TEST REPORT

Applicant:	SIPEC S.P.A
Address of Applicant:	Via Kuliscioff 16/18 20152 Milano-Itaky
Manufacturer:	SIPEC S.P.A
Address of Manufacturer:	Via Kuliscioff 16/18 20152 Milano-Itaky

Equipment Under Test (EUT)

Product Name:	Hub
Model No.:	25423
Applicable standards:	EN 55032:2015+A1:2020 EN 55035:2017+A11:2020
Date of sample receipt:	August 06, 2024
Date of Test:	August 06- 29, 2024
Date of report issued:	August 29, 2024
Test Result :	PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Robinson Luo
Laboratory Manager

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

2 Version

Version No.	Date	Description
00	*August 29, 2024*	*Original*

Prepared By: ***Date:*** *August 29, 2024*

Project Engineer

Check By: ***Date:*** *August 29, 2024*

Reviewer

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4 Test Summary

Test item	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission (up to 1G)	EN 55032	EN 55032	Class B	Pass
Radiated Emission (Above 1G) #	EN 55032	EN 55032	Class B	N/A
Conducted Emission	EN 55032	EN 55032	Class B	N/A
Asymmetric mode conducted emissions	EN 55032	EN 55032	Class B	N/A
Disturbance voltage at antenna terminal	EN 55032	EN 55032	Class B	N/A
Harmonic Emission	EN IEC 61000-3-2	EN IEC 61000-3-2	Class A	N/A
Flicker Emission	EN 61000-3-3	EN 61000-3-3	Clause 5	N/A
Electrostatic discharge	EN 55035	EN 61000-4-2	Contact ±4 kV Air ±2,±4,±8 kV	Pass
Continuous RF electromagnetic field disturbances	EN 55035	EN 61000-4-3	3V/m 80%, 1kHz, AM	Pass
Electrical fast transients	EN 55035	EN 61000-4-4	± 1.0kV for AC port; ± 0.5kV for signal ports	N/A
Surges	EN 55035	EN 61000-4-5	±1kV D.M,for AC port; ±1kV for signal port	N/A
Continuous induced RF disturbance	EN 55035	EN 61000-4-6	0.15MHz to 10MHz:3V 10MHz to 30MHz:3V to 1V 30MHz to 80MHz:1V 80%, 1kHz Amp. Mod.	N/A
Voltage dips and Voltage interruptions	EN 55035	EN 61000-4-11	0 % U_T* for 0.5per 0 % U_T* for 250per 70 % U_T* for 25per	N/A

Remark:

1. *Pass: Comply with the essential requirements in the standard.*
2. *N/A: Not applicable*
3. *U_T: the nominal supply voltage; D.M: Differential Mode; C.M: Common Mode.*
4. *# Refer to EN55032 clause 8 conditional testing procedure :*

Highest internal frequency (Fx)	*Highest measured frequency*
Fx ≤ 108 MHz	*1GHz*
108 MHz < Fx ≤ 500 MHz	*2GHz*
500 MHz < Fx ≤ 1 GHz	*5GHz*
Fx > 1 GHz	*5 x Fx up to a maximum of 6 GHz*
NOTE 1 For FM and TV broadcast receivers, Fx is determined from the highest frequency generated or used excluding the local oscillator and tuned frequencies. *NOTE 2 Fx is defined in 3.1.18.* *NOTE 3 For outdoor units of home satellite receiving systems highest measured frequency shall be 18 GHz.*	

The highest frequency of the internal sources of the EUT is less than 108MHz.

5 General Information

5.1 General Description of EUT

Product Name:	Hub
Model No.:	25423
Power Supply:	Power supply by PC

Remark: The relevant information of the sample is provided by the entrusting company, and the laboratory is not responsible for its authenticity.

5.2 Test mode and Test Voltage

Test mode:	
Operation mode	Keep the EUT in the operation status.
Test voltage:	
Power supply by PC	

5.3 Description of Support Units

Manufacturer	Description	Model	Serial Number
Lenovo	Notebook PC	E40-80	N/A
TP LINK	Router	TL-WDR7500	N/A
YISHE	MOUSE	YS-MA75USB	N/A
Sony	USB disk	8GB	N/A
SanDisk	USB disk	16GB	N/A
Kingston	SD card	16GB	N/A

5.4 Monitoring of EUT for All Immunity Test

Visual:	Monitor the data transmission of the PC and USB disk.
Audio:	N/A

5.5 Deviation from Standards

None.

5.6 Abnormalities from Standard Conditions

None.

5.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **FCC —Registration No.: 381383**

Designation Number: CN5029

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files.

● **ISED —Registration No.: 9079A**

CAB identifier: CN0091

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of ISED for radio equipment testing.

● **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

5.8 Test Location

All test items were performed at:

Global United Technology Services Co., Ltd.

Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

Tel: 0755-27798480; Fax: 075527798960

6 Test Instruments List

Radiated Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	June 22, 2024	June 21, 2027
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	April 11, 2024	April 10, 2025
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9168	GTS640	March 19, 2023	March 18, 2025
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	April 17, 2023	April 16, 2025
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	April 11, 2024	April 10, 2025
8	Loop Antenna	ZHINAN	ZN30900A	GTS534	Nov. 13, 2023	Nov.12, 2024
9	Broadband Preamplifier	SCHWARZBECK	BBV9718	GTS535	April 11, 2024	April 10, 2025
10	Amplifier(1GHz-26.5GHz)	HP	8449B	GTS601	April 11, 2024	April 10, 2025
11	Horn Antenna (18-26.5GHz)	/	UG-598A/U	GTS664	Oct. 29, 2023	Oct. 28, 2024
12	Horn Antenna (26.5-40GHz)	A.H Systems	SAS-573	GTS665	Oct. 29, 2023	Oct. 28, 2024
13	FSV·Signal Analyzer (10Hz-40GHz)	Keysight	FSV-40-N	GTS666	March 12, 2024	March 11, 2025
14	Amplifier	/	LNA-1000-30S	GTS650	April 11, 2024	April 10, 2025
15	CDNE M2+M3-16A	HCT	30MHz-300MHz	GTS692	Nov. 08, 2023	Nov.07, 2024
16	Wideband Amplifier	/	WDA-01004000-15P35	GTS602	April 11, 2024	April 10, 2025
17	Thermo meter	JINCHUANG	GSP-8A	GTS643	April 17, 2024	April 16, 2025
18	RE cable 1	GTS	N/A	GTS675	July 02. 2024	July 01. 2025
19	RE cable 2	GTS	N/A	GTS676	July 02. 2024	July 01. 2025
20	RE cable 3	GTS	N/A	GTS677	July 02. 2024	July 01. 2025
21	RE cable 4	GTS	N/A	GTS678	July 02. 2024	July 01. 2025
22	RE cable 5	GTS	N/A	GTS679	July 02. 2024	July 01. 2025
23	RE cable 6	GTS	N/A	GTS680	July 02. 2024	July 01. 2025
24	RE cable 7	GTS	N/A	GTS681	July 05. 2024	July 04. 2025
25	RE cable 8	GTS	N/A	GTS682	July 05. 2024	July 04. 2025

ESD						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	ESD Simulator	LINCEL	ESD-203B	GTS645	April 16, 2024	April 15, 2025
2	Thermo meter	KTJ	TA328	GTS243	April 17, 2024	April 16, 2025

Radiated Immunity						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Probe	STT	SEM-600	GTS648	April 16, 2024	April 15, 2025
2	Stacked Log.-Per.-Broadband Antenna	SCHWARZBECK	STLP 9129	GTS658	Aug.03, 2024	Aug.02, 2025
3	MXG vector Signal Generator	Agilent	N5181A	GTS659	Nov. 08, 2023	Nov.07, 2024
4	Power amplifier	Micotop	MPA-20-1000-250	GTS660	Aug.03, 2024	Aug.02, 2025
5	Power amplifier	Micotop	MPA-1000-6000-100	GTS661	Aug.03, 2024	Aug.02, 2025
6	EPM SSERIES POWER METER	Agilent	E4419B	GTS662	Nov. 08, 2023	Nov.07, 2024
7	E-SERIES AVG POWER SENSOR	HP	E9301A	GTS670	Nov. 08, 2023	Nov.07, 2024
8	Thermo meter	JINCHUANG	GSP-8A	GTS643	April 17, 2024	April 16, 2025

General used equipment:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Barometer	KUMAO	SF132	GTS647	April 18, 2024	April 17, 2025

7 Emission Test Results

7.1 Radiated Emission

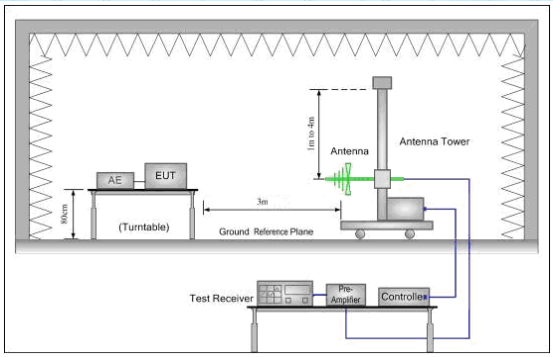
Test Requirement:	EN 55032
Test Method:	EN 55032
Test Frequency Range:	30MHz to 1GHz
Class / Severity:	Class B
Test site:	Measurement Distance: 3m
Receiver setup:	

Frequency	Detector	RBW	VBW	Value
30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak

Limit:

Frequency	Limit (dBμV/m @3m)	Value
30MHz-230MHz	40.00	Quasi-peak
230MHz-1GHz	47.00	Quasi-peak

Test setup:



Test Procedure:

1. The radiated emissions test was conducted in a semi-anechoic chamber.
2. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
3. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT.
4. The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.

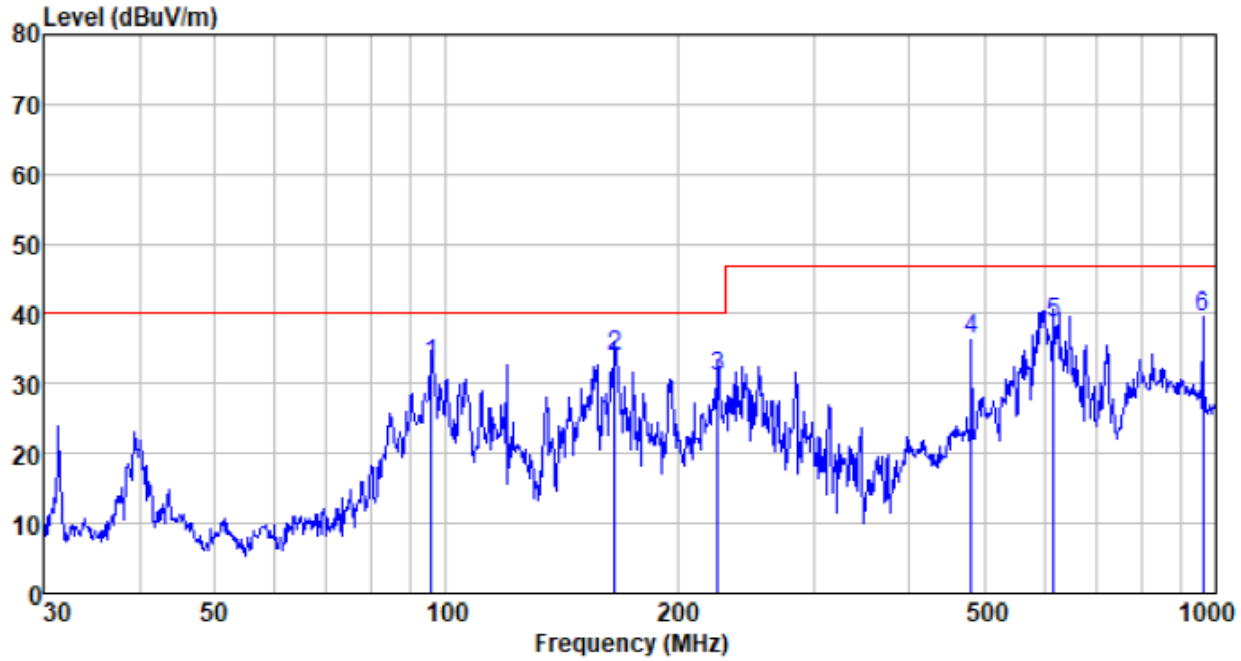
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1 012mbar

Measurement Record: Uncertainty: 3.8039dB （30MHz-200MHz）
3.9679dB （200MHz-1GHz）

Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.2 for details, and only show the worst case.
Test results:	Pass

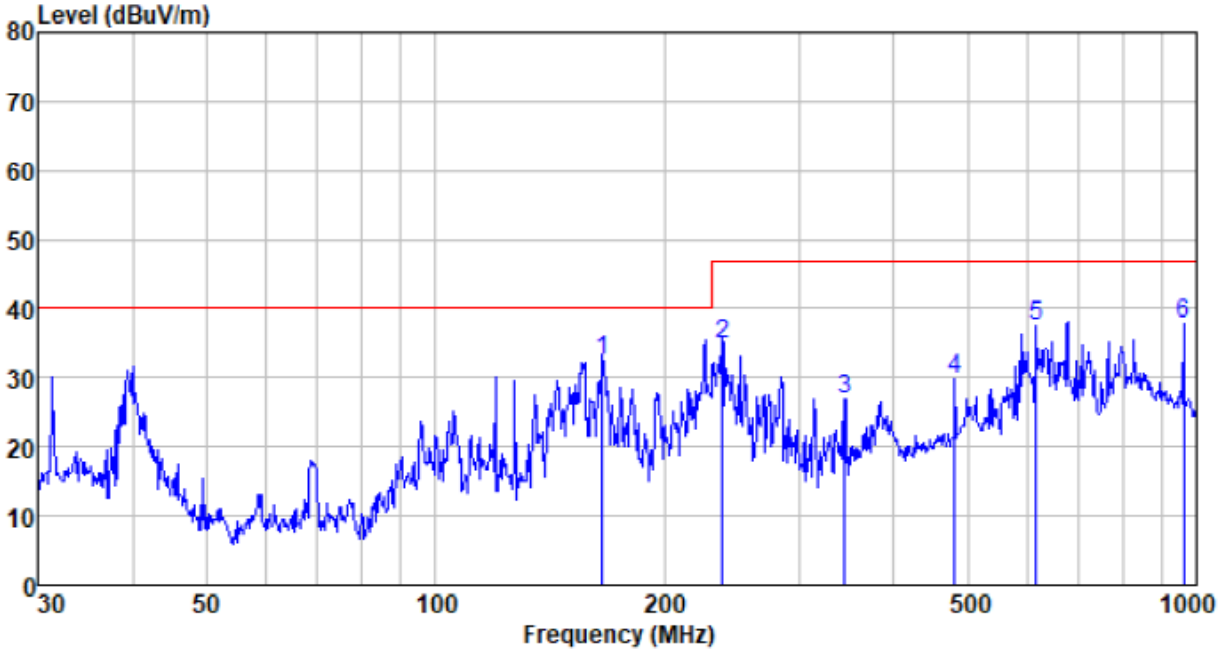
Measurement Data

Test mode:	Operation mode	Antenna Polarity:	Horizontal



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
95.762	54.60	8.90	1.86	32.48	32.88	40.00	-7.12	QP
165.487	50.04	13.80	2.60	32.43	34.01	40.00	-5.99	QP
225.308	51.04	9.41	3.02	32.37	31.10	40.00	-8.90	QP
480.528	48.03	16.50	4.13	32.21	36.45	47.00	-10.55	QP
616.372	46.34	19.36	4.71	31.77	38.64	47.00	-8.36	QP
962.162	41.18	23.70	5.91	31.10	39.69	47.00	-7.31	QP

Test mode:	Operation mode	Antenna Polarity:	Vertical



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
165.487	48.50	13.80	2.60	32.43	32.47	40.00	-7.53	QP
238.310	54.08	9.93	3.10	32.36	34.75	47.00	-12.25	QP
344.386	42.00	13.45	3.64	32.28	26.81	47.00	-20.19	QP
480.528	41.37	16.50	4.13	32.21	29.79	47.00	-17.21	QP
616.372	45.14	19.36	4.71	31.77	37.44	47.00	-9.56	QP
962.162	39.29	23.70	5.91	31.10	37.80	47.00	-9.20	QP

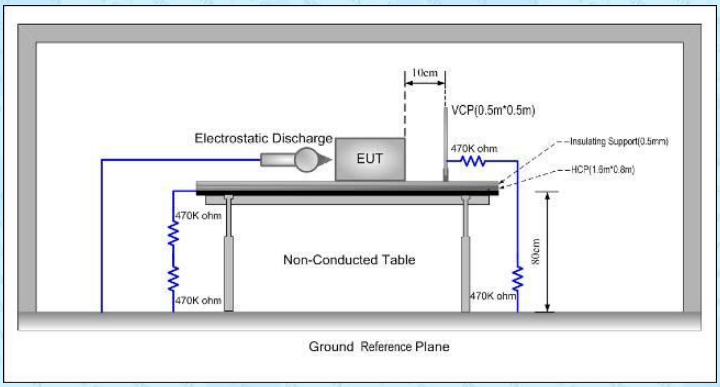
Note:
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
1. Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

8 Immunity Test Results

8.1 Performance Criteria Description in Clause 8 of EN 55035

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.
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.
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.

8.2 Electrostatic discharge

Test Requirement:	EN 55035
Test Method:	EN 61000-4-2
Discharge Voltage:	Contact Discharge:±4kV Air Discharge: ±2kV, ±4kV, ±8kV HCP/VCP:±4kV
Polarity:	Positive & Negative
Number of Discharge:	Contact Discharge: Minimum 10 times at each test point, Air Discharge: Minimum 10 times at each test point.
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum
Performance Criterion:	Criterion B
Test setup:	
Test Procedure:	**1. Air discharge:** The test was applied on non-conductive surfaces of EUT. The round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT. After each discharge, the discharge electrode was removed from the EUT. The generator was re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure was repeated until all the air discharge completed **2. Contact Discharge:** The test was applied on conductive surfaces of EUT. the generator was re-triggered for a new single discharge and repeated 25 times for each pre-selected test point. the tip of the discharge electrode was touch the EUT before the discharge switch was operated. **3. Indirect discharge for horizontal coupling plane** At least 10 single discharges shall be applied at the front edge of each HCP opposite the centre point of each unit of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge. Consideration should be given to exposing all sides of the EUT. **4. Indirect discharge for vertical coupling plane** At least 10 single discharges were applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, was placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges were applied to the coupling plane, with this plane in

	sufficient different positions that the four faces of the EUT are completely illuminated.					
Test environment:	Temp.:	24 °C	Humid.:	51%	Press.:	1 012mbar
Test Instruments:	Refer to section 6 for details					
Test mode:	Refer to section 5.2 for details					
Test results:	Pass					

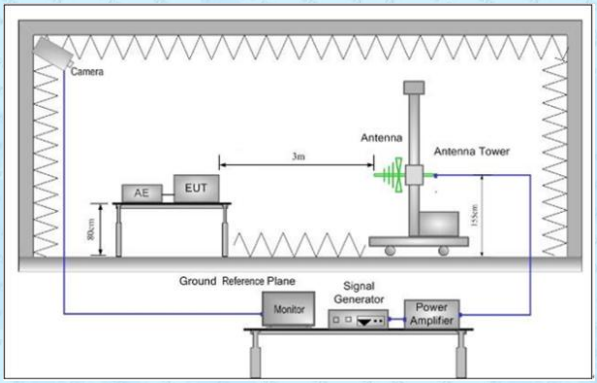
Measurement Record:

Test points:	I: Metal II: All plastic seams			
Direct discharge				
Discharge Voltage (KV)	**Type of discharge**	**Test points**	**Observations Performance**	**Result**
± 4	Contact	I	A	Pass
± 2,± 4,± 8	Air	II	A	Pass
Indirect discharge				
Discharge Voltage (KV)	**Type of discharge**	**Test points**	**Observation Performance**	**Result**
± 4	HCP-Bottom/Top/ Front/Back/Left/Right	Edge of the HCP	A	Pass
± 4	VCP-Bottom/Top/ Front/Back/Left/Right	Center of the VCP	A	Pass

Remark:

Performance Criteria: A, B, C: Refer to section 8.1 for details

8.3 Continuous RF electromagnetic field disturbances

Test Requirement:	EN 55035
Test Method:	EN 61000-4-3
Frequency range:	80MHz to 5GHz
Test Level:	3V/m
Performance Criterion:	Criterion A
Test setup:	
Test Procedure:	1. For table-top equipment, the EUT was placed in the chamber on a non-conductive table 0.8m high. For arrangement of floor-standing equipment, the EUT was mounted on a non-conductive support 0.1m above the supporting plane. For human body-mounted equipment, the EUT may be tested in the same manner as table top items. 2. If possible, a minimum of 1 m of cable is exposed to the electromagnetic field. Excess length of cables interconnecting units of the EUT shall be bundled low-inductively in the approximate center of the cable to form a bundle 30 cm to 40 cm in length. 3. The EUT was initially placed with one face coincident with the calibration plane. The EUT face being illuminated was contained within the UFA (Uniform Field Area). 4. The frequency ranges to be considered were swept with the signal modulated and pausing to adjust the RF signal level or to switch oscillators and antennas as necessary.Where the frequency range was swept incrementally, the step size was not exceed 1 % of the preceding frequency value. 5. The dwell time of the amplitude modulated carrier at each frequency was not be less than the time necessary for the EUT to be exercised and to respond, and was not less than 0,5 s. 6. The test normally was performed with the generating antenna facing each side of the EUT. 7. The polarization of the field generated by each antenna necessitates testing each selected side twice, once with the antenna positioned vertically and again with the antenna positioned horizontally. 8. The EUT was performed in a configuration to actual installation conditions, a video camera and/or a audio monitor were used to monitor the performance of the EUT.
Test environment:	Temp.: 25 °C | Humid.: 52% | Press.: 1 012mbar
Test Instruments:	Refer to section 6 for details

Test mode:	Refer to section 5.2 for details
Test results:	Pass

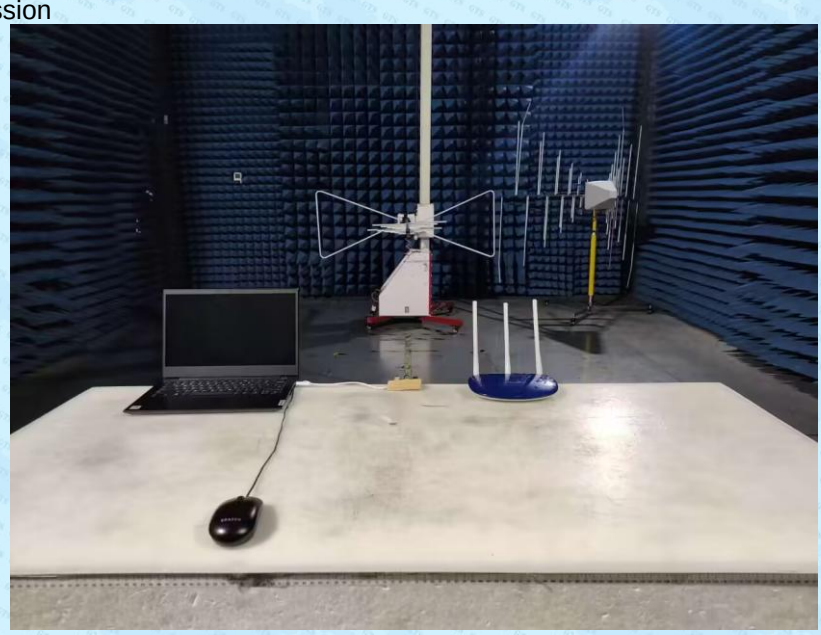
Measurement Record:

Frequency	Level	Modulation	Antenna Polarization	EUT Face	Observations (Performance Criterion)	Result
80 MHz-1 GHz	3 V/m	1 kHz, 80 % Amp. Mod, 1 % increment, dwell time=3seconds	V	Front	A	Pass
			H		A	Pass
			V	Rear	A	Pass
			H		A	Pass
			V	Left	A	Pass
			H		A	Pass
			V	Right	A	Pass
			H		A	Pass
			V	Top	A	Pass
			H		A	Pass
			V	Bottom	A	Pass
			H		A	Pass
1800MHz, 2600MHz 3500MHz 5000MHz	3 V/m	1 kHz, 80 % Amp. Mod, 1 % increment, dwell time=2seconds	V	Front	A	Pass
			H		A	Pass
			V	Rear	A	Pass
			H		A	Pass
			V	Left	A	Pass
			H		A	Pass
			V	Right	A	Pass
			H		A	Pass
			V	Top	A	Pass
			H		A	Pass
			V	Bottom	A	Pass
			H		A	Pass

Remark: Performance Criteria: A, B, C: Refer to section 8.1 for details

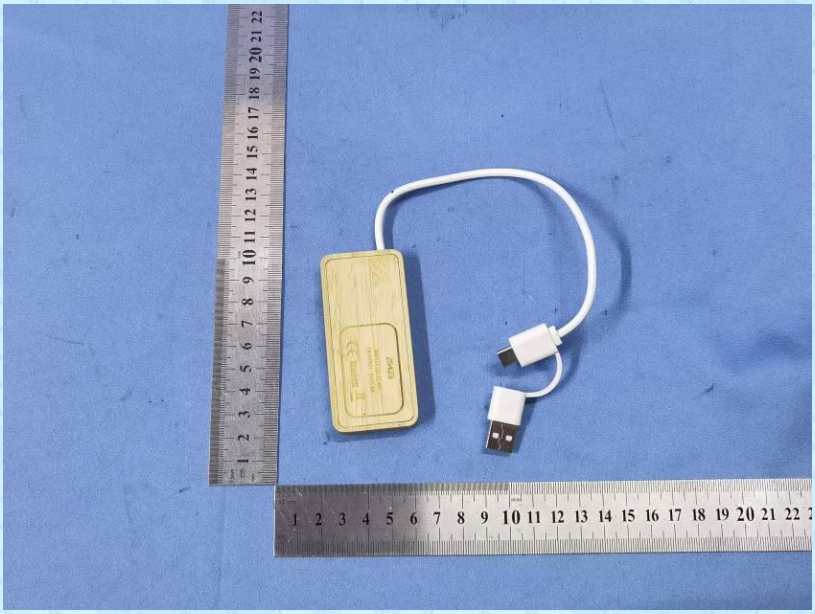
9 Test Setup Photo

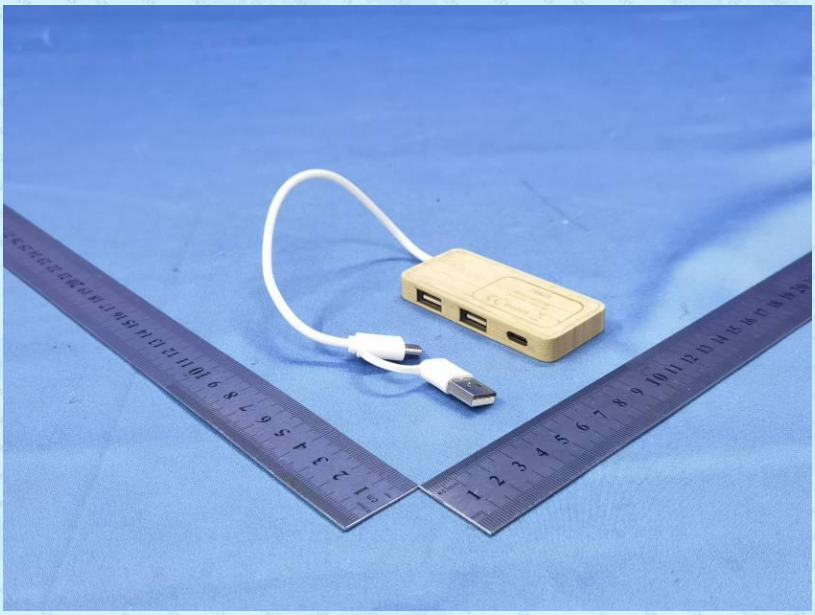
Radiated Emission

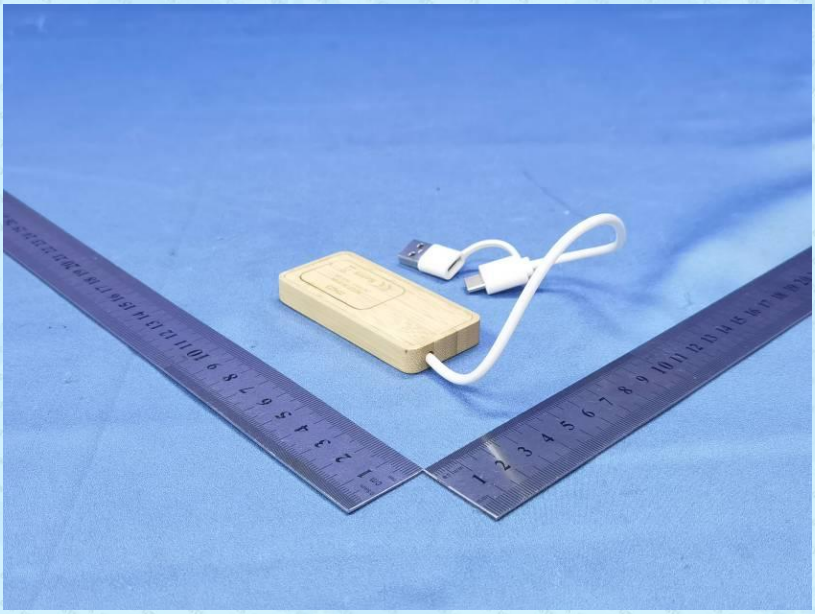


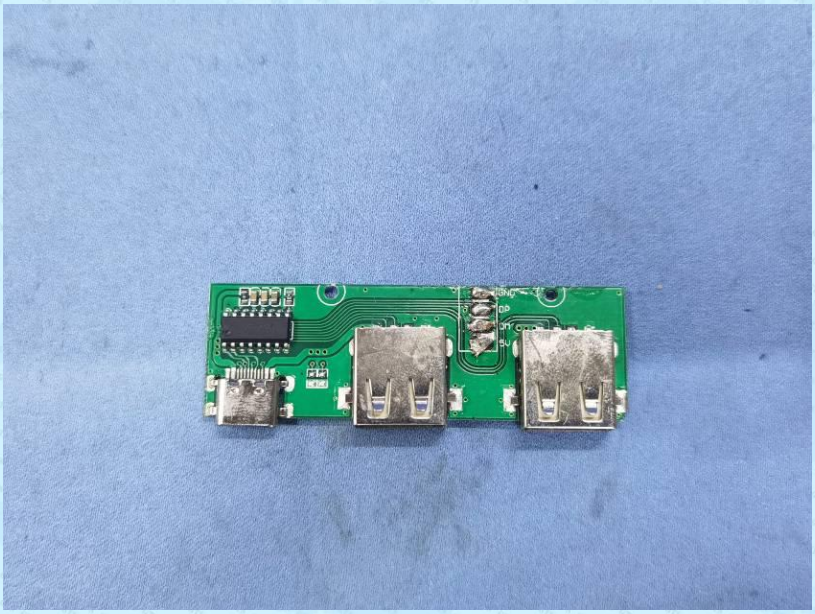
Electrostatic discharge

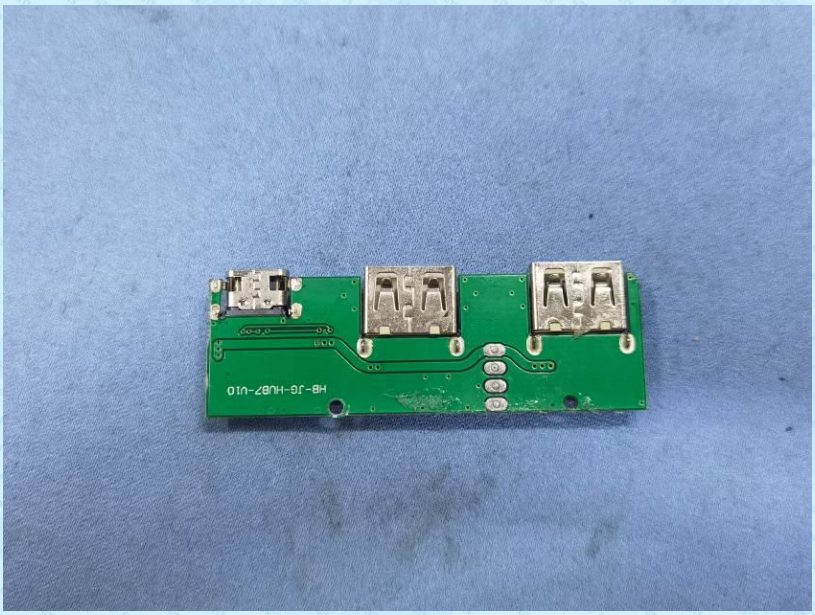
10 EUT Constructional Details











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