

EMC TEST REPORT

Product Name Active Stylus Pen

Trade mark /

Model No. G2

Report No. CTB210624027EX

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Date of Test(s) 2021-06-21~ 2021-06-24

Date of Issue 2021-06-24

Test Standard(s) EN 55032:2015+ A11:2020, EN 55035:2017/A11:2020
EN IEC 61000-3-2:2019, EN 61000-3-3:2013/A1:2019

Test Result: Pass

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

Blake Cai

Blake Cai/ Project Handler

Zeck Zhu

Zeck Zhu/Reviewer



Bin Mei/Manager

Note: The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report shall not be reproduced except in full, without prior written approval of CTB. This document may be altered or revised by CTB, personnel only, and shall be noted in the revision of the document.

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1. Description of version

Report No.	Issue Date	Description	Approved
CTB210624027EX	2021-06-24	Original	Valid

2. Test summary

Emission		
Requirement - Test	Test Method	Result
Conducted Emission	EN 55032	PASS
Radiated emissions at frequencies up to 1 GHz		PASS
Radiated emissions at frequencies above 1 GHz		N/A
Harmonic current emissions	EN IEC 61000-3-2	N/A
Voltage changes, voltage fluctuations and flicker	EN 61000-3-3	N/A
Immunity(EN 55035:2017/A11:2020)		
Requirement - Test	Test Method	Result
Electrostatic discharges (ESD)	IEC 61000-4-2	PASS
Continuous RF electromagnetic field disturbances	IEC 61000-4-3	PASS
Electrical fast transients/burst (EFT/B)	IEC 61000-4-4	N/A
Surges	IEC 61000-4-5	N/A
Continuous induced RF disturbances	IEC 61000-4-6	N/A
Power frequency magnetic field	IEC 61000-4-8	N/A
Voltage dips and interruptions	IEC 61000-4-11	N/A

Note: N/A is abbreviation for Not Applicable.

3. Measurement uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard

Test	Parameters	Expanded Uncertainty (U_{Lab})
Conducted Emission	150 kHz to 30 MHz	± 3.2 dB
Radiated Emission	30 MHz to 1000 MHz	± 4.8 dB
Radiated Emission	1000 MHz to 6000 MHz	± 4.9 dB

uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %

4. General information

4.1. Description of EUT

Product name	Active Stylus Pen
Trade Mark	/
Model	G2
Serial No.	/
Model Difference	N/A
Rated Power	0.5W
Normal Testing Voltage	DC 5V from adapter
Configuration	☒ Table-top ☐ Floor-standing
The highest frequency of the internal sources of the EUT :	☒ less than 108 MHz, the measurement shall only be made up to 1 GHz. ☐ between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz. ☐ between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz. ☐ above 1 GHz, the measurement shall be made up to 6 GHz.
Adapter Information:	/

Note: The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

4.2. Description of accessory device

No.	Device Type	Brand	Model	Specification	Note

4.3. Test conditions

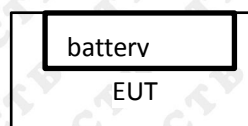
Temperature: 15-25℃
 Relative Humidity: 30-60 %
 Atmospheric pressure: 800hPa-1060hPa

4.4. Block diagram of EUT configuration

CHARGE



WORKING



4.5. Operating condition of EUT

Operating condition	Mode 1*	Charging	Test Voltage	AC 230V/50Hz
	Mode 2	Discharge	Test Voltage	DC 3.7V
Note: This test covers all possible operating modes of the device, only the worst data are list in report. The worst data are shows (*) is the nearest standard limit which were recorded in this report.				

5. List of Test and Measurement Instruments

Conducted Emission Measurement					
No.	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	AMN	ROHDE&SCHWARZ	ESH3-Z5	831551852	2021.09.27
2	Pulse limiter	ROHDE&SCHWARZ	ESH3Z2	357881052	2021.09.27
3	EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCS30	834115/006	2021.09.27
4	Coaxial cable	ZDECL	Z302S	18091904	2021.09.27
5	AAN	Schwarzbeck	NTFM8158	6114	2021.09.27
6	EZ-EMC	Frad	EMC-con3A1.1	/	/

Radiated Emission Measurement					
No.	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA 9120D	1911	2021.11.01
2	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	869	2021.11.01
3	Amplifier	Agilent	8449B	3008A01838	2021.09.27
4	Amplifier	HP	8447E	2945A02747	2021.09.27
5	EMI TEST RECEIVER	ROHDE&SCHWARZ	ESPI7	100362	2021.09.27
6	Coaxial cable	ETS	RFC-SNS-100-NMS-80 NI	/	2021.09.27
7	Coaxial cable	ETS	RFC-SNS-100-NMS-20 NI	/	2021.09.27
8	Coaxial cable	ETS	RFC-SNS-100-SMS-20 NI	/	2021.09.27
9	Coaxial cable	ETS	RFC-NNS-100-NMS-300 NI	/	2021.09.27
10	EZ-EMC	Frad	EMC-con3A1.1	/	/

Electrostatic Discharge Test					
No.	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	ESD Simulator	TESTQ	NSG437	329	2021.09.27

Continuous RF electromagnetic field disturbances Test					
No.	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Signal Generator	Agilent	N5181A	MY49060920	2021.09.27
2	Bilog Antenna	Teseq	CBL 6111D	27089	2021.09.27
3	Antenna Log-Periodic	AR	ATR80M6G	0337307	2021.09.27
4	Antenna Log-Periodic	AR	ATS700M11G	0336821	2021.09.27
5	Switch Controller	AR	SC1000	0337343	2021.09.27
6	RF Power Meter	ESE	4242	13984	2021.09.27
7	Power Sensor	ESE	51011EMC	35716	2021.09.27
8	Power Sensor	ESE	51011EMC	35715	2021.09.27
9	E-Field probe	Narda	NBM-520	2403/01B	2021.09.27
10	Power Amplifier	TESEQ	CBA 1G-150	T44029	2021.09.27
11	Power Amplifier	TESEQ	CBA 3G-100	T44030	2021.09.27
12	Power Amplifier	TESEQ	CBA 6G-050	1041204	2021.09.27
13	Dual Directional	TESEQ	C5982	95208	2021.09.27
14	Dual Directional	TESEQ	C6187	95175	2021.09.27
15	Dual Directional	TESEQ	CPH-274F	M25 134-01	2021.09.27
16	Test Software	ADT	BVADT_RS_V 7.6.4-DG	/	/

Requirements for asymmetric mode conducted emissions from Class A equipment

Frequency range MHz	Coupling device	Detector type / bandwidth	Class A limits dB(μ V)
0,15 to 0,5	AAN	Quasi Peak / 9 kHz	97 to 87
0,5 to 30			87
0,15 to 0,5		Average / 9 kHz	84 to 74
0,5 to 30			74

Requirements for asymmetric mode conducted emissions from Class B equipment

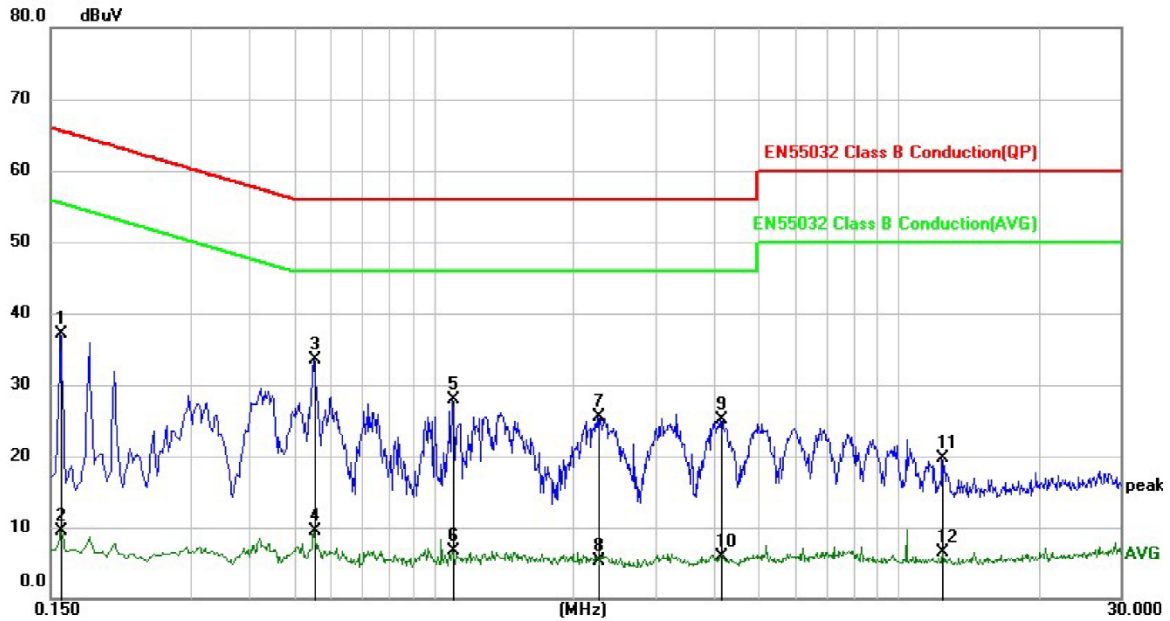
Frequency range MHz	Coupling device	Detector type / bandwidth	Class B limits dB(μ V)
0,15 to 0,5	AAN	Quasi Peak / 9 kHz	84 to 74
0,5 to 30			74
0,15 to 0,5		Average / 9 kHz	74 to 64
0,5 to 30			64

6.1.3. Test procedure

1. Measurement was performed in shielded room, and instruments used were followed CISPR 16-2-1 clause 7.
2. Detailed test procedure was following clause 7 of CISPR 16-2-1.
3. Frequency range 150kHz – 30MHz was checked and EMI receiver measurement bandwidth was set to 9 kHz.

6.1.4. Test results

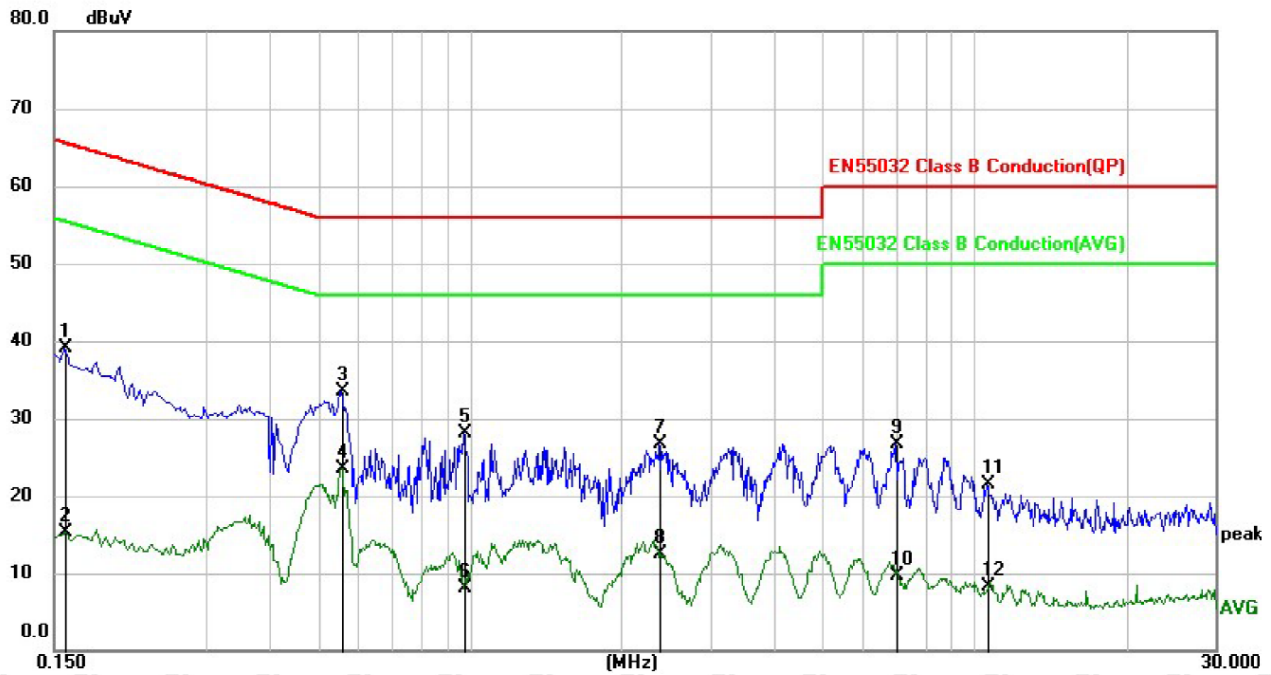
Phase: L



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Detector
		MHz	dBuV	dB	dBuV	dBuV	dB	
1		0.1580	27.08	9.96	37.04	65.57	-28.53	QP
2		0.1580	-0.45	9.96	9.51	55.57	-46.06	AVG
3	*	0.5540	23.62	9.96	33.58	56.00	-22.42	QP
4		0.5540	-0.51	9.96	9.45	46.00	-36.55	AVG
5		1.0980	17.99	9.97	27.96	56.00	-28.04	QP
6		1.0980	-3.30	9.97	6.67	46.00	-39.33	AVG
7		2.2580	15.41	10.03	25.44	56.00	-30.56	QP
8		2.2580	-4.66	10.03	5.37	46.00	-40.63	AVG
9		4.1420	15.02	10.12	25.14	56.00	-30.86	QP
10		4.1420	-4.15	10.12	5.97	46.00	-40.03	AVG
11		12.3860	8.79	10.88	19.67	60.00	-40.33	QP
12		12.3860	-4.34	10.88	6.54	50.00	-43.46	AVG

Note: Result=Reading + Factor
Over Limit=Result – Limit

Phase: N



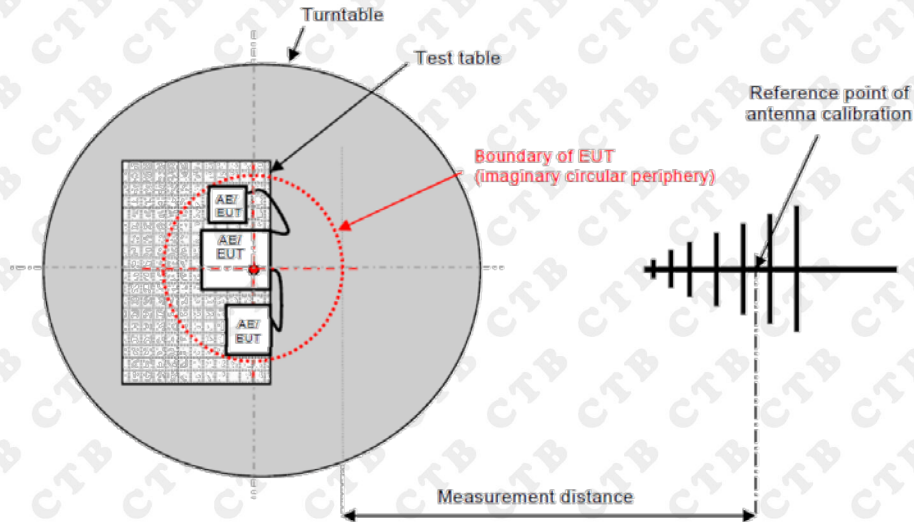
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector
1		0.1580	29.22	9.96	39.18	65.57	-26.39	QP
2		0.1580	5.40	9.96	15.36	55.57	-40.21	AVG
3		0.5580	23.53	9.96	33.49	56.00	-22.51	QP
4	*	0.5580	13.59	9.96	23.55	46.00	-22.45	AVG
5		0.9780	18.05	9.96	28.01	56.00	-27.99	QP
6		0.9780	-1.87	9.96	8.09	46.00	-37.91	AVG
7		2.3820	16.59	10.03	26.62	56.00	-29.38	QP
8		2.3820	2.42	10.03	12.45	46.00	-33.55	AVG
9		6.9940	16.31	10.42	26.73	60.00	-33.27	QP
10		6.9940	-0.70	10.42	9.72	50.00	-40.28	AVG
11		10.6059	10.69	10.82	21.51	60.00	-38.49	QP
12		10.6059	-2.52	10.82	8.30	50.00	-41.70	AVG

Note: Result=Reading + Factor
Over Limit=Result – Limit

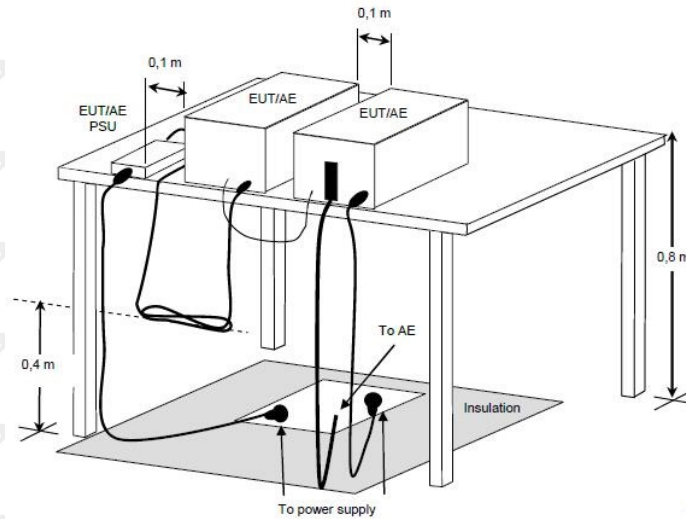
6.2. Radiated emissions

6.2.1. Block diagram of test setup

Measurement distance



For table-top equipment



6.2.2. Limit

Requirements for radiated emissions at frequencies up to 1 GHz for class A equipment

Frequency range MHz	Measurement			Class B limits dB(μ V/m)
	Facility	Distance m	Detector type / bandwidth	
30 to 230	SAC	3	Quasi Peak / 120 kHz	50
230 to 1 000				57

Requirements for radiated emissions at frequencies above 1 GHz for class A equipment

Frequency range MHz	Measurement			Class B limits dB(μ V/m)
	Facility	Distance m	Detector type / bandwidth	
1 000 to 3 000	FSOATS	3	Average / 1MHz	56
3 000 to 6 000				60
1 000 to 3 000		3	Average / 1MHz	76
3 000 to 6 000				80

Requirements for radiated emissions at frequencies up to 1 GHz for class B equipment

Frequency range MHz	Measurement			Class B limits dB(μ V/m)
	Facility	Distance m	Detector type / bandwidth	
30 to 230	SAC	3	Quasi Peak / 120 kHz	40
230 to 1 000				47

Requirements for radiated emissions at frequencies above 1 GHz for class B equipment

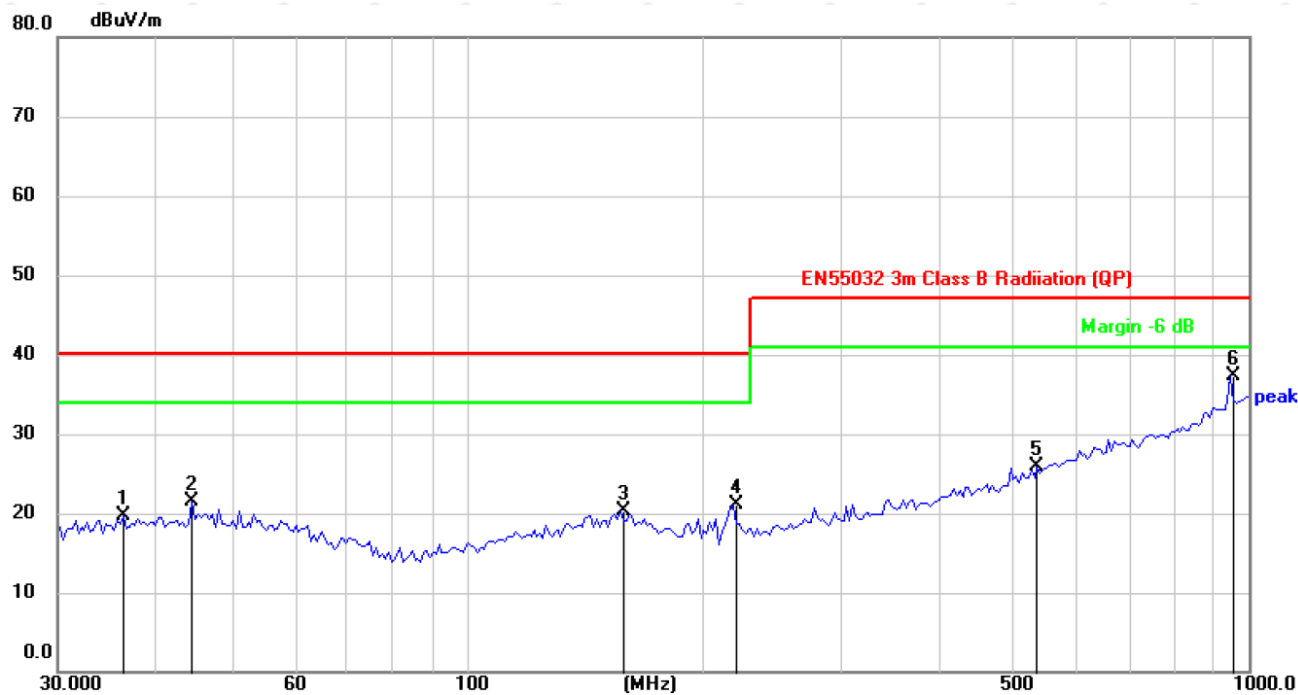
Frequency range MHz	Measurement			Class B limits dB(μ V/m)
	Facility	Distance m	Detector type / bandwidth	
1 000 to 3 000	FSOATS	3	Average / 1MHz	50
3 000 to 6 000				54
1 000 to 3 000		3	Average / 1MHz	70
3 000 to 6 000				74

6.2.3. Test procedure

1. The measurement was performed in a semi-anechoic chamber.
2. The distance from EUT to receiving antenna is 3 meters.
3. Measurement was performed according to clause 7.3 of CISPR 16-2-3.

6.2.4. Test results

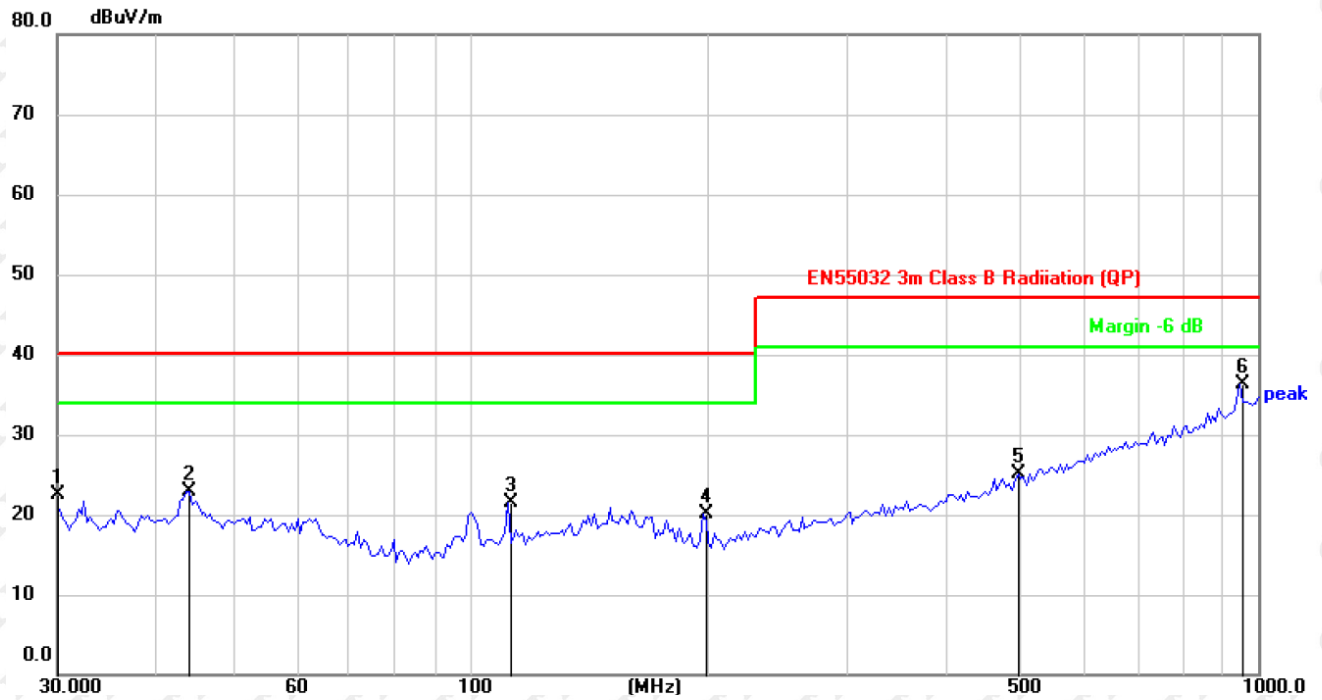
Polarization: H



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		36.3814	26.83	-7.14	19.69	40.00	-20.31	QP
2		44.5087	28.44	-6.91	21.53	40.00	-18.47	QP
3		157.2829	26.93	-6.70	20.23	40.00	-19.77	QP
4		219.4598	30.29	-9.21	21.08	40.00	-18.92	QP
5		536.6473	27.08	-1.17	25.91	47.00	-21.09	QP
6	*	948.7610	30.26	7.09	37.35	47.00	-9.65	QP

Note: Result=Reading+Factor
Over Limit=Result-Limit

Polarization: V



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1		30.0000	30.94	-8.39	22.55	40.00	-17.45	QP
2		43.7352	29.74	-6.89	22.85	40.00	-17.15	QP
3		111.7380	30.67	-9.25	21.42	40.00	-18.58	QP
4		197.5462	30.19	-10.15	20.04	40.00	-19.96	QP
5		495.9344	27.53	-2.41	25.12	47.00	-21.88	QP
6	*	948.7610	29.13	7.09	36.22	47.00	-10.78	QP

Note: Result=Reading+Factor
Over Limit=Result-Limit

7. Immunity

Performance criteria

Performance criterion A

The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss 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 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

The equipment shall continue to operate as intended after the test. No degradation of performance or loss function is allowed below a performance level specified by the manufacturer, when the equipment is used as intended. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from equipment if used as intended.

Performance criterion C

Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by operation of the controls.

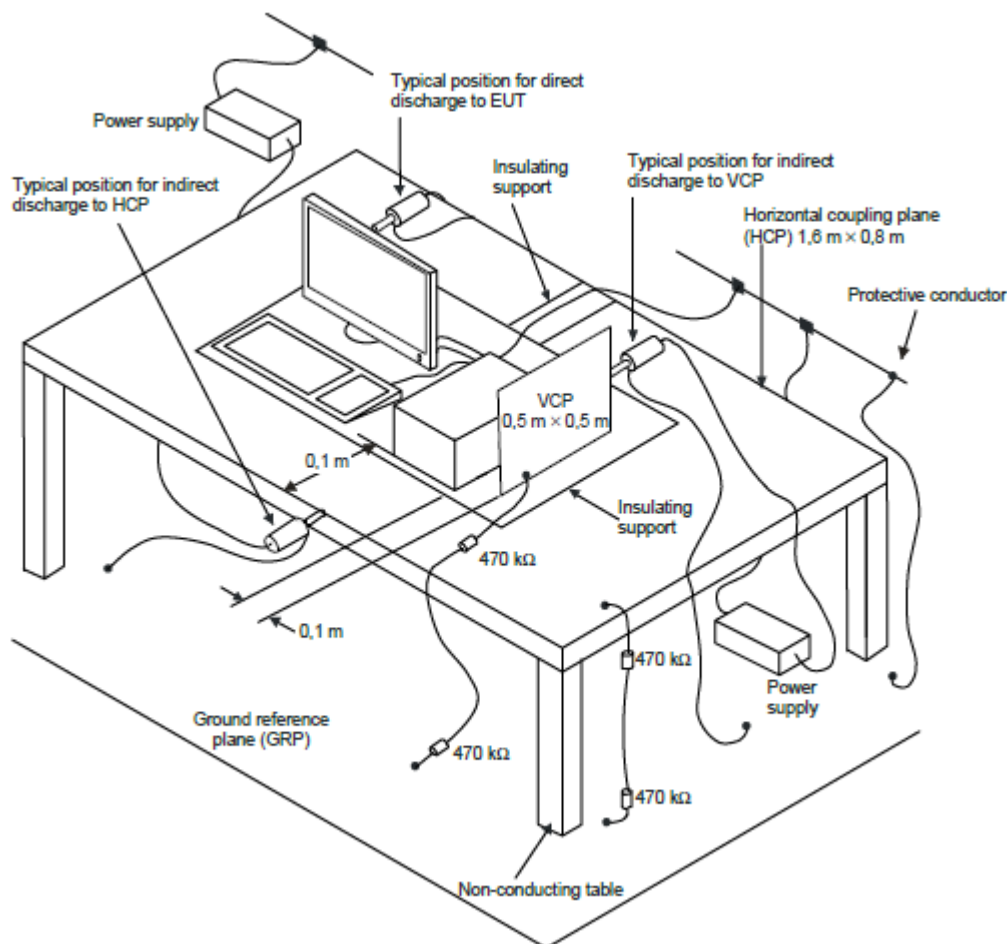
7.1. Electrostatic discharges (ESD)

7.1.1. Test standard and Levels

Environmental phenomenon	Test specifications	Basic standard
Electrostatic discharge	8 kV air discharge	IEC 61000-4-2
	4 kV contact discharge	

7.1.2. Block diagram of test setup

For table-top equipment



7.1.3. Test Procedure

1. 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.

2. Contact discharge:

All the procedure shall be same as Section 1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

3. 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 0.1m from the EUT and with the discharge electrode touching the coupling plane.

4. Indirect discharge for vertical coupling plane

At least 20 single discharge shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 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.

7.1.4. Test Result

Discharge Method	Discharge Position	Voltage ($\pm$ kV)	Min. No. of Discharge per polarity (Each Point)	Required Criterion	Performance Criterion
Contact Discharge	Conductive Surfaces	4	10	B	A
	Indirect Discharge HCP	4	10	B	A
	Indirect Discharge VCP	4	10	B	A
Air Discharge	Slots, Apertures, and Insulating Surfaces	8	10	B	A
Note*: N/A					

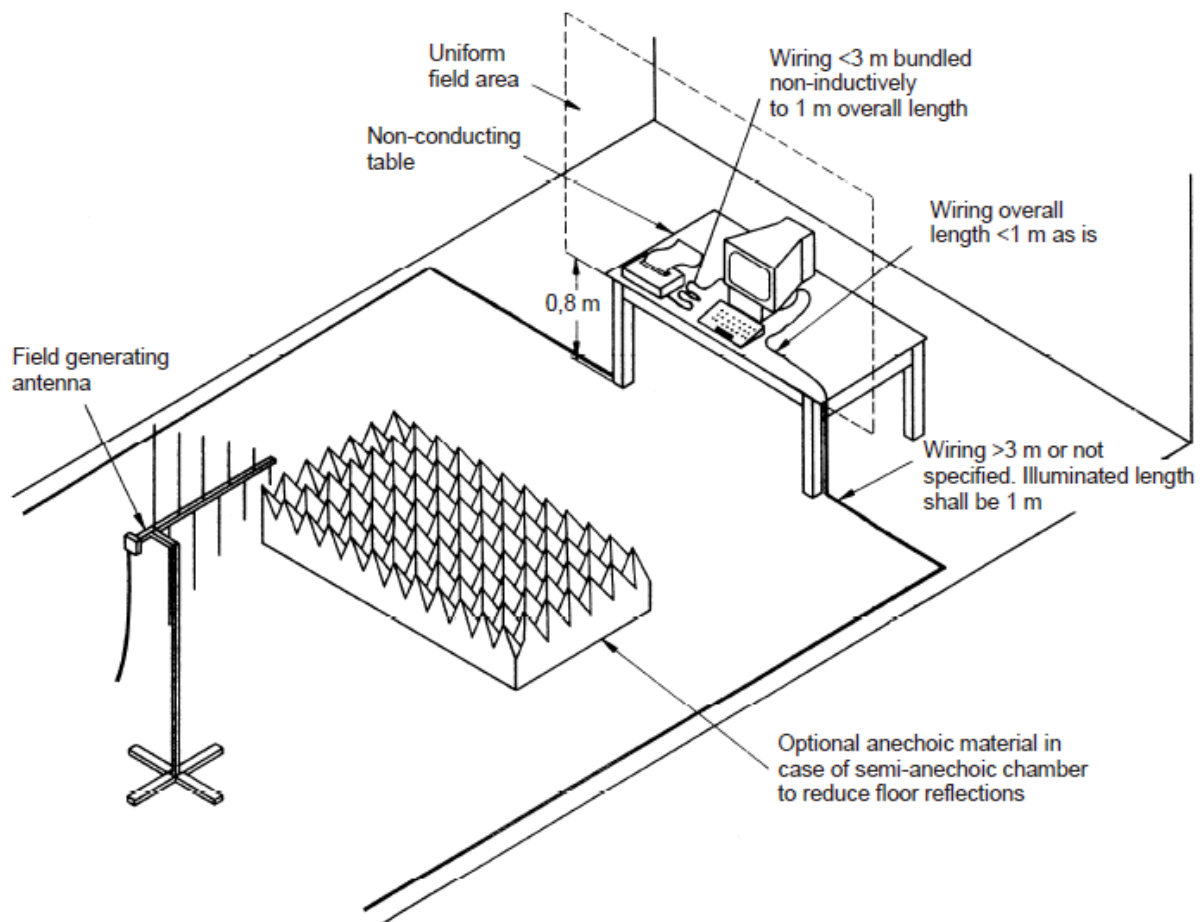
7.2. Electromagnetic field

7.2.1. Test standard and Levels

Characteristics	Test levels	Test levels	Basic standard
Frequency range	80 MHz to 1000 MHz,	1800MHz, 2600MHz, 3500MHz, 5000MHz	IEC 61000-4-3
Test level	3 V/m (unmodulated)	1 V/m (unmodulated)	
Modulation	1 kHz, 80 % AM, sine wave	1 kHz, 80 % AM, sine wave	

7.2.2. Block diagram of test setup

For table-top equipment



7.2.3. Test Procedure

1. Measurement was performed in full-anechoic chamber.
2. Measurement procedure was applied according to EN 61000-4-3 clause 8.
3. The test method and equipment was specified by EN 61000-4-3.

7.2.4. Test Result

Frequency range [MHz]	Test Level [V/m]	Polarization	EUT Face	Required Criterion	Performance Criterion
80 to 1000, 1800, 2600, 3500, 5000	3	Horizontal & Vertical	Front/ Rear	A	A
			Right/ Left	A	A
			Top/ Underside	A	A
Note*: N/A					

8. Photographs of test setup

Radiated Emission

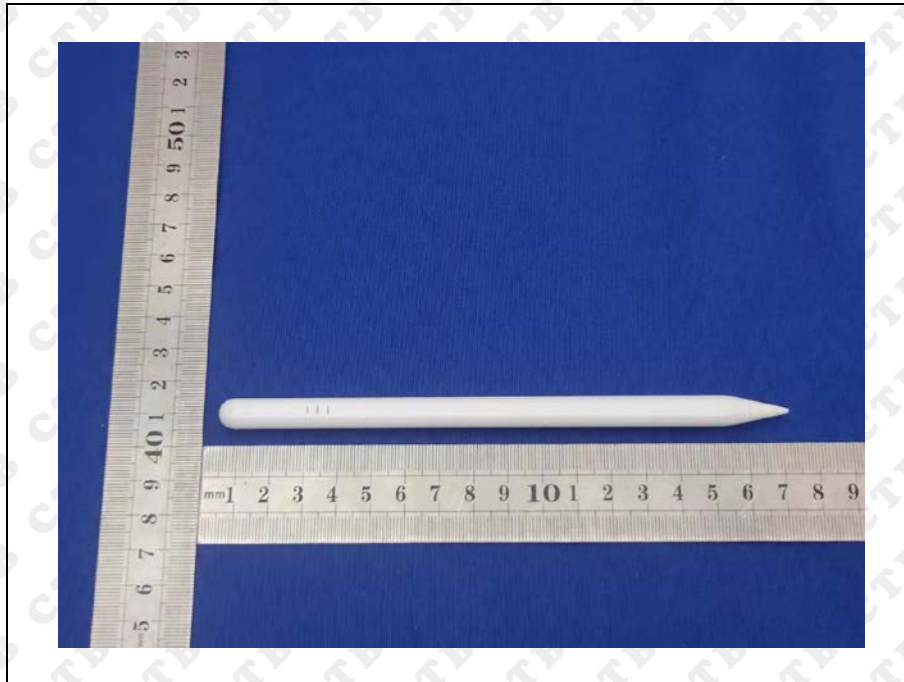


Conducted Emission

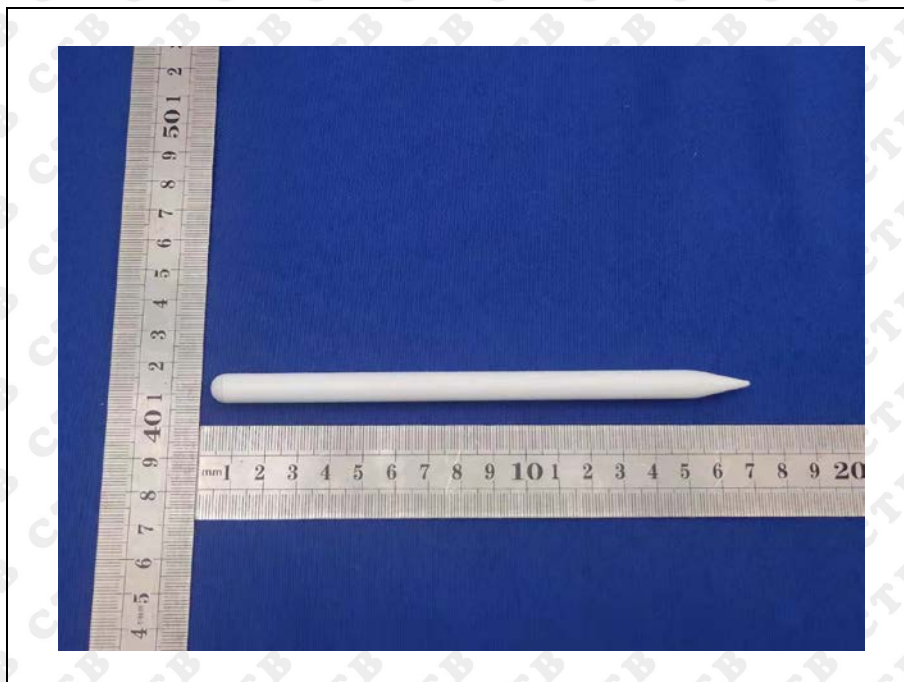


9. Photographs of EUT

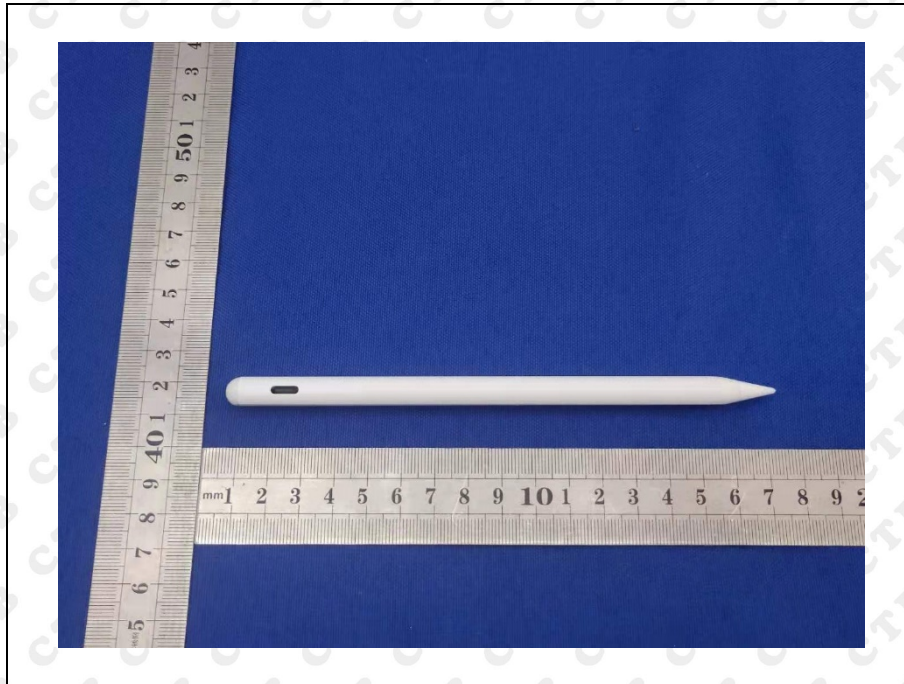
EUT photo 1



EUT photo 2



EUT photo 3



End of report