ETSI EN 301 489-1 V2.2.3 (2019-11)
Draft ETSI EN 301 489-17 V3.2.5 (2022-08)

TEST REPORT

For

M5Stack Technology Co., Ltd

5F, Tangwei Stock Commercial Building, Youli Road, Bao'an District, Shenzhen, China

Tested Model: ATOMS3, ATOMS3-LITE

Report Type:	**Product Name:**
Original Report	M5ATOMS3

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant:	M5Stack Technology Co., Ltd
Product Name:	M5ATOMS3
Tested Model:	ATOMS3, ATOMS3-LITE
Rated Voltage:	DC 5V from type-C USB port
★Highest Operation Frequency:	2480 MHz

Note:
1. The highest operating frequency was provided by the applicant.
2. The difference between the two models were explained in the attached declaration letter.

All measurement and test data in this report was gathered from production sample serial number: RSHE220928001-1(ATOMS3), RSHE220928001-2(ATOMS3-LITE). (Assigned by BACL (Kunshan). The EUT supplied by the applicant was received on 2022-09-28)

Objective

This test report is prepared for *M5Stack 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.

Draft ETSI EN 301489-17 V3.2.5 (2022-08), ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband and Wideband Data Transmission Systems.

The objective is to determine compliance with ETSI EN 301489-1 V2.2.3 (2019-11), Draft ETSI EN 301489-17 V3.2.5 (2022-08).

Test Methodology

All measurements contained in this report were conducted with ETSI EN 301 489-1 V2.2.3 (2019-11).

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a typical mode (as normally used by a typical user)

Test mode 1: Wi-Fi link (Worse case)
Test mode 2: Wi-Fi standby
Test mode 3: BT link (Worse case)
Test mode 4: BT standby

Pre-scan all mode, mode 1 is worse than mode 2 and mode 3 is worse than mode 4.

EUT Exercise Software

No exercise software was to test.

Equipment Modifications

No modifications were made to the EUT.

Support Equipment List and Details

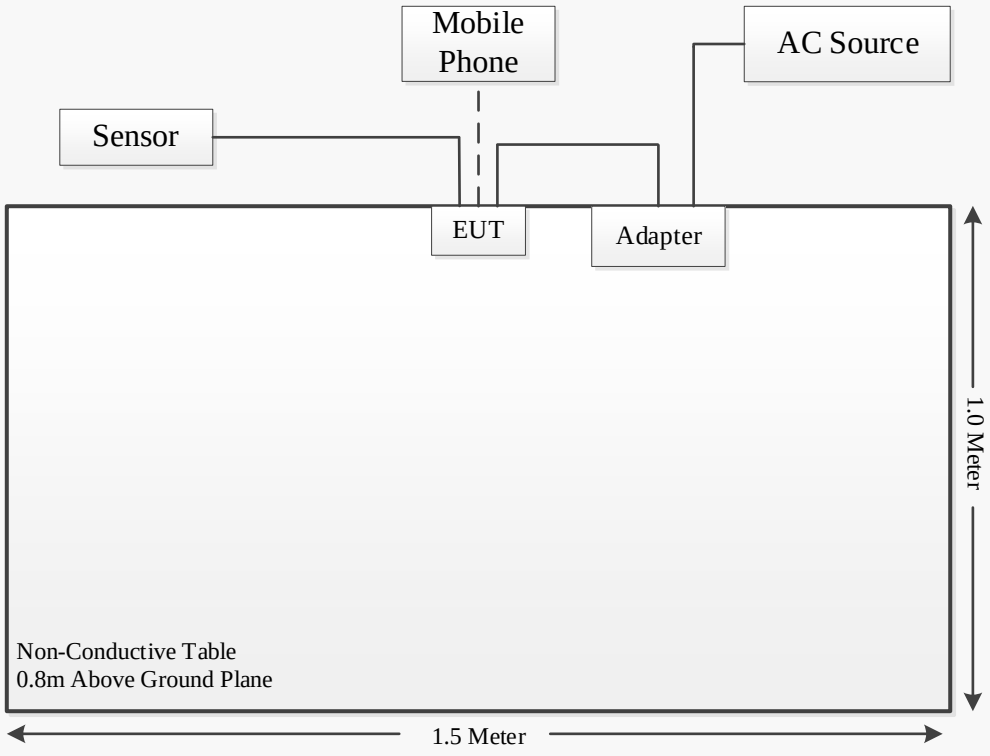
Manufacturer	Description	Model	Serial Number
Unknown	Adapter	N/A	N/A
M5Stack	Sensor	N/A	N/A
Apple Inc.	Mobile Phone	MN8P2Zp/A	C76SP3H5HG74

External I/O Cable

Cable Description	Length (m)	From Port	To Port
Power Cable 1	1.5	Adapter	AC Source
Power Cable 2	1.0	Adapter	EUT
Cable	1.5	EUT	Sensor

Block Diagram of Radiated Test Setup

Test mode 1-4:



SUMMARY OF TEST RESULTS

Test Requirements	Description of Test	Result
Reference to clauses EN 301 489-1 §7.1	Reference to clauses EN 301 489-1 §8.2 Enclosure port	Compliant
	Reference to clauses EN 301 489-1§8.3 DC power input/output ports	Not Applicable (See Note 1)
	Reference to clauses EN 301 489-1 §8.4 AC mains power input/output ports	Compliant
	Reference to clauses EN 301 489-1 §8.5 Harmonic current emissions (AC mains input port)	Not Applicable (See Note 2)
	Reference to clauses EN 301 489-1 §8.6 Voltage fluctuations and flicker (AC mains input port)	Compliant
	Reference to clauses EN 301 489-1§8.7 Wired network ports	Not Applicable (See Note 3)
Reference to clauses EN 301 489-1 §7.2	Reference to clauses EN 301 489-1 §9.3 Electrostatic discharge (EN 61000-4-2)	Compliant
	Reference to clauses EN 301 489-1 §9.2 Radio frequency electromagnetic field (80 MHz to 6000 MHz) (EN IEC 61000-4-3)	Compliant
	Reference to clauses EN 301 489-1§9.4 Fast transients, common mode (EN 61000-4-4)	Compliant
	Reference to clauses EN 301 489-1§9.8 Surges (EN 61000-4-5)	Compliant
	Reference to clauses EN 301 489-1§9.5 Radio frequency, common mode (EN 61000-4-6)	Compliant
	Reference to clauses EN 301 489-1§9.7 Voltage dips and interruptions (EN 61000-4-11)	Compliant
	Reference to clauses EN 301 489-1 §9.6 Transients and surges in the vehicular environment (ISO 7637-2)	Not Applicable (See Note 4)

Note:
1. The EUT intended for direct connection to a dedicated AC/DC power supply, then the measurement shall be performed on the AC power input port.
2. The equipment with a rated power of 75 W or less, other than lighting equipment, are not included in this standard.
3. There are no wired network ports.
4. This equipment will not in vehicular environment.

Immunity test performance criteria:
“continuous phenomena” means: A, Reference to clauses EN 301 489-1 §6.1/ EN 301 489-17 §6.3
“transient phenomena” means: B or C, Reference to clauses EN 301 489-1 §6.2/ EN 301 489-17 §6.4

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions					
Rohde & Schwarz	EMI Test Receiver	ESR	101746	2022-06-23	2023-06-22
Rohde & Schwarz	AMN	ENV216	101115	2021-11-13	2022-11-12
Rohde & Schwarz	Pulse limiter	ESH3-Z2	0357.8810.54	2022-06-24	2023-06-23
MICRO-COAX	Coaxial Cable	Cable-15	015	2022-08-15	2023-08-14
Audix	Test Software	e3	V9	N/A	N/A
Radiated Emissions Chamber 1#（30 MHz to 1 GHz）					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2022-06-23	2023-06-22
Sunol Sciences	Hybrid Antenna	JB3	A090314-2	2020-01-07	2023-01-06
Sonoma Instrunent	Amplifier	310N	171205	2022-08-15	2023-08-14
Narda	6dB Attenuator	773-6	10690812-2-2	2022-08-15	2023-08-14
MICRO-COAX	Coaxial Cable	Cable-8	008	2022-08-15	2023-08-14
MICRO-COAX	Coaxial Cable	Cable-9	009	2022-08-15	2023-08-14
MICRO-COAX	Coaxial Cable	Cable-10	010	2022-08-15	2023-08-14
Rohde & Schwarz	Test Software	EMC32	100361	N/A	N/A
Radiated Emissions Chamber 2#（Above 1 GHz）					
Rohde & Schwarz	EMI Test Receiver	ESU40	100207/040	2022-06-23	2023-06-22
ETS-LINDGREN	Horn Antenna	3115	9311-4159	2020-07-15	2023-07-14
A.H.Systems,inc	Amplifier	PAM-0118P	512	2022-08-15	2023-08-14
MICRO-COAX	Coaxial Cable	Cable-11	011	2022-08-15	2023-08-14
MICRO-COAX	Coaxial Cable	Cable-12	012	2022-08-15	2023-08-14
MICRO-COAX	Coaxial Cable	Cable-13	013	2022-08-15	2023-08-14
Rohde & Schwarz	Test Software	EMC32	100361	N/A	N/A
Voltage Fluctuations and Flicker					
EM TEST	Harmonic & Flicker Analyzer	DPA 500N	P1402129120	2022-06-23	2023-06-22
EM TEST	AC Power Source	ACS 500N	P1251107475	2022-06-23	2023-06-22
EM TEST	Test Software	net. control	Version 3.0.0	N/A	N/A

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Continuous induced RF disturbances or Injected currents					
Agilent	Signal Generator	8648C	3537A01810	2022-06-24	2023-06-23
COM-POWER	CDN	CDN M225E	511098	2022-07-25	2023-07-24
SPANAWAVE	Power Amplifier	PAS-000023-25	AA00535	N/A	N/A
Dressler	Attenuator	ATT 6/75	510020010004	N/A	N/A
BACL	Test Software	VEE-CS	N/A	N/A	N/A
Continuous RF electromagnetic field disturbances					
Agilent	Signal Generator	E4428C	MY49070179	2022-06-23	2023-06-22
Agilent	Power Meter	E4419B	MY41291878	2022-06-23	2023-06-22
Agilent	Power Sensor	E9301A	US39211480	2022-06-23	2023-06-22
AR	Trapezoidal Log Periodic Antenna	ATT700M12G	0350307	N/A	N/A
AR	Power Amplifier	200W1000M3A	18062	N/A	N/A
AR	Log-Periodic Antenna	ATL80M1G	0350122	N/A	N/A
AR	Power Amplifier	60S1G6	0369442	N/A	N/A
BACL	Test Software	VEE-RS	N/A	N/A	N/A
Electrostatic discharge (ESD)					
TESEQ	ESD Simulator	NSG 438	1079	2022-06-23	2023-06-22
Electrical fast transients/burst & Surge & Voltage dips and interruptions					
HTEC	Transient Integrated Immunity Generator	HV1P16T	214401	2021-11-21	2022-11-20
HTEC	Single Phase AC Fault Power Supply	HCOMPACT 7	214402	2021-11-21	2022-11-20

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

§8.4 - AC MAINS POWER INPUT/OUTPUT PORTS

Measurement Uncertainty

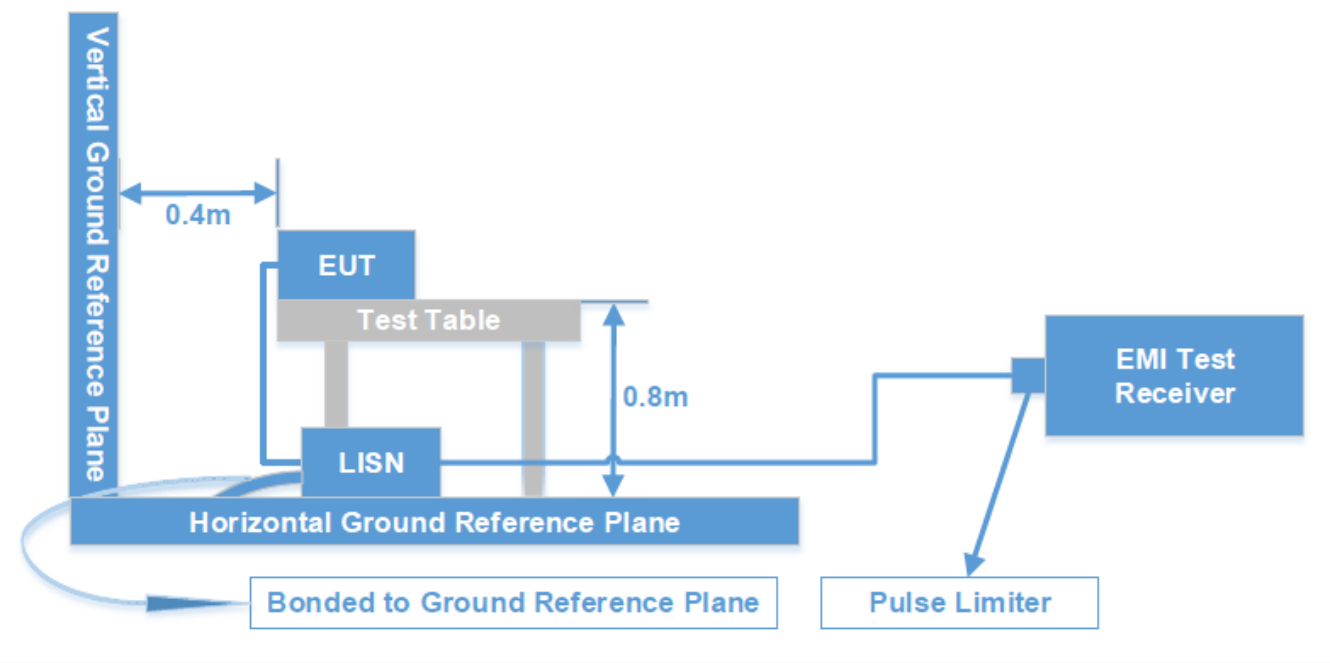
Compliance or non- compliance with a disturbance limit shall be determined in the following manner:

If U_{lab} is less than or equal to U_{cispr} of Table 1, then:
–compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
–Non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If U_{lab} is greater than U_{cispr} of Table 1, then:
–compliance is deemed to occur if no measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit;
–Non - compliance is deemed to occur if any measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit.

Table 1 – Values of U_{cispr}

Item	Frequency Range	Measurement Uncertainty	U_{cispr}
Conducted Emissions	150kHz~30MHz	3.19 dB	3.4 dB

EUT Setup



The setup of EUT is according with ETSI EN 301489-1 measurement procedures. The specification used was with ETSI EN 301 489-1 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 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	RBW	VBW
150 kHz - 30 MHz	9 kHz	30 kHz

If the maximum peak measurement complies with the QP limit and is below the average limit, the QP value and average value measurement need not be performed, only record the maximum peak measured value.

Factor & Over Limit Calculation

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

Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)

The "**Over Limit**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, Over Limit of 7 dB means the emission is 7 dB above the limit. The equation for Over Limit calculation is as follows:

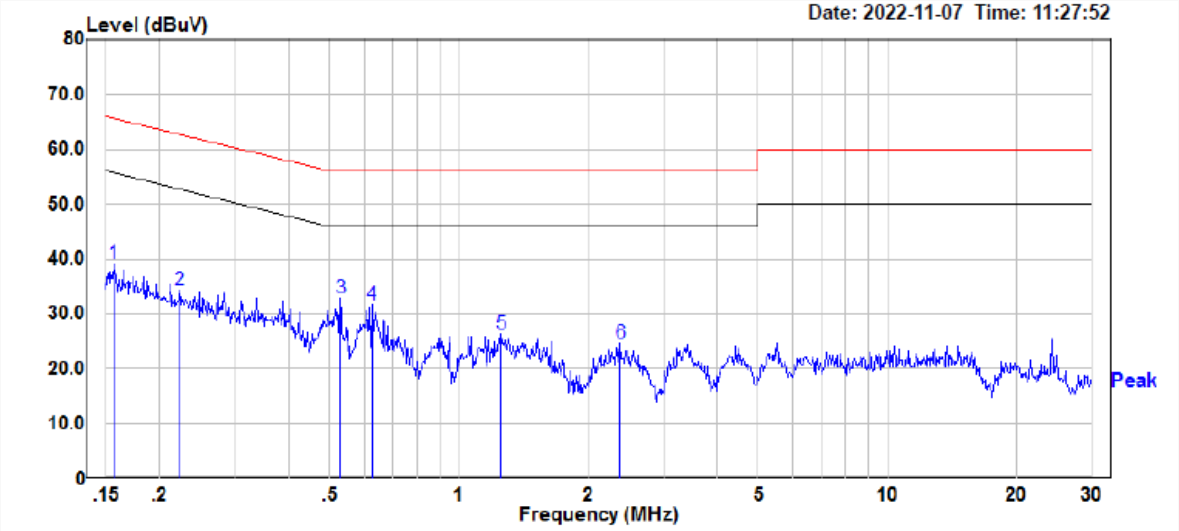
Over Limit (dB) = Read level (dBμV) + Factor (dB) - Limit (dBμV)

Test Data

Environmental Conditions

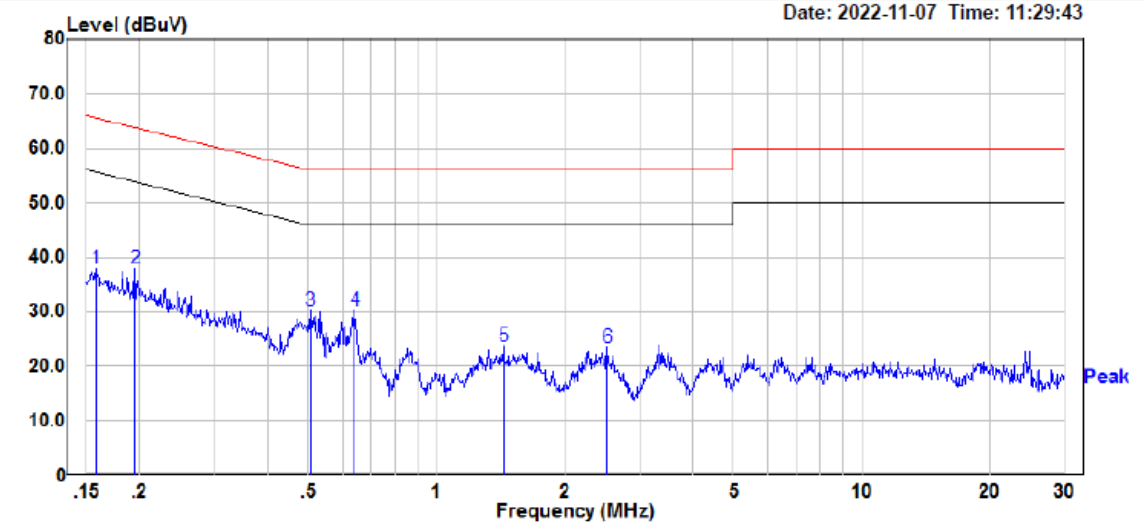
Temperature:	20.0 °C
Relative Humidity:	37 %
ATM Pressure:	102.3 kPa
Test Date:	2022-11-07
Test Engineer:	Kris Qu

Model: ATOMS3
Test mode 1:
Line:



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.156	19.00	20.06	39.06	65.67	-26.61	Peak
2	0.223	14.30	20.00	34.30	62.69	-28.39	Peak
3	0.529	13.41	19.39	32.80	56.00	-23.20	Peak
4	0.627	12.18	19.38	31.56	56.00	-24.44	Peak
5	1.254	7.01	19.37	26.38	56.00	-29.62	Peak
6	2.385	5.24	19.43	24.67	56.00	-31.33	Peak

Neutral:

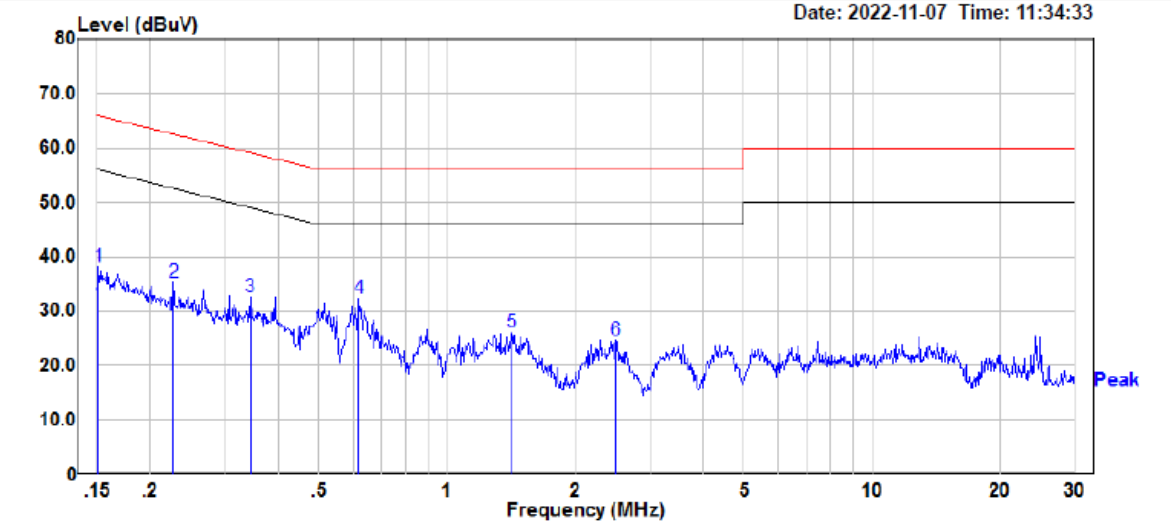


	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.158	17.89	20.05	37.94	65.54	-27.60	Peak
2	0.195	17.89	20.04	37.93	63.81	-25.88	Peak
3	0.506	10.81	19.39	30.20	56.00	-25.80	Peak
4	0.643	10.93	19.38	30.31	56.00	-25.69	Peak
5	1.442	4.20	19.38	23.58	56.00	-32.42	Peak
6	2.519	4.00	19.43	23.43	56.00	-32.57	Peak

Note:

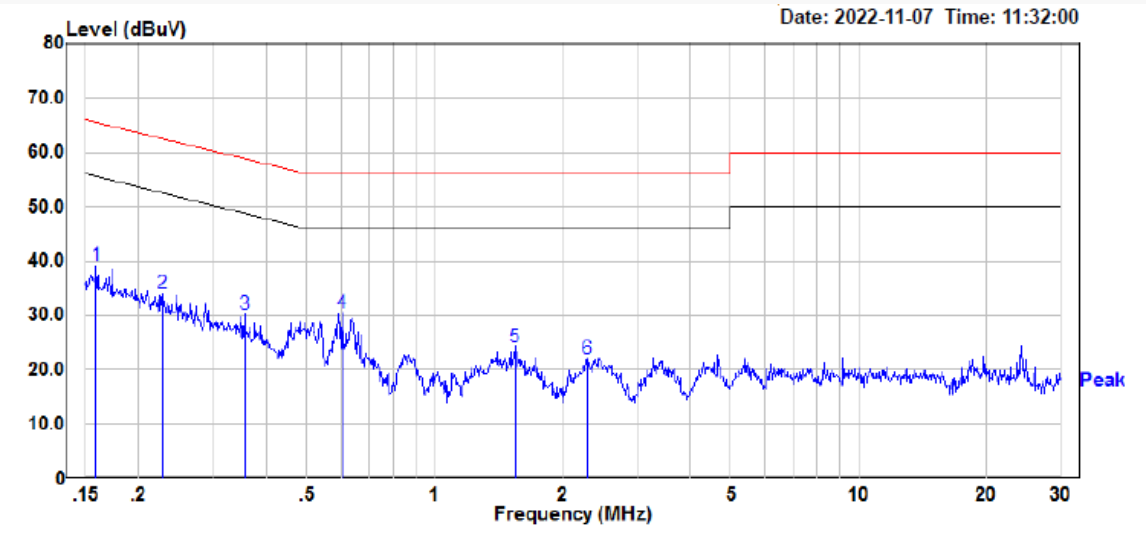
1) Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)
2) Over Limit (dB) = Read level (dBµV) + Factor (dB) - Limit (dBµV)

Test mode 3:
Line:



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.152	18.05	20.06	38.11	65.92	-27.81	Peak
2	0.227	15.25	19.99	35.24	62.56	-27.32	Peak
3	0.345	12.95	19.73	32.68	59.09	-26.41	Peak
4	0.621	12.93	19.38	32.31	56.00	-23.69	Peak
5	1.420	6.62	19.38	26.00	56.00	-30.00	Peak
6	2.494	5.21	19.43	24.64	56.00	-31.36	Peak

Neutral:

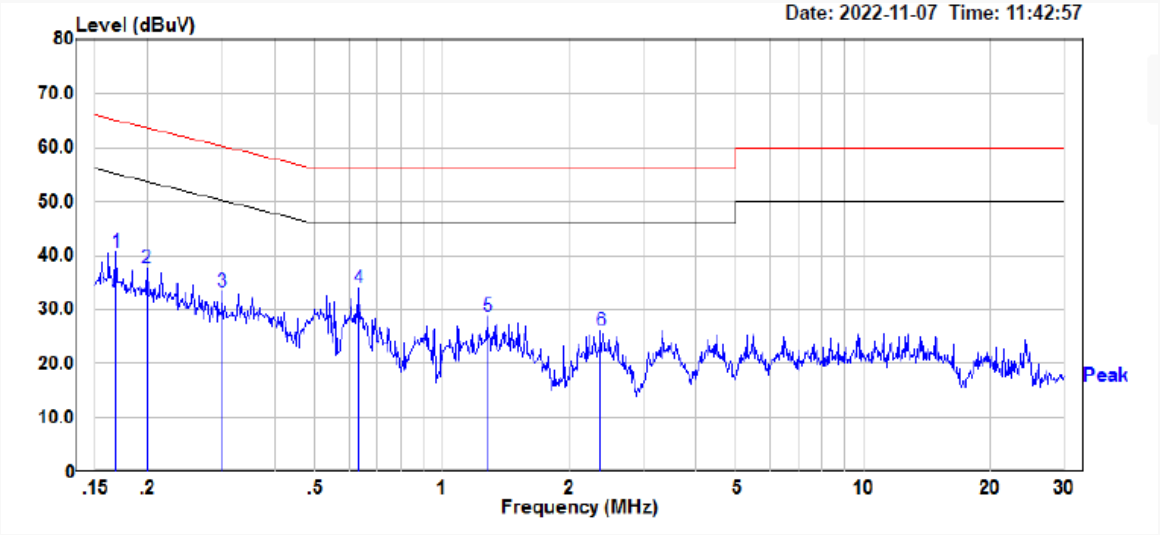


	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.159	19.21	20.05	39.26	65.50	-26.24	Peak
2	0.228	14.04	19.98	34.02	62.52	-28.50	Peak
3	0.357	10.49	19.70	30.19	58.80	-28.61	Peak
4	0.606	11.02	19.38	30.40	56.00	-25.60	Peak
5	1.546	4.91	19.39	24.30	56.00	-31.70	Peak
6	2.292	2.57	19.43	22.00	56.00	-34.00	Peak

Note:

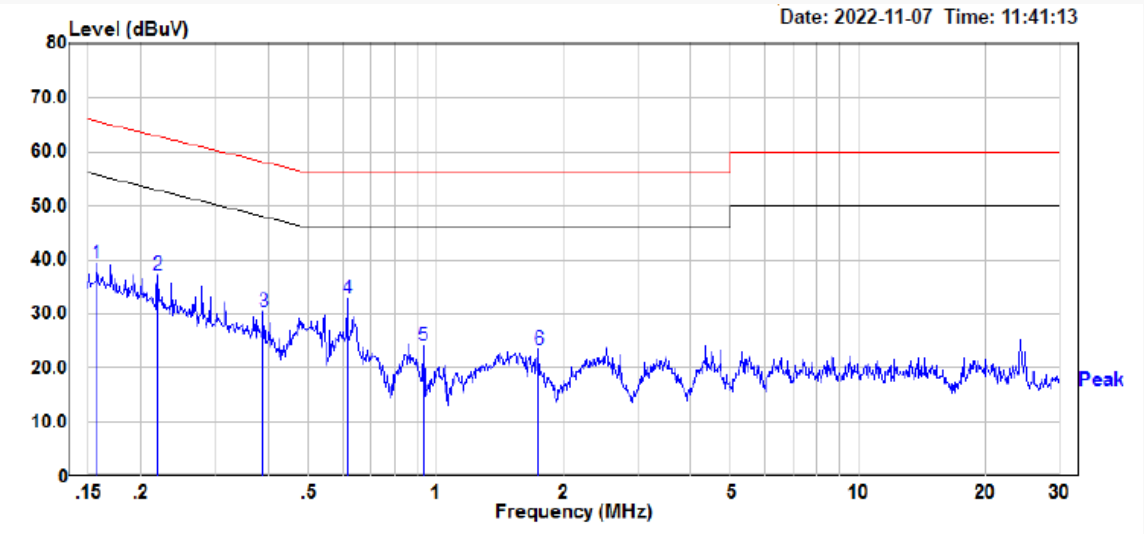
1) Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)
2) Over Limit (dB) = Read level (dBµV) + Factor (dB) - Limit (dBµV)

Model: ATOMS3-LITE
Test mode 1:
Line:



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.168	20.45	20.05	40.50	65.05	-24.55	Peak
2	0.199	17.71	20.04	37.75	63.64	-25.89	Peak
3	0.300	13.60	19.83	33.43	60.25	-26.82	Peak
4	0.633	14.64	19.38	34.02	56.00	-21.98	Peak
5	1.285	9.40	19.37	28.77	56.00	-27.23	Peak
6	2.385	6.65	19.43	26.08	56.00	-29.92	Peak

Neutral:

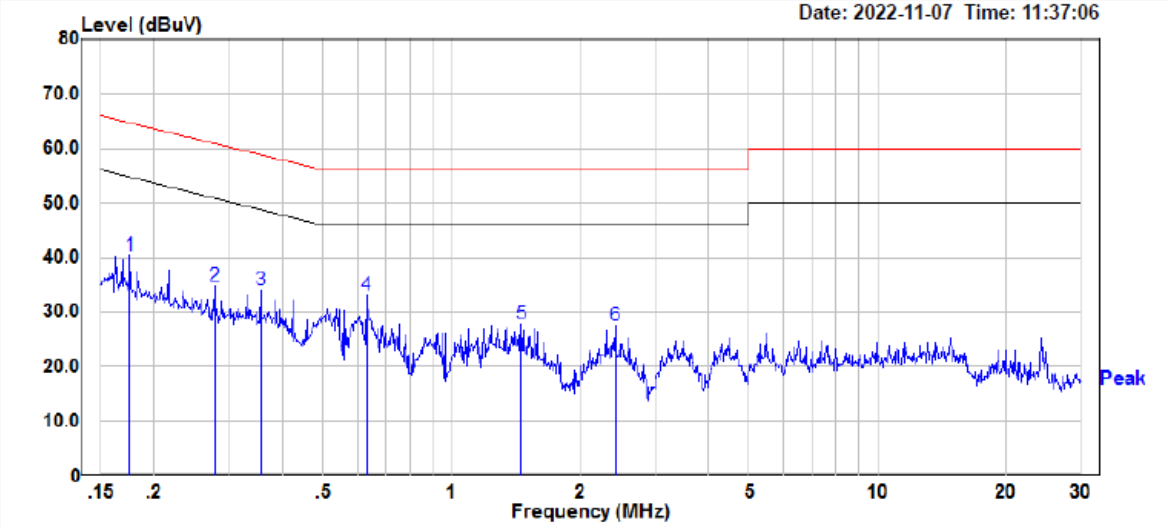


	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.157	19.42	20.06	39.48	65.63	-26.15	Peak
2	0.219	17.32	20.00	37.32	62.85	-25.53	Peak
3	0.391	10.76	19.64	30.40	58.05	-27.65	Peak
4	0.618	13.61	19.38	32.99	56.00	-23.01	Peak
5	0.934	4.79	19.36	24.15	56.00	-31.85	Peak
6	1.751	4.16	19.40	23.56	56.00	-32.44	Peak

Note:

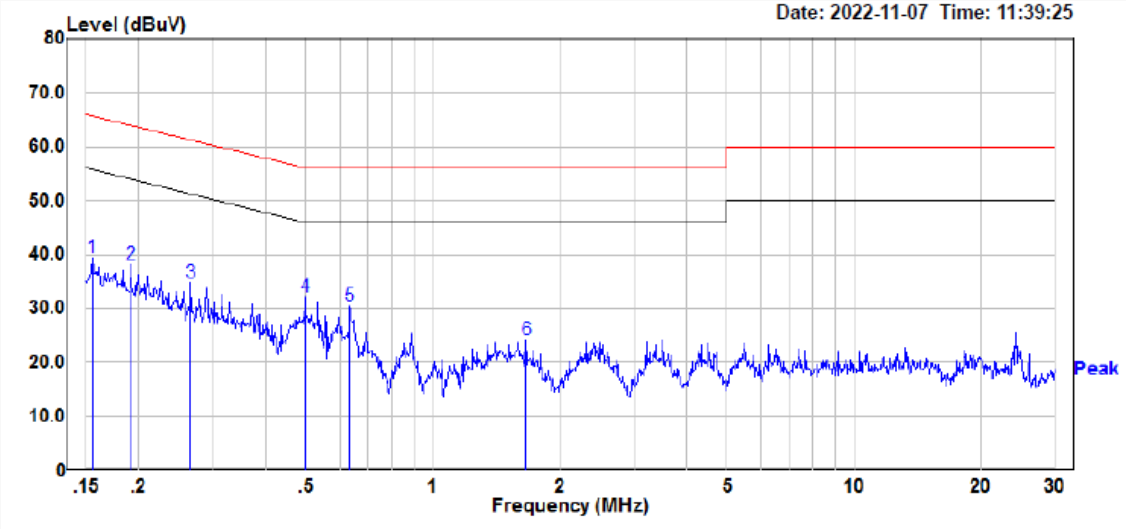
1) Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)
2) Over Limit (dB) = Read level (dBµV) + Factor (dB) - Limit (dBµV)

Test mode 3:
Line:



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.176	20.21	20.05	40.26	64.68	-24.42	Peak
2	0.278	15.04	19.88	34.92	60.87	-25.95	Peak
3	0.357	14.42	19.70	34.12	58.80	-24.68	Peak
4	0.630	13.71	19.38	33.09	56.00	-22.91	Peak
5	1.456	8.46	19.38	27.84	56.00	-28.16	Peak
6	2.421	8.03	19.43	27.46	56.00	-28.54	Peak

Neutral:



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.155	19.32	20.06	39.38	65.71	-26.33	Peak
2	0.191	18.06	20.04	38.10	63.97	-25.87	Peak
3	0.266	14.91	19.90	34.81	61.24	-26.43	Peak
4	0.499	12.77	19.39	32.16	56.02	-23.86	Peak
5	0.633	10.97	19.38	30.35	56.00	-25.65	Peak
6	1.666	4.81	19.39	24.20	56.00	-31.80	Peak

Note:

1) Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)
2) Over Limit (dB) = Read level (dBµV) + Factor (dB) - Limit (dBµV)

§8.2 - ENCLOSURE PORT

Measurement Uncertainty

Compliance or non- compliance with a disturbance limit shall be determined in the following manner：

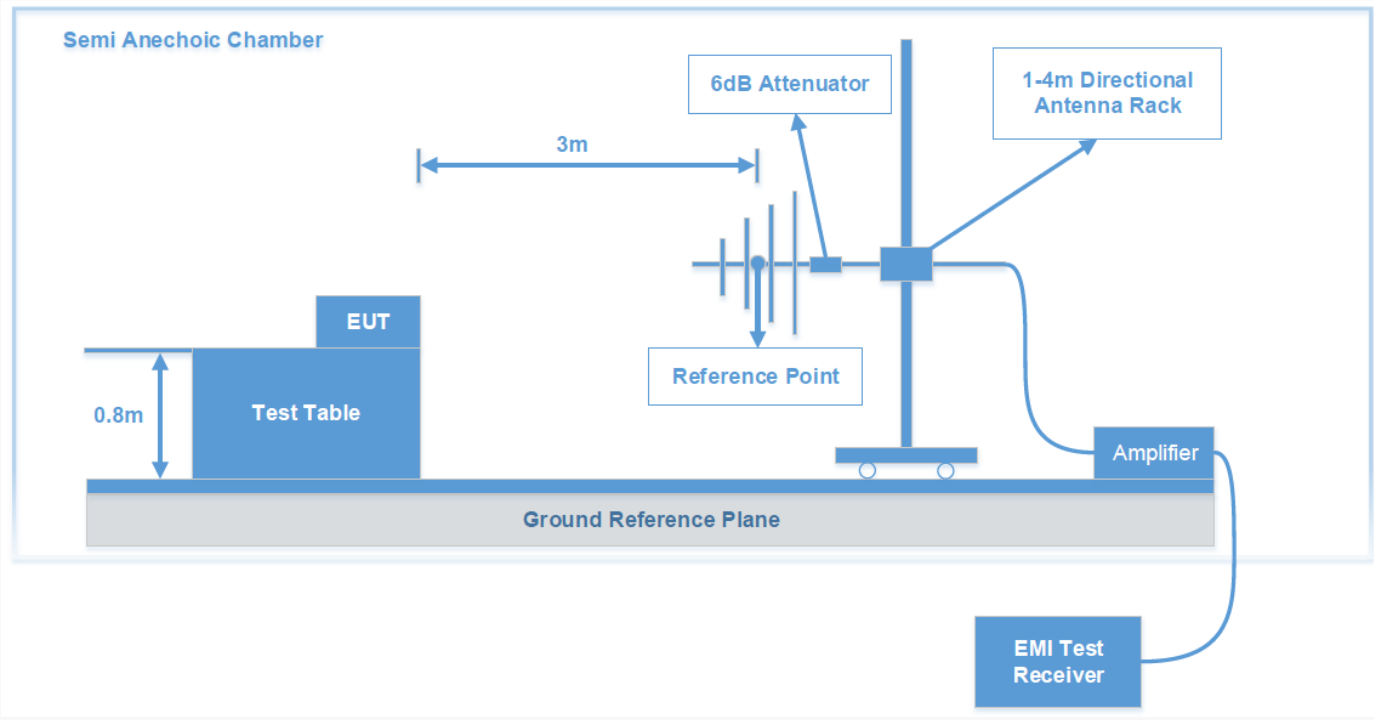
If U_{lab} is less than or equal to U_{cispr} of Table 1, then:
–compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
–Non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If U_{lab} is greater than U_{cispr} of Table 1, then:
–compliance is deemed to occur if no measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit;
–Non - compliance is deemed to occur if any measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit.

Table 1 – Values of U_{cispr}

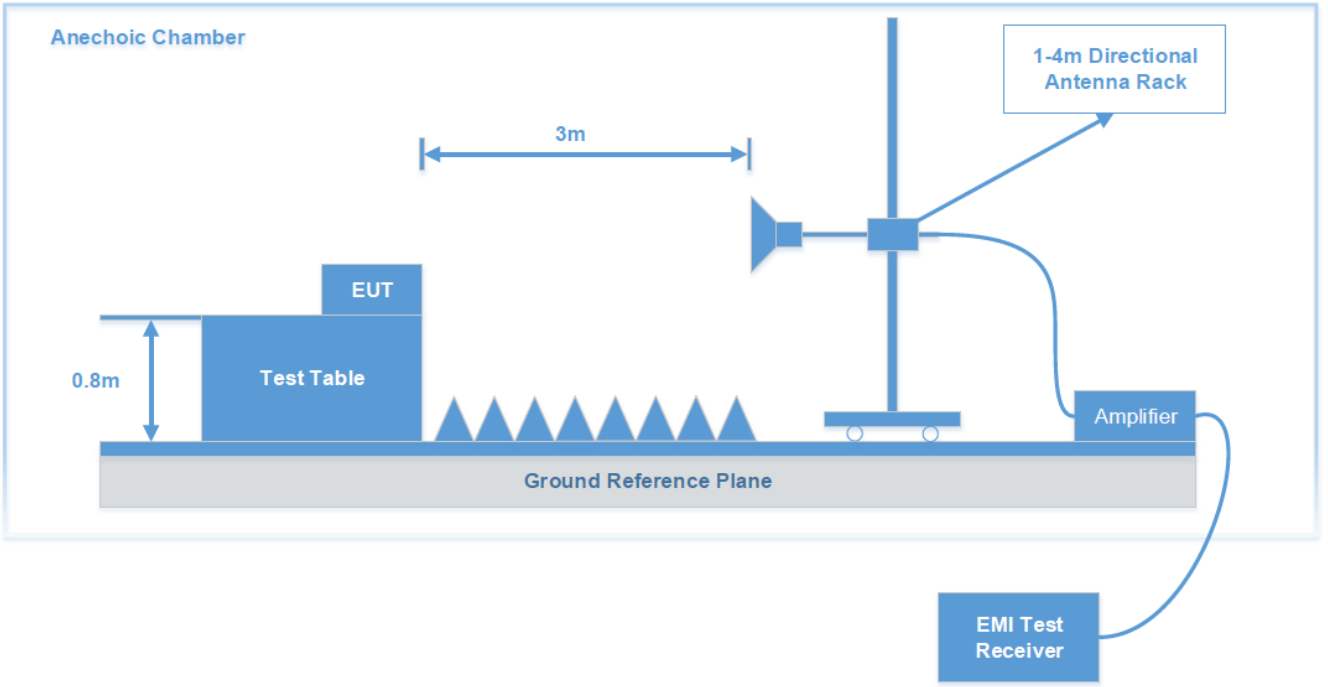
Item	Frequency Range	Measurement Uncertainty	U_{cispr}
Radiated Emissions	30MHz~1GHz	6.11 dB	6.3 dB
	1GHz~6GHz	4.45 dB	5.2 dB

Test System Setup

30MHz- 1GHz:



Above 1GHz:



Radiated Top View:

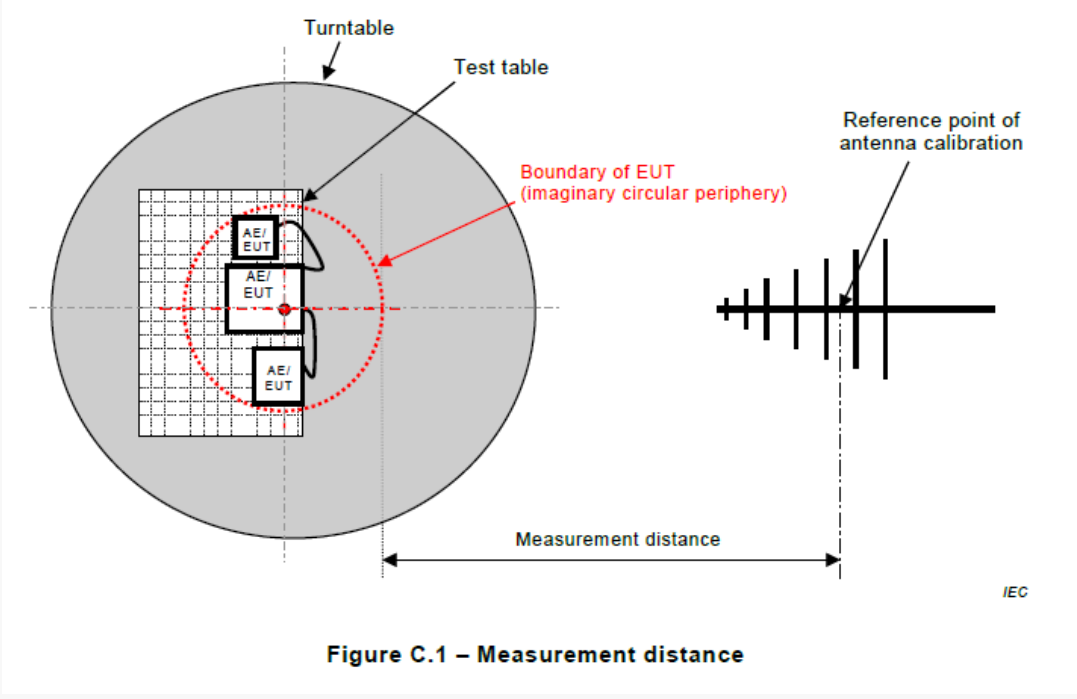


Figure C.1 – Measurement distance

The radiated emission tests were performed in the 3 meters, using the setup accordance with ETSI EN 301489-1 measurement procedures. The specification used was with ETSI EN 301 489-1 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 6 GHz.

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

Frequency Range	RBW	VBW	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	QP
Above 1 GHz	1MHz	3 MHz	Peak
	1MHz	3 MHz	AVG

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 Amplitude 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:

Corrected Amplitude (dBμV/m) = Meter Reading (dBμV) + Antenna Factor (dB/m) + Cable Loss (dB) - Amplifier Gain (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:

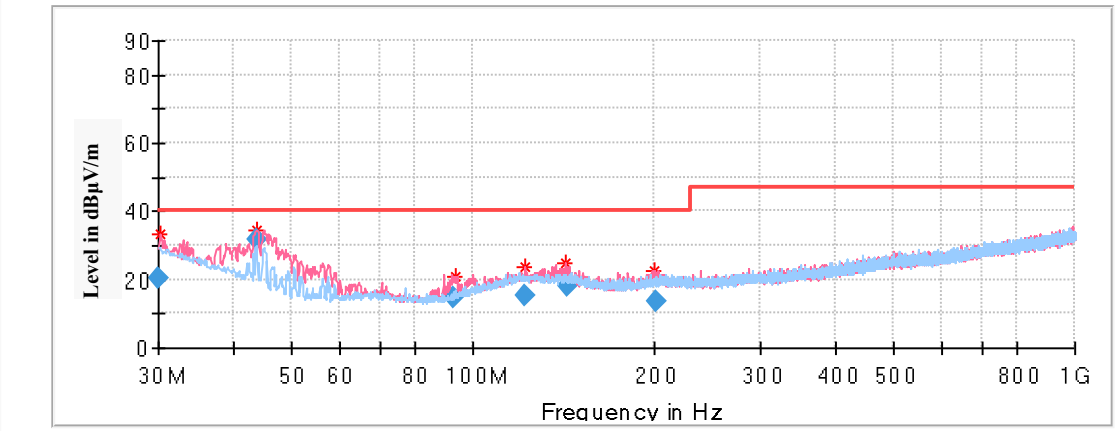
Margin (dB) = Limit (dBμV/m) – Corrected Amplitude (dBμV/m)

Test Data

Environmental Conditions &Test Information

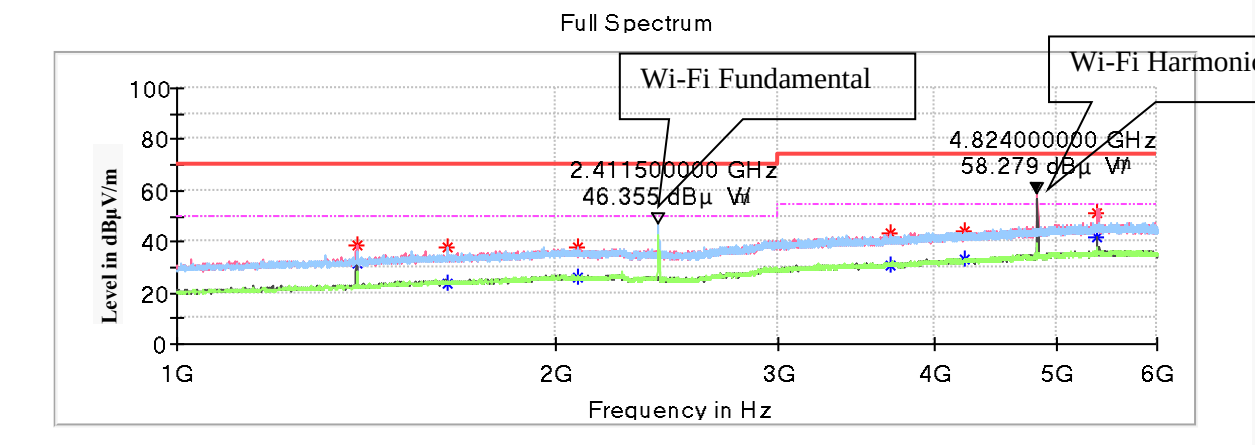
Test Frequency Range:	Below 1 GHz	Above 1 GHz
Temperature:	25.1 ℃	22.3 ℃
Relative Humidity:	37 %	38 %
ATM Pressure:	102.2 kPa	102.4 kPa
Test Date:	2022-10-18	2022-10-14
Test Engineer:	Mecal He	Rick Dai

Model: ATOMS3
Test mode 1:
30MHz - 1 GHz:



Frequency (MHz)	Corrected Amplitude Quasi Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.093402	20.42	40.00	19.58	100.0	V	285.0	-3.5
43.685050	31.48	40.00	8.52	100.0	V	219.0	-12.8
93.115300	14.50	40.00	25.50	100.0	V	152.0	-16.6
122.352150	15.11	40.00	24.89	100.0	V	252.0	-11.3
143.320750	18.16	40.00	21.84	100.0	V	201.0	-11.9
201.452600	13.41	40.00	26.59	200.0	V	164.0	-12.3

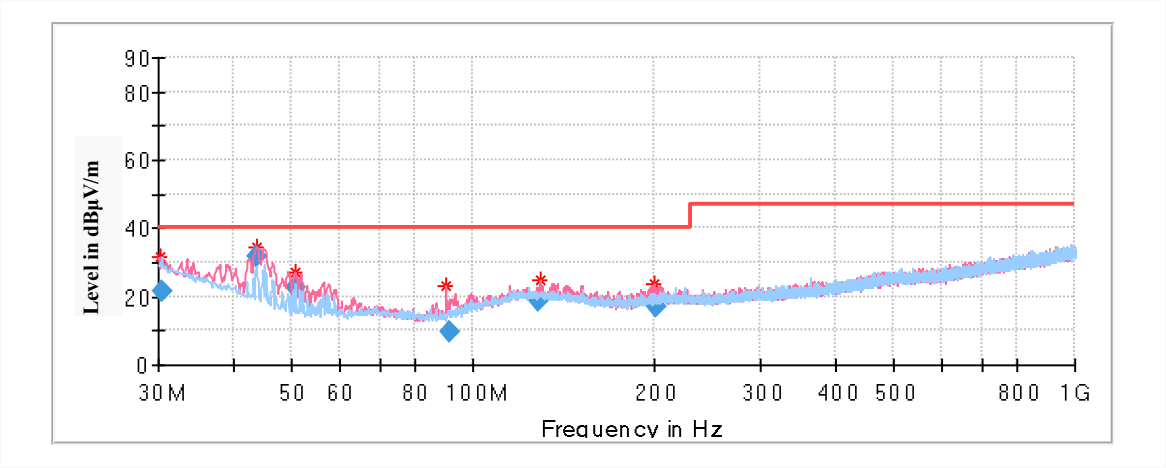
Above 1 GHz:



Frequency (MHz)	Corrected Amplitude		Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
	Max Peak (dBµV/m)	Average (dBµV/m)						
1389.000000	---	31.65	50.00	18.35	100.0	V	0.0	-13.4
1389.000000	38.21	---	70.00	31.79	100.0	V	0.0	-13.4
1639.500000	---	23.86	50.00	26.14	200.0	V	221.0	-11.9
1639.500000	37.78	---	70.00	32.22	200.0	V	221.0	-11.9
2083.000000	---	26.01	50.00	23.99	200.0	H	297.0	-10.0
2083.000000	37.61	---	70.00	32.39	200.0	H	297.0	-10.0
3679.000000	---	30.92	54.00	23.08	200.0	H	92.0	-4.4
3679.000000	43.46	---	74.00	30.54	200.0	H	92.0	-4.4
4221.500000	---	32.98	54.00	21.02	200.0	H	329.0	-2.7
4221.500000	43.77	---	74.00	30.23	200.0	H	329.0	-2.7
5383.500000	51.57	---	74.00	22.43	200.0	V	316.0	0.8
5383.500000	---	41.44	54.00	12.56	200.0	V	316.0	0.8

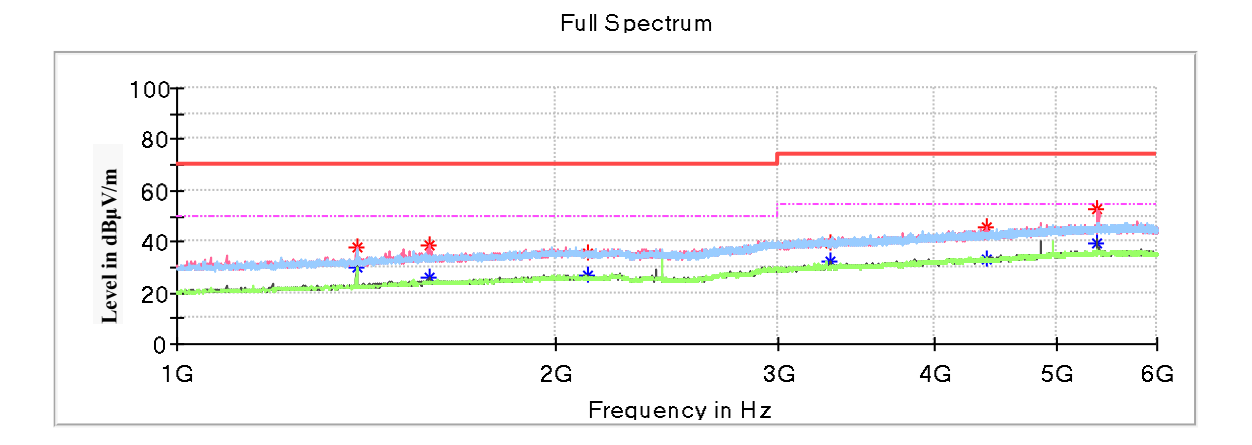
Test mode 3:

30MHz - 1 GHz:



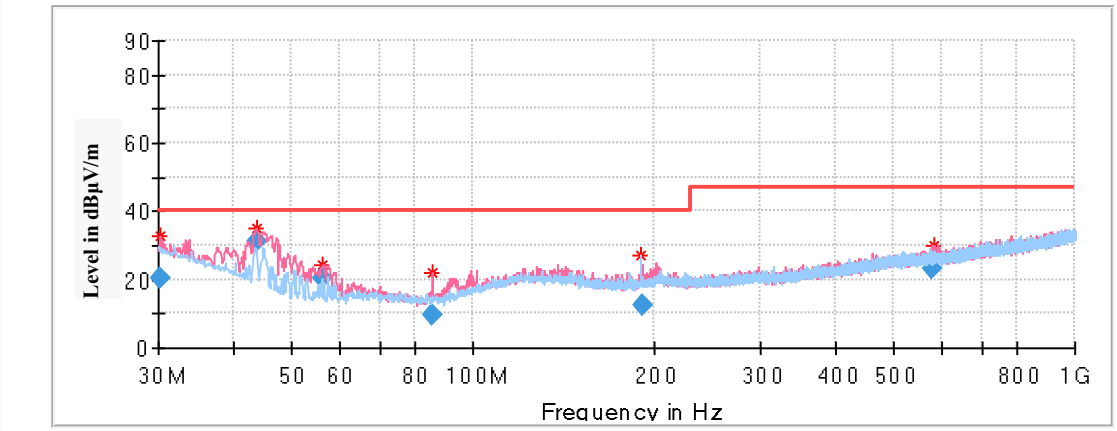
Frequency (MHz)	Corrected Amplitude Quasi Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.450601	21.24	40.00	18.76	100.0	V	239.0	-3.7
43.807450	31.65	40.00	8.35	100.0	V	233.0	-12.8
50.641200	22.91	40.00	17.09	100.0	V	333.0	-17.1
91.192750	9.81	40.00	30.19	200.0	V	159.0	-17.1
128.809800	18.89	40.00	21.11	100.0	V	178.0	-11.4
201.264050	17.25	40.00	22.75	100.0	V	62.0	-12.3

Above 1 GHz:



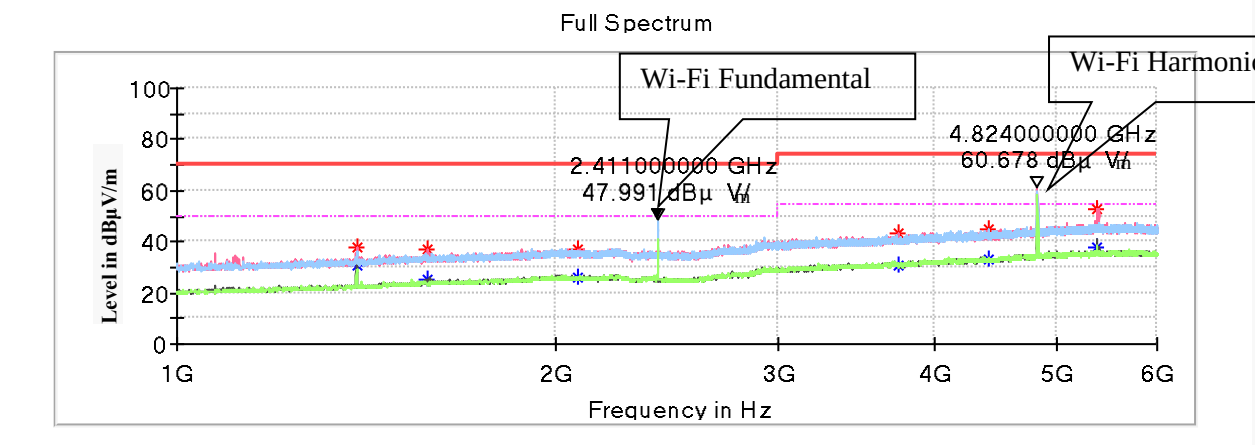
Frequency (MHz)	Corrected Amplitude		Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
	Max Peak (dBµV/m)	Average (dBµV/m)						
1388.500000	---	29.77	50.00	20.23	200.0	V	186.0	-13.4
1388.500000	37.47	---	70.00	32.53	200.0	V	186.0	-13.4
1587.000000	---	26.09	50.00	23.91	100.0	V	330.0	-12.2
1587.000000	38.84	---	70.00	31.16	100.0	V	330.0	-12.2
2118.000000	35.74	---	70.00	34.26	100.0	H	140.0	-9.9
2118.000000	---	26.88	50.00	23.12	100.0	H	140.0	-9.9
3306.500000	39.49	---	74.00	34.51	100.0	V	131.0	-5.7
3306.500000	---	32.39	54.00	21.61	100.0	V	131.0	-5.7
4392.500000	---	32.89	54.00	21.11	200.0	H	1.0	-2.3
4392.500000	45.61	---	74.00	28.39	200.0	H	1.0	-2.3
5379.000000	---	39.07	54.00	14.93	100.0	V	237.0	0.8
5379.000000	52.71	---	74.00	21.29	100.0	V	237.0	0.8

Model: ATOMS3-LITE
Test mode 1:
30MHz - 1 GHz:



Frequency (MHz)	Corrected Amplitude Quasi Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.214703	20.25	40.00	19.75	100.0	V	10.0	-3.6
43.614200	31.05	40.00	8.95	100.0	V	179.0	-12.7
56.229450	20.13	40.00	19.87	100.0	V	86.0	-17.3
85.438000	9.73	40.00	30.27	100.0	V	262.0	-17.5
190.898750	12.47	40.00	27.53	100.0	H	250.0	-12.8
581.199250	23.06	47.00	23.94	100.0	V	346.0	-5.1

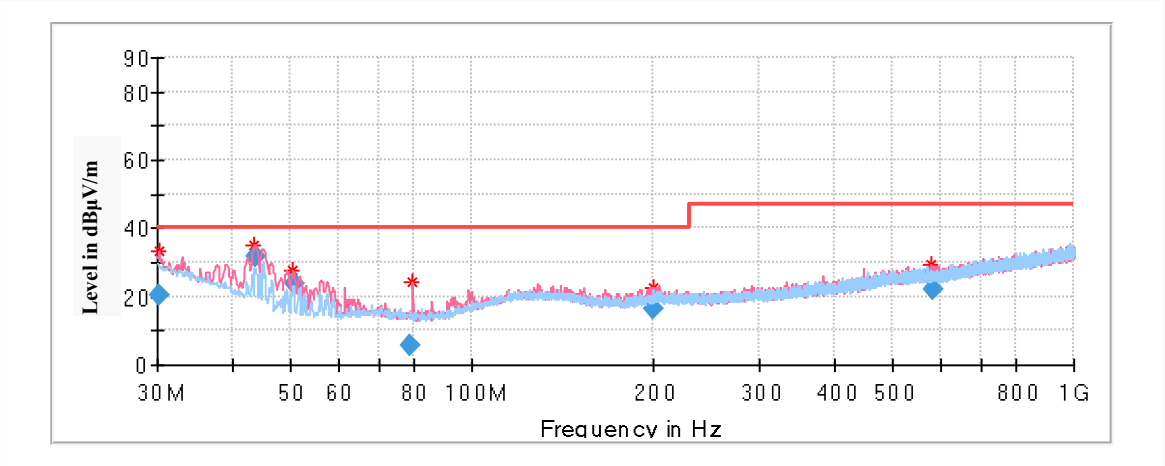
Above 1 GHz:



Frequency (MHz)	Corrected Amplitude		Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
	Max Peak (dBµV/m)	Average (dBµV/m)						
1389.000000	37.62	---	70.00	32.38	200.0	V	359.0	-13.4
1389.000000	---	30.58	50.00	19.42	200.0	V	359.0	-13.4
1580.000000	36.85	---	70.00	33.15	100.0	V	0.0	-12.2
1580.000000	---	25.51	50.00	24.49	100.0	V	0.0	-12.2
2084.500000	---	26.32	50.00	23.68	100.0	V	218.0	-10.0
2084.500000	36.71	---	70.00	33.29	100.0	V	218.0	-10.0
3736.000000	---	30.84	54.00	23.16	100.0	V	67.0	-4.2
3736.000000	43.12	---	74.00	30.88	100.0	V	67.0	-4.2
4415.000000	---	32.75	54.00	21.25	200.0	V	9.0	-2.2
4415.000000	44.88	---	74.00	29.12	200.0	V	9.0	-2.2
5379.500000	52.92	---	74.00	21.08	100.0	V	234.0	0.8
5379.500000	---	37.53	54.00	16.47	100.0	V	234.0	0.8

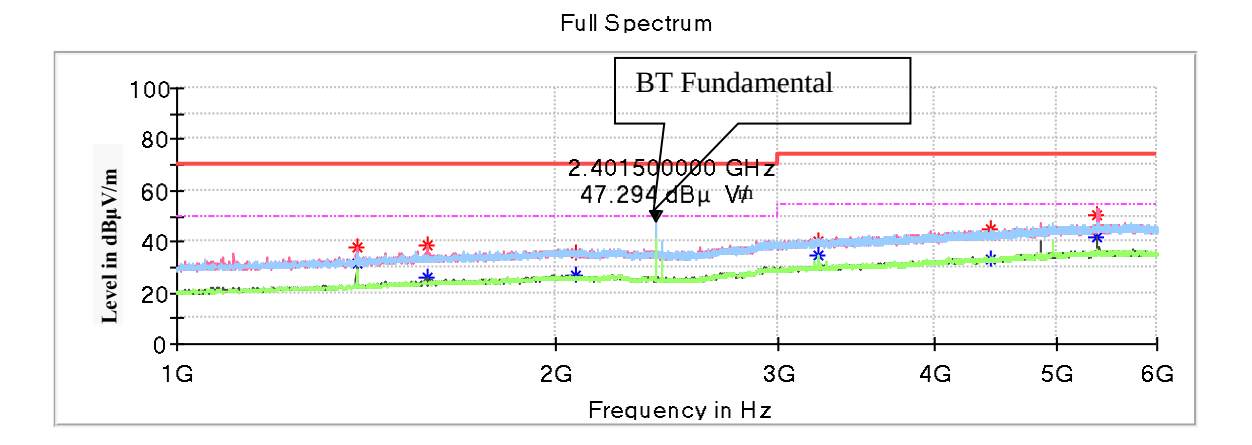
Test mode 3:

30MHz - 1 GHz:



Frequency (MHz)	Corrected Amplitude Quasi Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.322880	20.47	40.00	19.53	100.0	V	263.0	-3.6
43.628300	31.74	40.00	8.26	100.0	V	153.0	-12.7
50.485450	23.58	40.00	16.42	100.0	V	302.0	-17.1
78.931900	5.48	40.00	34.52	100.0	V	219.0	-17.6
200.572300	16.57	40.00	23.43	100.0	V	274.0	-12.3
584.274450	22.19	47.00	24.81	100.0	V	84.0	-5.0

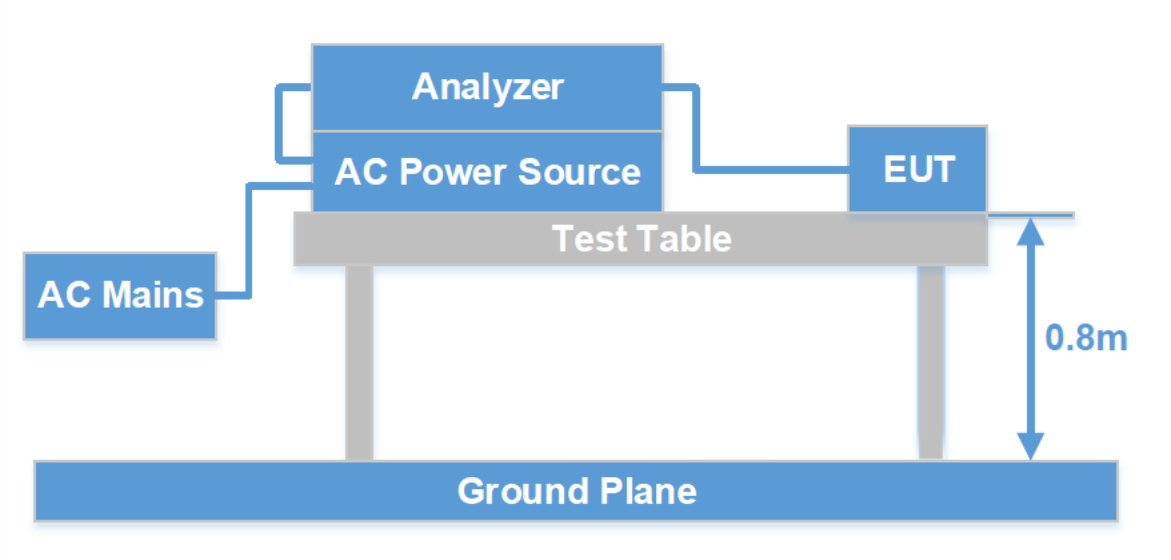
Above 1 GHz:



Frequency (MHz)	Corrected Amplitude		Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
	Max Peak (dBµV/m)	Average (dBµV/m)						
1389.500000	37.98	---	70.00	32.02	100.0	V	16.0	-13.4
1389.500000	---	31.38	50.00	18.62	100.0	V	16.0	-13.4
1581.000000	---	25.98	50.00	24.02	100.0	V	0.0	-12.2
1581.000000	38.56	---	70.00	31.44	100.0	V	0.0	-12.2
2075.500000	35.52	---	70.00	34.48	200.0	V	122.0	-10.0
2075.500000	---	26.71	50.00	23.29	200.0	V	122.0	-10.0
3234.500000	---	34.42	54.00	19.58	100.0	H	9.0	-5.9
3234.500000	40.03	---	74.00	33.97	100.0	H	9.0	-5.9
4434.000000	---	33.10	54.00	20.90	100.0	H	197.0	-2.2
4434.000000	44.53	---	74.00	29.47	100.0	H	197.0	-2.2
5383.500000	50.49	---	74.00	23.51	200.0	V	301.0	0.8
5383.500000	---	41.88	54.00	12.12	200.0	V	301.0	0.8

§8.6-VOLTAGE FLUCTUATIONS AND FLICKER (AC MAINS INPUT PORT)

Test System Setup



Test Standard

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 Pst shall not be greater than 1,0;
– the value of Plt shall not be greater than 0,65;
– the Tmax, the accumulated time value of d(t) with a deviation exceeding 3,3 % during a single voltage change at the EUT terminals, shall not exceed 500 ms;
– the relative steady-state voltage change, dc, shall not exceed 3,3 %;
– the maximum relative voltage change dmax, 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 Pst and Plt limit. For example: a dmax 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

Environmental Conditions & Test Information

Temperature:	22.4 ℃
Relative Humidity:	37 %
ATM Pressure:	102.4 kPa
Test Date:	2022-10-25
Test Engineer:	Max Min

Standard Name:	EN 61000-3-3 (Edition 3.2)
Observation period:	P_{st}: T_p = 10 min
	P_{lt}: T_p = 120 min
EUT operation mode:	Test mode 1
Model:	ATOMS3

Maximum Flicker Results

Parameter	EUT values	Limit	Result
Pst	0.076	1.00	PASS
Plt	0.033	0.65	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.318	4.00	PASS
Tmax [s]	0.000	0.50	PASS

Standard Name:	EN 61000-3-3 (Edition 3.2)
Observation period:	P_{st}: T_p = 10 min
	P_{lt}: T_p = 120 min
EUT operation mode:	Test mode 1
Model:	ATOMS3-LITE

Maximum Flicker Results

Parameter	EUT values	Limit	Result
Pst	0.070	1.00	PASS
Plt	0.031	0.65	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.200	4.00	PASS
Tmax [s]	0.000	0.50	PASS

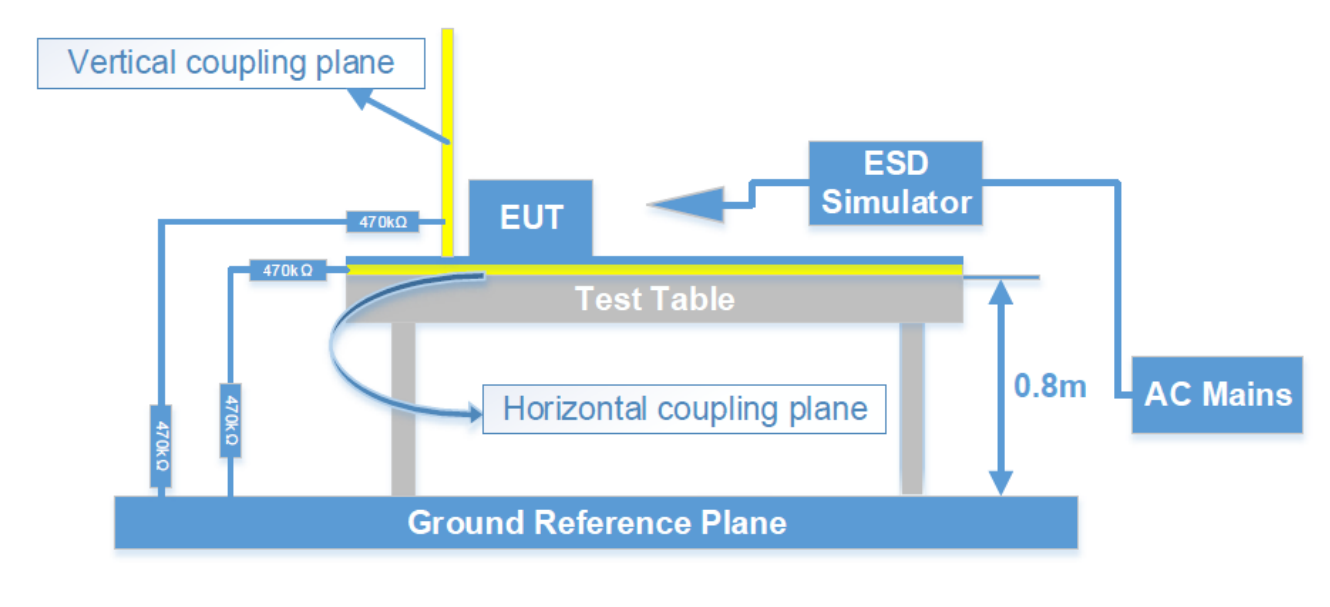
§9.3 - ELECTROSTATIC DISCHARGE

Measurement Uncertainty

U_{lab} (measurement uncertainty of lab) and U_{EN} (measurement uncertainty of EN 61000-4-2) please refer to the following:

Parameter	U_{EN}	U_{lab}
Rise time t_r	≤15%	15%
Peak current I_p	≤7%	6.30%
Current at 30 ns	≤7%	6.30%
Current at 60 ns	≤7%	6.30%

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 an 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 kOhms 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

ETSI EN 301 489-1 V2.2.3 (2019-11) / EN 61000-4-2:2009
Test Level 3 for Air Discharge at ±8 kV
Test Level 2 for Contact Discharge at ±4 kV

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 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 50 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 0.1m from the EUT and with the discharge electrode touching the coupling plane.

Indirect discharge for vertical coupling plane

At least 50 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 & Test Information

Temperature:	22.4 °C
Relative Humidity:	37 %
ATM Pressure:	102.4 kPa
Test Date:	2022-10-25
Test Engineer:	Jack Liu

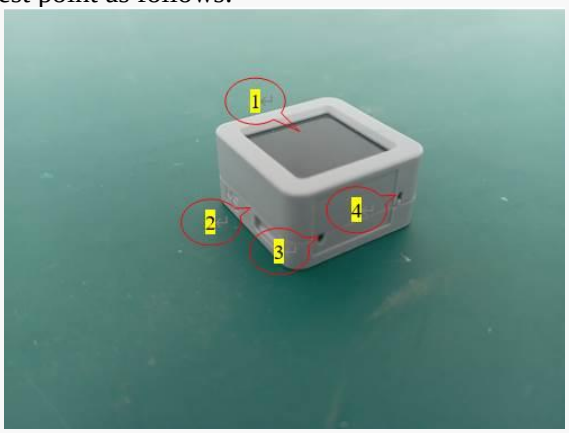
Test mode 1-4:

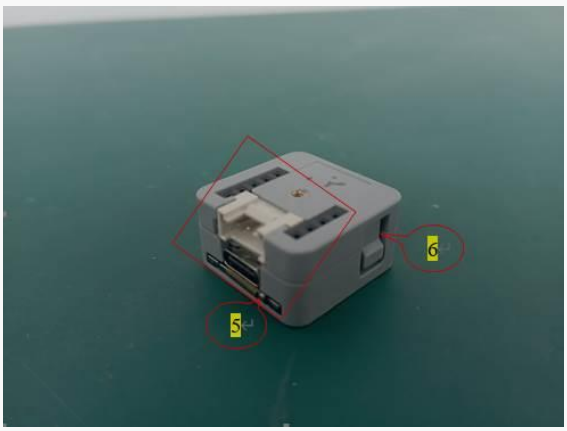
Model: ATOMS3

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**
1~6	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	A	A	/	/	/	/	/
Back Side	A	A	A	A	/	/	/	/	/
Left Side	A	A	A	A	/	/	/	/	/
Right Side	A	A	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	A	A	/	/	/	/	/
Back Side	A	A	A	A	/	/	/	/	/
Left Side	A	A	A	A	/	/	/	/	/
Right Side	A	A	A	A	/	/	/	/	/

Note: “A” stands for, during test, operate as intended no loss of function, no degradation of performance, and after test, no degradation of performance, no loss of function.

Test point as follows:



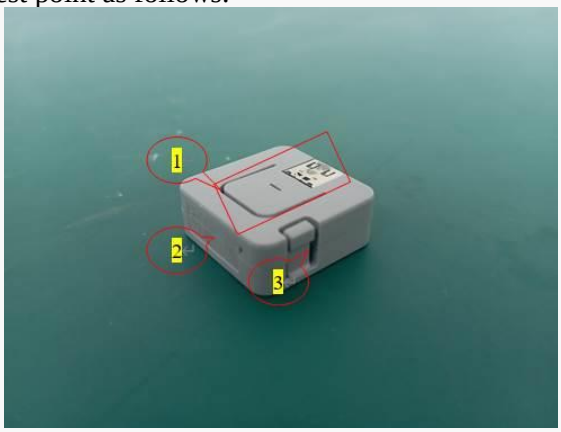


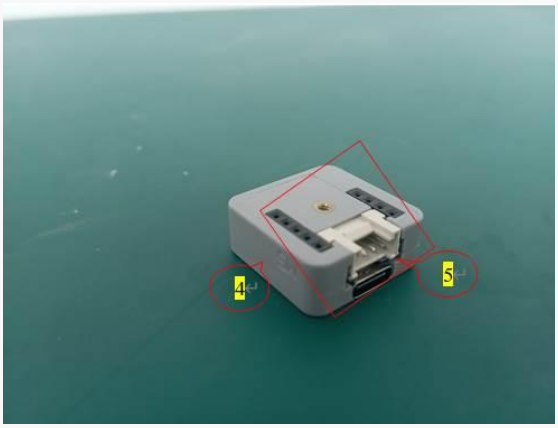
Model: ATOMS3-LITE

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**
1~5	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	A	A	/	/	/	/	/
Back Side	A	A	A	A	/	/	/	/	/
Left Side	A	A	A	A	/	/	/	/	/
Right Side	A	A	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	A	A	/	/	/	/	/
Back Side	A	A	A	A	/	/	/	/	/
Left Side	A	A	A	A	/	/	/	/	/
Right Side	A	A	A	A	/	/	/	/	/

Note: “A” stands for, during test, operate as intended no loss of function, no degradation of performance, and after test, no degradation of performance, no loss of function.

Test point as follows:





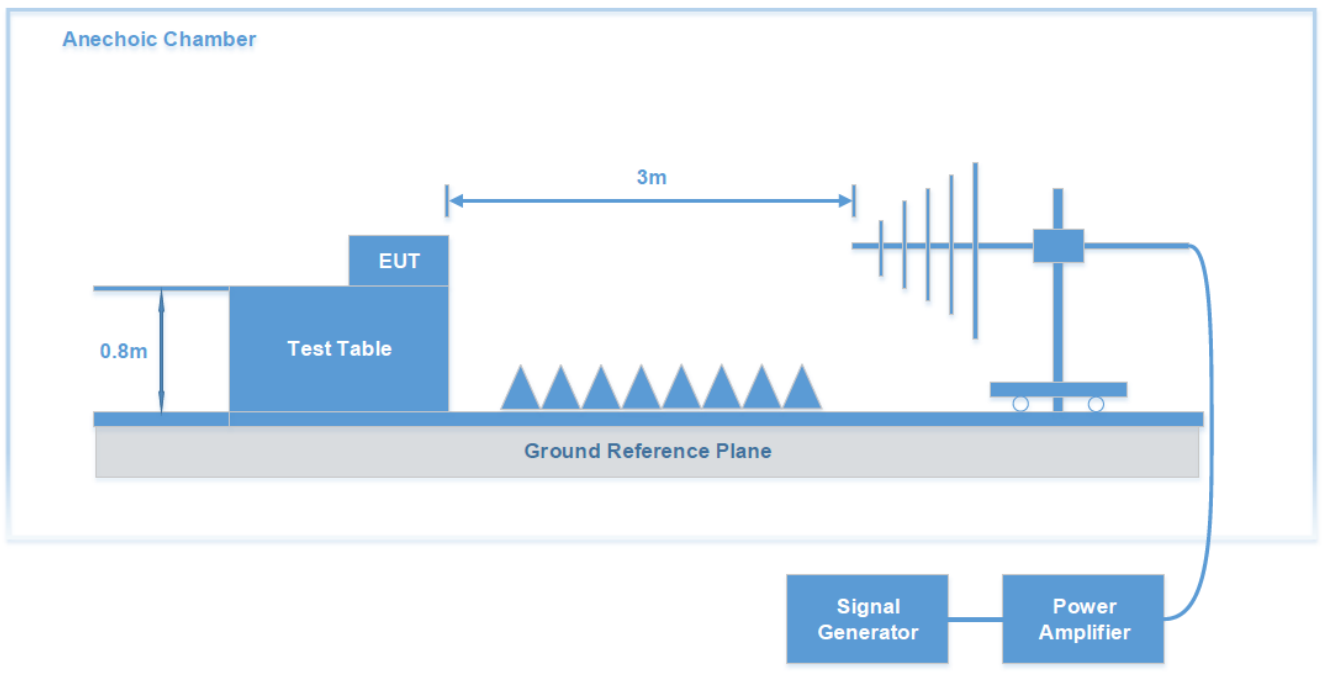
§9.2 -RADIO FREQUENCY ELECTROMAGNETIC FIELD (80 MHZ – 6000 MHZ)

Measurement Uncertainty

U_{lab} (measurement uncertainty of lab) and U_{EN} (measurement uncertainty of EN IEC 61000-4-3) please refer to the following:

Parameter	U_{EN}	U_{lab}
Calibration process	1.88 dB	1.88 dB
Level setting	2.19 dB	2.19 dB

Test System Setup



Test Standard

ETSI EN 301 489-1 V2.2.3 (2019-11) / EN IEC 61000-4-3:2020
Test Level 2 at 3V/m

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.

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

All the scanning conditions are as follows:

Condition of Test	**Remarks**
Field Strength	3 V/m
Radiated Signal	AM 80%, 1kHz sin wave
Scanning Frequency	80 - 6000 MHz
Dwell Time	3 Sec.
Test step	1%

Test Data

Environmental Conditions & Test Information

Temperature:	22.4 °C
Relative Humidity:	37 %
ATM Pressure:	102.4 kPa
Test Date:	2022-10-25
Test Engineer:	Jay Liu

Test mode 1-4:

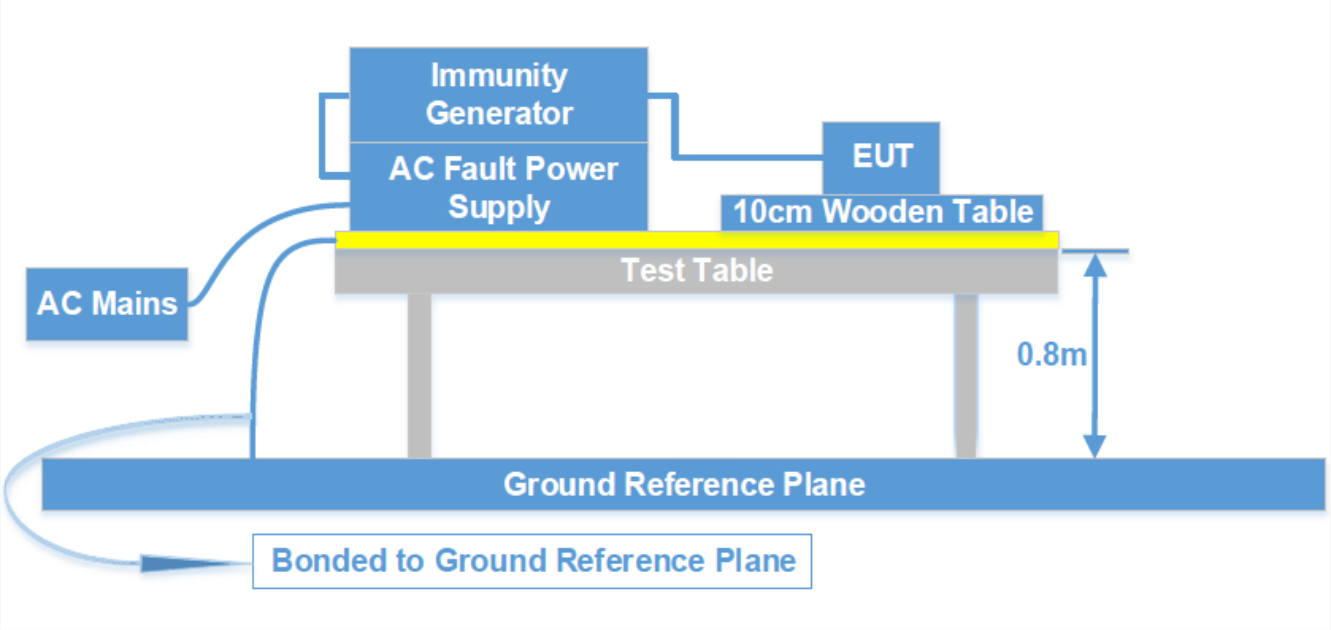
Model: ATOMS3&ATOMS3-LITE

Frequency Range (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
80-6000	A	A	A	A	A	A	A	A

Note:
1. “A” stands for, during the test, the equipment shall: continue to operate as intended; not unintentionally transmit; not unintentionally change its operating state; not unintentionally change critical stored data.
2. “Wi-Fi link” is to monitor smart phone to connect EUT and monitor the connection state.
3. “Wi-Fi standby” is to monitor the EUT in standby mode to unintentional transmission does not occur.
4. “Bluetooth link” is to monitor smart phone to connect EUT and monitor the connection state.
5. “Bluetooth standby” is to monitor the EUT in standby mode to unintentional transmission does not occur.

§9.4 –FAST TRANSIENTS, COMMON MODE

Test System Setup



Test Standard

ETSI EN 301 489-1 V2.2.3 (2019-11)/ EN 61000-4-4:2012
AC Mains: Test level 2 at 1 kV

Test Level

Open Circuit Output Test Voltage ±10%				
Level	Power ports,earth port(PE)		Signal and control ports	
	Voltage(kV)	Repetition frequency(kHz)	Voltage(kV)	Repetition frequency(kHz)
1	0.5	5 or 100	0.25	5 or 100
2	1		0.5	
3	2		1	
4	4		2	
X	Special	Special	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 & Test Information

Temperature:	22.4 °C
Relative Humidity:	37 %
ATM Pressure:	102.4 kPa
Test Date:	2022-10-25
Test Engineer:	Jack Liu

Test mode 1-4:

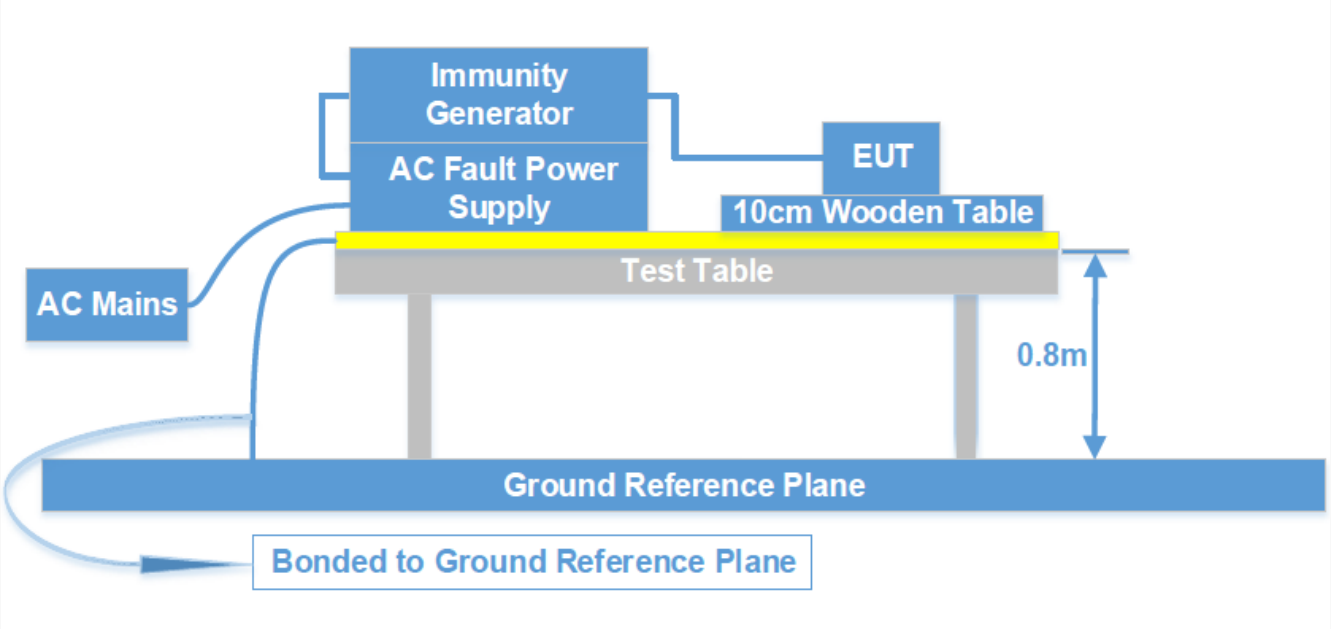
Model: ATOMS3&ATOMS3-LITE

Test Ports		**Test Levels (kV) Repetition frequency(5kHz)**							
		+0.5	**-0.5**	**+1.0**	**-1.0**	**+2.0**	**-2.0**	**+4.0**	**-4.0**
AC Mains Power Input Ports	L	A	A	A	A	/	/	/	/
	N	A	A	A	A	/	/	/	/
	L+N	A	A	A	A	/	/	/	/
	L+PE	/	/	/	/	/	/	/	/
	N+PE	/	/	/	/	/	/	/	/
	L+N+PE	/	/	/	/	/	/	/	/
Signal Port	/	/	/	/	/	/	/	/	/

Note:
1."A" stands for, during test, operate as intended no loss of function, no degradation of performance, and after test, no degradation of performance, no loss of function.

§9.8 – SURGES

Test System Setup



Test Standard

ETSI EN 301 489-1 V2.2.3 (2019-11) / EN 61000-4-5:2014+A1:2017
AC Mains: L-N: Test level 3 at 1 kV

Test Level

Level	Open Circuit Output Test Voltage ±10%		Performance Criterion	
	Line - Line	Line - Ground	AC Mains	Signal Port
1	---	0.5	---	---
2	0.5	1	---	---
3	1	2	B	---
4	2	4	---	---
X	Special	Special	---	---

Test Procedure

1. For line to line coupling mode, provide a 1.2/50μs voltage surge (at open-circuit condition) and an 8/20 μs current surge into a short circuit.
2. At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
3. Different phase angles are done individually.
4. Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

Test Data

Environmental Conditions & Test Information

Temperature:	22.4 °C
Relative Humidity:	37 %
ATM Pressure:	102.4 kPa
Test Date:	2022-10-25
Test Engineer:	Jack Liu

Test mode 1-4:

Model: ATOMS3&ATOMS3-LITE

Test Ports		Test Levels (kV)							
		+0.5	**-0.5**	**+1.0**	**-1.0**	**+2.0**	**-2.0**	**+4.0**	**-4.0**
AC Mains power input ports	L-N	A	A	A	A	/	/	/	/
	L-PE	/	/	/	/	/	/	/	/
	N-PE	/	/	/	/	/	/	/	/
Signal port	/	/	/	/	/	/	/	/	/

Note:
1. “A” stands for, during test, operate as intended no loss of function, no degradation of performance, and after test, no degradation of performance, no loss of function.

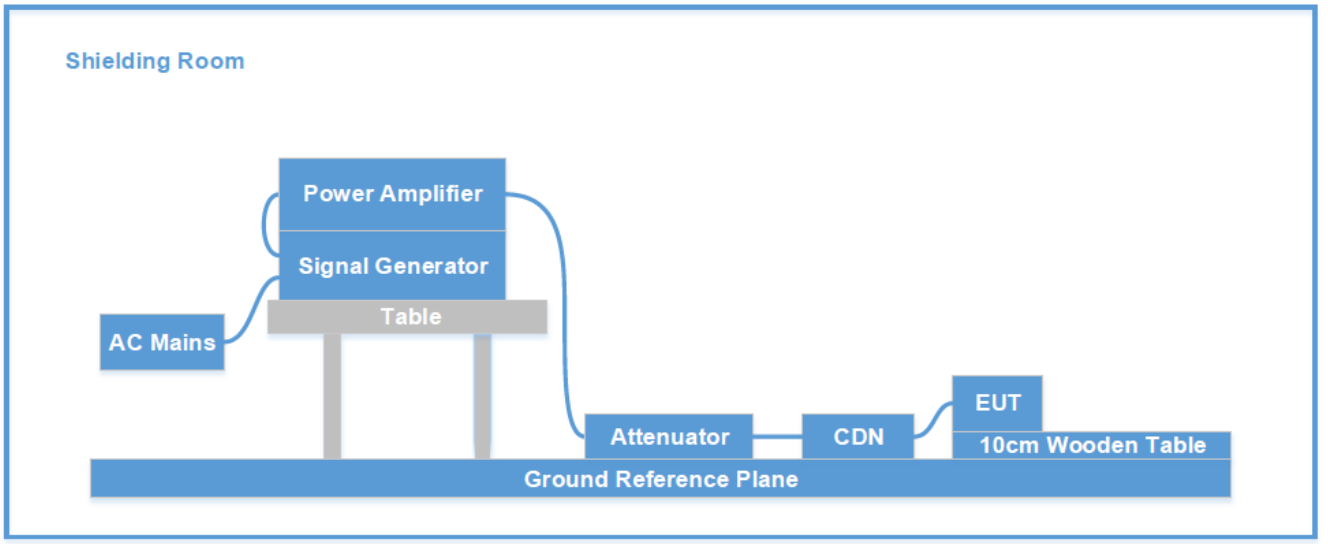
§9.5 - RADIO FREQUENCY, COMMON MODE

Measurement Uncertainty

U_{lab} (measurement uncertainty of lab) and U_{IEC} (measurement uncertainty of IEC 61000-4-6) please refer to the following:

Parameter	U_{IEC}	U_{lab}
CDN calibration process	1.27 dB	1.27 dB
CDN test process	1.36 dB	1.36 dB

Test Setup



Test Standard

ETSI EN 301 489-1 V2.2.3 (2019-11)/ EN 61000-4-6:2014+AC:2015
Test level 2 at 3 V (r.m.s.), 0.15 MHz ~ 80 MHz

Test Level

Level	Voltage Level (V)
1	1
2	3
3	10
X	Special

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 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m 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 50mm (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*10-3decades/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) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

Test Data

Environmental Conditions & Test Information

Temperature:	22.3 °C
Relative Humidity:	37 %
ATM Pressure:	102.5 kPa
Test Date:	2022-10-11
Test Engineer:	Jack Liu

Test mode 1-4:

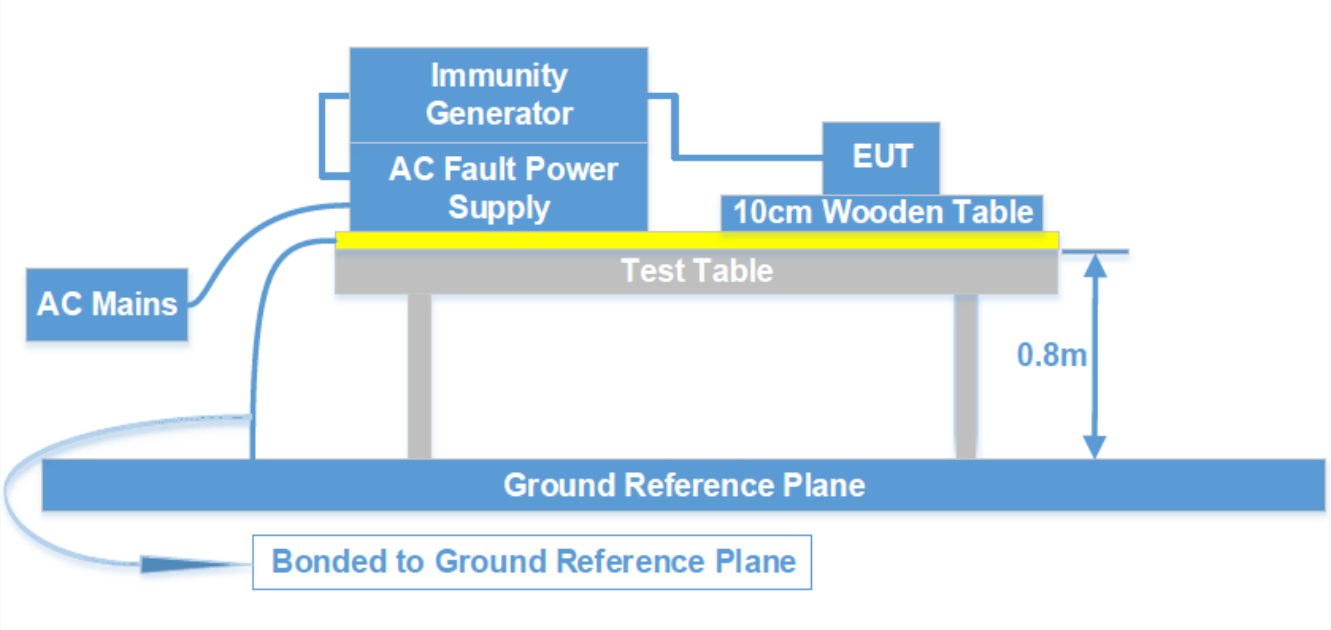
Model: ATOMS3&ATOMS3-LITE

Test Ports	Test Equipment	Frequency Range (MHz)	Voltage Level (e.m.f.) U0			
			1V	3V	10V	X
AC mains power input ports	CDN M225E	0.15-80	/	**A**	/	/
Signal Ports	/	/	/	/	/	/

Note: “A” stands for, during the test, the equipment shall: continue to operate as intended; not unintentionally transmit; not unintentionally change its operating state; not unintentionally change critical stored data.

§9.7 - VOLTAGE DIPS AND INTERRUPTIONS

Test Setup



Test Standard

ETSI EN 301 489-1 V2.2.3 (2019-11) / EN 61000-4-11:2020+AC:2020-06

Test levels and Performance Criterion

Test Level	Cycle	Performance criterion
Voltage dips: 0% residual voltage	0.5	B
Voltage dips: 0% residual voltage	1	B
Voltage dips: 70% residual voltage	25	C
Voltage interruptions: 0% residual voltage	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 & Test Information

Temperature:	22.4 °C
Relative Humidity:	37 %
ATM Pressure:	102.4 kPa
Test Date:	2022-10-25
Test Engineer:	Jay Liu

Test mode 1-4:

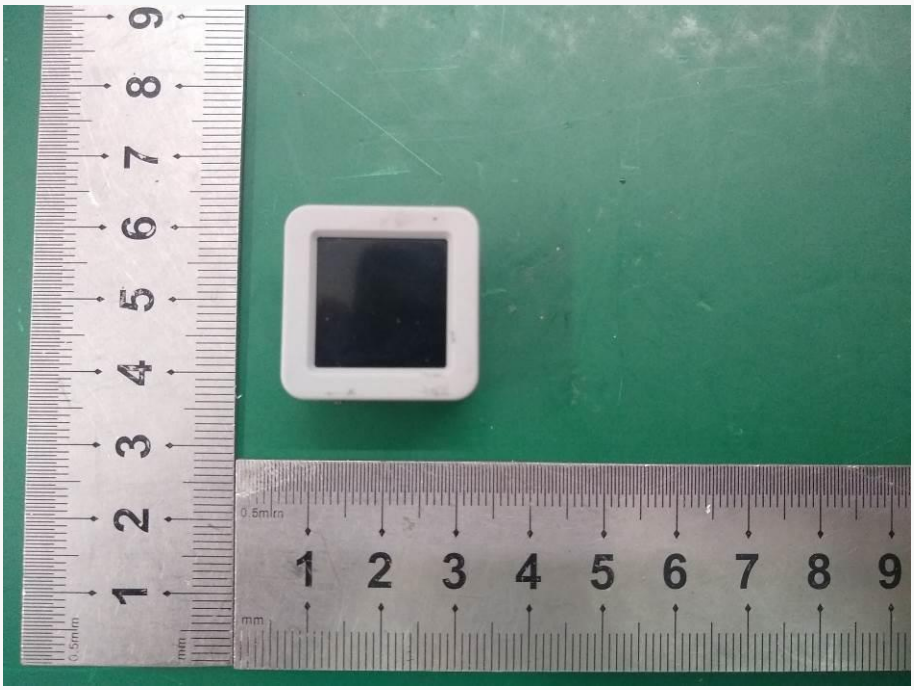
Model: ATOMS3&ATOMS3-LITE

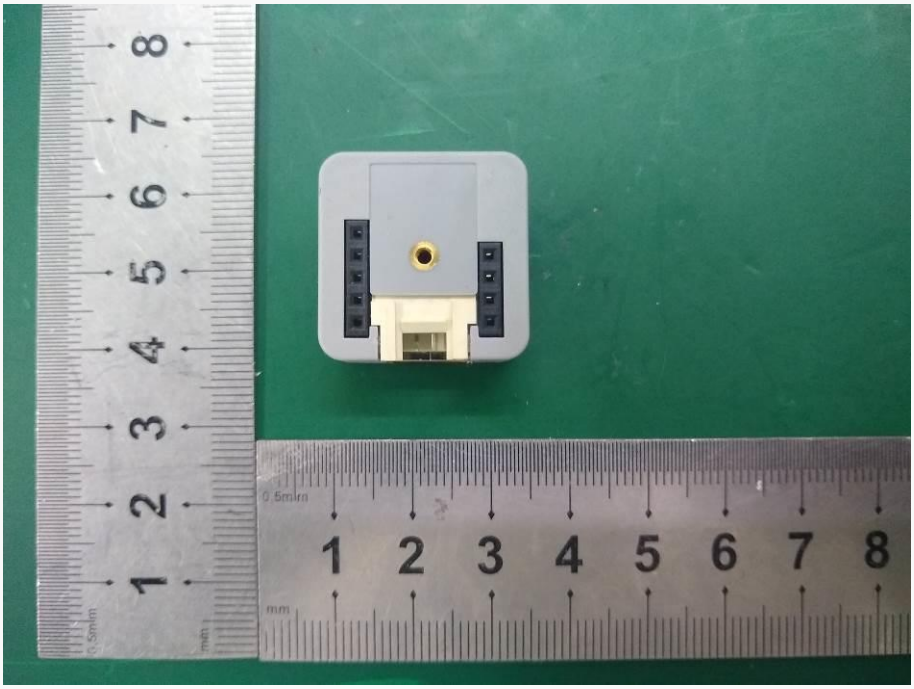
Test Level	Cycle	Phase Angle	Result
Voltage dips: 0 % residual voltage	0.5	0º/90º/180º/270º	A
Voltage dips: 0 % residual voltage	1	0º/90º/180º/270º	A
Voltage dips: 70 % residual voltage	25	0º/90º/180º/270º	A
Voltage interruptions: 0 % residual voltage	250	0º/90º/180º/270º	C

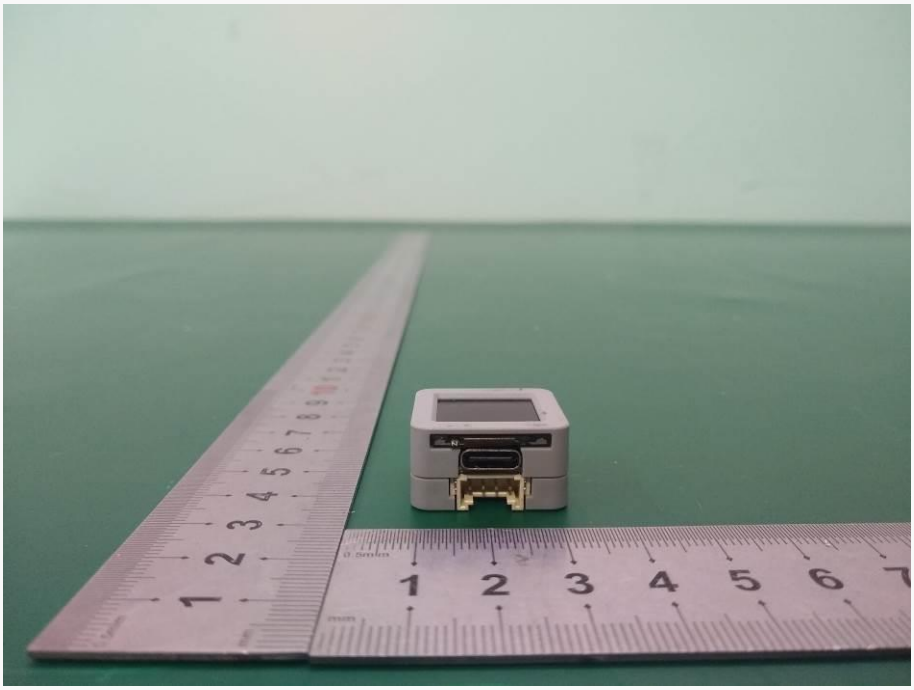
Note:
1. “A” stands for, during test, operate as intended no loss of function, no degradation of performance, and after test, no degradation of performance, no loss of function.
2. “C” stands for, the EUT stops working during the test. Manually restore the working status after the test.

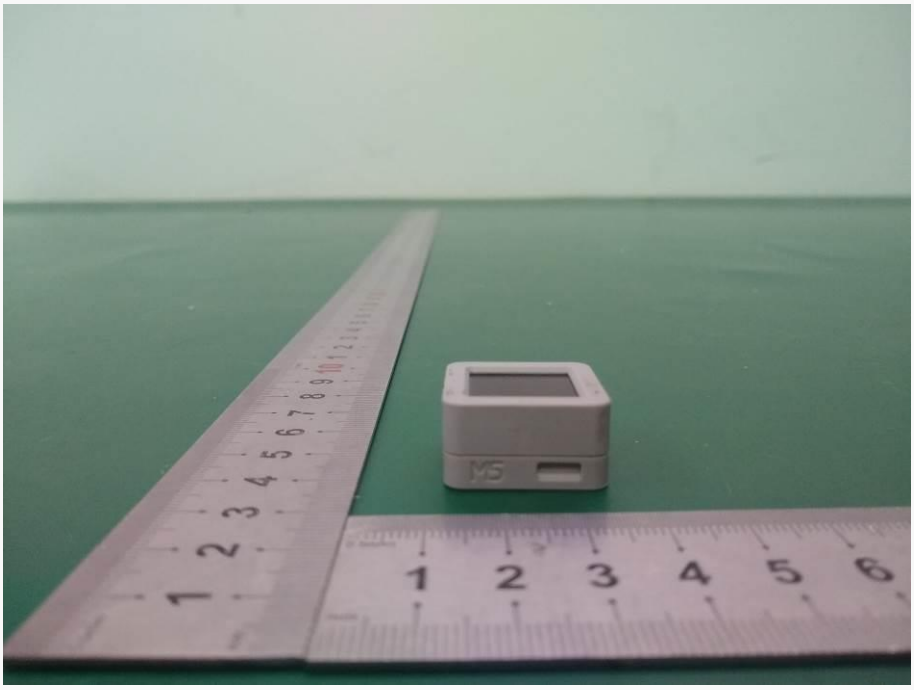
EXHIBIT A - EUT PHOTOGRAPHS

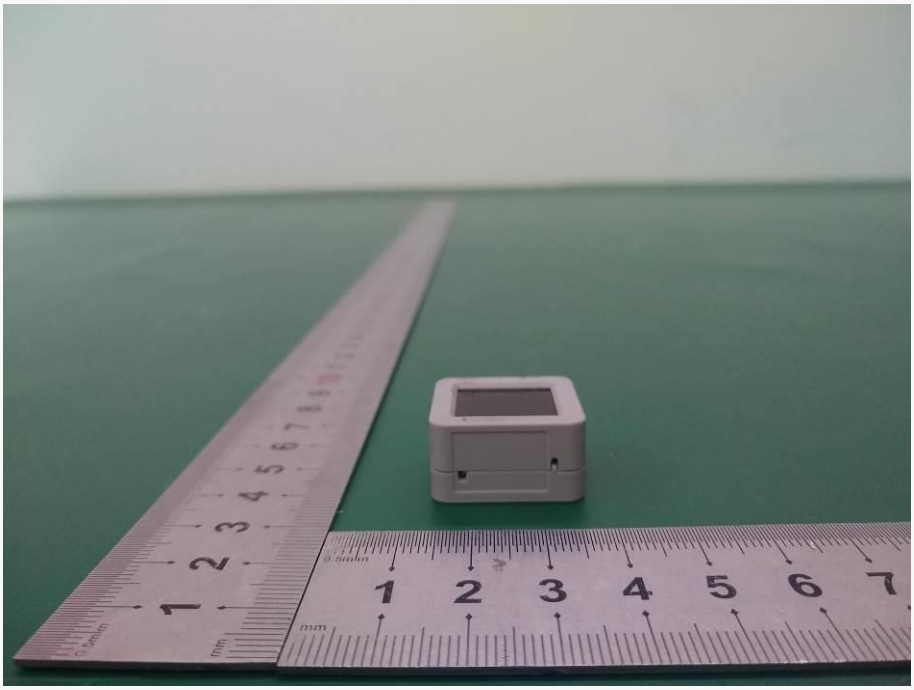
Model: ATOMS3

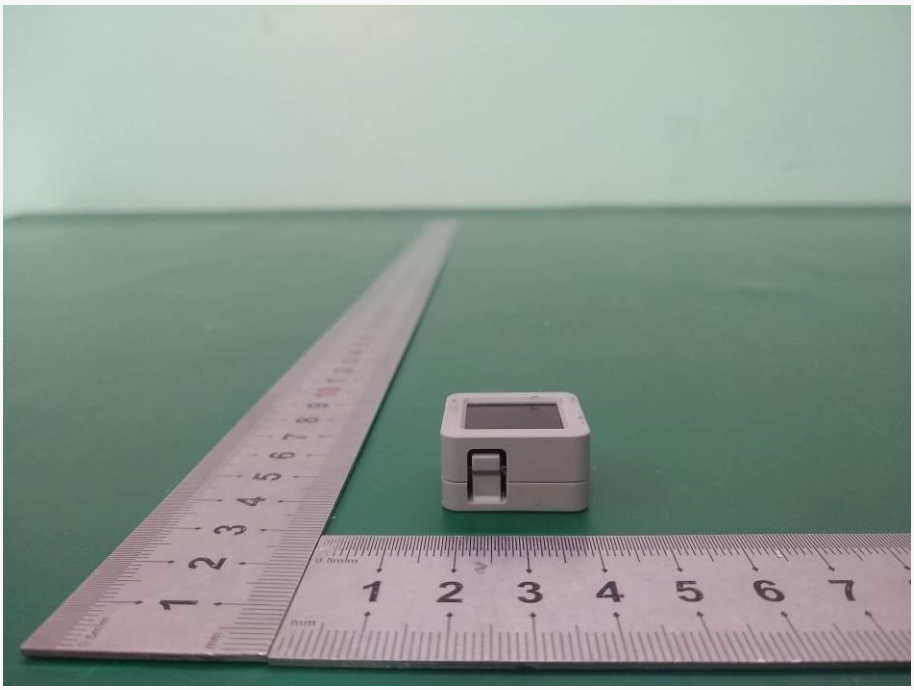


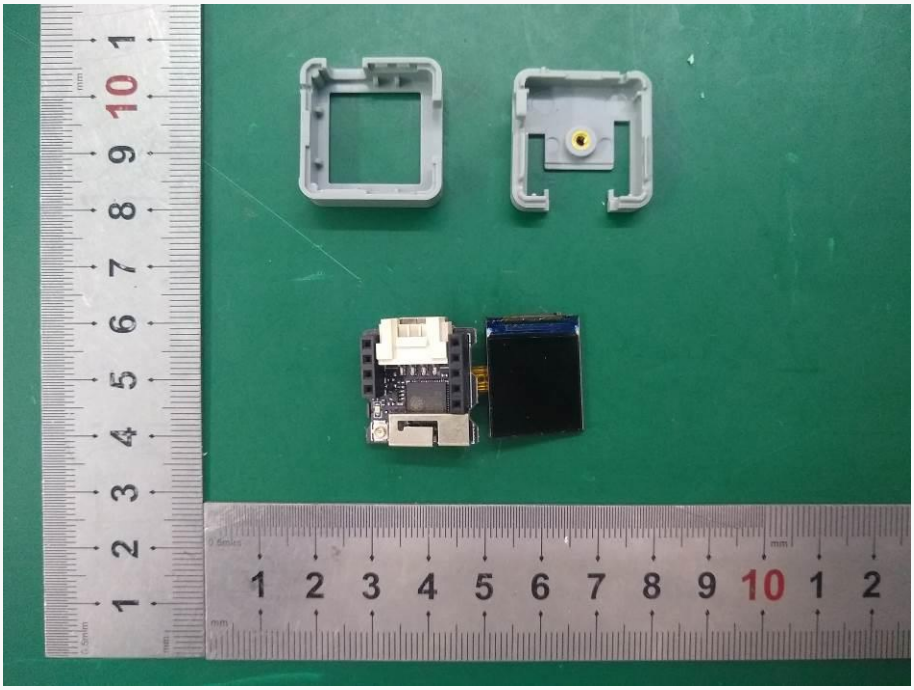


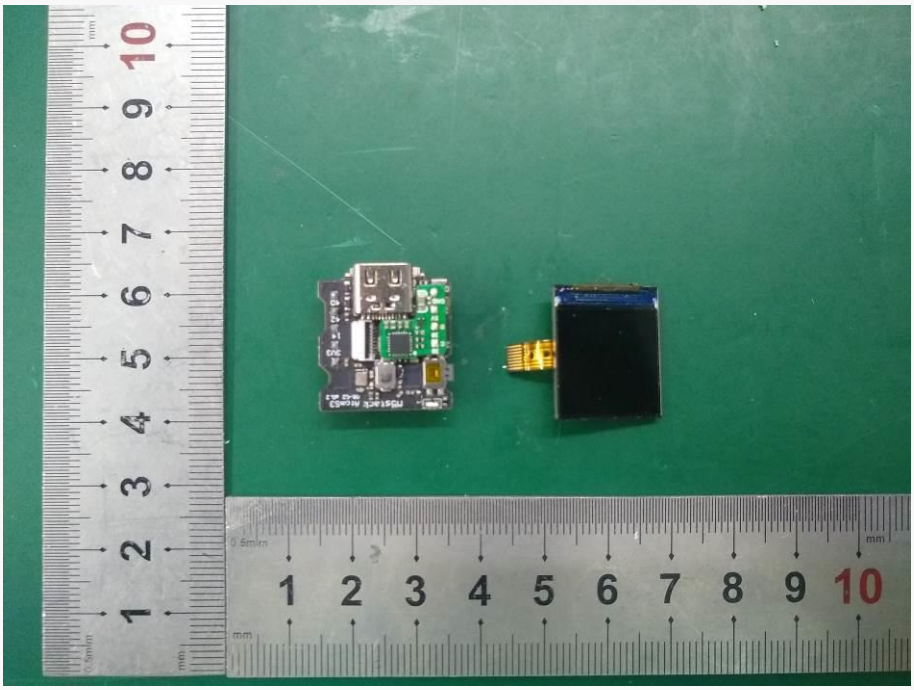


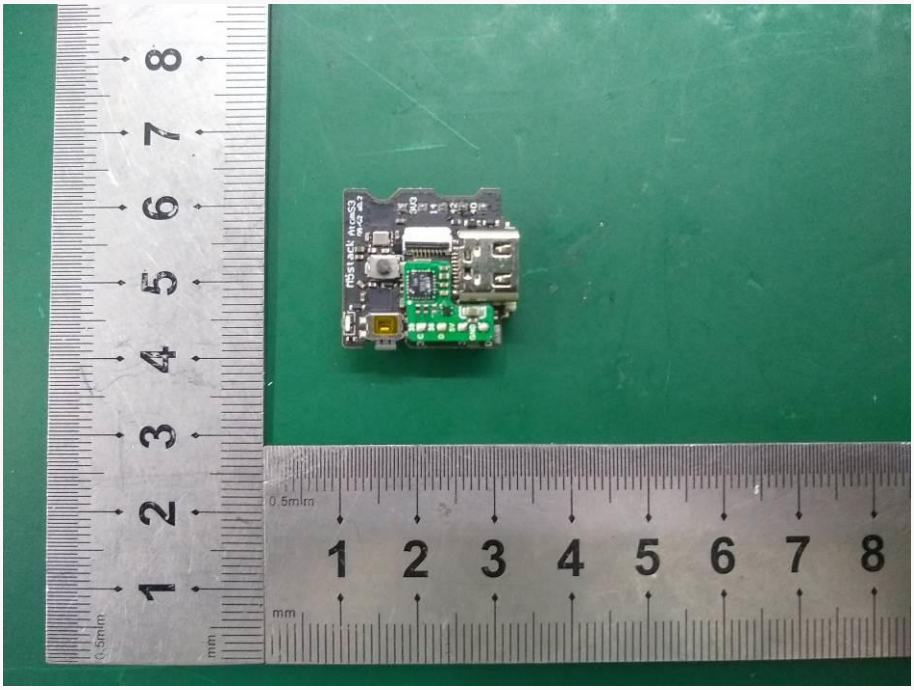


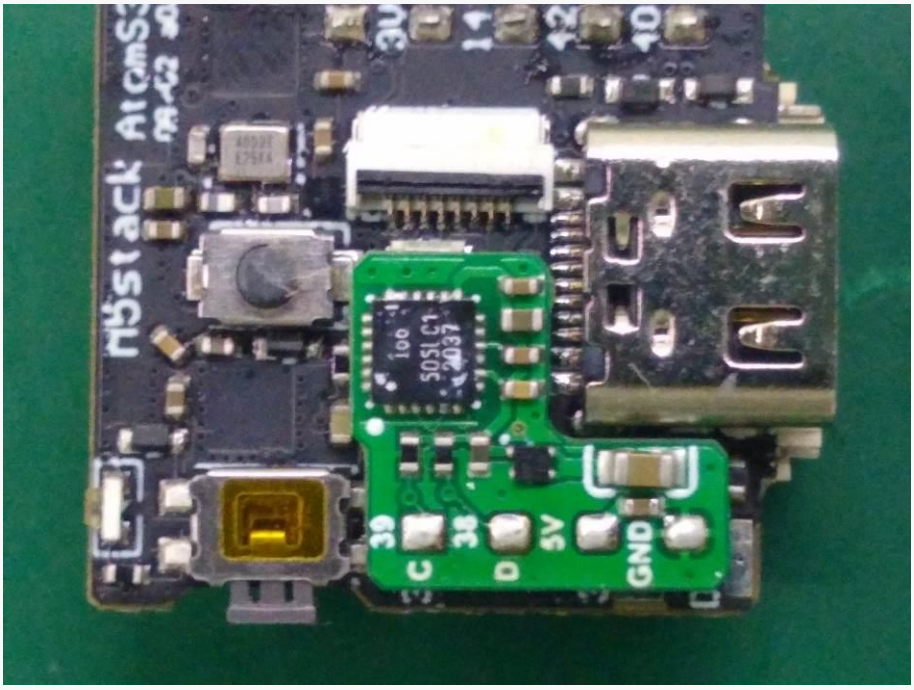


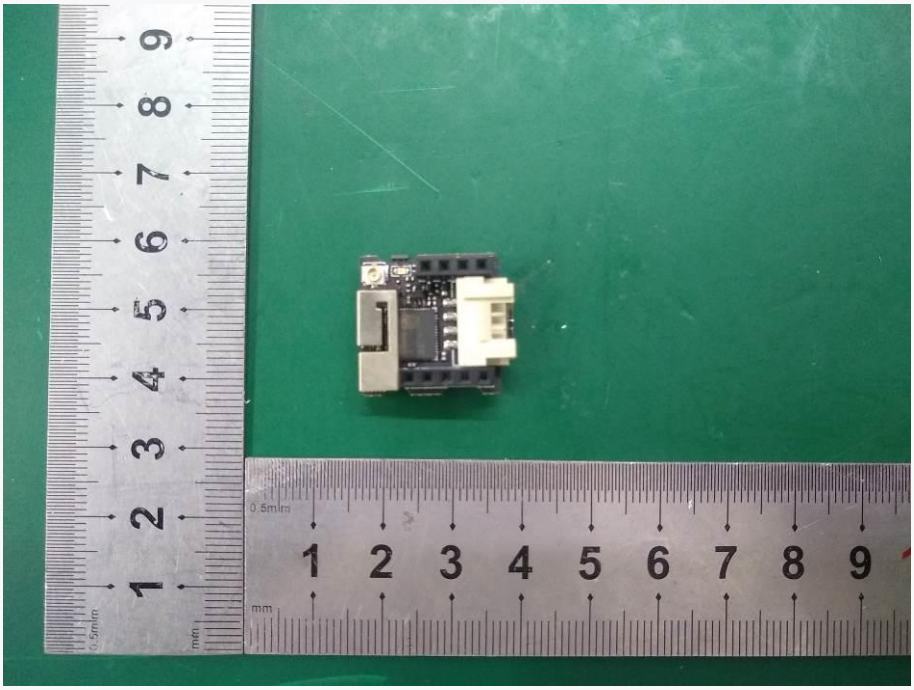


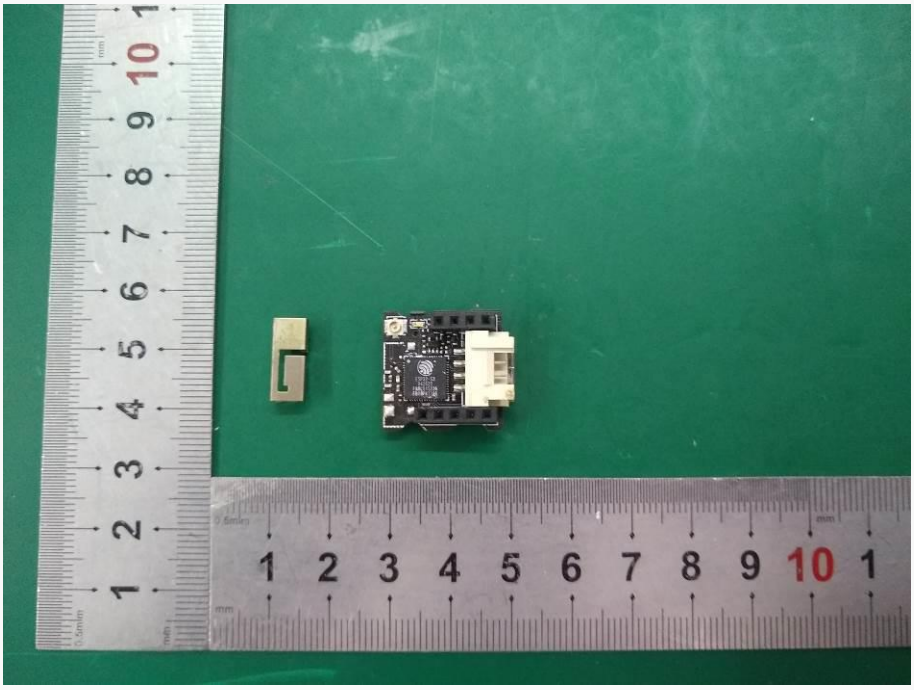


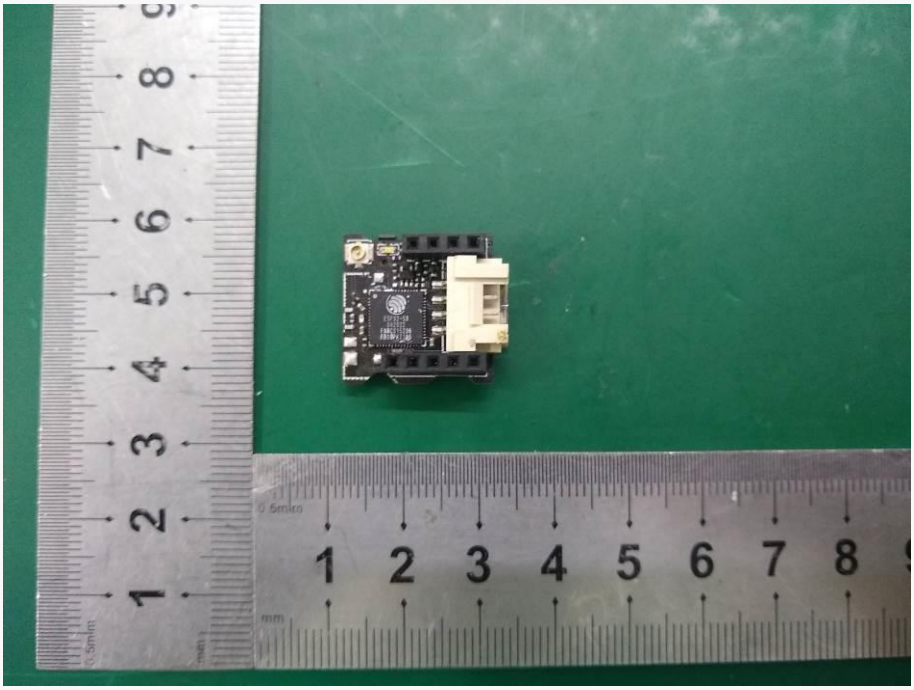


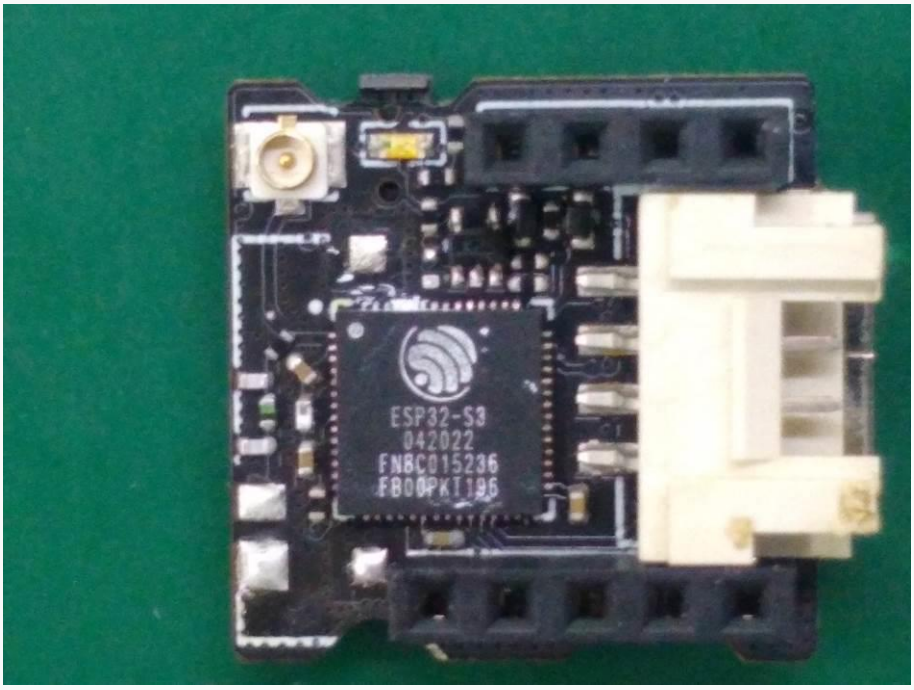



39
38
5V
GND
C
D

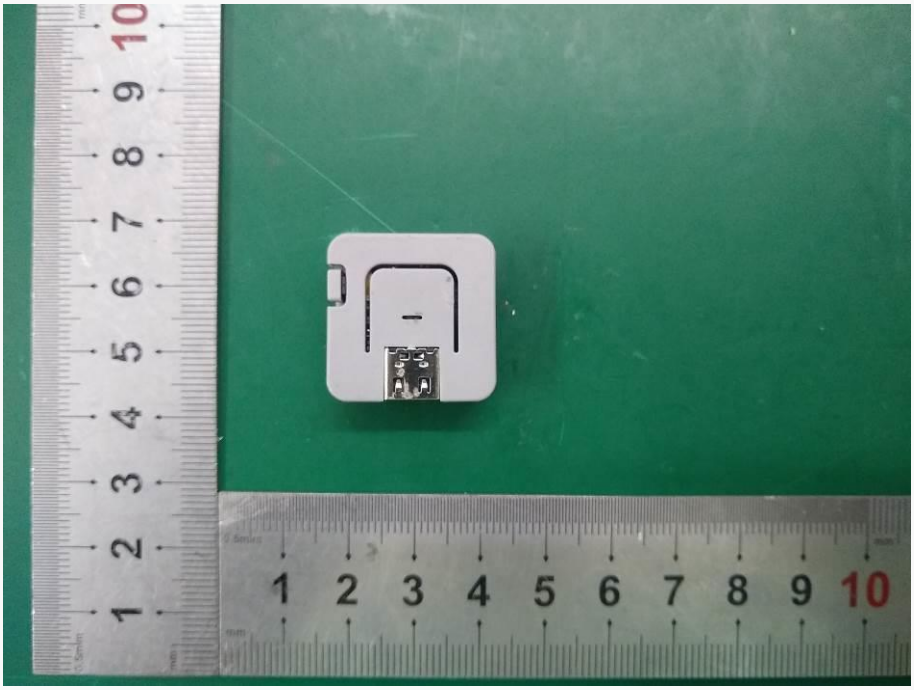


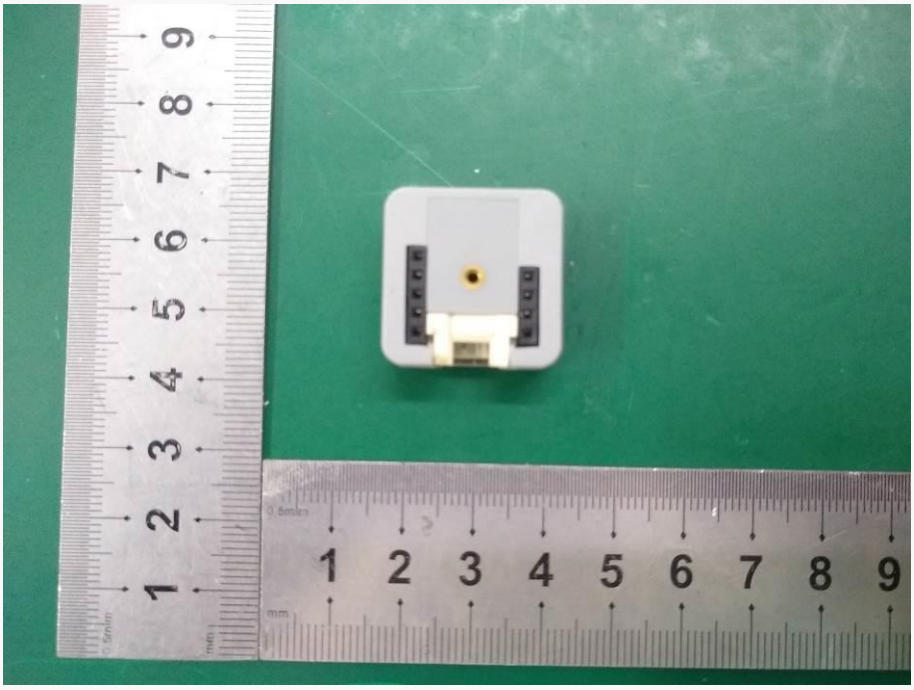


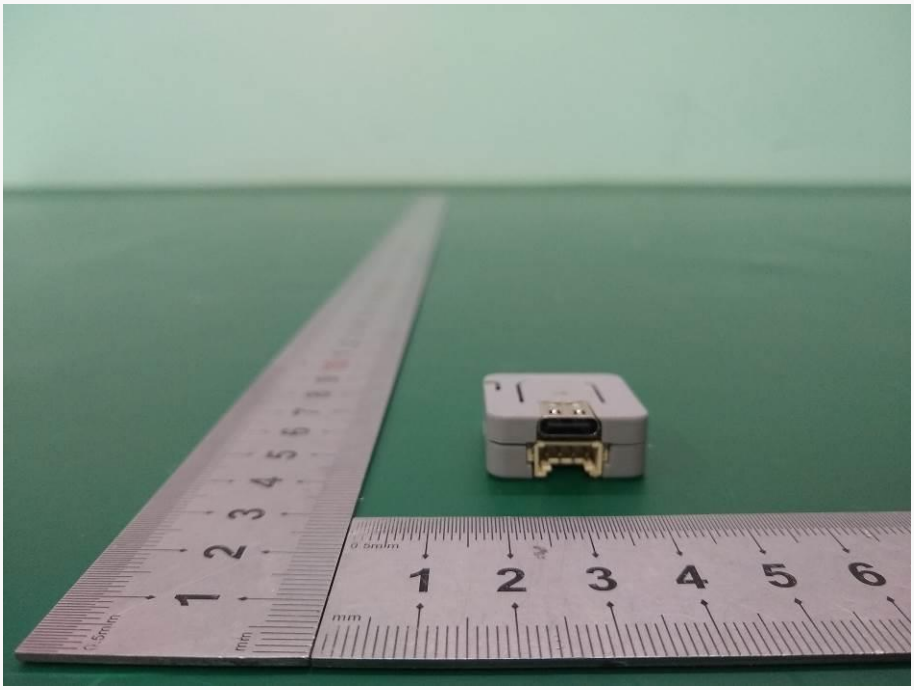


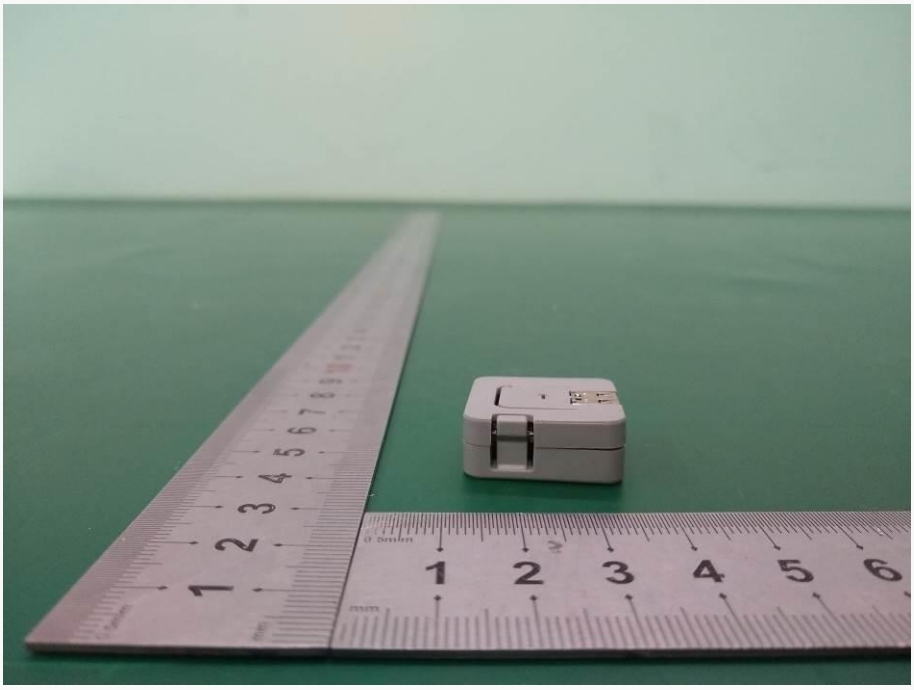

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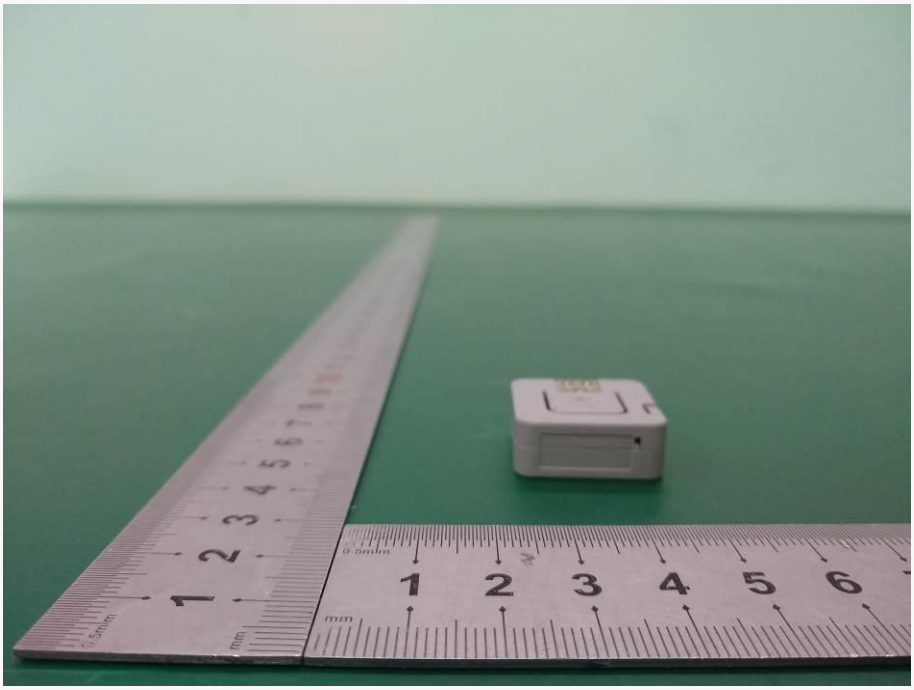
Model: ATOMS3-LITE

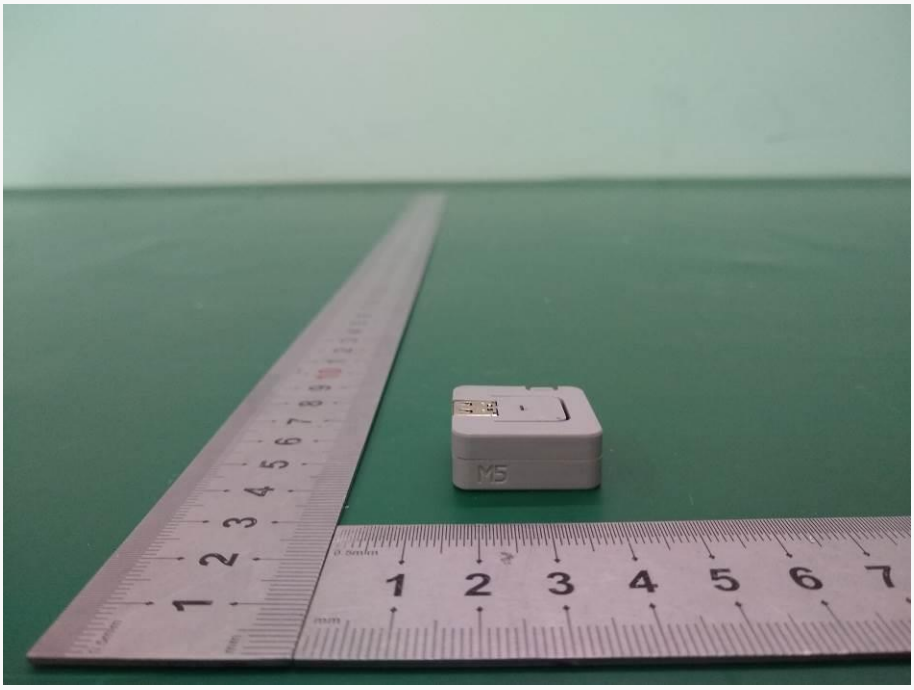


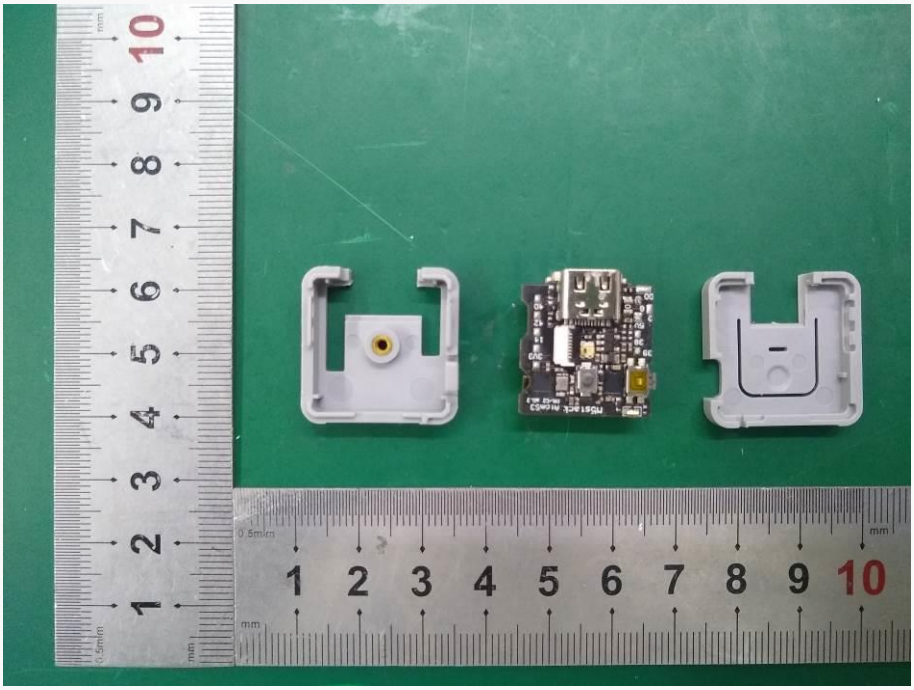


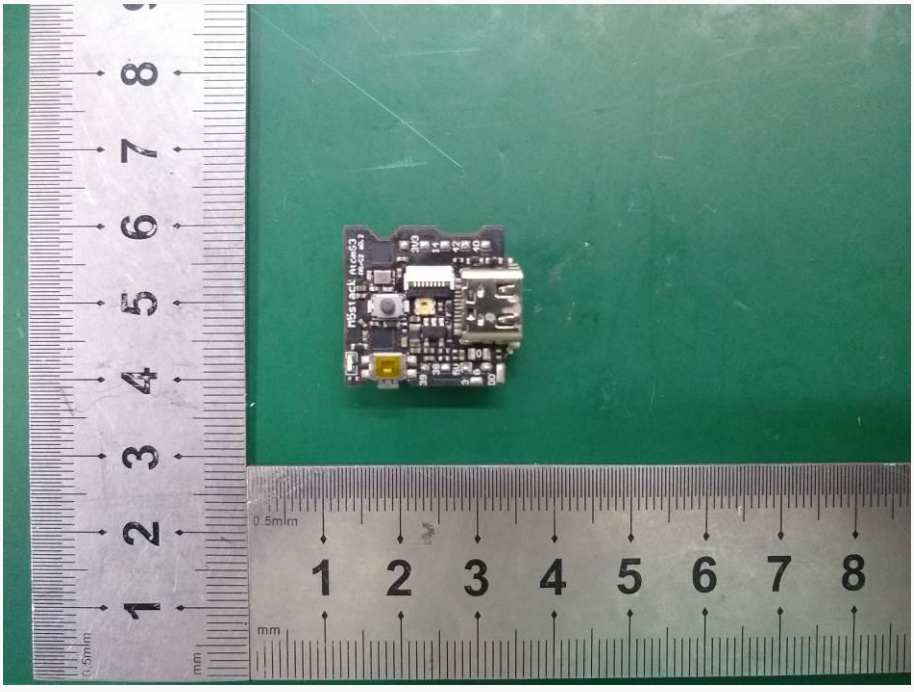


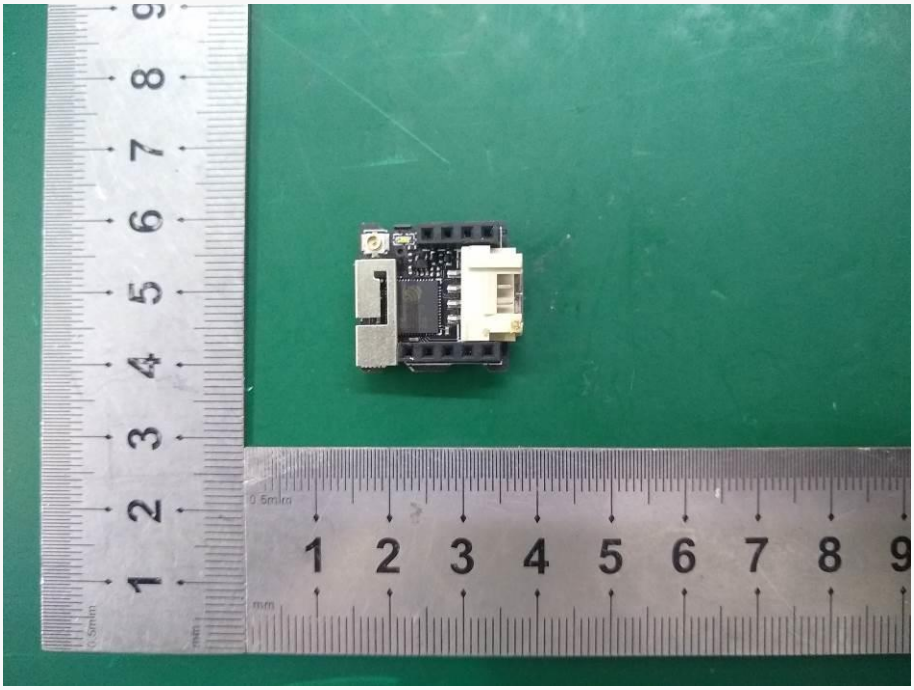


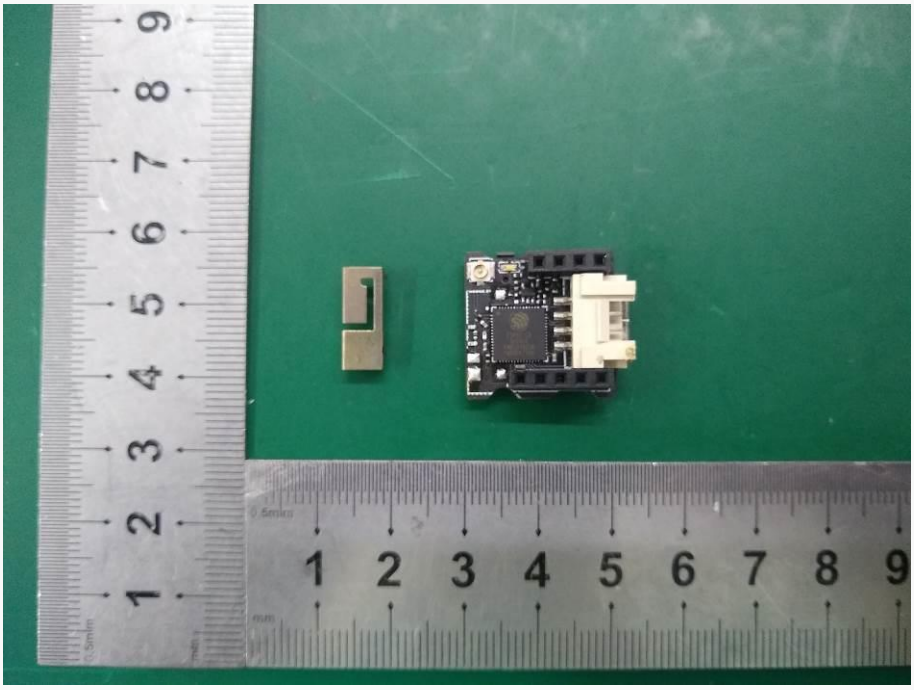


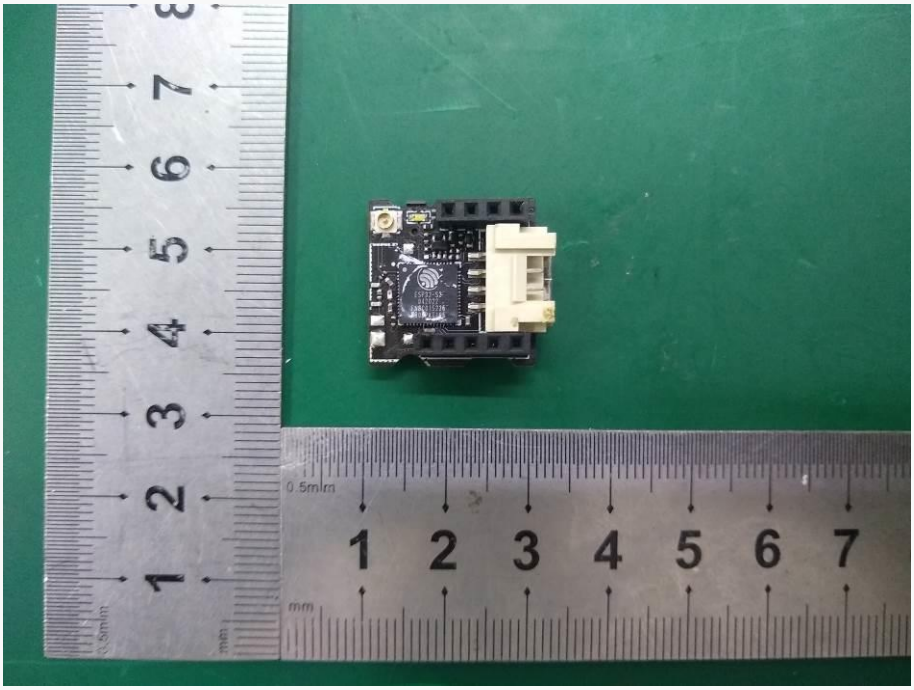











1 2 3 4 5 6 7
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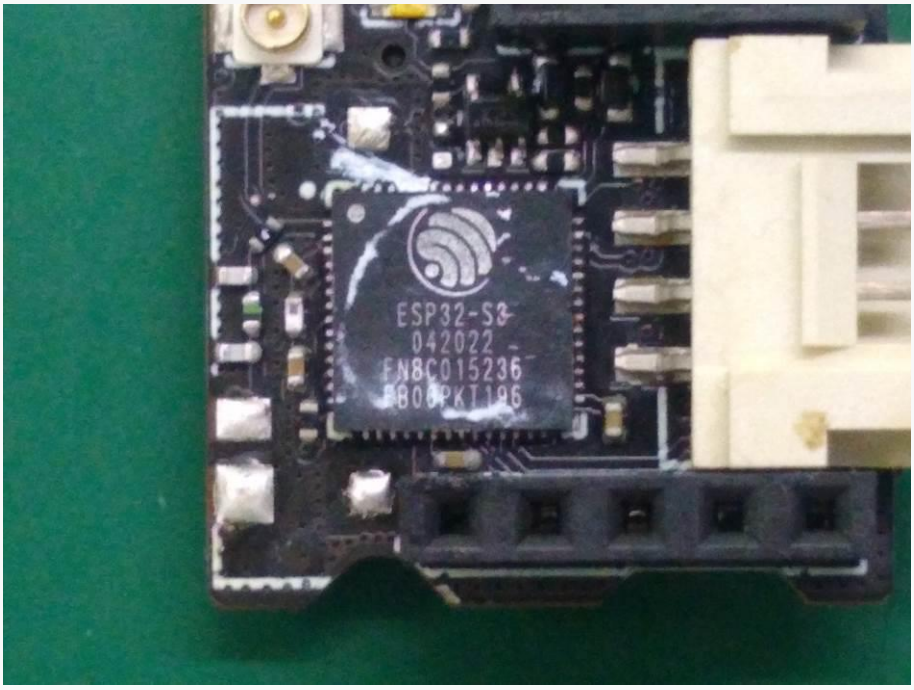

ESP32-S3
042022

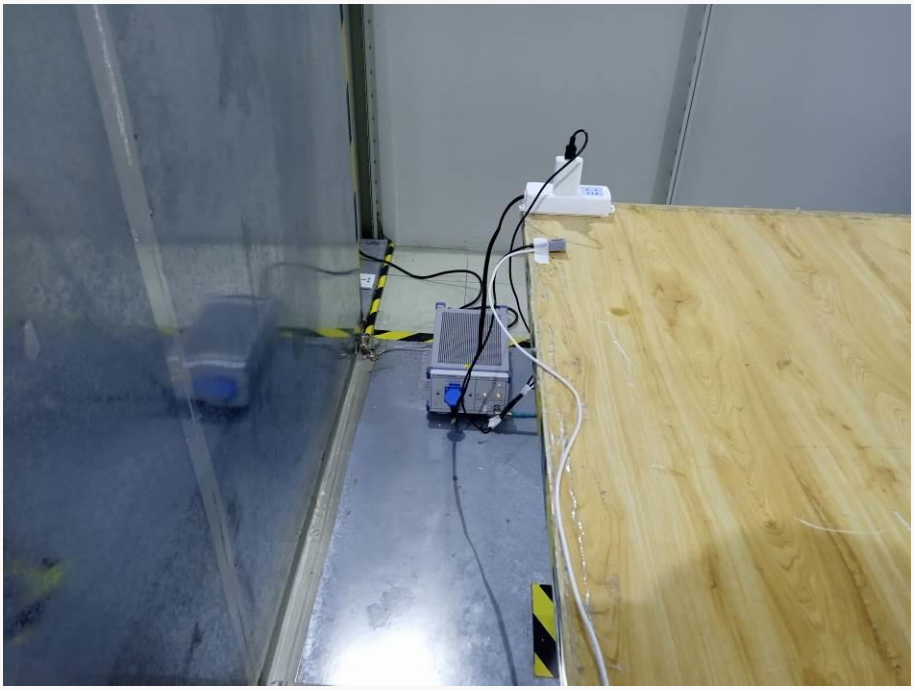
EXHIBIT B – TEST SETUP PHOTOGRAPHS

Model: ATOMS3

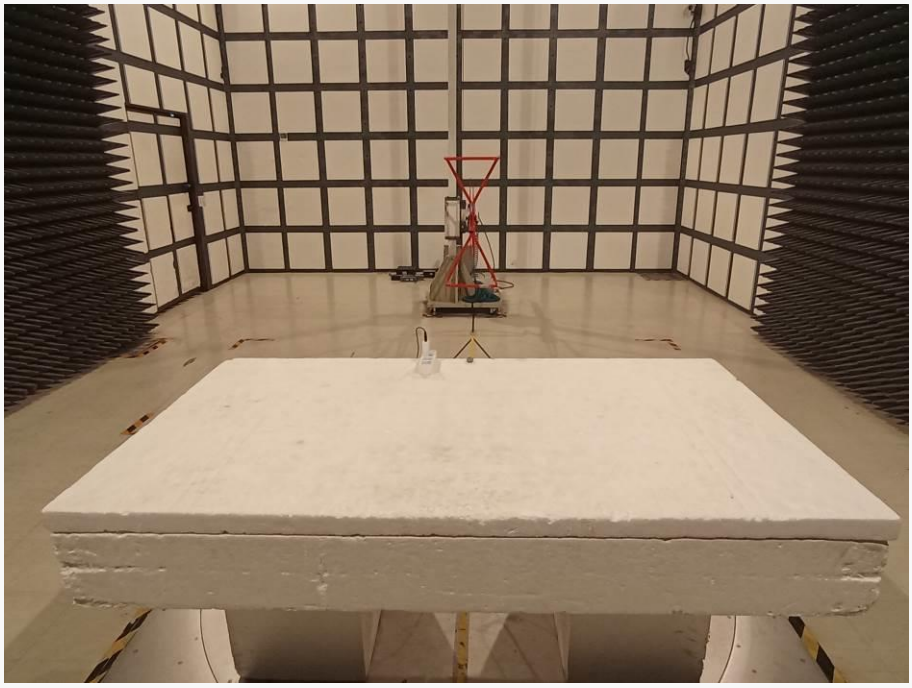
Conducted Emissions - Front View



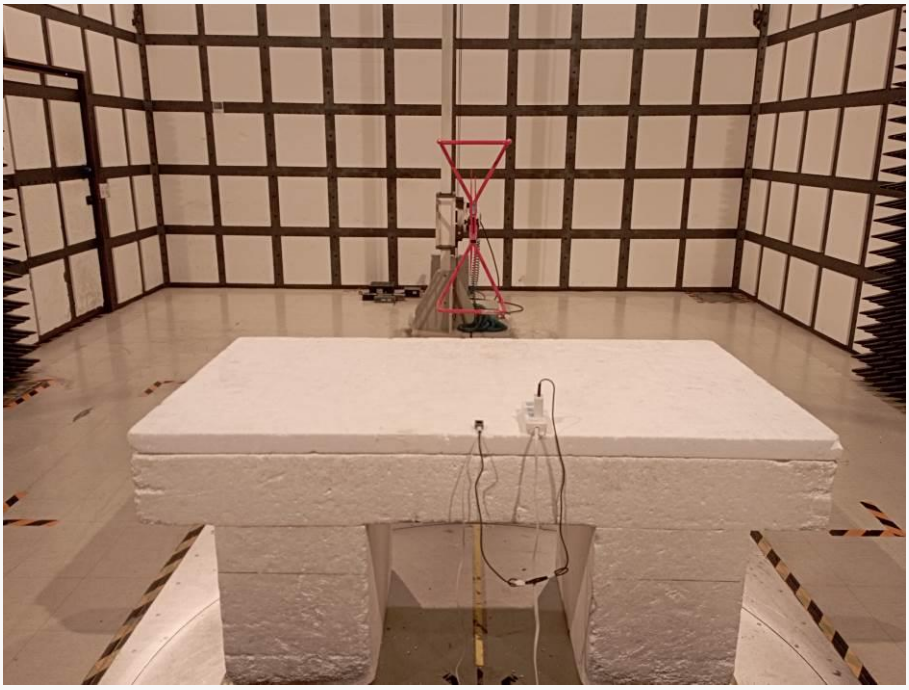
Conducted Emissions - Side View



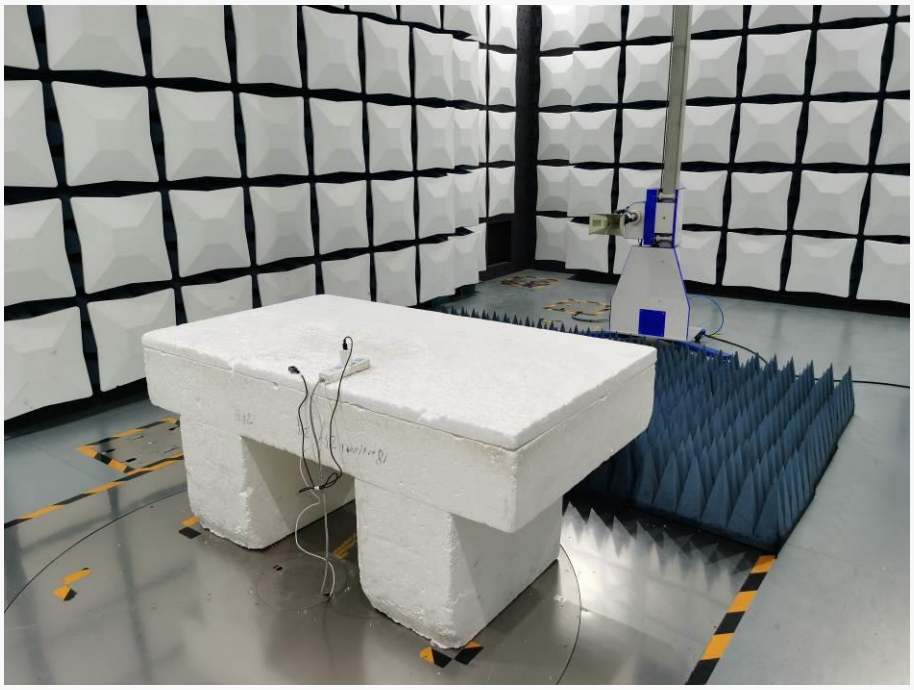
Radiated Emissions - Front View (Below 1GHz)



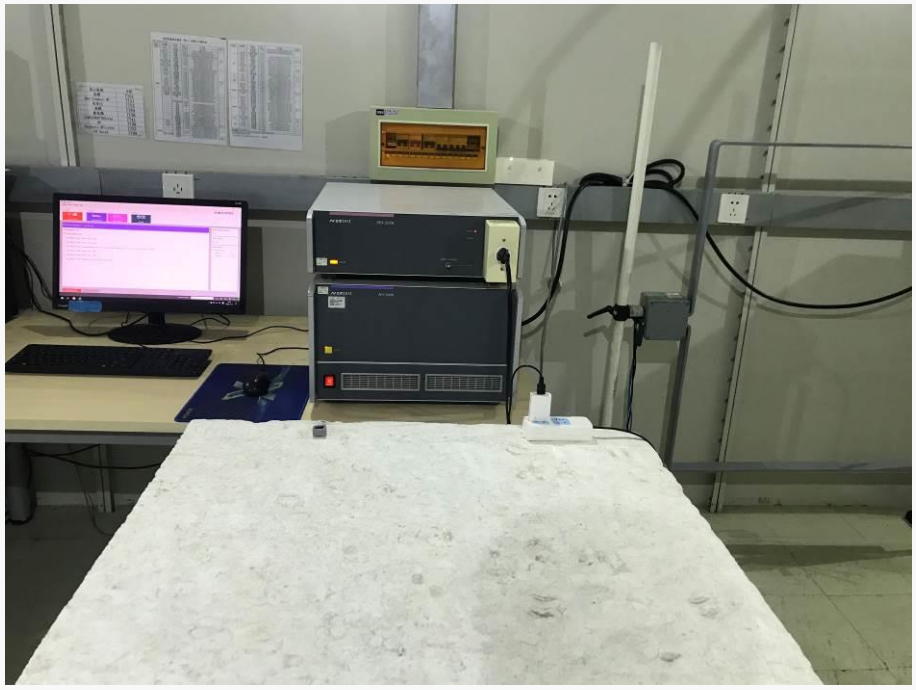
Radiated Emissions - Rear View (Below 1GHz)



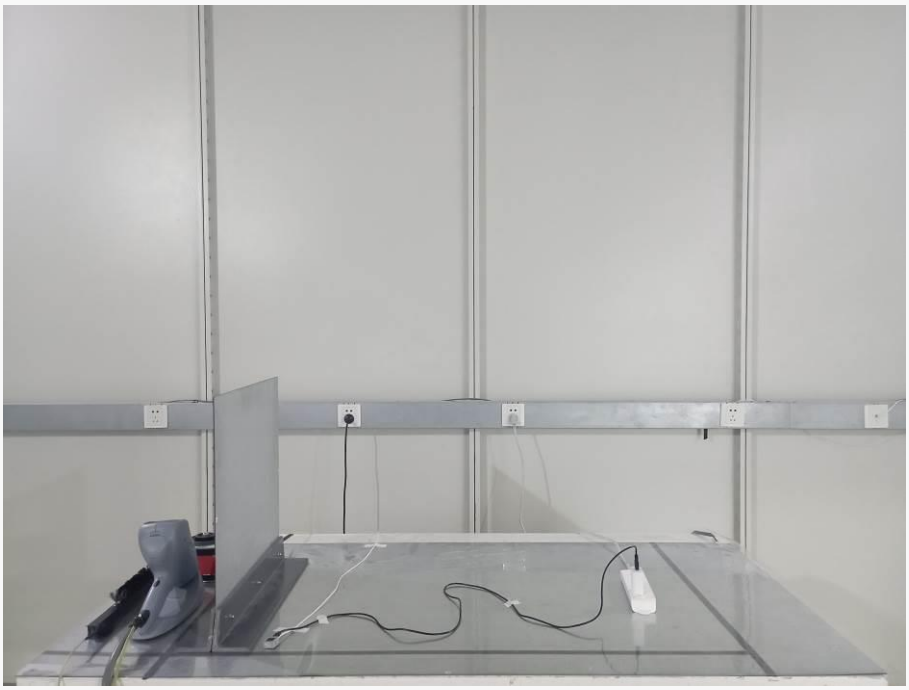
Radiated Emissions - Side View (Above 1GHz)



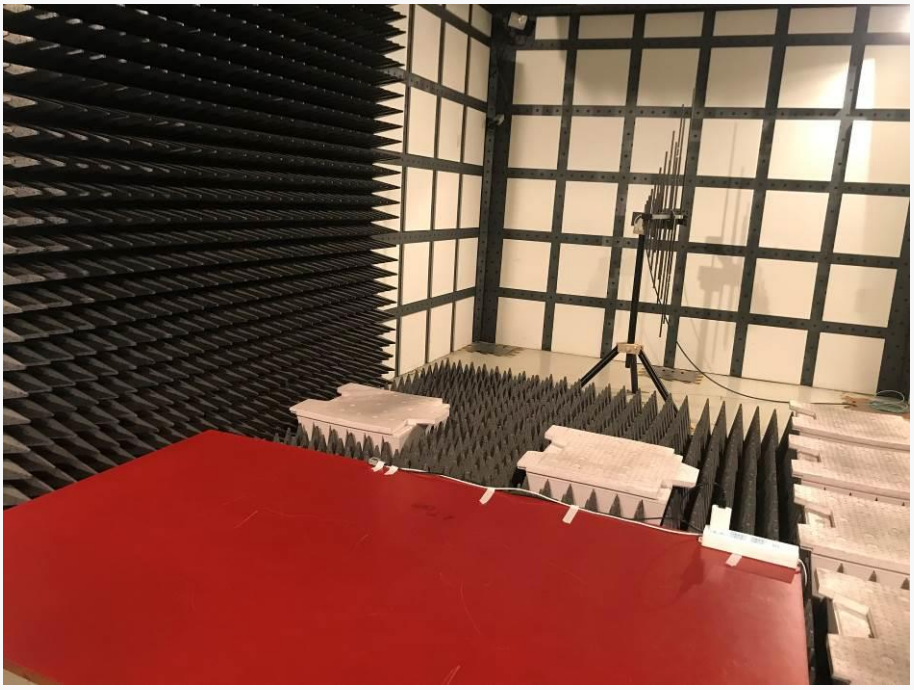
Voltage Fluctuations and Flicker



Electrostatic discharge



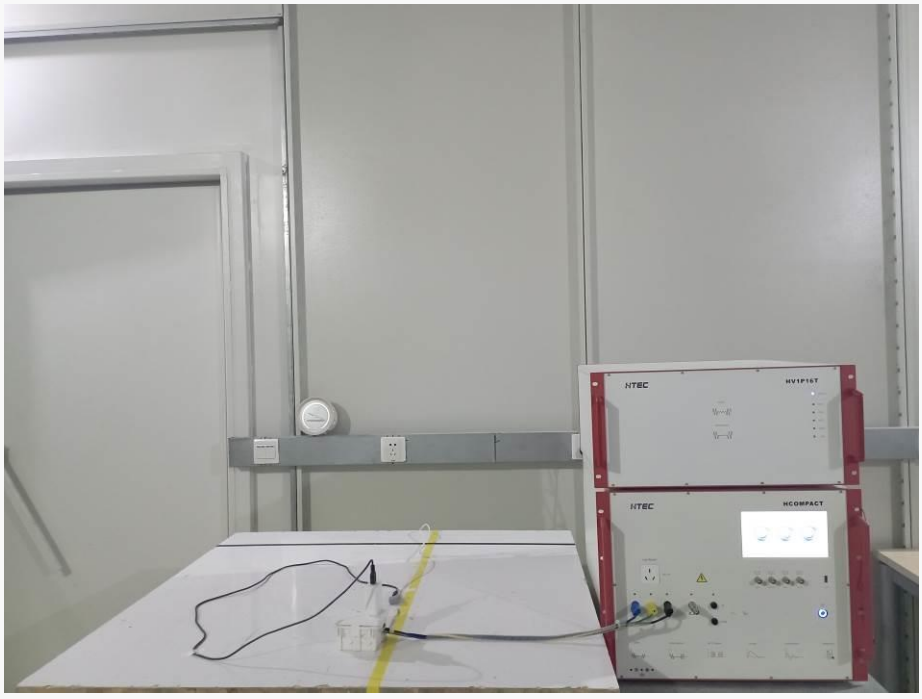
Continuous RF electromagnetic field disturbances (Below 1GHz)



Continuous RF electromagnetic field disturbances (Above 1GHz)



Electrical fast transients burst & Surge & Voltage dips and interruptions



Continuous induced RF disturbances

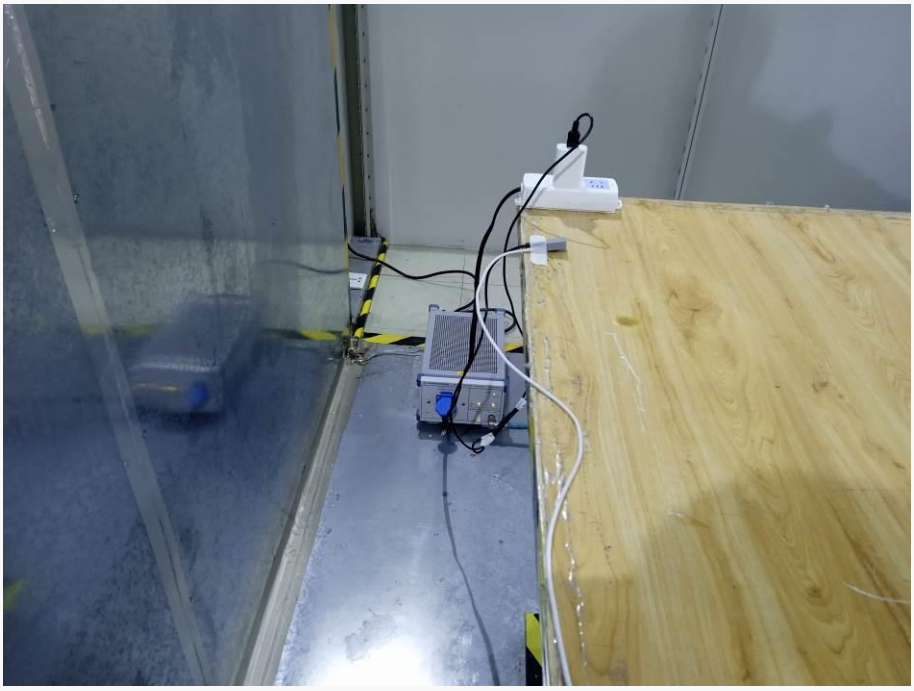


Model: ATOMS3-LITE

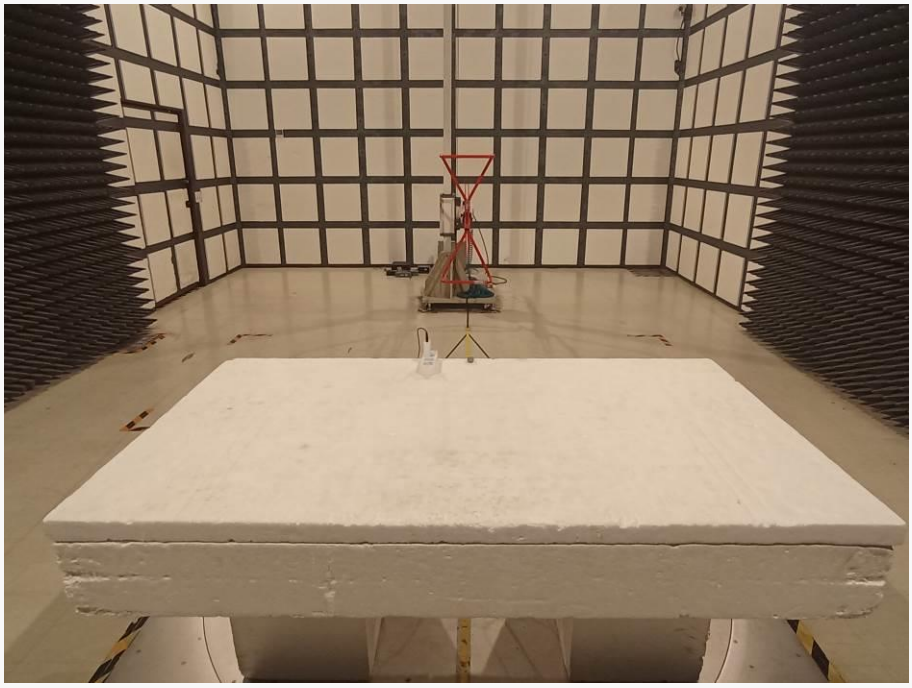
Conducted Emissions - Front View



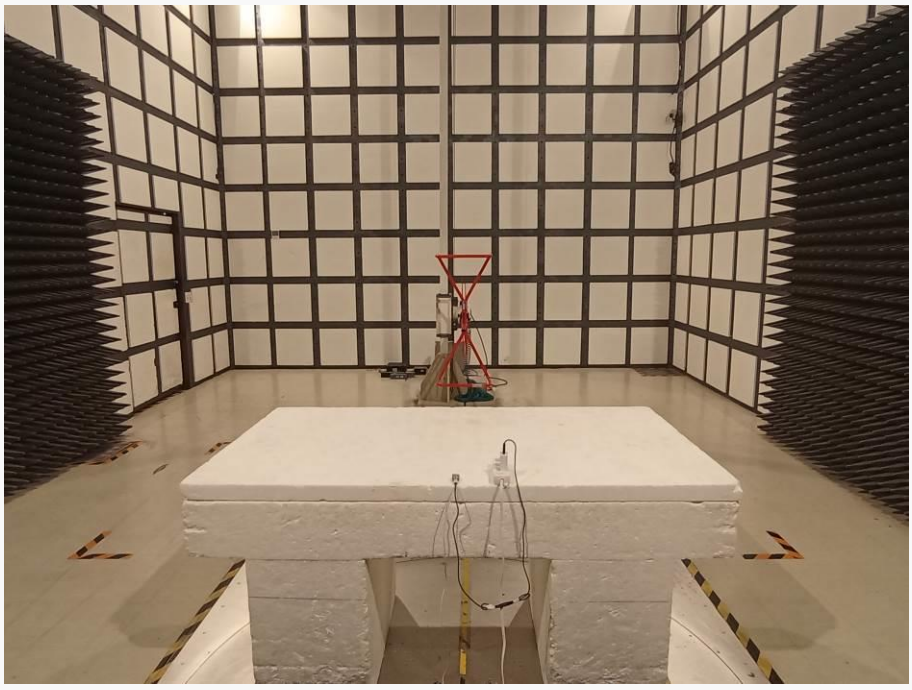
Conducted Emissions - Side View



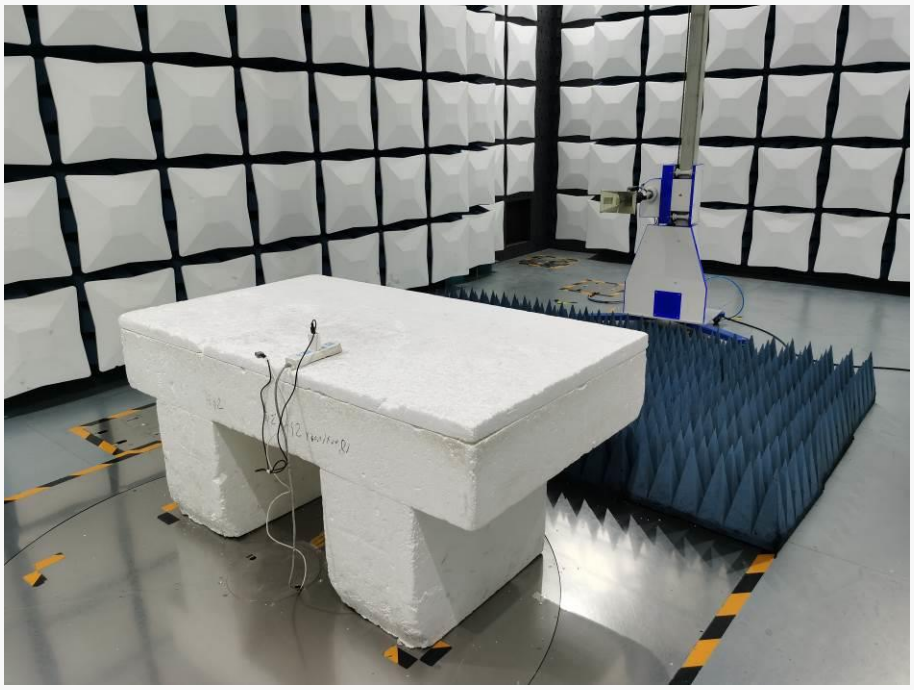
Radiated Emissions - Front View (Below 1GHz)



Radiated Emissions - Rear View (Below 1GHz)



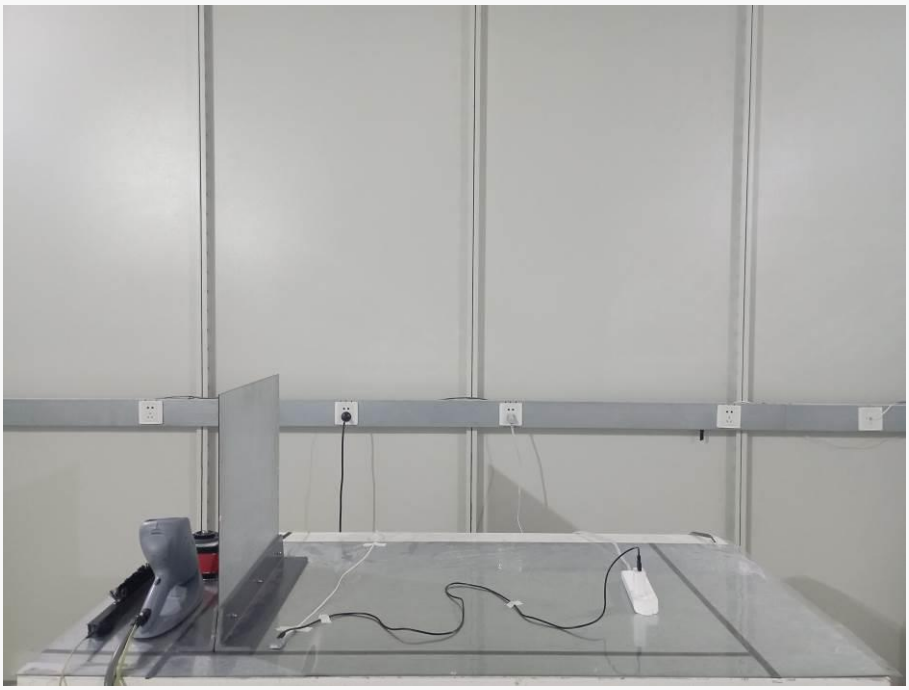
Radiated Emissions - Side View (Above 1GHz)



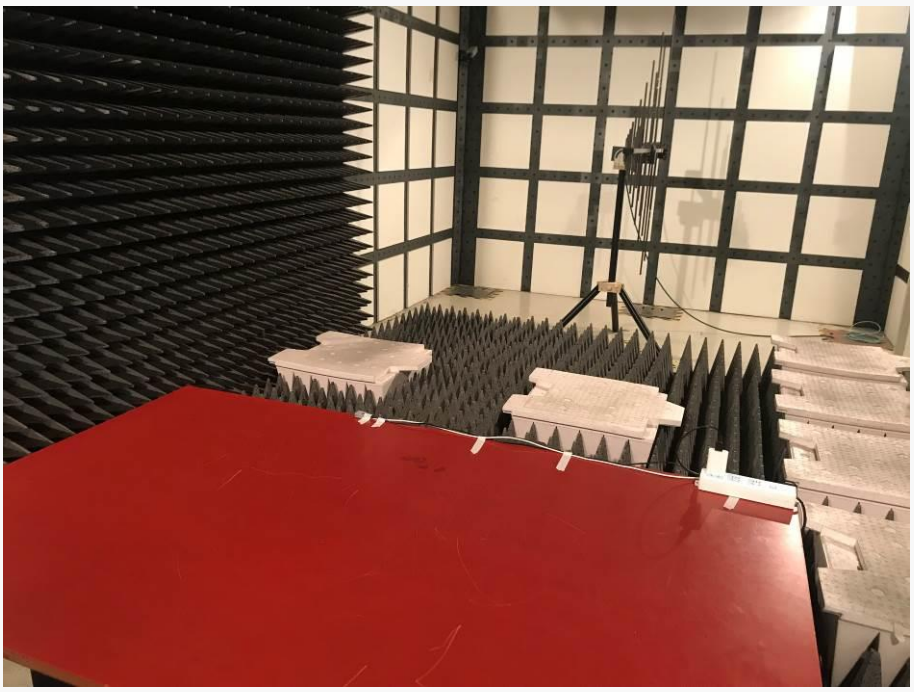
Voltage Fluctuations and Flicker



Electrostatic discharge



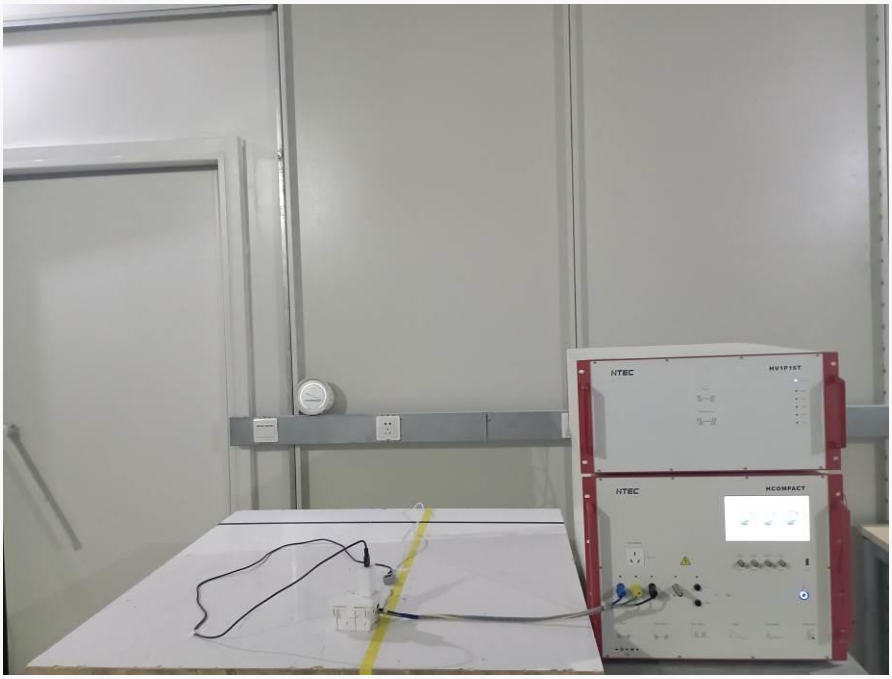
Continuous RF electromagnetic field disturbances (Below 1GHz)



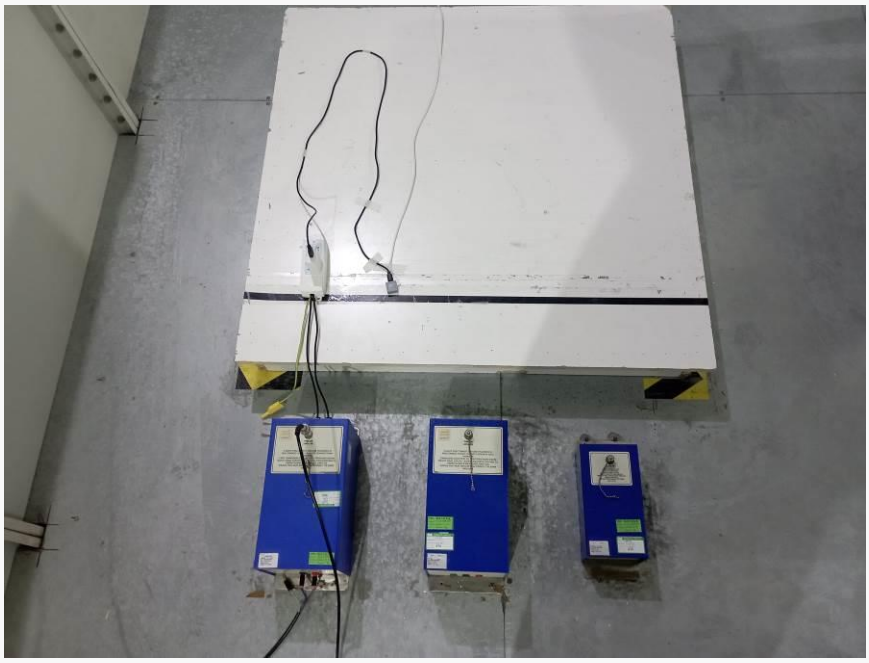
Continuous RF electromagnetic field disturbances (Above 1GHz)



Electrical fast transients burst & Surge & Voltage dips and interruptions



Continuous induced RF disturbances



Declarations

1. Bay Area Compliance Laboratories Corp. (Kunshan) is not responsible for authenticity of any test data provided by the applicant. Test data from the applicant that may affect test results are marked with an asterisk "★". The model number, product name, address, trademark, etc. from the applicant are not considered as test data.

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 95.45% confidence interval.

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