

Prüfbericht-Nr.: <i>Test report no.:</i>	CN24HRDT 001	Auftrags-Nr.: <i>Order no.:</i>	168497124	Seite 1 von 22 Page 1 of 22
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2024-07-31	
Auftraggeber: <i>Client:</i>	LG Electronics USA, Inc. 111 Sylvan Avenue North Building Englewood Cliffs New Jersey, 07632 United States			
Prüfgegenstand: <i>Test item:</i>	Stylus Pen			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	PEW8 (Trademark: LG)			
Auftrags-Inhalt: <i>Order content:</i>	Test Report			
Prüfgrundlage: <i>Test specification:</i>	CFR47 FCC Part 15: Subpart C Section 15.209			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2024-07-31	Refer to photos document		
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003772389			
Prüfzeitraum: <i>Testing period:</i>	2024-07-31 - 2024-08-22			
Ort der Prüfung: <i>Place of testing:</i>	See Section 2.1			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	genehmigt von: <i>authorized by:</i>			
Datum: <i>Date:</i>	Ausstellungsdatum: <i>Issue date:</i>			
Stellung / Position:	Stellung / Position:			
Sonstiges / FCC ID: BEJSP-PEW8 <i>Other:</i>				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende: P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet * Legend: P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested				
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the above mentioned test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

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Anmerkungen
Remarks

1	Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden. <i>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i>
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3	Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt. <i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.</i> <i>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i>
4	Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezüglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019. <i>The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.</i>

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Test Summary

5.1.1 ANTENNA REQUIREMENT

RESULT: Pass

5.1.2 RADIATED SPURIOUS EMISSION

RESULT: Pass

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1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Photographs of the Test Set-up

2 Test Sites

2.1 Test Facilities

Shenzhen Huaxia Testing Technology Co., Ltd.

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, 518000, China

FCC Registration No.: 522263

ISED Wireless Device Testing Laboratory: 22984

The tests at the test sites have been conducted under the supervision of a TÜV engineer.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Radio Spectrum Testing				
Description	Manufacturer	Model	Serial No.	Cal. Until
Spectrum analyzer	R&S	FSU26	CQA-038	2024/9/7
DC power	KEYSIGHT	E3631A	DC power	2024/9/7
RF Control Unit	Tonsced	JS0806-2	RF Control Unit	2024/9/7
Coaxial Cable (Below 1GHz)	CQA	N/A	Coaxial Cable (Below 1GHz)	2024/9/7
RF Cable (9KHz~40GHz)	CQA	N/A	RF Cable (9KHz~40GHz)	2024/9/7
Temperature& Humidity test chamber	Auchno	OJN-9606	Temperature& Humidity test chamber	2024/9/7
Radiated Emission Testing				
Description	Manufacturer	Model	Serial No.	Cal. Until
Horn Antenna	R&S	HF906	CQA-012	2024/9/15
Bilog Antenna	R&S	HL562	CQA-011	2024/9/15
EMI Test Receiver	R&S	ESR7	CQA-005	2024/9/7
Spectrum analyzer	R&S	FSU26	CQA-038	2024/9/7
Preamplifier	MITEQ	AMF-6D-02001800- 29-20P	CQA-036	2024/9/7
Universal Radio Communication Tester	Rohde & Schwarz	CMW500	CQA-022	2024/9/7
high-low temperature chamber	Auchno	OJN-9606	CQA-S003	2024/9/7
Signal generator	R&S	SME06	CQA-024	2024/9/7
Vector signal generator	R&S	SMBV100A	CQA-039	2024/9/7
DC power	KEYSIGHT	E3631A	CQA-028	2024/9/7

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RF Control Unit	Tonsced	JS0806-2	CQA-057	2024/9/7
Coaxial Cable (Above 1GHz)	CQA	N/A	C007	2024/9/7
Coaxial Cable (Below 1GHz)	CQA	N/A	C013	2024/9/7
RF Cable (9KHz~40GHz)	CQA	N/A	C005	2024/9/7
Loop antenna	SCHWARZBECK	FMZB 1516	Loop antenna	2024/9/15

2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table

Table 2: Measurement Uncertainty

Parameter	Uncertainty (k=2)
Occupied Channel Bandwidth	$\pm 2.08 \%$
All emissions, radiated	$\pm 5.12 \text{ dB}$

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) Co., Ltd. file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The Shenzhen Huaxia Testing Technology Co., Ltd. Test facility located at 1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, 518000, China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3 General Product Information

3.1 Product Function and Intended Use

The product is a Stylus Pen, it can operate with a drawing board through the nib, the frequency of the nib are 18-89KHz, 111-210kHz (Microsoft Pen Protocol). This product has two different colour of enclosure.

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 Ratings and System Details

Table 3: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment:	Stylus Pen
Type Designation:	PEW8
FCC ID:	BEJSP-PEW8
Operating Voltage:	DC 3.85V, 80mAh via built-in battery
Operating Temperature Range:	0 °C ~ 45 °C
Technical Specification of Radio	
Frequency Range:	18-89KHz, 111-210kHz
Type of Modulation:	PWM
Antenna Type:	Integrated antenna
Antenna Gain:	0dBi (provided by client)

Note: This device is too low to measure the actual occupied bandwidth and fundamental emissions, thus 500Hz maximum occupied bandwidth and 37.84 dBμV@3m declared by applicant.

3.3 Independent Operation Modes

The basic operation modes are:

- A. On, Operating
- B. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- | | |
|-------------------------|----------------|
| - Application Form | - User Manual |
| - Operation Description | - Rating Label |

4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5 & 6. All testing were performed according to the procedures in ANSI C63.10: 2013.

According to clause 3.1, all tests were performed on model PEW8 in this report.

4.3 Special Accessories and Auxiliary Equipment

Table 4: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N	Rating
Laptop	LG	16T90SP-XXXXXXK	308PGZU835837	Laptop

4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 30MHz)

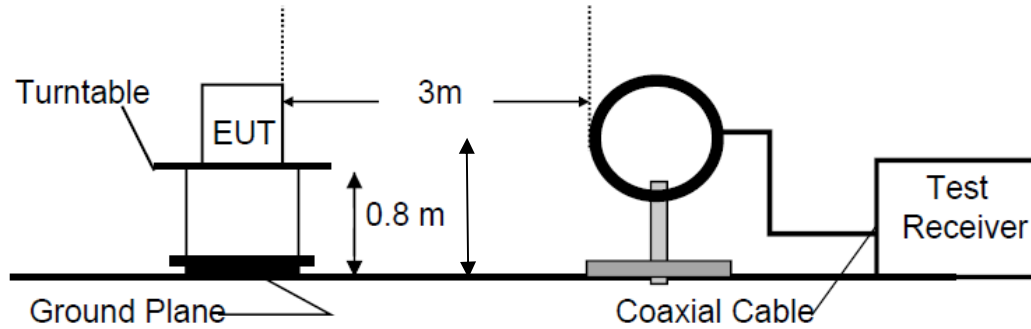
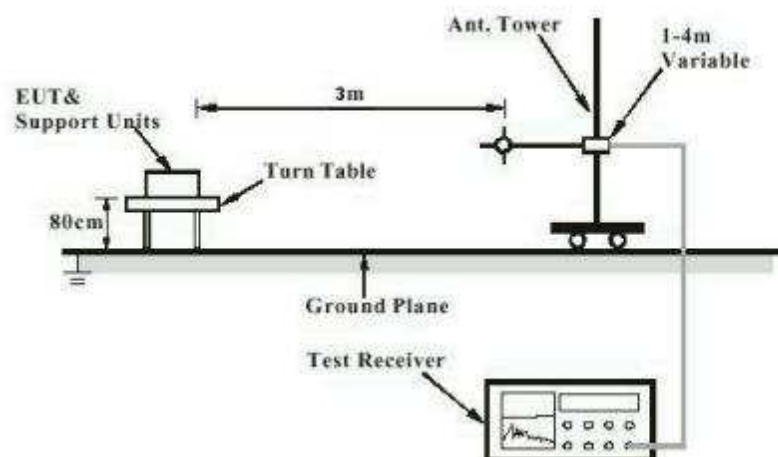


Diagram of Measurement Configuration for Radiation Test (Below 1GHz)



5 Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT:

Pass

Test Specification

Test standard : Part 15.203

According to the manufacturer declared, the EUT has one internal antenna, and the antenna is permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

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5.1.2 Radiated Spurious Emission

RESULT:**Pass****Test Specification**

Test standard	: FCC Part 15.209
Basic standard	: ANSI C63.10: 2013
Limits	: Refer to 15.209(a)
Kind of test site	: 3m Semi-anechoic Chamber

Test Setup

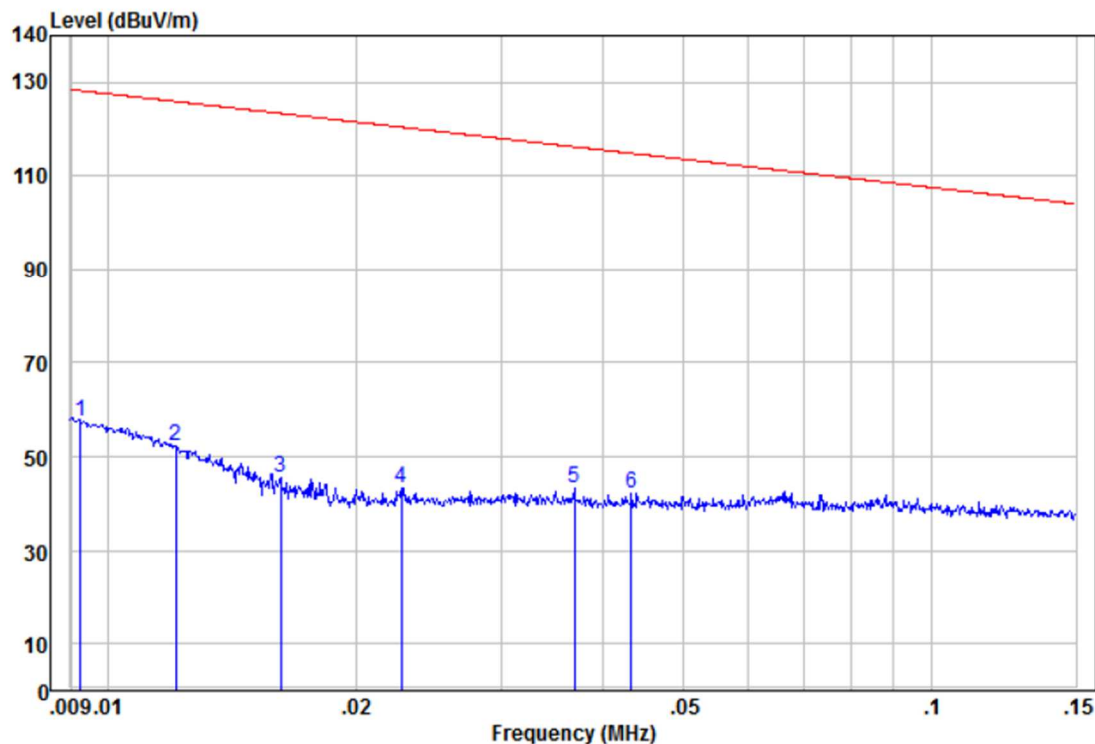
Date of testing	: 2024-07-31 to 2024-08-22
Input voltage	: DC 3.85V
Operation mode	: A
Ambient temperature	: Refer to test data
Relative humidity	: Refer to test data
Atmospheric pressure	: 101 kPa

Remark: Testing was carried out within frequency range 9kHz to the tenth harmonics. Only the worst case spurious emissions configuration of the each mode were reported.

For the measurement records, refer to the following test plots.

EUT Information

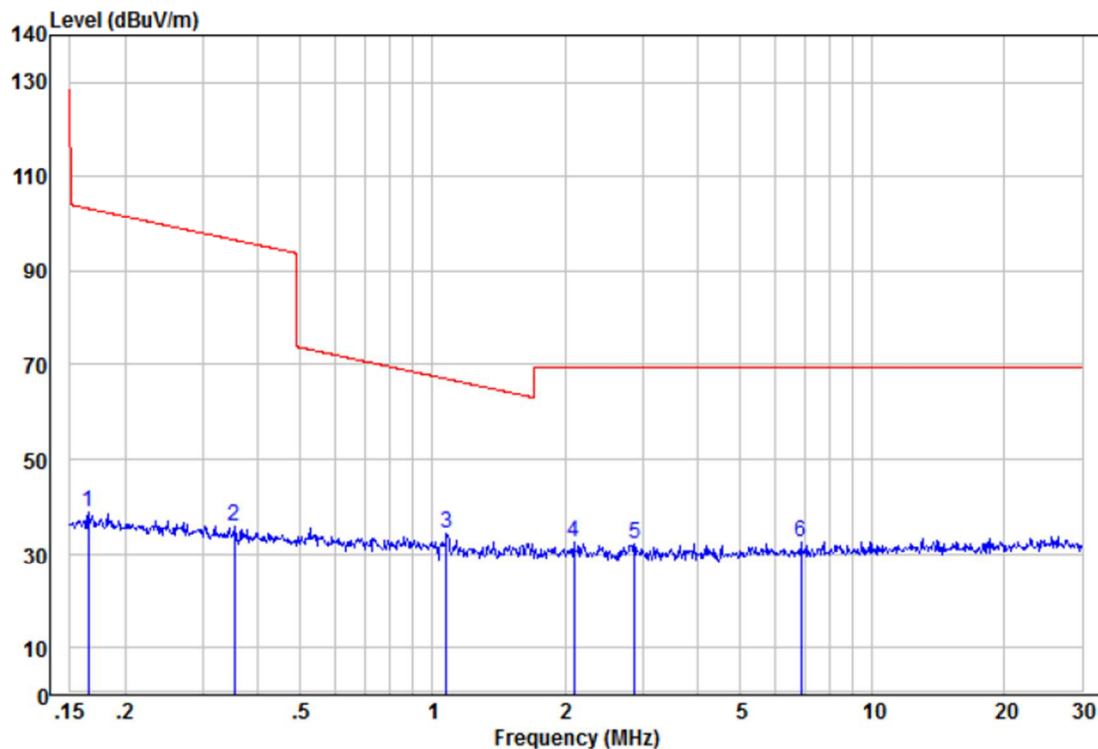
EUT Name:	Stylus Pen
Model:	PEW8
Test Mode:	Operating
Test Voltage::	Battery
Remark:	Temp 23 Humi:45%
Test Standard:	FCC part 15 209
Polarity	X



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1 pp	0.01	37.84	19.69	57.53	128.26	-70.73	Peak
2	0.01	32.52	19.63	52.15	125.94	-73.79	Peak
3	0.02	26.07	19.55	45.62	123.40	-77.78	Peak
4	0.02	23.95	19.51	43.46	120.46	-77.00	Peak
5	0.04	23.60	19.57	43.17	116.26	-73.09	Peak
6	0.04	22.55	19.58	42.13	114.87	-72.74	Peak

EUT Information

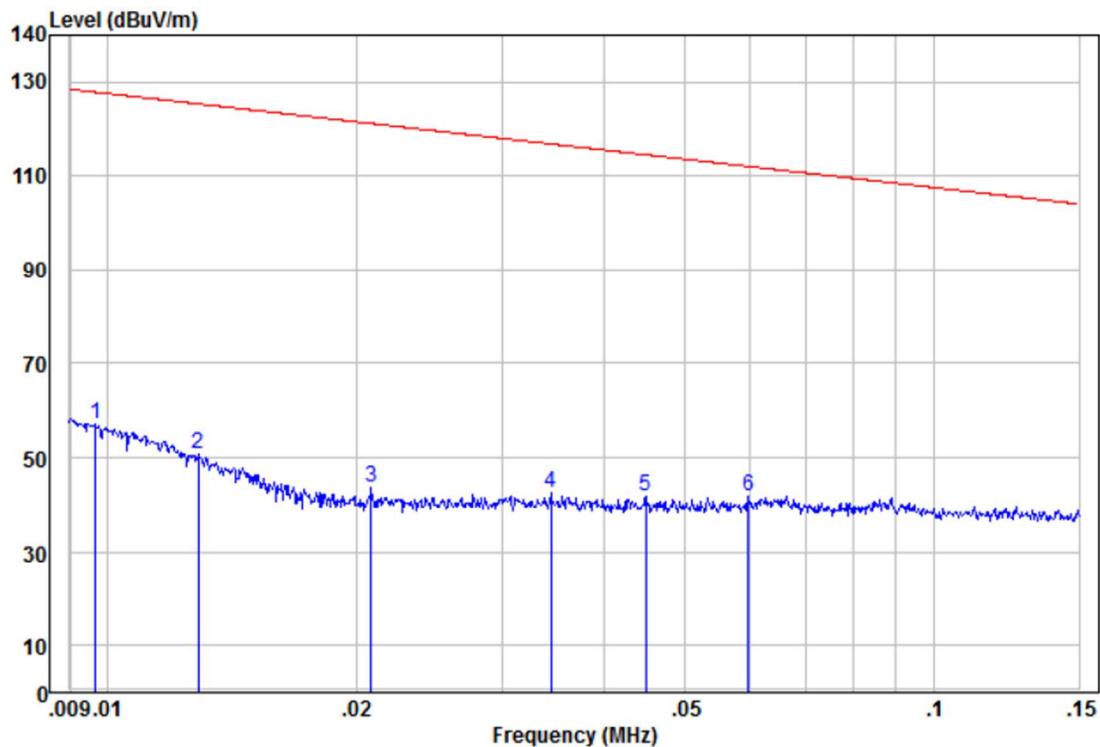
EUT Name: Stylus Pen
Model: PEW8
Test Mode: Operating
Test Voltage:: Battery
Remark: Temp 23 Humi:45%
Test Standard: FCC part 15 209
Polarity: X



		Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	0.18	19.64	19.51	39.15	102.28	-63.13	Peak
2	0.35	16.95	19.63	36.58	96.72	-60.14	Peak
3	0.57	15.12	19.73	34.85	72.53	-37.68	Peak
4	1.07	14.02	19.91	33.93	67.03	-33.10	Peak
5 pp	1.63	13.36	19.97	33.33	63.40	-30.07	Peak
6	3.38	12.53	19.85	32.38	69.50	-37.12	Peak

EUT Information

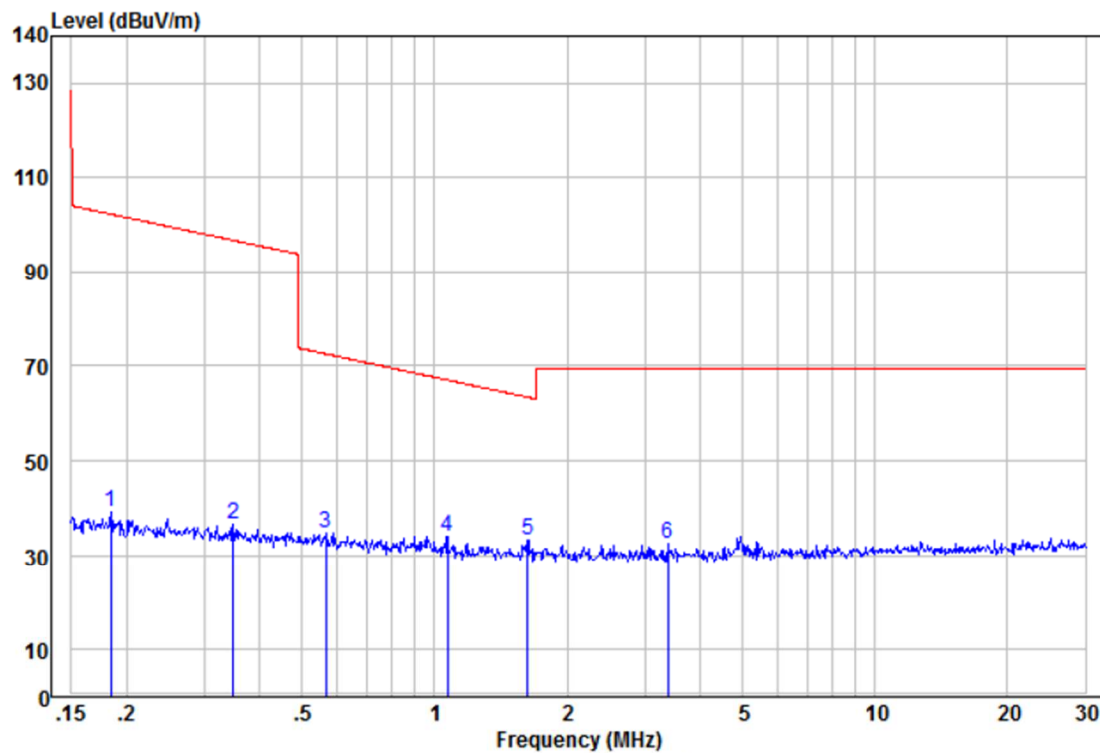
EUT Name: Stylus Pen
Model: PEW8
Test Mode: Operating
Test Voltage:: Battery
Remark: Temp 23 Humi:45%
Test Standard: FCC part 15 209
Polarity: Y



	Freq	Read		Limit	Over	
	MHz	Level	Factor	Level	Line	Limit Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB
1	0.01	37.44	19.68	57.12	127.86	-70.74 Peak
2	0.01	31.11	19.61	50.72	125.40	-74.68 Peak
3	0.02	24.17	19.50	43.67	121.20	-77.53 Peak
4	0.03	23.11	19.56	42.67	116.85	-74.18 Peak
5	0.04	22.16	19.59	41.75	114.55	-72.80 Peak
6 pp	0.06	22.22	19.64	41.86	112.06	-70.20 Peak

EUT Information

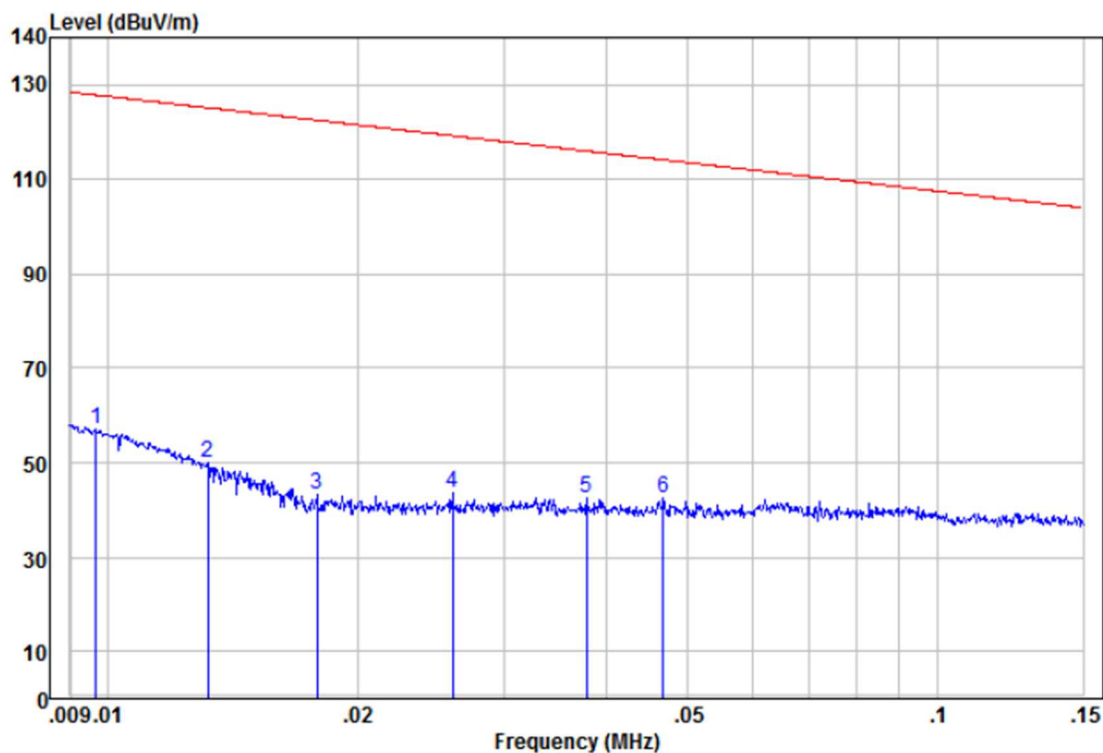
EUT Name: Stylus Pen
Model: PEW8
Test Mode: Operating
Test Voltage:: Battery
Remark: Temp 23 Humi:45%
Test Standard: FCC part 15 209
Polarity: Y



		Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	0.18	19.64	19.51	39.15	102.28	-63.13	Peak
2	0.35	16.95	19.63	36.58	96.72	-60.14	Peak
3	0.57	15.12	19.73	34.85	72.53	-37.68	Peak
4	1.07	14.02	19.91	33.93	67.03	-33.10	Peak
5 pp	1.63	13.36	19.97	33.33	63.40	-30.07	Peak
6	3.38	12.53	19.85	32.38	69.50	-37.12	Peak

EUT Information

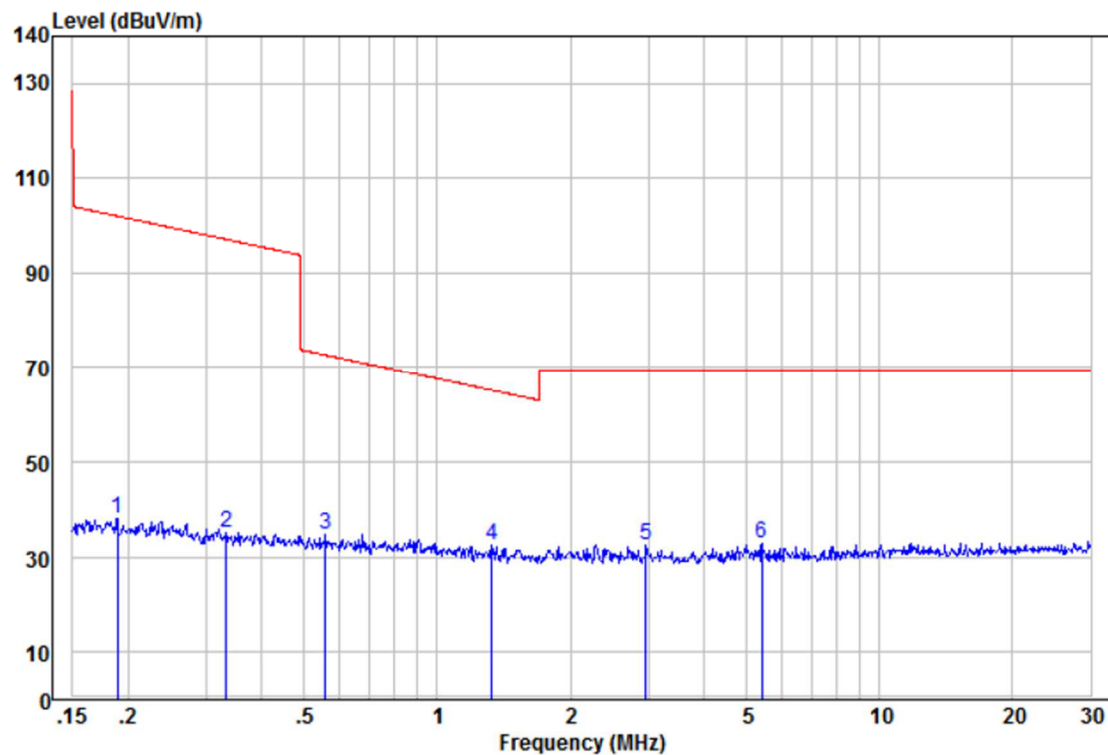
EUT Name: Stylus Pen
Model: PEW8
Test Mode: Operating
Test Voltage:: Battery
Remark: Temp 23 Humi:45%
Test Standard: FCC part 15 209
Polarity: Z



		Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	pp	0.01	37.41	19.68	57.09	127.86	-70.77 Peak
2		0.01	30.44	19.60	50.04	125.18	-75.14 Peak
3		0.02	23.96	19.53	43.49	122.54	-79.05 Peak
4		0.03	24.03	19.53	43.56	119.27	-75.71 Peak
5		0.04	22.97	19.57	42.54	116.04	-73.50 Peak
6		0.05	22.92	19.59	42.51	114.19	-71.68 Peak

EUT Information

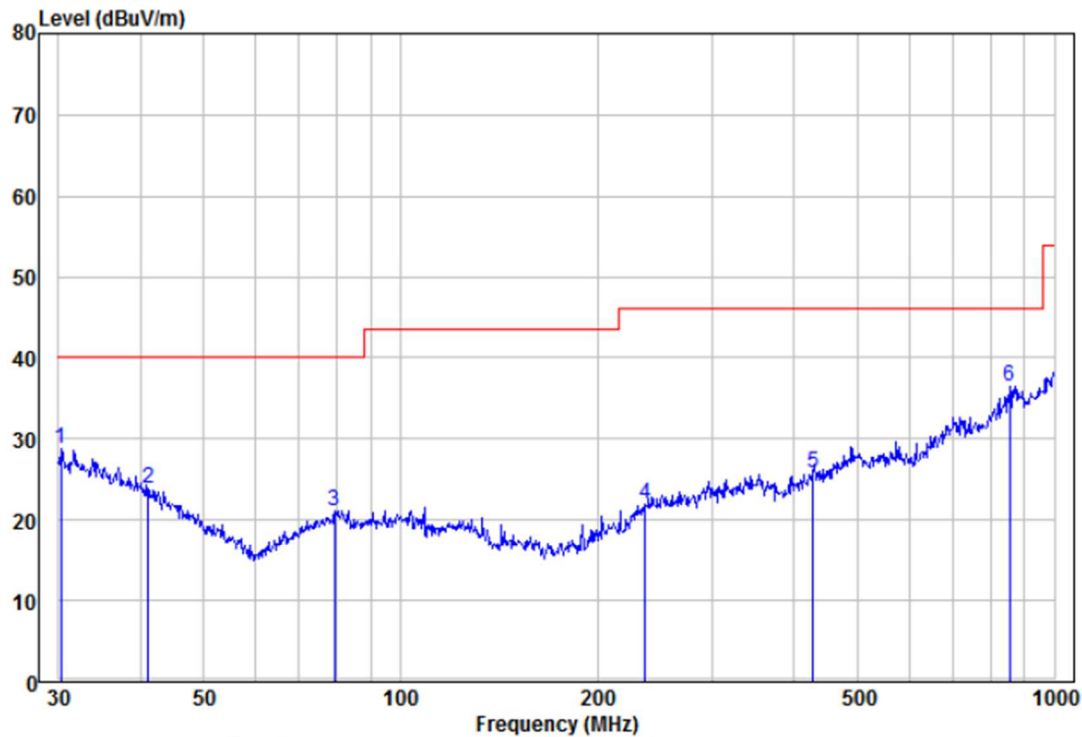
EUT Name: Stylus Pen
Model: PEW8
Test Mode: Operating
Test Voltage:: Battery
Remark: Temp 23 Humi:45%
Test Standard: FCC part 15 209
Polarity: Z



	Read			Limit	Over	
Freq	Level	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	0.19	18.61	19.51	38.12	102.05	-63.93 Peak
2	0.33	15.52	19.62	35.14	97.13	-61.99 Peak
3	0.56	14.98	19.73	34.71	72.67	-37.96 Peak
4 pp	1.33	12.56	19.94	32.50	65.15	-32.65 Peak
5	2.96	12.57	19.90	32.47	69.50	-37.03 Peak
6	5.42	13.11	19.73	32.84	69.50	-36.66 Peak

EUT Information

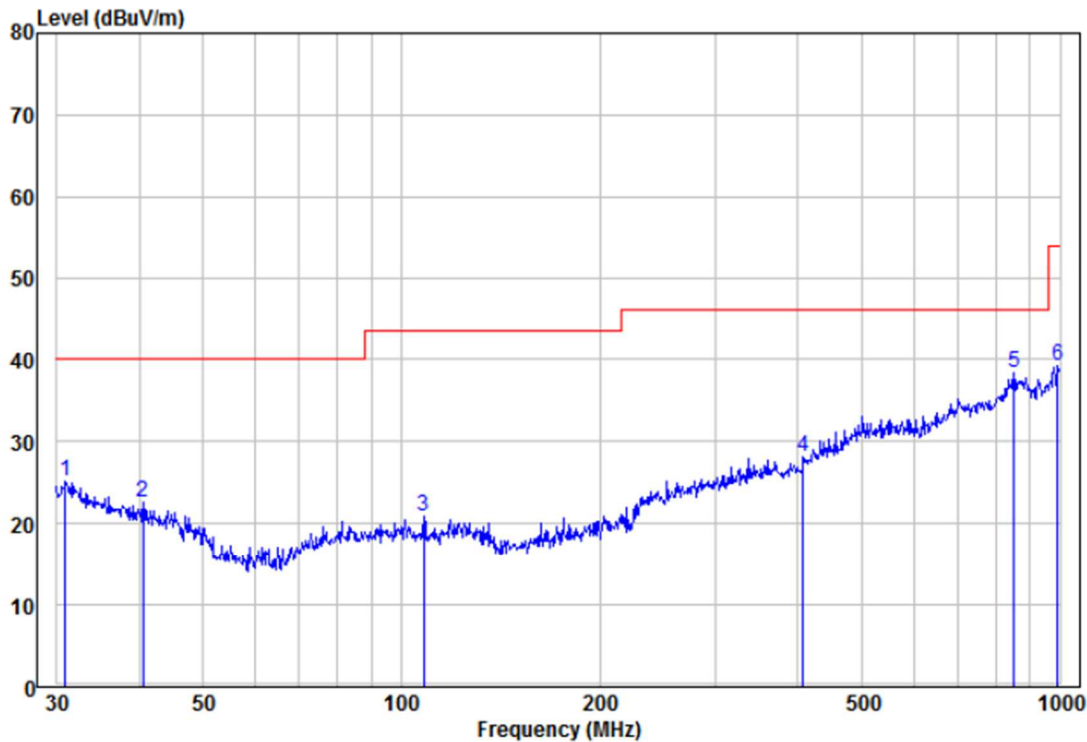
EUT Name: Stylus Pen
Model: PEW8
Test Mode: Operating
Test Voltage:: Battery
Remark: Temp 24.3 Humi:48.4%
Test Standard: FCC part 15 209



		Read		Limit	Over			
	Freq	Level	Factor	Level	Line	Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	30.21	12.69	16.03	28.72	40.00	-11.28	Peak	HORIZONTAL
2	41.13	10.96	12.93	23.89	40.00	-16.11	Peak	HORIZONTAL
3	79.24	10.63	10.59	21.22	40.00	-18.78	Peak	HORIZONTAL
4	236.64	9.30	12.72	22.02	46.00	-23.98	Peak	HORIZONTAL
5	428.02	7.92	17.83	25.75	46.00	-20.25	Peak	HORIZONTAL
6 pp	854.02	9.74	26.82	36.56	46.00	-9.44	Peak	HORIZONTAL

EUT Information

EUT Name: Stylus Pen
Model: PEW8
Test Mode: Operating
Test Voltage:: Battery
Remark: Temp 24.3 Humi:48.4%
Test Standard: FCC part 15 209



	Freq	Read		Limit	Over			
	MHz	Level	Factor	Level	Line	Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	30.85	9.20	15.90	25.10	40.00	-14.90	Peak	VERTICAL
2	40.56	9.40	13.21	22.61	40.00	-17.39	Peak	VERTICAL
3	108.27	9.45	11.40	20.85	43.50	-22.65	Peak	VERTICAL
4	407.51	11.07	17.13	28.20	46.00	-17.80	Peak	VERTICAL
5 pp	851.04	11.49	26.81	38.30	46.00	-7.70	Peak	VERTICAL
6	993.01	11.73	27.52	39.25	54.00	-14.75	Peak	VERTICAL

6 Photographs of the Test Set-Up

For photographs of the test set-up, refer to the appendix A.

7 List of Tables

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