

ETSI EN 301 489-1 V2.2.3 (2019-11)
ETSI EN 301 489-17 V3.3.1 (2024-09)

TEST REPORT

For

**XIAMEN HYSEN CONTROL TECHNOLOGY CO.,
LTD**

No.888 Yuan long Industrial Park,Haicang District,Xiamen,Fujian,China

Tested Model: HY531WE WIFI


Report Type: Original Report	Product Name: THERMOSTAT
Report Number:	2507A04674E-EM-02
Report Date:	2025-12-15
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REPORT REVISION HISTORY

Number of Revisions	Report No.	Version	Issue Date	Description
0	2507A04674E-EM-02	R1 V1	2025-12-15	Initial Release

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant:	XIAMEN HYSEN CONTROL TECHNOLOGY CO., LTD											
Applicant Address:	No.888 Yuan long Industrial Park,Haicang District,Xiamen,Fujian,China											
Manufacturer:	XIAMEN HYSEN CONTROL TECHNOLOGY CO., LTD											
Manufacturer Address:	No.888 Yuan long Industrial Park,Haicang District,Xiamen,Fujian,China											
Product Name:	THERMOSTAT											
Tested Model:	HY531WE WIFI											
Multiple Model(s):	HY531, HY531WW WIFI, HY531LD WIFI, HY531AC WIFI, HY531WE, HY531WW, HY531LD, HY531AC, HY131, HY131WE WIFI, HY131WW WIFI, HY131LD WIFI, HY131AC WIFI, HY131WE, HY131WW, HY131LD, HY131AC											
Trade Mark:	N/A											
Power Supply:	AC 90-240V, 50/60Hz, 16A, 3520W											
★Highest Operating Frequency:	2480 MHz											
EUT Received Status:	Good											
<i>Note:</i> 1. The highest operating frequency is provided by the applicant. 2. The test model is identify with the series model as below:												
<table><tr><th>Tested Model</th><th>Series Models</th><th>Differences Items</th><th>Others</th></tr><tr><td rowspan="2">HY531WE WIFI</td><td>HY531, HY531WW WIFI, HY531LD WIFI, HY531AC WIFI, HY531WE, HY531WW, HY531LD, HY531AC</td><td>Model name</td><td>All are the same except model name. (Each model comes in two colors: black and white.)</td></tr><tr><td>HY131WE WIFI, HY131, HY131WW WIFI, HY131LD WIFI, HY131AC WIFI, HY131WE, HY131WW, HY131LD, HY131AC</td><td>Model name and Appearance</td><td>All are the same except model name and appearance (The appearance widths of the products vary). Each models is available in black and white.</td></tr></table>		Tested Model	Series Models	Differences Items	Others	HY531WE WIFI	HY531, HY531WW WIFI, HY531LD WIFI, HY531AC WIFI, HY531WE, HY531WW, HY531LD, HY531AC	Model name	All are the same except model name. (Each model comes in two colors: black and white.)	HY131WE WIFI, HY131, HY131WW WIFI, HY131LD WIFI, HY131AC WIFI, HY131WE, HY131WW, HY131LD, HY131AC	Model name and Appearance	All are the same except model name and appearance (The appearance widths of the products vary). Each models is available in black and white.
Tested Model	Series Models	Differences Items	Others									
HY531WE WIFI	HY531, HY531WW WIFI, HY531LD WIFI, HY531AC WIFI, HY531WE, HY531WW, HY531LD, HY531AC	Model name	All are the same except model name. (Each model comes in two colors: black and white.)									
	HY131WE WIFI, HY131, HY131WW WIFI, HY131LD WIFI, HY131AC WIFI, HY131WE, HY131WW, HY131LD, HY131AC	Model name and Appearance	All are the same except model name and appearance (The appearance widths of the products vary). Each models is available in black and white.									
Based on the description above, the appearance differences do not affect the test results. Therefore, model HY531WE WIFI has been selected for testing.												
3. All measurement and test data in this report was gathered from production sample serial number: 3DU1-1 (Assigned by the BACL (Fujian). The EUT supplied by the applicant was received on 2025-12-02).												

Objective

This report is prepared for XIAMEN HYSEN CONTROL TECHNOLOGY CO., LTD in accordance with

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 301 489-17 V3.3.1 (2024-09) ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband and Wideband Data Transmission Systems; Harmonised Standard for ElectroMagnetic Compatibility;

The objective is to determine the compliance of EUT with: ETSI EN 301 489-1 V2.2.3 (2019-11) and ETSI EN 301 489-17 V3.3.1 (2024-09)

Test Methodology

All measurements contained in this report were conducted with 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.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Fujian) to collect test data is located on the Unit 302, No. 902, Meifeng South Road, Tong'an District, Xiamen City.

Measurement Uncertainty

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

If U_{lab} is less than or equal to U_{cispr} , then compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit.

$$u_c(y) = \sqrt{\sum_i c_i^2 u^2(x_i)}$$

Item	Frequency Range	U_{cispr}	$U_{lab} = 2 u_c(y)$ (Confidence of 95%)
Conducted emissions	150kHz-30MHz	3.44 dB	2.45 dB
Radiated emissions	30MHz~200MHz	5.06 dB	3.47 dB
	200MHz~1GHz	5.12 dB	4.86 dB
	1GHz~6GHz	5.18 dB	4.88 dB

SYSTEM TEST CONFIGURATION

Test Mode and Voltage

The system was configured for testing in a typical mode (as normally used by a typical user).	
Test mode:	Test Mode 1: Operation + WIFI Link
Test voltage:	AC 230V/50Hz

EUT Exercise Software

No exercise software was used to test.

Special Accessories

No Special accessories was used to test.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Unknown	Load	Unknown	Unknown
Apple	Mobile phone	iphone 13	Unknown

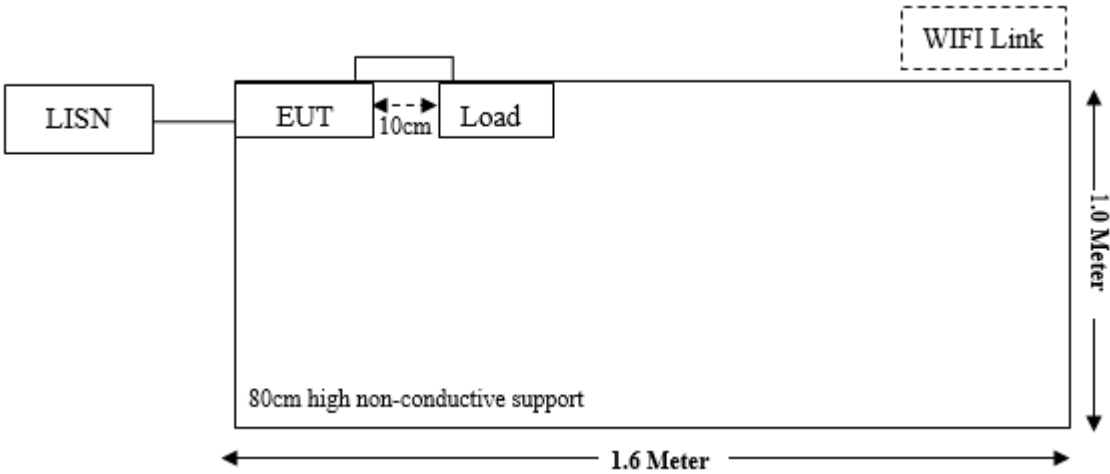
External I/O Cable

Cable Description	Length (m)	From Port	To Port
Power cable	0.5	EUT	Load

Block Diagram of Test Setup

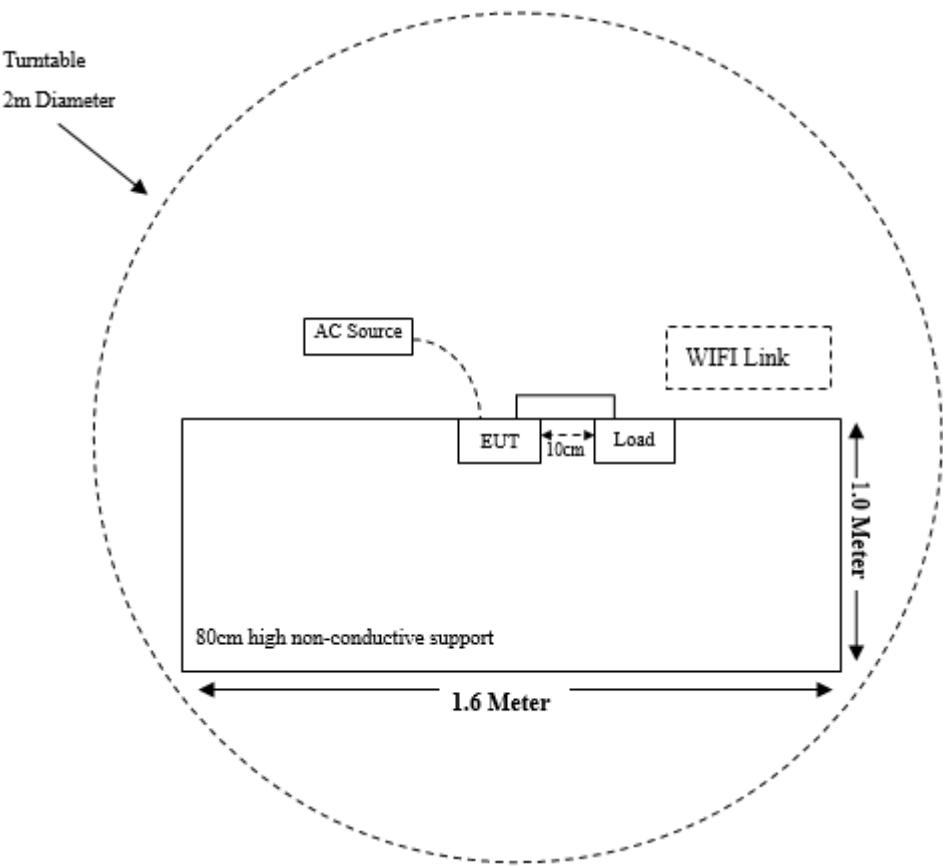
Conducted Emission:

Test Mode 1:



Radiated Emissions:

Test Mode 1:



SUMMARY OF TEST RESULTS

Clause	Description	Results
ETSI EN 301 489-1 Clause 8.2	Radiated emission (Enclosure port of ancillary equipment) (30 MHz-1 GHz)	Compliant
ETSI EN 301 489-1 Clause 8.2	Radiated emission (Enclosure port of ancillary equipment) (1 GHz - 6 GHz)	Compliant
ETSI EN 301 489-1 Clause 8.3	DC power input/output ports	Not Applicable (See Note 1)
ETSI EN 301 489-1 Clause 8.4	AC mains power input/output ports	Compliant
ETSI EN 301 489-1 Clause 8.5	Harmonic current emissions (AC mains input port)	Compliant
ETSI EN 301 489-1 Clause 8.6	Voltage fluctuations and flicker (AC mains input port)	Compliant
ETSI EN 301 489-1 Clause 8.7	Wired network ports	Not Applicable (See Note 2)
ETSI EN 301 489-1 Clause 9.2	Radio frequency electromagnetic fields (80 MHz to 6 000 MHz)	Compliant
ETSI EN 301 489-1 Clause 9.3	Electrostatic discharges	Compliant
ETSI EN 301 489-1 Clause 9.4	Fast transients, common mode	Compliant
ETSI EN 301 489-1 Clause 9.5	Radio frequency, common mode	Compliant
ETSI EN 301 489-1 Clause 9.6	Transients and surges in the vehicular environment	Not Applicable (See Note 3)
ETSI EN 301 489-1 Clause 9.7	Voltage dips and short interruptions	Compliant
ETSI EN 301 489-1 Clause 9.8	Surges	Compliant

Note:

1. Please refer to Applicability overview tables in sections 7.1 of ETSI EN 301 489-1 requirements for Radio and ancillary equipment.
2. The item applies only to equipment which have wired network ports.
3. This equipment will not be used in vehicular environment.

Immunity test performance criteria refer to ETSI EN 301 489-1 §7.2 & ETSI EN 301 489-17 §7.2.

TEST EQUIPMENT LIST

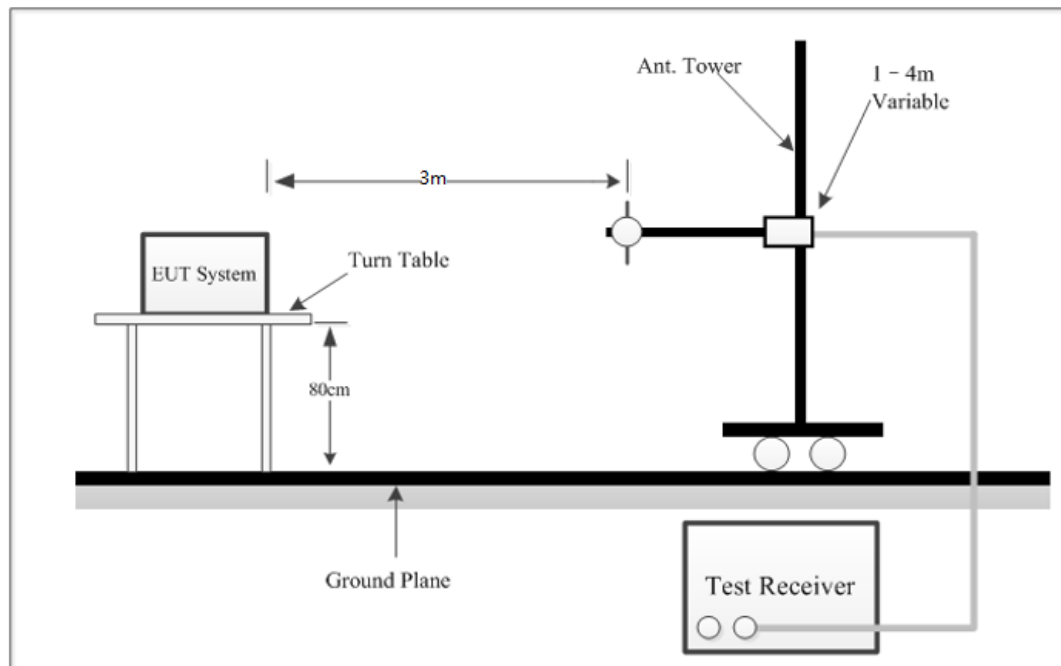
Test Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions					
EMI Test Receiver	Rohde & Schwarz	ESR	103105	2025/02/20	2026/02/19
LISN	Rohde & Schwarz	ENV216	100129	2025/02/20	2026/02/19
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	0357.8810.54	2025/02/20	2026/02/19
Coaxial Cable	XINHANGWEIBO	XH400T-N-4M	CC001	2025/02/20	2026/02/19
Test Software	Audix	E3	18621a	N/A	N/A
Radiated Emissions 30 MHz to 1 GHz					
EMI Test Receiver	Rohde & Schwarz	ESR	103103	2025/02/20	2026/02/19
Antenna	Sunol Sciences	JB6	A122022-5	2023/07/27	2026/07/26
Amplifier	Sonoma	310B	120903	2025/02/20	2026/02/19
Coaxial Cable	XINHANGWEIBO	XH400T-N-4M	CC002	2025/02/20	2026/02/19
Coaxial Cable	XINHANGWEIBO	XH460B-N-2M	CC006	2025/02/20	2026/02/19
Coaxial Cable	XINHANGWEIBO	XH460B-N-12M	CC007	2025/02/20	2026/02/19
Test Software	Audix	E3	18621a	N/A	N/A
Radiated Emissions Above 1 GHz					
Spectrum Analyzer	Rohde & Schwarz	FSU	100405	2025/02/20	2026/02/19
Horn Aantenna	EMCO	3115	9002-3355	2024/11/19	2027/11/18
Preamplifier	GLOBAL	1313-A100M18G	4121301	2025/01/16	2026/01/15
Coaxial Cable	XINHANGWEIBO	XH800A-N-6M	CC003	2025/02/20	2026/02/19
Coaxial Cable	XINHANGWEIBO	XH800A-N-1M	CC005	2025/02/20	2026/02/19
Test Software	Audix	E3	18621a	N/A	N/A
Harmonic & Flicker					
Harmonic & Flicker Analyzer	TESEQ	CCN1000-1	72676	2025/02/20	2026/02/19
Harmonic & Flicker power source	TESEQ	NSG1007	58835	2025/02/20	2026/02/19
Test Software	California Instrument	CTS4	V 4.29.0	N/A	N/A
Electrostatic discharge (ESD)					
ESD Simulator	TESEQ	NSG 438	724	2025/02/20	2026/02/19
Test Software	TESEQ	Pistol	V 01.00	N/A	N/A
Radio frequency, common mode					
CS Test System	EMTEST	CWS 500N	P1409132219	2025/02/20	2026/02/19
CDN	ETEST	ES-CDN-M2	231119	2025/02/20	2026/02/19
Attenuator	EMTEST	ATT6-75	1012-72	2025/09/08	2026/09/07
Test Software	EMTEST	icd. control	V 5.2.9	N/A	N/A

Test Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Radio Frequency Electromagnetic Fields					
Log Periodic Antenna	Amplifier Research	ATL80M1G	583474	N/A	N/A
Double Ridge Guide Horn Antenna	ARA	DRG-118/A	1057	N/A	N/A
RF Power Amplifier	Amplifier Research	150W1000MS	303367	2025/02/20	2026/02/19
RF Power Amplifier	Amplifier Research	50S1G6	0423141	2025/02/20	2026/02/19
High Power Directional Coupler	WERLATONE	06934	11947	2025/02/20	2026/02/19
Dual Directional Coupler	WERLATONE	C10526-10	129975	2025/02/20	2026/02/19
Microwave Analog Signal Generator	Agilent	N5181A	MY48180319	2025/02/20	2026/02/19
Power meter	Agilent	E4419B	MY45100315	2025/02/20	2026/02/19
Power Sensor	Agilent	E9301A	MY52010003	2025/02/20	2026/02/19
Power Sensor	Agilent	E9301A	MY54200004	2025/02/20	2026/02/19
Test Software	BACL	VEE PRO	V 2.7.6	N/A	N/A
Electrical fast transients/burst & Surges & Voltage dips and interruptions					
Voltage Regulator	EMTEST	MV2616	V0834104173	2025/02/20	2026/02/19
Communication surge generator	EMTEST	Tsurge 6.1	V0834104174	2025/02/20	2026/02/19
Anti-interference signal simulator	EMTEST	UCS500N6	V0834104170	2025/02/20	2026/02/19
Test Software	EMTEST	iec. control	V 5.0.9.0	N/A	N/A

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Fujian) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

RADIATED EMISSION (ENCLOSURE PORT OF ANCILLARY EQUIPMENT) (30 MHz-1 GHz)

Test System Setup



Radiated Top View:

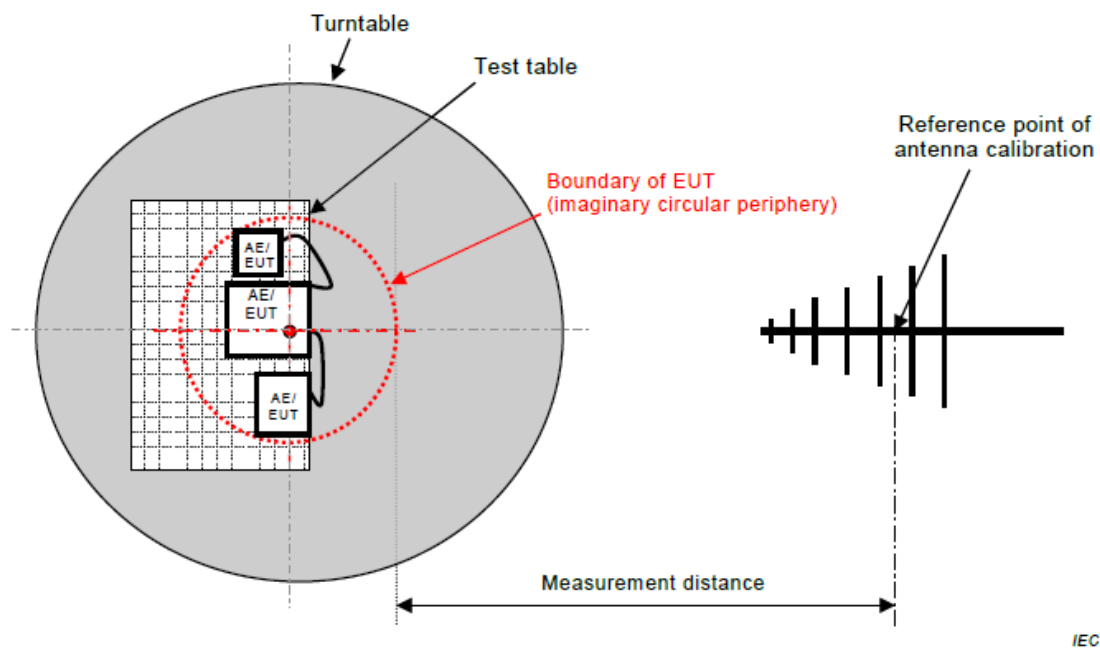


Figure C.1 – Measurement distance

The radiated emission tests were performed in the 3 meters, using the setup accordance with the ETSI EN 301 489-1 V2.2.3 (2019-11). The specification used was the ETSI EN 301 489-1 V2.2.3 (2019-11) limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 1 GHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	VBW	Measurement	Detector
30MHz – 1000 MHz	100 kHz	300 kHz	PK	PK
	120 kHz	/	QP	QP

Test Procedure

Maximizing procedure was performed on the six (6) highest emissions to ensure that the EUT complied with all installation combinations.

If the measured peak level of the emissions that the measuring receiver reading level plus corrected factor is at least 10 dB below the QP emission limit, there's no need to record the measured QP level of the emissions in the report.

Result &Margin Calculation

The Result is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) - Amplifier Gain (dB)

Result (dB μ V/m) = Reading (dB μ V) + Factor (dB/m)

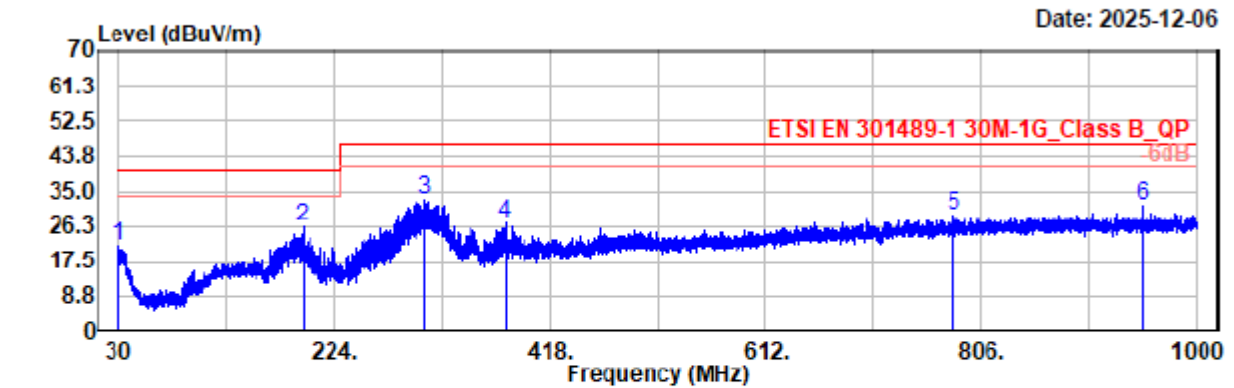
The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin (dB) = Limit (dB μ V/m) – Result (dB μ V/m)

Test Data

Project No.: 2507A04674E-EM
Test Mode: Mode1
EUT Model: HY531WE WIFI
Test distance: 3m

Temp/Humi/ATM: 20.1°C/50%/100.1kPa
Tested by: Zane Zhang
Power Source: AC 230V/50Hz

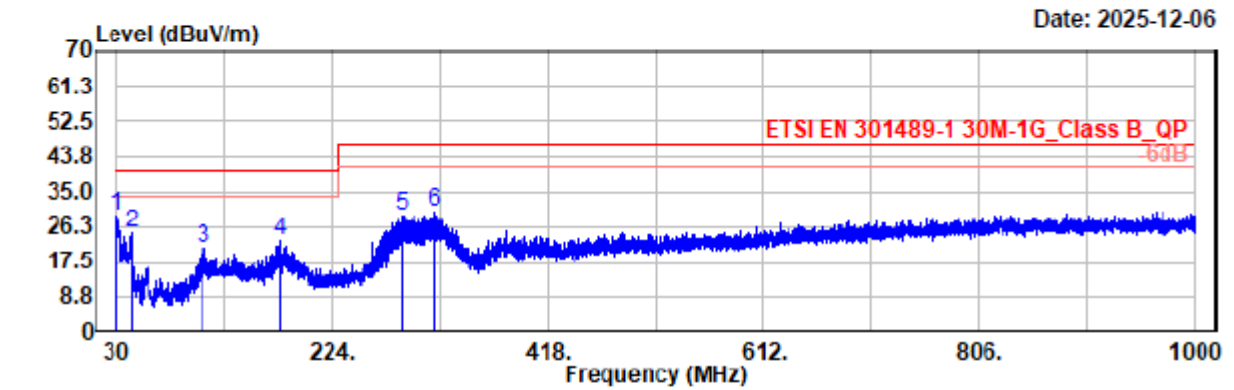


Condition: PK RBW:100kHz VBW:300kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
30.29	26.68	-5.68	21.00	40.00	19.00	Horizontal	Peak
195.58	37.88	-11.95	25.93	40.00	14.07	Horizontal	Peak
305.09	41.89	-9.14	32.75	47.00	14.25	Horizontal	Peak
377.84	34.31	-7.17	27.14	47.00	19.86	Horizontal	Peak
780.78	27.70	1.08	28.78	47.00	18.22	Horizontal	Peak
951.60	28.40	3.18	31.58	47.00	15.42	Horizontal	Peak

Project No.: 2507A04674E-EM
Test Mode: Mode1
EUT Model: HY531WE WIFI
Test distance: 3m

Temp/Humi/ATM: 20.1°C/50%/100.1kPa
Tested by: Zane Zhang
Power Source: AC 230V/50Hz

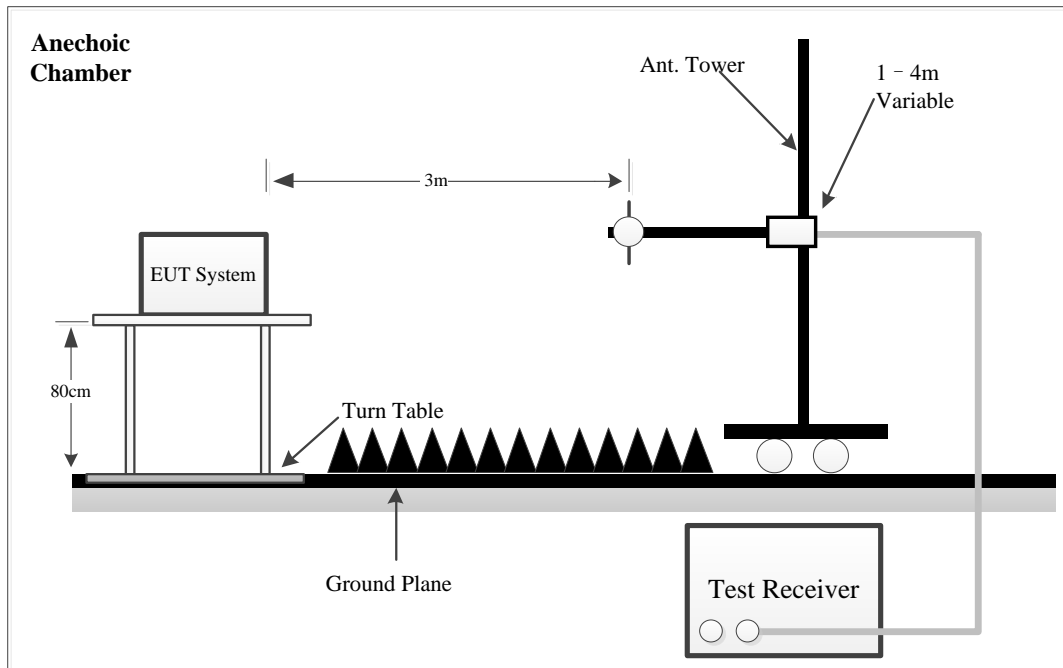


Condition: PK RBW:100kHz VBW:300kHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
30.49	34.59	-5.73	28.86	40.00	11.14	Vertical	Peak
43.10	38.62	-13.97	24.65	40.00	15.35	Vertical	Peak
107.70	33.45	-12.51	20.94	40.00	19.06	Vertical	Peak
176.76	35.05	-12.18	22.87	40.00	17.13	Vertical	Peak
286.37	38.27	-9.26	29.01	47.00	17.99	Vertical	Peak
315.57	38.65	-8.88	29.77	47.00	17.23	Vertical	Peak

RADIATED EMISSION (ENCLOSURE PORT OF ANCILLARY EQUIPMENT) (Above 1 GHz)

Test System Setup



The radiated emission tests were performed in the 3 meters, using the setup accordance with the ETSI EN 301 489-1 V2.2.3 (2019-11). The specification used was the ETSI EN 301 489-1 V2.2.3 (2019-11) limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The system was investigated above 1 GHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	VBW	Measurement	Detector
Above 1 GHz	1 MHz	3 MHz	PK	PK
	1 MHz	10 Hz	AV	PK

Test Procedure

Maximizing procedure was performed on the six (6) highest emissions to ensure that the EUT complied with all installation combinations.

If the maximum peak value of the emissions is below the average limit, the average value measurement will not need to be performed and only record the maximum peak measured value to meet the requirements.

Result & Margin Calculation

The Result is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Factor (dB/m)} = \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Amplifier Gain (dB)}$$

$$\text{Result (dB}\mu\text{V/m)} = \text{Reading (dB}\mu\text{V)} + \text{Factor (dB/m)}$$

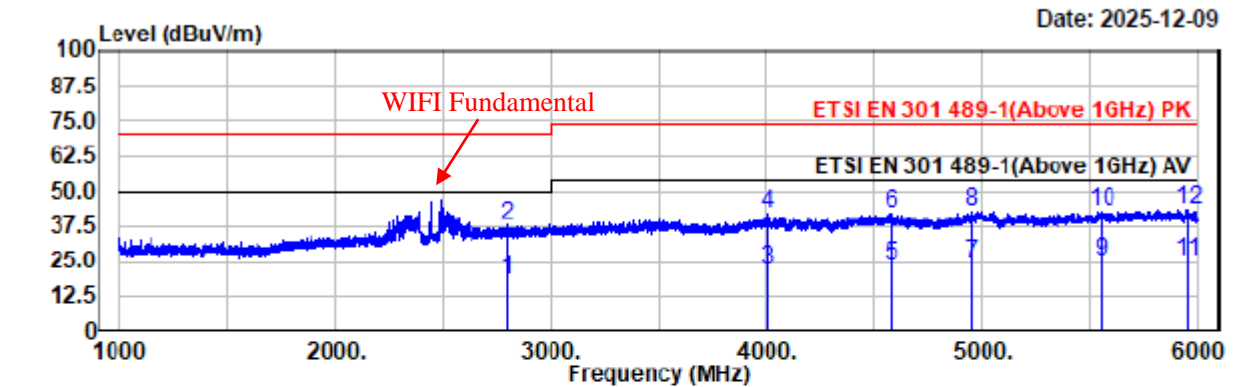
The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin (dB)} = \text{Limit (dB}\mu\text{V/m)} - \text{Result (dB}\mu\text{V/m)}$$

Test Data

Project No.: 2507A04674E-EM
Test Mode: Mode1
EUT Model: HY531WE WIFI
Test distance: 3m

Temp/Humi/ATM: 19.8°C/48%/100.1kPa
Tested by: Zane Zhang
Power Source: AC 230V/50Hz

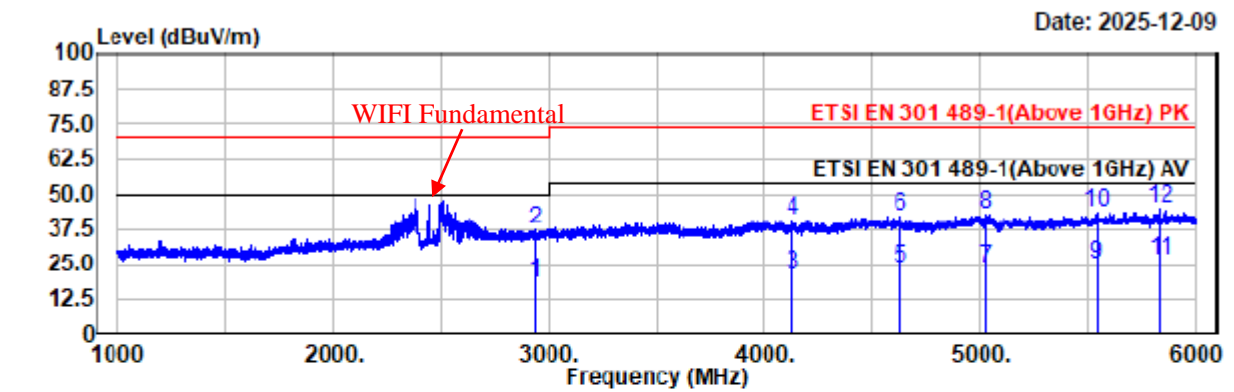


Condition: PK RBW:1MHz VBW:3MHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
2799.50	28.33	-9.79	18.54	50.00	31.46	horizontal	Average
2799.50	47.56	-9.79	37.77	70.00	32.23	horizontal	Peak
4006.50	28.89	-6.49	22.40	54.00	31.60	horizontal	Average
4006.50	48.46	-6.49	41.97	74.00	32.03	horizontal	Peak
4579.50	28.49	-5.28	23.21	54.00	30.79	horizontal	Average
4579.50	47.56	-5.28	42.28	74.00	31.72	horizontal	Peak
4956.00	29.11	-5.13	23.98	54.00	30.02	horizontal	Average
4956.00	48.04	-5.13	42.91	74.00	31.09	horizontal	Peak
5555.50	28.83	-4.19	24.64	54.00	29.36	horizontal	Average
5555.50	47.24	-4.19	43.05	74.00	30.95	horizontal	Peak
5955.00	28.01	-3.49	24.52	54.00	29.48	horizontal	Average
5955.00	47.04	-3.49	43.55	74.00	30.45	horizontal	Peak

Project No.: 2507A04674E-EM
Test Mode: Mode1
EUT Model: HY531WE WIFI
Test distance: 3m

Temp/Humi/ATM: 19.8°C/48%/100.1kPa
Tested by: Zane Zhang
Power Source: AC 230V/50Hz

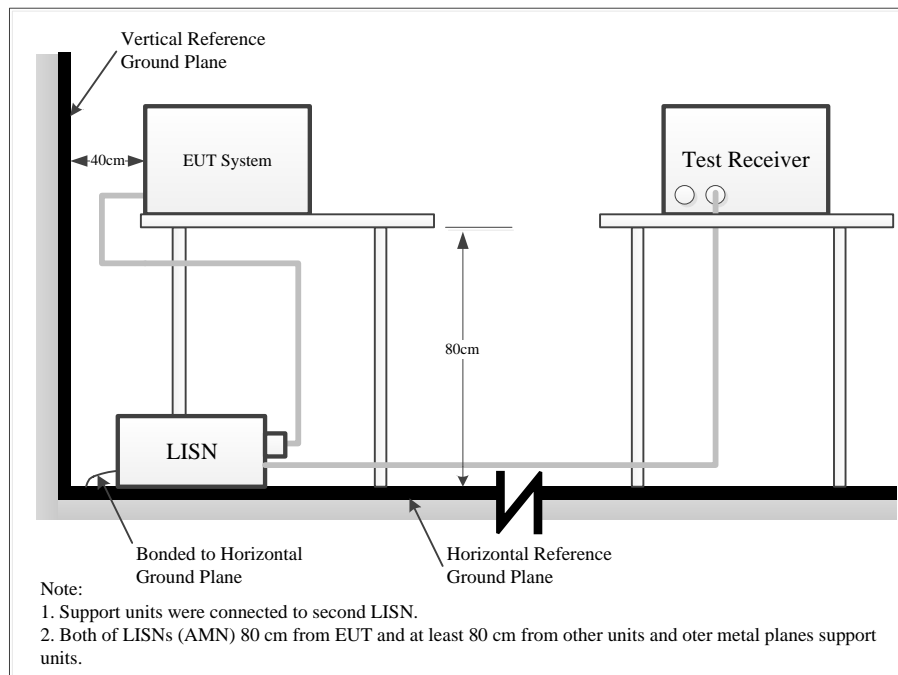


Condition: PK RBW:1MHz VBW:3MHz SWT:auto

Freq MHz	Reading dBuV	Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Polarity	Remark
2938.00	28.06	-9.29	18.77	50.00	31.23	vertical	Average
2938.00	46.60	-9.29	37.31	70.00	32.69	vertical	Peak
4132.00	27.12	-5.99	21.13	54.00	32.87	vertical	Average
4132.00	46.80	-5.99	40.81	74.00	33.19	vertical	Peak
4629.00	28.79	-5.24	23.55	54.00	30.45	vertical	Average
4629.00	47.28	-5.24	42.04	74.00	31.96	vertical	Peak
5028.50	28.57	-4.93	23.64	54.00	30.36	vertical	Average
5028.50	47.56	-4.93	42.63	74.00	31.37	vertical	Peak
5541.00	29.01	-4.23	24.78	54.00	29.22	vertical	Average
5541.00	47.78	-4.23	43.55	74.00	30.45	vertical	Peak
5833.00	29.62	-3.68	25.94	54.00	28.06	vertical	Average
5833.00	48.22	-3.68	44.54	74.00	29.46	vertical	Peak

CONDUCTED EMISSION (DC POWER INPUT/OUTPUT PORTS)

Test System Setup



The setup of EUT is according with per ETSI EN 301 489-1 measurement procedures. The specification used was with the ETSI EN 301 489-1 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle.

The spacing between the peripherals was 10cm.

The adapter was connected to AC 230V/50Hz power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz - 30 MHz	9 kHz

Test Procedure

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.

If the maximum peak value of the emissions is below the average limit, the QP value and average value measurement will not need to be performed and only record the maximum peak measured value to meet the requirements.

Result & Margin Calculation

The Result is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation from the Meter Reading. The basic equation is as follows:

$$\text{Factor (dB)} = \text{LISN VDF (dB)} + \text{Cable Loss (dB)} + \text{Transient Limiter Attenuation (dB)}$$
$$\text{Result (dB}\mu\text{V)} = \text{Reading (dB}\mu\text{V)} + \text{Factor (dB)}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin (dB)} = \text{Limit (dB}\mu\text{V)} - \text{Result (dB}\mu\text{V)}$$

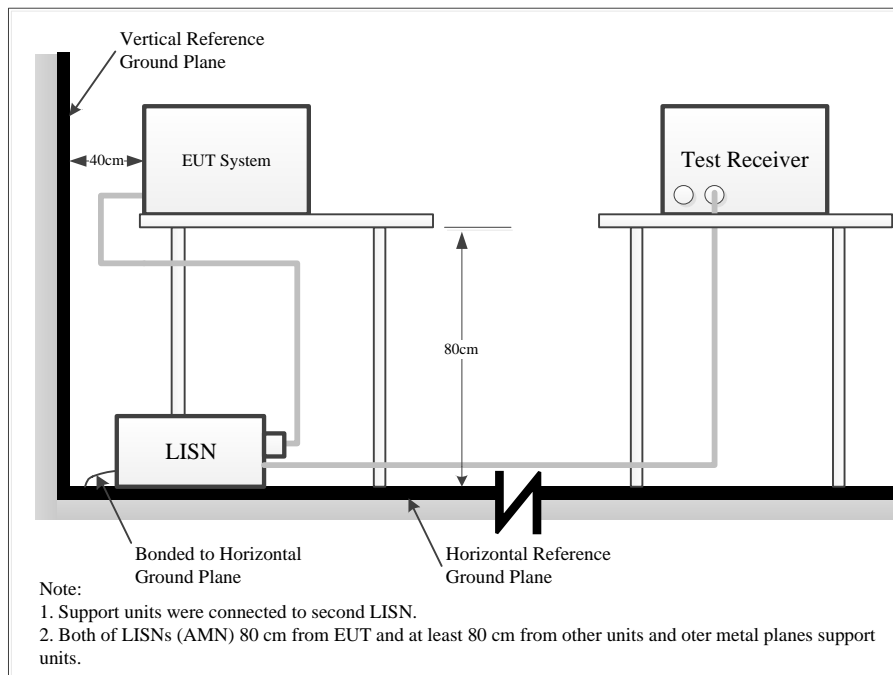
Test Data

Test Result: N/A

Note: Please refer to Applicability overview tables in sections 7.1 of ETSI EN 301 489-1 requirements for Radio and ancillary equipment.

CONDUCTED EMISSION (AC MAINS POWER INPUT/OUTPUT PORTS)

Test System Setup



The setup of EUT is according with per ETSI EN 301 489-1 measurement procedures. The specification used was with the ETSI EN 301 489-1 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle.

The spacing between the peripherals was 10cm.

The adapter was connected to AC 230V/50Hz power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz - 30 MHz	9 kHz

Test Procedure

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.

If the maximum peak value of the emissions is below the average limit, the QP value and average value measurement will not need to be performed and only record the maximum peak measured value to meet the requirements.

Result &Margin Calculation

The Result is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation from the Meter Reading. The basic equation is as follows:

$$\text{Factor (dB)} = \text{LISN VDF (dB)} + \text{Cable Loss (dB)} + \text{Transient Limiter Attenuation (dB)}$$
$$\text{Result (dB}\mu\text{V)} = \text{Reading (dB}\mu\text{V)} + \text{Factor (dB)}$$

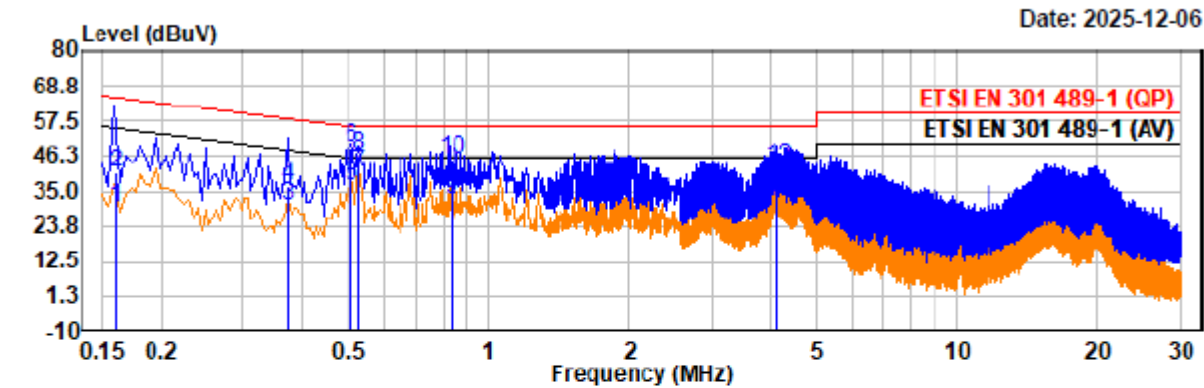
The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin (dB)} = \text{Limit (dB}\mu\text{V)} - \text{Result (dB}\mu\text{V)}$$

Test Data

Project No.: 2507A04674E-EM
Test Mode: Mode1
EUT Model: HY531WE WIFI

Temp/Humi/ATM: 24.2°C/41%/100.1kPa
Tested by: Spike Gao
Power Source: AC 230V/50Hz



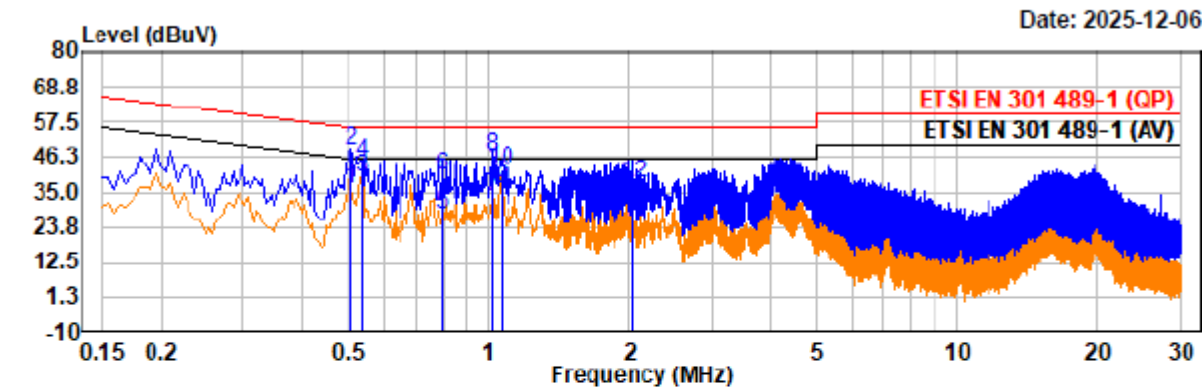
Trace: 1

Condition: IF B/W 9kHz PK/AV

Freq MHz	Reading dBuV	Factor dB	Result dBuV	Limit dBuV	Margin dB	Phase	Remark
0.160	9.51	20.27	29.78	55.47	25.69	Line	Average
0.160	20.64	20.27	40.91	65.47	24.56	Line	QP
0.373	10.35	20.18	30.53	48.43	17.90	Line	Average
0.373	16.44	20.18	36.62	58.43	21.81	Line	QP
0.509	16.45	20.11	36.56	46.00	9.44	Line	Average
0.509	28.58	20.11	48.69	56.00	7.31	Line	QP
0.528	20.99	20.12	41.11	46.00	4.89	Line	Average
0.528	26.49	20.12	46.61	56.00	9.39	Line	QP
0.837	12.33	20.17	32.50	46.00	13.50	Line	Average
0.837	25.02	20.17	45.19	56.00	10.81	Line	QP
4.146	11.60	20.01	31.61	46.00	14.39	Line	Average
4.146	22.91	20.01	42.92	56.00	13.08	Line	QP

Project No.: 2507A04674E-EM
Test Mode: Model
EUT Model: HY531WE WIFI

Temp/Humi/ATM: 24.2°C/41%/100.1kPa
Tested by: Spike Gao
Power Source: AC 230V/50Hz



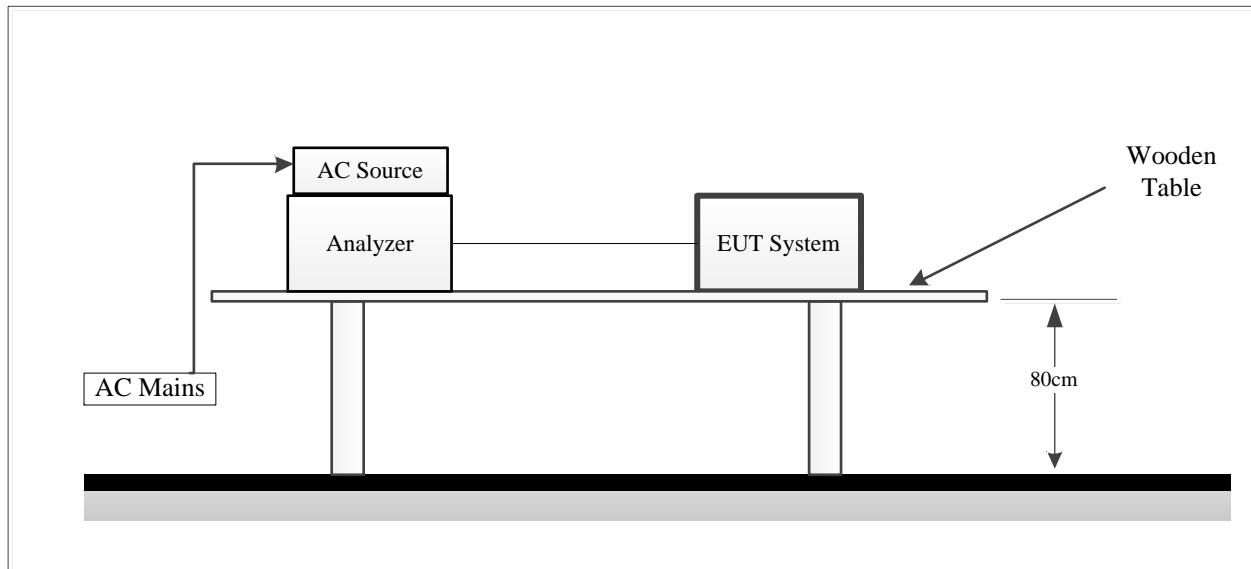
Trace: 1

Condition: IF B/W 9kHz PK/AV

Freq MHz	Reading dBuV	Factor dB	Result dBuV	Limit dBuV	Margin dB	Phase	Remark
0.509	15.94	20.16	36.10	46.00	9.90	Neutral	Average
0.509	28.28	20.16	48.44	56.00	7.56	Neutral	QP
0.537	19.52	20.16	39.68	46.00	6.32	Neutral	Average
0.537	24.52	20.16	44.68	56.00	11.32	Neutral	QP
0.797	7.54	20.13	27.67	46.00	18.33	Neutral	Average
0.797	20.19	20.13	40.32	56.00	15.68	Neutral	QP
1.017	13.03	20.11	33.14	46.00	12.86	Neutral	Average
1.017	26.13	20.11	46.24	56.00	9.76	Neutral	QP
1.062	16.05	20.11	36.16	46.00	9.84	Neutral	Average
1.062	22.18	20.11	42.29	56.00	13.71	Neutral	QP
2.040	5.37	20.10	25.47	46.00	20.53	Neutral	Average
2.040	17.54	20.10	37.64	56.00	18.36	Neutral	QP

HARMONIC CURRENT EMISSIONS(AC MAINS INPUT PORT)

Test System Setup



Test Standard

EN IEC 61000-3-2:2019+A2:2024

Test product class

The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under Mode 1 conditions for each successive harmonic component in turn. The classification of EUT is according to section 5 of EN IEC 61000-3-2.

The EUT is classified as follows:

Class A:

Equipment not specified as belonging to Class B, C or D shall be considered as Class A equipment. Some examples of Class A equipment are:

- balanced three-phase equipment;
- household appliances, excluding those specified as belonging to Class B, C or D;
- vacuum cleaners;
- high pressure cleaners;
- tools, excluding portable tools;
- independent phase control dimmers;
- audio equipment;
- professional luminaires for stage lighting and studios.

Class B:

- Portable tools;
- Arc welding equipment which is not professional equipment.

Class C:

- Lighting equipment.

Class D:

Equipment having a specified power less than or equal to 600 W, of the following type:

- Personal computer and personal computer monitors;
- Television receivers;
- Refrigerators and freezers having one or more variable-speed drives to control compressor motor(s).

Application of limits

The harmonics of the input current shall not exceed the values given in Table 1.

Limits for Class A equipment:

Table 1 – Limits for Class A equipment

Harmonic order h	Maximum permissible harmonic current A
Odd harmonics	
3	2,30
5	1,14
7	0,77
9	0,40
11	0,33
13	0,21
$15 \leq h \leq 39$	$0,15 \frac{15}{h}$
Even harmonics	
2	1,08
4	0,43
6	0,30
$8 \leq h \leq 40$	$0,23 \frac{8}{h}$

Limits for Class B equipment:

For Class B equipment, the harmonics of the input current shall not exceed the values given in Table 1 multiplied by a factor of 1.5.

Limits for Class C equipment:

Rated power > 25 W

For luminaires with incandescent lamps and built-in phase control dimming having a rated power greater than 25 W, the harmonics of the input current shall not exceed the limits given in Table 1.

For any other lighting equipment having a rated power greater than 25 W, the harmonics of the input current shall not exceed the relative limits given in Table 2. For those types that include means for control (e.g. dimming, colour), the harmonics of the input current shall not exceed the harmonic current values derived from the percentage limits given in Table 2 for the maximum active input power (P_{max}) condition when tested in both following conditions:

– with the means for control set to obtain P_{max} ;
 – with the means for control set to the position expected to produce the maximum total harmonic current (THC) within the active input power range [P_{min} , P_{max}], where

- $P_{min} = 5 \text{ W}$, if $P_{max} \leq 50 \text{ W}$;
- $P_{min} = 10 \% \text{ of } P_{max}$, if $50 \text{ W} < P_{max} \leq 250 \text{ W}$;
- $P_{min} = 25 \text{ W}$, if $P_{max} > 250 \text{ W}$.

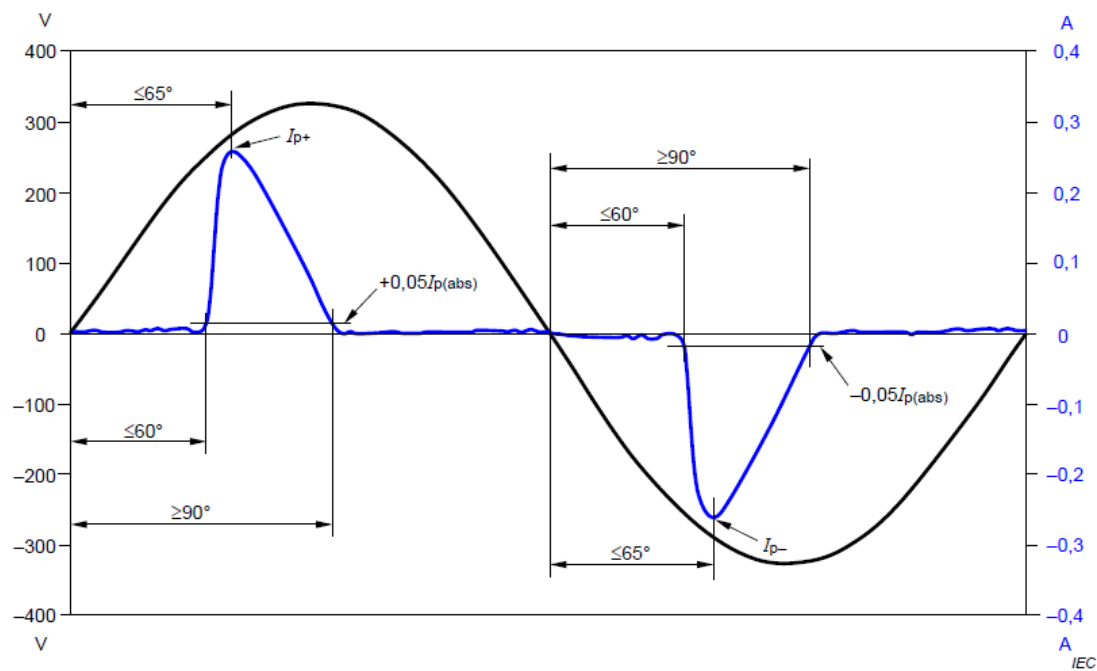
Table 2 – Limits for Class C equipment ^a

Harmonic order	Maximum permissible harmonic current expressed as a percentage of the input current at the fundamental frequency
<i>h</i>	%
2	2
3	27 ^b
5	10
7	7
9	5
11 ≤ <i>h</i> ≤ 39 (odd harmonics only)	3

^a For some Class C products, other emission limits apply (see 7.4).

^b The limit is determined based on the assumption of modern lighting technologies having power factors of 0,90 or higher.

Rated power ≥ 5 W and ≤ 25 W



NOTE $I_{p(abs)}$ is the higher absolute value of I_{p+} and I_{p-} .

Lighting equipment having a rated power greater than or equal to 5 W and less than or equal to 25 W shall comply with one of the following three sets of requirements:

- the harmonic currents shall not exceed the power-related limits of Table 3, column 2;
- the third harmonic current, expressed as a percentage of the fundamental current, shall not exceed 86 % and the fifth harmonic current shall not exceed 61 %. In addition, the waveform of the input current shall be such that it reaches the 5 % current threshold before or at 60°, has its peak value before or at 65° and does not fall below the 5 % current threshold before 90°, referenced to any zero crossing of the fundamental supply voltage. The current threshold is 5 % of the highest absolute peak value that occurs in the measurement window, and the phase angle measurements are made on the cycle that includes this absolute peak value (see Figure 2). Components of current with frequencies above 9 kHz shall not influence this evaluation (a filter similar to the one described in 5.3 of IEC 61000-4-7:2002 and IEC 61000-4-7:2002/AMD1:2008 may be used);
- the *THD* shall not exceed 70 %. The third order harmonic current, expressed as a percentage of the fundamental current, shall not exceed 35 %, the fifth order current shall not exceed 25 %, the seventh order current shall not exceed 30 %, the ninth and eleventh order currents shall not exceed 20 % and the second order current shall not exceed 5 %.

If the lighting equipment includes means for control (e.g. dimming, colour), or is specified to drive multiple loads, then the measurement is made only at the control setting and at the load of the light sources that gives the maximum active input power.

Limits for Class D equipment:

Table 3 – Limits for Class D equipment

Harmonic order h	Maximum permissible harmonic current per watt mA/W	Maximum permissible harmonic current A
3	3,4	2,30
5	1,9	1,14
7	1,0	0,77
9	0,5	0,40
11	0,35	0,33
$13 \leq h \leq 39$ (odd harmonics only)	$\frac{3,85}{h}$	See Table 1

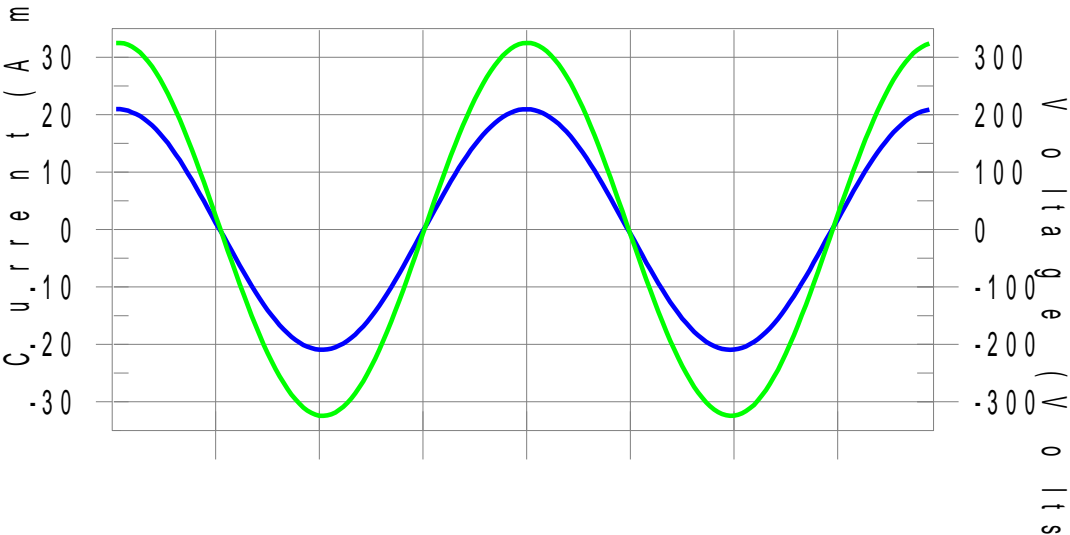
Test Data

Test Model:	HY531WE WIFI	Test Mode:	Mode 1
Test Engineer:	Toby Chen	Test Date:	2025-12-08
Test Voltage:	AC 230V/50Hz	Environment:	Temp.: 23.3°C Humi.: 51% Press.: 99.9kPa

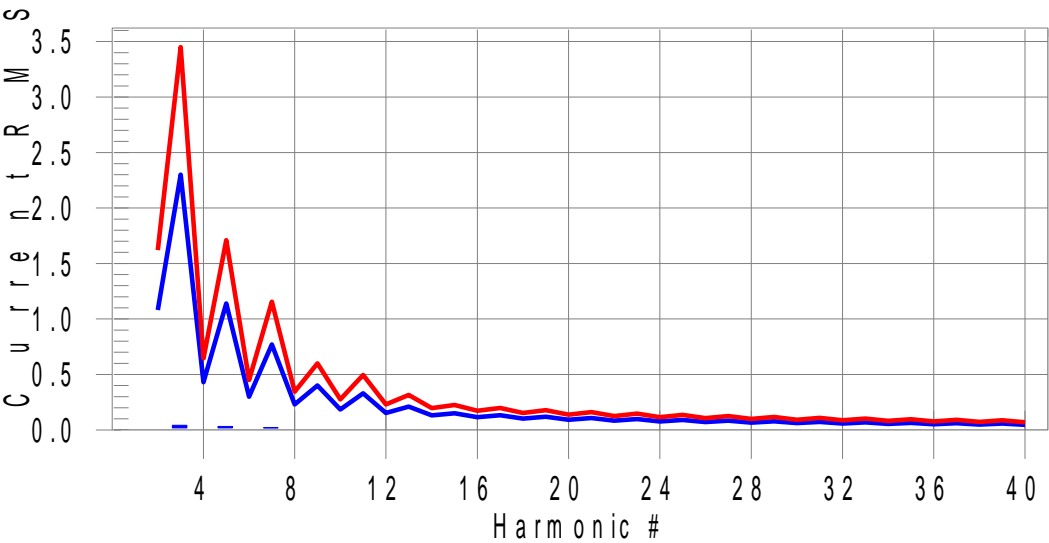
HARMONICS – CLASS-A PER IEC 61000-3-2 (RUN TIME)

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

Test Result: Pass

Source qualification: Normal

THC(A): 0.063

I-THD(%): 0.4

POHC(A): 0.009

POHC Limit(A): 0.251

Highest parameter values during test:

V_RMS (Volts): 229.92

Frequency(Hz): 50.00

I_Peak (Amps): 21.071

I_RMS (Amps): 14.838

I_Fund (Amps): 14.837

Crest Factor: 1.424

Power (Watts): 3410.9

Power Factor: 1.000

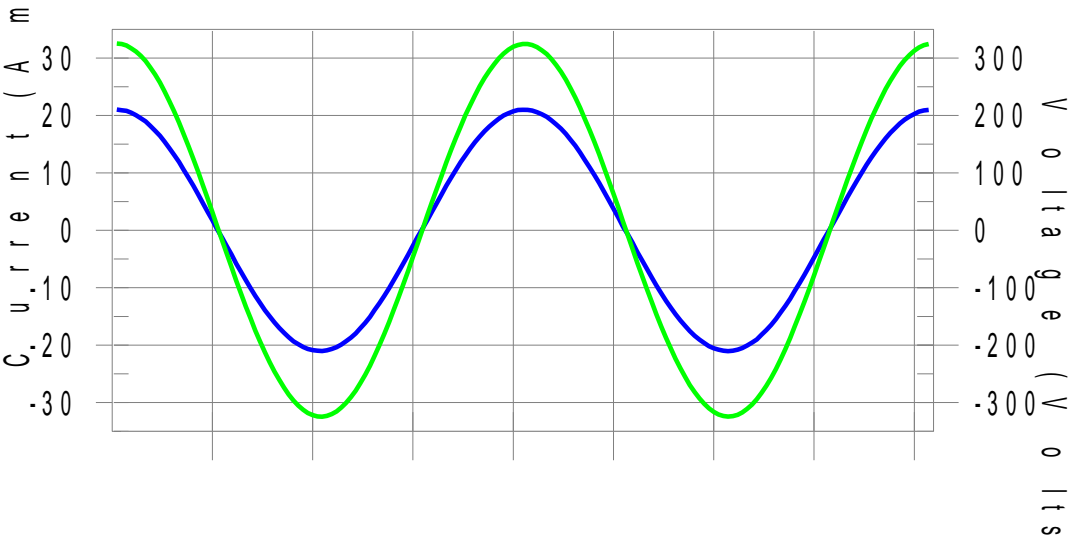
Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.006	1.080	N/A	0.010	1.620	N/A	Pass
3	0.042	2.300	N/A	0.047	3.450	N/A	Pass
4	0.006	0.430	N/A	0.007	0.645	N/A	Pass
5	0.032	1.140	N/A	0.033	1.710	N/A	Pass
6	0.001	0.300	N/A	0.003	0.450	N/A	Pass
7	0.021	0.770	N/A	0.022	1.155	N/A	Pass
8	0.001	0.230	N/A	0.002	0.345	N/A	Pass
9	0.013	0.400	N/A	0.014	0.600	N/A	Pass
10	0.002	0.184	N/A	0.003	0.276	N/A	Pass
11	0.012	0.330	N/A	0.012	0.495	N/A	Pass
12	0.001	0.153	N/A	0.001	0.230	N/A	Pass
13	0.010	0.210	N/A	0.011	0.315	N/A	Pass
14	0.001	0.131	N/A	0.001	0.197	N/A	Pass
15	0.007	0.150	N/A	0.008	0.225	N/A	Pass
16	0.001	0.115	N/A	0.001	0.173	N/A	Pass
17	0.007	0.132	N/A	0.007	0.198	N/A	Pass
18	0.001	0.102	N/A	0.001	0.153	N/A	Pass
19	0.007	0.118	N/A	0.007	0.178	N/A	Pass
20	0.001	0.092	N/A	0.001	0.138	N/A	Pass
21	0.005	0.107	N/A	0.005	0.161	N/A	Pass
22	0.000	0.084	N/A	0.001	0.125	N/A	Pass
23	0.004	0.098	N/A	0.004	0.147	N/A	Pass
24	0.001	0.077	N/A	0.001	0.115	N/A	Pass
25	0.004	0.090	N/A	0.004	0.135	N/A	Pass
26	0.000	0.071	N/A	0.001	0.107	N/A	Pass
27	0.003	0.083	N/A	0.004	0.125	N/A	Pass
28	0.000	0.066	N/A	0.001	0.099	N/A	Pass
29	0.003	0.078	N/A	0.003	0.116	N/A	Pass
30	0.000	0.061	N/A	0.001	0.092	N/A	Pass
31	0.002	0.073	N/A	0.003	0.109	N/A	Pass
32	0.000	0.058	N/A	0.001	0.086	N/A	Pass
33	0.002	0.068	N/A	0.002	0.102	N/A	Pass
34	0.000	0.054	N/A	0.001	0.081	N/A	Pass
35	0.002	0.064	N/A	0.002	0.096	N/A	Pass
36	0.000	0.051	N/A	0.001	0.077	N/A	Pass
37	0.001	0.061	N/A	0.001	0.091	N/A	Pass
38	0.000	0.048	N/A	0.001	0.073	N/A	Pass
39	0.001	0.058	N/A	0.001	0.087	N/A	Pass
40	0.000	0.046	N/A	0.001	0.069	N/A	Pass

Test Model:	HY531WE WIFI	Test Mode:	Mode 1
Test Engineer:	Toby Chen	Test Date:	2025-12-08
Test Voltage:	AC 230V/60Hz	Environment:	Temp.: 23.3°C Humi.: 51% Press.: 99.9kPa

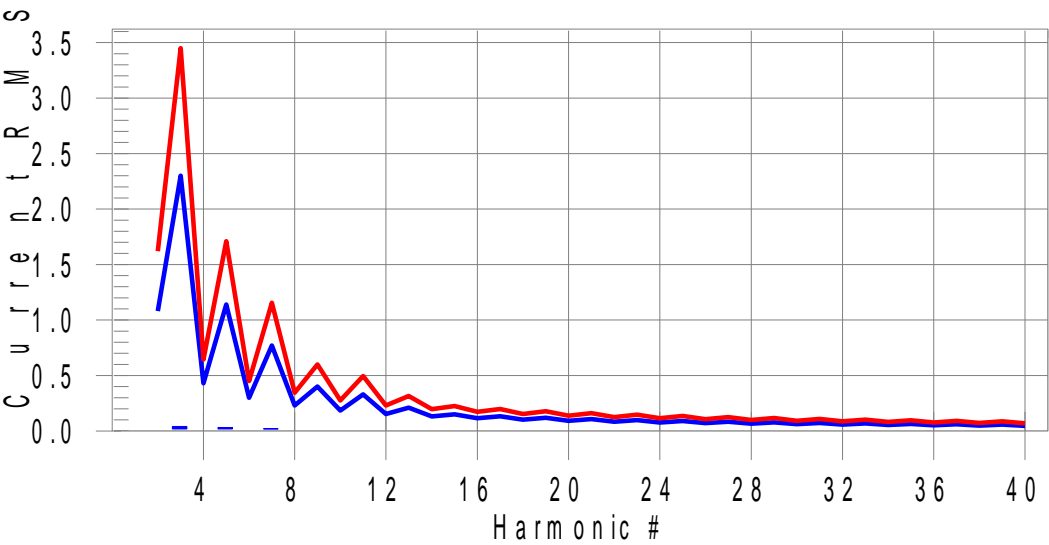
HARMONICS – CLASS-A PER IEC 61000-3-2 (RUN TIME)

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

Test Result: Pass

Source qualification: Normal

THC(A): 0.061

I-THD(%): 0.4

POHC(A): 0.009

POHC Limit(A): 0.251

Highest parameter values during test:

V_RMS (Volts): 229.88

Frequency(Hz): 60.00

I_Peak (Amps): 21.118

I_RMS (Amps): 14.852

I_Fund (Amps): 14.851

Crest Factor: 1.424

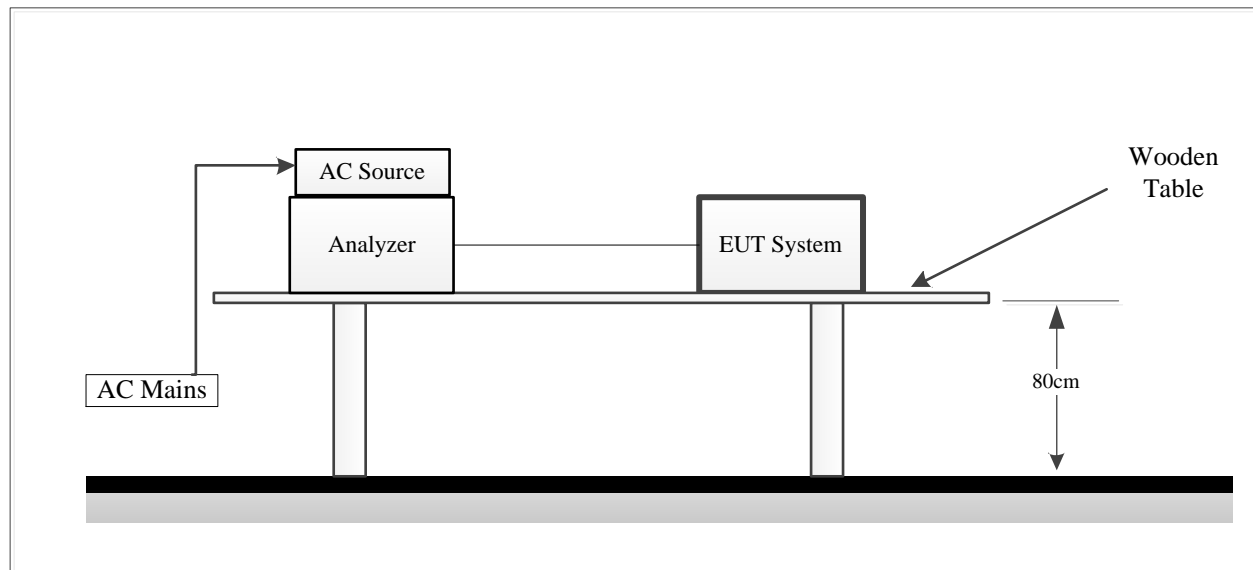
Power (Watts): 3413.3

Power Factor: 1.000

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.004	1.080	N/A	0.005	1.620	N/A	Pass
3	0.041	2.300	N/A	0.043	3.450	N/A	Pass
4	0.001	0.430	N/A	0.002	0.645	N/A	Pass
5	0.032	1.140	N/A	0.033	1.710	N/A	Pass
6	0.001	0.300	N/A	0.001	0.450	N/A	Pass
7	0.020	0.770	N/A	0.021	1.155	N/A	Pass
8	0.001	0.230	N/A	0.001	0.345	N/A	Pass
9	0.013	0.400	N/A	0.013	0.600	N/A	Pass
10	0.002	0.184	N/A	0.002	0.276	N/A	Pass
11	0.012	0.330	N/A	0.012	0.495	N/A	Pass
12	0.001	0.153	N/A	0.001	0.230	N/A	Pass
13	0.010	0.210	N/A	0.010	0.315	N/A	Pass
14	0.001	0.131	N/A	0.001	0.197	N/A	Pass
15	0.007	0.150	N/A	0.007	0.225	N/A	Pass
16	0.001	0.115	N/A	0.001	0.173	N/A	Pass
17	0.007	0.132	N/A	0.007	0.198	N/A	Pass
18	0.001	0.102	N/A	0.001	0.153	N/A	Pass
19	0.007	0.118	N/A	0.007	0.178	N/A	Pass
20	0.001	0.092	N/A	0.001	0.138	N/A	Pass
21	0.005	0.107	N/A	0.005	0.161	N/A	Pass
22	0.000	0.084	N/A	0.001	0.125	N/A	Pass
23	0.004	0.098	N/A	0.004	0.147	N/A	Pass
24	0.001	0.077	N/A	0.001	0.115	N/A	Pass
25	0.003	0.090	N/A	0.004	0.135	N/A	Pass
26	0.001	0.071	N/A	0.002	0.107	N/A	Pass
27	0.003	0.083	N/A	0.003	0.125	N/A	Pass
28	0.001	0.066	N/A	0.001	0.099	N/A	Pass
29	0.003	0.078	N/A	0.003	0.116	N/A	Pass
30	0.001	0.061	N/A	0.002	0.092	N/A	Pass
31	0.002	0.073	N/A	0.002	0.109	N/A	Pass
32	0.001	0.058	N/A	0.001	0.086	N/A	Pass
33	0.001	0.068	N/A	0.002	0.102	N/A	Pass
34	0.001	0.054	N/A	0.002	0.081	N/A	Pass
35	0.002	0.064	N/A	0.002	0.096	N/A	Pass
36	0.001	0.051	N/A	0.002	0.077	N/A	Pass
37	0.001	0.061	N/A	0.002	0.091	N/A	Pass
38	0.001	0.048	N/A	0.001	0.073	N/A	Pass
39	0.001	0.058	N/A	0.001	0.087	N/A	Pass
40	0.000	0.046	N/A	0.001	0.069	N/A	Pass

VOLTAGE FLUCTUATIONS AND FLICKER (AC MAINS INPUT PORT)

Test System Setup



Test Standard

EN 61000-3-3:2013+A2:2021+AC: 2022-01

Test procedure

The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under Mode 1 conditions.

During the flick measurement, the measure time shall include that part of whole operation cycle in which the EUT produce the most unfavorable sequence of voltage changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

Flicker Test Limits:

The limits shall be applicable to voltage fluctuations and flicker at the supply terminals of the equipment under test, measured or calculated according to clause 4 under test conditions described in clause 6 and annex A. Tests made to prove compliance with the limits are considered to be type tests.

The following limits apply:

- the value of P_{st} shall not be greater than 1,0;
- the value of Plt shall not be greater than 0,65;
- the value of $d(t)$ during a voltage change shall not exceed 3,3 % for more than 500 ms;
- 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;
 - 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 Plt limit. For example: a d_{max} of 6 % producing a rectangular voltage change characteristic twice per hour will give a Plt 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.

In the case of equipment having several separately controlled circuits in accordance with 6.6, limits b) and c) shall apply only if there is delayed or manual restart after a power supply interruption; for all equipment with automatic switching which is energized immediately on restoration of supply after a power supply interruption, limits a) shall apply; for all equipment with manual switching, limits b) or c) shall apply depending on the rate of switching. Pst and Plt requirements shall not be applied to voltage changes caused by manual switching. The limits shall not be applied to voltage changes associated with emergency switching or emergency interruptions.

Test Data

Test Model:	HY531WE WIFI	Test Mode:	Mode 1
Test Engineer:	Toby Chen	Test Date:	2025-12-08
Test Voltage:	AC 230V/50Hz	Environment:	Temp.: 23.3°C Humi.: 51% Press.: 99.9kPa

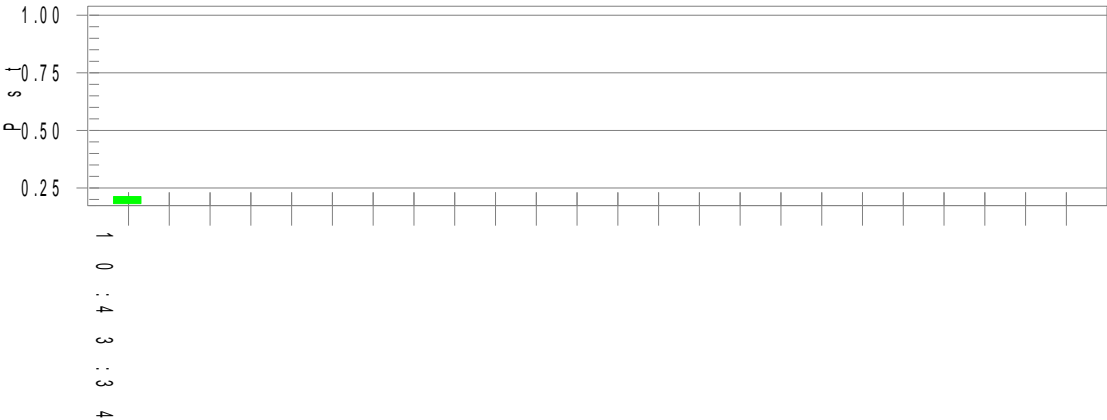
Flicker Test Summary per IEC 61000-3-3 (Run time)

Test Result: Pass

Status: Test Completed

Pst_t and limit line

European Limits



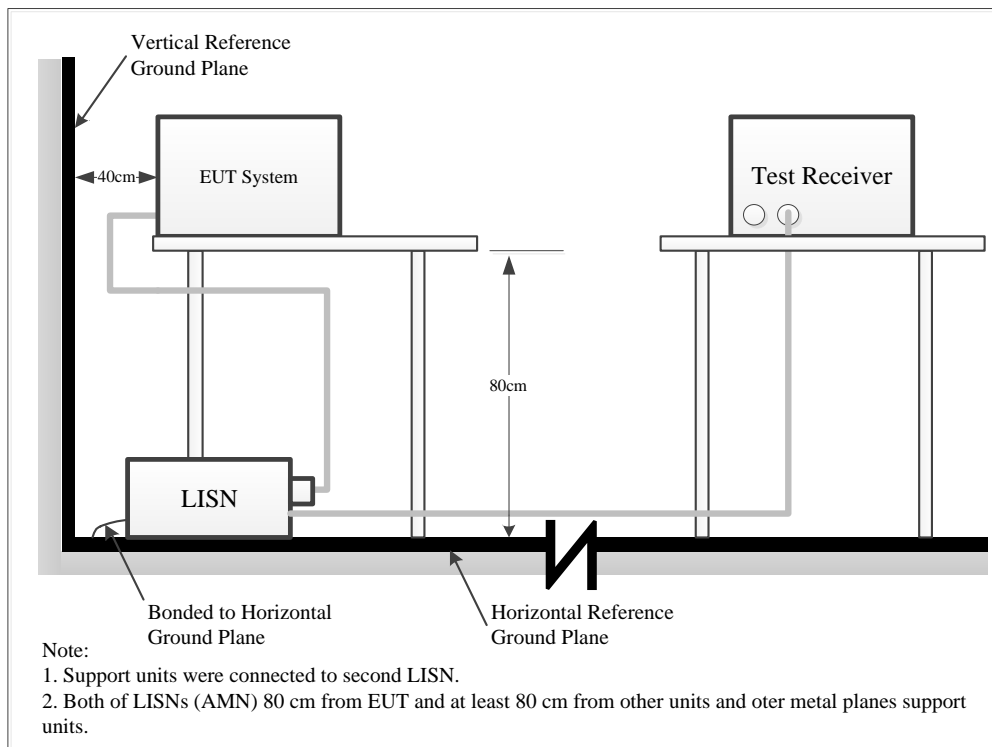
Parameter values recorded during the test:

Vrms at the end of test (Volt): 227.91
Highest dt (%):
T-max (mS): 0
Highest dc (%): 0.00
Highest dmax (%): 0.00
Highest dmax (%): 0.00
Highest Pst (10 min. period): 0.213

Test limit (%):
Test limit (mS): 500.0 Pass
Test limit (%): 3.30 Pass
Test limit (%): 4.00 Pass
Test limit (%): 4.00 Pass
Test limit: 1.000 Pass

CONDUCTED EMISSION (WIRED NETWORK PORT)

Test System Setup



The setup of EUT is according with per ETSI EN 301 489-1 measurement procedures. The specification used was with the ETSI EN 301 489-1 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle.

The spacing between the peripherals was 10cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz - 30 MHz	9 kHz

Test Procedure

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.

If the maximum peak value of the emissions is below the average limit, the QP value and average value measurement will not need to be performed and only record the maximum peak measured value to meet the requirements.

Result &Margin Calculation

The Result is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation from the Meter Reading. The basic equation is as follows:

$$\text{Factor (dB)} = \text{LISN VDF (dB)} + \text{Cable Loss (dB)} + \text{Transient Limiter Attenuation (dB)}$$
$$\text{Result (dB}\mu\text{V)} = \text{Reading (dB}\mu\text{V)} + \text{Factor (dB)}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin (dB)} = \text{Limit (dB}\mu\text{V)} - \text{Result (dB}\mu\text{V)}$$

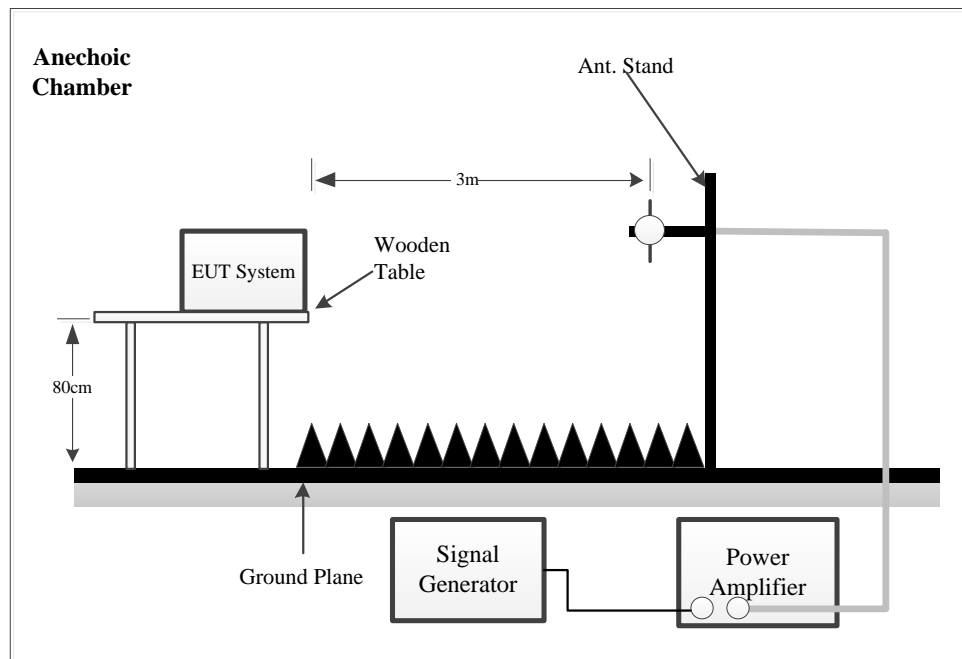
Test Data

Test Result: N/A

Note: The item applies only to equipment which have wired network ports.

RADIO FREQUENCY ELECTROMAGNETIC FIELDS (80 MHz TO 6 000 MHz)

Test System Setup



Test specification

Basic Standard:	ETSI EN 301 489-1 V2.2.3(2019-11) / EN 61000-4-3
Frequency Range:	80 MHz - 6000MHz
Field Strength:	3 V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Polarity of Antenna:	Horizontal and Vertical
Antenna Height:	1.5m
Dwell Time:	3seconds
Performance Criterion:	A

Test Procedure

The testing was performed in a fully-anechoic chamber.

The frequency range is swept from 80 MHz to 6000 MHz, with the signal 80% amplitude modulated with a 1kHz sinewave.

The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised and to respond, but shall in no case be less than 0.5s.

The field strength level was 3V/m.

The EUT and its simulators are placed on a turn table which is 0.8 meter above the ground. The EUT is set 3 meters away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarizations of the antenna are set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually.

In order to judge the EUT performance, a CCD camera is used to monitor the EUT.

Test Data

Test Model:	HY531WE WIFI		Test Mode:	Mode 1	
Test Engineer:	Toby Chen		Test Date:	2025-12-08	
Test Voltage:	AC 230V/50Hz		Environment:	Temp.: 23.3°C Humi.: 51% Press.: 99.9kPa	
Frequency[MHz]	Level [V/m]	Modulation	Antenna Polarization	EUT Face	Observations (Performance Criterion)
80-6000	3	1 kHz, 80 % Amp. Mod, 1 % increment, dwell time=3seconds	V	Front	A
			H		A
			V	Left	A
			H		A
			V	Right	A
			H		A
			V	Top	A
			H		A
			V	Bottom	A
			H		A

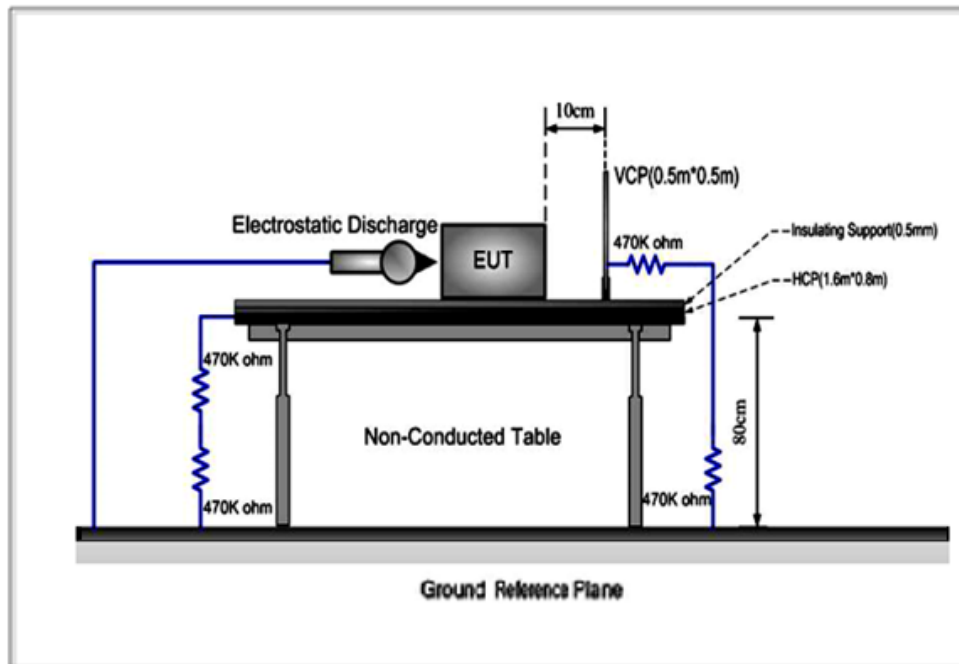
Note: “A” stands for, during the test, the apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended.

WIFI communication

Note: “A” stand for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.

ELECTROSTATIC DISCHARGES

Test System Setup



EN 61000-4-2 specifies that a tabletop EUT shall be placed on a non-conducting table which is 80 centimeters above a ground reference plane and that floor mounted equipment shall be placed on a insulating support approximately 10 centimeters above a ground plane. During the tests, the EUT is positioned over a ground reference plane in conformance with this requirement.

For tabletop equipment, a 1.6 by 0.8-meter metal sheet (HCP) is placed on the table and connected to the ground plane via a metal strap with two 470 k Ohms resistors in series. The EUT and attached cables are isolated from this metal sheet by 0.5-millimeter thick insulating material. A Vertical Coupling Plane (VCP) grounded on the ground plane through the same configuration as in the HCP is used.

Test Specification

Basic Standard:	ETSI EN 301 489-1 V2.2.3(2019-11) / EN 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Discharge Voltage:	Air Discharge: 2, 4, 8 kV (Direct) Contact Discharge: 4 kV (Direct)
Polarity:	Positive & Negative
Number of Discharge:	Minimum 20 times at each test point
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum
Performance Criterion:	B

Test Procedure

The basic test procedure was in accordance with EN 61000-4-2:

Electrostatic discharges were applied only to those points and surfaces of the EUT that are accessible to users during normal operation.

The test was performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.

The time interval between two successive single discharges was at least 1 second.

The ESD generator was held perpendicularly to the surface to which the discharge was applied and the return cable was at least 0.2 meters from the EUT.

Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

Contact Discharge:

All the procedure shall be same as Section 8.3.1 of EN 61000-4-2, except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

Indirect discharge for horizontal coupling plane:

At least 20 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1 m from the EUT and with the discharge electrode touching the coupling plane.

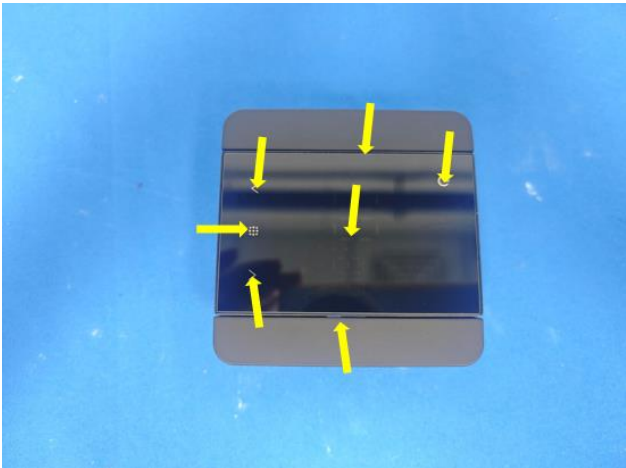
Indirect discharge for vertical coupling plane:

At least 20 single discharges shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m * 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

Test Data

Test Model:	HY531WE WIFI			Test Mode:		Mode 1			
Test Engineer:	Toby Chen			Test Date:		2025-12-08			
Test Voltage:	AC 230V/50Hz			Environment:		Temp.: 23.3°C Press.: 99.9kPa		Humi.: 51%	
Electrostatic Discharge Immunity (Air Discharge)									
Test Levels									
Test Points Location	-2 kV	+2 kV	-4 kV	+4 kV	-8 kV	+8 kV	-15 kV	+15 kV	X
Front side (7 points)	A	A	A	A	A	A	/	/	/
Top side (2 points)	A	A	A	A	A	A	/	/	/
Left side (1 point)	A	A	A	A	A	A	/	/	/
Right side (1 point)	A	A	A	A	A	A	/	/	/
Down side (3 points)	A	A	A	A	A	A	/	/	/
Electrostatic Discharge Immunity (Contact Discharge)									
Test Levels									
Test Points Location	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV	X
/	/	/	/	/	/	/	/	/	/
Electrostatic Discharge Immunity (Indirect Contact HCP)									
Test Levels									
Test Points Location	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV	X
Front Side	/	/	A	A	/	/	/	/	/
Back Side	/	/	A	A	/	/	/	/	/
Left Side	/	/	A	A	/	/	/	/	/
Right Side	/	/	A	A	/	/	/	/	/
Electrostatic Discharge Immunity (Indirect Contact VCP)									
Test Levels									
Test Points Location	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV	X
Front Side	/	/	A	A	/	/	/	/	/
Back Side	/	/	A	A	/	/	/	/	/
Left Side	/	/	A	A	/	/	/	/	/
Right Side	/	/	A	A	/	/	/	/	/
Note: “A” stands for, during the test, the apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended.									

Test point as follows:



Front side



Left side



Right side



Top side

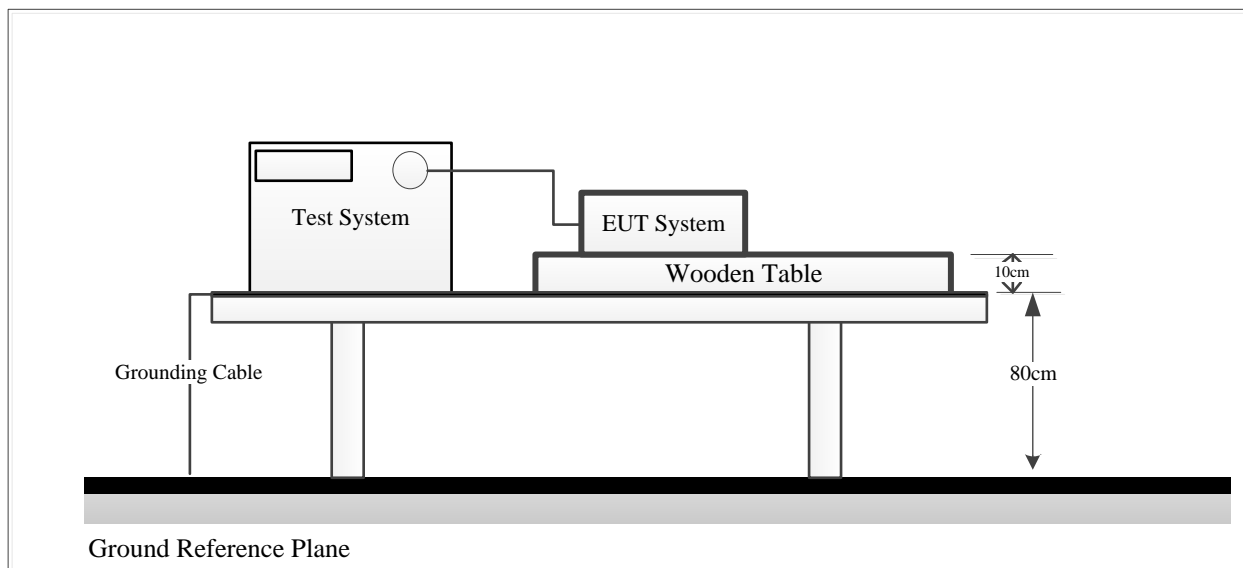


Down side

Note: ➡ represents air discharge, ➡ represents direct contact

FAST TRANSIENTS, COMMON MODE

Test System Setup



Test Specification

Basic Standard:	ETSI EN 301 489-1 V2.2.3(2019-11) / EN 61000-4-4
Test Voltage:	AC mains power ports: 1 kV DC power input ports: 0.5 kV Signal ports, wired network ports(excluding xDSL), and control ports: 0.5 kV
Polarity:	Positive & Negative
Impulse Frequency:	5 kHz
Impulse Wave Shape :	5/50 ns
Burst Duration:	15 ms
Burst Period:	300 ms
Test Duration:	2 min.
Performance Criterion:	B

Test Procedure

The EUT was arranged for Power Line Coupling and for I/O Line Coupling through a capacitive clamp, where applicable. (Note: The I/O coupling test using a capacitive clamp is performed on the I/O interface cables that are longer in length than 3 meters.) A metal ground plane is connected to the earth by a ground rod. The ground rod is connected to the test facility's electrical earth.

Both positive and negative polarity discharges were applied.

The length of the "hot wire" from the coaxial output of the EFT generator to the terminals on the EUT should not exceed 0.5 meter \pm 0.05 meter.

The duration time of each test sequential was 2 minute.

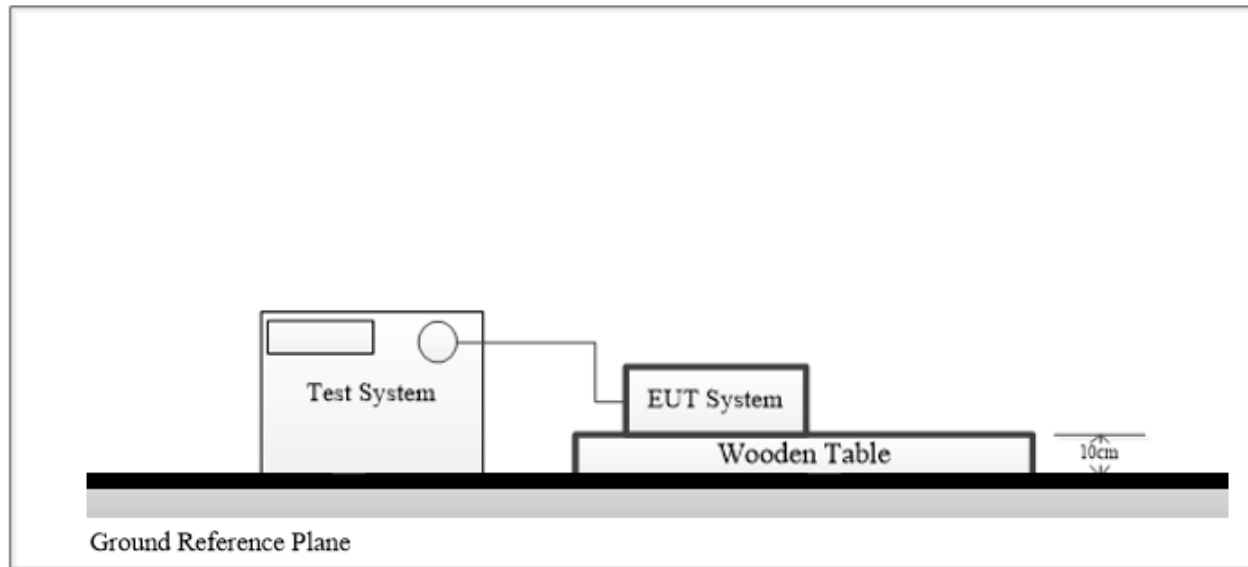
The transient/burst waveform was in accordance with EN 61000-4-4, 5/50ns.

Test Data

Test Model:		HY531WE WIFI		Test Mode:			Mode 1		
Test Engineer:		Toby Chen		Test Date:			2025-12-08		
Test Voltage:		AC 230V/50Hz		Environment:			Temp.: 23.3°C Humi.: 51% Press.: 99.9kPa		
Test Ports				Test Levels (kV); Repetition frequency(5kHz)					
				+0.5	-0.5	+1.0	-1.0	+2.0	-2.0
AC mains power input ports	L	/	/	A	A	/	/	/	/
	N	/	/	A	A	/	/	/	/
	PE	/	/	/	/	/	/	/	/
	L-N	/	/	A	A	/	/	/	/
	L-PE	/	/	/	/	/	/	/	/
	N-PE	/	/	/	/	/	/	/	/
	L-N-PE	/	/	/	/	/	/	/	/
Signal Line		/	/	/	/	/	/	/	/
Note: “A” stands for, during the test, the apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended.									

RADIO FREQUENCY, COMMON MODE

Test System Setup



Test specification

Basic Standard:	ENSI EN 301 489-1 V2.2.3(2019-11) / EN 61000-4-6
Frequency Range:	0.15 MHz - 80 MHz
Field Strength:	3 V/m
Modulation:	1 kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Dwell Time:	1 second
Performance Criterion:	A

Test Procedure

- 1) Let the EUT work in test mode and test it.
- 2) The EUT are placed on an insulating support 0.1 m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3 m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 3) The disturbance signal described below is injected to EUT through CDN.
- 4) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 5) The frequency range is swept from 150 kHz to 80 MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1 kHz sine wave.
- 6) Where the frequency is swept incrementally, the step size shall not exceed 1 % of the preceding frequency value. The dwell time of the amplitude modulated carrier at each frequency shall not be less than the time necessary for the EUT to be exercised and to respond, but shall in no case be less than 0.5 s.
- 7) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

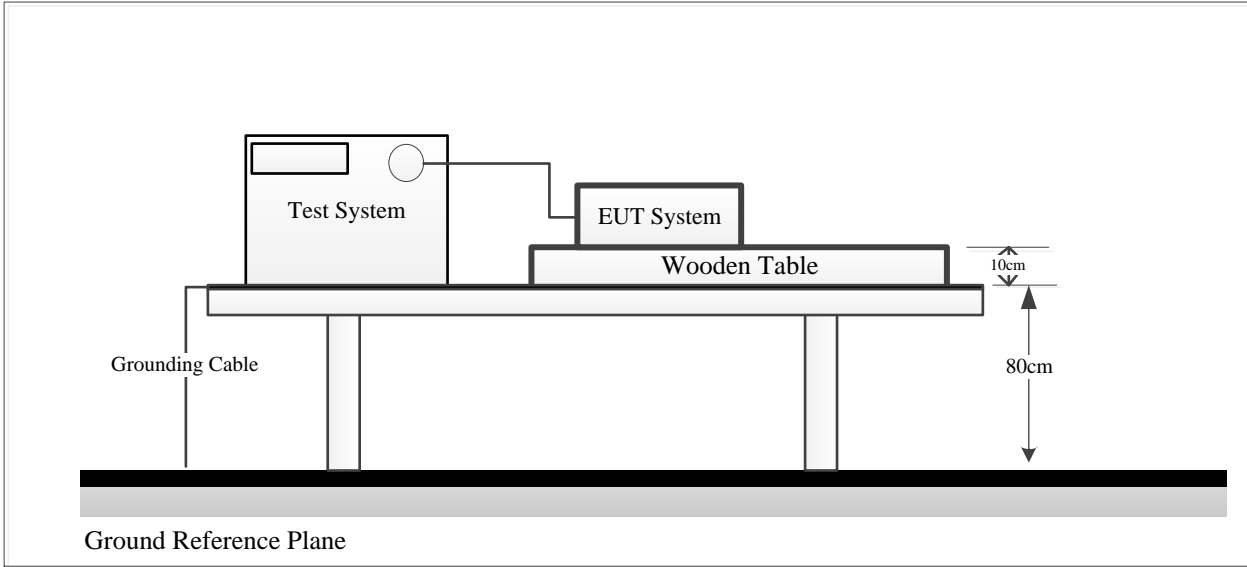
Test Data

Test Model:		HY531WE WIFI		Test Mode:		Mode 1
Test Engineer:		Toby Chen		Test Date:		2025-12-08
Test Voltage:		AC 230V/50Hz		Environment:		Temp.: 23.3°C Humi.: 51% Press.: 99.9kPa
Frequency (MHz)	Injected Position	Test Level (V)	Modulation	Step Size	Dwell Time	Observations (Performance Criterion)
0.15-80	AC power ports	3	80%, 1kHz Amp. Mod.	1%	1s	A
0.15-80	Signal Line	3				/

Note: “A” stands for, during the test, the apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended.

VOLTAGE DIPS AND INTERRUPTIONS

Test System Setup



Test Specification

Basic Standard:	ETSI EN 301 489-1 V2.2.3(2019-11) / EN 61000-4-11			
Test Duration Time:	Minimum three test events in sequence			
Interval between Event:	Minimum ten seconds			
Phase Angle:	0°/180°			
Numbers of dropout:	3 times			
Performance Criterion:	Test Level	Cycle	Phase Angle	Performance criterion
	0 %	0.5	0°/180°	B
	0 %	1.0	0°/180°	B
	70 %	25	0°/180°	B
	0 %	250	0°/180°	C

Test Procedure

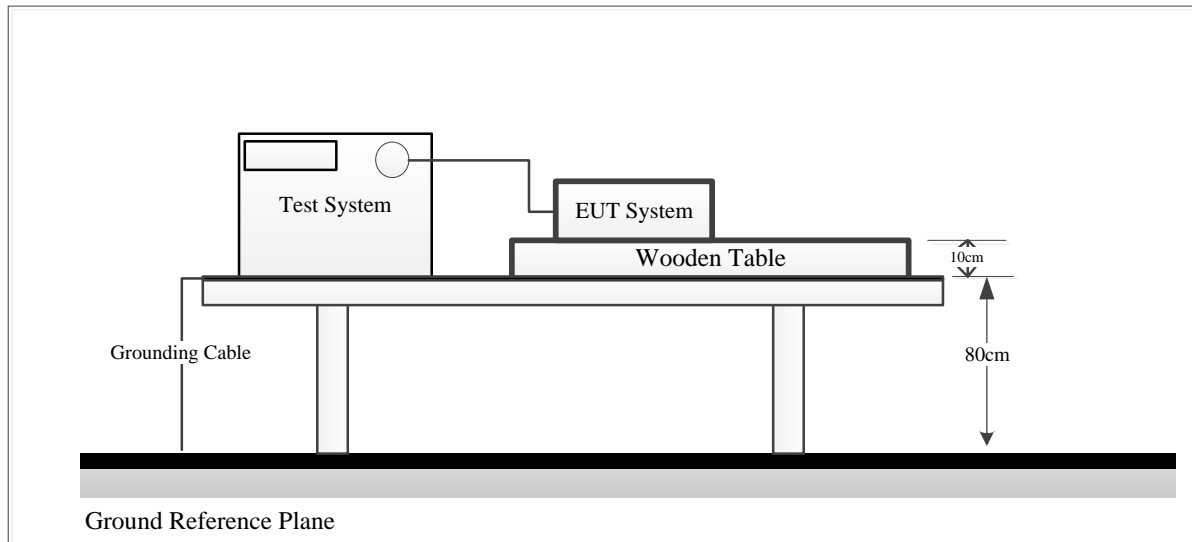
The EUT shall be tested for each selected combination of test levels and duration with a sequence of three dips/interruptions with intervals of 10 s minimum (between each test event).
Each representative mode of operation shall be tested.
Abrupt changes in supply voltage shall occur at zero crossings of the voltage waveform.

Test Data

Test Model:		HY531WE WIFI		Test Mode:		Mode 1	
Test Engineer:		Toby Chen		Test Date:		2025-12-08	
Test Voltage:		AC 230V/50Hz or AC 90V/60Hz		Environment:		Temp.: 23.3°C Humi.: 51% Press.: 99.9kPa	
Test Level % U _T	Durations (Period)			Phase angle	Numbers of dropout	Observations (Performance Criterion)	
	50 Hz		60 Hz				
0	0.5		0.5	0°, 180°	3	A	
0	1		1	0°, 180°	3	A	
70	25		/	0°, 180°	3	A	
0	250		/	0°, 180°	3	C	
Note: 1. “A” stands for, during the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operating state is allowed below a performance level specified by the manufacturer when the equipment is used as intended. 2. “C” stands for, during the test, the equipment stopped working. After the test, stops working shall be able to be manually restored and run as expected after restoration.							

SURGES

Test System Setup



Test Specification

Basic Standard:	ETSI EN 301 489-1 V2.2.3(2019-11) / EN 61000-4-5
Wave-Shape:	Combination Wave 1.2/50 μ s Open Circuit Voltage 8 /20 μ s Short Circuit Current
Test Voltage:	AC mains power ports: Line - line: 1kV, Line - earth: 2kV; Wired network ports, outdoor cables: line to line: 0.5kV, Line to ground, or shield to ground: 1.0kV; Wired network ports, indoor cables: Line to ground, or shield to ground: 0.5kV
Generator Source Impedance:	2 ohm between networks 12 ohm between network and ground
Polarity:	Positive/Negative
Phase Angle:	0°/90°/180°/270°
Pulse Repetition Rate:	1 time / 60 Sec.
Performance Criterion:	B

Test Procedure

For input a.c. power ports, provide a 1.2/50 μ s voltage surge (at open-circuit condition) and a 8/20 μ s current surge into a short circuit.

For telecommunication port, provide a 10/700 μ s voltage surge (at open-circuit condition) and a 5/320 μ s current surge into a short circuit.

At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.

Different phase angles are done individually.

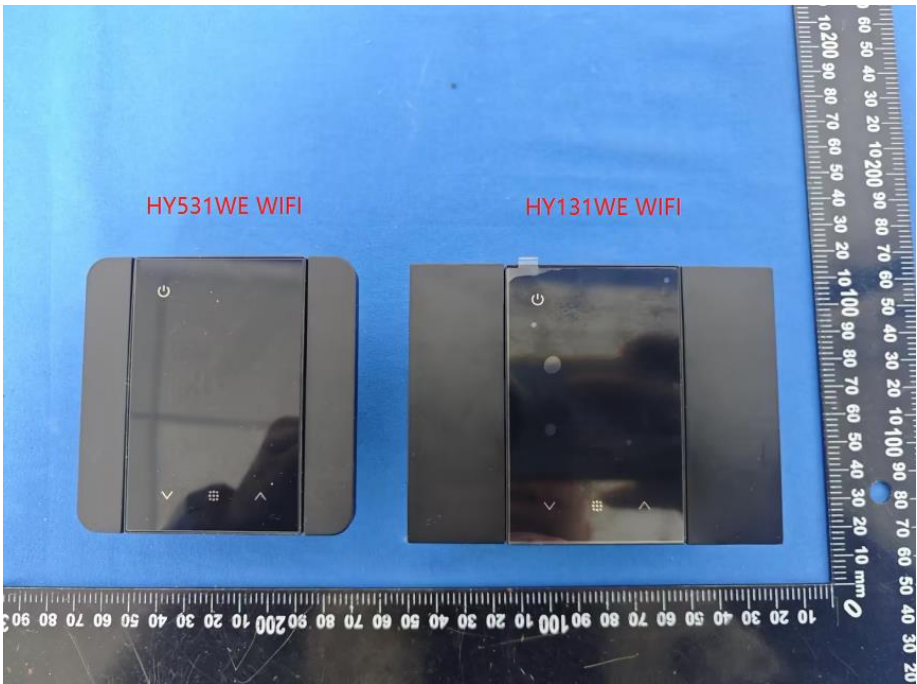
Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

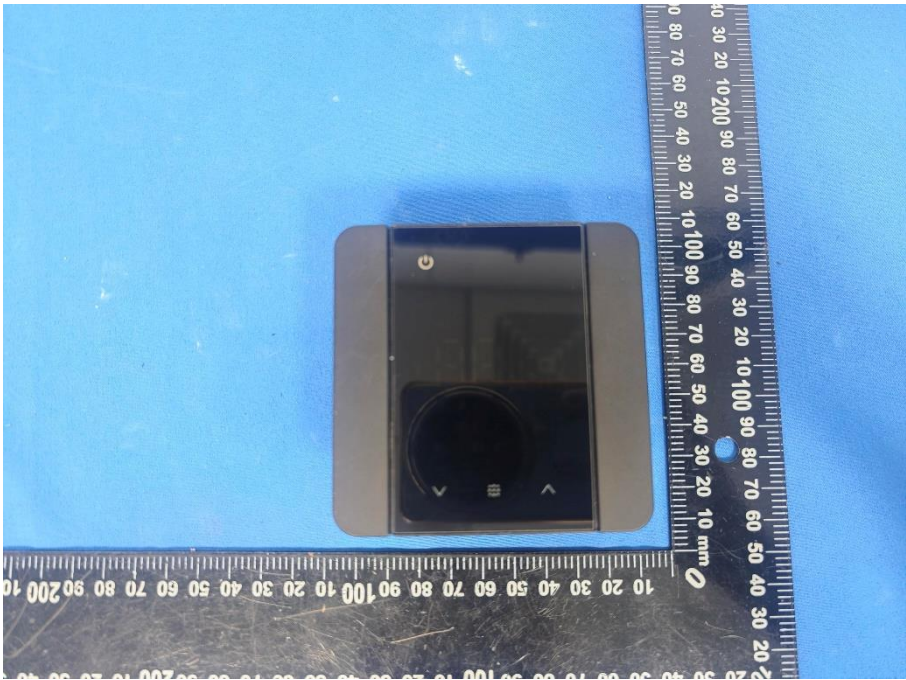
Test Data

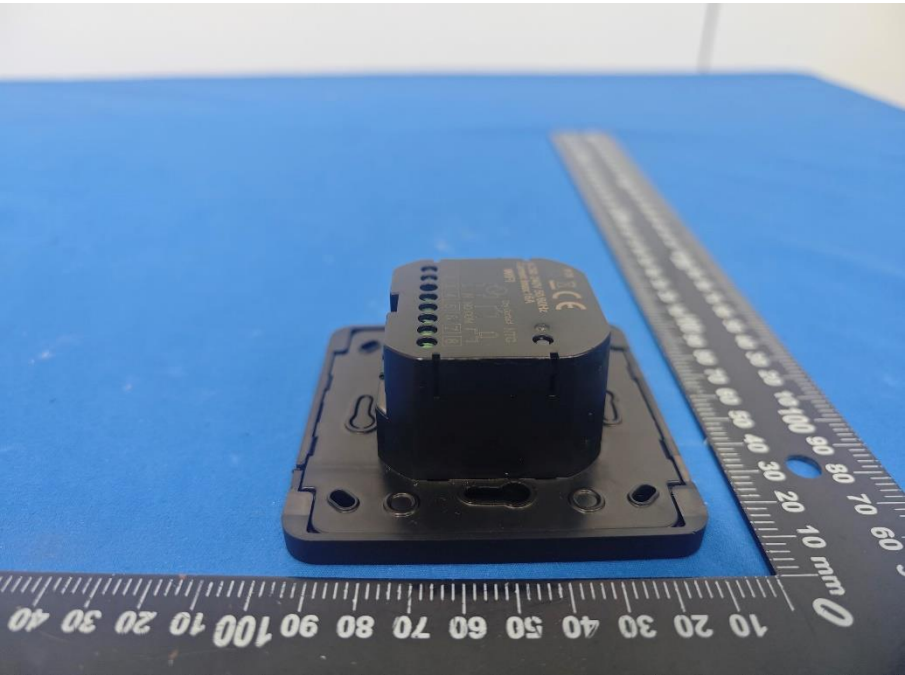
Test Model:		HY531WE WIFI		Test Mode:		Mode 1	
Test Engineer:		Toby Chen		Test Date:		2025-12-08	
Test Voltage:		AC 230V/50Hz		Environment:		Temp.: 23.3℃ Humi.: 51% Press.: 99.9kPa	
Location	Surge Interval	Pulse No.	Level(kV)	Phase(deg)		Observations (Performance Criterion)	
L-N	60s	5	±0.5	0°/90°/180°/270°		A	
			±1	0°/90°/180°/270°		A	
L-PE	60s	5	±0.5	0°/90°/180°/270°		/	
			±1	0°/90°/180°/270°		/	
			±2	0°/90°/180°/270°		/	
N-PE	60s	5	±0.5	0°/90°/180°/270°		/	
			±1	0°/90°/180°/270°		/	
			±2	0°/90°/180°/270°		/	
Signal Line	60s	5	±0.5	0°/90°/180°/270°		/	
Note: “A” stands for, during the test, the apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended.							

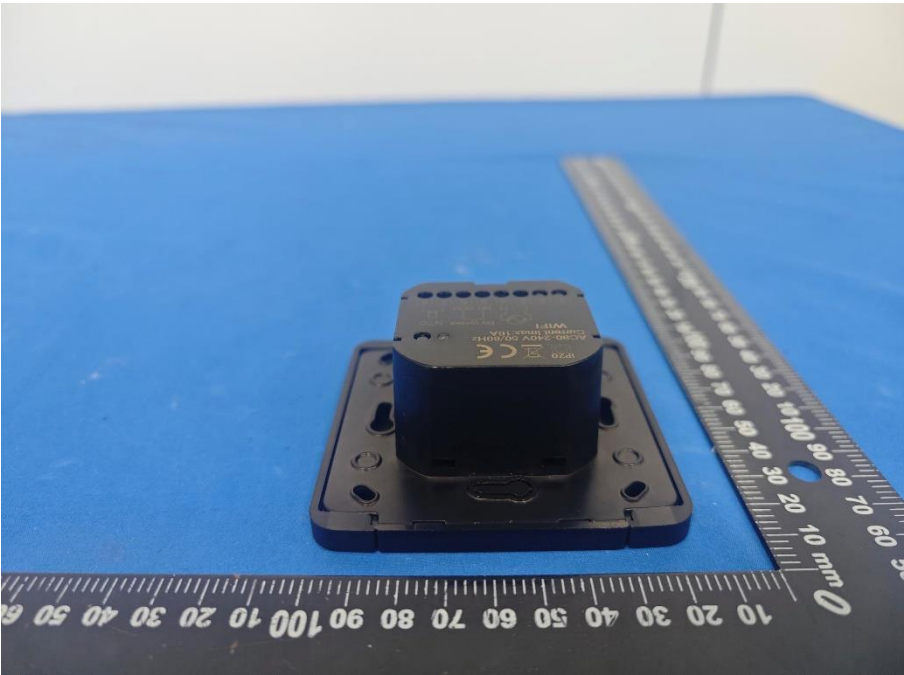
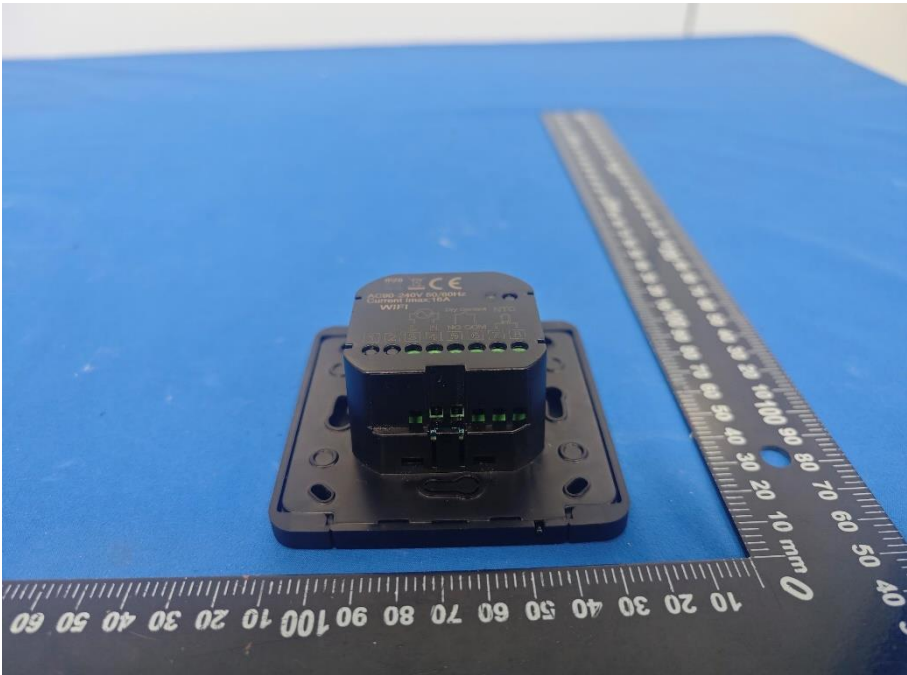
EXHIBIT A - EUT PHOTOGRAPHS

External Photos

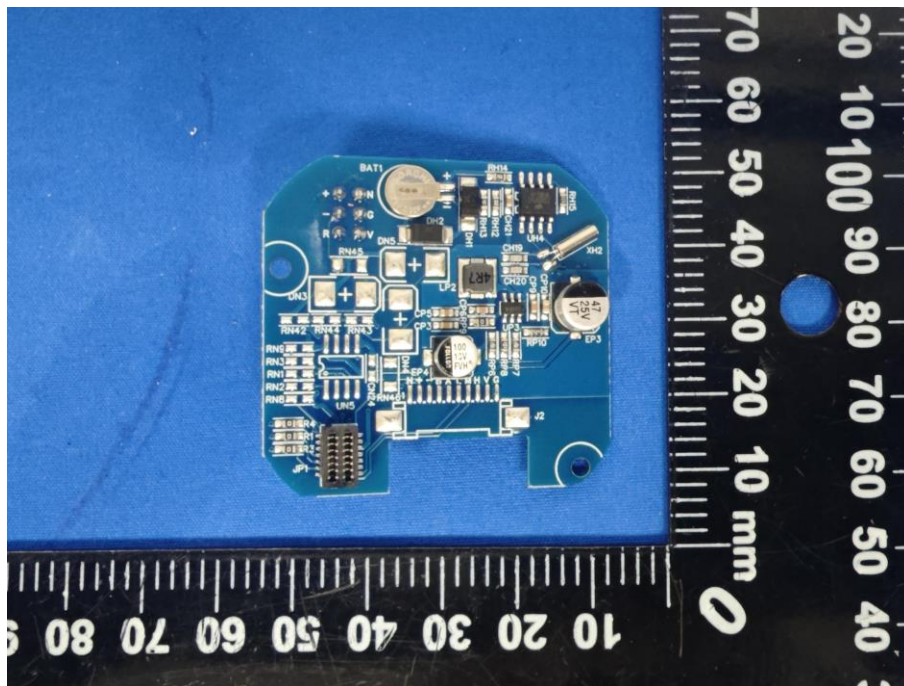
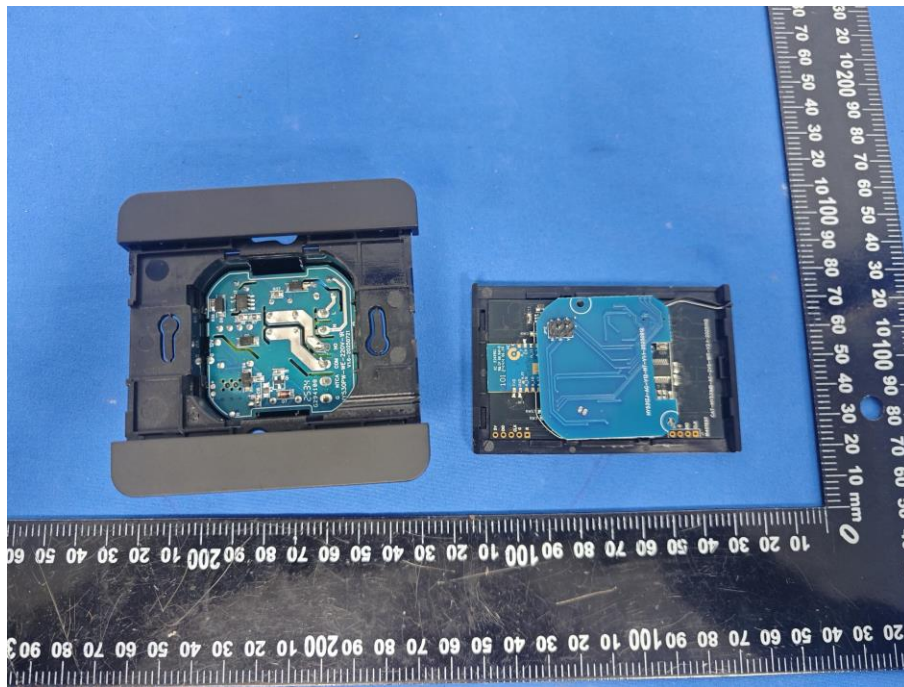


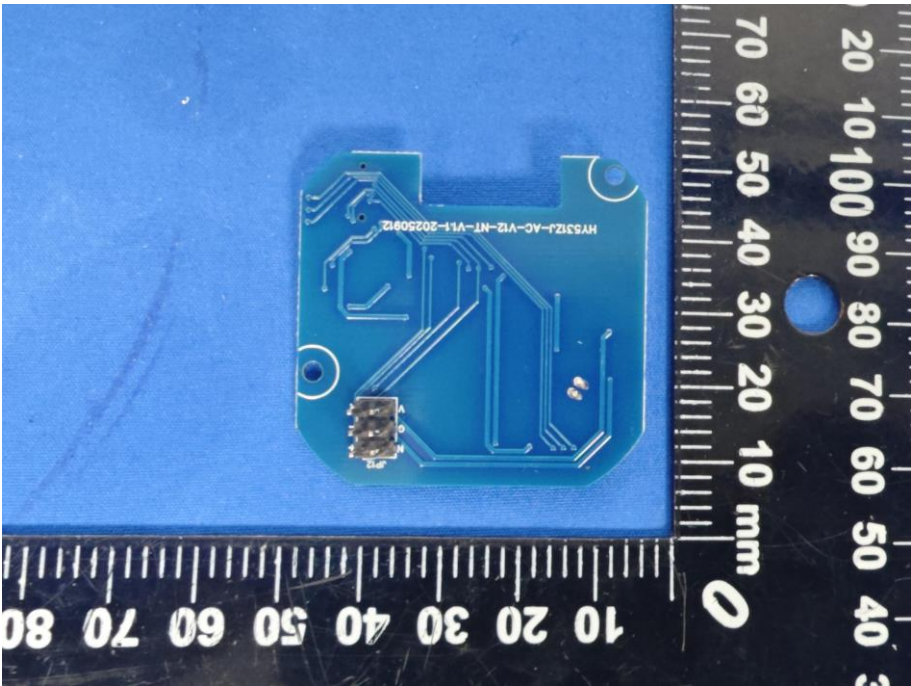
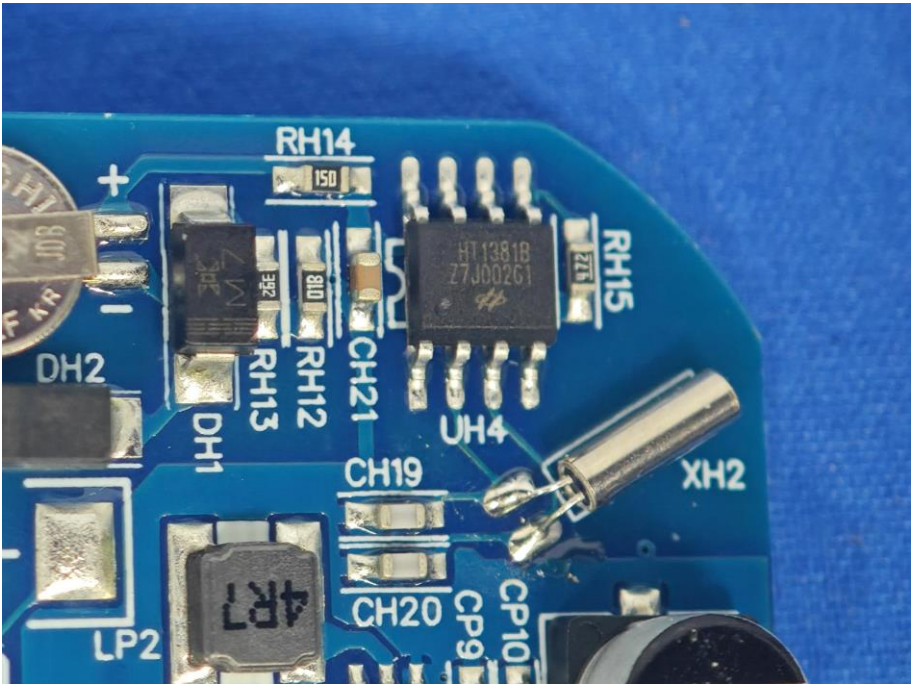


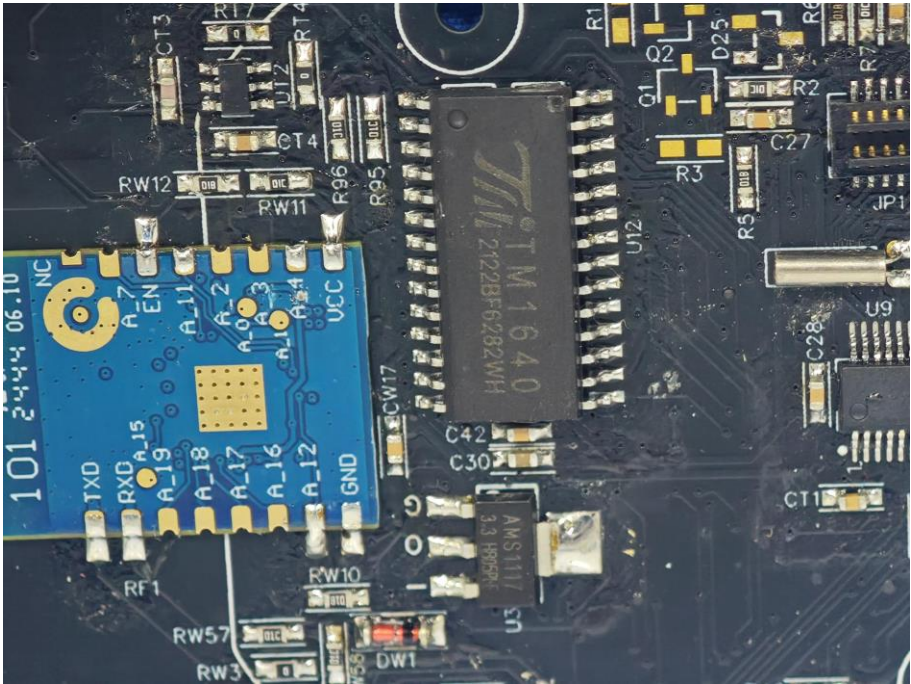
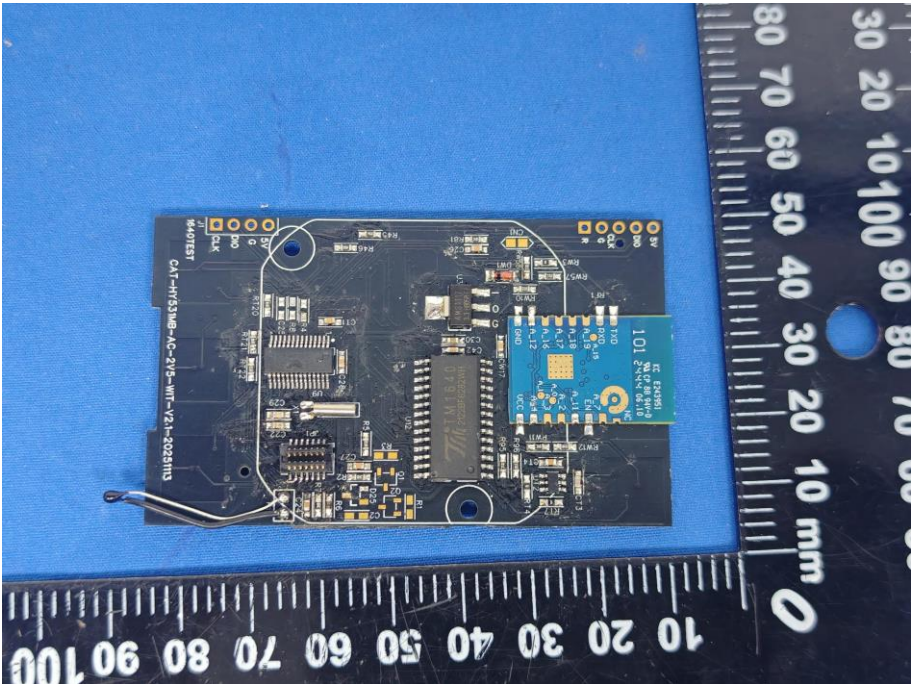


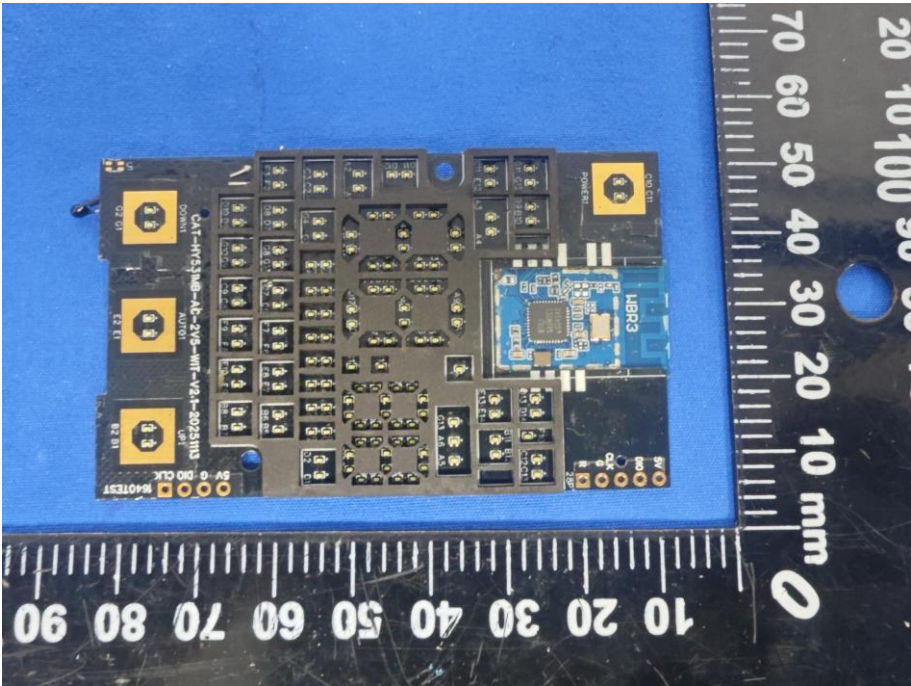
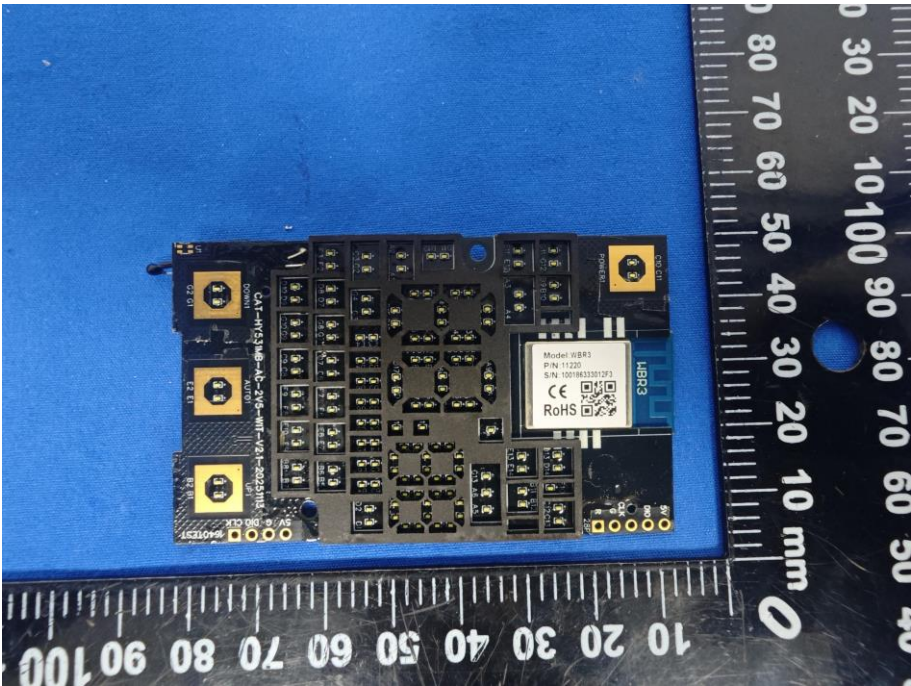


Internal Photos

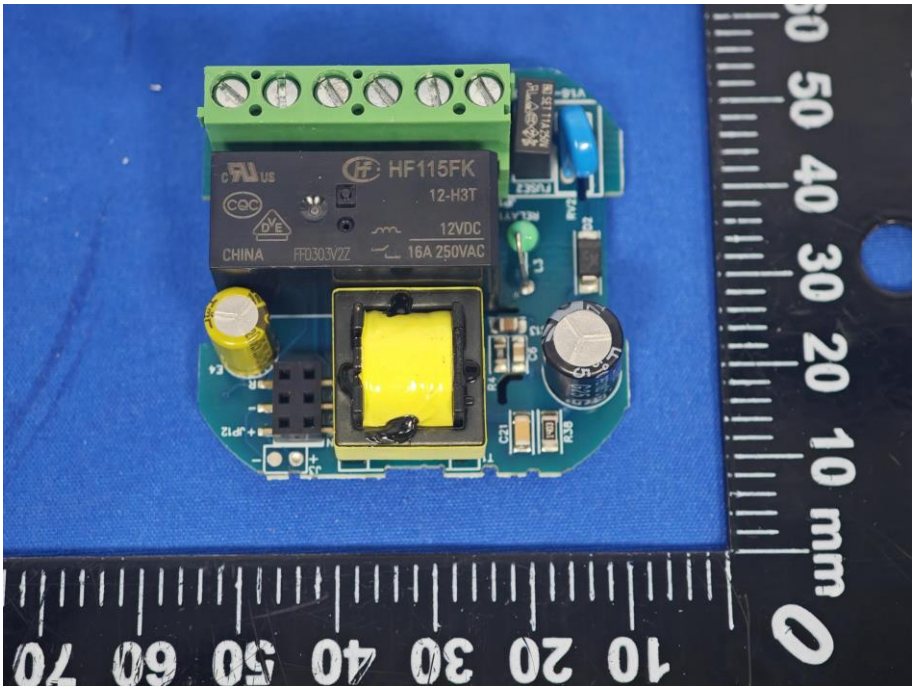
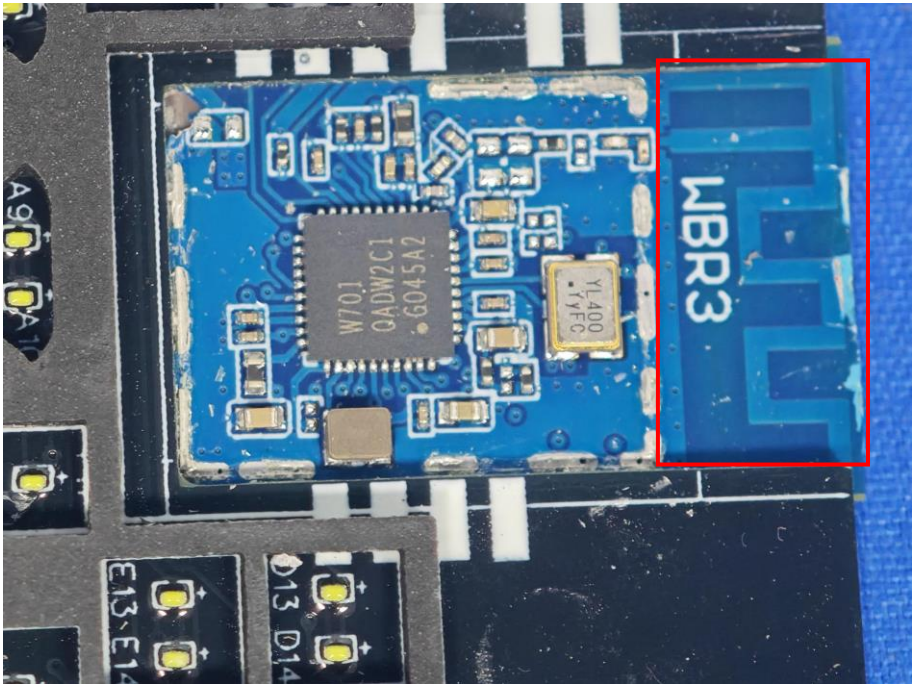








WIFI Antenna



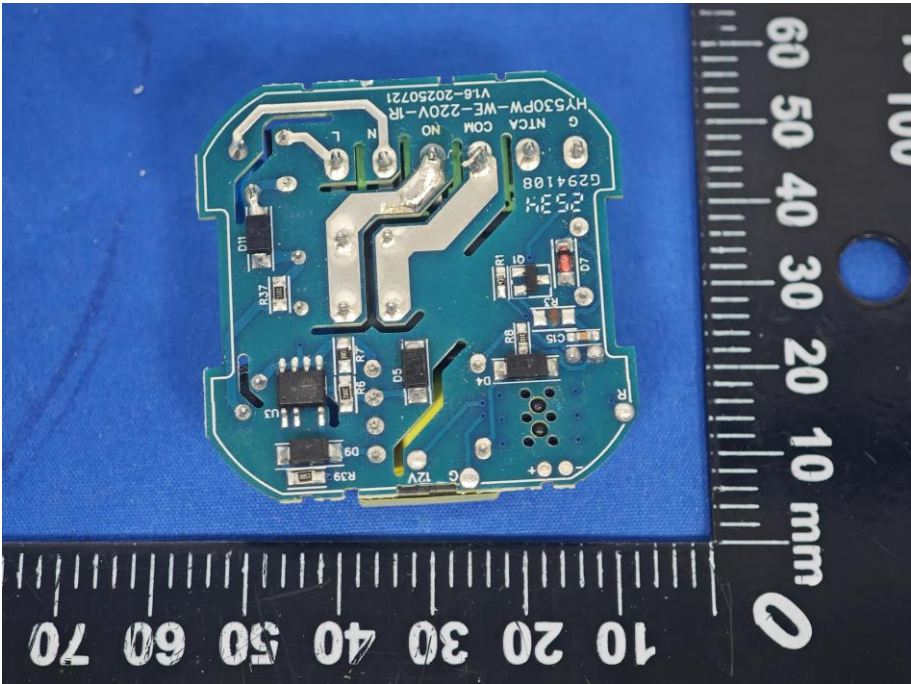
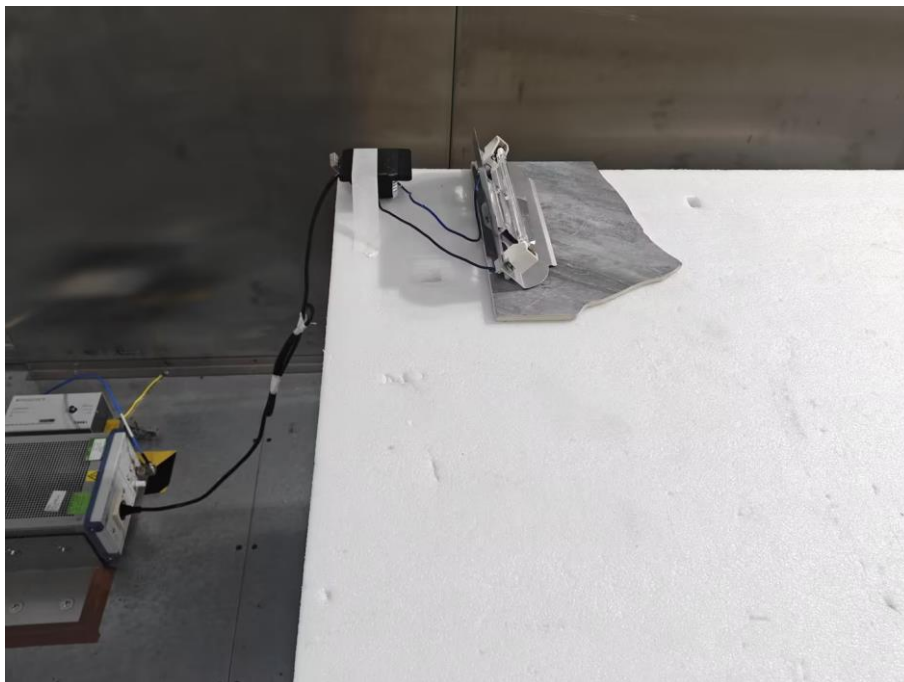


EXHIBIT B - TEST SETUP PHOTOGRAPHS

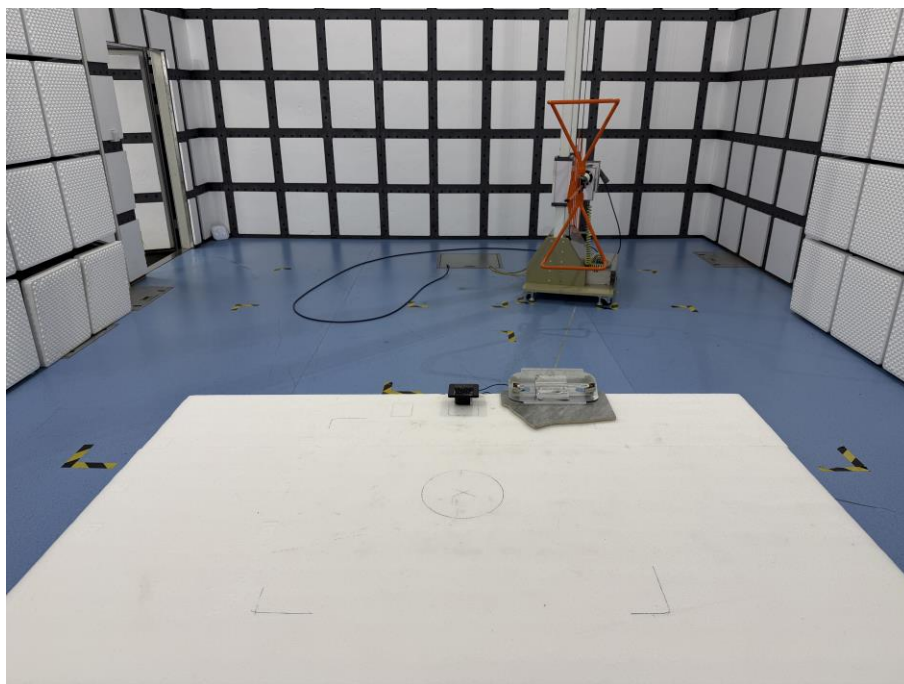
CE - Front View



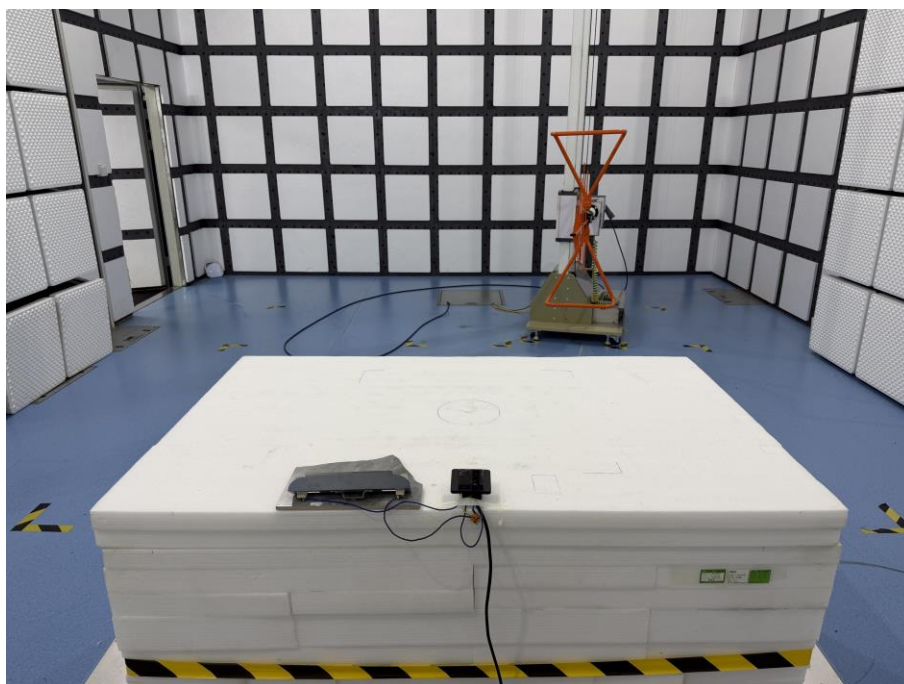
CE - Side View



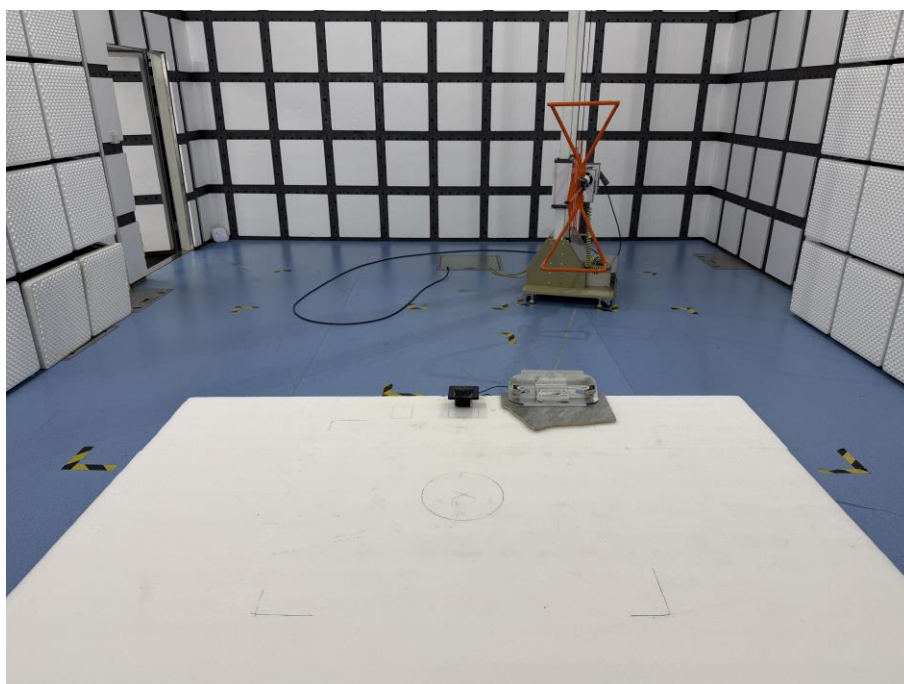
RE - Front View (Below 1GHz)



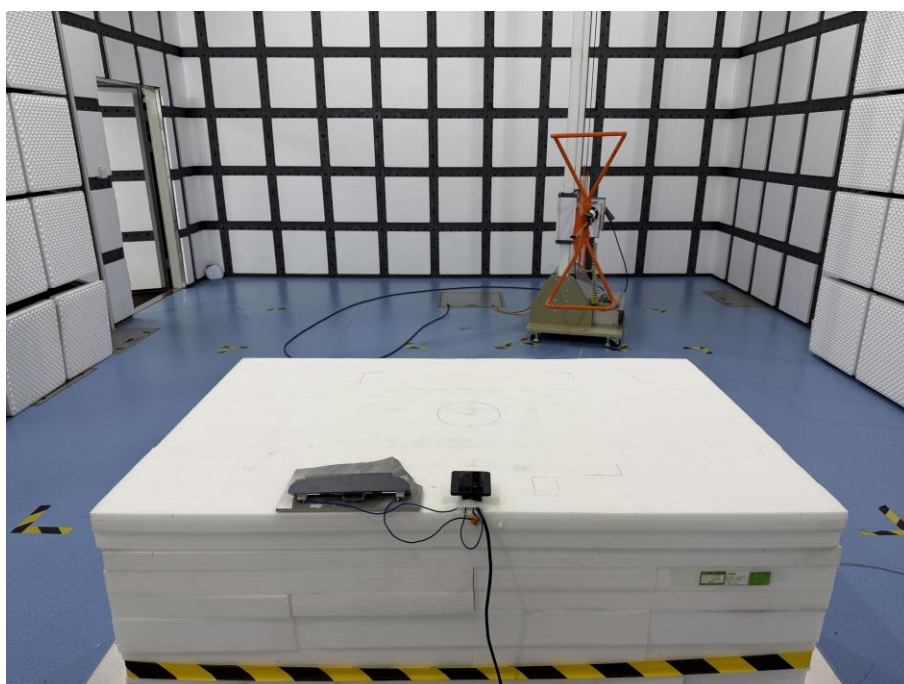
RE - Back View (Below 1GHz)



RE - Front View (Above 1GHz)



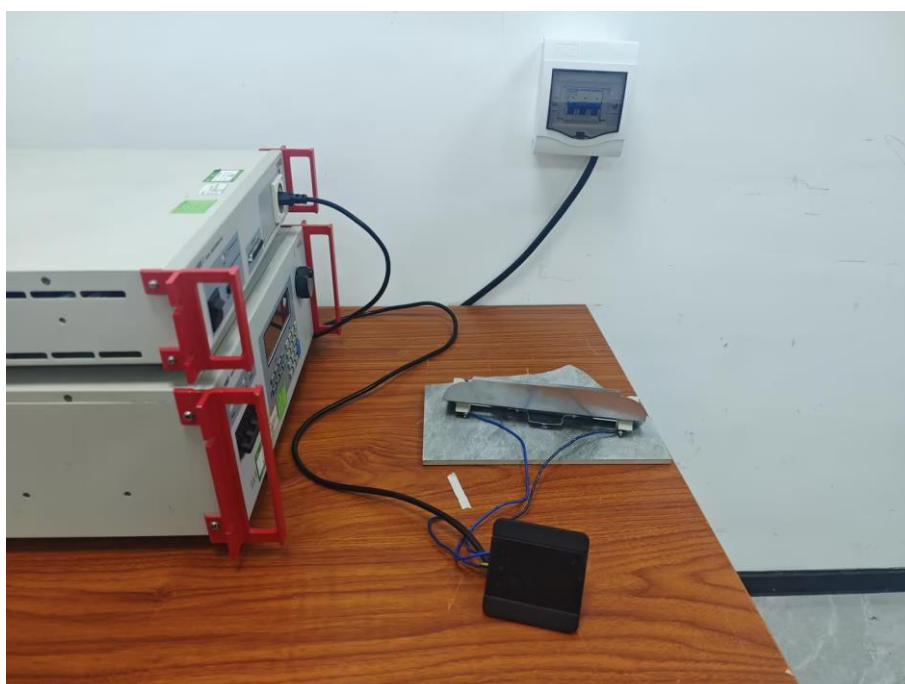
RE - Back View (Above 1GHz)



Electrostatic Discharge



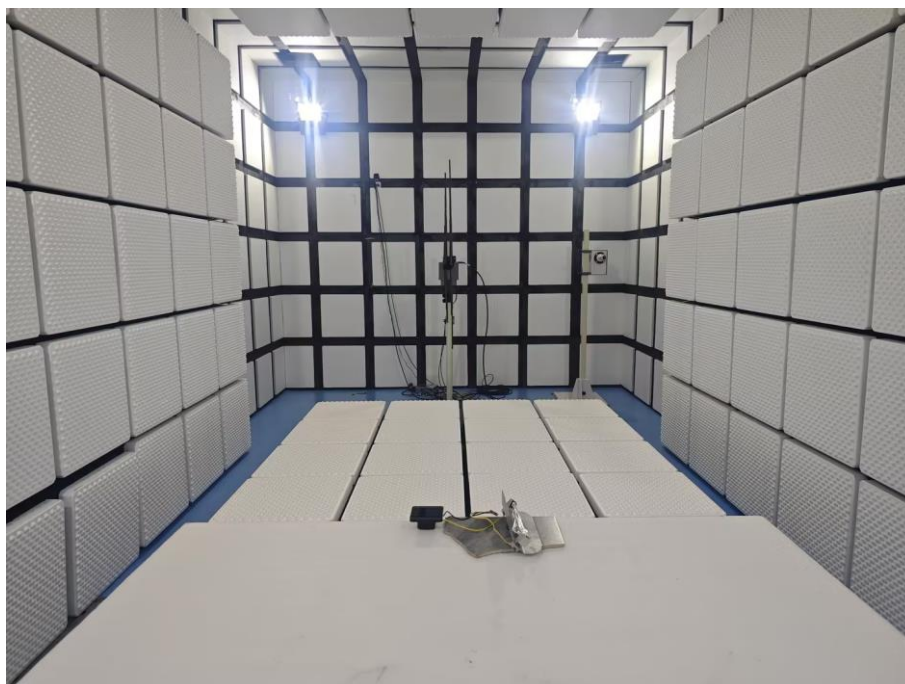
Harmonic & Flicker



RS - Front View (Below 1GHz)



RS - Back View (Below 1GHz)



RS - Front View (Above 1GHz)



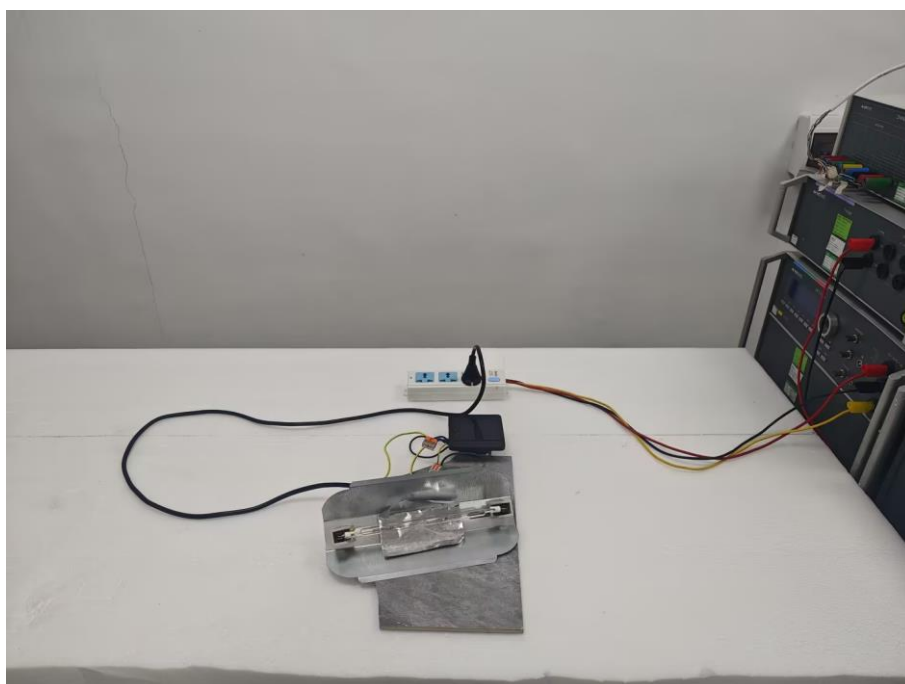
RS - Back View (Above 1GHz)



CS



Electrical fast transients / burst & Surges & Voltage dips and interruptions



Declarations

1. Bay Area Compliance Laboratories Corp. (Fujian) is not responsible for authenticity of any information provided by the applicant. Information from the applicant that may affect test results are marked with an asterisk “★”.
2. Unless otherwise stated, the results shown in this test report refer only to the sample(s) tested.
3. Unless required by the rule provided by the applicant or product regulations, then decision rule in this report did not consider the uncertainty.
4. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor $k=2$ with the 95% confidence interval.
5. This report cannot be reproduced except in full, without prior written approval of Bay Area Compliance Laboratories Corp. (Fujian).
6. This report is valid only with a valid digital signature. The digital signature may be available only under the adobe software above version 7.0.

PRODUCT SIMILARITY DECLARATION LETTER

XIAMEN HYSEN CONTROL TECHNOLOGY CO., LTD
No.888 Yuan long Industrial Park, HaicangDistrict, Xiamen, Fujian, China

Declaration of Model Difference

To Whom It May Concern,

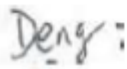
We XIAMEN HYSEN CONTROL TECHNOLOGY CO., LTD hereby declare that there are some differences between series models and tested model(s). Details are as below:

Products Description	Name:	THERMOSTAT	
	Brand:	N/A	
	Manufacturer:	XIAMEN HYSEN CONTROL TECHNOLOGY CO., LTD	
	Project No.:	2507A04674E-EM、 2507A04674E-RF	
Differences Description			
Tested Model(s)	Series Models	Differences Items	Details
HY531WE WIFI	HY531, HY531WW WIFI, HY531LD WIFI, HY531AC WIFI, HY531WE, HY531WW, HY531LD, HY531AC	Model Name	All are the same except model name. (Each model comes in two colors: black and white.)
	HY131WE WIFI, HY131, HY131WW WIFI, HY131LD WIFI, HY131AC WIFI, HY131WE, HY131WW, HY131LD, HY131AC	Model Name and appearance	All are the same except model name and appearance (The appearance widths of the products vary). Each models is available in black and white.

Note: Tested Model(s) mean the models have been tested by Bay Area Compliance Laboratories Corp.(Fujian).

Except for the differences in above table, we declare the products are identical in every other way. We guarantee all the information provided above is true, and notice that we'll bear all the consequences caused by any false information or concealing.

Best Regards,

Signature: 
Print Name: Deng
Title: Manager

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