

# TEST REPORT

Applicant/ Manufacturer: Shenzhen Huafului Technology Co., Ltd.  
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Report Number : SZ1230223-08060E-EM-01

## Test Standard (s)

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

## Sample Description

Product Type: SmartWatch  
Model No.: C21  
Multiple Model(s) No.: N/A  
Trade Mark: CUBOT  
Date Received: 2023/02/23  
Report Date: 2023/03/03

Test Result:	Pass*
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\* In the configuration tested, the EUT complied with the standards above.

**Prepared and Checked By:**

**Approved By:**

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EMC Engineer

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Note: BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk "\*". Customer model name, addresses, names, trademarks etc. are not considered data.

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	SZ1230223-08060E-EM-01	Original Report	2023-03-03

## GENERAL INFORMATION

### Product Description for Equipment under Test (EUT)

Voltage Range	DC 5V from adapter or DC 3.8V from battery
Highest operating frequency	2480MHz
Test Sample serial number	22FE_1 (Assigned by BACL, Shenzhen)
Sample/EUT Status	Good condition

### Objective

This test report is in accordance with EN 55032: Electromagnetic compatibility of multimedia equipment - Emission Requirements. EN 55035: Electromagnetic compatibility of multimedia equipment -Immunity requirements. EN IEC 61000-3-2, Limits – Limits for harmonic current emissions (equipment input current up to and including 16 A per phase), and also in accordance with EN 61000-3-3, Limits Section 3; Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current<16A.

The objective is to determine the compliance of EUT with EN 55032, EN 55035, EN IEC 61000-3-2 and EN 61000-3-3.

### Performance criterion

#### Performance criterion A

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.

The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

#### Performance criterion B

During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test. After the test, the equipment shall continue to operate as intended without operator intervention; no degradation of performance or loss of function is allowed, below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level (or the permissible performance loss), or recovery time, is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

#### Performance criterion C

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. A reboot or re-start operation is allowed.

Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

**Measurement Uncertainty**

Item	Frequency Range		Expanded Measurement uncertainty
Conducted Emissions	AC Mains	150KHz~30MHz	2.84 dB (k=2, 95% level of confidence)
Radiated emission	30MHz~200MHz	Horizontal	4.26 dB (k=2, 95% level of confidence)
	30MHz~200MHz	Vertical	4.14 dB (k=2, 95% level of confidence)
	200MHz~1000MHz	Horizontal	4.64 dB (k=2, 95% level of confidence)
	200MHz~1000MHz	Vertical	4.42 dB (k=2, 95% level of confidence)
	1GHz~6GHz	/	4.96 dB (k=2, 95% level of confidence)

*Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.*

**Test Facility**

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 5F(B-West) , 6F, 7F, the 3rd Phase of Wan Li Industrial Building D, Shihua Rd, FuTian Free Trade Zone, Shenzhen, China.

Each test item follows test standards and with no deviation.

## SYSTEM TEST CONFIGURATION

### Justification

The system was configured for testing in normal mode.

Test Mode: Charging & Working

### EUT exercise software

No software was used.

### Equipment Modifications

No modification was made to the EUT tested.

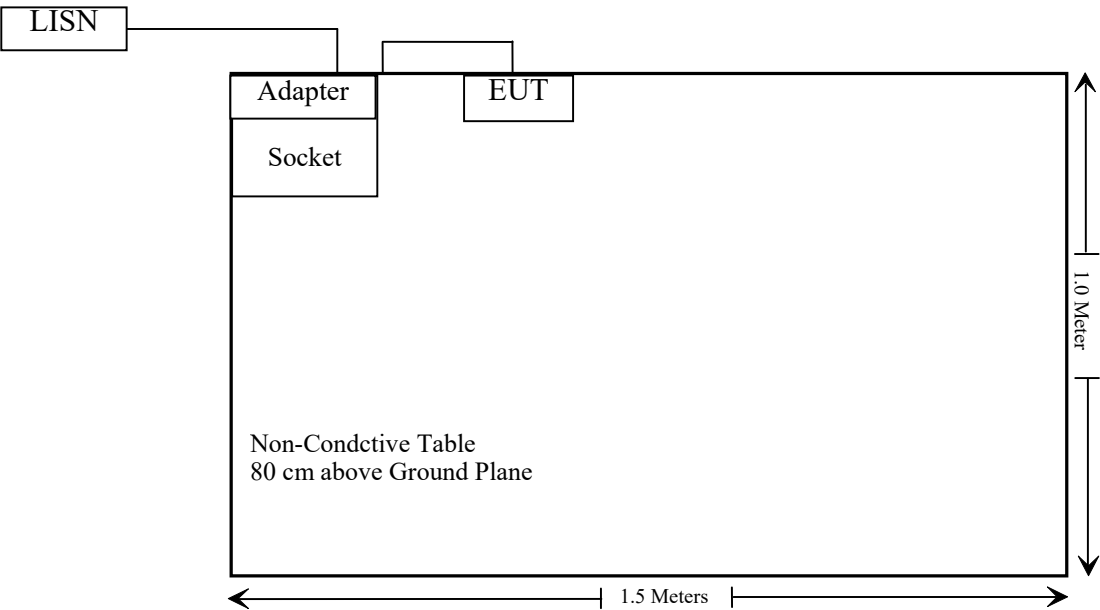
### Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
benco	Adapter	TPA-67050150VU	TTYW132183114403

### External I/O Cable

Cable Description	Length (m)	From/Port	To
Unshielded un-detachable AC cable	1.2	Socket	LISN
Shielded detachable USB cable	0.6	EUT	Adapter

Block Diagram of Test Setup





**SUMMARY OF TEST REPORT****EN 55032**

<b>RULE</b>	<b>DESCRIPTION</b>	<b>RESULTS</b>
§ A.3	Conducted Disturbance	Compliant
§ A.2	Radiated Disturbance	Compliant

**EN 55035**

<b>RULE</b>	<b>DESCRIPTION</b>	<b>RESULTS</b>
§4.2.1	Electrostatic Discharge IEC 61000-4-2	Compliant
§4.2.2.2	Continuous Radiated Immunity IEC 61000-4-3	Compliant
§4.2.2.3	Continuous Conducted Immunity IEC 61000-4-6	Compliant
§4.2.3	Power Frequency Magnetic Fields IEC 61000-4-8	Compliant
§4.2.4	Electrical Fast Transients IEC 61000-4-4	Compliant
§4.2.5	Surges IEC 61000-4-5	Compliant
§4.2.6	Voltage Dips And Interruptions, IEC 61000-4-11	Compliant
§4.2.7	Broadband impulsive conducted disturbances	Not Applicable

**EN IEC 61000-3-2**

<b>Rule</b>	<b>Description</b>	<b>Results</b>
§7	Harmonic Current Emissions	Not Applicable

**EN 61000-3-3**

<b>Rule</b>	<b>Description</b>	<b>Results</b>
§5	Voltage Fluctuation and Flicker	Compliant

**TEST EQUIPMENT LIST**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
EMI					
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2023/02/08	2024/02/07
Rohde & Schwarz	LISN	ENV216	101613	2023/02/08	2024/02/07
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2022/11/11	2023/11/10
Unknown	CE Cable	CE Cable	UF A210B-1-0720-504504	2022/11/11	2023/11/10
Rohde & Schwarz	CE Test software	EMC 32	V8.53.0	NCR	NCR
R&S	EMI Test Receiver	ESR3	102455	2023/02/08	2024/02/07
Sonoma instrument	Pre-amplifier	310 N	186238	2022/11/11	2023/11/10
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2020/12/22	2023/12/21
Unknown	Cable	Chamber Cable 1	F-03-EM236	2022/11/11	2023/11/10
Unknown	Cable	Chamber Cable 4	EC-007	2022/11/11	2023/11/10
Audix	EMI Test software	E3	19821b(V9)	NCR	NCR
Rohde & Schwarz	Spectrum Analyzer	FSV40	101605	2023/02/10	2024/02/09
COM-POWER	Pre-amplifier	PA-122	181919	2022/11/25	2023/11/24
Sunol Sciences	Horn Antenna	3115	9107-3694	2021/01/15	2024/01/14
Insulted Wire Inc.	RF Cable	SPS-2503-3150	02222010	2022/11/25	2023/11/24
Unknown	RF Cable	W1101-EQ1 OUT	F-19-EM005	2022/11/25	2023/11/24
Audix	EMI Test software	E3	191218(V9)	NCR	NCR
EM TEST	Harmonics/flicker Analyer	DPA 500N	V0939105176	2023/02/10	2024/02/09
EM TEST	AC Source	ACS500	303276	2023/02/08	2024/02/07
EM Test	DPA.Control	V5.0.3.0	Unknown	NCR	NCR

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
EMS					
EM Test	ESD Generator	NSG 438	1476	2022/10/07	2023/10/06
HP	Signal Generator	8665B	3744A01692	2023/02/08	2024/02/07
AR	Amplifier	500W1000B	0348446	NCR	NCR
AR	Amplifier	60S1G6	0348712	NCR	NCR
AR	Antenna	ATL80M1G	0348837	NCR	NCR
AR	Antenna	ATT700M12G	0349411	NCR	NCR
BACL	Test Software	VEE PRO	V2.3 VXE	NCR	NCR
HP	Signal Generator	8648C	3426A01345	2023/02/08	2024/02/07
A&R	Power Amplifier	15A250	13444	NCR	NCR
WEINSCHEL	6dB Attenuator	50-6	R4376	NCR	NCR
Com-Power Corporation	CDN	CDN M325E	521145	2022/06/27	2023/06/26
BACL	Test Software	VEE PRO	V2.3 VXE	NCR	NCR
EM TEST	EMS Combination Tester	UCS 500 N5	V0939105172	2022/10/07	2023/10/06
EM TEST	AC Source	MV2616	V0939105173	2022/10/07	2023/10/06
EM TEST	CDN	CNV 504N	V0939105174	2022/04/01	2023/03/31
EM TEST	Loop Antenna	MS100	0809-05	2021/12/27	2024/12/26
EM TEST	Current Transformer	MC 2630	0309-59	2022/04/11	2023/04/10
EM TEST	IEC.Control	V5.1.3.0	135689	NCR	NCR

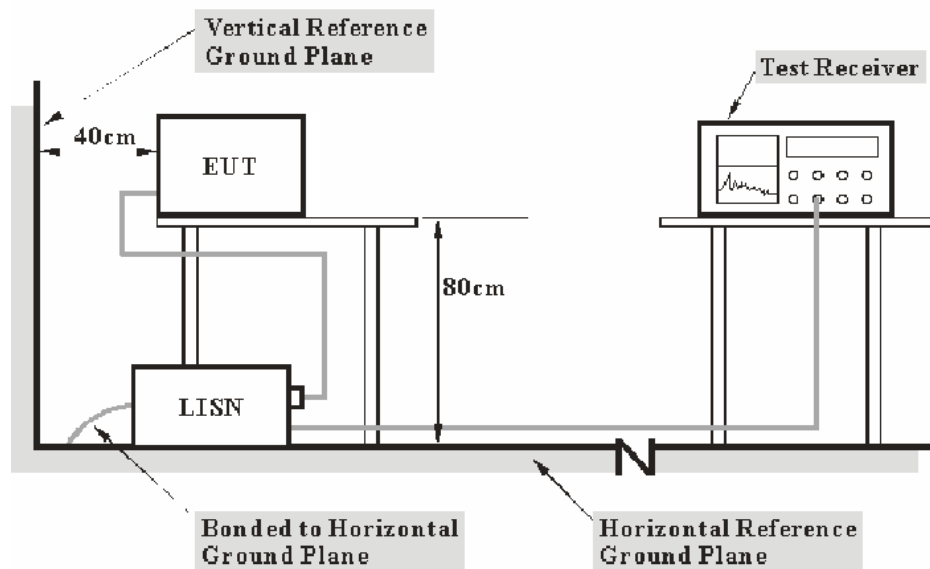
\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

## EN 55032 §A.3 - CONDUCTED DISTURBANCE

### Applicable Standard

According to EN 55032 §A.3

### Test System Setup



Note: 1. Support units were connected to second LISN.  
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The measurement procedure of EUT setup is in according with CISPR 16-1-1:2010+A1:2010+A2:2014, CISPR 16-2-1:2014. The related limit was specified in the EN 55032.

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 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.

All final data was recorded in the Quasi-peak and average detection mode.

## Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN/ISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

$$\text{Correction Factor} = \text{LISN/ISN VDF} + \text{Cable Loss} + \text{Transient Limiter Attenuation}$$

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 7 dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

## Test Results Summary

According to the recorded data in following table, the EUT complied with the limit of EN 55032

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

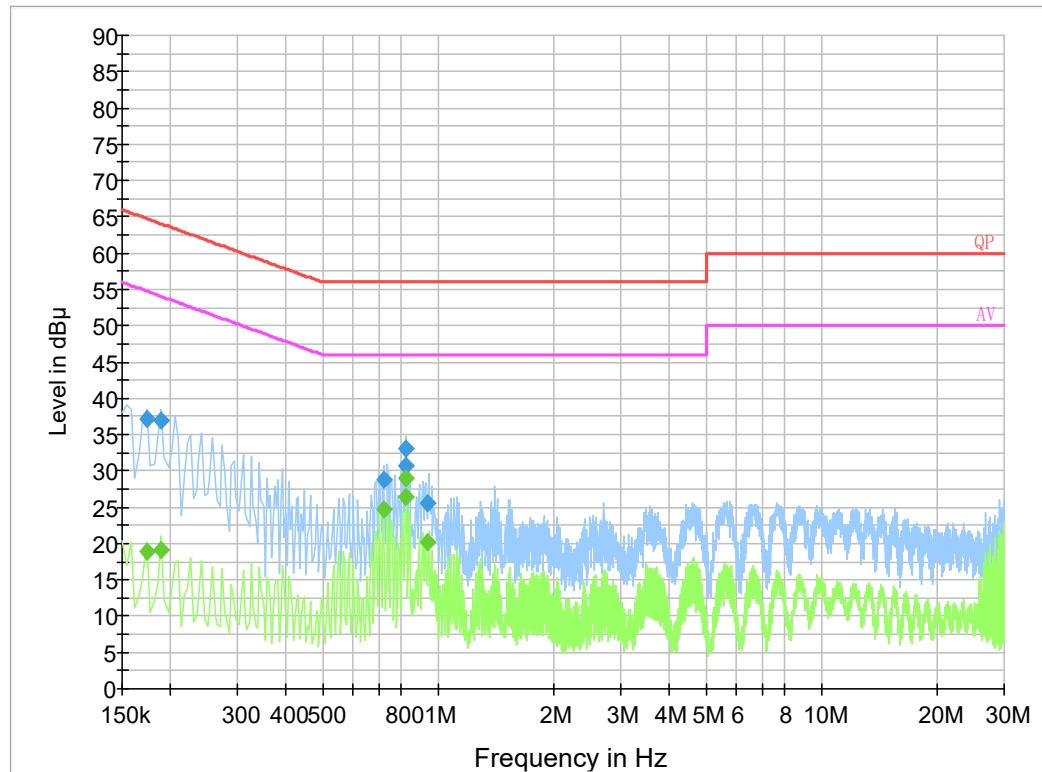
In BACL,  $U_{(Lm)}$  is less than  $U_{cispr}$ , if  $L_m$  is less than  $L_{lim}$ , it implies that the EUT complies with the limit.

## Test Data

### Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

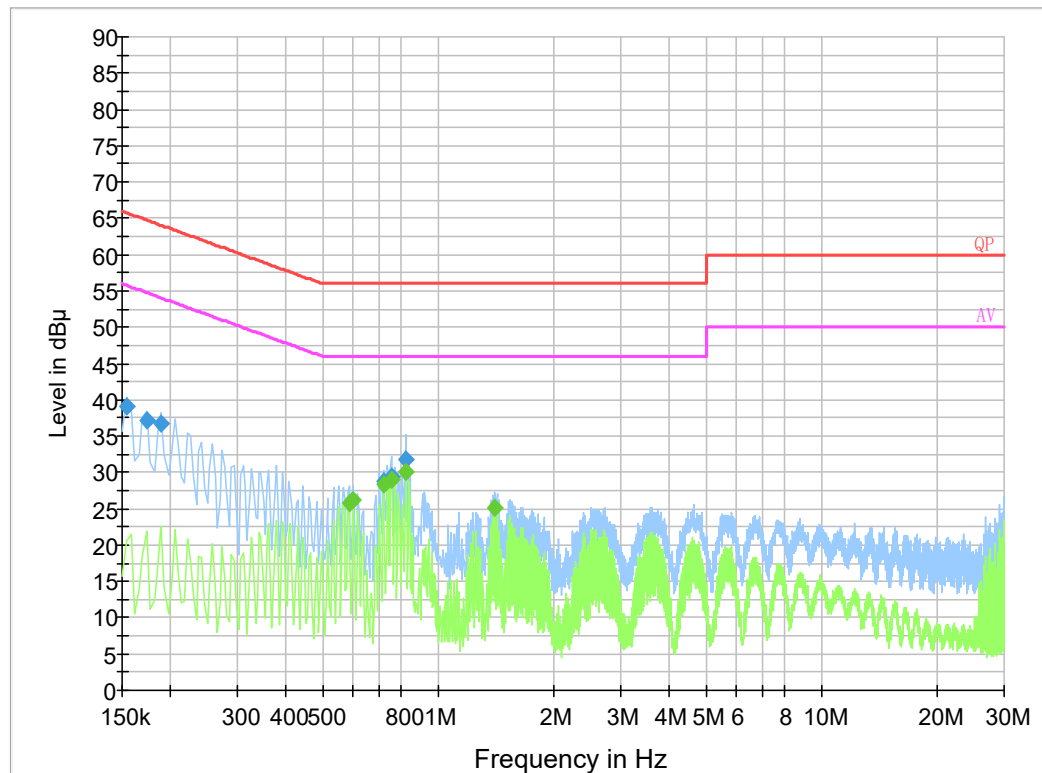
*The testing was performed by Macy Shi on 2023-03-01.*

**AC 230V/50 Hz, Line:****Final Result 1**

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.173500	37.2	9.000	L1	20.4	27.6	64.8
0.189500	37.0	9.000	L1	20.3	27.1	64.1
0.723170	28.9	9.000	L1	20.5	27.1	56.0
0.822150	30.7	9.000	L1	20.4	25.3	56.0
0.825610	33.1	9.000	L1	20.4	22.9	56.0
0.943810	25.5	9.000	L1	20.4	30.5	56.0

**Final Result 2**

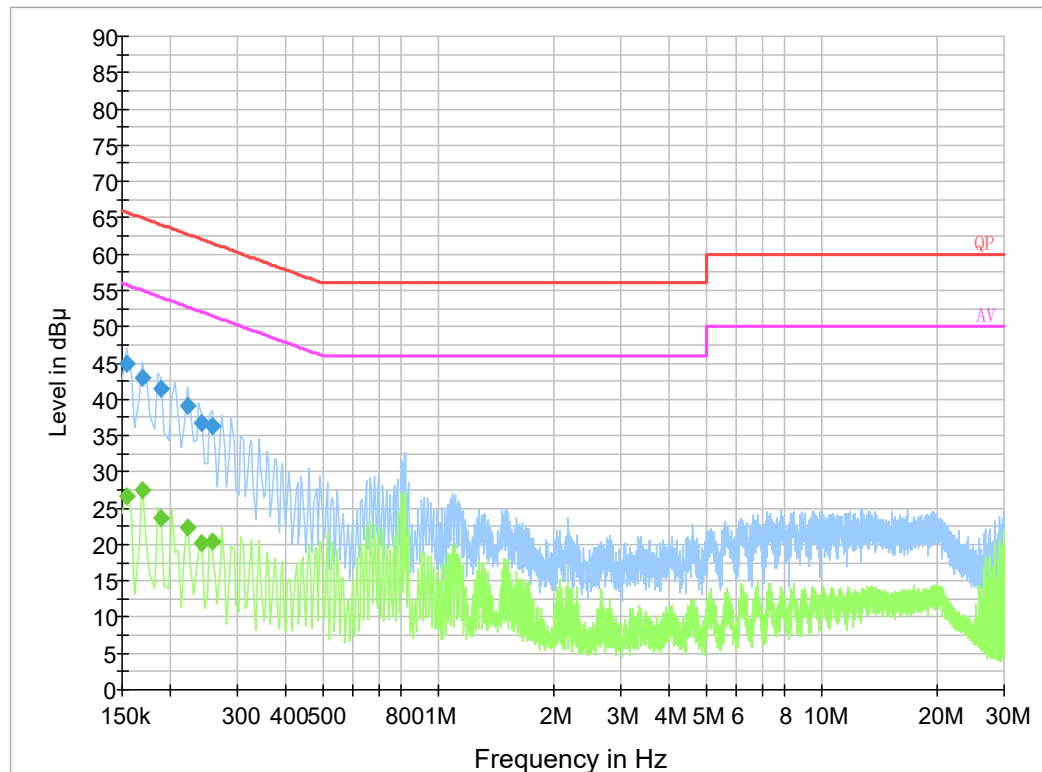
Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.173500	18.8	9.000	L1	20.4	36.0	54.8
0.189500	19.1	9.000	L1	20.3	35.0	54.1
0.723170	24.7	9.000	L1	20.5	21.3	46.0
0.822150	26.4	9.000	L1	20.4	19.6	46.0
0.825610	28.9	9.000	L1	20.4	17.1	46.0
0.943810	20.2	9.000	L1	20.4	25.8	46.0

**AC 230 V /50 Hz, Neutral****Final Result 1**

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.154000	39.2	9.000	N	20.4	26.6	65.8
0.173500	37.2	9.000	N	20.4	27.6	64.8
0.189500	36.7	9.000	N	20.4	27.3	64.1
0.723170	28.7	9.000	N	20.4	27.3	56.0
0.754630	29.5	9.000	N	20.4	26.5	56.0
0.825610	31.7	9.000	N	20.4	24.3	56.0

**Final Result 2**

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.586000	25.7	9.000	N	20.4	20.3	46.0
0.602000	26.1	9.000	N	20.4	19.9	46.0
0.722000	28.3	9.000	N	20.4	17.7	46.0
0.758000	28.9	9.000	N	20.4	17.1	46.0
0.826000	30.0	9.000	N	20.4	16.0	46.0
1.410000	25.1	9.000	N	20.4	20.9	46.0

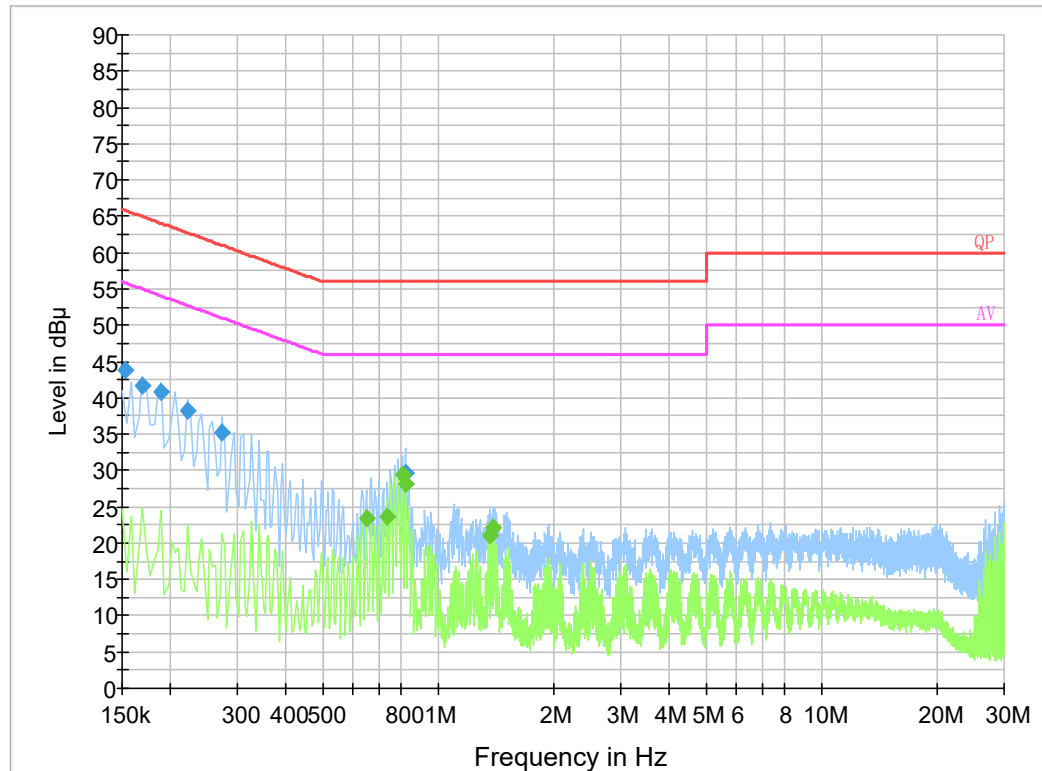
**AC 110 V /60 Hz, Line:****Final Result 1**

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.154000	44.8	9.000	L1	20.3	21.0	65.8
0.169500	42.9	9.000	L1	20.4	22.1	65.0
0.189500	41.5	9.000	L1	20.3	22.6	64.1
0.221500	39.2	9.000	L1	20.3	23.6	62.8
0.241500	36.8	9.000	L1	20.3	25.2	62.0
0.257500	36.4	9.000	L1	20.3	25.2	61.5

**Final Result 2**

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.154000	26.7	9.000	L1	20.3	29.1	55.8
0.169500	27.5	9.000	L1	20.4	27.5	55.0
0.189500	23.6	9.000	L1	20.3	30.5	54.1
0.221500	22.3	9.000	L1	20.3	30.4	52.8
0.241500	20.2	9.000	L1	20.3	31.9	52.0
0.257500	20.4	9.000	L1	20.3	31.1	51.5



**AC 110V/60 Hz, Neutral****Final Result 1**

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.153500	43.8	9.000	N	20.4	22.0	65.8
0.169500	41.7	9.000	N	20.4	23.3	65.0
0.189500	40.8	9.000	N	20.4	23.2	64.1
0.221500	38.3	9.000	N	20.4	24.5	62.8
0.273500	35.3	9.000	N	20.4	25.7	61.0
0.821670	29.7	9.000	N	20.4	26.3	56.0

**Final Result 2**

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.650000	23.4	9.000	N	20.4	22.6	46.0
0.734000	23.7	9.000	N	20.4	22.3	46.0
0.806000	29.5	9.000	N	20.4	16.5	46.0
0.822000	28.2	9.000	N	20.4	17.8	46.0
1.370000	21.0	9.000	N	20.4	25.0	46.0
1.390000	22.0	9.000	N	20.4	24.0	46.0

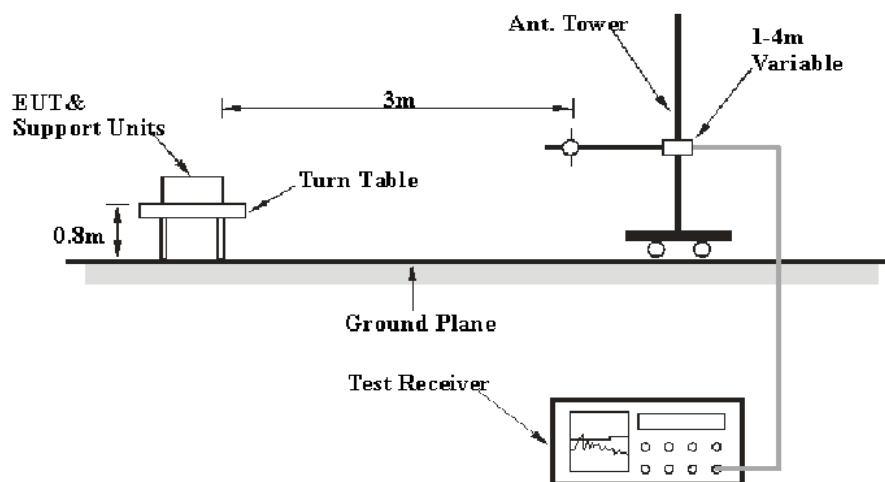
## EN 55032 §A.2-RADIATED DISTURBANCE

### Applicable Standard

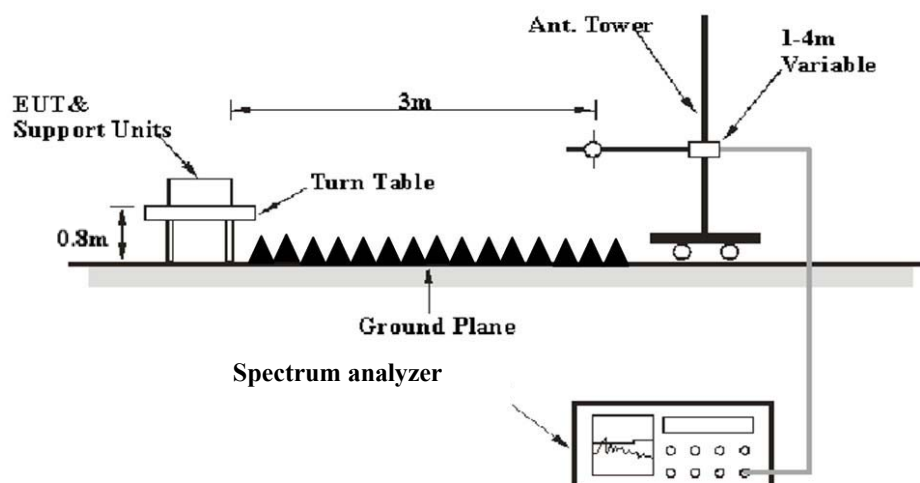
EN 55032 §A.2

### Test System Setup

Below 1 GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the CISPR16-1-4:2010+A1:2012, CISPR 16-2-3:2010+A1:2010+A2:2014. The limit was specified in EN 55032.

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 and Spectrum analyzer Setup

During the radiated emission test, the EMI test receiver and spectrum analyzer setup was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
1 GHz~6 GHz	1 MHz	3 MHz	/	Peak
1 GHz~6 GHz	1 MHz	10 Hz	/	Average

## Test Procedure

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

## Corrected Amplitude & Margin Calculation

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

$$\text{Correction factor} = \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

$$\text{Corrected Level} = \text{Read Level} + \text{Correction factor}$$

The “**Over limit**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6 dB means the emission is 6 dB below the limit for Class B. The equation for margin calculation is as follows:

$$\text{Over limit} = \text{Corrected Level} - \text{Limit.}$$

## Test Results Summary

According to the data in the following table, the EUT complied with the limit of EN 55032.

## Test Data

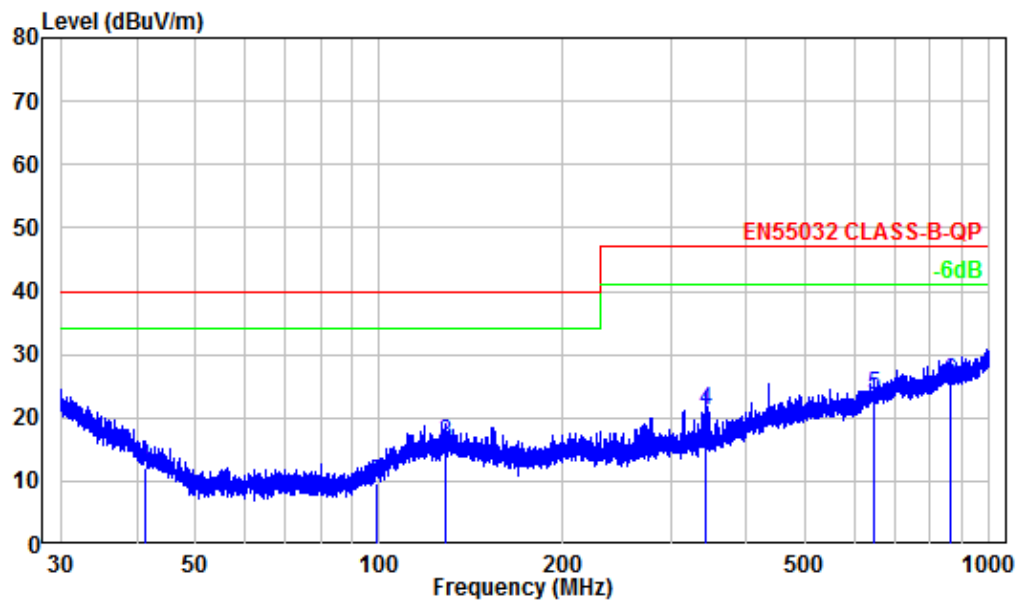
### Environmental Conditions

Temperature:	24~25℃
Relative Humidity:	45~55%
ATM Pressure:	101.0 kPa

*The testing was performed by Anson Su on 2023-02-28 for below 1GHz and Tom Liu on 2023-02-28 for above 1GHz.*

30 MHz~1 GHz

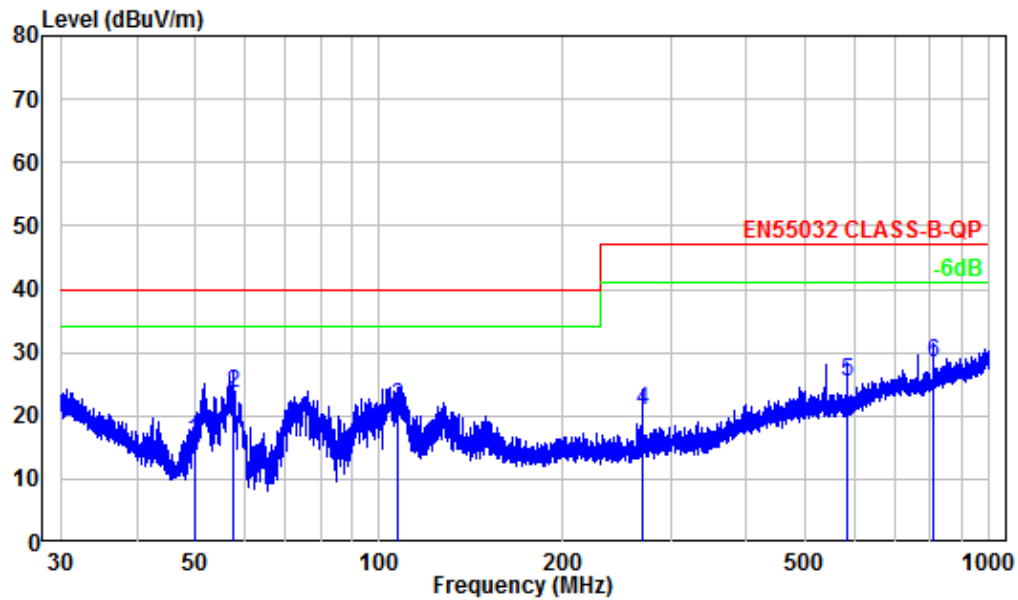
Horizontal



Site : chamber  
Condition: 3m Horizontal  
Job No. : SZ1230223-08060E-EM  
Test Mode: Charging & Working

	Freq Factor		Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	41.39	-11.27	23.48	12.21	40.00	-27.79	QP
2	98.96	-14.02	23.76	9.74	40.00	-30.26	QP
3	127.94	-10.29	26.24	15.95	40.00	-24.05	QP
4	343.33	-9.86	31.04	21.18	47.00	-25.82	QP
5	645.69	-2.62	26.02	23.40	47.00	-23.60	QP
6	861.17	0.37	25.43	25.80	47.00	-21.20	QP

## Vertical

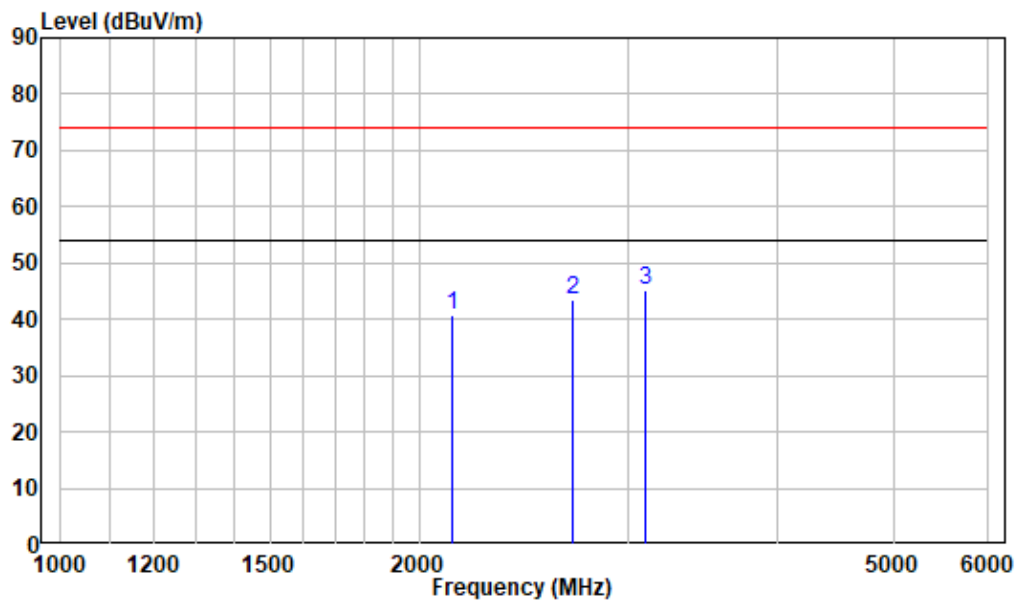


Site : chamber  
Condition: 3m Vertical  
Job No. : SZ1230223-08060E-EM  
Test Mode: Charging & Working

	Freq Factor		Read Level	Level	Limit	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	49.66	-16.46	32.32	15.86	40.00	-24.14	QP
2	57.64	-16.53	39.93	23.40	40.00	-16.60	QP
3	107.32	-11.83	33.20	21.37	40.00	-18.63	QP
4	270.02	-11.09	32.04	20.95	47.00	-26.05	QP
5	584.79	-4.49	30.00	25.51	47.00	-21.49	QP
6	810.27	-0.40	28.88	28.48	47.00	-18.52	QP

## 1-6 GHz

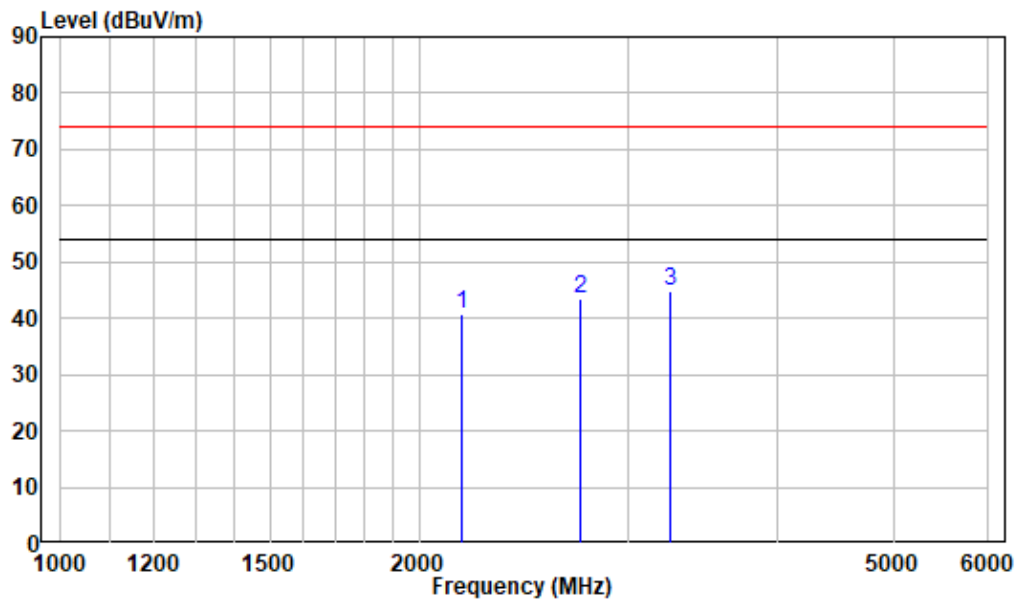
## Horizontal



Site : chamber  
Condition : 3m Horizontal  
Project Number: SZ1230223-08060E-EM  
Test Mode : Charging & Working

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2131.875	-0.63	41.43	40.80	74.00	-33.20	Peak
2	2694.375	1.07	42.49	43.56	74.00	-30.44	Peak
3	3095.000	2.24	43.07	45.31	74.00	-28.69	Peak

## Vertical

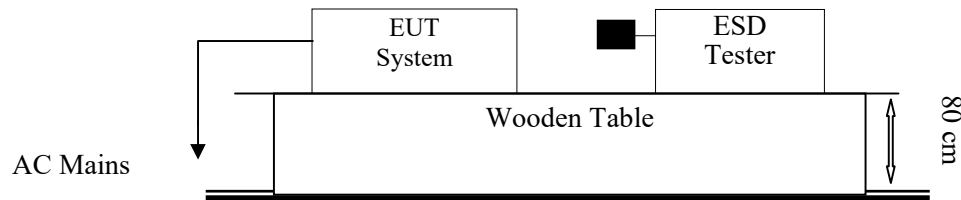


Site : chamber  
 Condition : 3m Vertical  
 Project Number: SZ1230223-08060E-EM  
 Test Mode : Charging & Working

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2175.625	-0.48	41.25	40.77	74.00	-33.23	Peak
2	2731.875	1.28	42.30	43.58	74.00	-30.42	Peak
3	3249.375	2.50	42.46	44.96	74.00	-29.04	Peak

## EN 55035 §4.2.1-ELECTROSTATIC DISCHARGES (IEC 61000-4-2)

### Test System Setup



Remark: ■ is the tip of the electrode

IEC 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 Standard

EN 55035:2017+A11:2020 (IEC 61000-4-2:2008)

### Test Level

Level	Test Voltage Contact Discharge (±kV)	Test Voltage Air Discharge (±kV)
1.	2	2
2.	4	4
3.	6	8
4.	8	15
X.	Special	Special

Performance criterion: B



## Test Procedure

### 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 IEC 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

### Environmental Conditions

Temperature:	25°C
Relative Humidity:	45%
ATM Pressure:	101.0 kPa

*The testing was performed by Ethan Bu on 2023-03-02.*

For test mode: charging&amp;working

**Table 1: Electrostatic Discharge Immunity (Air Discharge)**

IEC 61000-4-2 Test Points	Test Levels							
	-2 kV	+2 kV	-4 kV	+4 kV	-8 kV	+8 kV	-15 kV	+15 kV
Front (1 point)	A	A	A	A	A	A	/	/
Back (1 point)	A	A	A	A	A	A	/	/
Left (2 points)	A	A	A	A	A	A	/	/
Right (1 point)	A	A	A	A	A	A	/	/
Top (2 points)	A	A	A	A	A	A	/	/
Bottom (2 points)	A	A	A	A	A	A	/	/

**Table 2: Electrostatic Discharge Immunity (Direct Contact)**

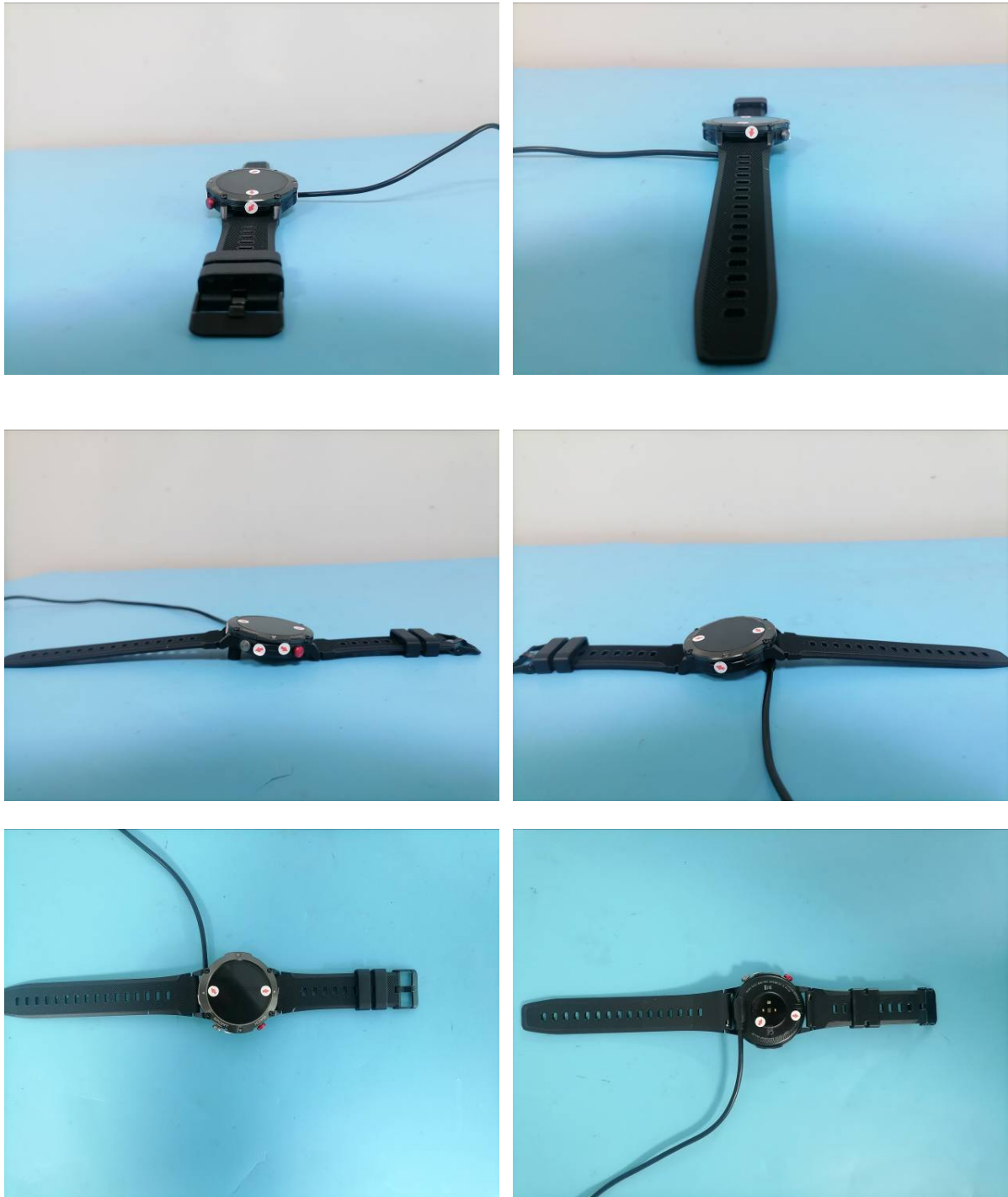
IEC 61000-4-2 Test Points	Test Levels							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
/	/	/	/	/	/	/	/	/

**Table 3: Electrostatic Discharge Immunity (Indirect Contact HCP)**

IEC 61000-4-2 Test Points	Test Levels							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Front Side	A	A	A	A	/	/	/	/
Back Side	A	A	A	A	/	/	/	/
Left Side	A	A	A	A	/	/	/	/
Right Side	A	A	A	A	/	/	/	/

**Table 4: Electrostatic Discharge Immunity (Indirect Contact VCP)**

IEC 61000-4-2 Test Points	Test Levels							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Front Side	A	A	A	A	/	/	/	/
Back Side	A	A	A	A	/	/	/	/
Left Side	A	A	A	A	/	/	/	/
Right Side	A	A	A	A	/	/	/	/



**Note:**  represents air discharge,  represents direct contact

Note: The list is only for photos of the location where the discharge can be made, the others not listed are without discharge points, or not the EUT part.

For test mode: working

**Table 1: Electrostatic Discharge Immunity (Air Discharge)**

IEC 61000-4-2 Test Points	Test Levels							
	-2 kV	+2 kV	-4 kV	+4 kV	-8 kV	+8 kV	-15 kV	+15 kV
Front (1 point)	A	A	A	A	A	A	/	/
Back (1 point)	A	A	A	A	A	A	/	/
Left (2 points)	A	A	A	A	A	A	/	/
Right (1 point)	A	A	A	A	A	A	/	/
Top (2 points)	A	A	A	A	A	A	/	/
Bottom (2 points)	A	A	A	A	A	A	/	/

**Table 2: Electrostatic Discharge Immunity (Direct Contact)**

IEC 61000-4-2 Test Points	Test Levels							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Bottom (1 point)	A	A	A	A	/	/	/	/

**Table 3: Electrostatic Discharge Immunity (Indirect Contact HCP)**

IEC 61000-4-2 Test Points	Test Levels							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Front Side	A	A	A	A	/	/	/	/
Back Side	A	A	A	A	/	/	/	/
Left Side	A	A	A	A	/	/	/	/
Right Side	A	A	A	A	/	/	/	/

**Table 4: Electrostatic Discharge Immunity (Indirect Contact VCP)**

IEC 61000-4-2 Test Points	Test Levels							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Front Side	A	A	A	A	/	/	/	/
Back Side	A	A	A	A	/	/	/	/
Left Side	A	A	A	A	/	/	/	/
Right Side	A	A	A	A	/	/	/	/



**Note:**  represents air discharge,  represents direct contact

Note: The list is only for photos of the location where the discharge can be made, the others not listed are without discharge points, or not the EUT part.

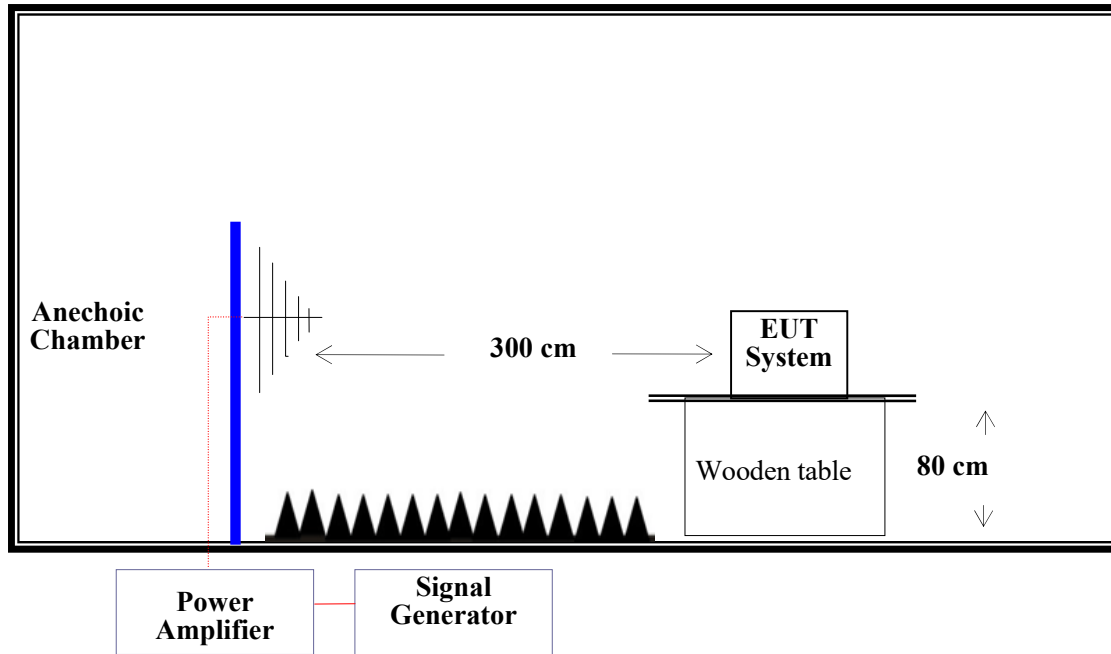
ESD-1



ESD-2



Test setup photo

**EN 55035 §4.2.2.2-CONTINUOUS RADIATED IMMUNITY (IEC 61000-4-3)****Test System Setup****Test Standard**

EN 55035:2017+A11:2020 (IEC 61000-4-3: 2006 + A1:2007 + A2:2010)

**Test Level**

Level	Field Strength V/m
1.	1
2.	3
3.	10
X.	Special

**Performance Criterion: A**

## Test Procedure

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.

All the scanning conditions are as follows:

Condition of Test	Remarks
1. Field Strength	3 V/m (Test level 2)
2. Radiated Signal	AM 80%, 1 kHz Modulation
3. Scanning Frequency	80 – 1000 MHz, 1800MHz, 2600MHz, 3500MHz, 5000MHz
4. Frequency step	1%
5. Dwell Time	1 sec.

## Test Data

### Environmental Conditions

Temperature:	25°C
Relative Humidity:	47%.
ATM Pressure:	101.0 kPa

The testing was performed by Ethan Bu on 2023-03-02.

Frequency (MHz)	Front Side (3 V/m)		Rear Side (3 V/m)		Left Side (3 V/m)		Right Side (3 V/m)	
	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	A	A	A	A	A	A	A	A
1800	A	A	A	A	A	A	A	A
2600	A	A	A	A	A	A	A	A
3500	A	A	A	A	A	A	A	A
5000	A	A	A	A	A	A	A	A

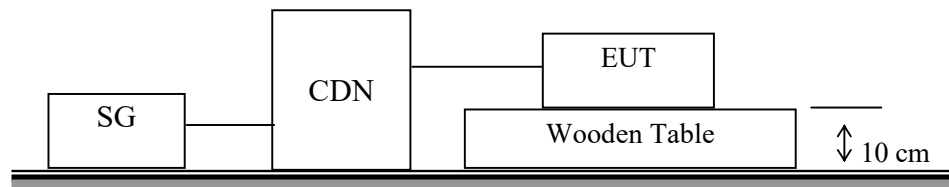




**Test setup photo**

## EN 55035 §4.2.2.3-CONTINUOUS CONDUCTED IMMUNITY (IEC 61000-4-6)

### Test Setup



### Test Standard

EN 55035:2017+A11:2020 (IEC 61000-4-6:2008)

### Test Level

Frequency(MHz)	Voltage Level (r.m.s.) (V)
0.15 to 10	3
10 to 30	3 to 1
30 to 80	1

### 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) The rate of sweep shall not exceed  $1.5 \times 10^{-3}$  decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 7) An artificial ear and sound level meter are used to monitor the sound pressure level. RF communication test set is used to monitor the noise level.
- 8) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

**Test Data****Environmental Conditions**

<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	47 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Ethan Bu on 2023-03-02.*

**AC Mains**

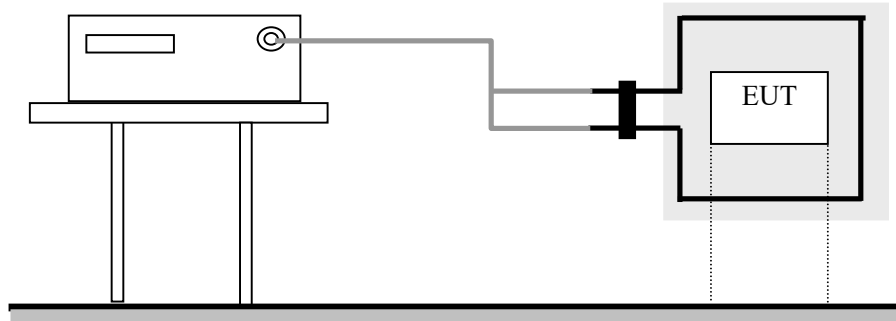
**Modulation:** Amplitude 80%, 150 kHz sine wave

**Test Level:**

<b>Frequency (MHz)</b>	<b>Voltage Level (r.m.s.) U<sub>0</sub></b>	<b>Criterion</b>
0.15 to 10	3	A
10 to 30	3 to 1	A
30 to 80	1	A
X	Special	/



**Test setup photo**

**EN 55035 §4.2.3-POWER FREQUENCY MAGNETIC FIELDS (IEC 61000-4-8)****Test Setup****Test Standard**

EN 55035:2017+A11:2020 (IEC 61000-4-8:2009)

**Test Level**

Level	Magnetic Field Strength A/m
1	1
2	3
3	10
4	30
5	100
X.	Special

**Performance criterion: A****Test Procedure**

The EUT shall be subjected to the test magnetic field by using the induction coil of standard dimensions (1 m\*1 m). The induction coil shall then be rotated by 90° in order to expose the EUT to the test field with different orientations.

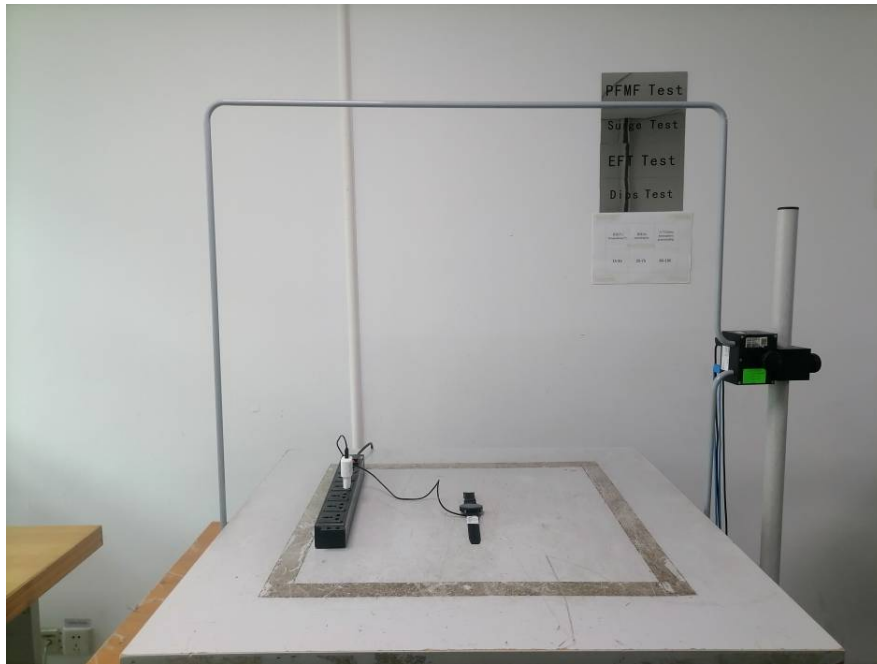
Test Data and Setup Photo

Environmental Conditions

Temperature:	25°C
Relative Humidity:	47%
ATM Pressure:	101.0 kPa

The testing was performed by Ethan Bu on 2023-03-02.

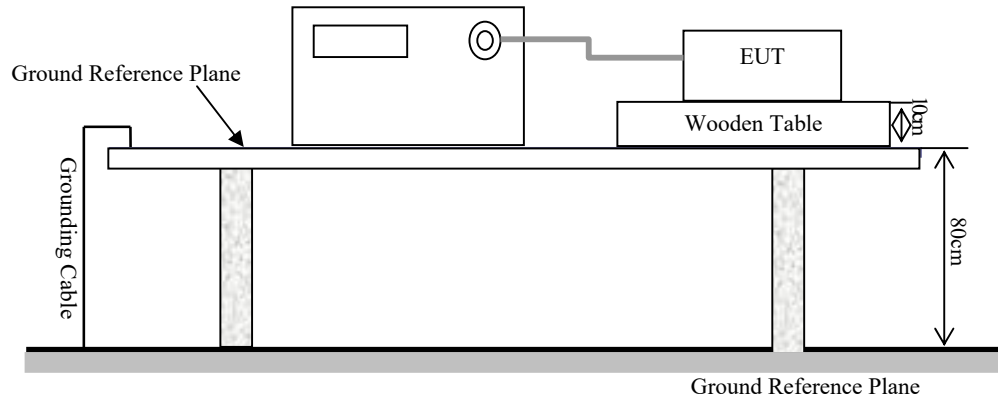
Level	Magnetic Field Strength A/m	X (Horizontal)	Y (Vertical)	Z (Special)
1	1	A	A	A
2	3	/	/	/
3	10	/	/	/
4	30	/	/	/
5	100	/	/	/
X	Special	/	/	/



**Test setup photo**

## EN 55035 §4.2.4-ELECTRICAL FAST TRANSIENTS (IEC 61000-4-4)

### Test System Setup



### Test Standard

EN 55035:2017+A11:2020 (IEC 61000-4-4:2012)

### Test Level

Open Circuit Output Test Voltage $\pm 10\%$		
Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1	0.5 kV	0.25 kV
2	1 kV	0.5 kV
3	2 kV	1 kV
4	4 kV	2 kV
X	Special	Special

### 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 2.4 meter by 2.0 meter was placed between the floor and the table and is connected to the earth by a 2.0 meter ground rod. The ground rod is connected to the test facility's electrical earth.



**Test Data****Environmental Conditions**

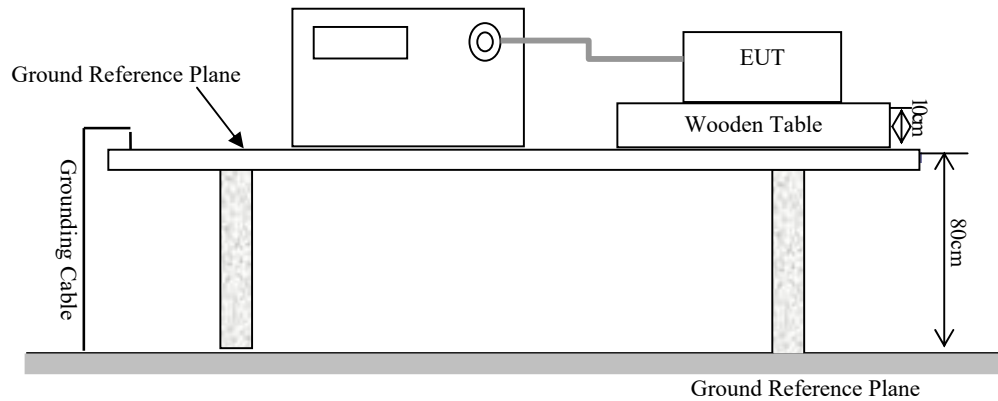
<b>Temperature:</b>	25°C
<b>Relative Humidity:</b>	47%
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Ethan Bu on 2023-03-02.*

<b>EN 61000-4-4 Test Points</b>		<b>Test Levels (kV)</b>							
		<b>+0.5</b>	<b>-0.5</b>	<b>+1.0</b>	<b>-1.0</b>	<b>+2.0</b>	<b>-2.0</b>	<b>+4.0</b>	<b>-4.0</b>
AC Mains Power Input Ports	L	/	/	A	A	/	/	/	/
	N	/	/	A	A	/	/	/	/
	PE	/	/	/	/	/	/	/	/
	L-N	/	/	A	A	/	/	/	/
	L-PE	/	/	/	/	/	/	/	/
	N-PE	/	/	/	/	/	/	/	/
	L+N-PE	/	/	/	/	/	/	/	/
Signal Port	/	/	/	/	/	/	/	/	/



**Test setup photo**

**EN 55035 §4.2.5-SURGES (IEC 61000-4-5)****Test System Setup****Test Standard**

EN 55035:2017+A11:2020 (IEC 61000-4-5:2014)

**Test Level**

Level	Open Circuit Output Test Voltage $\pm 10\%$	Performance Criterion	
		AC Mains	Signal Port
1	0.5 kV	B	C
2	1 kV	B	C
3	2 kV	B	C
4	4 kV	B	C
X	Special	/	/

**Test Procedure**

- 1) For input a.c. power ports, provide a 1.2/50 $\mu$ s voltage surge (at open-circuit condition) and a 8/20  $\mu$ s current surge into a short circuit.
- 2) For telecommunication port, provide a 10/700 $\mu$ s voltage surge (at open-circuit condition) and a 5/320  $\mu$ s current surge into a short circuit.
- 3) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 4) Different phase angles are done individually.
- 5) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

**Test Data****Environmental Conditions**

<b>Temperature:</b>	25°C
<b>Relative Humidity:</b>	47%
<b>ATM Pressure:</b>	101.0 kPa

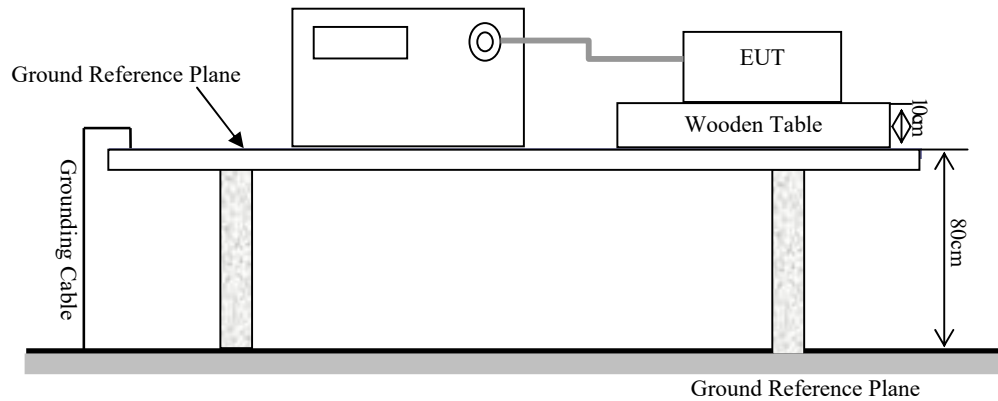
*The testing was performed by Ethan Bu on 2023-03-02.*

**AC Mains Port**

Level	Voltage	Poll	Path	Pass	Fail
1	0.5kV	±	L-N	A	/
2	1kV	±	L-N	A	/
3	2kV	±	/	/	/
4	4kV	±	/	/	/



**Test setup photo**

**EN 55035 §4.2.6-VOLTAGE DIPS AND INTERRUPTIONS (IEC 61000-4-11)****Test Setup****Test Standard**

EN 55035:2017+A11:2020 (IEC 61000-4-11:2004)

Test levels and Performance Criterion

Test Level	Voltage dip and short interruptions %UT	Duration (Periods)	Performance Criterion
1	>95	0.5	B
2	30	25	C
3	>95	250	C

**Test Procedure**

- 1) The interruption is introduced at selected phase angles with specified duration.
- 2) Record any degradation of performance.

**Test Data****Environmental Conditions**

<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	47 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Ethan Bu on 2023-03-02.*

Level	U2 (% Reduction)	Td(Periods)	Phase Angle	N	Pass	Fail
1	0	0.5	0/180	3	A	/
2	70	25	0/180	3	A	/
3	0	250	0/180	3	B	/
/	/	/	/	/	/	/

Note: B means charging interrupt and restore automatically.



Test setup photo

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## **EN IEC 61000-3-2:2019+A1:2021– HARMONIC CURRENT EMISSIONS**

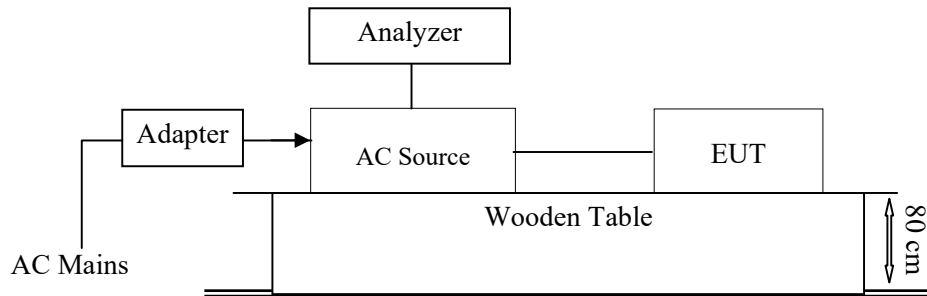
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According to EN IEC 61000-3-2:2019+A1:2021 section 7: Equipment with a rated power of 75 W or less, other than lighting equipment, are not included in this standard.



## EN 61000-3-3 – VOLTAGE FLUCTUATION AND FLICKER

### Test System Setup



### Test Standard

According to EN 61000-3-3:2013+A2:2021

#### 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  $P_{lt}$  shall not be greater than 0,65;
- the value of  $d(t)$  during a voltage change shall not exceed 3,3 % for more than 500 ms;
- the relative steady-state voltage change,  $d_c$ , shall not exceed 3,3 %;
- the maximum relative voltage change  $d_{max}$ , shall not exceed

a) 4 % without additional conditions;

b) 6 % for equipment which is:

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

Note: The cycling frequency will be further limited by the  $P_{st}$  and  $P_{lt}$  limit. For example: a  $d_{max}$  of 6 % producing a rectangular voltage change characteristic twice per hour will give a  $P_{lt}$  of about 0.65.

c) 7 % for equipment which is

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

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

### Environmental Conditions

<b>Temperature:</b>	24°C
<b>Relative Humidity:</b>	47%
<b>ATM Pressure:</b>	101.0 kPa

<b>Date of test:</b>	11:10 2 Mar 2023
<b>Tester:</b>	Ethan Bu
<b>Standard used:</b>	EN/IEC 61000-3-3 Flicker
<b>Short time (Pst):</b>	10 min
<b>Observation time:</b>	120 min (12 Flicker measurement)
<b>Flicker meter:</b>	230V / 50Hz
<b>Model:</b>	C21
<b>EUT operation mode:</b>	Charging&Working

### Maximum Flicker results

	<b>EUT values</b>	<b>Limit</b>	<b>Result</b>
<b>Pst</b>	0.028	1.00	PASS
<b>Plt</b>	0.028	0.65	PASS
<b>dc [%]</b>	0.013	3.30	PASS
<b>dmax [%]</b>	0.055	4.00	PASS
<b>dt [s]</b>	0.000	0.50	PASS



Test setup photo

## **EXHIBIT A - EUT PHOTOGRAPHS**

Please refer to the report number is SZ1230223-08060E-EUT.

## **EXHIBIT B - TEST SETUP PHOTOGRAPHS**

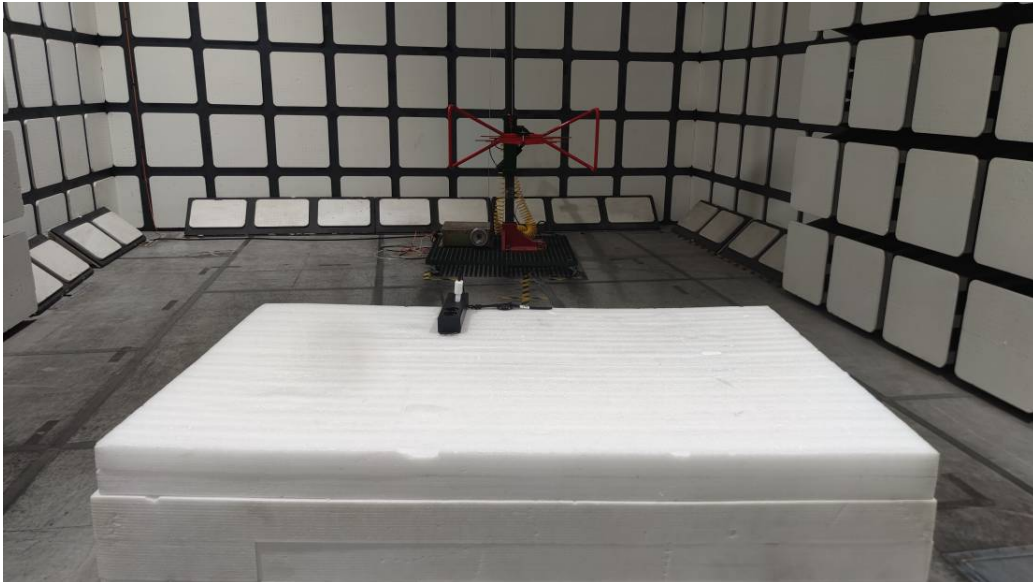
**Conducted Disturbance - Front View**



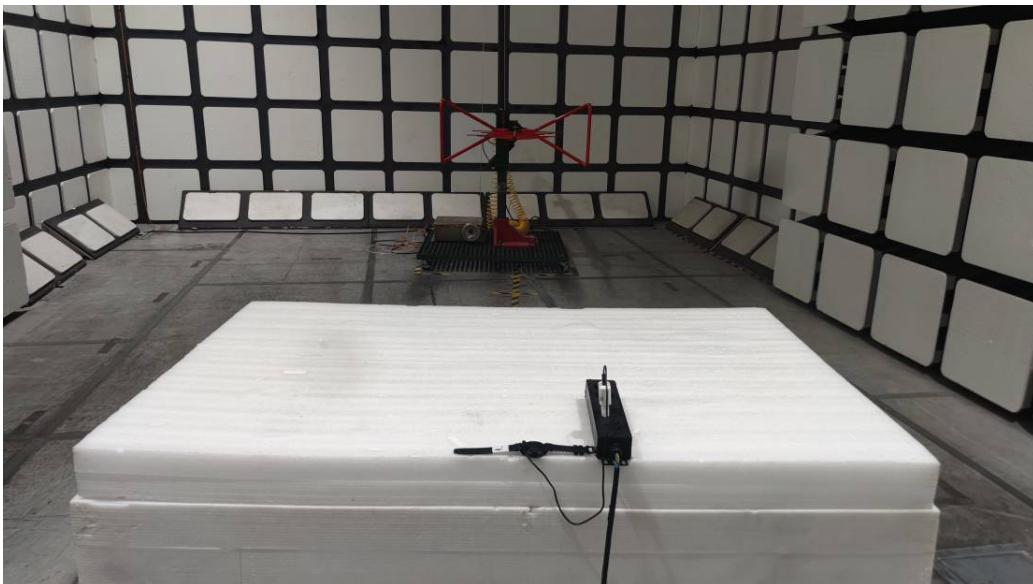
**Conducted Disturbance - Side View**



**Radiated Disturbance – Front View (Below 1 GHz)**

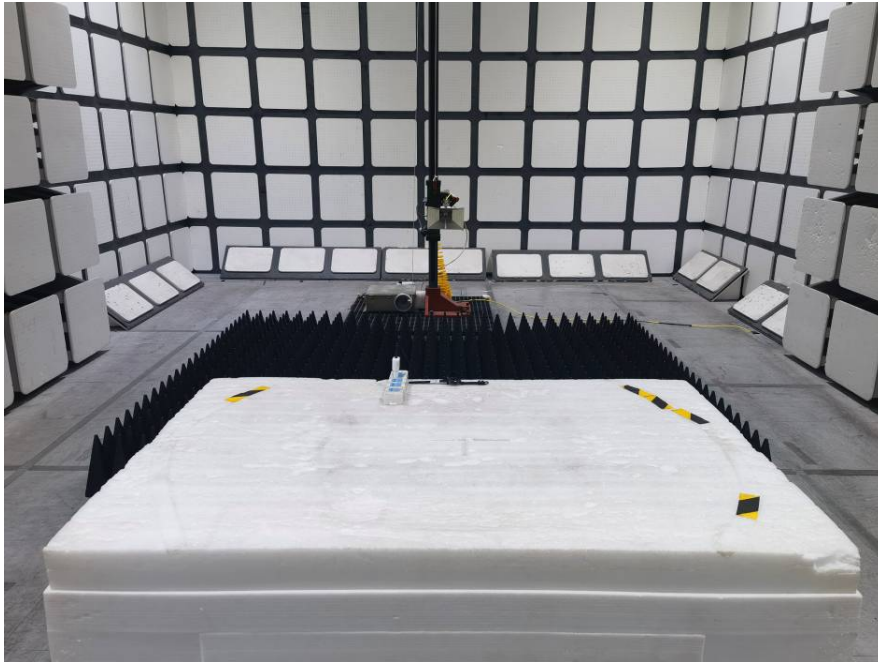


**Radiated Disturbance – Rear View (Below 1 GHz)**

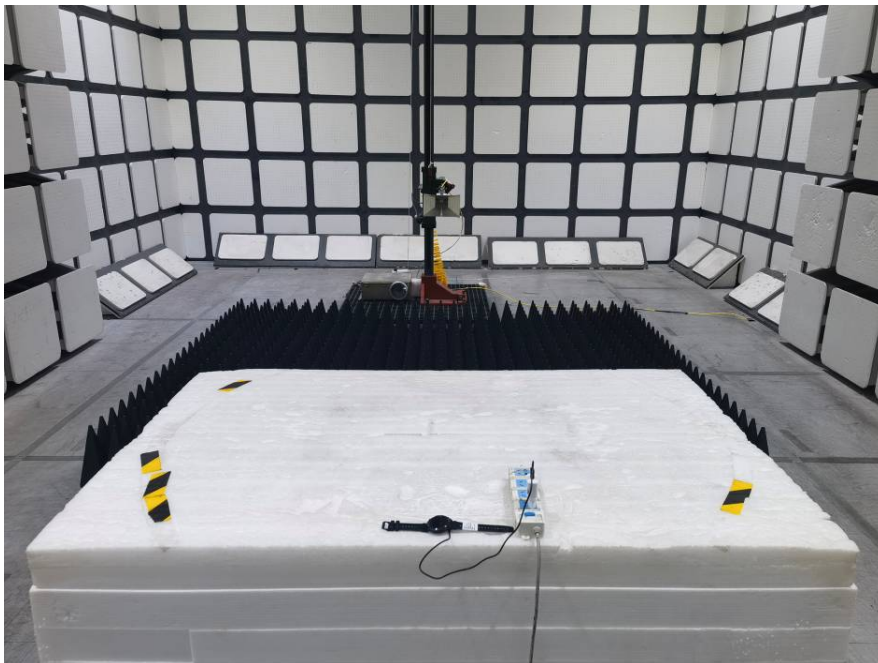




**Radiated Disturbance- View (Above 1 GHz)**



**Radiated Disturbance – Rear View (Above 1 GHz)**



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