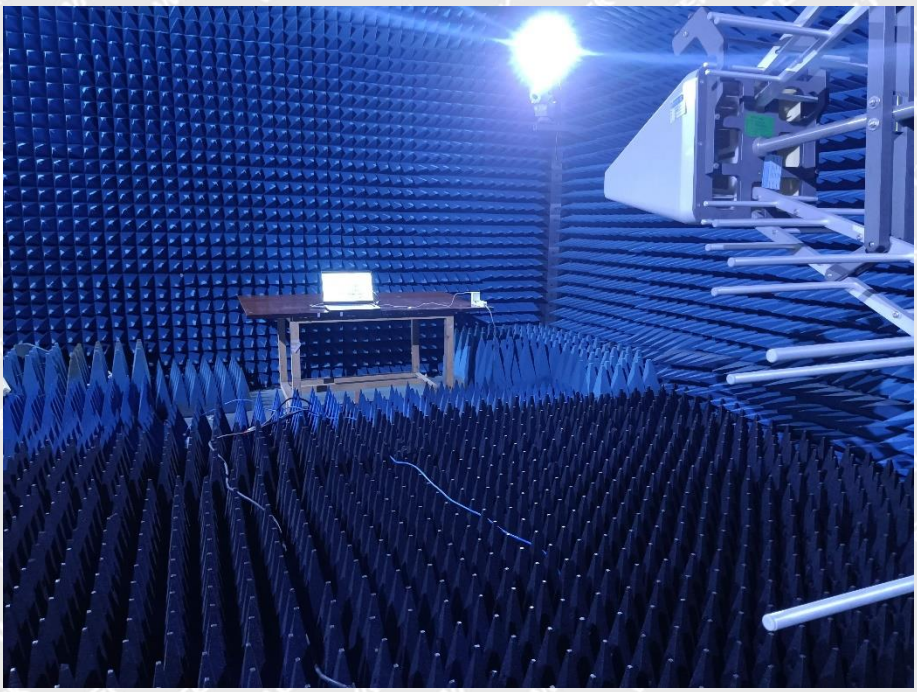
EXHIBIT 1 - EUT PHOTOGRAPHS

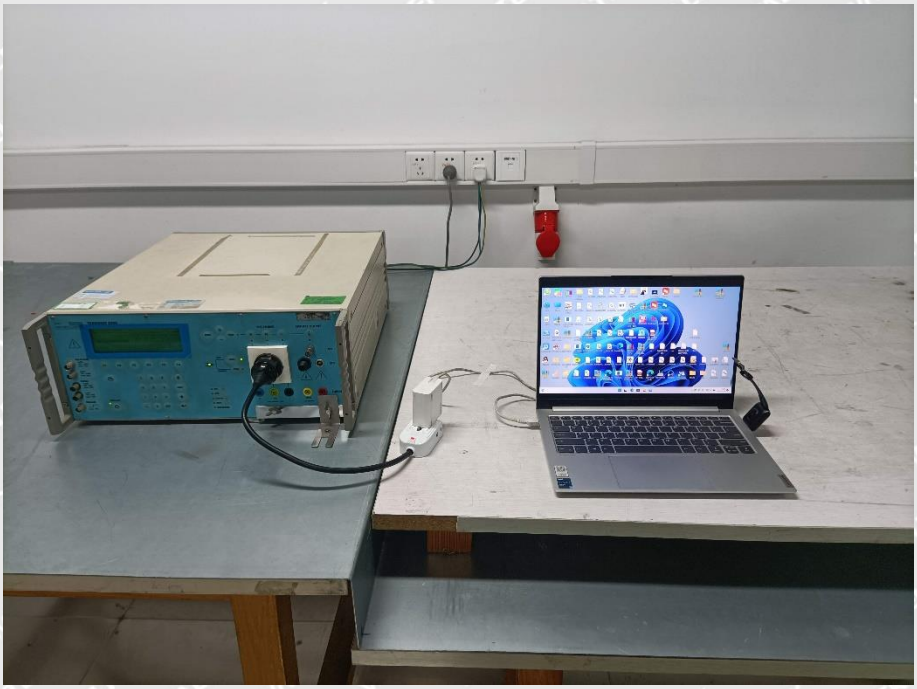
Please refer to “ANNEX”.

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 *******